

## LWD MEMORY COMPOSITE LOG



## Gamma Ray

Scale:  <b>1:240</b> <b>Measured Depth</b>	<b>Company:</b> Noble Energy Inc
	<b>Well:</b> GIG-EM STATE Y9-751
	<b>Field:</b> Weld County
Depth Reference:  <b>Driller's Depth</b>	<b>County:</b> Weld <b>Country:</b> United States
	<b>State:</b> Colorado
Status:  <b>Final Print</b>	Surface Location: Latitude: 40° 08' 38.796" N Longitude: 104° 33' 02.268" W
API: 05123518360000	Other Services:  Directional
Job ID: 111683763	SEC: 16 TWN: 2N RGE: 64W

## Operational Summary

## Rig &amp; Elevations

Dates	Drilled (ft)	Logged (ft)	Rig Contractor: Patterson-UTI	Rig: Patterson 268	Elev. KB: (ft)	4971.00
From: 2023-03-03	Top: 109.00	Top: 0.00	Permanent Datum (P.D.): Mean Sea Level	Elevation: (ft) 4942.00	Elev. DF: (ft)	4971.00
To: 2023-03-10	Bottom: 17608.00	Bottom: 17595.00	Log Measured From: Rig Floor	Above P.D.: (ft) 4971.00	Elev. GL: (ft)	4942.00

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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	PDC	4.00	Rotary	0.00	0.00	109.00	2064.00	2023-03-03 09:00	2023-03-03 18:40	0.00
2	2	8.500	PDC	2.50	AutoTrak Curve	2052.00	17595.00	2064.00	17608.00	2023-03-07 11:40	2023-03-10 08:17	55.95

## Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Jacob Johnson	2023-03-02	2023-03-09	Mark Cordova	2023-03-02	2023-03-10	Jason Wiley	2023-03-05	2023-03-09
Adam Schlenz	2023-03-07	2023-03-10	Jeremiah Samson	2023-03-07	2023-03-10	Abdullah Alkhoja	2023-03-09	2023-03-10
Kachi Okogbue	2023-03-09	2023-03-10						

## Witness

Name	Run
Abdullah Alkhoja	2
Kachi Okogbue	2

## 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+ (%)
2023-03-03 14:30	1	1314.00	Water Based Mud	8.8	2	N/A	N/A	0/100	Active Pit	497	N/A
2023-03-07 05:00	2	2064.00	Water Based Mud	9.8	16	N/A	N/A	69.2/17.6	Active Pit	25753	N/A
2023-03-08 07:14	2	6936.00	Oil Based Mud	9.7	13	N/A	N/A	80/20	Active Pit	28475	N/A
2023-03-09 05:00	2	15181.00	Oil Based Mud	10.0	16	N/A	N/A	81/19	Active Pit	26239	N/A
2023-03-10 03:29	2	17574.00	Oil Based Mud	10.6	15	N/A	N/A	81/19	Active Pit	23324	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	15069834G8000133	Gamma (single)	9.40	21.32	8.000	3.250
1	EvoOne	15069834G8000133	Directional (mag)	10.40	22.32	8.000	3.250
2	AutoTrak Curve Steering Unit	15965003	Near Bit Inclination	5.93	6.78	7.000	4.330
2	AutoTrak Curve Steering Unit	15965003	Near Bit VSS	5.93	6.78	7.000	4.330
2	AutoTrak Curve MWD	15855682	Gamma (single)	2.20	13.16	7.000	3.250
2	AutoTrak Curve MWD	15855682	Directional (mag)	12.27	23.23	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**


- Baker Hughes Company runs 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 1/2 inch PDC bit and rotary steerable assembly from 2064 to 17608 feet MD (2064 to 6983 feet TVD).
- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to a lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.

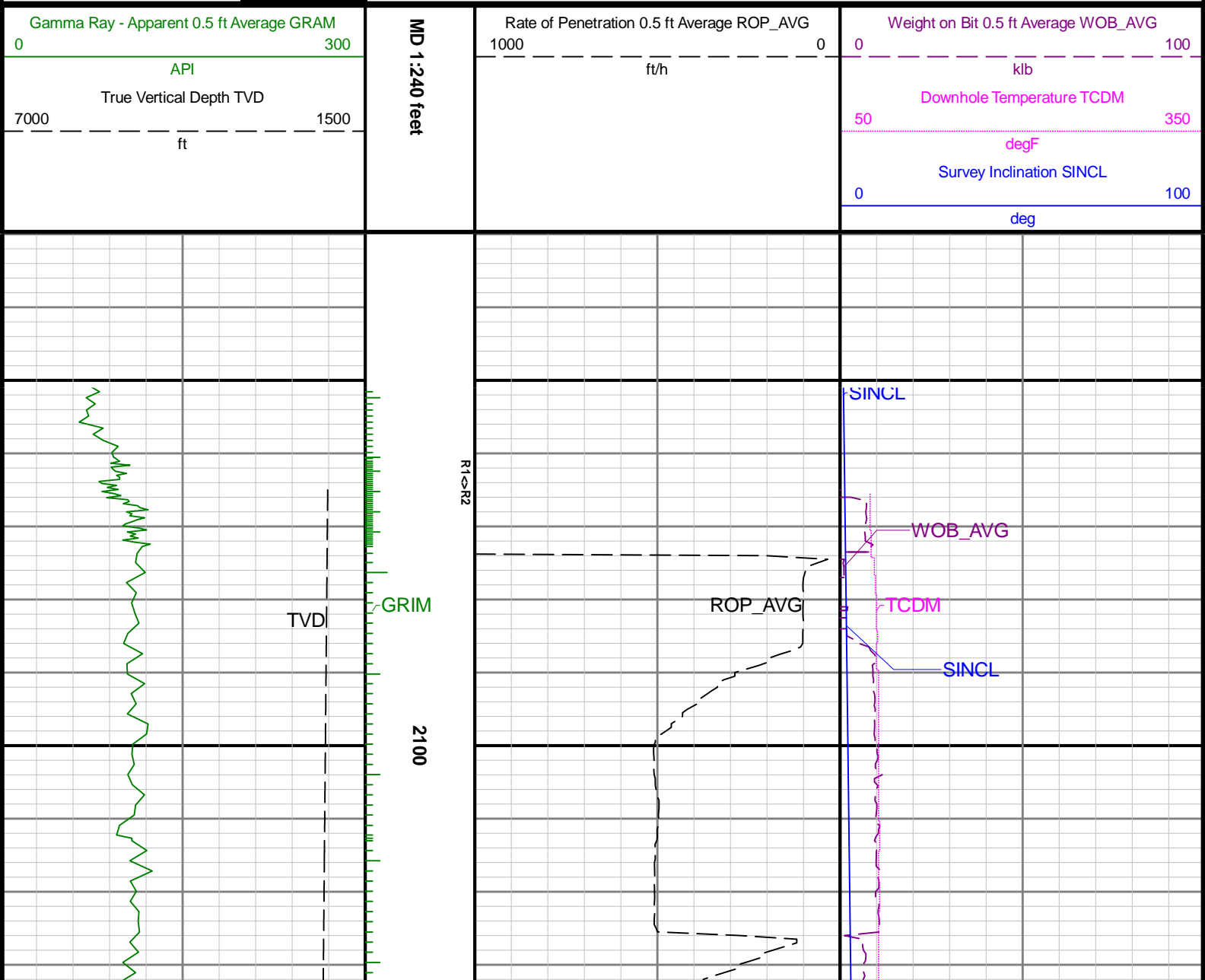
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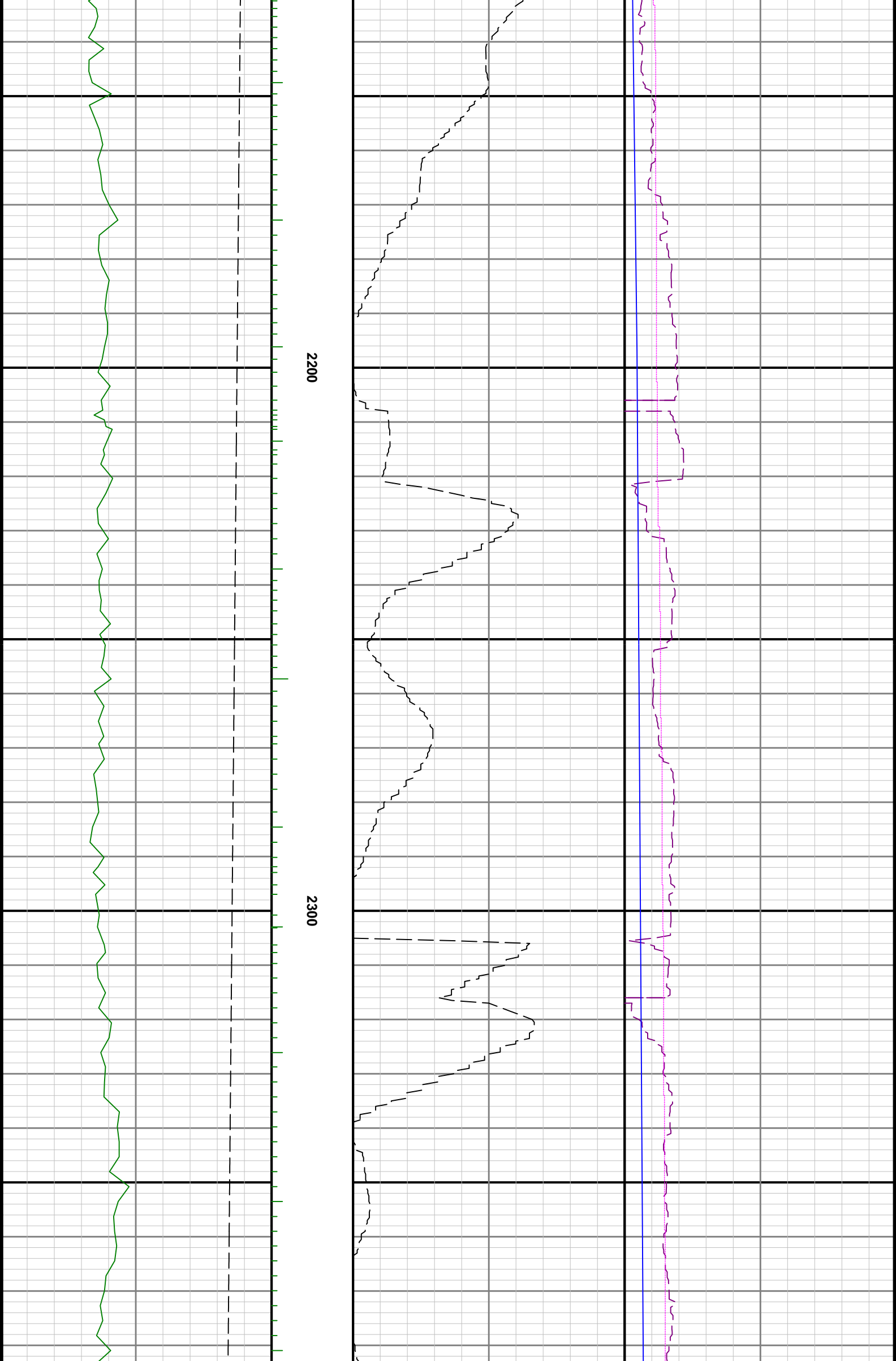
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	17595.00	8.500	2	The interval from 17595 to 17608 feet MD (6983 to 6983 feet TVD) was not logged due to sensor to bit offset at well TD.

**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

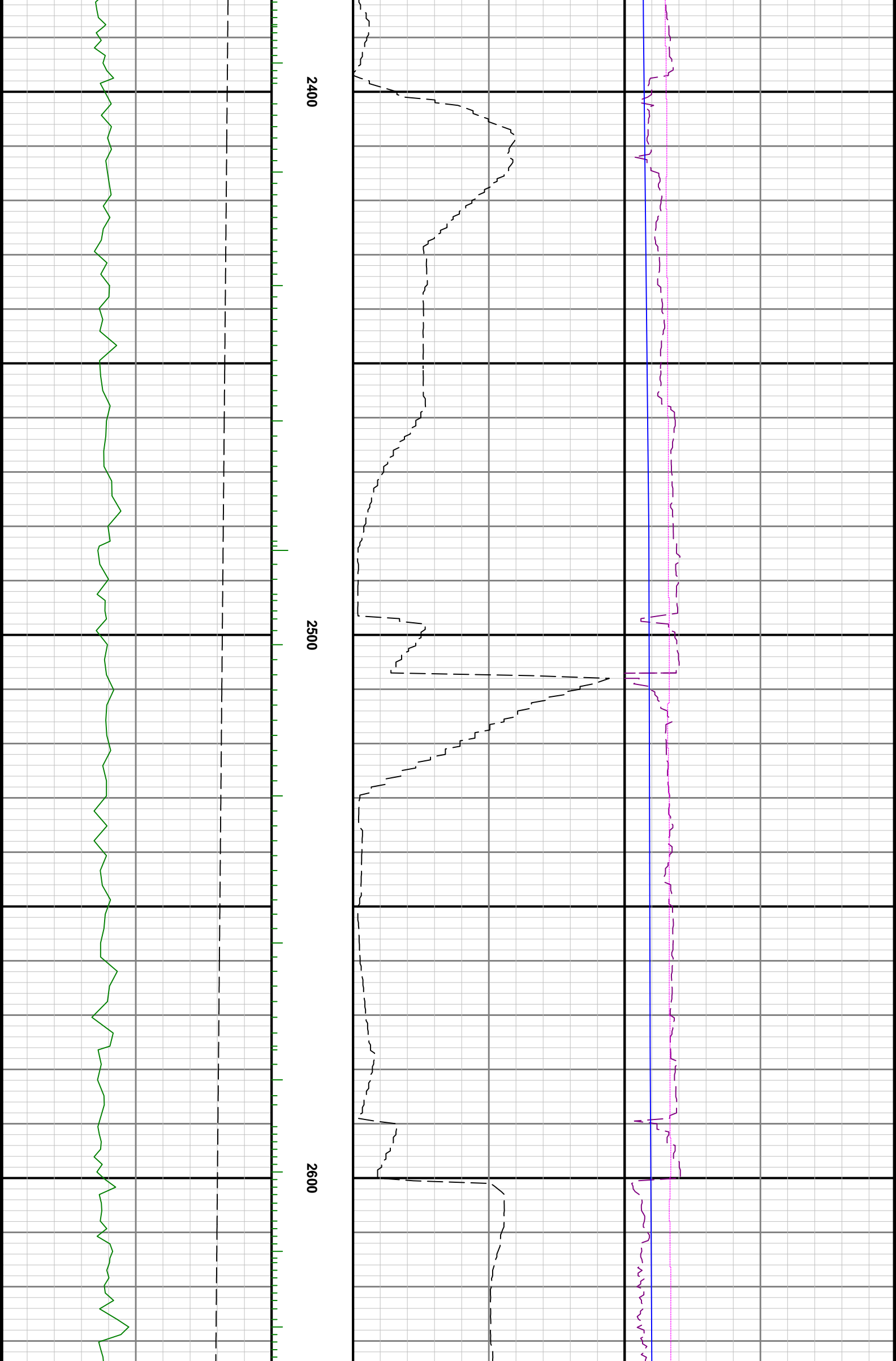
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	<b>Well</b>	GIG-EM STATE Y9-751		
	<b>Interval</b>	<b>Date From:</b> 2023-03-03 09:00	<b>Interval Drilled: (ft)</b>	109.00 - 17608.00
	<b>Created</b>	<b>Date To:</b> 2023-03-10 08:17	<b>Interval Logged: (ft)</b>	0.00 - 17595.00

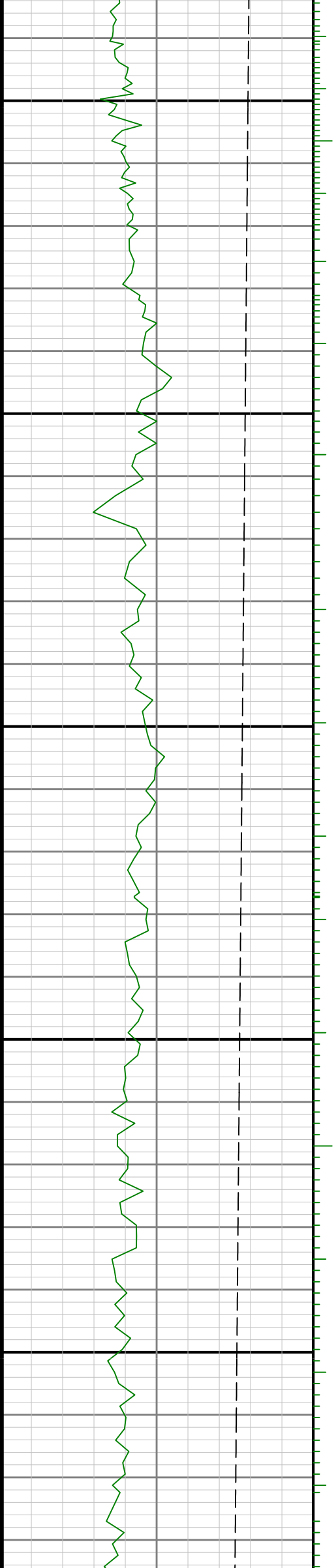




2200

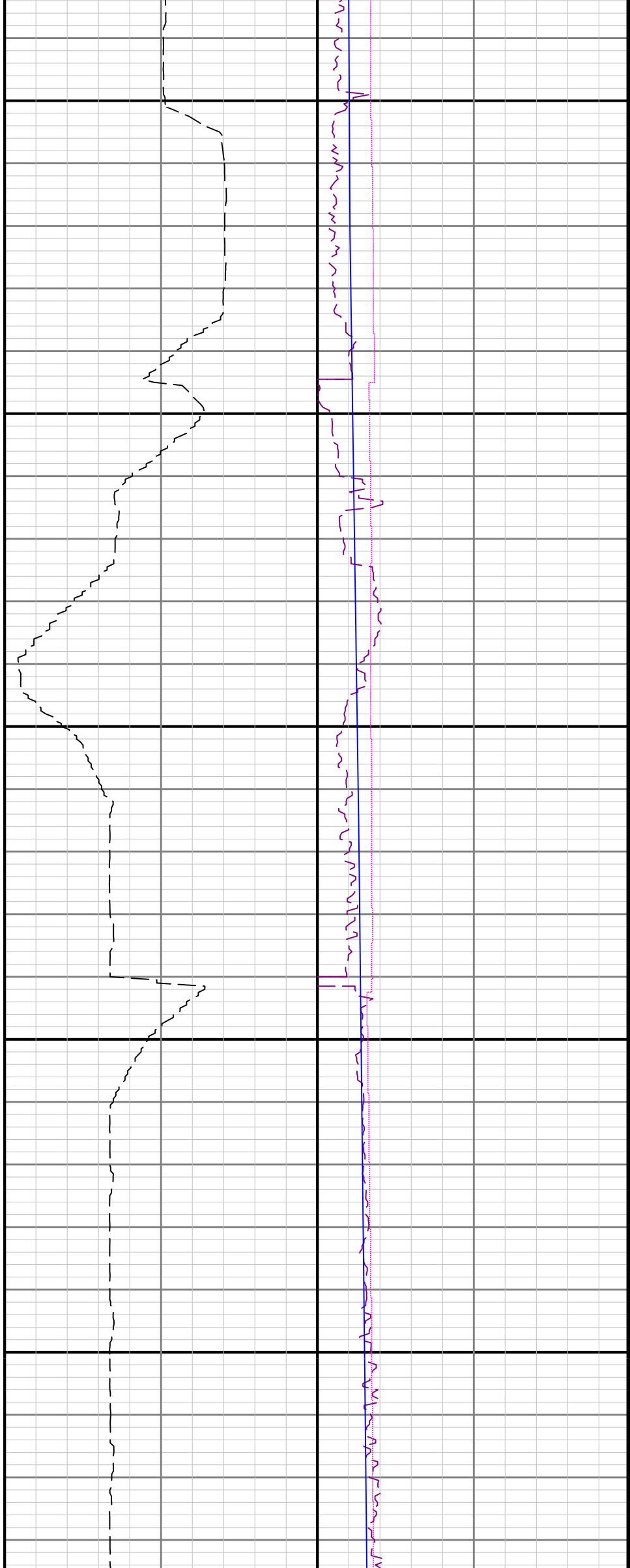
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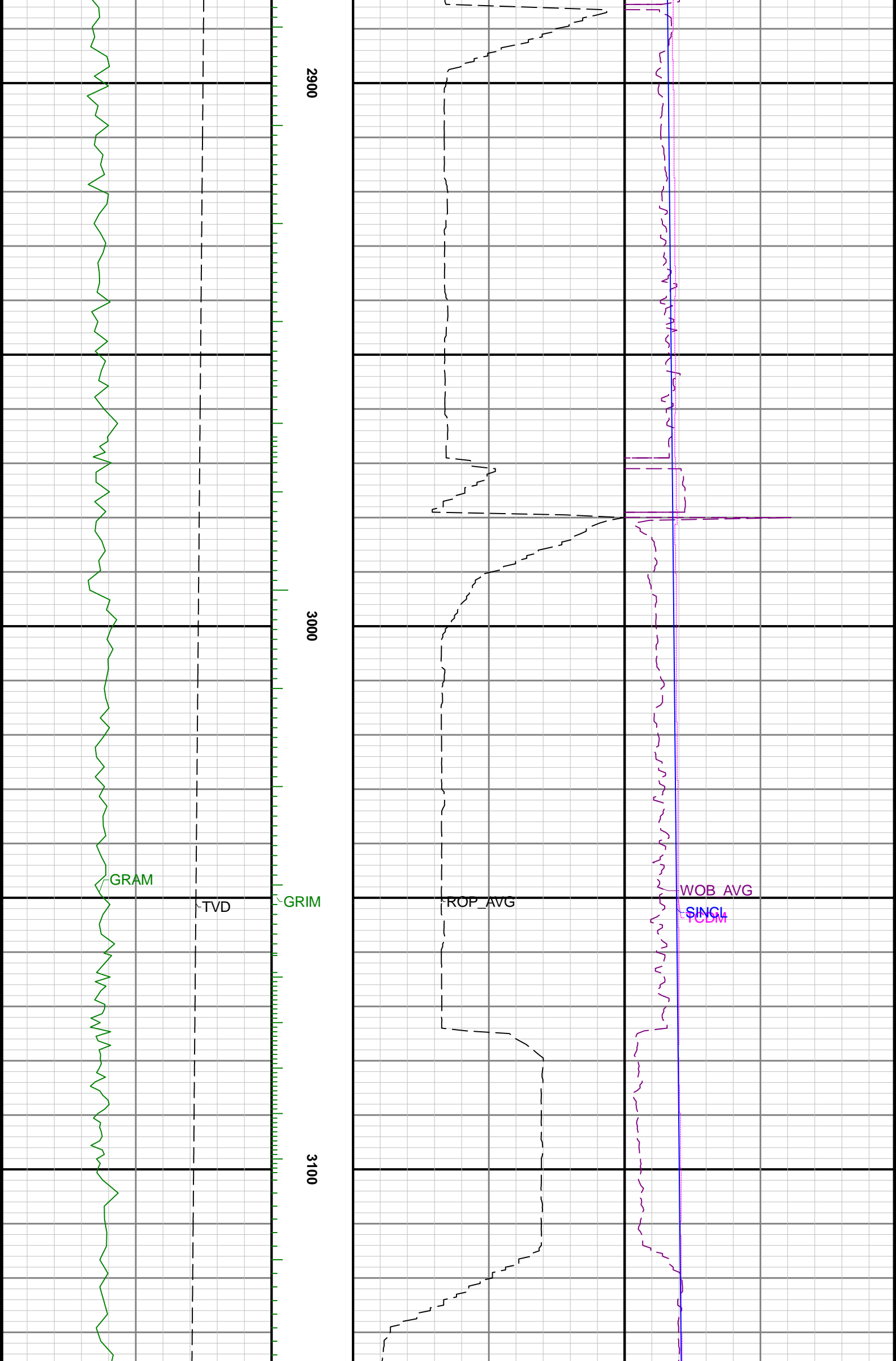




2700

2800





2900

3000

3100

GRAM

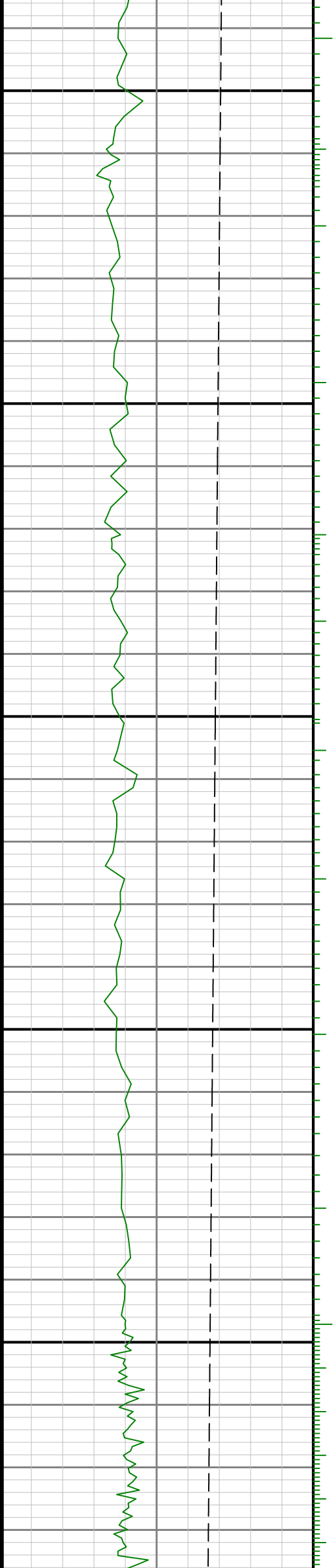
TVD

GRIM

ROP\_AVG

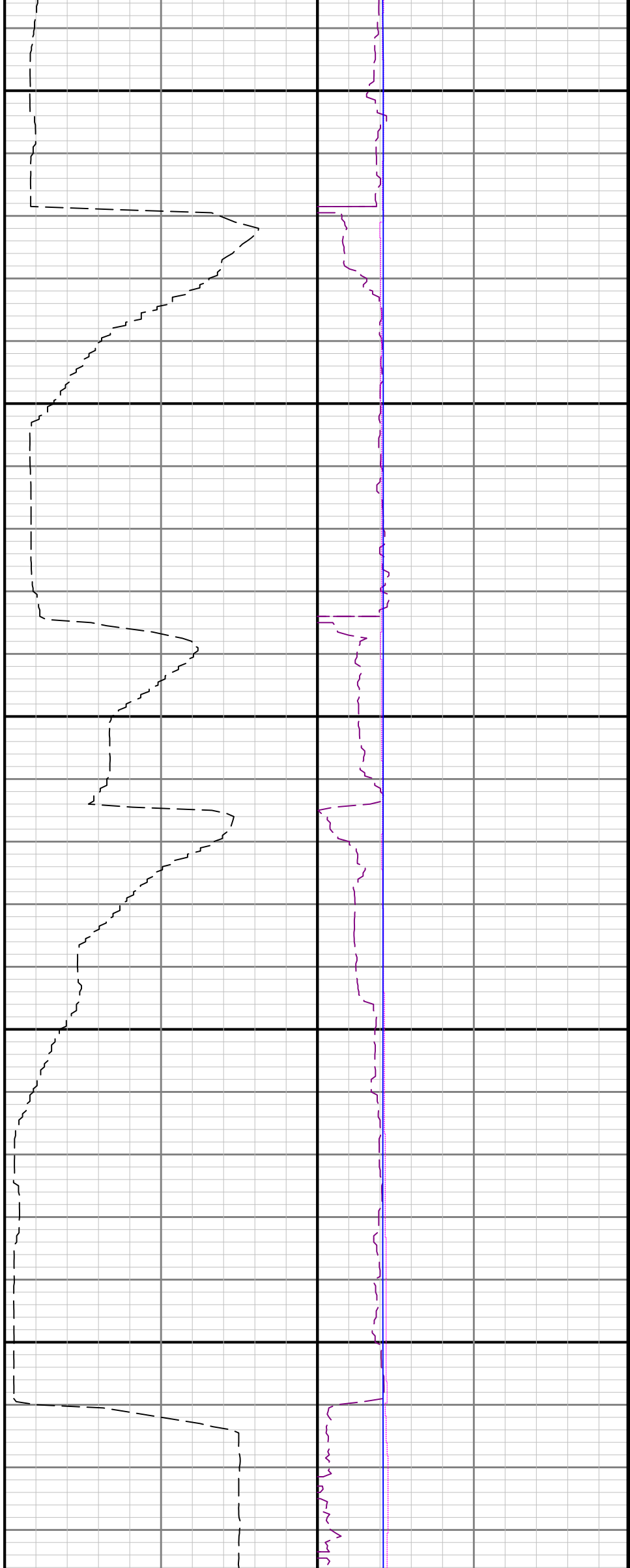
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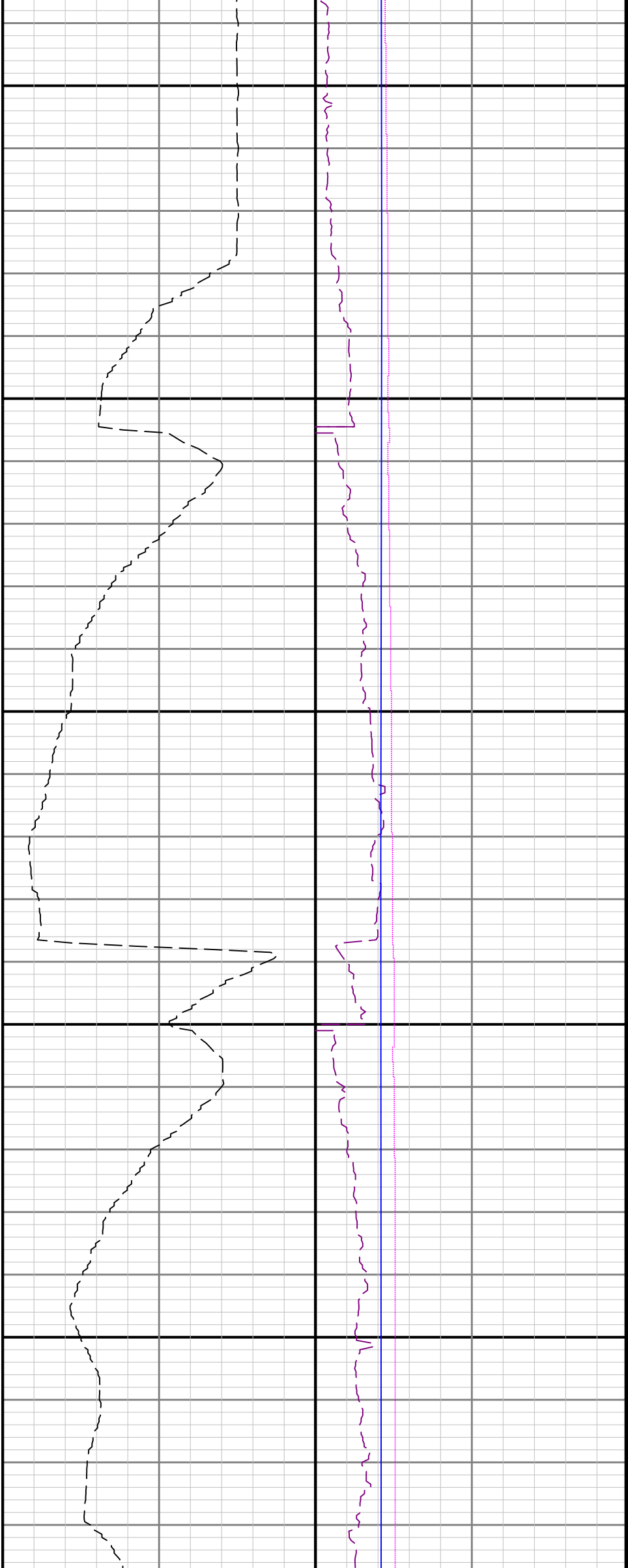
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3200

