



Real Time Log

Natural Formation Evaluation
Gamma Ray

Scale:

Company: Anadarko

Well: Roberts 13N-22HZ

Field: Weld County

Region: Continental US Country: United States

Status:

Final Print

Surface Location:

Latitude: 40° 12' 58.986" N

Longitude: 104° 46' 16.694" W

Other Services:

Directional
VSS

API Number:
05-123-36313

Section22

TWN: 3N

Range66W

Permanent Datum (P.D.): Ground Level

Elevation:

4898.00 ft.

Elevations:
N/A

Log Measured From: Rig Floor

13.00 ft.

Above P.D.

KB:
DF:
GL:

Depth Reference: Driller's Depth

4911.00 ft.

4898.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6567.0 ft. Date From: 24/Jun/14 Date To: 02/Jul/14 Dip Angle: 66.89° Azi Reference North: True

Bottom: 12076.0 ft. Date To: 02/Jul/14 Total Mag to Reference

Spud Date: 24/Jun/14 Field Strength: 52513.0 nT North Correction: 8.52°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
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13.500 in.	0.0 ft.	1240.0 ft.	9.625 in.	36.00 lb/ft	0.0 ft.	1225.0 ft.
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8.750 in.	1240.0 ft.	7570.0 ft.	7.000 in.	26.00 lb/ft	0.0 ft.	7560.0 ft.
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6.125 in.	7570.0 ft.	12125.0 ft.				
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Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
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Water Based	0.0 ft.	7570.0 ft.	8.750 in.	7570.0 ft.	0.3° / 268.7°	84.5° / 179.3°
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Water Based	7570.0 ft.	12125.0 ft.	6.125 in.	4555.0 ft.	89.4° / 181.8°	89.7° / 179.6°
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Acquisition System Software Version

Other

Advantage 2.20U4 Rig / Contractor: Ensign 145 / Ensign Drilling

PATS 6.4.1.34 Job No: 6478733

District / Unit: RMD / D & E

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Log Run Summary

LWD	BHA	Bit	Bit	Bit	Bit	Assembly	Logged Interval		Bit Depth Interval		Date / Time				Circ.
							Top	Bottom	From	To	Start		End		
Run	Run	Run	Size	Type	Gauge	Type									
No.	No.	No.	(in.)		Length		(ft.)	(ft.)	(ft.)	(ft.)				(hrs.)	
1	1	1	8.750	PDC Core	1.000	Steerable	6567.0	7516.0	1240.0	7570.0	24/Jun/2014	18:38	28/Jun/2014	13:30	40.1
2	2	2	6.125	PDC Core	1.000	Steerable	7516.0	12076.0	7570.0	12125.0	29/Jun/2014	12:30	02/Jul/2014	06:00	43.5

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Jason Williams	23/Jun/14	30/Jun/14	Michael Gurnsey	23/Jun/14	02/Jul/14			
Troy Clay	23/Jun/14	02/Jul/14	Alex Janorschke	23/Jun/14	28/Jun/14			
Donald Delay	30/Jun/14	02/Jul/14	Jason Weltin	28/Jun/14	02/Jul/14			

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+ (%)
25/Jun/14 22:00	1	1533.0	Water Based Mud	8.5	28	8.7	N/A	0/98	Active Mud Pits	2000	N/A
26/Jun/14 21:00	1	4903.0	Water Based Mud	8.5	28	8.5	N/A	0/99	Active Mud Pits	1400	N/A
27/Jun/14 22:00	2	7570.0	Water Based Mud	10.2	40	9.2	N/A	1/90	Active Mud Pits	1900	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent 0.5 ft. avg.	API
GRIX	Gamma Ray Data Density	points
GRSI	Gamma Ray Slide 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	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	10170012	Directional	57.63	6.750	2.875
1	SRIG	12131406	Gamma	54.26	6.750	2.875
2	DIR	12592552	Directional	52.02	4.750	2.625
2	SRIG	11703937	Gamma	48.64	4.750	2.625

Service and Tool Mnemonics

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

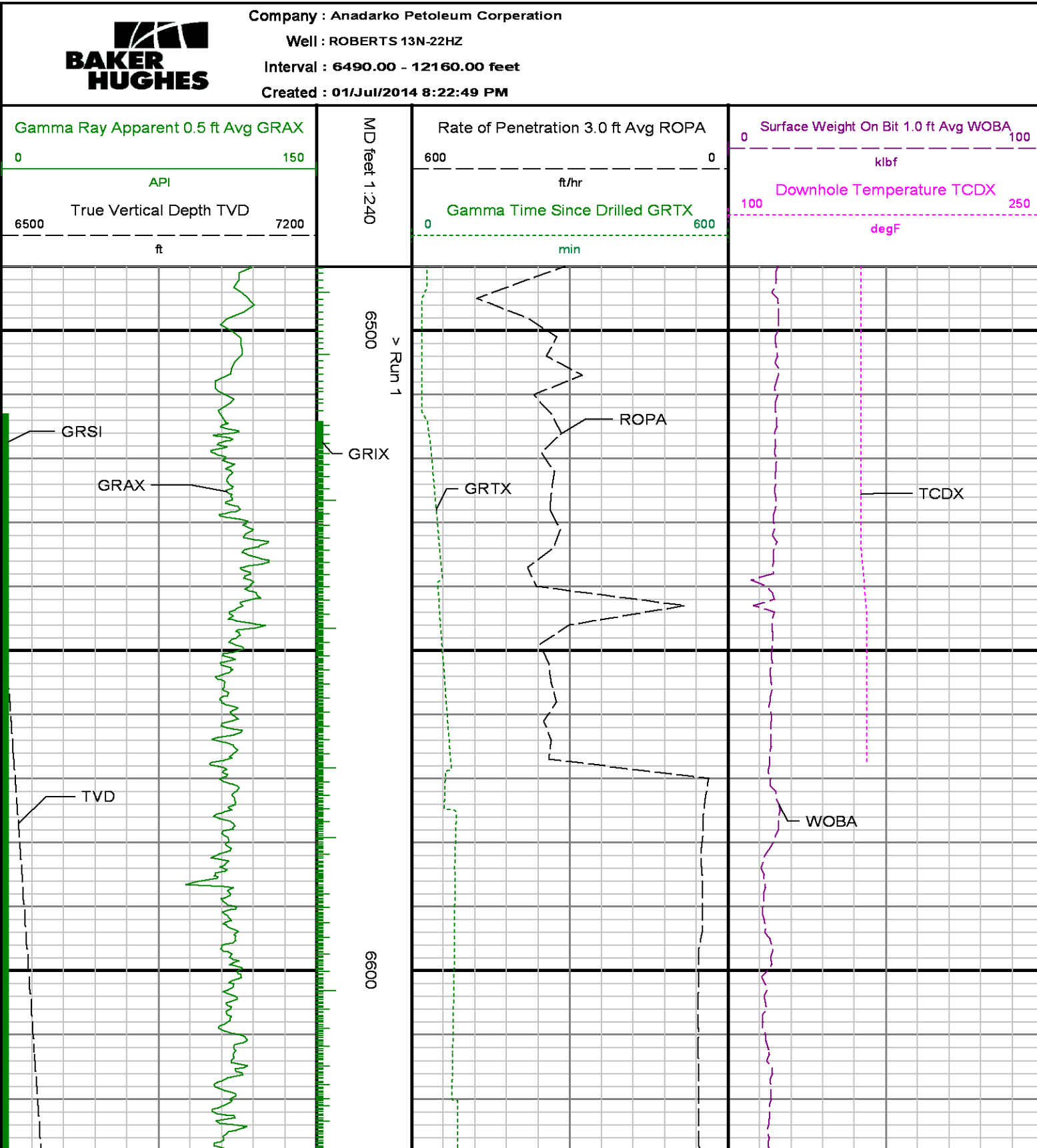
Comments

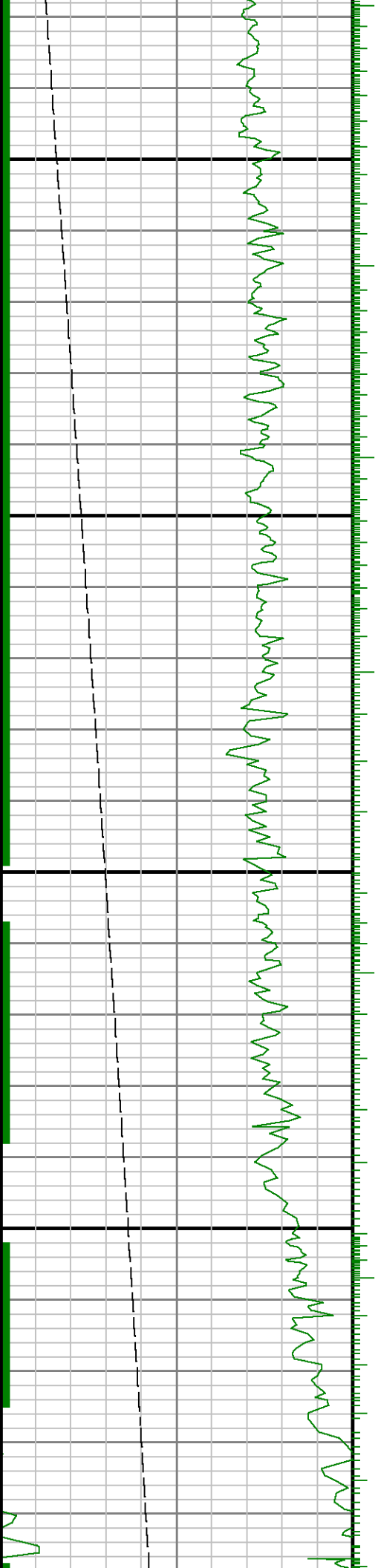
<p>1.) Baker Hughes INTEQ run 1 utilized 6 1/2 inch NaviGamma services (Directional and Gamma Ray) behind an 8 3/4 inch bit and steerable assembly from 1240 to 7570 feet MD (1239.97 to 7148.72 feet TVD).</p> <p>2.) Baker Hughes INTEQ run 2 utilized 4 3/4 inch NaviGamma services (Directional and Gamma Ray) behind an 6 1/8 inch bit and steerable assembly from 7570 to 12125 feet MD (7148.72 to 7158.87 feet TVD).</p> <p>3.) A sliding indicator is shown on the left edge of track 1 as a heavy line. This indicator has been depth shifted to the gamma ray sensor offset to correspond with gamma ray data acquired while sliding.</p>
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Remarks

Number	Measured Depth	Hole Section	LWD Run No.	Remark
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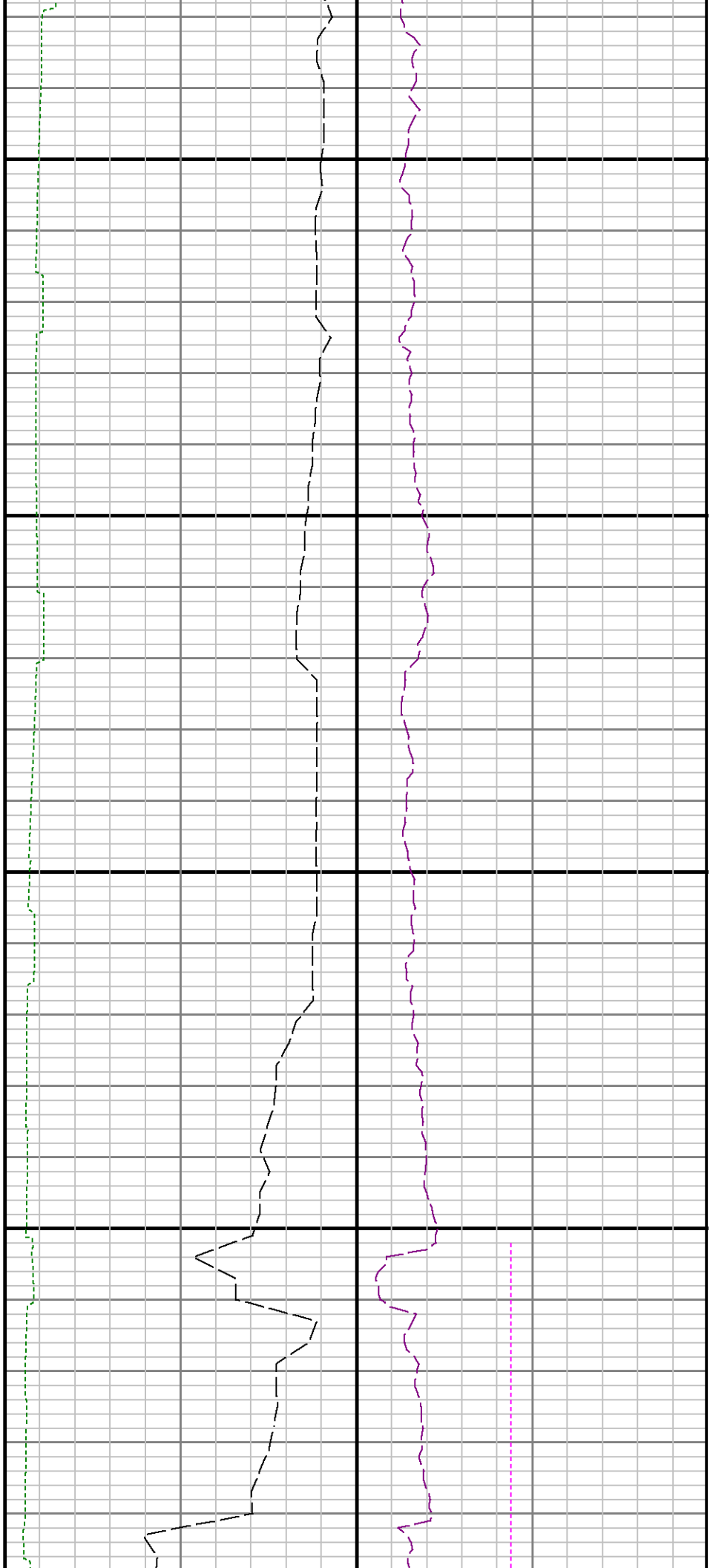
	(m.)	(in.)		
1	7515	8.750	1	The interval from 7515 to 7570 feet MD was logged up to 48 hours after being drilled due to casing operations.
2	12076	6.125	2	The interval from 12076 to 12125 feet MD has no logging data due to bit to sensor offset

