




LWD MEMORY LOG

Gamma Ray

LWD MEMORY LOG									
<div><div><div><div><div><div>BAKER</div><div>HUGHES</div><div>a GE company</div></div><div></div></div></div><div><div>Scale:</div><div>1:240</div><div>Measured Depth</div></div></div></div>				<div><div>Company: GREAT WESTERN OPERATING CO LLC</div><div>Well: Schneider HD 11-019HNX</div><div>Field: Weld County</div><div>County: Weld County</div><div>State: Colorado</div><div>Country: United States</div></div> <div>Gamma Ray</div>					
<div><div>Depth Reference:</div><div>Driller's Depth</div></div>				<div><div>Surface Location:</div><div>Latitude: 40° 19' 26.410" N</div><div>Longitude: 104° 49' 36.810" W</div><div>SEC: 7 TWN: 4N RGE: 66W</div><div>Elevation: 0.00 ft</div><div>Above P.D.: 4755.00 ft</div><div>Other Services:</div><div>Directional</div></div>					
<div><div>Status:</div><div>Final Print</div></div>									
<div><div>API No: 05-123-46413</div><div>Job ID: 110030130</div></div>									
<div><div>Permanent Datum (P.D.): Mean Sea Level</div><div>Log Measured From: Rig Floor</div></div>				<div><div>Elevation: 0.00 ft</div><div>Elev. KB: 4755.00 ft</div><div>Elev. DF: 4735.00 ft</div><div>Elev. GL:</div></div>					
<div><div>Dates</div><div>From: 2019-09-14</div><div>To: 2019-09-18</div><div>Sput: 2019-08-28</div></div>				<div><div>Interval</div><div>Drilled (ft)</div><div>Top: 1577.00</div><div>Bottom: 18136.00</div></div>		<div><div>Magnetic Field Reference</div><div>Azi Reference North: 1577.00</div><div>Total Magnetic Field Strength: (nT) 52081</div><div>Mag to Reference North Correction: (deg) 8.19</div></div>			
<div><div>Borehole Record</div><div>Casing Record</div></div>									
<div><div>Hole Size (in)</div><div>From (ft)</div><div>To (ft)</div><div>Size (in)</div><div>Weight (lb/ft)</div><div>From (ft)</div><div>To (ft)</div></div>									
<div><div>13.500</div><div>20.00</div><div>1577.00</div><div>9.625</div><div>36.00</div><div>20.00</div><div>1577.00</div></div>									
<div><div>8.500</div><div>1577.00</div><div>18136.00</div><div></div><div></div><div></div><div></div></div>									
<div><div>Mud Record</div><div>Deviation Record</div></div>									
<div><div>Type</div><div>From (ft)</div><div>To (ft)</div><div>Hole Size (in)</div><div>Interval (ft)</div><div>Inc Az (Start)</div><div>Inc Az (End)</div></div>									
<div><div>Diesel-Oil Based Mud</div><div>1577.00</div><div>18136.00</div><div>8.500</div><div>16559.00</div><div>19.07 352.36</div><div>90.15 263.77</div></div>									
<div><div>Acquisition System</div><div>Software Version</div><div>Other</div></div>									
<div><div>Cadence</div><div>RT 5.4</div><div>Plot Studio</div><div>5.4.8625.2</div></div>				<div><div>Rig: PD460</div><div>Contractor: Precision Drilling</div><div>District: RMD</div><div>Unit: D&E</div></div>					

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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	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	4.00	AutoTrak Curve	1577.00	8939.00	1577.00	8952.00	2019-09-14 19:29	2019-09-16 01:45	26.76
2	1	8.500	PDC	4.00	AutoTrak Curve	8940.00	18123.00	8952.00	18136.00	2019-09-16 11:13	2019-09-18 05:38	41.79

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Garrett Gerdson	2019-09-14	2019-09-15	Jairo Garcia	2019-09-14	2019-09-18	Alain Atemoh	2019-09-16	2019-09-18

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+ (%)
2019-09-14 20:00	1	1671.14	Diesel-Oil Based Mud	10.6	31	N/A	10.2	58.4/24.4	Shale Shaker	21058	0.00
2019-09-15 01:00	1	2716.00	Diesel-Oil Based Mud	10.5	32	N/A	10.2	58.5/24.4	Active Pit	21058	0.00
2019-09-16 07:22	2	8953.00	Diesel-Oil Based Mud	10.5	32	N/A	10.2	58.5/24.4	Active Pit	23500	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	14186735	Near Bit Inclination	5.93	6.77	7.000	4.330
1	AutoTrak Curve Steering Unit	14186735	Near Bit VSS	5.93	6.77	7.000	4.330
1	AutoTrak Curve MWD	12919396	Gamma (single)	2.76	12.94	7.000	3.250
1	AutoTrak Curve MWD	12919396	Directional (mag)	12.27	22.45	7.000	3.250
2	AutoTrak Curve Steering Unit	12160767	Near Bit VSS	5.93	6.77	7.000	4.330
2	AutoTrak Curve Steering Unit	12160767	Near Bit Inclination	5.93	6.77	7.000	4.330
2	AutoTrak Curve MWD	12304740	Gamma (single)	2.75	12.94	7.000	3.250
2	AutoTrak Curve MWD	12304740	Directional (mag)	12.27	22.46	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

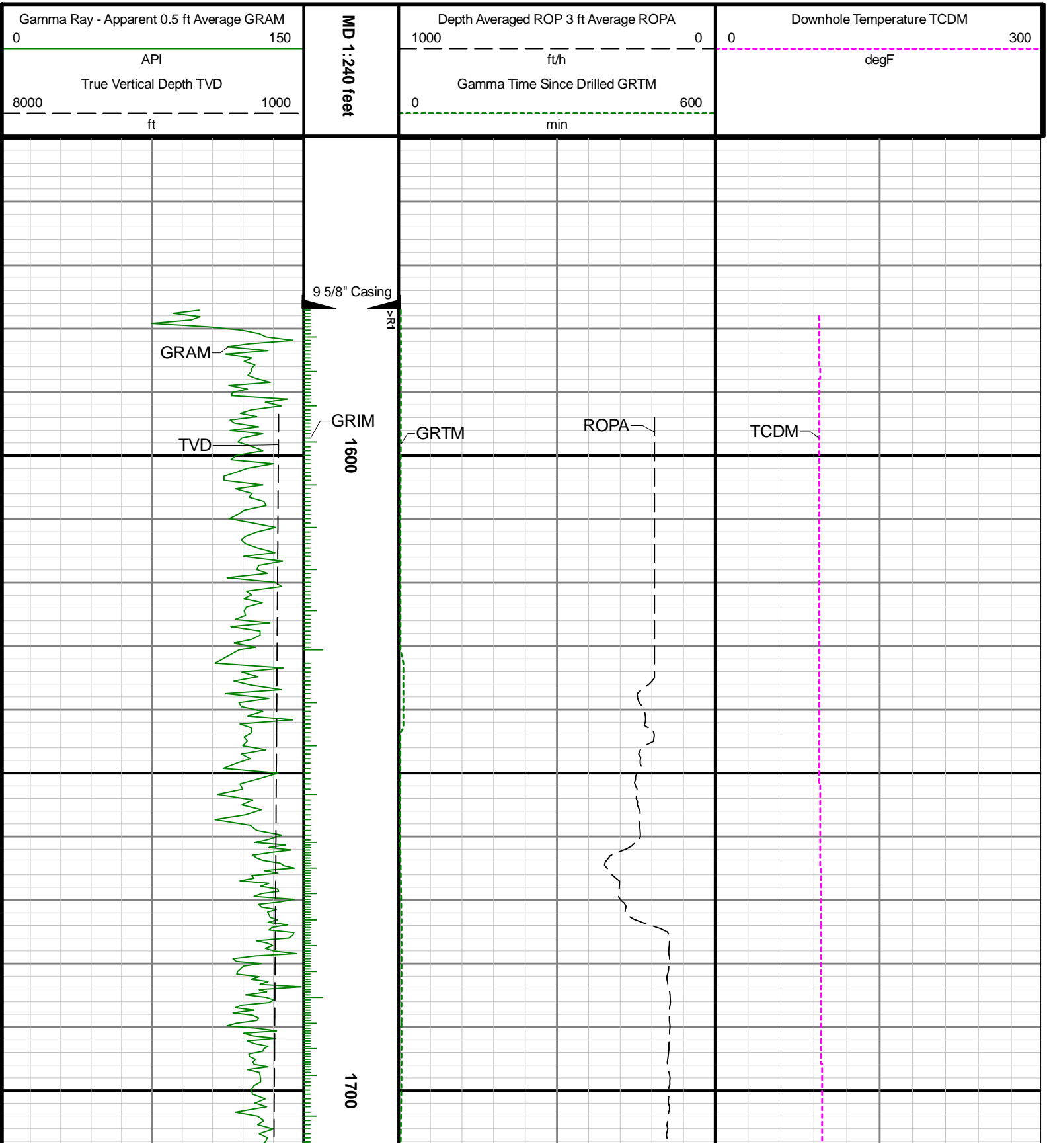
- 1
- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes, a GE Company (BHGE). Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
- 2
- BHGE LWD runs 1 and 2 utilized a 6.75 inch NaviGamma service (Directional and Gamma Ray) behind a 8.5 inch bit and rotary steerable assembly from 1577 to 18136 feet MD (1577 to 6926 feet TVD).
- 3
- "Date To" indicates the date and time the well reached Total Depth (TD) and logging services ended.

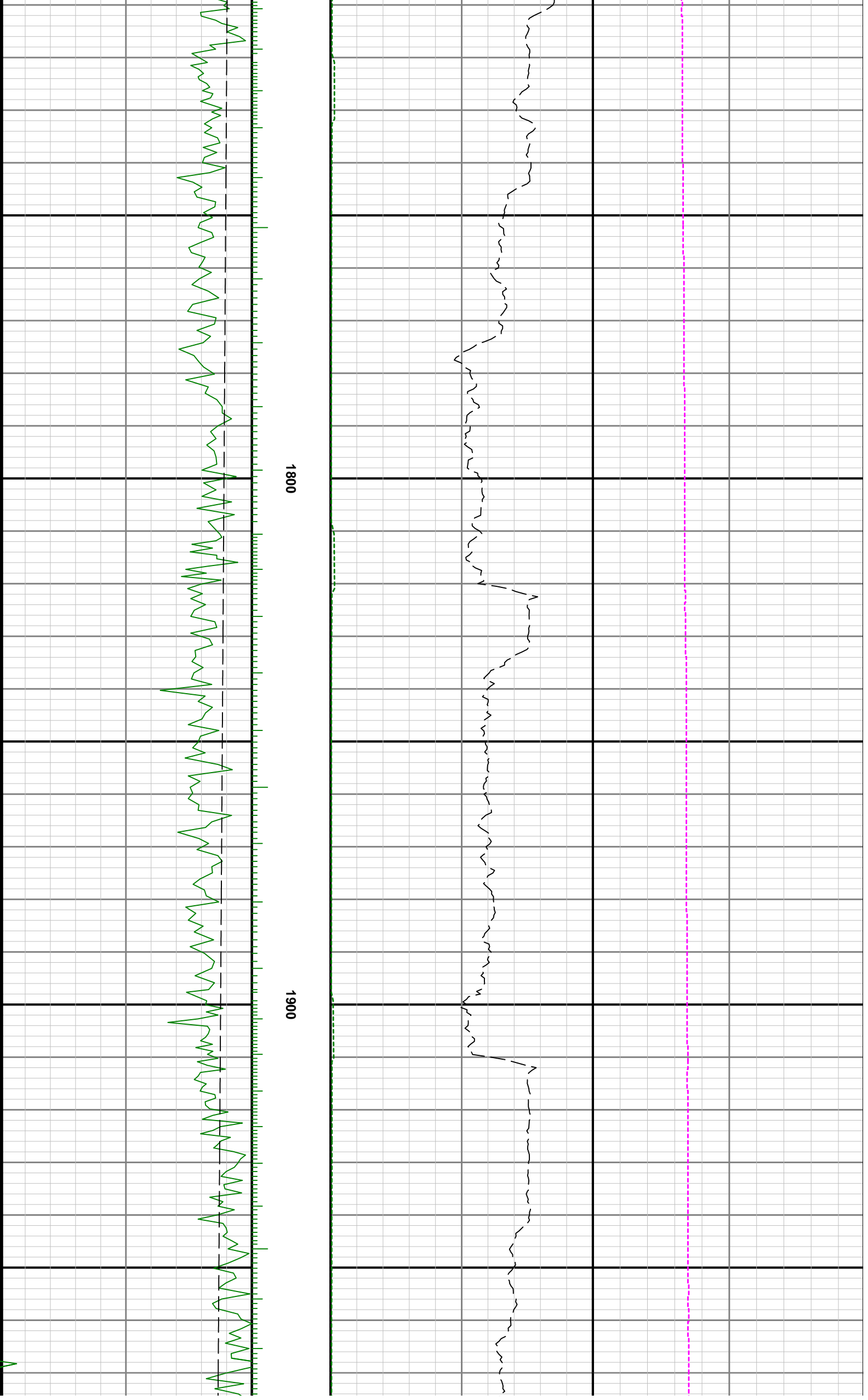
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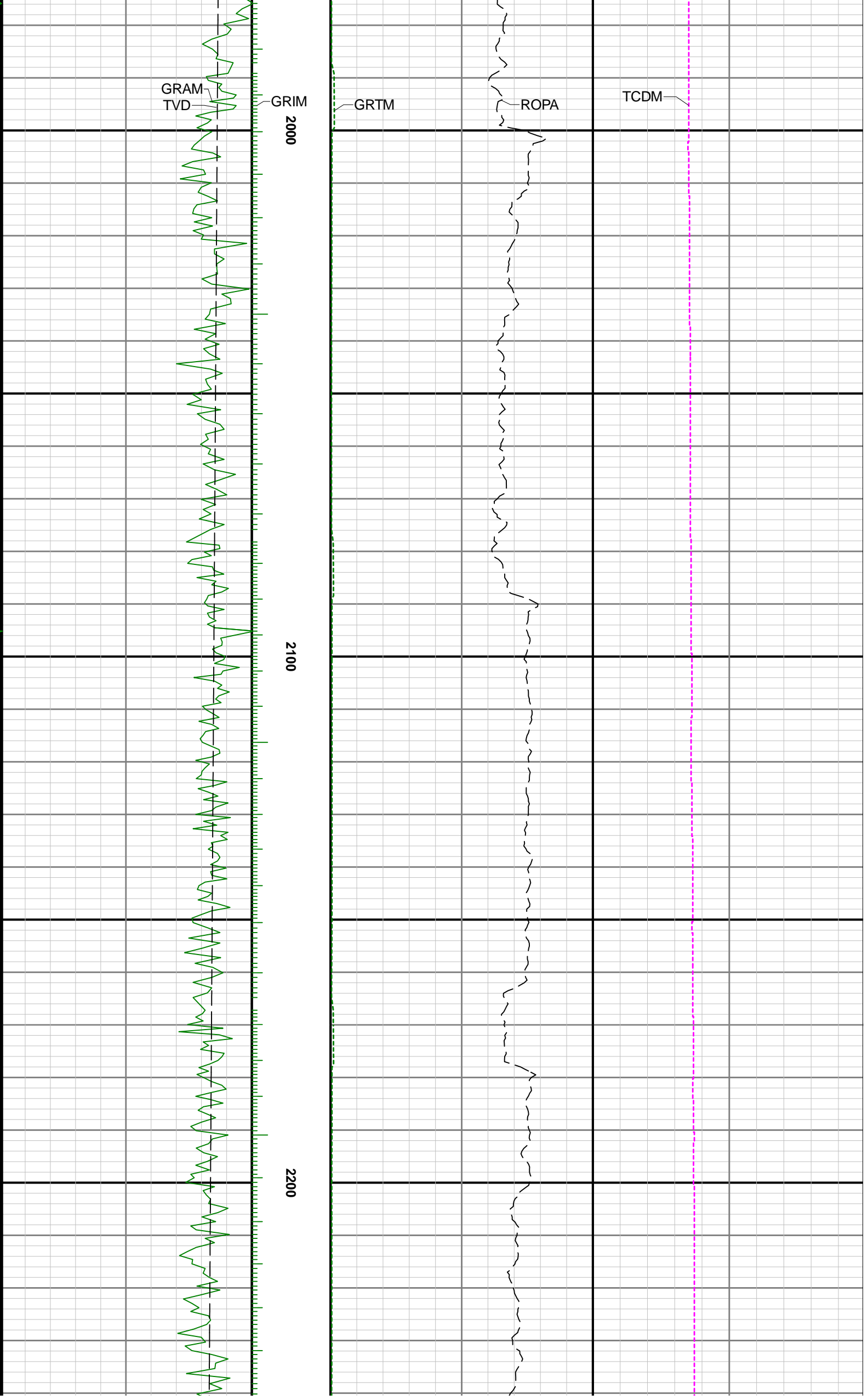
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	8945.00	8.500	1	The interval from 8939 to 8952 feet MD (6919 feet TVD) was logged up to 9.5 hours after being drilled due to a trip out of the hole to pick up a new rotary steerable assembly
2	18100.00	8.500	2	The interval from 18123 to 18136 feet MD (6926 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

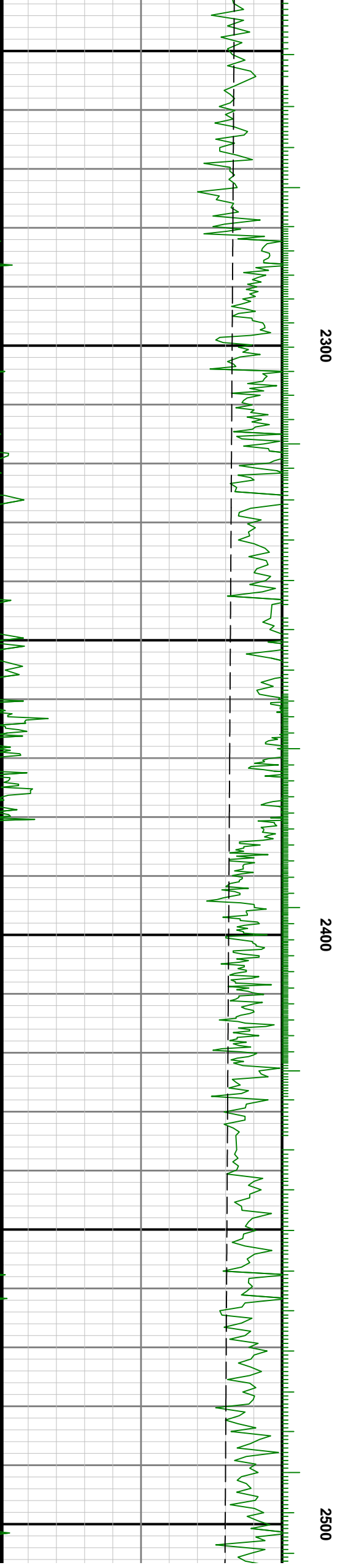
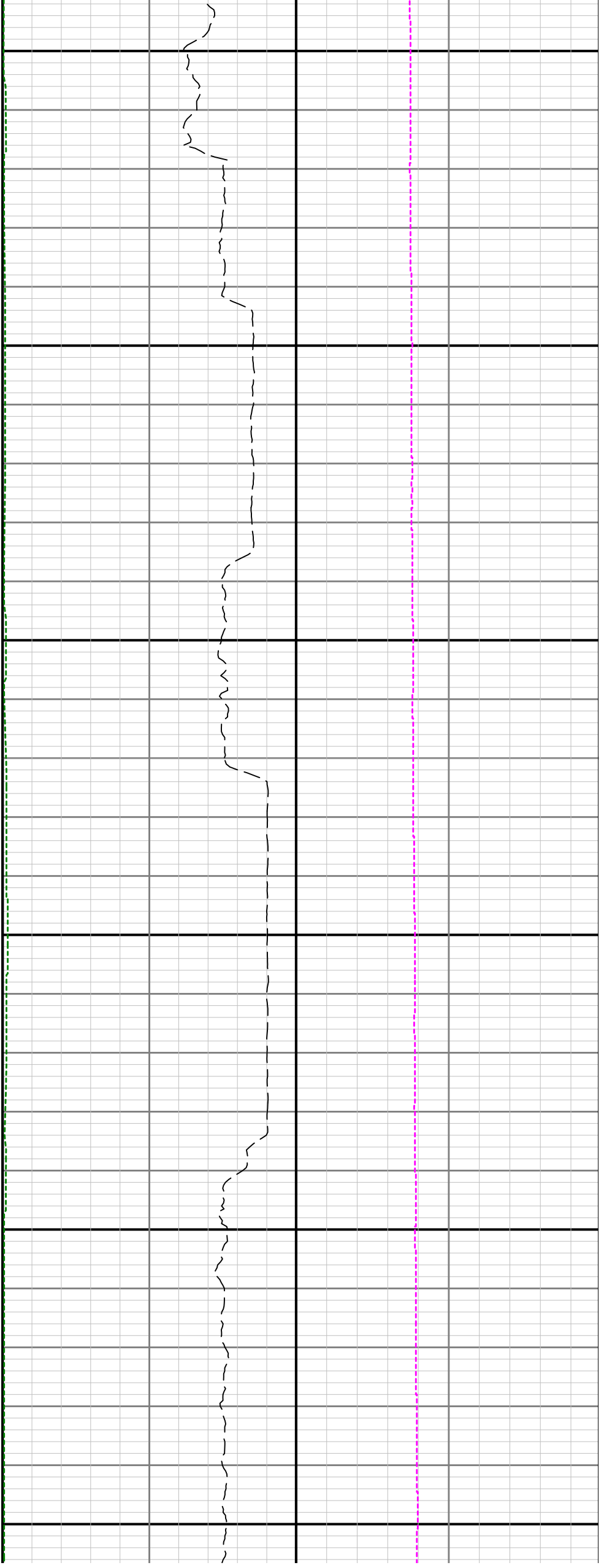
Curve Mnemonics

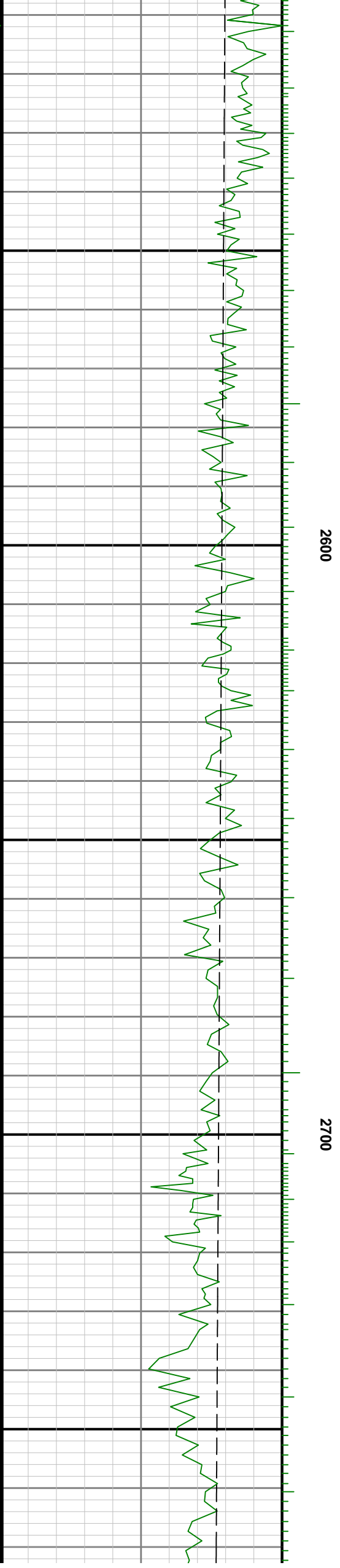
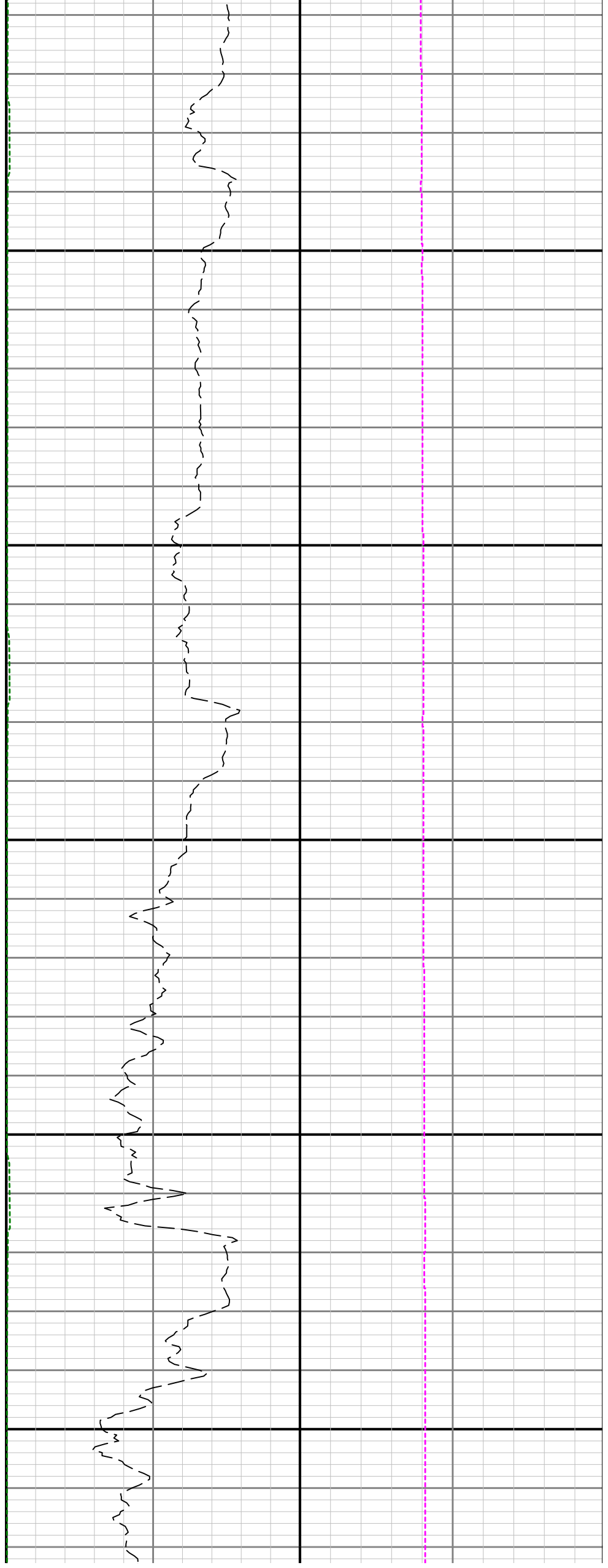
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
TCDM	Directional Real-Time Survey Temperature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