3300

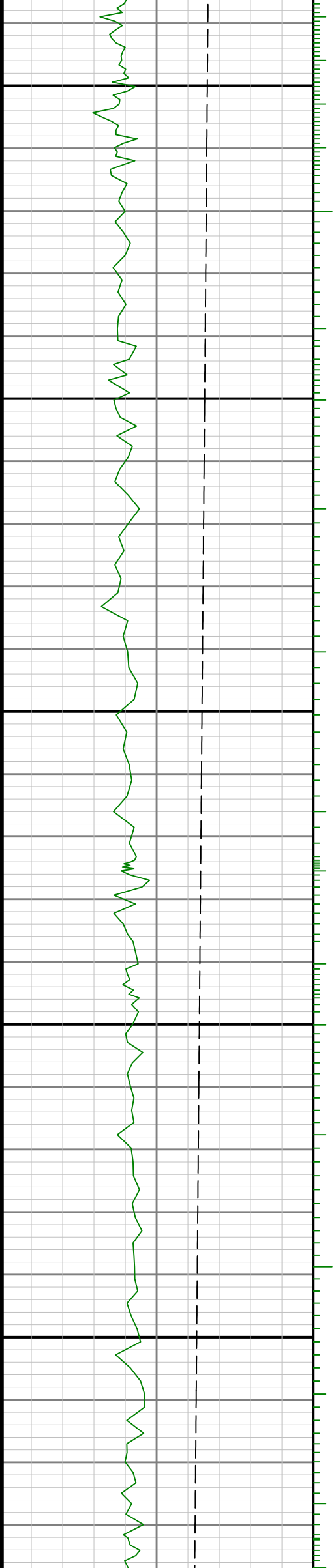


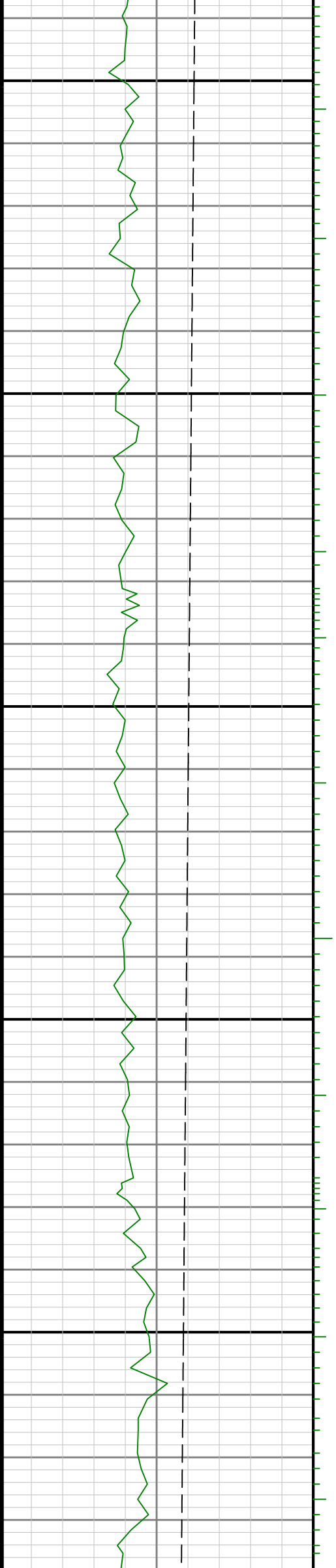


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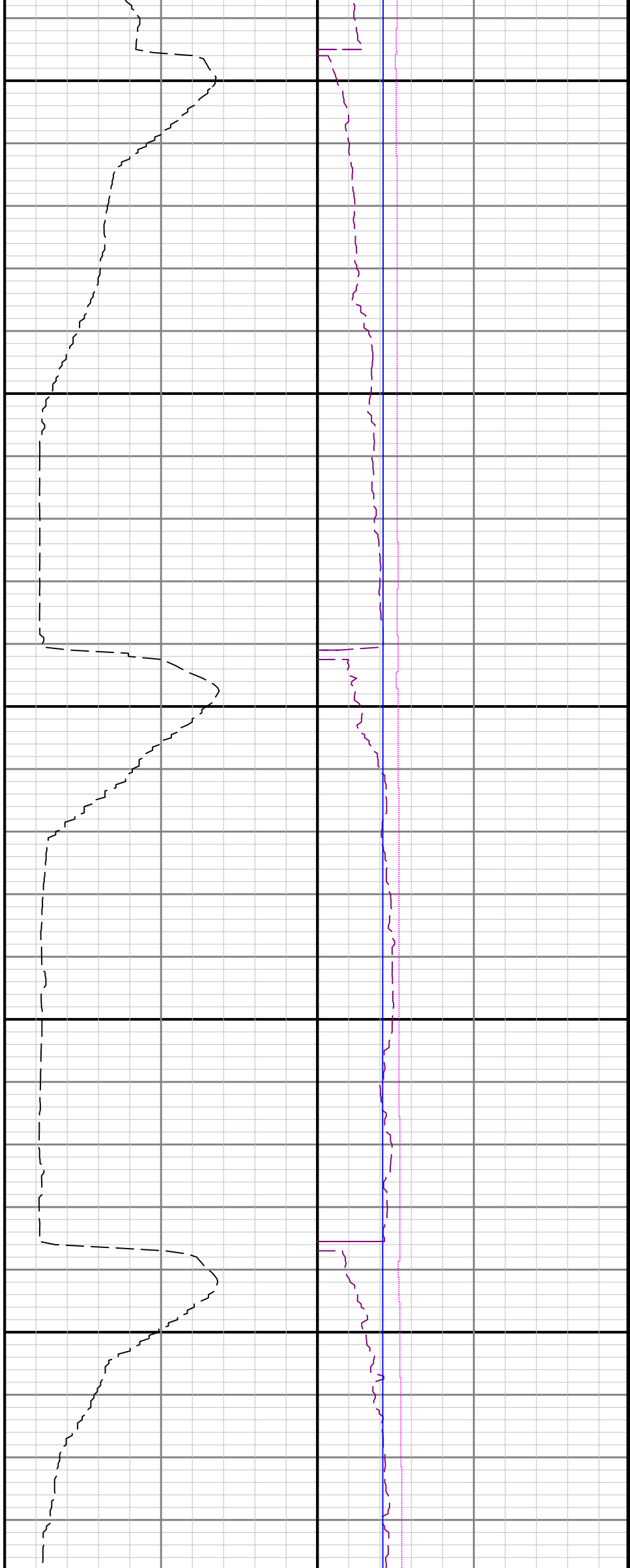
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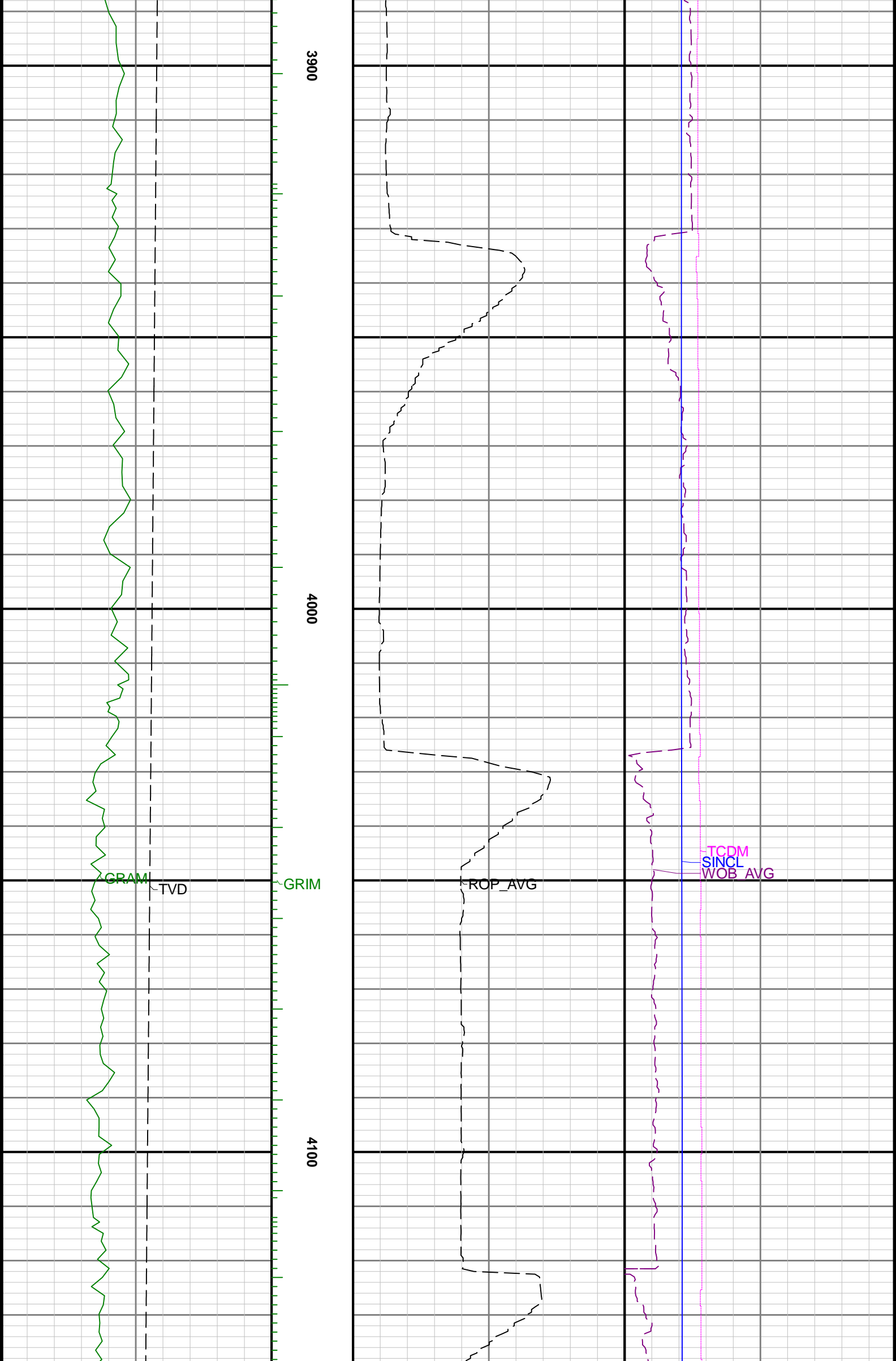




3700

3800





3900

4000

4100

GRAM

TVD

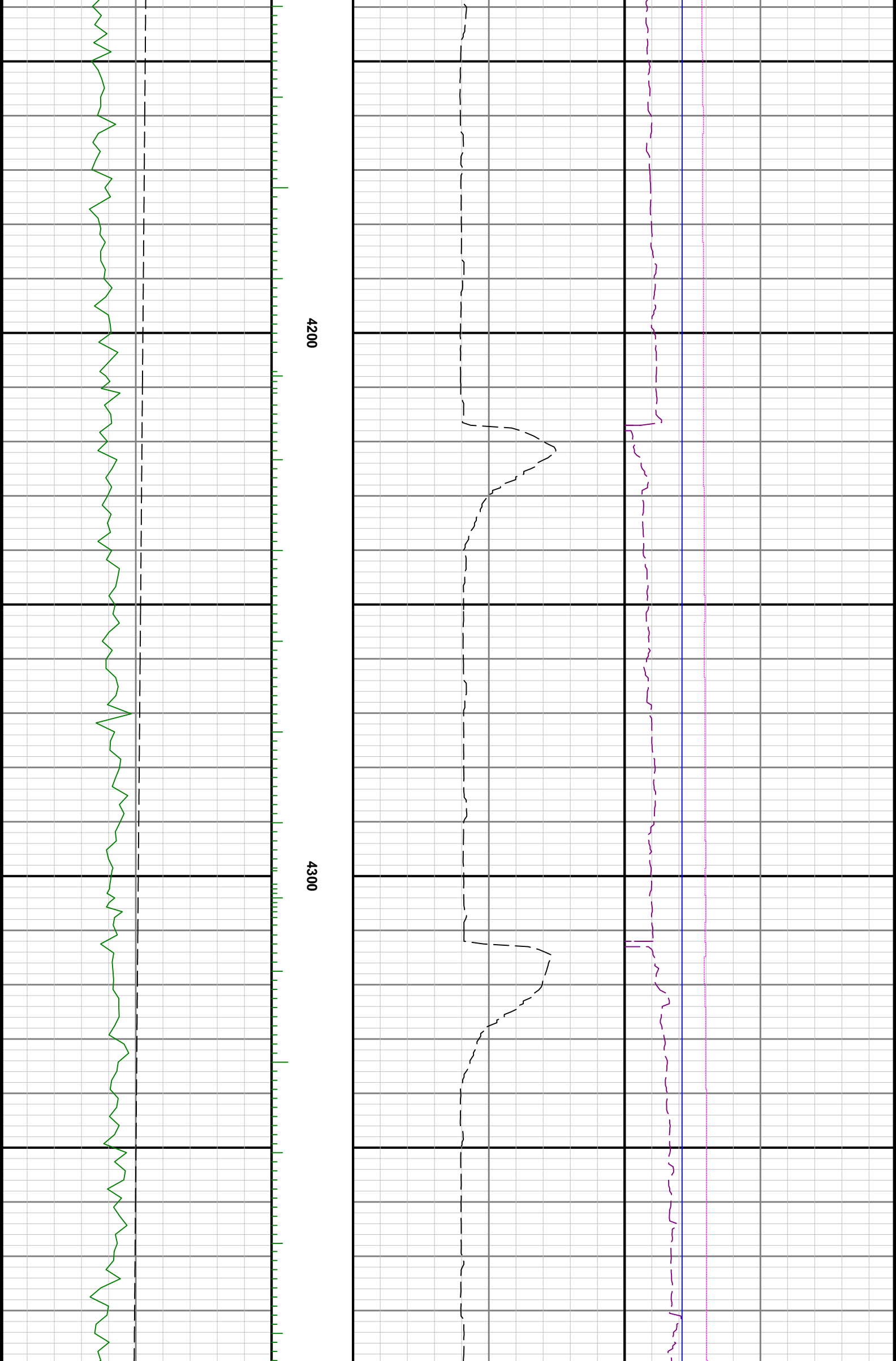
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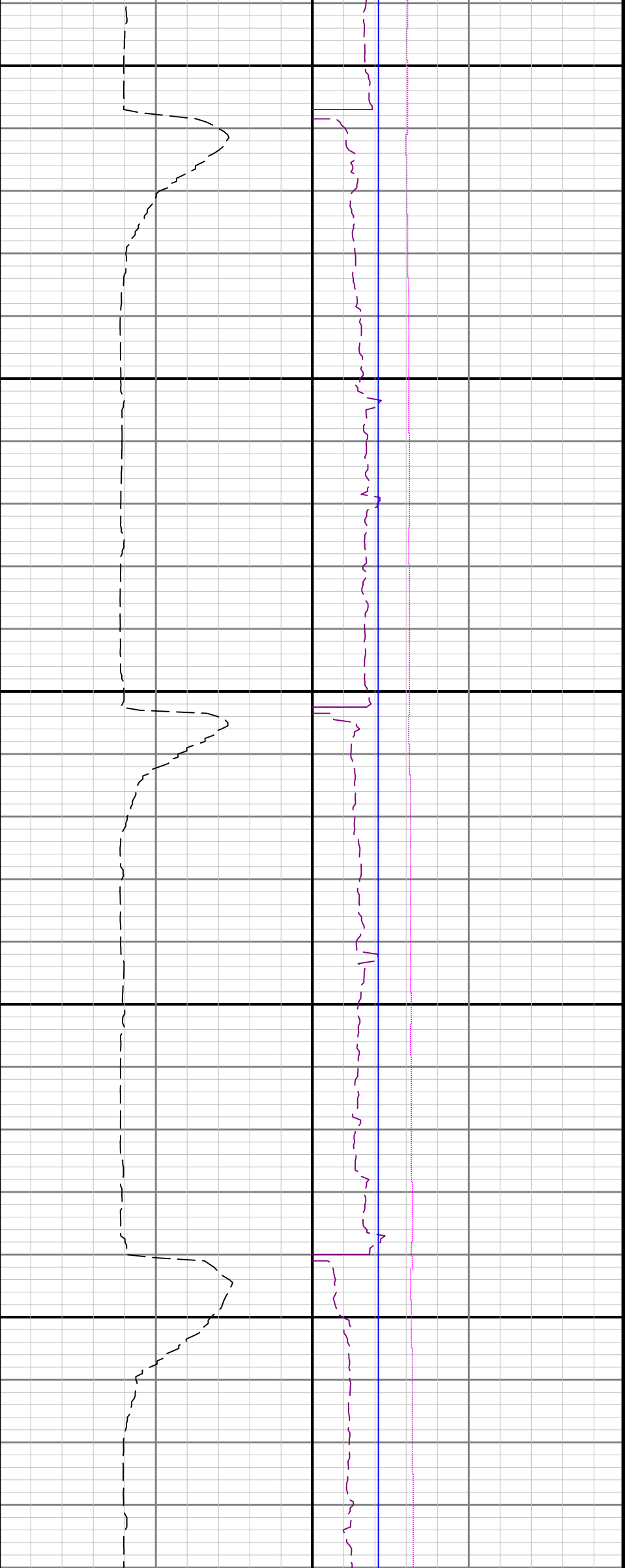
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TCDM

SINCL

WOB\_AVG

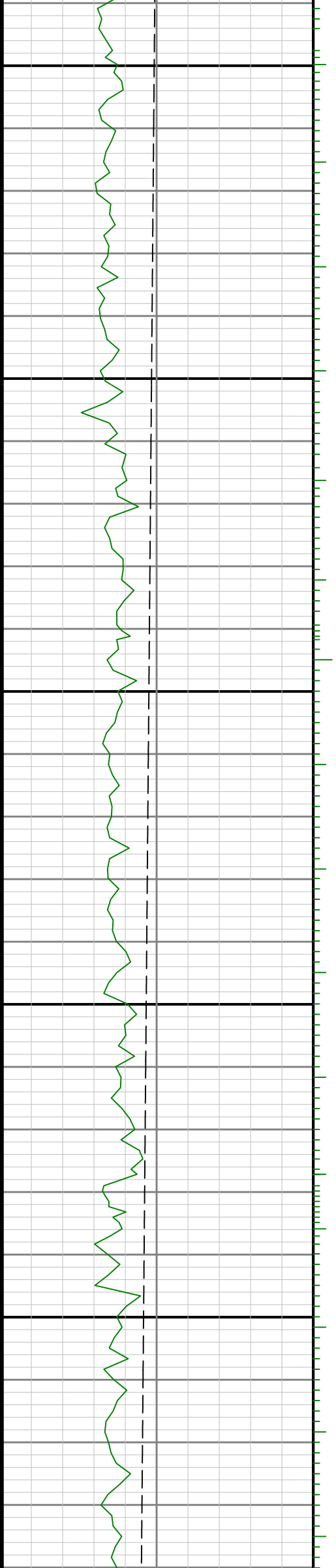


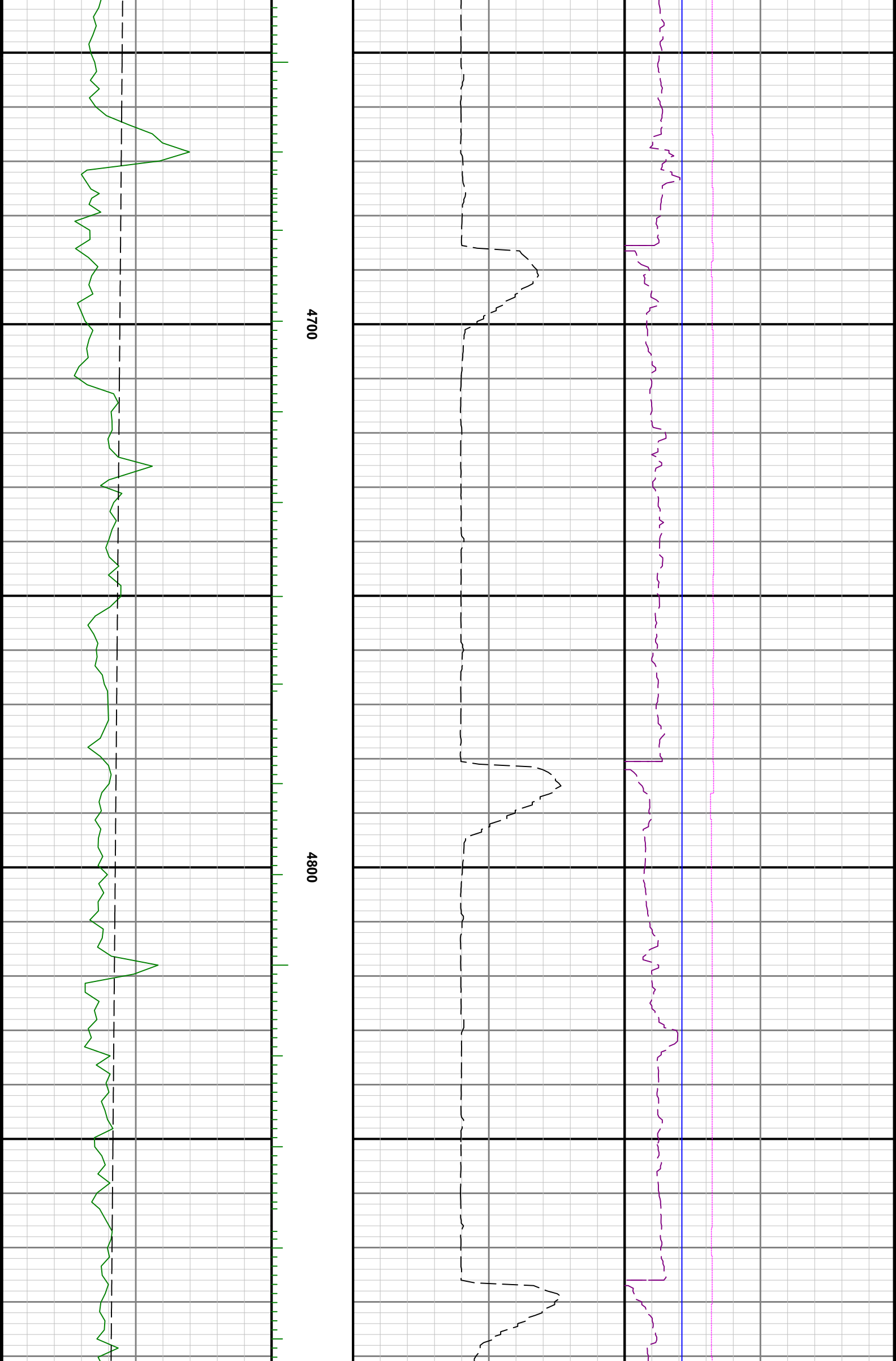


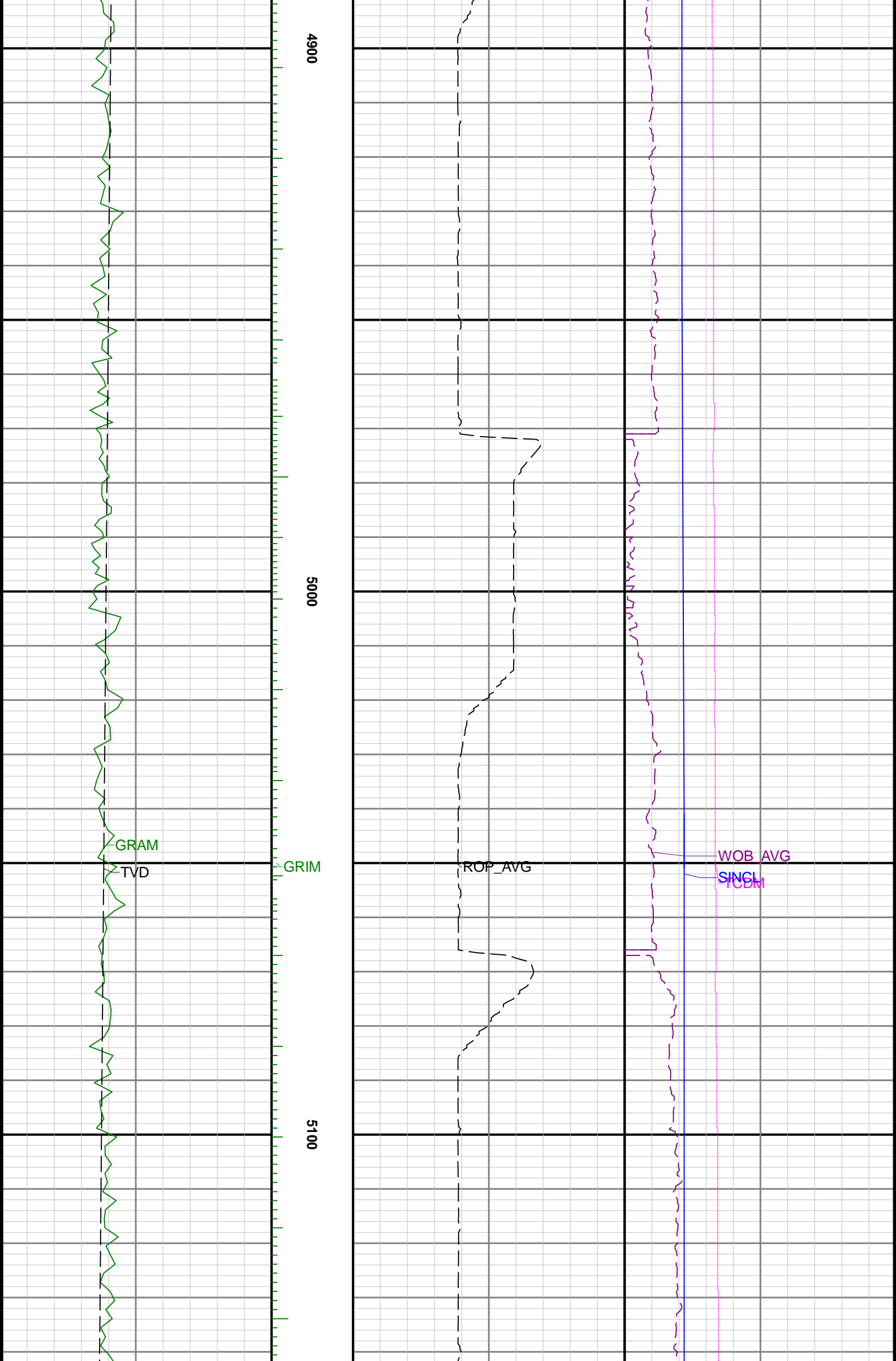
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4500

4600







4900

5000

5100

GRAM

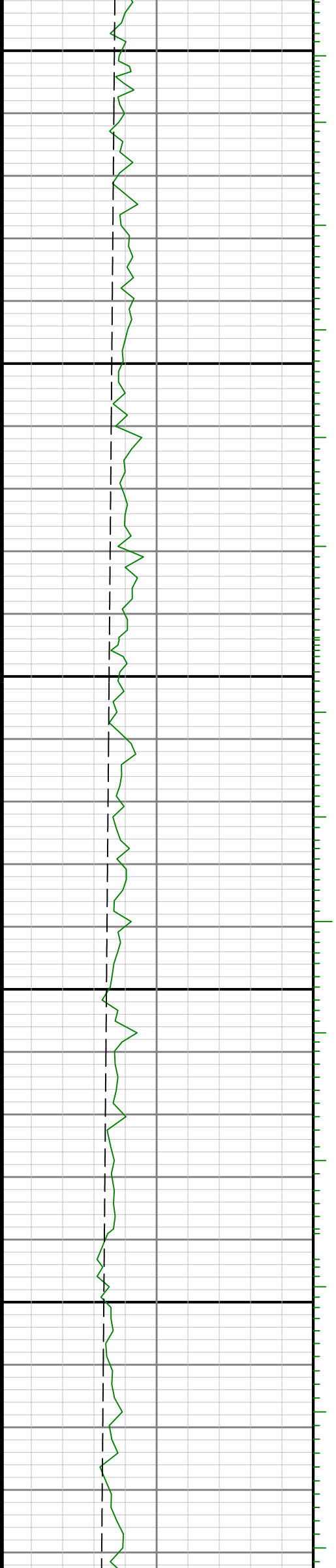
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GRIM

