



BAKER
HUGHES

LWD MEMORY LOG

Gamma Ray

Scale: Company: Ward Petroleum

1:240 MD Well: Ritchey 26-1-20HN

Depth Reference: Field: Weld County

Driller's Depth County: Weld County Country: United States
State: Colorado

Status: Surface Location: Other Services:

Final Print Latitude: Longitude: Directional

API No: 05-123-44747-0000 SEC: 26 TVN: 1N RGE: 66W

Job ID: 8628595 Elevation: 5154.00 ft Elev. KB: N/A

Permanent Datum (P.D.): Ground Level Above P.D. 20.00 ft Elev. DF: 5174.00 ft

Log Measured From: Rig Floor

Dates Interval Logged Magnetic Field Reference

Date From: 2017-07-03 Top: (ft) 1502.00 Azi Reference North: True Dip Angle: (deg) 66.59

Date To: 2017-07-05 Bottom: (ft) 12406.00 Total Magnetic Field Strength: (nT) 52227

Spud Date: 2017-06-19 Mag to Reference North Correction: (deg) 8.35 E

Borehole Record Casing Record

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

13.500 20.00 1502.00 13.500 37.00 20.00 1492.00

8.500 1502.00 12406.00

Mud Record Deviation Record

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

Oil Based Mud 1502.00 12406.00 8.500 10904.00 5.87 | 24.03 90.09 | 181.31

Acquisition System Software Version Other

Baker Hughes Cadence RT4.1

Pilot Studio 4.1.7763.3

Rig: PD 460
Contractor: Precision Drilling
District: US Land Unit: RMA

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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	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	3.00	AutoTrak Curve	1502.00	12394.00	1502.00	12406.00	2017-07-03 20:40	2017-07-05 22:46	47.44

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Andrew Clancy	2017-07-03	2017-07-06	Doug Rusco	2017-07-03	2017-07-06			

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2017-07-04 06:13	1	4472.00	Oil Based Mud	10.0	21	0	0.0	72/28	Active Pit	28000	0.00
2017-07-05 07:23	1	9757.00	Oil Based Mud	9.9	16	0	0.0	74/26	Active Pit	32000	0.00
2017-07-06 03:50	1	12406.00	Oil Based Mud	10.0	22	0	0.0	76/24	Active Pit	29	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	ATC_SU	12273683	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_SU	12273683	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_MWD	12168891	Gamma (single)	2.75	12.90	7.000	3.250
1	ATC_MWD	12168891	Directional (mag)	12.27	22.42	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_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	12406 feet MD (1496 to 7566 feet TVD).
3	Gaps in Gamma Ray data are present throughout the log due to downlinking while drilling ahead.


Remarks

Number	Measured Depth	Hole Section	Run No.	Remark
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	(ft)	(in)		
1	12394.00	8.500	1	The interval from 12394 to 12406 feet MD (7566 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	OnTrak - Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	OnTrak - Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	OnTrak - Gamma Ray - Time Since Drilled - Memory	min
TCDM	Downhole Temperature	degF



Company

Well

Interval

Created

Ward Petroleum

Ritchey 26-1-20HN

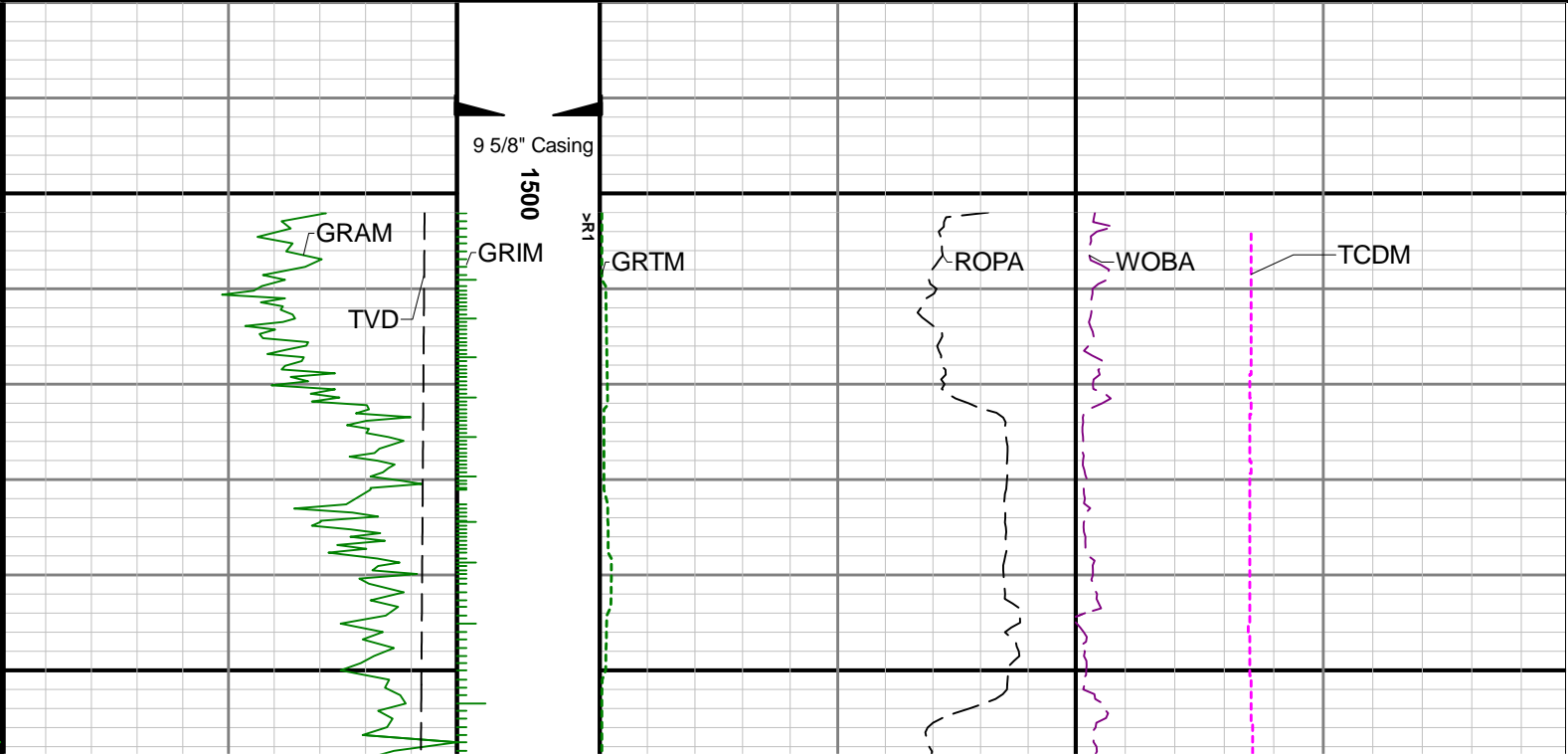
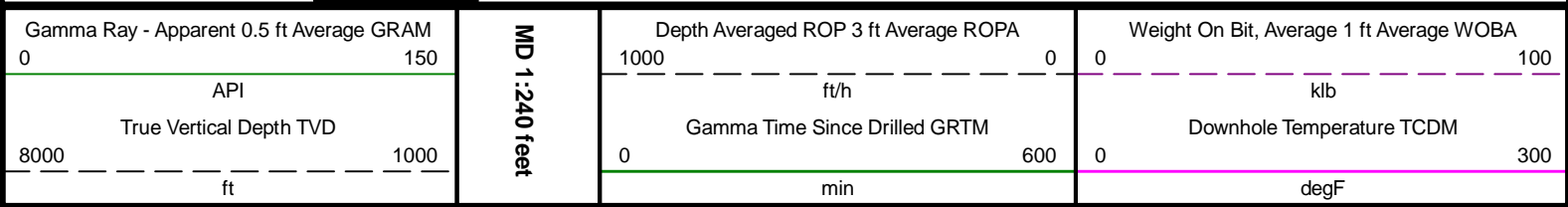
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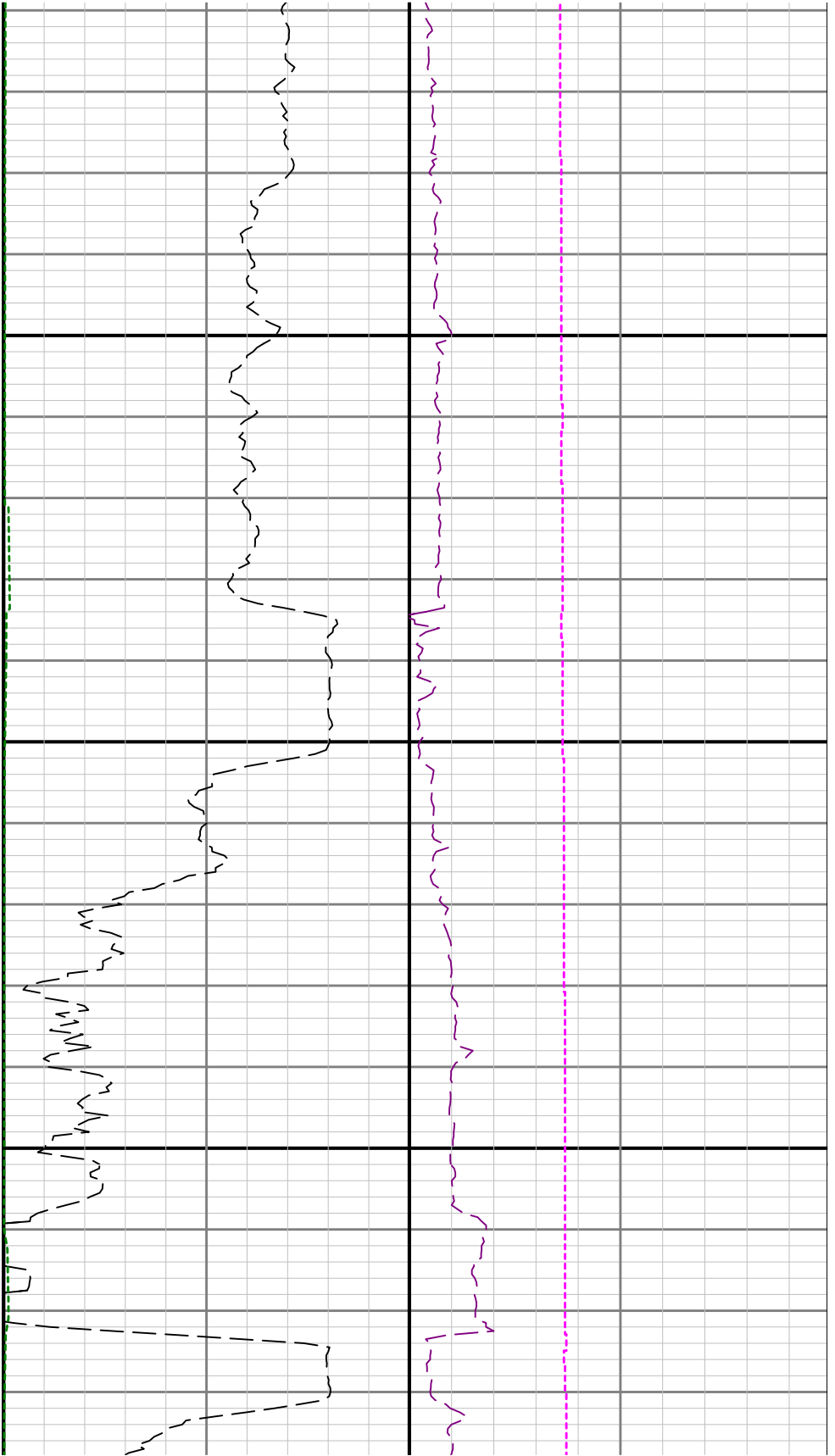
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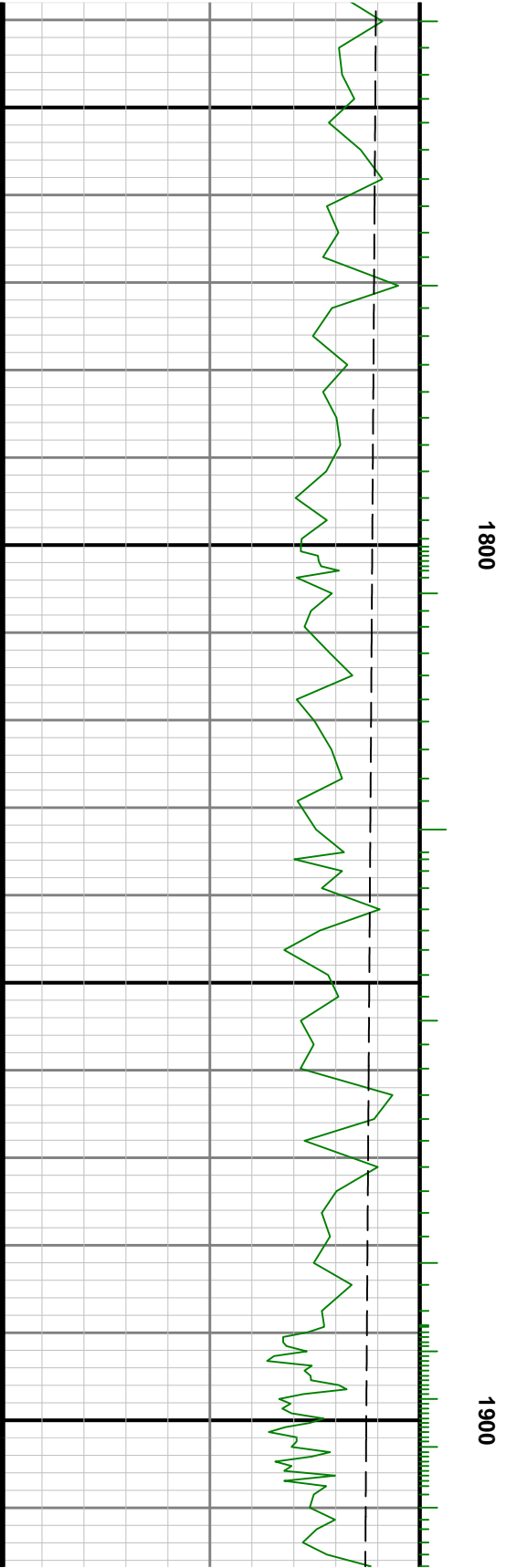
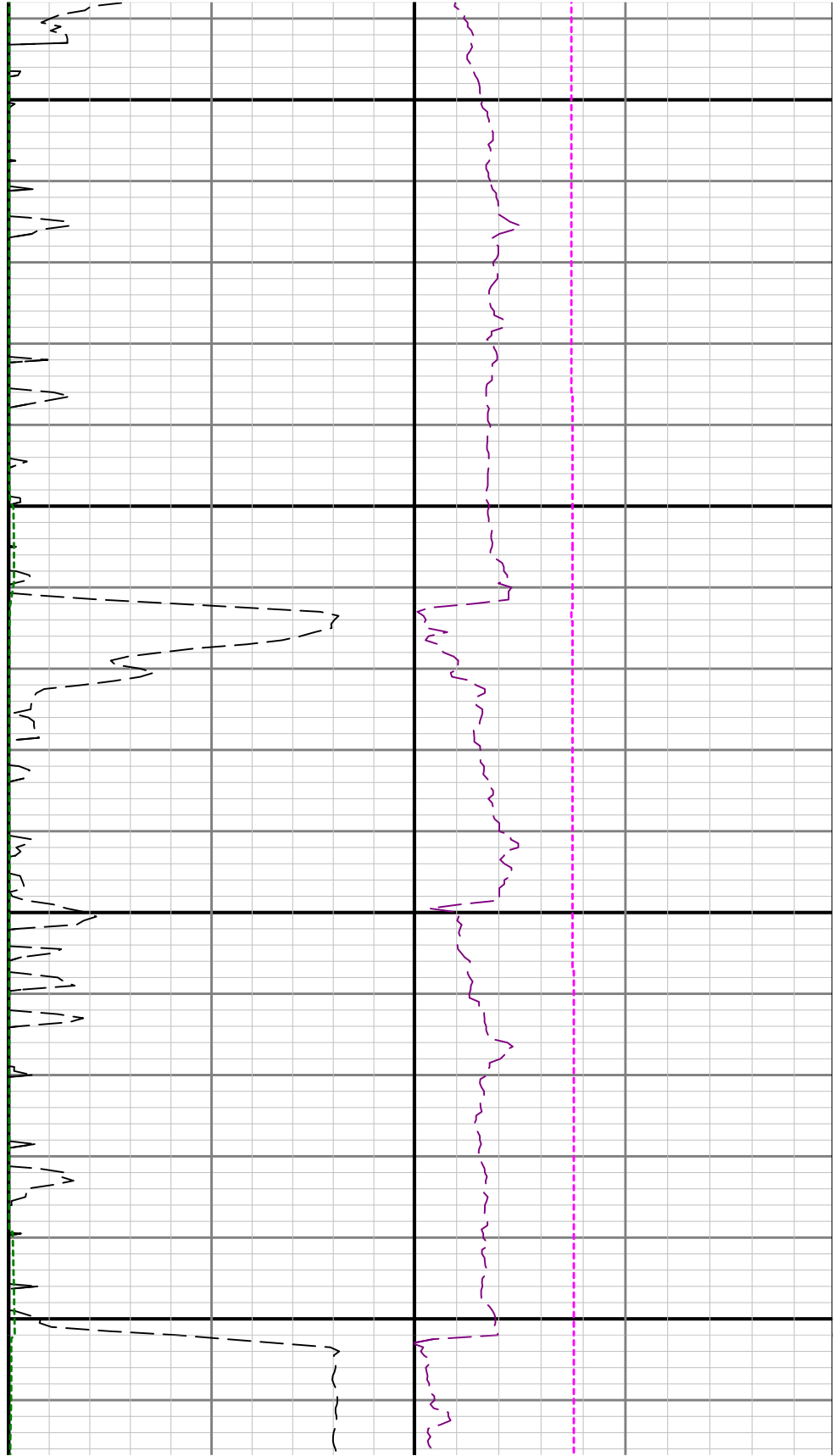
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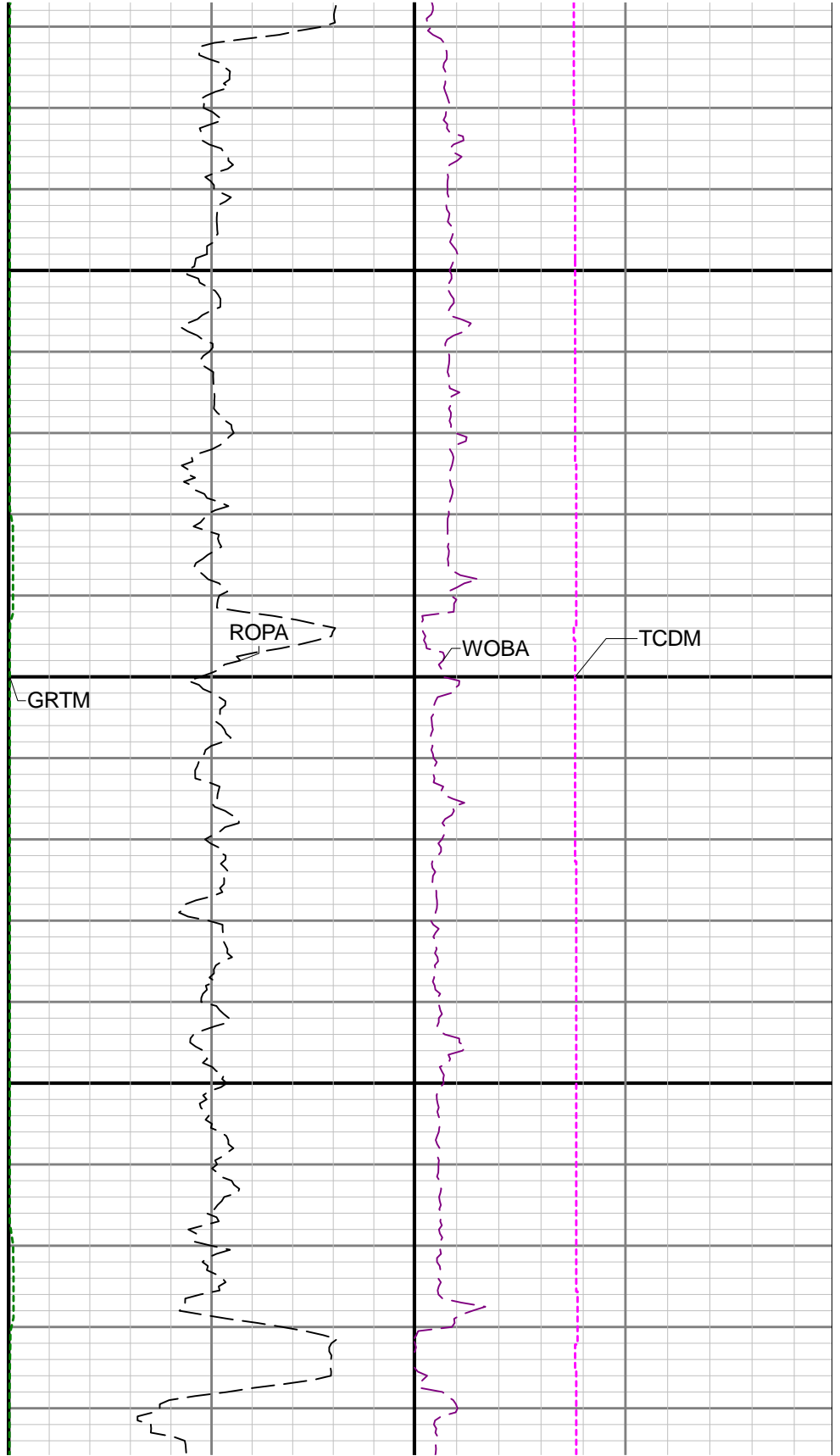
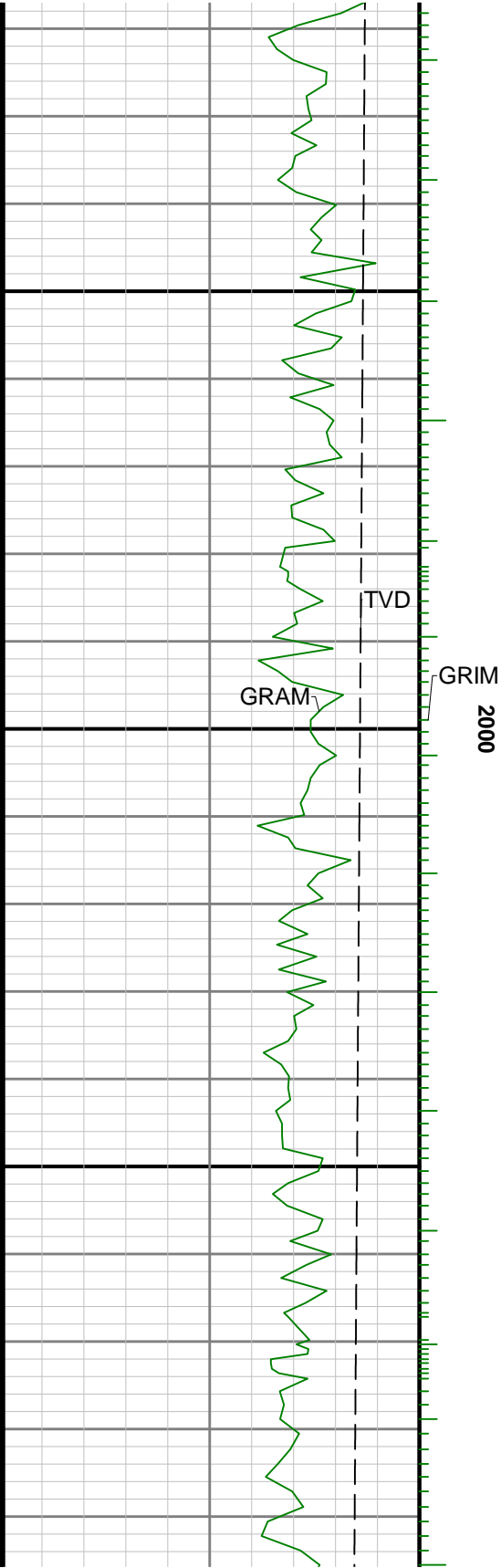


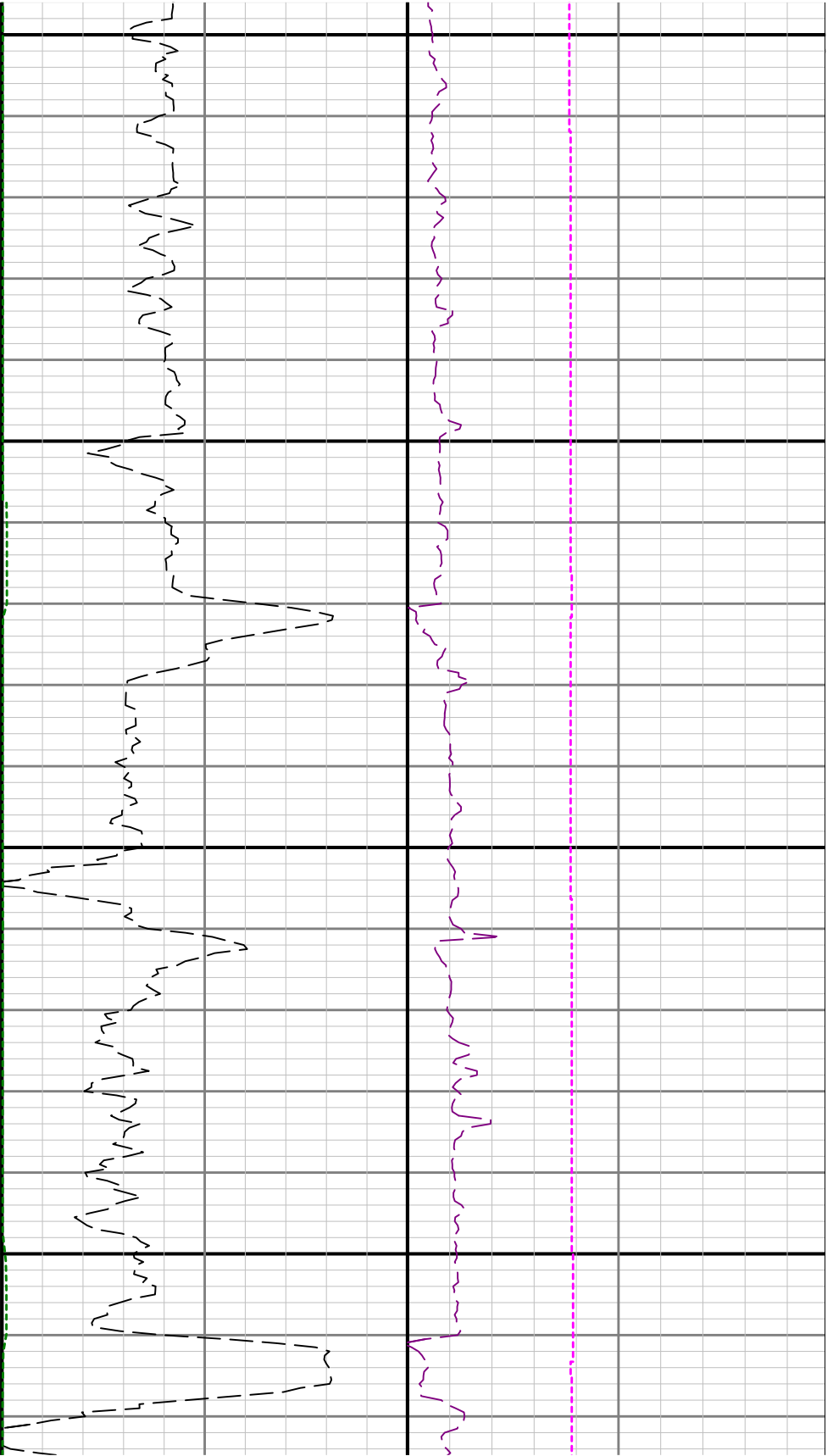


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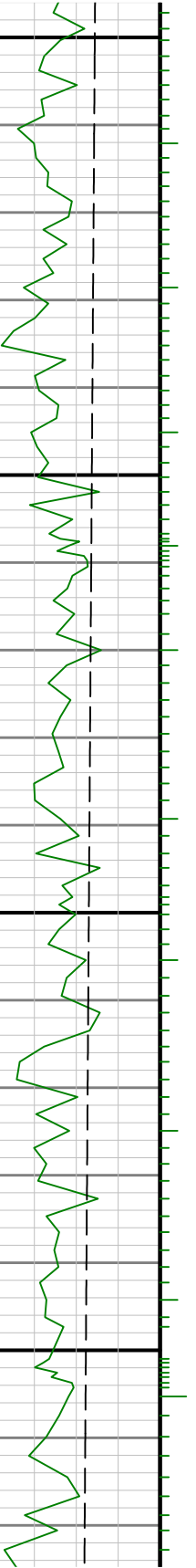


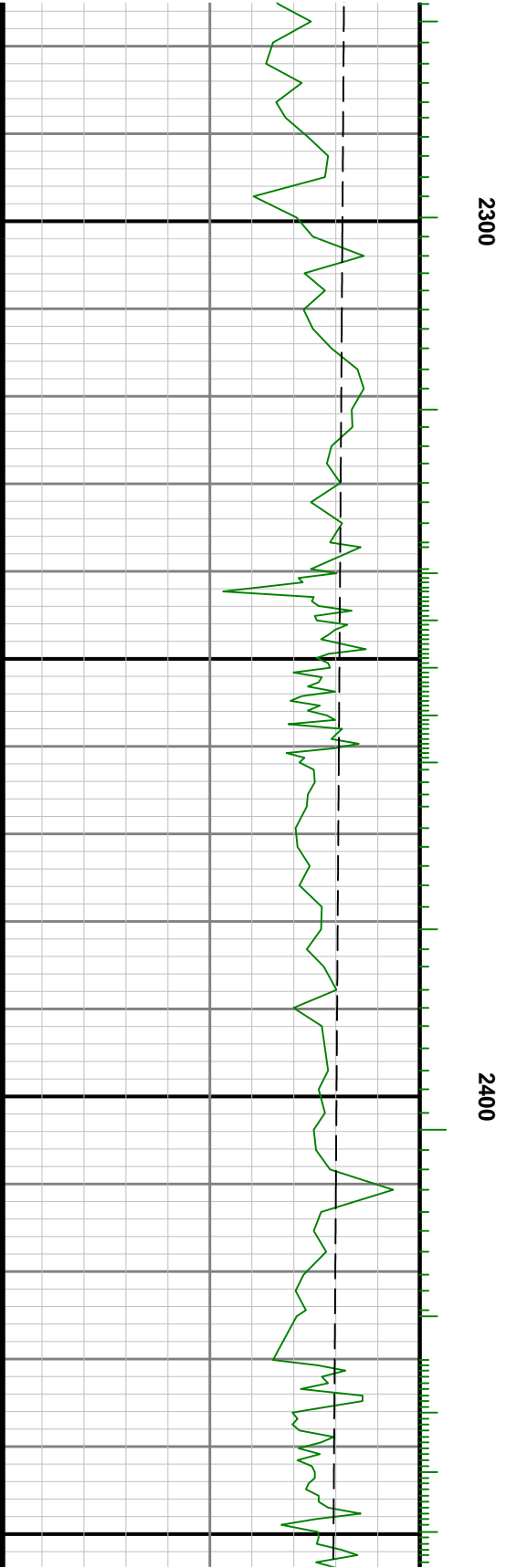
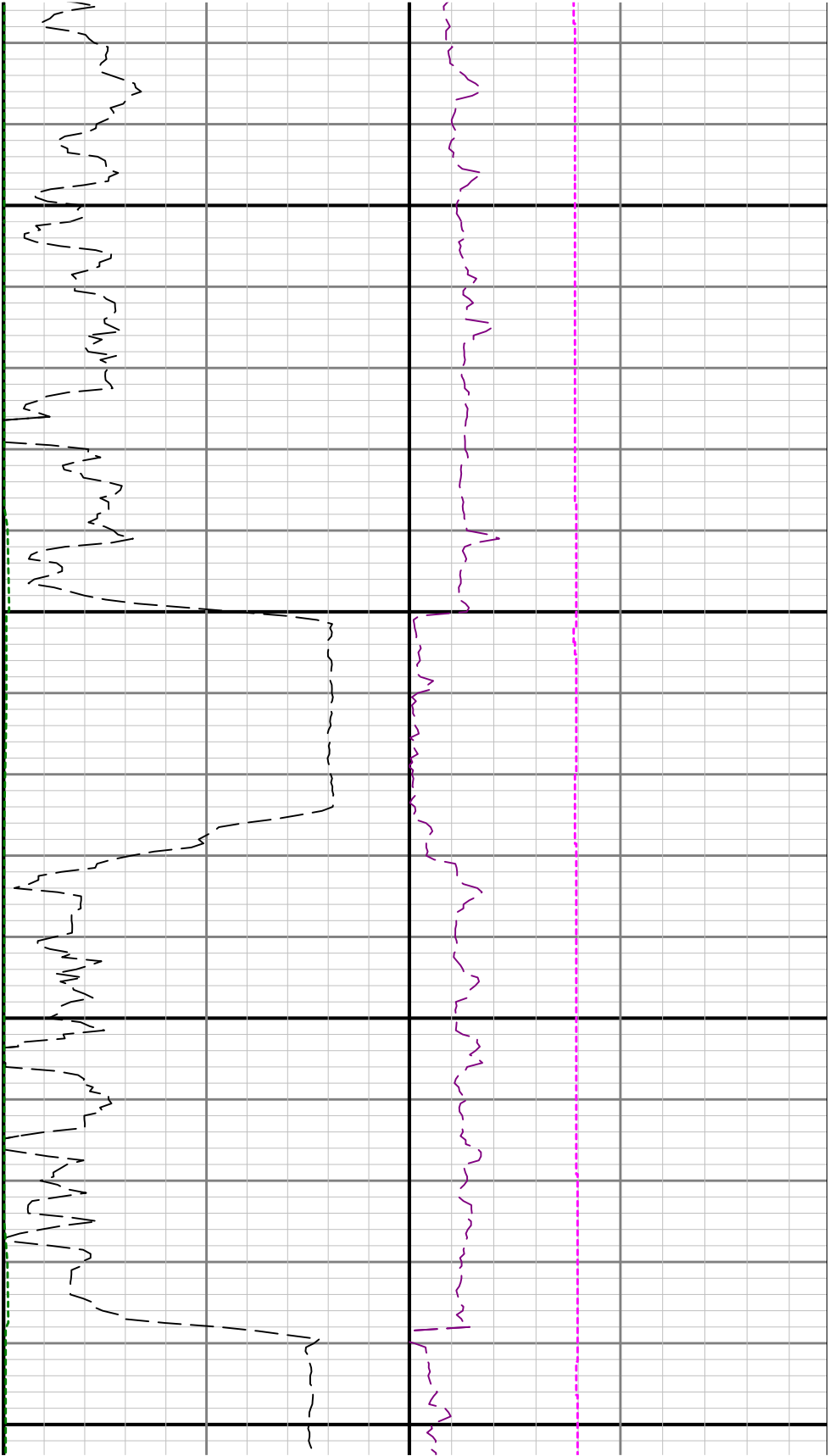


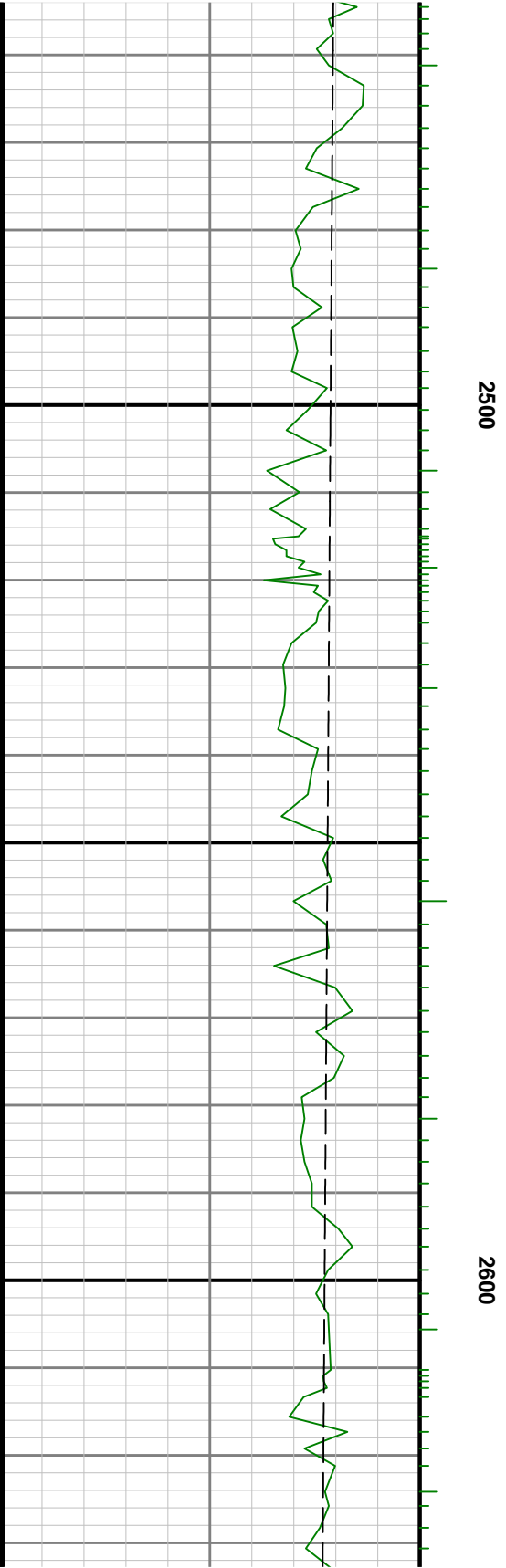
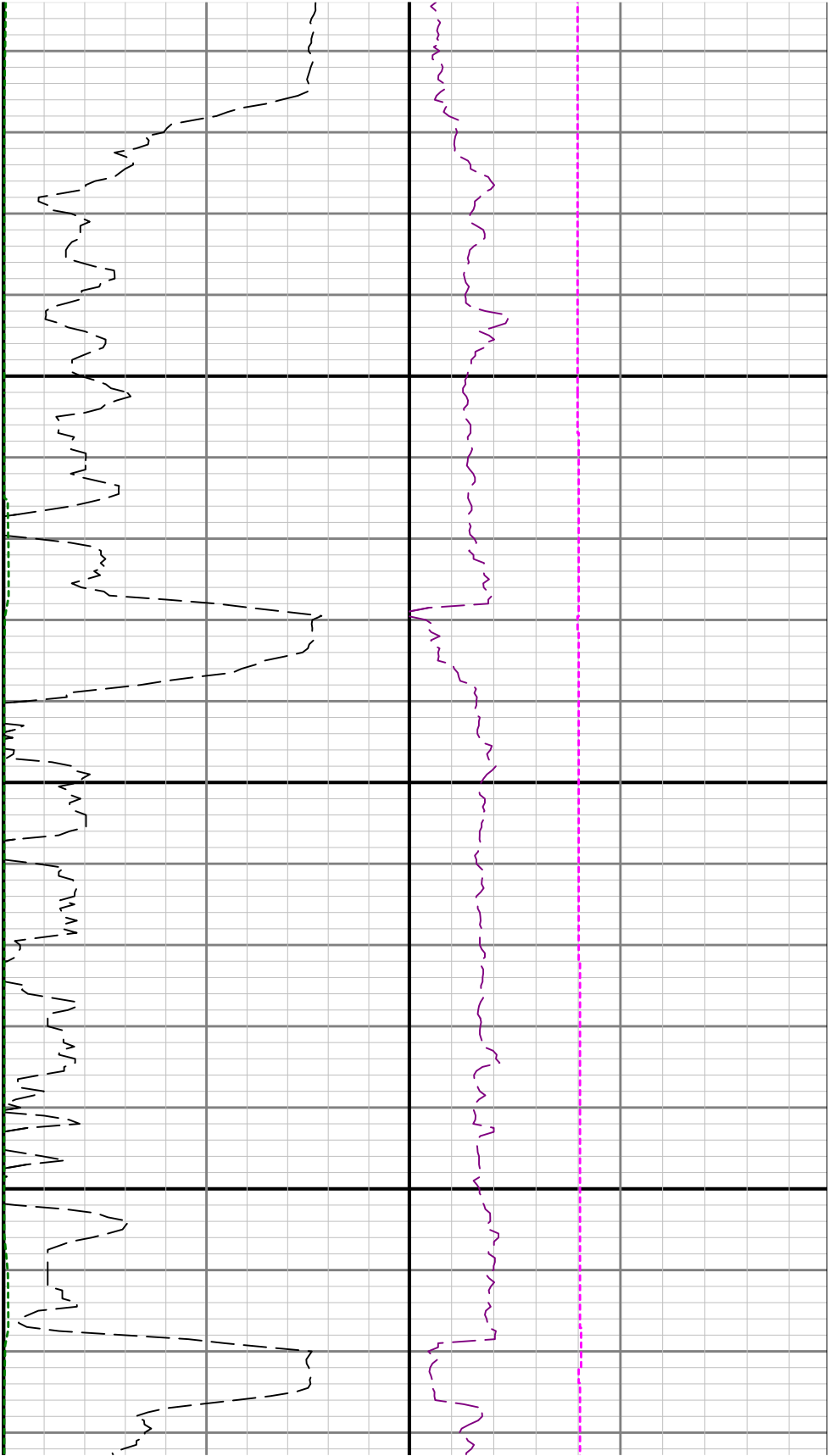


