

LWD MEMORY COMPOSITE LOG



Gamma Ray

Scale: 1:240 Measured Depth	Company: Noble Energy, Inc
	Well: Guttersen C28-785
	Field: Weld County (Noble NAD 83 Grid)
Depth Reference: Driller's Depth	County: Weld Country: United States
	State: Colorado
Status: Final Print	Surface Location: SESW Sec 33, 4N, 64W Latitude: 40° 15' 45.396" N Longitude: 104° 33' 36.648" W Other Services: Directional
API: 05123489350000	
Job ID: 111463216	

Operational Summary

Rig & Elevations

Dates	Drilled (ft)	Logged (ft)	Rig Contractor: Precision Drilling	Rig: Precision 460	Elev. KB: (ft)	4745.00	
From: 2022-08-19	Top: 21.00	Top: 1952.00	Permanent Datum (P.D.): Mean Sea Level	Elevation: (ft)	4724.00	Elev. DF: (ft)	4745.00
To: 2022-08-25	Bottom: 17518.00	Bottom: 17506.00	Log Measured From: Rig Floor	Above P.D.: (ft)	4745.00	Elev. GL: (ft)	4724.00

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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	Core Bit	N/A	Rotary	56.00	1936.00	83.00	1964.00	2022-08-19 18:17	2022-08-20 01:27	3.65
2	2	8.500	PDC	2.50	AutoTrak Curve	1952.00	12840.00	1965.00	12853.00	2022-08-22 06:14	2022-08-23 17:20	31.85
3	3	8.500	PDC	2.50	AutoTrak Curve	12842.00	17506.00	12854.00	17518.00	2022-08-24 14:18	2022-08-25 09:15	48.60

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Adam Schlenz	2022-08-19	2022-08-25	Bret Bartram	2022-08-19	2022-08-25	James Brown	2022-08-19	2022-08-24
Marcos Favela	2022-08-19	2022-08-25	Evan Androl	2022-08-25	2022-08-25			

Witness

Name	Run
Jim Turner	1,2,3

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+ (%)
2022-08-19 09:24	1	21.00	Water Based Mud	8.7	1	N/A	N/A	0/97.8	Active Pit	950	N/A
2022-08-22 02:02	2	1965.00	Oil Based Mud	9.4	16	N/A	N/A	69/20.5	Active Pit	29500	N/A
2022-08-23 23:44	3	12853.00	Oil Based Mud	9.9	17	N/A	N/A	69/18	Active Pit	30000	N/A

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	EvoOne	15069834	Gamma (single)	8.98	27.61	8.000	3.250
1	EvoOne	15069834	Directional (mag)	9.17	27.80	8.000	3.250
2	AutoTrak Curve Steering Unit	15789053	Near Bit VSS	5.93	6.78	7.000	4.330
2	AutoTrak Curve Steering Unit	15789053	Near Bit Inclination	5.93	6.78	7.000	4.330
2	AutoTrak Curve MWD	12398256	Gamma (single)	2.20	12.40	7.000	3.250
2	AutoTrak Curve MWD	12398256	Directional (mag)	12.27	22.47	7.000	3.250
3	AutoTrak Curve Steering Unit	14382369	Near Bit Inclination	5.93	6.78	7.000	4.330
3	AutoTrak Curve Steering Unit	14382369	Near Bit VSS	5.93	6.78	7.000	4.330
3	AutoTrak Curve MWD	14179565	Gamma (single)	2.20	12.40	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
MWD	EvoOne - Dir Gamma	EvoOne
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 Baker Hughes Company run 1 utilized 8 inch Directional-Only service behind a 13 ½ inch PDC bit and rotary assembly from 21 to 1956 feet MD (21 to 1955 feet TVD).
- 2 Baker Hughes Company runs 2 and 3 utilized 6 ¾ inch NaviGamma services (Gamma Ray and Directional) behind an 8 ½ inch PDC bit and rotary steerable assembly from 1956 to 17519 feet MD (1955 to 6800 feet TVD).
- 3 Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes Company. Due to a lack of control by Baker Hughes Company logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes Company are being used to present logging data.

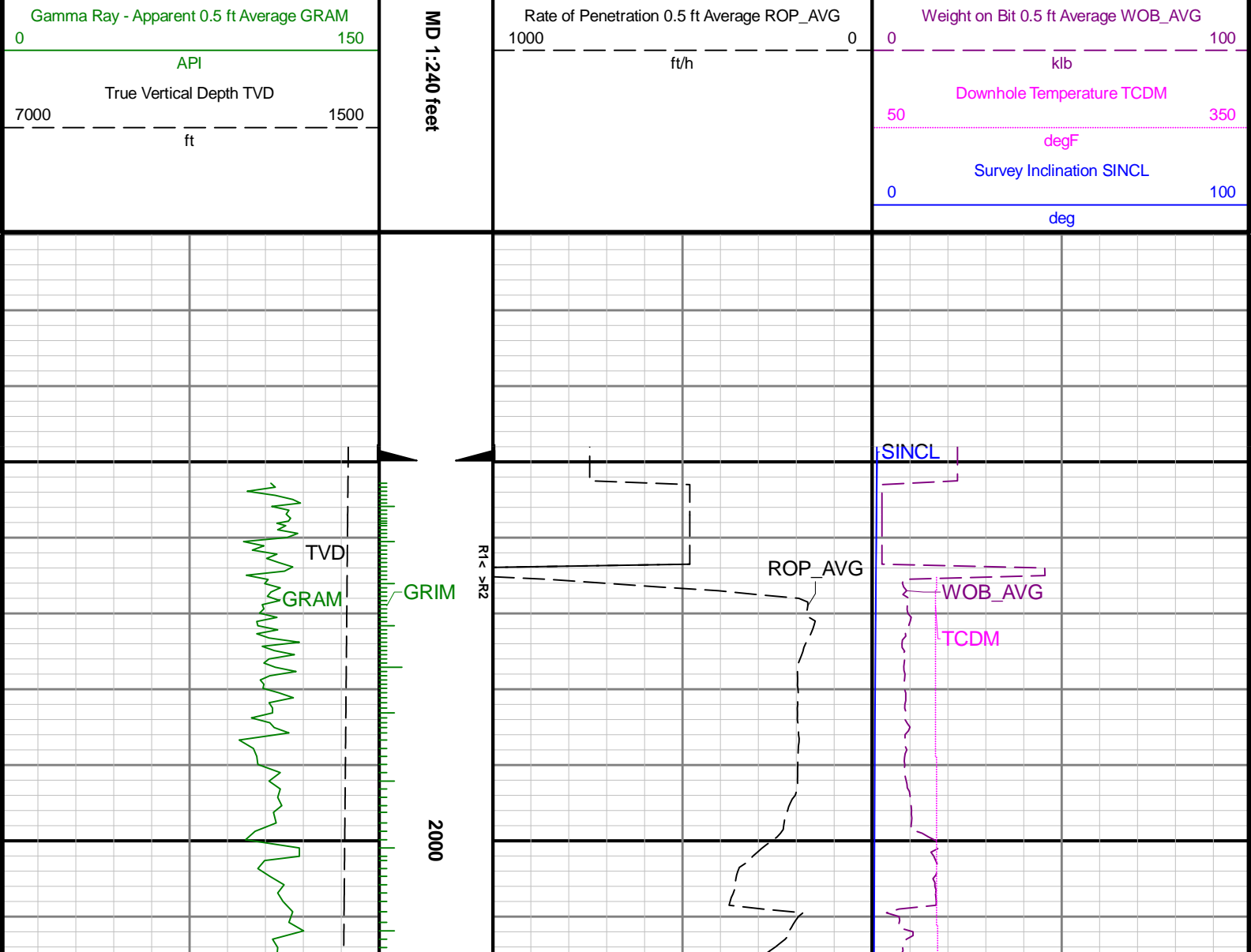
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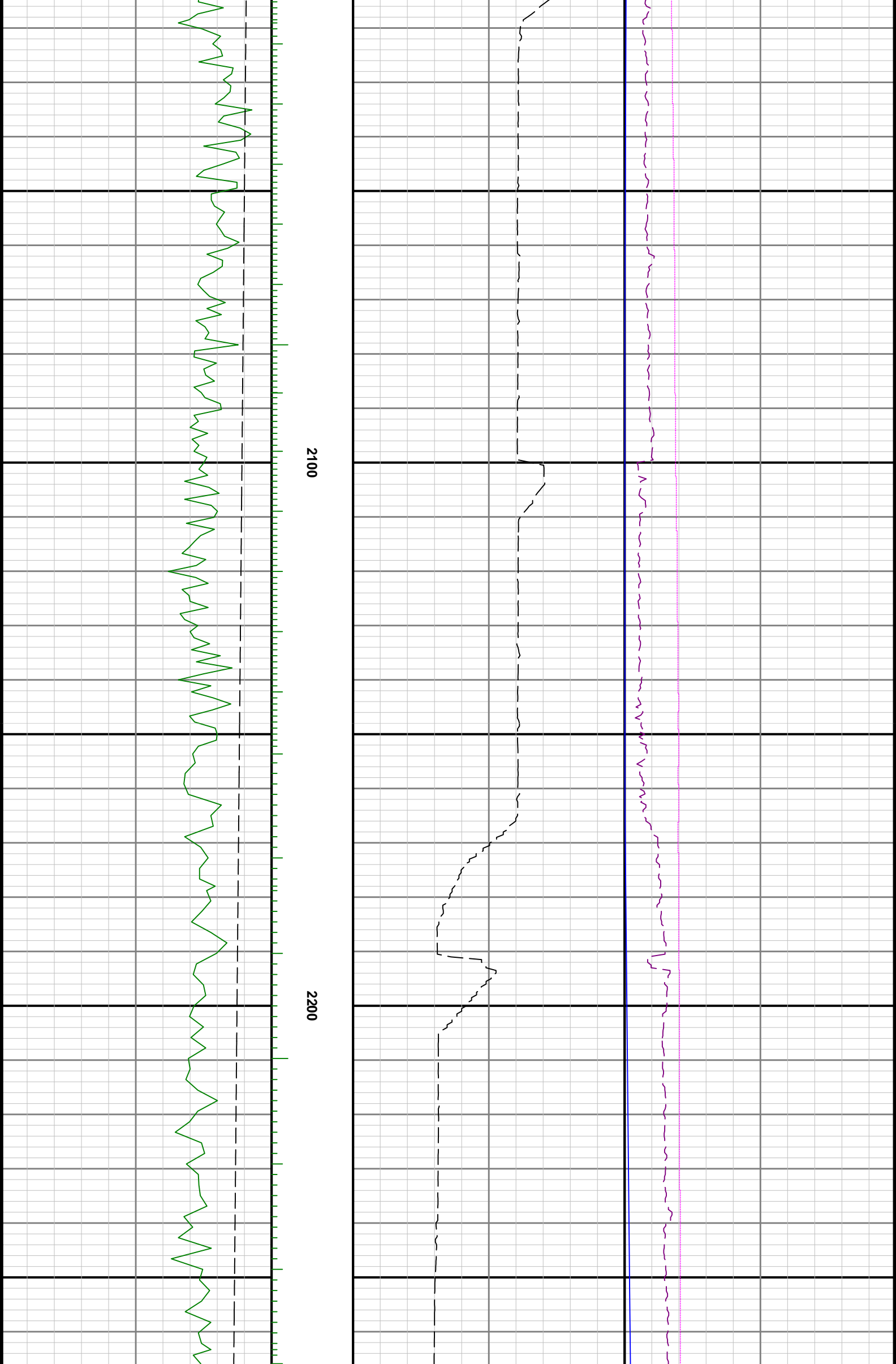
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	17506.00	8.500	3	The interval from 17506 to 17519 feet MD (6800 to 6800 feet TVD) was not logged due to sensor to bit offset at well TD.

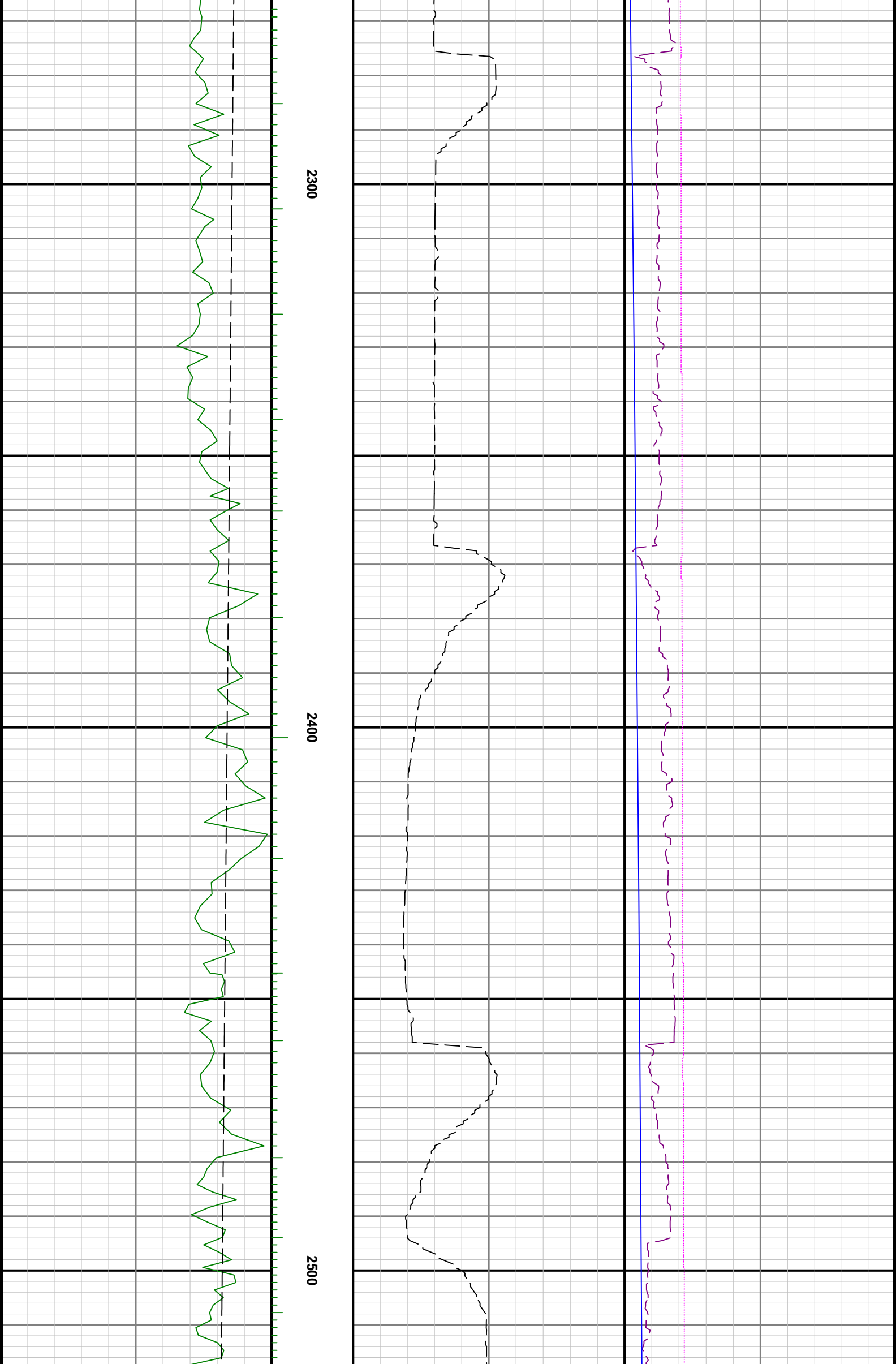
Curve Mnemonics

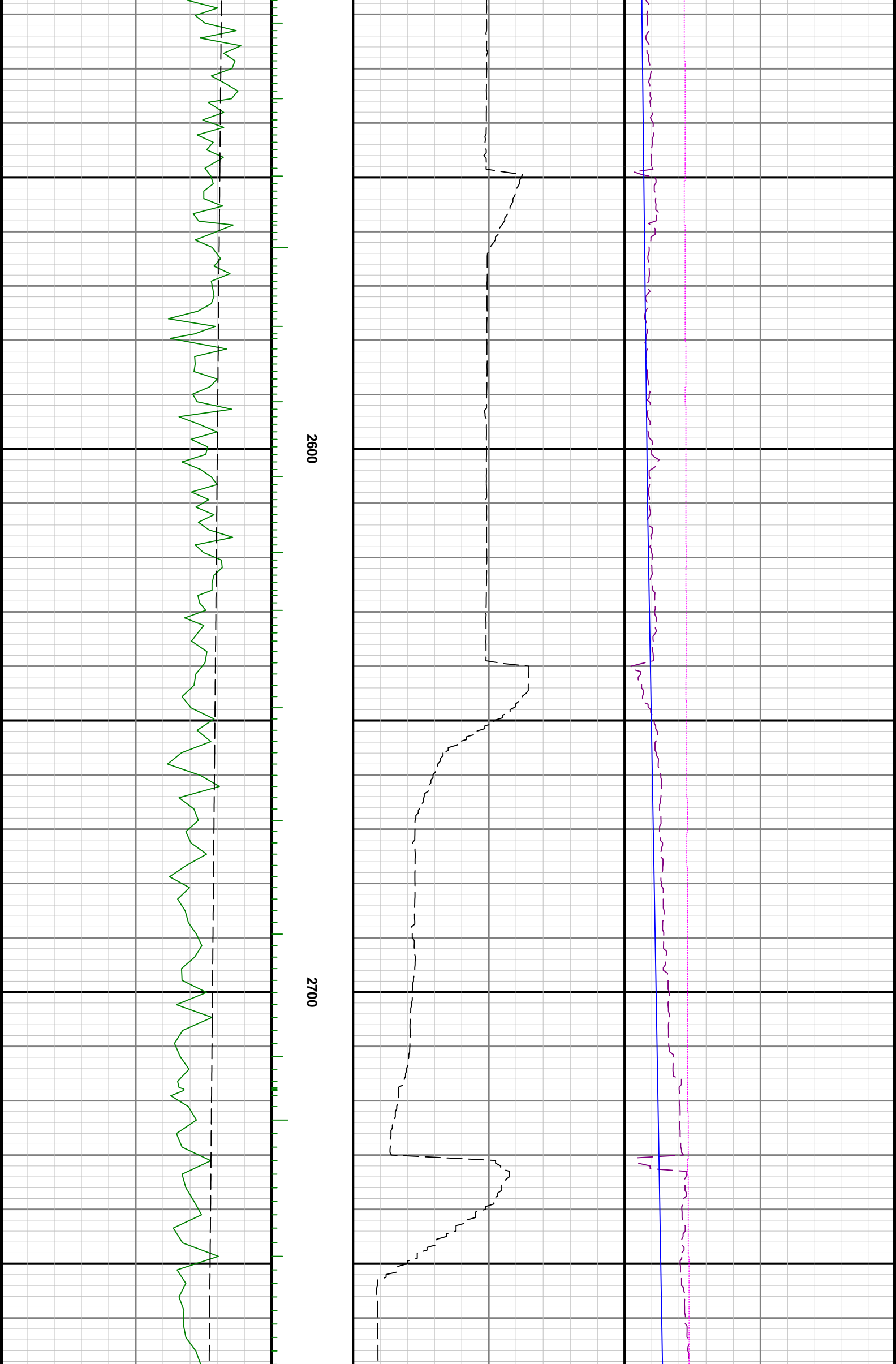
Presented Curves	Description	Units
ROP_AVG	Rate of Penetration of bit, Average	ft/h
TVD	True Vertical Depth	ft
WOB_AVG	Weight On Bit, Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
TCDM	Directional Real-Time Survey Temperature	degF
SINCL	Survey Inclination	deg

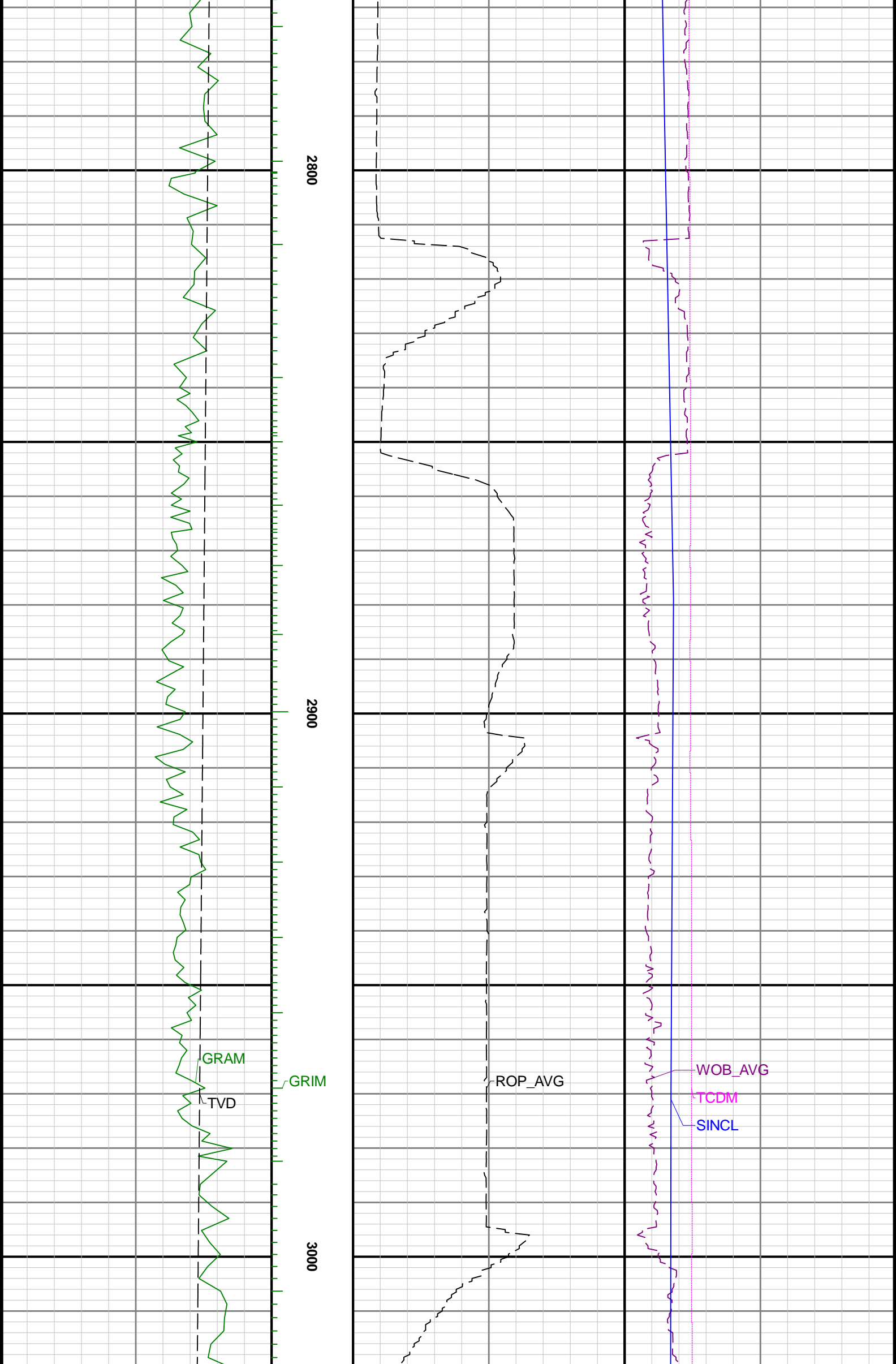
	Company	Noble Energy, Inc	
	Well	Guttersen C28-785	
	Interval	Date From: 2022-08-19 18:17 Date To: 2022-08-25 09:15	Interval Drilled: (ft) 21.00 - 17518.00 Interval Logged: (ft) 1952.00 - 17506.00
	Created	2022-08-25 21:41:23	

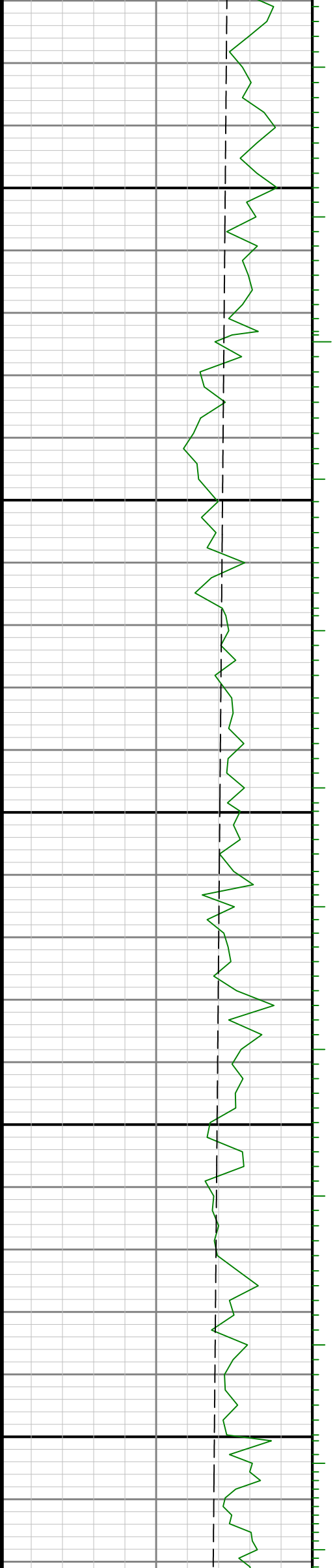






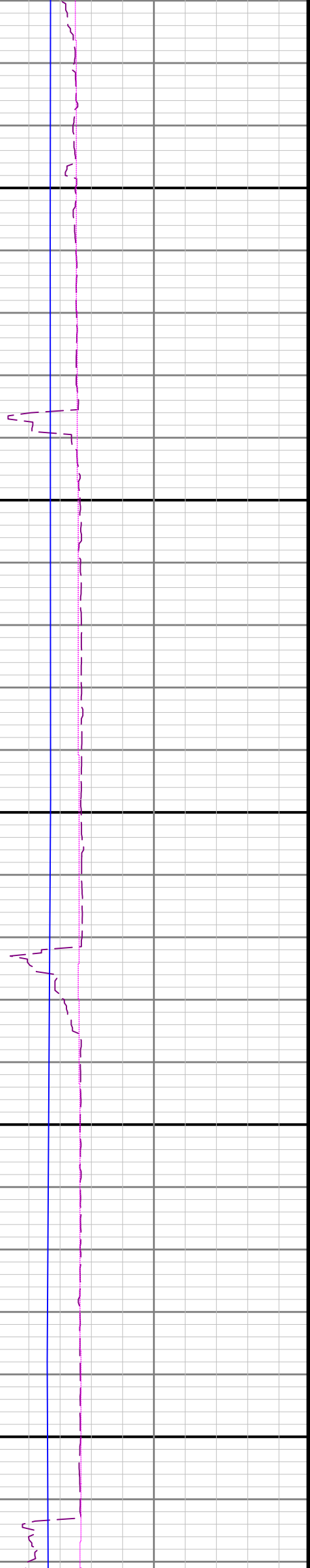
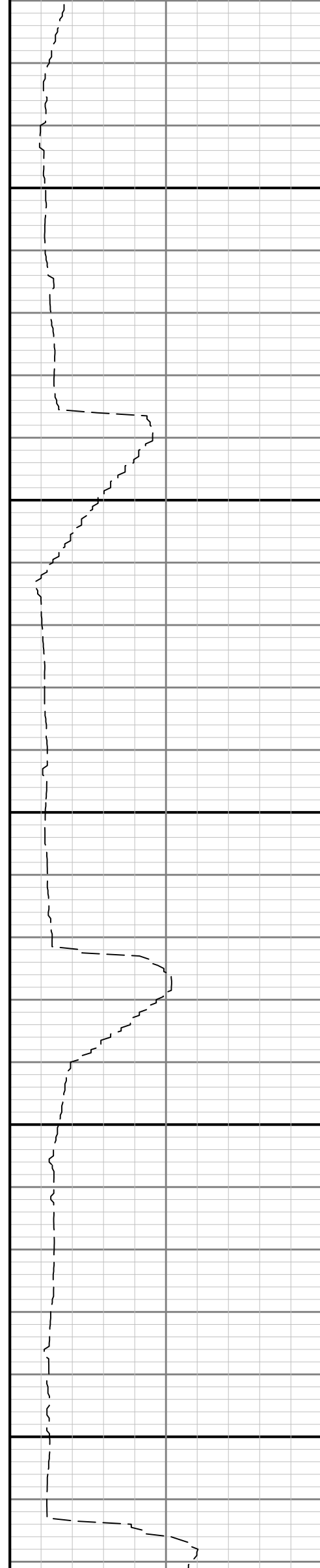


