



Gamma Ray

LWD MEMORY LOG

Scale: Company: Noble Energy

1:240 Well: Gutersen YY06-775

Measured Depth Field: Wattenberg

Depth Reference: County: Weld Country: United States

Driller's Depth State: Colorado

Status: Surface Location: Other Services:

Final Print Latitude: 40° 11' 26.874" N

Longitude: 104° 28' 52.545" W

API No: 05-123-48642

Job ID: 110462679 SEC: 30 TWN: 3N RGE: 63W

Permanent Datum (P.D.): Mean Sea Level Elevation: 0.00 ft Elev. KB: N/A

Log Measured From: Rig Floor Above P.D.: 4821.00 ft Elev. DF: 4821.00 ft Elev. GL: 4791.00 ft

Dates Interval Magnetic Field Reference

From: 2020-07-22 Drilled (ft) Logged (ft) Azi Reference North: Grid Dip Angle: (deg) 66.57

To: 2020-07-24 Top: 1942.00 Top: 1942.00 Total Magnetic Field Strength: (nT) 52003

Spud: 2020-07-11 Bottom: 17480.00 Bottom: 17467.00 Mag to Reference North Correction: (deg) 7.26

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
13.500	30.00	1942.00	9.625	36.00	30.00	1932.00
8.500	1942.00	17480.00				

Mud Record

Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc   Az (Start)	Inc   Az (End)
Oil Based Mud	1942.00	17480.00	8.500	15538.00	0.20   8.90	89.97   179.01

Acquisition System Software Version

Other

Cadence RT 5.7 Rig: H&P 517

DeliverableGen 5.7.8878.1 Contractor: Helmerich & Payne Drilling Co

District: RMA Unit: D&E

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	3.00	AutoTrak Curve	1929.03	17467.03	1942.00	17480.00	2020-07-21 01:32	2020-07-22 22:17	41.60

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Andrea Guidry	2020-07-20	2020-07-22	Chris Campbell	2020-07-20	2020-07-23	Jeremiah Samson	2020-07-20	2020-07-23
Marco Favela	2020-07-20	2020-07-23	Tien Bui	2020-07-20	2020-07-24	John Bryson	2020-07-22	2020-07-22

Mud Properties Record

Date / Time	Run No.	Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2020-07-20 19:43	1	1942.00	Oil Based Mud	9.2	14	N/A	20.0	68/20	Active Pit	26500	0.00
2020-07-23 08:10	1	15200.00	Oil Based Mud	9.6	14	N/A	16.8	71/18	Active Pit	25000	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	AutoTrak Curve Steering Unit	14236901	Near Bit VSS	5.93	6.80	7.000	4.330
1	AutoTrak Curve Steering Unit	14236901	Near Bit Inclination	5.93	6.80	7.000	4.330
1	AutoTrak Curve MWD	12118955	Gamma (single)	2.75	12.97	7.000	3.250
1	AutoTrak Curve MWD	12118955	Directional (mag)	12.27	22.49	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
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ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM

Comments

- 1

Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2

Baker Hughes LWD Run 1 utilized 6 ¾ inch NaviGamma service (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1942 to 17480 feet MD (1942 to 6684 feet TVD).
- 3

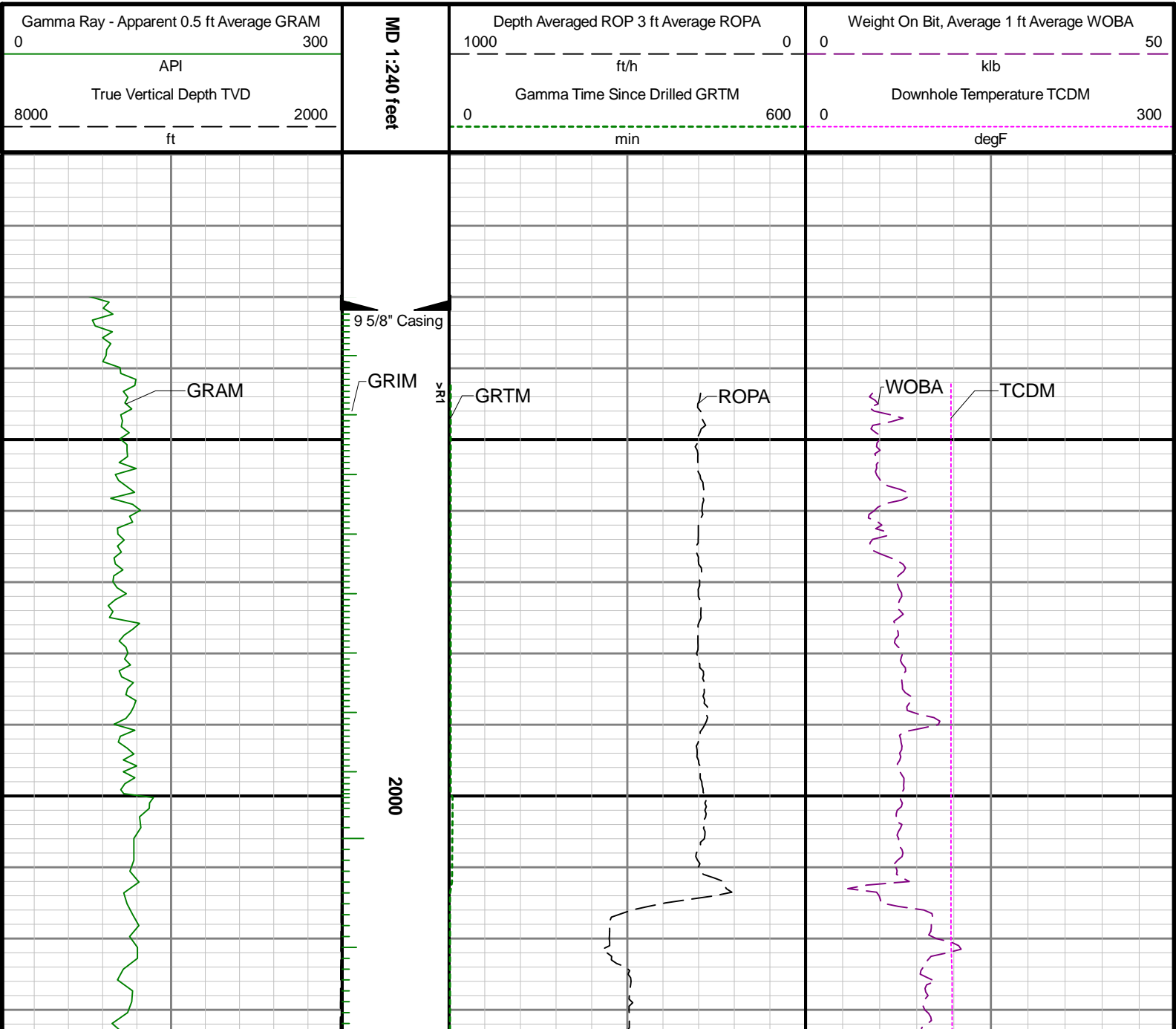
The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.

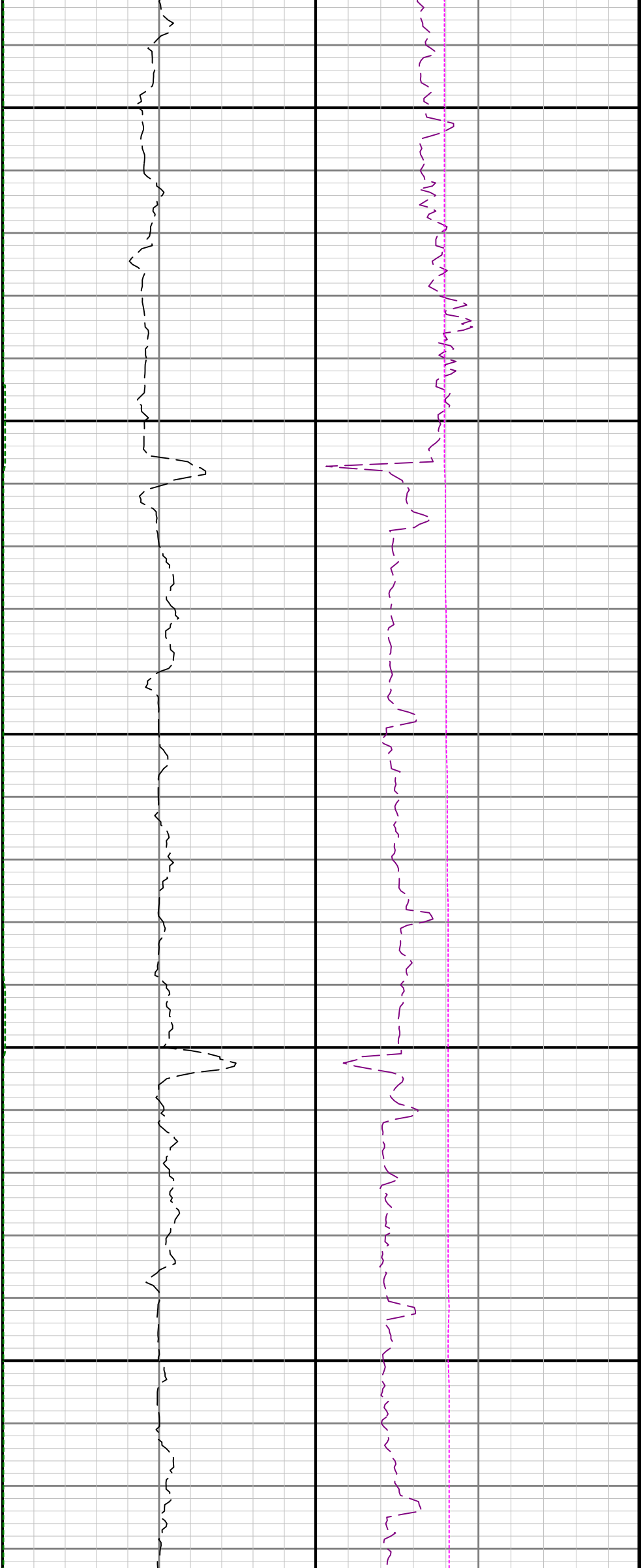
Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	13930.00	8.500	1	The interval from 13930 to 14025 feet MD (6710 to 6709 feet TVD) has gaps in Gamma Ray data due to losing connection with the third party Pason depth tracking system.
2	17467.00	8.500	1	The interval from 17467 to 17480 feet MD (6684 feet TVD) was not logged due to sensor to bit offset at well TD.

Curve Mnemonics

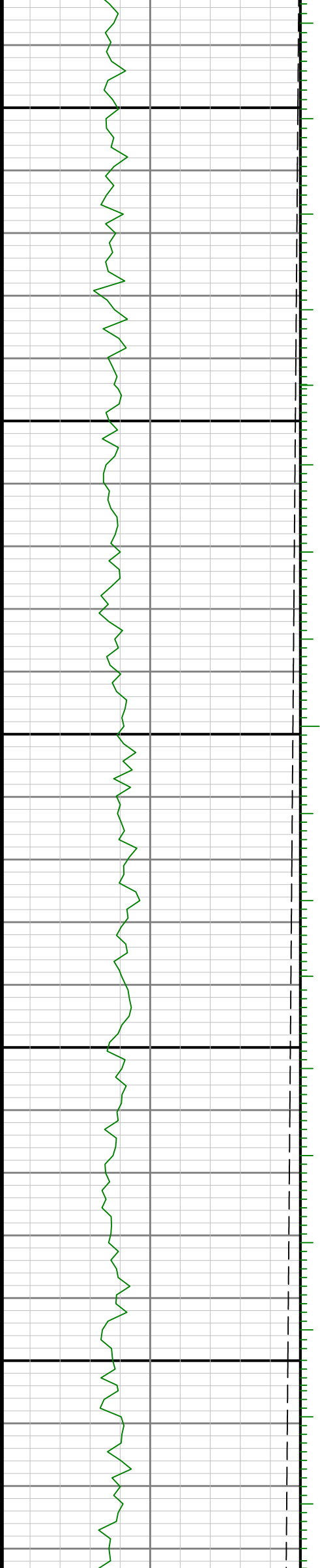
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	TVD	ft
WOBA	Weight On Bit 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
TCDM	Directional Real-Time Survey Temperature	degF

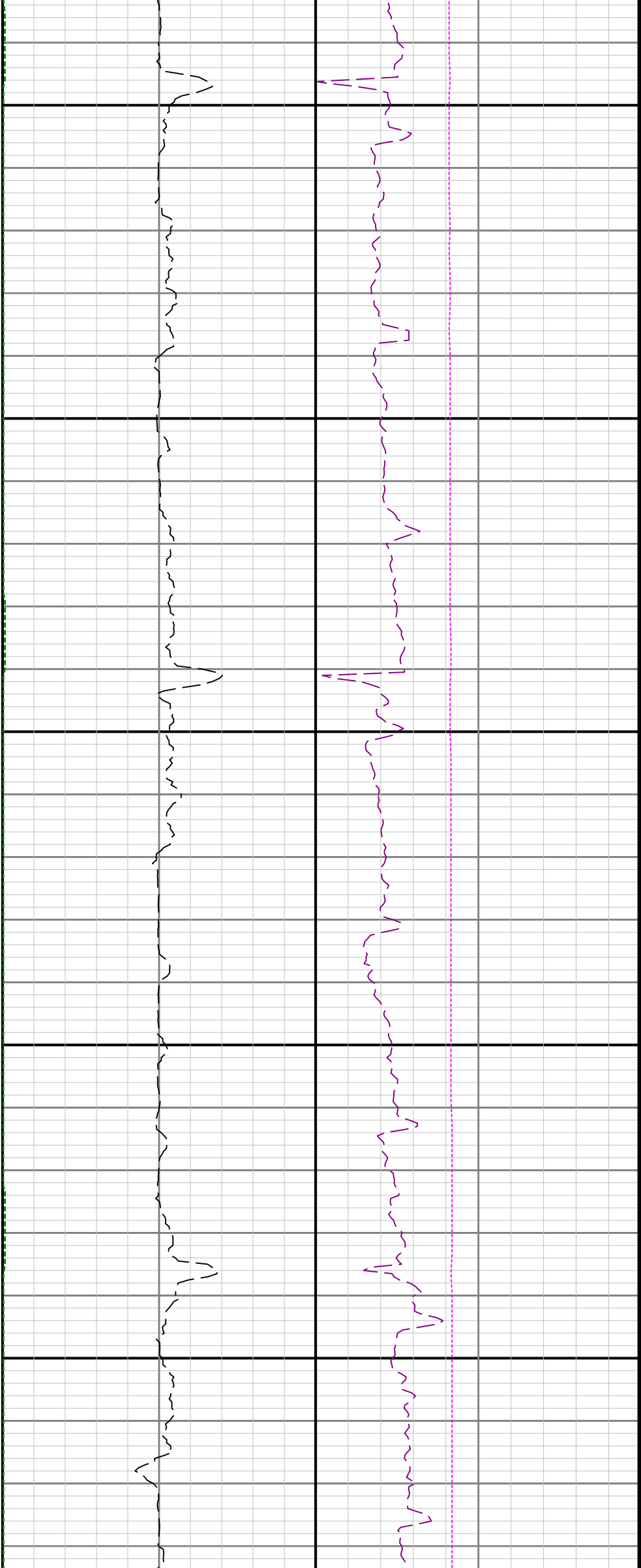




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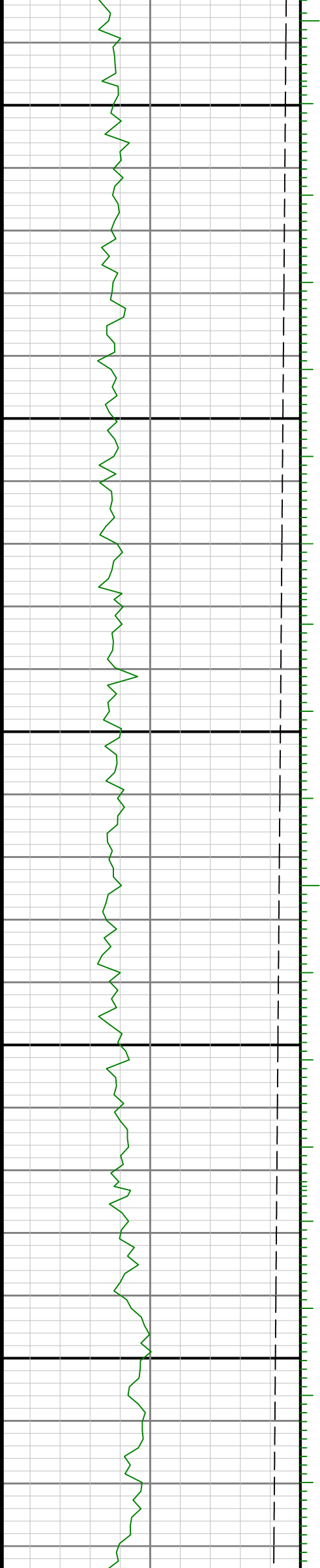


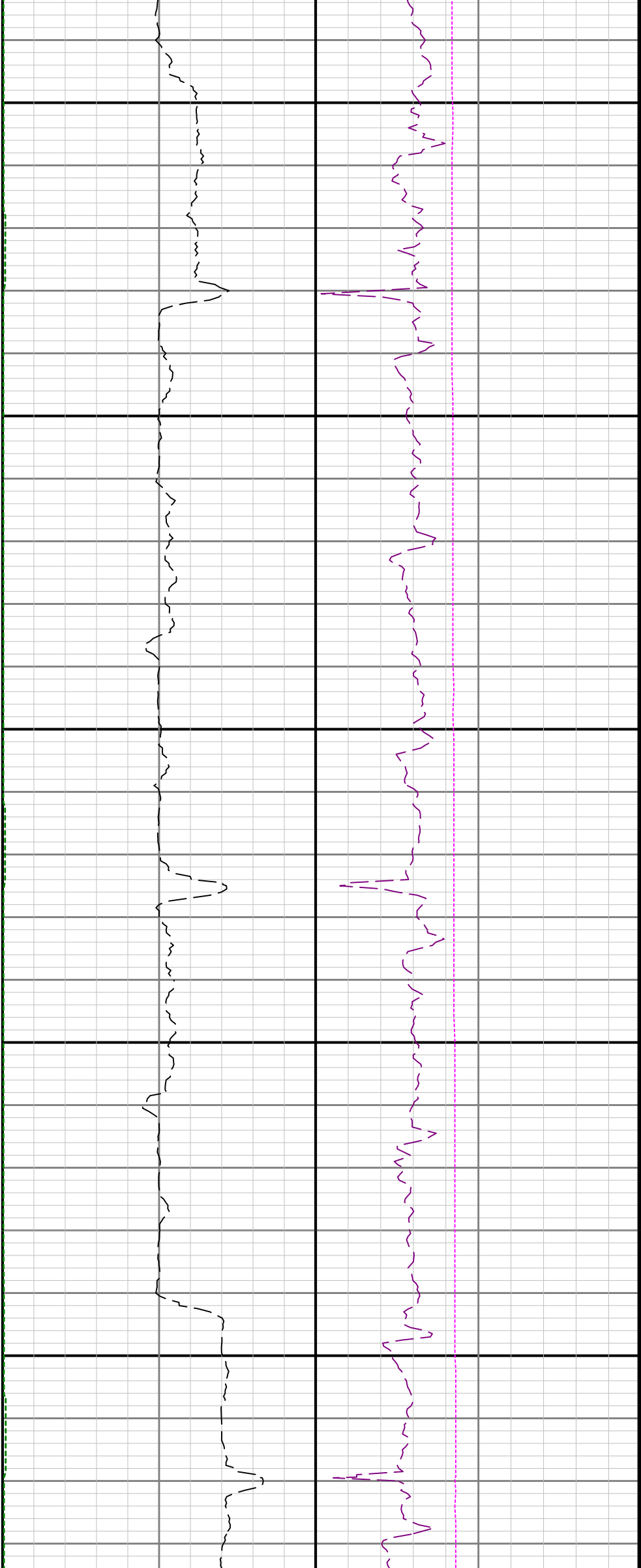


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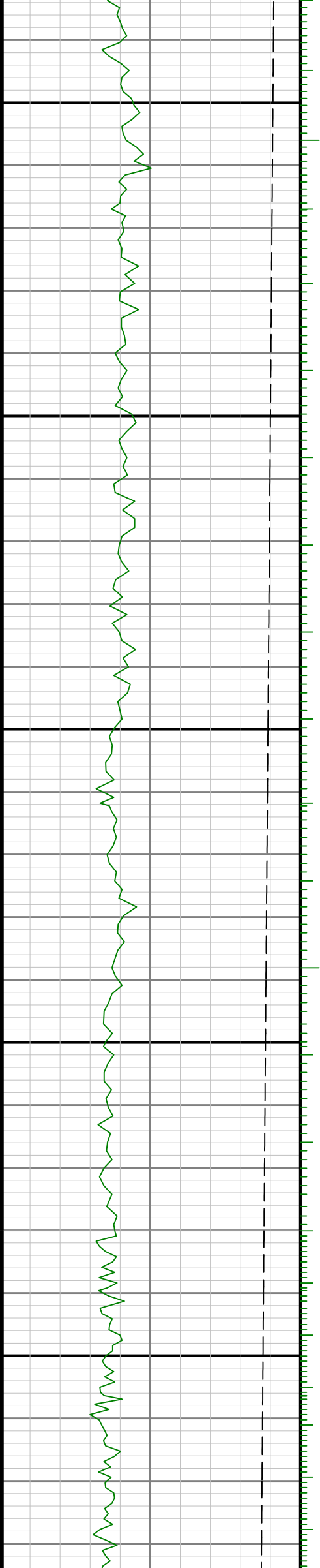
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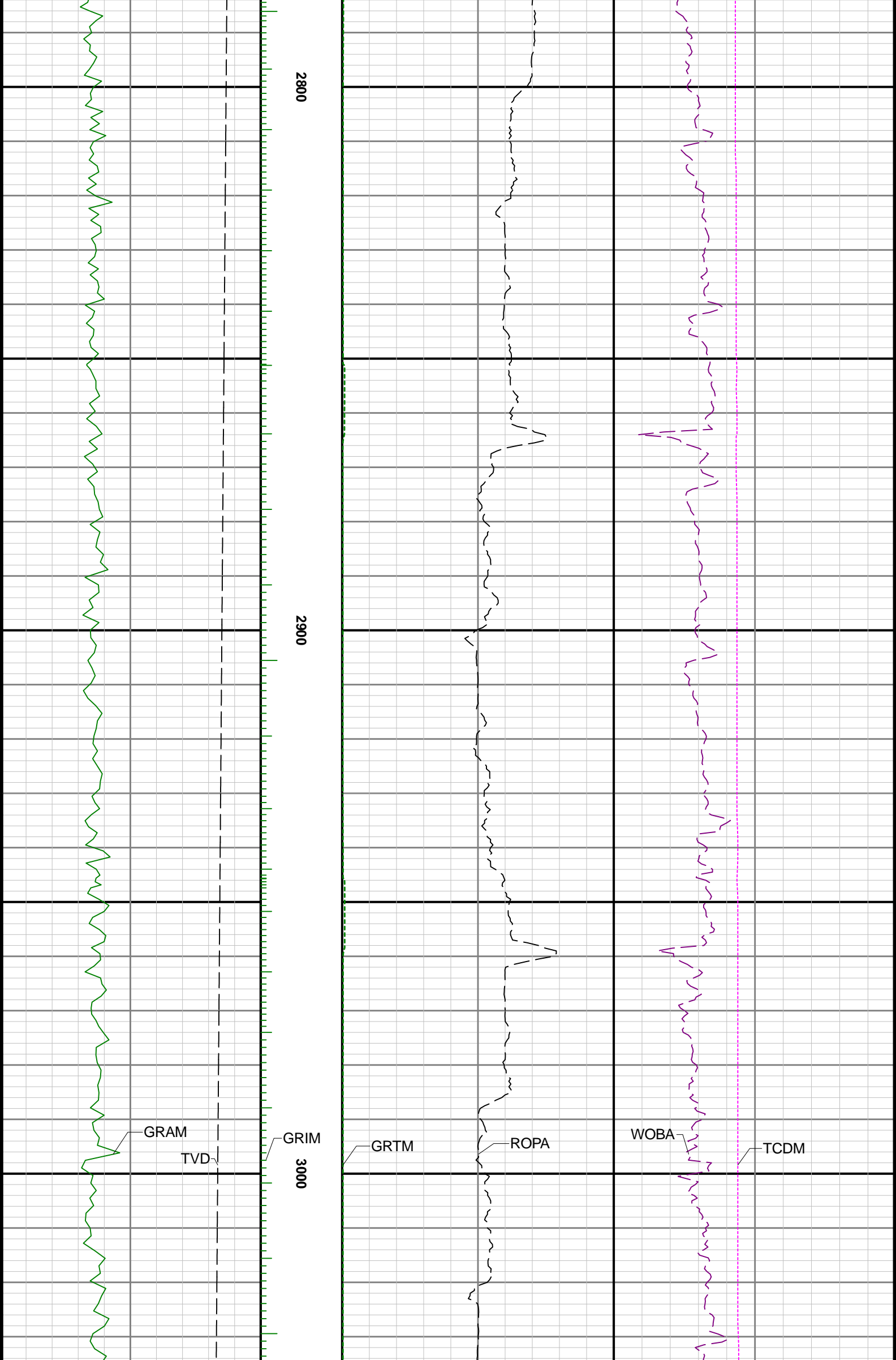


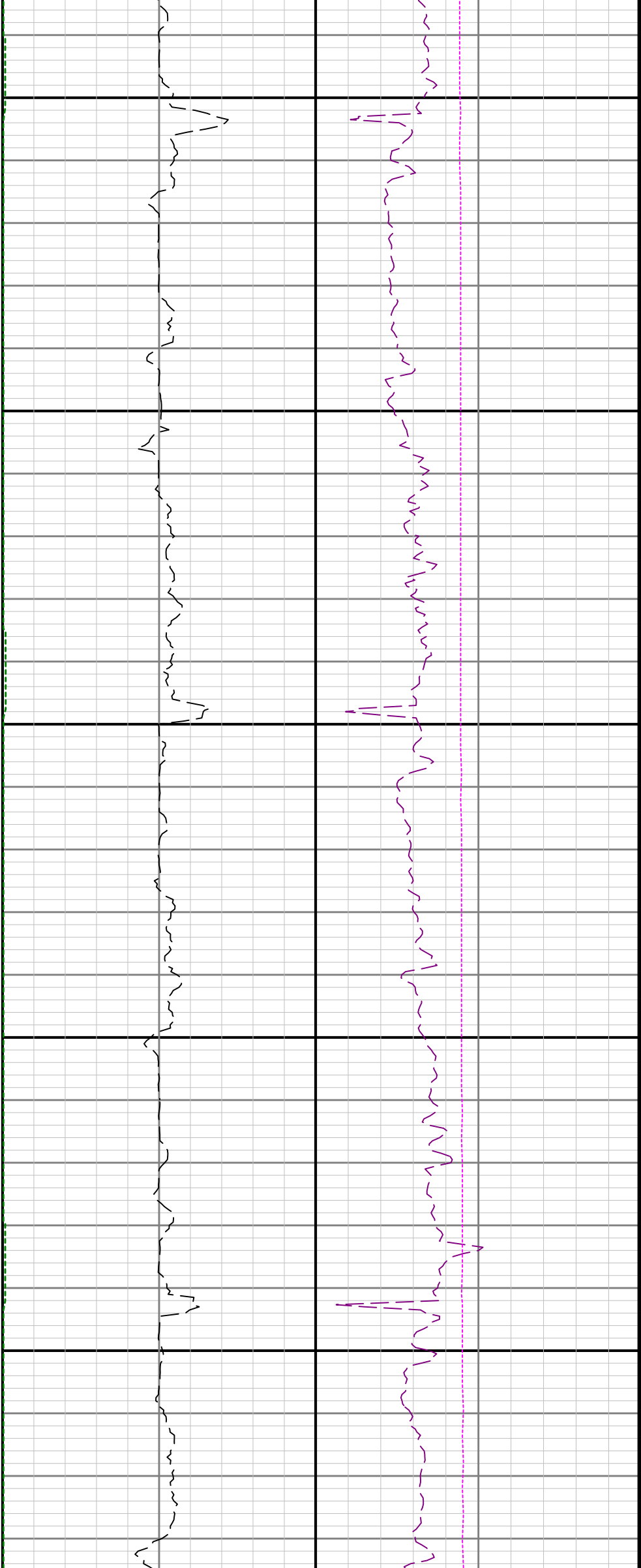


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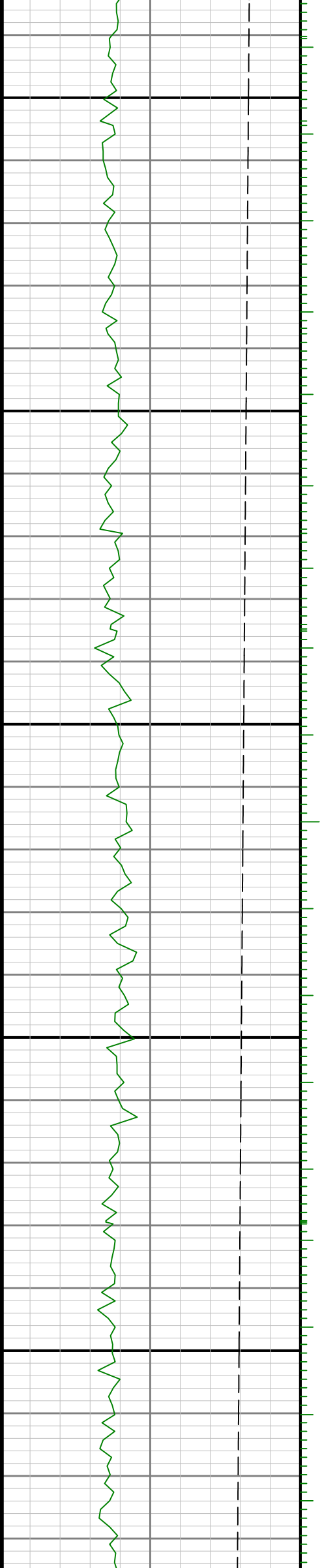