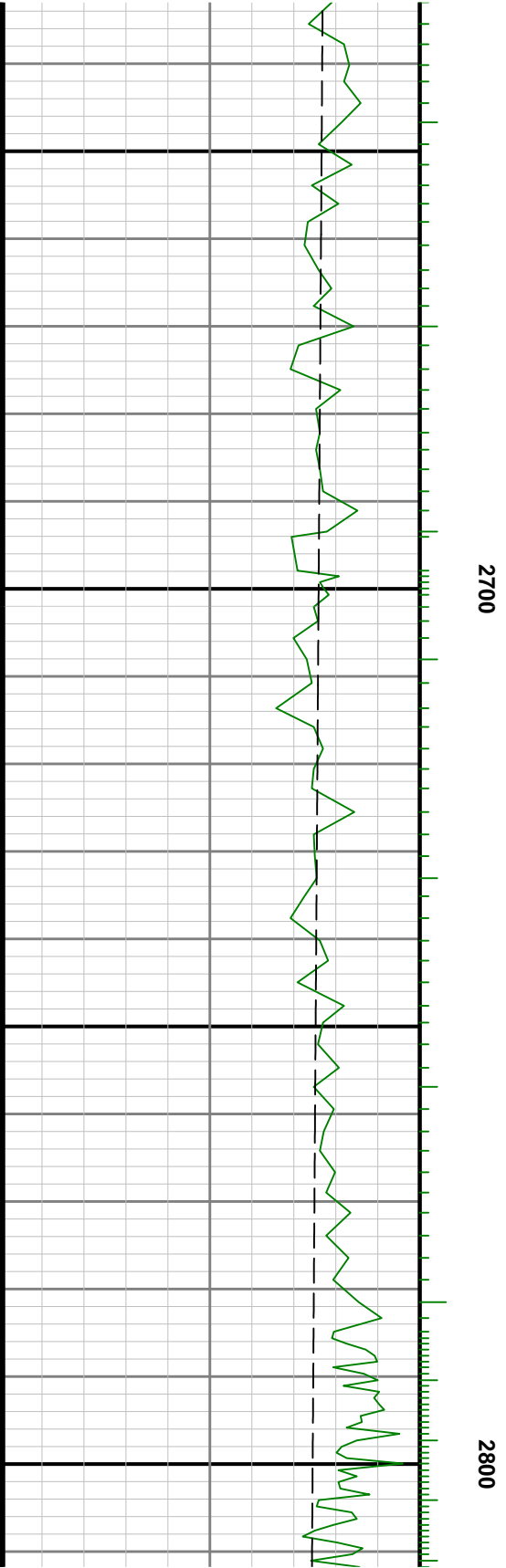
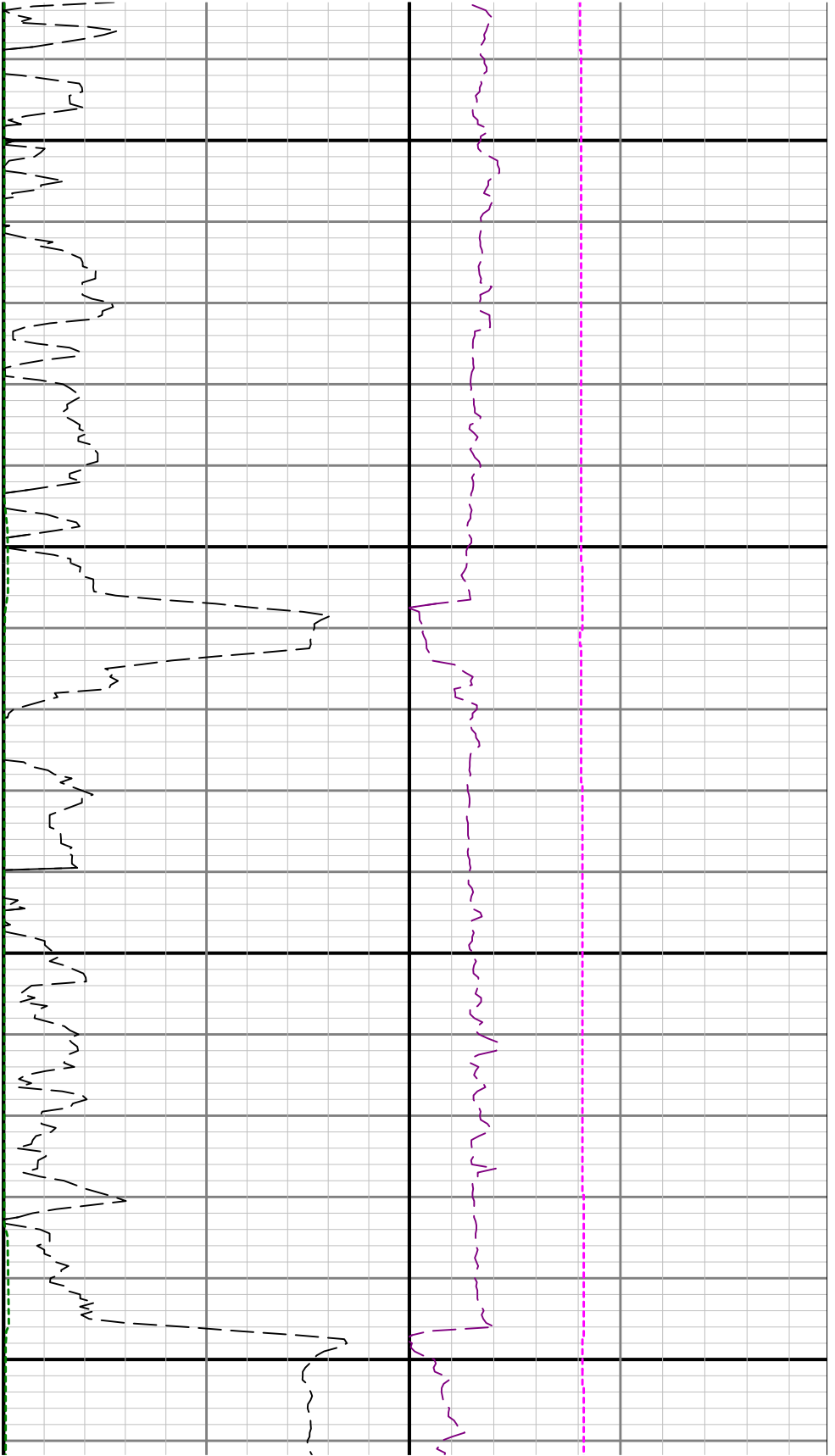
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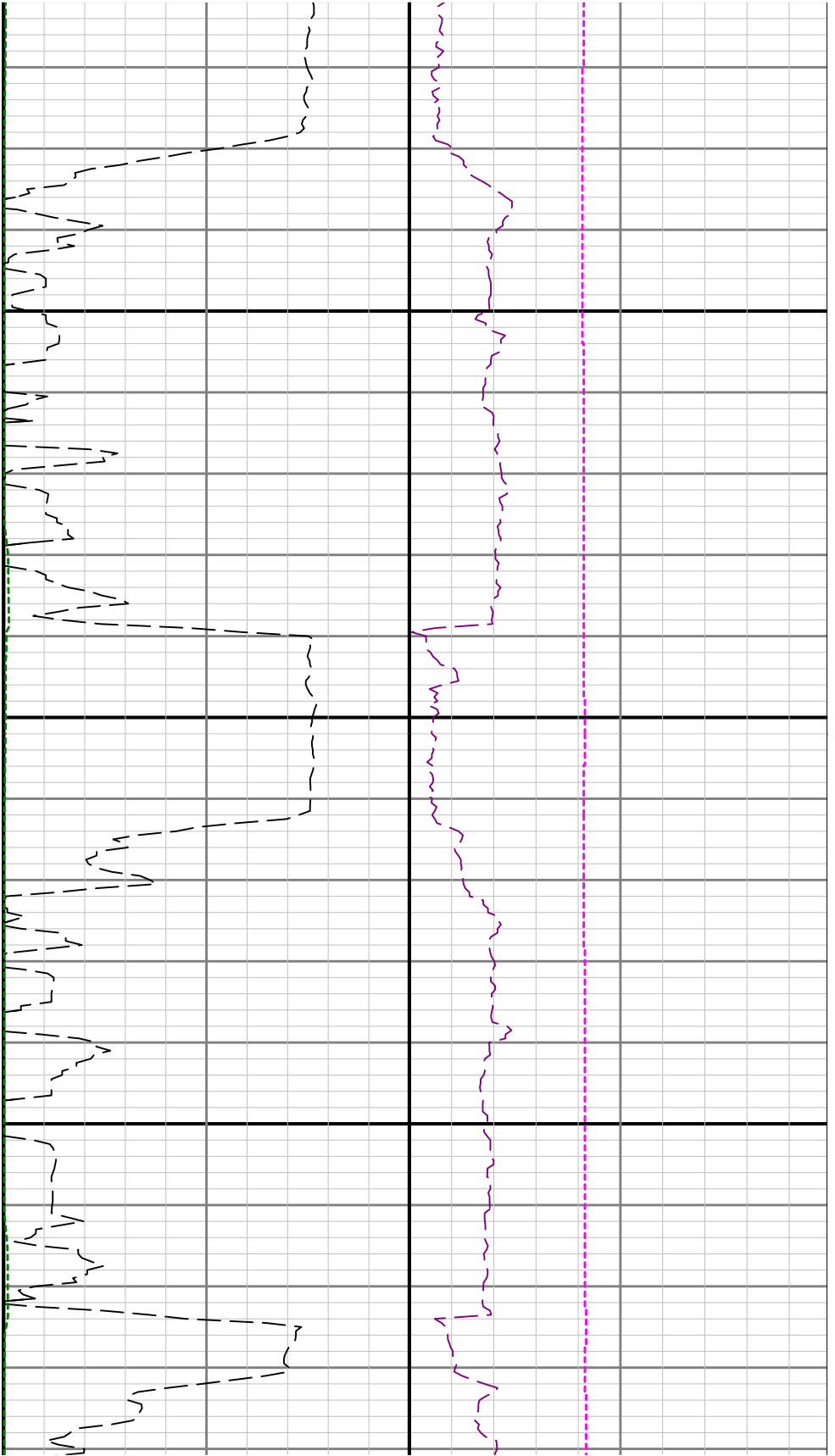
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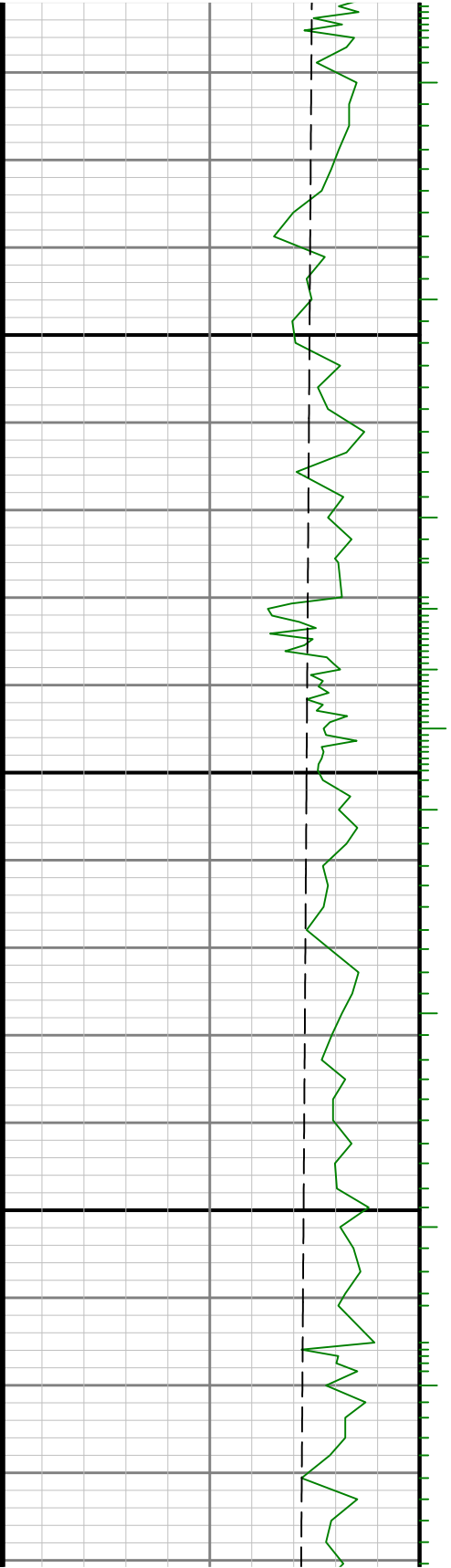


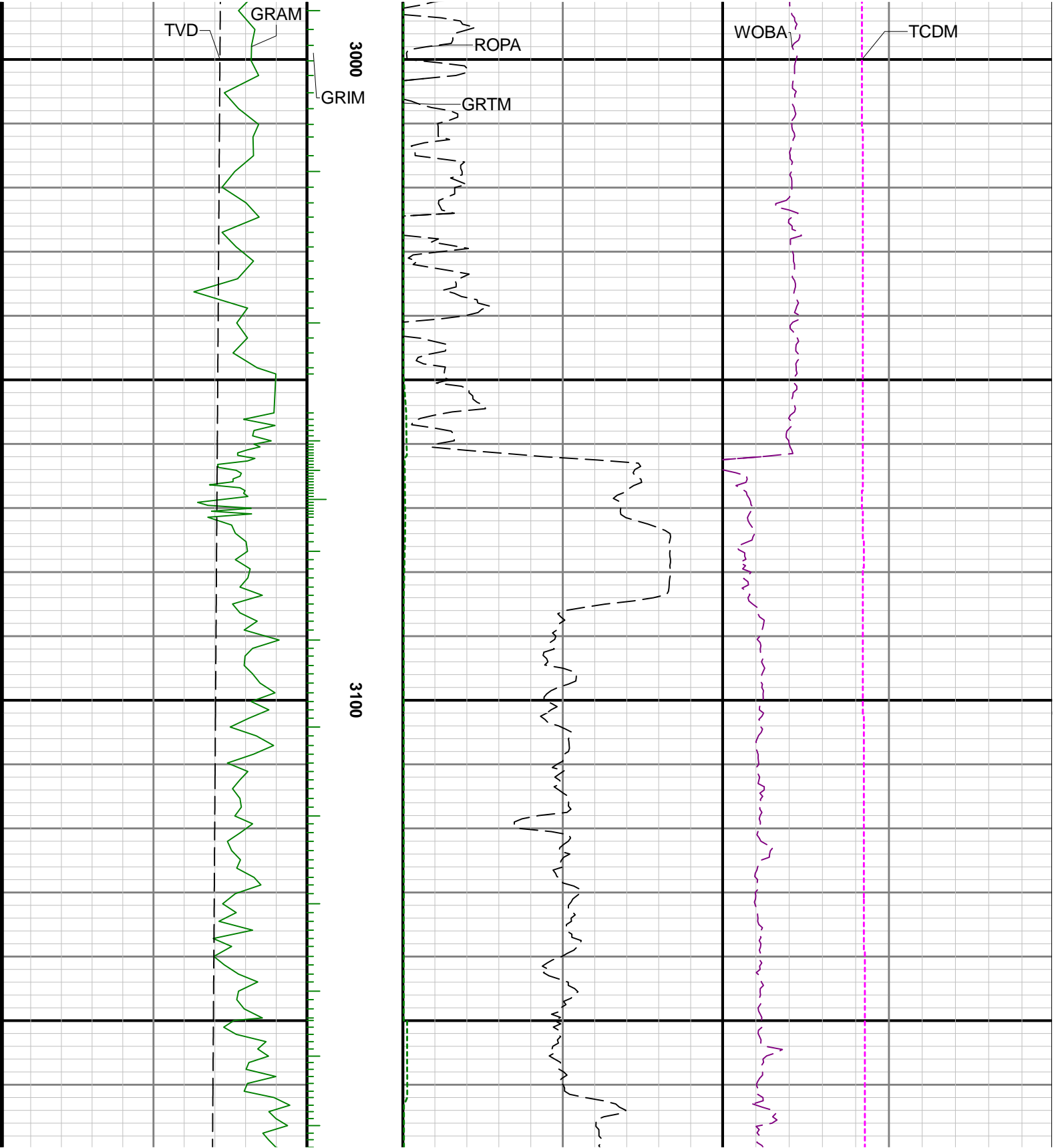


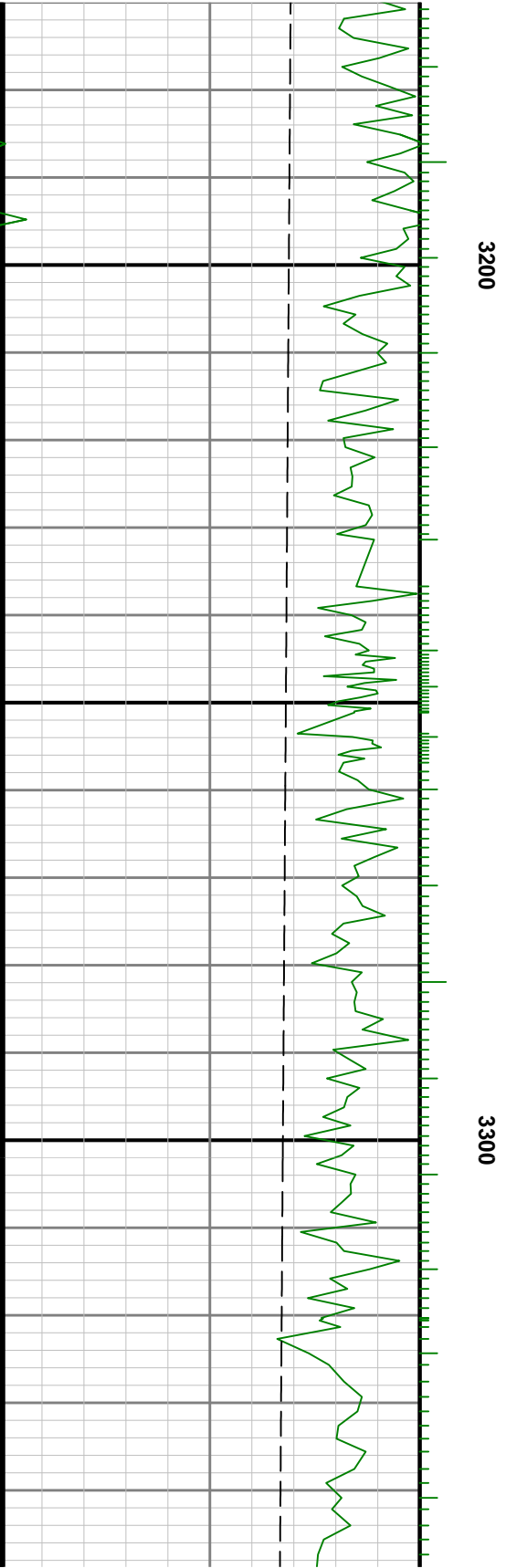
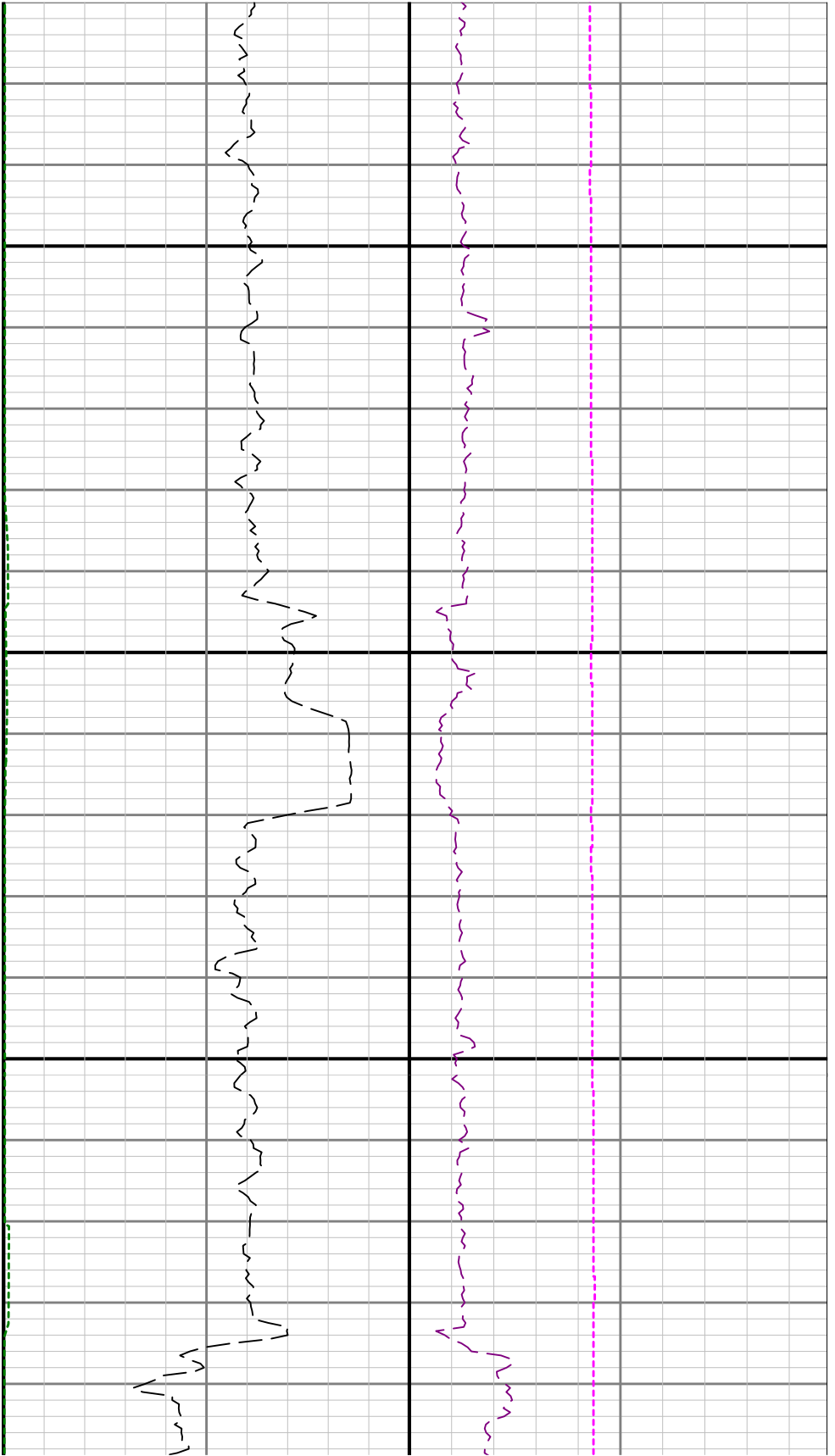


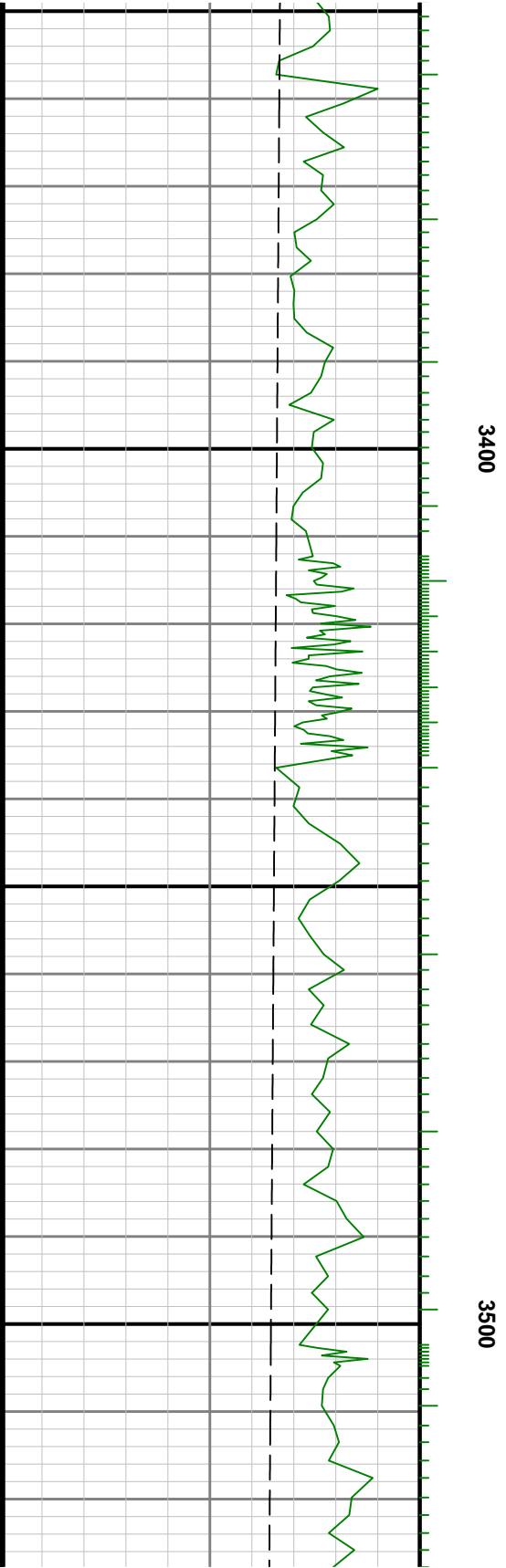
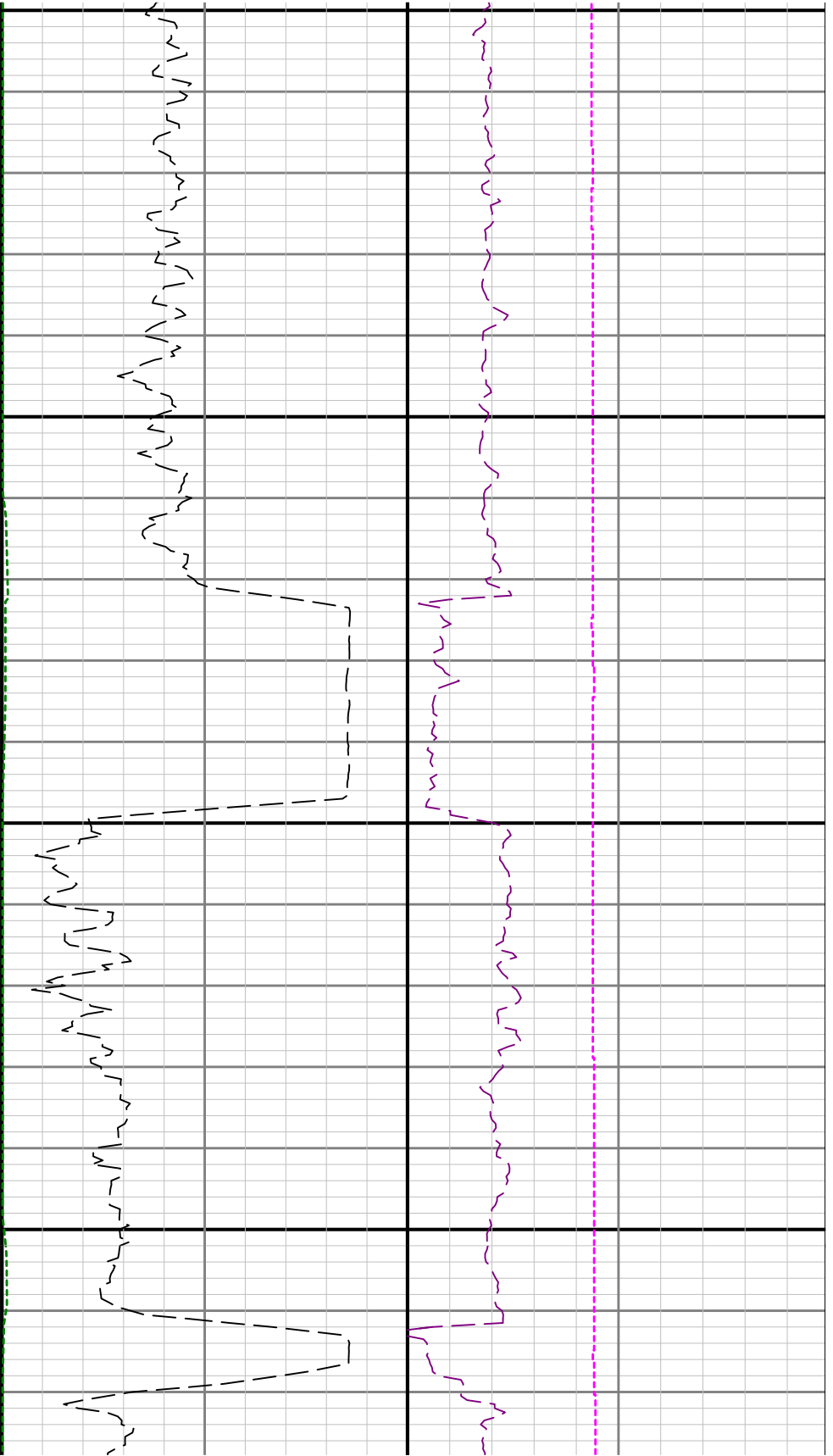


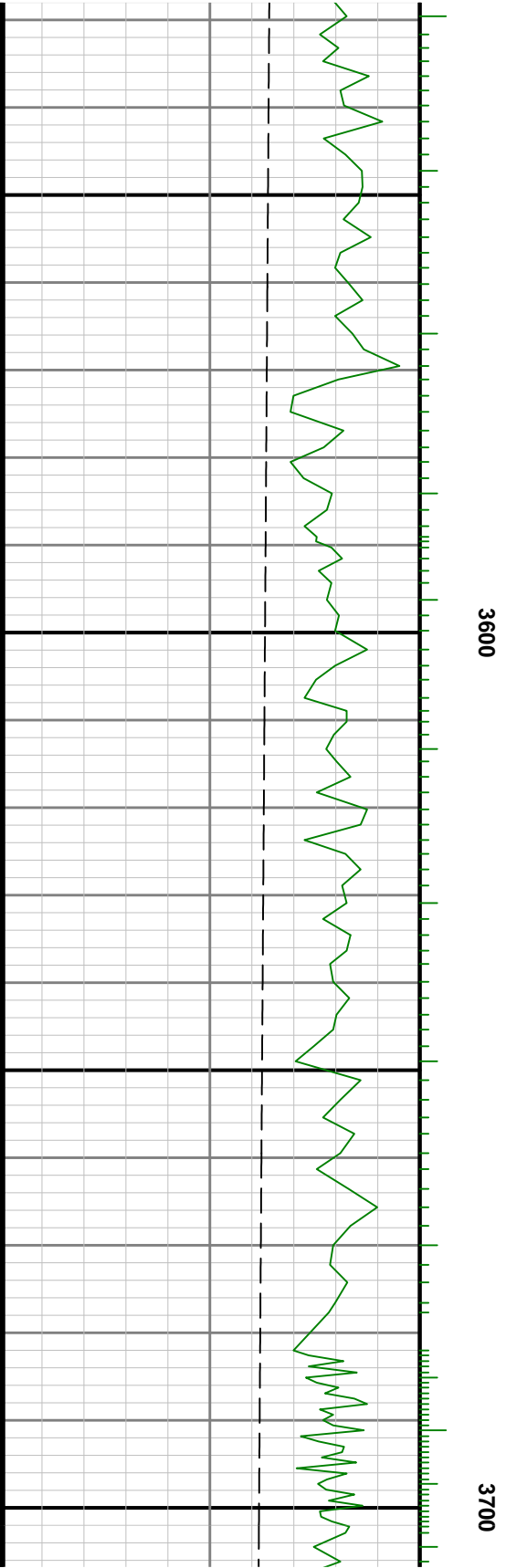
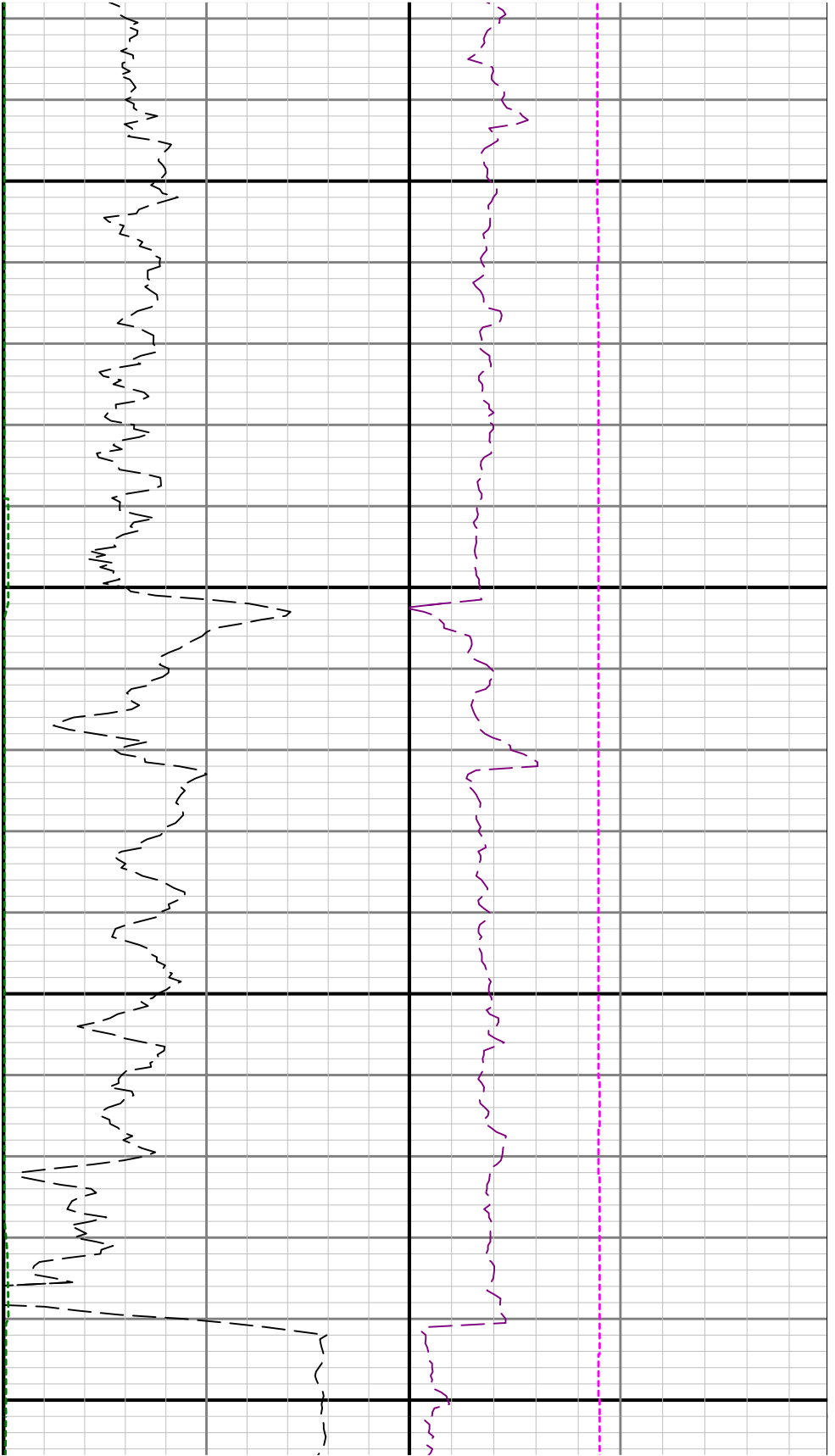
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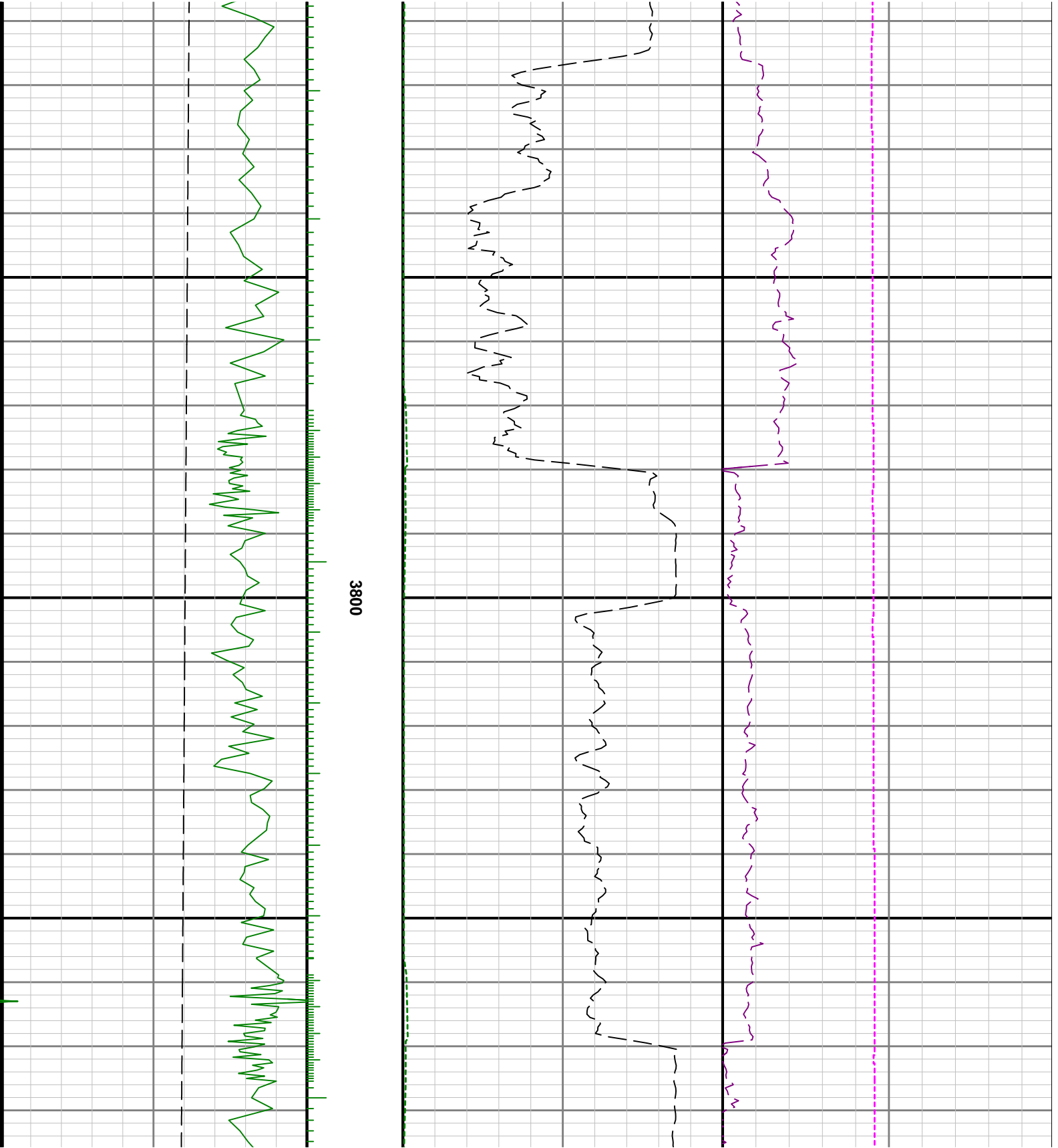


