



Natural Formation Evaluation

Gamma Ray

Company: Anadarko

Well: Vollmar 3N-11HZ

Field: Weld County (Kerr McGee)

County: Weld County State: Colorado

Surface Location: Latitude: 40 ° 8' 31.067" N Longitude: 104 ° 51' 37.793" W

Other Services: Directional VSS

Status: Final Print

API Number: 05-123-40533-00

SEC: 14 TWP: 2N RNG: 67W

Permanent Datum (P.D.): Ground Level Elevation: 4945.00 ft.

Log Measured From: Rig Floor 16.00 ft. Above P.D.

Depth Reference: Driller's Depth Elevations: N/A 4961.00 ft. 4945.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6800.0 ft. Date From: 15/Feb/2015 Dip Angle: 66.89 ° Azi Reference North: True

Bottom: 12934.0 ft. Date To: 19/Feb/2015 Total Mag to Reference

Spud Date: 14/Feb/2015 Field Strength: 52707.0 nT North Correction: 8.58 °

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13,500 in.	16.0 ft.	1210.0 ft.	9.625 in.	36.00 lb/ft	Surface	1194.0 ft.
8,750 in.	1210.0 ft.	7783.0 ft.	7.000 in.	26.00 lb/ft	Surface	7769.0 ft.
6,250 in.	7783.0 ft.	12934.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	Surface	12934.0 ft.	13,500 in.	1210.0 ft.	0.0 ° / 267.8 °	0.5 / 283.4 °
			8,750 in.	7783.0 ft.	0.8 ° / 204.0 °	90.1 ° / 357.7 °
			6,250 in.	3941.0 ft.	84.2 ° / 358.4 °	89.9 ° / 5.5 °
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig:	Xtreme 6	/	Anadarko
PATS	6.4.1.34	Job No:	7046543		
		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	5.000	Mud Motor	6800.0	7740.0	1210.0	7782.0	15/Feb/2015 08:10	15/Feb/2015 19:52	35.7
2	2	3	6.125	PDC	3.600	Mud Motor	7740.0	12885.0	7782.0	12934.0	17/Feb/2015 07:34	19/Feb/2015 00:50	38

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Matthew Delmore	14/Feb/2015	16/Feb/2015	Donald Delay	14/Feb/2015	19/Feb/2015	Bryan Severson	17/Feb/2015	19/Feb/2015
						Andy King	18/Feb/2015	18/Feb/2015

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+ (%)
15/Feb/2015	17:21	1	5240.0	Water Based	10.2	43	9.4	N/A	0 / 90	Active Mud Pit	3200	N/A
16/Feb/2015	17:22	2	7783.0	Water Based	10.4	44	9.4	N/A	0 / 90	Active Mud Pit	3200	N/A
17/Feb/2015	18:30	2	9252.0	Water Based	9.3	43	9.5	N/A	1/94	Active Mud Pit	3300	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	points
GRSI	Gamma Ray Sliding Indicator	unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	degF
TVD	True Vertical Depth	ft.
WOBA	Surface Weight on Bit, 1.0 ft. Avg.	klbs

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12497612	Directional	45.28	6.750	3.250
1	SRIG	12131373	Gamma	41.91	6.750	3.250
2	DIR	11700519	Directional	49.48	4.750	2.625
2	SRIG	11732967	Gamma	46.10	4.750	2.625

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 LWD run 1 utilized 6 3/4 inch NaviTrak Services (VSS, Directional) from 1210 to 6800 ft. MD ( 1210 to 6737 ft. TVD) and NaviGamma Services (VSS, Directional, Gamma Ray) from 6800 to 7883 ft. MD (6737 to 7336 ft. TVD) behind an 8 3/4 inch bit and steerable assembly.
2.) Baker Hughes LWD run 2 utilized 4 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) from 7883 to 12934 ft. MD (7336 to 7349 ft. TVD) behind an 6 1/8 inch bit and steerable assembly.
3.) A sliding indicator is shown on the left edge of track 1 as a heavy line. This indicator has been depth-shifted to the gamma ray sensor offset to correspond with gamma ray data.
4.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.

Remarks

Number	Measured	Hole	LWD	Remark
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	Depth (ft)	Section (in.)	Run No.	
1	7740	6.125	2	The interval from 7740 to 7782 ft. MD (7360 to 7363 ft. TVD) was logged up to 35.5 hours after being drilled due to a trip out of the hole to lay down the vertical/curve assembly, run intermediate casing, cementing operations, and to pick up the lateral assembly.
2	12885	6.125	2	The interval from 12885 to 12934 ft. MD (7349 to 7349 ft. TVD) does not contain GRAX, GRIX or GRTX due to the bit to sensor offset.

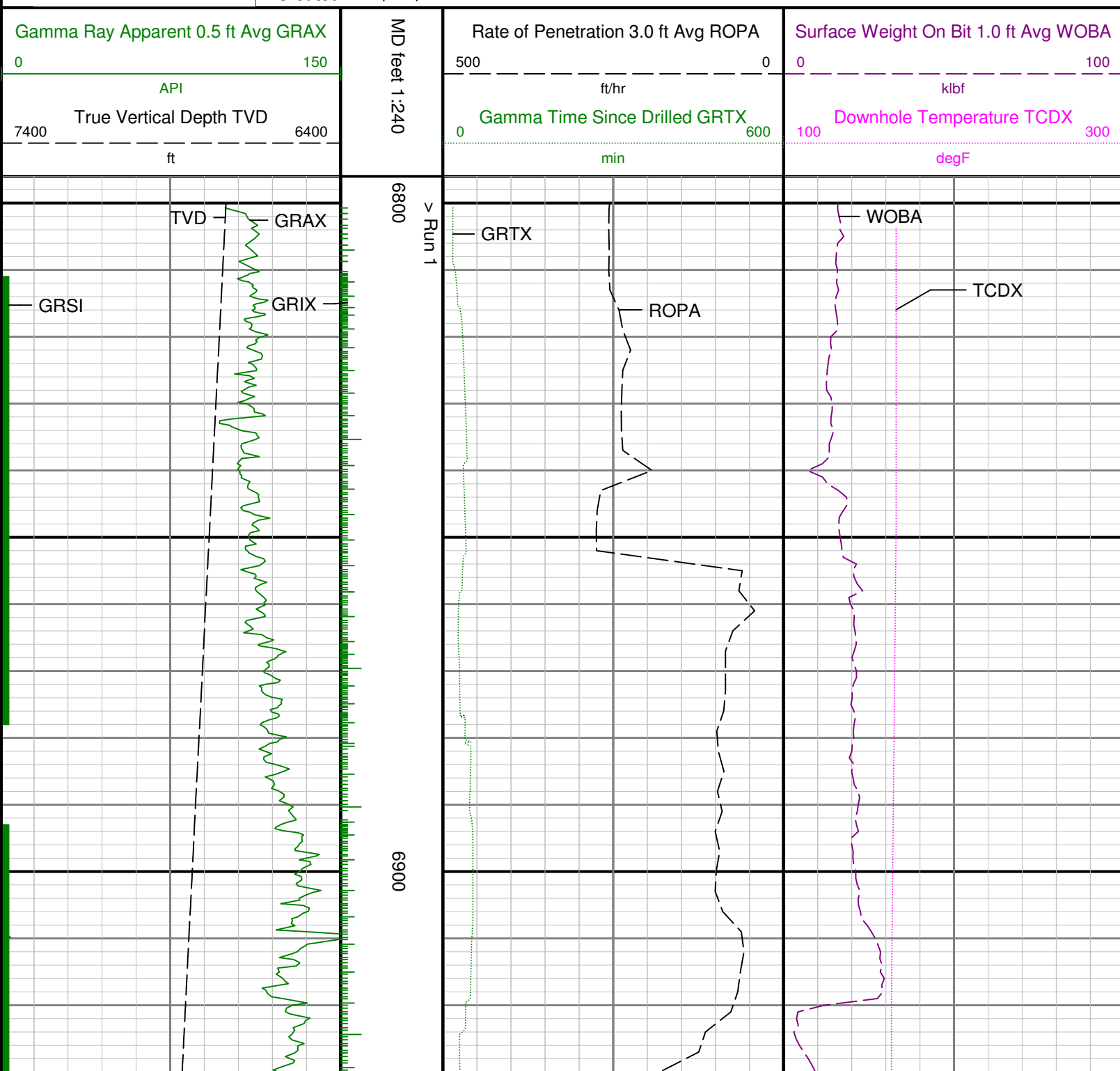


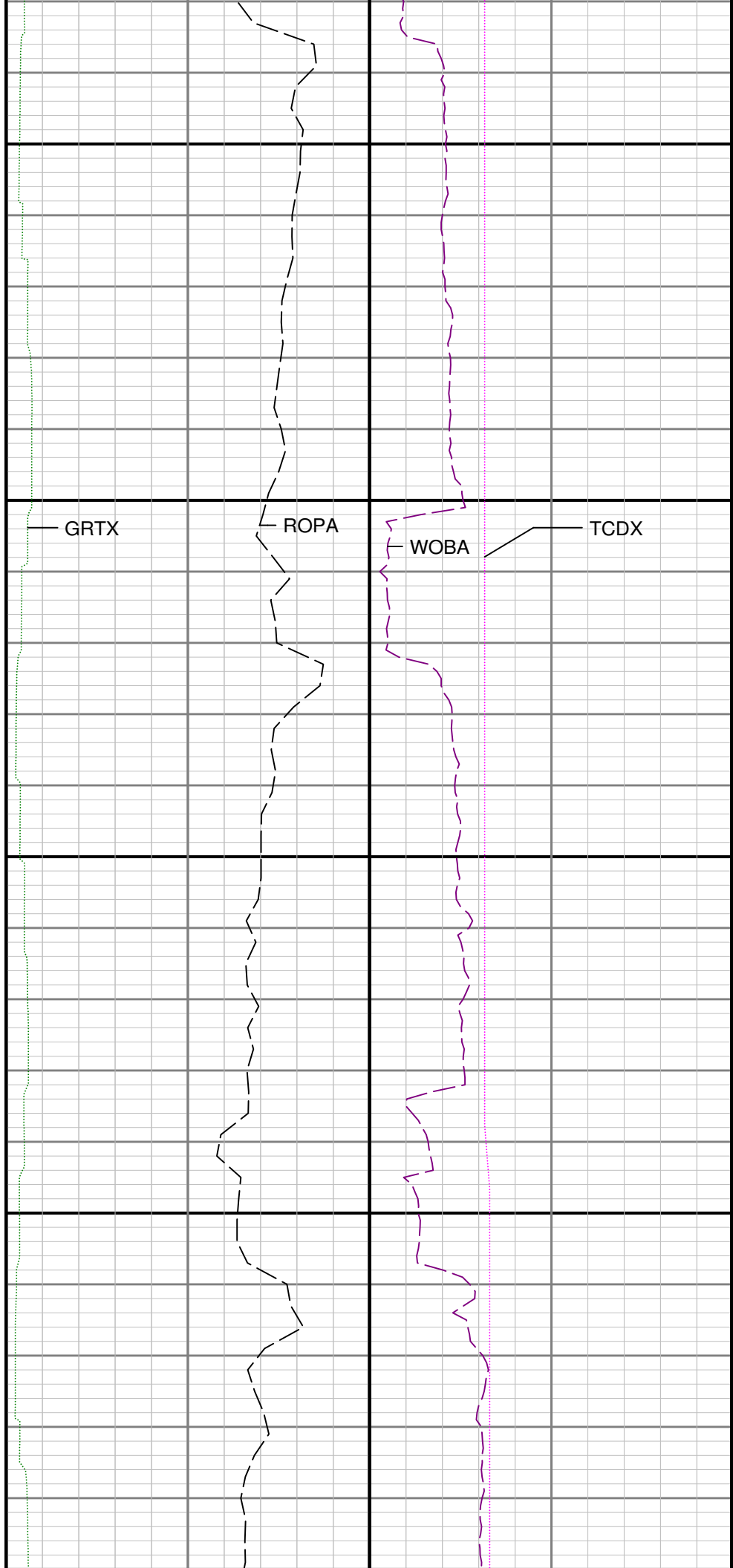
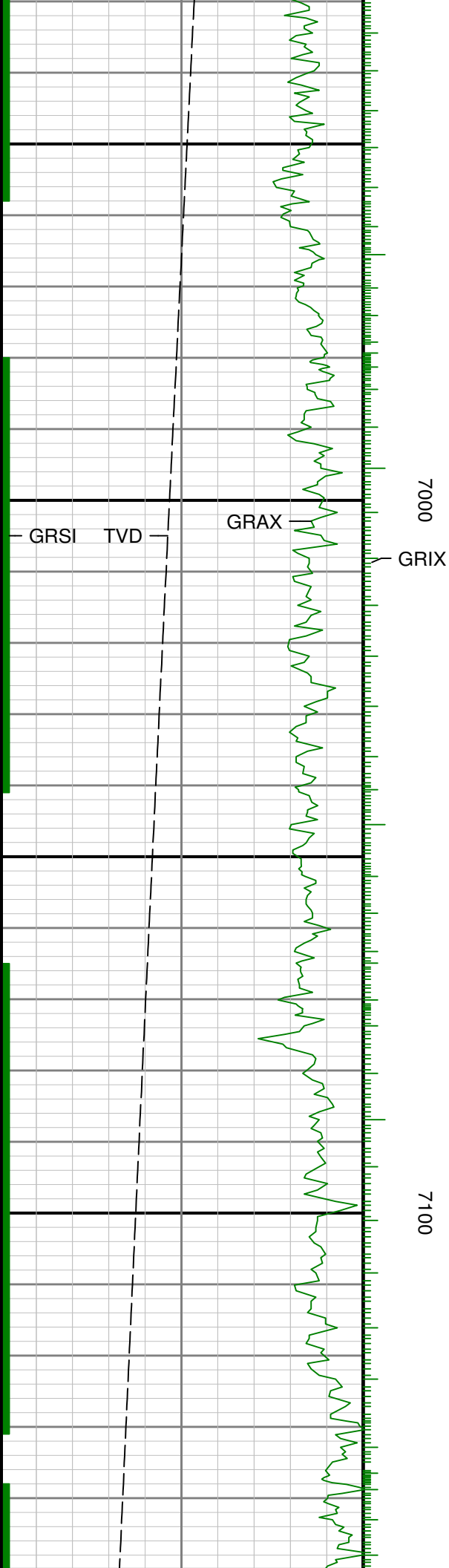
Company : Anadarko

