



Gamma Ray

LWD MEMORY LOG

Scale:

1:240

Measured Depth

Depth Reference:

Driller's Depth

Status:

Final Print

API No: 05-123-50930-00

Job ID: 111017844

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

Log Measured From: Rig Floor

Company: Noble Energy

Well: Rampart A32-739

Field: Wattenberg

County: Weld Country: United States

State: Colorado

Surface Location:

Latitude:

Longitude:

Other Services:

40° 27' 55.185" N

104° 34' 10.890" W

Directional

SEC: 20 TWN: 6N RGE: 64W

Elevation: 0.00 ft

Above P.D.: 4736.00 ft

Elev. KB: 4736.00 ft

Elev. DF: 4706.00 ft

Elev. GL:

Dates

From: 2021-09-07

To: 2021-09-09

Spud: 2021-08-31

Drilled (ft)

Top: 1941.00

Bottom: 16912.00

Logged (ft)

Top: 1941.00

Bottom: 16899.00

Azi Reference North:

Total Magnetic Field Strength: (nT)

Mag to Reference North Correction: (deg)

Grid Dip Angle: (deg)

66.78

51899

7.00

Magnetic Field Reference

Borehole Record

Casing Record

Hole Size (in)

13.500

8.500

From (ft)

30.00

1941.00

To (ft)

1941.00

16912.00

Size (in)

9.625

Weight (lb/ft)

36.00

From (ft)

30.00

To (ft)

1931.00

Mud Record

Deviation Record

Type

Oil Based Mud

From (ft)

1941.00

To (ft)

16912.80

Hole Size (in)

8.500

Interval (ft)

14971.80

Inc | Az (Start)

0.75 | 318.49

Inc | Az (End)

90.22 | 174.20

Acquisition System

Software Version

Other

Cadence

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	1941.00	16899.00	1941.00	16912.00	2021-09-07 05:18	2021-09-09 17:39	56.76

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Drew Greedes	2021-09-07	2021-09-10	Jeremiah Samson	2021-09-07	2021-09-10	Mike Grunsey	2021-09-07	2021-09-10
Tien Bui	2021-09-07	2021-09-10	Ahmad Ihmeidan	2021-09-09	2021-09-10	Tucker Landry	2021-09-09	2021-09-10

Witness

Name	Run
Drew Greedes	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+ (%)
2021-09-06 17:36	1	1941.00	Oil Based Mud	9.3	10	N/A	18.0	79.5/20.5	Active Pit	25000	0.00
2021-09-07 15:08	1	5600.00	Oil Based Mud	9.8	14	N/A	18.0	78.8/21.2	Active Pit	25000	0.00
2021-09-09 22:23	1	16912.00	Oil Based Mud	9.9	14	N/A	18.3	68.2/18.4	Active Pit	24295	0.00

Equipment and Service Data

Run No	Tool	Serial Number	Measurement	Sensor Offset	Bit Offset	Max C.D	Min I.D
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No.		Number		Onset (ft)	Onset (ft)	C.D. (in)	I.D. (in)
1	AutoTrak Curve Steering Unit	14306237	Near Bit VSS	5.93	6.76	7.000	4.330
1	AutoTrak Curve Steering Unit	14306237	Near Bit Inclination	5.93	6.76	7.000	4.330
1	AutoTrak Curve MWD	14371880	Gamma (single)	2.83	12.93	7.000	3.250
1	AutoTrak Curve MWD	14371880	Directional (mag)	12.27	22.37	7.000	3.250

Service and Tool Mnemonics

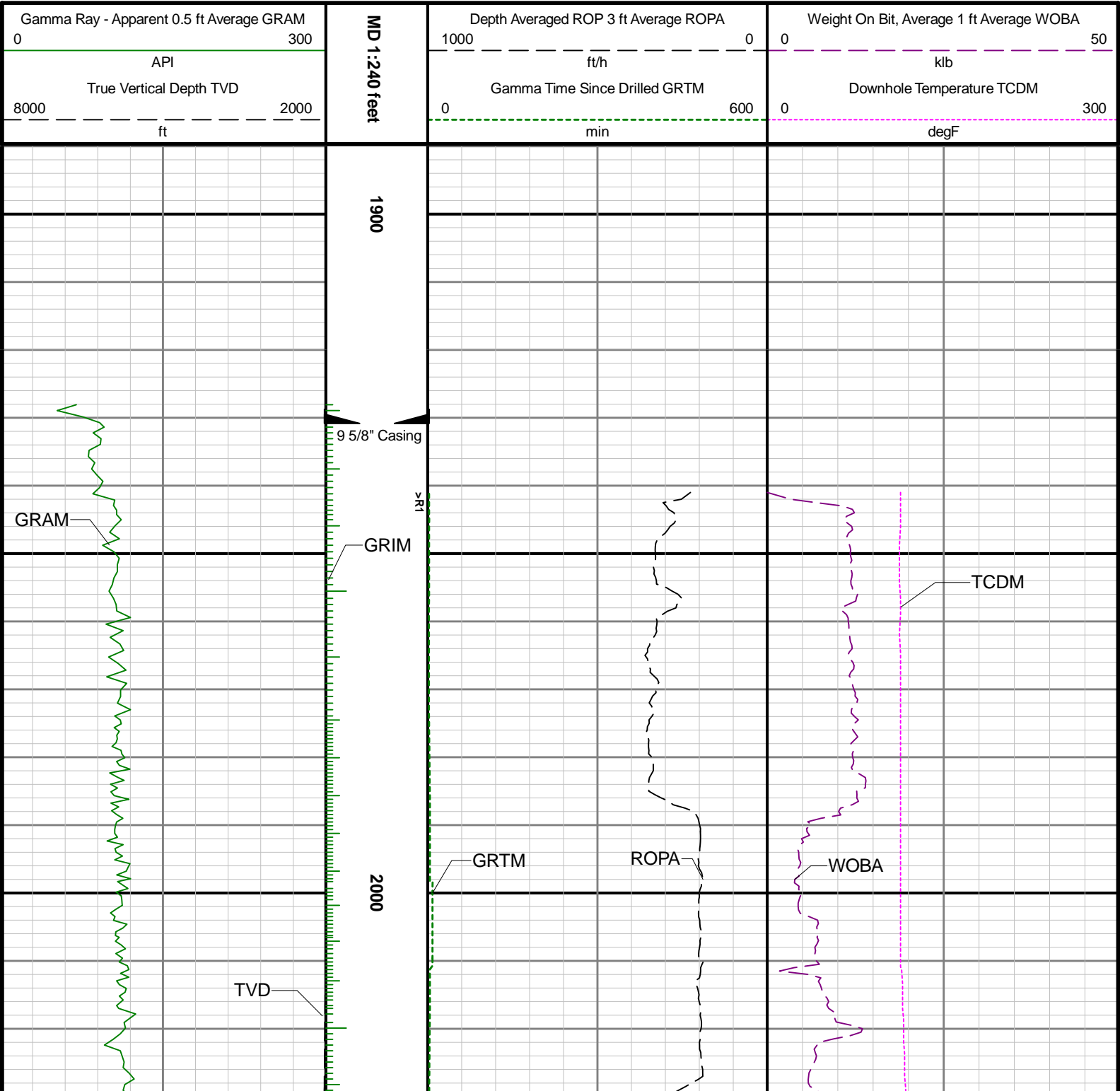
Mnemonic	Name	Description
ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM

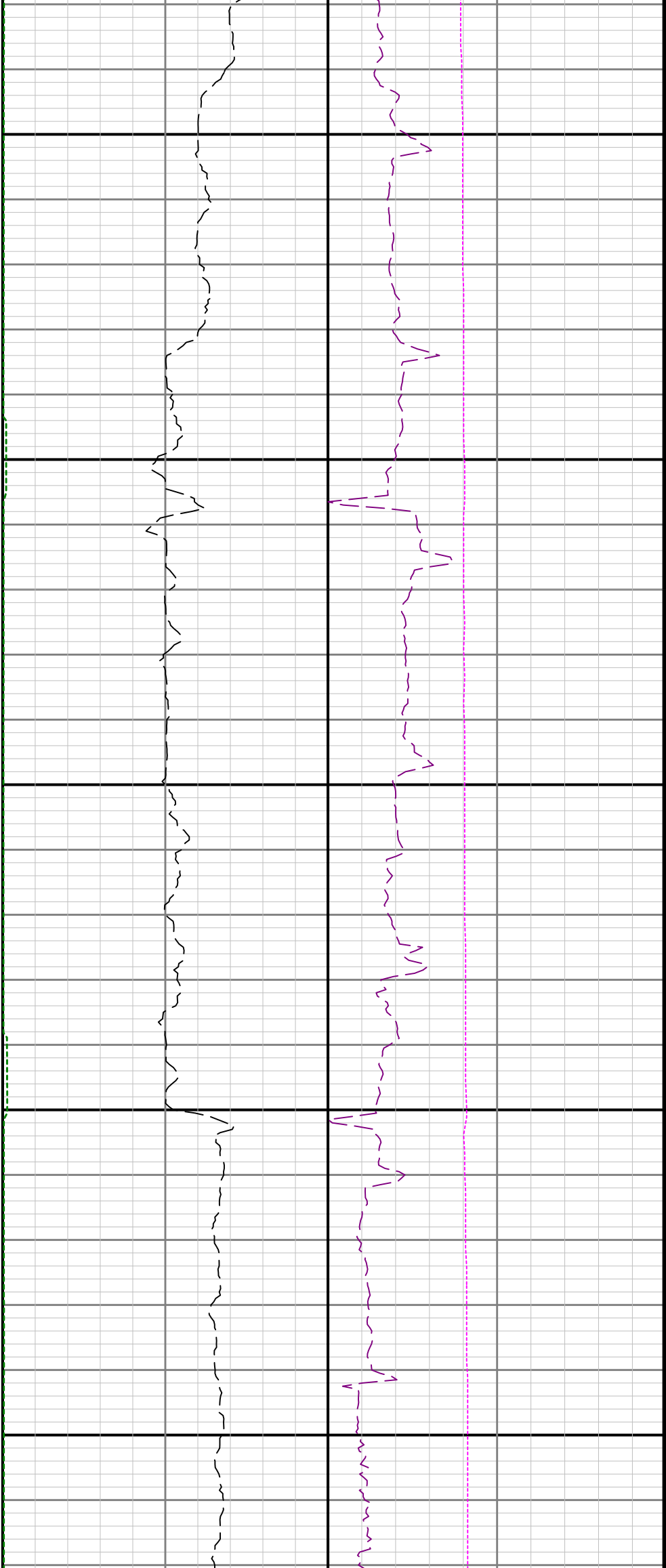
Comments

- Baker Hughes Company run 1 utilized 6 ¾ inch NaviGamma services (Gamma Ray and Directional) behind an 8 ½ inch PDC bit and rotary steerable assembly from 1941 to 16912 feet MD (1941 to 6798 feet TVD).
- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to a lack of control by Baker Hughes 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.
- The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.

Remarks

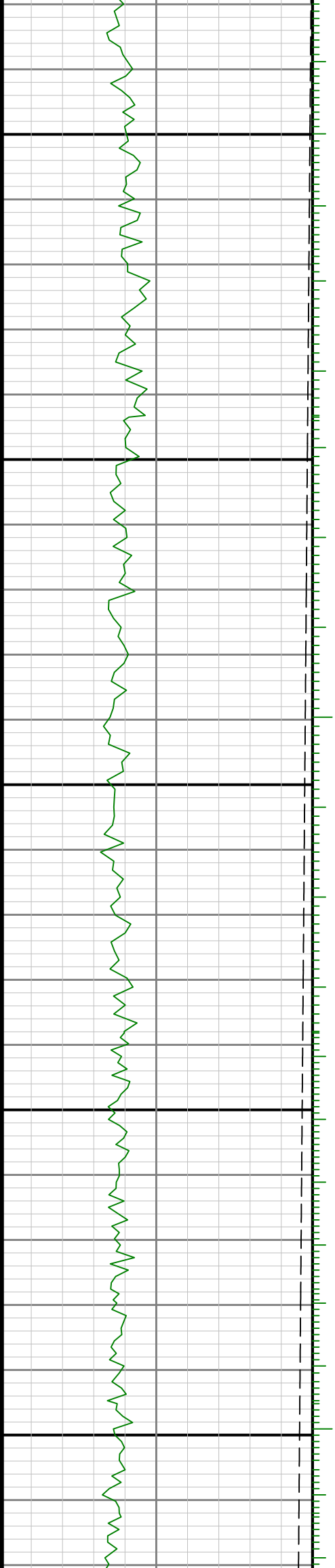
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	16899.00	8.500	1	The interval from 16899 to 16912 feet MD (6798 to 6798 feet TVD) was not logged due to sensor to bit offset at well TD.

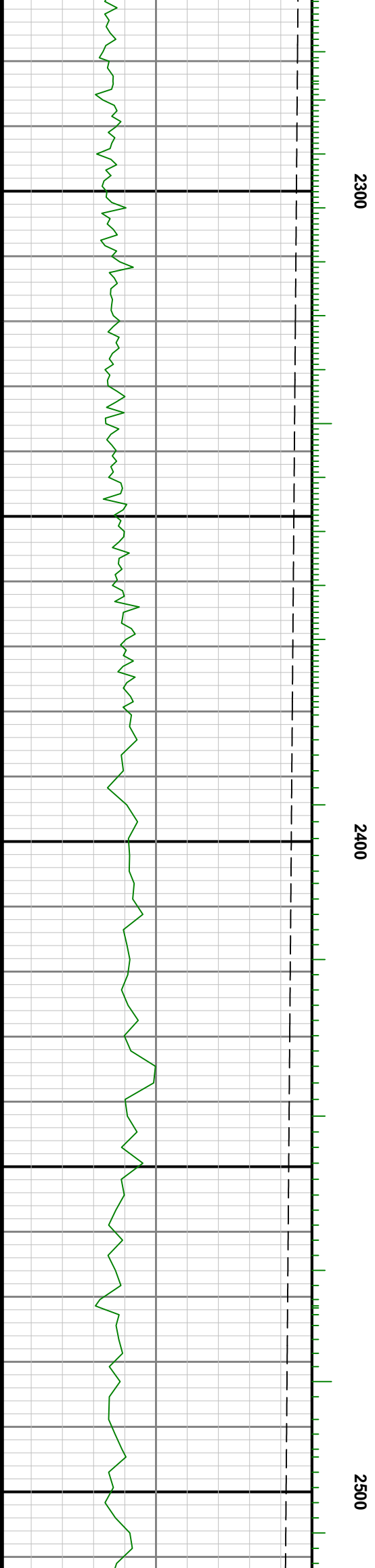
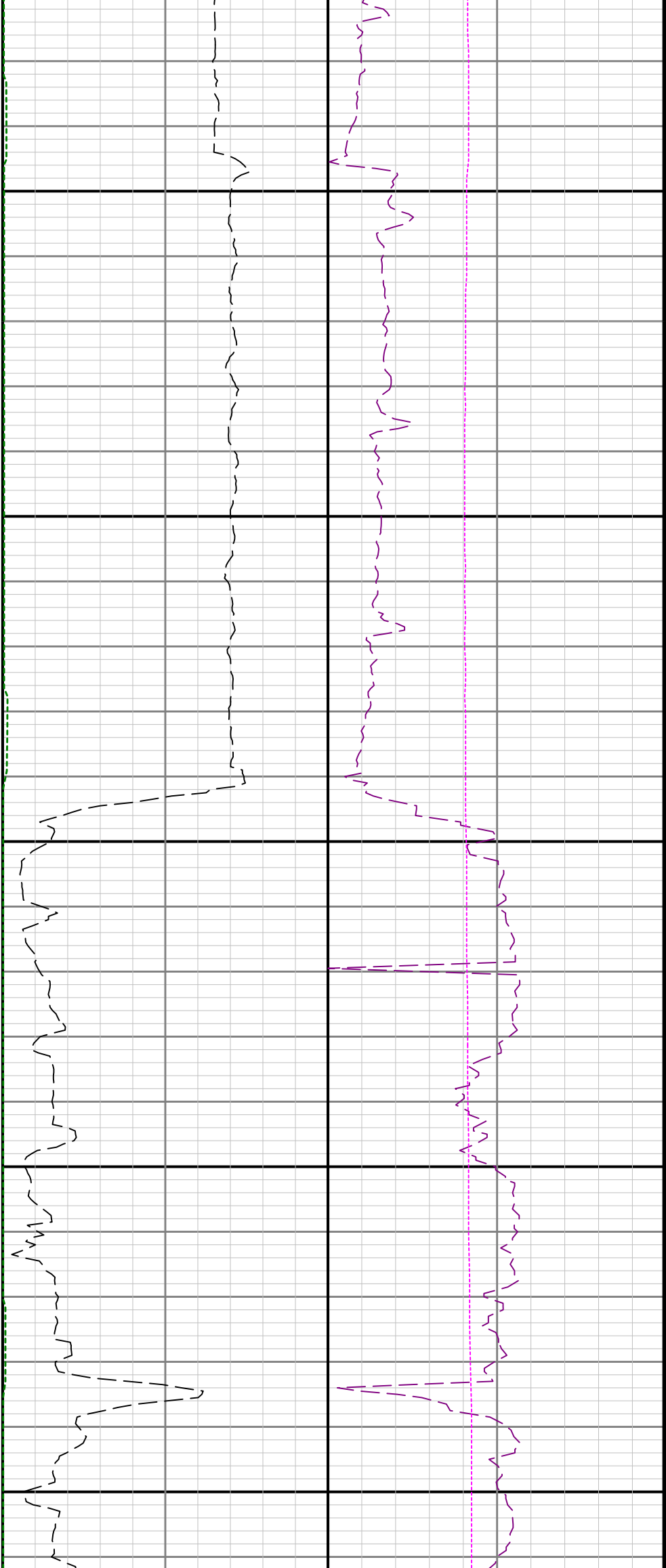


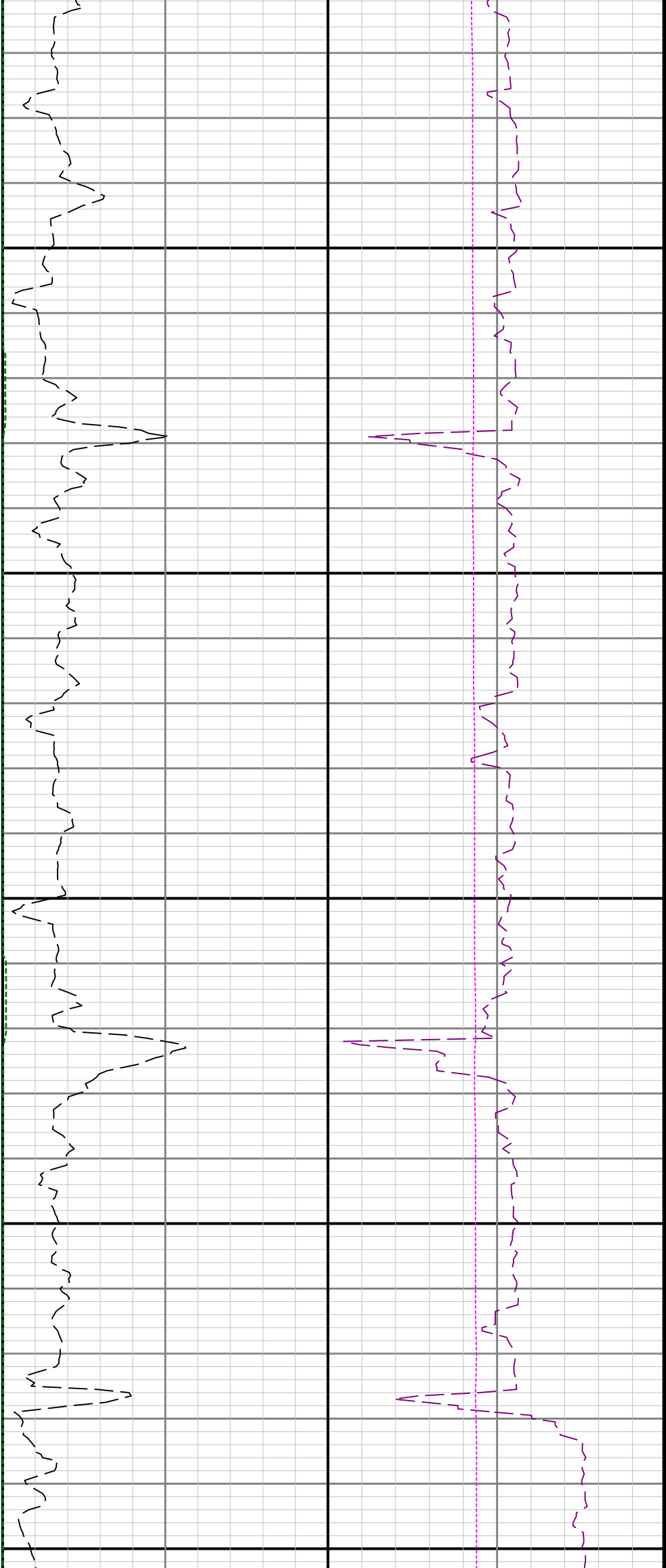


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2200

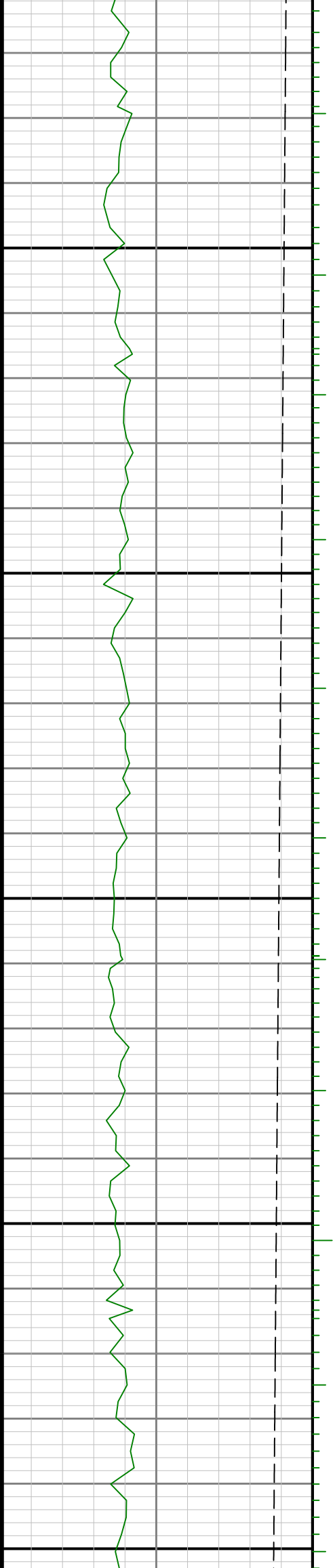


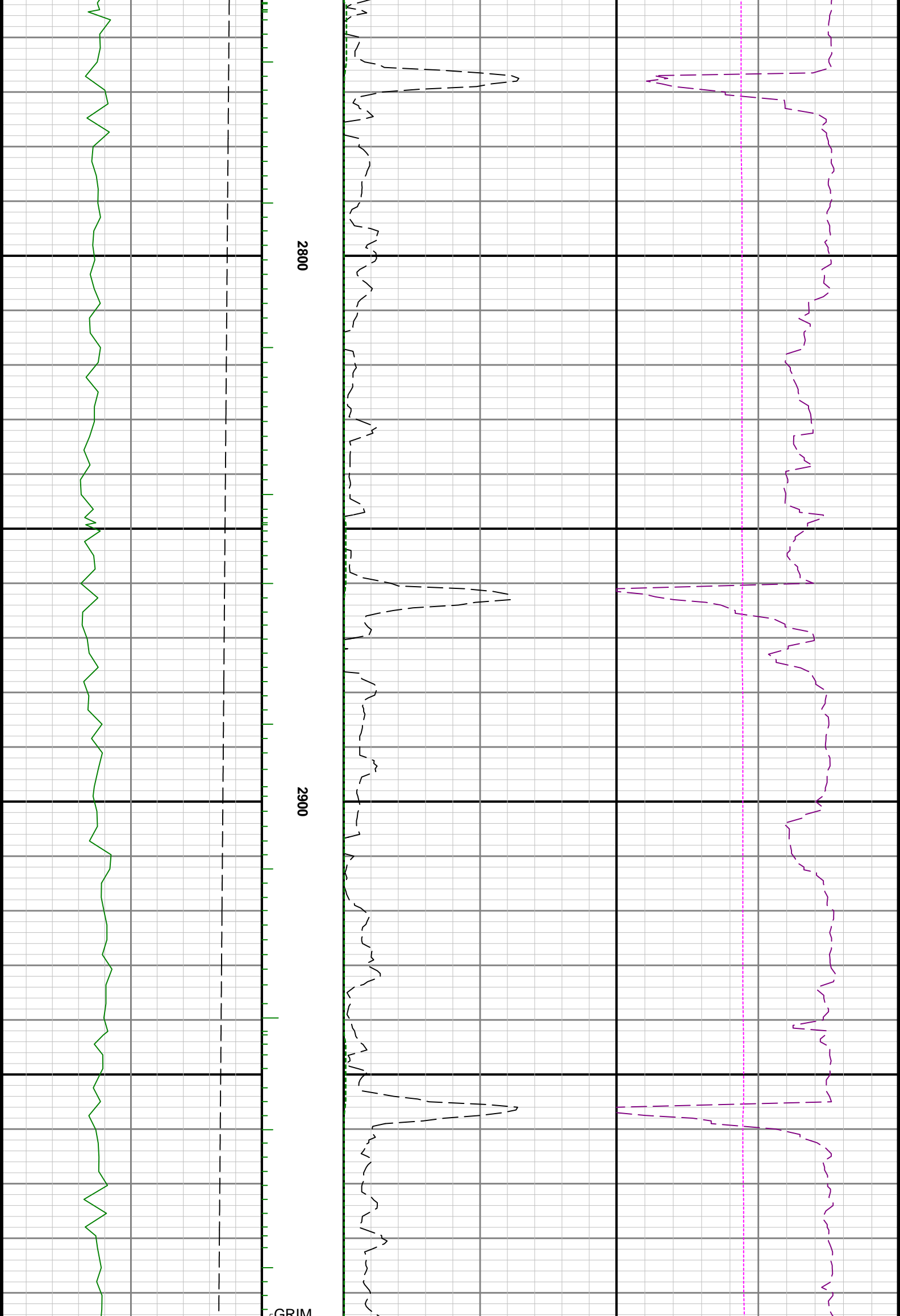




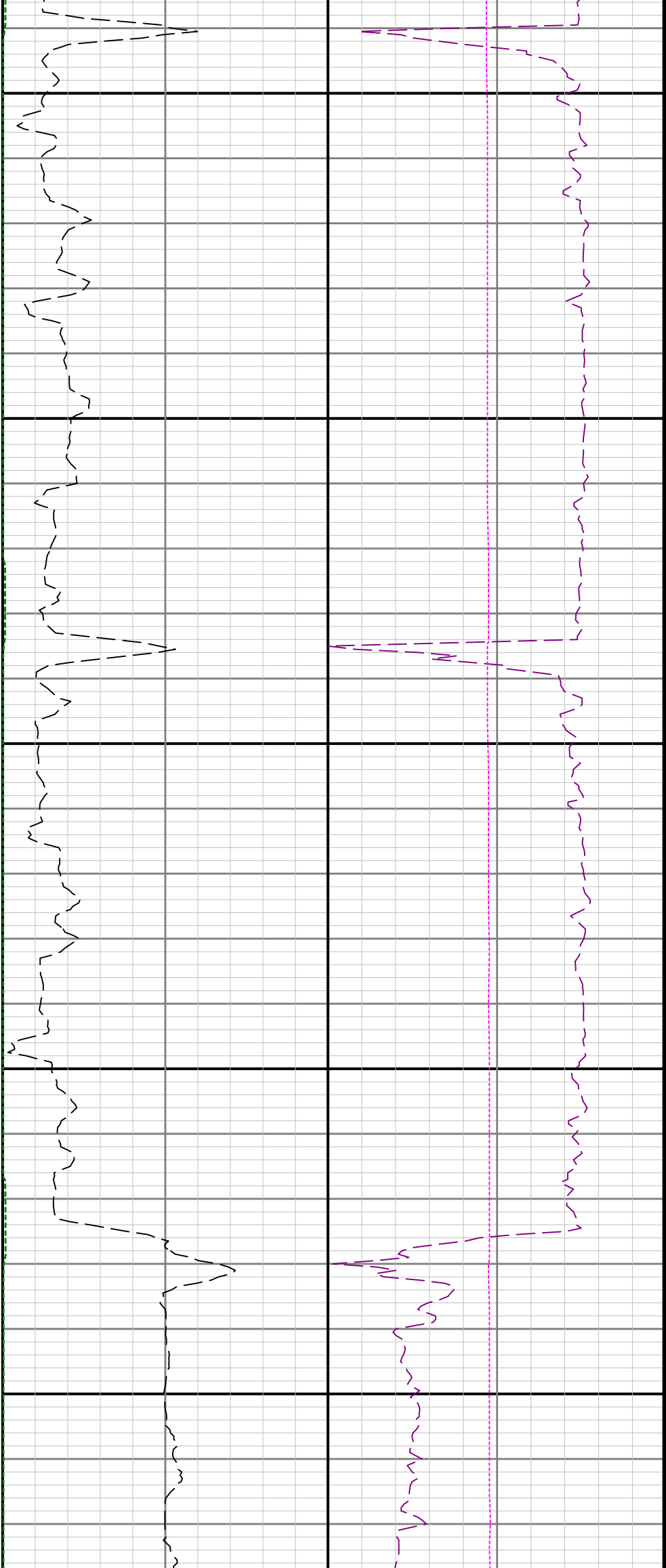
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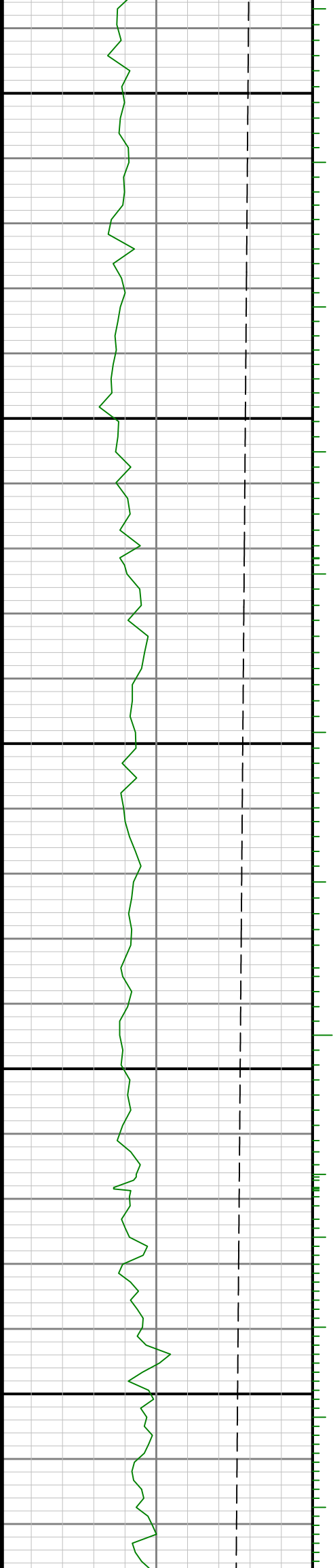


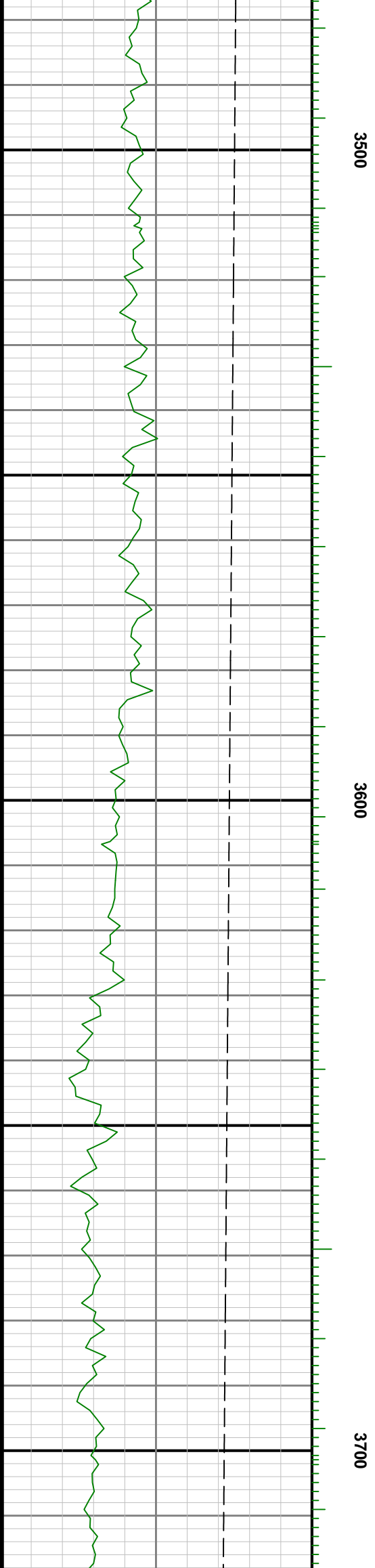
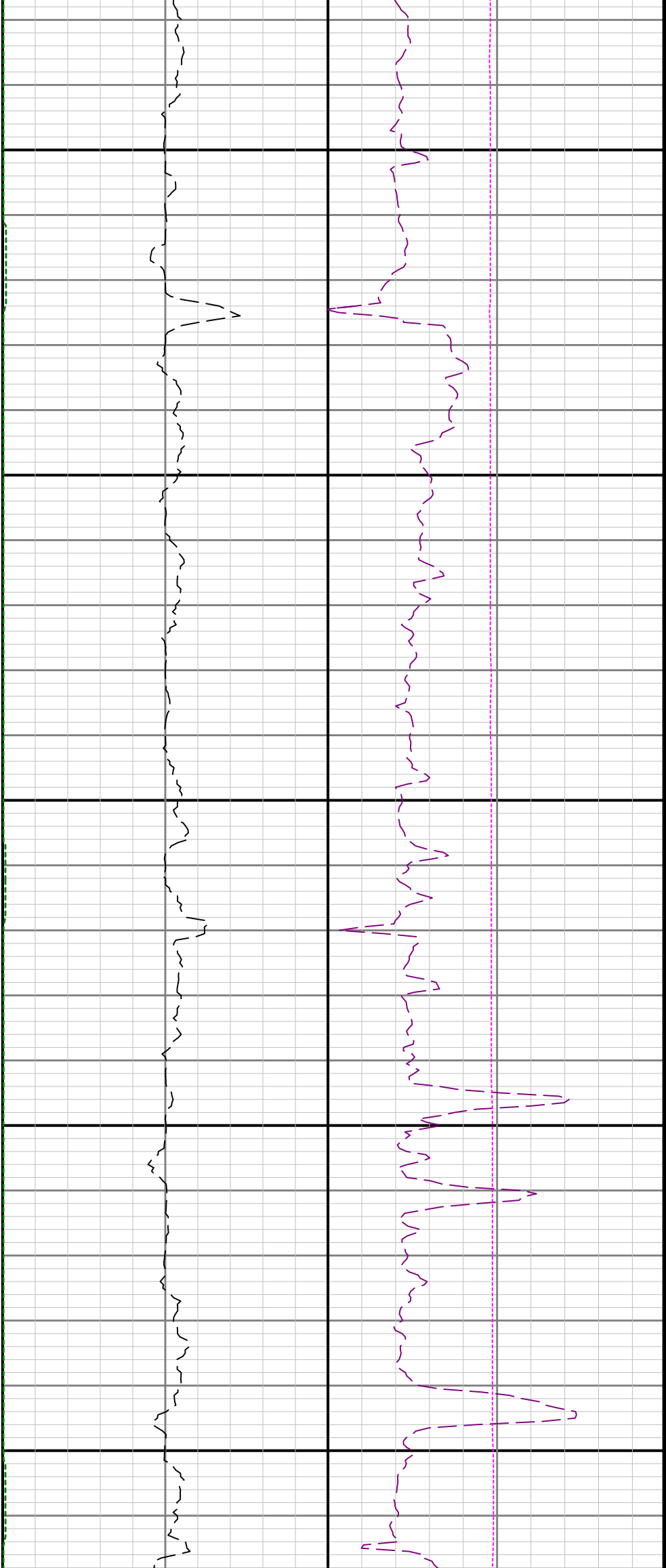


