



Memory and Realtime Log

Multiple Propagation Resistivity
Gamma Ray

Scale: **Company: Anadarko**

1:240 **Well: Russian Fiddler 37N-18HZ**

Measured Depth **Field: Weld County (Kerr McGee)**

County: Continental US State: Colorado

Status: **Final Print** Surface Location: **Other Services:**

API Number: **05-123-36227** Latitude: **40° 7' 3.324" N** Longitude: **104° 42' 21.942" W**

SEC: 19 TWP: 2N RNC: 6SE

Directional
VSS

Permanent Datum (P.D.): **Ground Level** Elevation: **4988.00 ft.**

Log Measured From: **Rig Floor** 17.00 ft. Above P.D.

Driller's Depth

Elevations: **N/A**
KB: **5005.00 ft.**
DF: **4988.00 ft.**
GL: **4988.00 ft.**

Interval Logged Dates Magnetic Field Reference

Top: **6585.0 ft.** Date From: **14/Apr/13** Dip Angle: **66.88°** Azi Reference North: **True**

Bottom: **12711.0 ft.** Date To: **20/Apr/13** Total Mag to Reference

Spud Date: **14/Apr/13** Field Strength: **52926.0 nT** North Correction: **8.43°**

Borehole Record Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	0.0 ft.	1033.0 ft.	9.625 in.	36.00 lb/ft	Surface	1029.0 ft.
8.750 in.	1033.0 ft.	7799.0 ft.	7.000 in.	26.00 lb/ft	Surface	7791.0 ft.
6.125 in.	7799.0 ft.	12711.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based Mud	Surface	12711.0 ft.	13.500 in.	1033.0 ft.	0.0° / 0.0°	0.2° / 195.2°
			8.750 in.	6770.0 ft.	0.2° / 192.0°	95.3° / 354.2°
			6.125 in.	4918.3 ft.	94.5° / 354.2°	89.6° / 358.3°
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig:	Xtreme 6	/ Xtreme Coil Drilling
PATS	6.4.1.34	Job No:	5325374	
		District / Unit:	RMD	/ D & E

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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. Time (hrs.)
							Top	Bottom	From	To	Start	End	
							(ft.)	(ft.)	(ft.)	(ft.)			
1	1	2	8.750	PDC Core	0.500	Steerable	6585.0	7799.0	1033.0	7799.0	14/Apr/2013 14:15	16/Apr/2013 14:15	41.2
2	2	3	6.125	PDC Core	0.500	Steerable	7756.0	12711.0	7799.0	12711.0	18/Apr/2013 16:15	20/Apr/2013 13:15	45.7

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Donald Delay	14/Apr/2013	21/Apr/2013	Matthew Delmore	13/Apr/2013	21/Apr/2013	Gregory Wheeler Jr.	13/Apr/2013	14/Apr/2013

Mud Properties Record

Date / Time	LWD	Measured	Mud	Density	Viscosity	pH	Fluid	Oil /	Source	Total	K+
	Run No.	Depth (ft.)	Type	(ppg)	(cp)		Loss (cc)	Water		Chlorides (ppm)	(%)
15/Apr/2013 09:00	1	3745.0	Water Based Mud	8.5	28	8.5	N/A	0.0/98.7	Suction Line	1100	N/A
15/Apr/2013 15:00	1	5959.0	Water Based Mud	9.2	32	8.0	18.0	0.0/94.5	Suction Line	1200	N/A
15/Apr/2013 22:00	1	6773.0	Water Based Mud	9.8	38	8.0	8.0	0.0/92.0	Suction Line	1300	N/A
16/Apr/2013 20:00	1	7799.0	Water Based Mud	10.2	42	8.5	5.2	0.5/89.5	Active Pit	2600	N/A
18/Apr/2013 13:00	2	7799.0	Water Based Mud	9.6	36	8.5	6.4	0.5/93.0	Suction Line	2800	N/A
18/Apr/2013 22:00	2	8320.0	Water Based Mud	9.9	40	8.5	6.0	0.75/92.0	Active Pit	2600	N/A
19/Apr/2013 5:30	2	9279.0	Water Based Mud	9.7	40	8.0	6.0	1.0/92.0	Suction Line	2900	N/A
19/Apr/2013 12:30	2	10176.0	Water Based Mud	9.7	43	8.0	5.6	1.5/90.5	Suction Line	2800	N/A
19/Apr/2013 22:30	2	11322.0	Water Based Mud	9.7	44	8.0	5.2	1.5/90.75	Suction Line	3000	N/A

Mud Resistivity Record				Surface				Downhole			
Date / Time		LWD Run No.	Measured Depth (ft.)	Surface Temp (deg F)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg F)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
18/Apr/2013	16:16	2	7799.0	83	0.92	N/A	N/A	199	0.39	N/A	N/A
18/Apr/2013	18:14	2	7962.0	80	0.93	N/A	N/A	183	0.42	N/A	N/A
18/Apr/2013	23:43	2	8486.0	79	0.97	N/A	N/A	193	0.41	N/A	N/A
19/Apr/2013	05:41	2	9187.0	79	1.01	N/A	N/A	204	0.41	N/A	N/A
19/Apr/2013	16:54	2	10704.0	78	1.00	N/A	N/A	218	0.37	N/A	N/A
20/Apr/2013	05:19	2	11896.0	73	1.01	N/A	N/A	228	0.34	N/A	N/A

Mnemonics		
Curve	Description	Units
CACHM	Conductivity (AT) (LS) 2 MHZ – Compensated Borehole Corrected	mho/o
GRAM	Gamma Ray Apparent, 0.5 ft. Avg	API
GRAX	Gamma Ray Apparent, 0.5 ft. Avg	API
GRIM	Gamma Ray Data Density	points
GRIX	Gamma Ray Data Density	points
RACHM	Resistivity, Attenuation (LS) 2 MHZ – Compensated Borehole Corrected	ohm.m
RACLM	Resistivity, Attenuation (LS) 400 kHz – Compensated Borehole Corrected	ohm.m
ROPA	Rate of Penetration, 3.0 ft. Avg	ft/hr
RPCHM	Resistivity Phase Difference (LS) 2 MHZ – Compensated Borehole Corrected	ohm.m
RPCLM	Resistivity, Phase Difference (LS) 400 kHz – Compensated Borehole Corrected	ohm.m
RPSIHM	Resistivity Slide Indicator	unitless
RPTHM	Time Since Drilled (RPCHM)	min

Equipment and Service Data						
LWD	Tool	Serial	Measurement	Bit	Max	Min
Run		Number		Offset	O.D.	I.D.
No.				(ft)	(in.)	(in.)
1	BIT	10777404	Bit Length	17.75	0.750	3.000

	DIR	12373461	Directional	47.35	6.750	3.250
1	SRIG	12376056	Gamma	43.98	6.750	3.250
2	CS	10432076	-	74.70	4.843	2.569
2	BCPM	11580381	Telemetry	63.70	4.843	2.569
2	STAB	11938368	-	60.51	0.000	2.569
2	OTK	11843941	Directional	56.03	4.843	2.569
2	OTK	11843941	Resistivity	50.06	4.843	2.569
2	OTK	11843941	Gamma	42.87	4.843	2.569
2	OTK	11843941	Pressure	45.50	4.843	2.569
2	CS	12031348	-	37.74	4.843	2.569

Service and Tool Mnemonics


Mnemonic	Name	Description
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

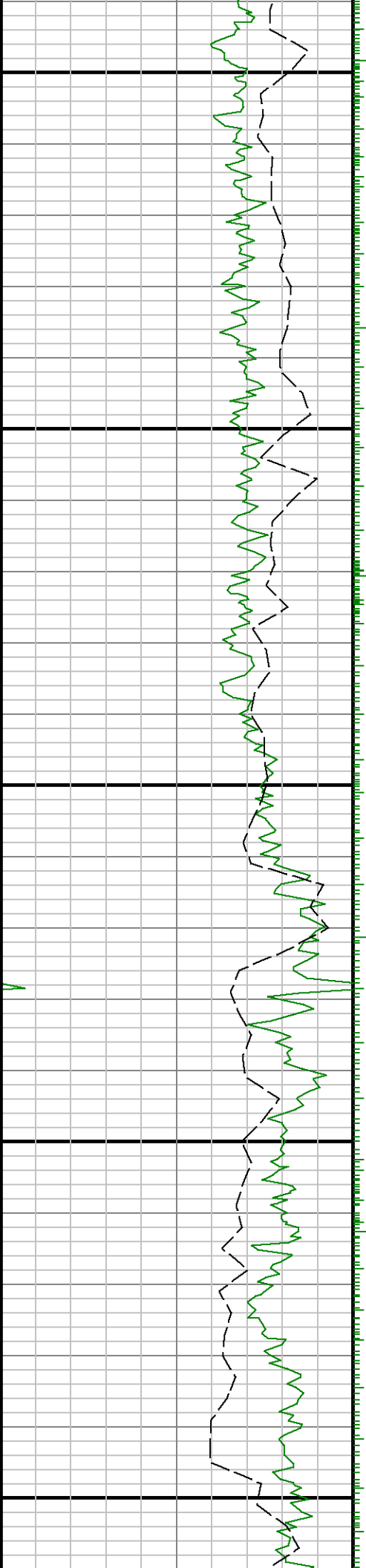
Comments

<p>1) Baker Hughes INTEQ run 1 utilized 6 3/4 inch NaviTrak and NaviGamma Services. NaviTrak services (VSS, Directional) were provided behind an 8 3/4 inch bit and steerable assembly from 1033 to 6635 ft MD (1032.96 to 6538.68 ft TVD). NaviGamma services (VSS, Directional, Gamma Ray) were provided behind an 8 3/4 inch bit and steerable assembly from 6585 to 7799 ft MD (6488.72 to 7230.51 ft TVD).</p> <p>2) Baker Hughes INTEQ Run 2 utilized 4 3/4 inch OnTrak Services (Multiple Propagation Resistivity, Gamma Ray, Azimuthal Gamma Ray, VSS, Directional) behind an 6 1/8 inch bit and steerable assembly from 7799 to 12711 feet MD (7230.51 to 7235.55 feet TVD).</p> <p>3) A sliding indicator is shown to the right of track 2 as a heavy red line. The indicator has been depth-shifted to the resistivity sensor offset to correspond with data acquired while sliding.</p> <p>4) Depth measurements were obtained from a depth tracking system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes LWD logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.</p>

Remarks

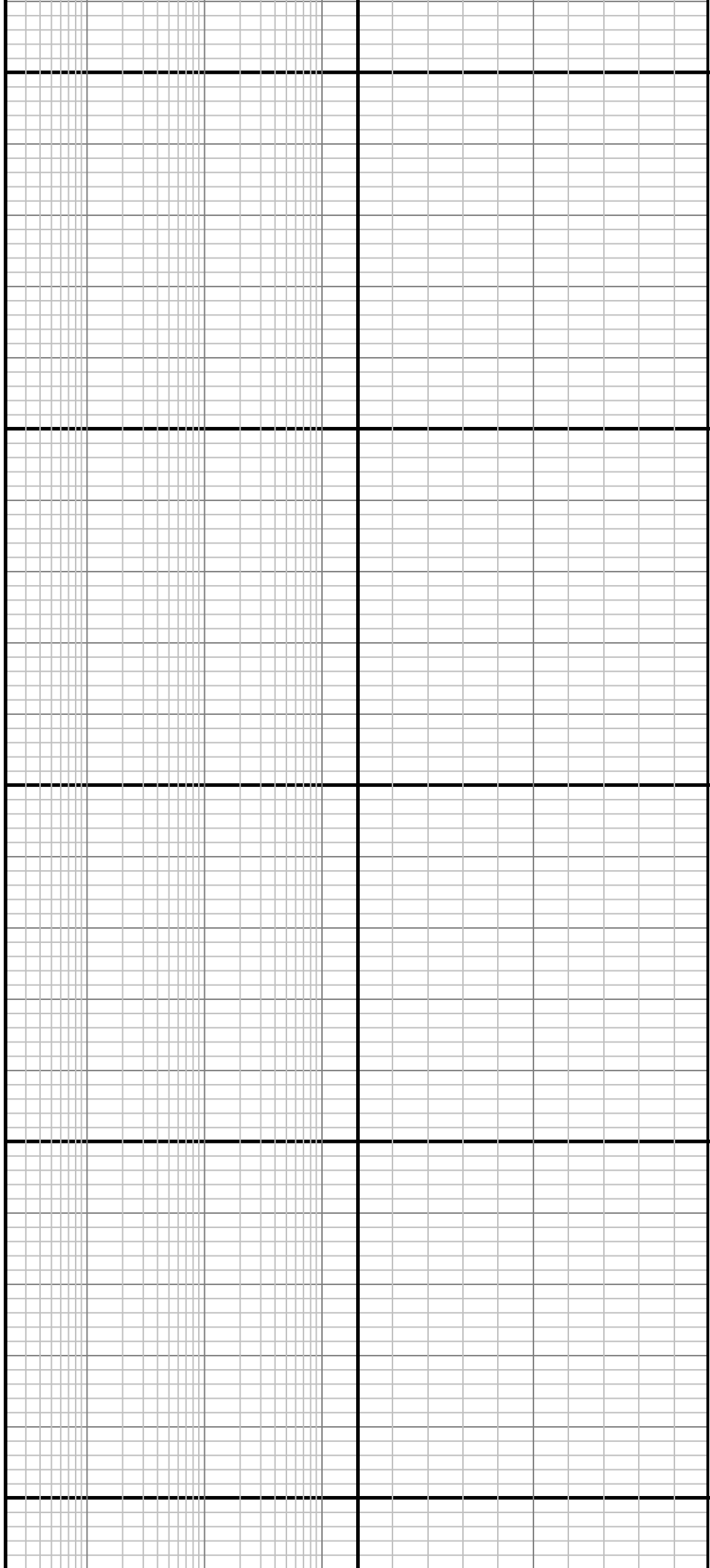
Number	Measured Depth (ft)	Hole Section (in.)	LWD Run No.	Remark
1	12688	6.125	2	The interval from 12666 to 12711 ft MD (7235.19 to 7235.55 ft TVD) contains no Gamma or Resistivity logging data due to sensor to bit offset at the end of the run.

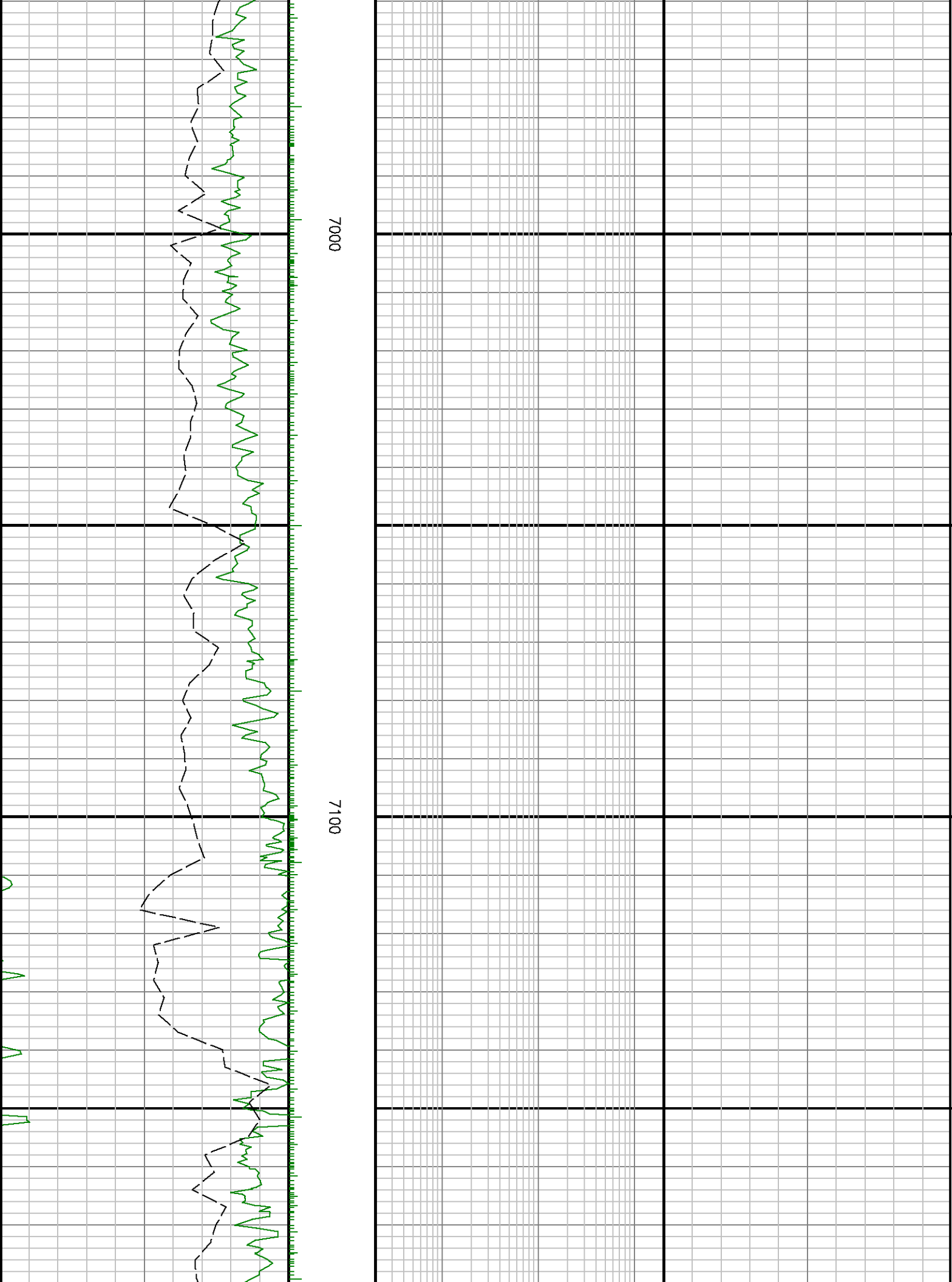
<div></div> <div>Company : Anadarko Well : Russian Fiddler 37N-18HZ Interval : 6555.00 - 12745.00 feet Created : 21/Apr/2013 10:58:06 AM</div>							
Gamma Ray Apparent 0.5 ft Avg GRAX		MD feet 1	Res PD LS 2MHz Corr RPCHM		Con AT LS 2MHz Corr CACHM		
0	150		0.2	200	100	0	
API			ohm.m		mmho/m		