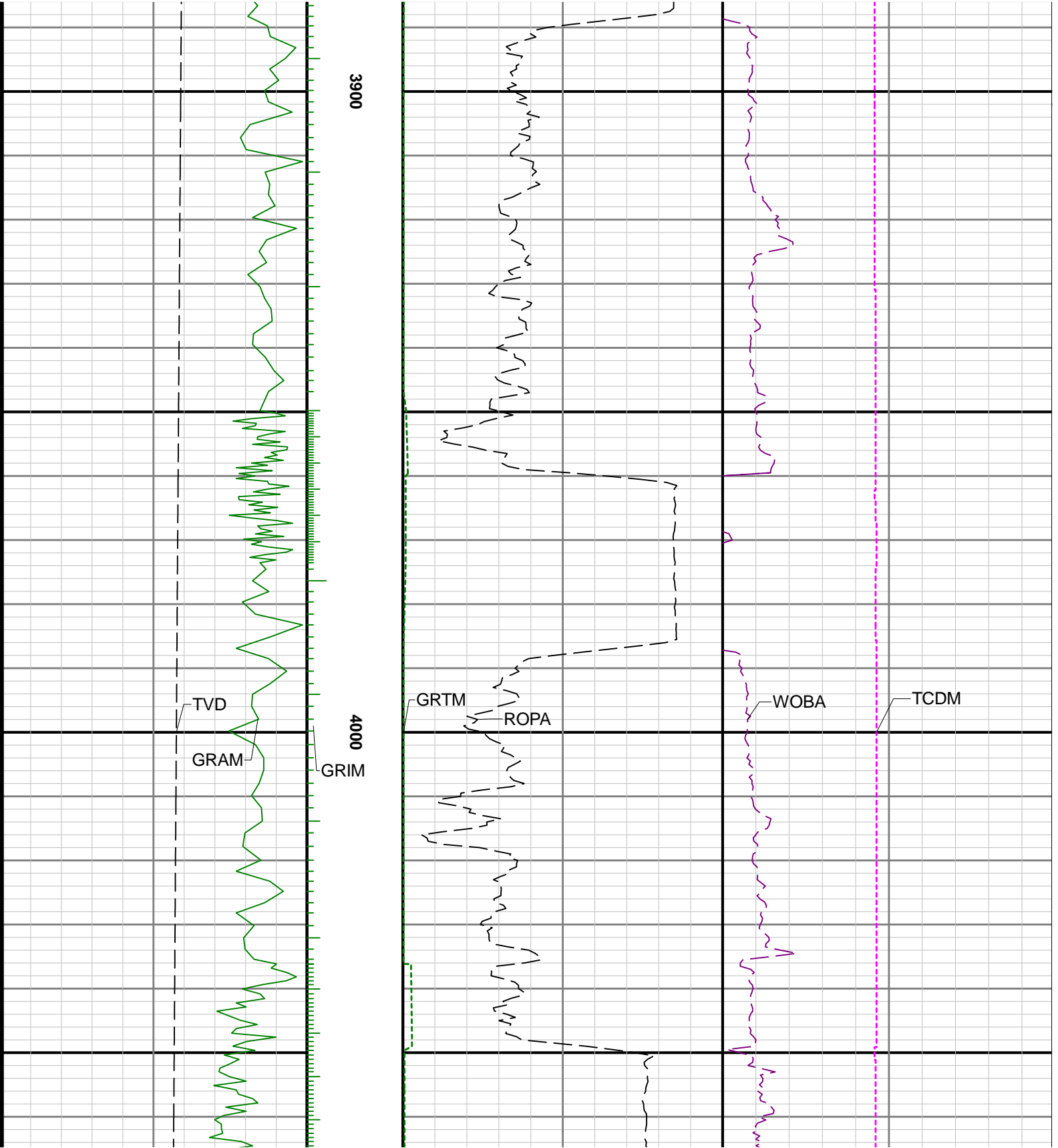


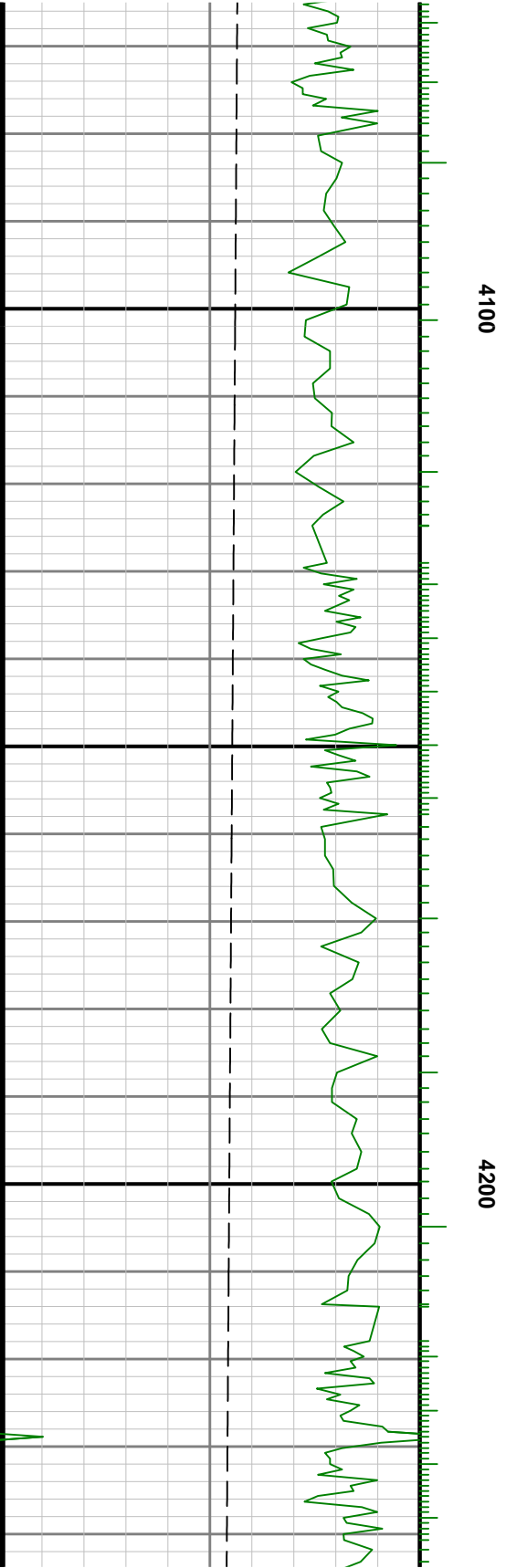
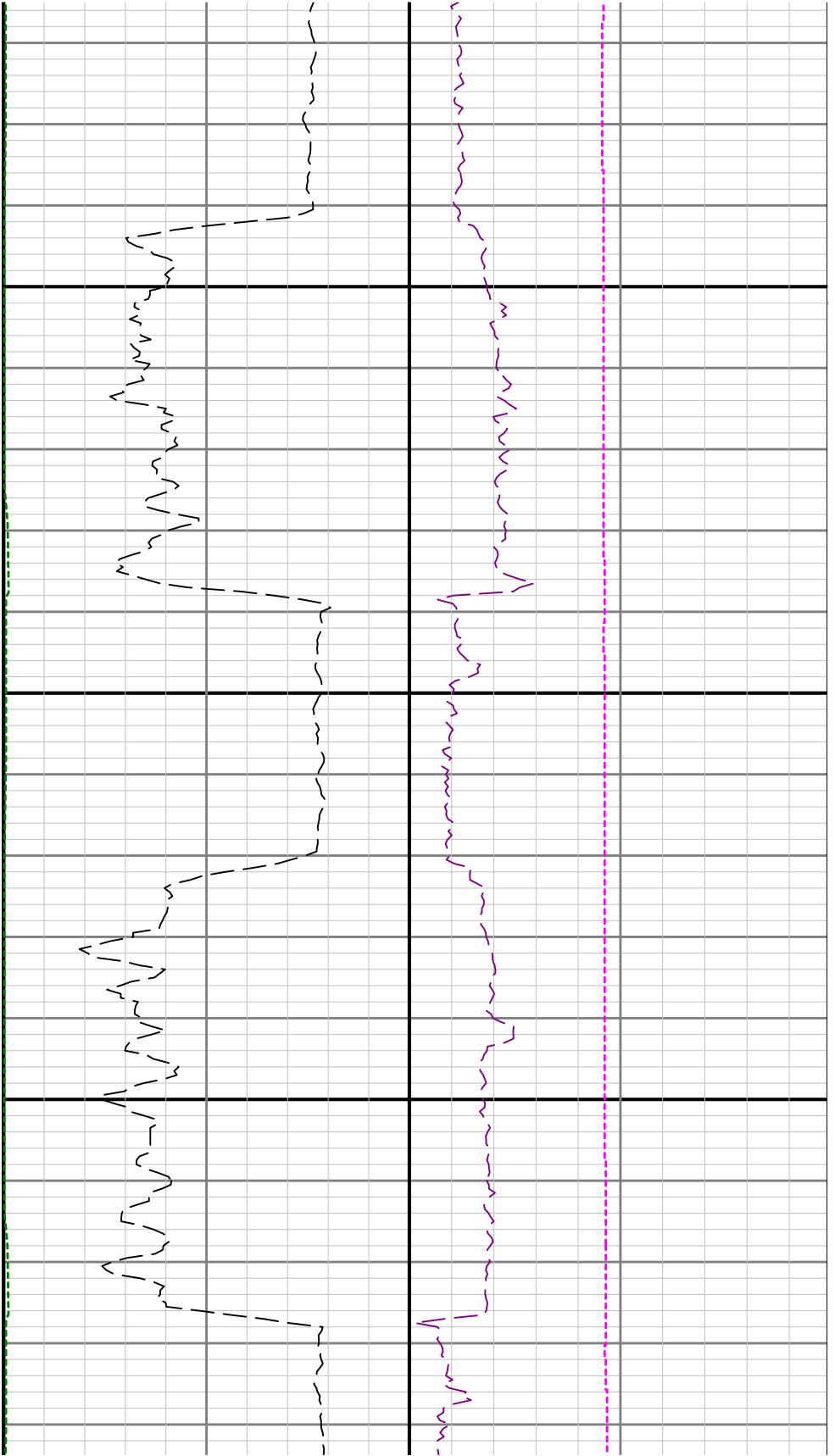


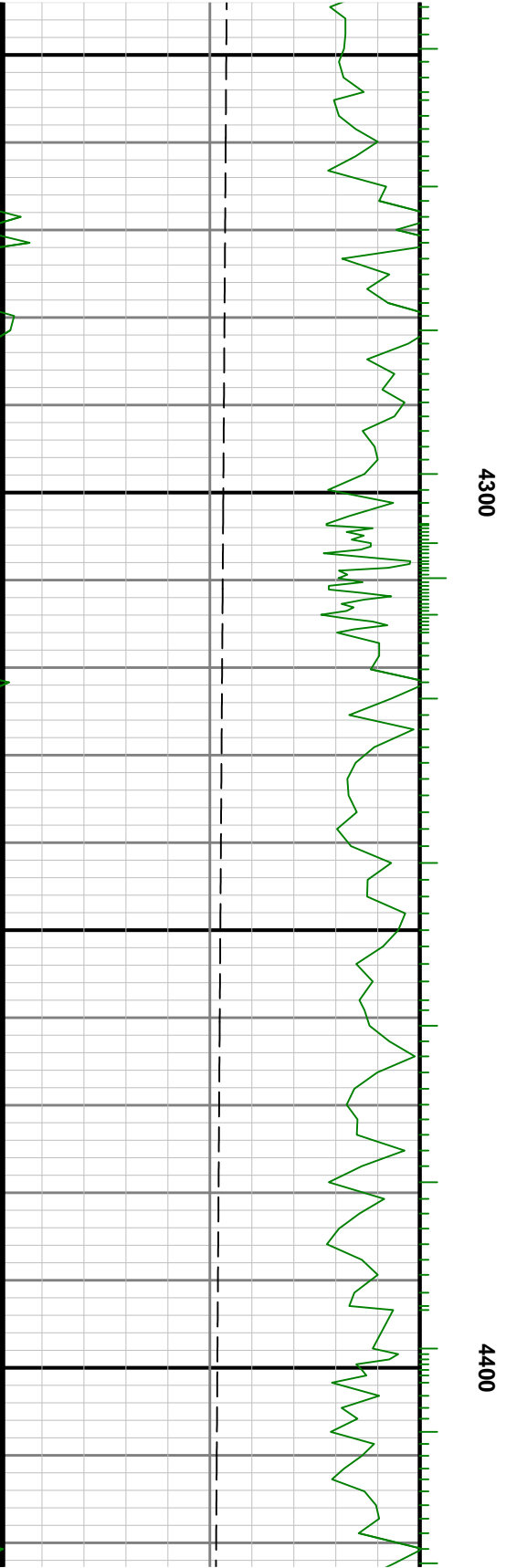
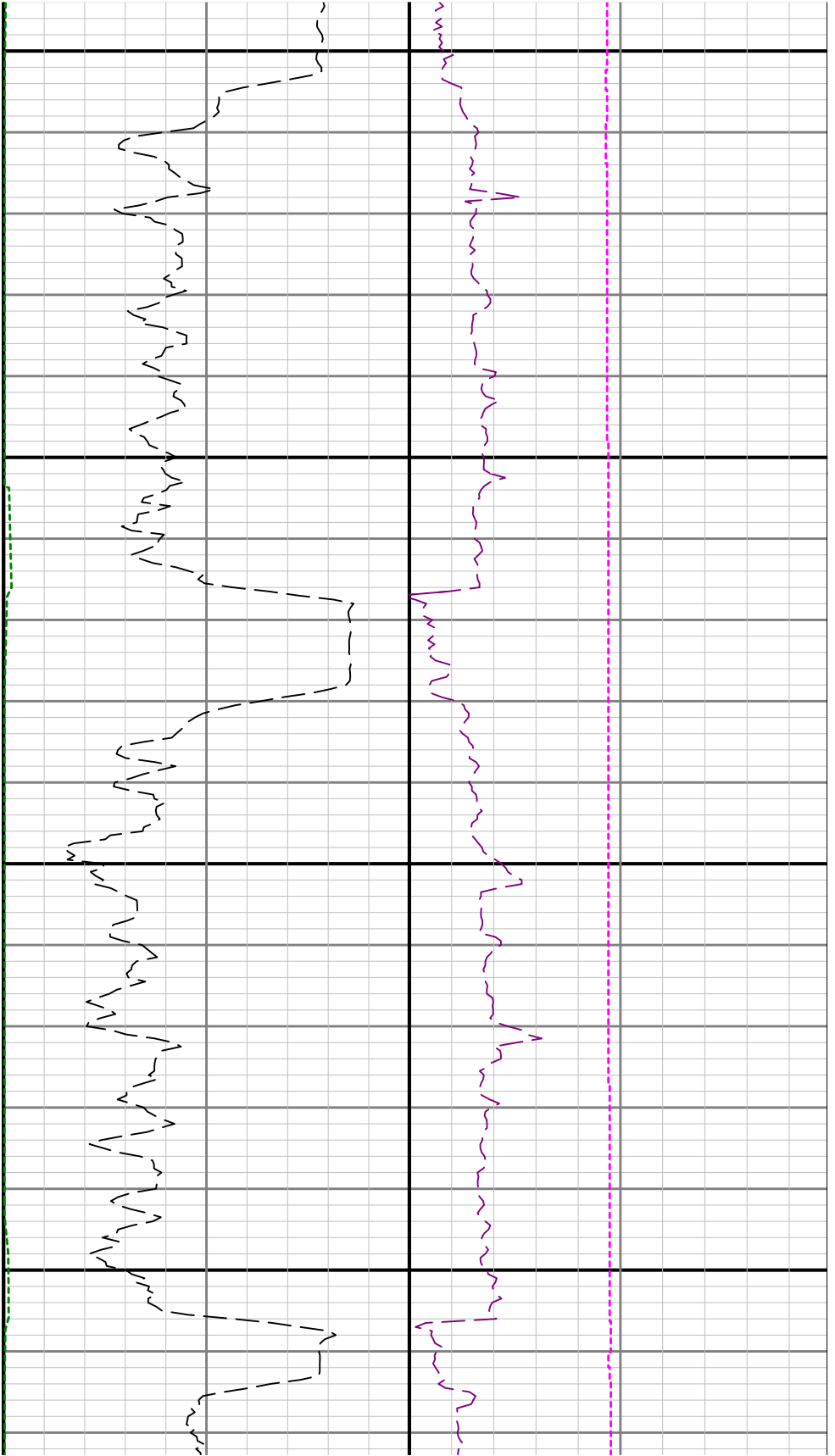


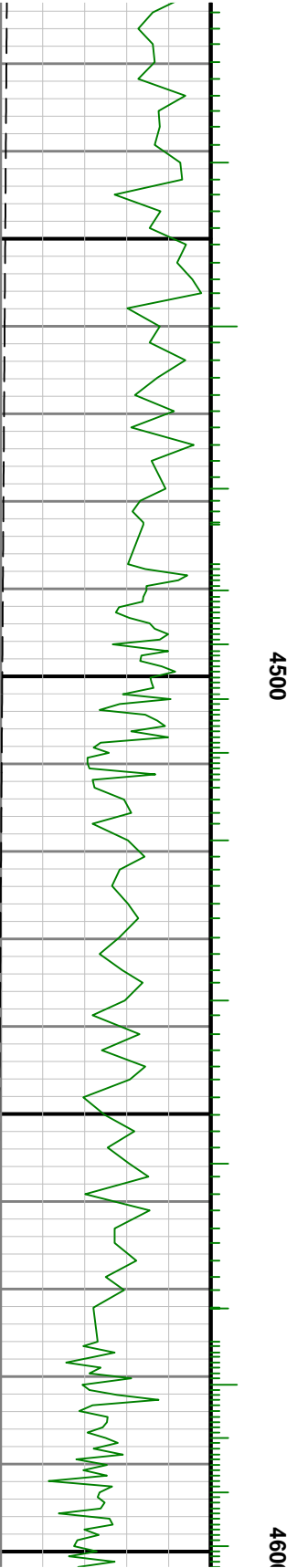


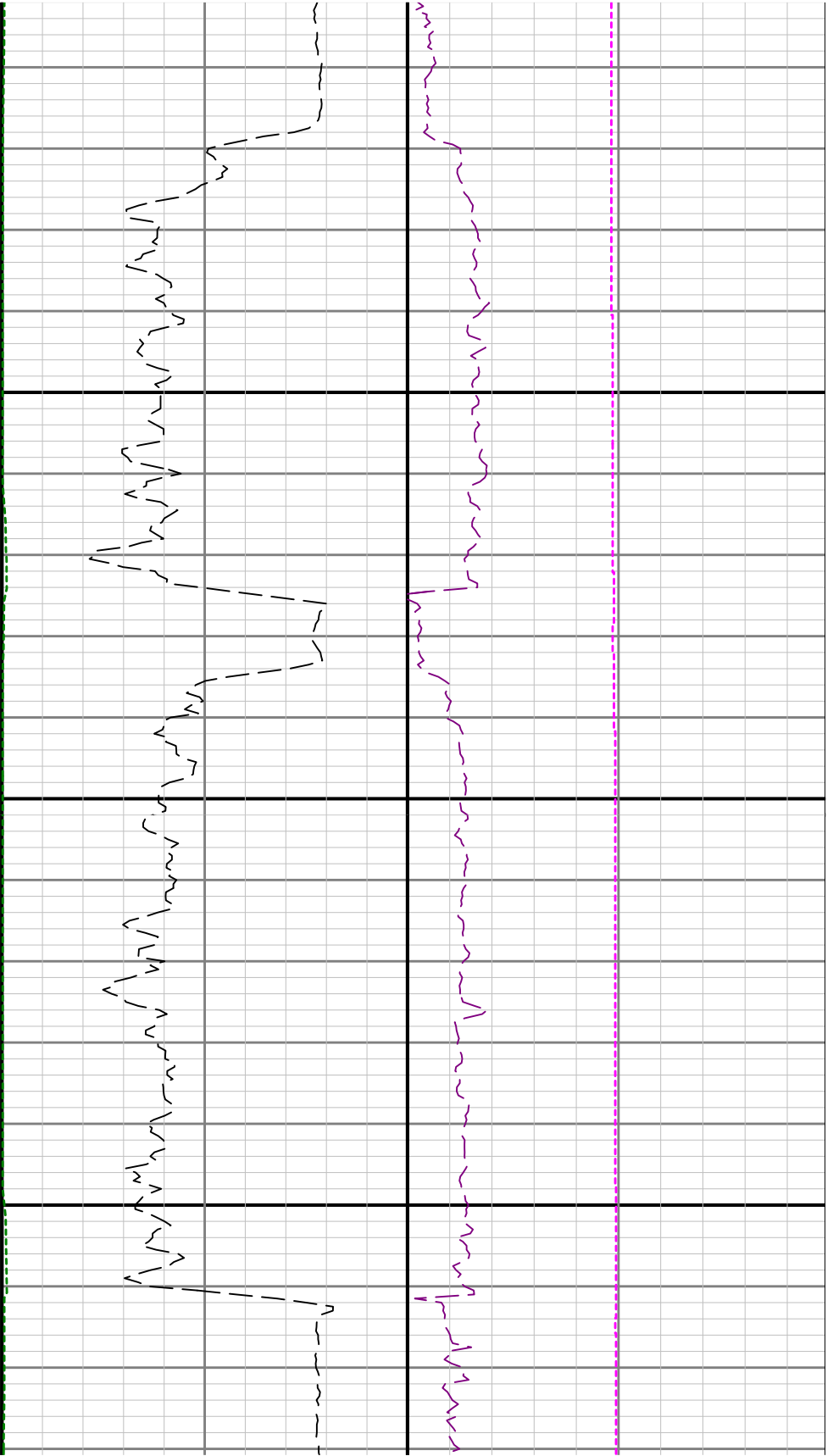




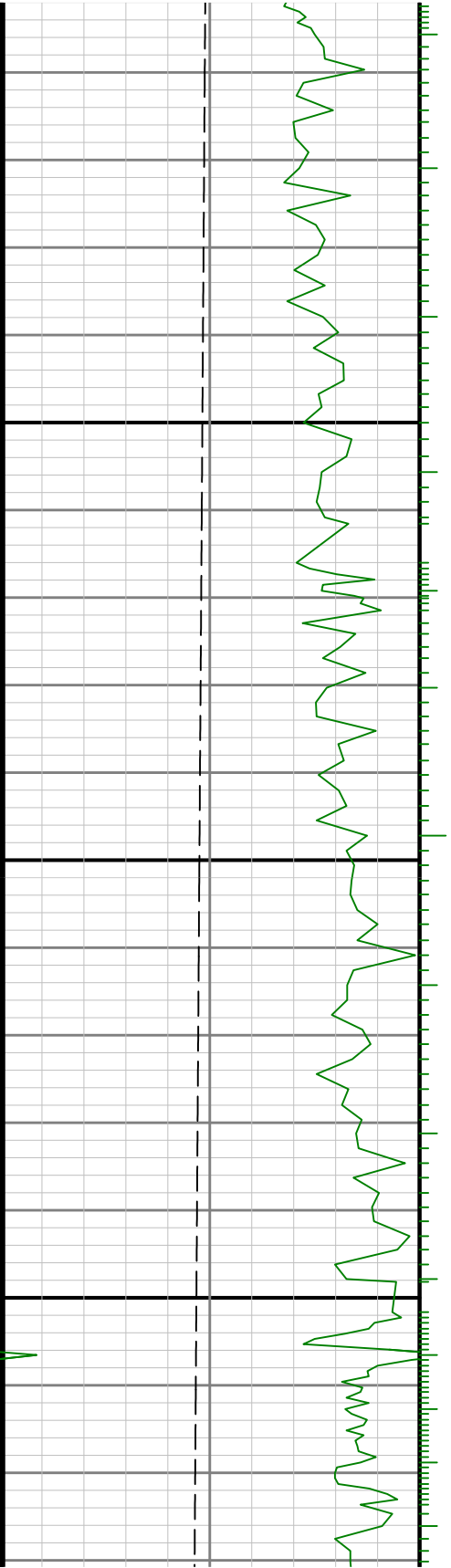


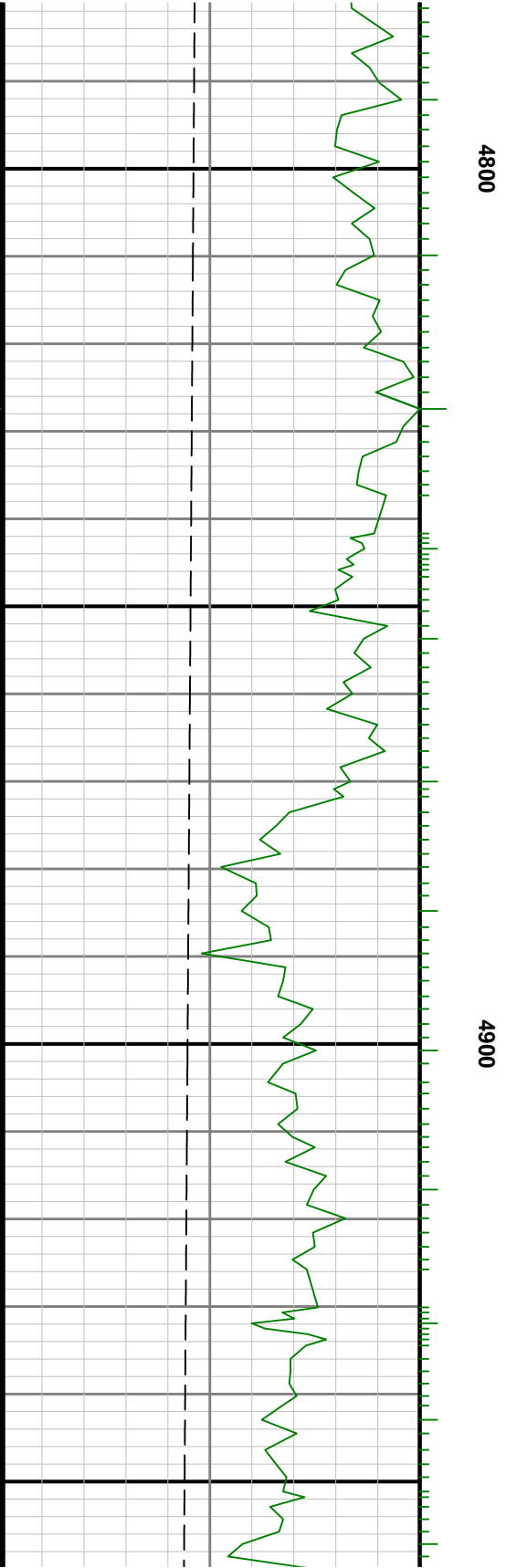
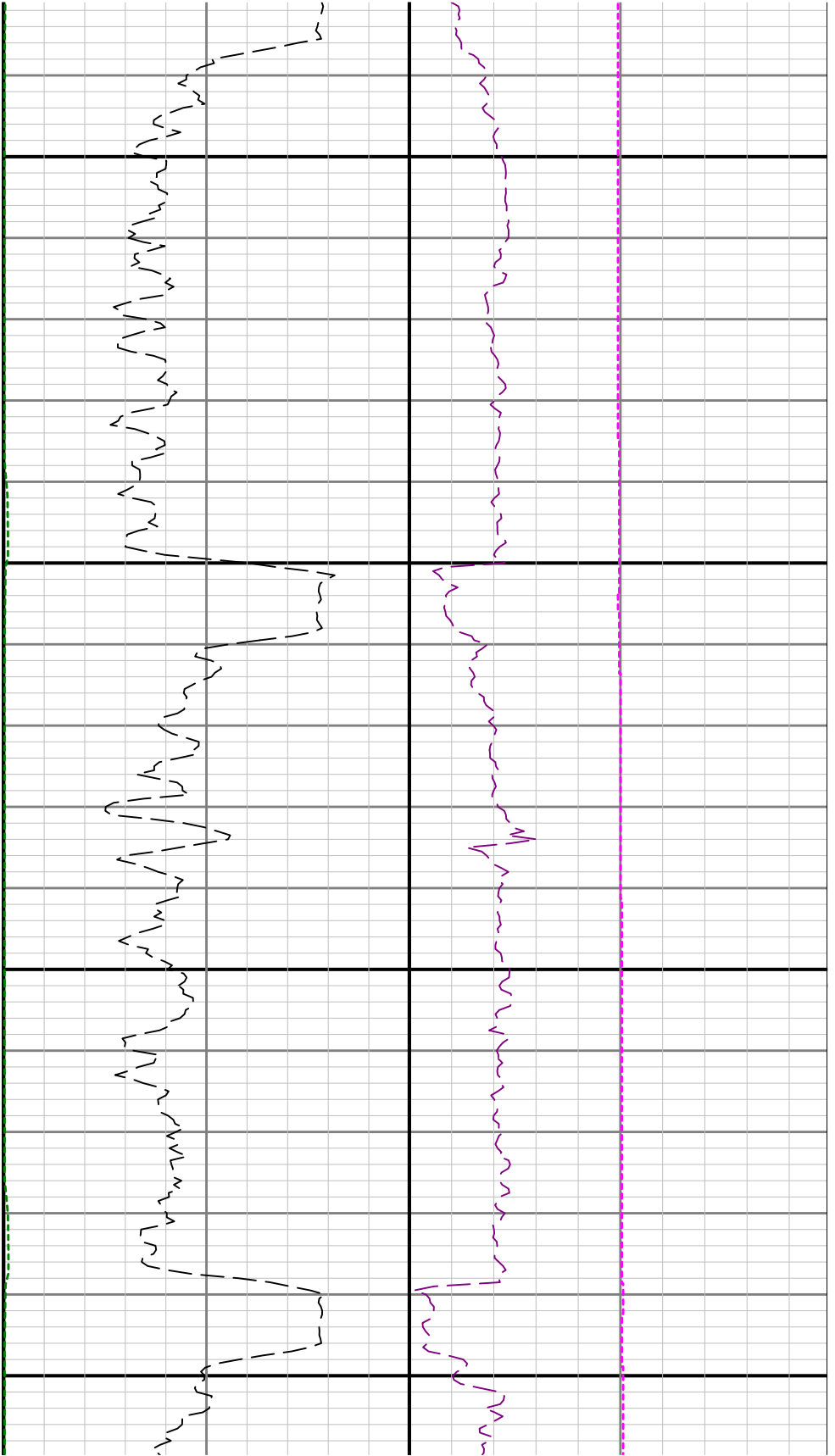


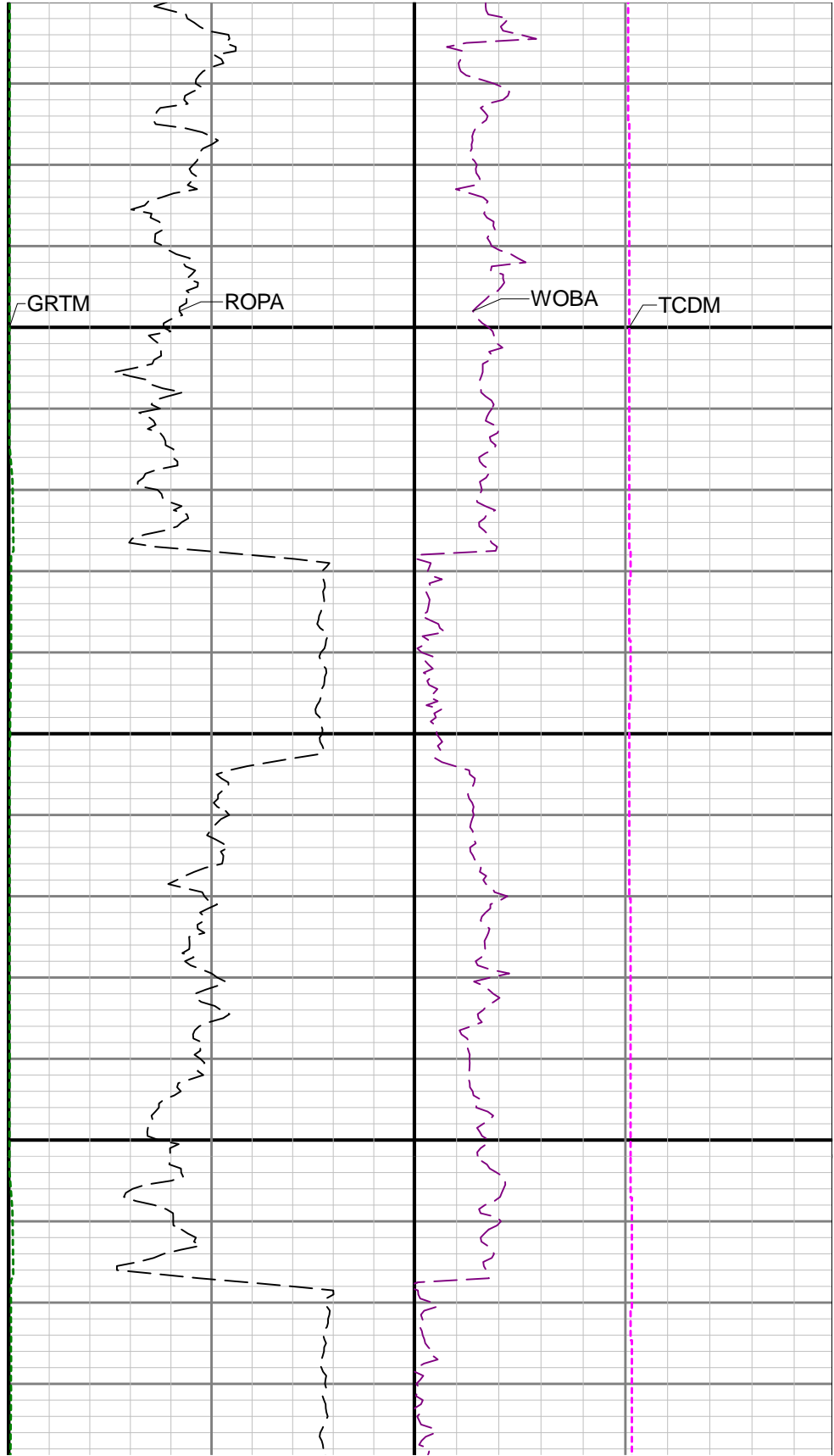
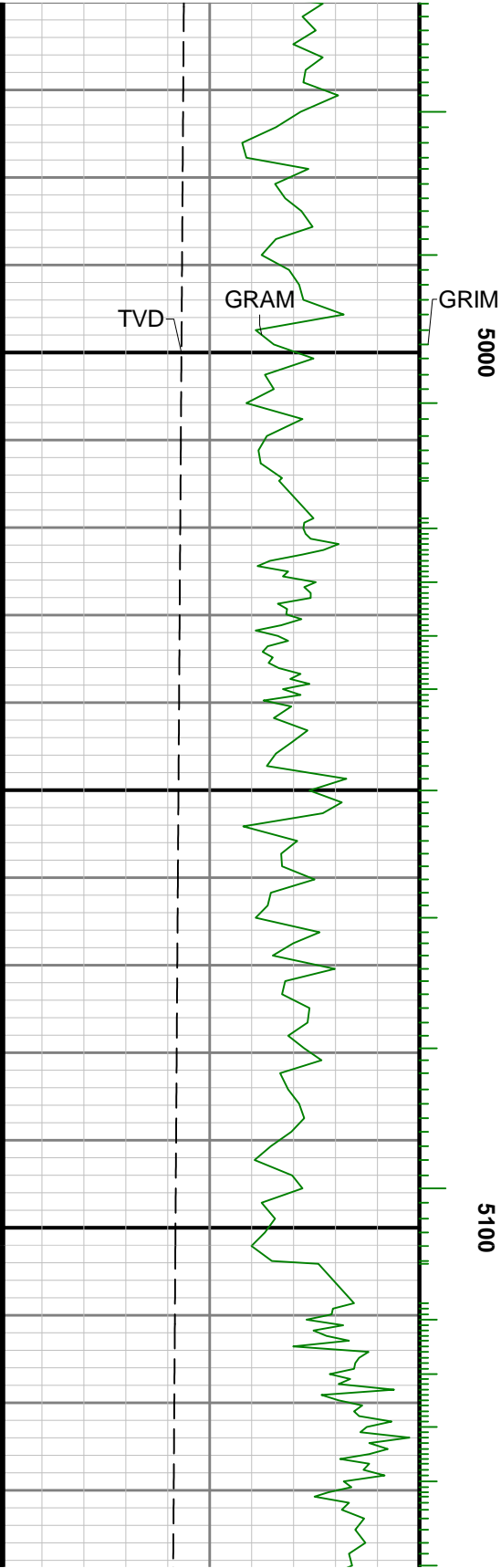