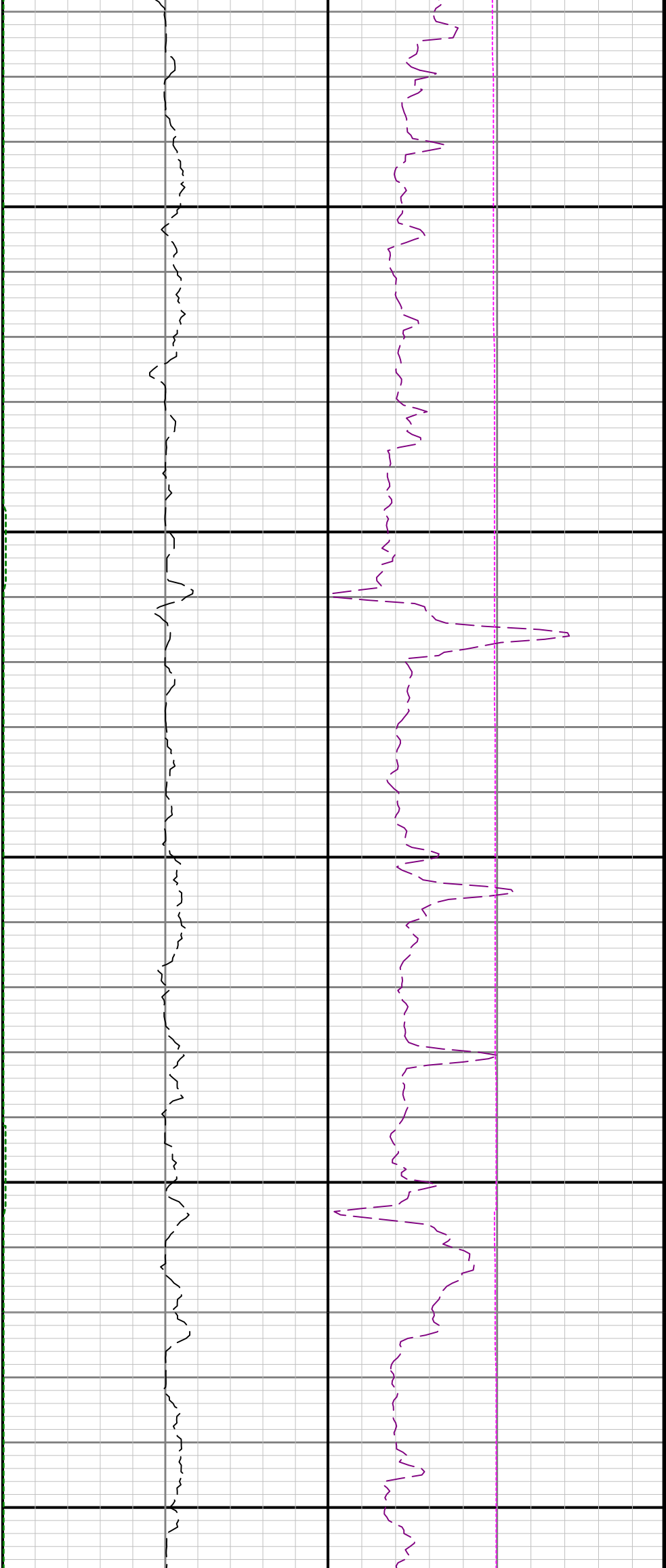


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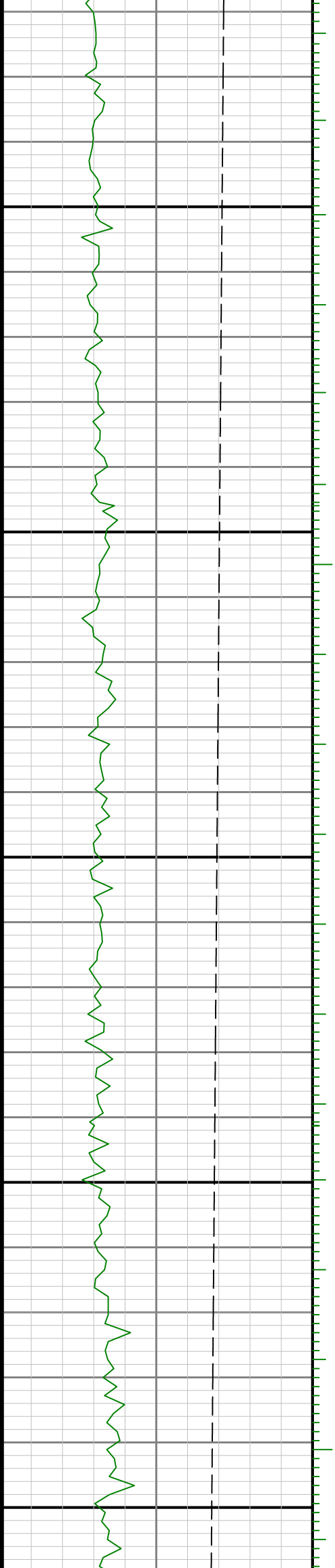


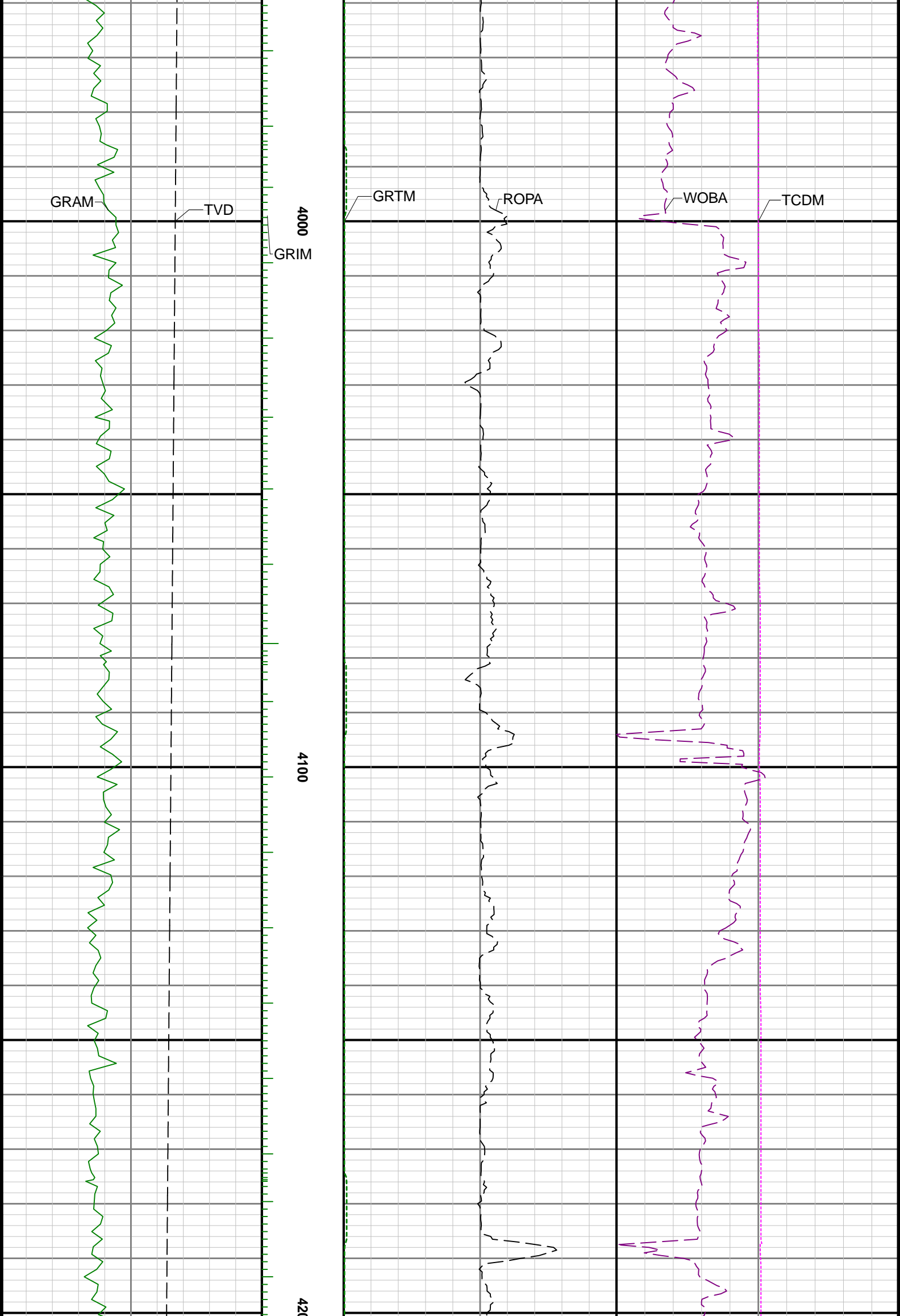


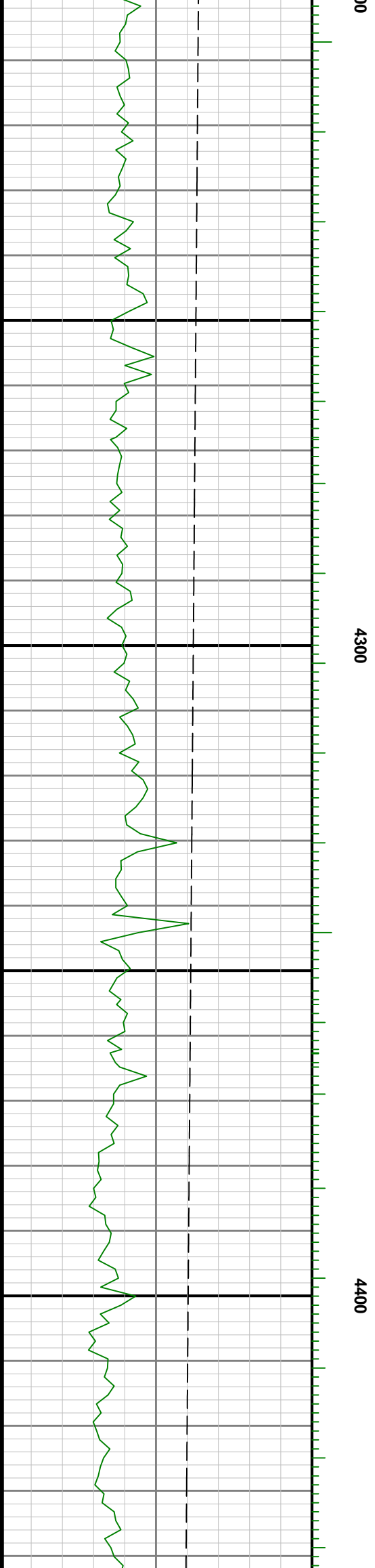
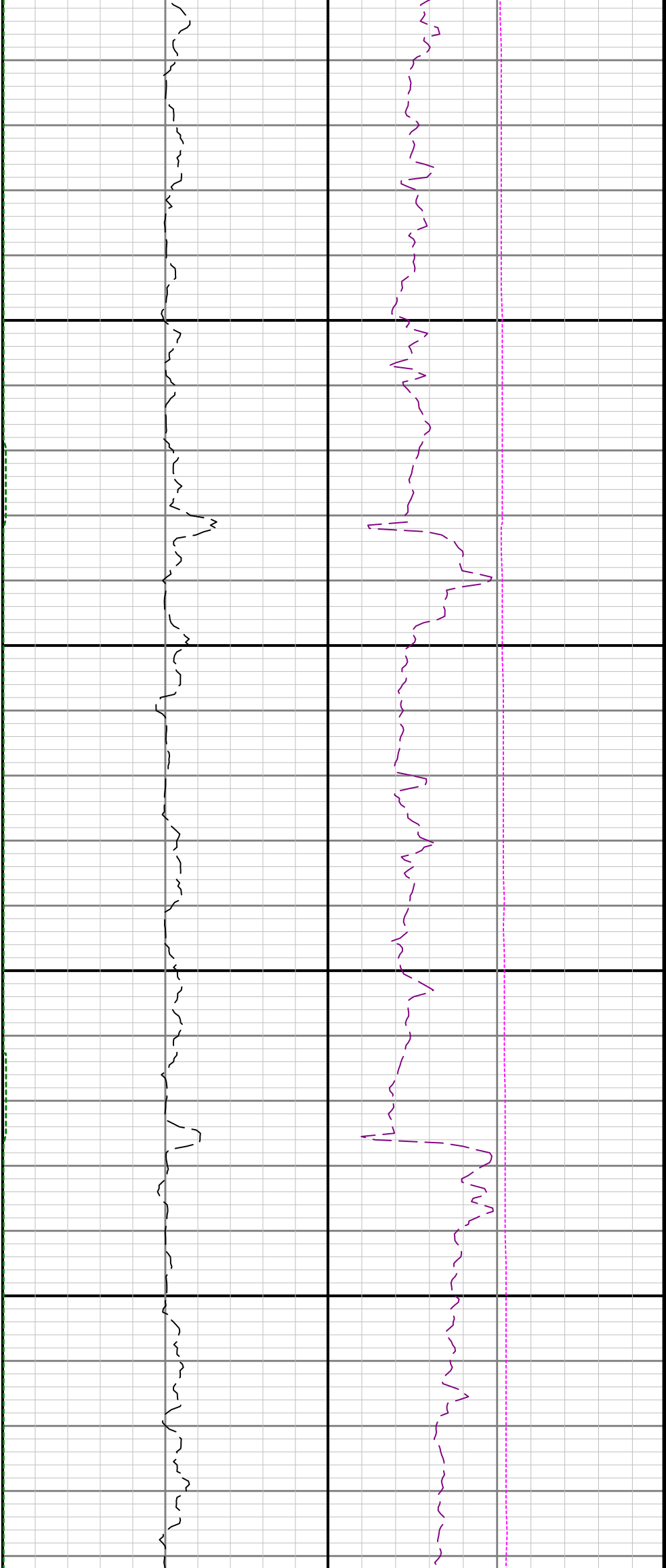


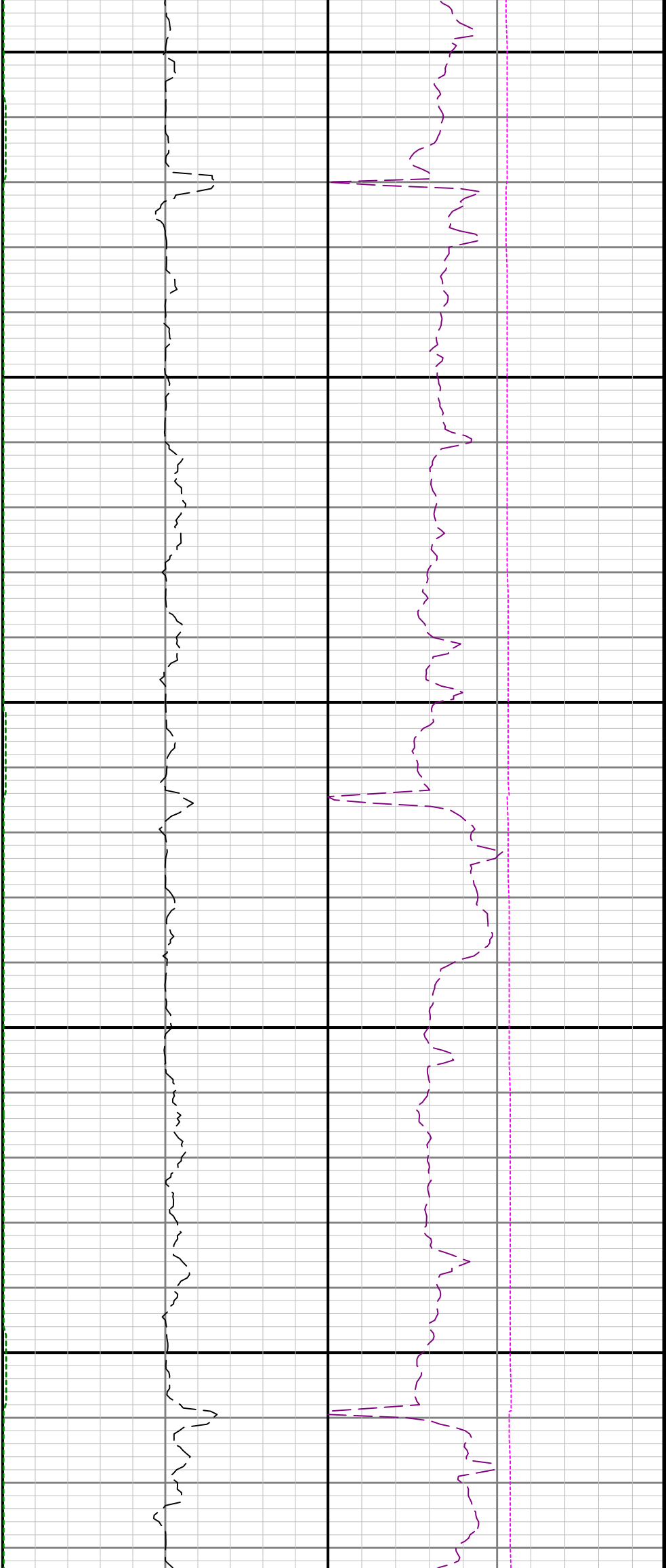
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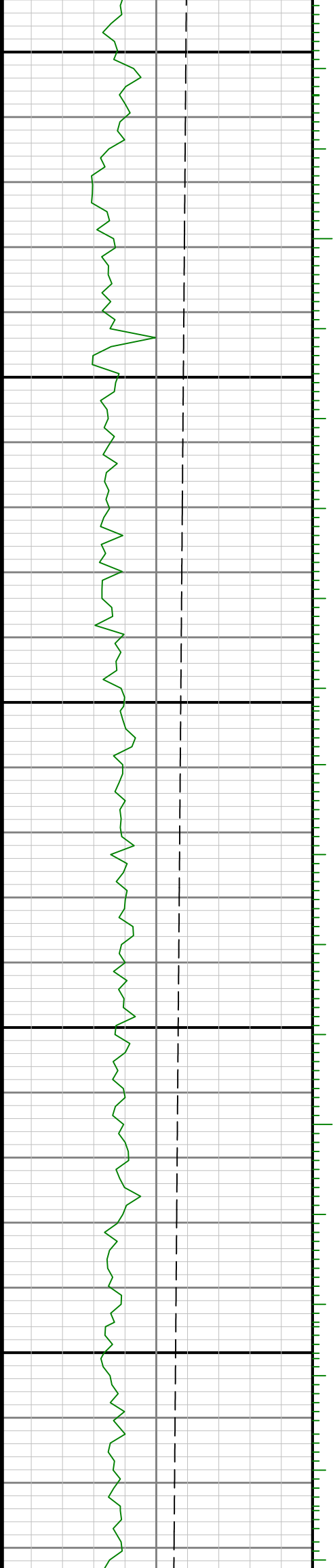


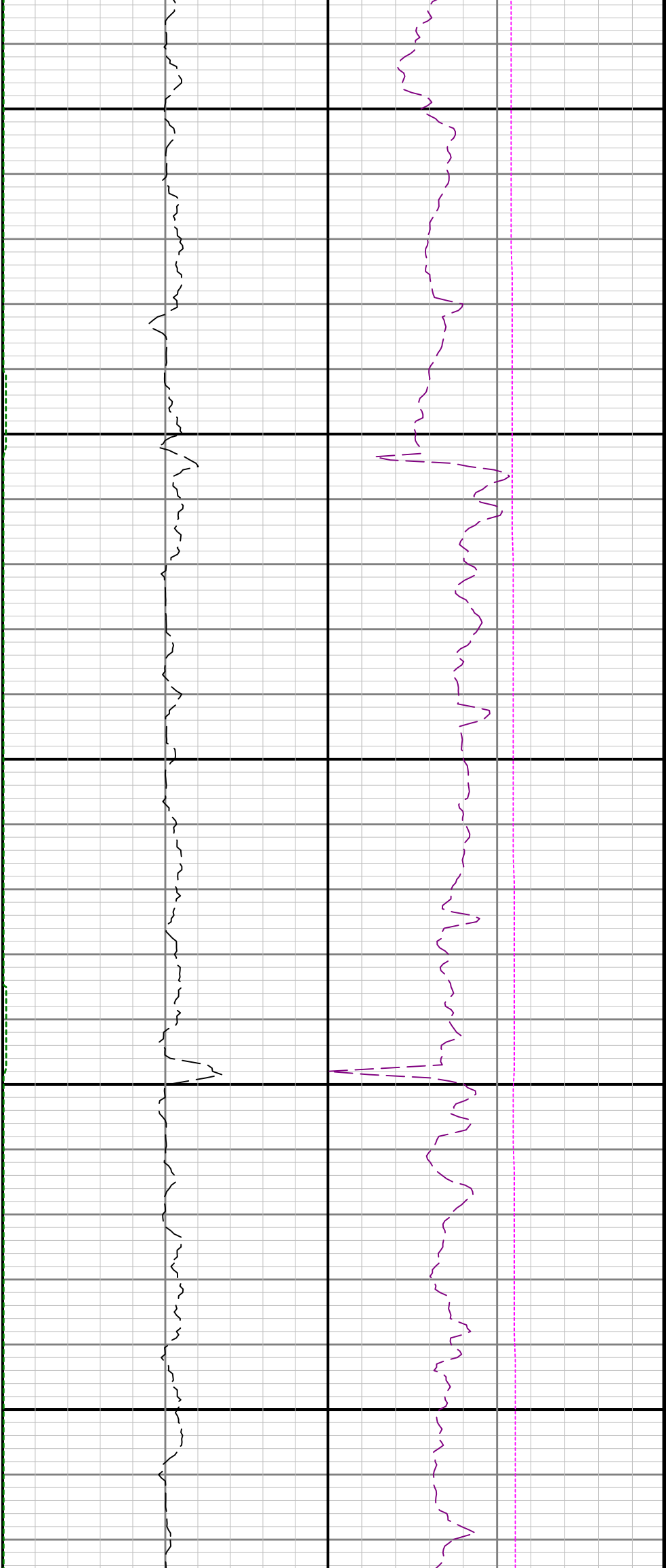




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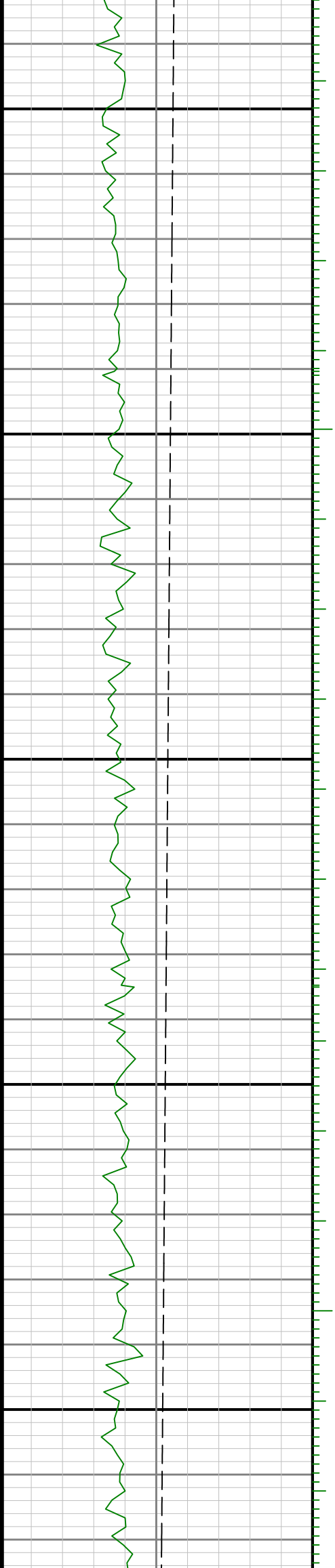