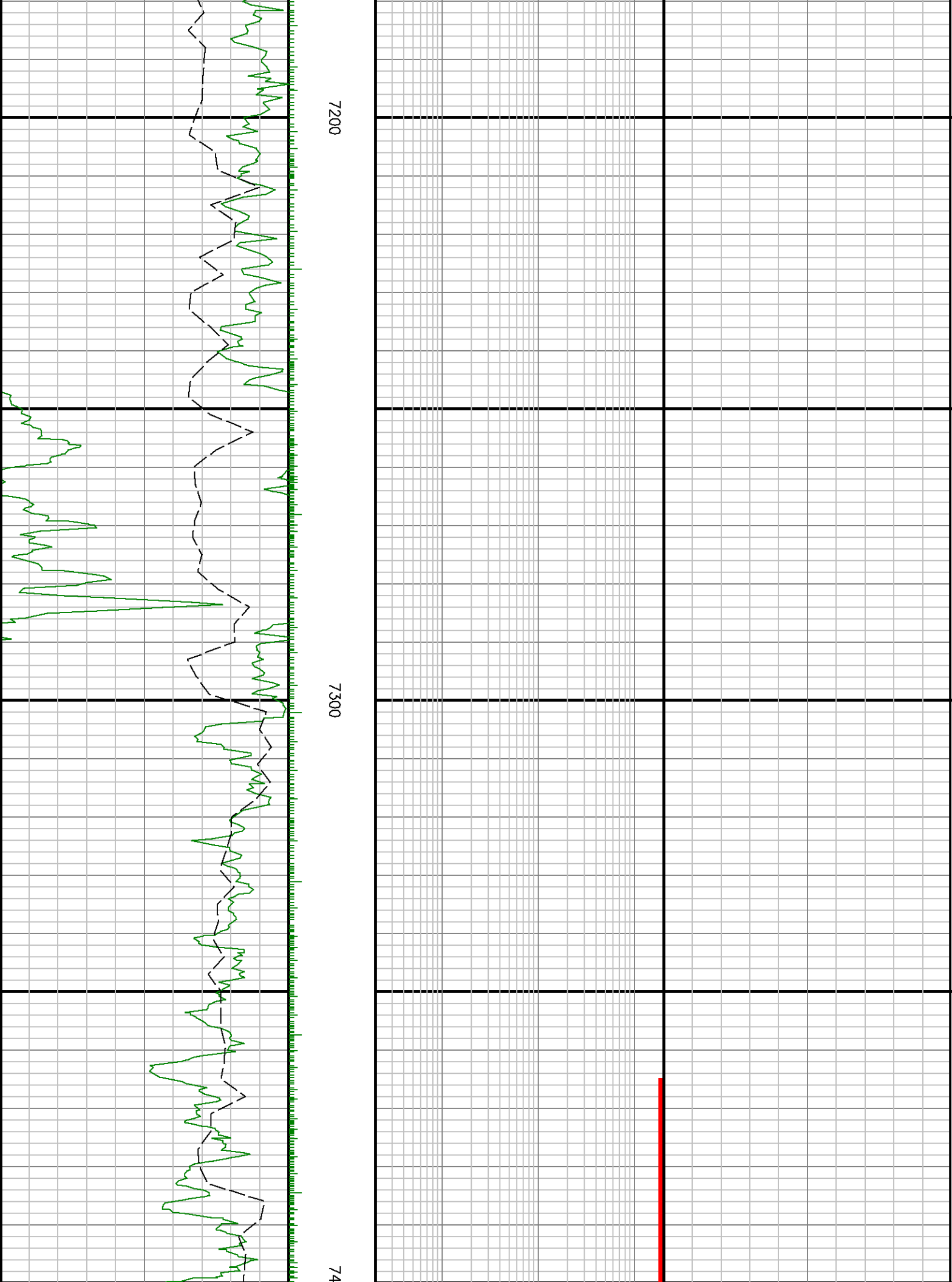


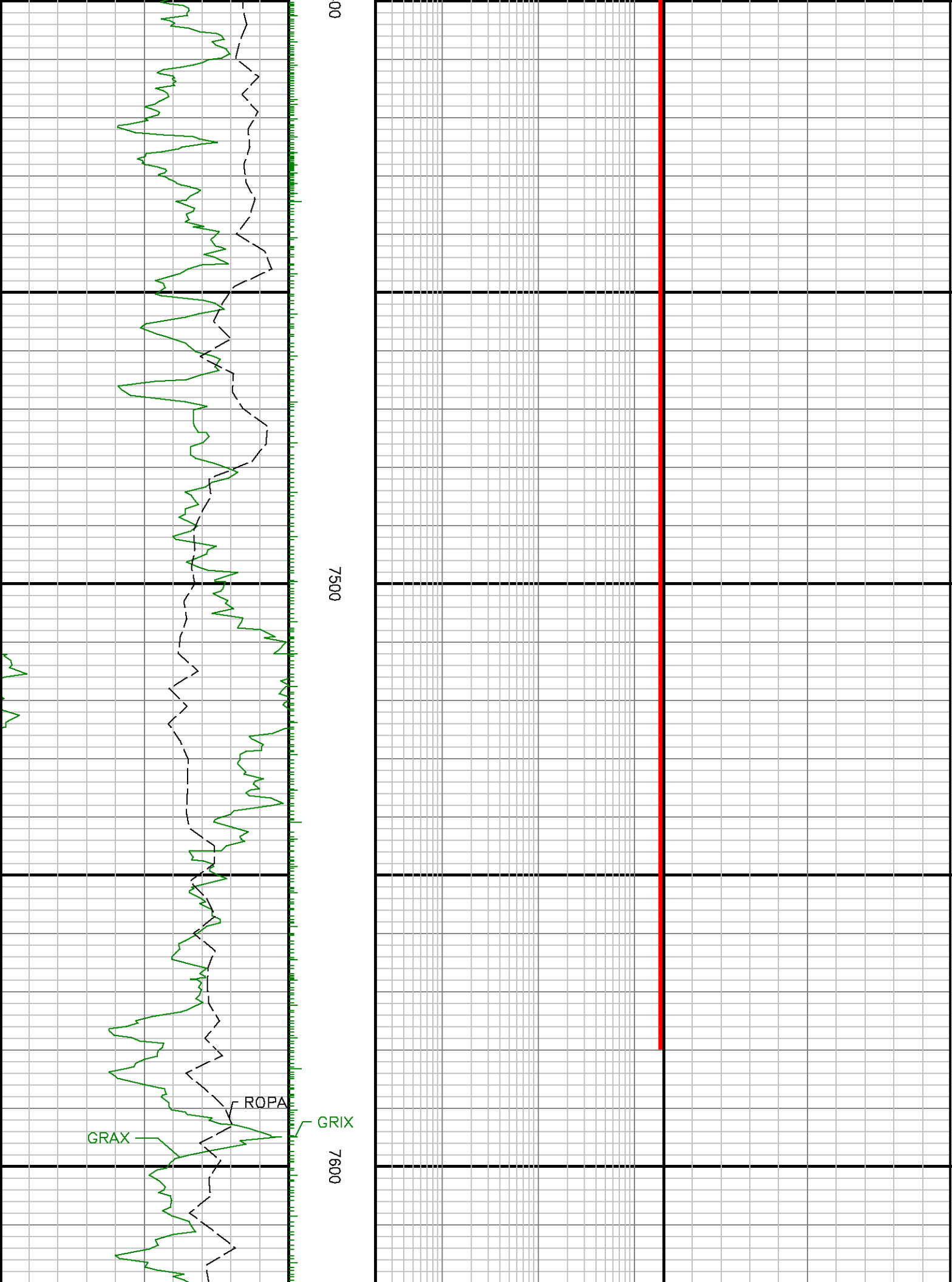
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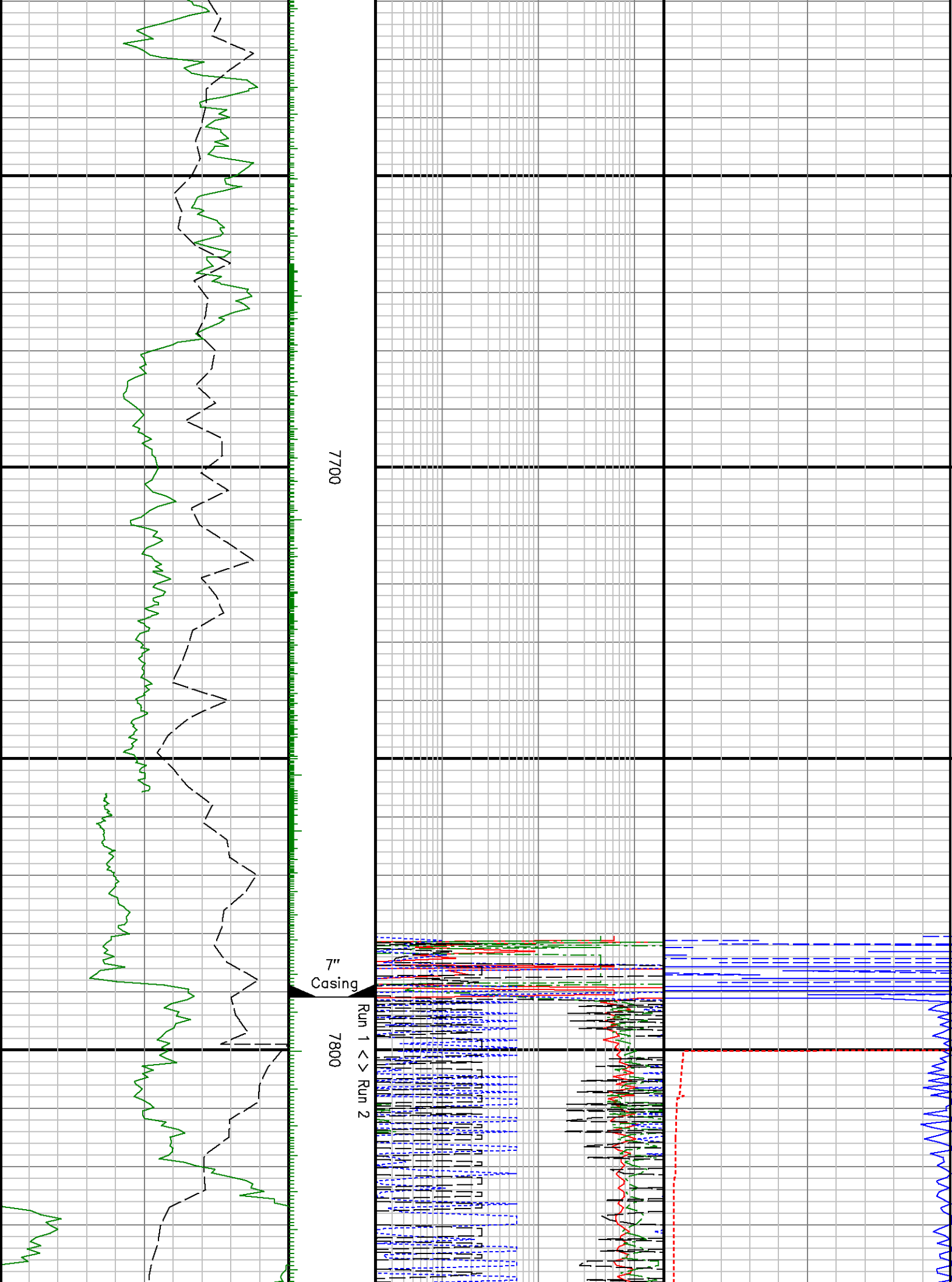
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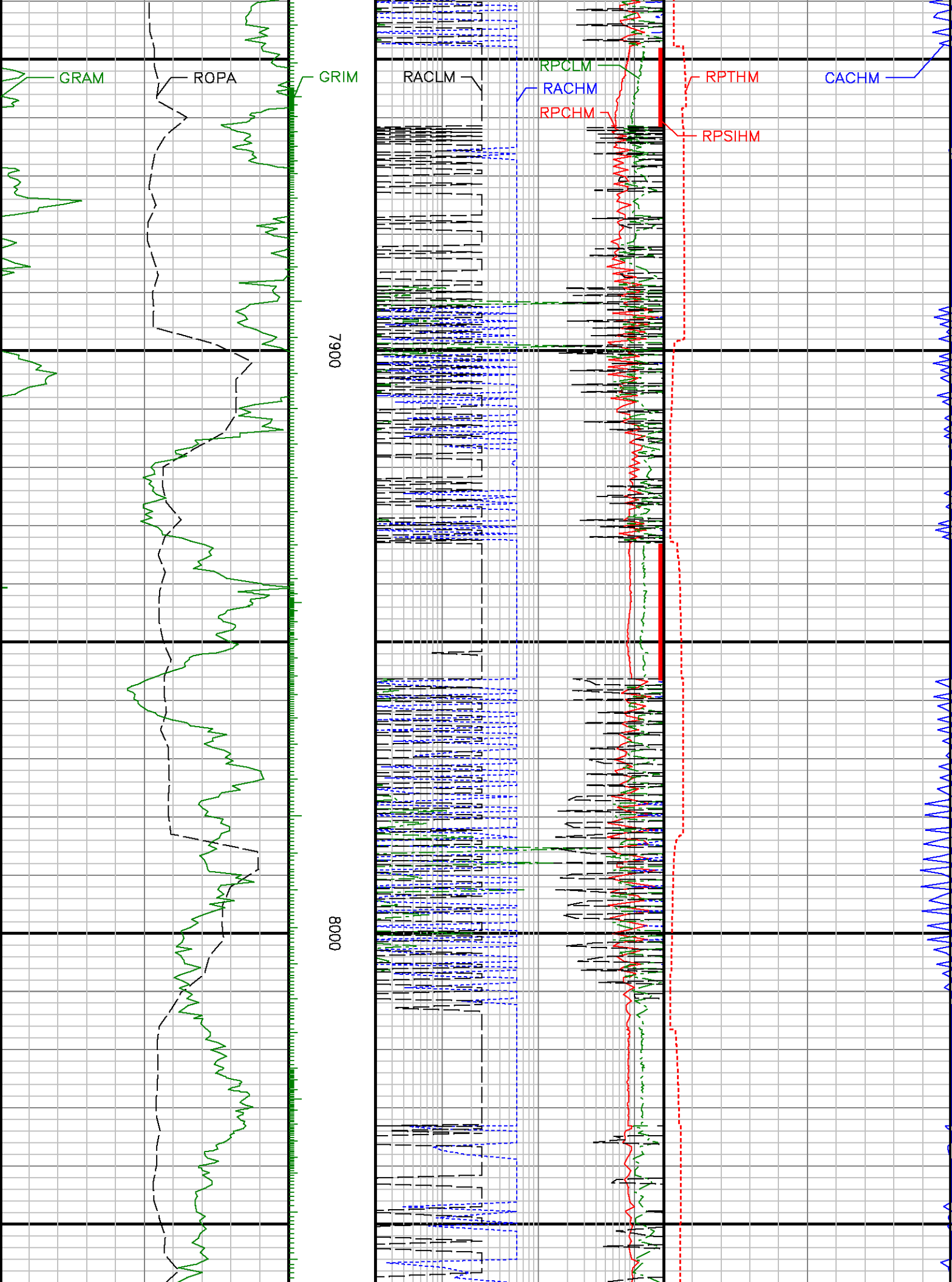


