



Realtime Log

Naturel Formation Evaluation
Gamma Ray

Scale:

1:240

Measured Depth

Company: Kerr-McGee Oil & Gas Onshore LP

Well: Howard 27N-28HZ

Field: Weld County (Kerr-McGee)

Region: RMD Country: United States

Status:

Final Print

Surface Location:

Latitude: 40° 1' 42.506" N

Longitude: 104° 53' 24.108" W

Other Services:

Directional
VSS

API Number:
051233692800

Section: 28 TWN: 1N Range: 67W

Permanent Datum (P.D.): Ground Level Elevation: 4999.00 ft.

Log Measured From: Drill Floor 13.00 ft. Above P.D.

Depth Reference: Driller's Depth

Elevations: N/A

KB: 4999.00 ft.

DF: 4986.00 ft.

GL: 4986.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6883 ft. Date From: 21/Oct/13 Date To: 25/Oct/13 Dip Angle: 66.33° Az: Reference North: True

Bottom: 11965 ft. Date To: 25/Oct/13 Total Mag to Reference

Spud Date: 18/Oct/13 Field Strength: 52739.0 nT North Correction: 8.47°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1043 ft.	9.625 in.	36.00 lb/ft	Surface	1034 ft.
8.750 in.	1044 ft.	7962 ft.	8.750 in.	26.00 lb/ft	Surface	7938 ft.
6.125 in.	7963 ft.	12017 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based - Fresh	3268 ft.	11769 ft.	13.500 in.	1043 ft.	0.1° / 123.7°	0.3° / 38.0°
			8.750 in.	6919 ft.	0.4° / 348.3°	85.86° / 180.58°
			6.125 in.	5098 ft.	89.3° / 180.91°	89.3° / 180.4°
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig: / Contractor:	Xtreme 20	/ Xtreme Drilling
PATS	6.4.1.34	Job No:	5769734	
		District: / Unit:	RMD	/ D&E

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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 (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start	End	
1	1	2	8.750	PDC	2.000	Steerable	6883	7906	1035	7962	21/Oct/2013 07:16	21/Oct/2013 22:40	39
2	2	2	6.125	PDC	3.996	Steerable	7909	11965	7962	12017	23/Oct/2013 17:39	25/Oct/2013 14:30	0

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
David Campbell	18 Oct 2013	26 Oct 2013	Barry Combs	18 Oct 2013	26 Oct 2013	Skipp Star	18 Oct 2013	26 Oct 2013
Travis Wilcox	18 Oct 2013	24 Oct 2013	Mark Snyder	24 Oct 2013	26 Oct 2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
20/Oct/2013	11:11	1	3268	Water Based - Fresh	8.5	32	7.5	14.0	0 / 99	Active Mud Pit	1100	0.0
21/Oct/2013	06:04	1	6883	Water Based - Fresh	8.6	32	7.6	18.0	0 / 97	Active Mud Pit	900	0.0
23/Oct/2013	11:22	2	7962	Water Based - Fresh	10.0	44	7.9	6.0	4 / 87	Active Mud Pit	1000	0.0
24/Oct/2013	06:34	2	8863	Water Based - Fresh	10.0	44	7.9	5.5	4 / 87	Active Mud Pit	1000	0.0
25/Oct/2013	06:07	2	11021	Water Based - Fresh	9.2	45	8.0	4.8	4 / 90	Active Mud Pit	1100	0.0

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 (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12373456	Directional	56.83	6.750	0.000
1	SRIG	12600750	Gamma	53.46	6.750	0.000
2	DIR	12479852	Directional	54.58	4.750	0.000
2	SRIG	12578109	Gamma	51.20	4.750	0.000

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 obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2.) Baker Hughes run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1044 to 7962 feet MD (1044 to 7520 feet TVD).
- 3.) Baker Hughes run 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 6 1/8 inch bit and steerable assembly from 7962 to 12017 feet MD (7520 to 7489 feet TVD).
- 4.) The interval from 1044 to 6880 feet MD (1044 to 6851 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes run 1.
- 5.) A sliding indicator is shown on the right side of track 2 as a heavy line. This indicator has been depth shifted to the resistivity sensor offset to correspond with

Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	6880	8.750	1	Begin logging due to directional only services being provided thru vertical section.
2	7909	8.750	1	The section between 7909' MD and 7966' MD (7518' and 7521' TVD) was relogged up to 18 hours after being drilled due to casing and cement operations.
3	11965	6.125	2	The section between 11965' and 12017' MD (7488' and 7489' TVD) has no sensor data due to sensor to bit offsets.