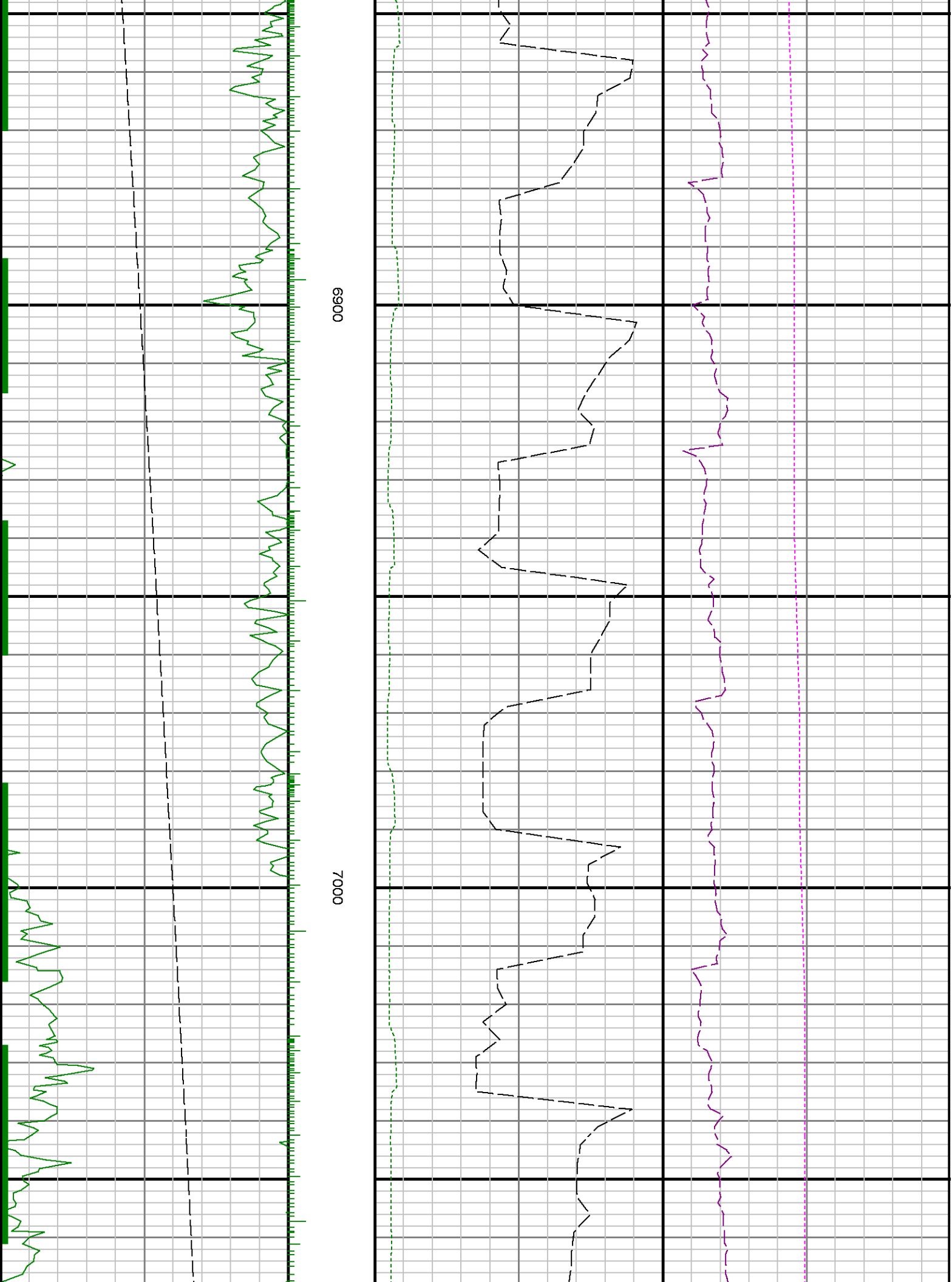




6700

0089

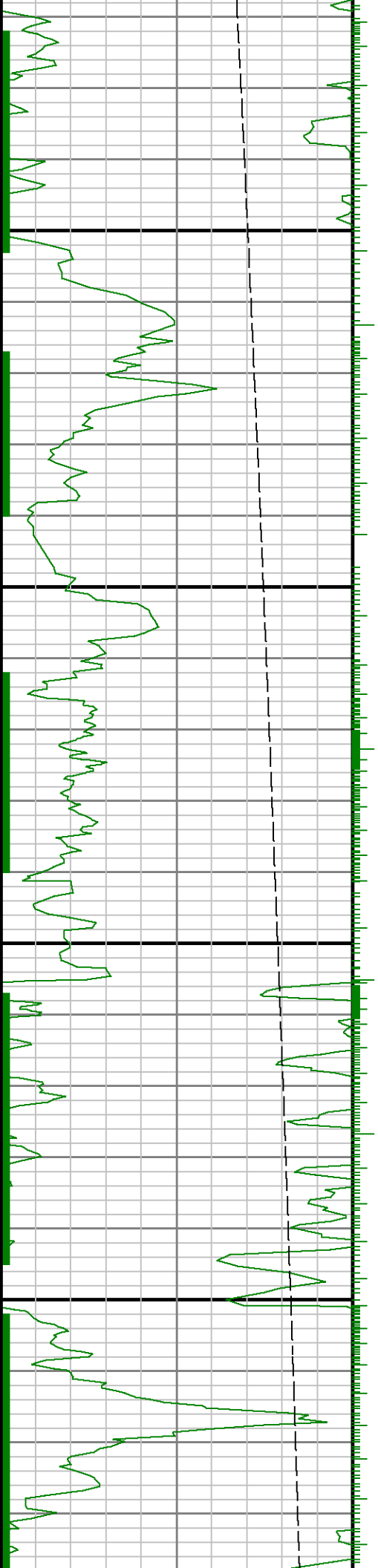


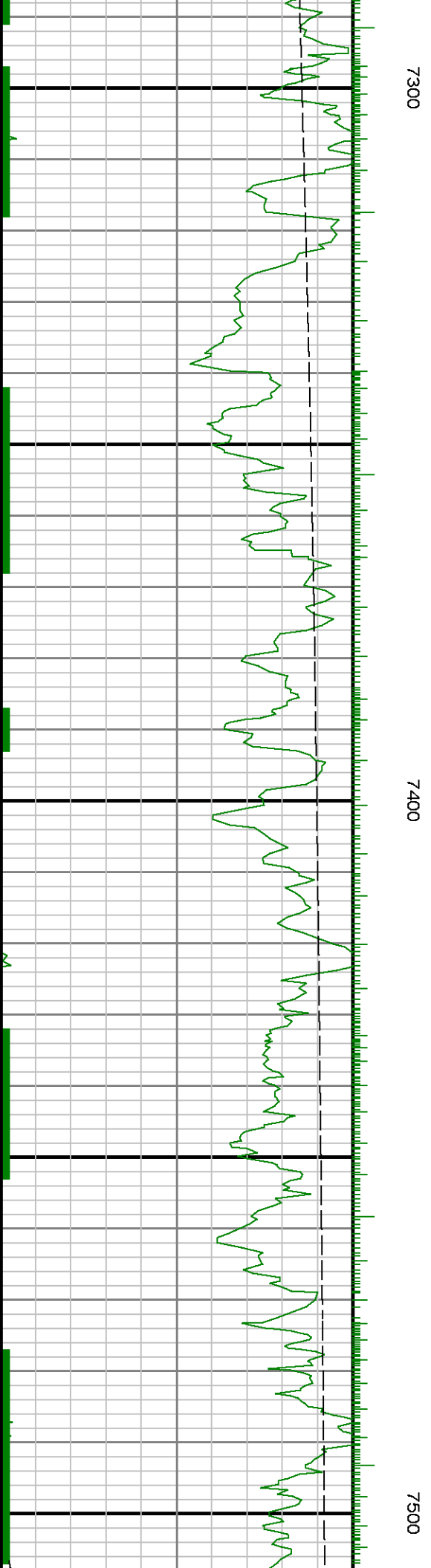
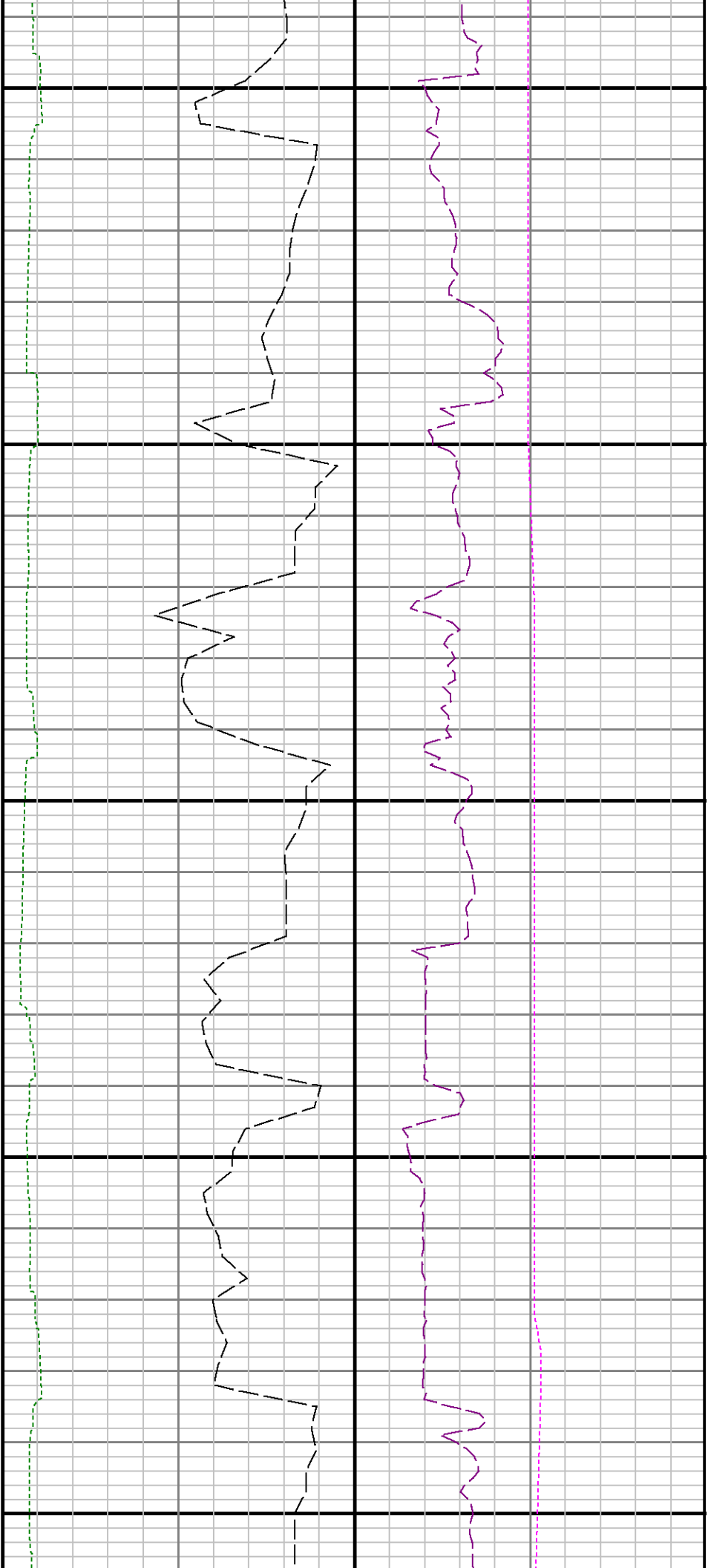


