



## LWD REALTIME LOG

# Gamma Ray

Scale:	Company: Anadarko		
1:240	Well: Buddy 7-13HZ		
Measured Depth	Field:	Wattenberg	
Depth Reference:	County:	Weld	Country: United States
Driller's Depth	State:	Colorado	Block: 1
Status:	Surface Location:	Other Services:	
Final Print	Latitude:	040° 04' 14.549" N	
API No: 05-123-48452-0000	Longitude:	104° 55' 39.194" W	
Job ID: 109751797	SEC:	7 TWN:	1N RGE: 67W
Permanent Datum (P.D.): Mean Sea Level	Elevation:	0.00 ft	Elev. KB: N/A
Log Measured From: Rig Floor	Above P.D.:	5093.00 ft	Elev. DF: 5093.00 ft
			Elev. GL: 5072.00 ft
Dates	Interval	Magnetic Field Reference	
From: 2019-04-30	Drilled (ft)	Logged (ft)	Azi Reference North: True Dip Angle: (deg)
To: 2019-05-04	Top: 1890.00	Top: 1890.00	Total Magnetic Field Strength: (nT)
Spud: 2019-04-30	Bottom: 18195.00	Bottom: 18144.00	Mag to Reference North Correction: (deg)
			8.24
Borehole Record			
Hole Size (in)	From (ft)	To (ft)	Size (in)
13.500	21.00	1890.00	9.625
7.875	1890.00	18195.00	
Mud Record			
Type	From (ft)	To (ft)	Hole Size (in)
Oil Based Mud	1890.00	18195.00	7.875
Deviation Record			
Acquisition System			
Baker Hughes Cadence	RT 5.1	Precision Drilling 464	Unit: D&E
Deliverable Gen	1.0.8304.1	Contractor: Precision Drilling District:	RMA

© 2018 Baker Hughes, a GE company, LLC – All rights reserved. Baker Hughes, a GE company, LLC and its affiliates (“BHGE”) provides this information on an “as is” basis for general information purposes and believes it to be accurate as of the date of publication. BHGE does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. BHGE hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. The BHGE logo is a trademark of Baker Hughes, a GE company, LLC. GE and the GE monogram are trademarks of General Electric Company used under trademark license.

## Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	7.875	PDC	2.25	Steerable	1890.00	18144.00	1890.00	18195.00	2019-04-30 21:15	2019-05-04 11:37	78.60

## Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Kaewan Gardi	2019-04-30	2019-05-04	Mohammad Odetallah	2019-04-30	2019-05-04			

# Mud Properties Record

Date / Time	Run No.	Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2019-04-29 20:34	1	1890.00	Oil Based Mud	9.2	23	N/A	4.8	79/21	Active Pit	40000	0.00
2019-05-01 15:00	1	7636.00	Oil Based Mud	9.2	20	N/A	3.6	76/24	Active Pit	43810	0.00
2019-05-02 15:00	1	12451.00	Oil Based Mud	9.2	19	N/A	4.0	76/24	Active Pit	40952	0.00
2019-05-03 15:00	1	15768.00	Oil Based Mud	9.3	18	N/A	4.0	76/24	Active Pit	40952	0.00

# Mud Resistivity Record

Well Resistivity Record				Surface			Downhole			
Date / Time	Run No.	Depth (ft)	Surface Temp (degF)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (degF)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
2019-05-02 09:00	1	1890.00	75.0	100.000	N/A	N/A	105.0	100.000	N/A	N/A
2019-05-03 19:01	1	7636.00	74.0	100.000	N/A	N/A	175.0	100.000	N/A	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	14765381	Gamma (single)	8.18	50.61	6.500	0.000
1	EvoOne	14765381	Directional (mag)	9.37	51.80	6.500	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
MWD	EvoOne - Dir Gamma	EvoOne

Comments

- 1
- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2
- Baker Hughes run 1 utilized 6 1/2 inch NaviTrak UT services (Gamma Ray and Directional) behind a 7 7/8 inch bit and steerable assembly from 1890 to 18195 feet MD (1889 to 7621 feet TVD).
- 3
- A sliding indicator is shown to the left edge of track 1 as a heavy line. The indicator has been depth shifted to the Gamma Ray sensor offset to correspond with Gamma Ray data acquired while sliding.
- 4
- Gamma Ray (GRAX) scale is presented from 0 to 200 API per customer request.

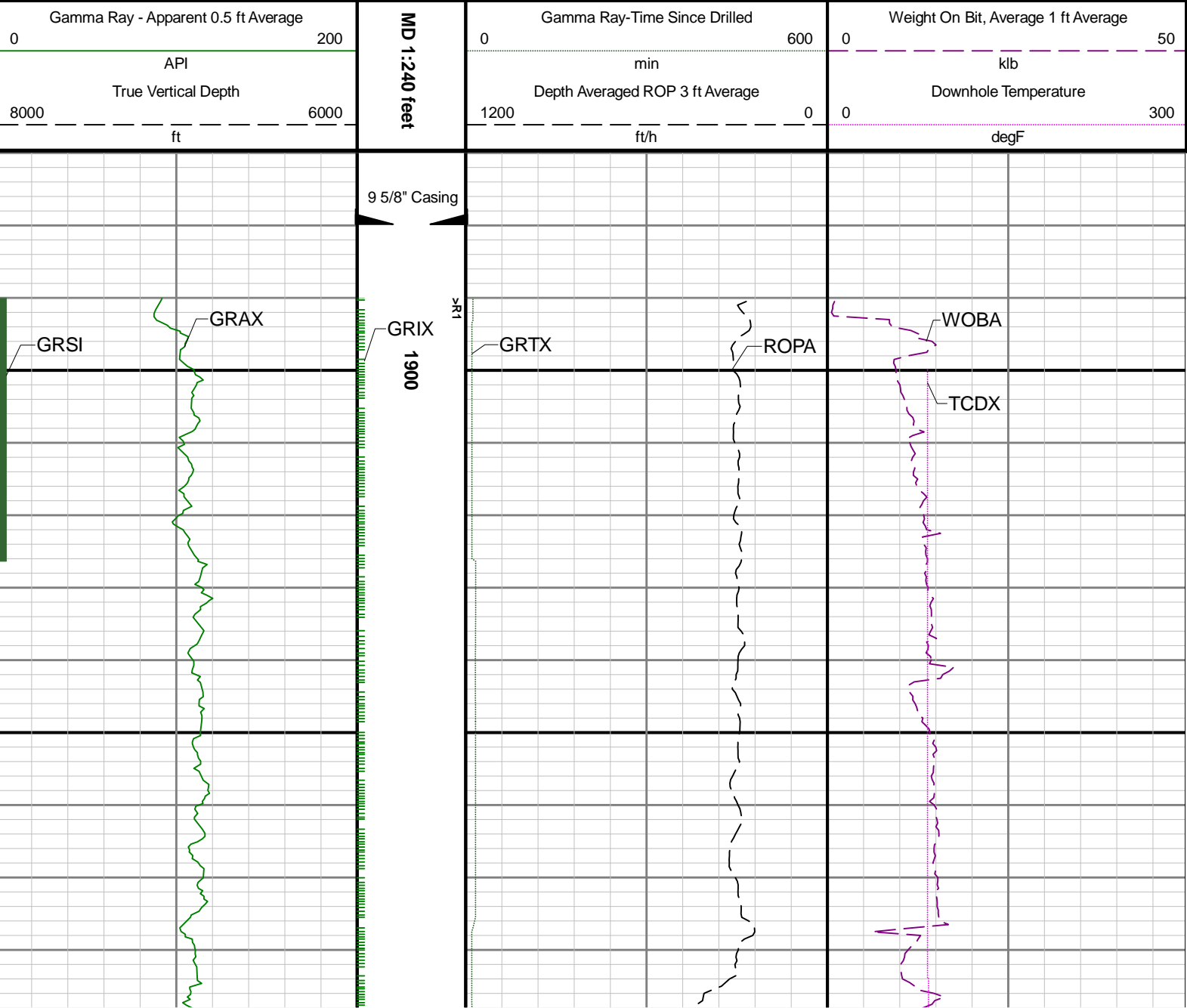
Remarks

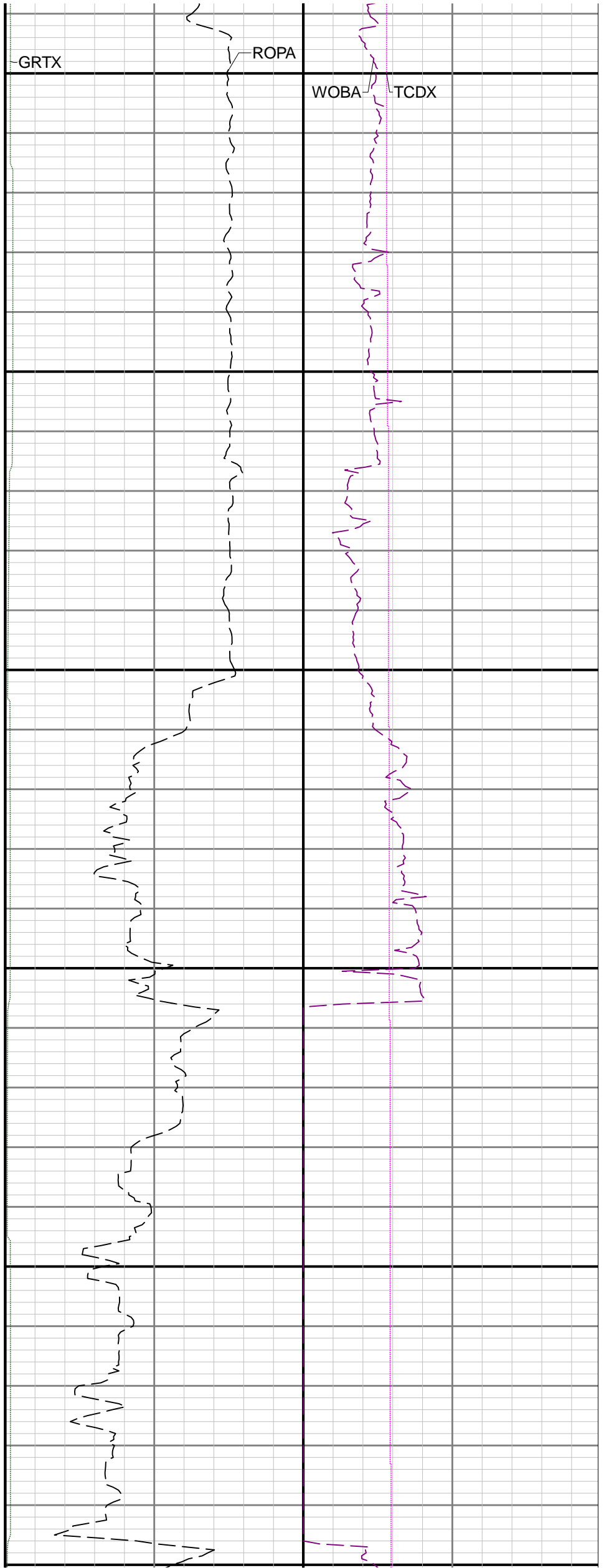
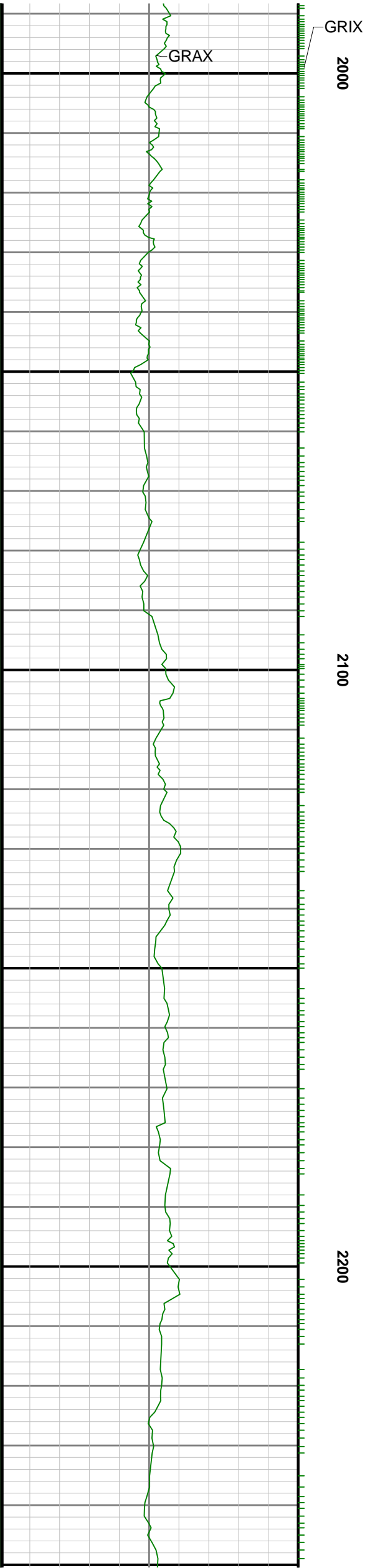
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	11131.00	7.875	1	The interval from 11131 to 11146 feet MD (7636 feet TVD) was not logged due to third party WITS issues.
2	13393.00	7.875	1	The interval from 13393 to 13408 feet MD (7632 feet TVD) was not logged due to third party WITS issues.
3	15327.00	7.875	1	The interval from 15327 to 15350 feet MD (7624 to 7625 feet TVD) was not logged due to EvoOne Surface Display issues.
4	18144.00	7.875	1	The interval from 18144 to 18195 feet MD (7623 to 7621 feet TVD) was not logged due to sensor to bit offset at TD.

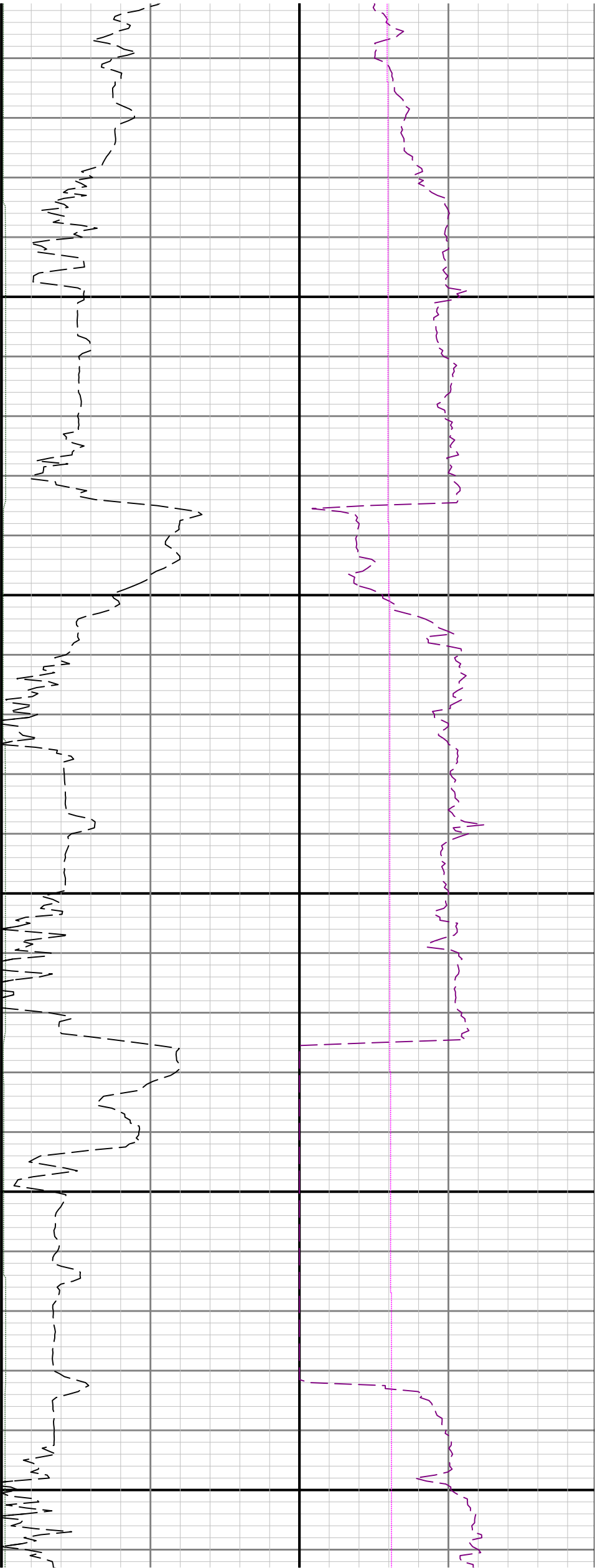
Curve Mnemonics

Presented Curves	Description	Units
TCDX	Downhole Temperature	degF
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAX	Gamma Ray - Apparent - Real-Time 0.5 ft Average	API
GRIX	Gamma Ray - Data Point Indicator - Real-Time	unitless
GRTX	Gamma Ray - Time Since Drilled - Real-Time	min
GRSI	Sliding Indicator Flag	unitless

<div><div><div>BAKER HUGHES</div><div>a GE company</div></div><div></div></div>	Company	Anadarko			
	Well	Buddy 7-13HZ			
	Interval	Date From:	2019-04-30 18:00	Interval Drilled: (ft)	1890.00 - 18195.00
		Date To:	2019-05-04 14:58	Interval Logged: (ft)	1890.00 - 18144.00
	Created	2019-05-04 14:59:18			



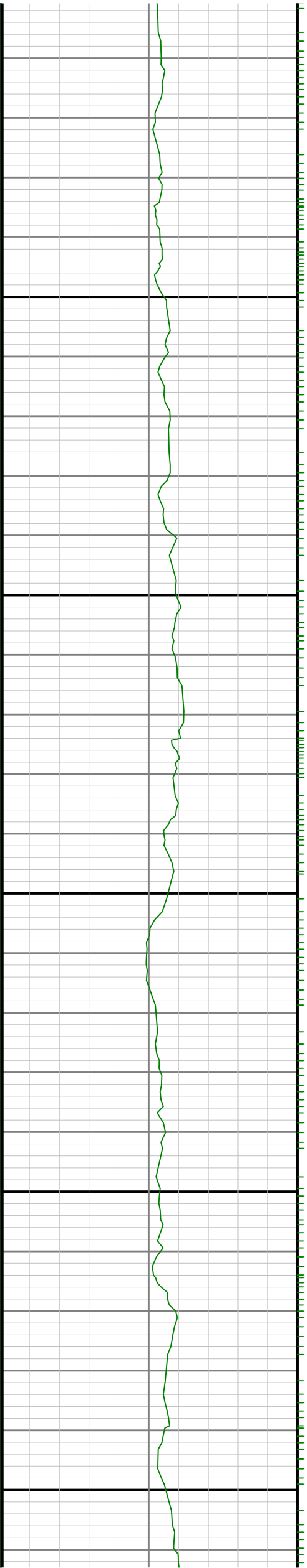


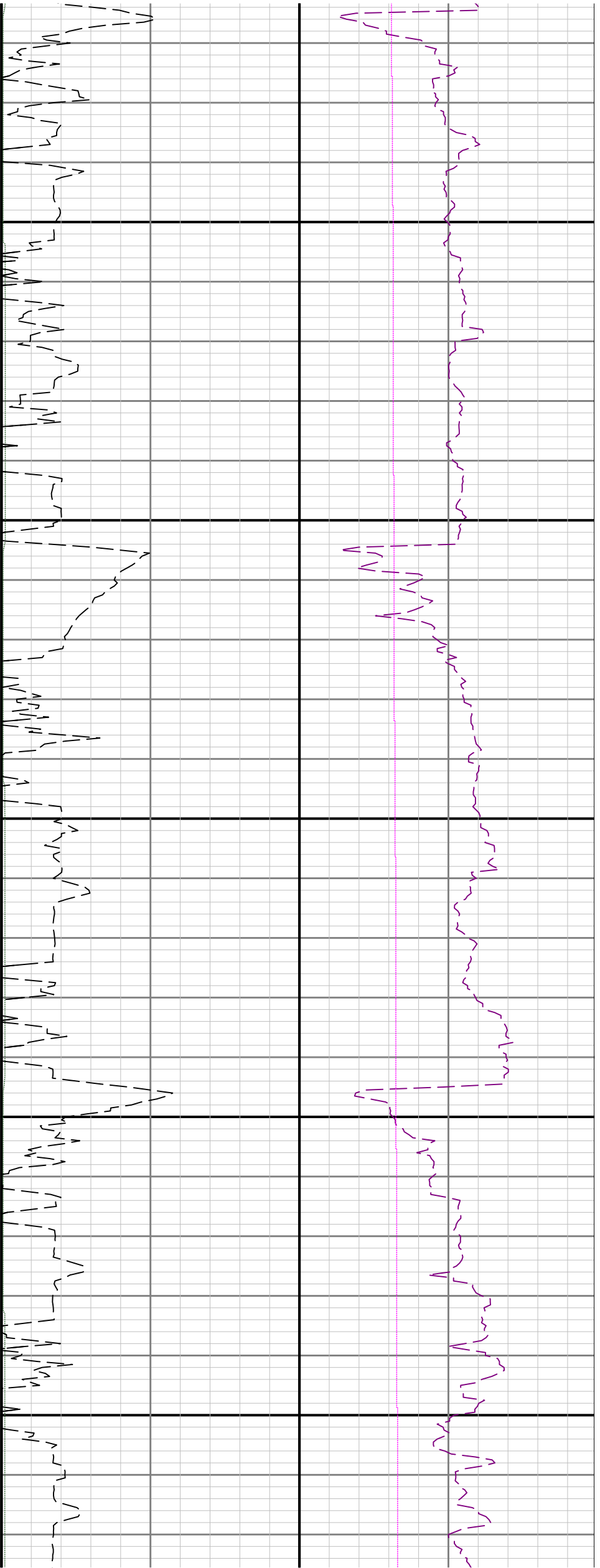


2300

2400

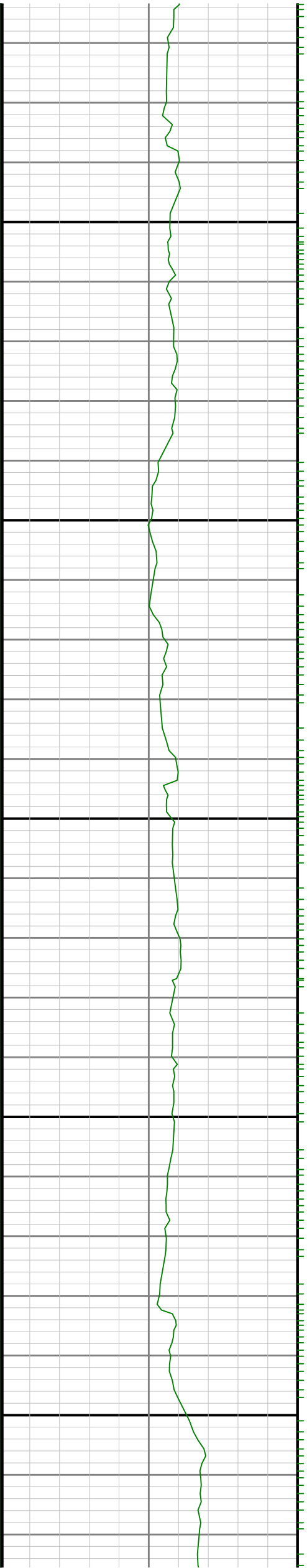
2500

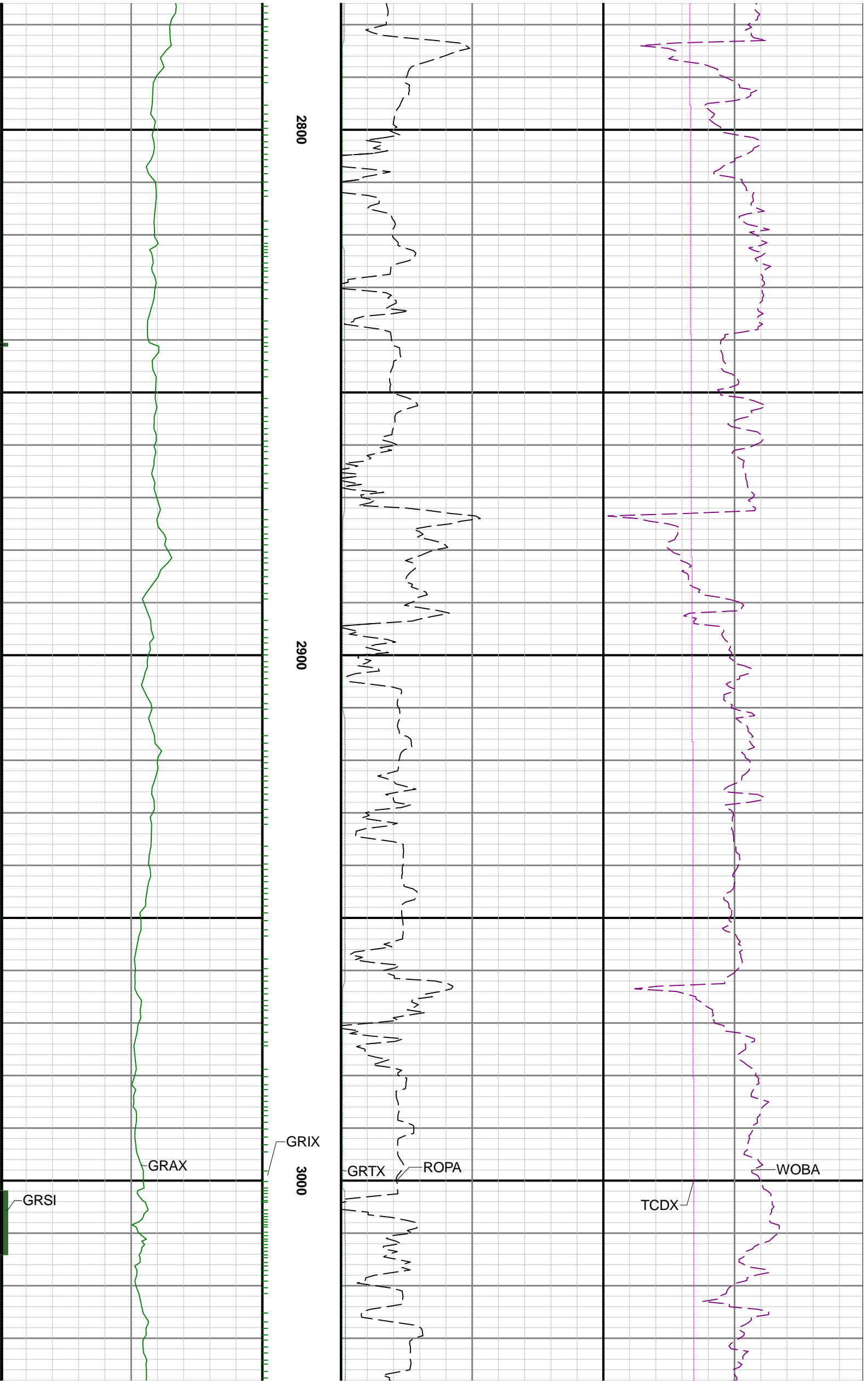


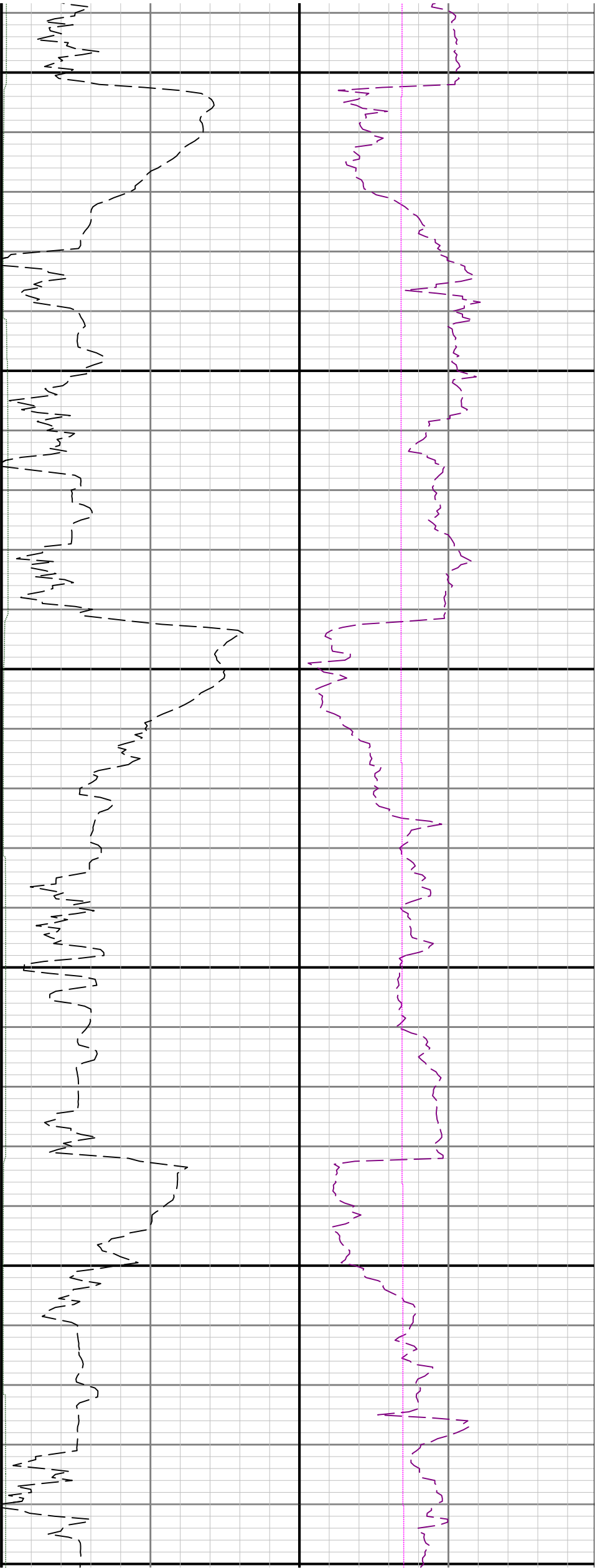


2600

2700



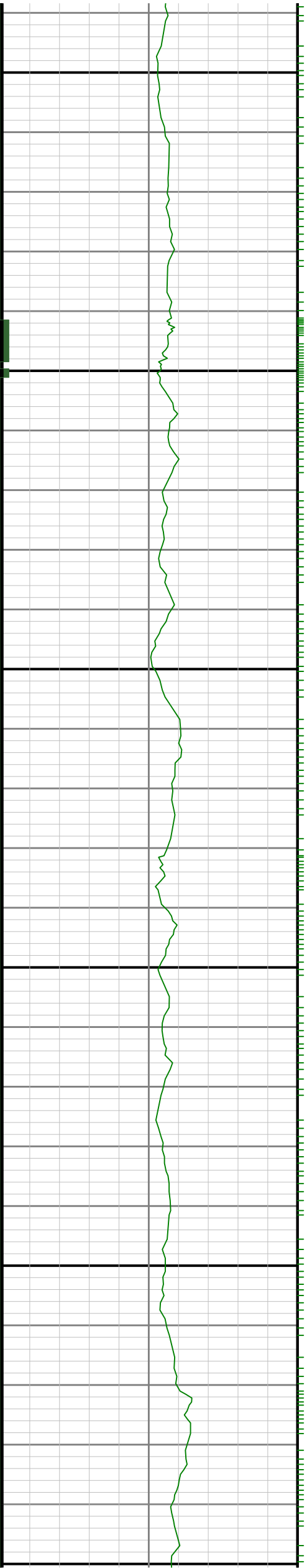


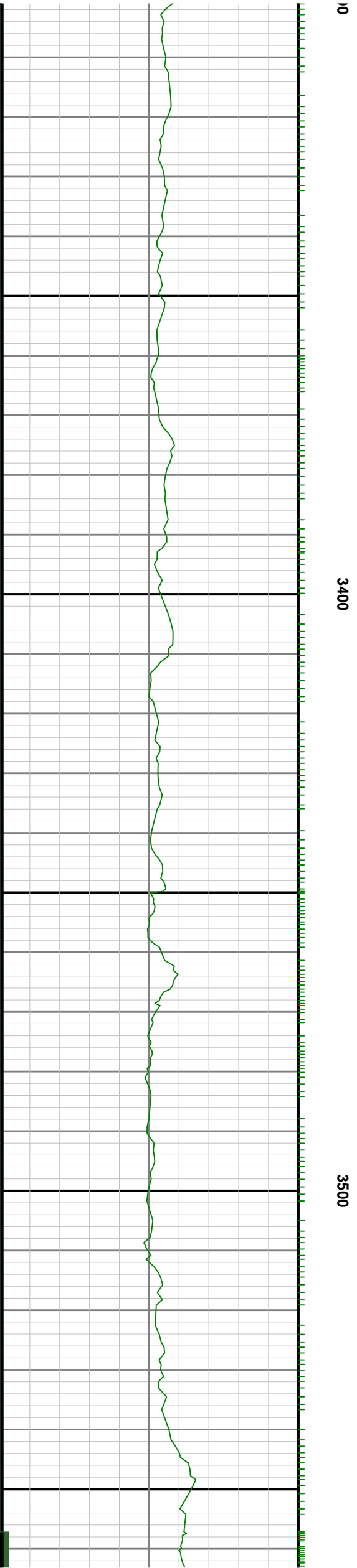
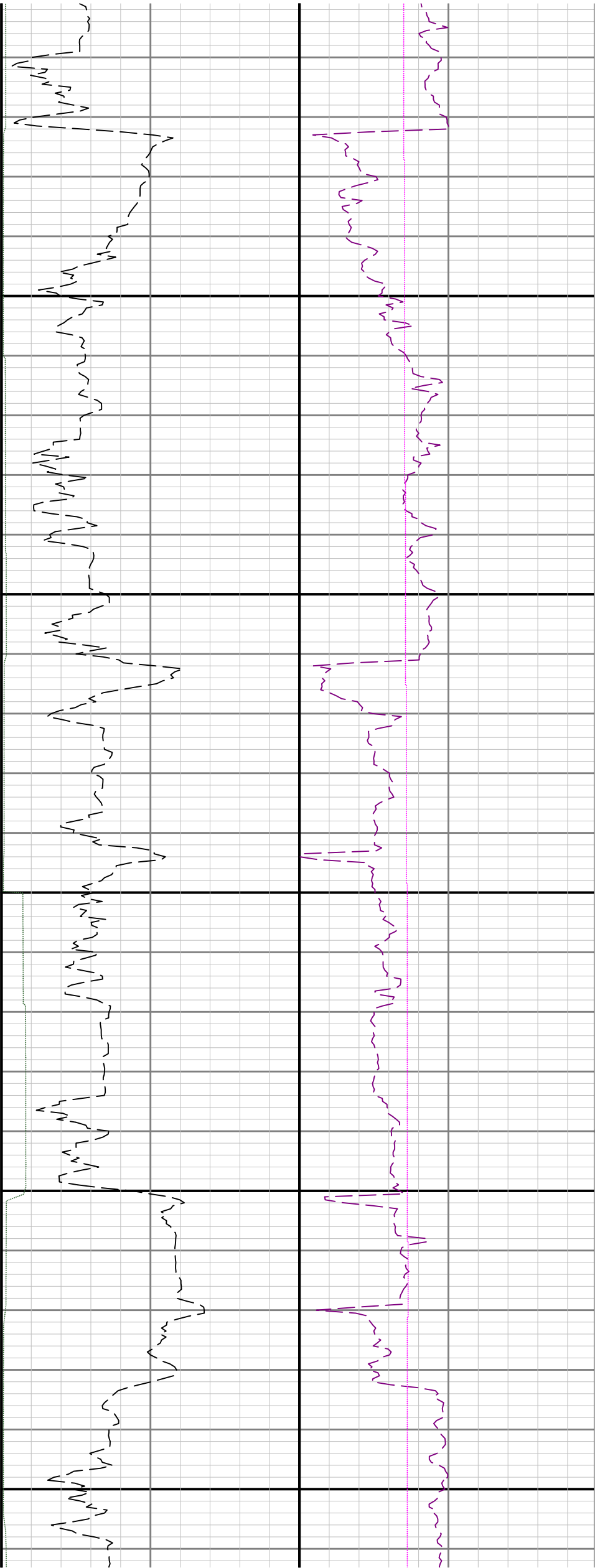


