



Gamma Ray

LWD MEMORY LOG

Company: Noble Energy

Well: Rampart A33-760

Field: Wattenberg

County: Weld Country: United States

State: Colorado

Driller's Depth

State:

Colorado

Other Services:

Final Print

API No: 05-123-50926-00

Job ID: 110958225

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

Log Measured From: Rig Floor

Elevation: 0.00 ft

Above P.D.: 4756.00 ft

Elev. KB: 4756.00 ft

Elev. DF: 4726.00 ft

Magnetic Field Reference

From: 2021-08-04 To: 2021-08-06 Spud: 2021-07-28

Drilled (ft) 1960.00 Bottom: 16915.00

Logged (ft) 1960.00 Bottom: 16888.00

Azi Reference North: Grid Dip Angle: (deg) 66.79

Total Magnetic Field Strength: (nT) 51906

Mag to Reference North Correction: (deg) 7.00

Borehole Record

Casing Record

Hole Size (in) From (ft) To (ft) Size (in) Weight (lb/ft) From (ft) To (ft)

13.500 30.00 1960.00 9.625 36.00 30.00 1950.00

8.500 1960.00 16915.00

Mud Record

Deviation Record

Type From (ft) To (ft) Hole Size (in) Interval (ft) Inc | Az (Start) Inc | Az (End)

Oil Based Mud 1960.00 16915.00 8.500 14955.00 1.01 | 242.41 90.46 | 178.14

Software Version

RT 6.1 6.1.9214.1

Rig: H&P 517 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
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	3.00	AutoTrak Curve	1960.00	16888.00	1960.00	16915.00	2021-08-04 00:07	2021-08-06 15:10	57.19

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Dallata Dinh	2021-08-03	2021-08-05	Jeremiah Samson	2021-08-03	2021-08-07	Michael Gurnsey	2021-08-03	2021-08-07
Rizwan Khan	2021-08-03	2021-08-05	Tien Bui	2021-08-03	2021-08-07	Alixandria Cain	2021-08-05	2021-08-07
Tyler Bench	2021-08-05	2021-08-07						

Witness

Name	Run
Charles Collver	1

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+ (%)
2021-08-03 12:23	1	1960.00	Oil Based Mud	9.2	10	N/A	2.0	79.5/20.5	Active Pit	25000	0.00
2021-08-04 20:28	1	6532.00	Oil Based Mud	9.4	13	N/A	3.0	80/20	Active Pit	27992	0.00
2021-08-05 05:00	1	7688.00	Oil Based Mud	9.5	12	N/A	3.0	80.1/19.9	Active Pit	27510	0.00
2021-08-05 16:00	1	11510.00	Oil Based Mud	9.6	12	N/A	3.0	81.1/18.9	Active Pit	26725	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	15322209	Near Bit VSS	5.93	6.75	7.000	4.330
1	AutoTrak Curve Steering Unit	15322209	Near Bit Inclination	5.93	6.75	7.000	4.330
1	AutoTrak Curve MWD	14256861	Gamma (single)	2.82	12.92	7.000	3.250
1	AutoTrak Curve MWD	14256861	Directional (mag)	12.27	22.37	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
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 a 8 1/2 inch bit and rotary steerable assembly from 1960 to 16915 feet MD (1960 to 6803 feet TVD).
- 3

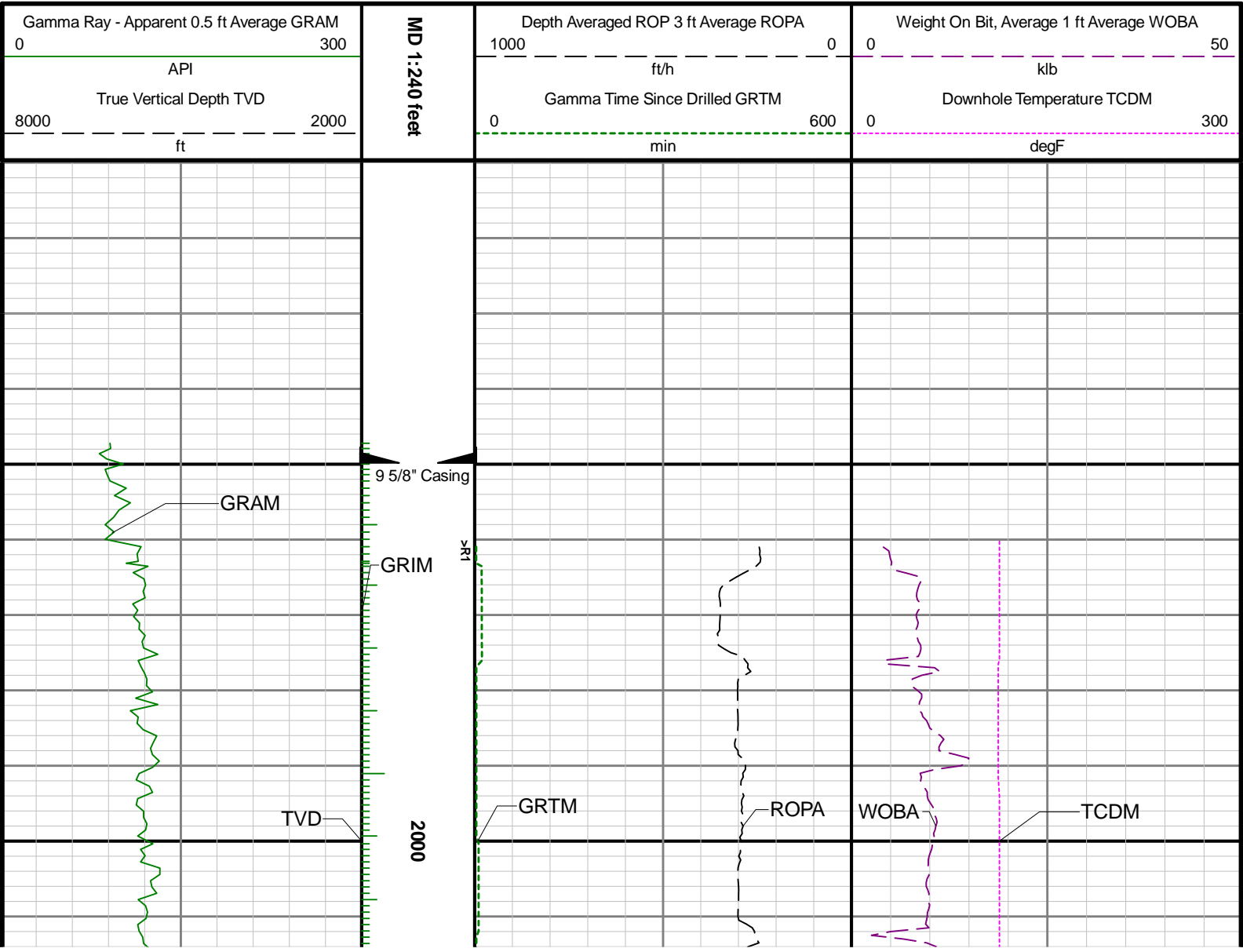
The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.

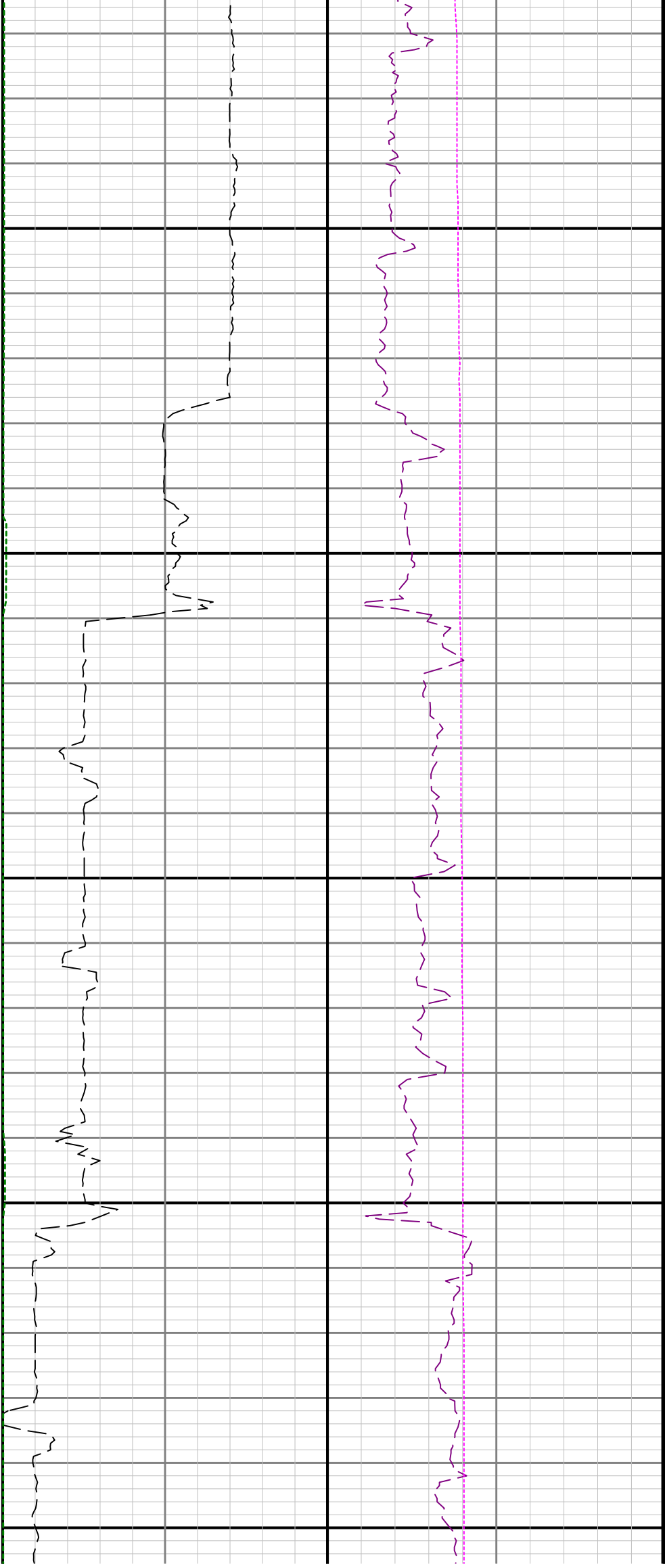
Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	16888.00	8.500	1	The interval from 16888 to 16915 feet MD (6803 to 6803 feet TVD) was not logged due to sensor to bit offset at well TD.

Curve Mnemonics

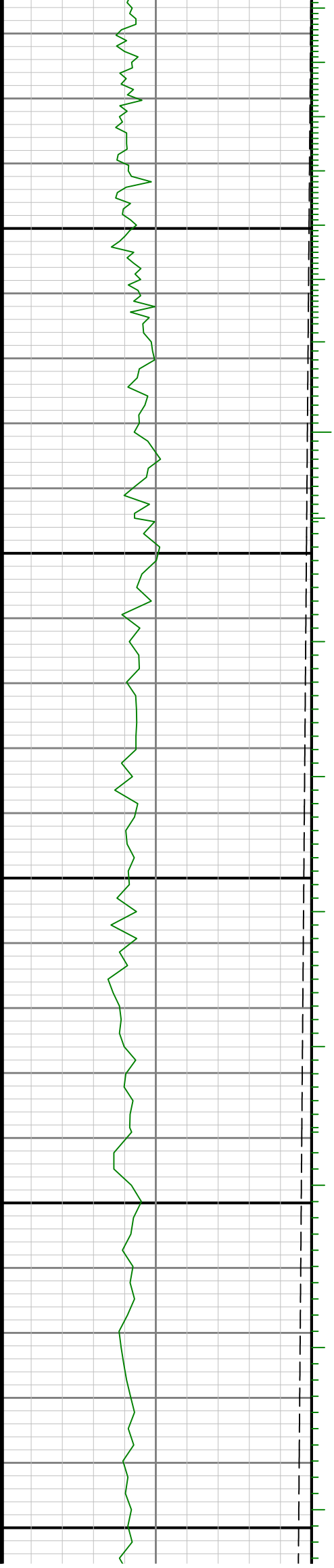
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight on Bit - Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory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

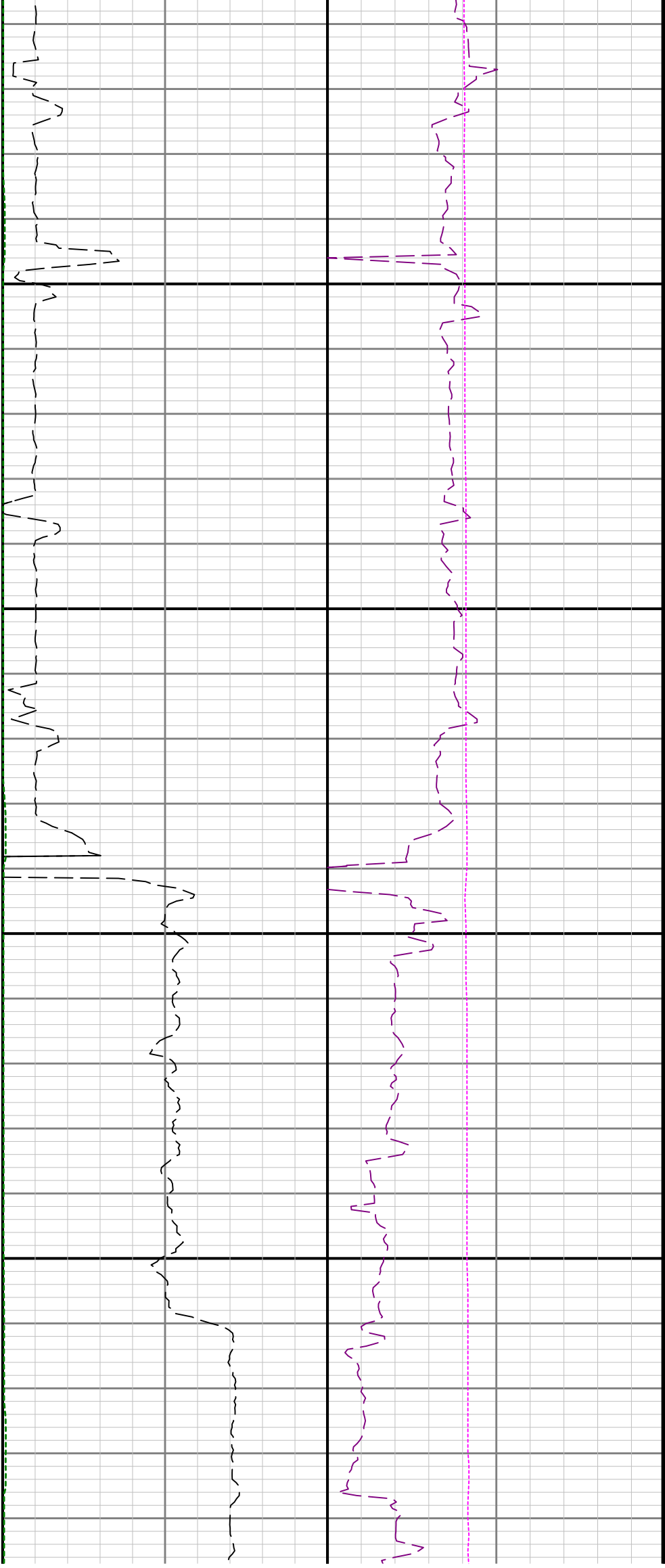




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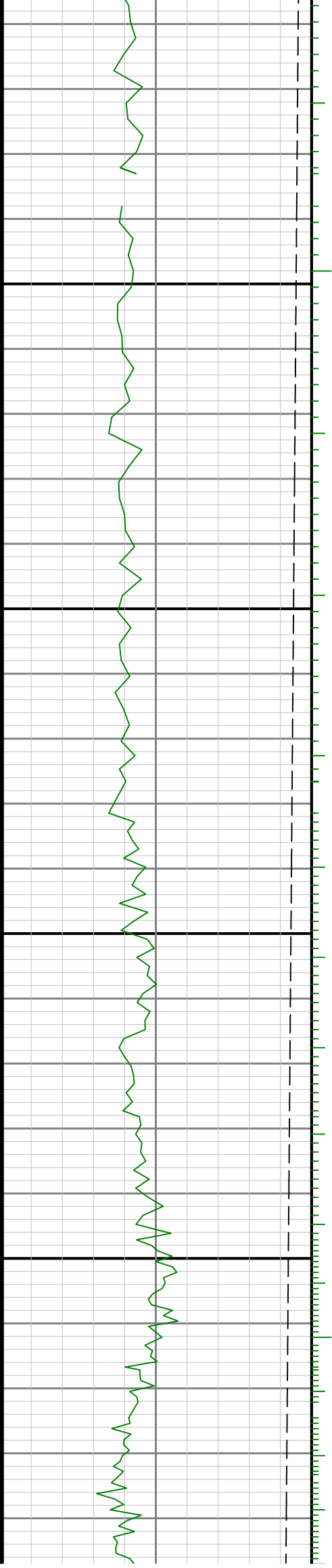
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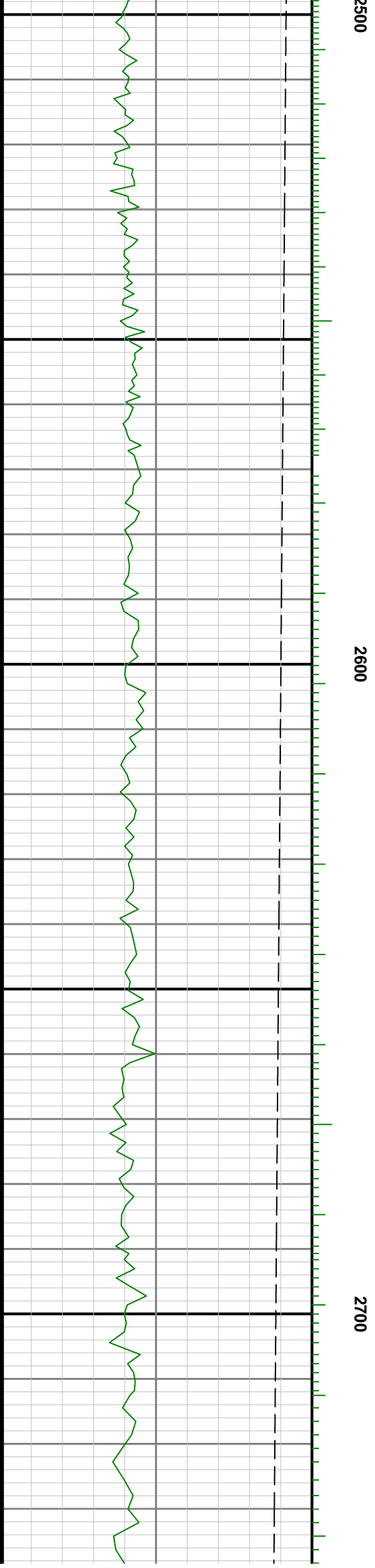
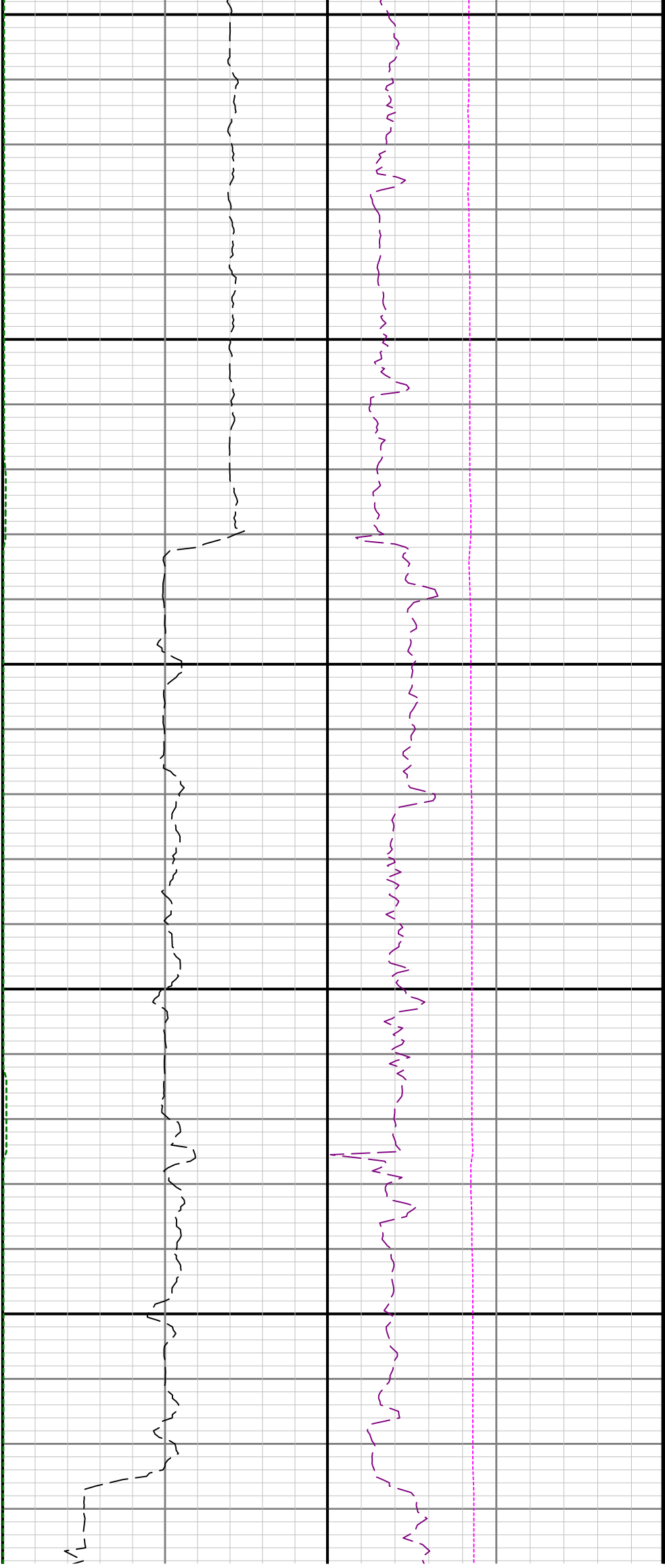


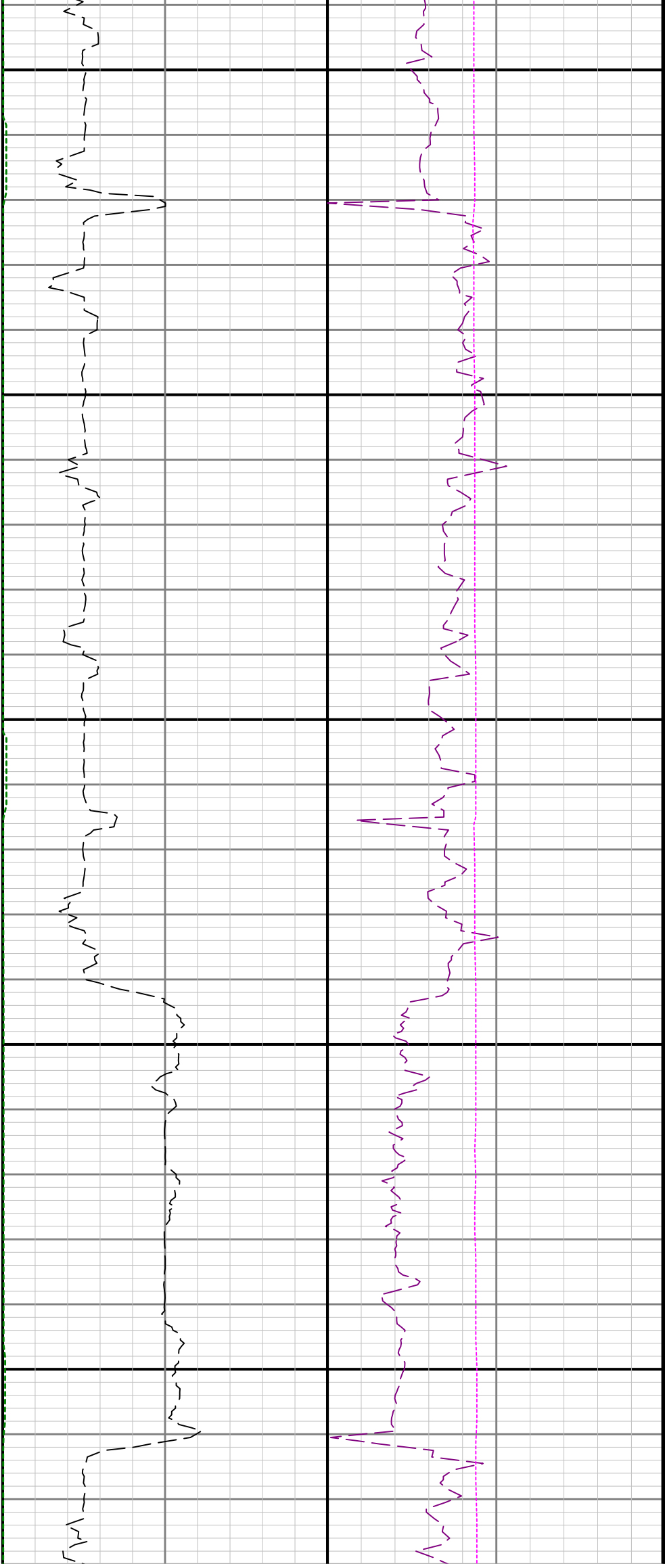


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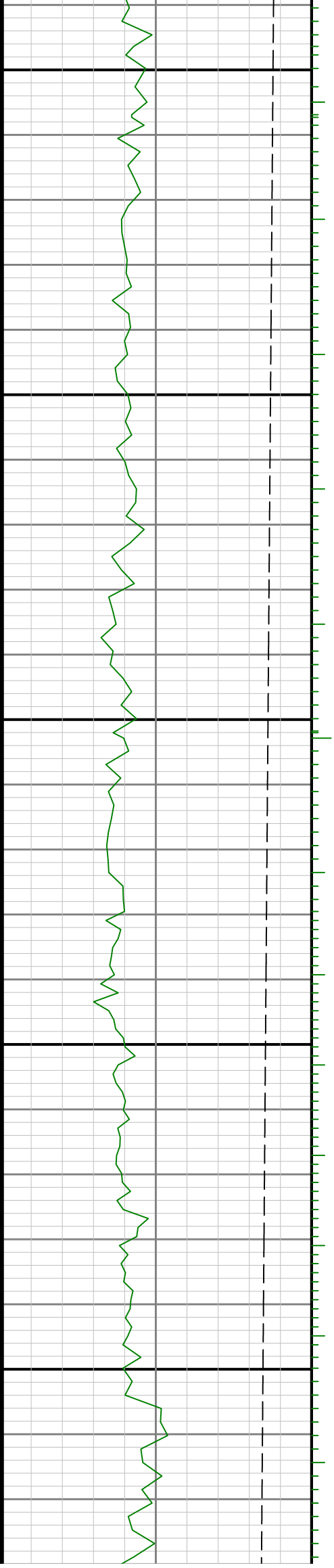


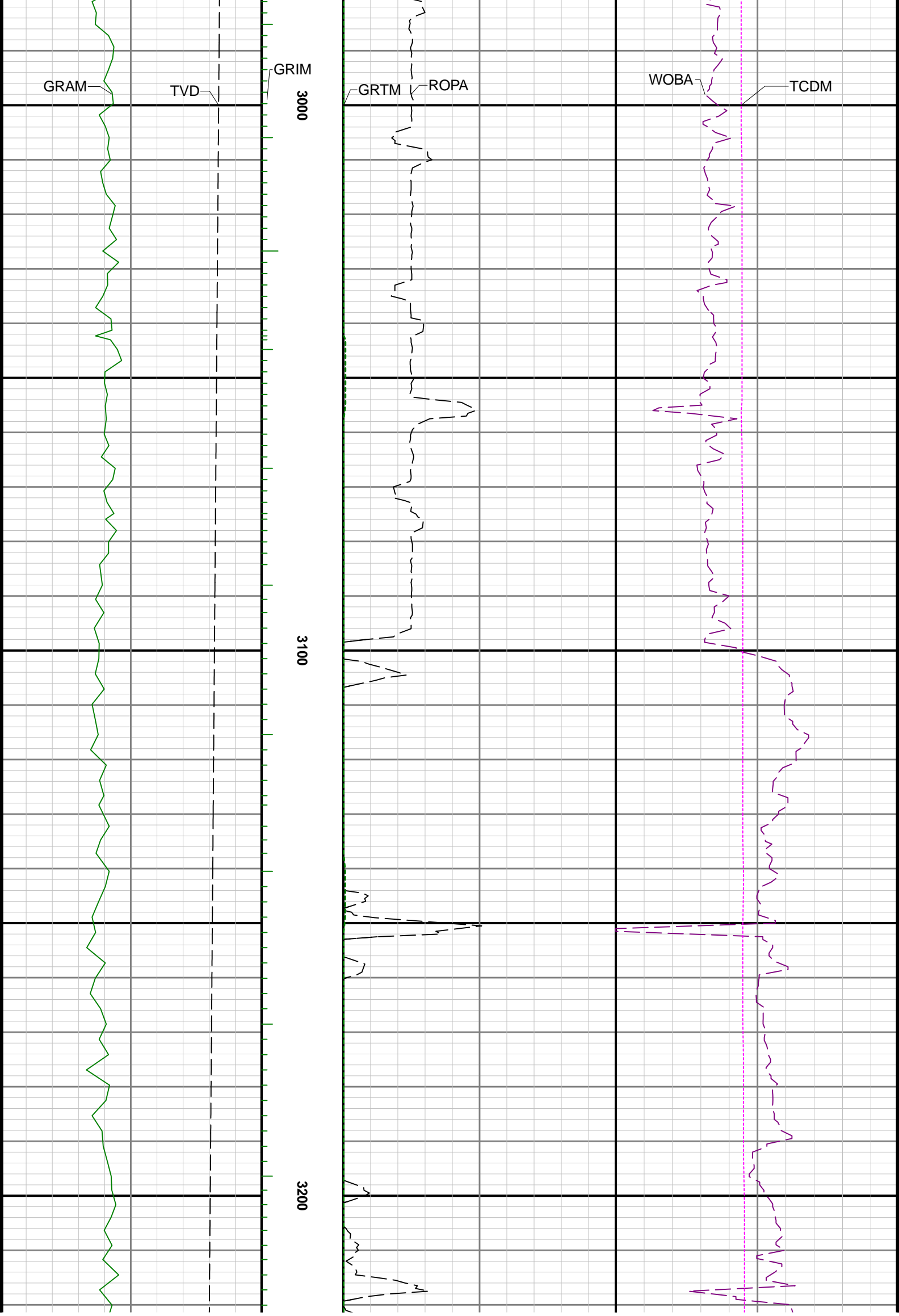


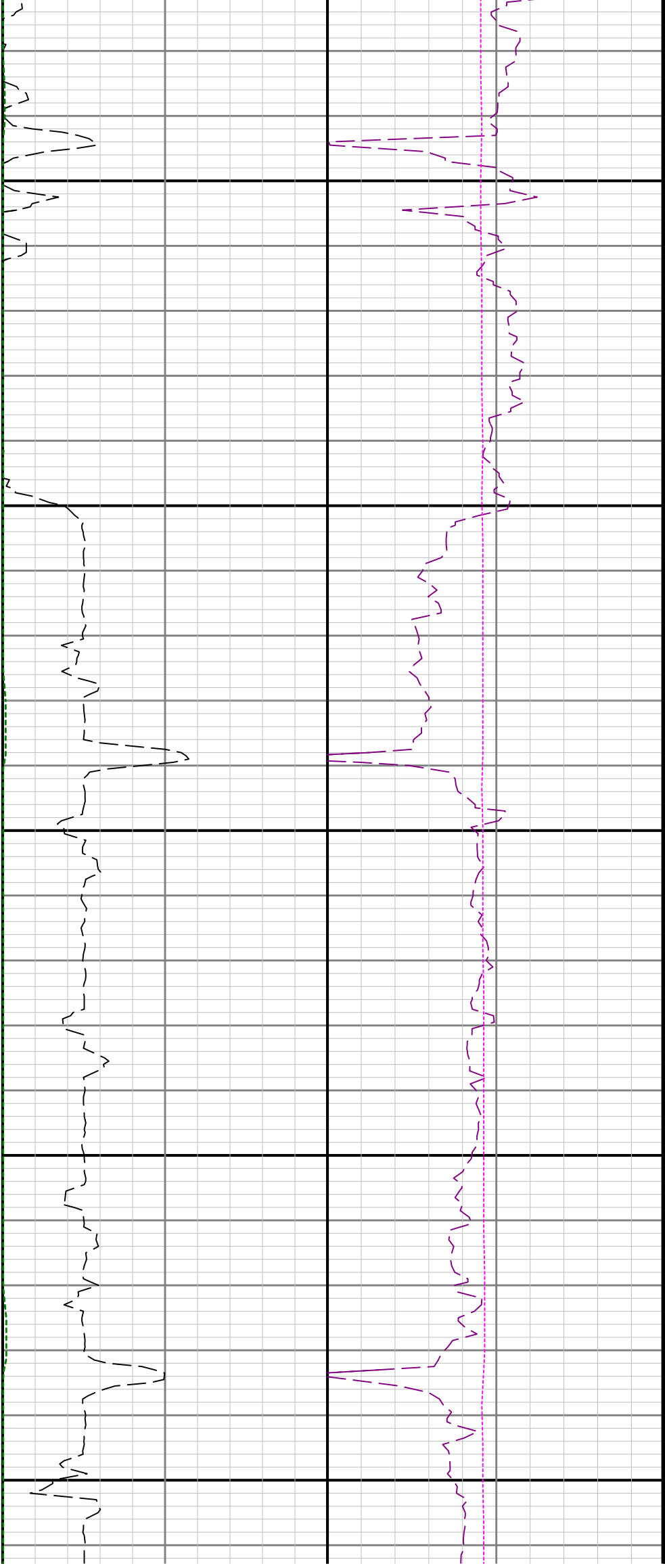


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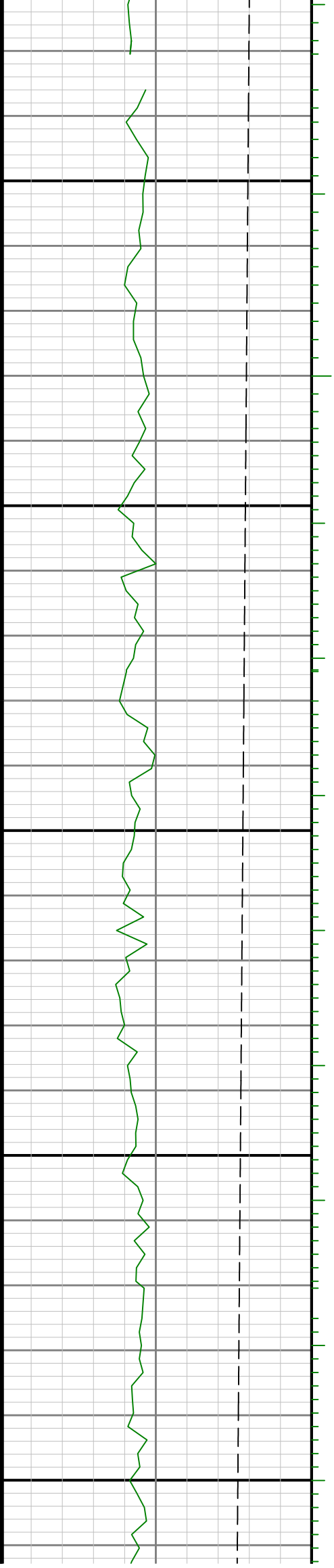