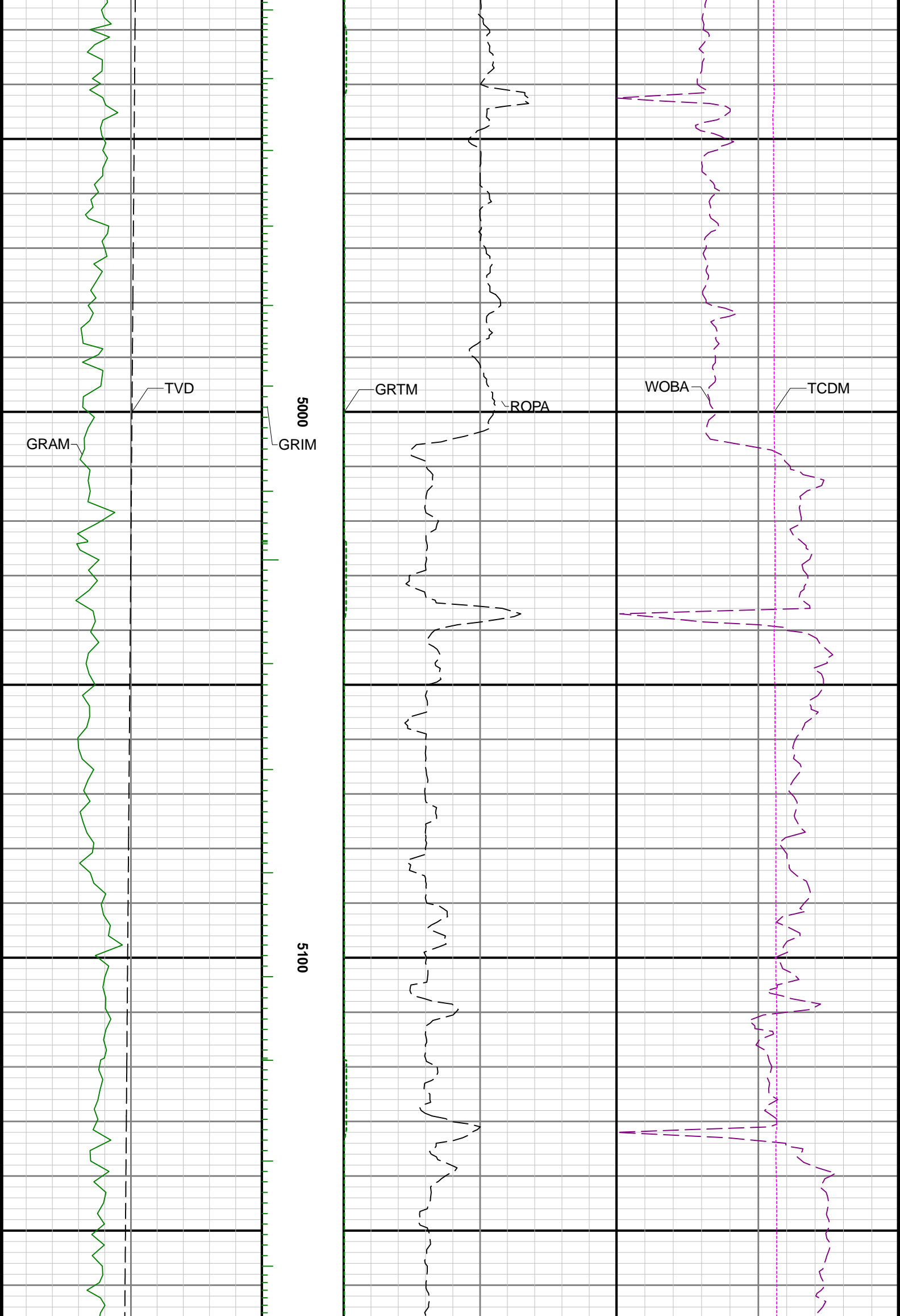


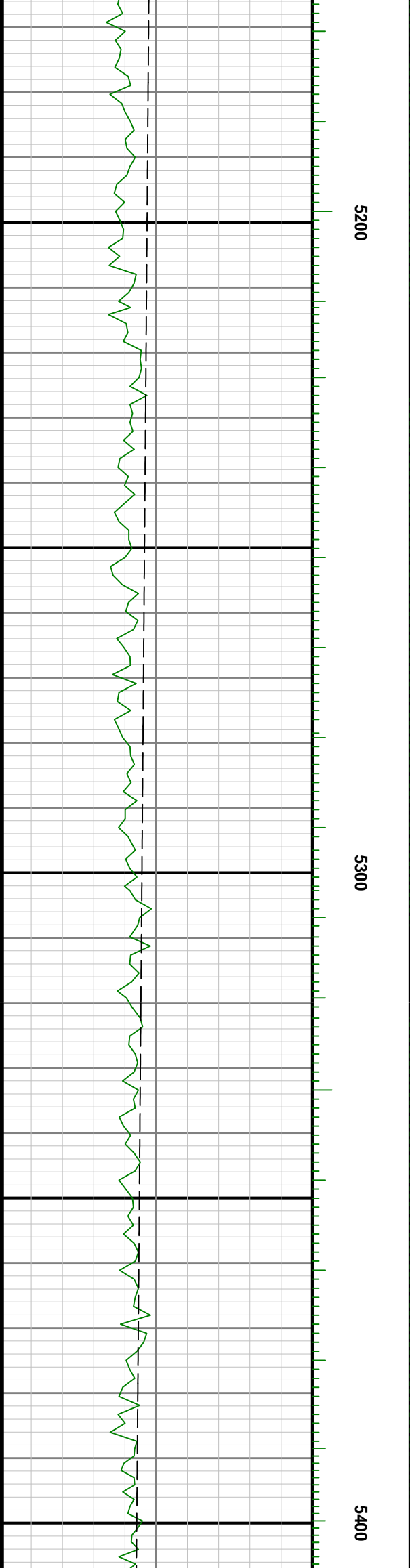
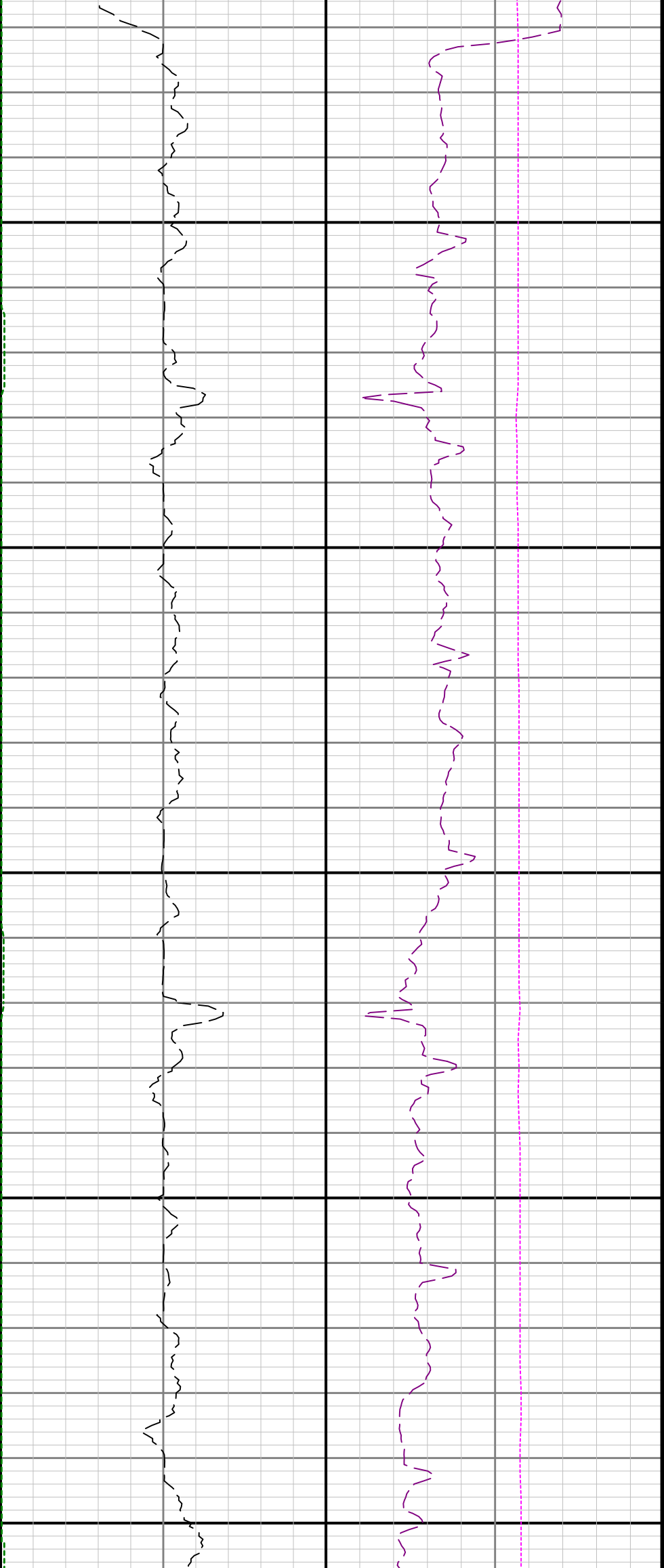
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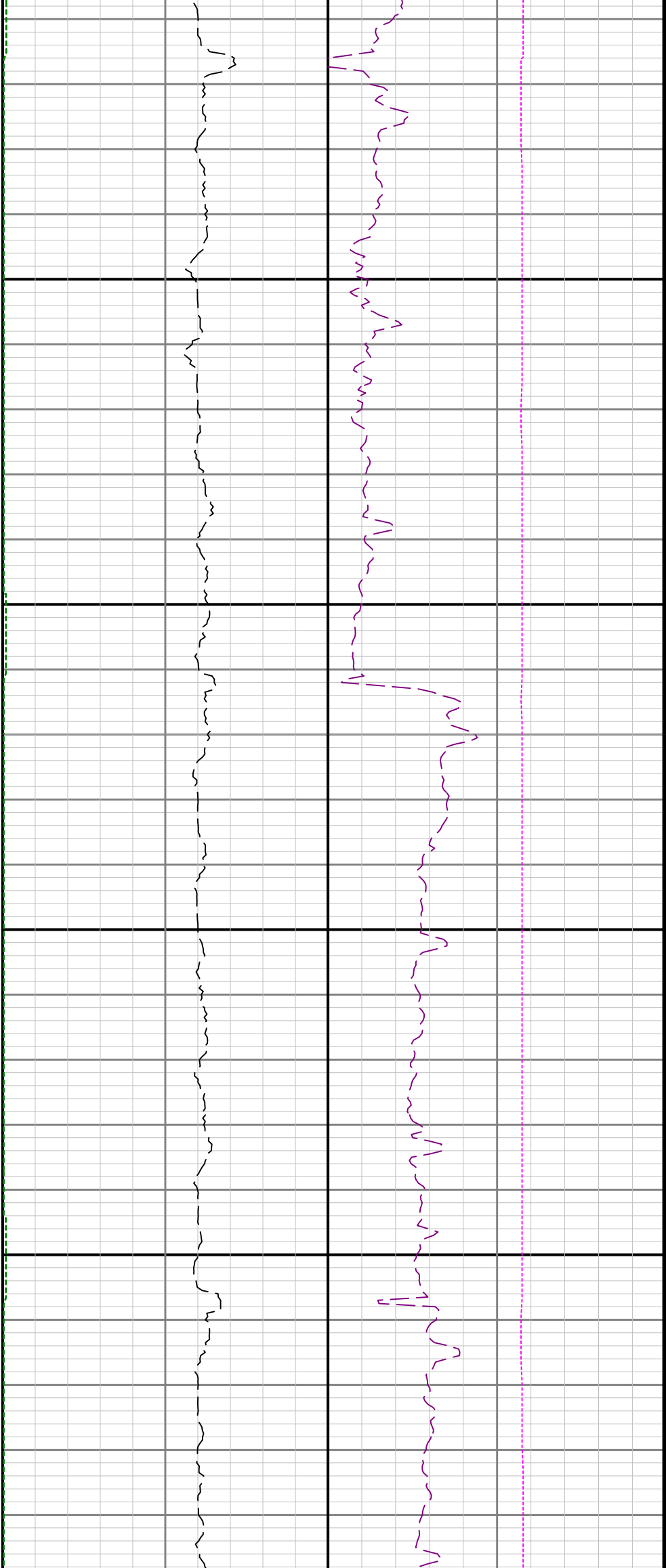
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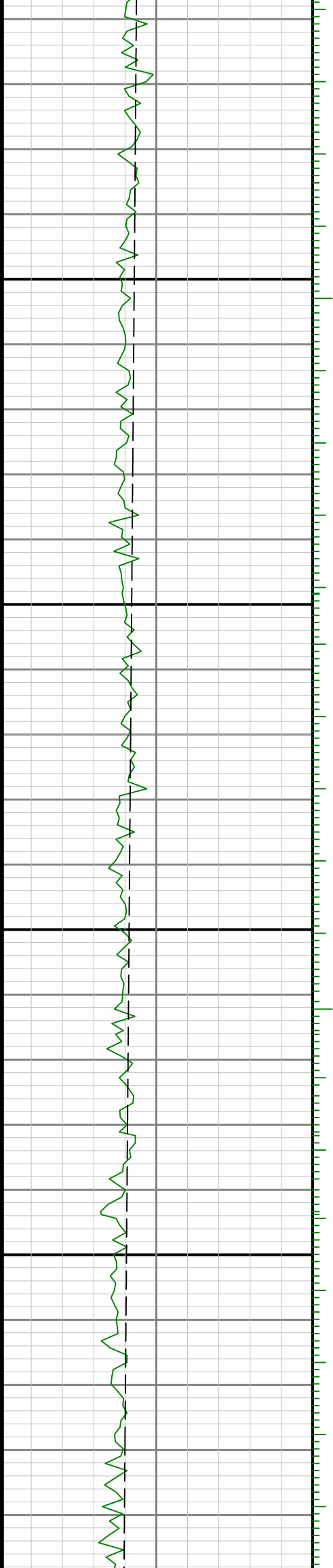


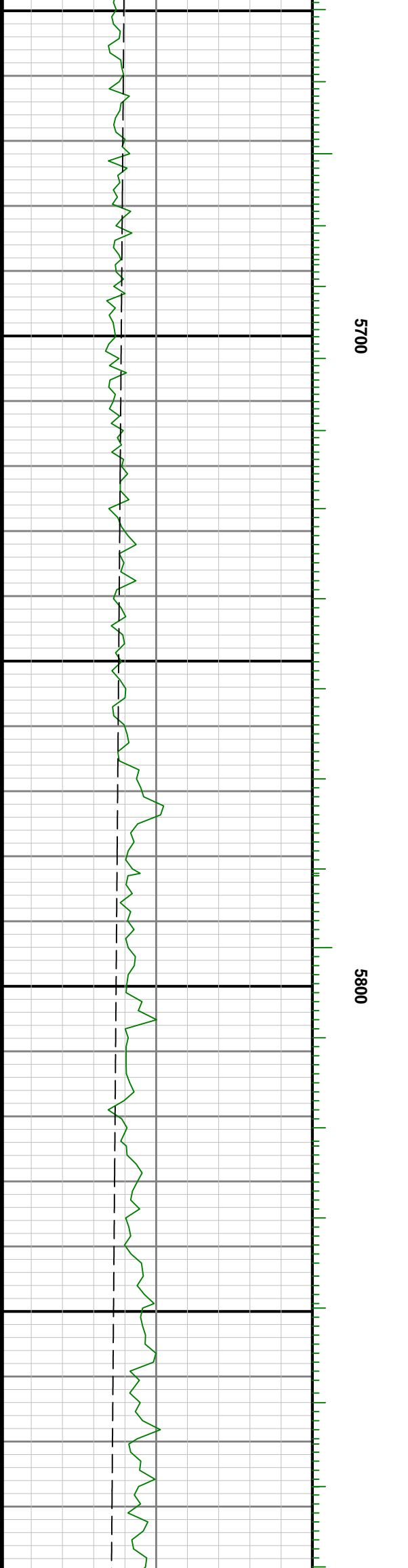
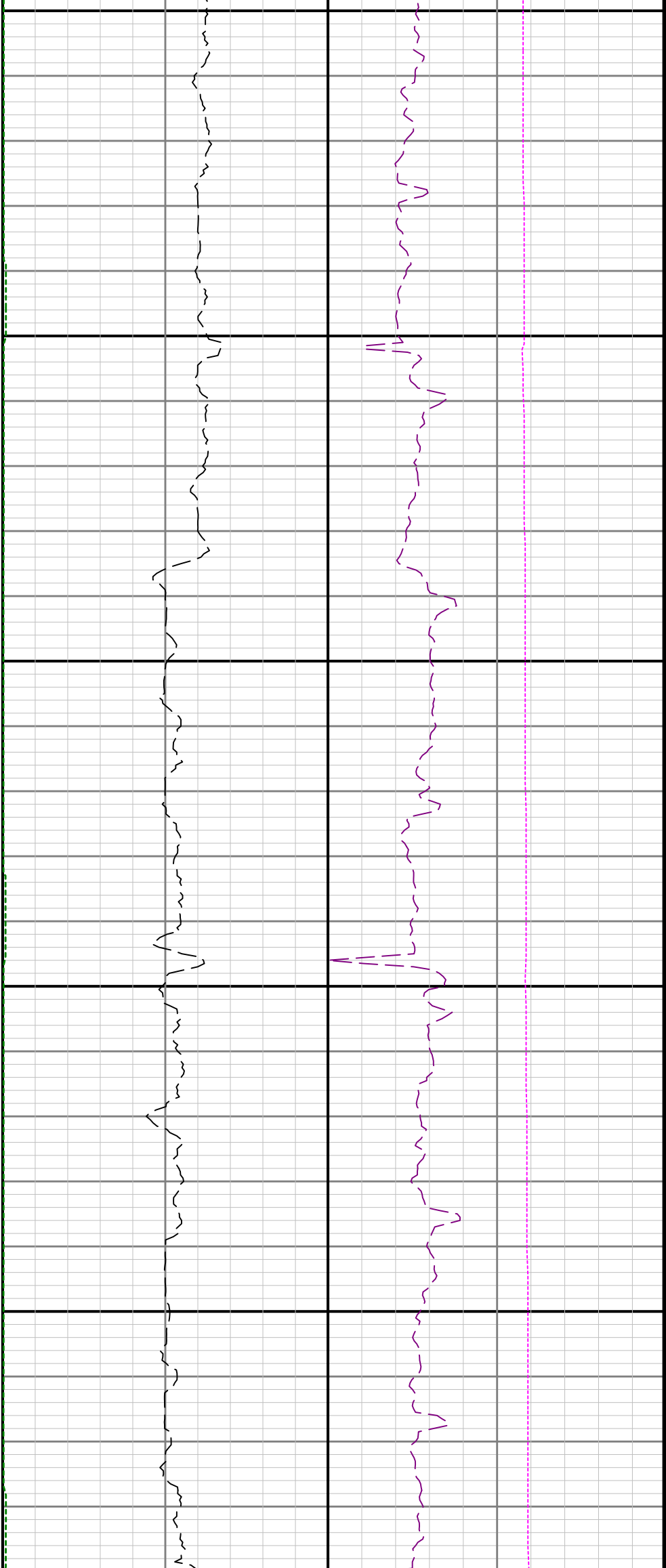


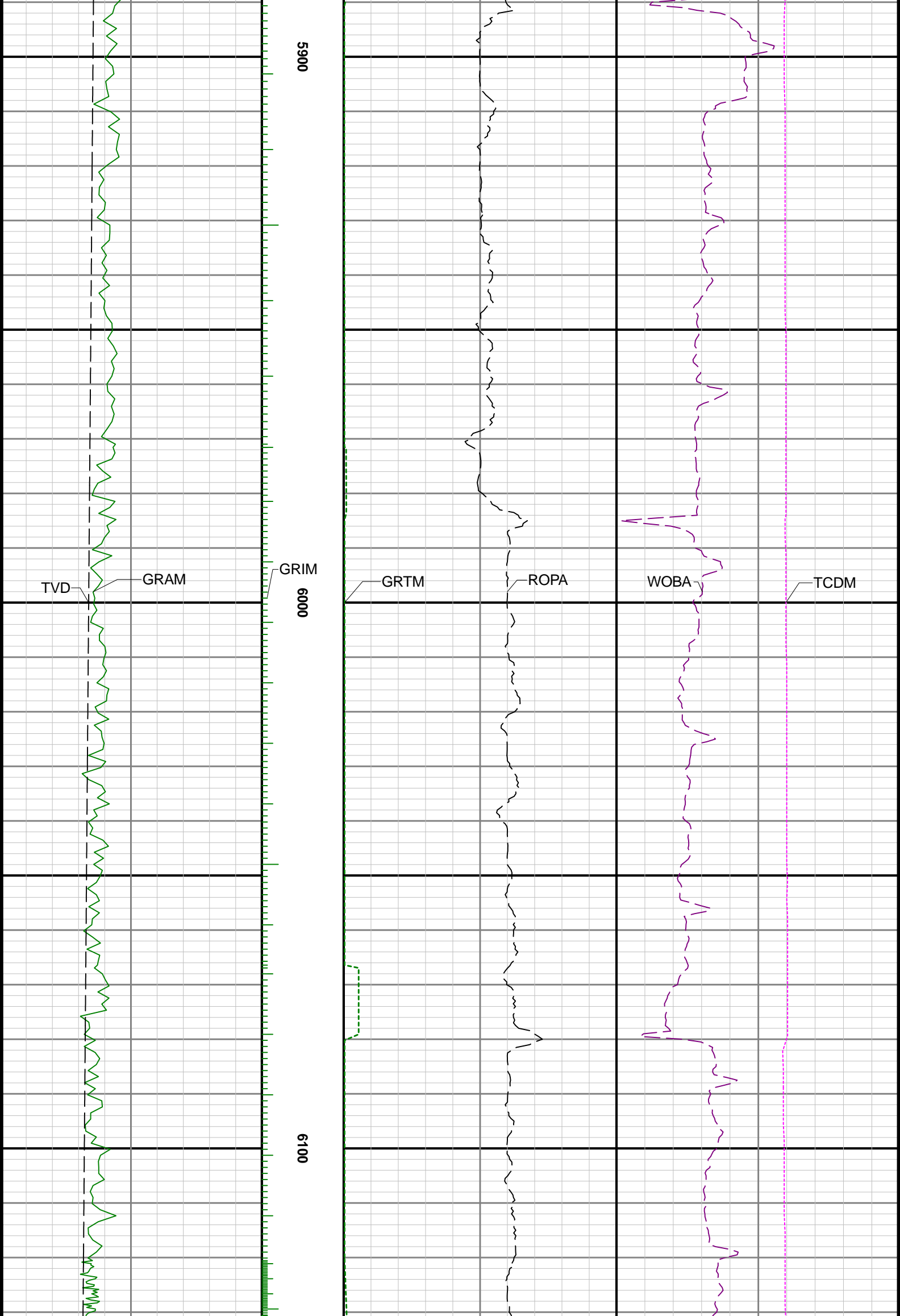


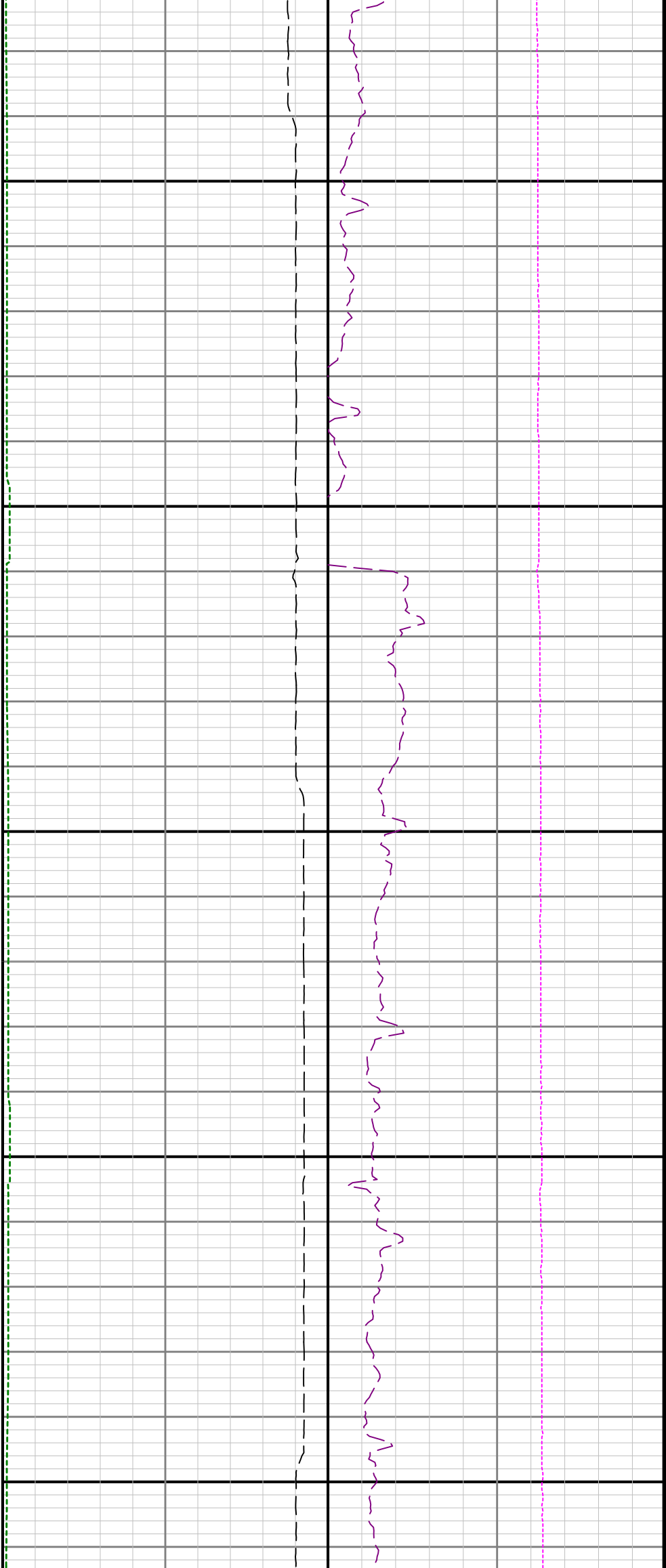
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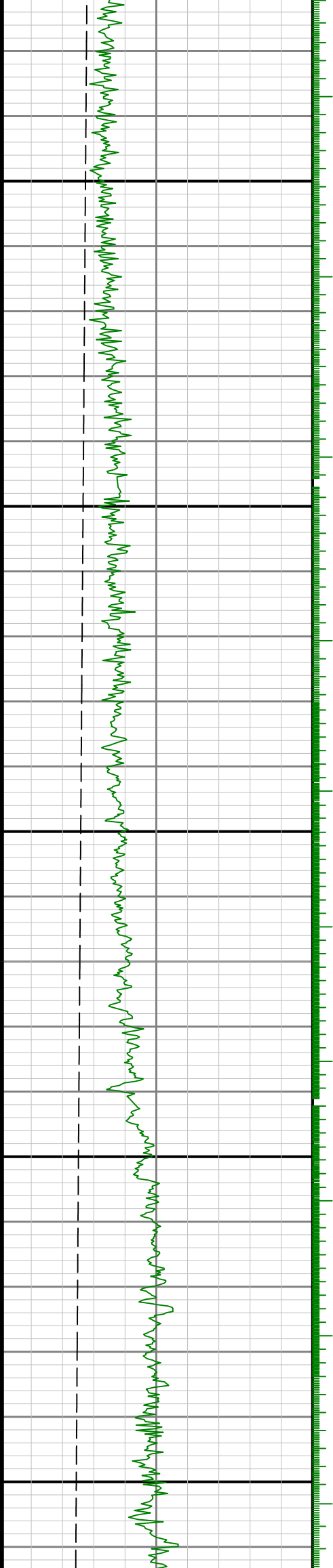


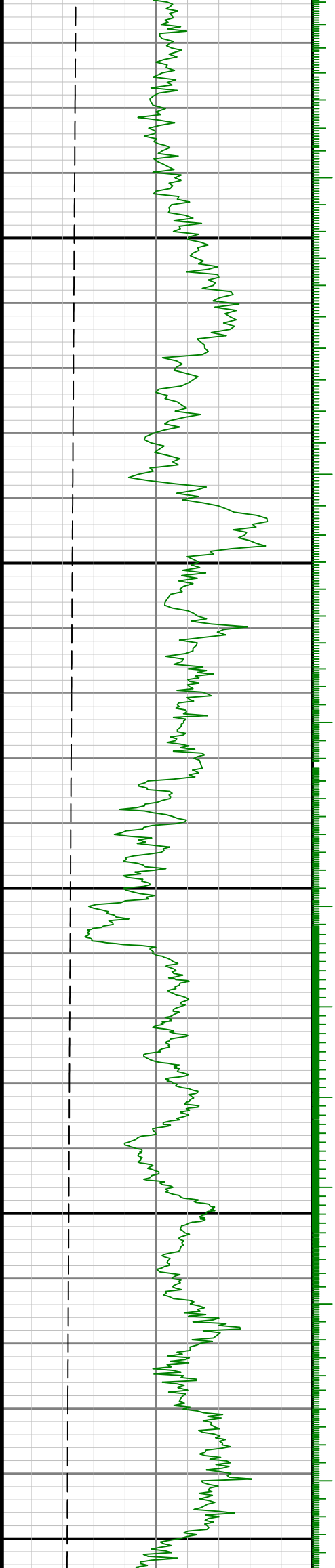


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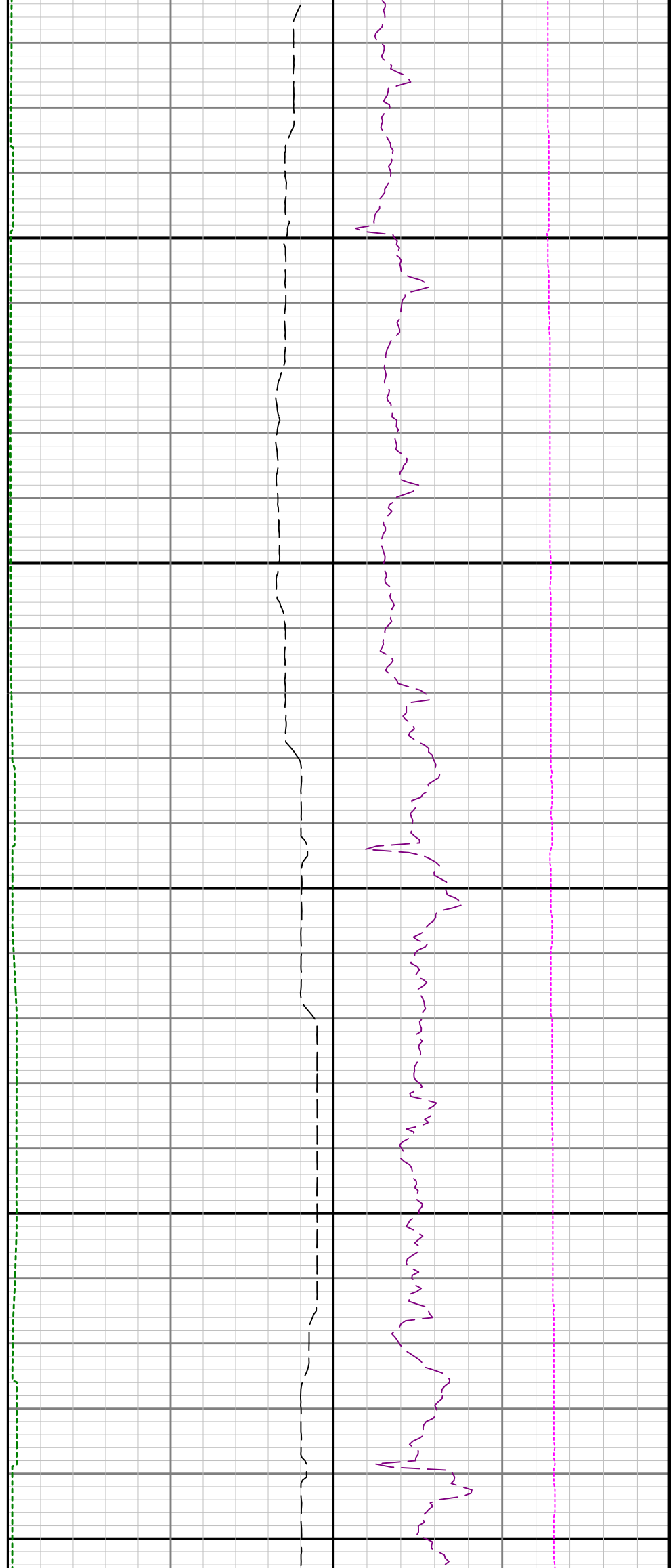
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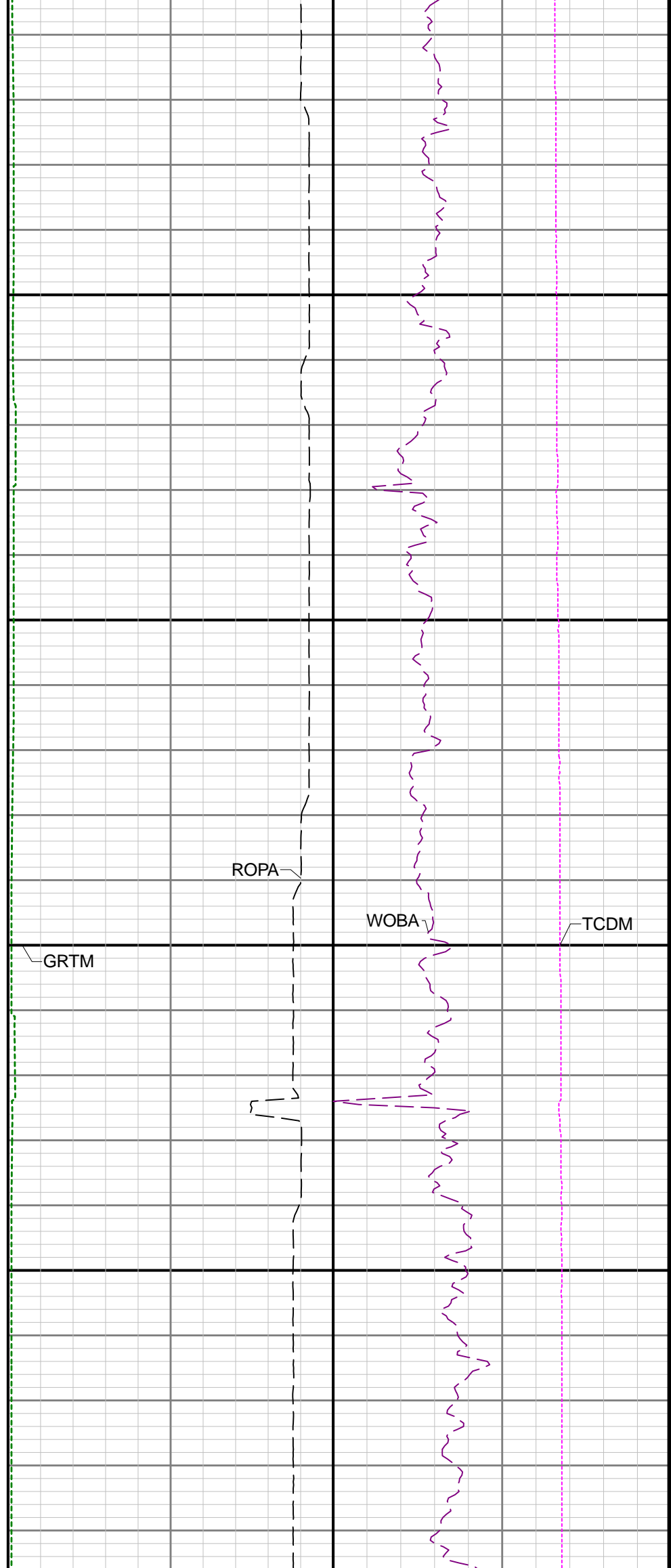
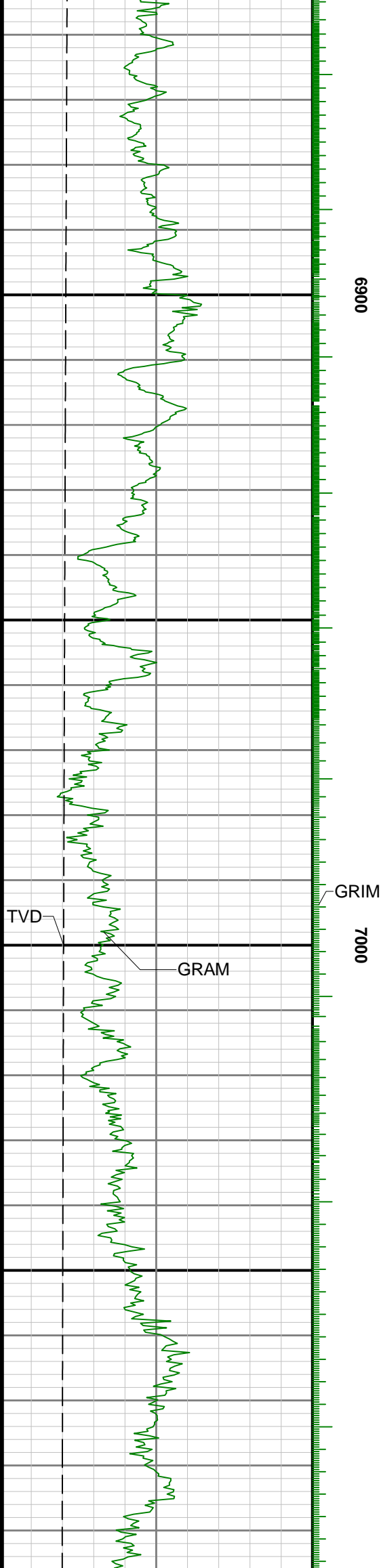


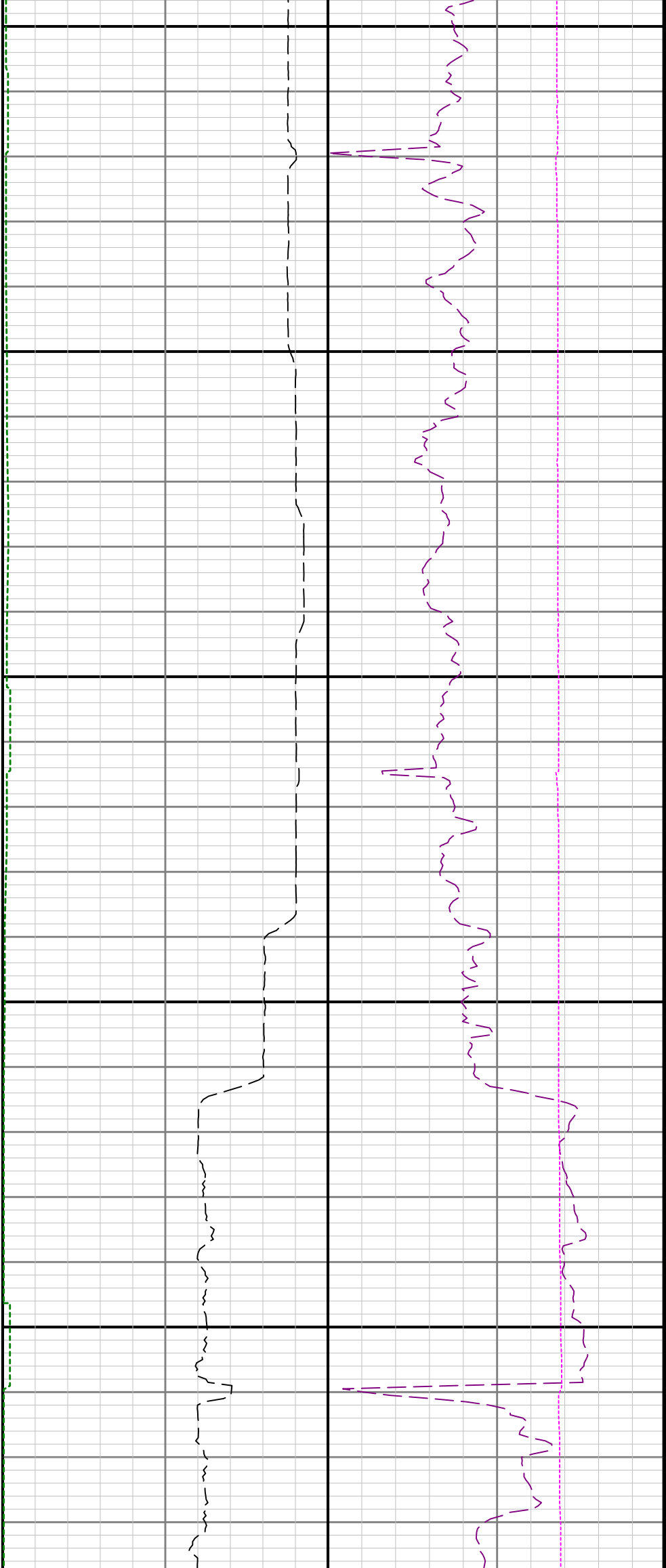


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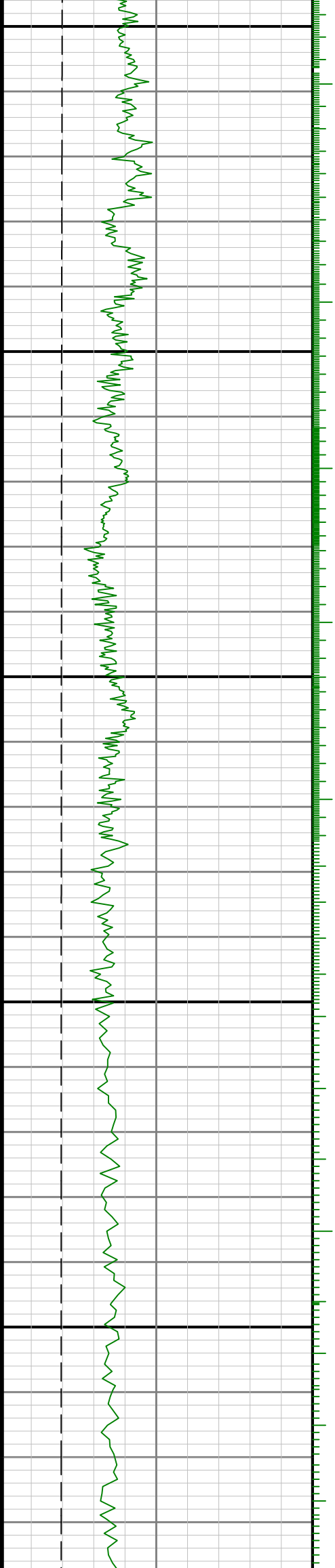


