



LWD MEMORY LOG

Gamma Ray

Company: Bonanza Creek Oil Company

Well: North Platte F21-J24-28HNB

Field: Weld County

County: Weld State: Colorado Country: United States

Driller's Depth

Status: Final Print Surface Location: 040° 22' 53.954" N 104° 26' 43.166" W Directional Azimuthal Gamma Ray

API No: 05-123-47011-00 Longitude: SEC: 21 TWN: 5N RGE: 63W Elev. KB: 0.00 ft Elev. DF: 4570.00 ft Elev. GL: 4553.00 ft

Job ID: 109388045 Permanent Datum (P.D.): Mean Sea Level Elevation: Above P.D. 4570.00 ft

Log Measured From: Rig Floor

Dates Interval Drilled Magnetic Field Reference

Date From: 2018-09-07 Top: (ft) 17.00 Azi Reference North: True Dip Angle: (deg) 66.84

Date To: 2018-09-19 Bottom: (ft) 11537.00 Total Magnetic Field Strength: (nT) 52330

Spud Date: 2018-09-07 Mag to Reference North Correction: (deg) 8.08

Borehole Record

Casing Record

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

13.500 17.00 1612.00 9.625 36.00 17.00 1601.00

8.500 1612.00 11537.00

Mud Record

Deviation Record

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

Water Based Mud 0.00 2369.00 13.500 1612.00 1.08 | 170.13 0.04 | 246.49

Diesel-Oil Based Mud 0.00 11537.00 8.500 9925.00 0.04 | 246.49 90.06 | 179.08

Acquisition System Software Version Other

Baker Hughes Cadence RT 4.2 Xtreme 19

DeliverableGen 1.0.8107.2 Contractor: Xtreme Drilling Unit: D&E

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	13.500	PDC	4.00	Steerable	0.00	0.00	17.00	1612.00	N/A	N/A	5.04
2	1	8.500	PDC	4.00	AutoTrak Curve	5000.00	10331.00	1612.00	10344.00	2018-09-16 16:18	2018-09-17 18:20	31.31
3	1	8.500	PDC	4.00	AutoTrak Curve	10331.90	11522.40	10345.00	11535.50	2018-09-18 07:19	2018-09-18 11:47	9.54

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Steve Bueghly	2018-09-07	2018-09-16	Mark Herpin	2018-09-16	2018-09-19			

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+ (%)
2018-09-06 14:20	1	17.00	Water Based Mud	8.9	1	8	0.0	0/96.5	Active Pit	300	0.00
2018-09-16 08:00	2	2368.00	Diesel-Oil Based Mud	8.6	8	N/A	0.0	79/12.5	Active Pit	14000	0.00
2018-09-18 16:44	2	5975.00	Diesel-Oil Based Mud	9.0	11	N/A	8.4	83/17	Active Pit	14000	0.00
2018-09-18 16:46	2	8638.00	Diesel-Oil Based Mud	9.5	11	N/A	N/A	85/15	Active Pit	14000	0.00

2018-09-18 10:48	2	0038.00	Diesel-Oil Based Mud	9.5	11	N/A	8.5	85/15	Active Pit	14000	0.00
2018-09-18 01:15	3	10344.00	Diesel-Oil Based Mud	9.5	11	N/A	8.5	85/15	Active Pit	14000	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	NaviTrak	13225711	VSS	16.02	52.03	8.000	0.000
1	NaviTrak	13225711	Directional (mag)	16.02	52.03	8.000	0.000
2	ATC_SU	12252538	Near Bit Inclination	5.93	6.93	7.000	4.330
2	ATC_SU	12252538	Near Bit VSS	5.93	6.93	7.000	4.330
2	ATC_MWD	14313851	Gamma (single)	2.23	12.55	7.000	3.250
2	ATC_MWD	14313851	Directional (mag)	12.27	22.59	7.000	3.250
3	ATC_SU	14186737	Near Bit VSS	5.93	6.93	7.000	4.330
3	ATC_SU	14186737	Near Bit Inclination	5.93	6.93	7.000	4.330
3	ATC_MWD	14179564	Gamma (single)	2.75	13.10	7.000	3.250
3	ATC_MWD	14179564	Directional (mag)	12.27	22.62	7.000	3.250

Service and Tool Mnemonics



Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
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

- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
- Baker Hughes LWD Run 1 used the 8 inch NaviTrak service (Directional) behind a 13 1/2 inch bit and steerable assembly to drill from 17 to 1612 feet MD (17 to 1612 feet TVD).
- Baker Hughes LWD Runs 2 through 3 used the 6 3/4 inch NaviGamma service (Gamma Ray, Azimuthal Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly to drill from 1612 to 11537 feet MD (1622 to 6329 feet TVD).
- The Gamma Ray Apparent (GRAM) data is presented from 0 to 200 API, per customer's request.
- There are numerous gaps in Gamma Ray data due to sensor failing downhole.

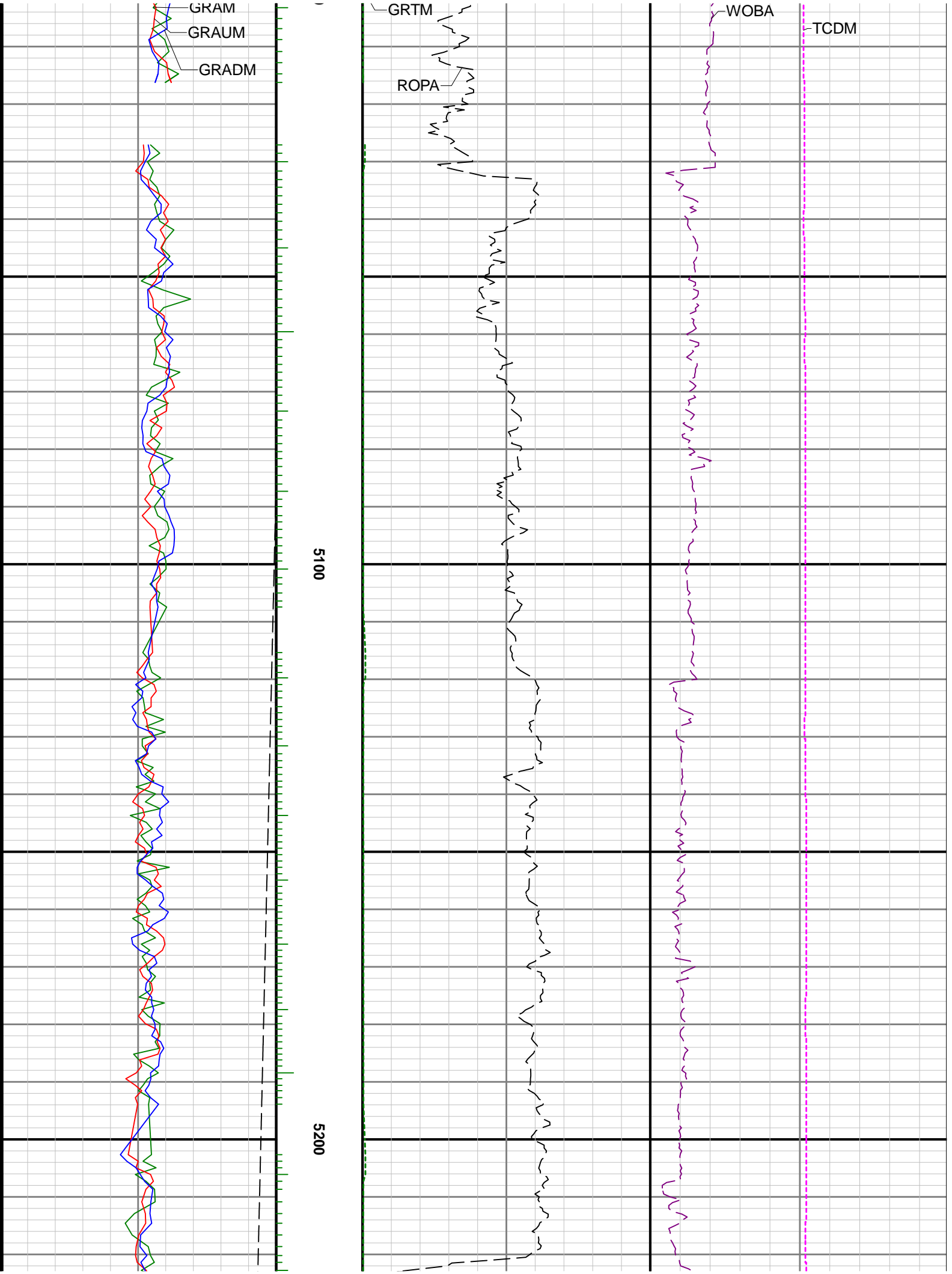
Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	5000.00	8.500	2	The Gamma Ray Apparent (GRAM) log starts at 5000 feet, per customer's request.
2	10334.43	8.500	3	The GRTM curve exceeds the 600 min scale in the interval from 10331 to 10344 feet MD (6329 TVD) because it was not logged for up to 12 hours after a trip out of hole to change BHA.
3	11535.00	8.500	3	The interval from 11524 to 11537 feet MD (6329 feet TVD) was not logged due to sensor to bit offset at well TD.

 	Company	Bonanza Creek Oil Company	
	Well	North Platte F21-J24-28HNB	
	Interval	Date From:	2018-09-07 01:18
		Date To:	2018-09-19 05:46
	Created	2018-09-19 06:25:21	
		Top:	17.00 ft
		Bottom:	11537.00 ft

<div>Gamma Ray - Apparent 0.5 ft Average GRAM</div> <div>0200</div> <div>API</div> <div>Azimuthal Gamma Ray - Apparent - Up Quadrant 0.5 ft Average GRAUM</div> <div>0200</div> <div>API</div> <div>Azimuthal Gamma Ray - Apparent - Down Quadrant 0.5 ft Average GRADM</div> <div>0200</div> <div>API</div> <div>True Vertical Depth TVD</div> <div>70005000</div> <div>ft</div>	MD 1:240 feet	<div>Depth Averaged ROP 3 ft Average ROPA</div> <div>10000</div> <div>ft/h</div> <div>Gamma Time Since Drilled GRTM</div> <div>0600</div> <div>min</div>	<div>Weight On Bit, Average 1 ft Average WOBA</div> <div>0100</div> <div>klb</div> <div>Downhole Temperature TCDM</div> <div>0300</div> <div>degF</div>	