ROP\_AVG

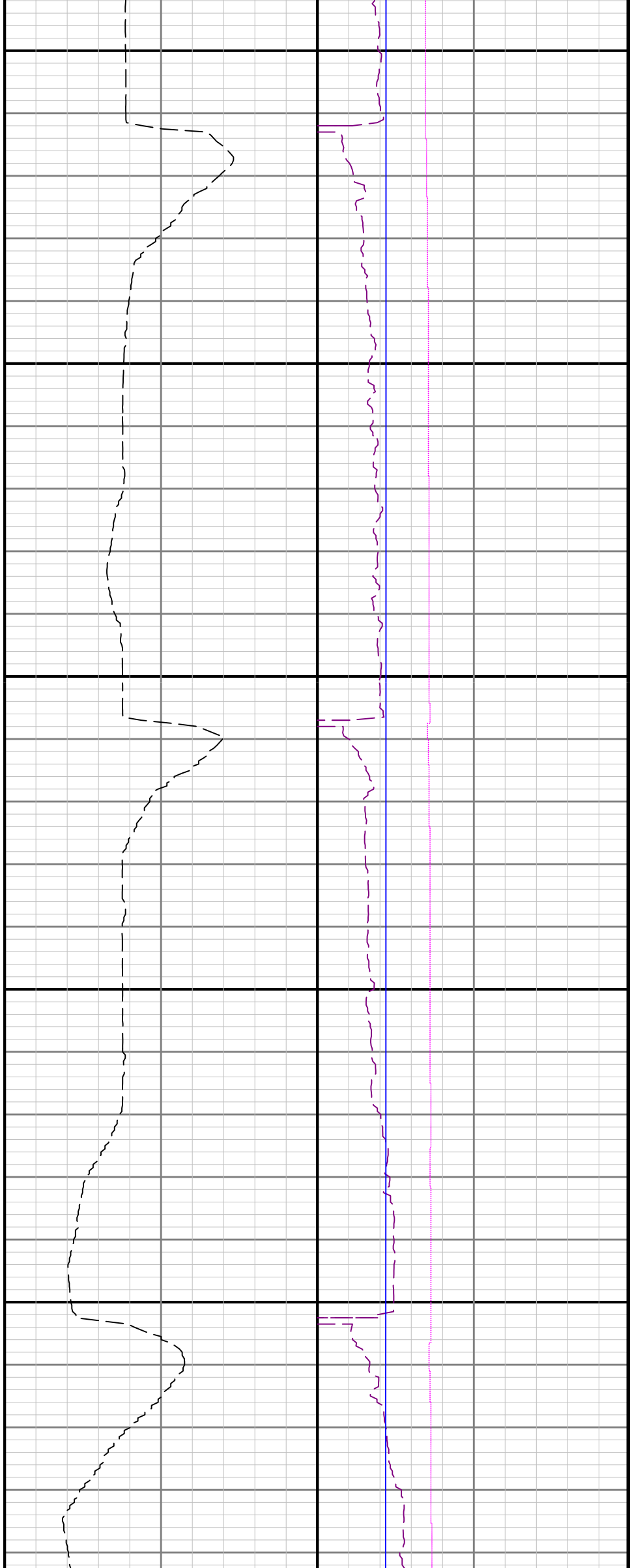
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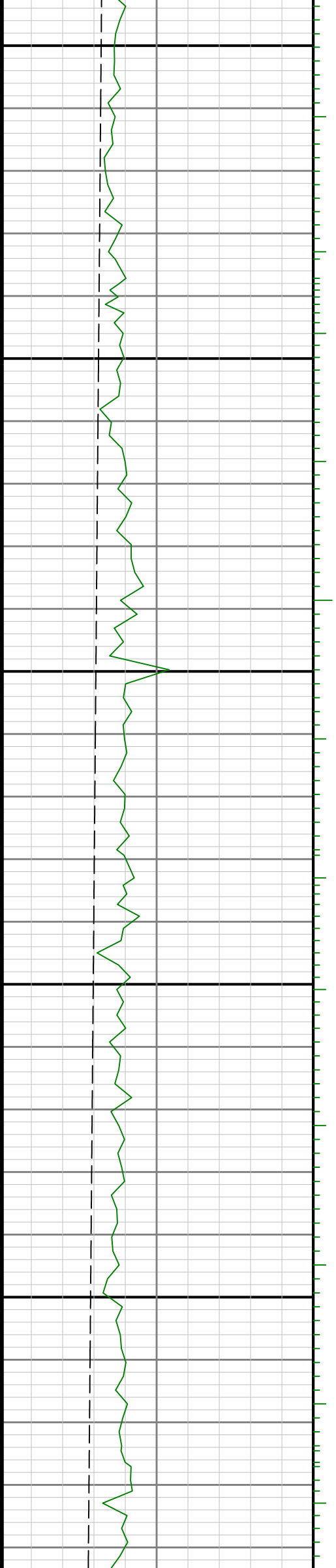
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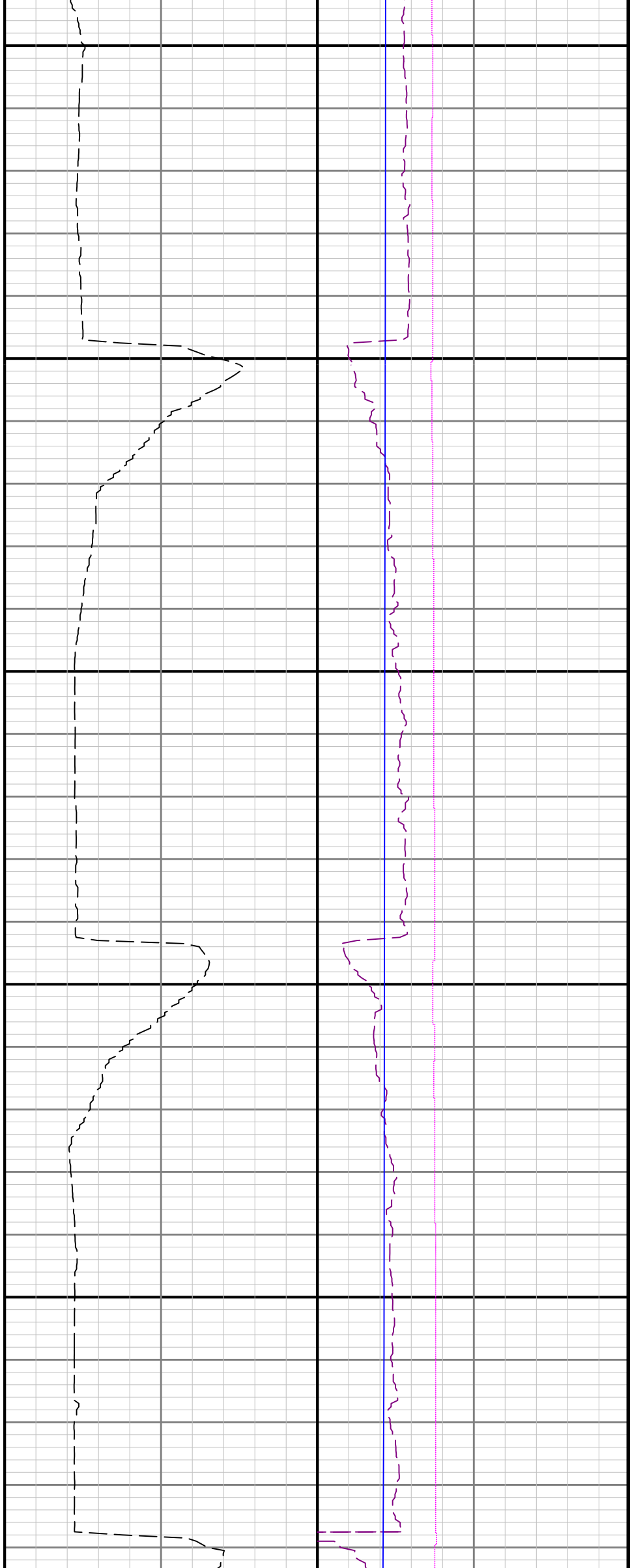


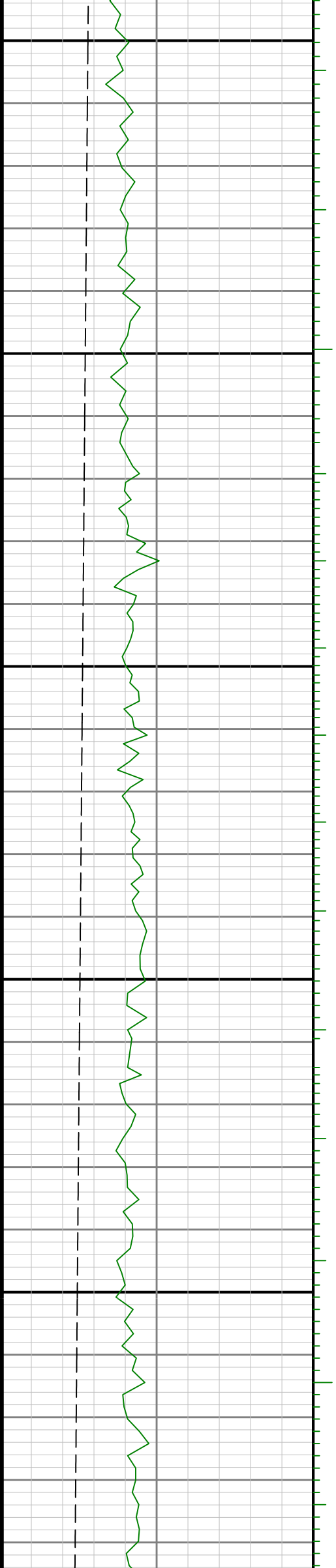


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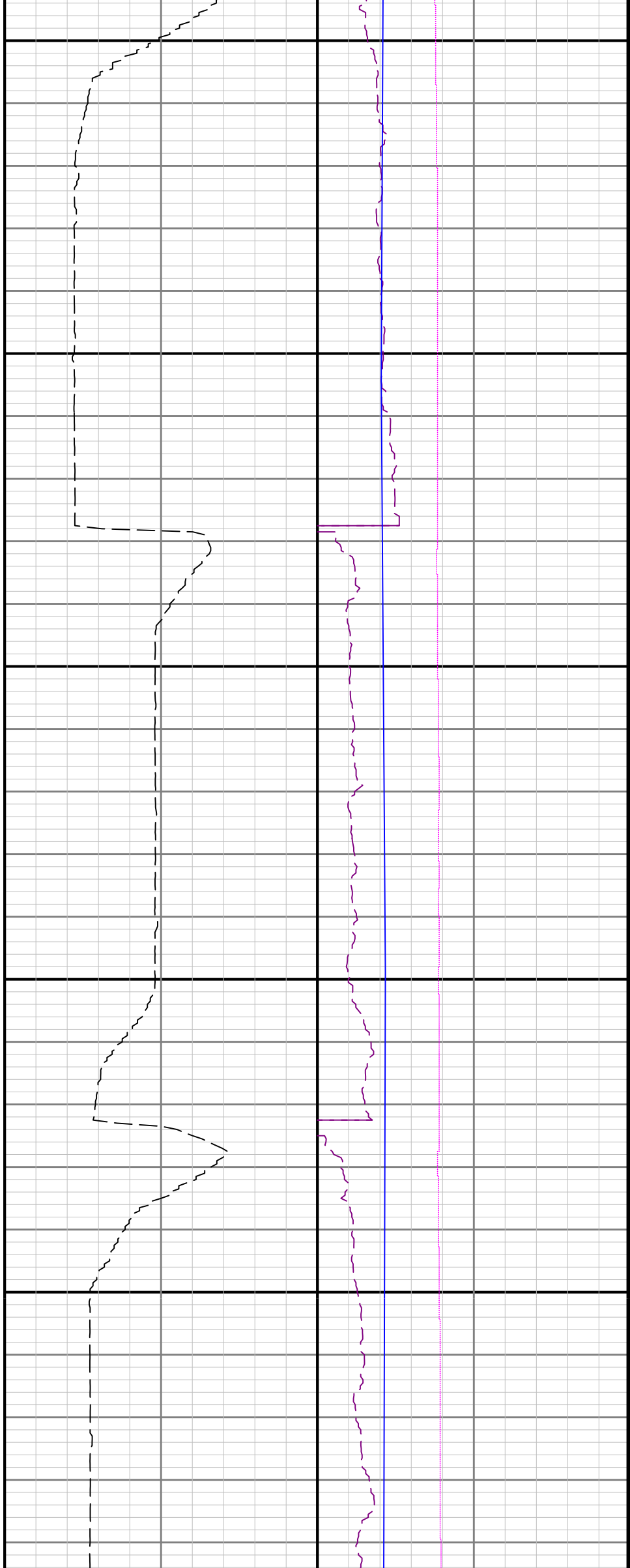
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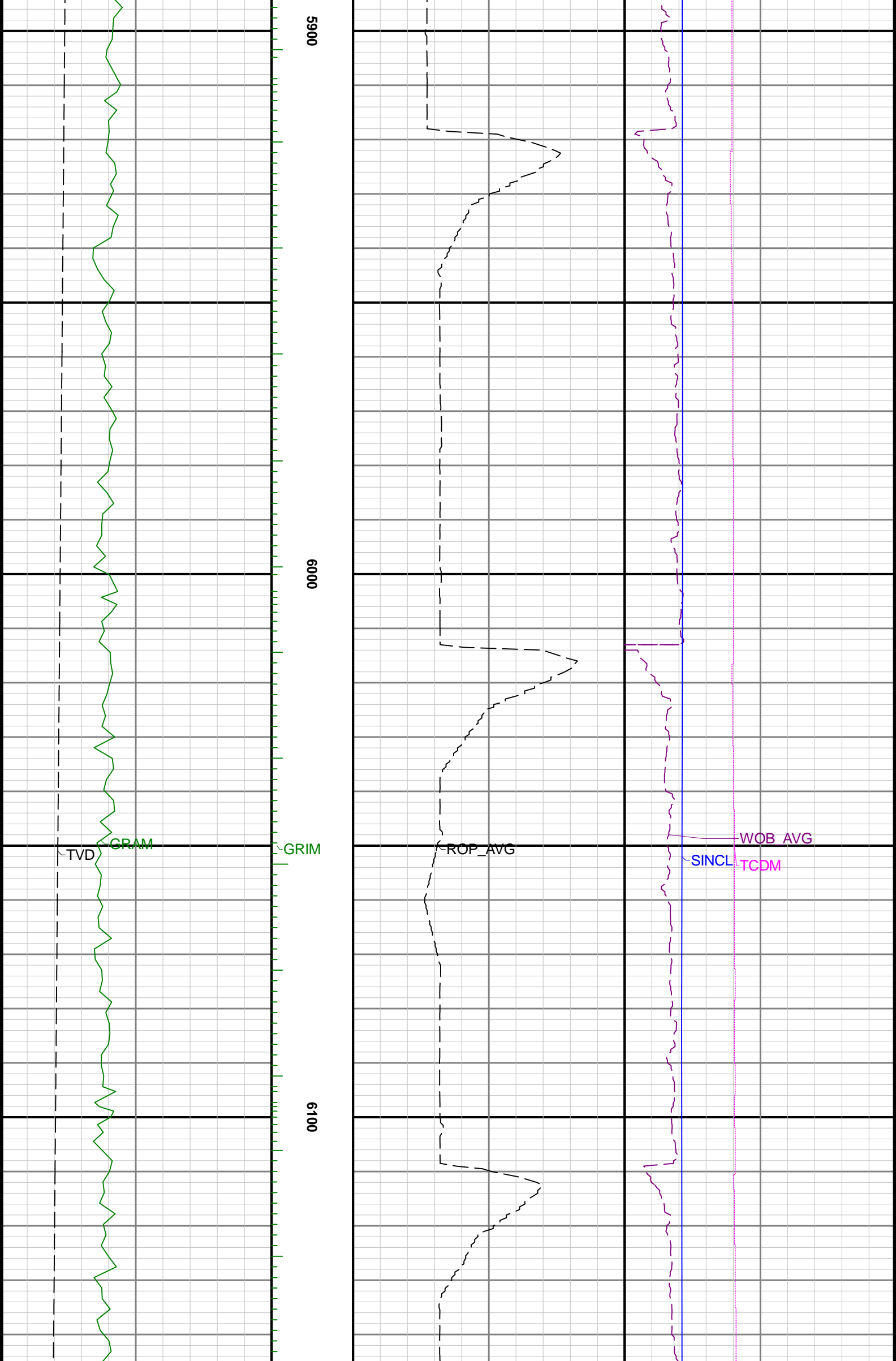




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5800





5900

6000

6100

TVD

GRAM

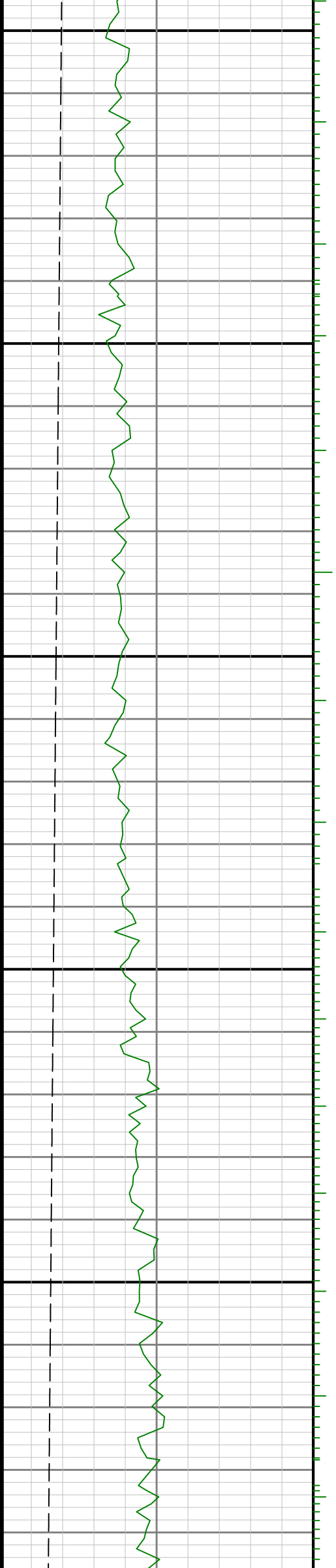
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SINCL

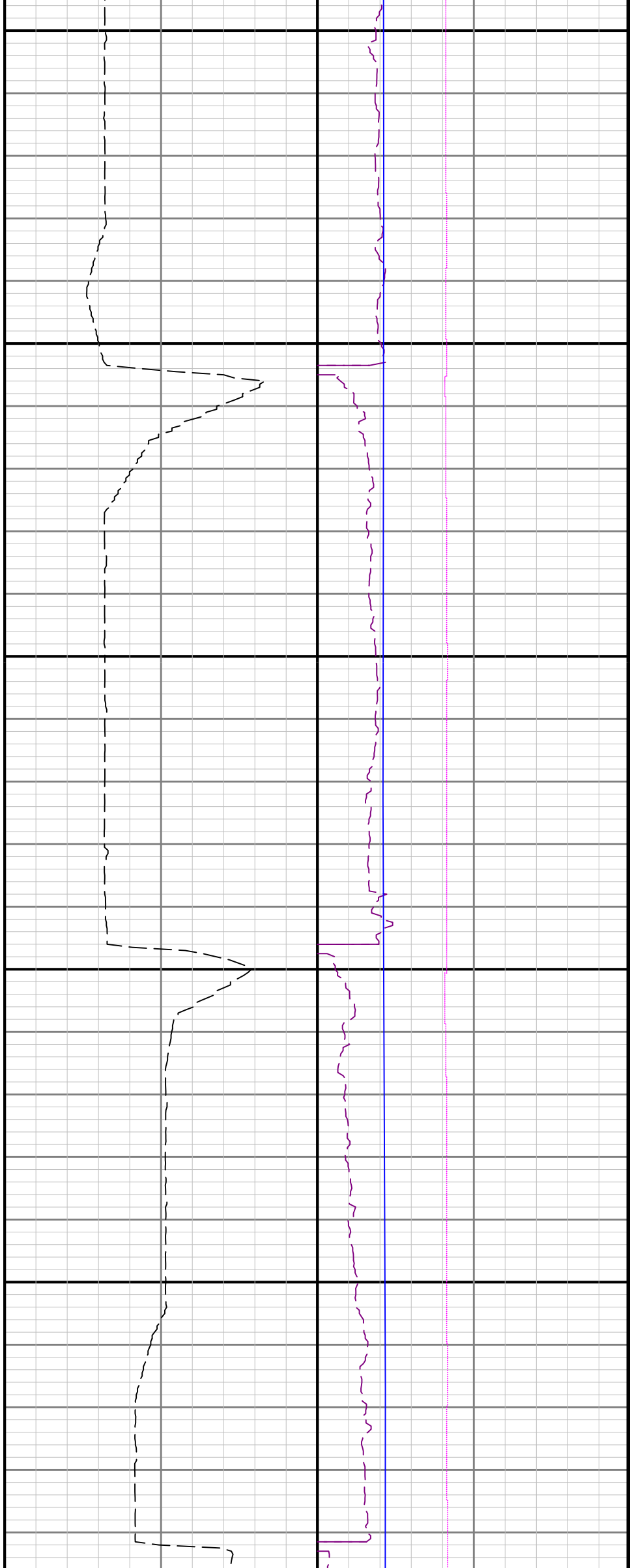
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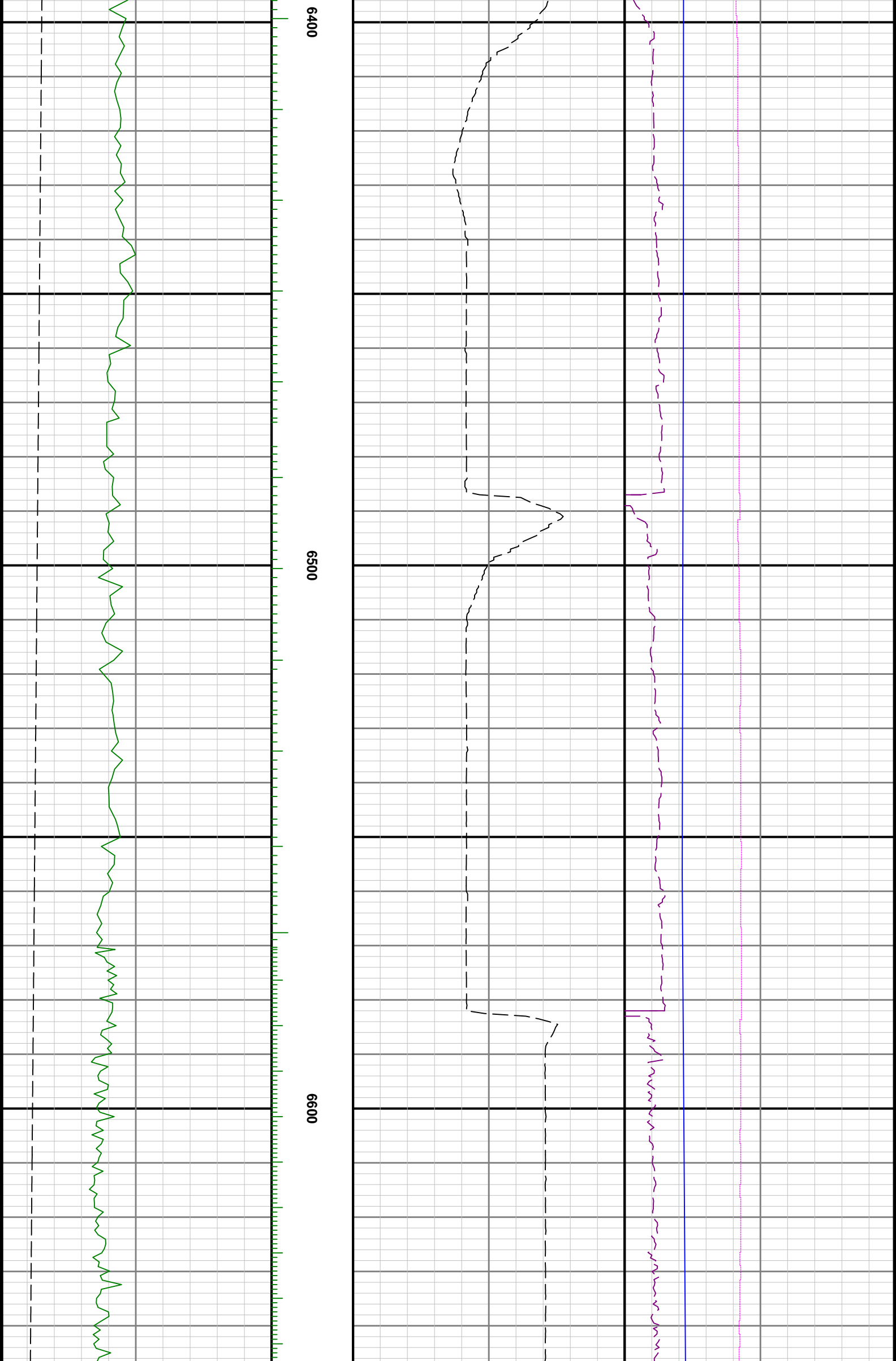
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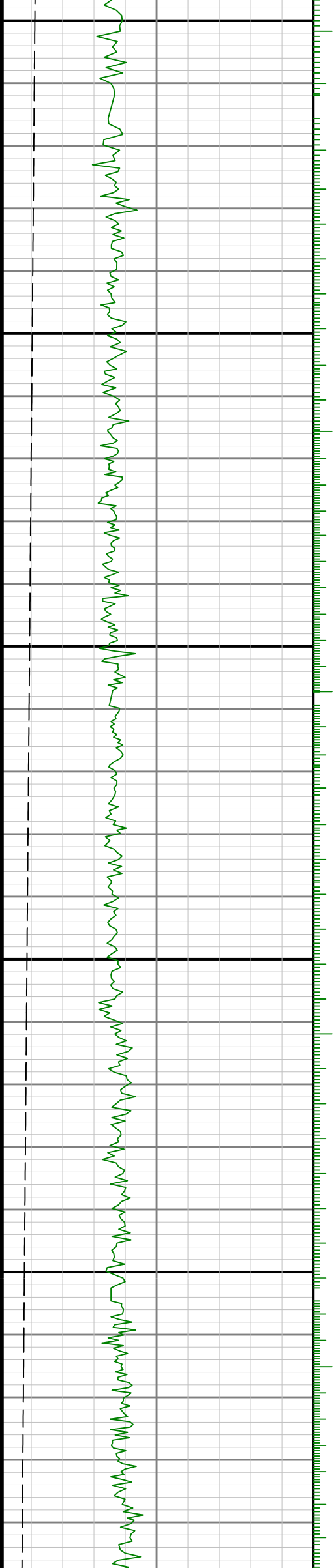


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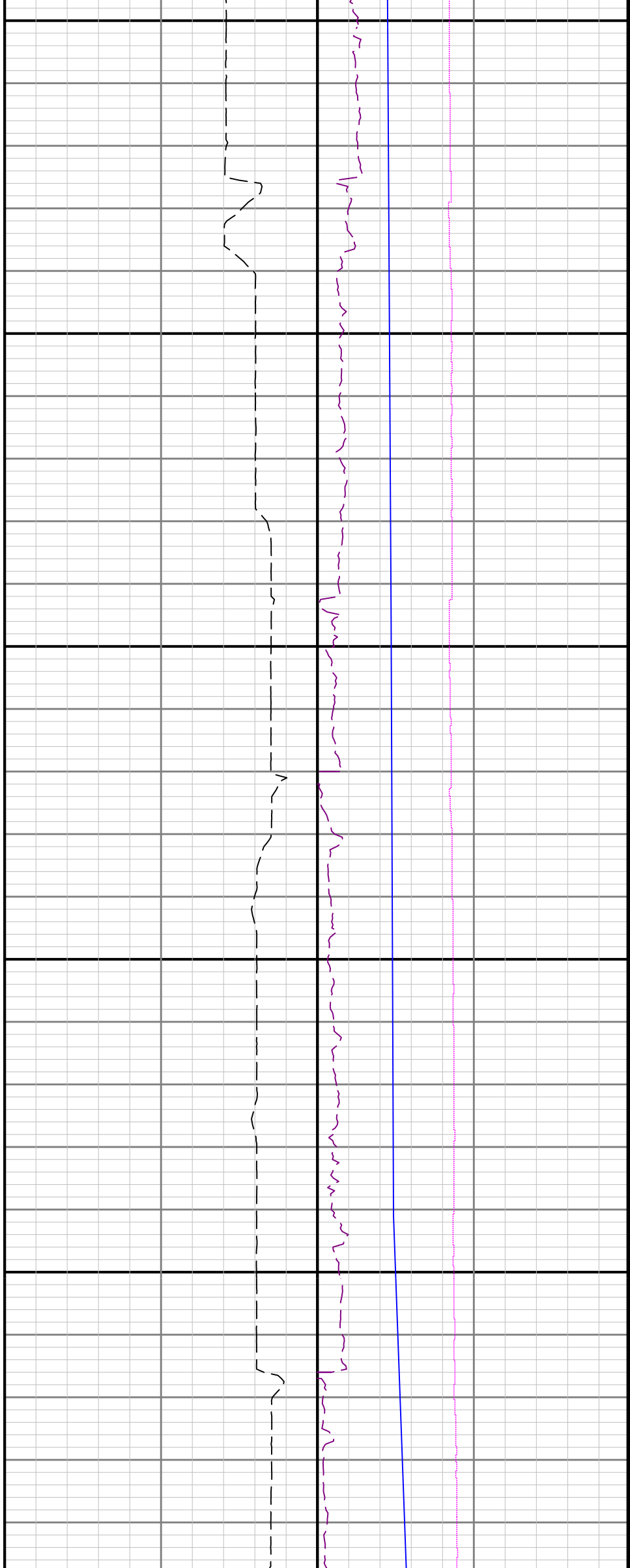