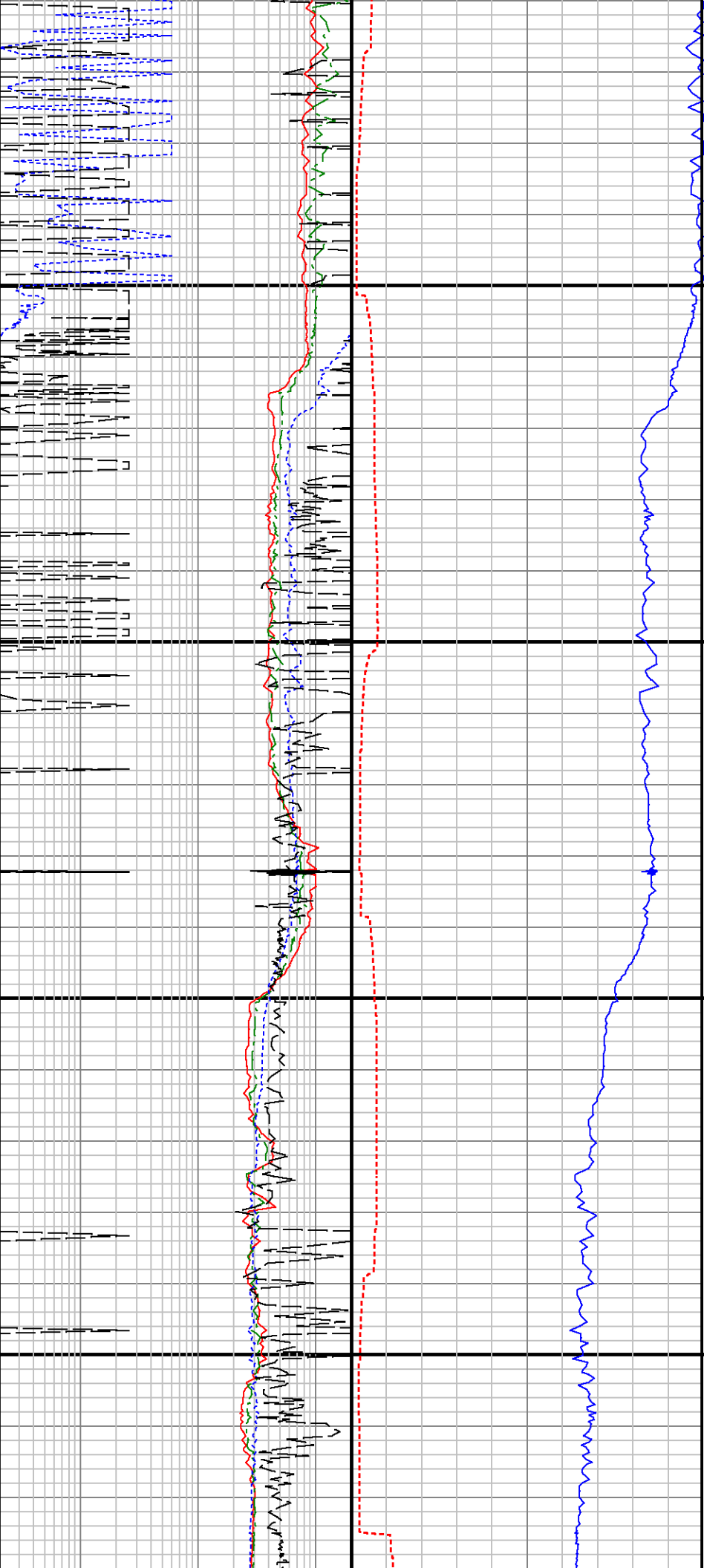






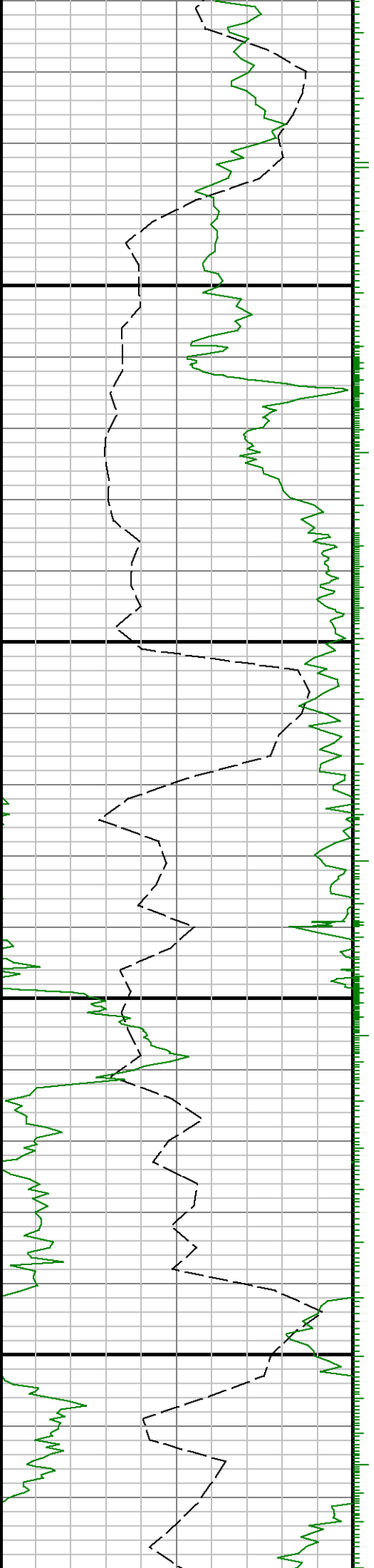


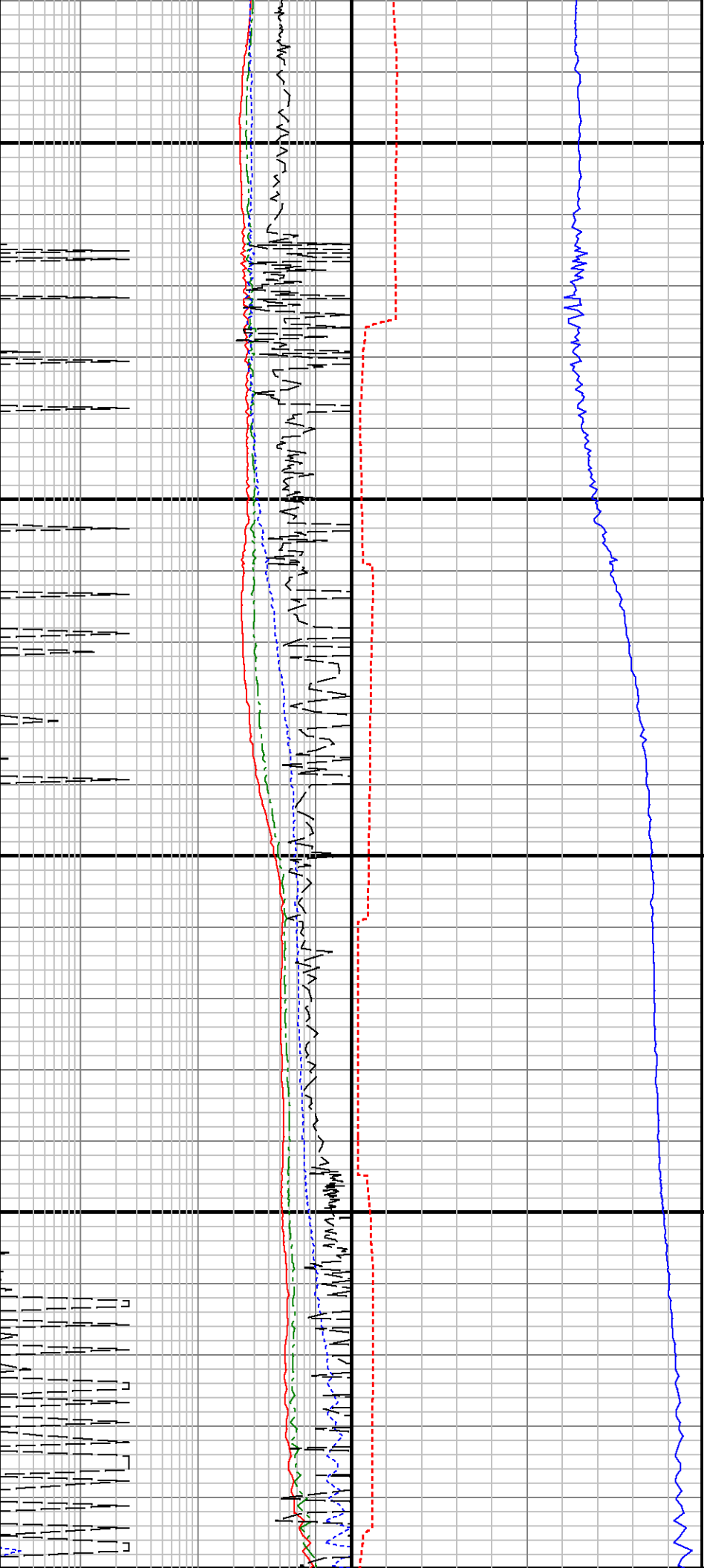




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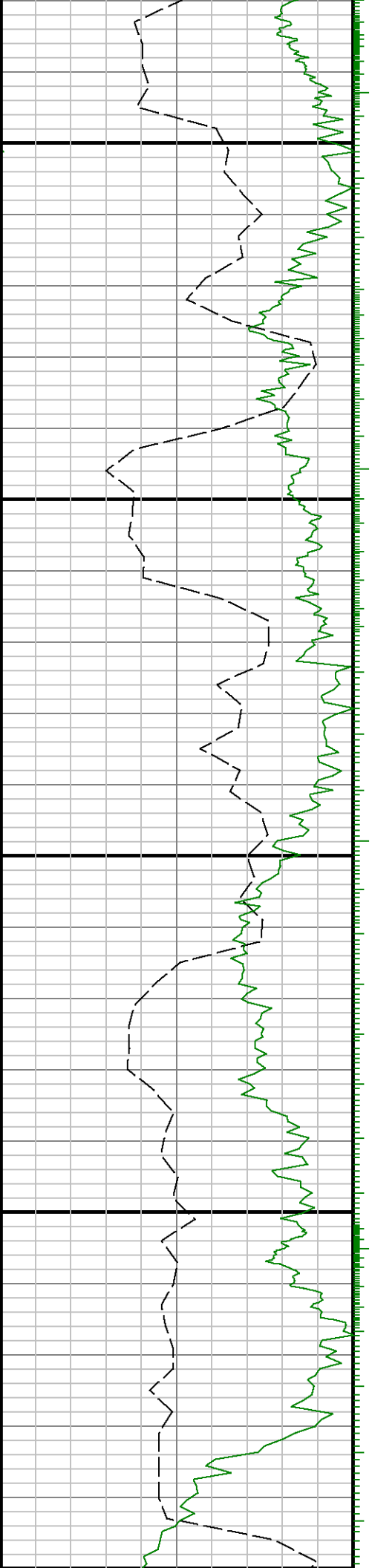