3100

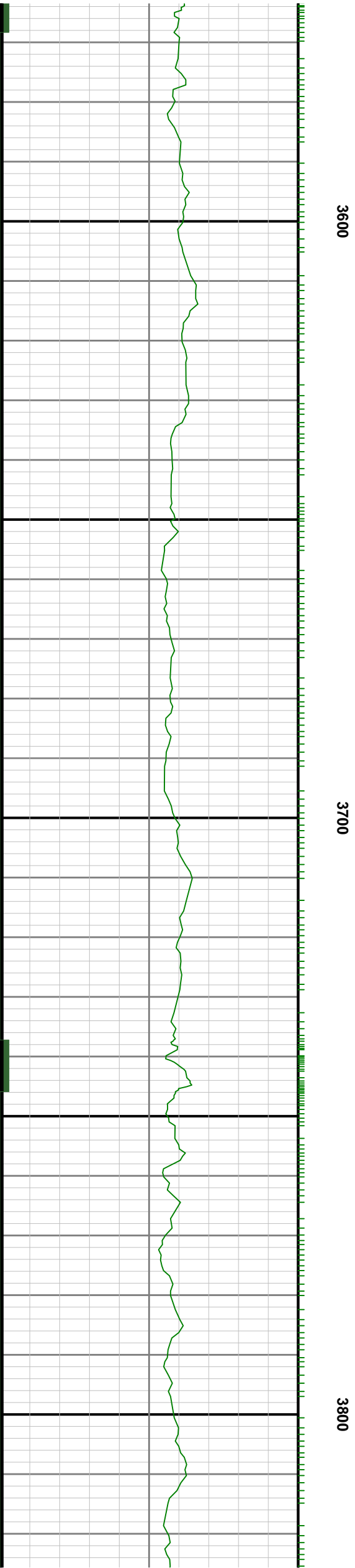
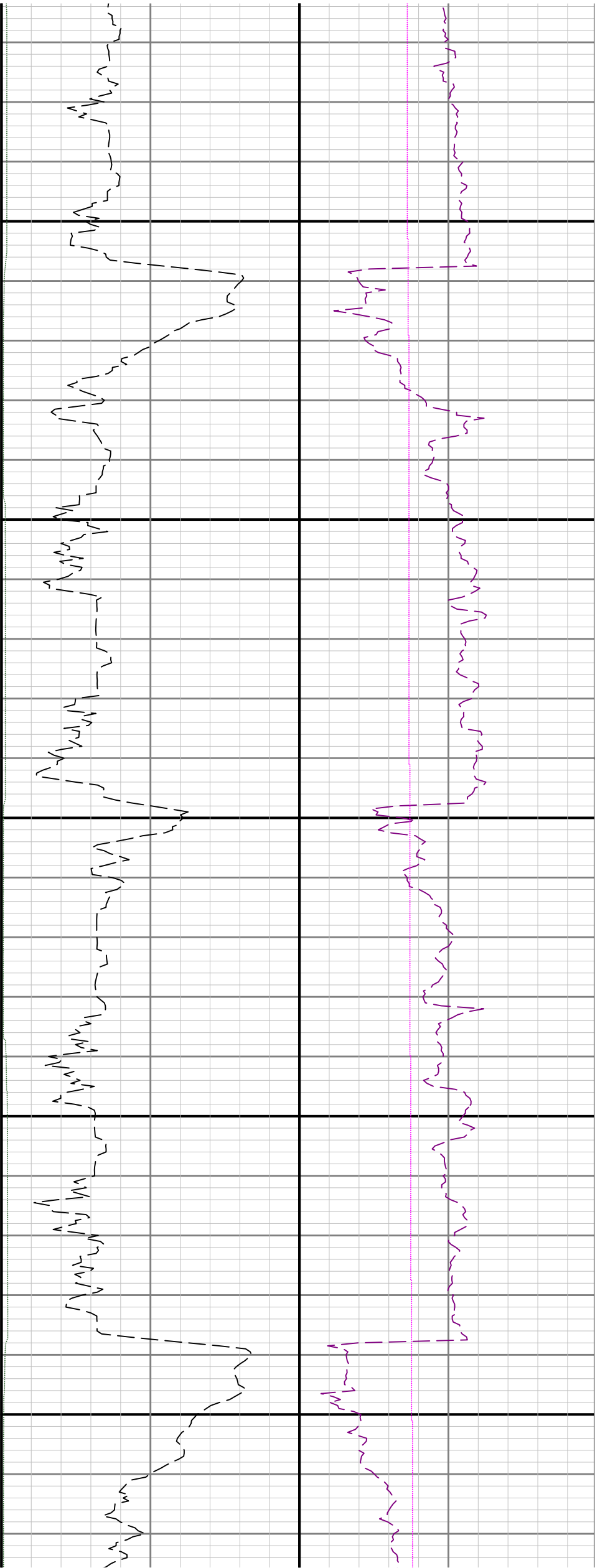
3200