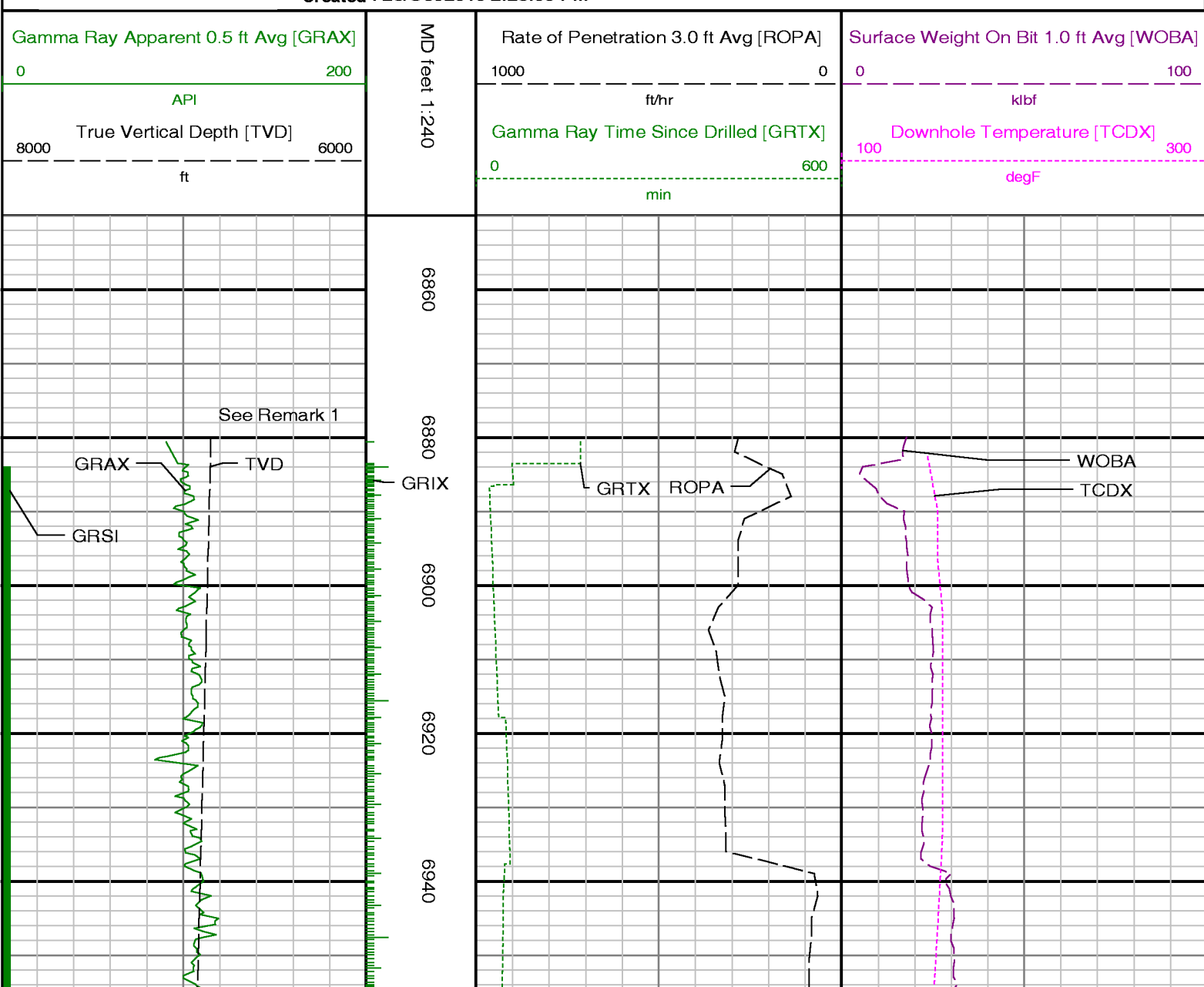


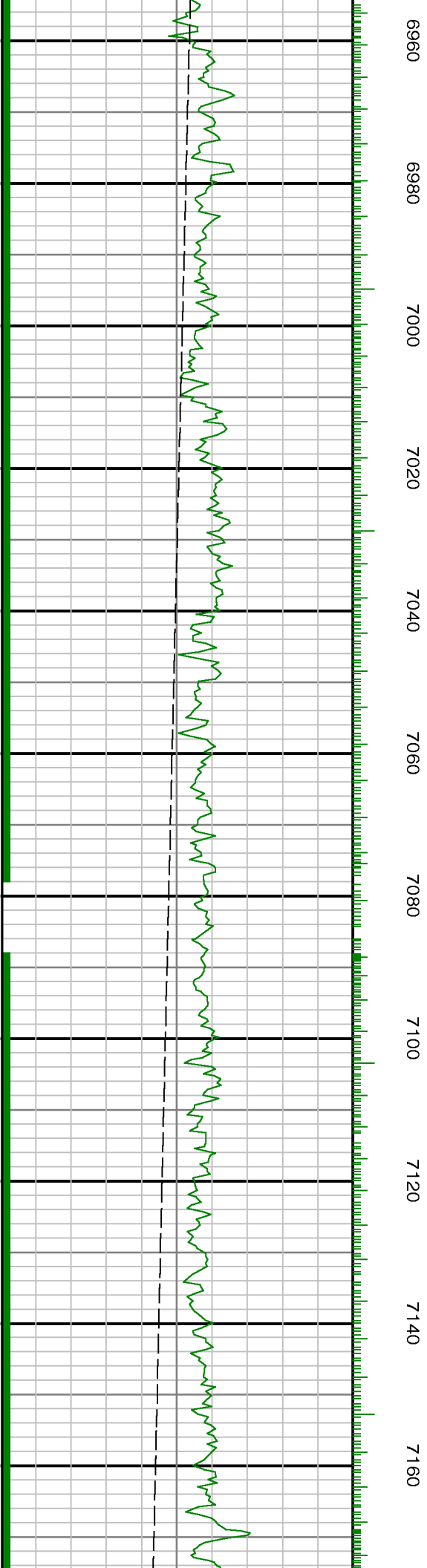
Company : Kerr-McGee Oil & Gas Onshore LP

