

Witness

Name	LWD Run Number
Kyle Renton	1,2,3,4
Mark Hicks	1,2,3,4

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (m.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
10/Aug/2016 06:40	4	5395	Water Based	9.9	9	9.1	7.8	2 / 88.6	Suction	1500	0.0
11/Aug/2016 11:20	4	10868	Water Based	10.0	11	9.0	6.0	2 / 88.6	Suction	1500	0.0
12/Aug/2016 05:45	4	13990	Water Based	10.4	11	9.1	6.0	2 / 86	Suction	1400	0.0

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent 0.5 ft Avg	API
GRIX	Gamma Ray Density	unitless
GRSI	Gamma Ray Sliding Indicator	unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate Of Penetration 3.0 ft Avg	ft/hr
TCDX	Downhole Temperature	deg F
TVD	True Vertical Depth	ft
WOBA	Surface Weight on Bit 1.0 ft Avg	klbs

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12131653	Directional	50.37	8.250	3.250
1	SRIG	12600749	Gamma	46.95	8.250	3.250
2	DIR	12042365	Directional	45.10	6.750	3.250
2	SRIG	12899613	Gamma	41.69	6.750	3.250
3	DIR	12042365	Directional	45.13	6.750	3.250
3	SRIG	12899613	Gamma	41.72	6.750	3.250
4	DIR	11983381	Directional	46.18	6.750	3.250
4	SRIG	13640750	Gamma	42.77	6.750	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

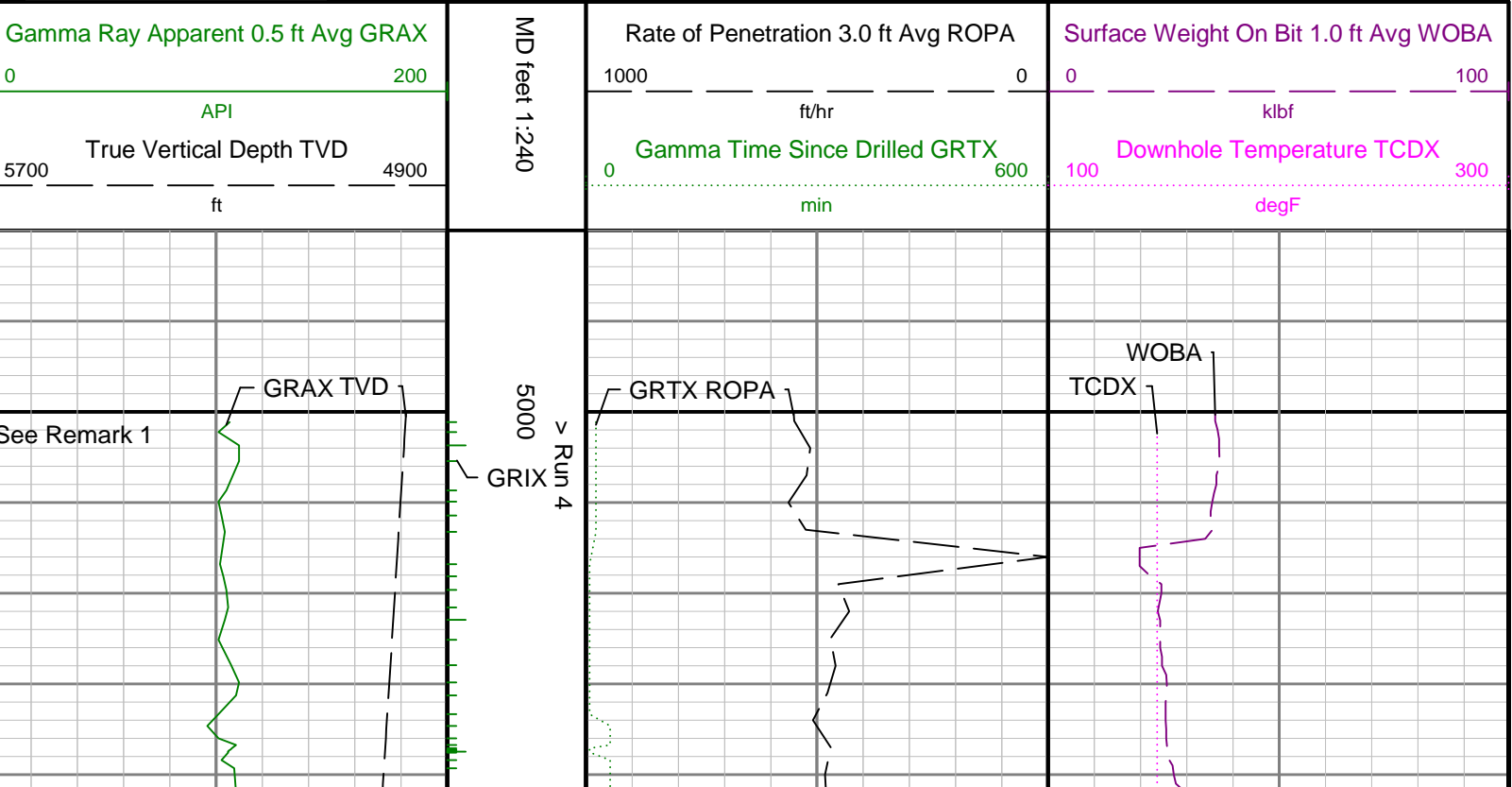
- 1.) Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes LWD logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.
- 2.) Baker Hughes LWD runs 2,3,4 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 1/2 inch bit and steerable assembly from 2095 to 15844 ft MD (2084 to 5617 ft TVD).
- 3.) A sliding indicator shown on the left side of track 1 as a heavy line. This indicator has been shifted to the Gamma Ray sensor offset to correspond to Gamma Ray data acquired while sliding.
- 4.) Gamma Ray Apparent (GRAX) is presented 0 to 200 API
- 5.) All surveys were corrected by Surcon Survey Management Services, with the exception of 149 ft MD

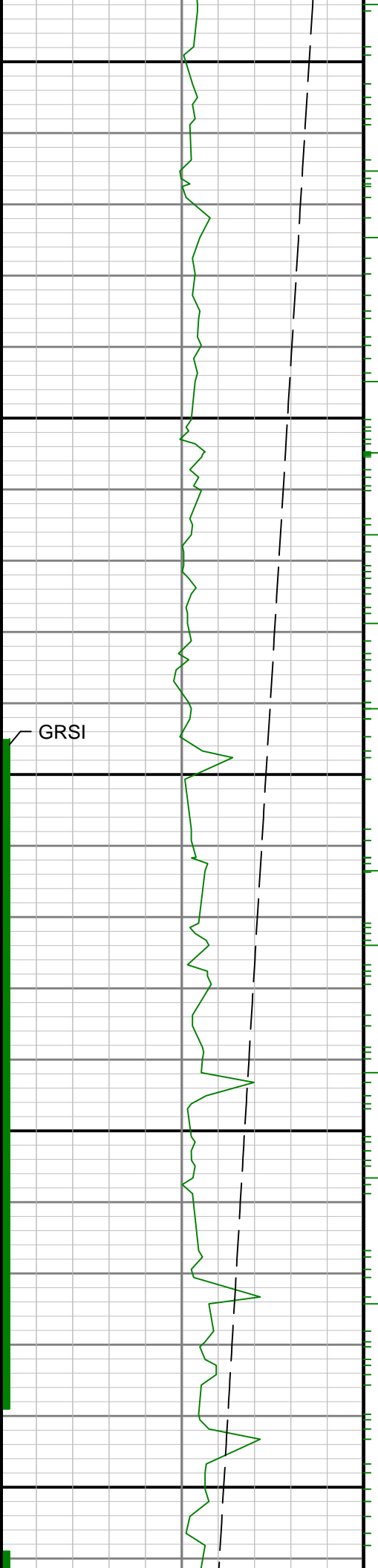
Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	4900	8.500	4	Gamma ray logging operations began at 4900 ft MD (4871 ft TVD).
2	5450	8.500	4	The interval from 5450 to 5600 ft MD (5377 to 5472 ft TVD) has poor gamma ray data density due to poor decoding caused by down hole issues.
3	15801	8.500	4	There is no gamma ray data from 15801 to 15844 ft MD (5617 ft TVD) due to sensor to bit offset at well TD.



Company : Whiting Oil & Gas Corp.
Well : Razor #250-2410
Interval : 4980.00 - 15860.00 feet
Created : 14/Aug/2016 12:30:17 AM





5100

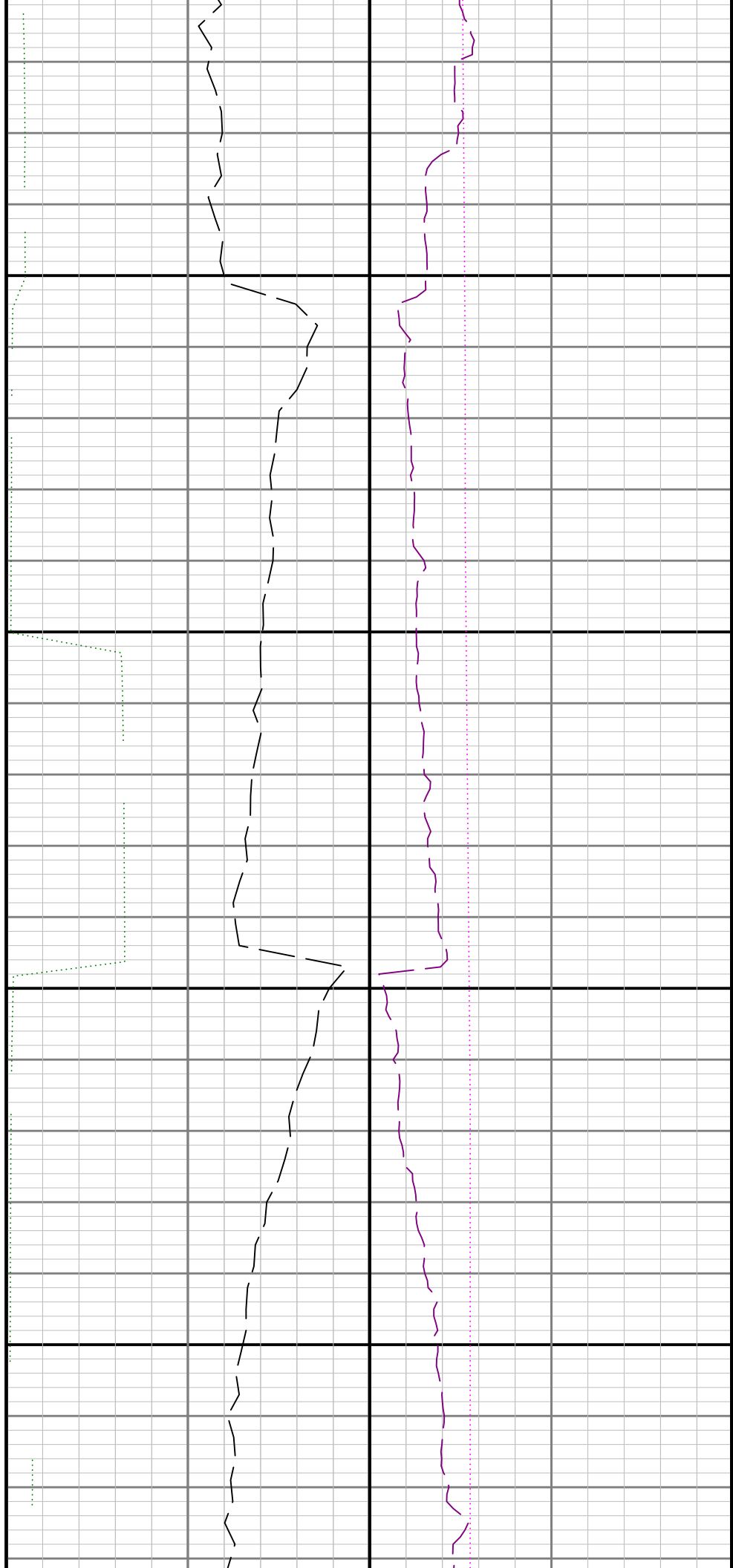
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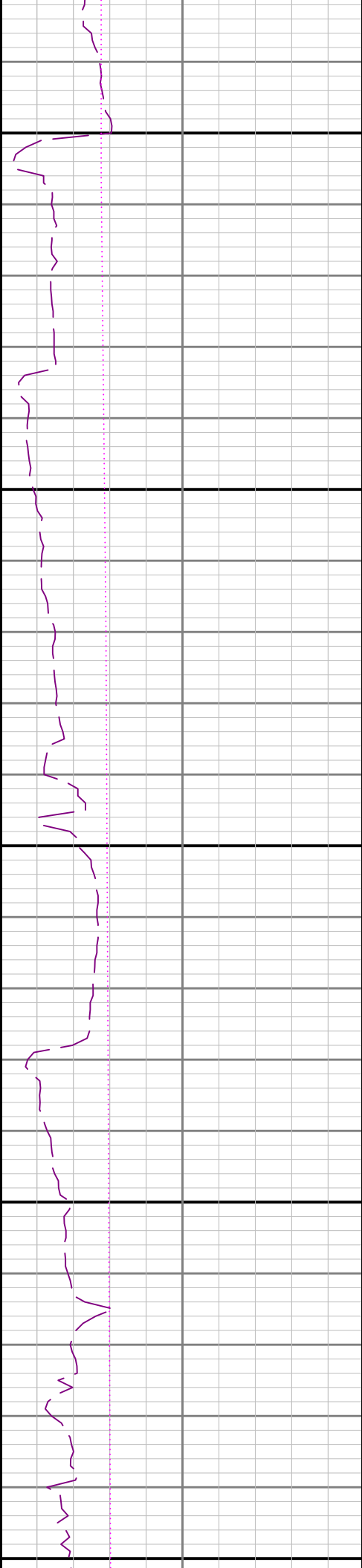
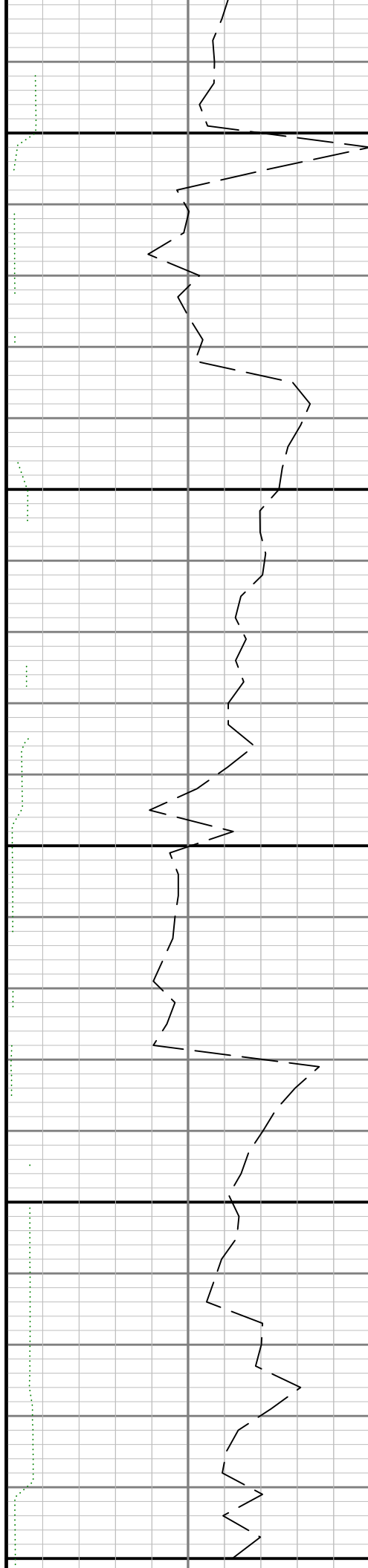


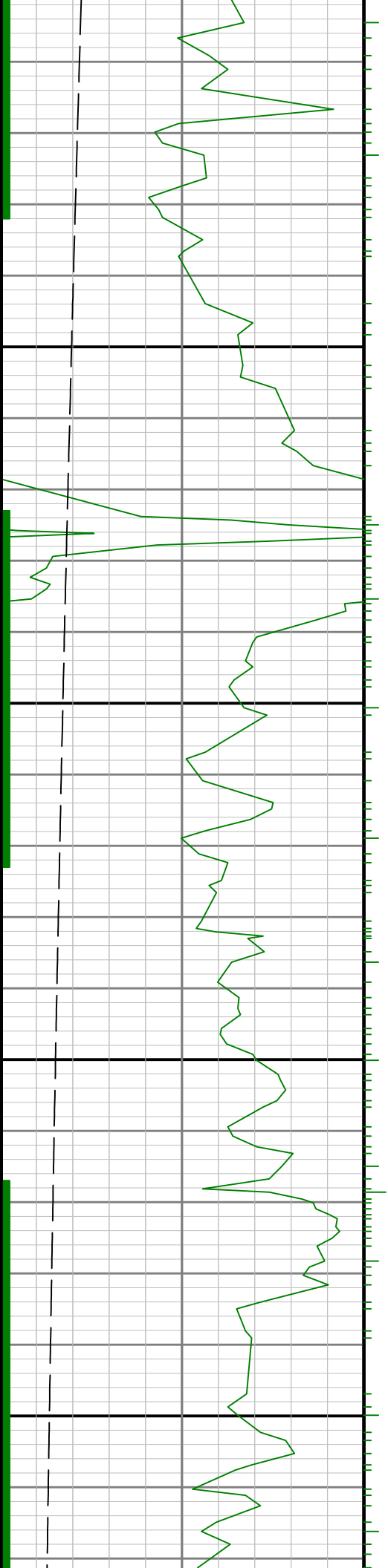


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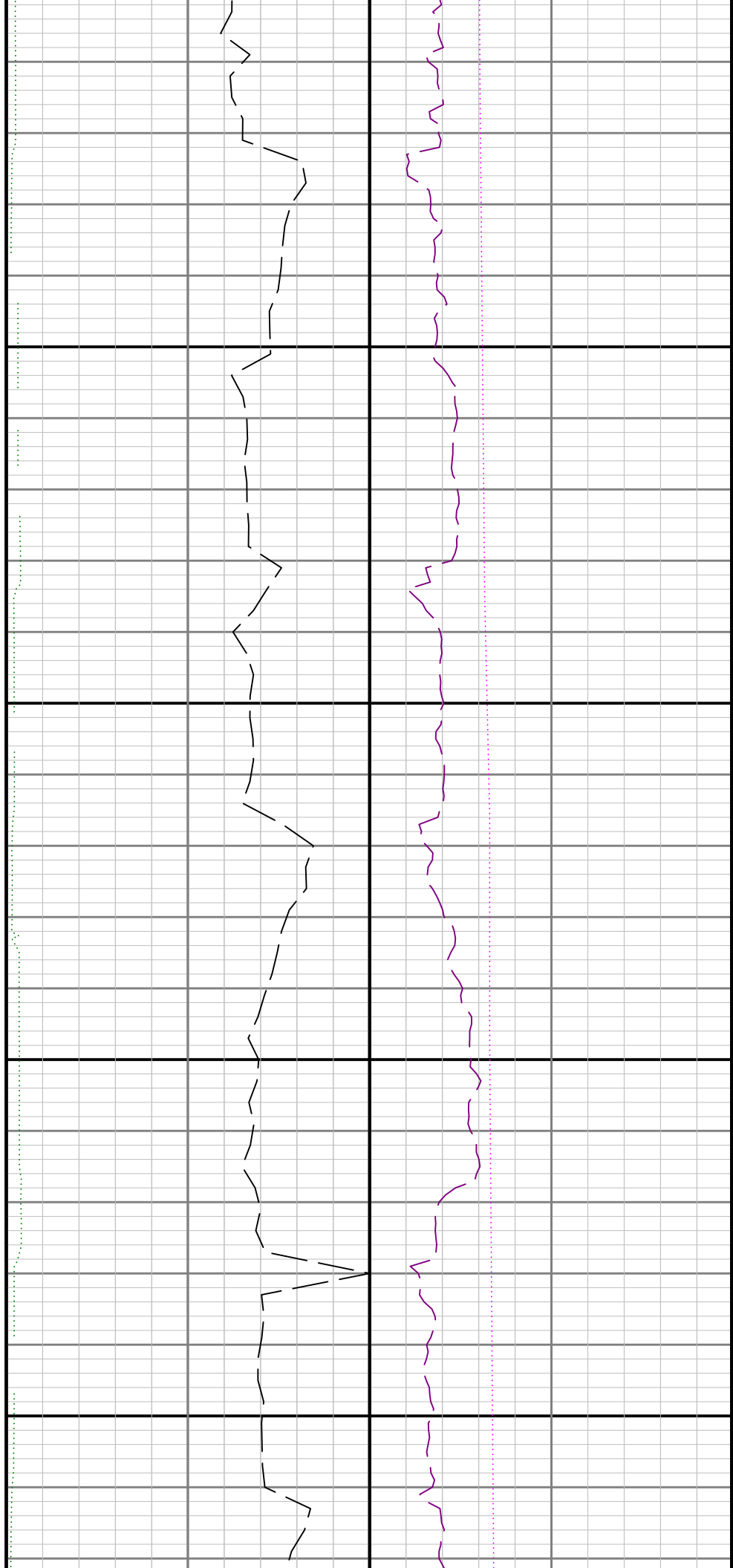
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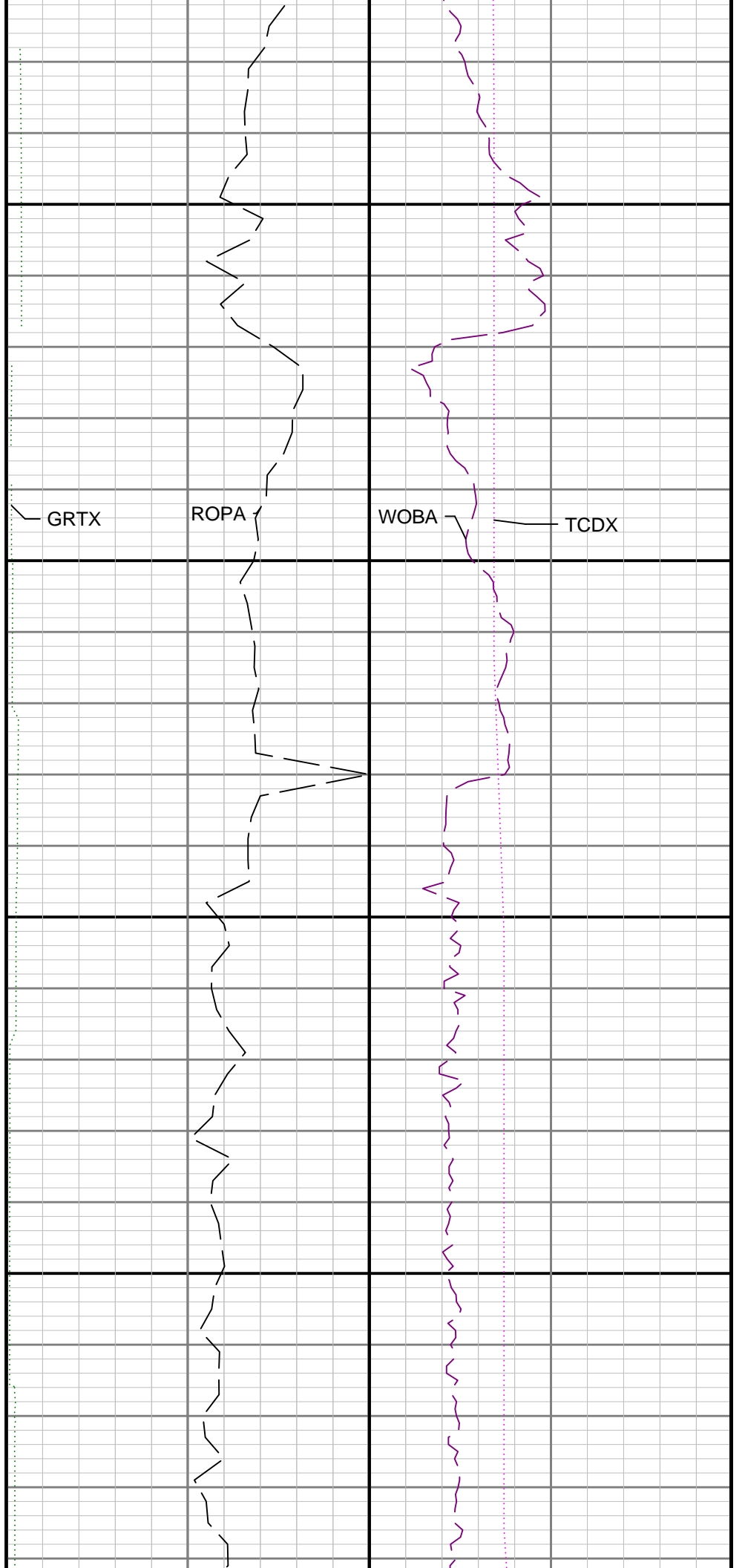
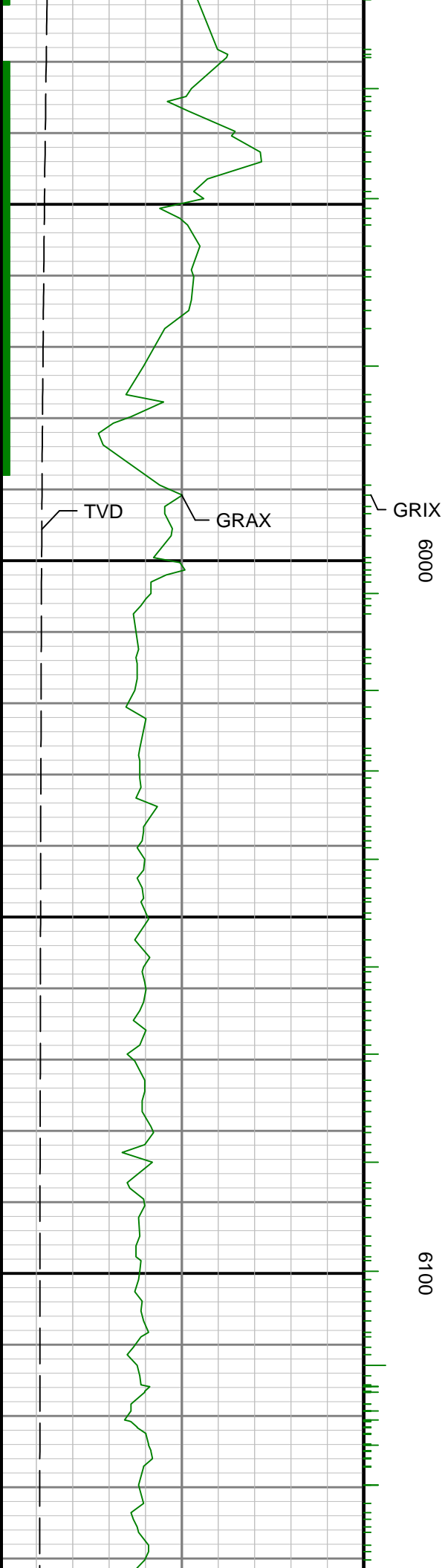
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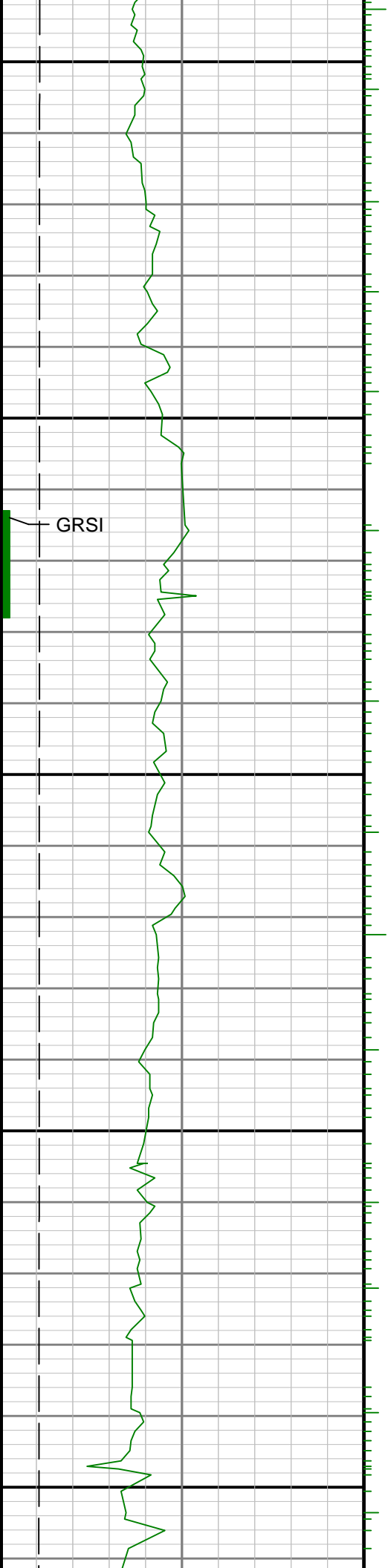