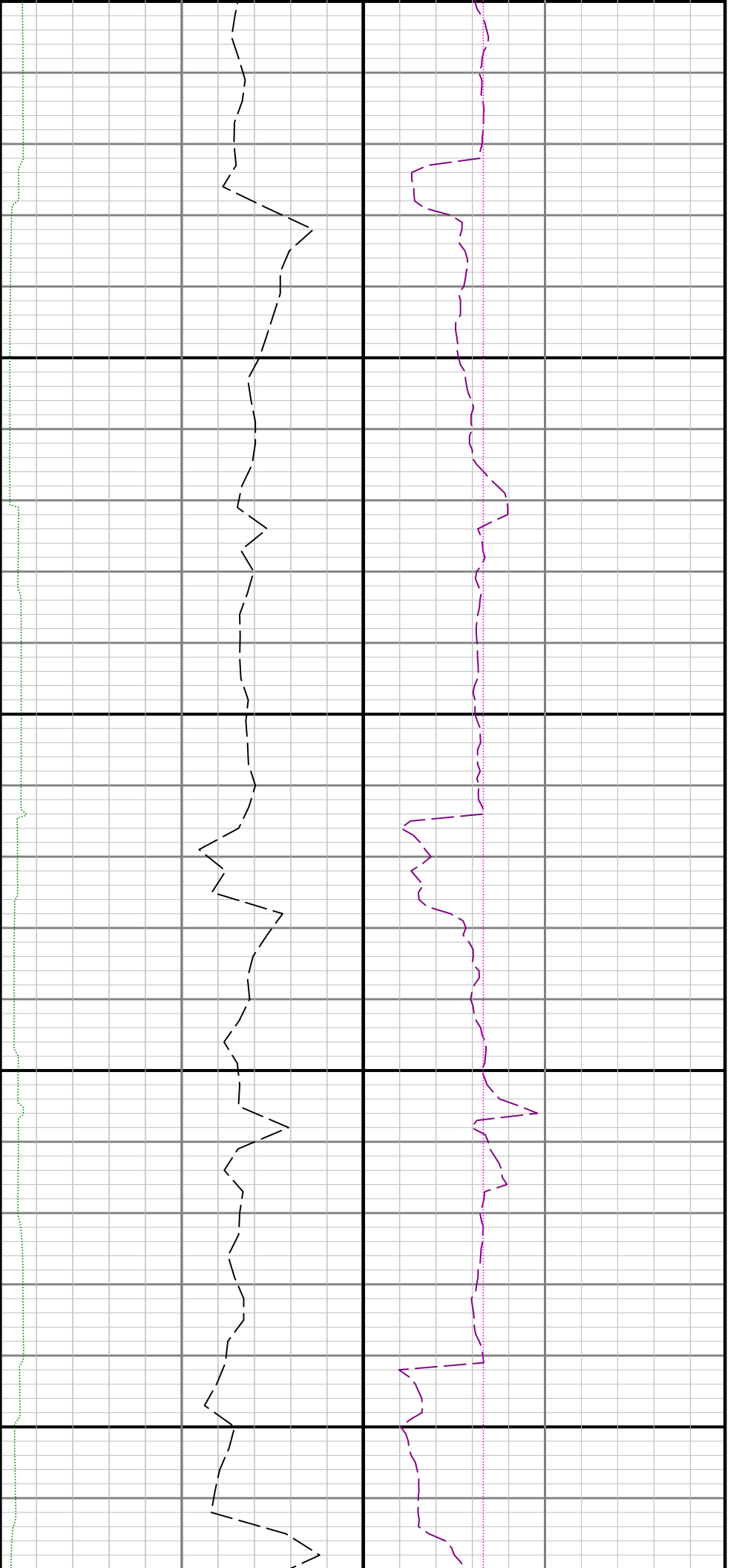
Well : Vollmar 3N-11HZ

Interval : 6796.00 - 12936.00 feet

Created : 19/Feb/2015 2:16:01 AM

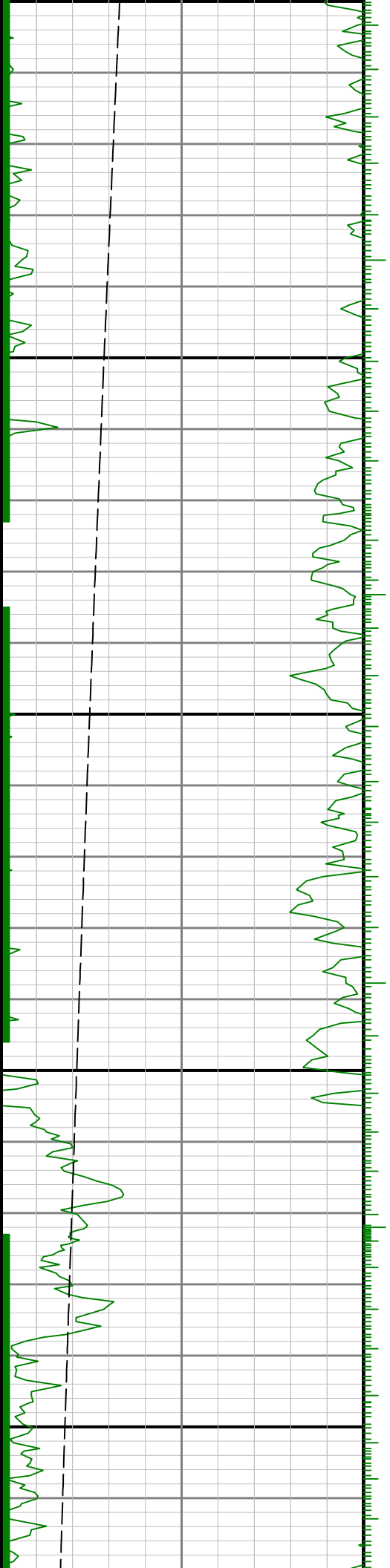


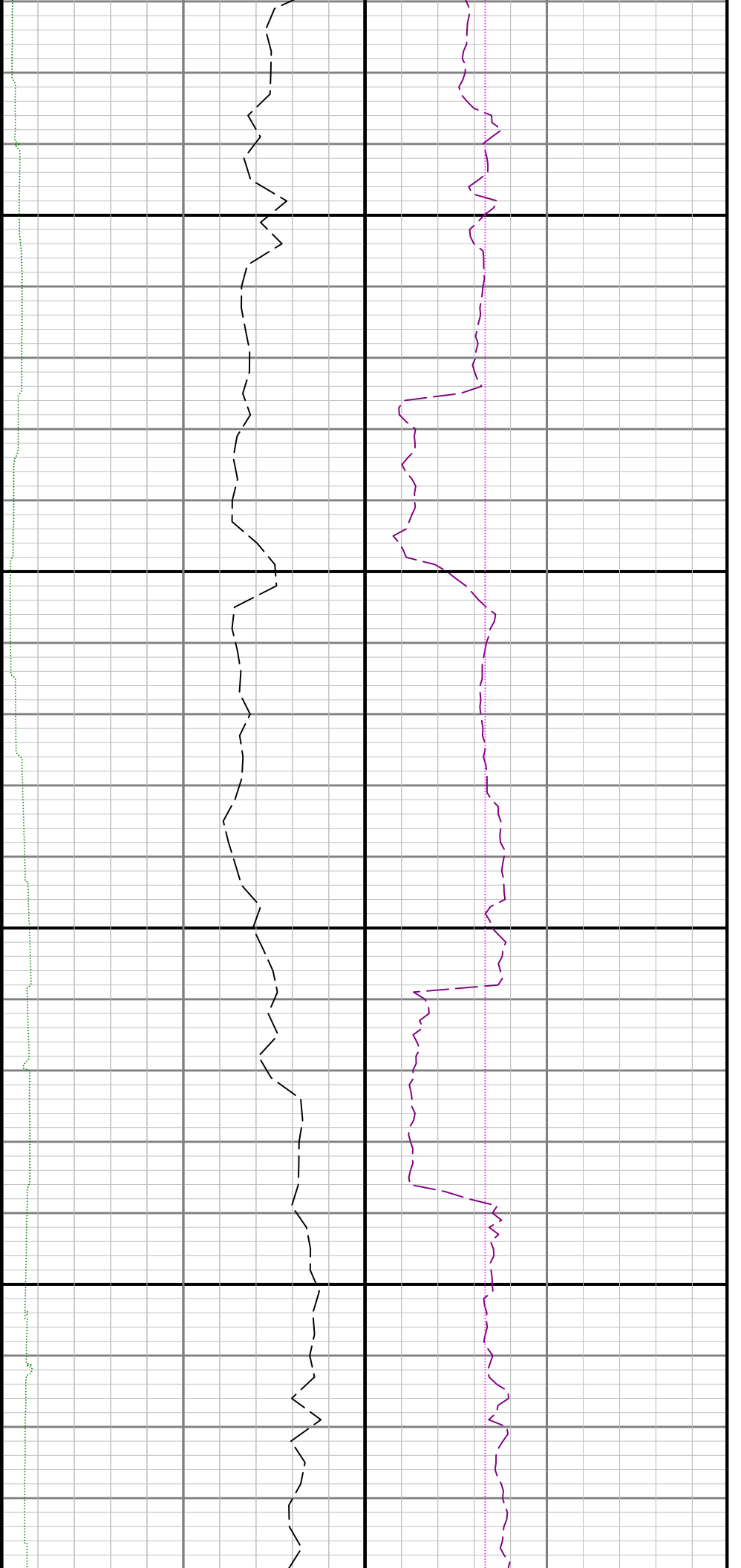




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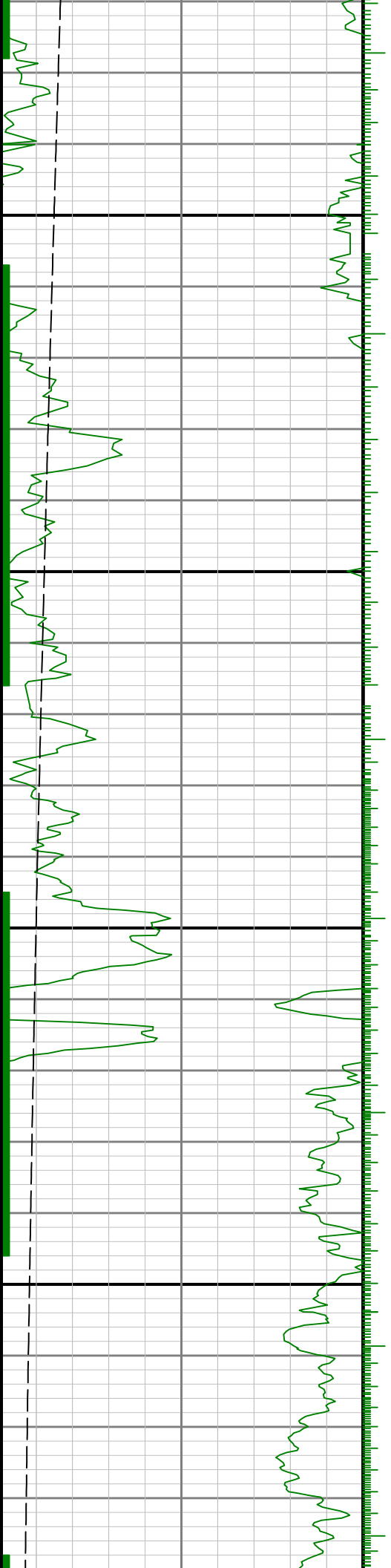
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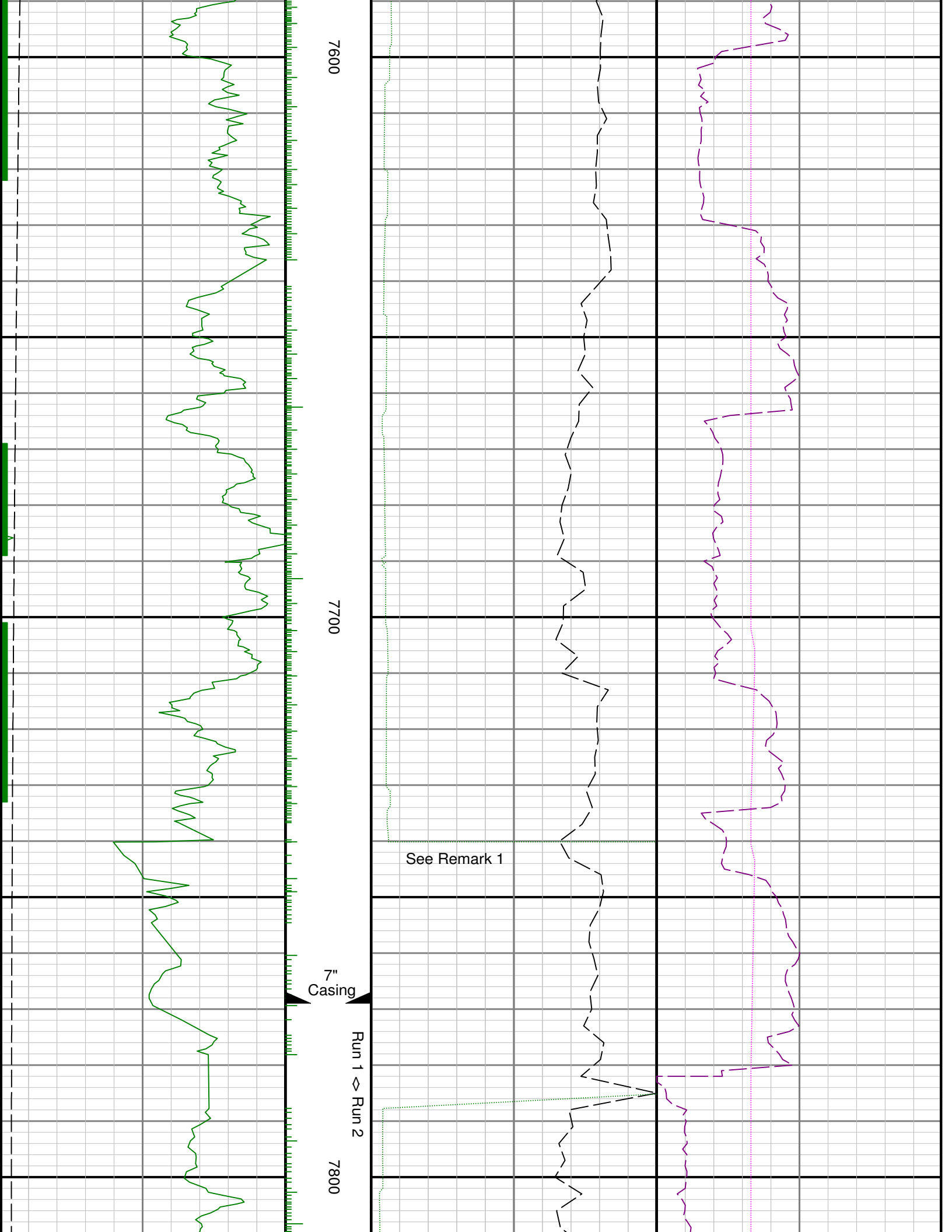


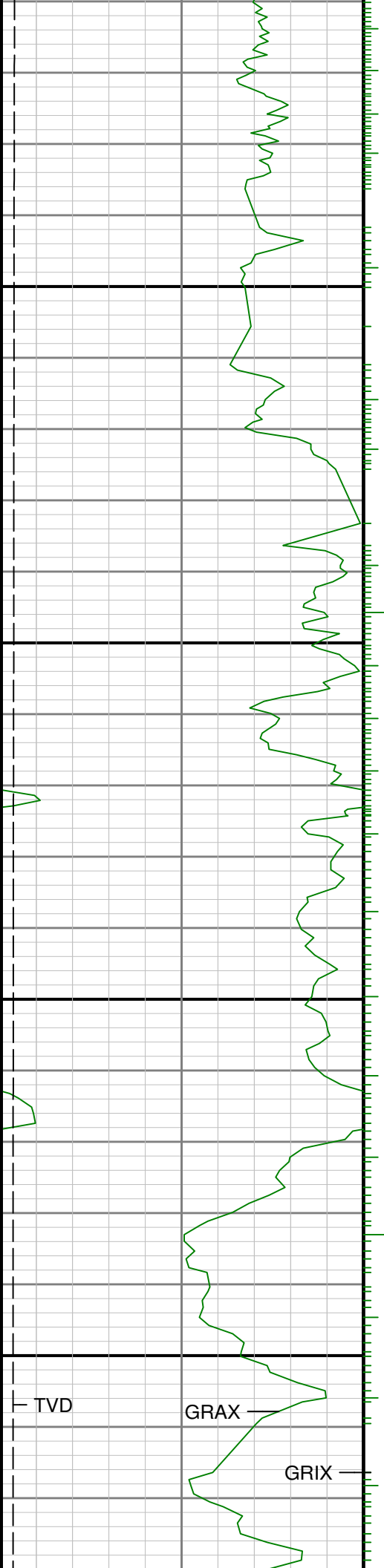


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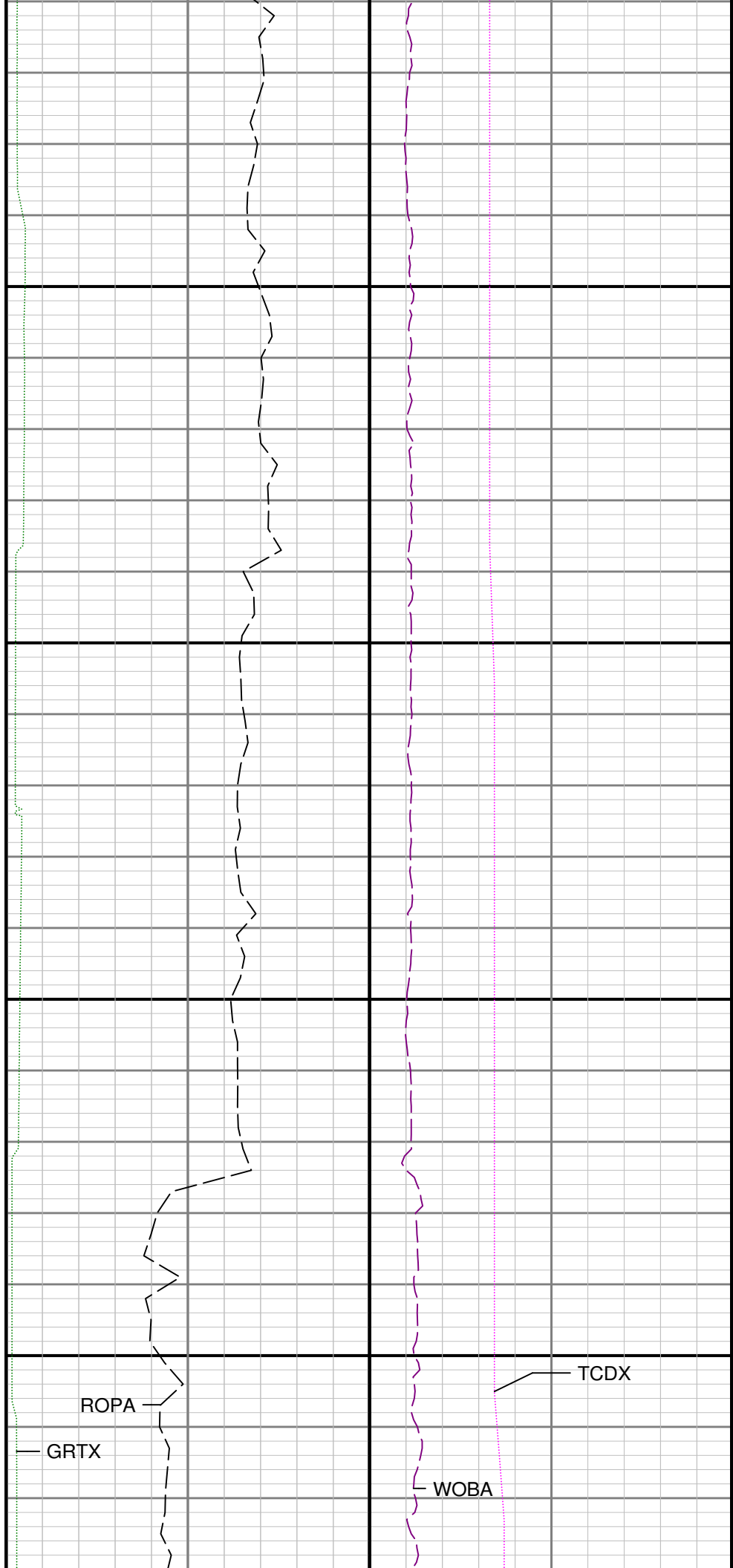
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TVD

