



Real Time Log

Gamma Ray  
Natural Formation Evaluation

Scale: 1:240  
Measured Depth

Company: Anadarko  
Well: Howard 3C-28HZ  
Field: Weld County (Kerr McGee)  
Region: Rocky Mountains Country: United States

Status: Final Print  
API Number: 051233767700  
Permanent Datum (P.D.): Ground Level  
Log Measured From: Rig Floor  
Depth Reference: Driller's Depth

Surface Location:  
Latitude: 40° 0' 55.804" N  
Longitude: 104° 53' 53.336" W  
Section 28 TWN: 1N Range 67W

Other Services:  
Elevations:  
KB: N/A  
DF: 5036.00 ft.  
GL: 5020.00 ft.

Interval Logged  
Top: 7175.0 ft. Date From: 03/Sep/13  
Bottom: 12656.0 ft. Date To: 07/Sep/13  
Spud Date: 2/Sep/13

Dates  
Dip Angle: 66.35°  
Total  
Field Strength: 52762.0 nT  
North Correction: 8.47°

Magnetic Field Reference  
Az Reference North: True  
Mag to Reference  
North Correction:

Borehole Record			Casing Record		
Hole Size	From	To	Size	Weight	From To
8.750 in.	1031.0 ft.	8120.0 ft.	9.625 in.	36.00 lb/ft	Surface 1023.0 ft.
6.125 in.	8120.0 ft.	12707.0 ft.	7.000 in.	26.00 lb/ft	Surface 8110.0 ft.

Mud Record			Deviation Record		
Type	From	To	Hole Size	Interval	Inc / Az (Start) Inc / Az (End)
Water Based	Surface	8120.0 ft.	8.750 in.	85.0 ft.	0.4° / 281.0° 0.8° / 330.2°
LSND	8120.0 ft.	12707.0 ft.	8.750 in.	43.0 ft.	0.8° / 330.2° 83.7° / 0.9°
			6.125 in.	85.0 ft.	83.7° / 0.9° 91.1° / 358.3°
					/
					/
					/

Acquisition System			Software Version			Other		
Advantage	2.20U4	Rig / Contractor:	Xtreme 24	/	Advance Drilling			
PATS	6.4.1.34	Job No:	5740607	/	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. Time (hrs.)
							Top	Bottom	From	To	Start	End	
							(m.)	(m.)	(m.)	(m.)			
1	1	1	8.750	PDC	2.000	Steerable	7175.0	8070.0	7225.0	8120.0	02/Sep/2013 07:30	04/Sep/2014 02:30	30.5
2	2	2	6.125	PDC	6.000	Steerable	8078.0	8078.0	8120.0	8120.0	05/Sep/2013 01:30	05/Sep/2014 11:00	1.5
3	3	3	6.125	PDC	6.000	Steerable	8069.0	12656.0	8120.0	12707.0	05/Sep/2013 12:14	07/Sep/2013 12:00	32.7

Crew								
Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Marcus Boucher	01/Sep/2013	07/Sep/2013	Osagie Otoikhine	03/Sep/2013	07/Sep/2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (m.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
03/Sep/13	18:00	1	7997.0	LSND	9.7	41	8.8	N/A	0.0/92.6	Flowline	1200	N/A
05/Sep/13	18:00	3	8185.0	LSND	9.1	41	9.0	N/A	0.0/95.0	Flowline	800	N/A
06/Sep/13	18:00	3	11800.0	LSND	9.1	41	8.7	N/A	0.0/95.0	Flowline	1800	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent 0.5 ft. Avg.	API
GRIX	Gamma Ray Density	Points
GRSI	Gamma Ray Slide Indicator	Unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate of Penetration 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	deg F
TVD	True Vertical Depth	ft
WOBA	Surface Weight on Bit 1.0 ft Avg.	klbf

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12566669	Directional	56.29	6.750	2.750
1	SRIG	11703994	Gamma	52.92	6.750	2.750
3	DIR	12440863	Directional	53.54	4.750	0.000
3	SRIG	12600747	Gamma	50.16	4.750	2.750

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

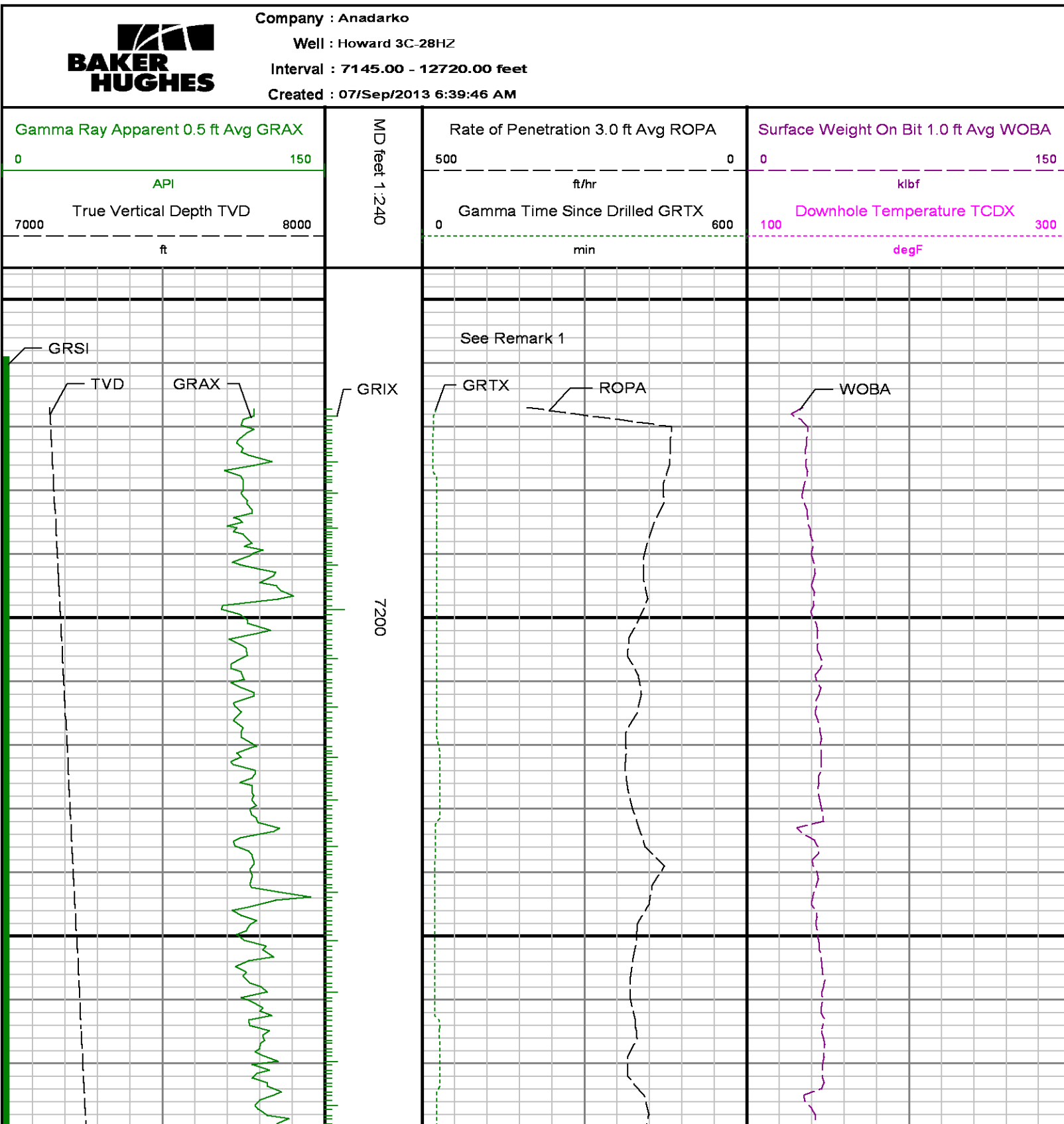
Comments

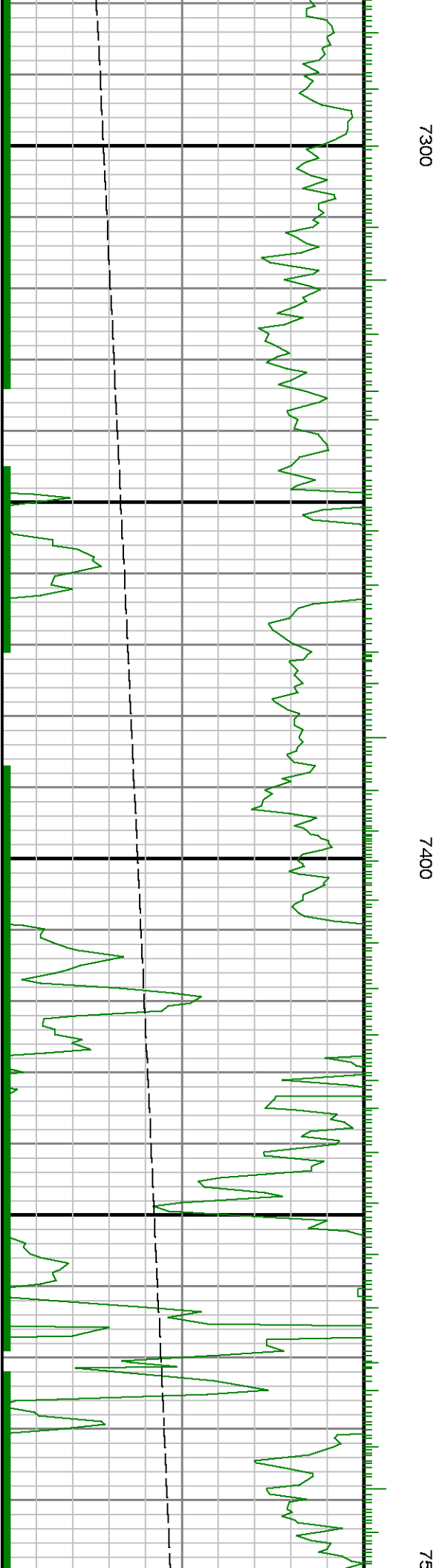
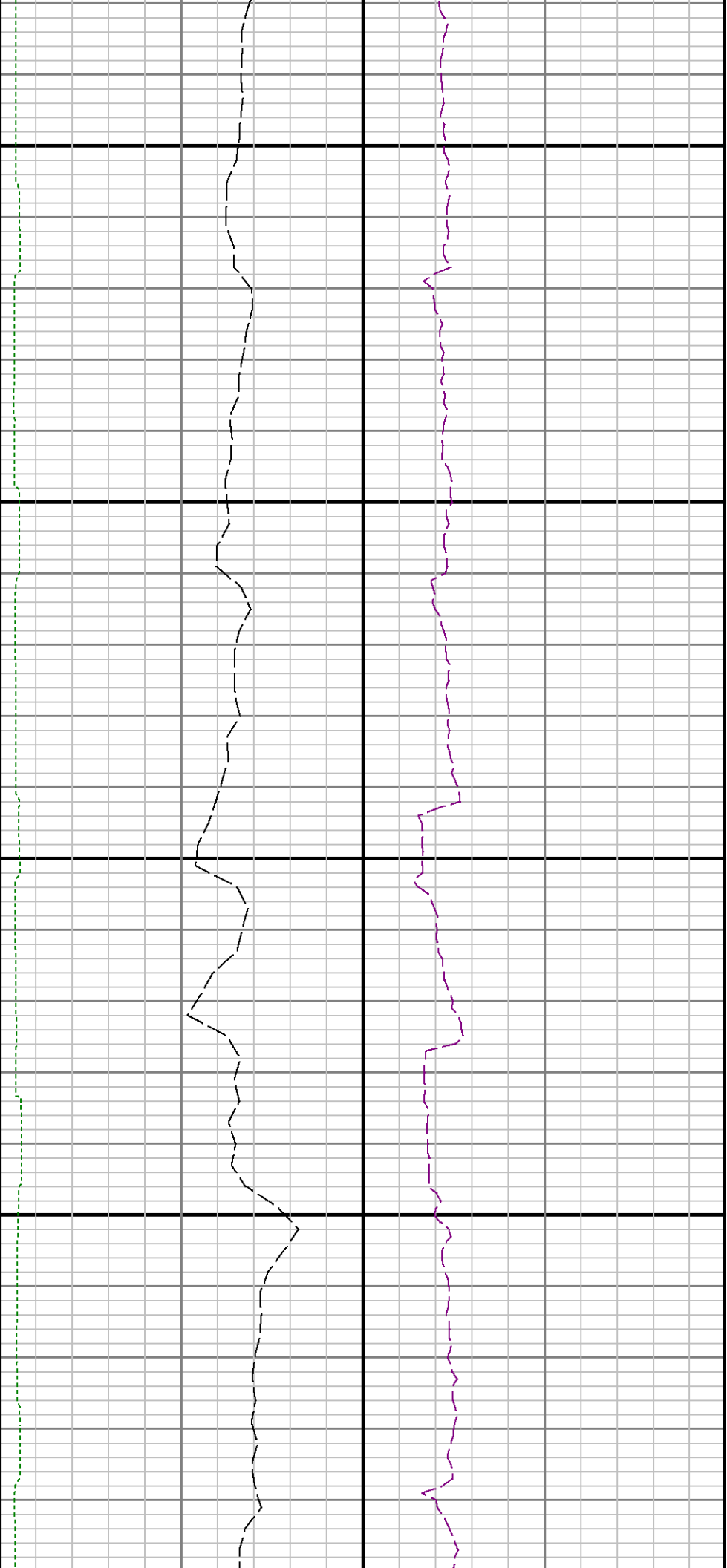
1) Baker Hughes INTEQ run 1 utilized 6 1/2 inch NaviGamma(Gamma Ray and Directional) behind a 8 3/4 inch bit and steerable assembly from 7225 feet to 8120 feet MD (7207 feet to 7781 feet TVD).
2) Baker Hughes INTEQ run 3 utilized 4 3/4 inch NaviGamma(Gamma Ray and Directional) behind a 6 1/8 inch bit and steerable assembly from 8120 feet to 12707 feet MD (7781 feet to 7754 feet TVD).
3) A sliding indicator is shown to the left edge of track 1 as a heavy line. The indicator has been depth-shifted to the gamma sensor offset to correspond with gamma data acquired while sliding.