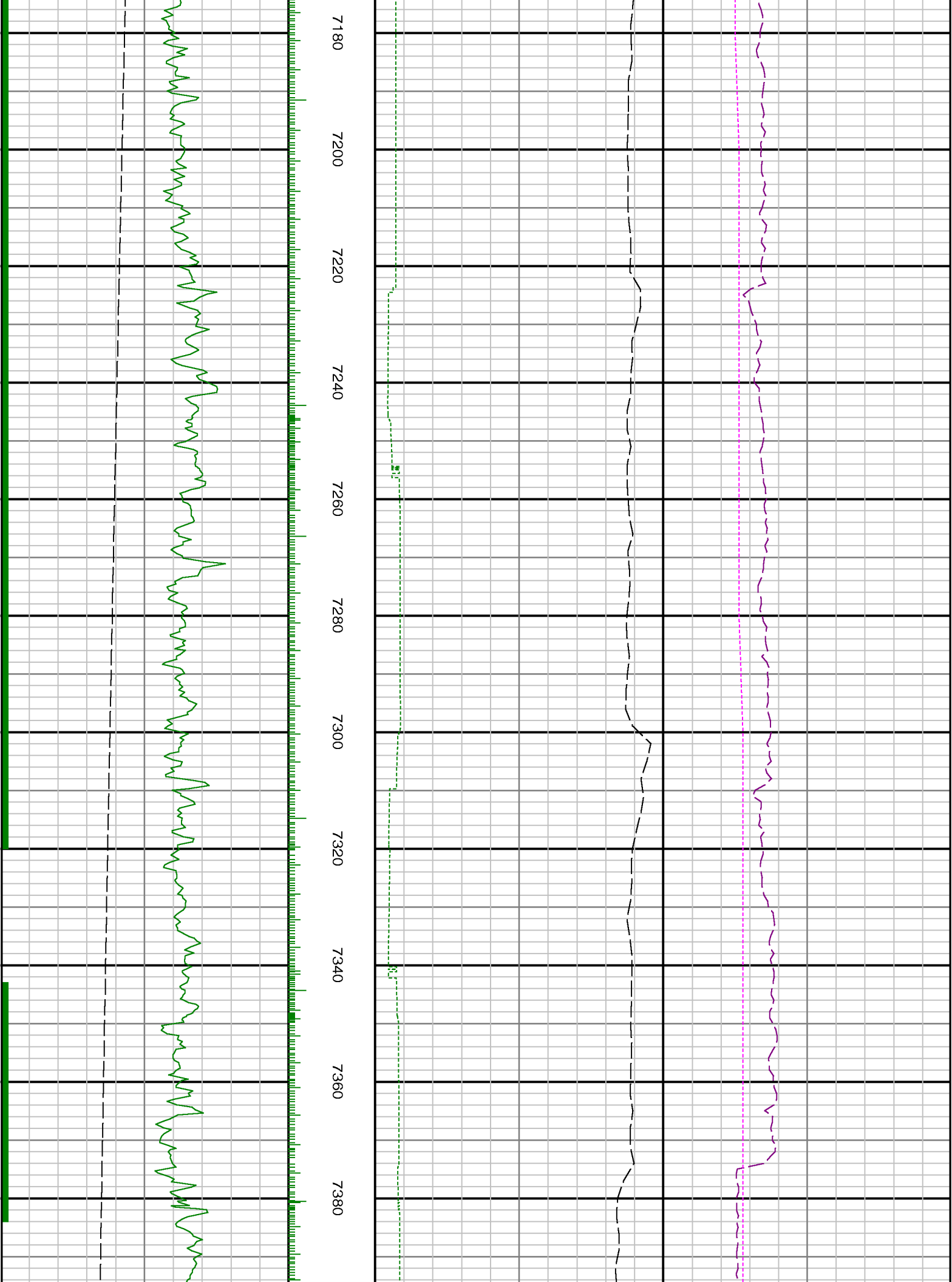
Well : Howard 