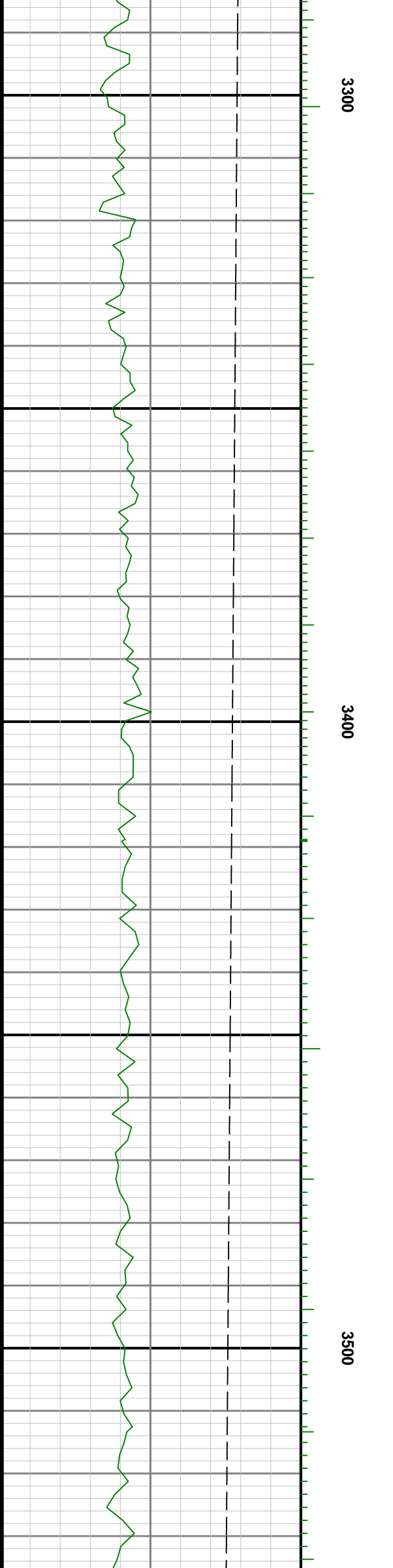
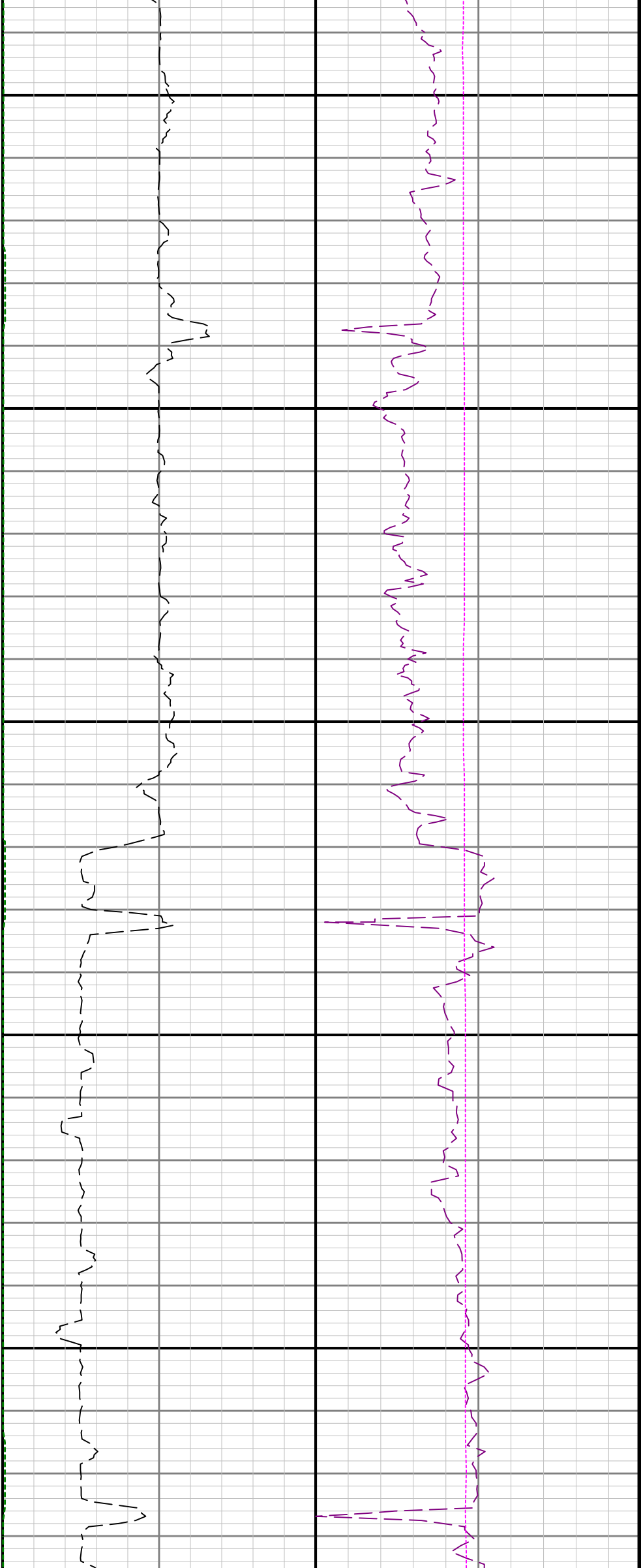




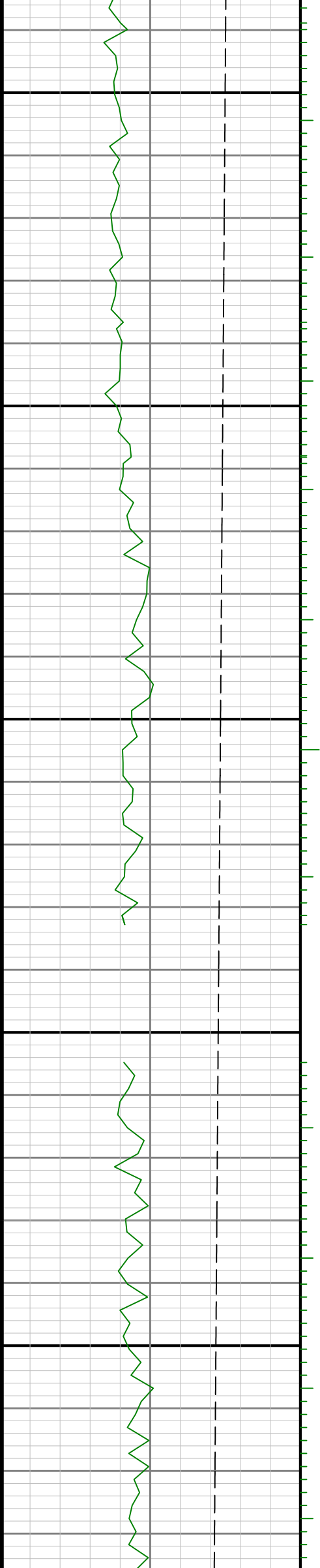
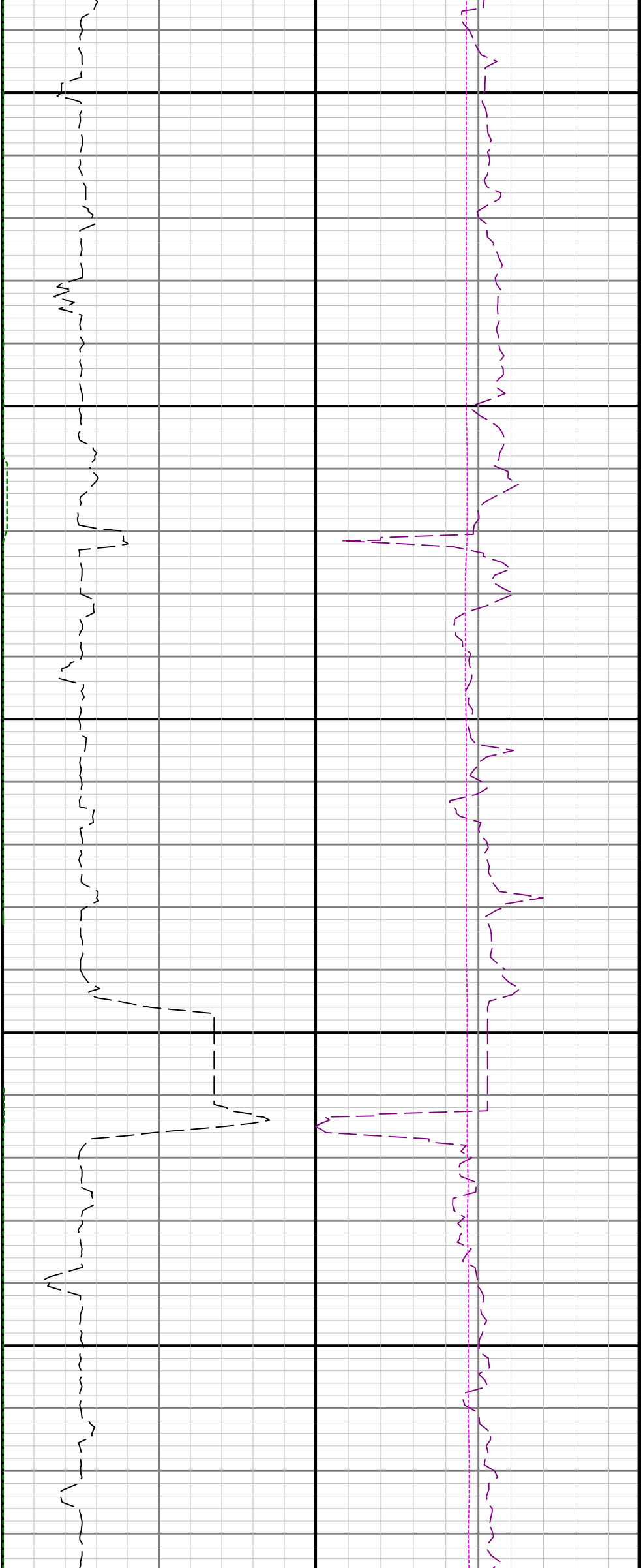
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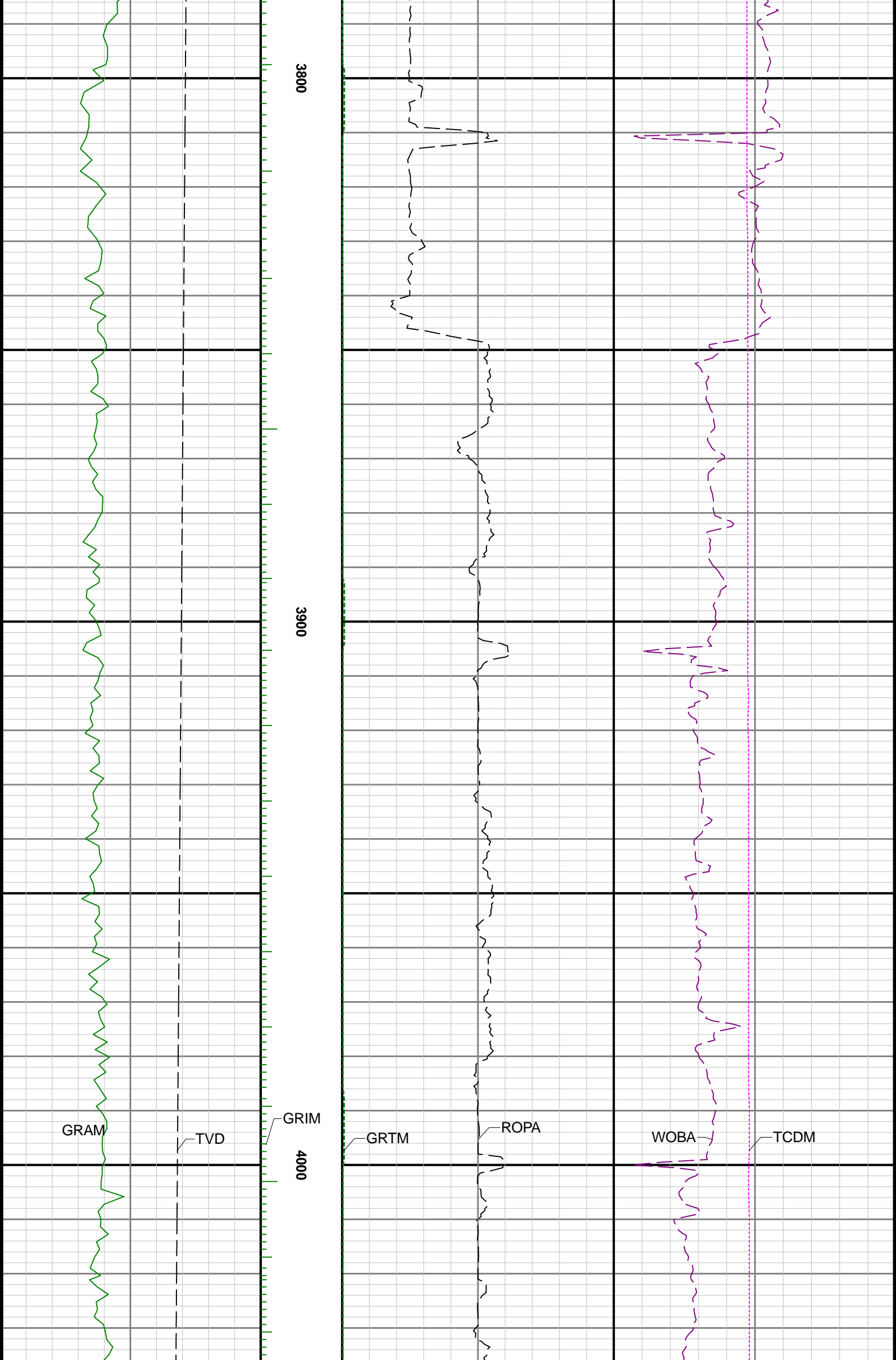
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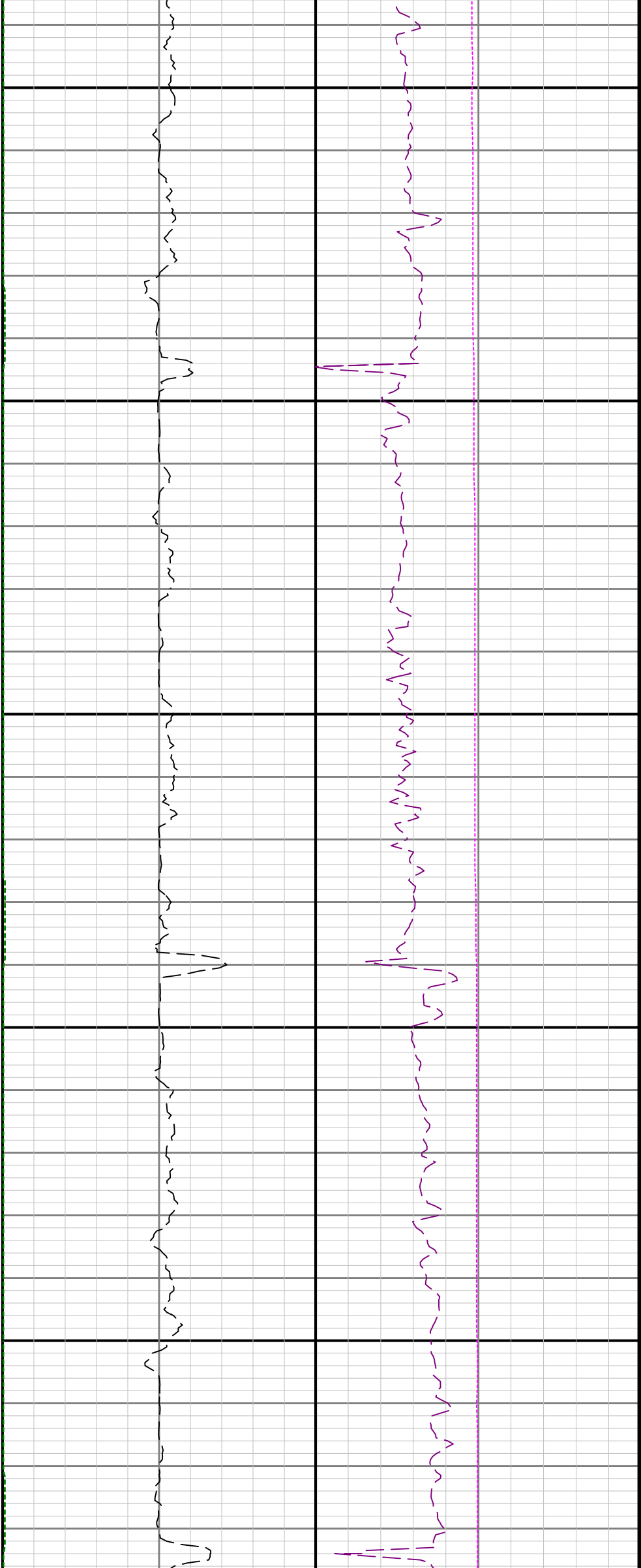






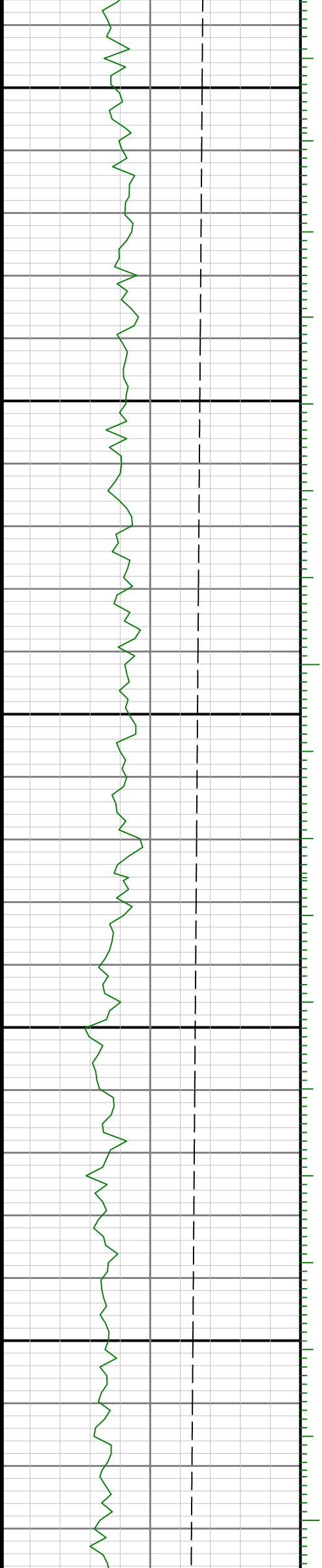


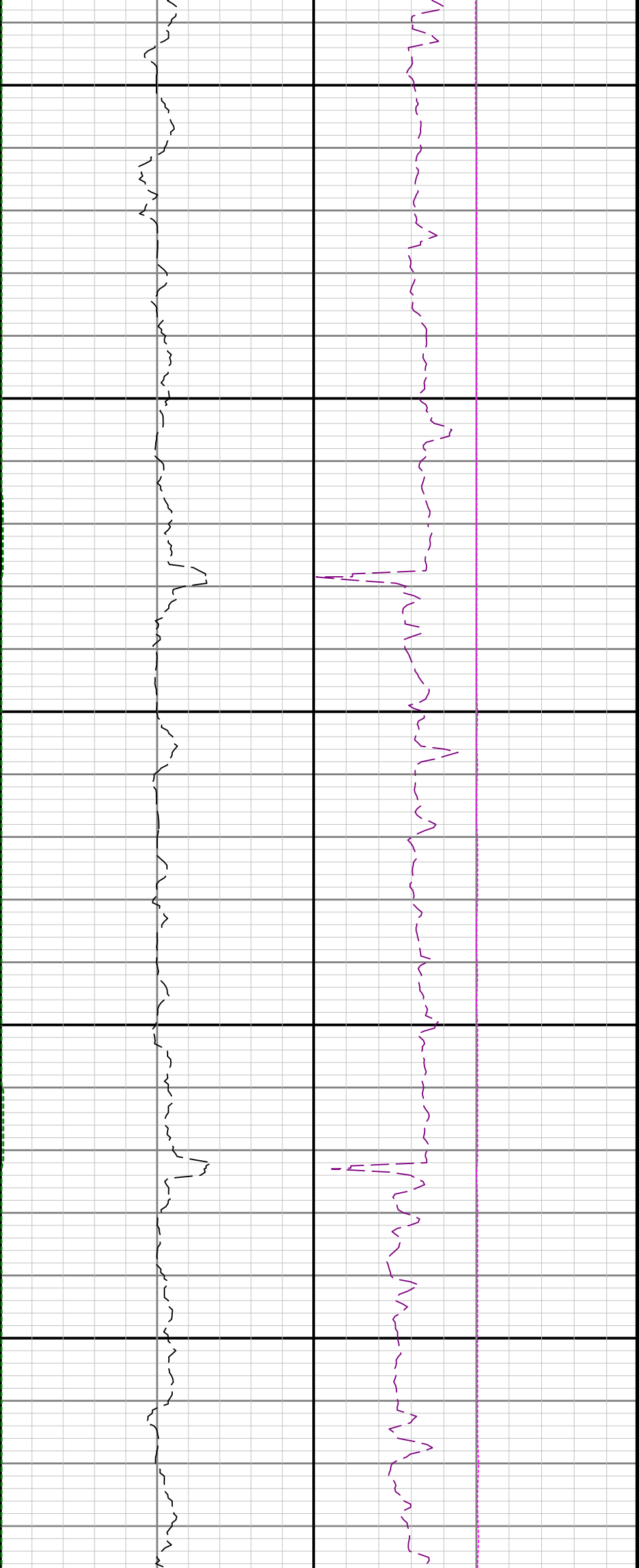




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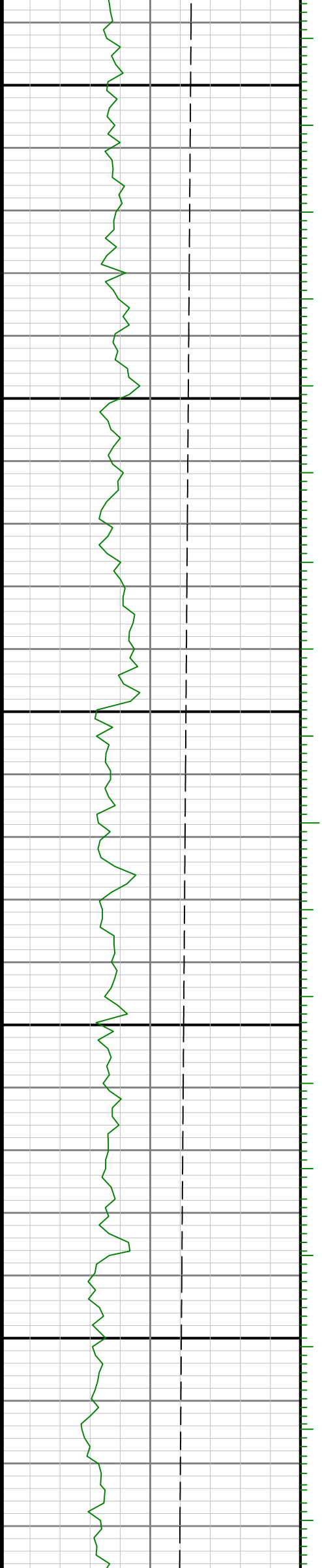


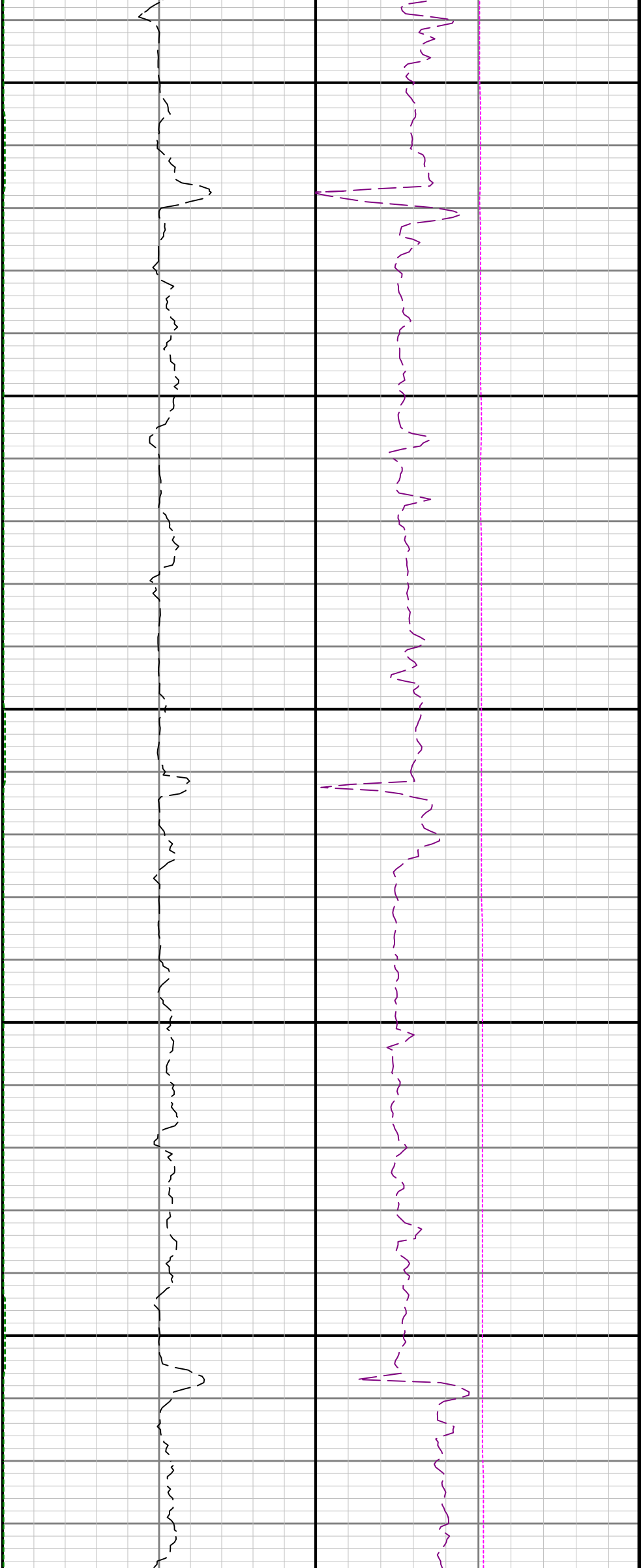


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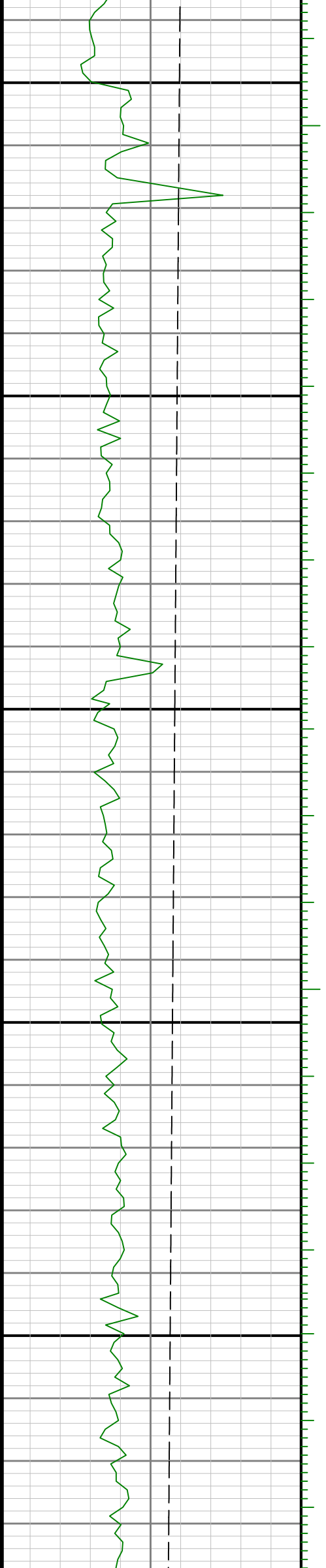
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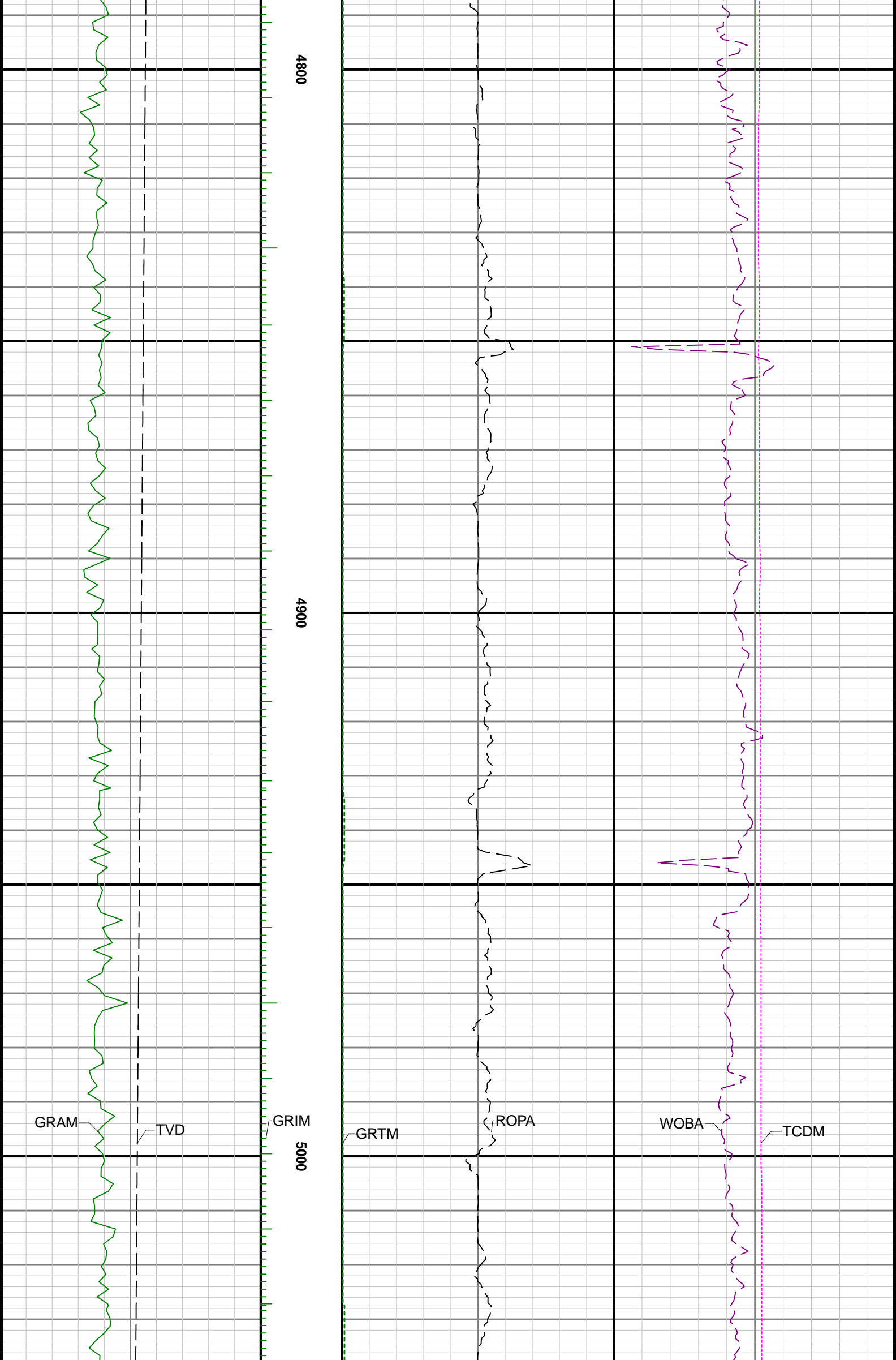


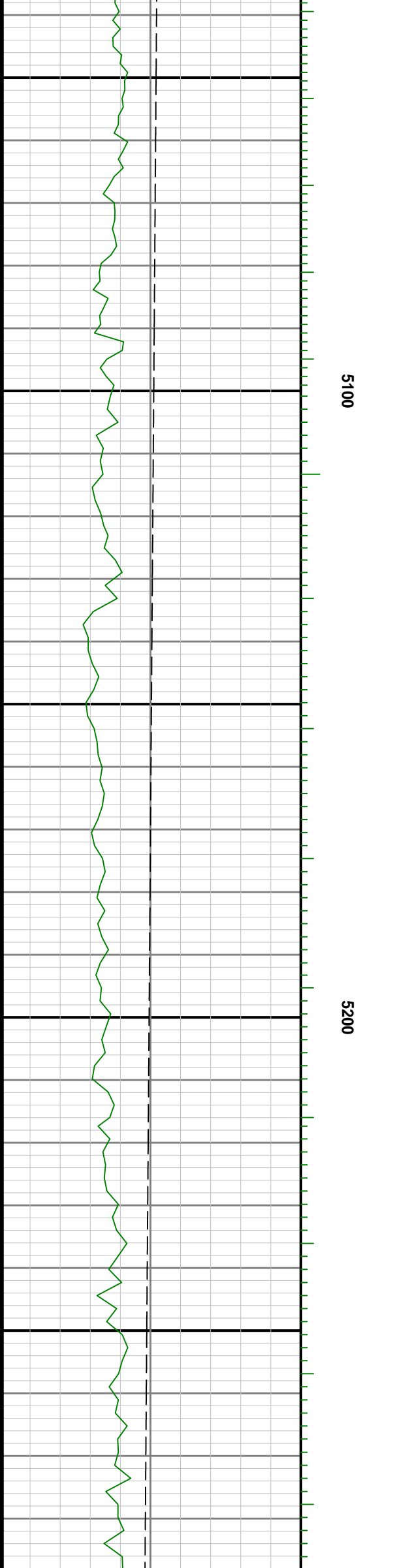
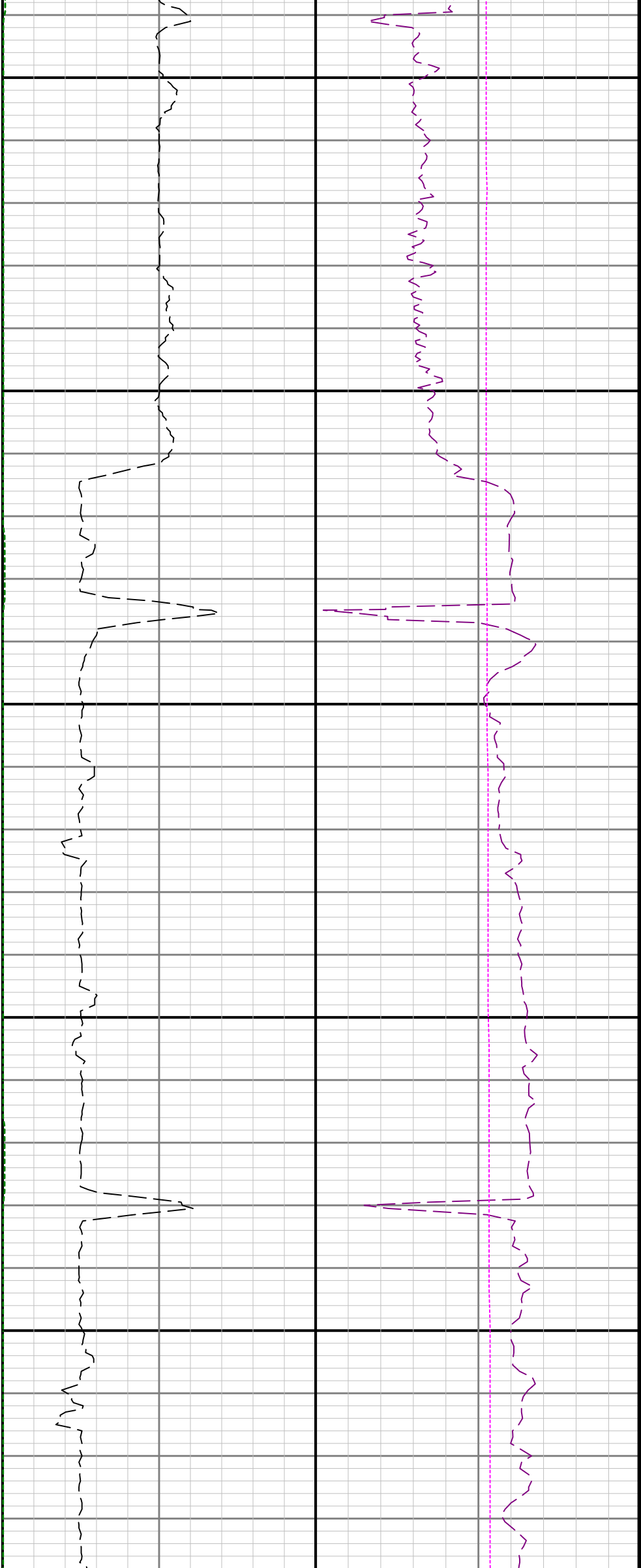