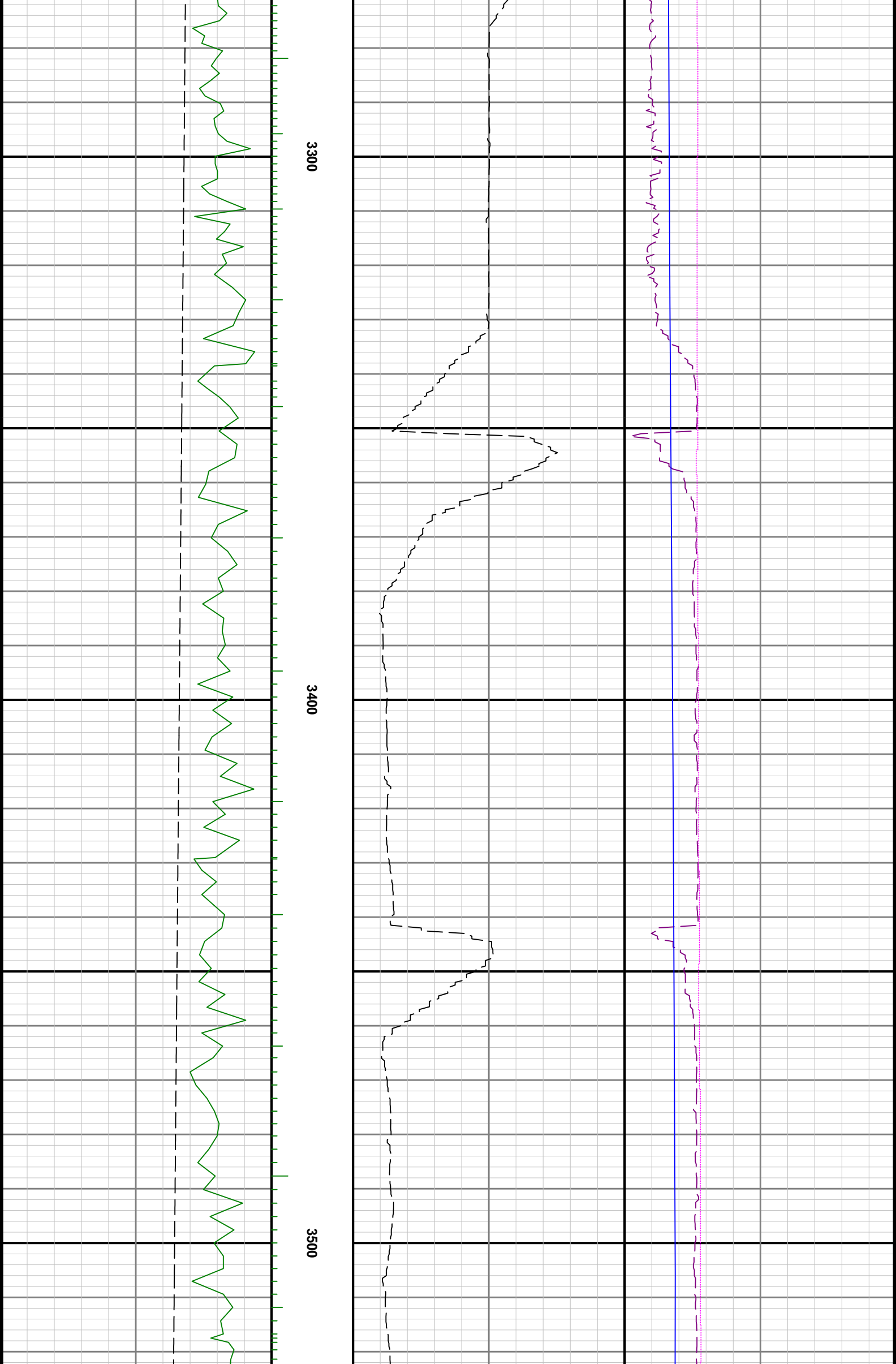


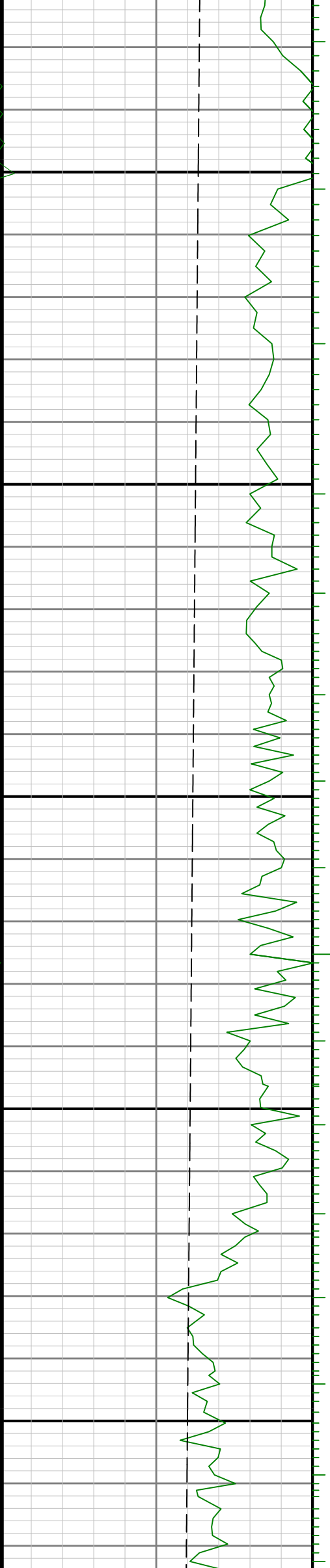


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3200

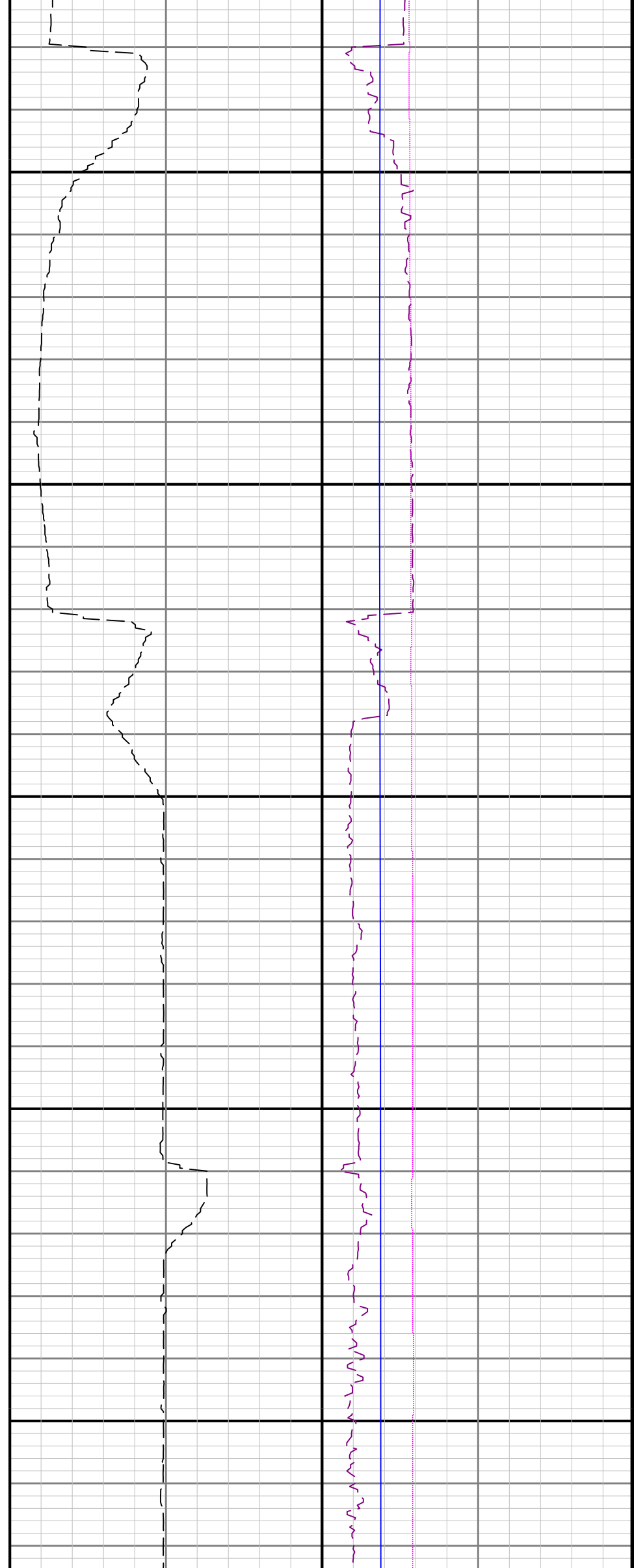


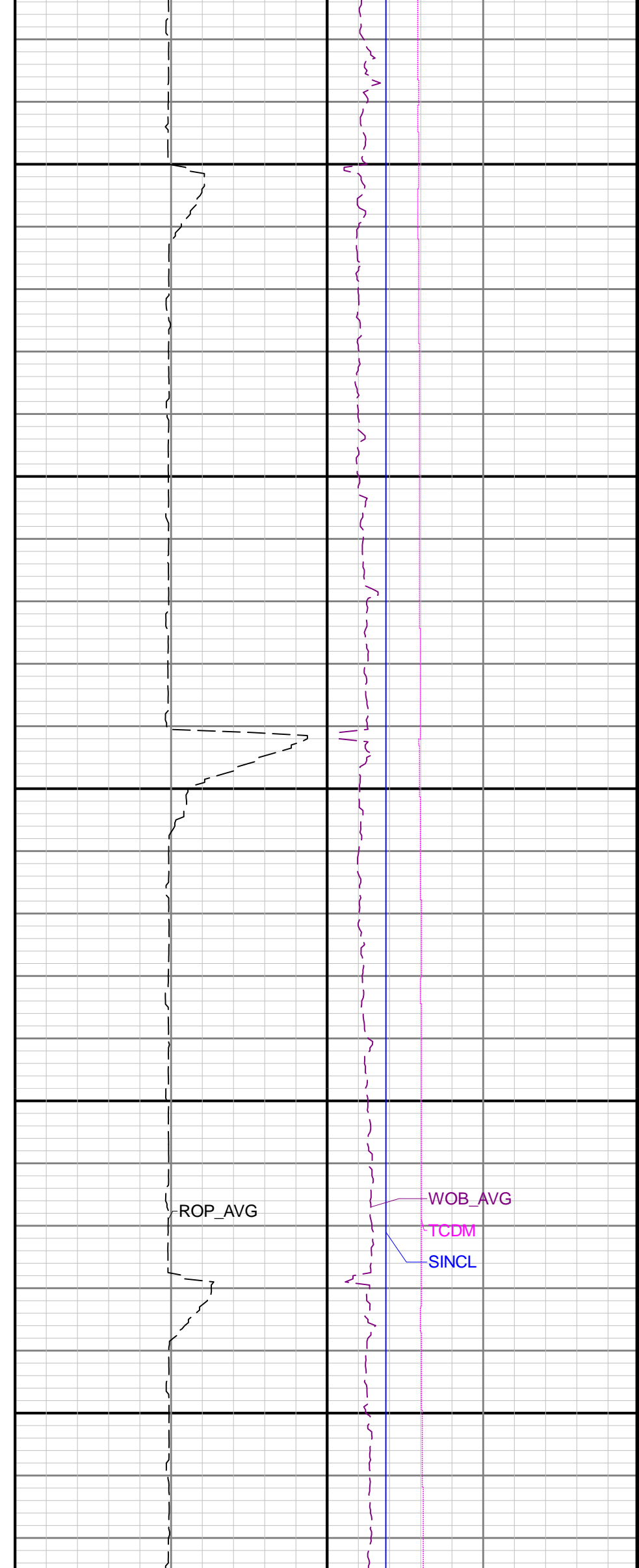
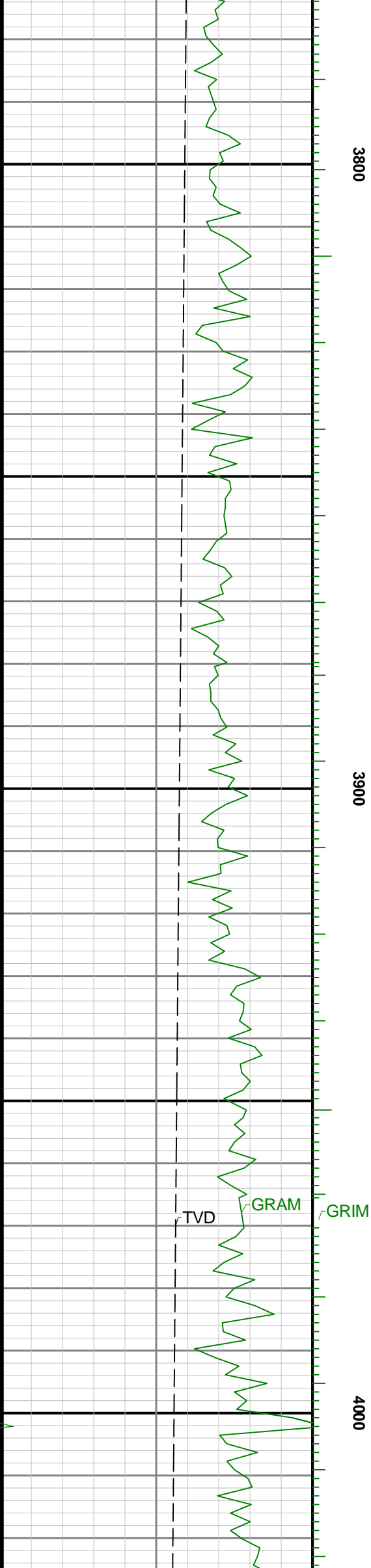


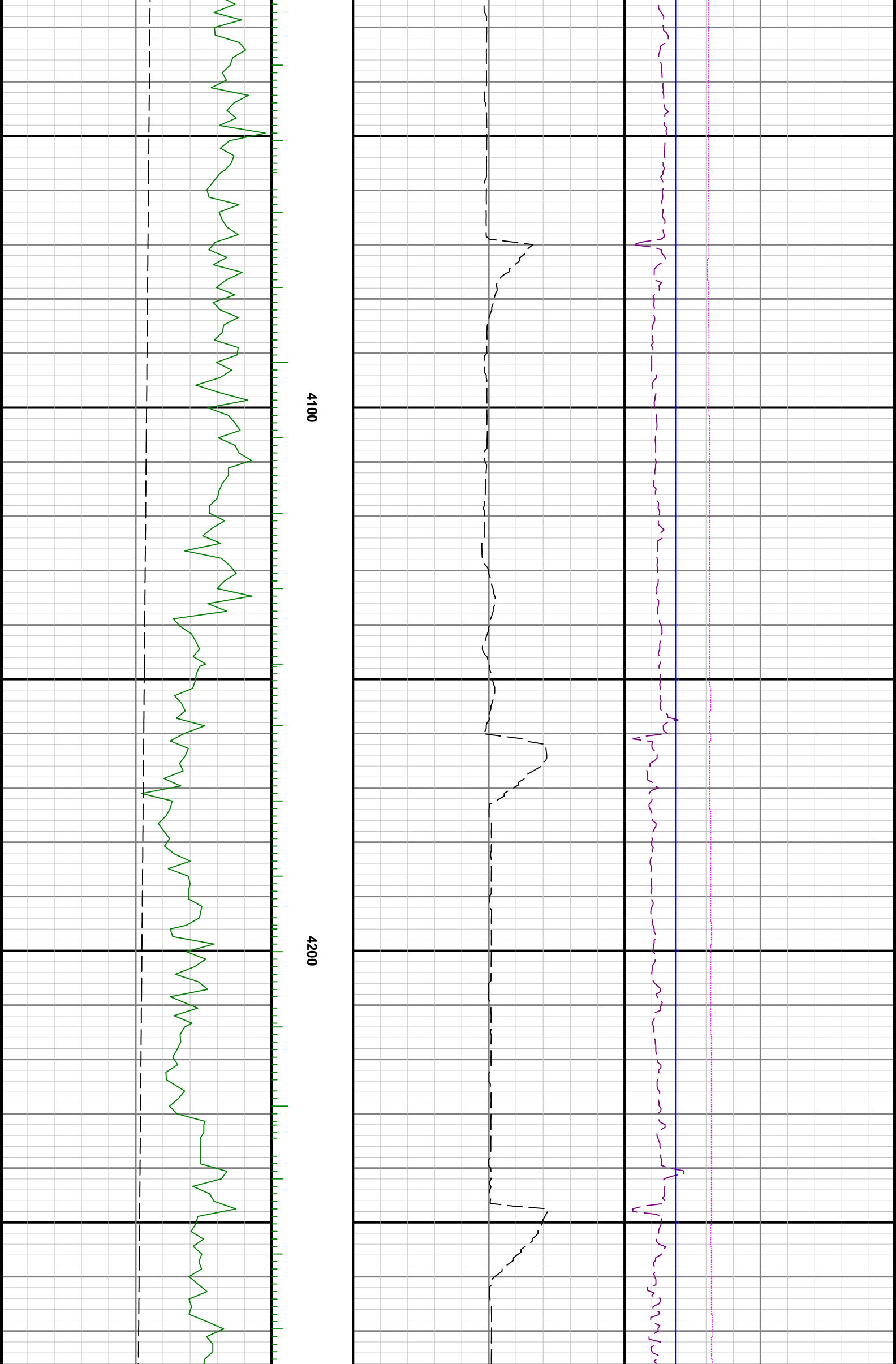


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3700

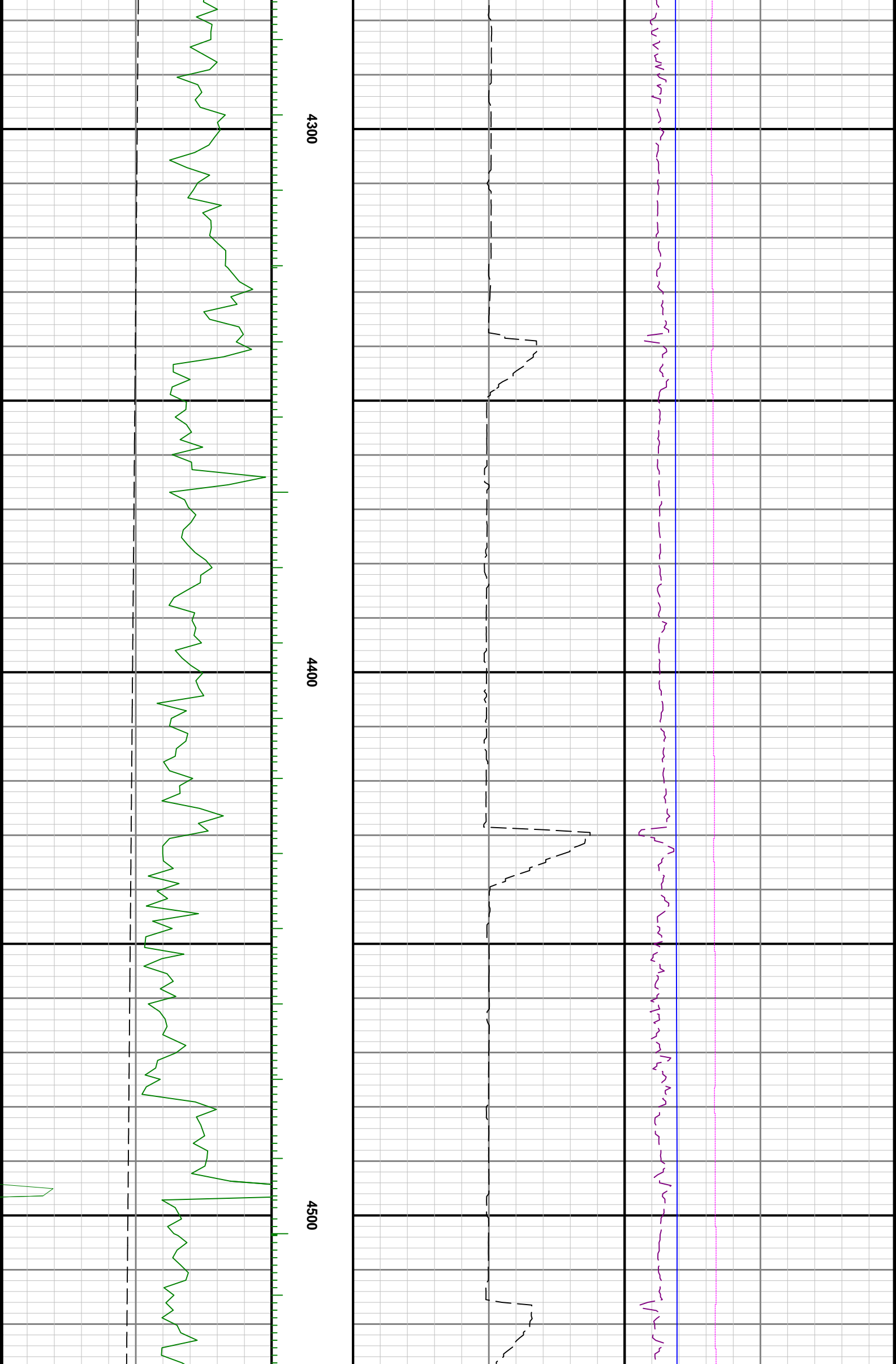


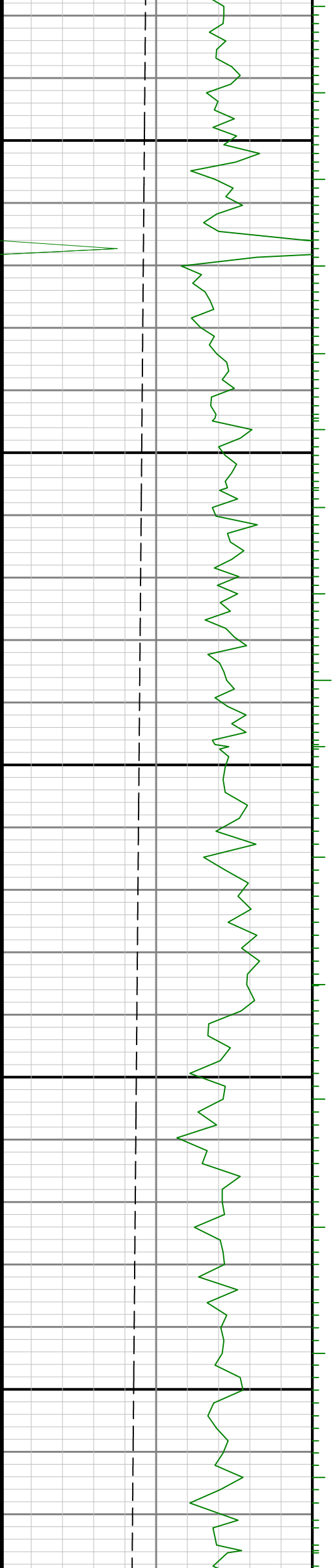




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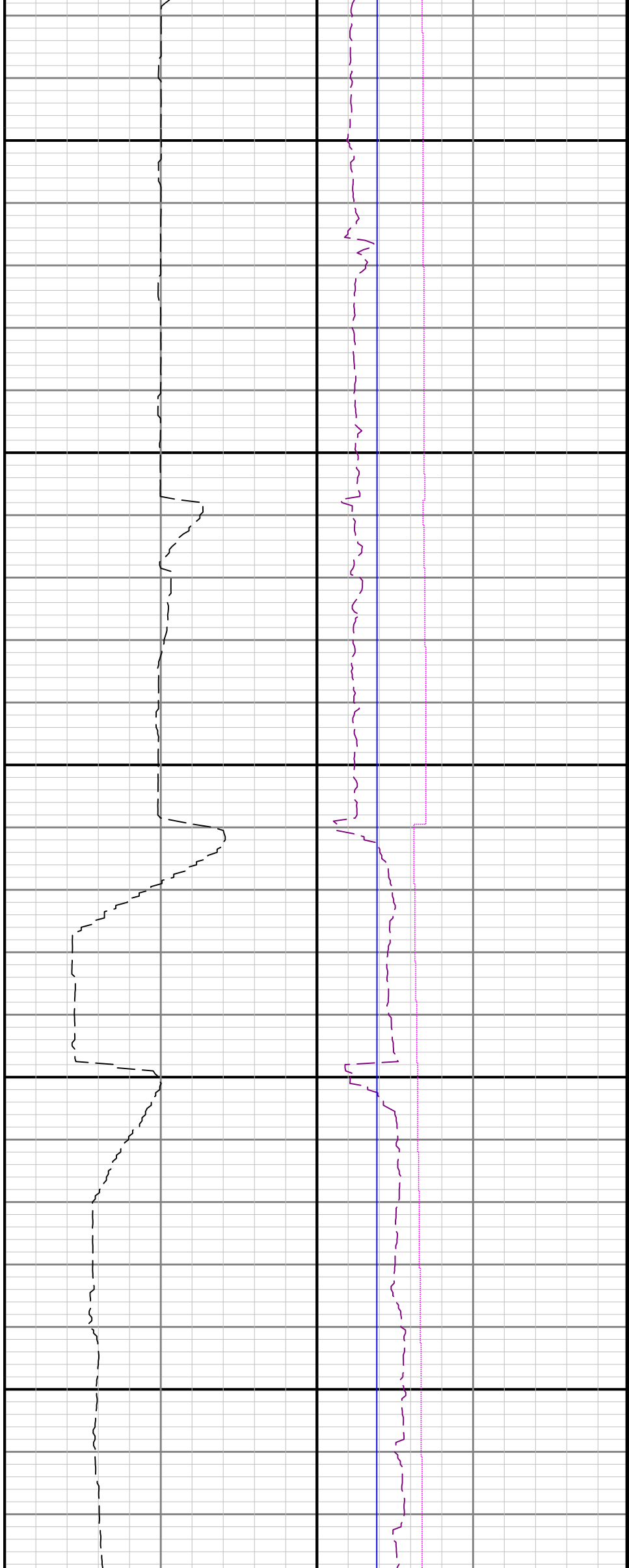
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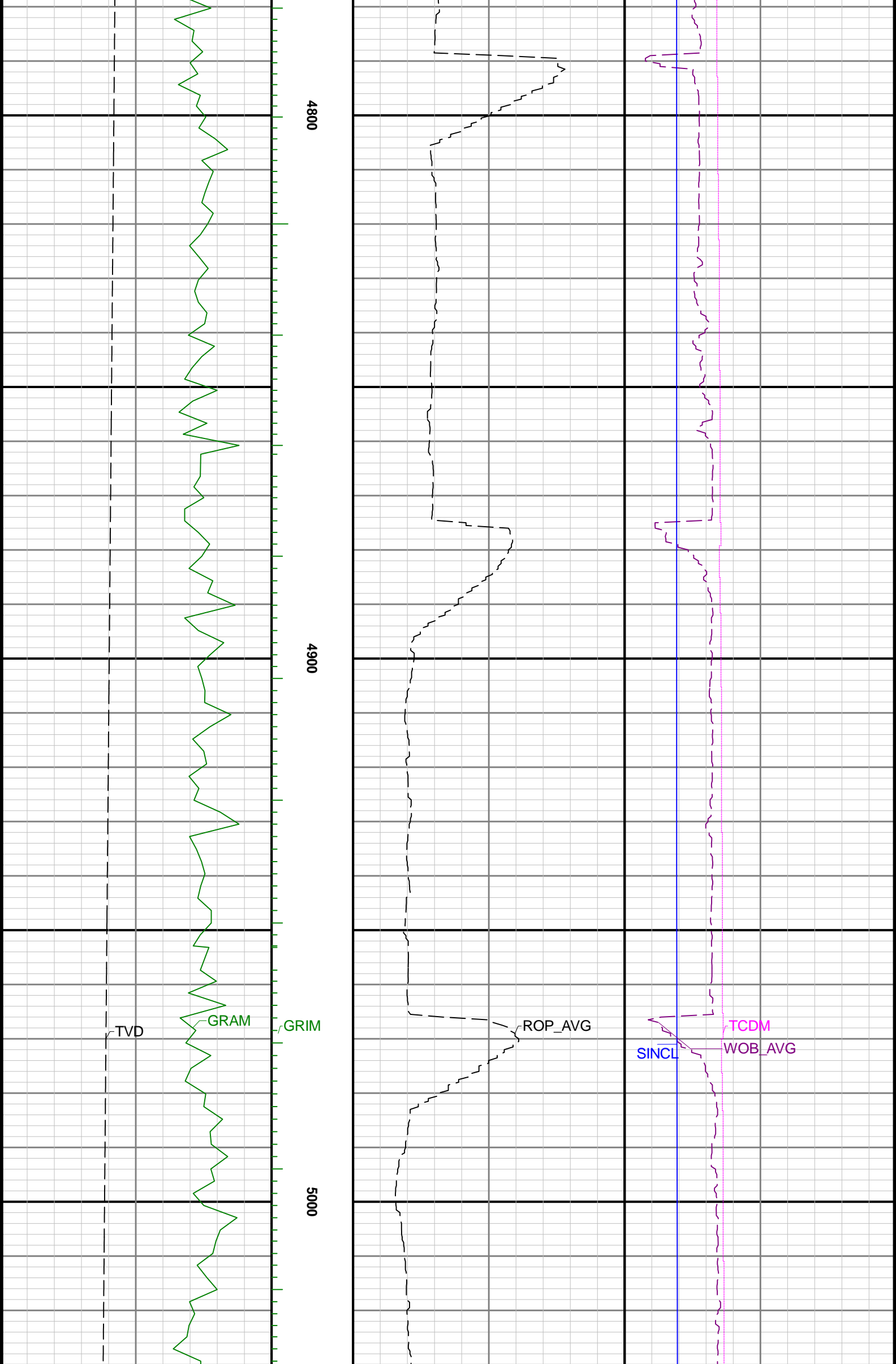


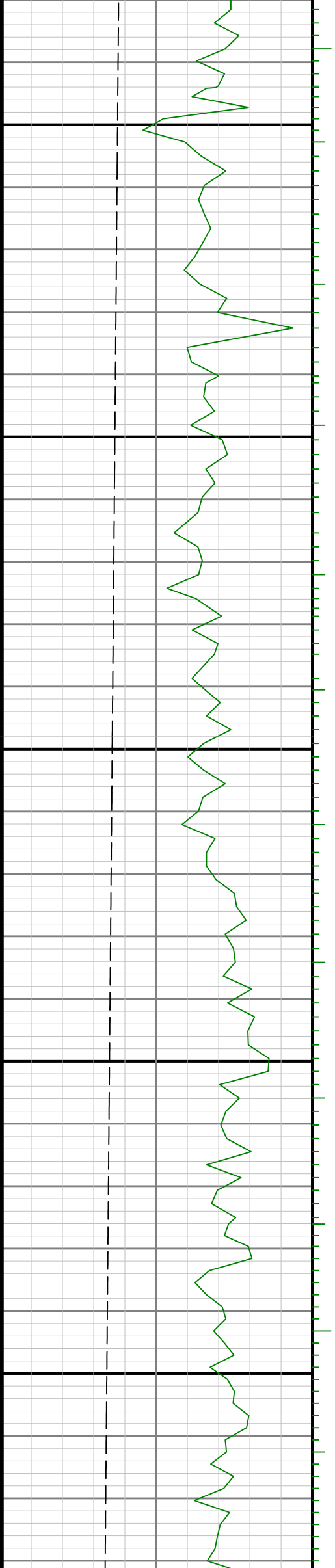


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4700



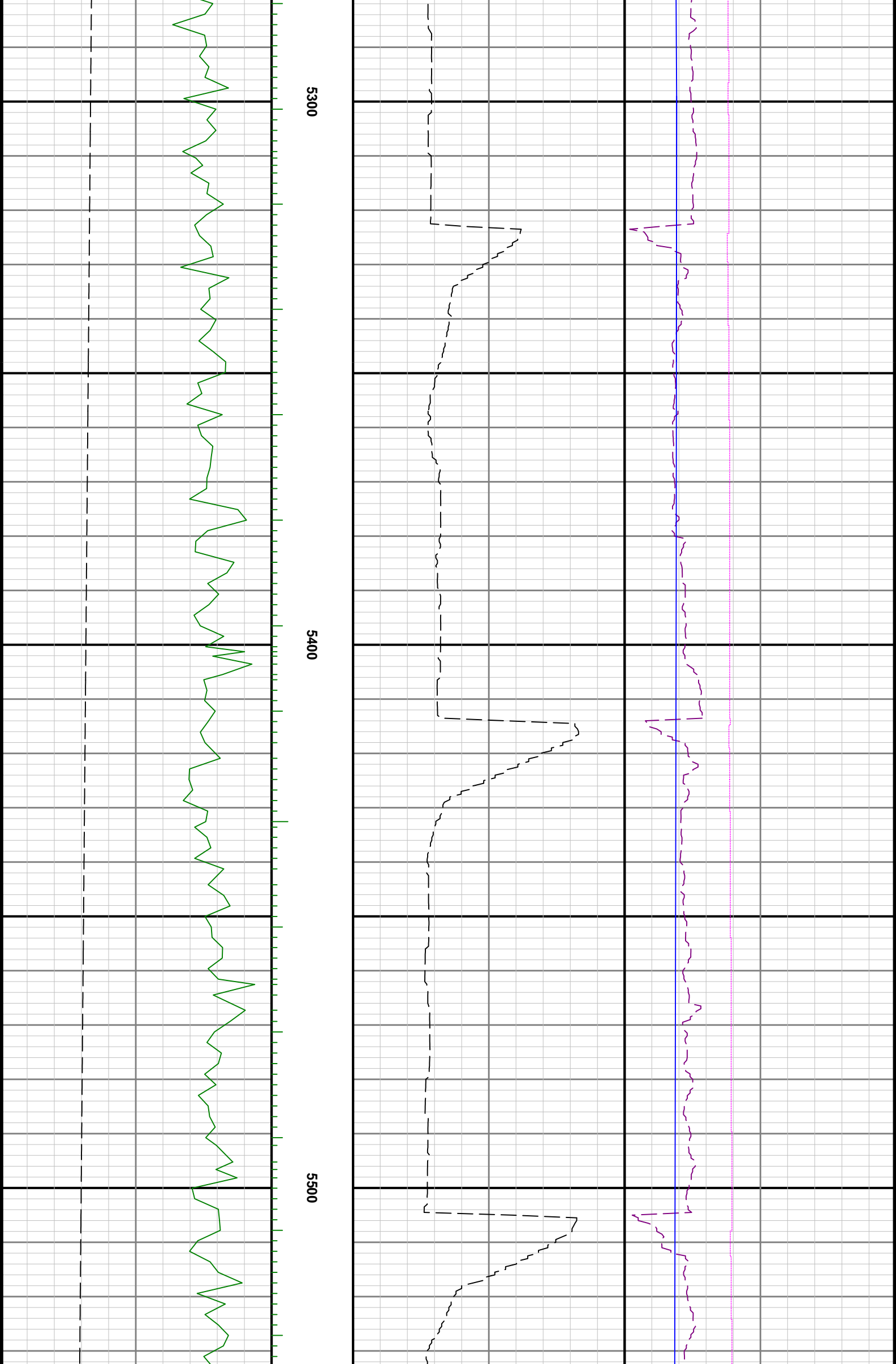


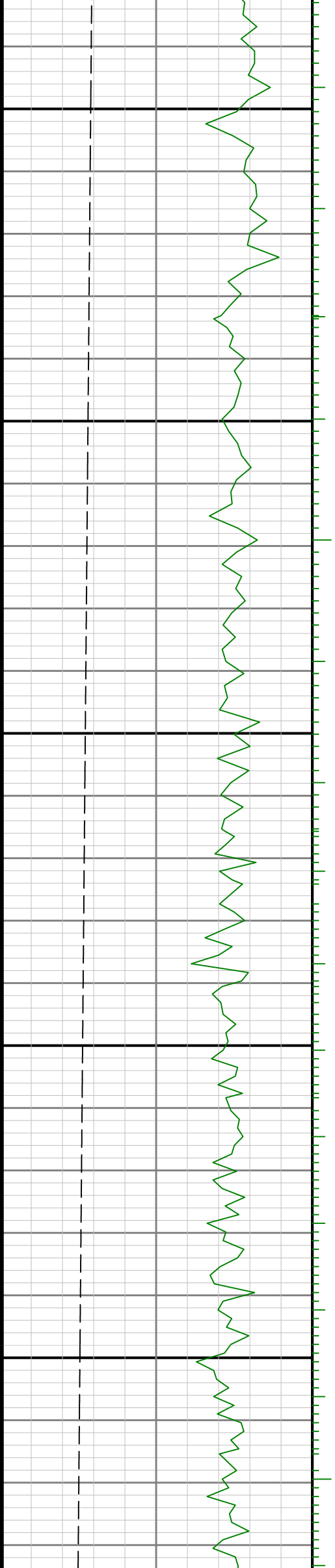


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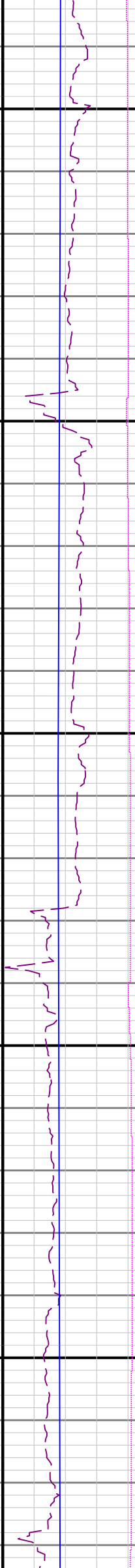
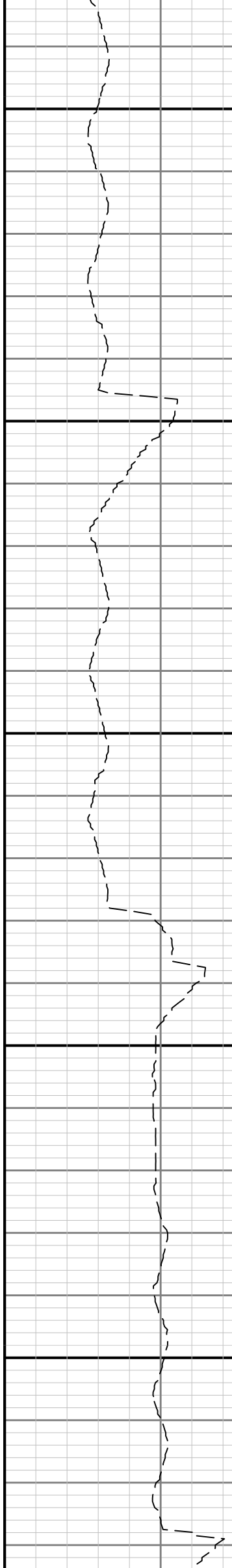