GRAX

GRIX



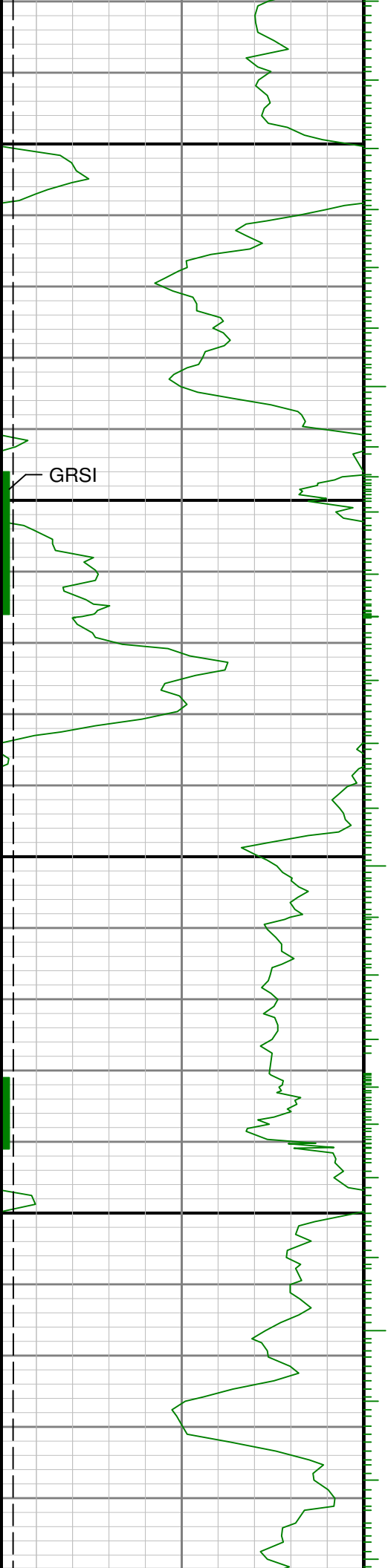
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GRTX

WOBA

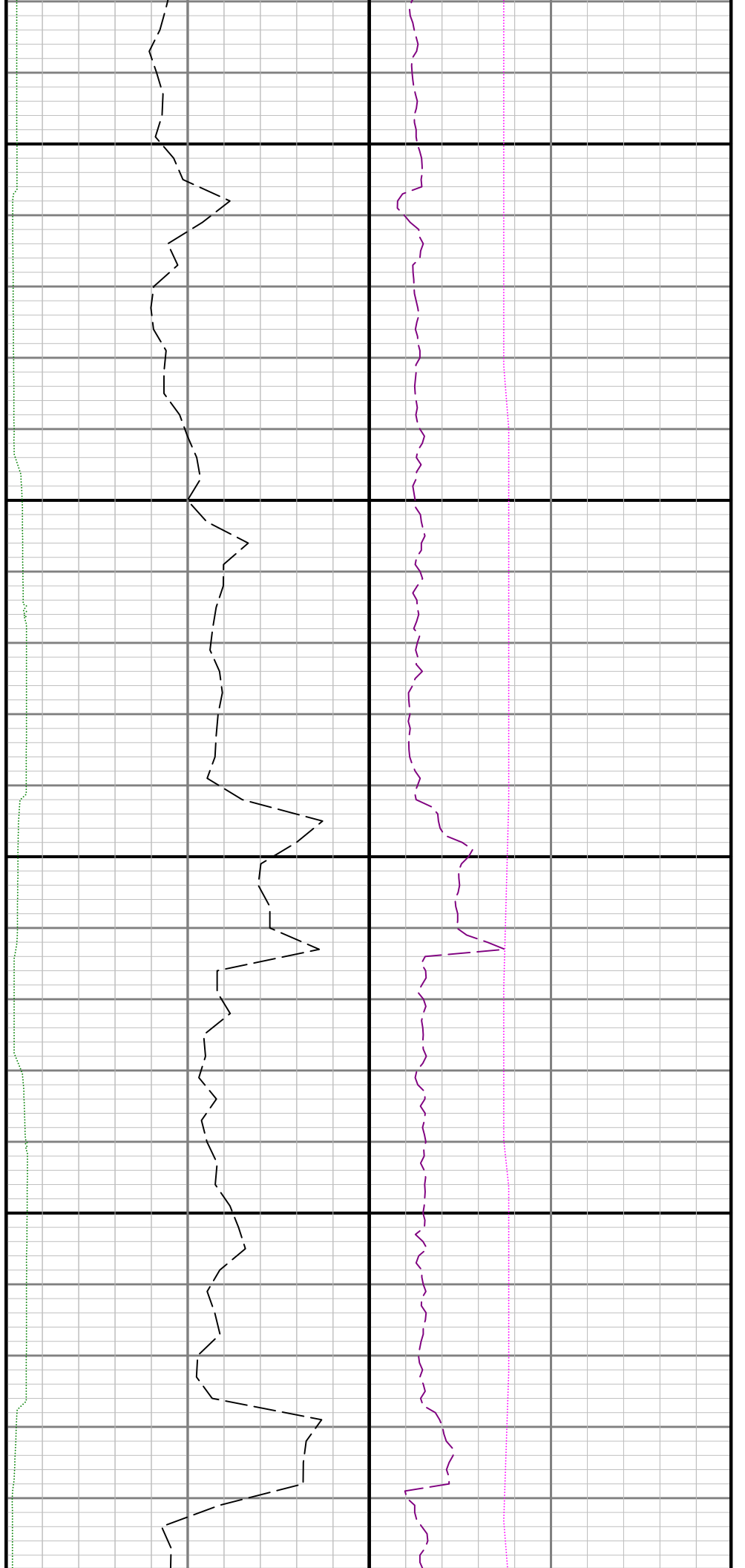
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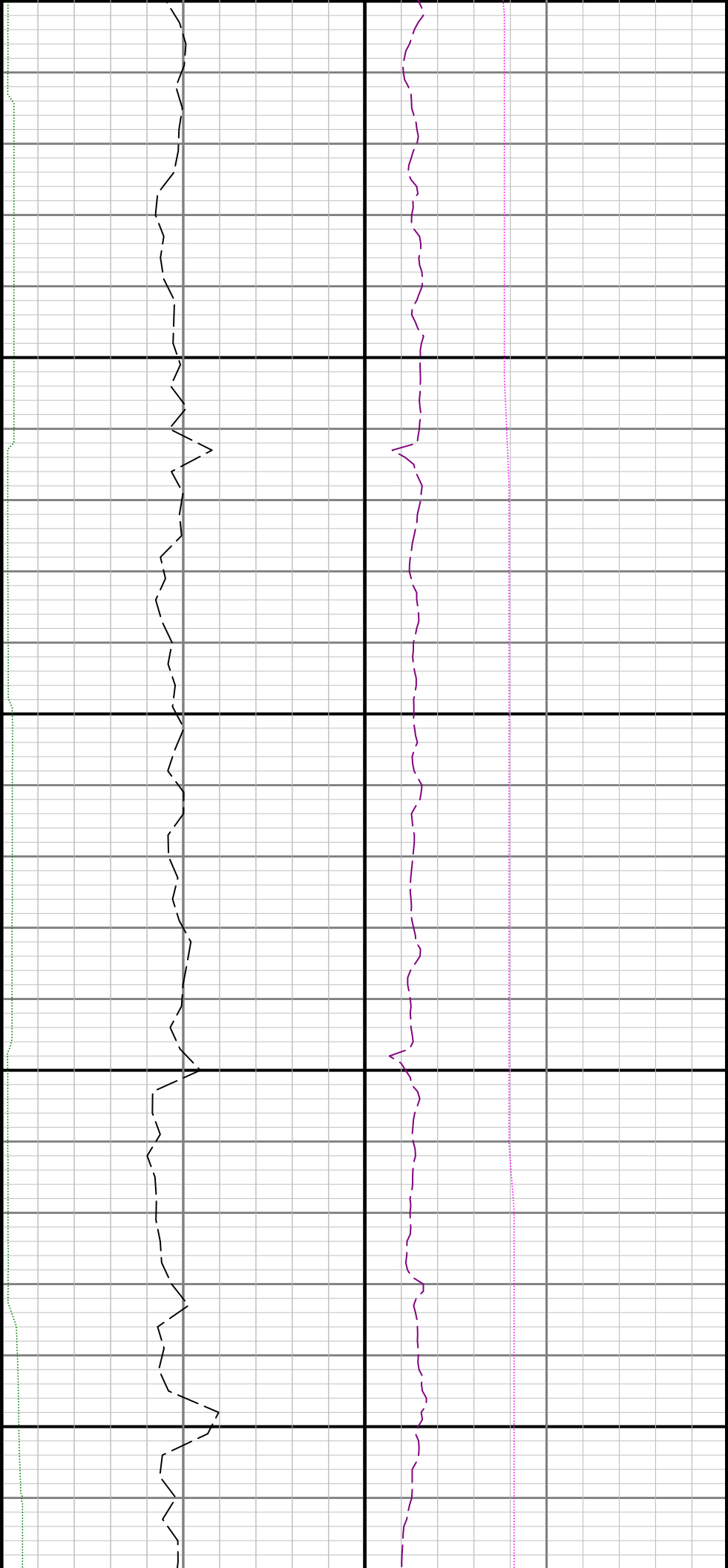




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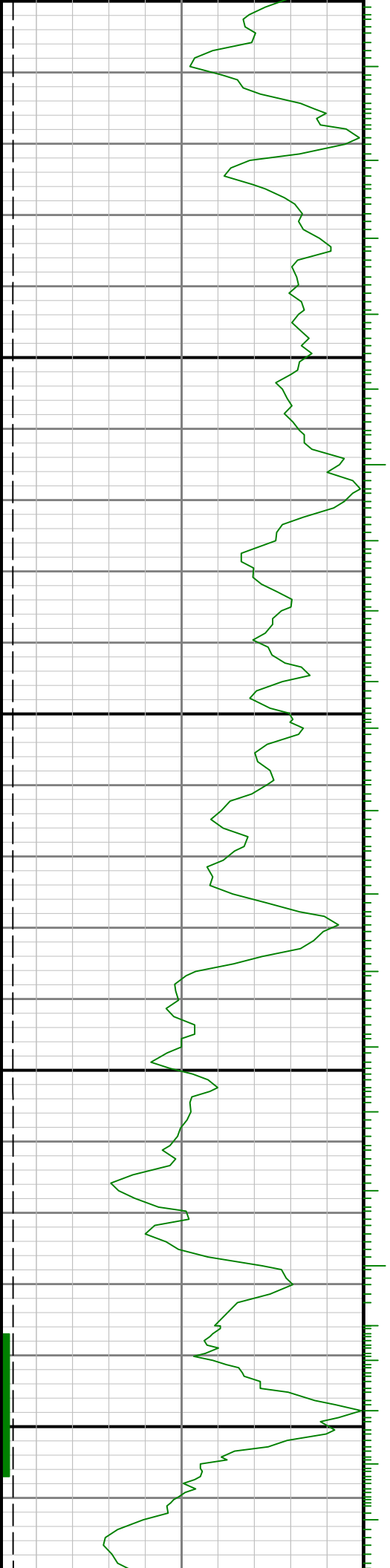
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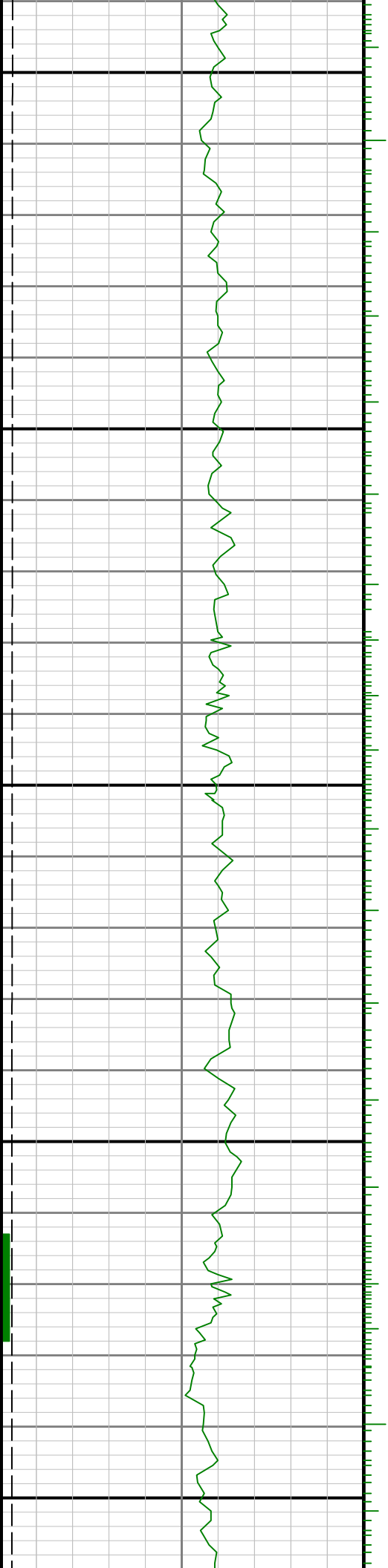


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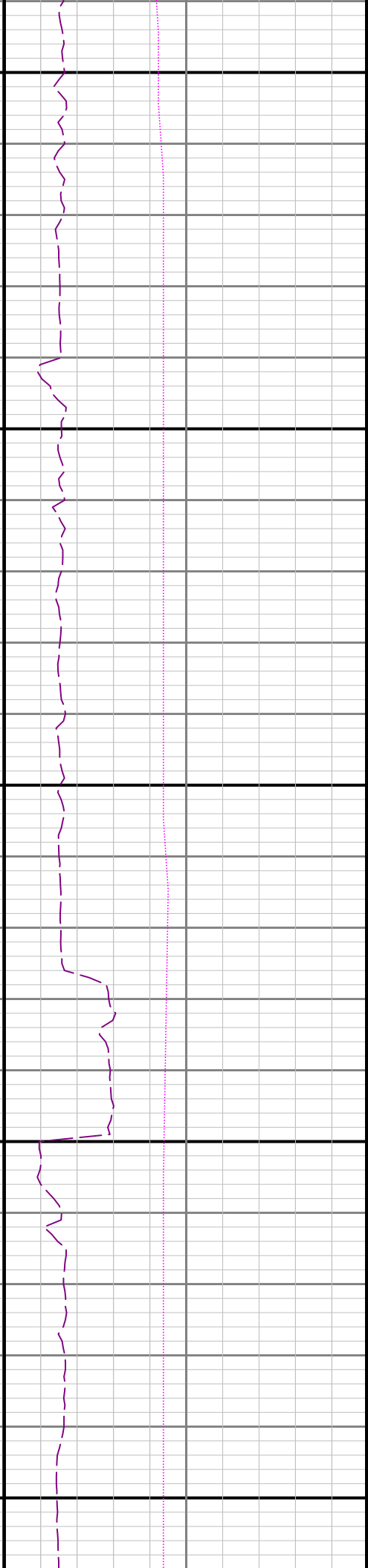
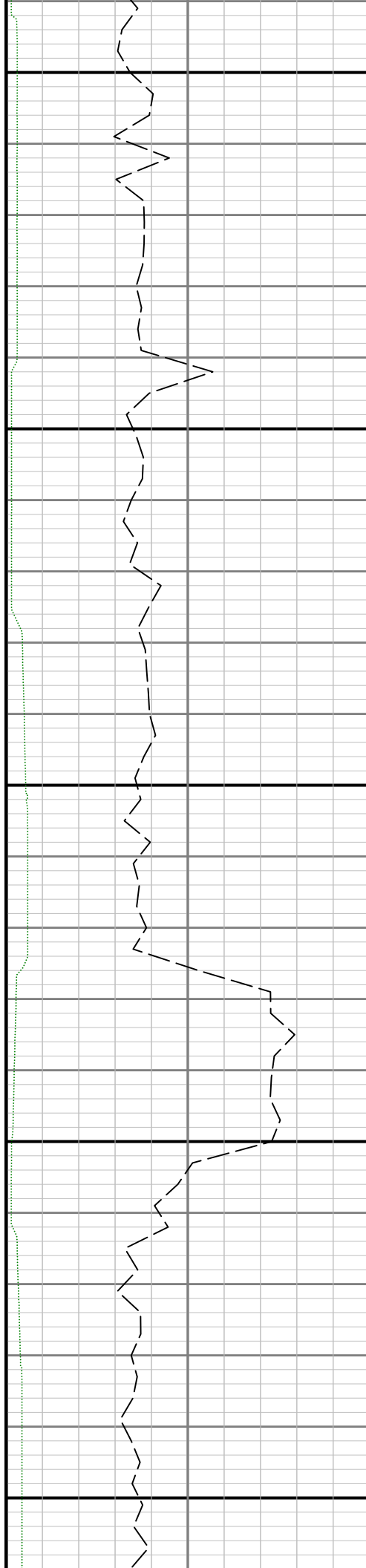