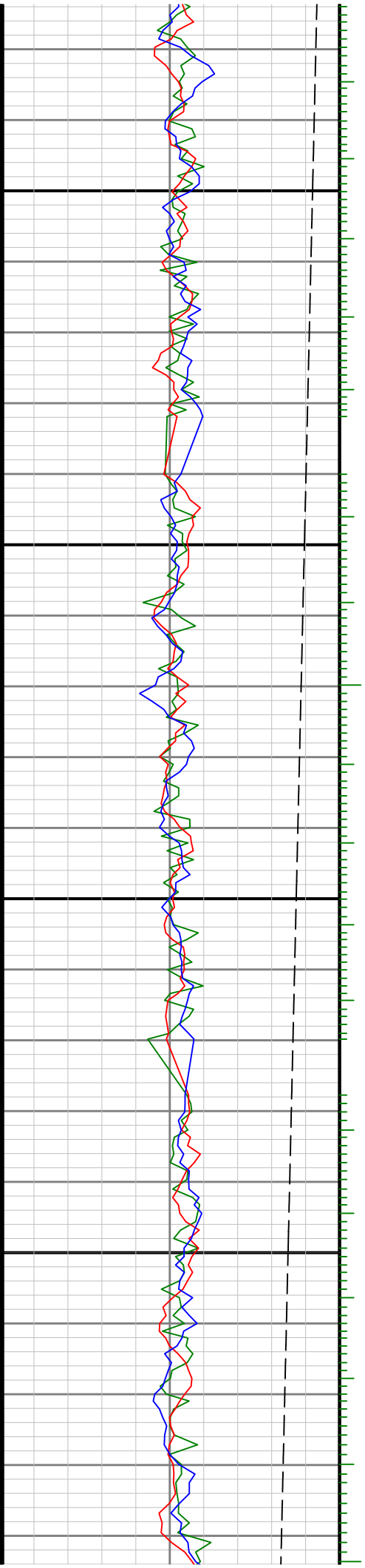
<div>See Remark 1</div>	<div>5000</div>						

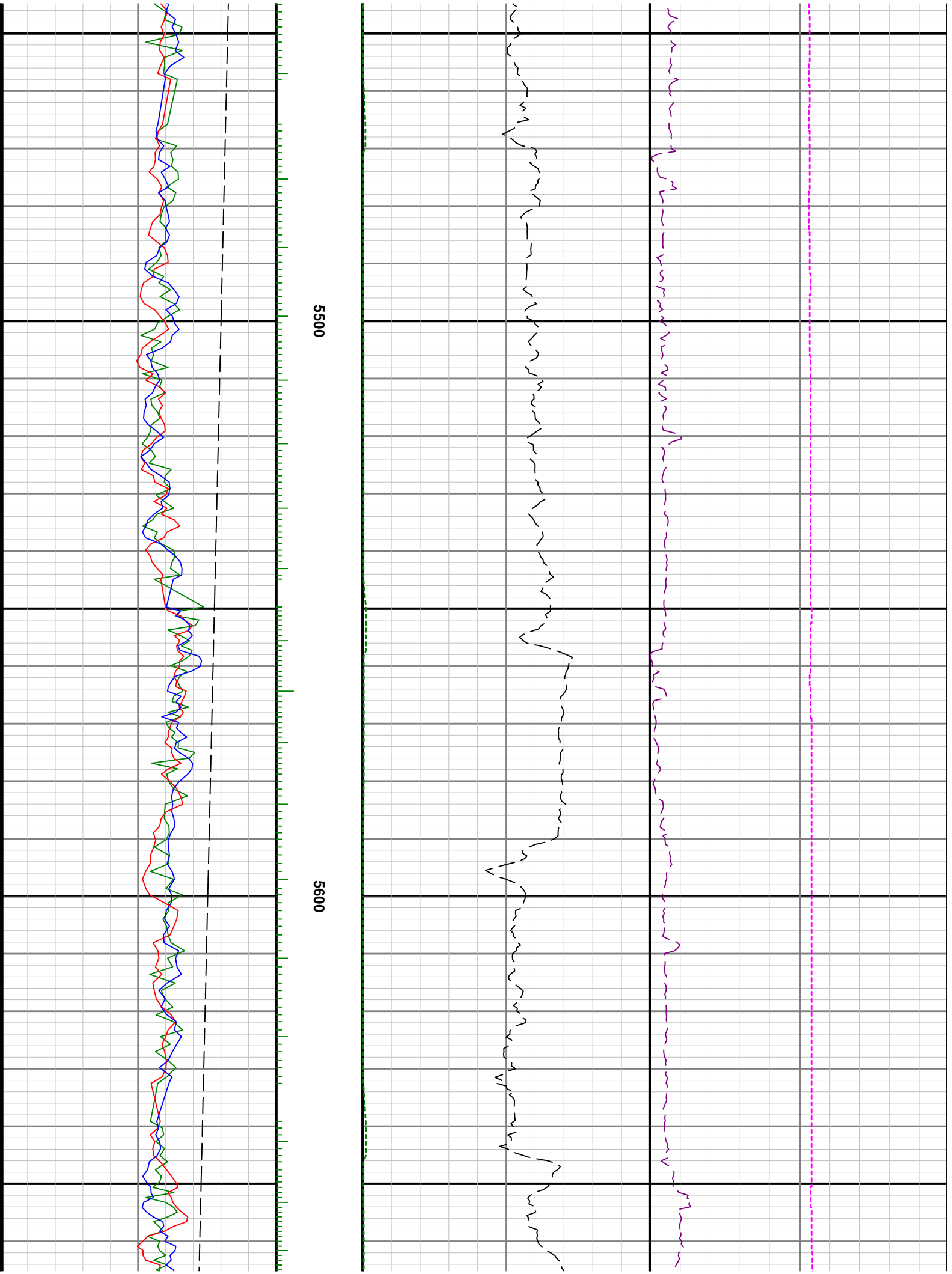


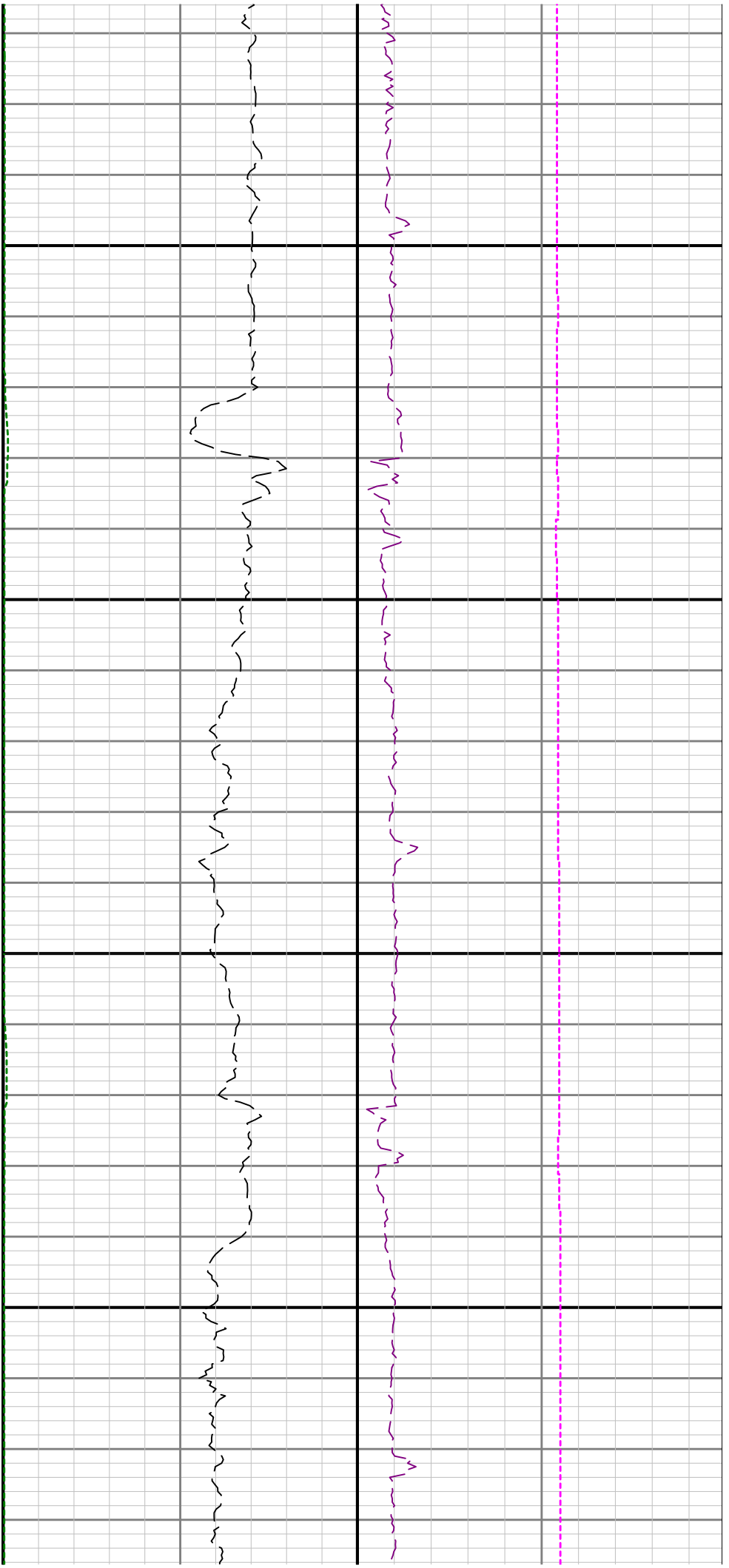


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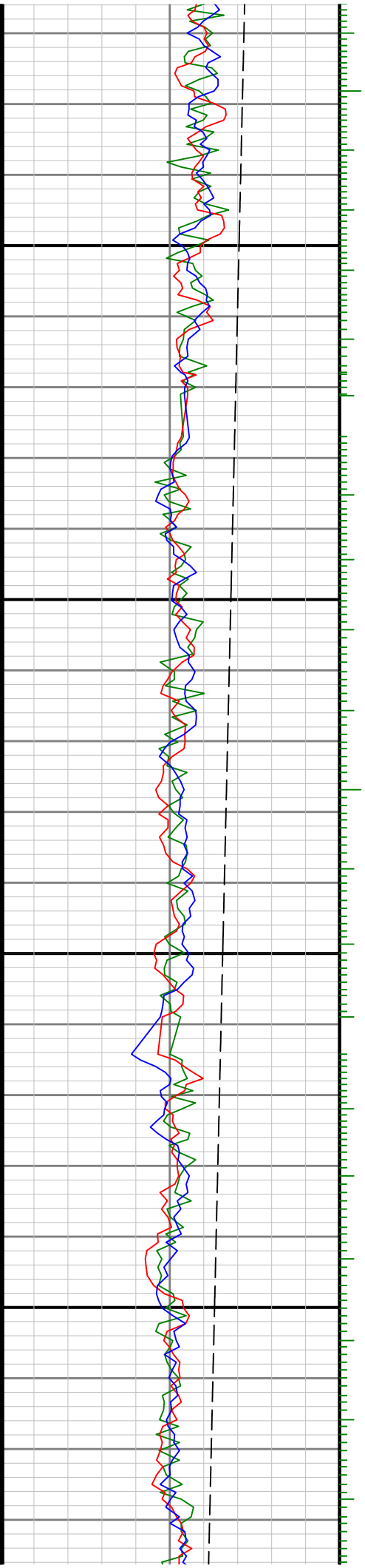