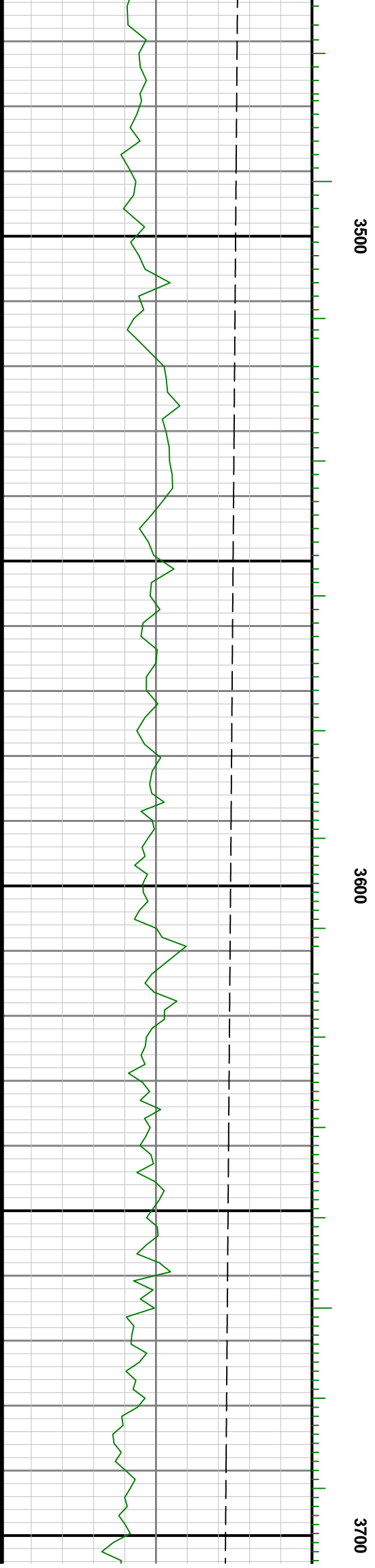
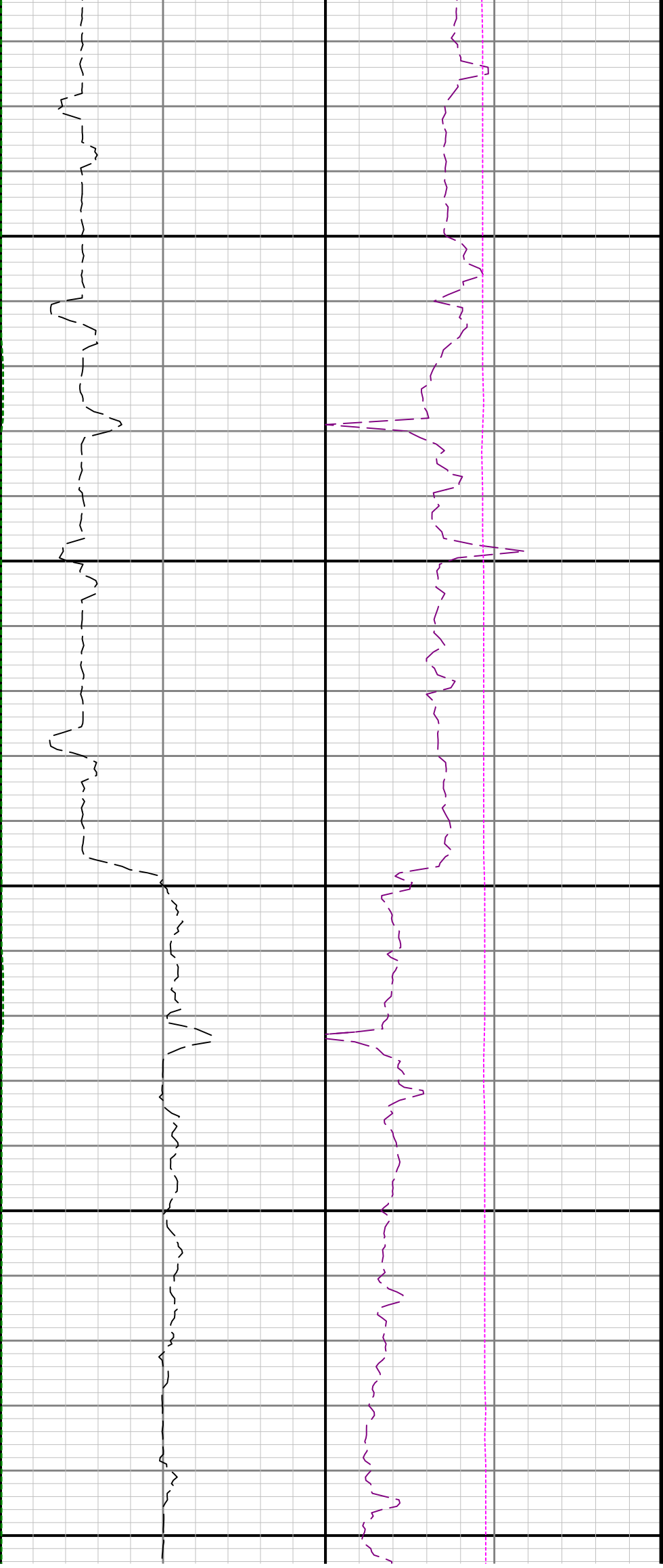


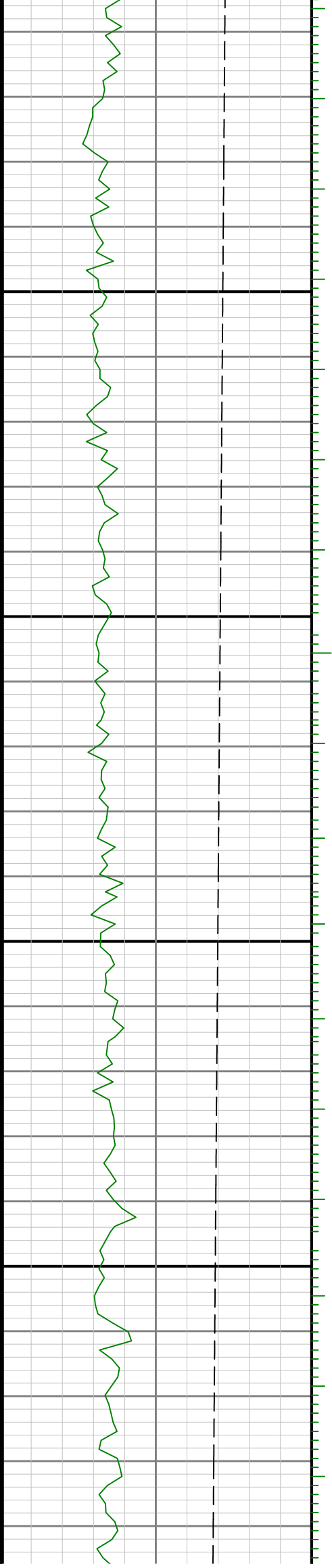
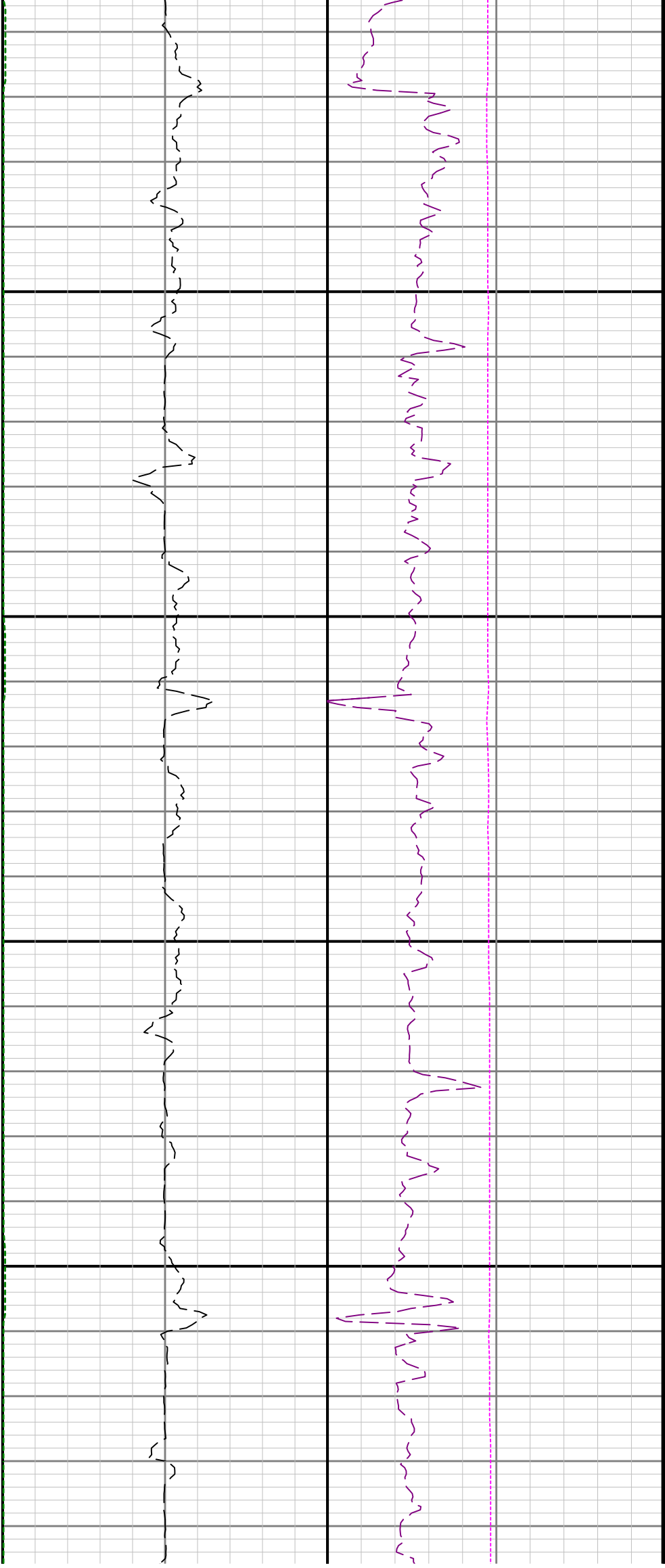


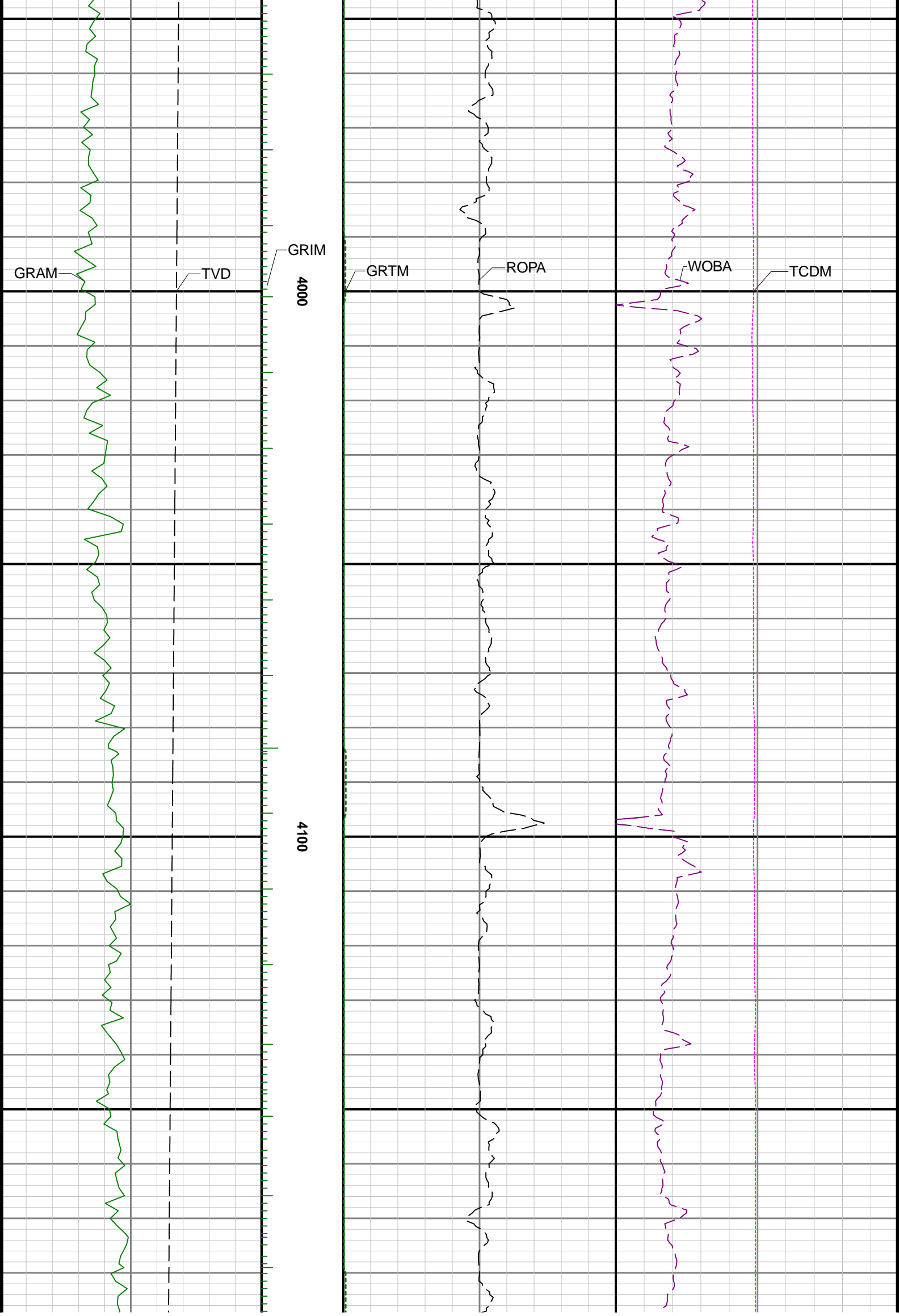
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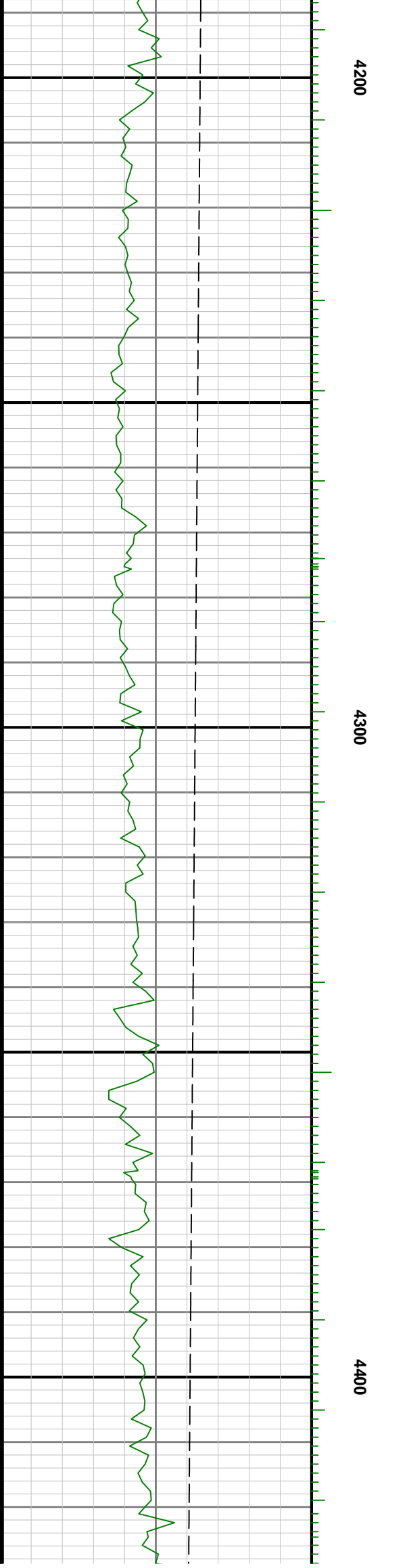
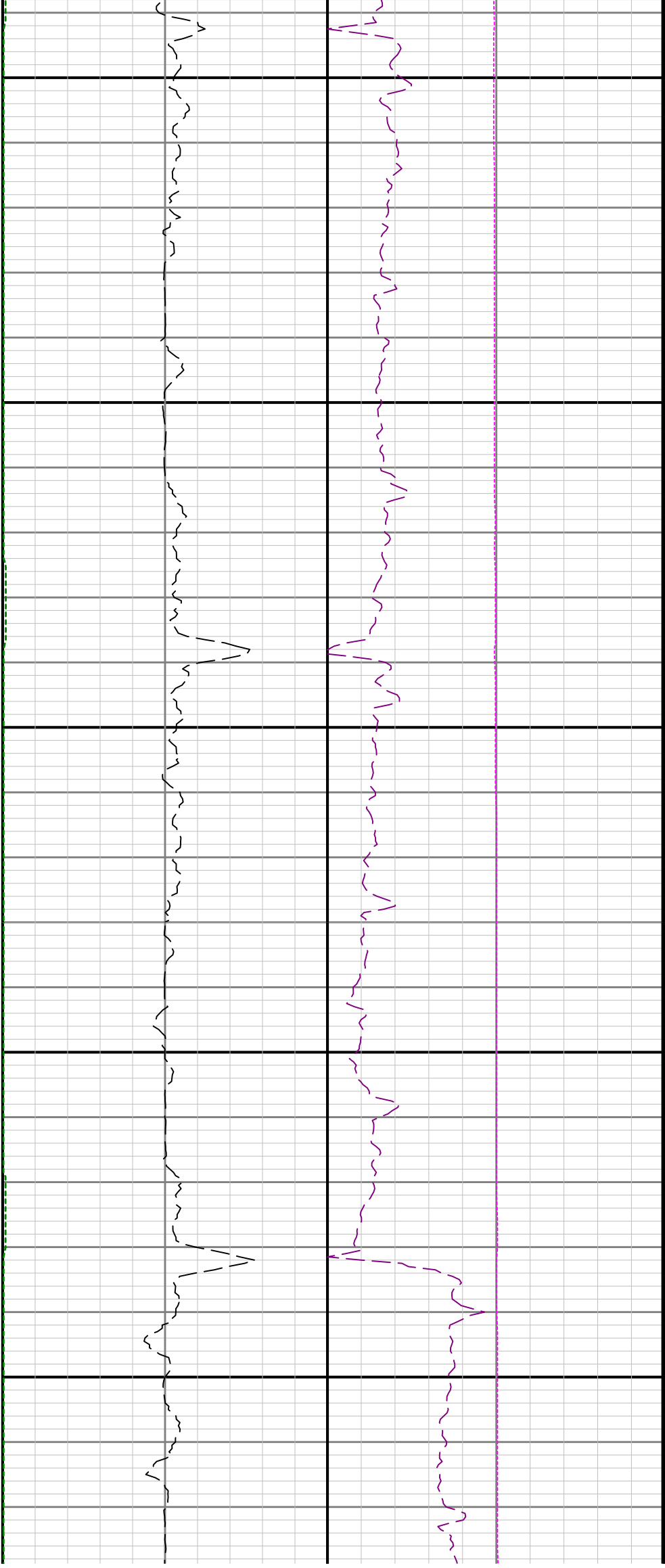
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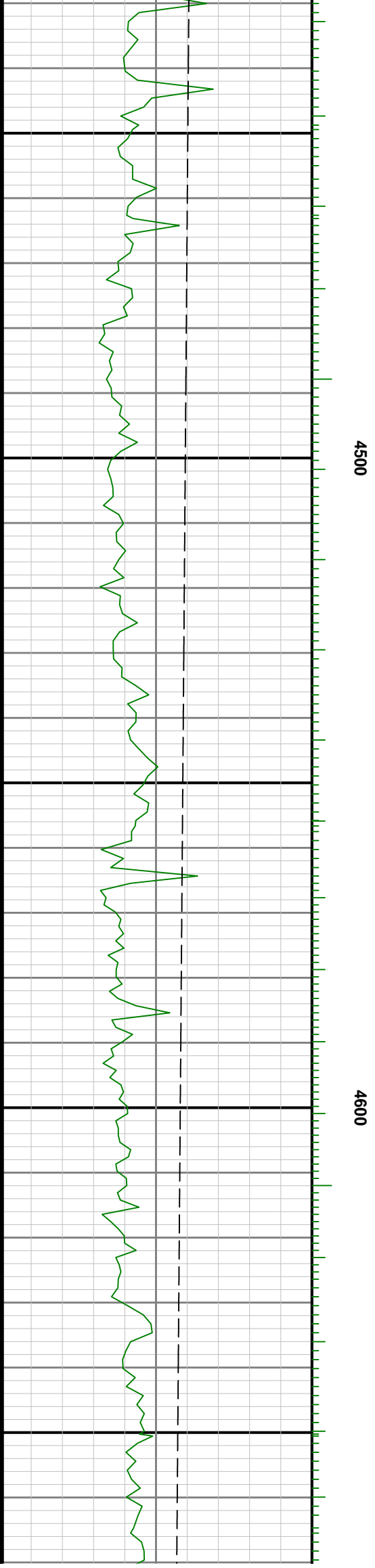
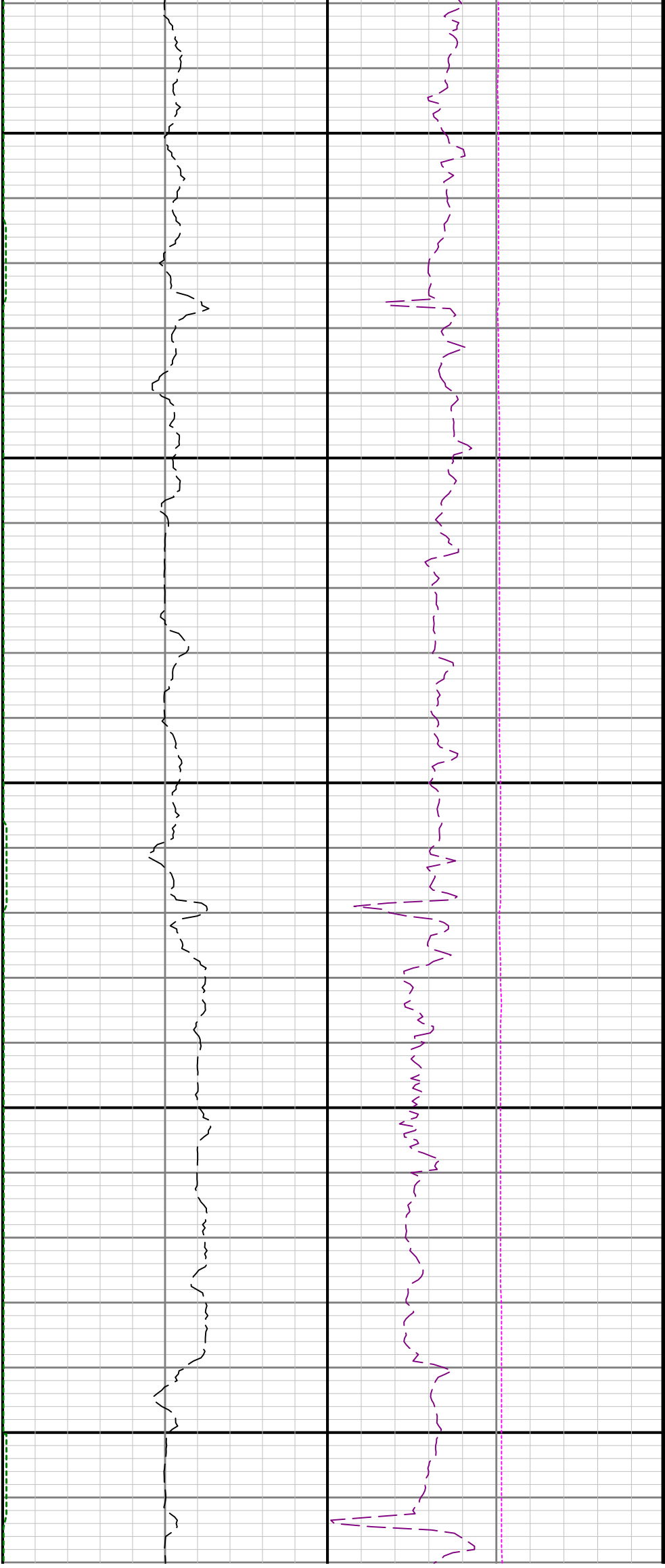


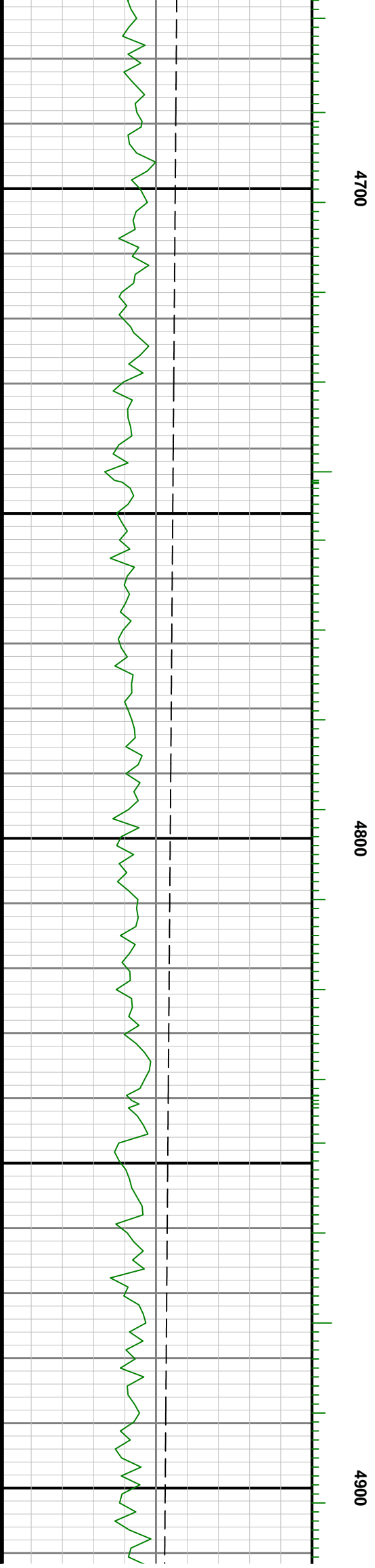


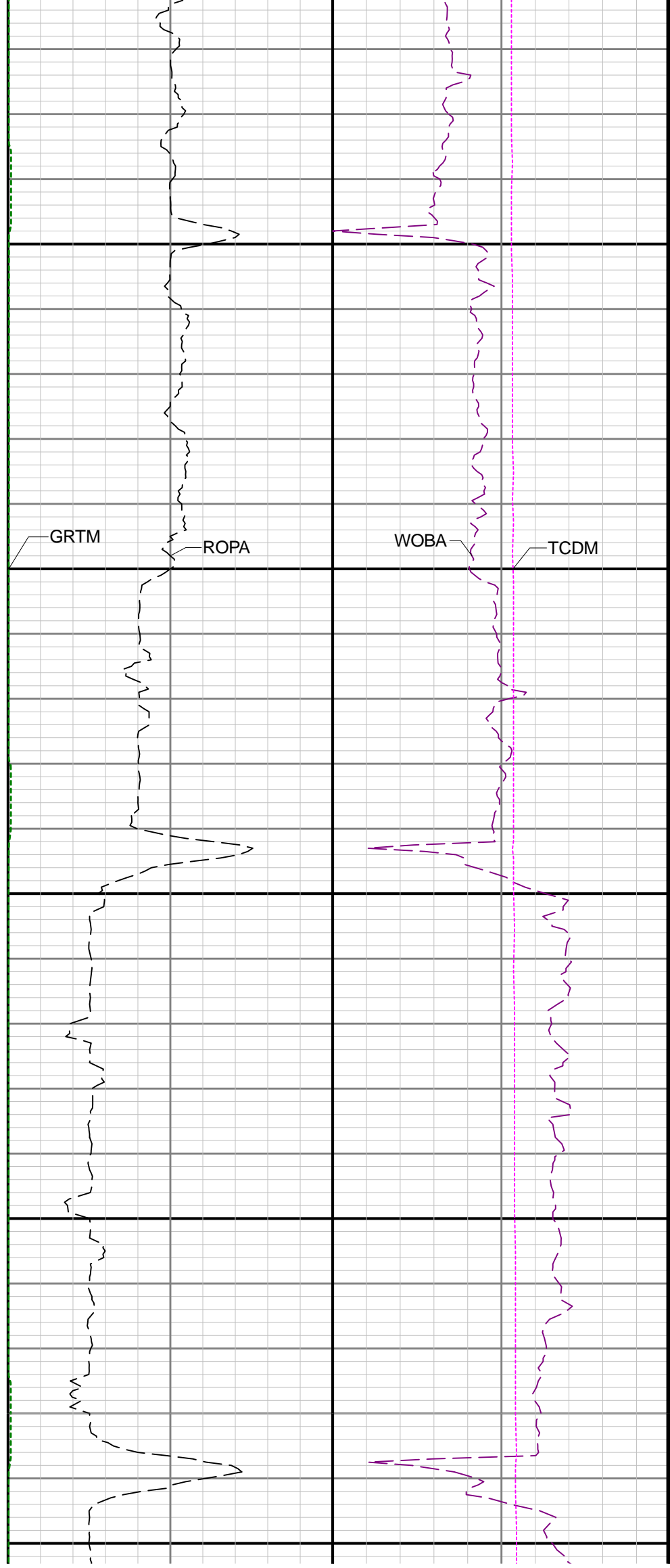
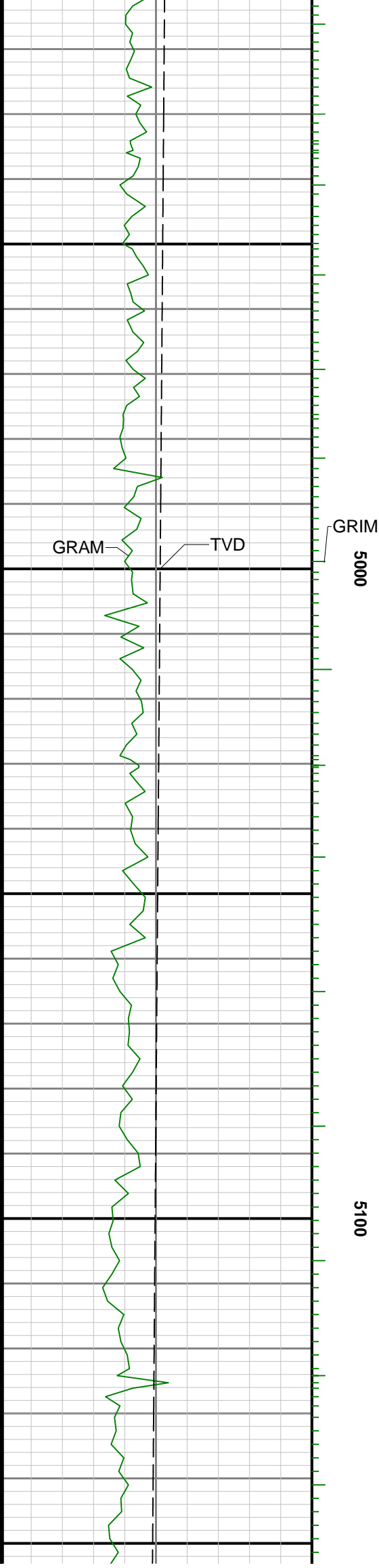