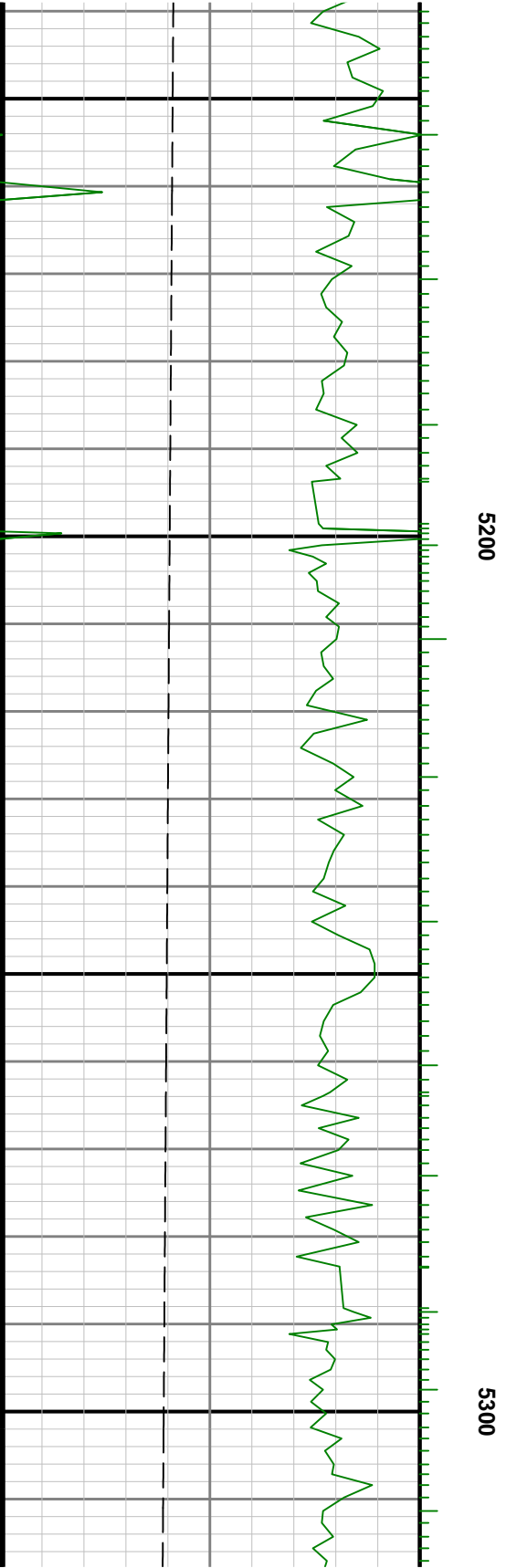
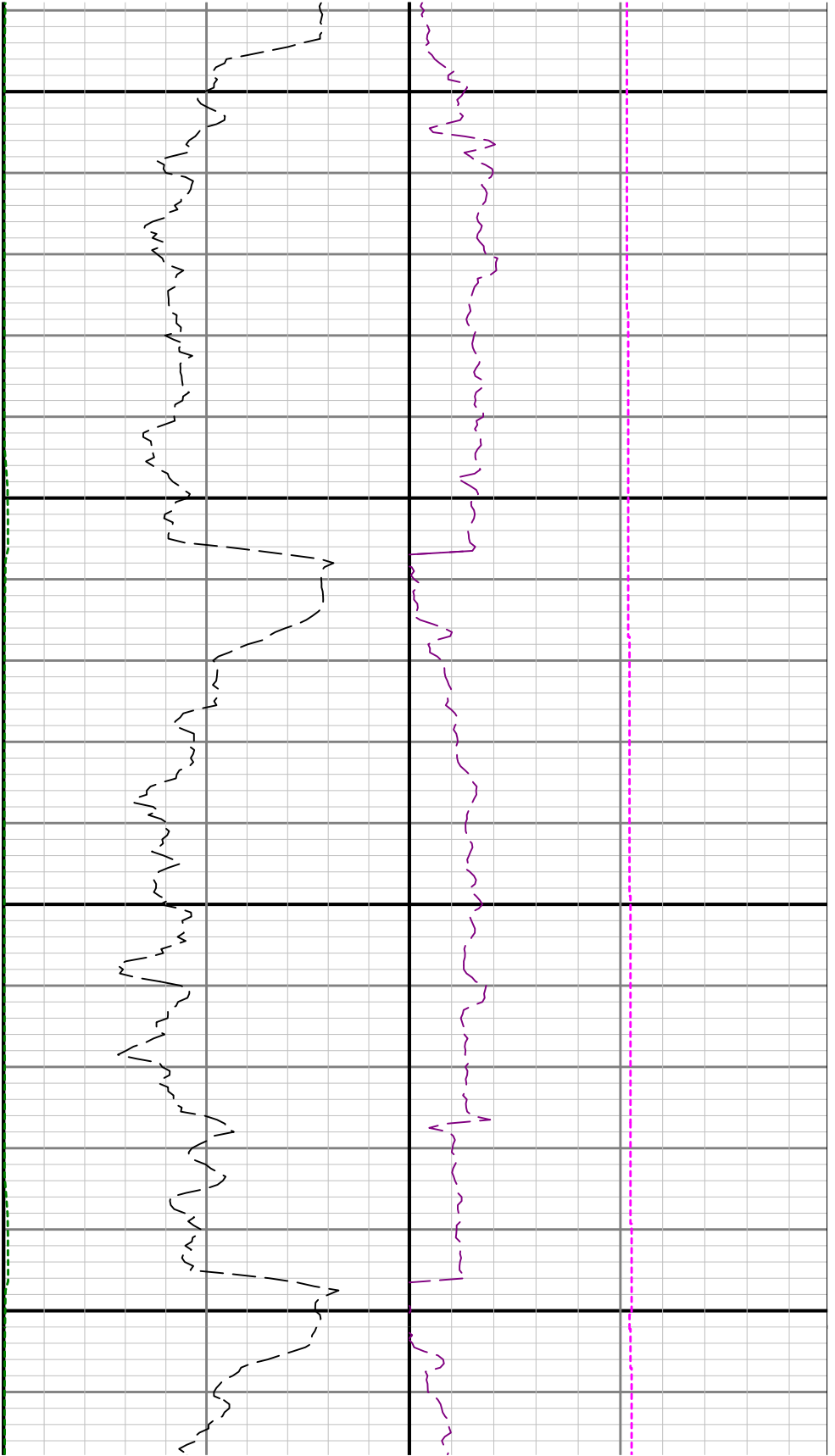


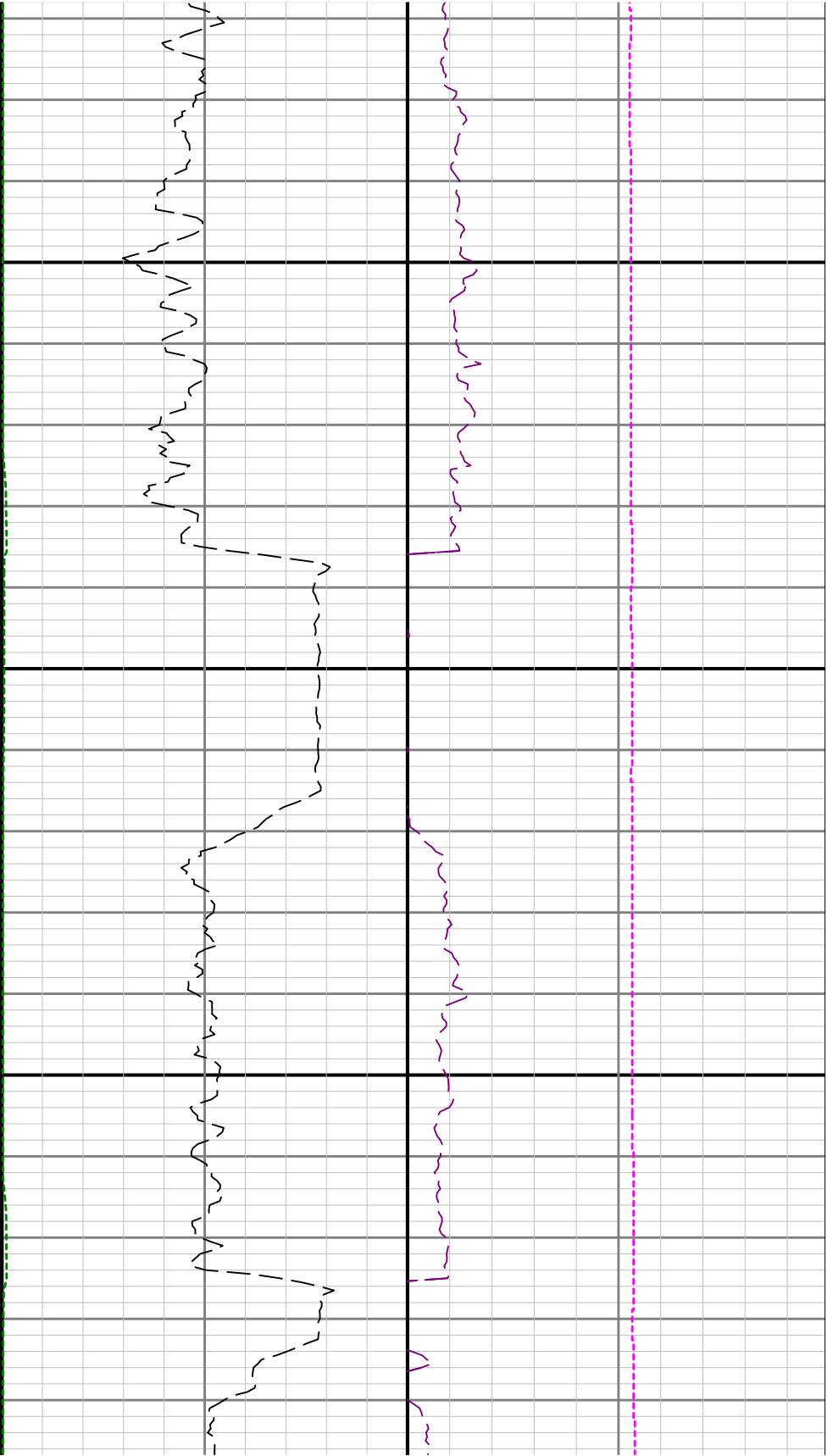
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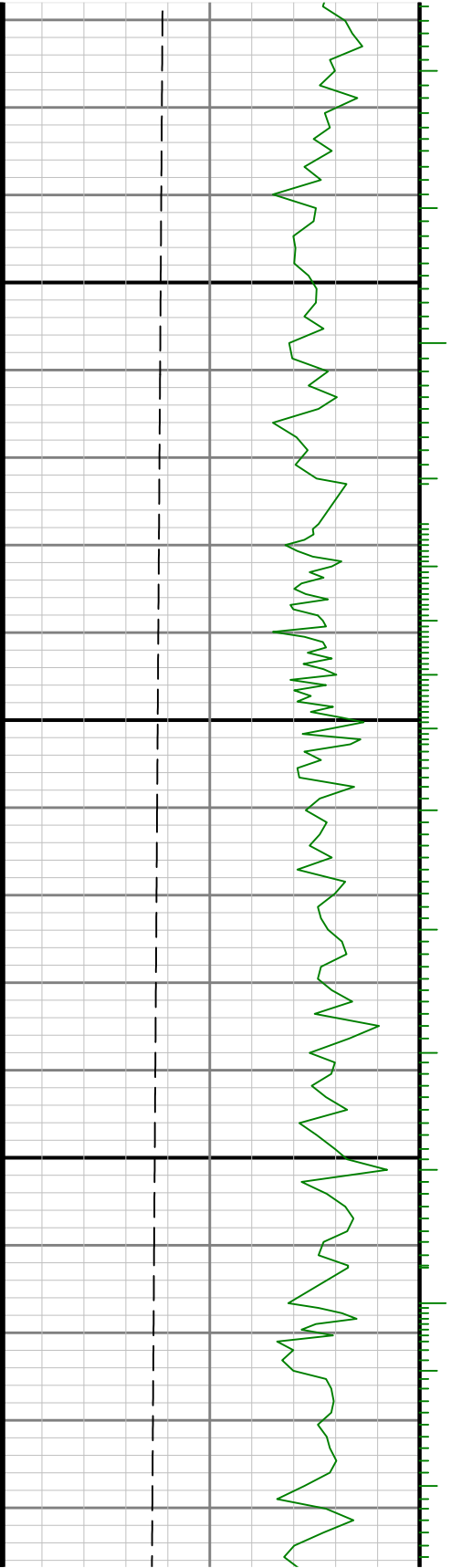


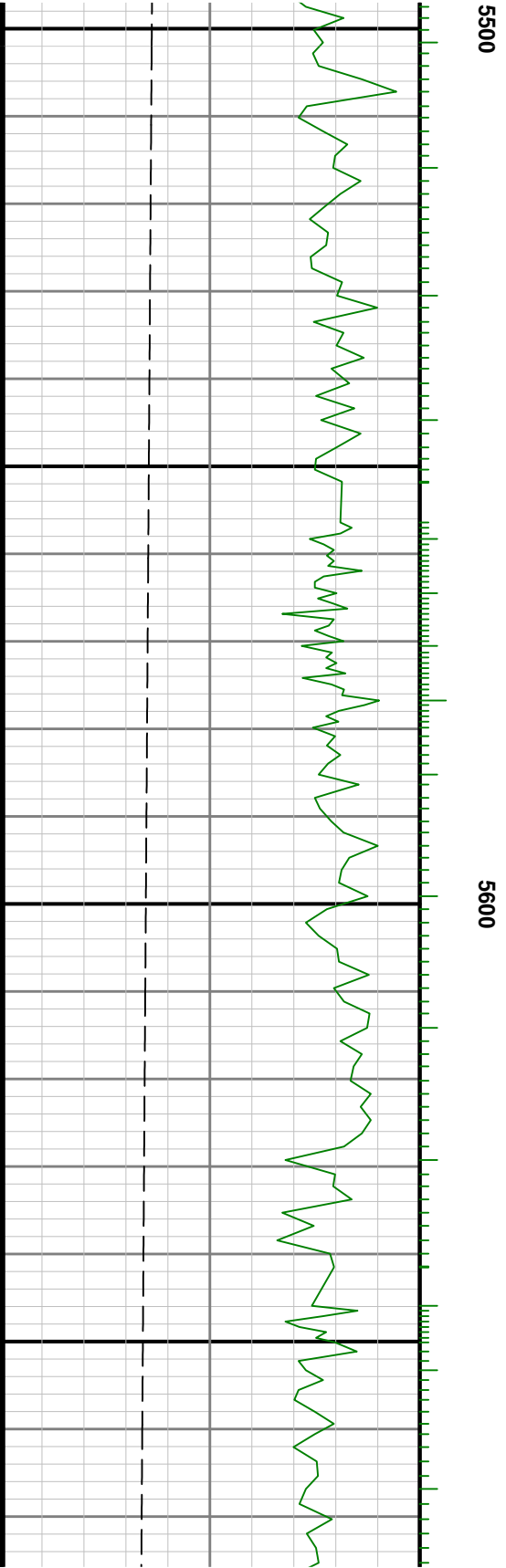
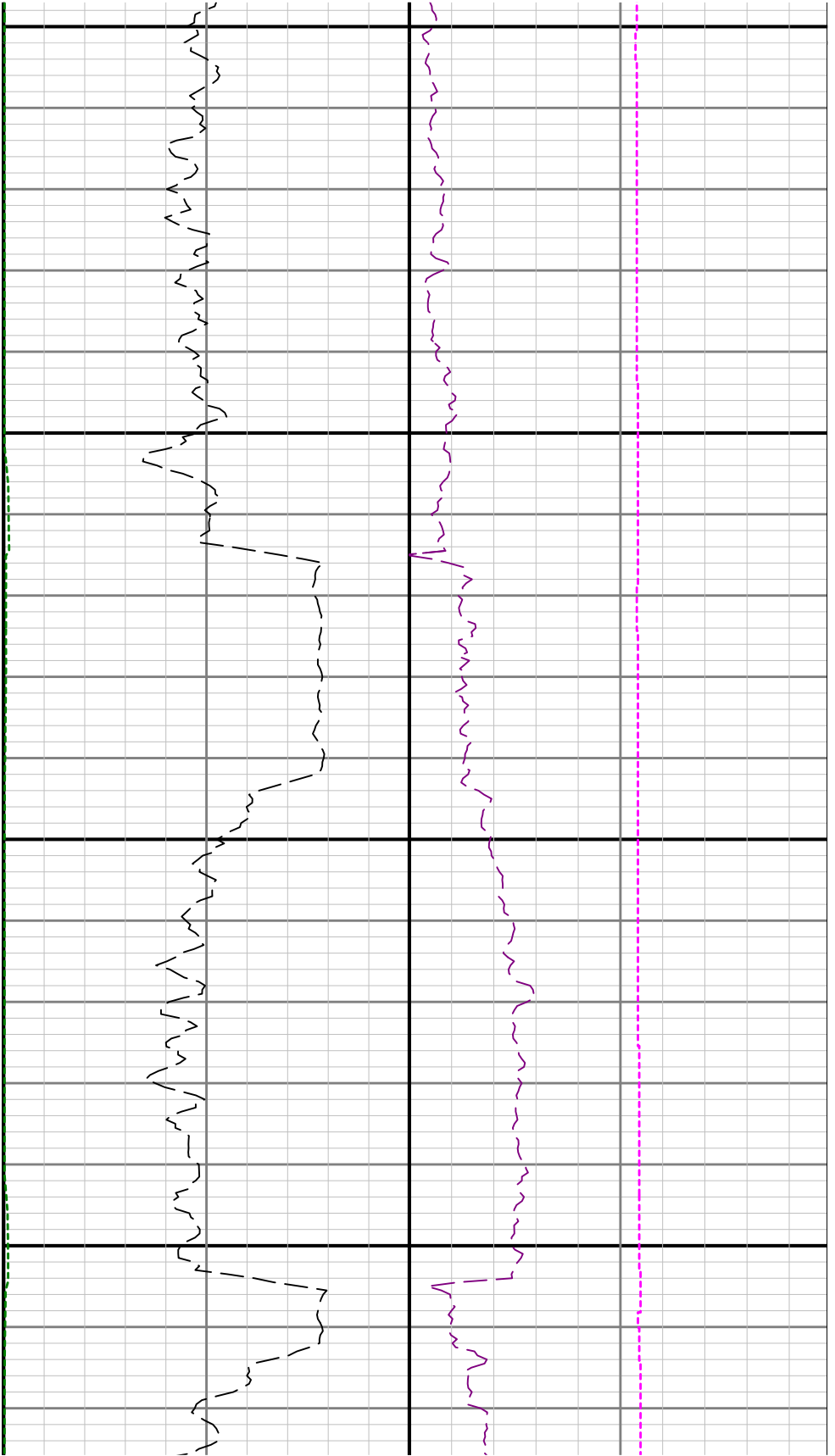


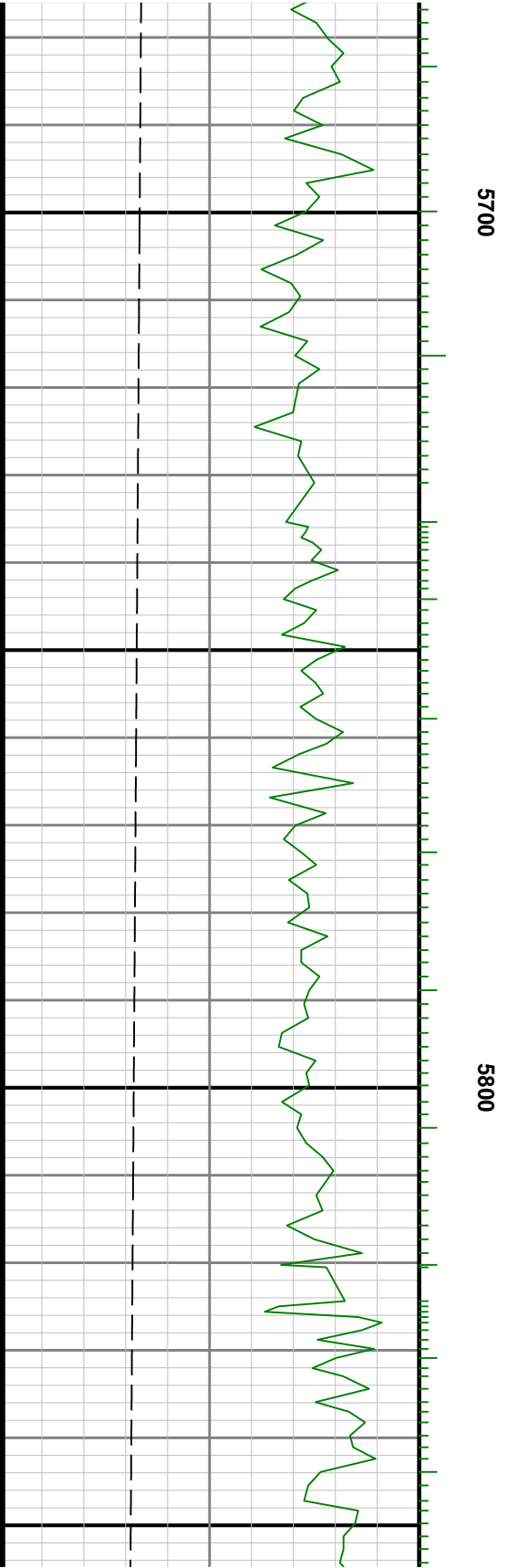
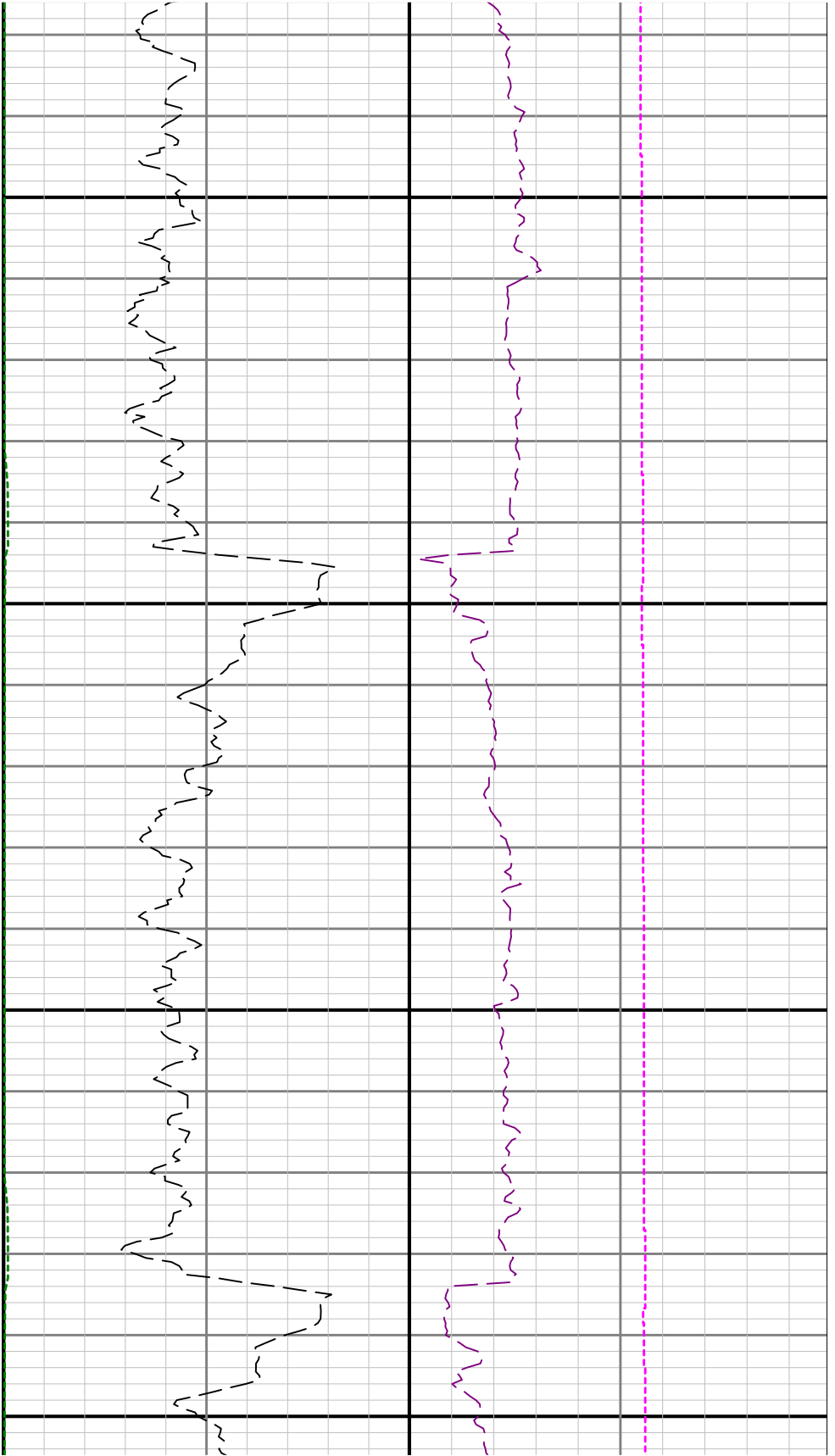


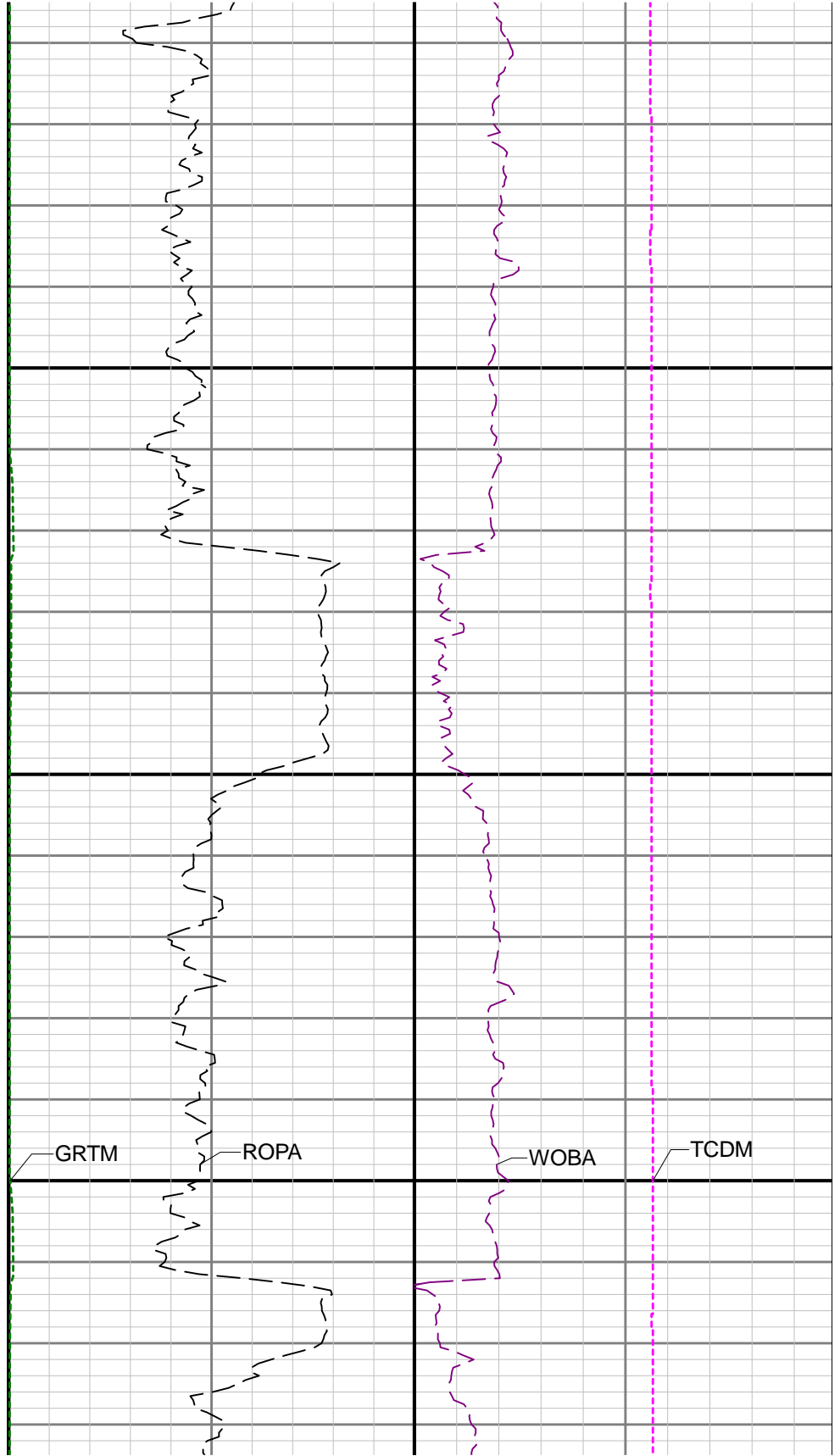
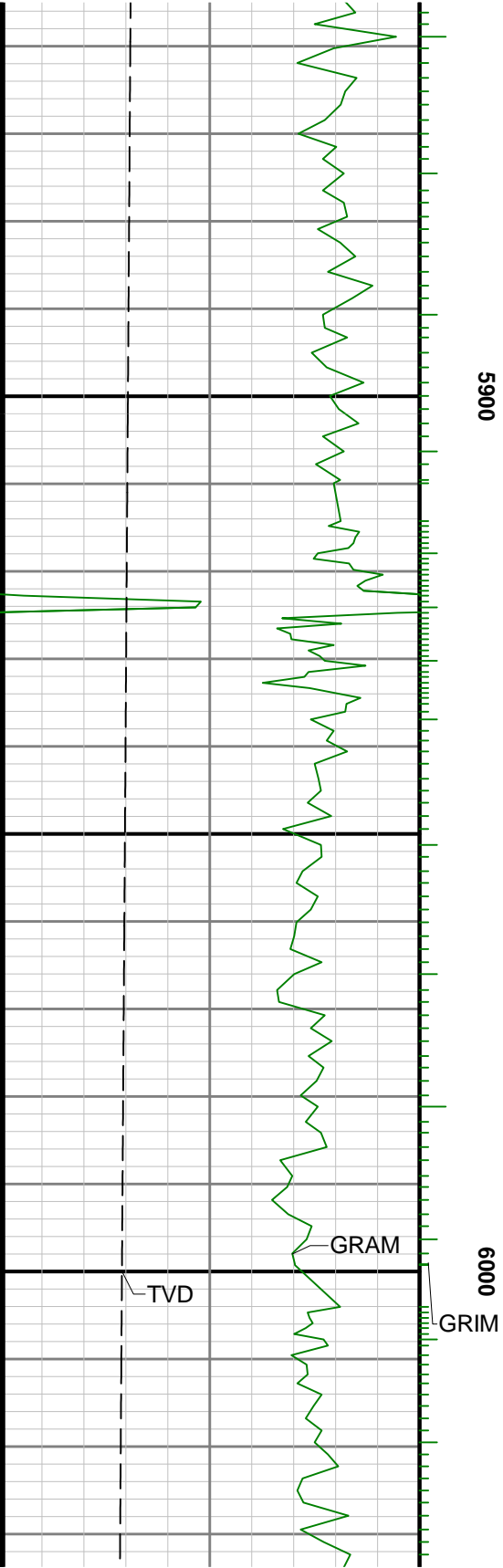


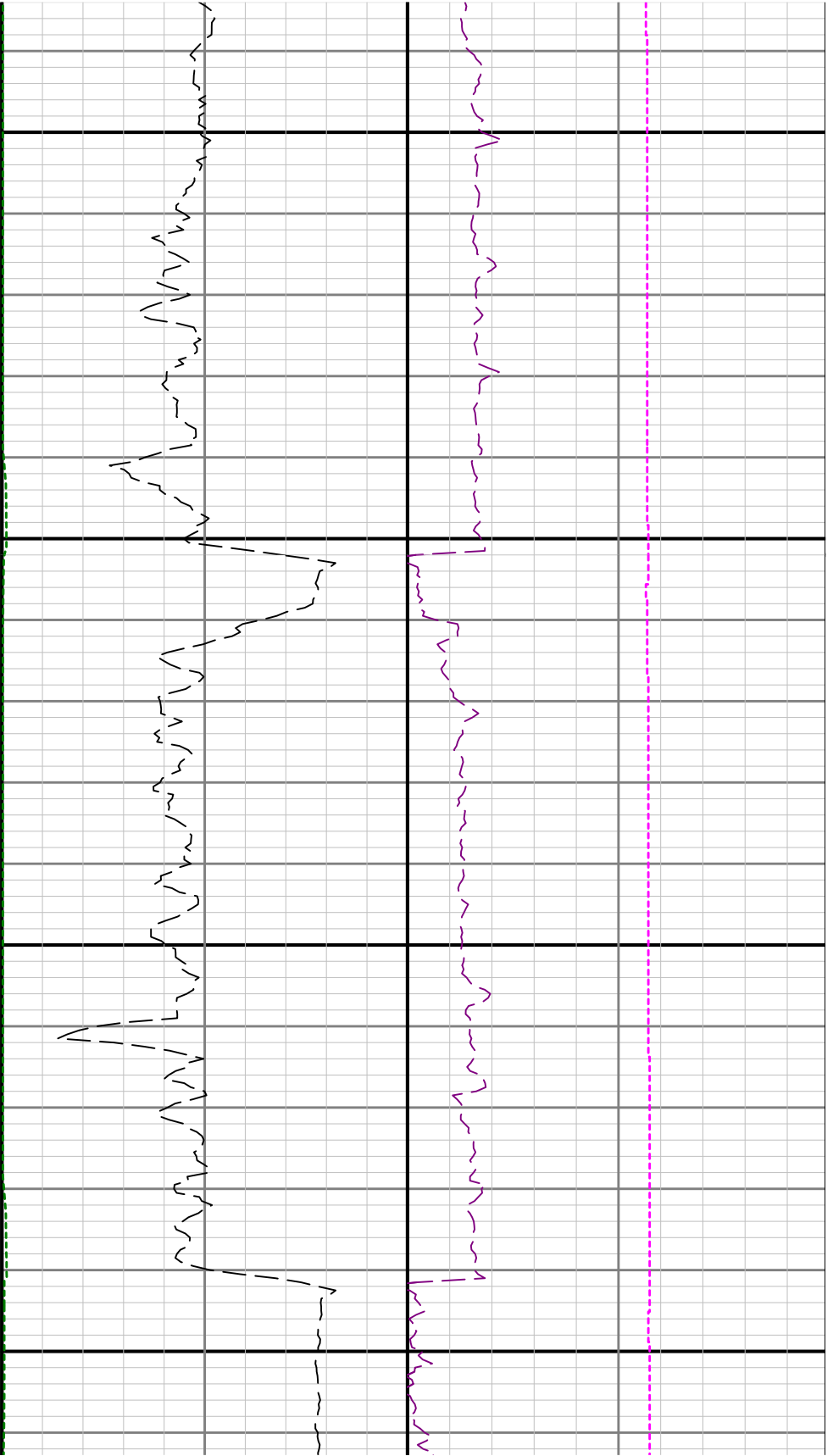
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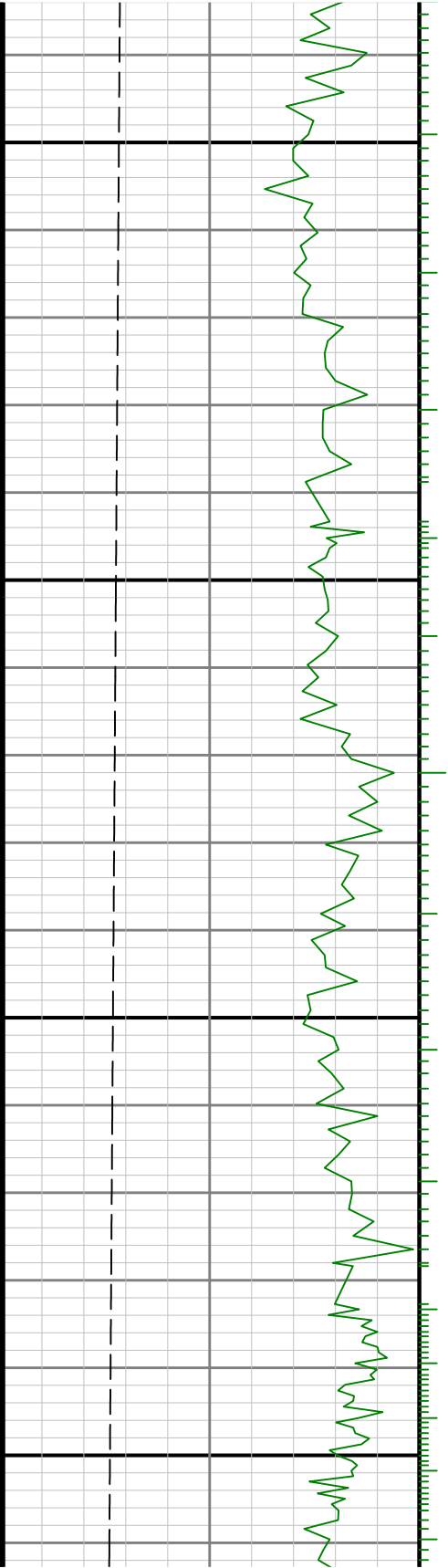