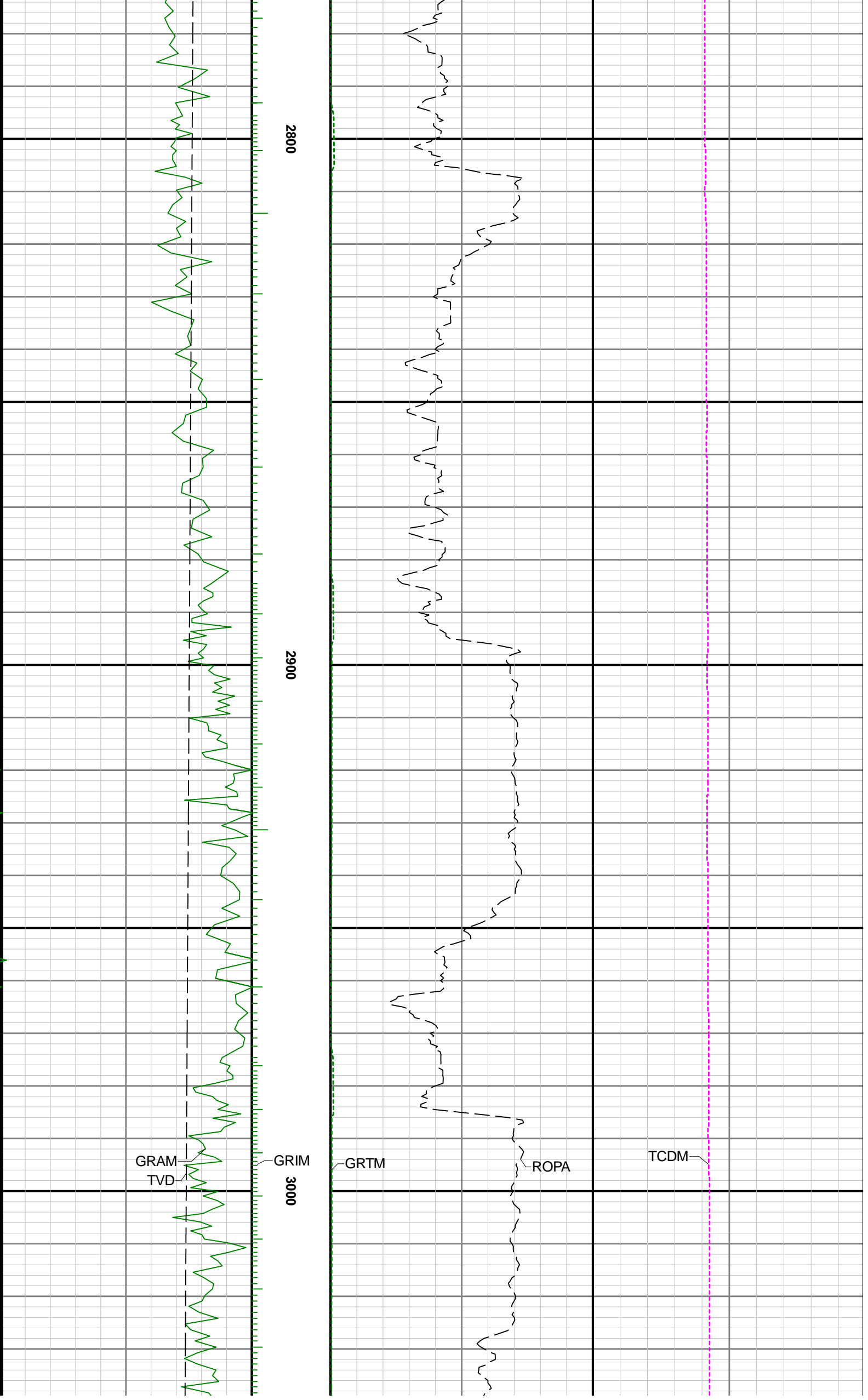


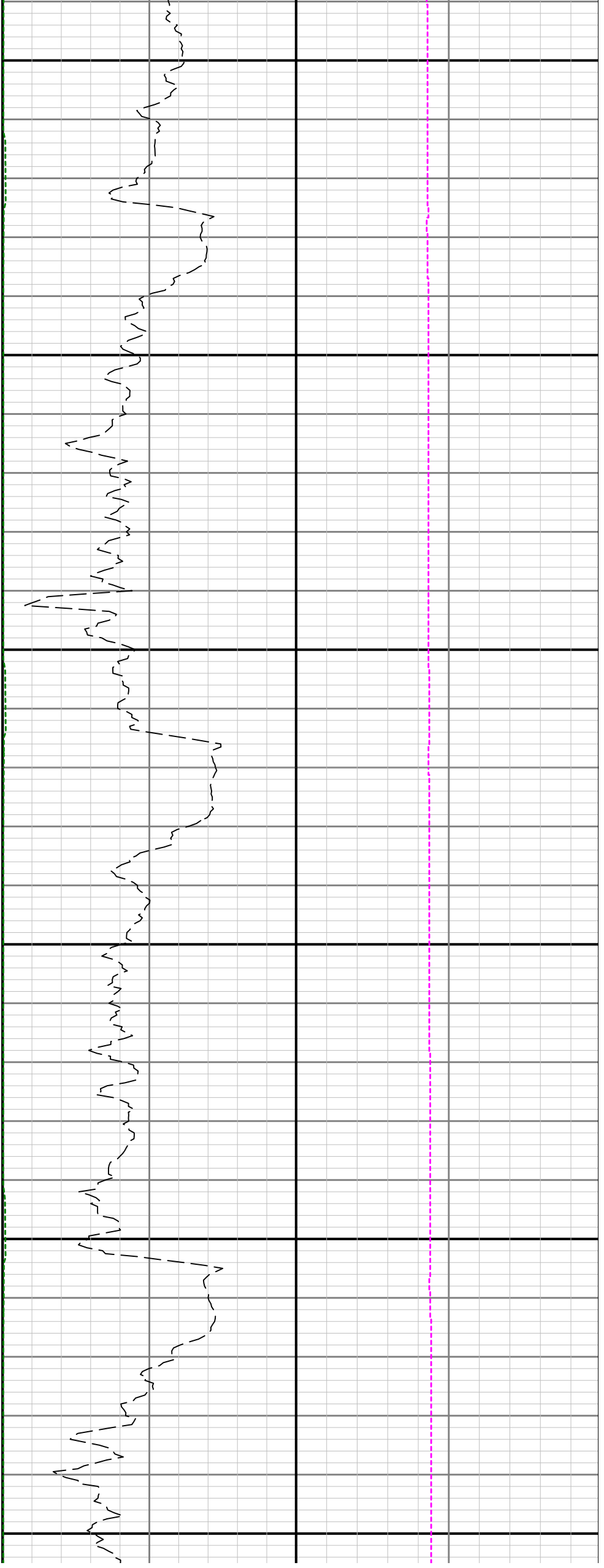








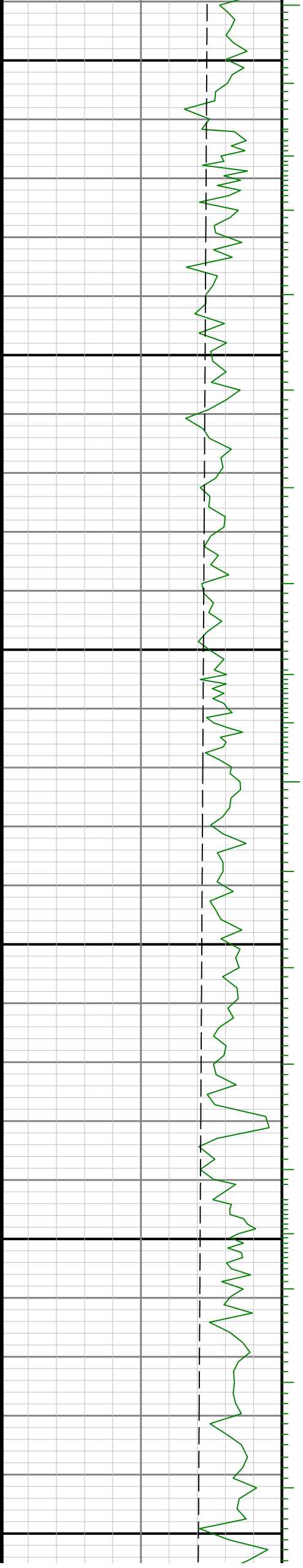


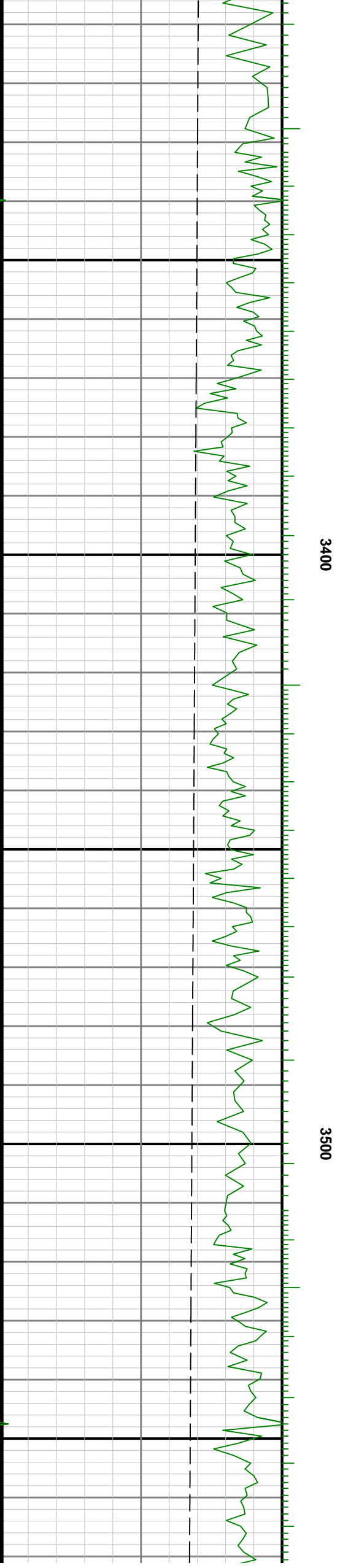
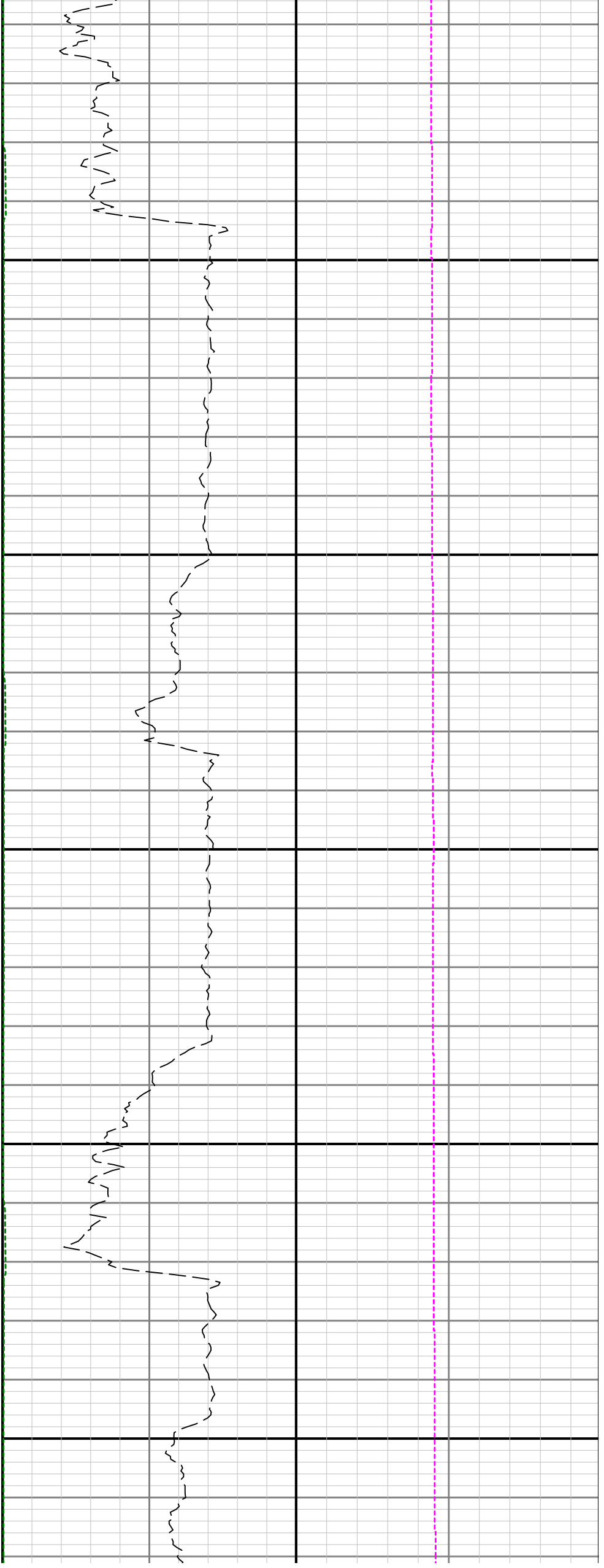


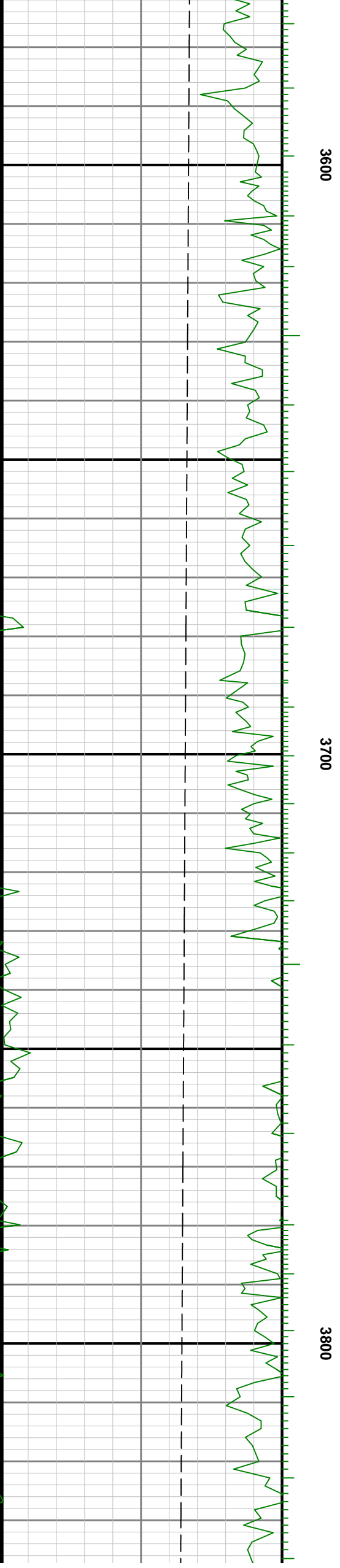
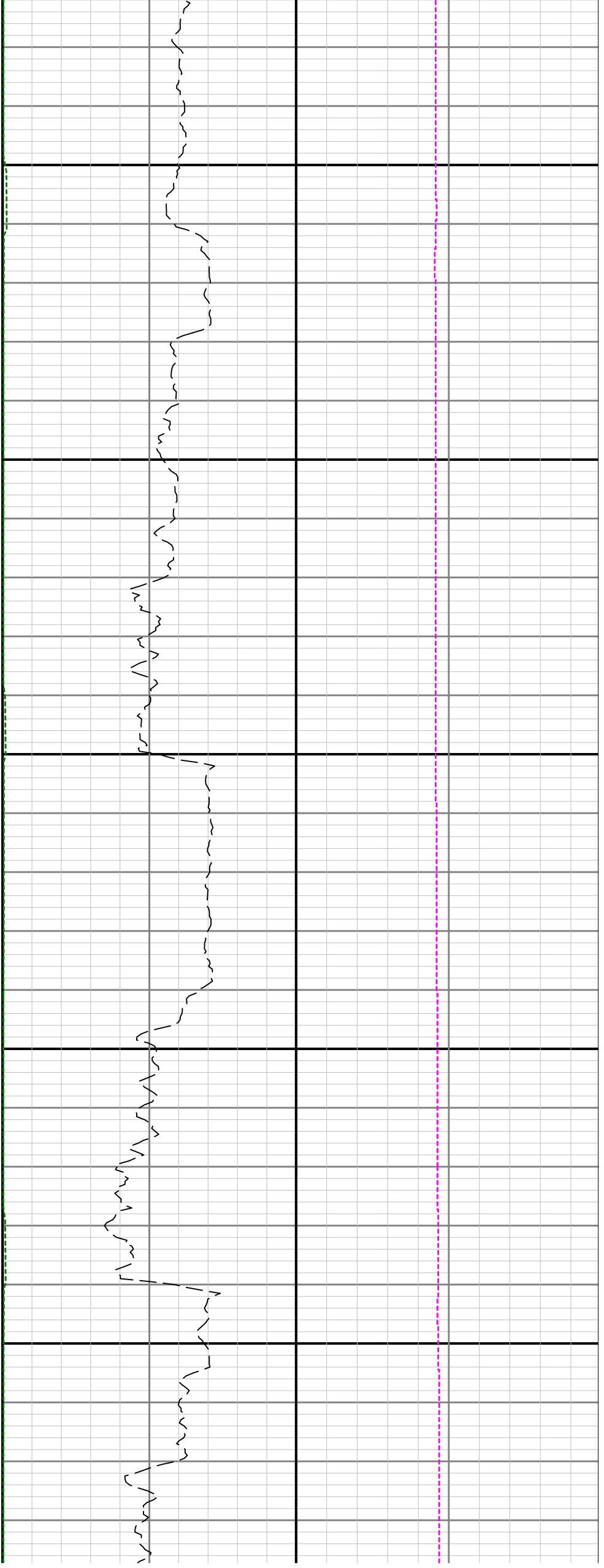
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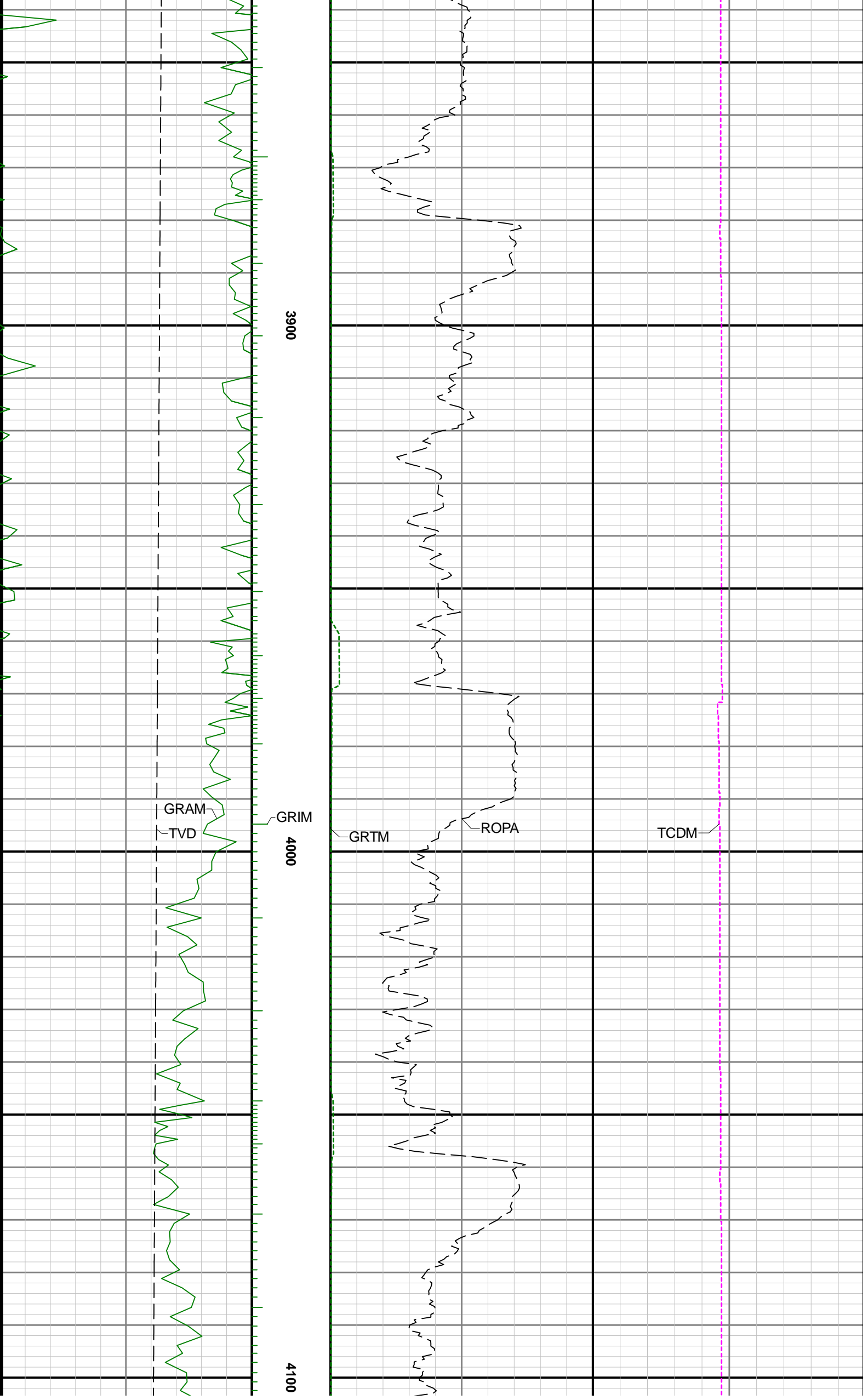
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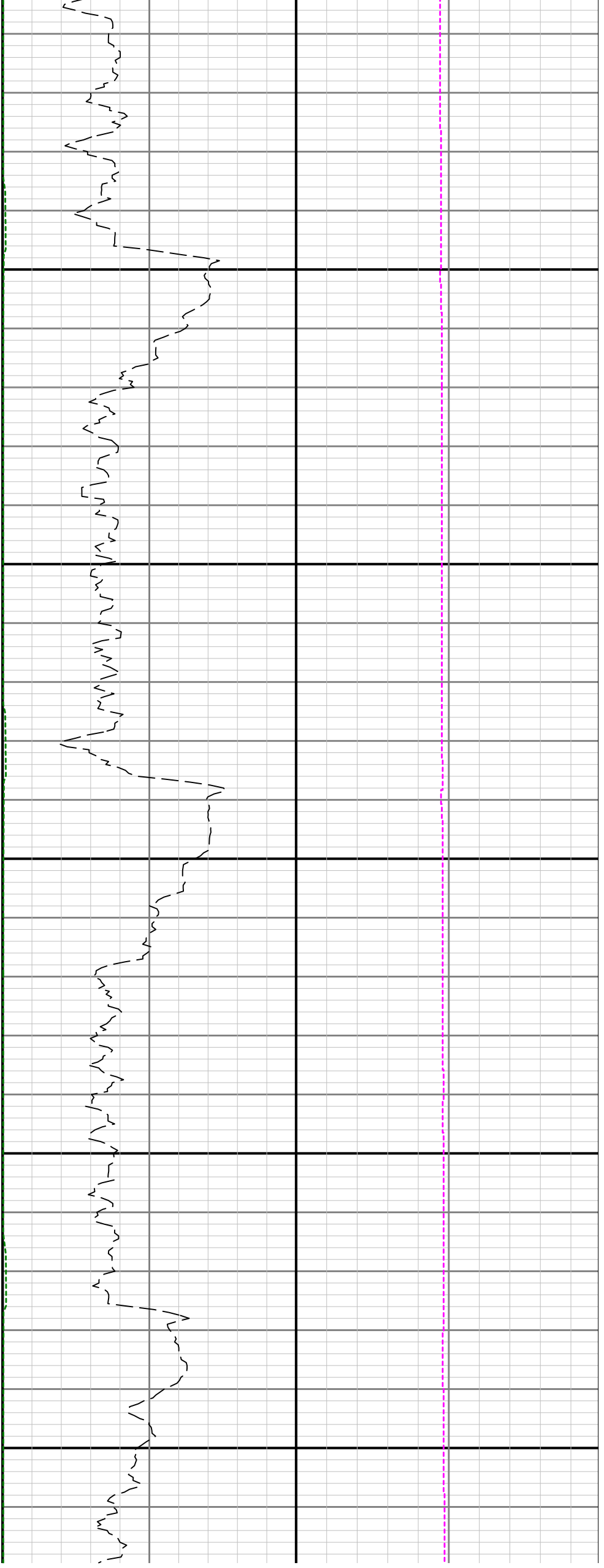
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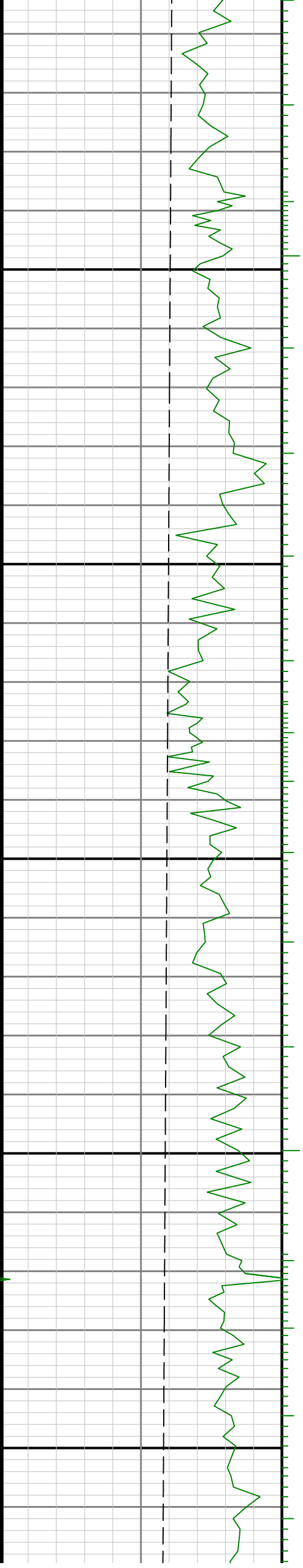


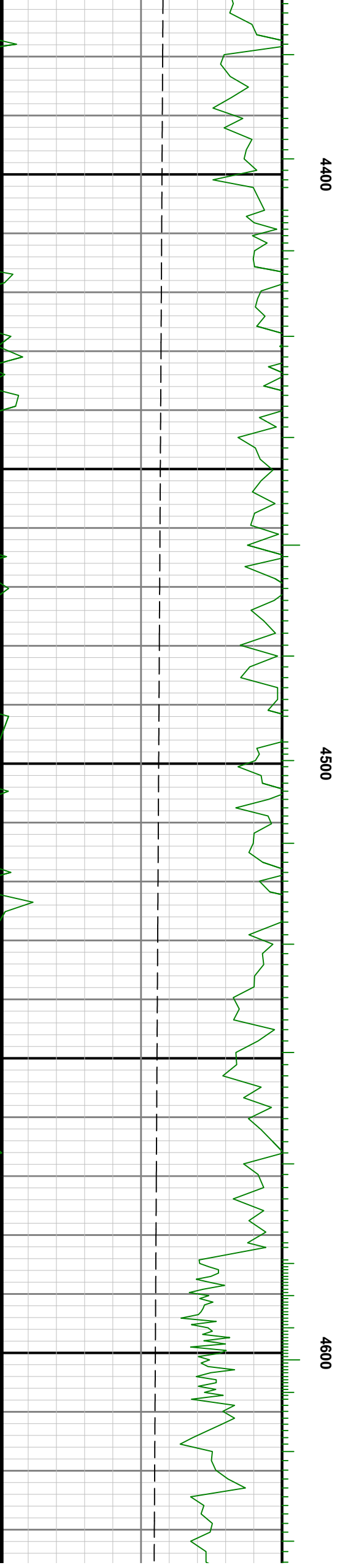
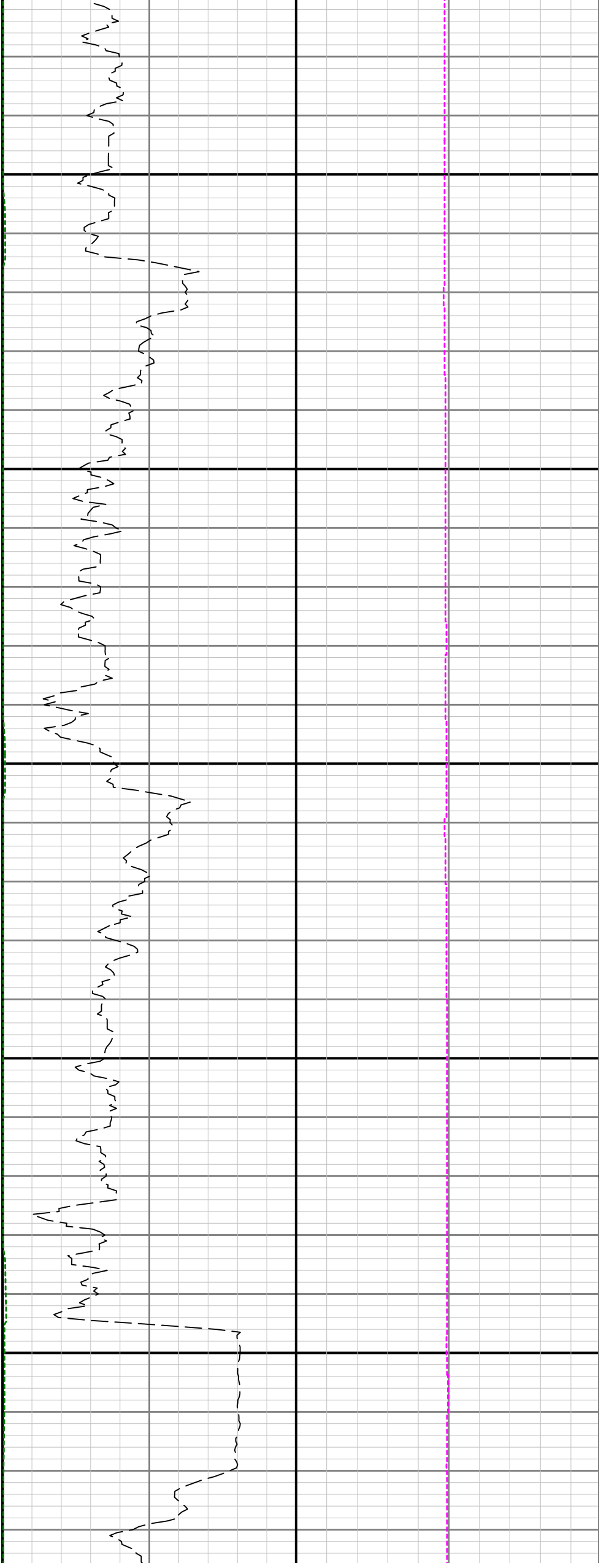


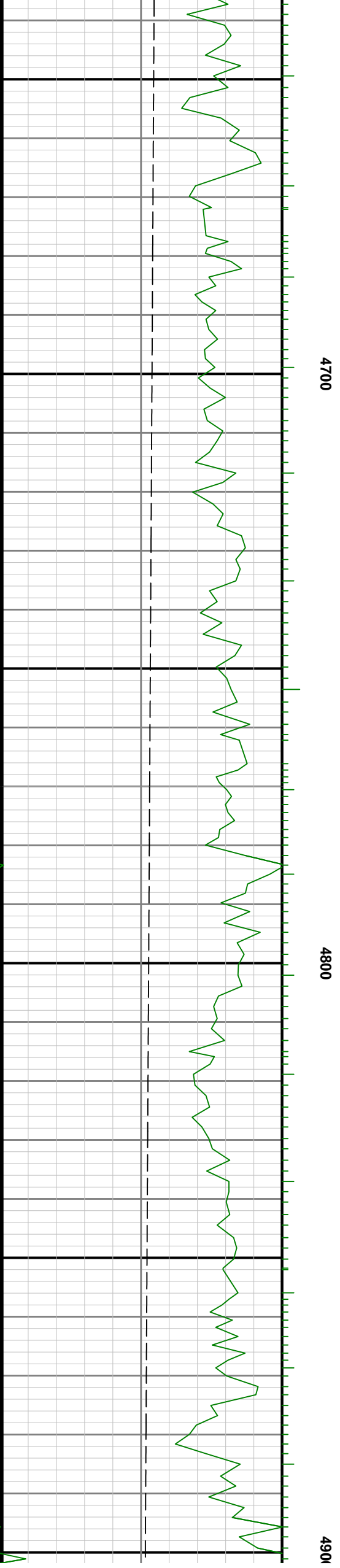
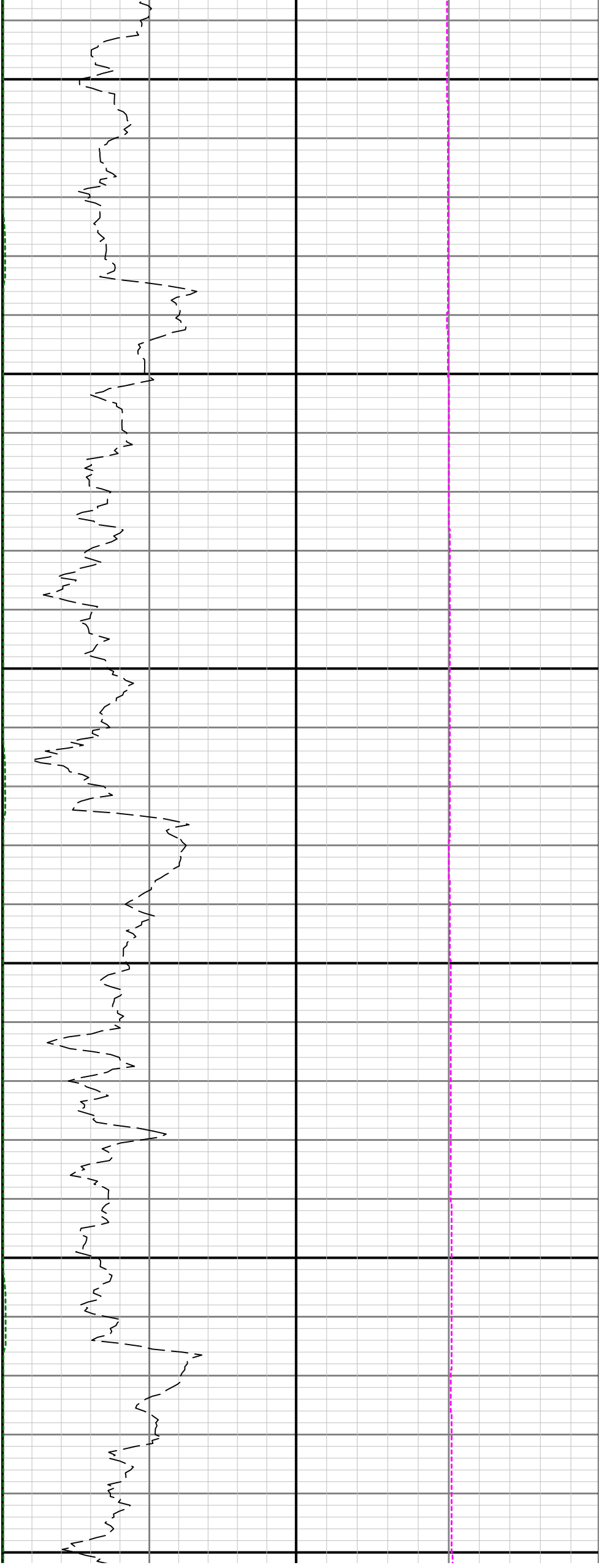