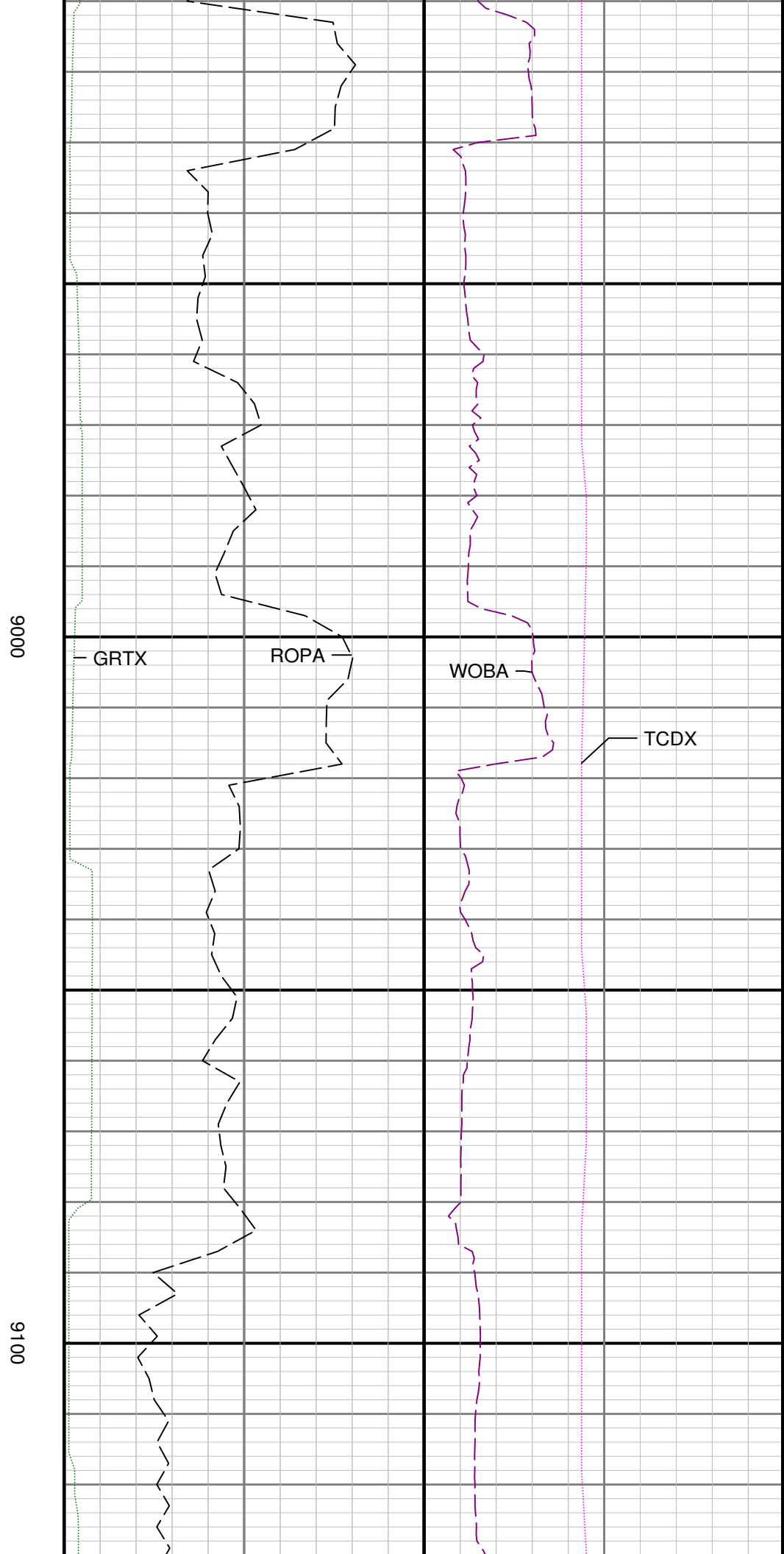
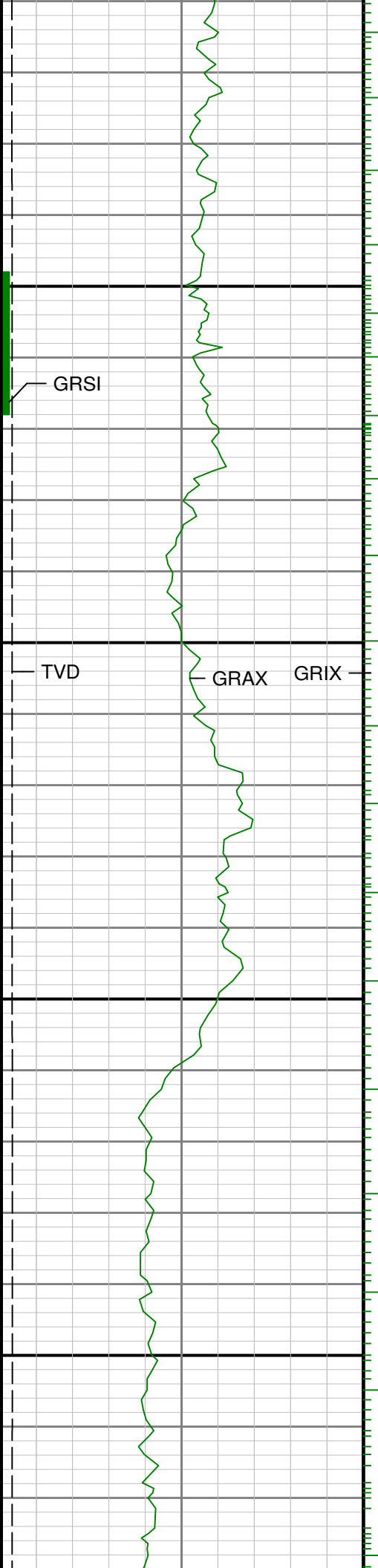


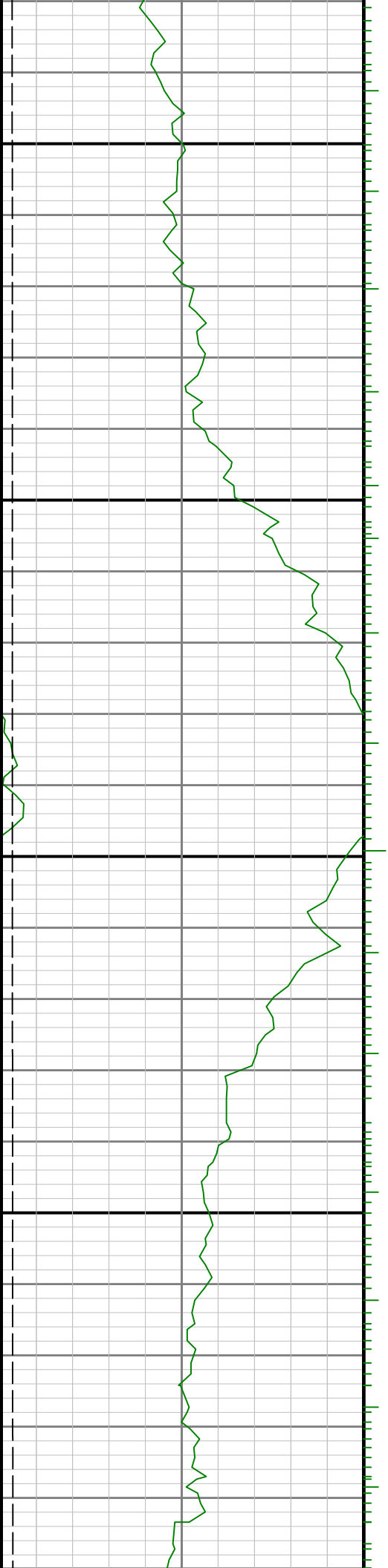
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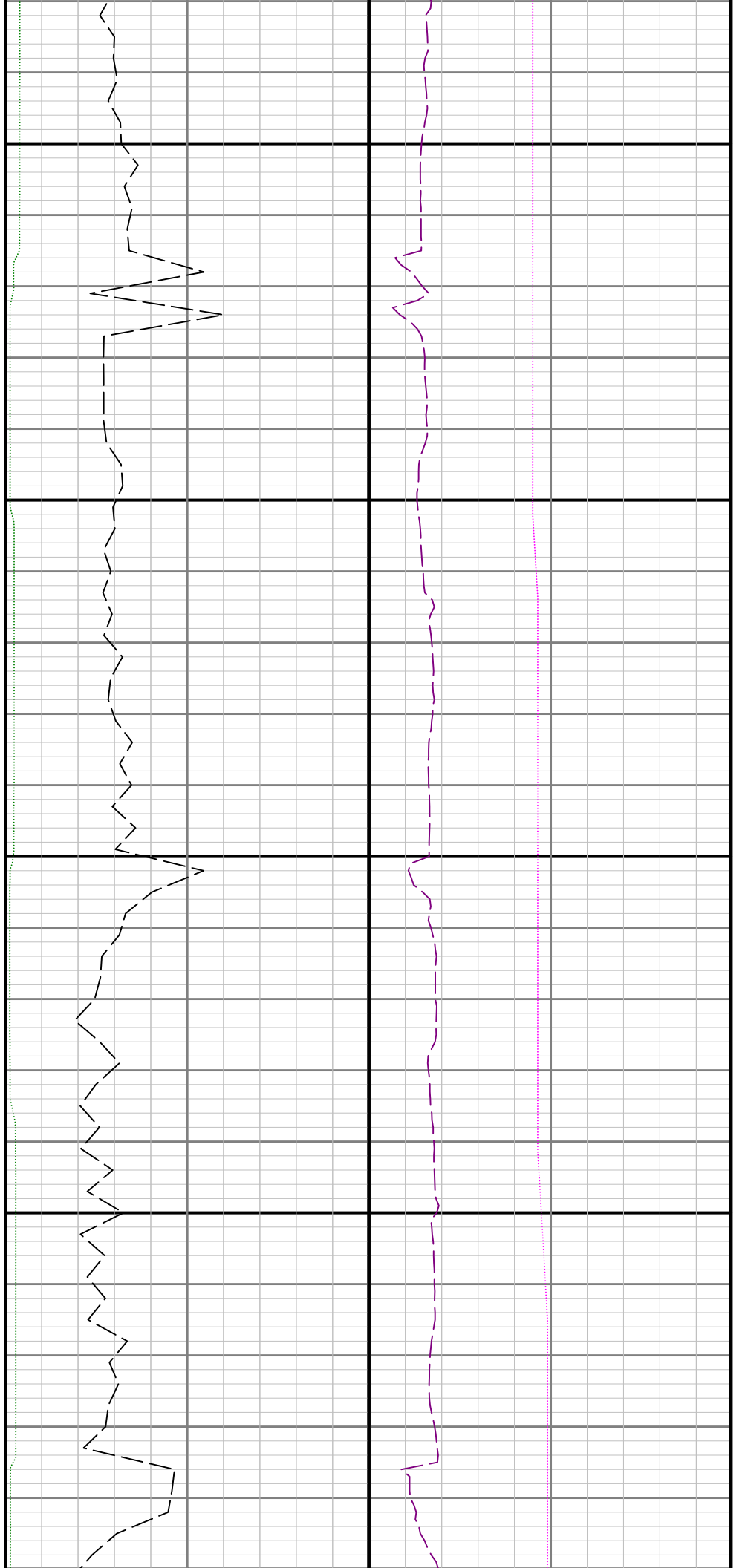