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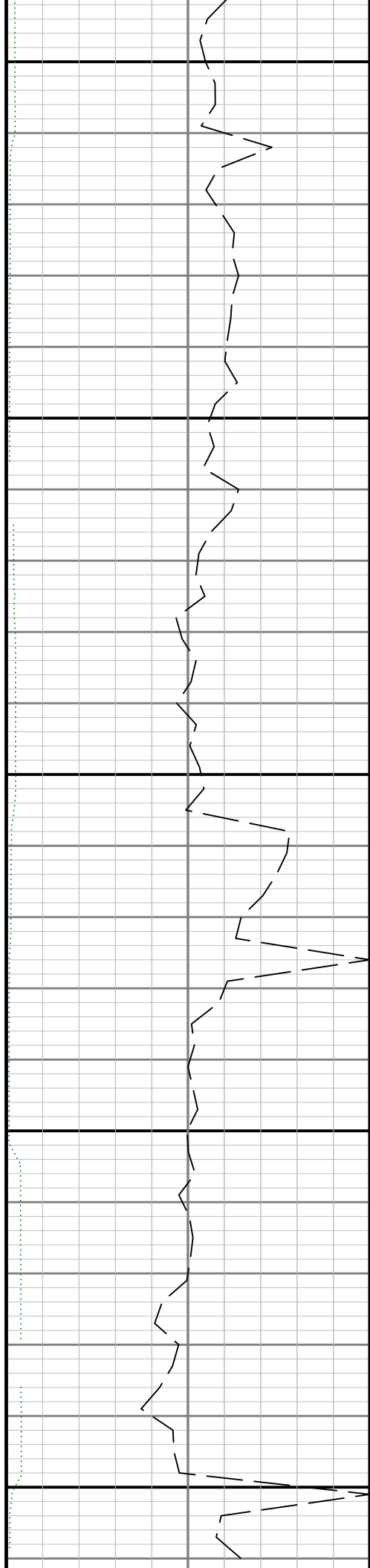


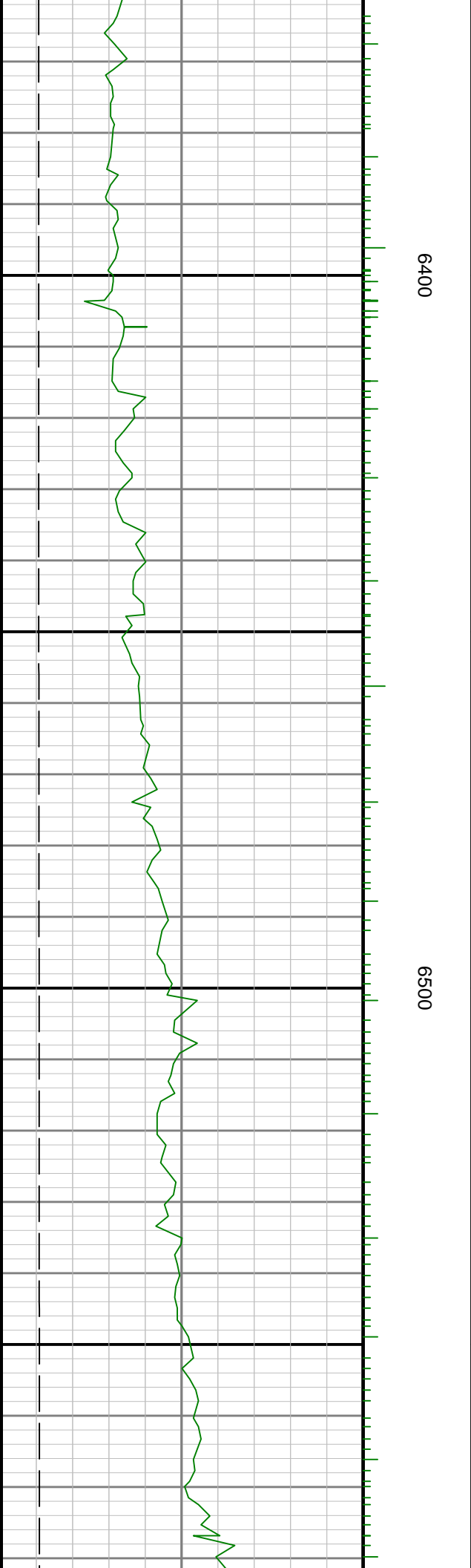
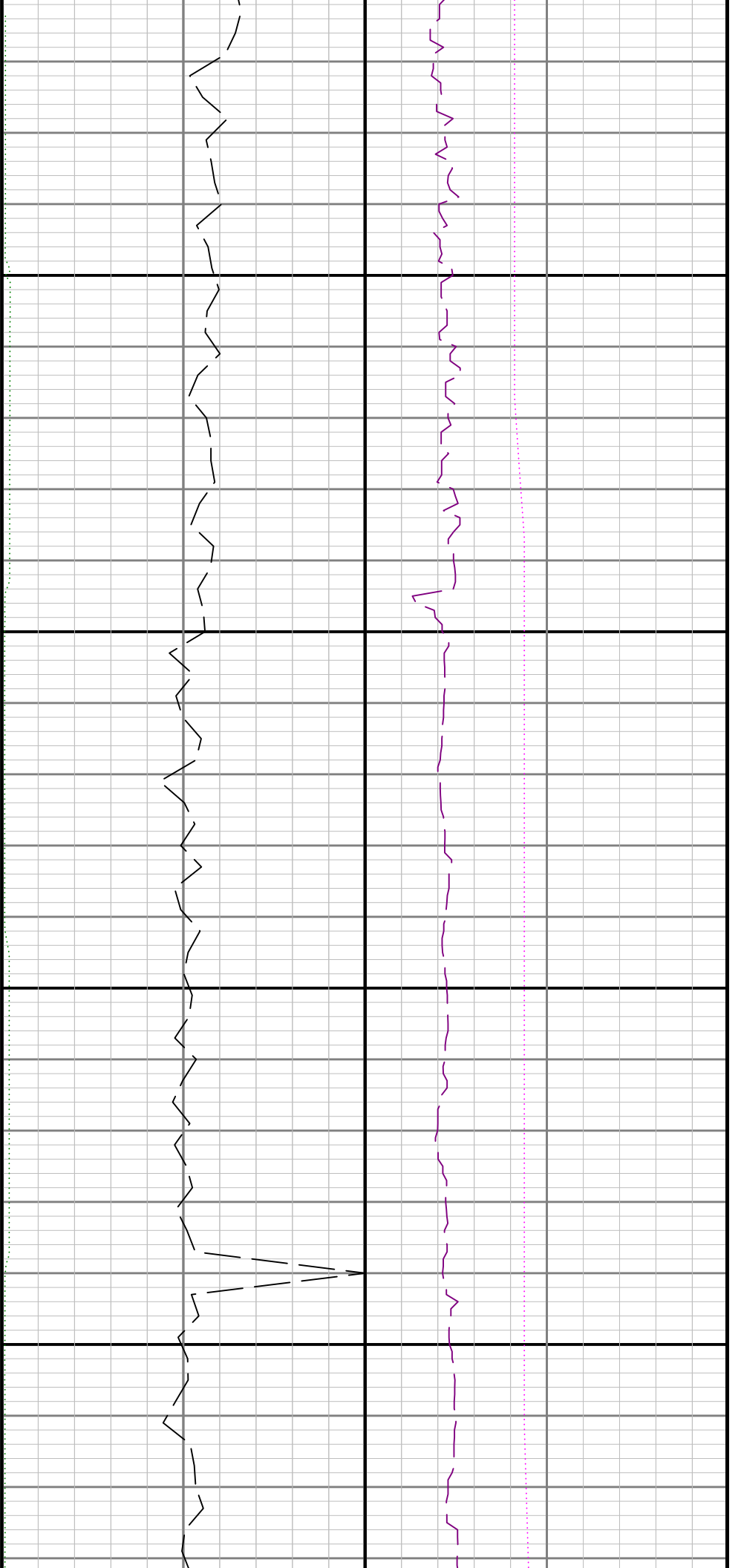




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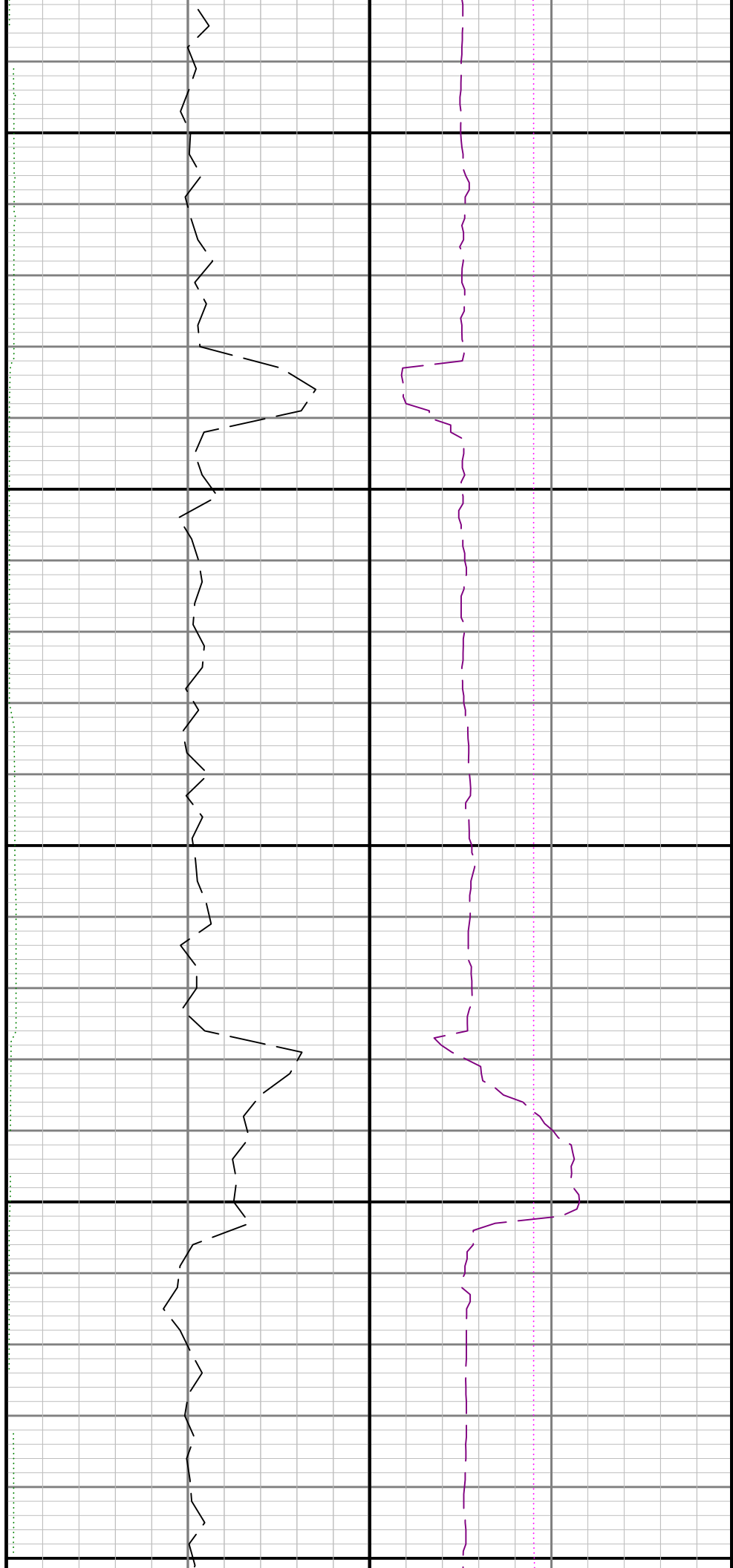


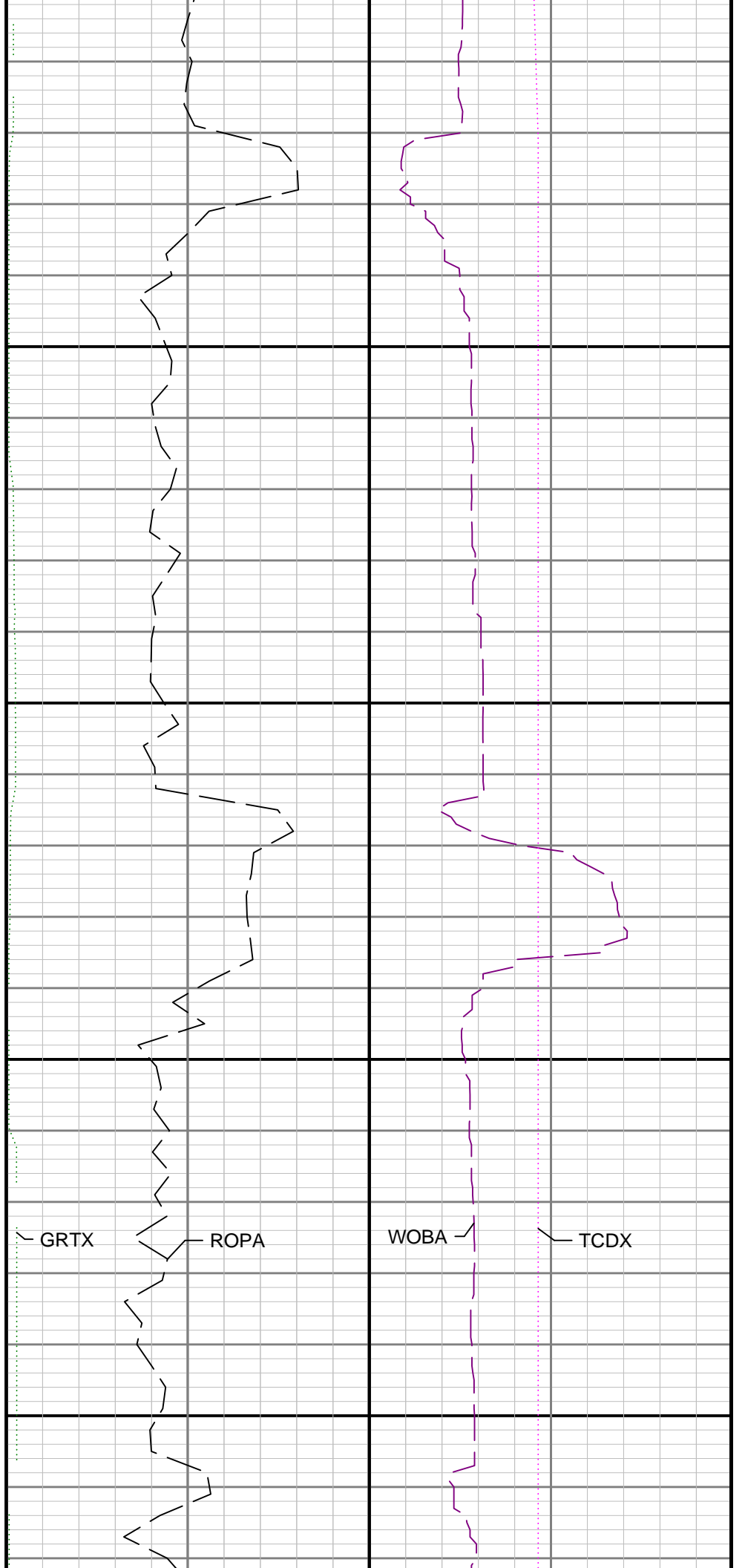
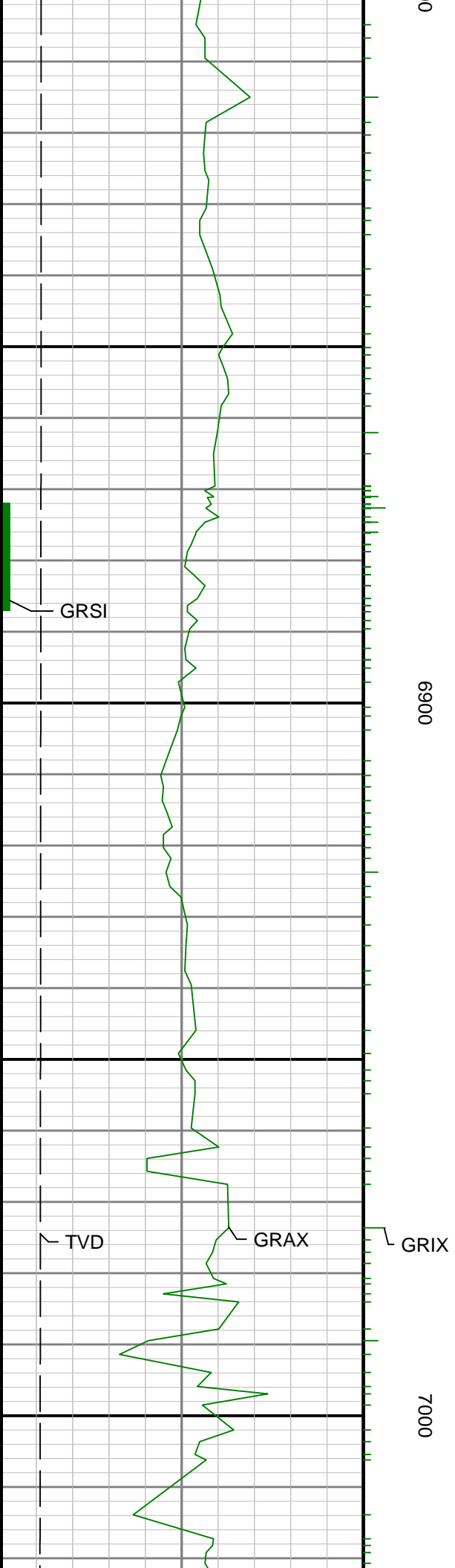


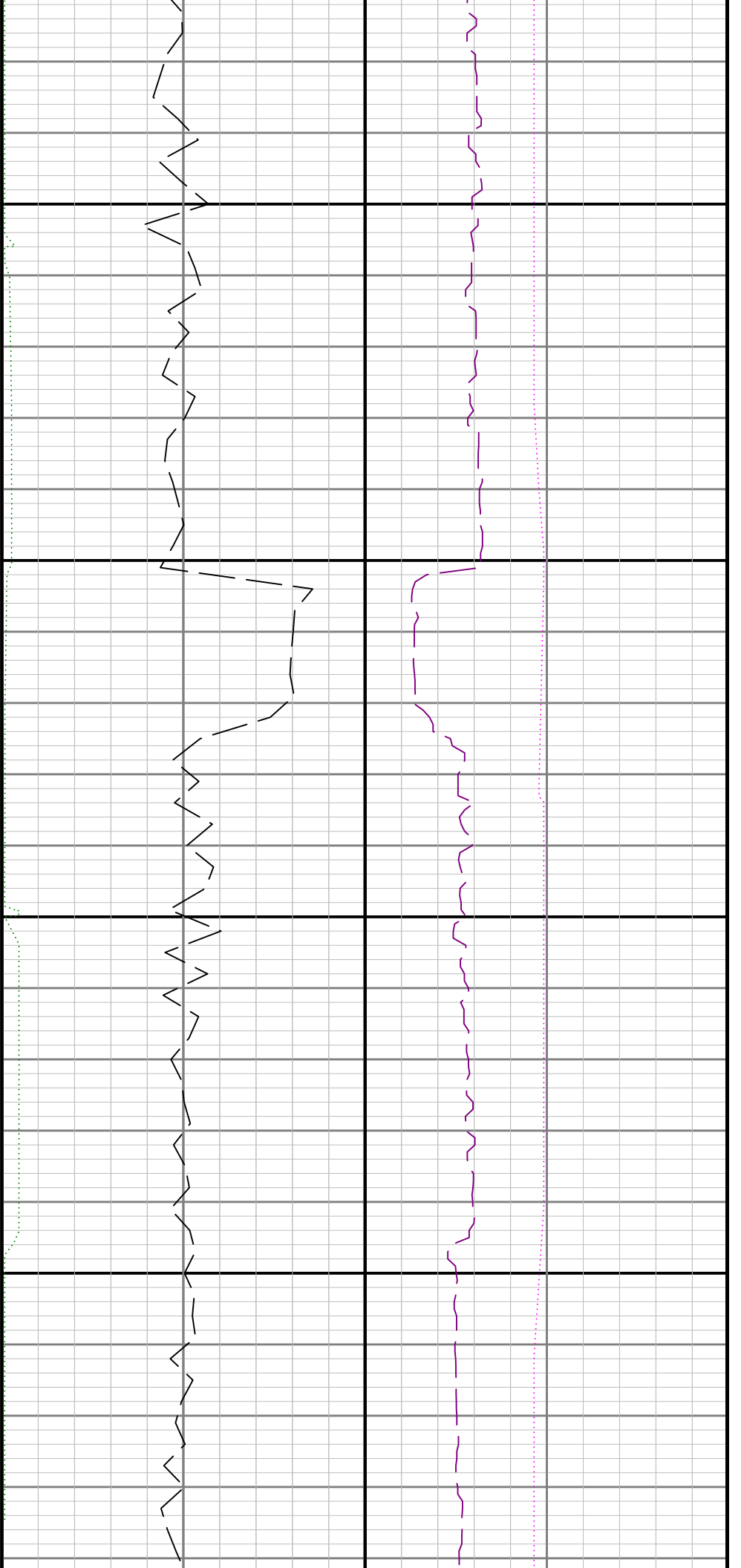
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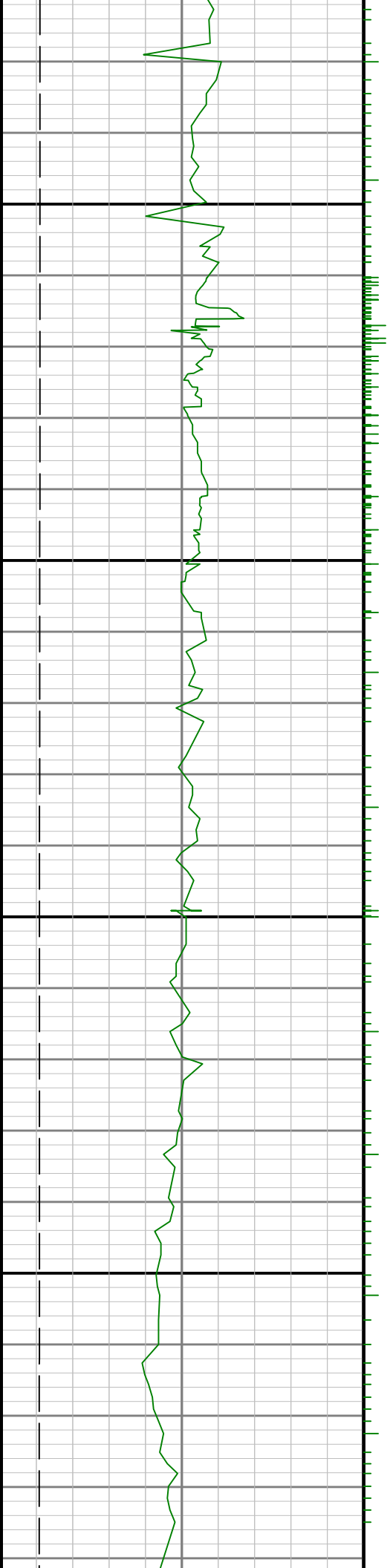


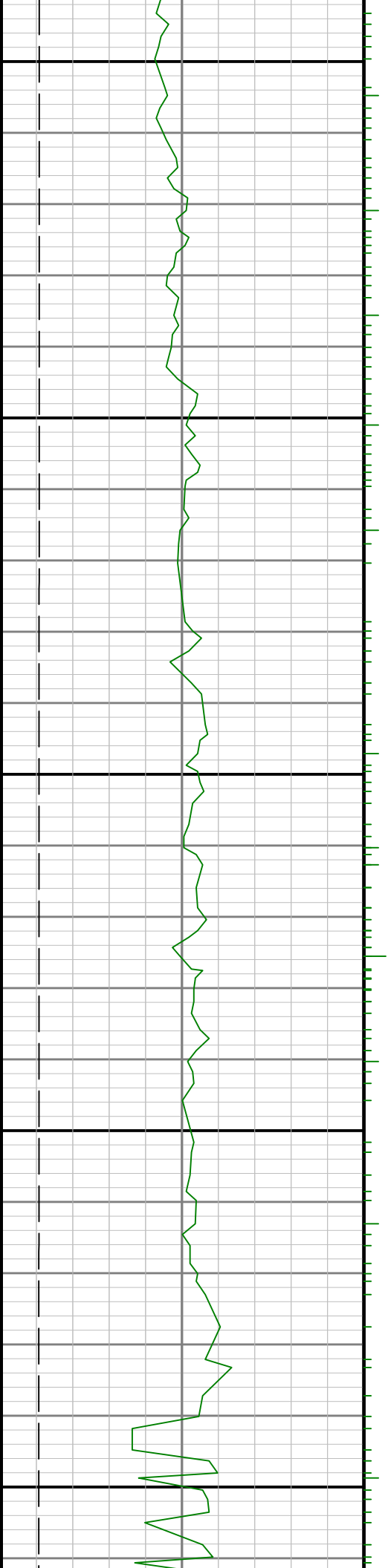




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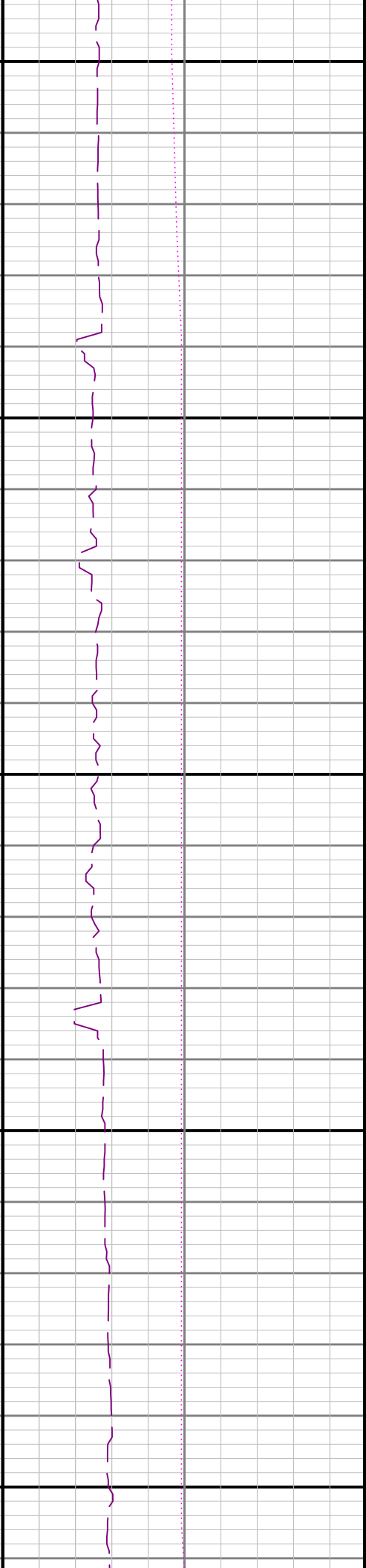
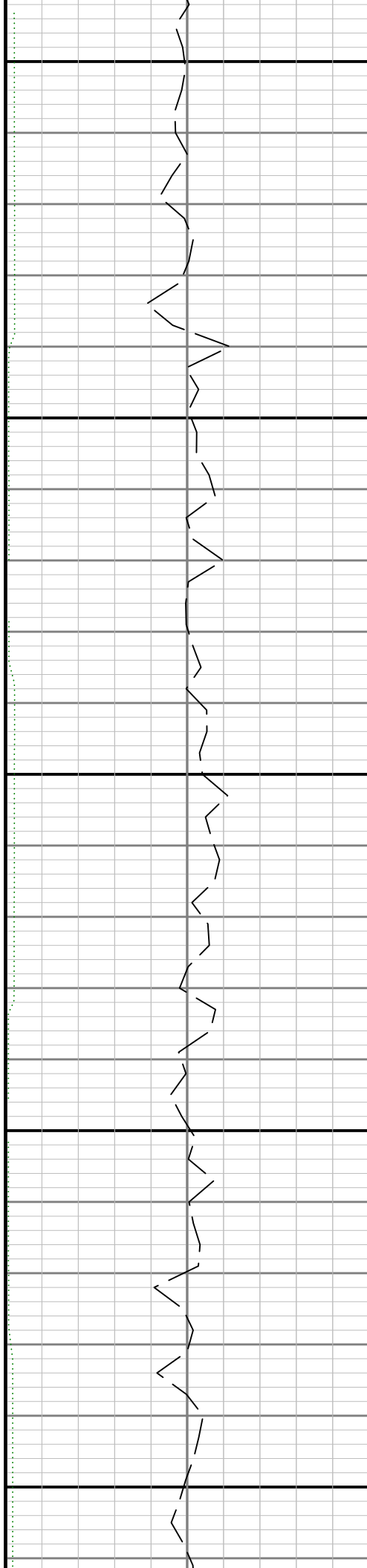
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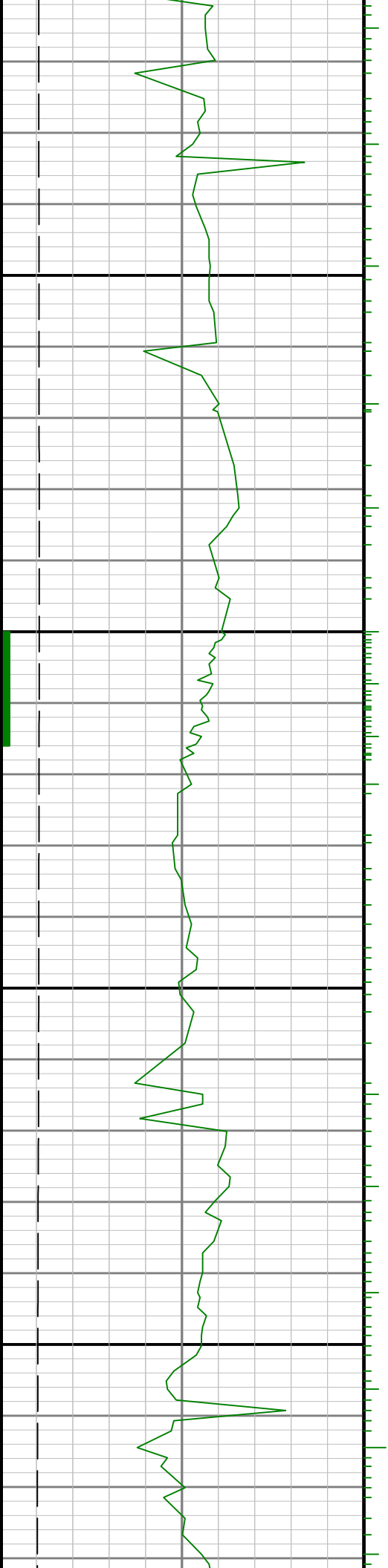