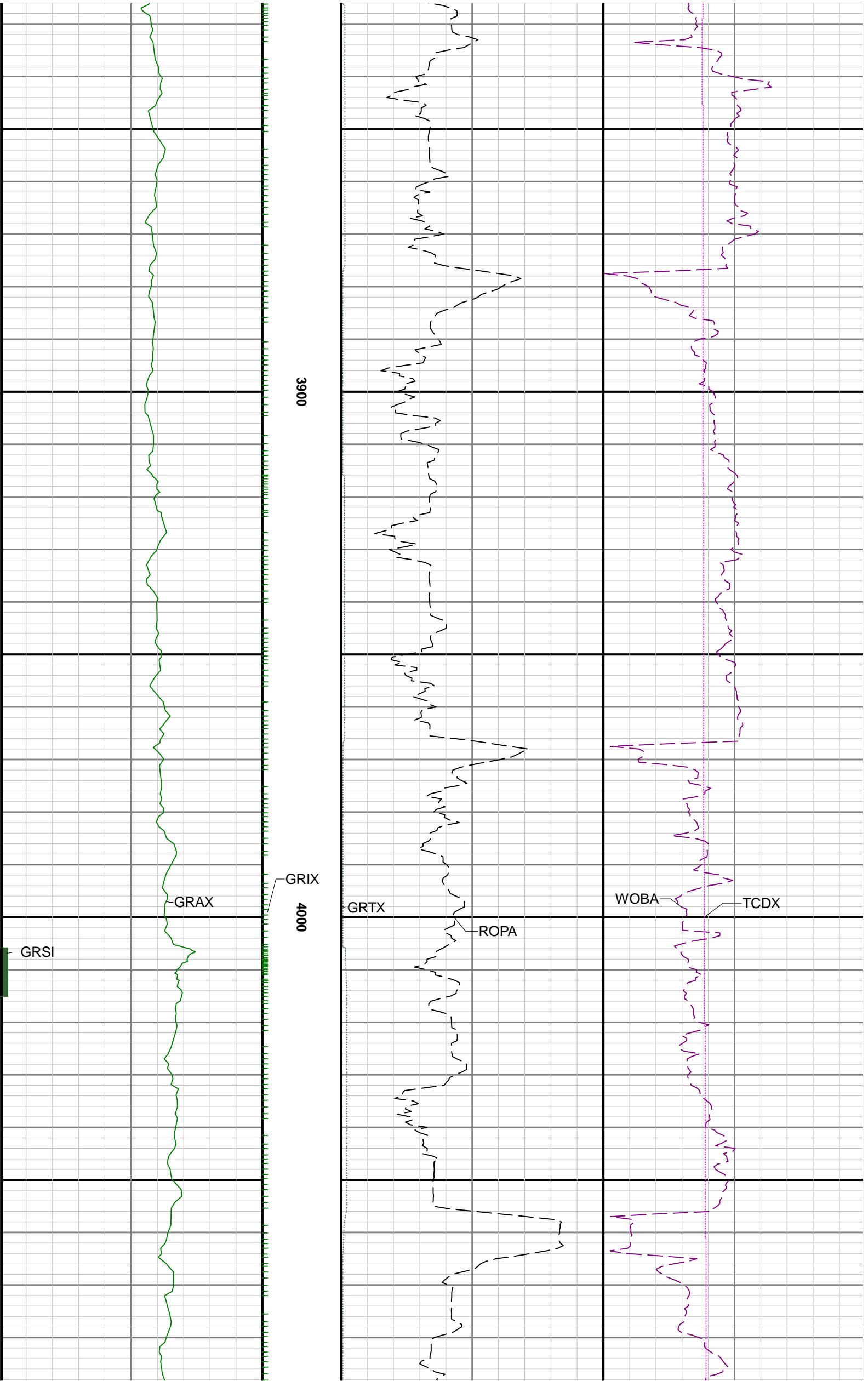
3300

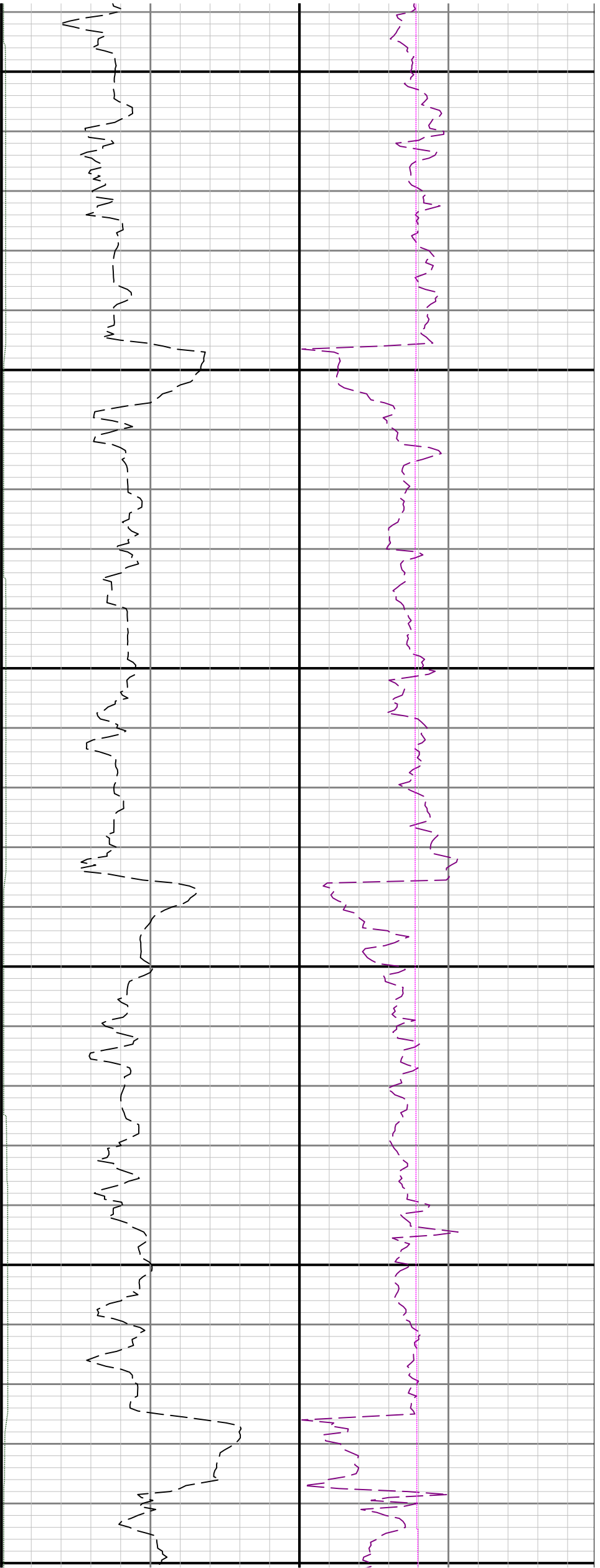








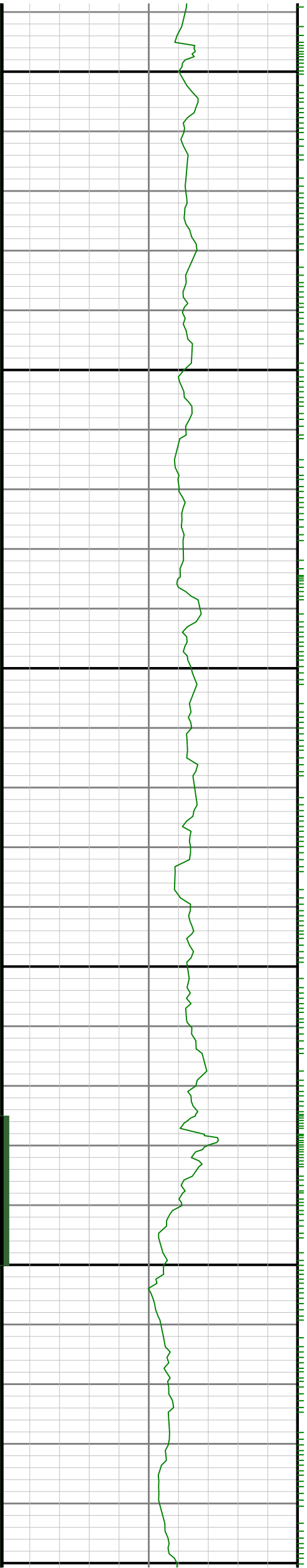


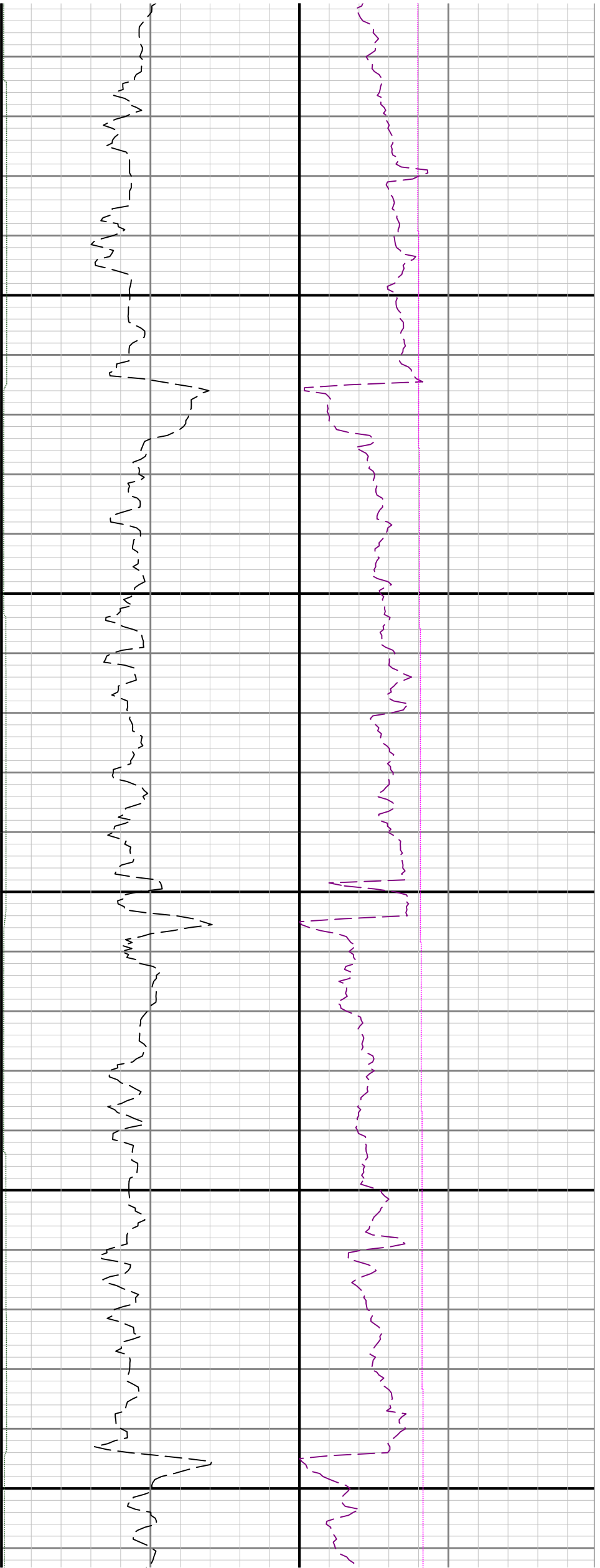


4100

4200

4300

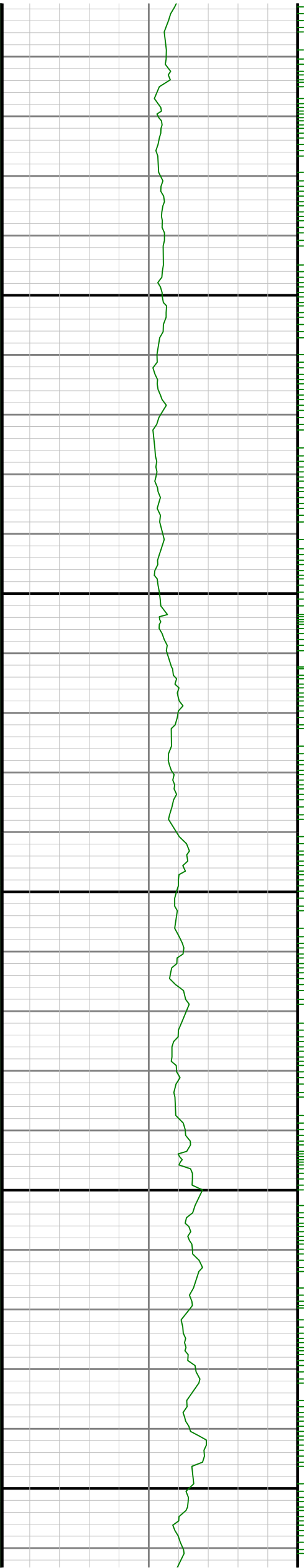


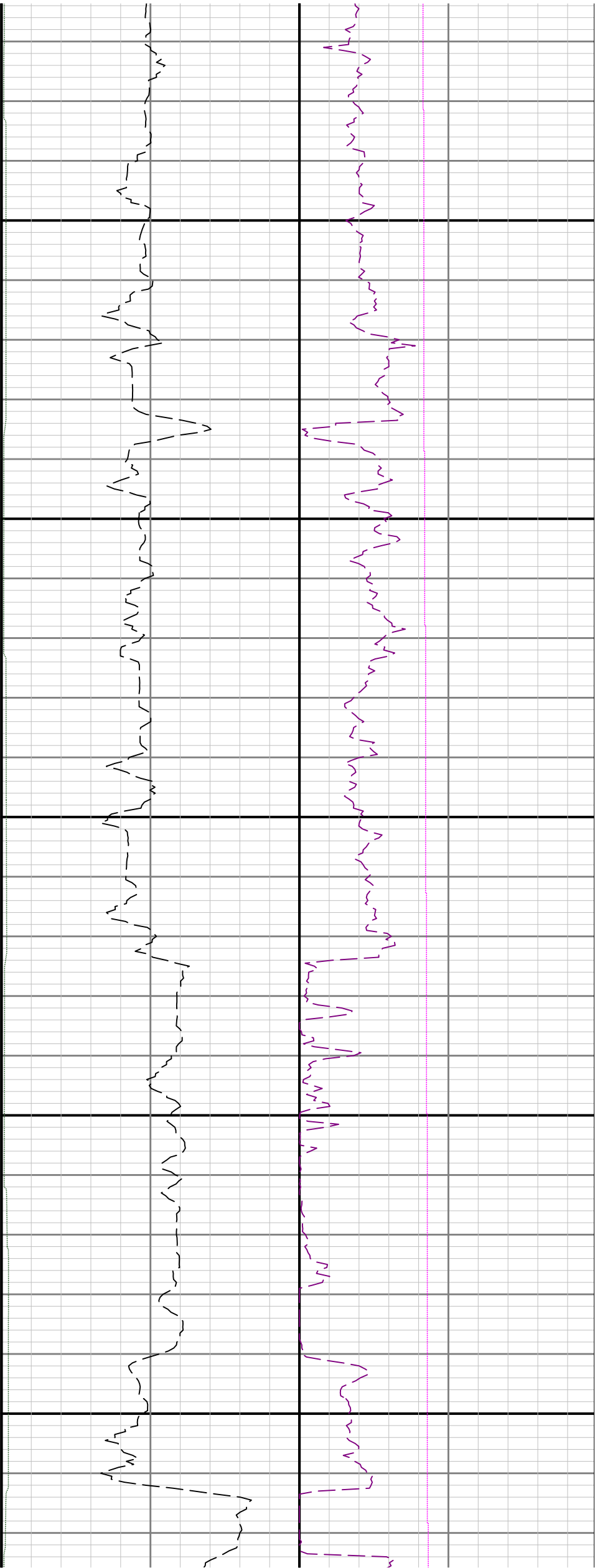


4400

4500

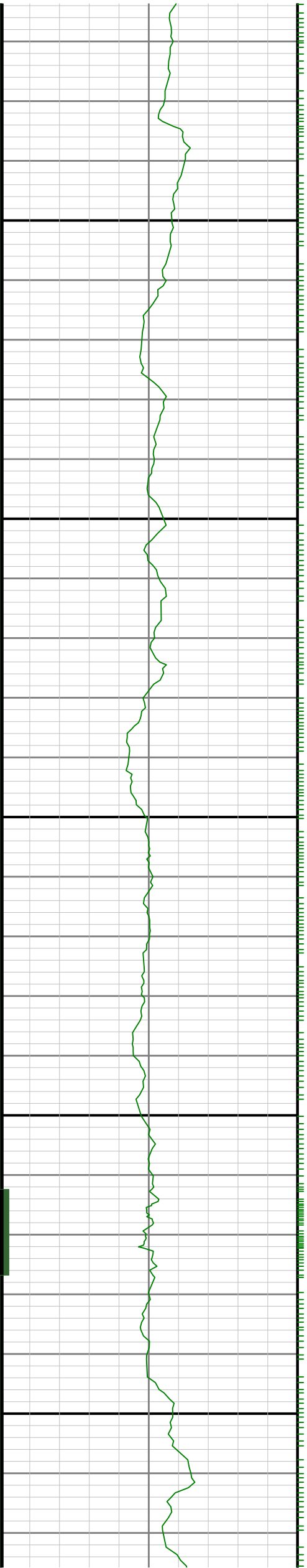
4600

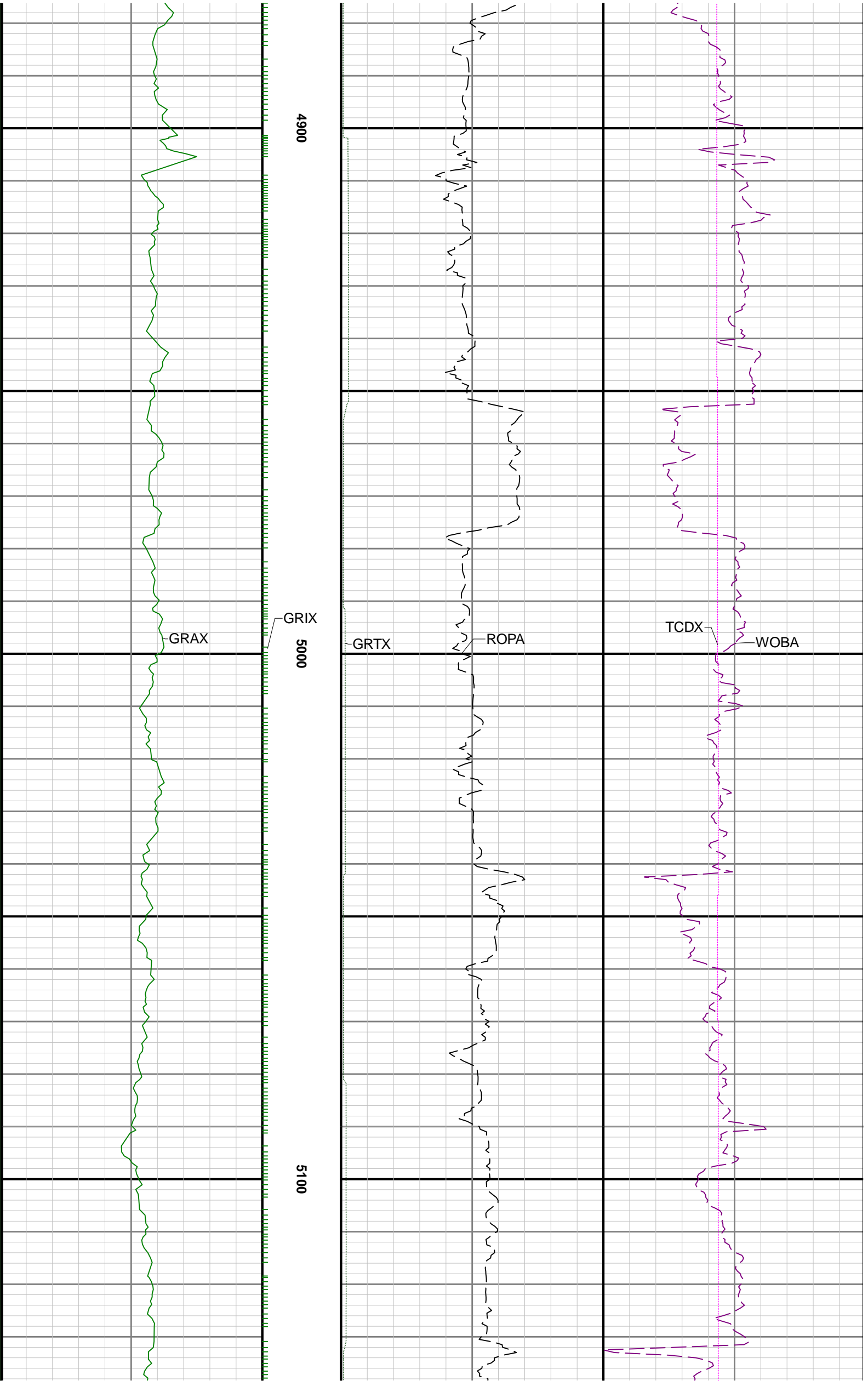


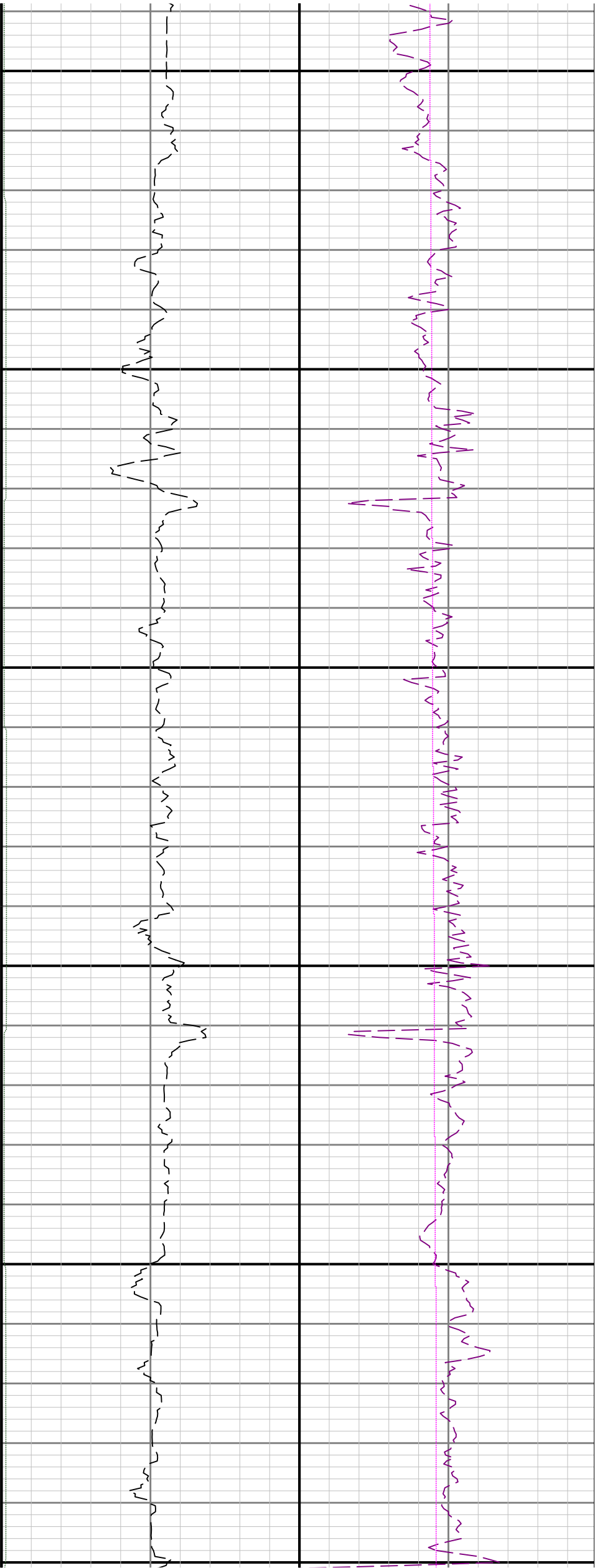


4700

4800



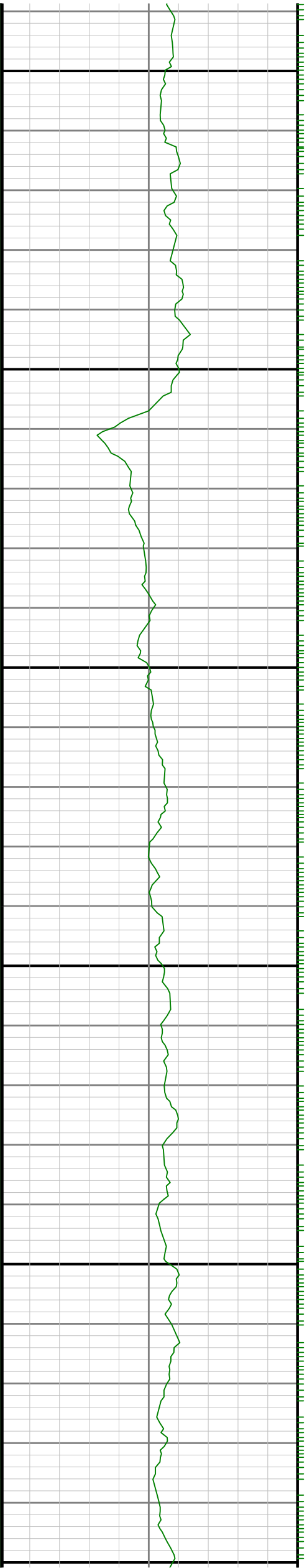


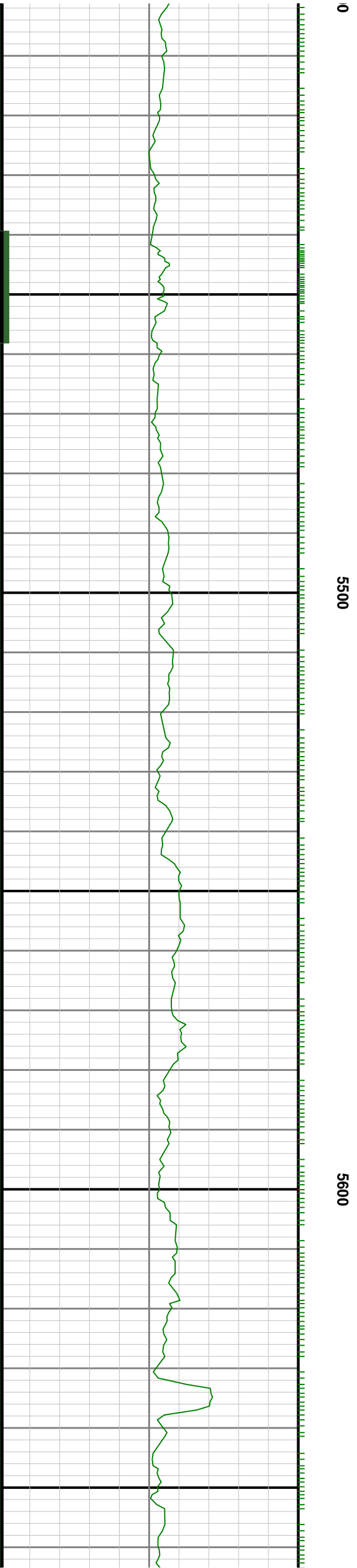
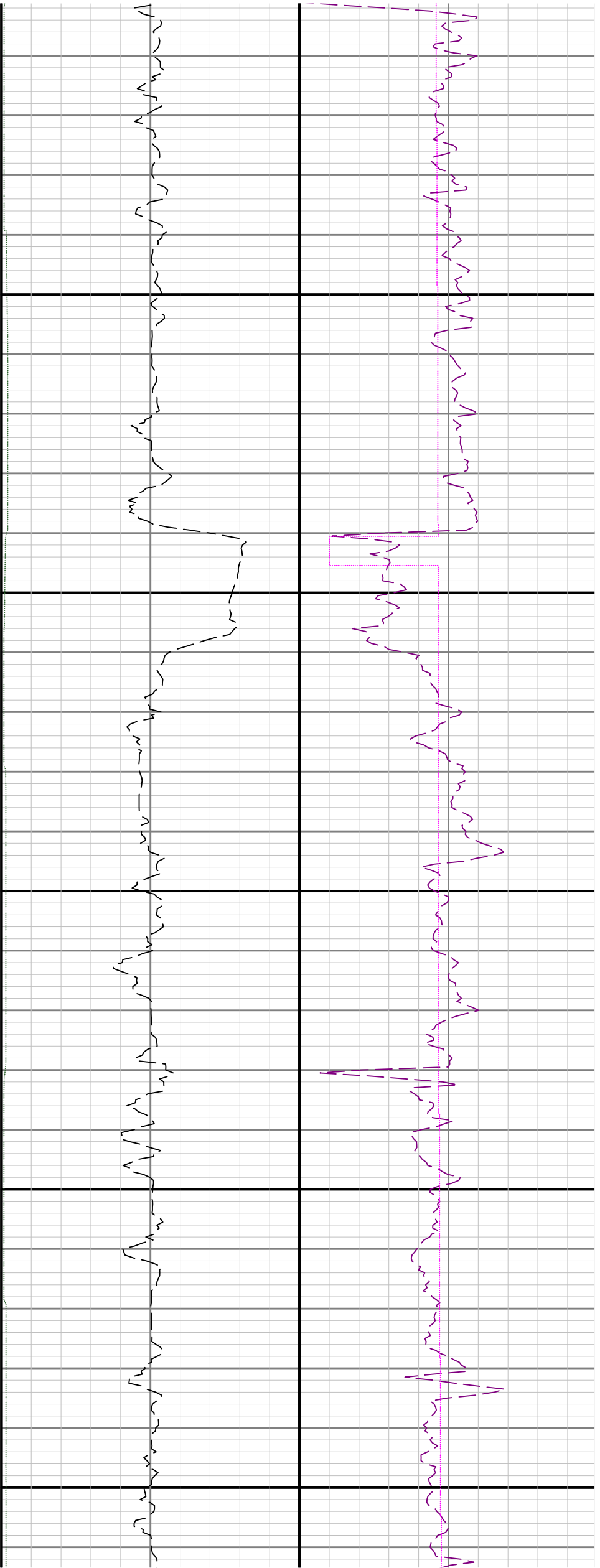


5200

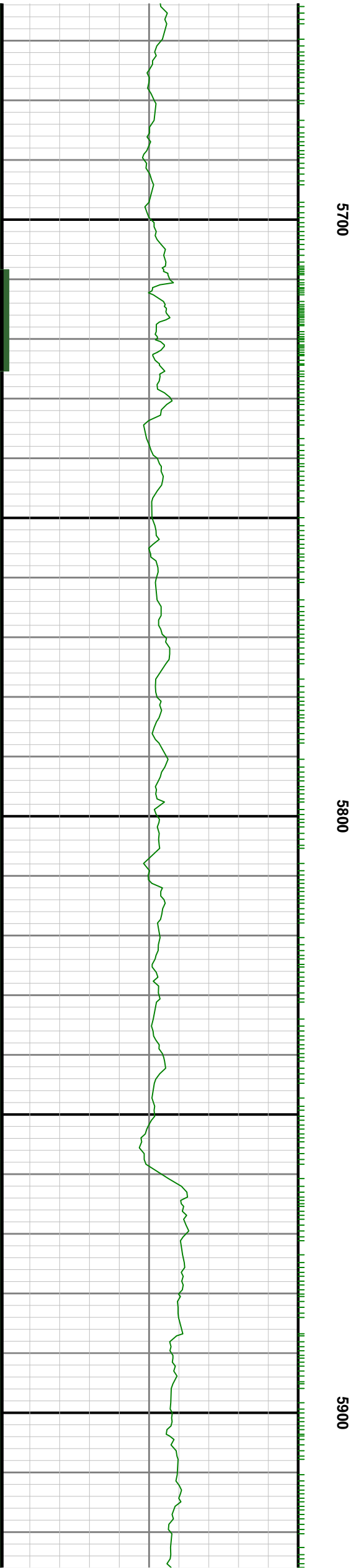
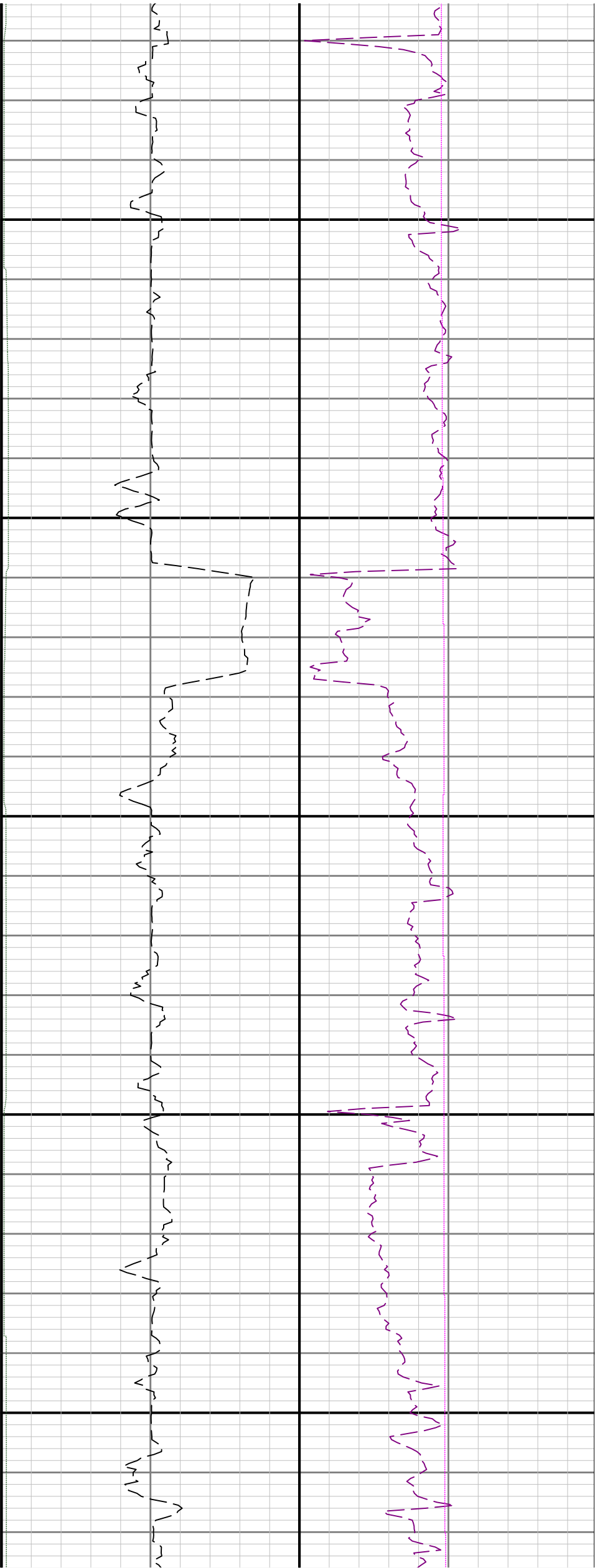
5300

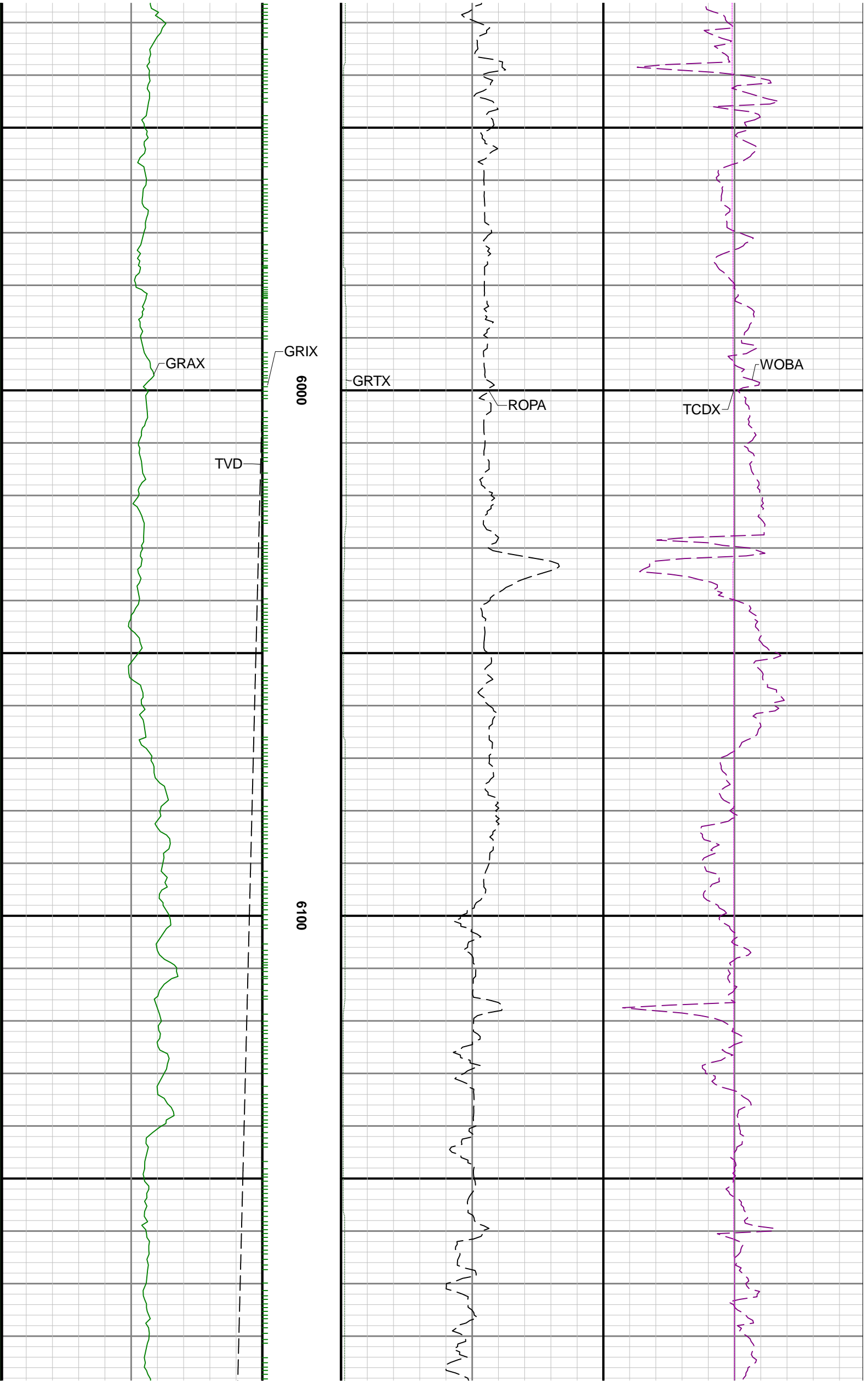
5400

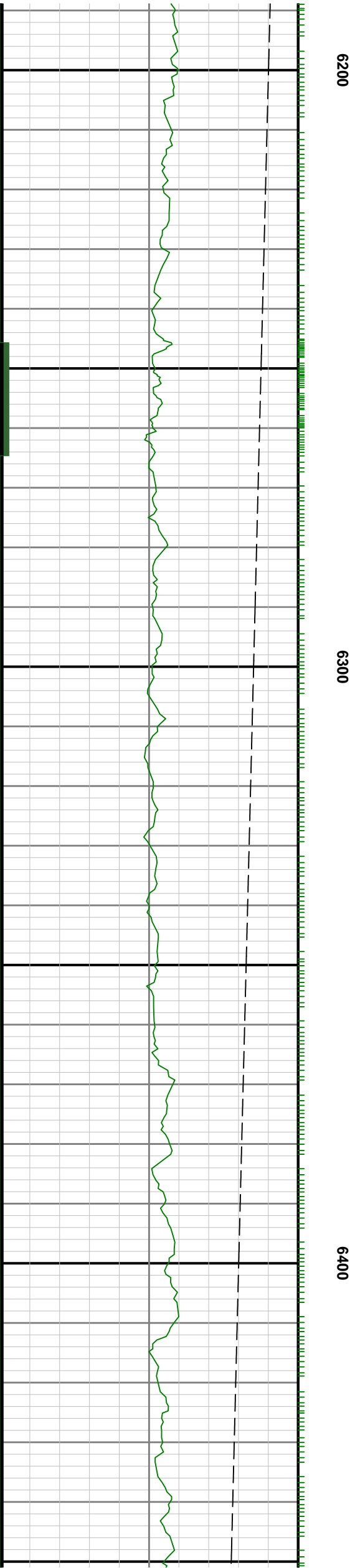
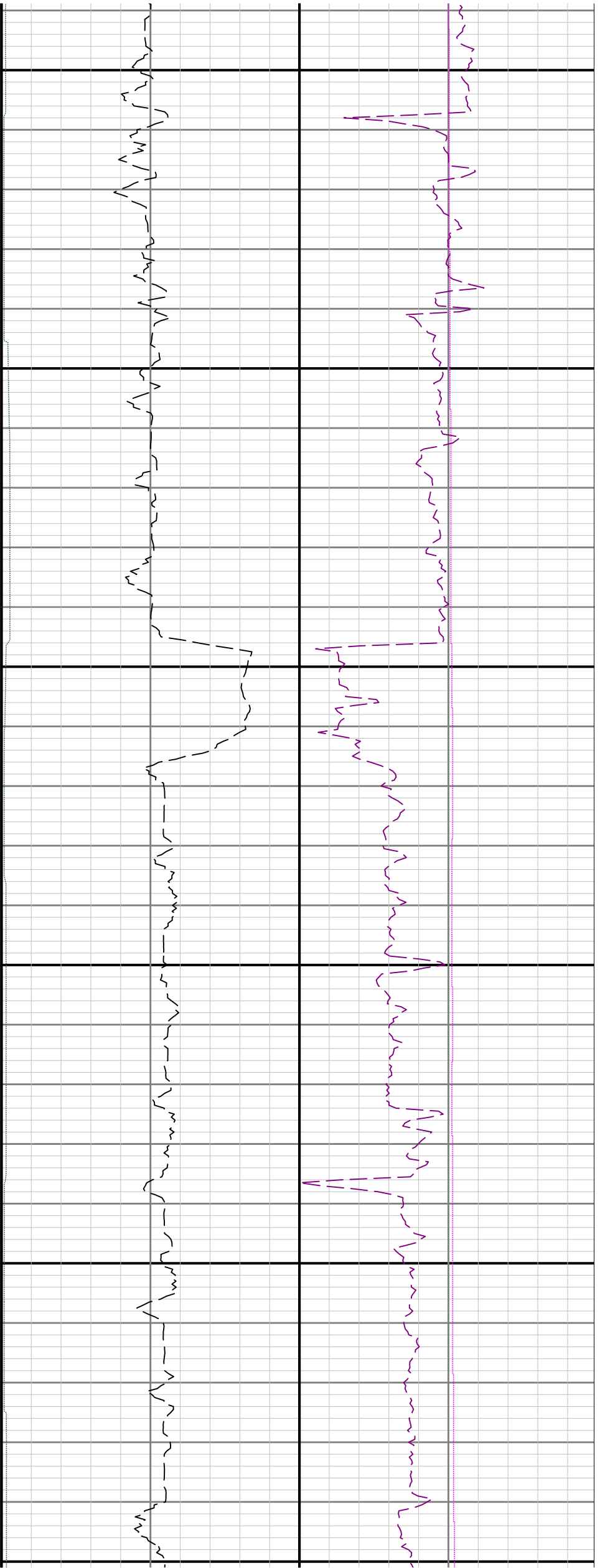


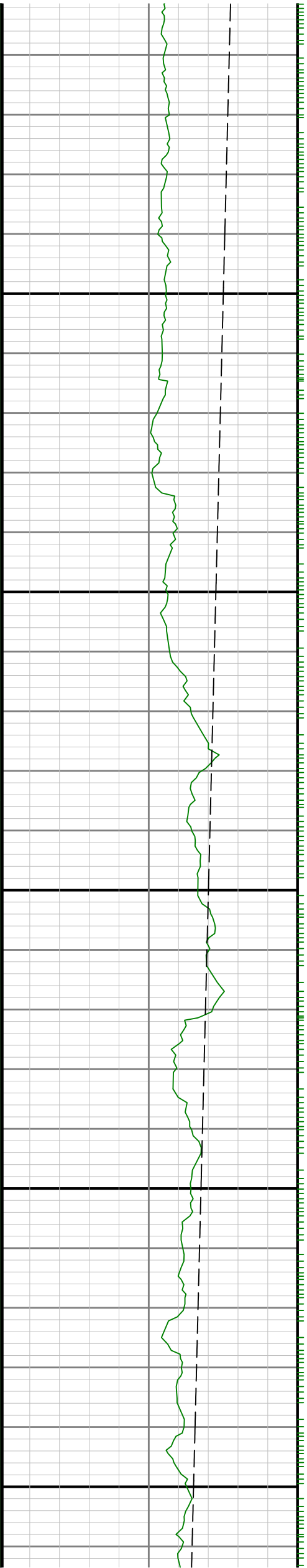








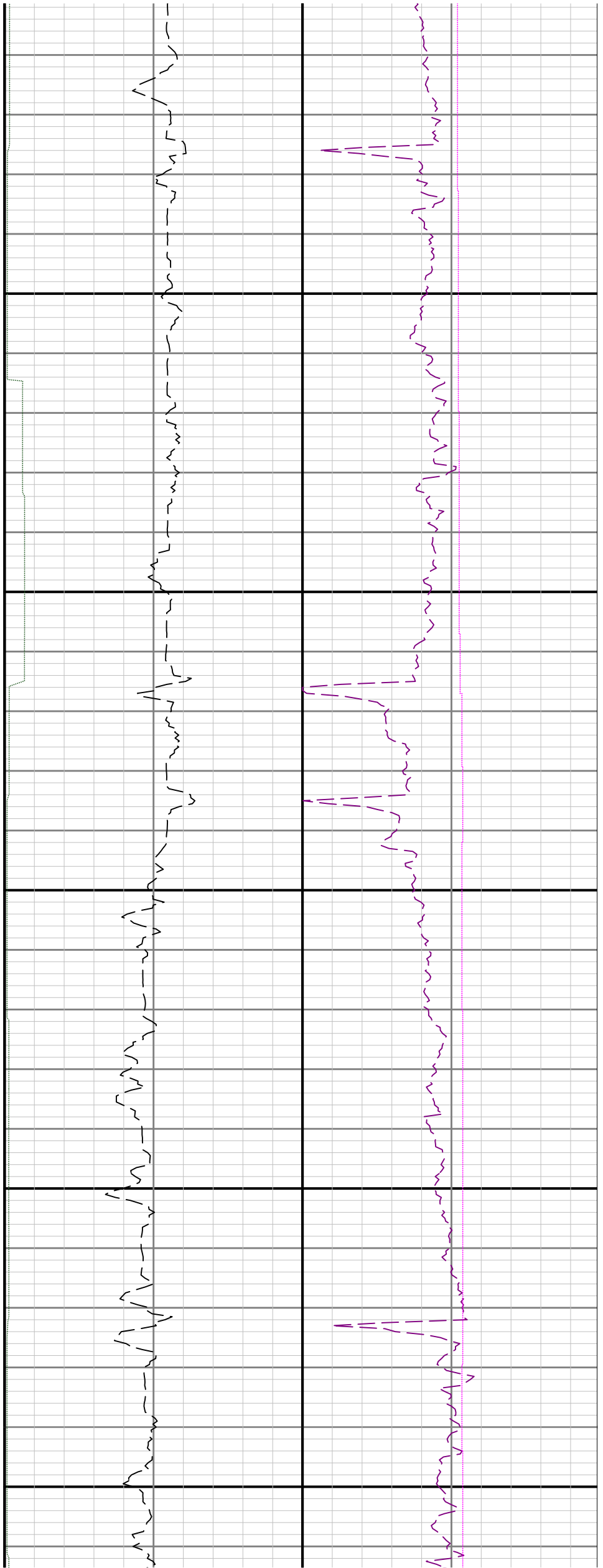


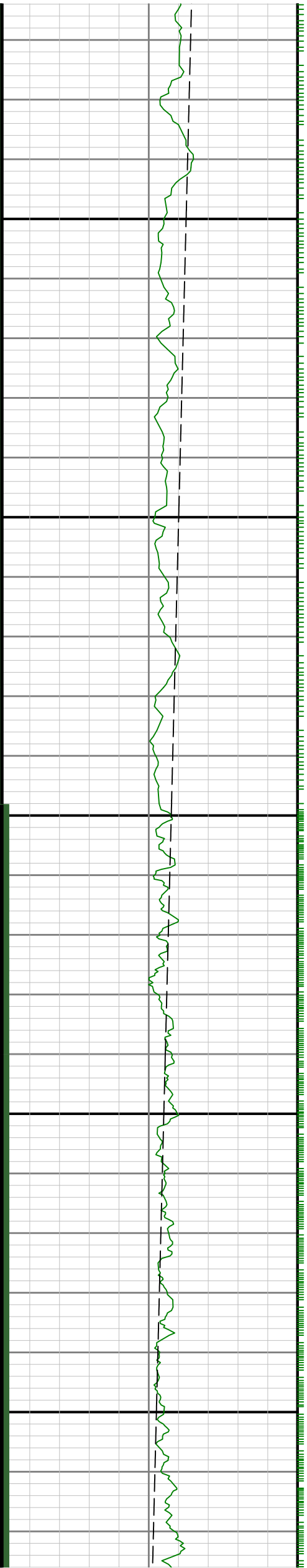


6500

0099

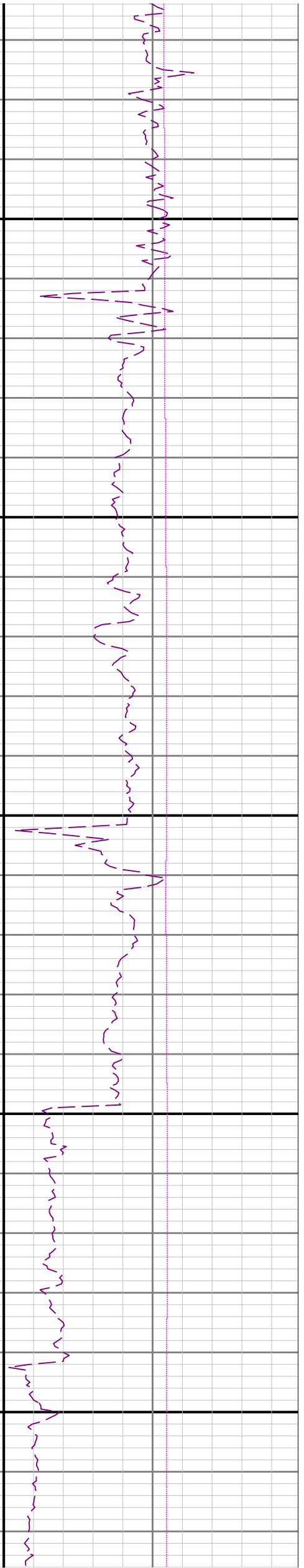
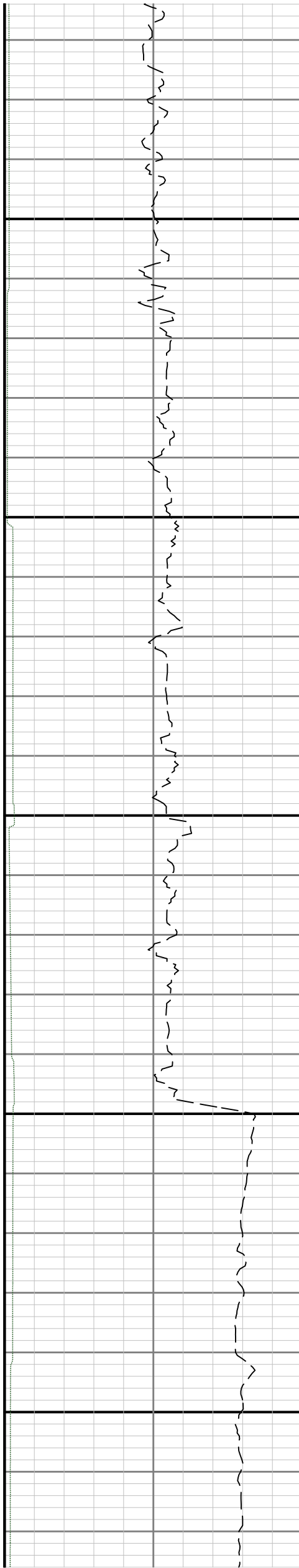
6700