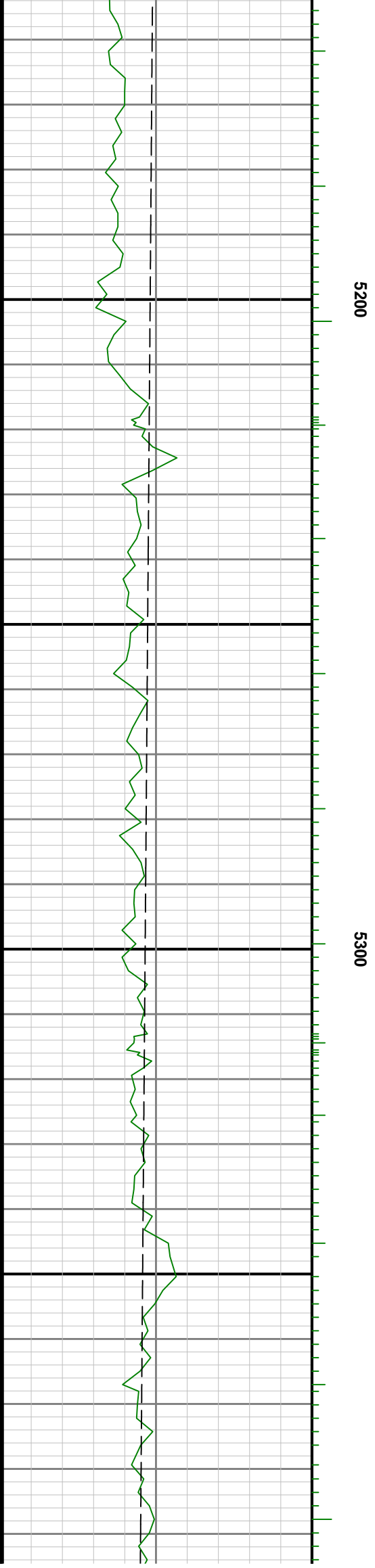


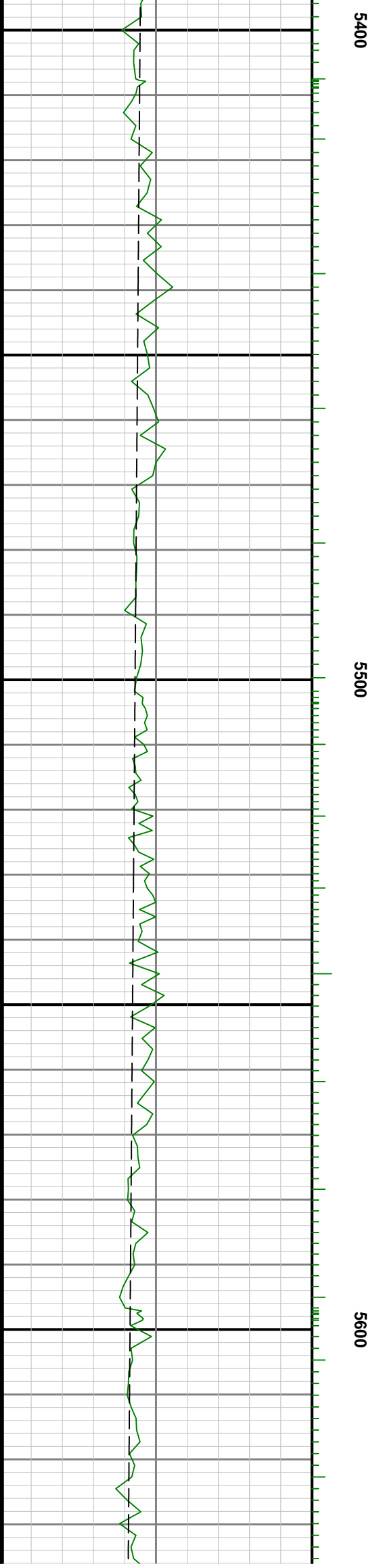
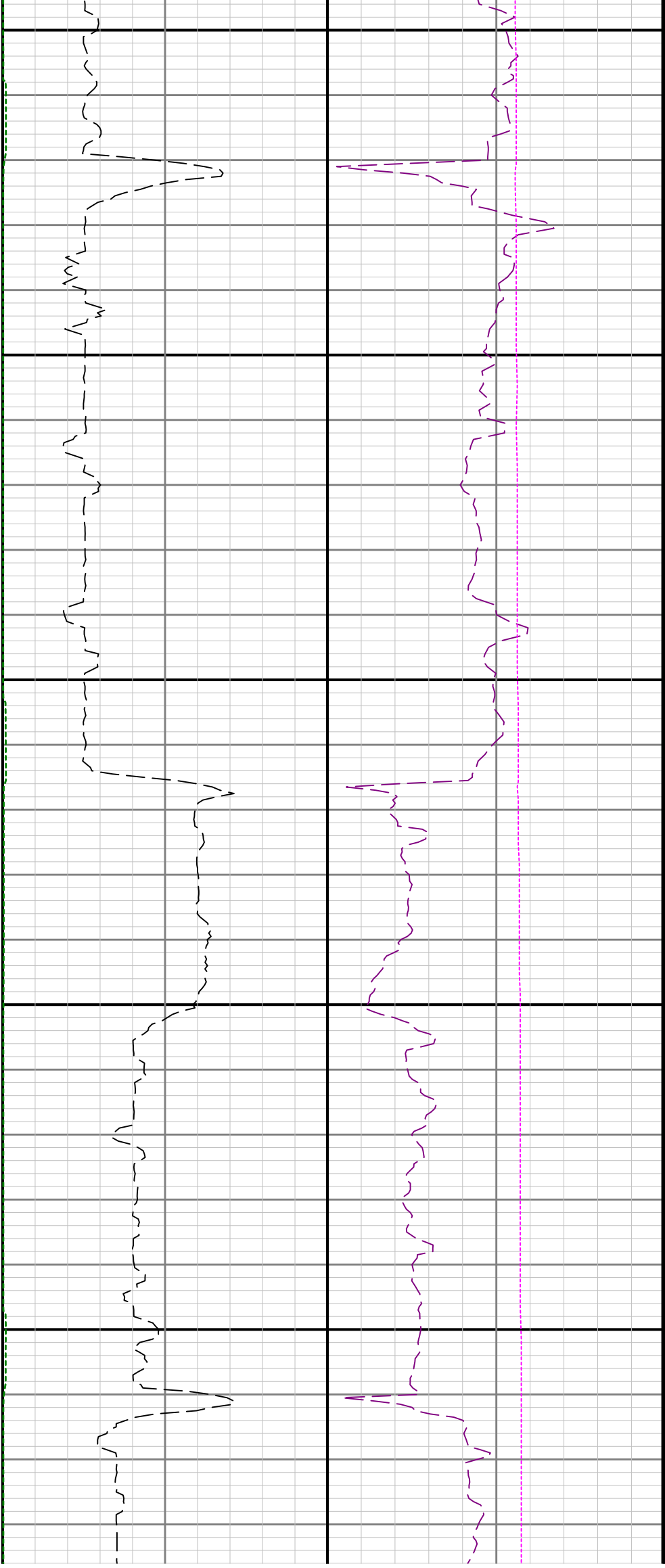


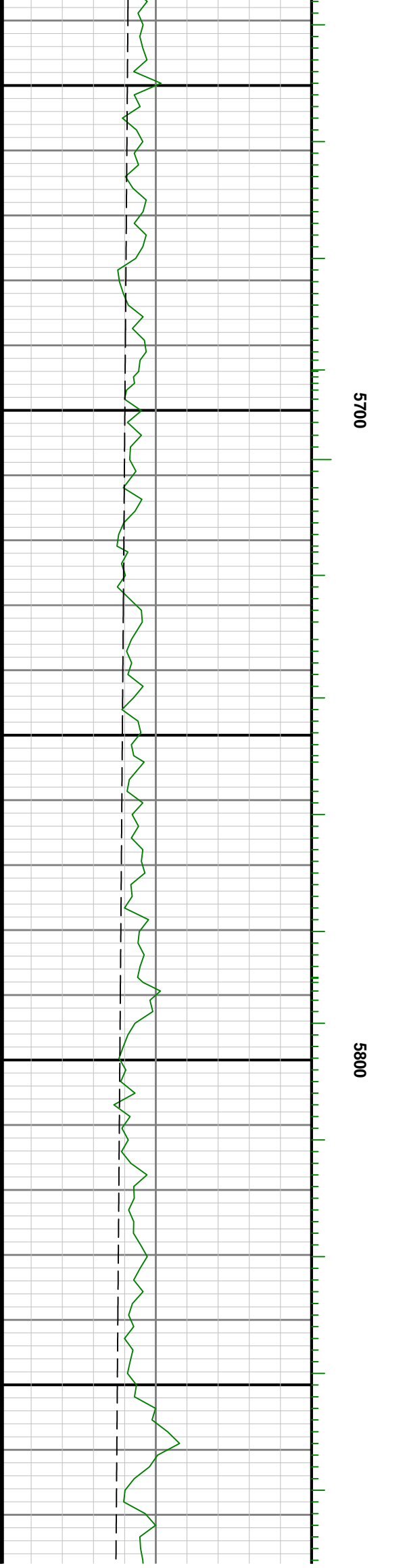
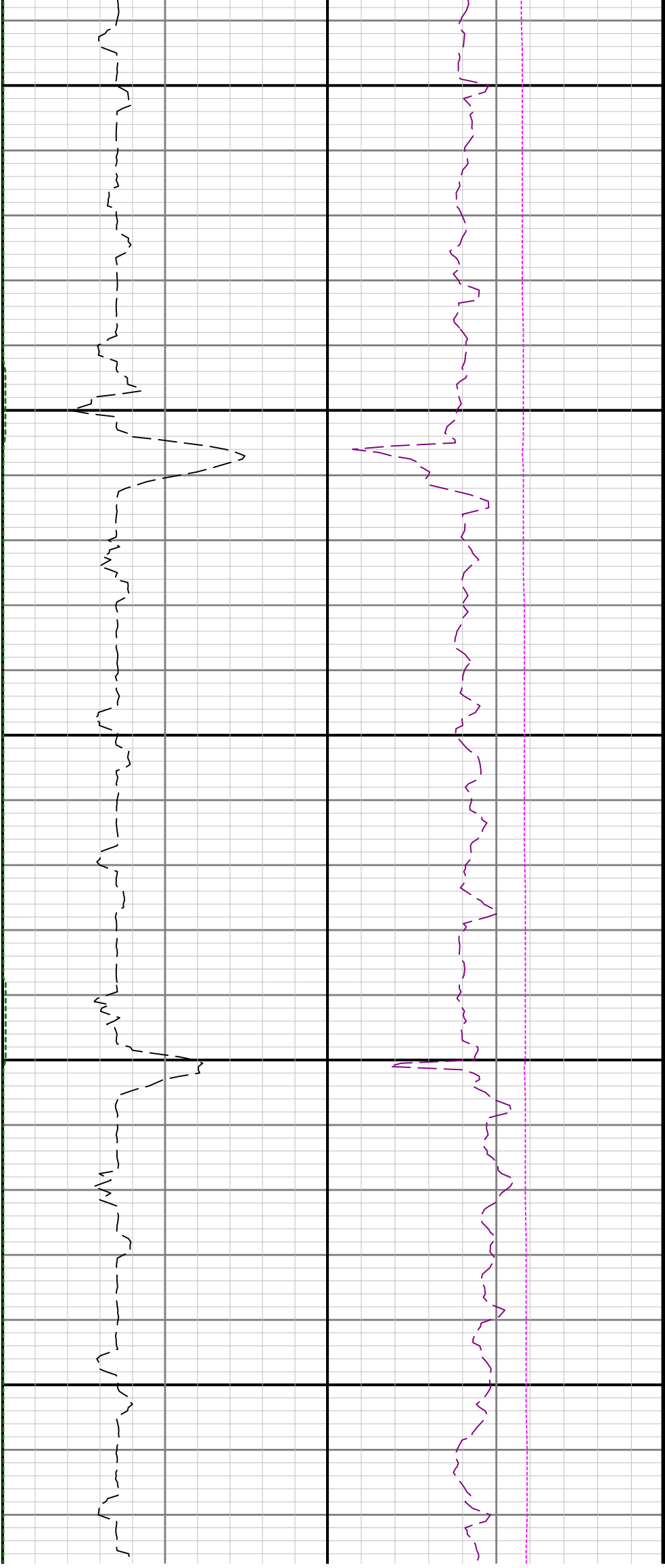


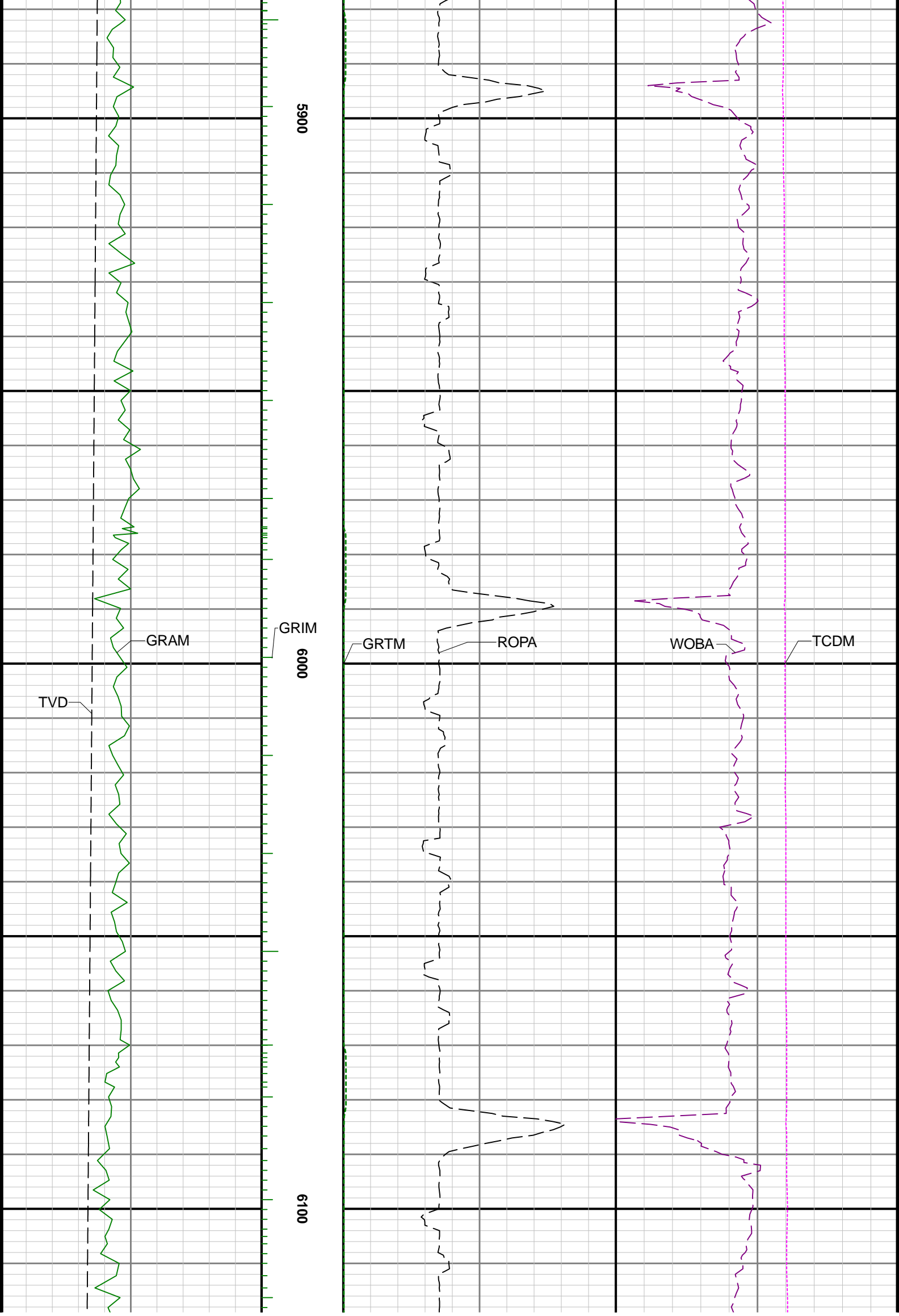


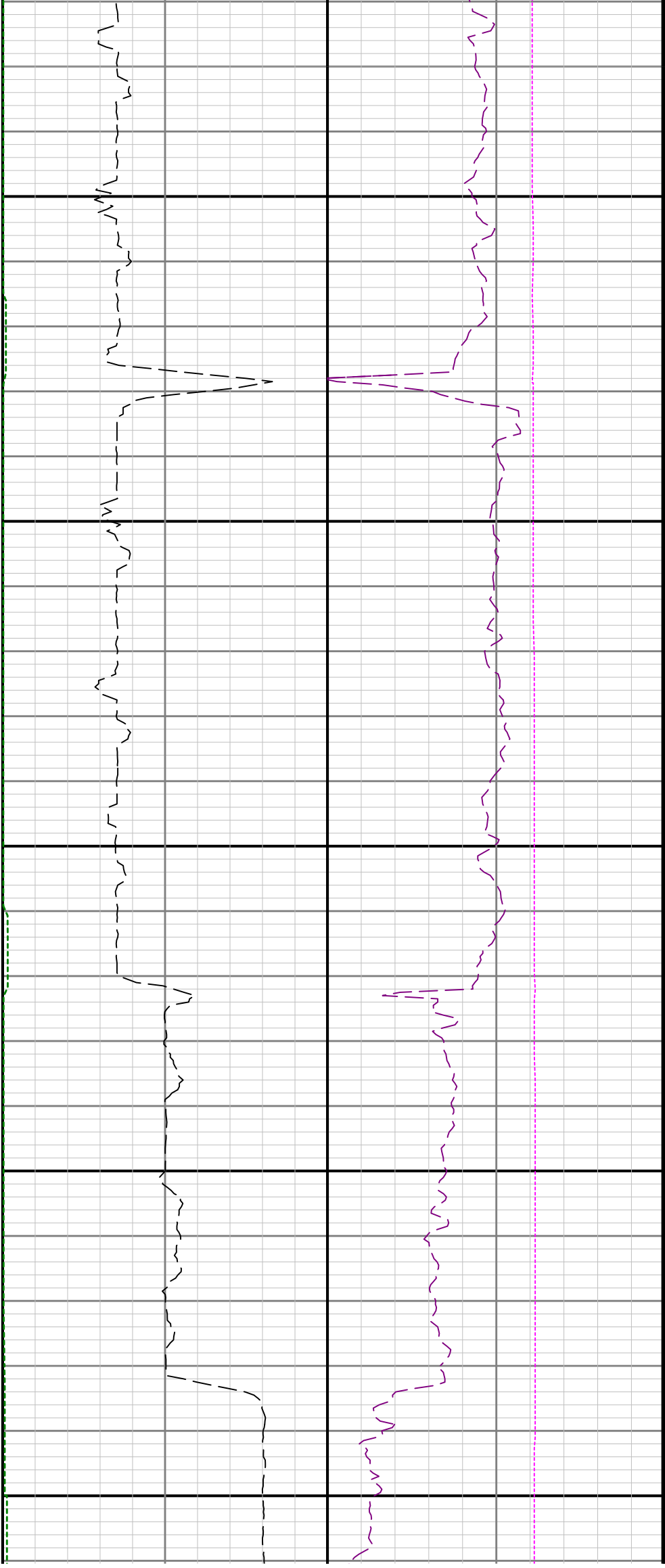






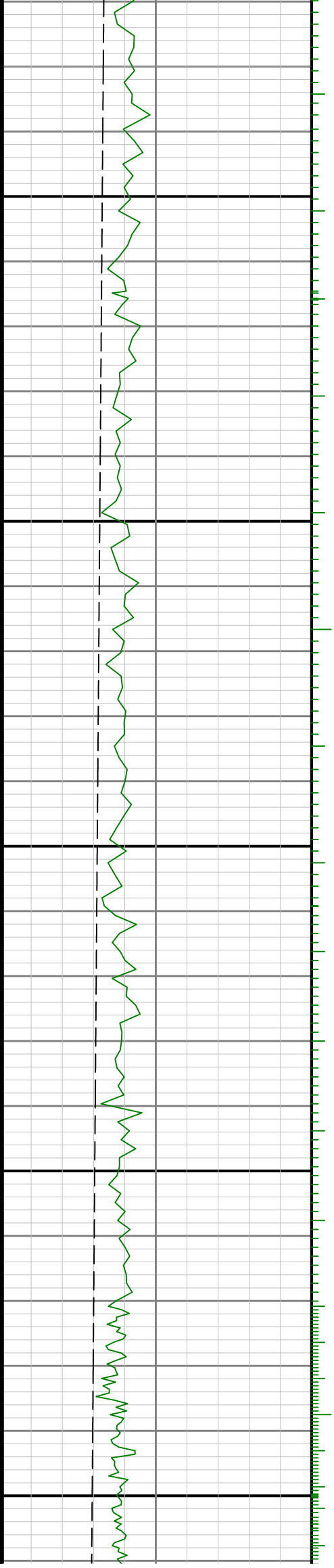


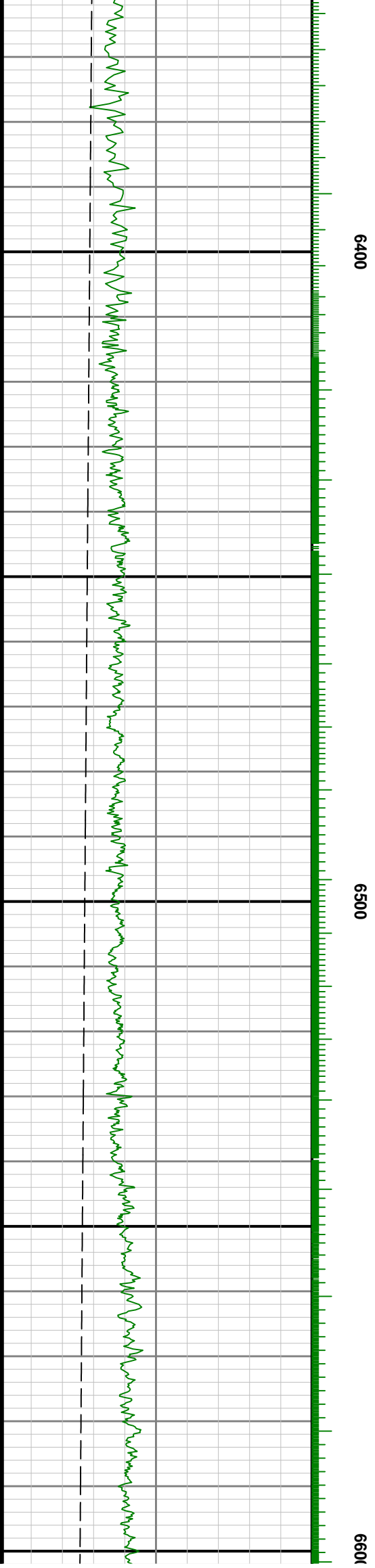
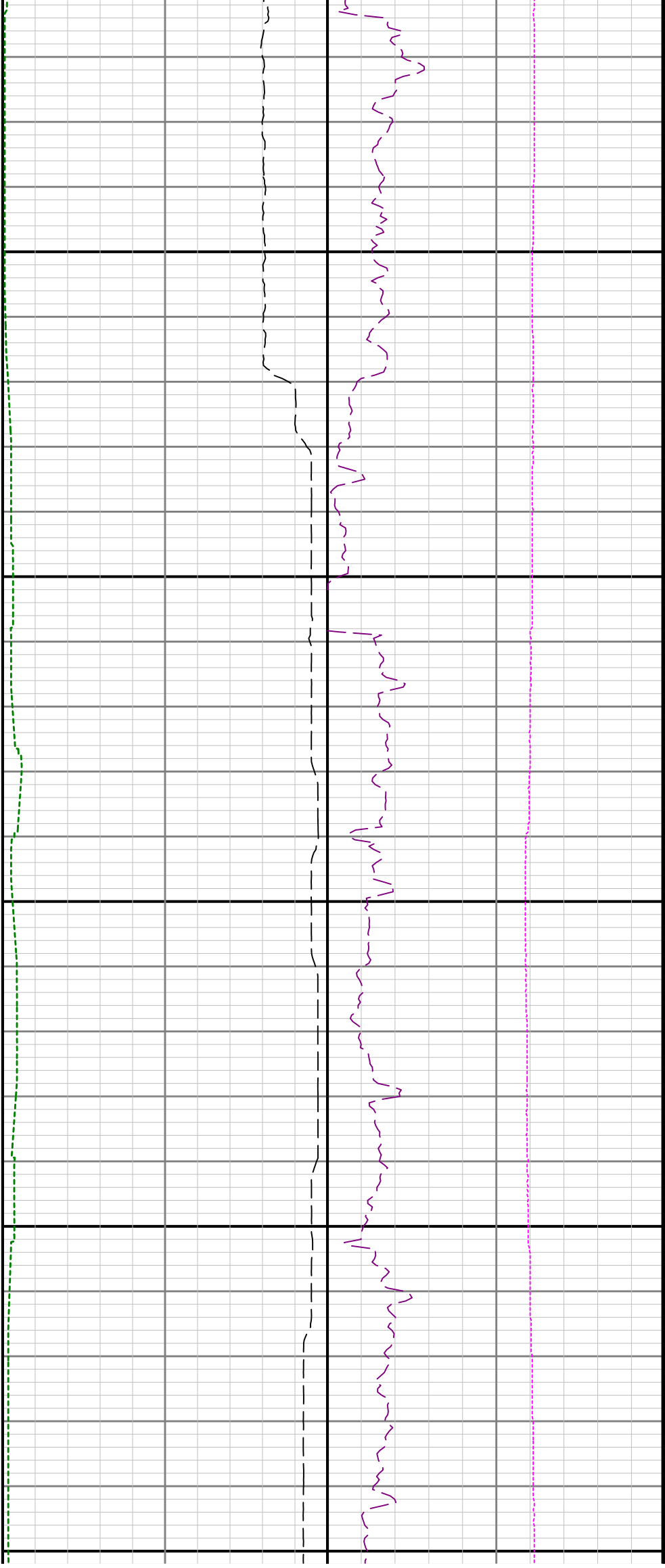