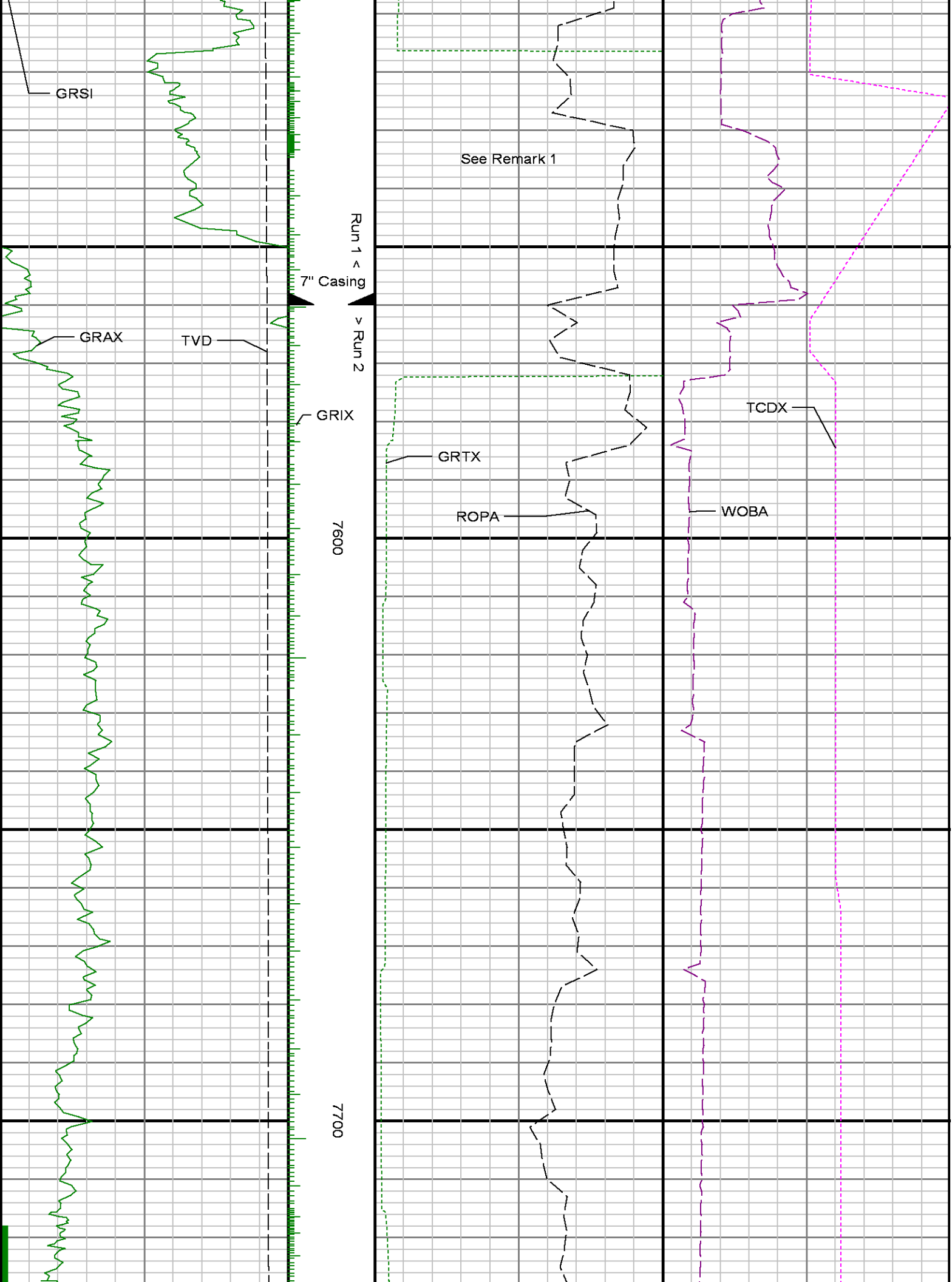


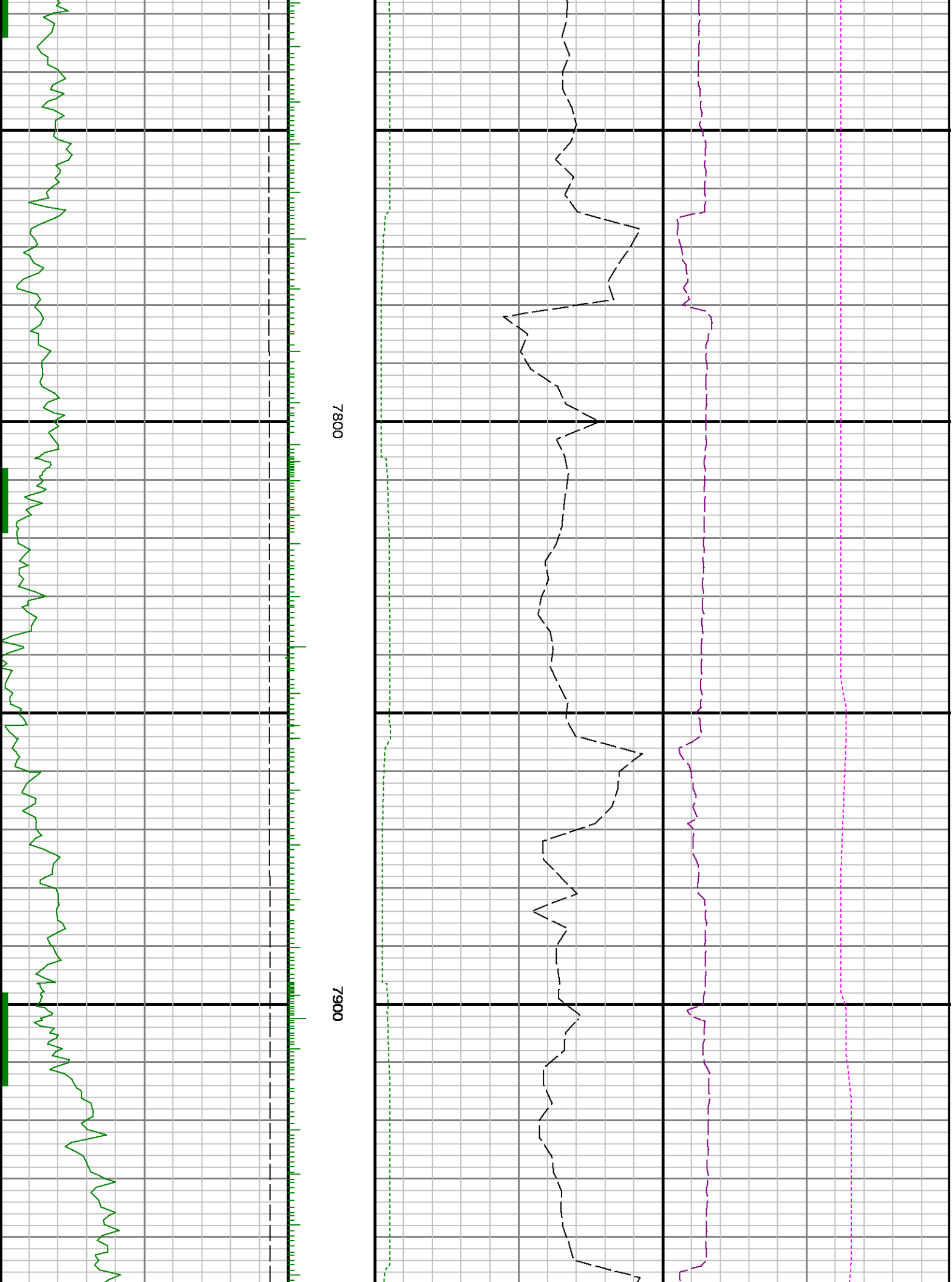
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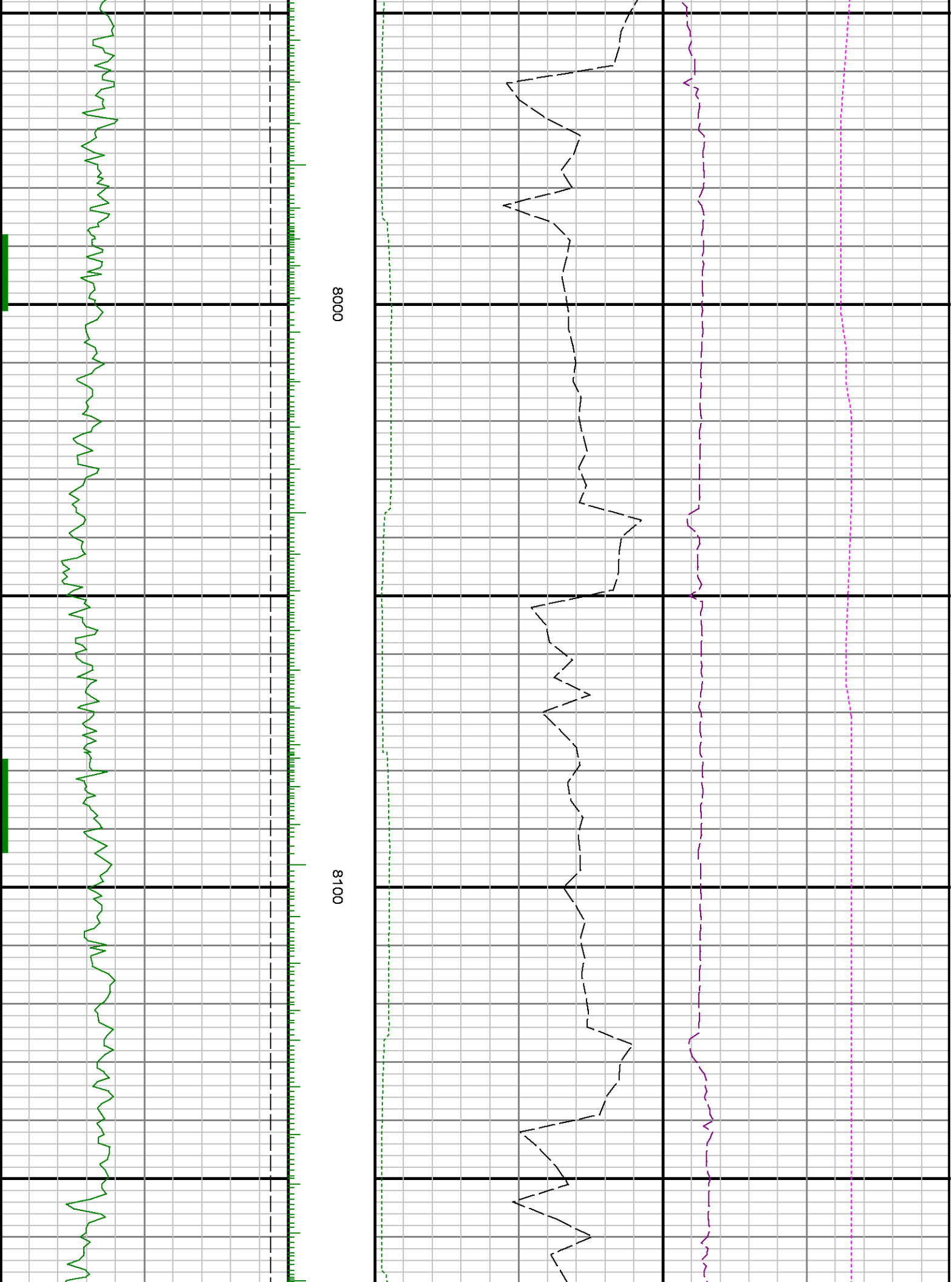
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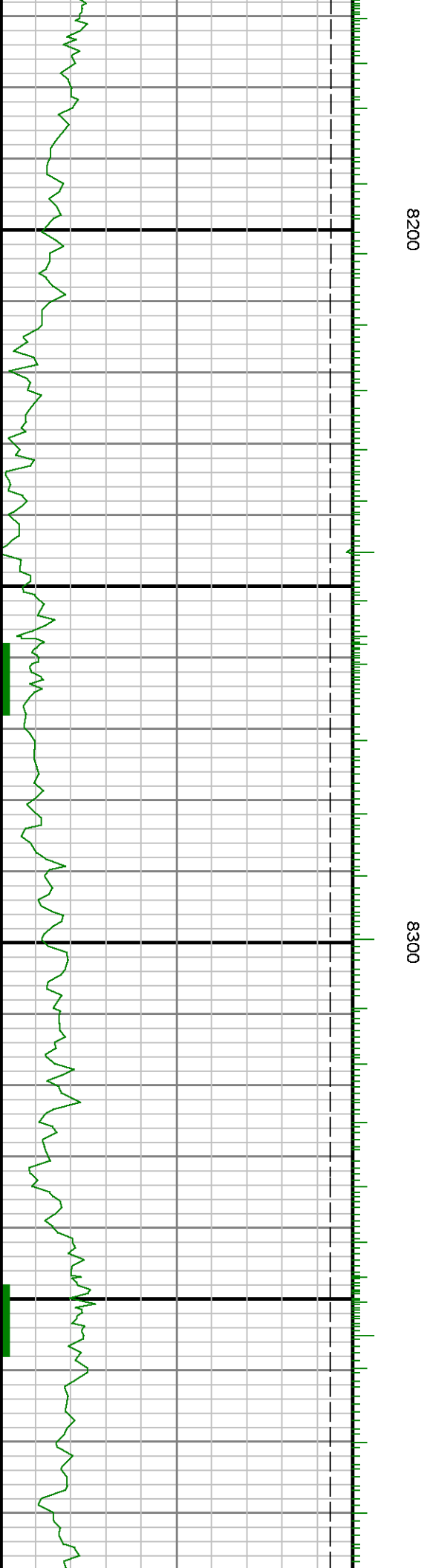
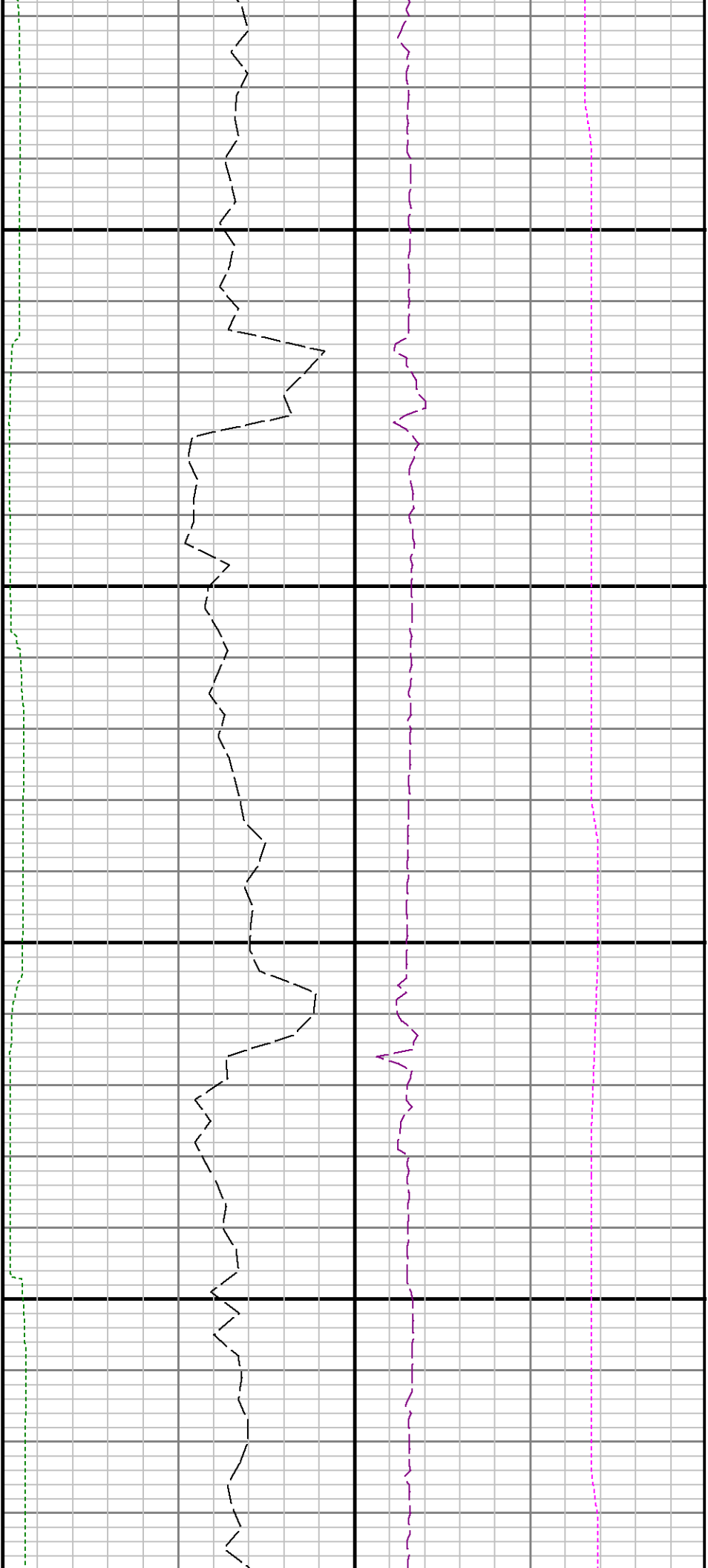