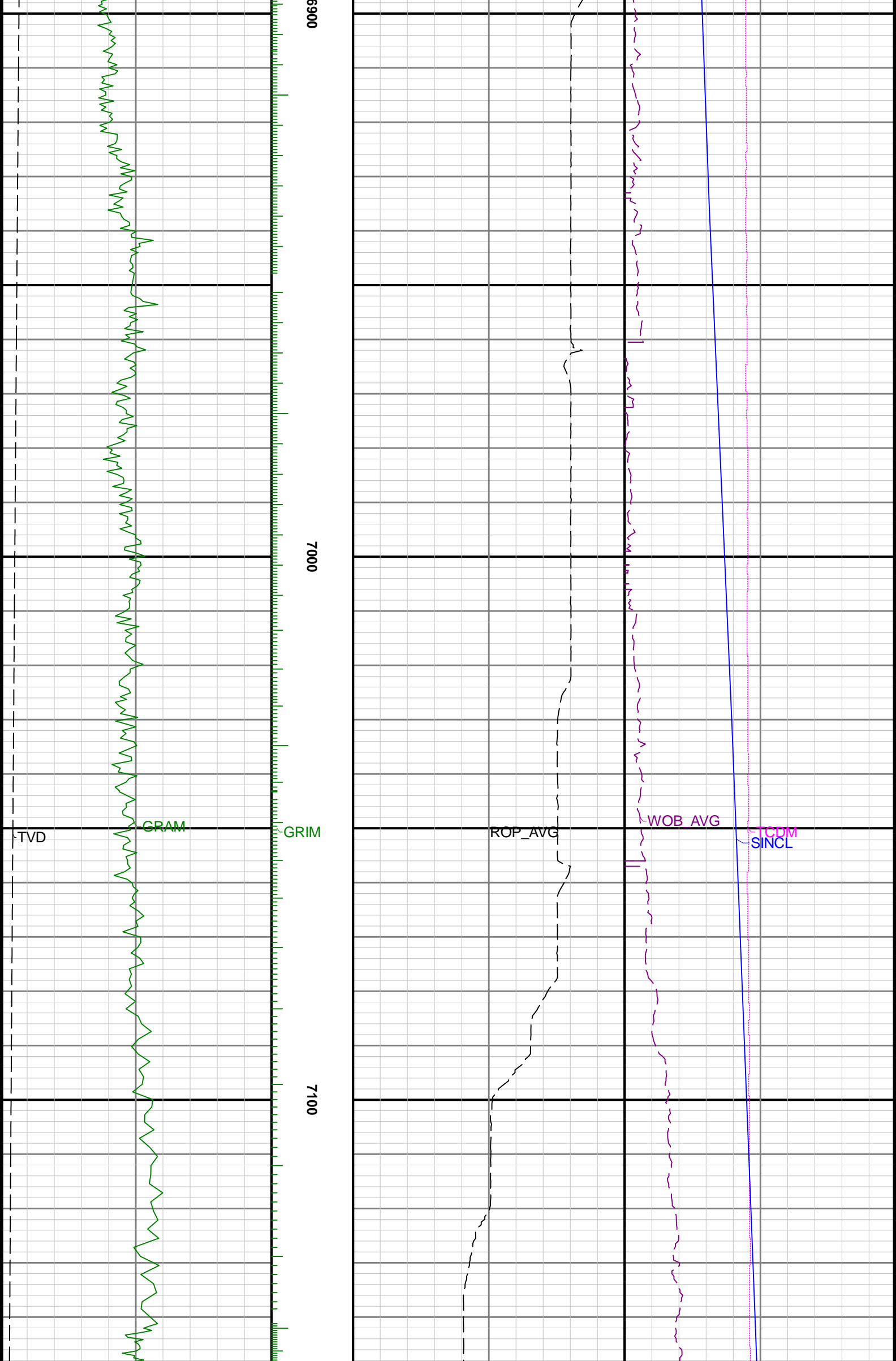


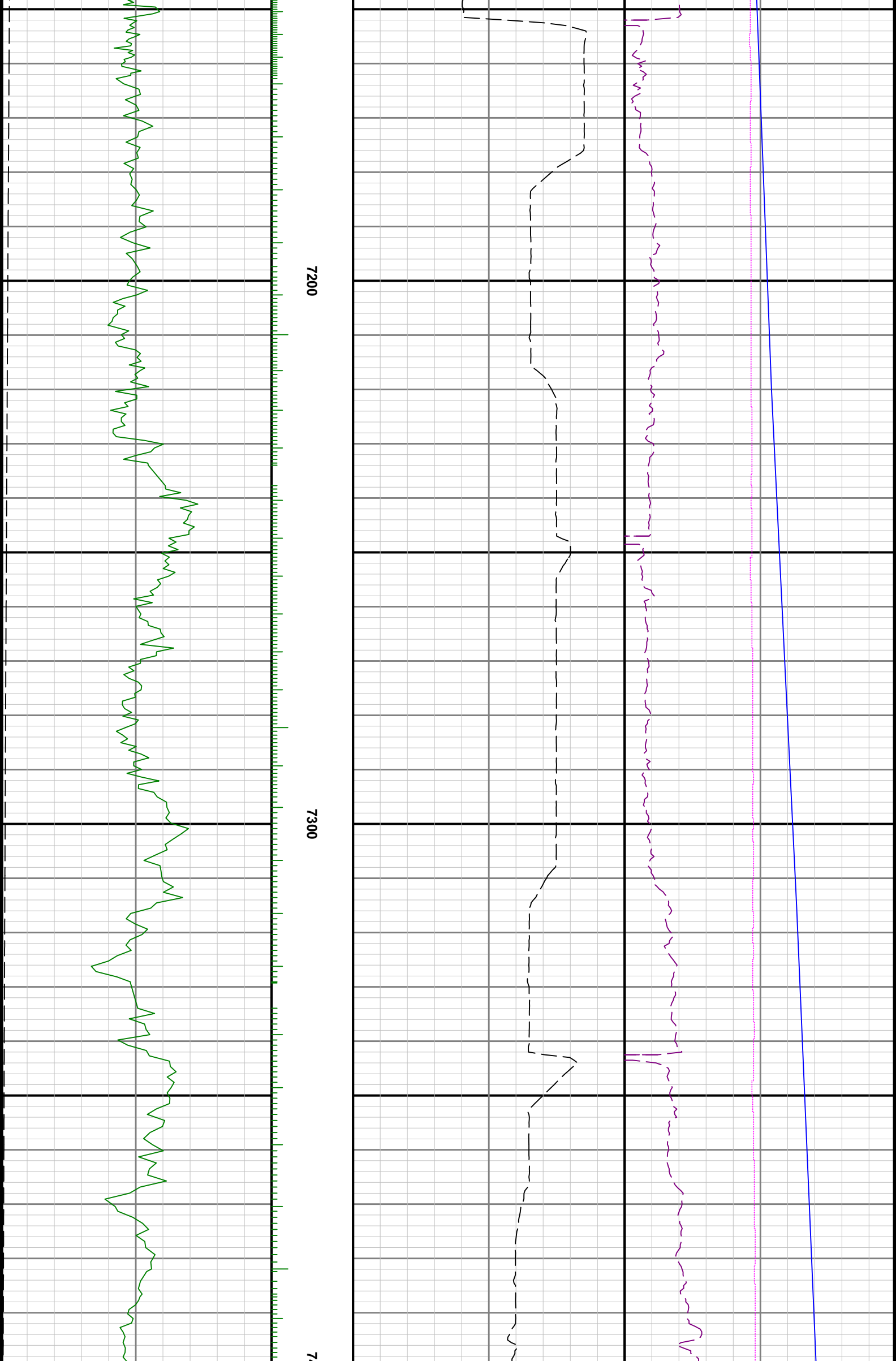


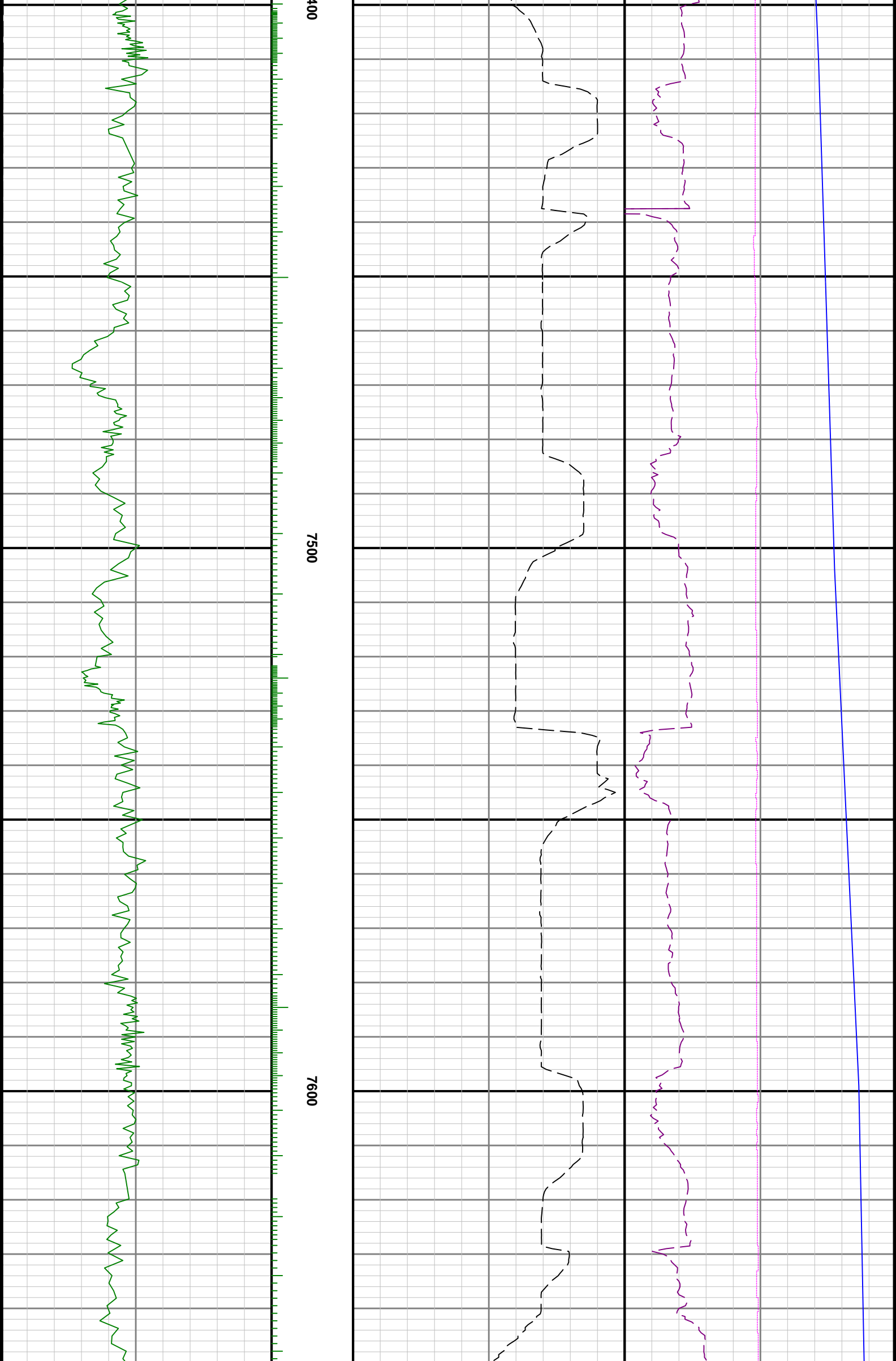
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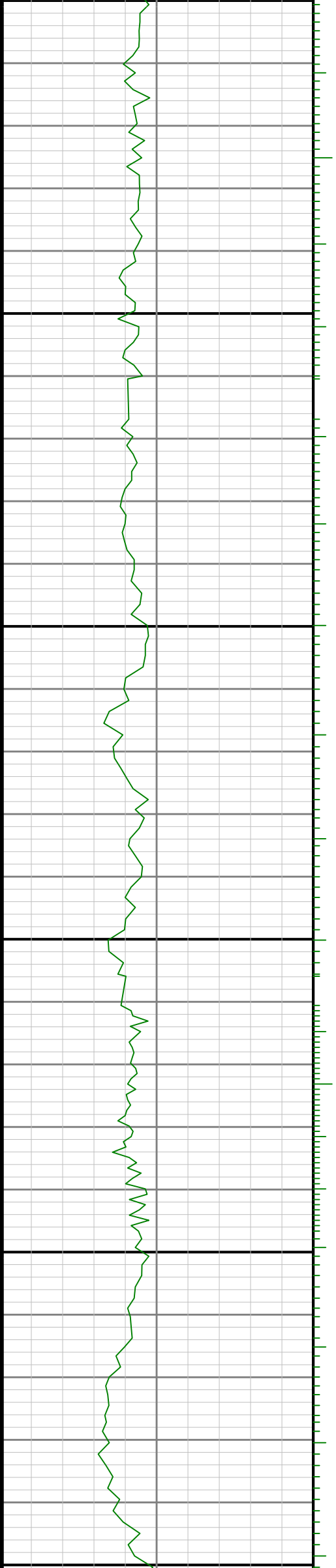
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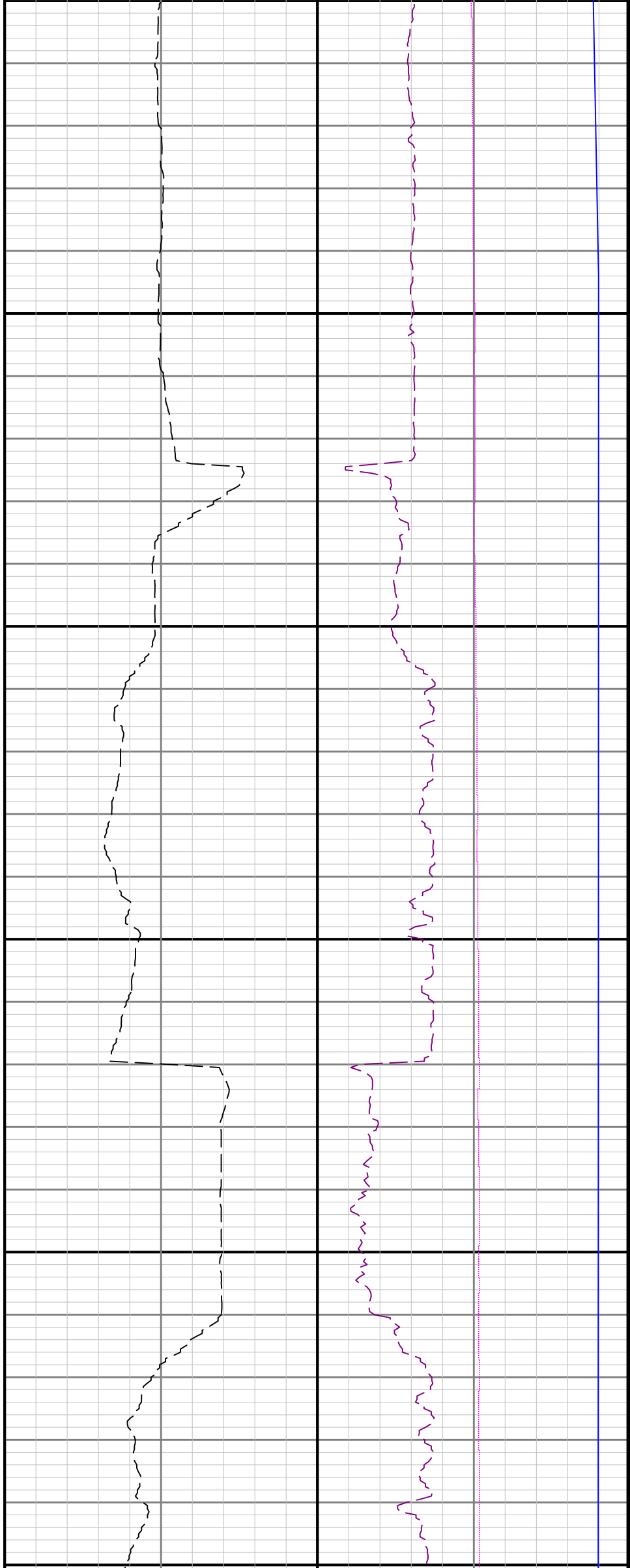


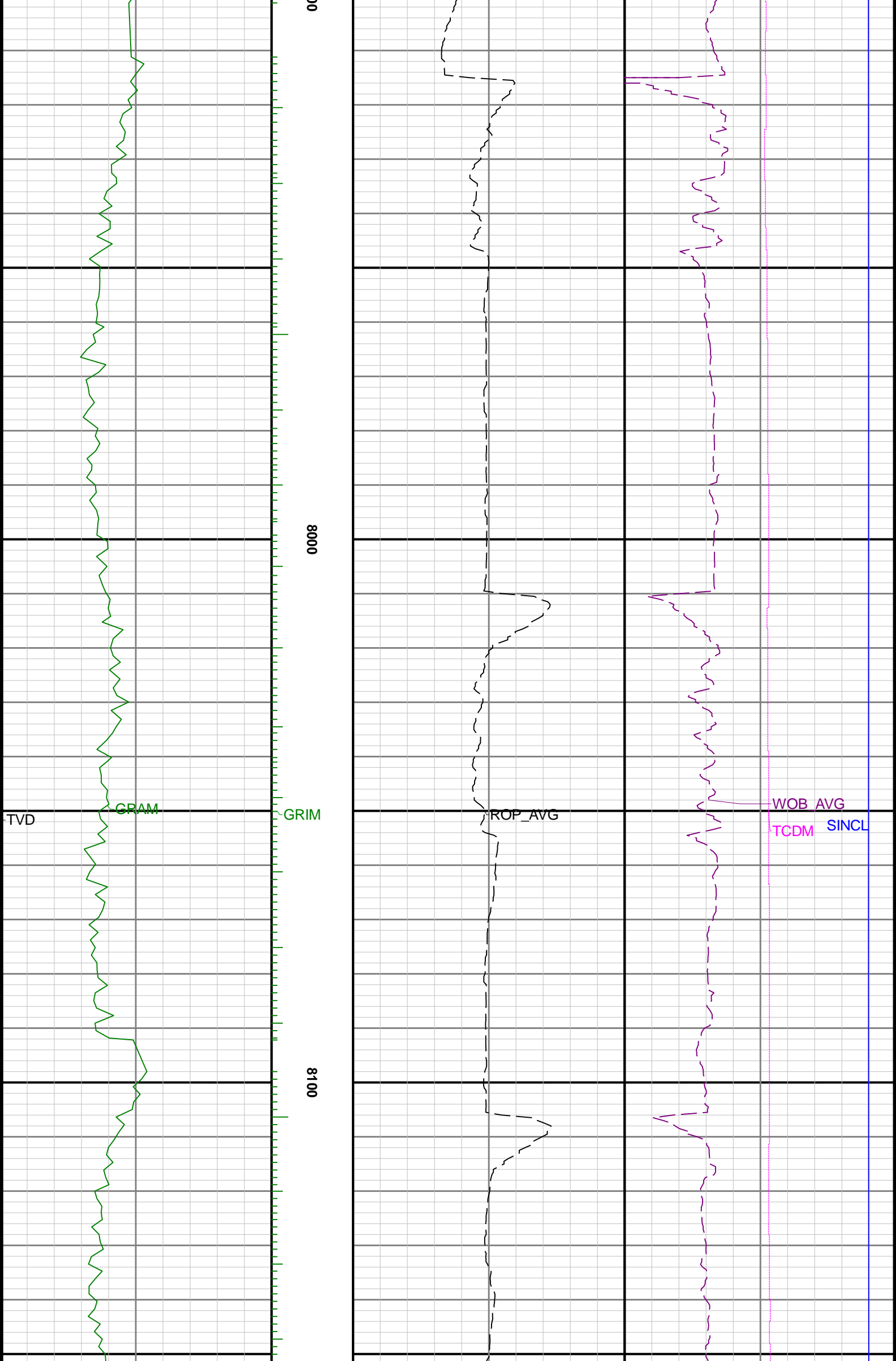


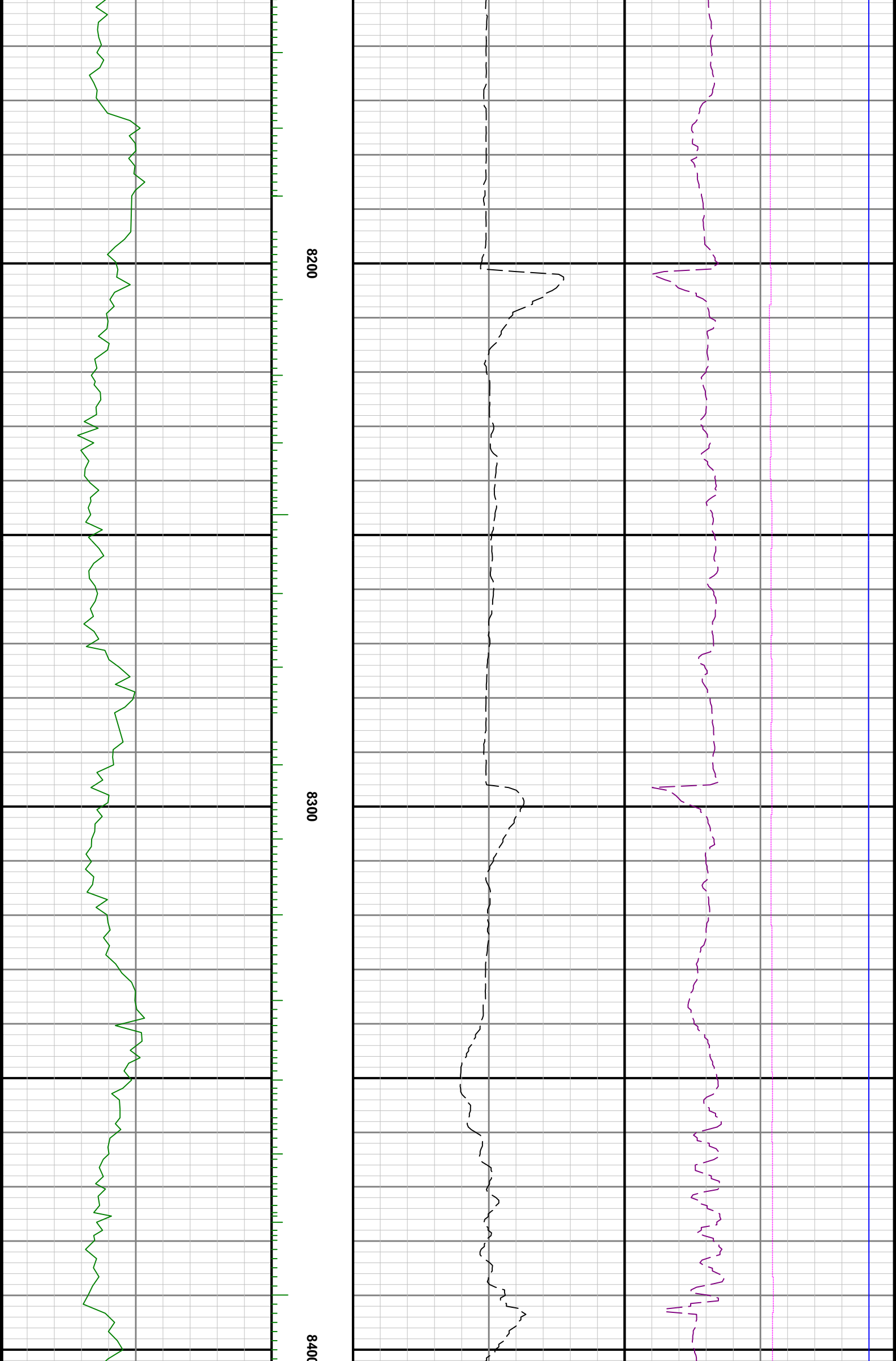
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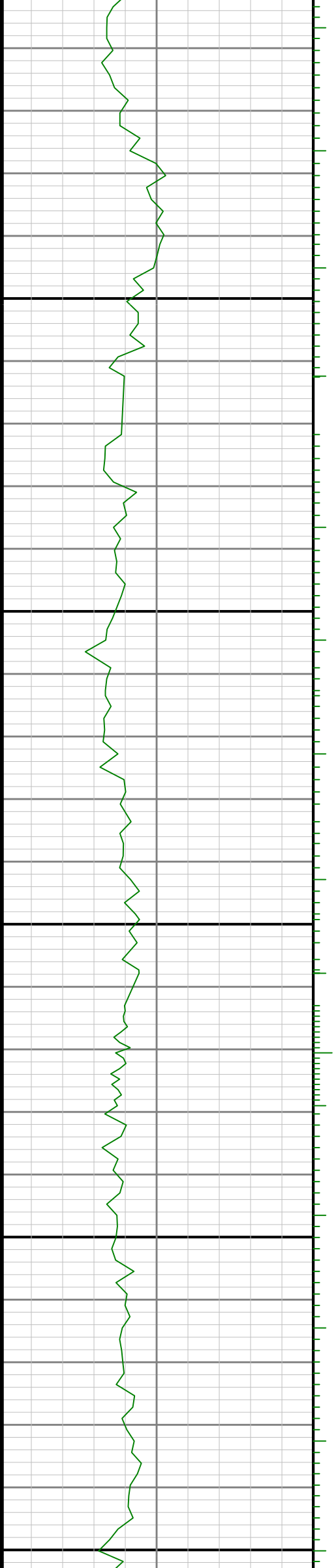
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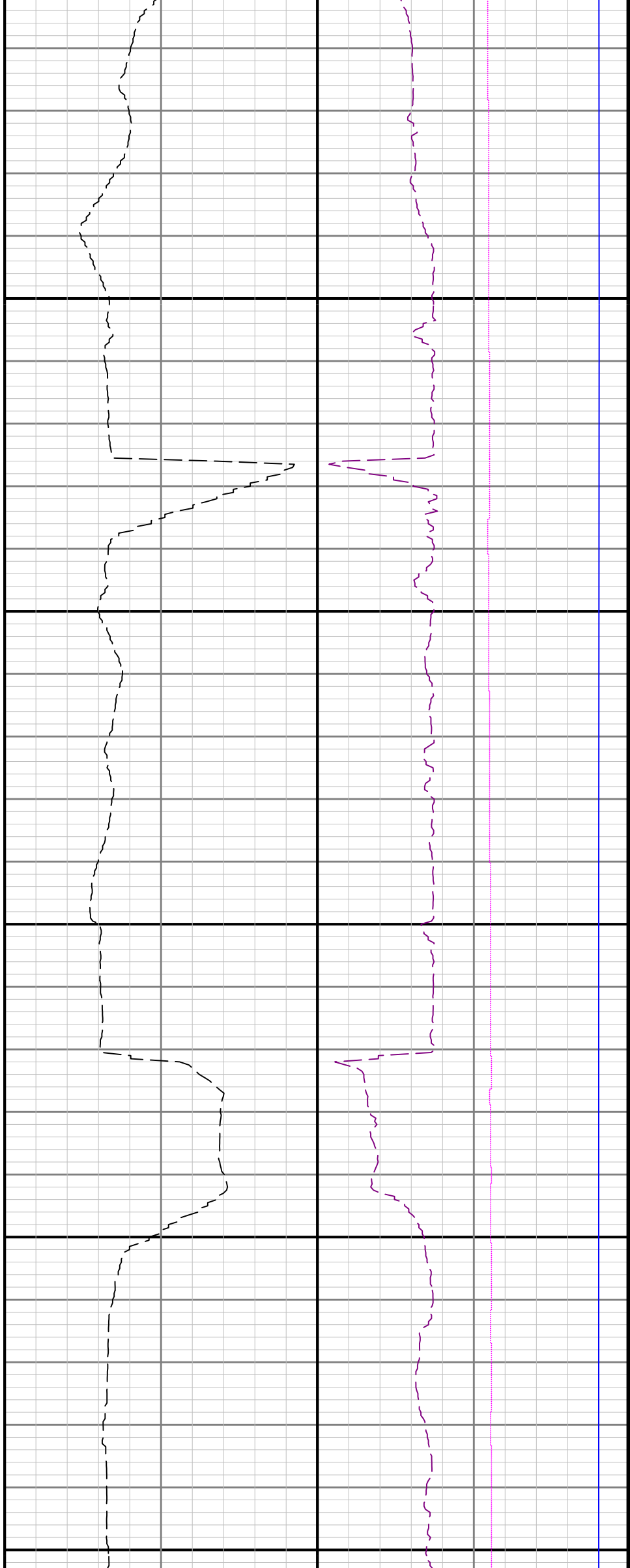


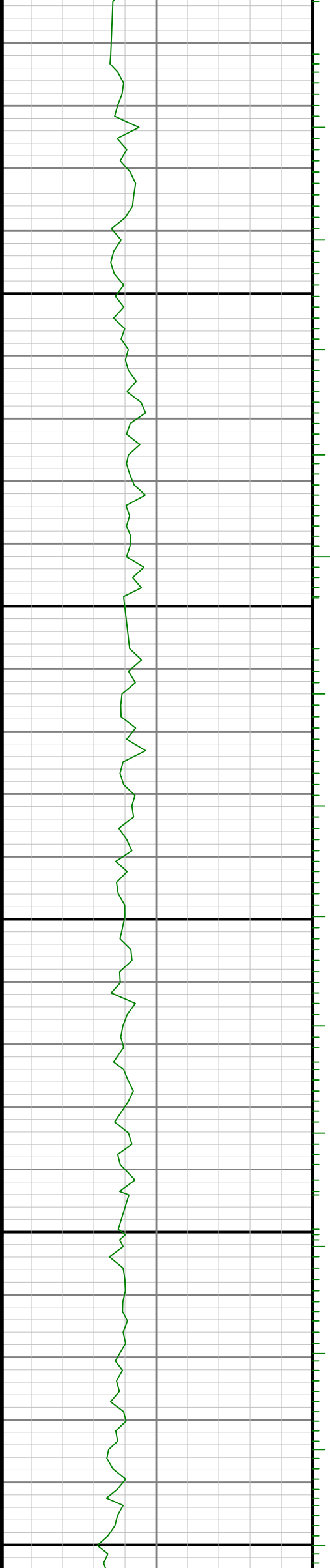




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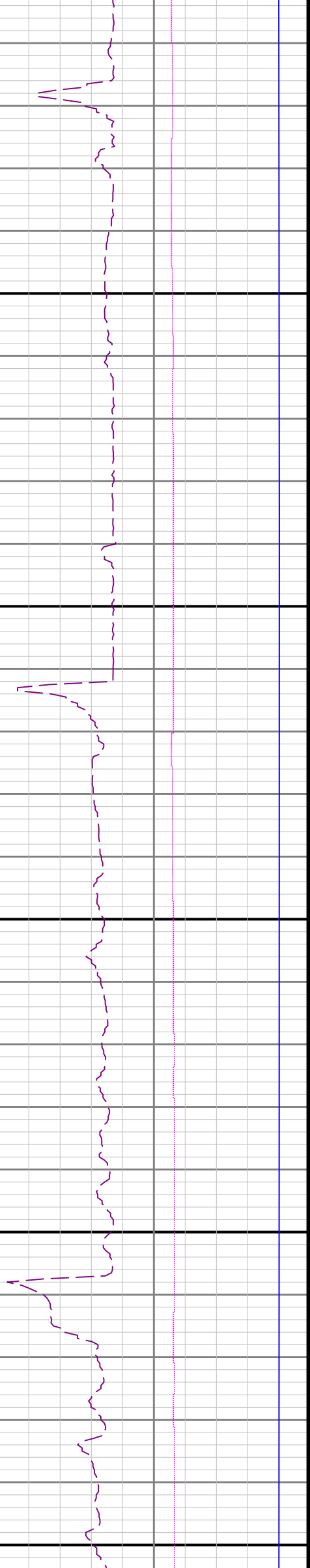
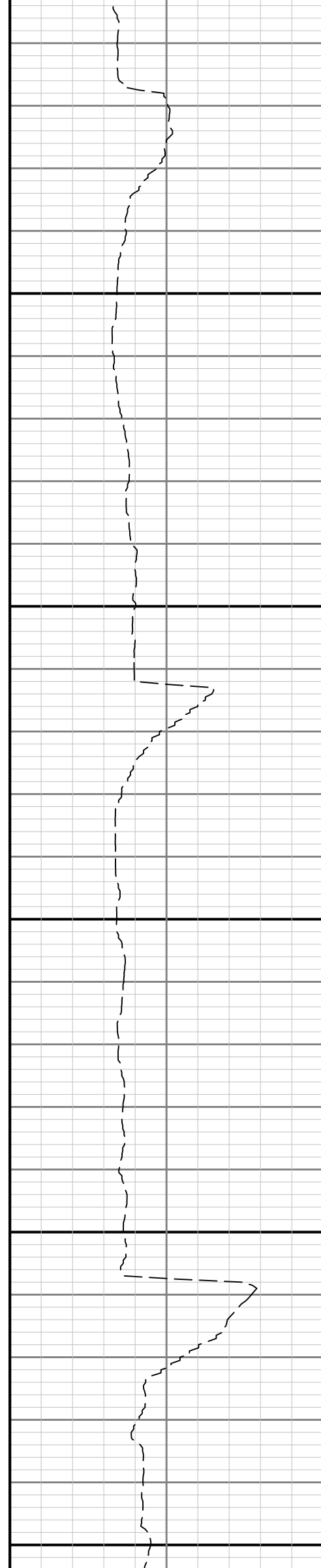