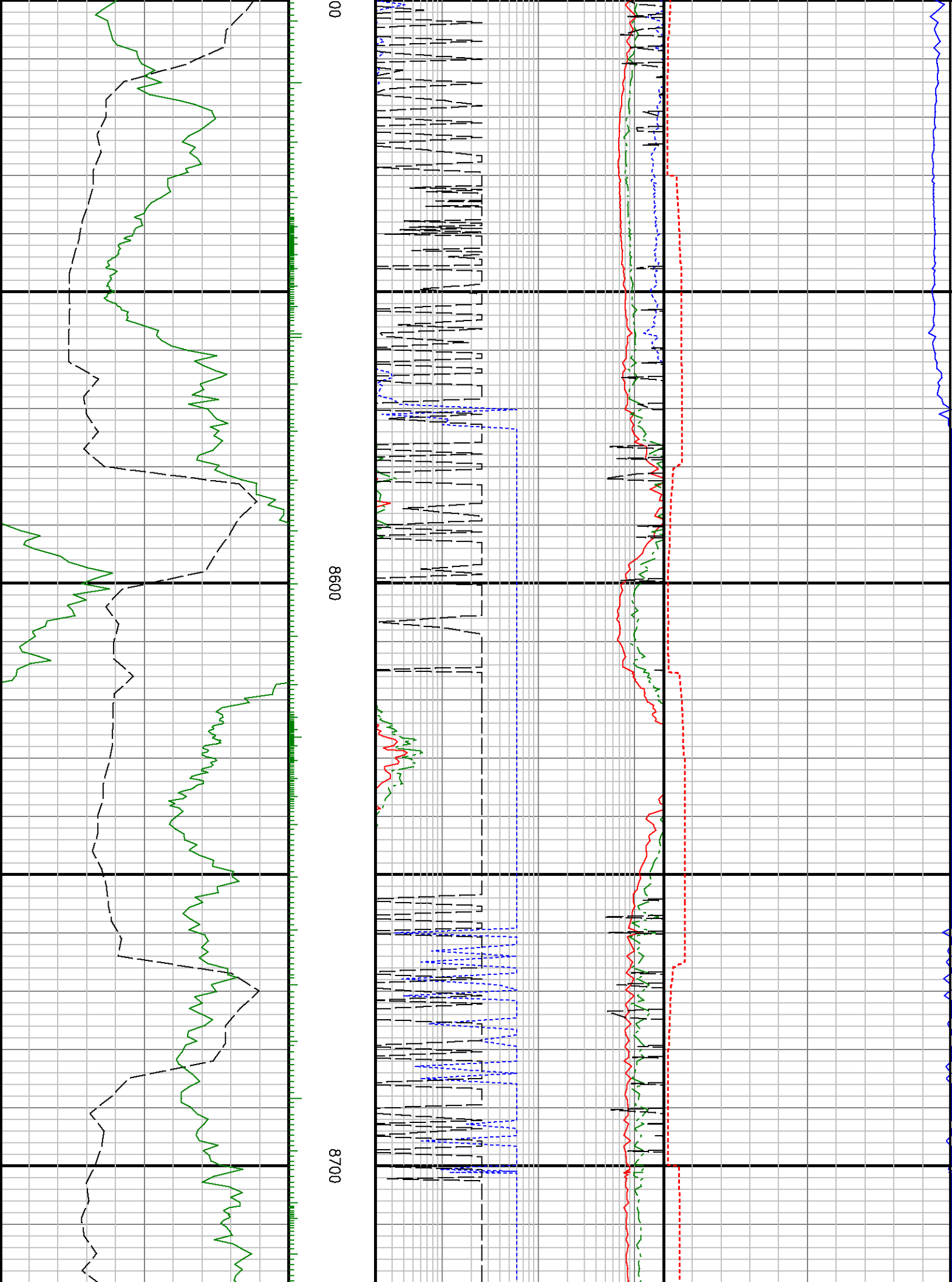


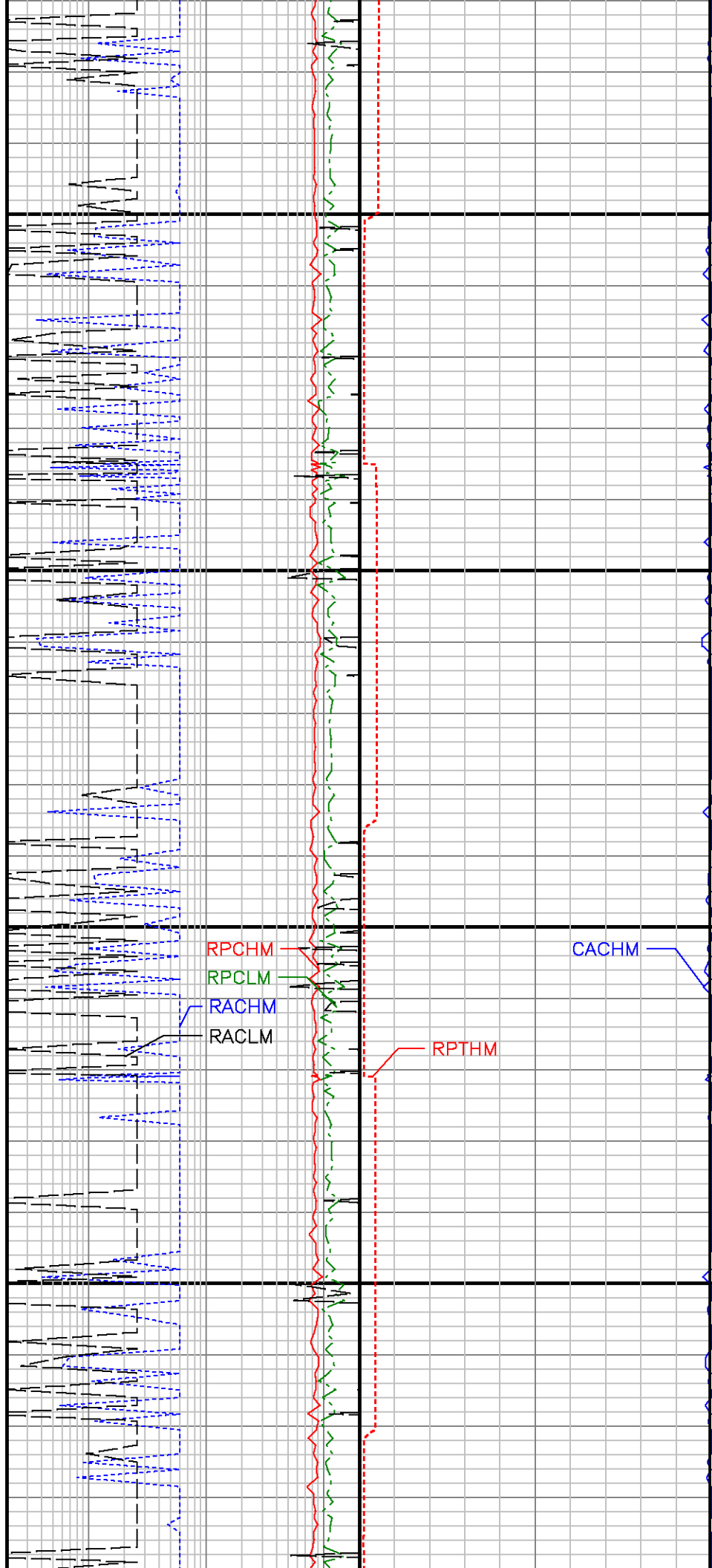
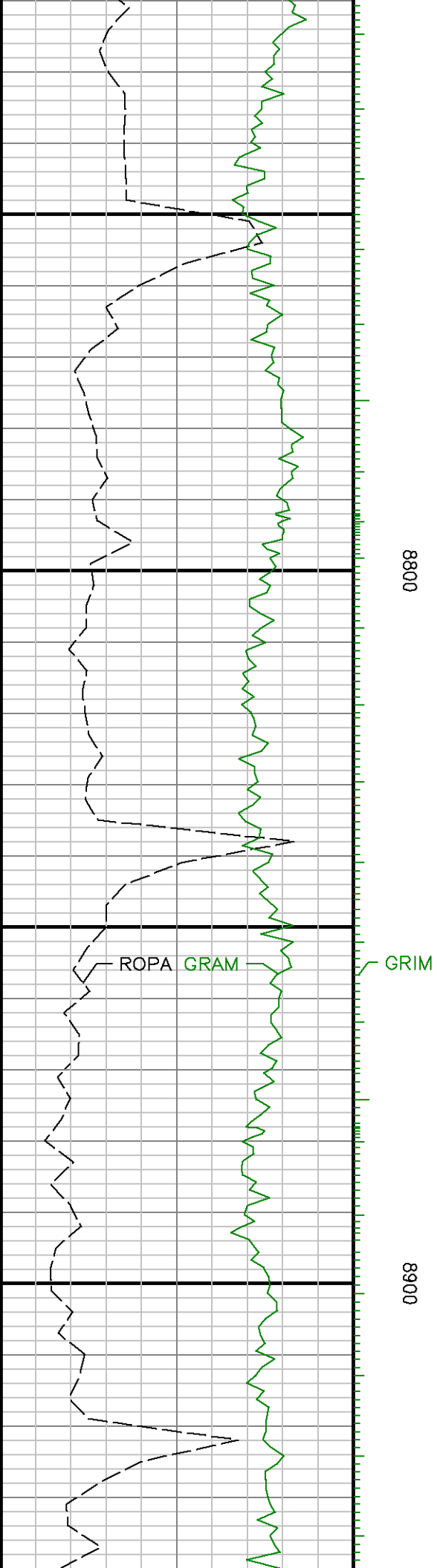
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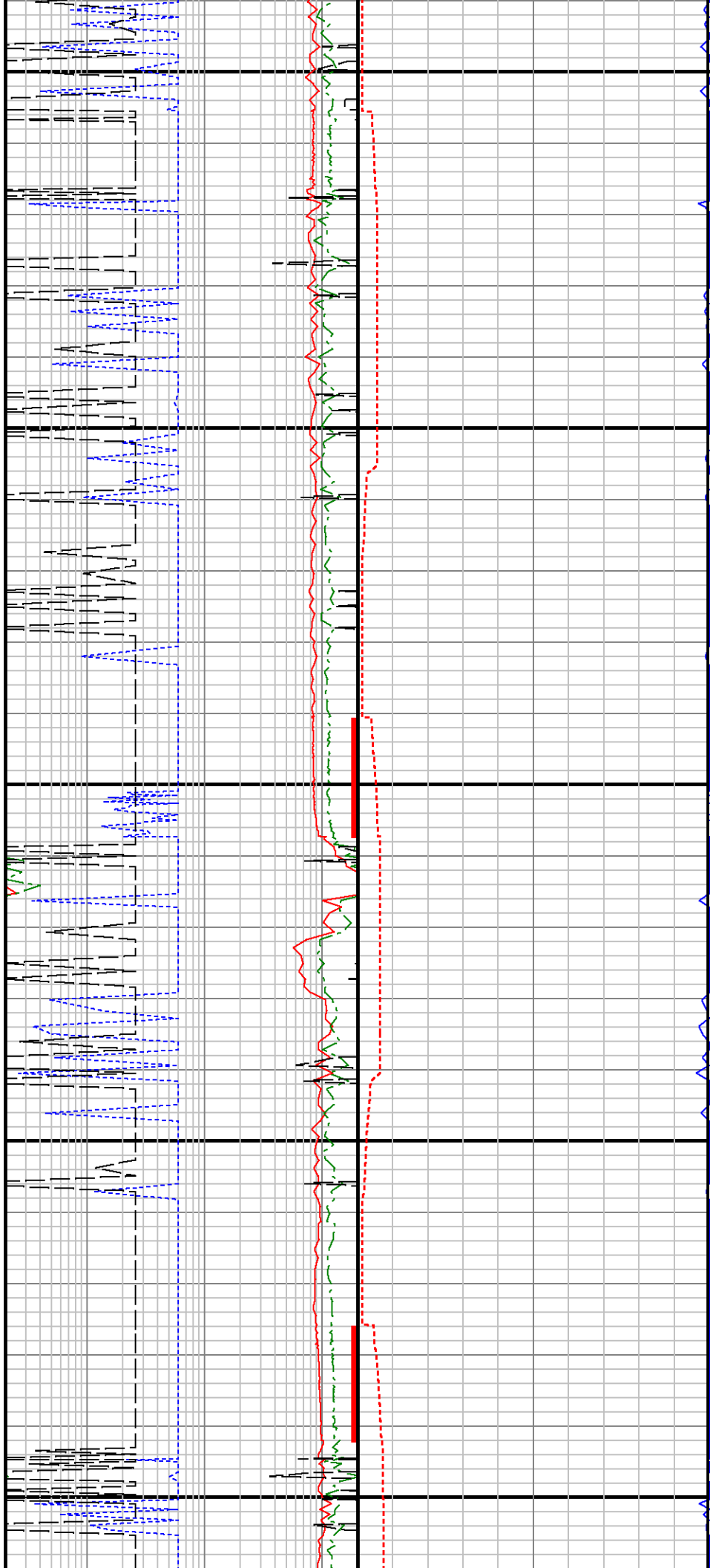
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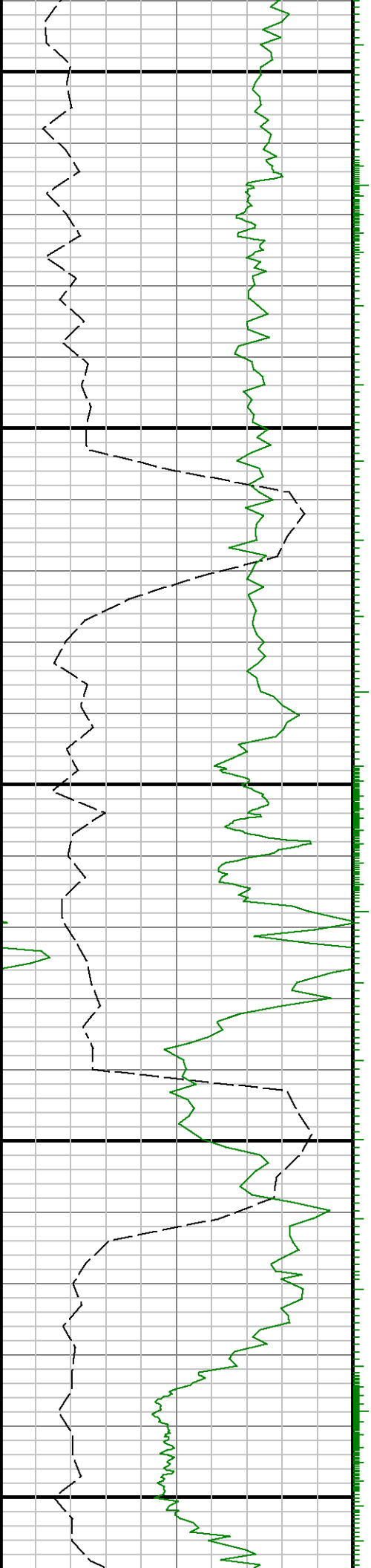


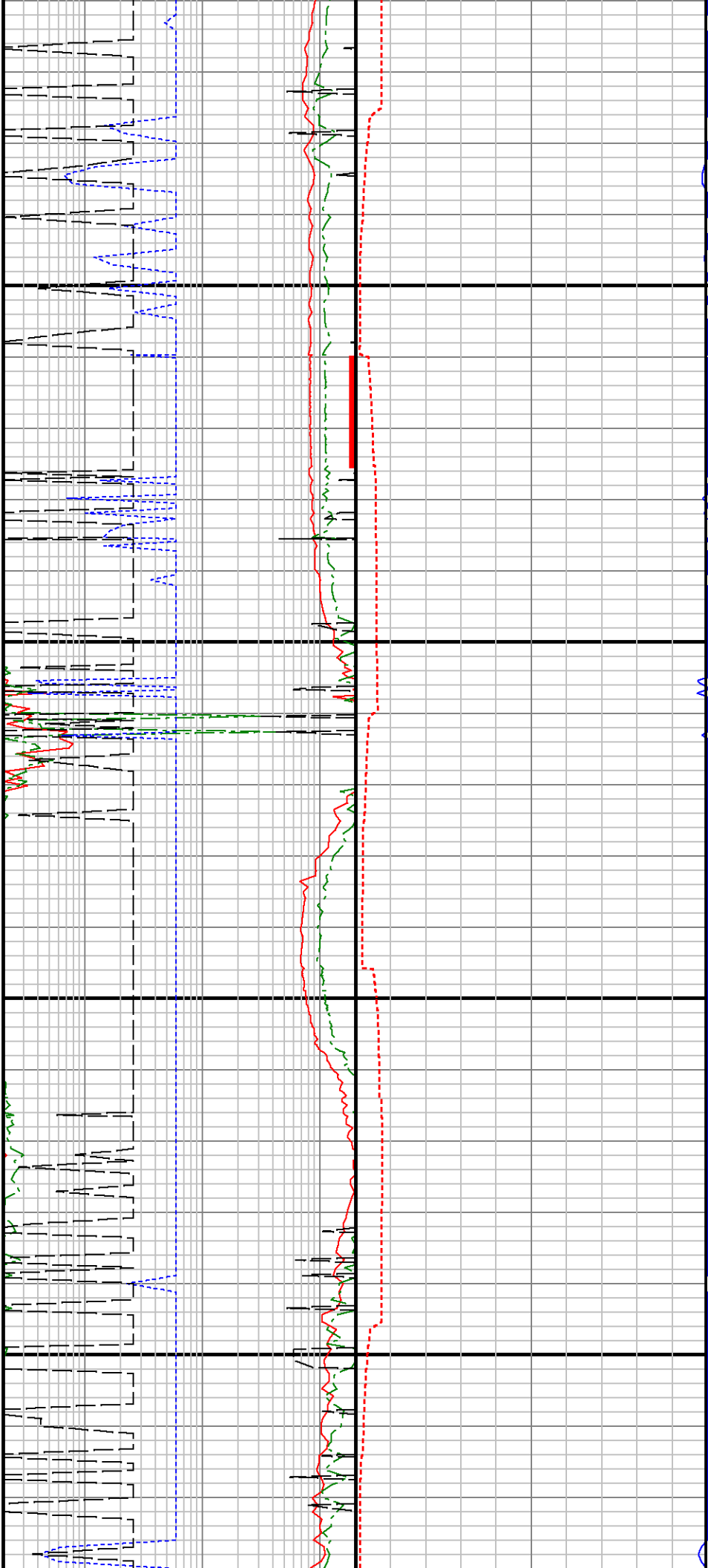




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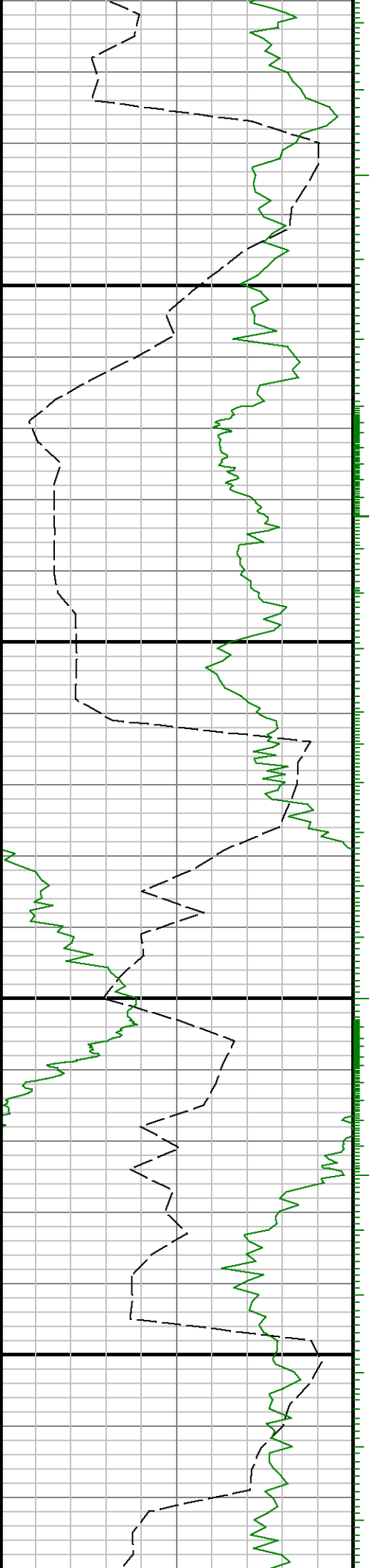
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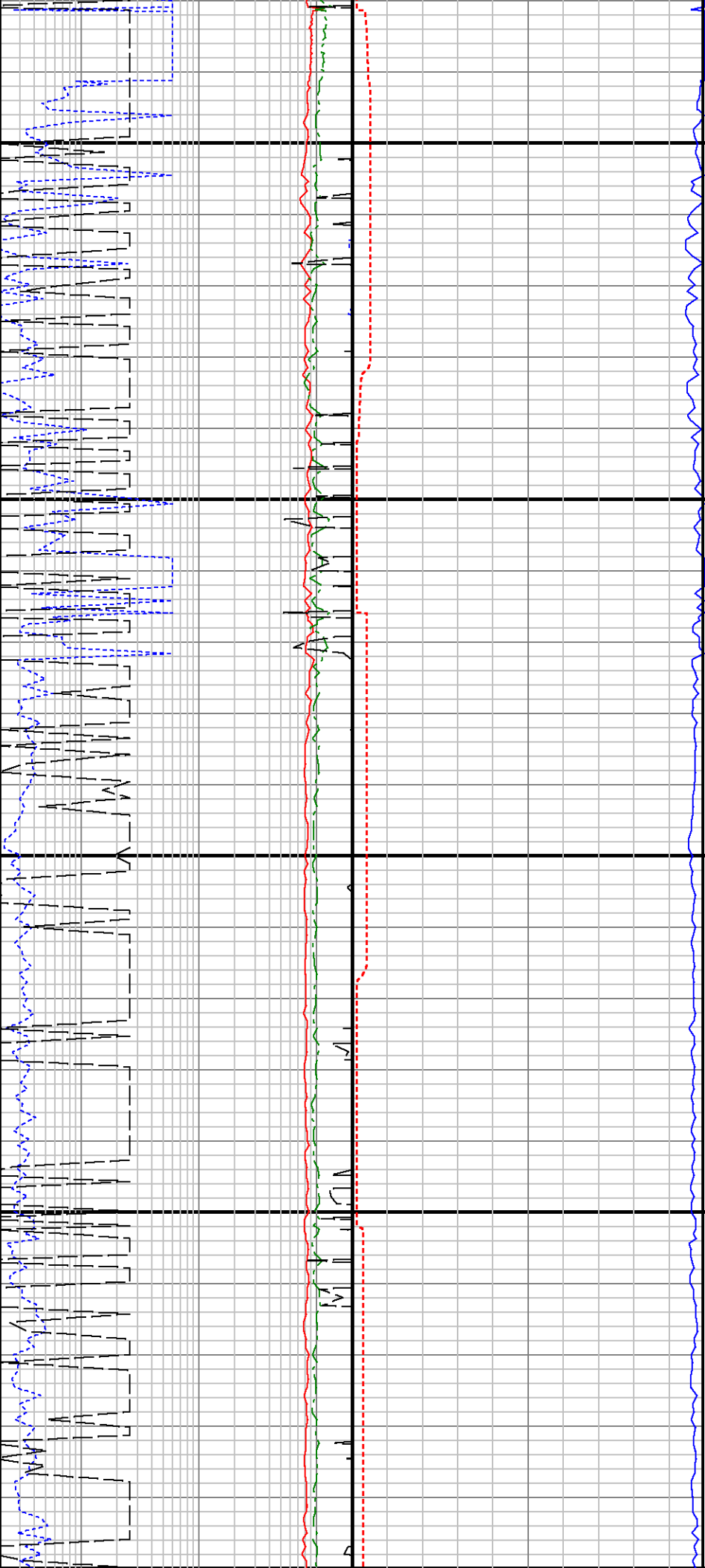




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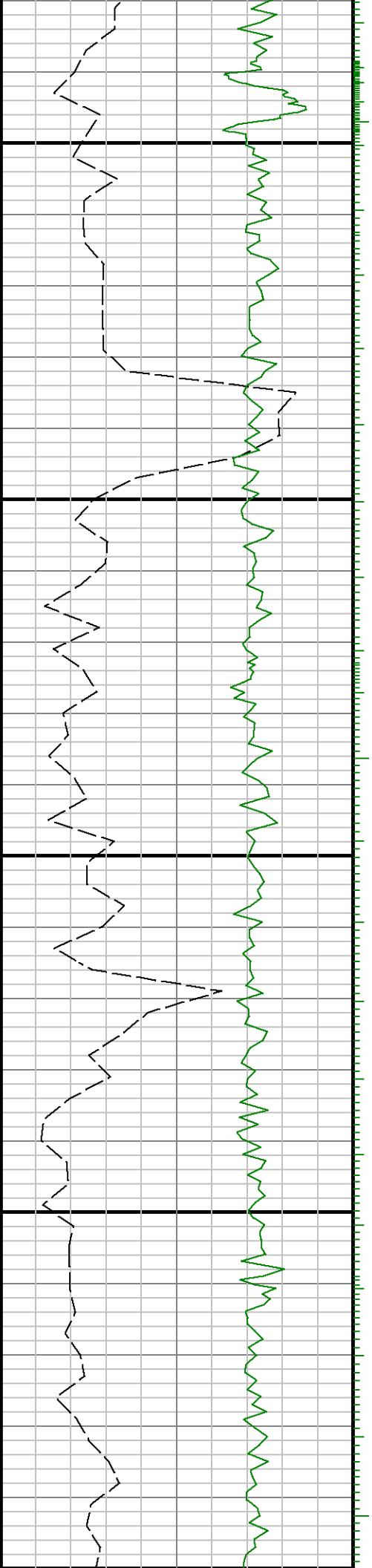