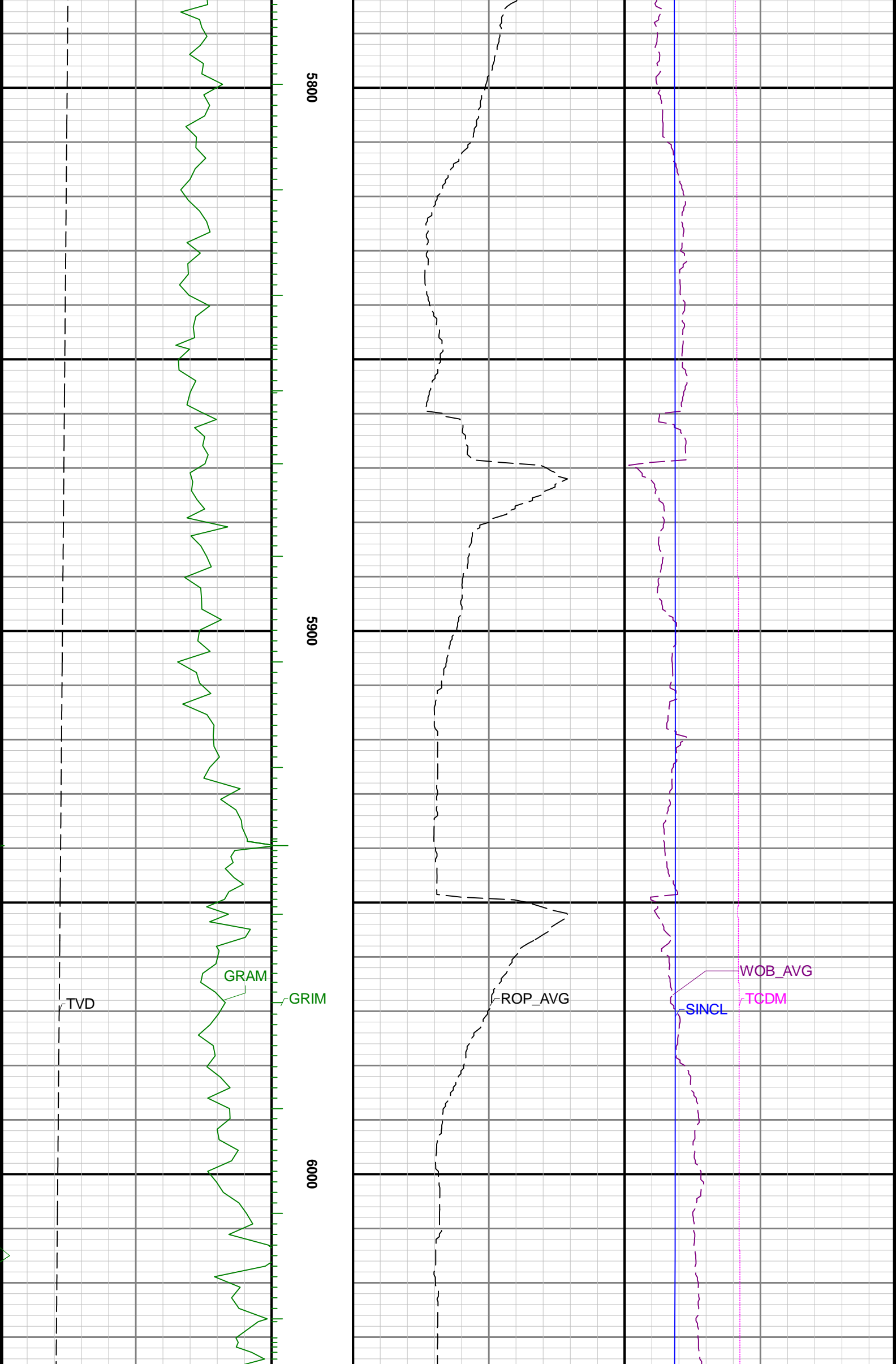




5600

5700





5800

5900

6000

TVD

GRAM

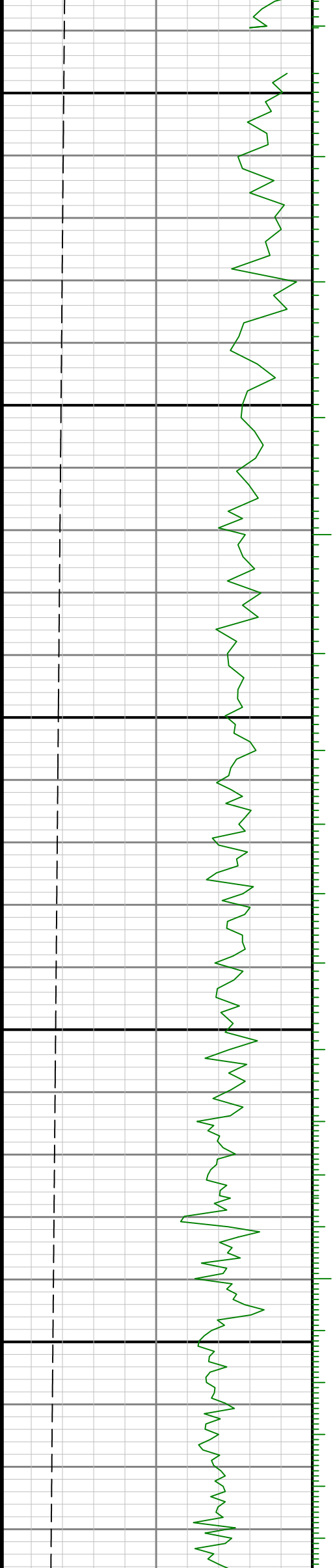
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ROP_AVG

SINCL

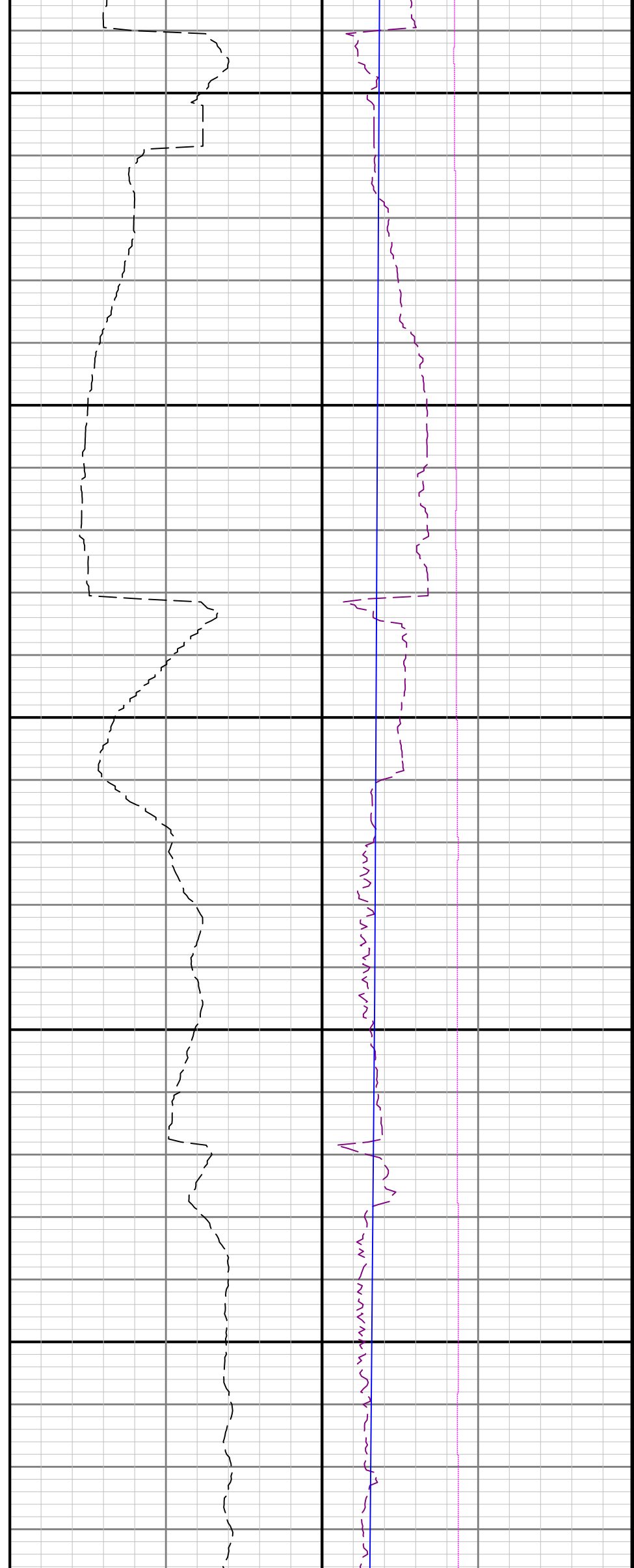
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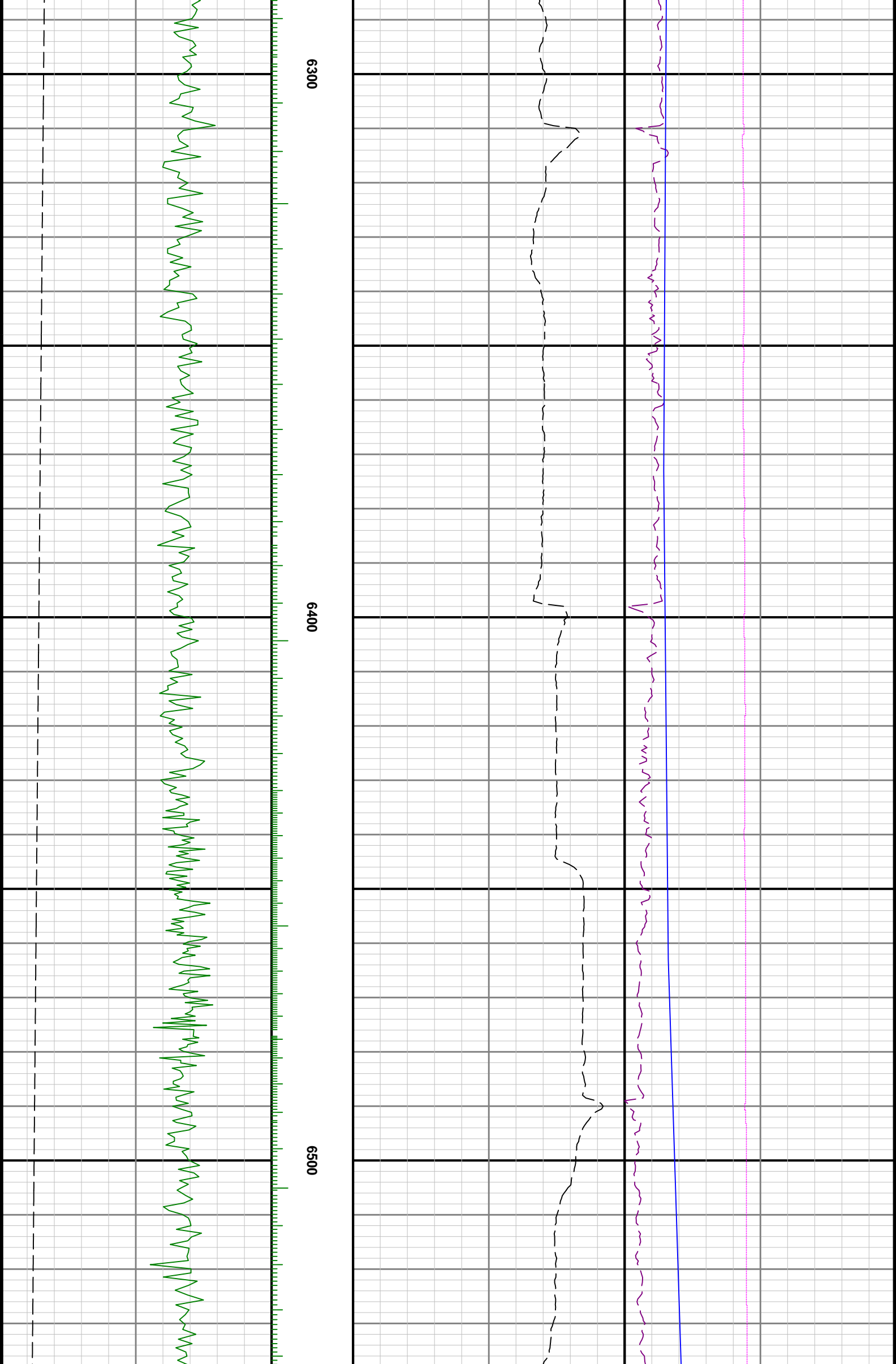
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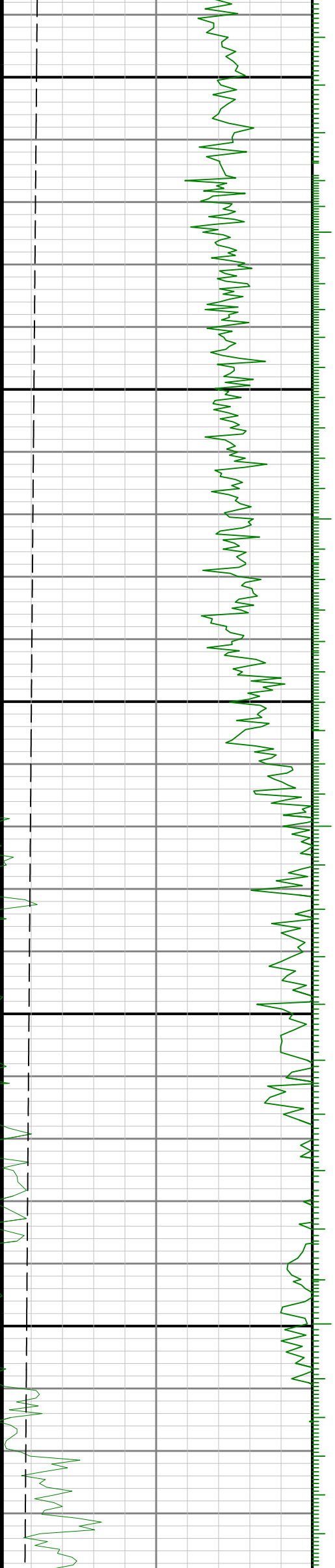


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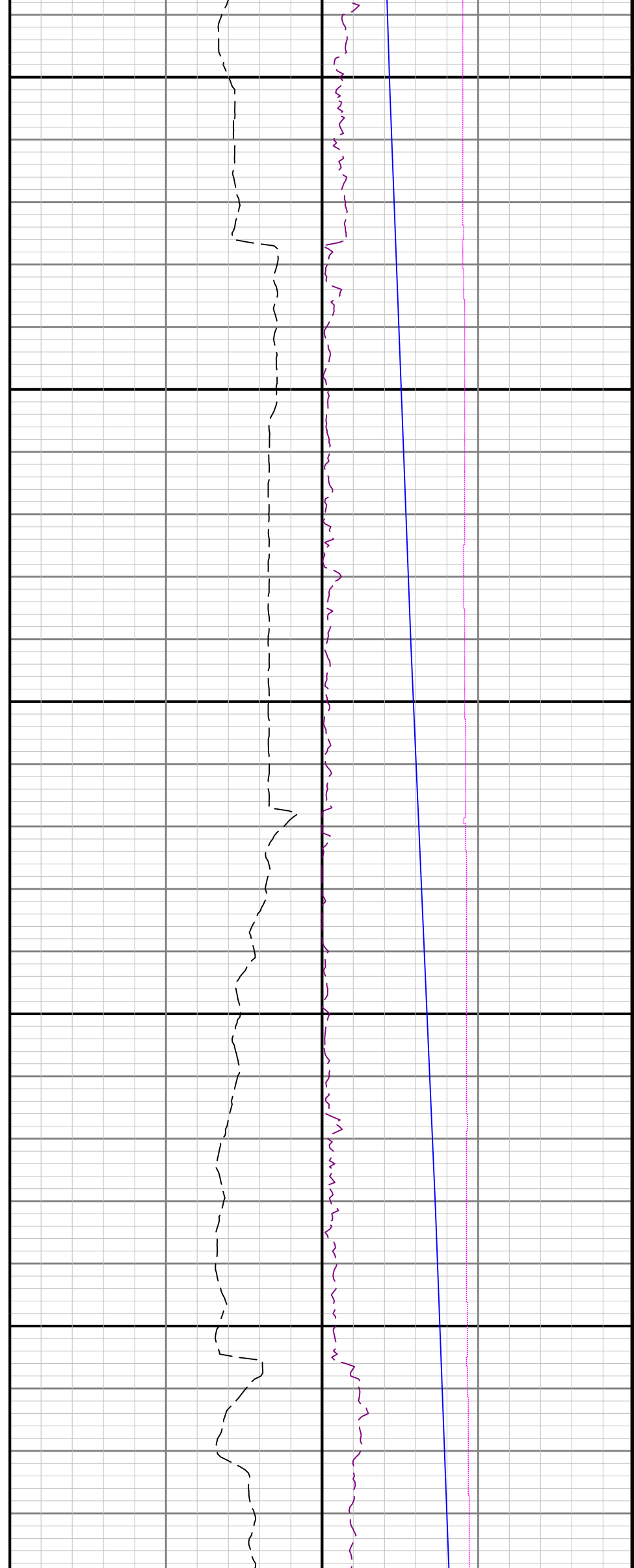


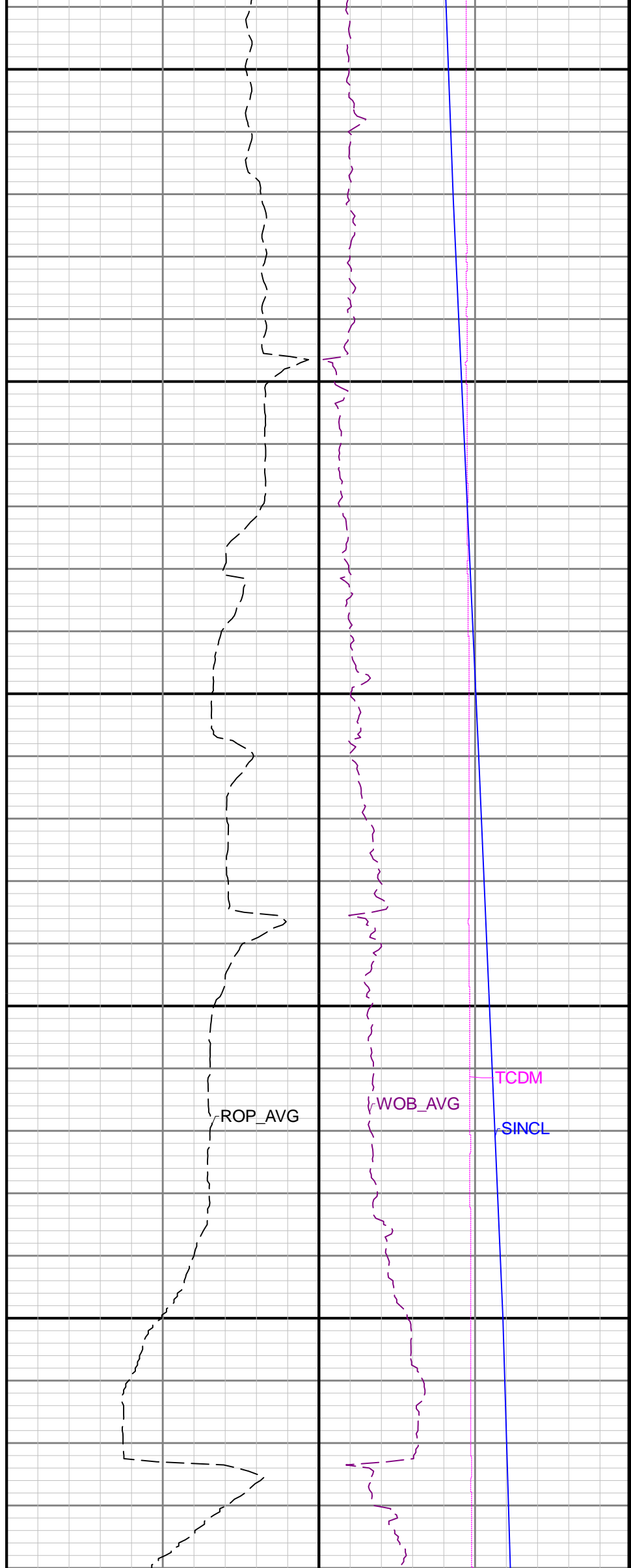
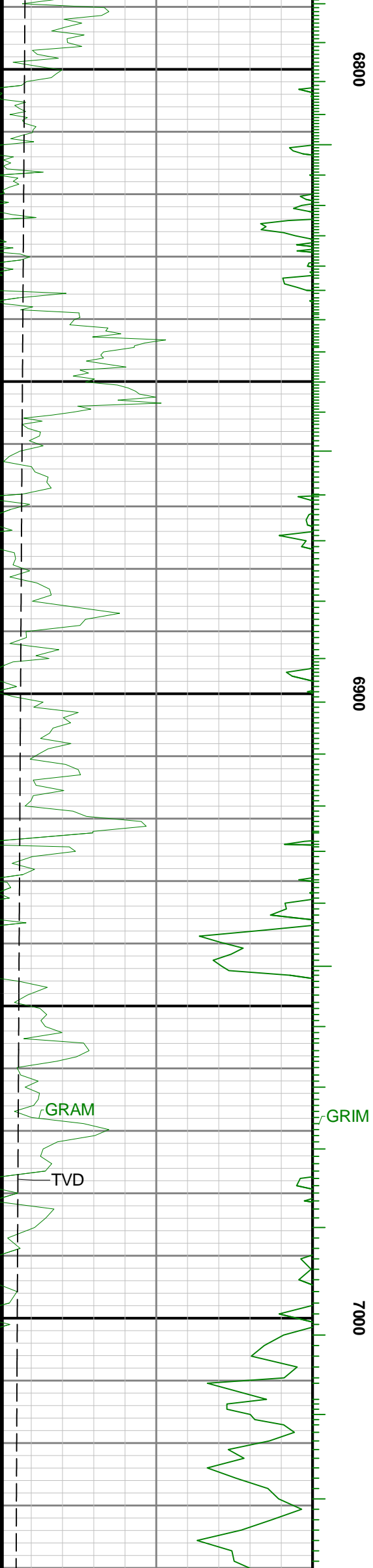