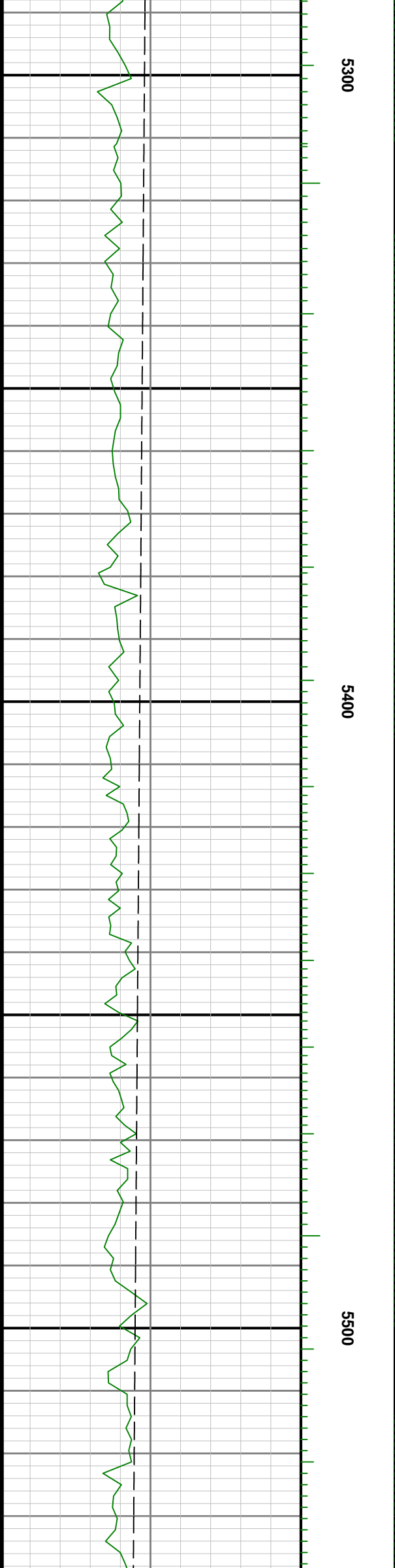
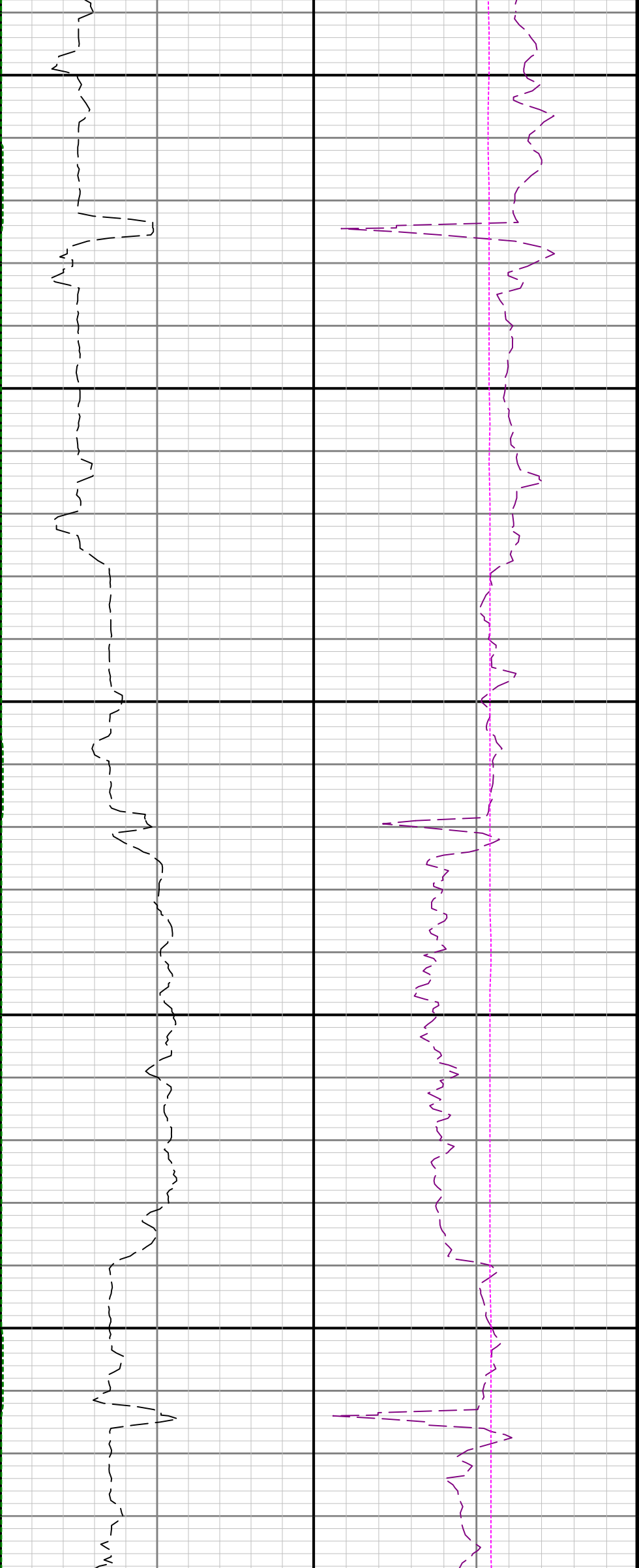
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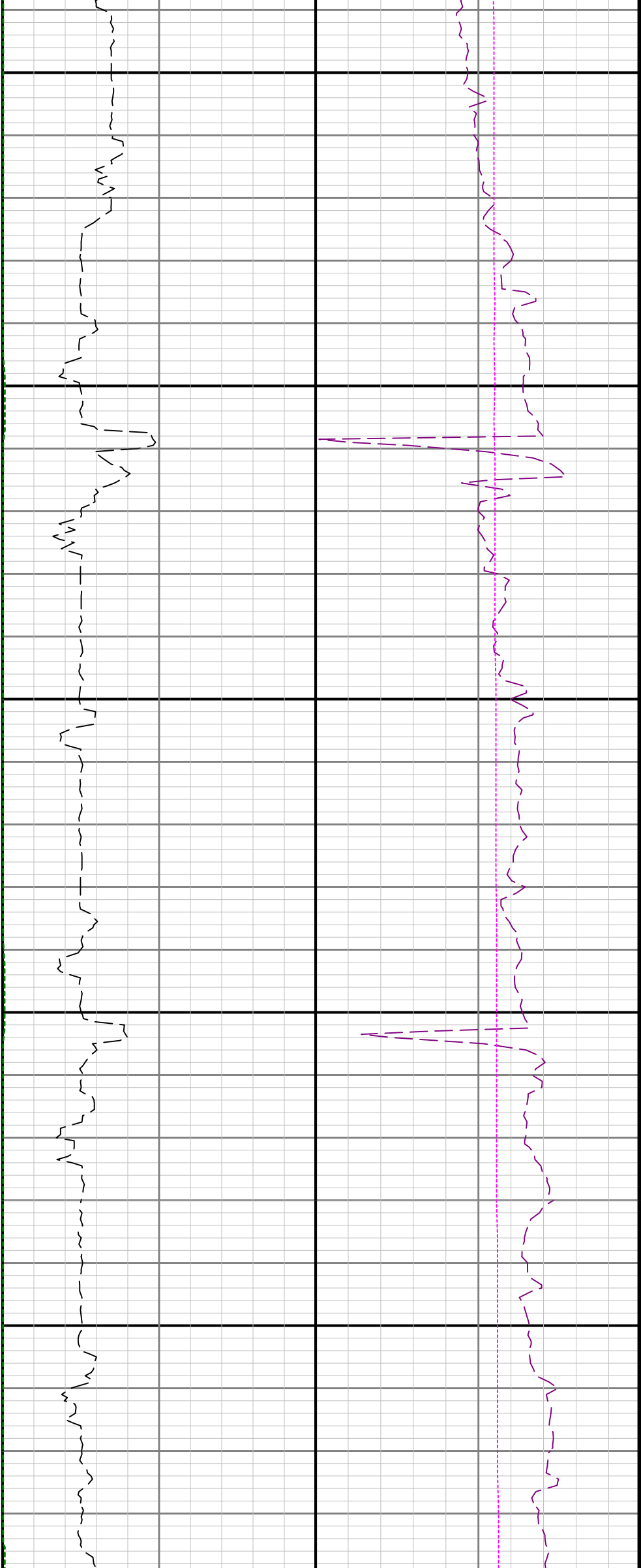






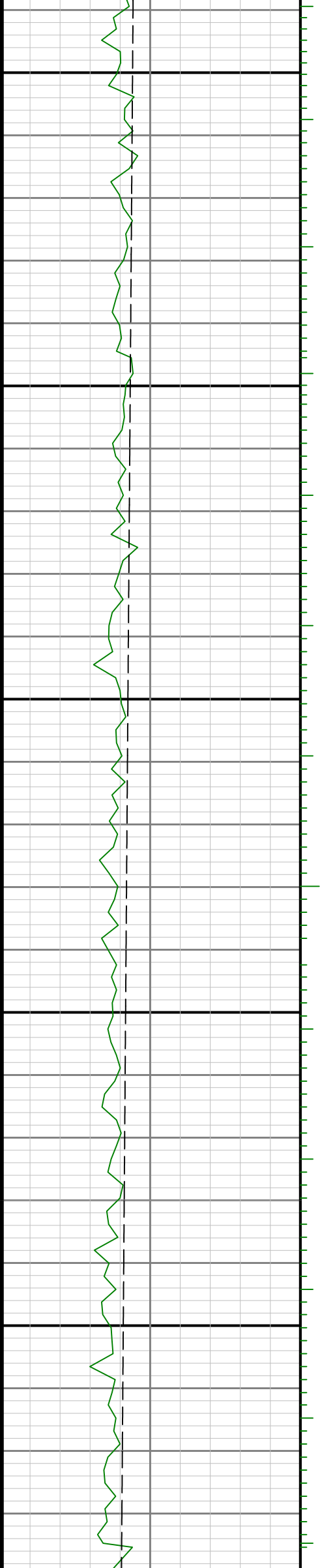


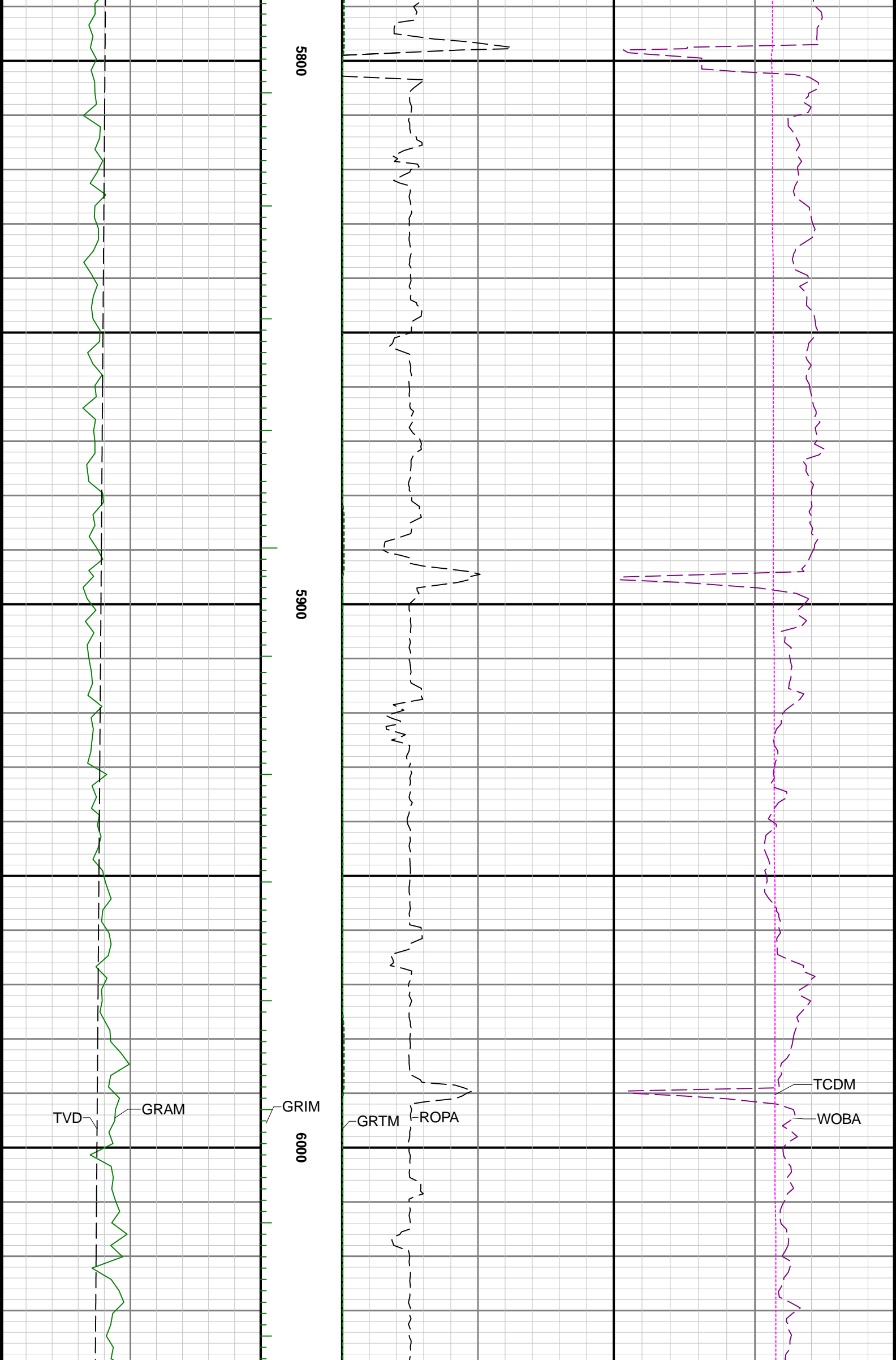


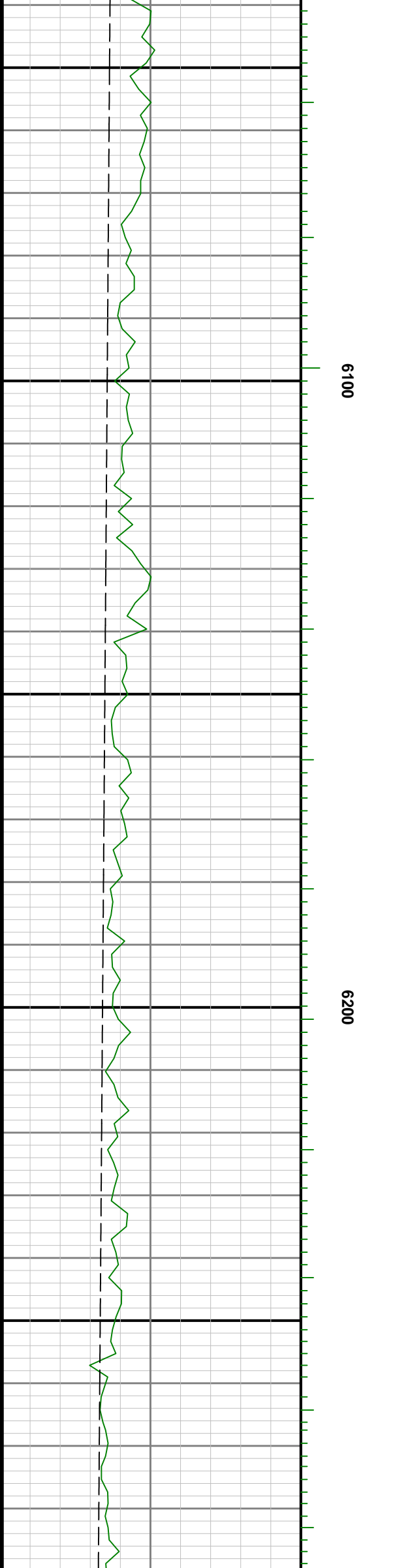
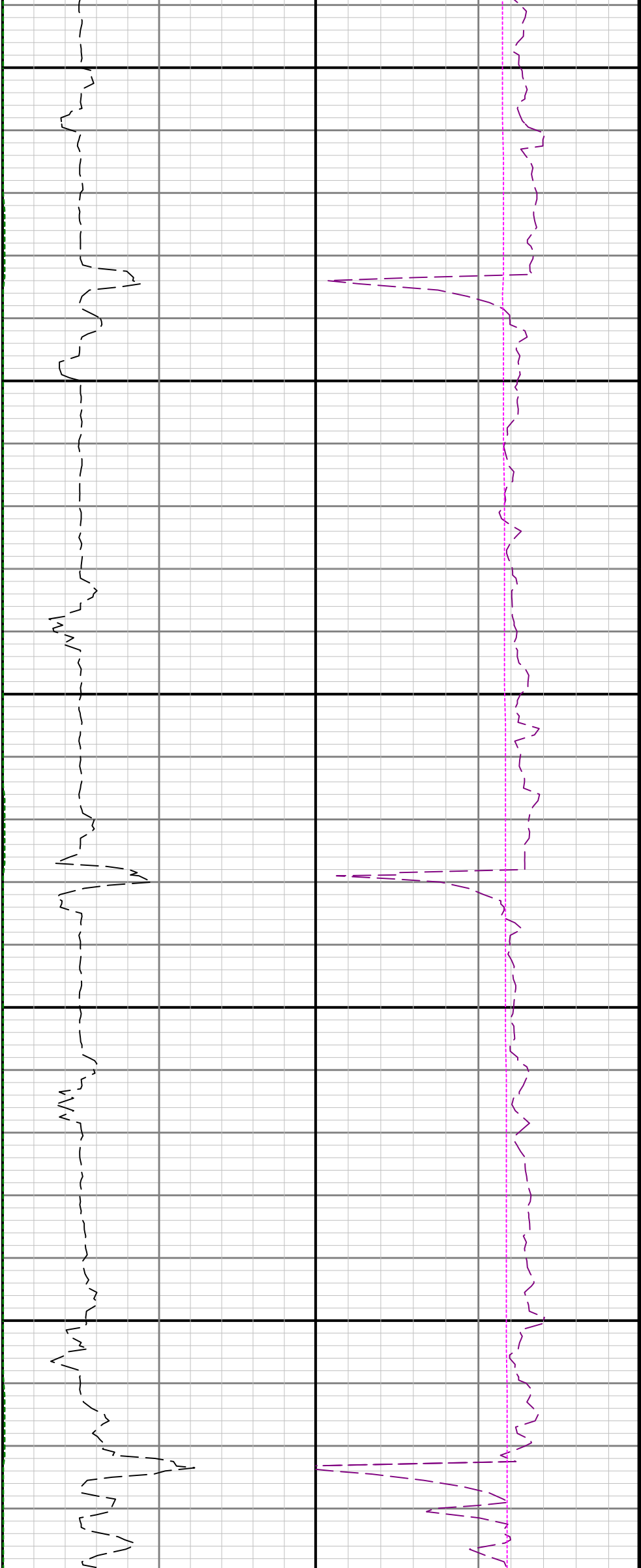


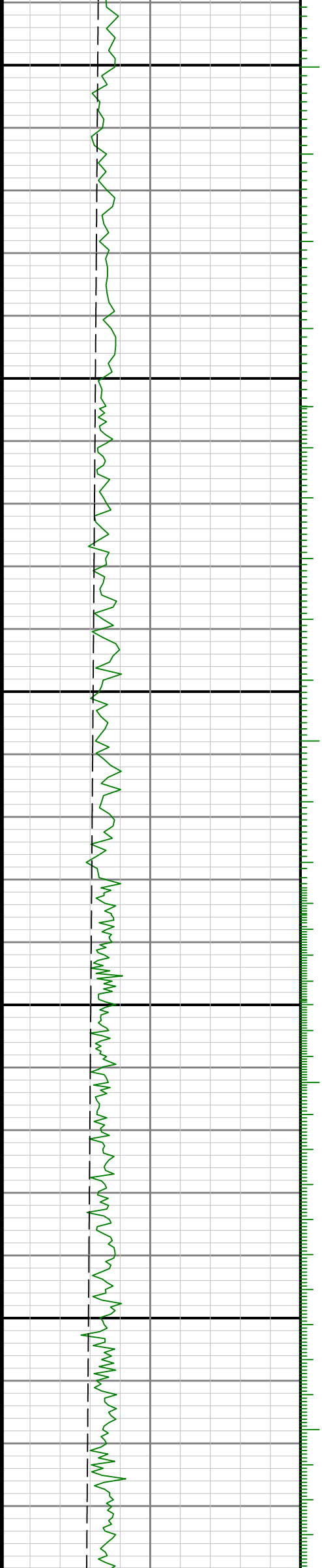
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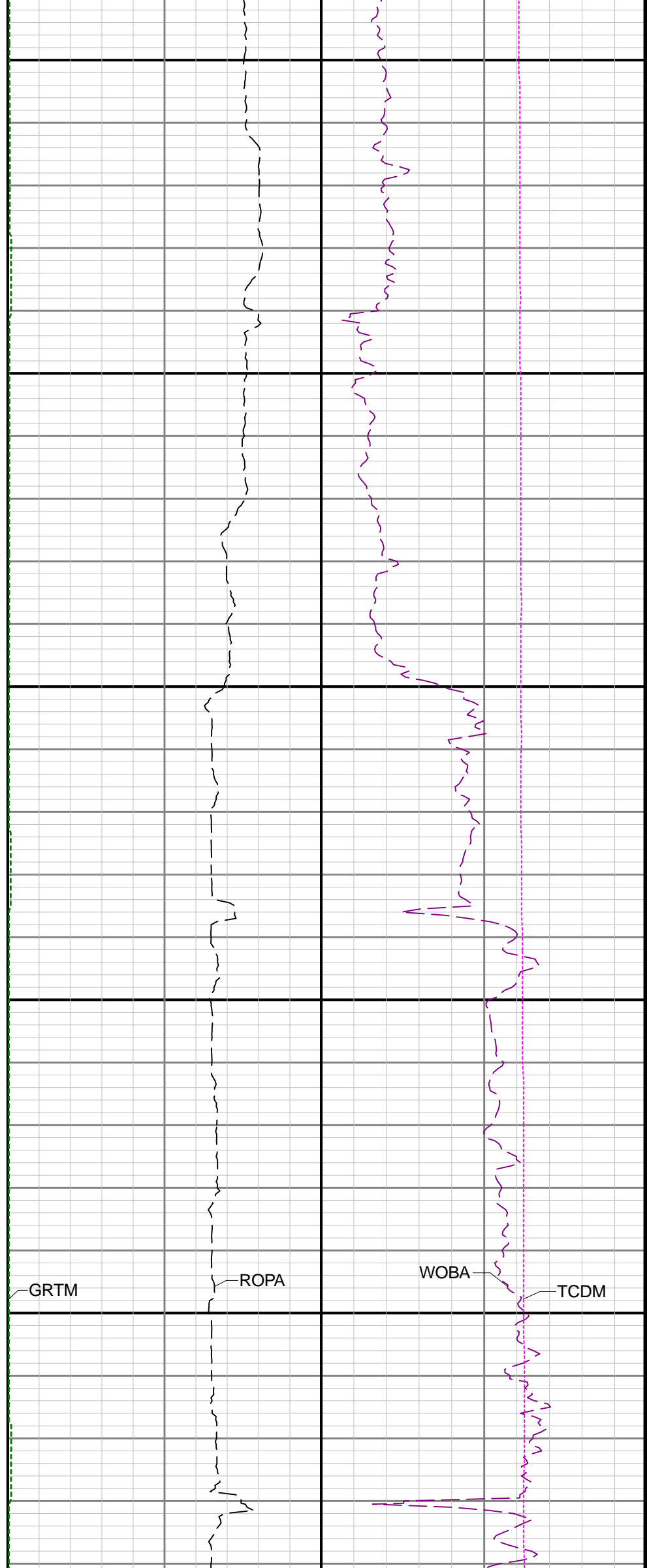
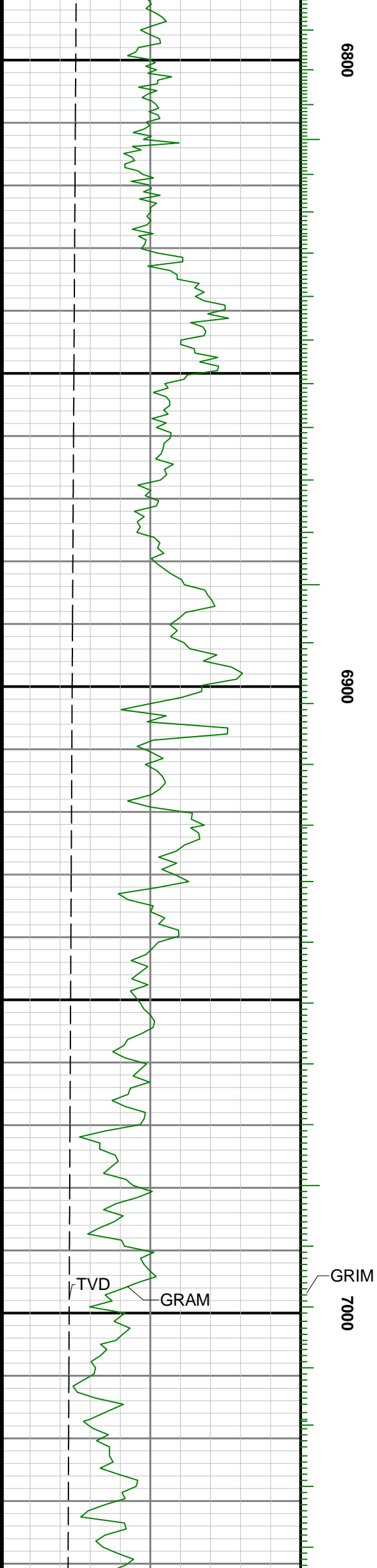


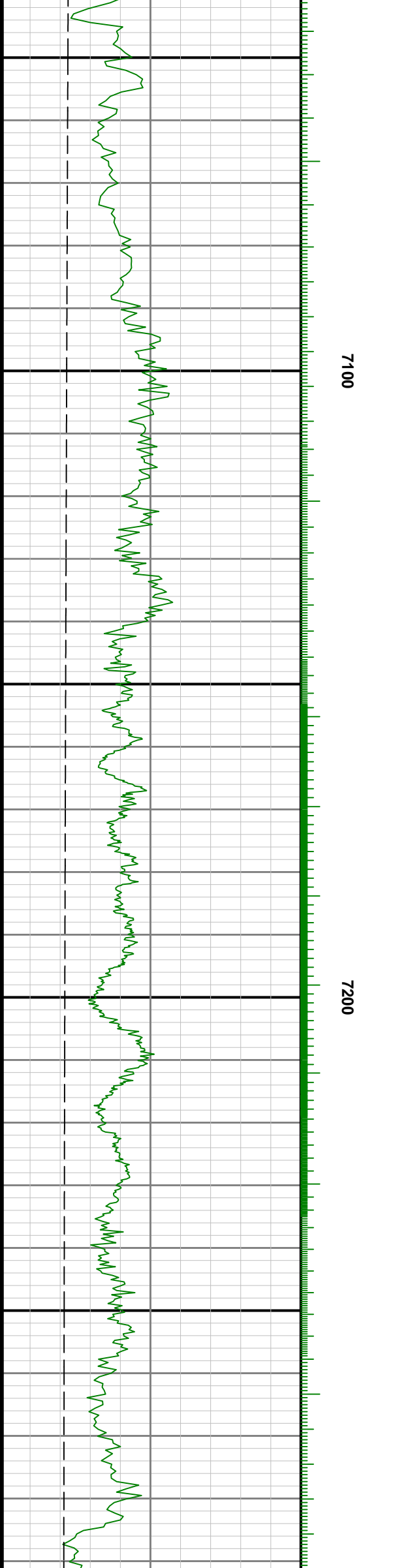
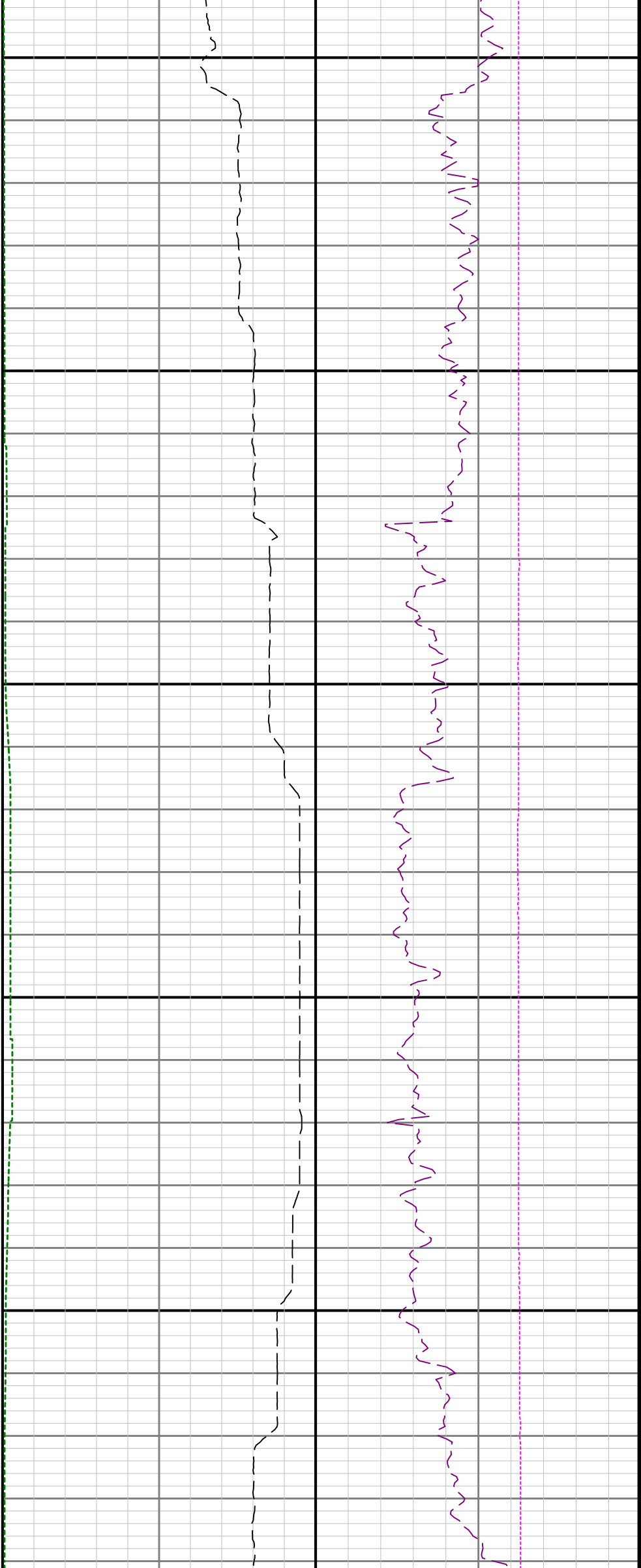