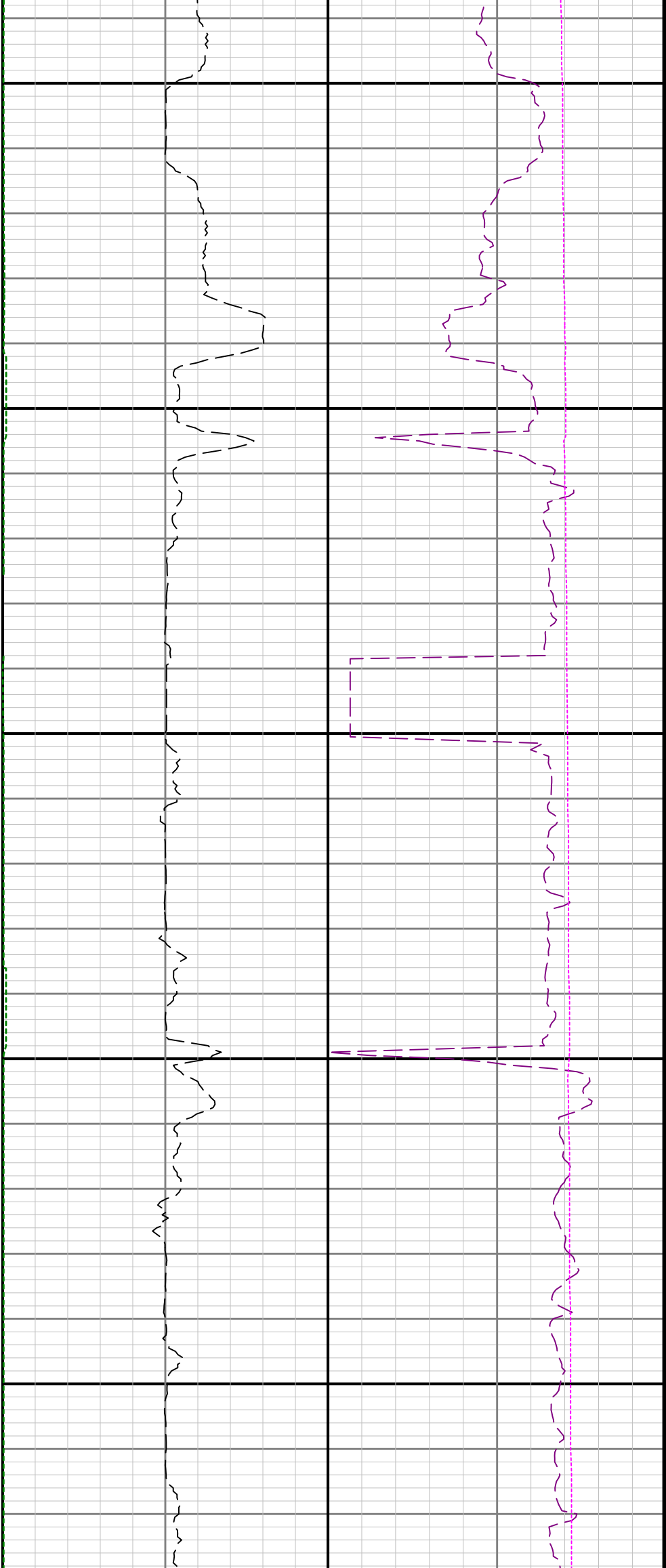


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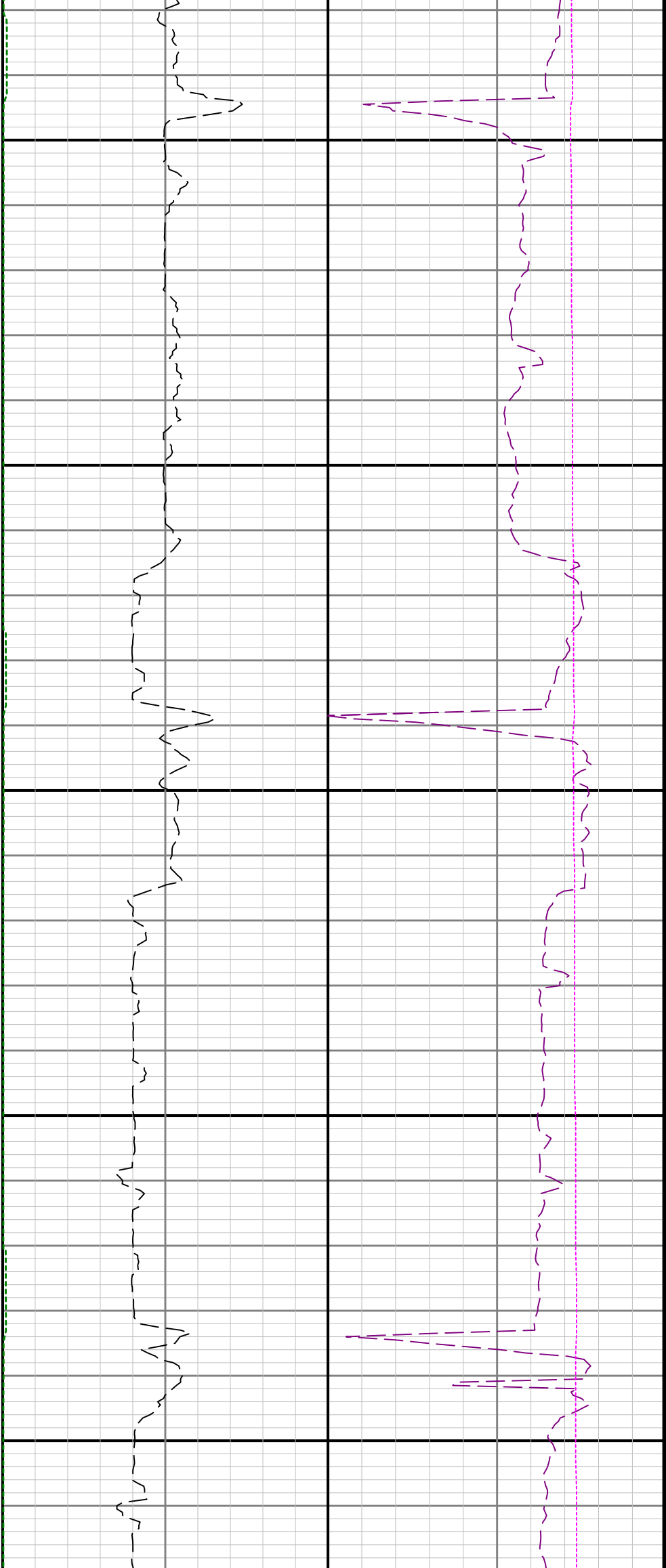
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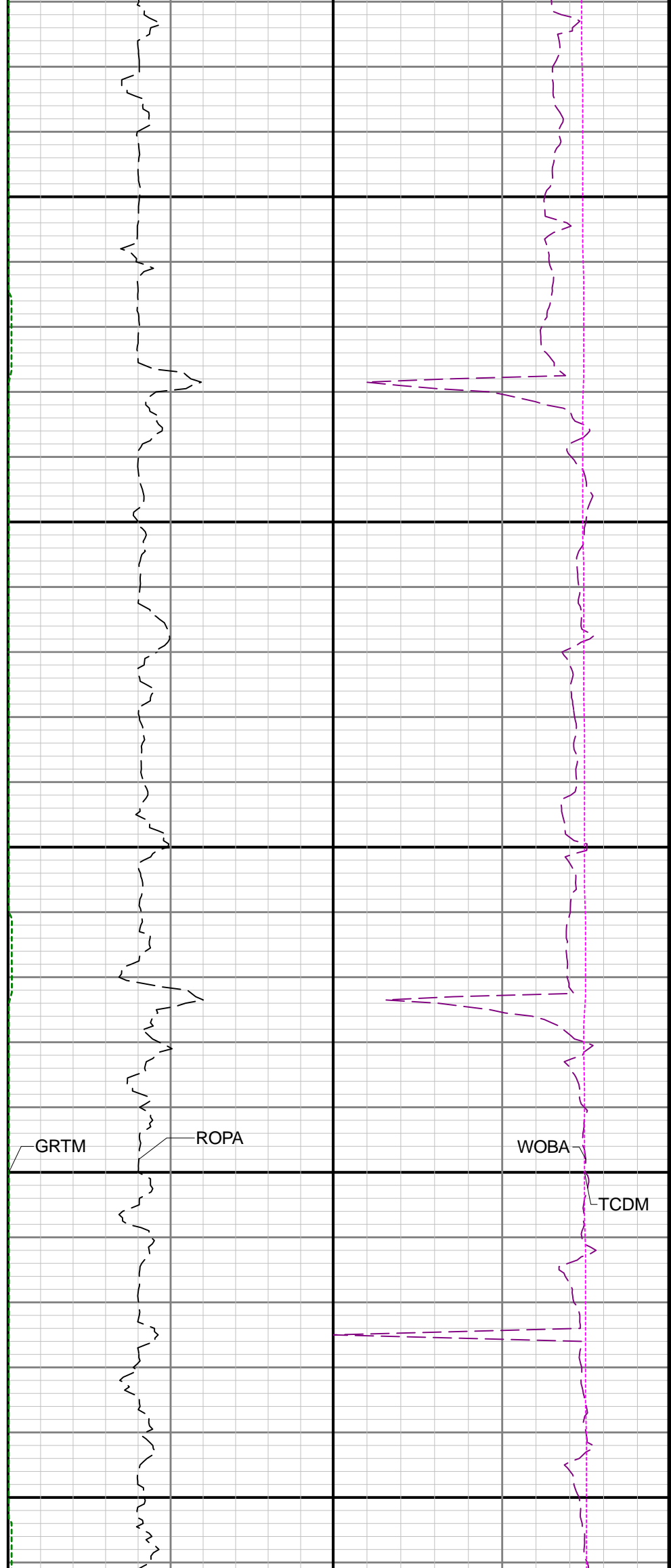
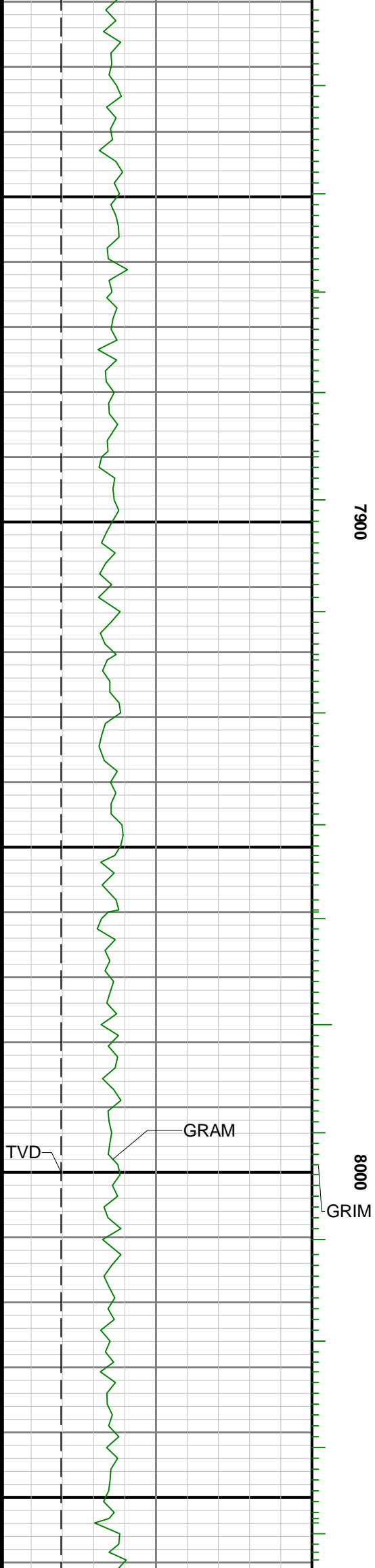
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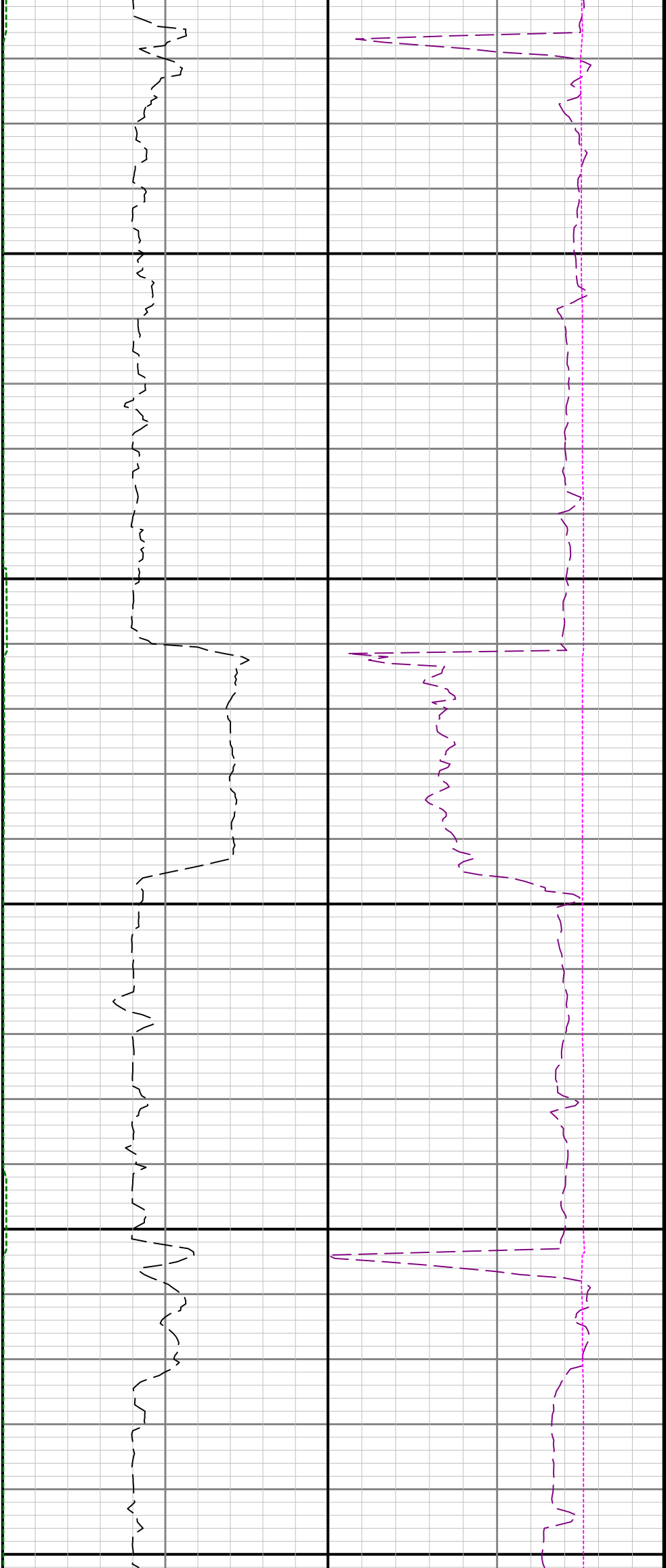


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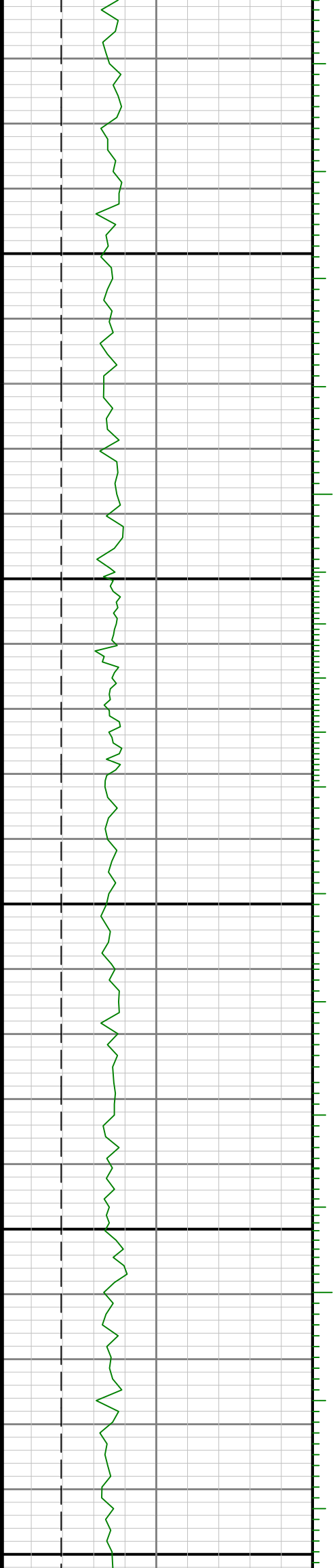


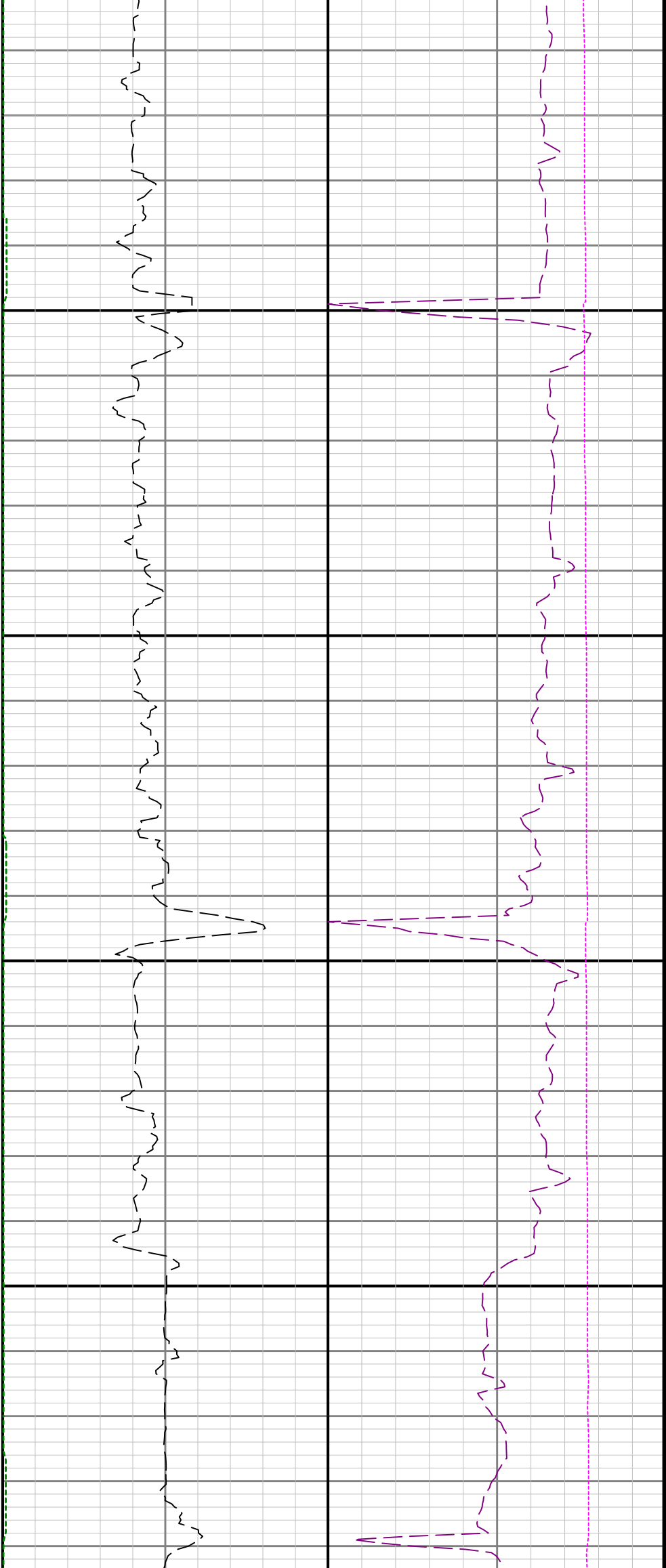


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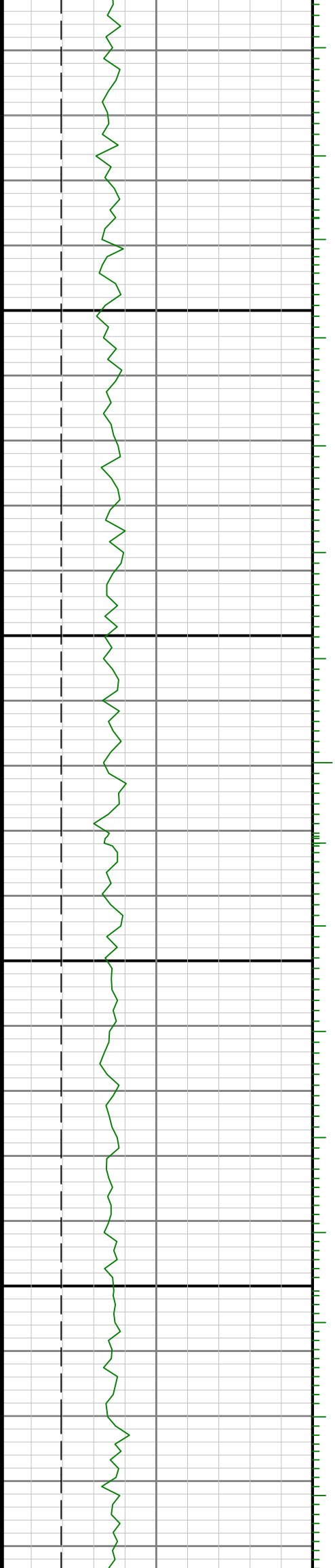
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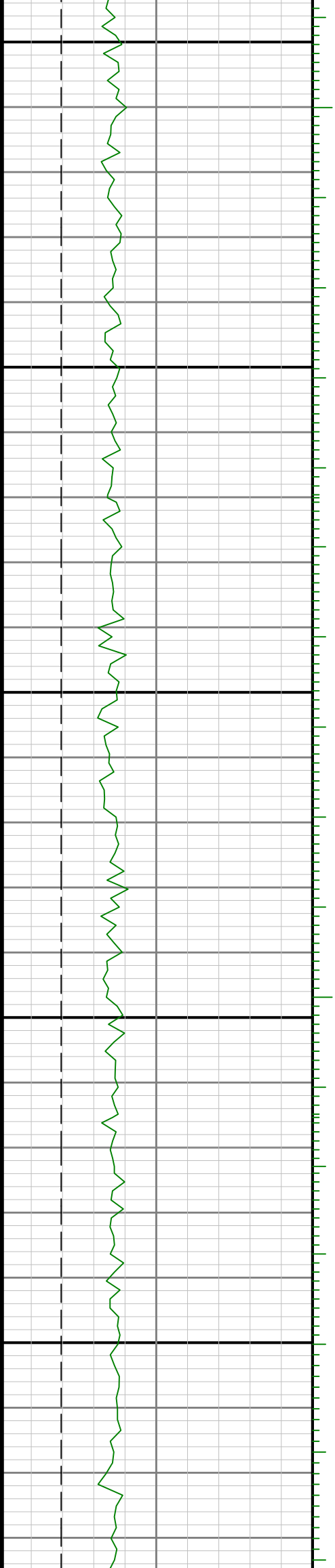




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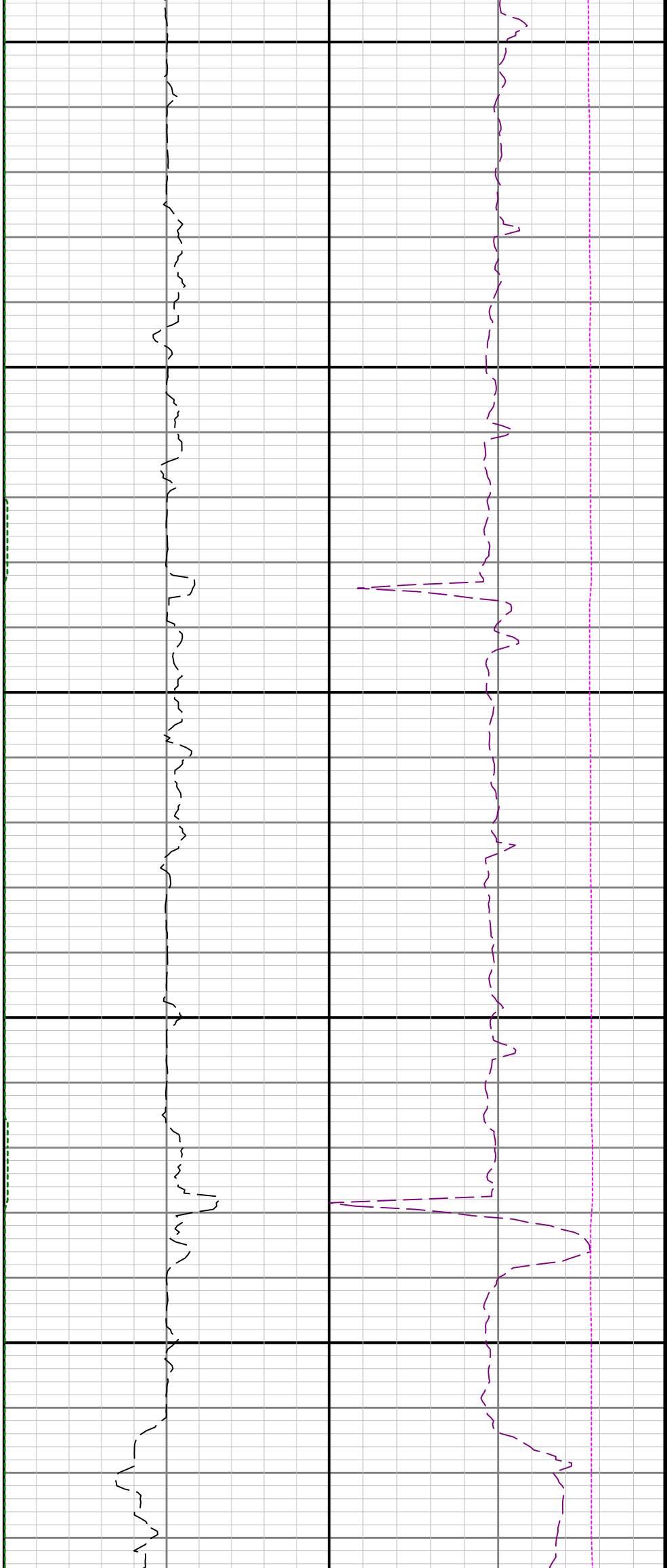
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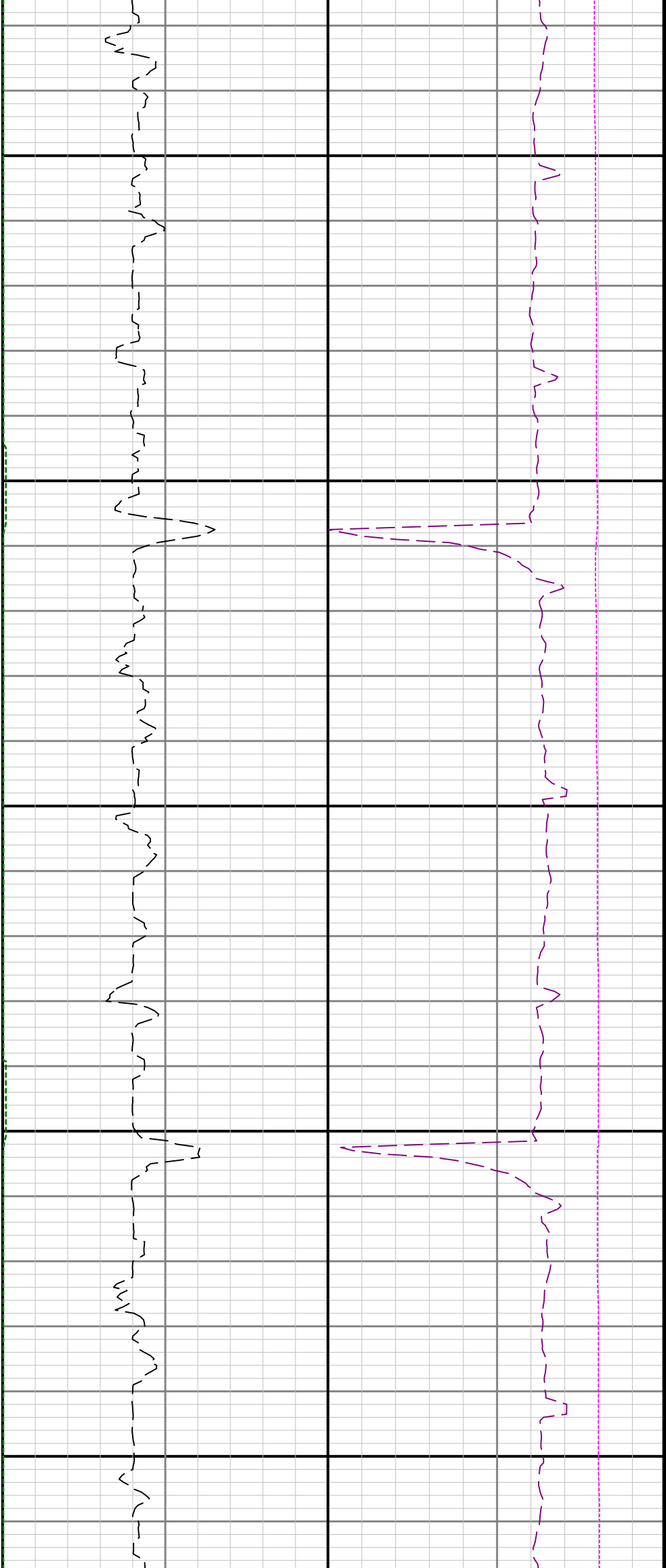


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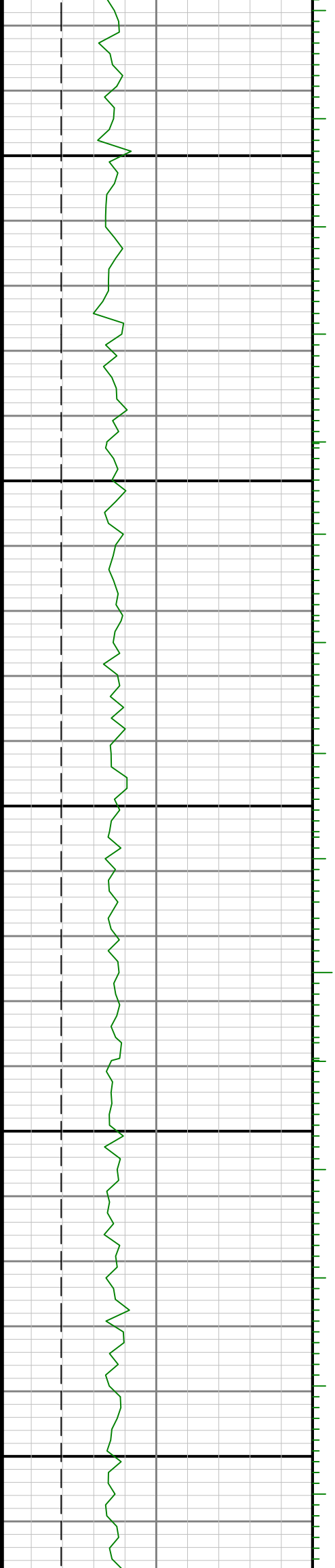