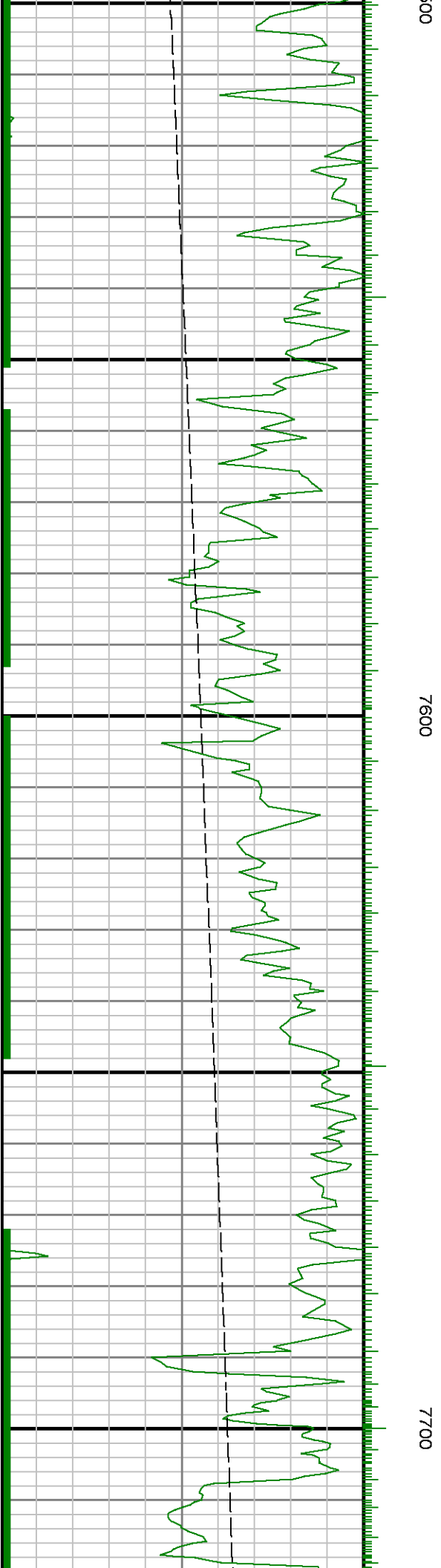
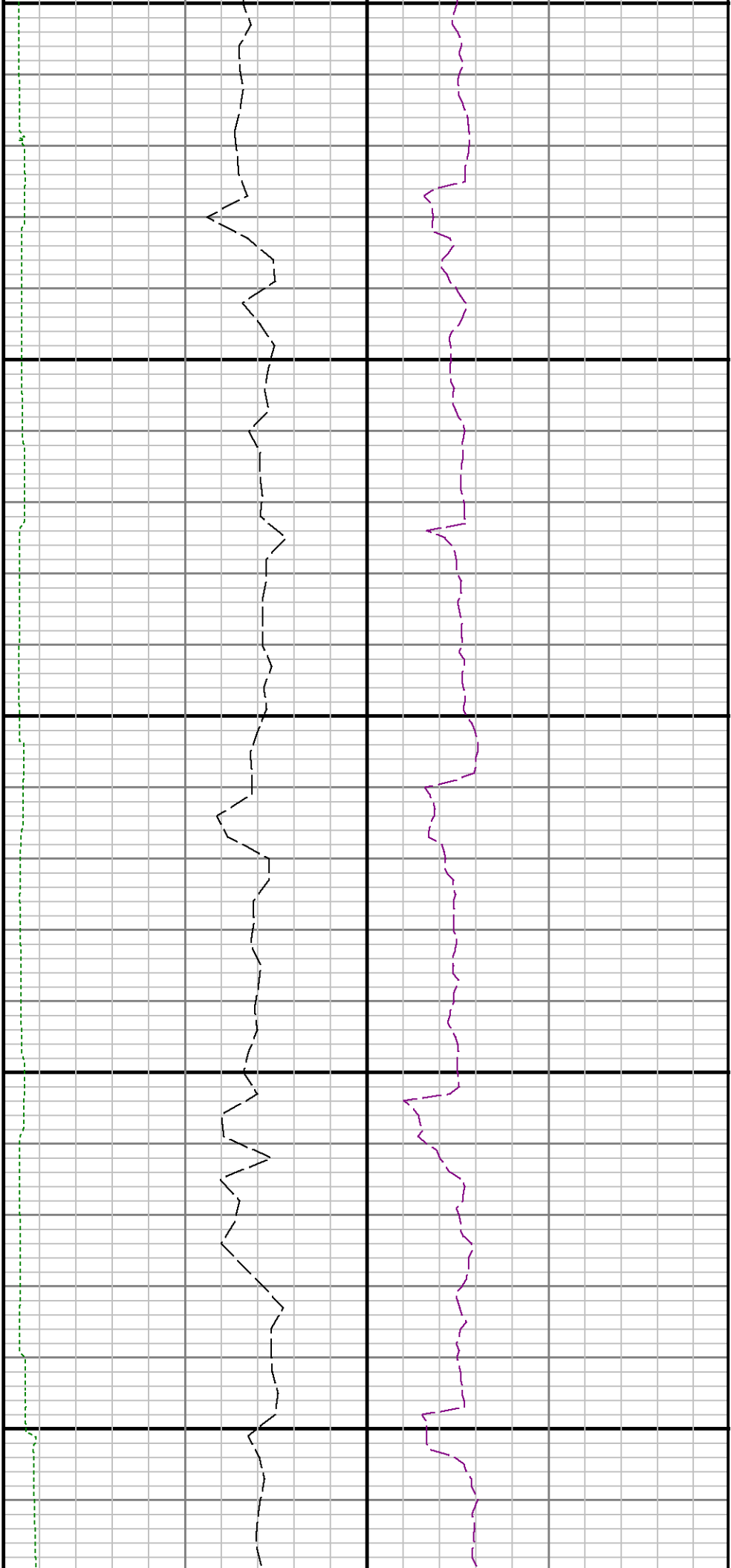
Remarks

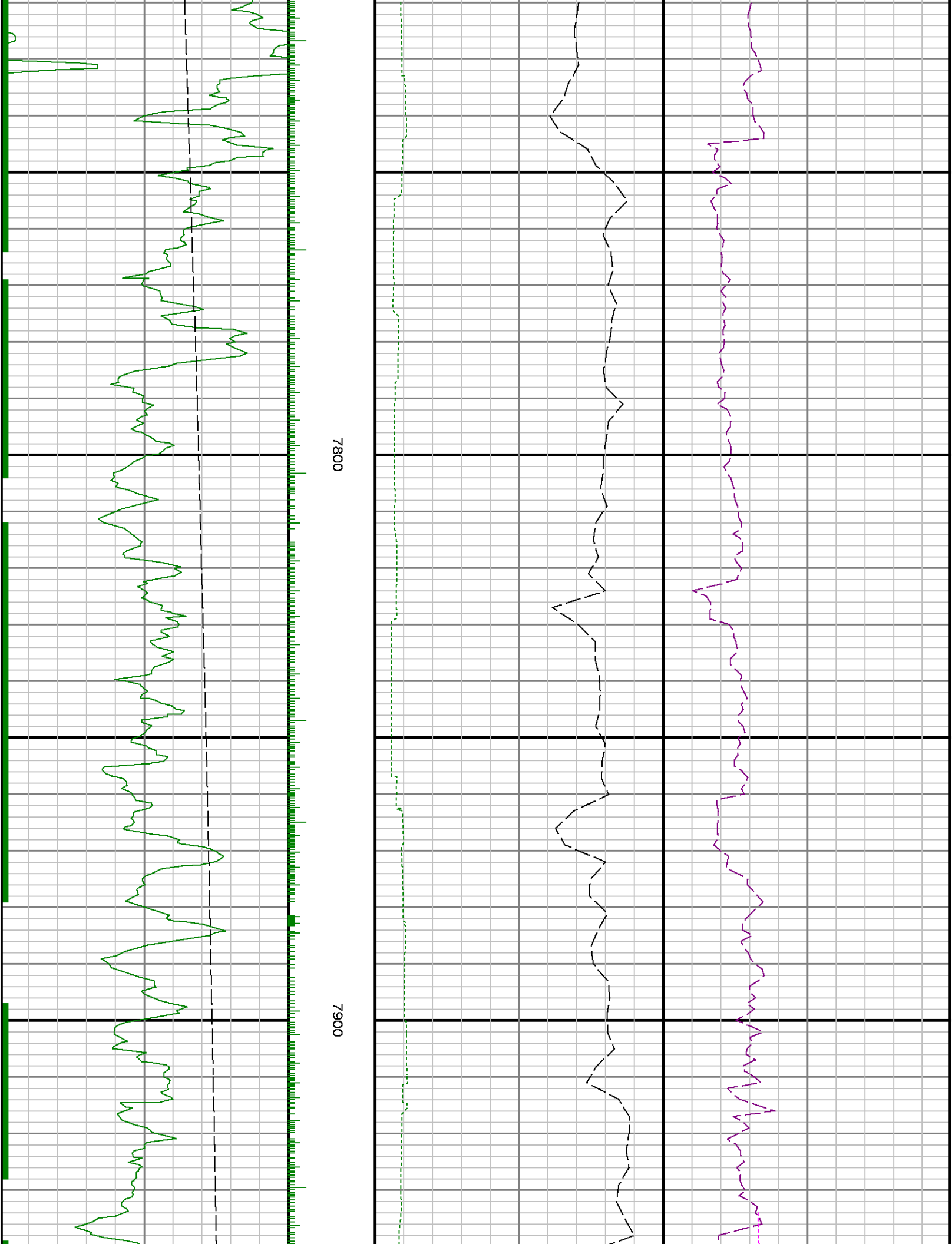
Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
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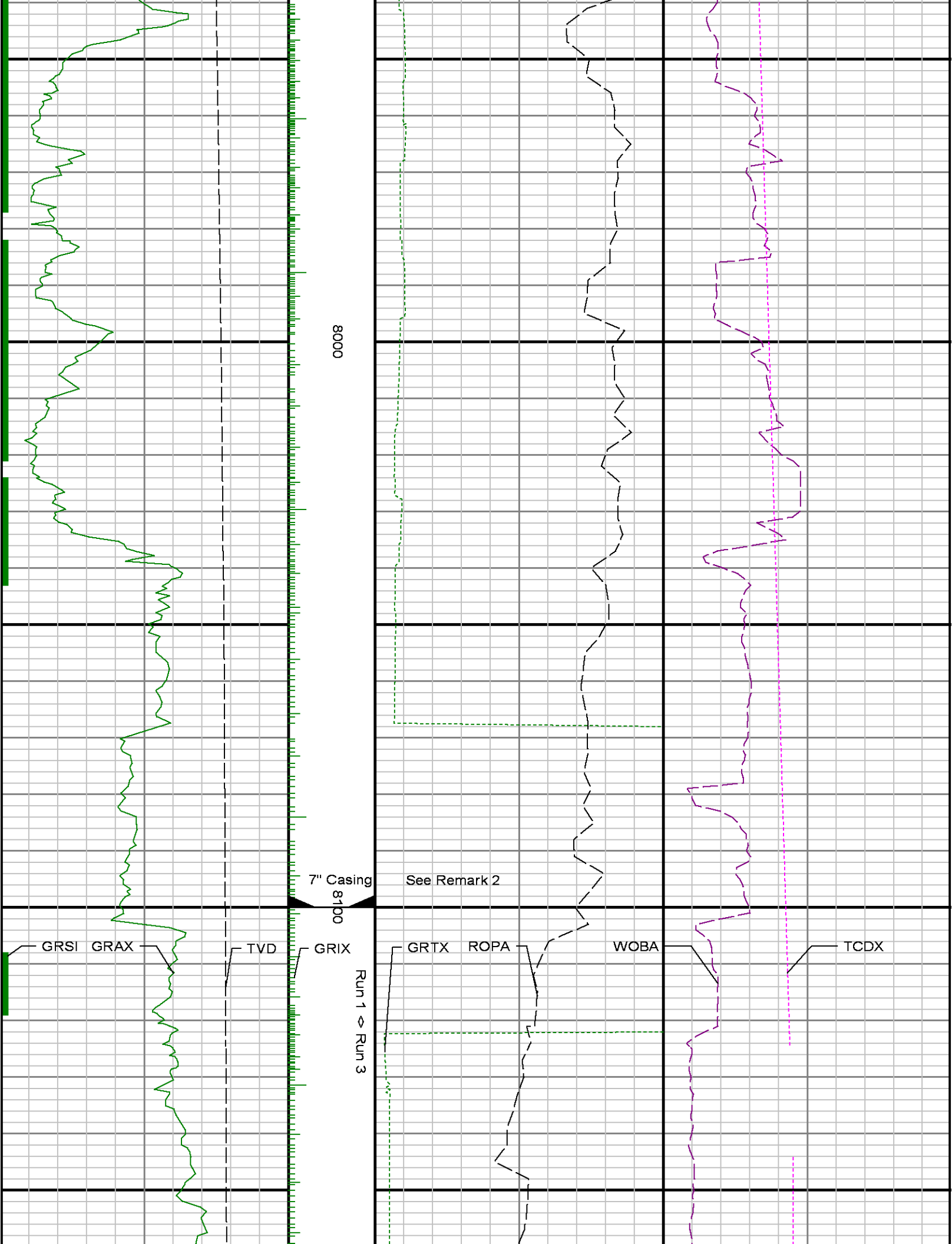
1	7175	8.750	1	The interval from surface to 7175 feet MD( 7157 feet TVD) was not logged since logging services began at kick off point.
2	8121	8.750	1	Interval from 8067 feet to 8121 feet MD (7776 feet to 7781 feet TVD) was logged more than 10 hours after drilling due to tripping for a new BHA.
3	12707	6.125	3	Interval from 12656 feet to 12707 feet MD (7755 feet to 7754 feet TVD) was not logged due to gamma ray sensor offset at well TD.