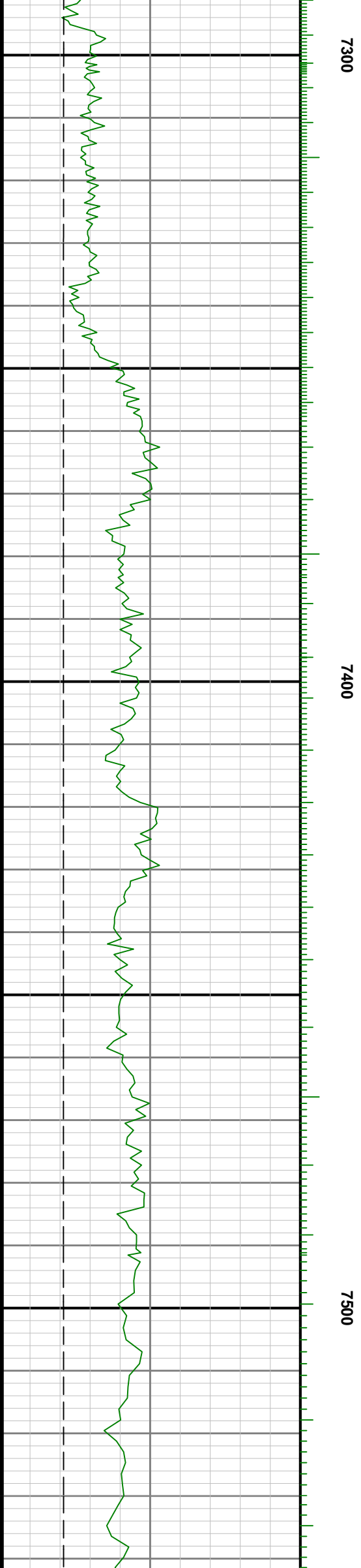
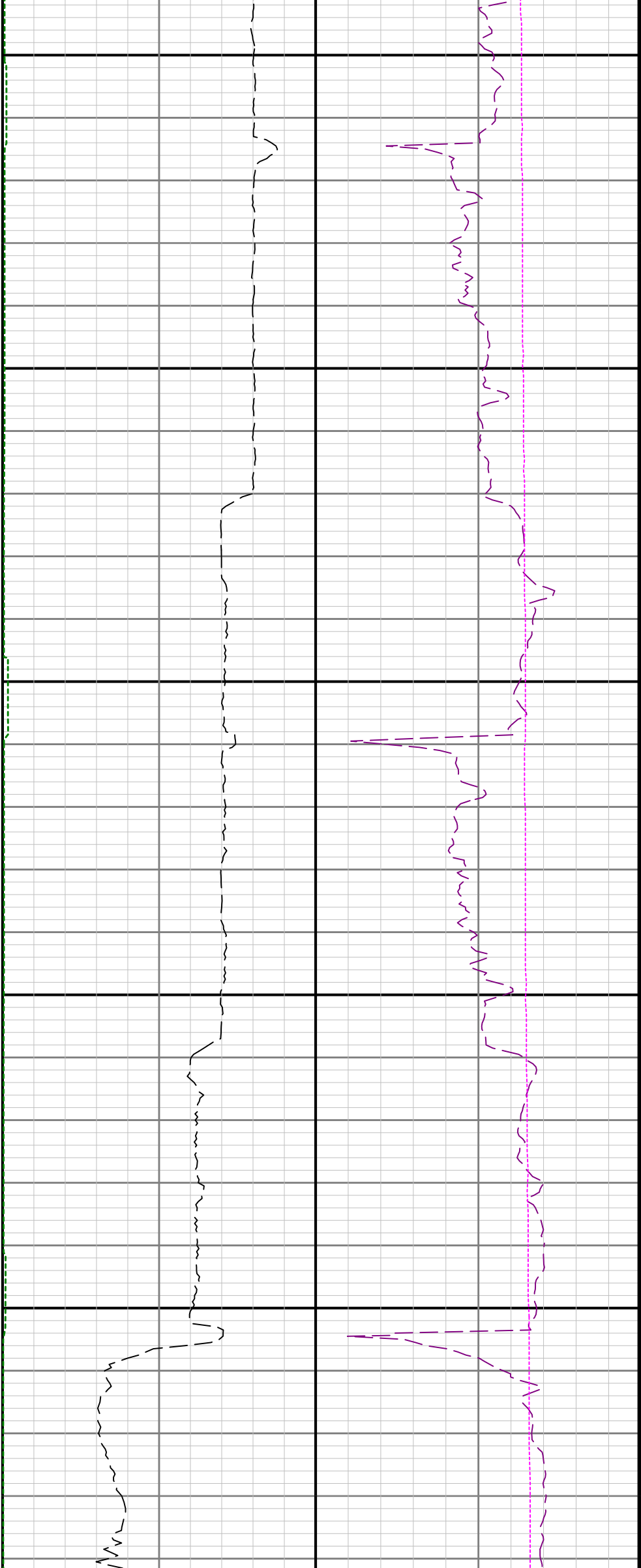




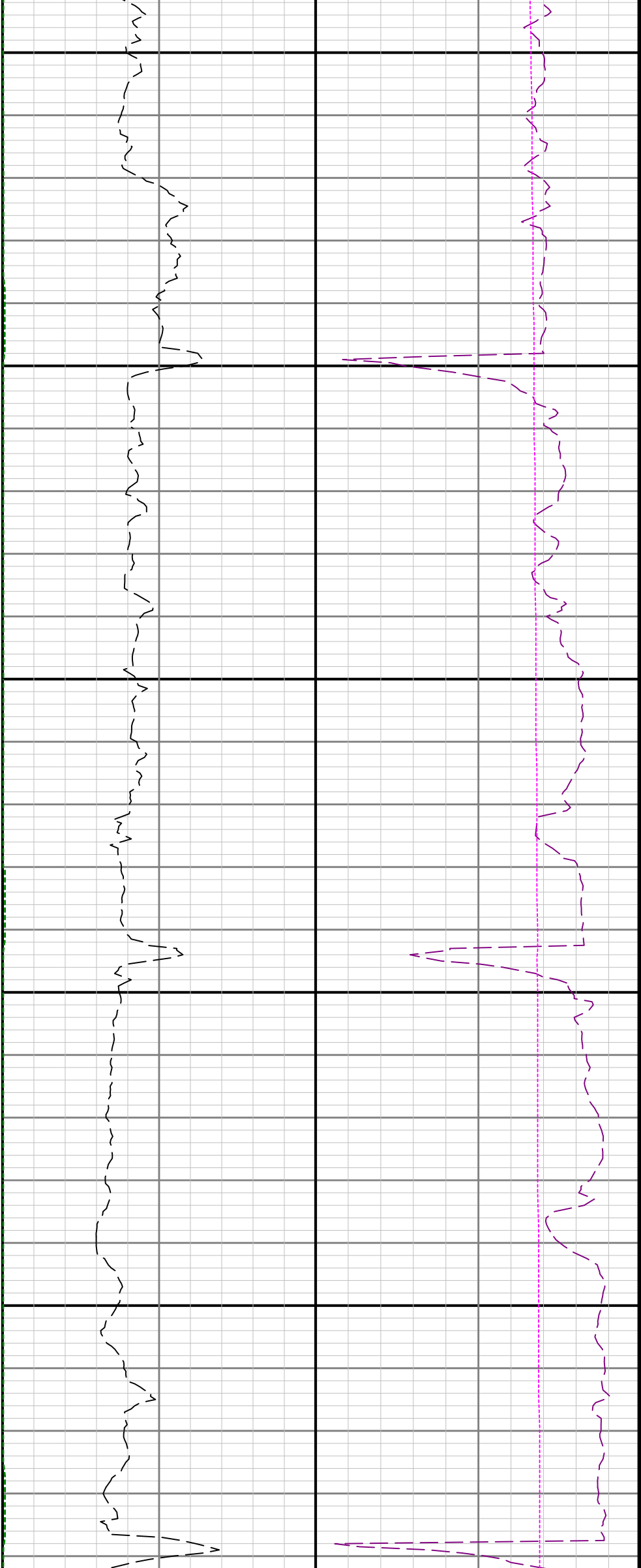






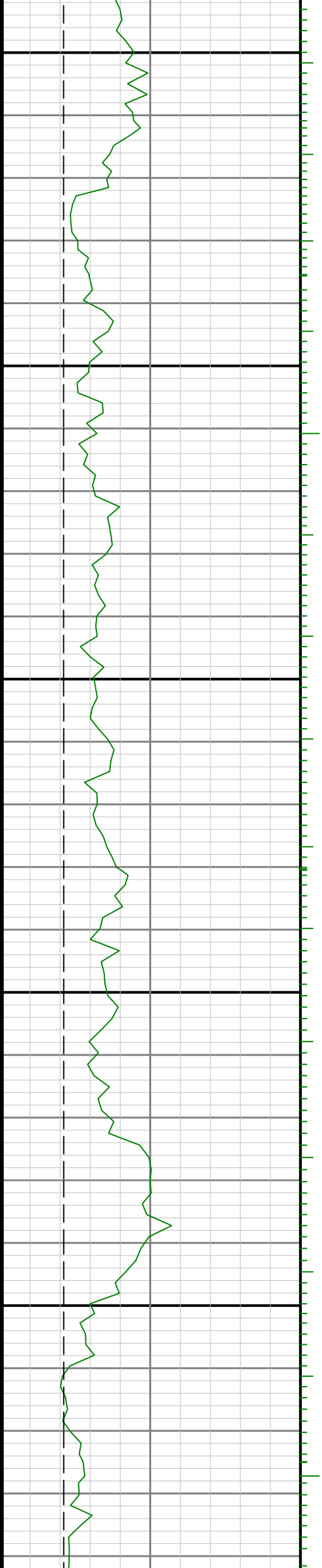


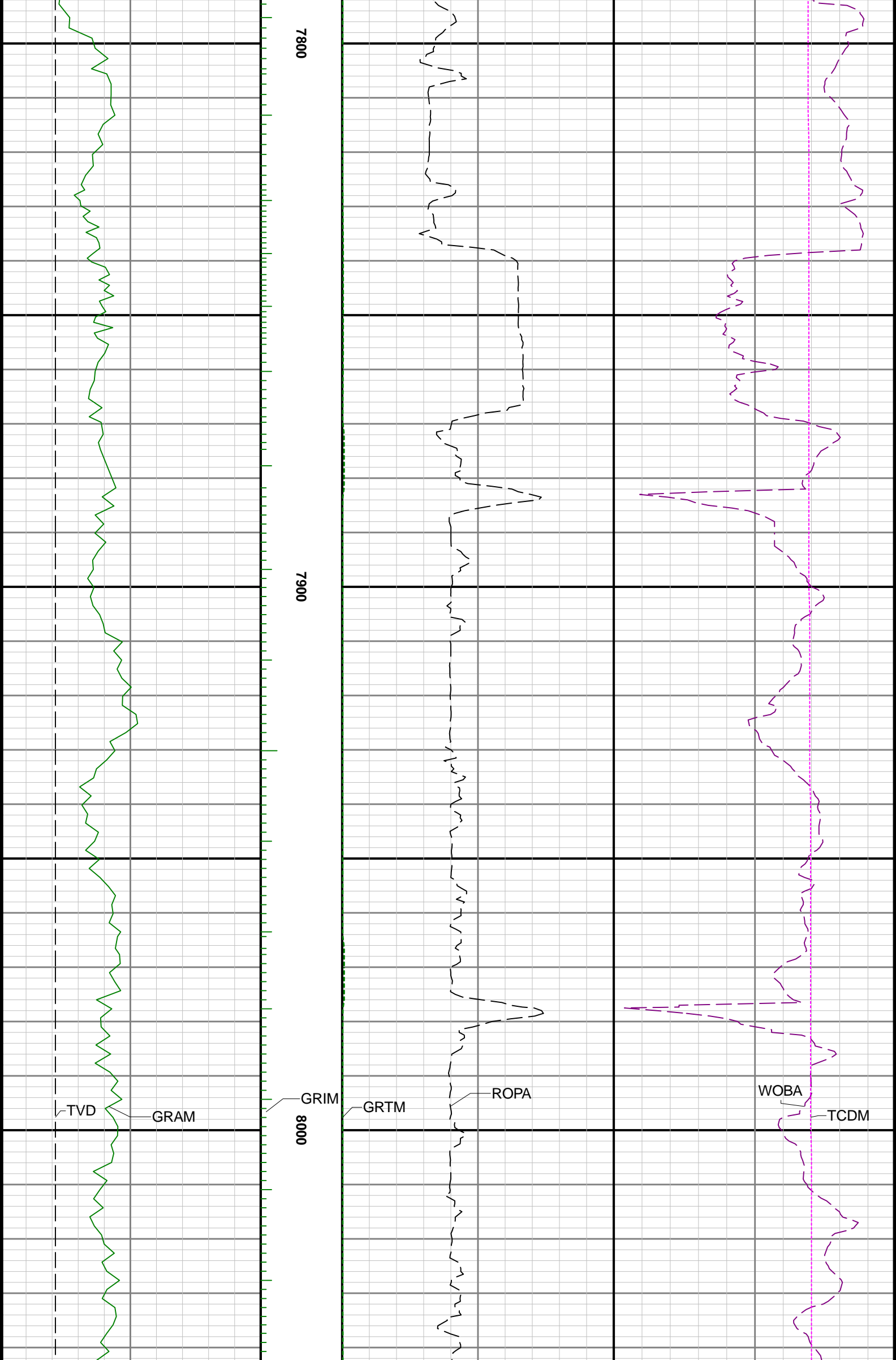


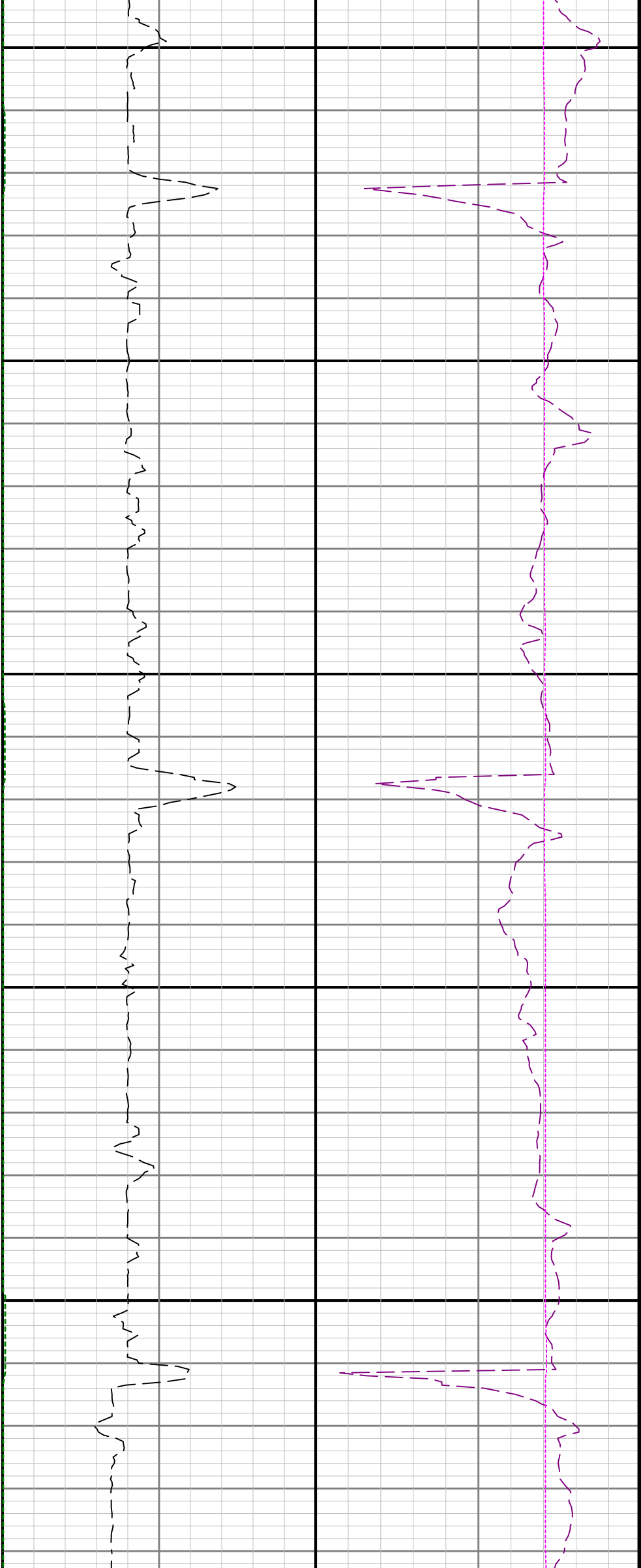


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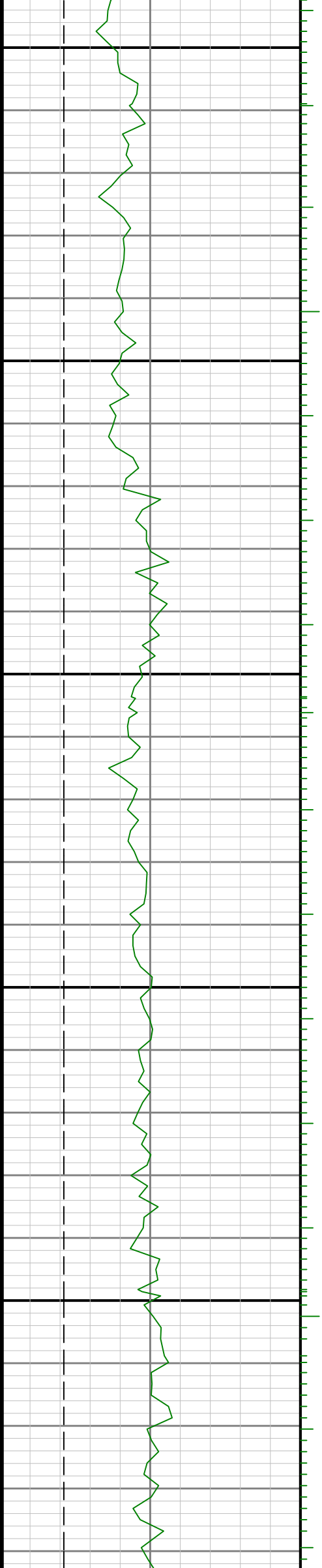


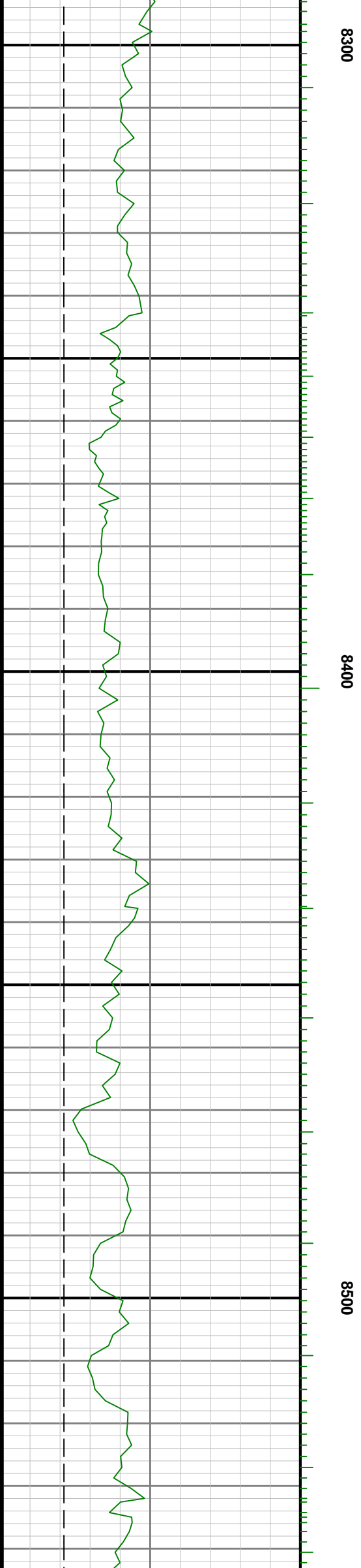
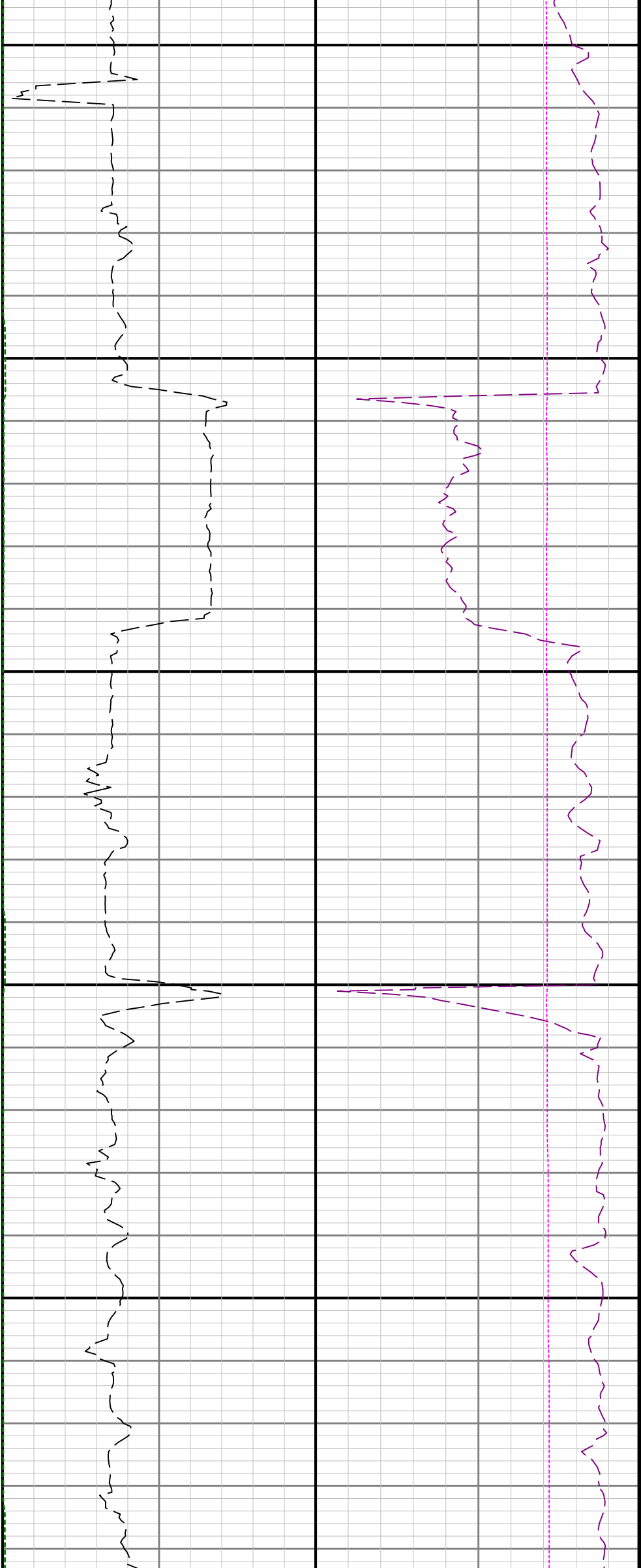