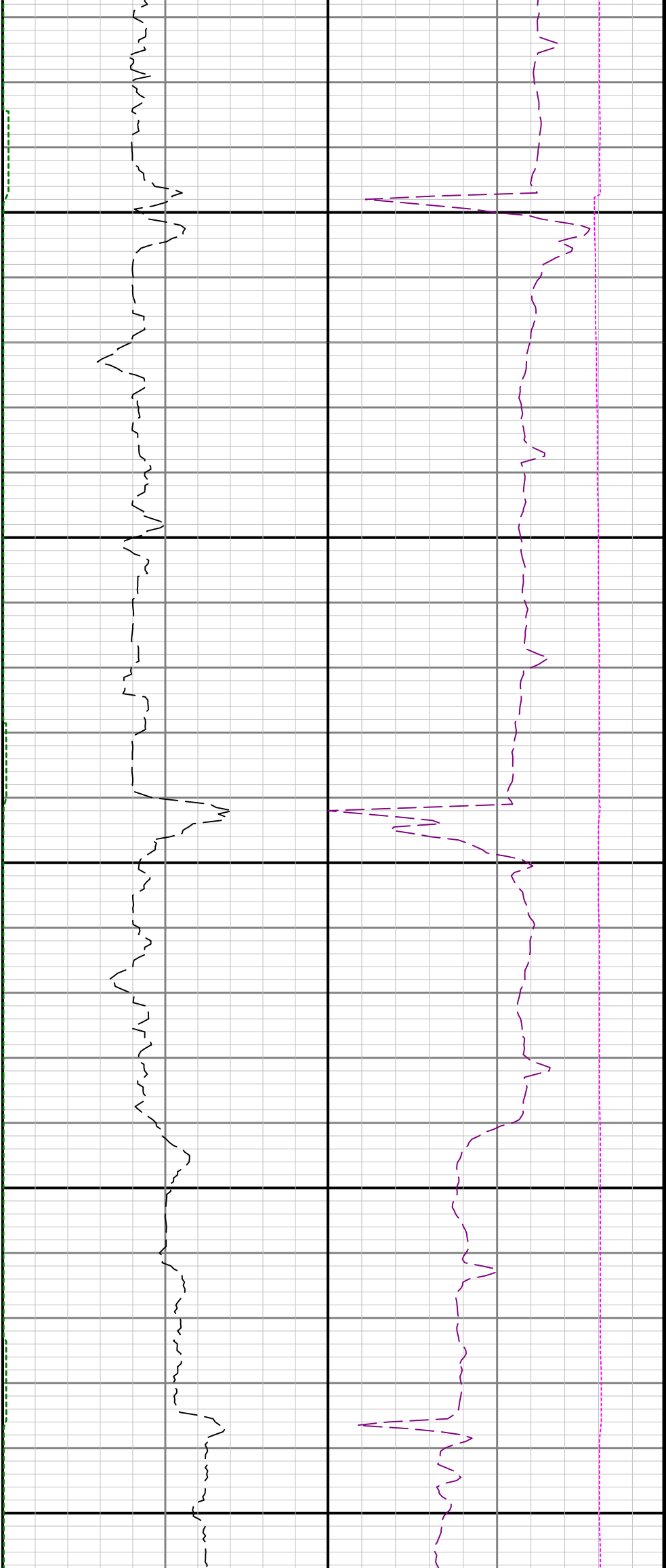




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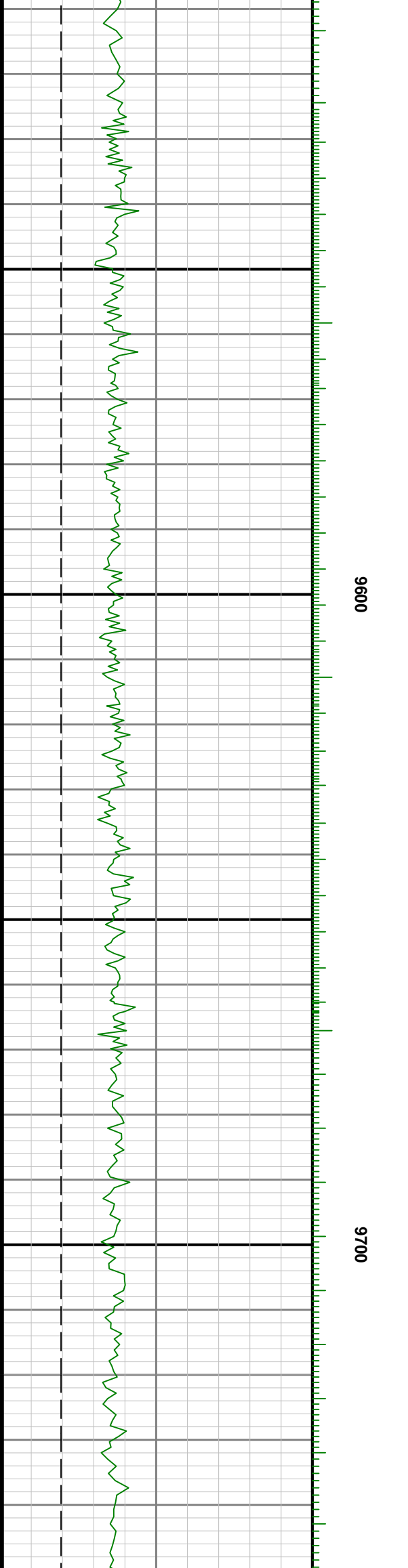
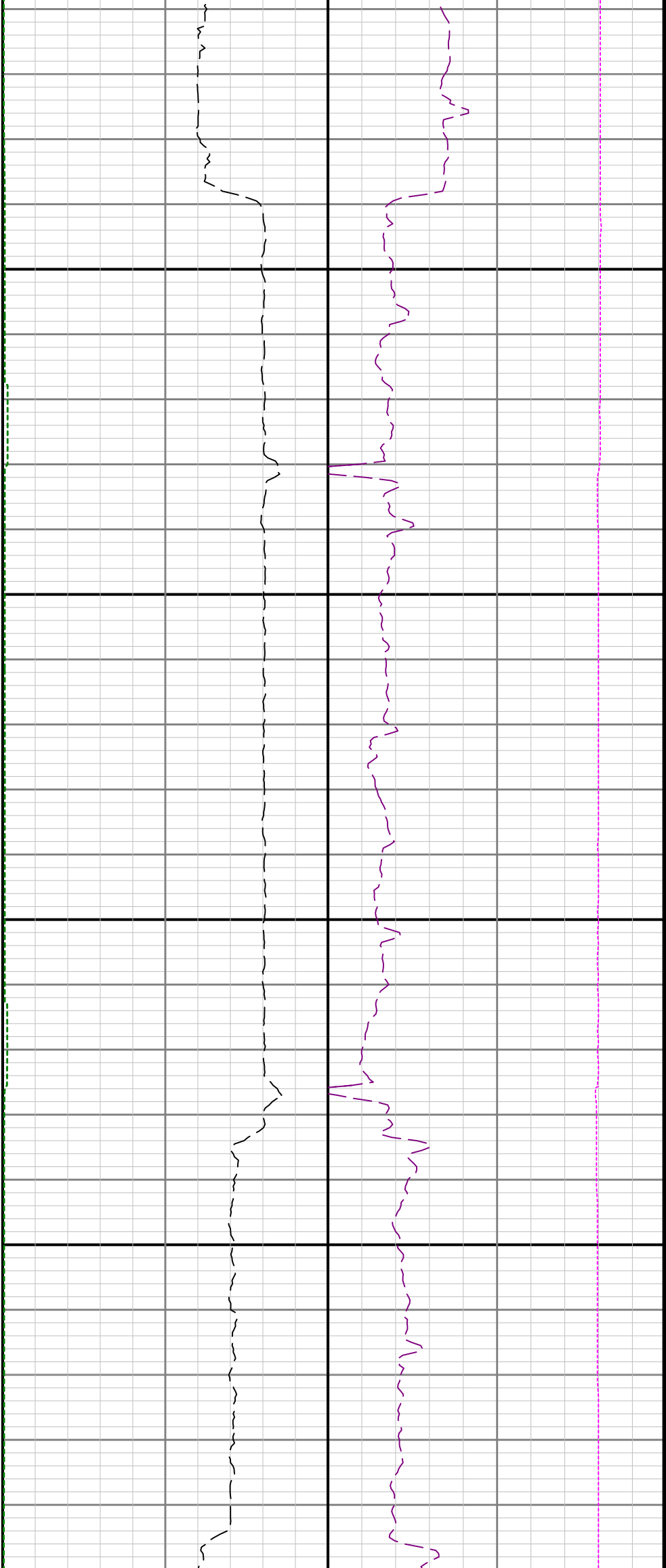


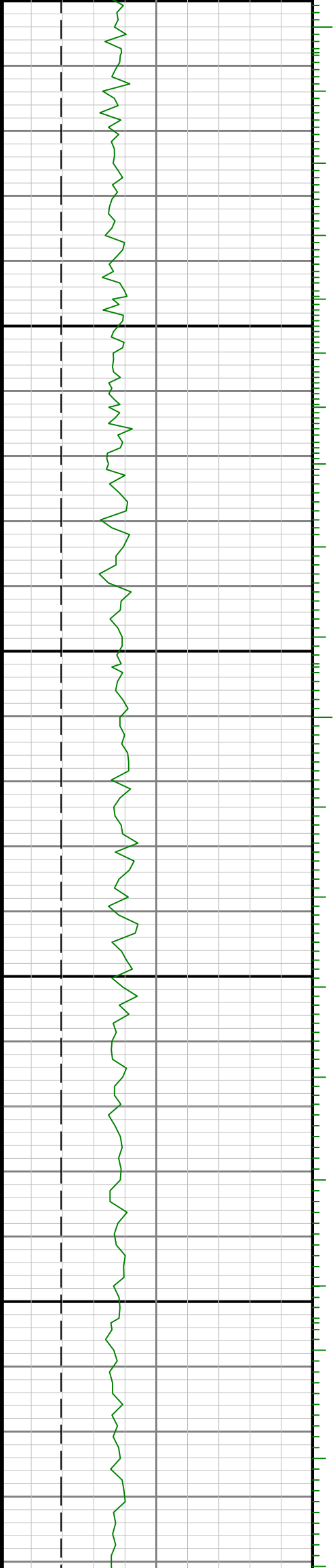


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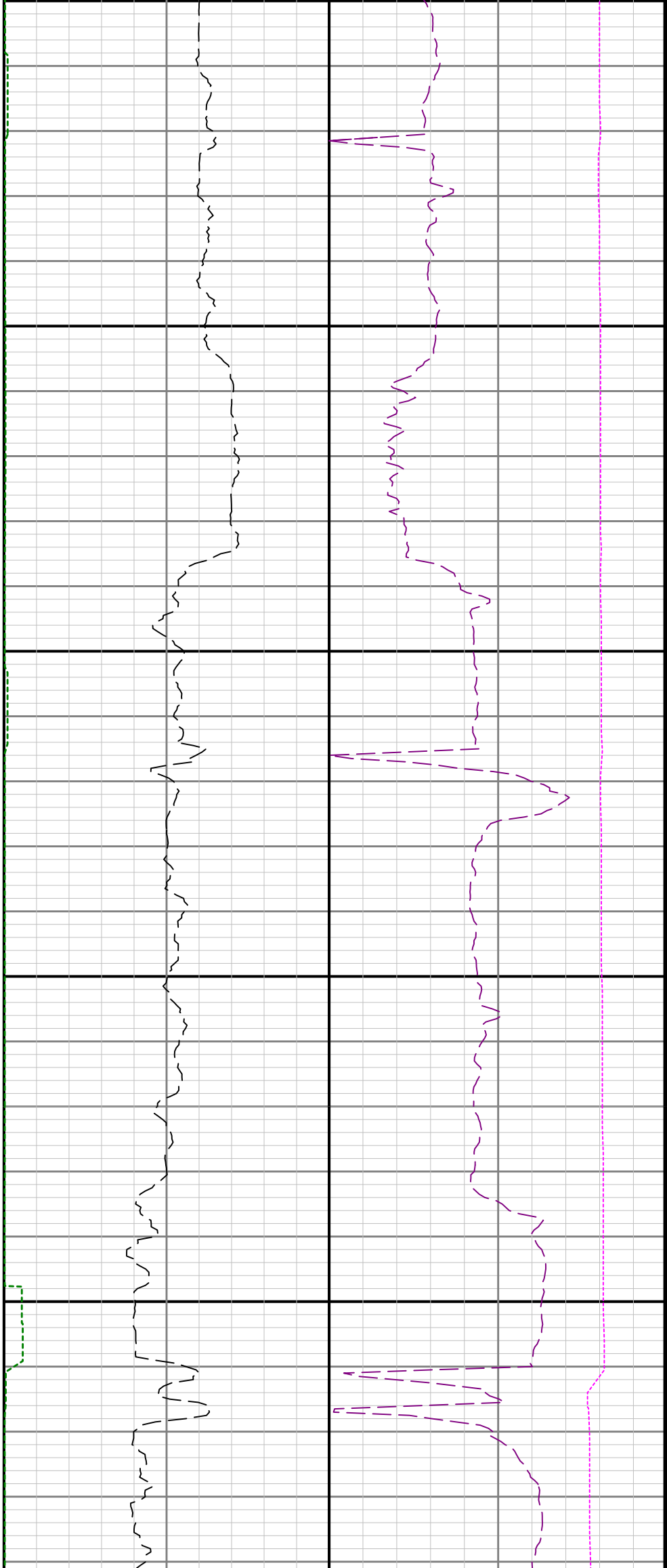
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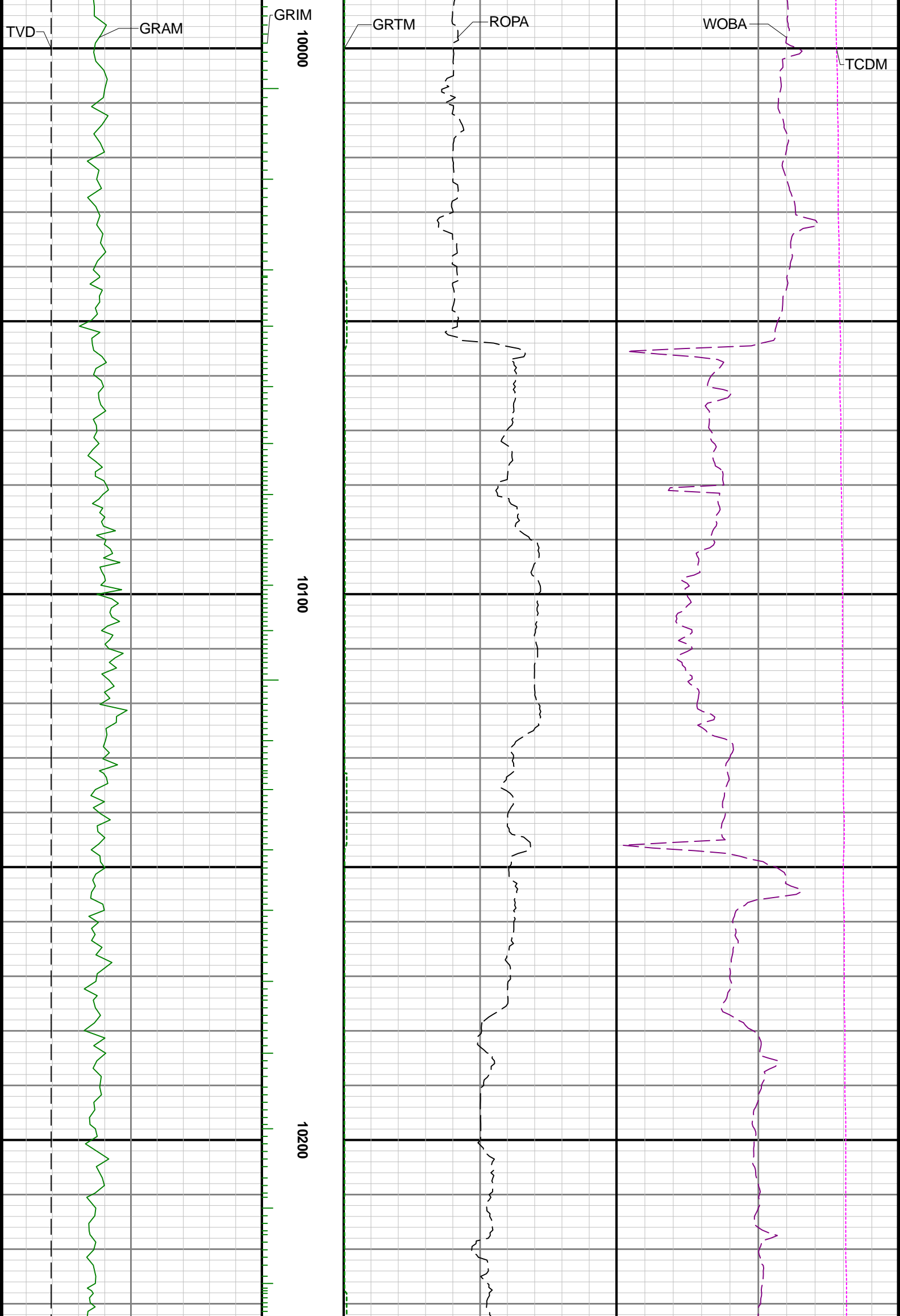


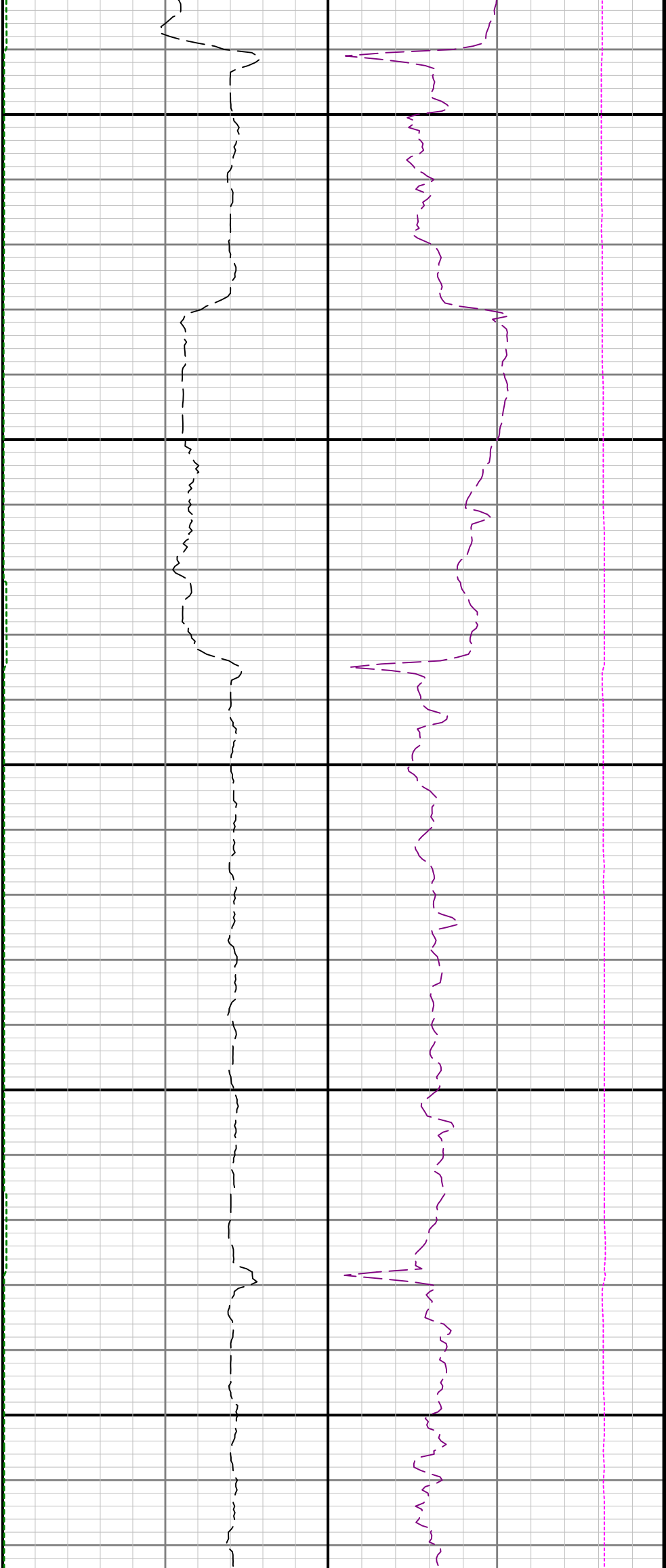


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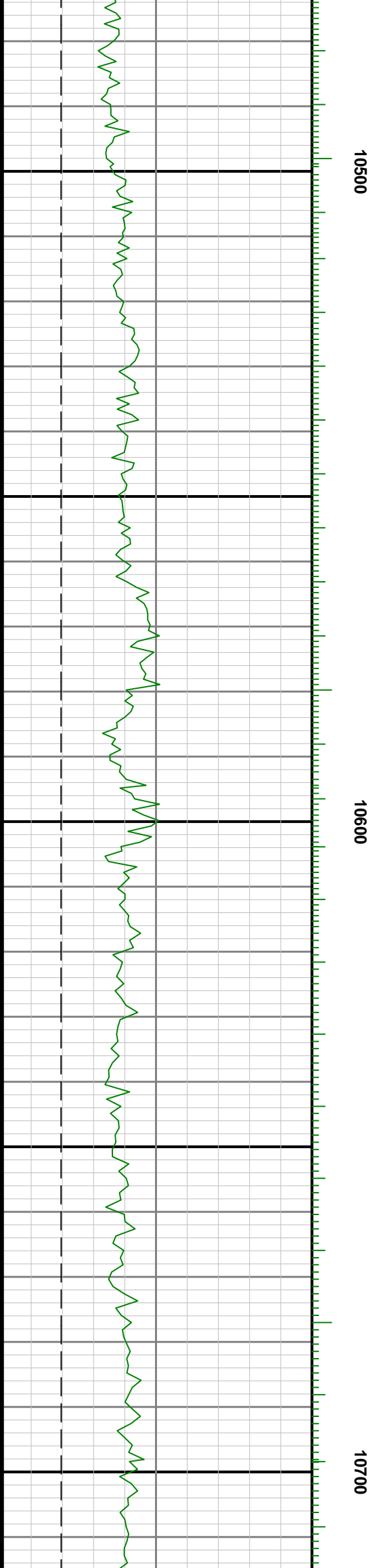
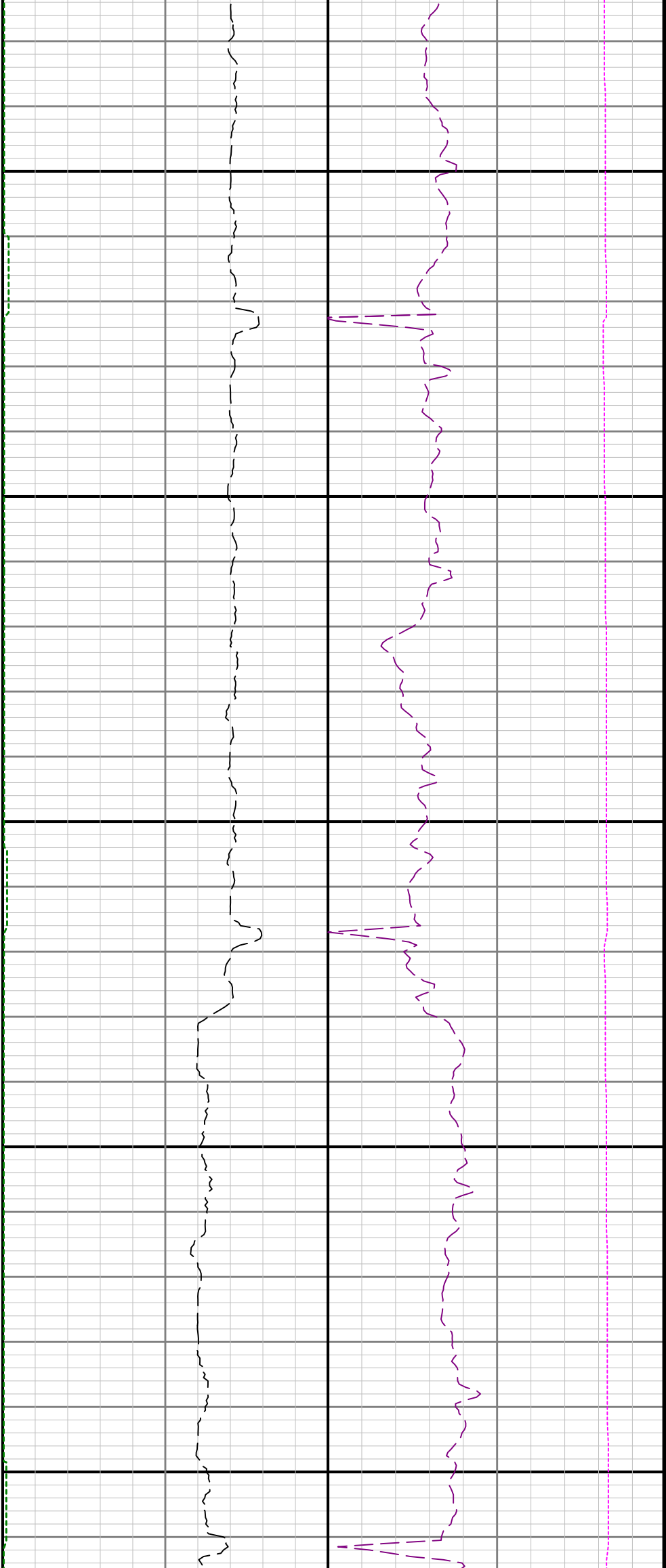


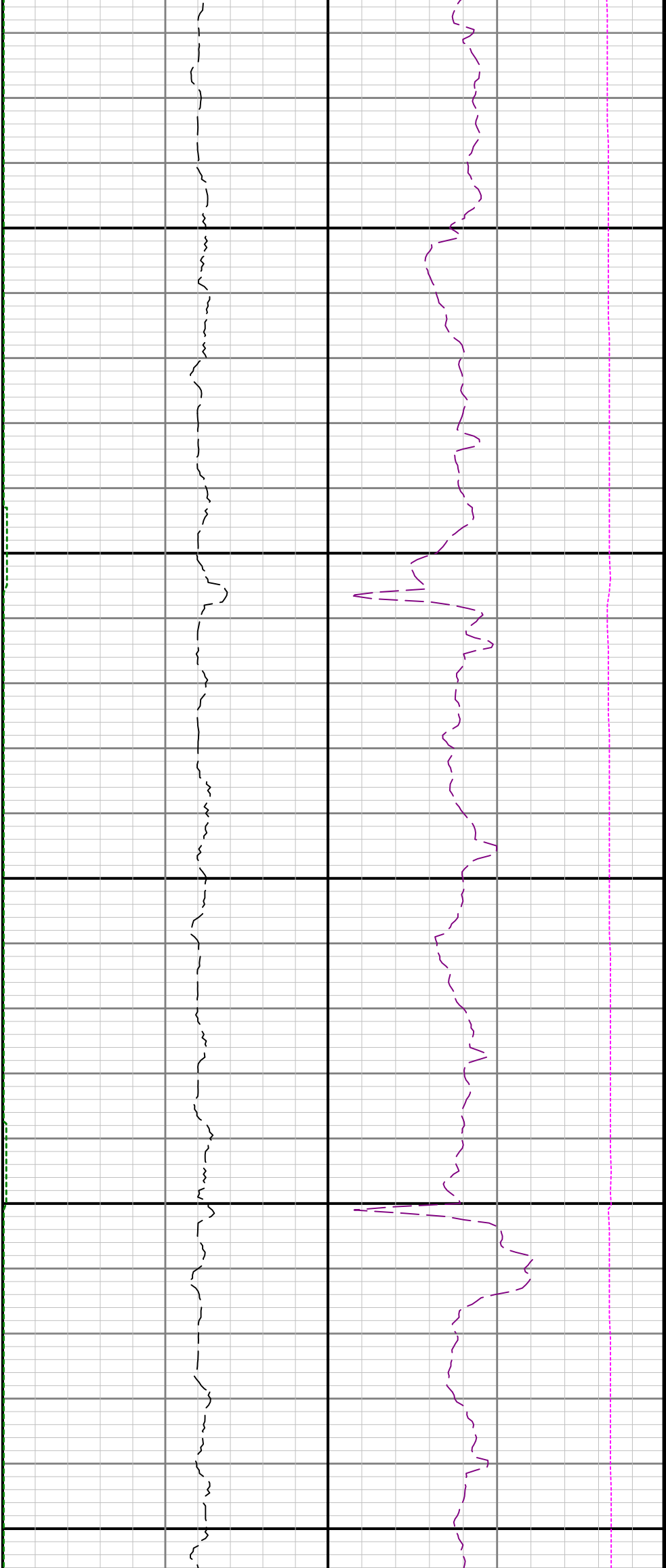




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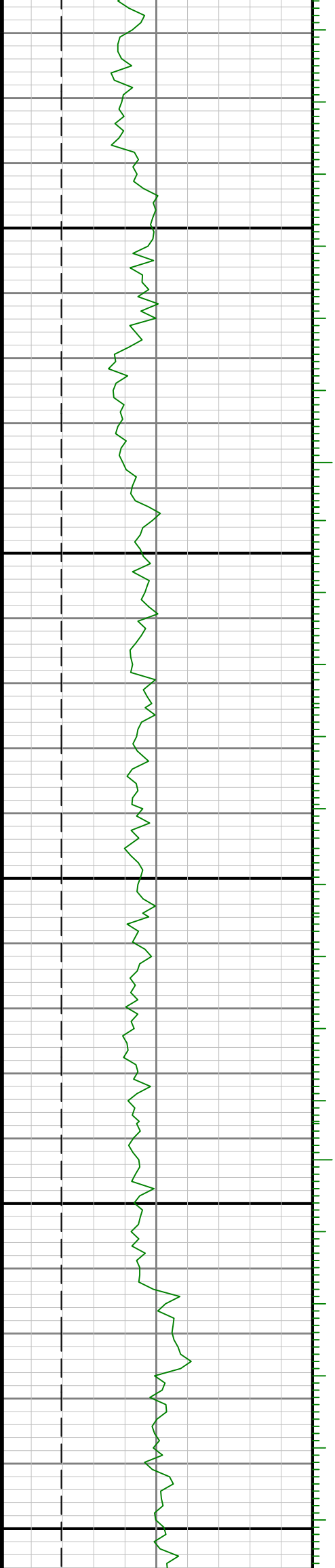
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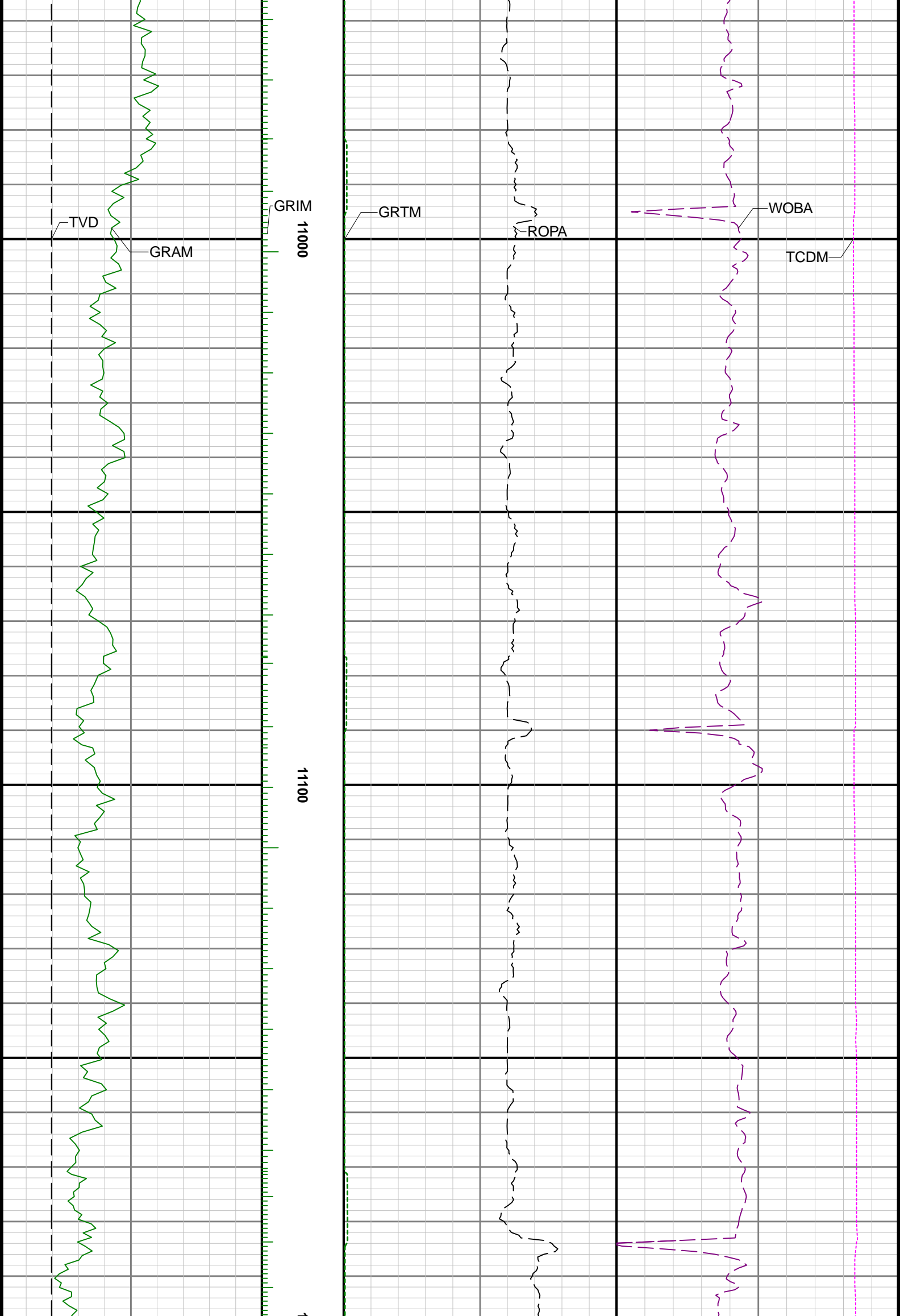