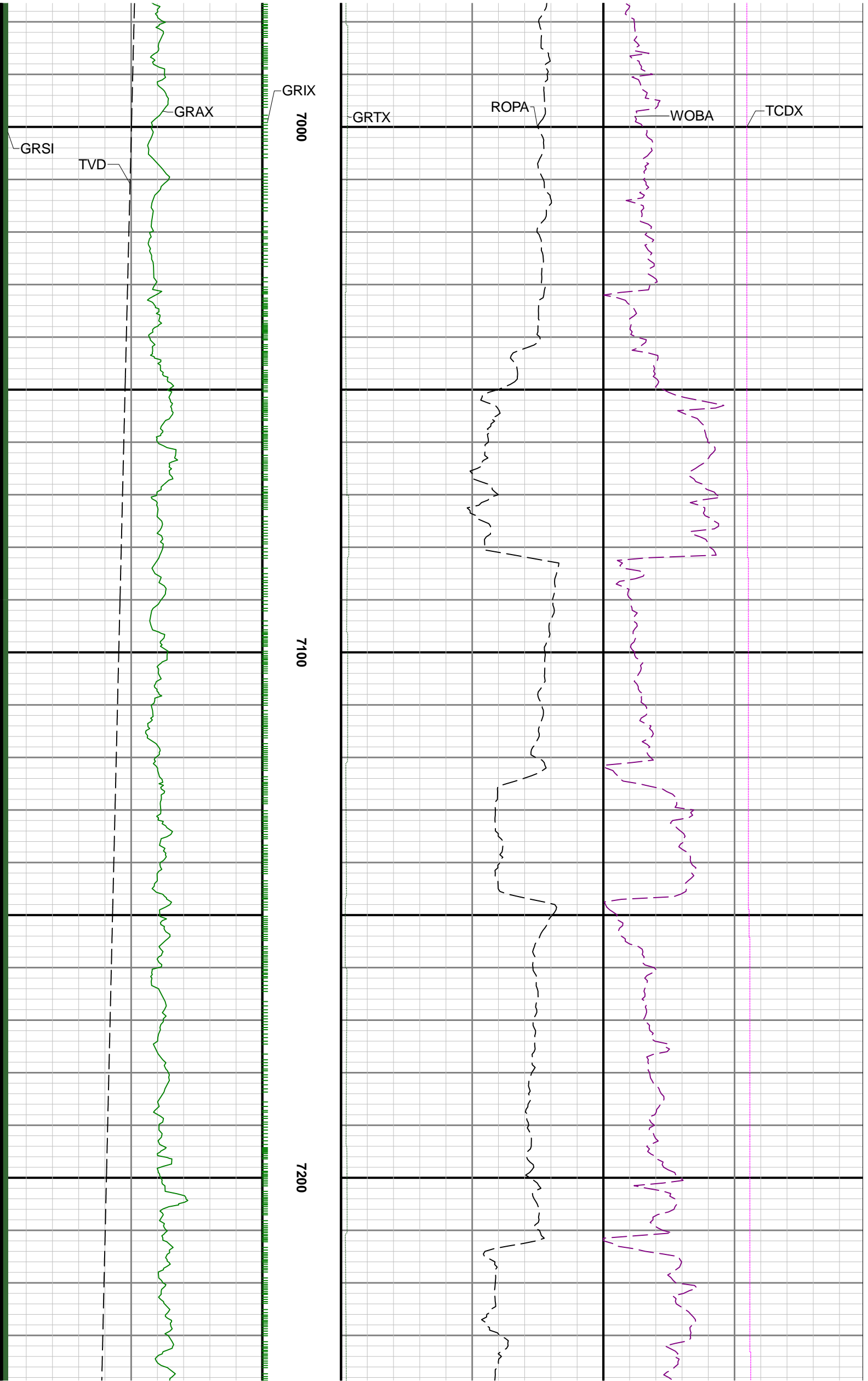


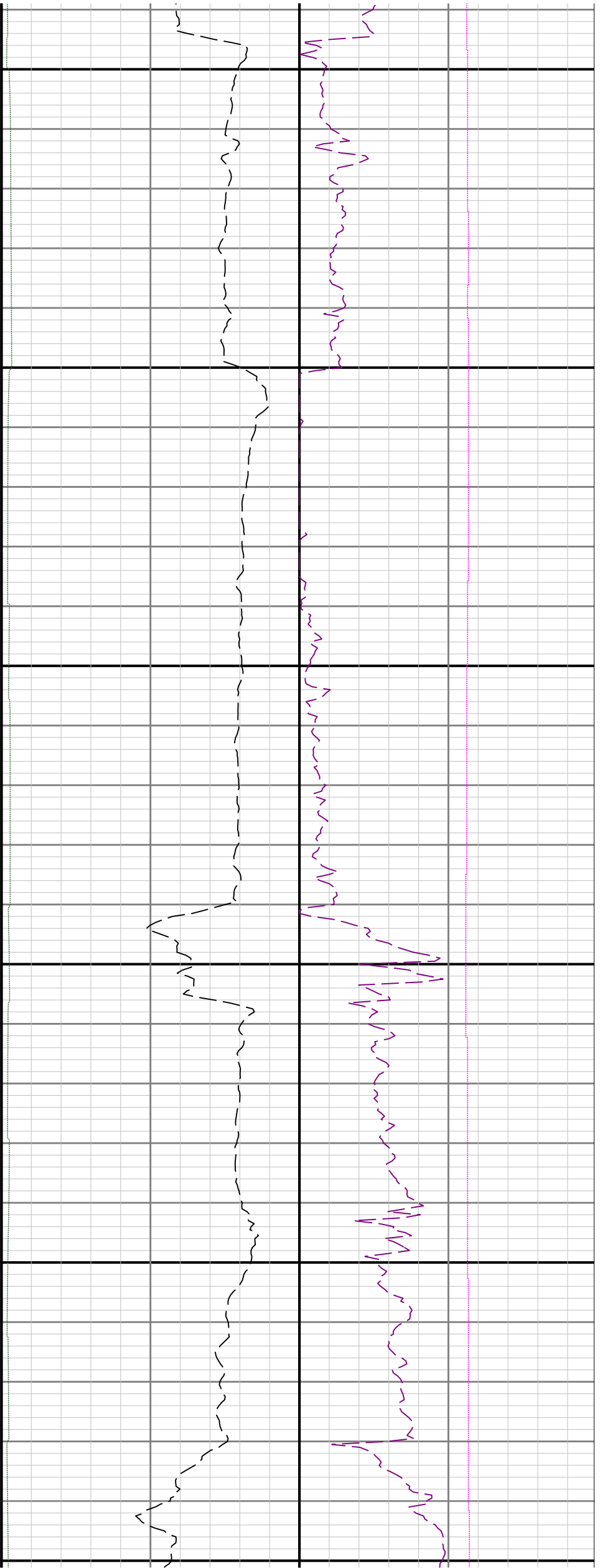


0069

0089



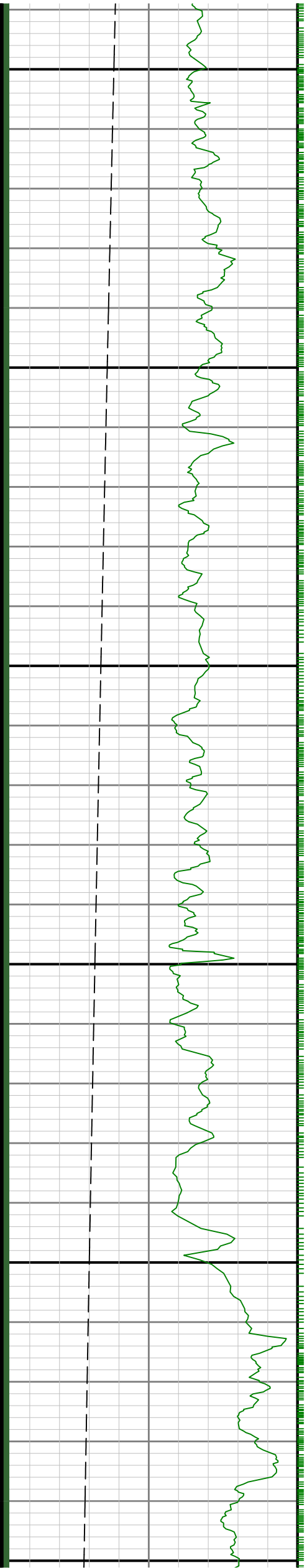


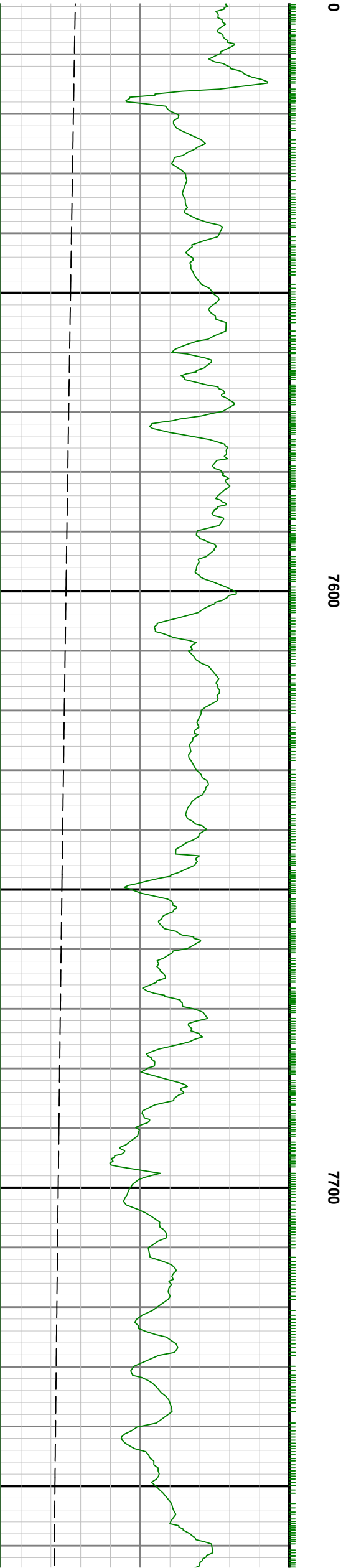
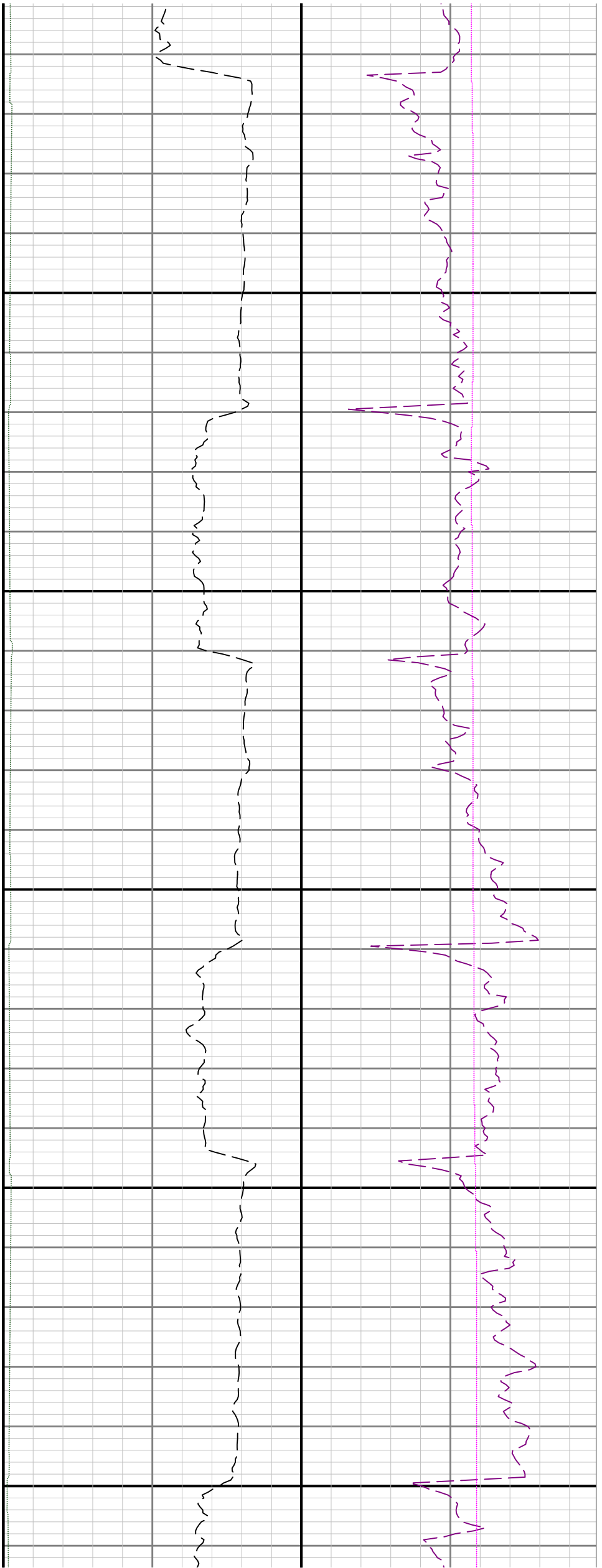


7300

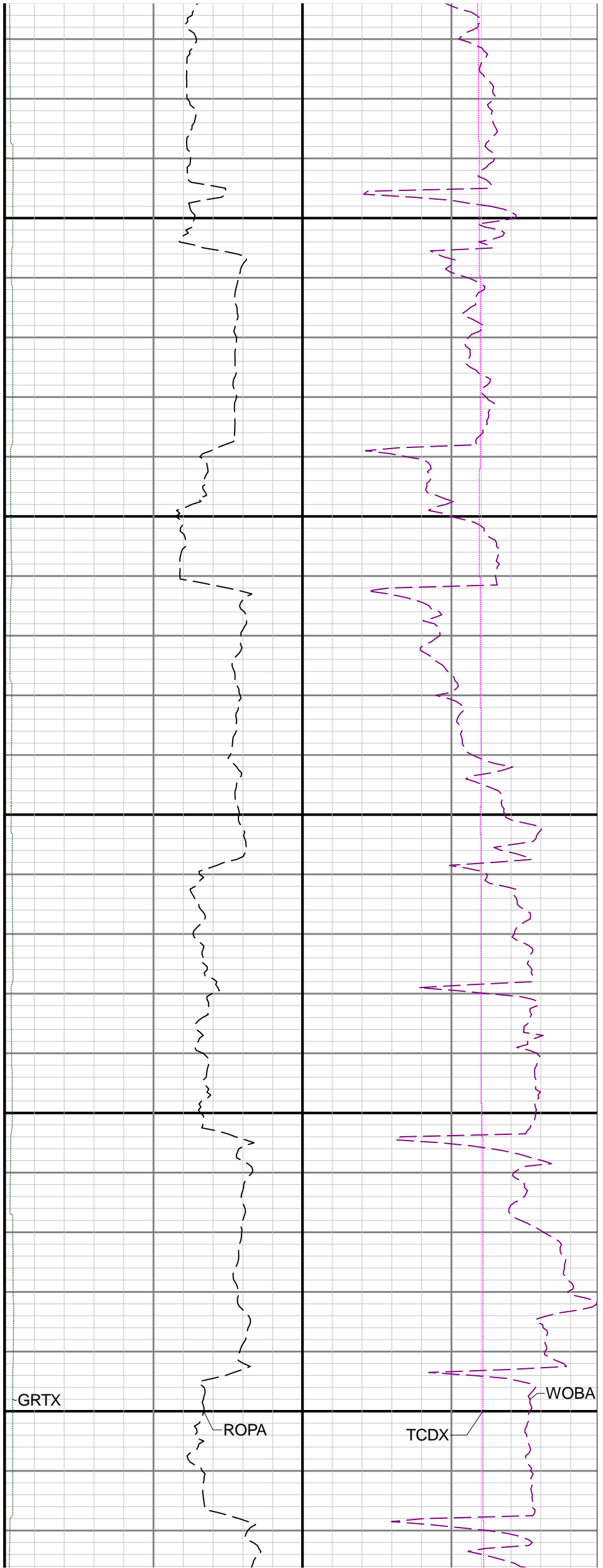
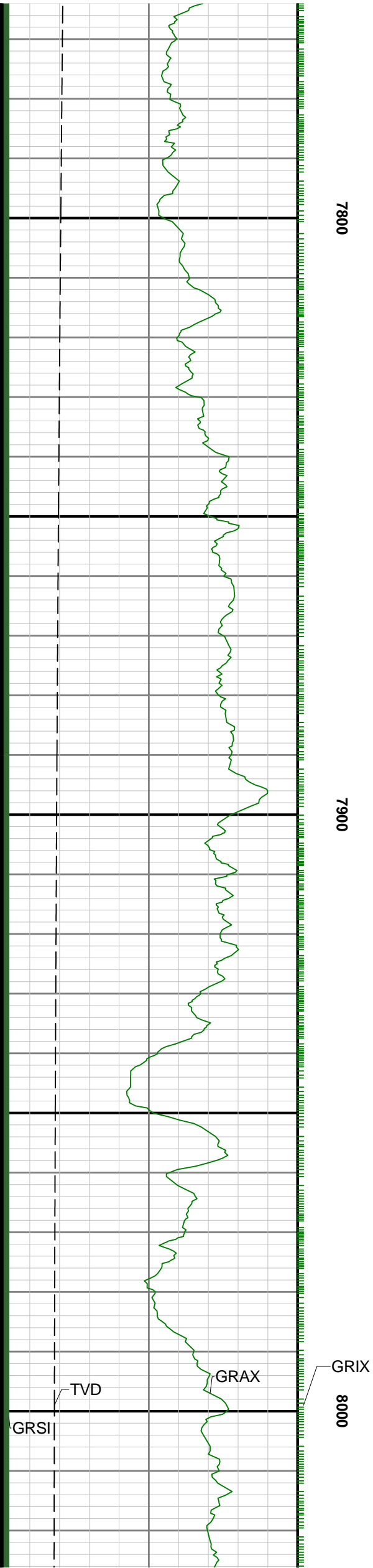
7400

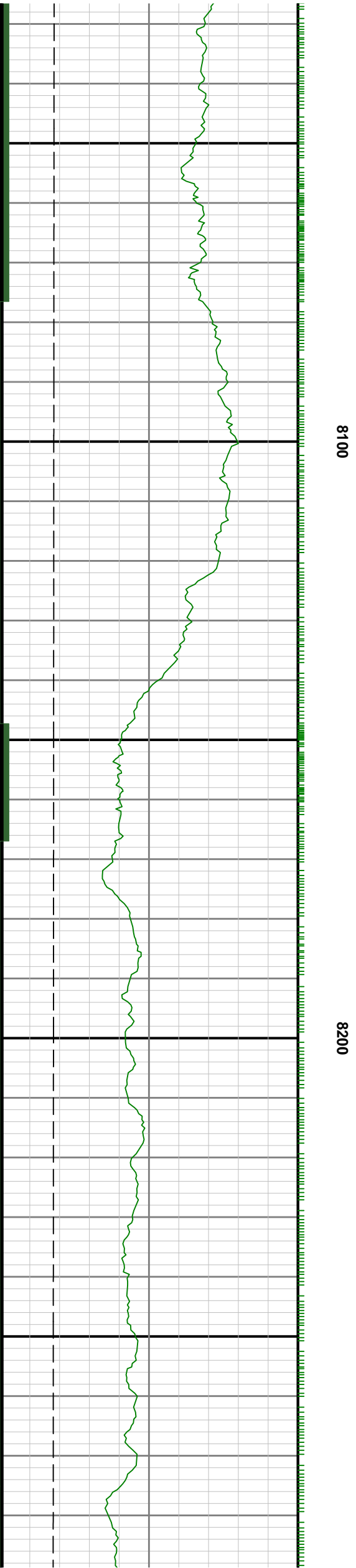
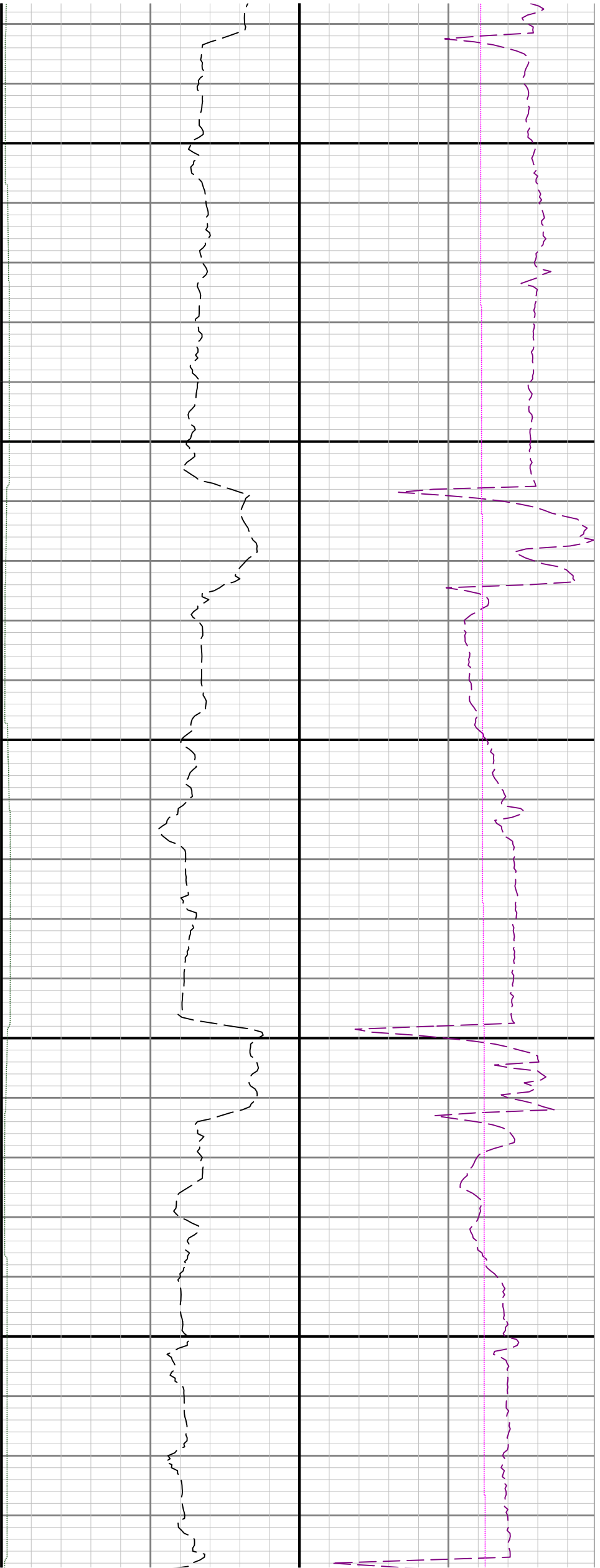
7500

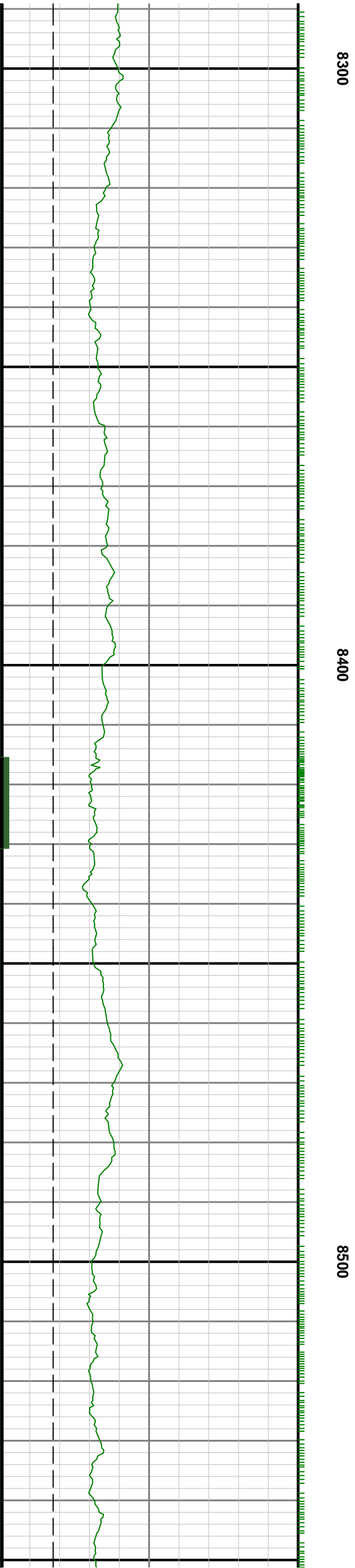
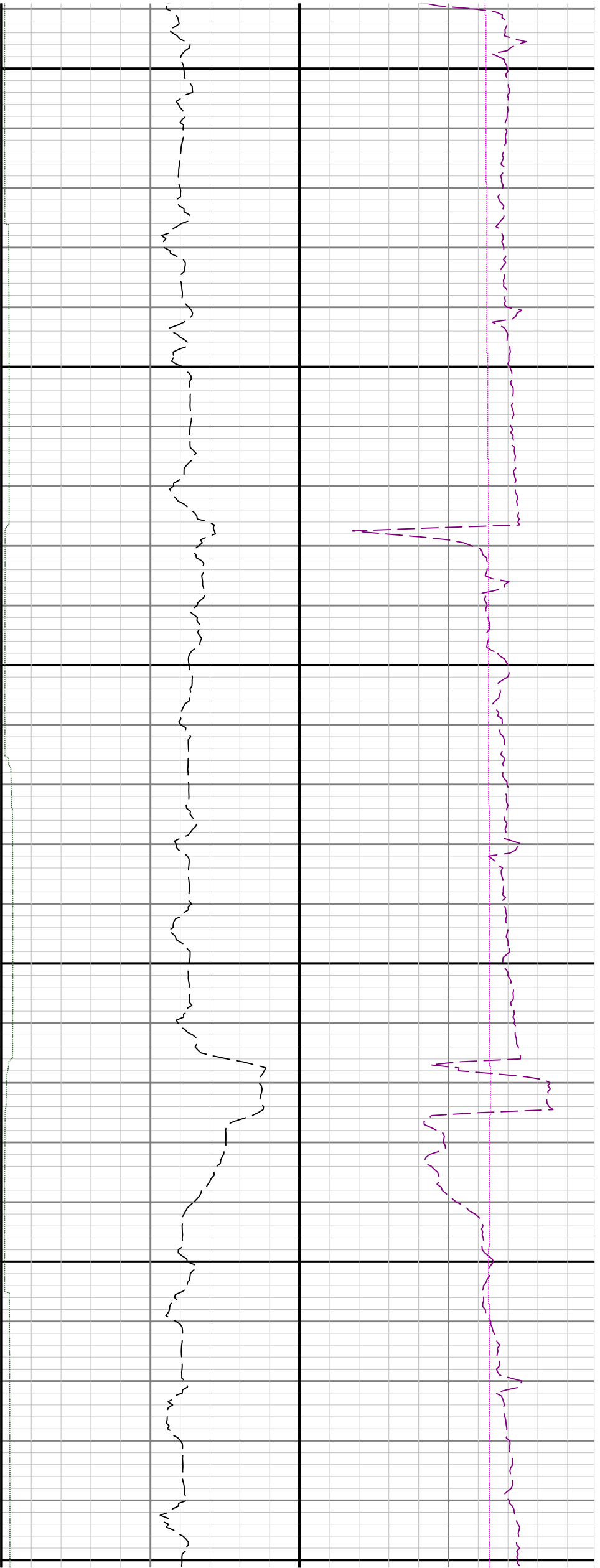


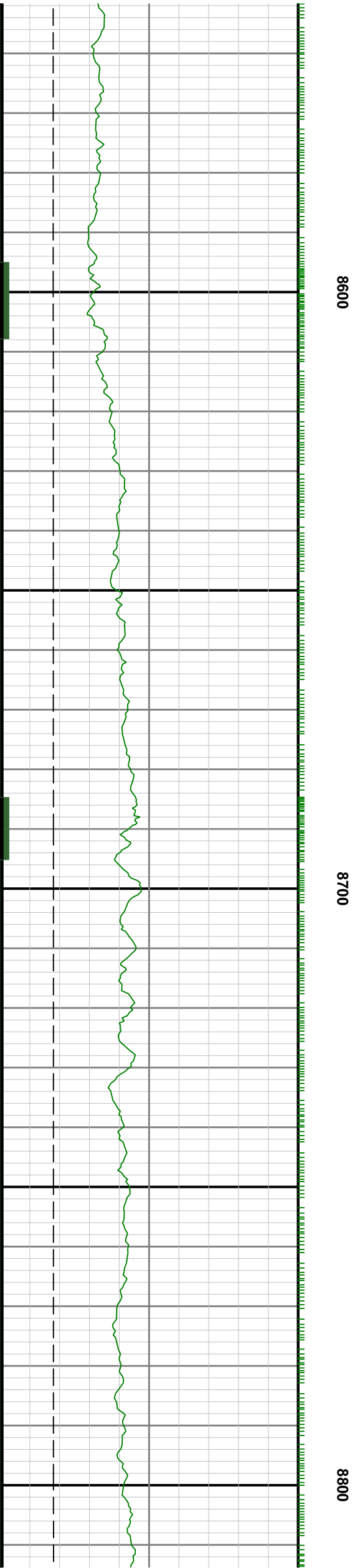
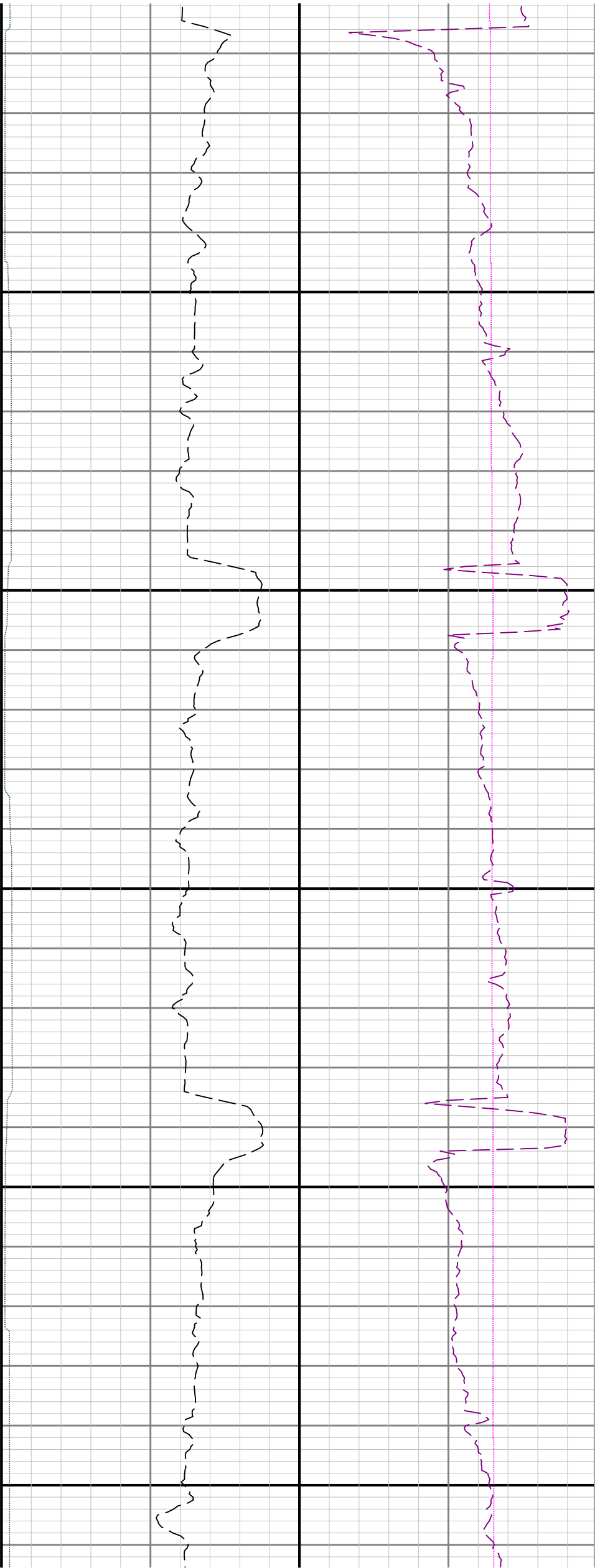


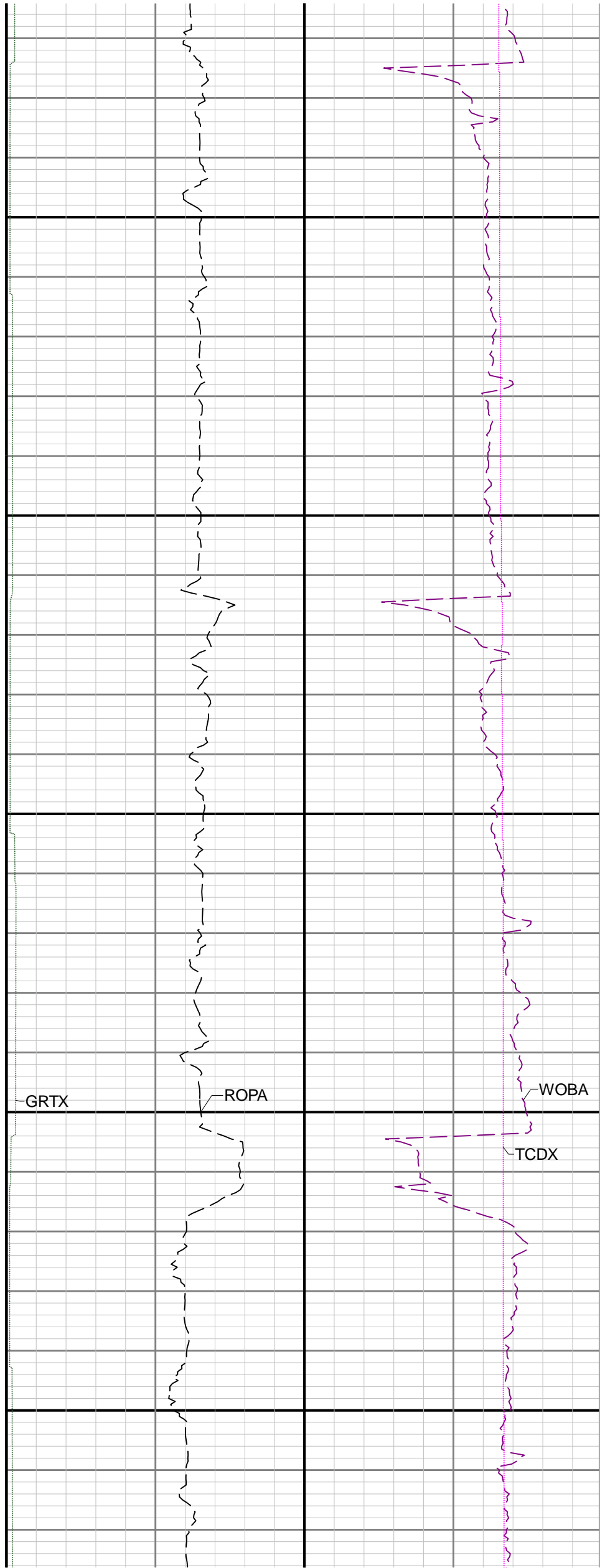
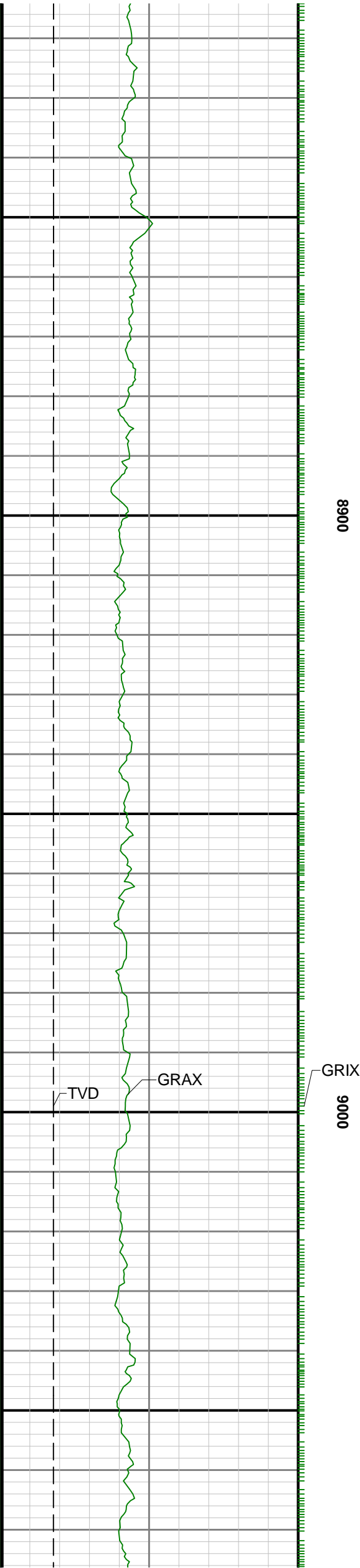