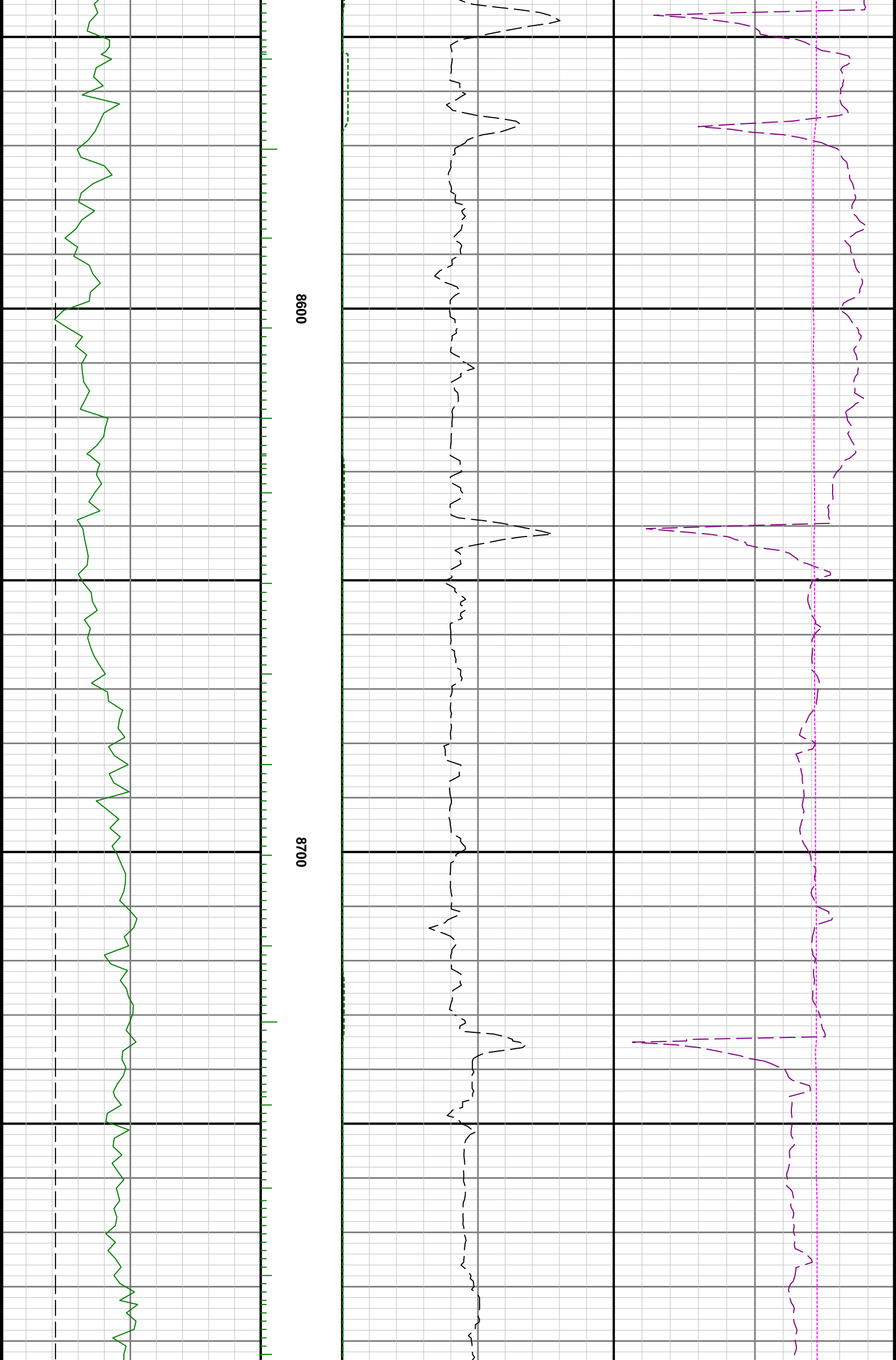


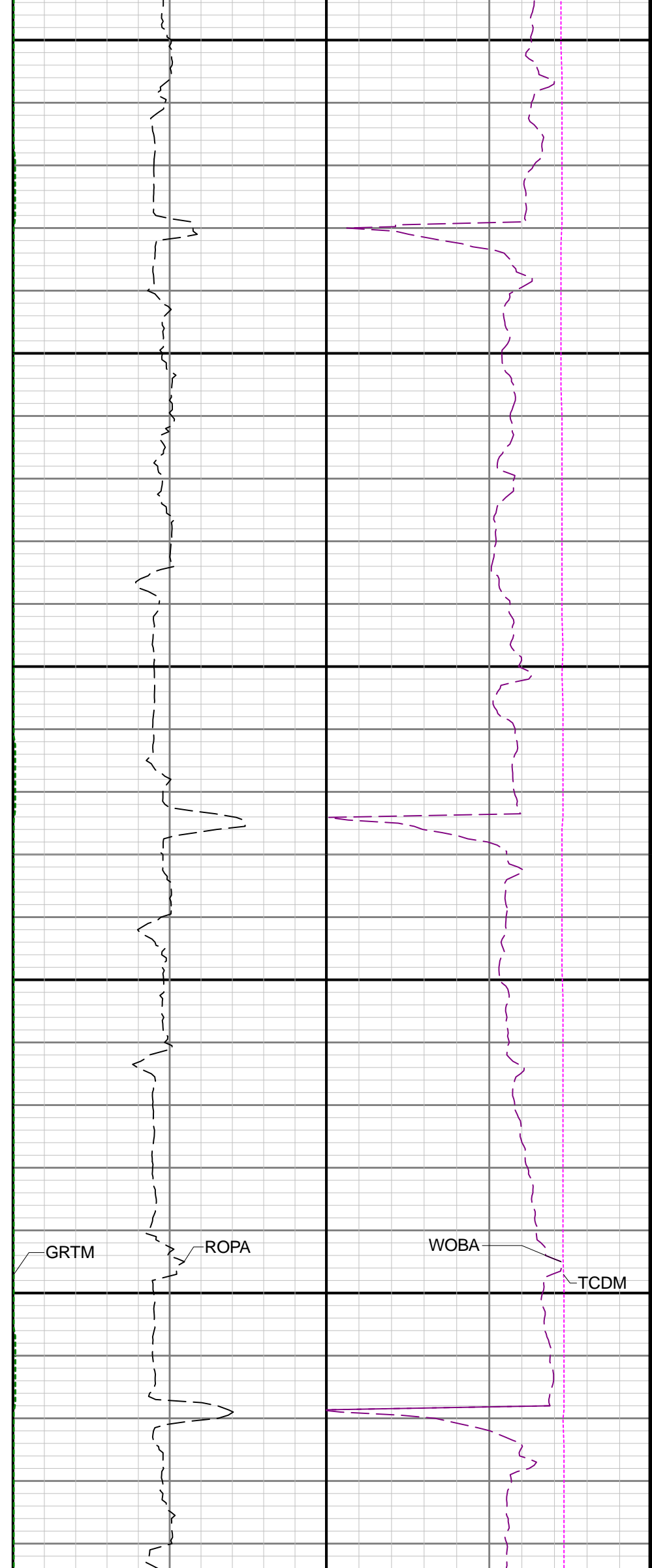
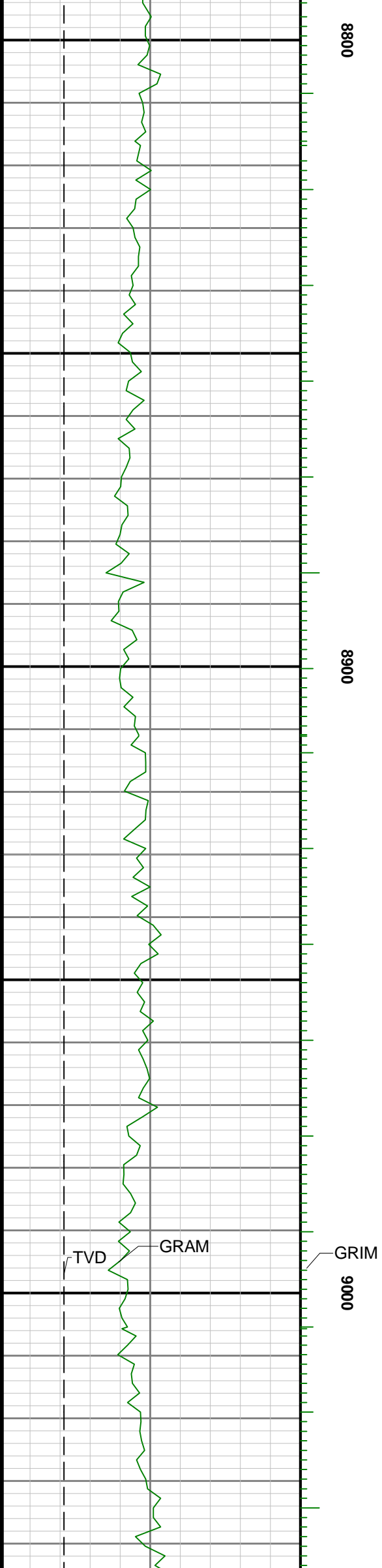
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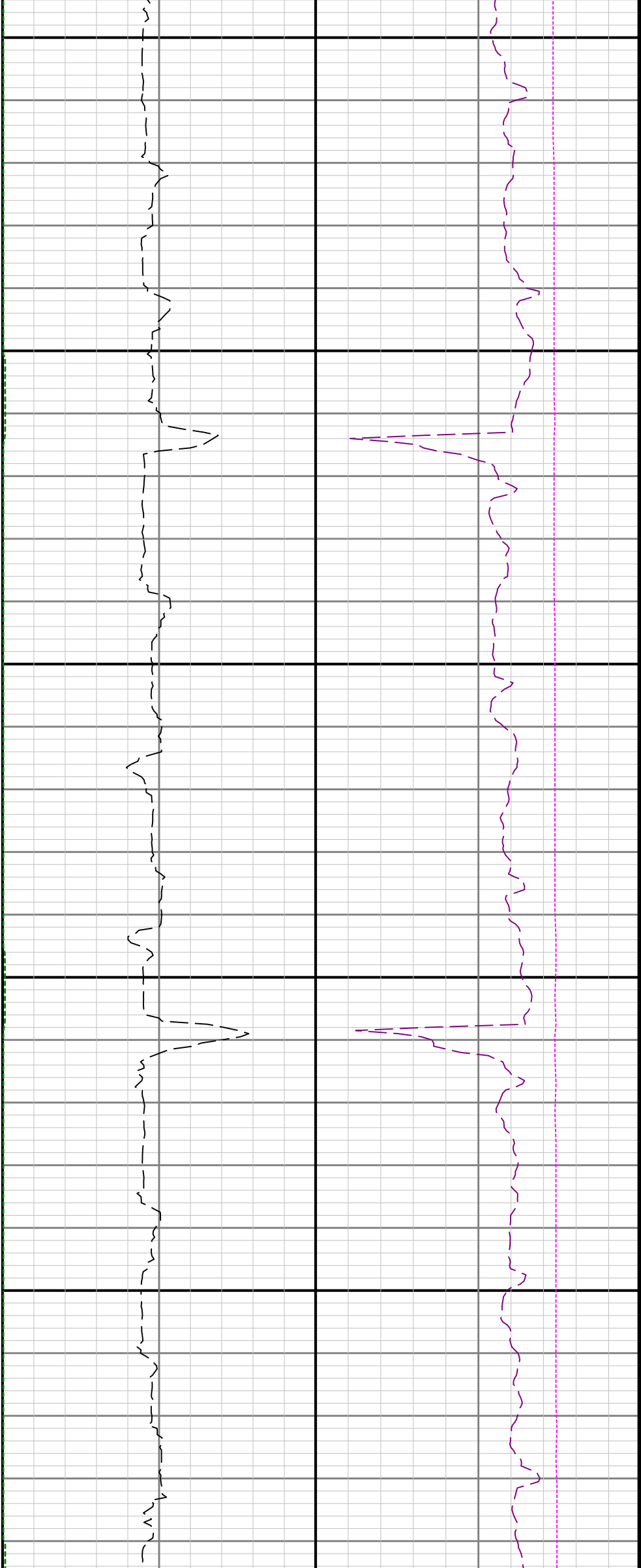
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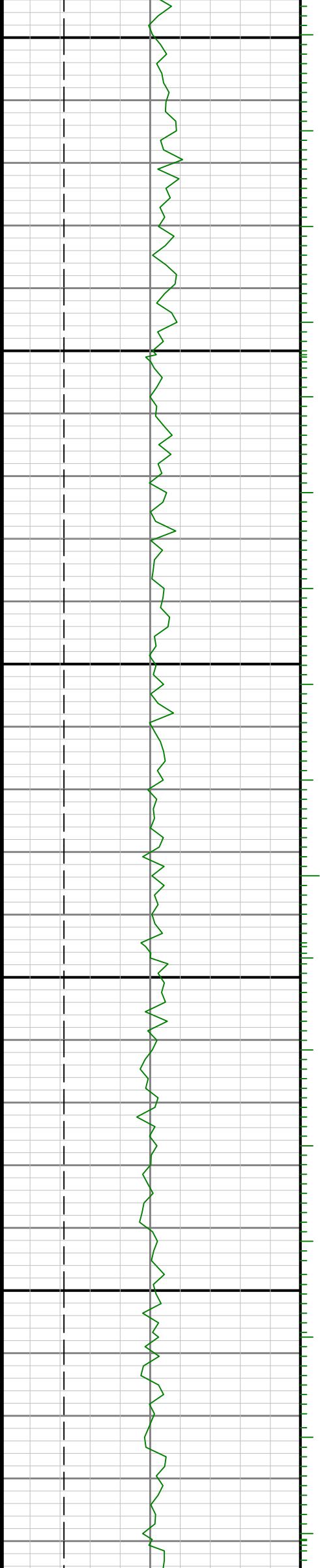


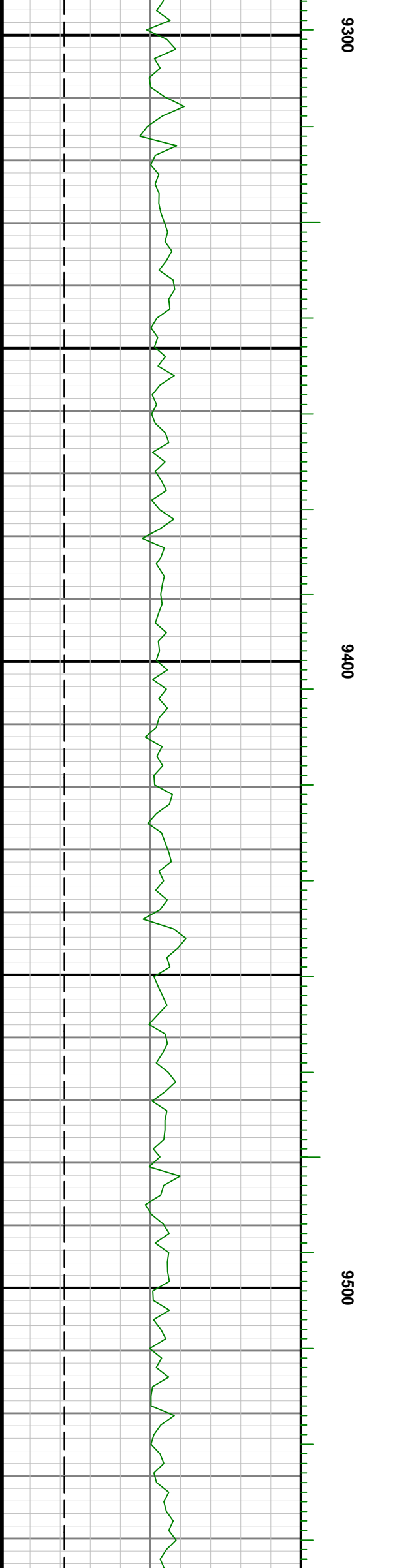
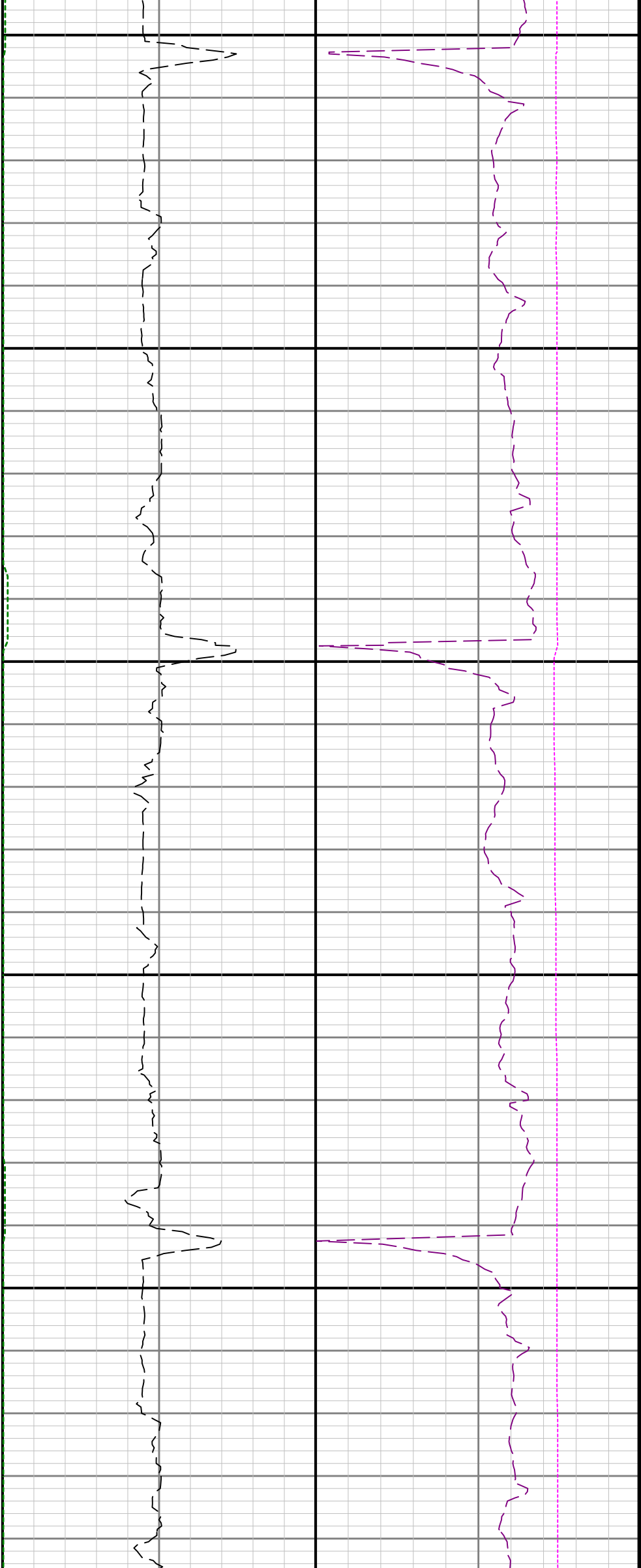




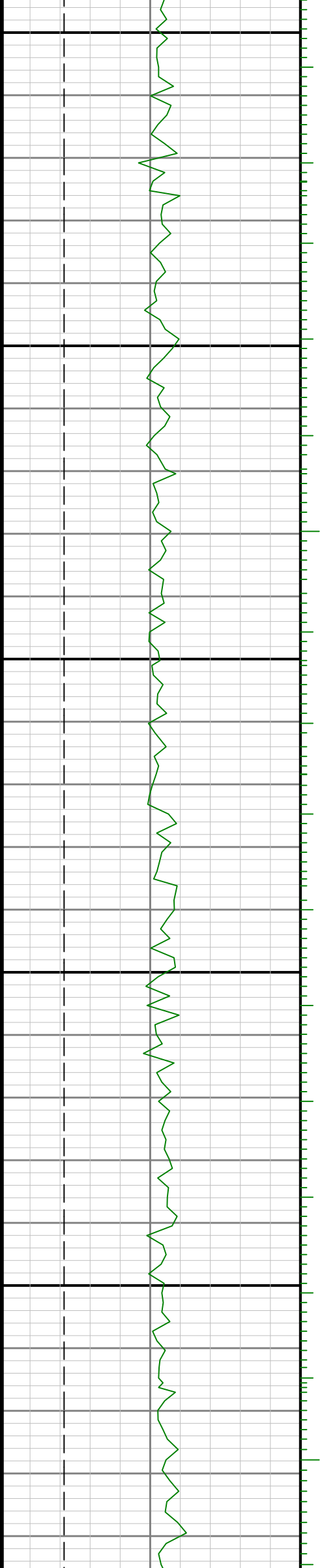
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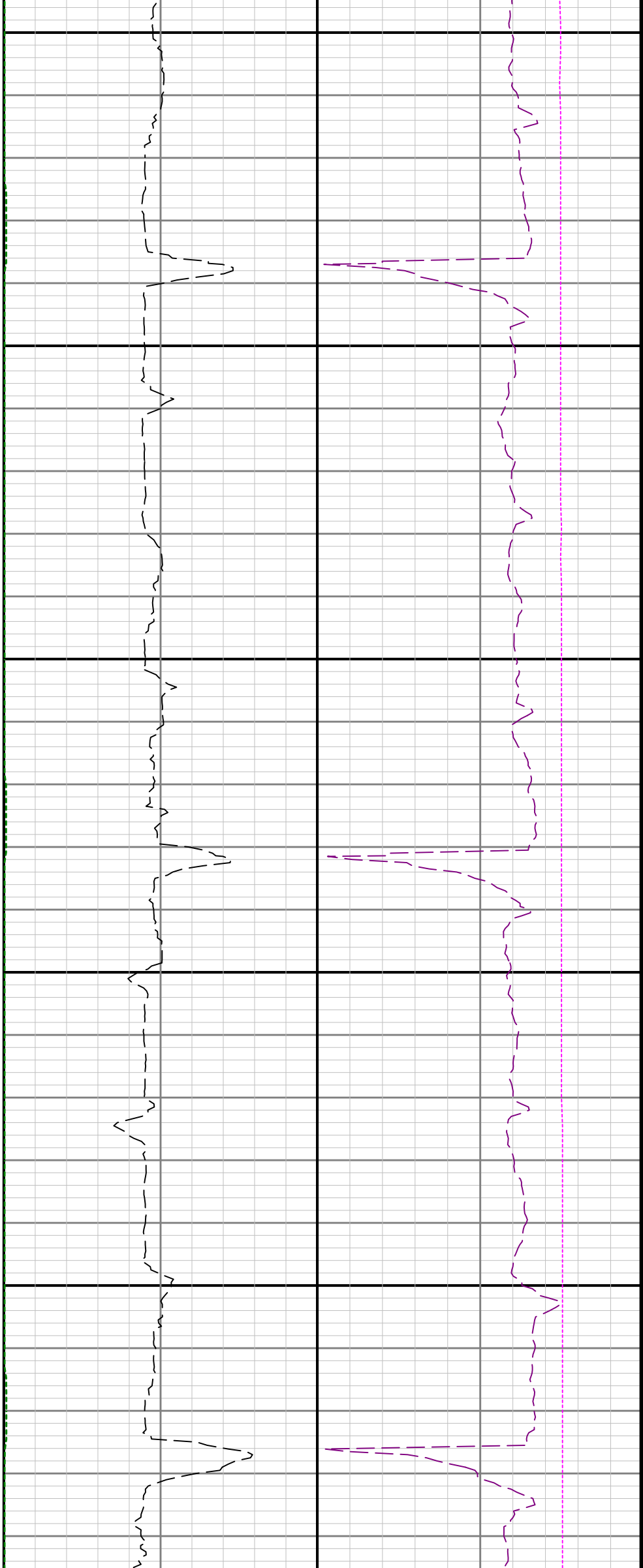


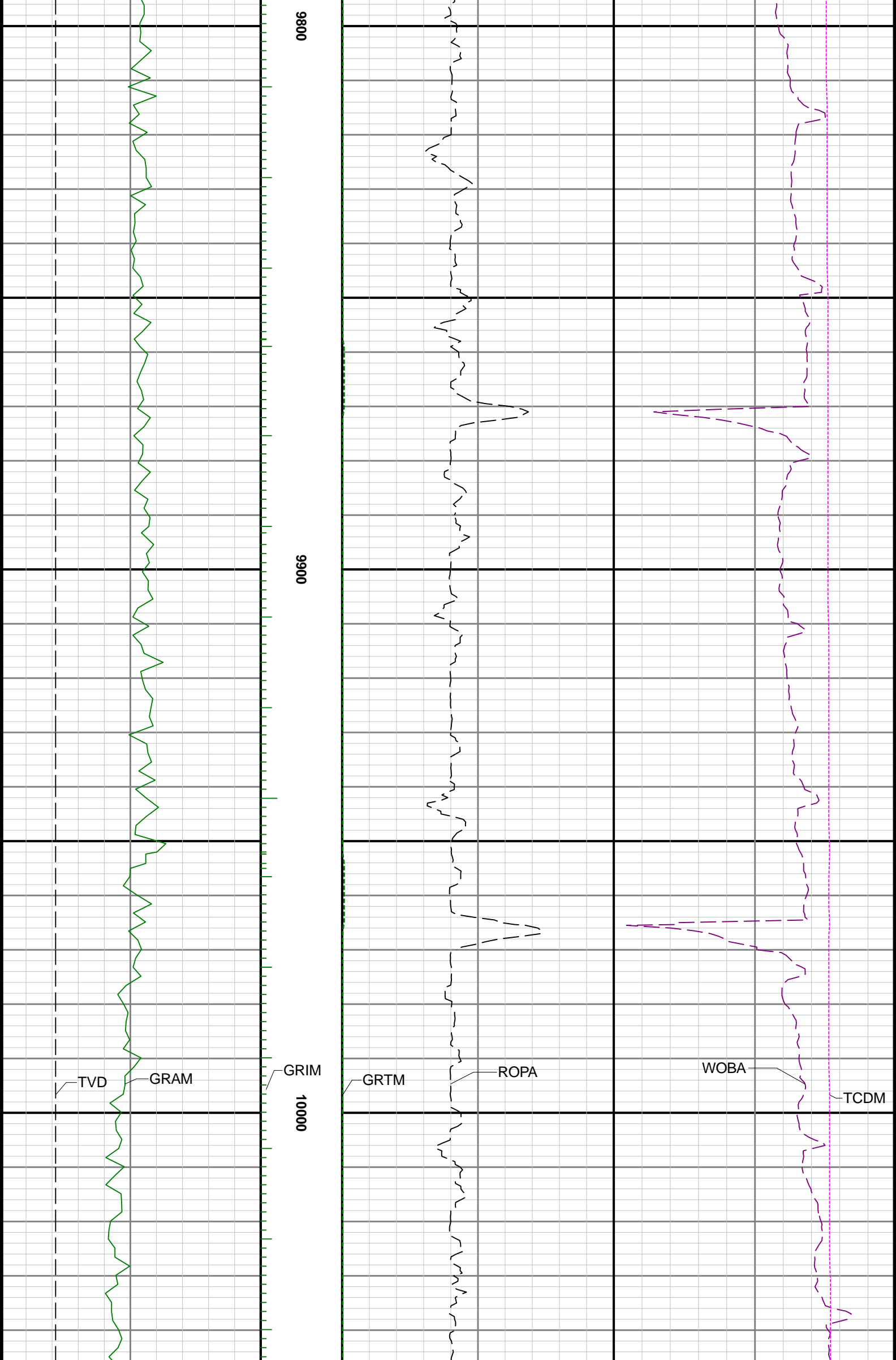




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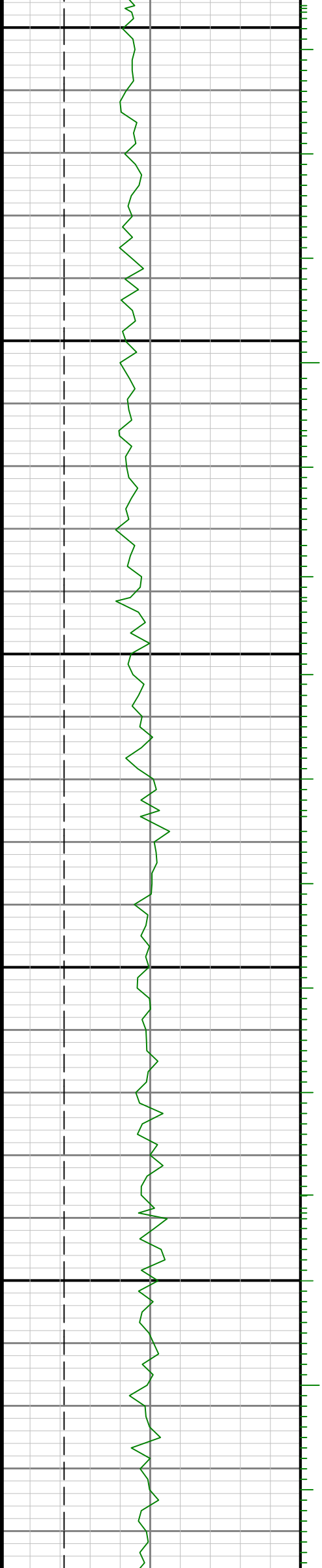


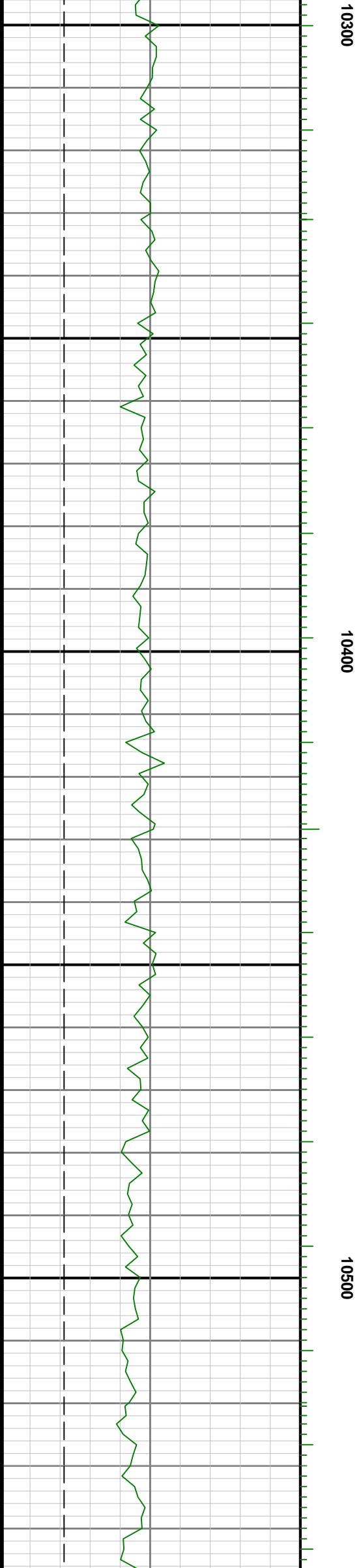


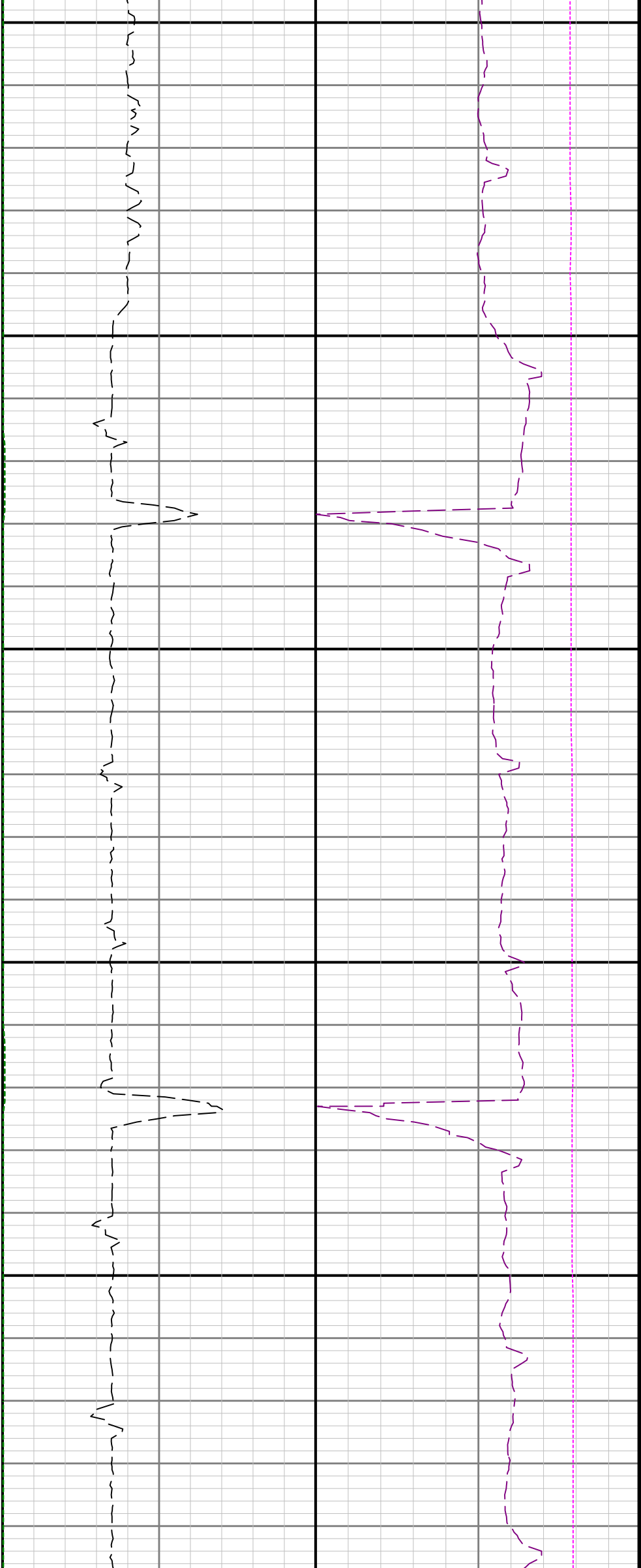


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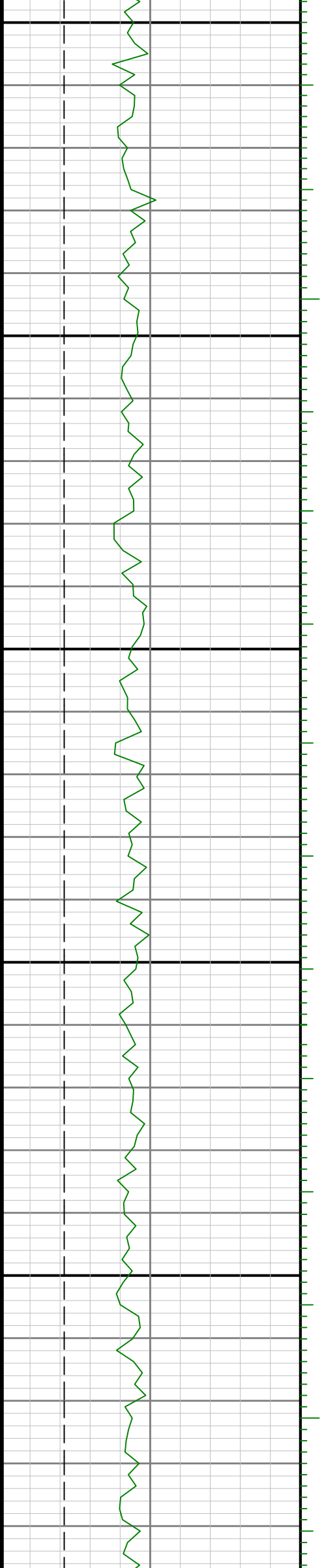


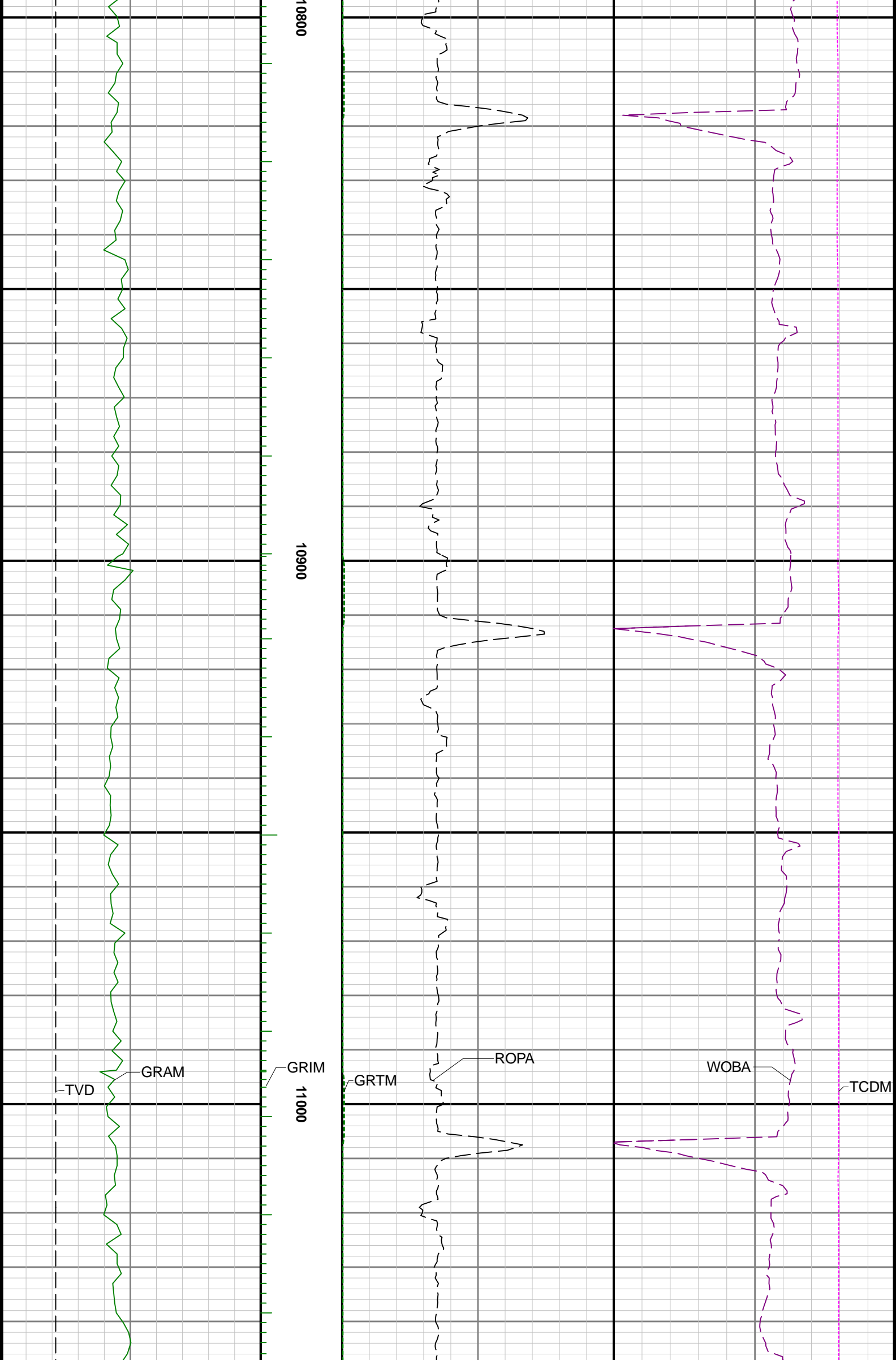


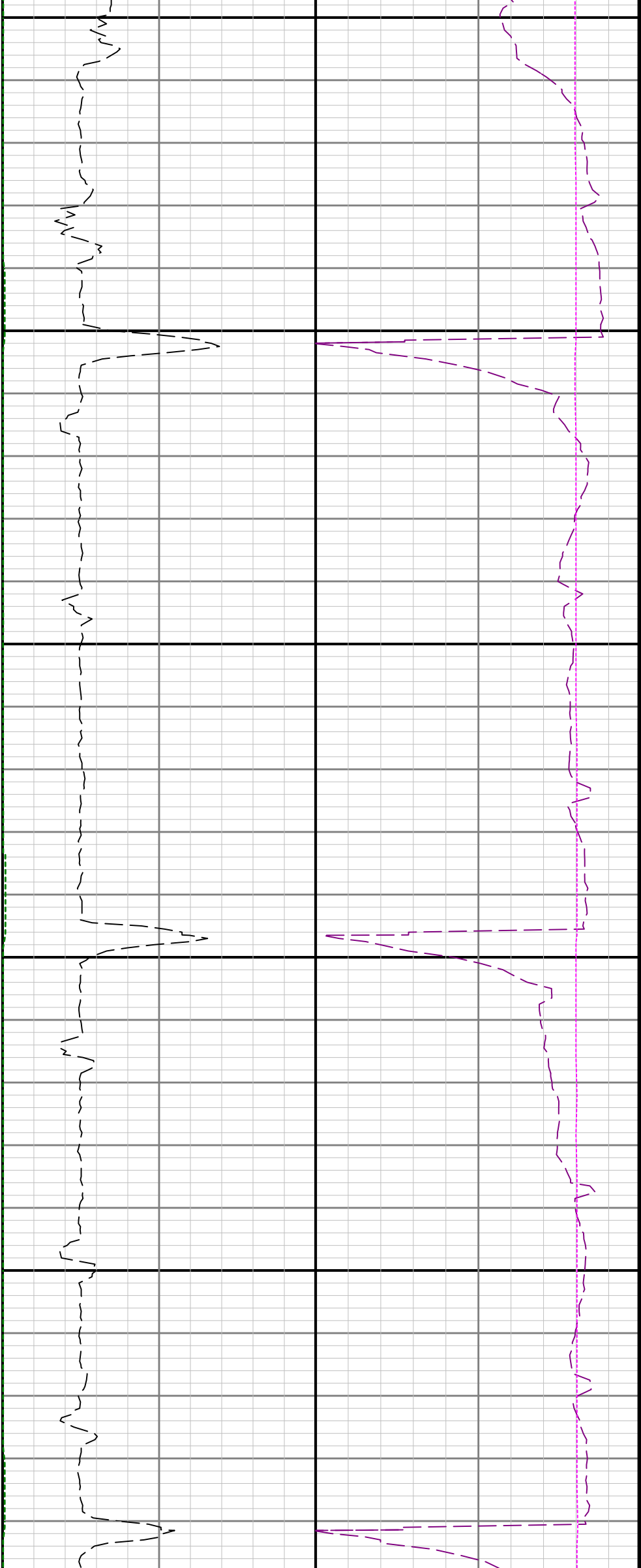


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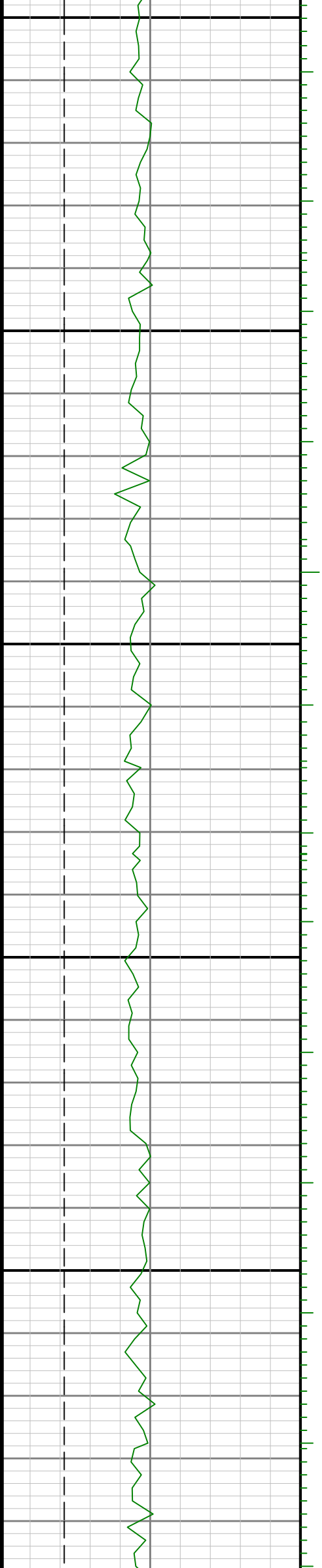