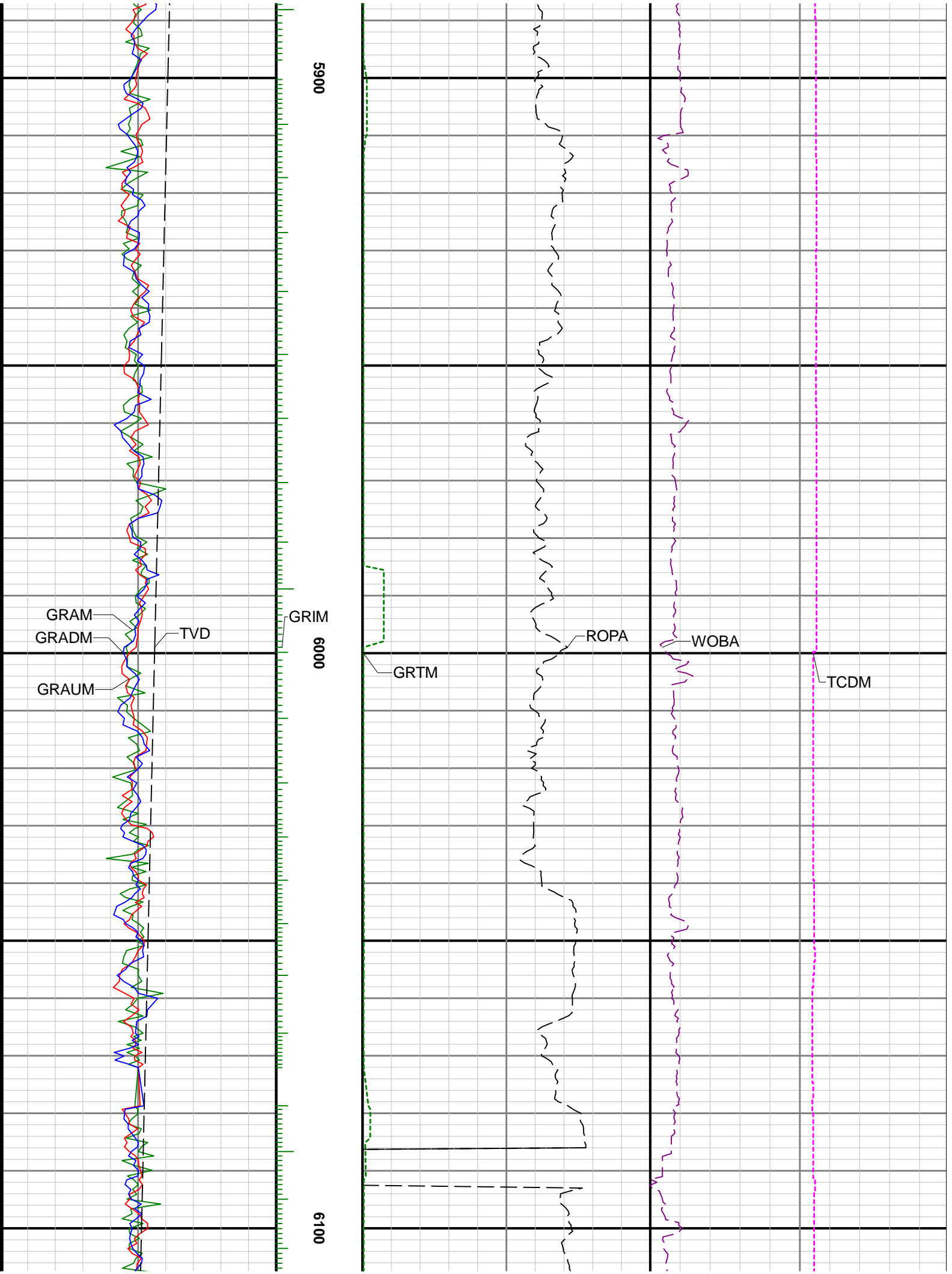


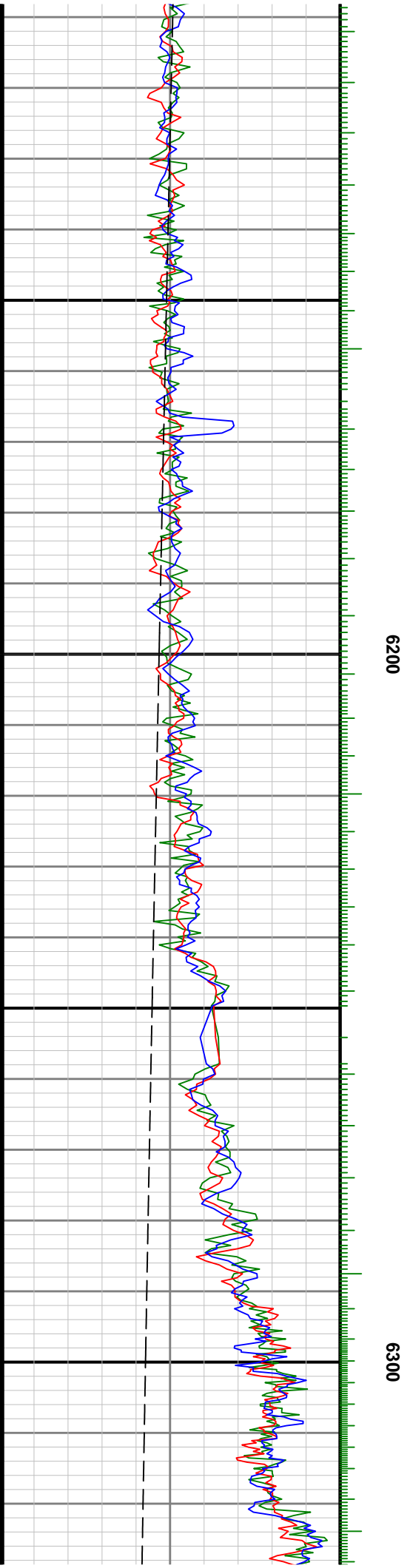
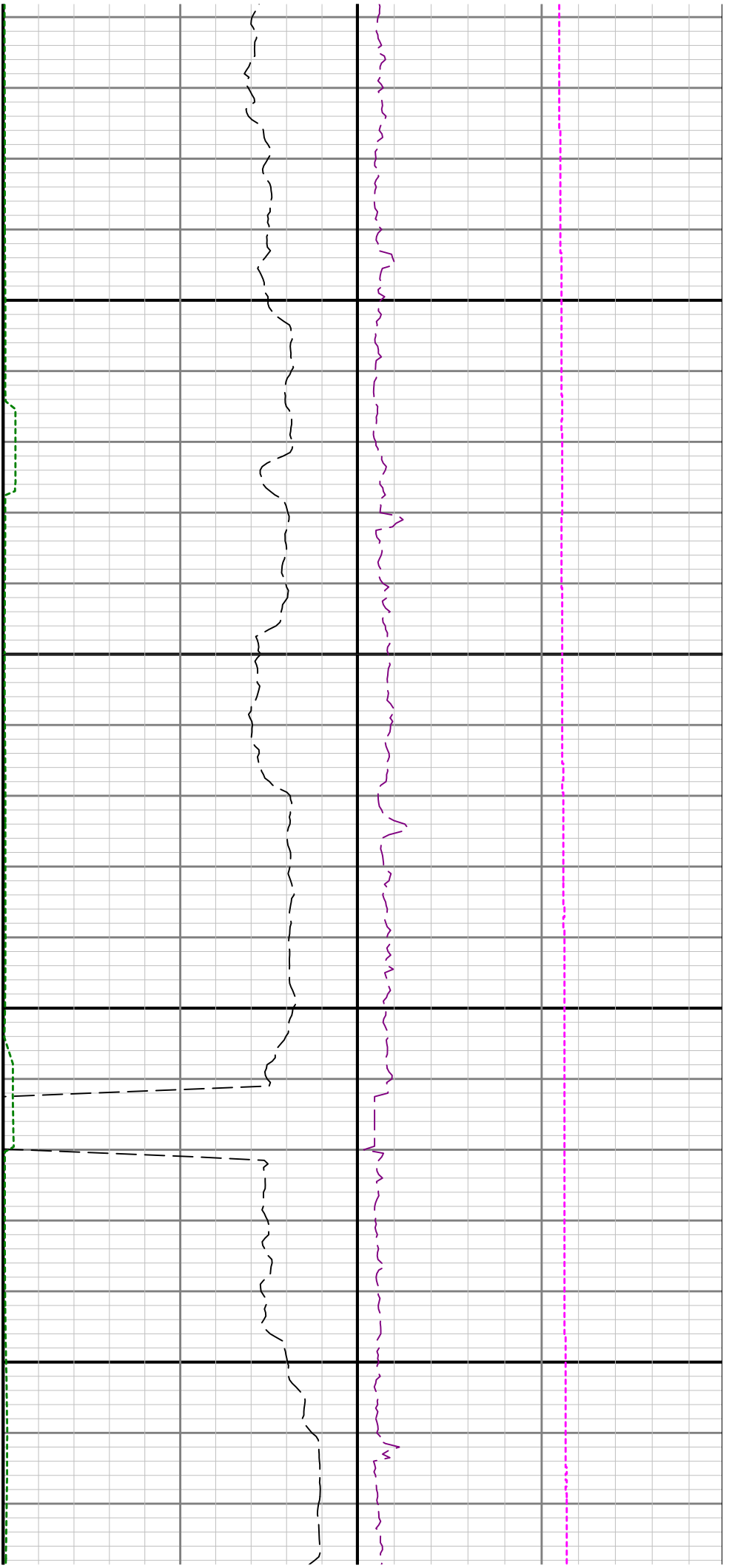


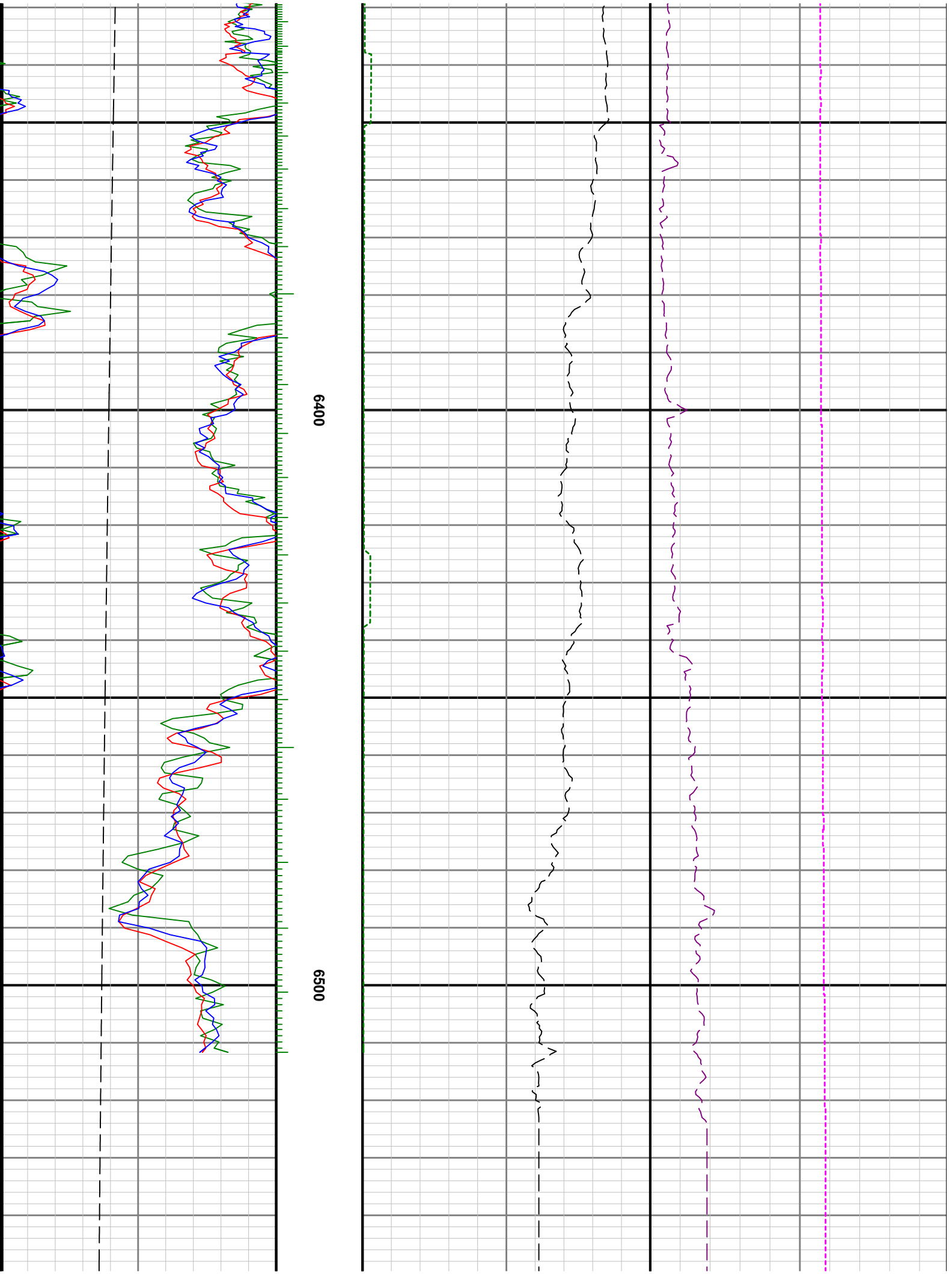
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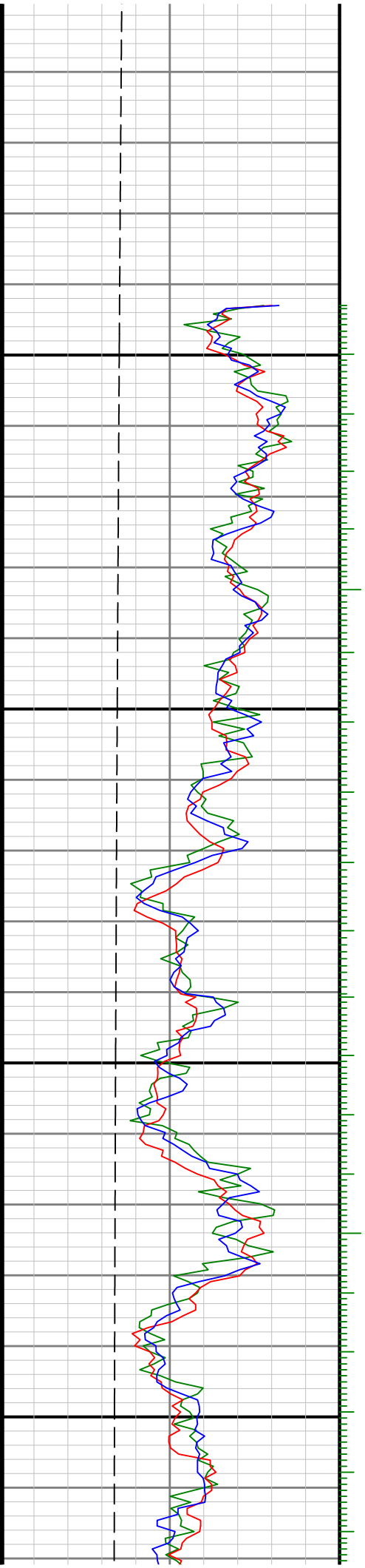
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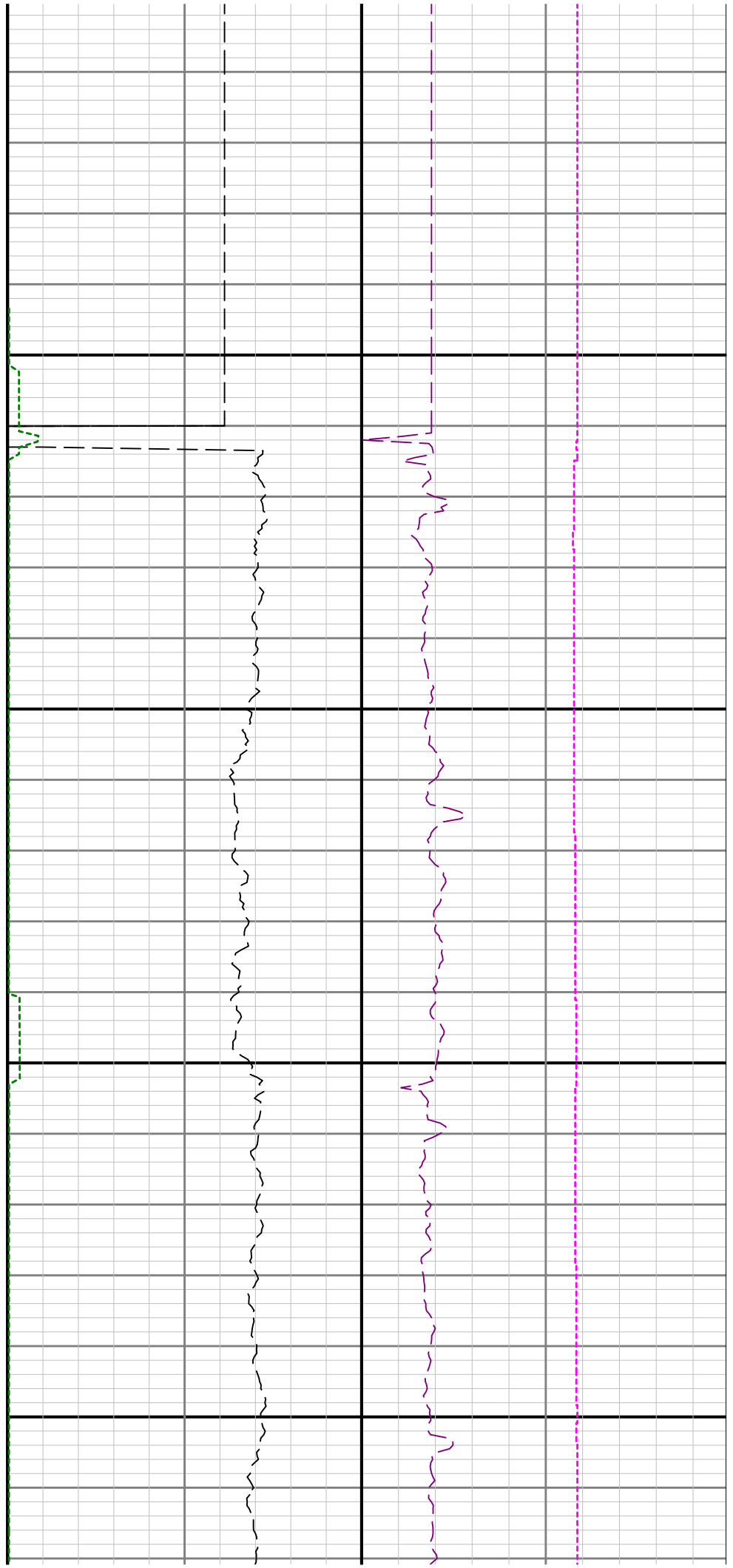