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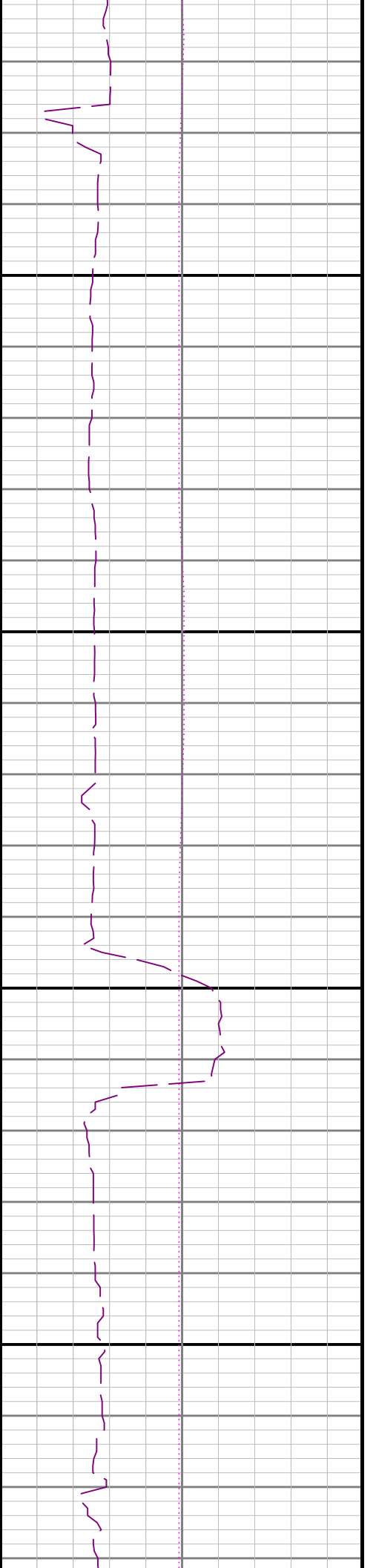
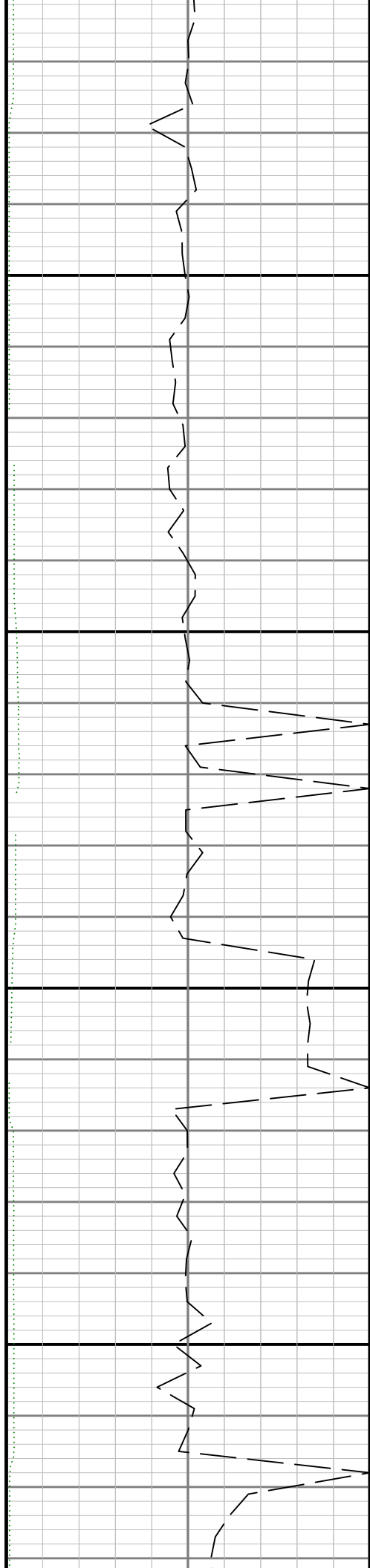
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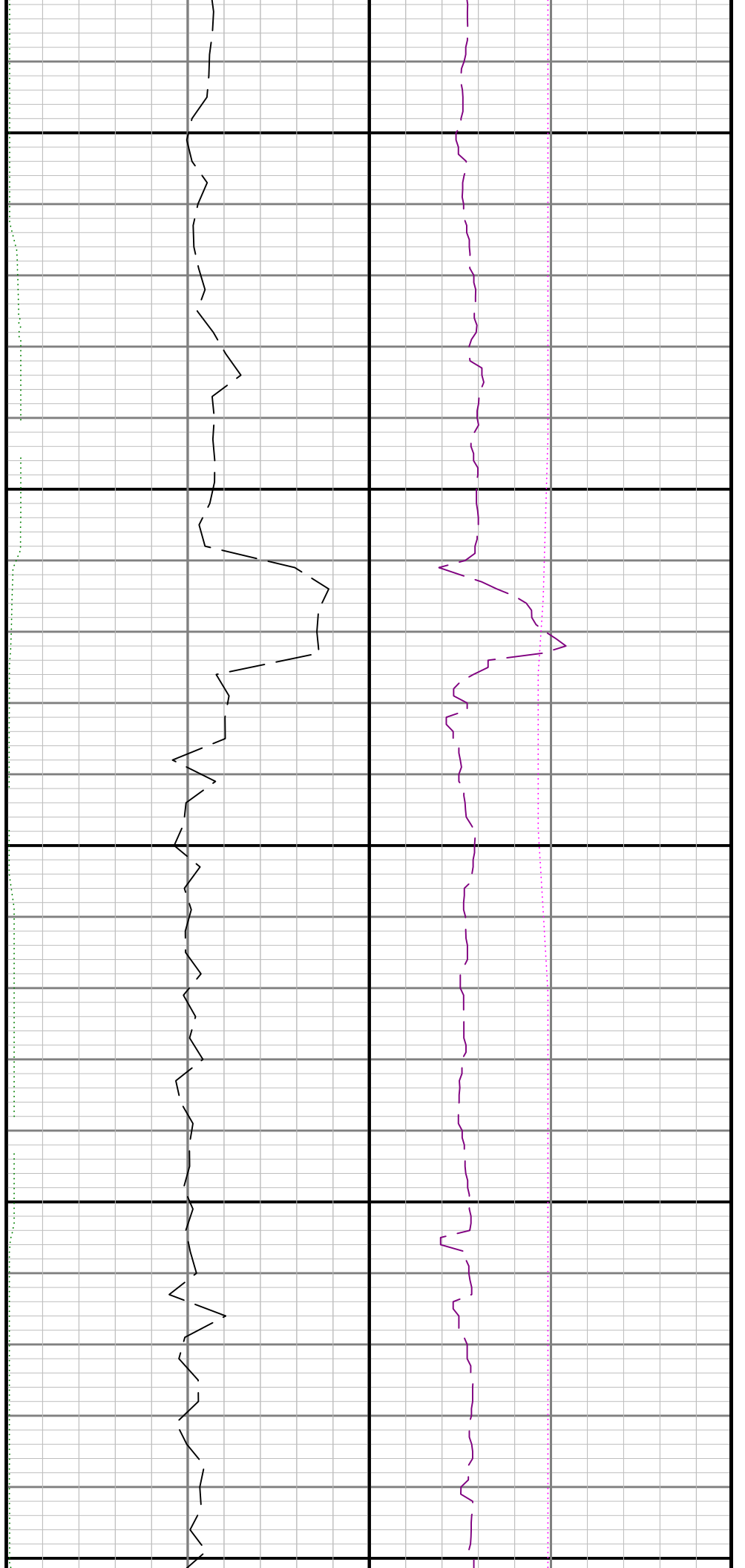
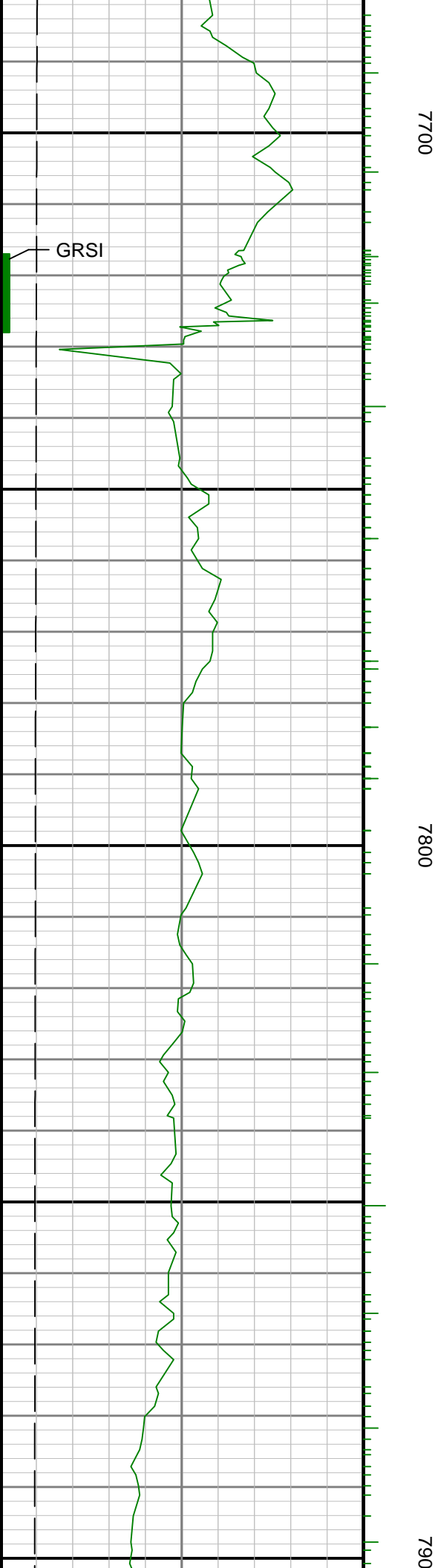


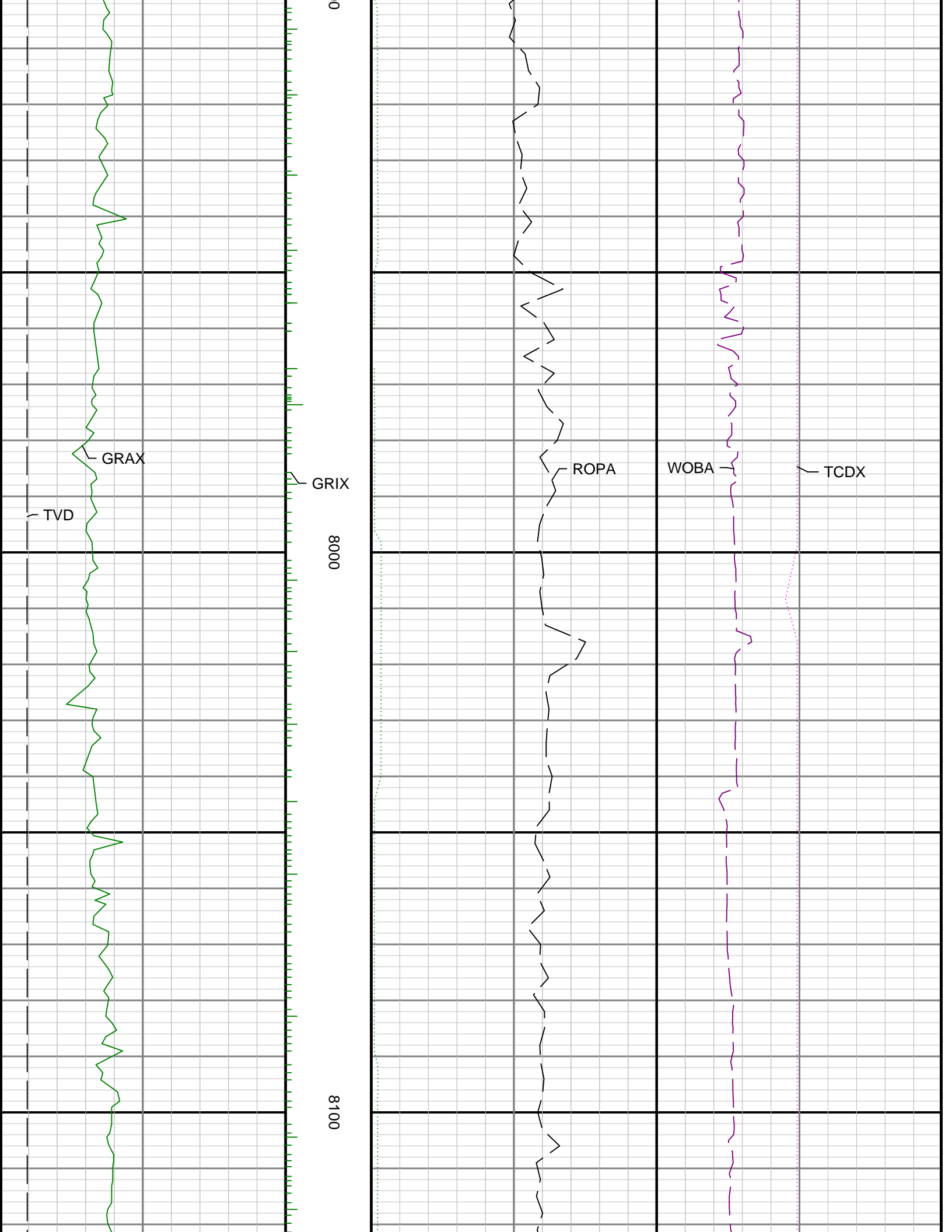


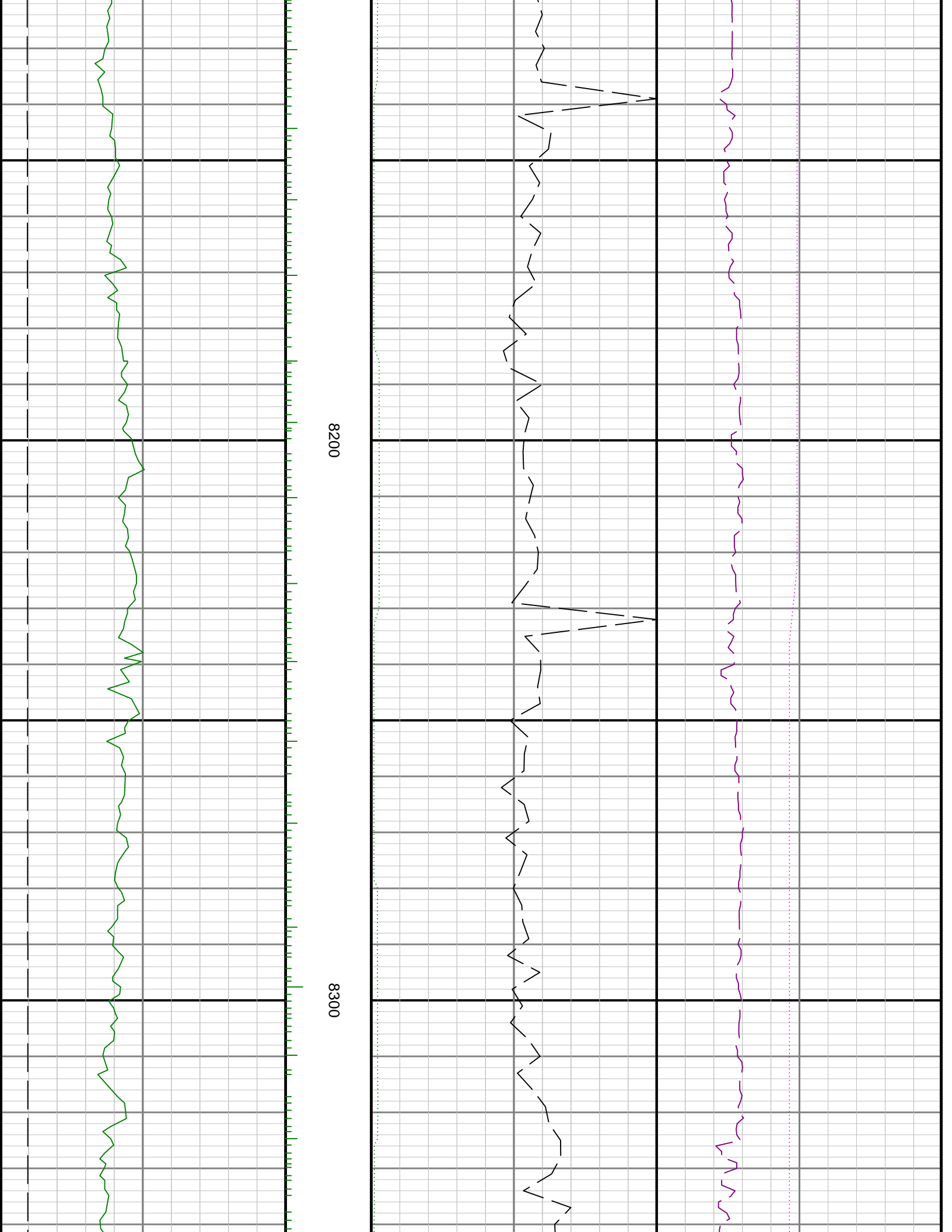
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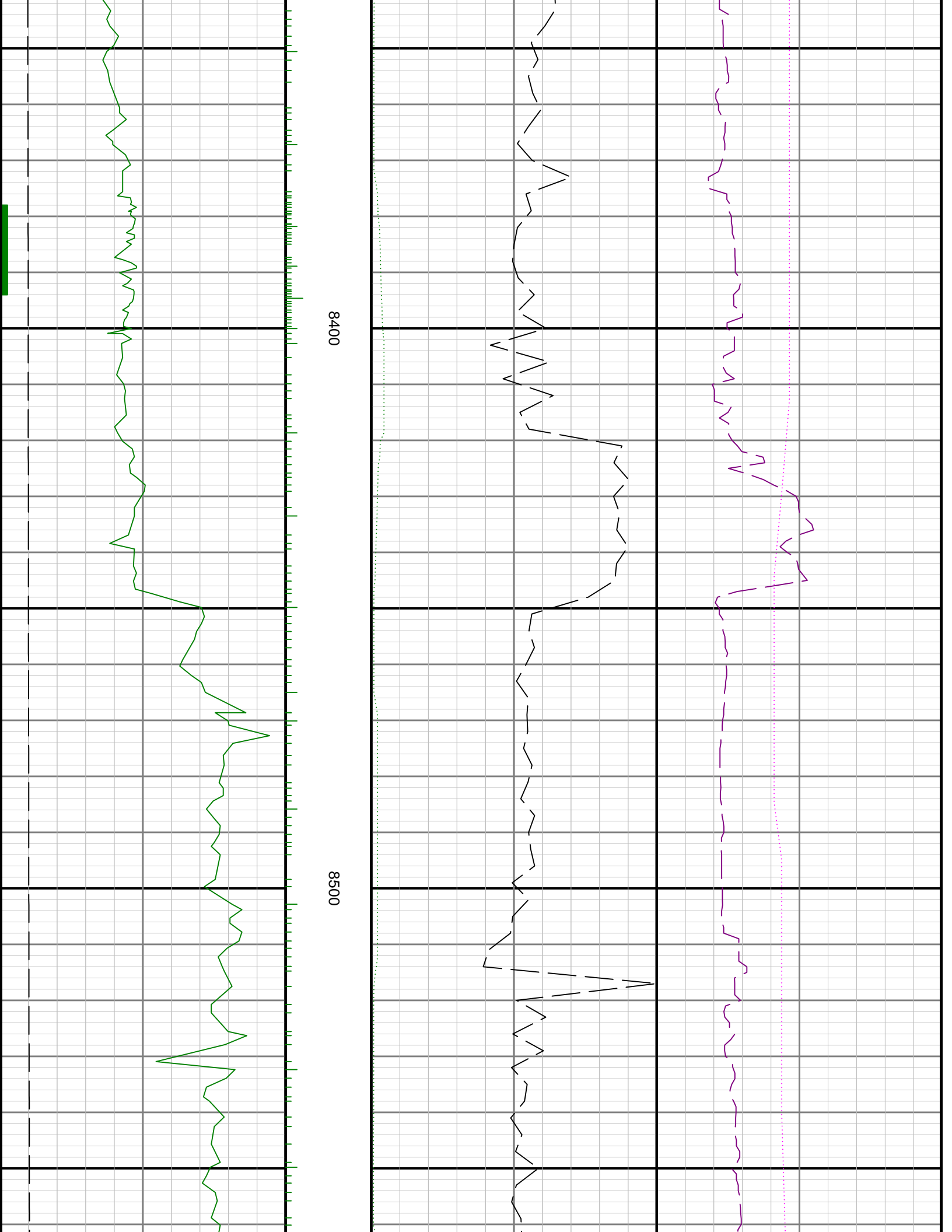
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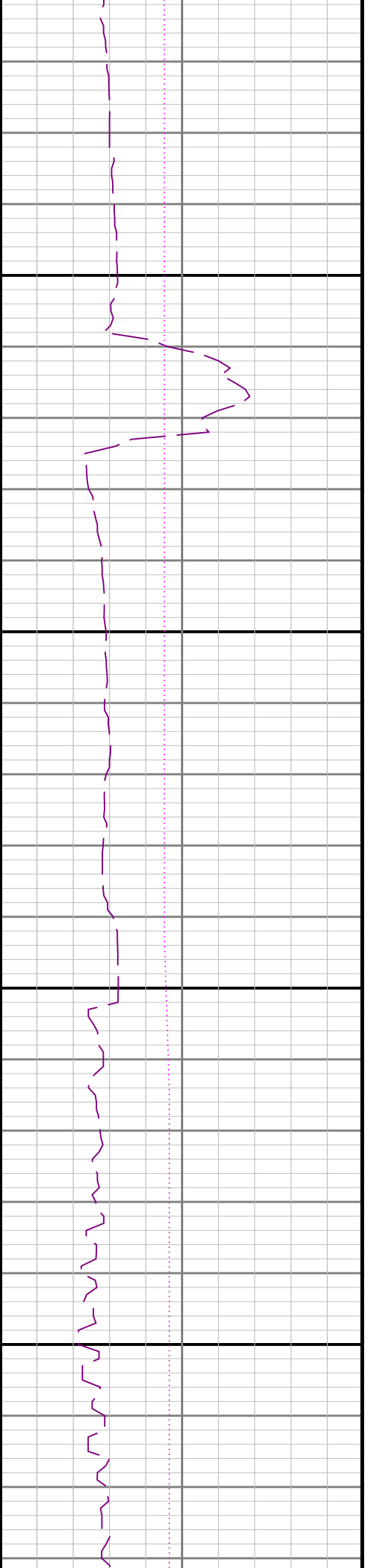
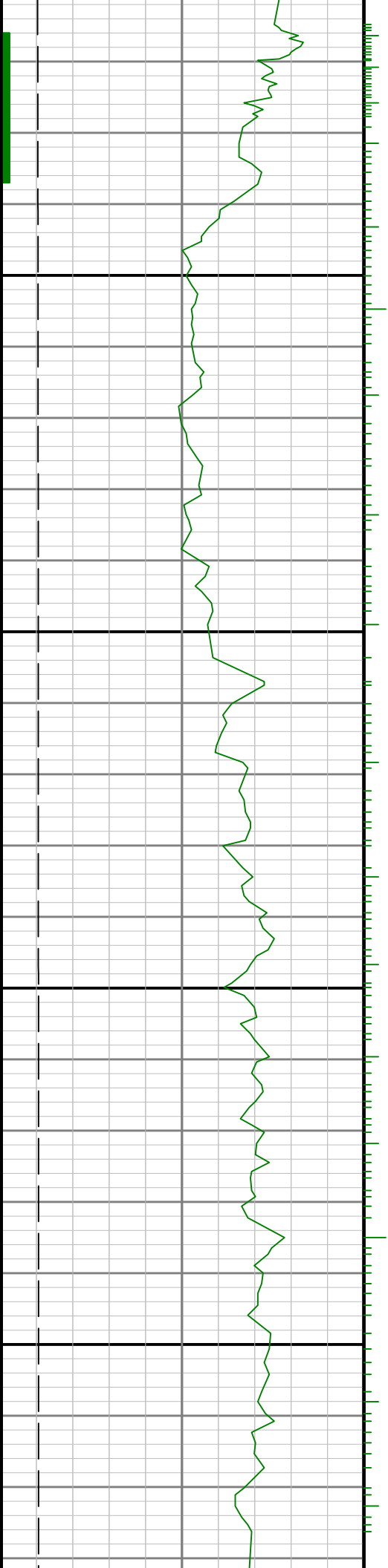