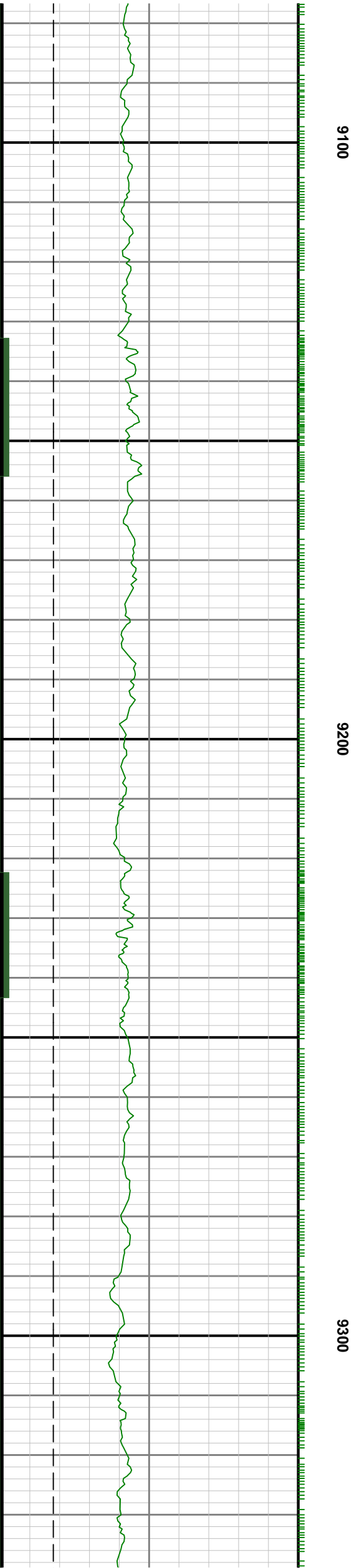
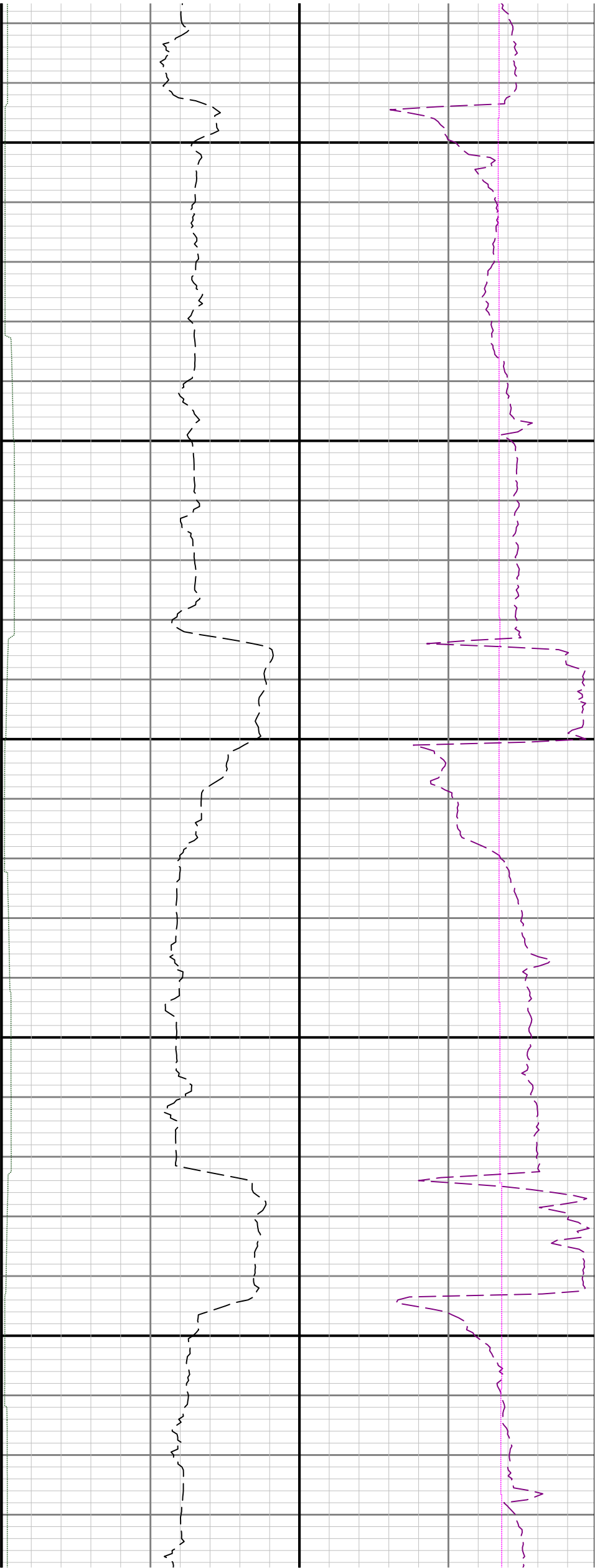


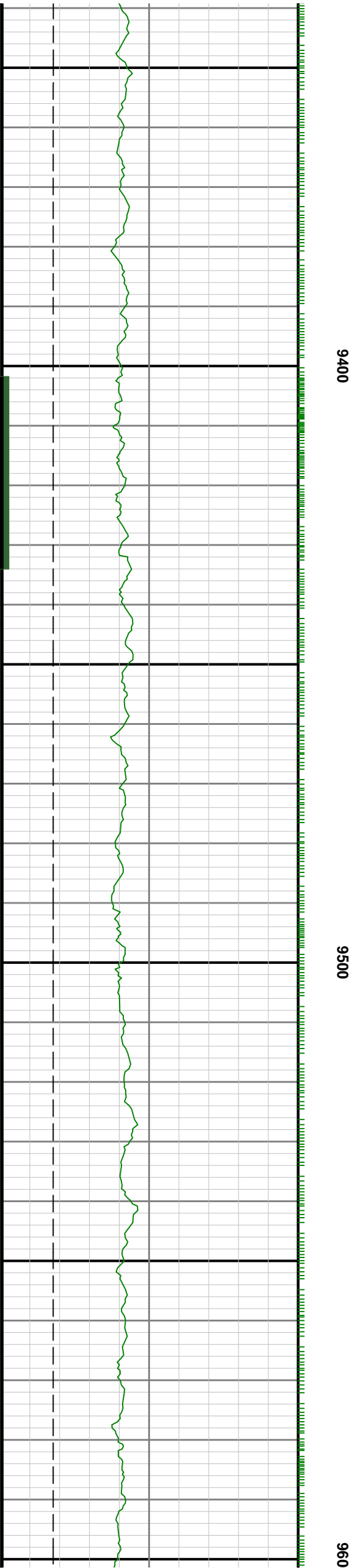
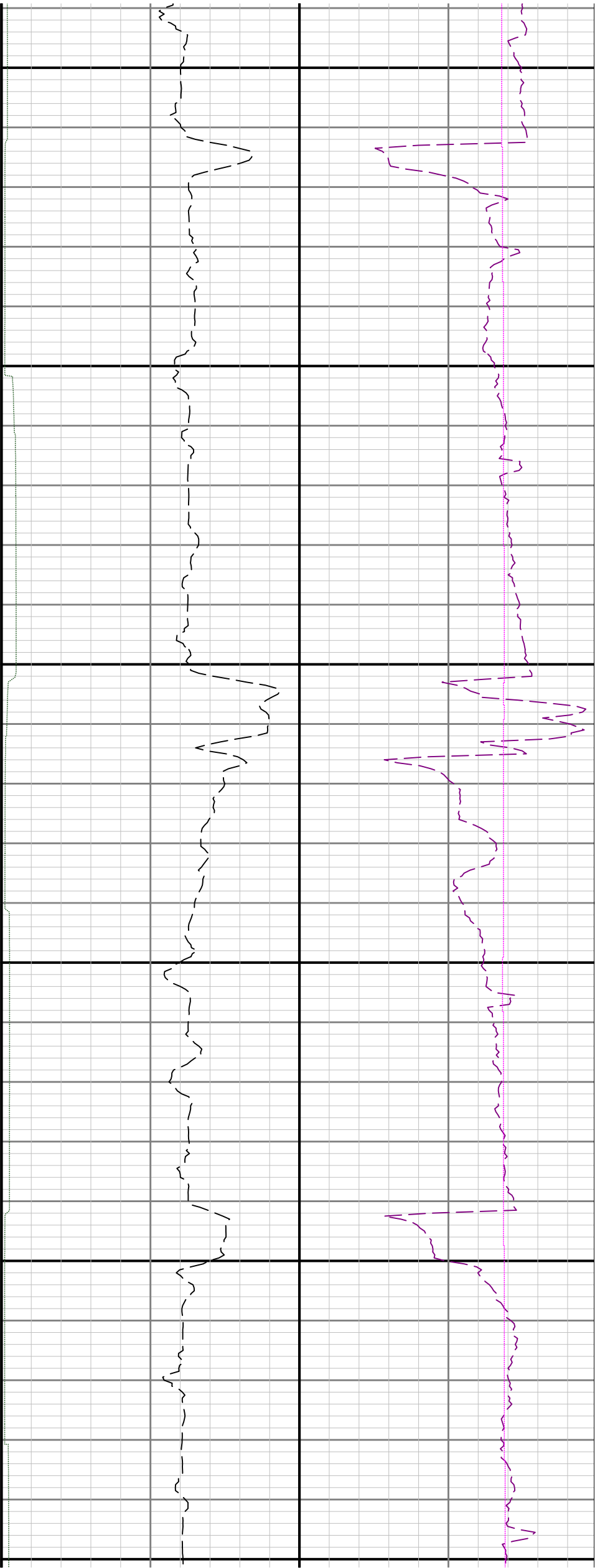


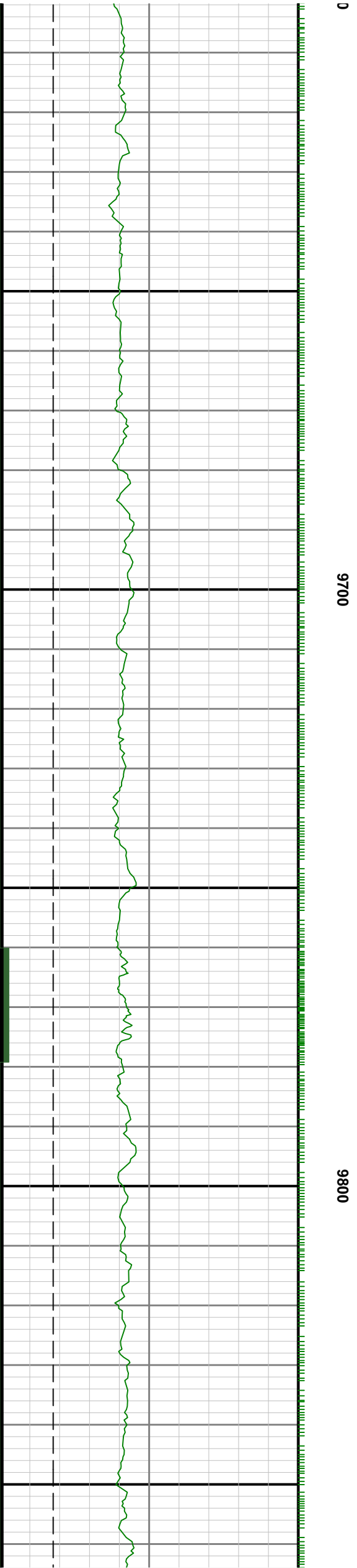
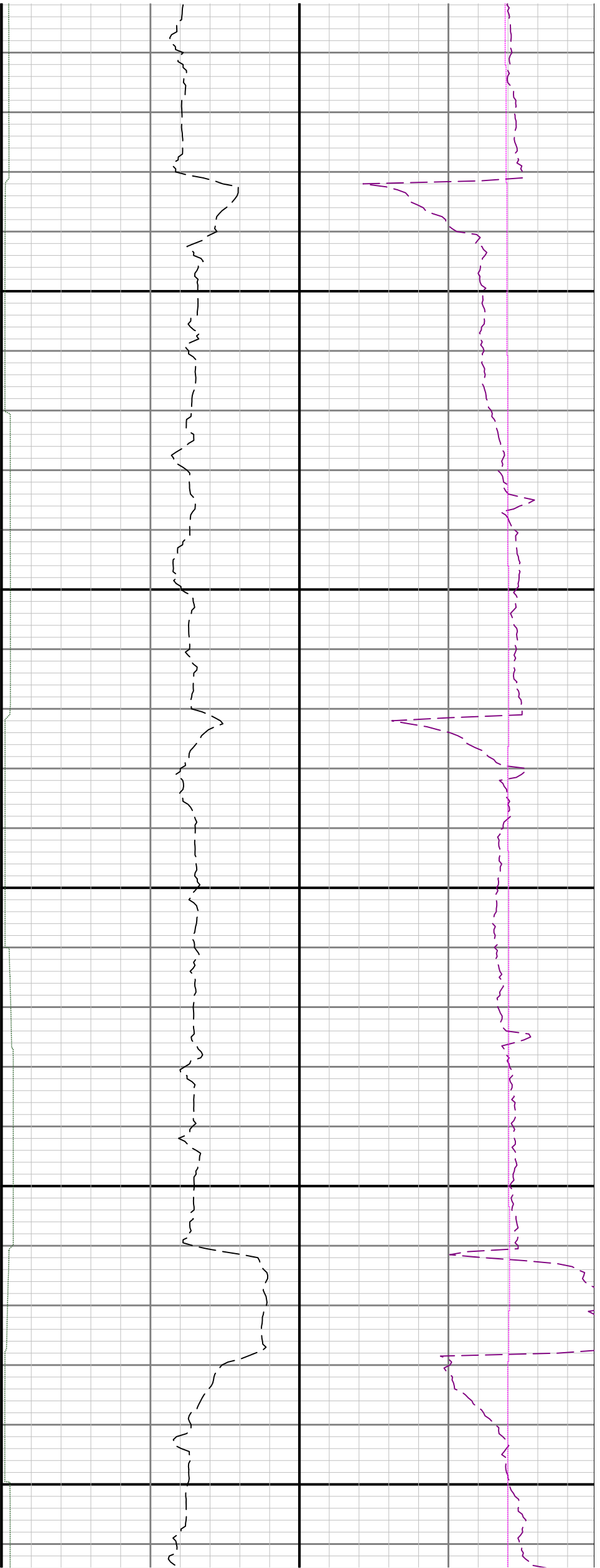




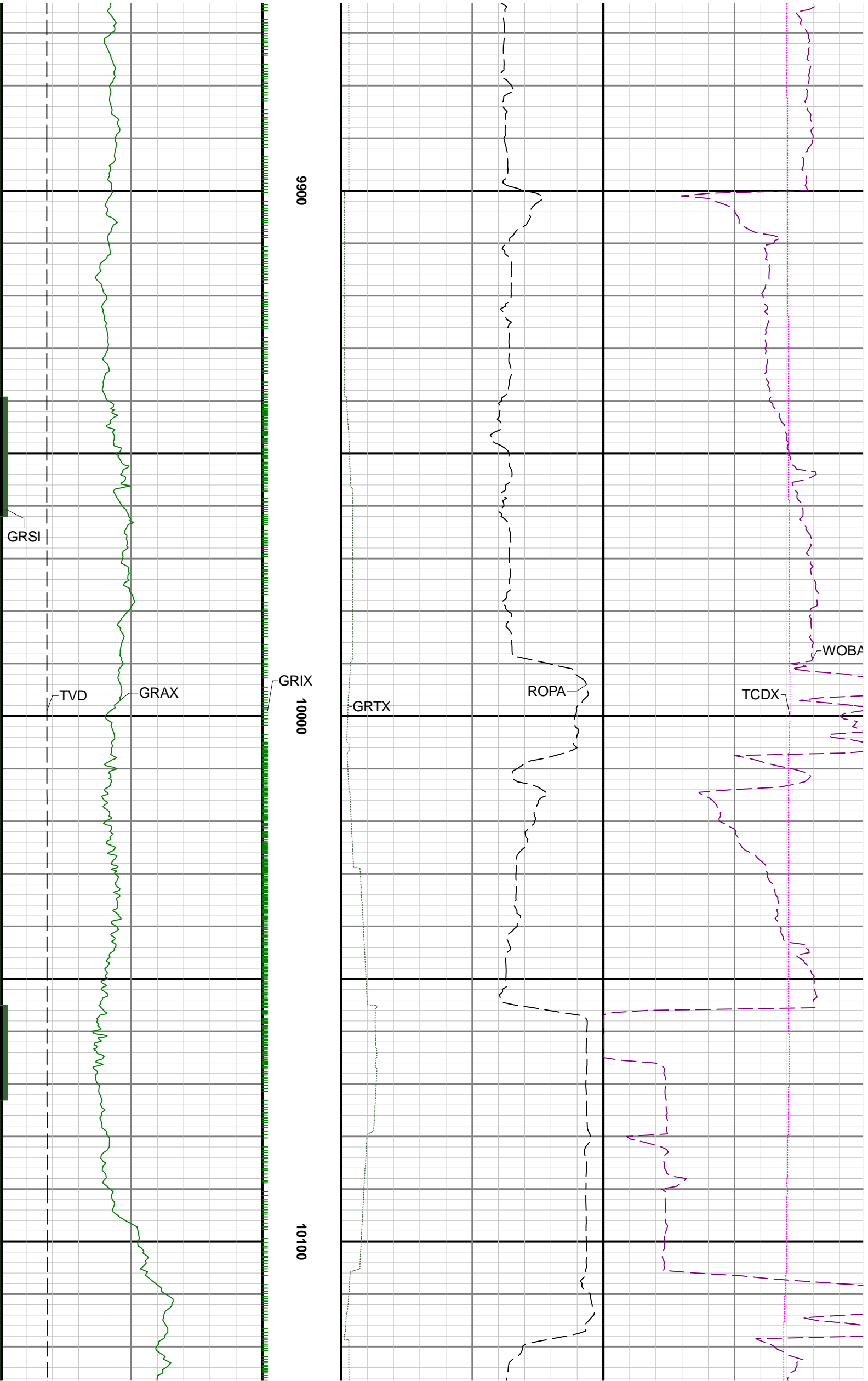


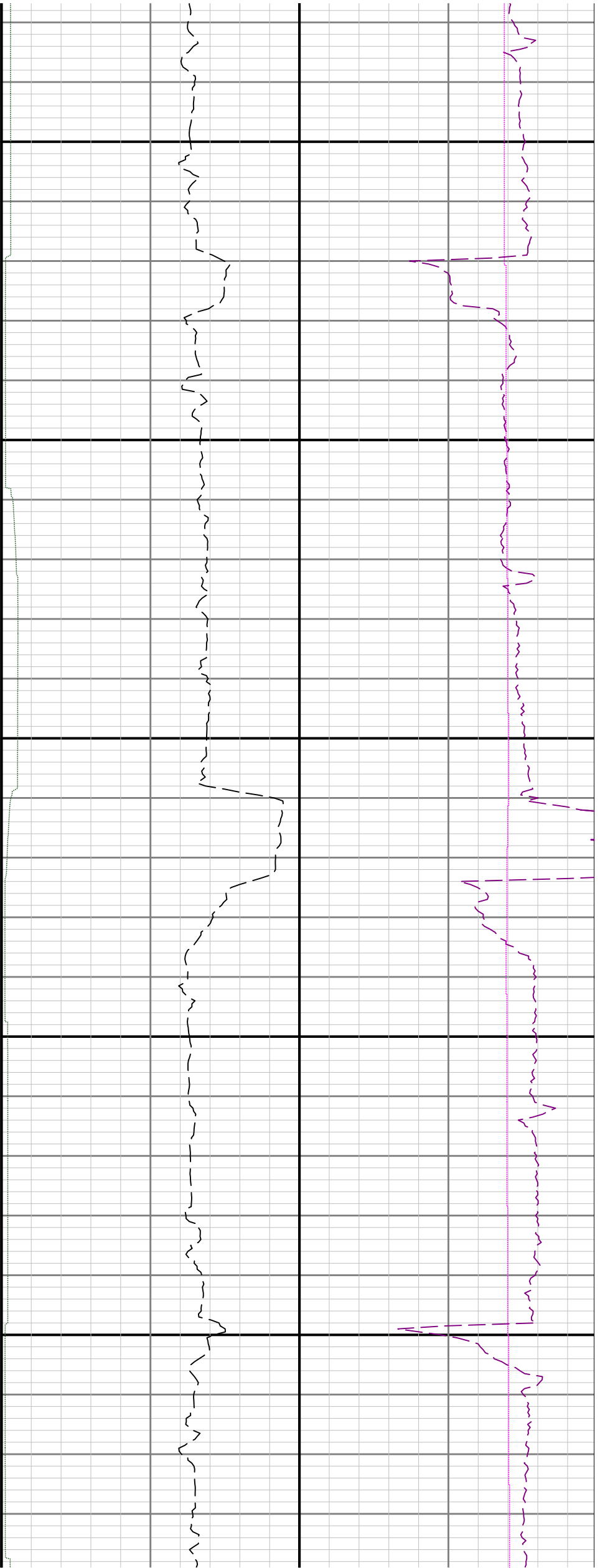






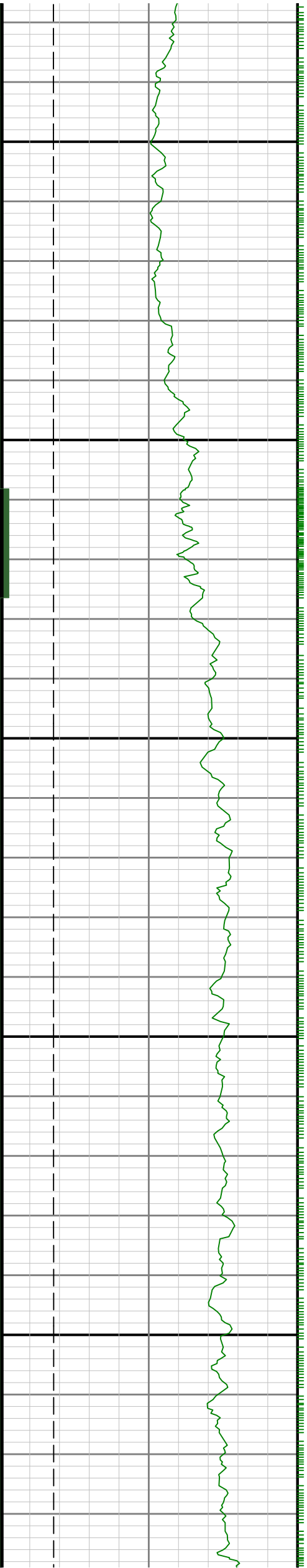


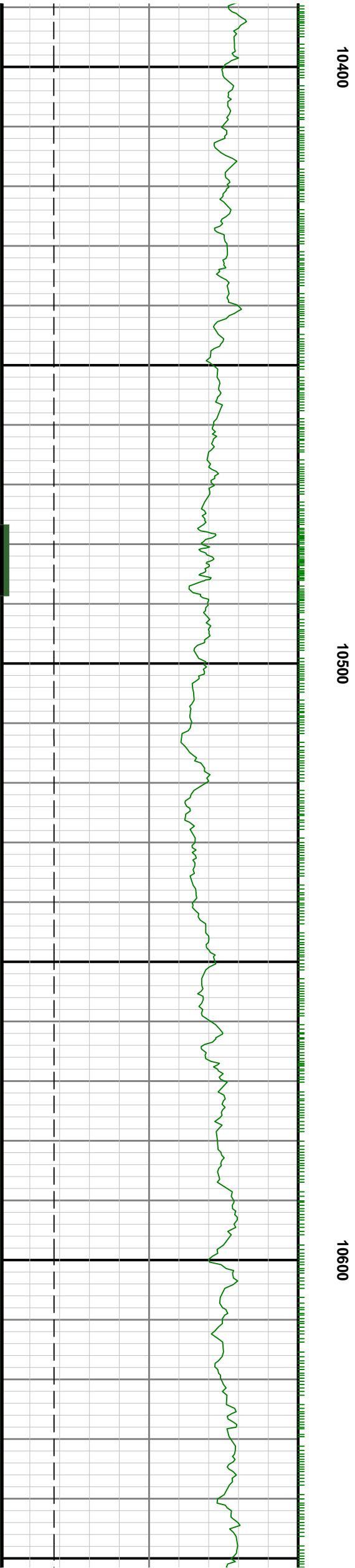
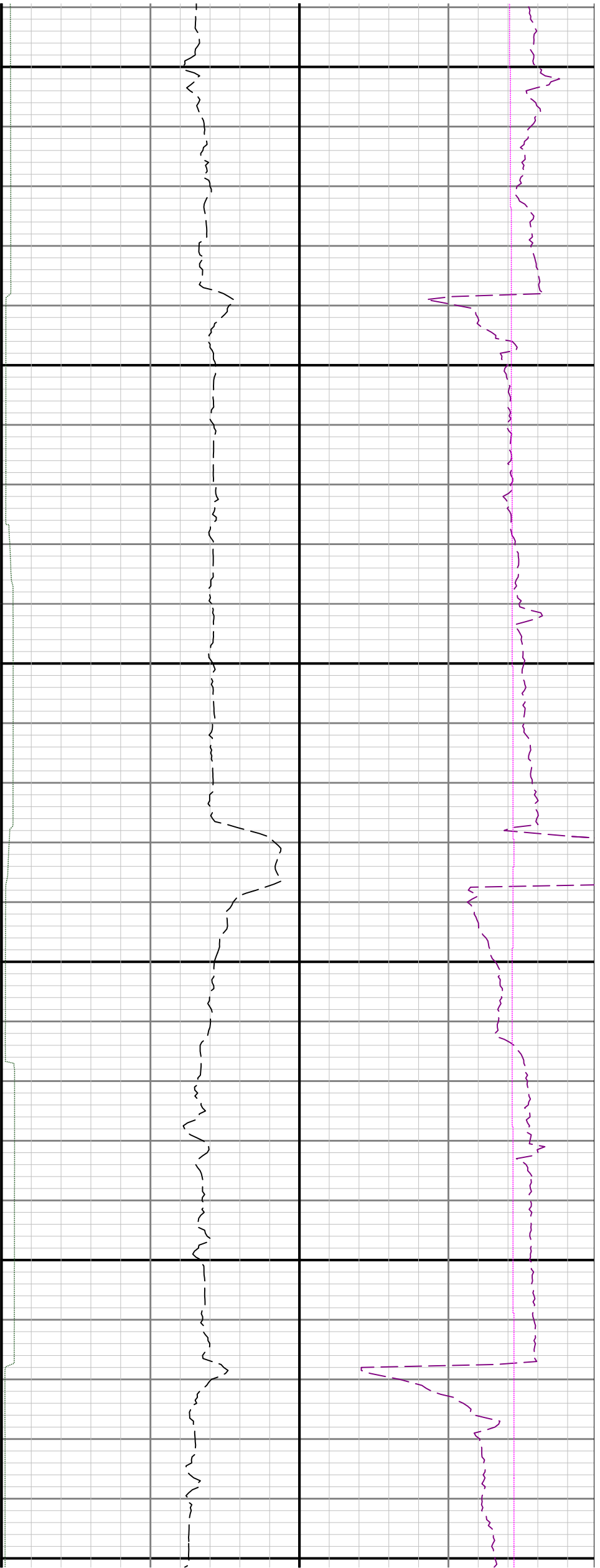