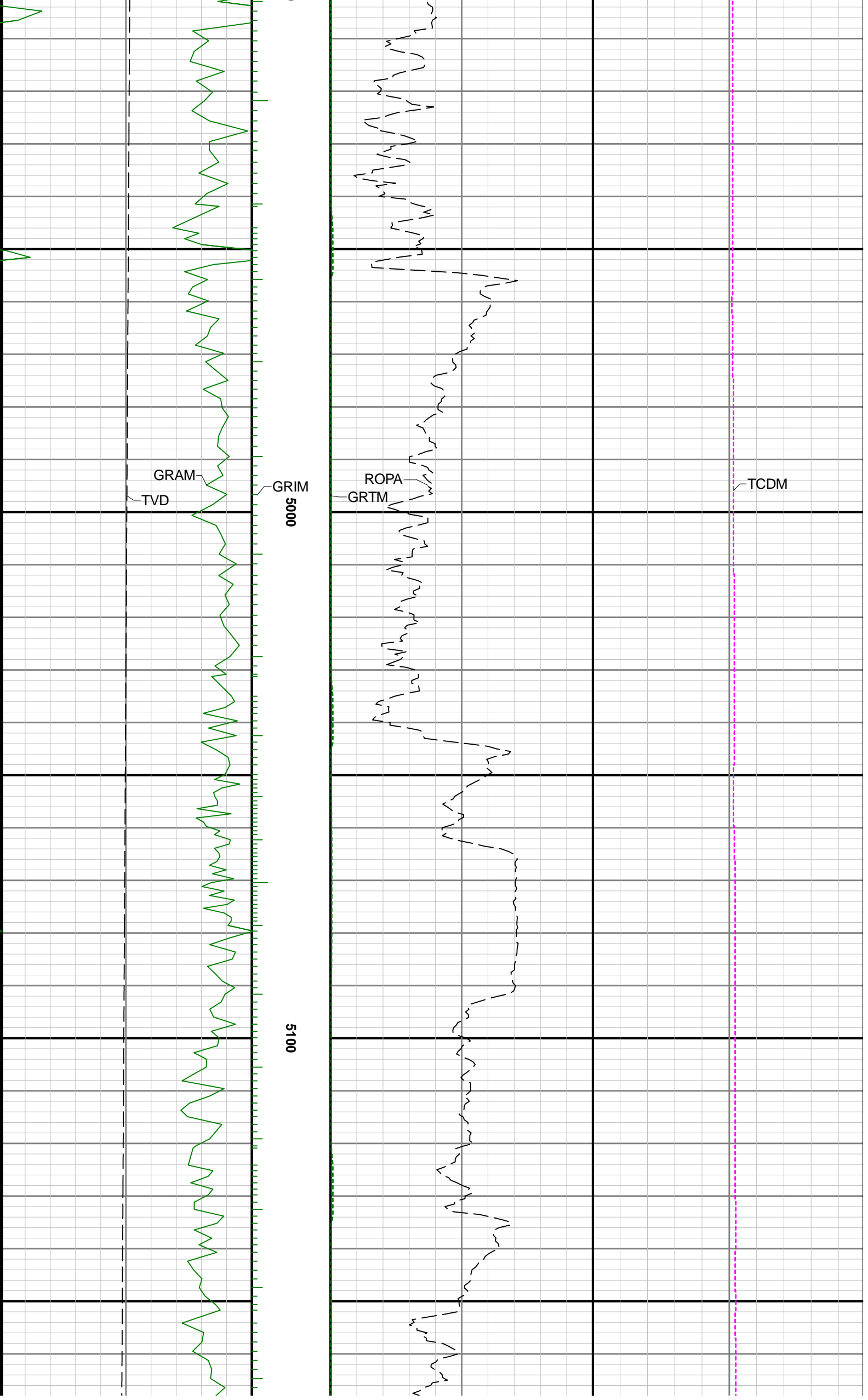
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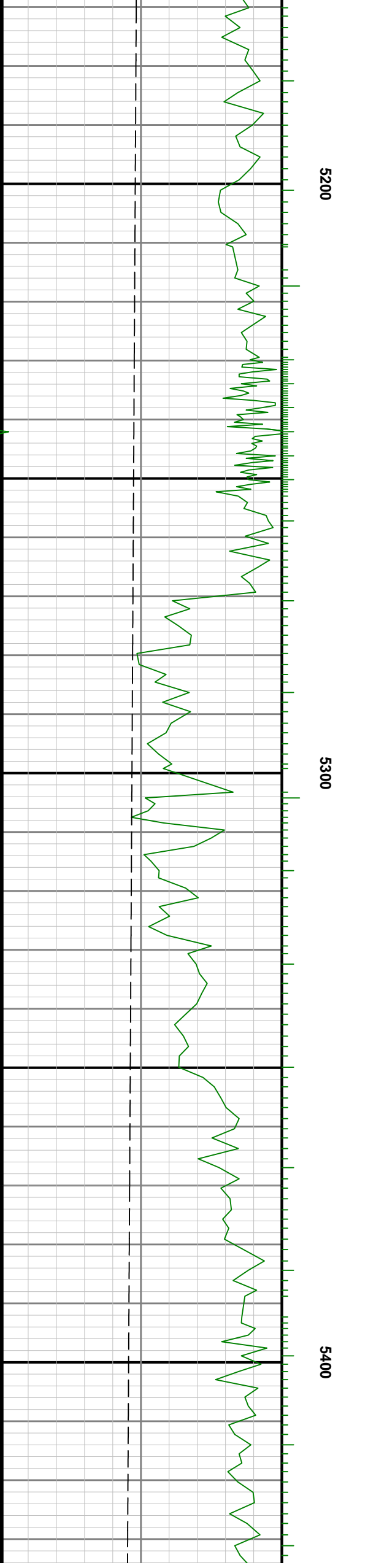
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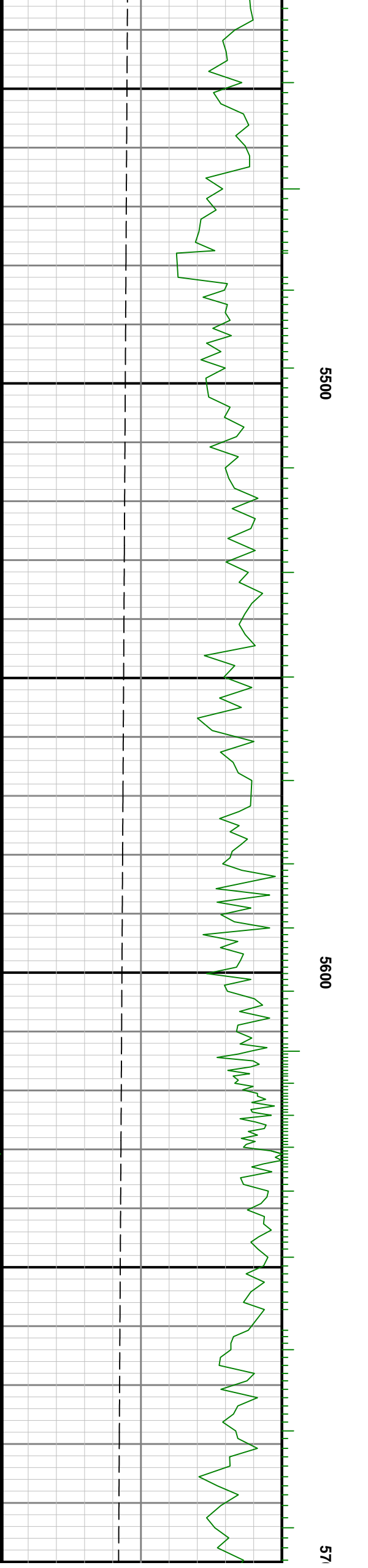


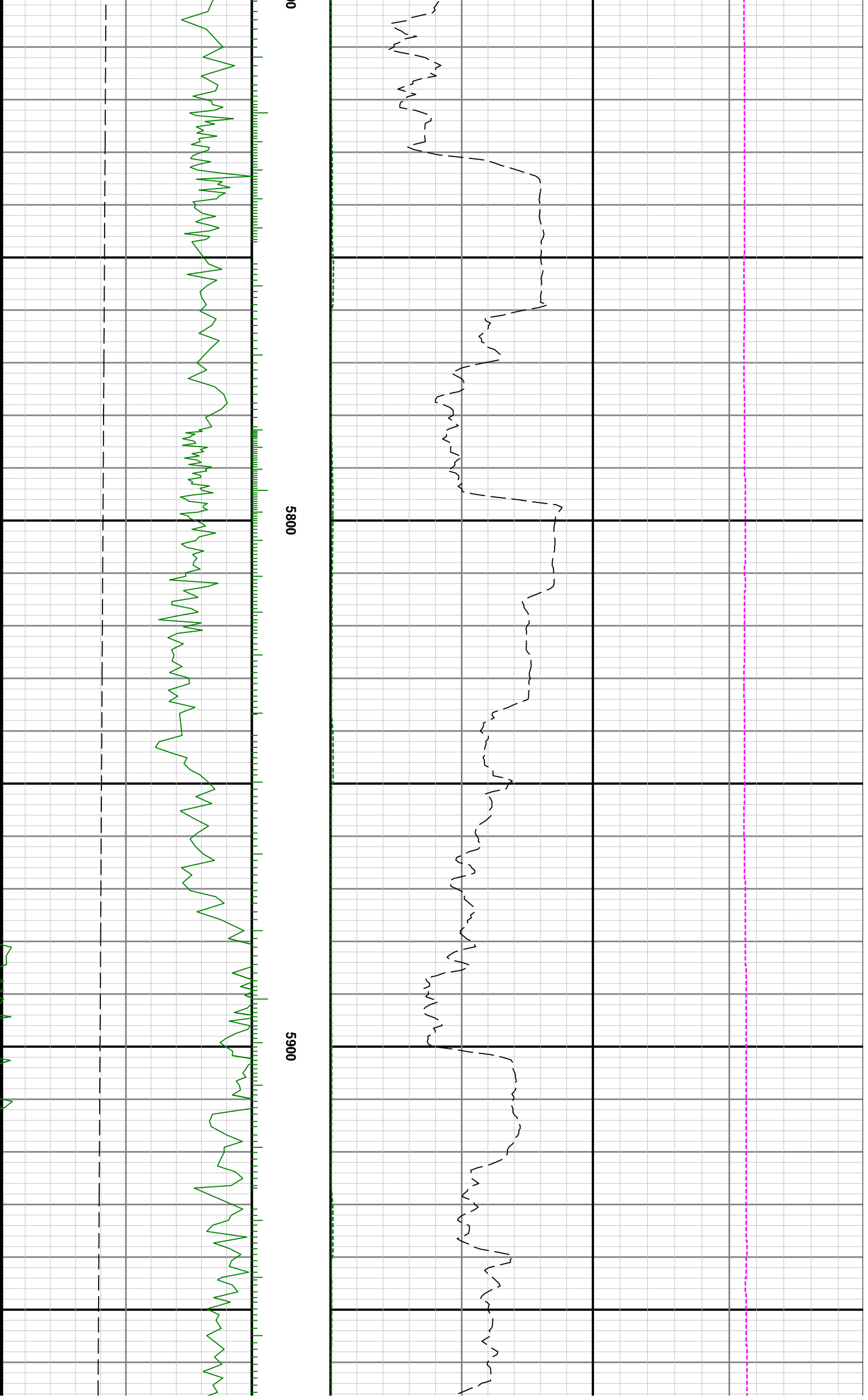


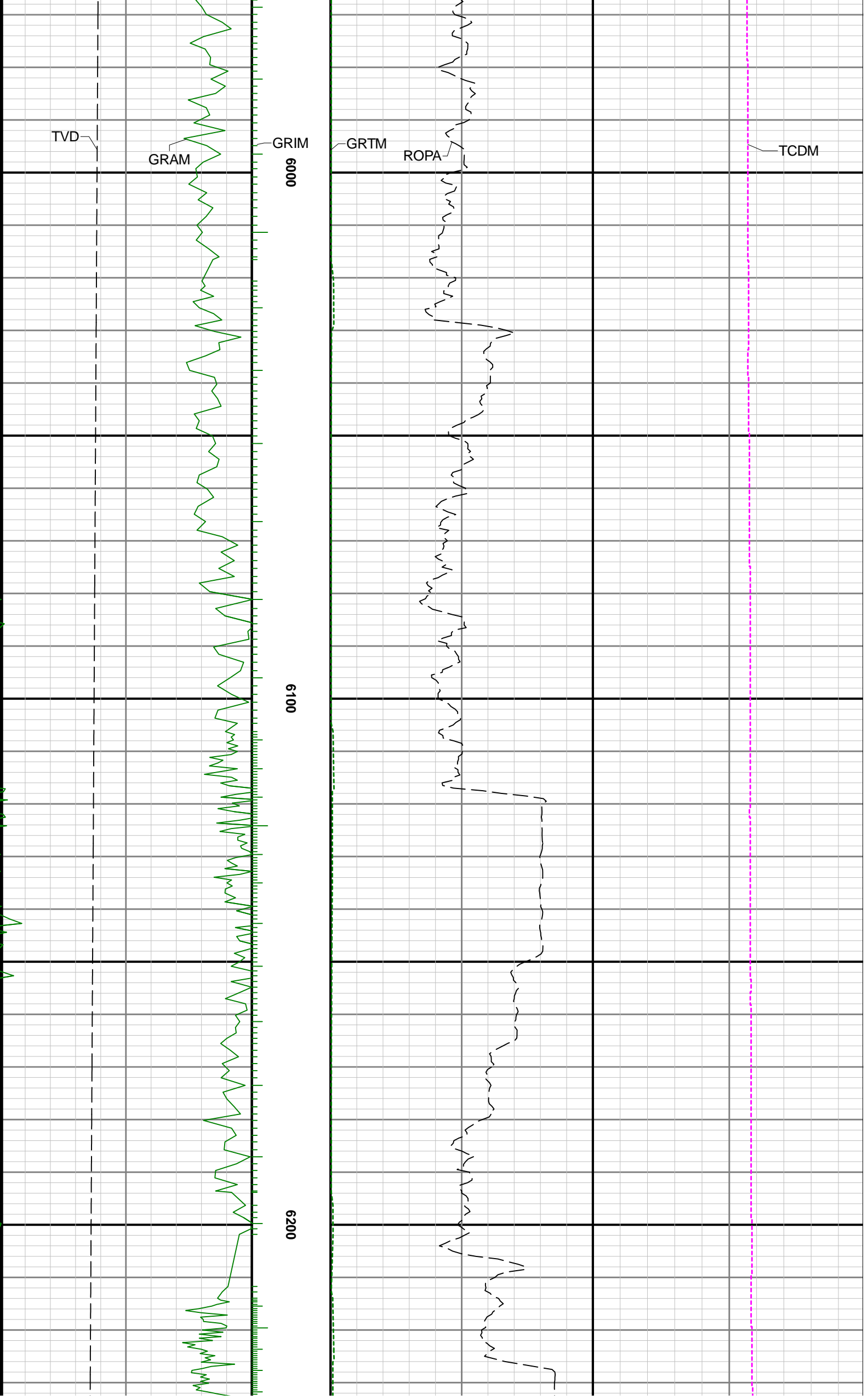


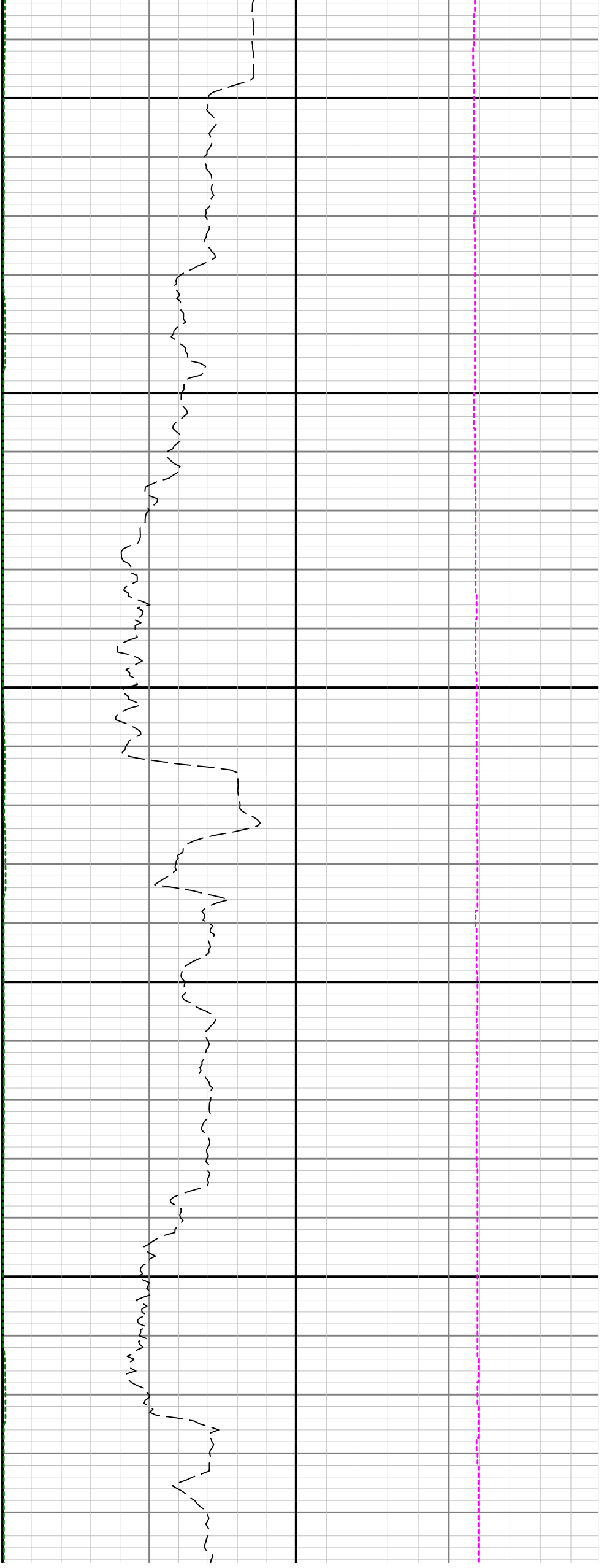








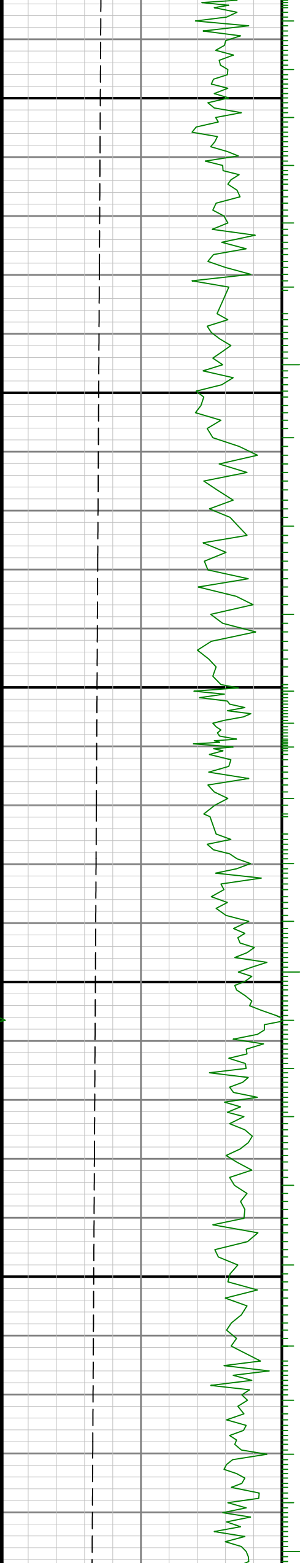


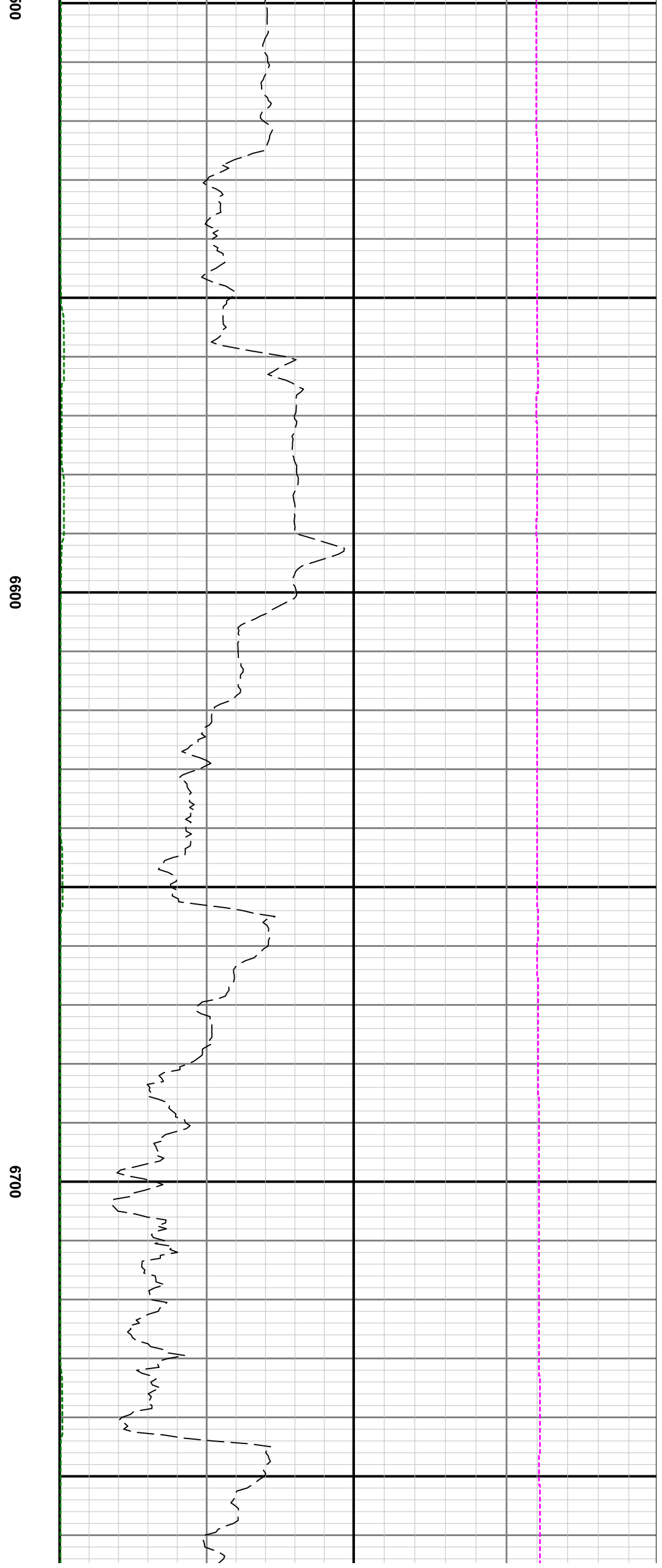
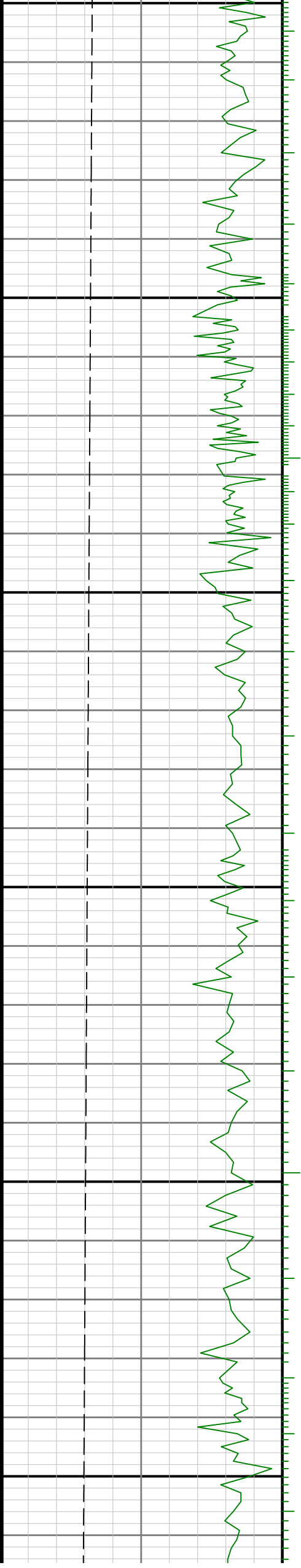