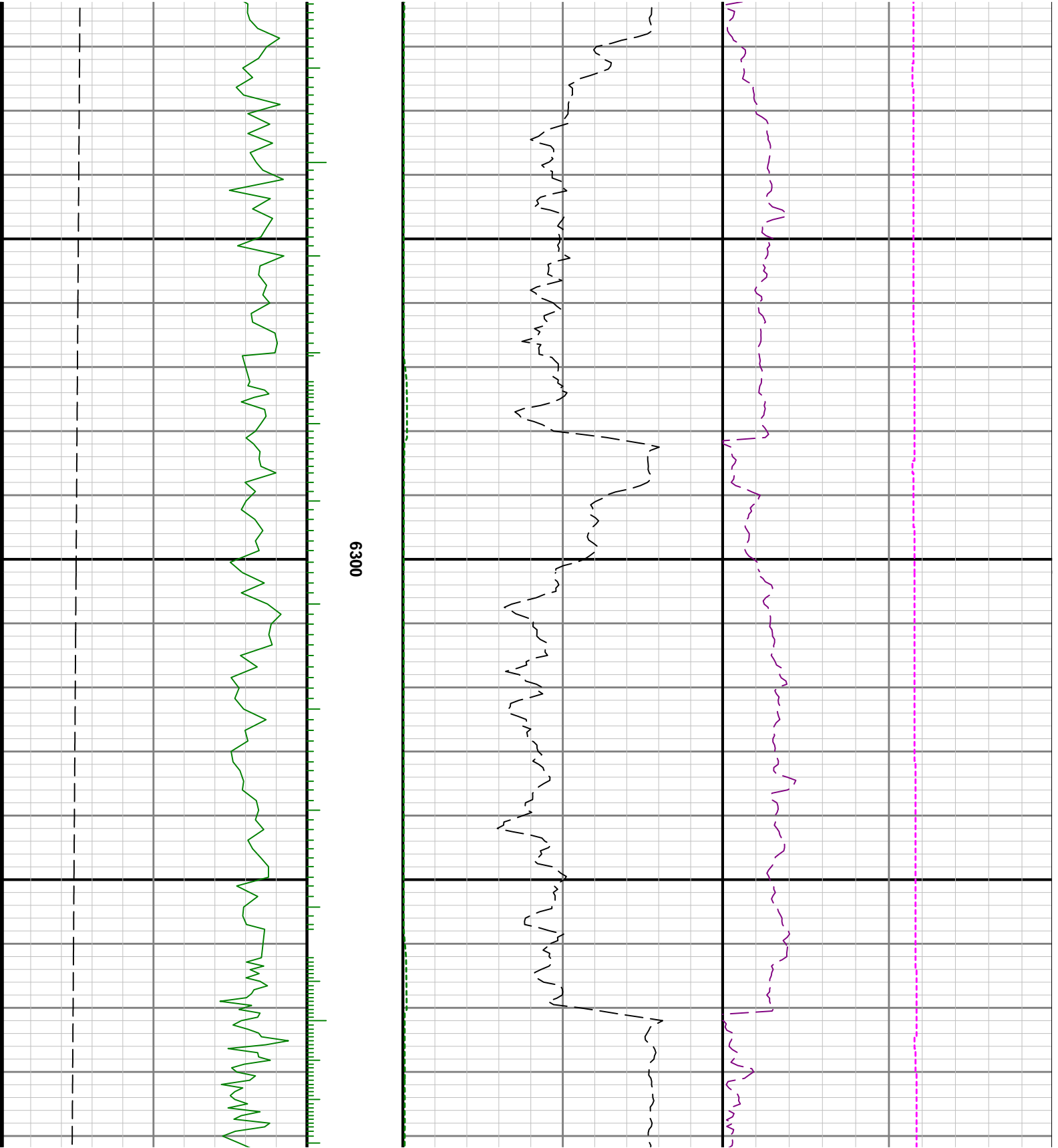


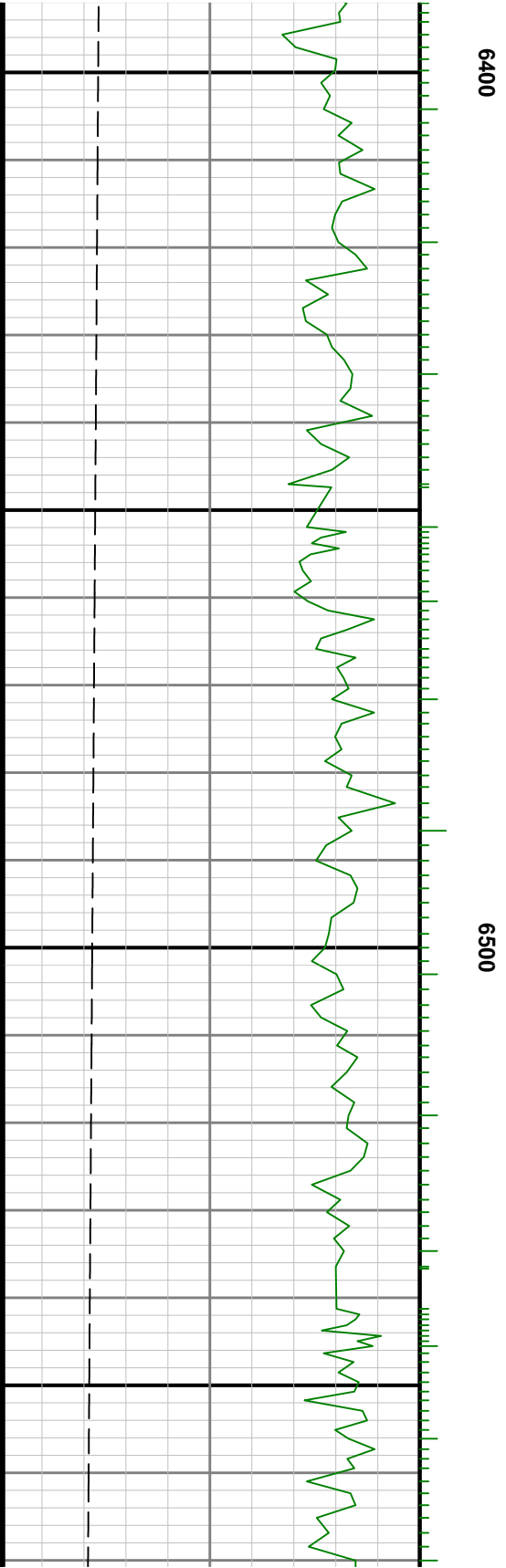
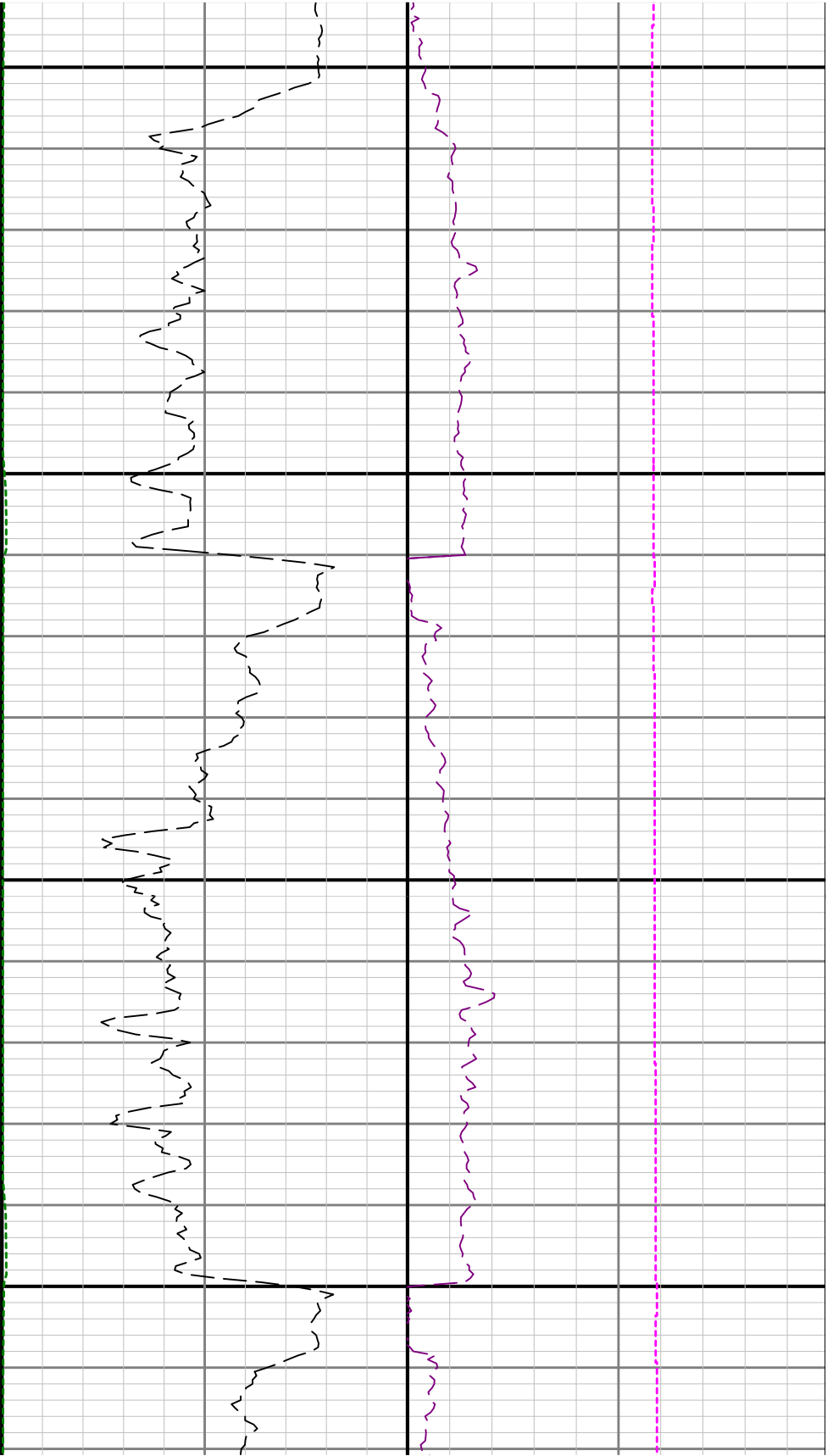


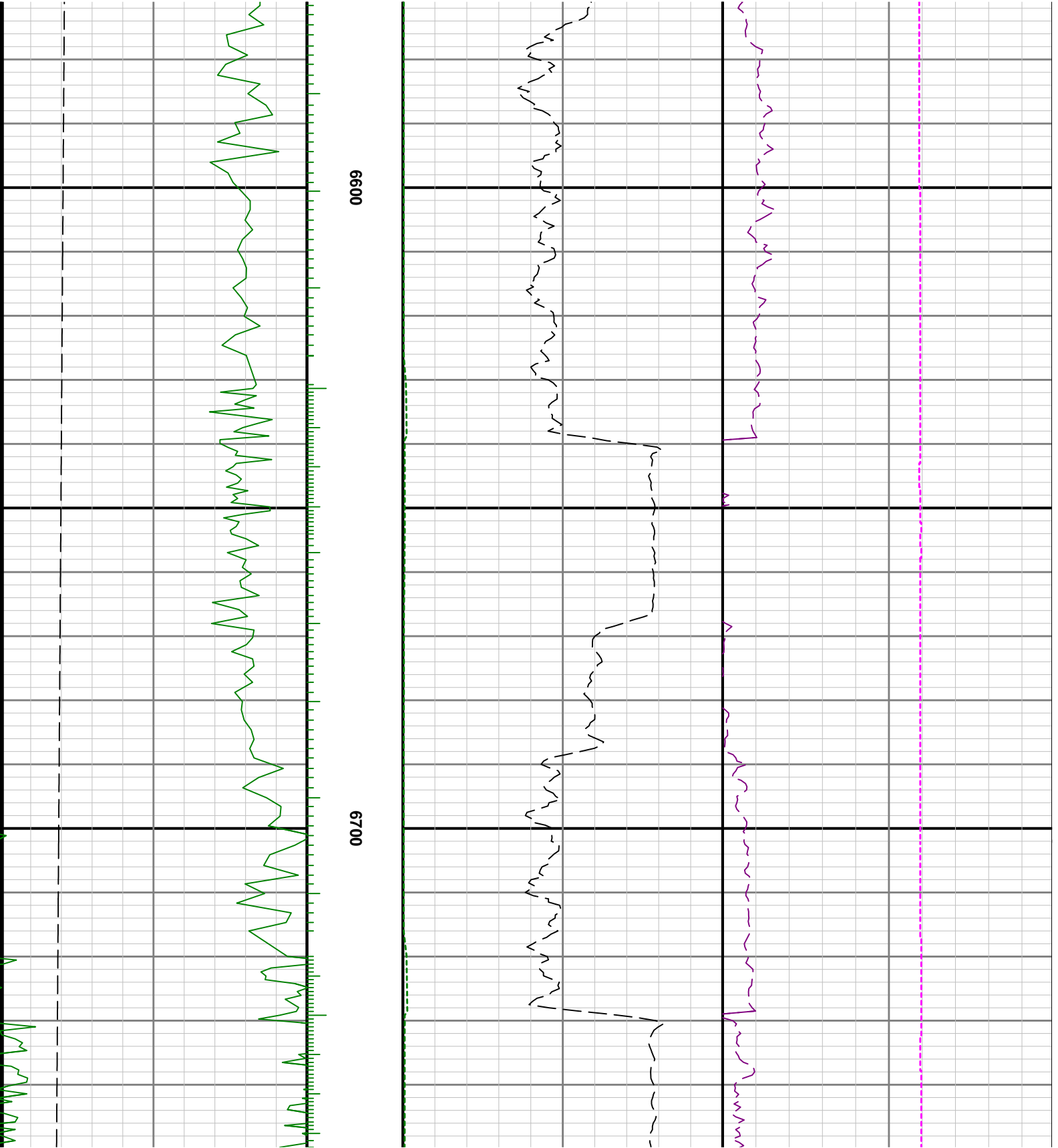
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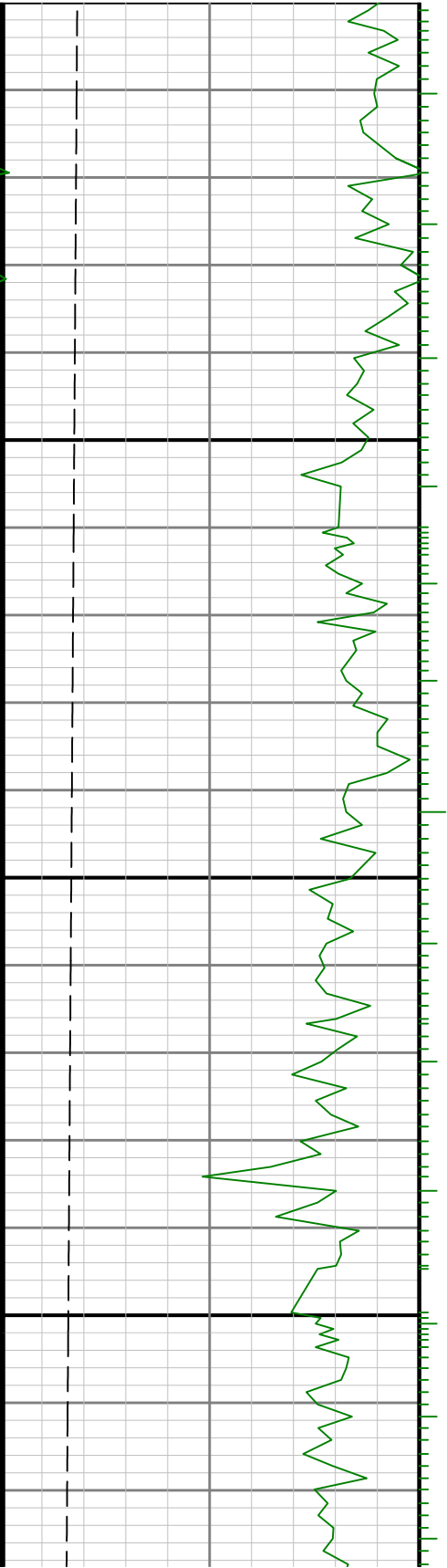
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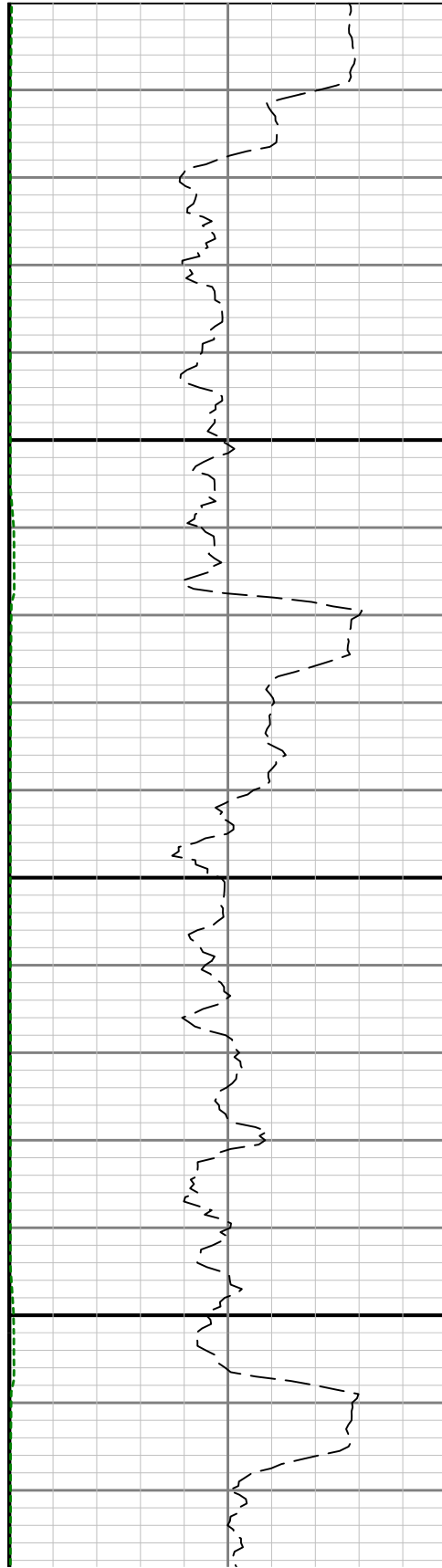


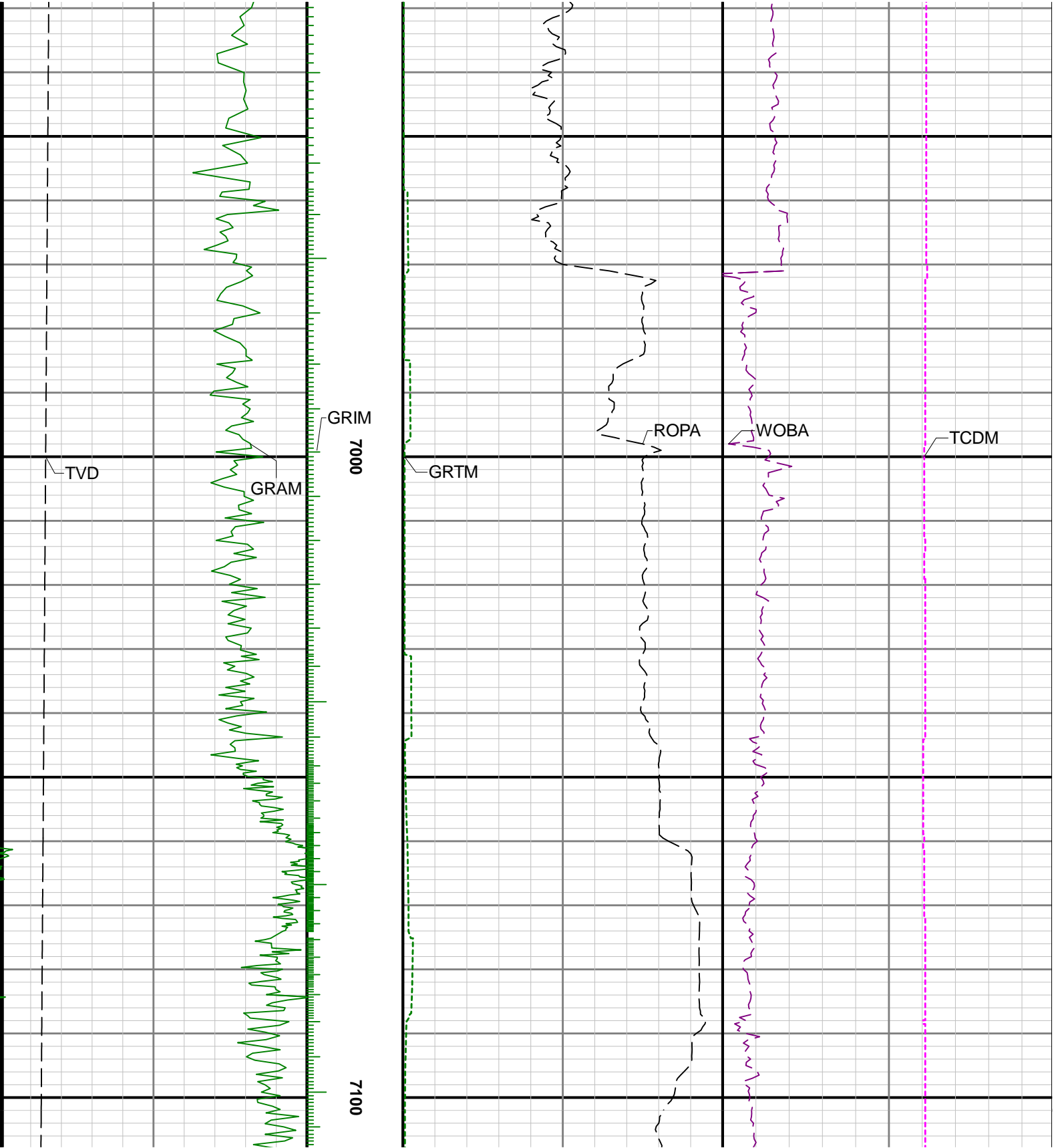


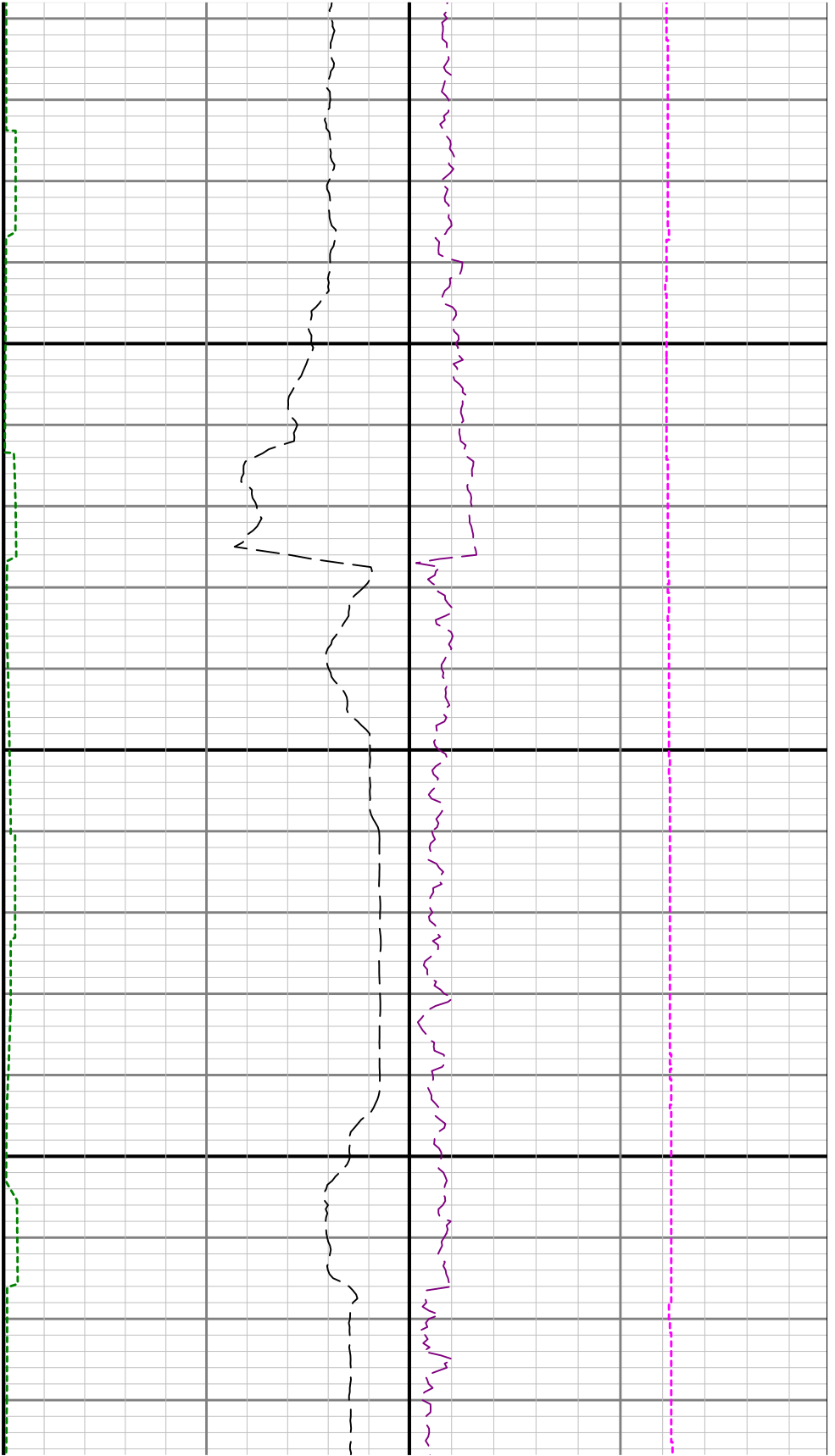


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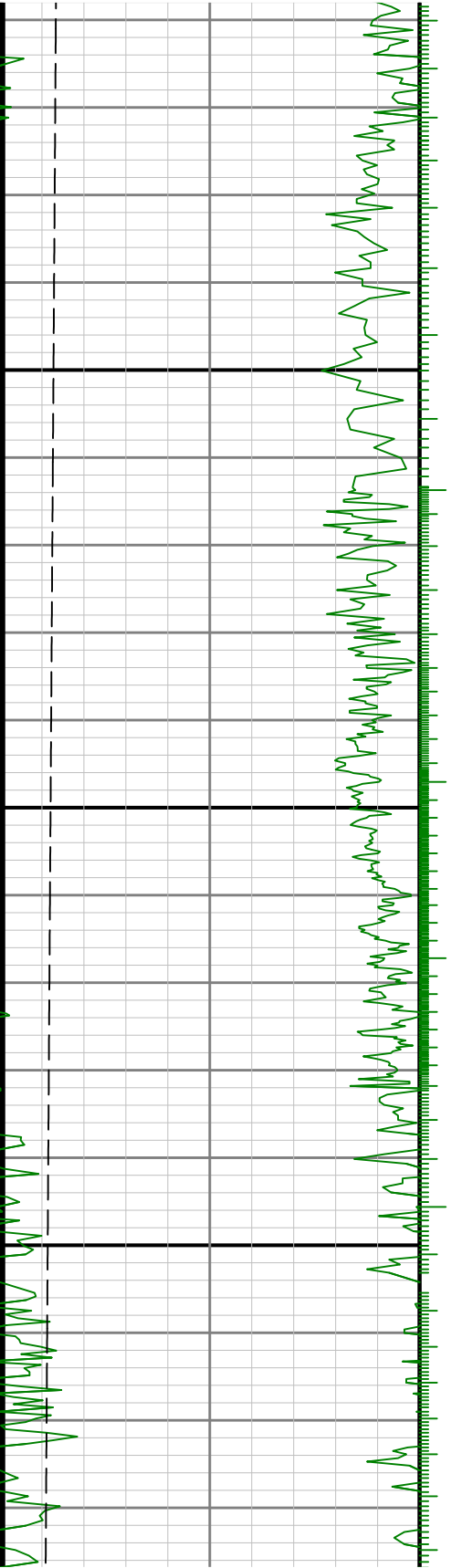
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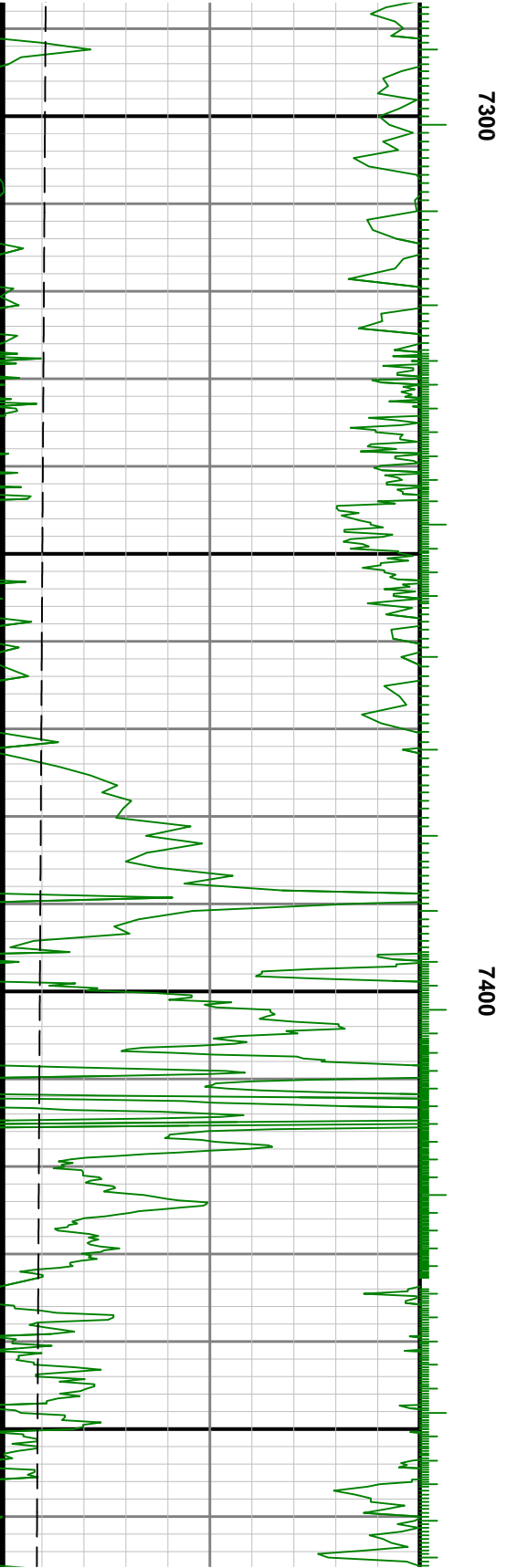
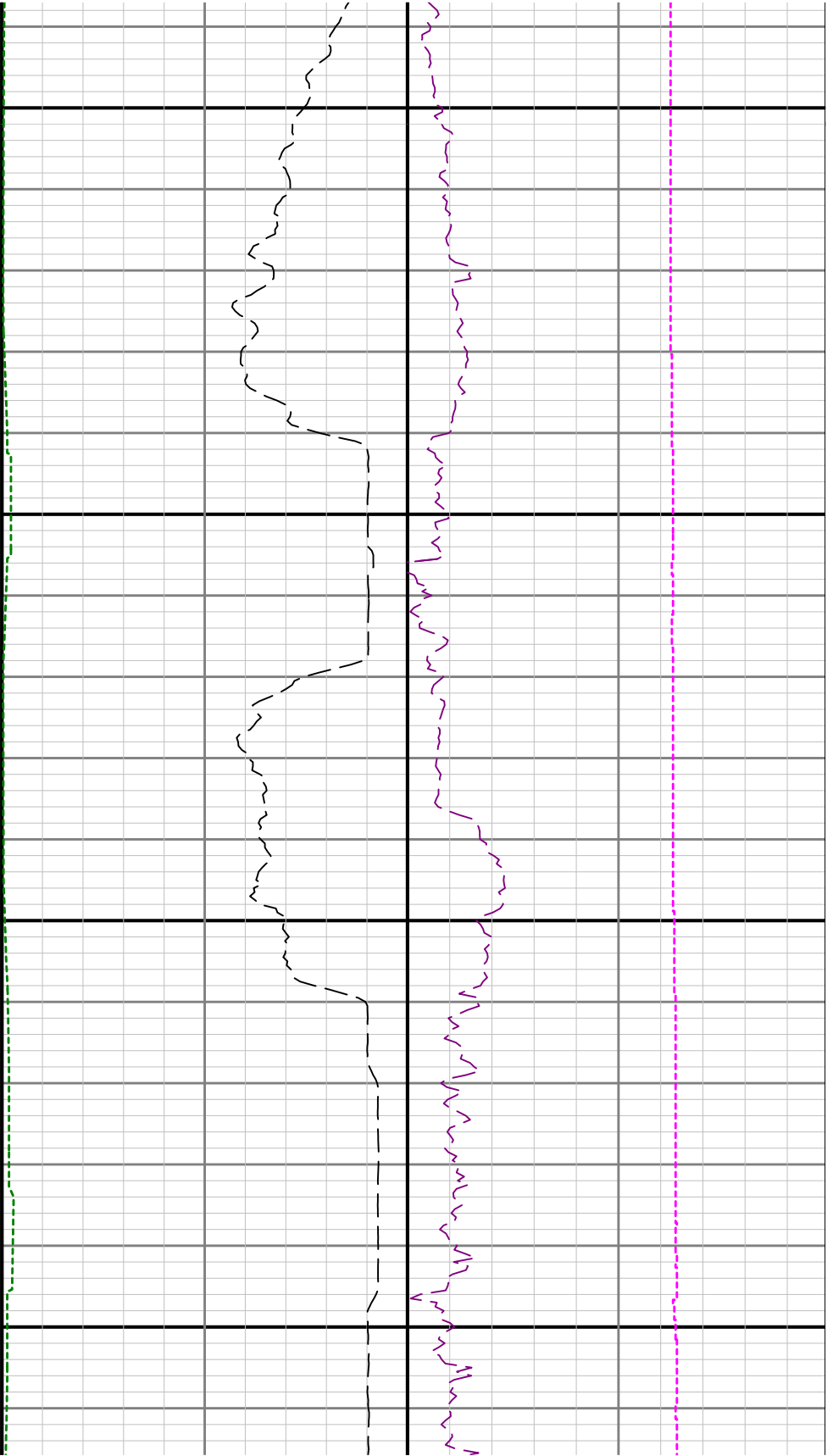


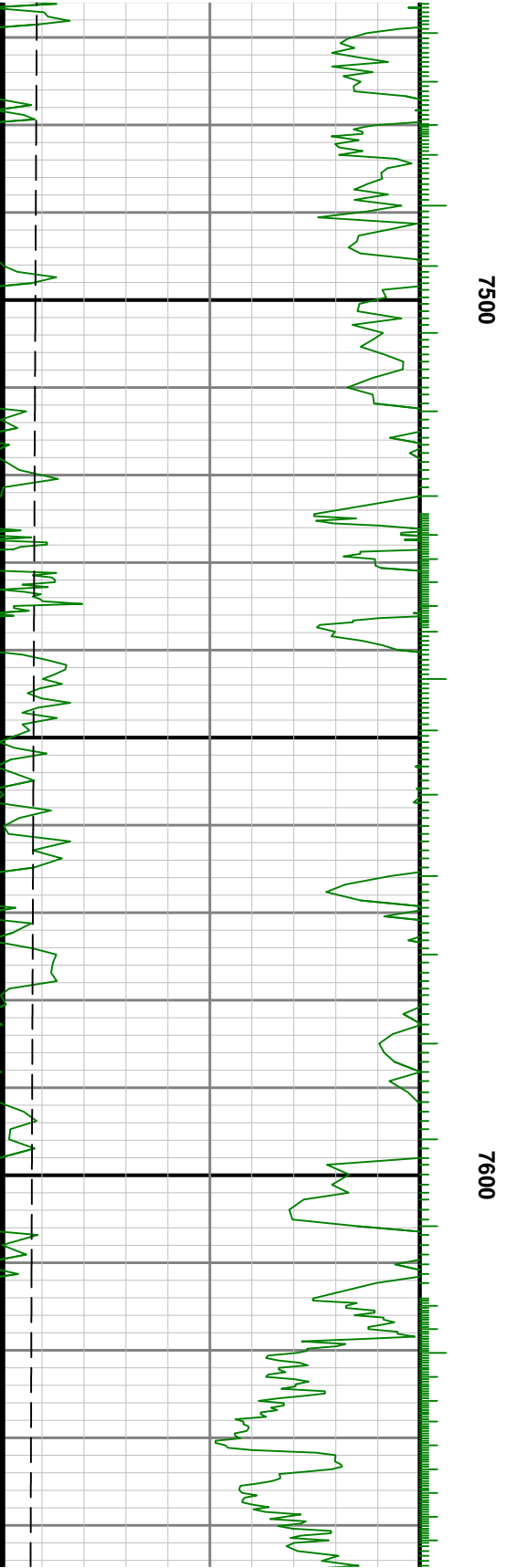
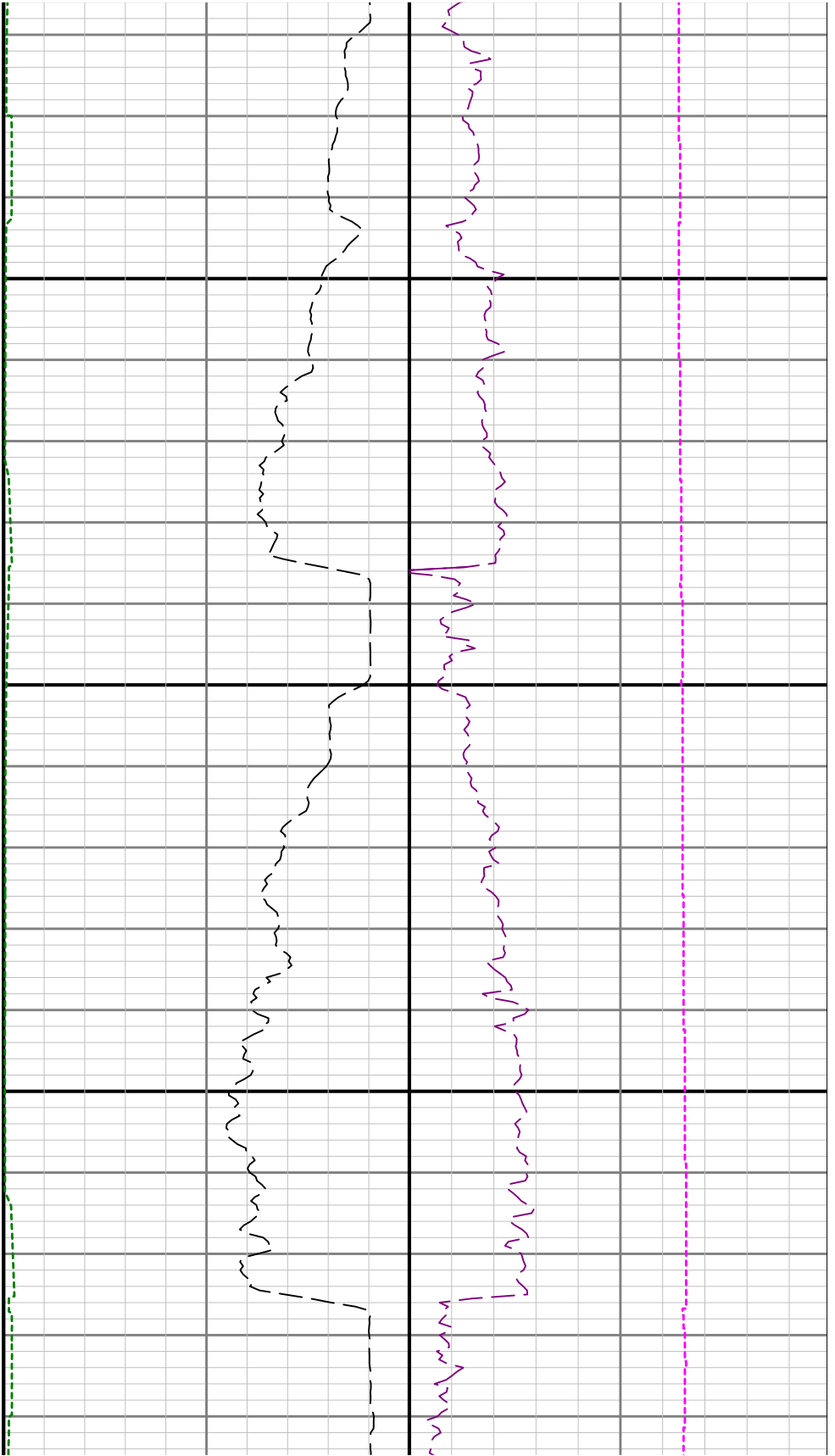