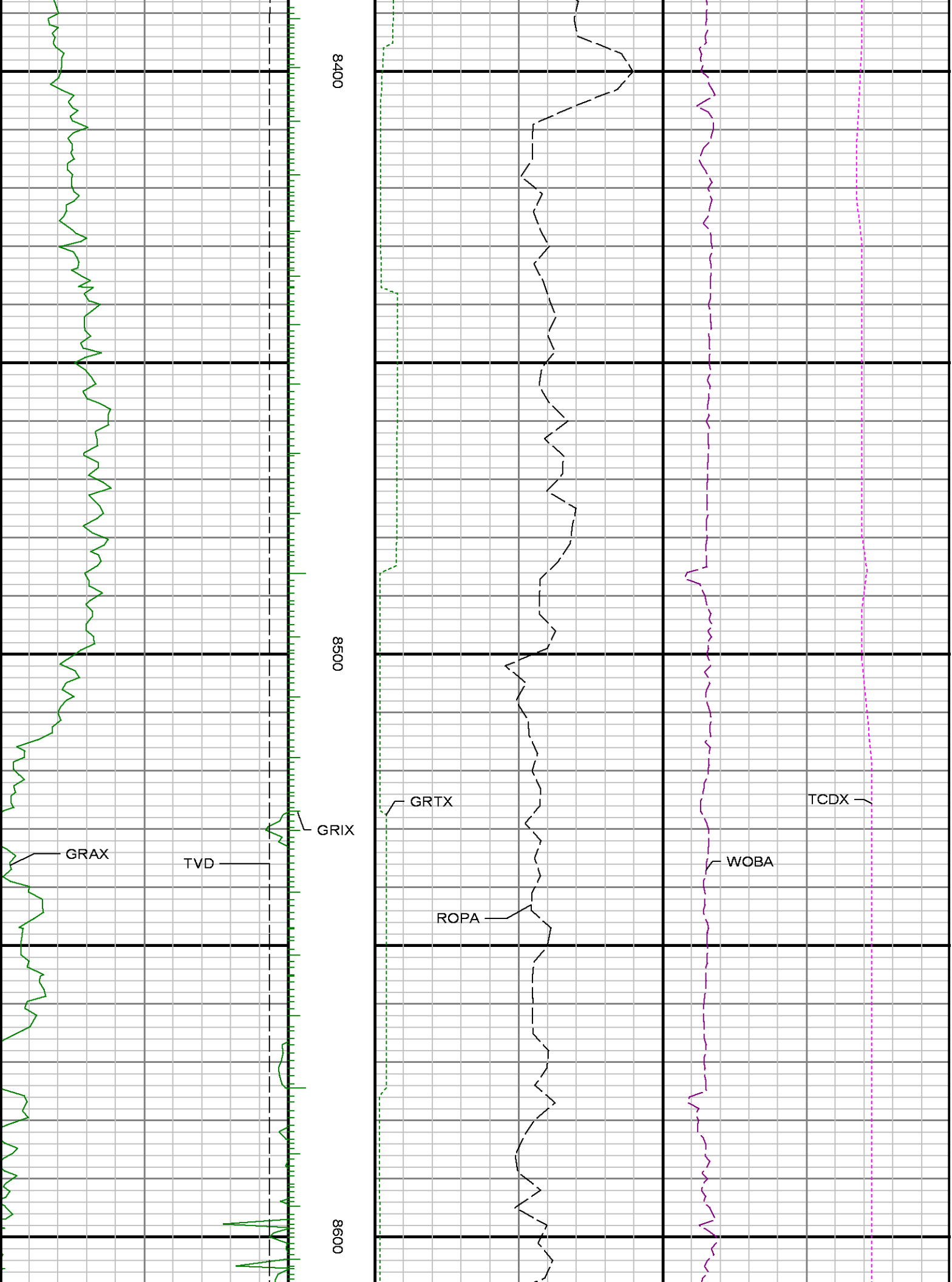


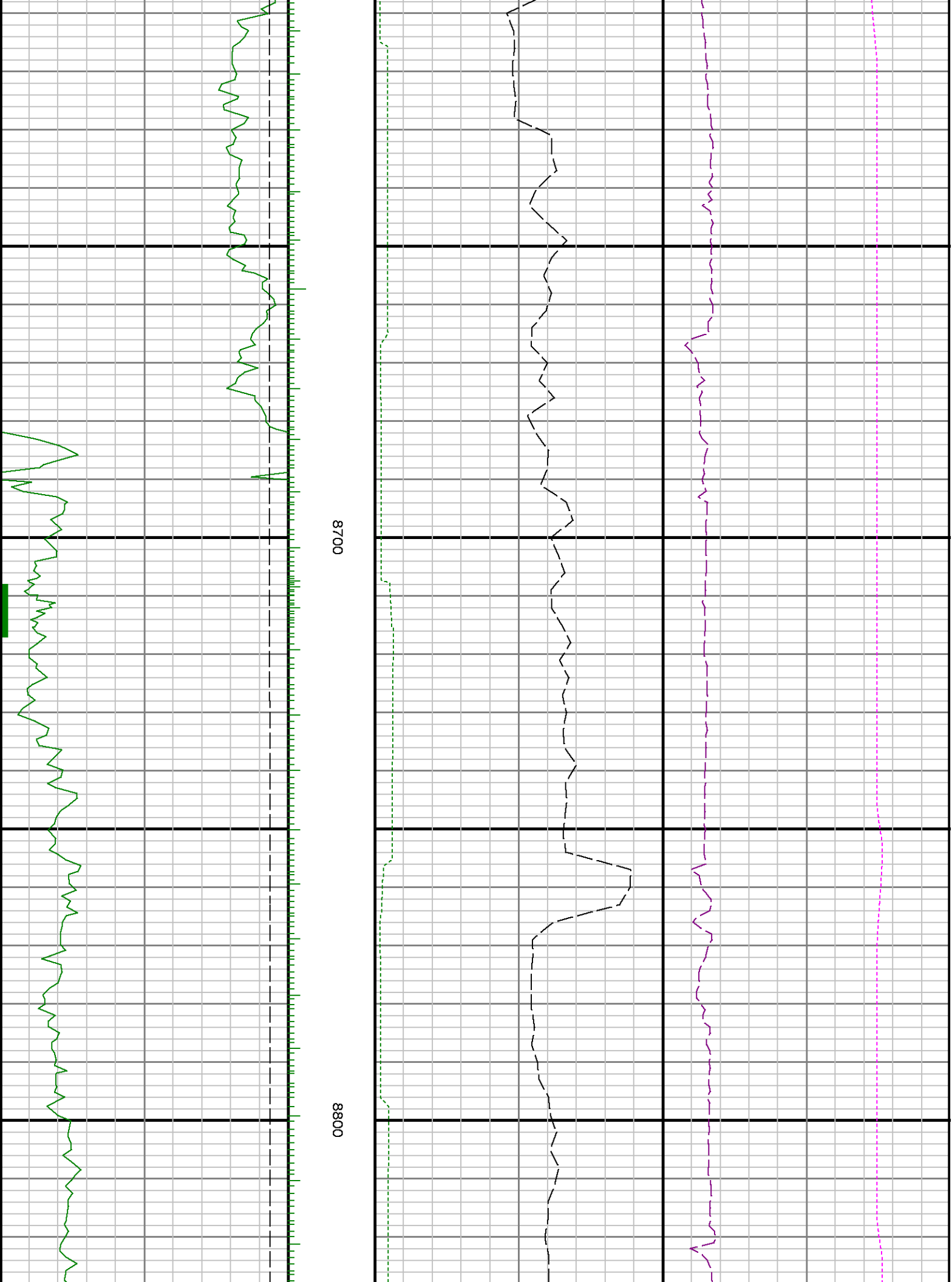


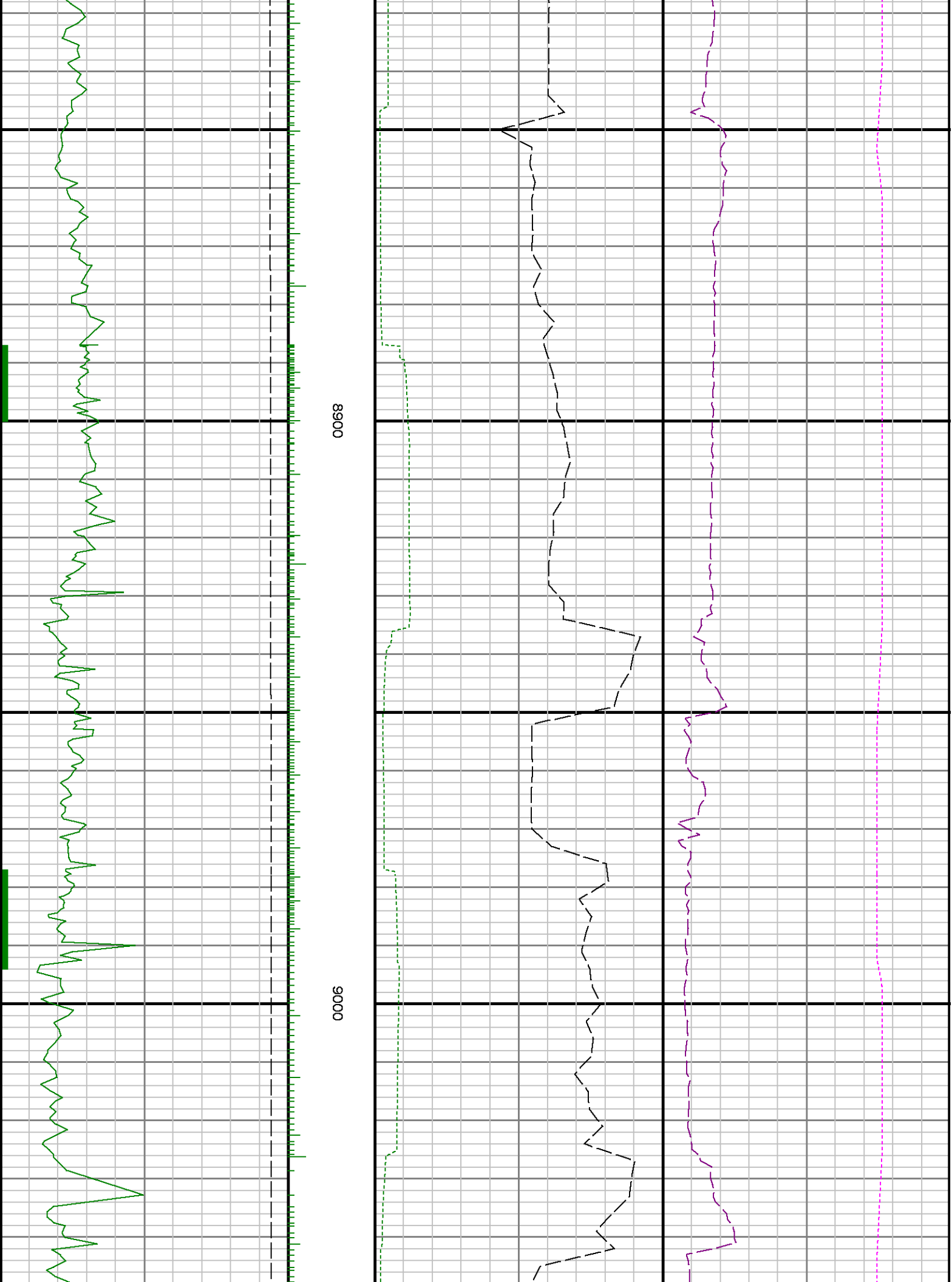


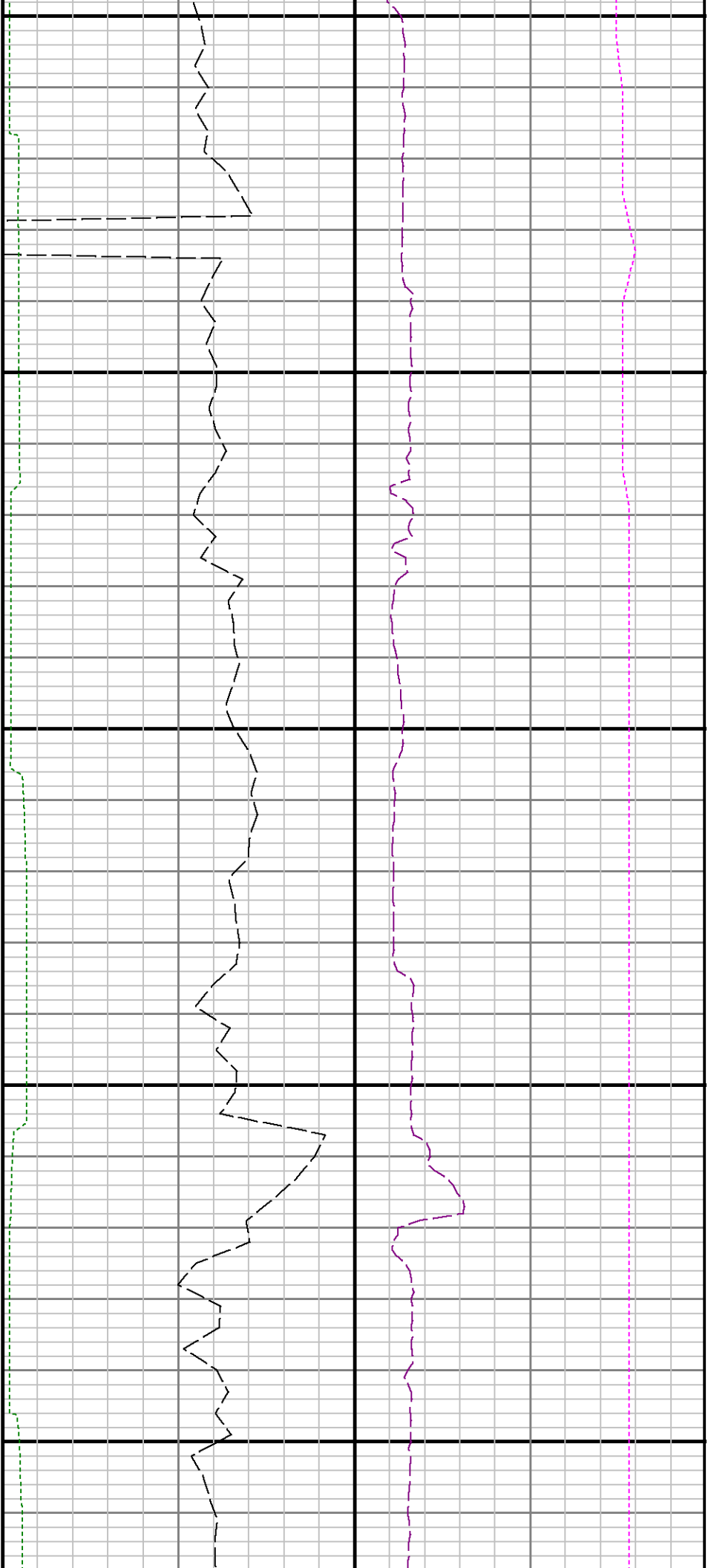