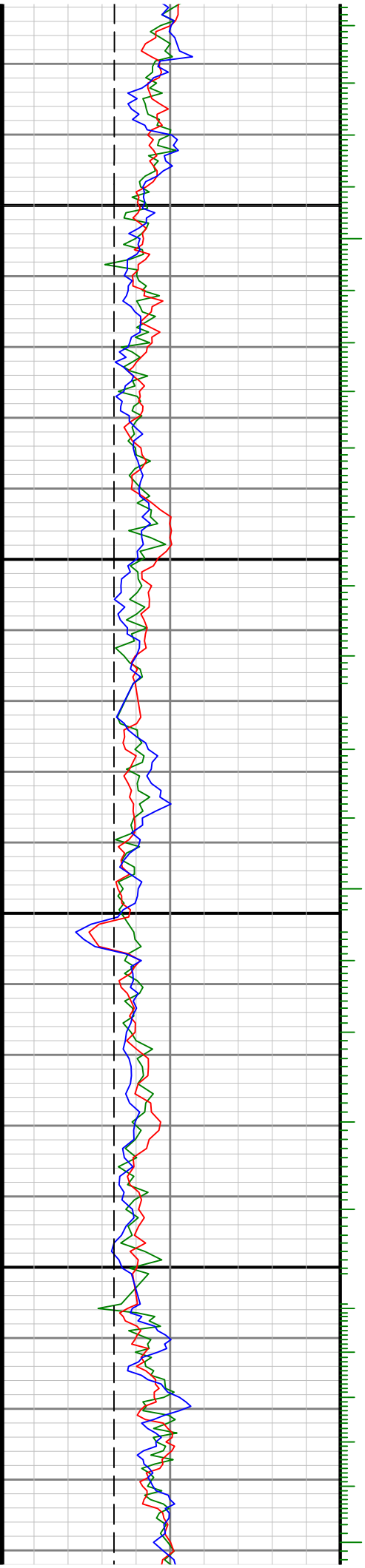




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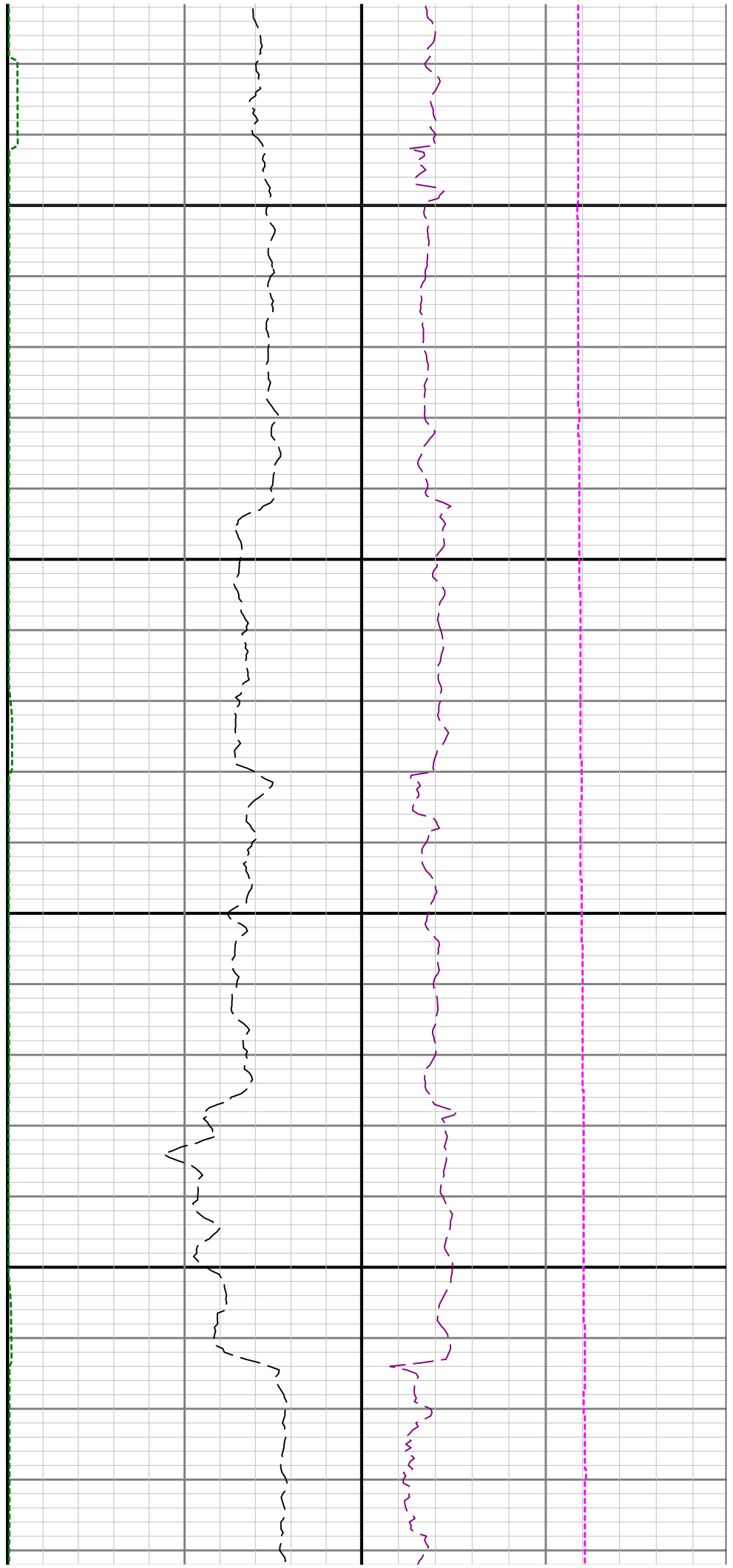
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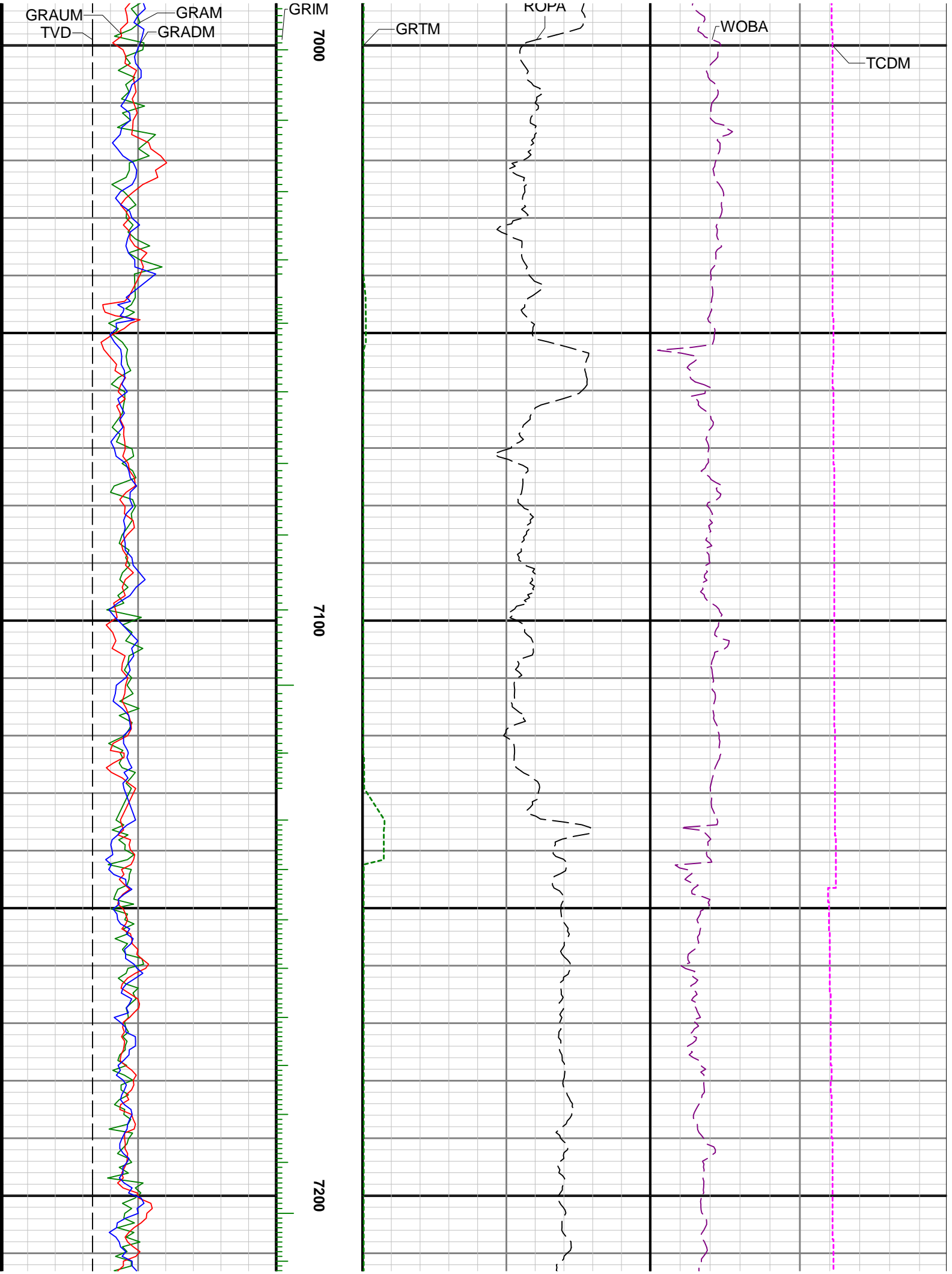


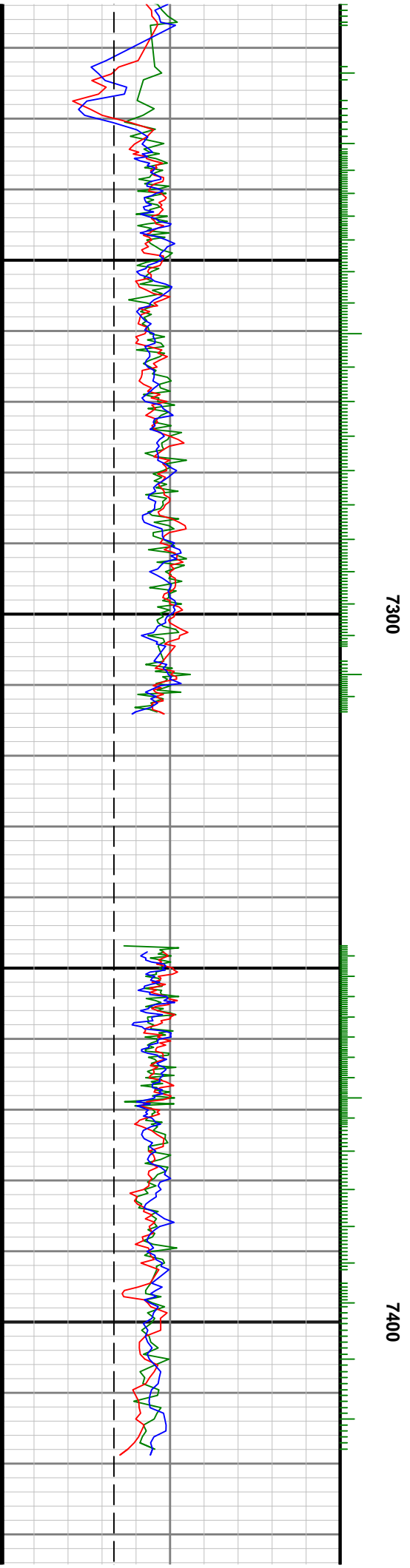
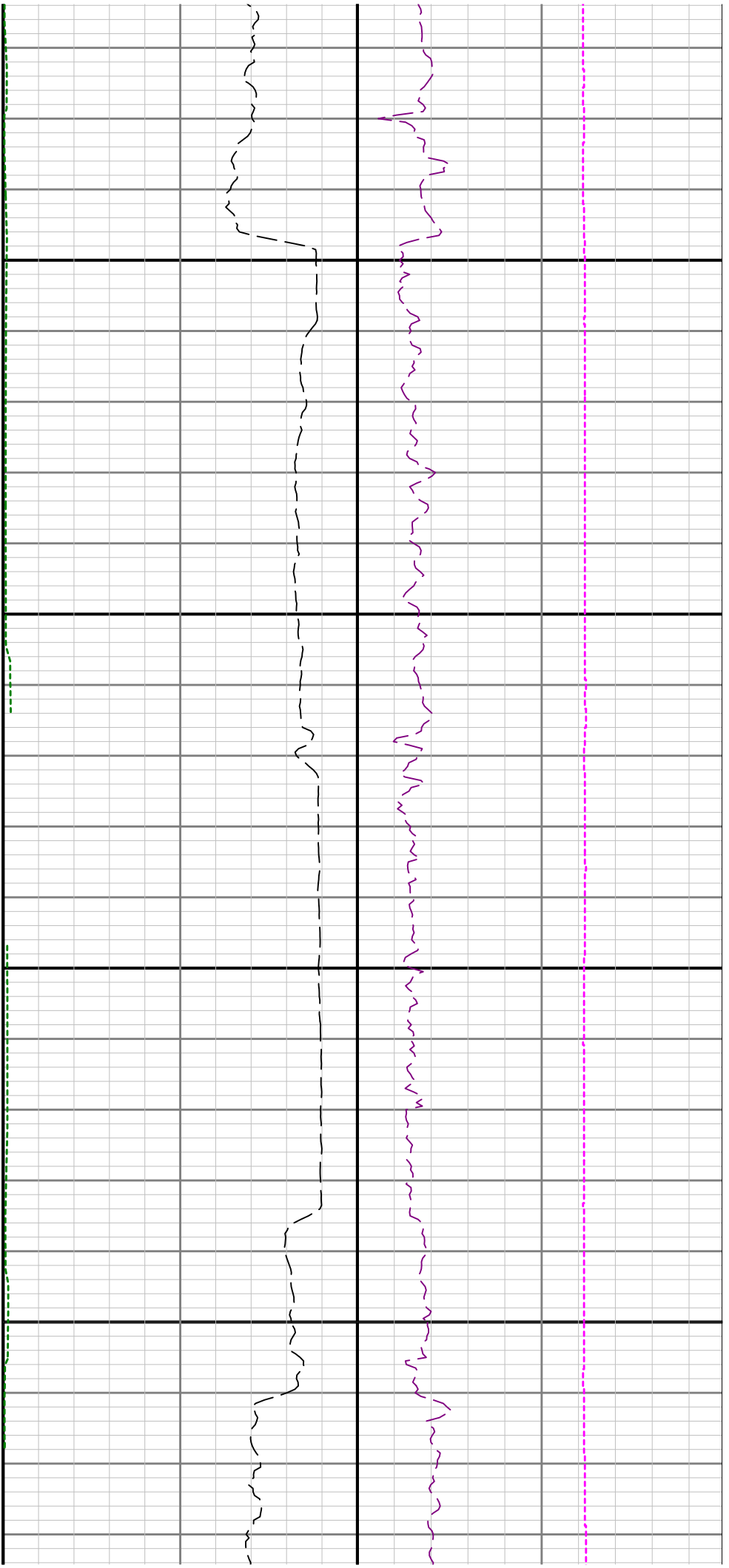