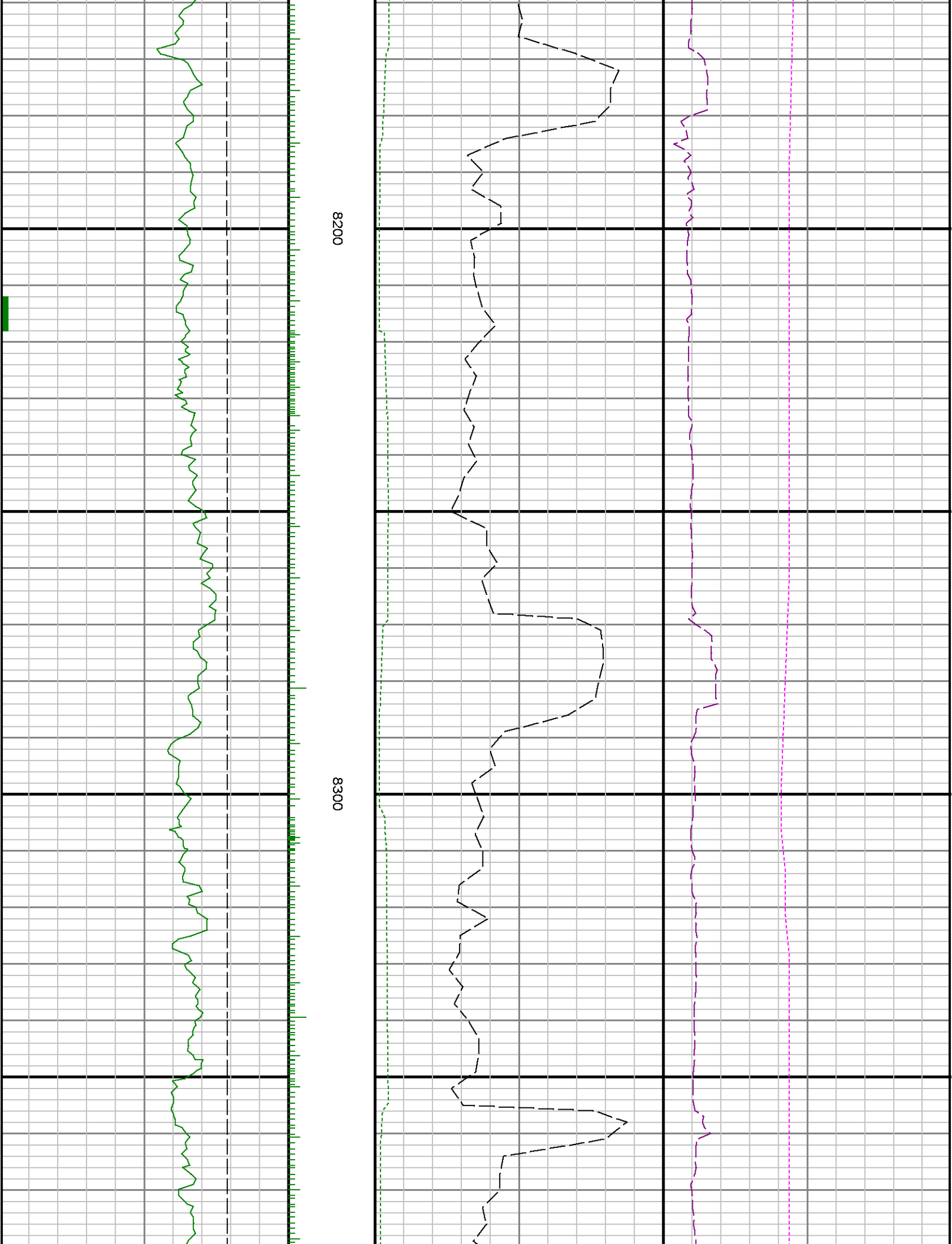




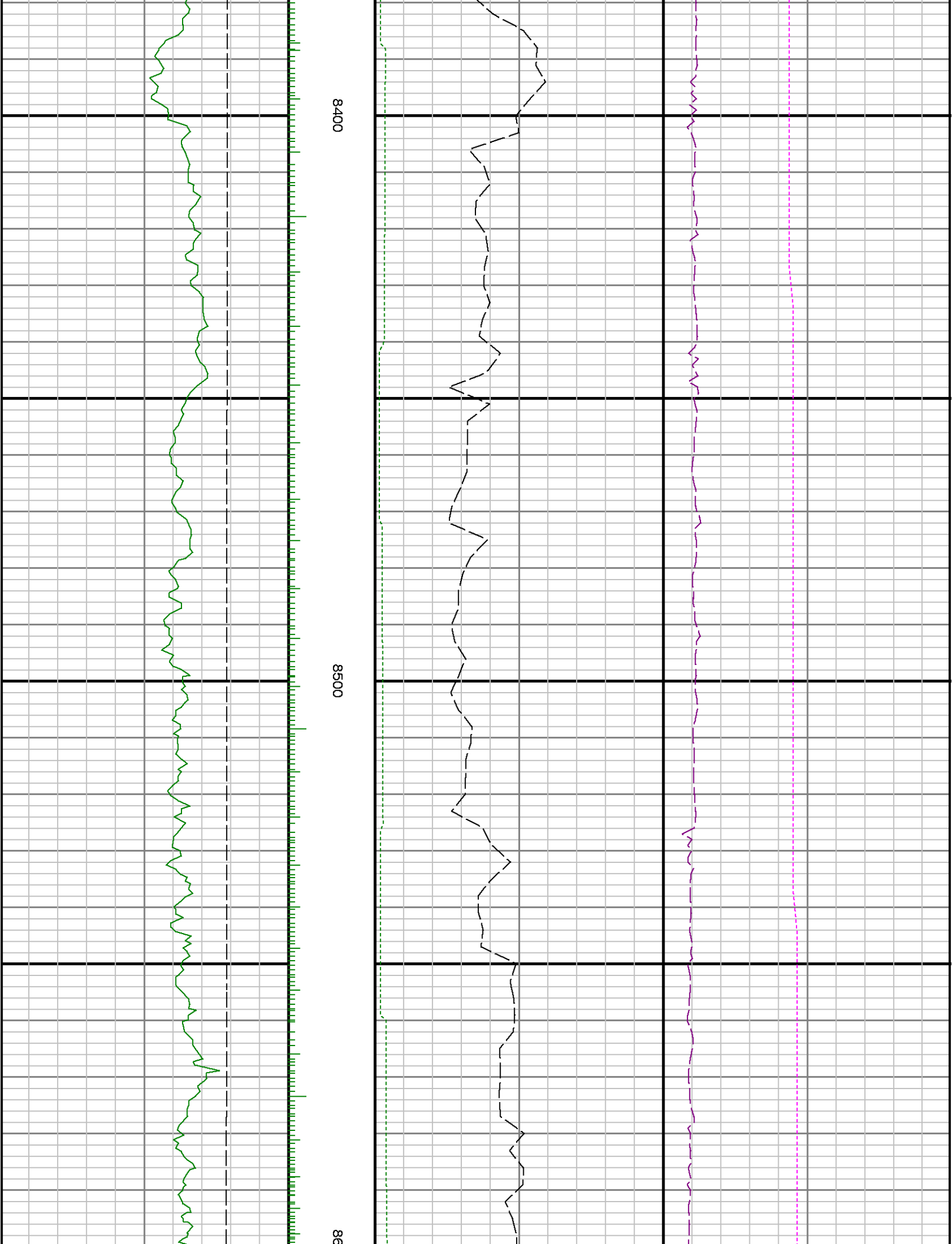


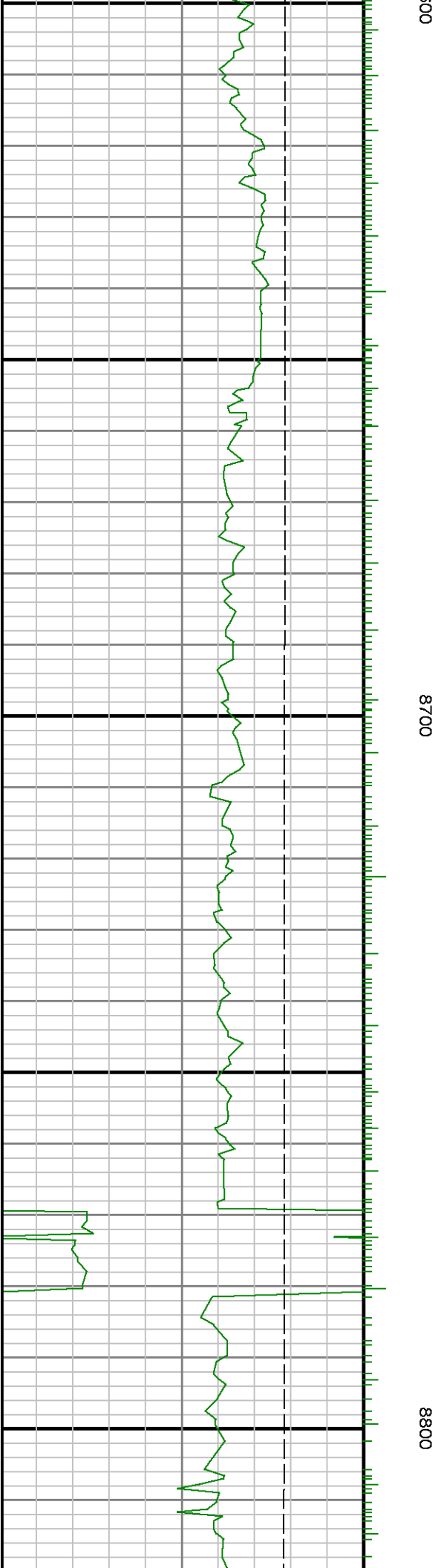


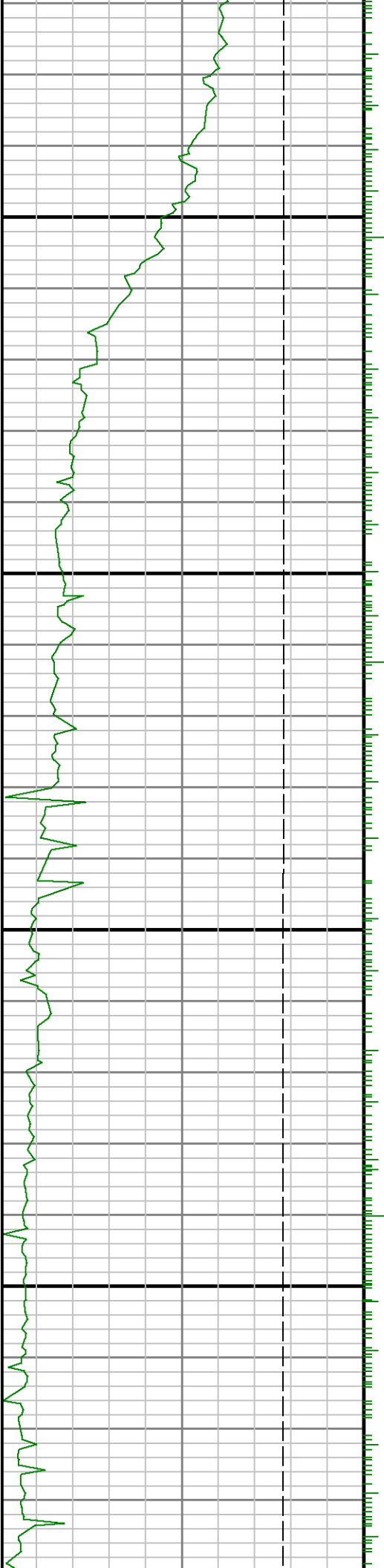






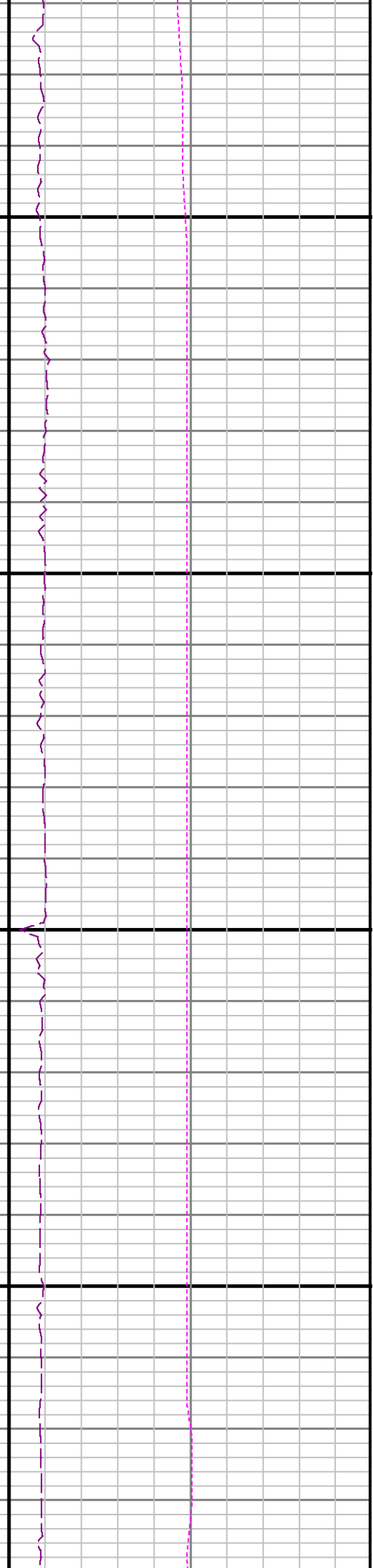
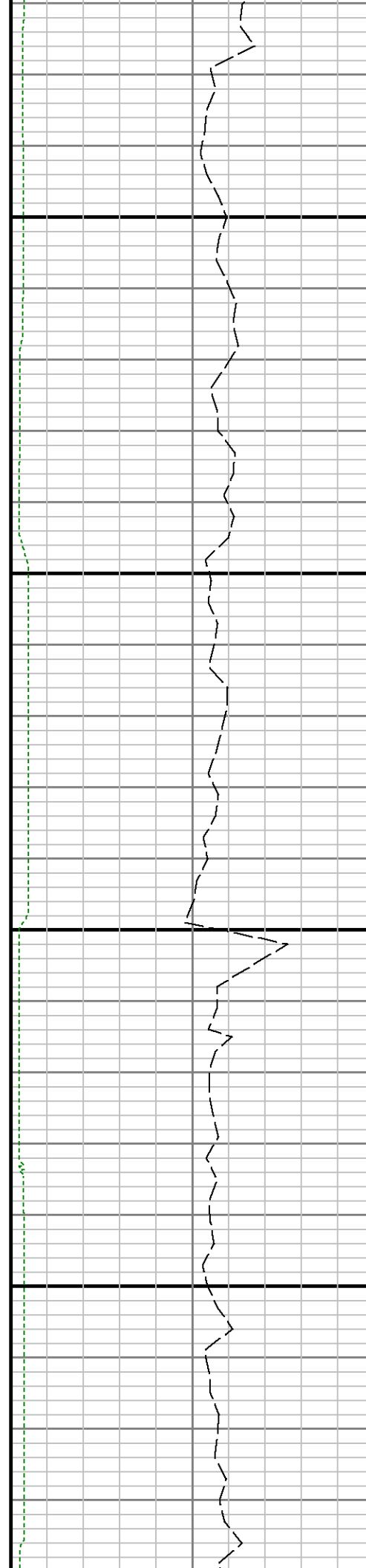