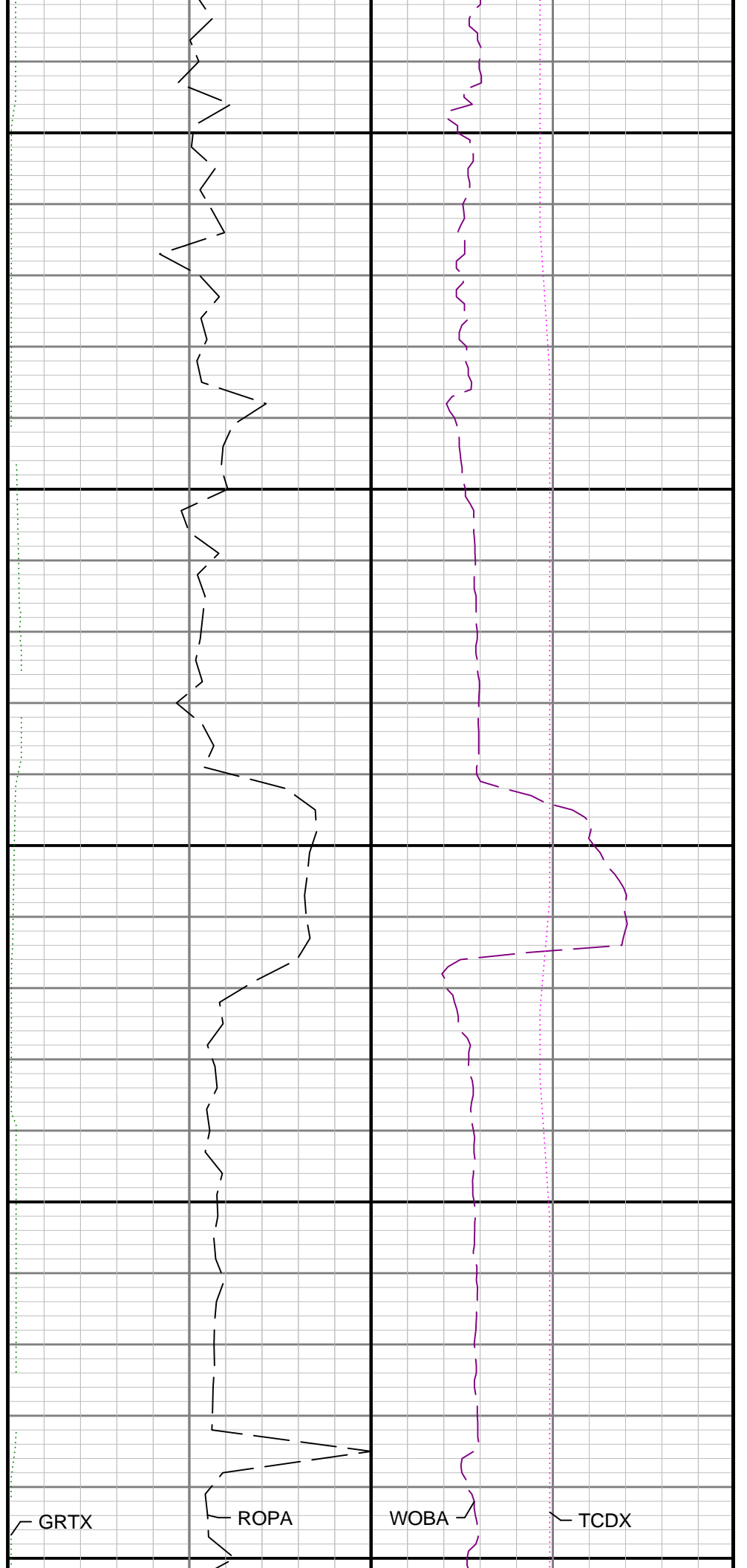
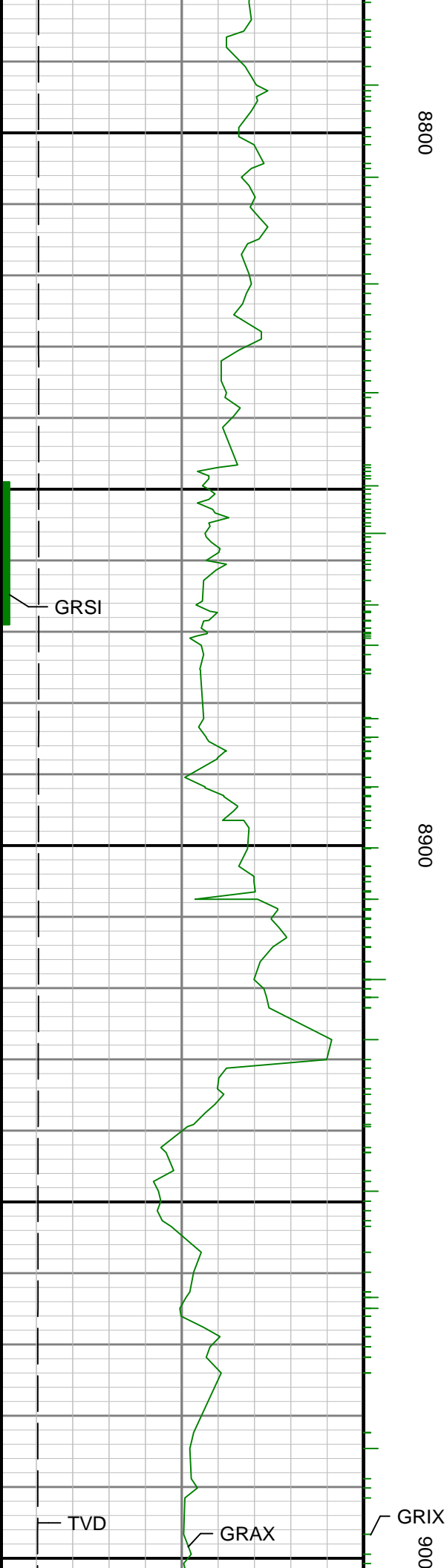


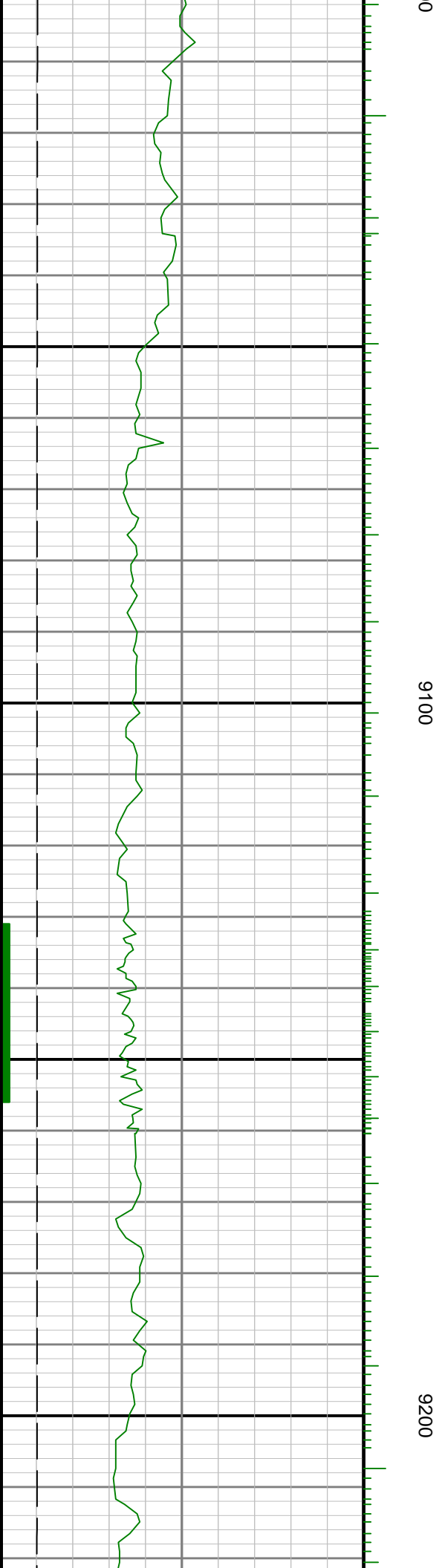
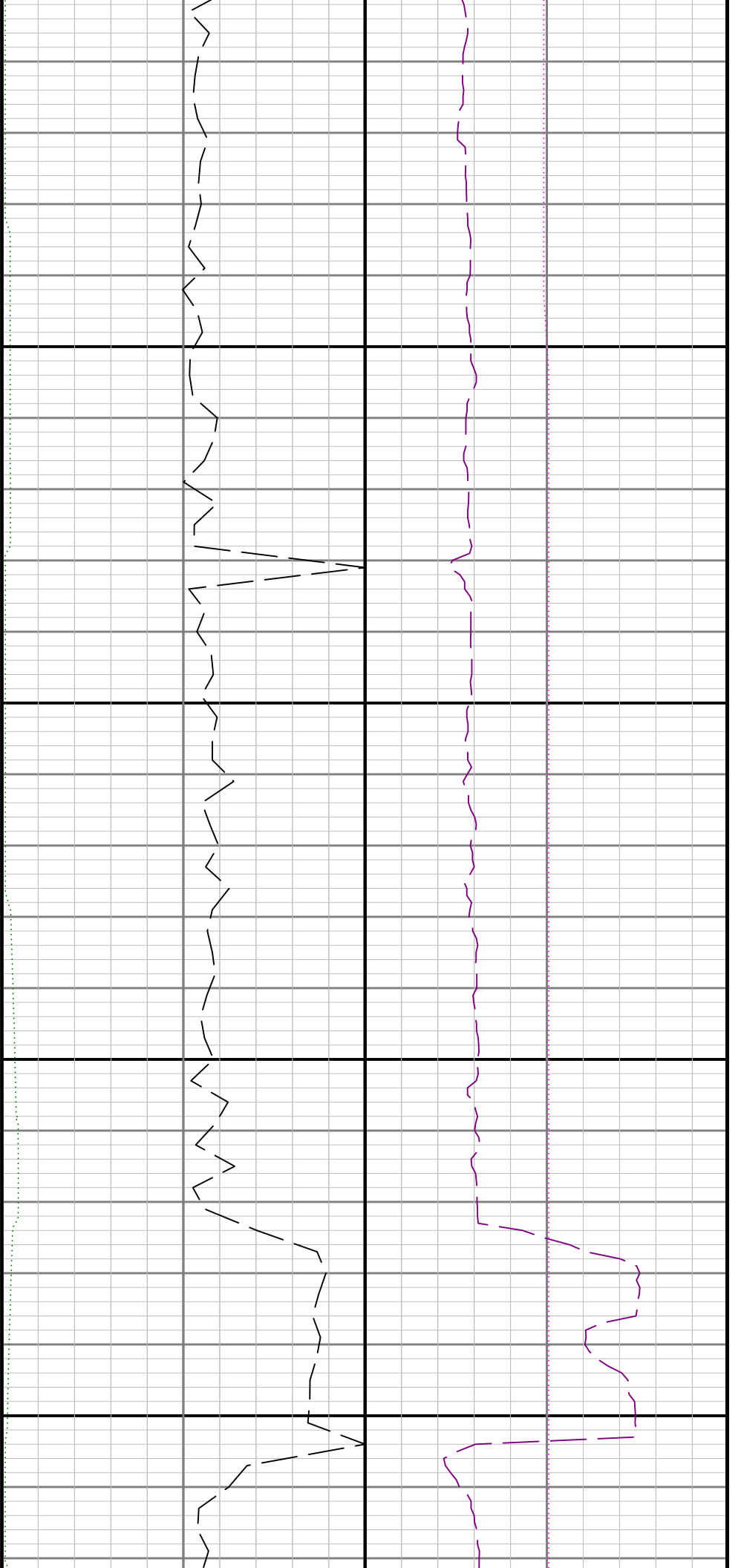


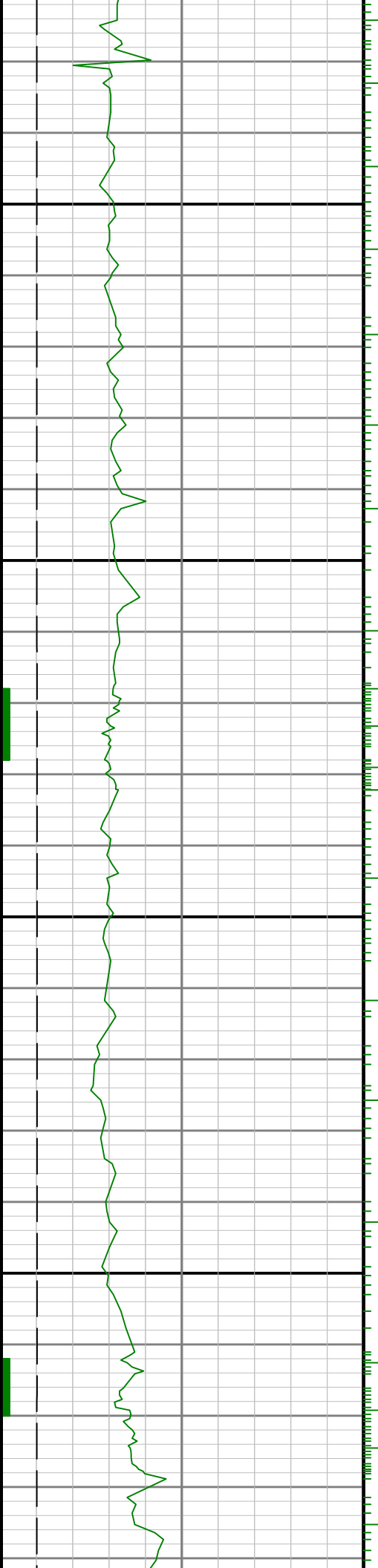






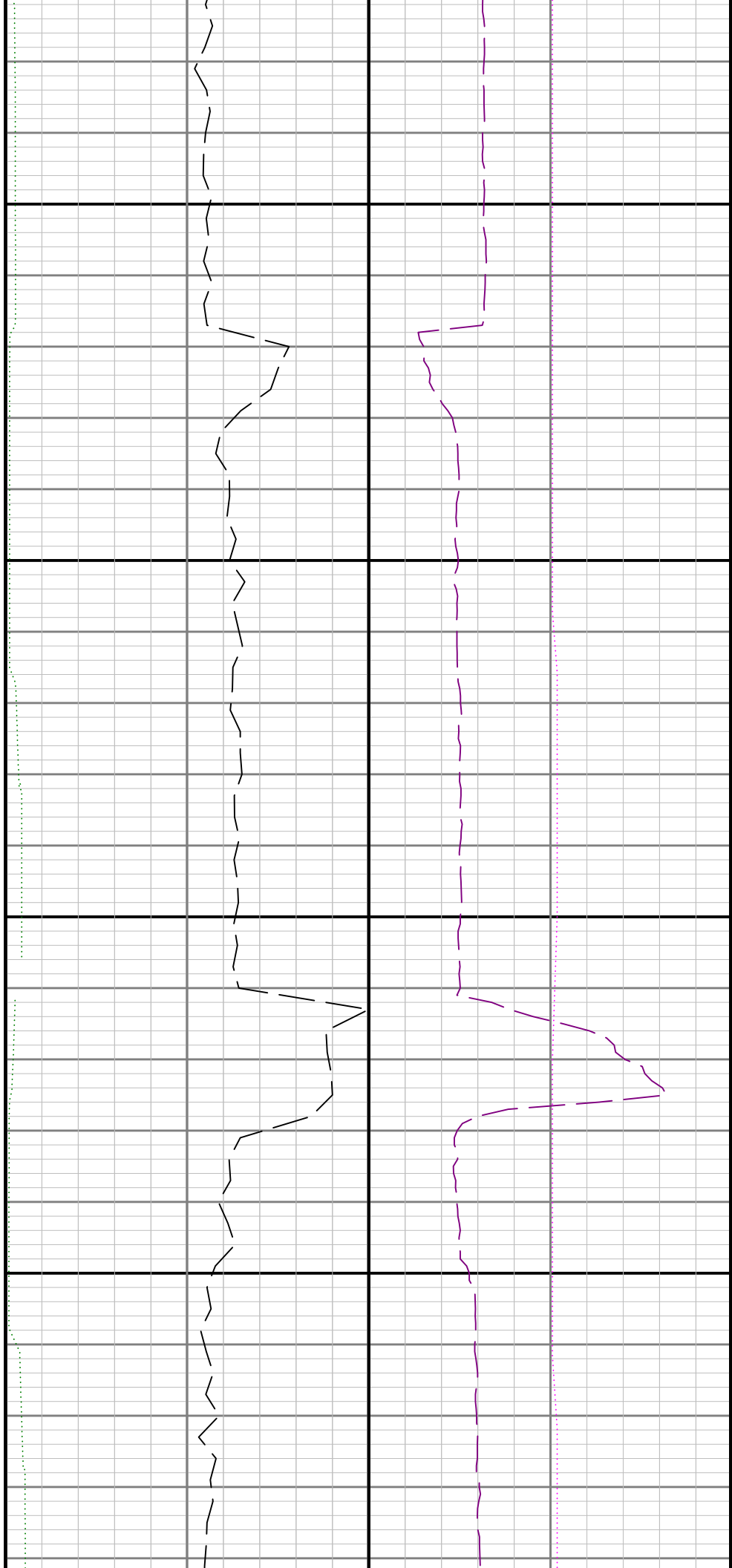


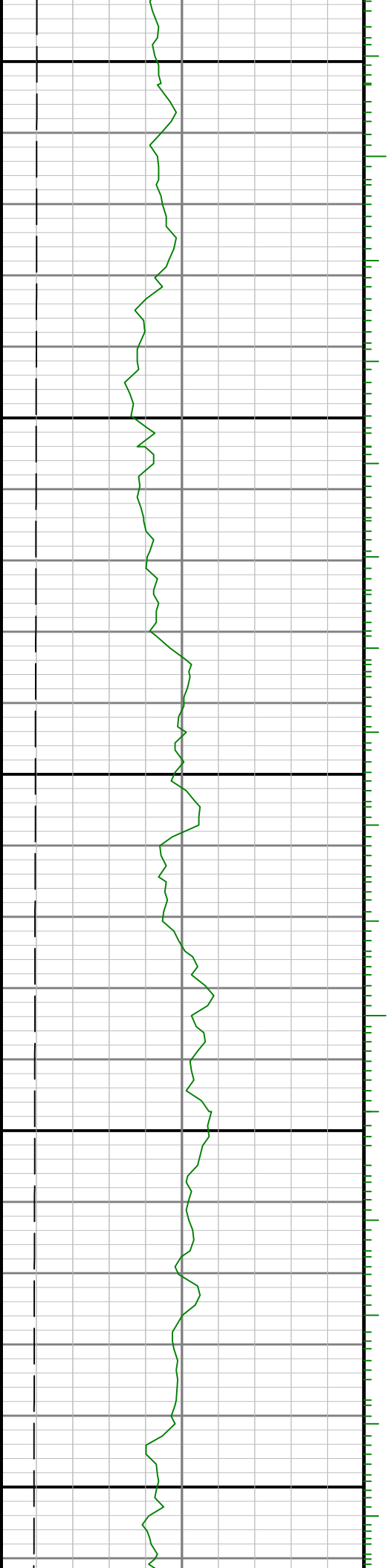




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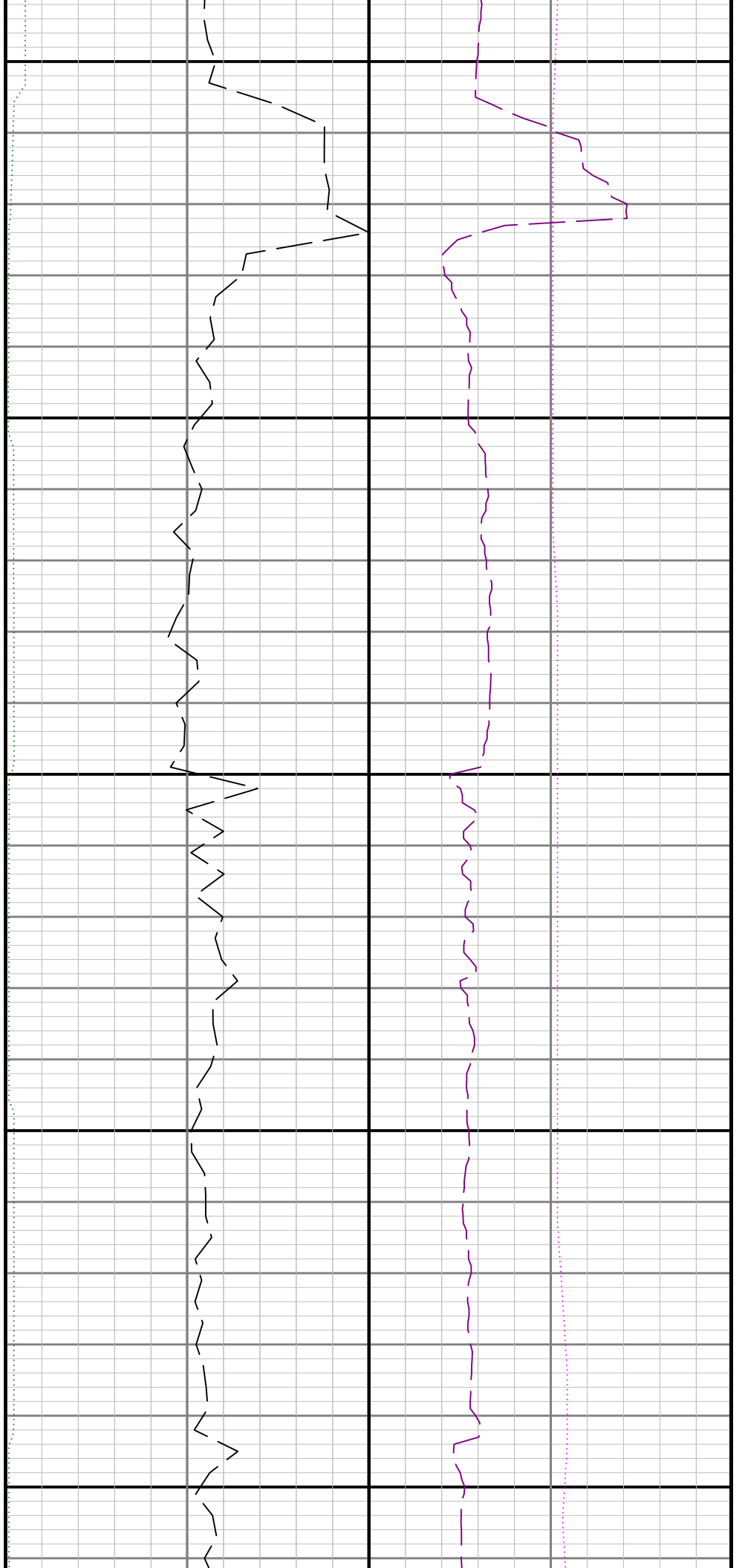
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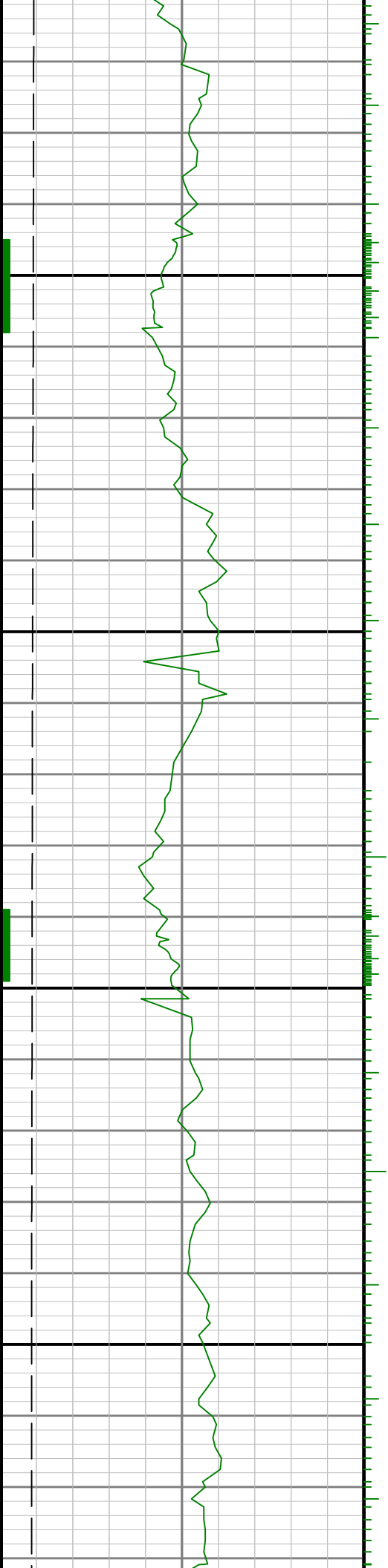




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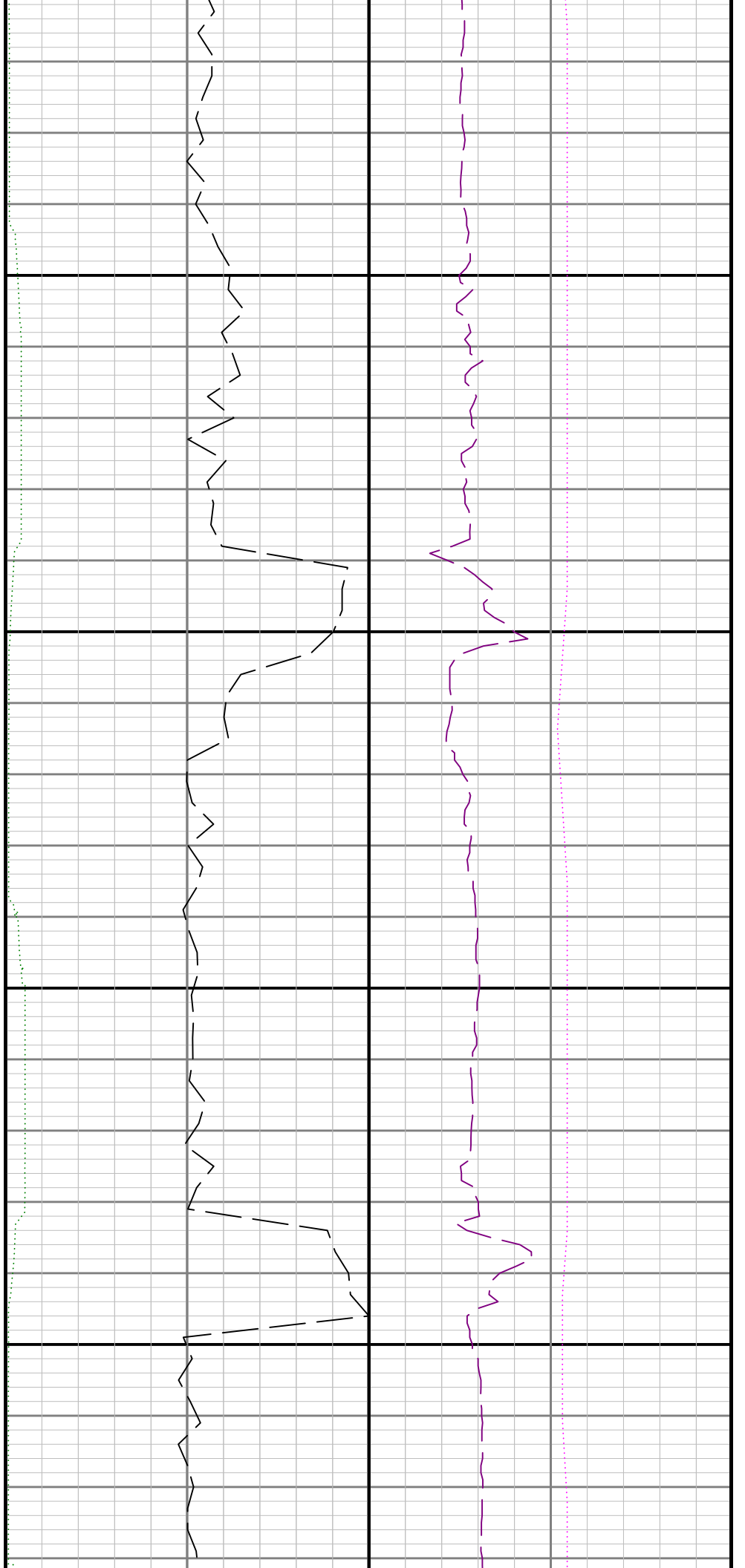
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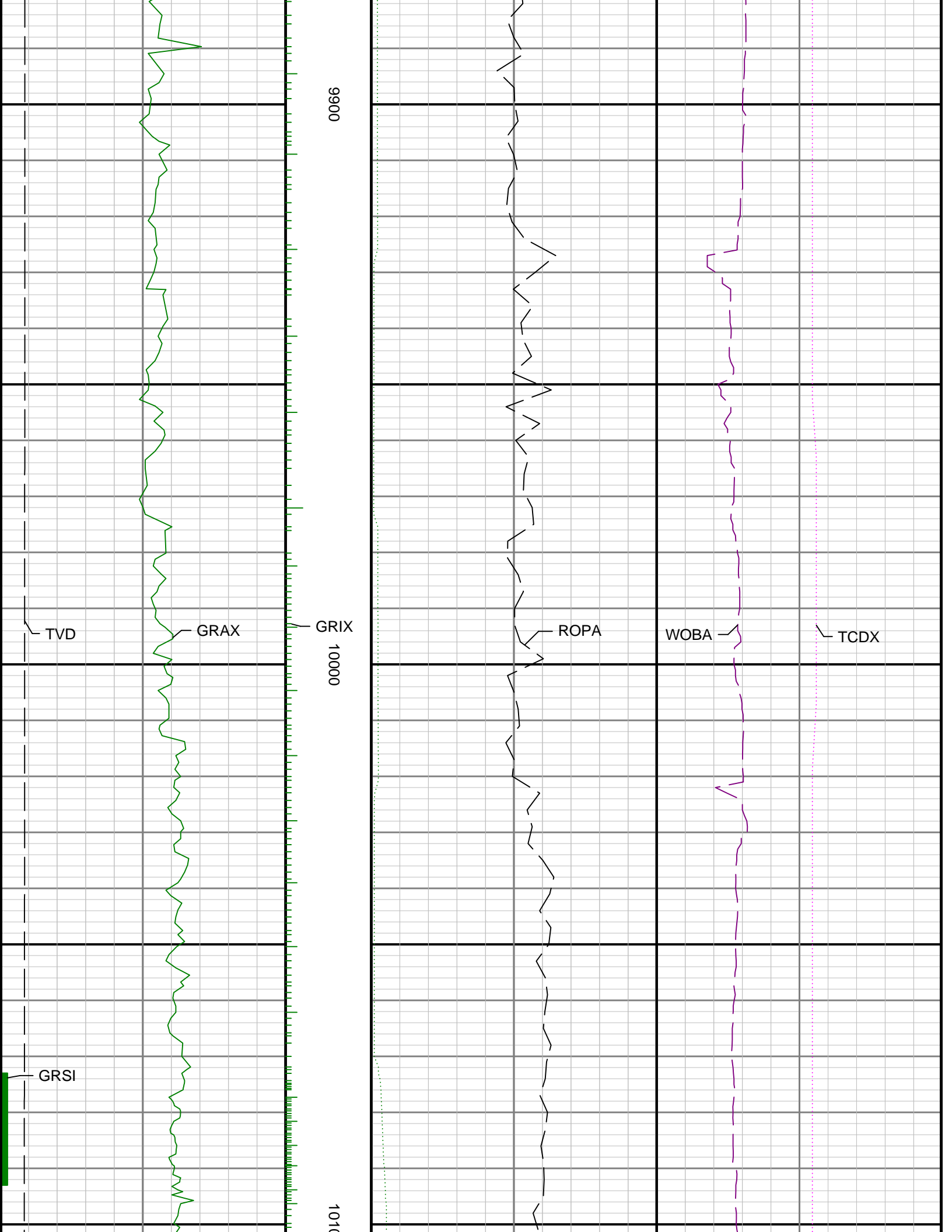