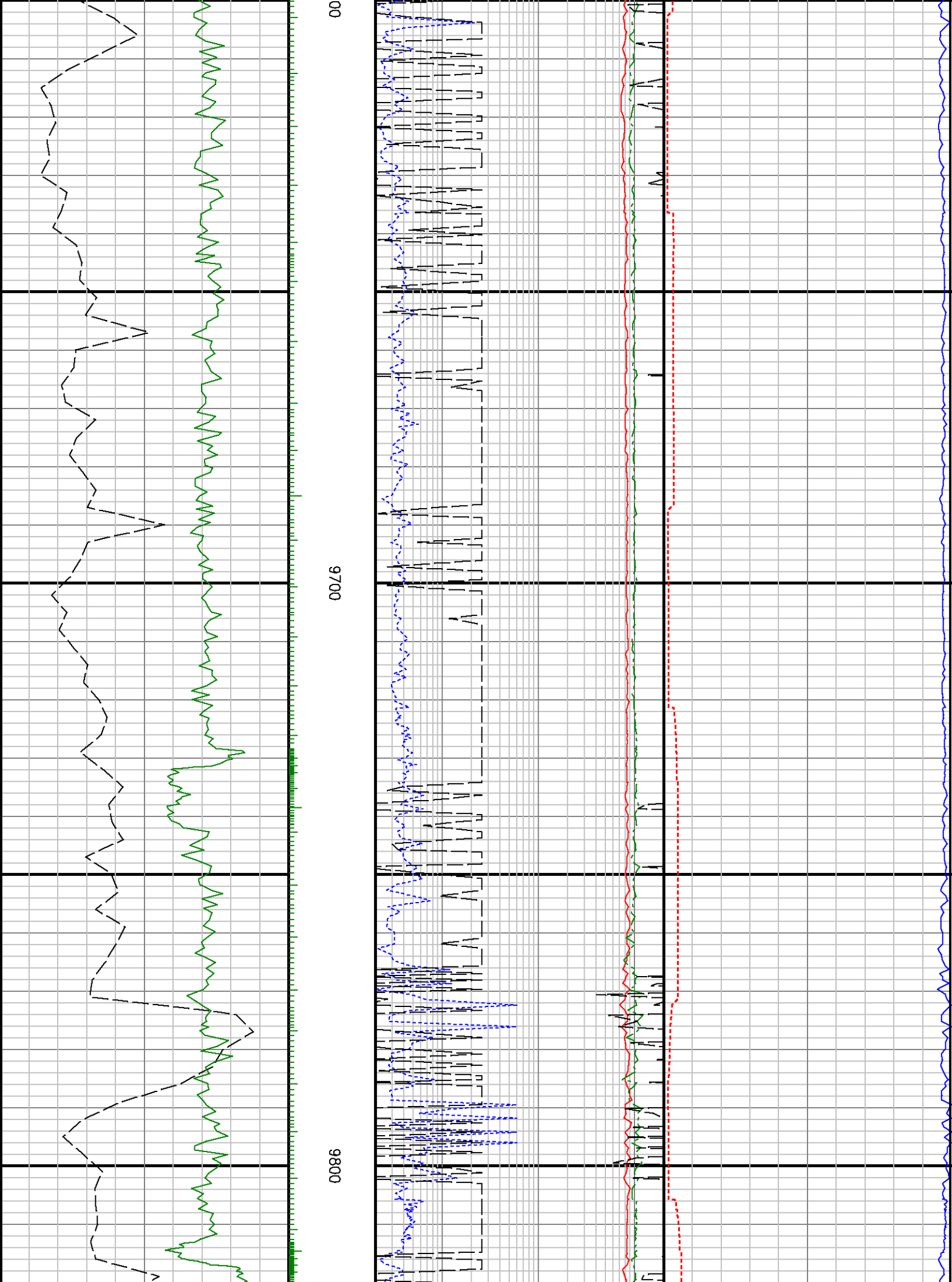


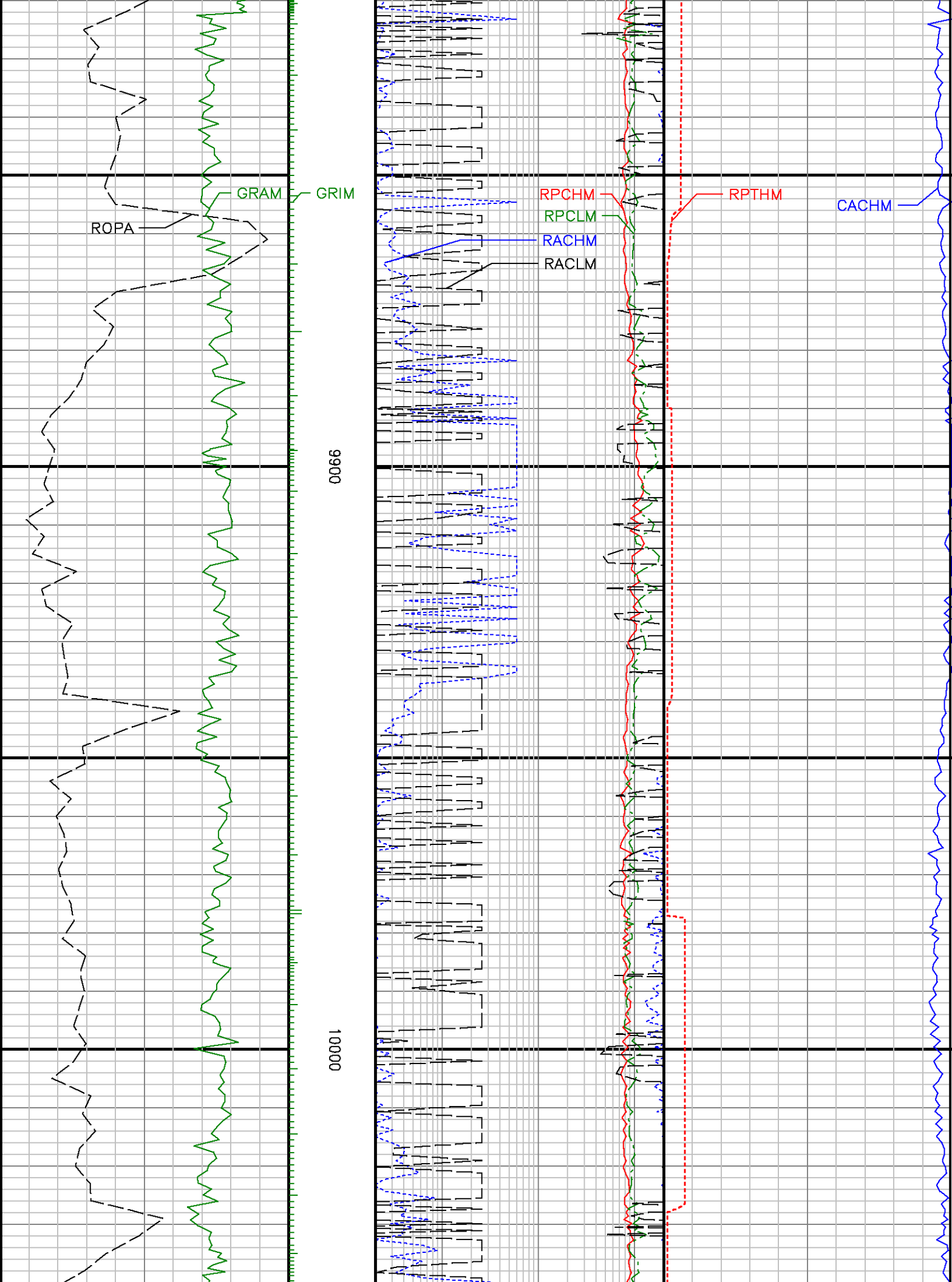
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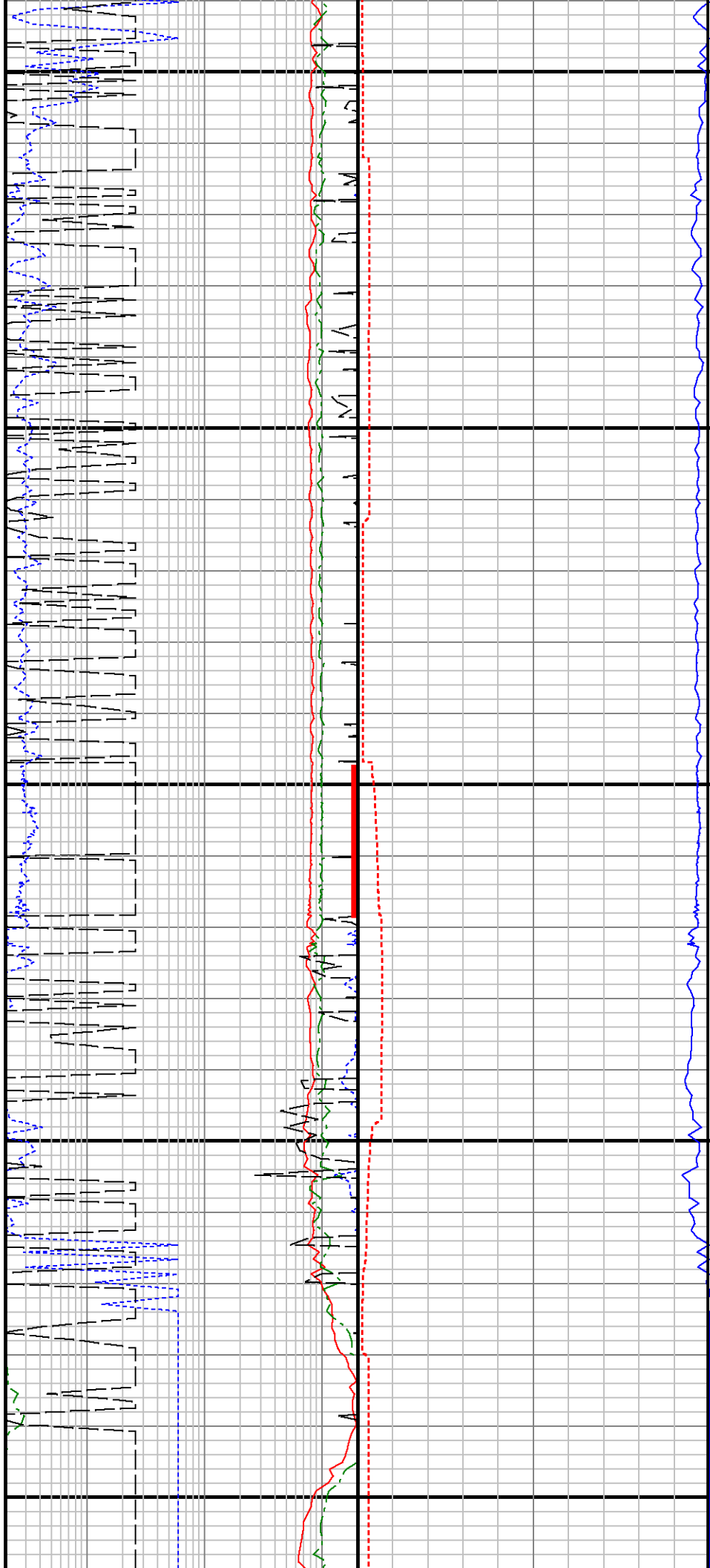
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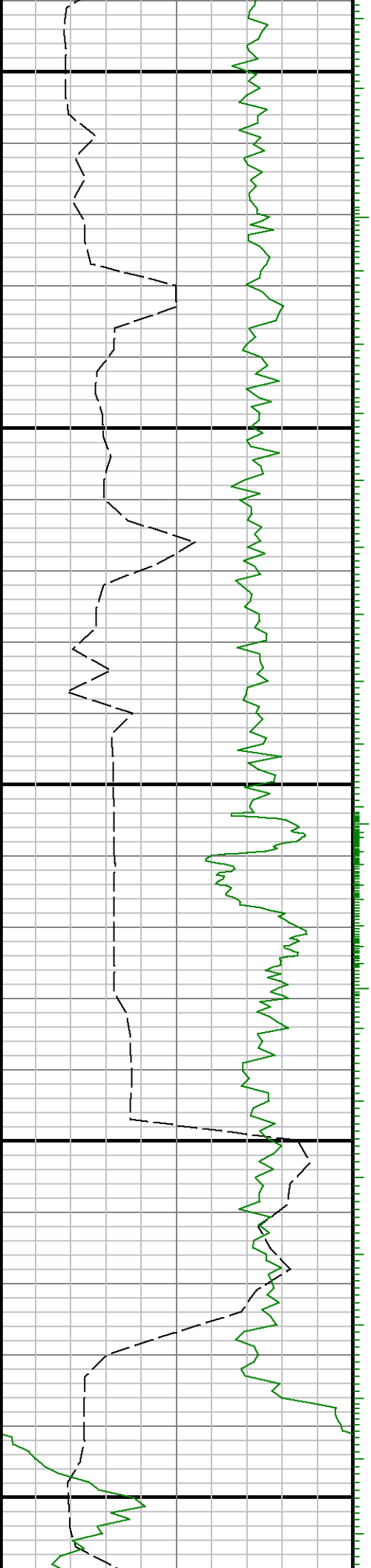