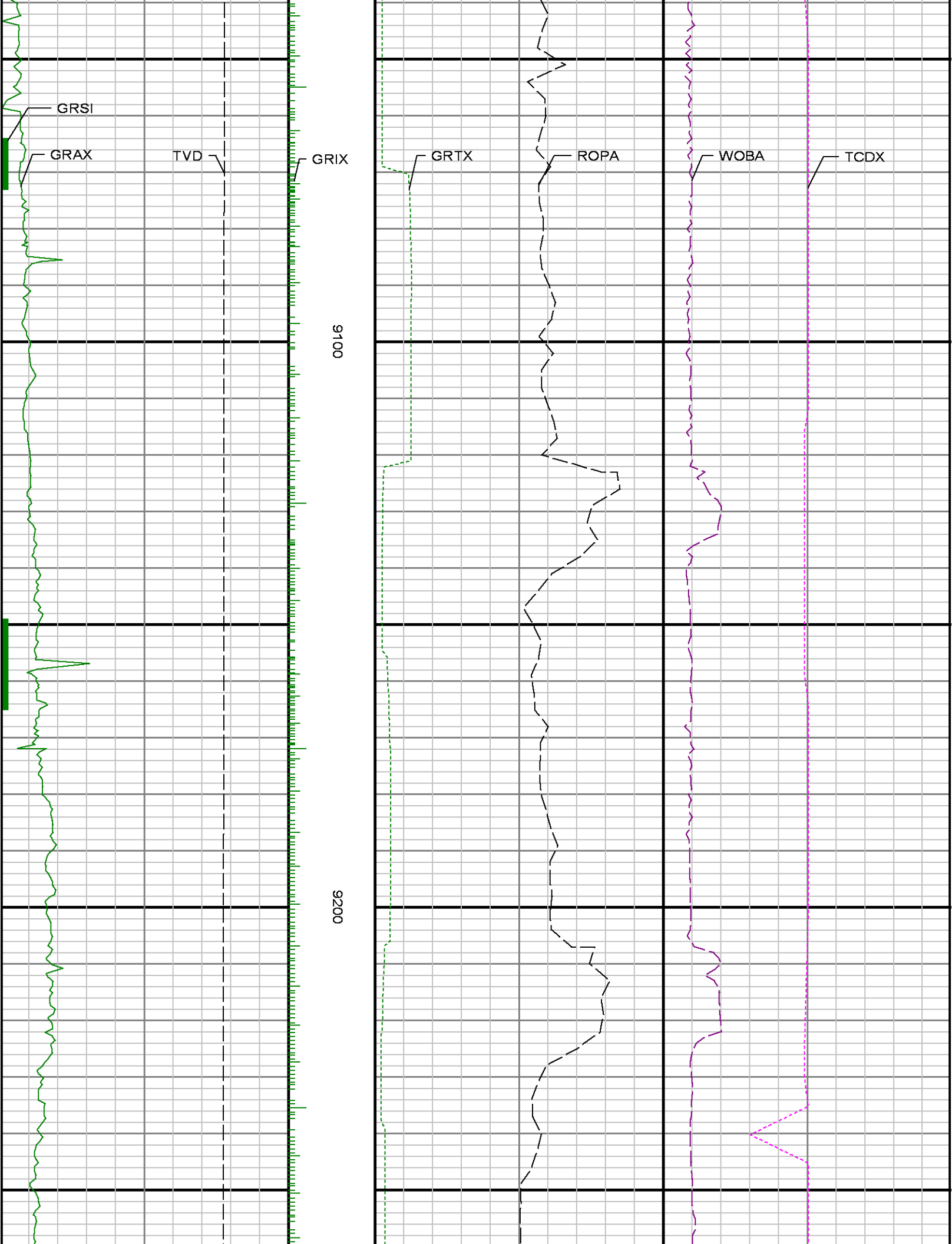


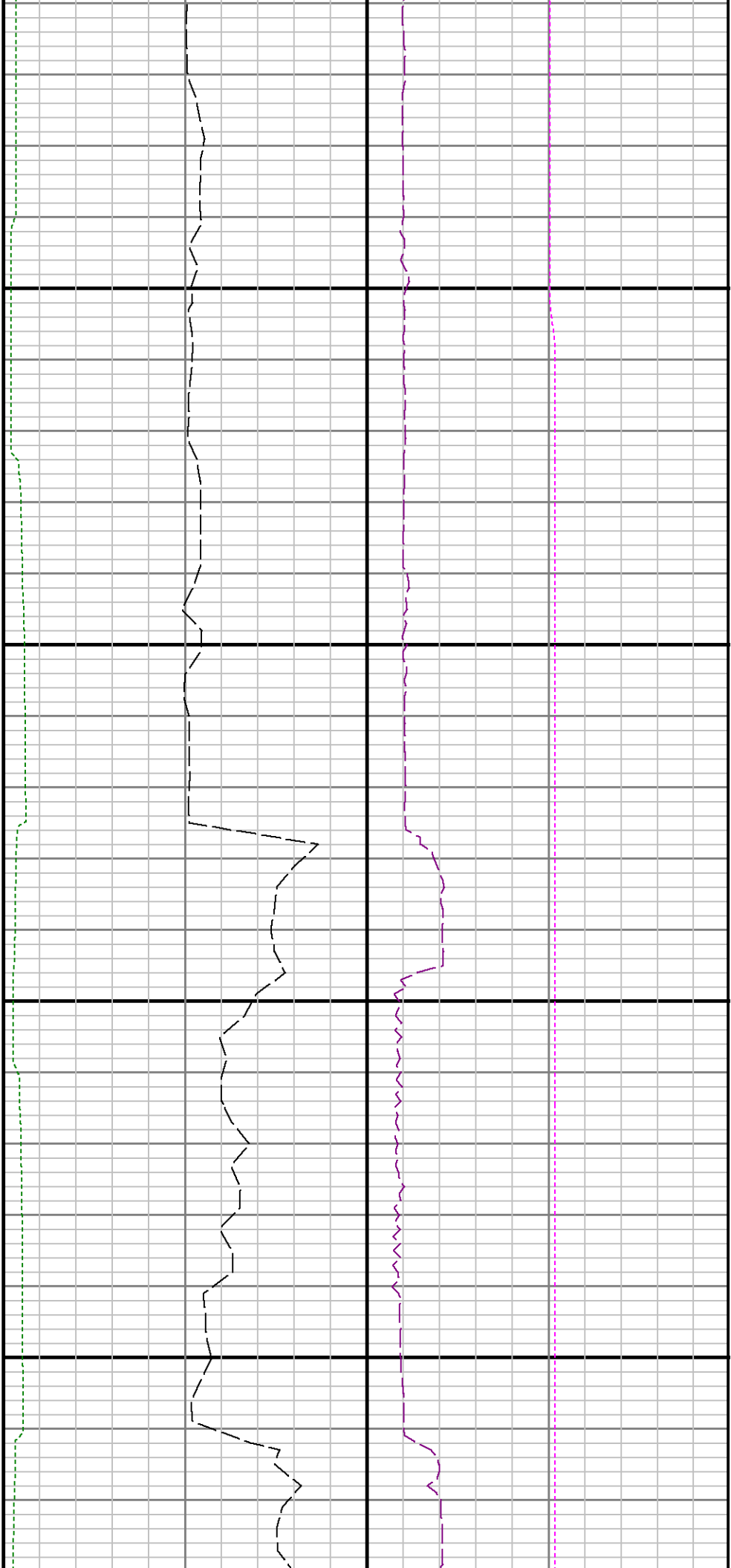


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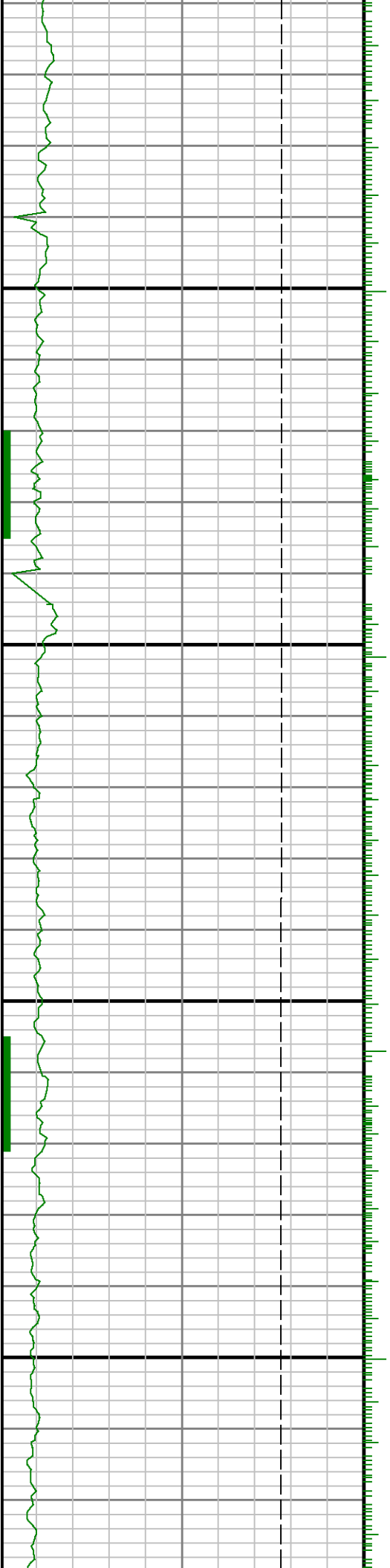