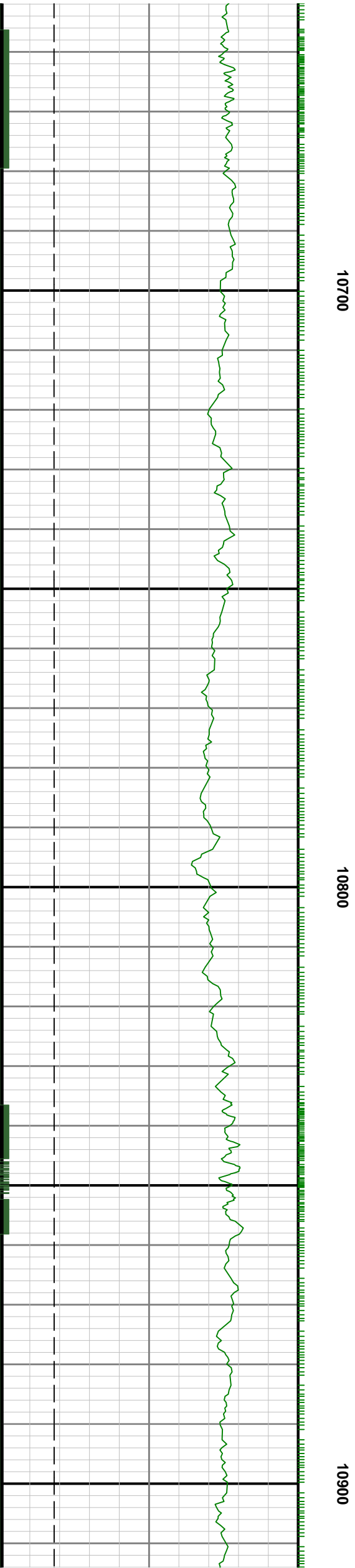


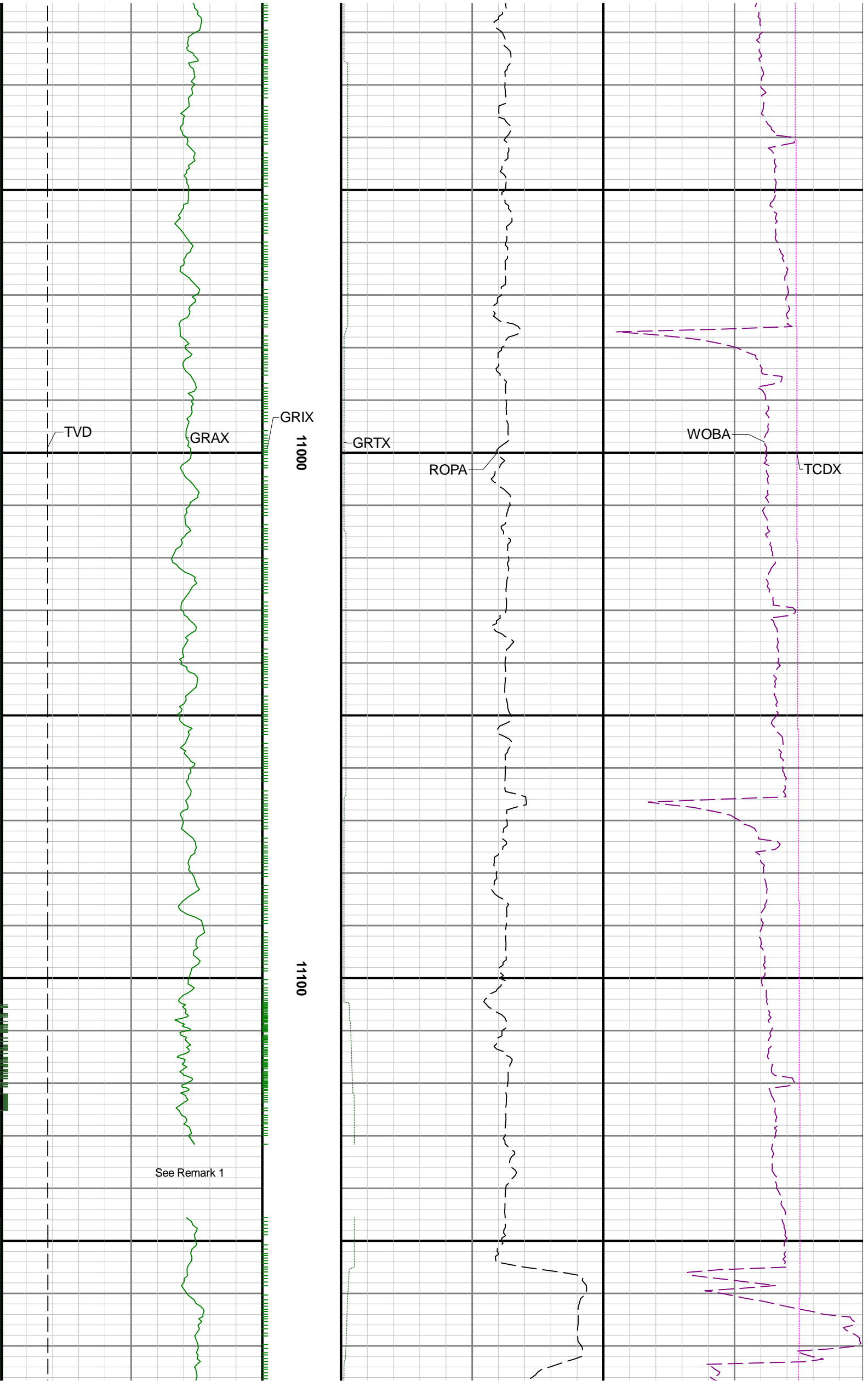
10200

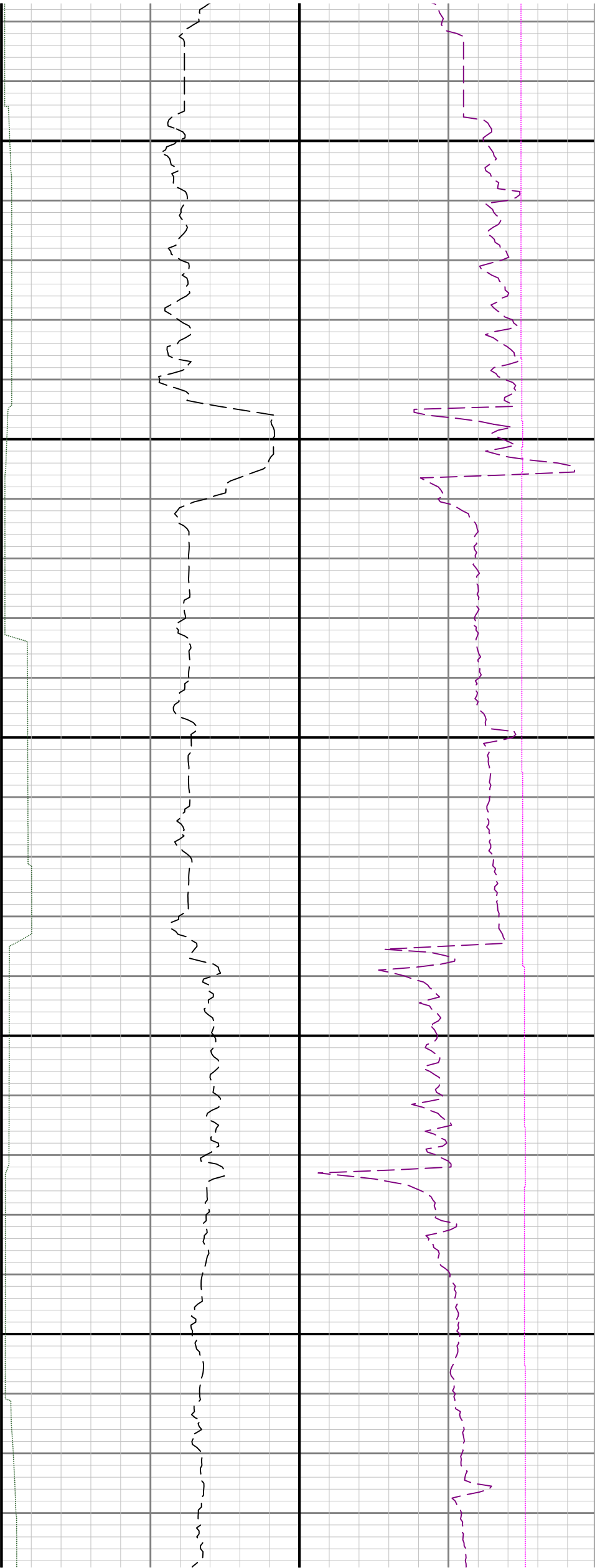
10300







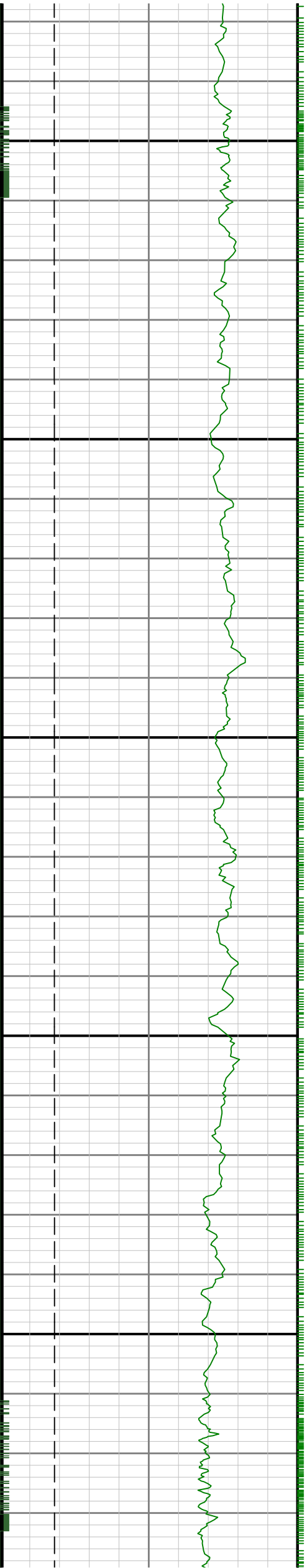


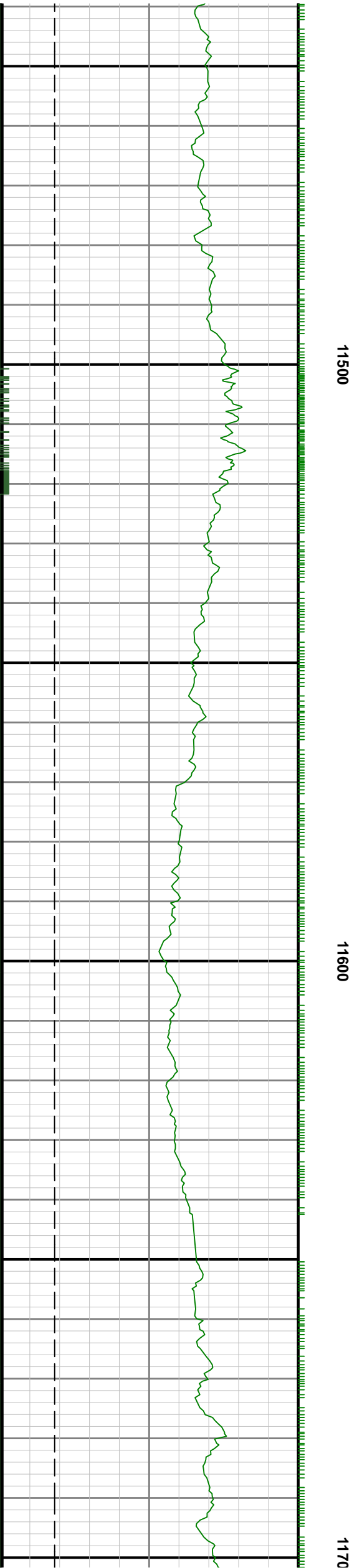
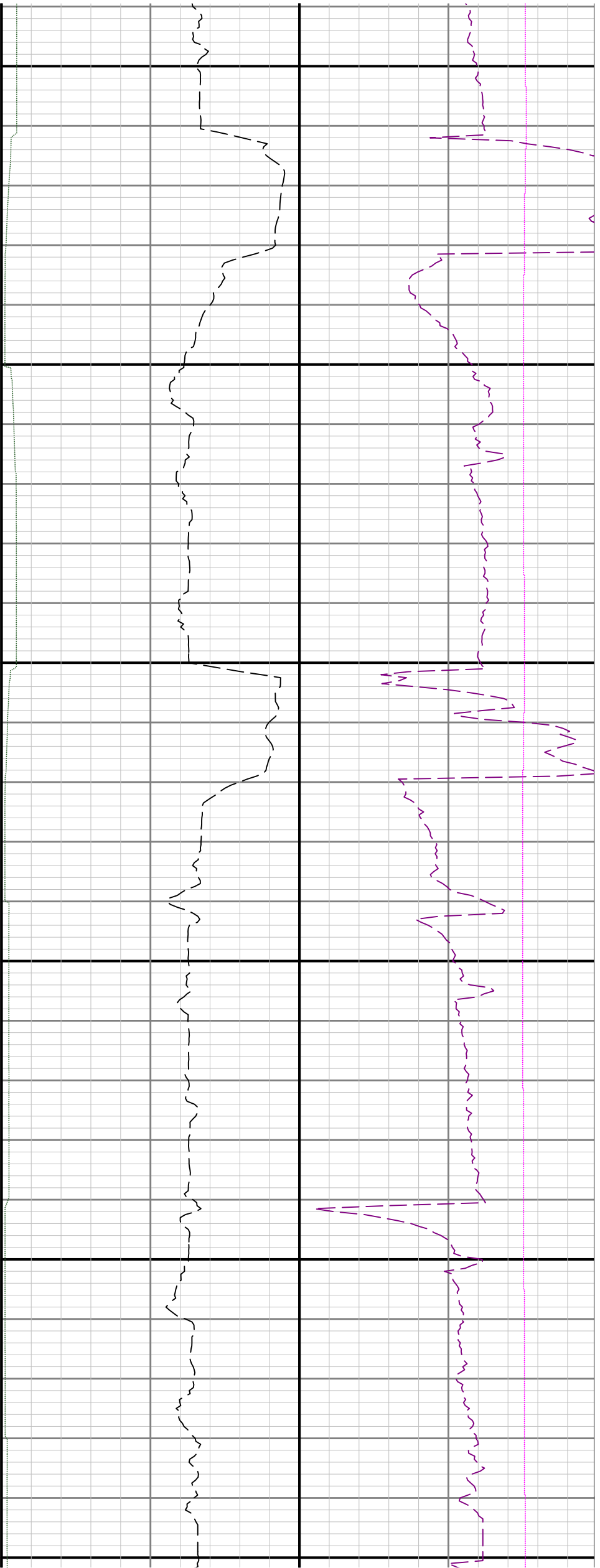


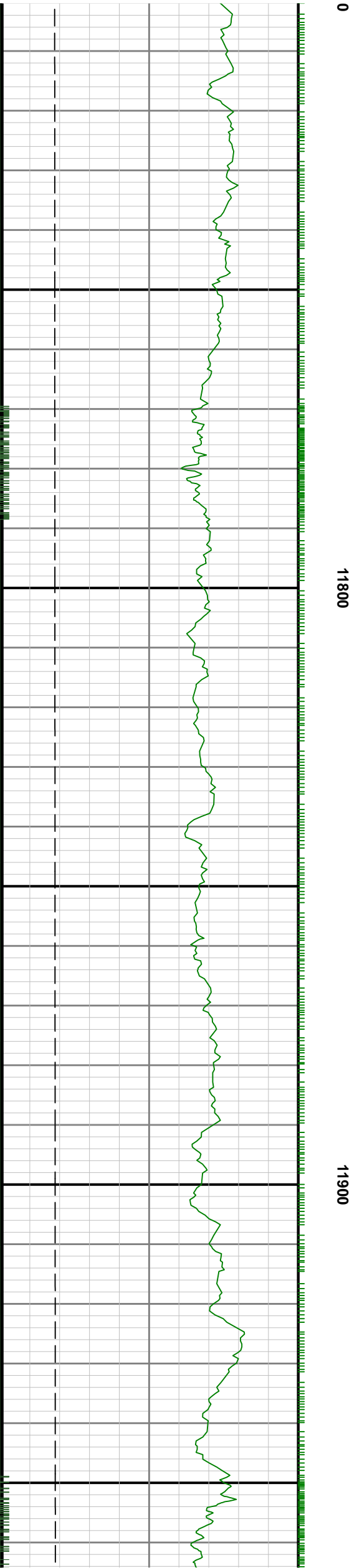
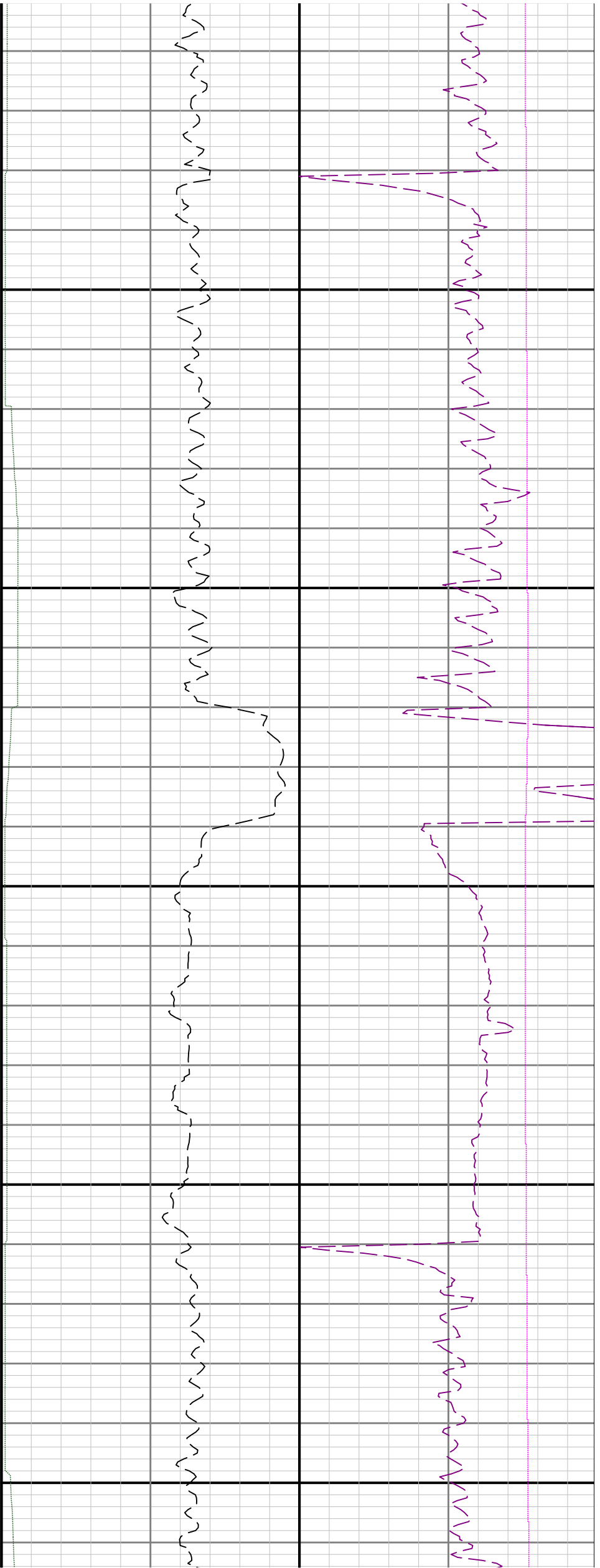
11200

11300

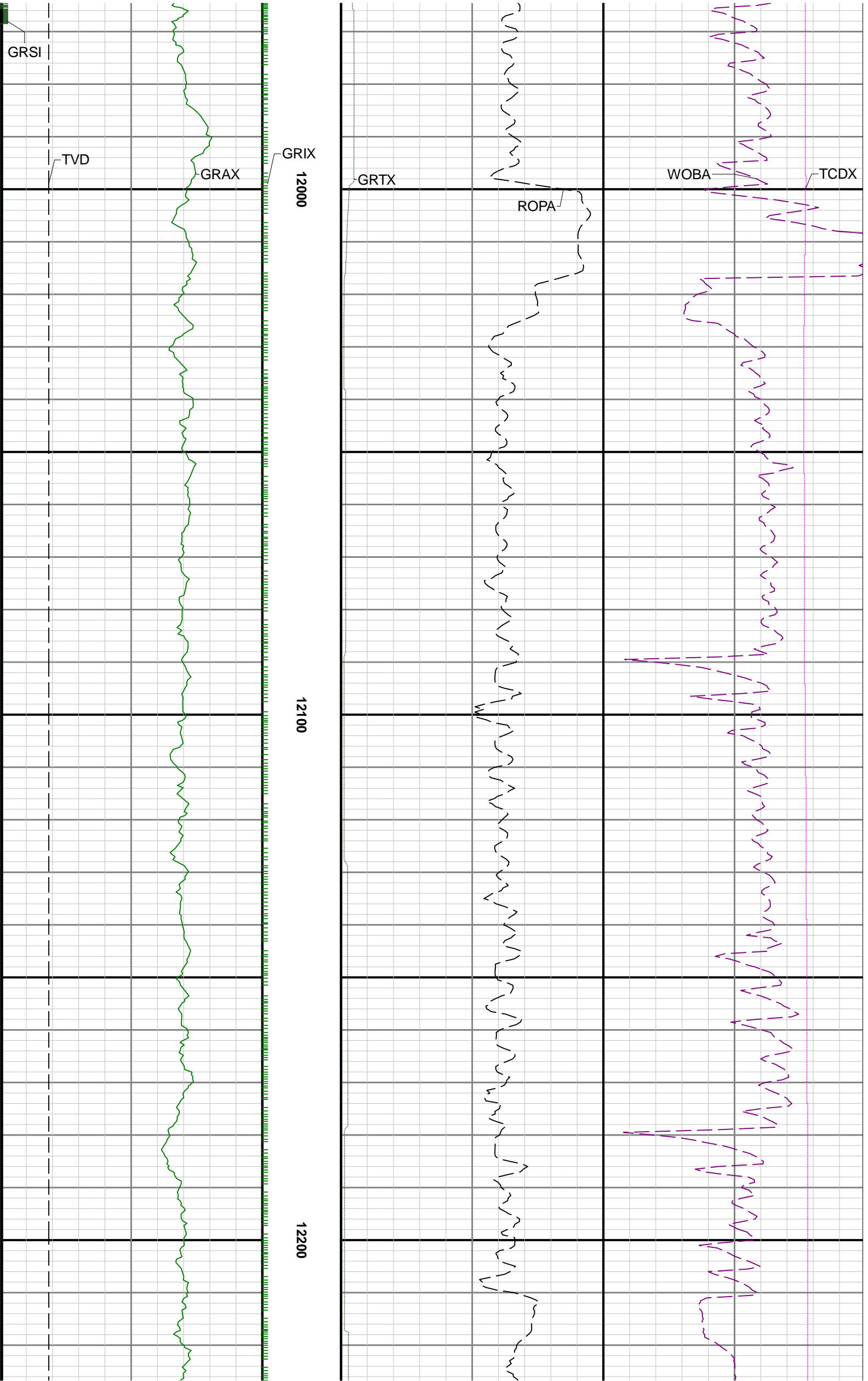
11400

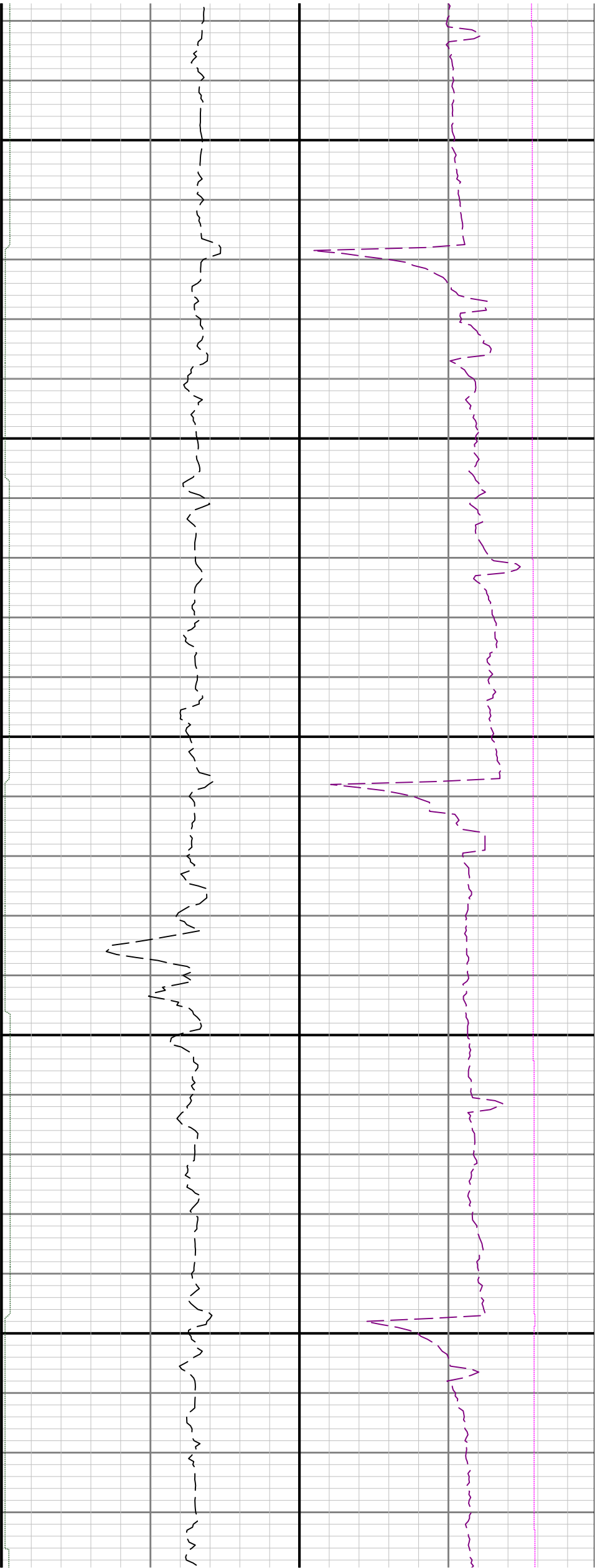






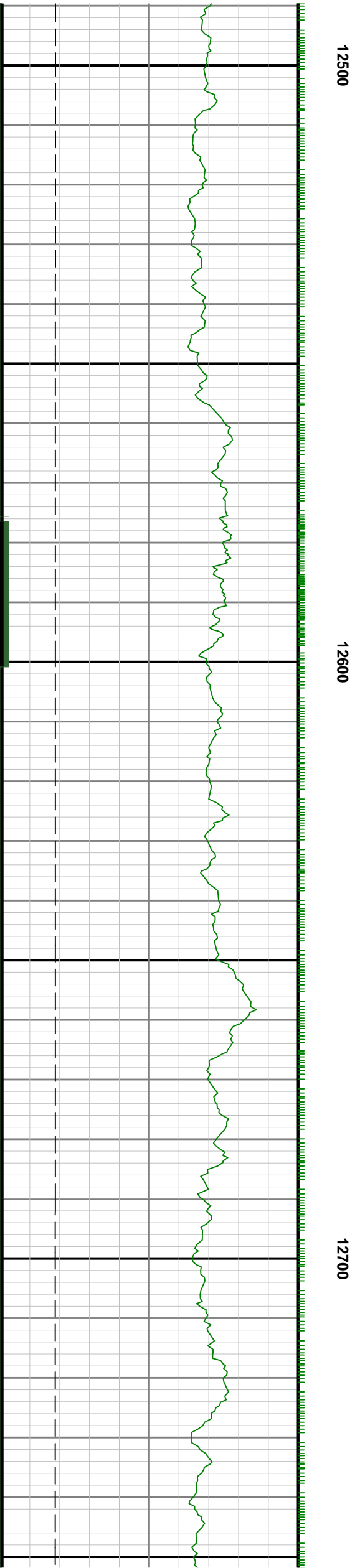
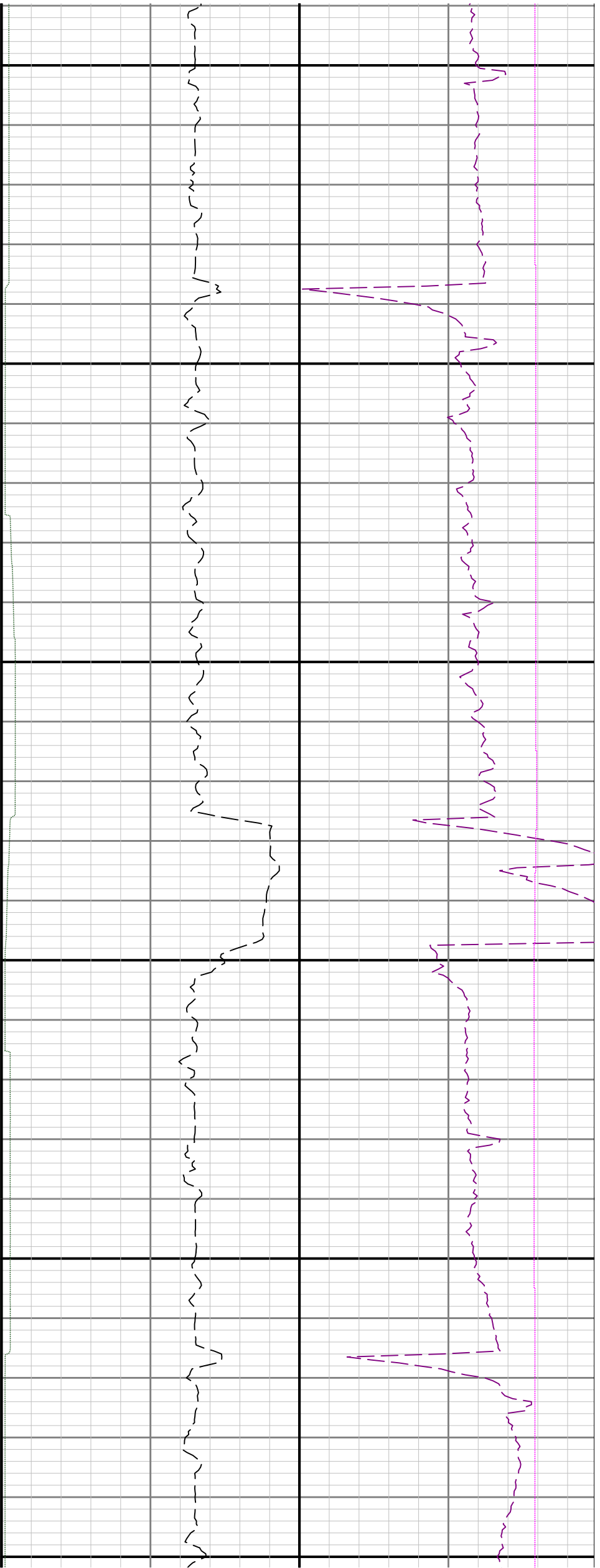