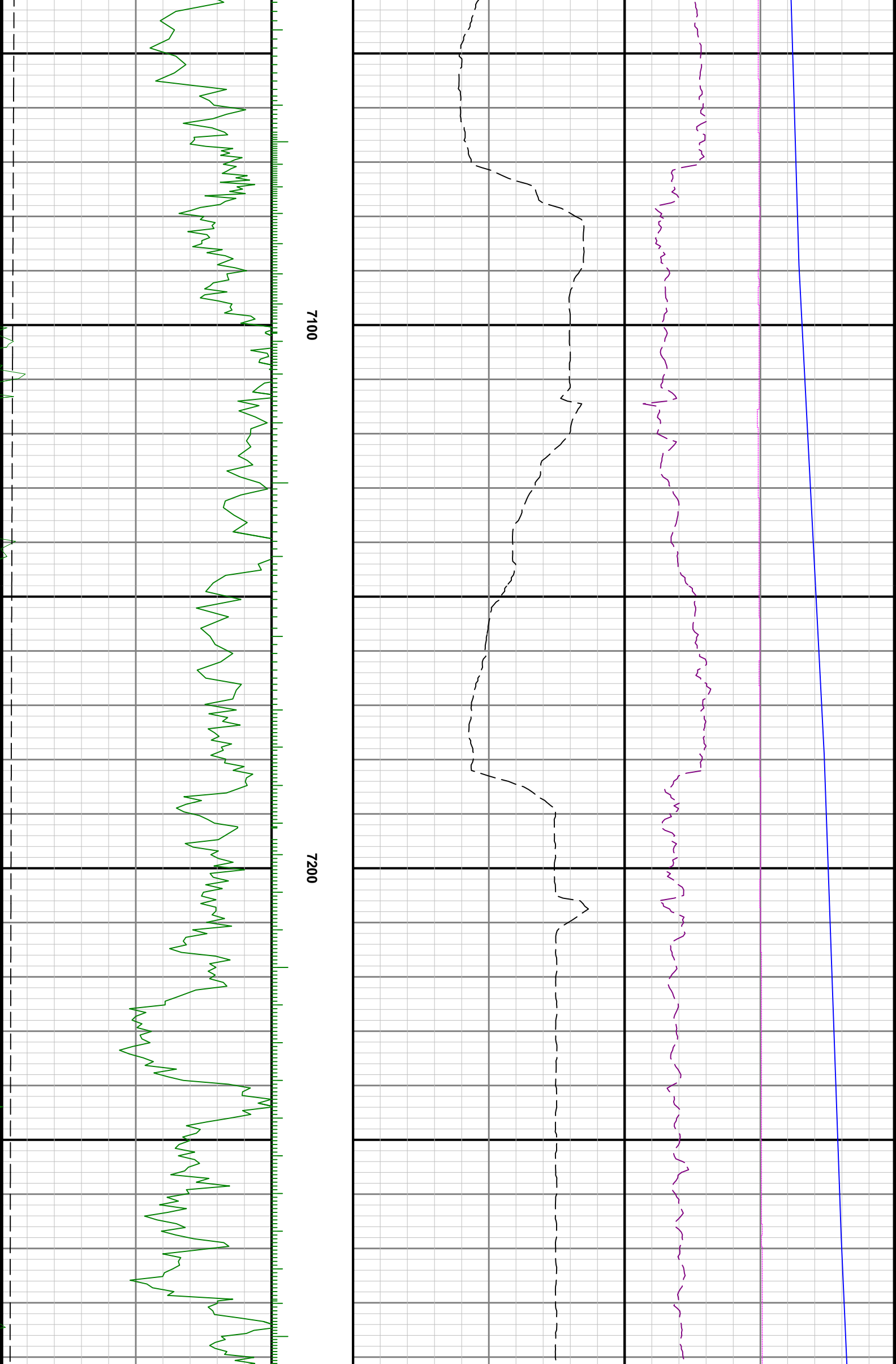


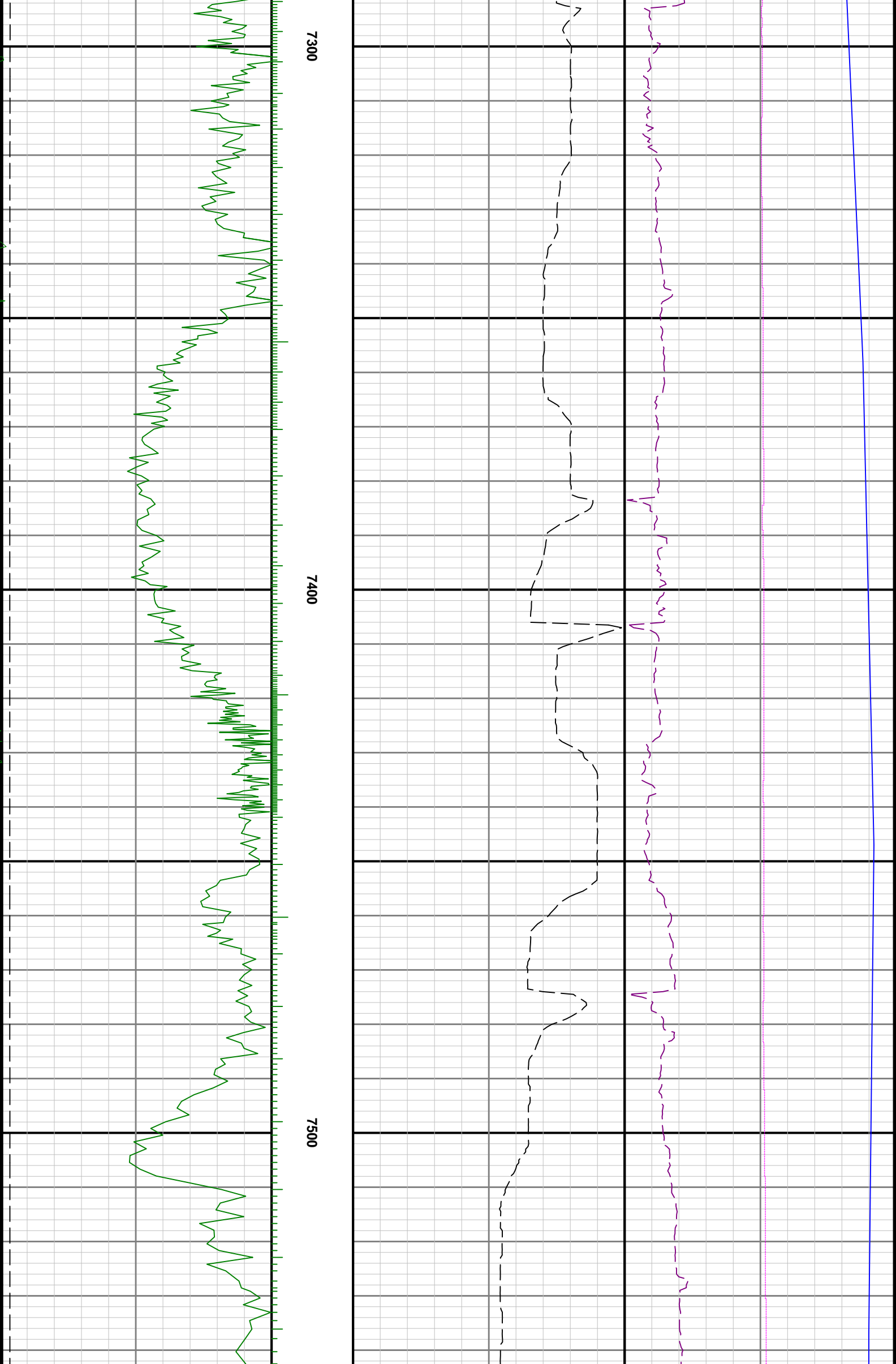
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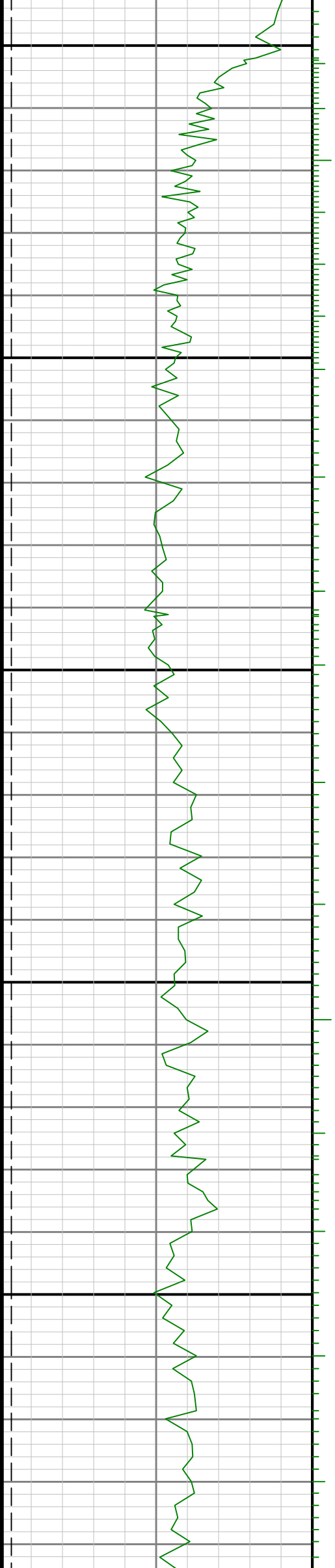
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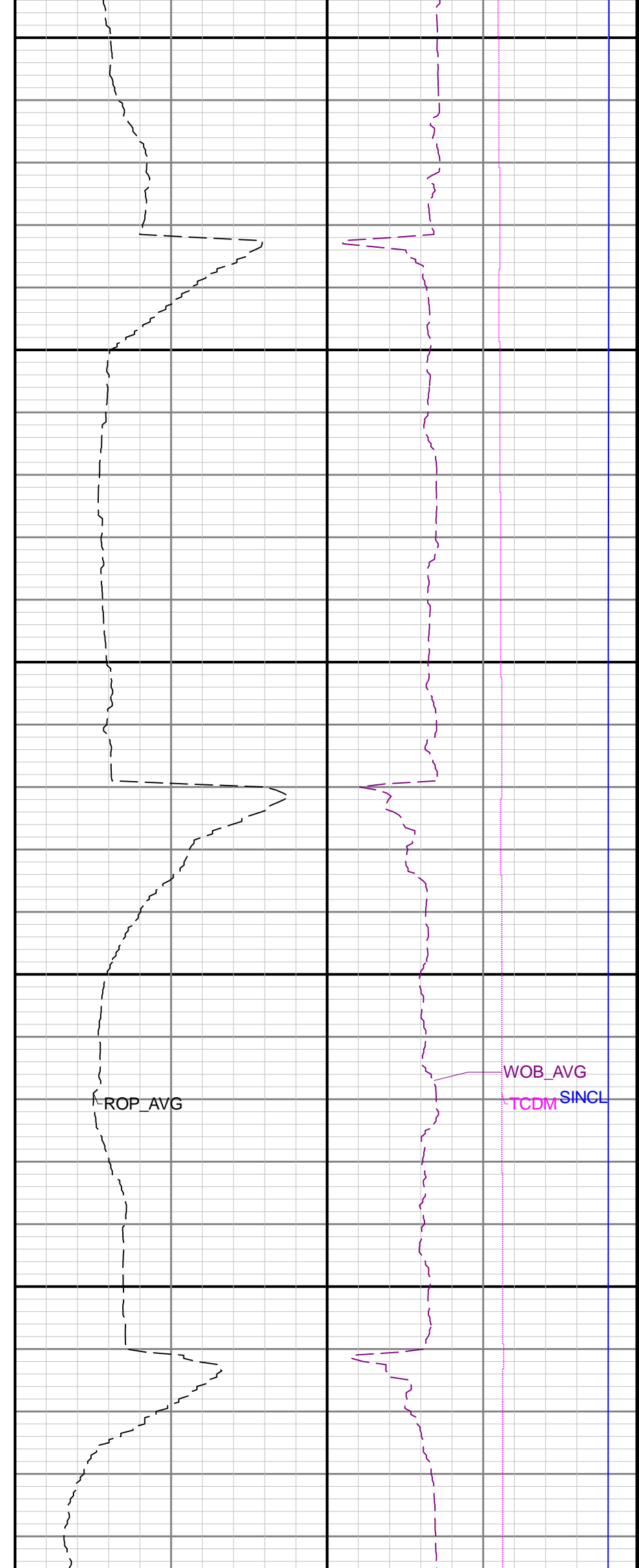
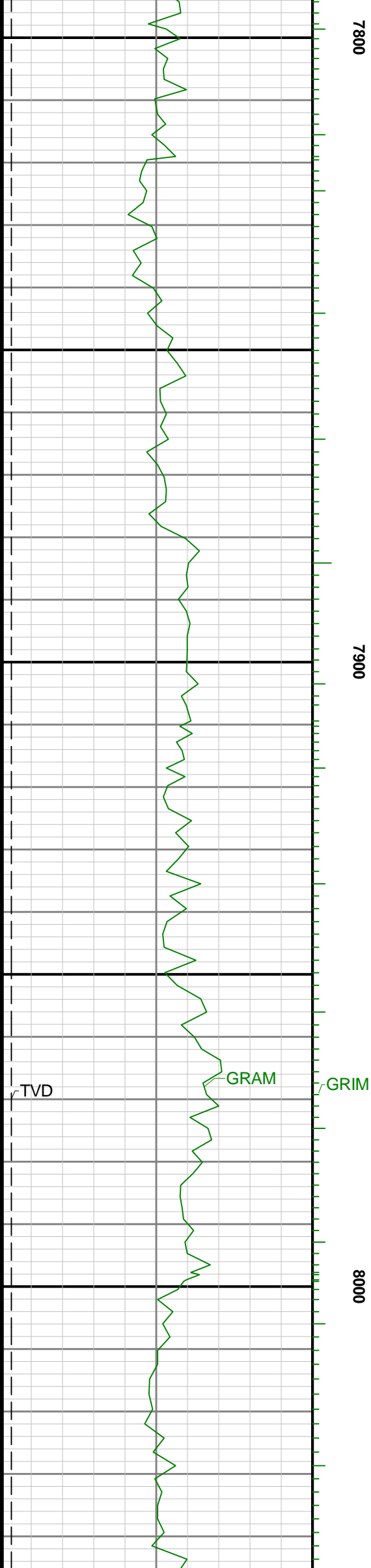


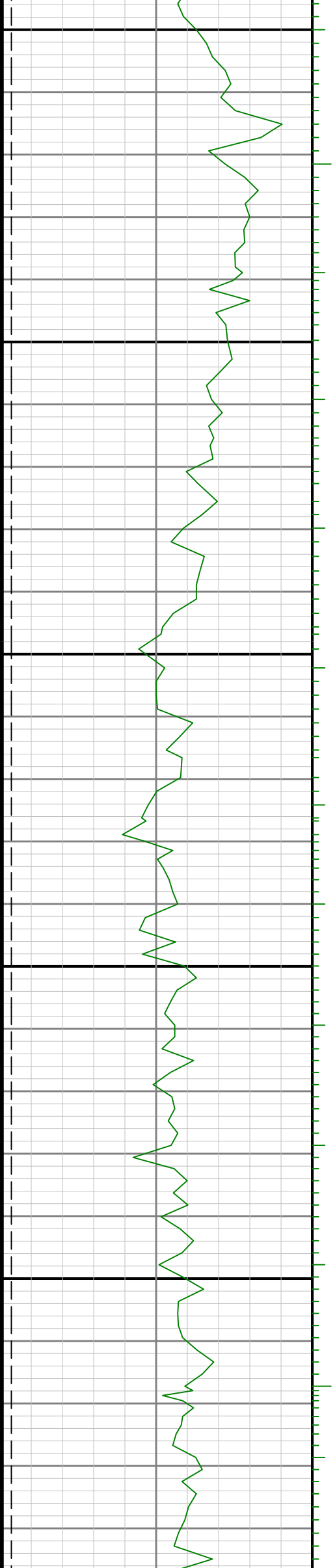


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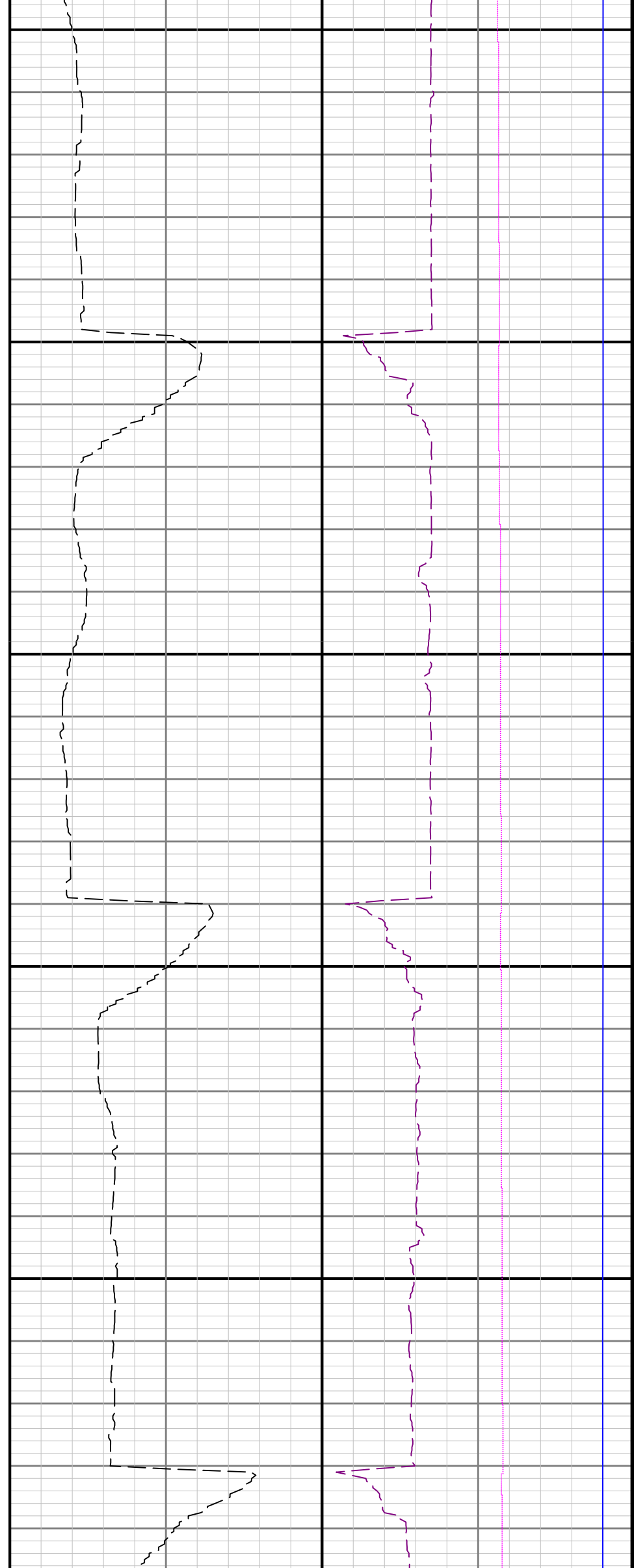


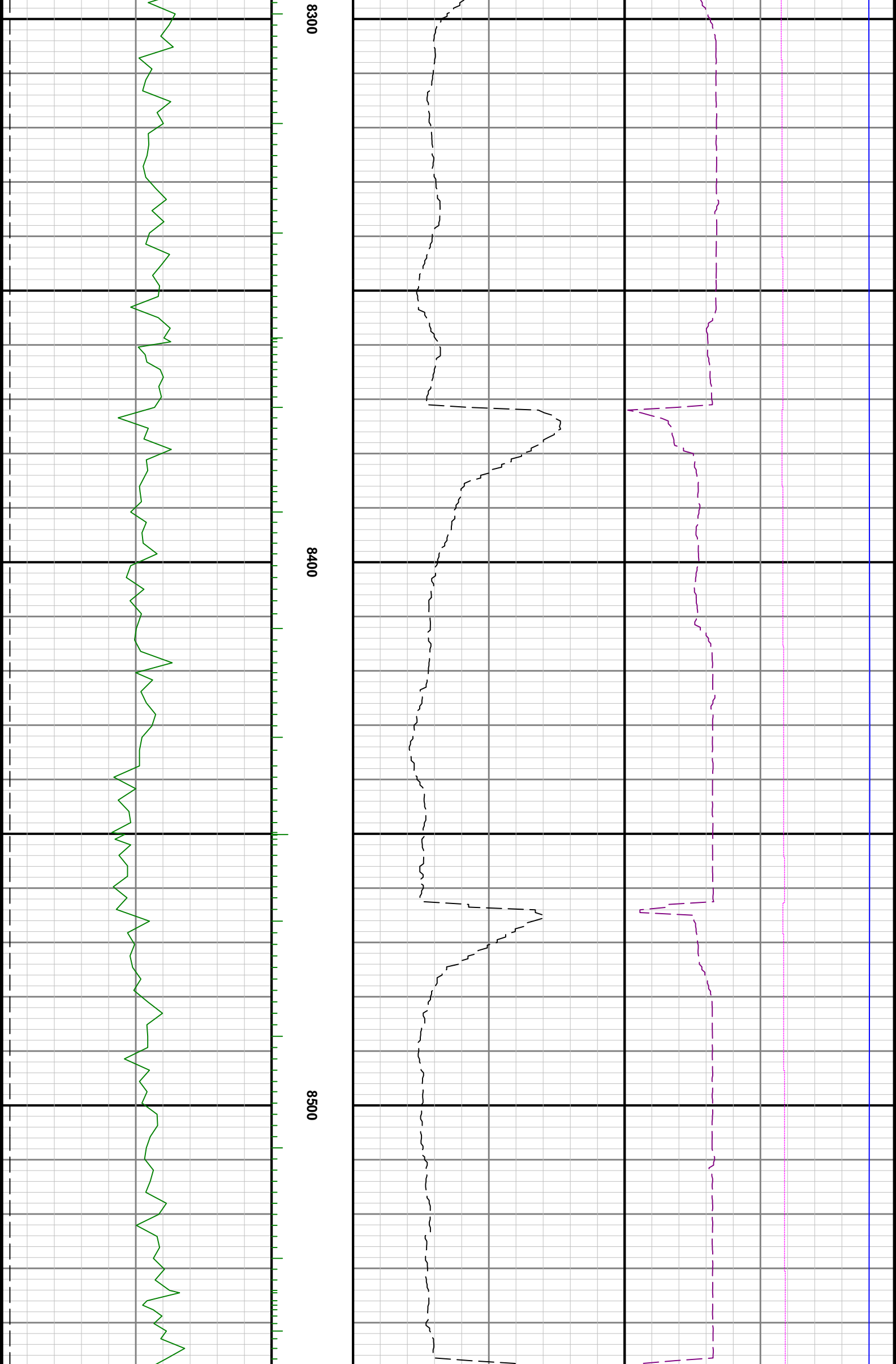


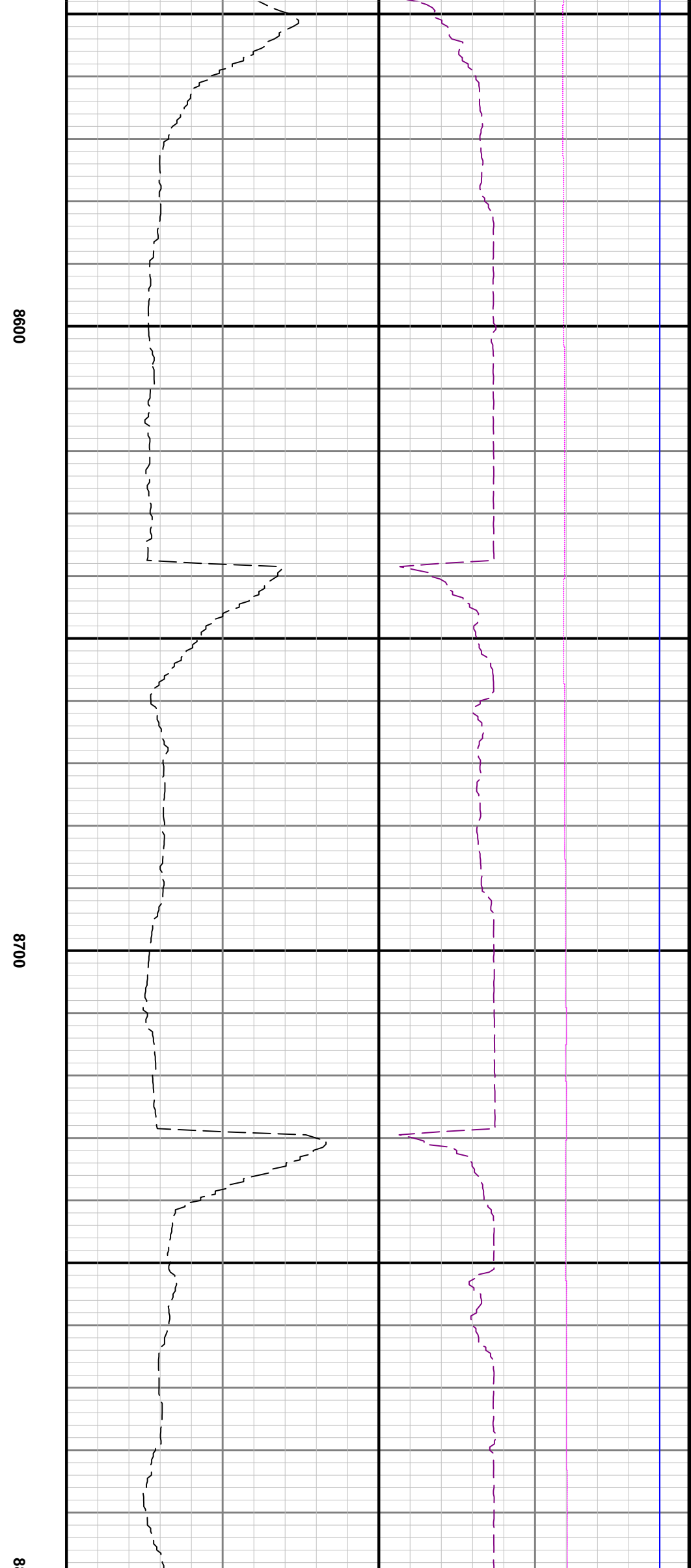
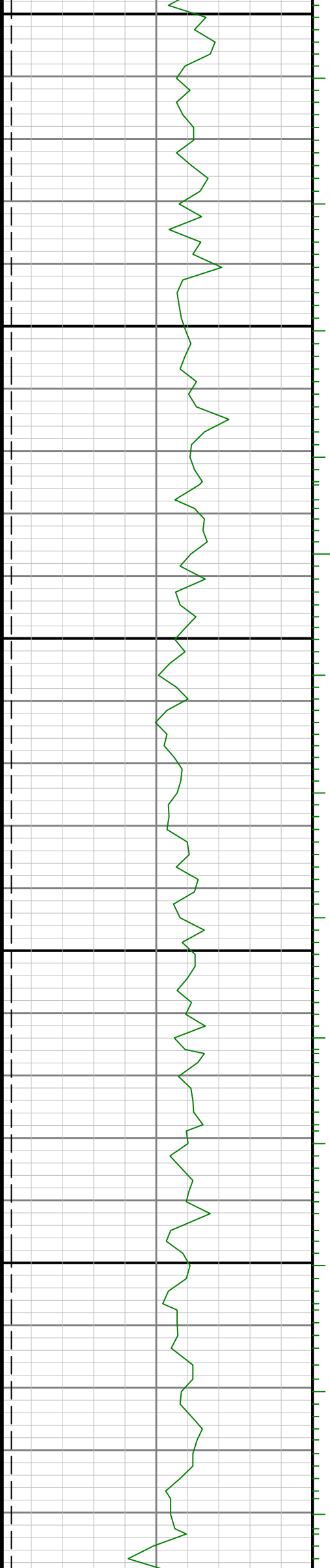


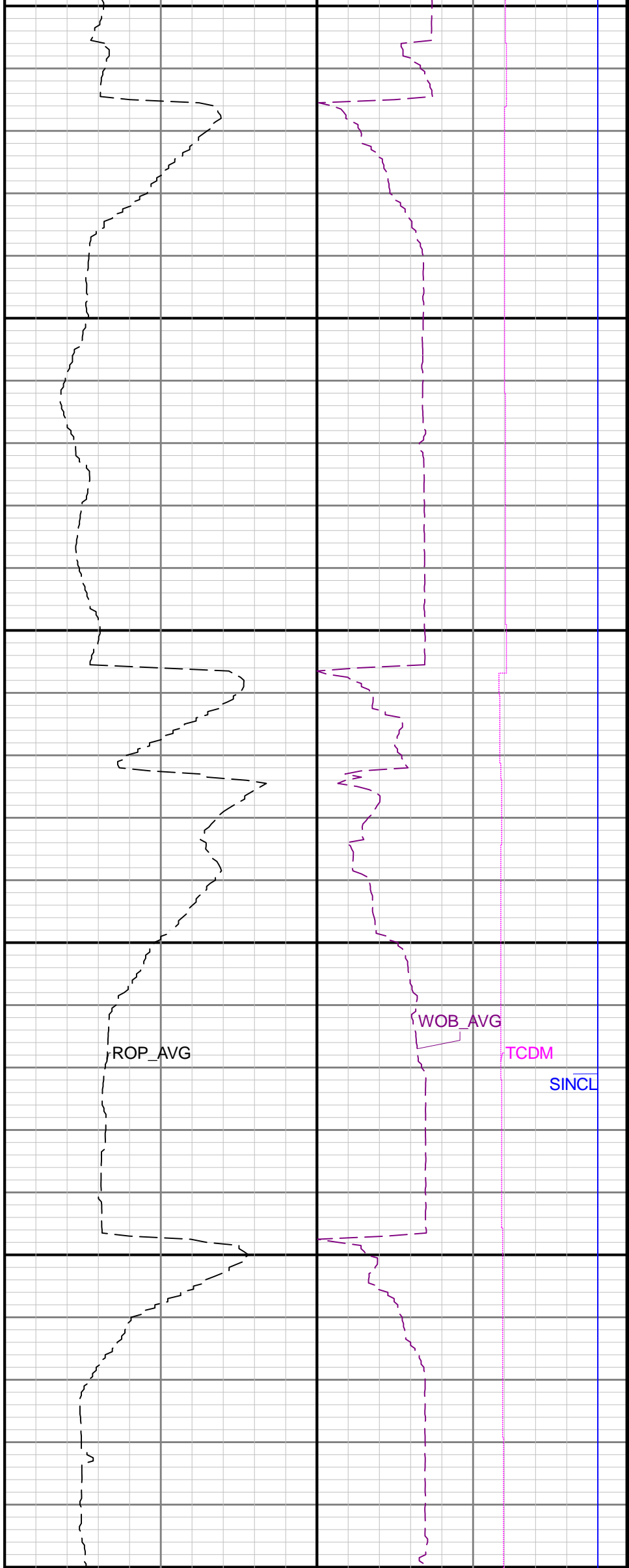
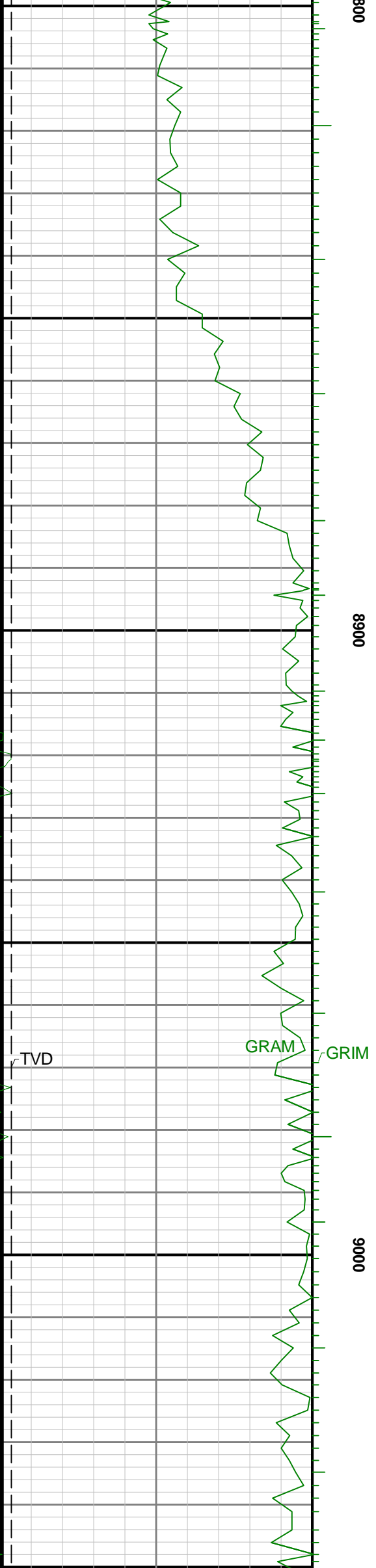
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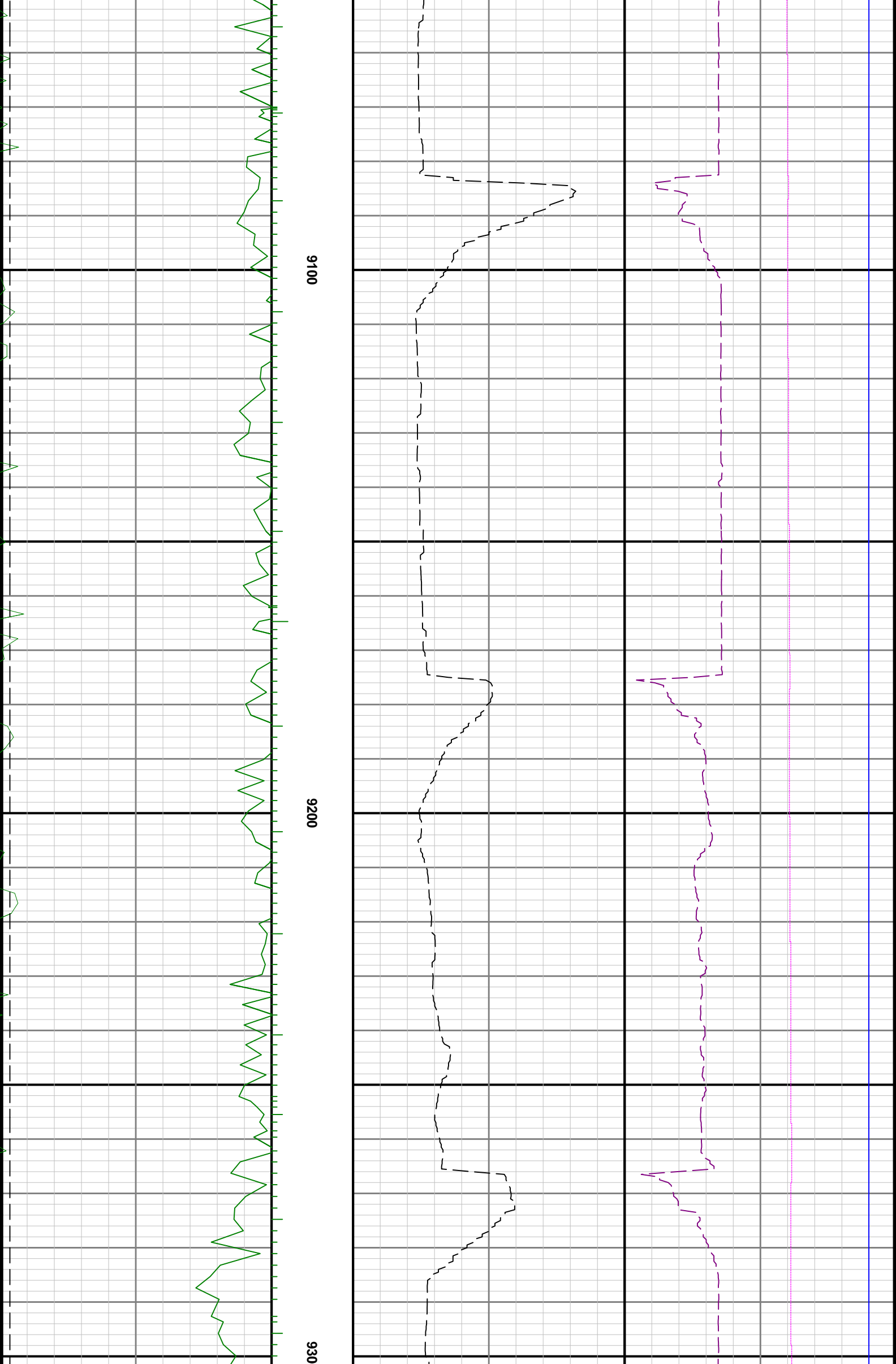
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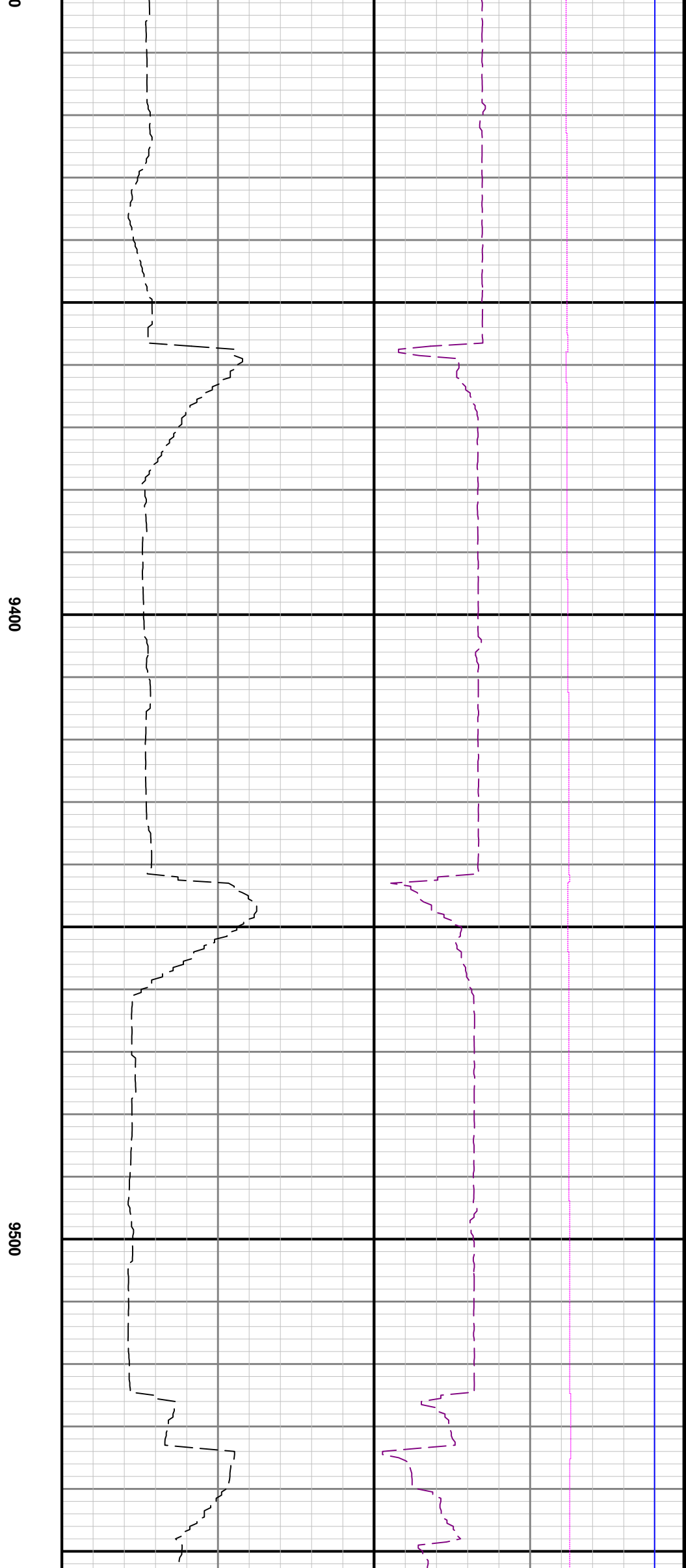
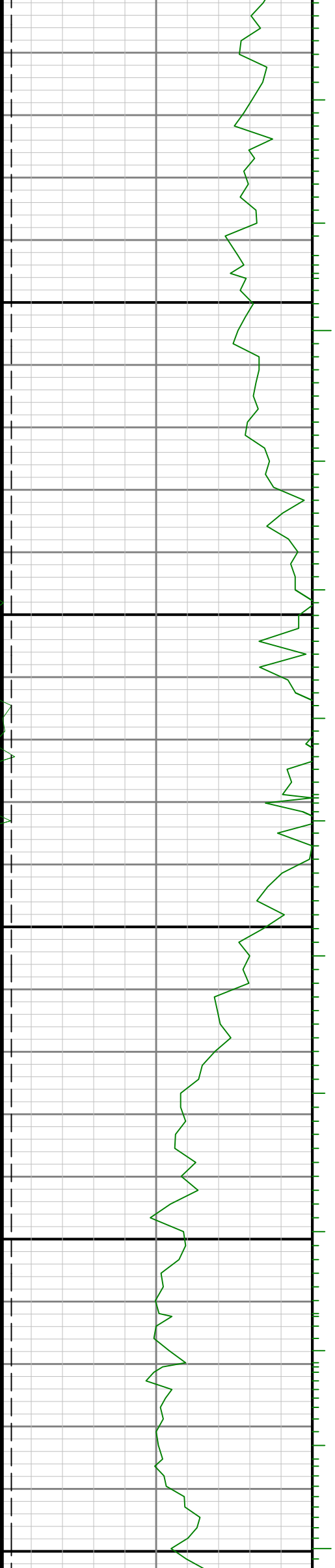