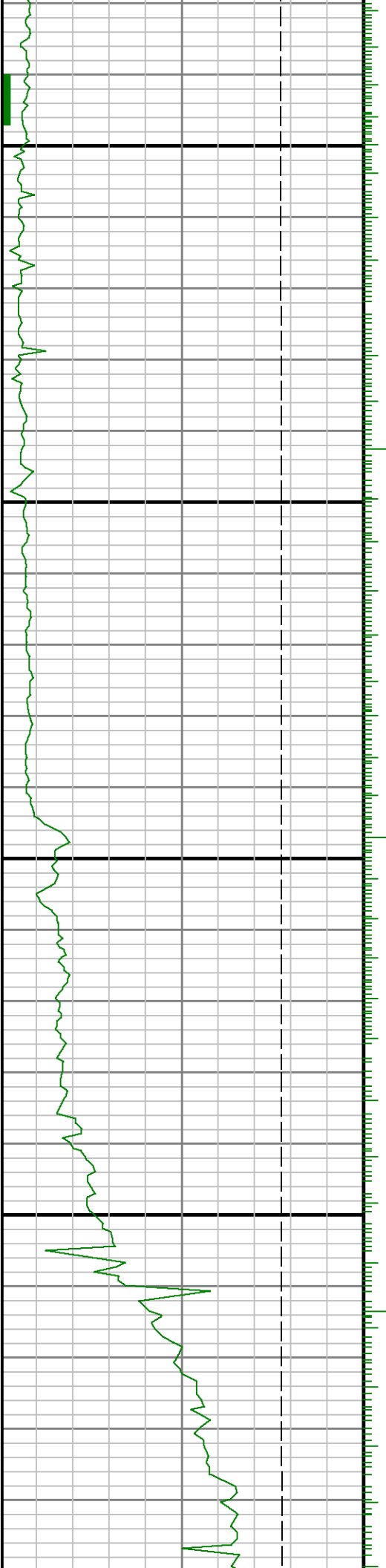




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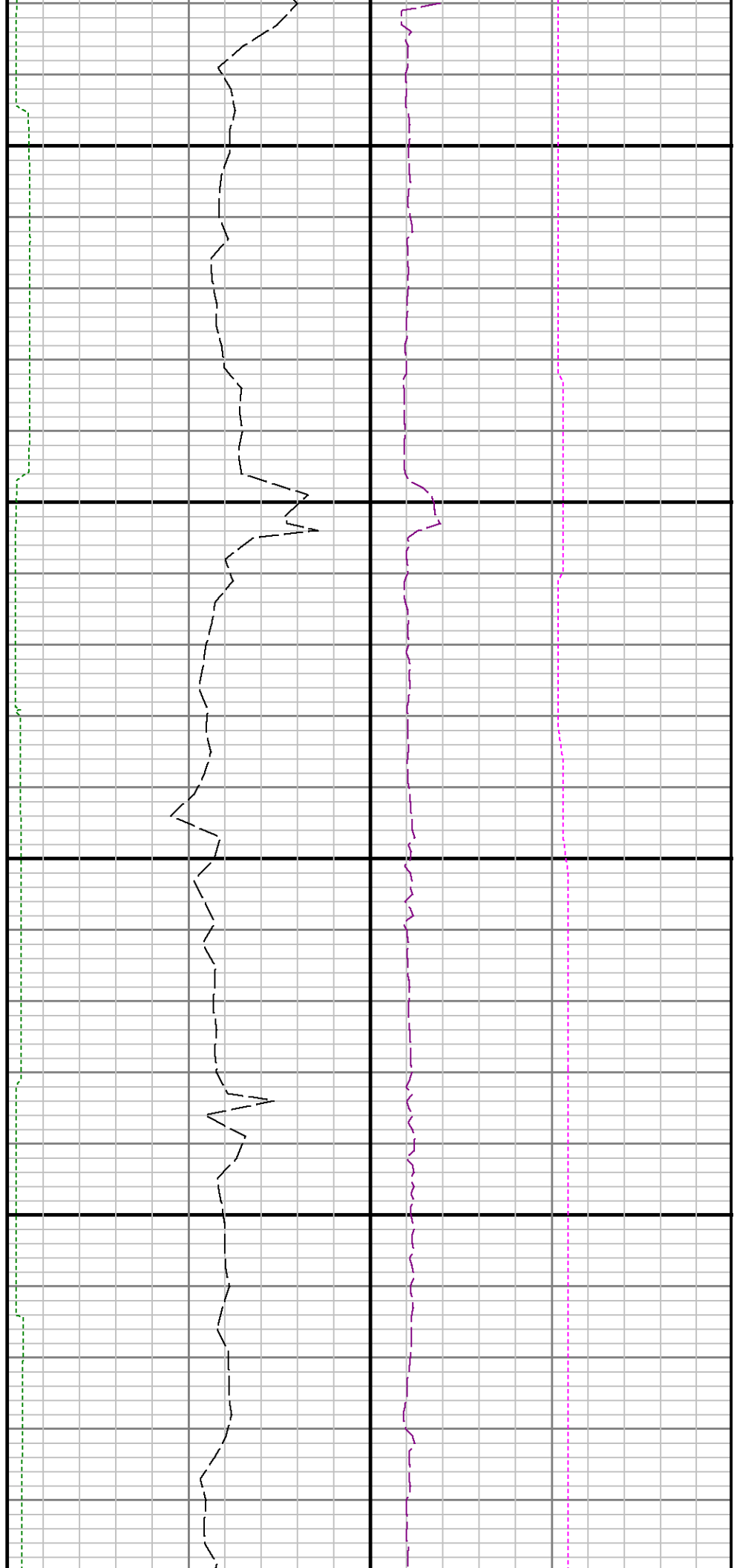


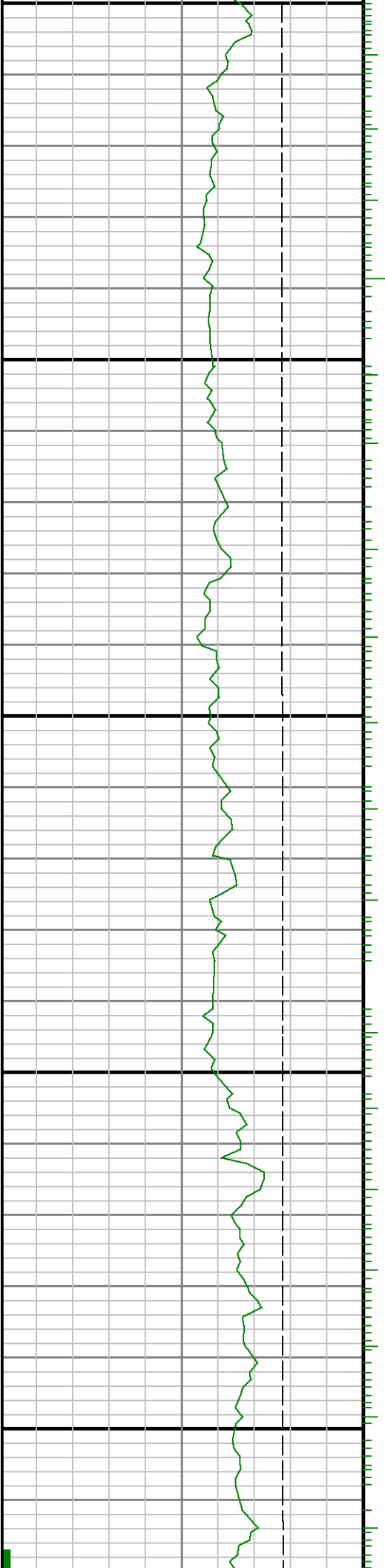


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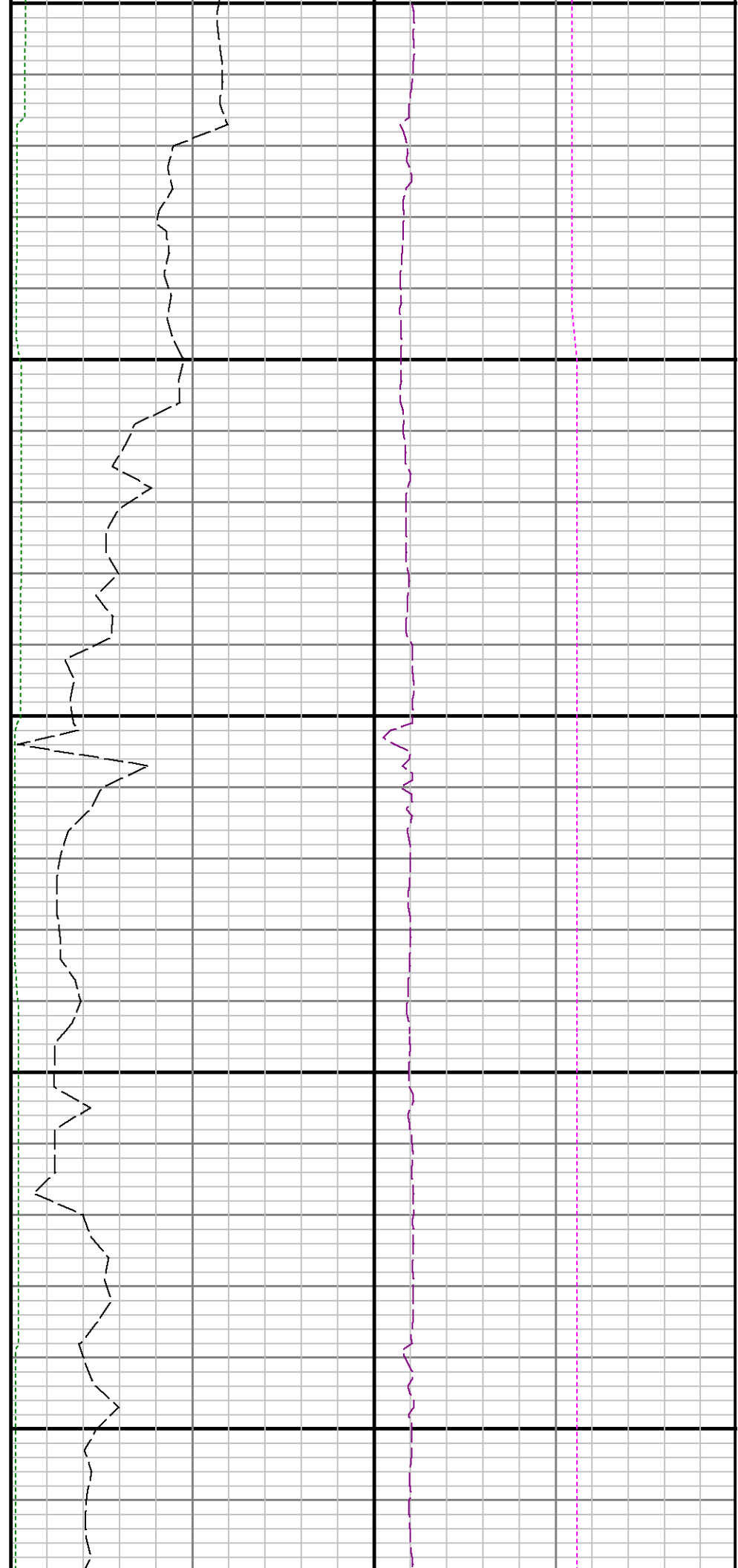