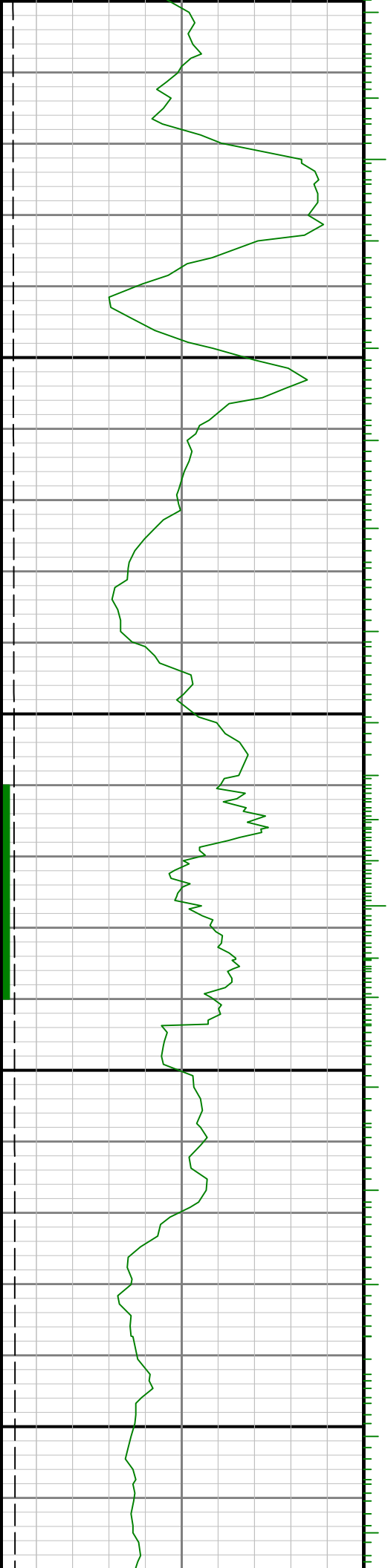




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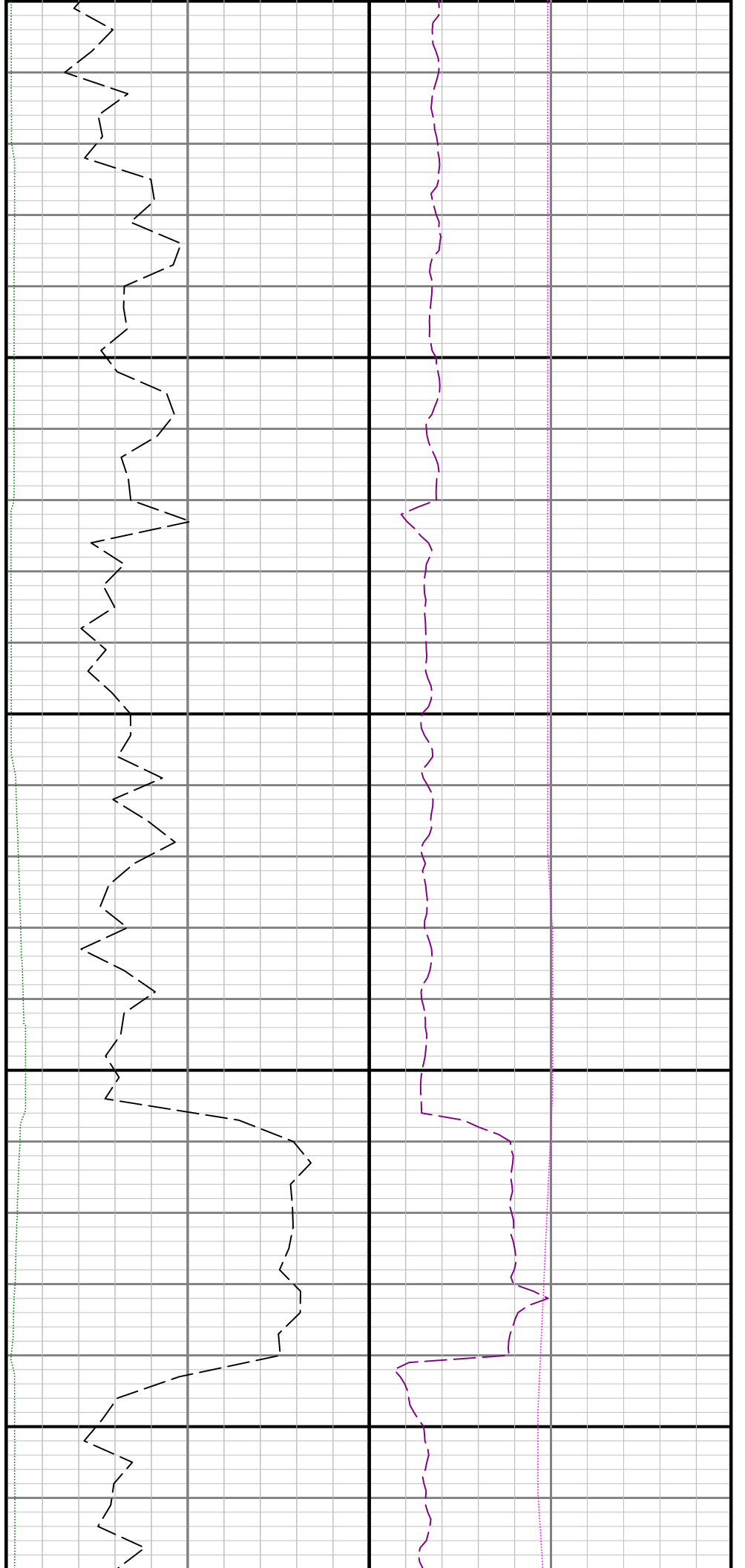
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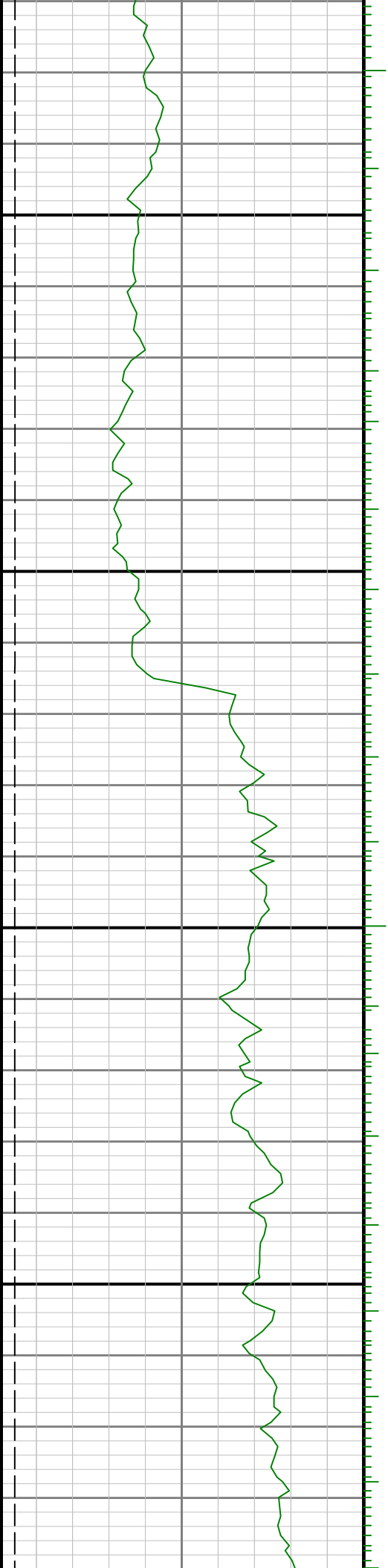




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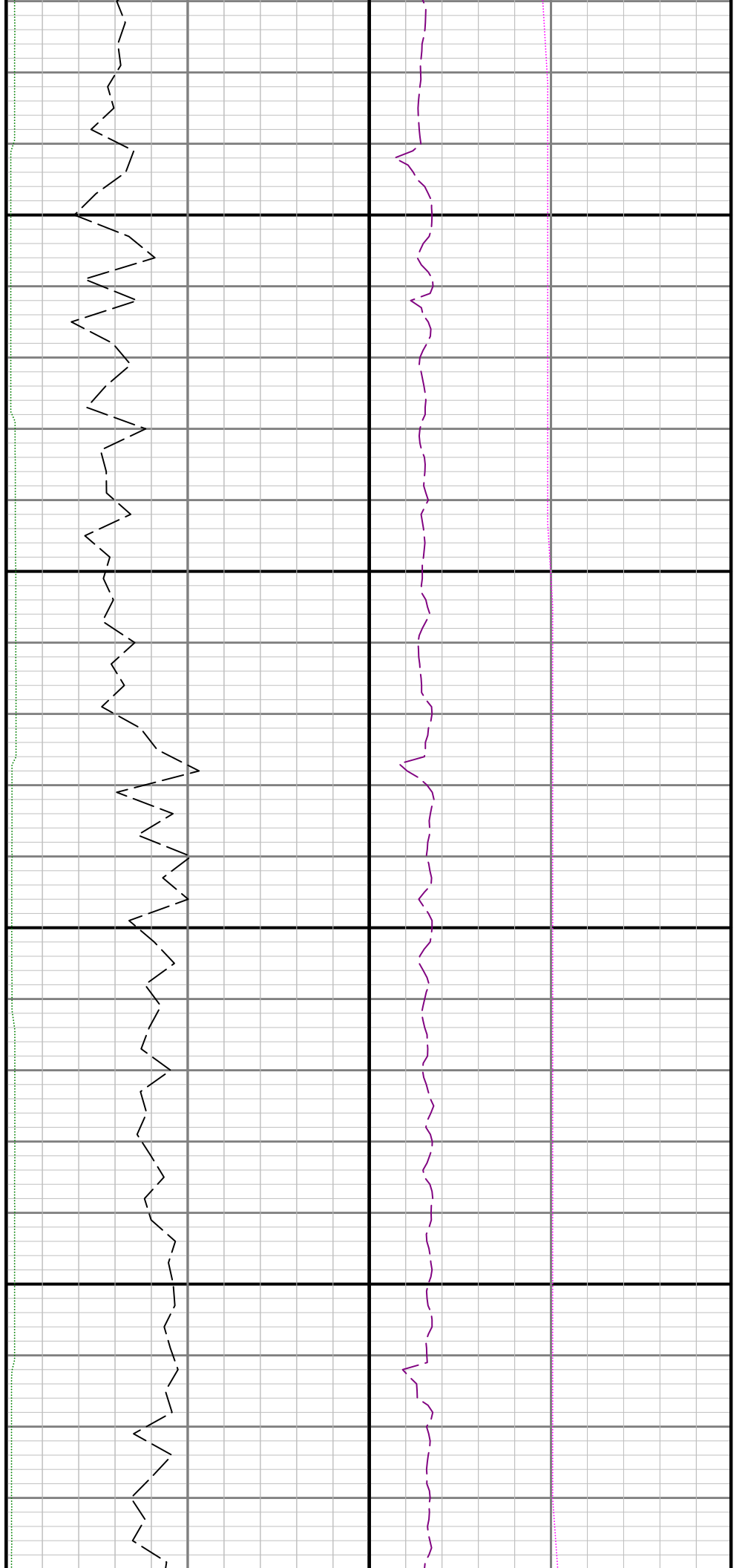
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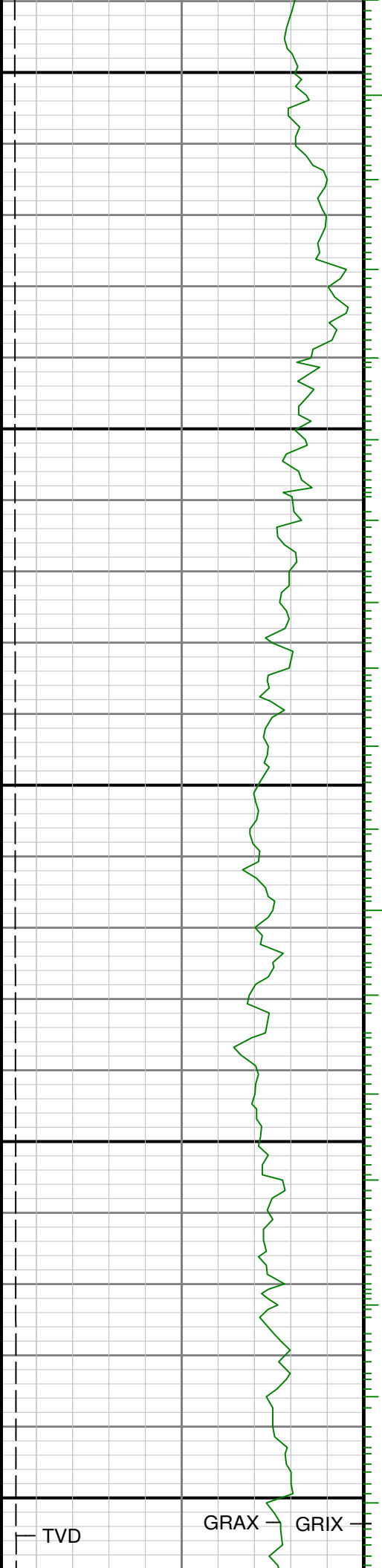


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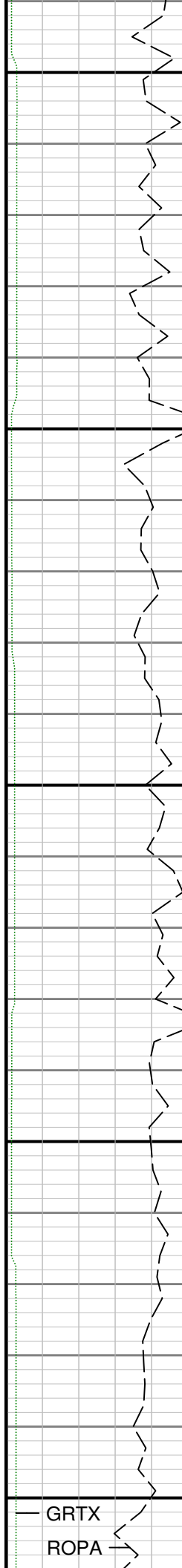




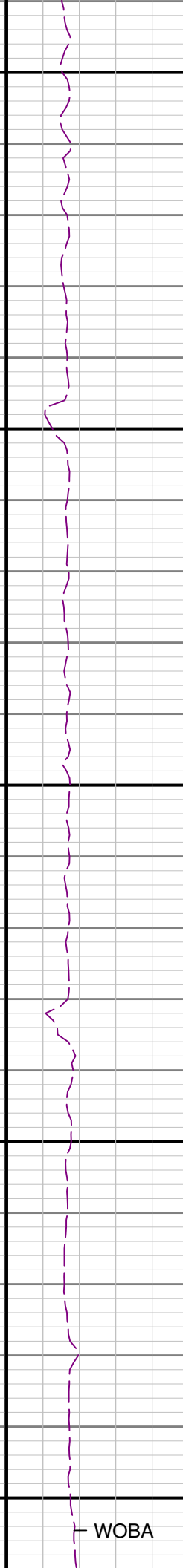
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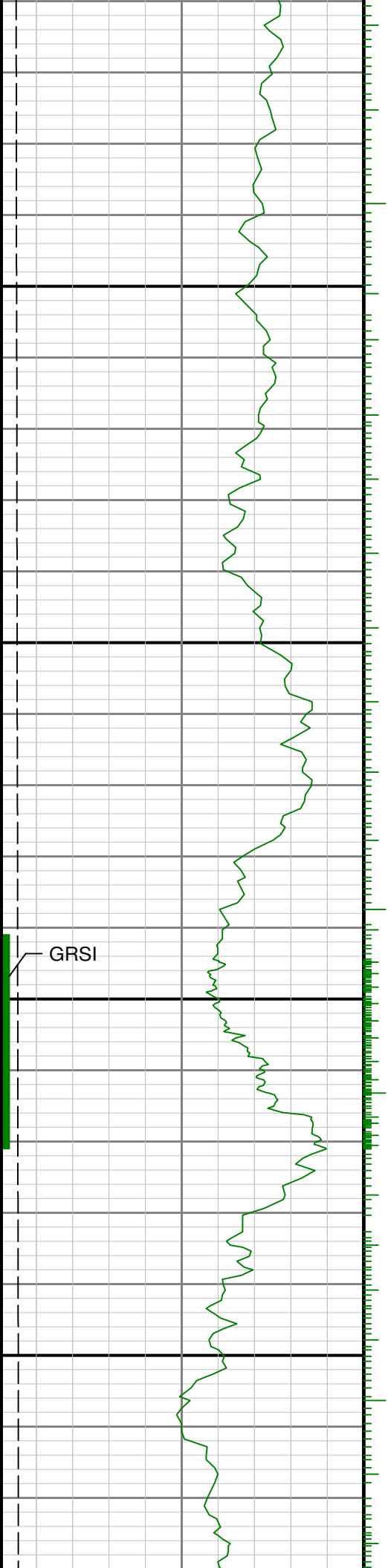