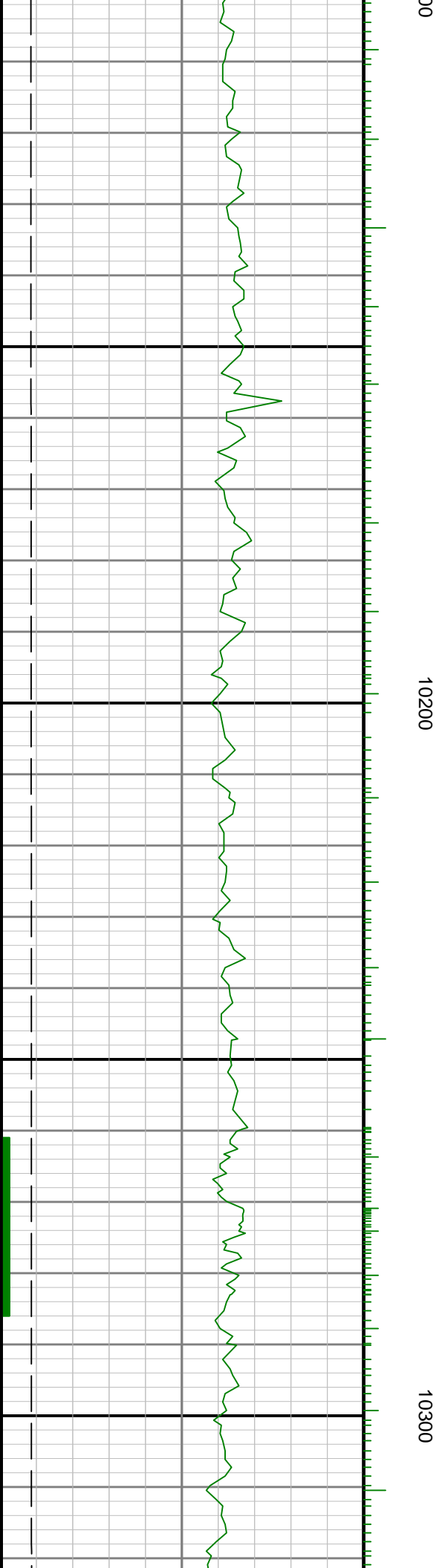
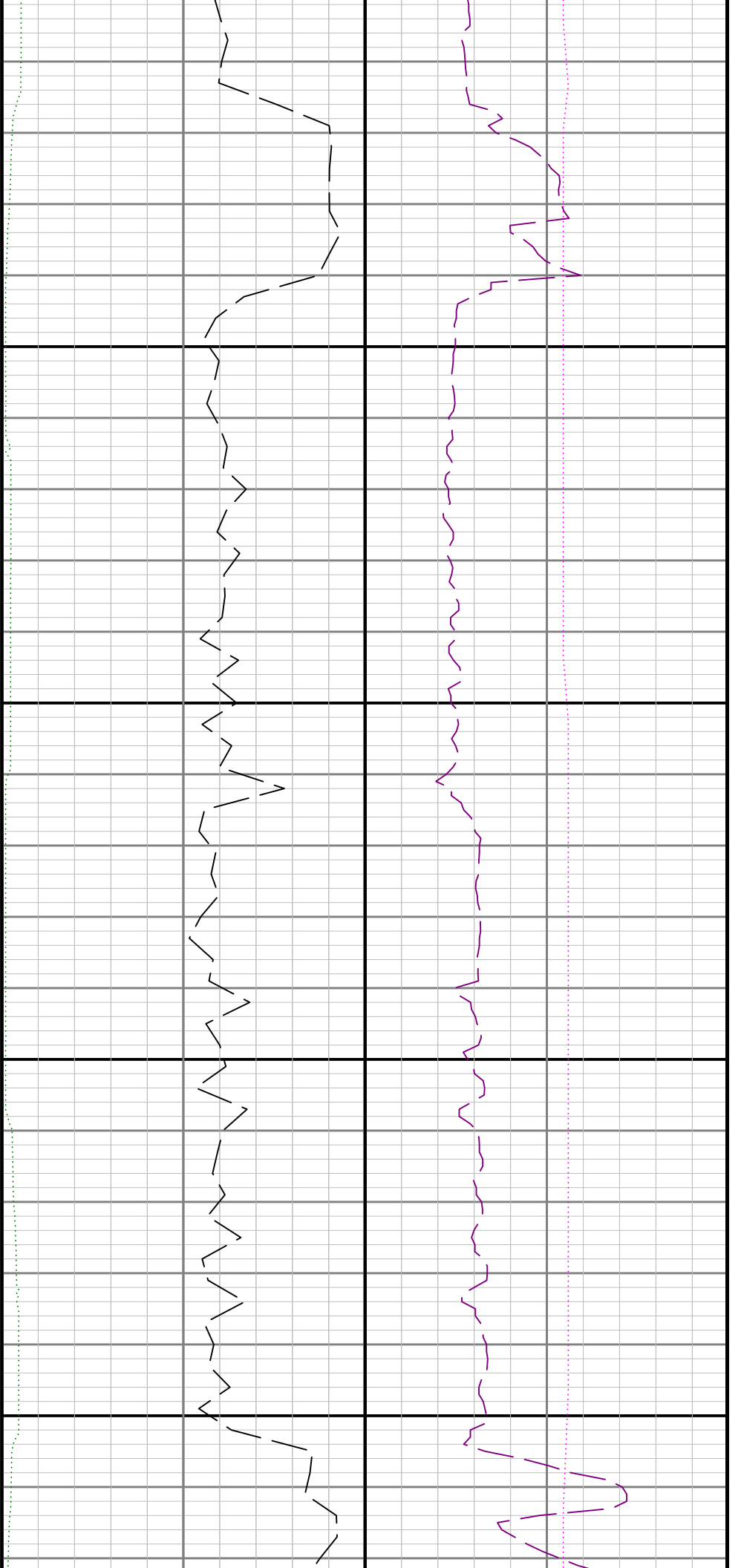


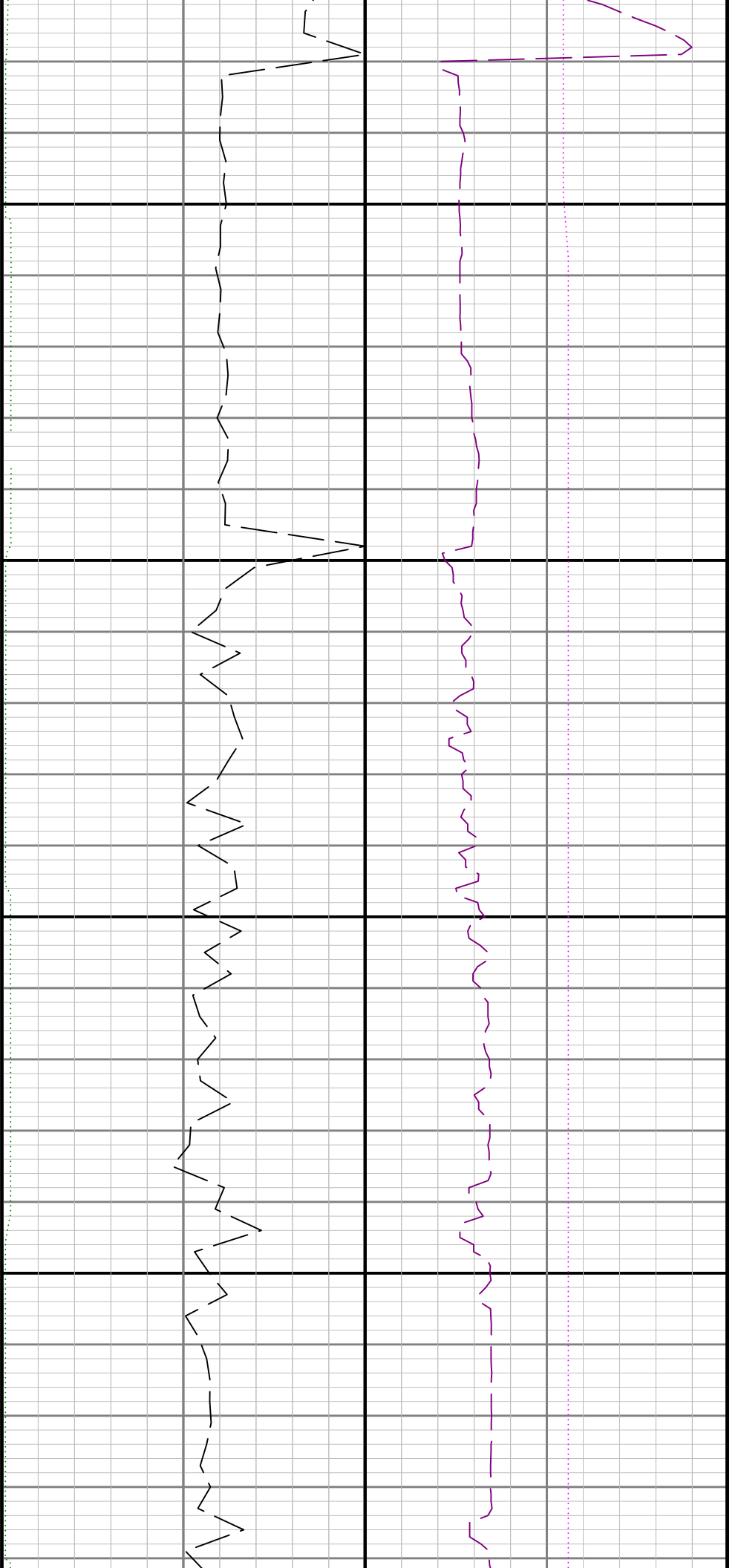
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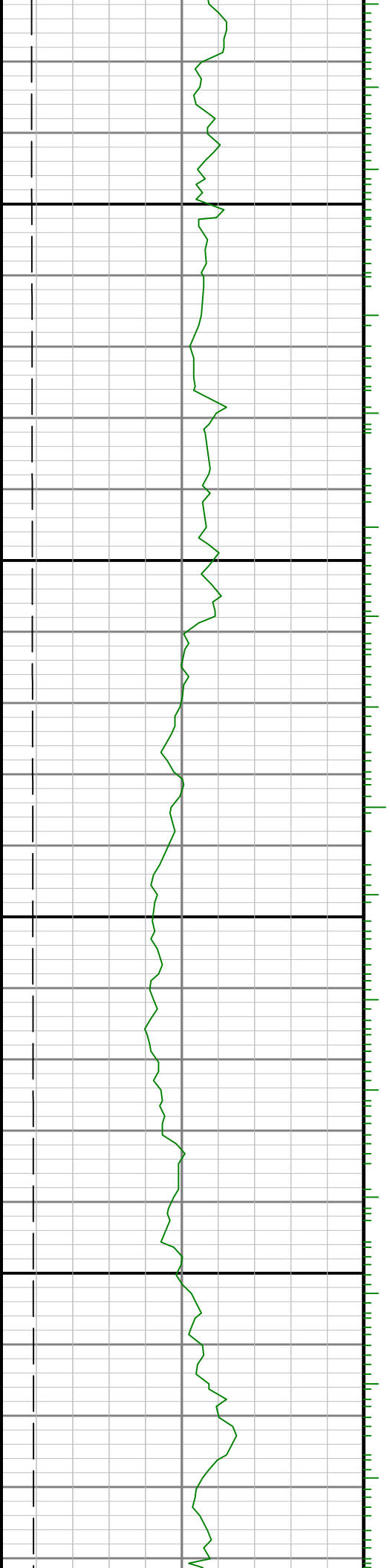


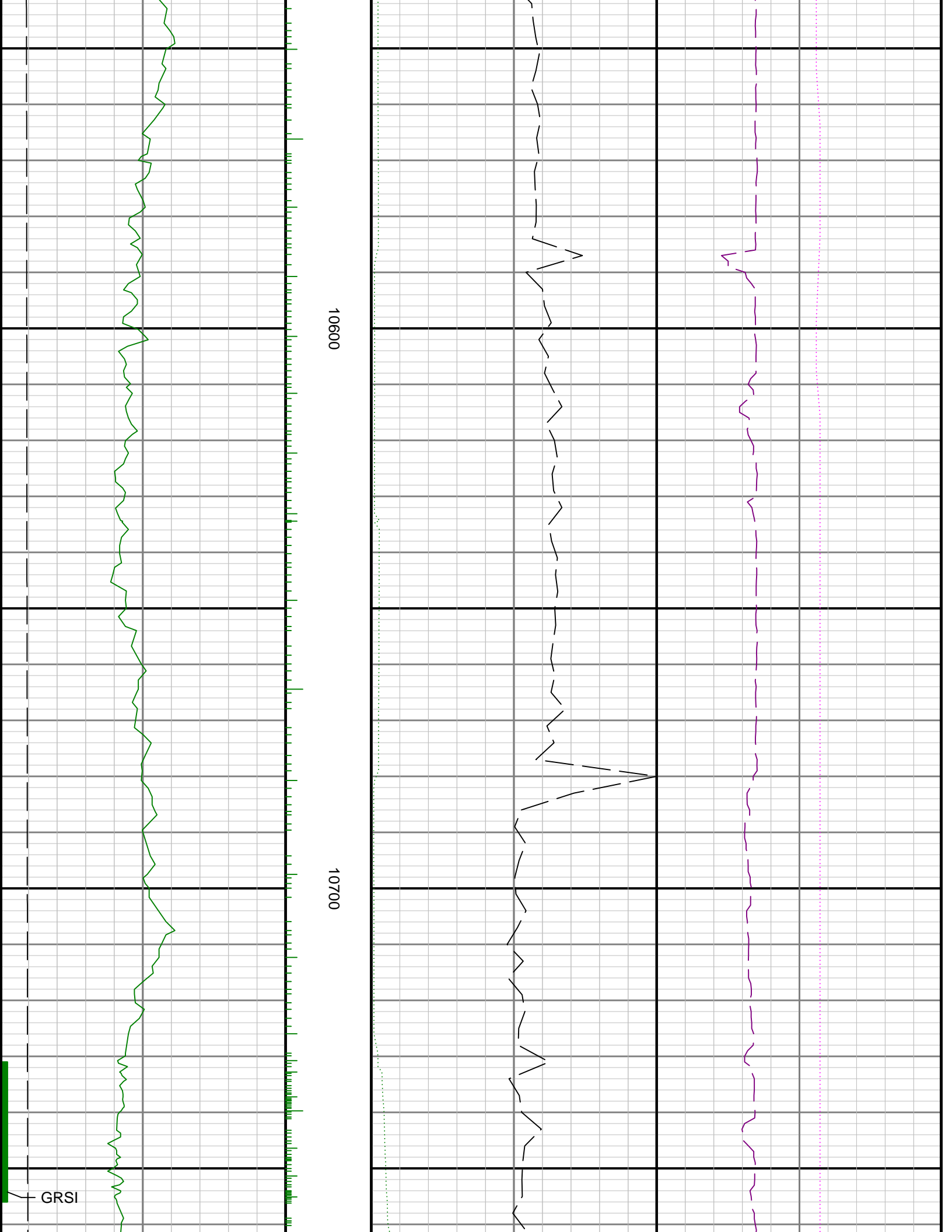


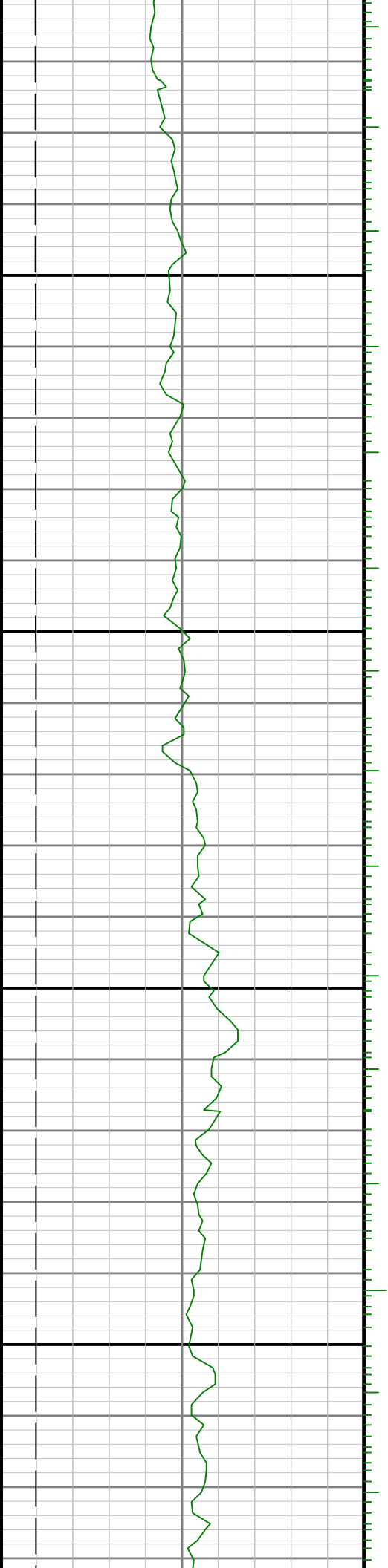


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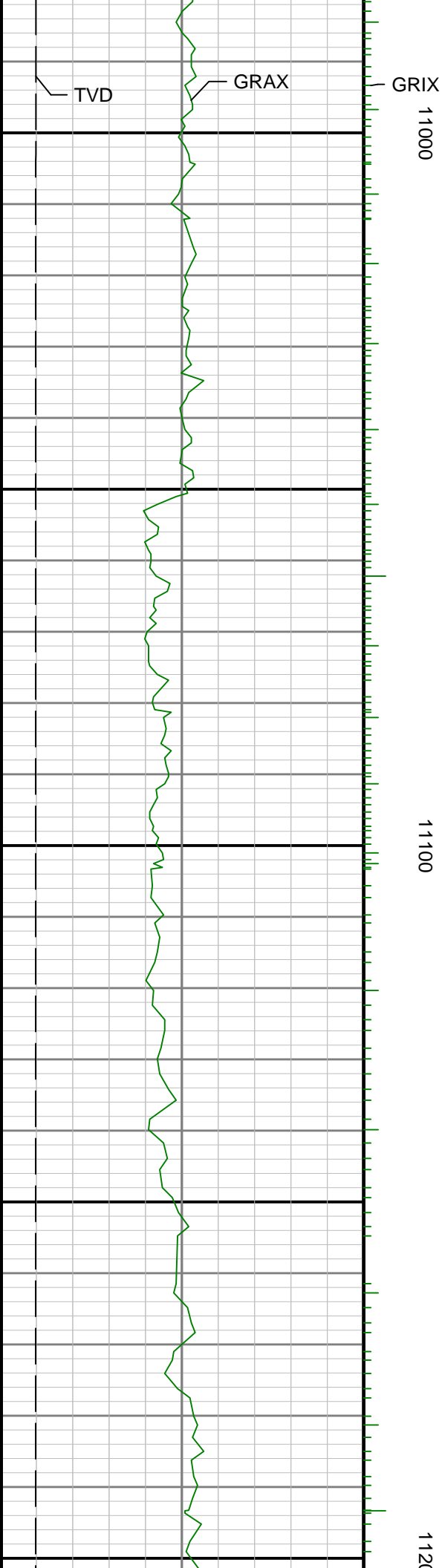


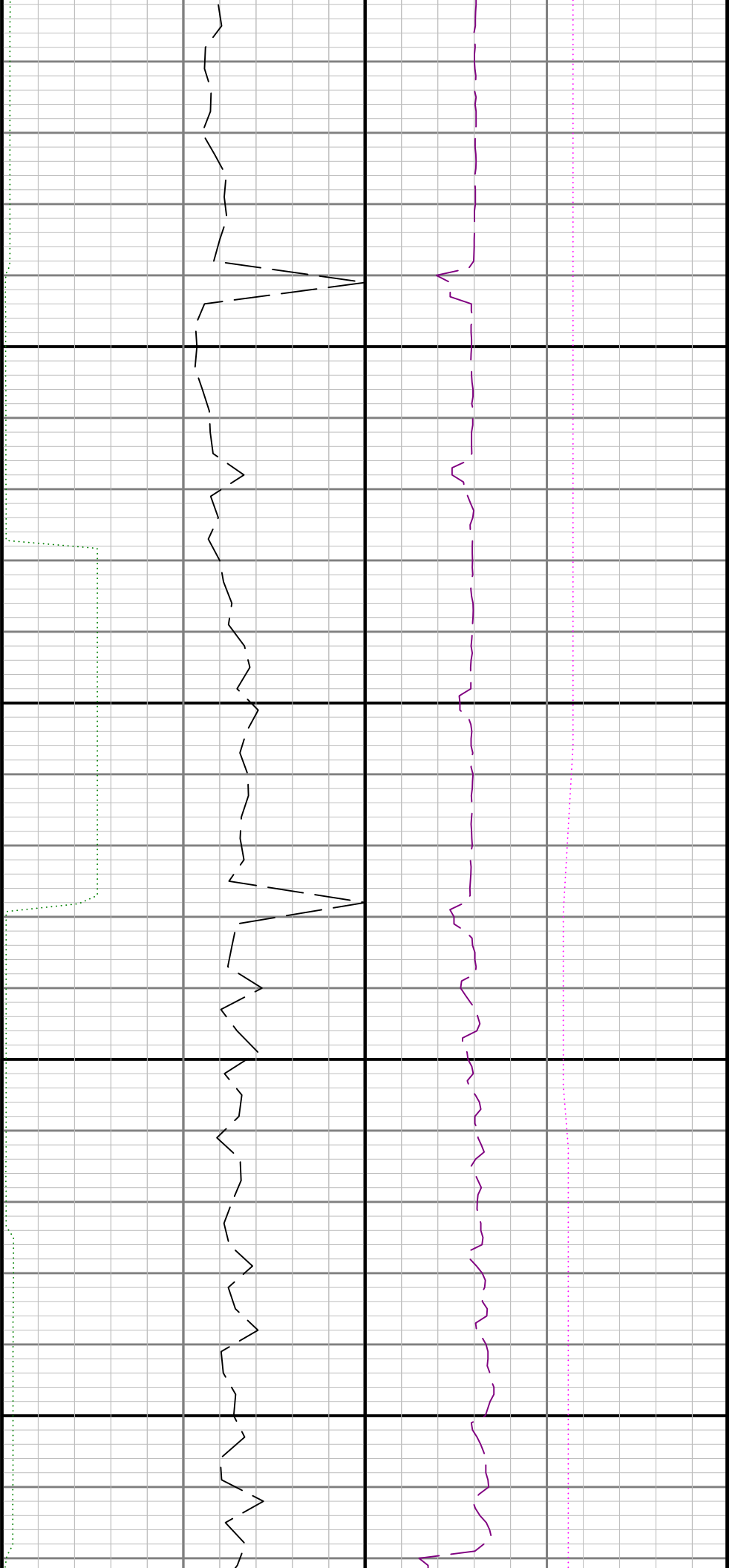


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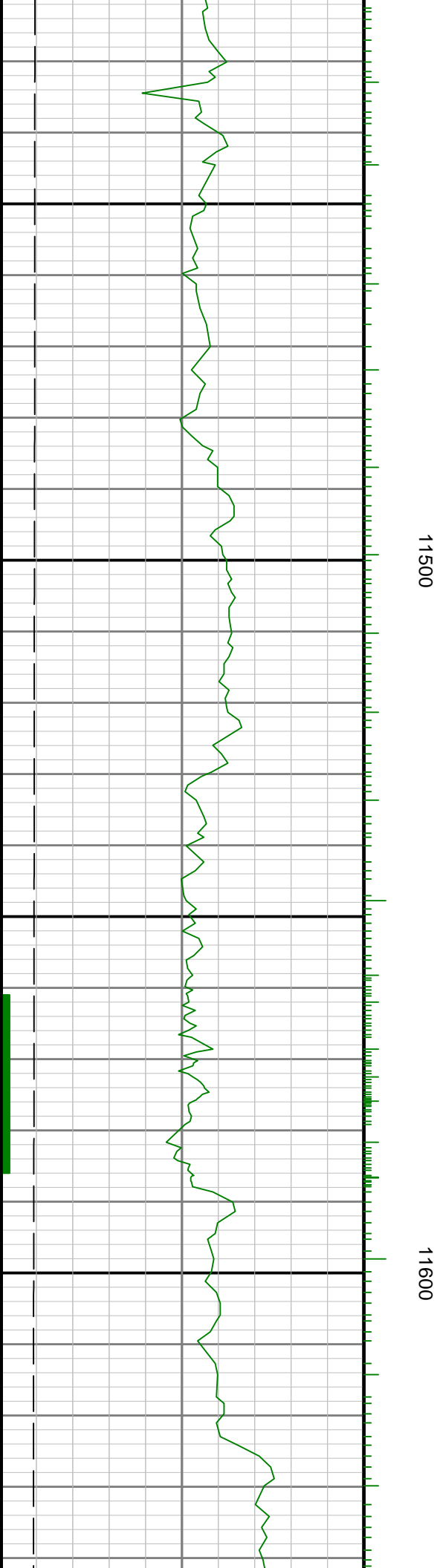
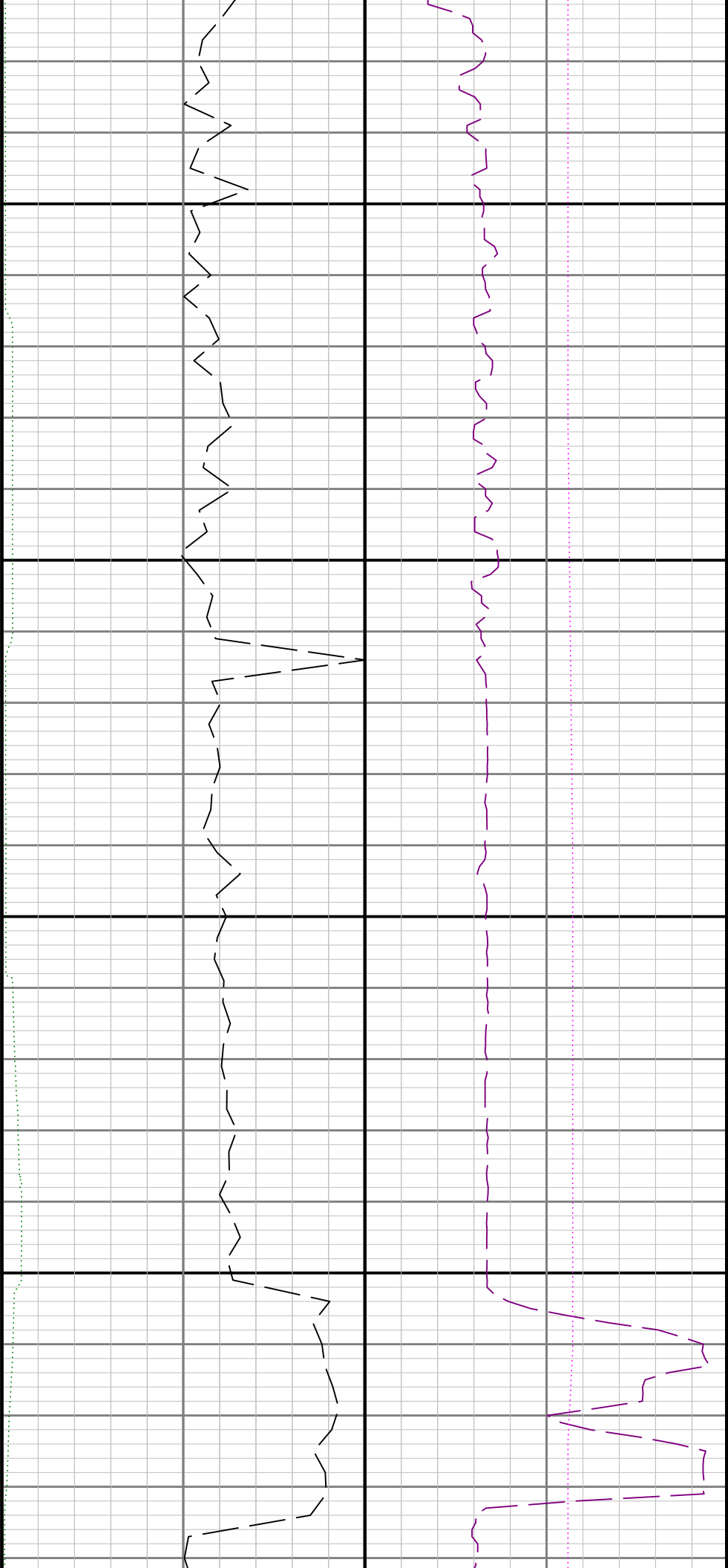