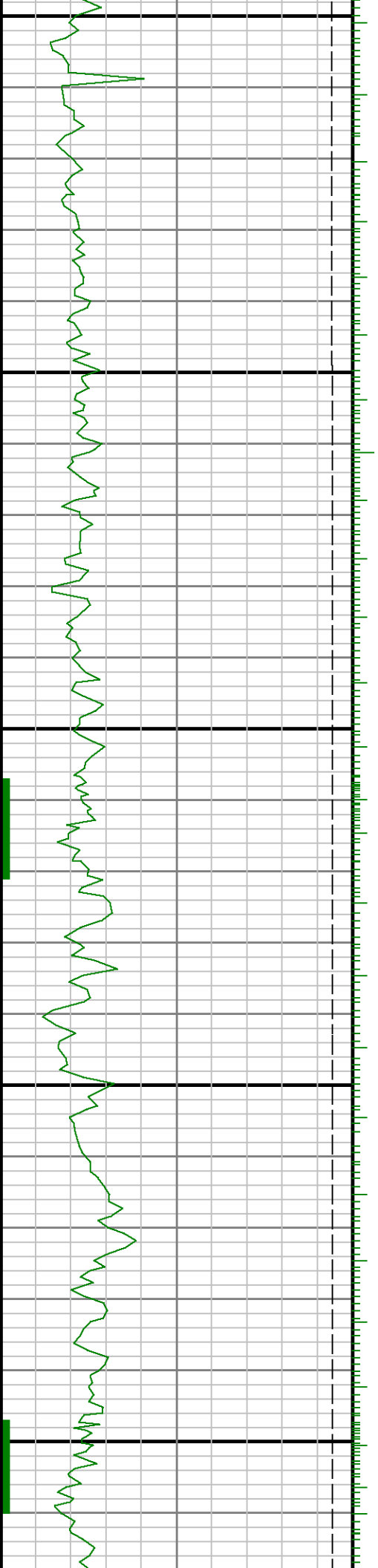




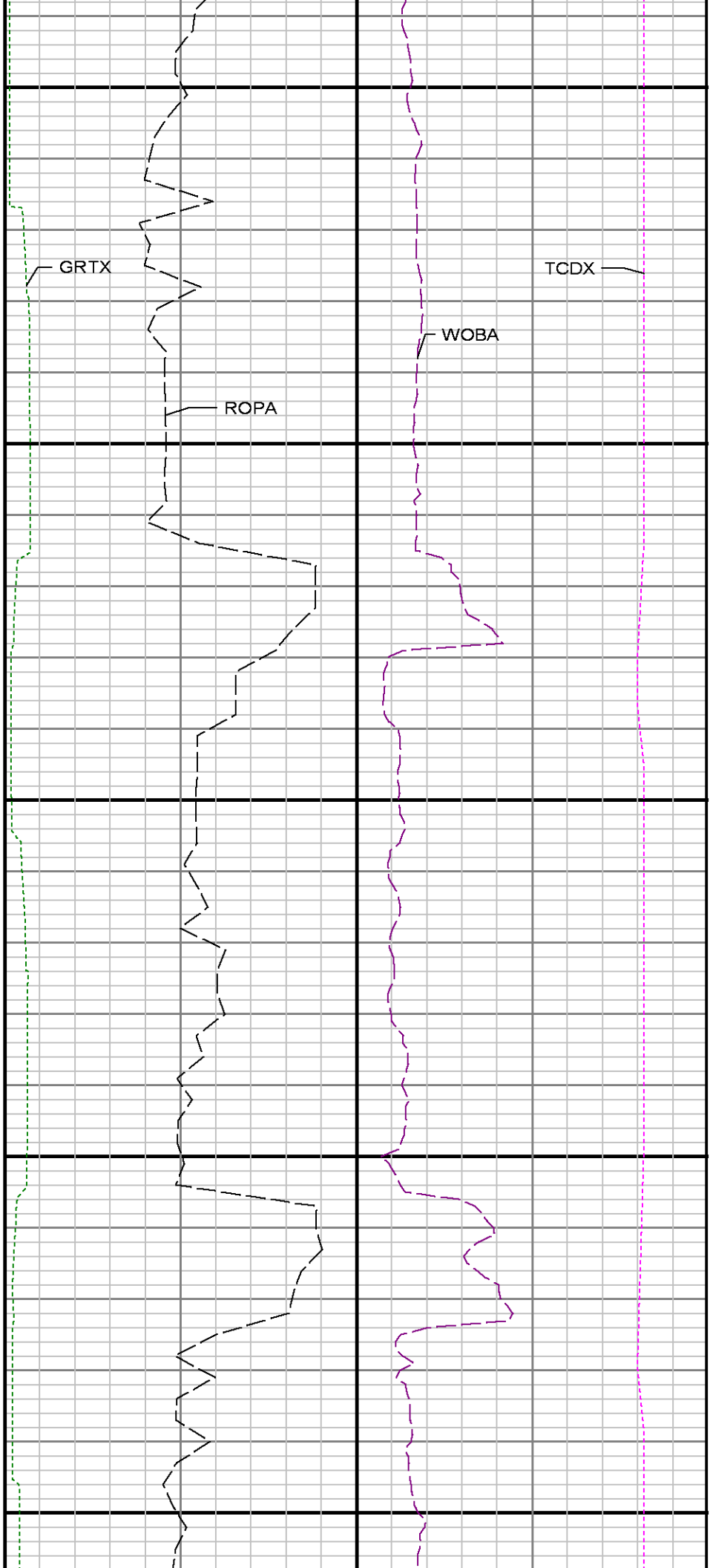
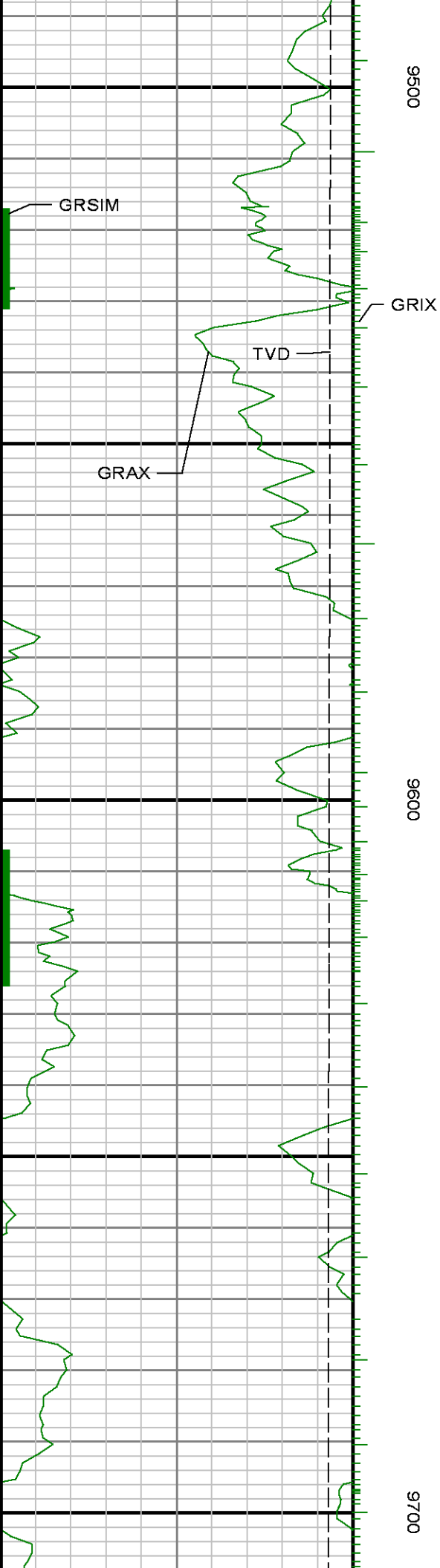