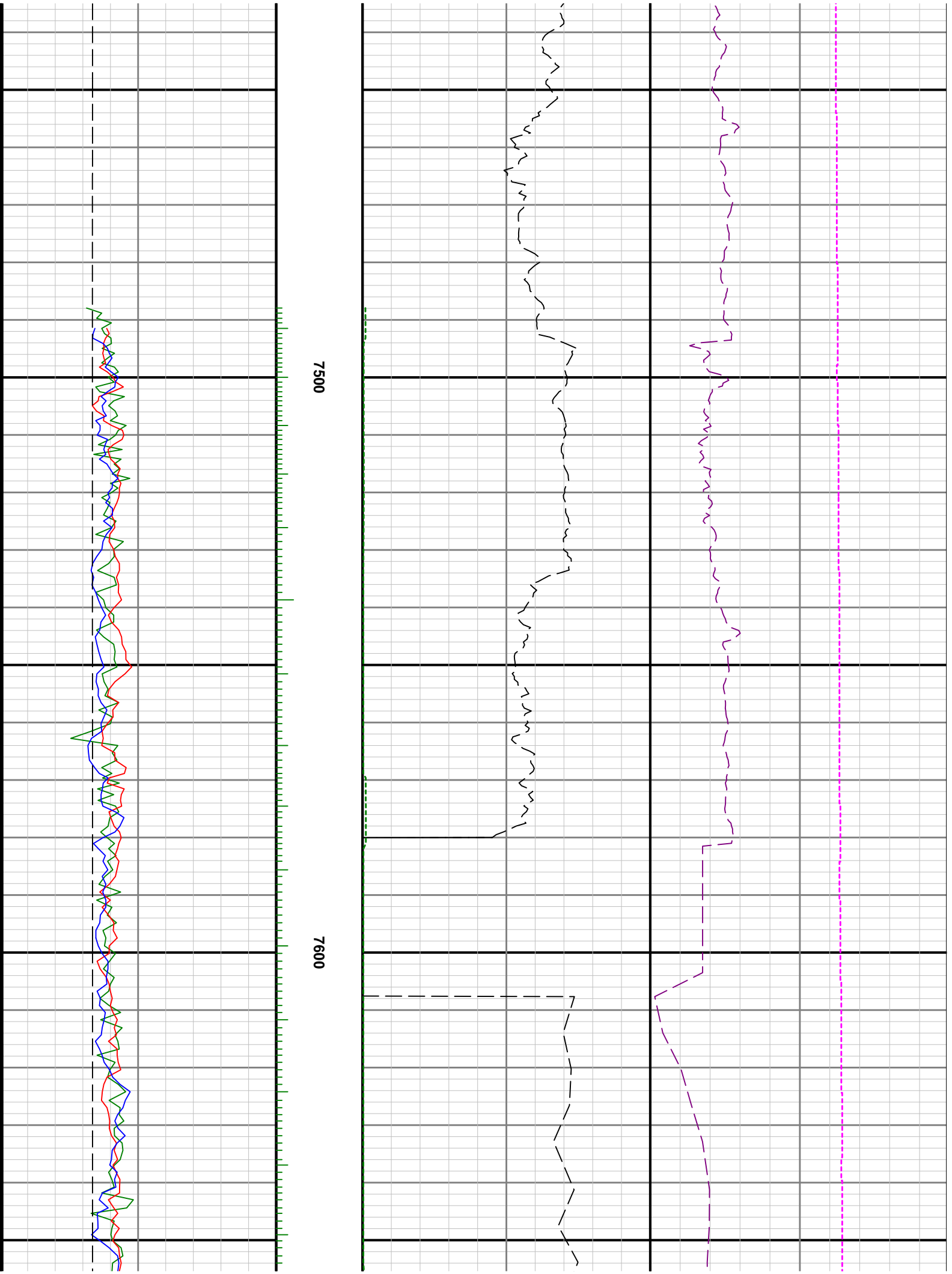
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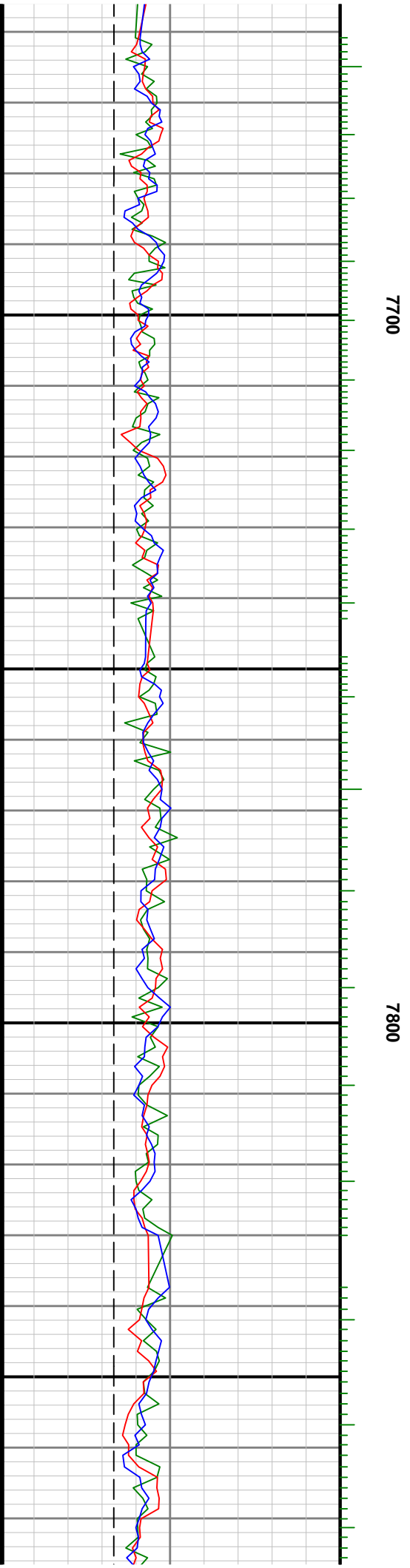
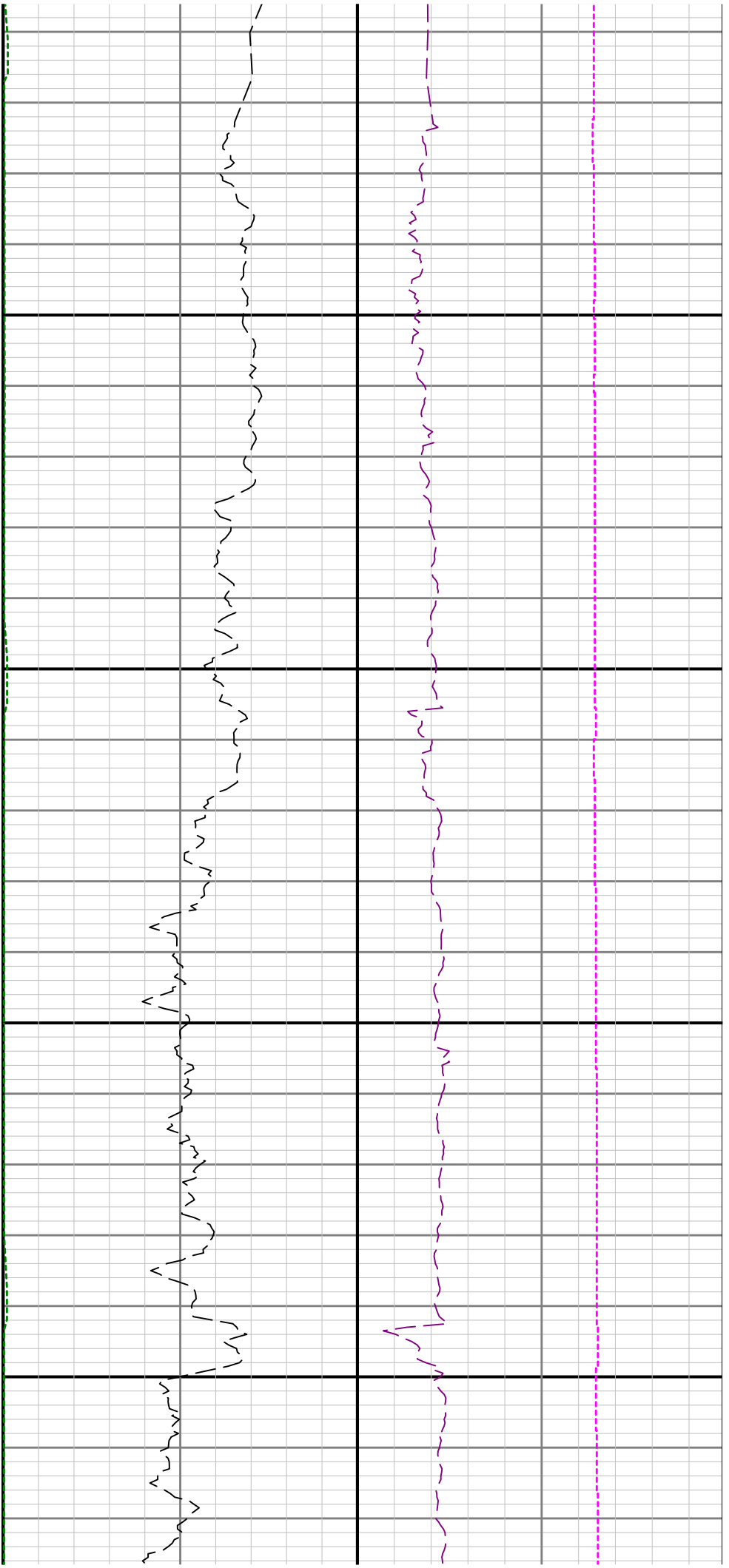
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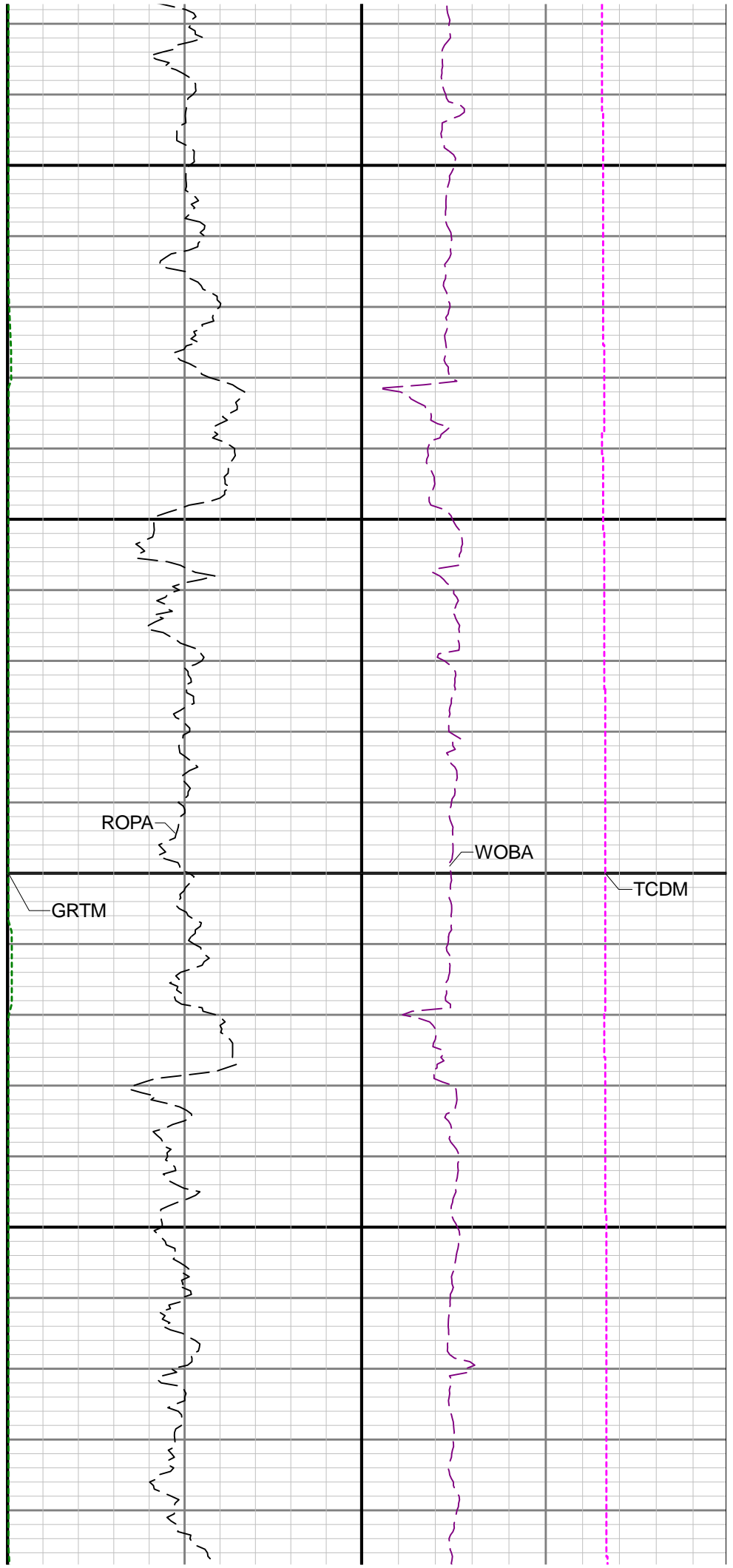
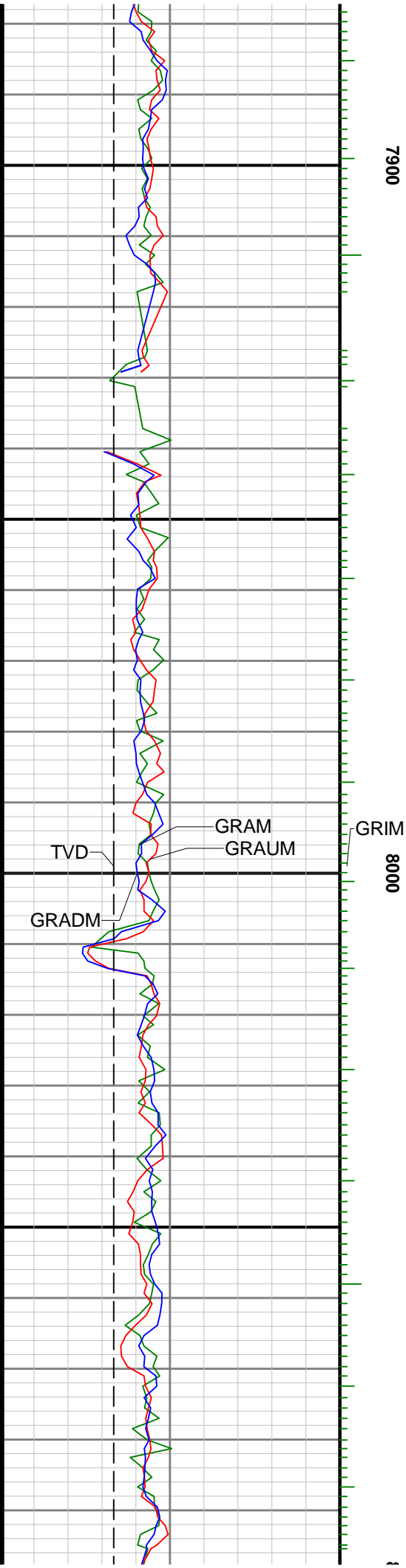