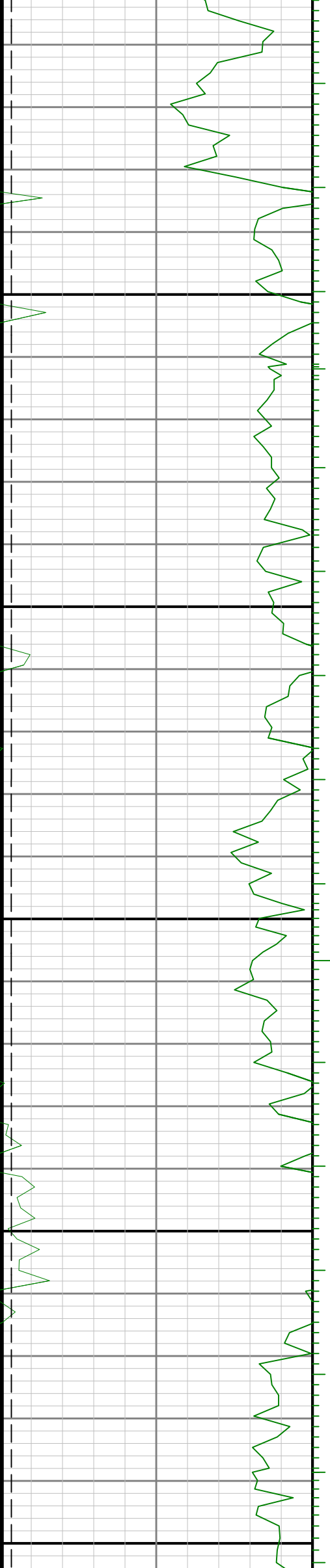








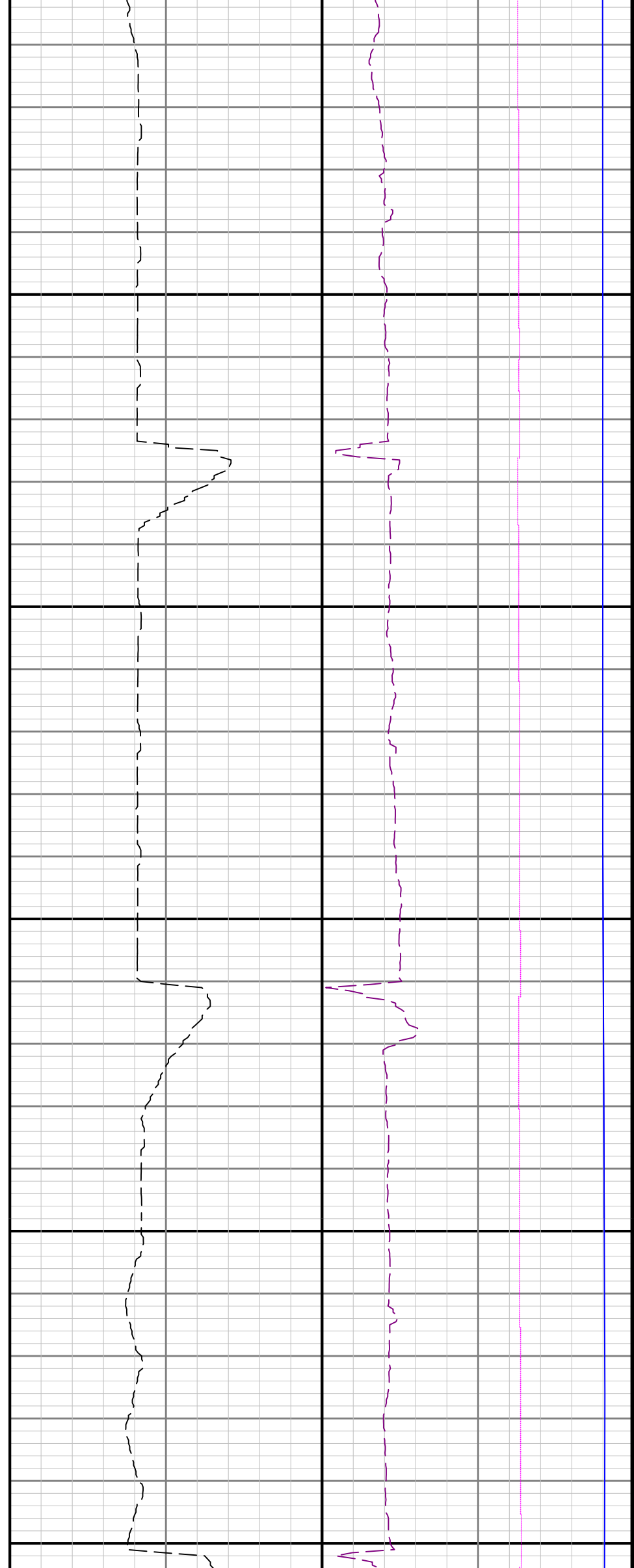


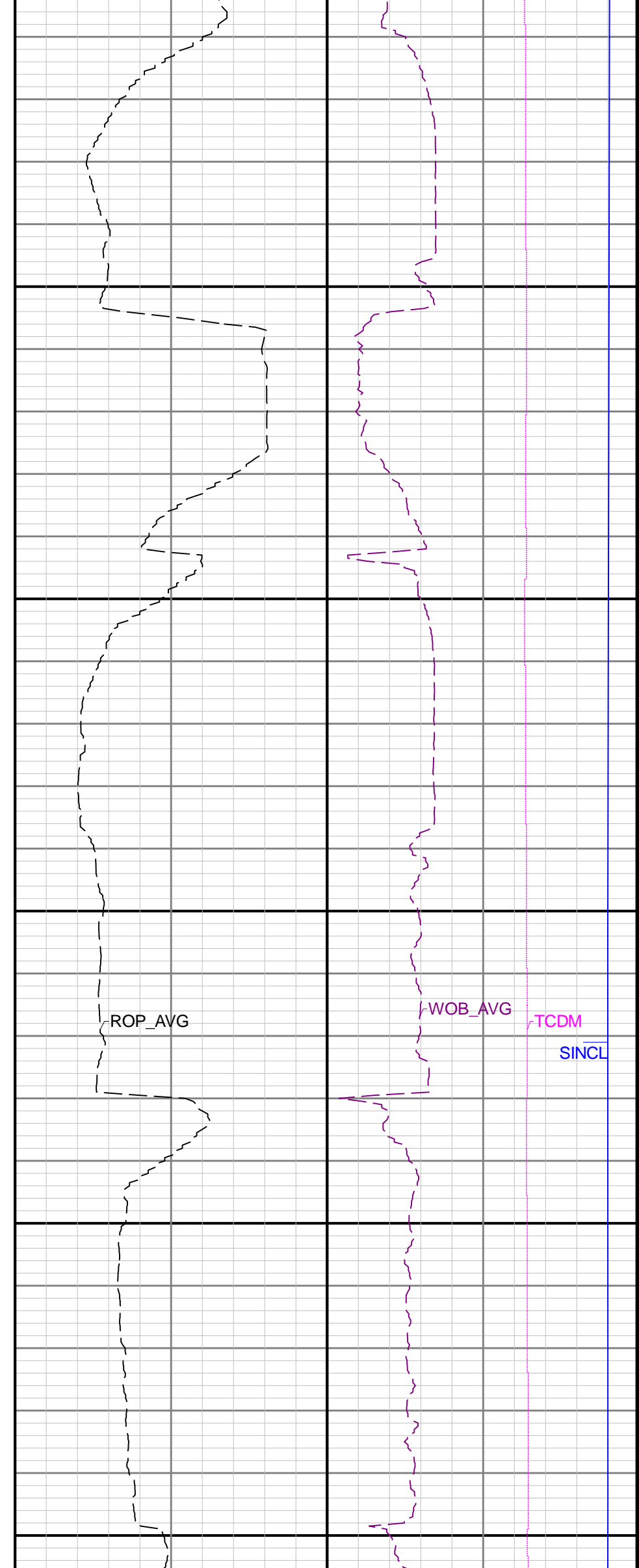
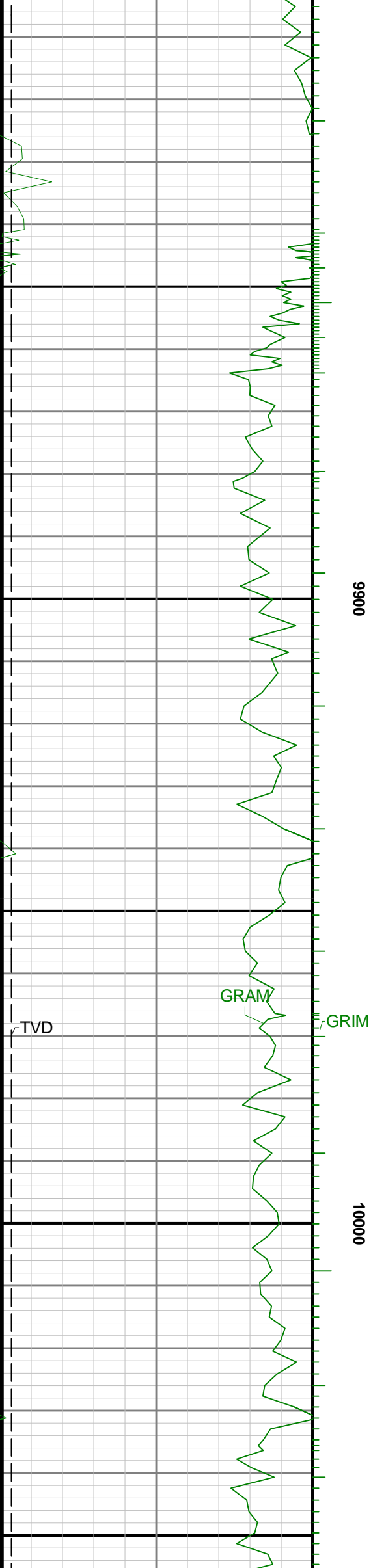


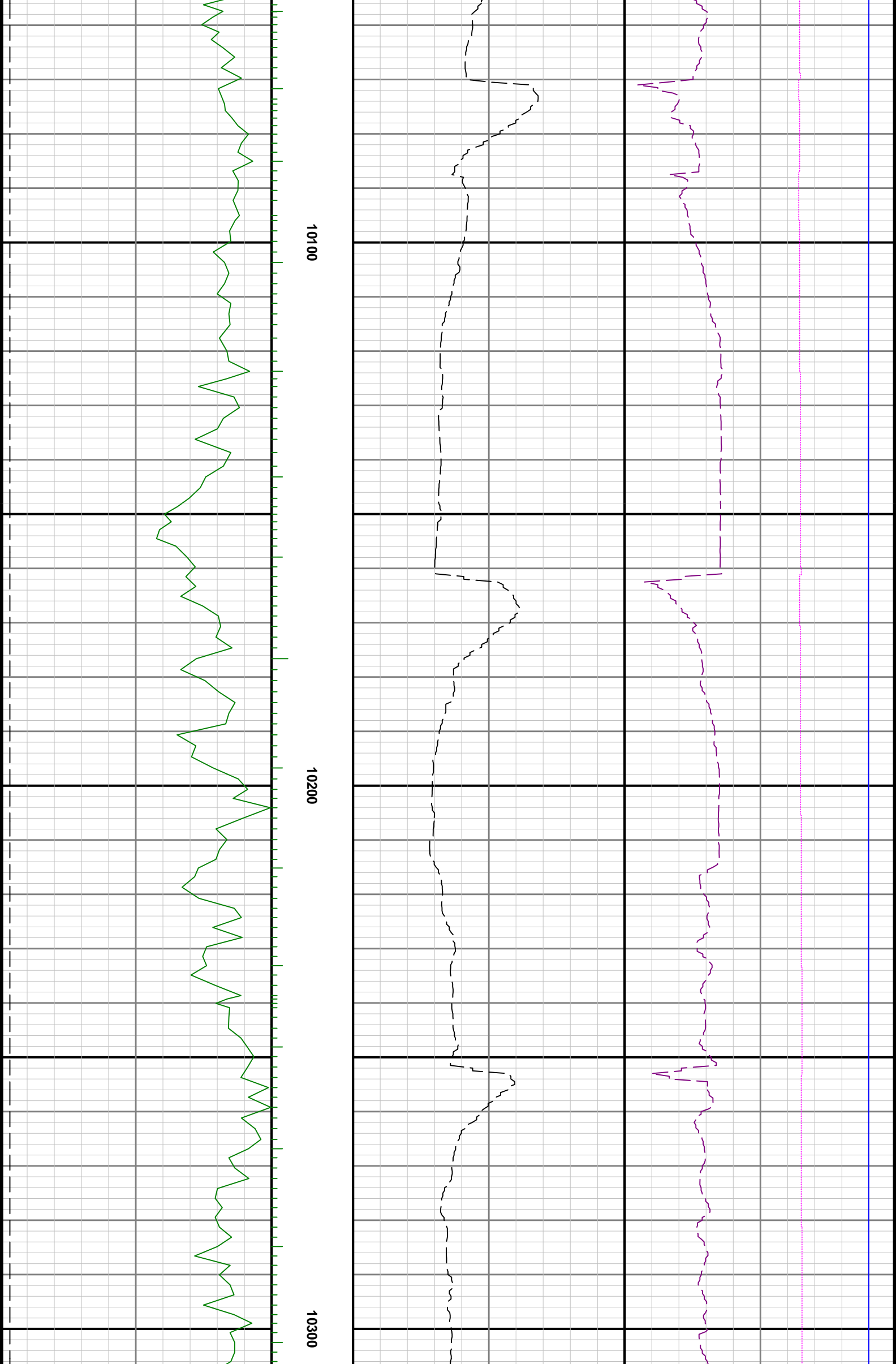
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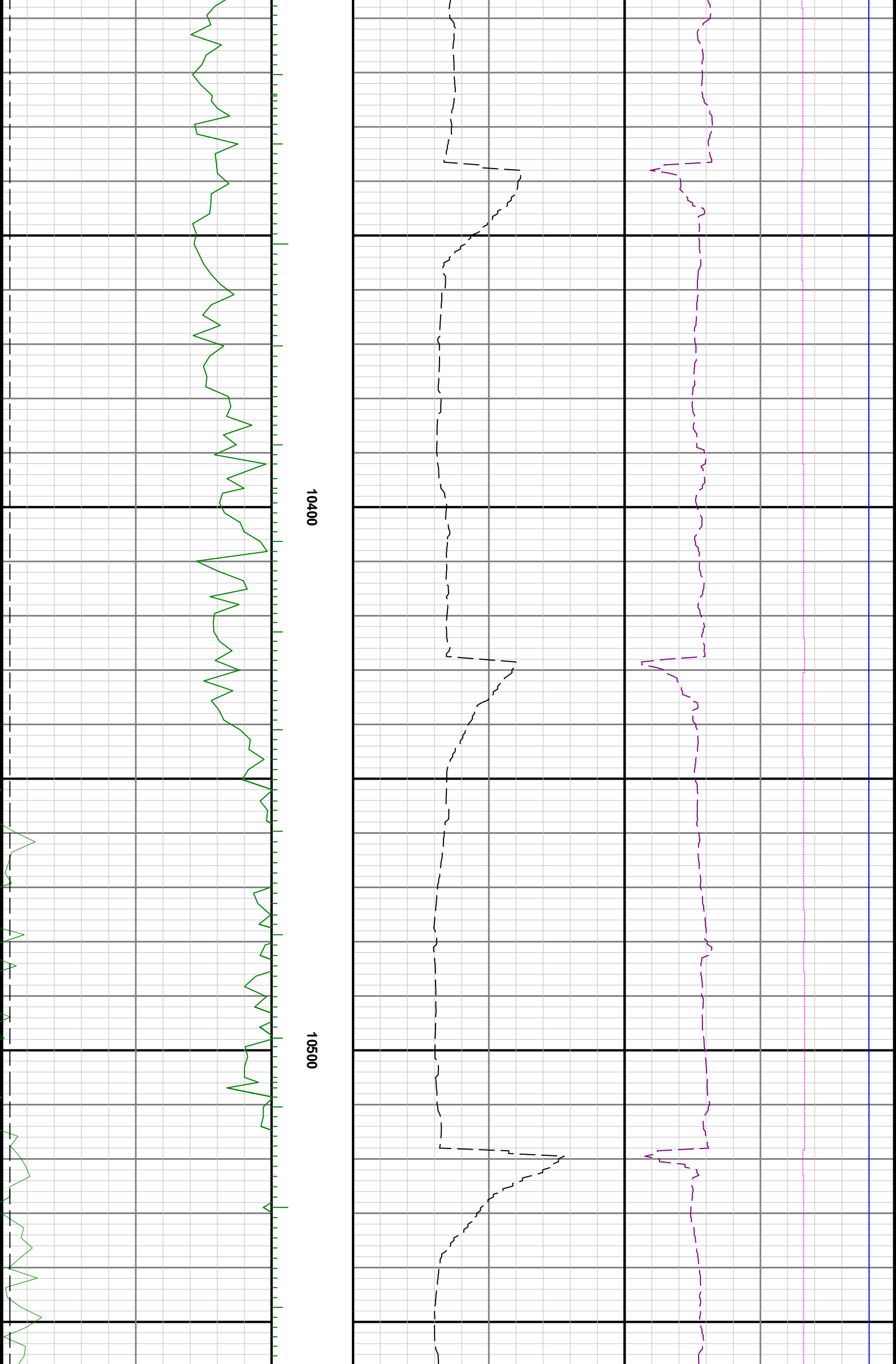


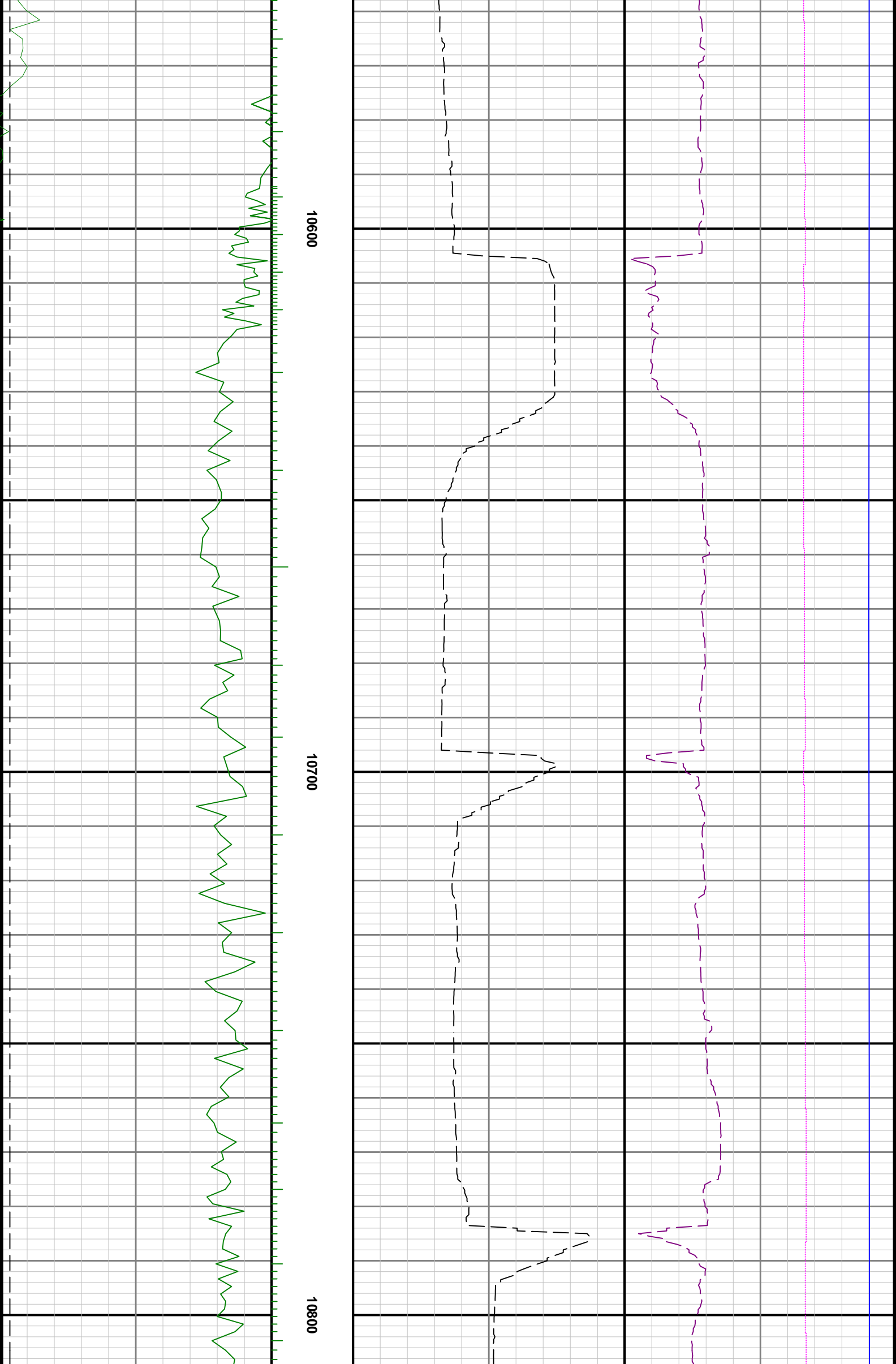


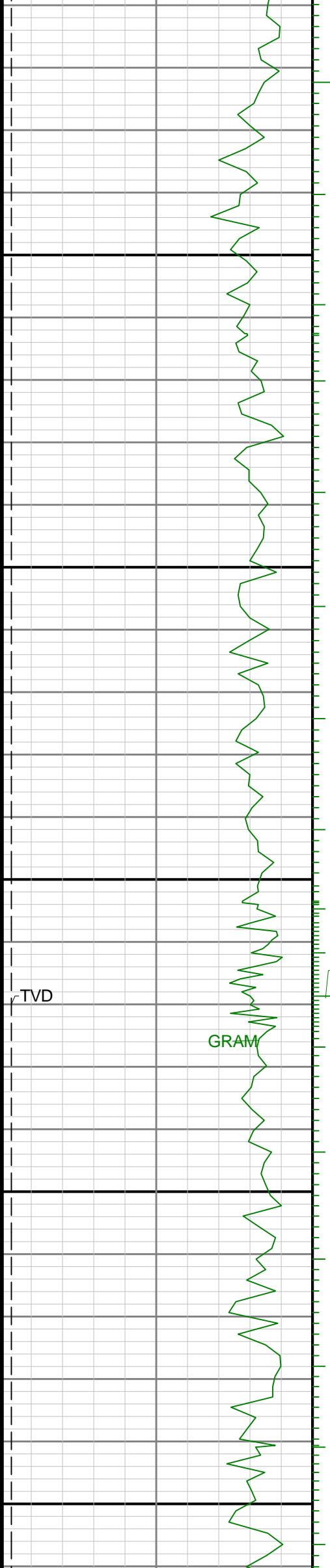
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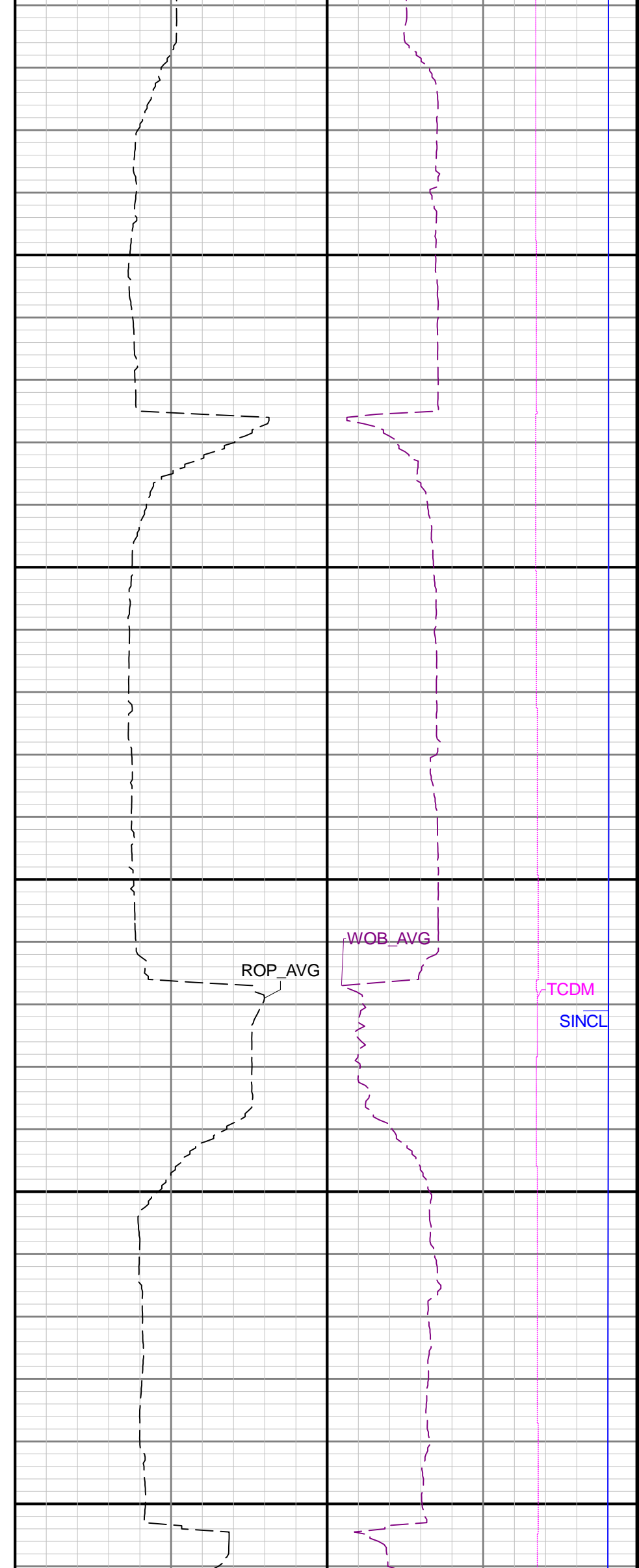
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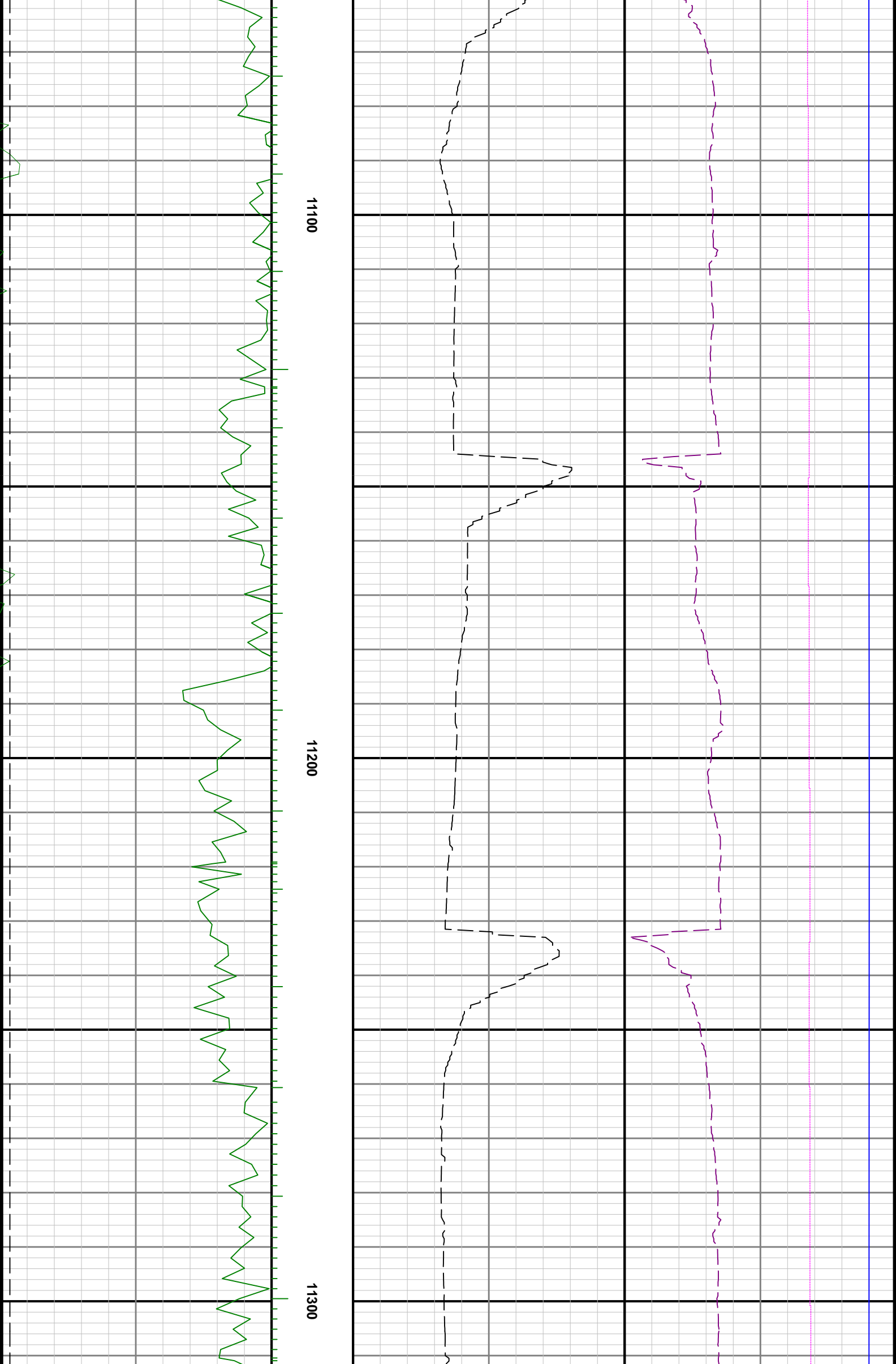