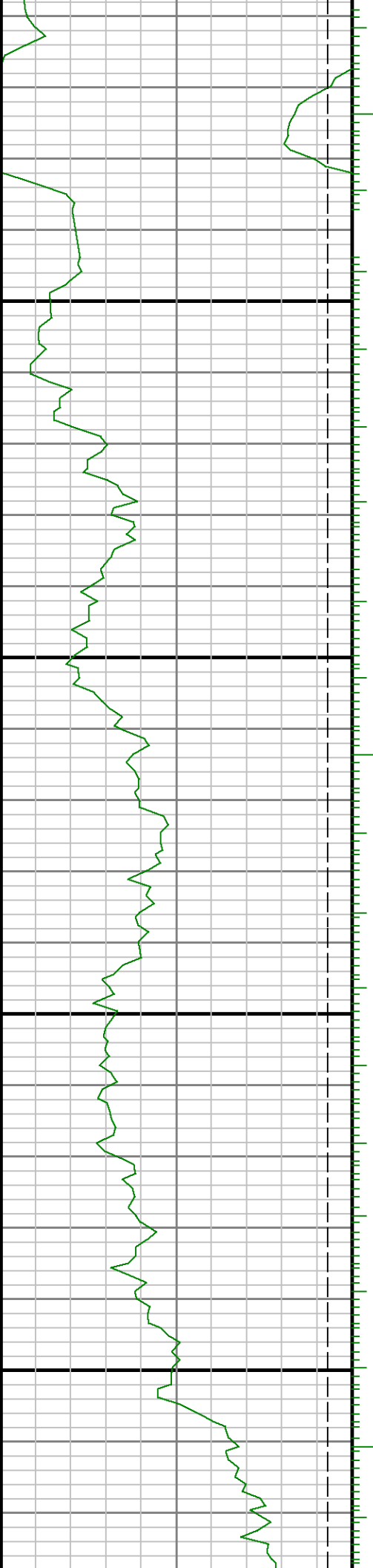
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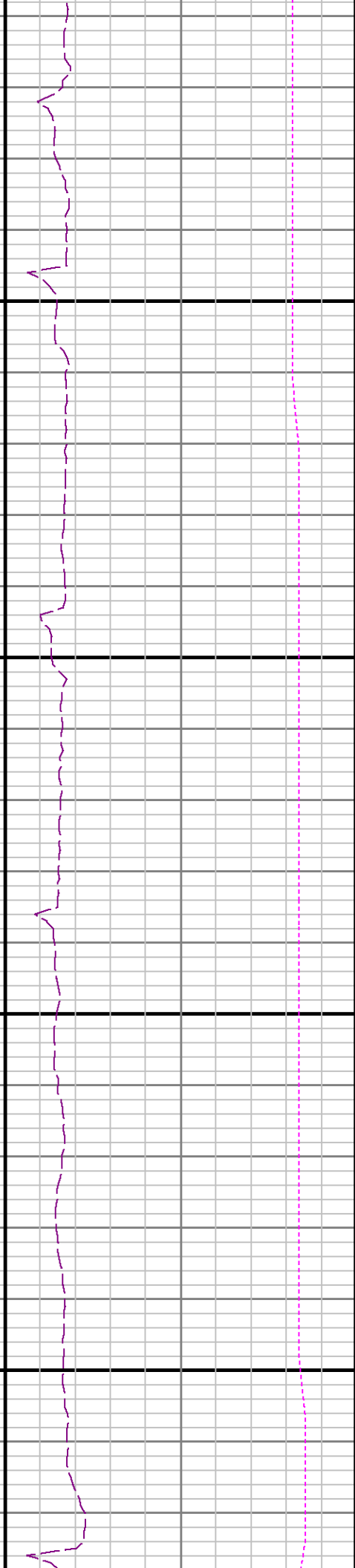






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0086

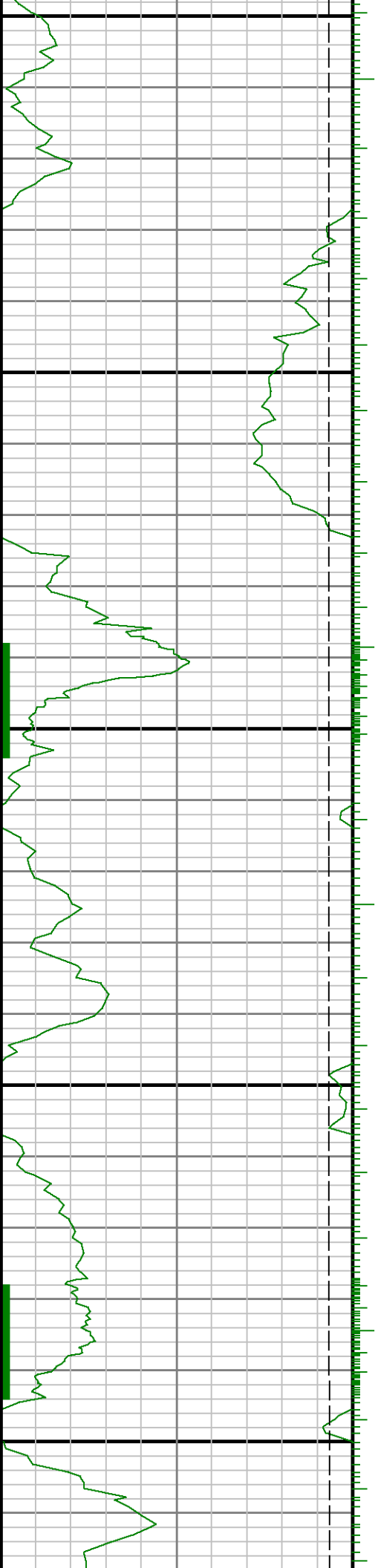


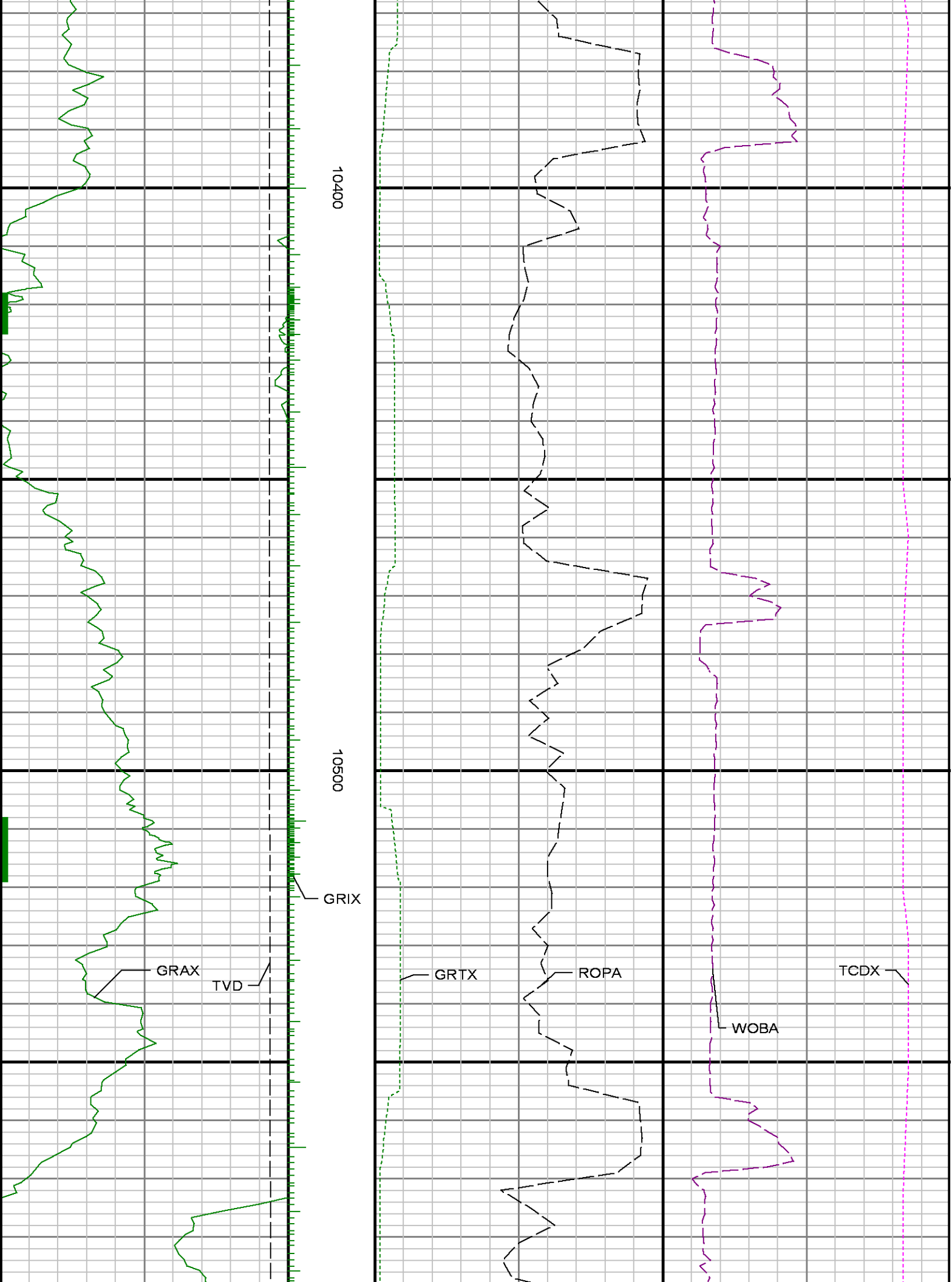


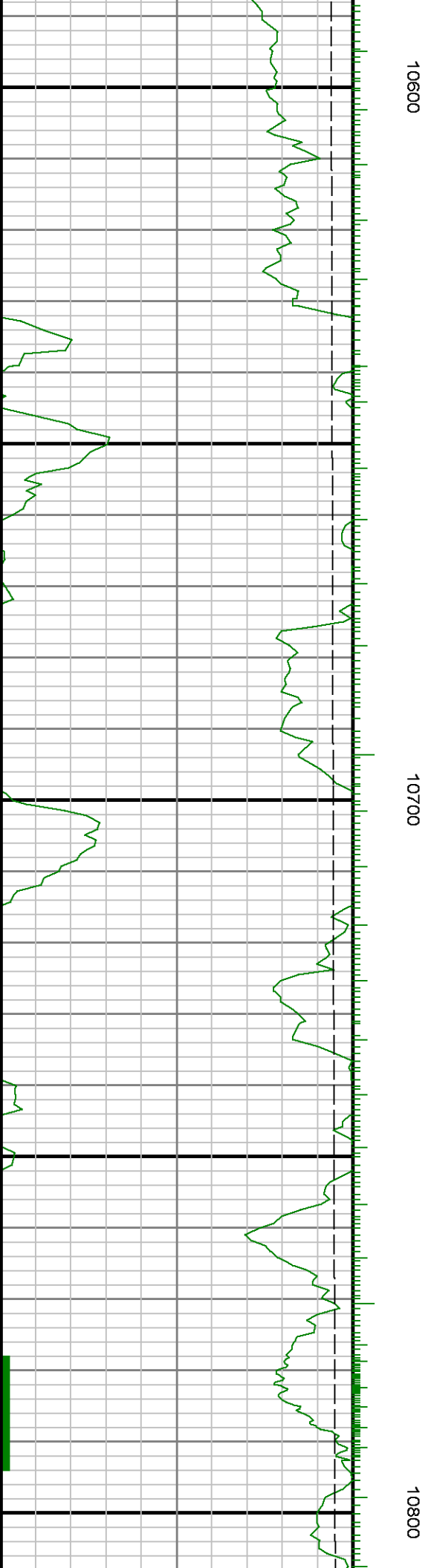
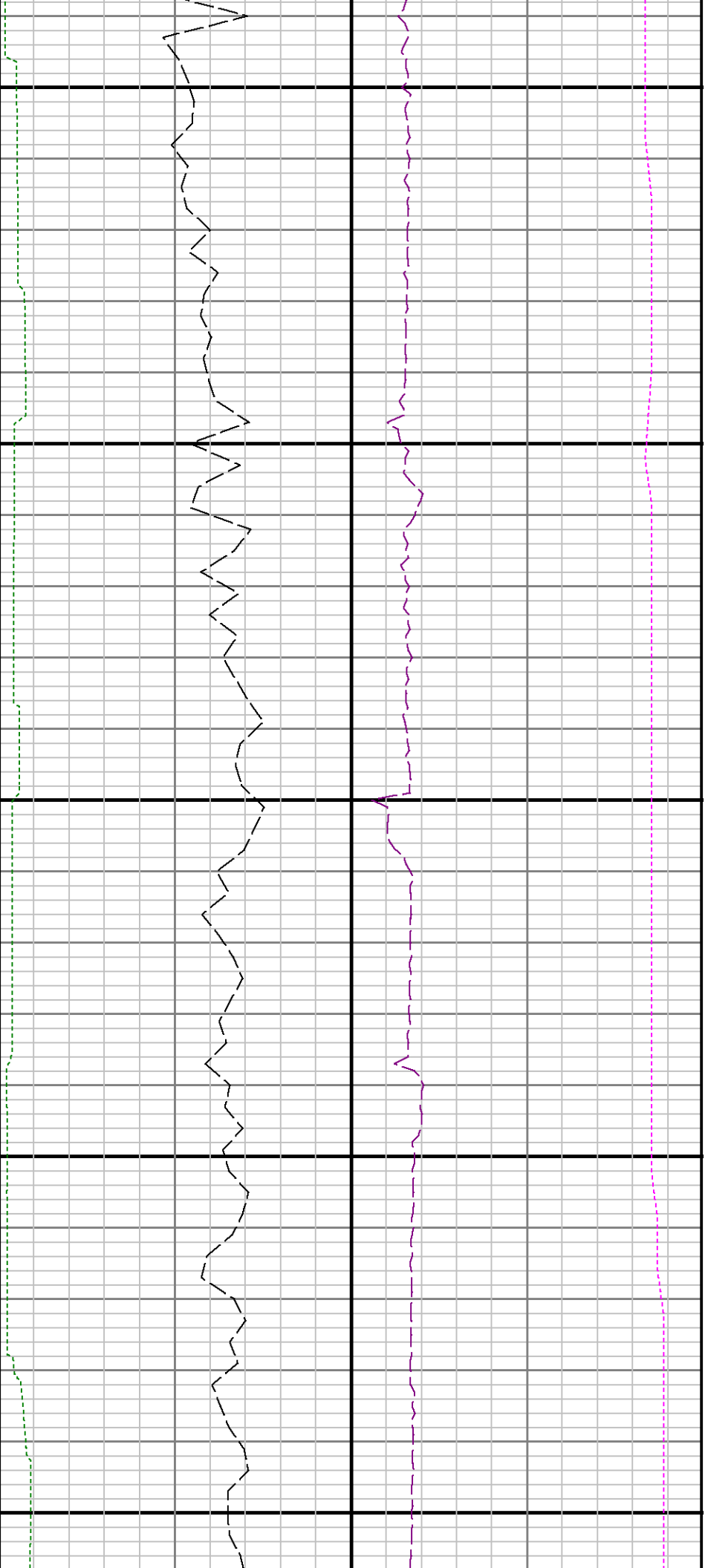