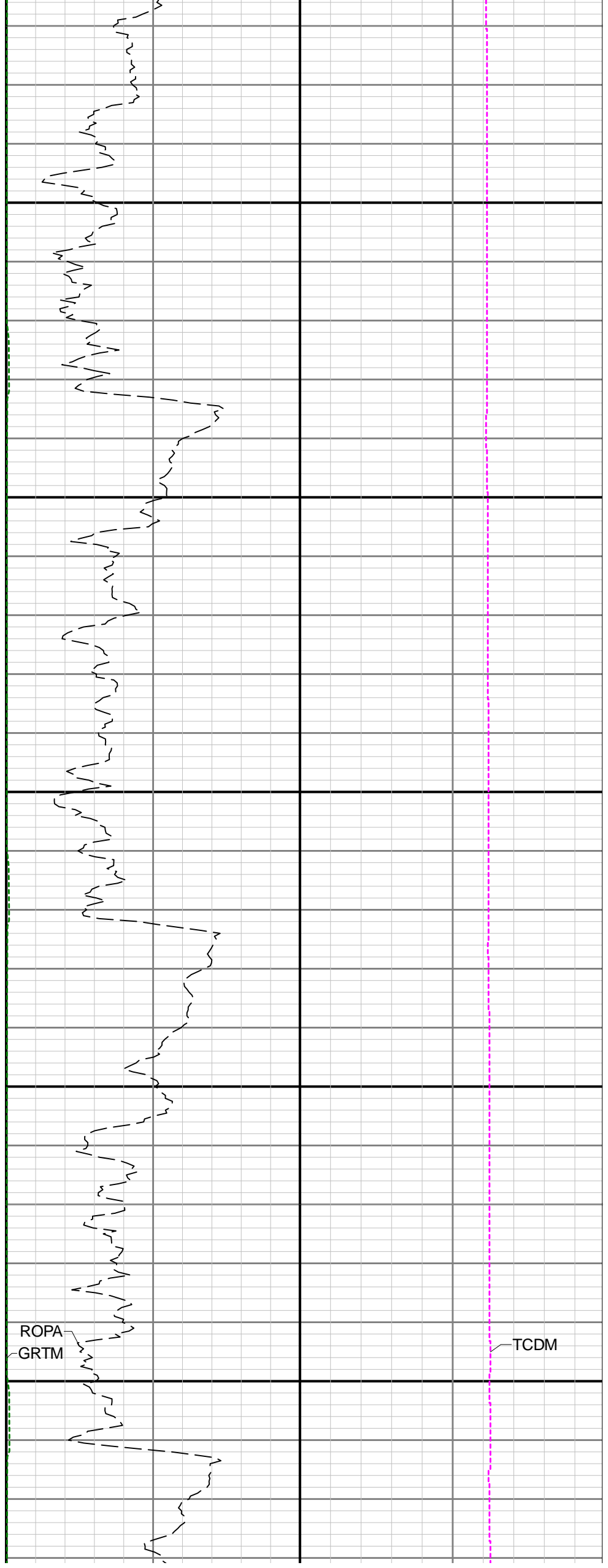
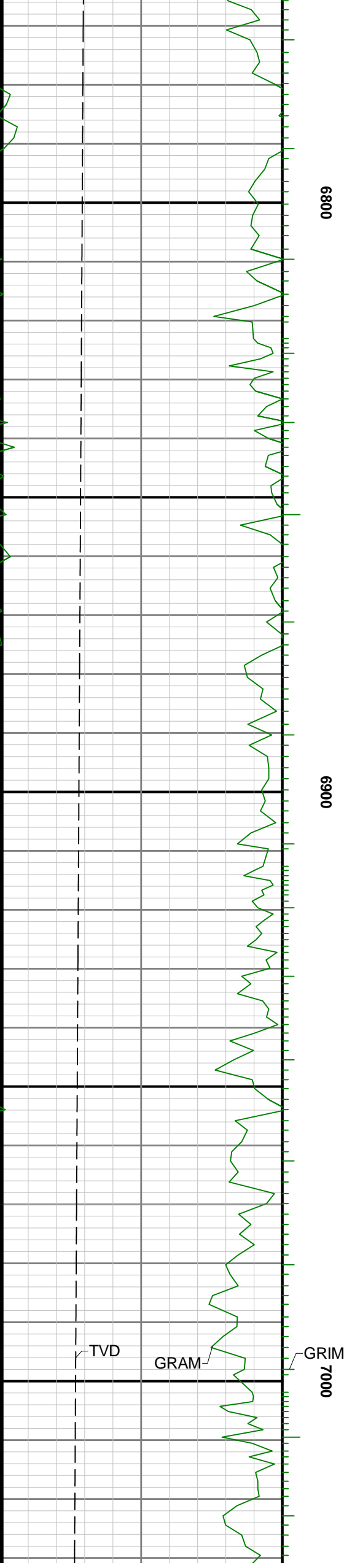
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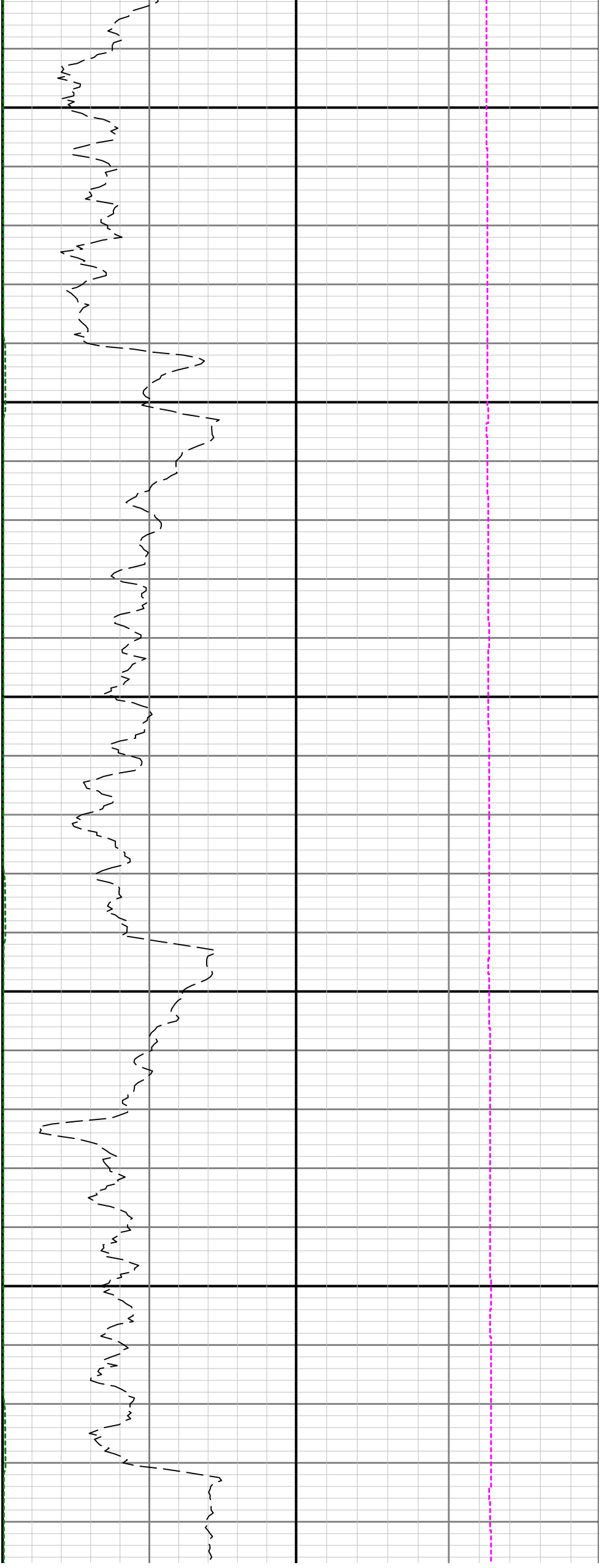
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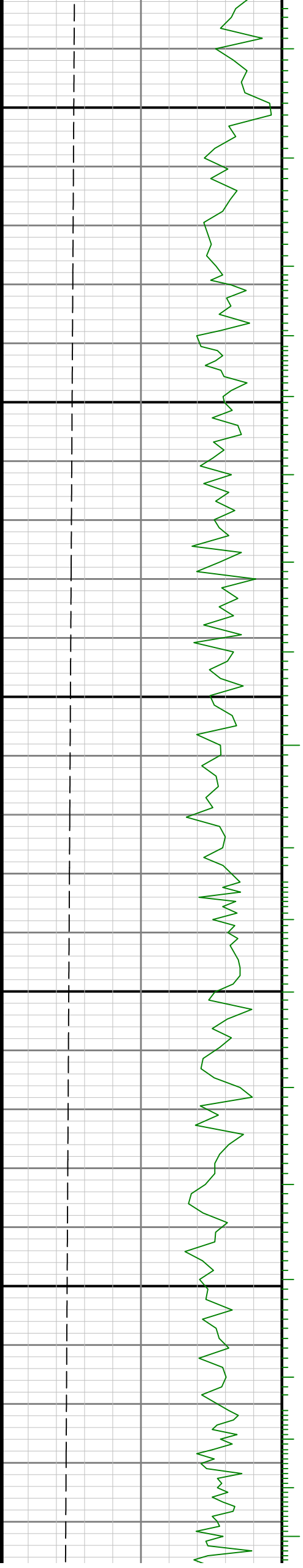


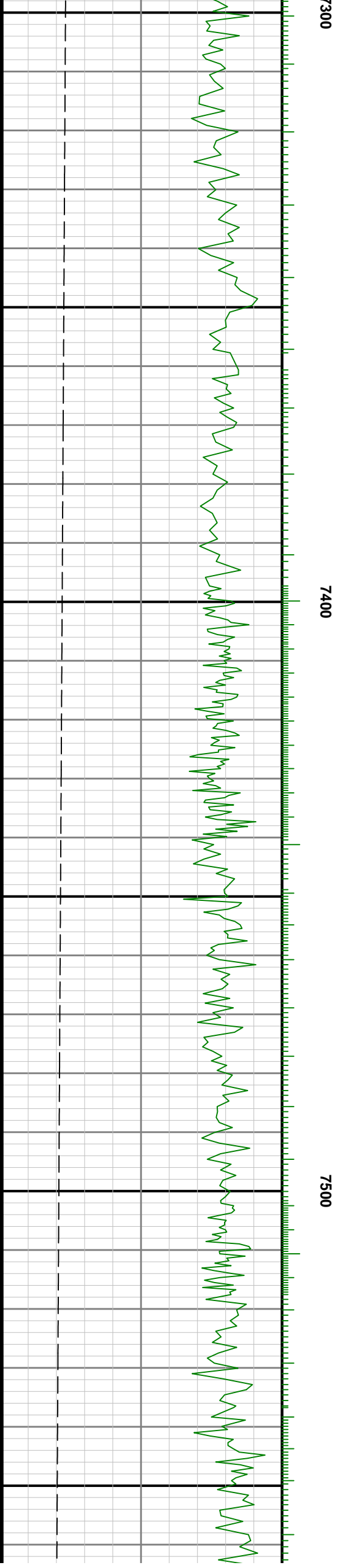
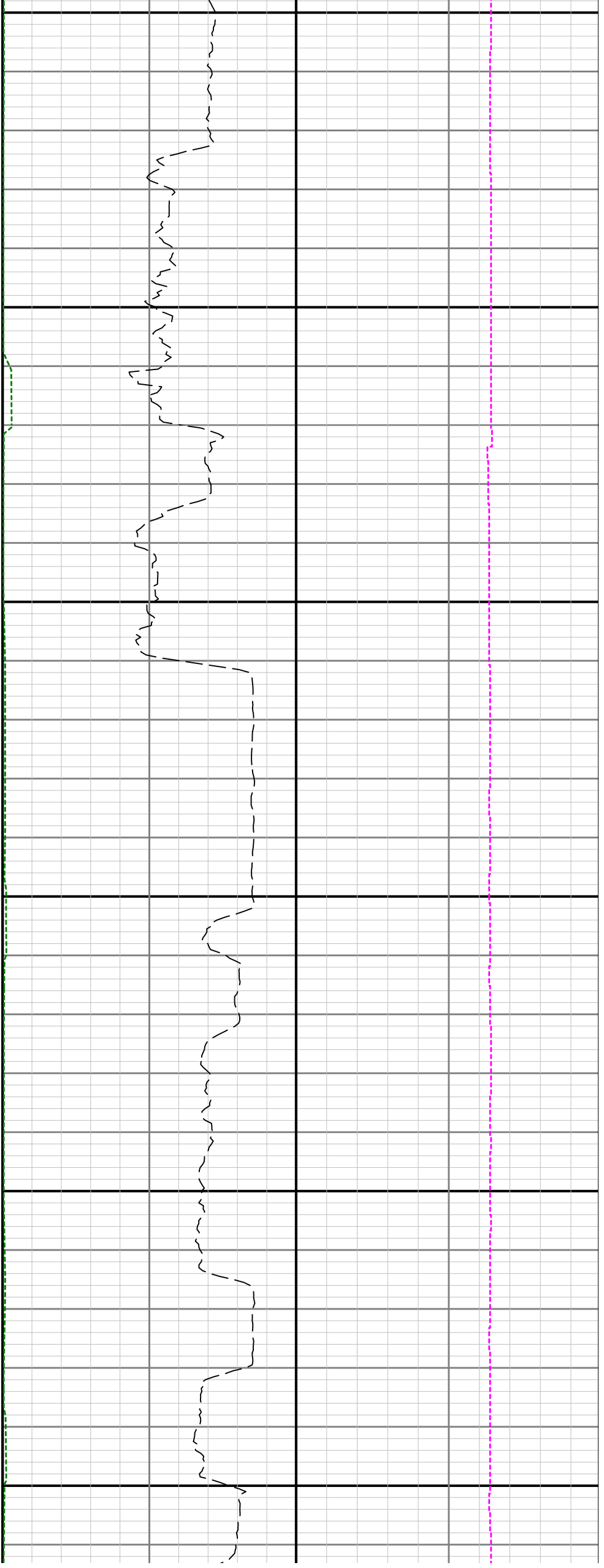


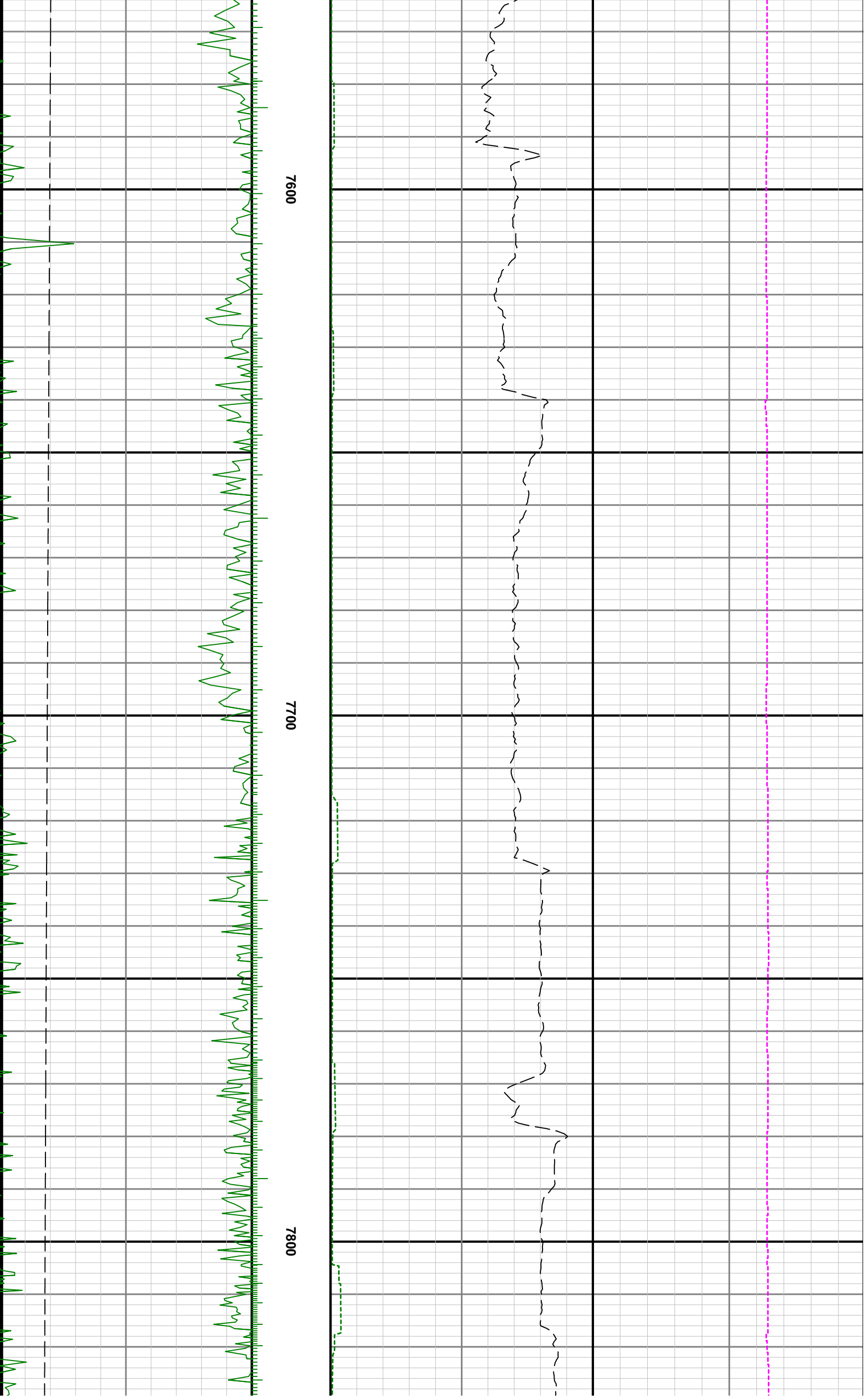


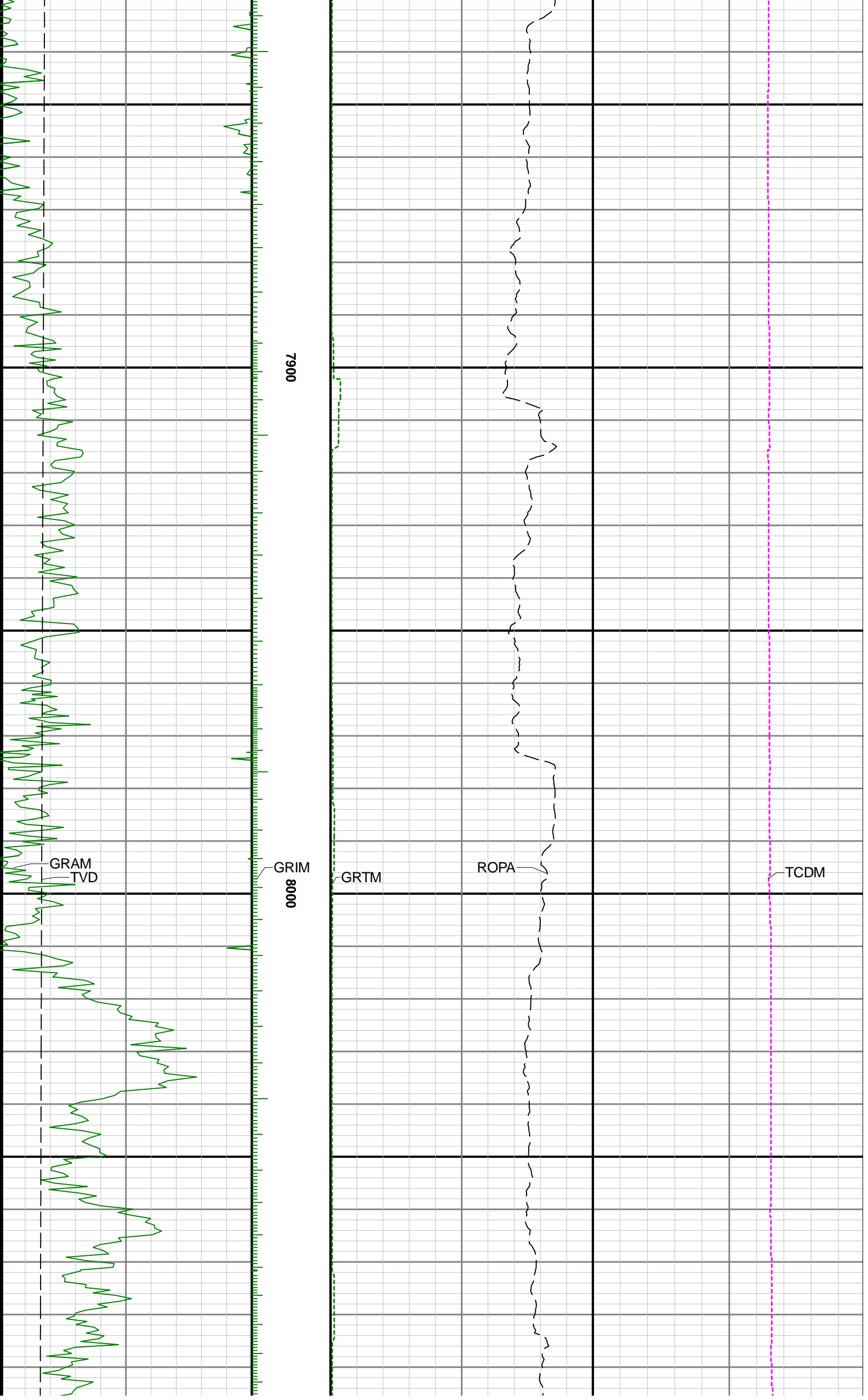
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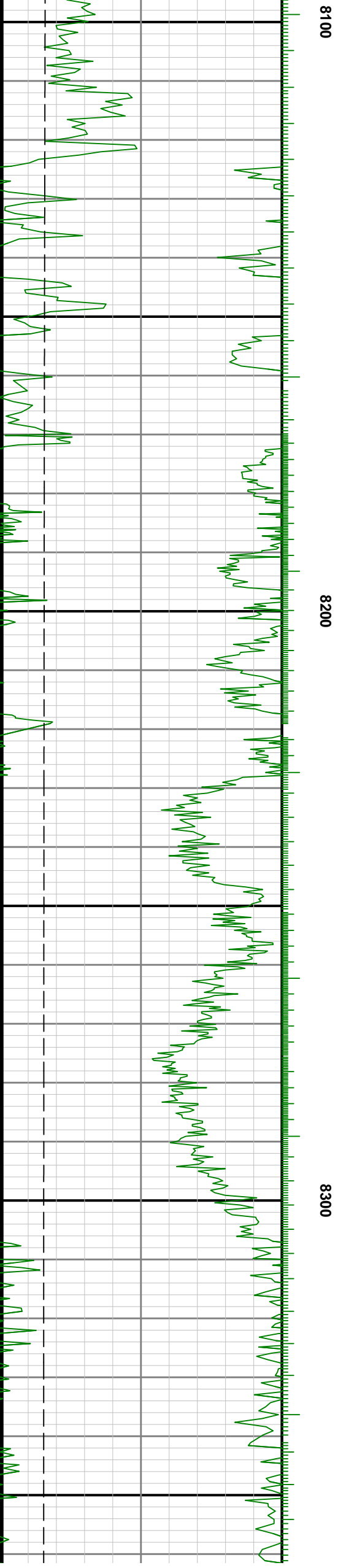
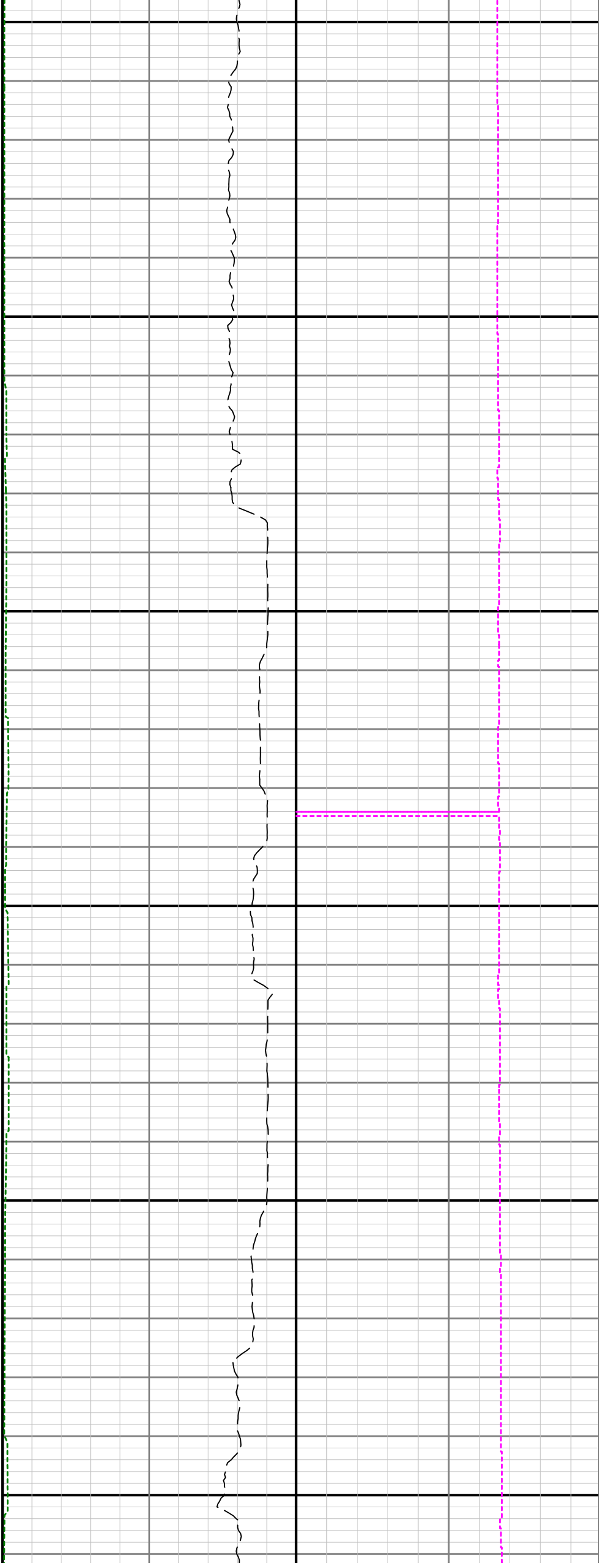
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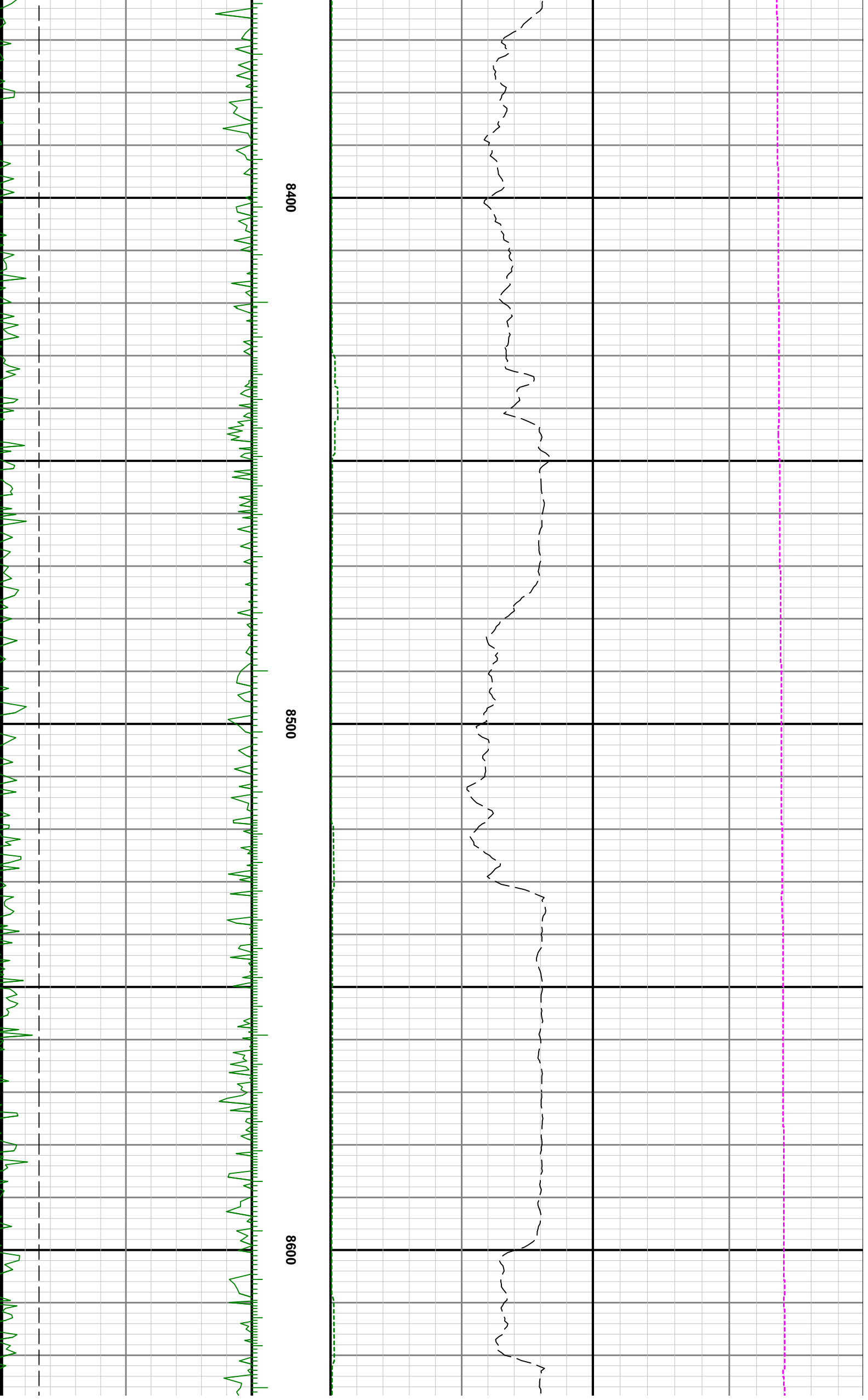