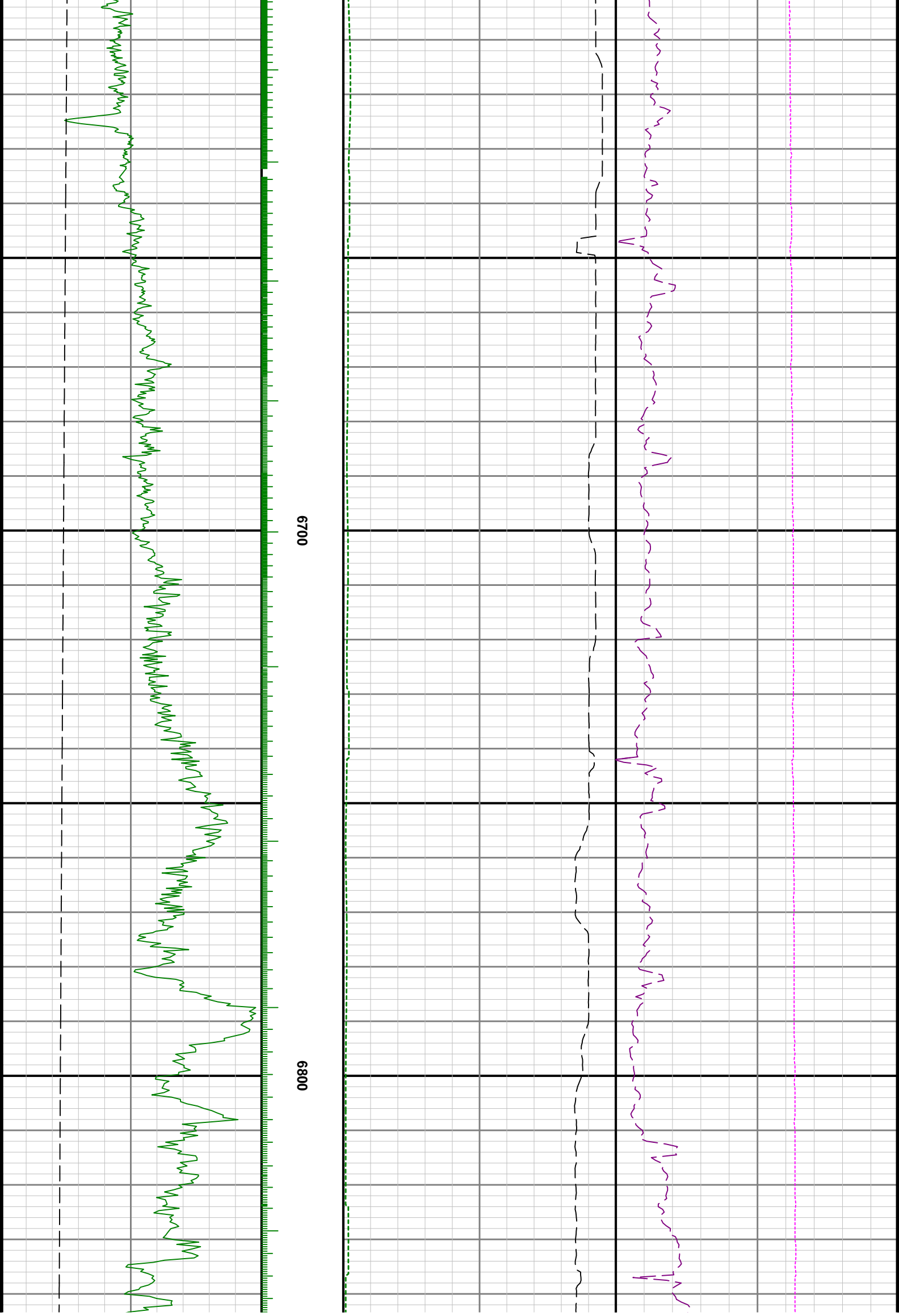


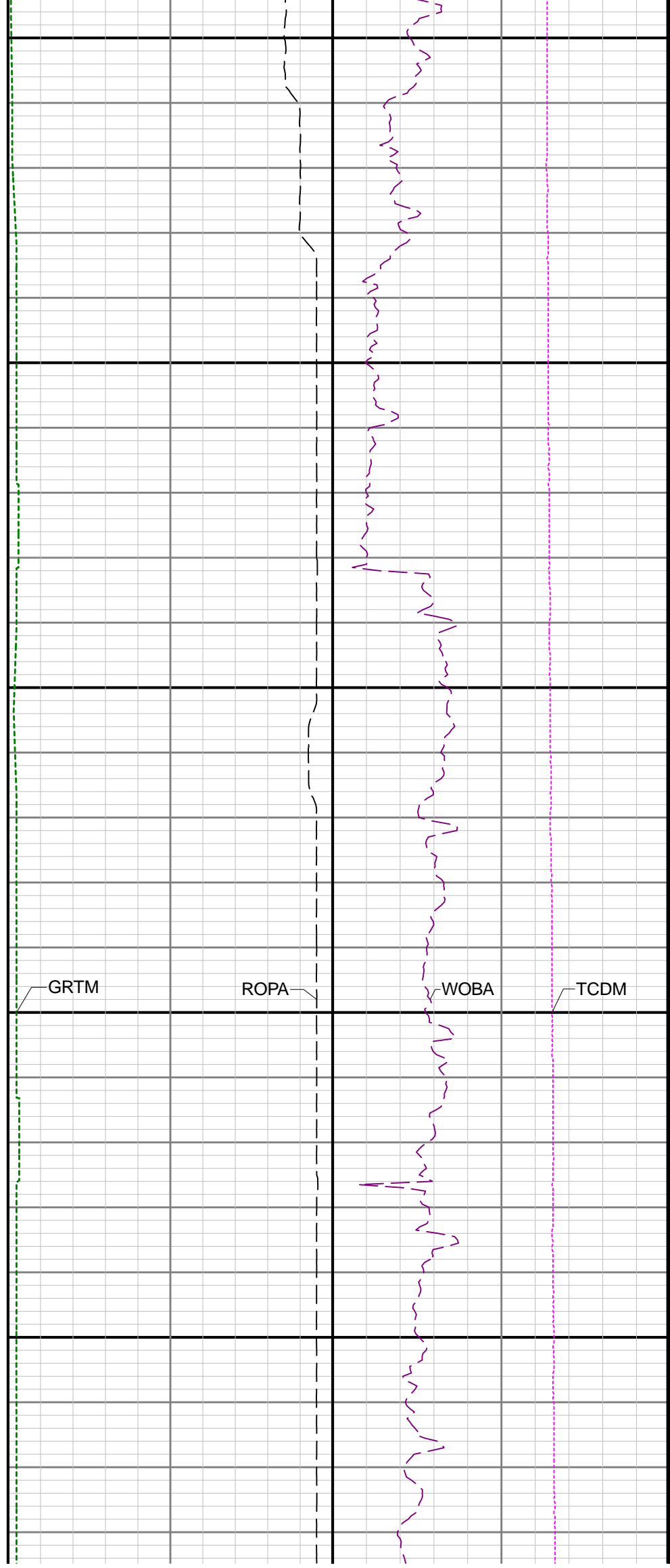
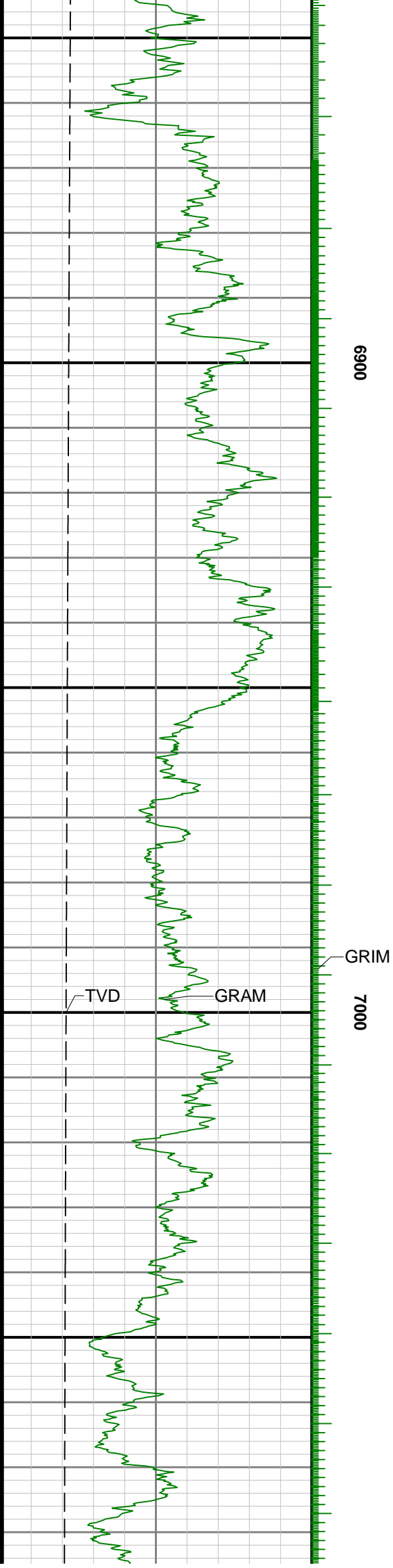
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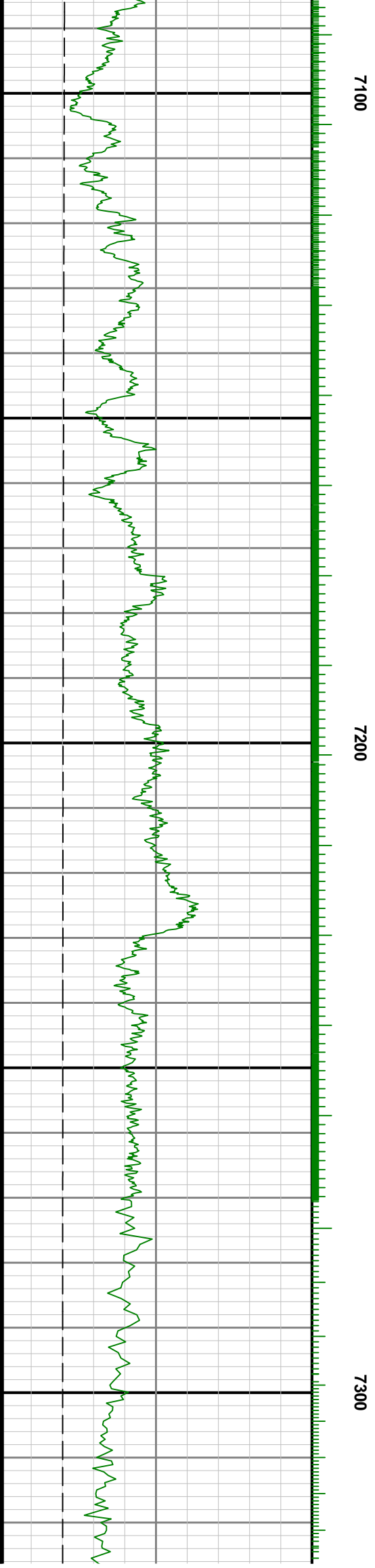
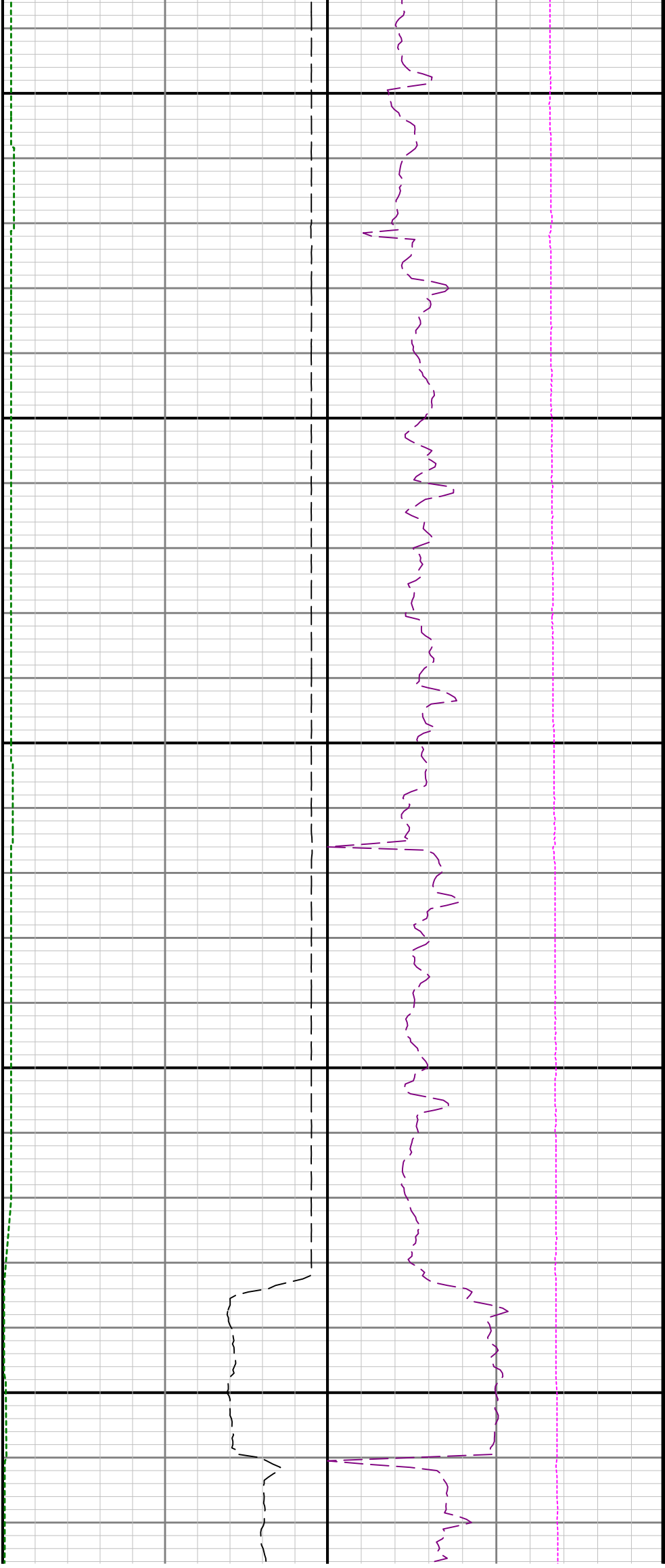
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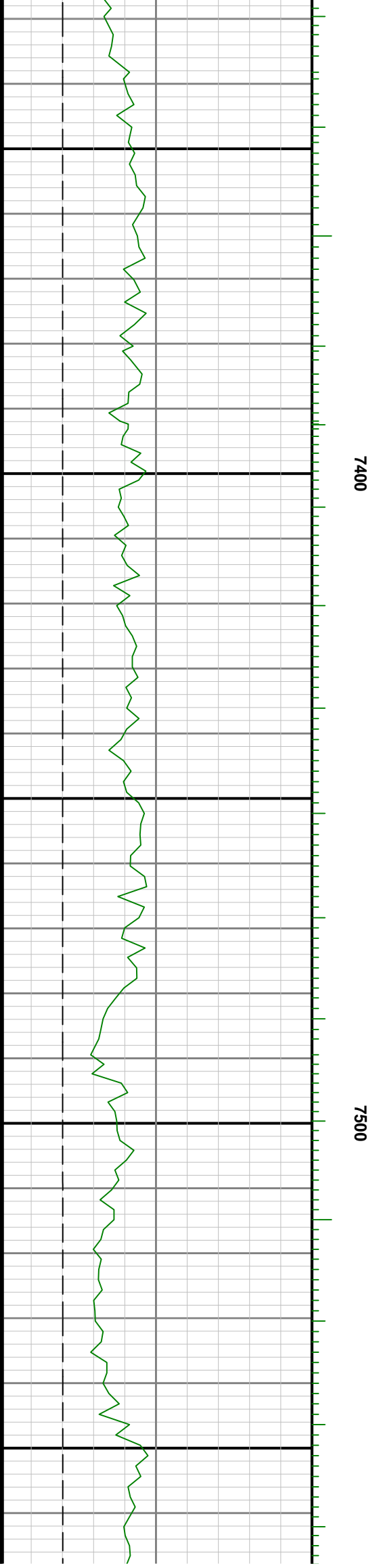
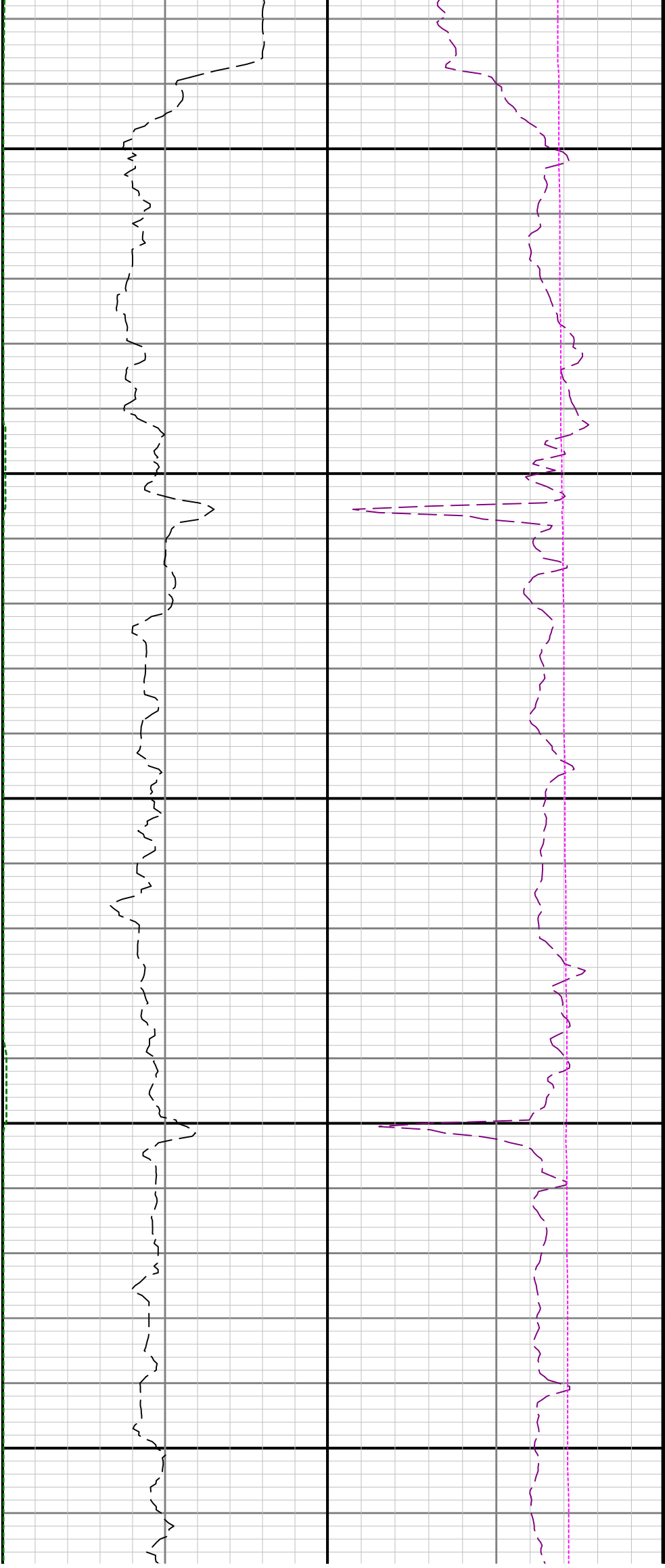


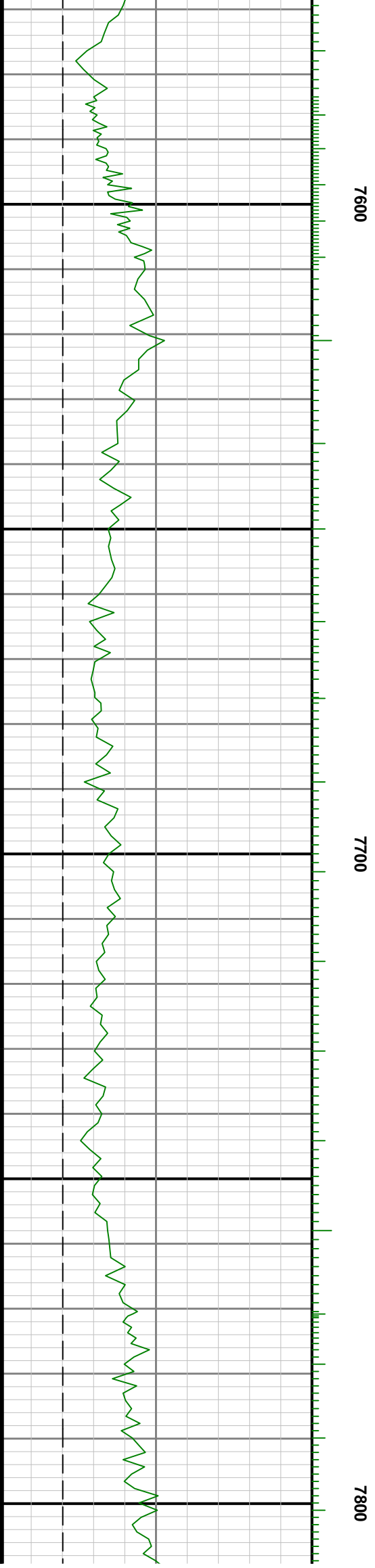


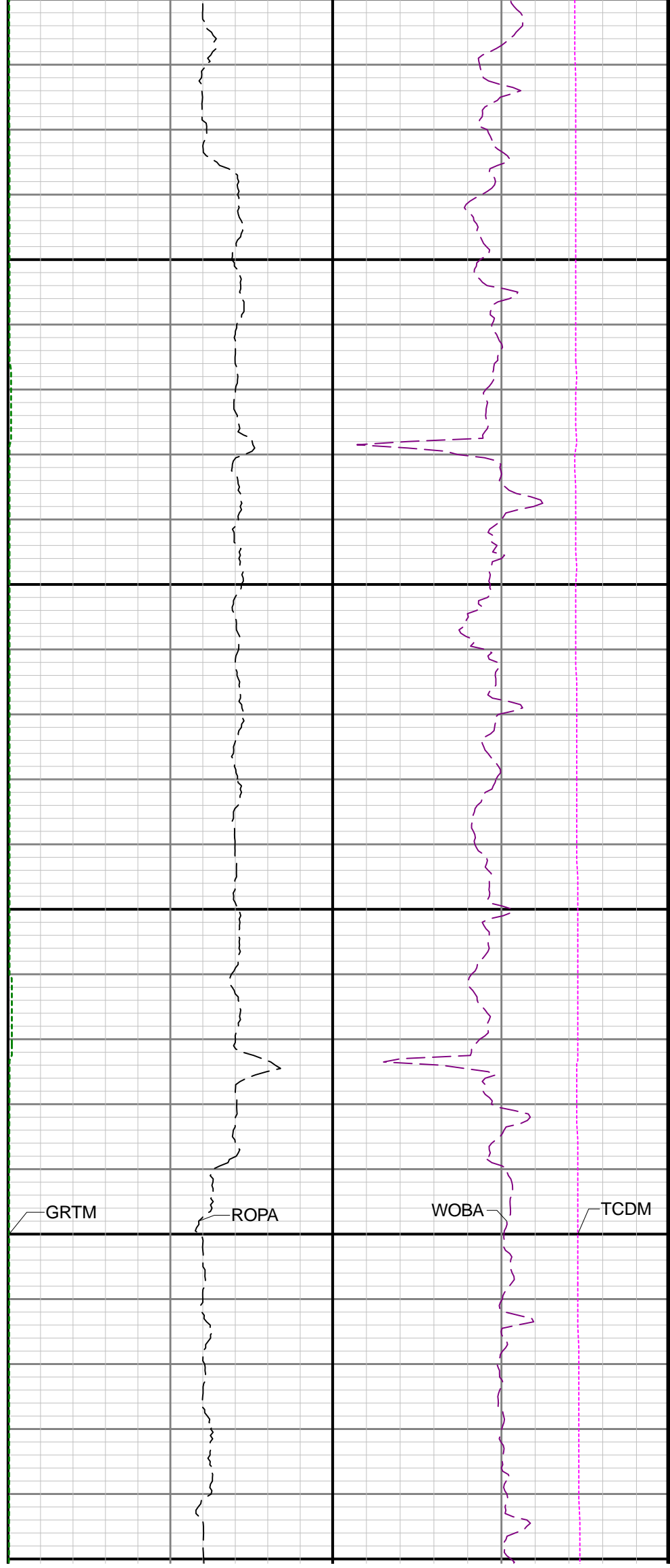
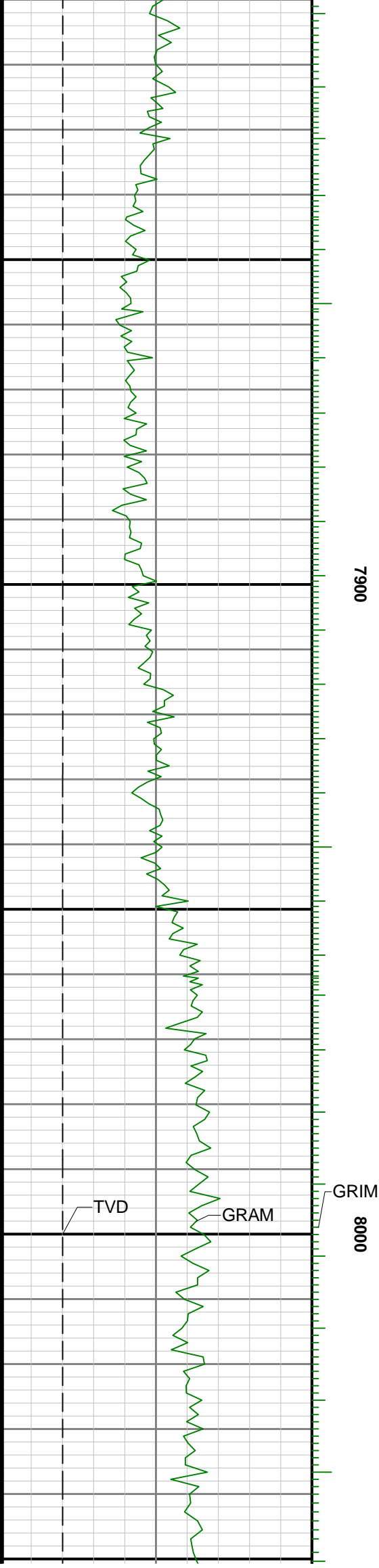


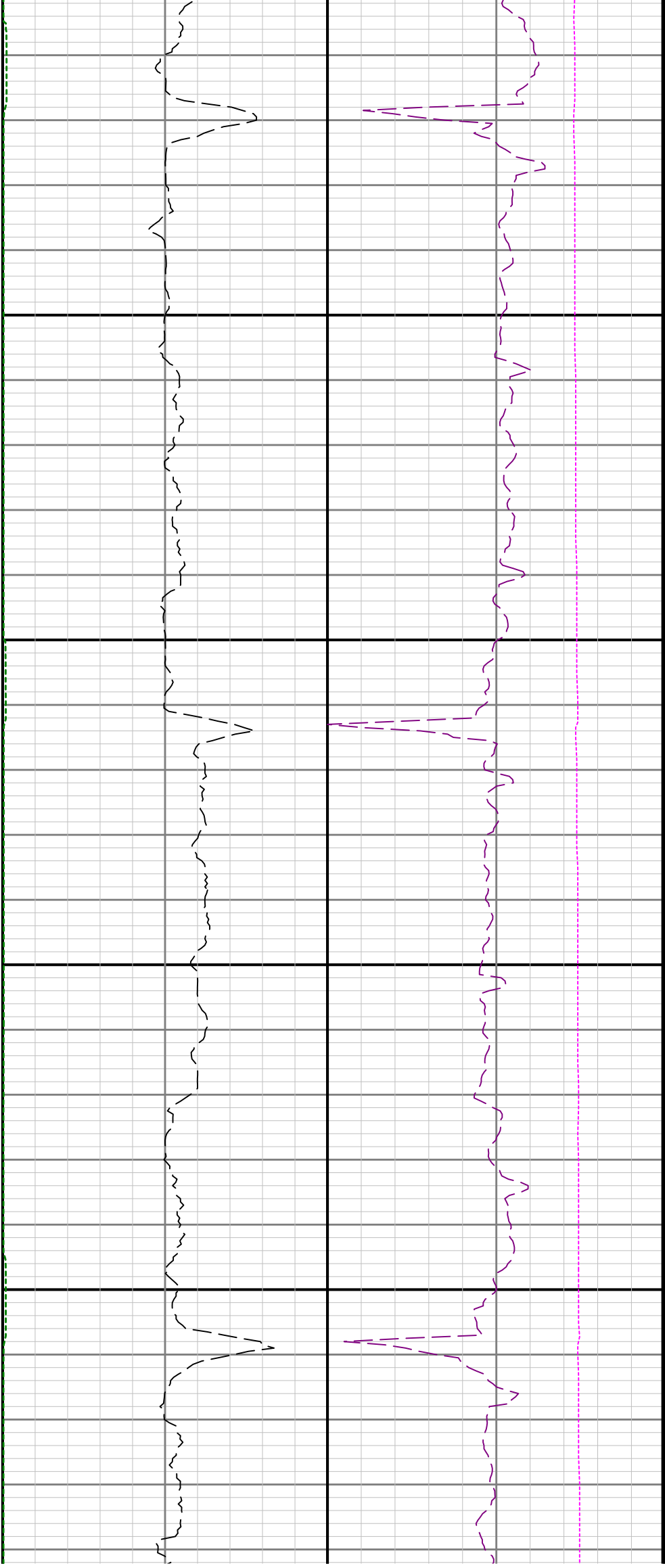






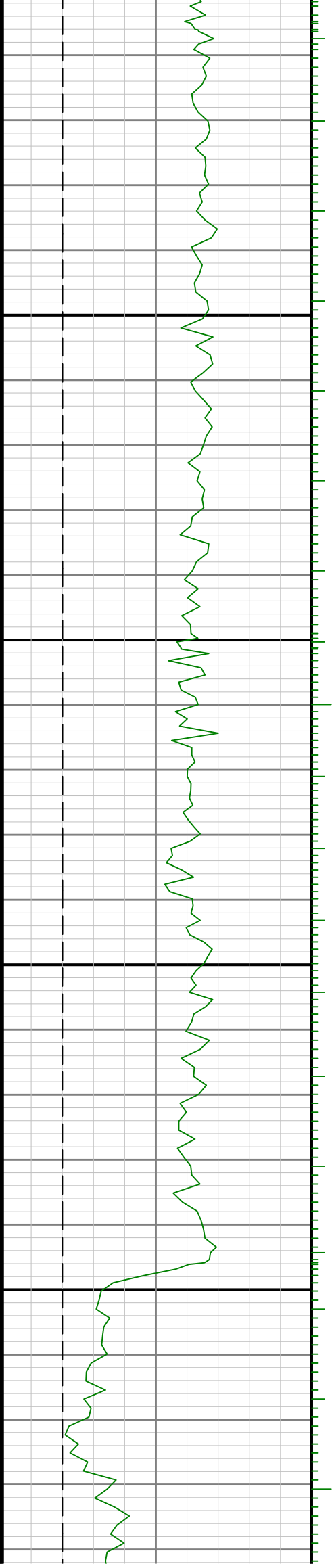


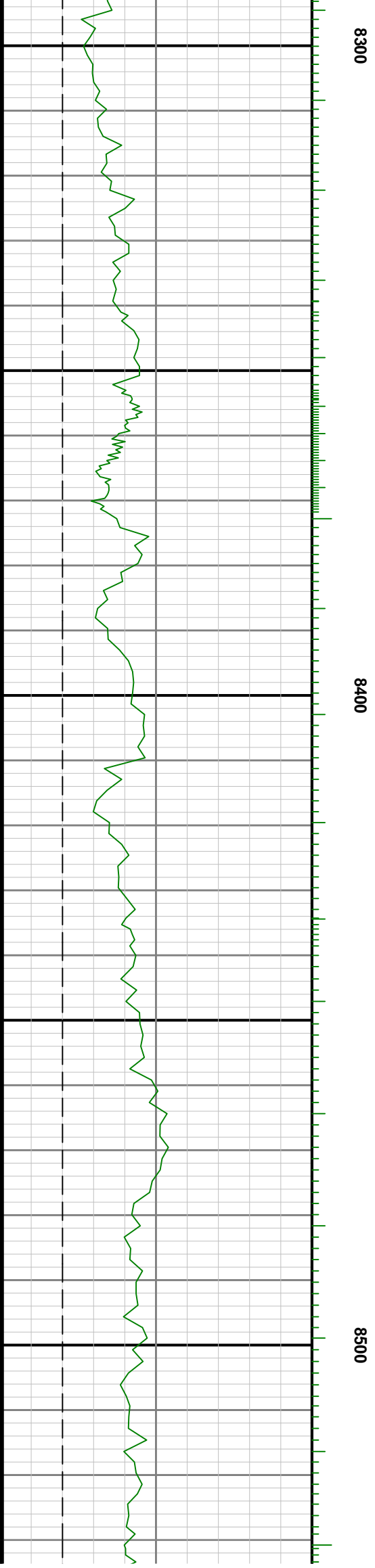
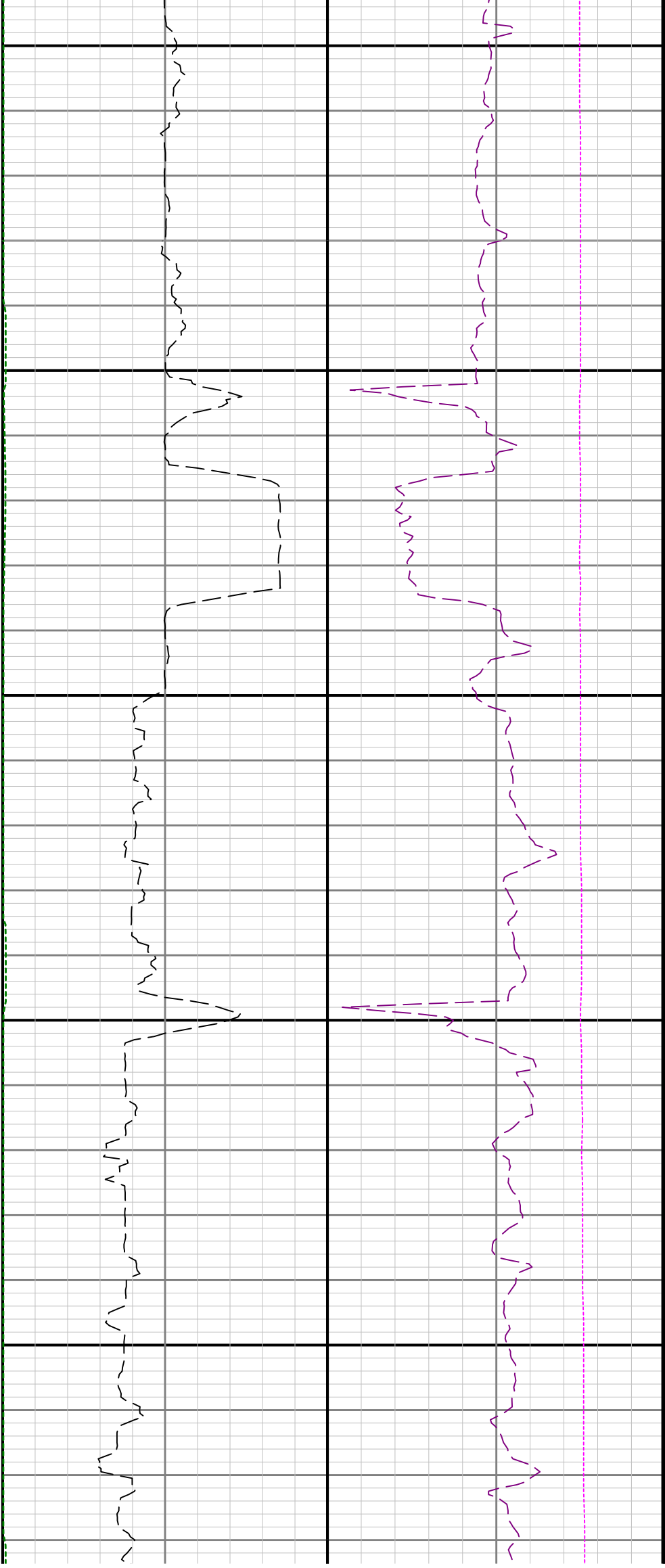




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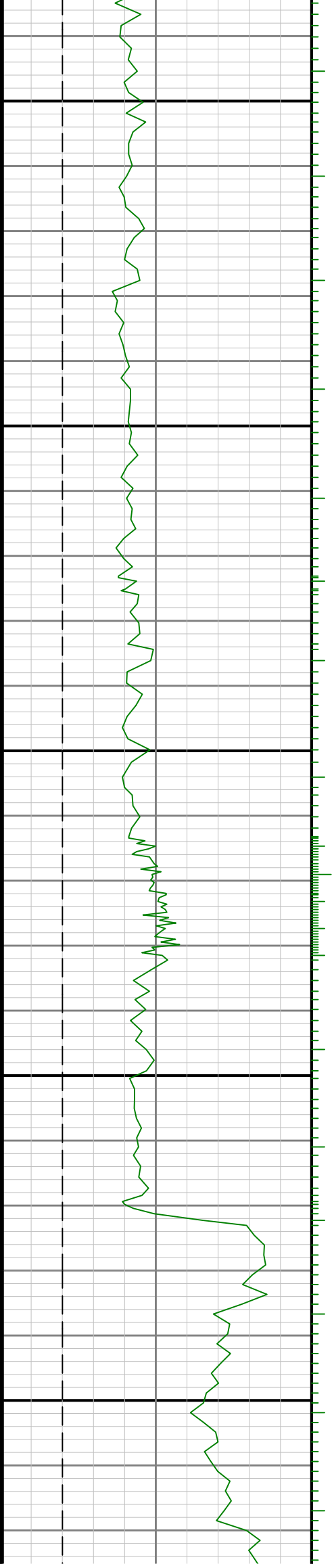


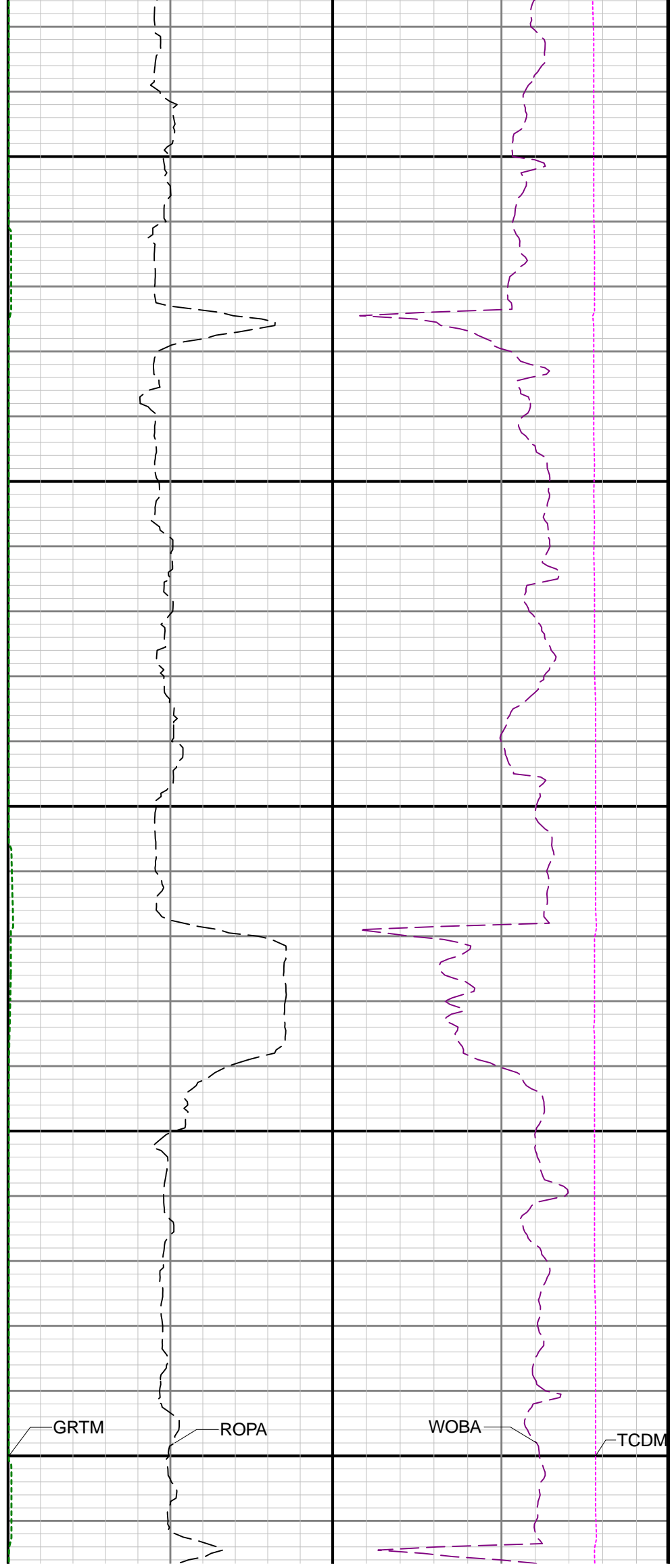
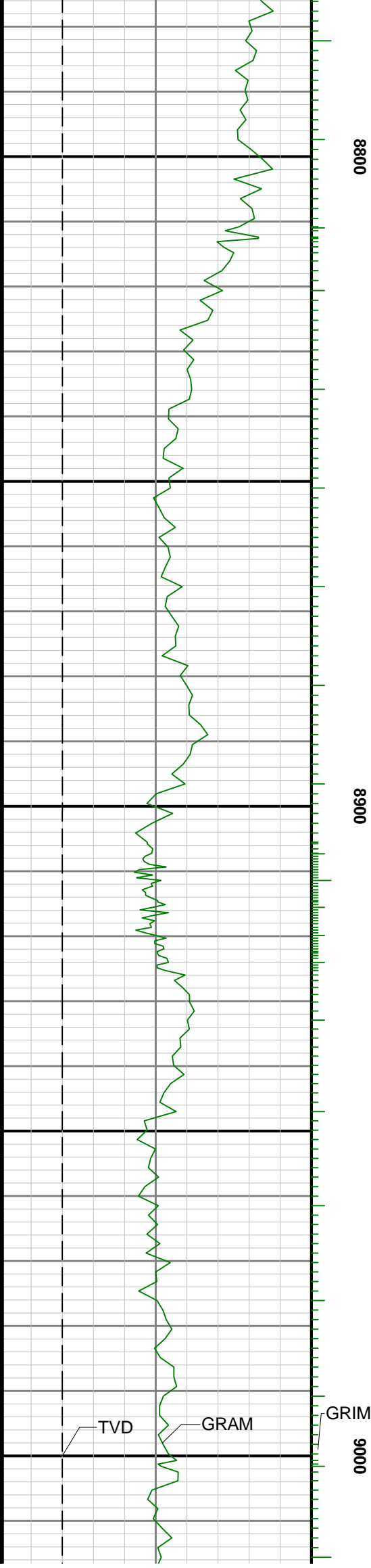