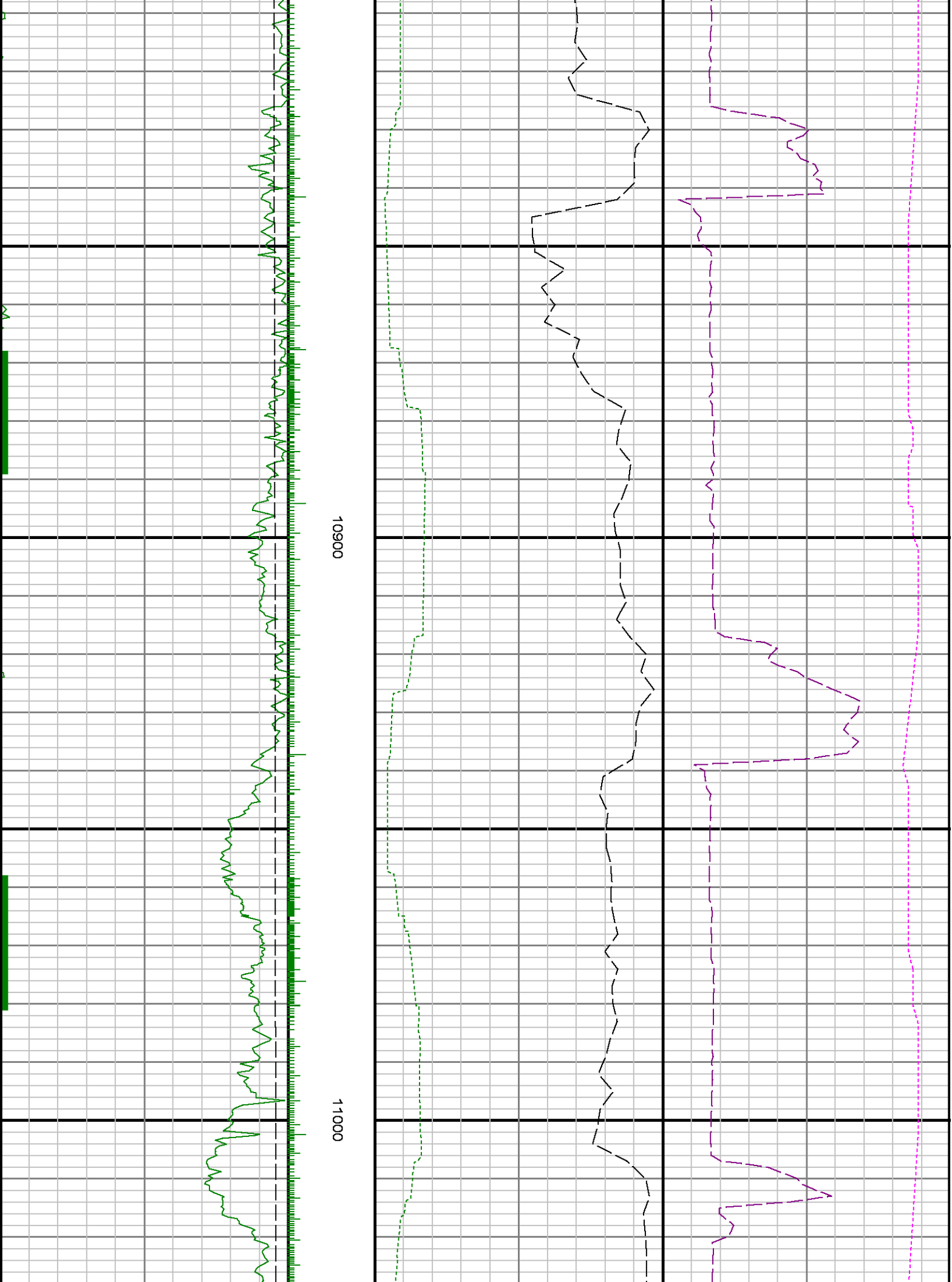
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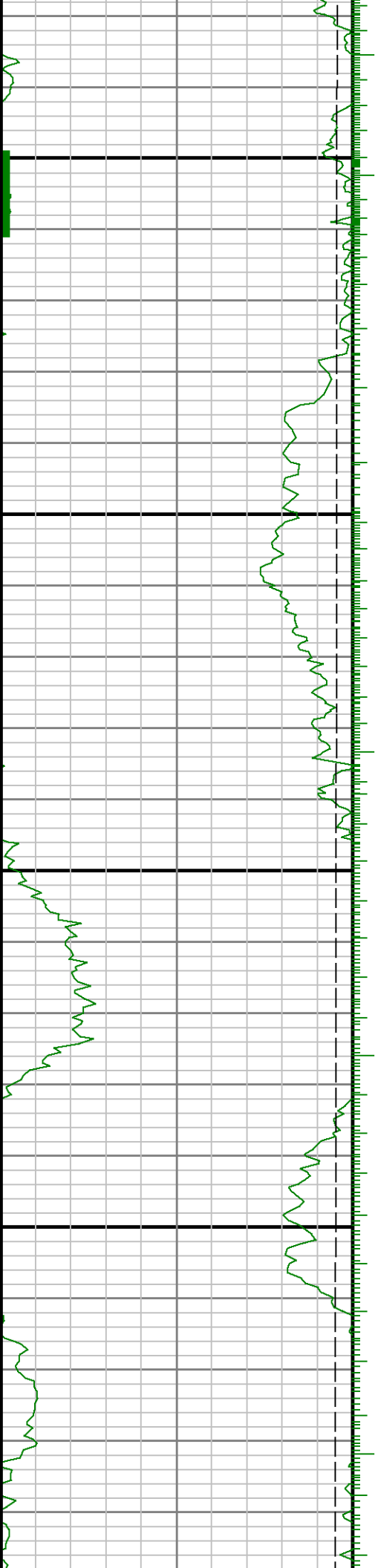