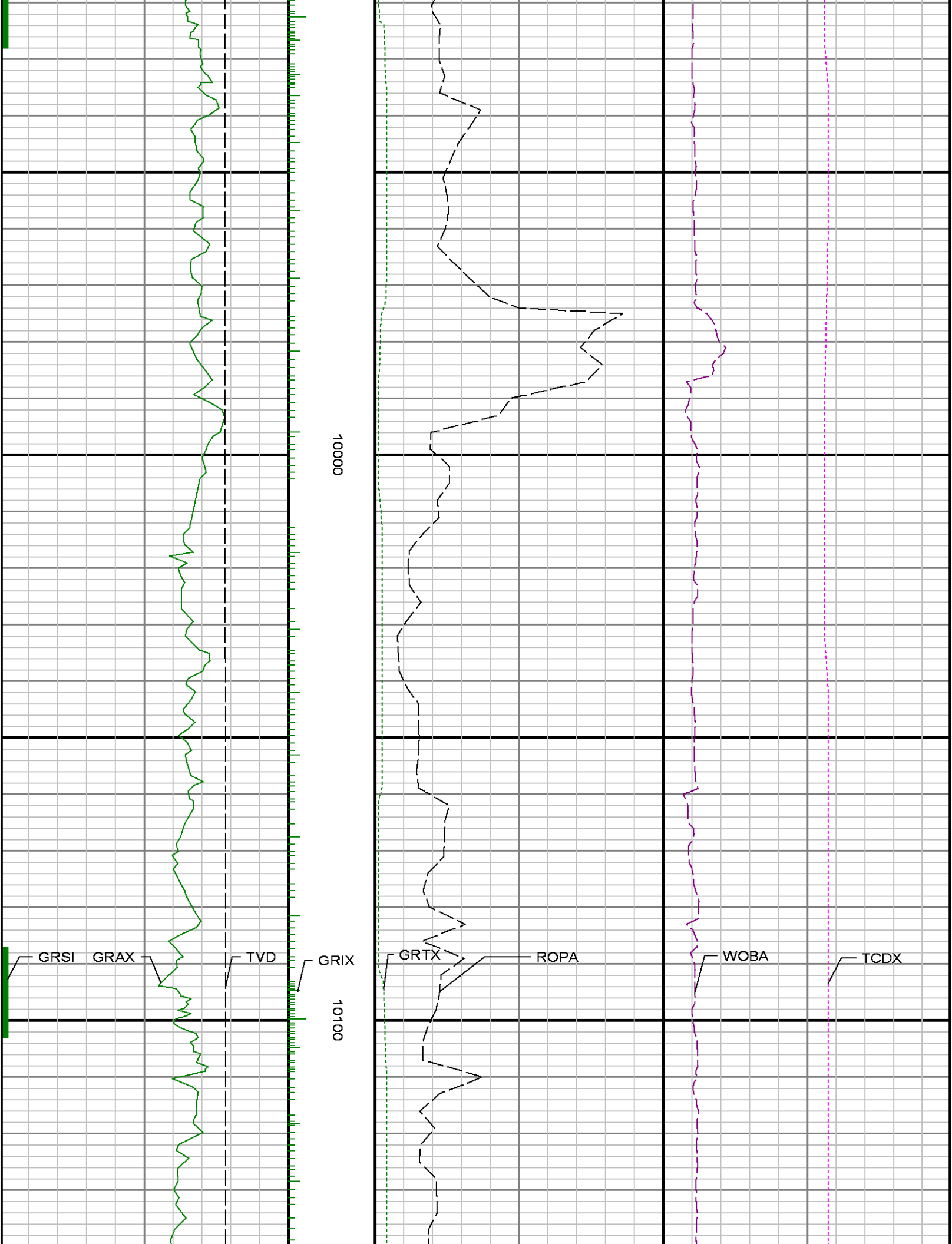


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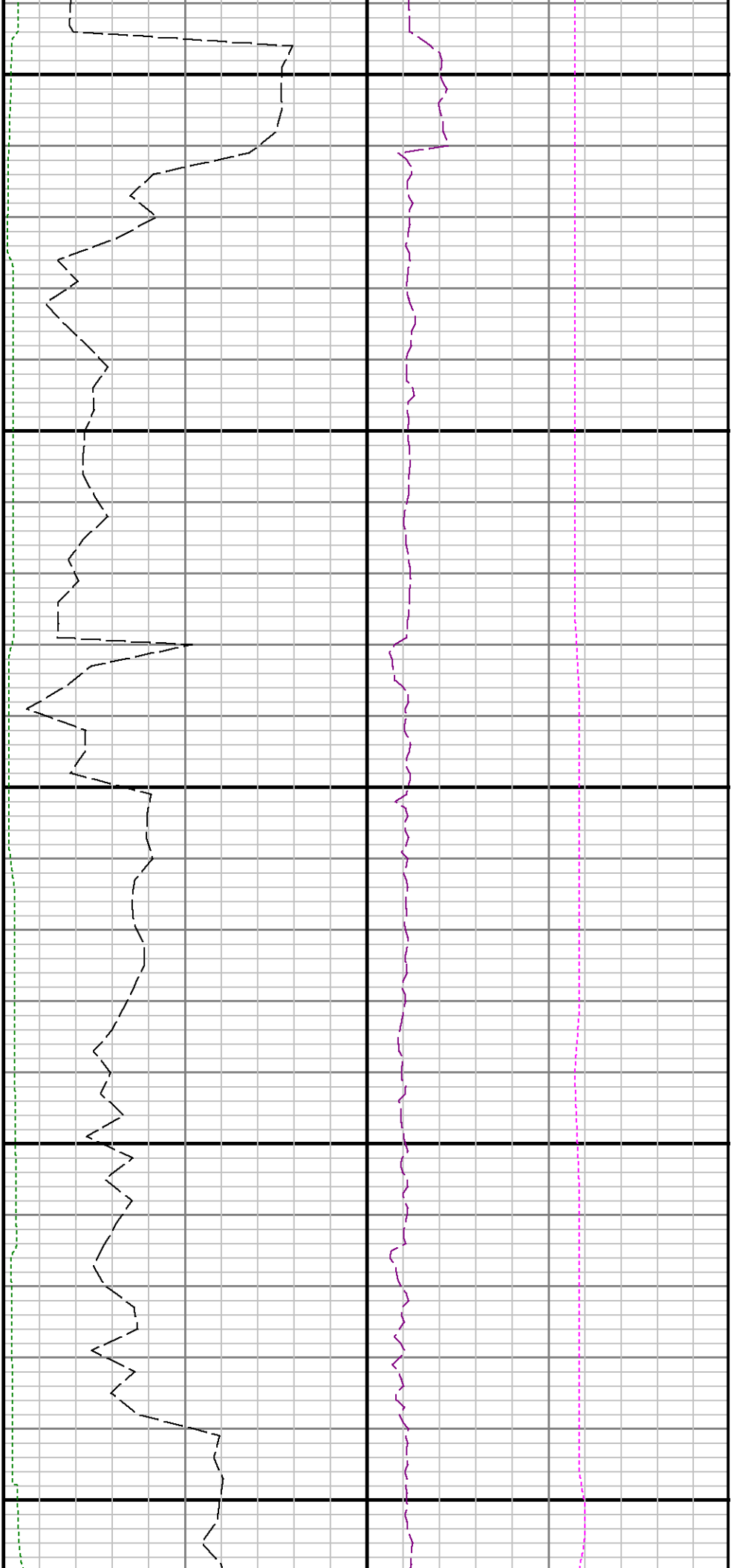
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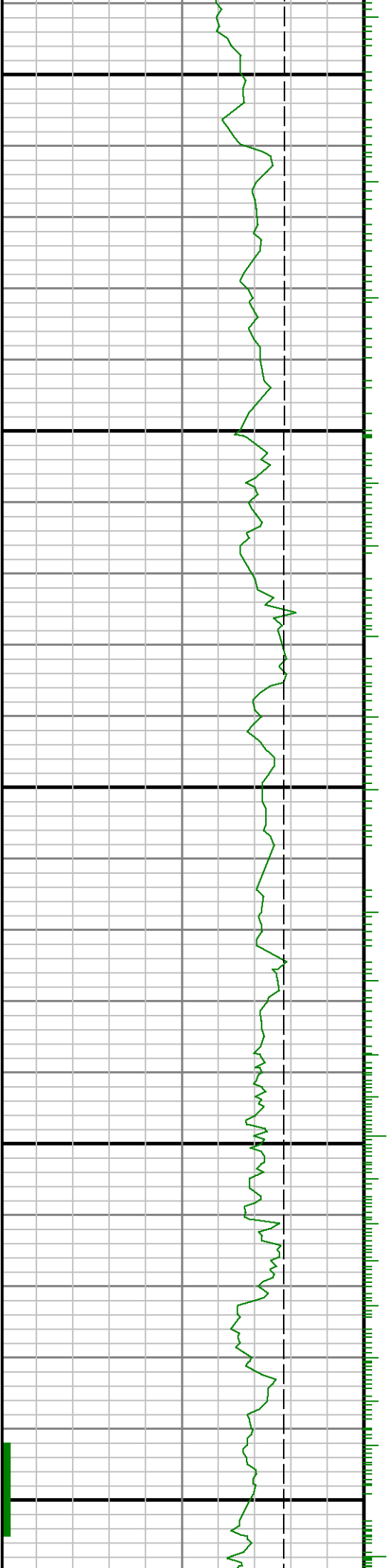