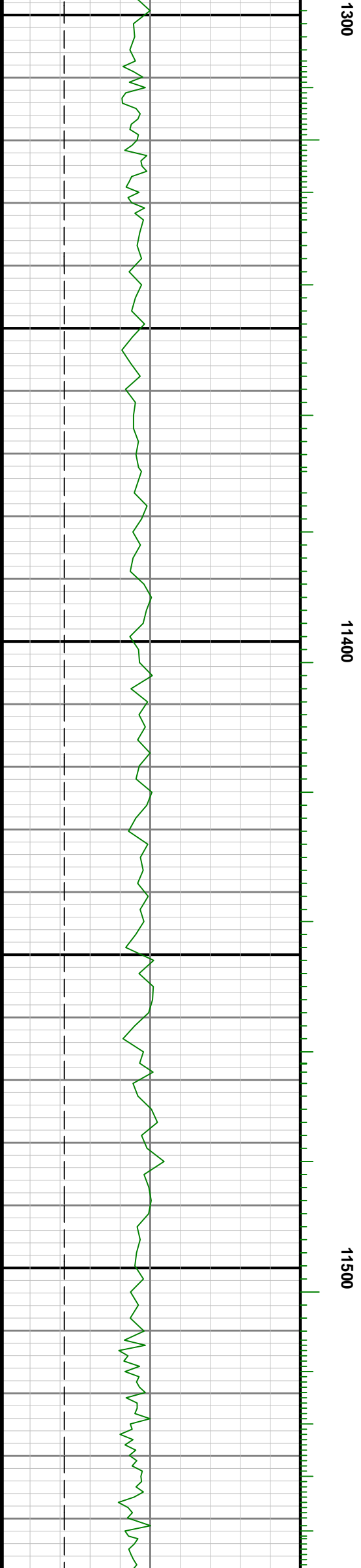
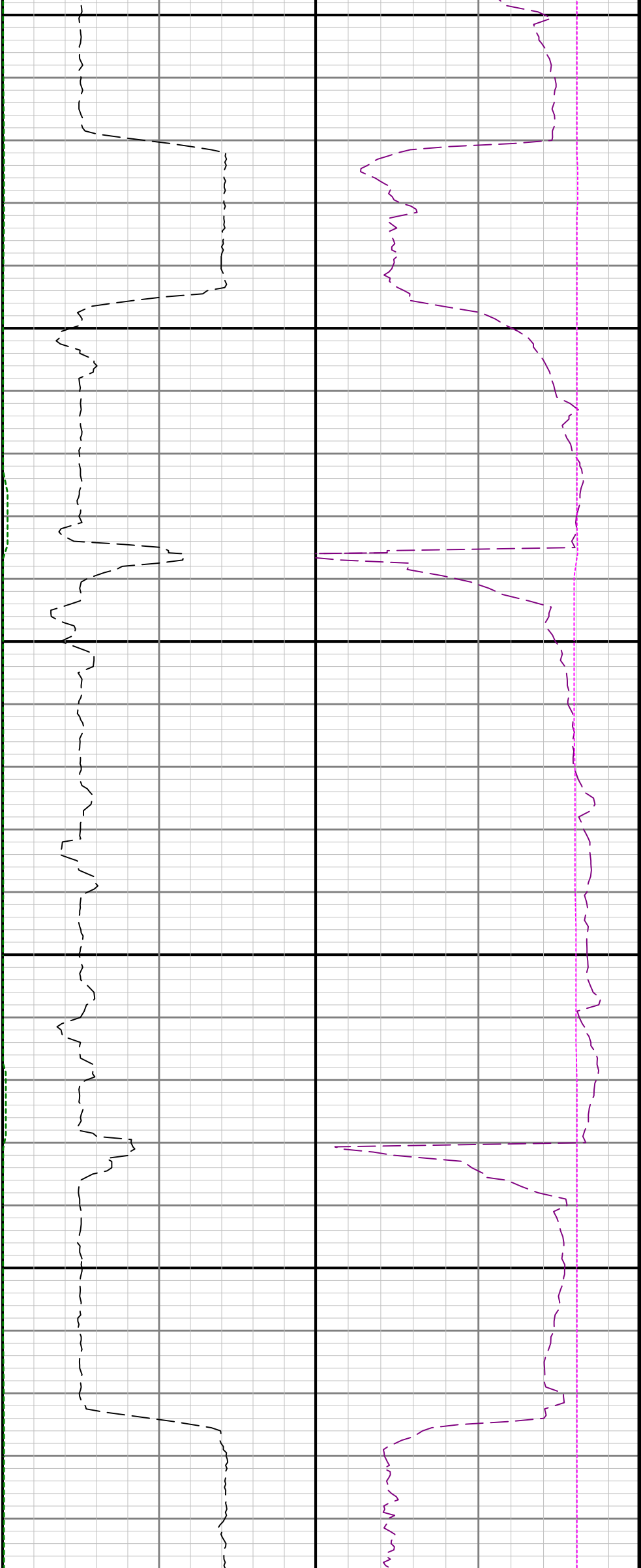


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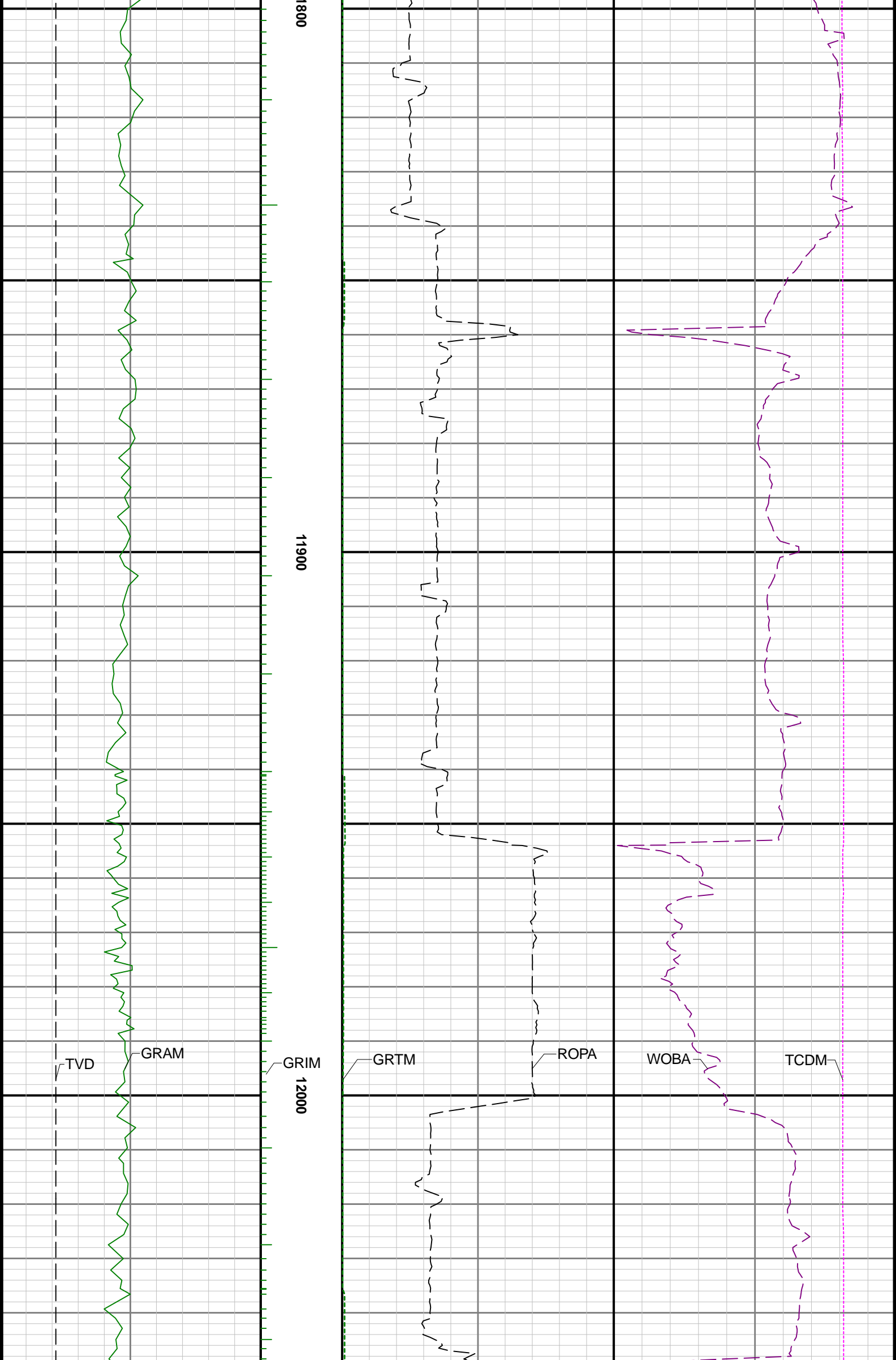


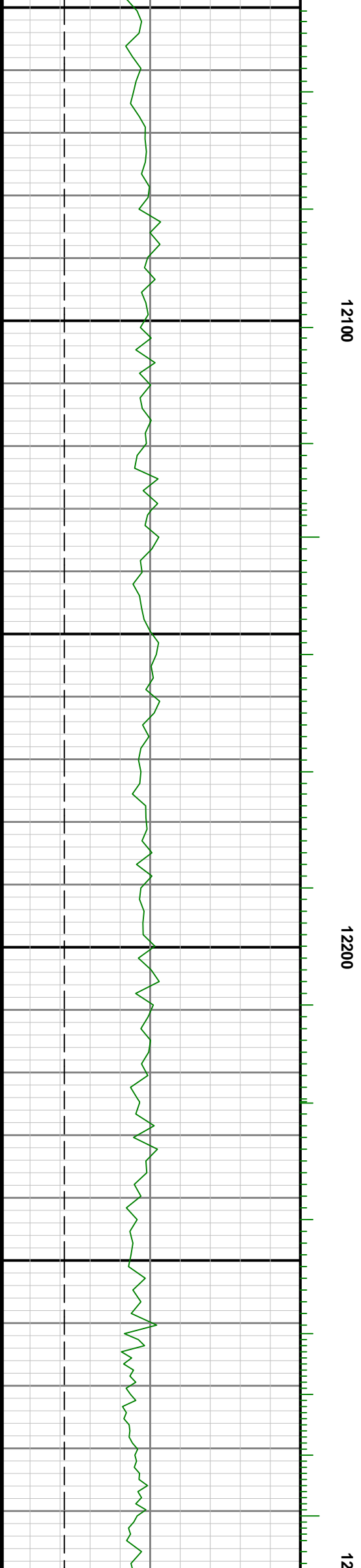
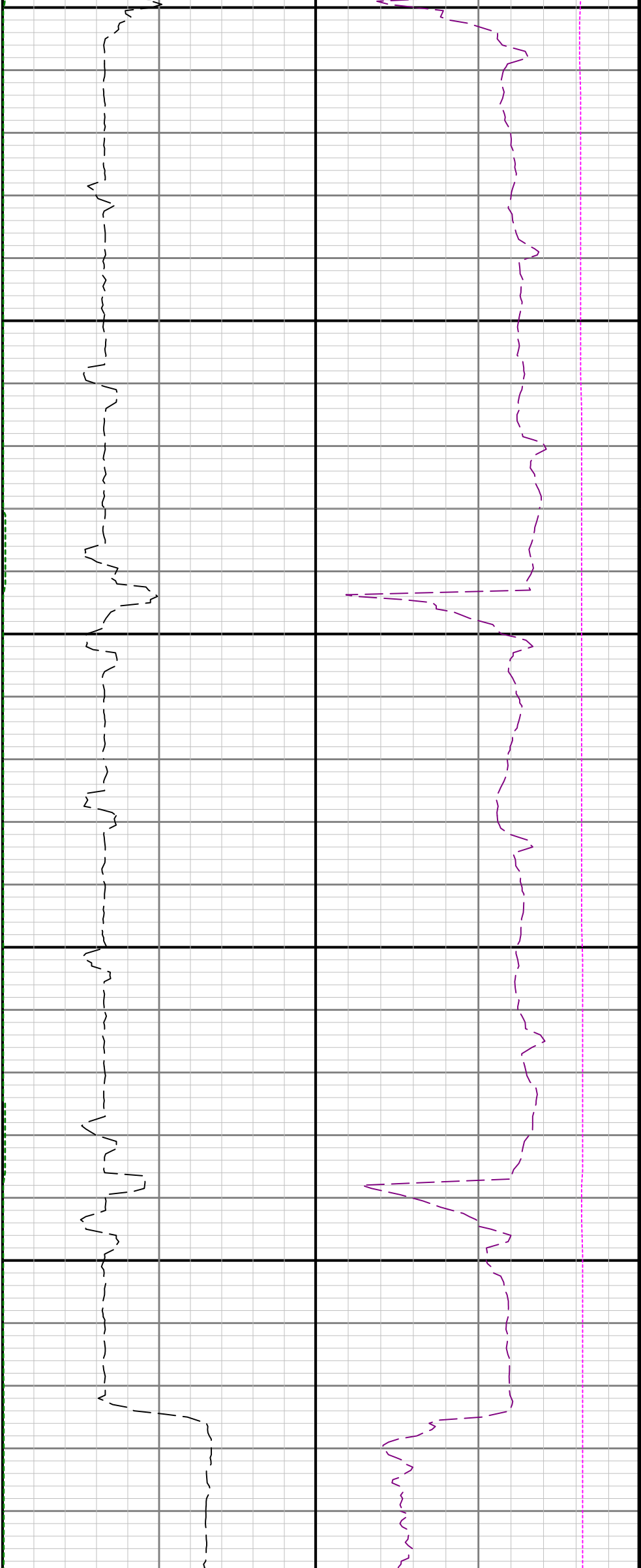


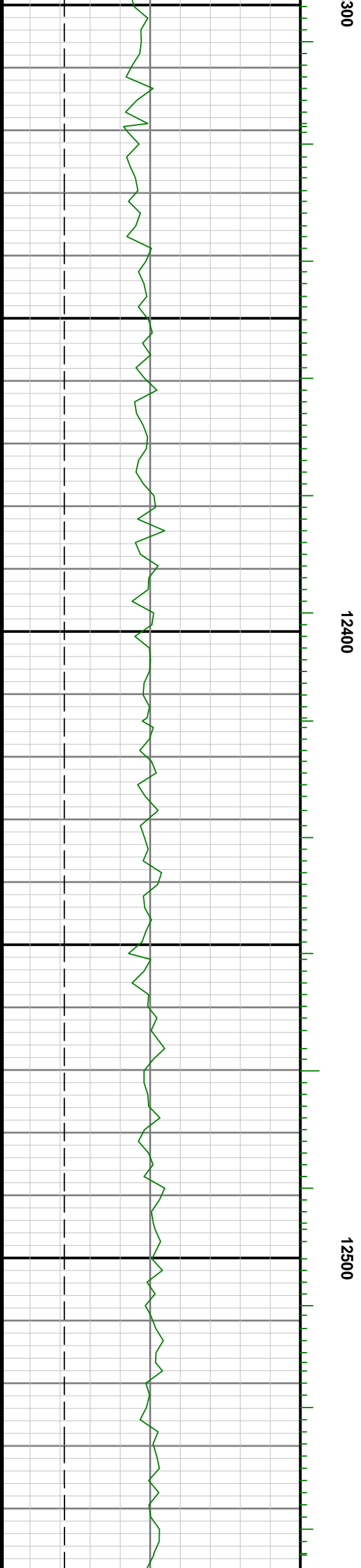
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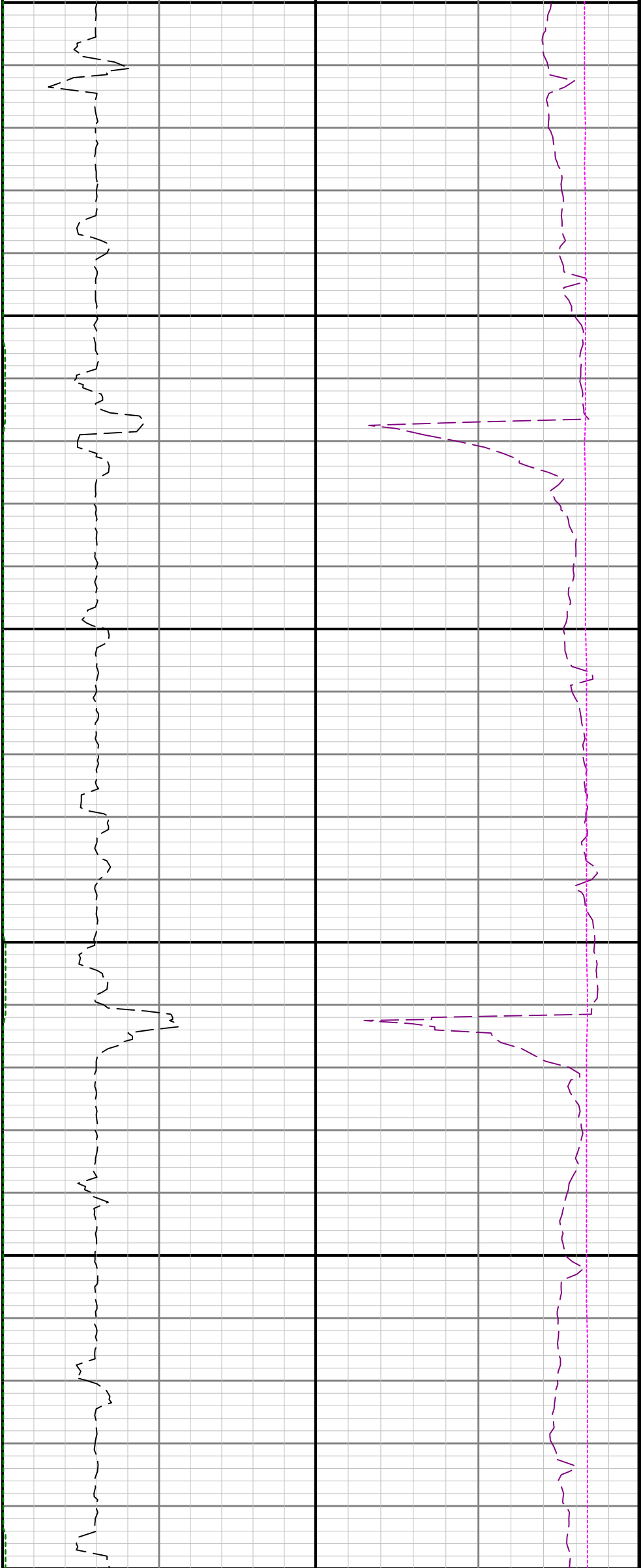
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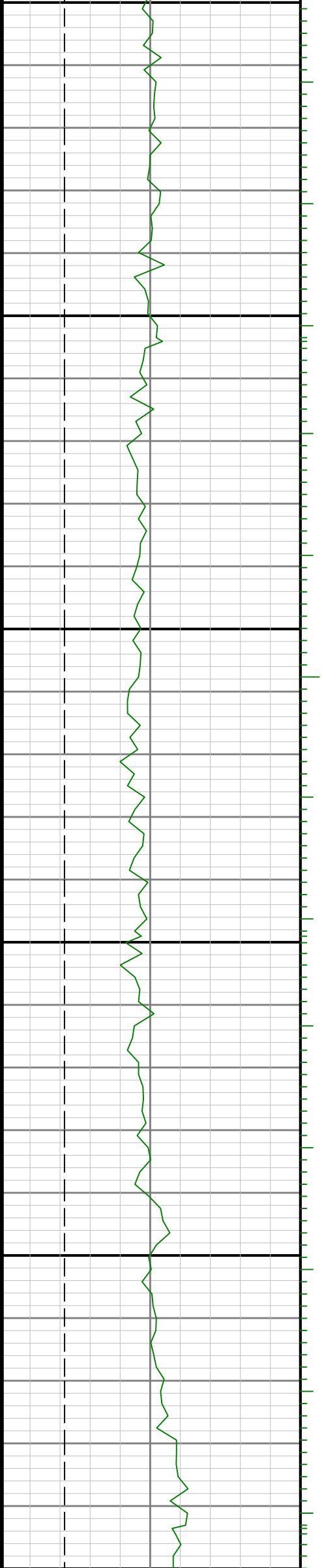


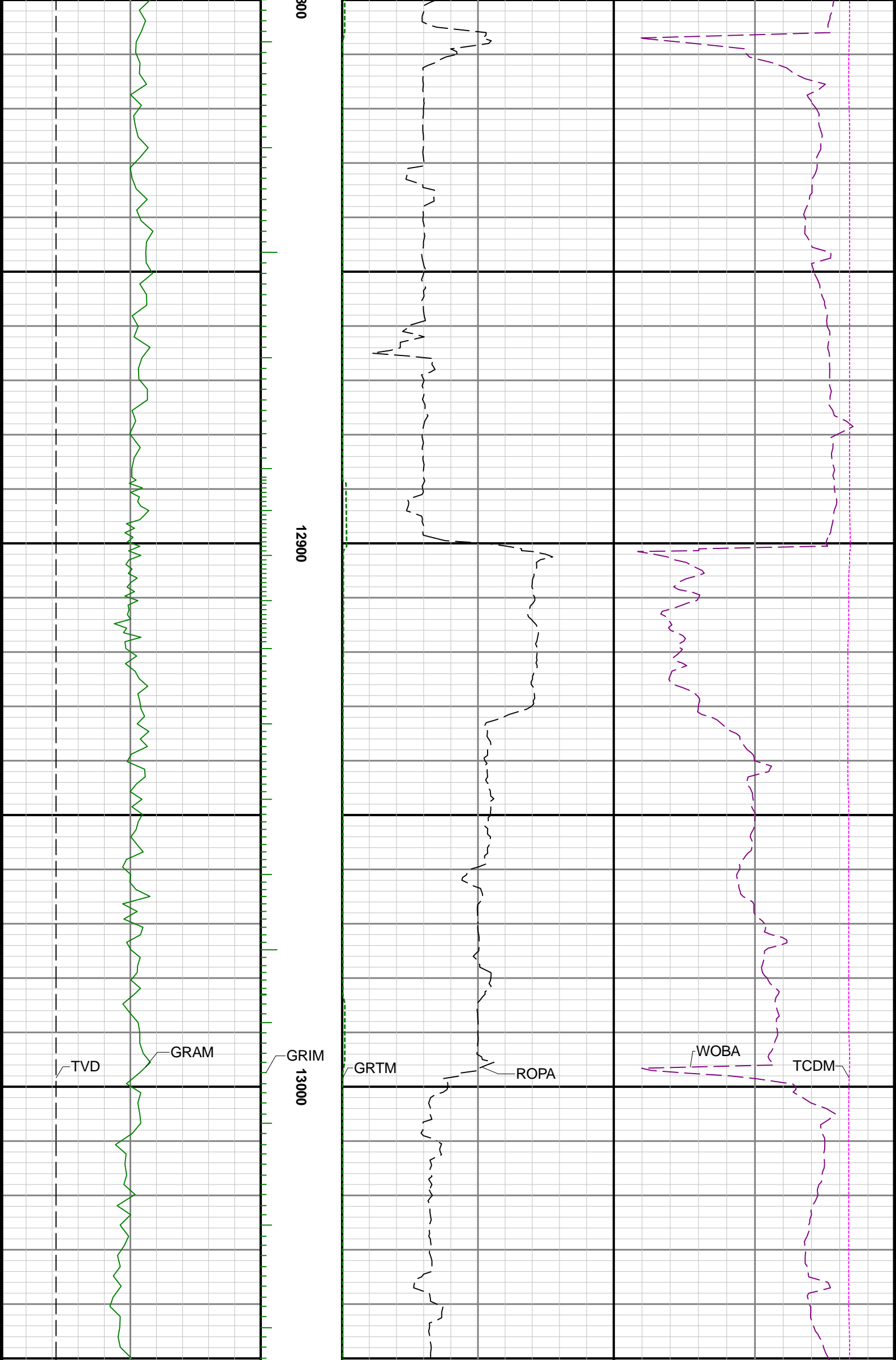


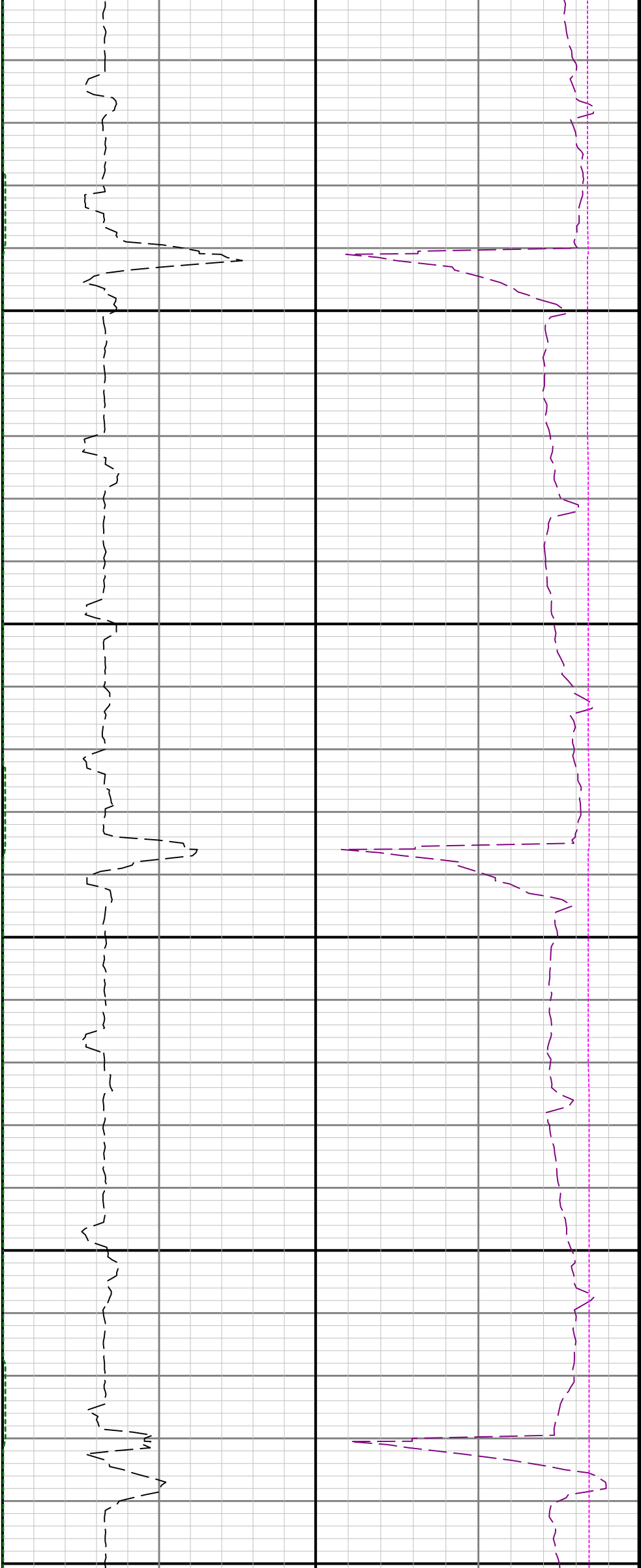
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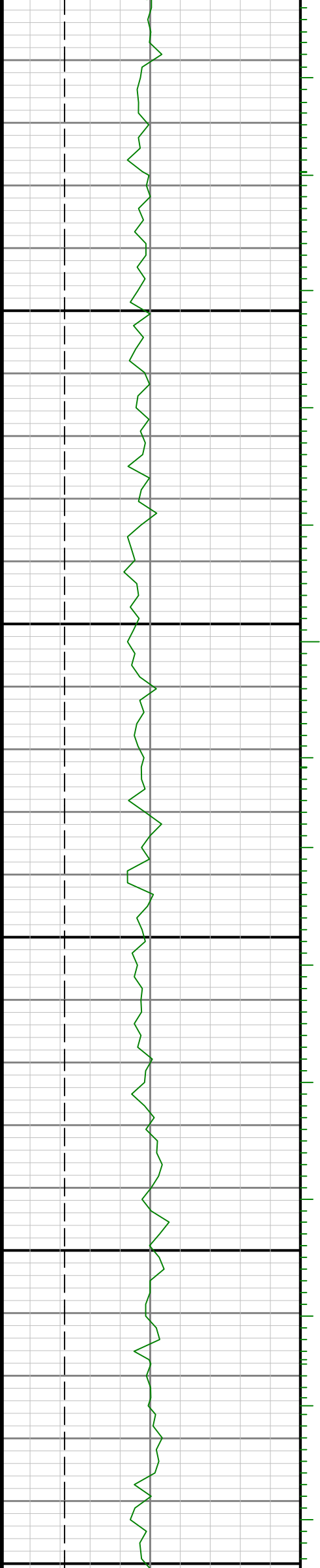