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WOB_AVG

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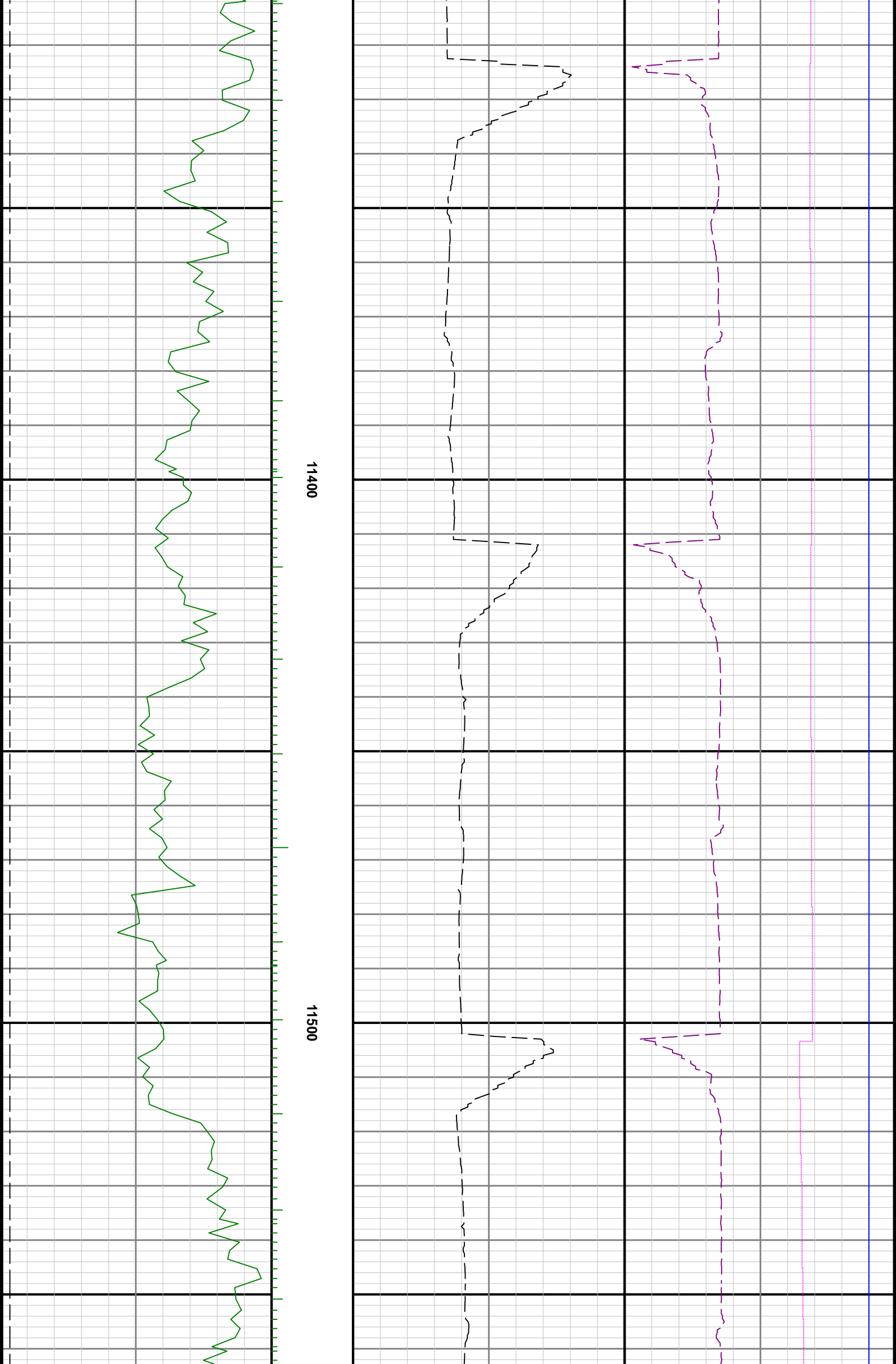
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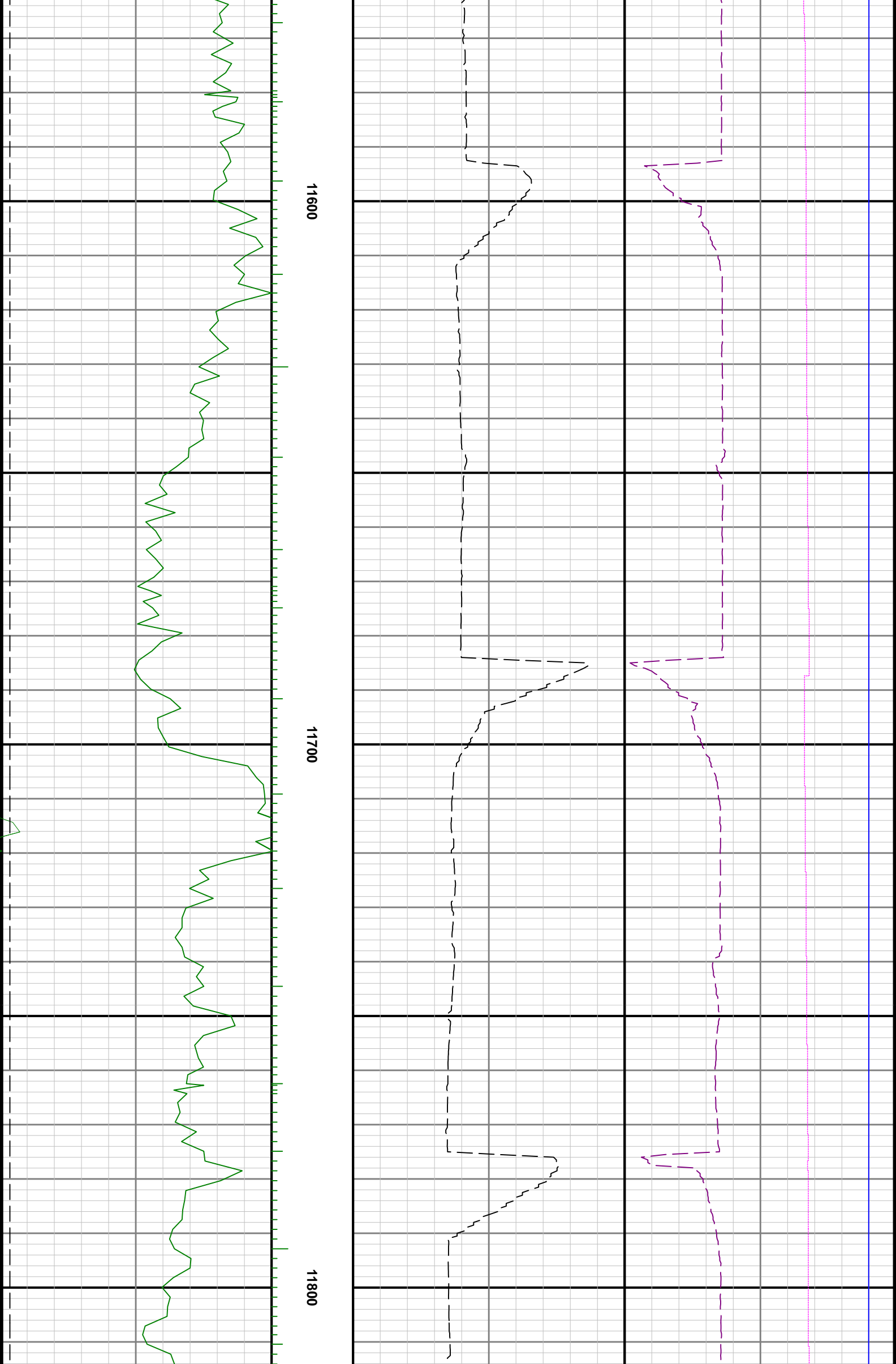
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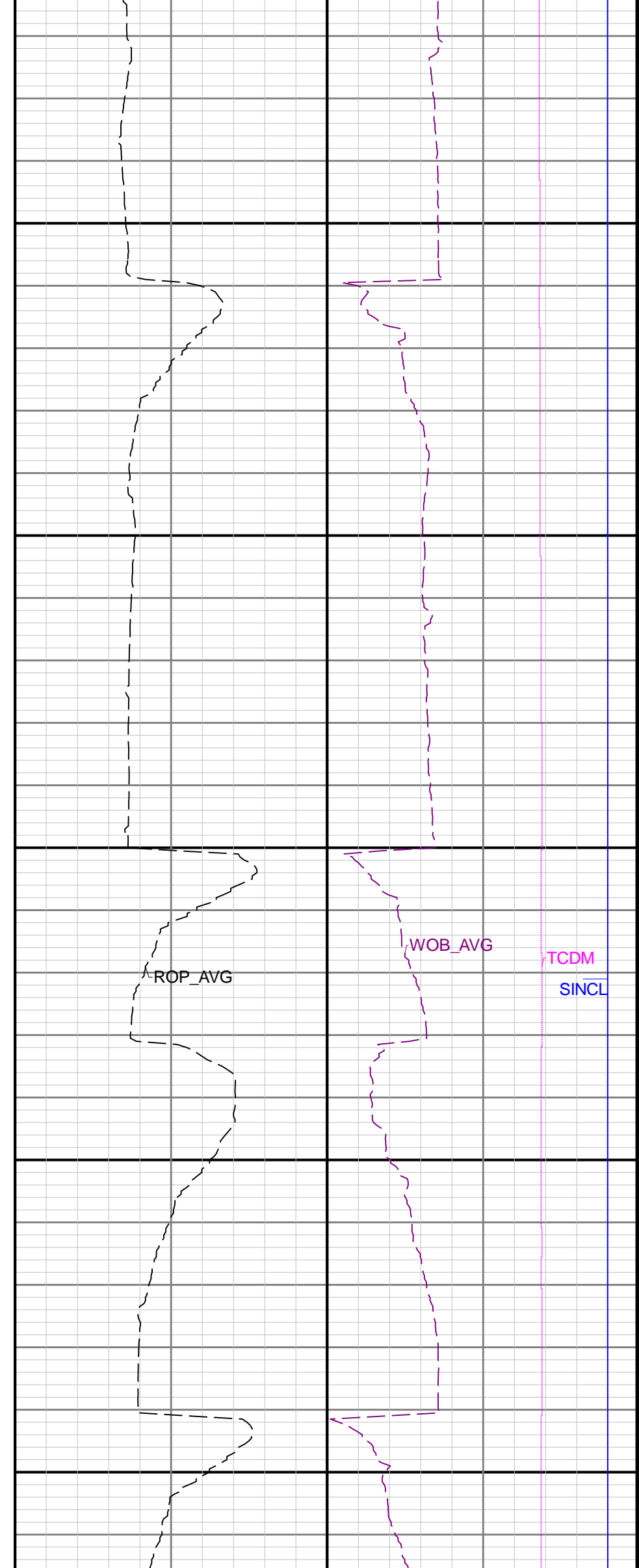
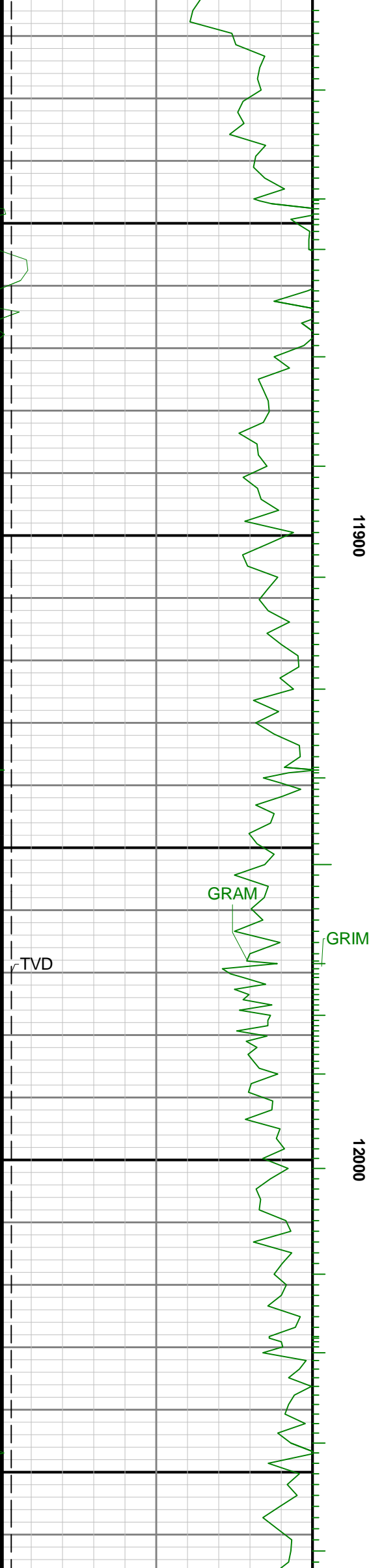
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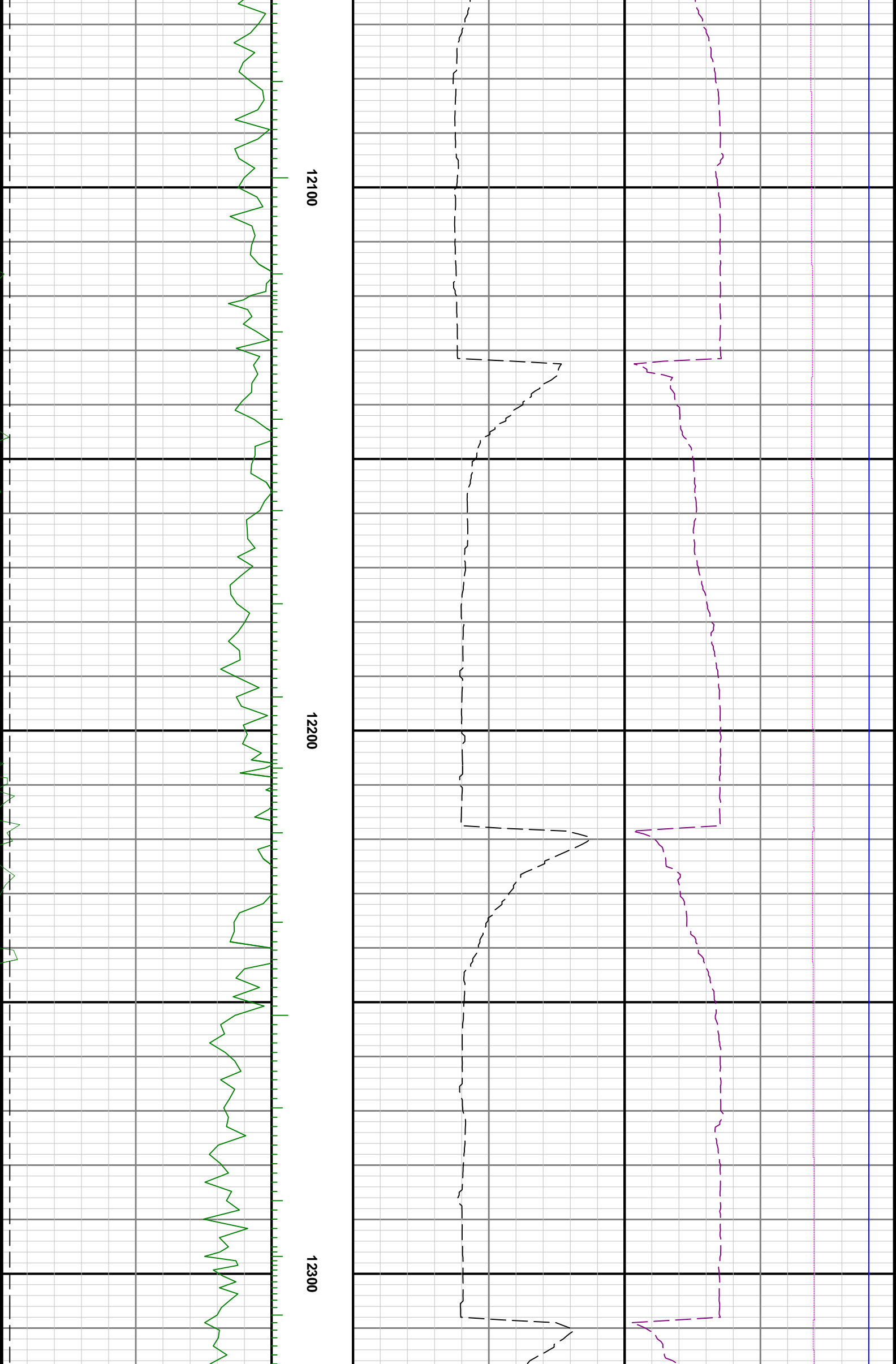


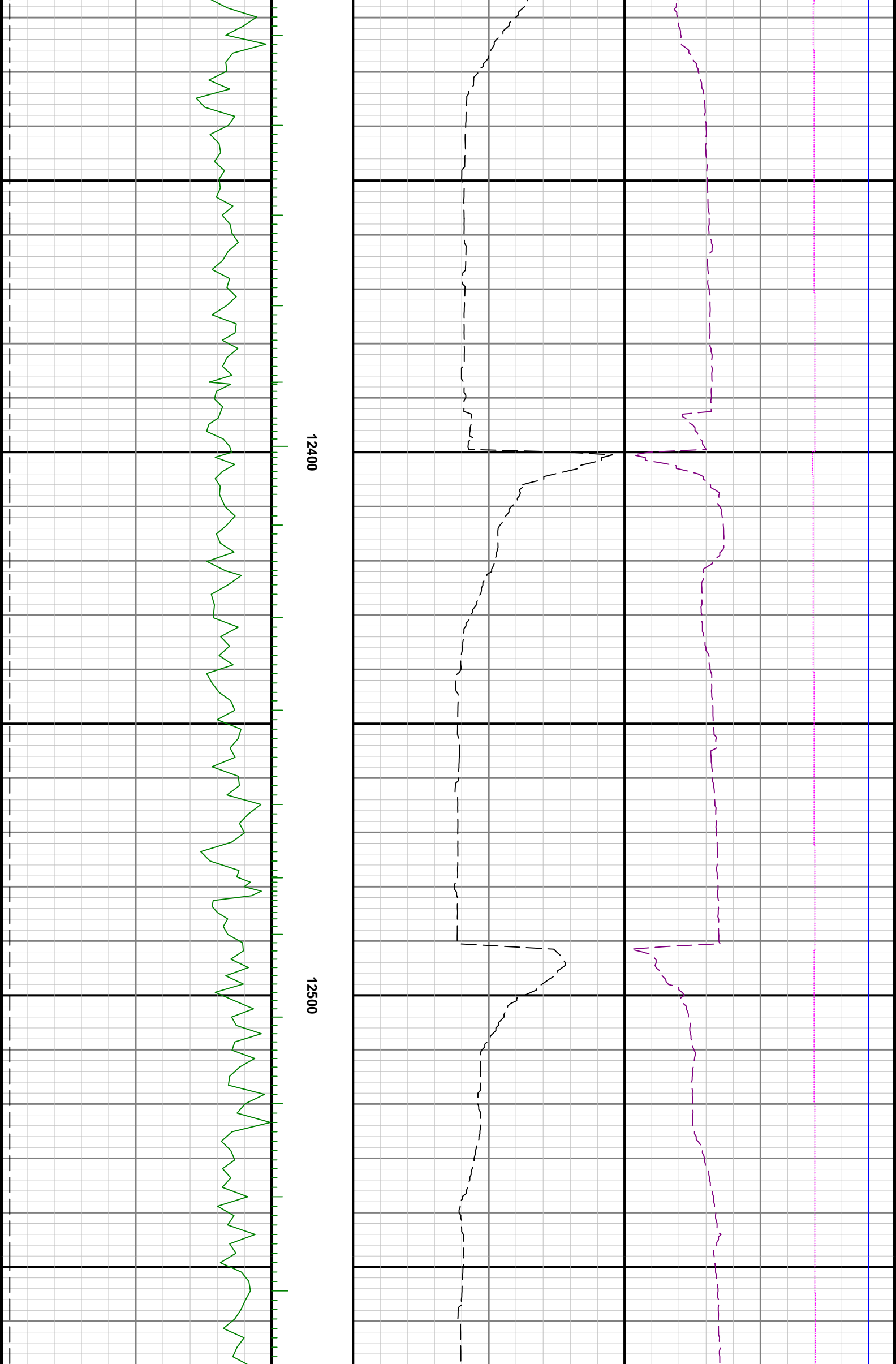
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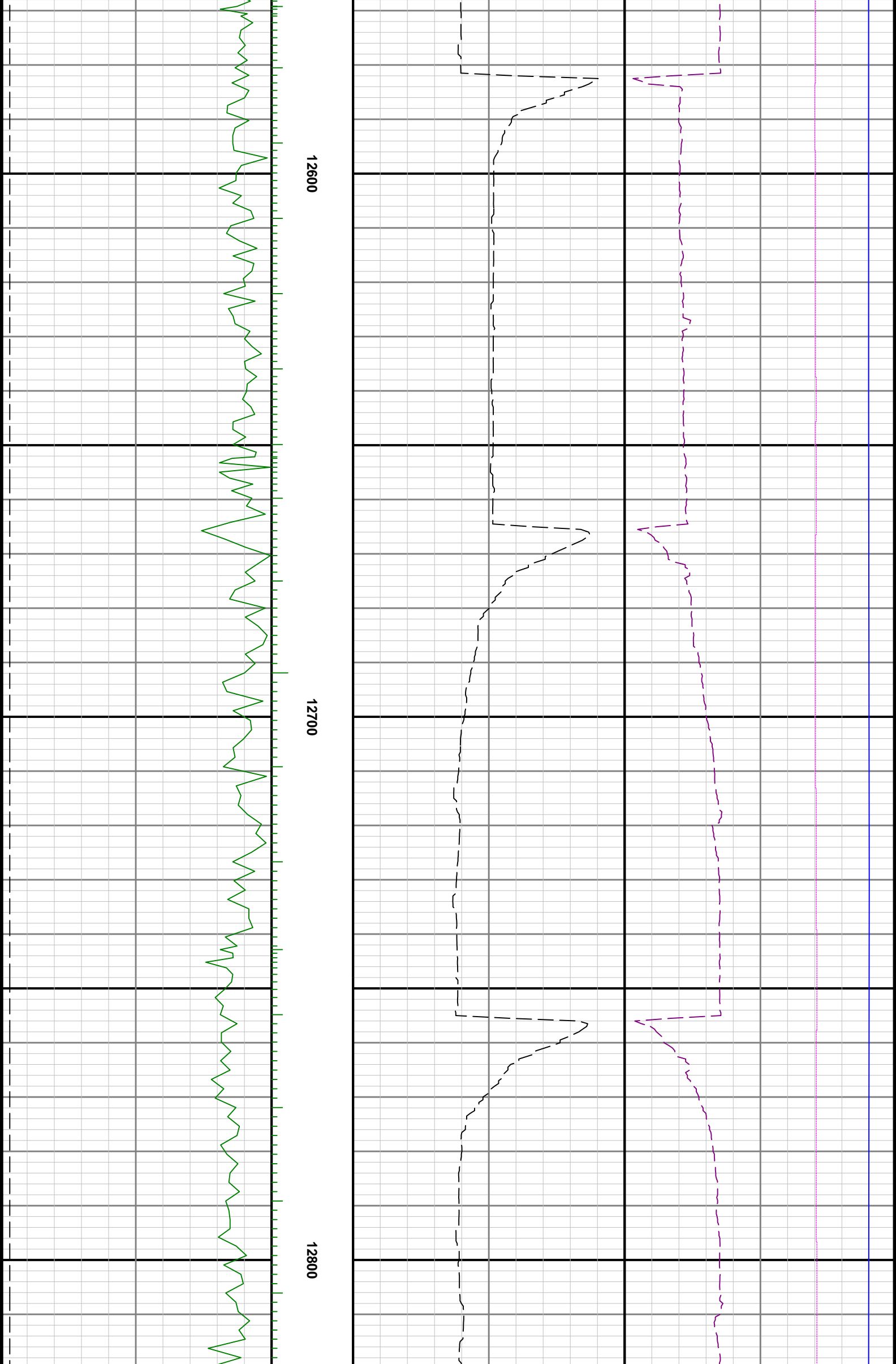