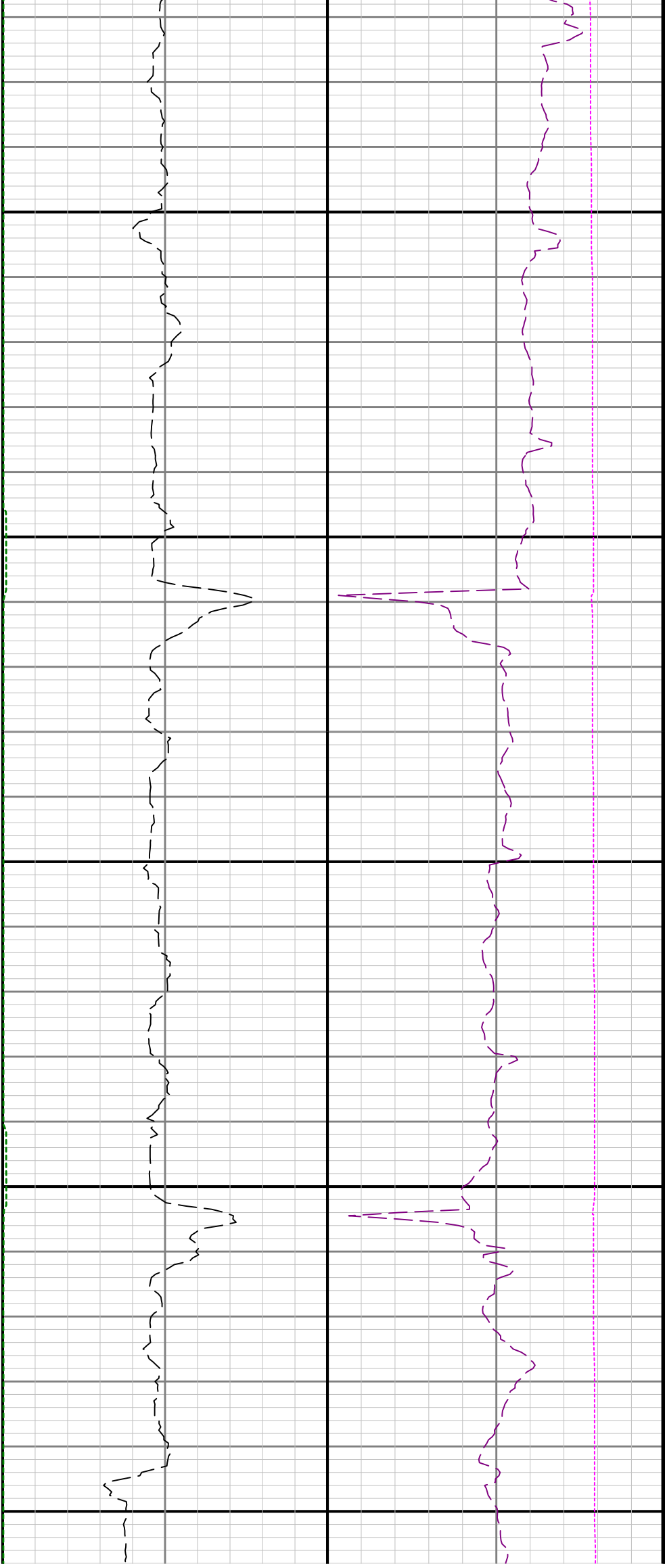


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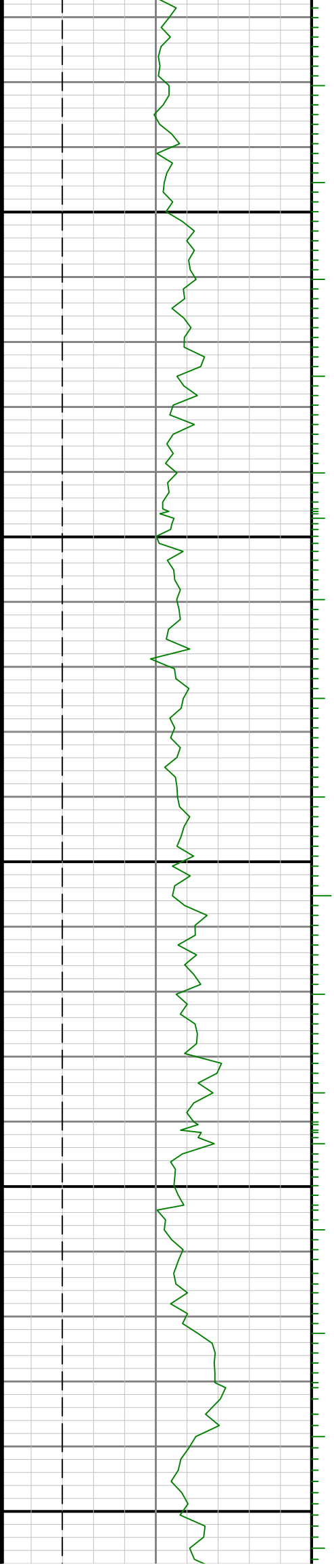


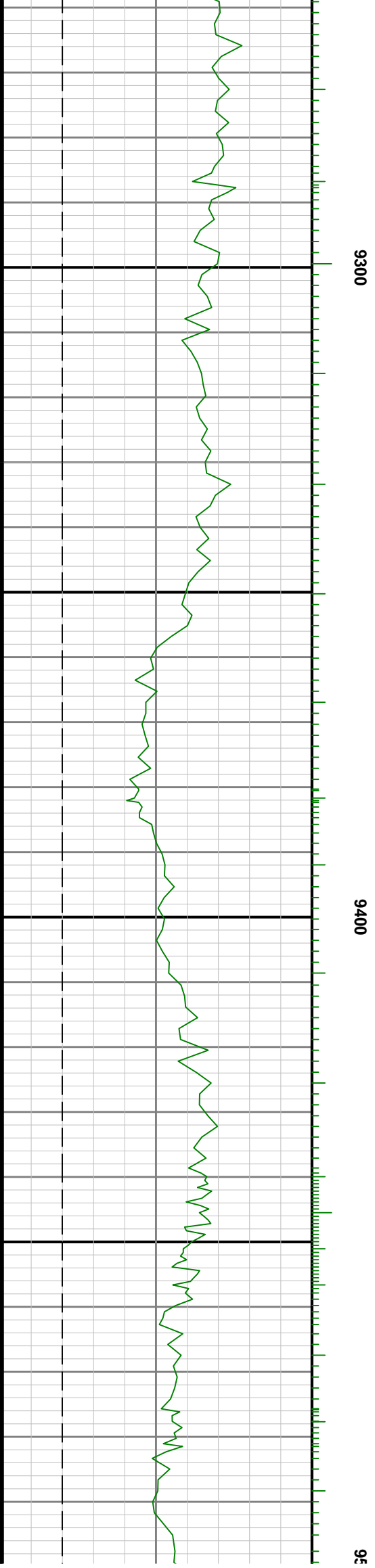
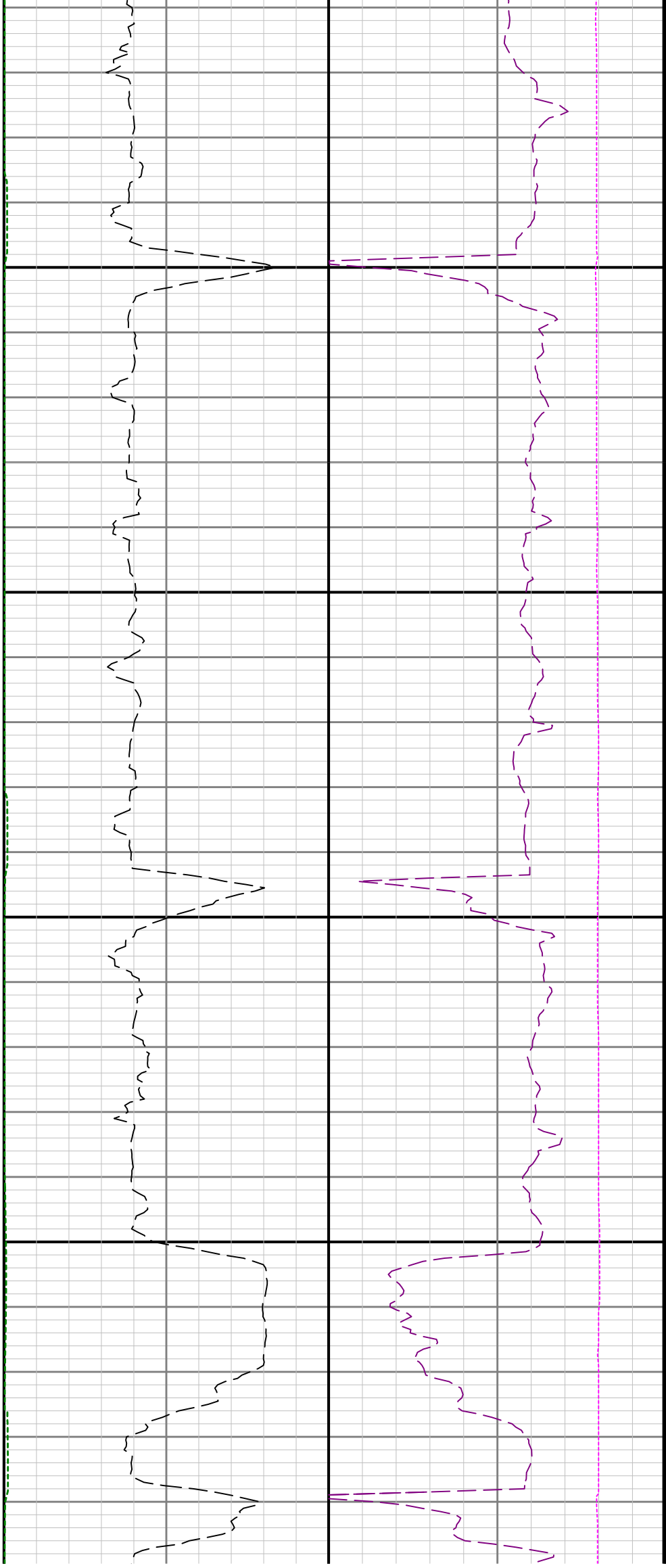


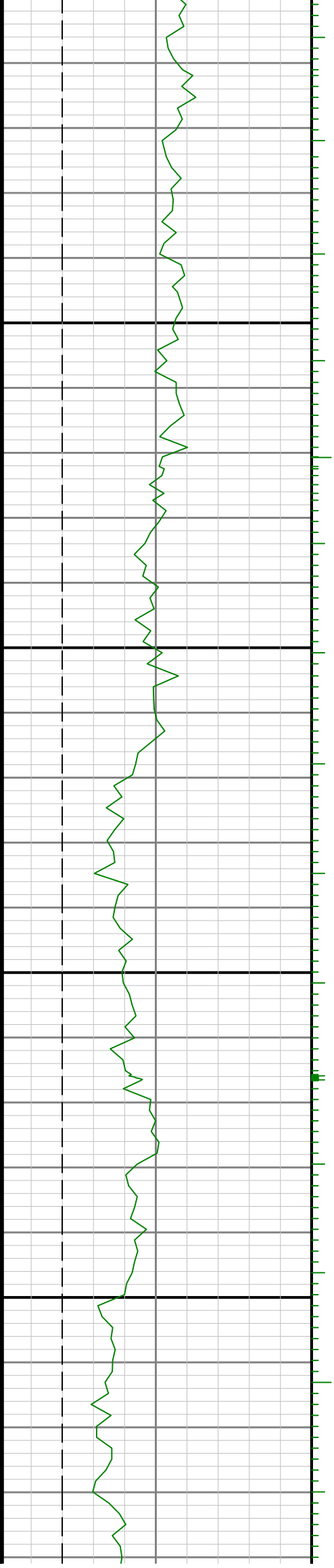


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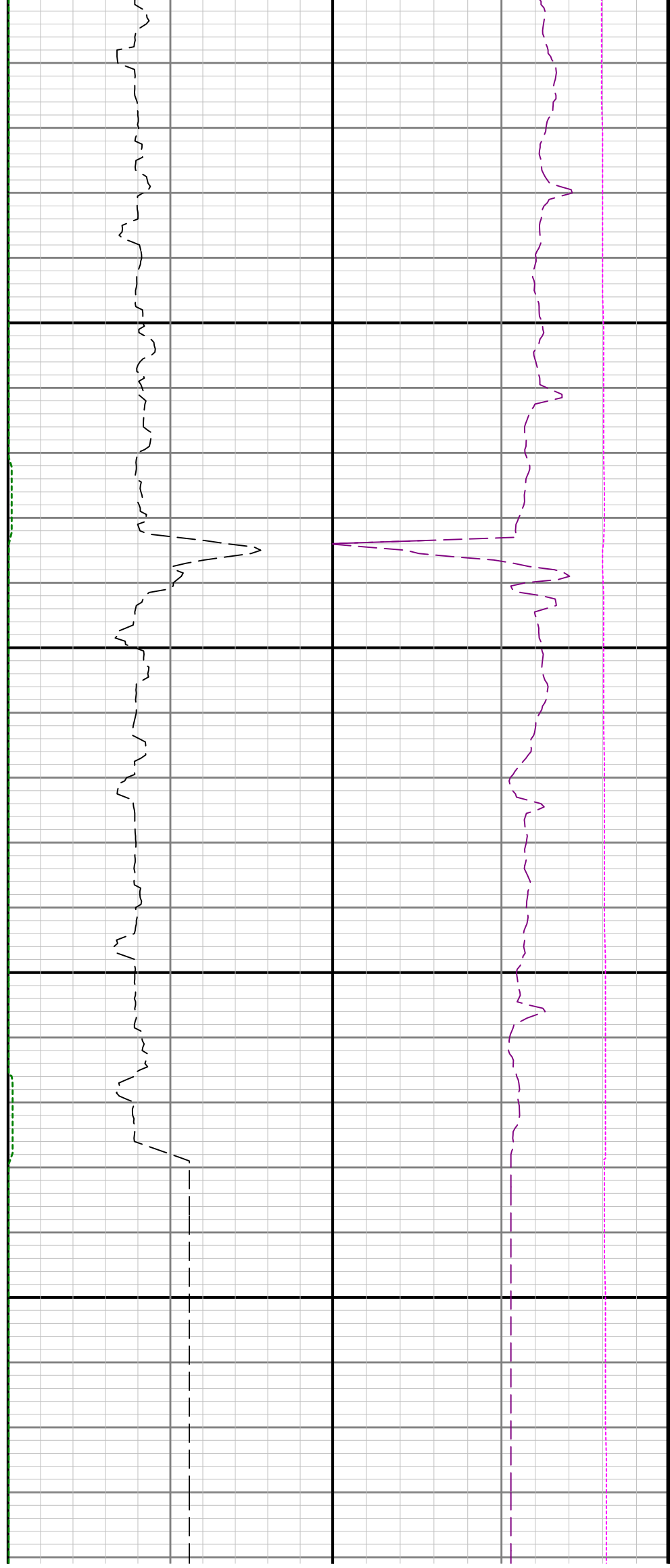
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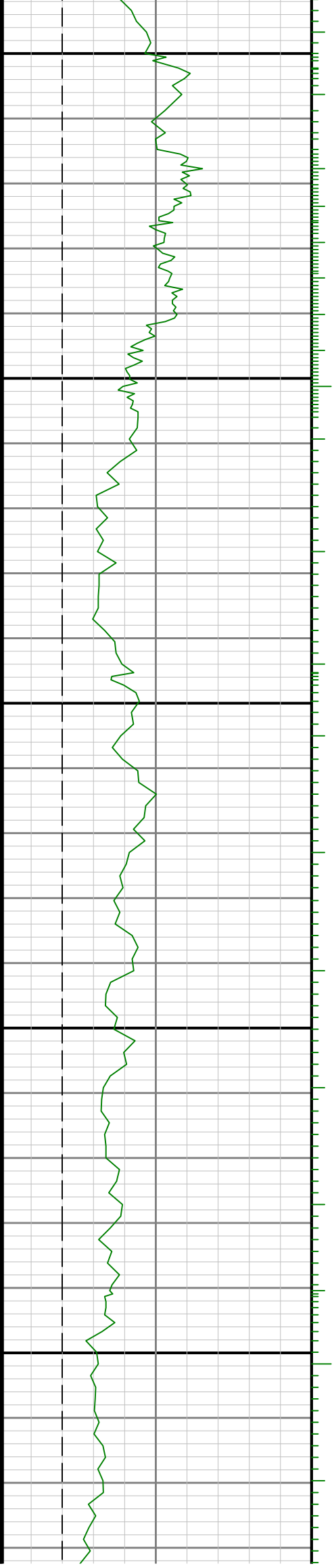






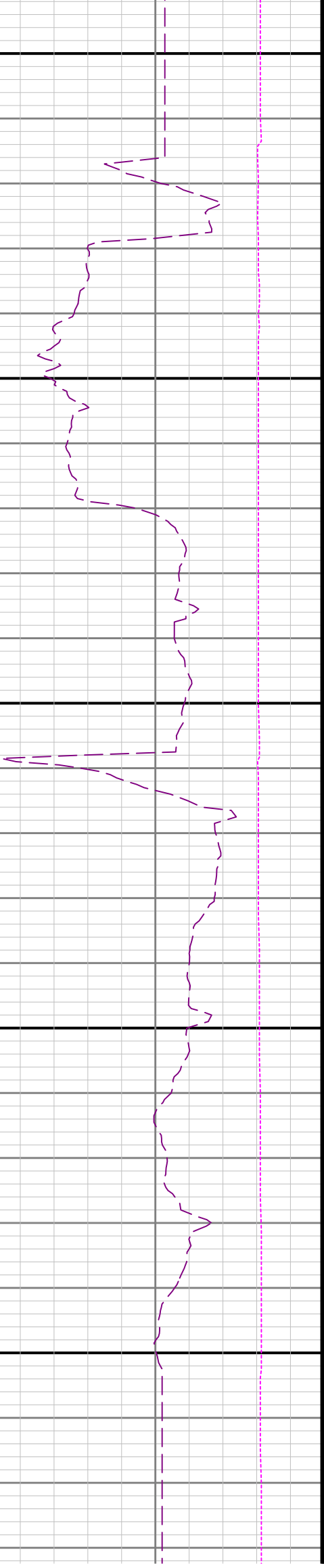
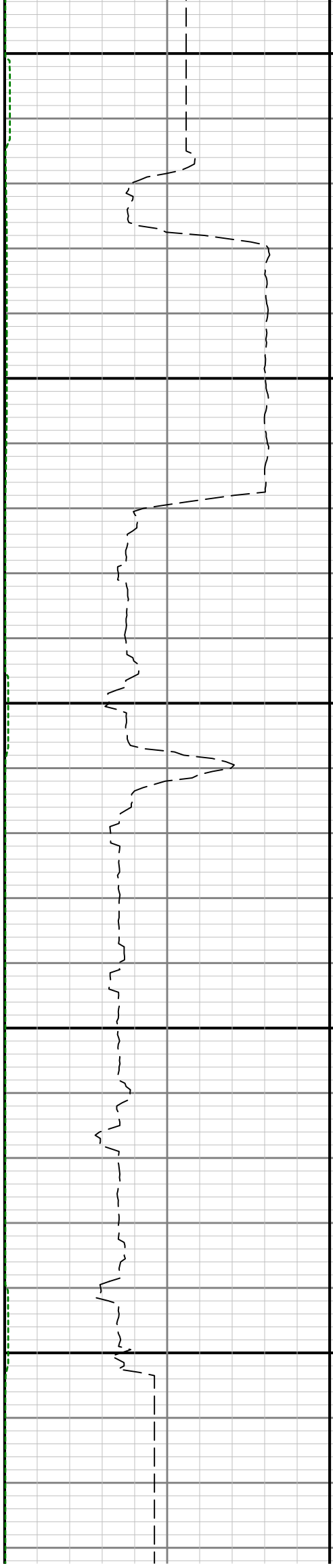
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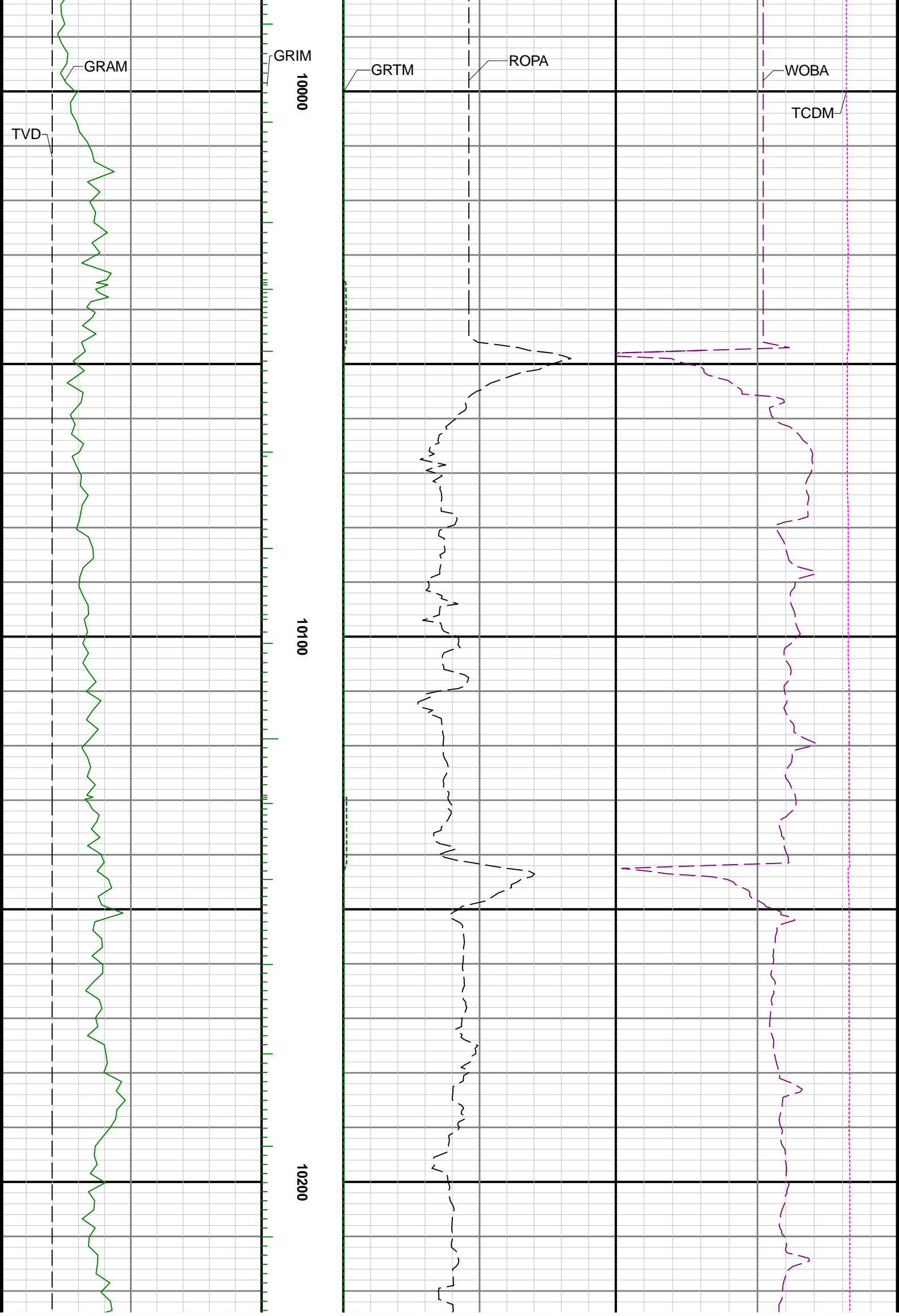


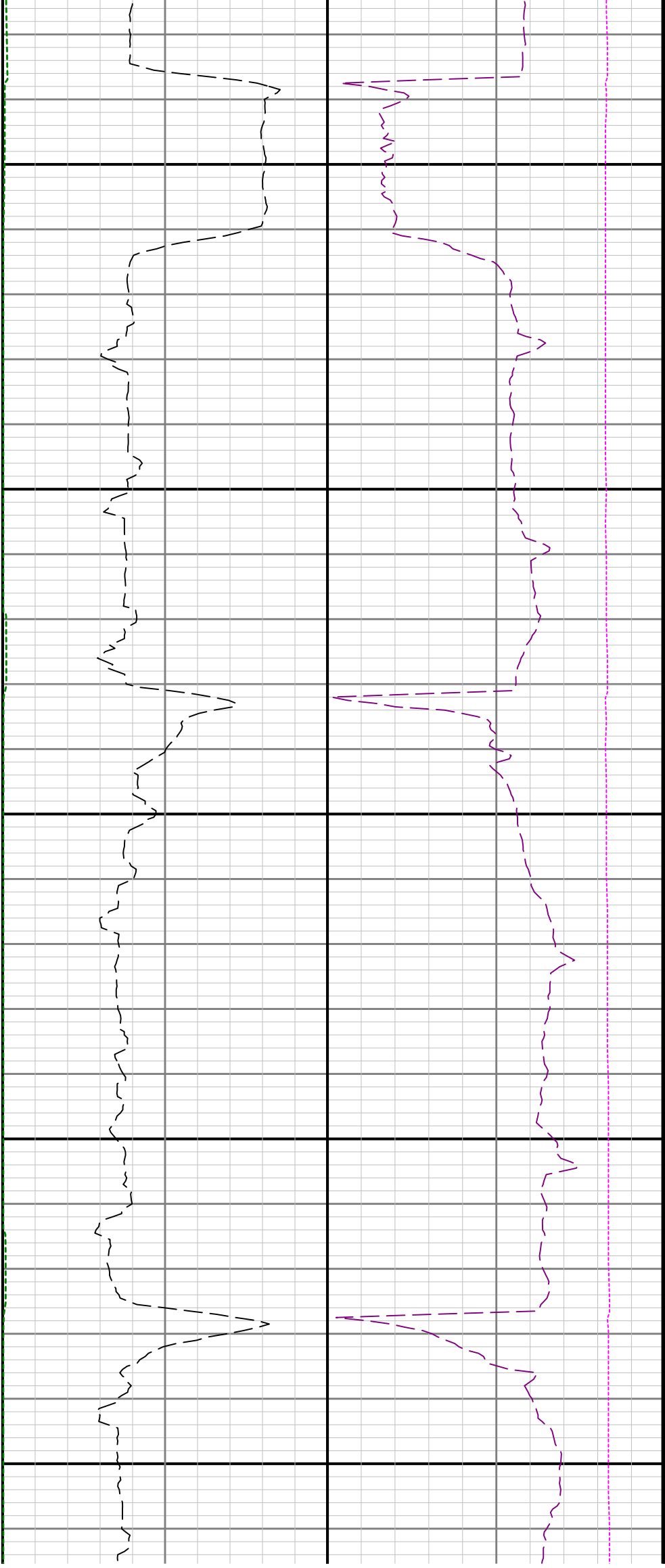


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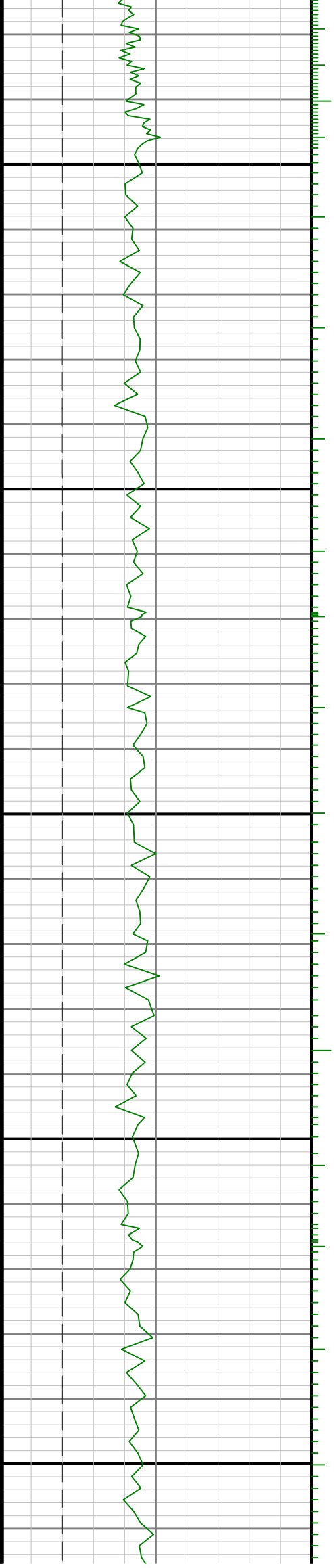


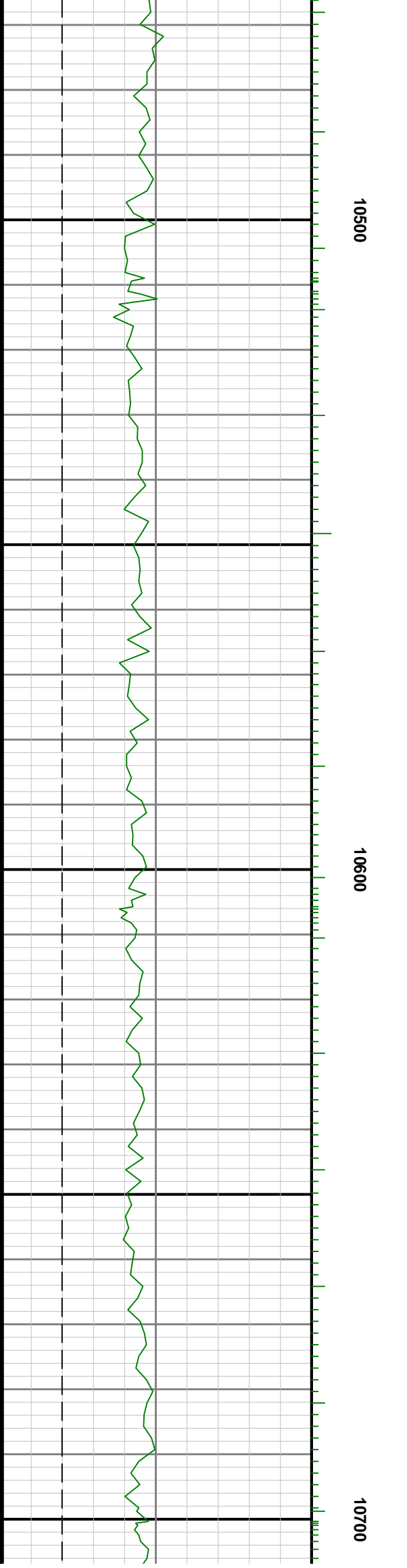
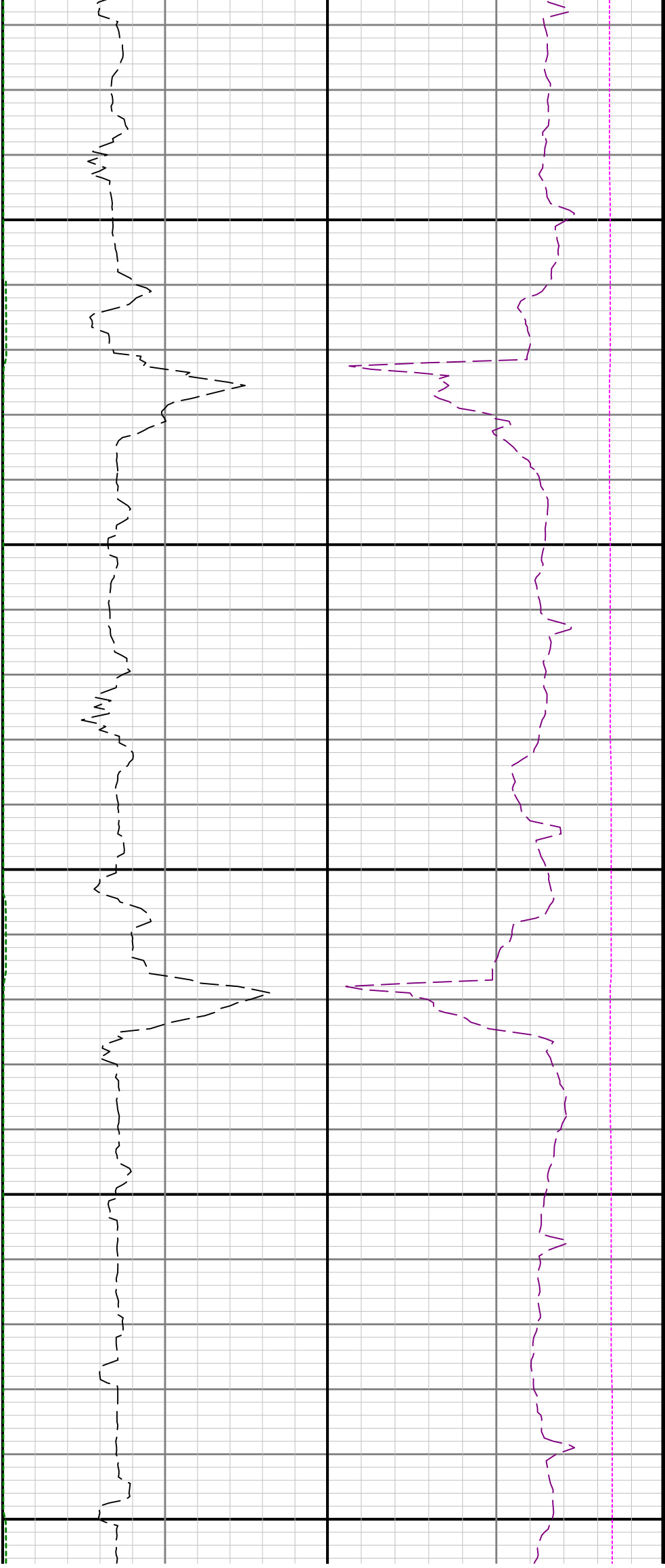