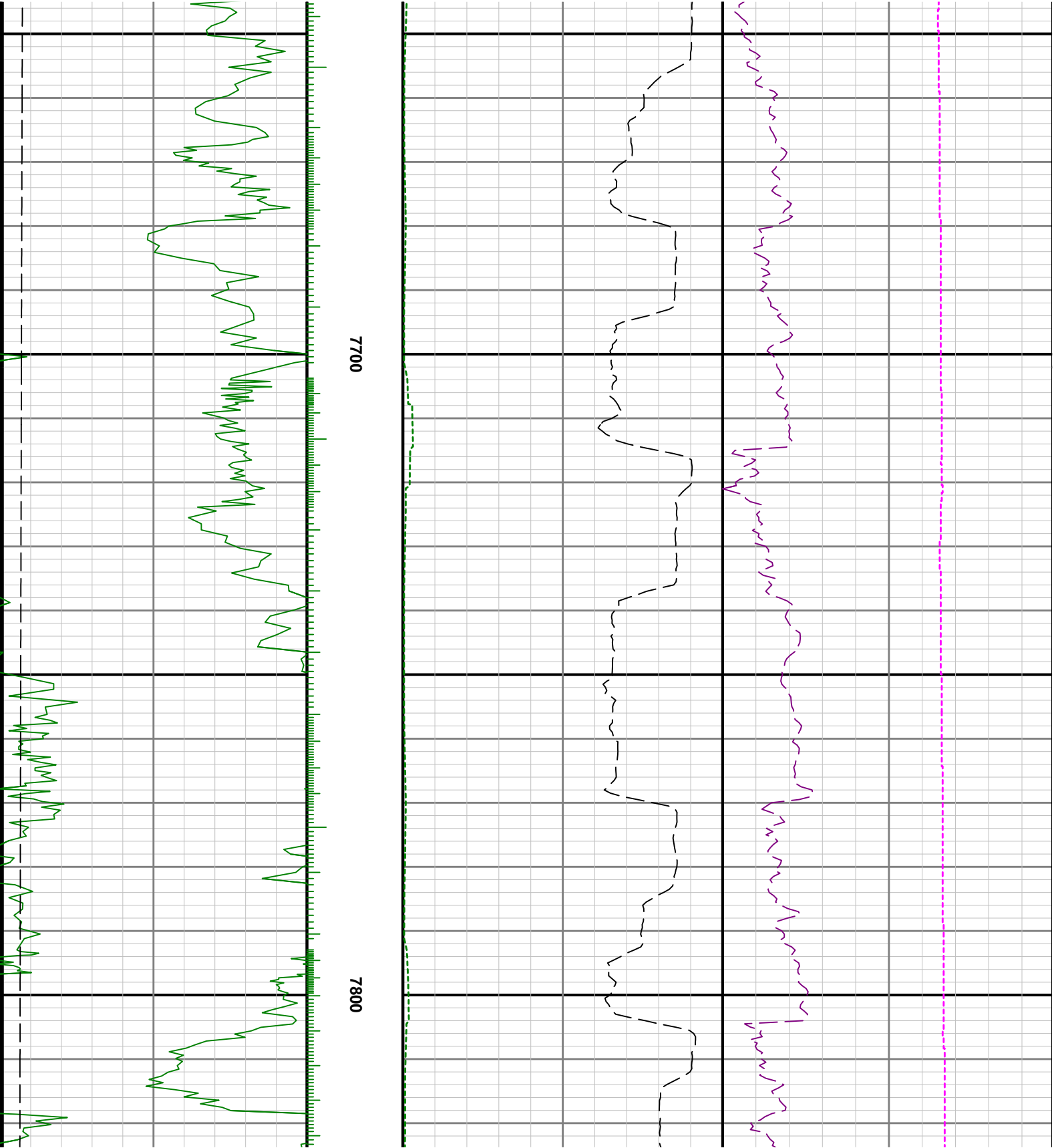


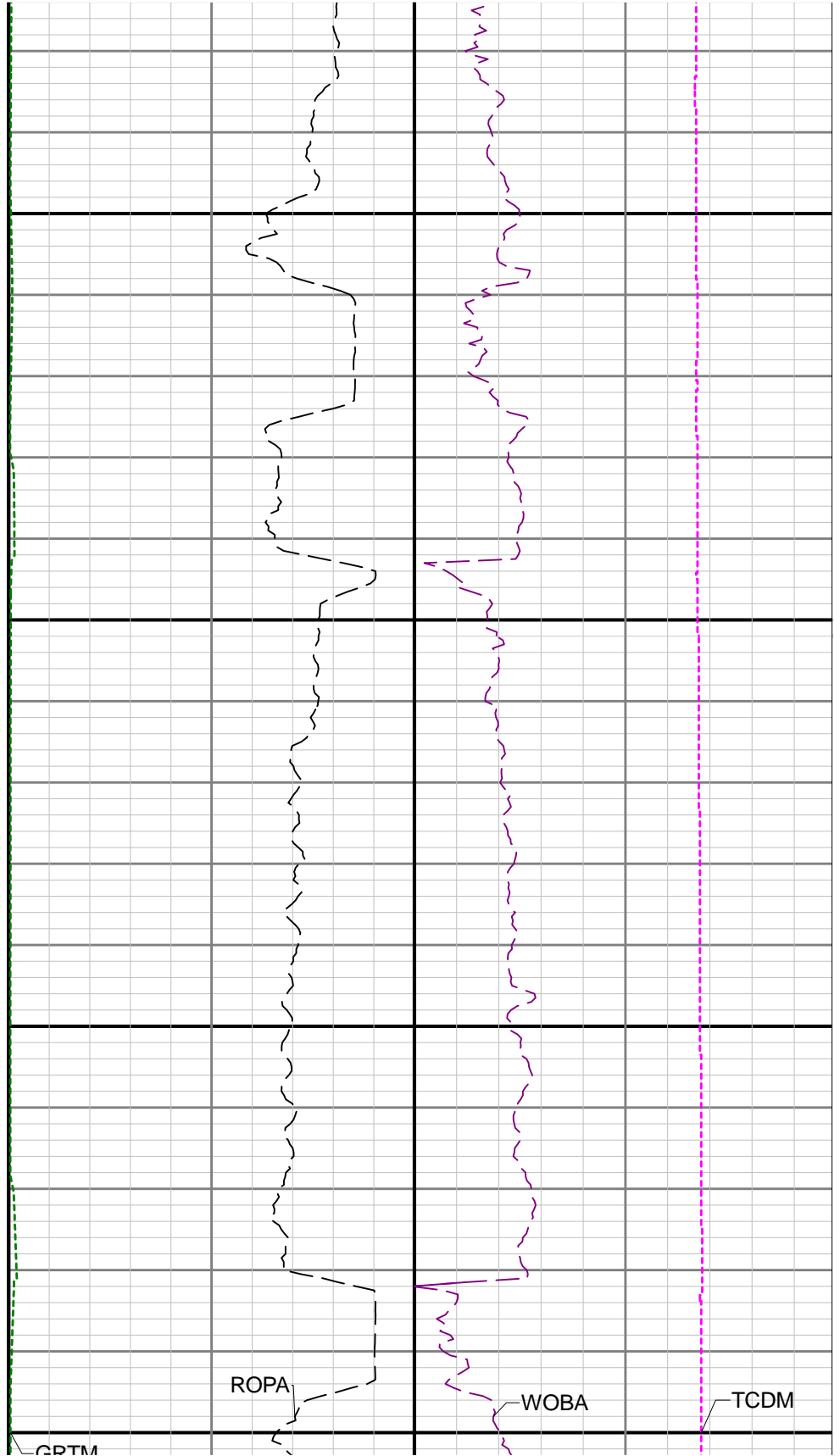
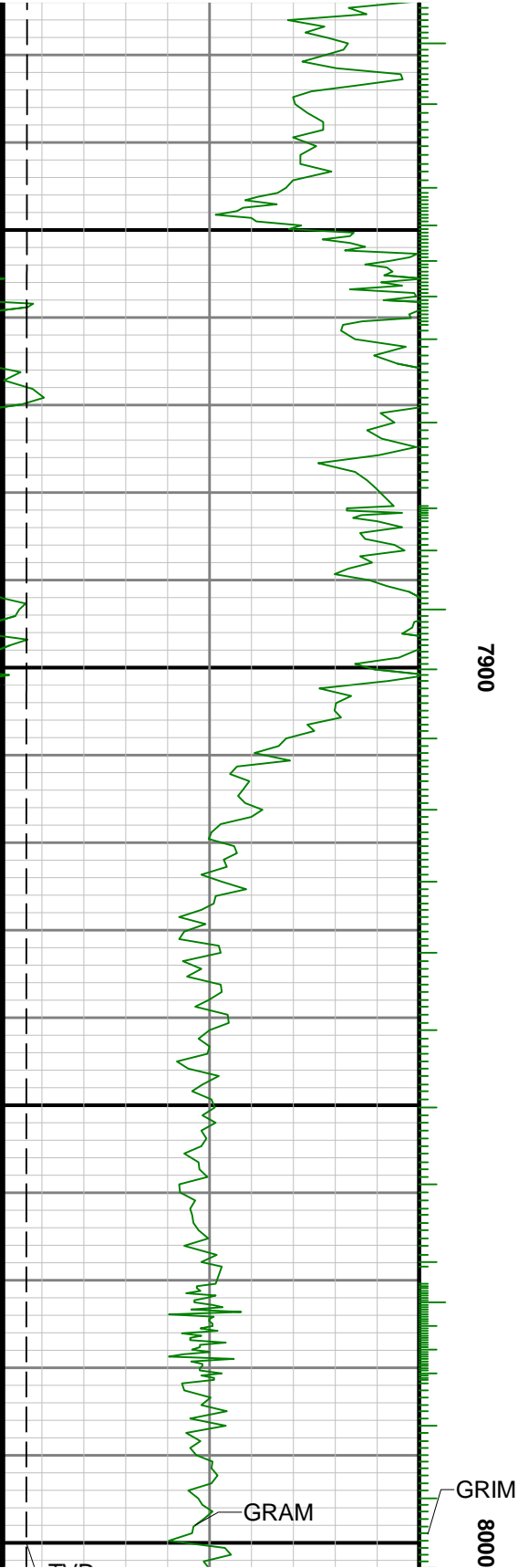
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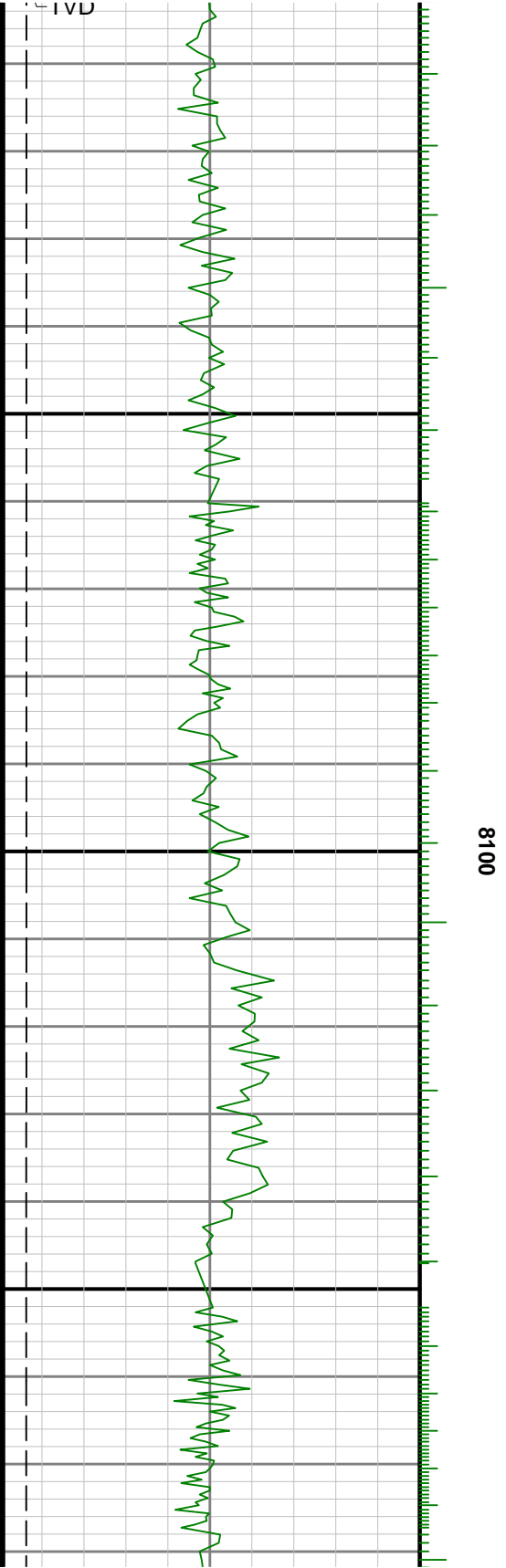
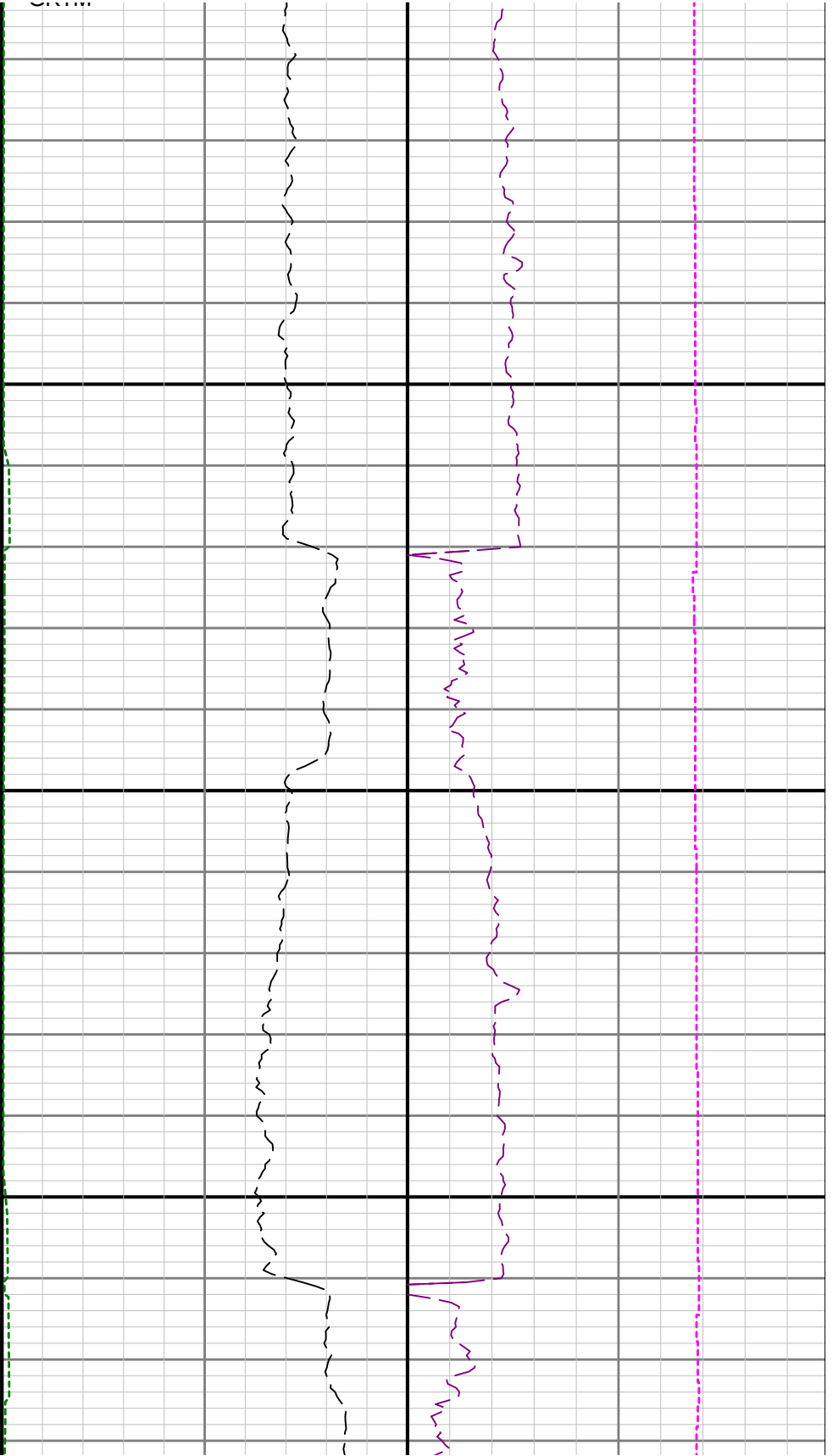


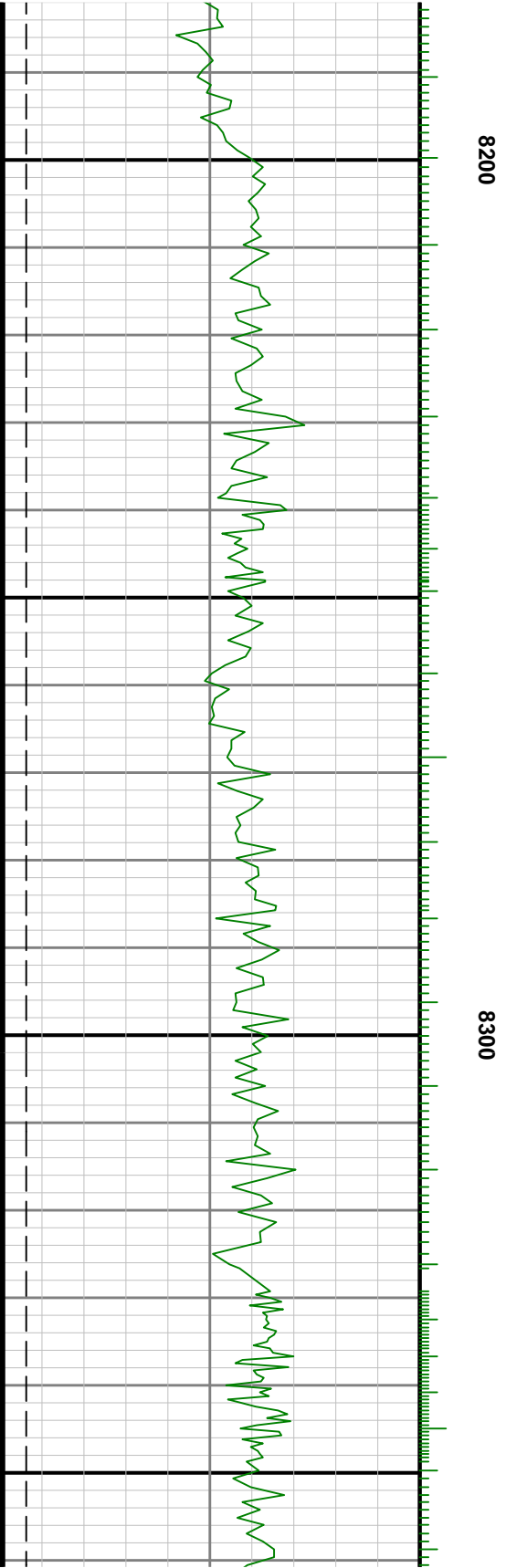


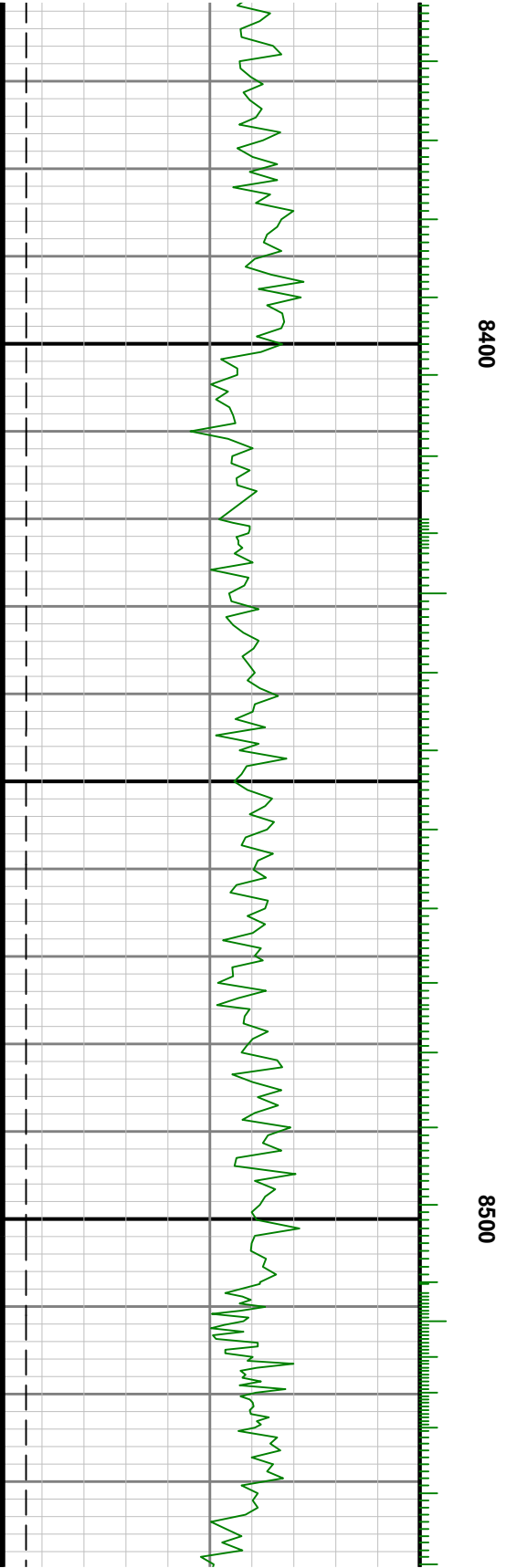
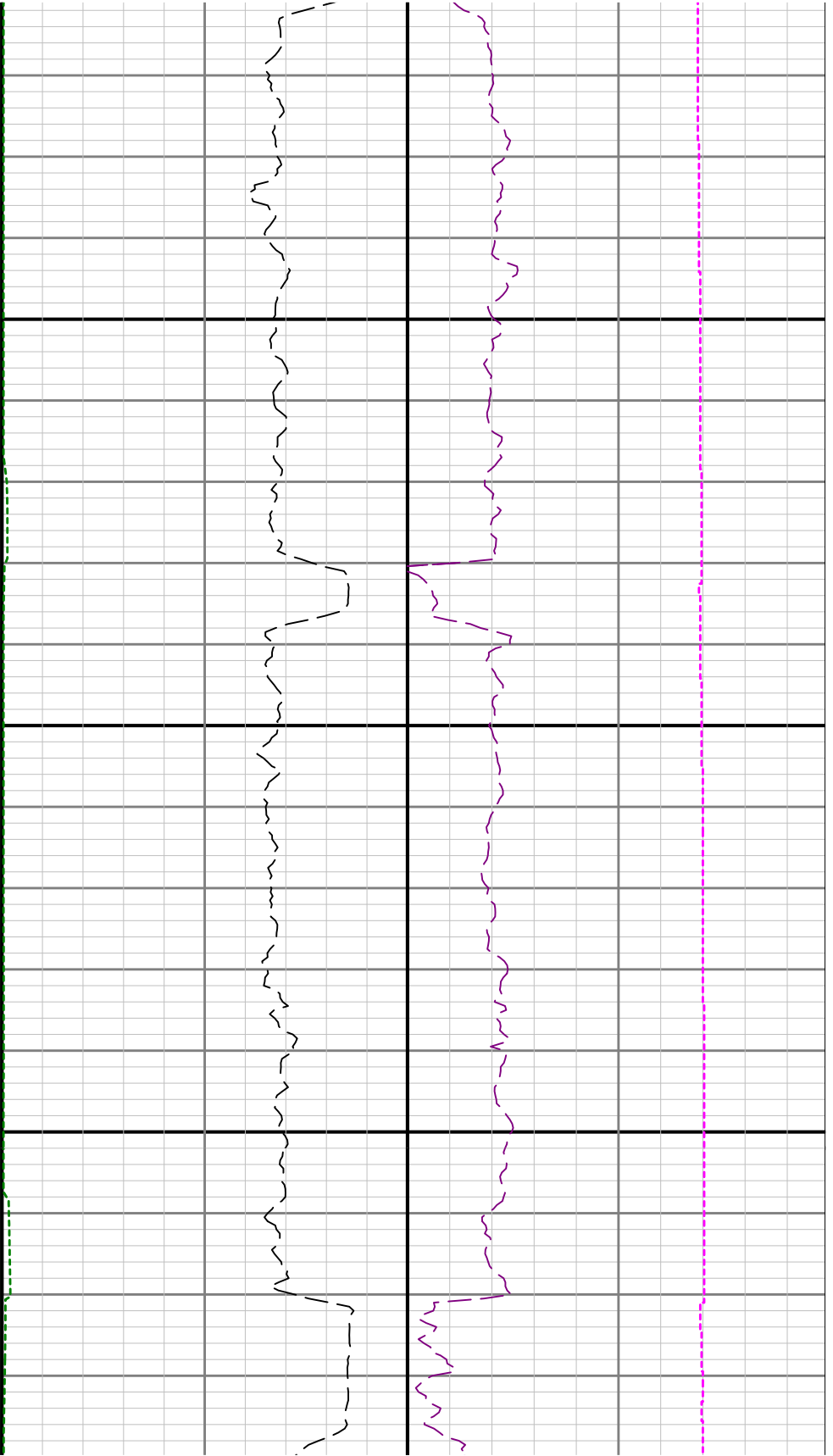


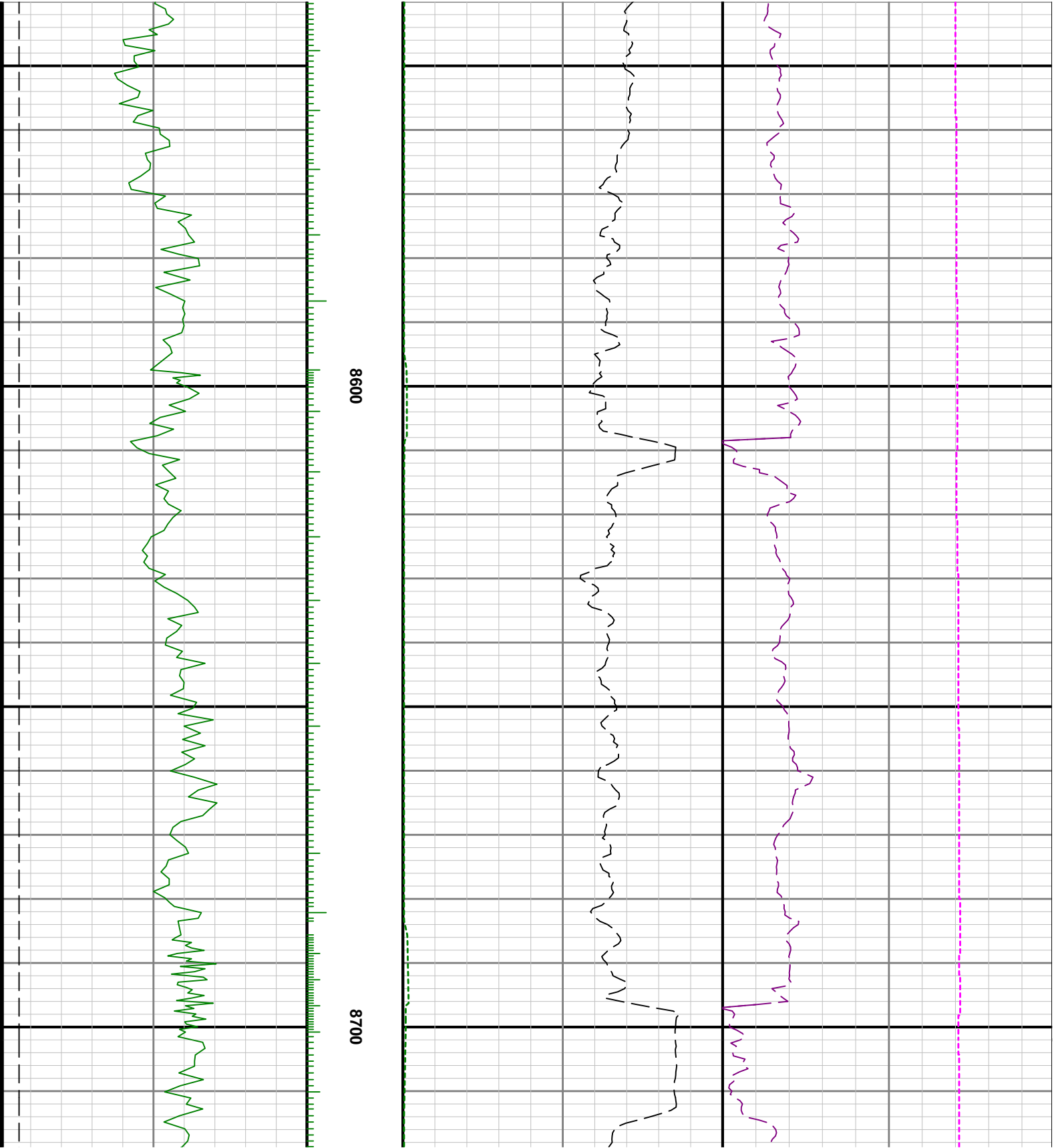


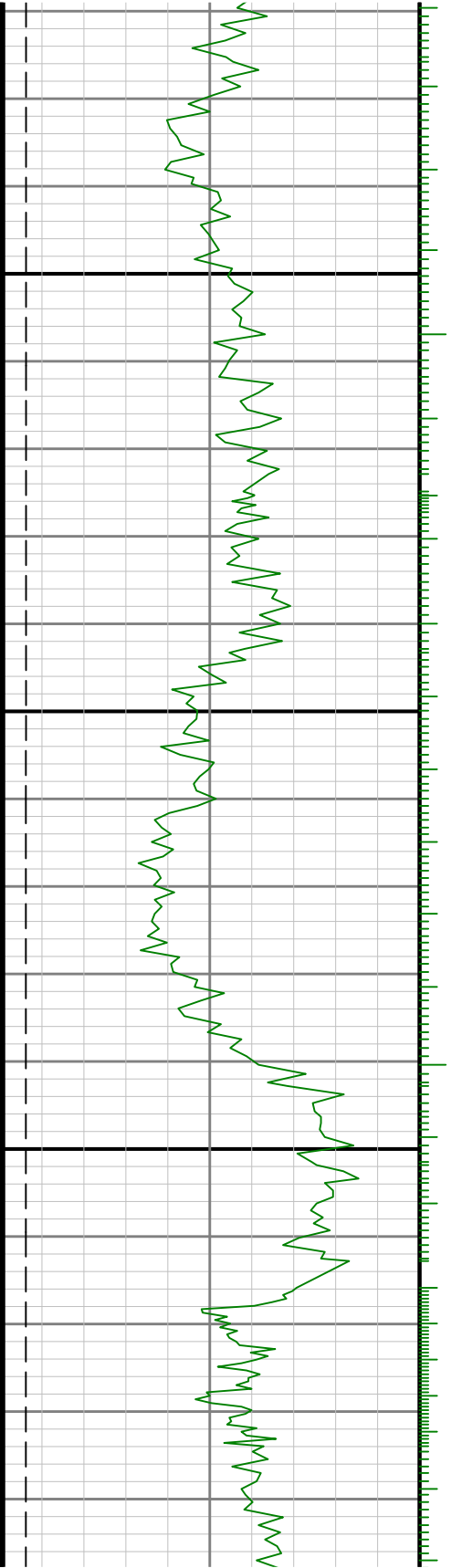






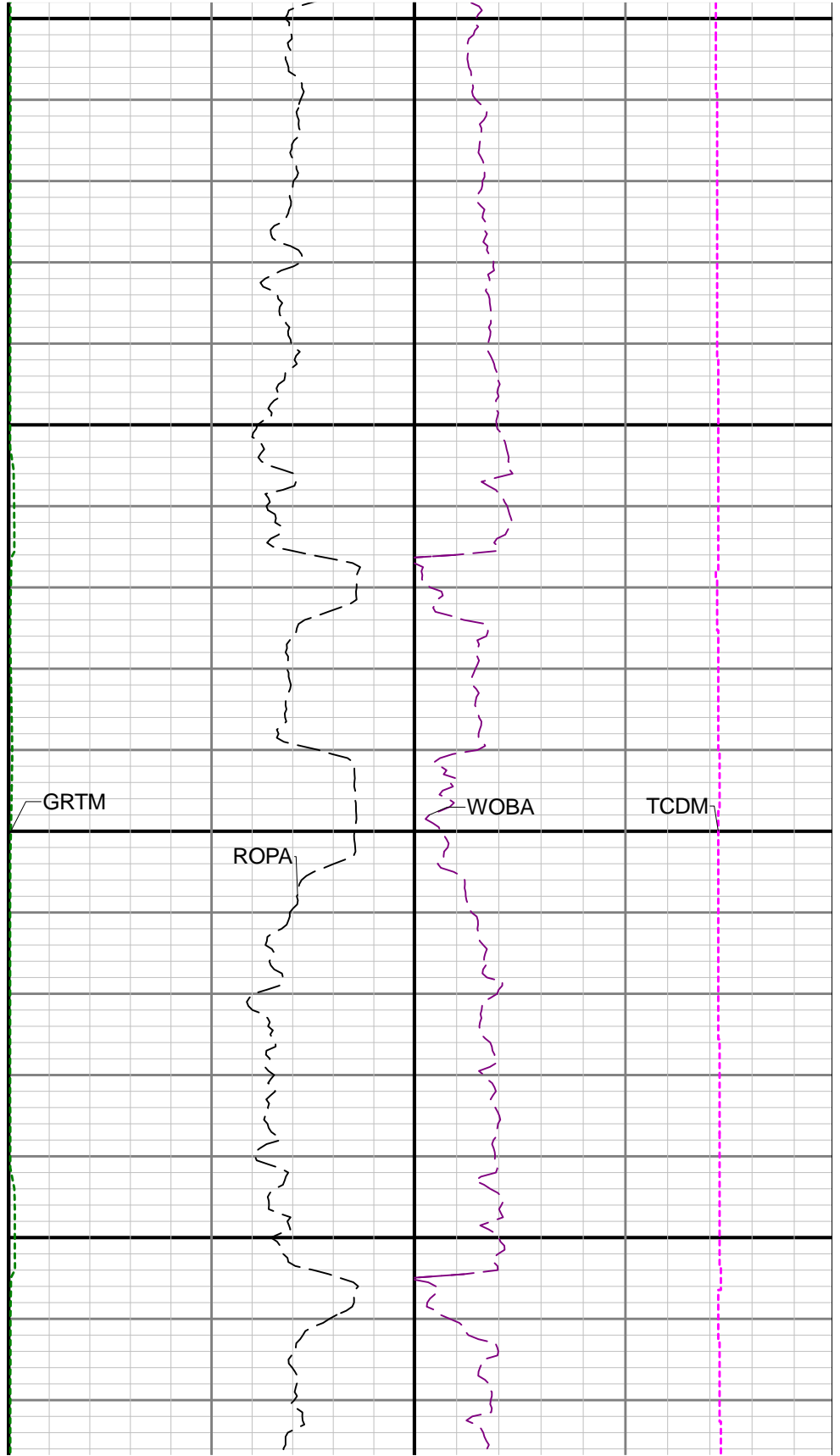
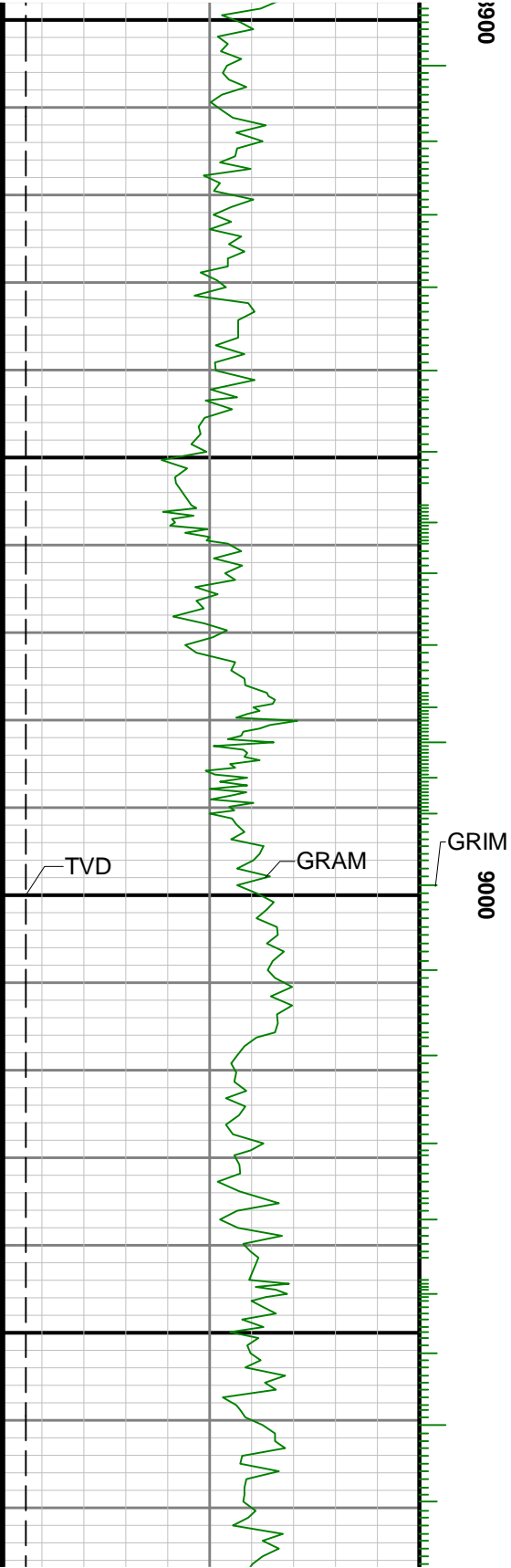