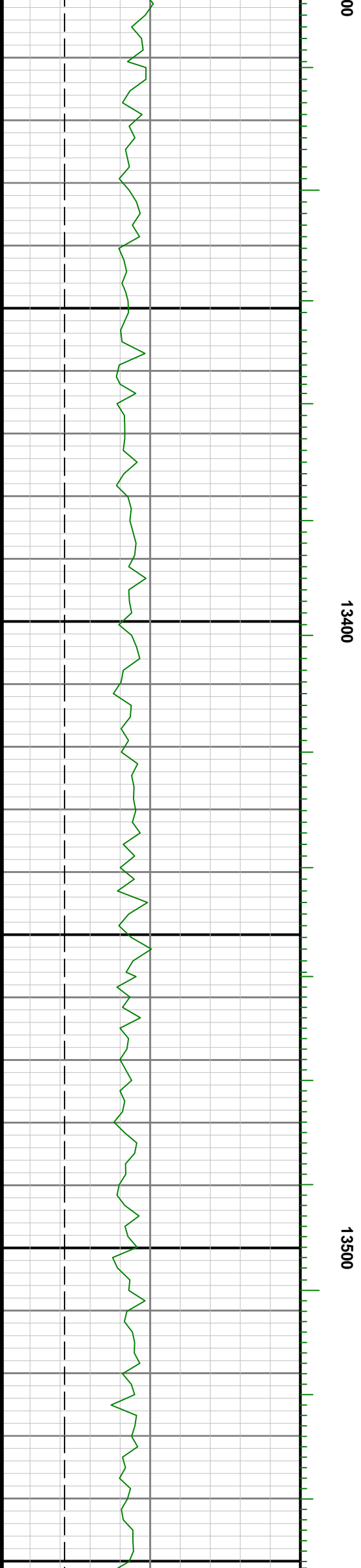
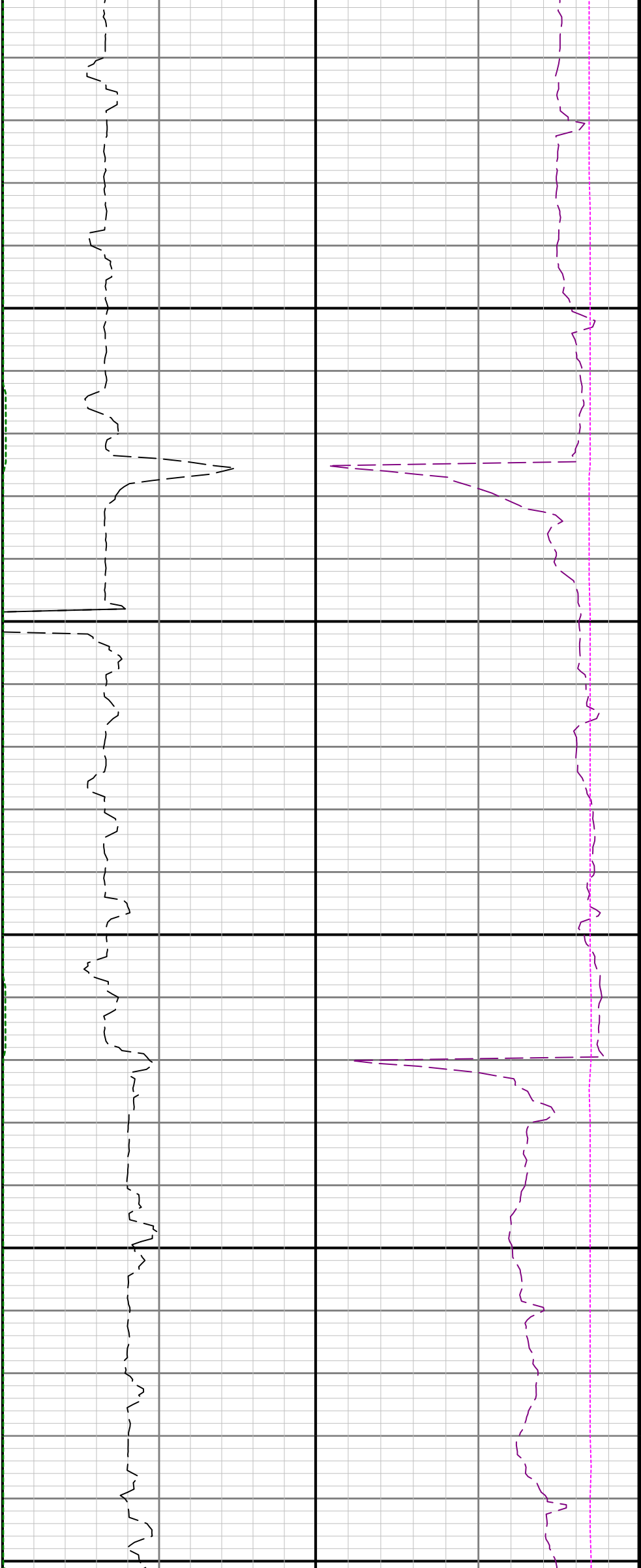


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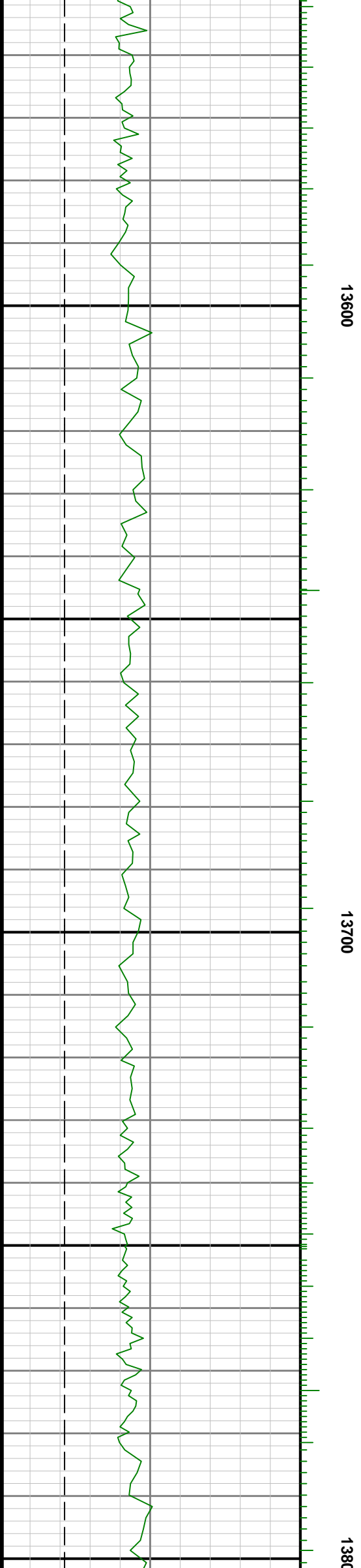
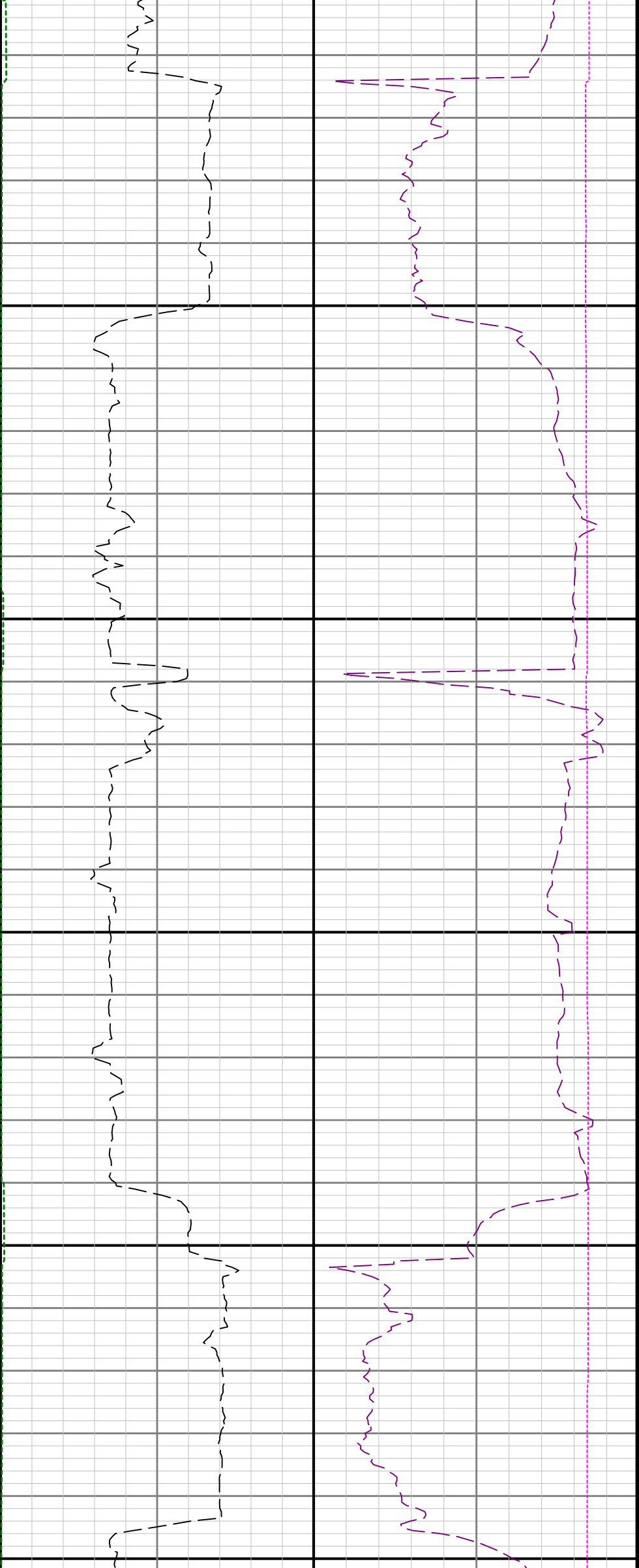
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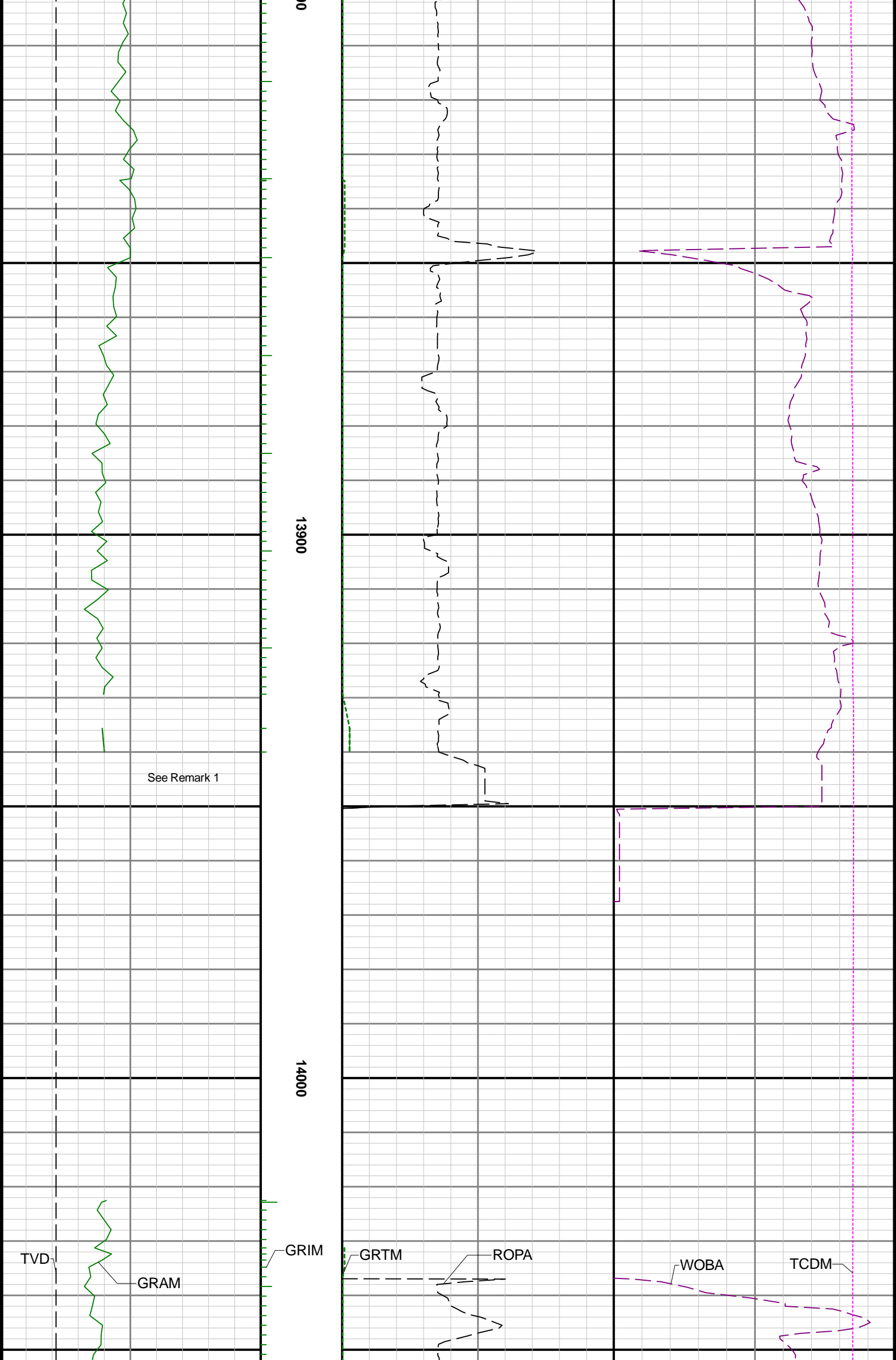
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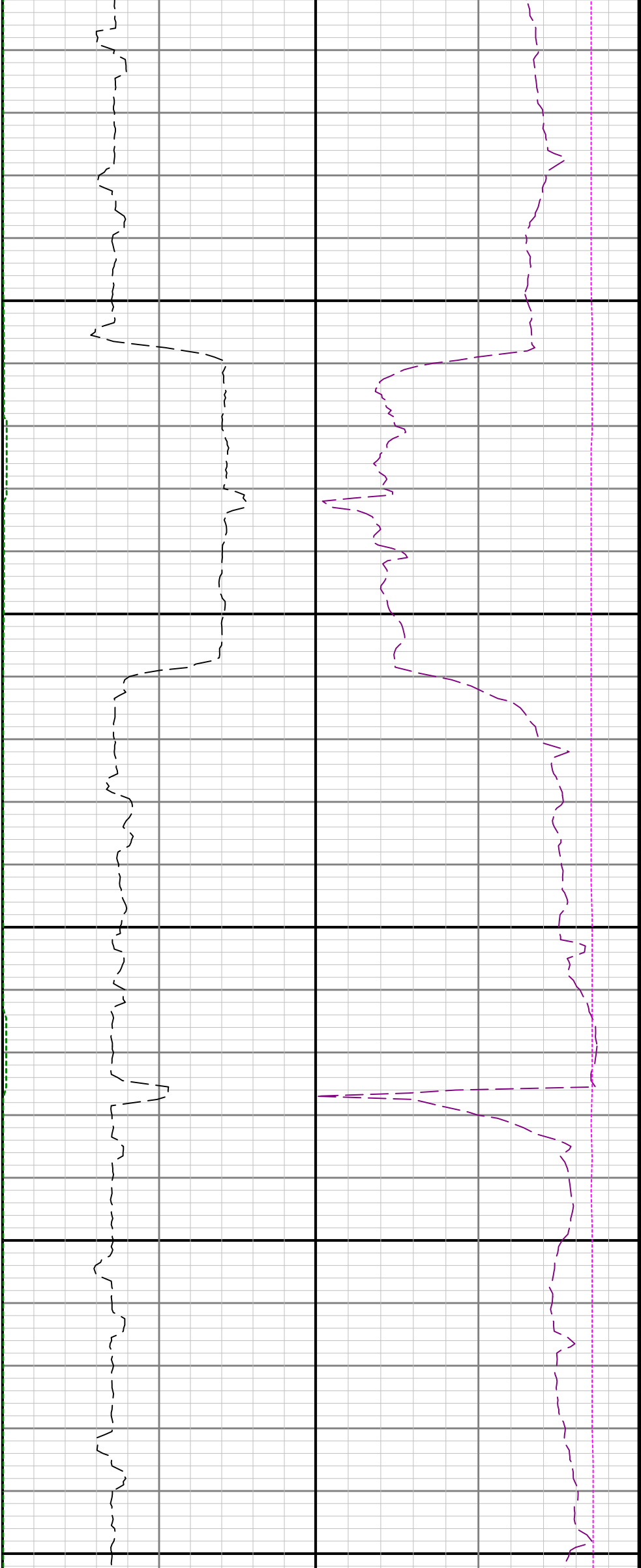








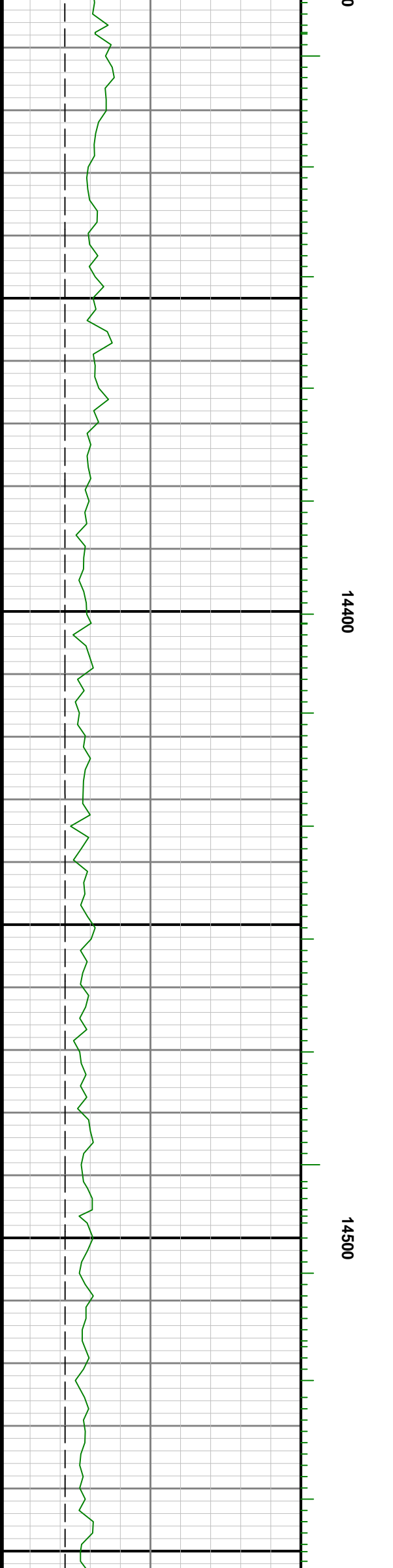
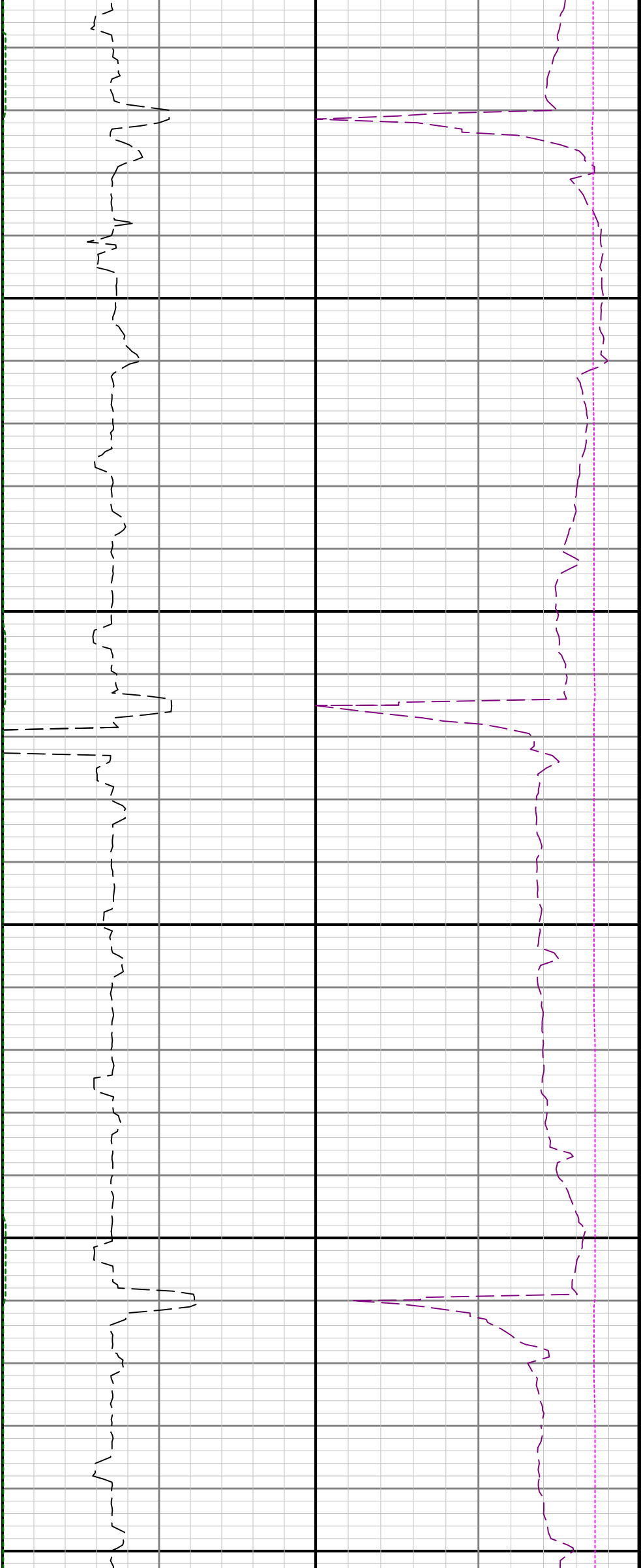


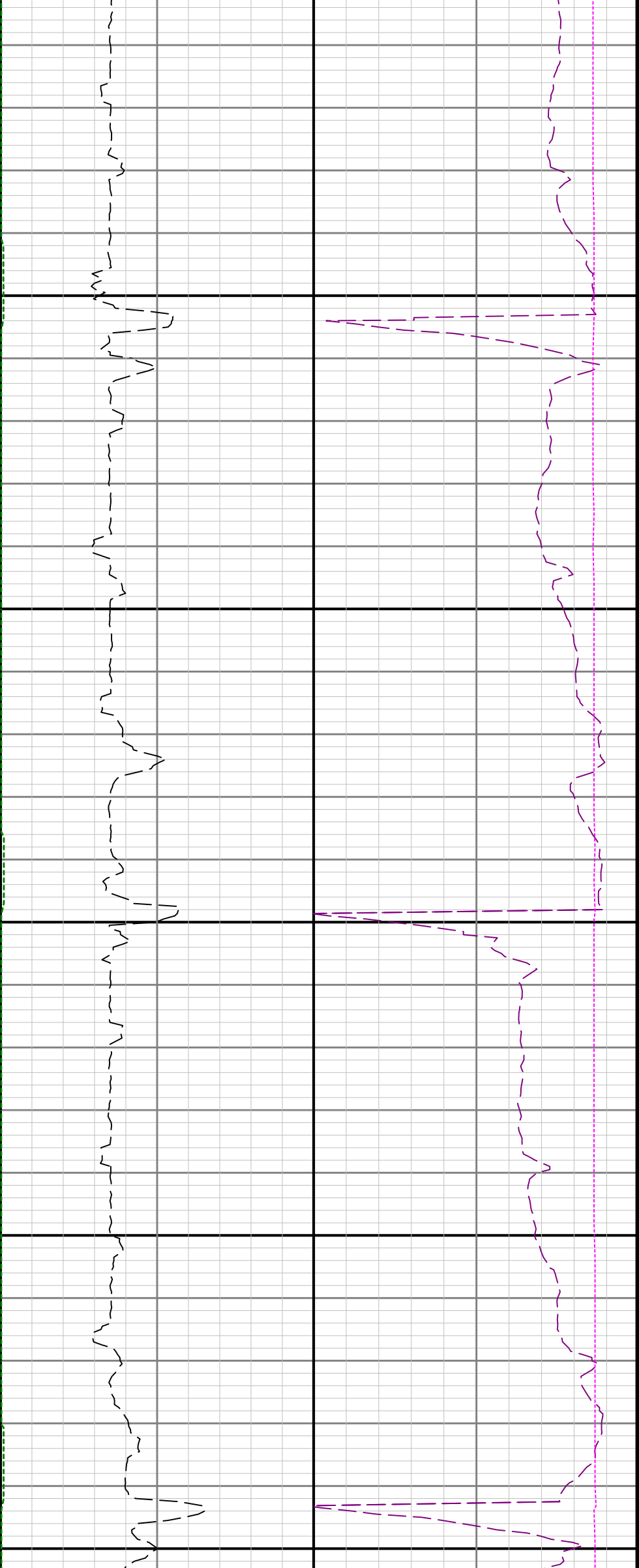


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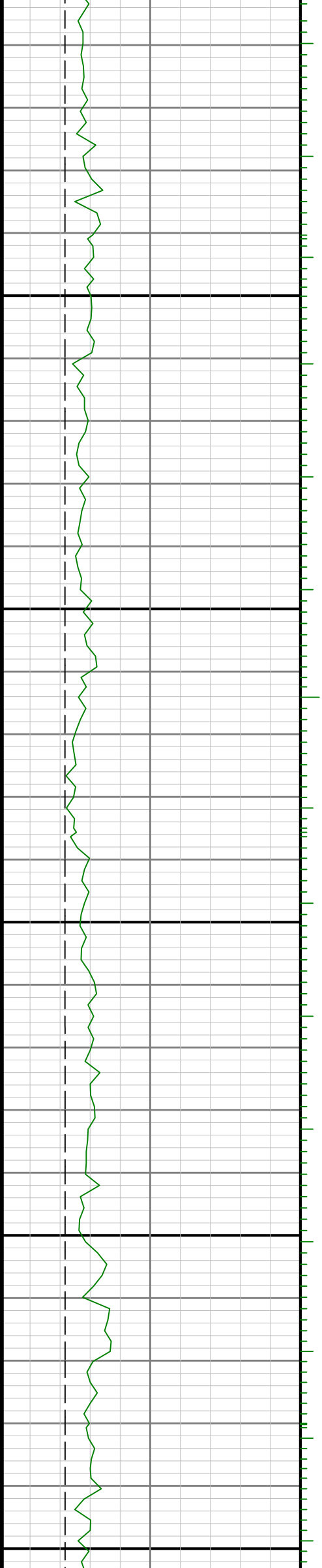


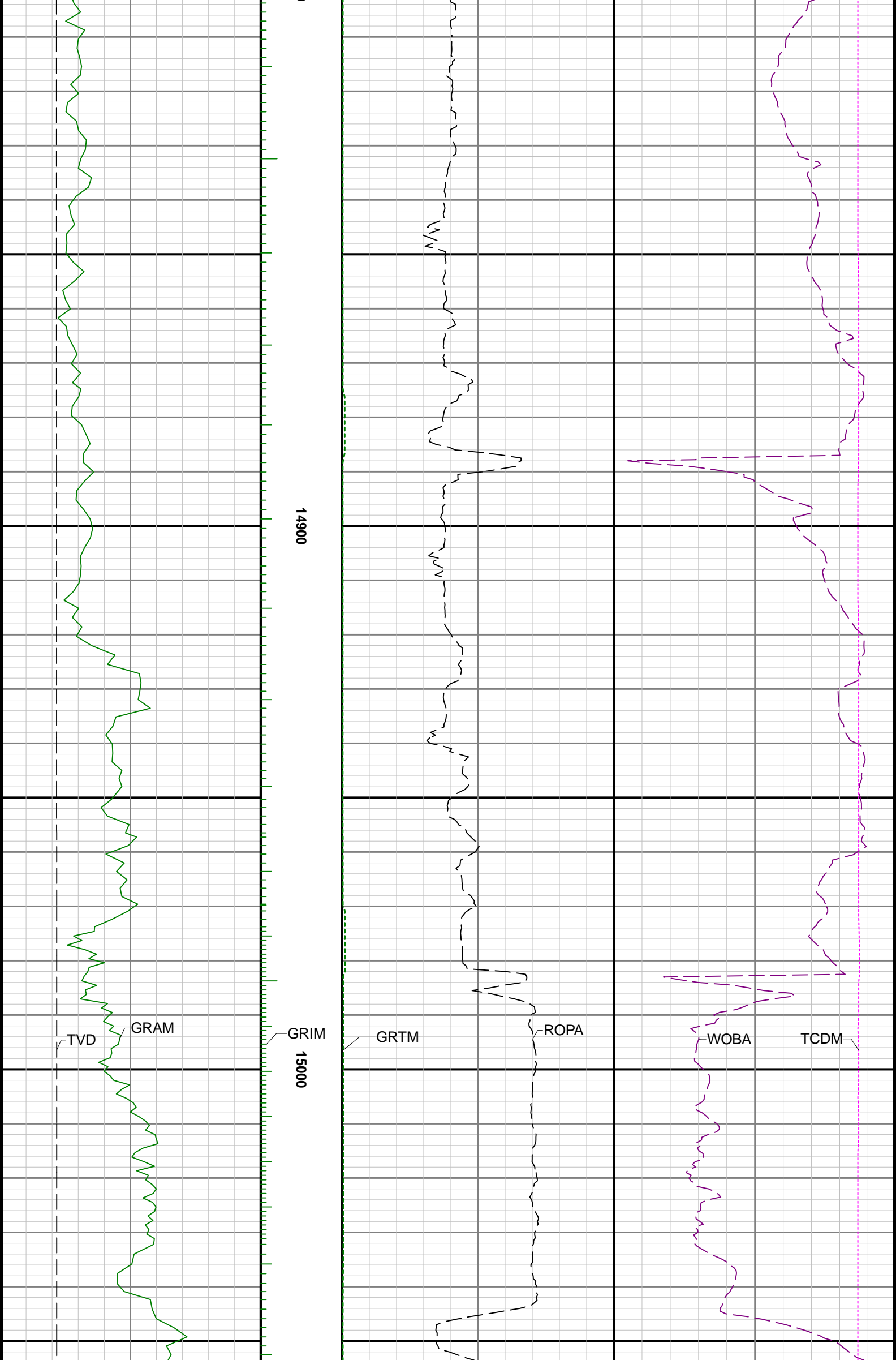


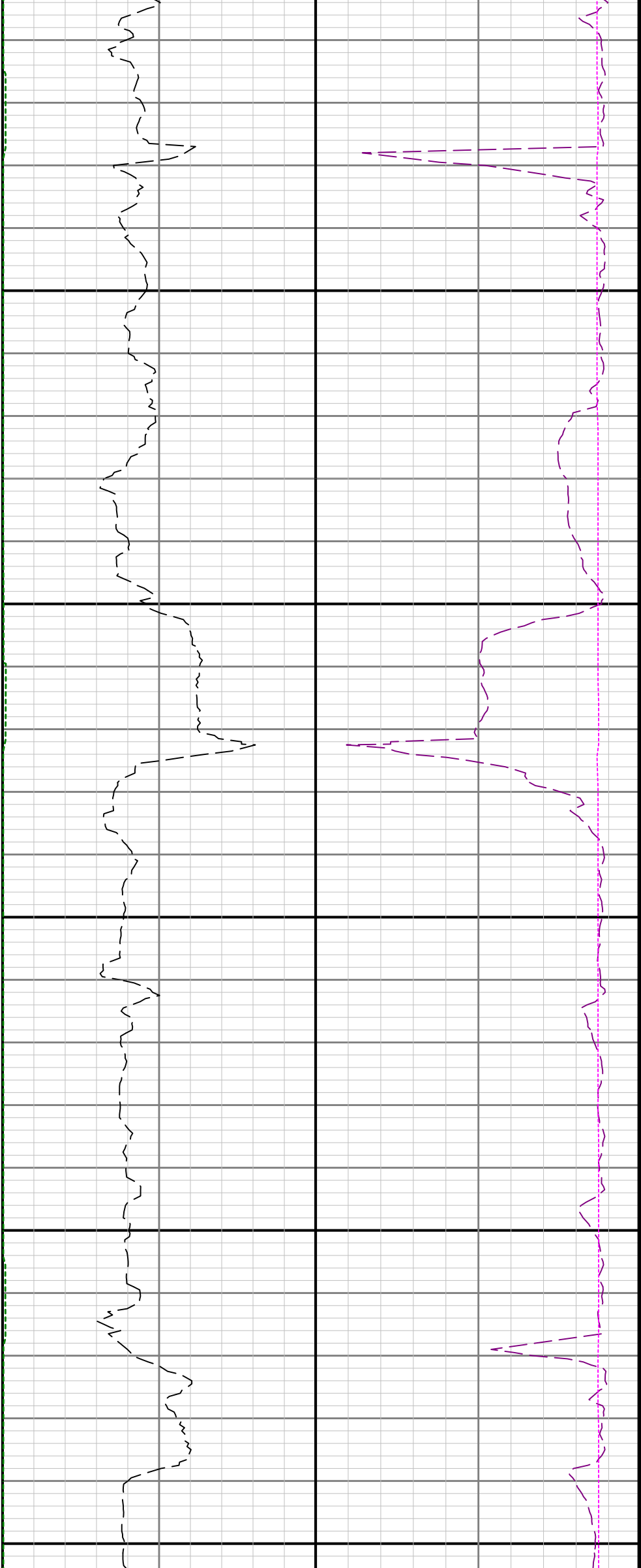
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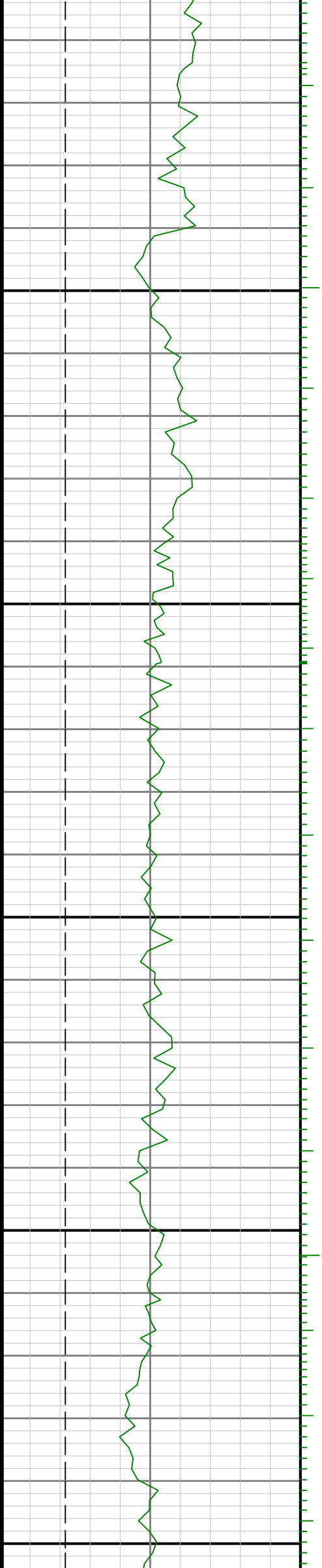