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ROPA



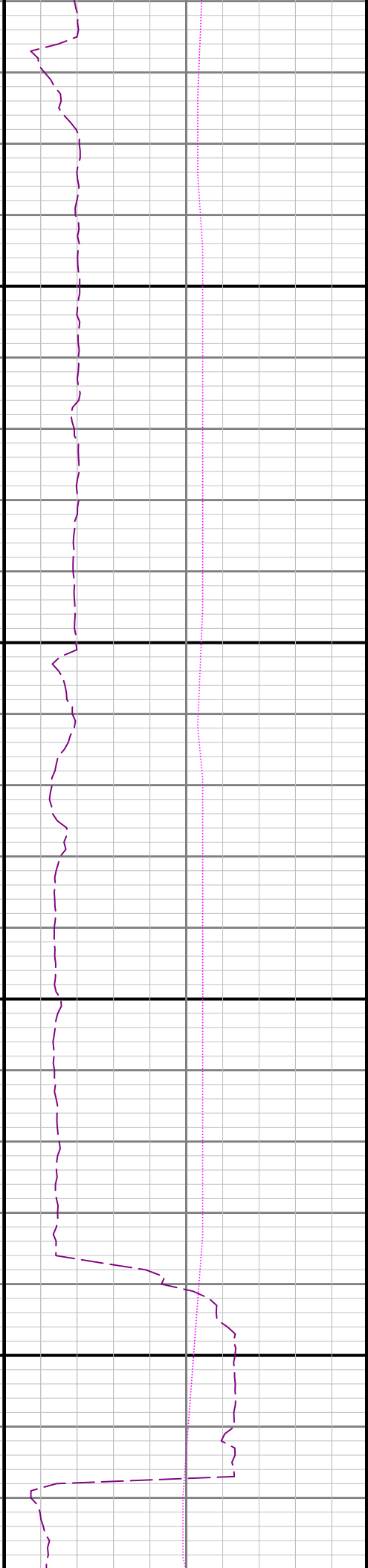
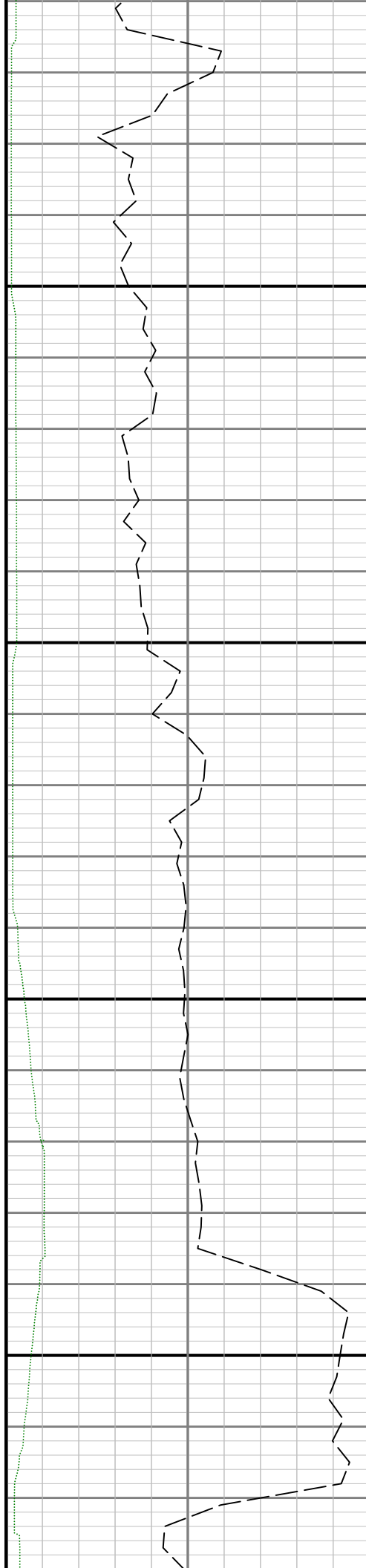
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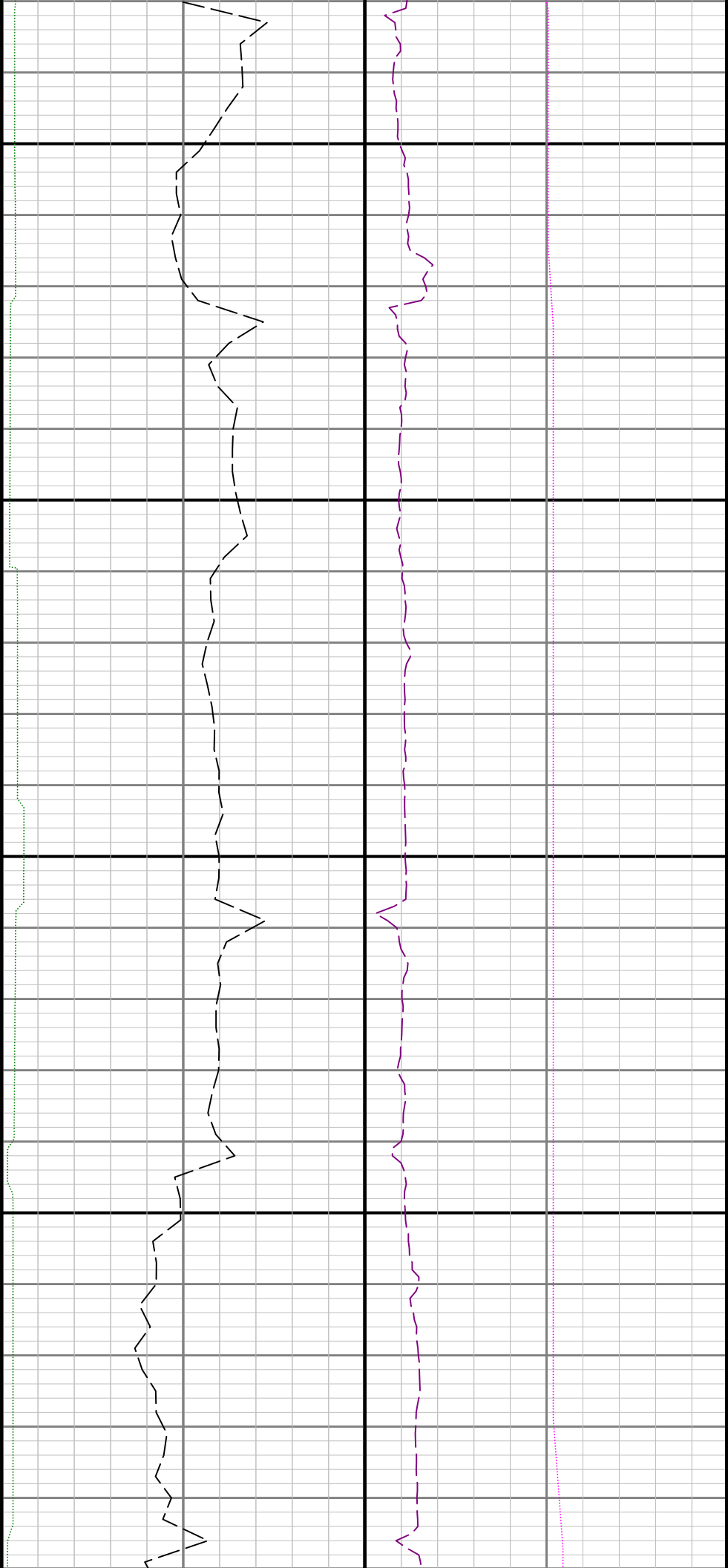


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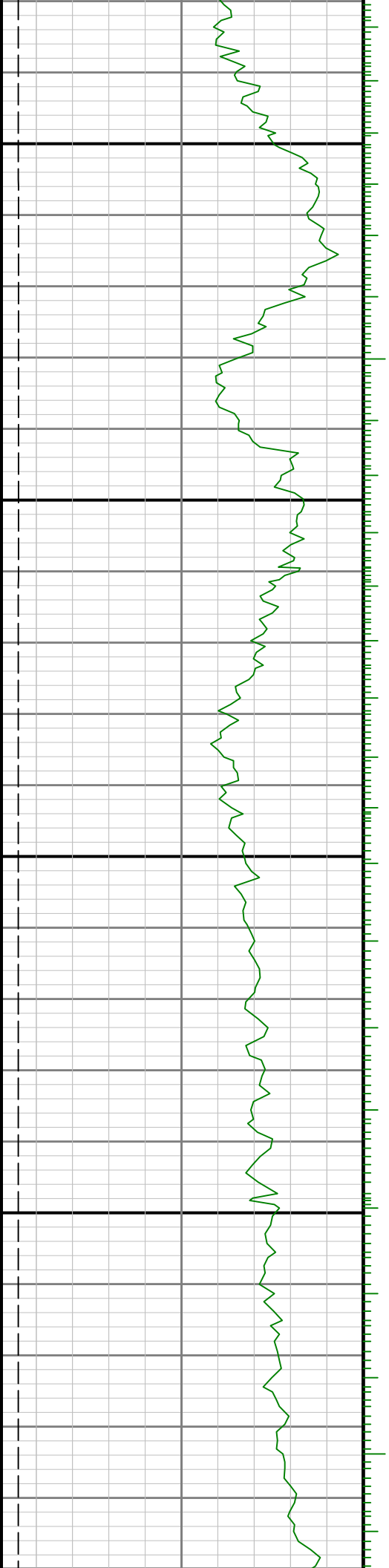


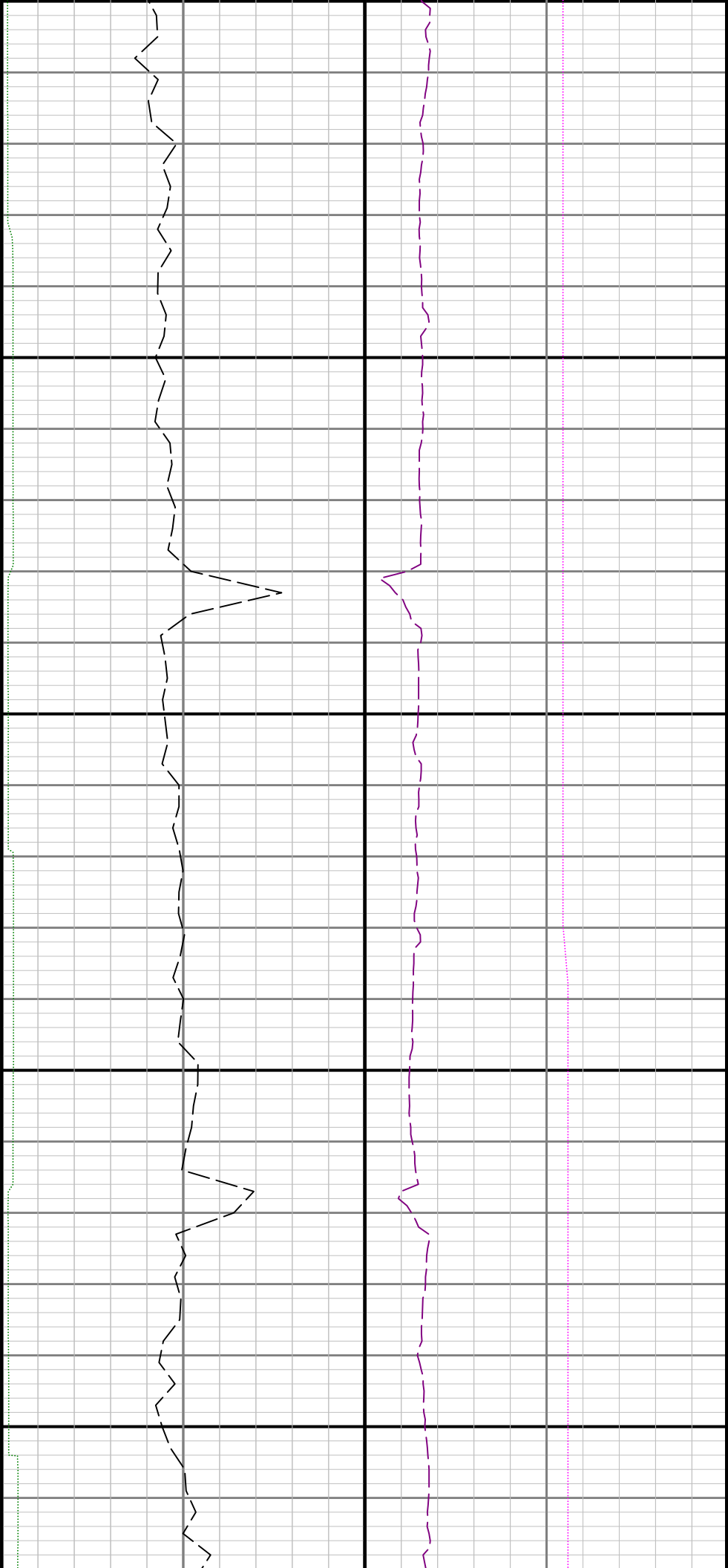
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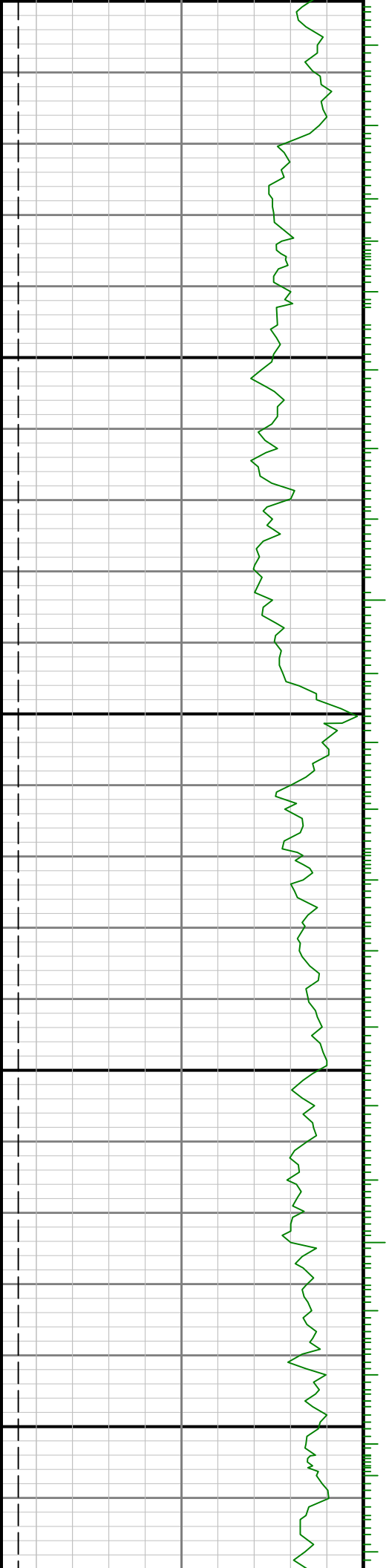
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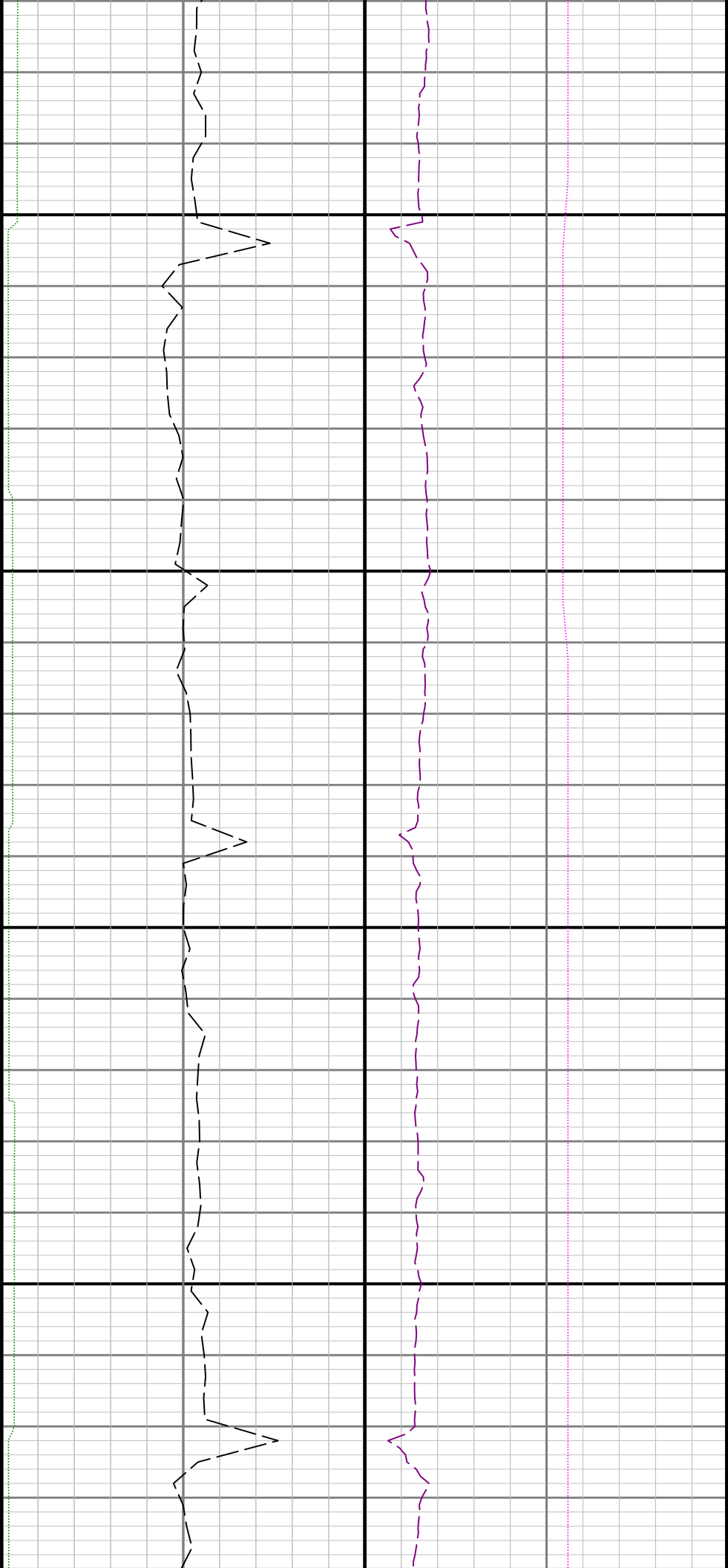