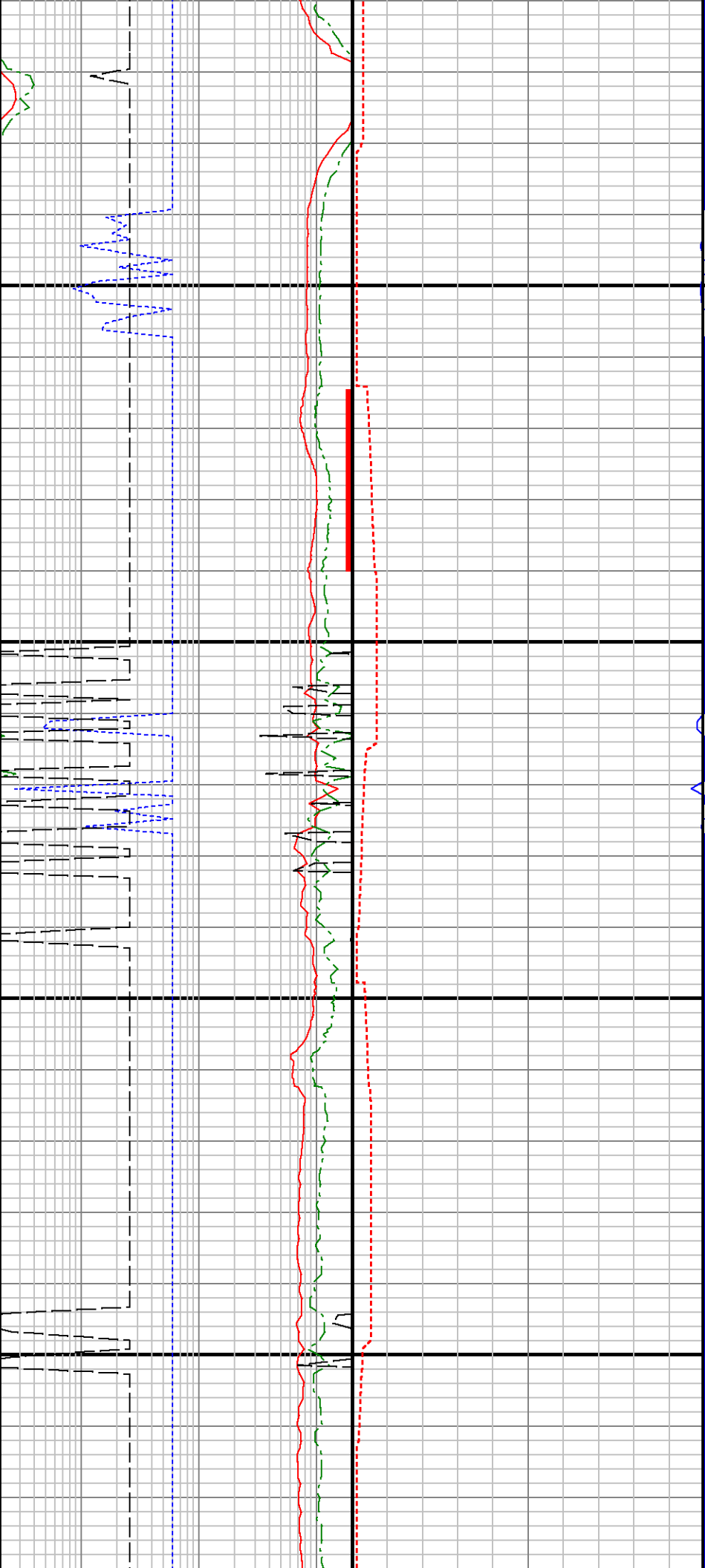




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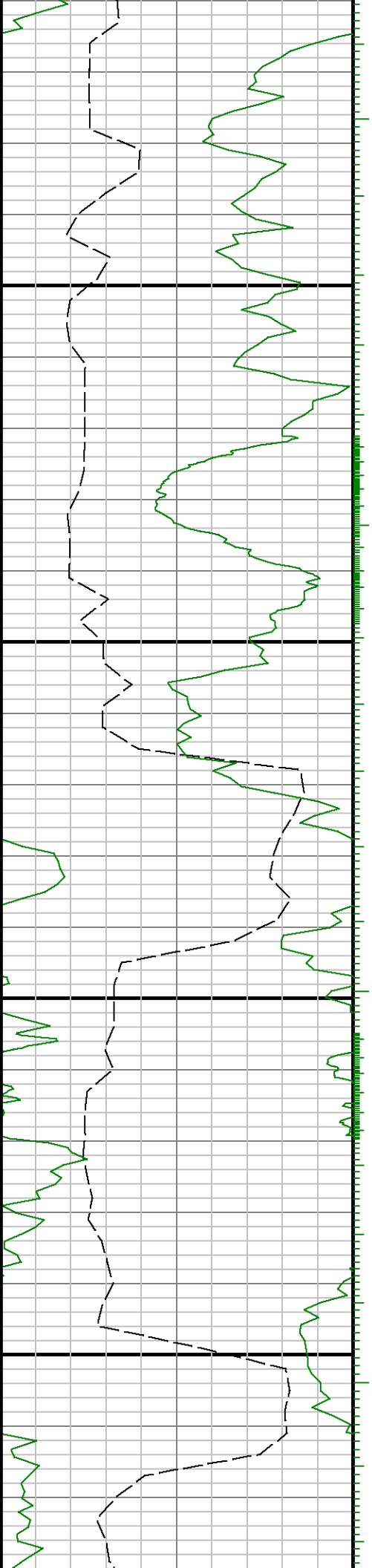
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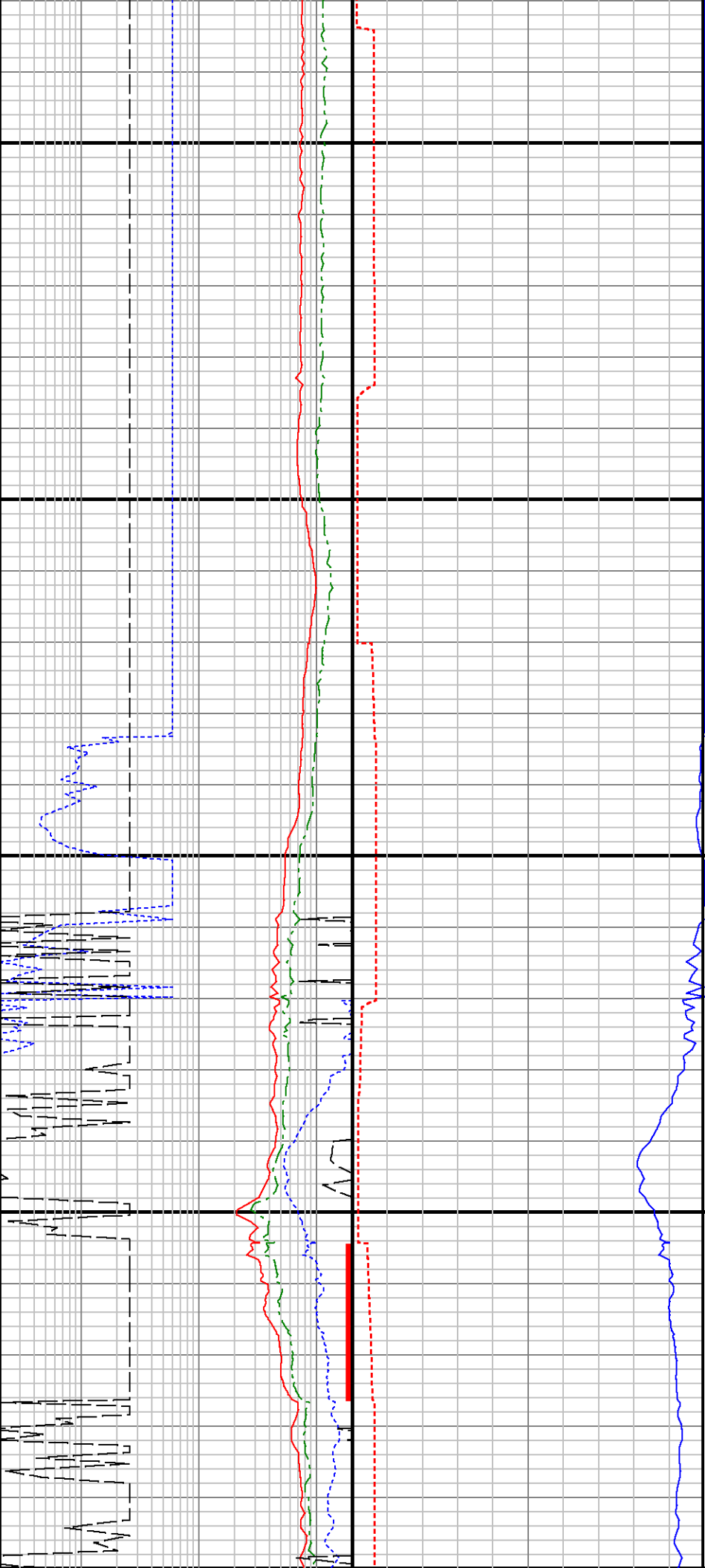




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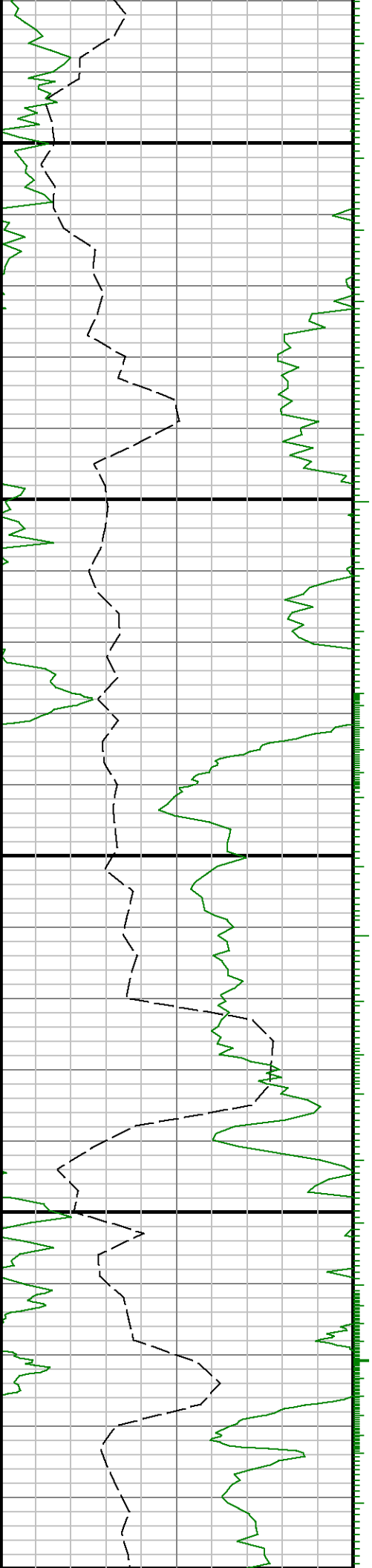


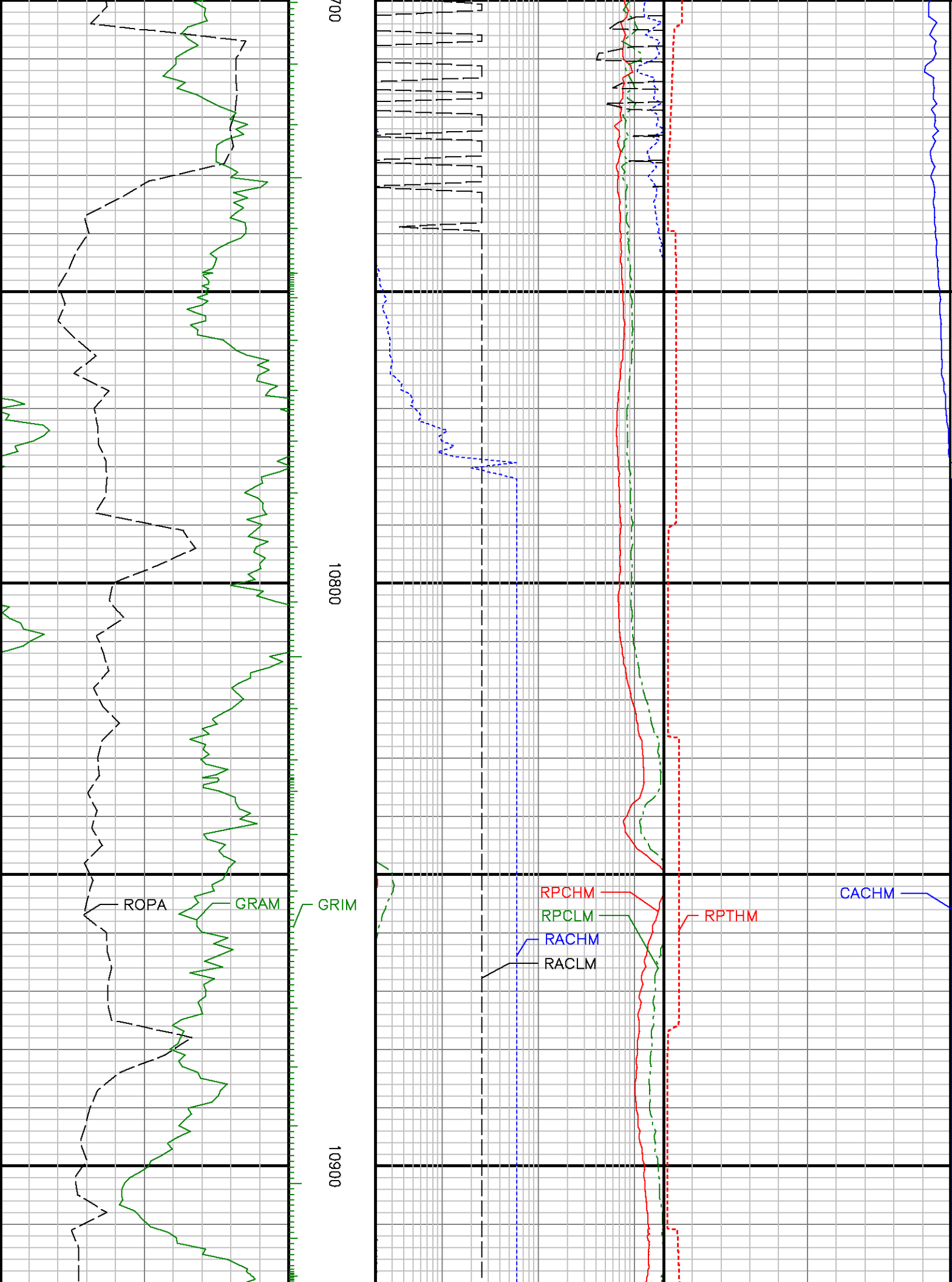


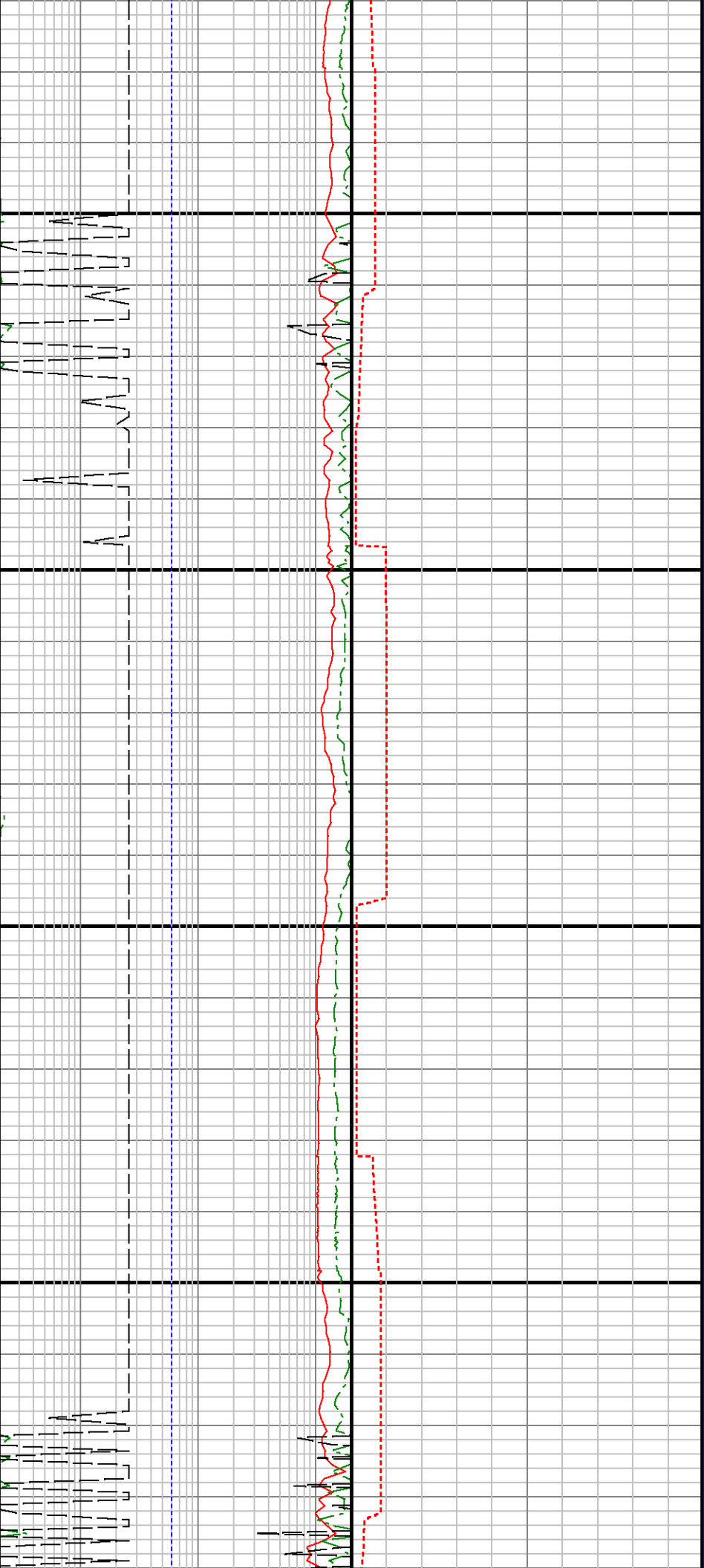
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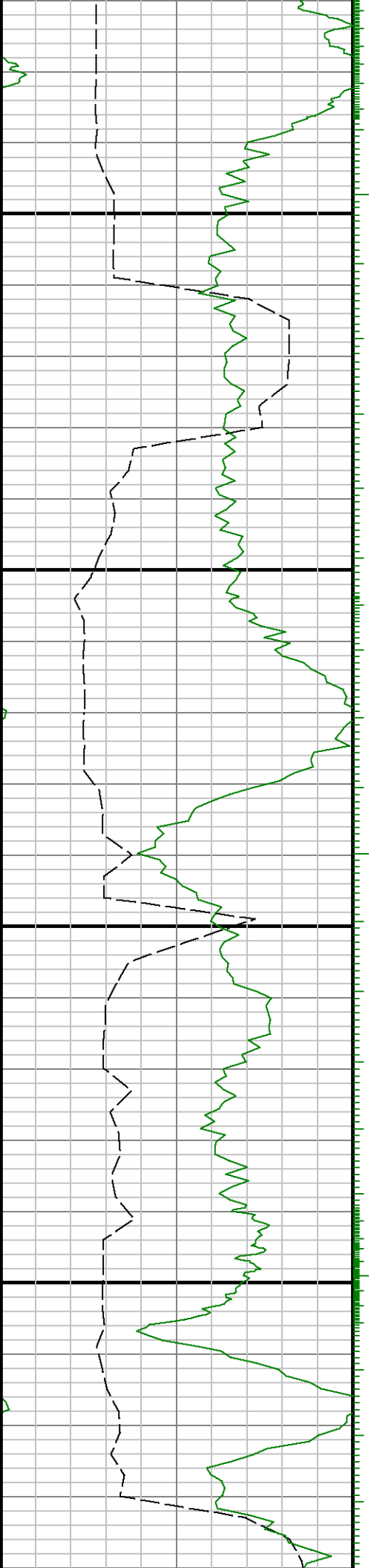