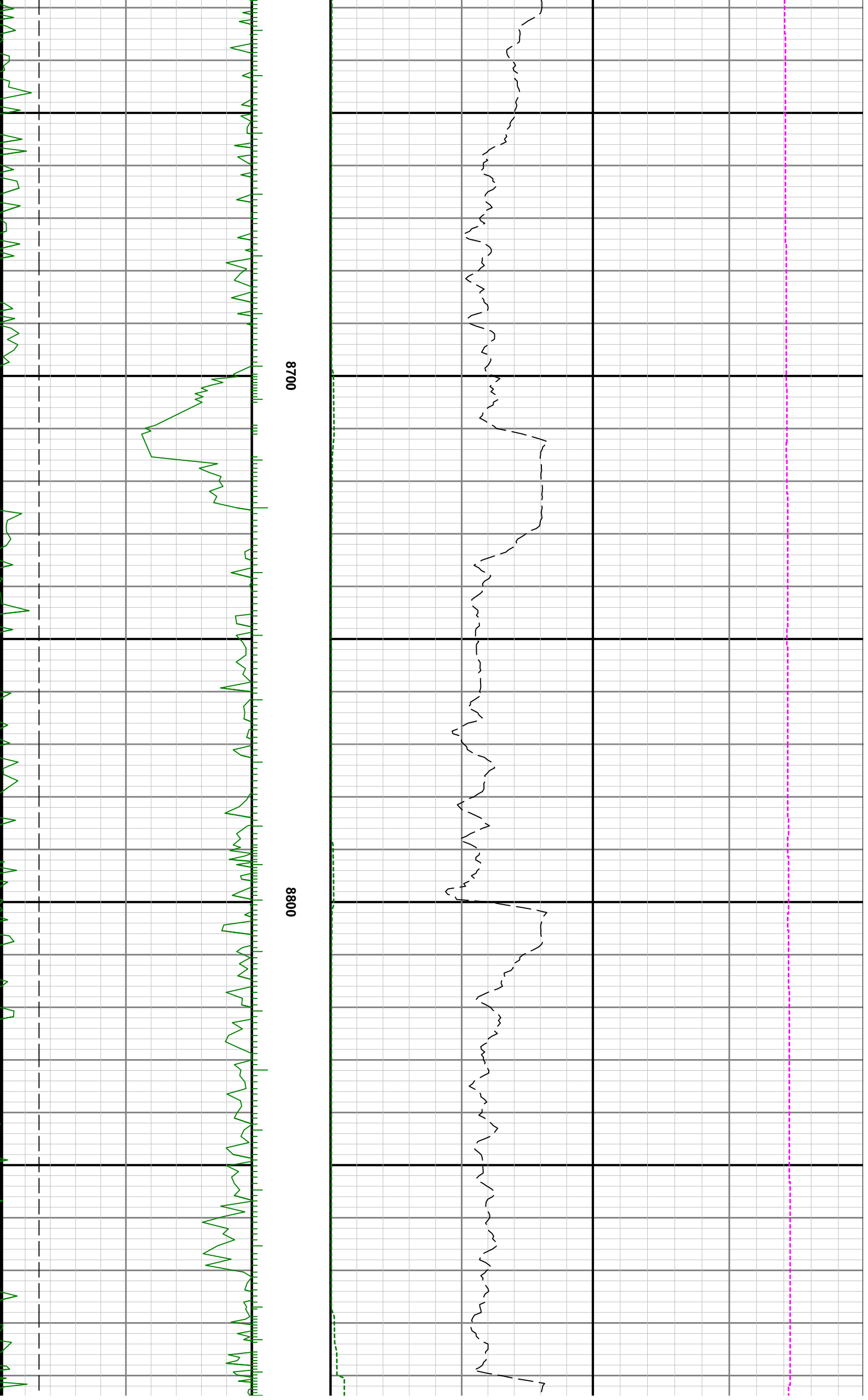


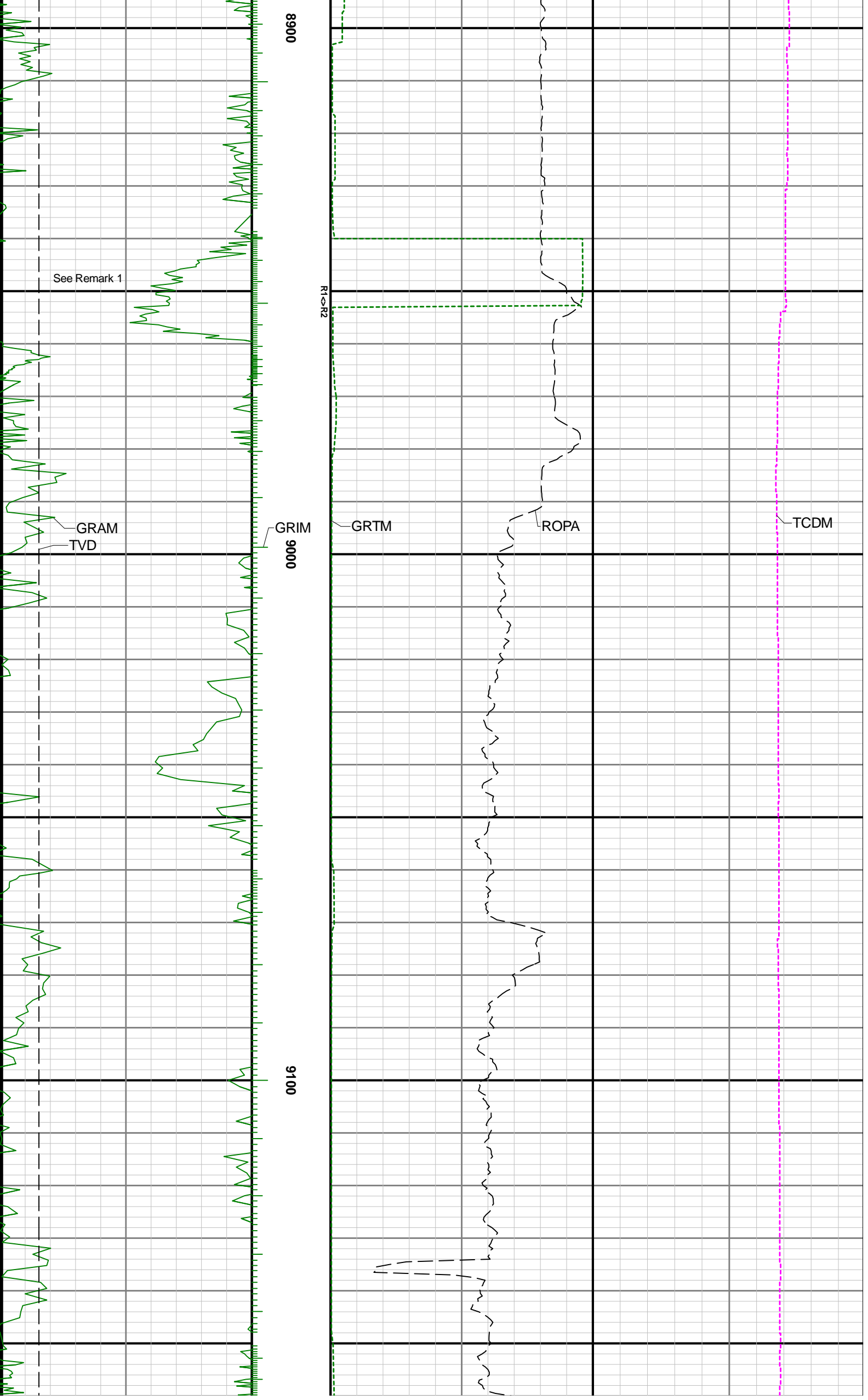


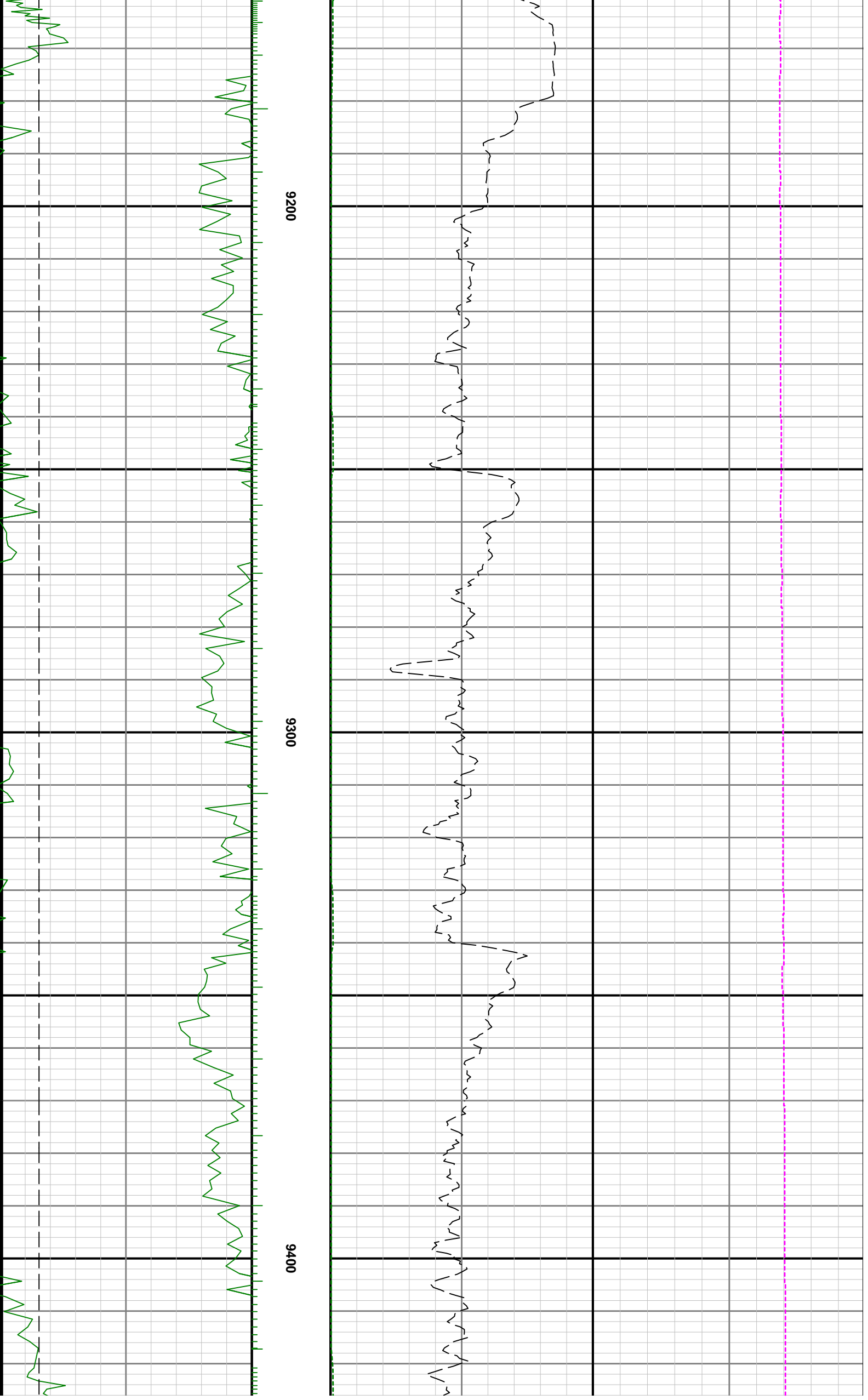


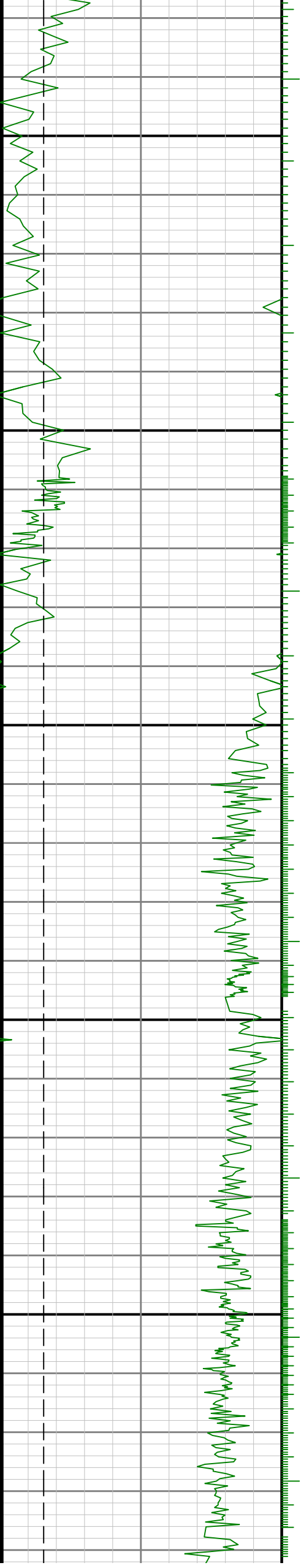






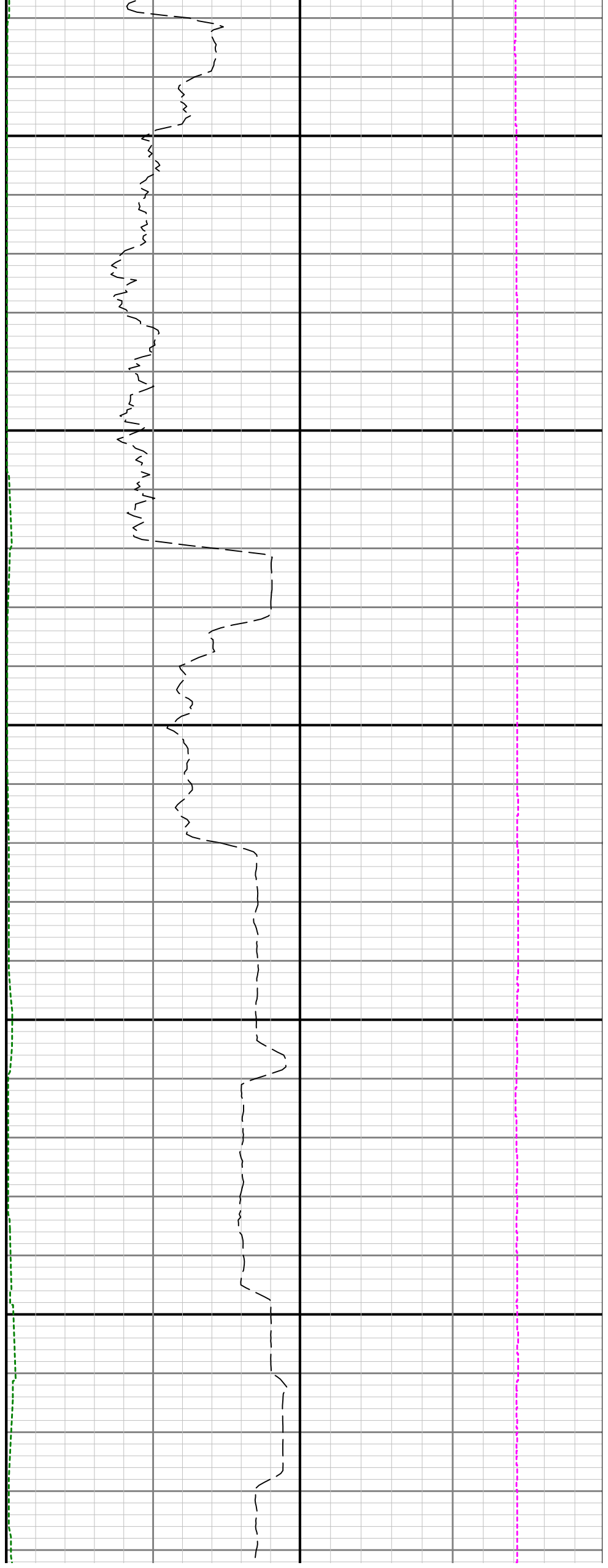


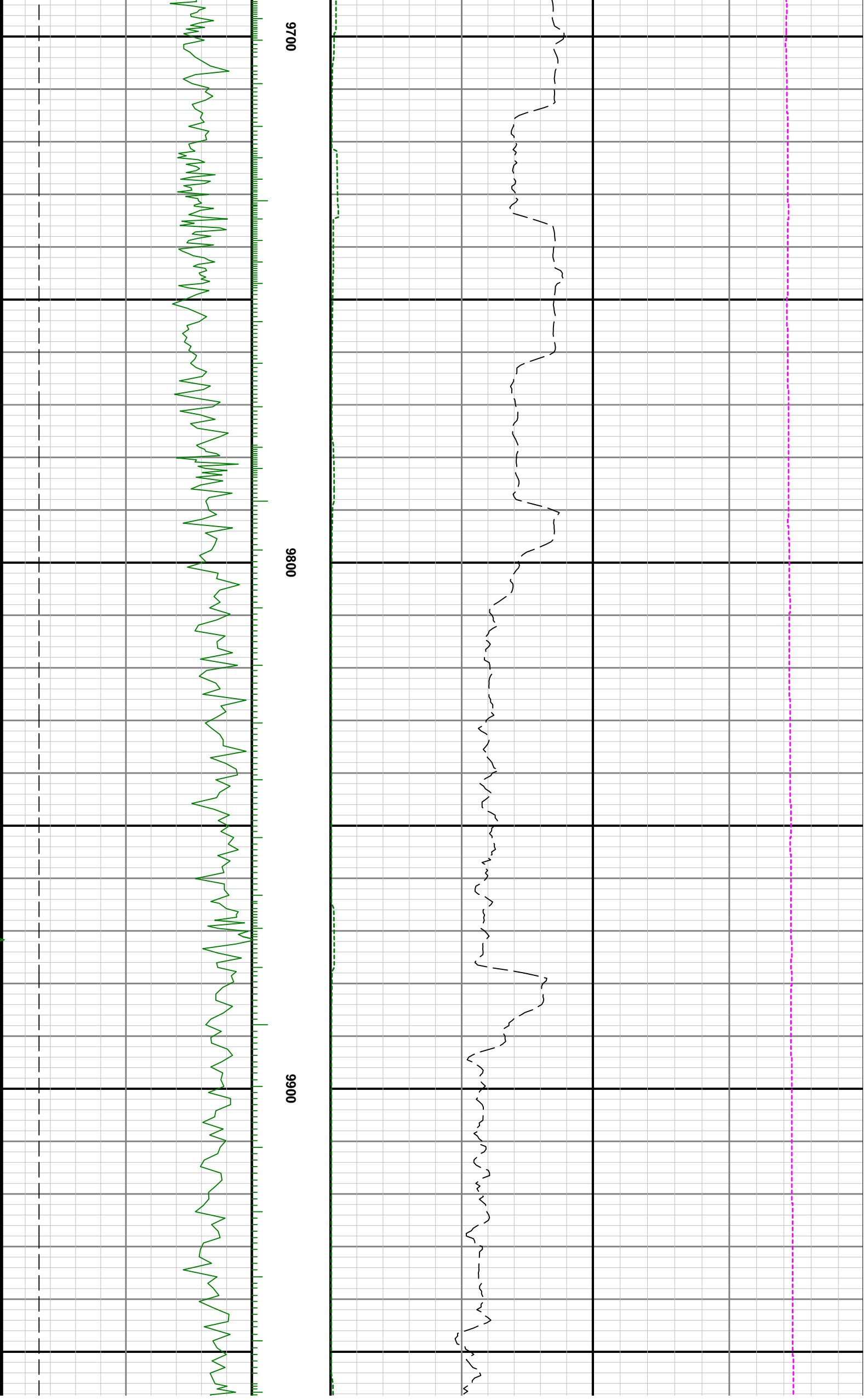


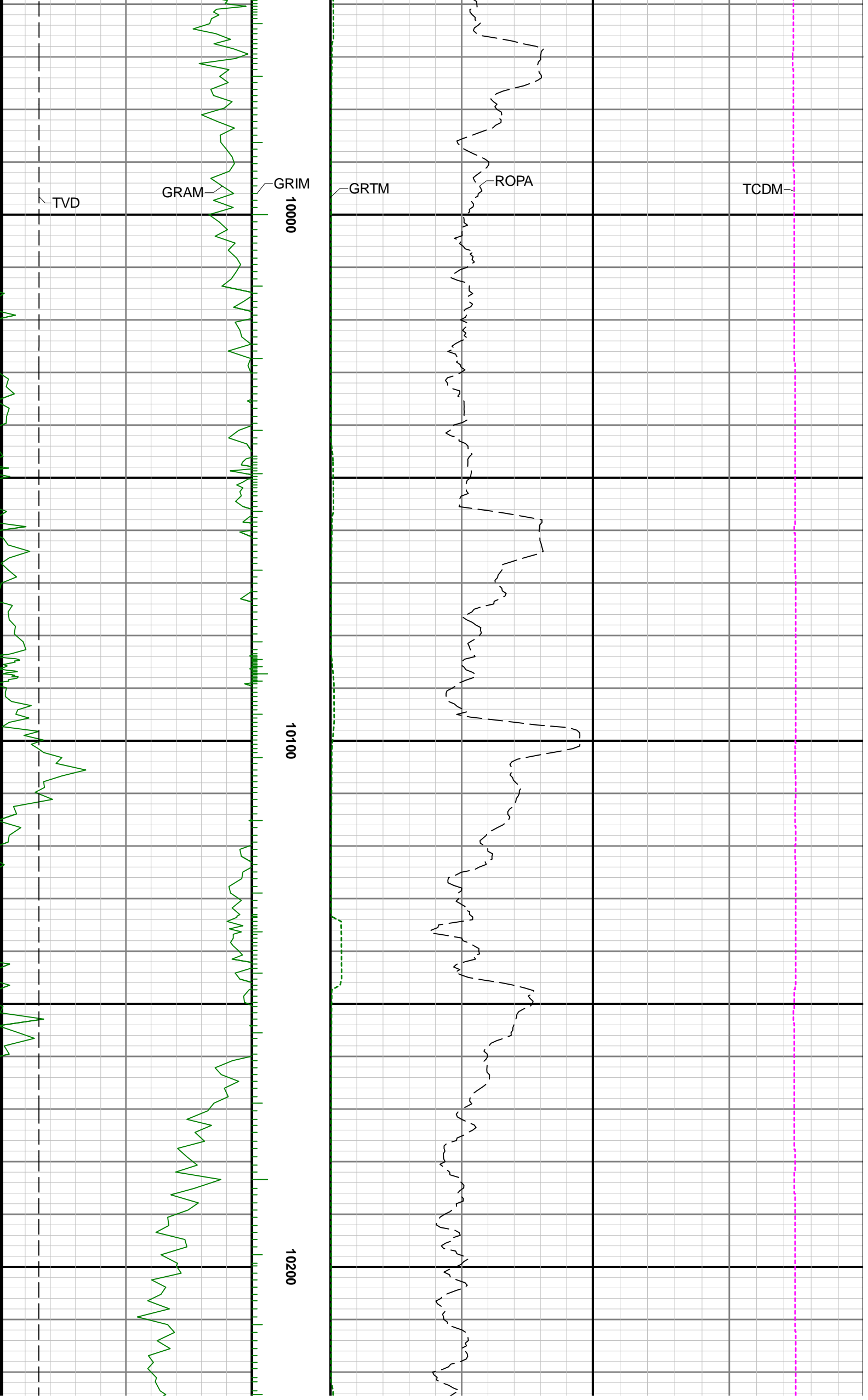


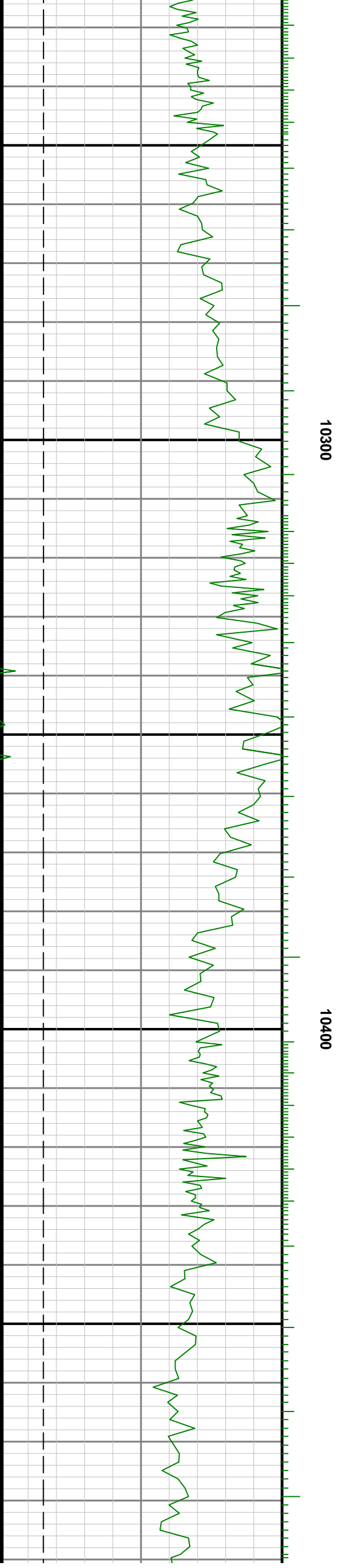
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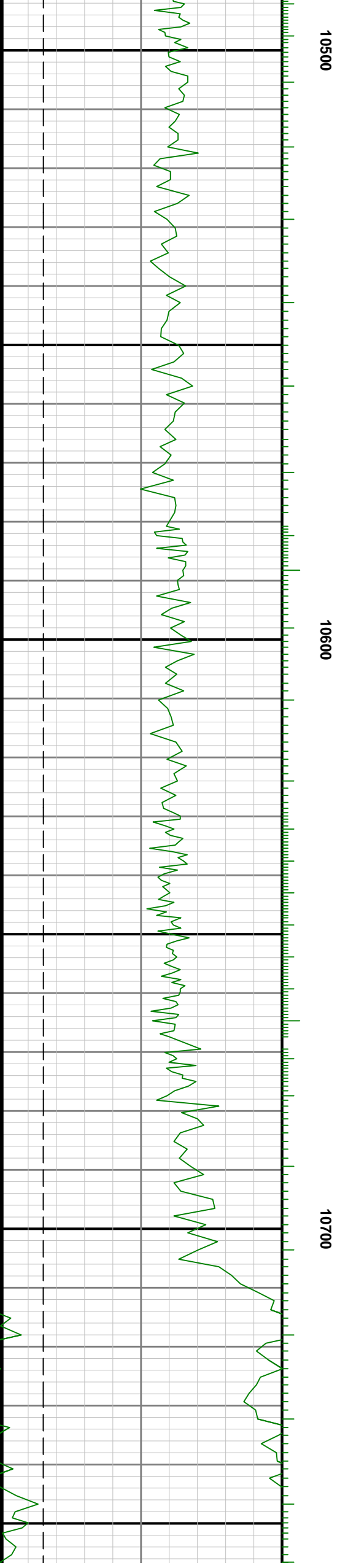
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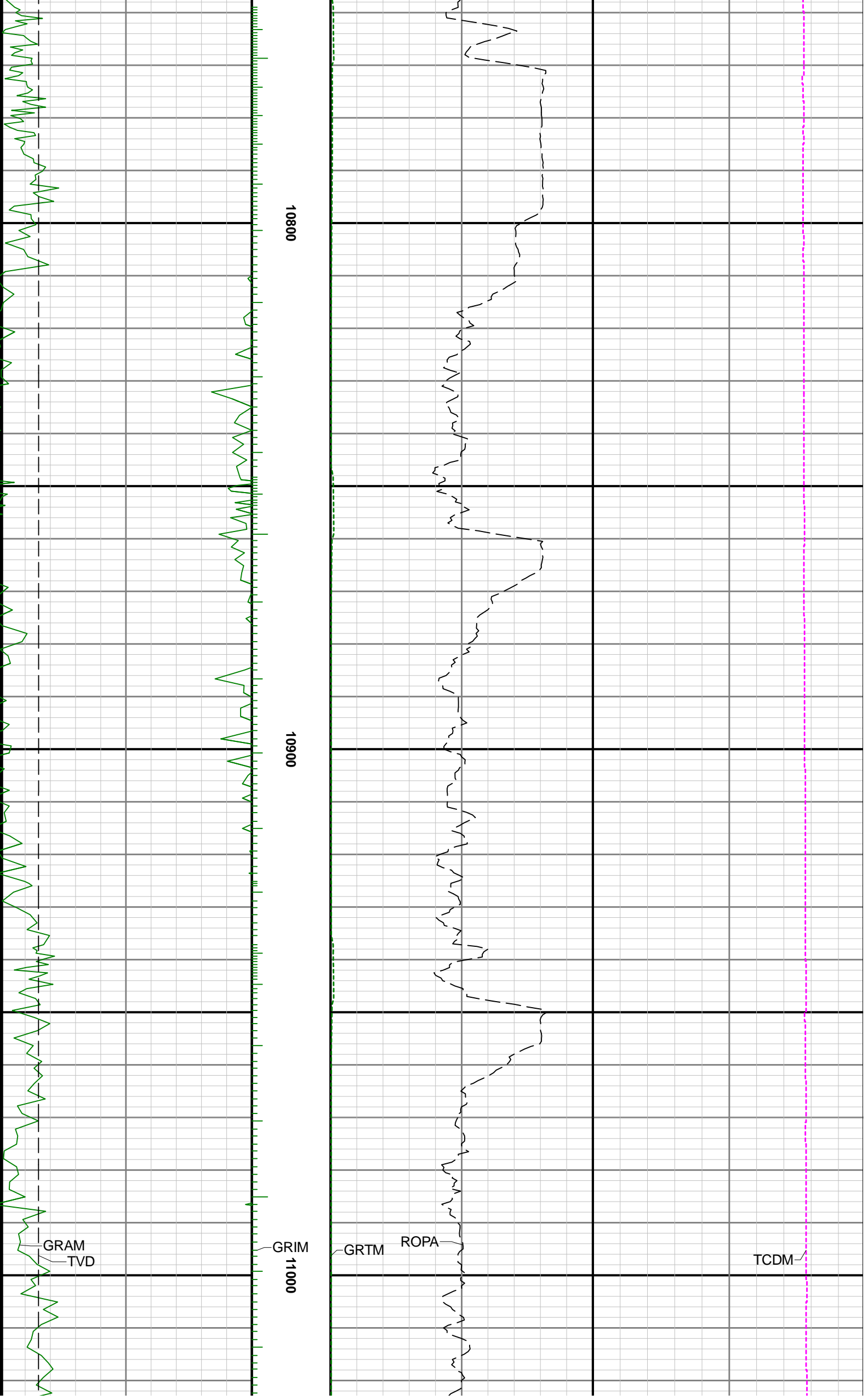








