



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale:

1:240

Measured Depth

Company: Anadarko E&P Company LP

Well: Aggregate State 35N-E16HZ

Field: Wattenberg

Region: Continental US Country: U.S.A.

Status:

Final Print

Surface Location:

Latitude: 40° 9' 6.923" N

Longitude: 104° 47' 3.307" W

Other Services:

Wellbore Survey

API Number:
05-123-38680-00

Section: TWN: 2N

Range: 66W

Permanent Datum (P.D.): Ground Level Elevation: 4911.00 ft.

Log Measured From: Drill Floor 16.00 ft. Above P.D.

Depth Reference: Driller's Depth

Elevations:

KB: N/A
DF: 4927.00 ft.
GL: 4911.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6718.0 ft. Date From: 07/Mar/14 Date To: 15/Mar/14 Dip Angle: 66.93° Azl Reference North: True

Bottom: 14323.0 ft. Spud Date: 07/Mar/14 Field Strength: 52817.0 nT North Correction: 8.48°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1032.0 ft.	9.625 in.	36.00 lb/ft	Surface	1032.0 ft.
8.750 in.	1036.0 ft.	7651.0 ft.	7.000 in.	26.00 lb/ft	Surface	7640.0 ft.
6.125 in.	7651.0 ft.	14375.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based Mud	Surface	14375.0 ft.	13.500 in.	1032.0 ft.	0.0° / 0.0°	.067° / 352.1°
			8.750 in.	6619.0 ft.	.067° / 352.1°	85.7° / 181.68°
			6.125 in.	6723.0 ft.	85.7° / 181.68°	91.1° / 180.9°
					/	/
					/	/
					/	/
					/	/

Acquisition System

Software Version

Other

Advantage	2.20U4	Rig / Contractor:	Xtreme 20	/ Xtreme Coil Drilling Corp.
PATS	6.4.1.34	Job No:	6121209	/ D&E
		District / Unit:	RMD	

INTEQ does not guarantee the accuracy or correctness of interpretations provided in or from this log. Since all interpretations are opinions based on measurements, INTEQ shall under no circumstances be responsible for consequential damages or any other loss, costs, damages or expenses incurred or sustained in connection with the use of any such interpretations. INTEQ disclaims all expressed and implied warranties related to this service. INTEQ's liabilities and obligations shall be governed by INTEQ's Standard Terms and Conditions.

Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time				Circ. Time (hrs.)
							Top	Bottom	From	To	Start		End		
							(ft.)	(ft.)	(ft.)	(ft.)					
1	1	1	8.750	PDC	3.000	Steerable	6718.0	7609.0	1032.0	7651.0	07/Mar/2014	22:21	10/Mar/2014	06:25	39.4
2	2	2	6.125	PDC	5.000	Steerable	7609.0	11817.0	7651.0	11883.0	11/Mar/2014	02:35	13/Mar/2015	10:10	36.5
3	3	2	6.125	PDC	5.000	Steerable	11817.0	14324.0	11883.0	14375.0	13/Mar/2014	11:20	15/Mar/2015	00:20	28.5

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Adam Schlenz	07/Mar/2014	15/Mar/2014	Greg Dore	07/Mar/2014	15/Mar/2014			

Witness	
Name	LWD Run Number
Marvin Hackeworth	1
Charlie Daigle	2,3

Mud Properties Record												
Date / Time		LWD	Measured	Mud	Density	Viscosity	pH	Fluid	Oil /	Source	Total	K+
		Run No.	Depth	Type				Loss	Water		Chlorides	
			(ft.)		(ppg)	(cp)		(cc)			(ppm)	(%)
08/Mar/2014	08:00	1	6866.0		9.8	13	9.2		2/88.6		800	
09/Mar/2014	22:45	1	7651.0		9.9	13	9.3		3.5/86.8		800	
10/Mar/2014	08:00	1	7651.0		10.1	13	9.2		3.4/86.5		800	
10/Mar/2014	22:00	1	7651.0		10.1	14	9.2		3.4/86.5		800	
11/Mar/2014	22:00	2	8856.0		9.1	13	9.4		3.4/91.3		800	
13/Mar/2014	08:00	3	11883.0		9.4	15	9.3		3.3/90.2		550	
13/Mar/2014	22:45	3	11993.0		9.4	14	9.2		3.2/90.3		500	

Mnemonics		
Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	point
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	degF
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 (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12815870	Directional	45.40	6.750	3.250
1	SRIG	11602059	Gamma	41.98	6.750	3.250
2	DIR	11592525	Directional	54.79	4.750	2.688
2	SRIG	12023982	Gamma	51.41	4.750	2.688
3	DIR	12497612	Directional	53.79	4.750	2.750
3	SRIG	10392040	Gamma	50.41	4.750	2.750

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.) Baker Hughes LWD run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1032 to 7651 feet MD (1031 to 7217 feet TVD), logging operations began at 6718 feet MD (6646 feet TVD).

2.) Baker Hughes LWD run 2 and 3 utilized 4 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 61/8 inch bit and steerable assembly from 7651 to 14374 feet MD (7217 to 7221 feet TVD).

3.) The solid line on the left side of the gamma ray track indicates the interval over which data was collected while not rotating.

4.) 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.

Remarks

Number	Measured	Hole	LWD	Remark
	Depth (ft.)	Section (in.)	Run No.	
1	6670	8.750	1	Gamma ray logging operations began at 6718 feet MD (6646 feet TVD).
2	7651	6.125	2	The interval from 7609 to 7651 feet MD (7214 to 7217 feet TVD) was logged more than 10 hrs after being drilled due to a trip out of the hole for casing and cement operations.
3	11838	6.125	3	The interval from 11832 to 11883 feet MD (7221 feet TVD) was logged more than 10 hrs after being drilled due to a trip out of the hole to replace the MWD and mud motor.
4	14374	6.125	3	No sensor data logged from 14324 to 14374 feet MD (7221 feet TVD) due to sensor to bit offset at well TD.