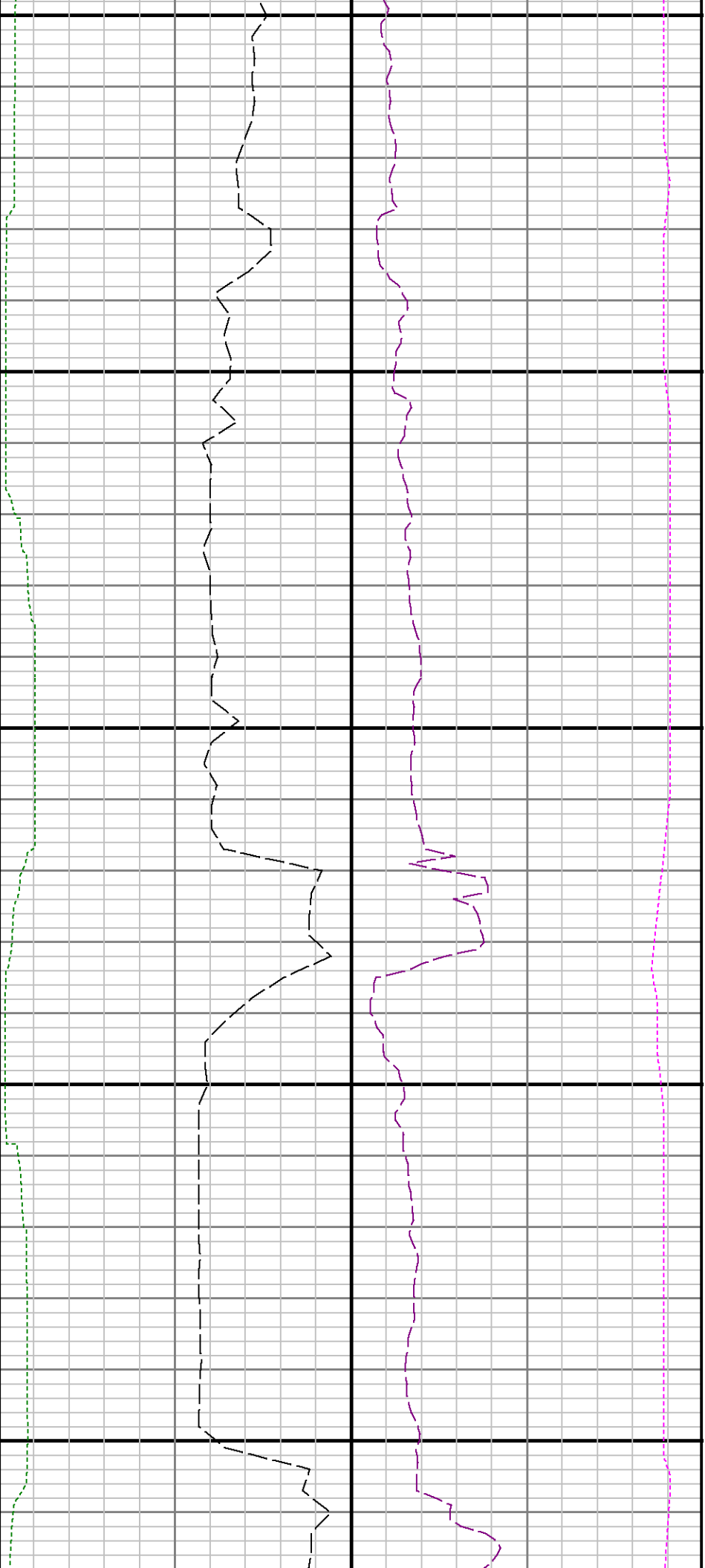




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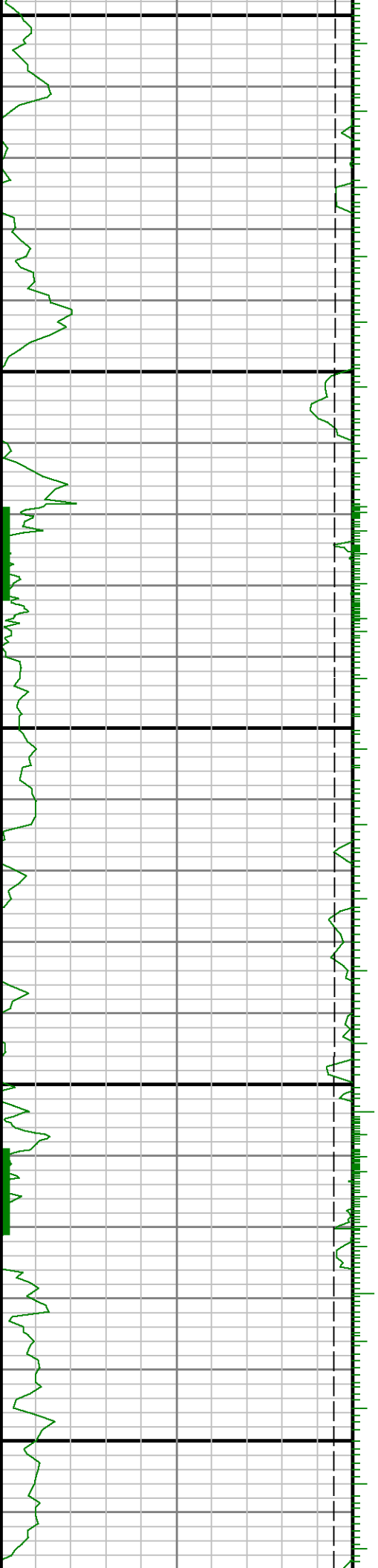
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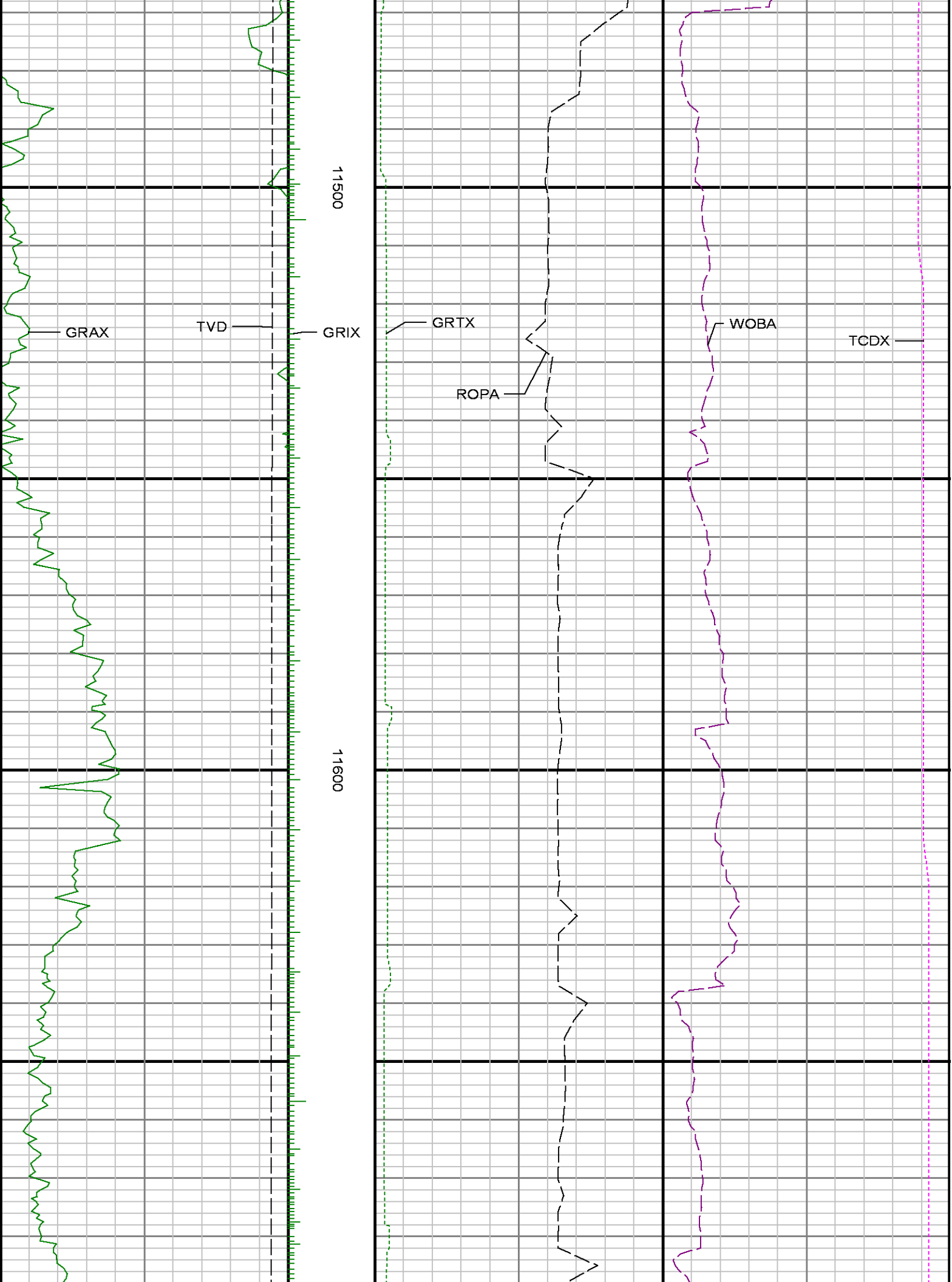


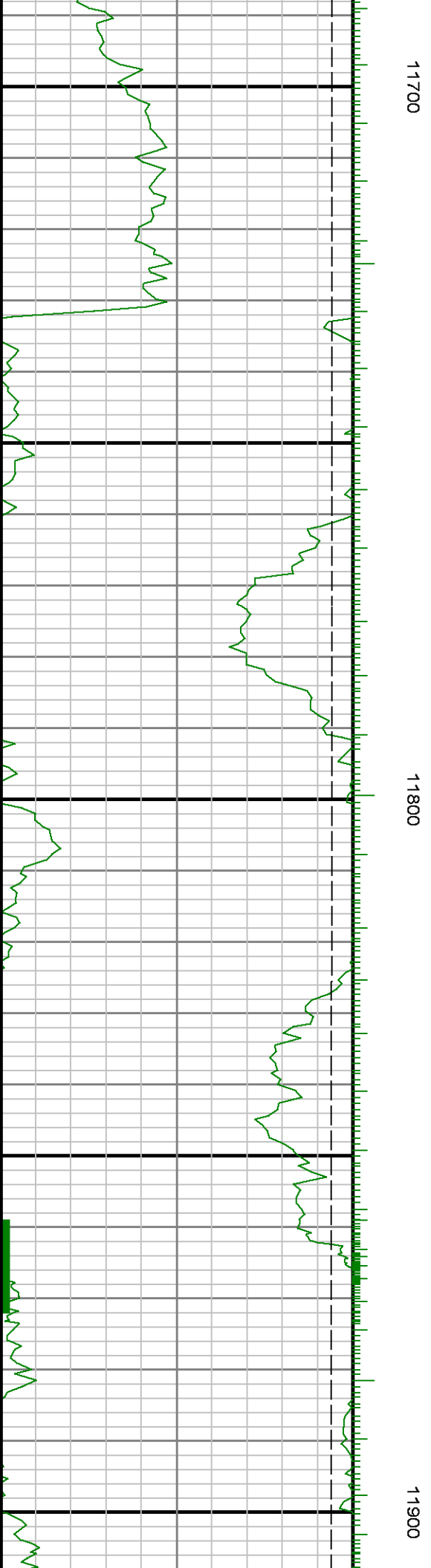
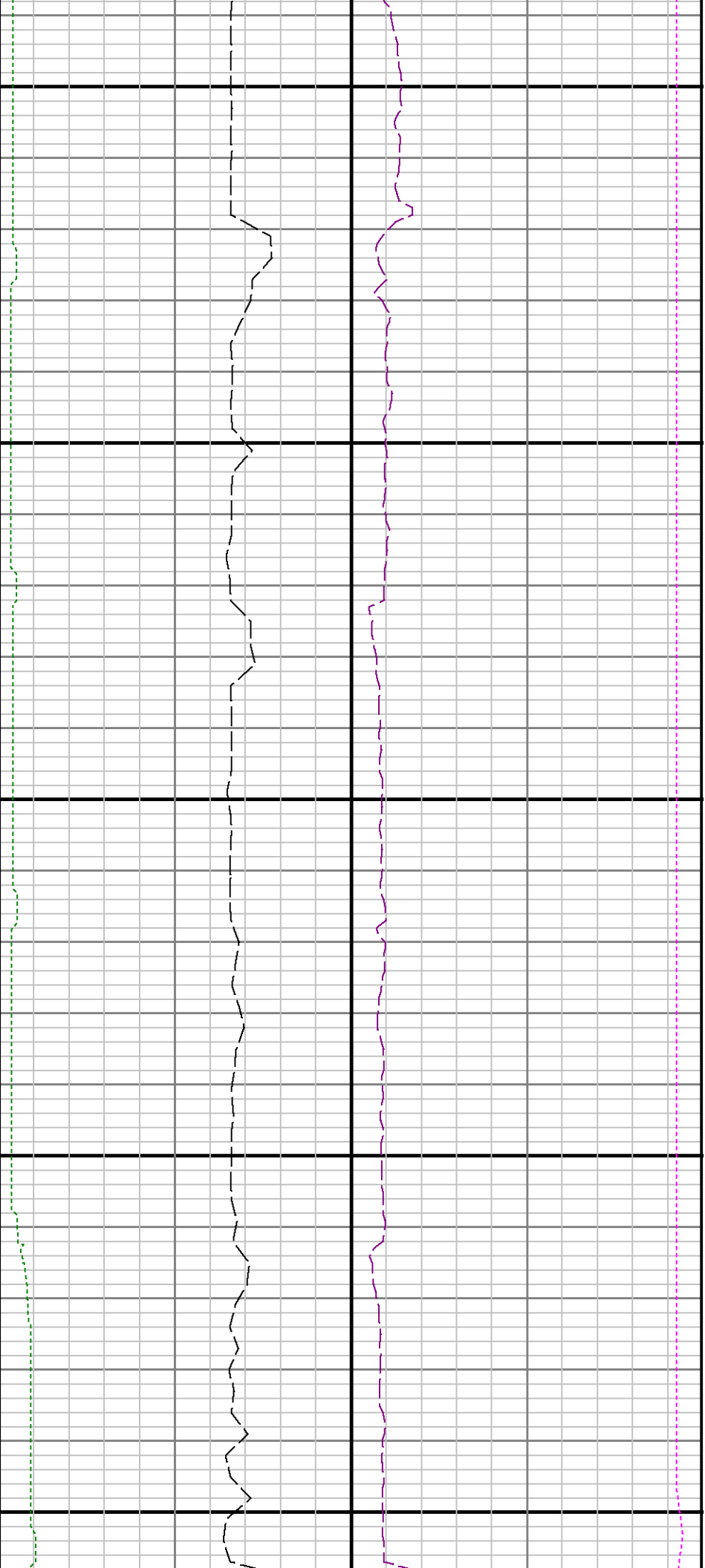


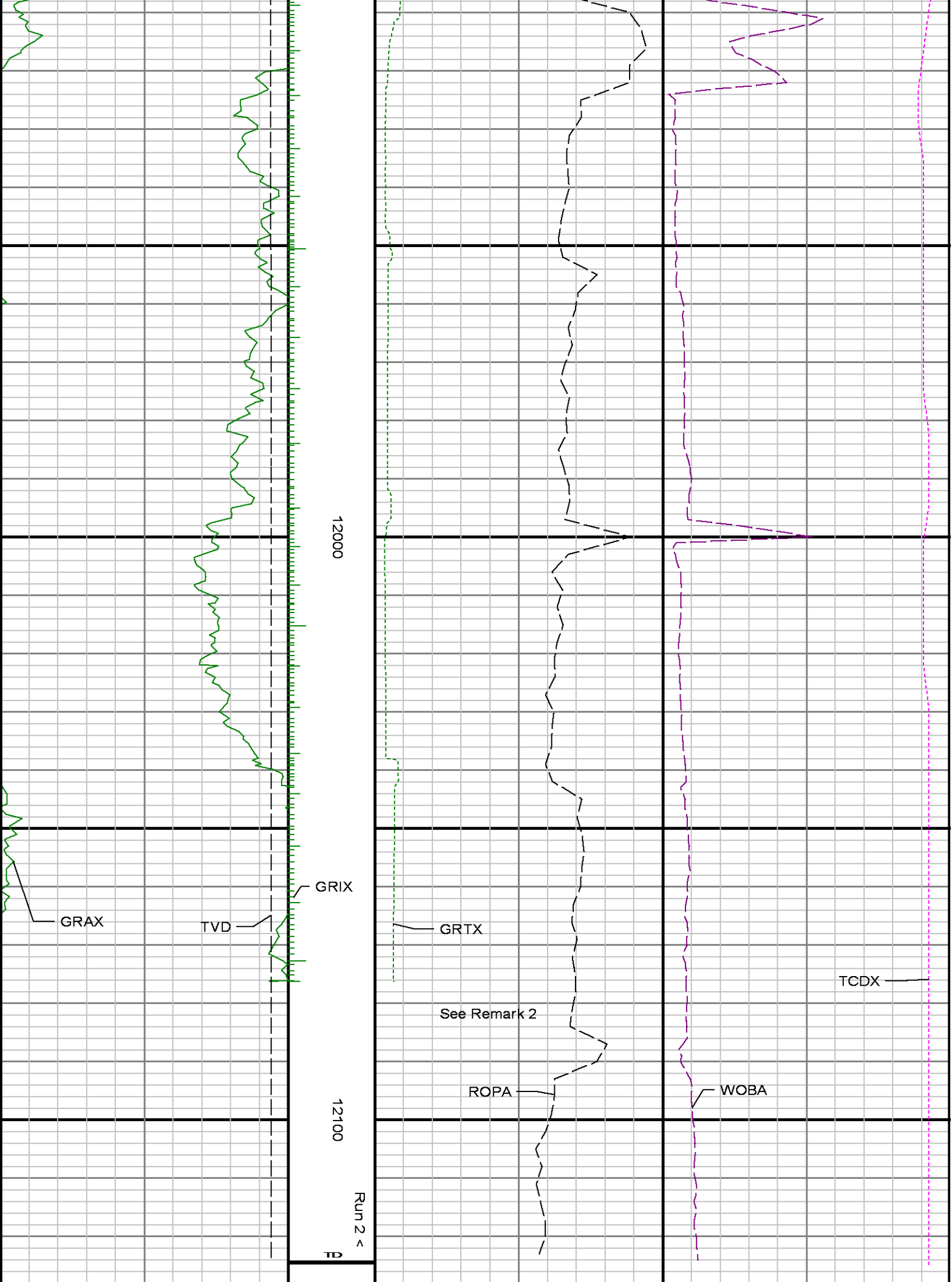
11300

11400









<p>Gamma Ray Apparent 0.5 ft Avg GRAX</p> <p>0 150</p> <p>API</p> <p>True Vertical Depth TVD</p> <p>6500 7200</p> <p>ft</p>	MD feet 1:240	<p>Rate of Penetration 3.0 ft Avg ROPA</p> <p>600 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 WOBA</p> <p>0 100</p> <p>klbf</p> <p>Downhole Temperature TCDX</p> <p>100 250</p> <p>degF</p>