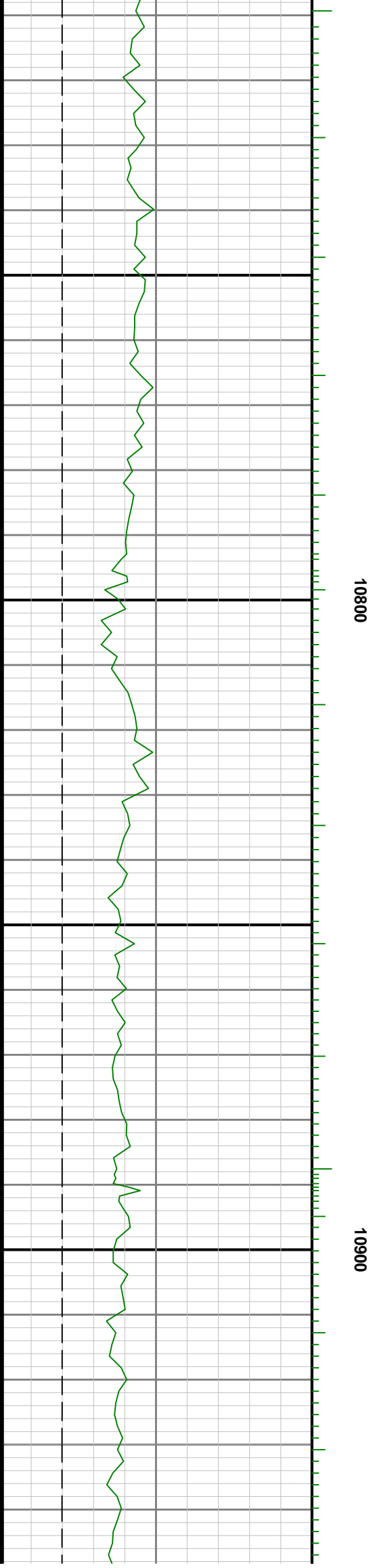
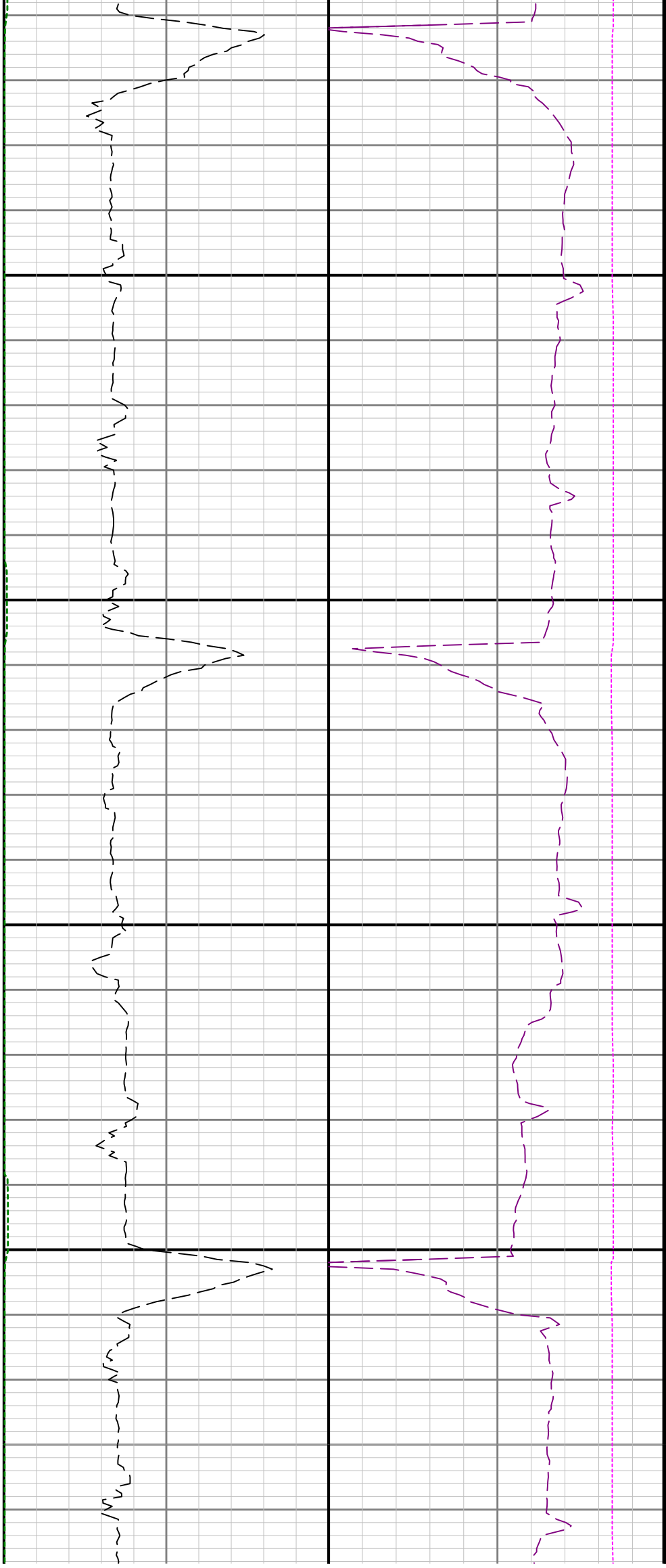


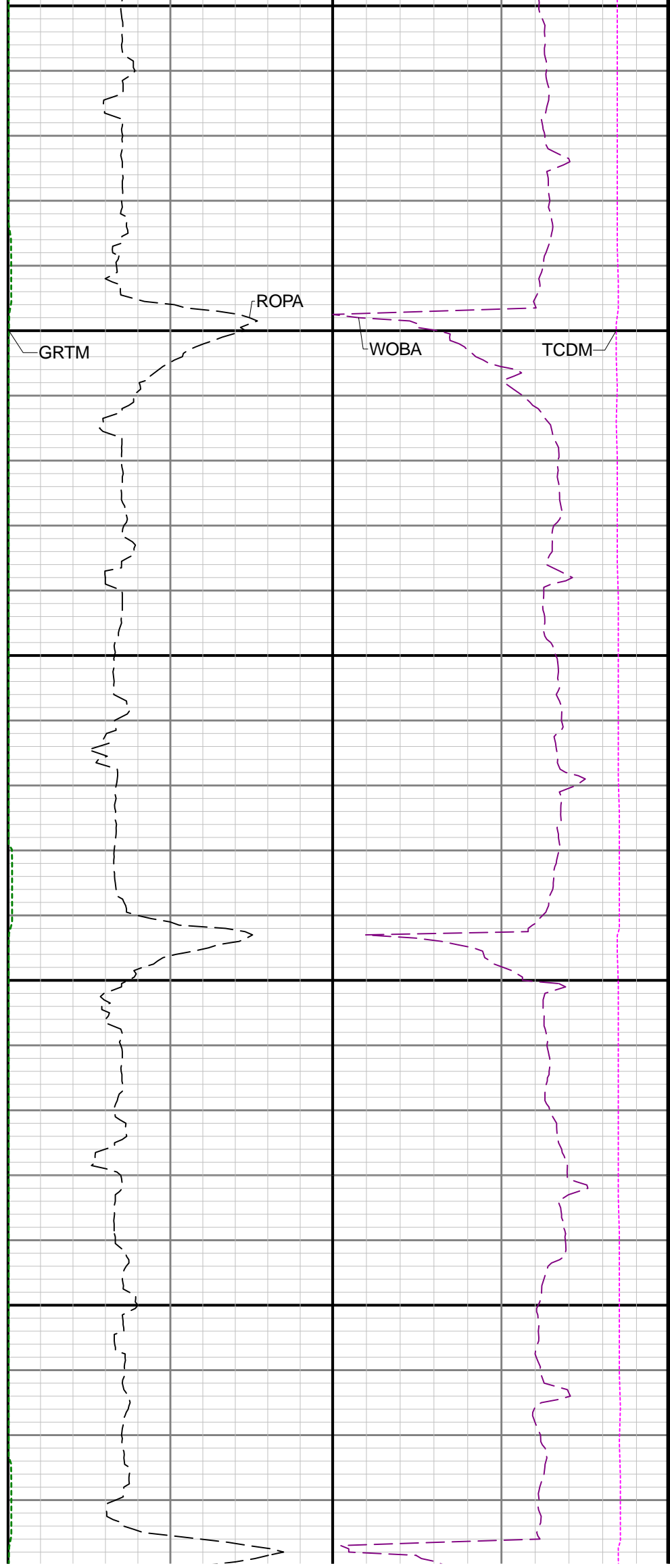
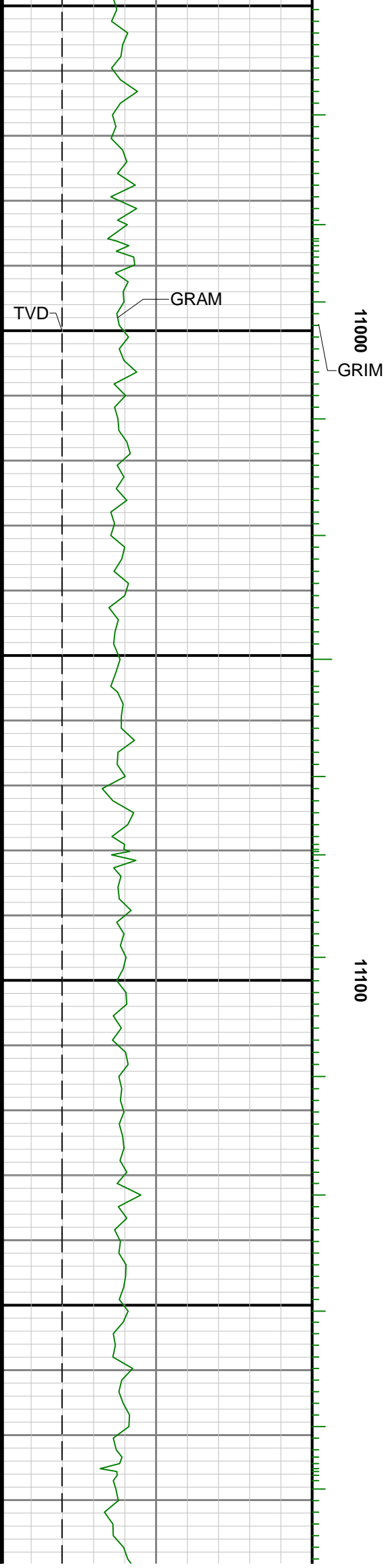
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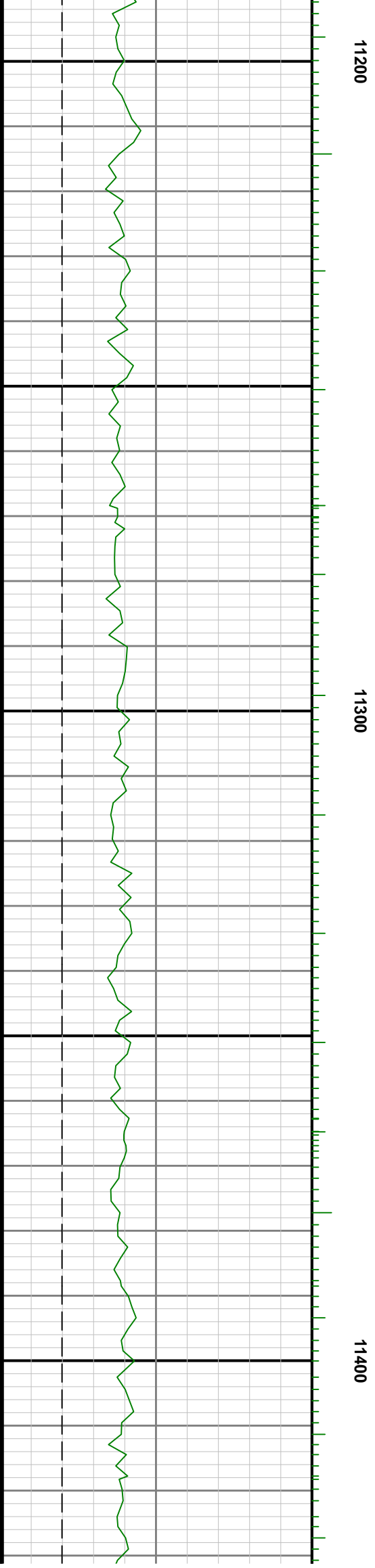
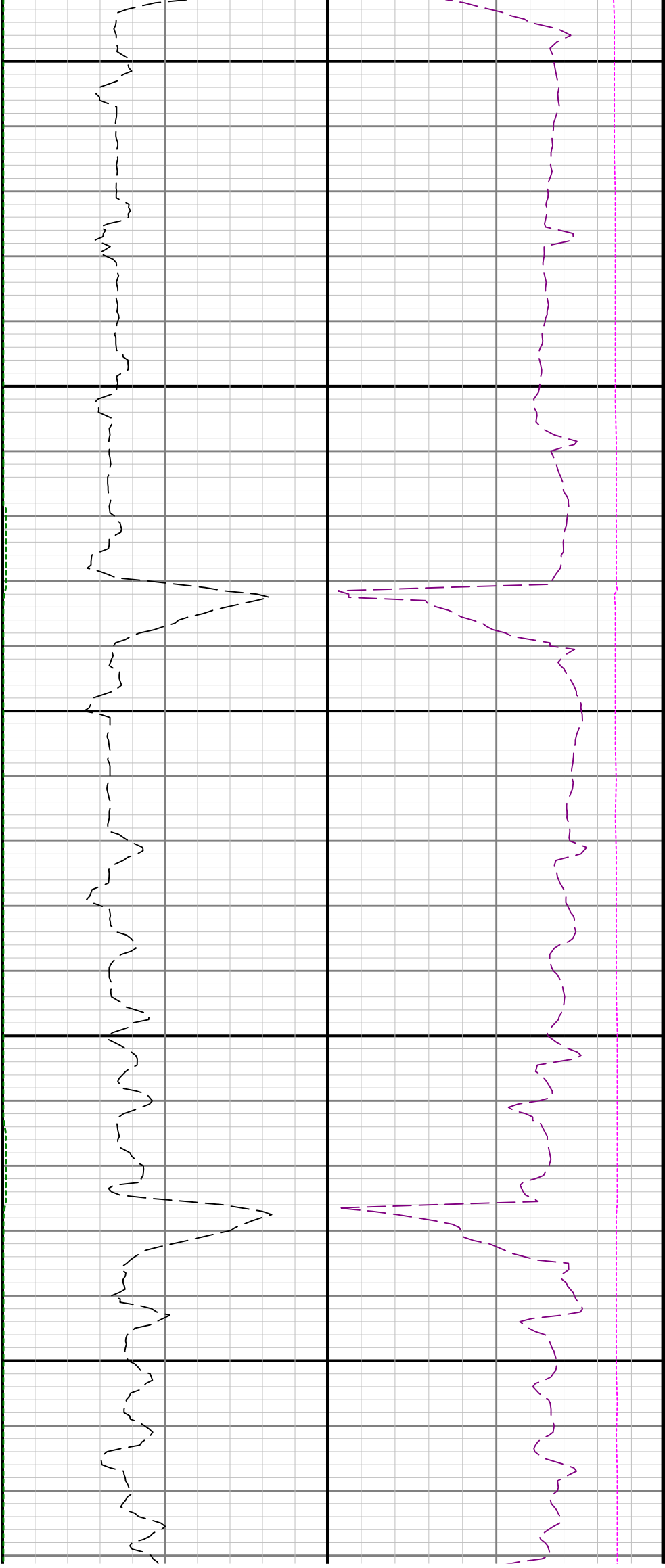
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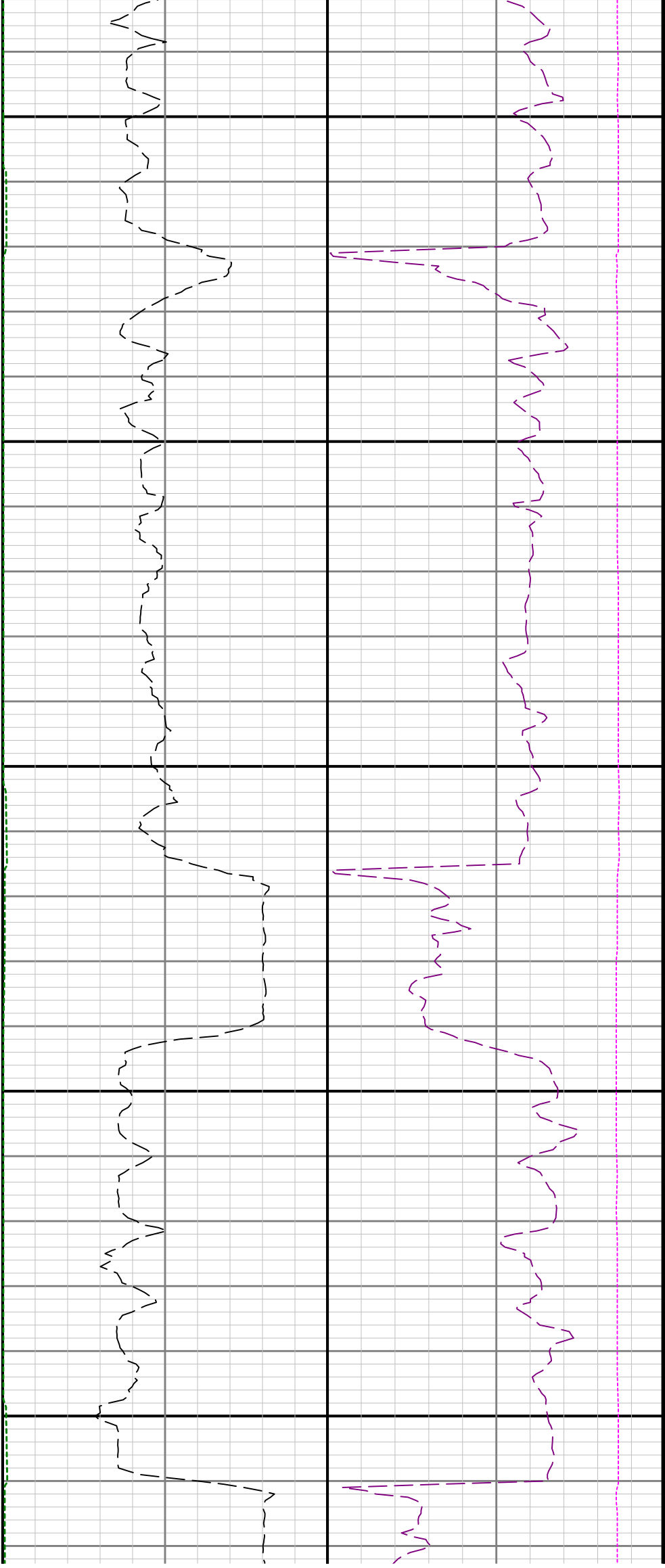






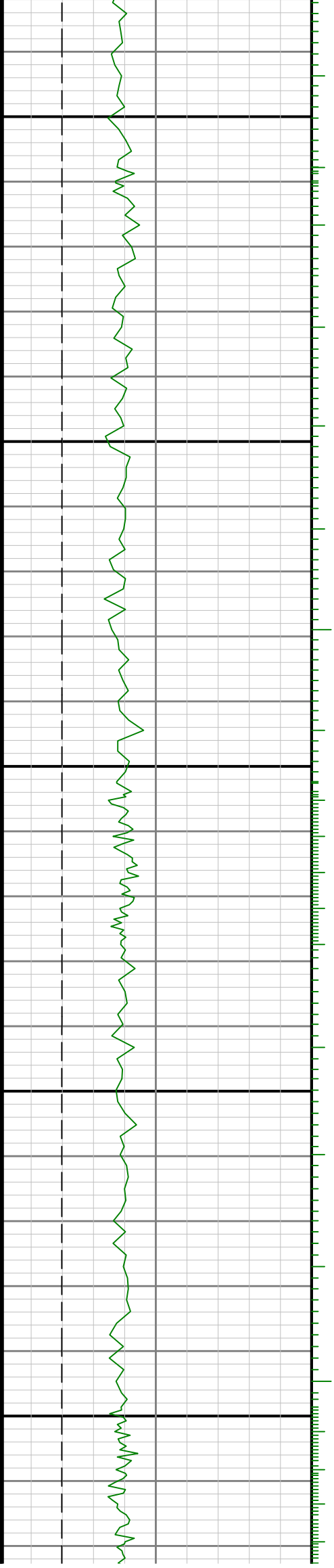


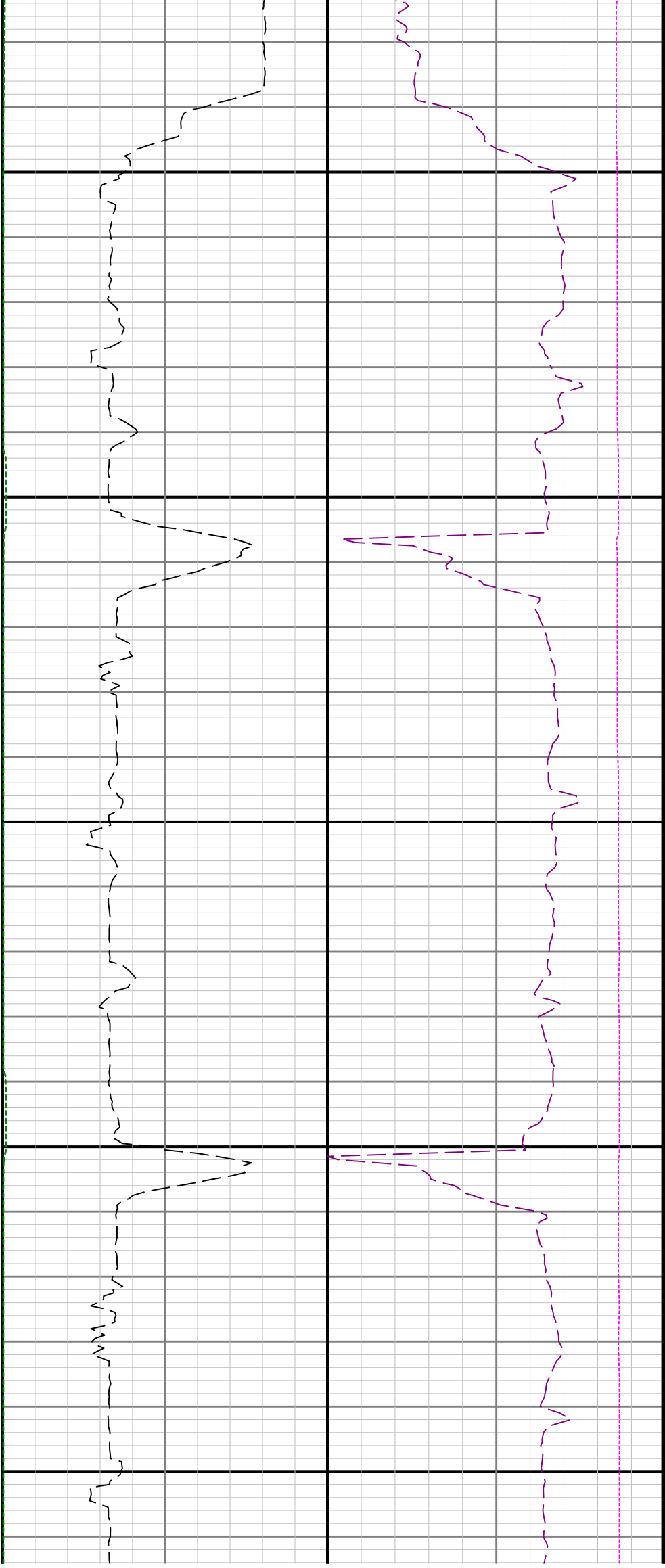




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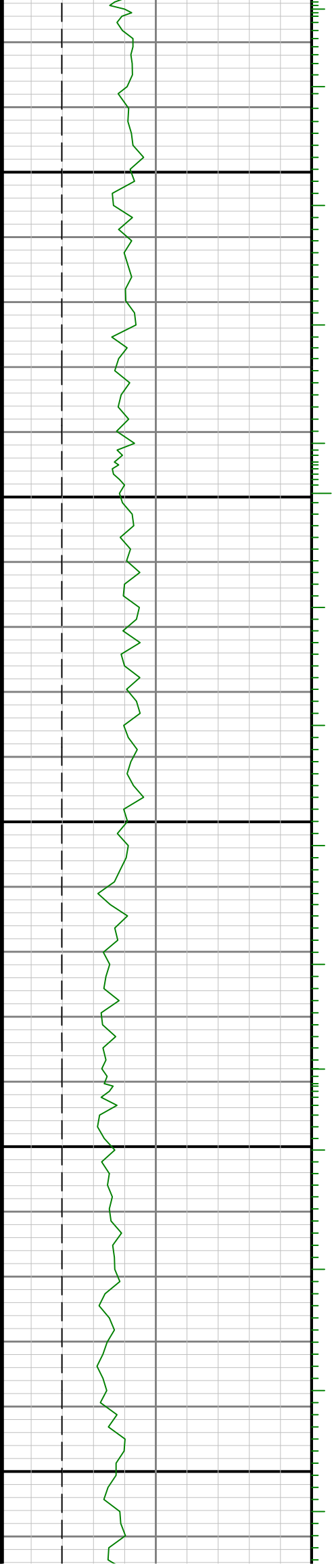


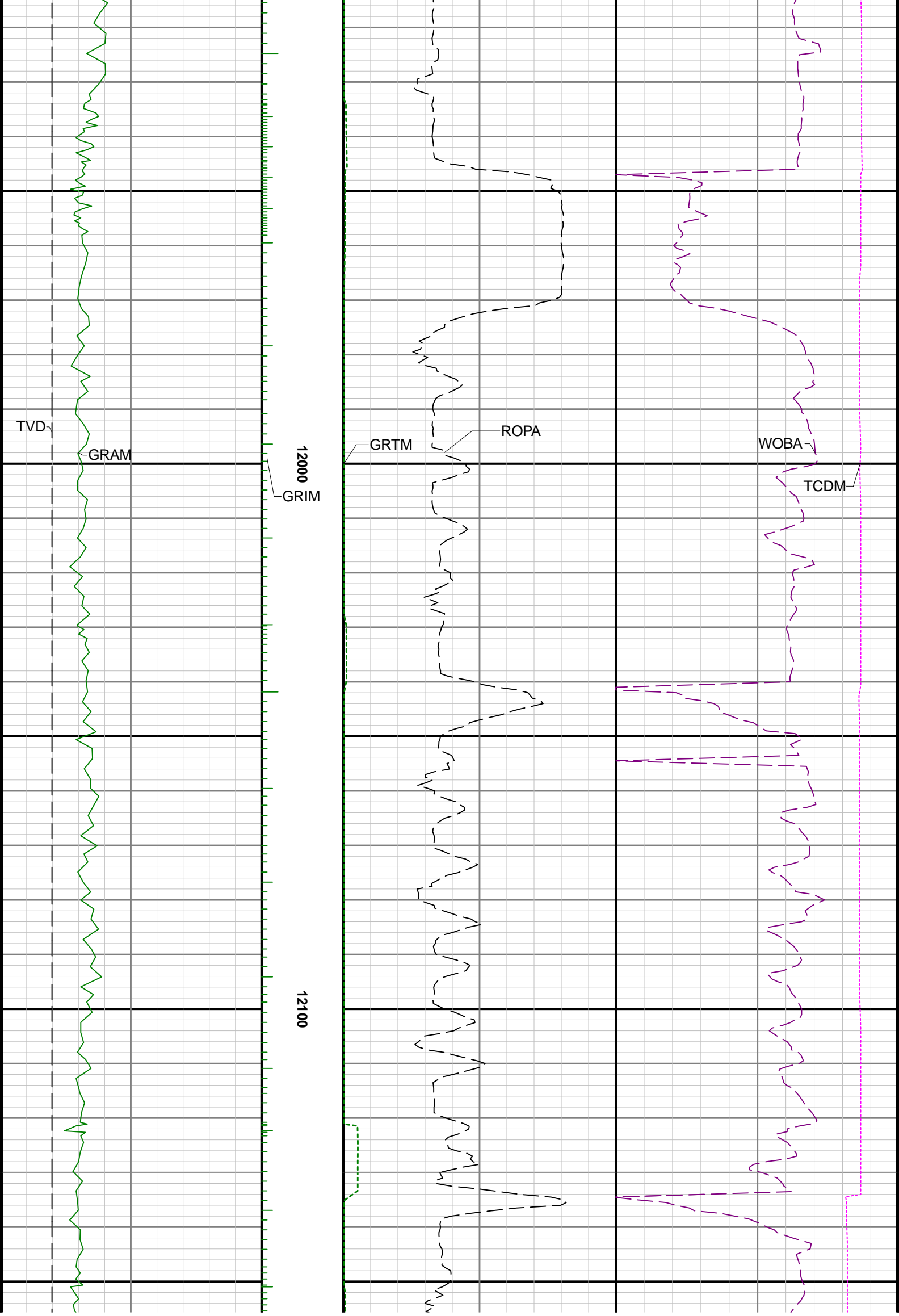


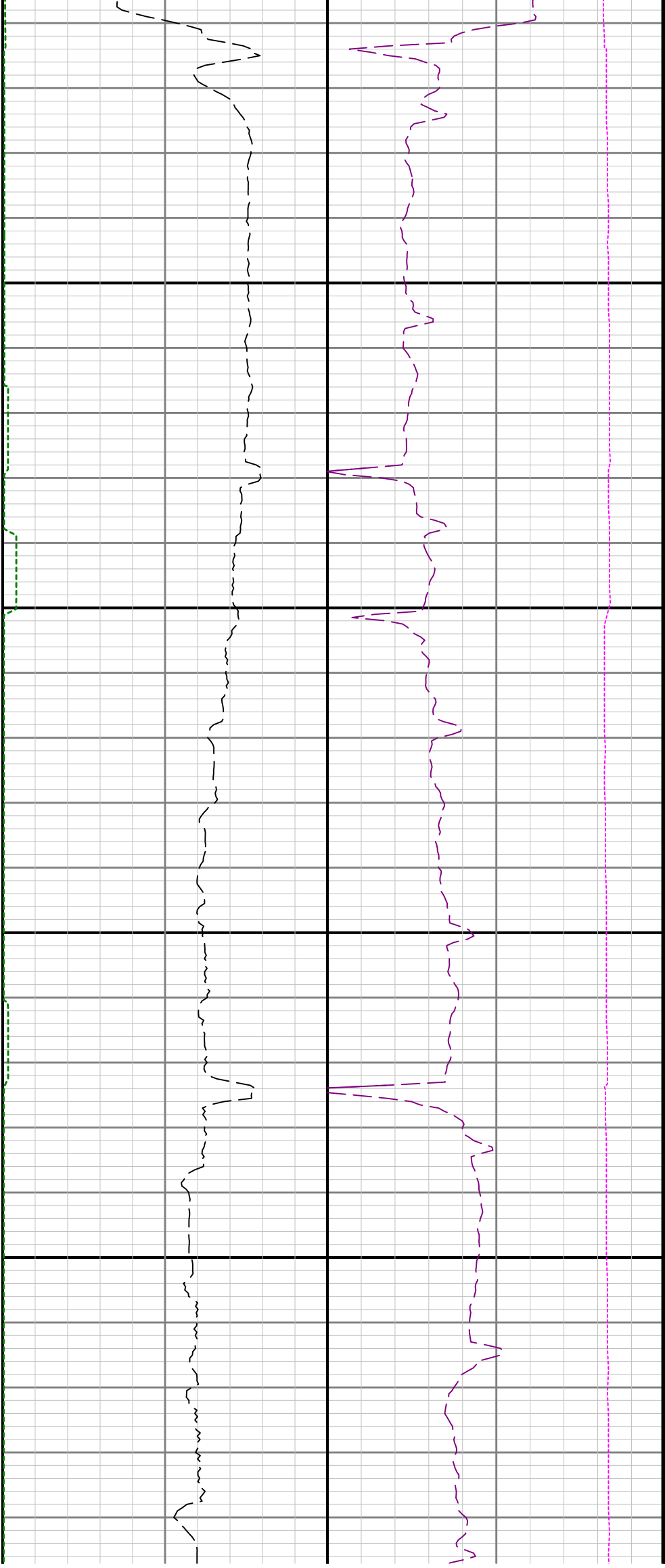
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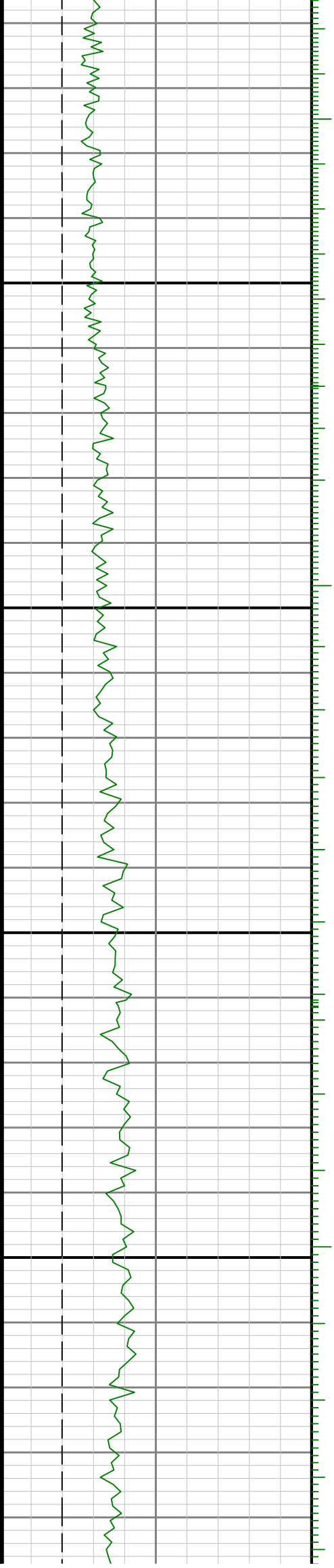


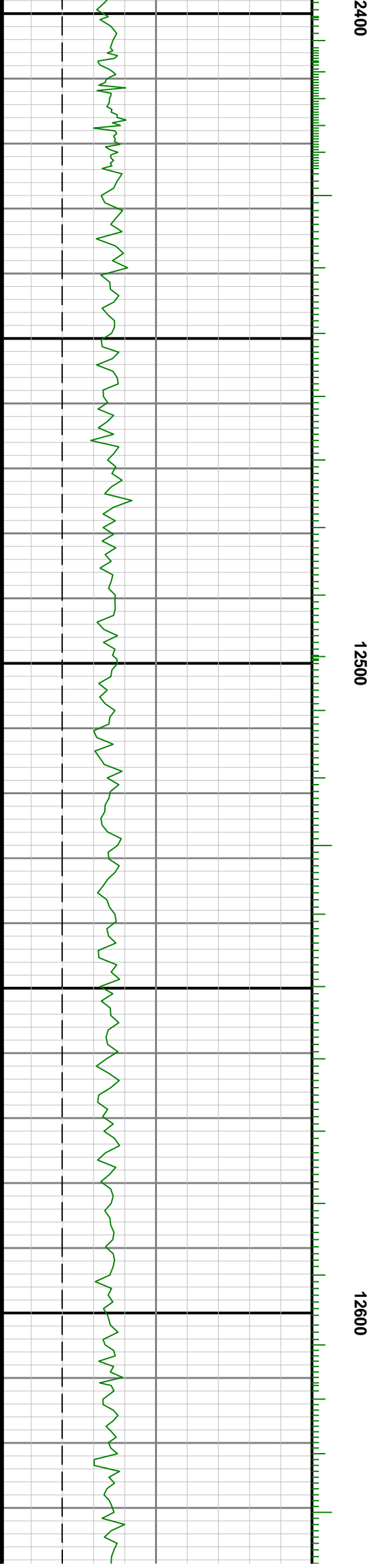
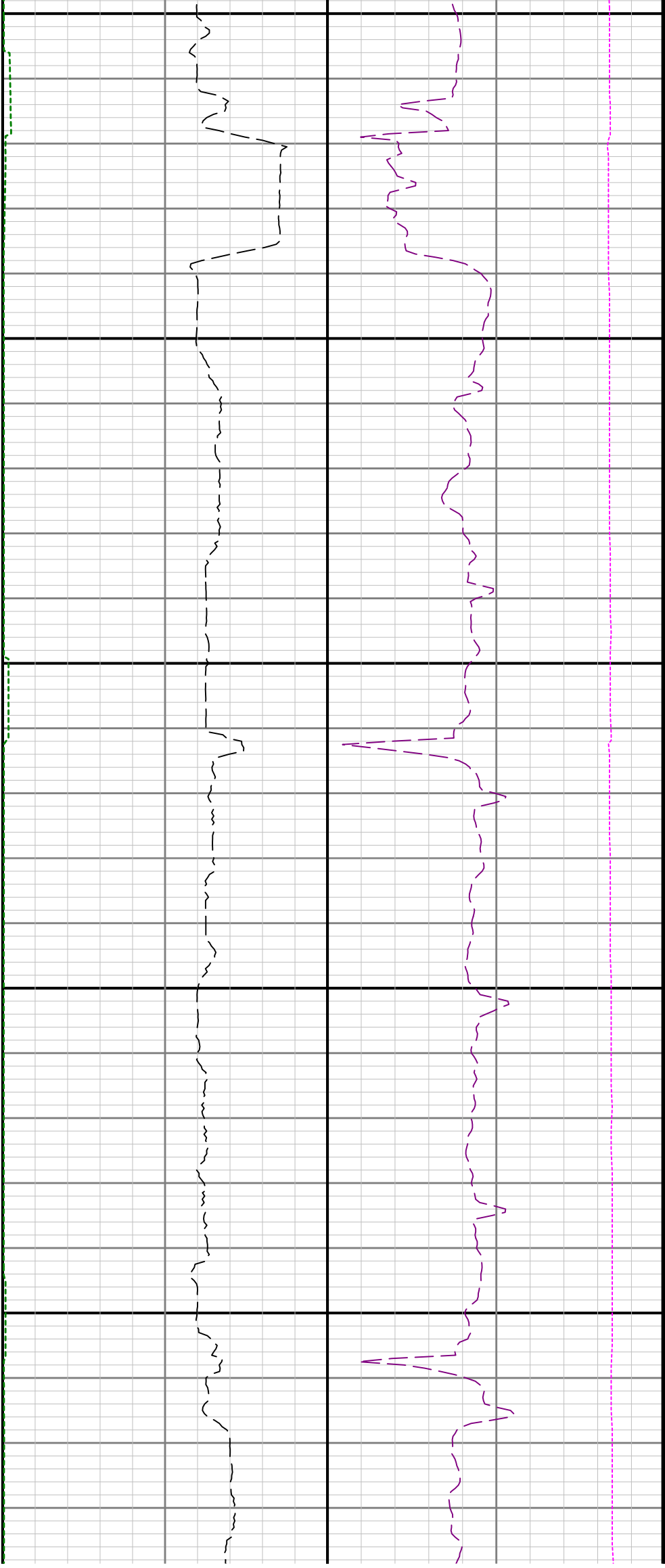