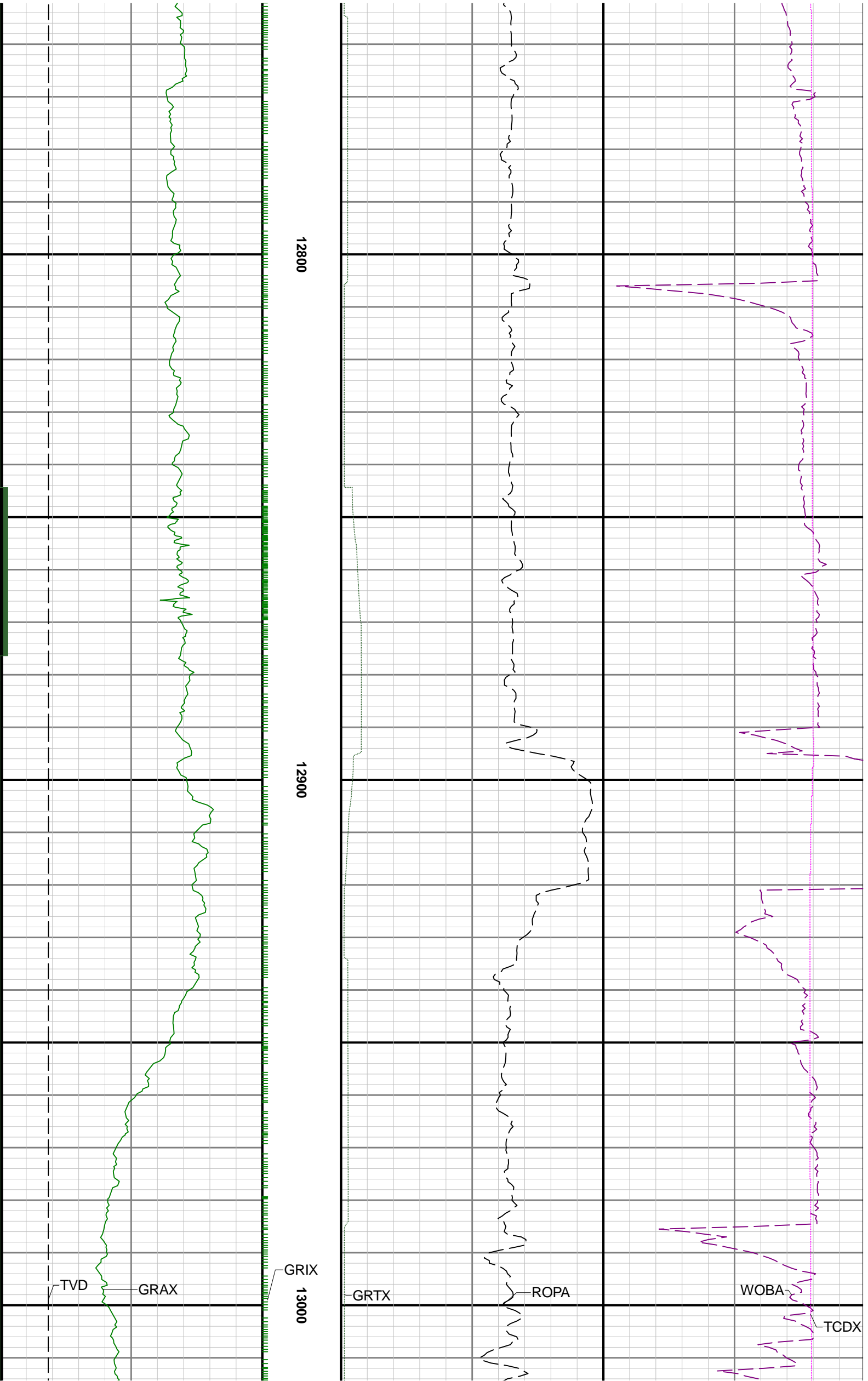


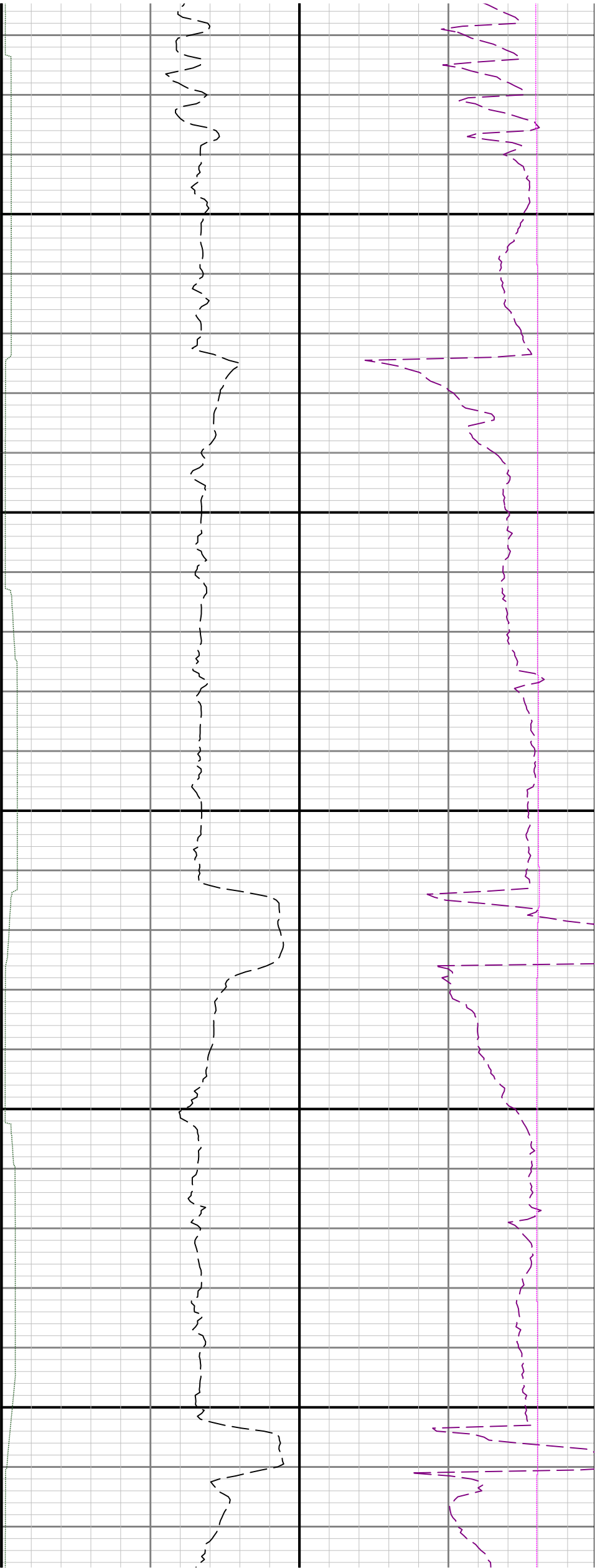


12300

12400

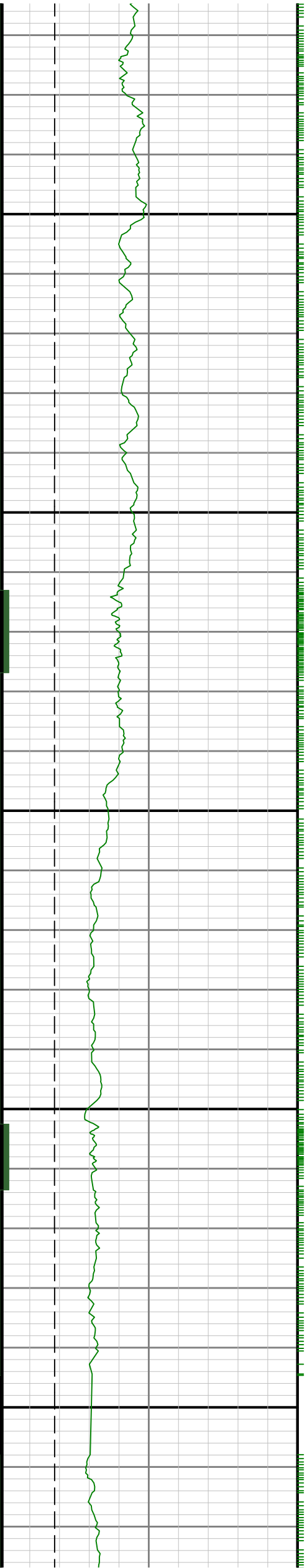


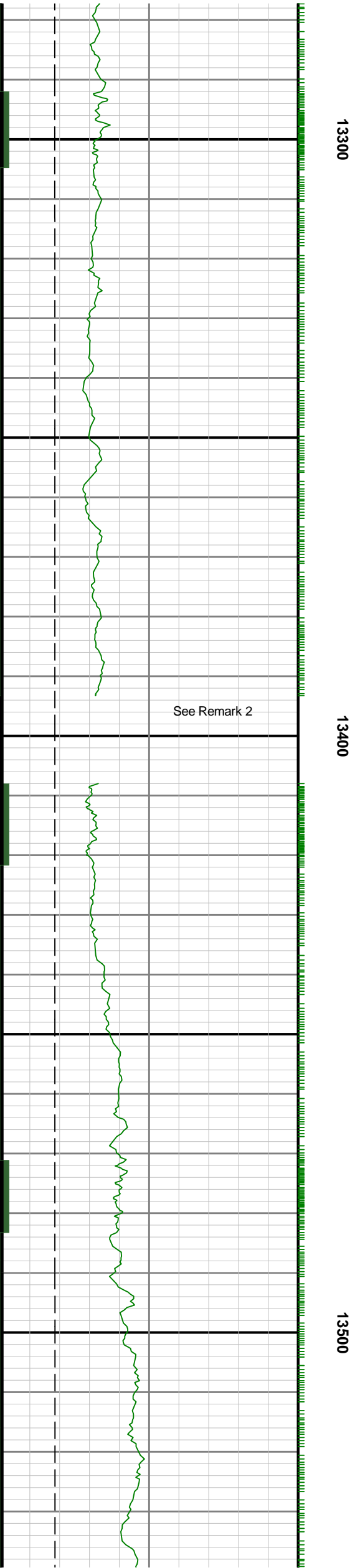
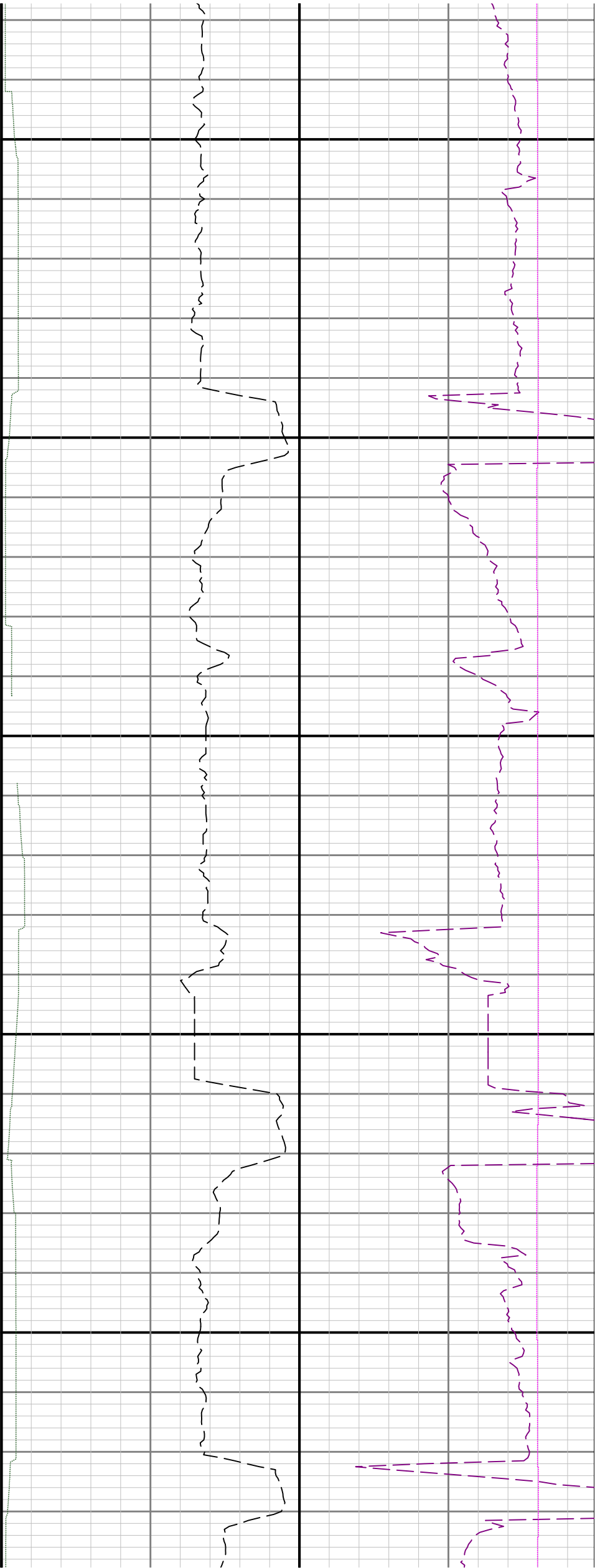


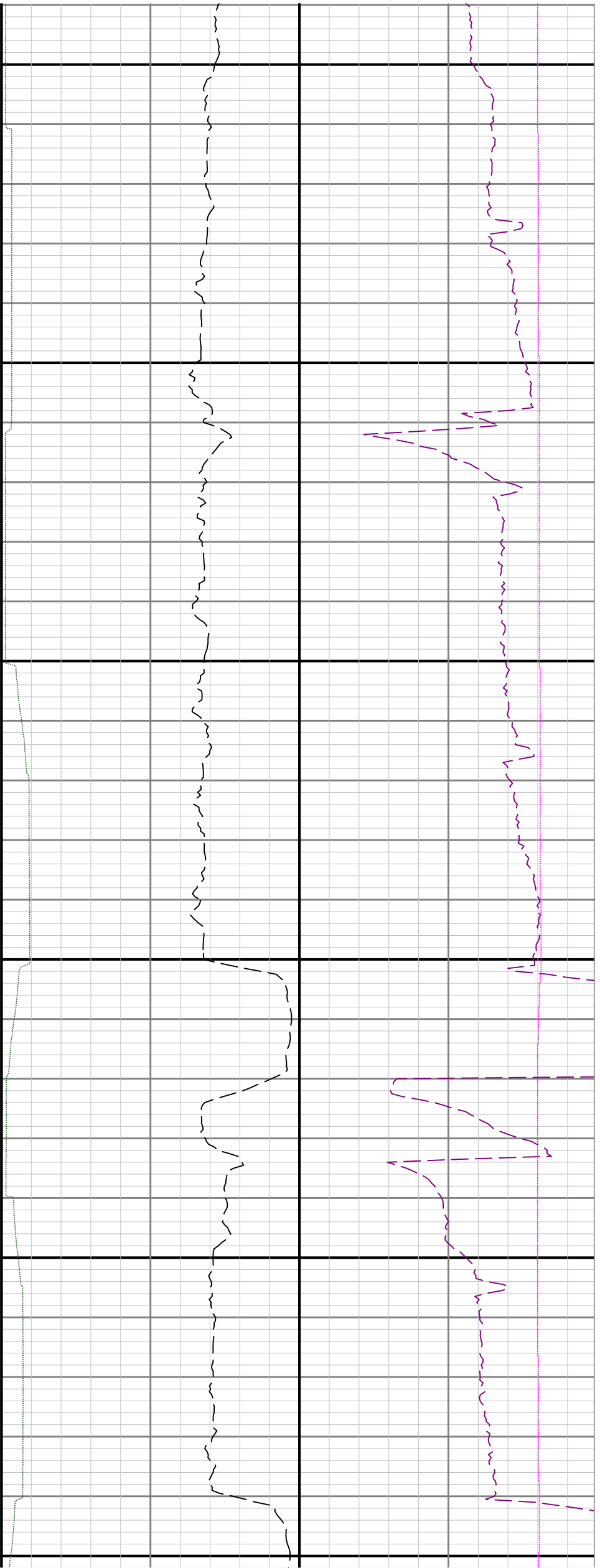


13100

13200



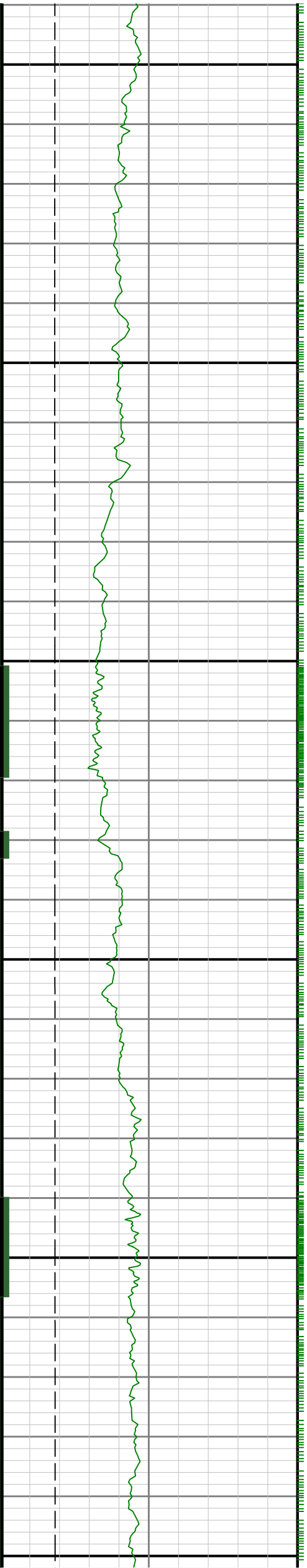


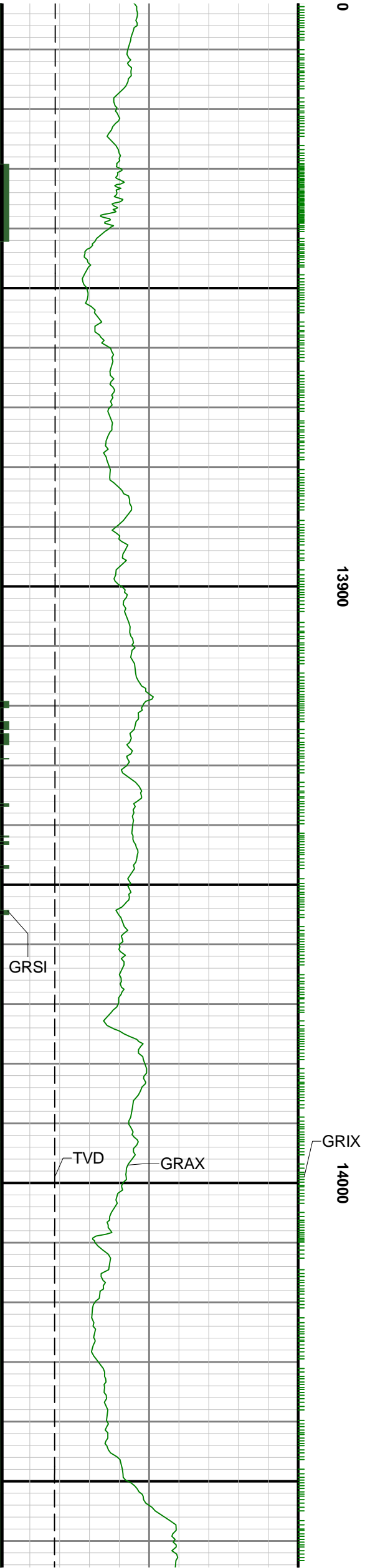
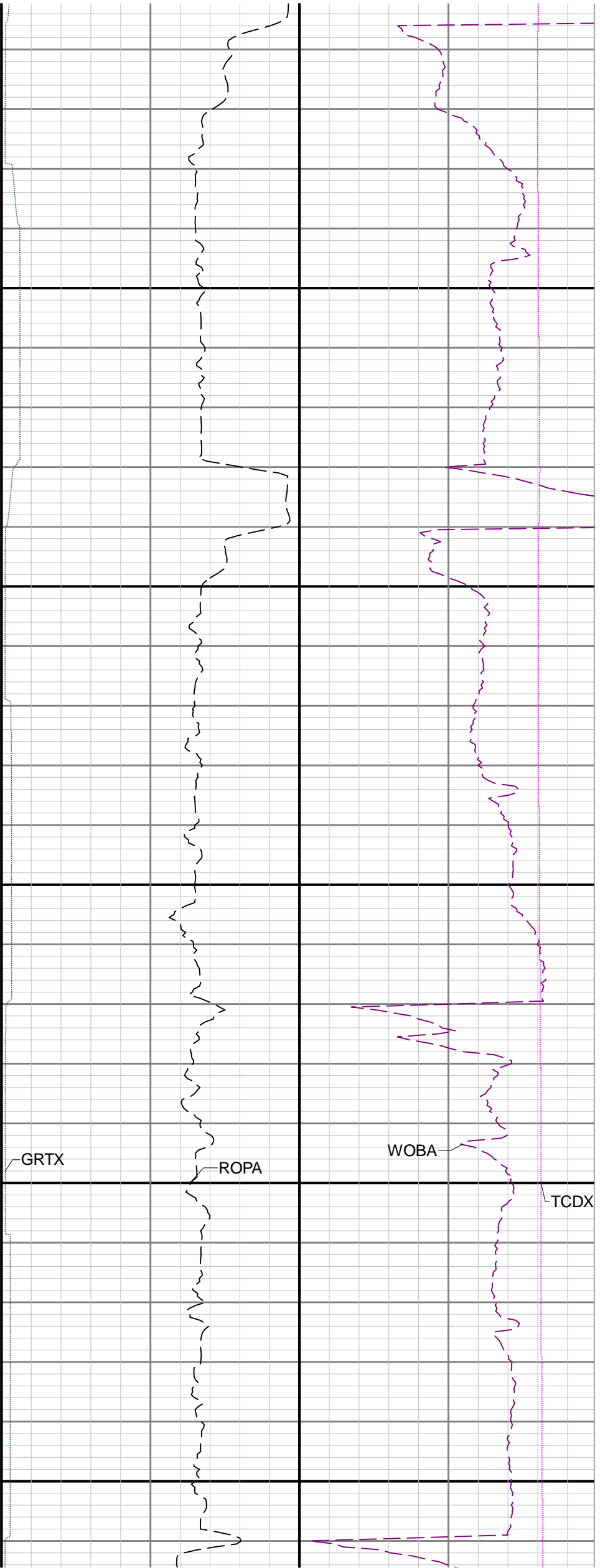


13600

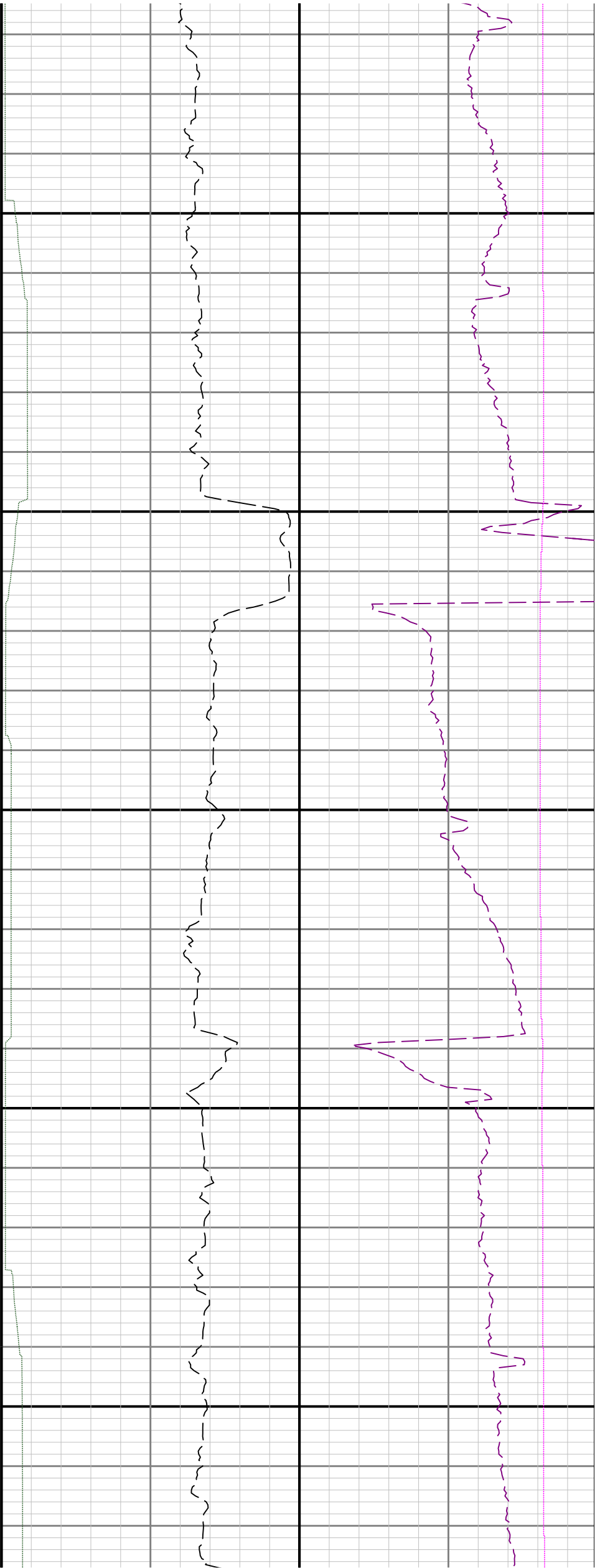
13700

13800





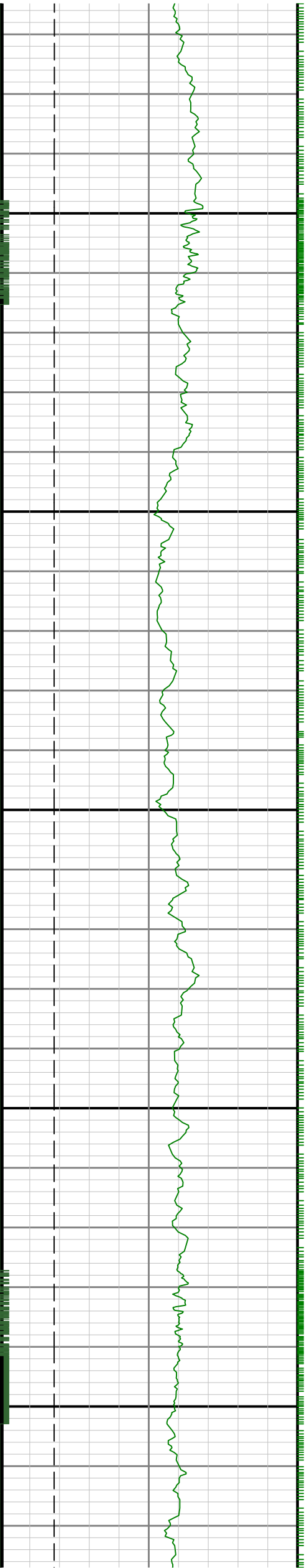


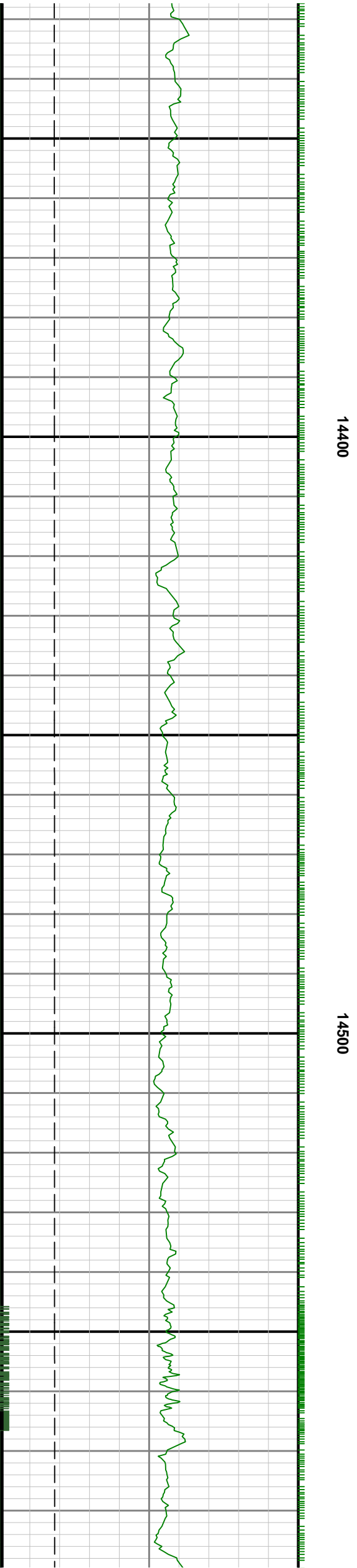
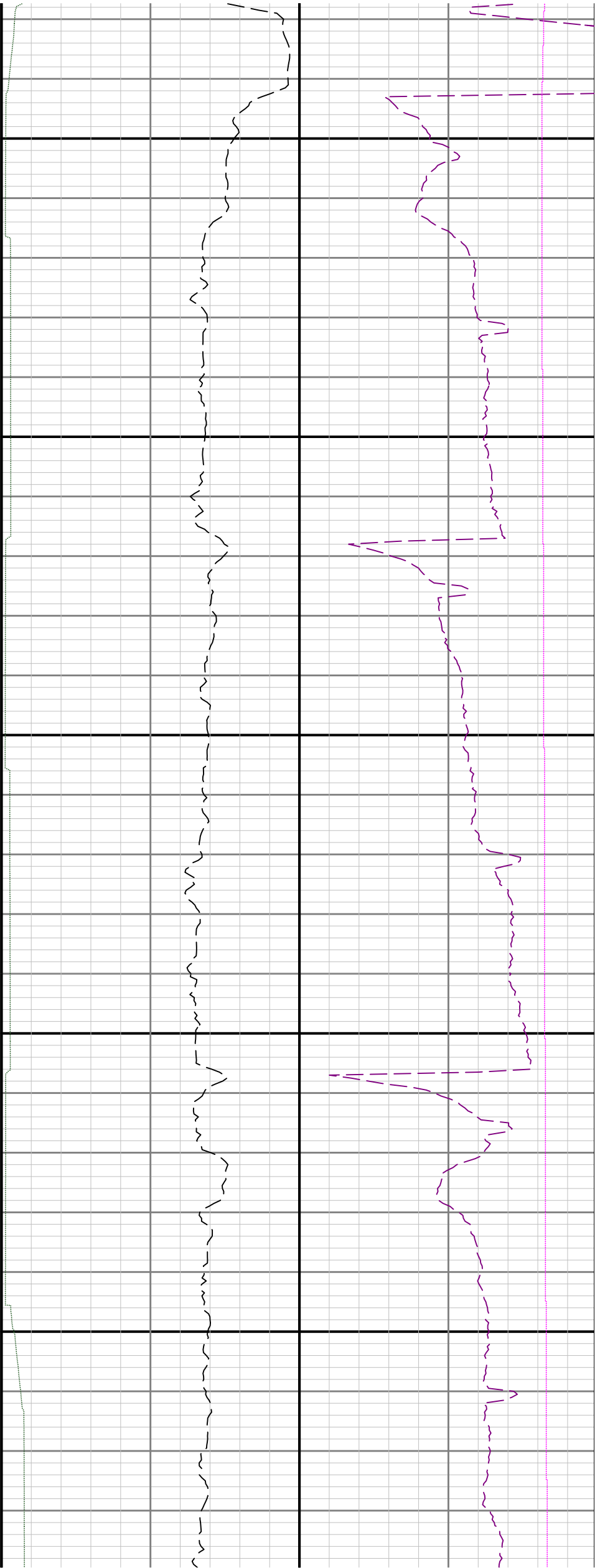


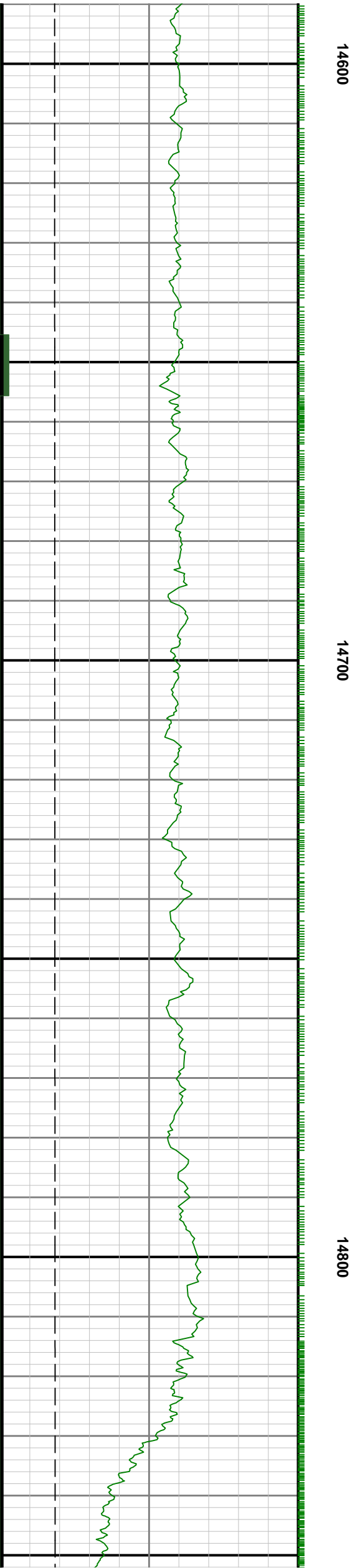
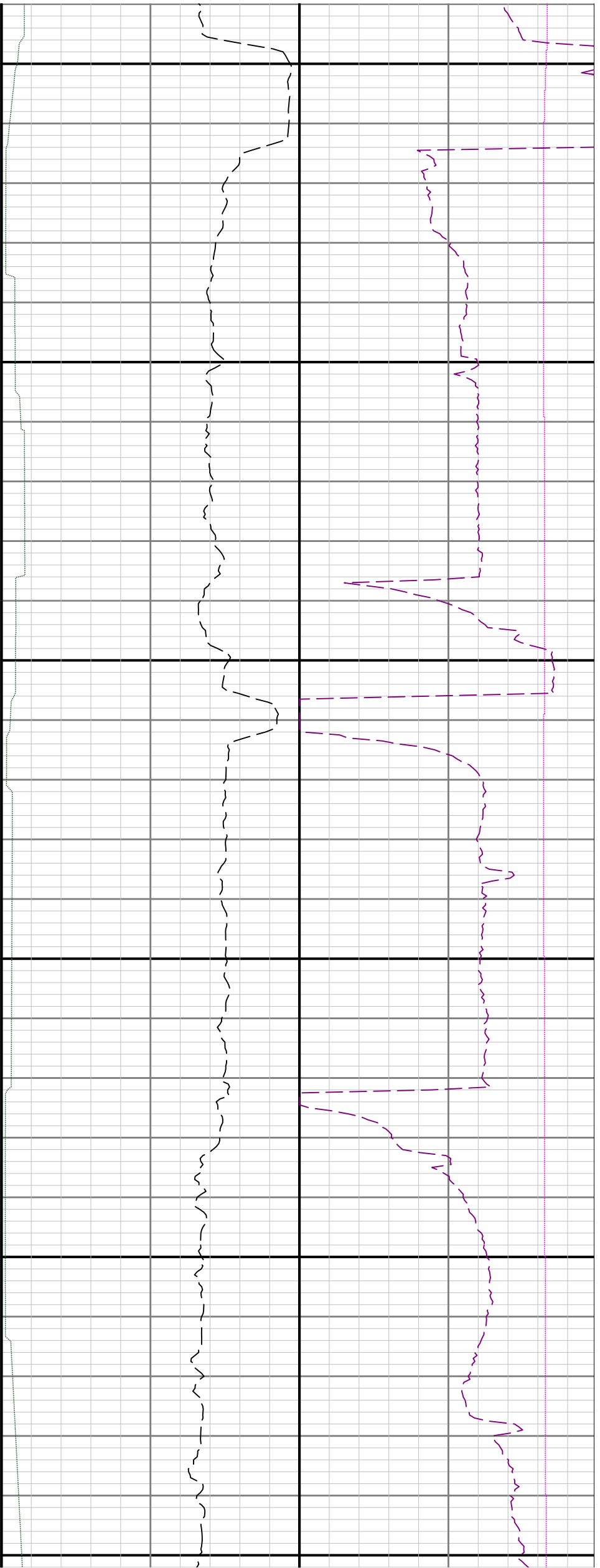
14100