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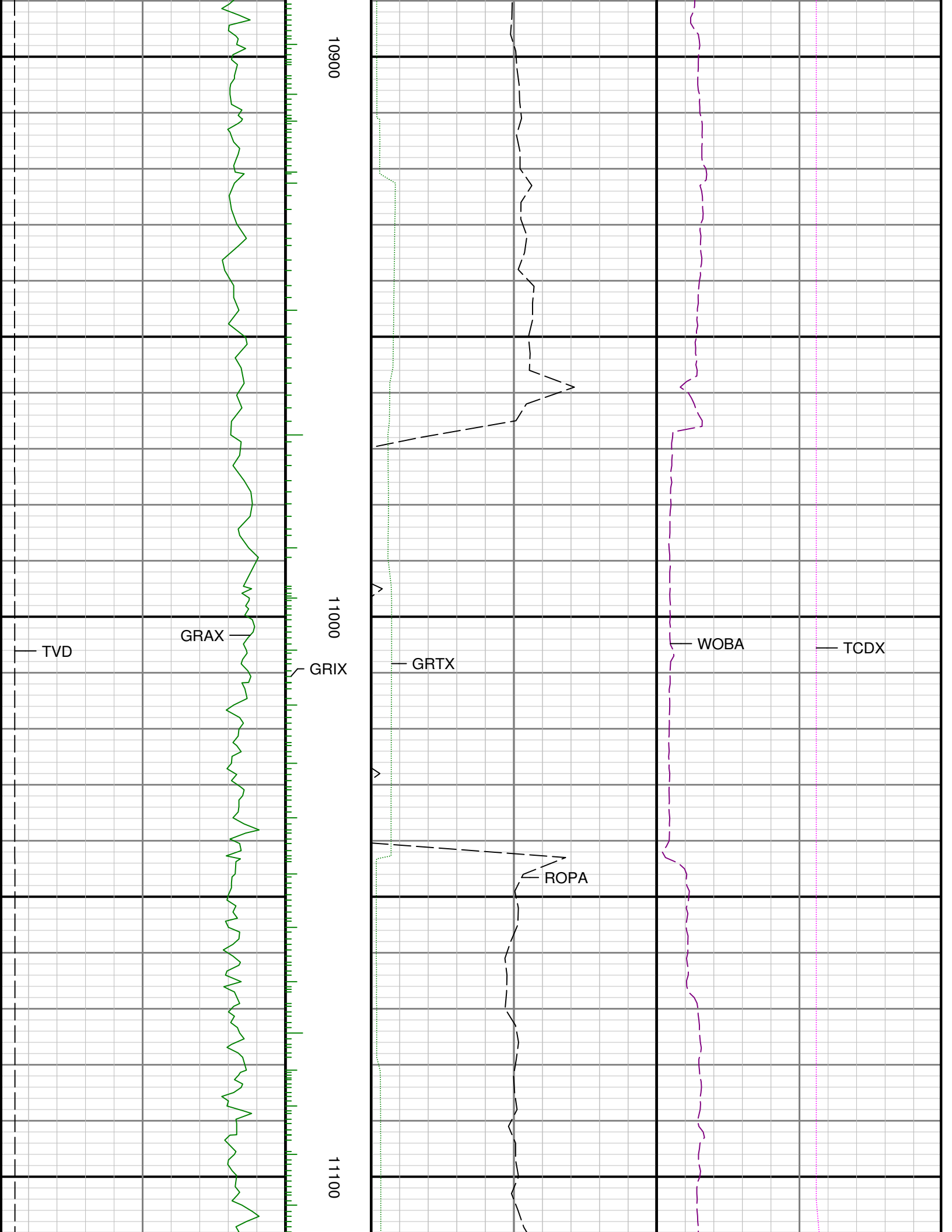
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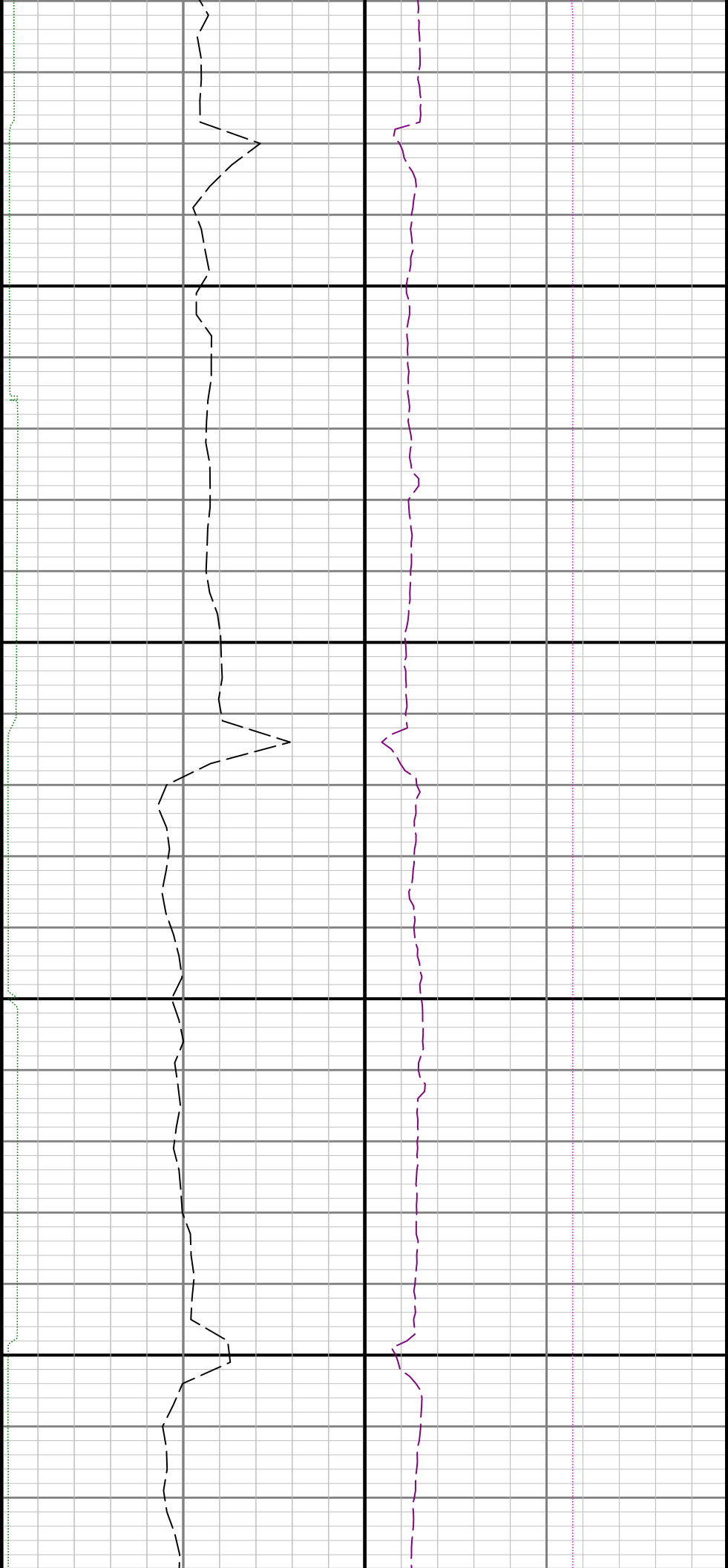




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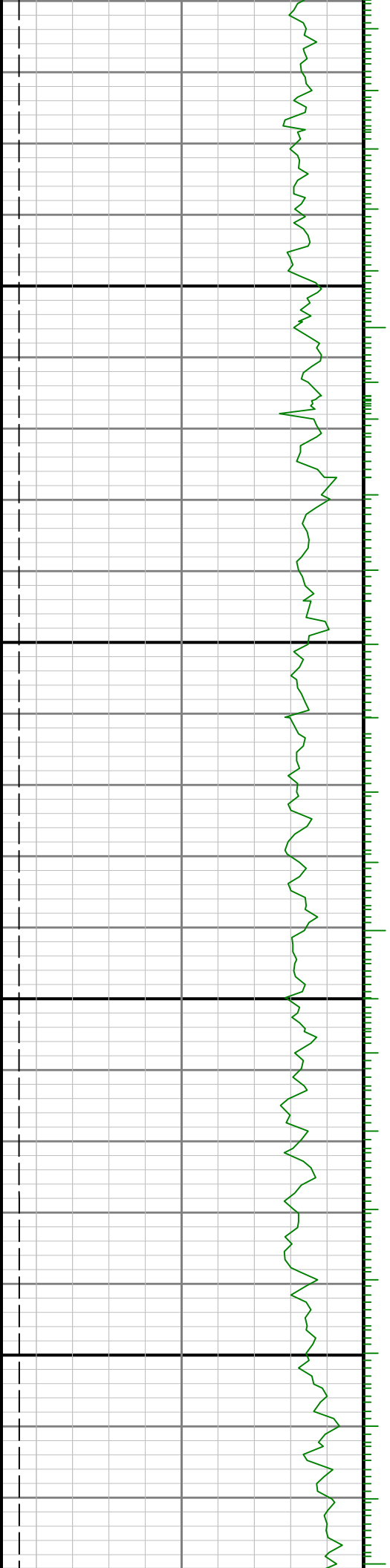
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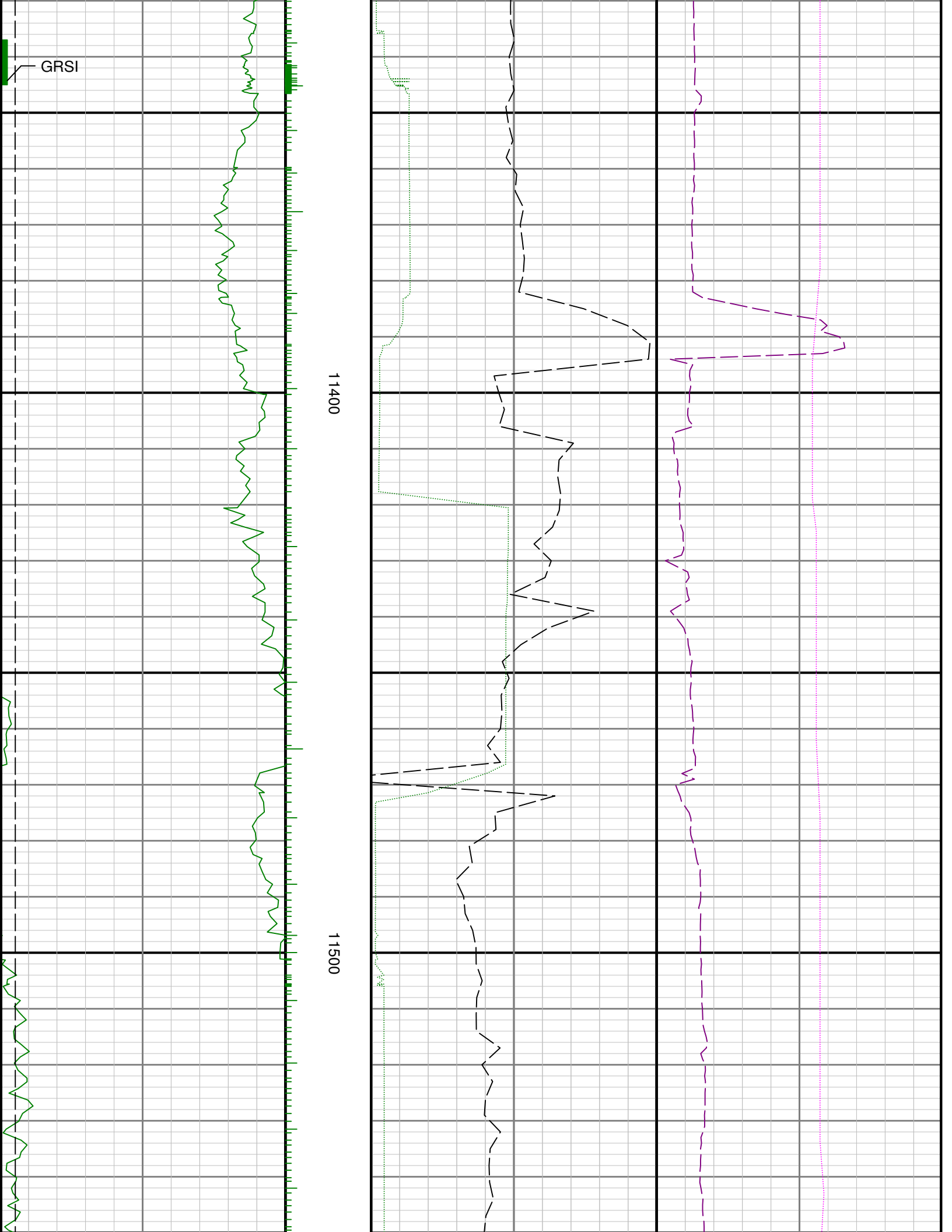




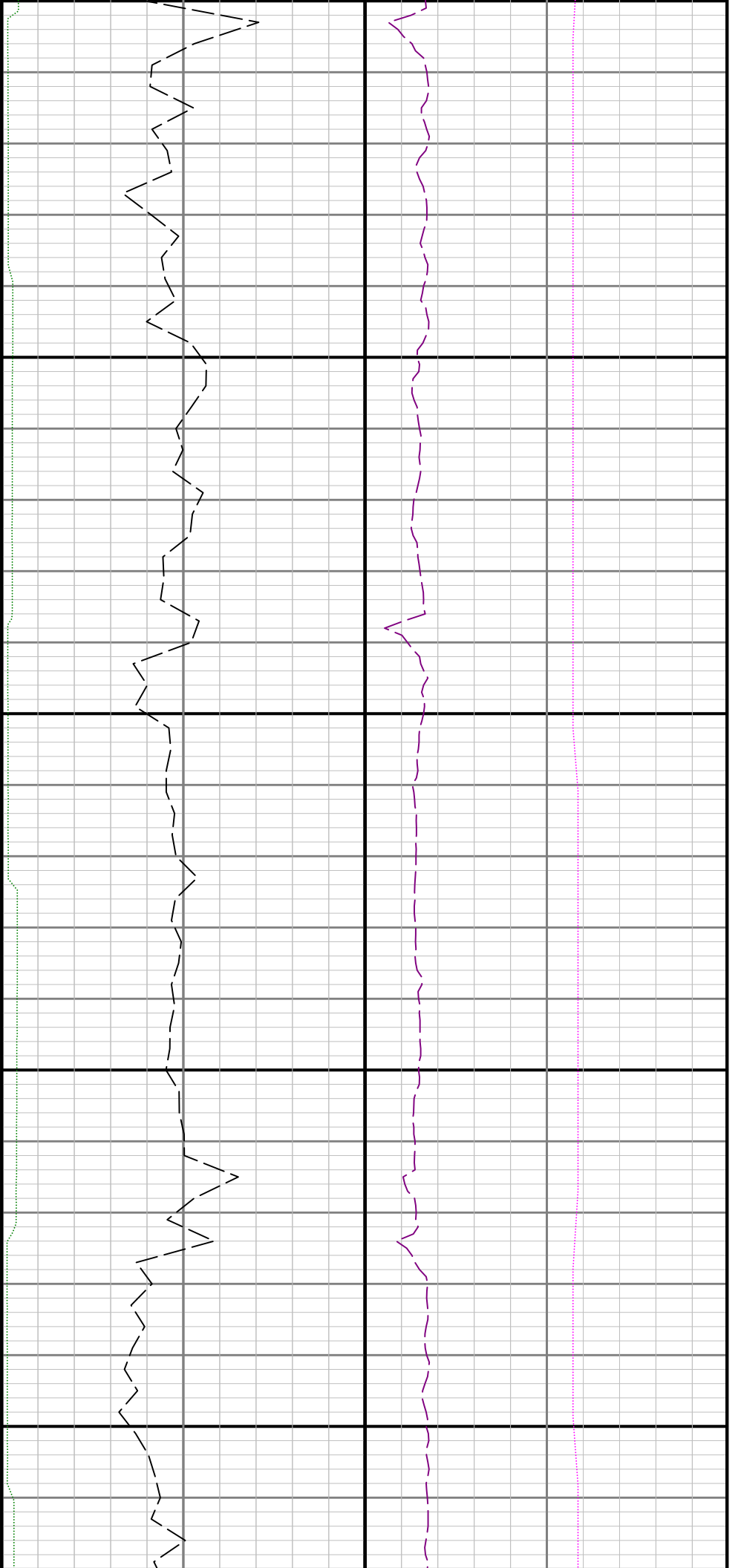
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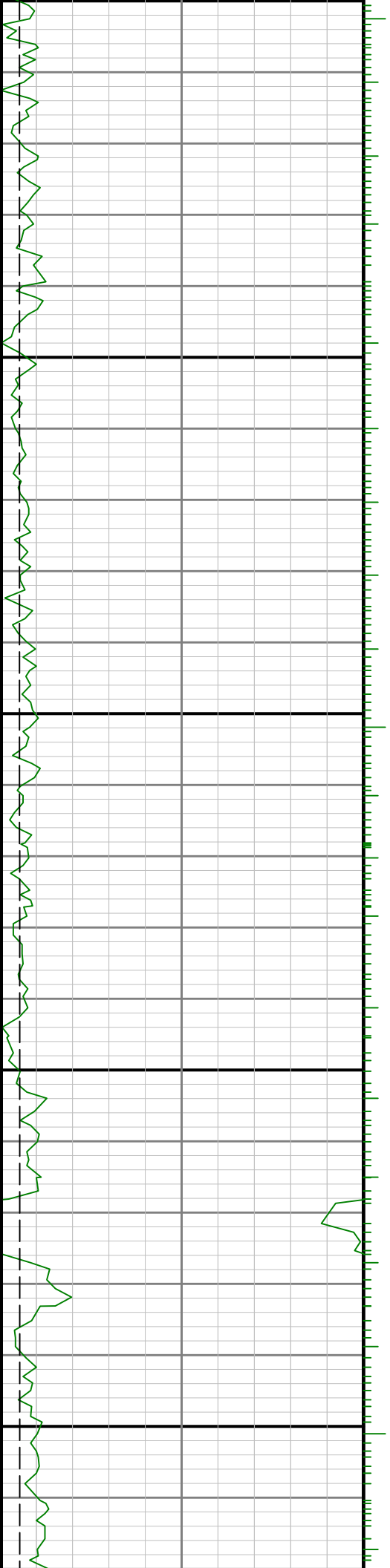