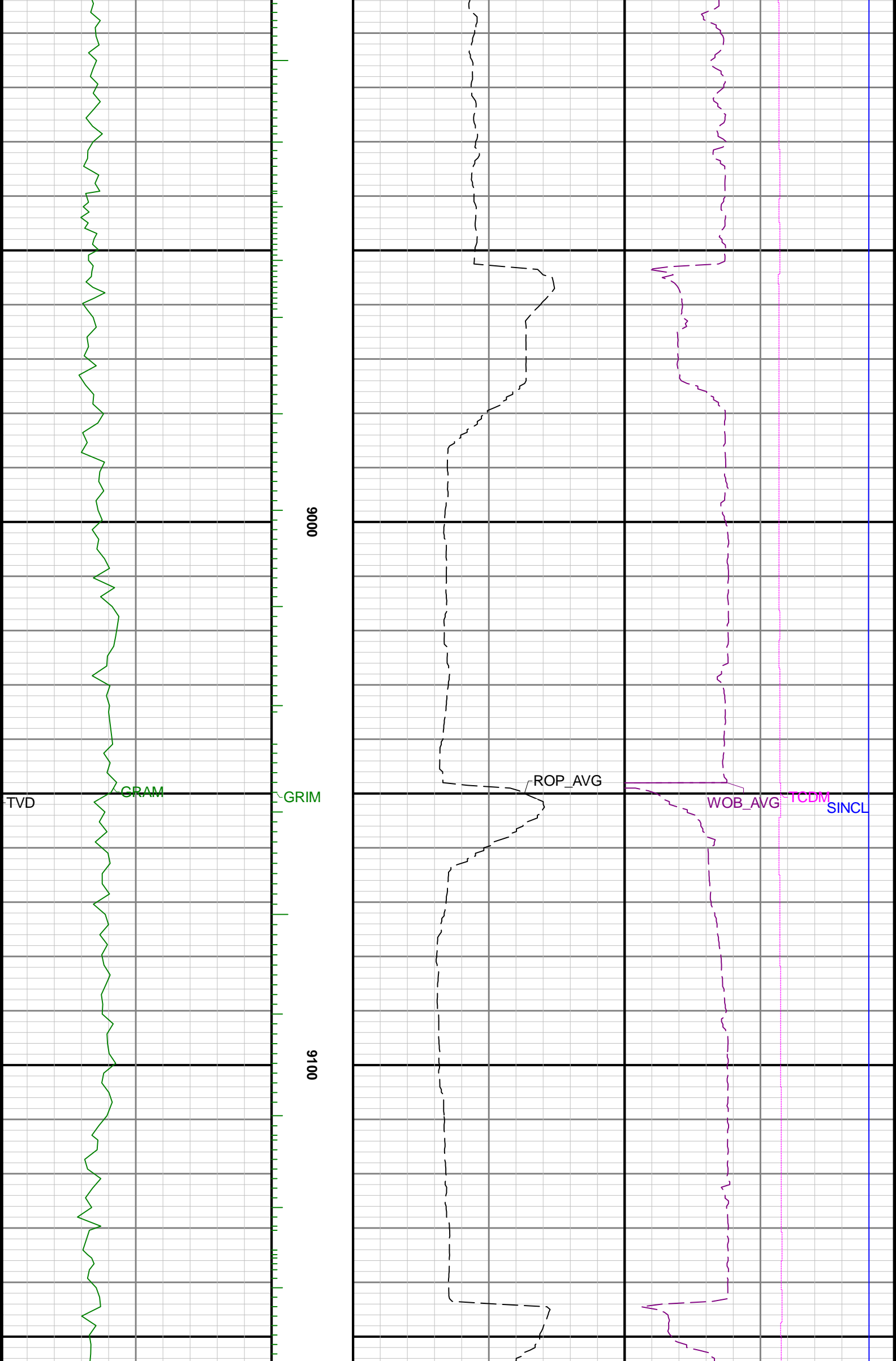


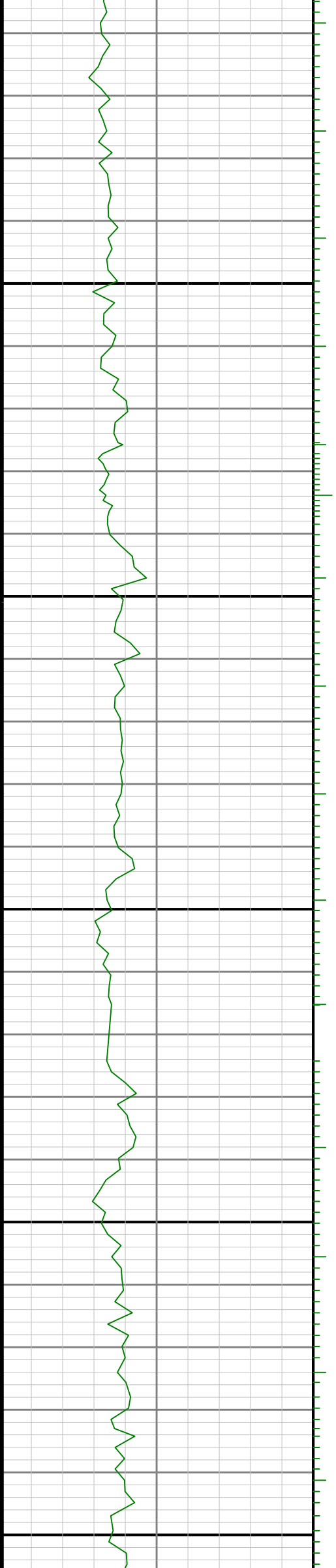
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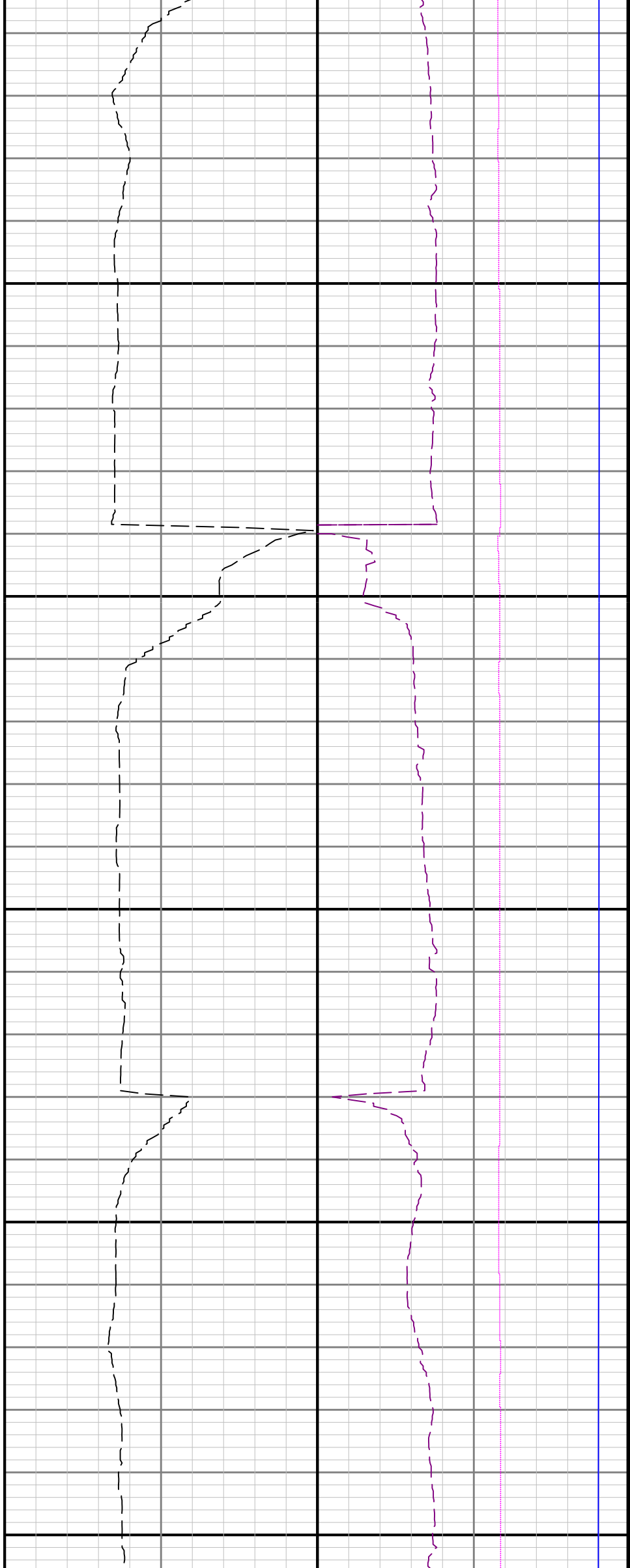


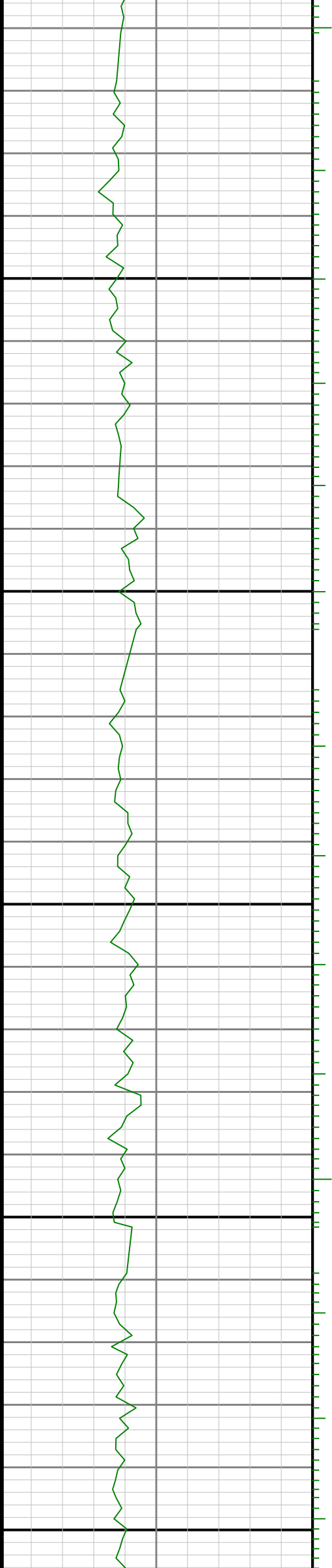


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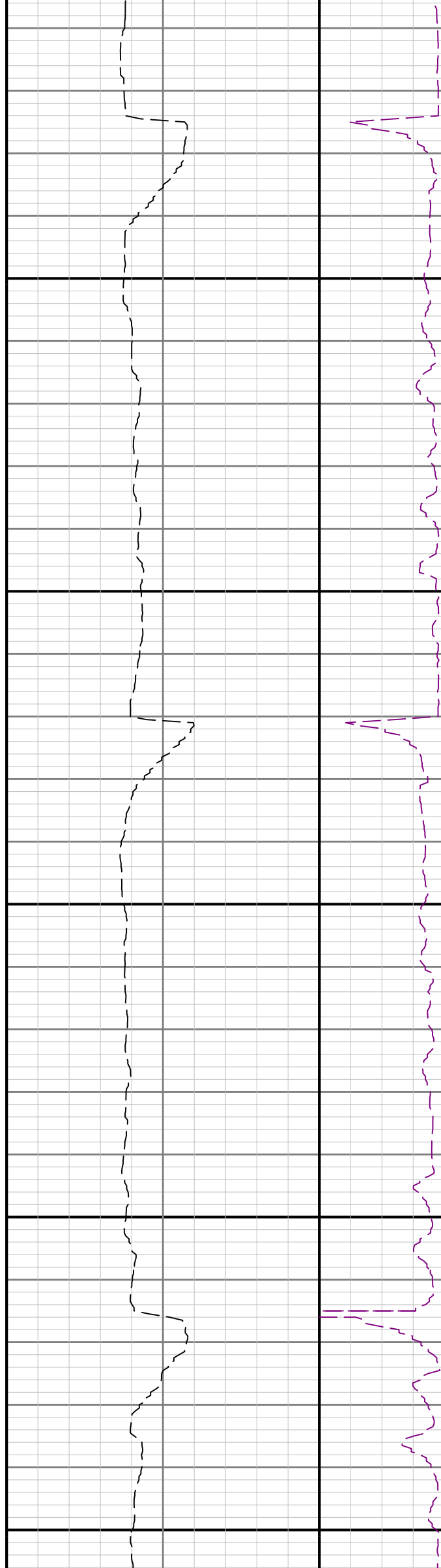
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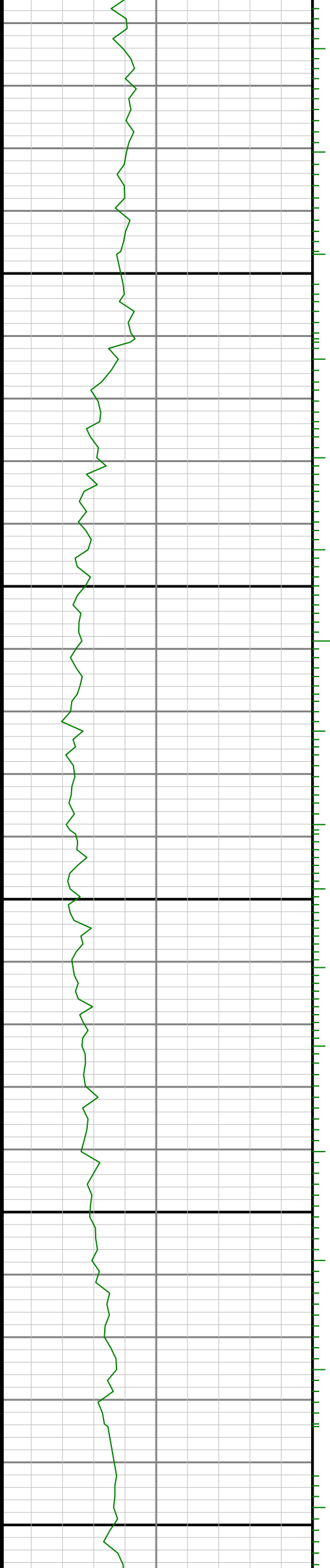




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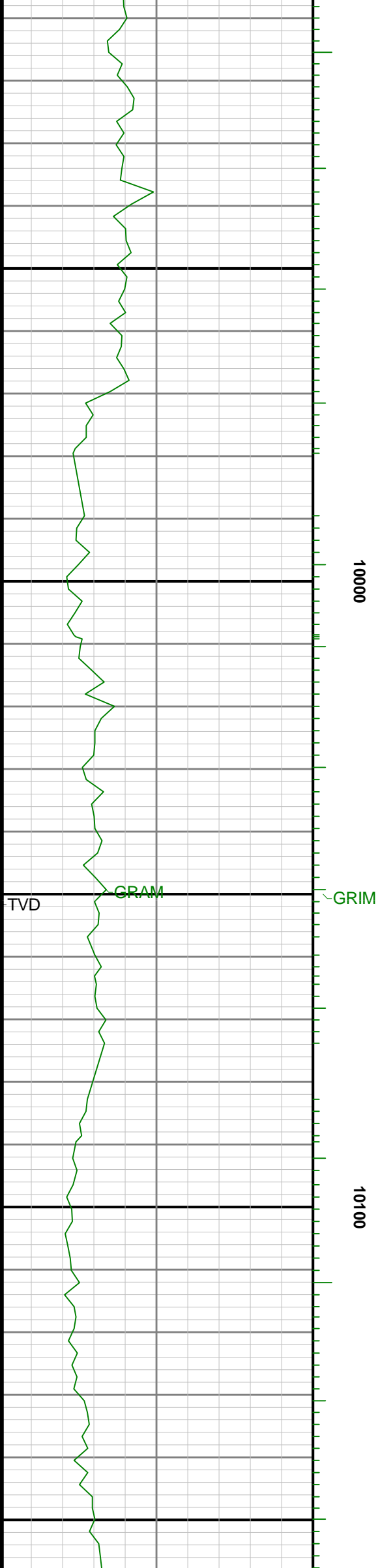


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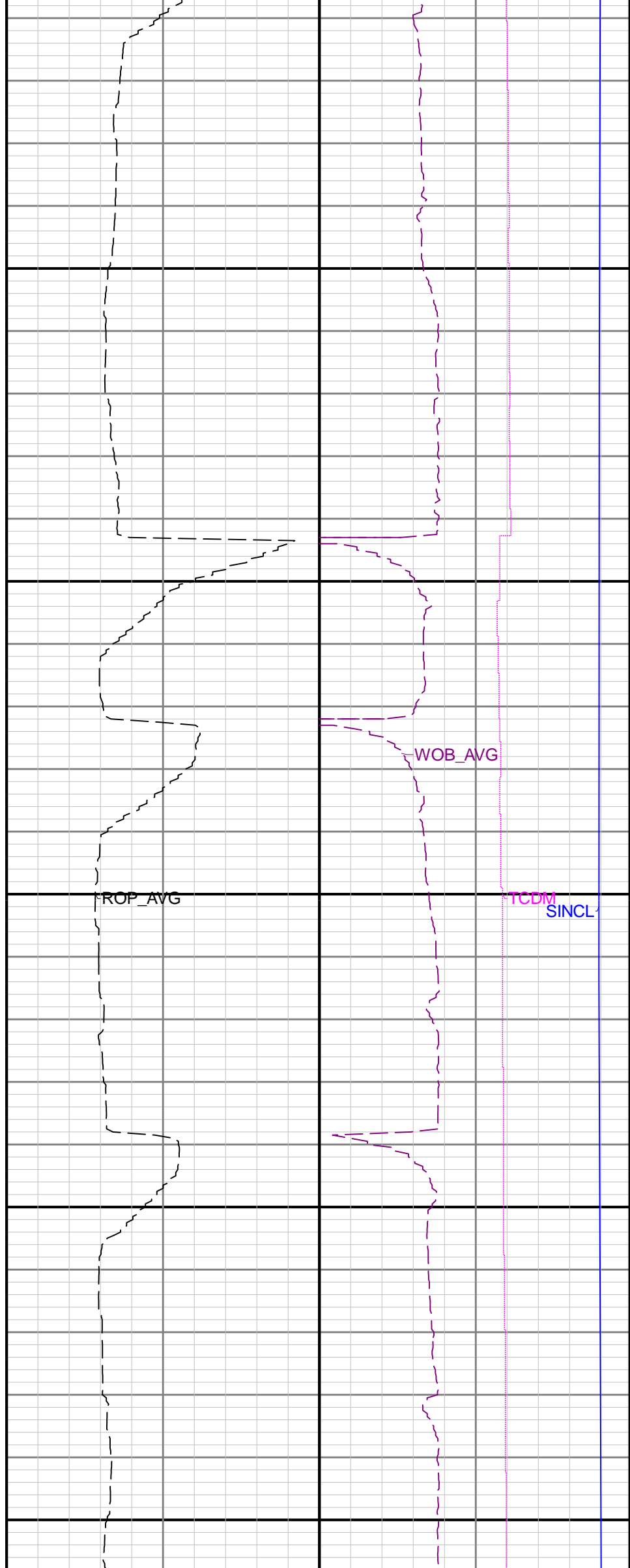


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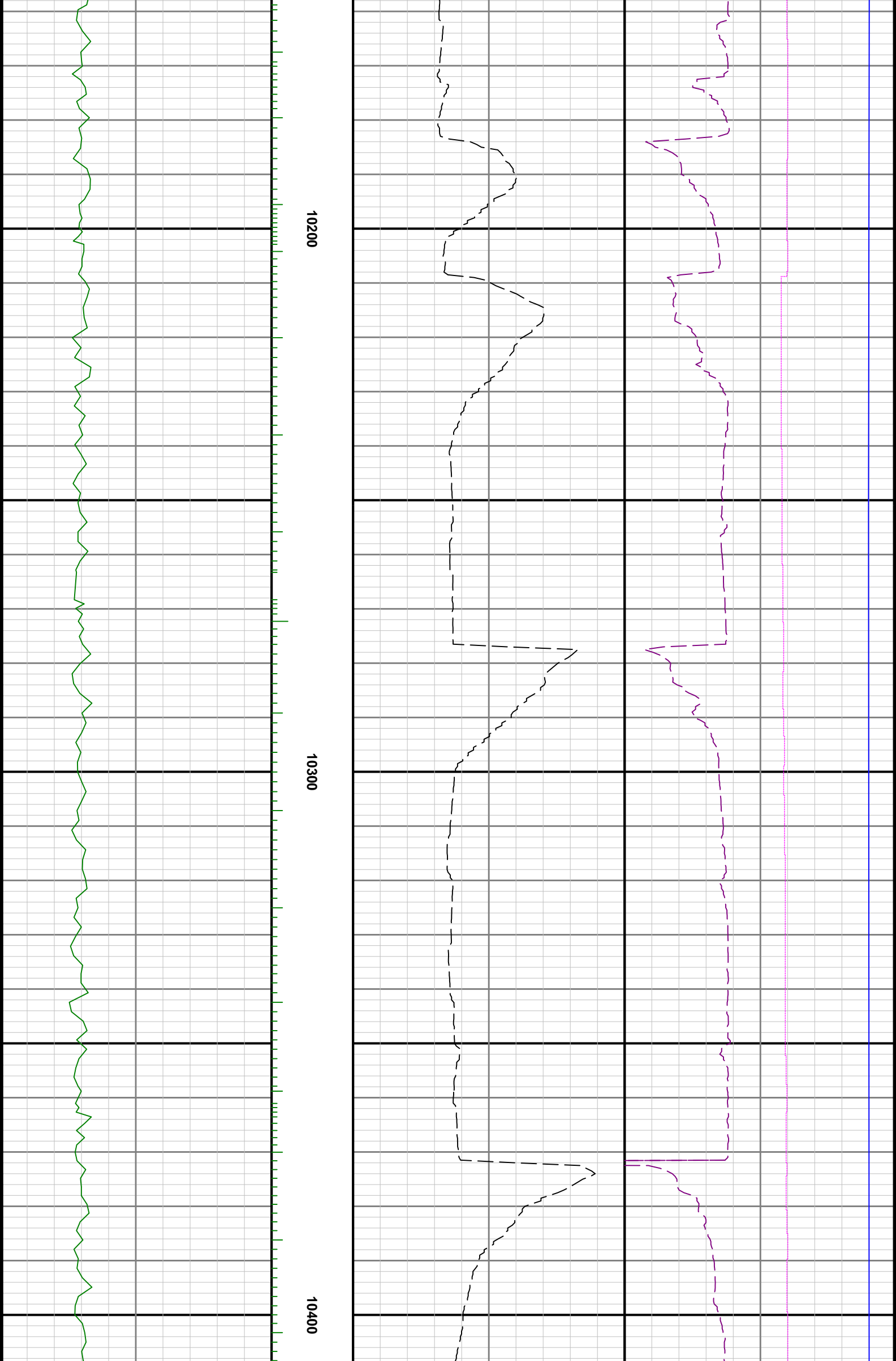
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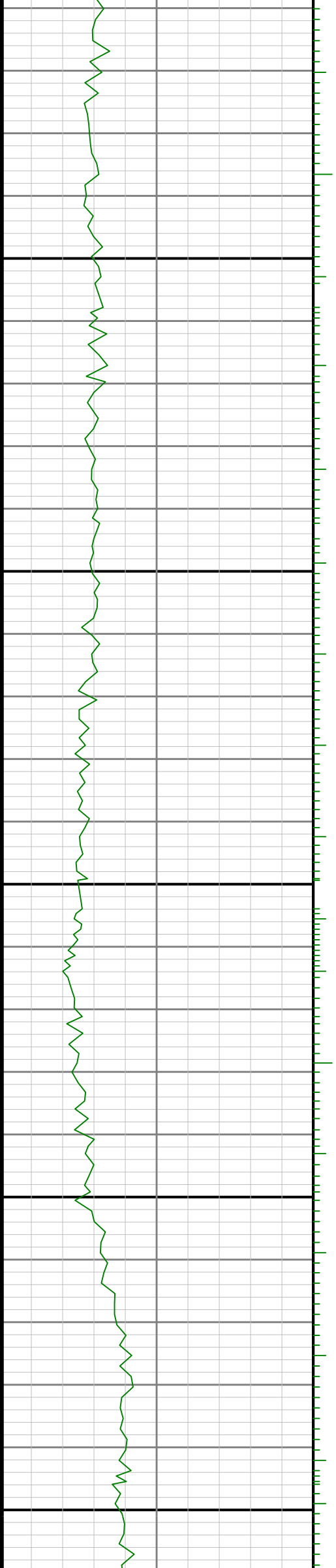


ROP\_AVG

WOB\_AVG

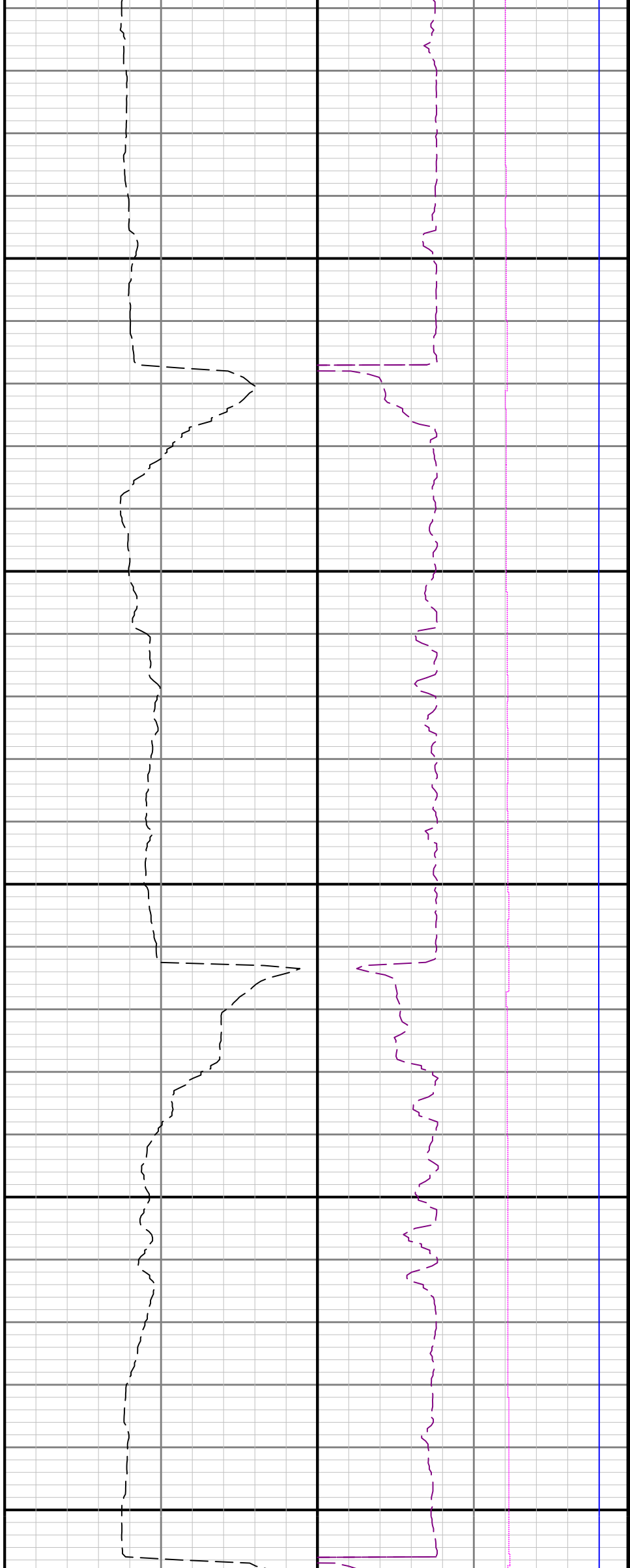
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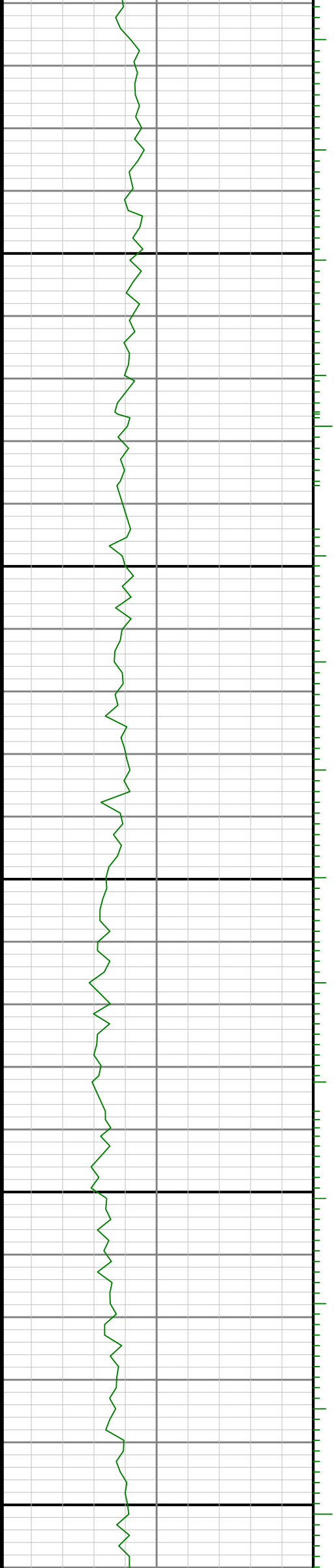