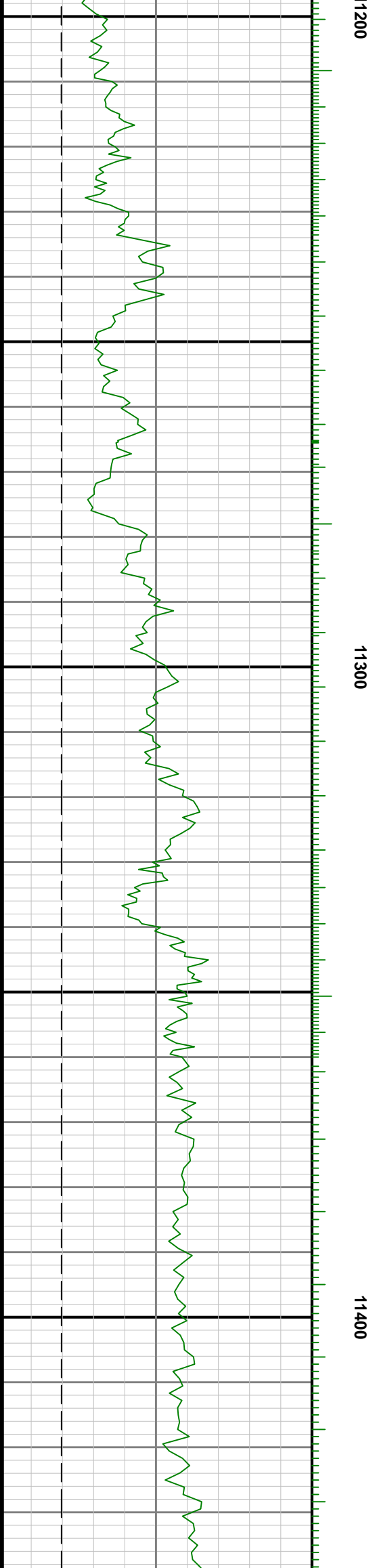
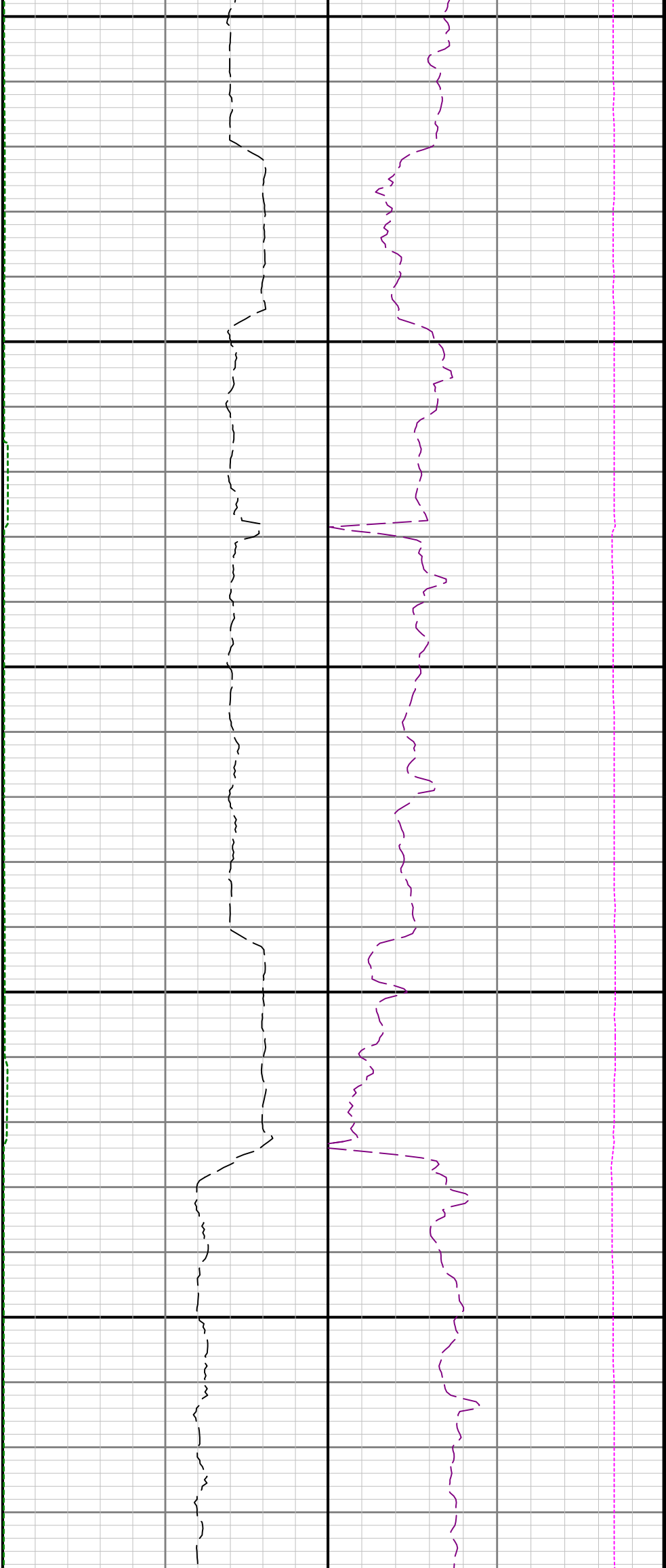


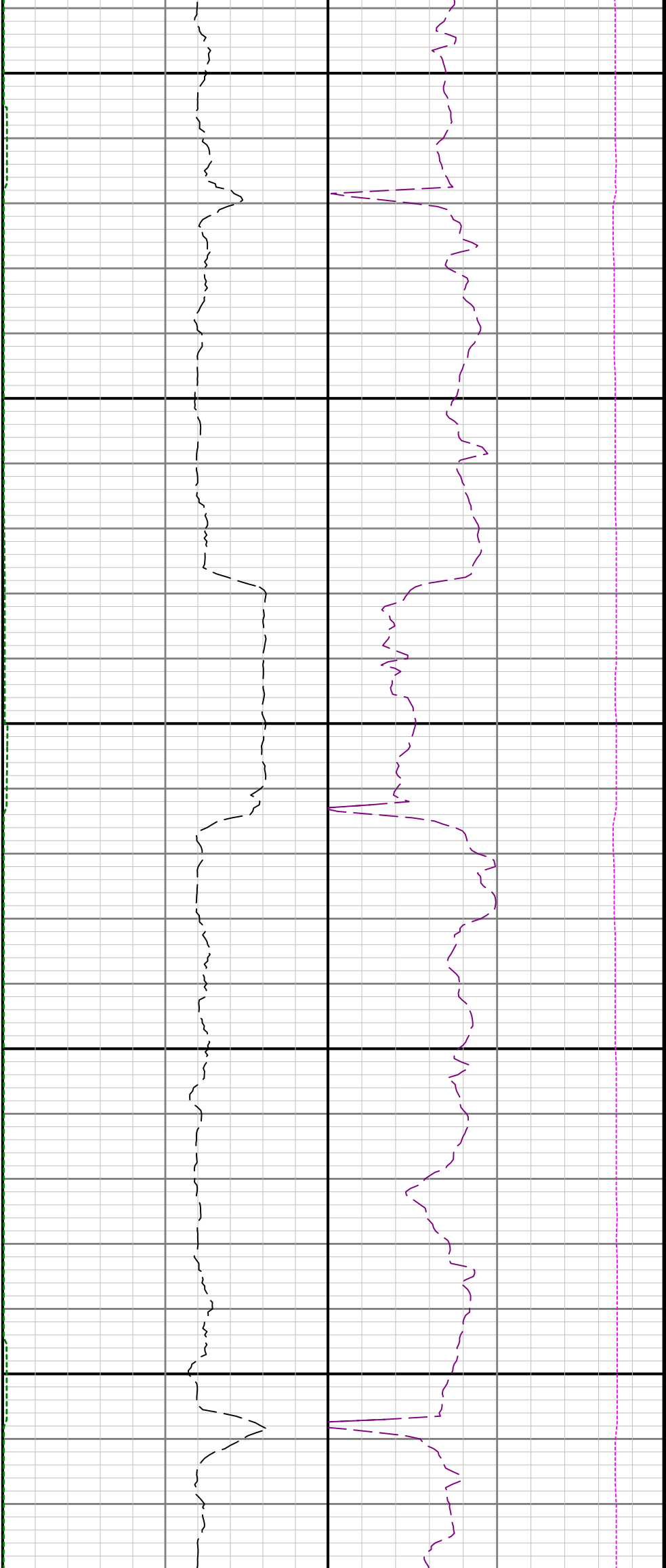
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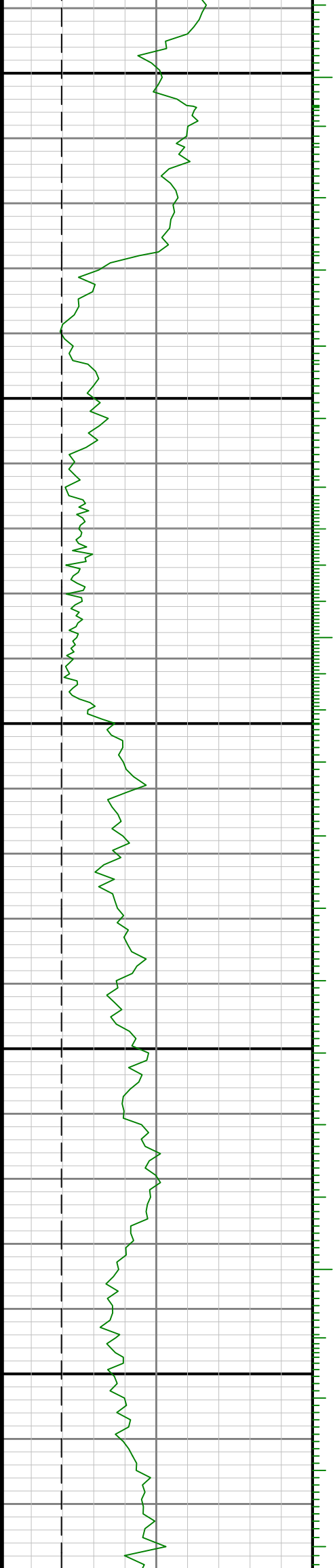


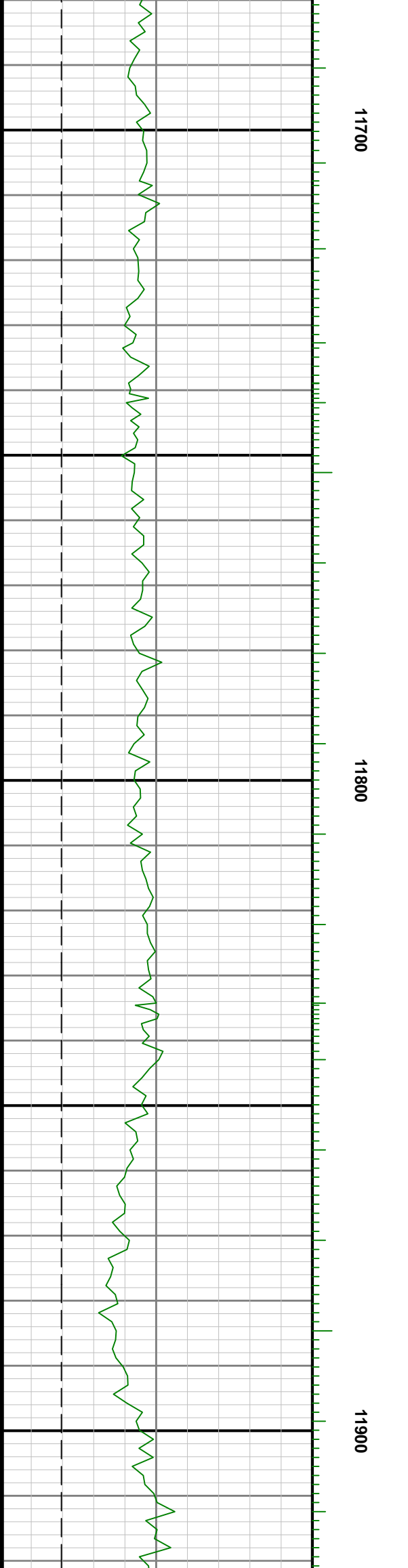
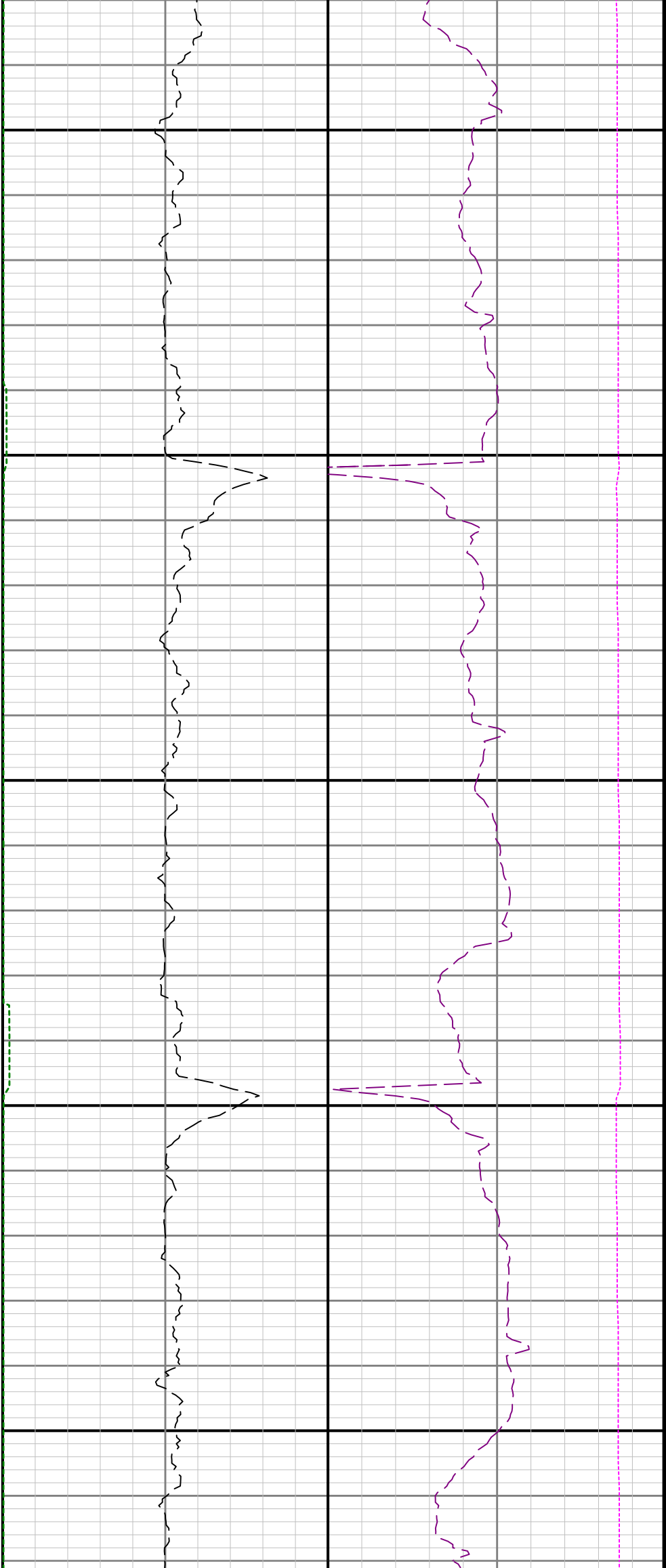


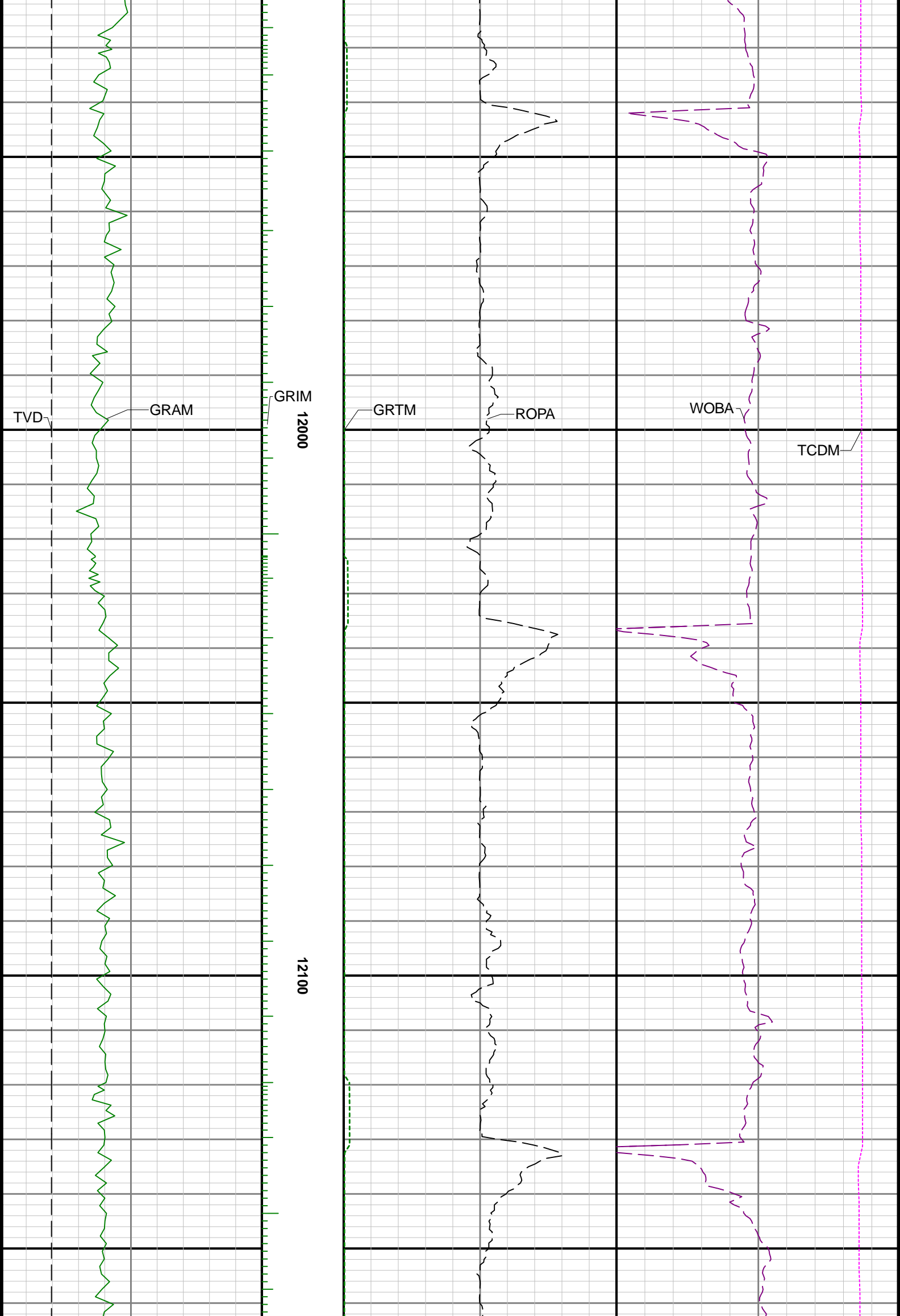


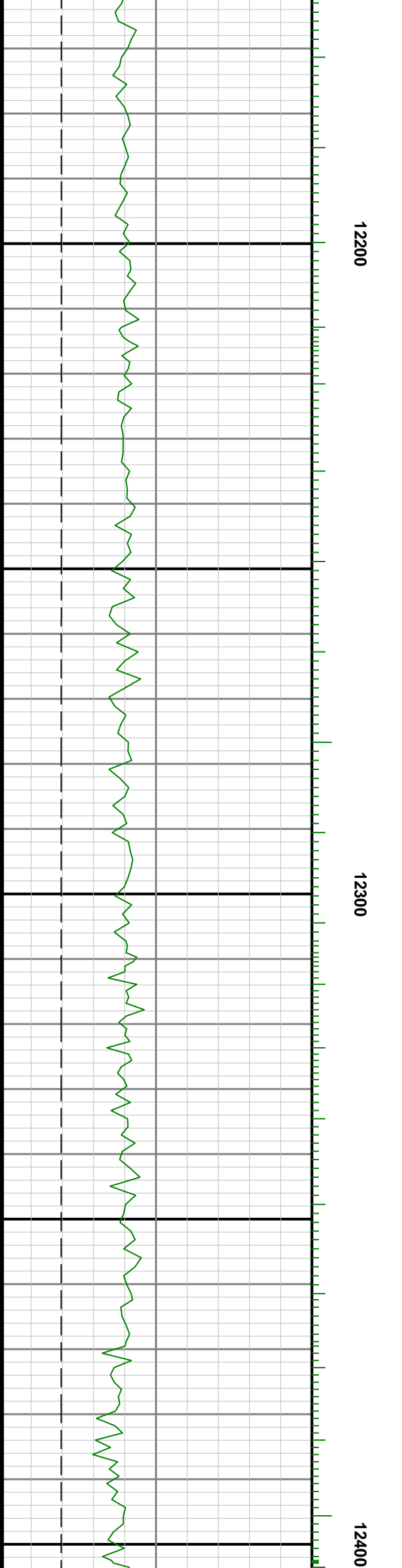
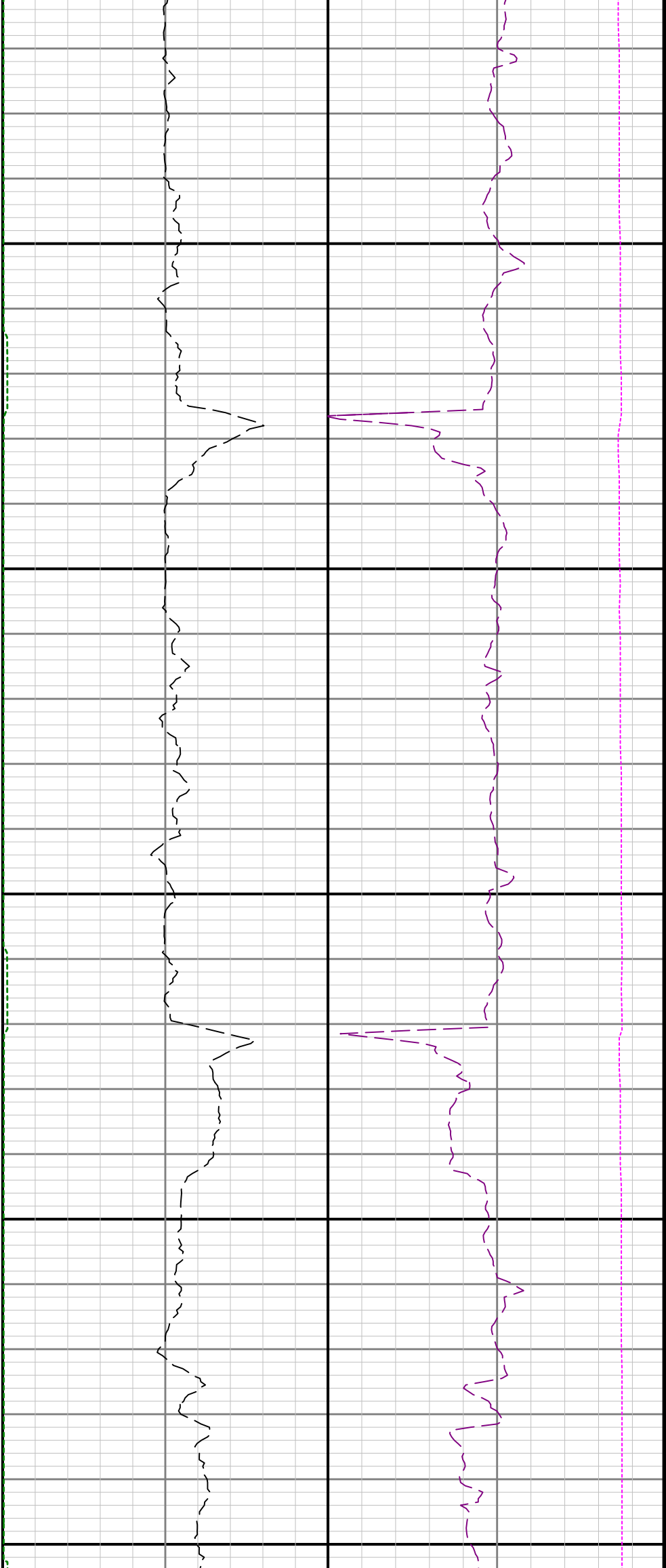
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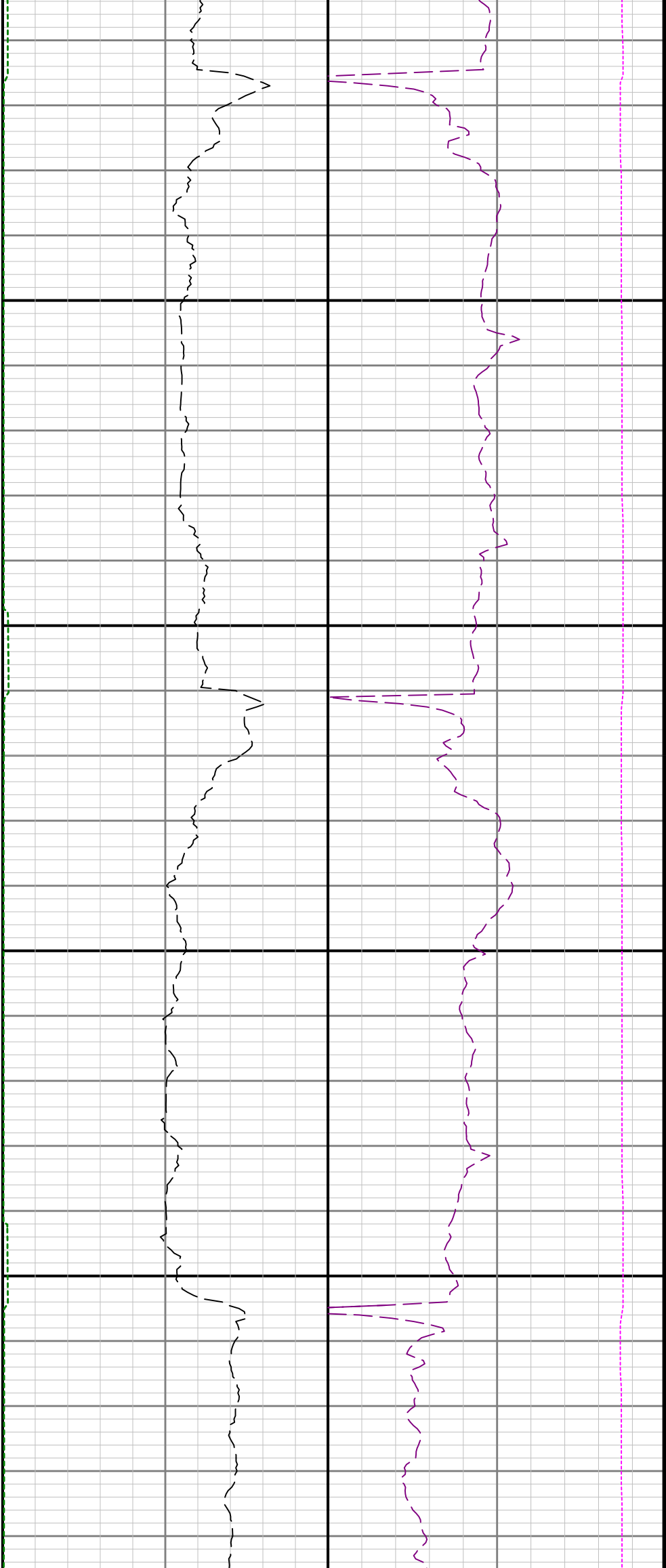
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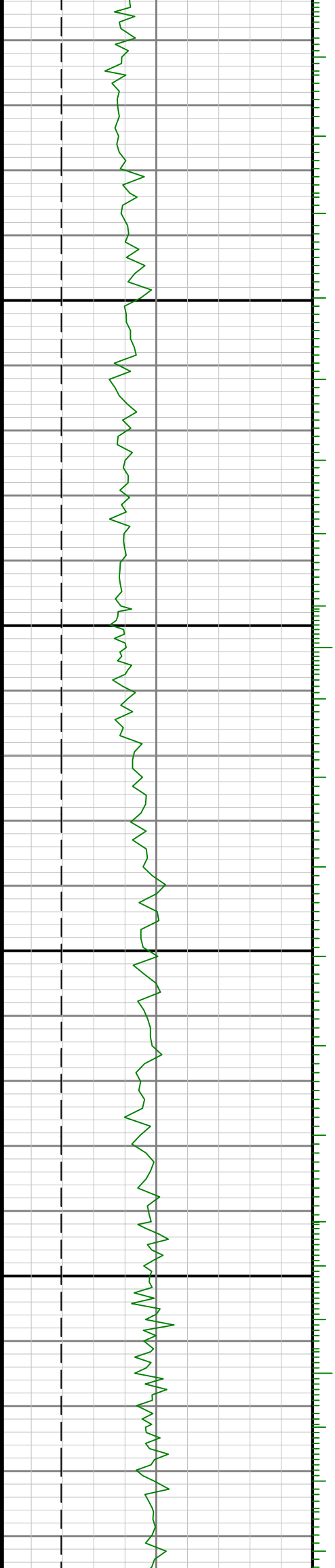


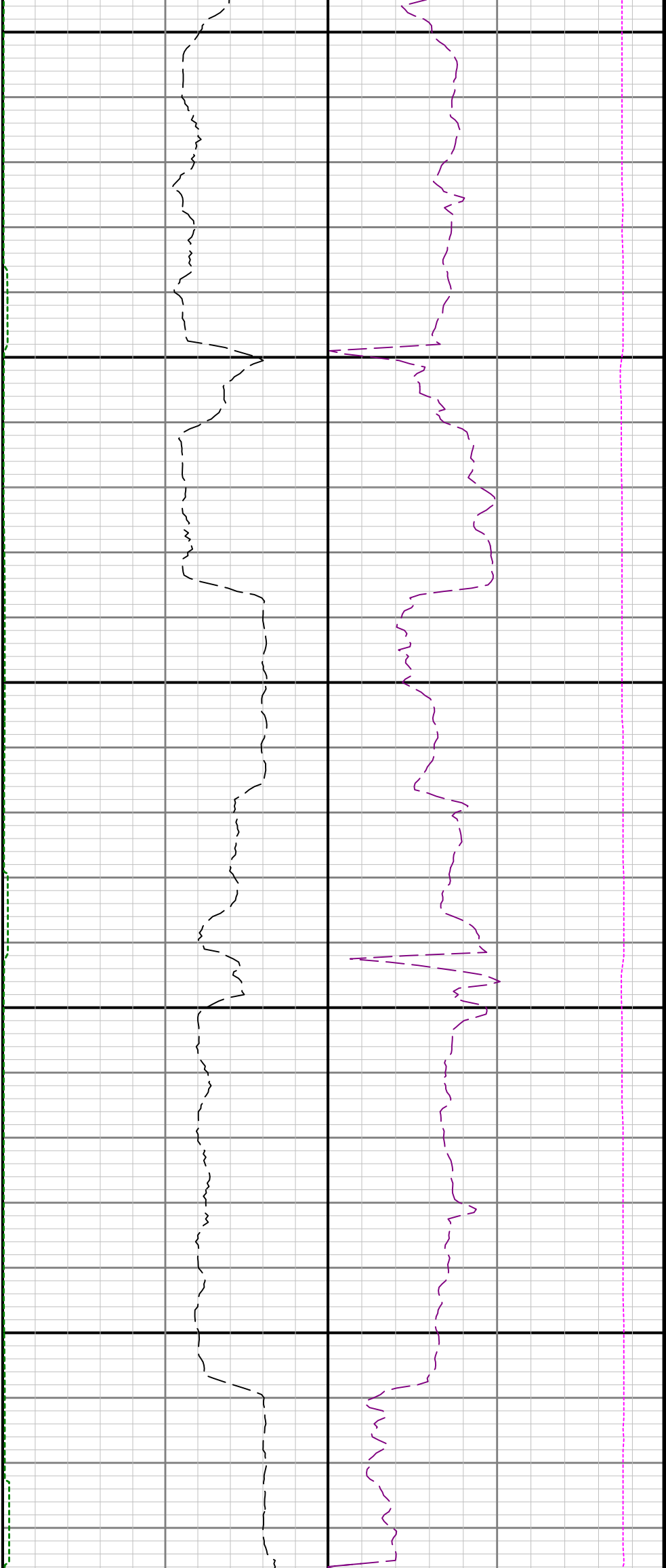




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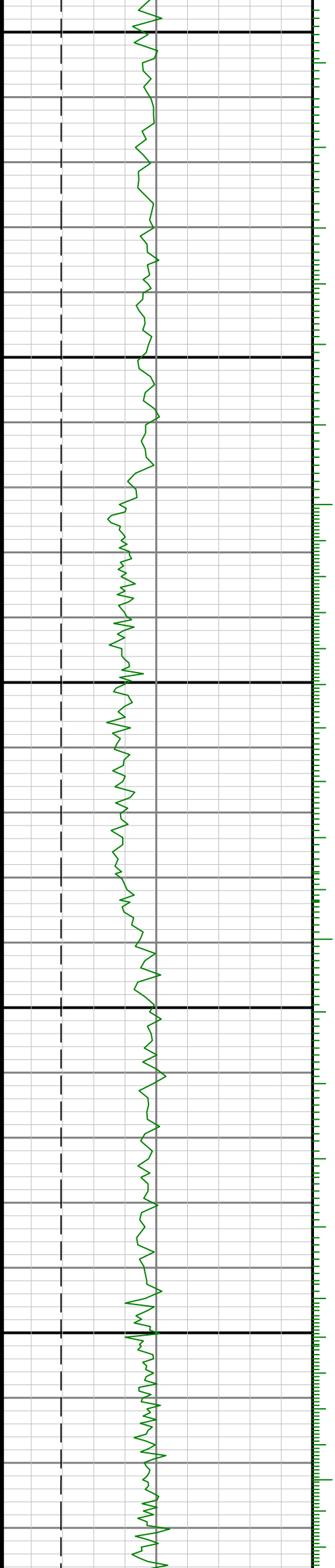
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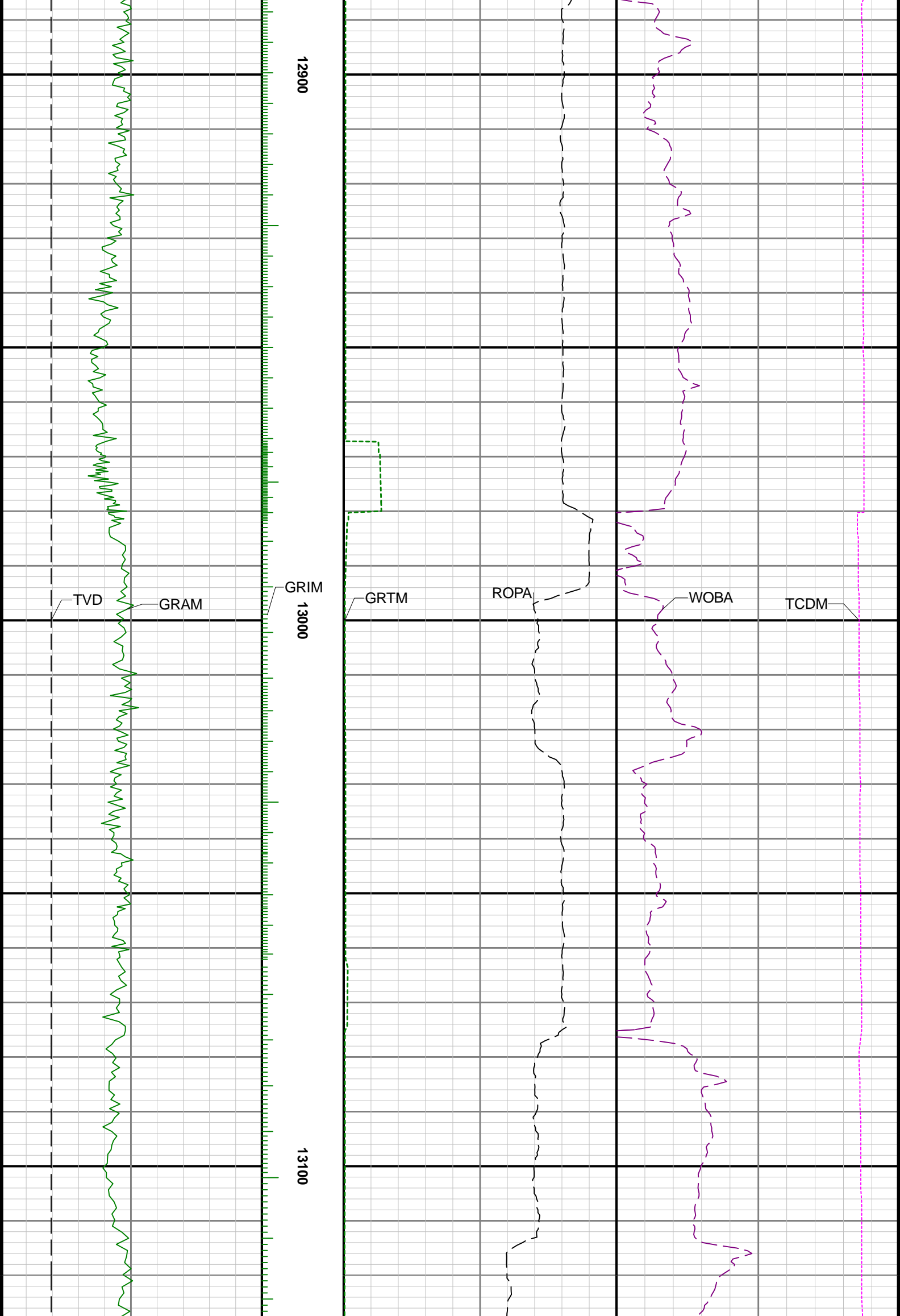