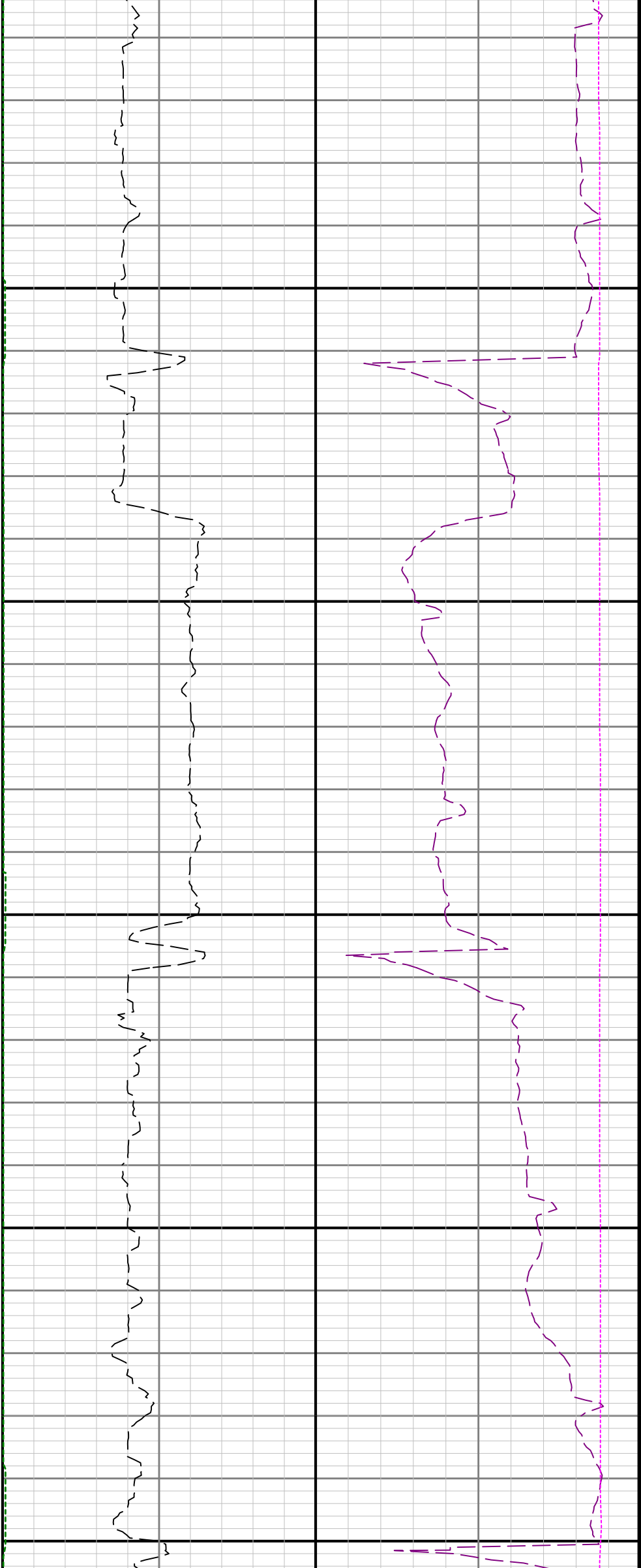


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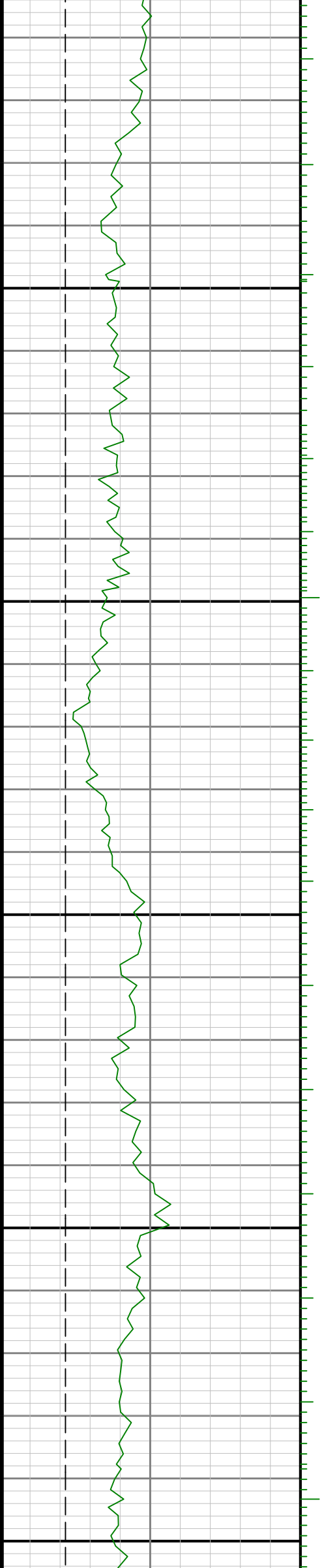
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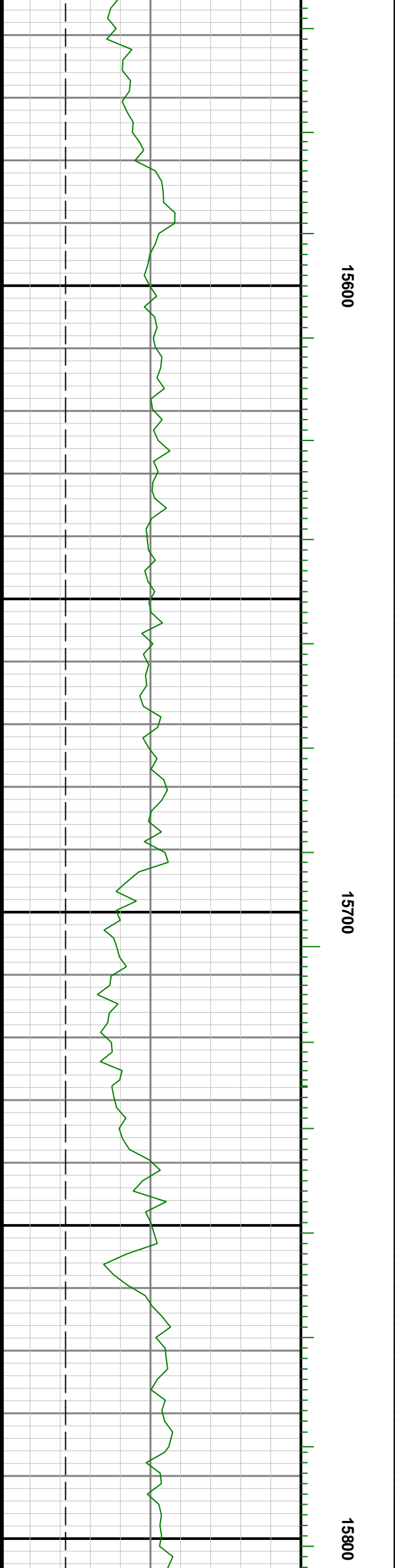


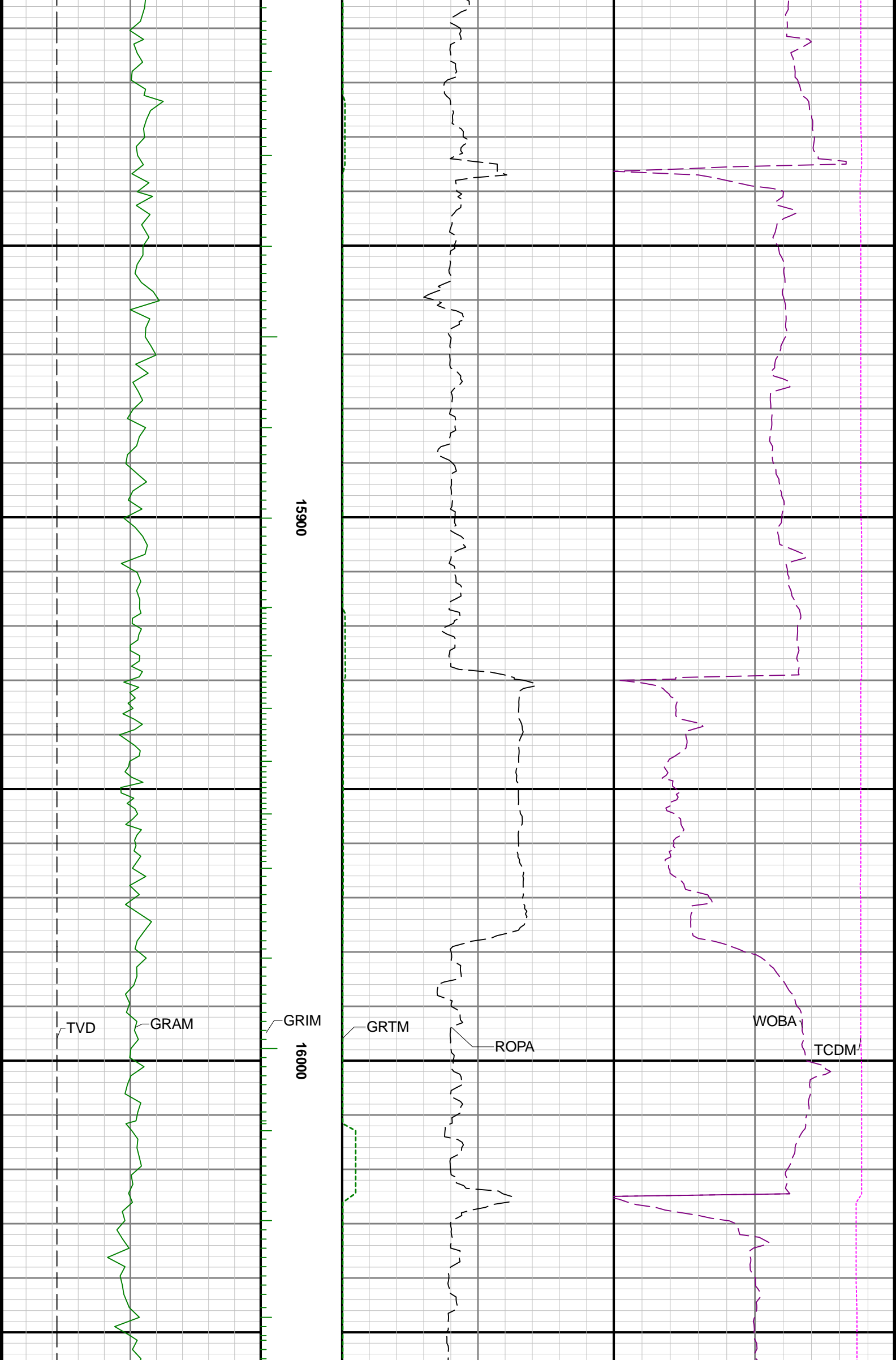
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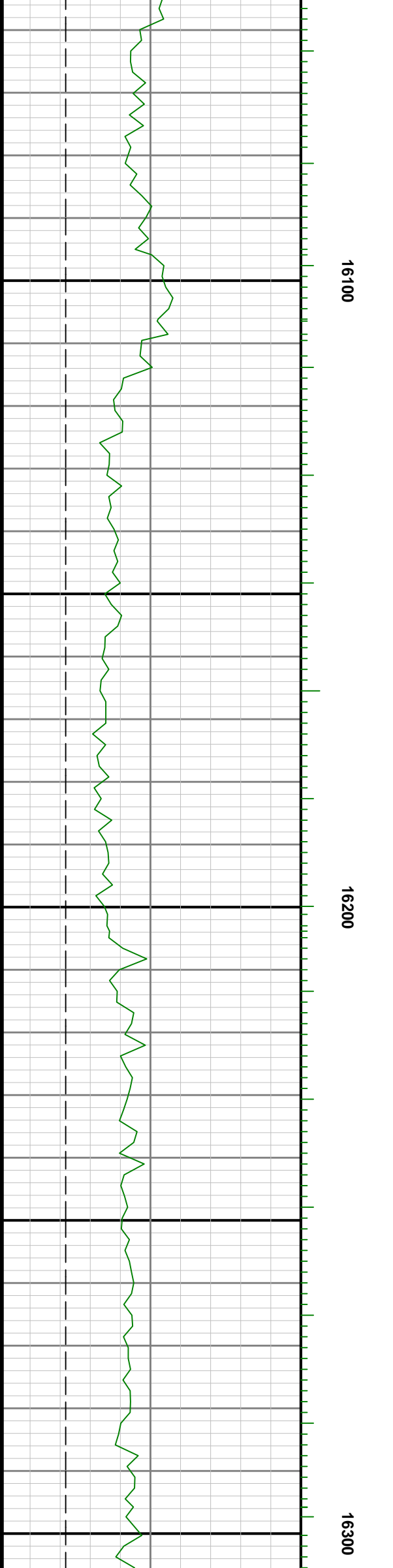
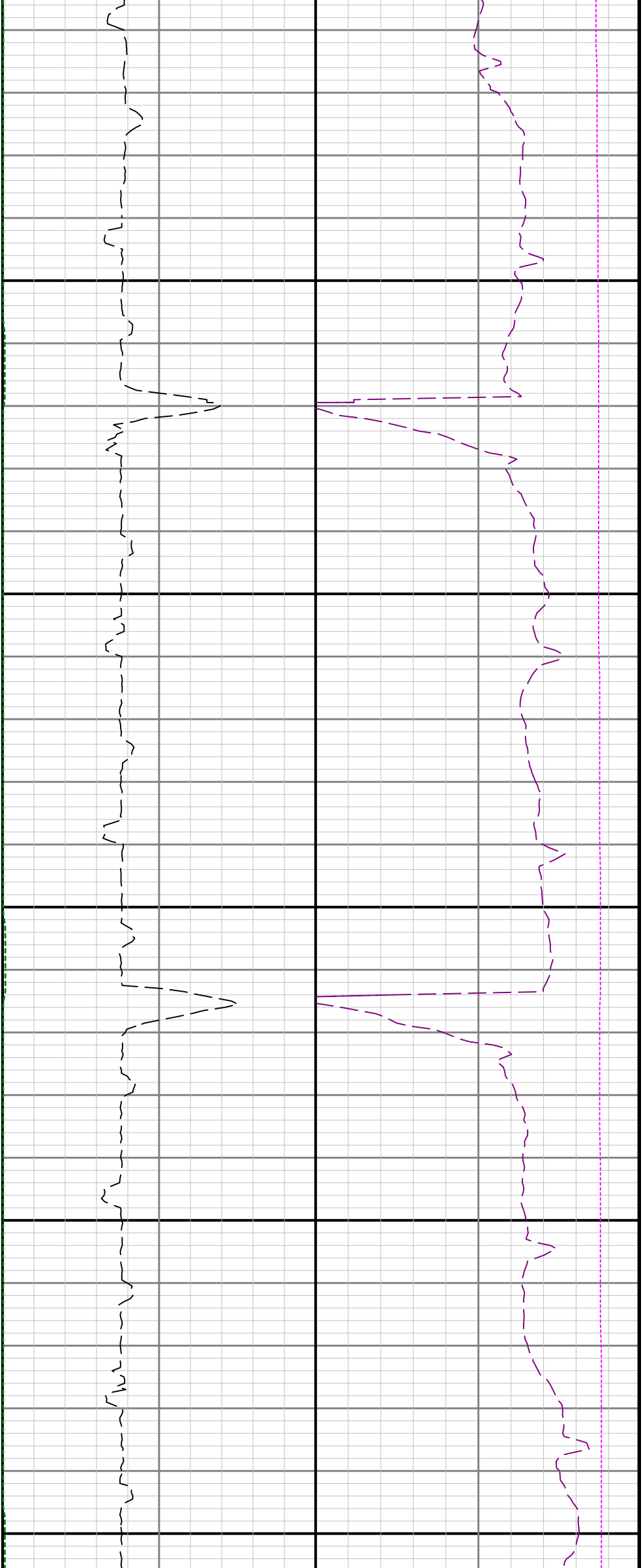
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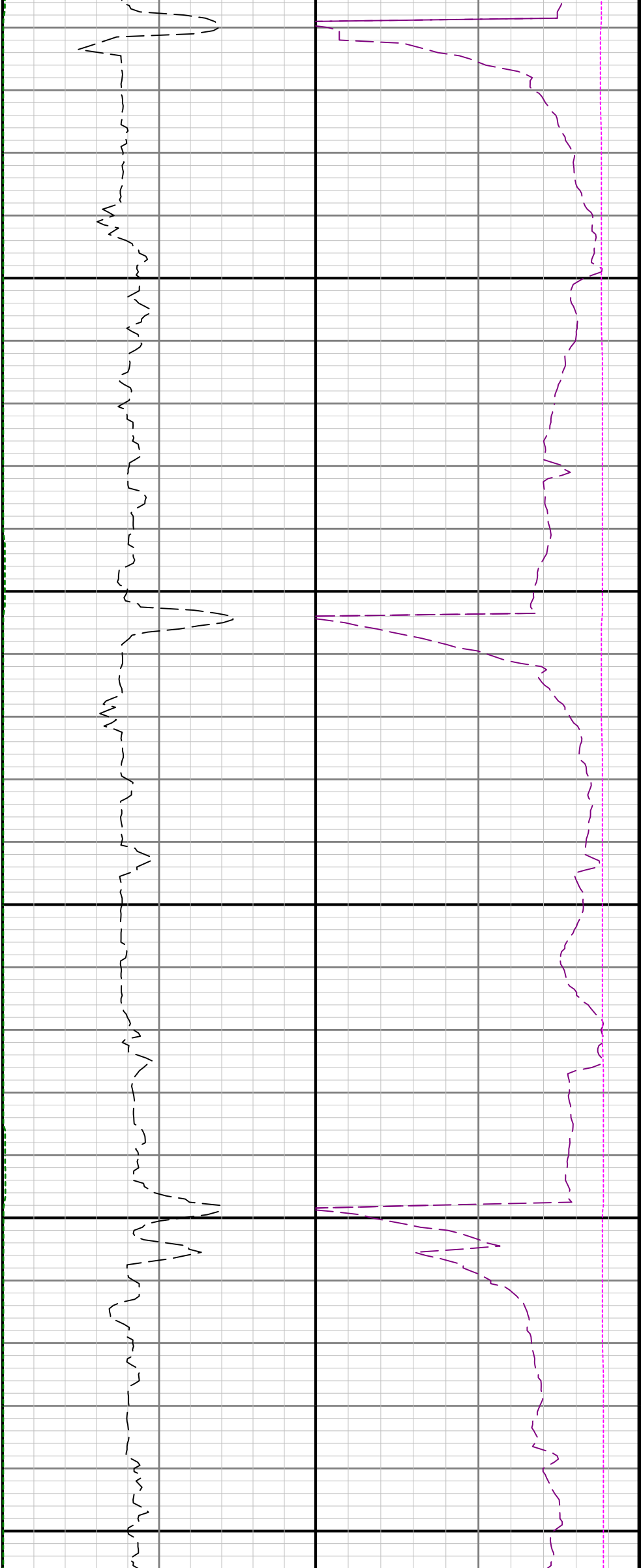






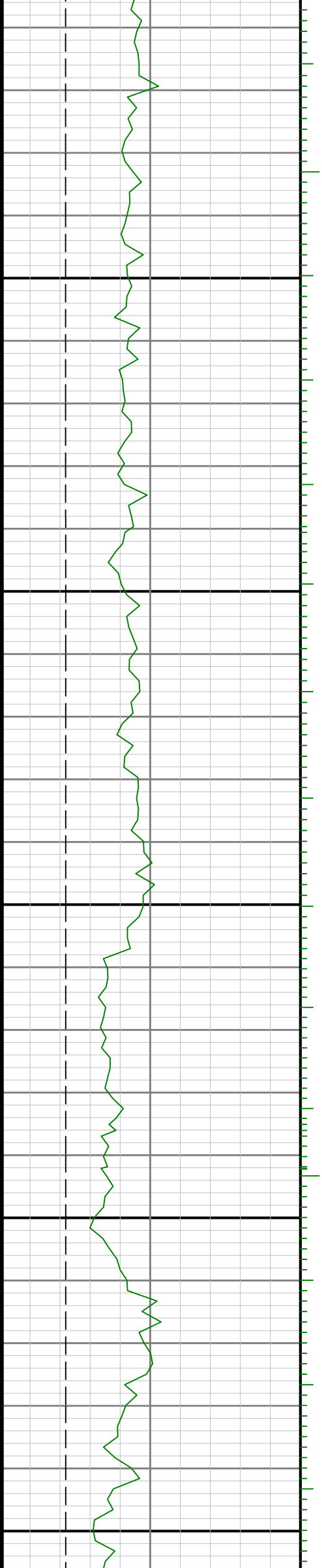


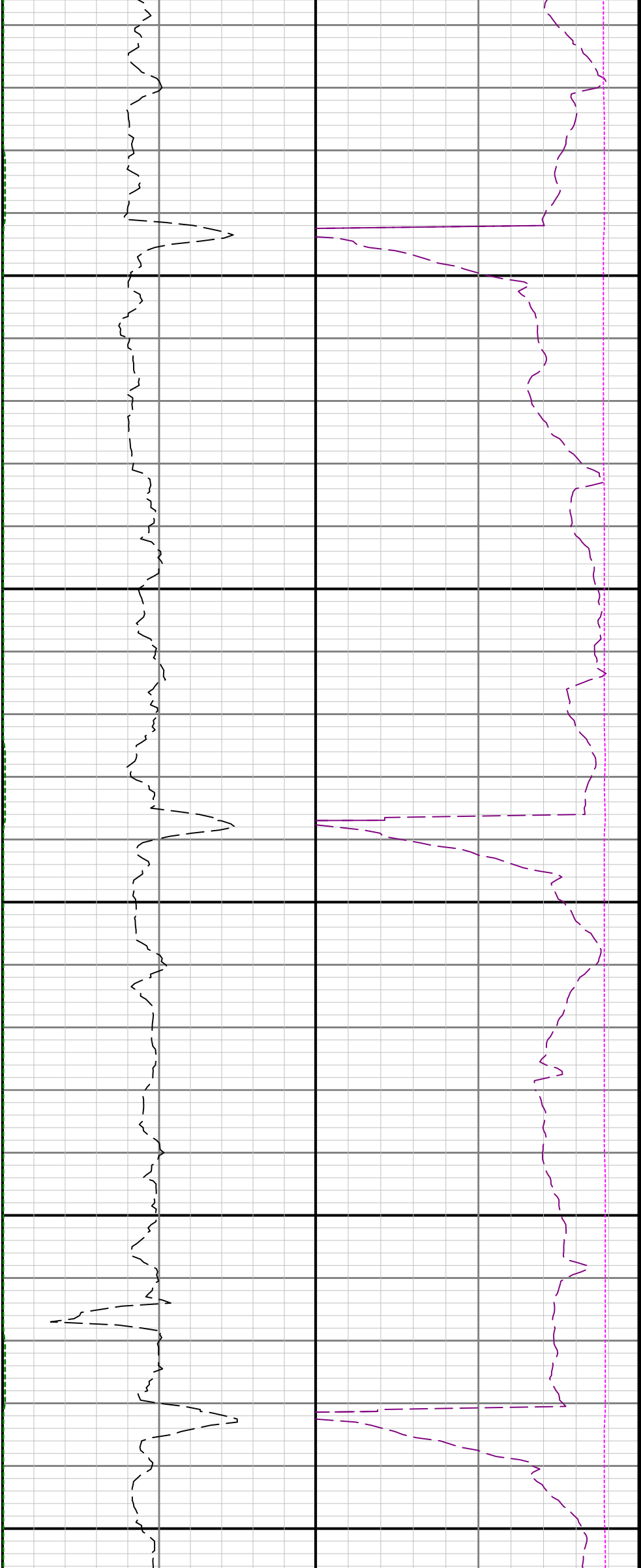




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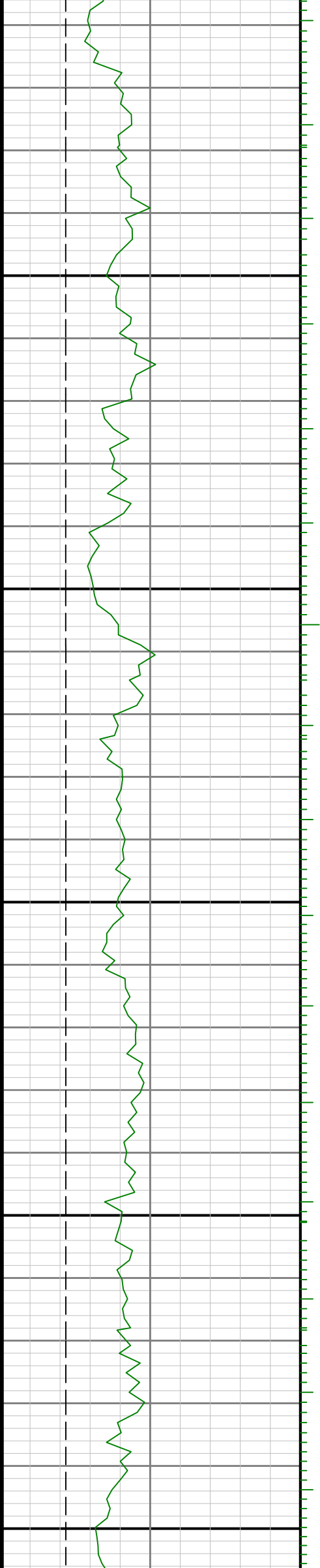


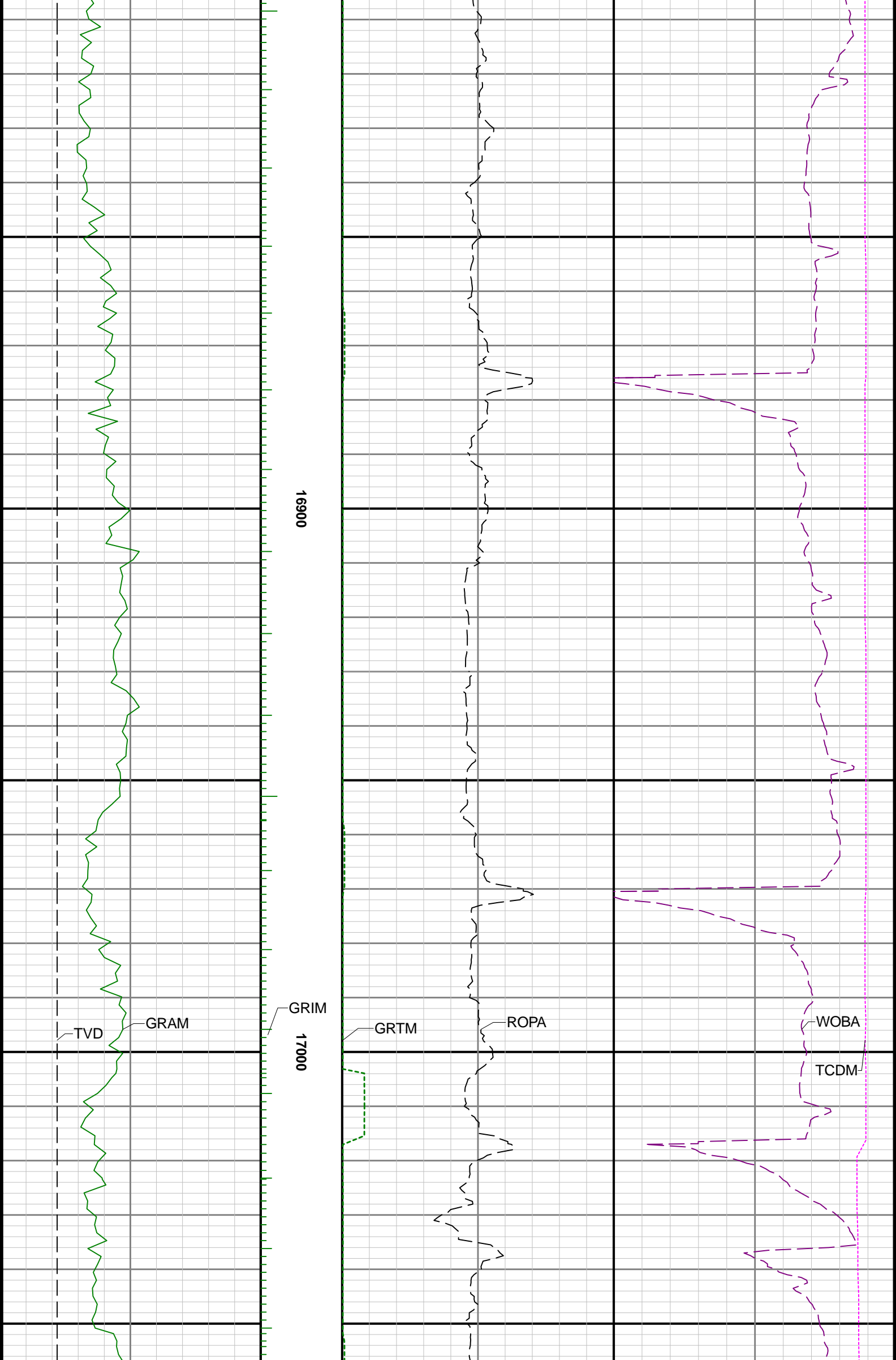


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