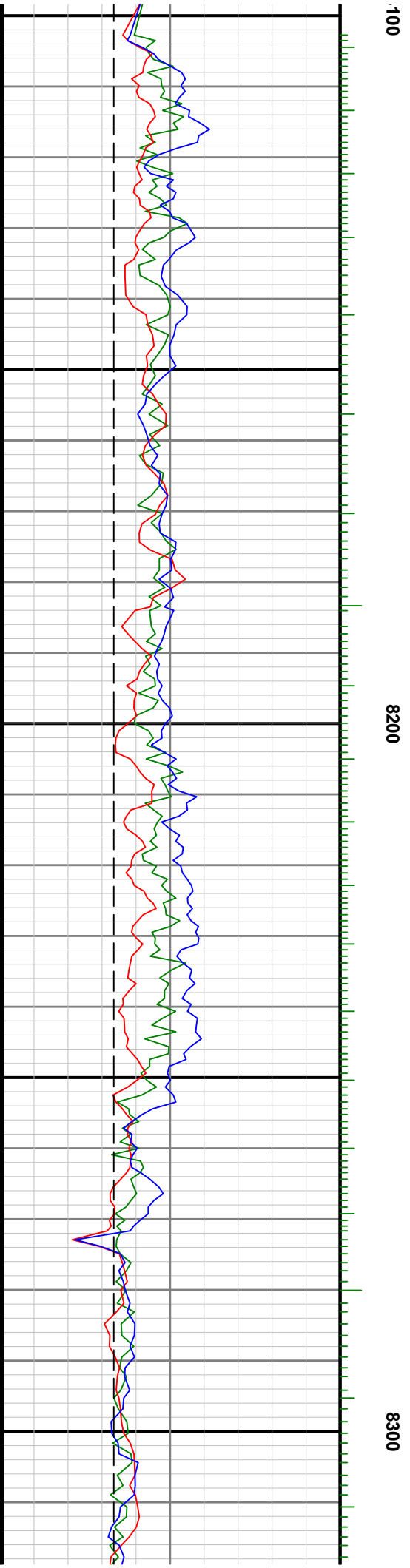
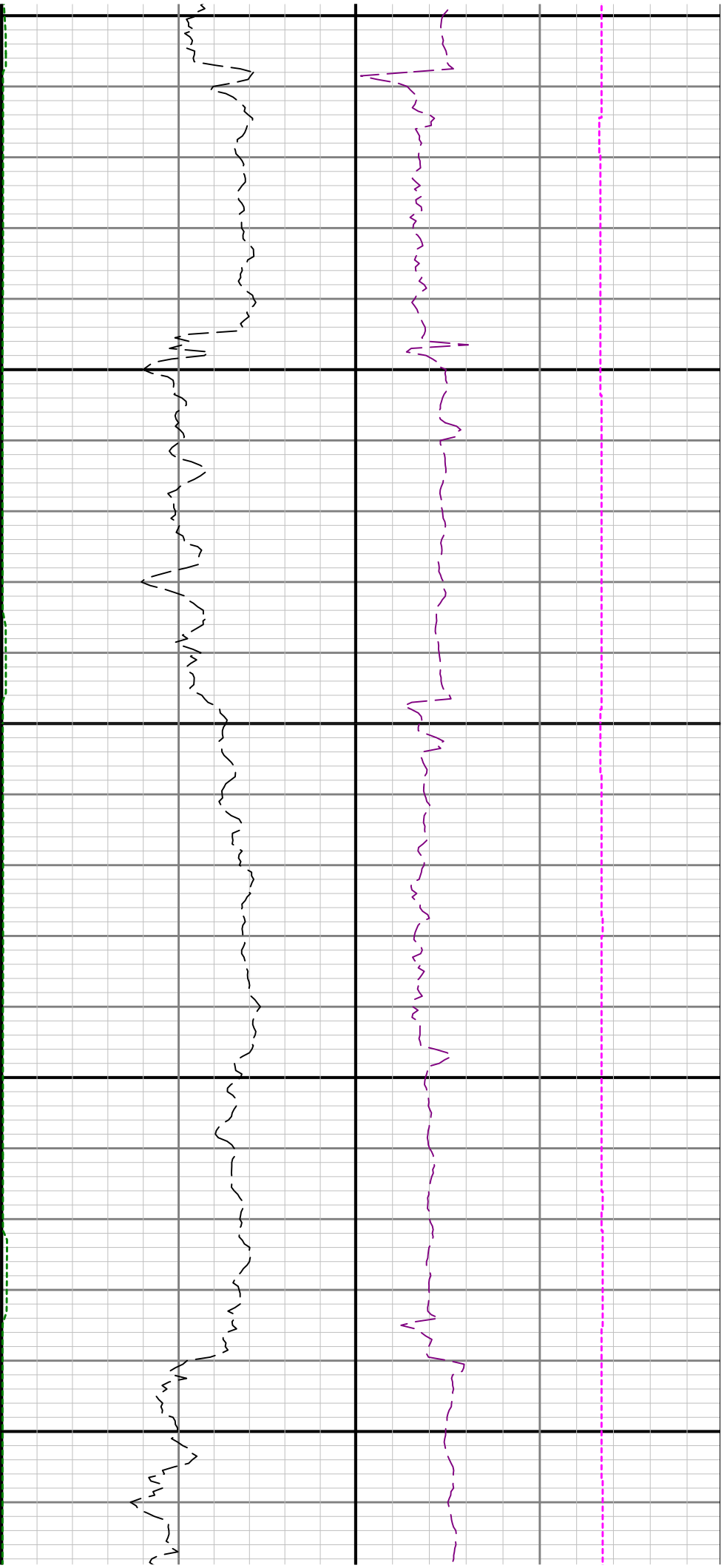


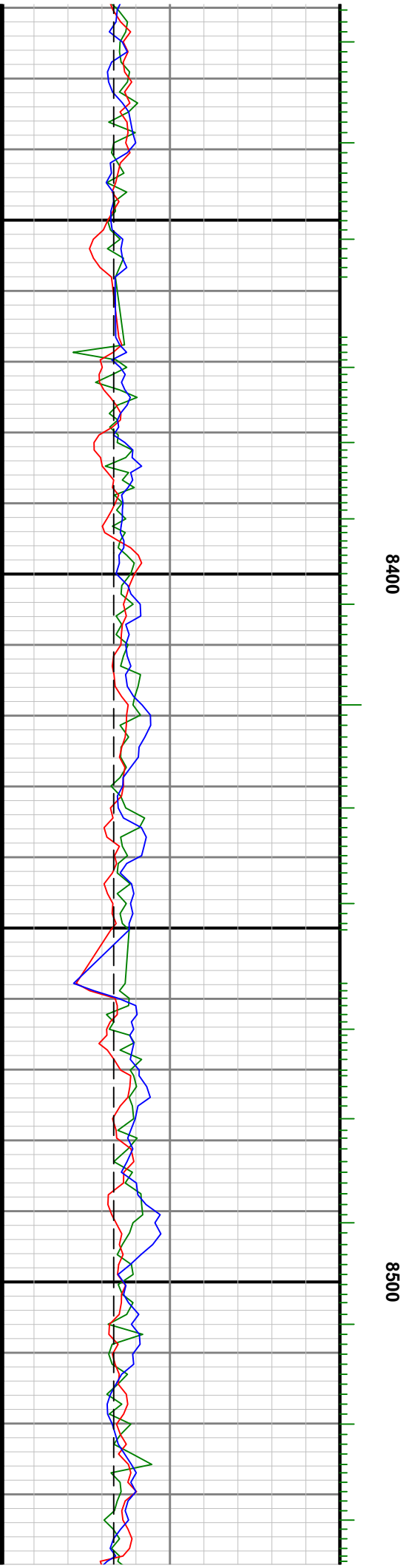
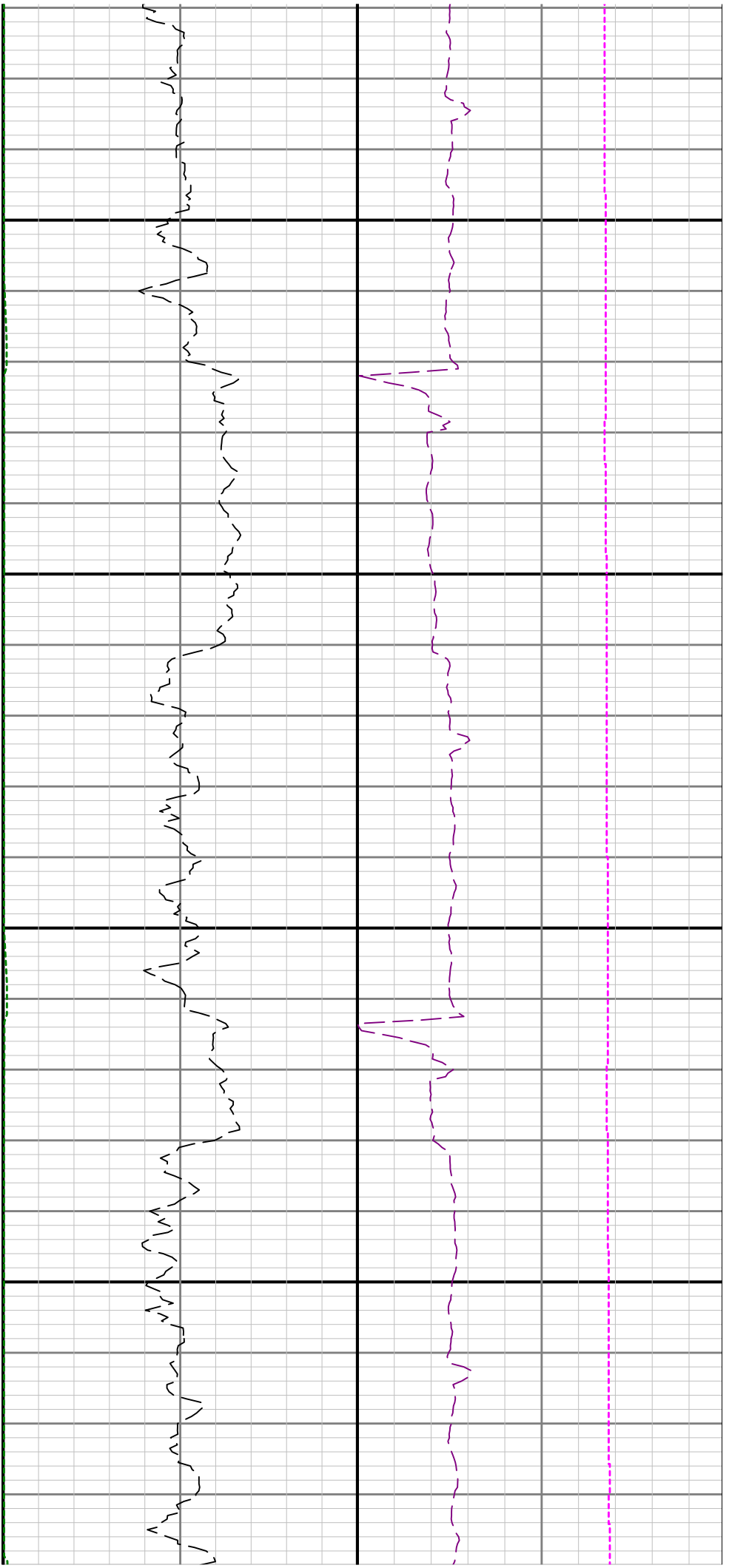