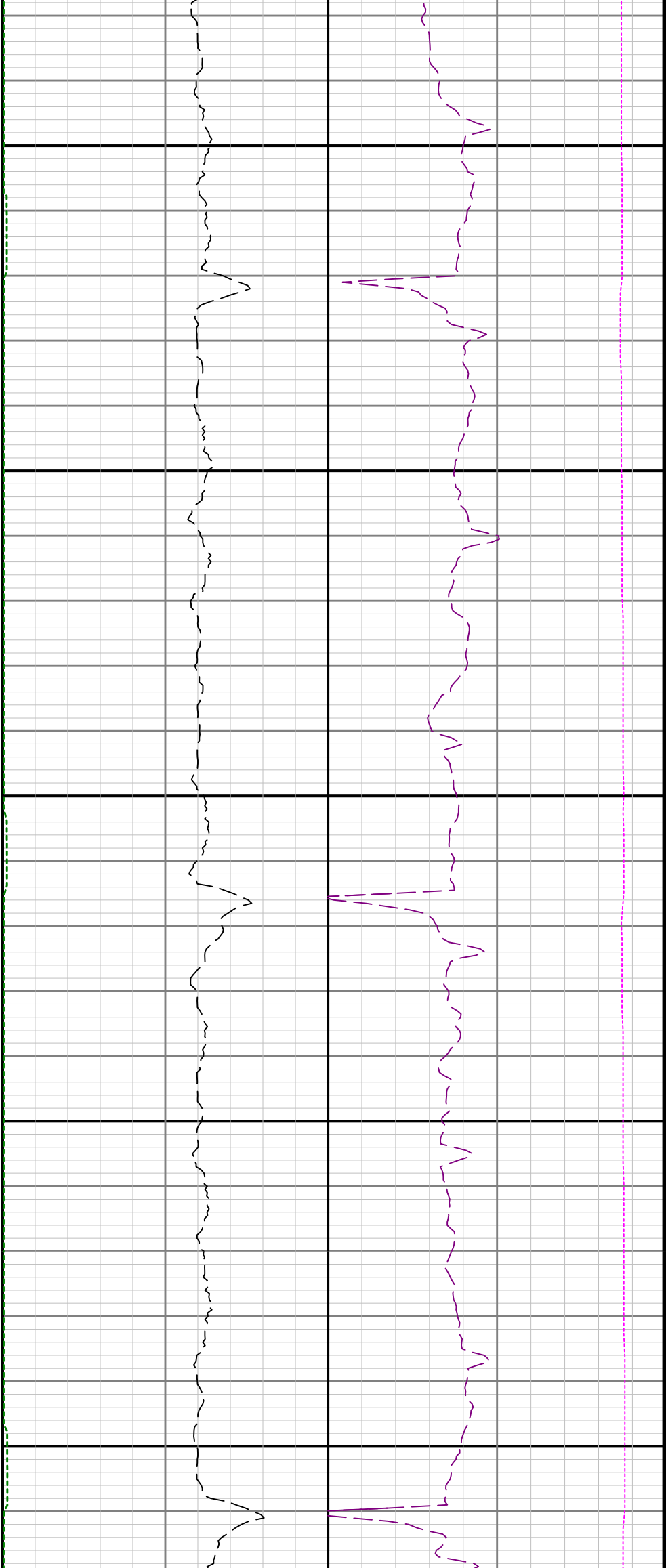


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12800

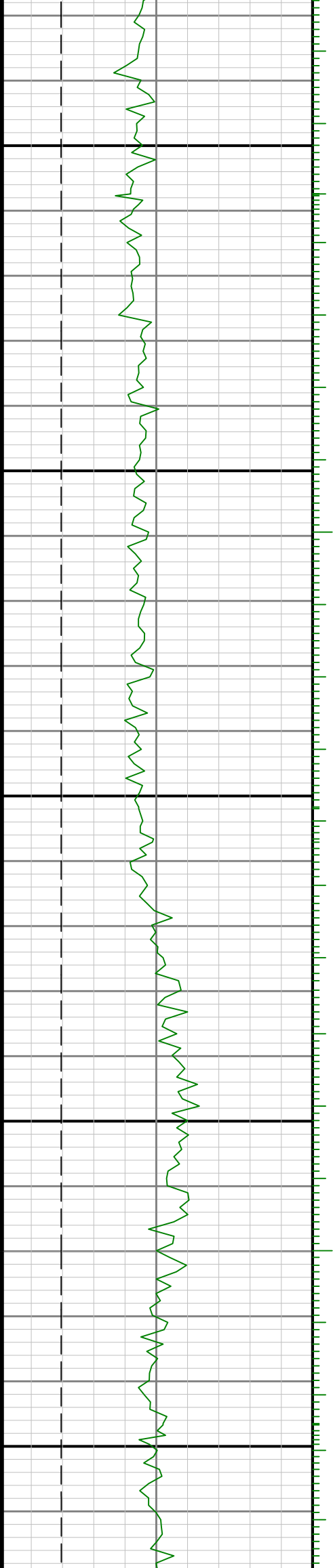


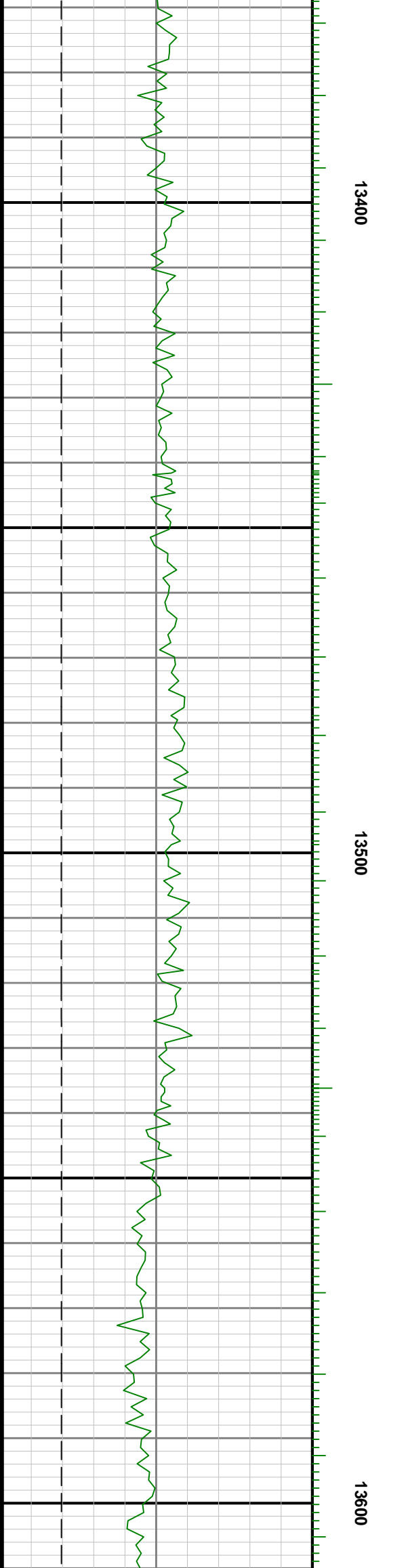
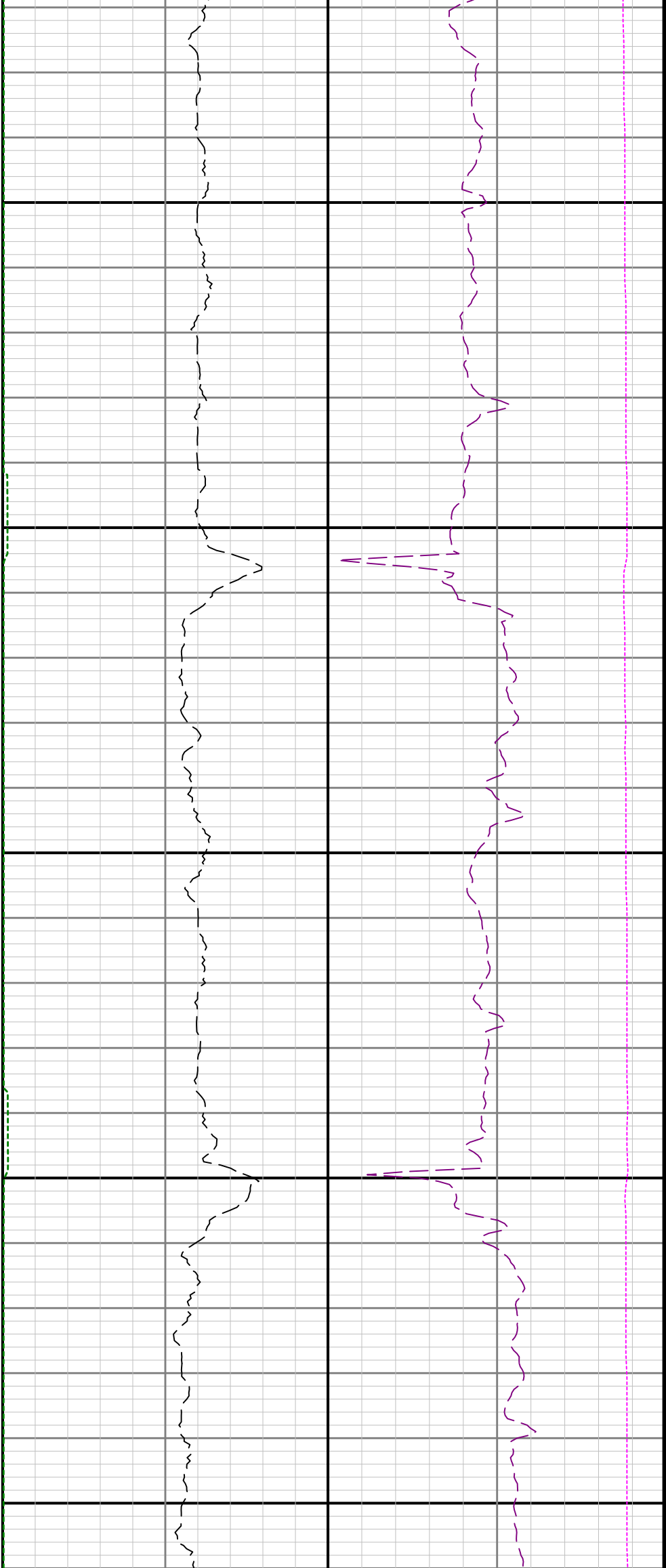


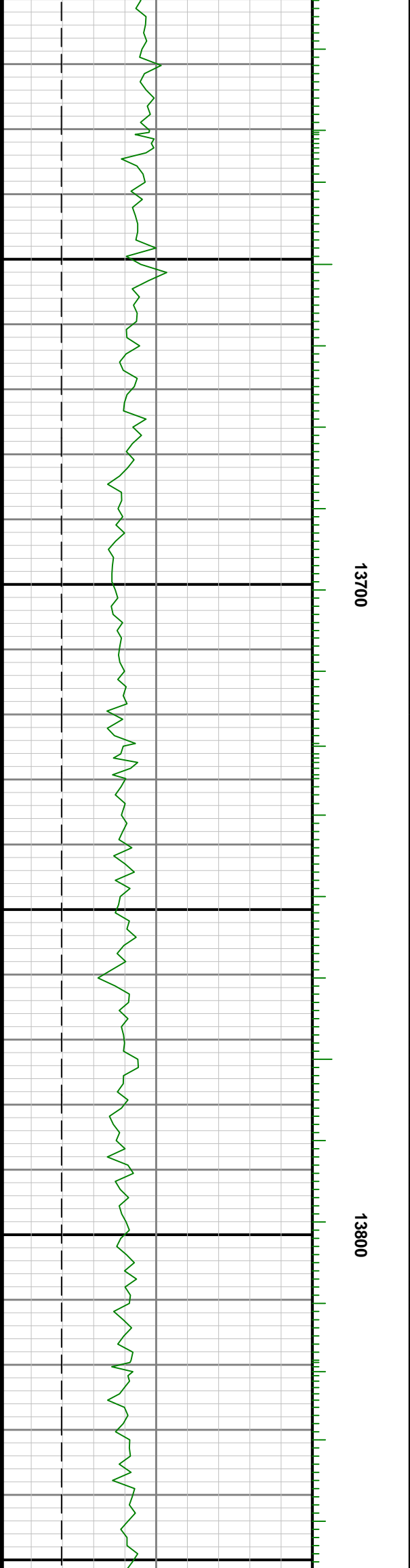
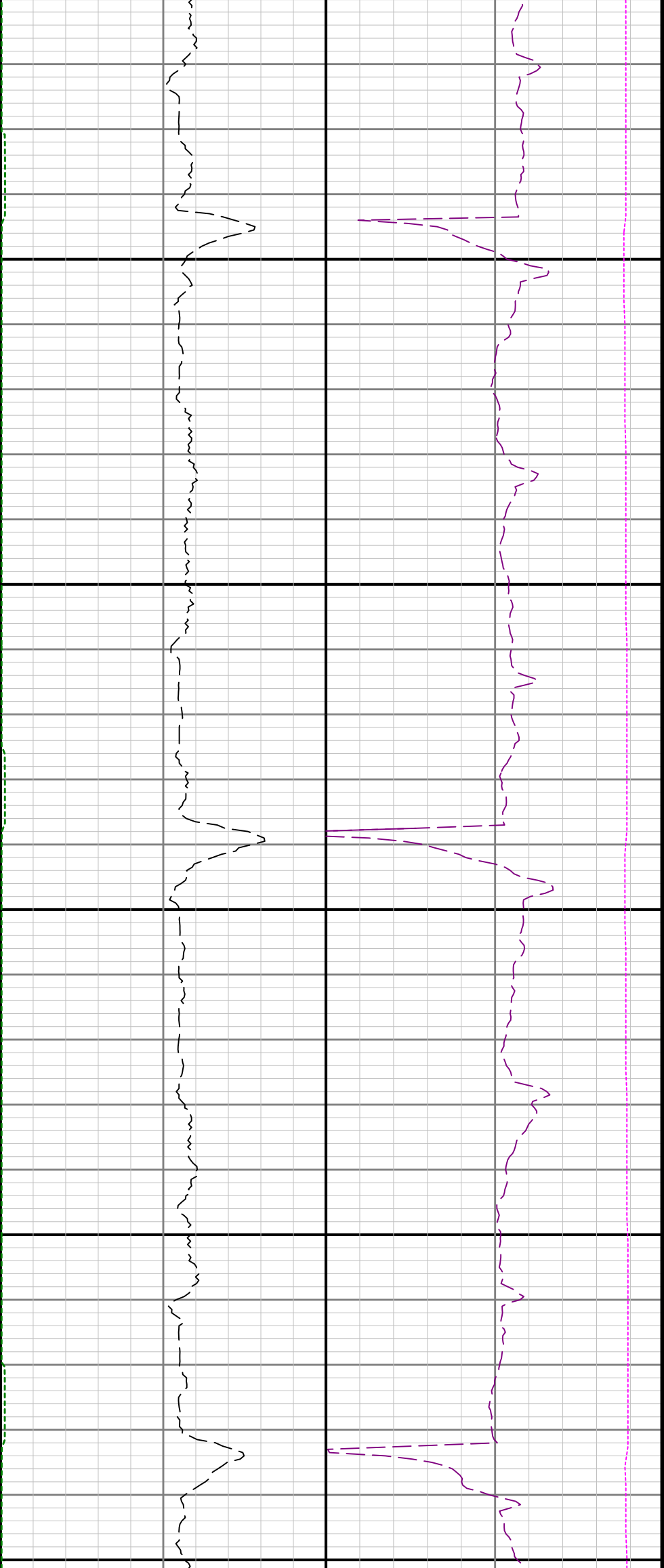


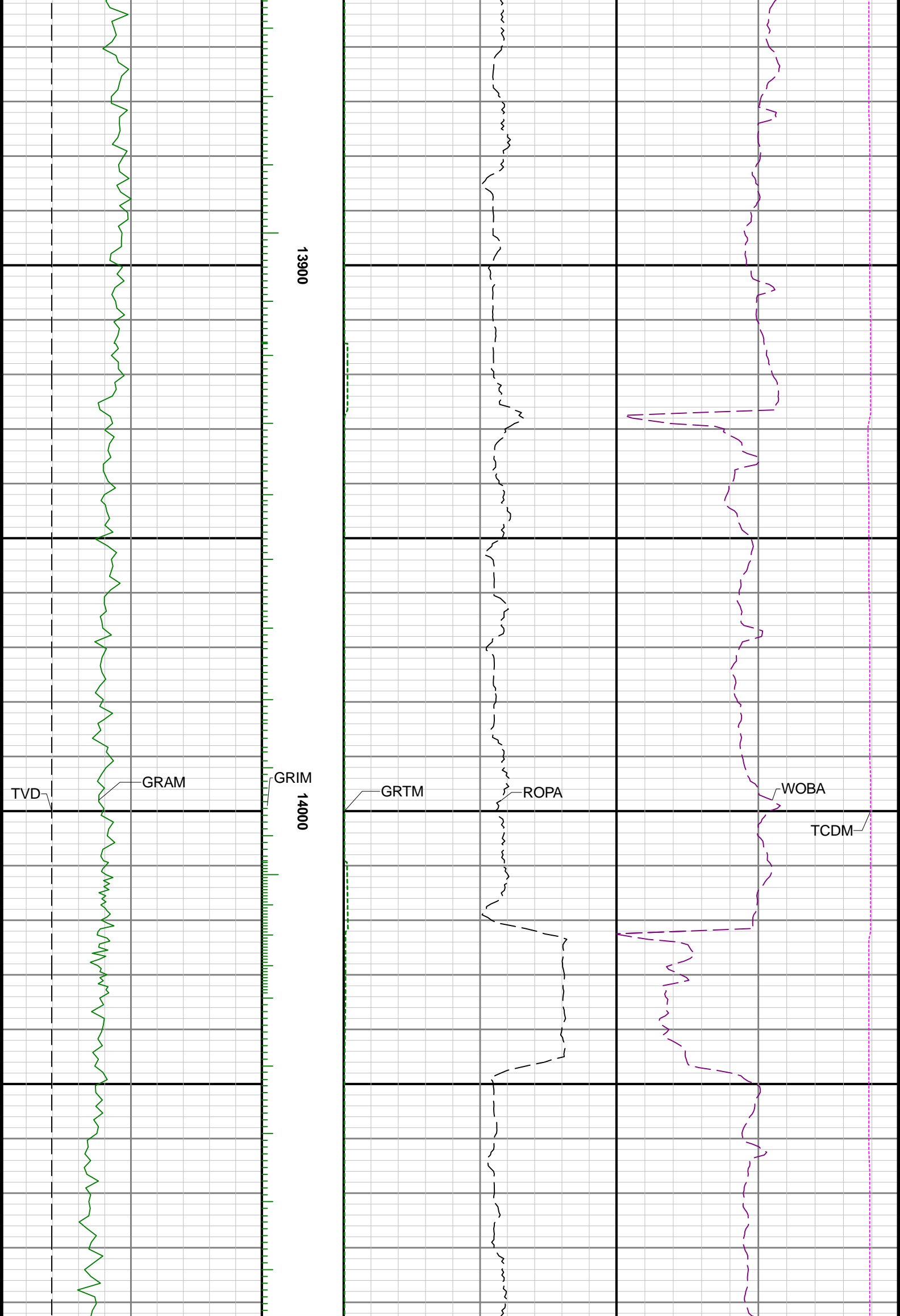
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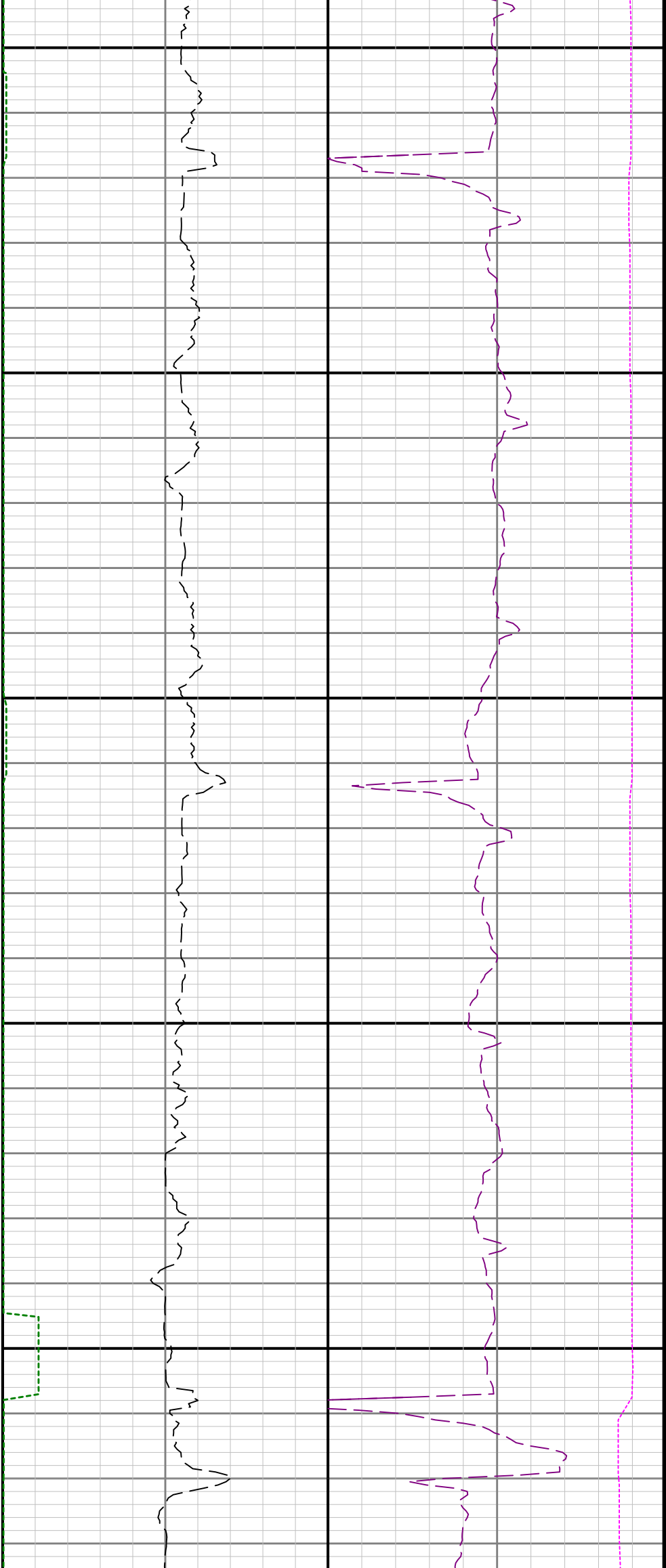
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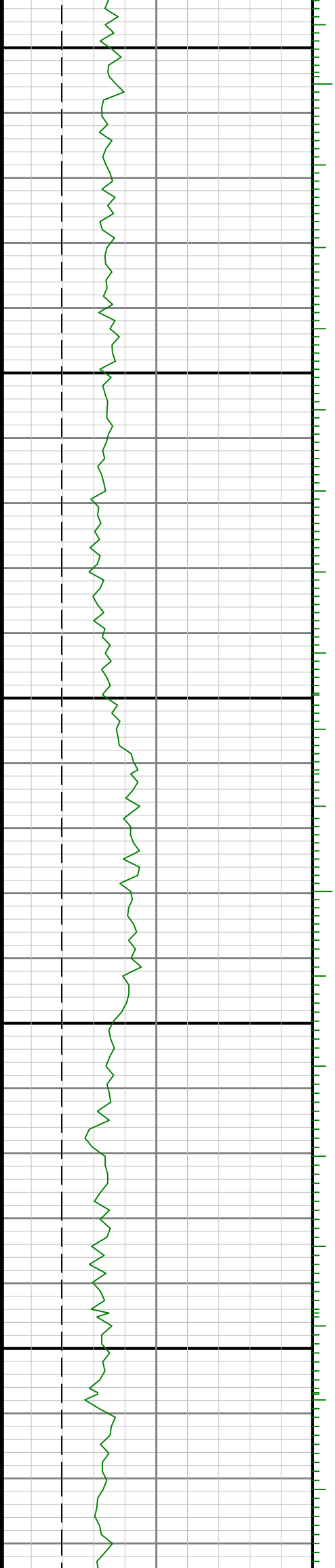


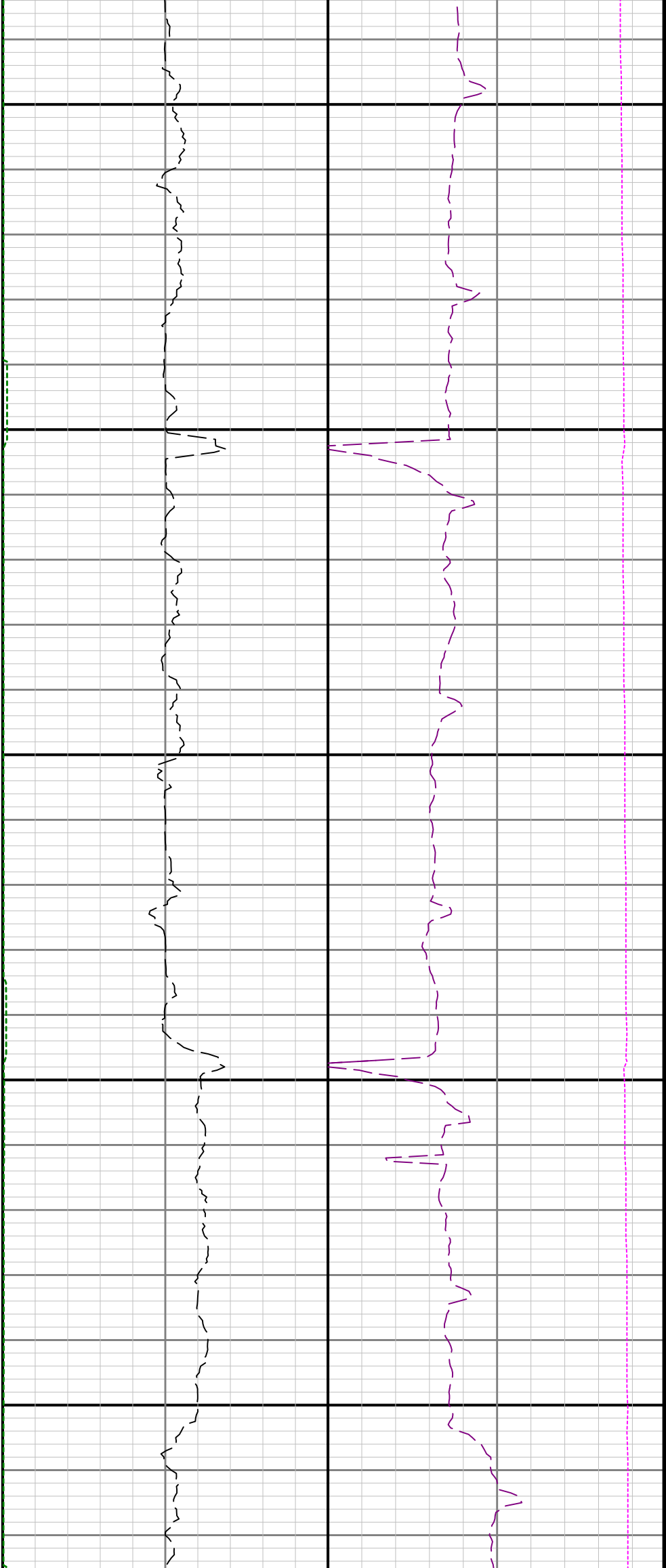


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14200

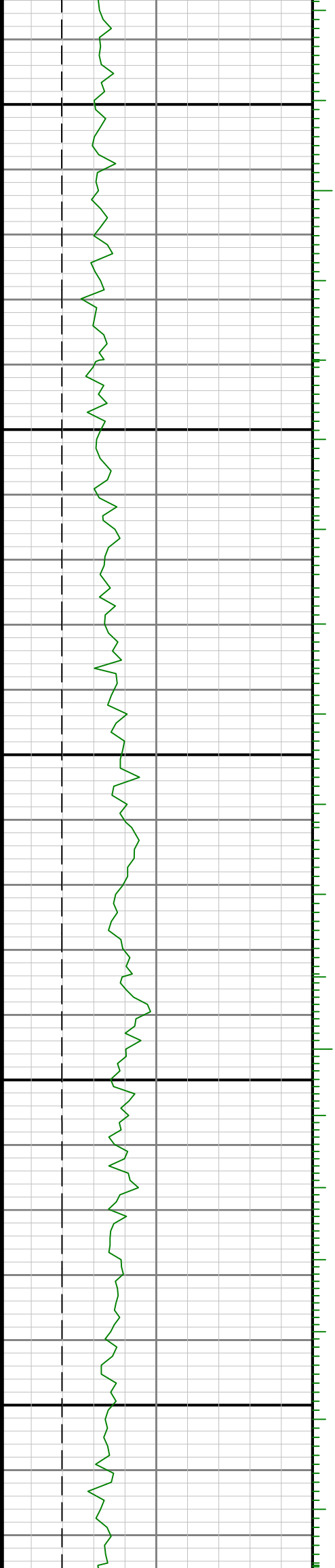
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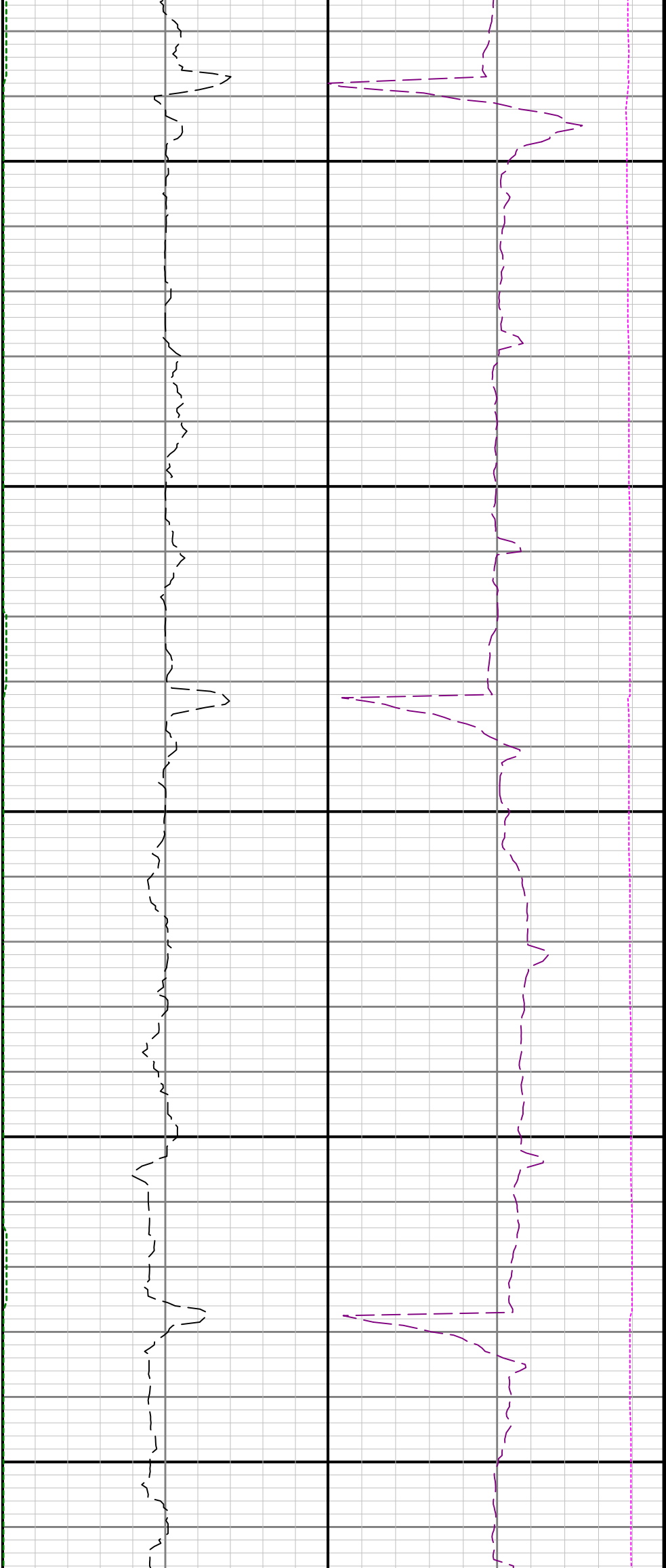