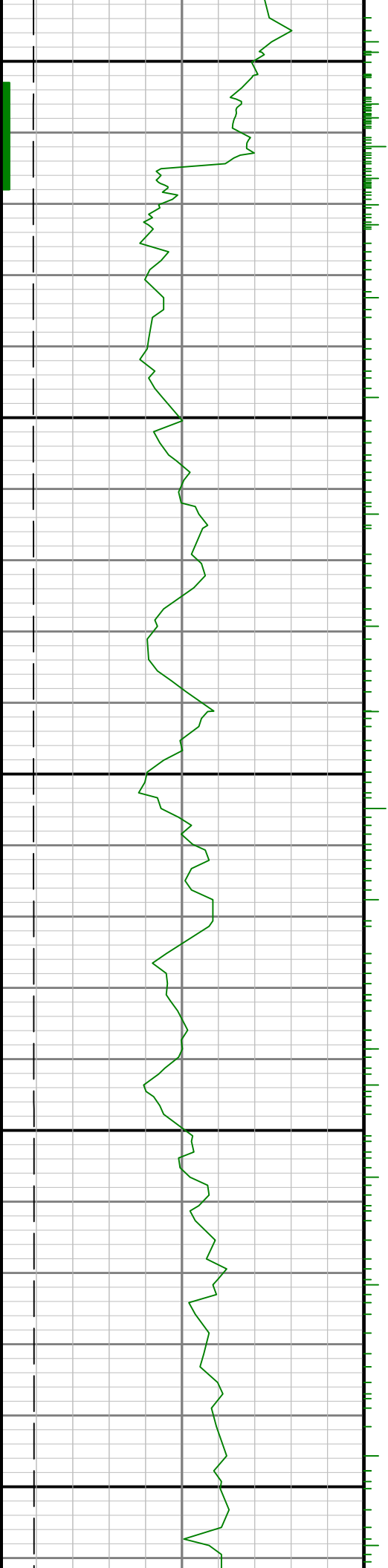


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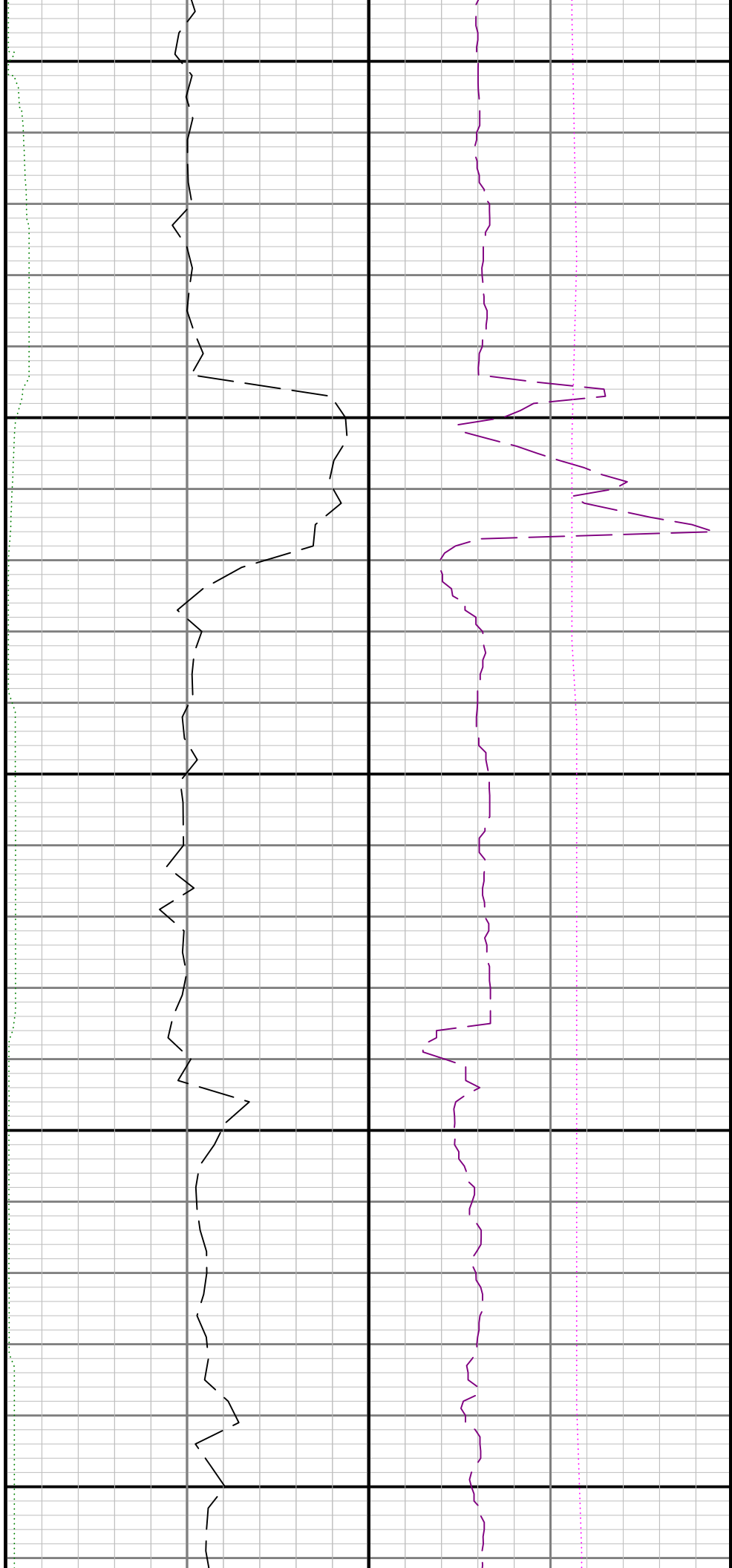
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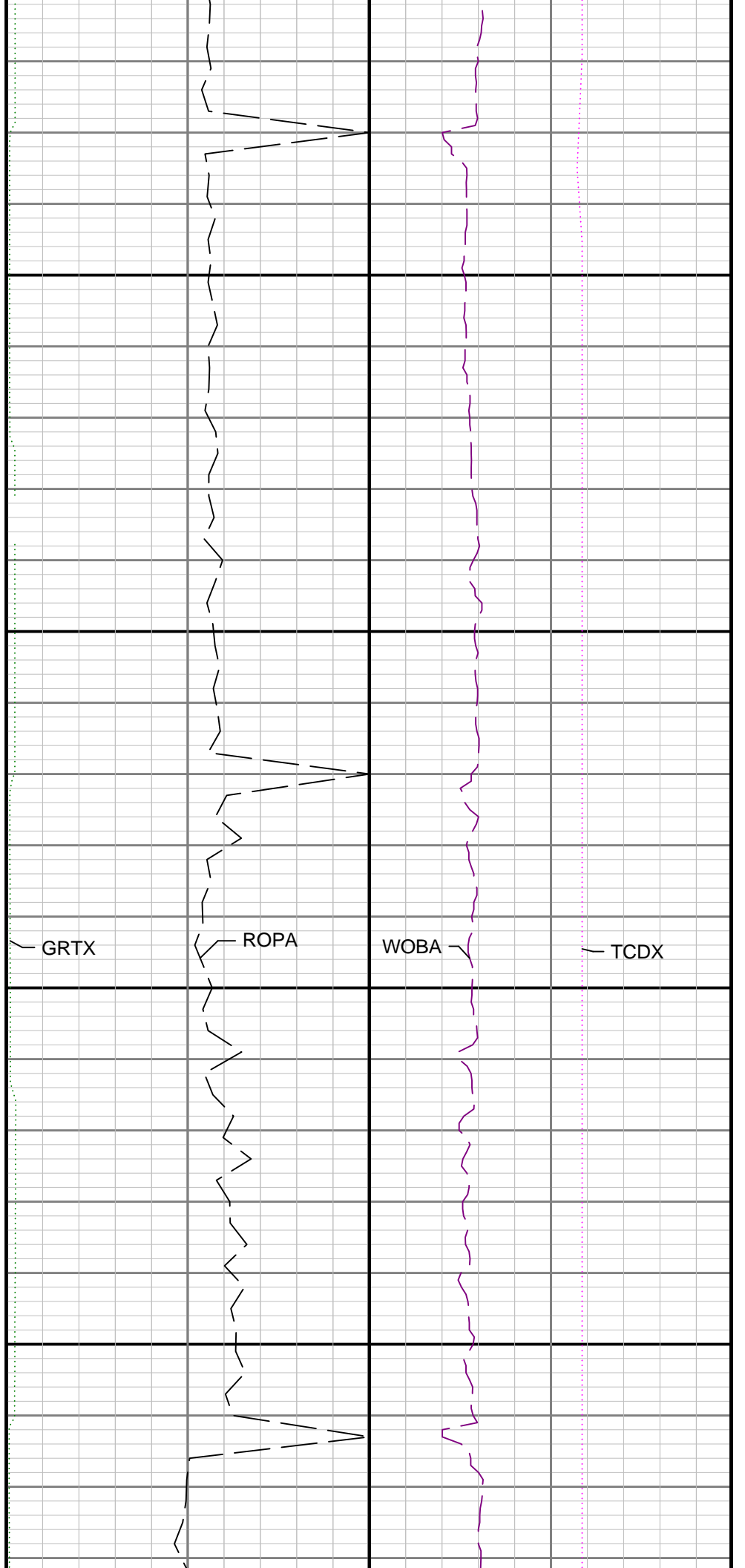
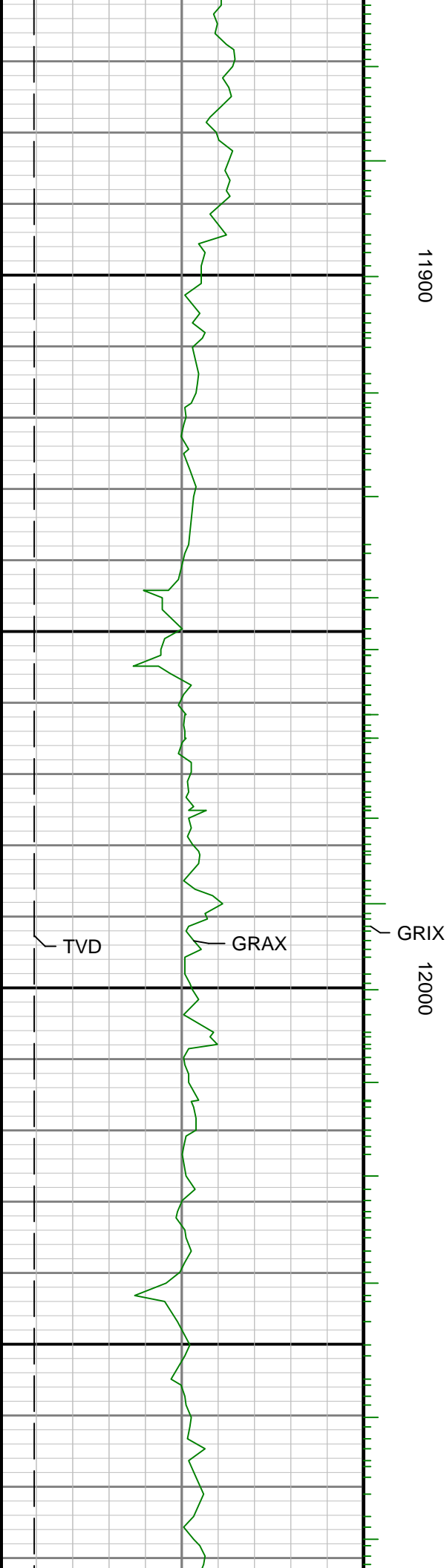


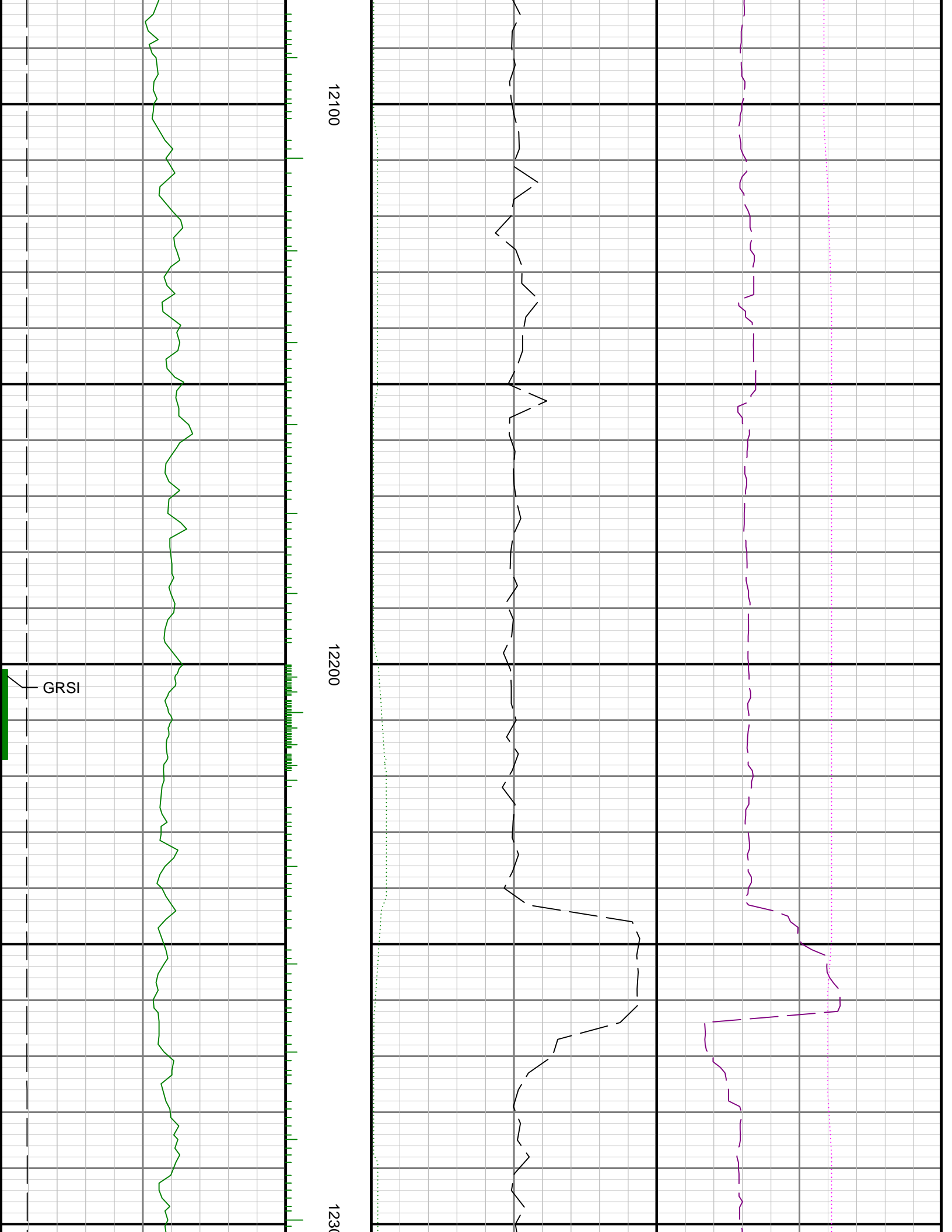


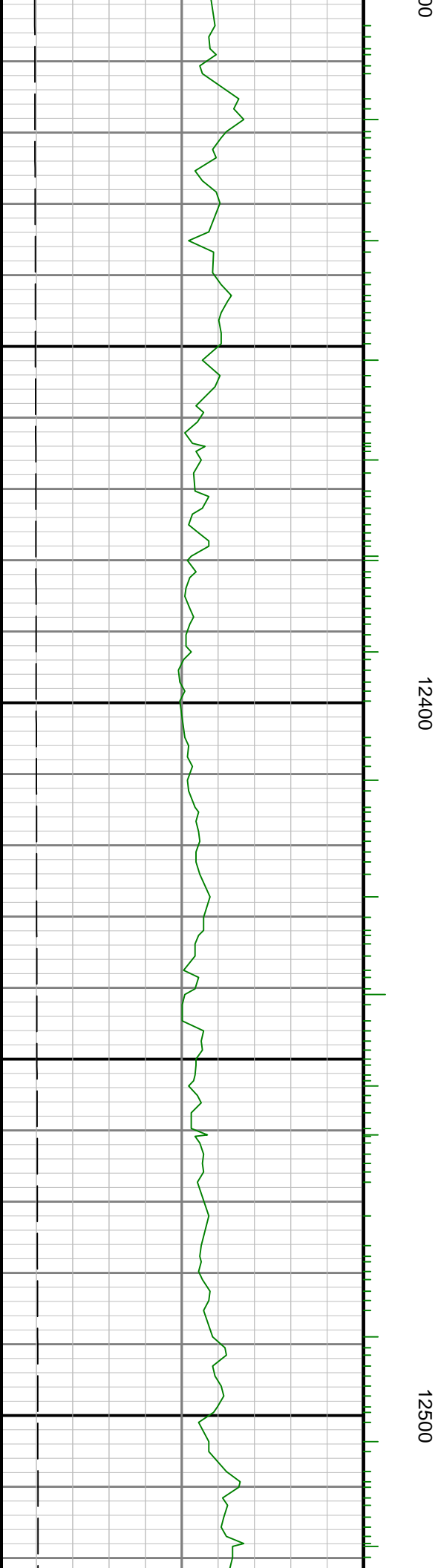
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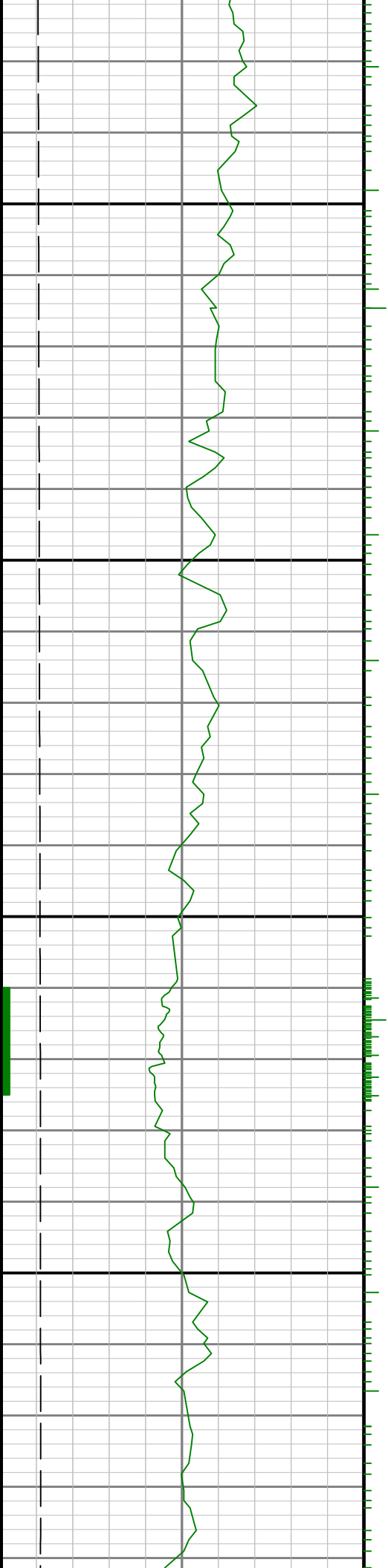
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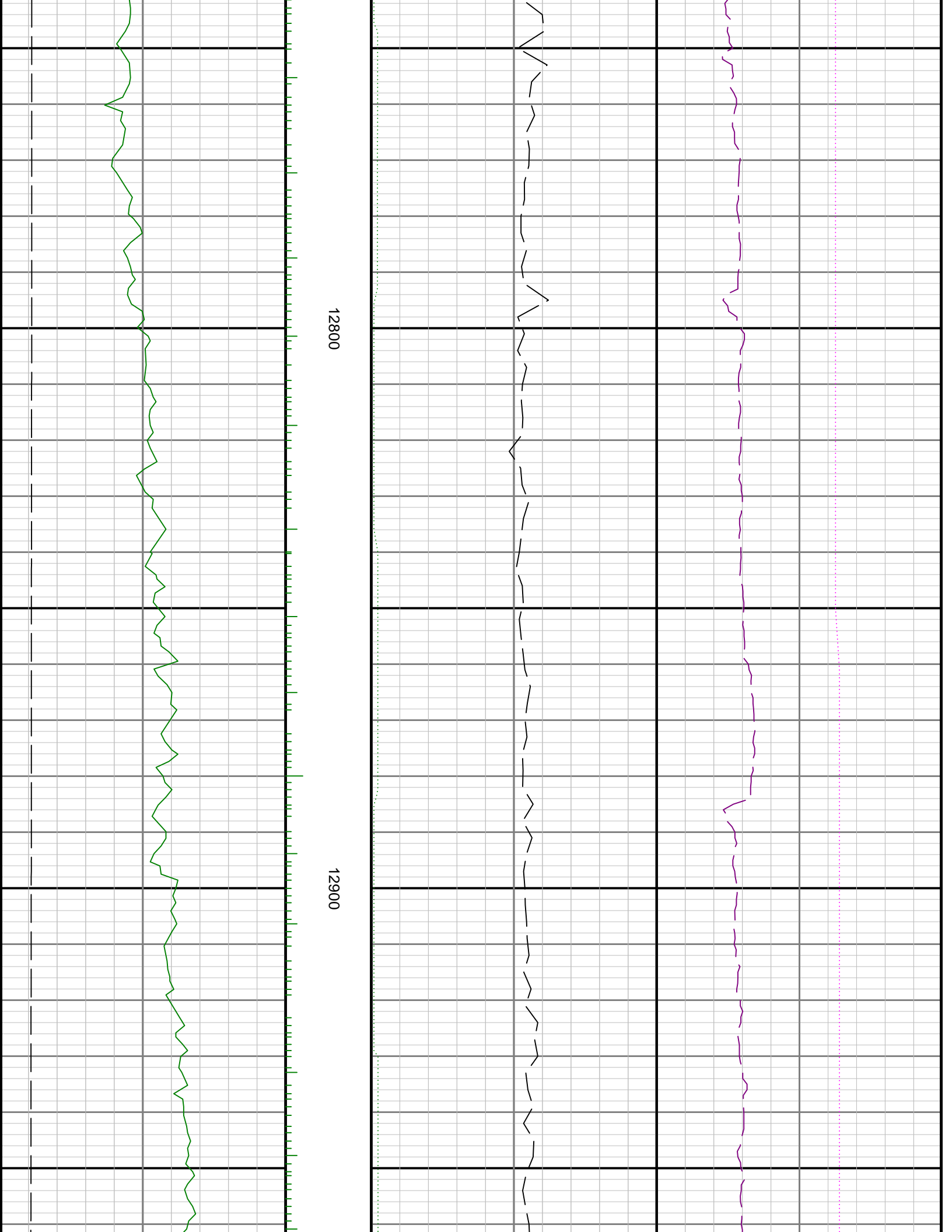


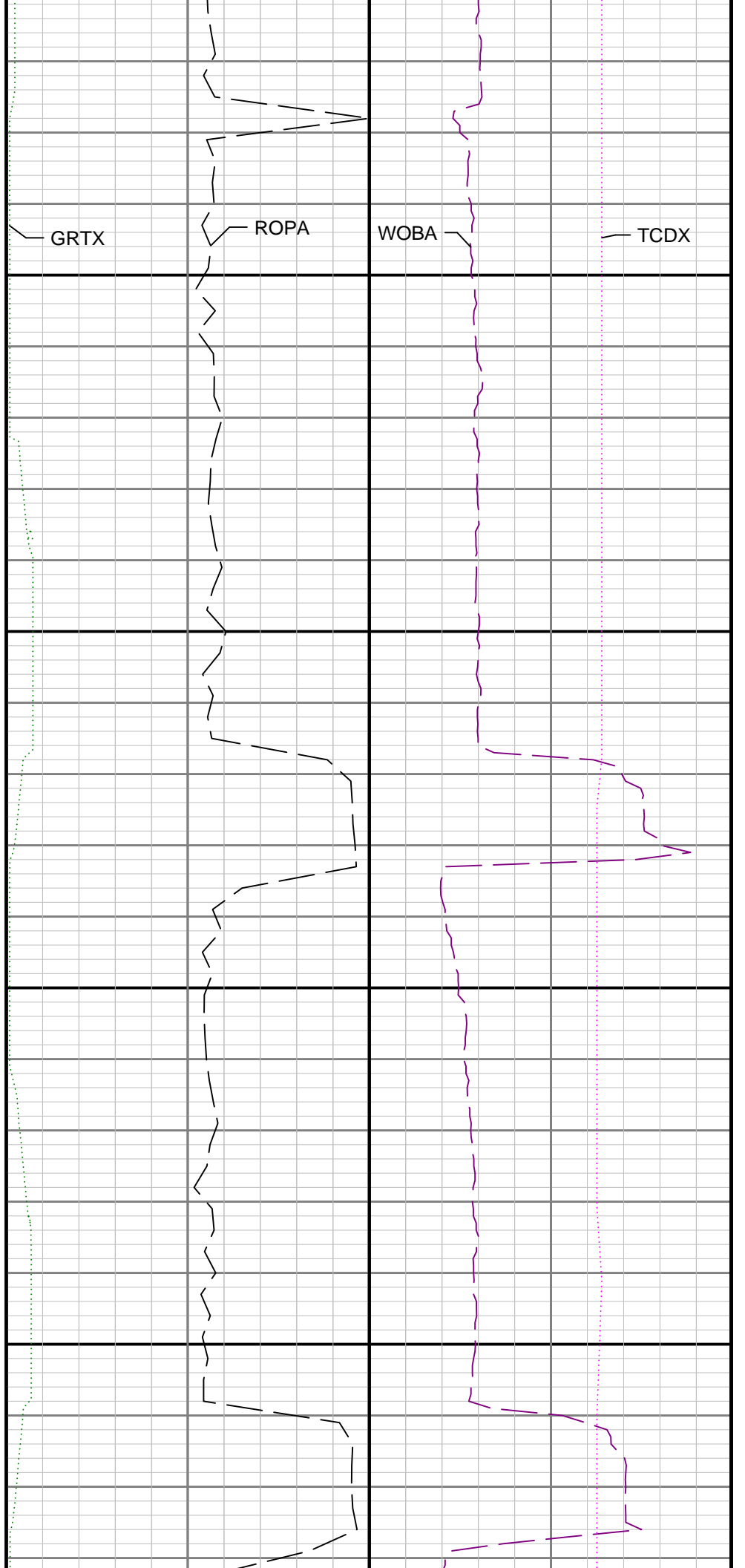
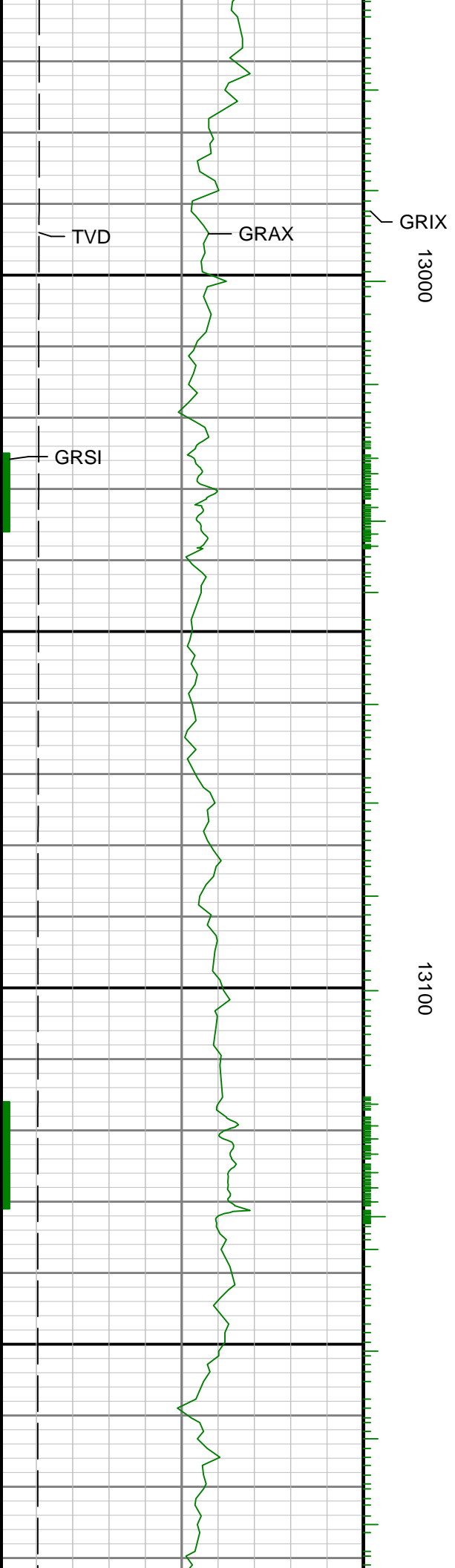