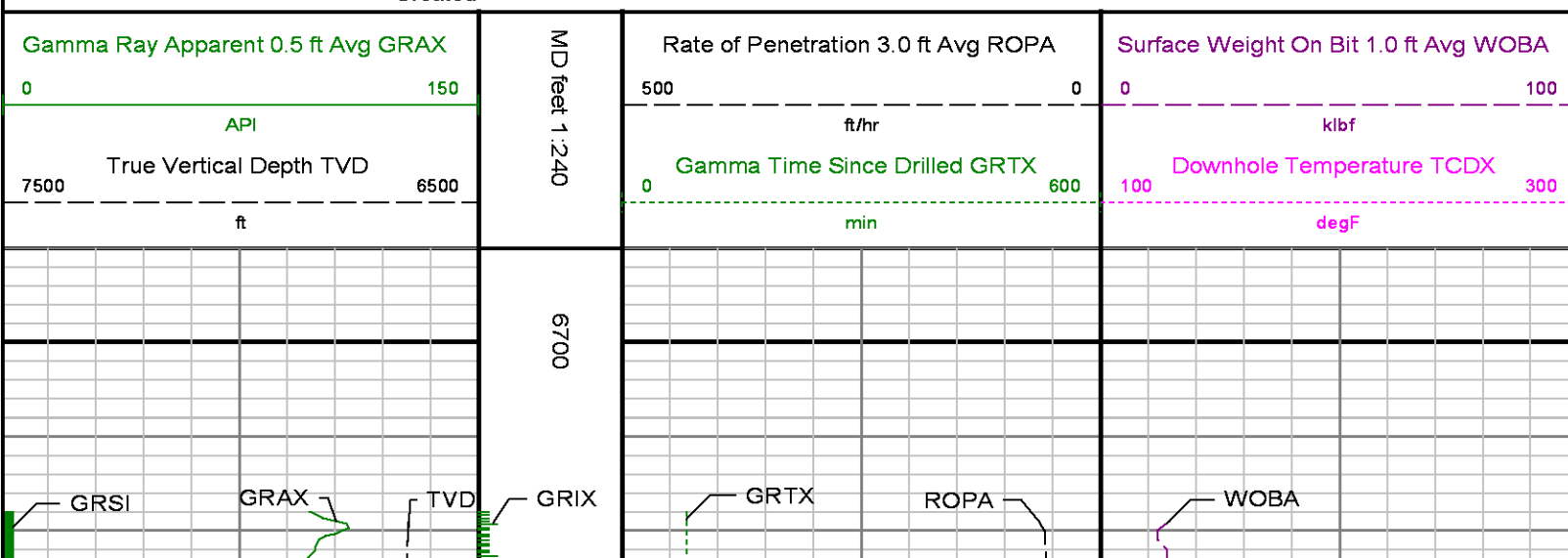


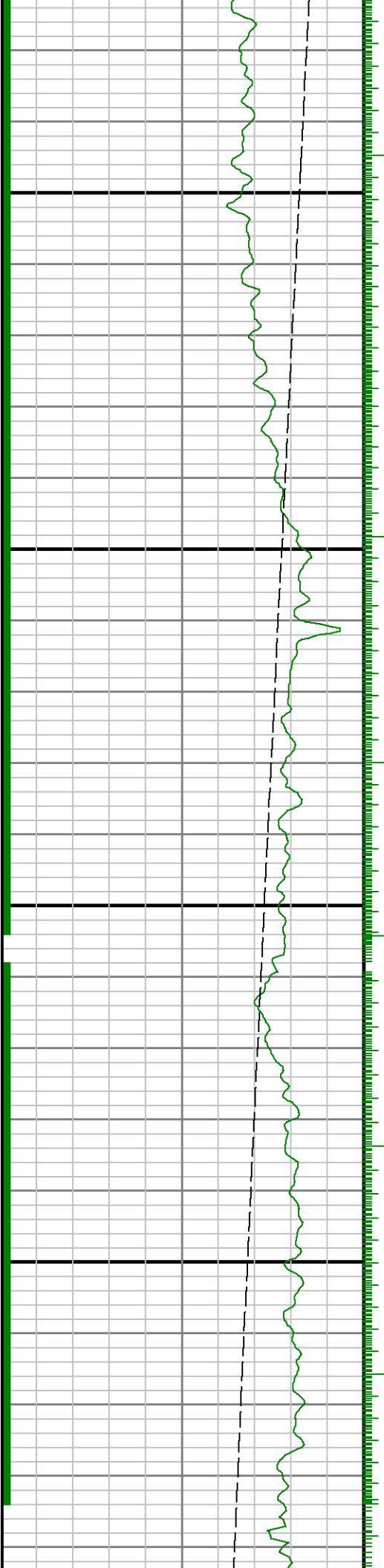
Company : Anadarko E&P Company LP

Well : Aggregate State 35N-E116HZ

Interval : 6690.00 - 14390.00 feet

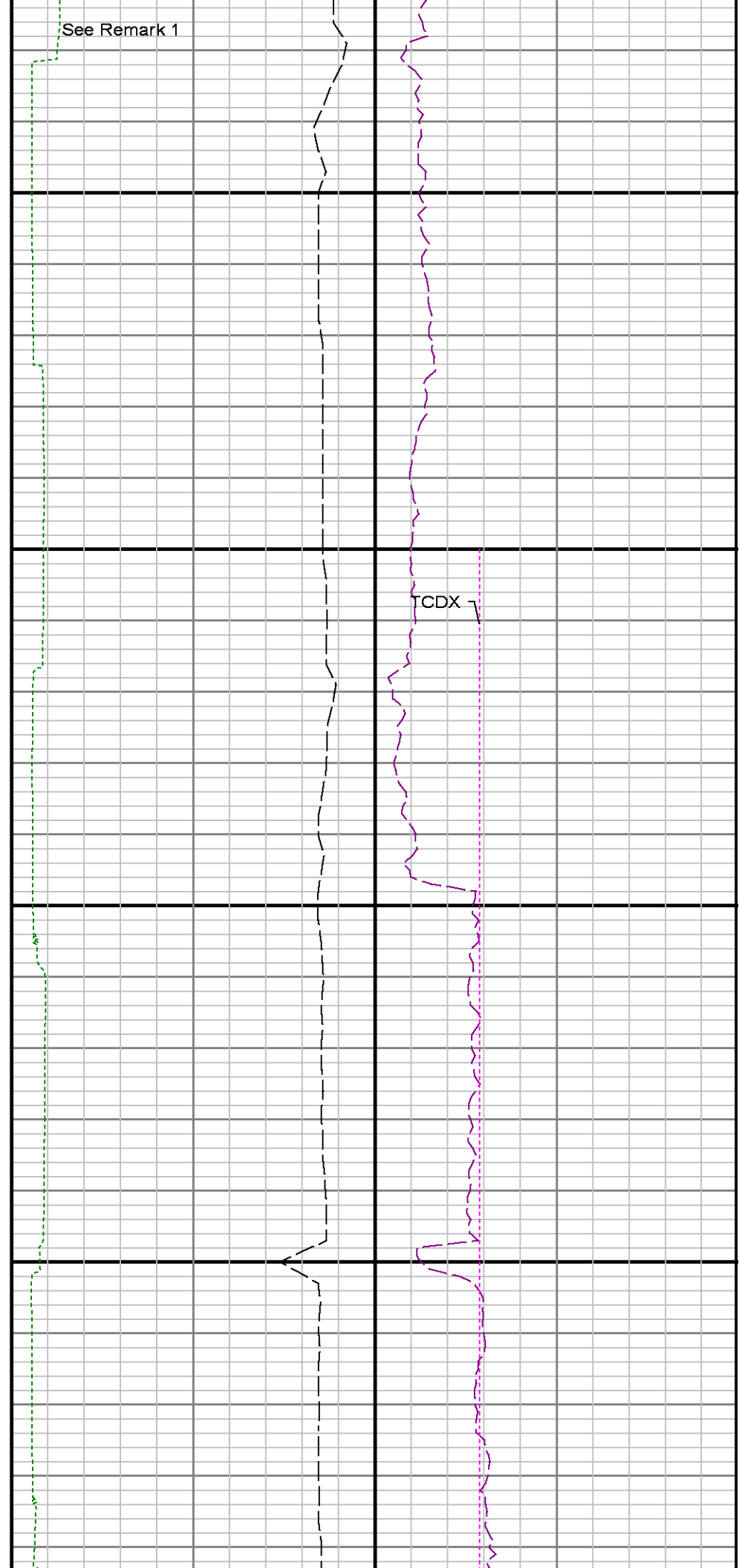
Created : 15/Mar/2014 6:03:13 AM

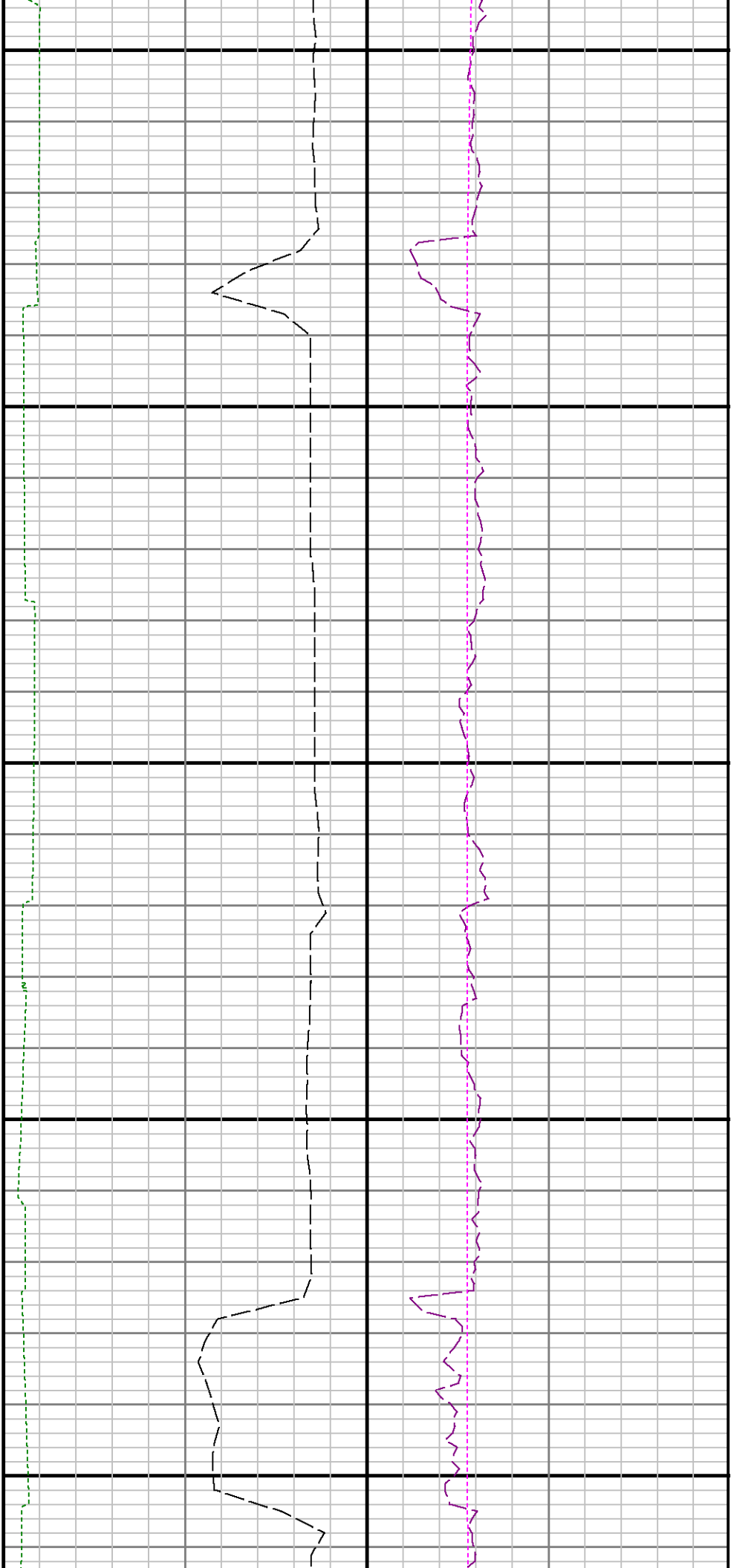




0089

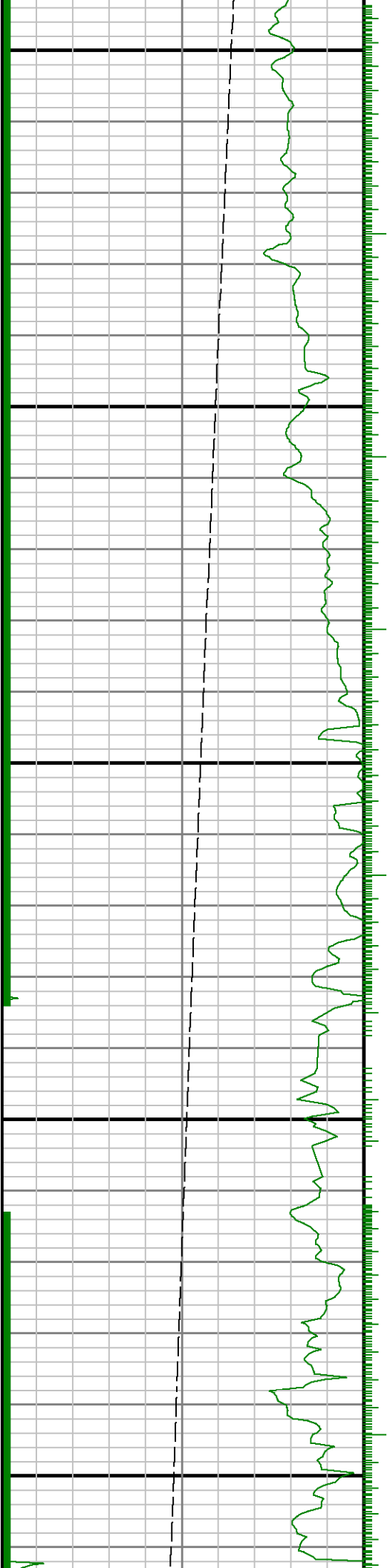
0069

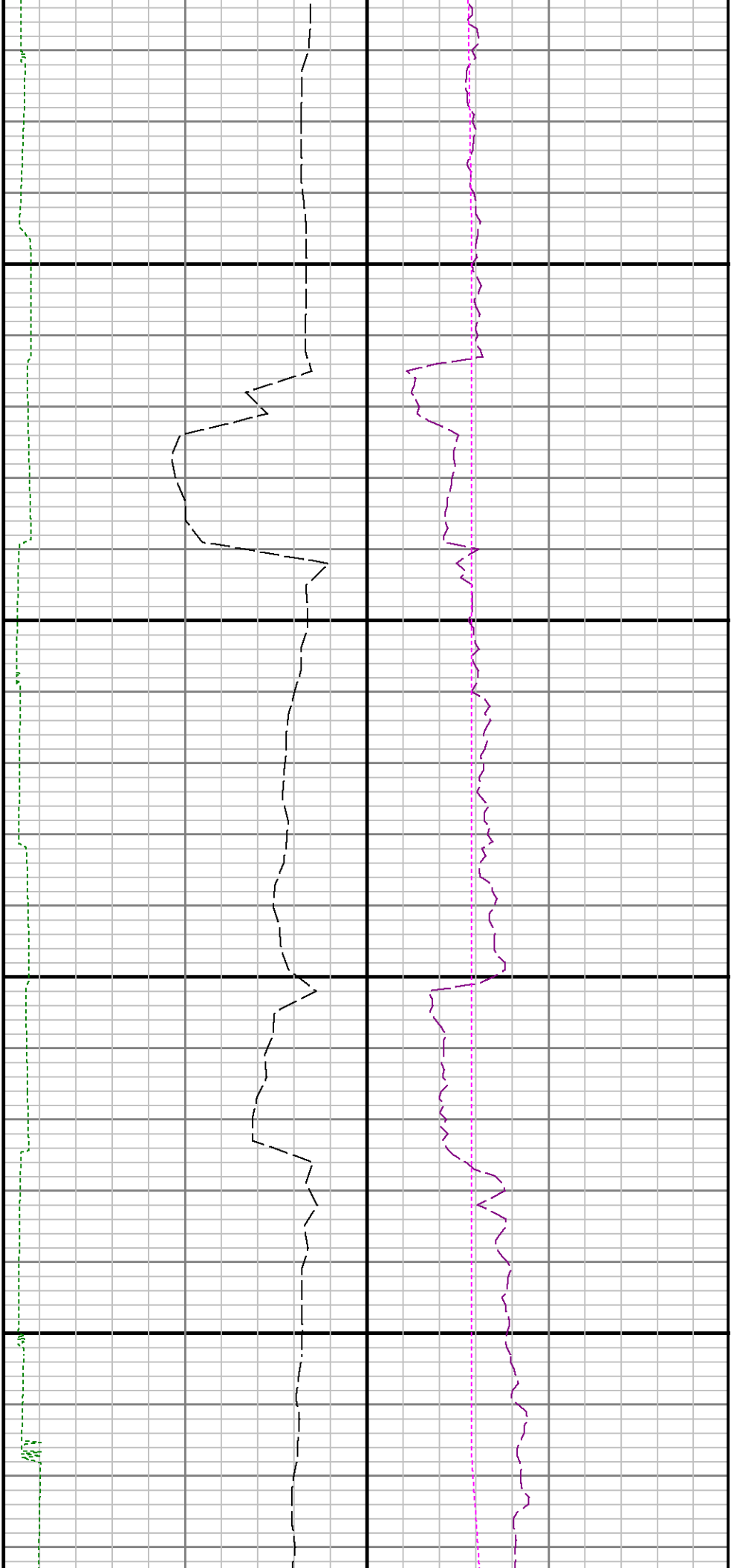




7000

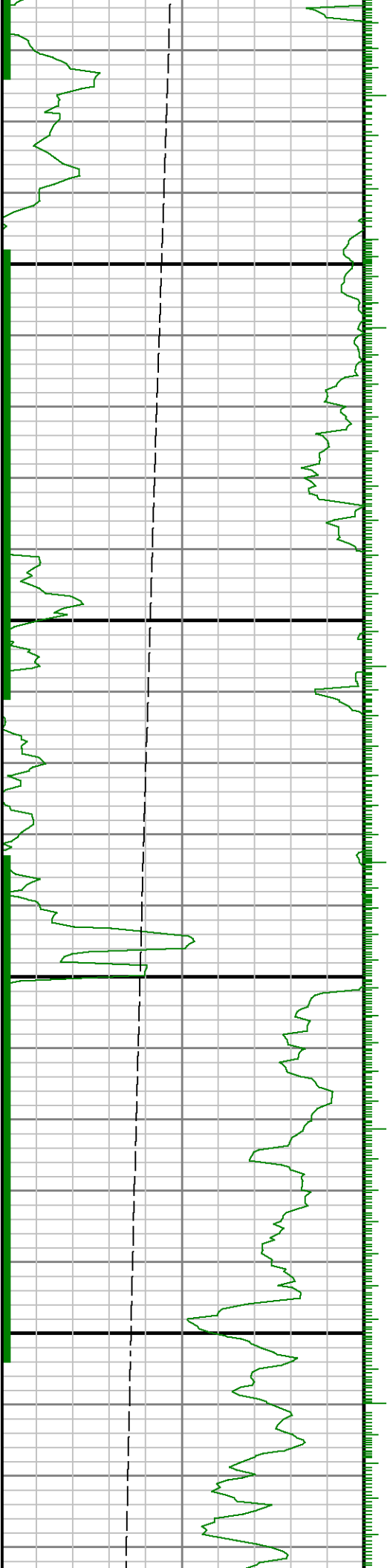
7100

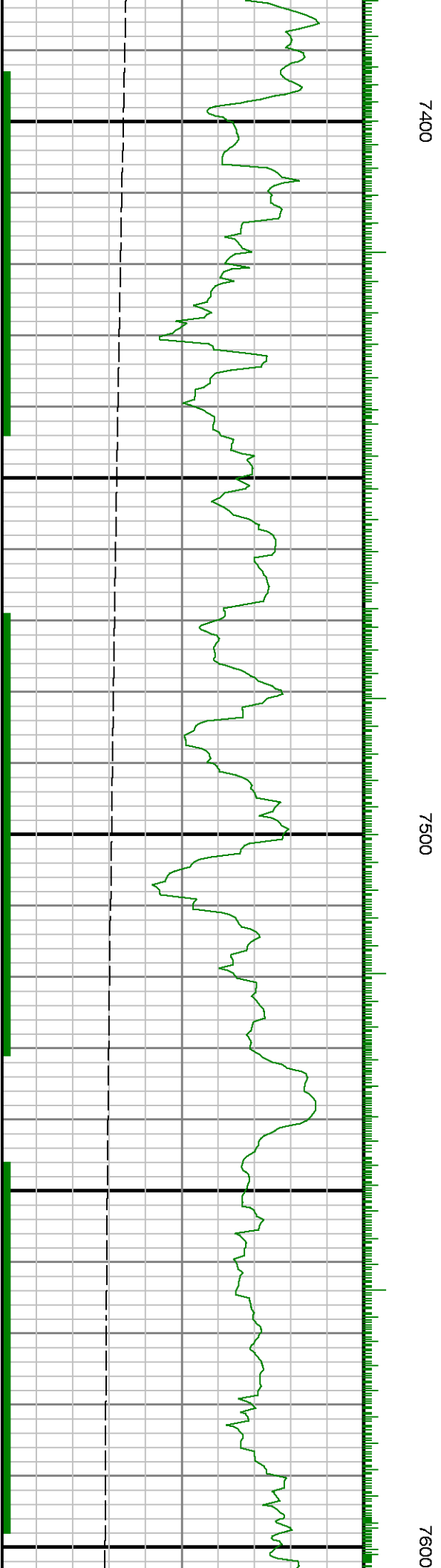
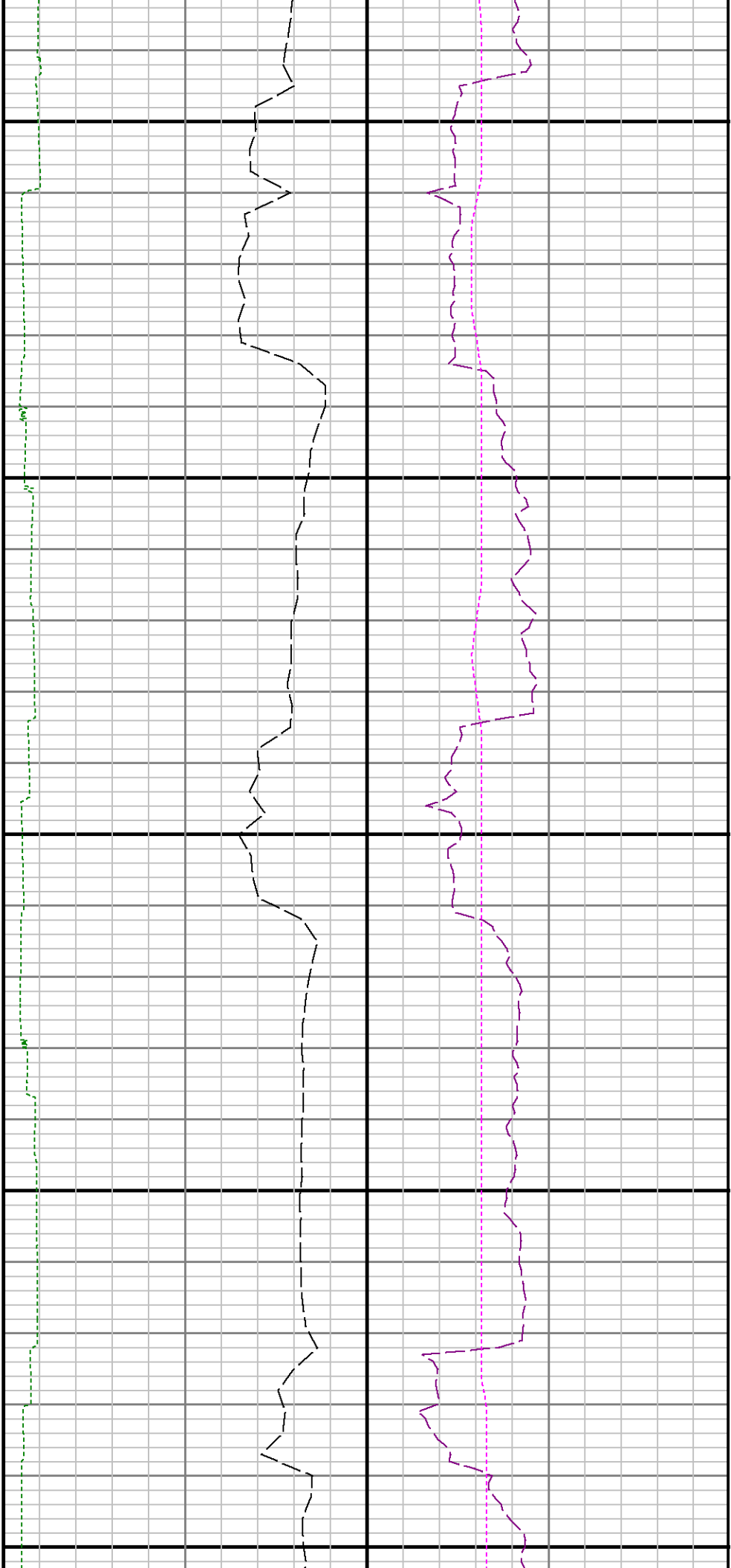




7200

7300





See Remark 2

GRTX

ROPA

WOBA

7" Casing

Run

GRIX

7700

780

GRSI

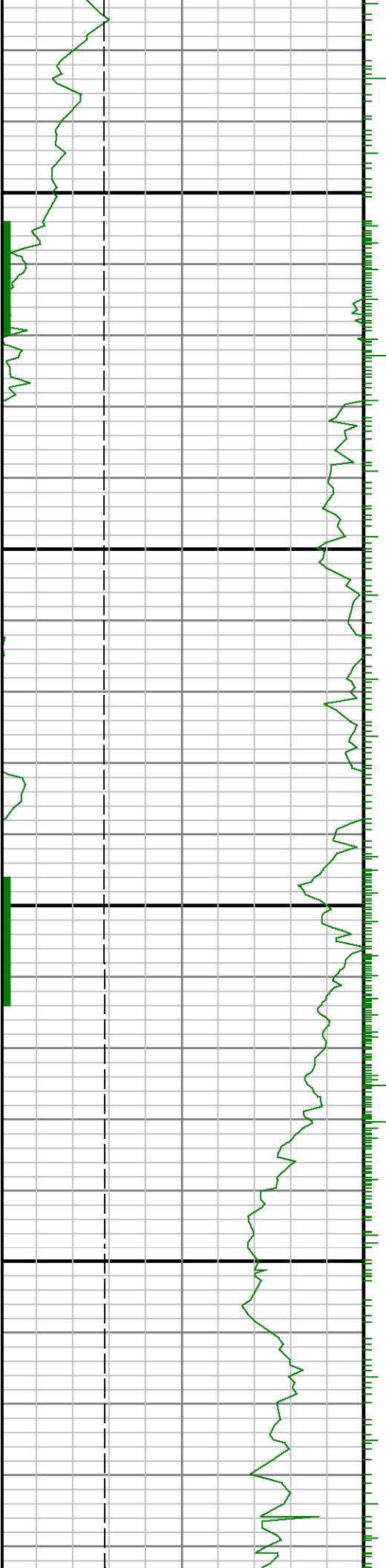
TV GRAX



A graph showing the Generalized Royden Test (GRT) curve. The curve starts at the origin, rises linearly, and then levels off to a horizontal line. The label "GRT" is placed to the right of the curve.

Graph of Work (W) vs. Displacement (s) for a block on a rough horizontal surface. The graph shows a constant force applied from $s=0$ to $s=s_0$, where the work is W_0 . After $s=s_0$, the work remains constant at W_0 .