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14500

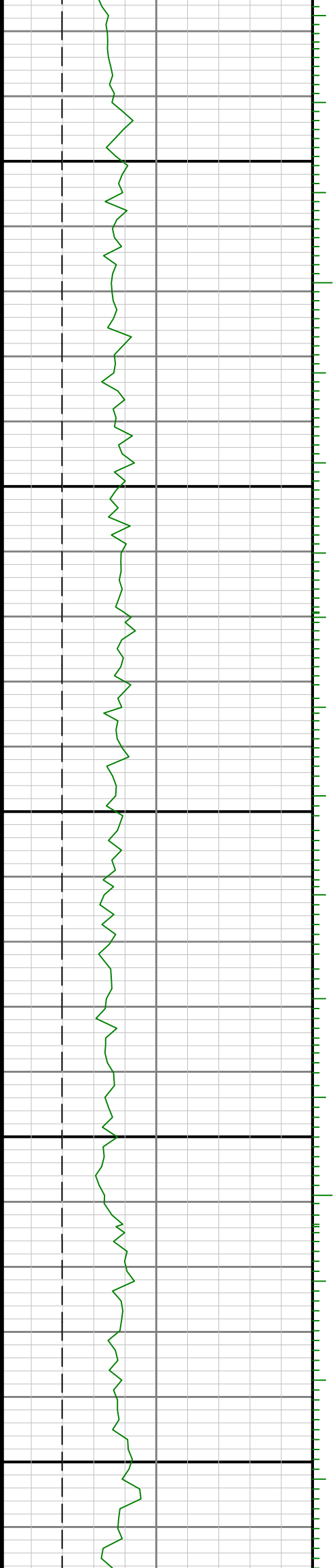


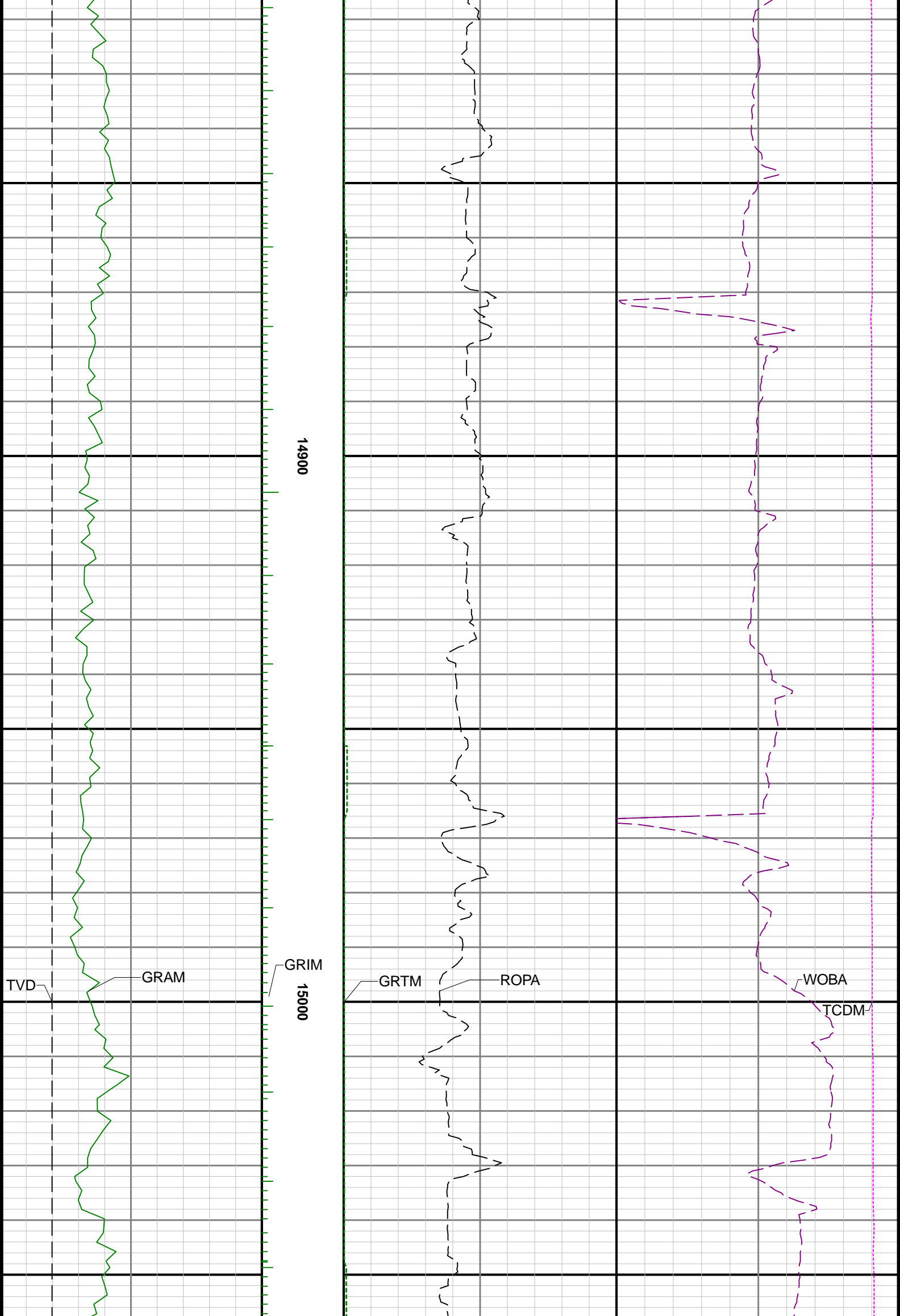


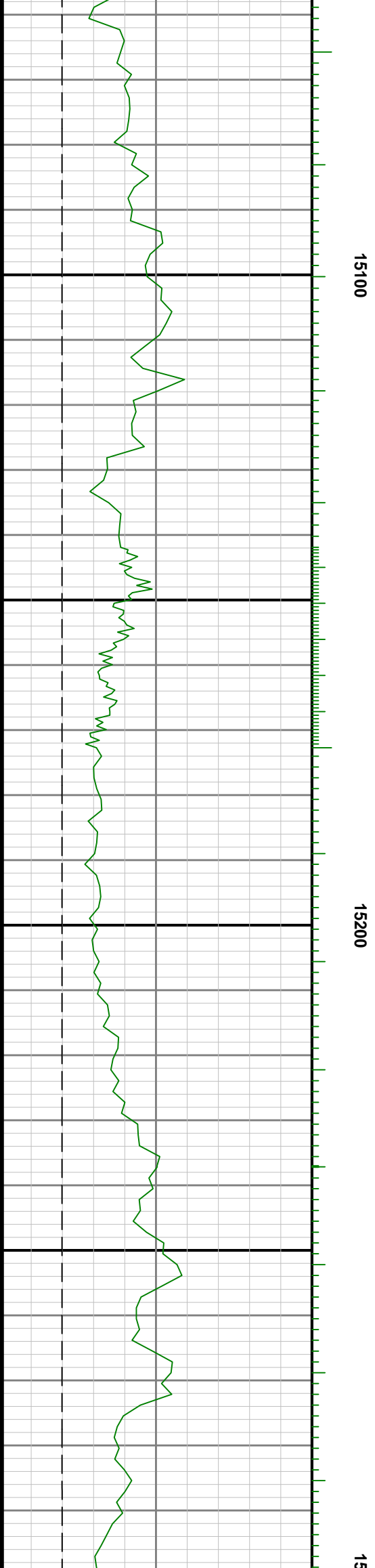
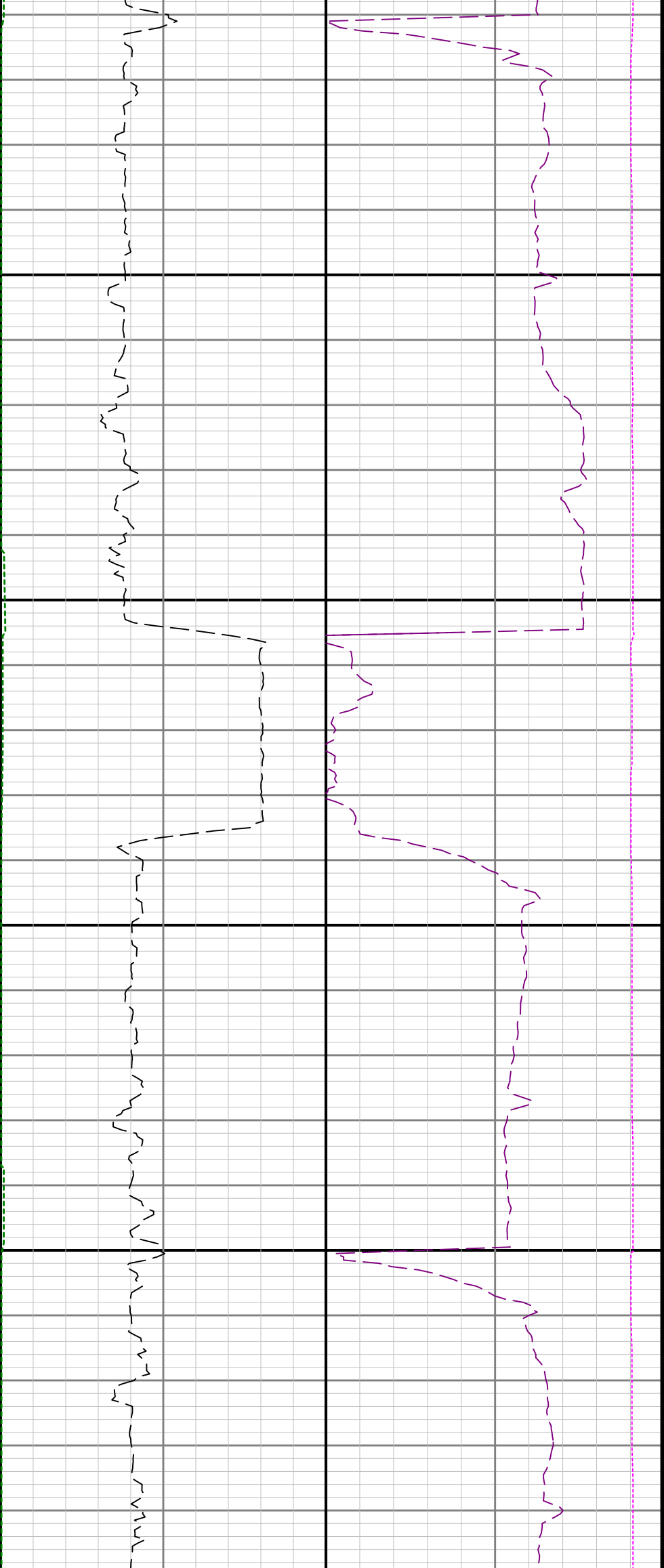
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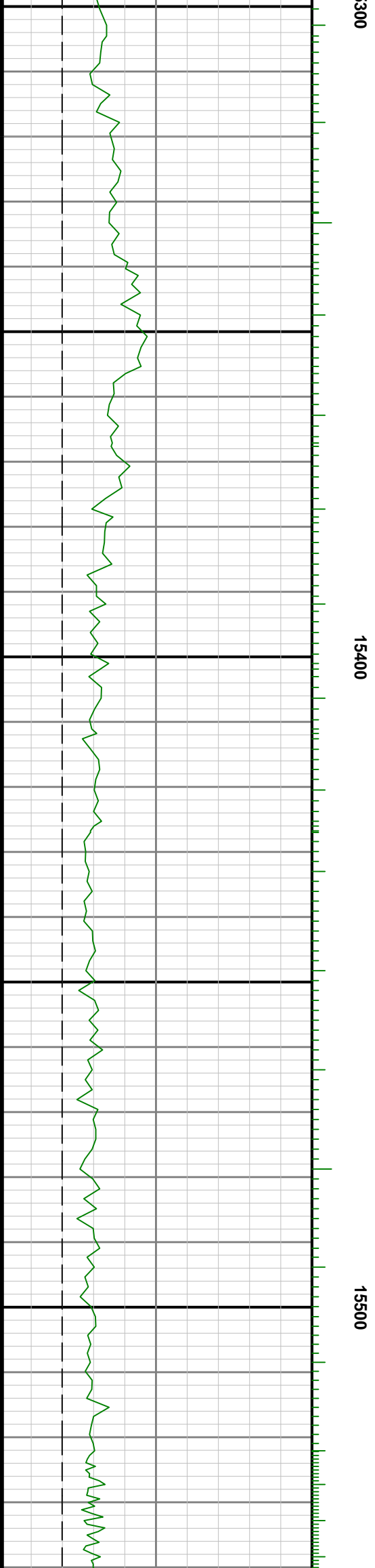
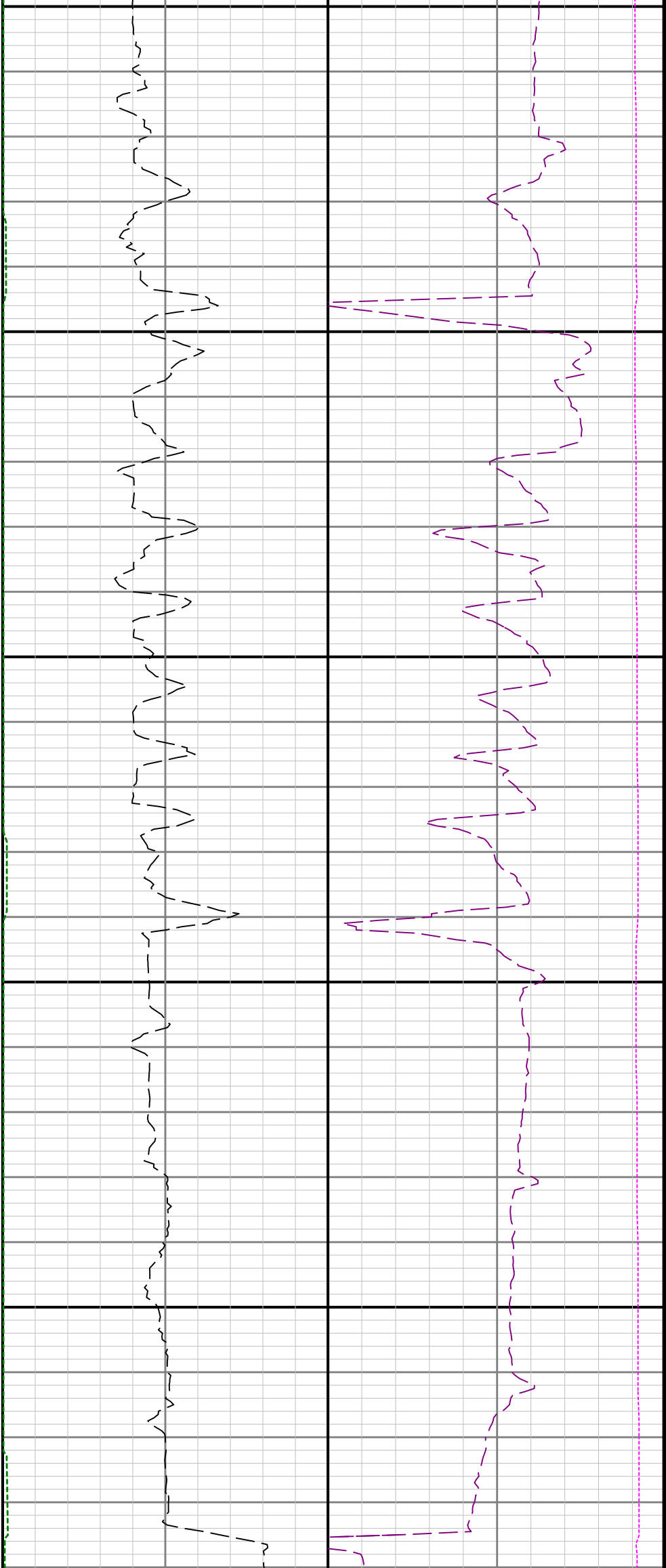
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14800





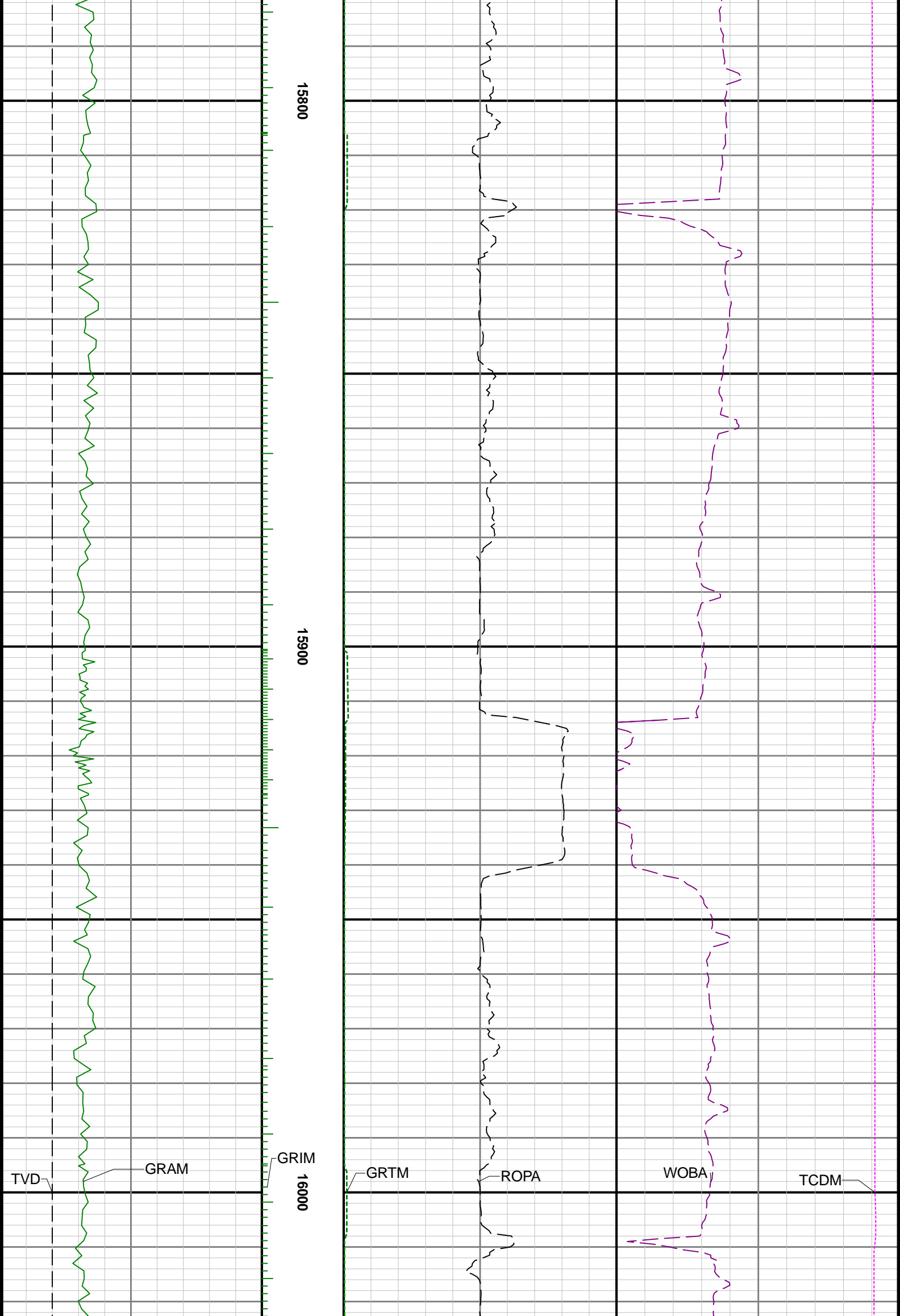


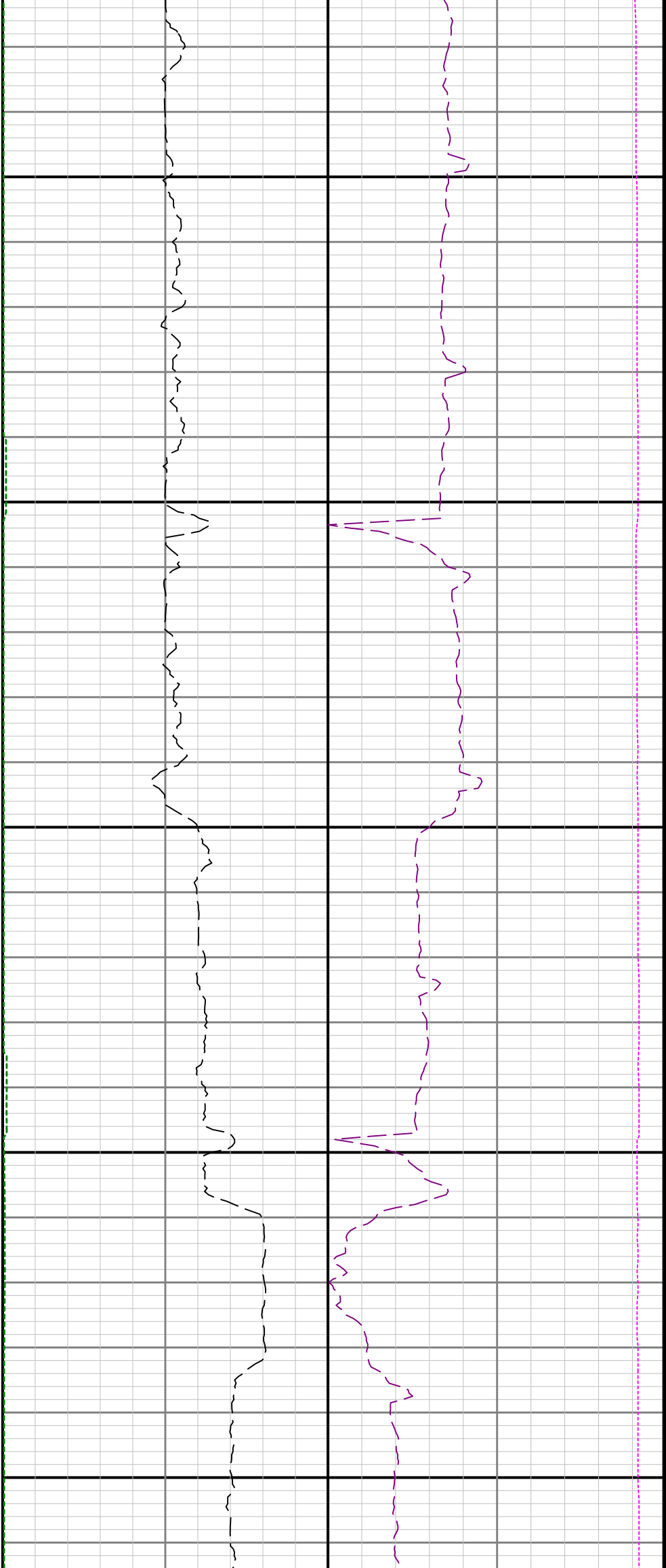




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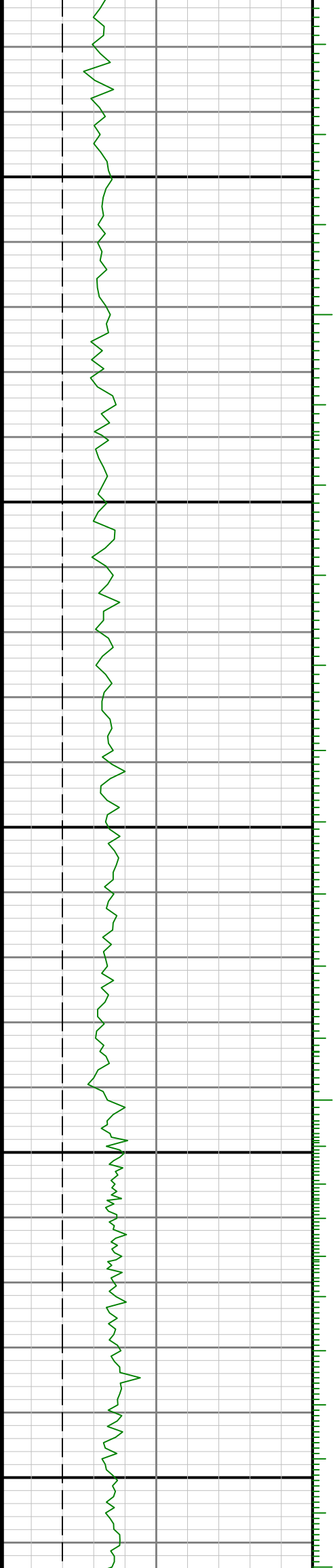
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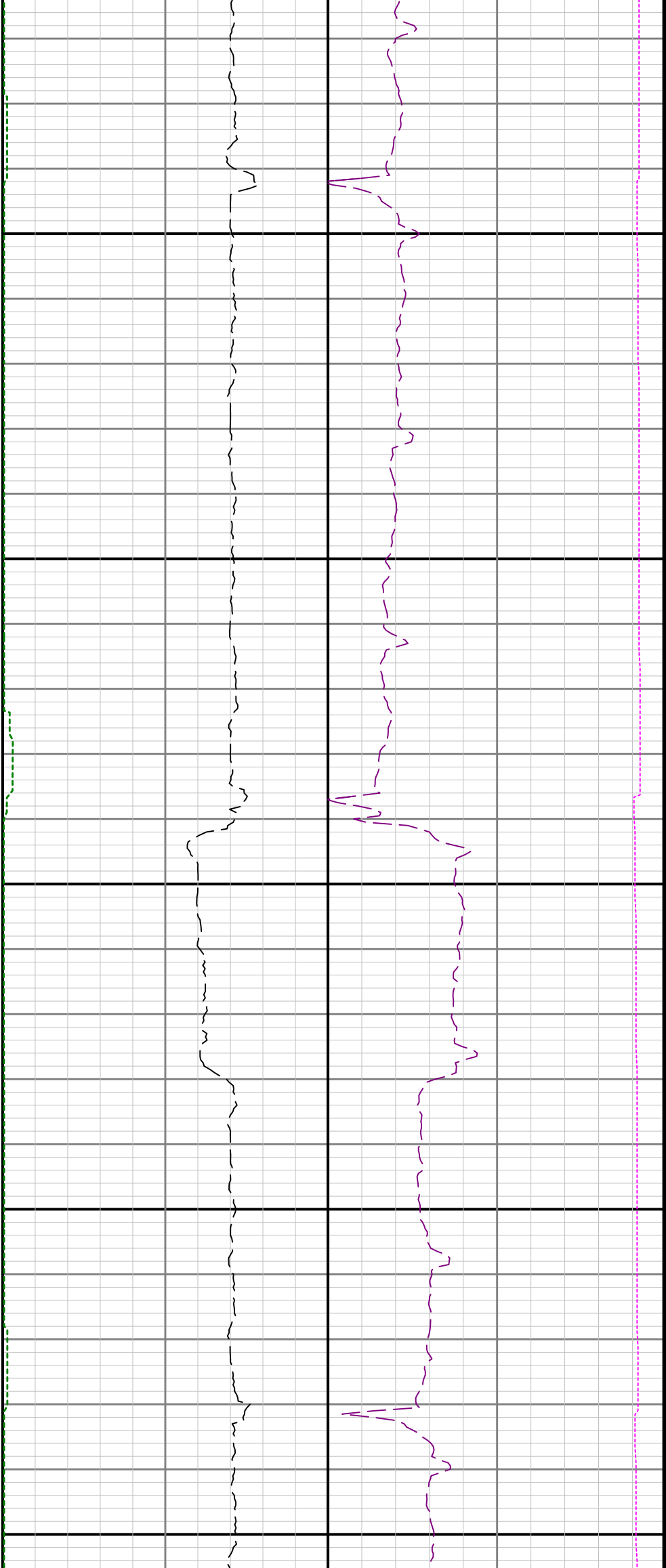




16100

16200

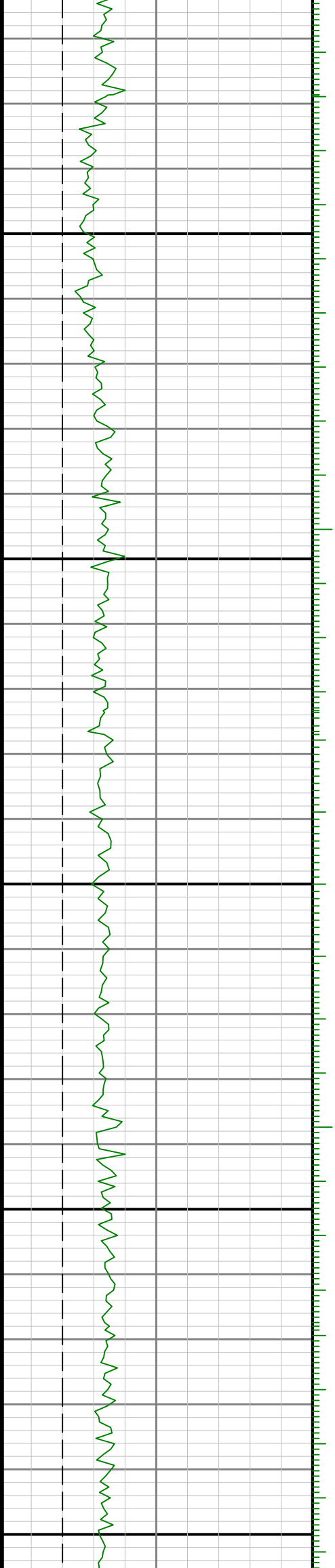


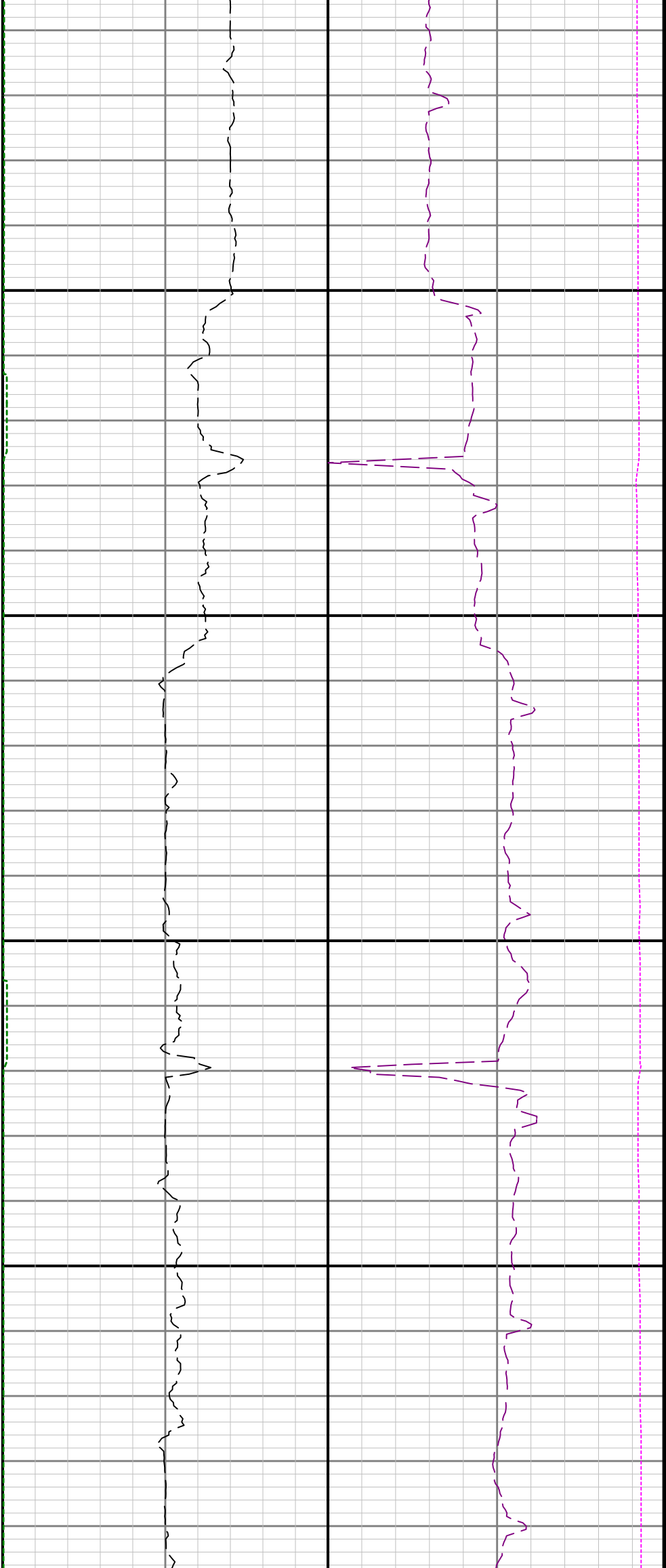


16300

16400

16500





16600

16700