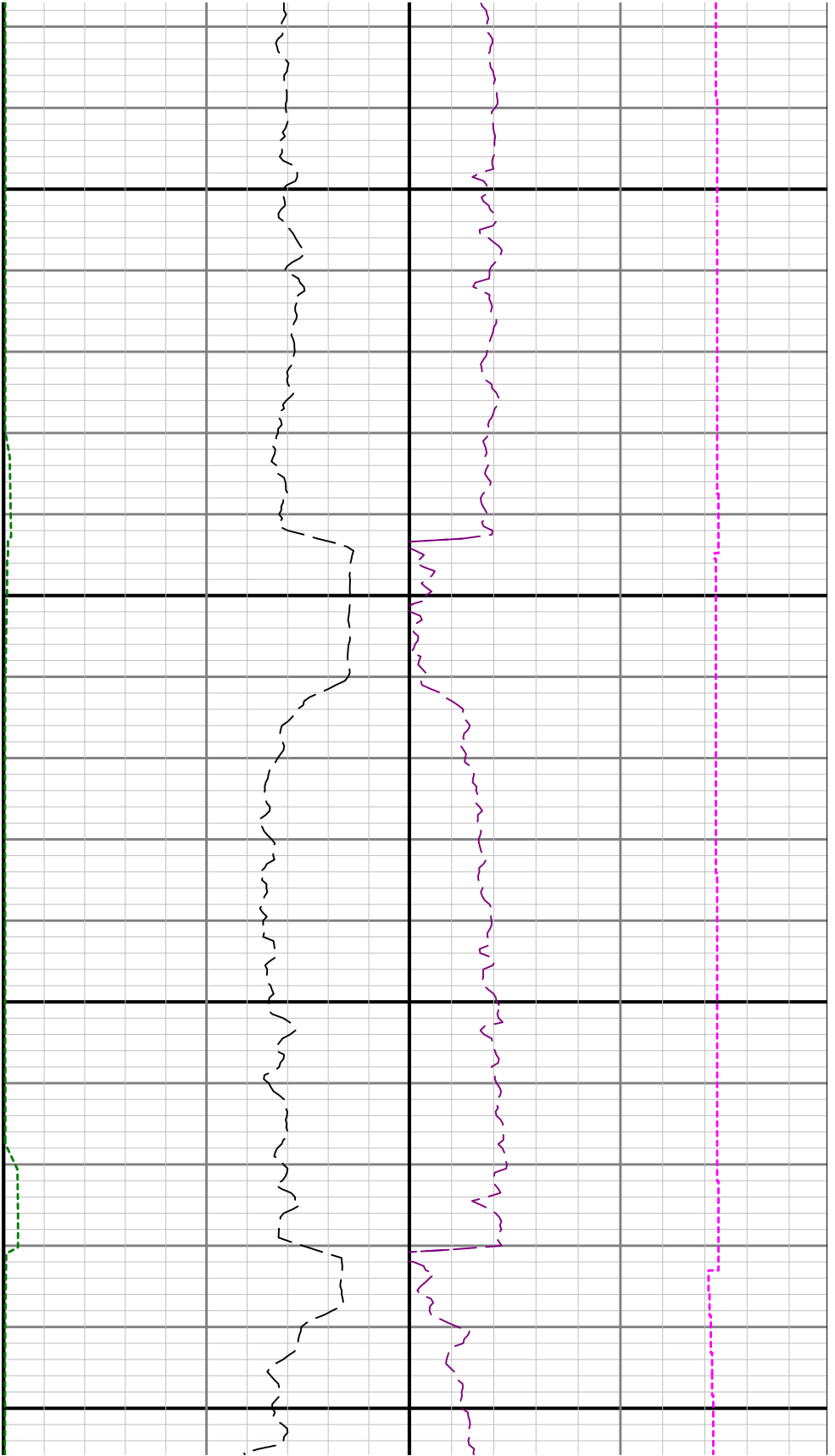




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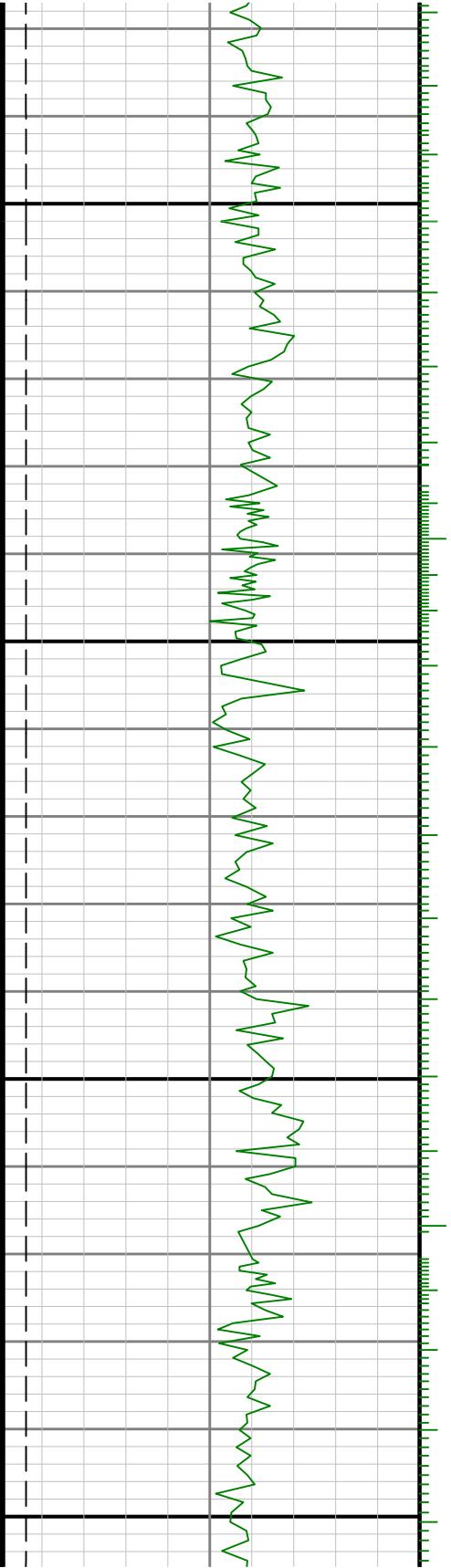


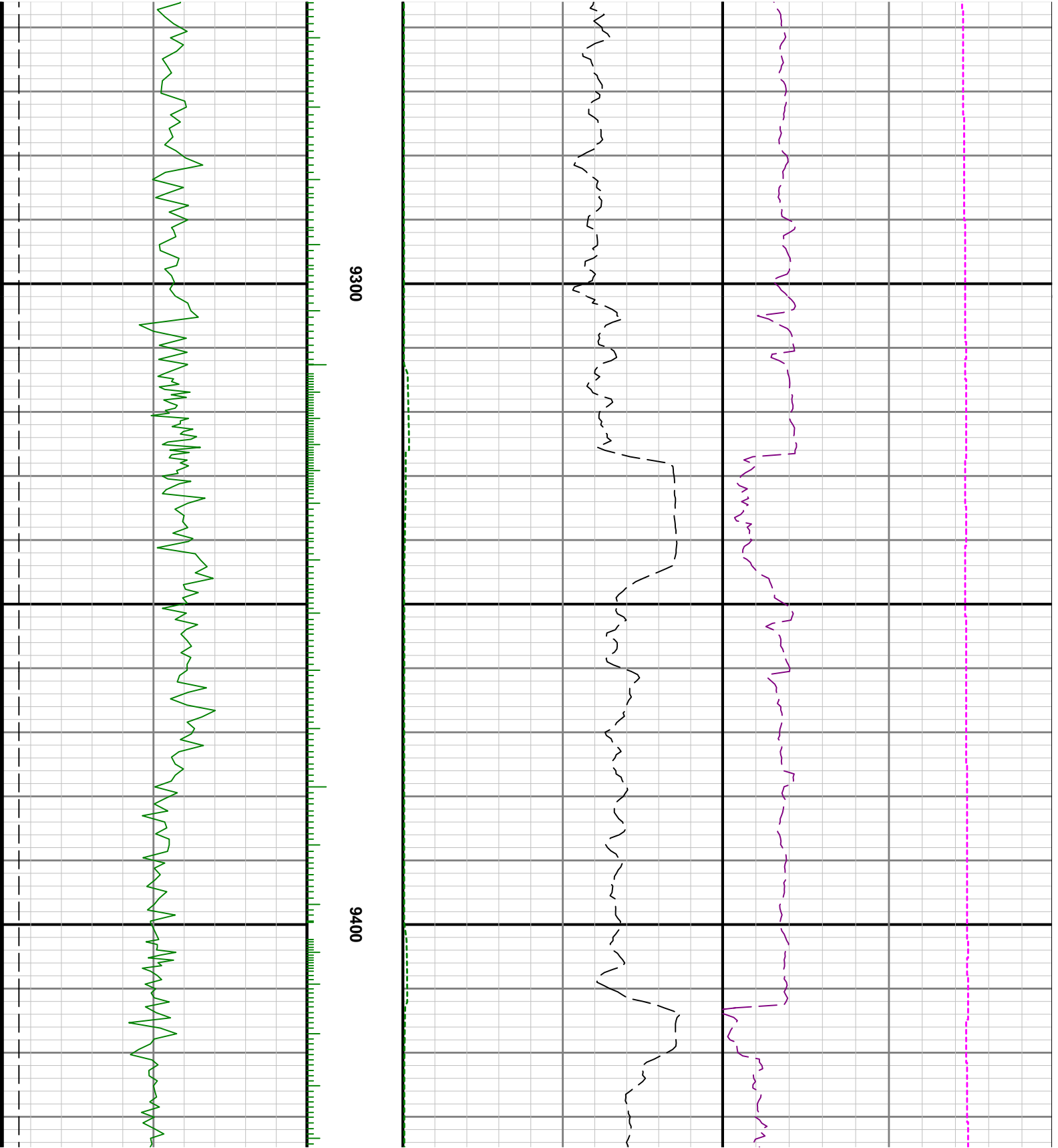


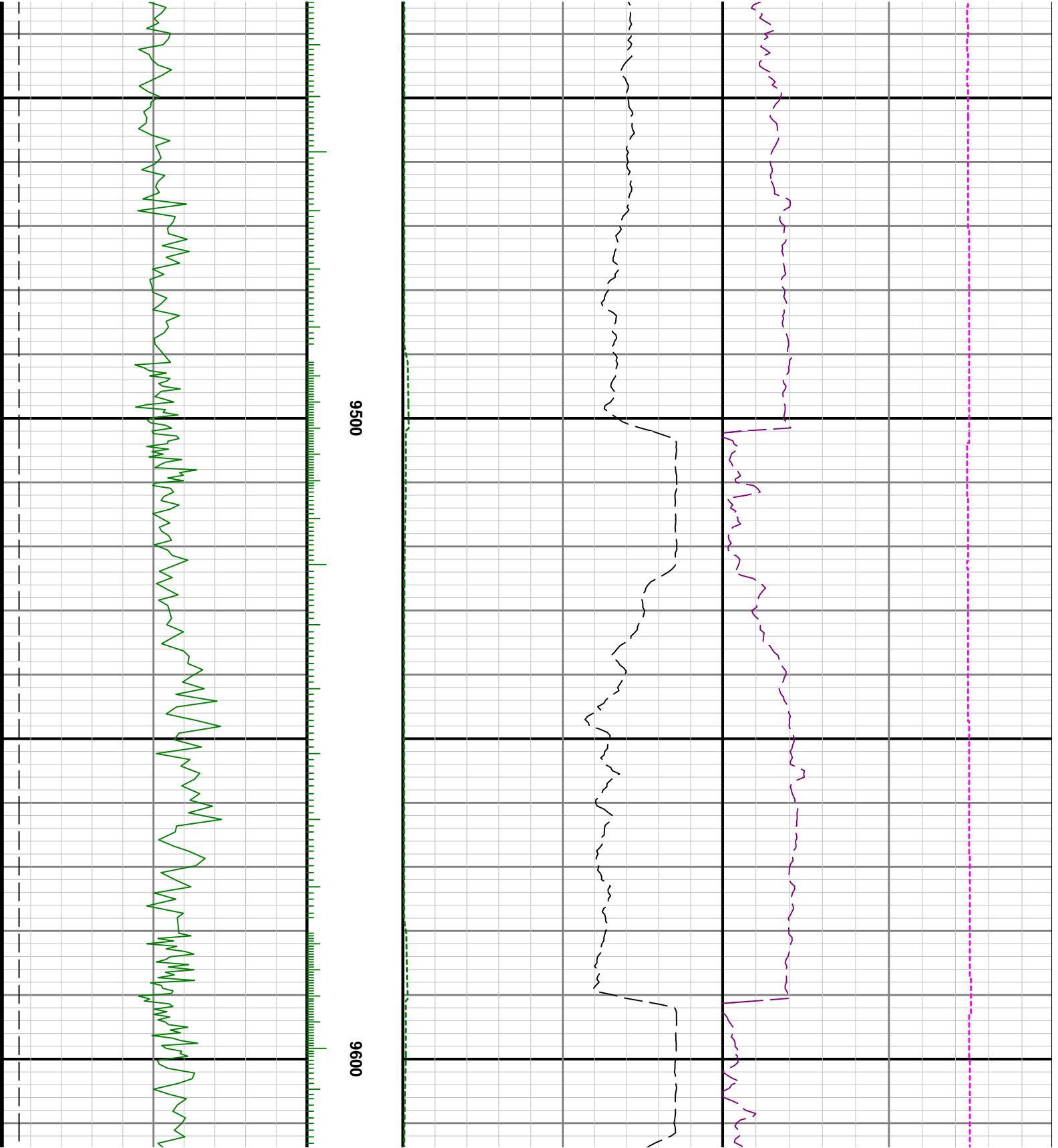


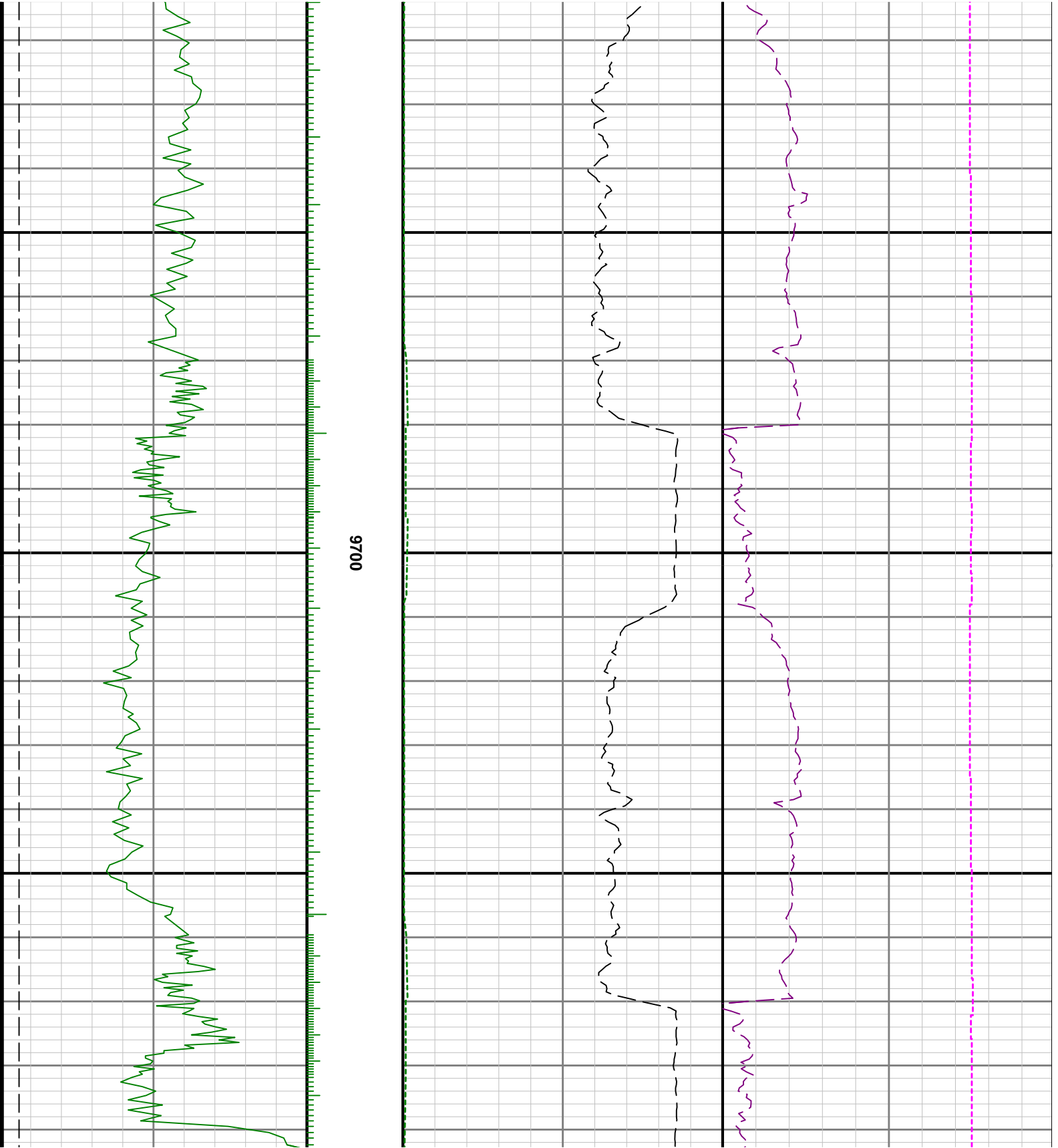
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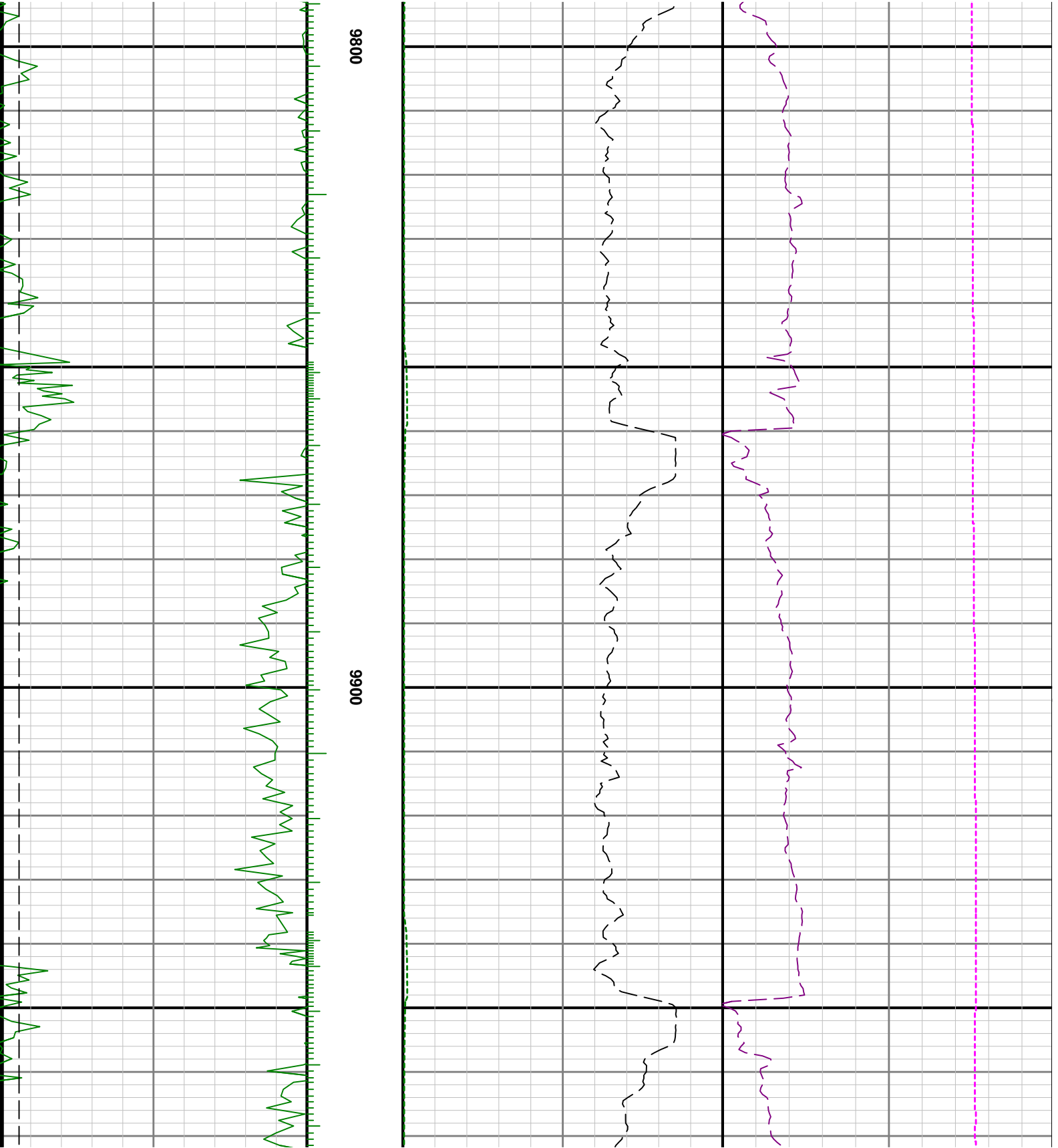
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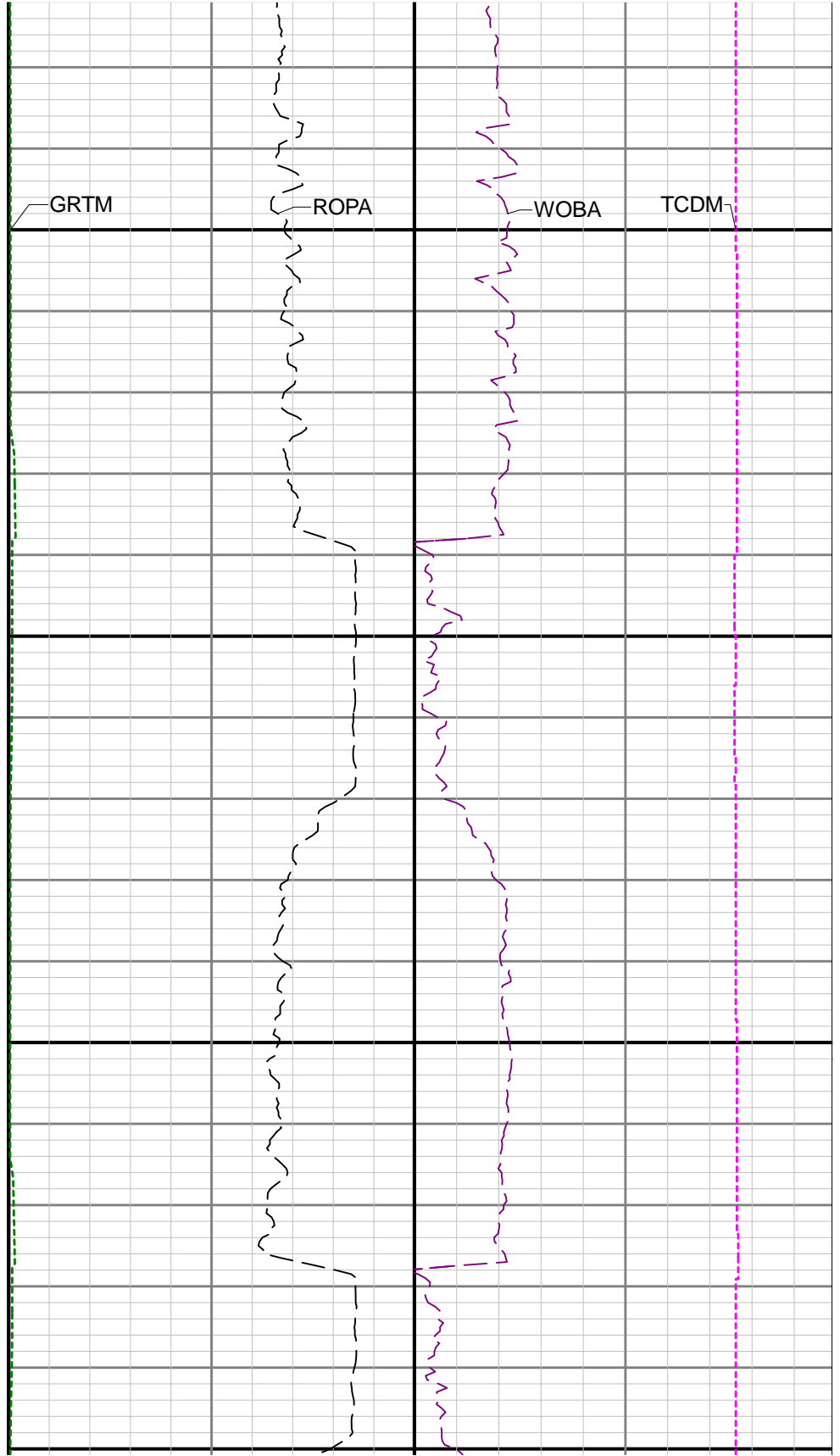
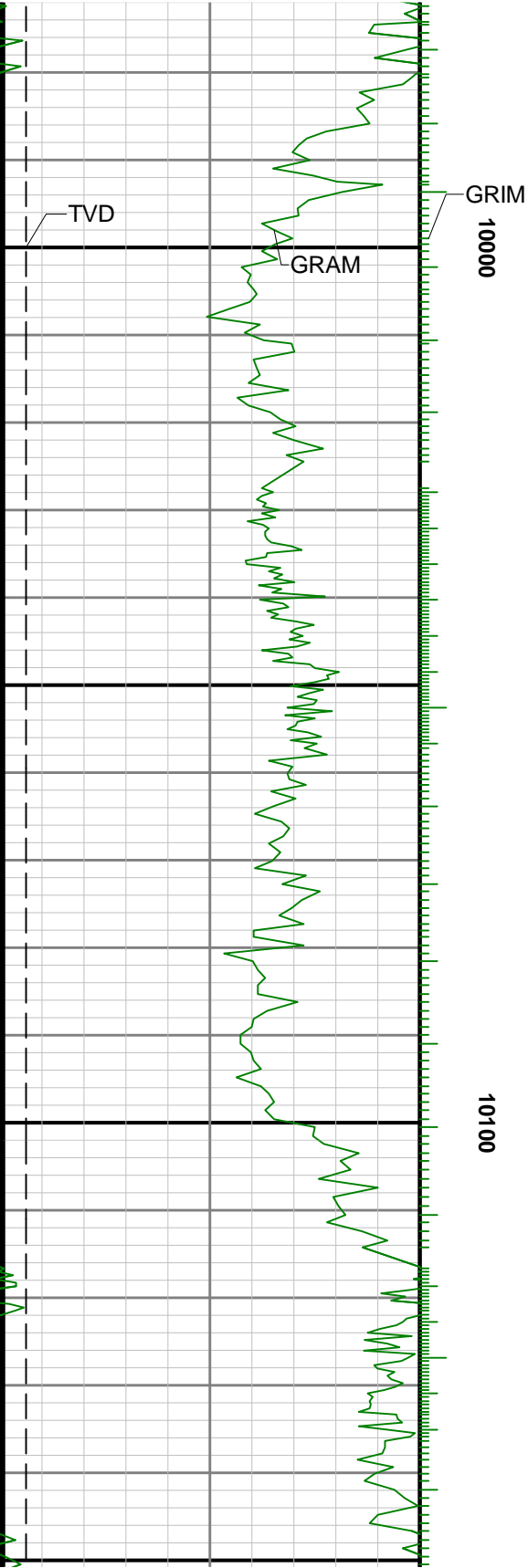


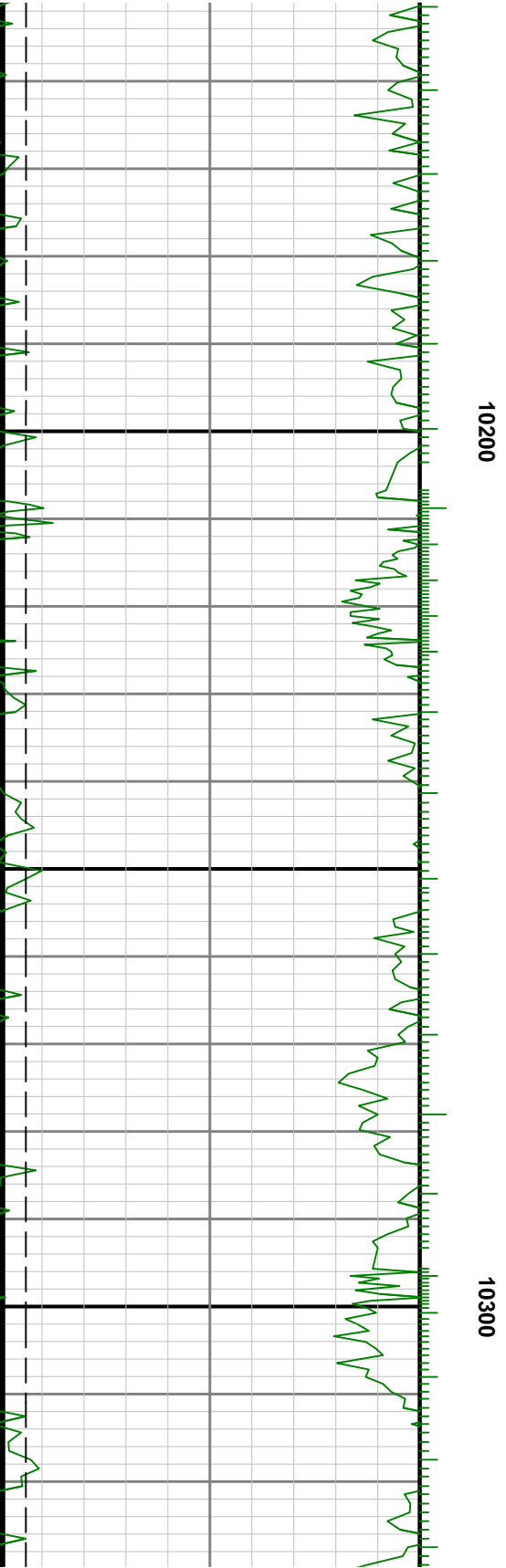
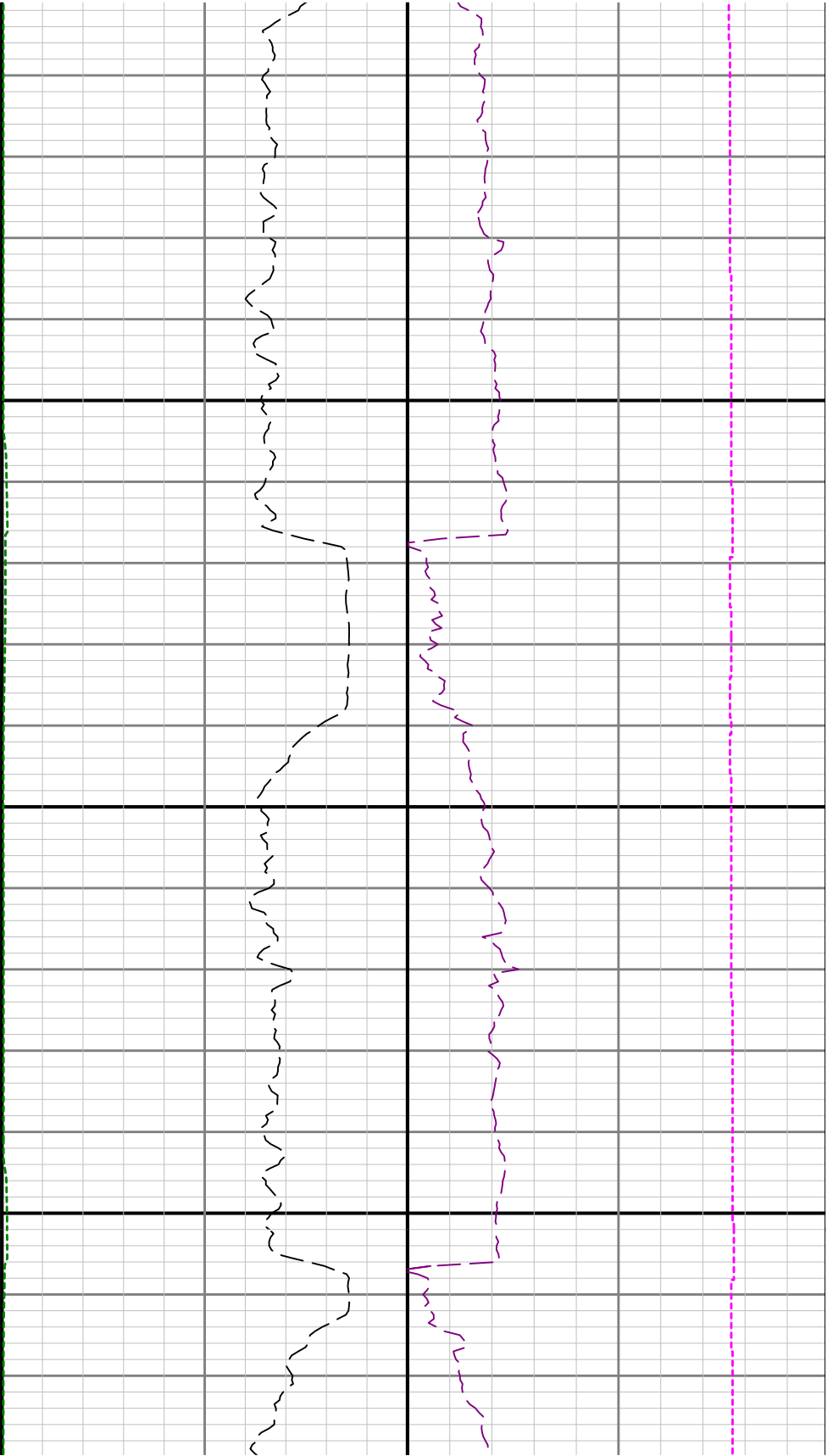


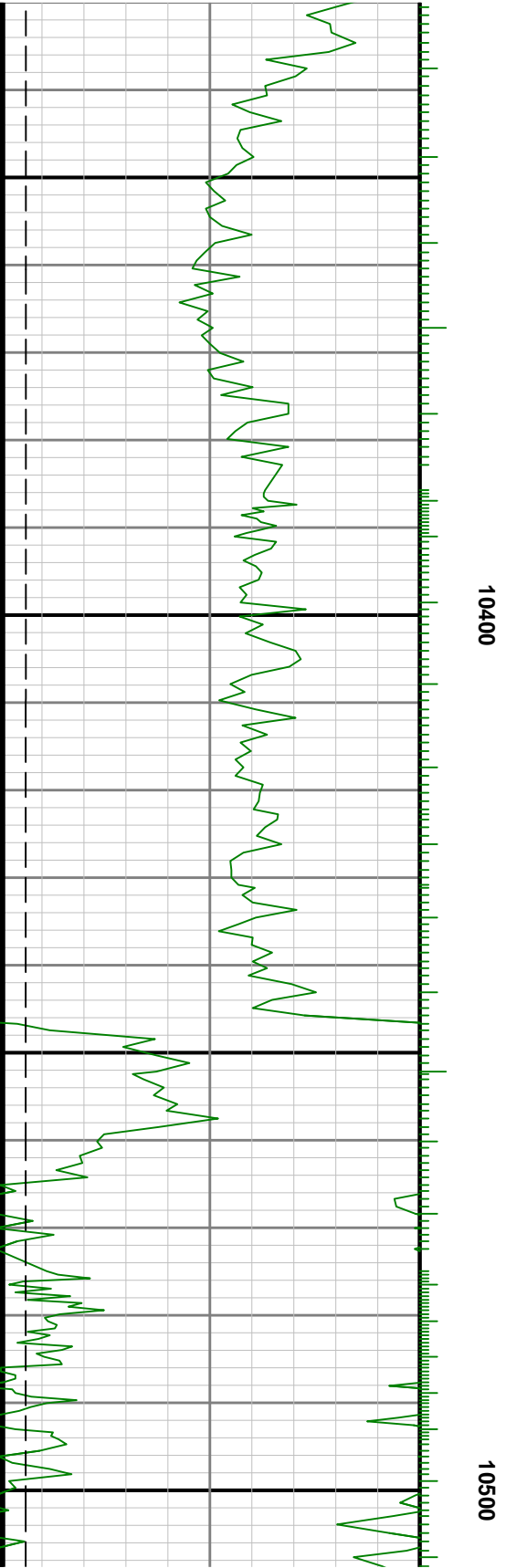
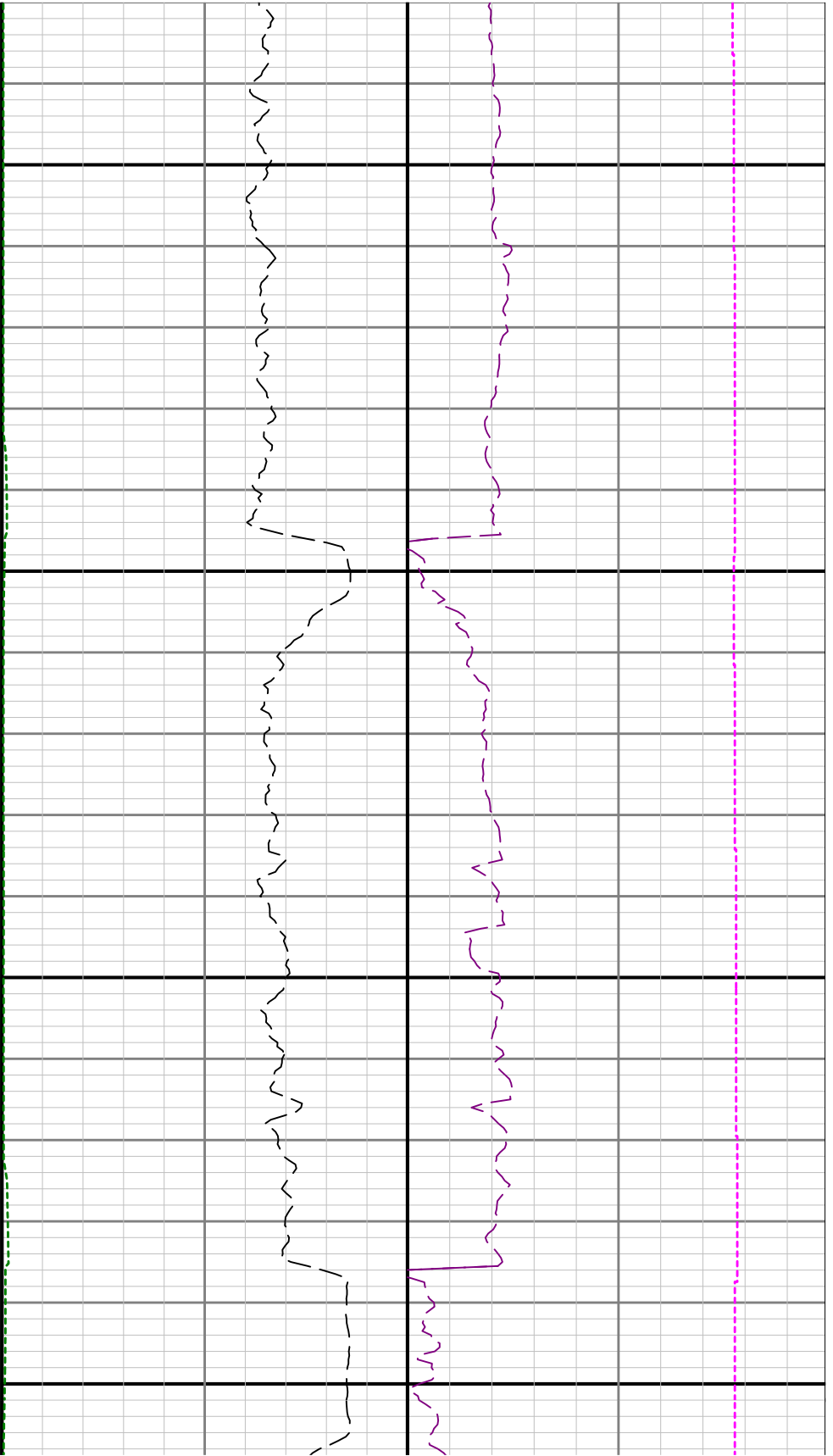