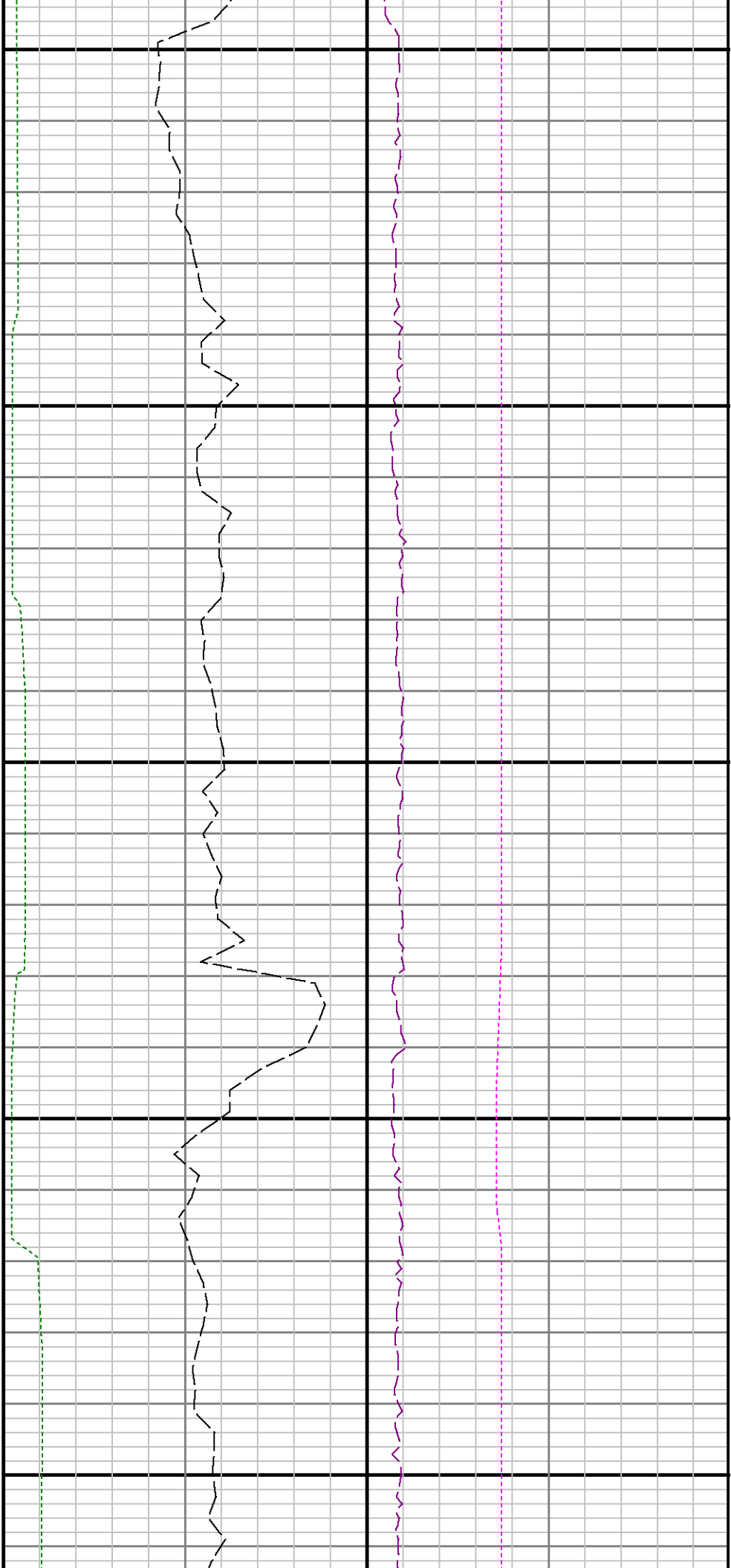
BA TCD



7900

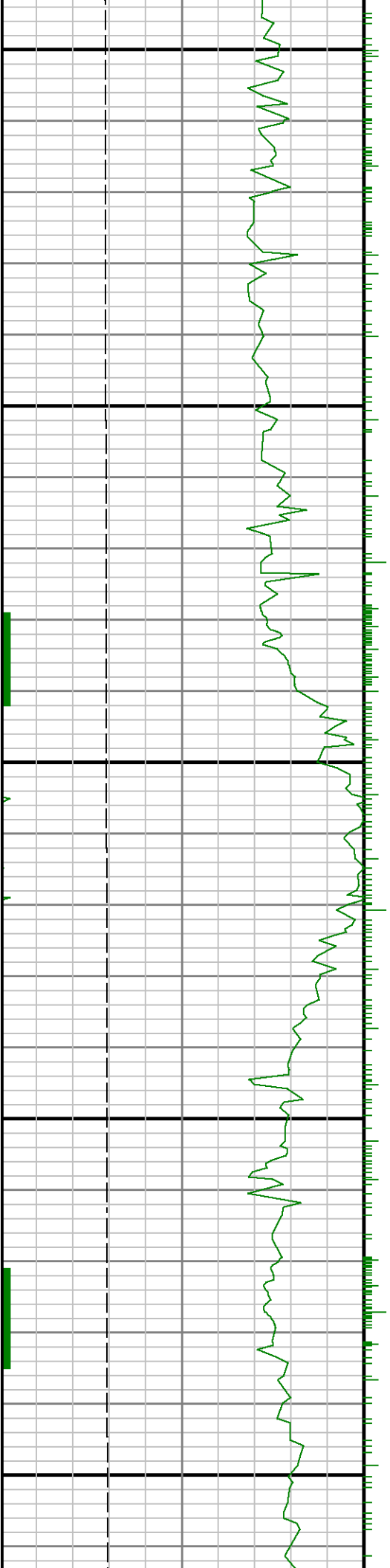
8000

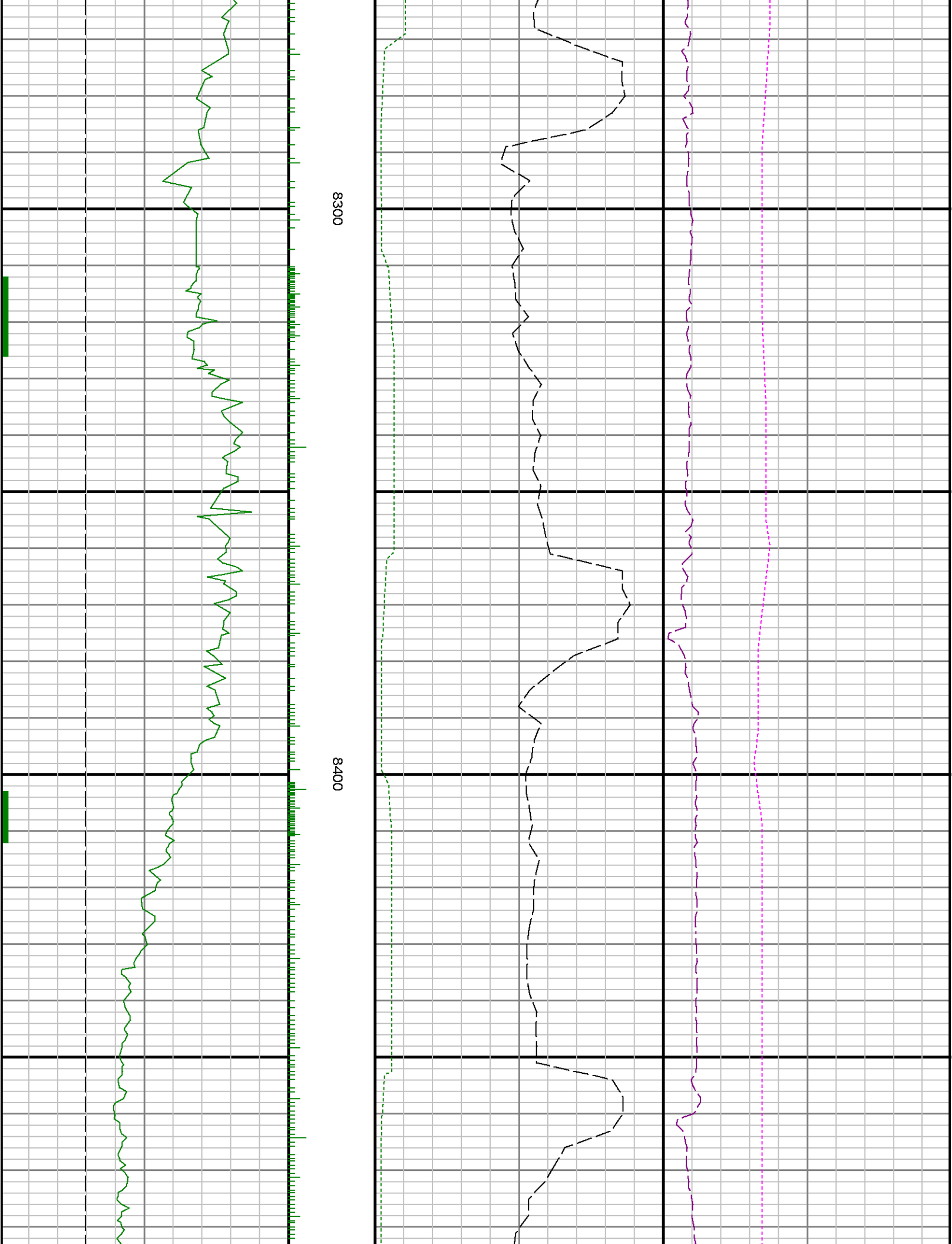




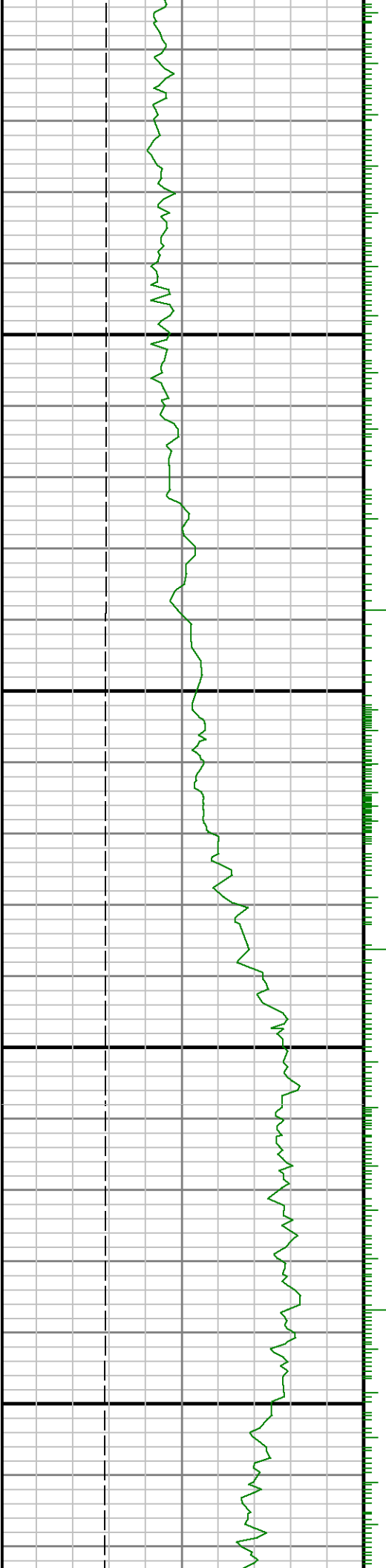
8100

8200





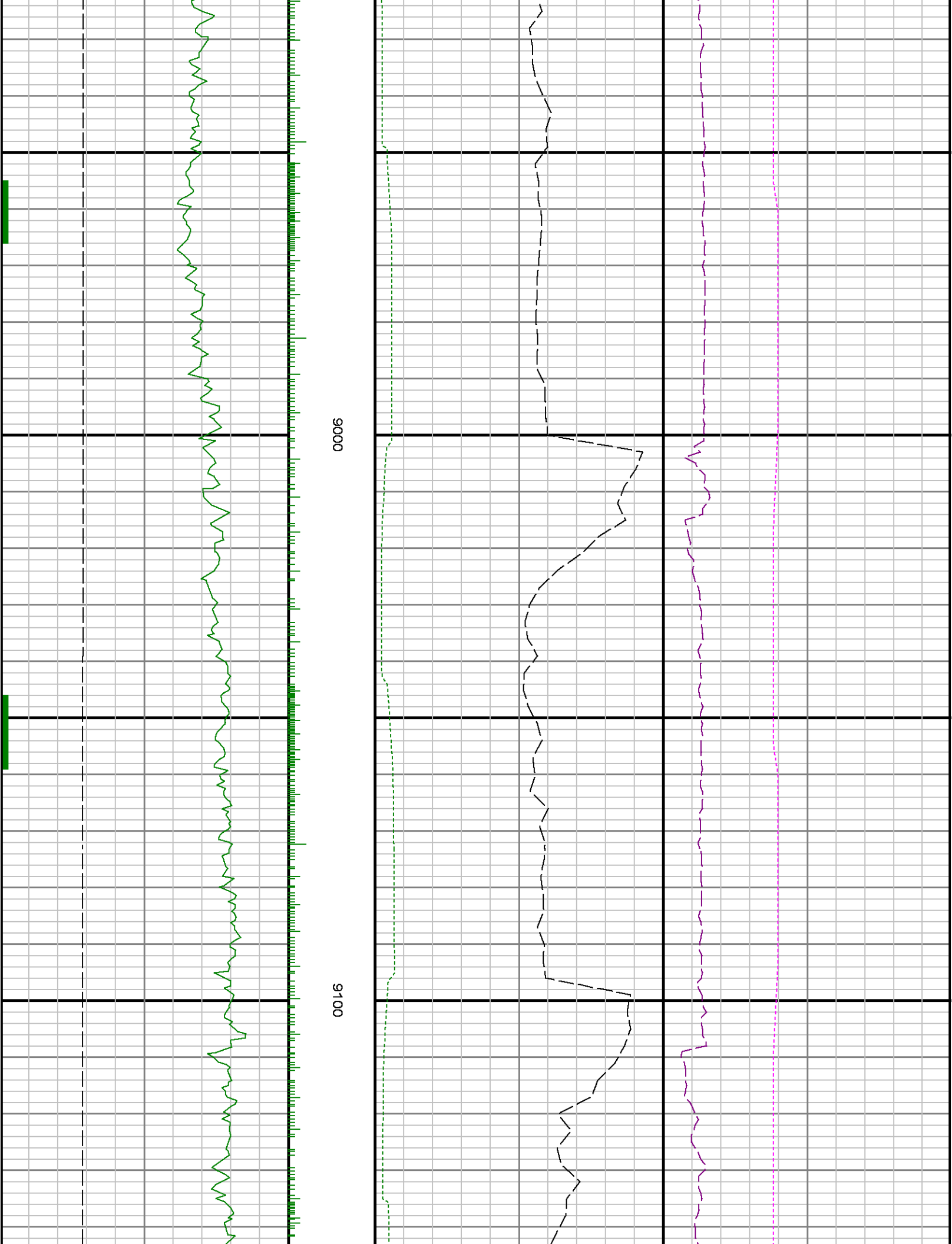