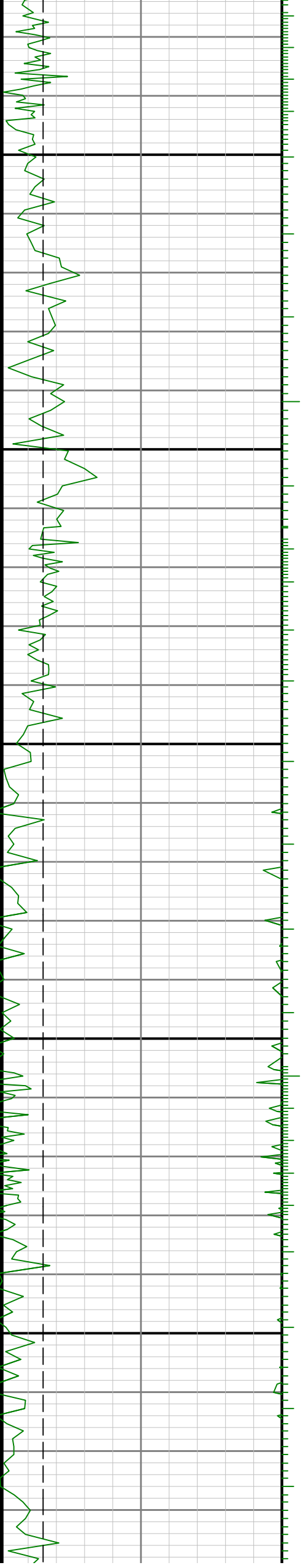


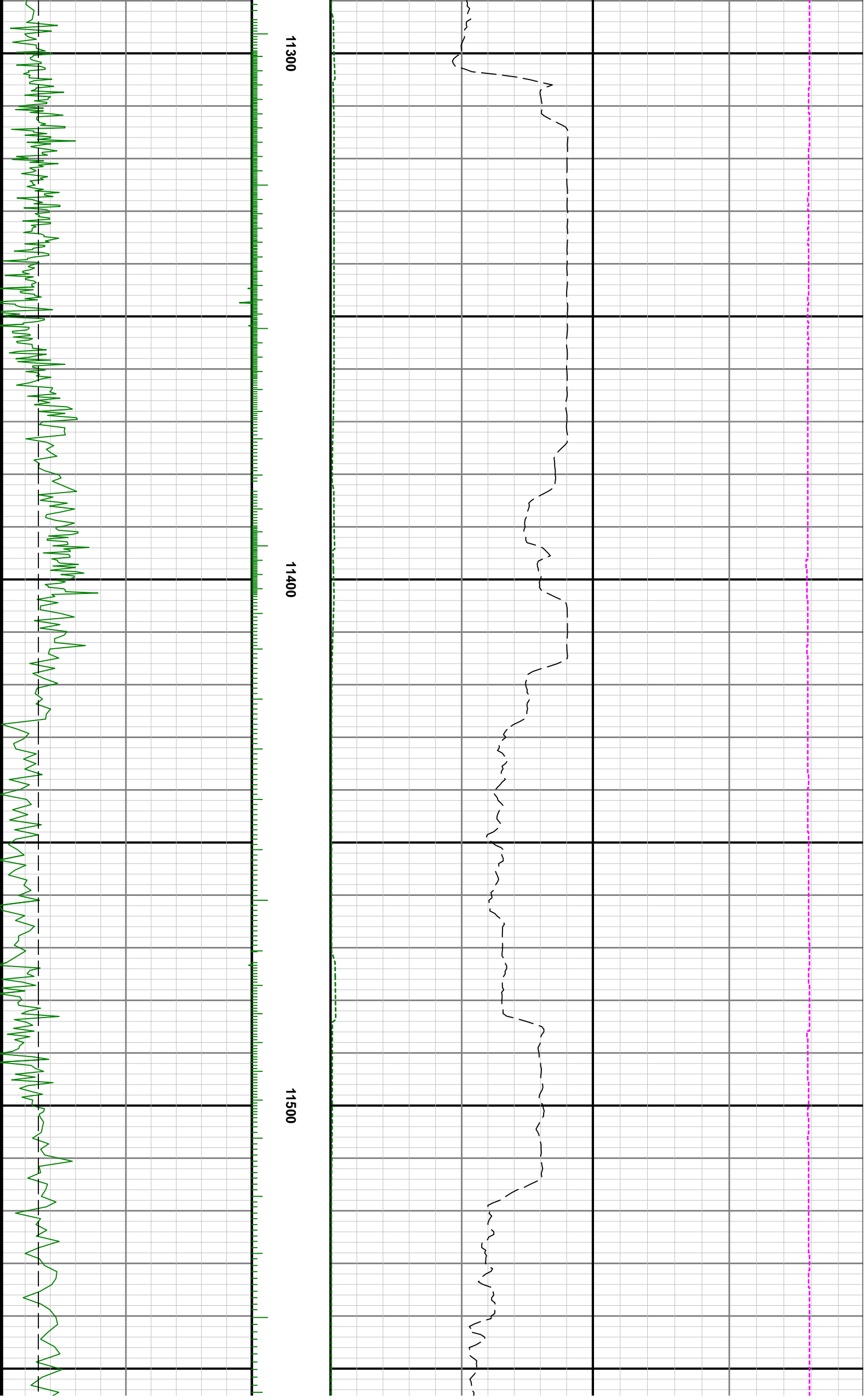


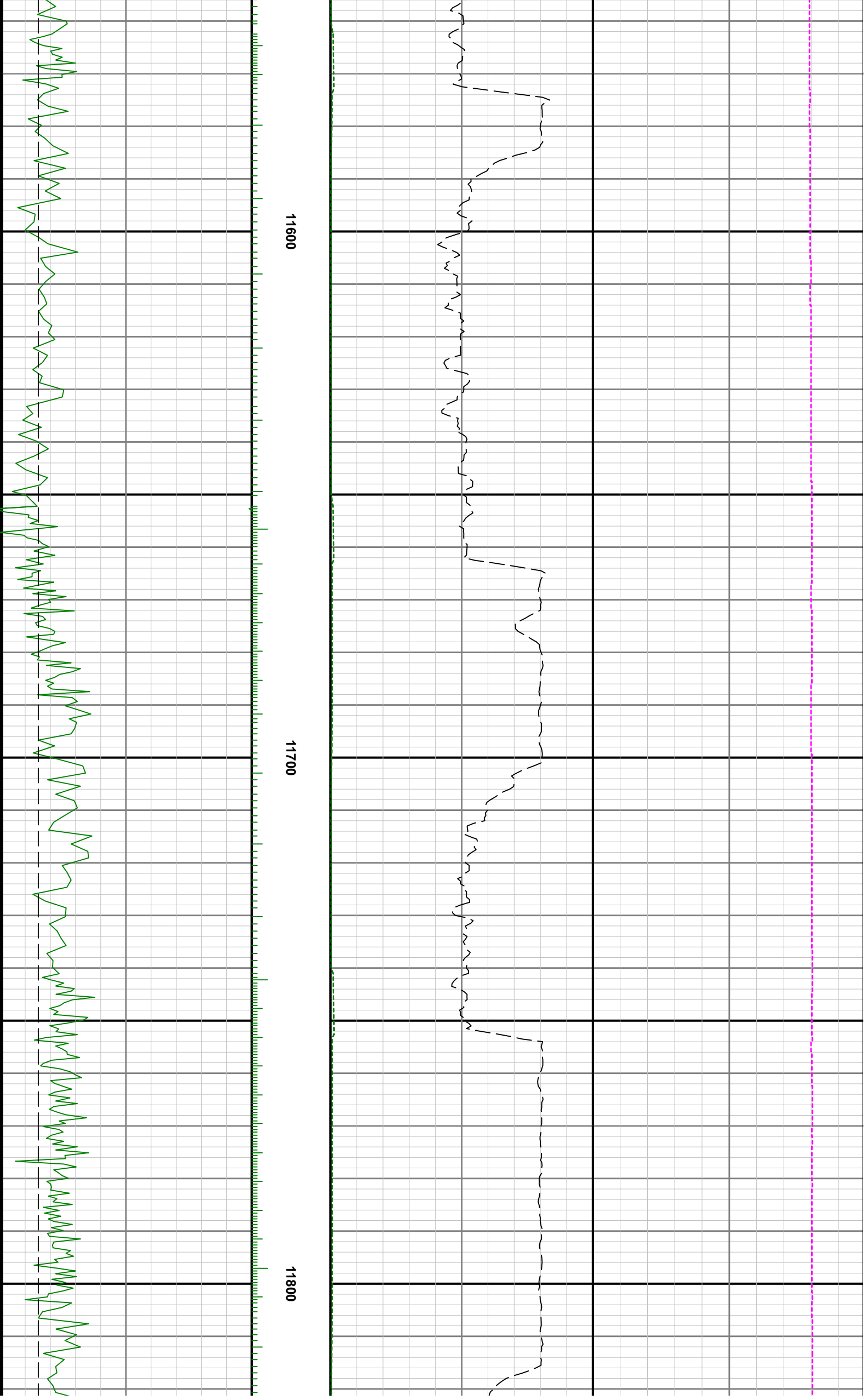


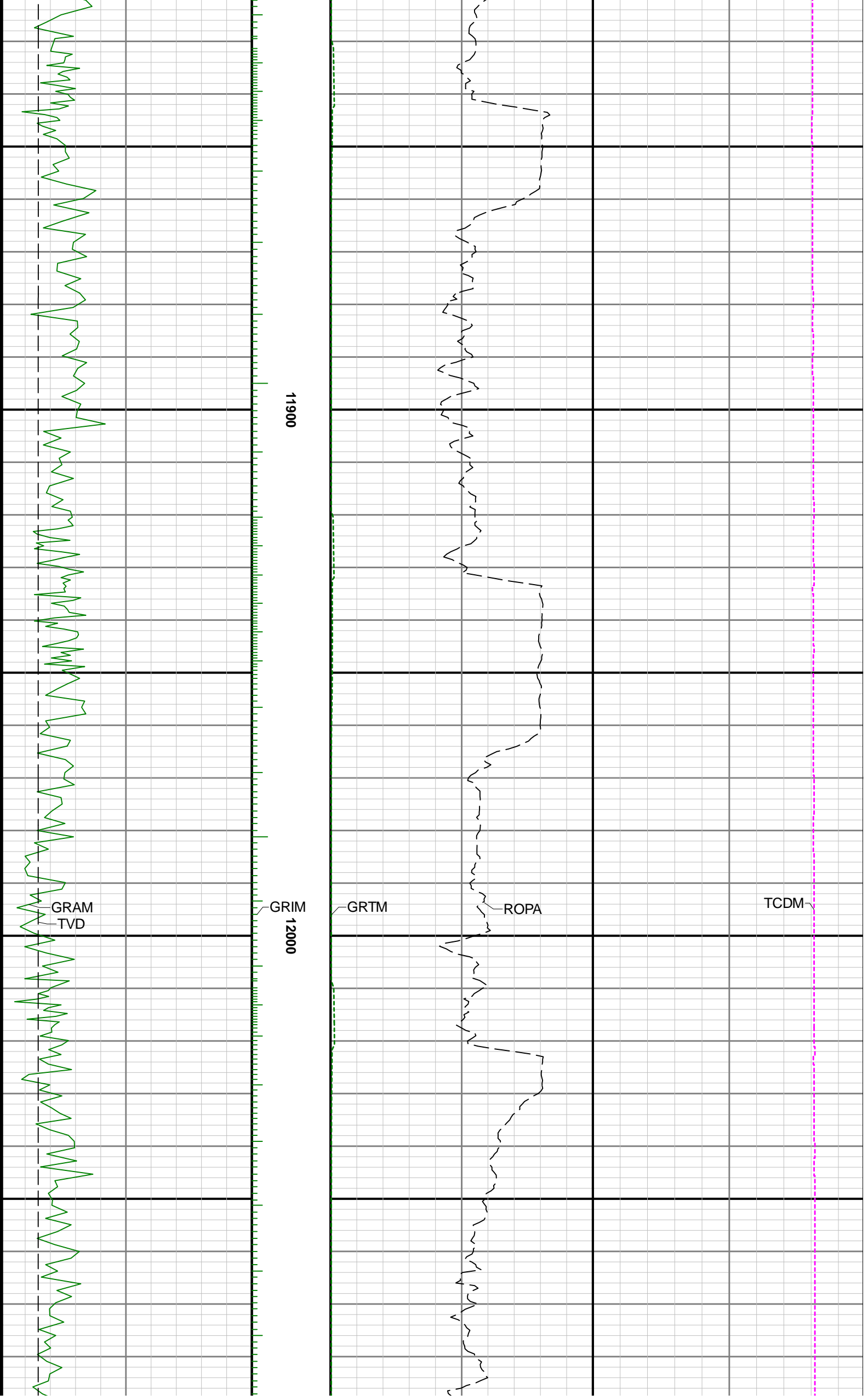
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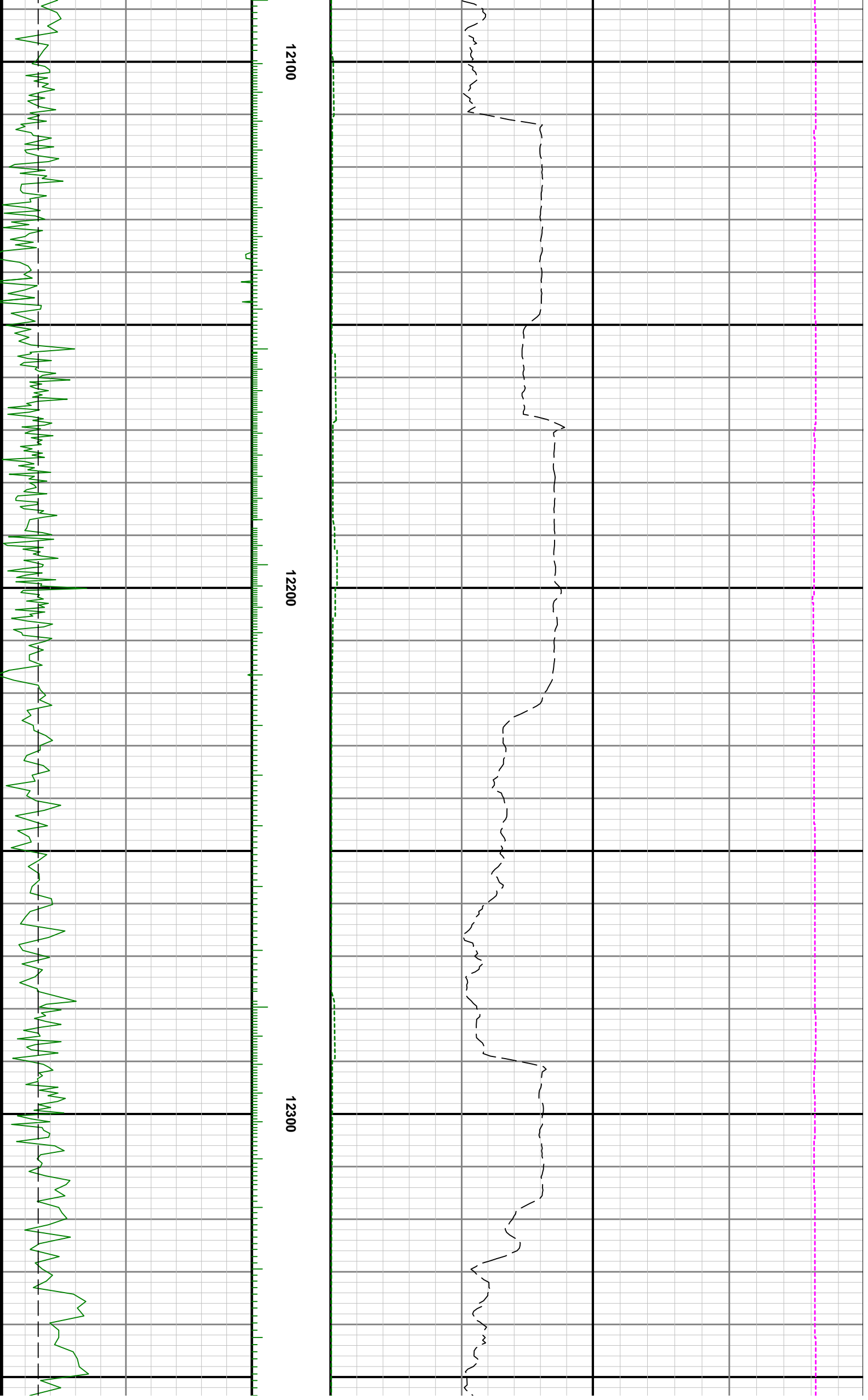
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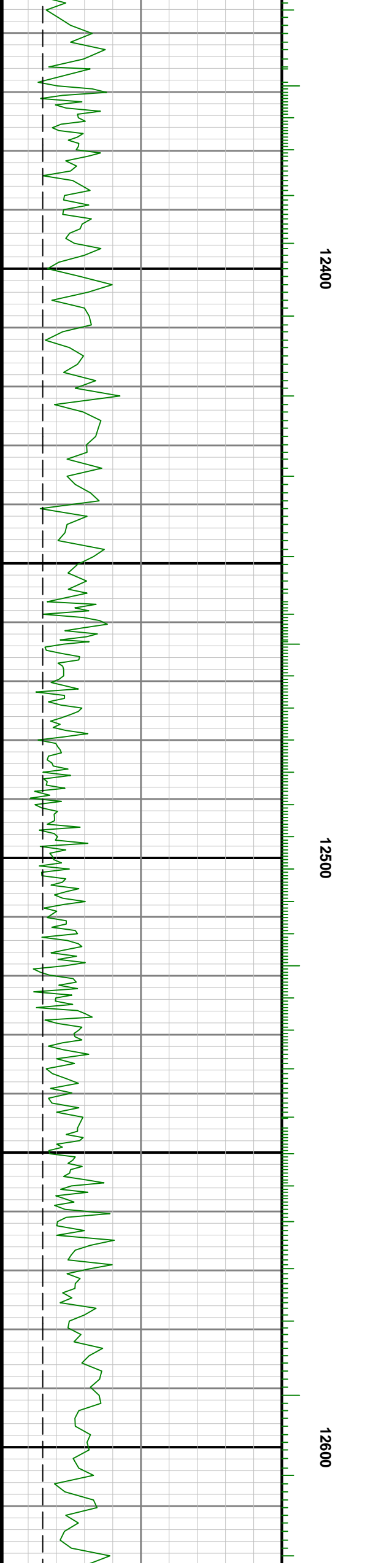
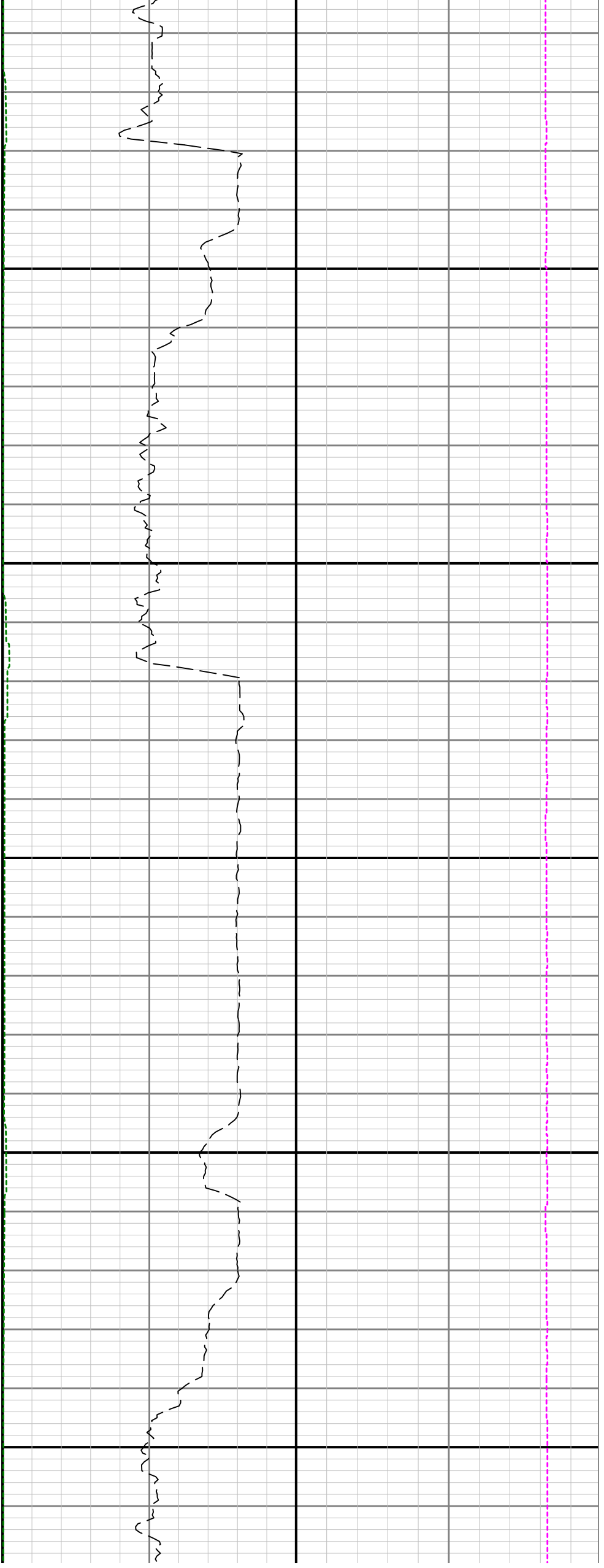