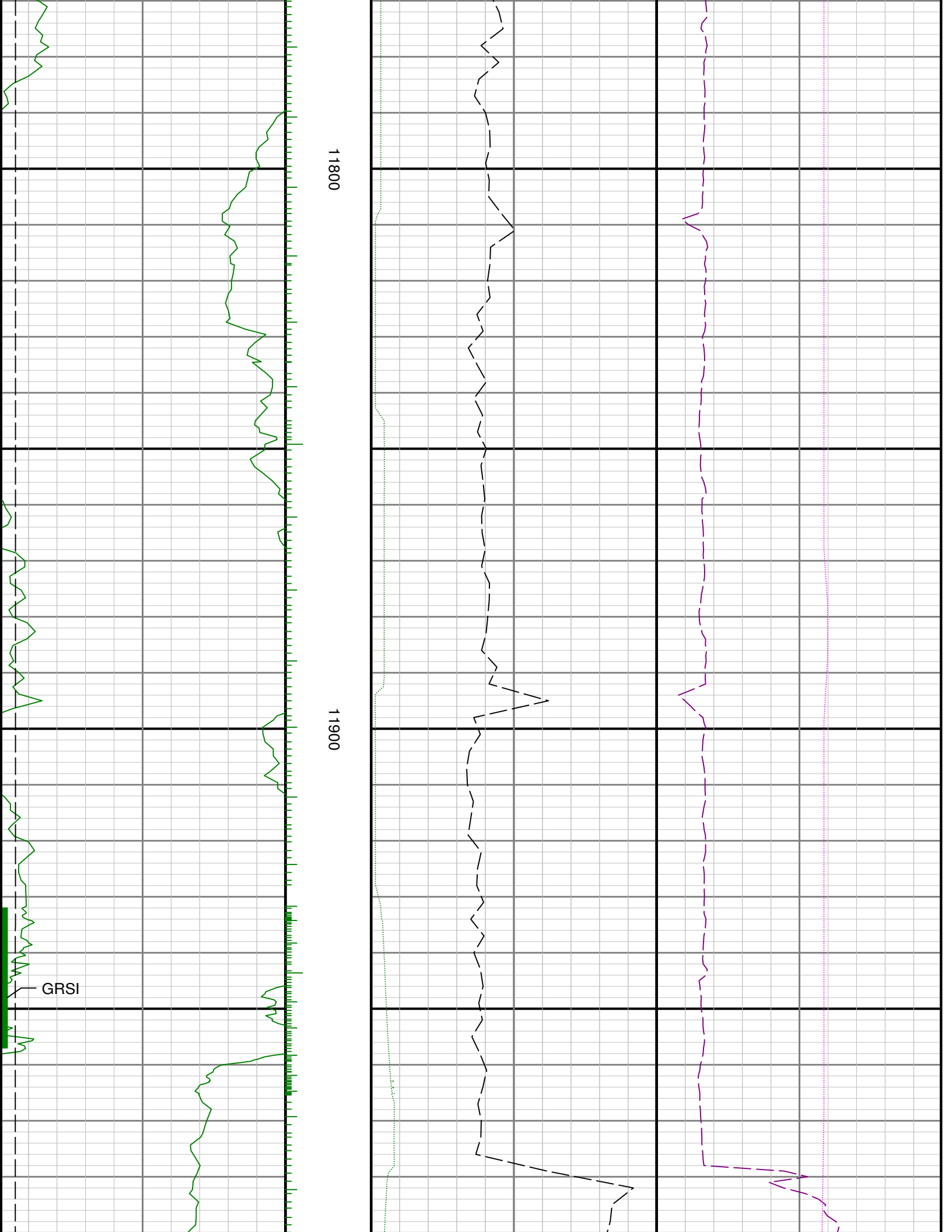


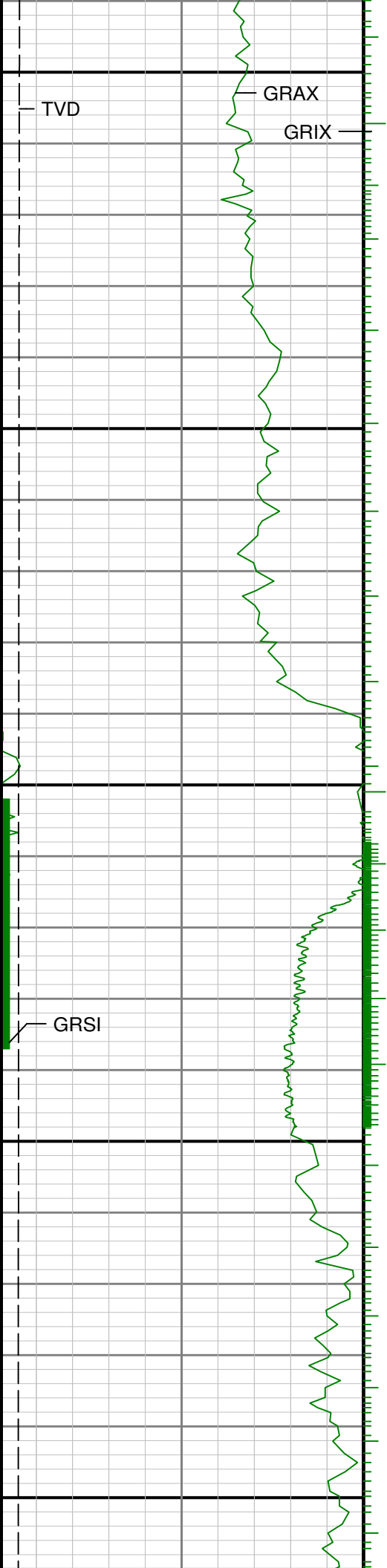


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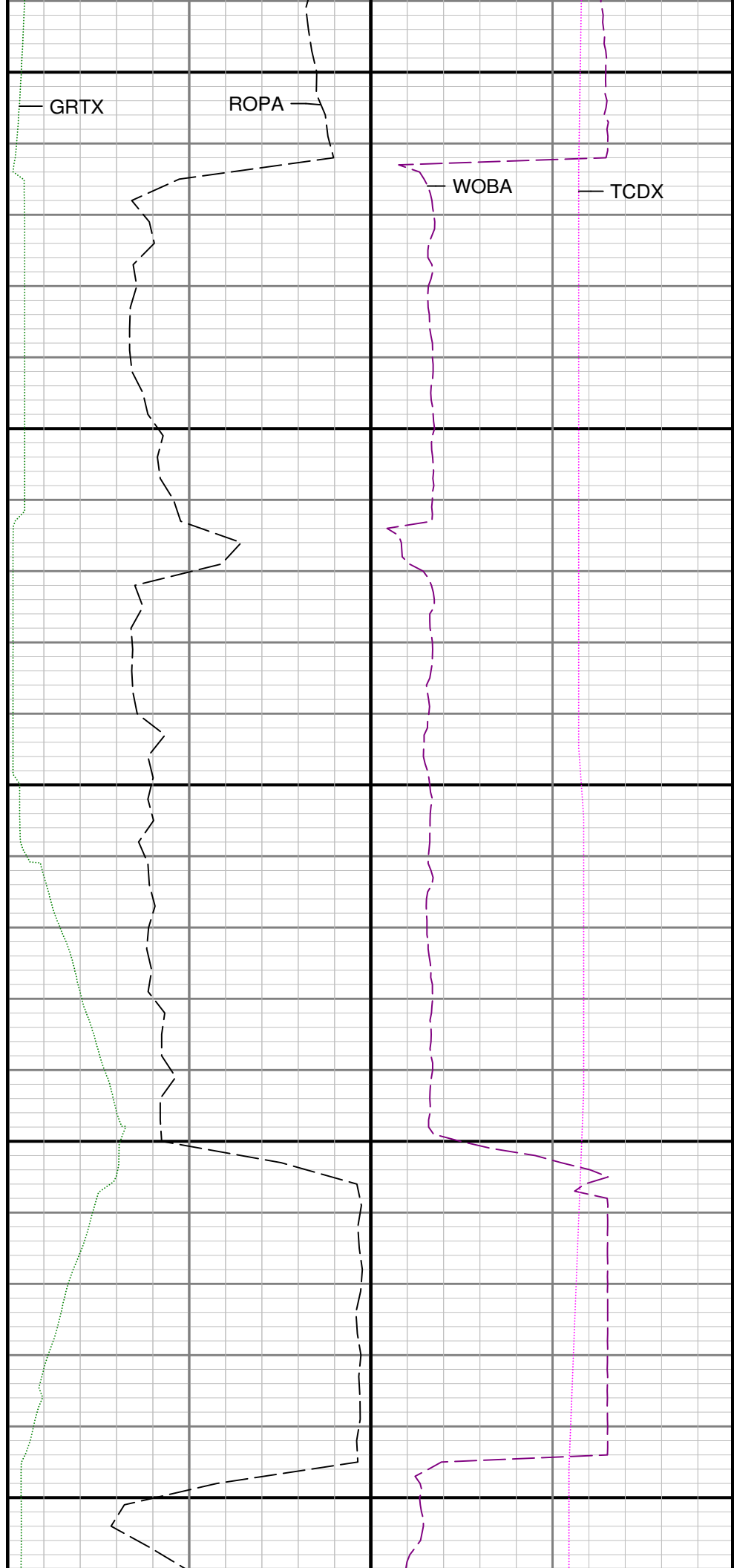




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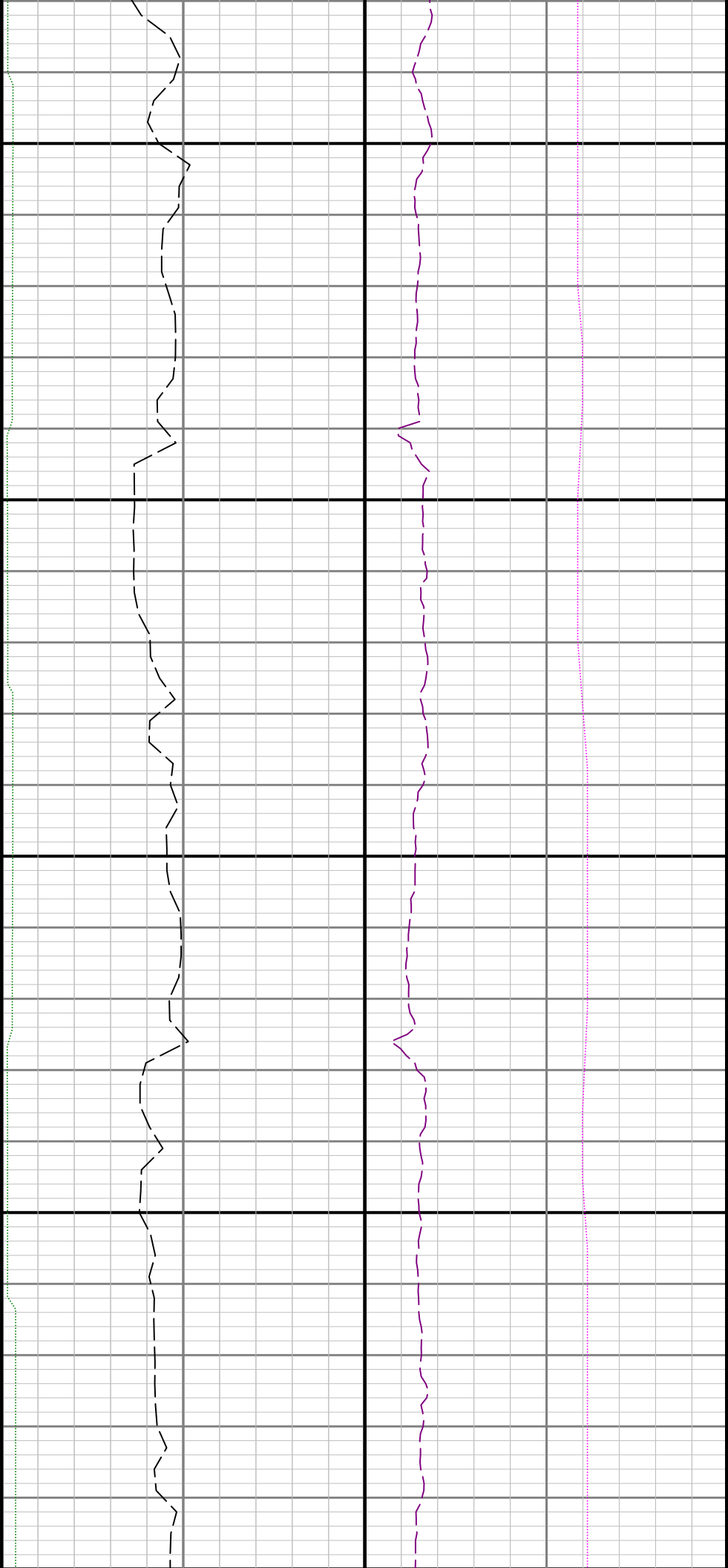
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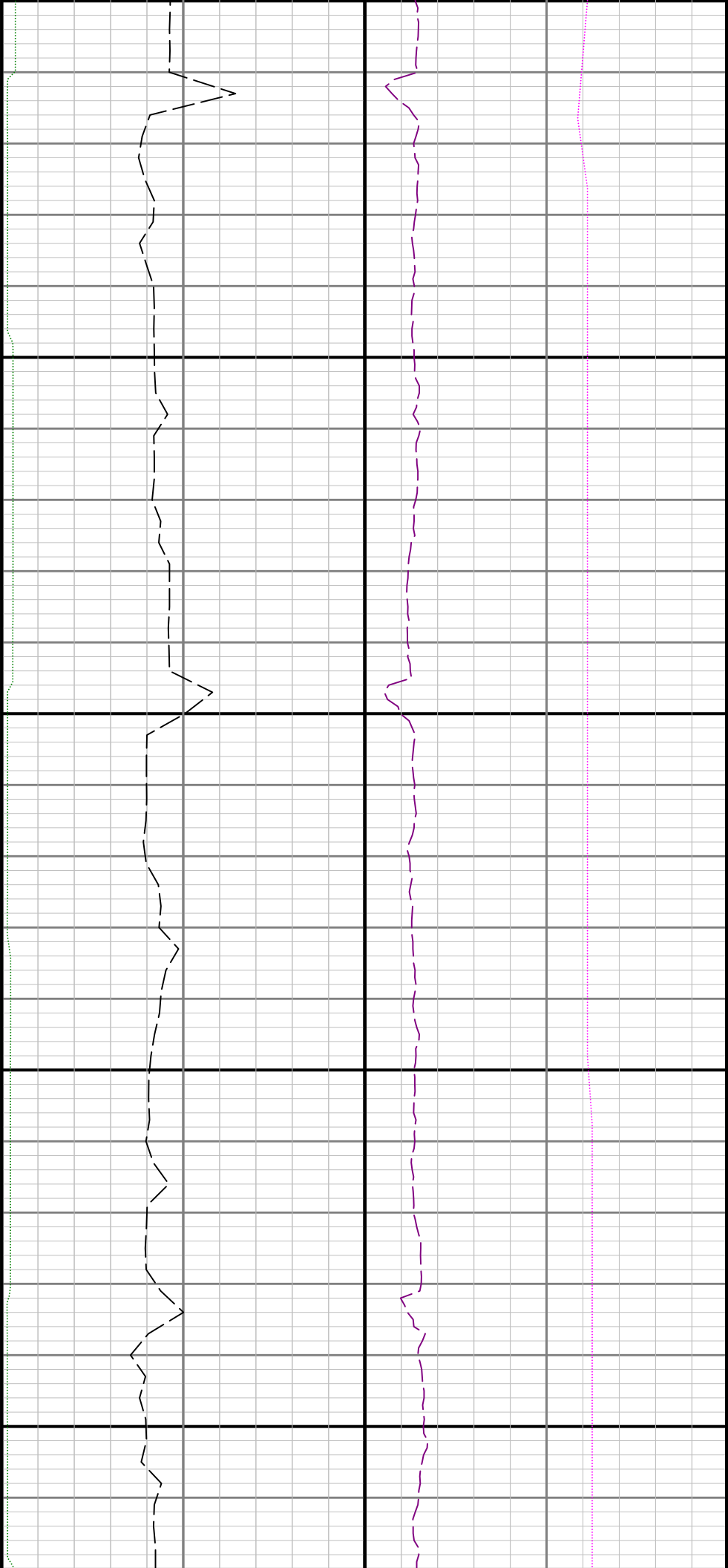
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