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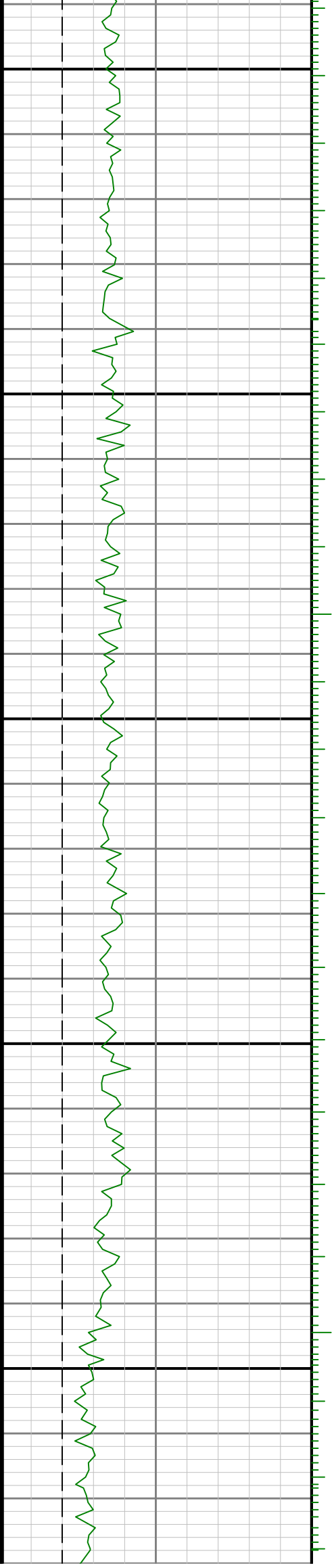


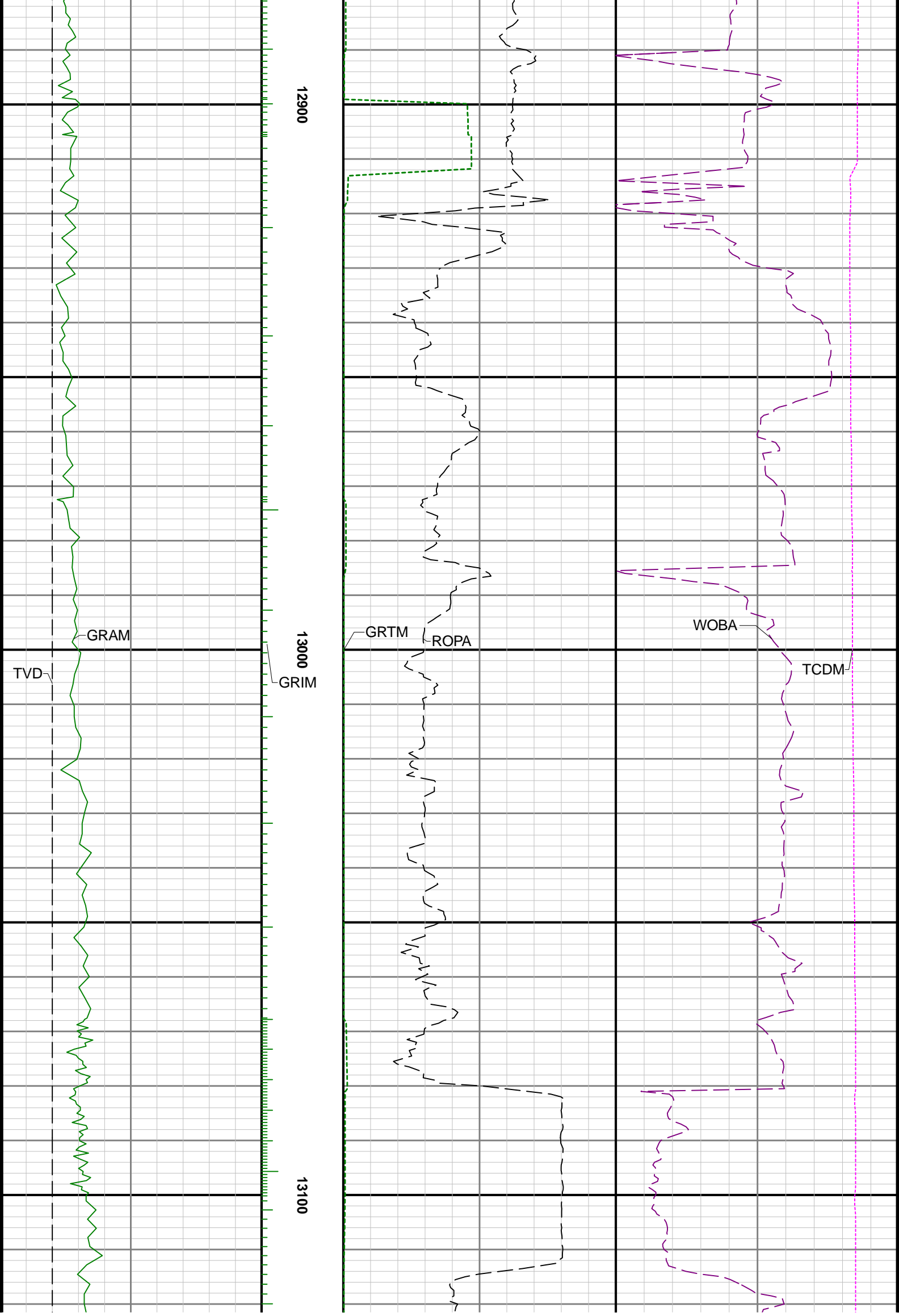


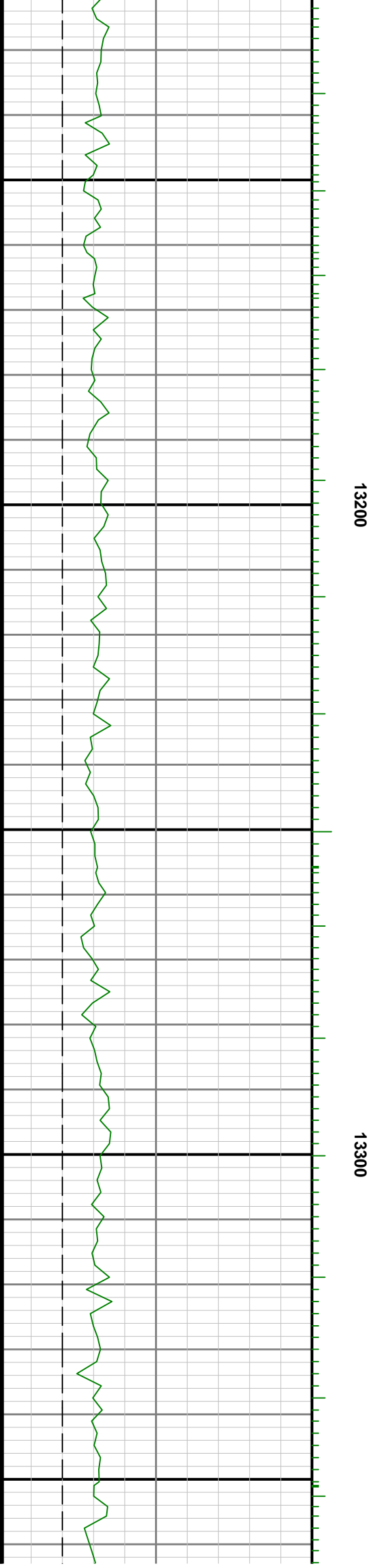
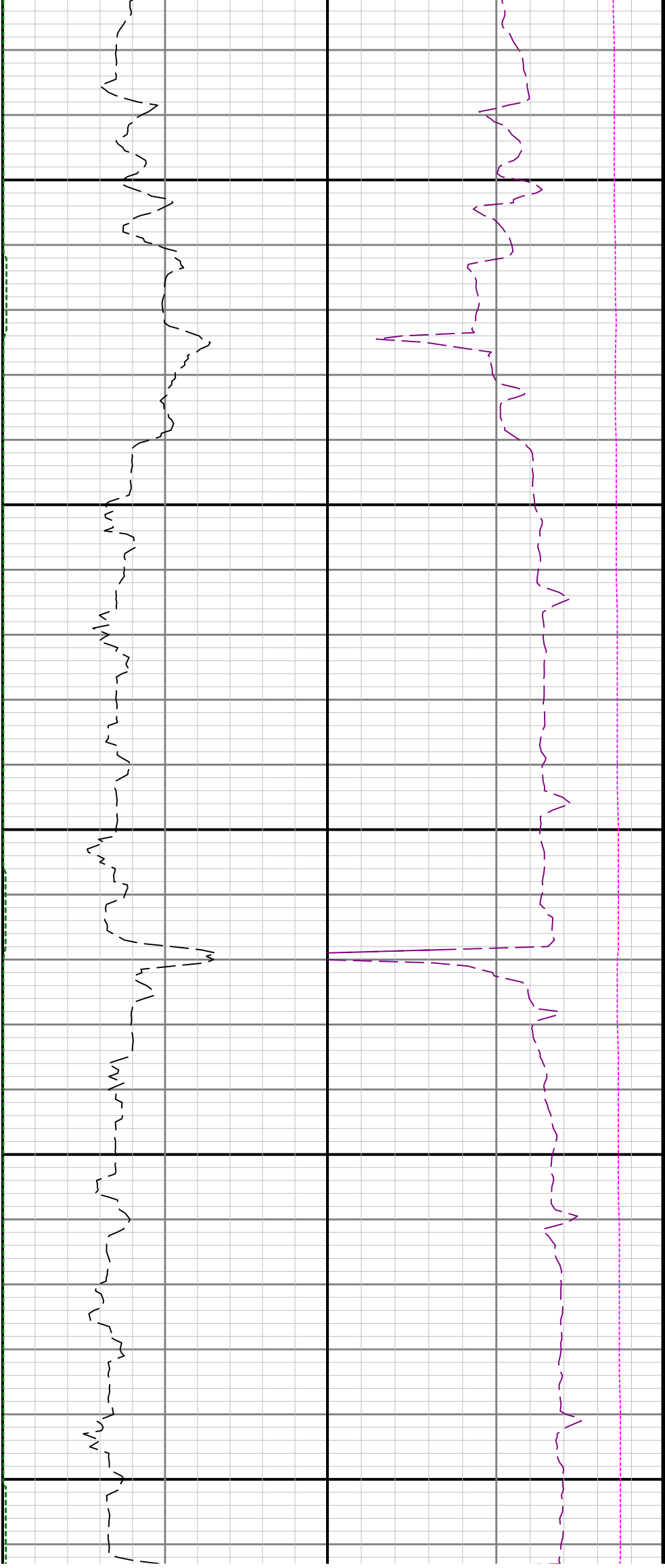


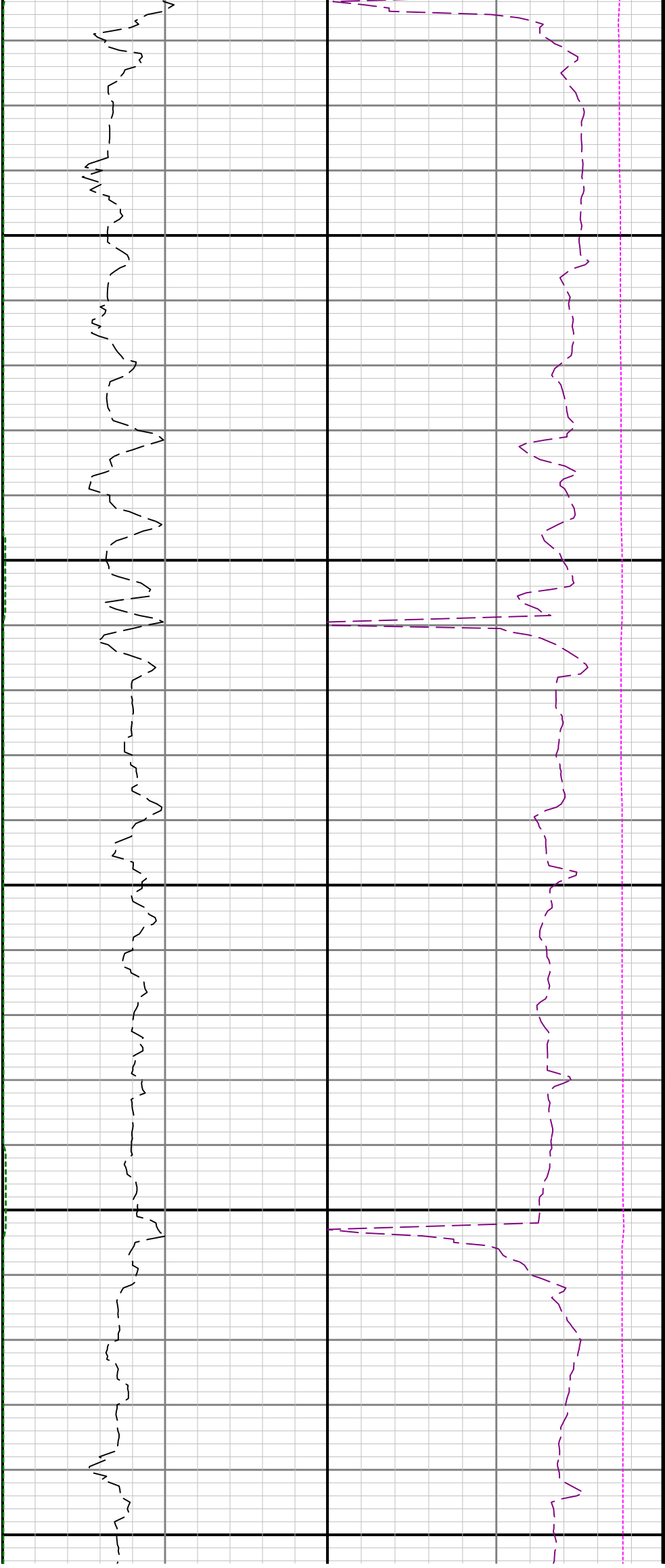
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12800





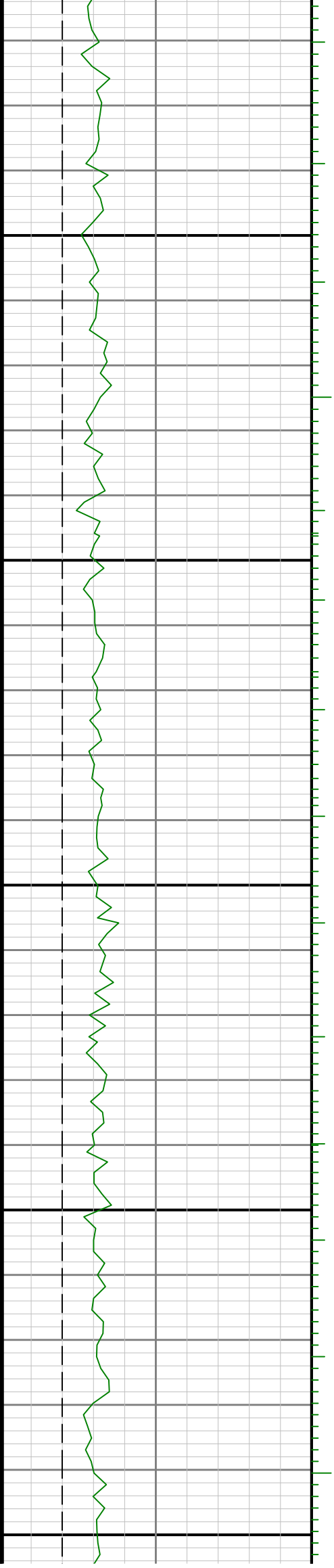


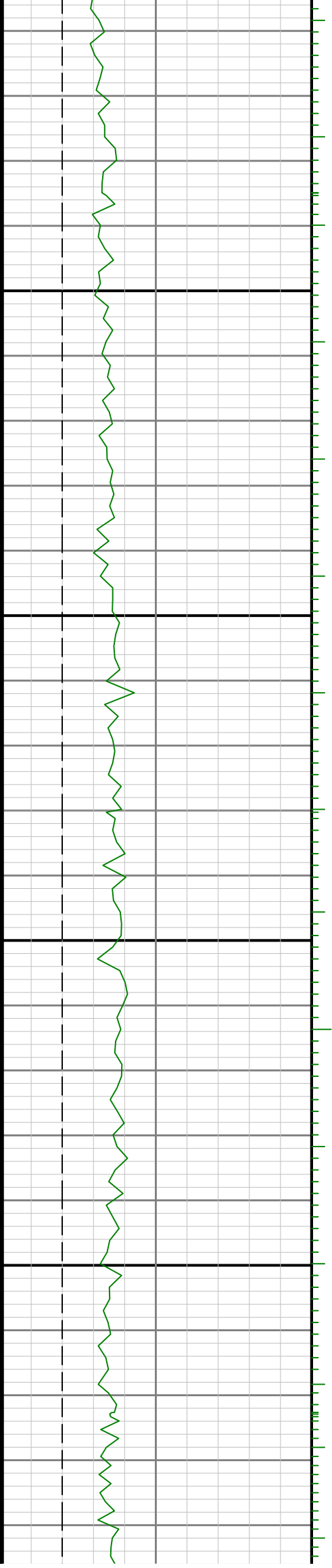
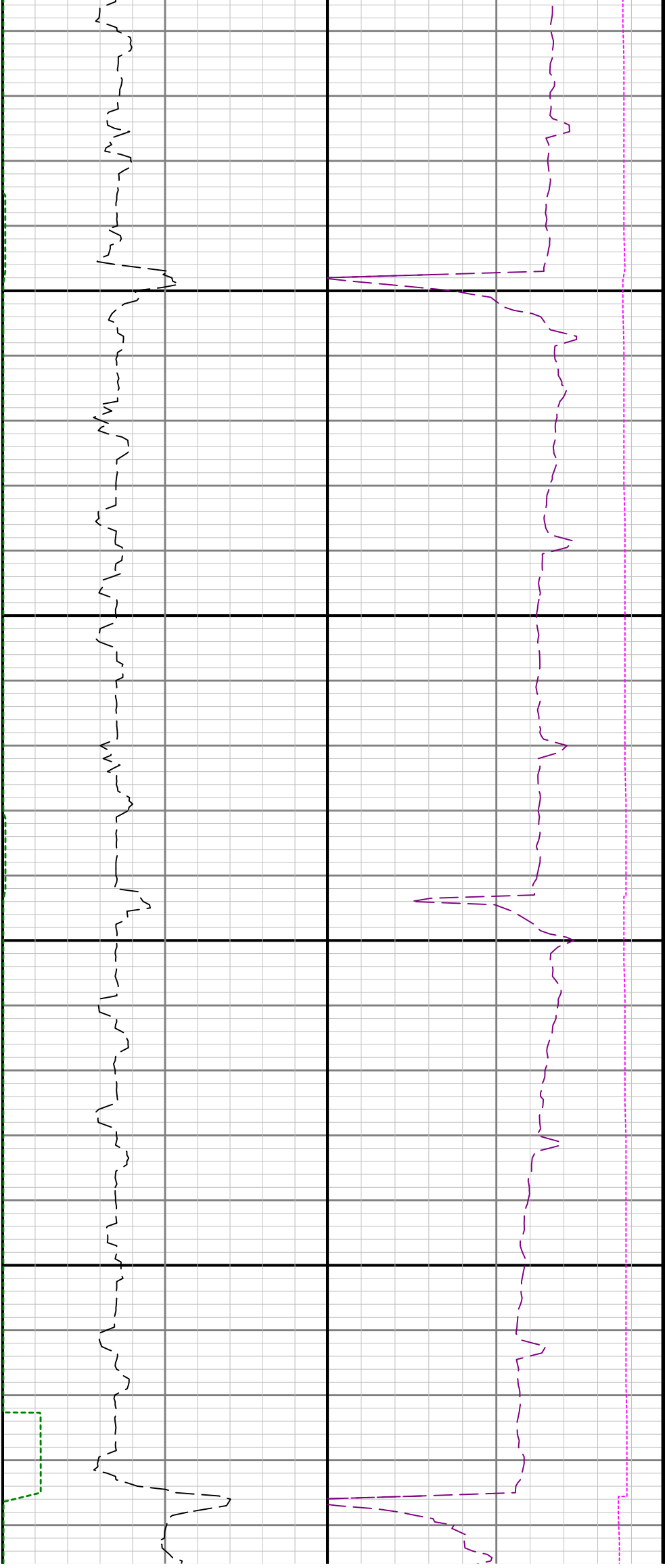


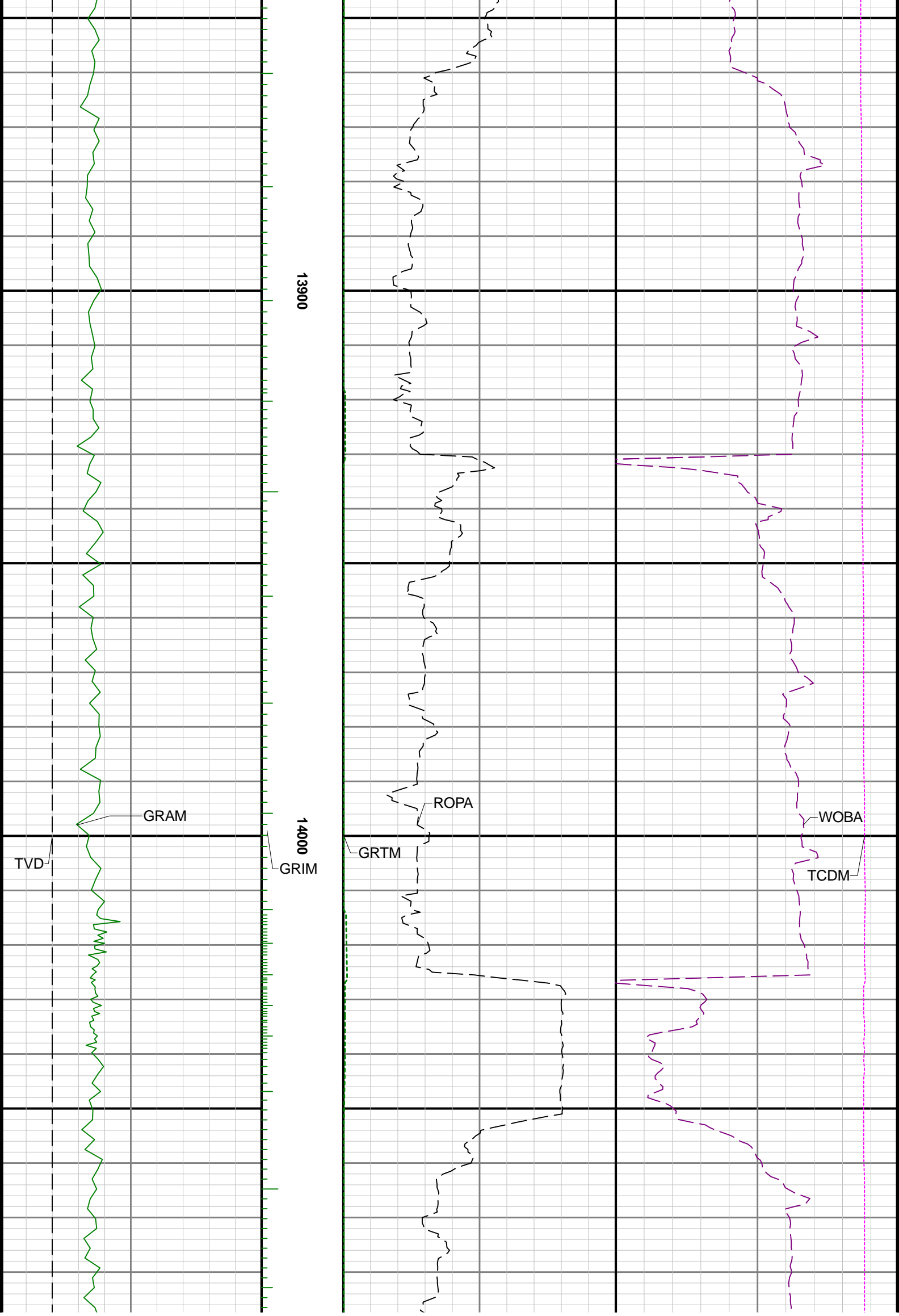
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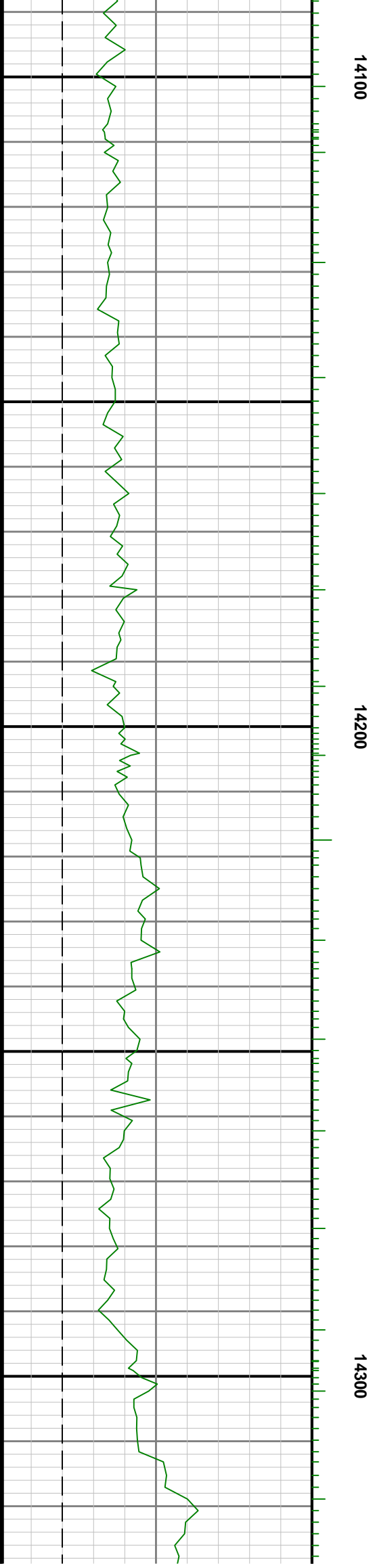
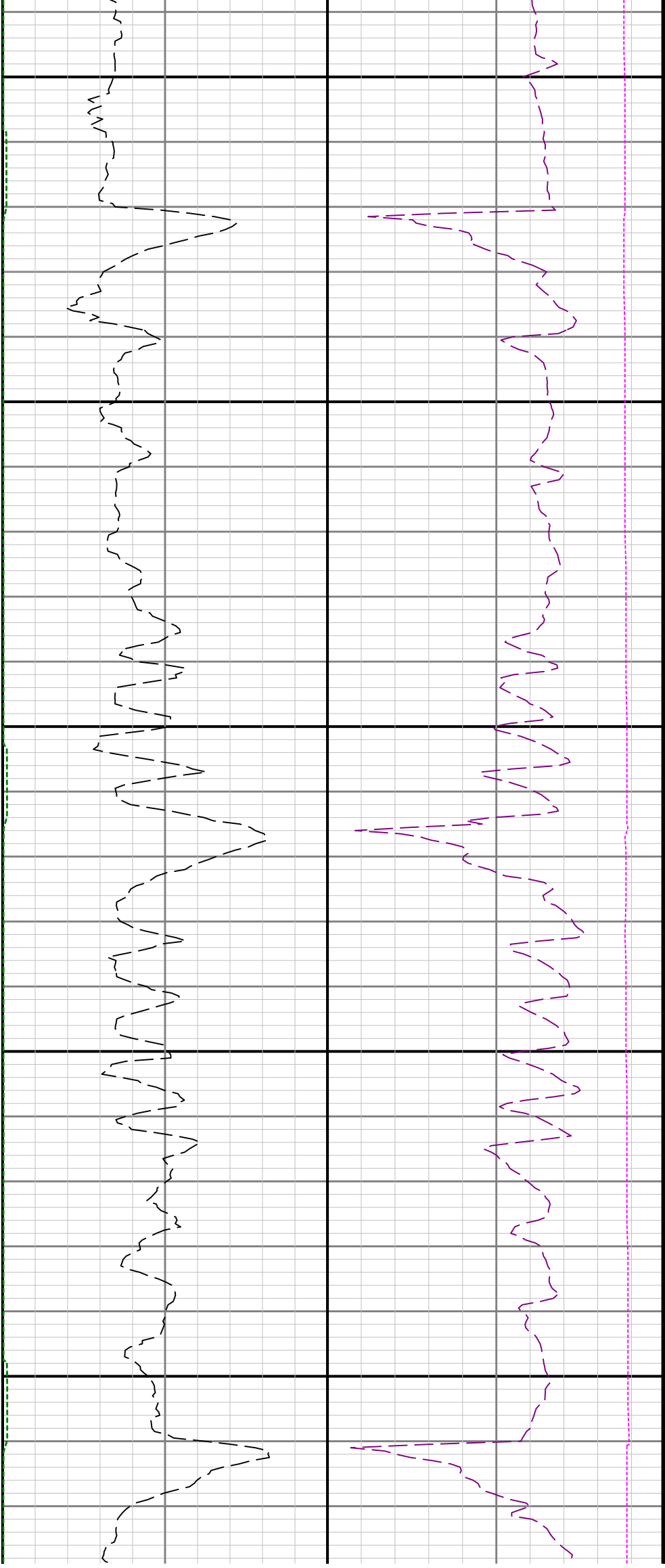
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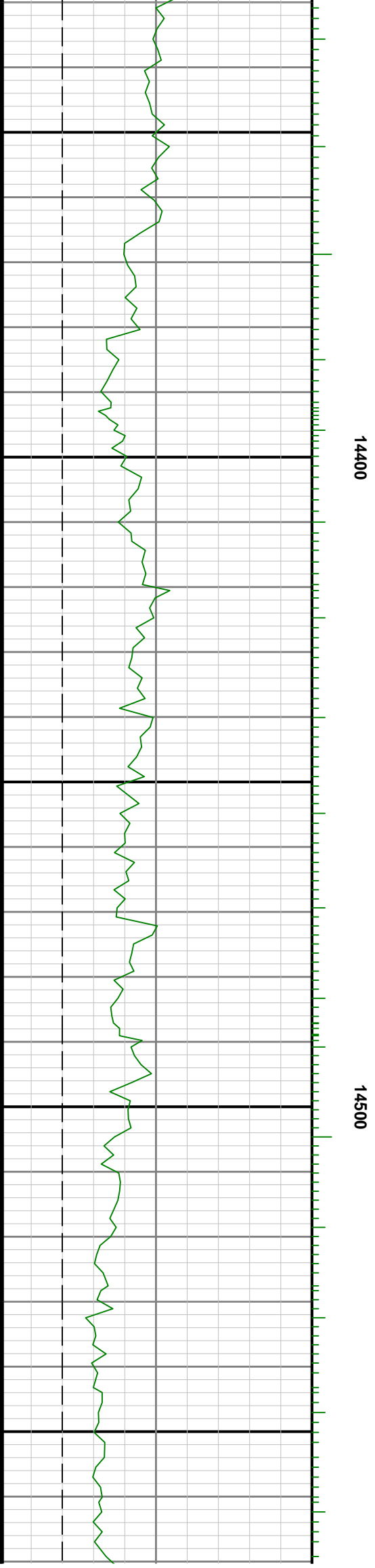
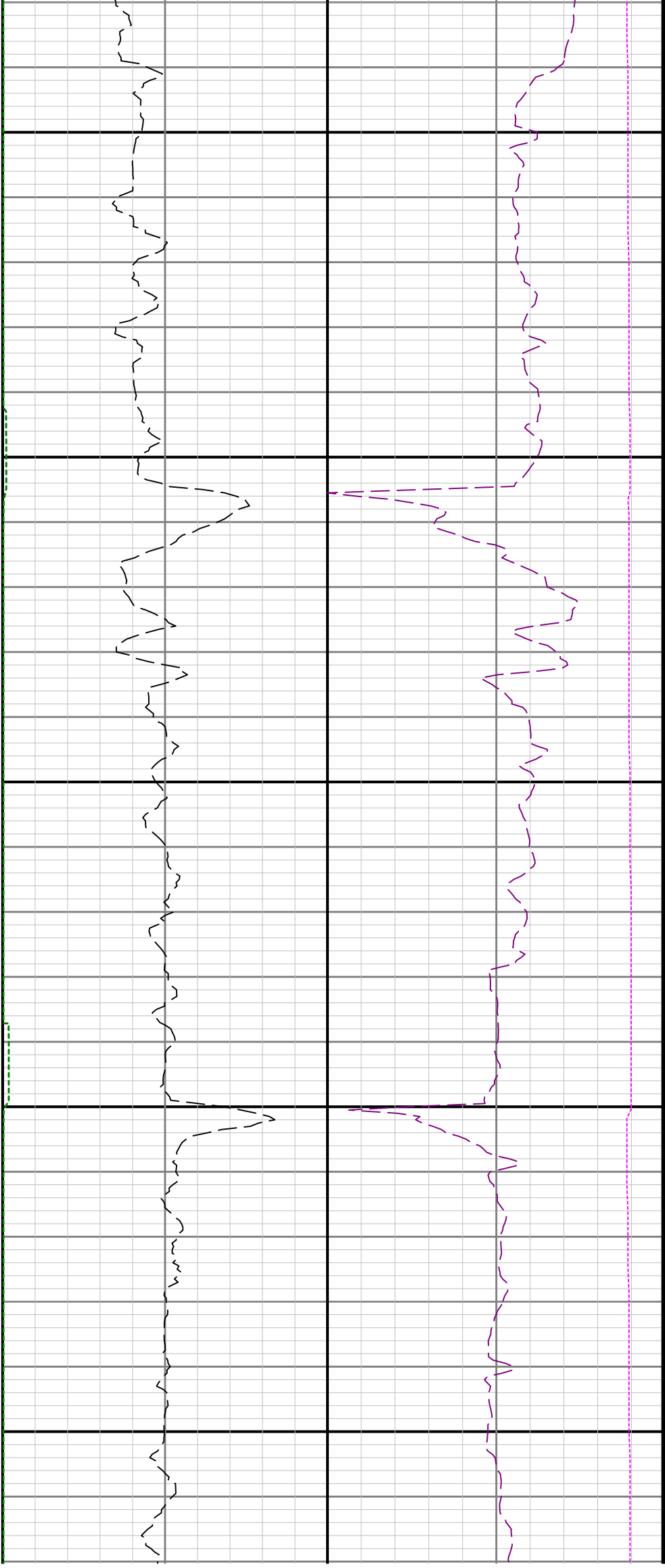
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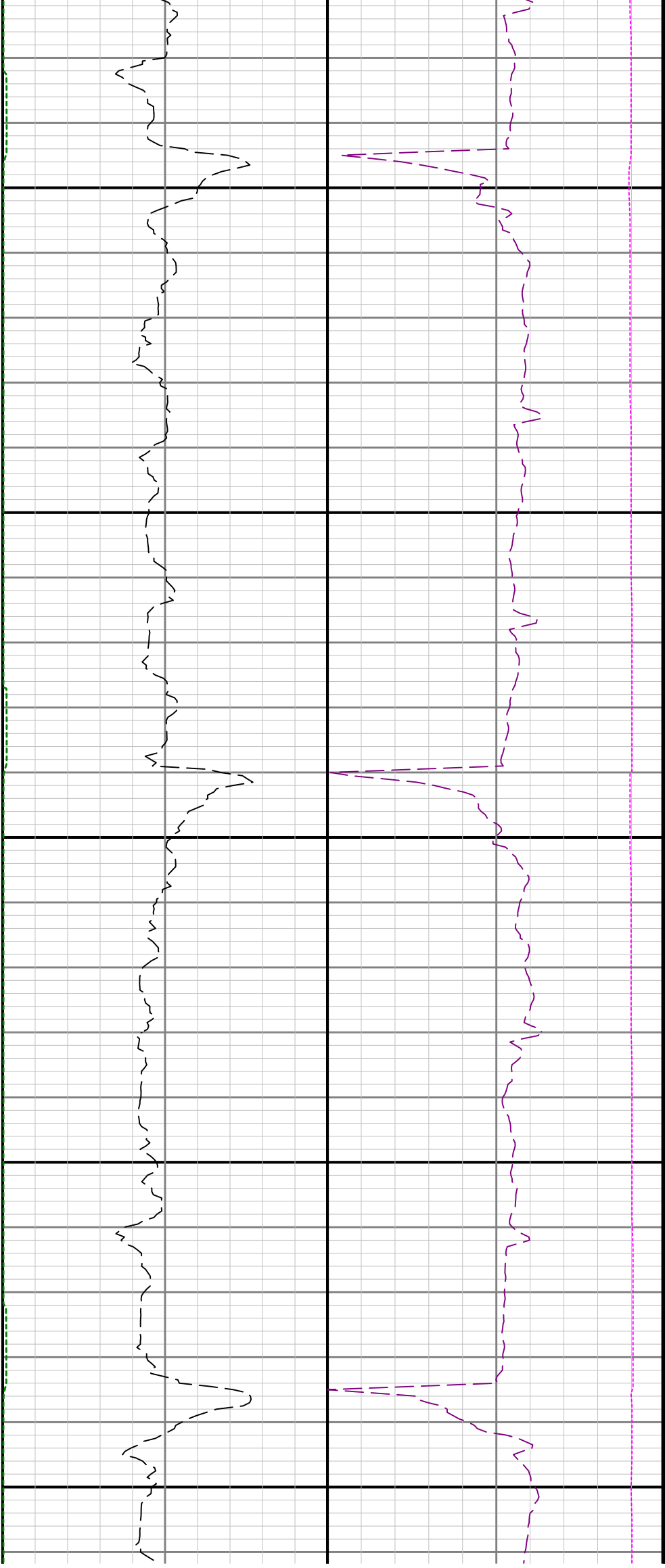