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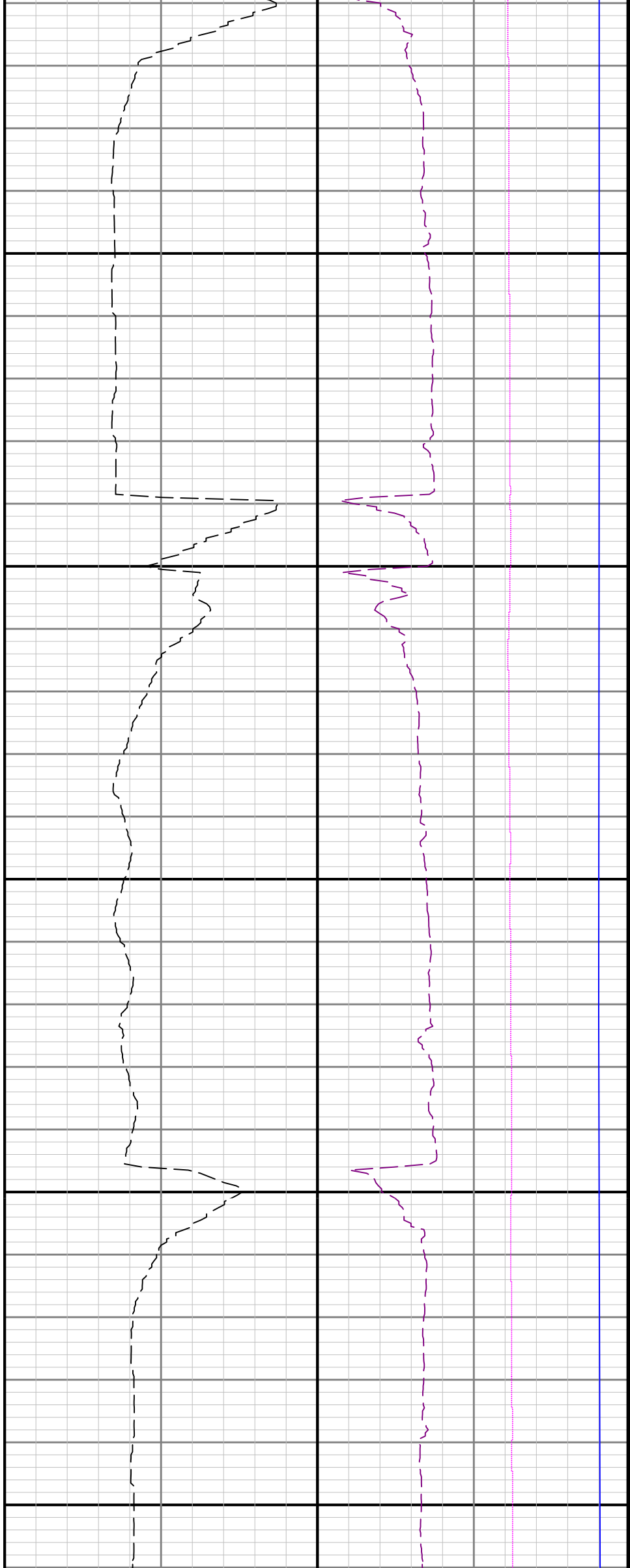


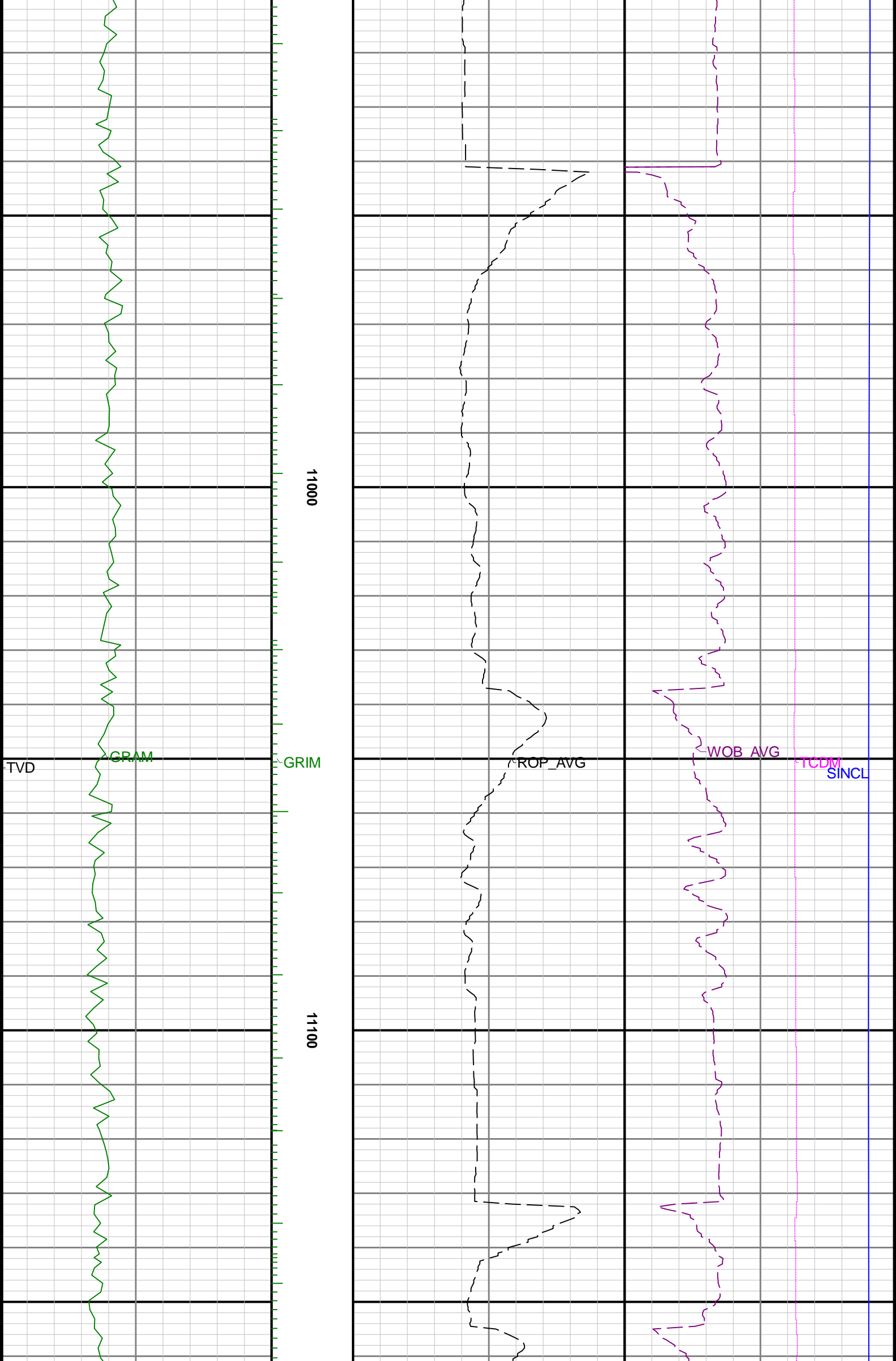


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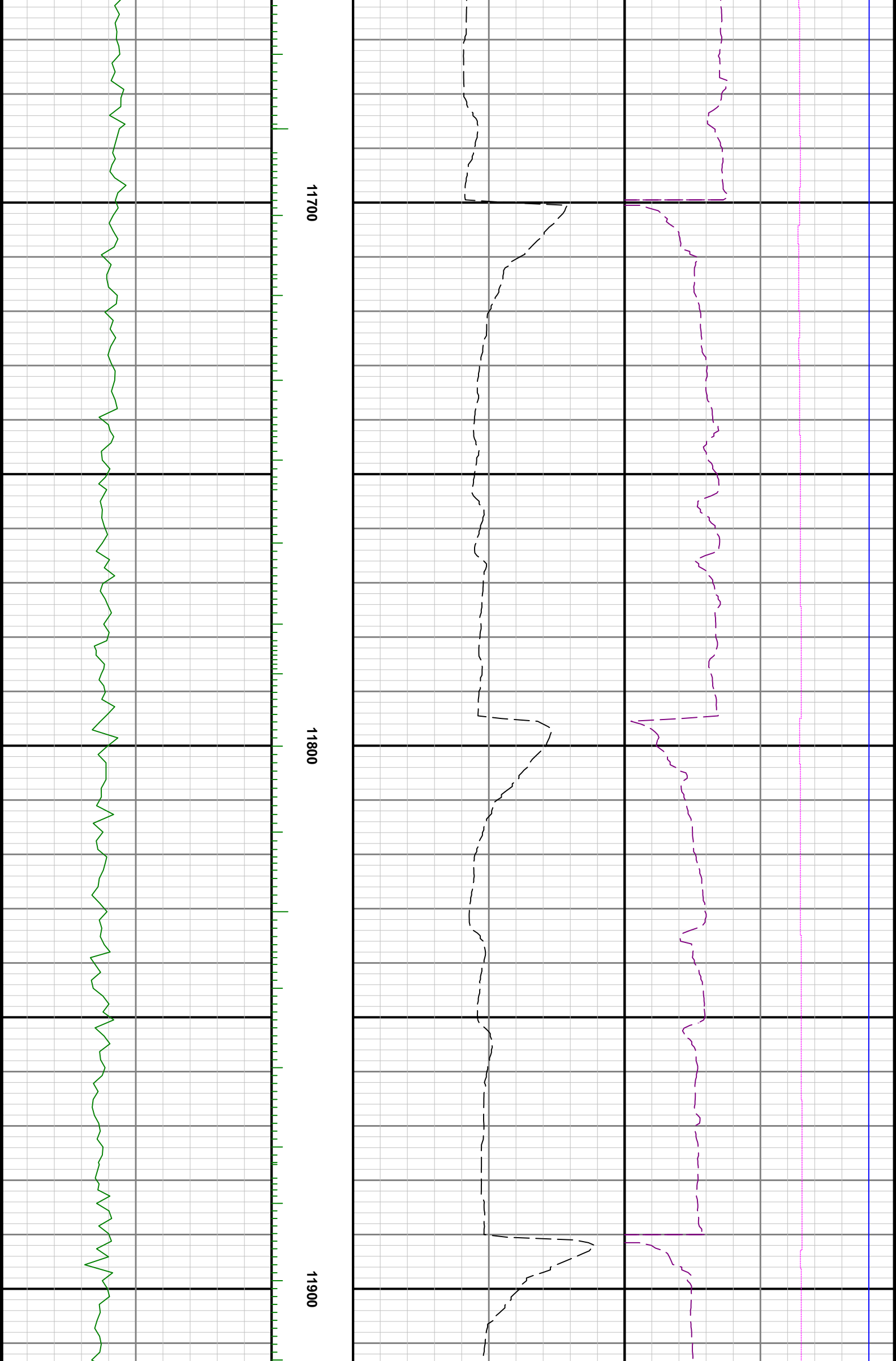
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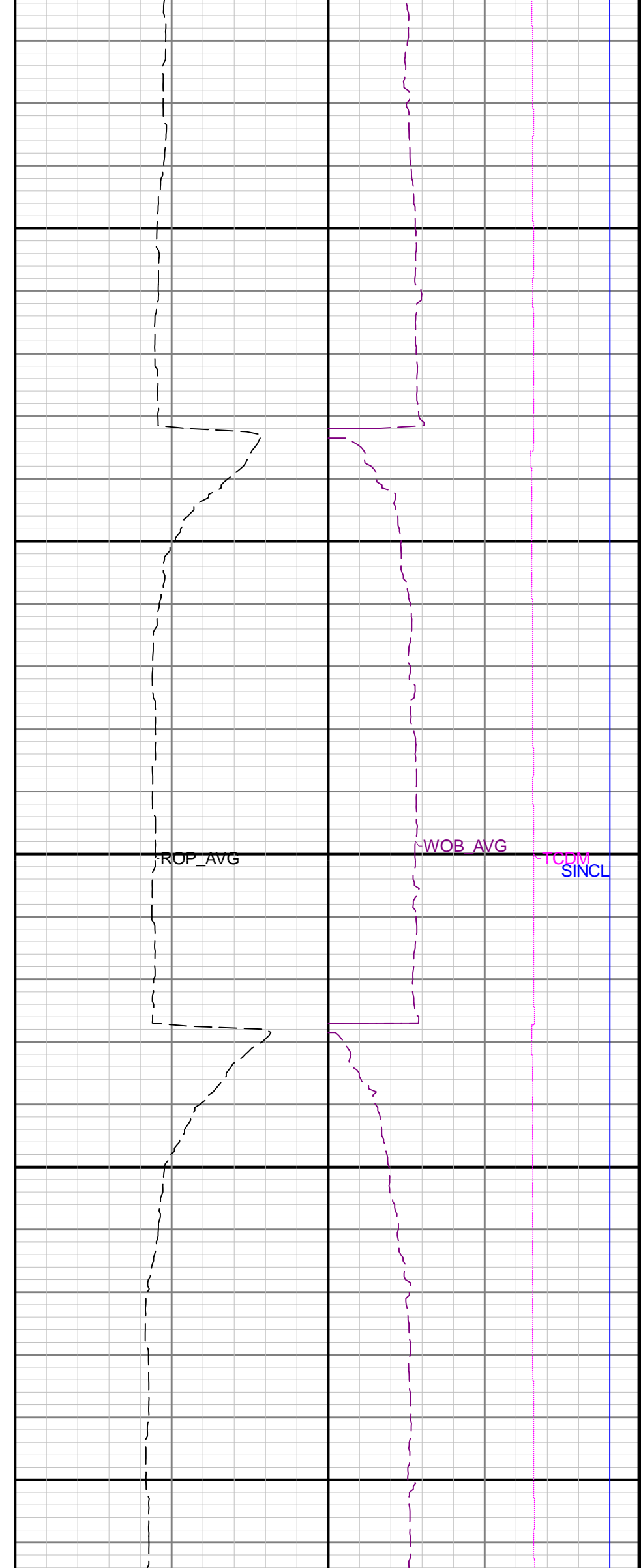
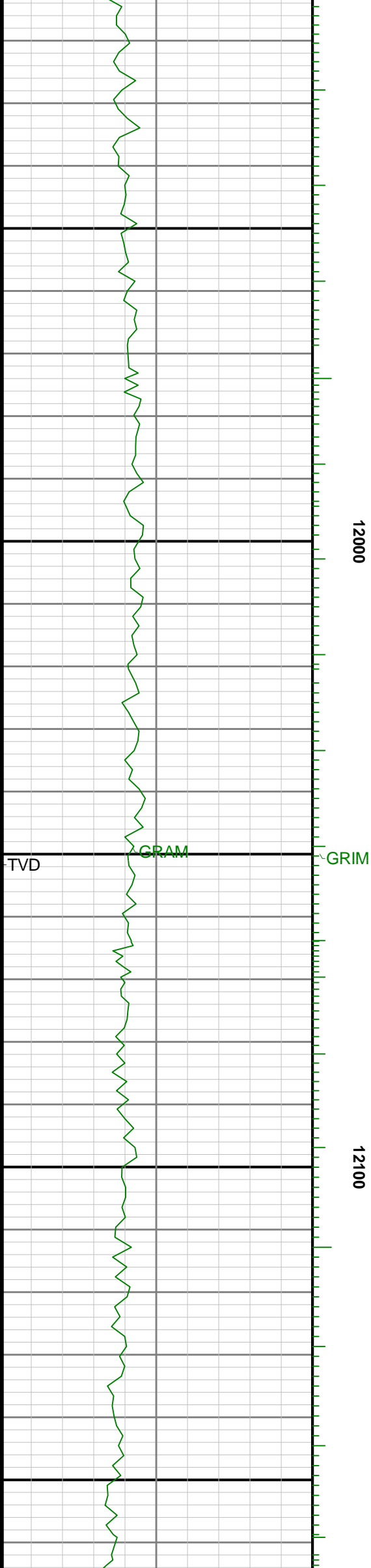