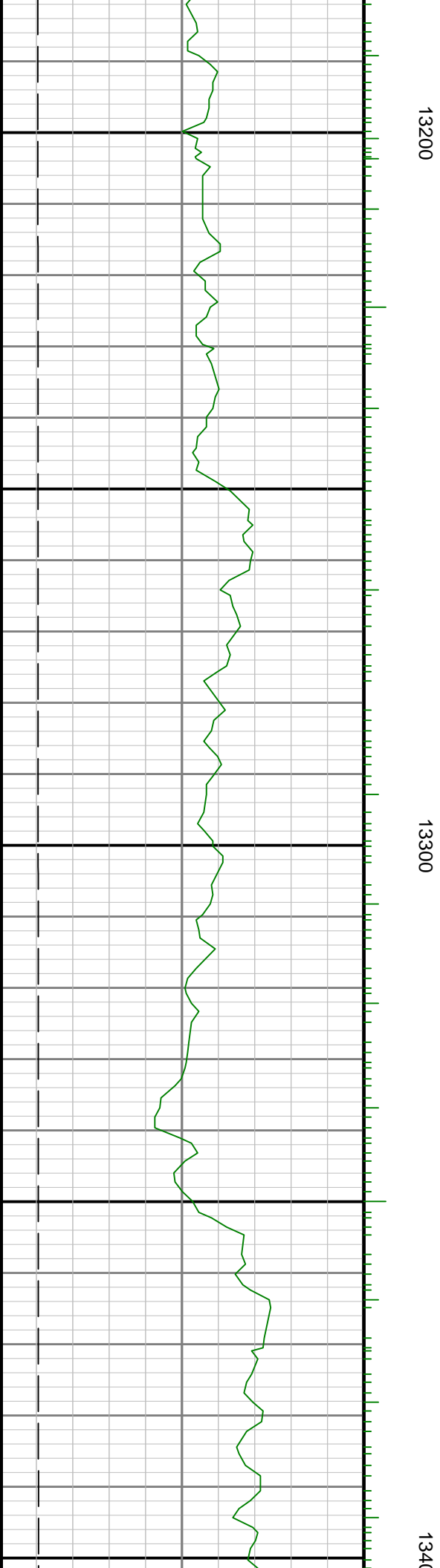
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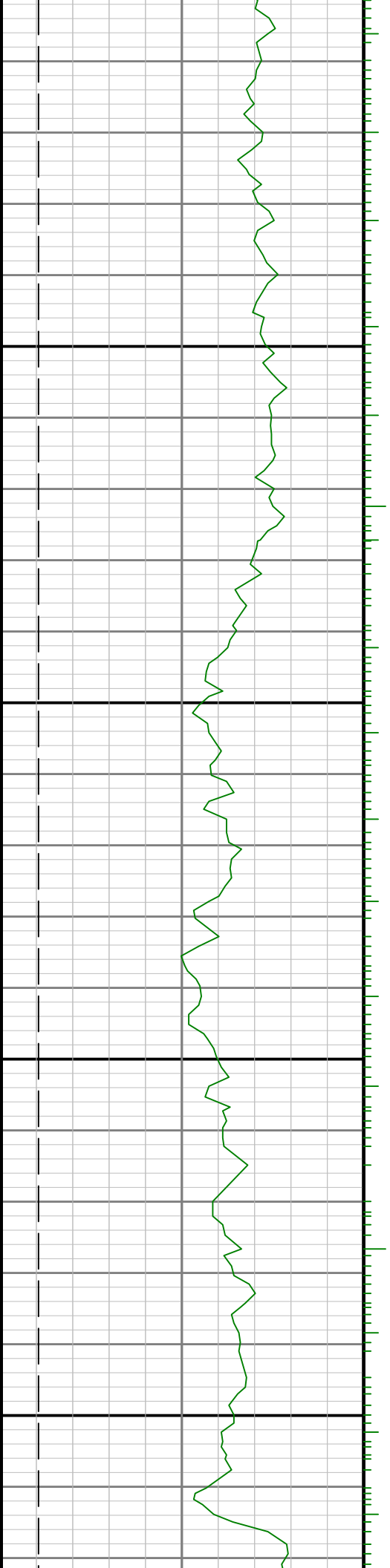


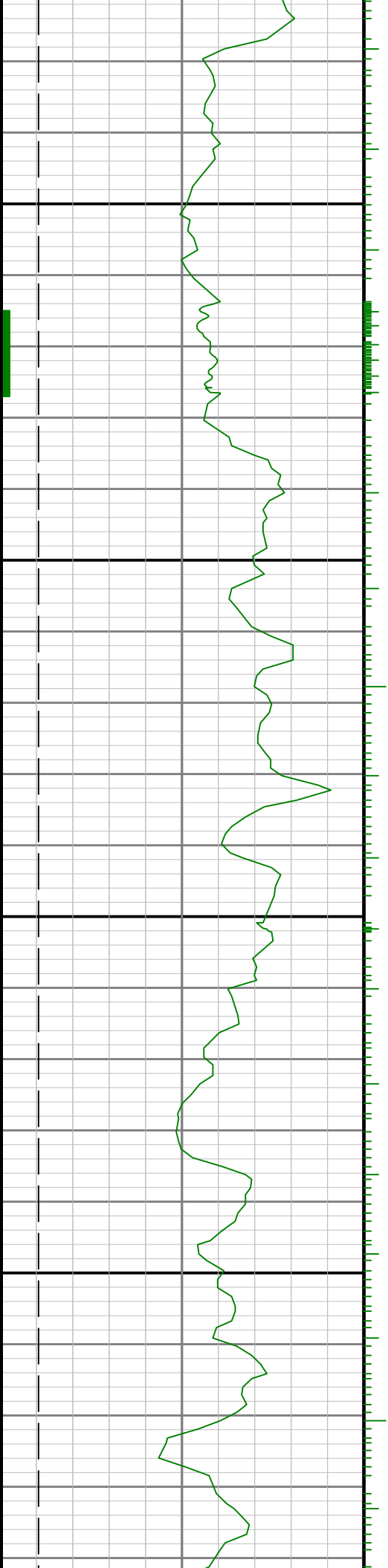


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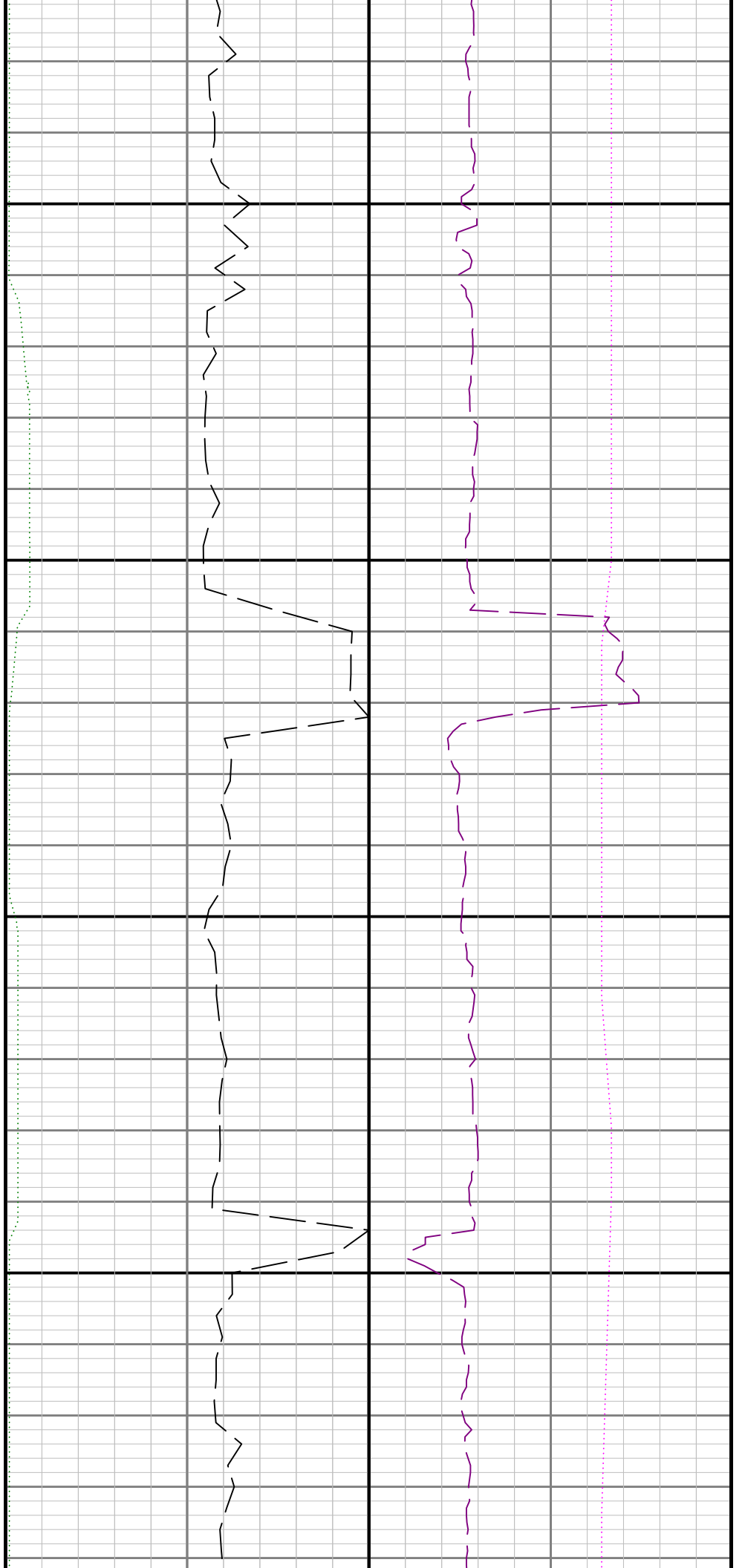
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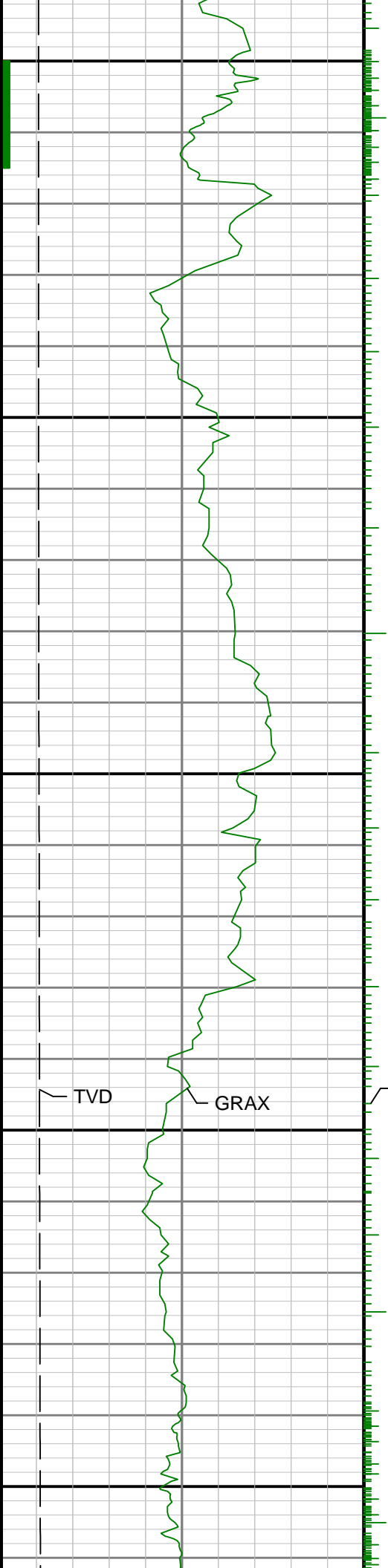




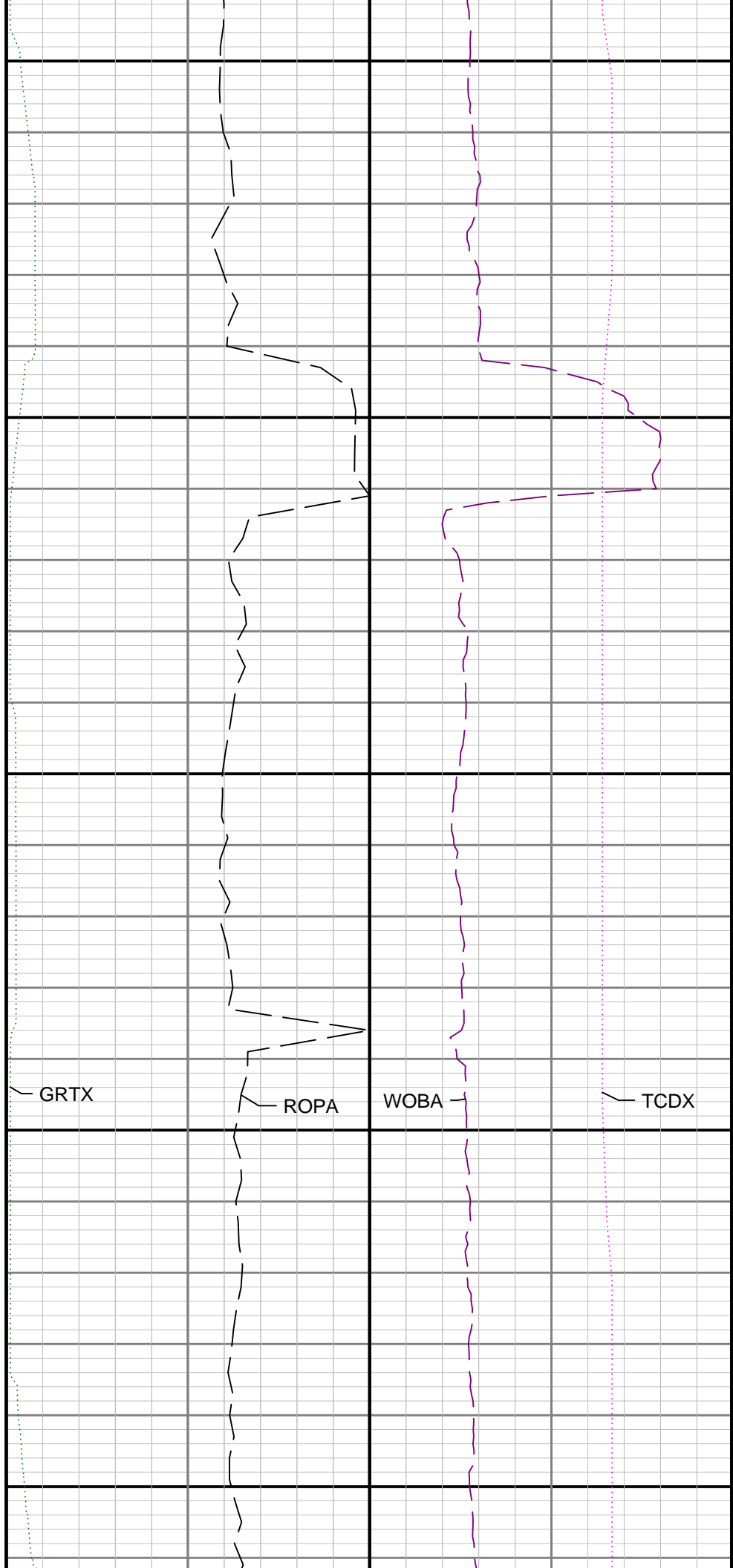
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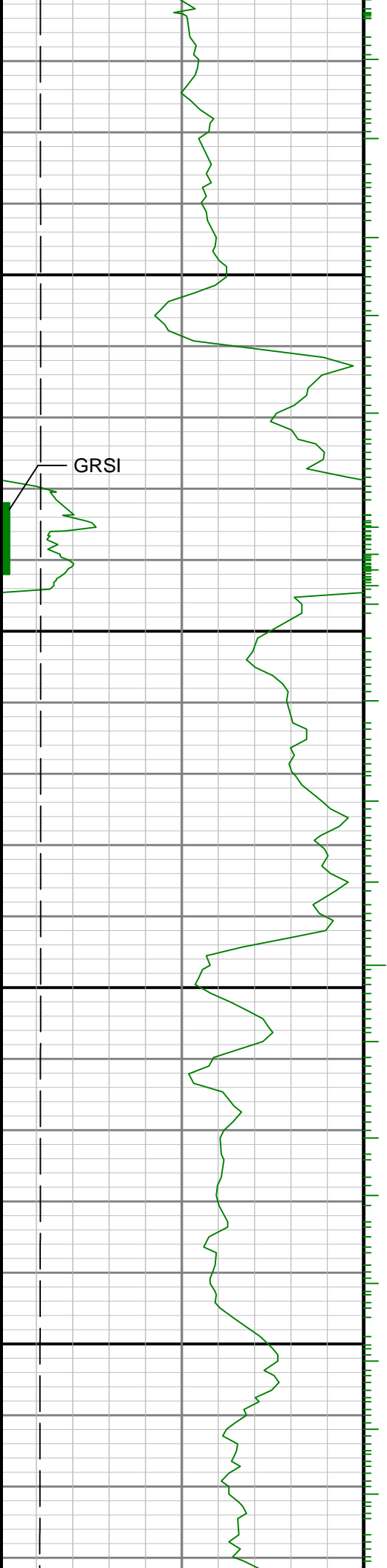




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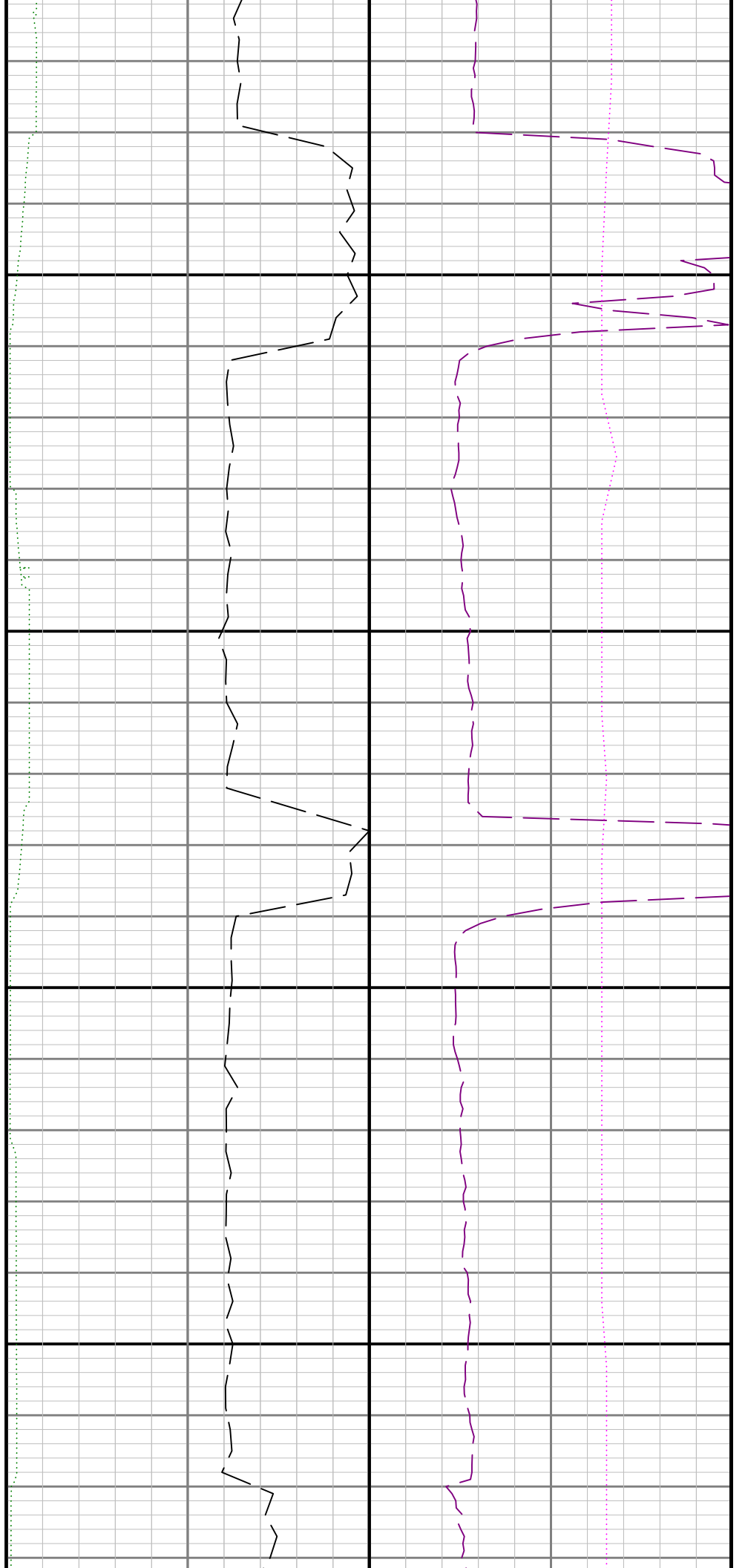


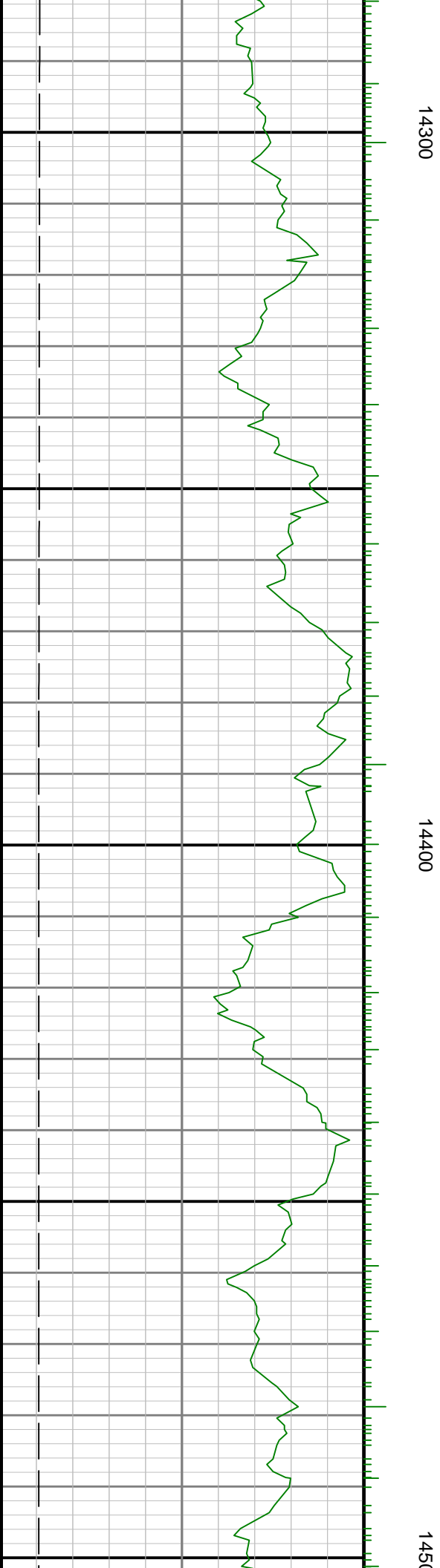
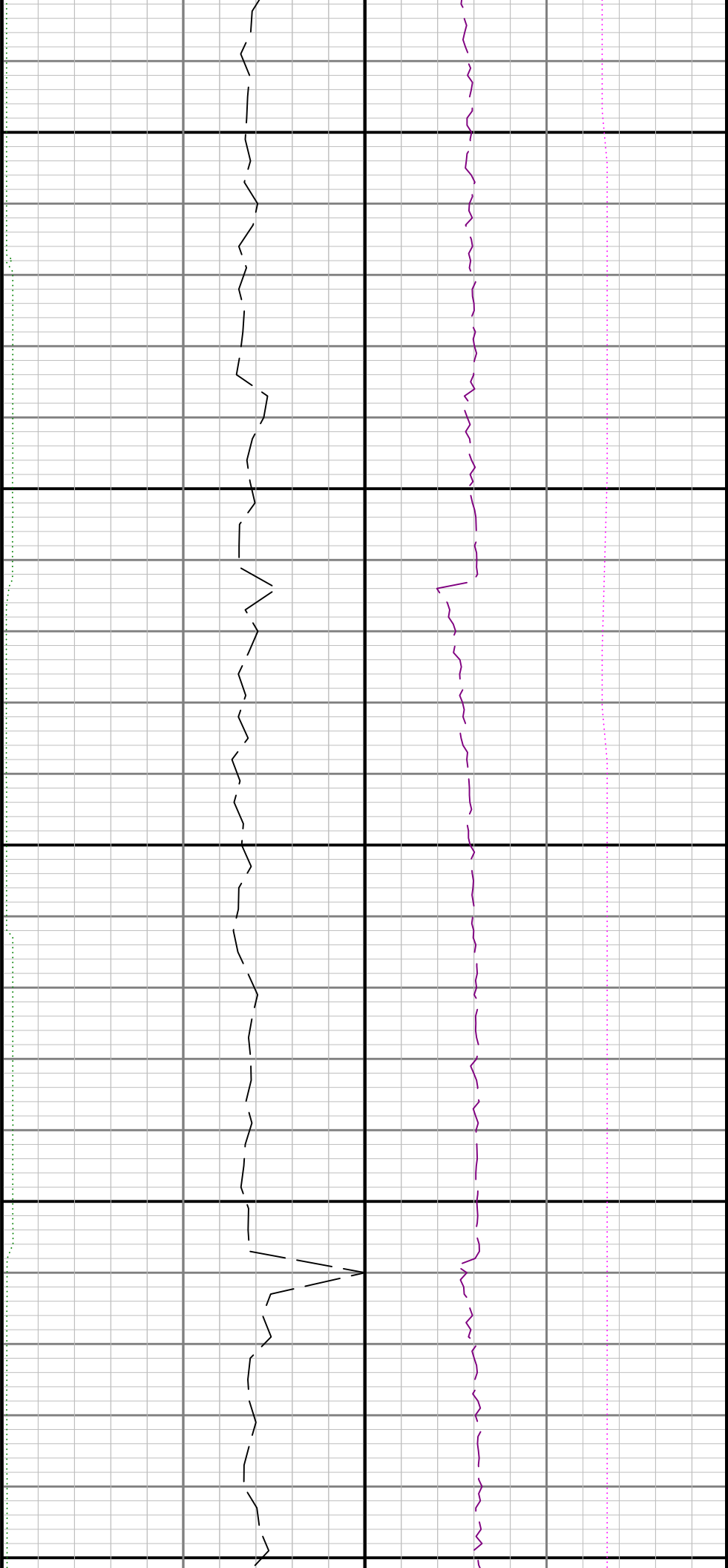
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ROPA
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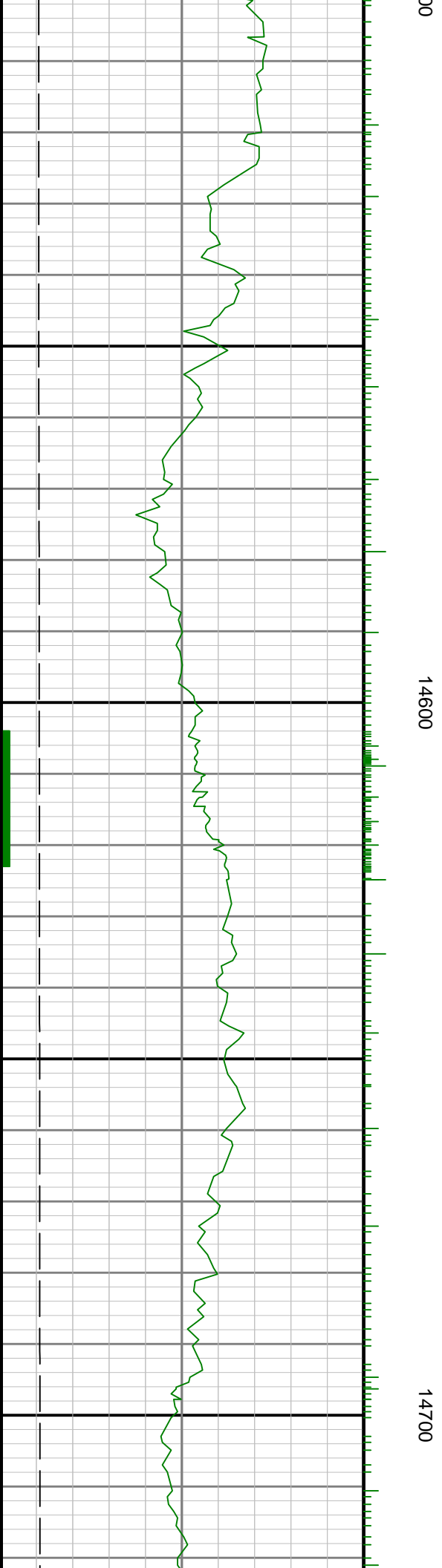
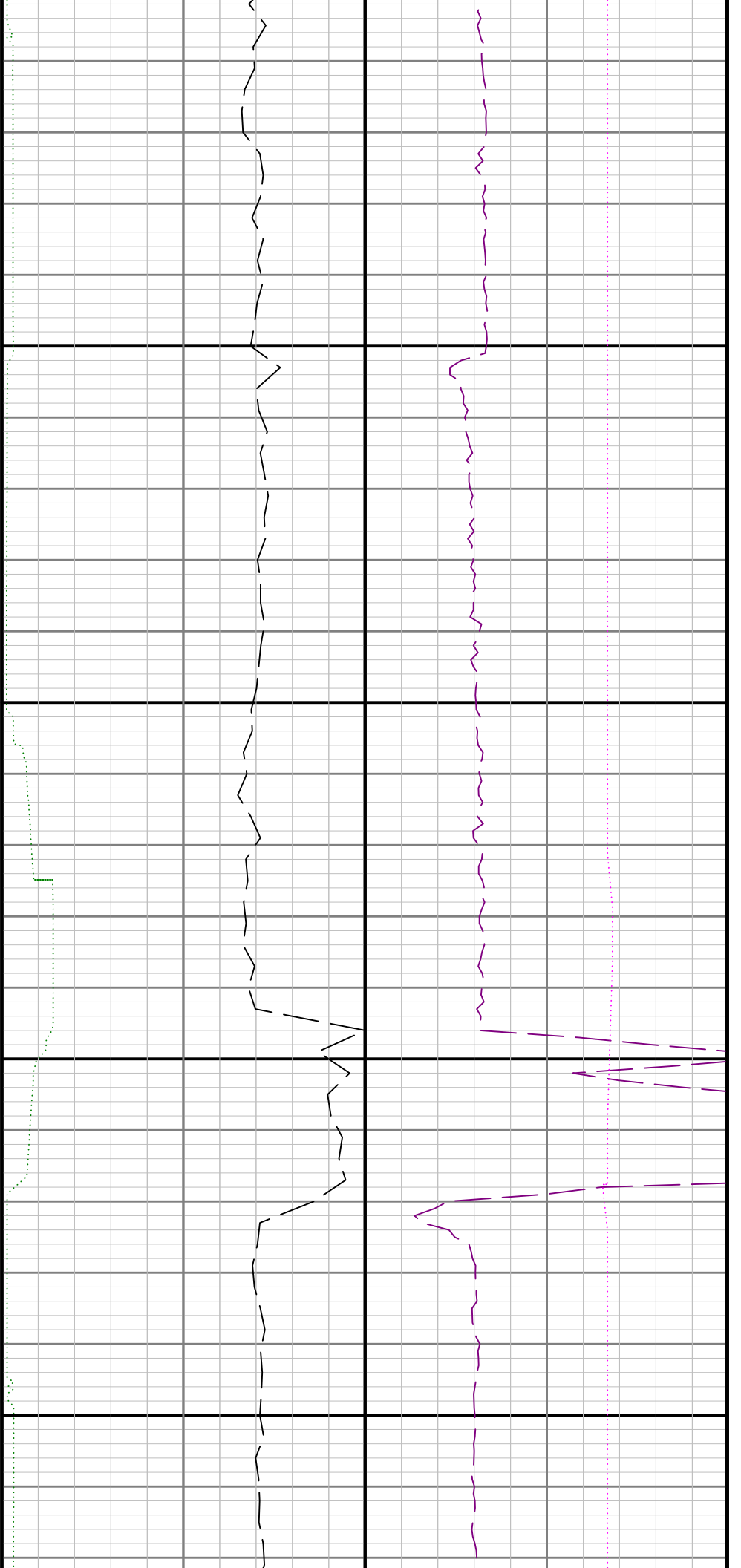