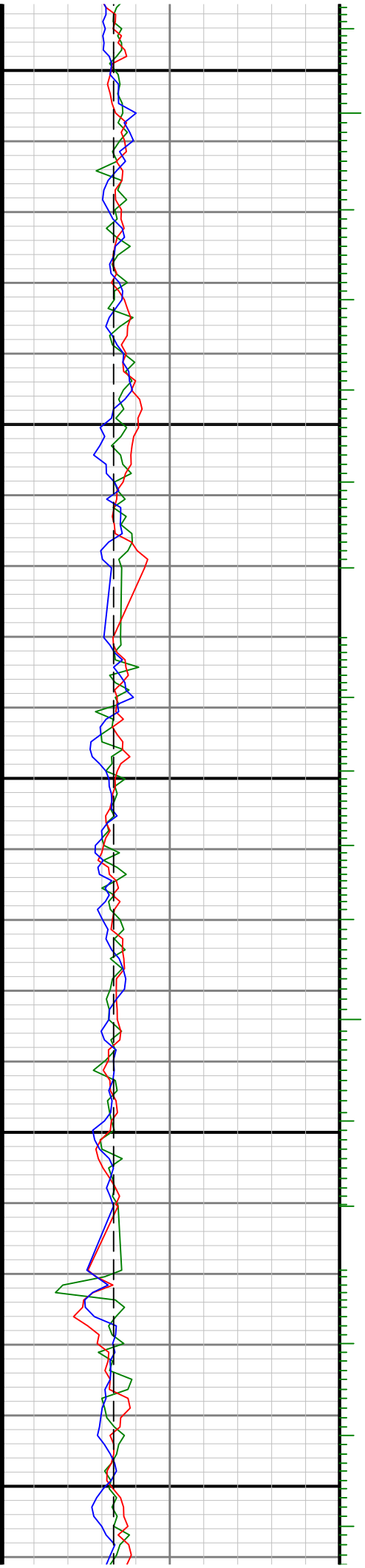






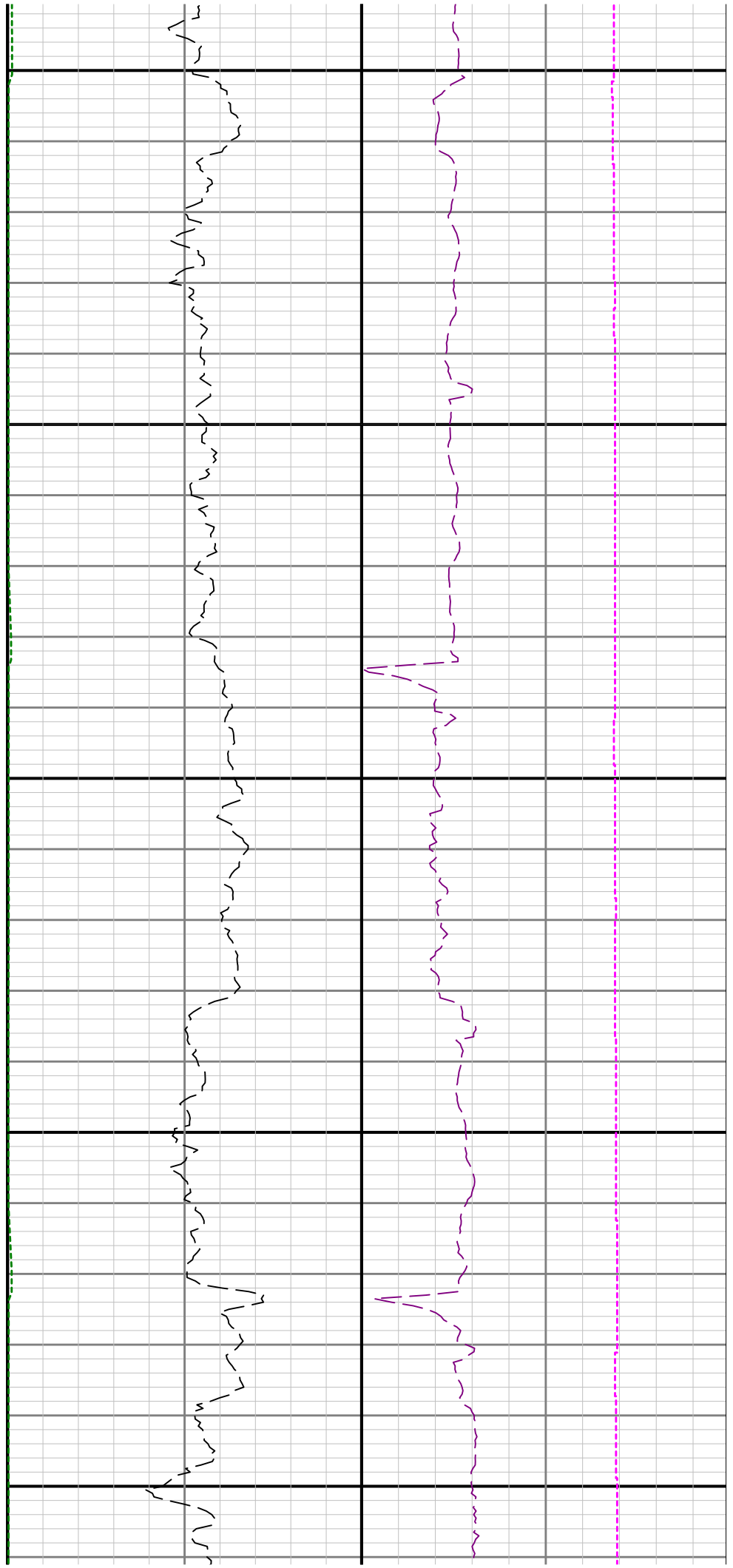


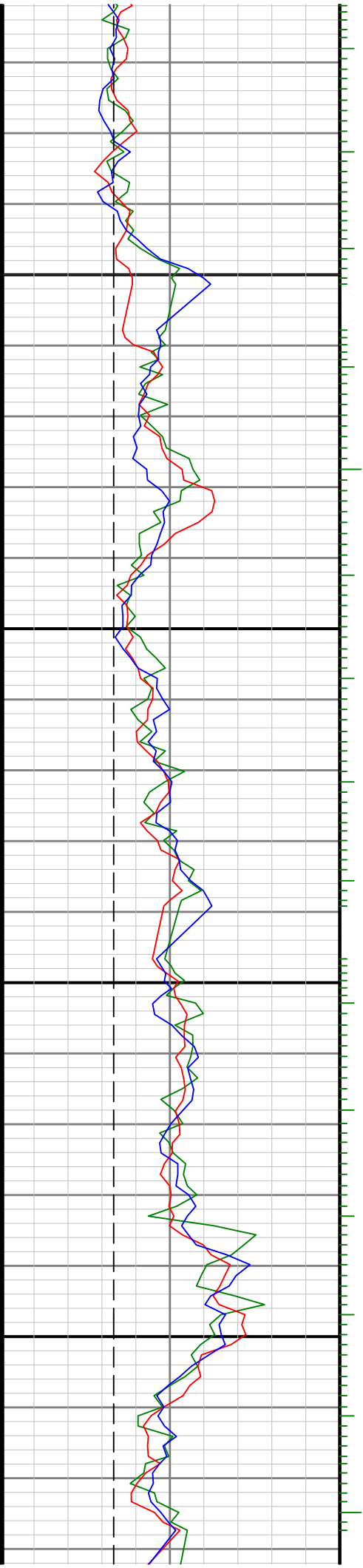




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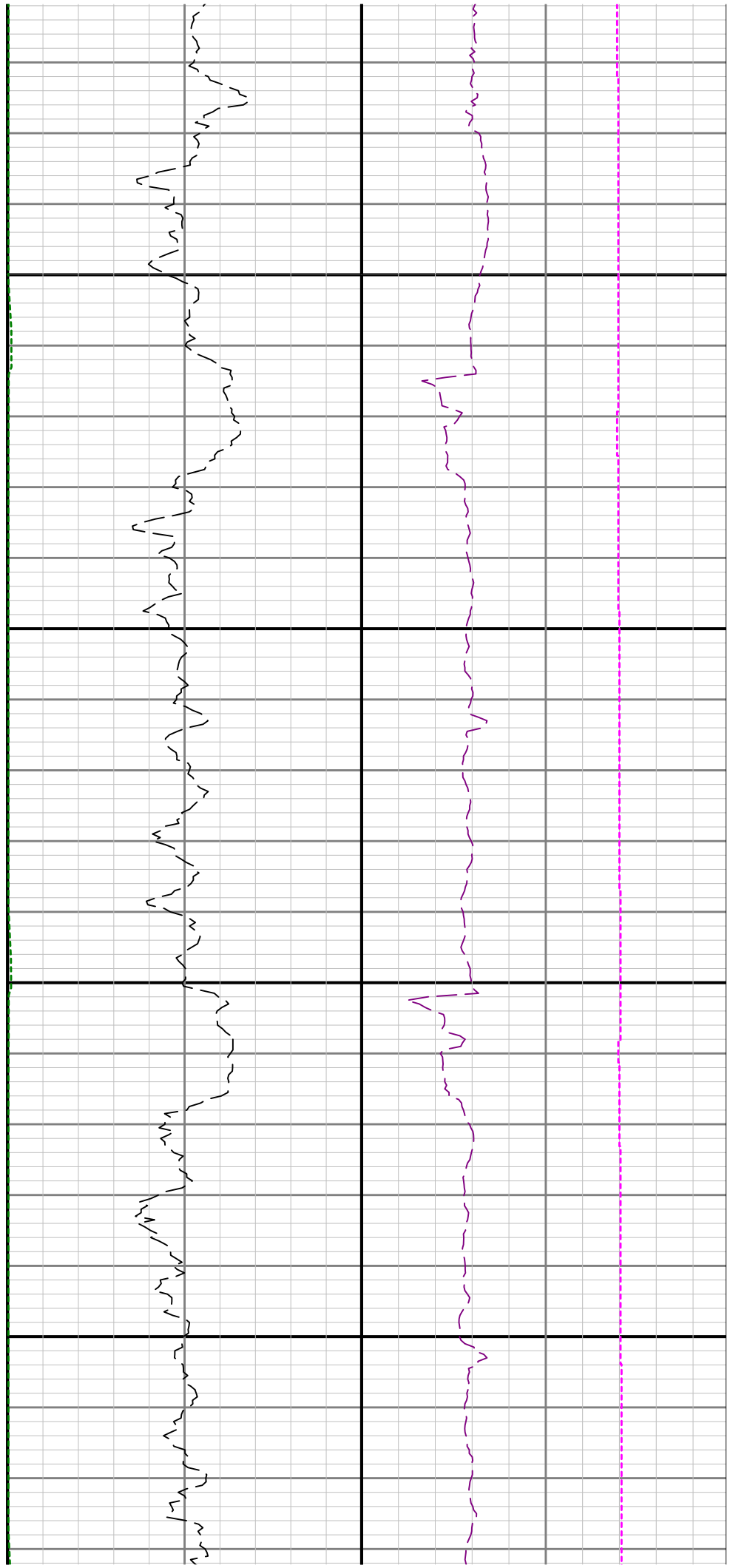
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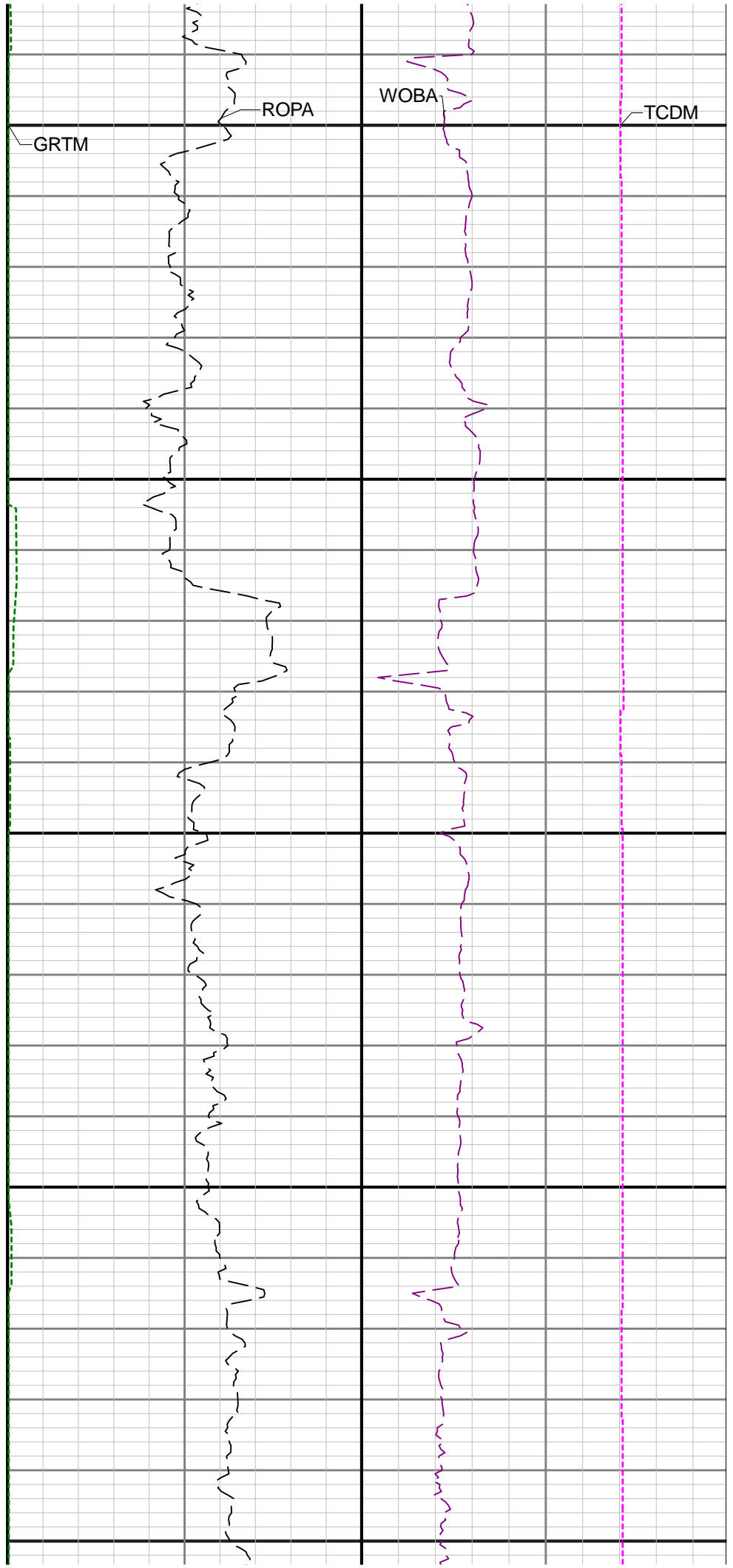
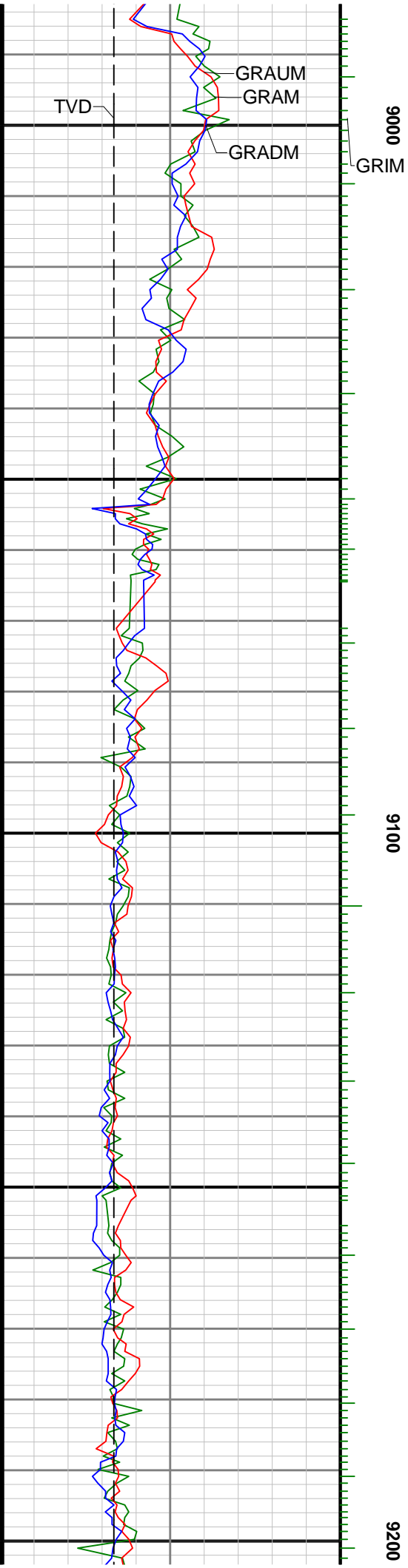