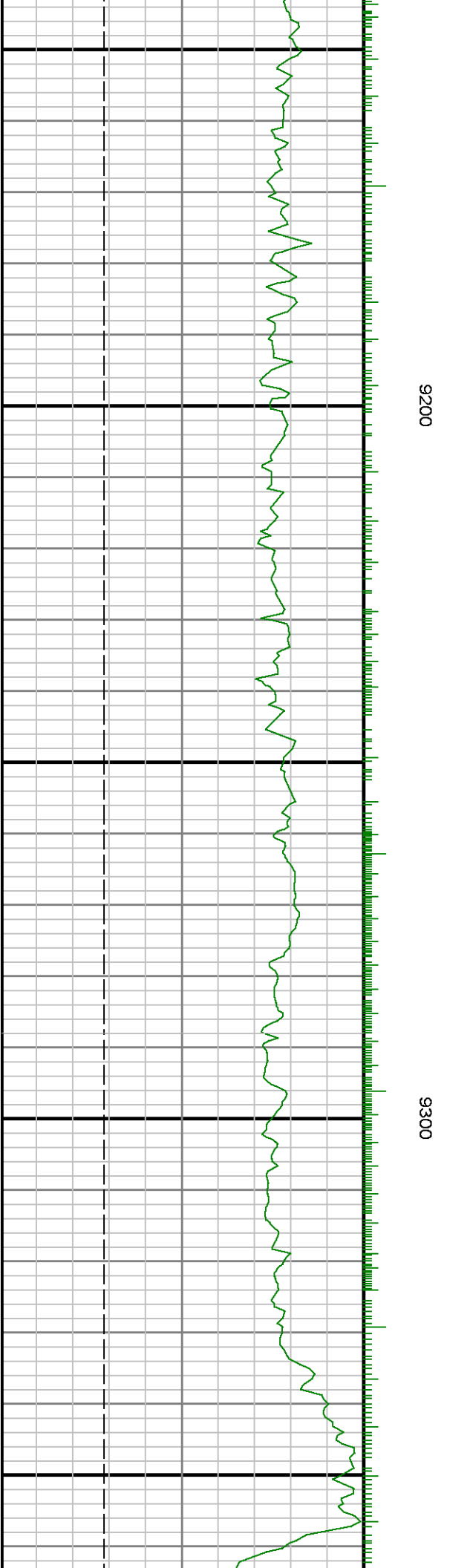
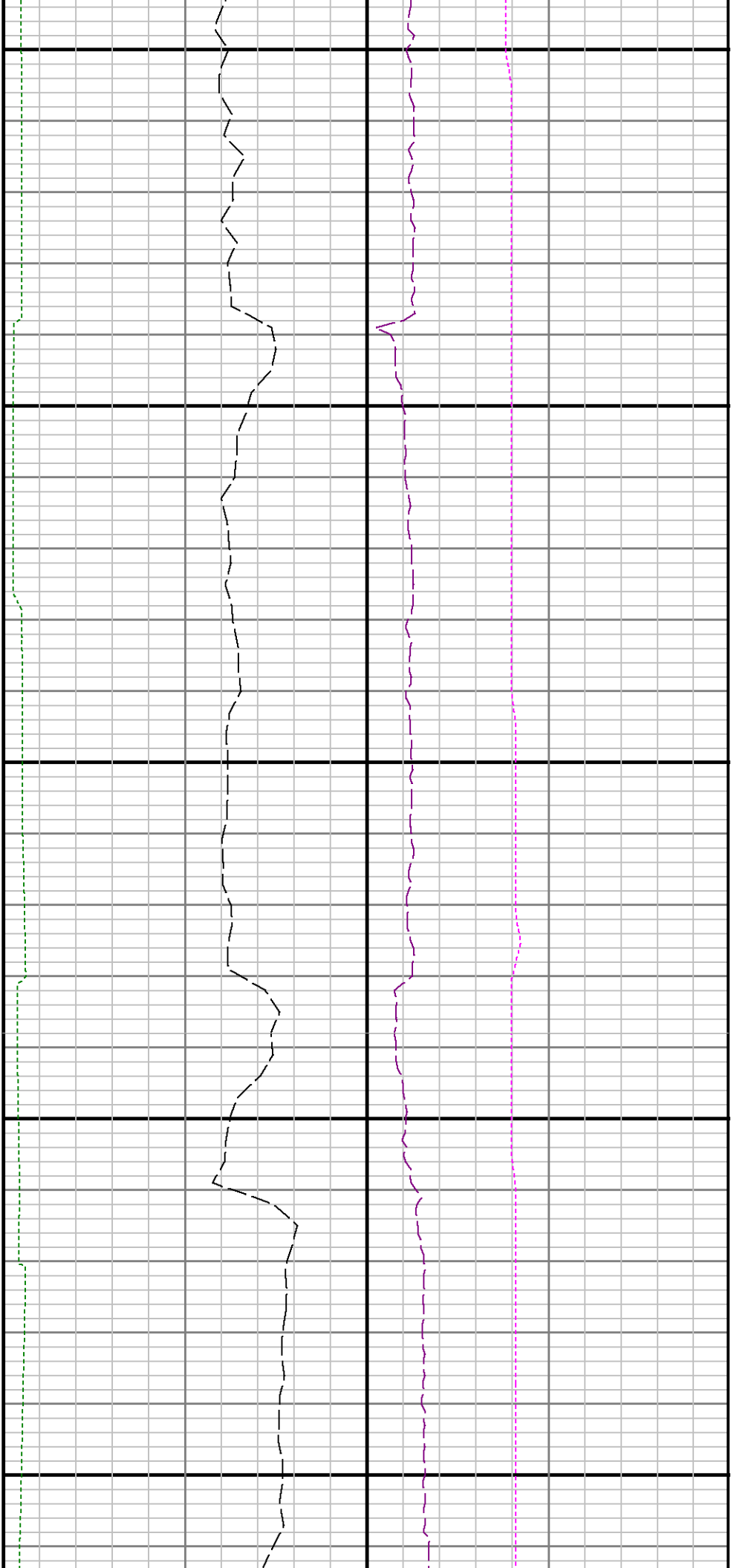


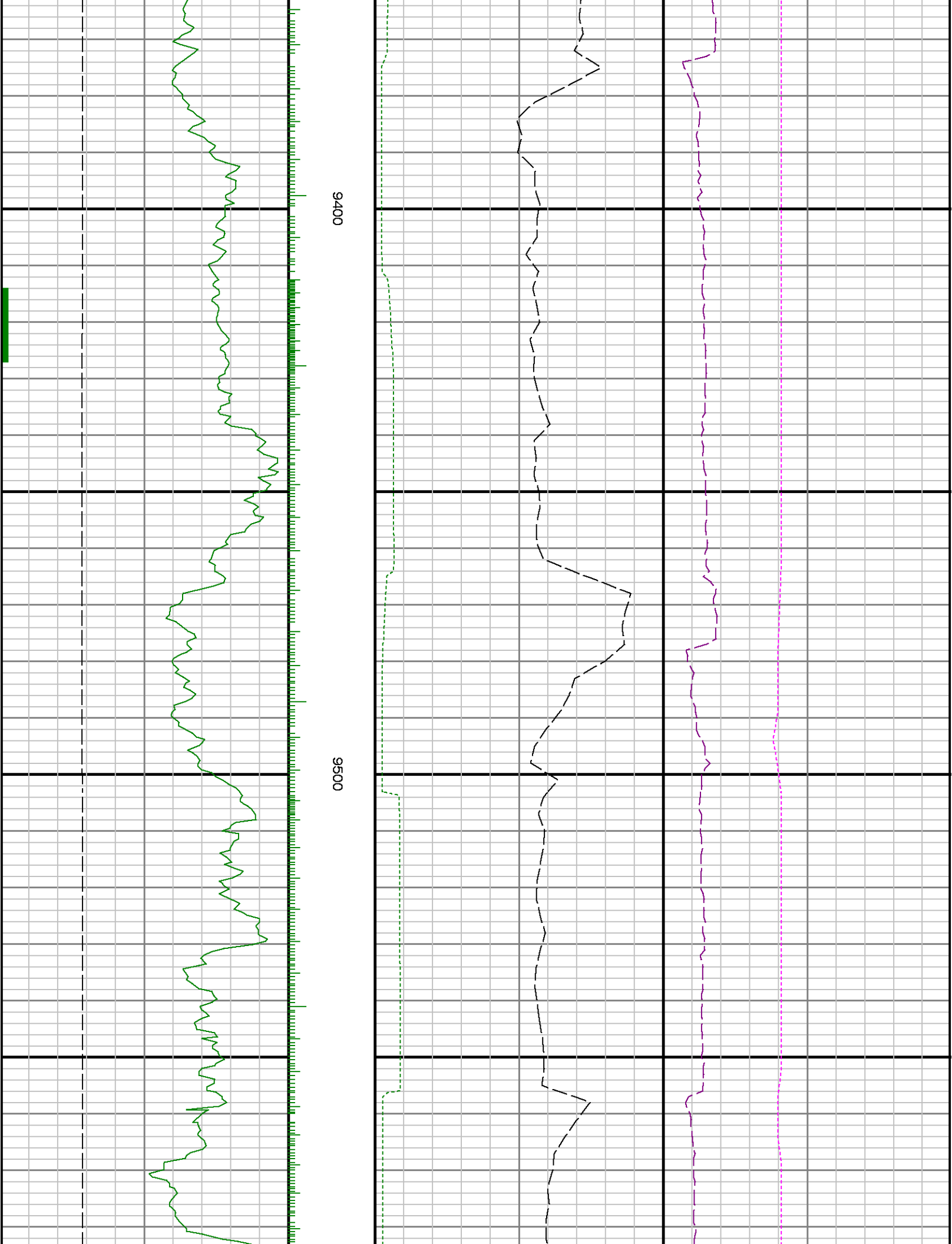
8900

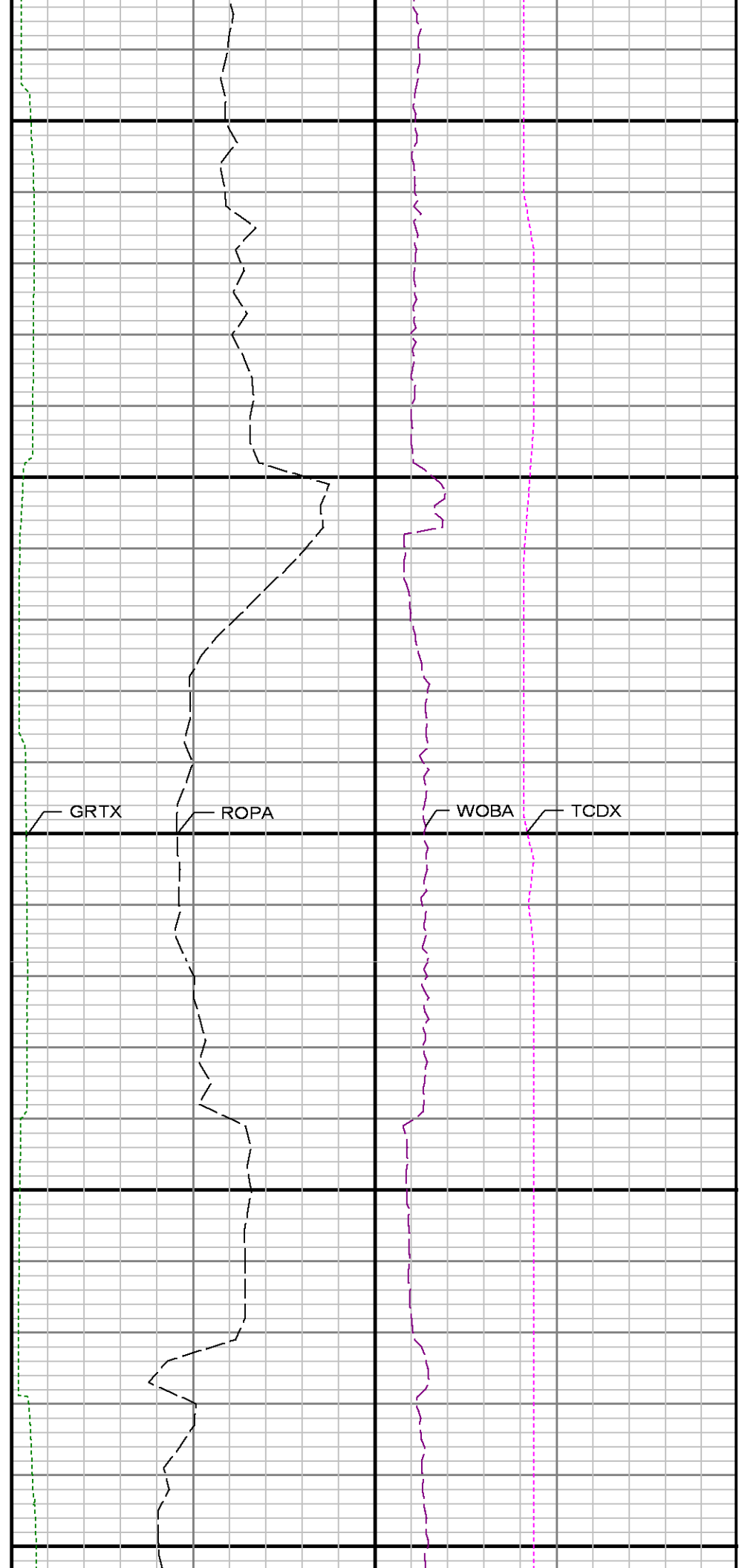
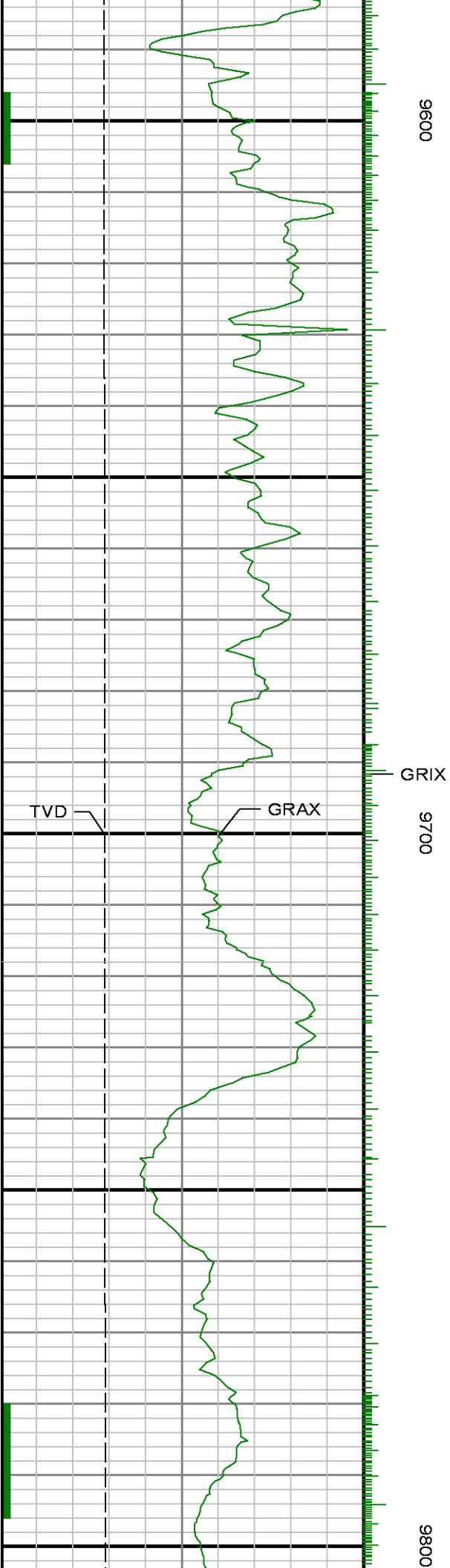
0088