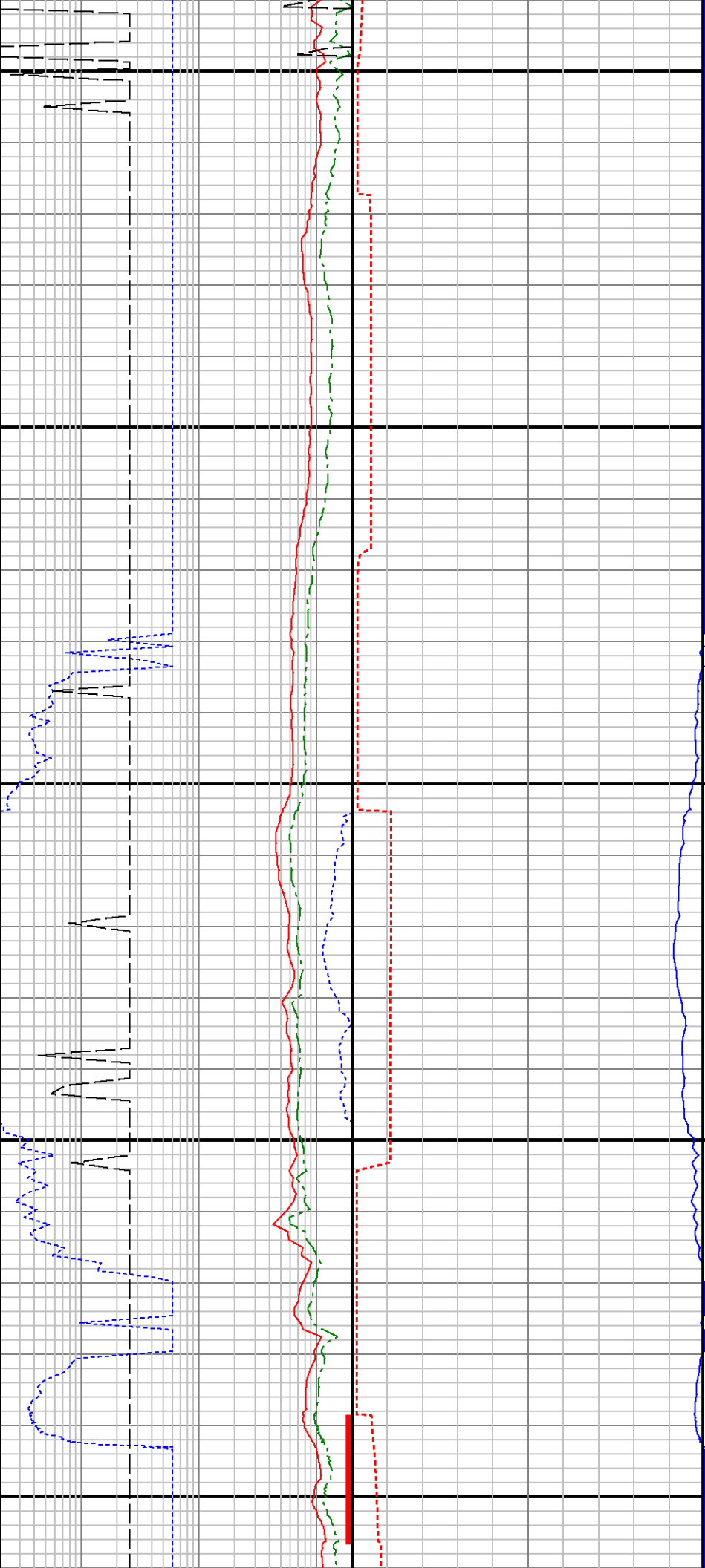




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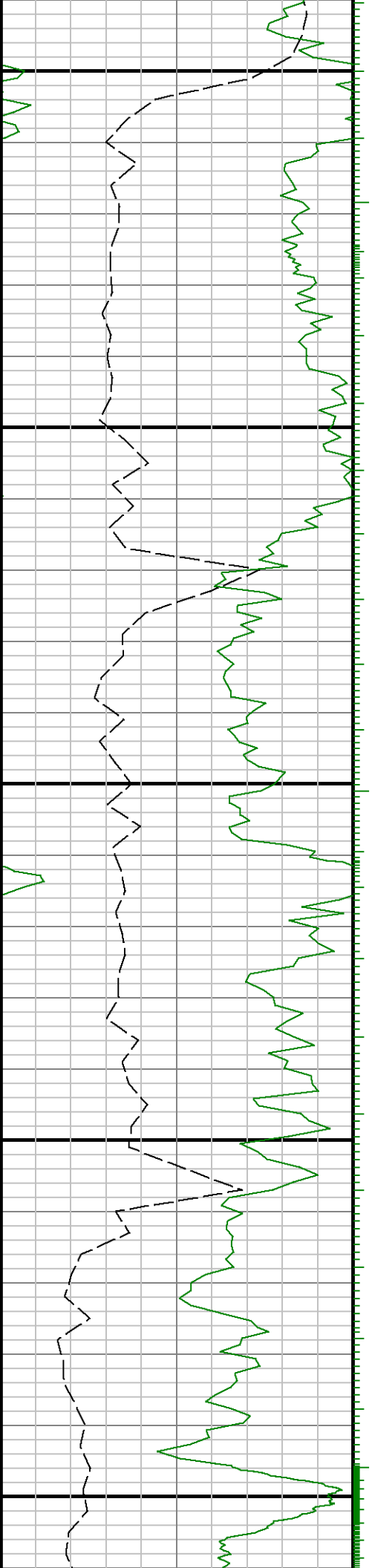
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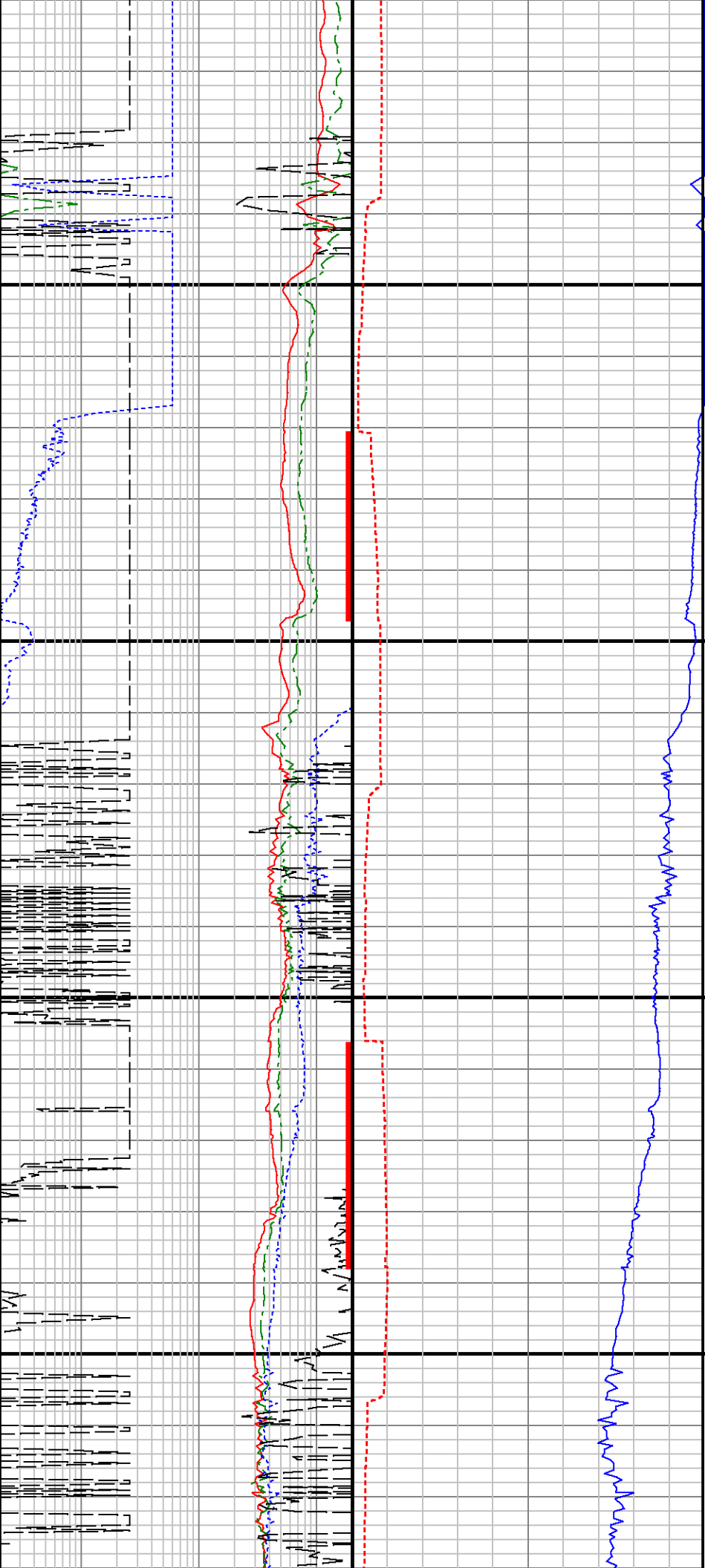




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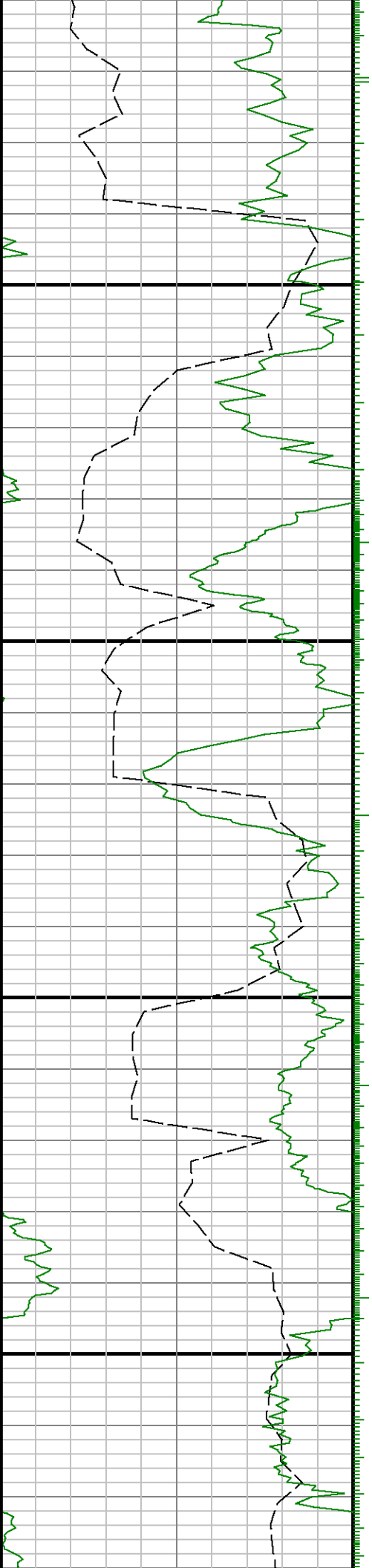
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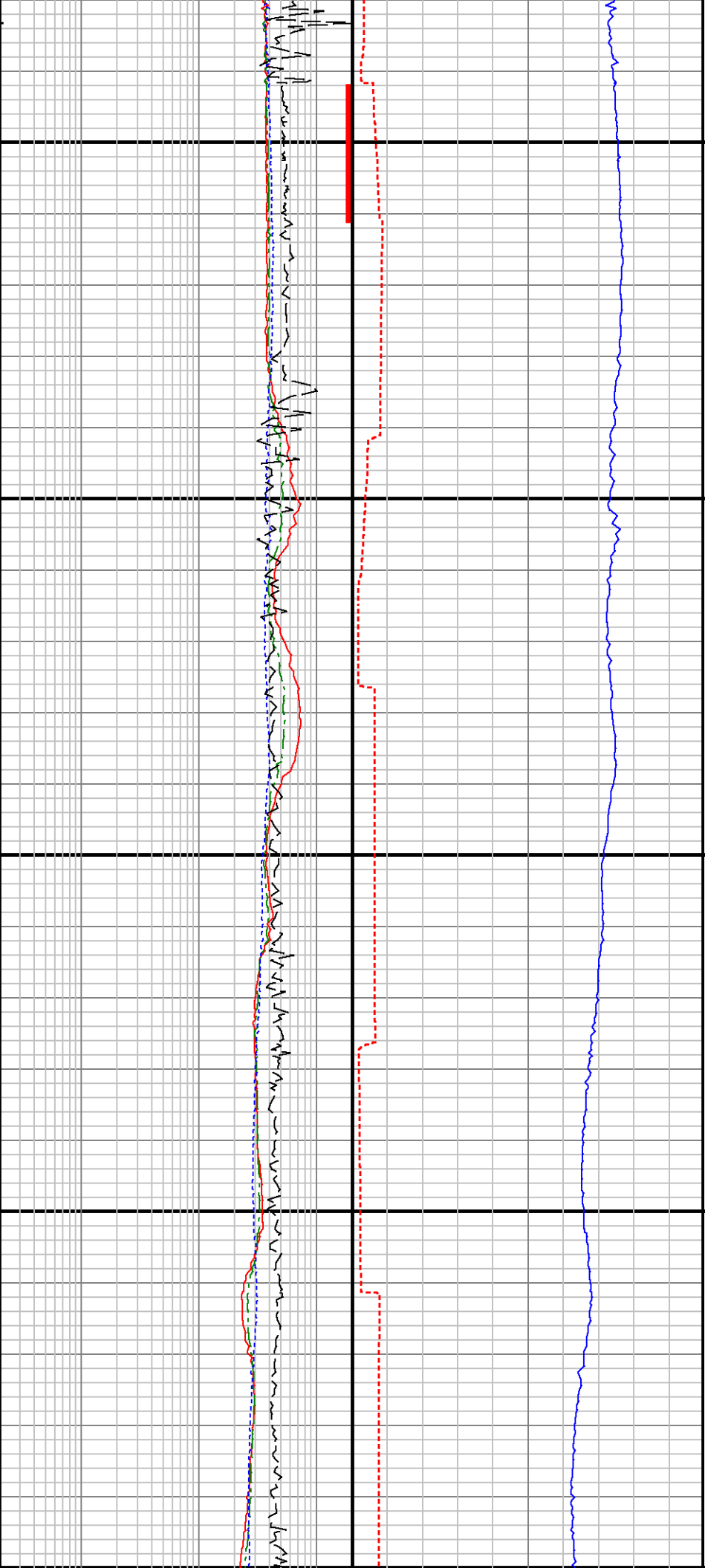




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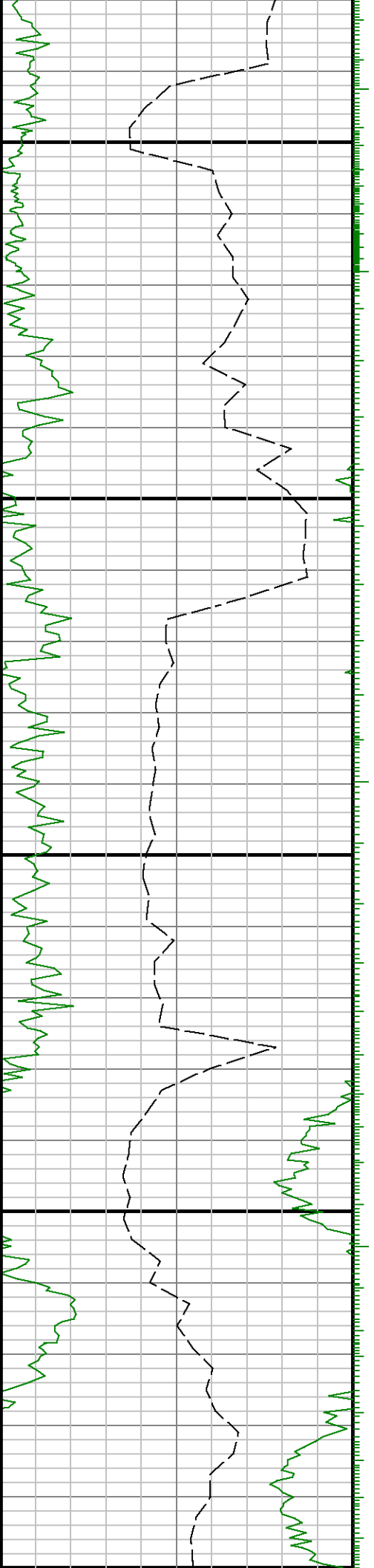