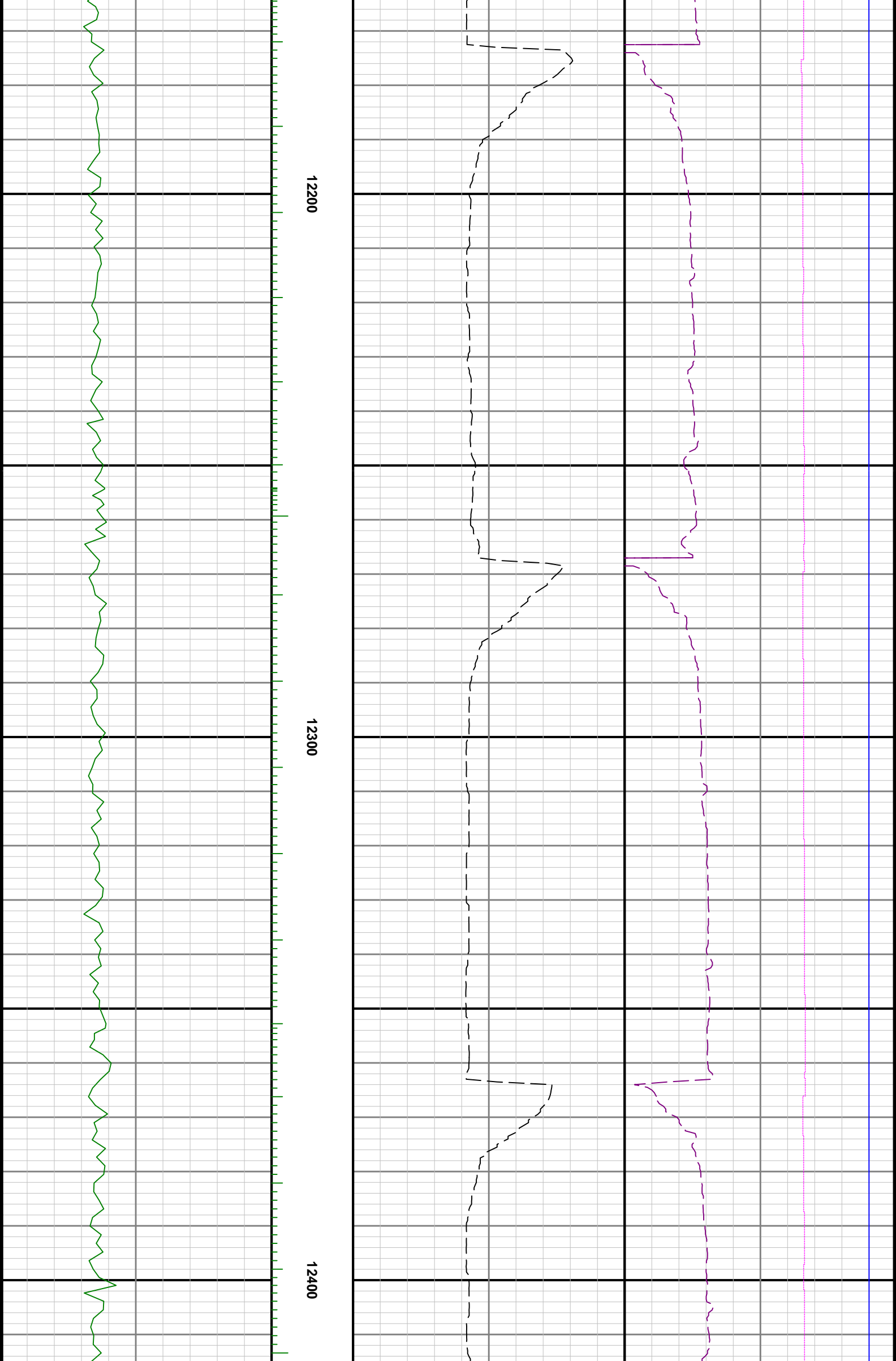


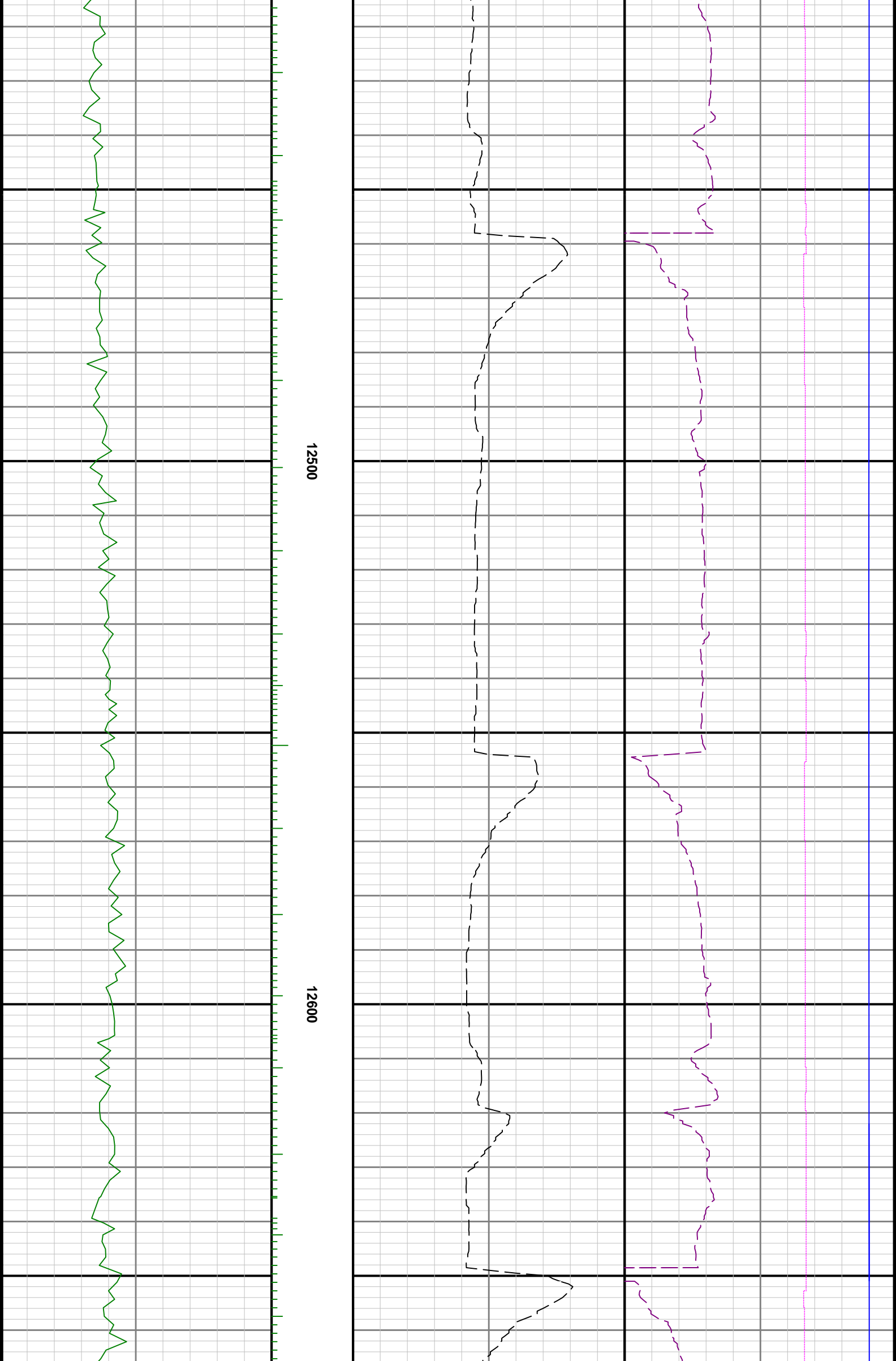






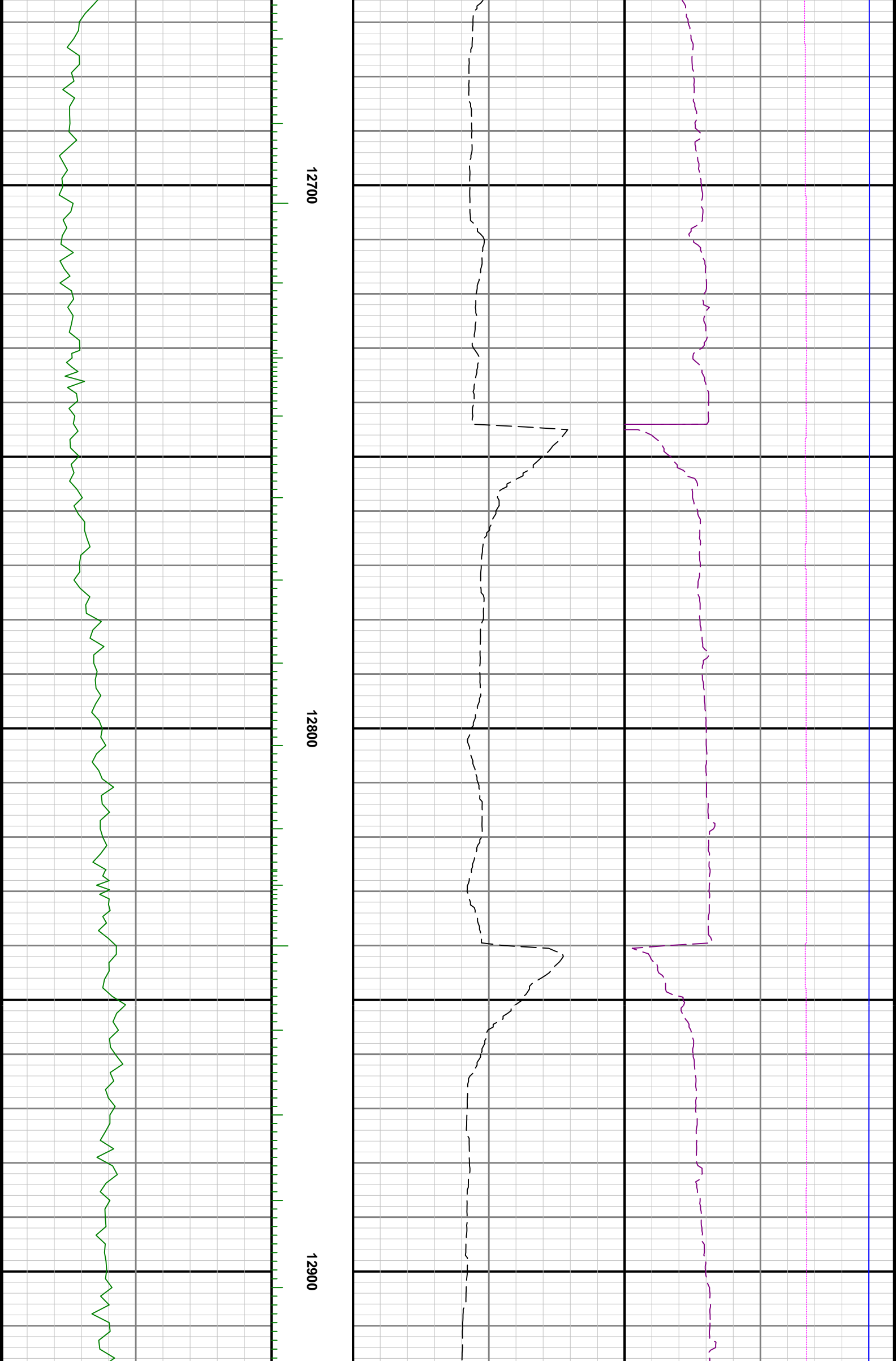


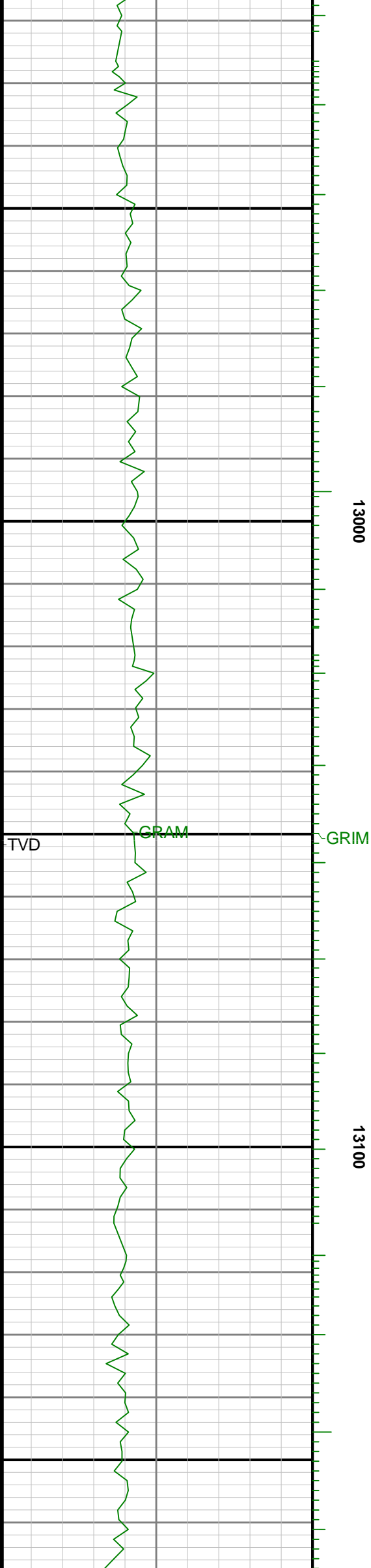




12500

12600





13000

13100

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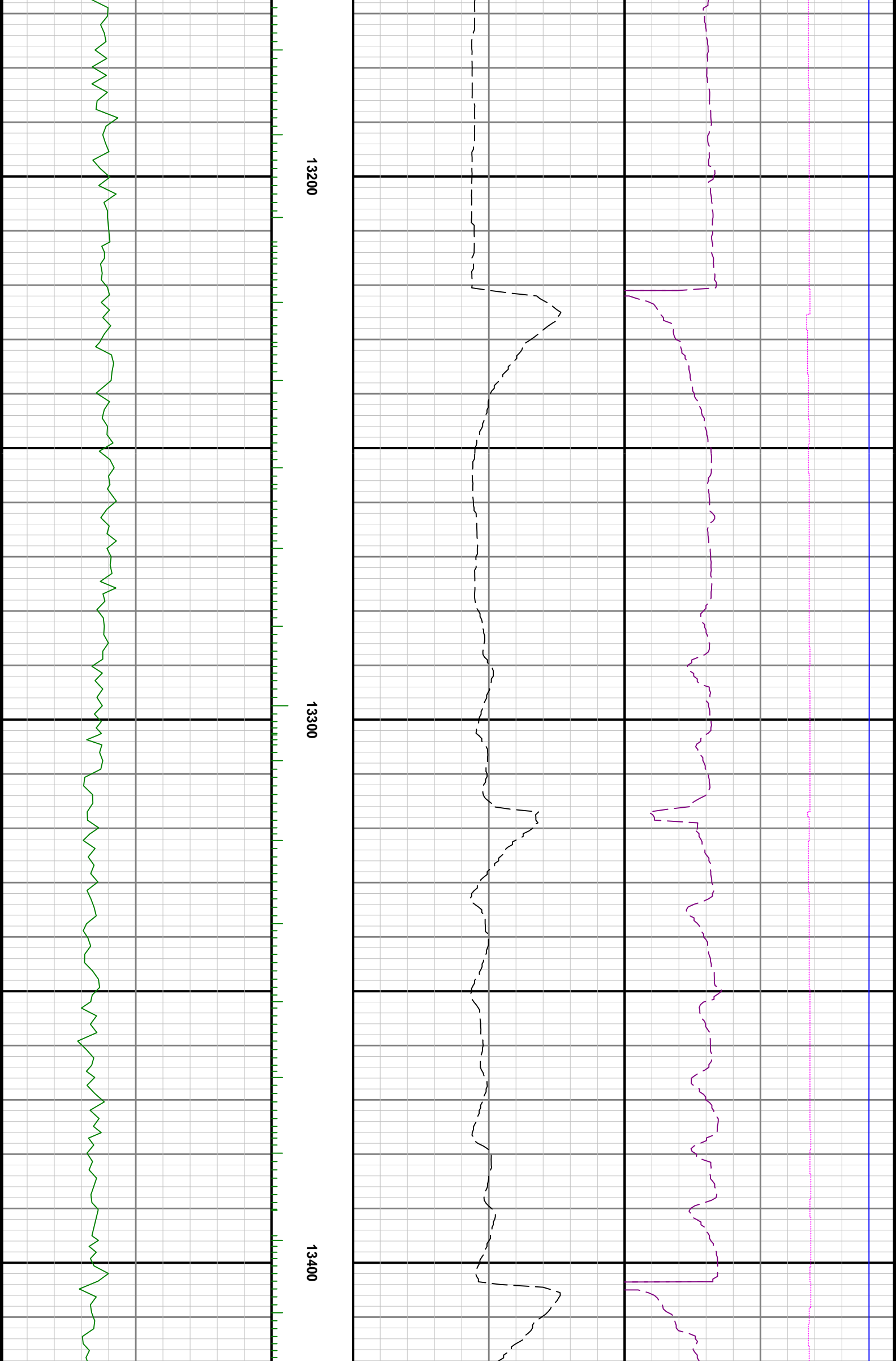
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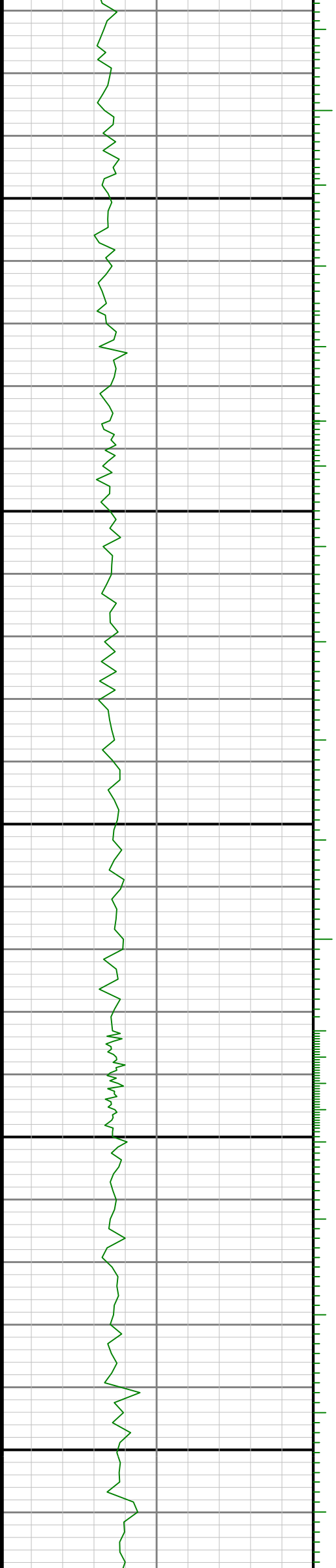


ROP\_AVG

WOB\_AVG

TCDM  
SINCL

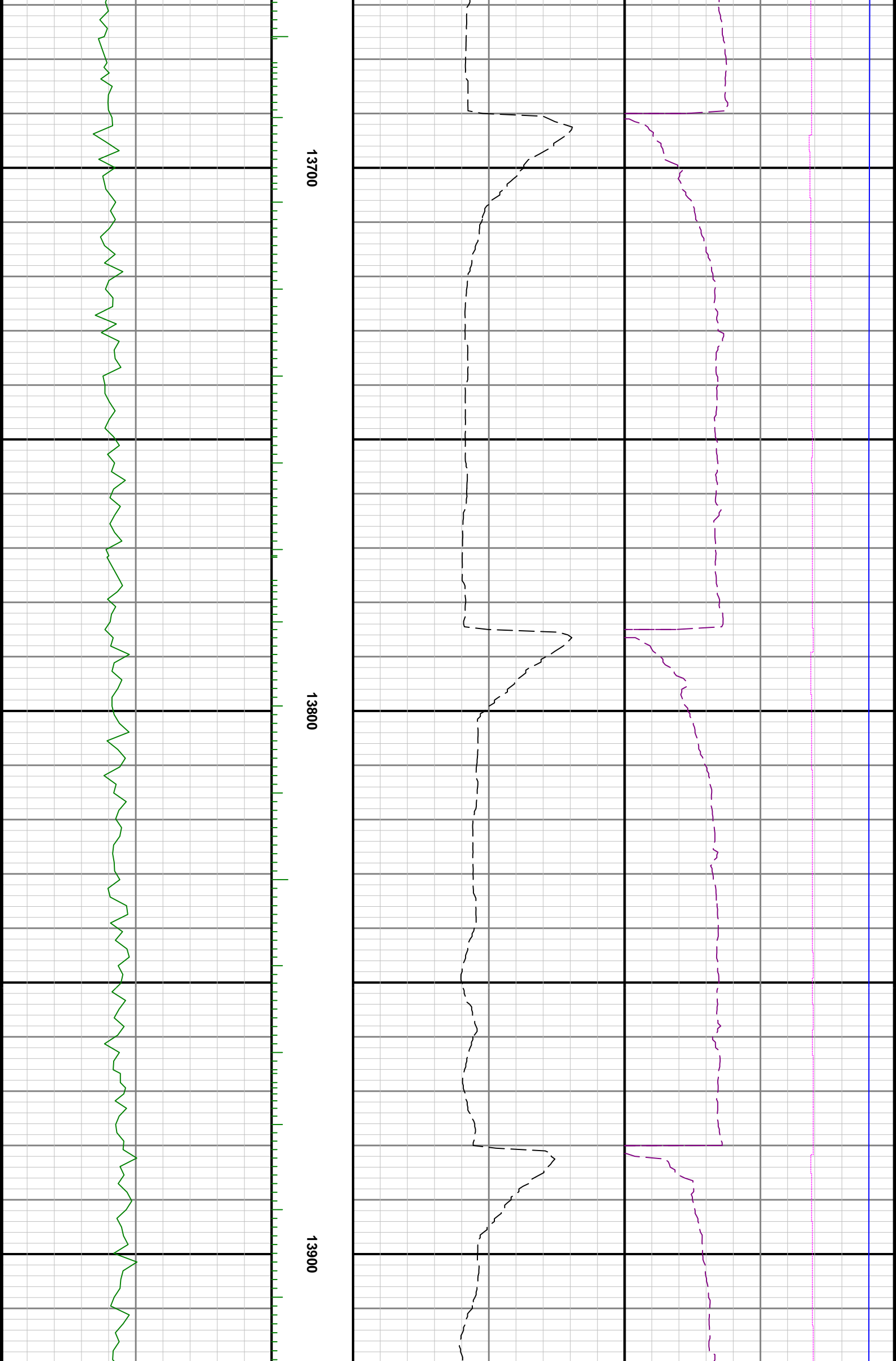


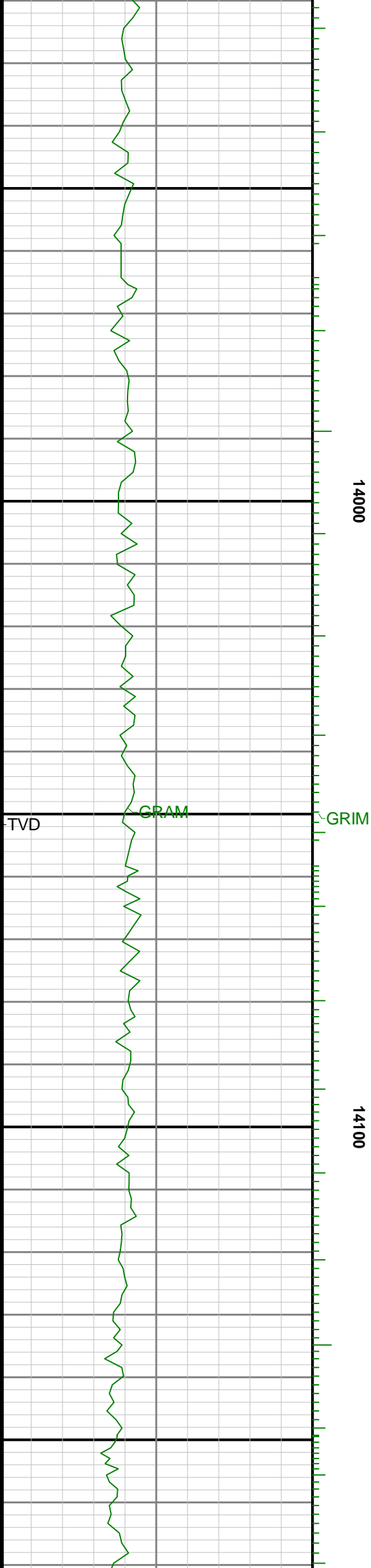


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13600

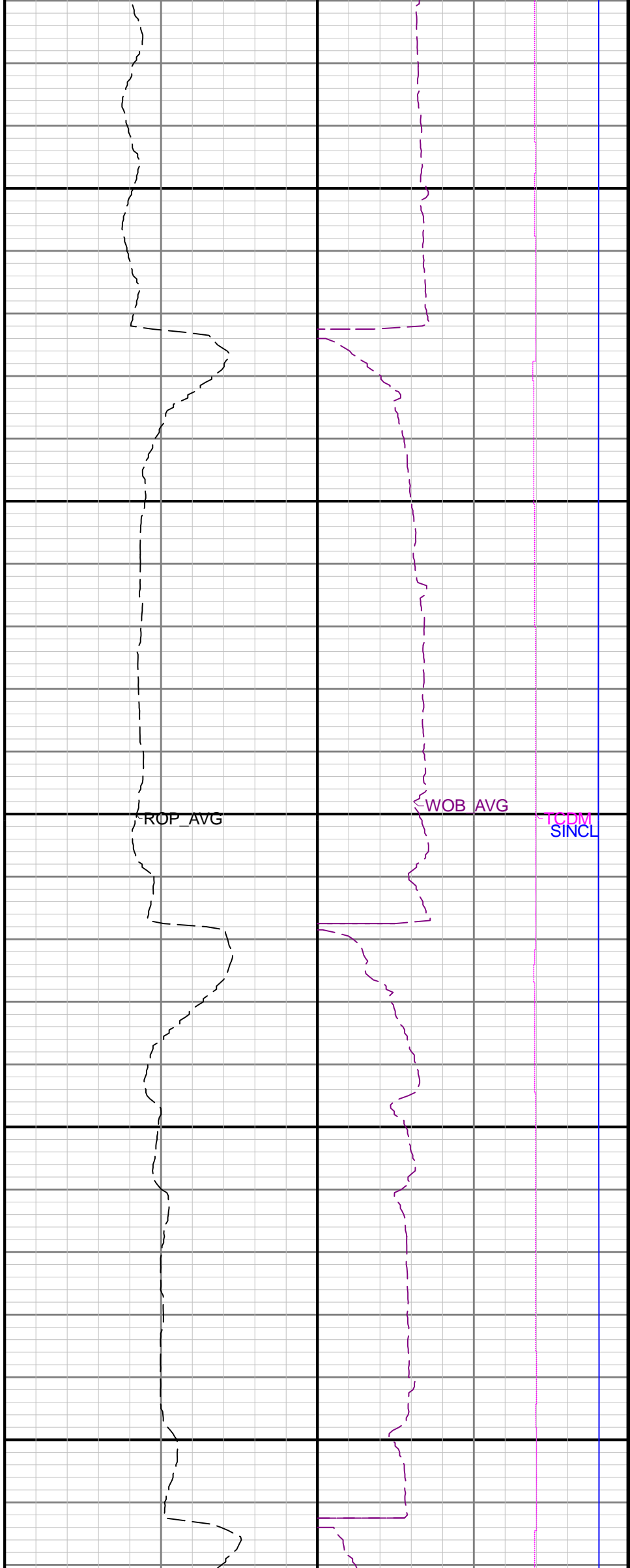






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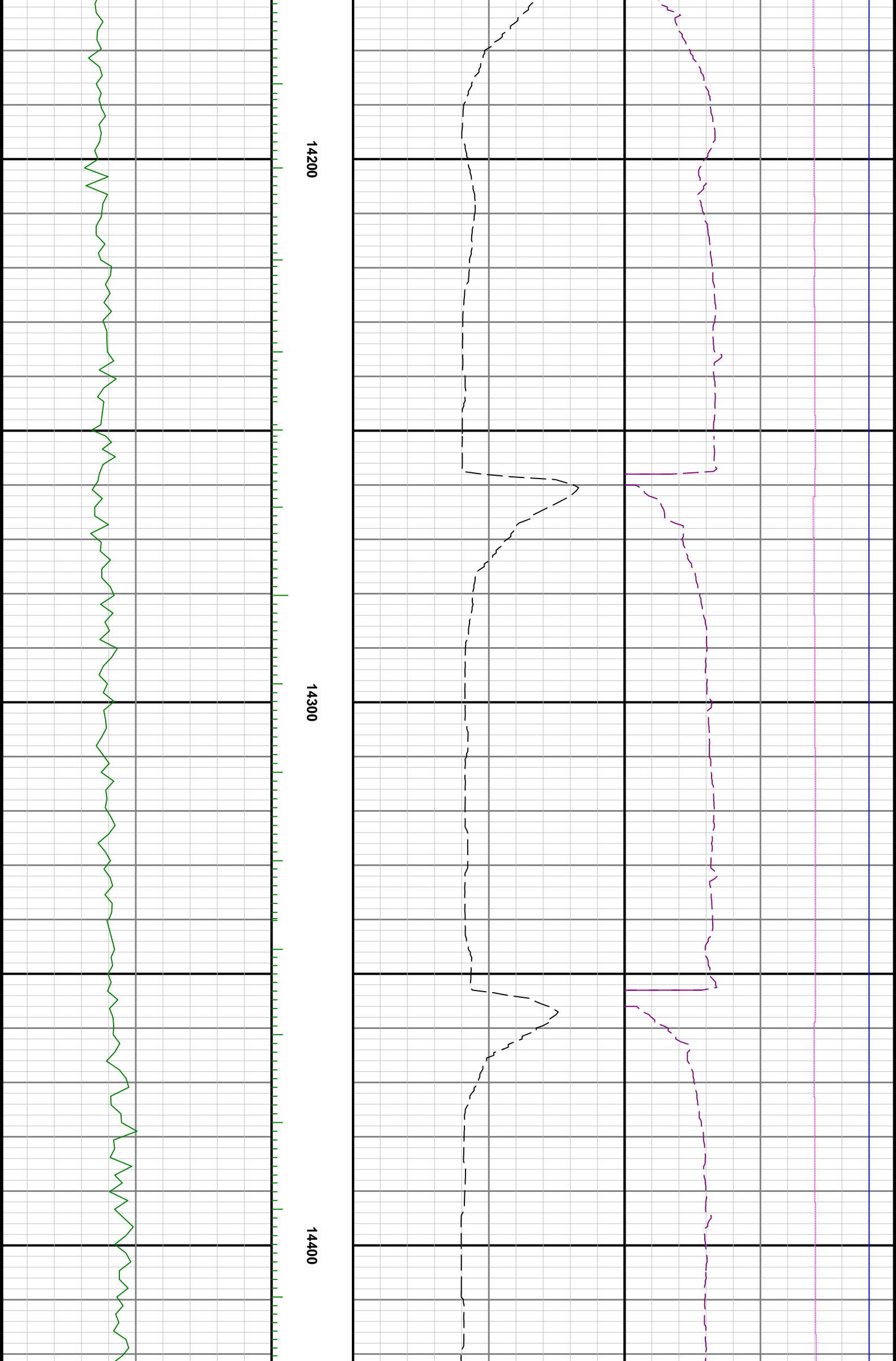
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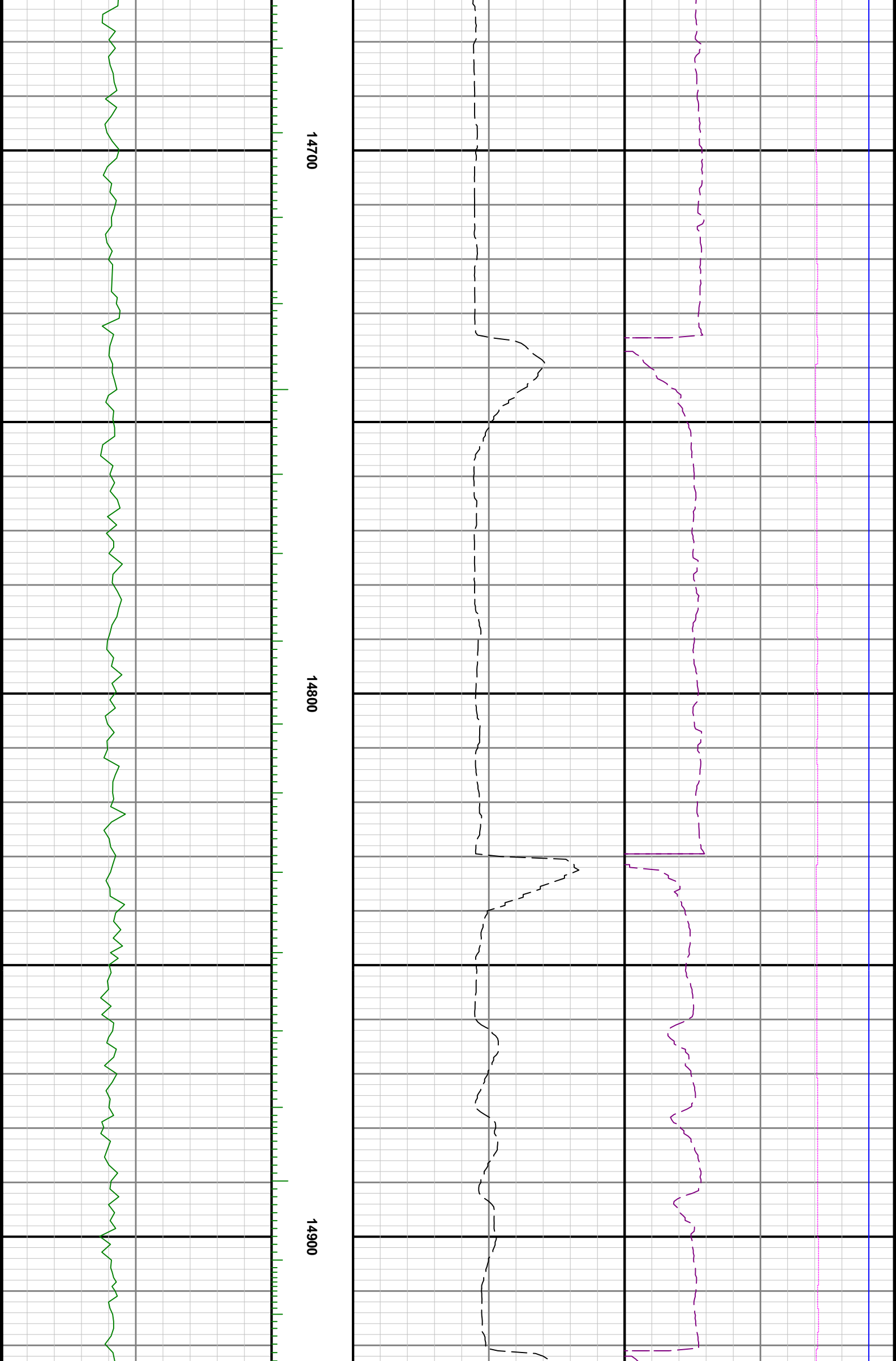
ROP\_AVG

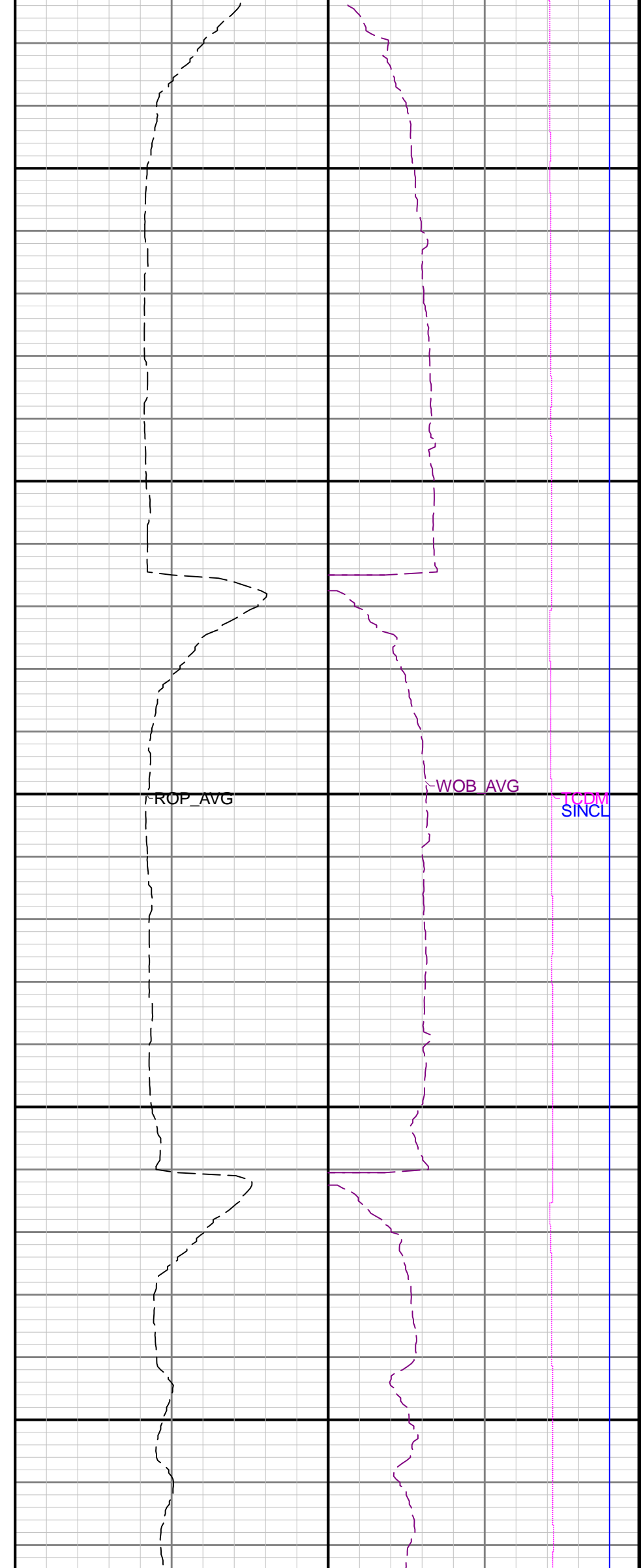
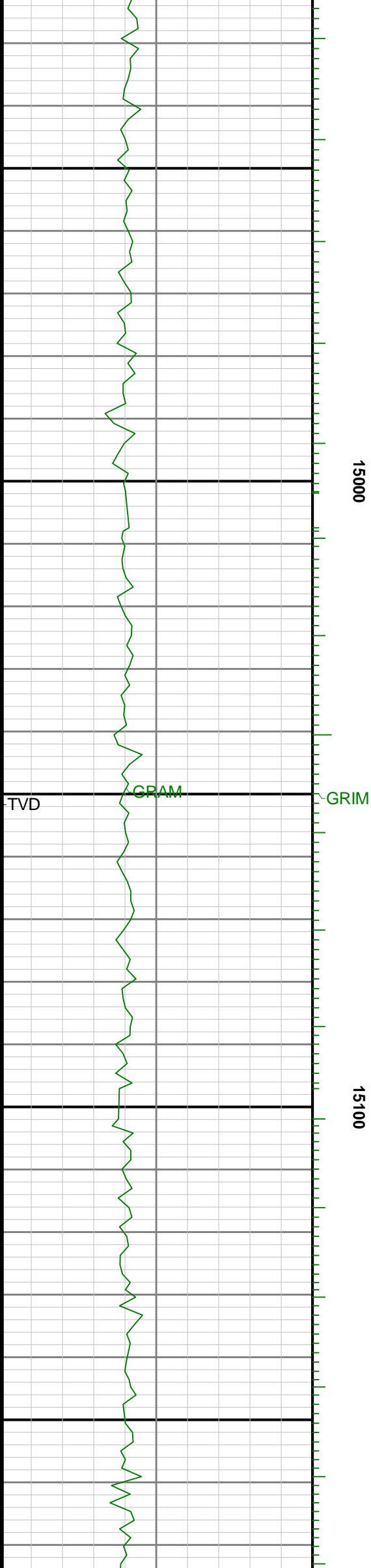
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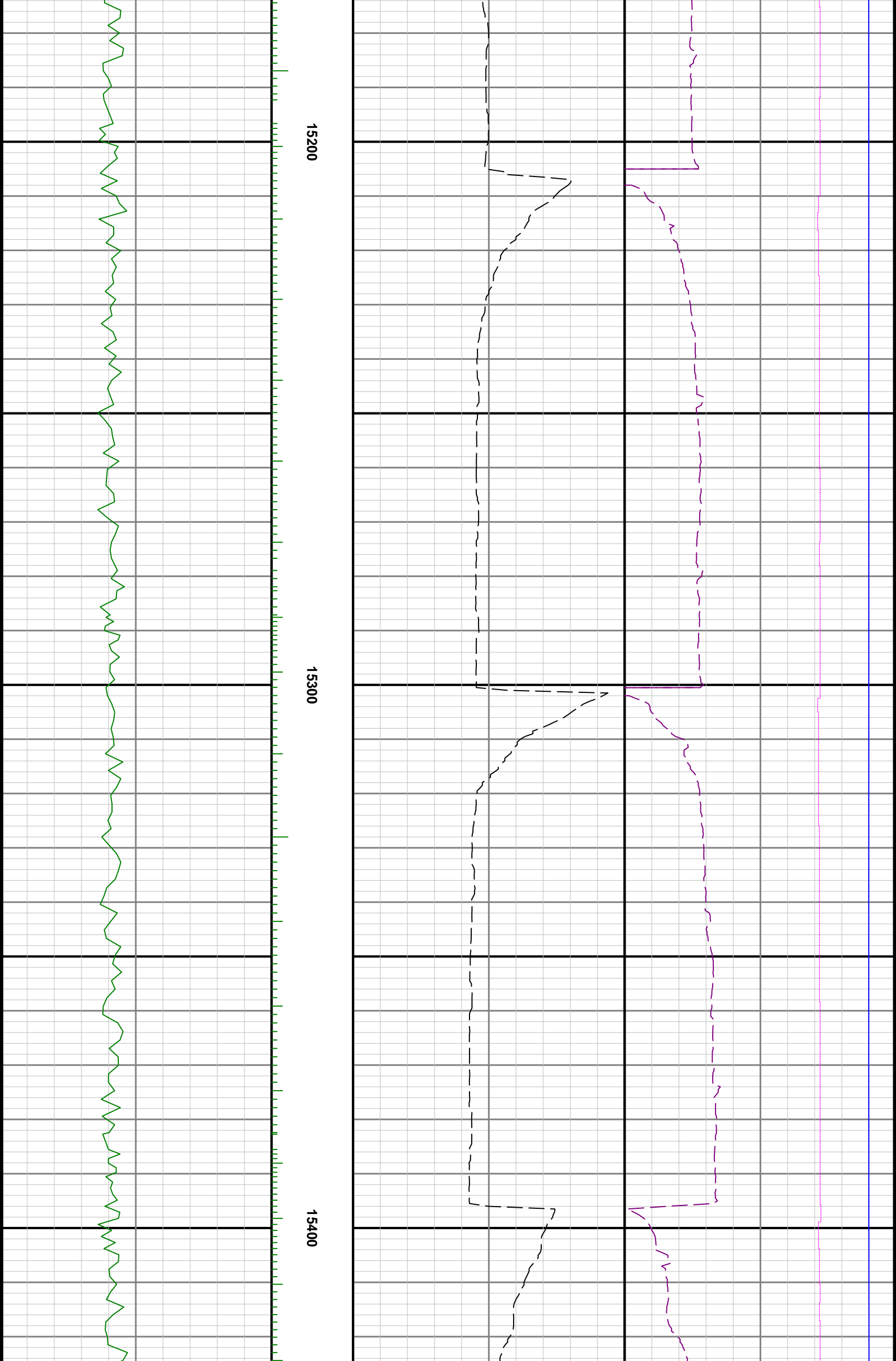
TCDM  
SINCL