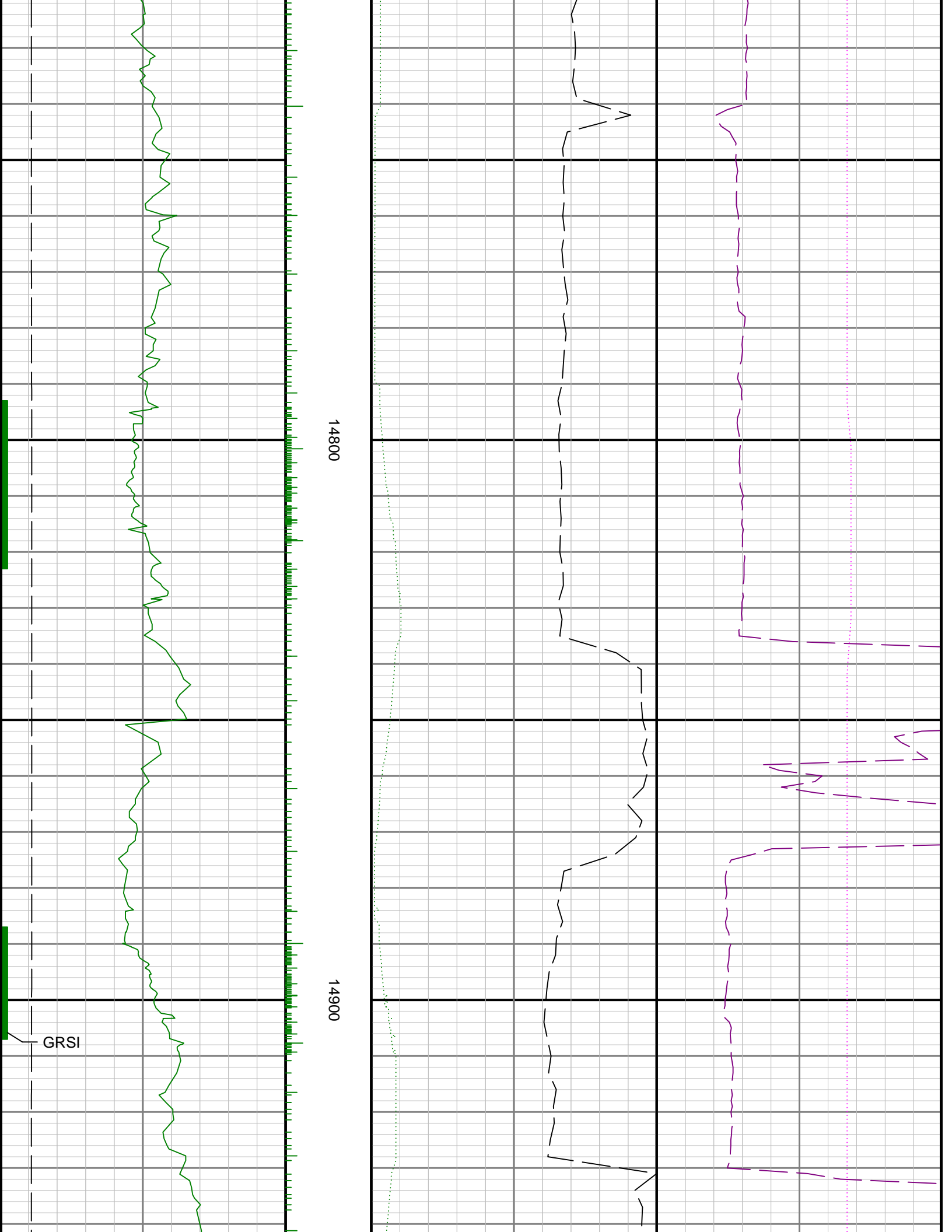
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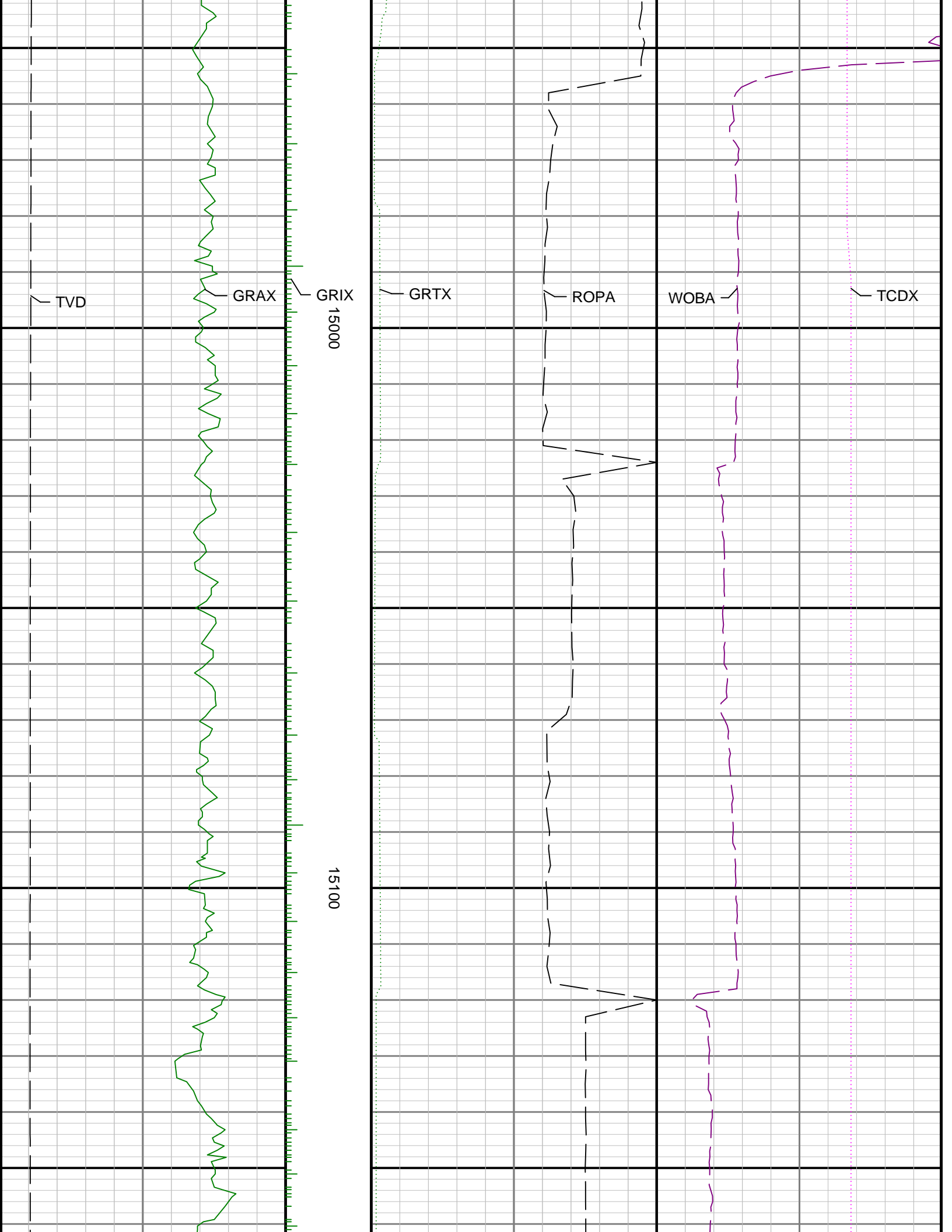
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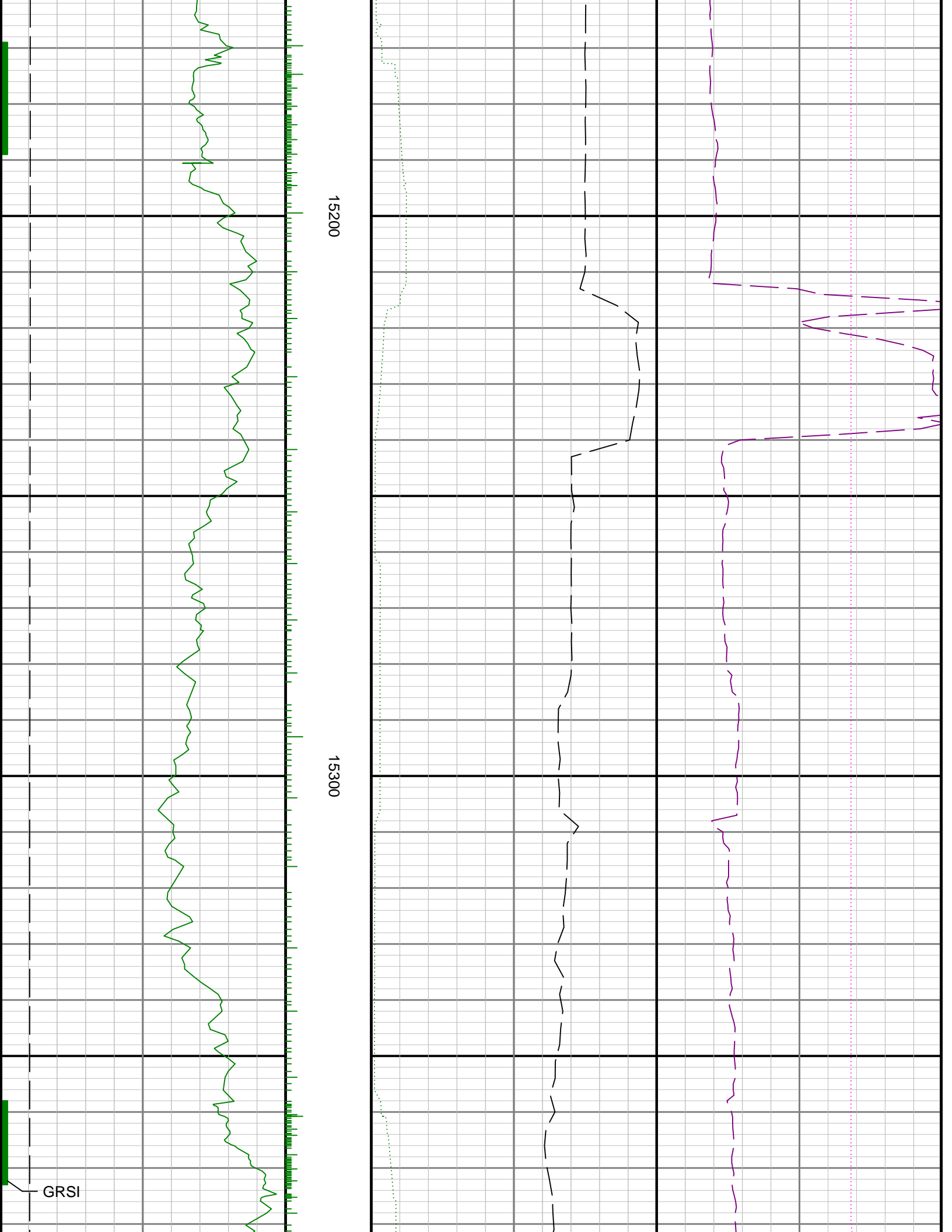


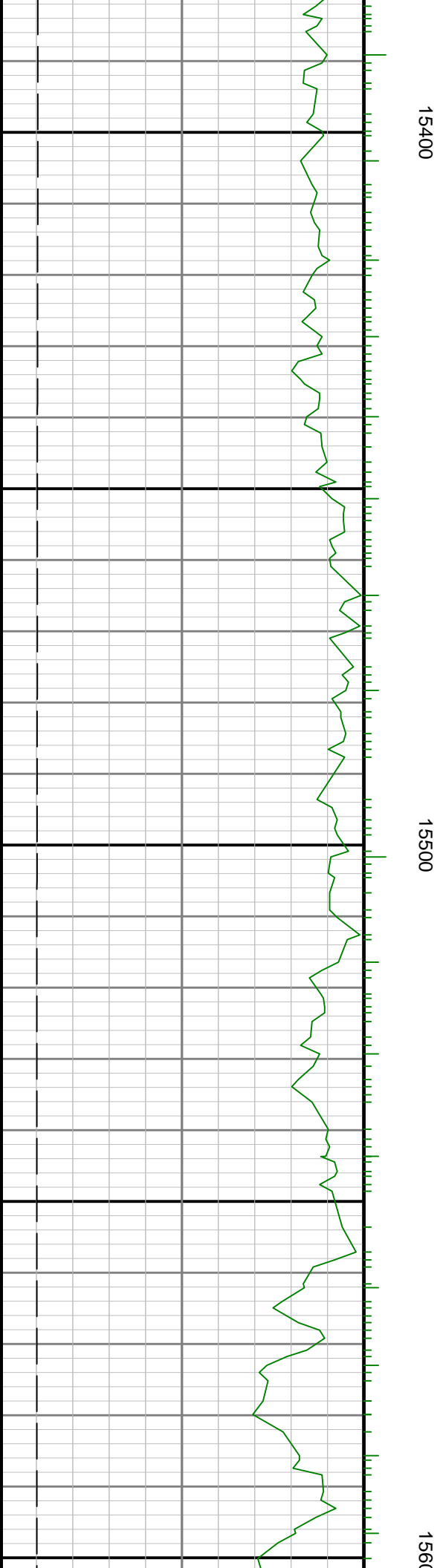
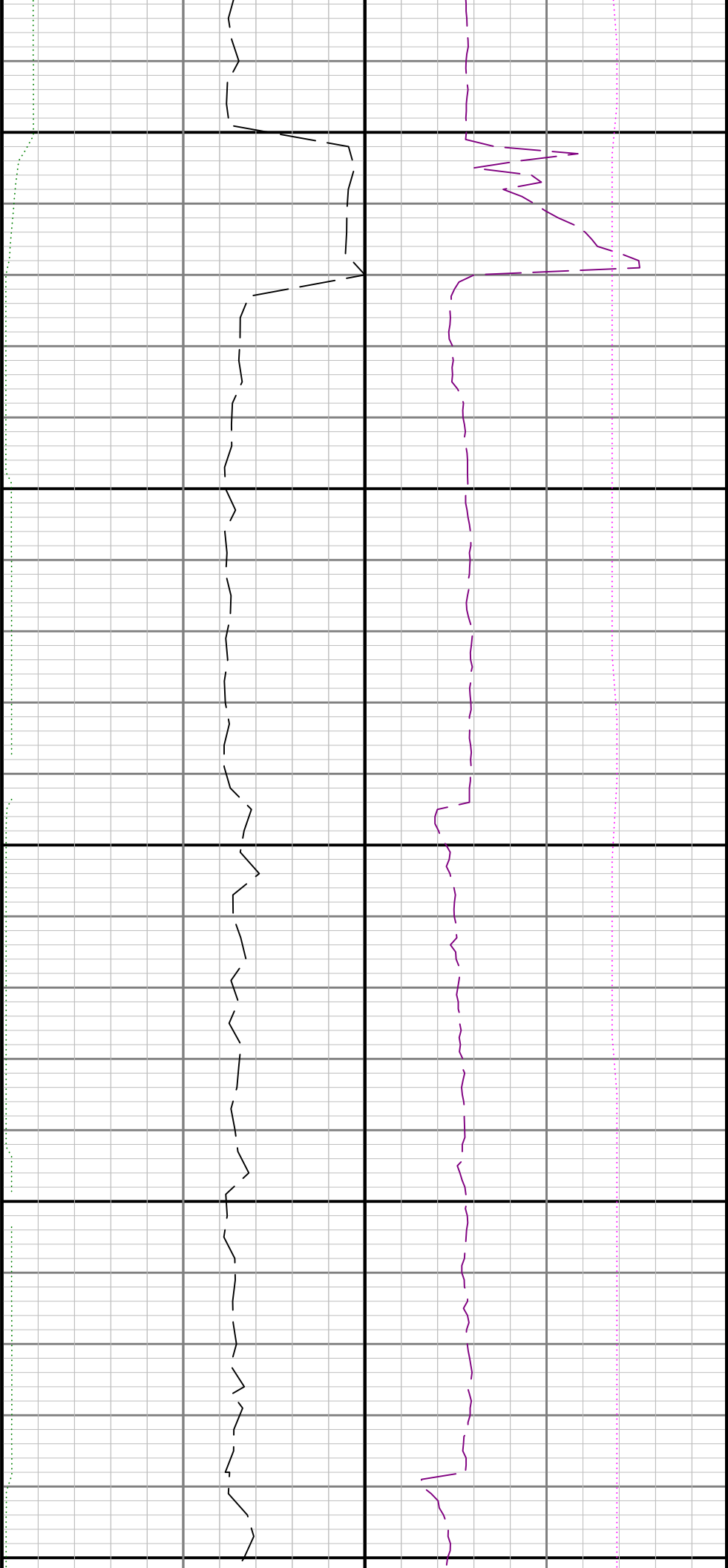


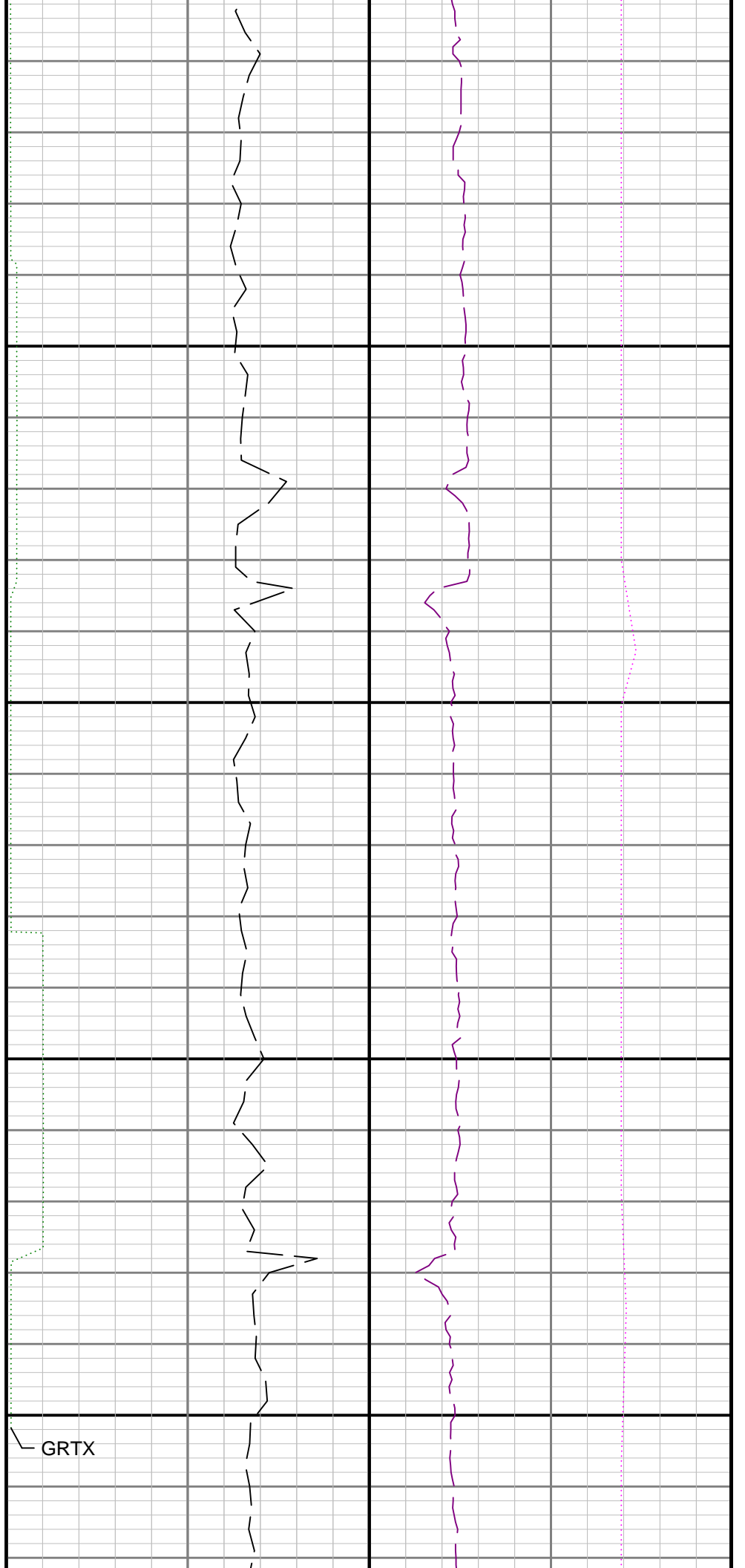
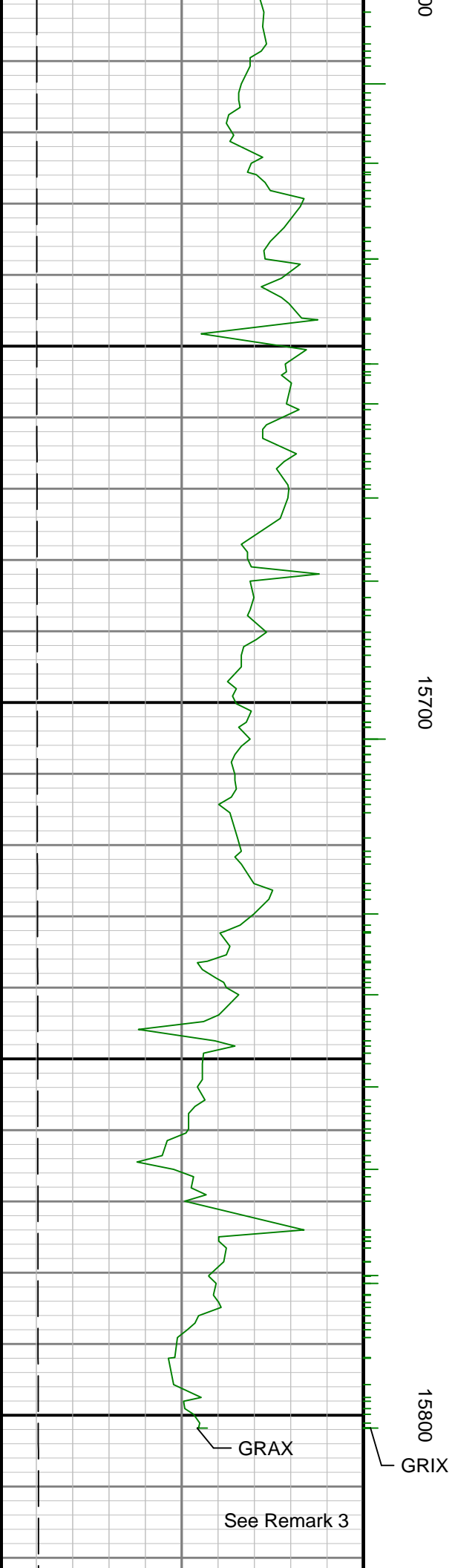


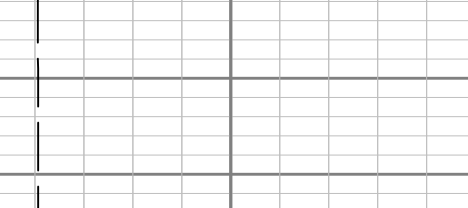
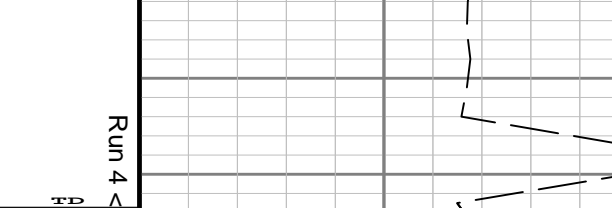
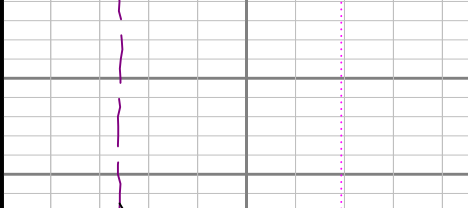











 <p>TVD</p>	 <p>ROP</p>	 <p>WOB</p>	 <p>TCDX</p>
<p>Gamma Ray Apparent 0.5 ft Avg GRAX</p> <p>0 200</p> <p>API</p> <p>True Vertical Depth TVD</p> <p>5700 4900</p> <p>ft</p>	<p>MD feet 1:240</p>	<p>Rate of Penetration 3.0 ft Avg ROPA</p> <p>1000 0</p> <p>ft/hr</p> <p>Gamma Time Since Drilled GRTX</p> <p>0 600</p> <p>min</p>	<p>Surface Weight On Bit 1.0 ft Avg WOB</p> <p>0 100</p> <p>klbf</p> <p>Downhole Temperature TCDX</p> <p>100 300</p> <p>degF</p>