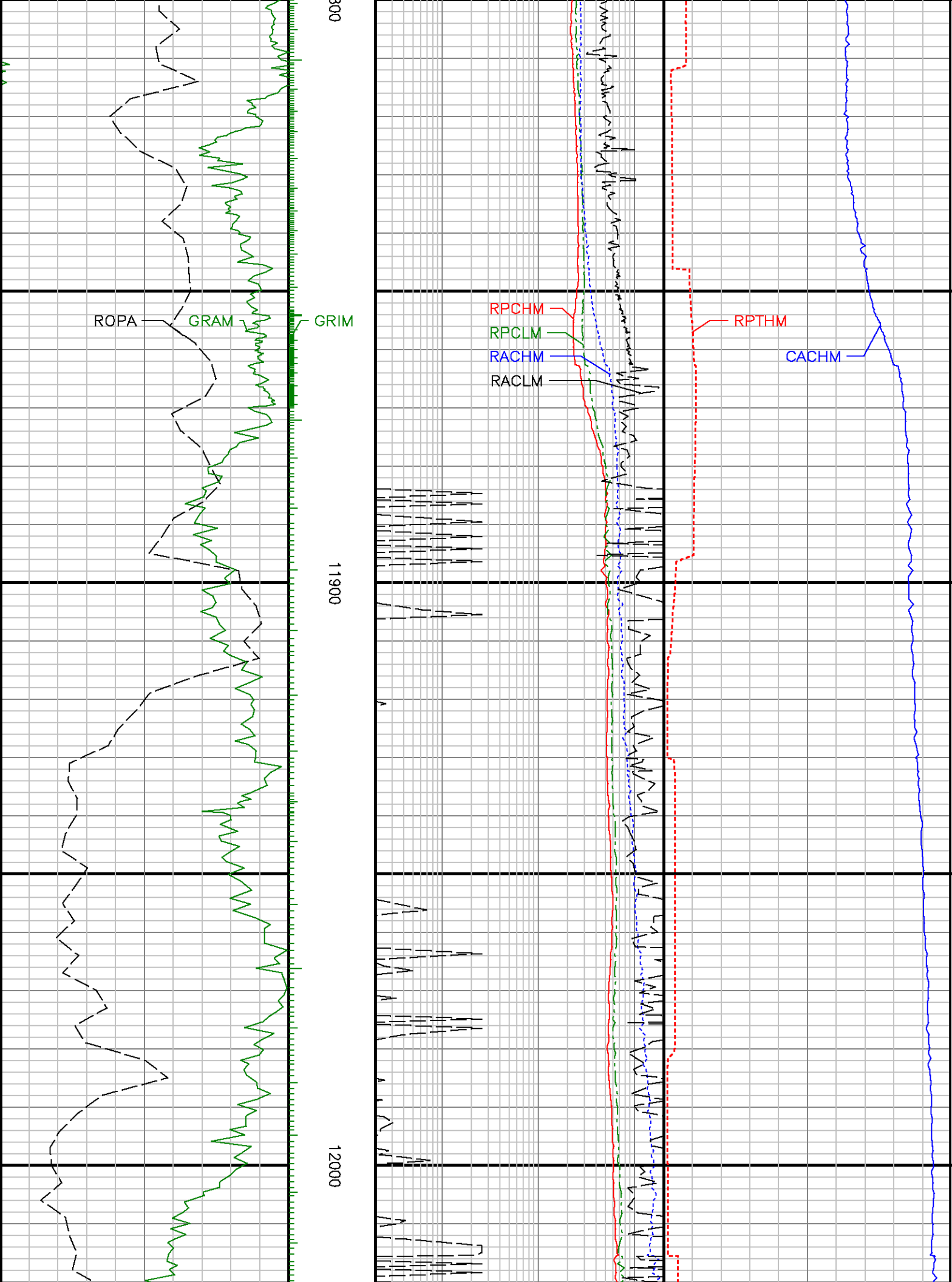


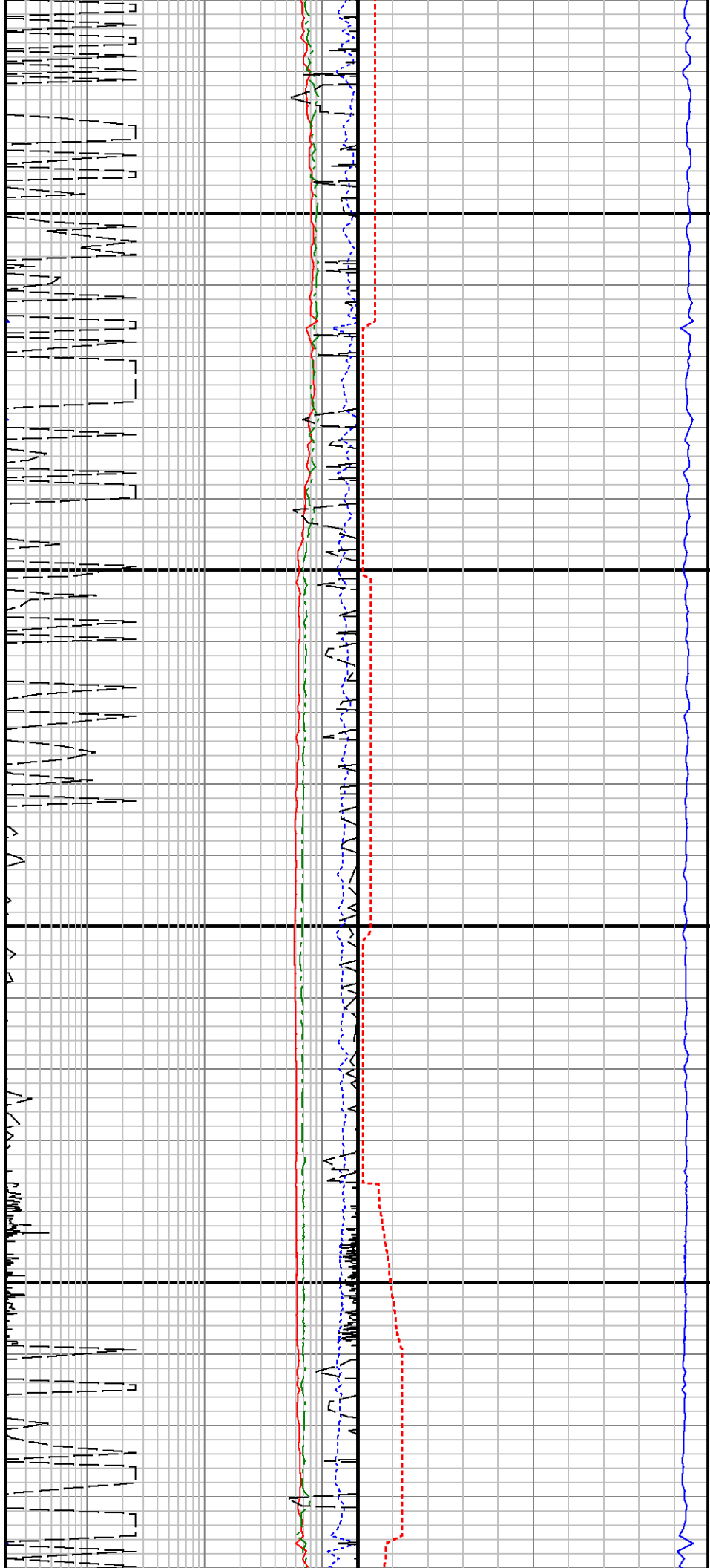
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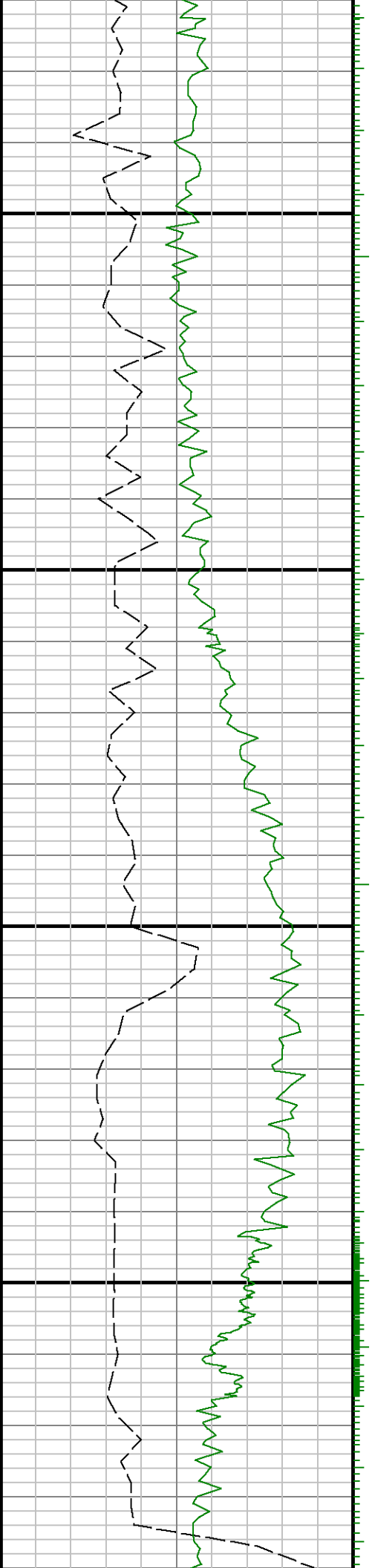


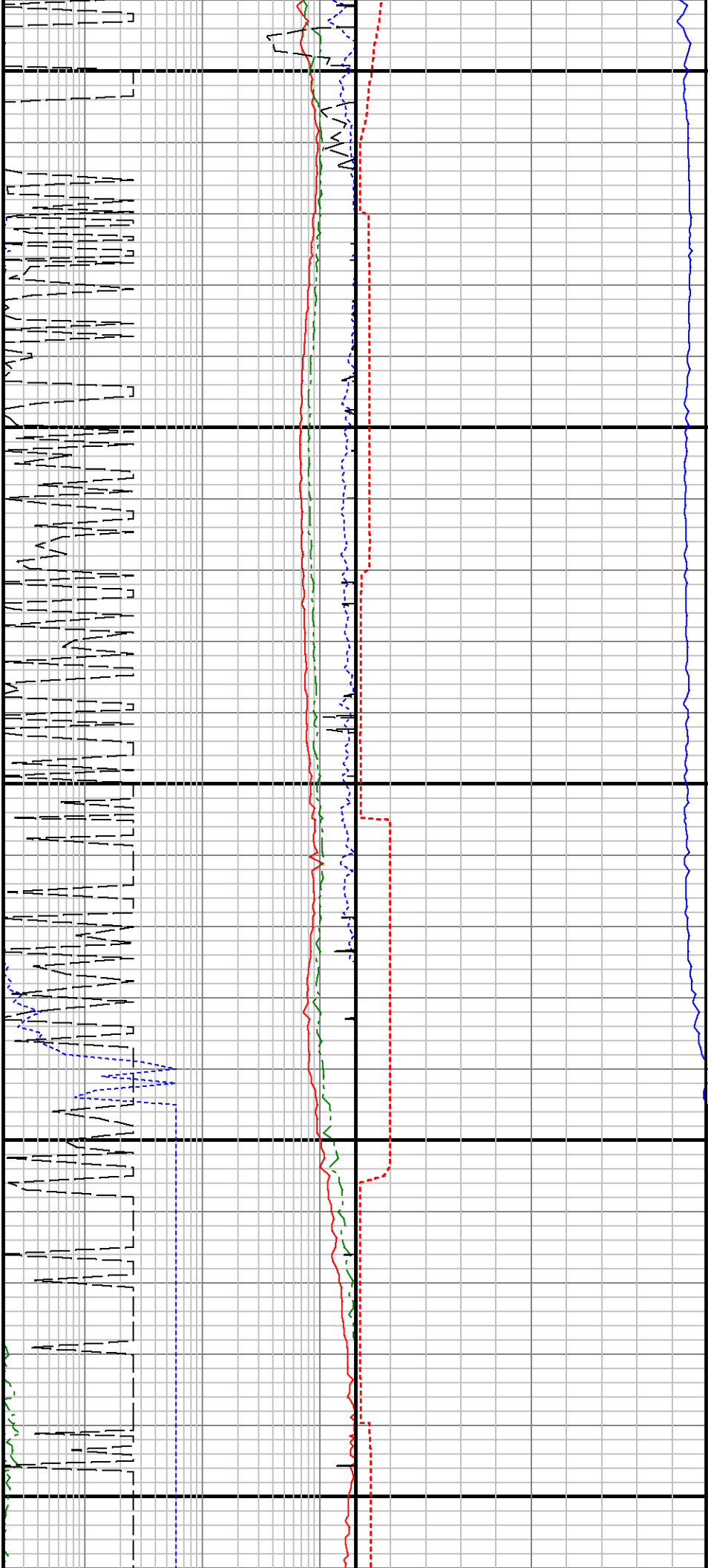




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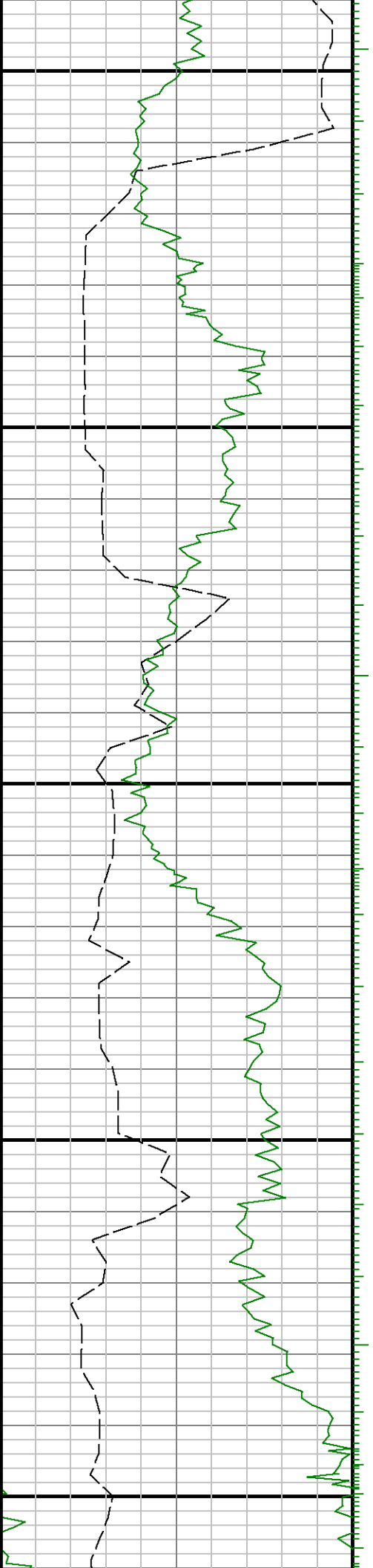
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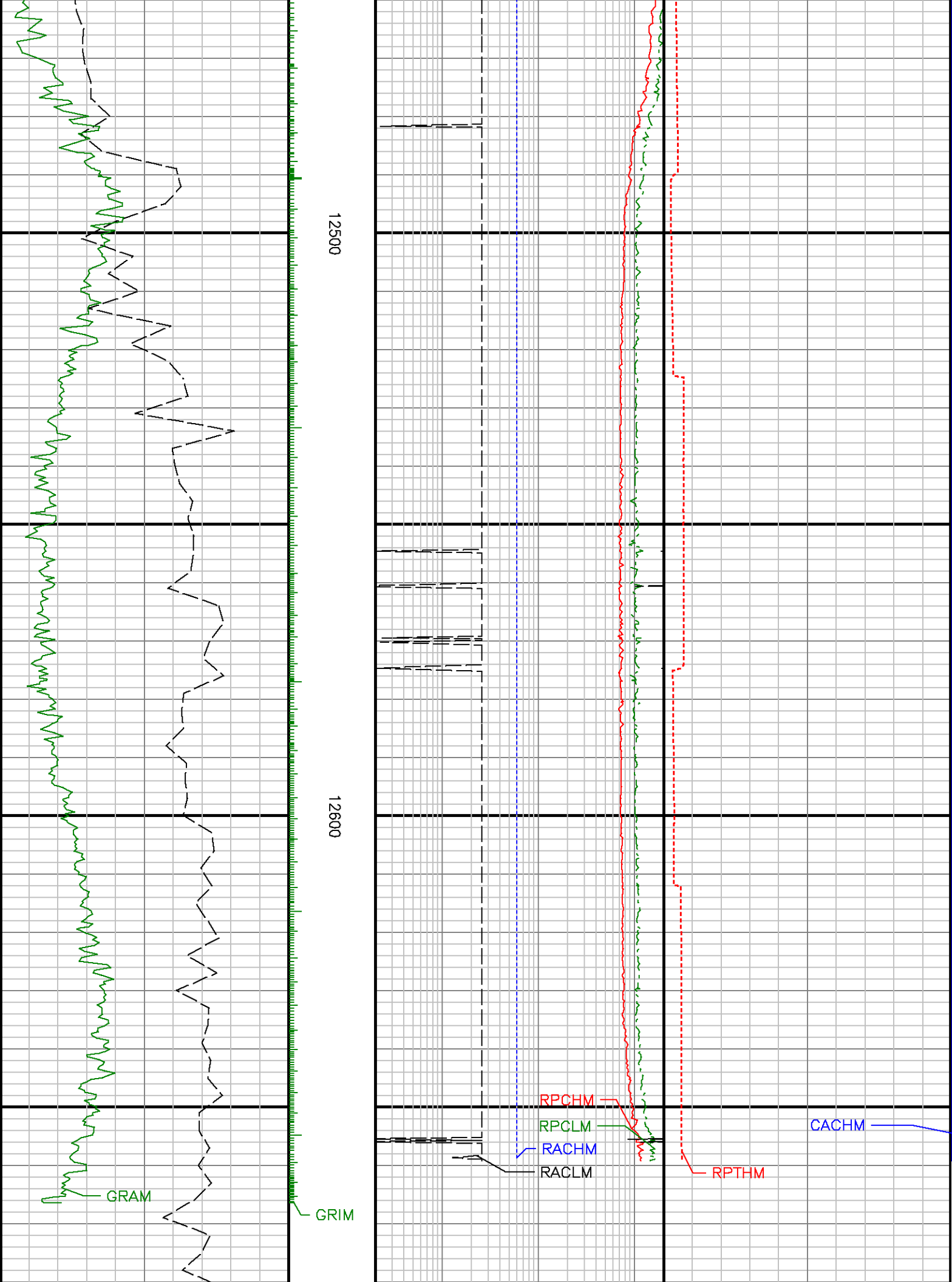


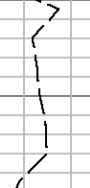


12300

12400





	<div>Run 2 <</div> <div>12700 ft</div>	<div>See Remark 1</div>	
<div>ROPA</div>			
<div>Gamma Ray Apparent 0.5 ft Avg GRAX</div> <div>0150</div> <div>API</div> <div>Rate of Penetration 3.0 ft Avg ROPA</div> <div>5000</div> <div>ft/hr</div> <div>Gamma Ray Apparent 0.5 ft Avg GRAM</div> <div>0150</div> <div>API</div>	<div>MD feet 1:240</div>	<div>Res PD LS 2MHz Corr RPCHM</div> <div>0.2200</div> <div>ohm.m</div> <div>Res PD LS 400kHz Corr RPCLM</div> <div>0.2200</div> <div>ohm.m</div> <div>Res AT LS 2MHz Corr RACHM</div> <div>0.2200</div> <div>ohm.m</div> <div>Res AT LS 400kHz Corr RACLM</div> <div>0.2200</div> <div>ohm.m</div>	<div>Con AT LS 2MHz Corr CACHM</div> <div>1000</div> <div>mmho/m</div> <div>Time Since Drilled RPTHM</div> <div>0600</div> <div>min</div>