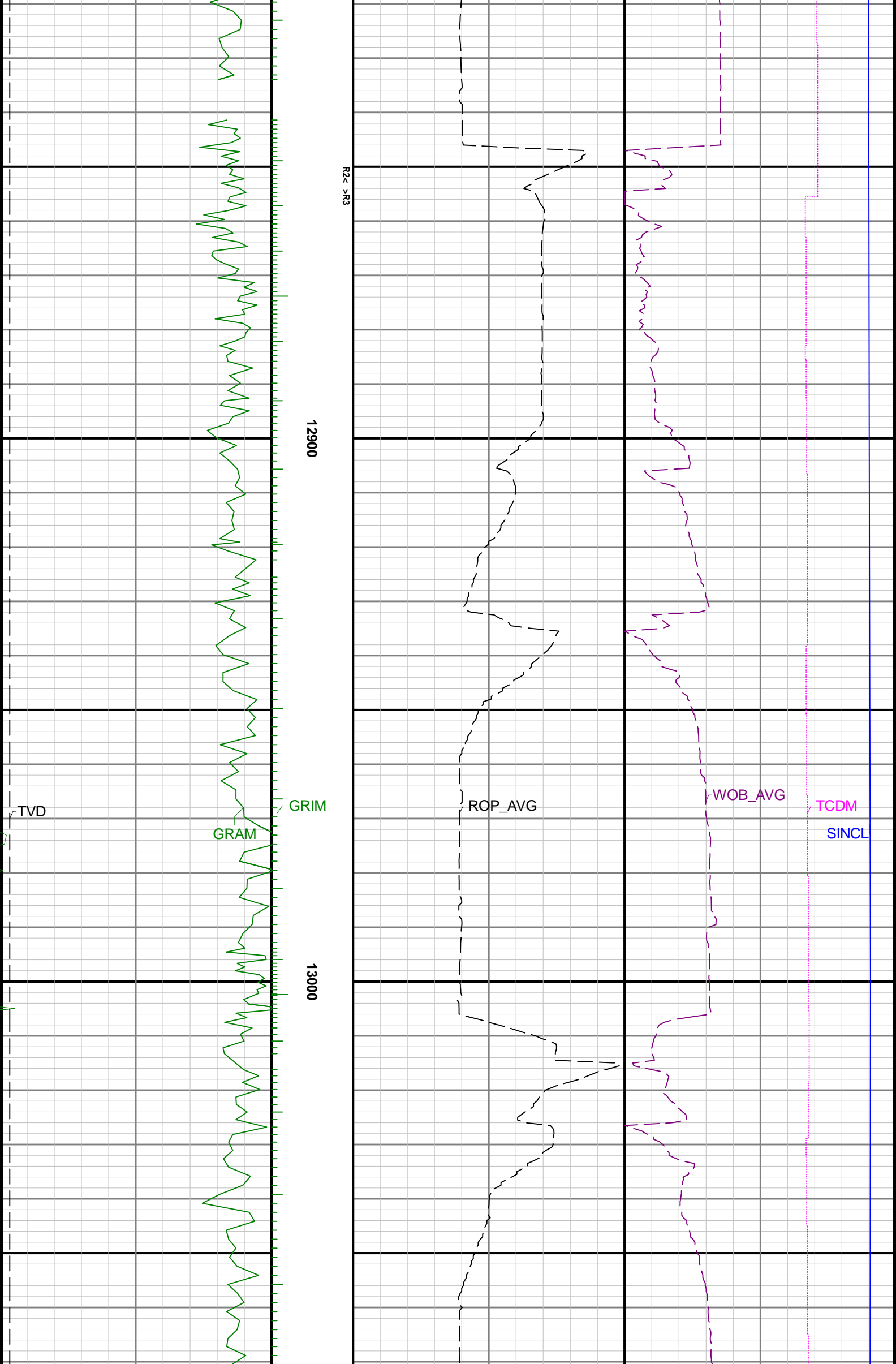


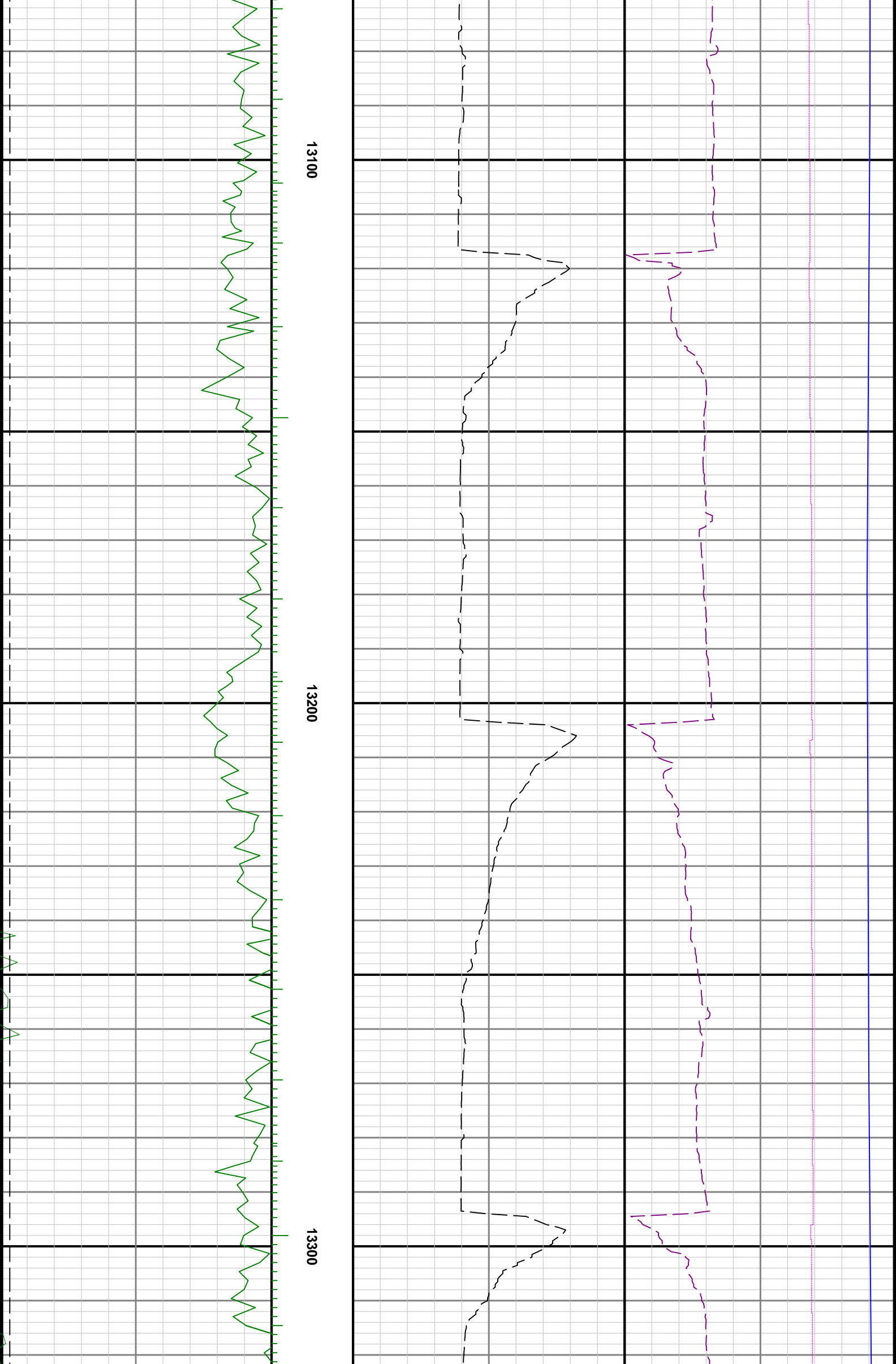


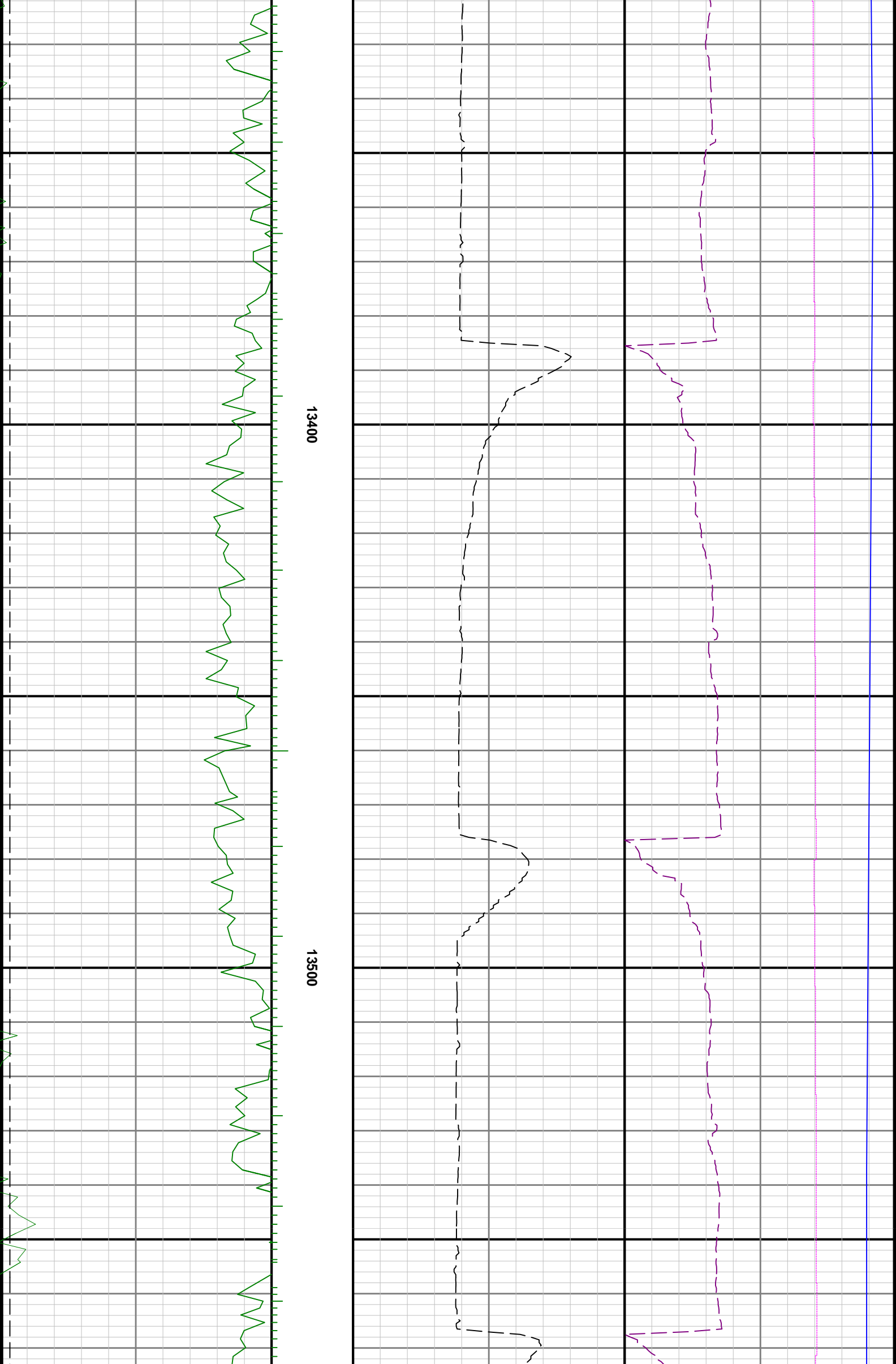
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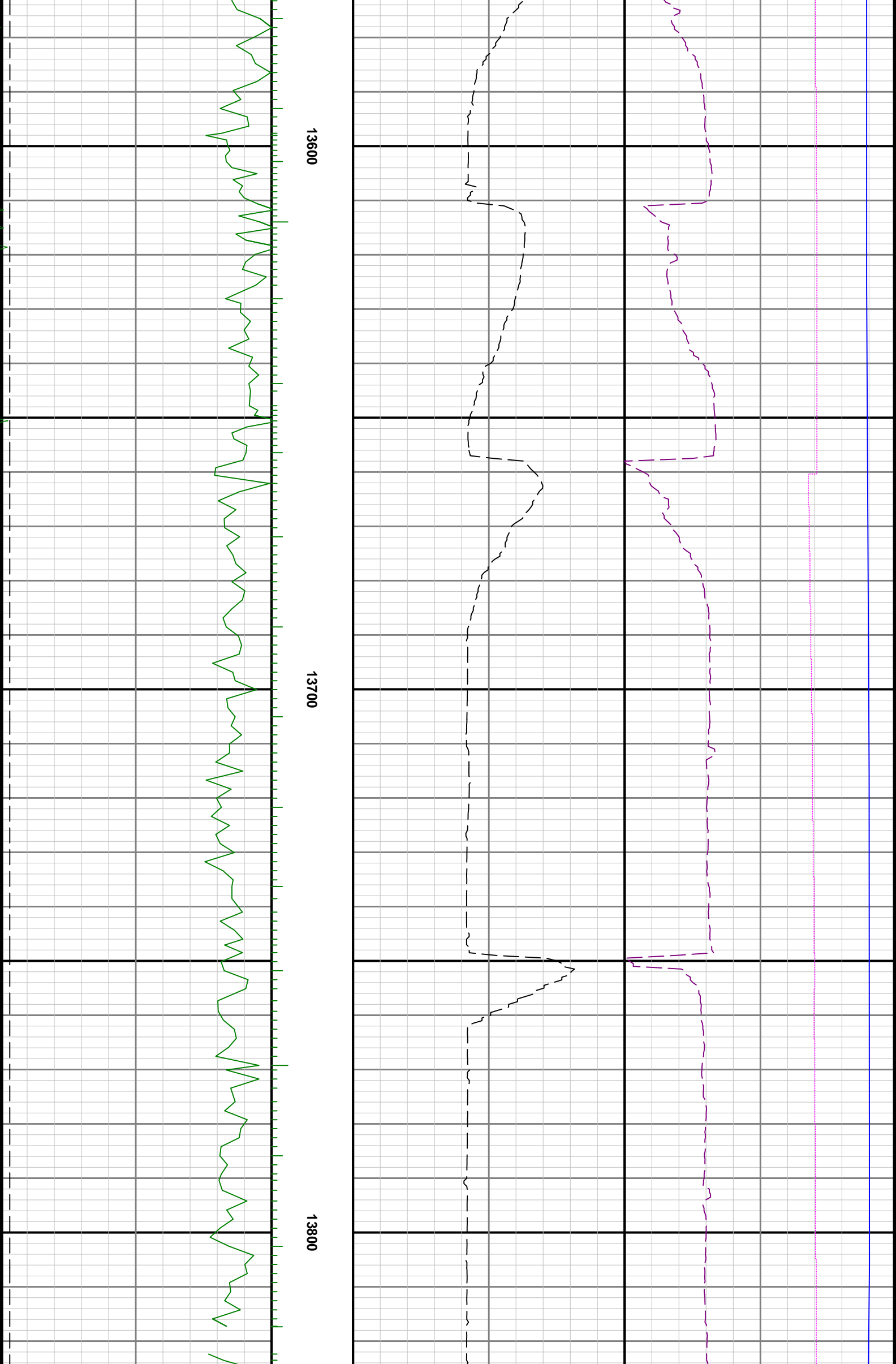
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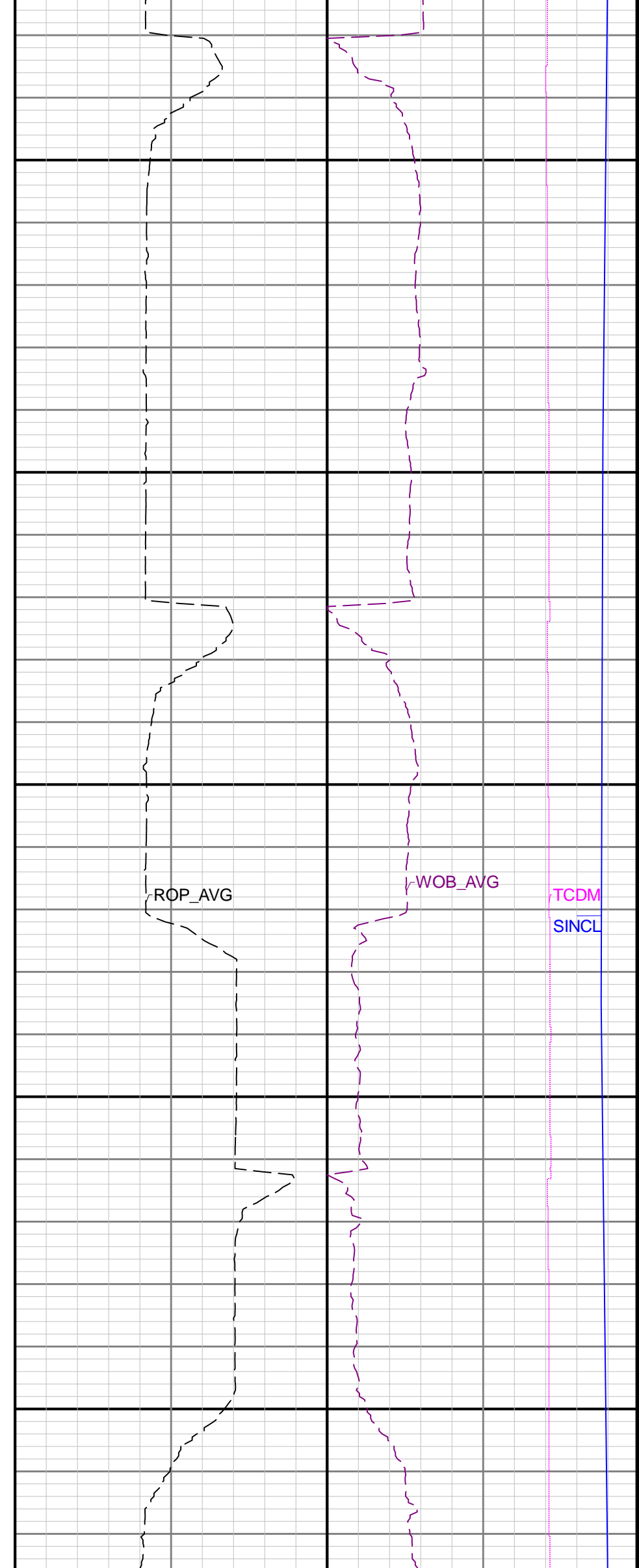
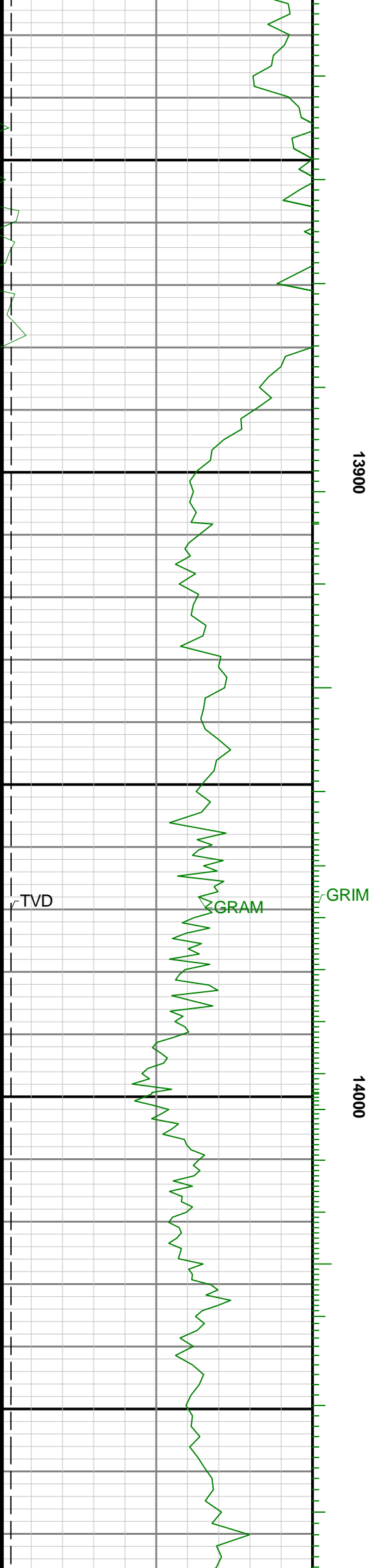


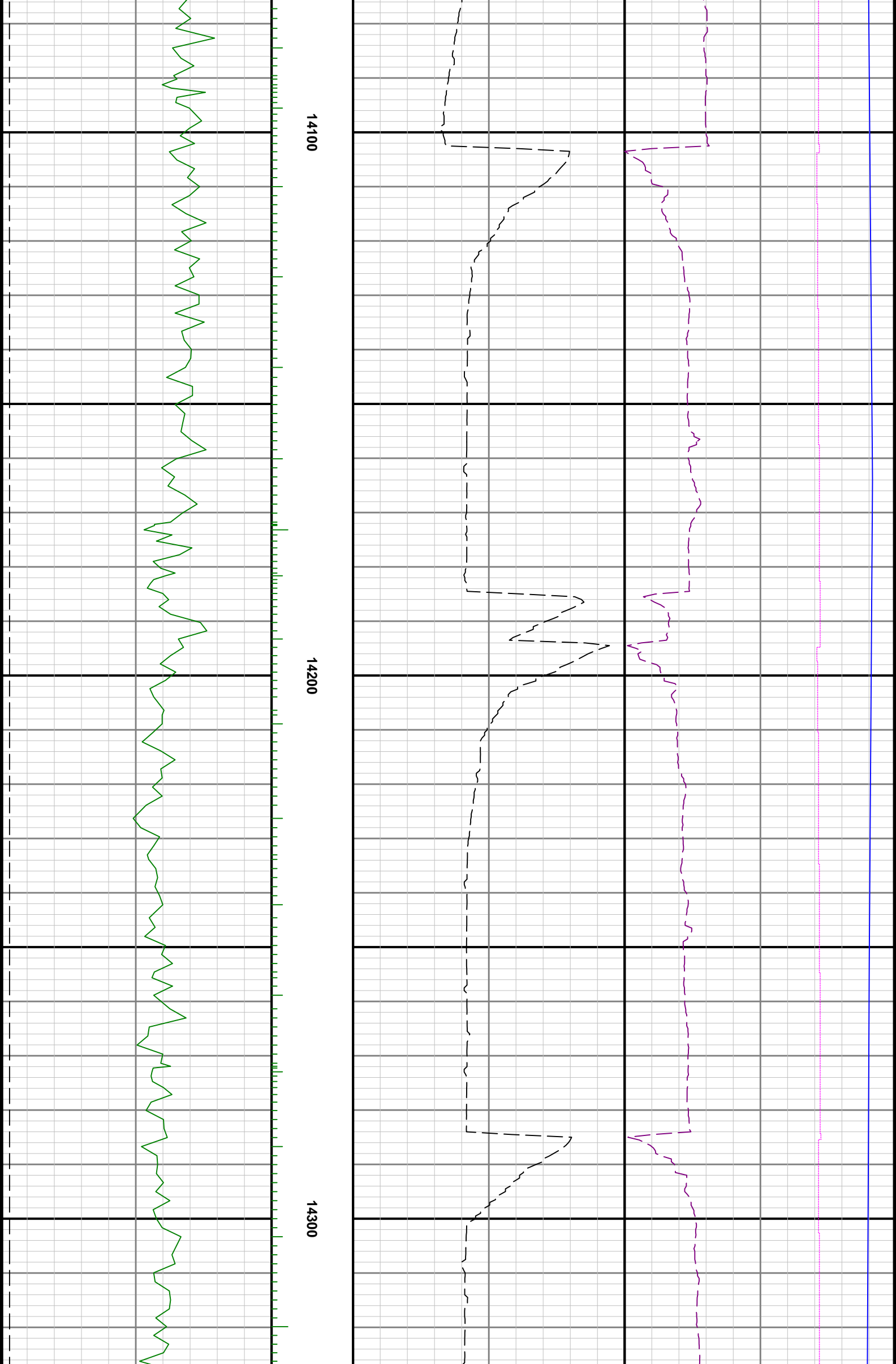


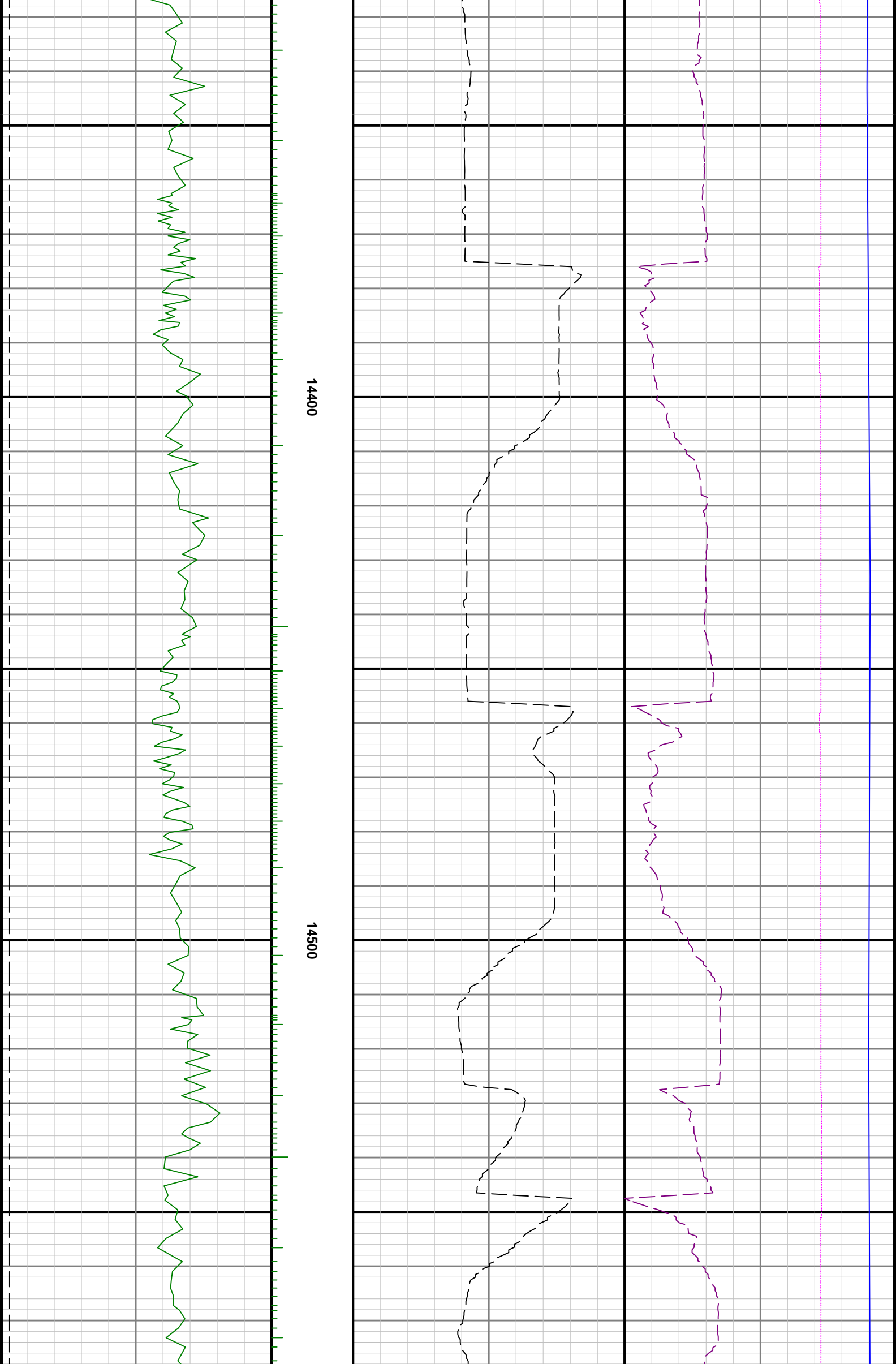


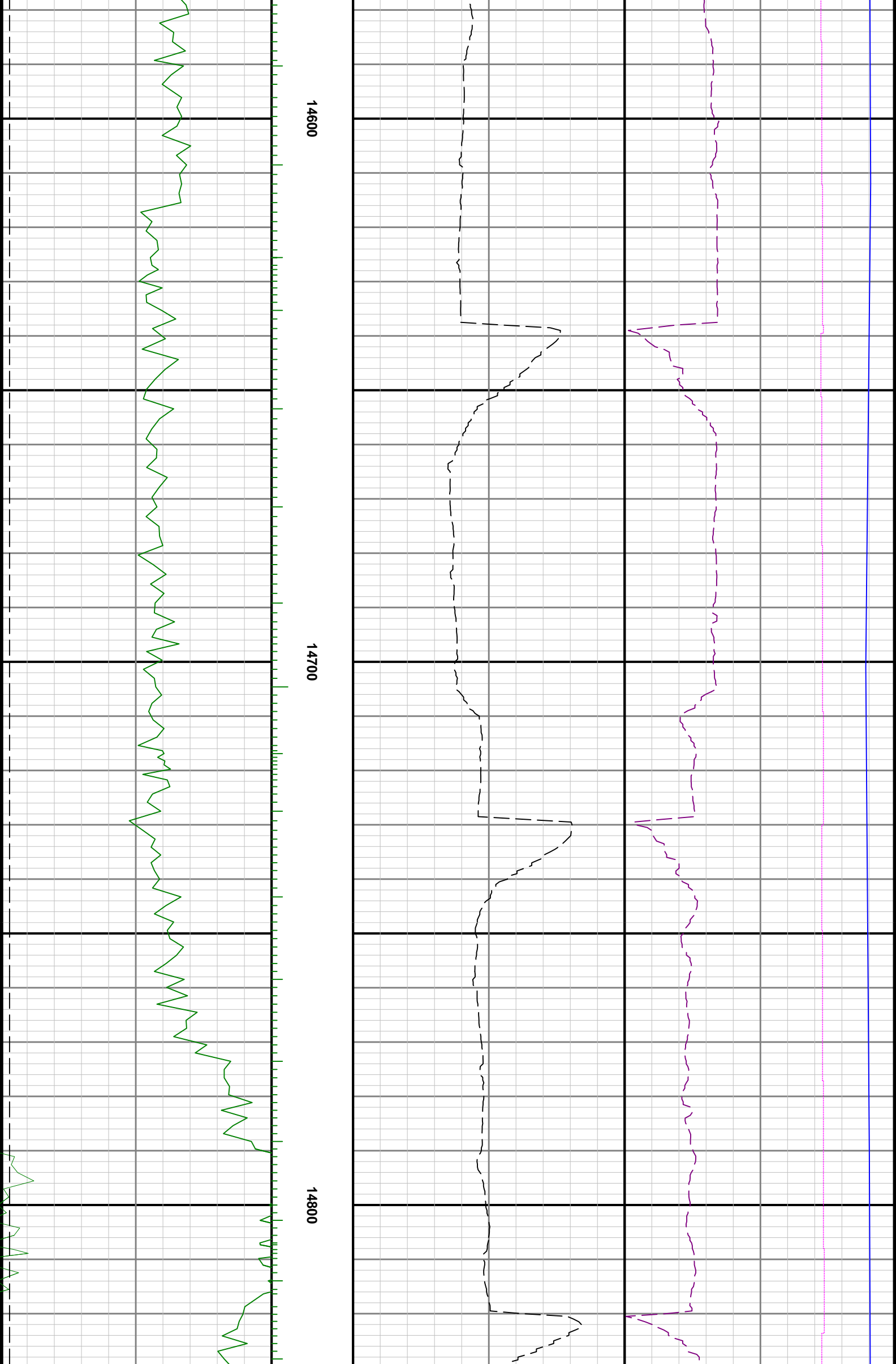


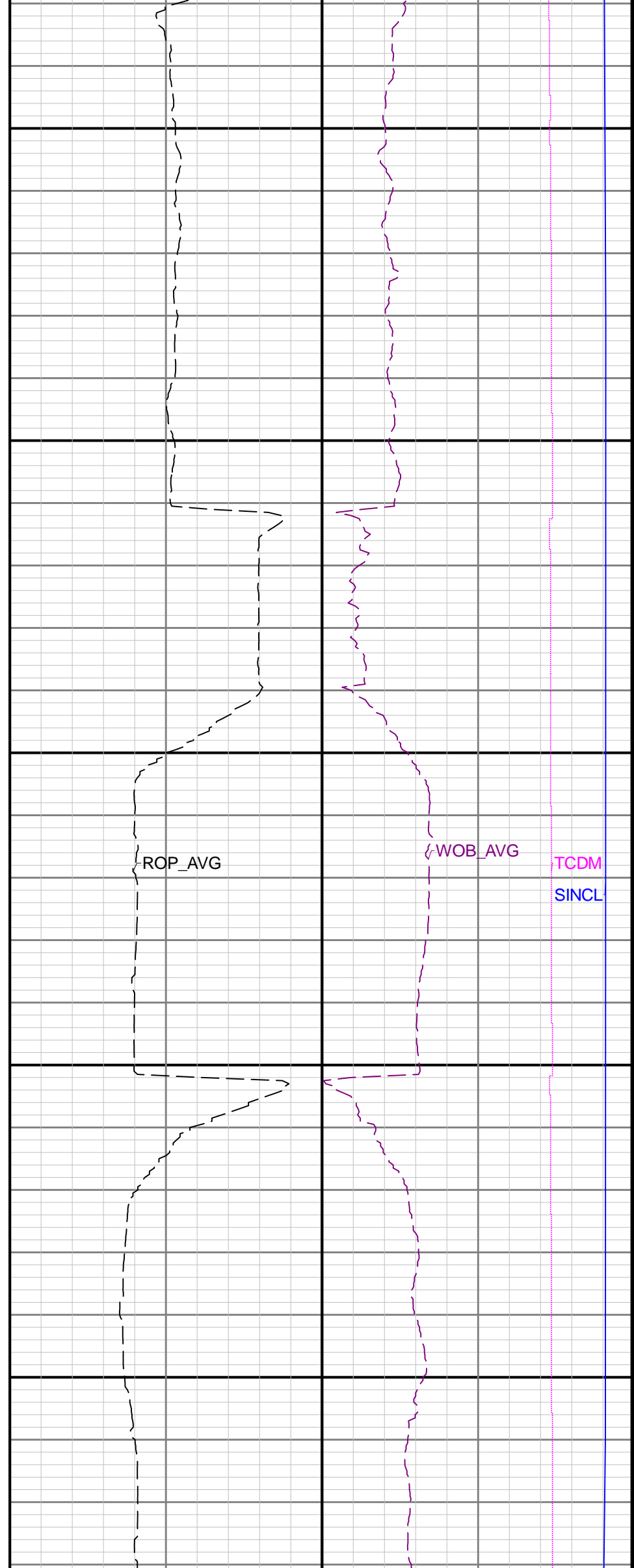
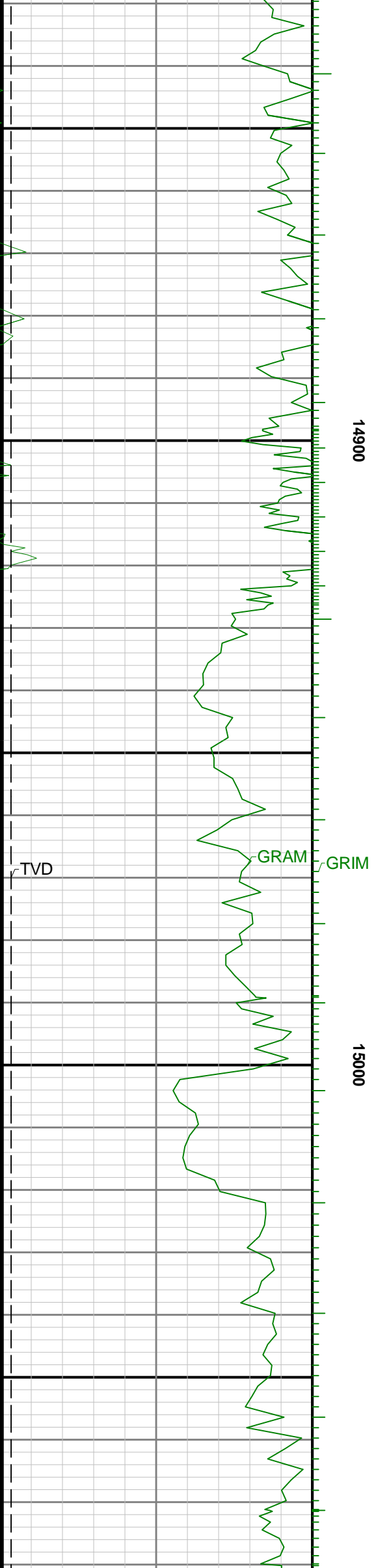