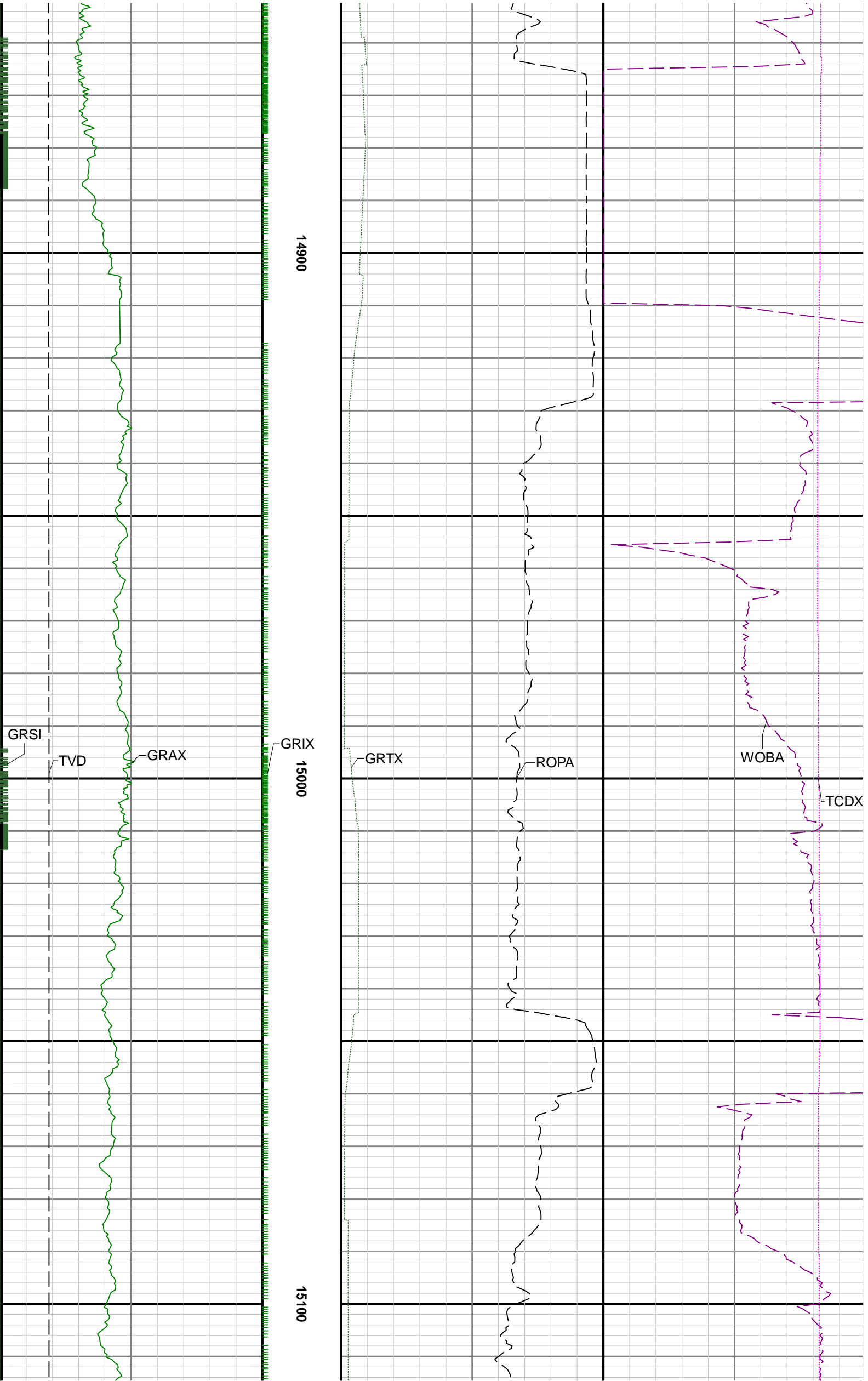
14200

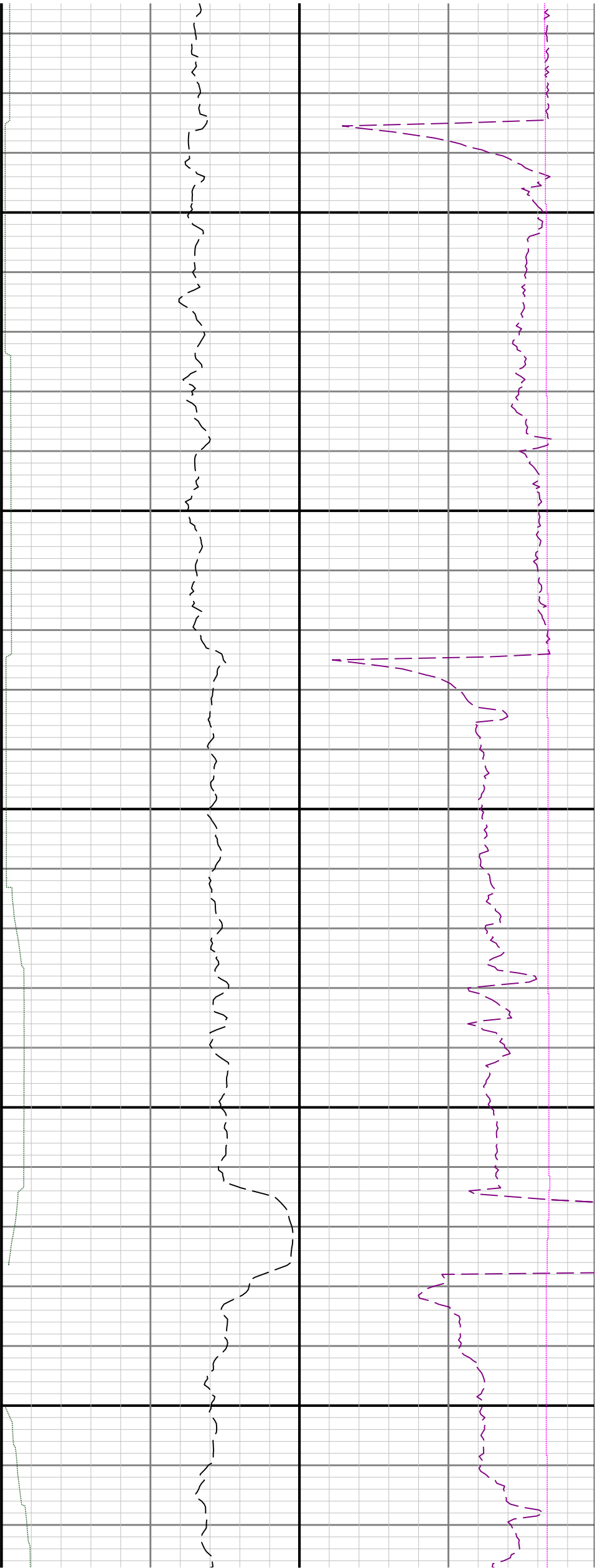
14300

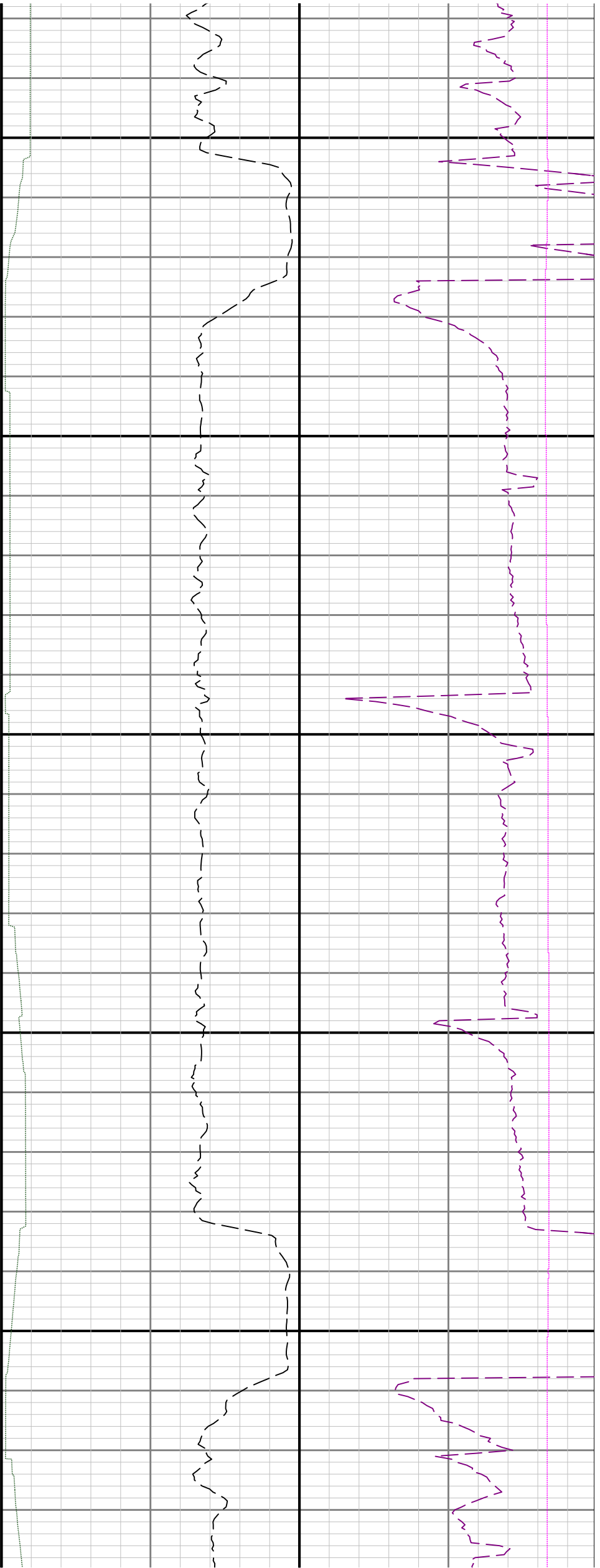








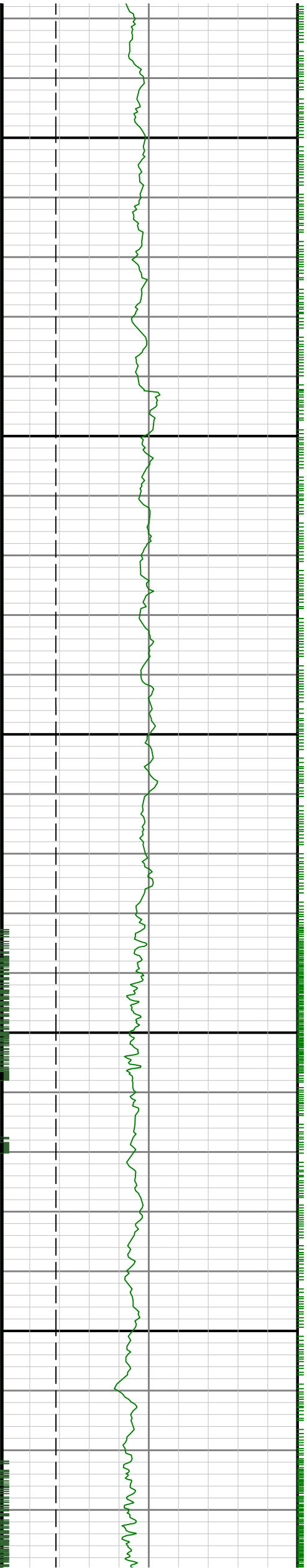


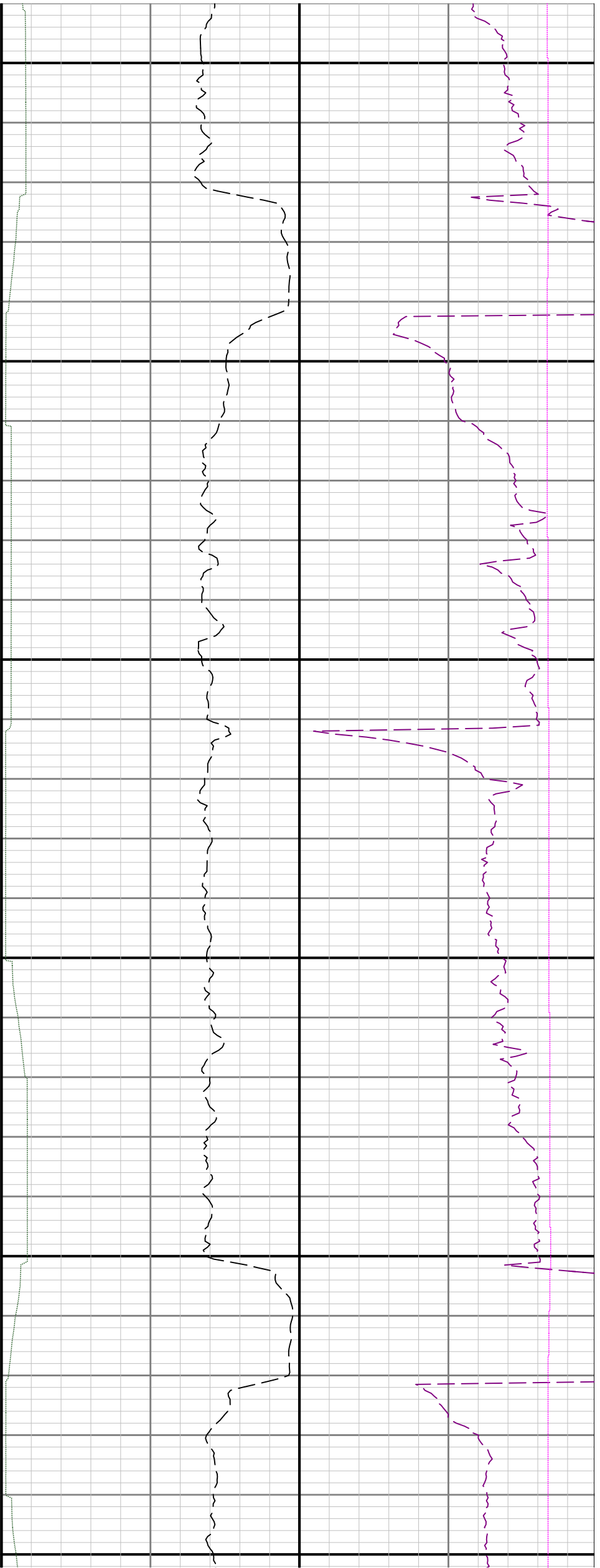


15400

15500

15600

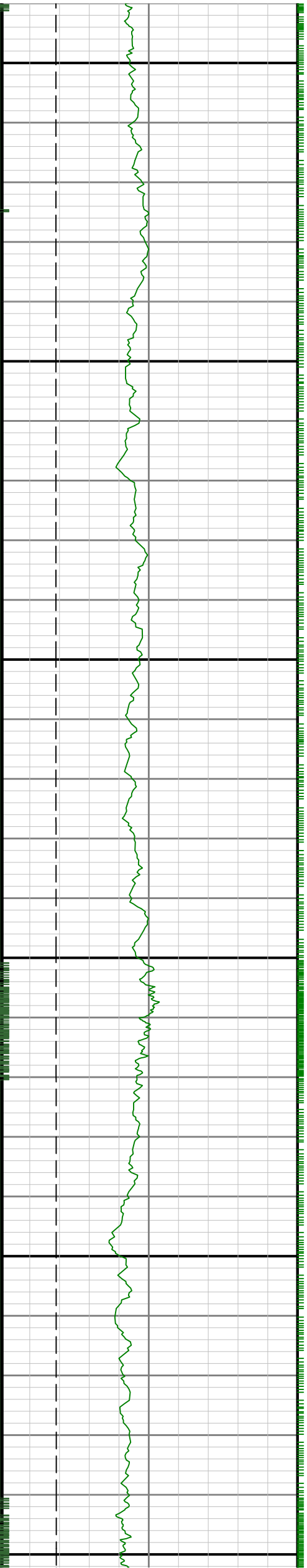


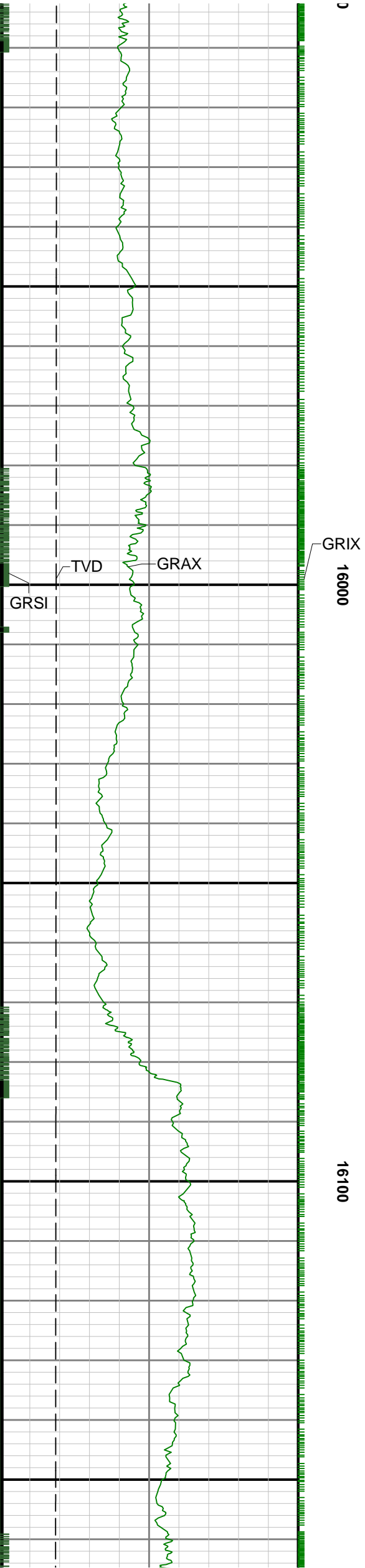
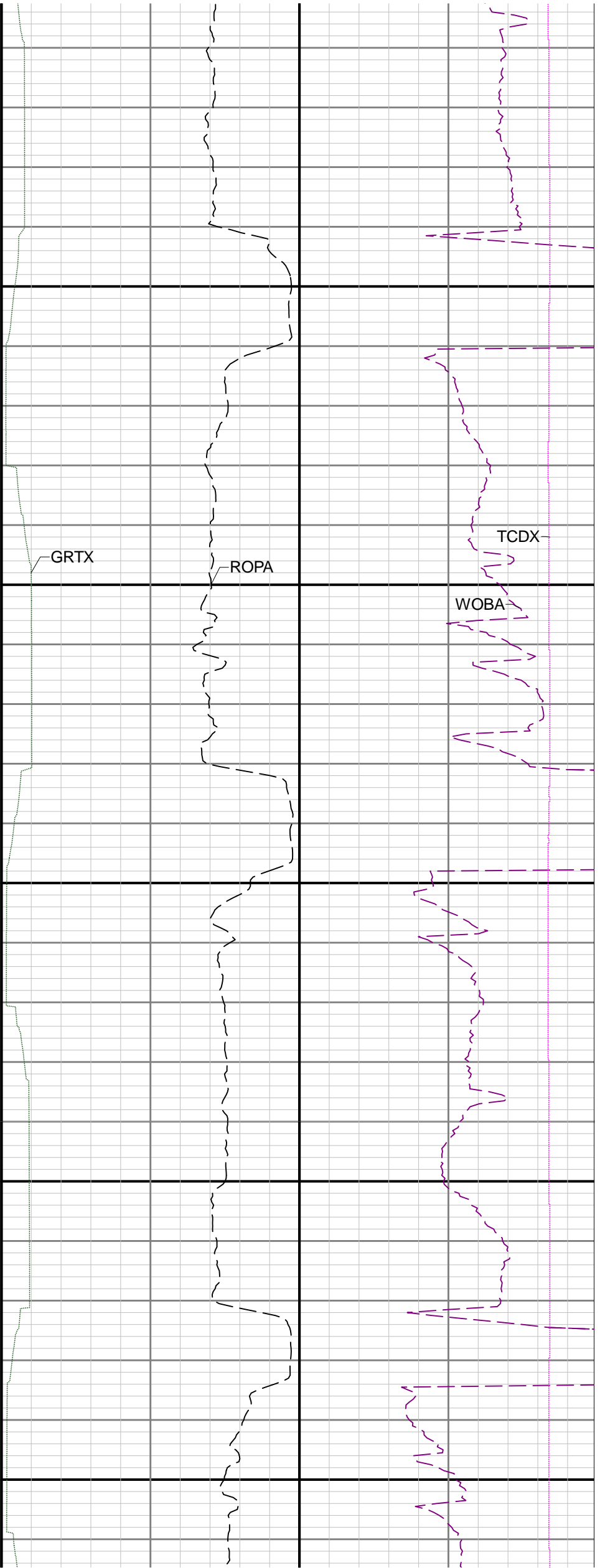


15700

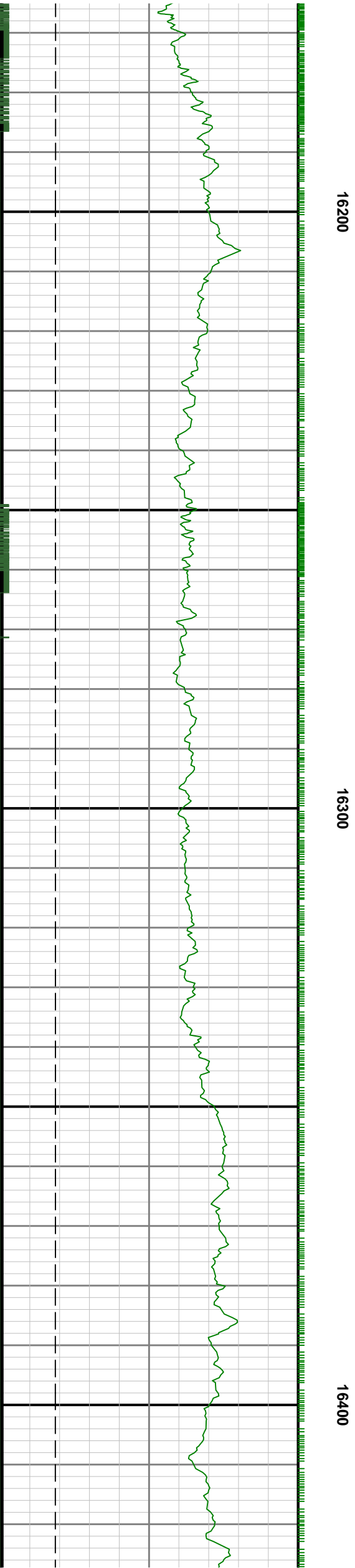
15800

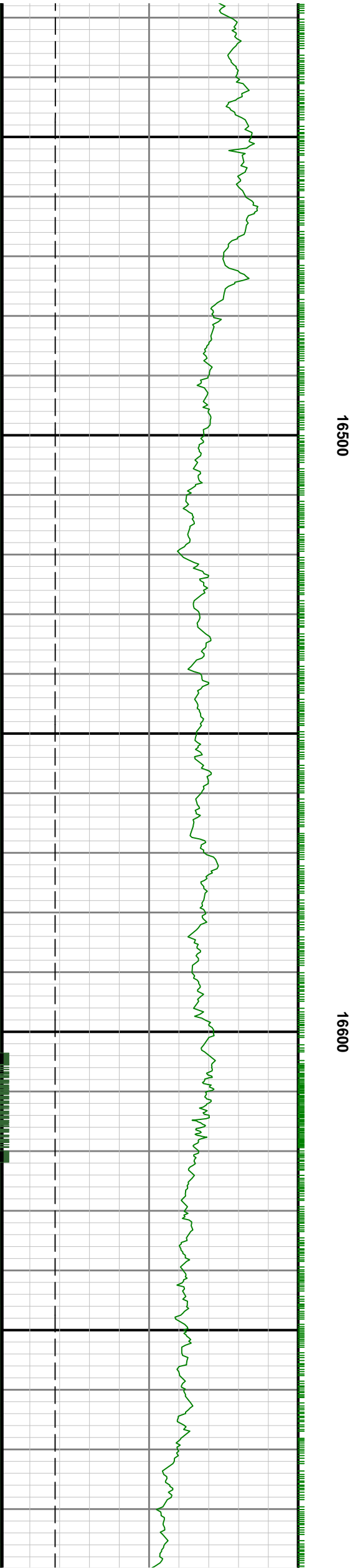
15900

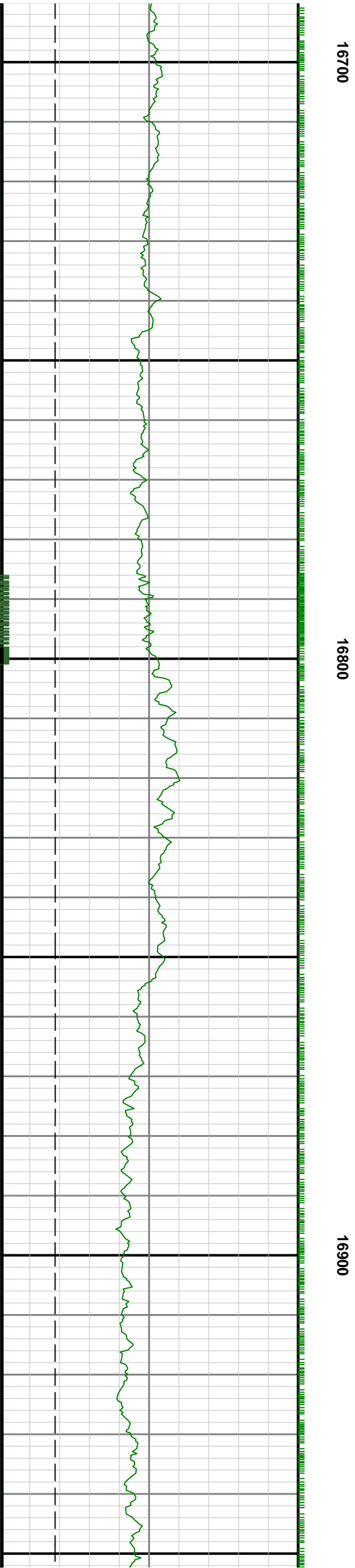


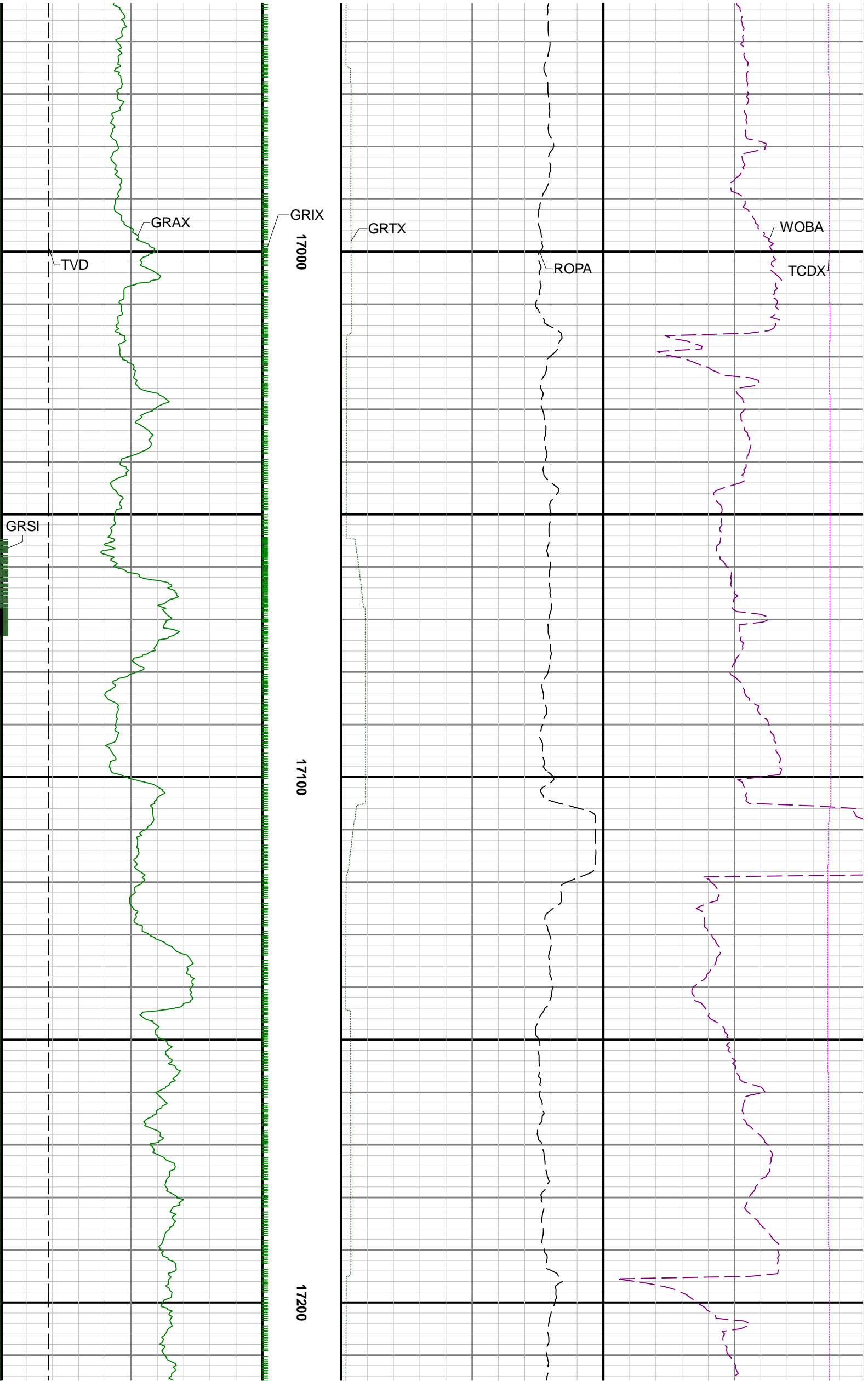


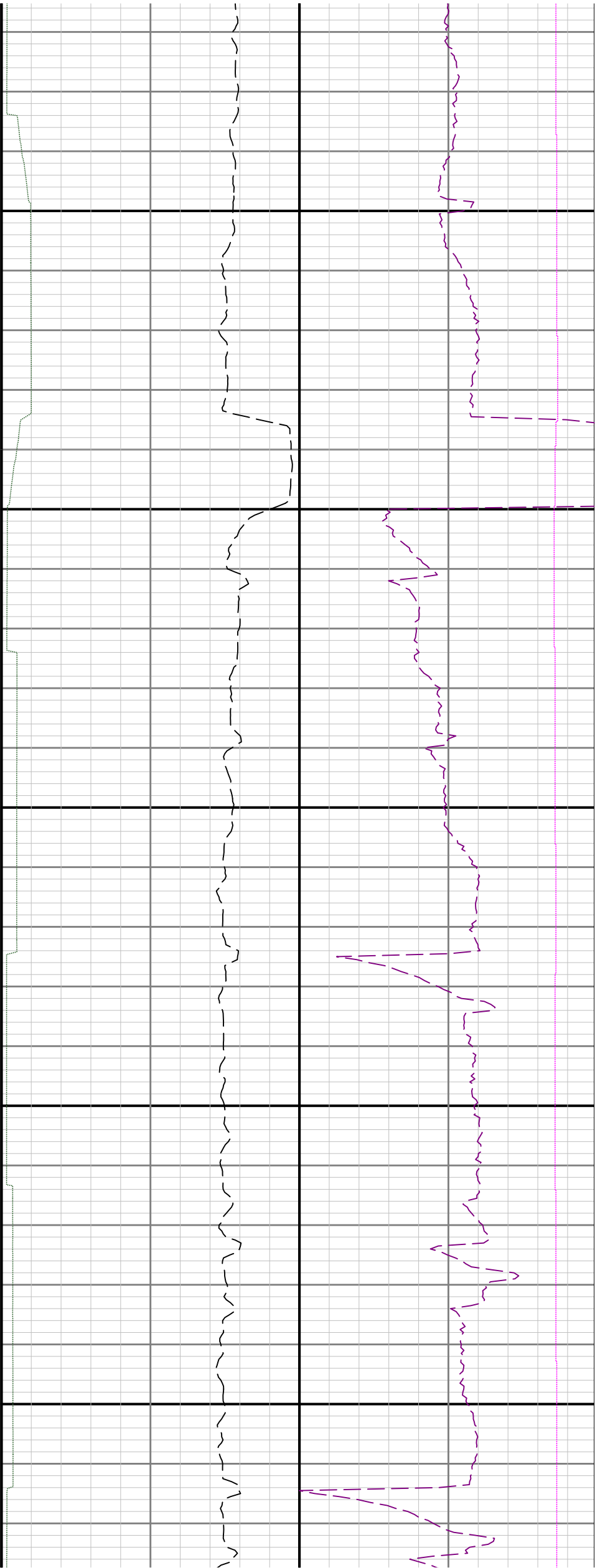












17300

17400