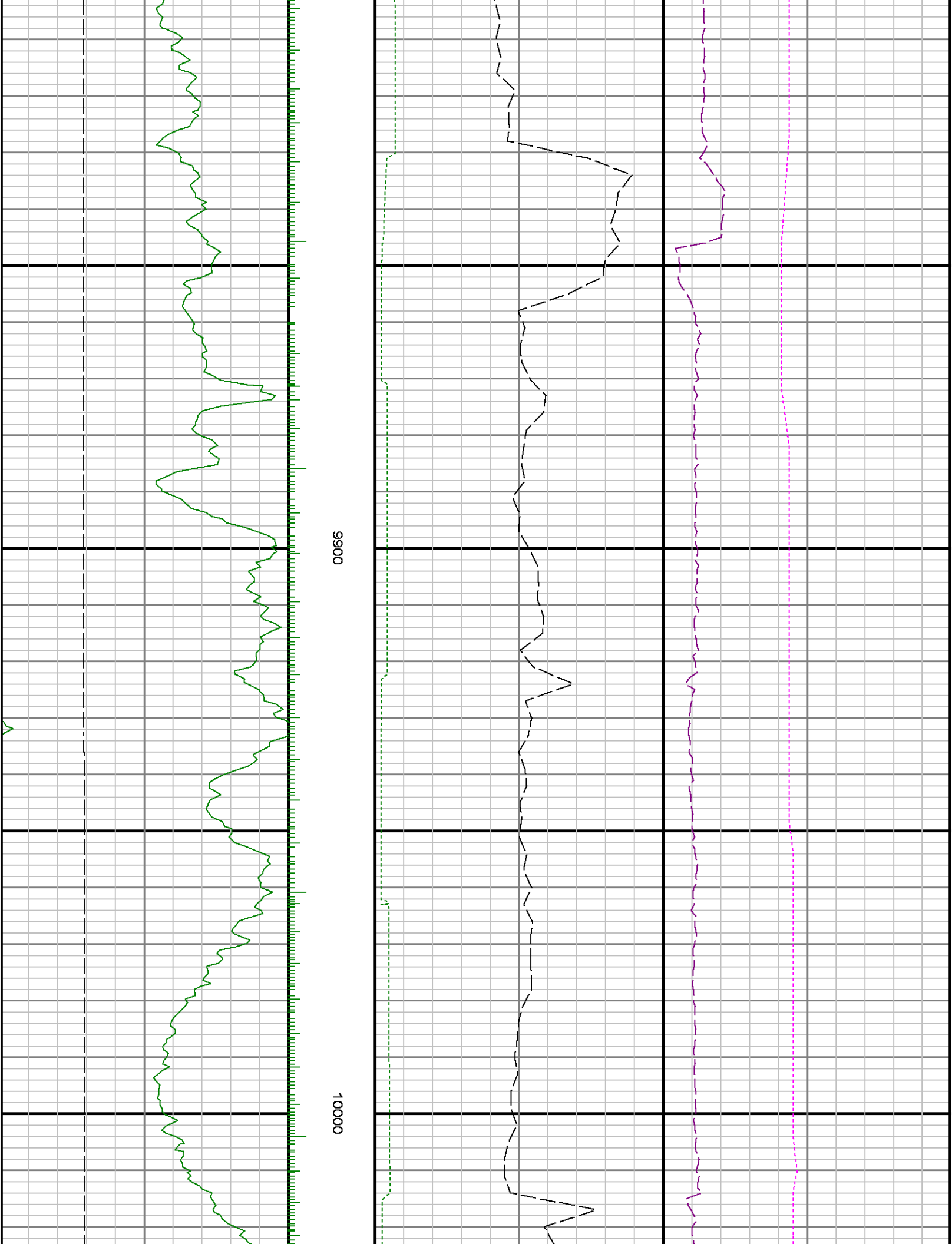


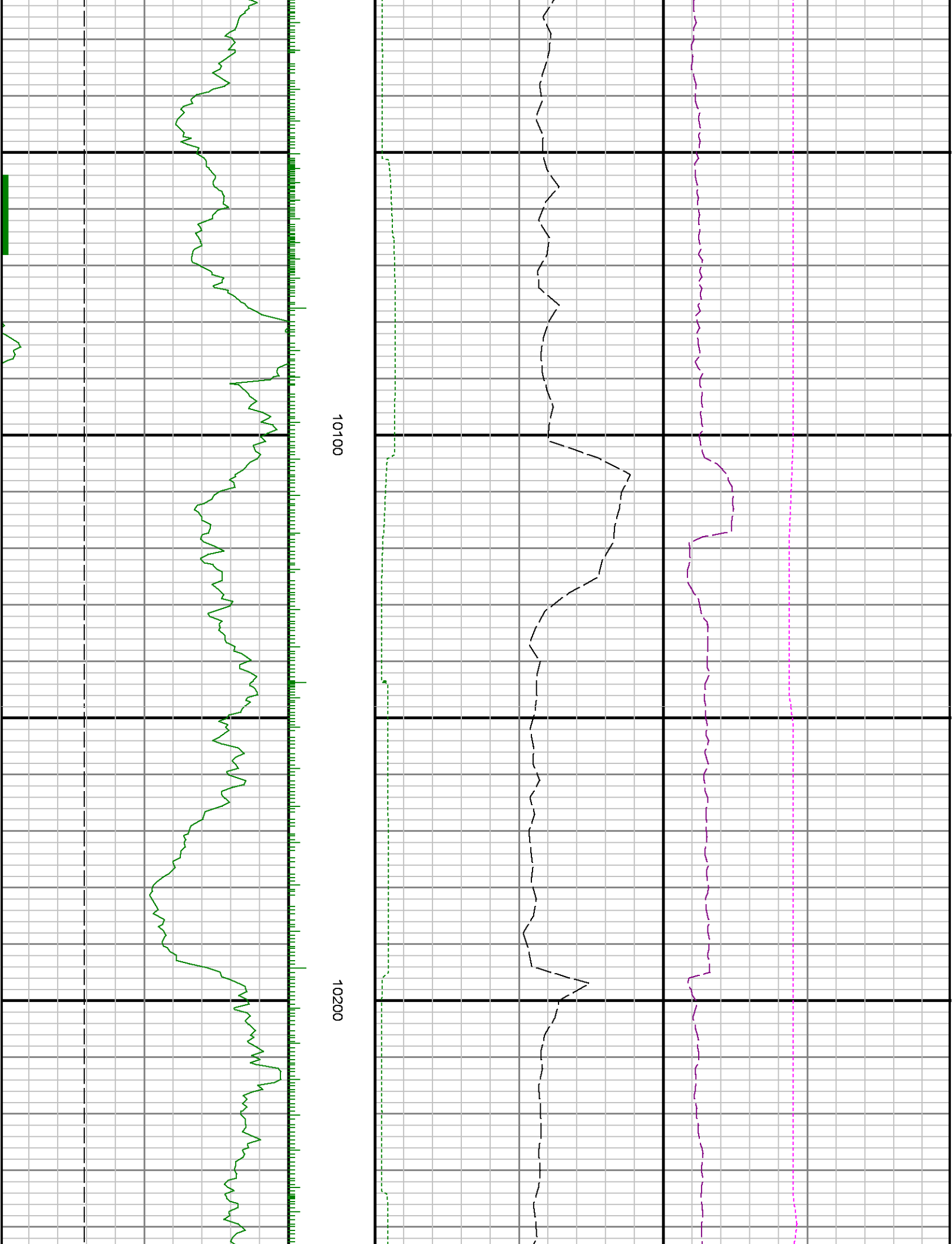


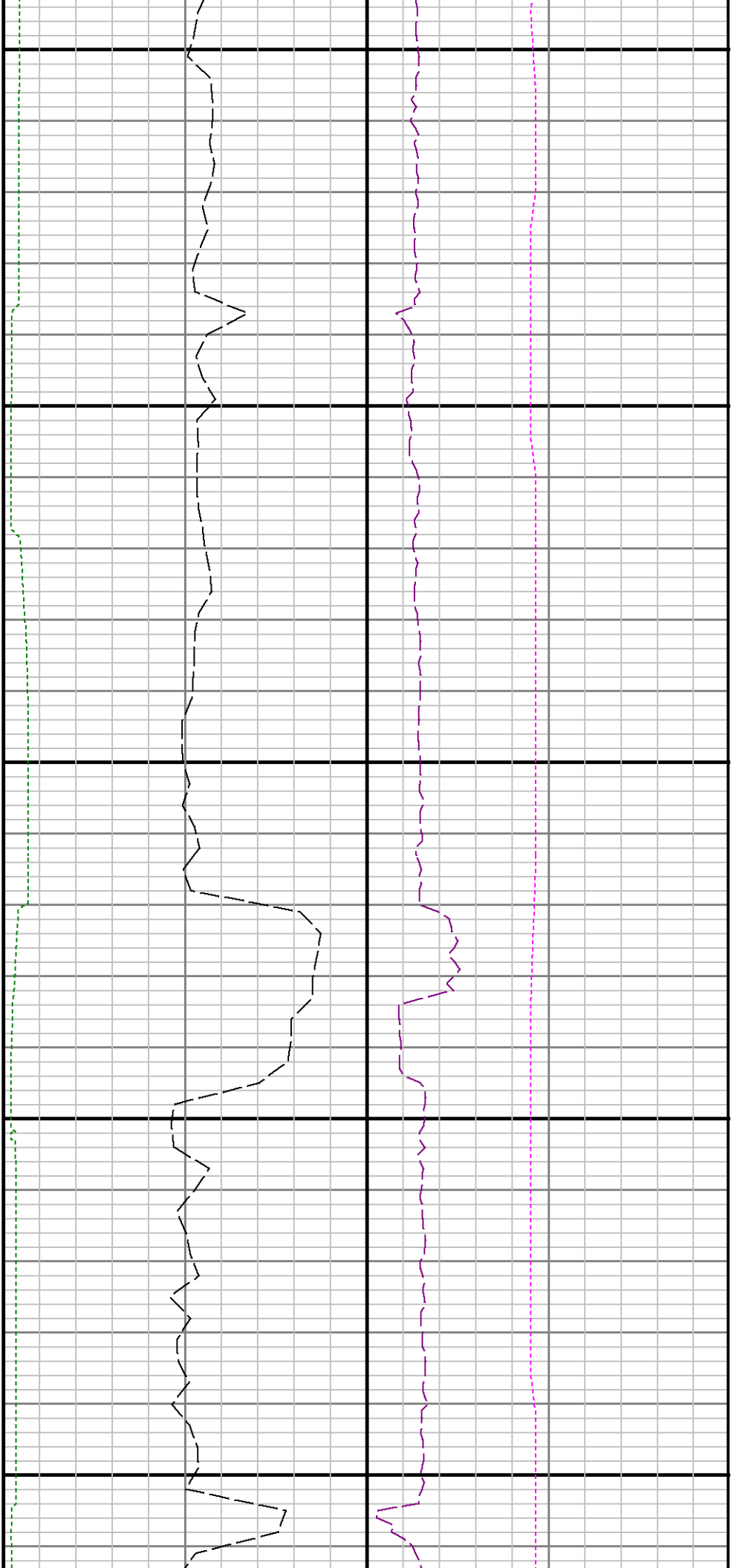






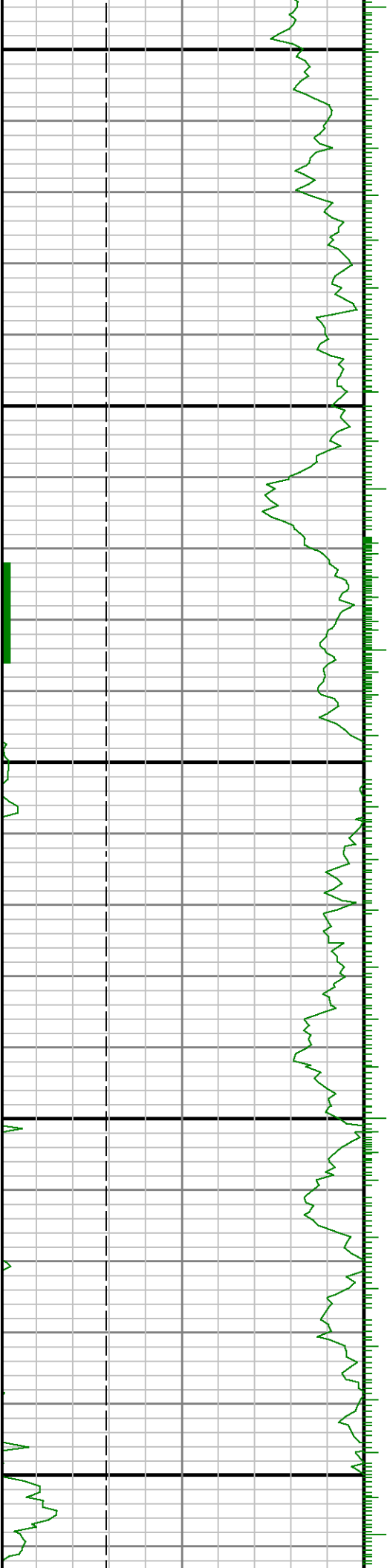






10300

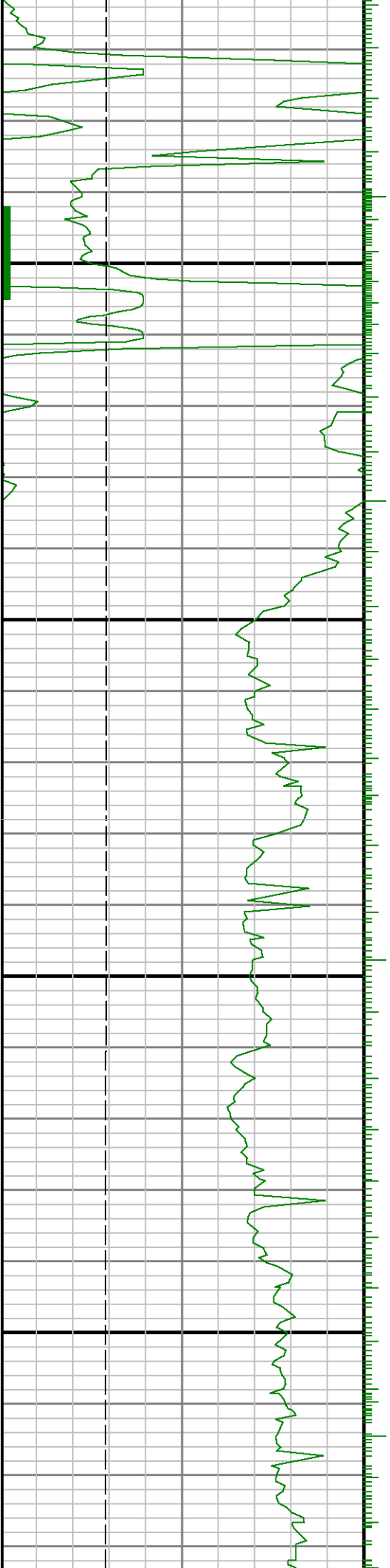
10400

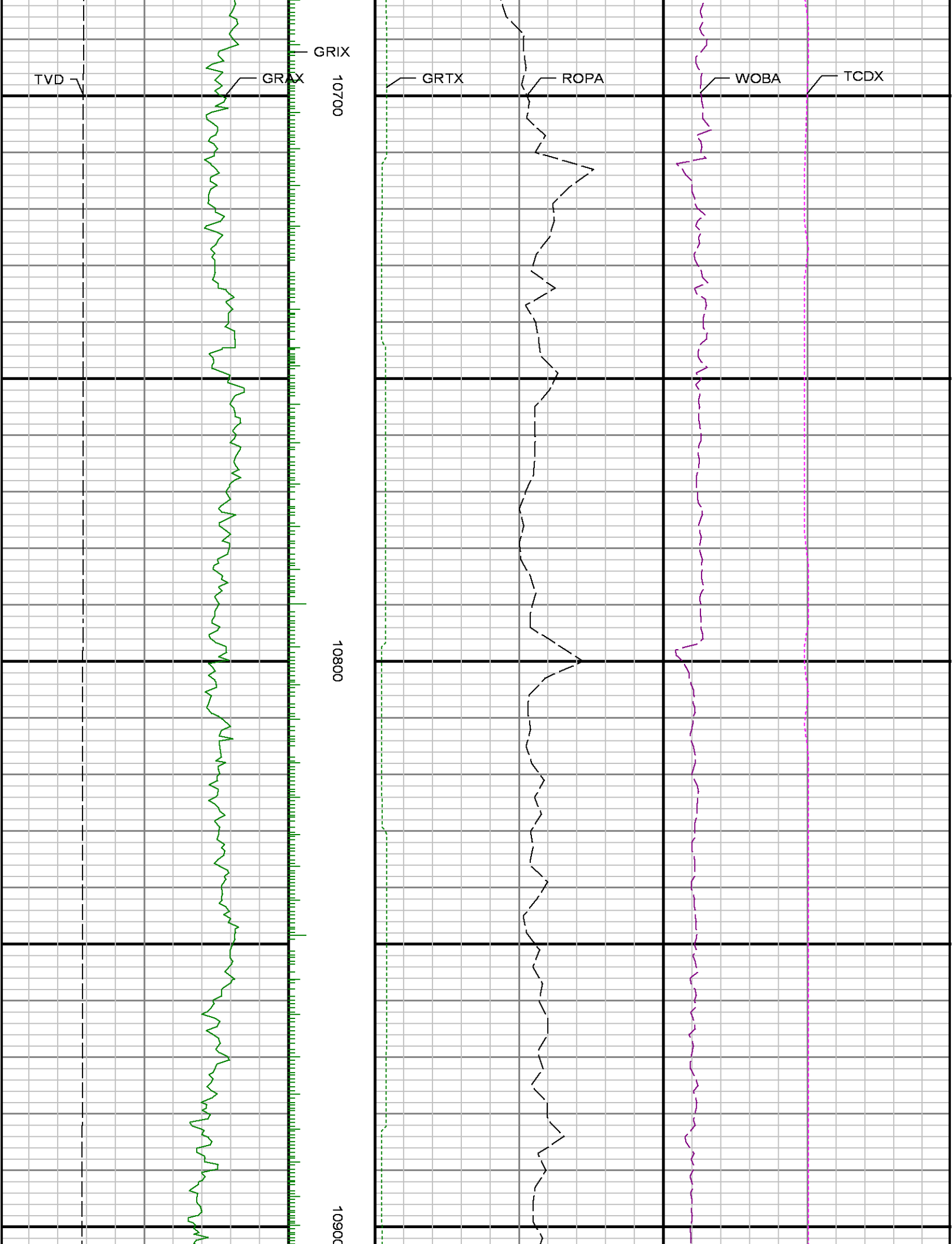




10500

10600

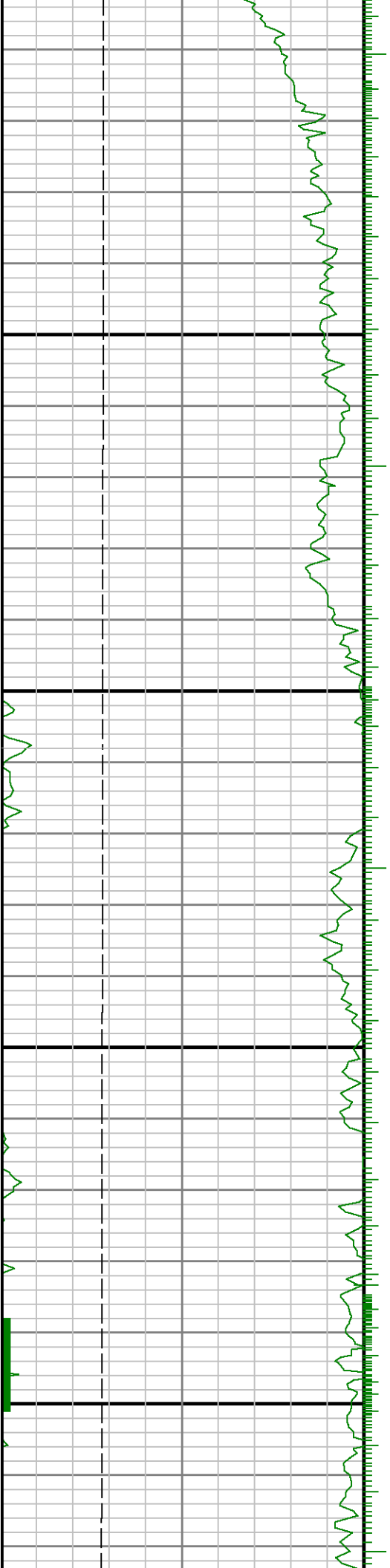