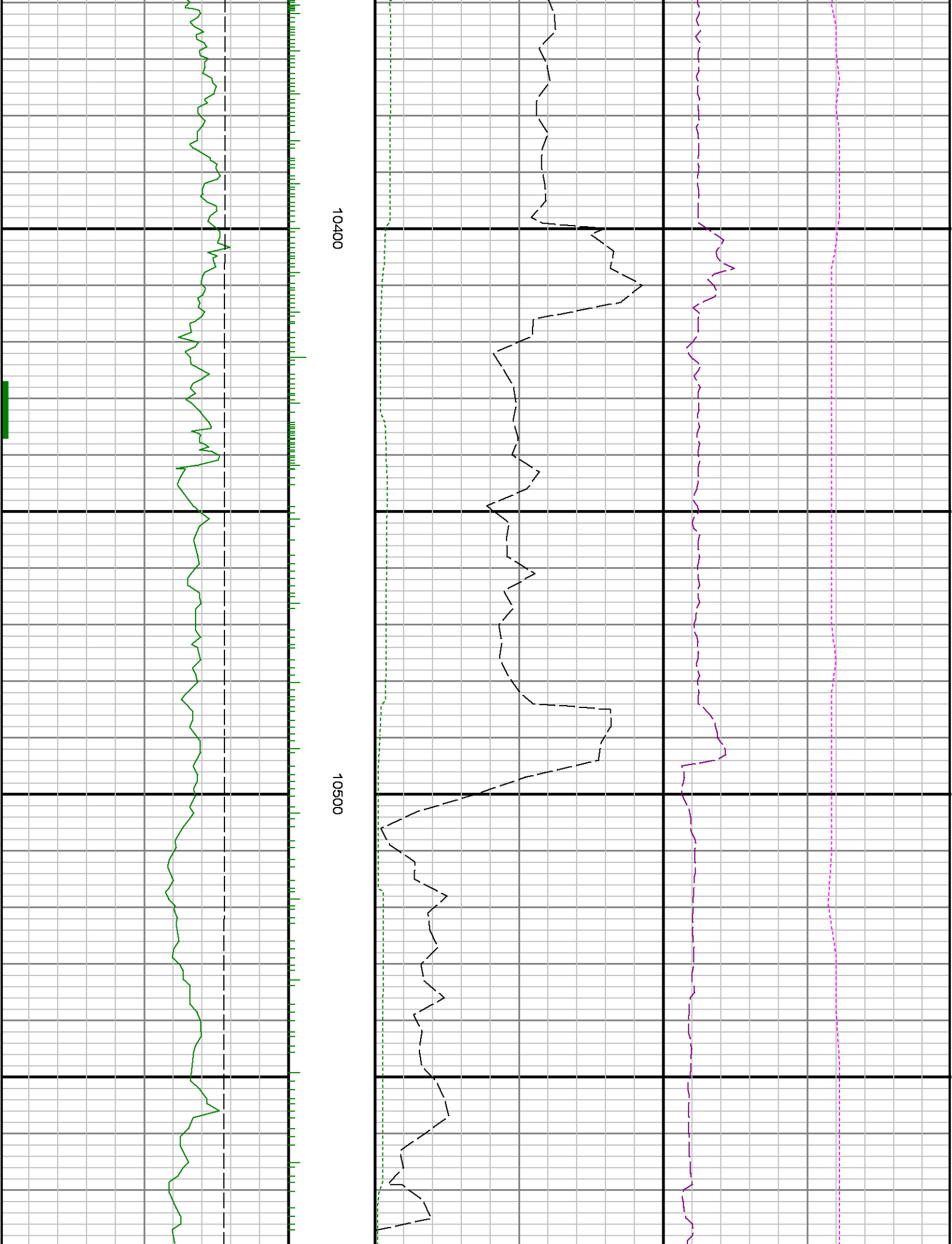


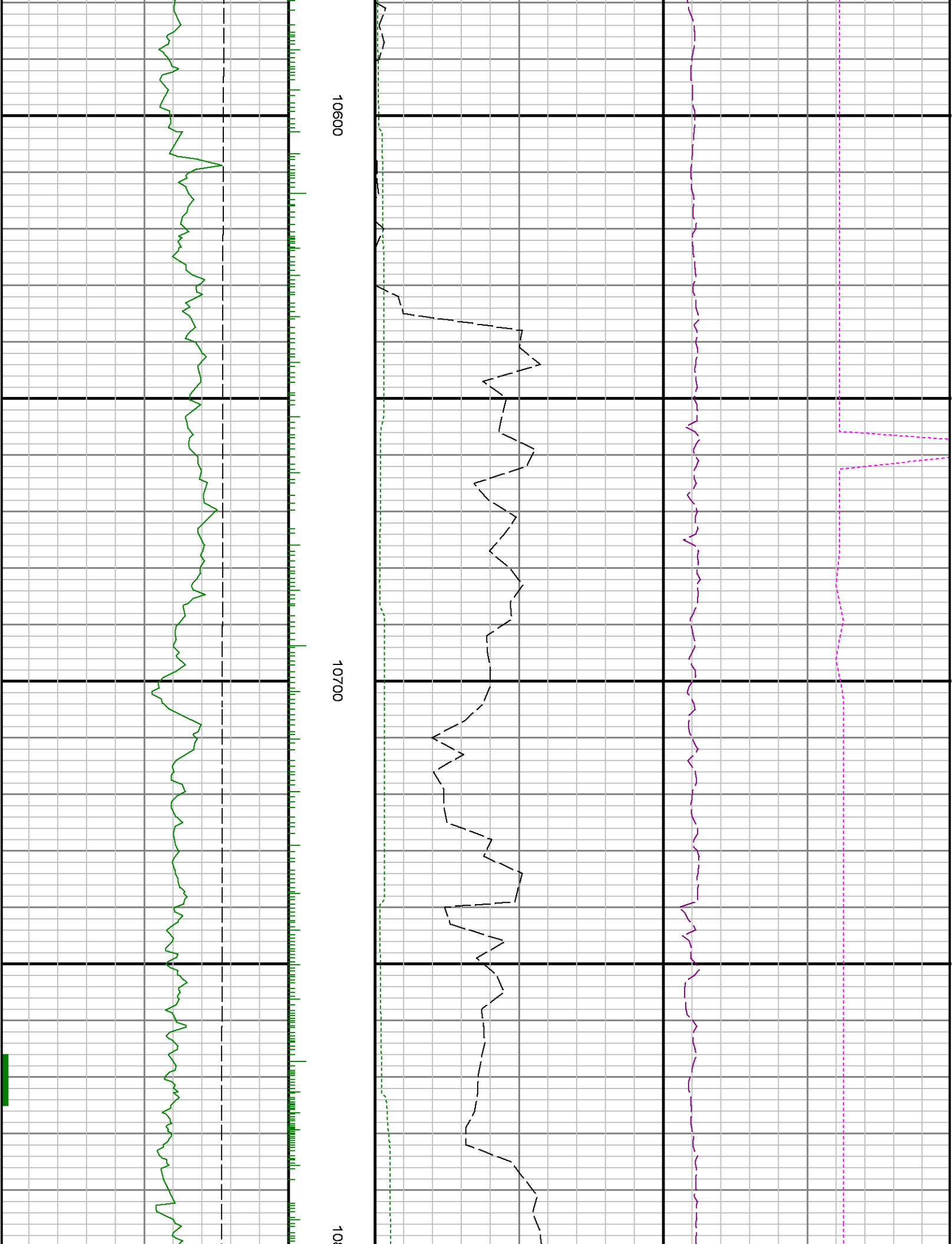


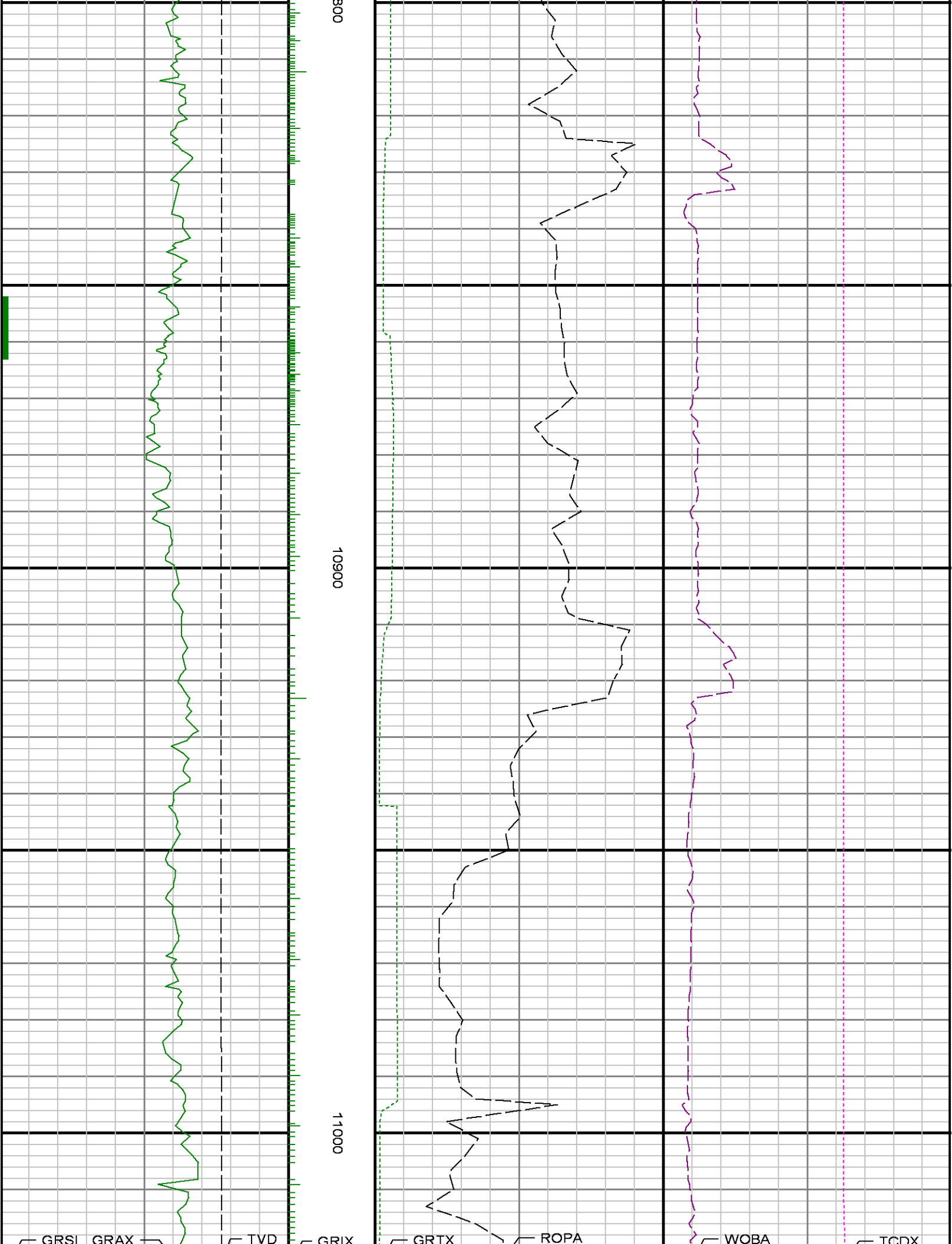
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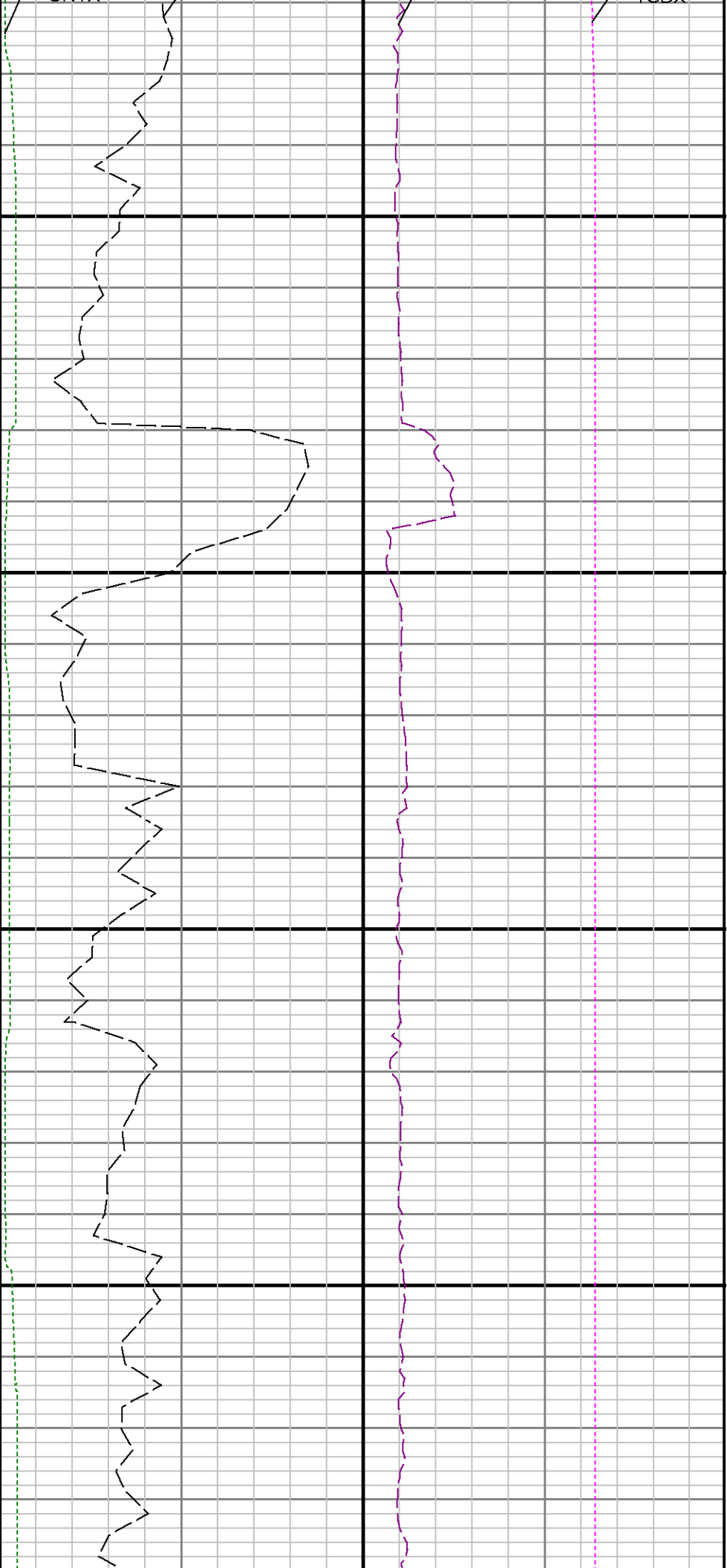
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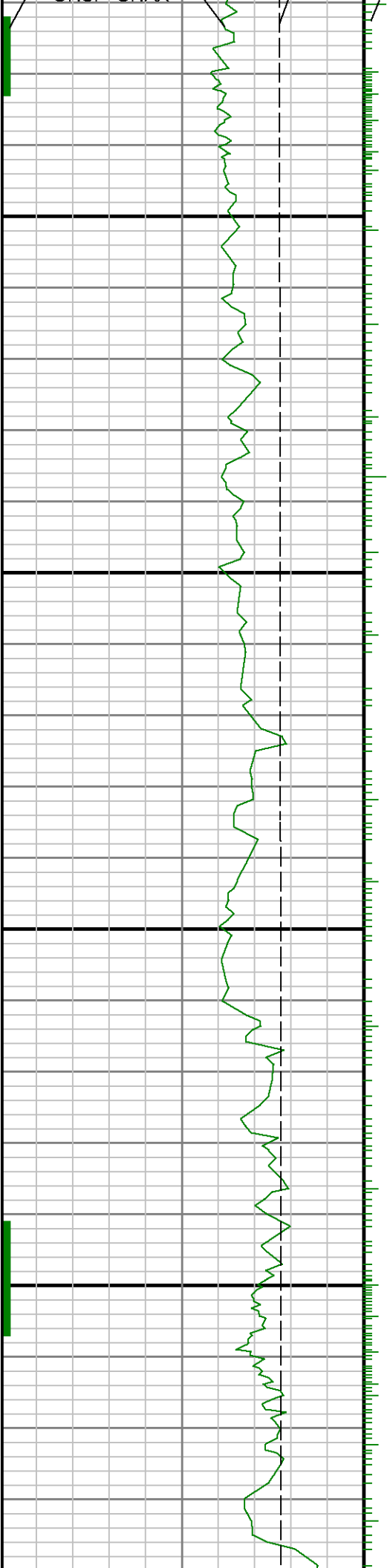