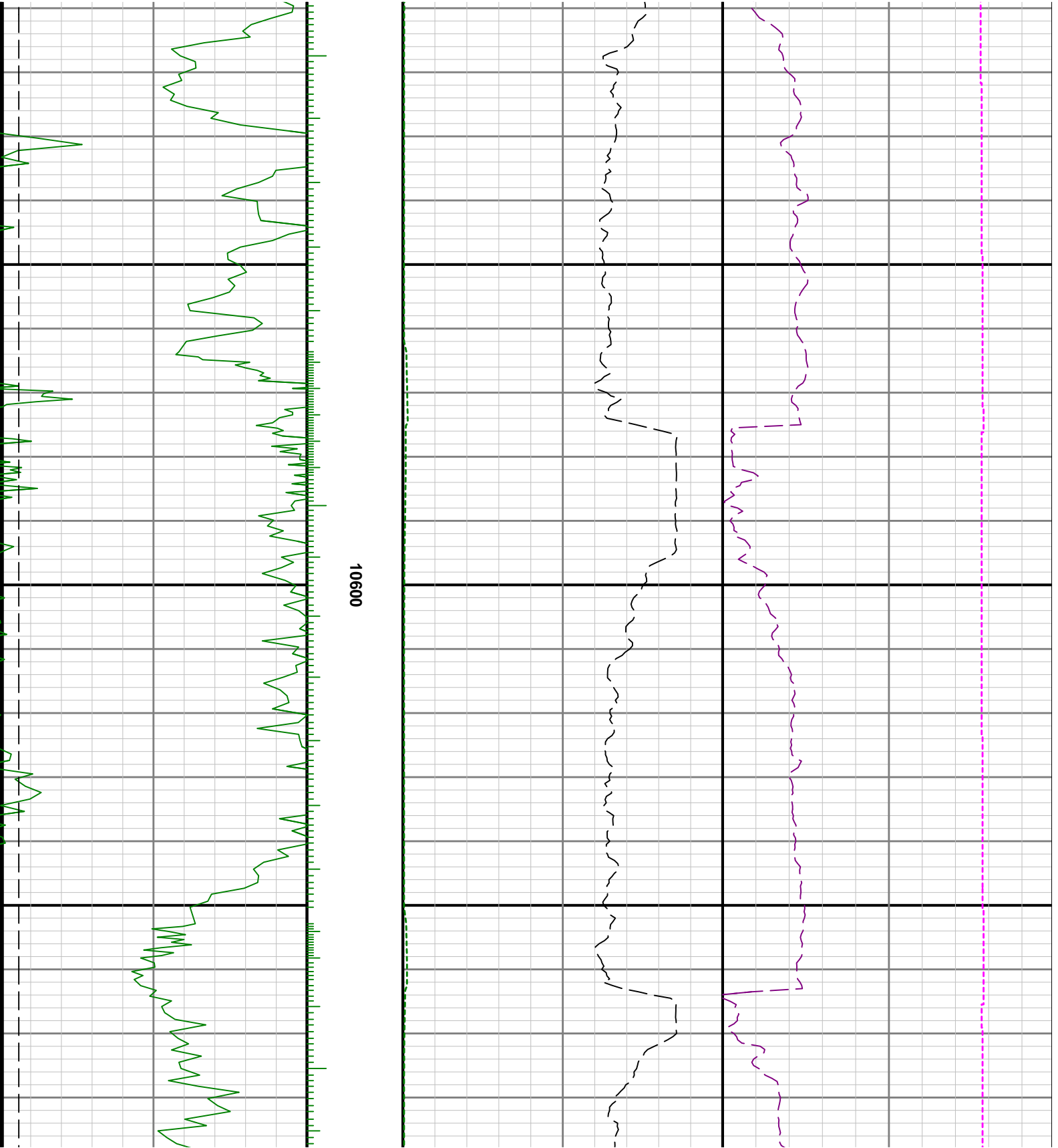


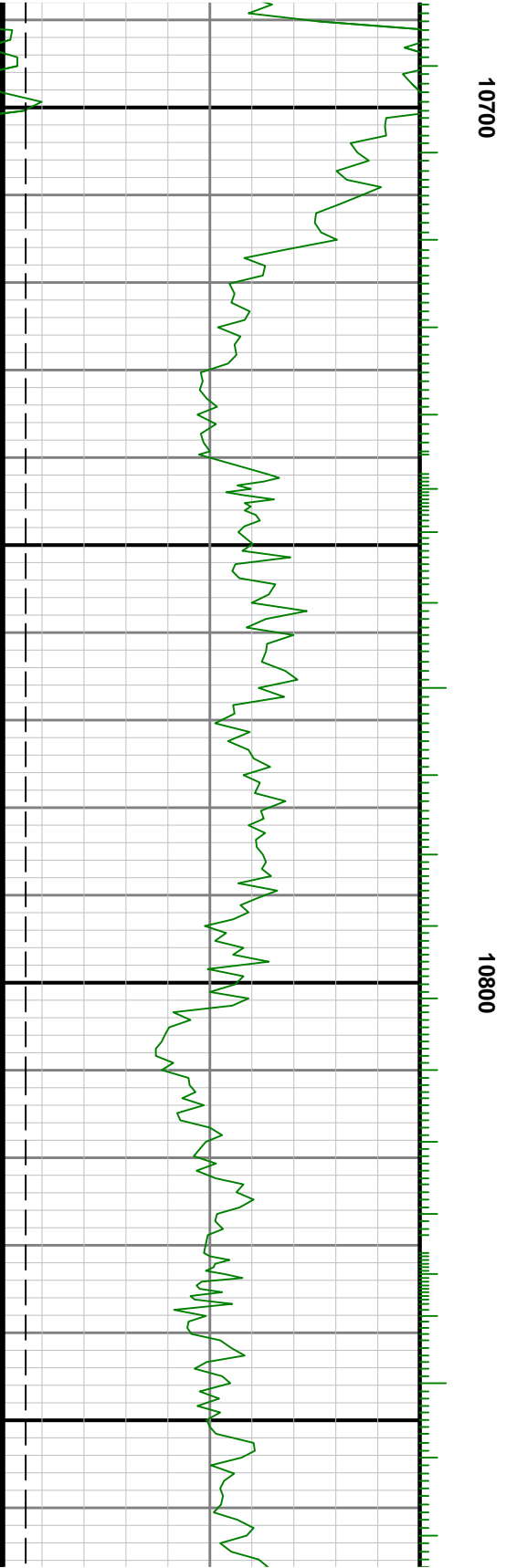
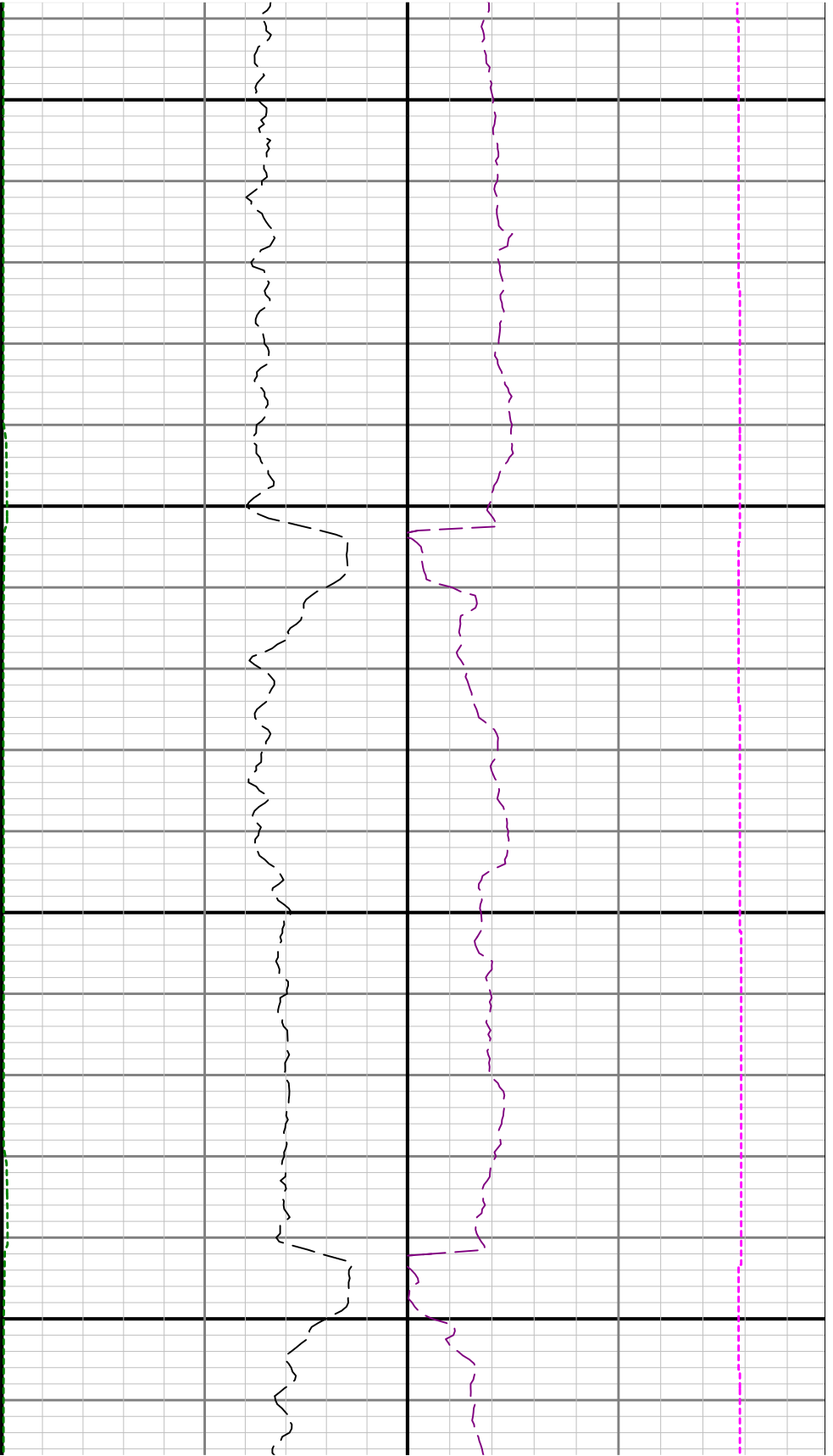


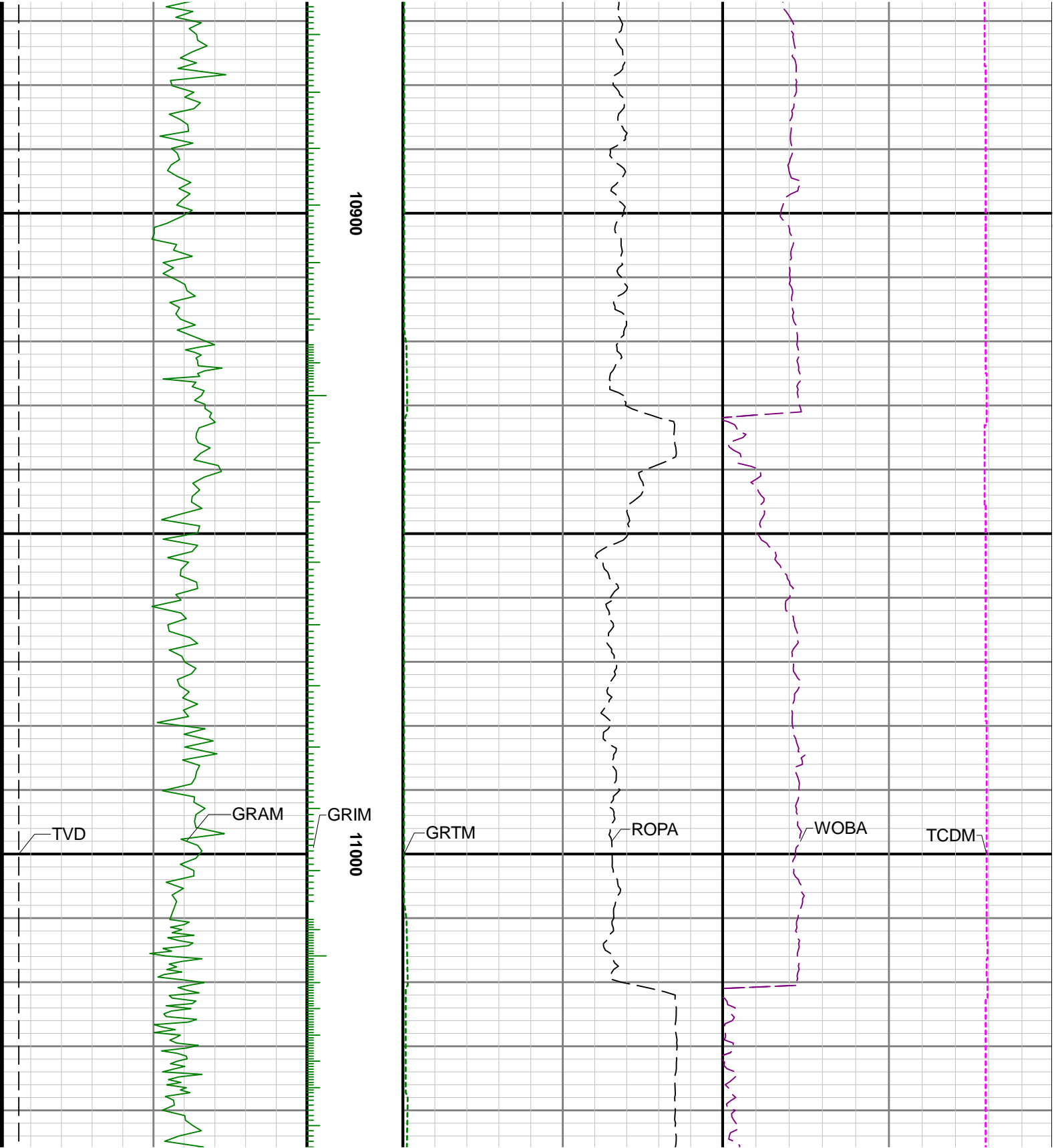








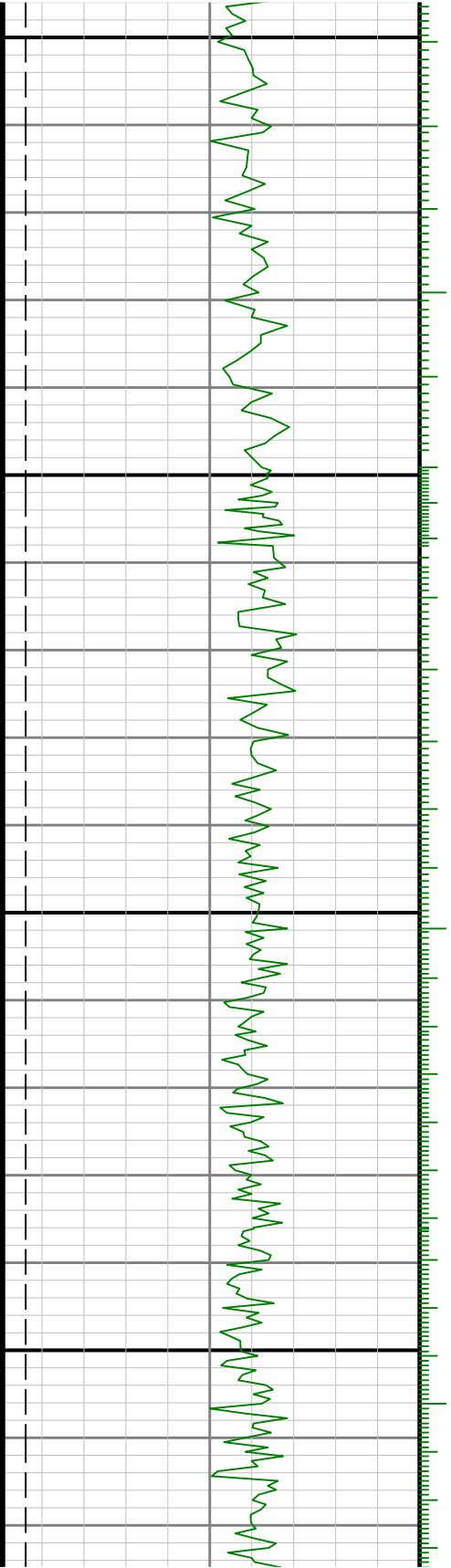


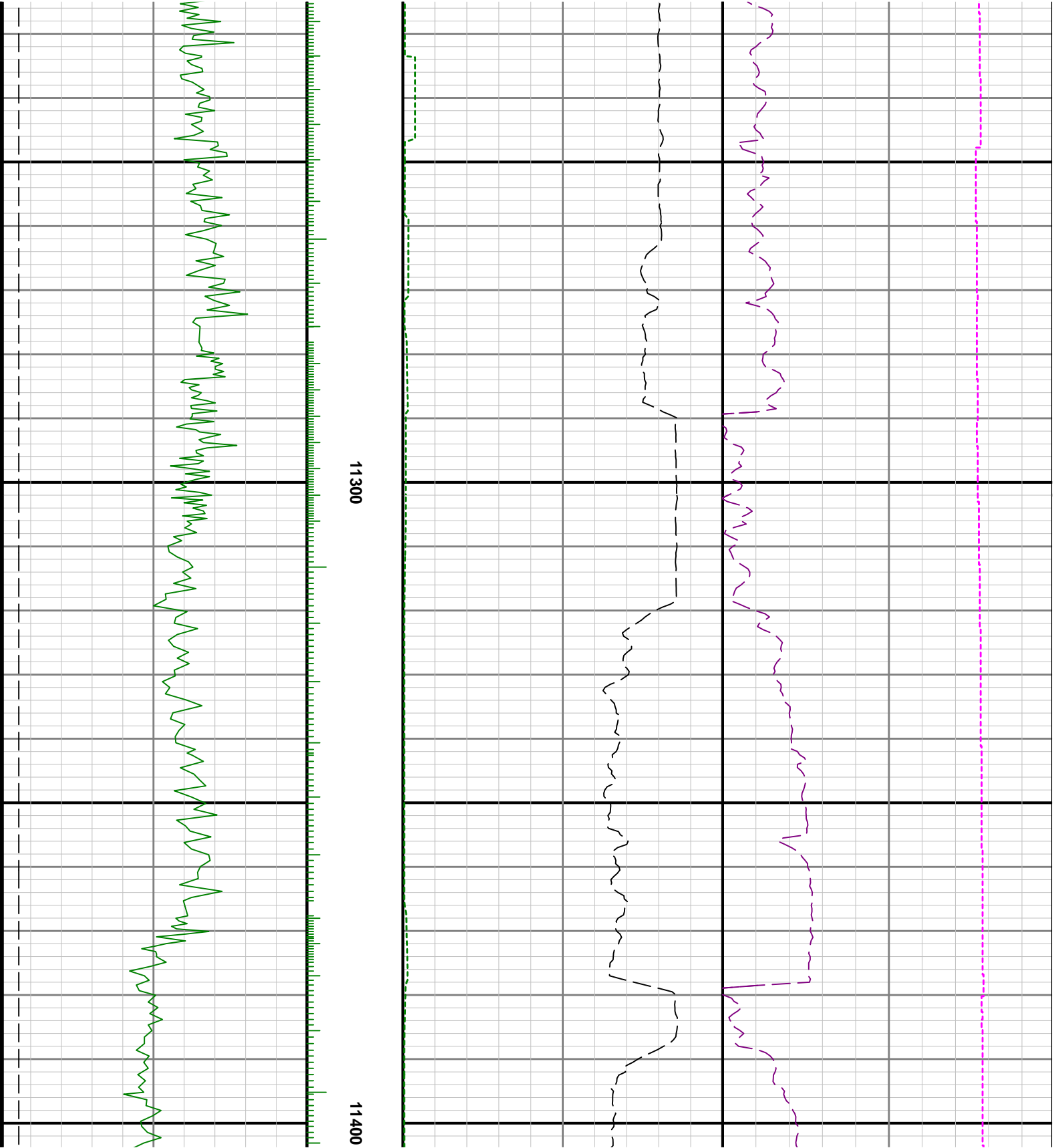


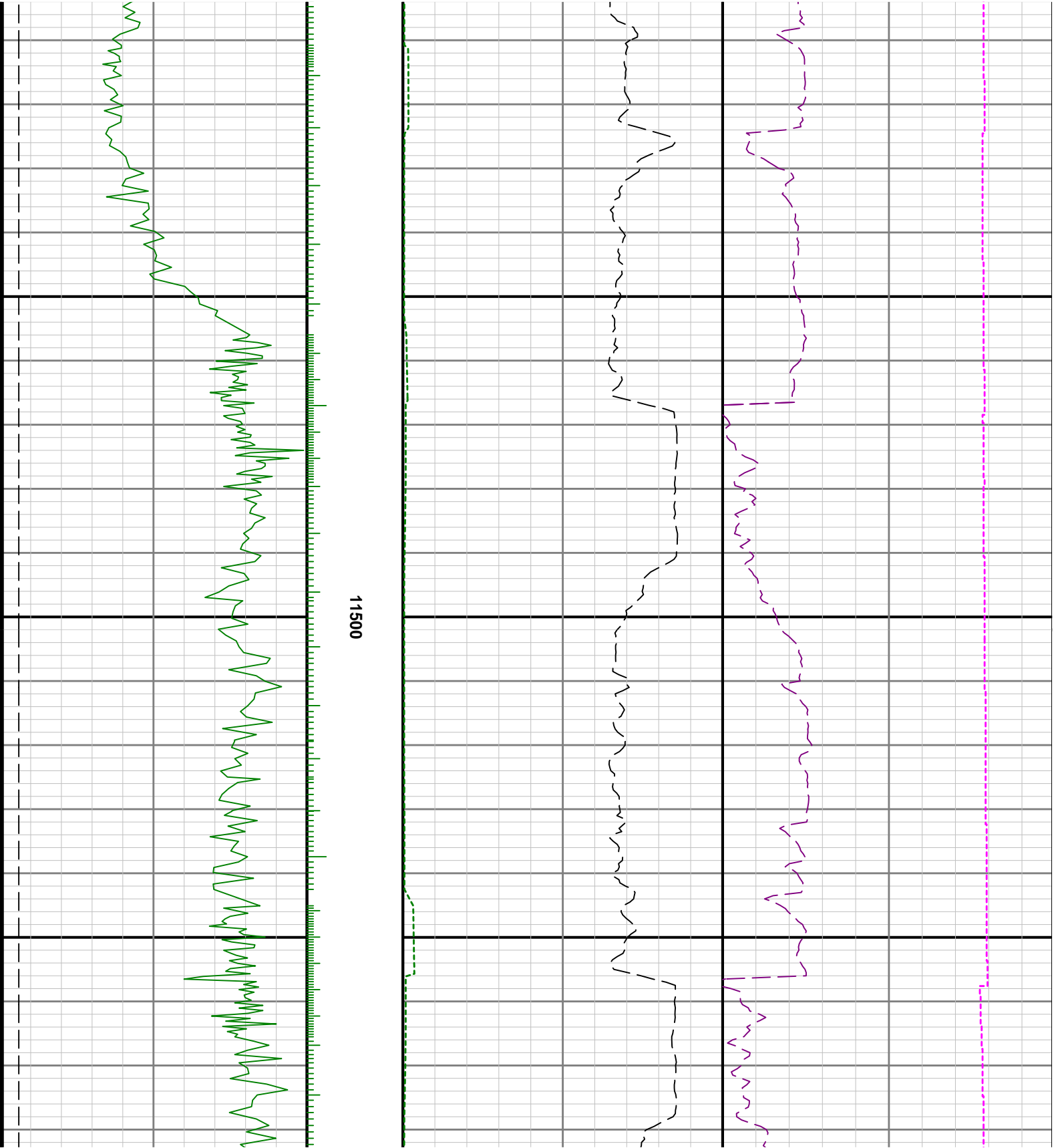


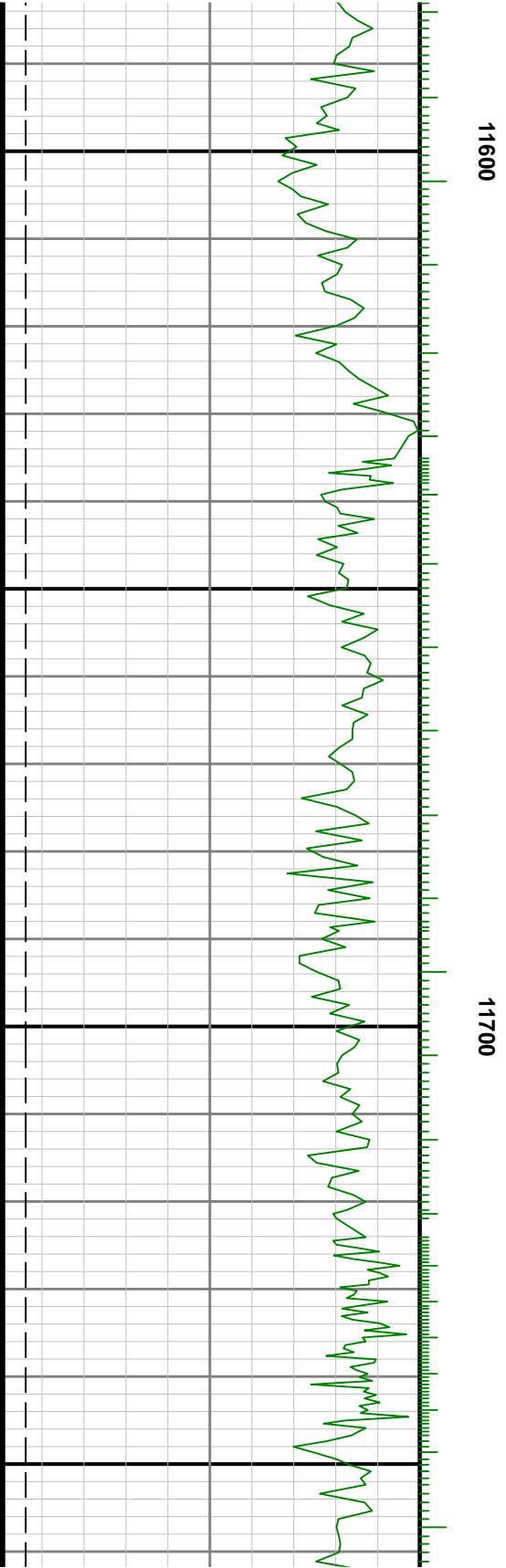
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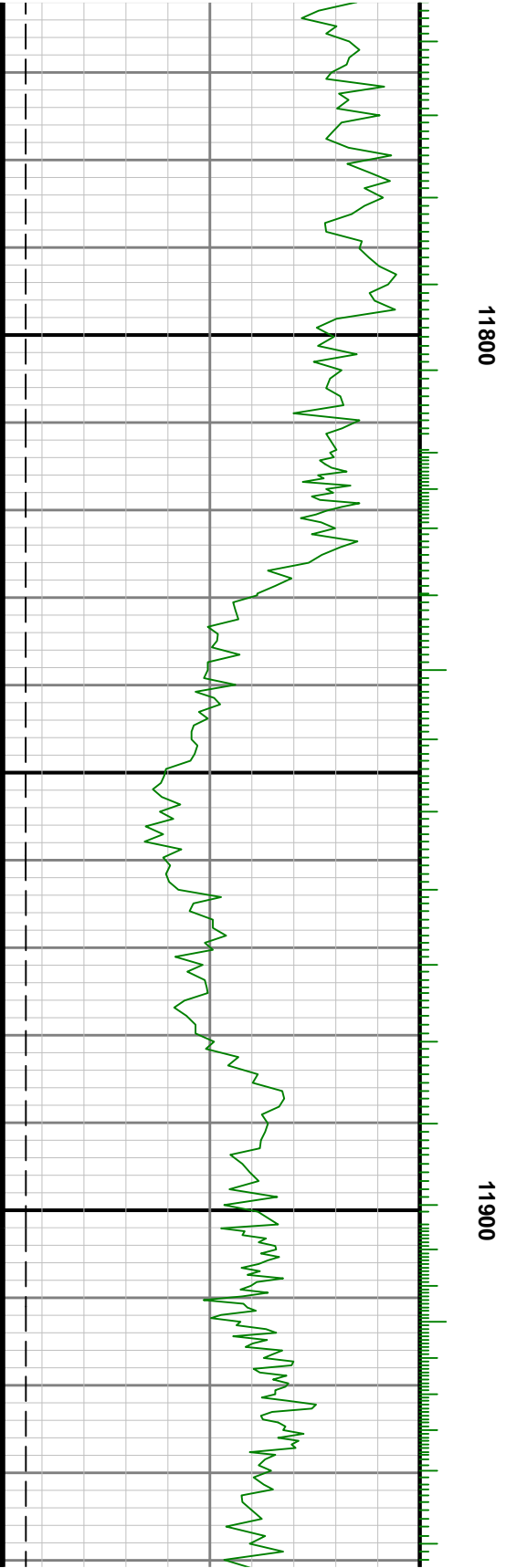
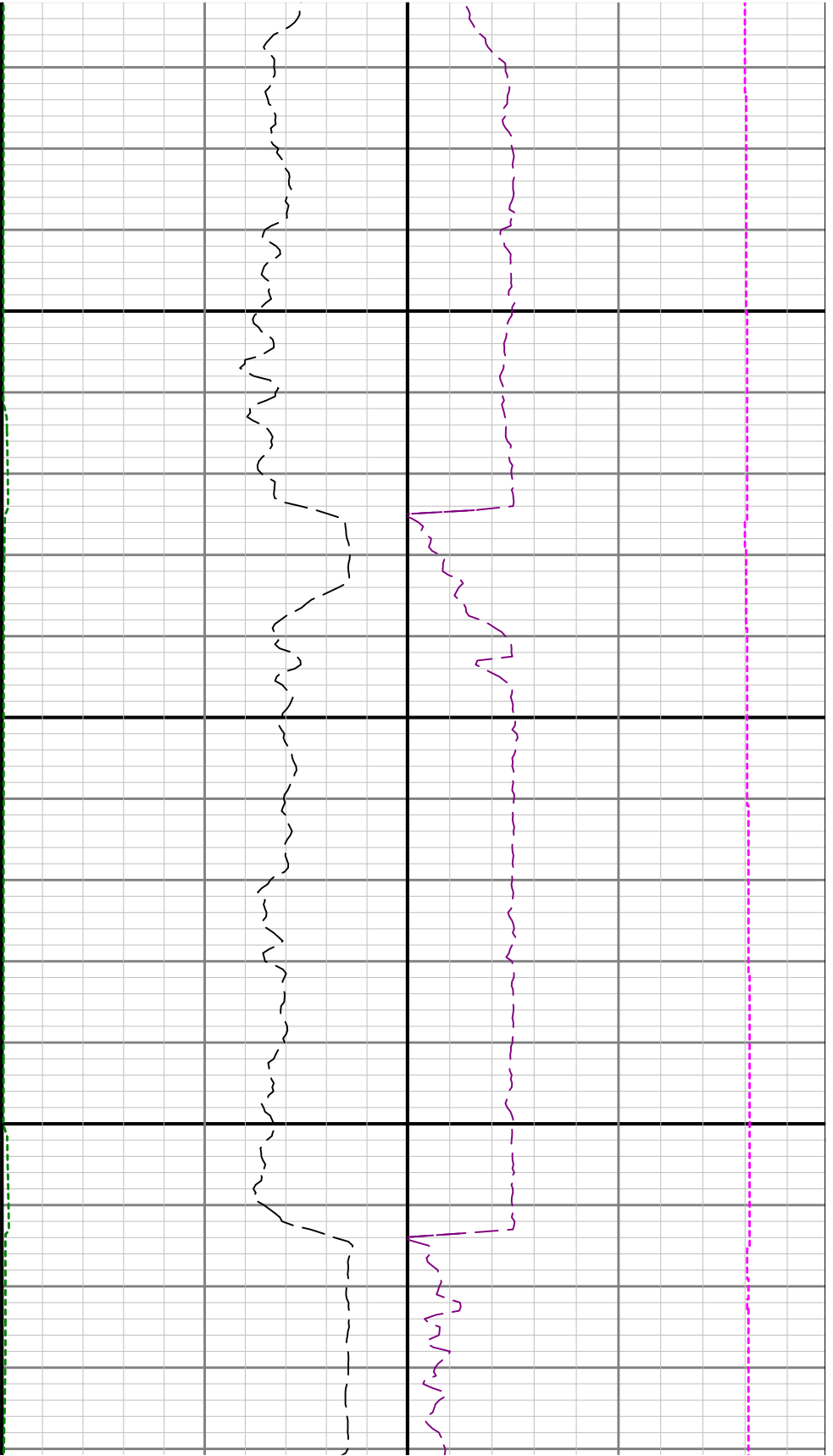
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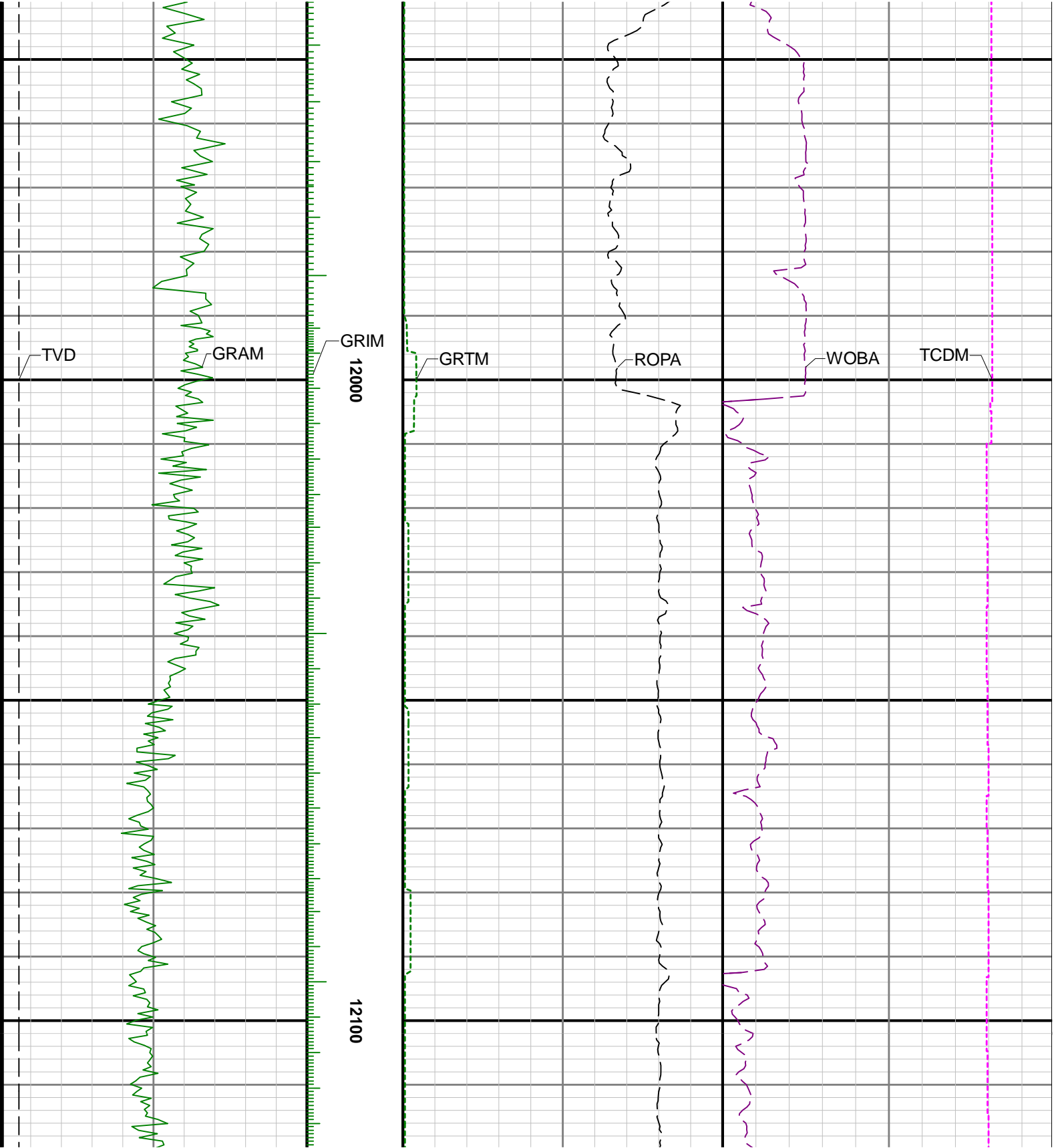


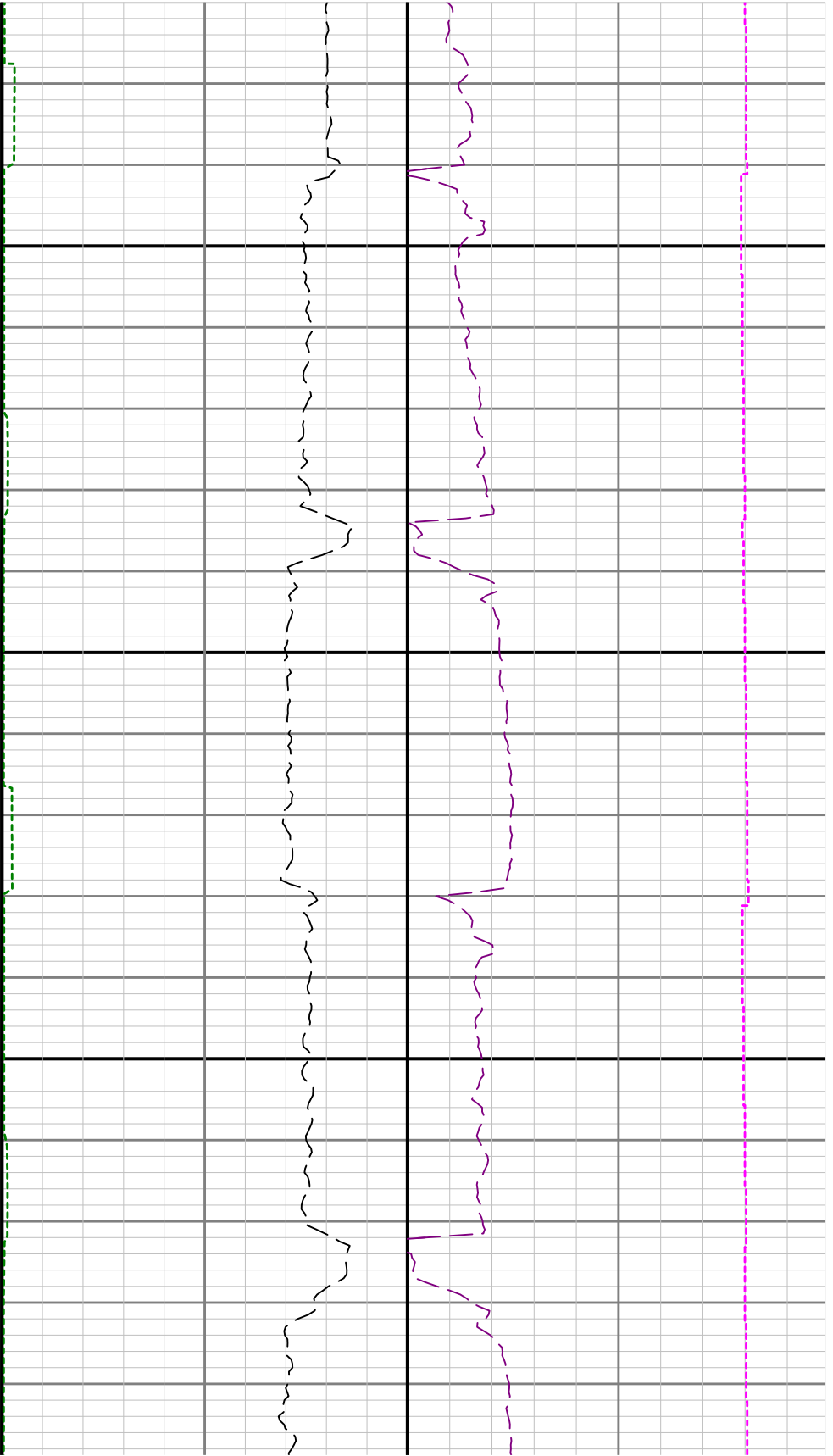












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