11000

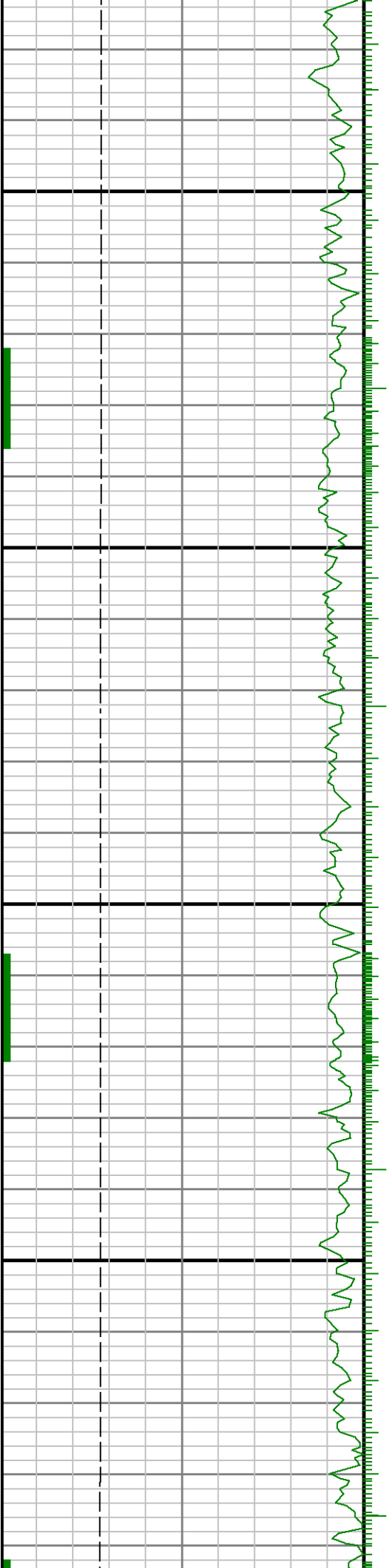
11100

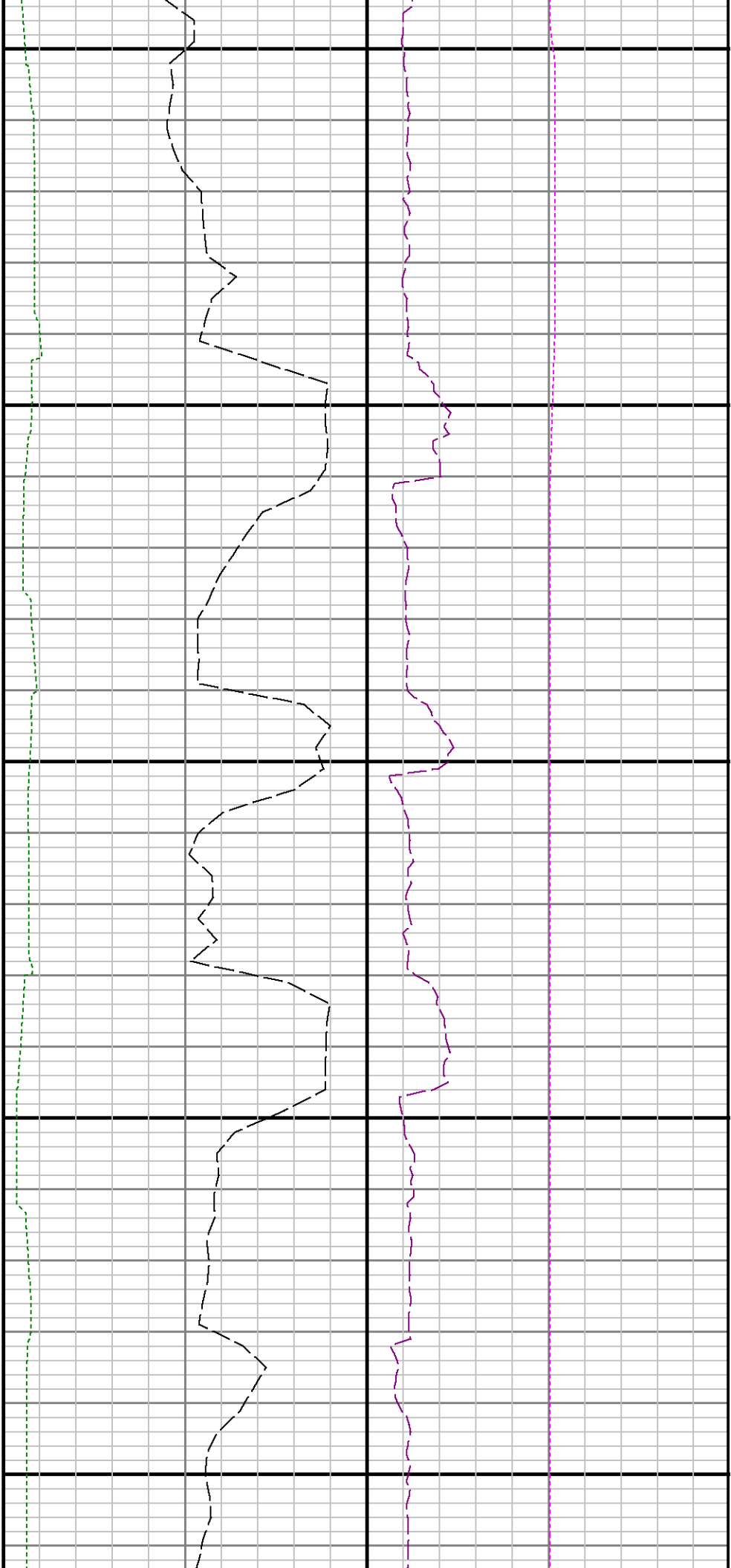




11200

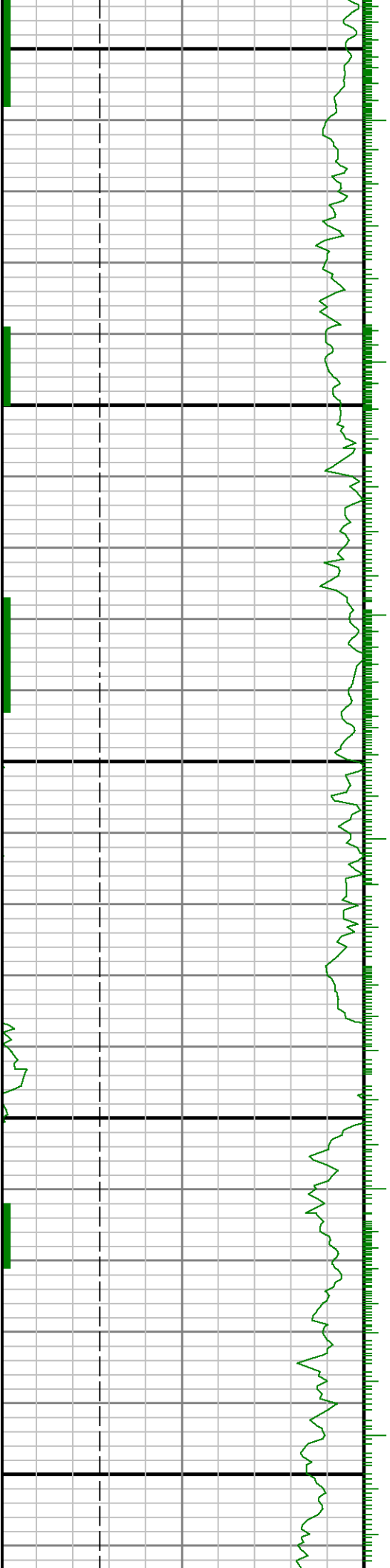
11300

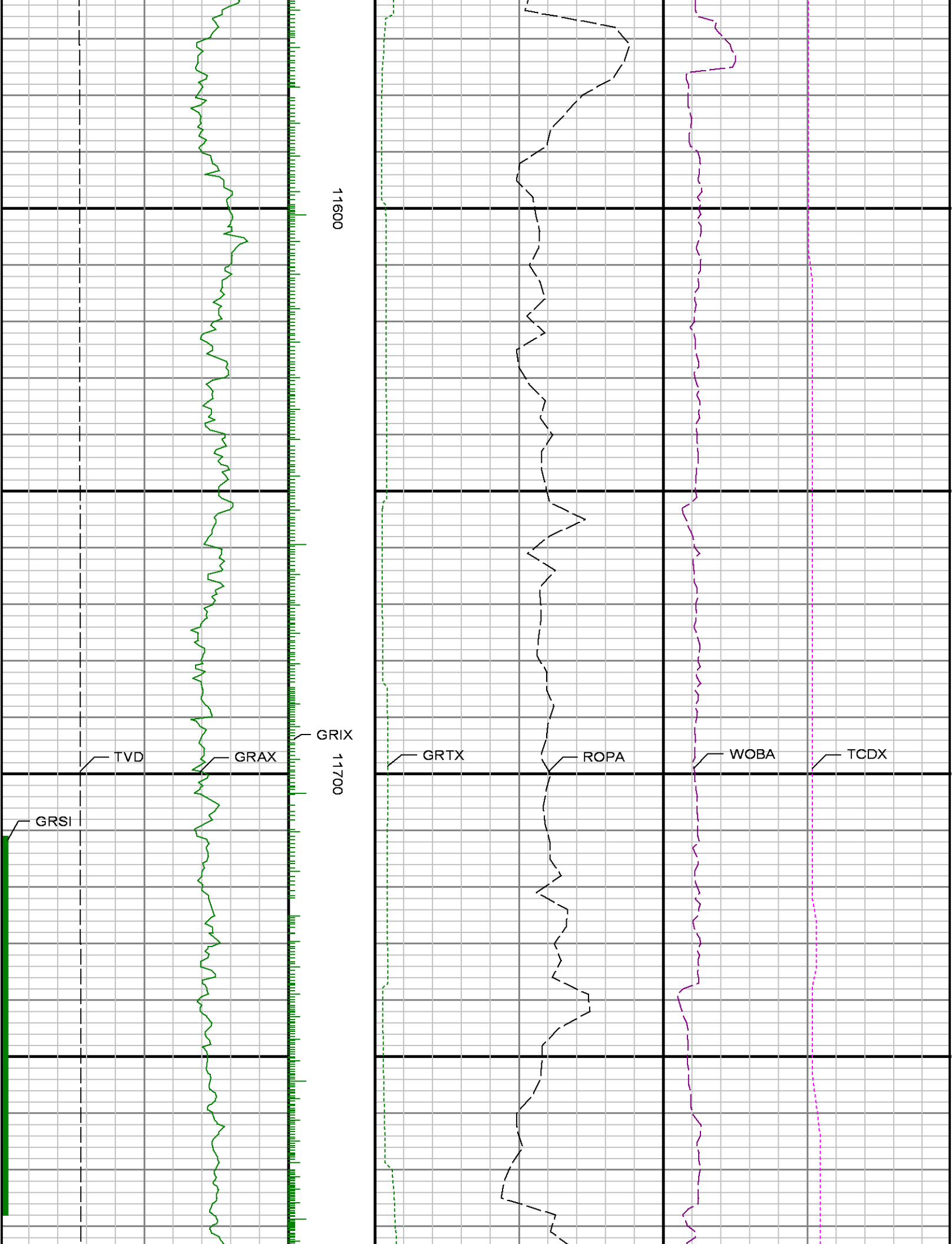


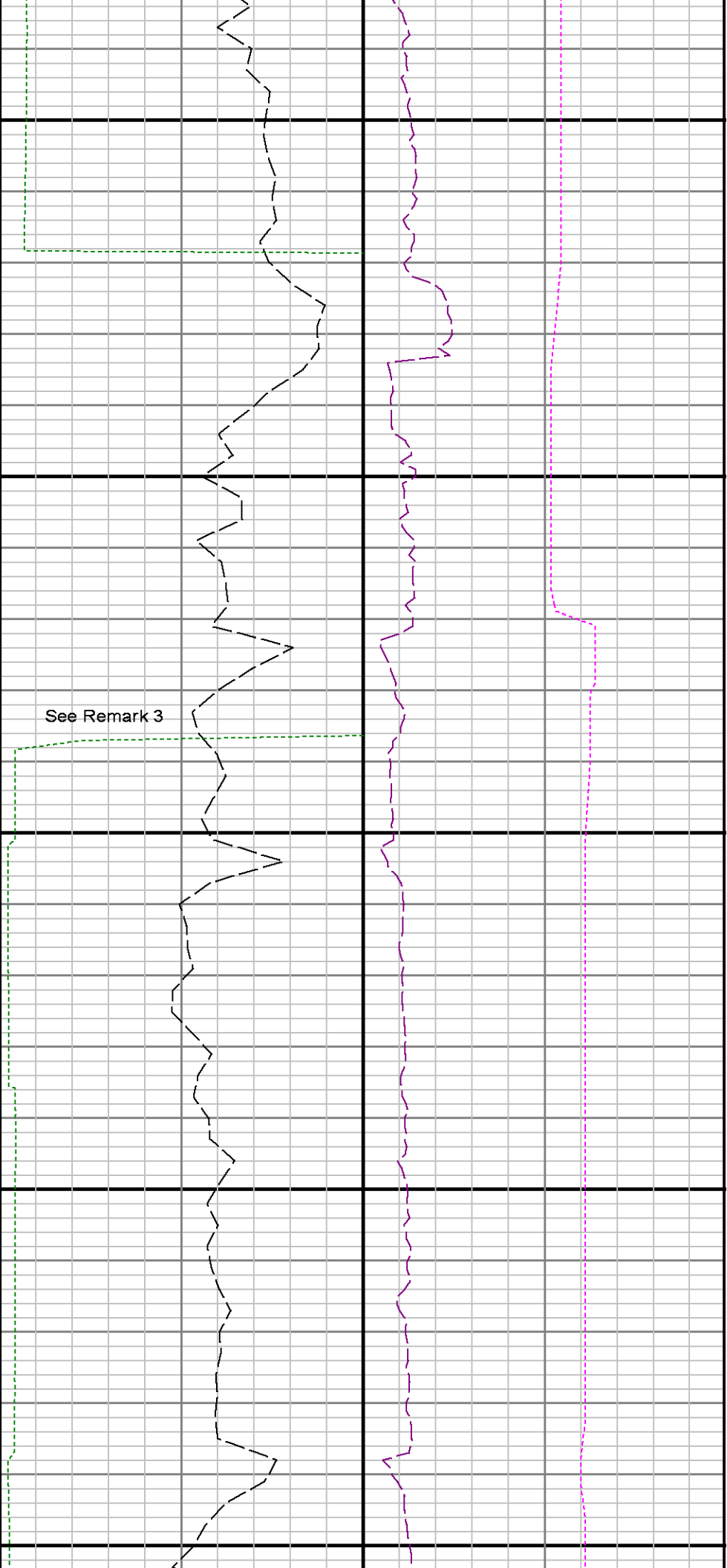


11400

11500







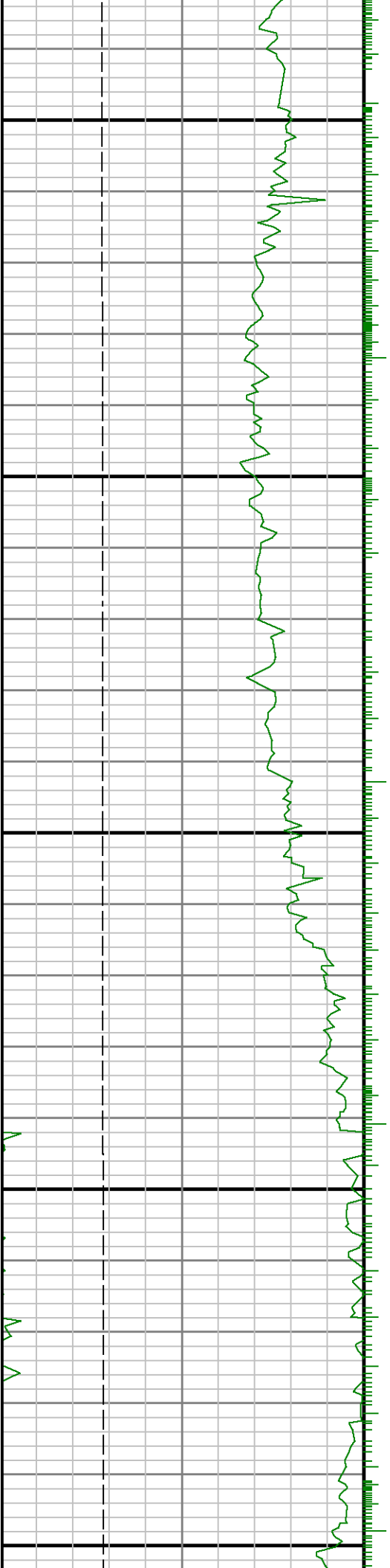
See Remark 3