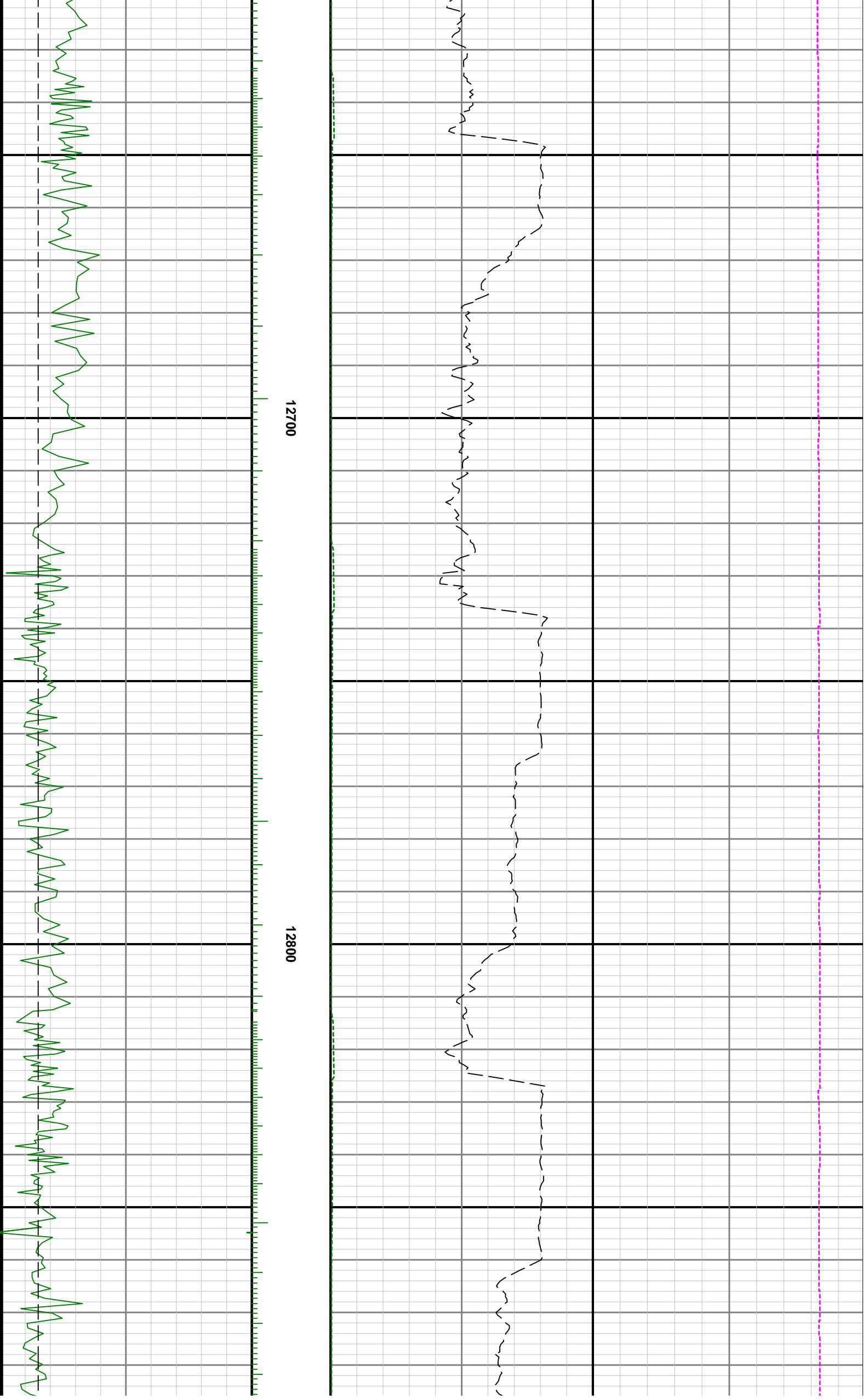


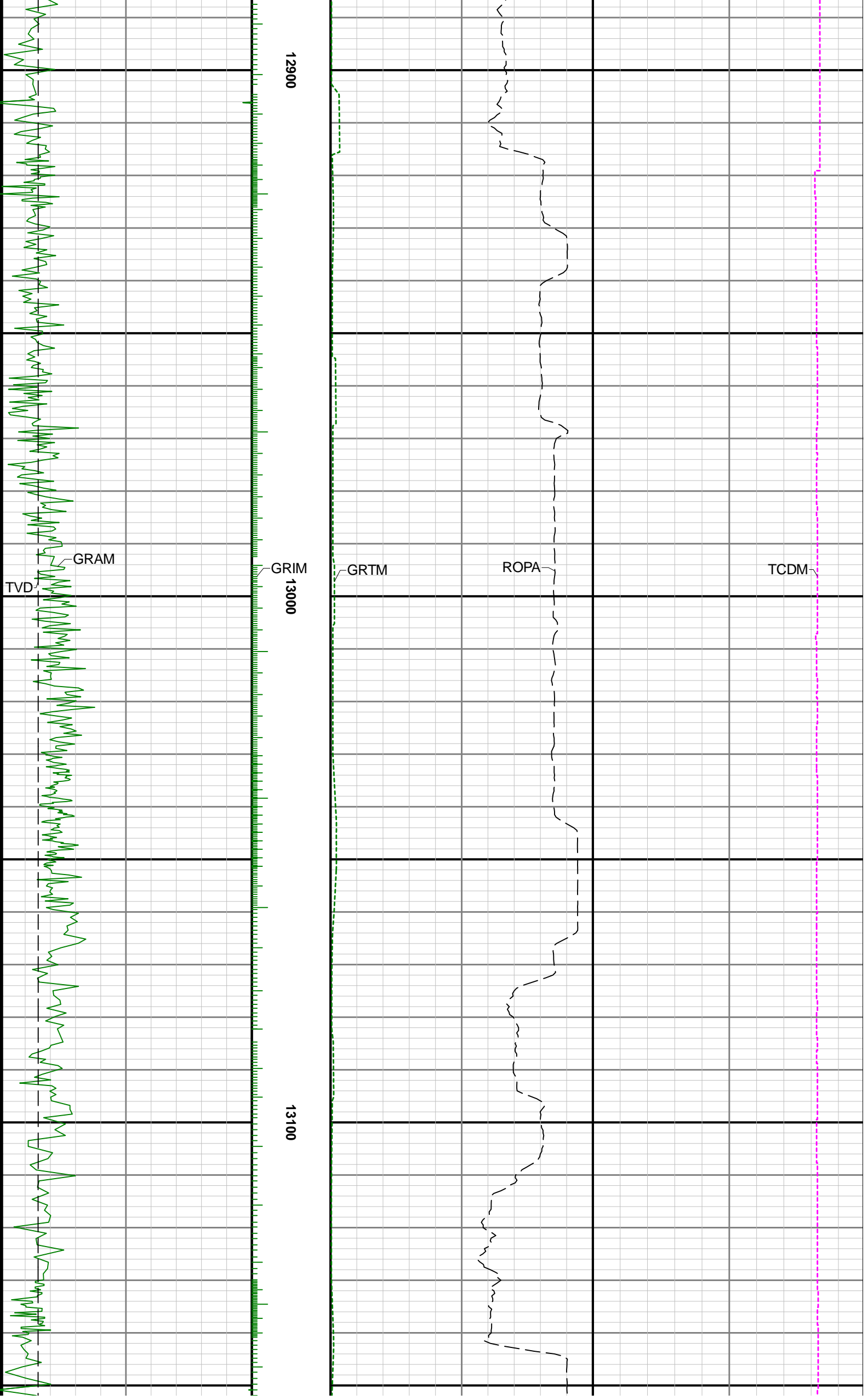


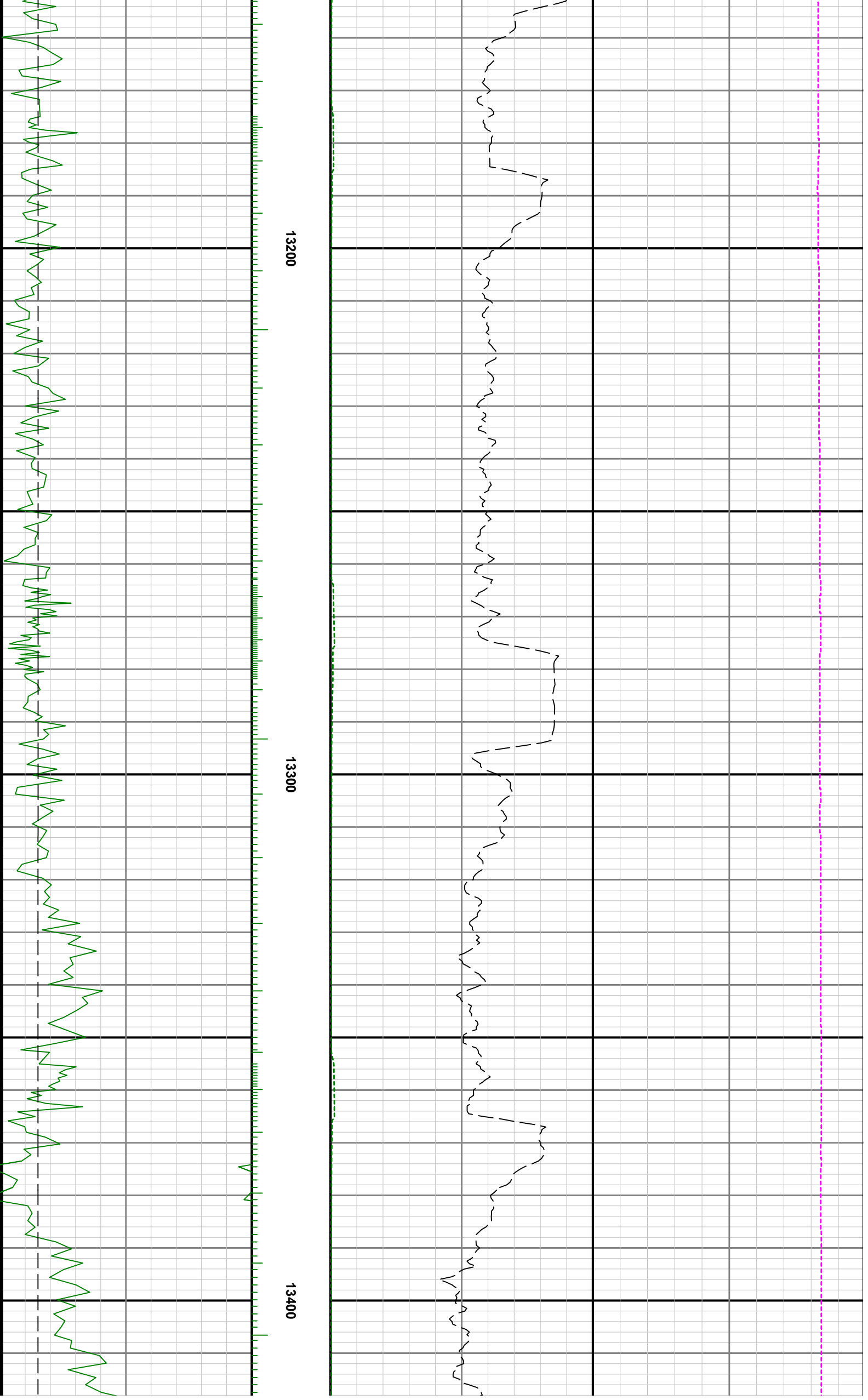


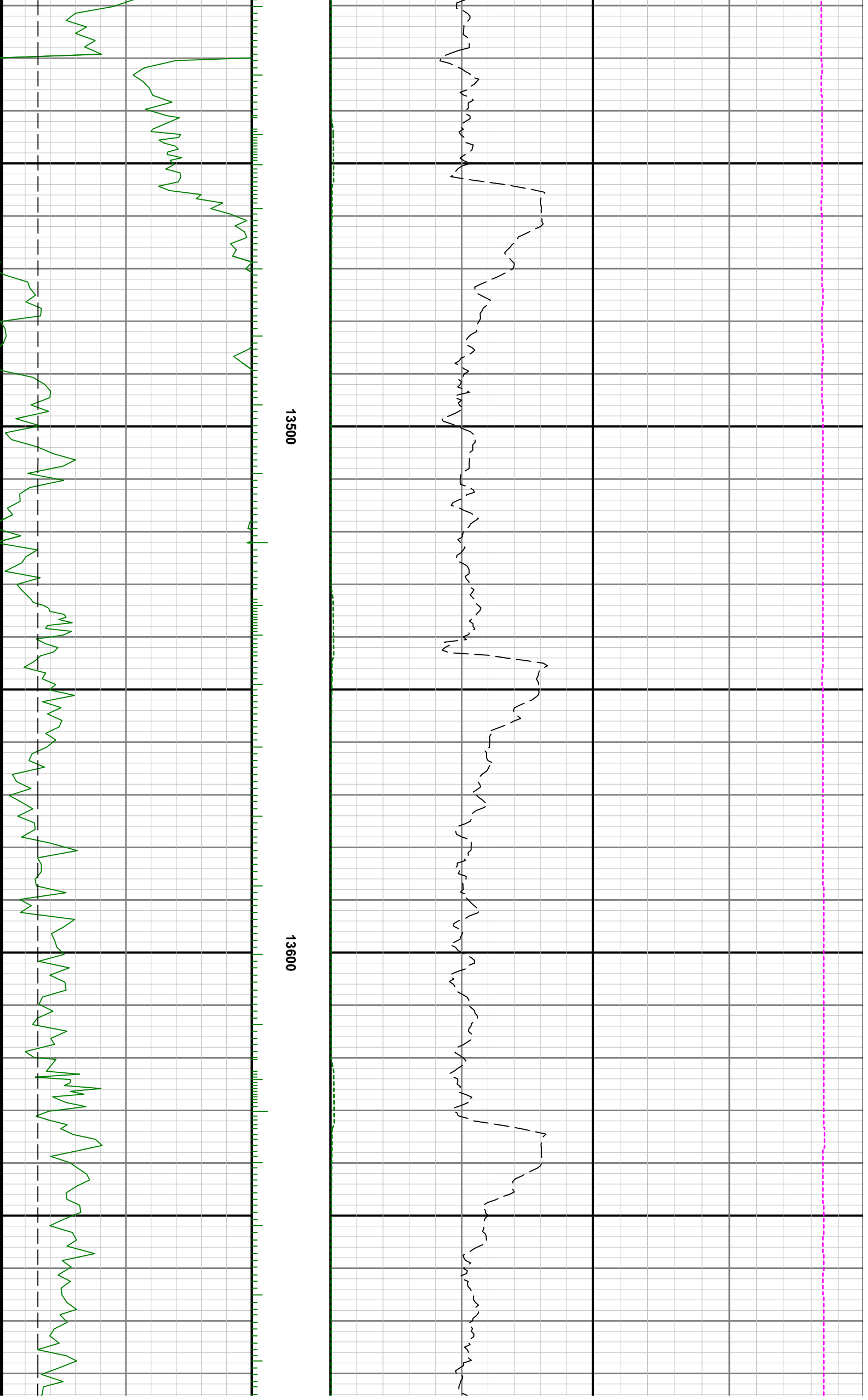


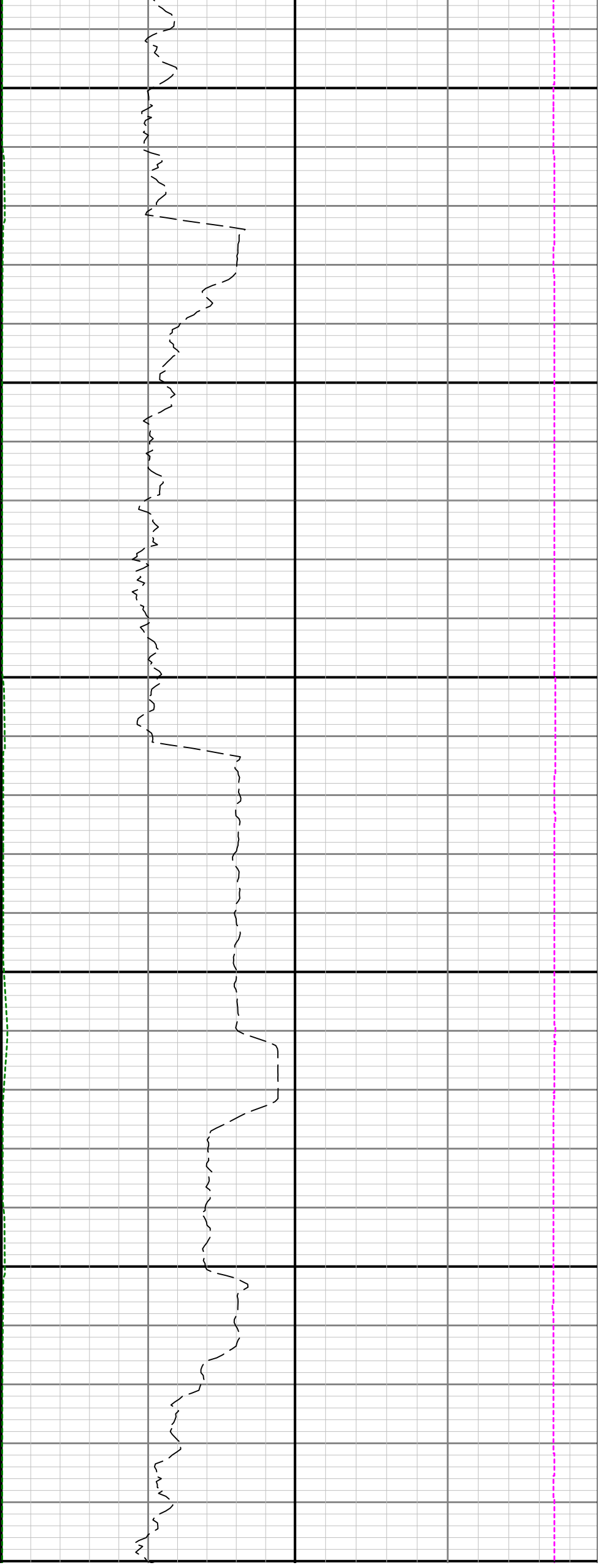








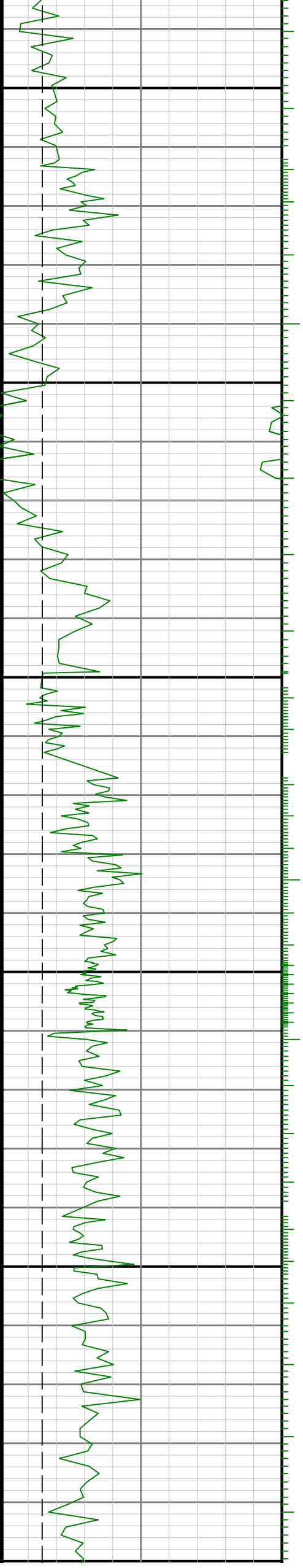


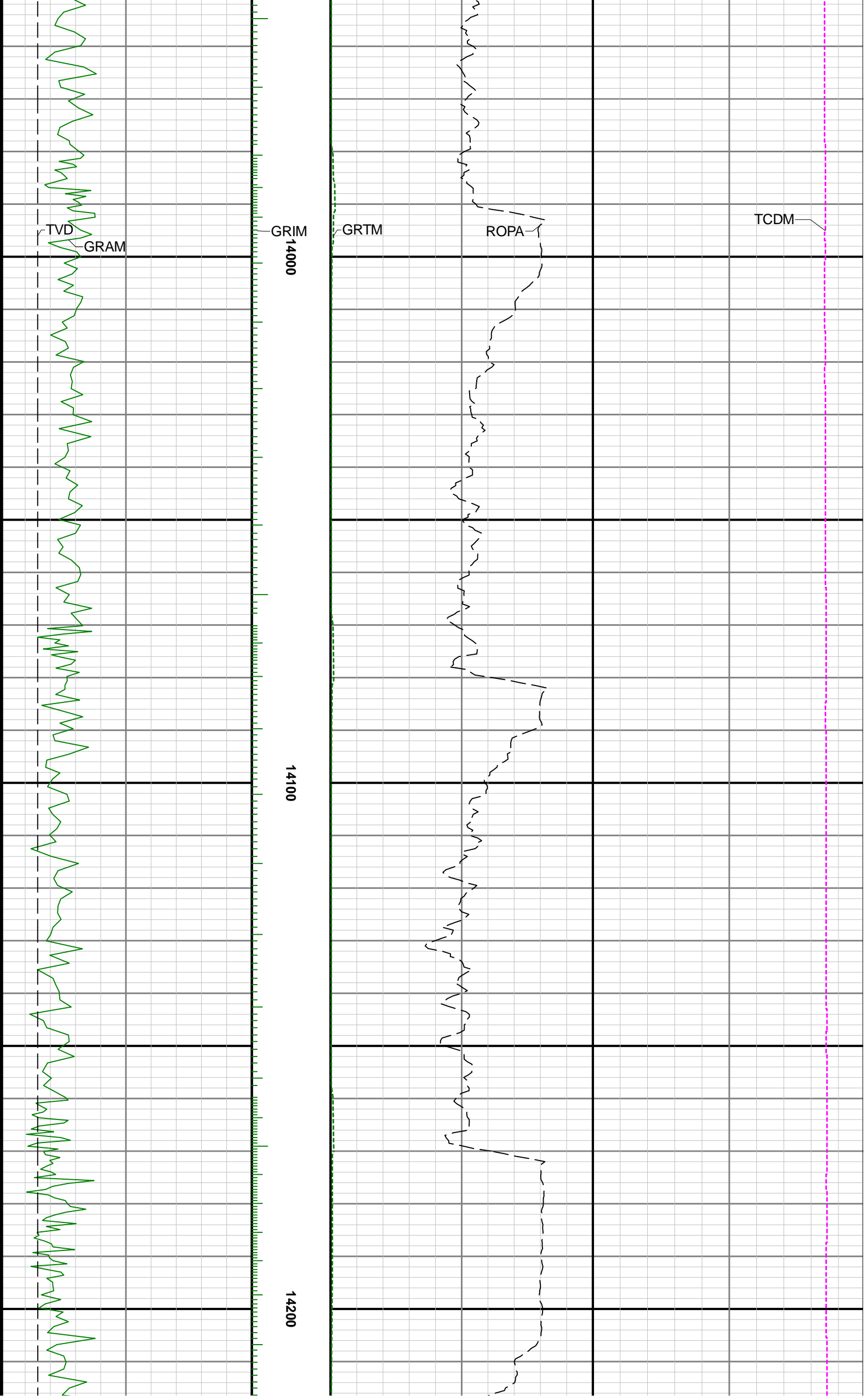


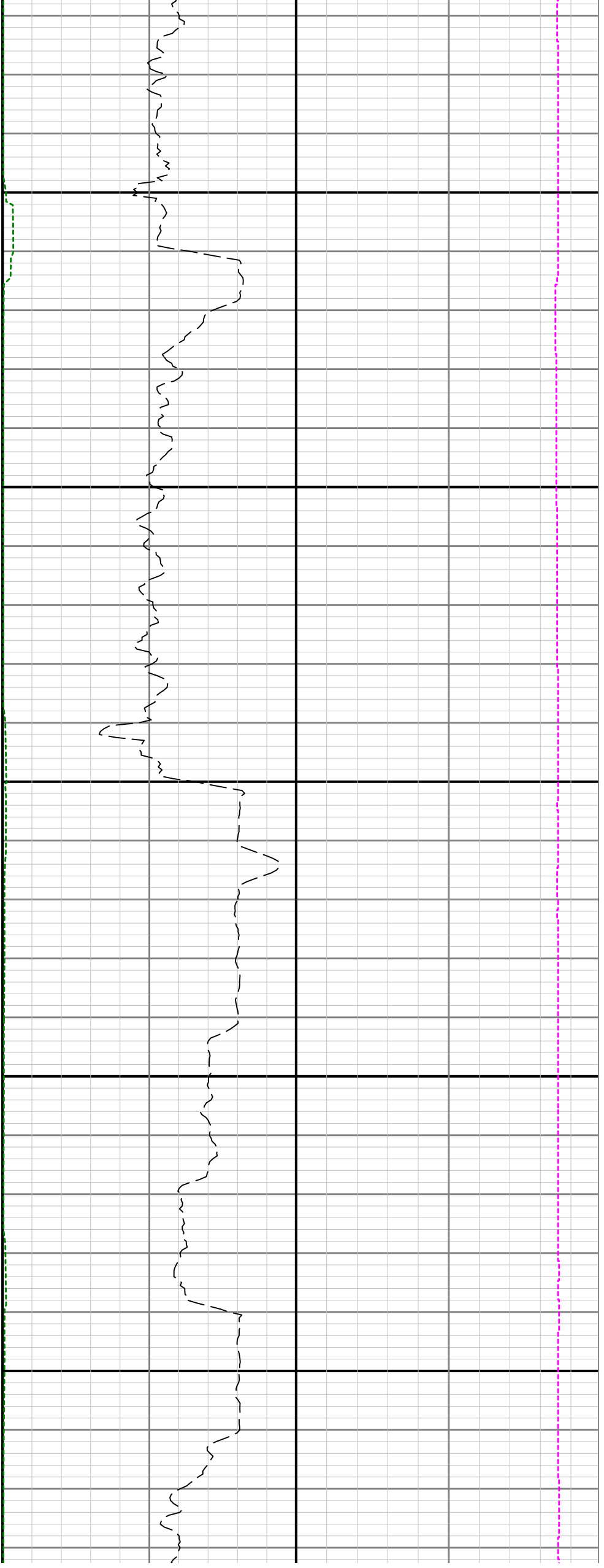
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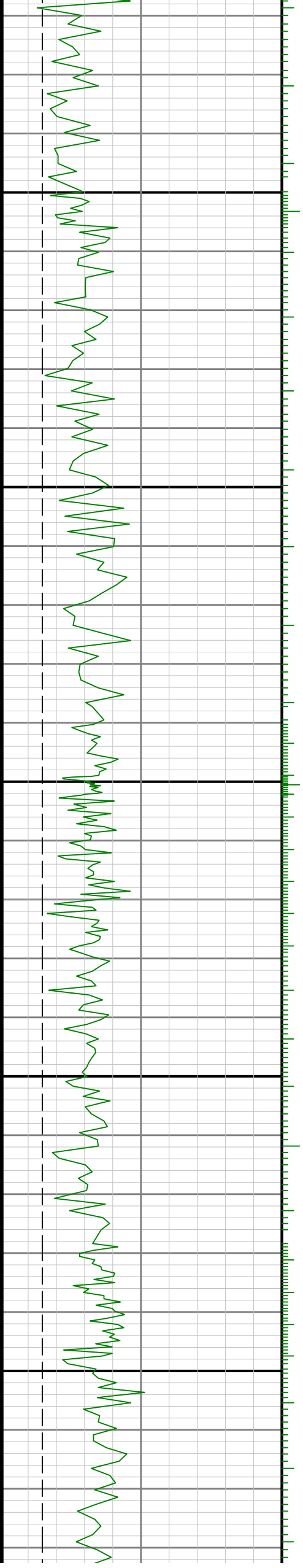


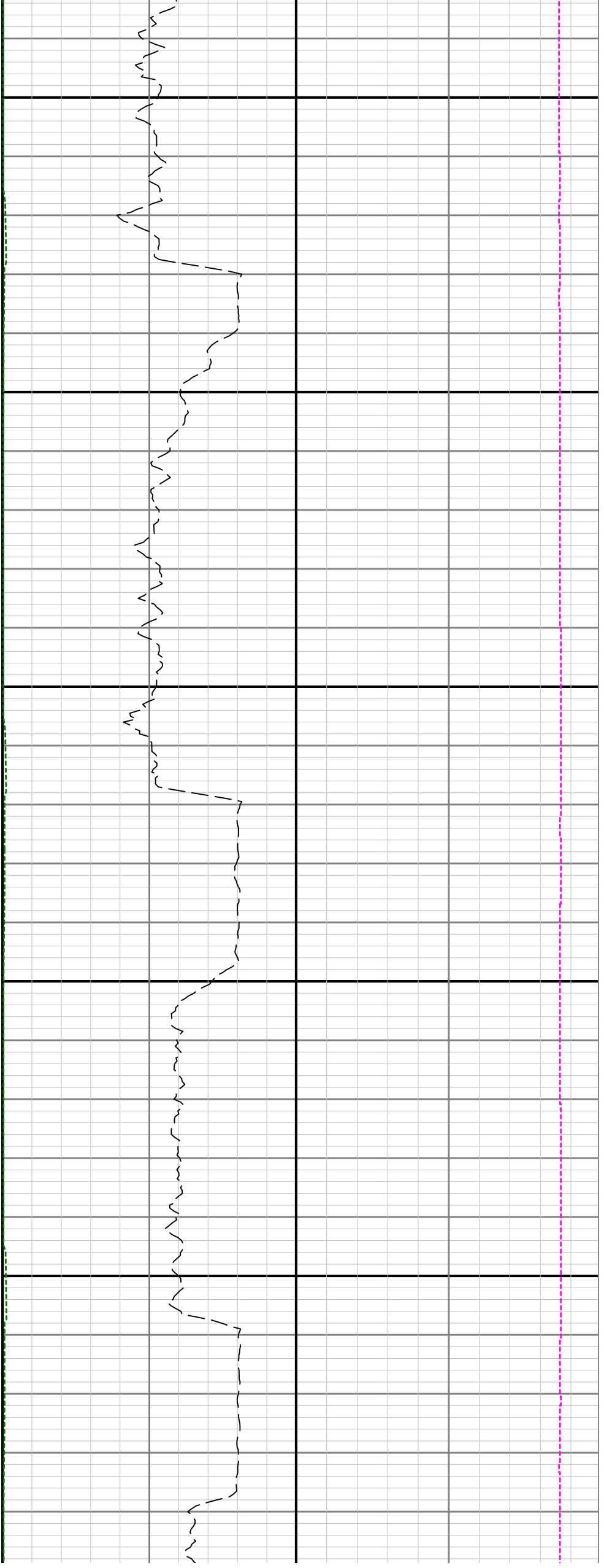




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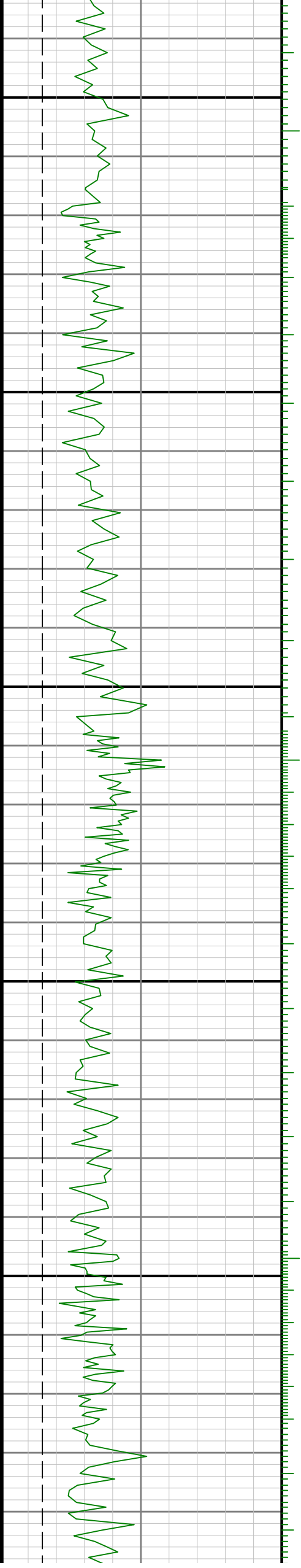


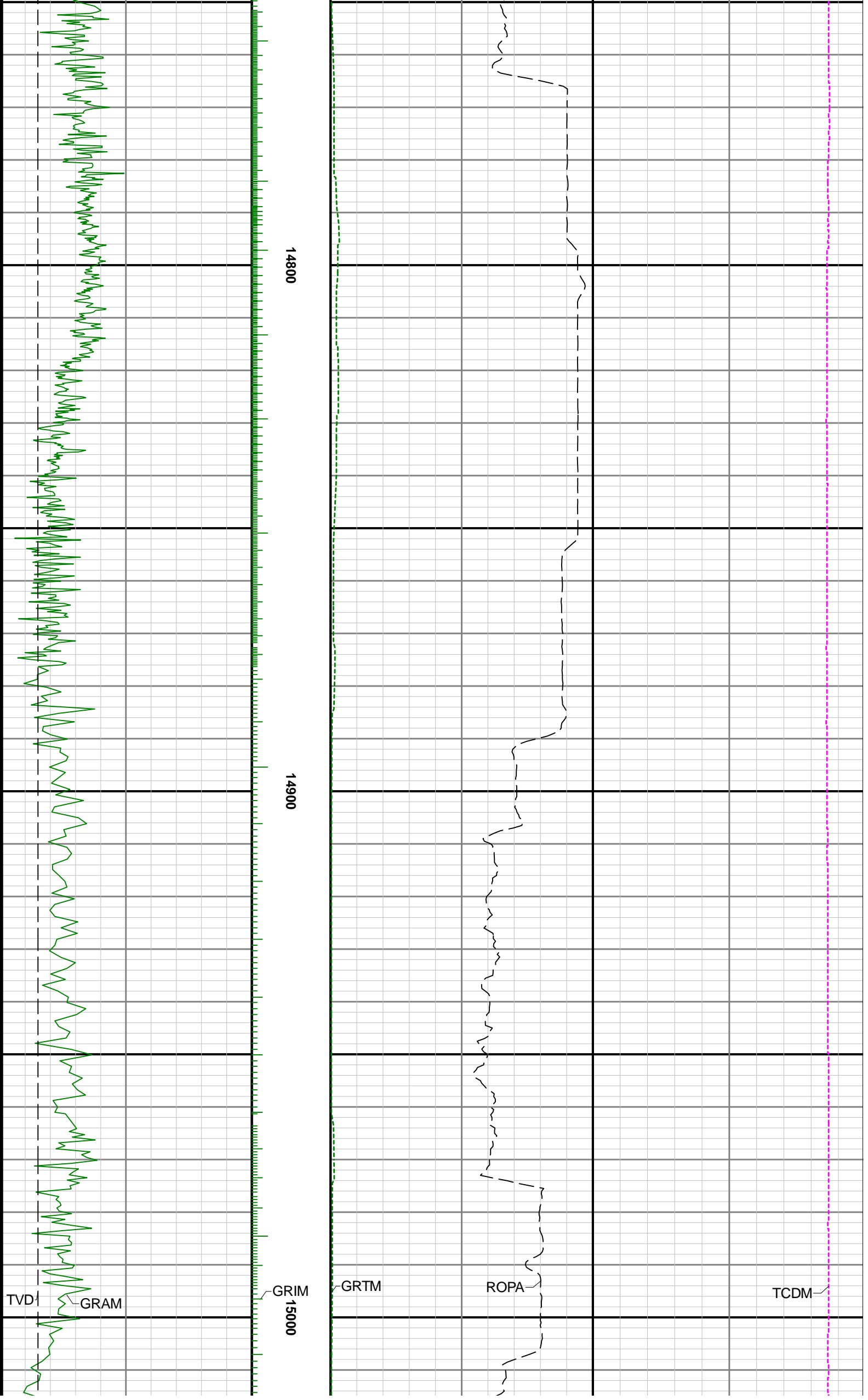


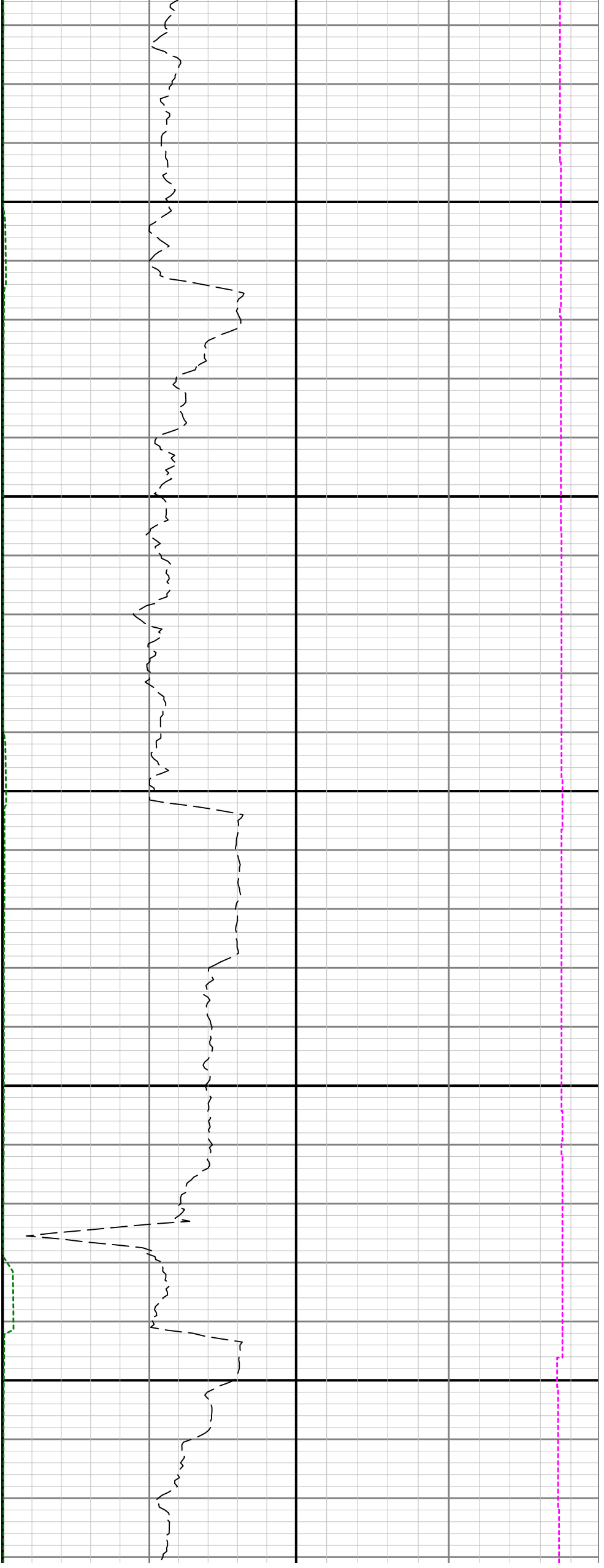
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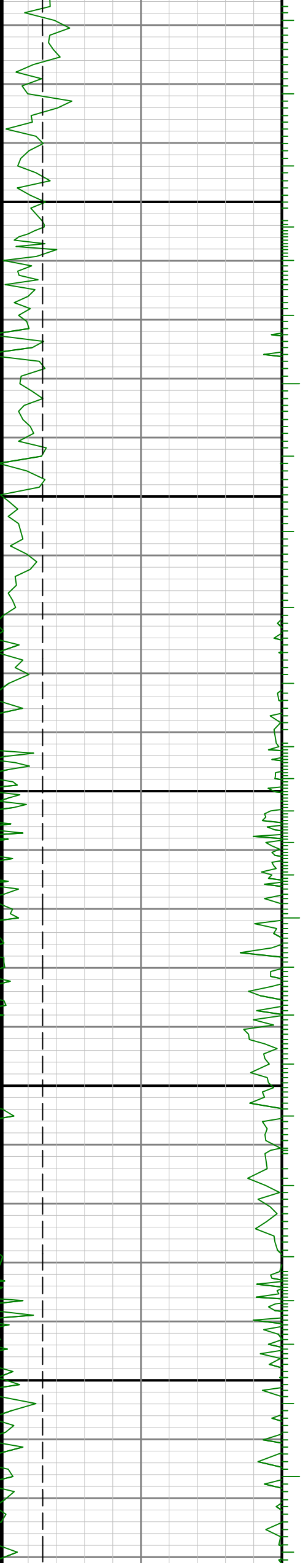