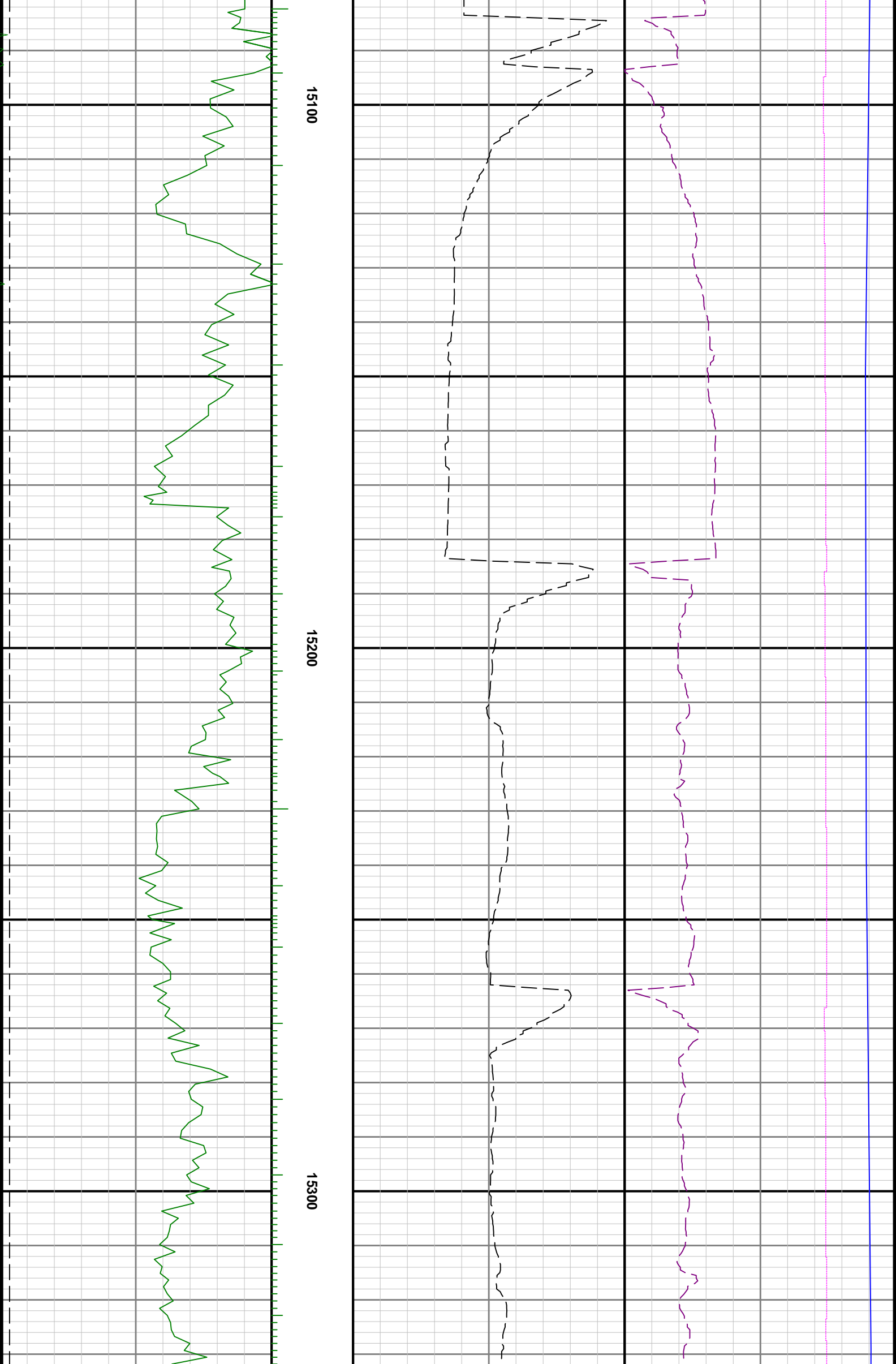


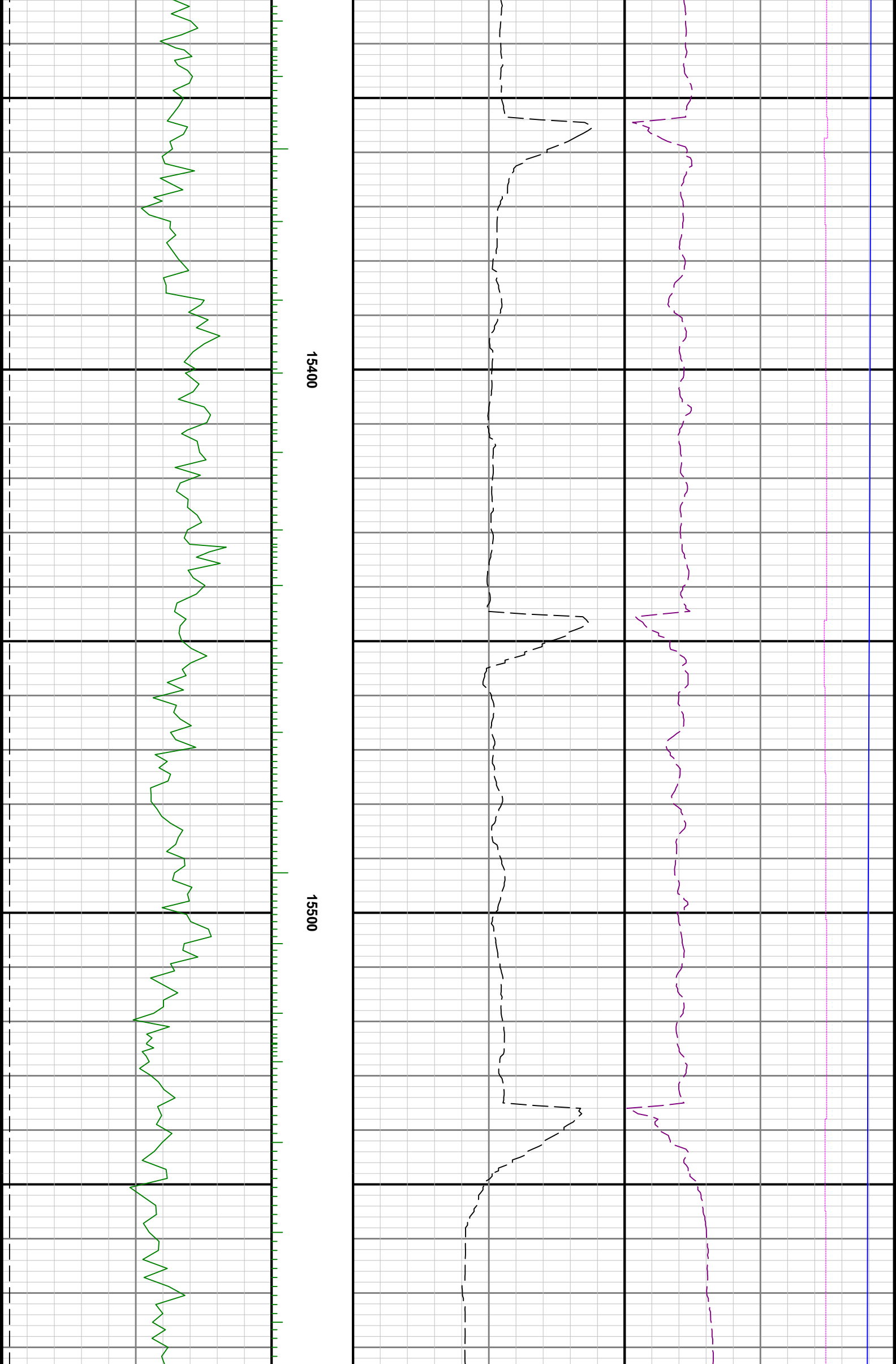


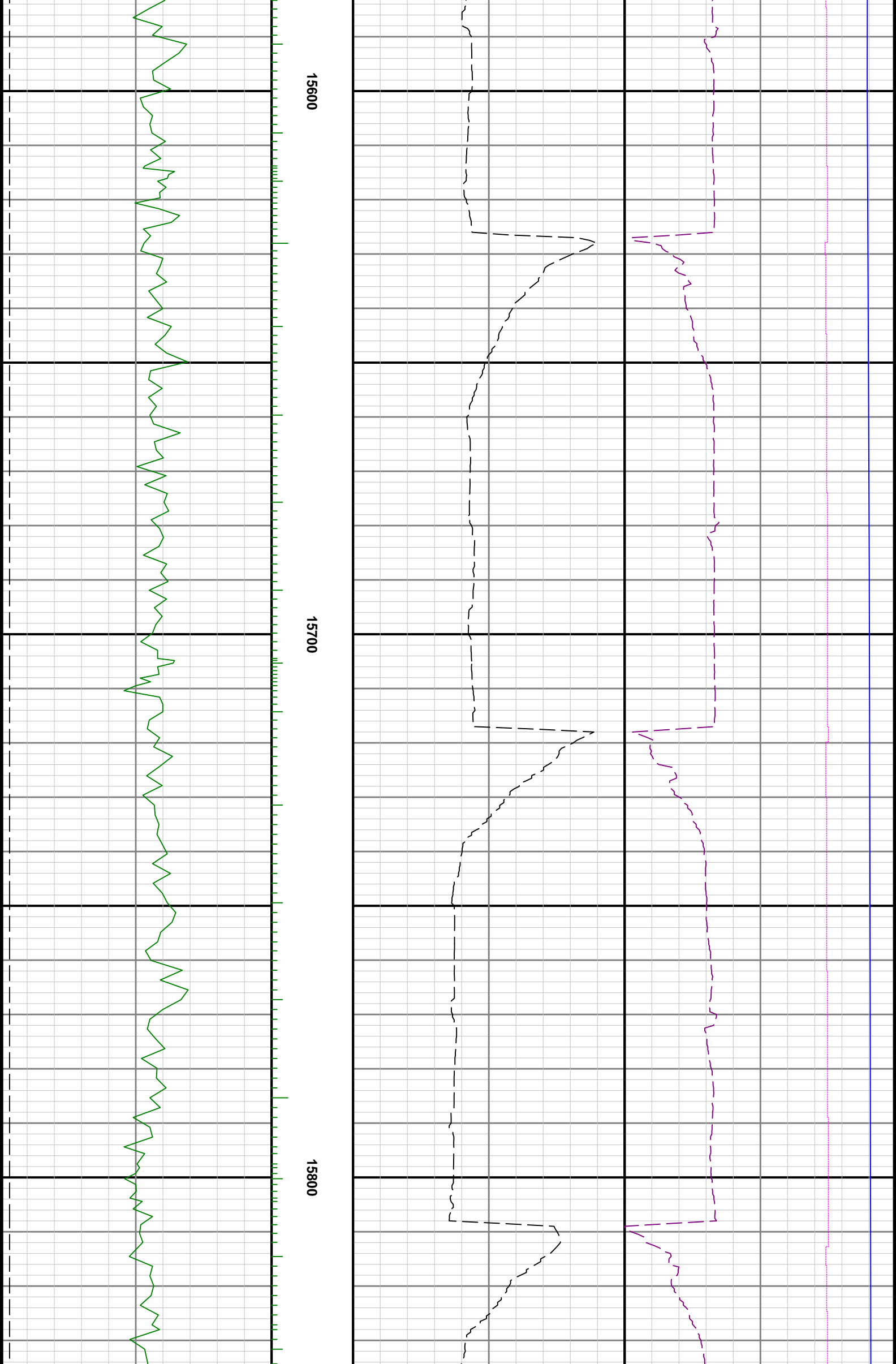


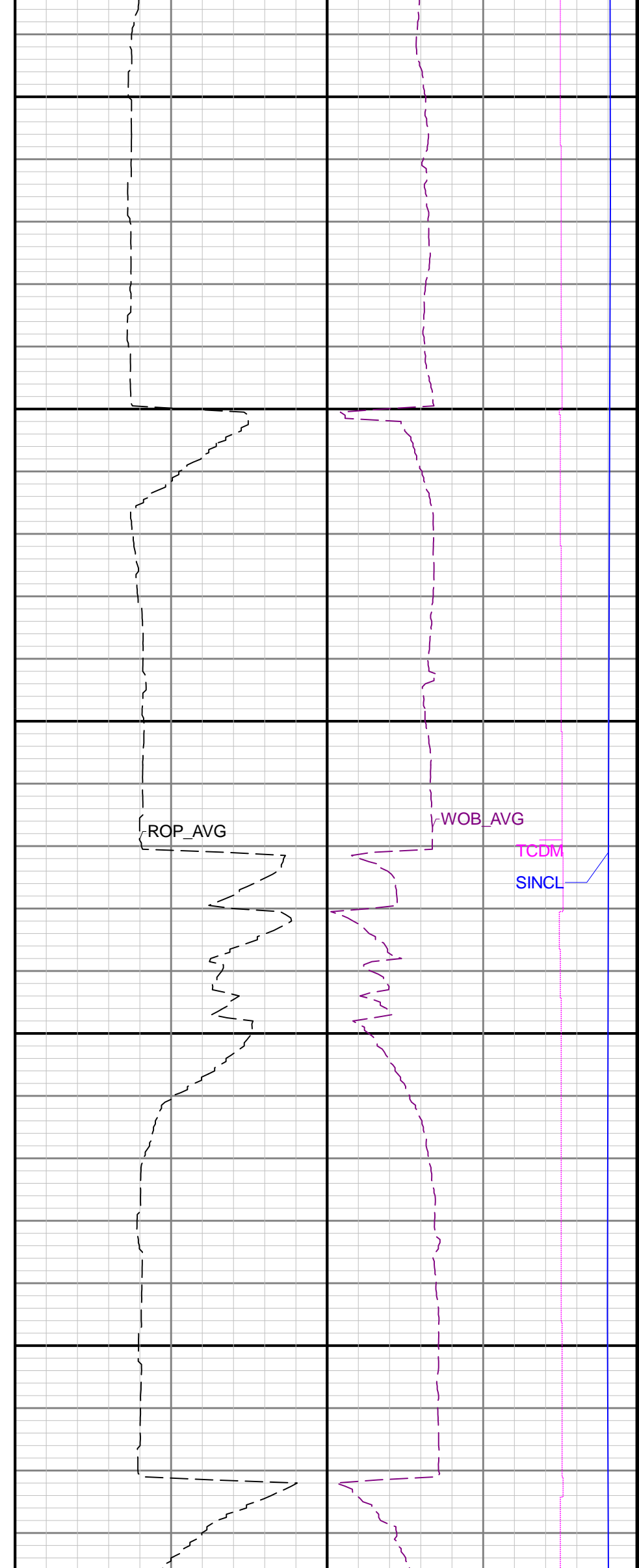
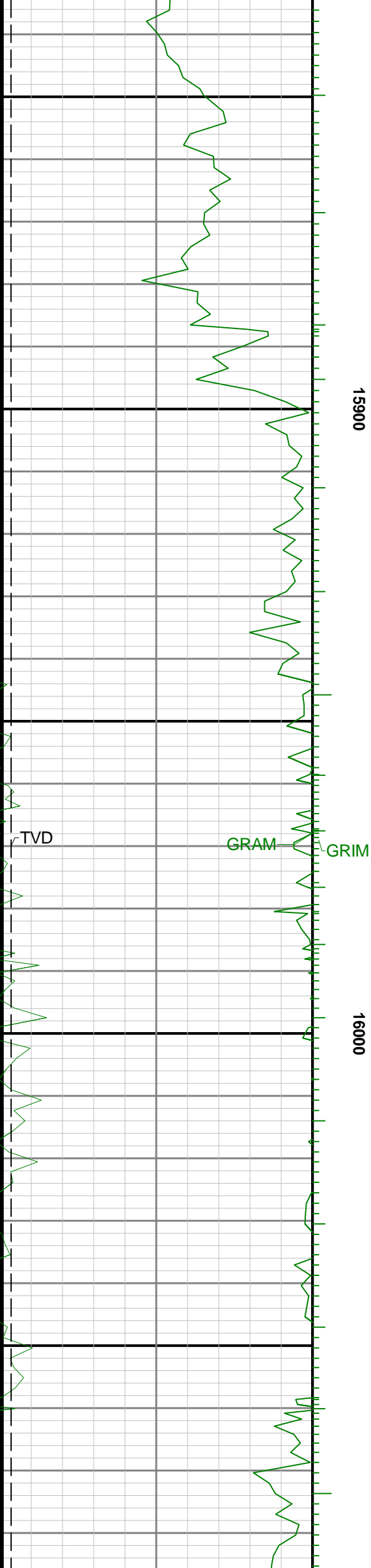


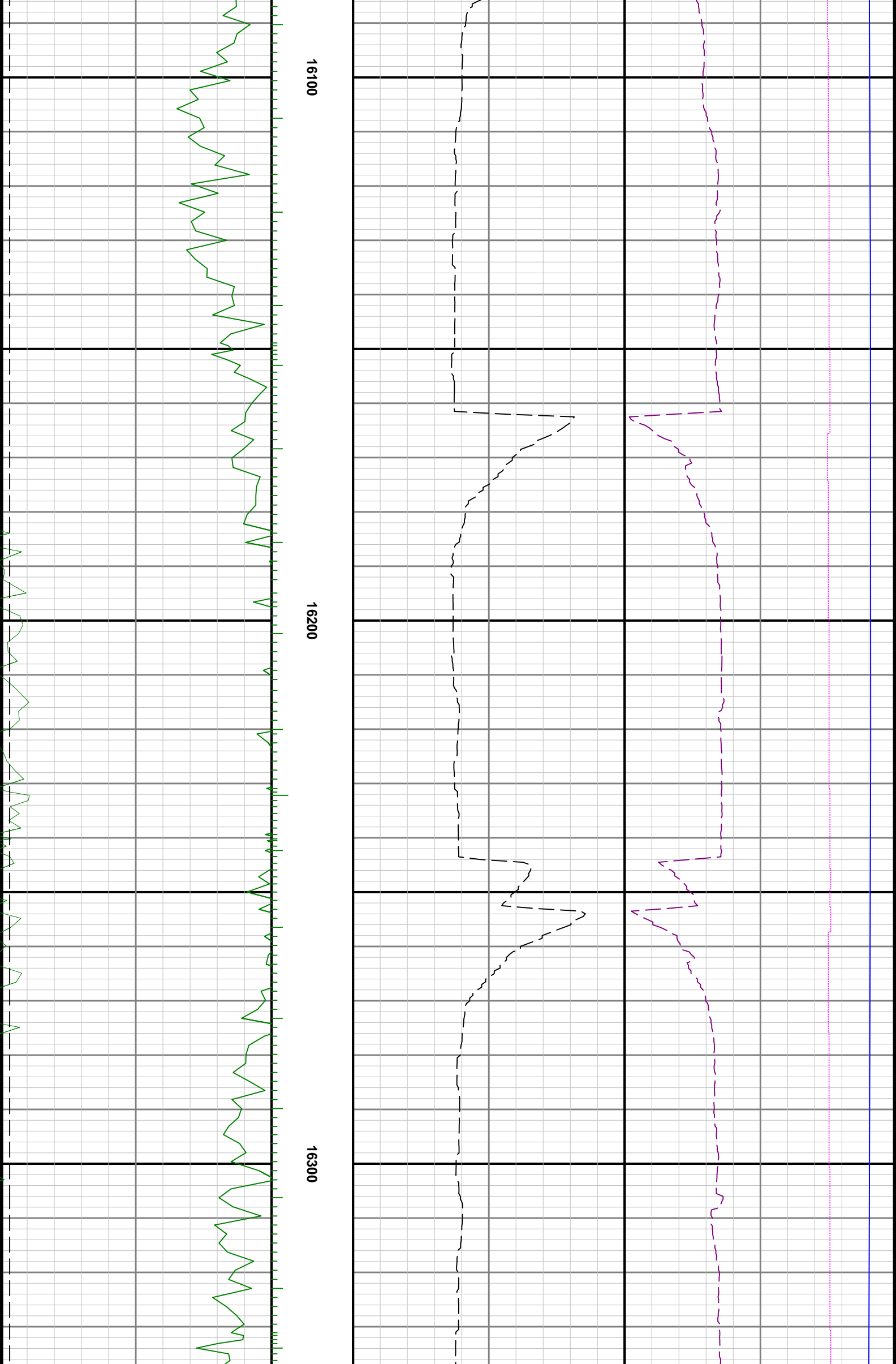


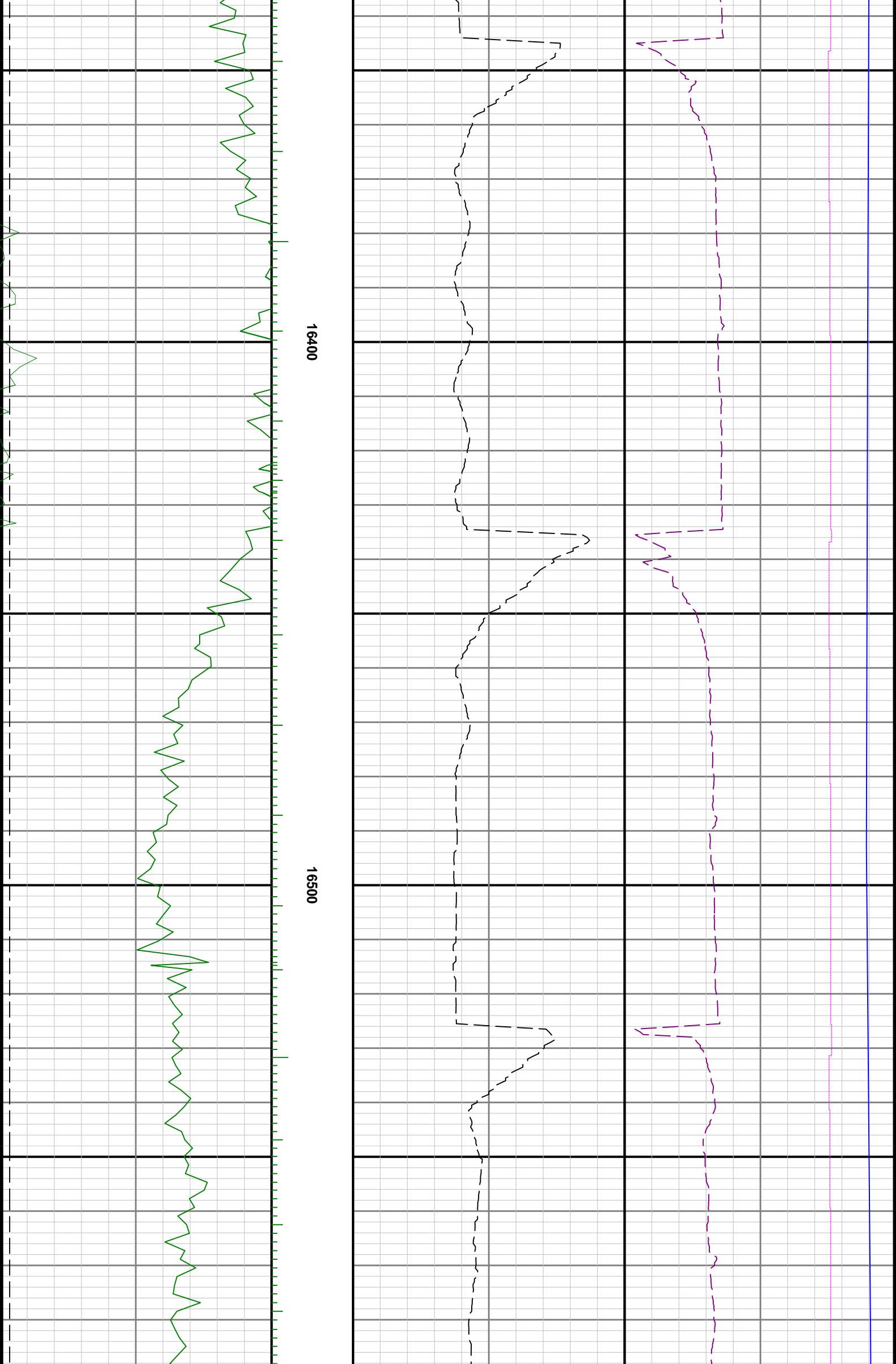


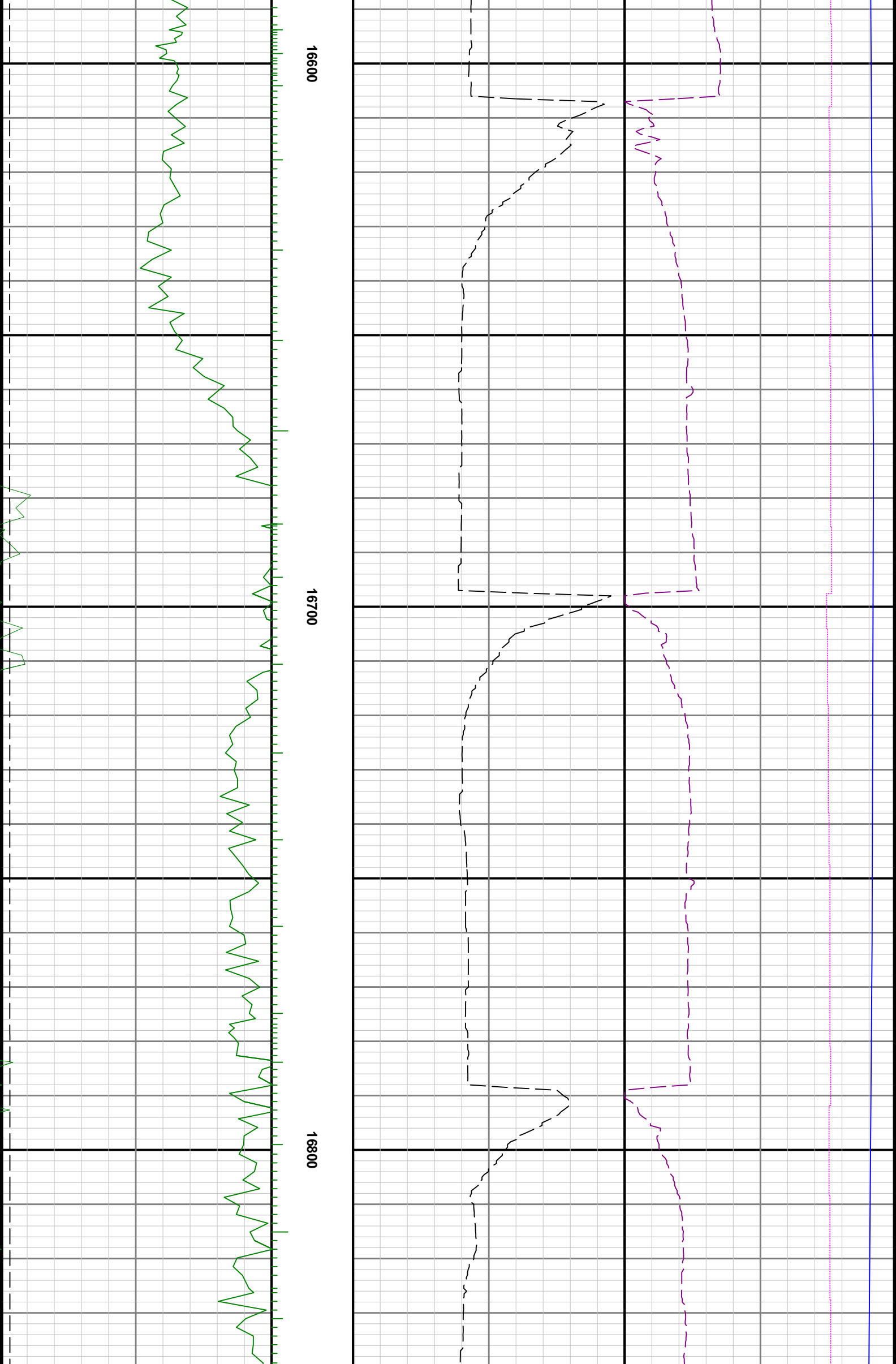


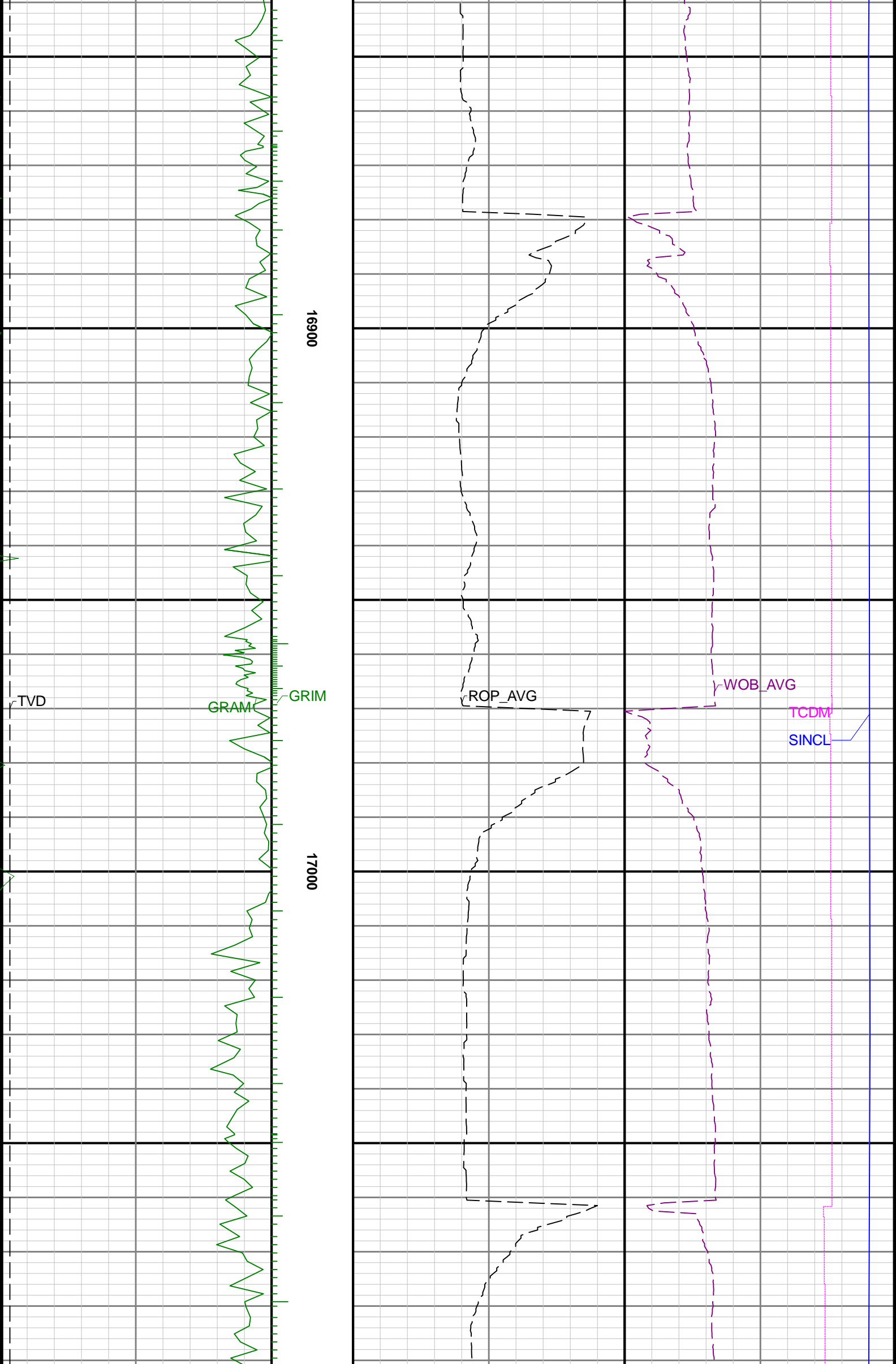


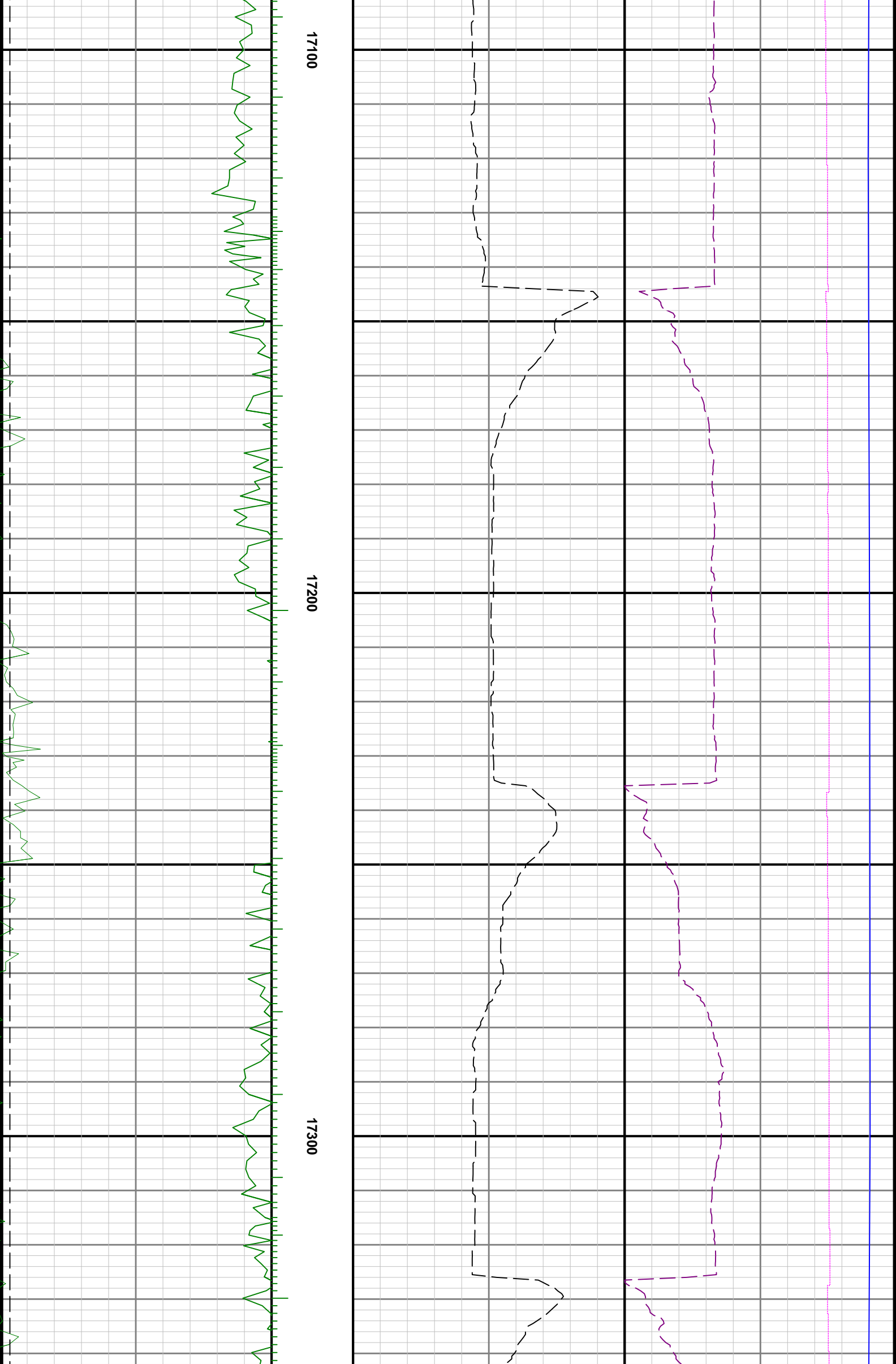


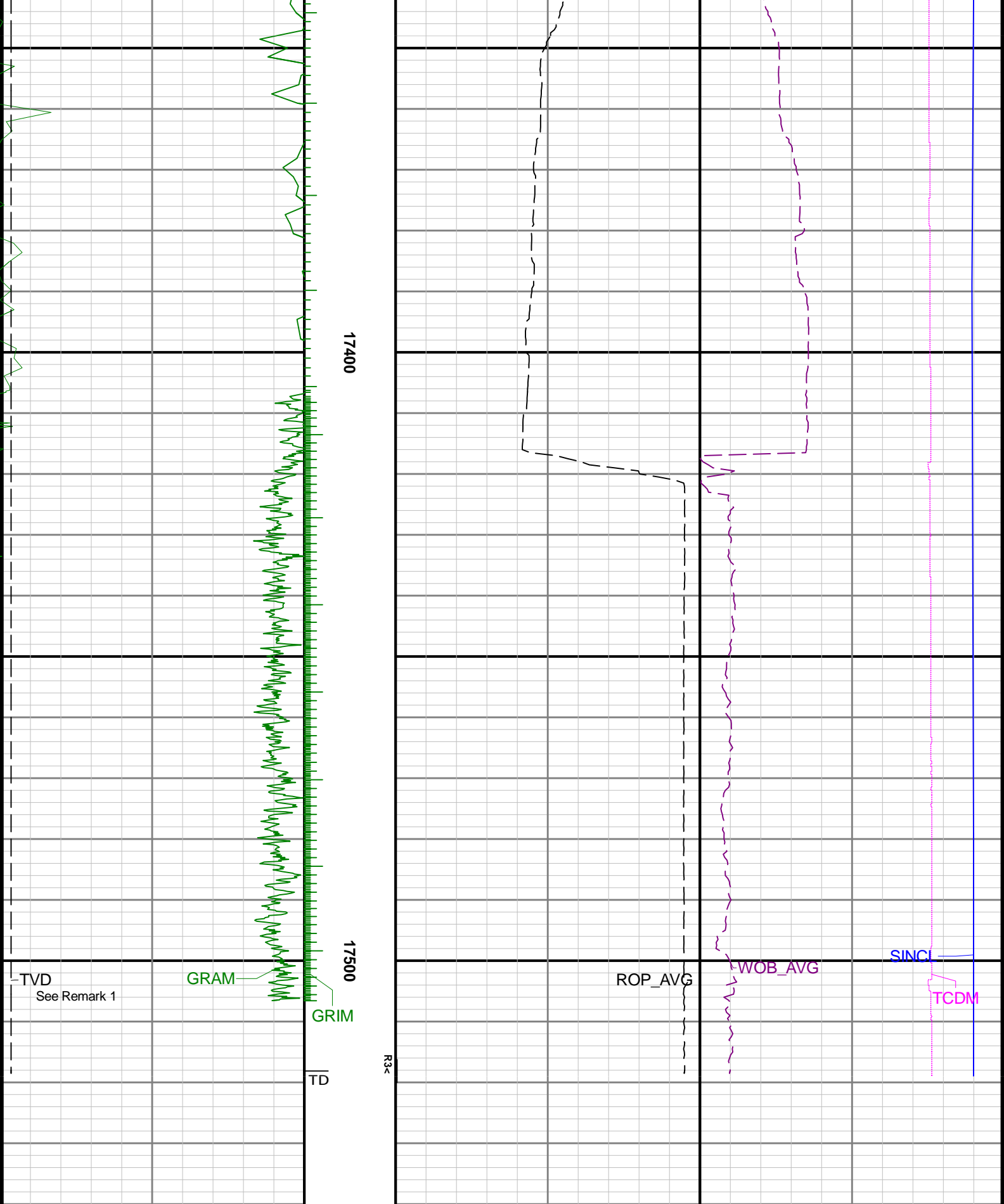












Gamma Ray - Apparent 0.5 ft Average GRAM	
0	150
API	
True Vertical Depth TVD	
7000	1500
ft	

MD 1:240 feet

Rate of Penetration 0.5 ft Average ROP_AVG	
1000	0
ft/h	

Weight on Bit 0.5 ft Average WOB_AVG	
0	100
klb	
Downhole Temperature TCDM	
50	350
degF	
Survey Inclination SINCL	
0	100
deg	