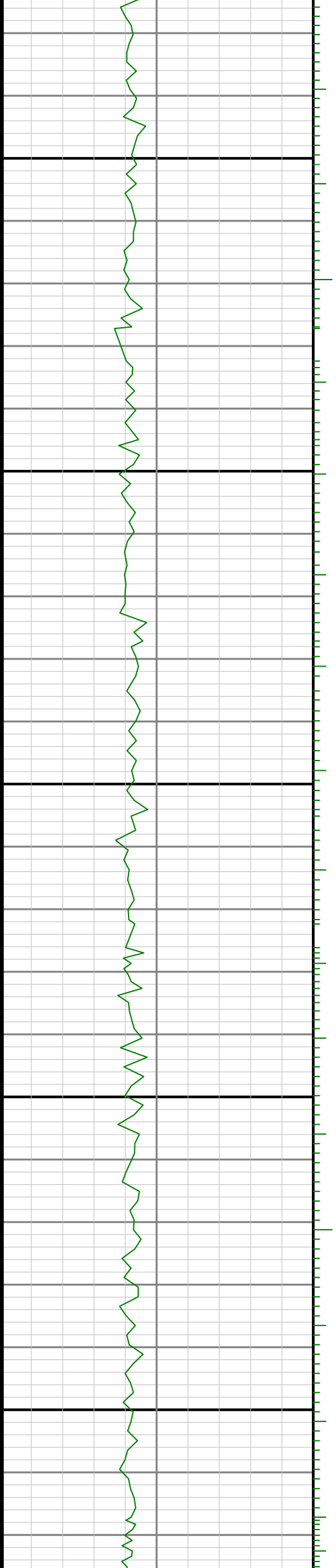






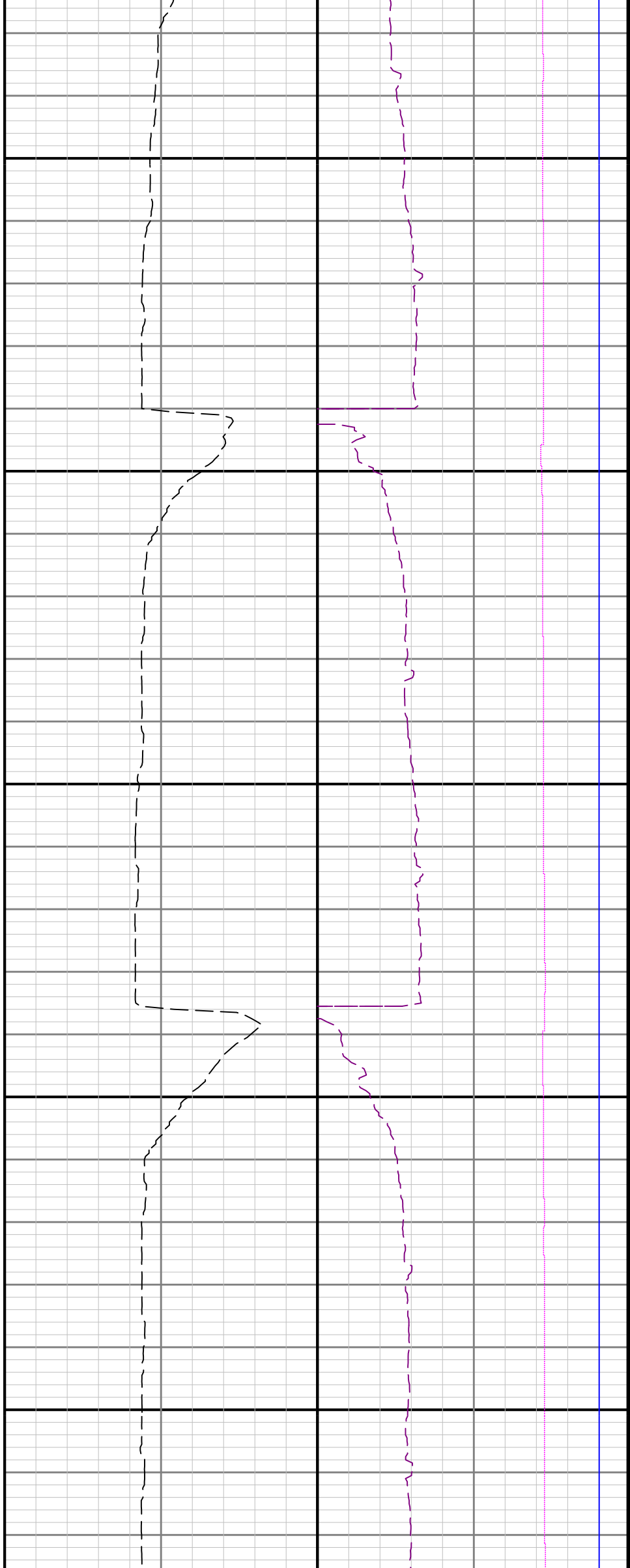




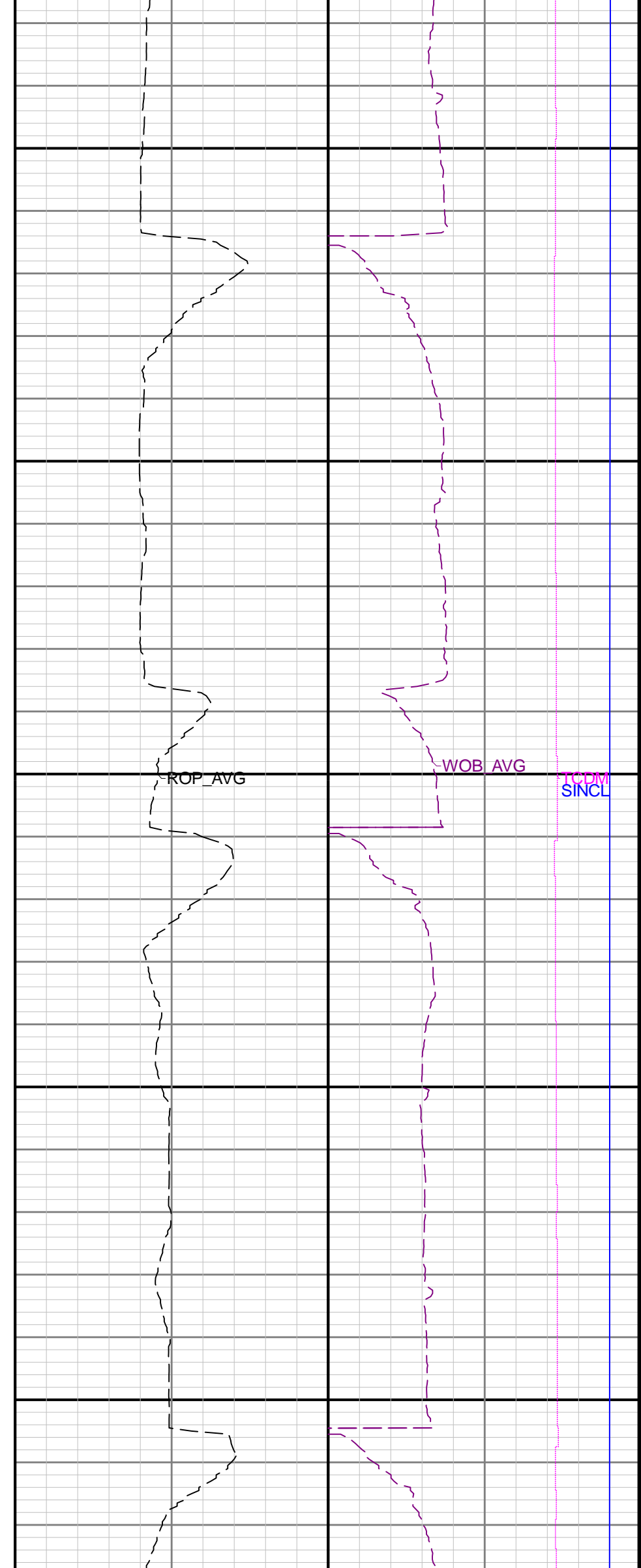
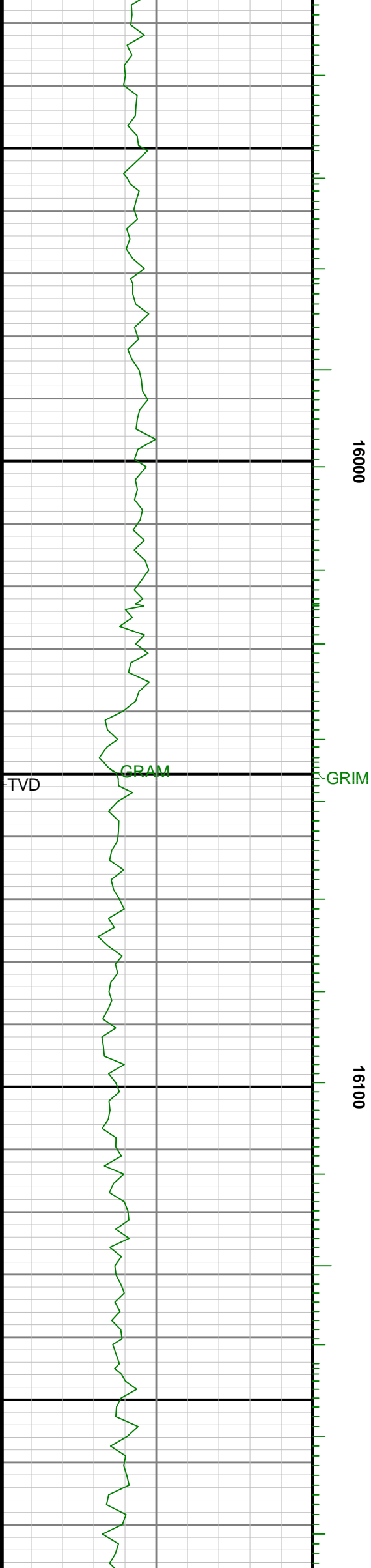


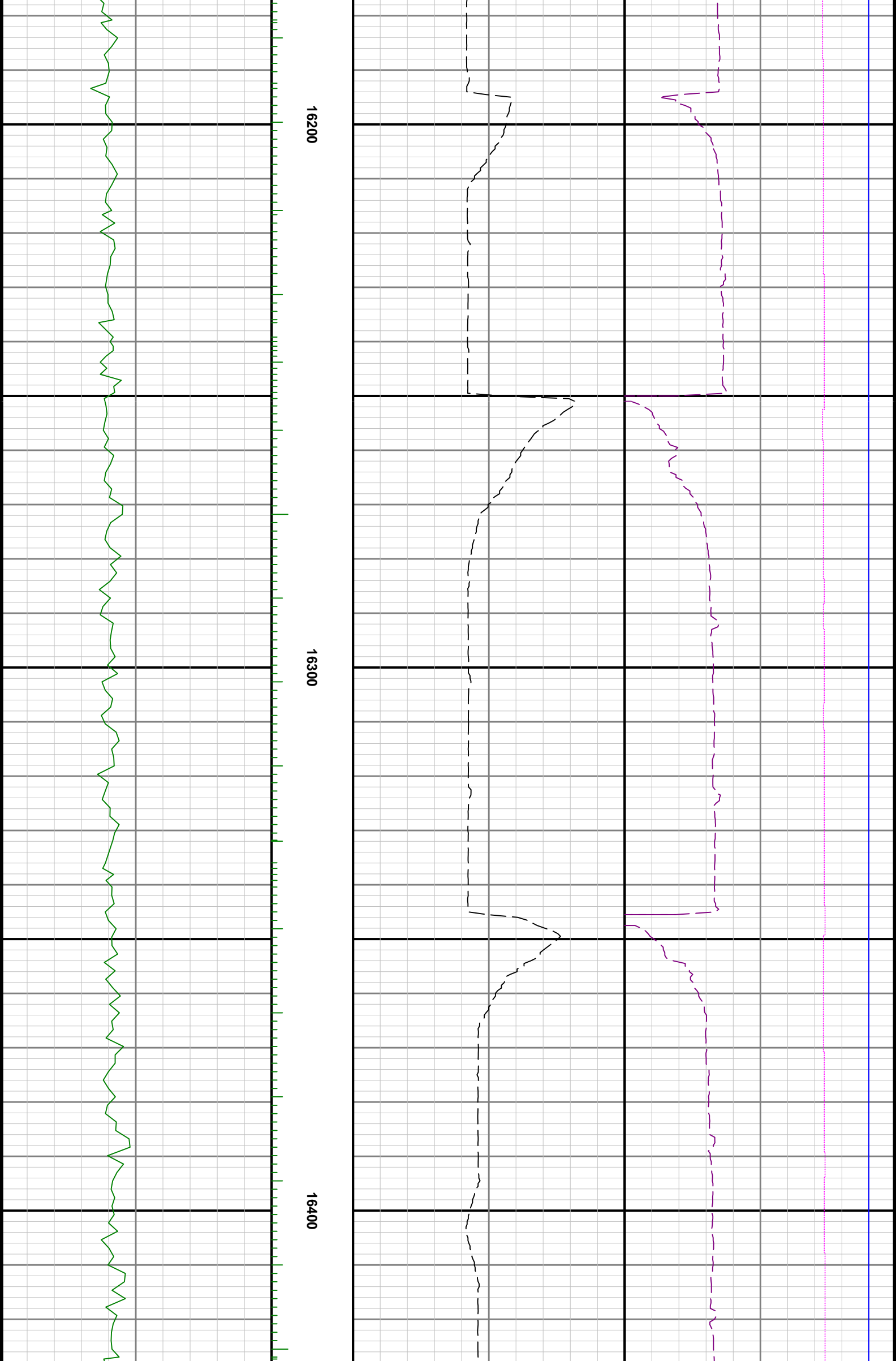
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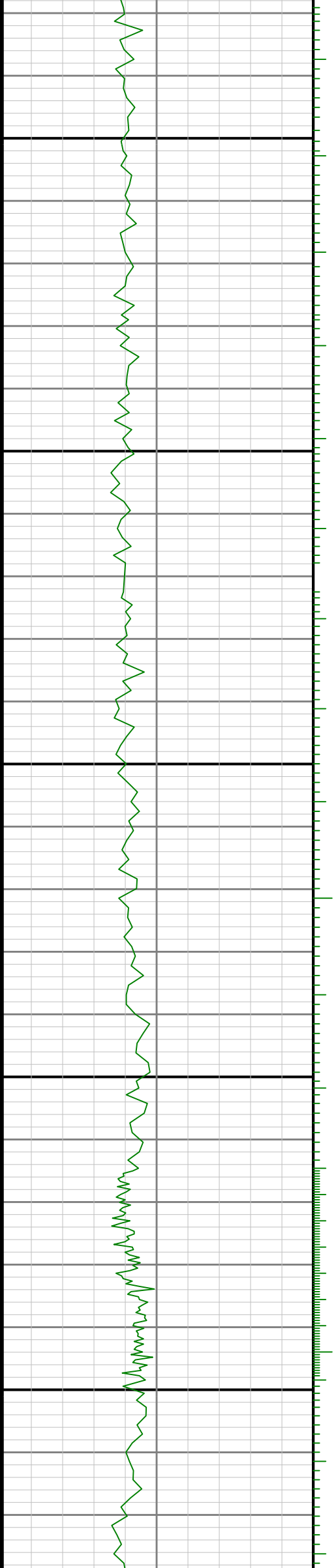
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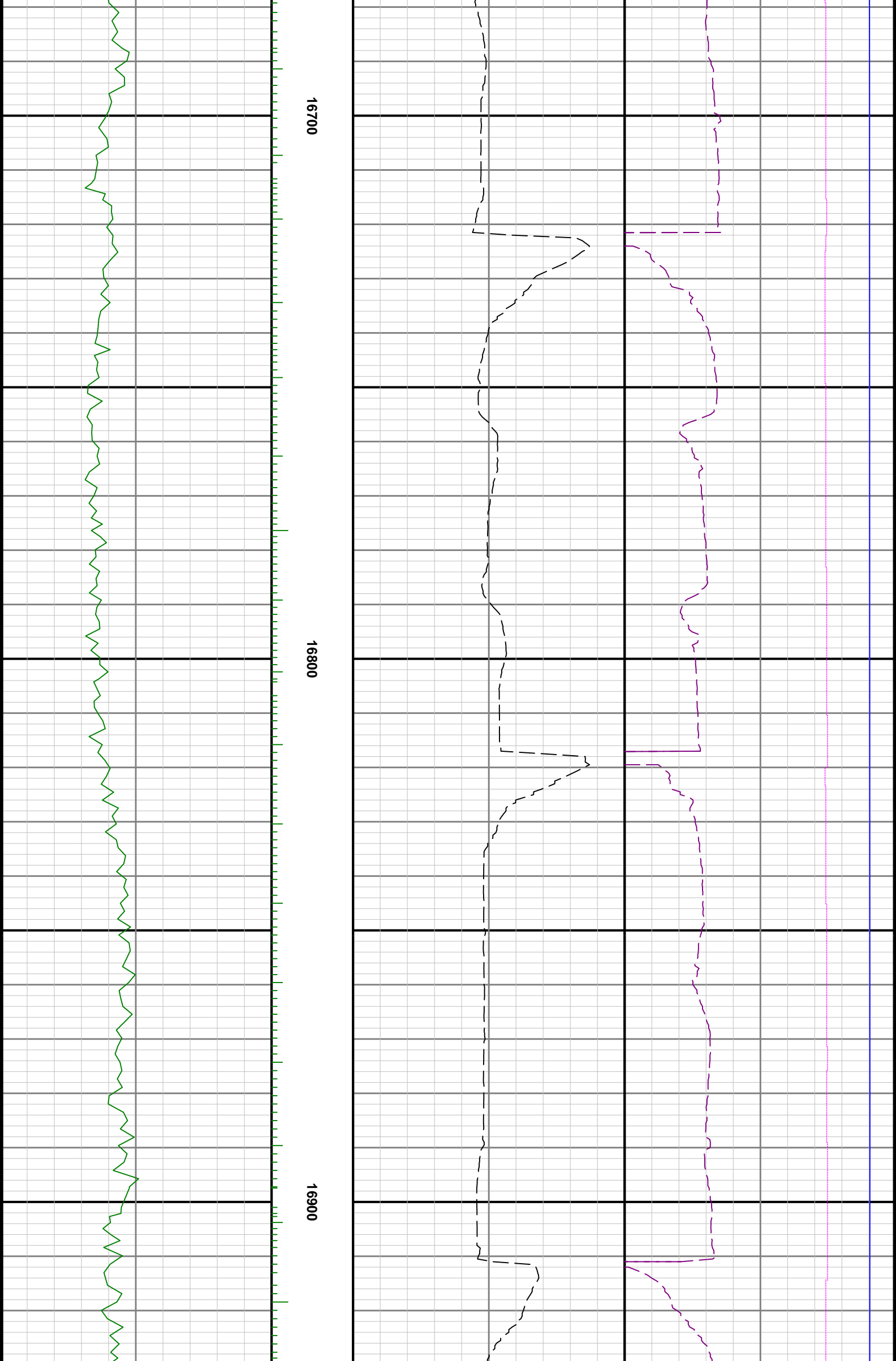


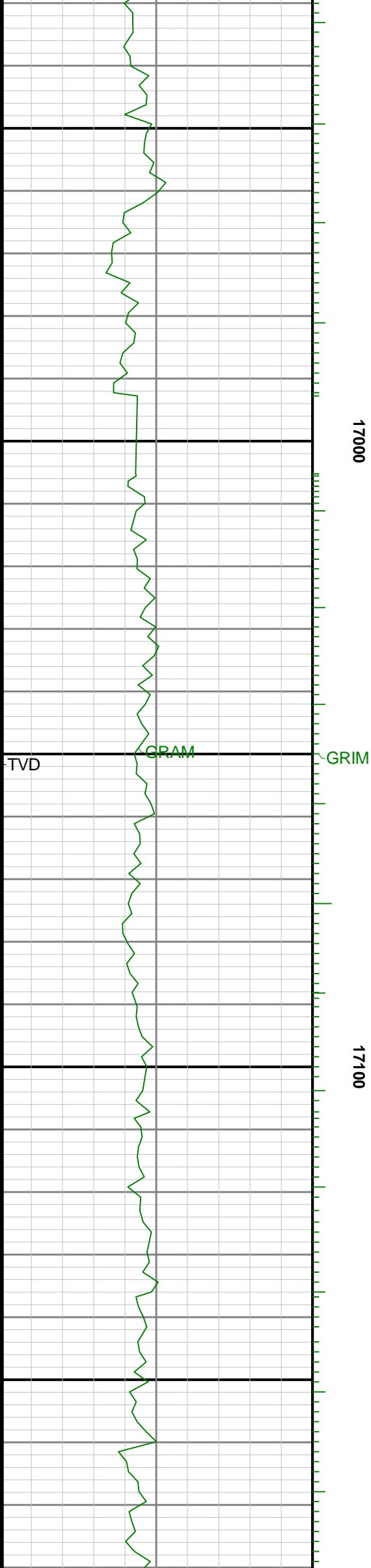


16500

16600





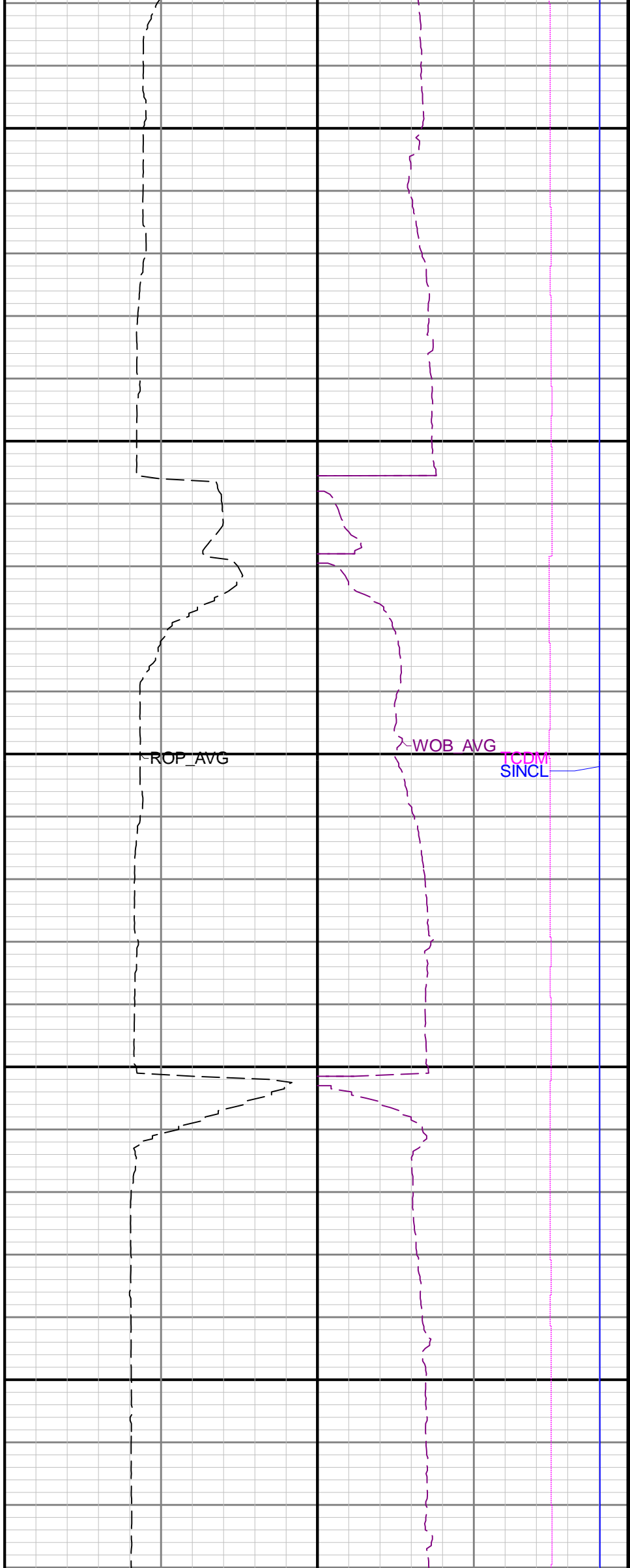


17000

17100

GRAM

TVD

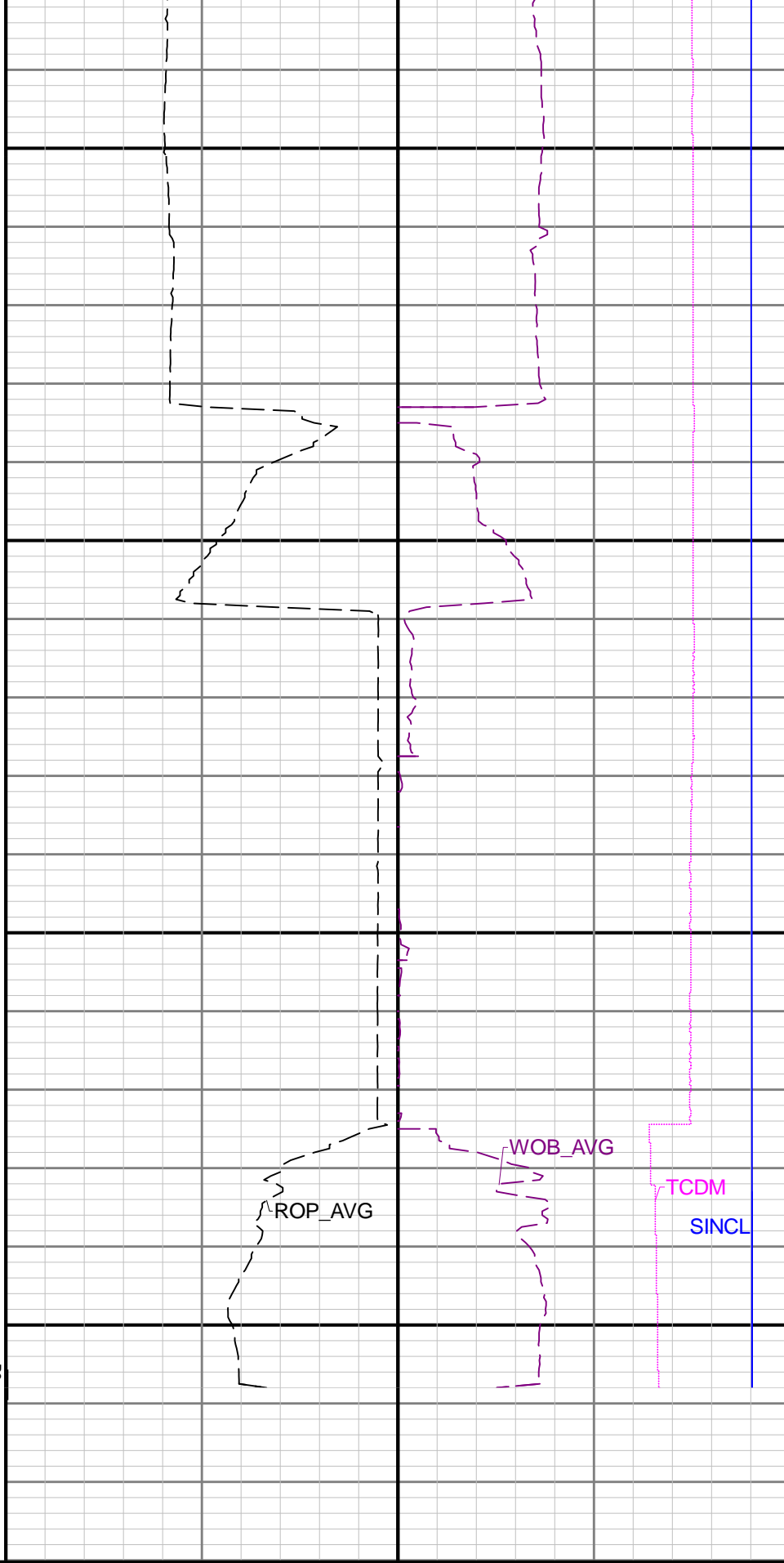
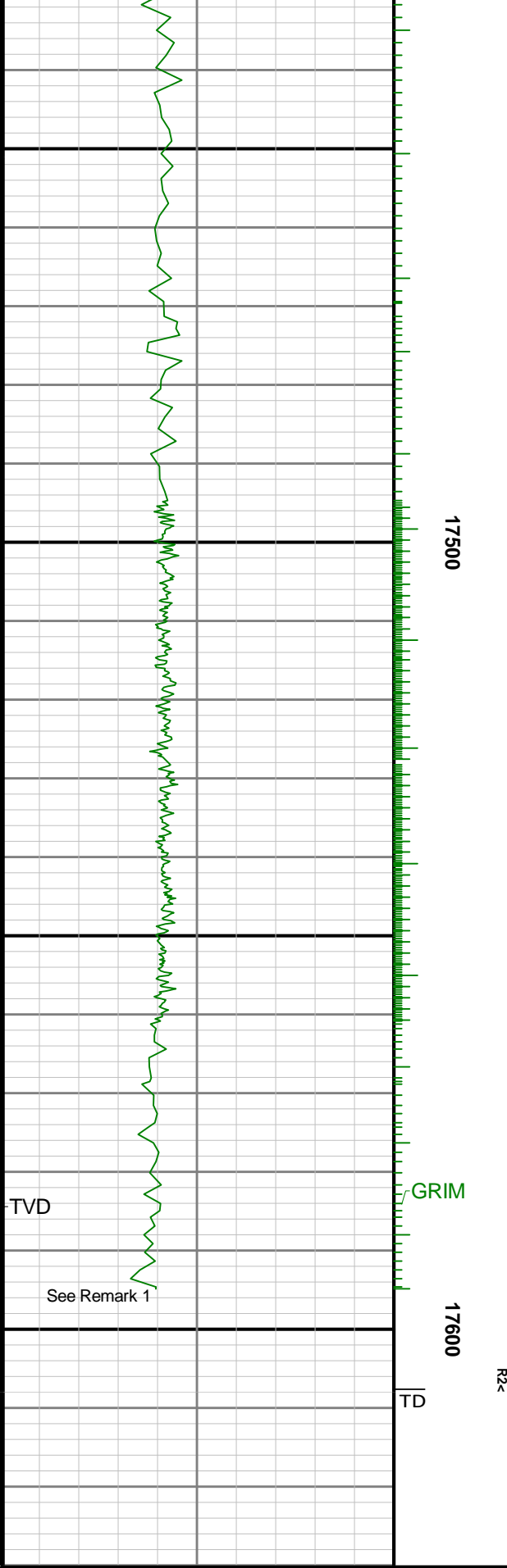


ROP\_AVG

WOB\_AVG

TCDM  
SINCL





Gamma Ray - Apparent 0.5 ft Average GRAM	0	300
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		