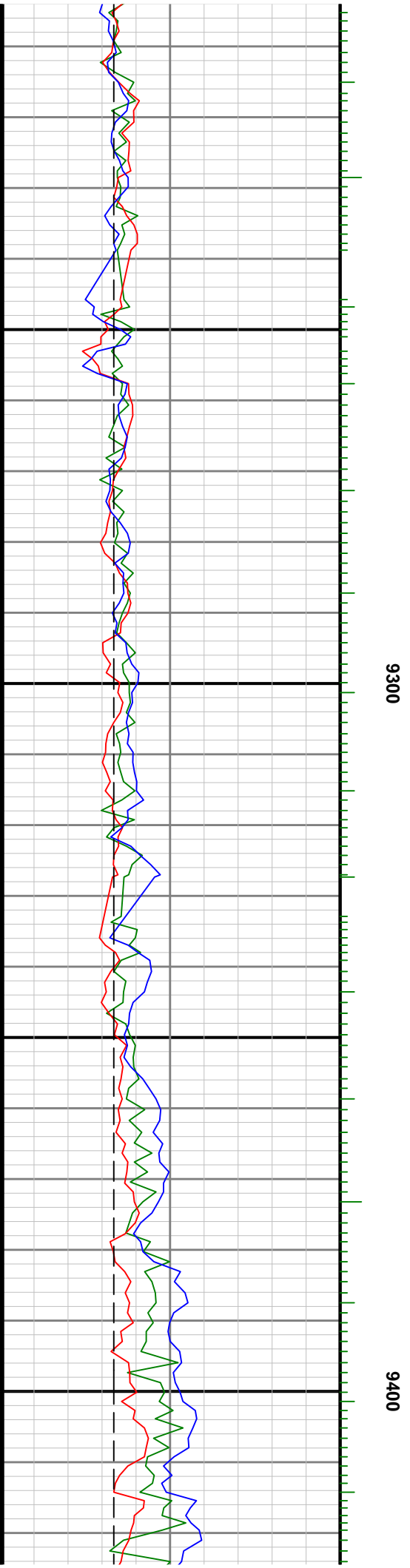
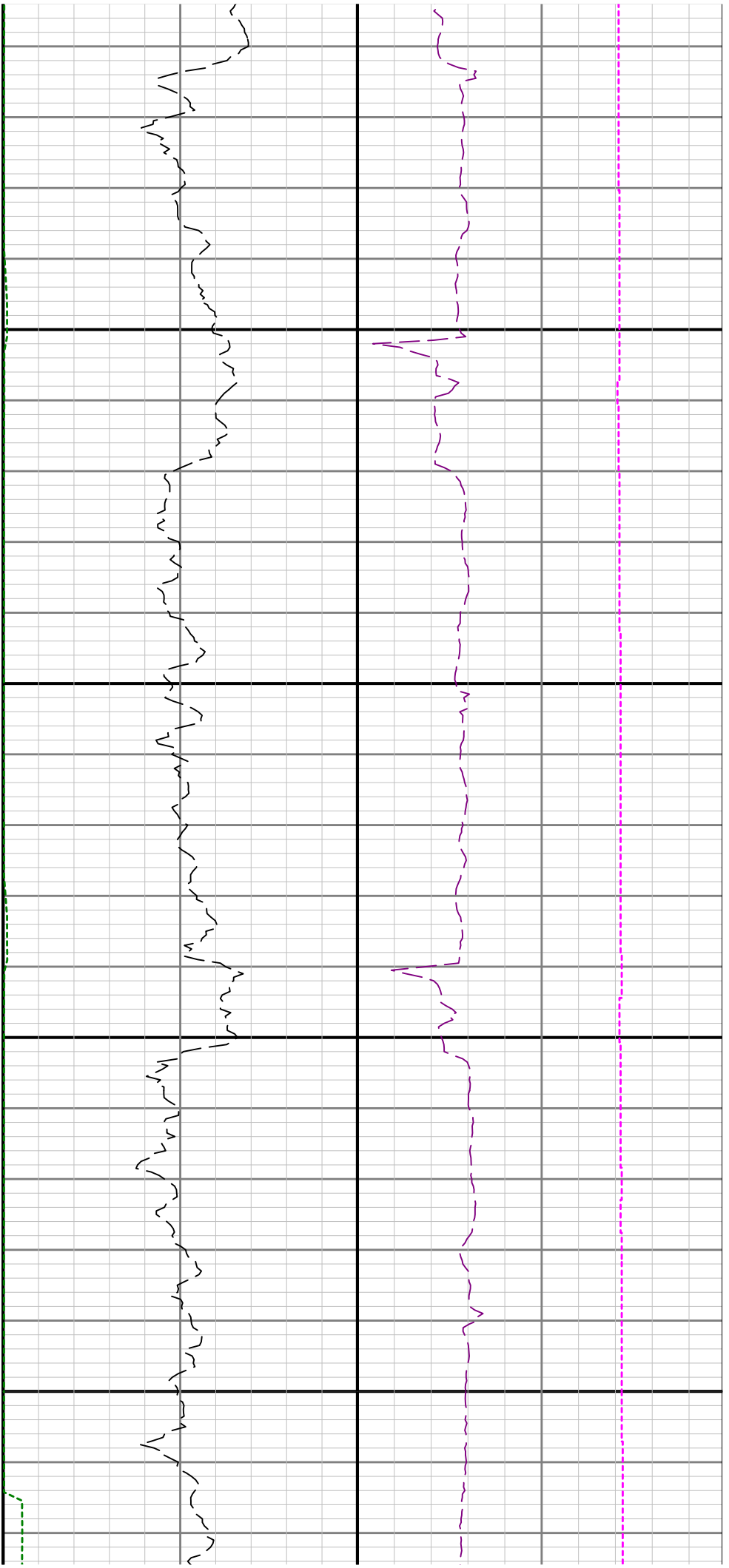


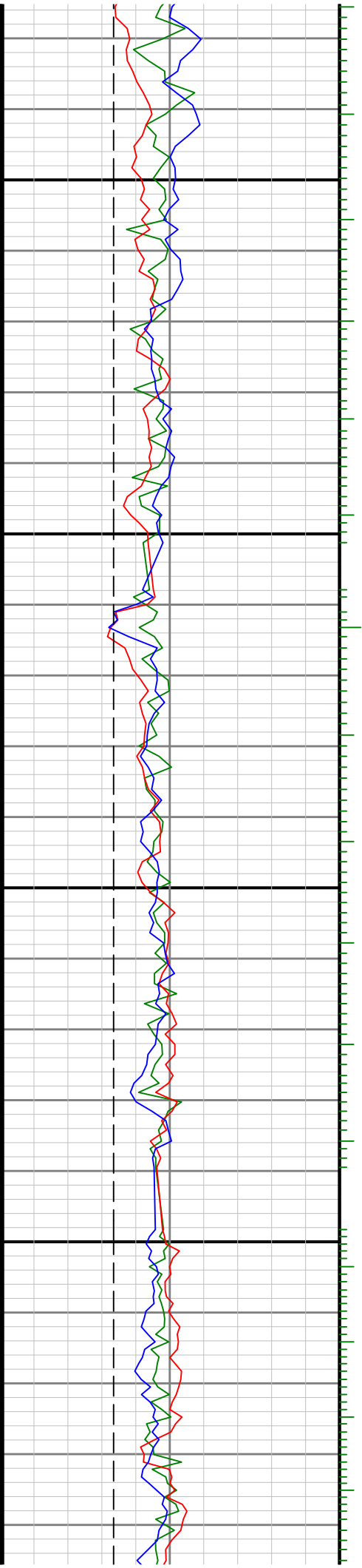
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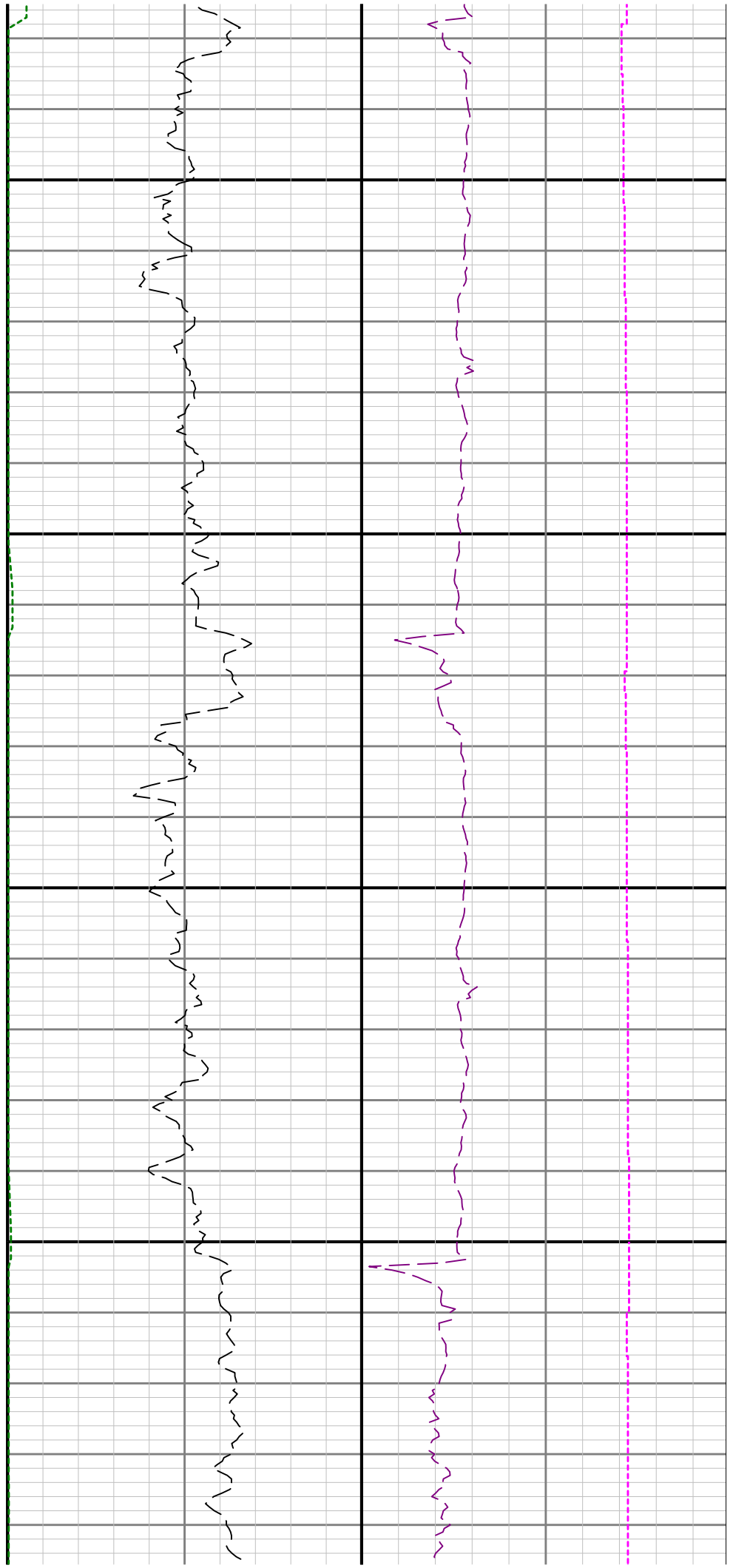


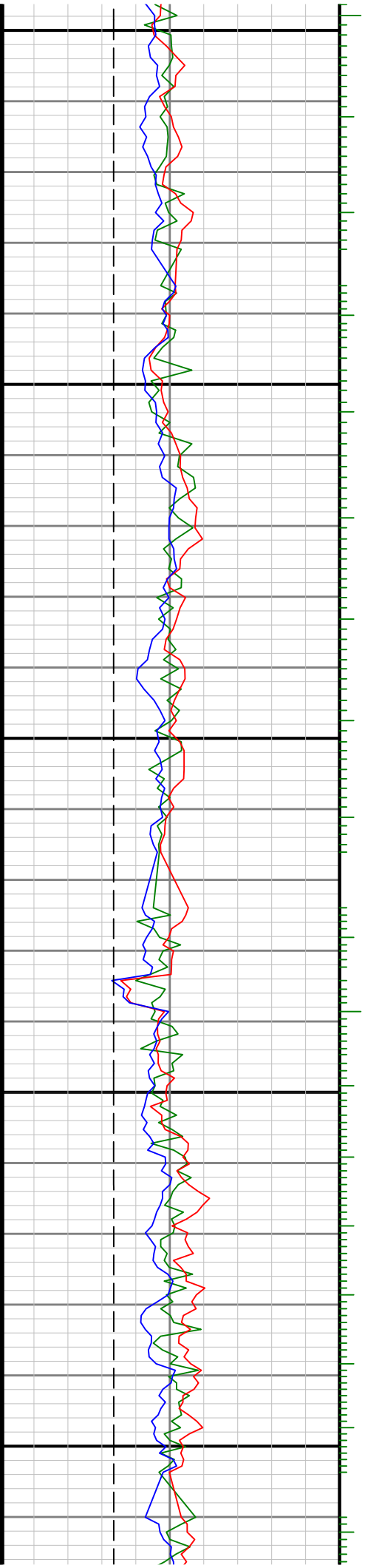




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