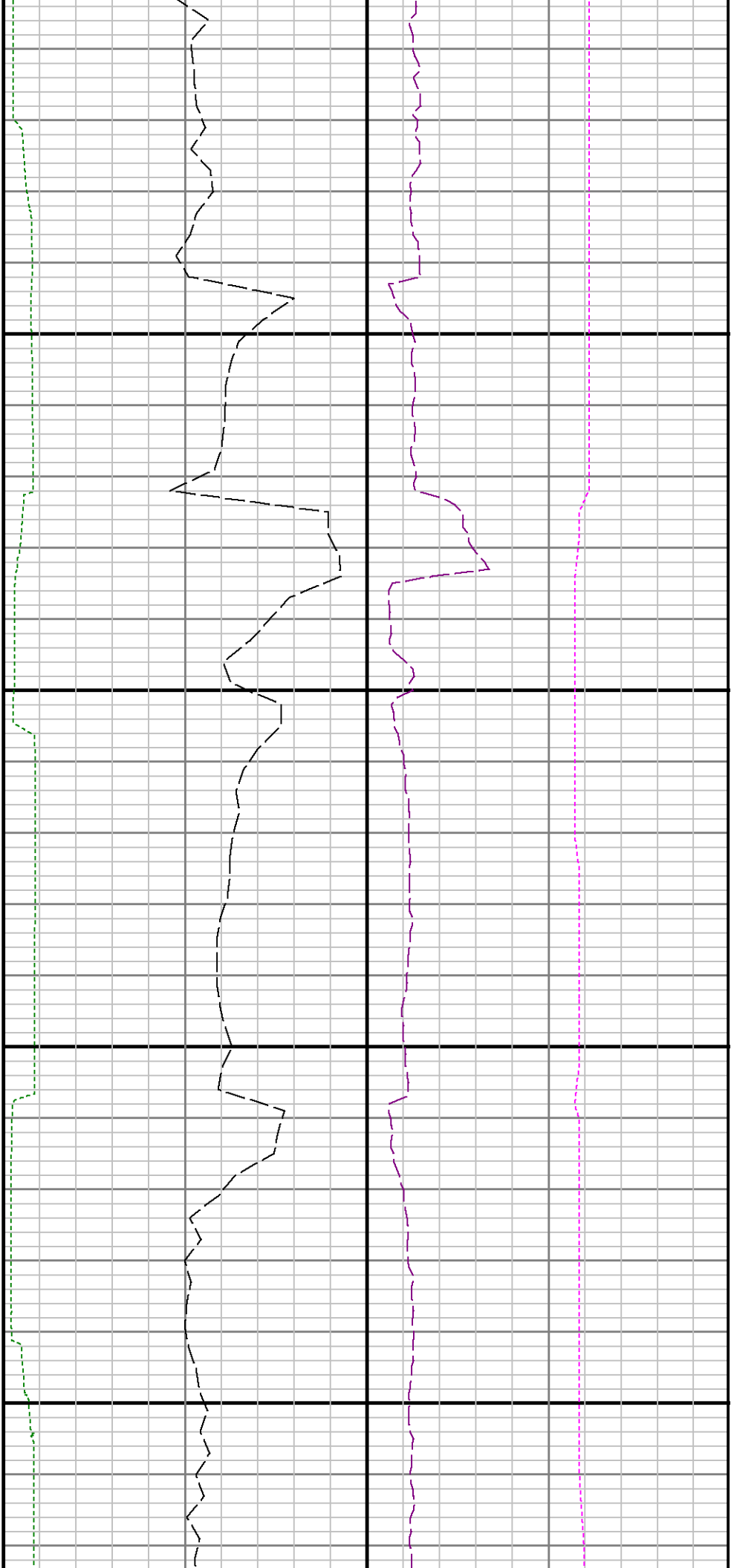
11800

Run 2 \diamond Run 3

11900

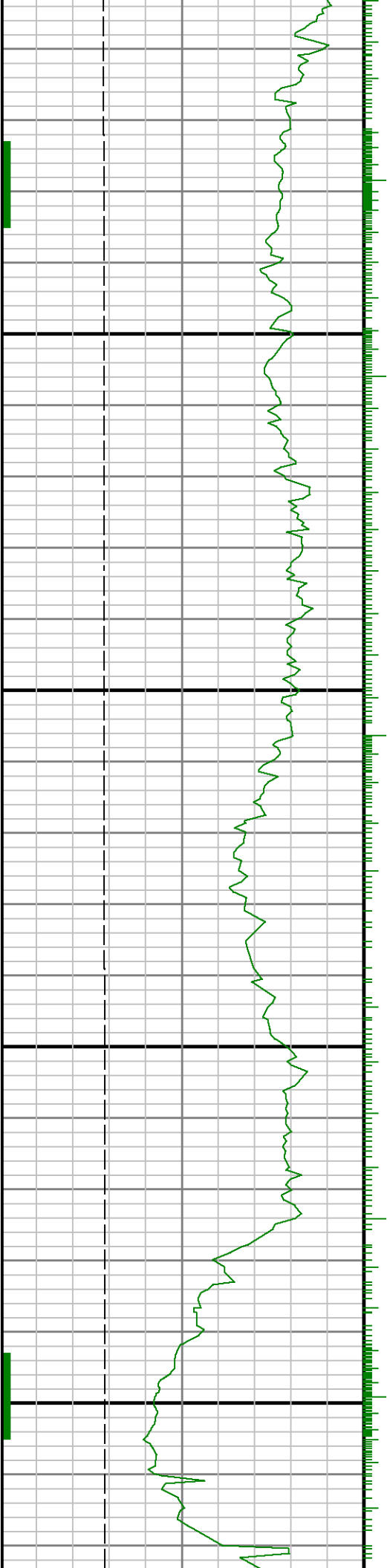
12000

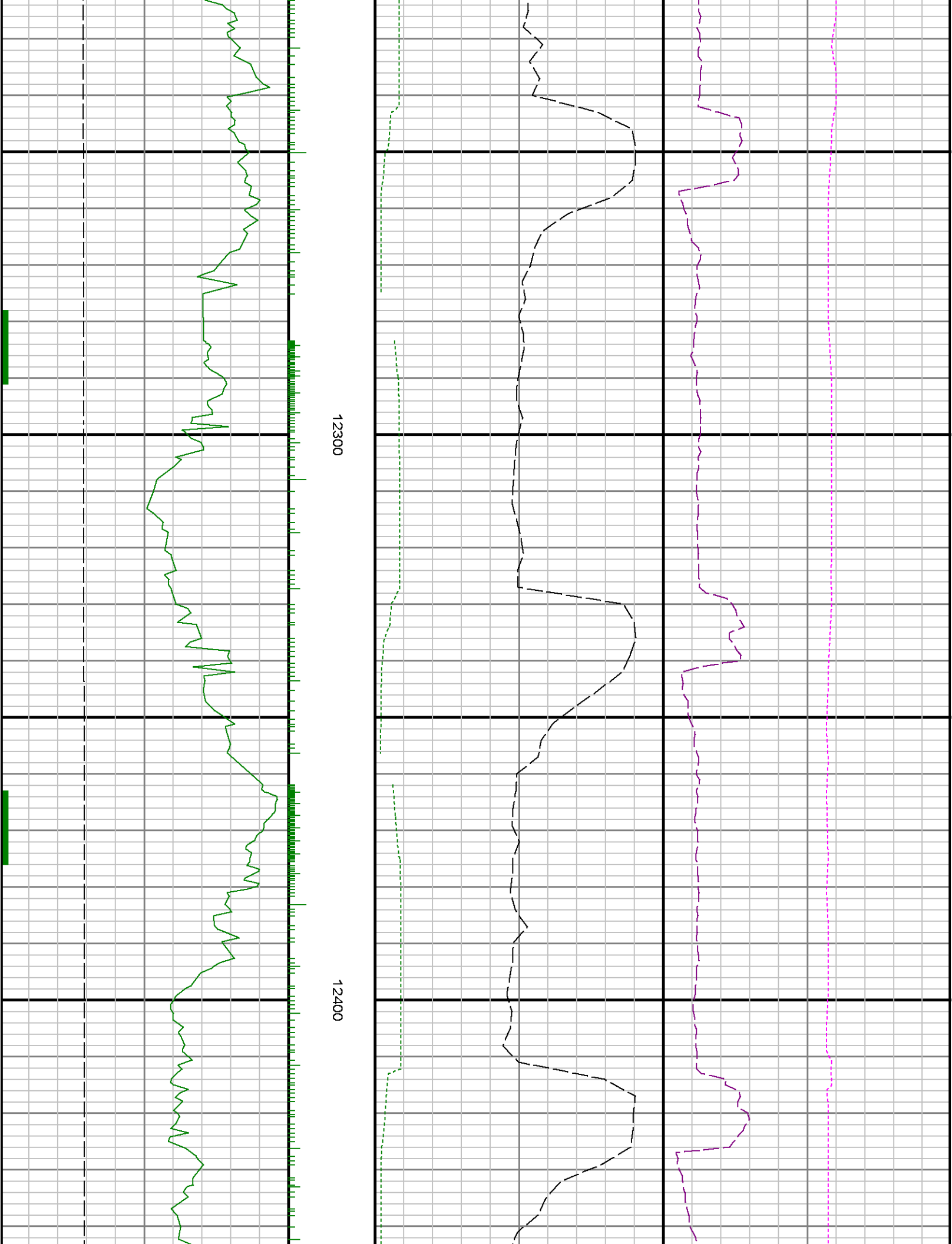


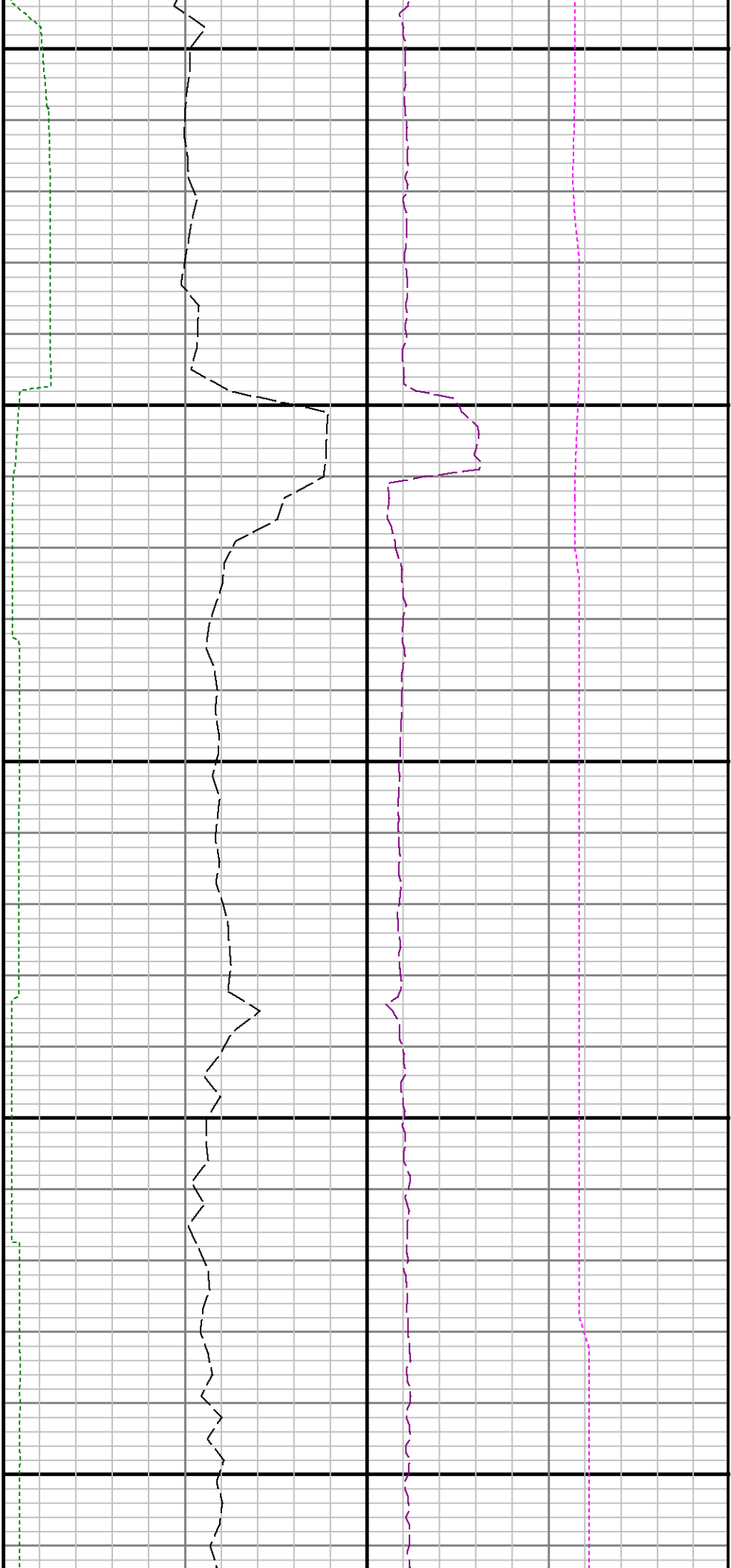


12100

12200

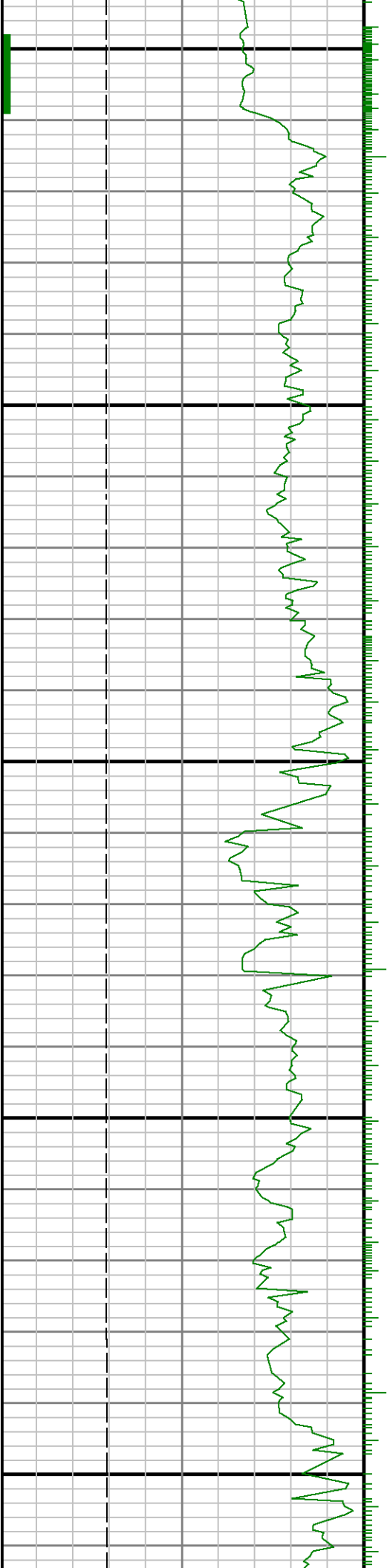


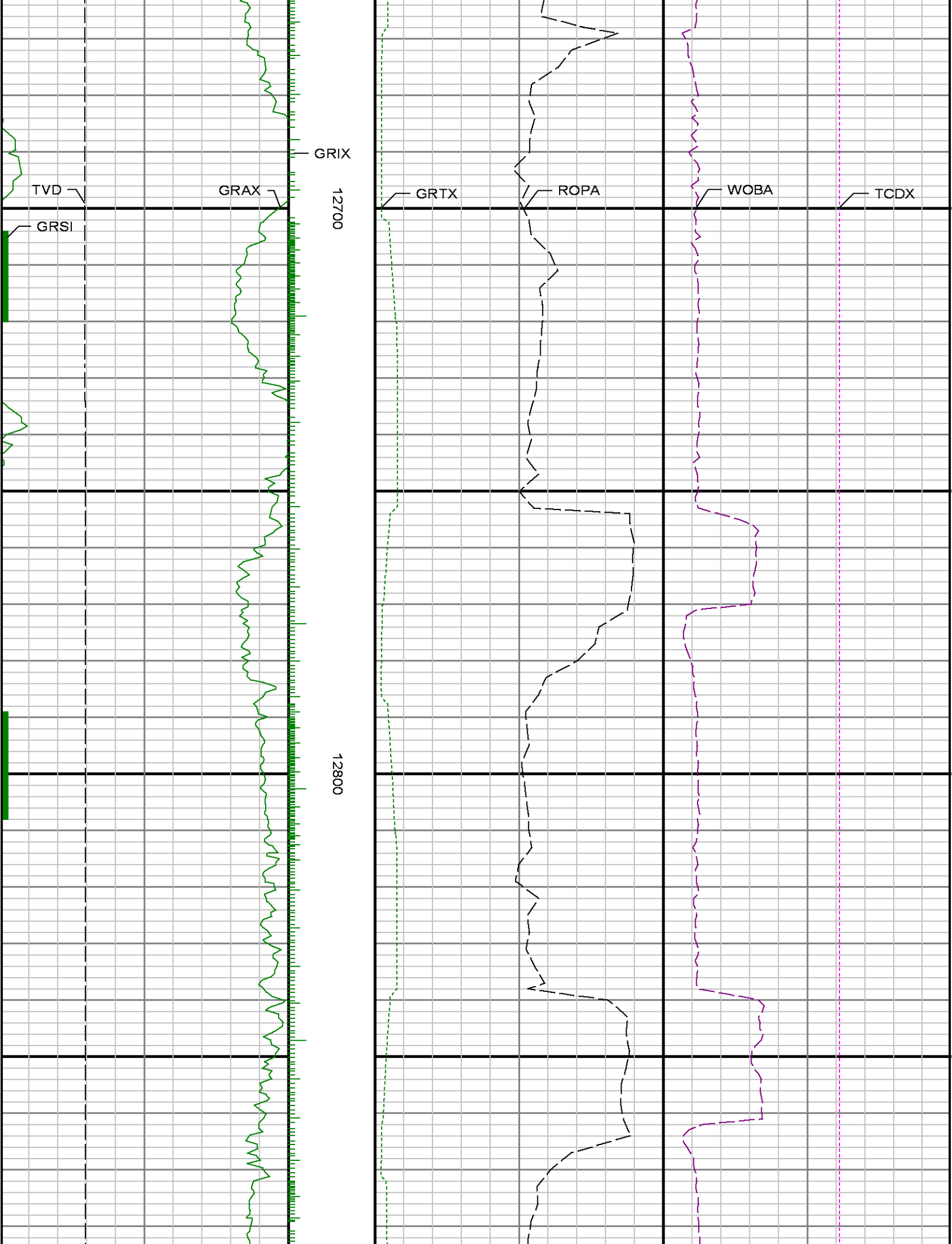




12500

12600