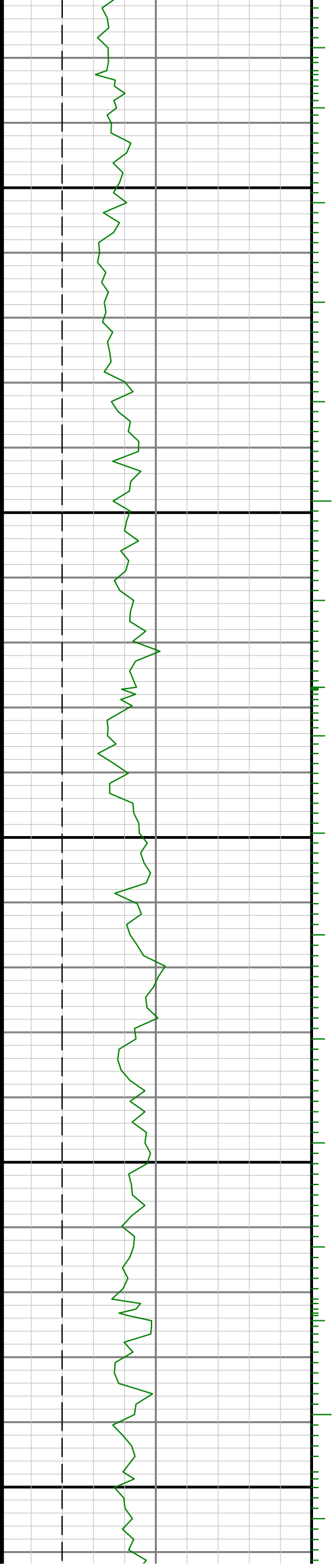


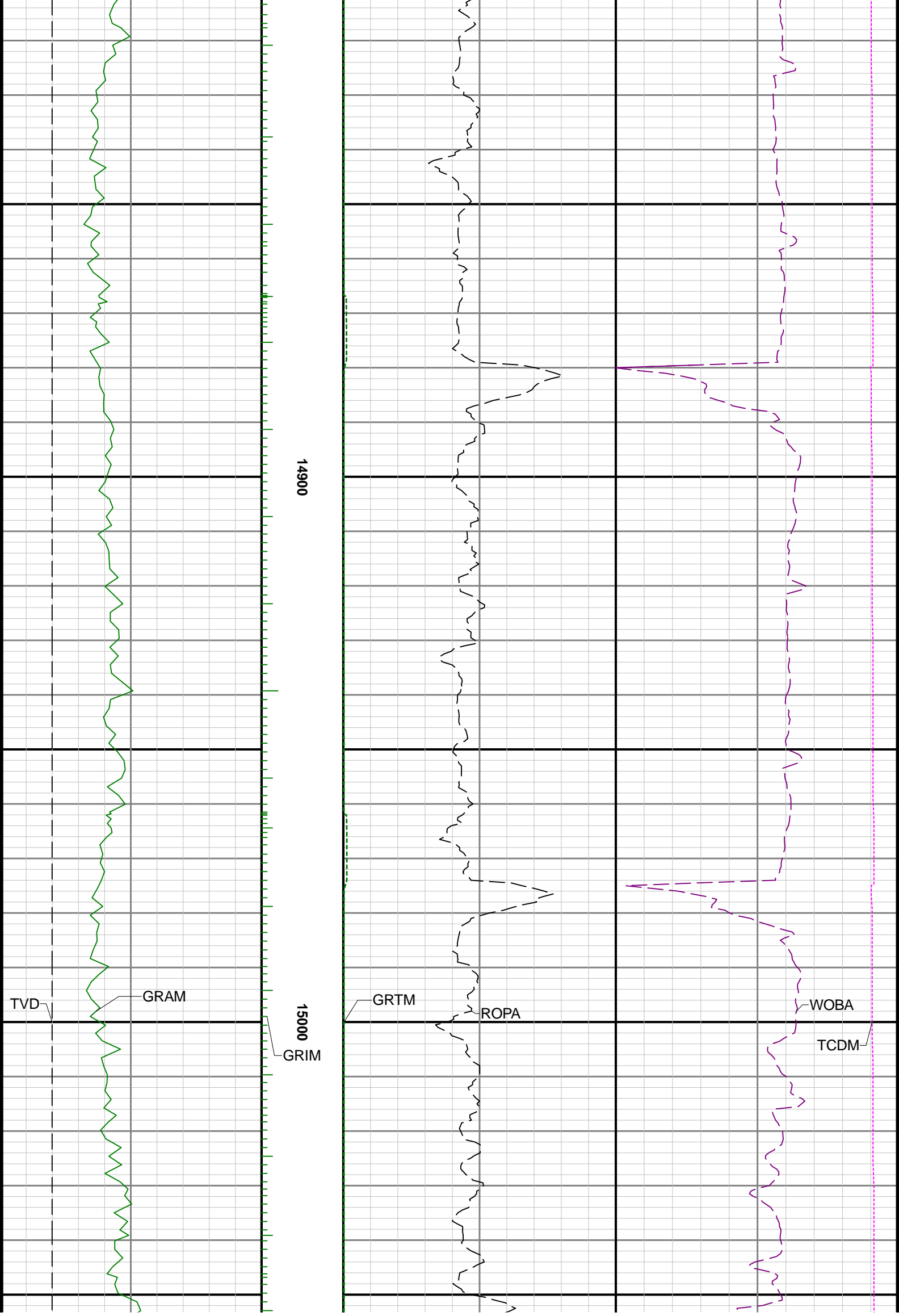


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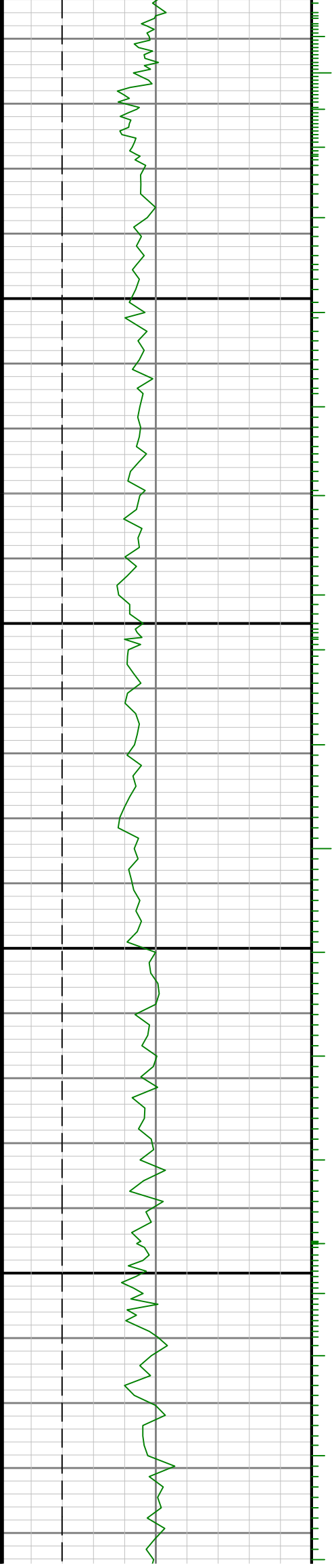


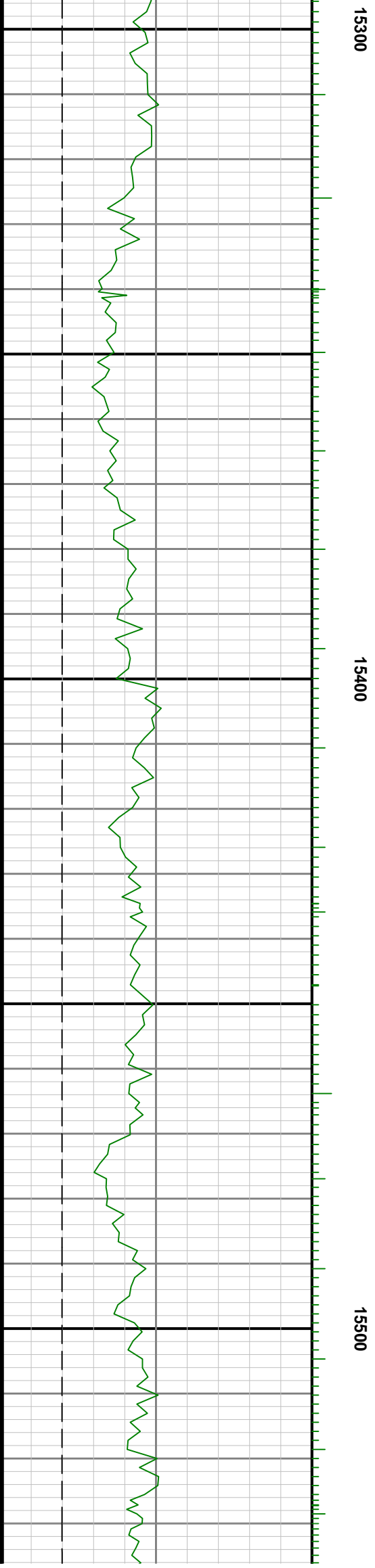
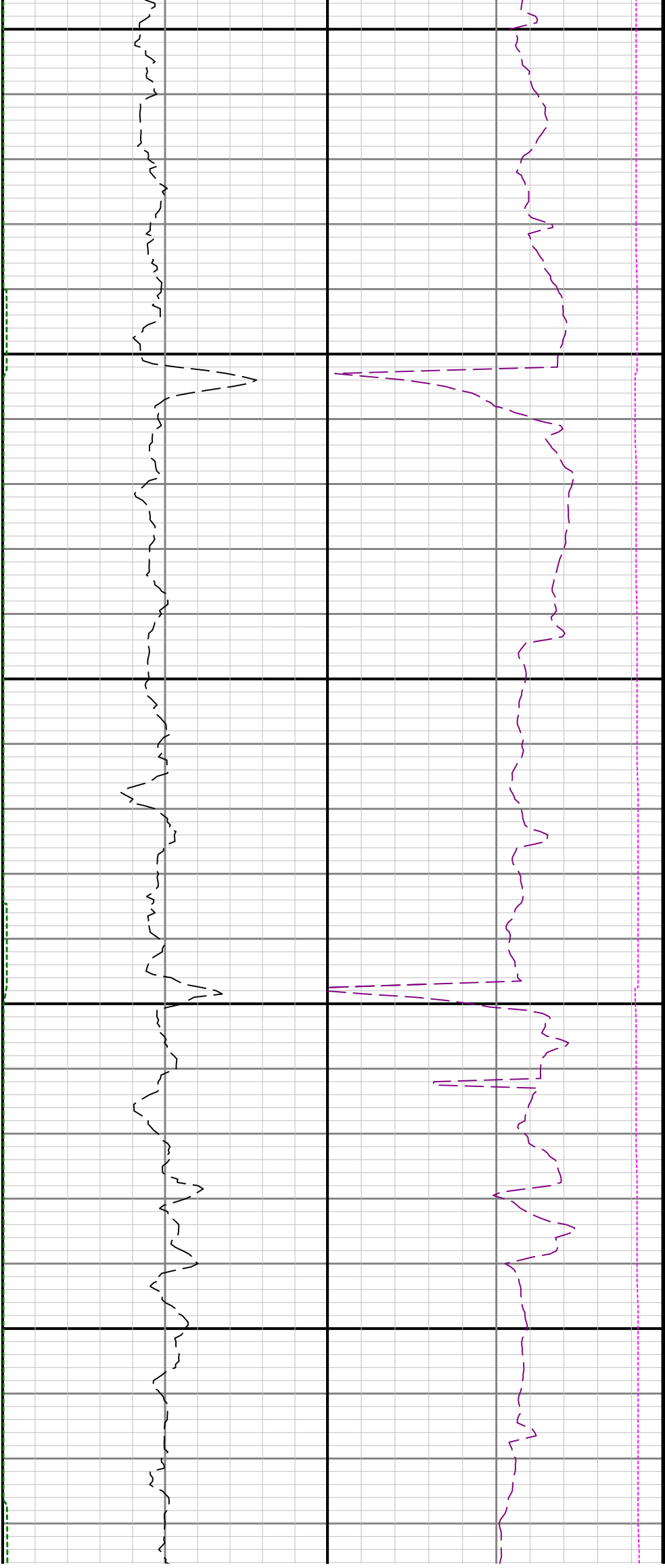


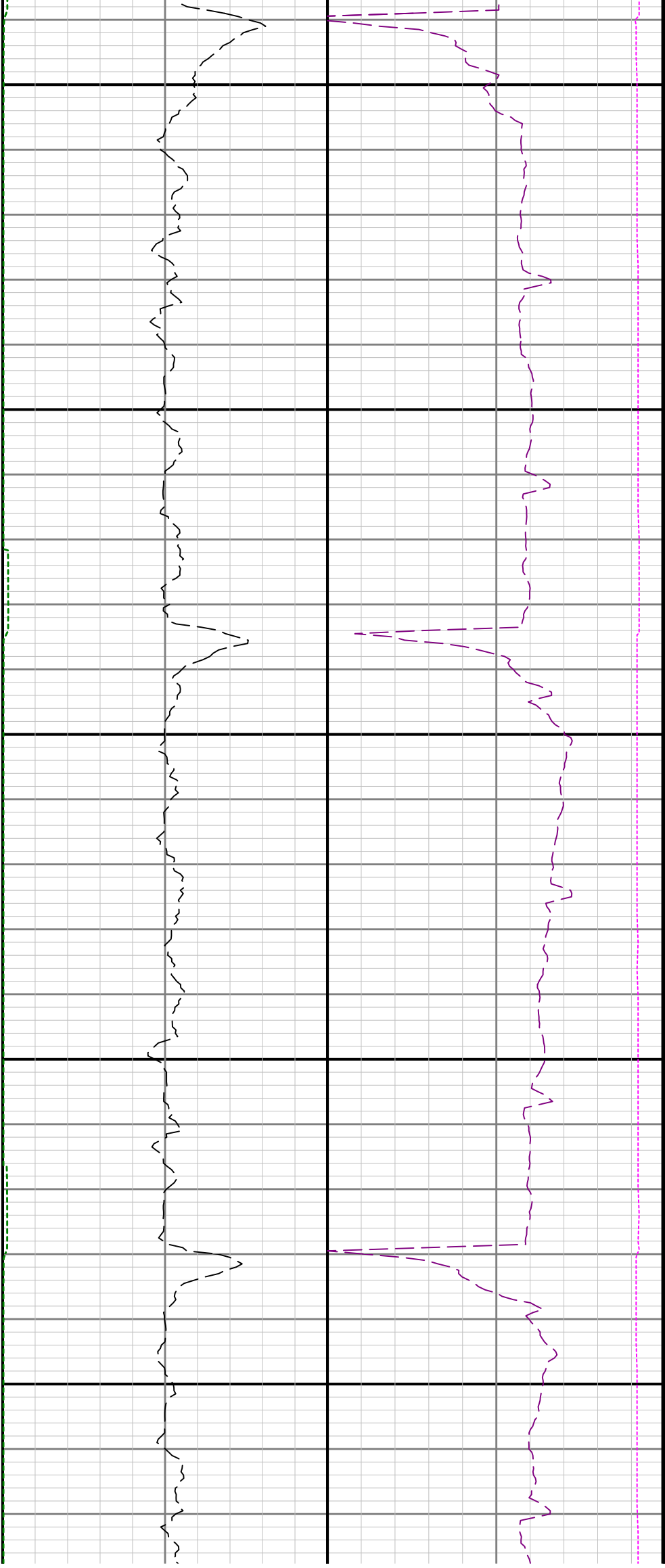


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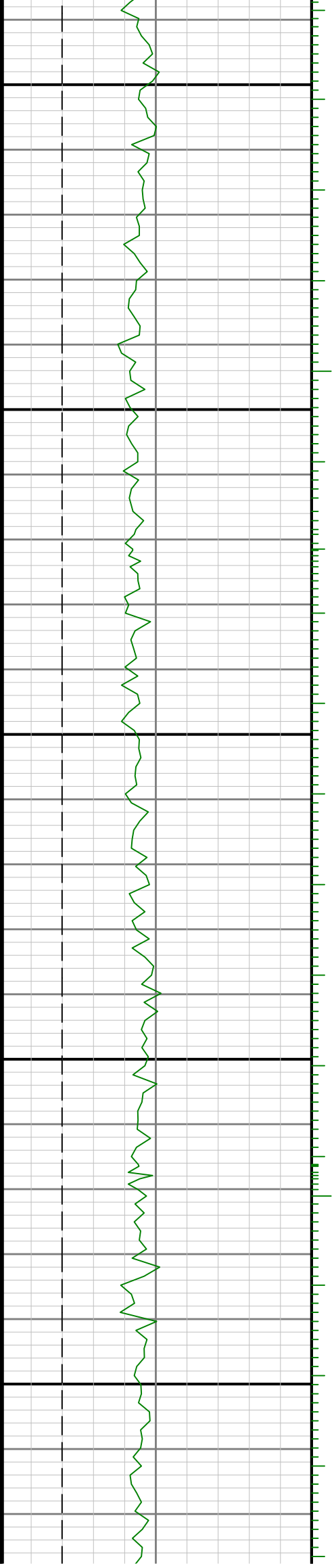


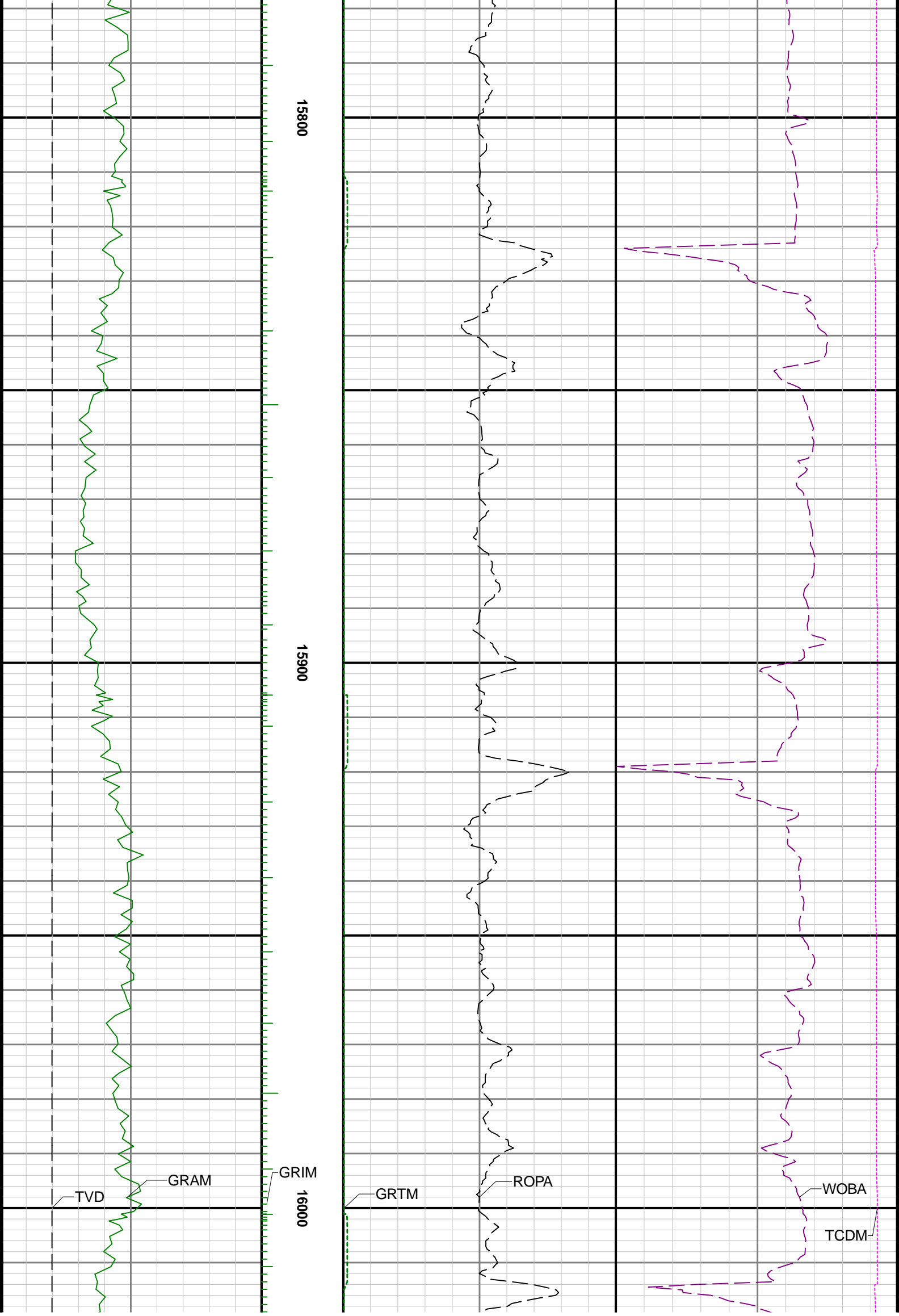


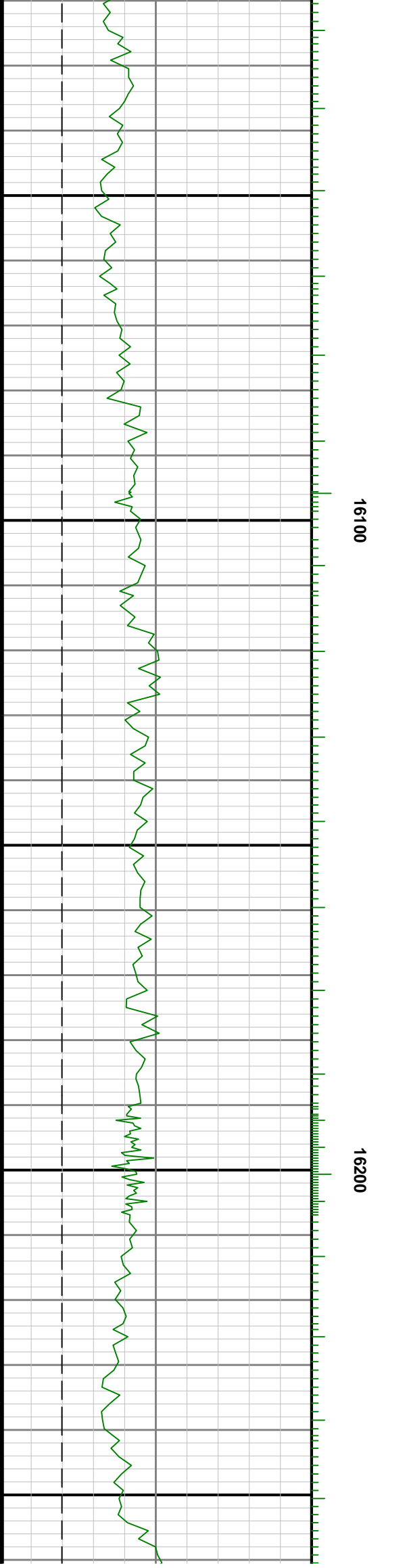
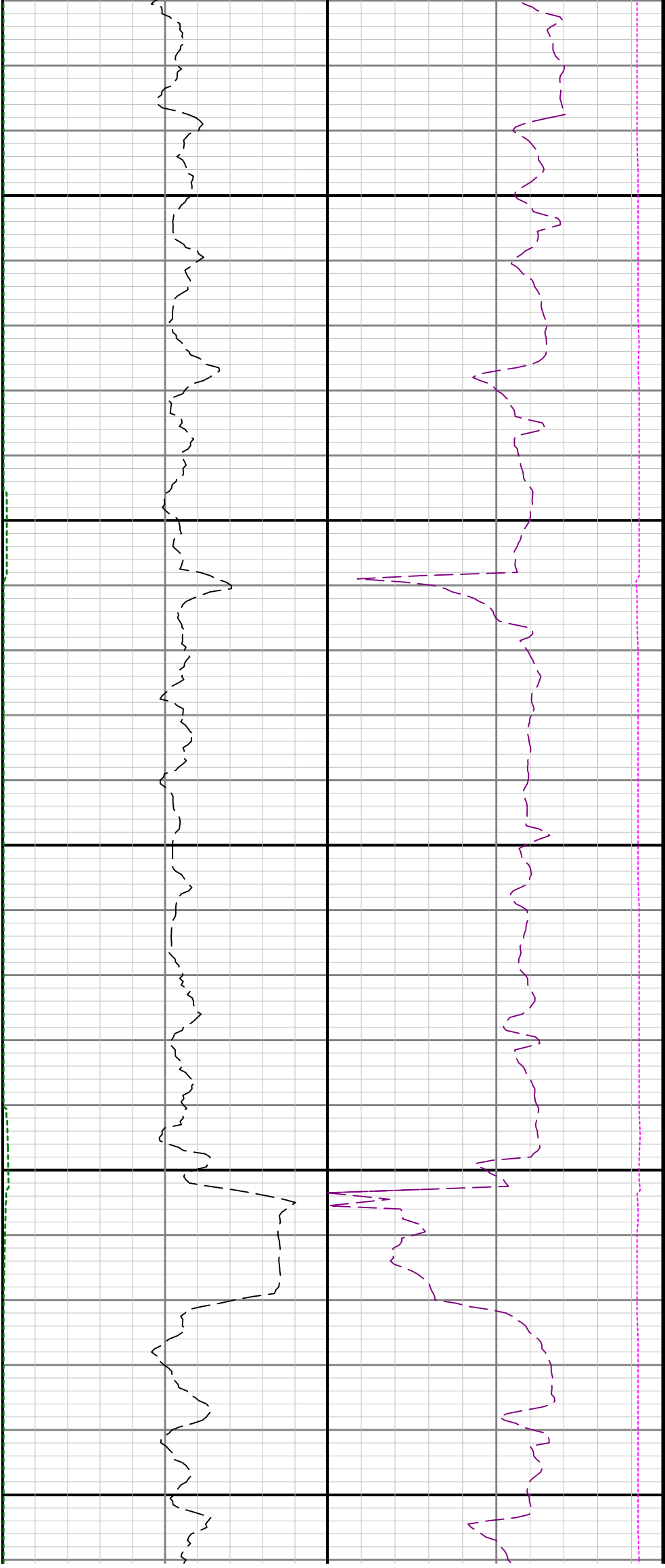


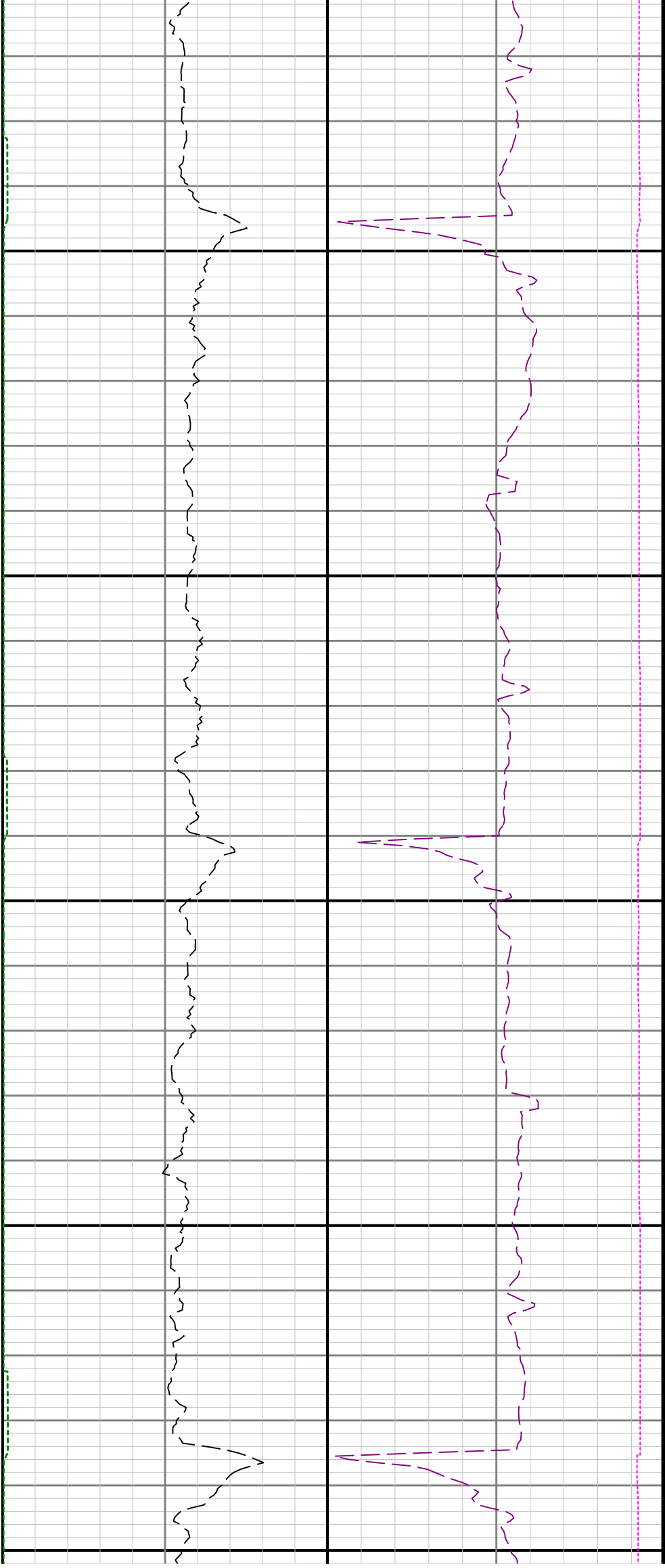
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15700









16300

16400

1650