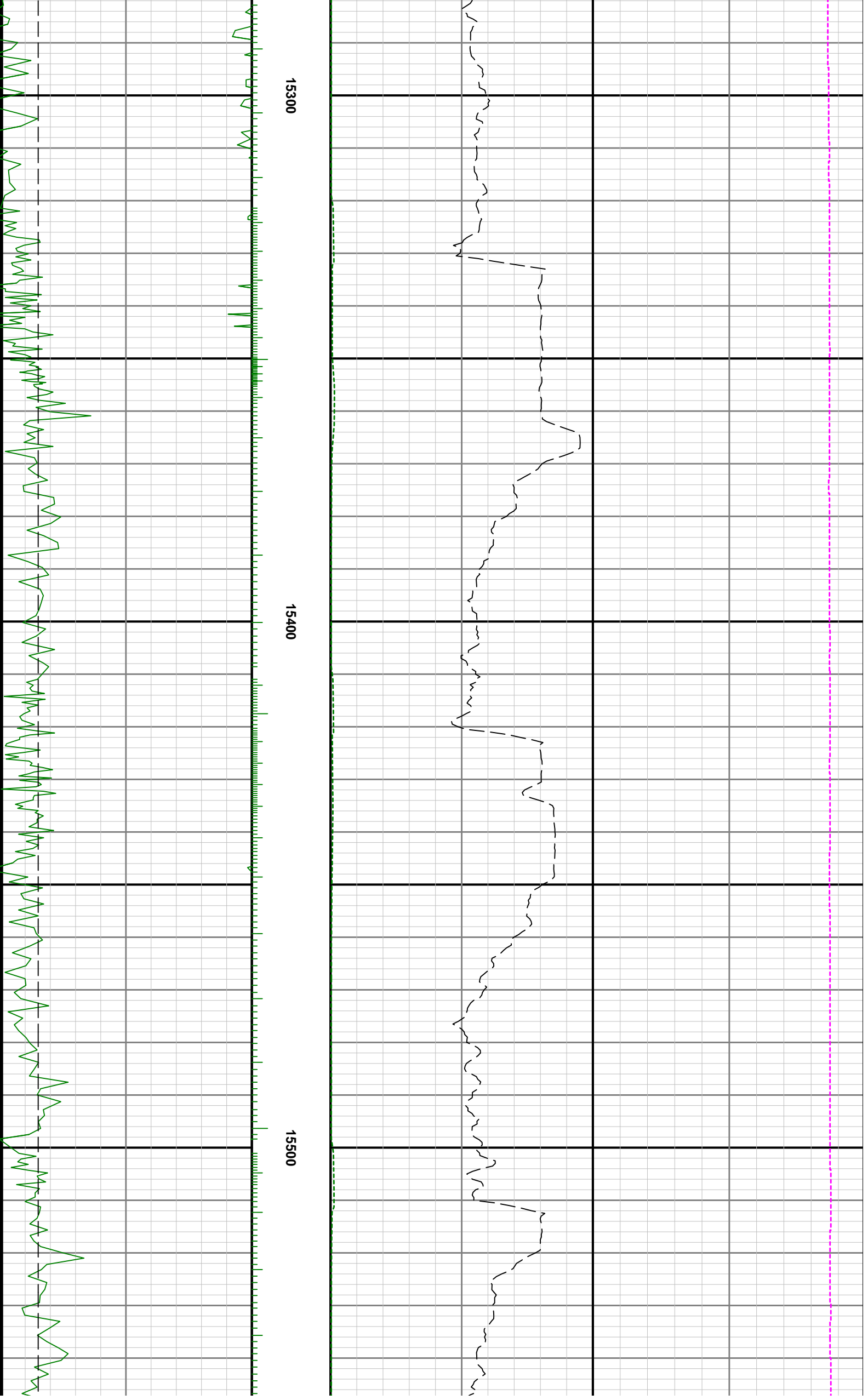


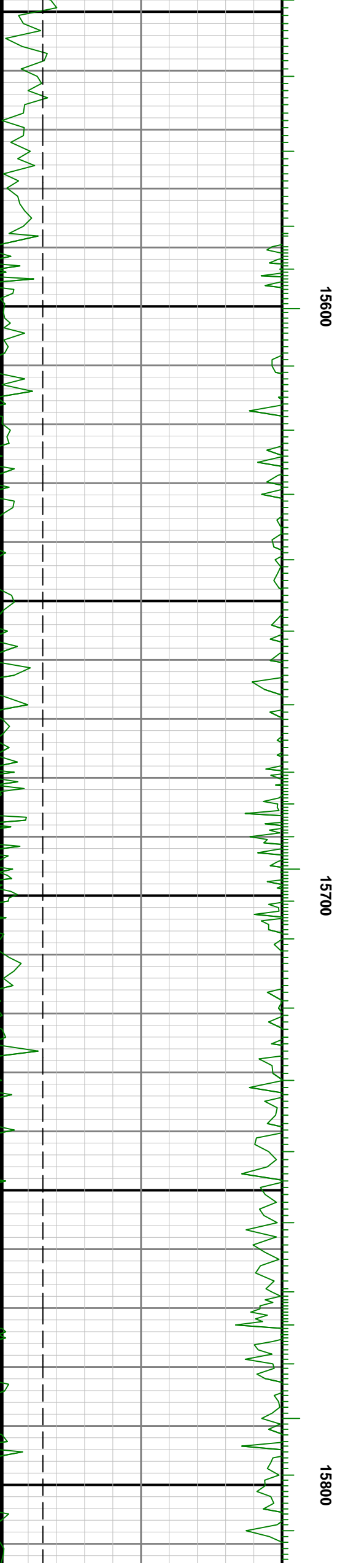
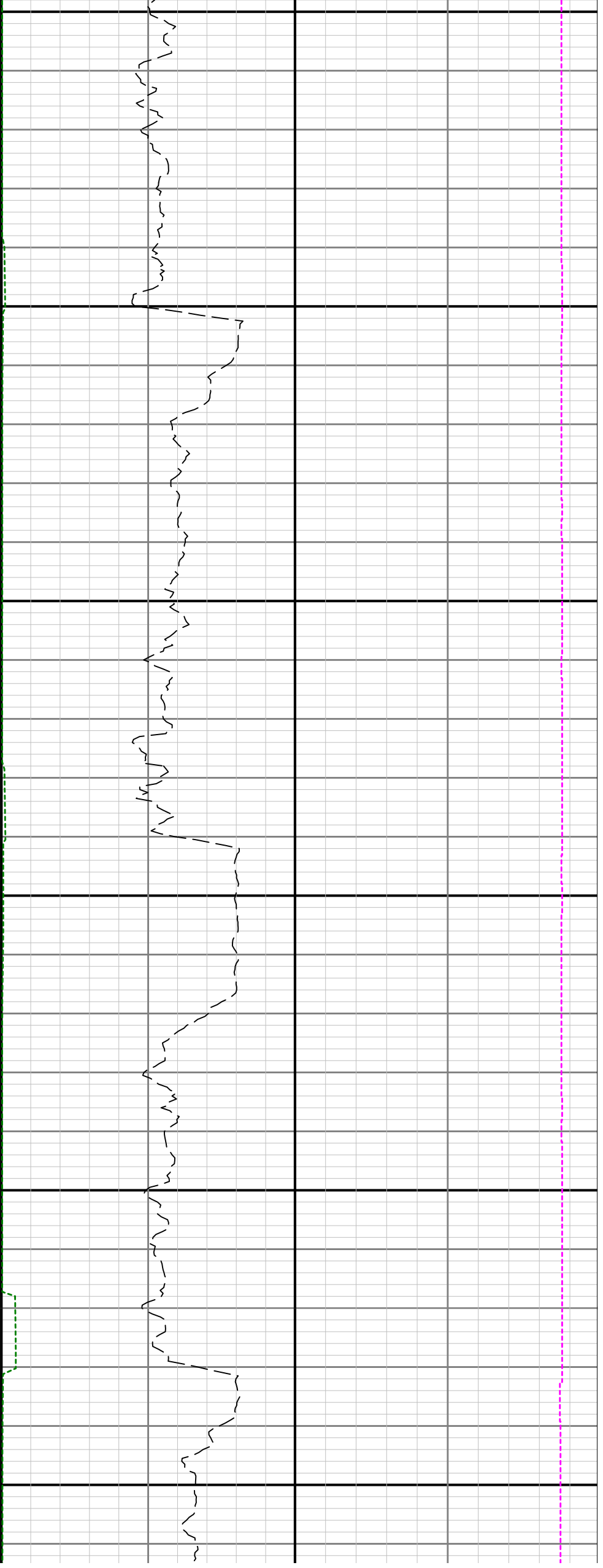


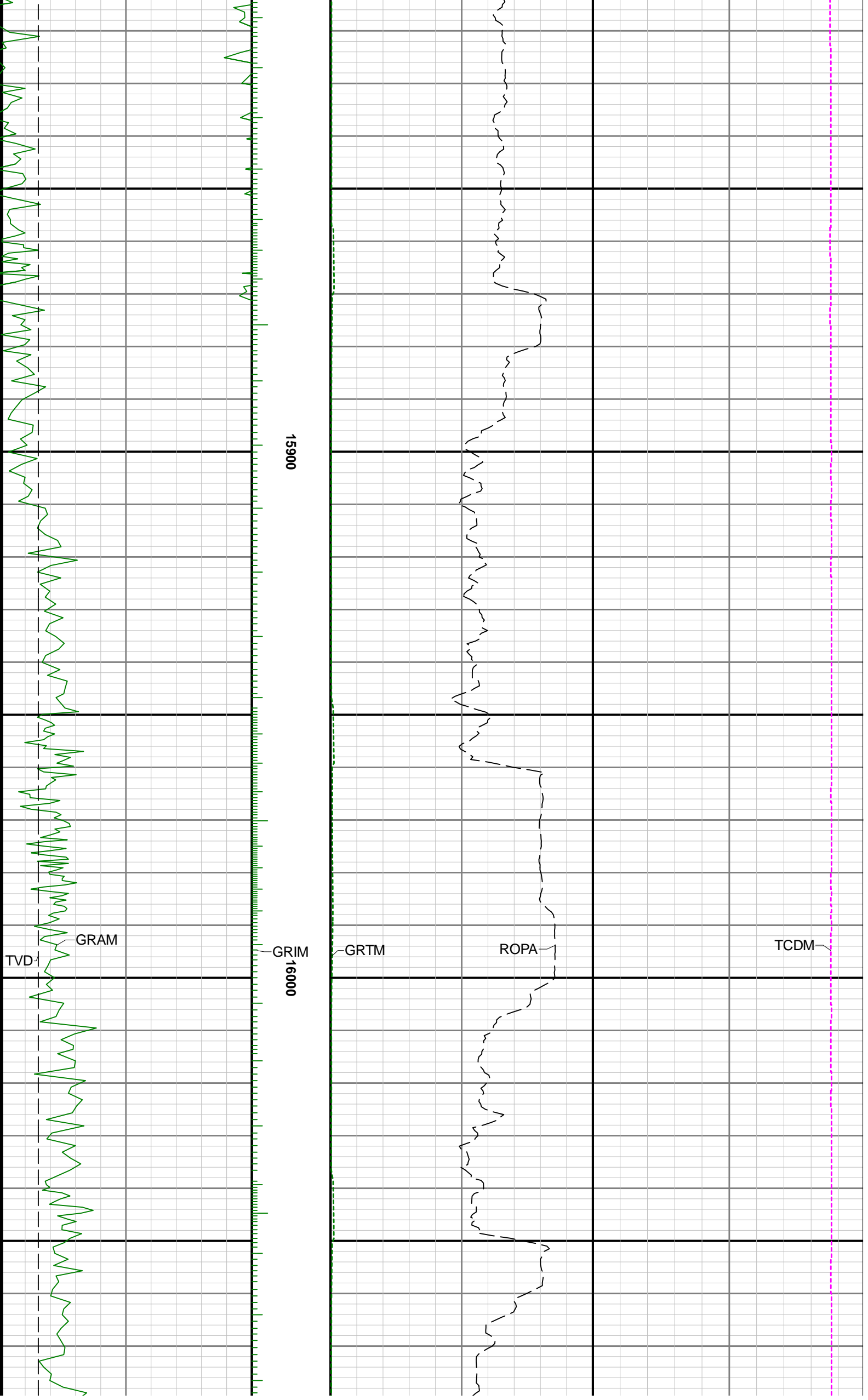
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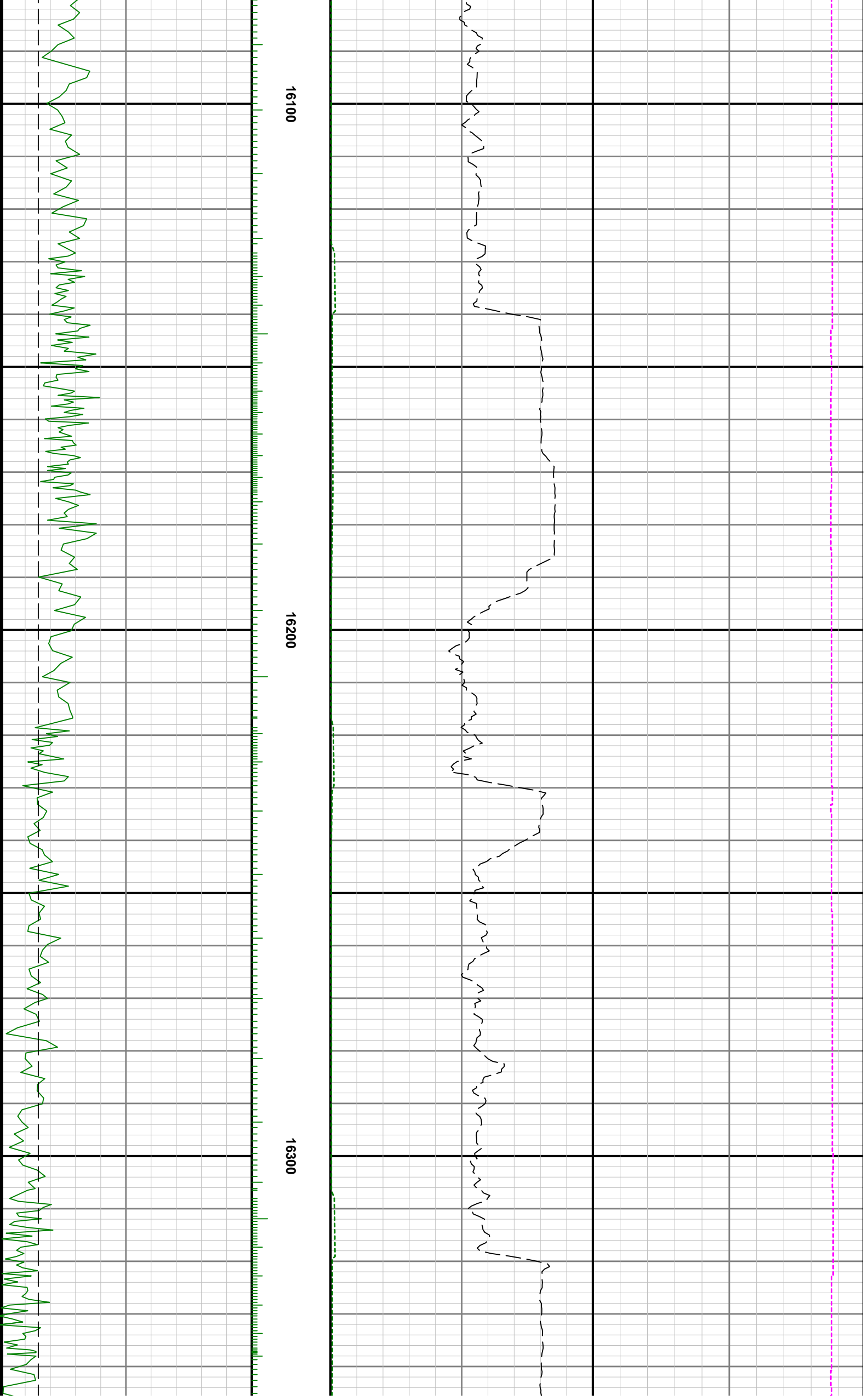
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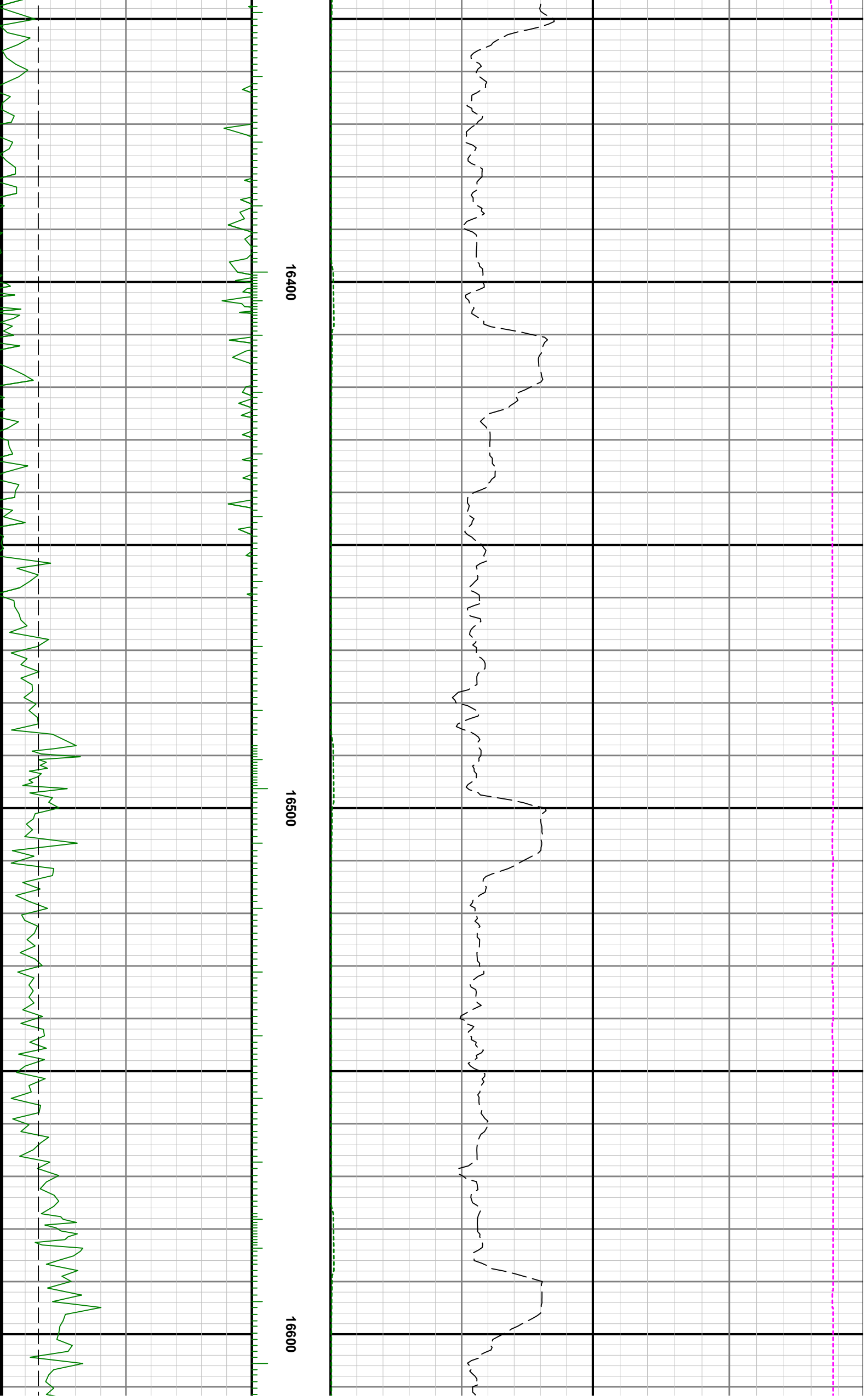


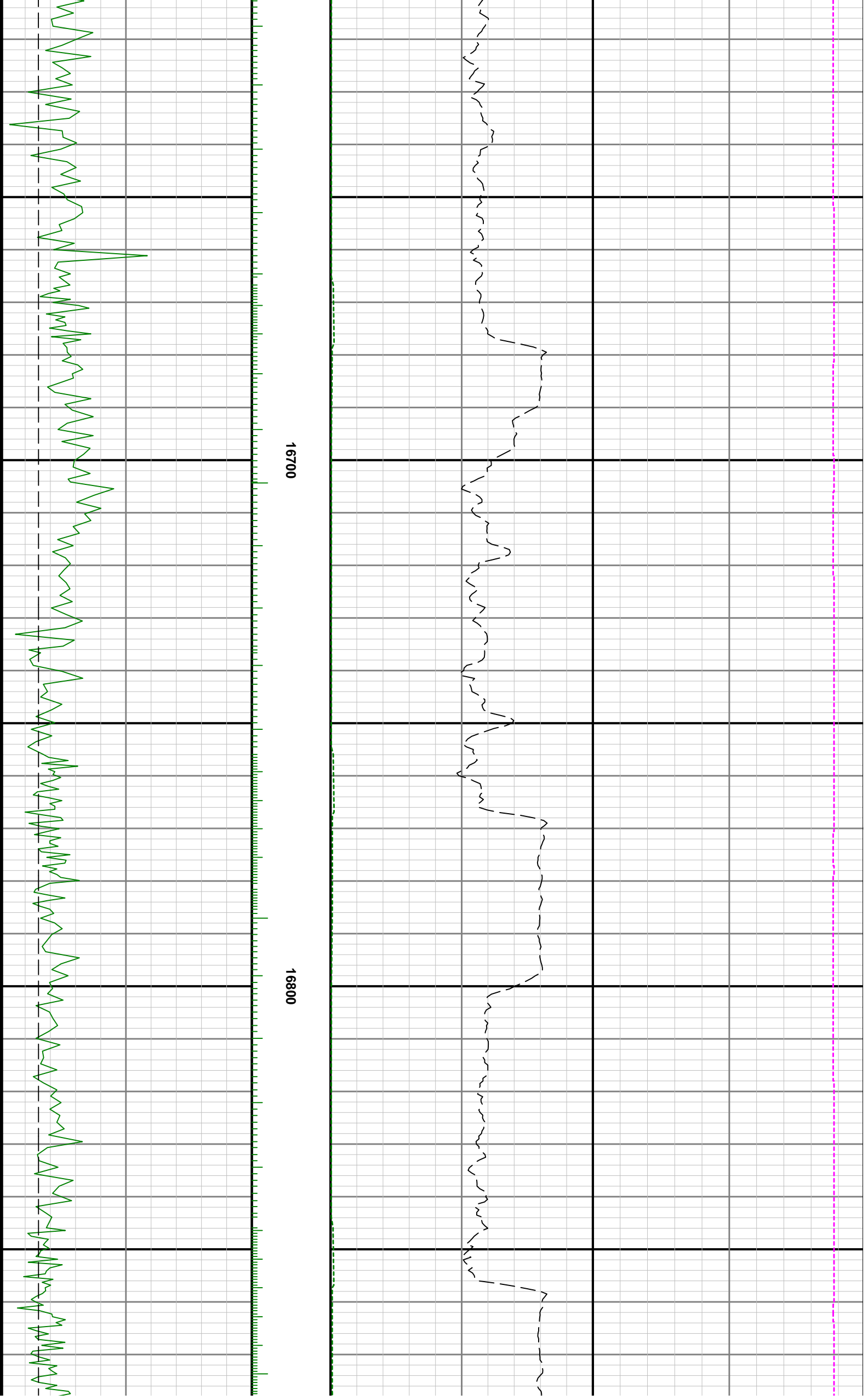


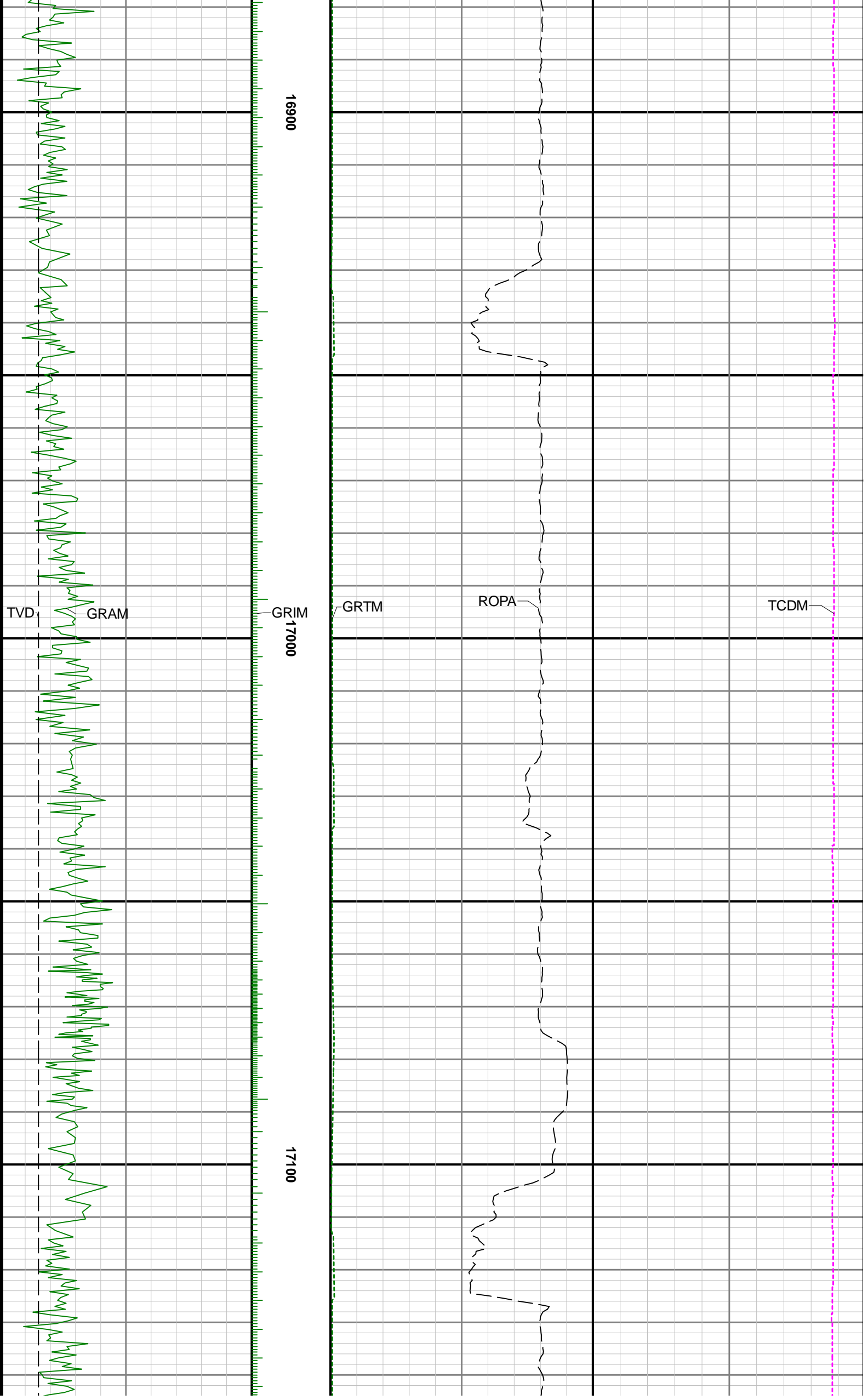


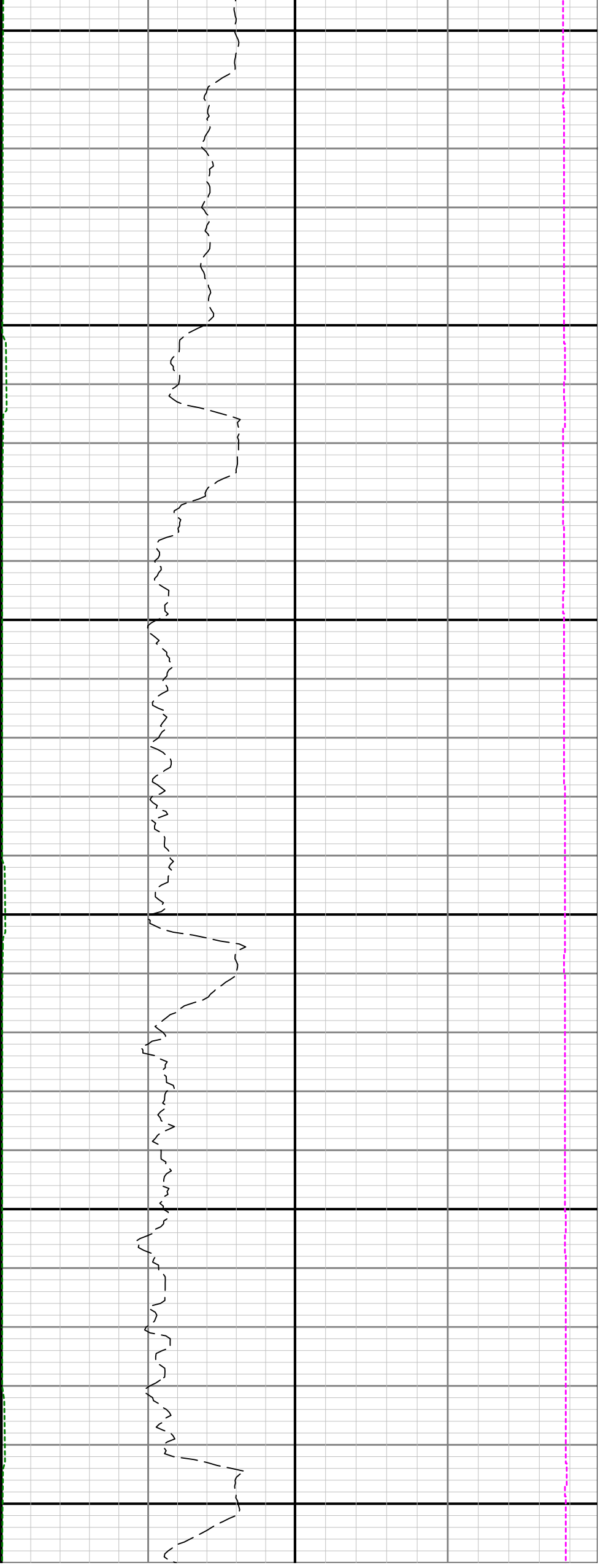












17200

17300

17400