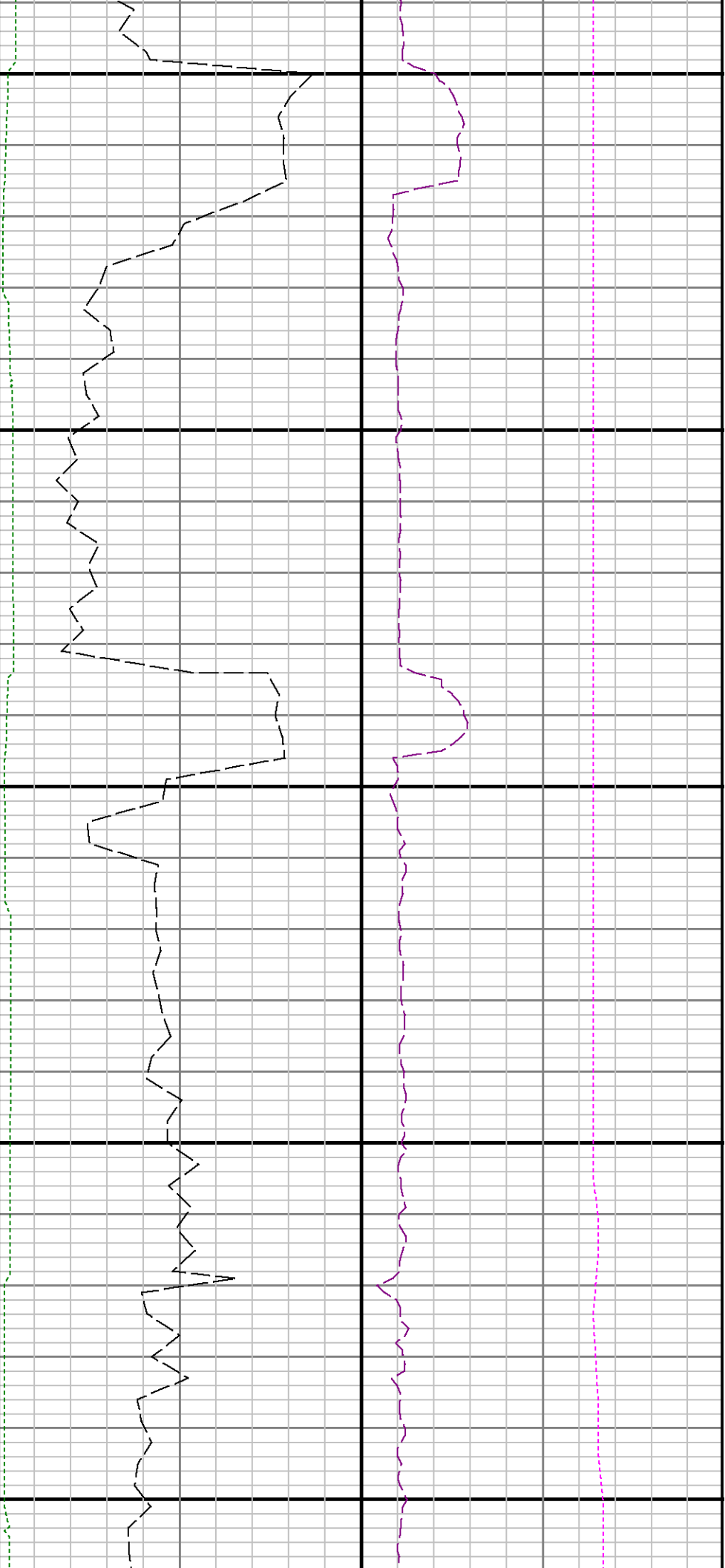


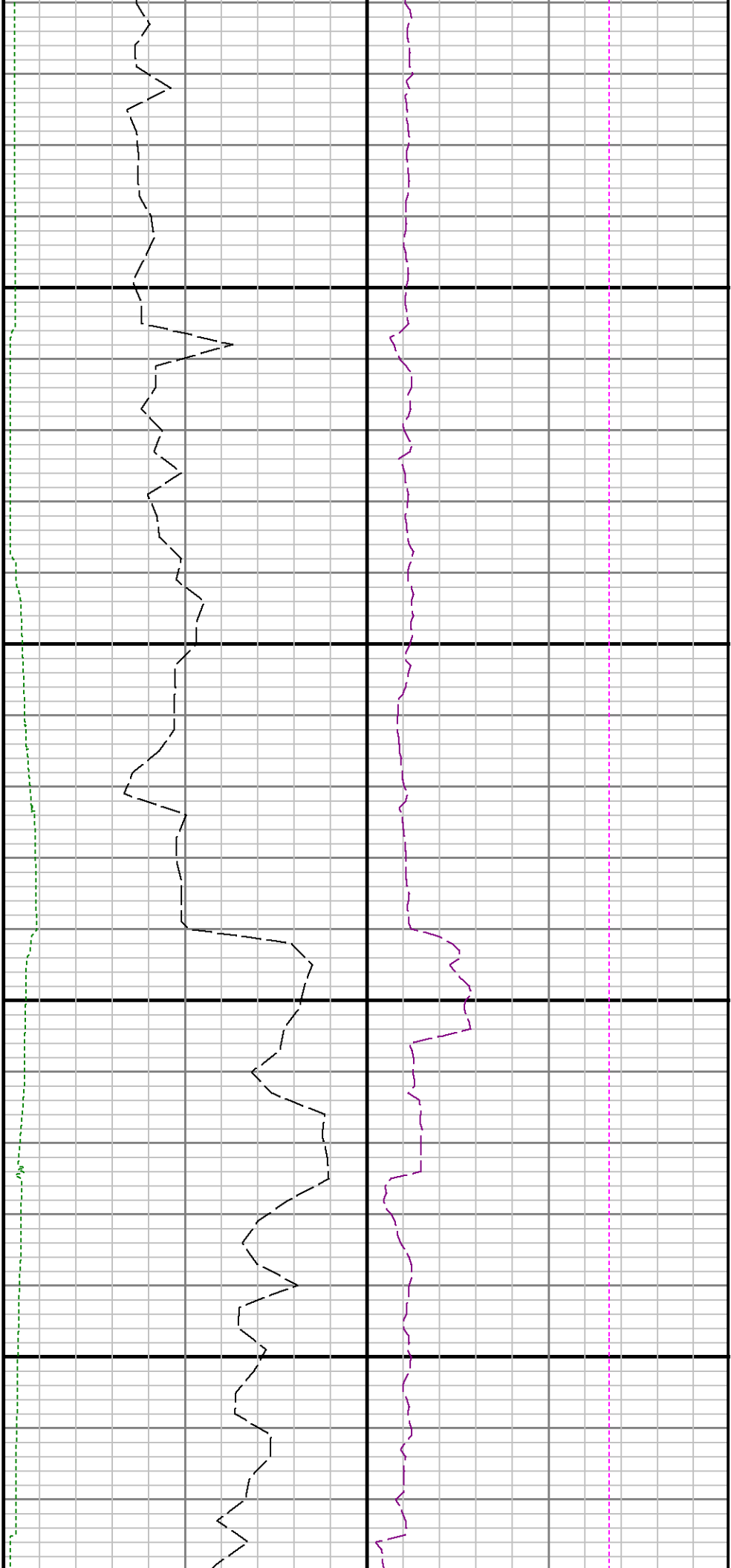


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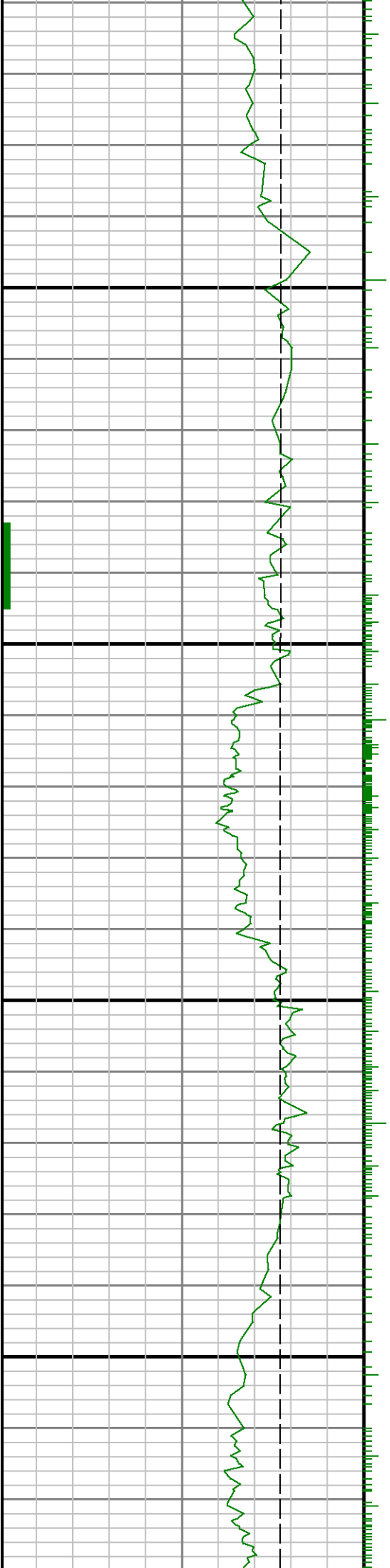


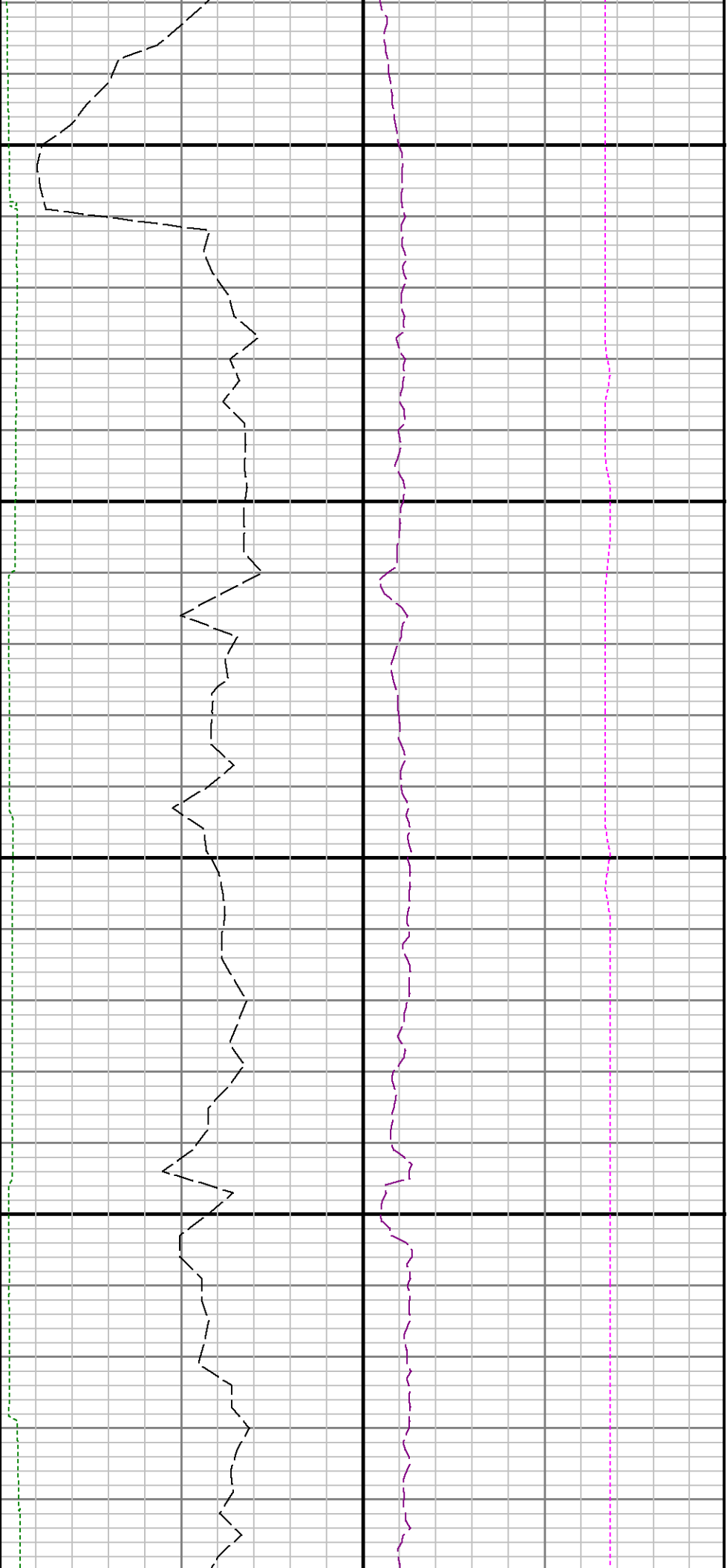




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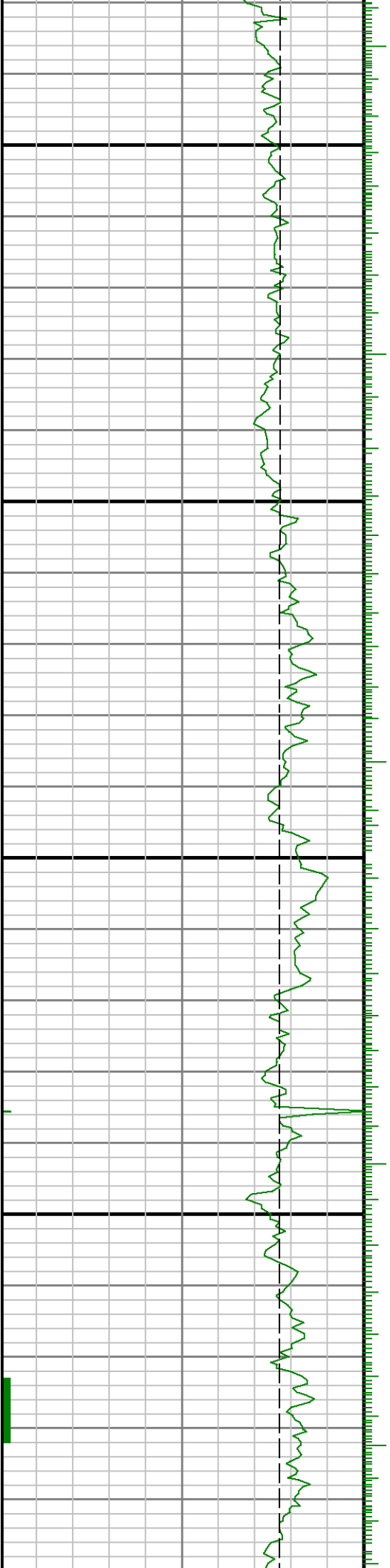




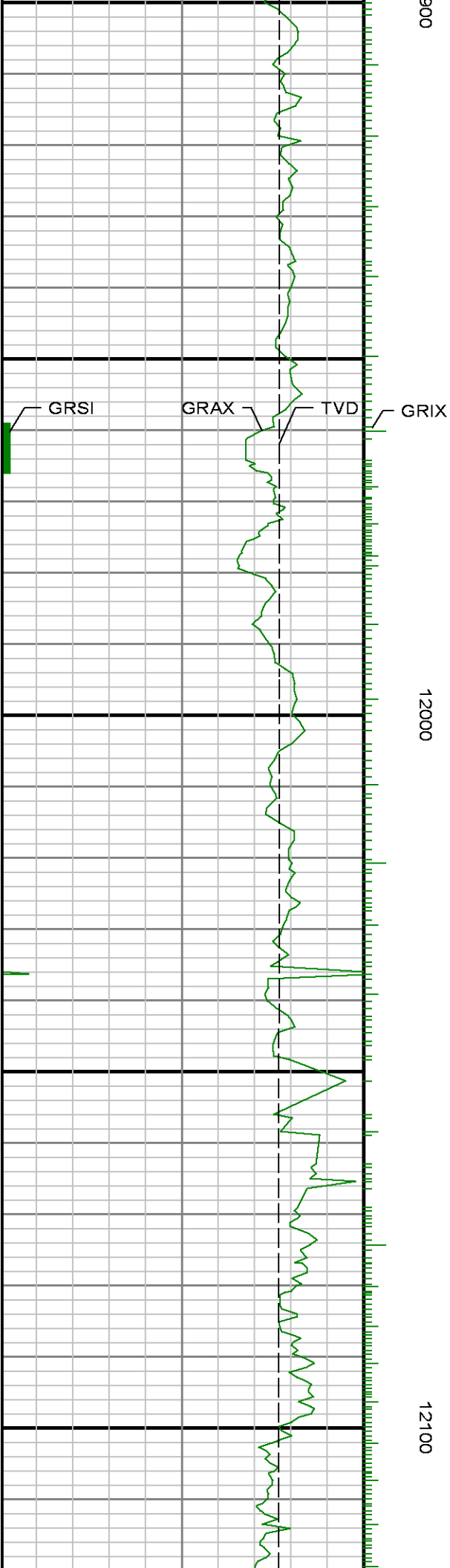
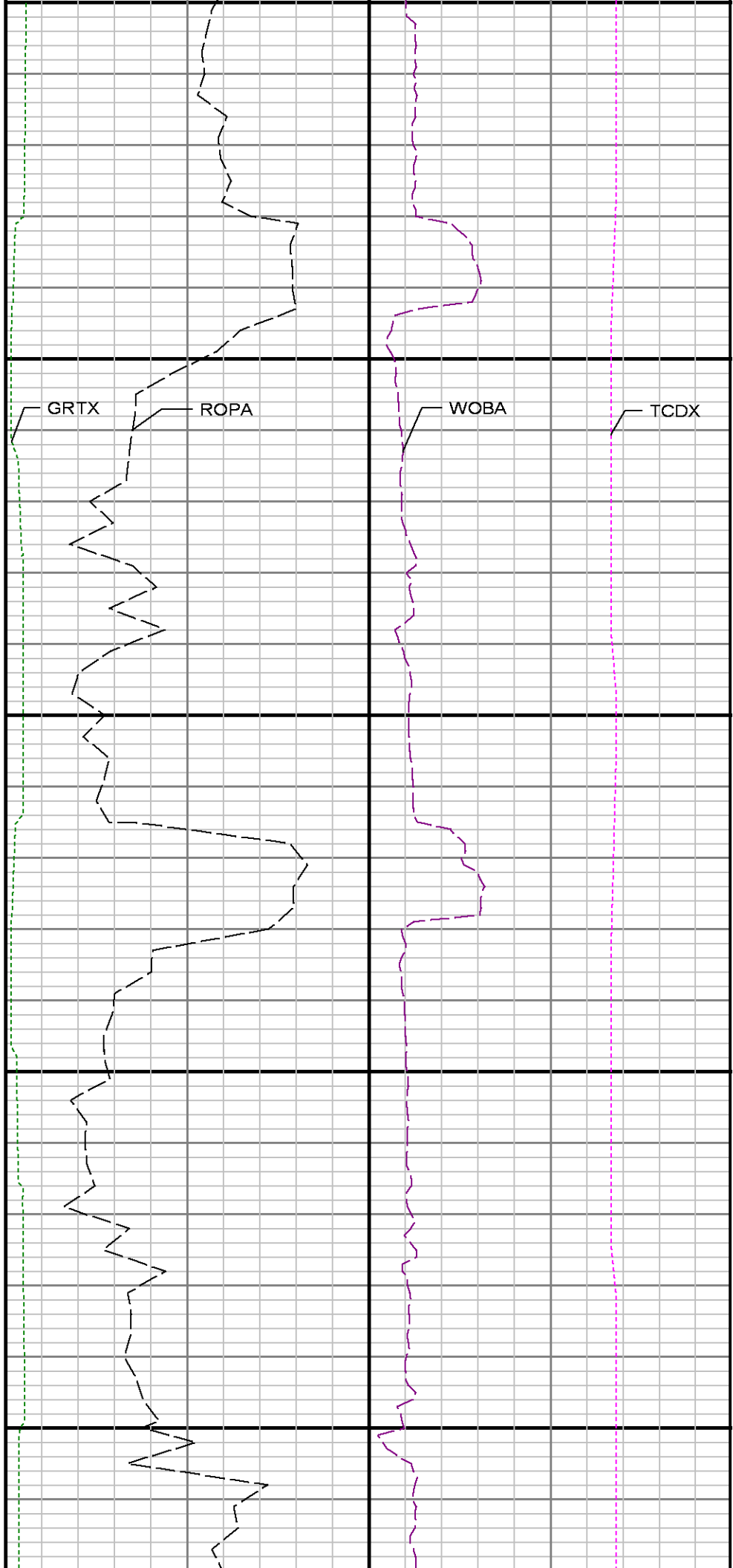
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