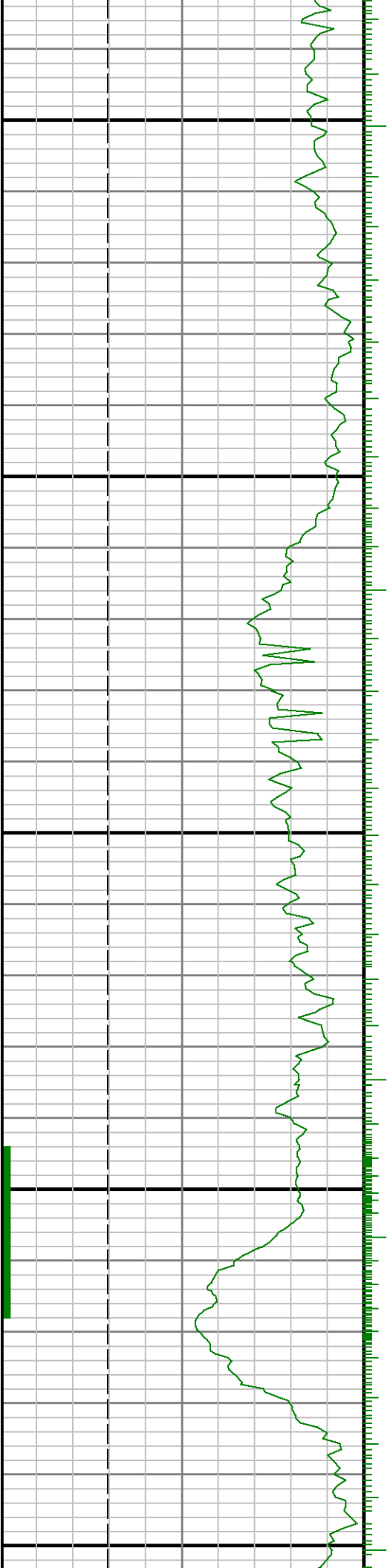


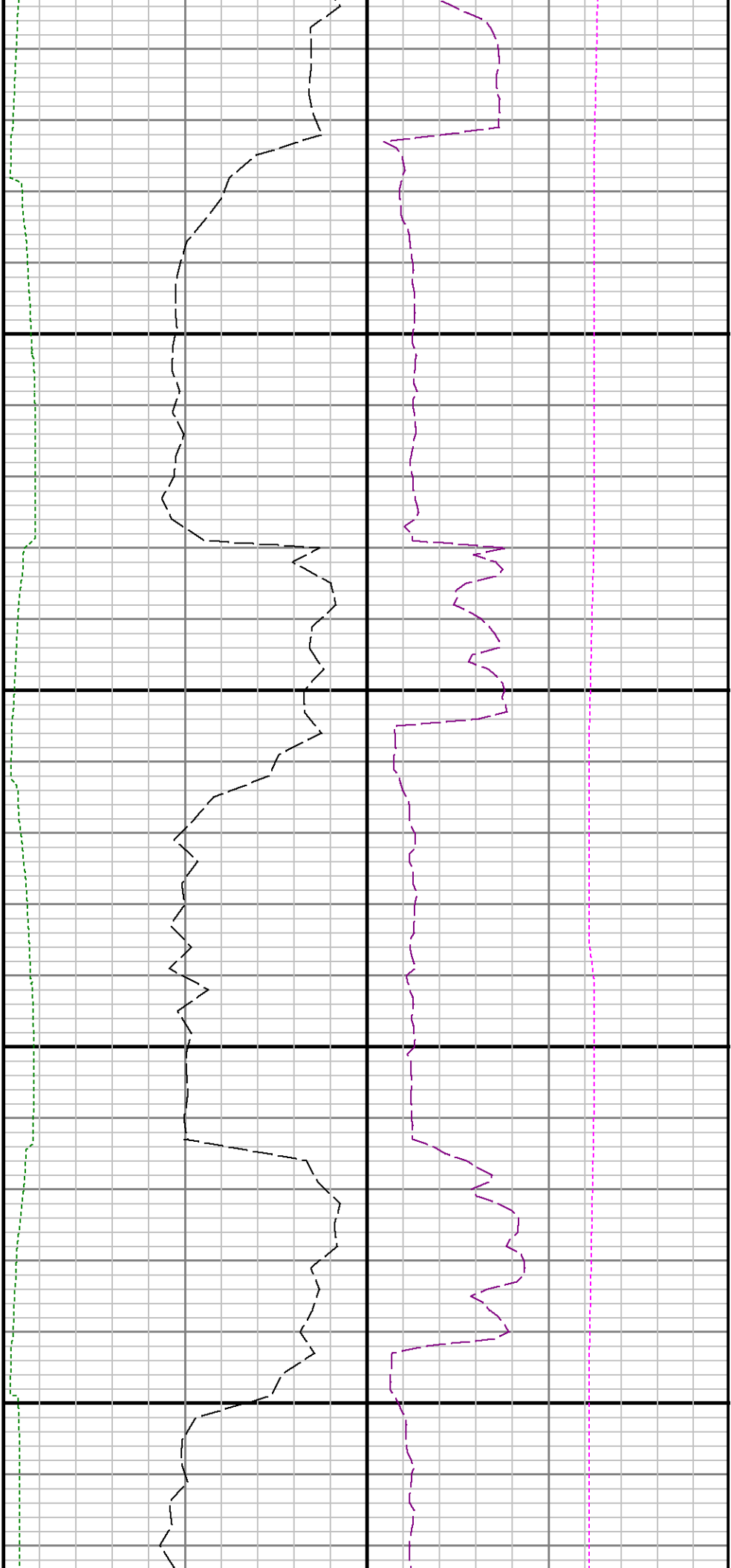


12900

13000

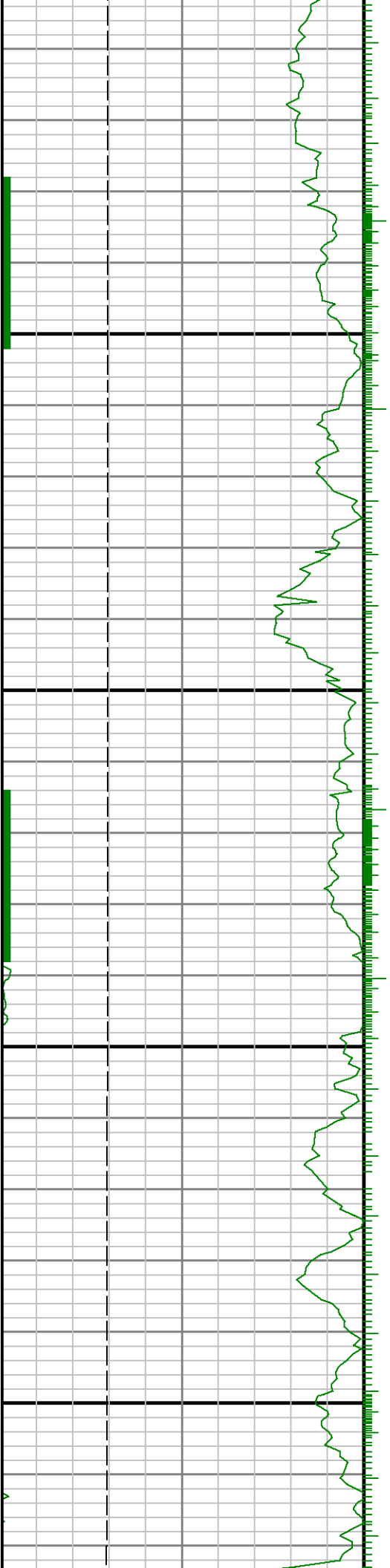
13100

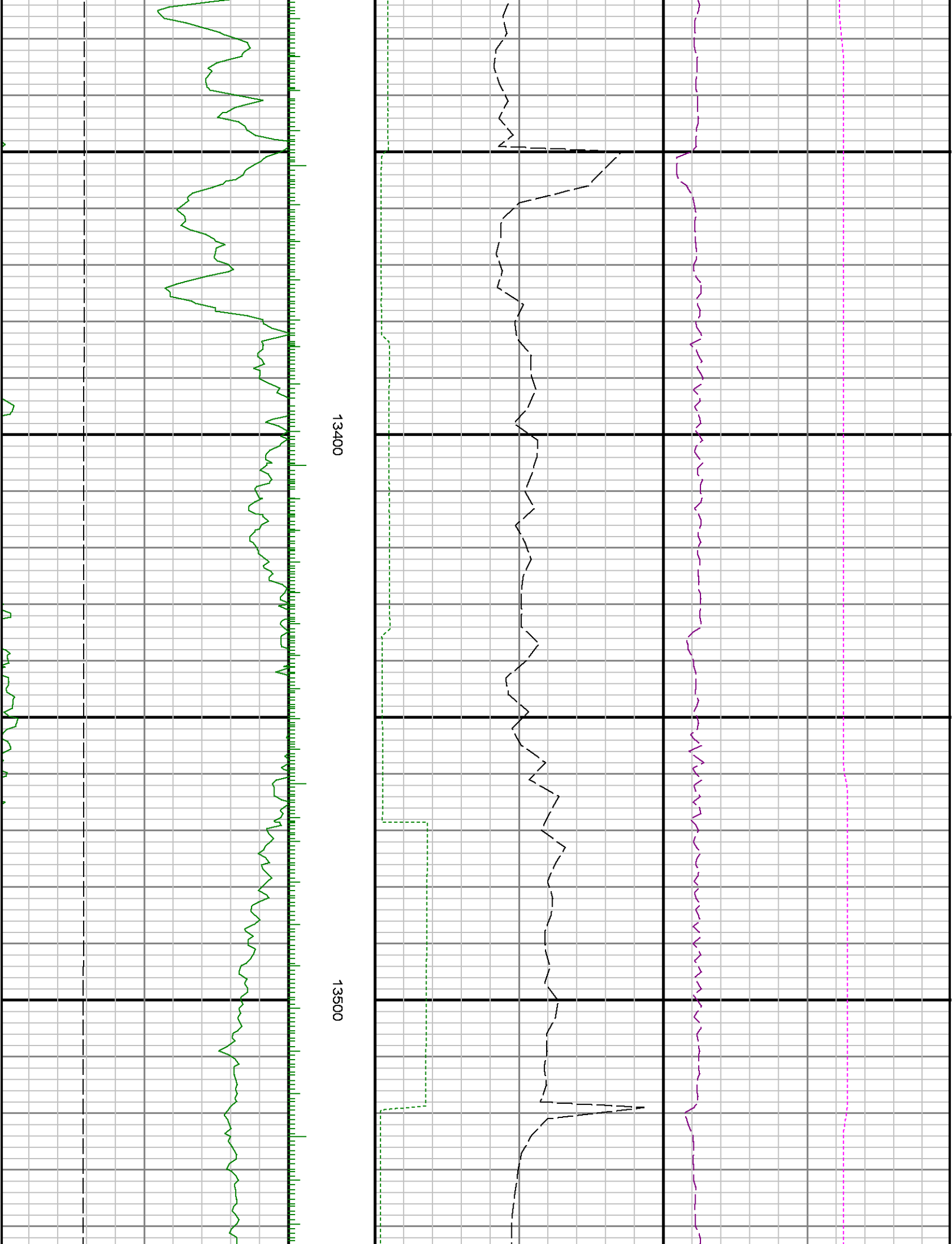




13200

13300

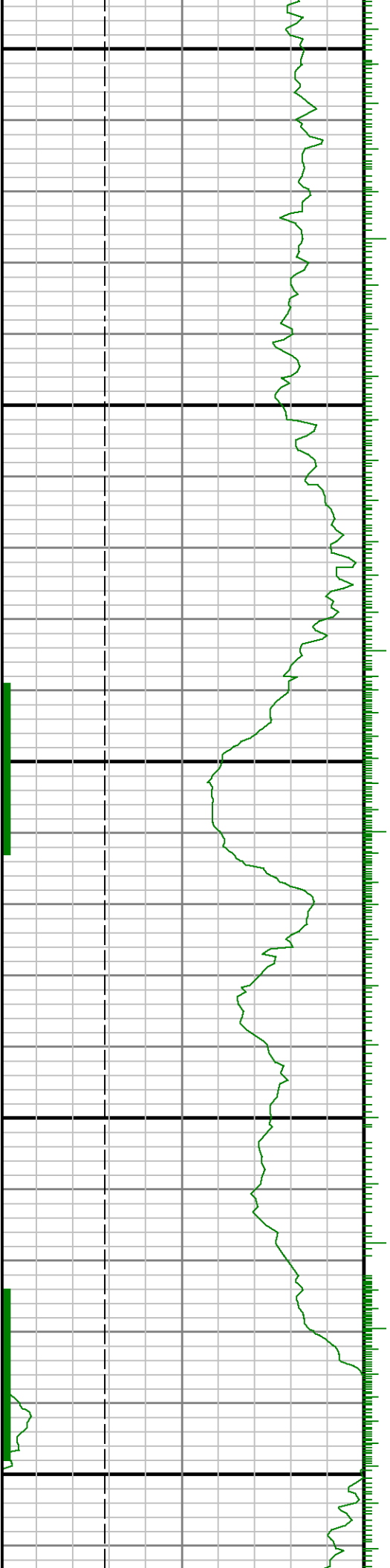


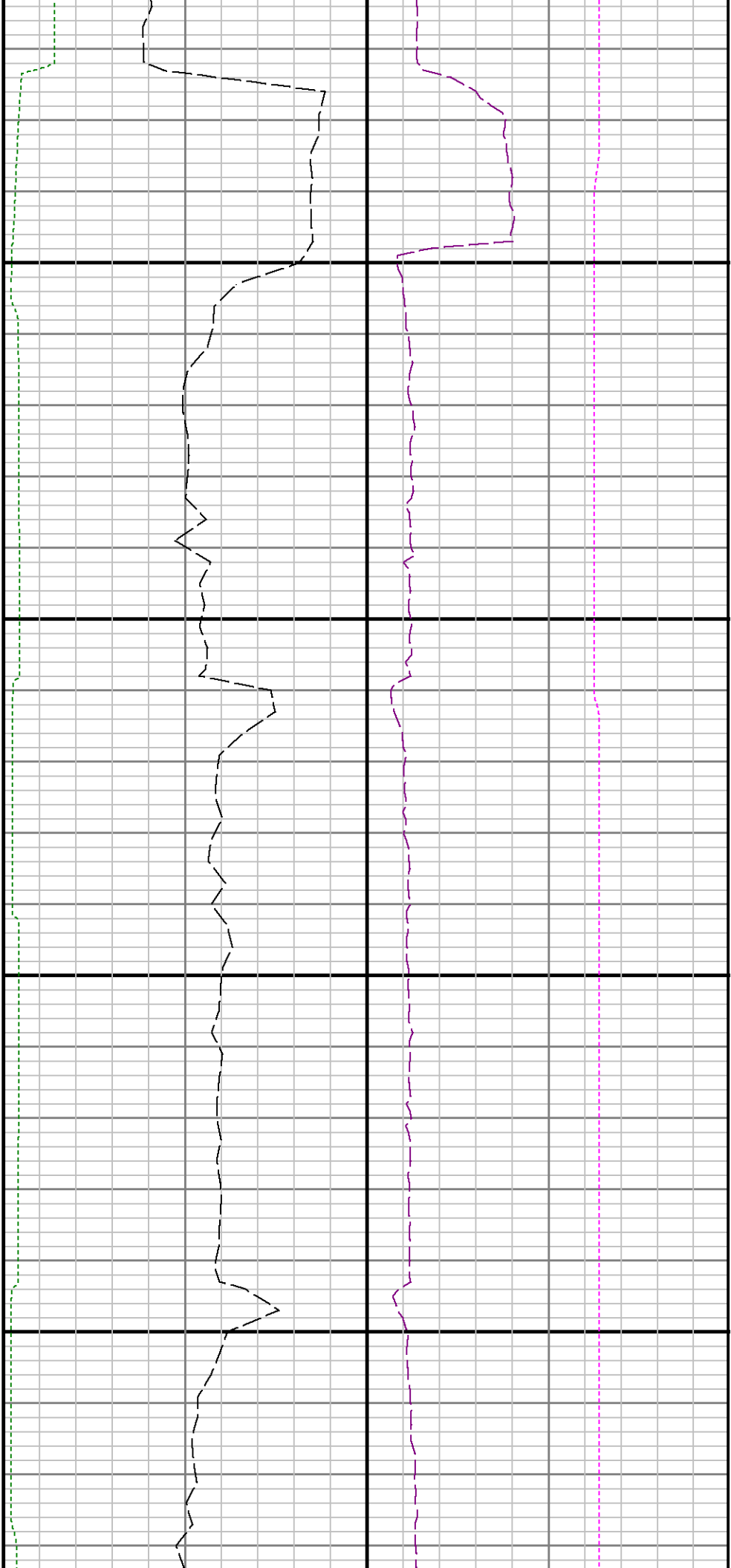




13600

13700





13800

13900