27N-28HZ

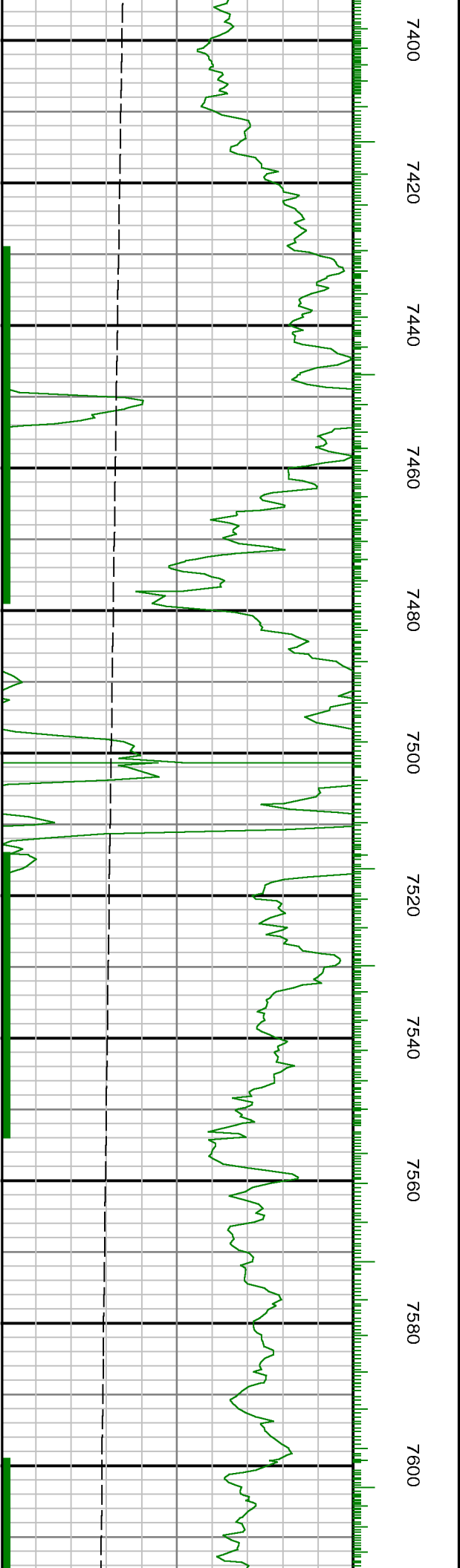
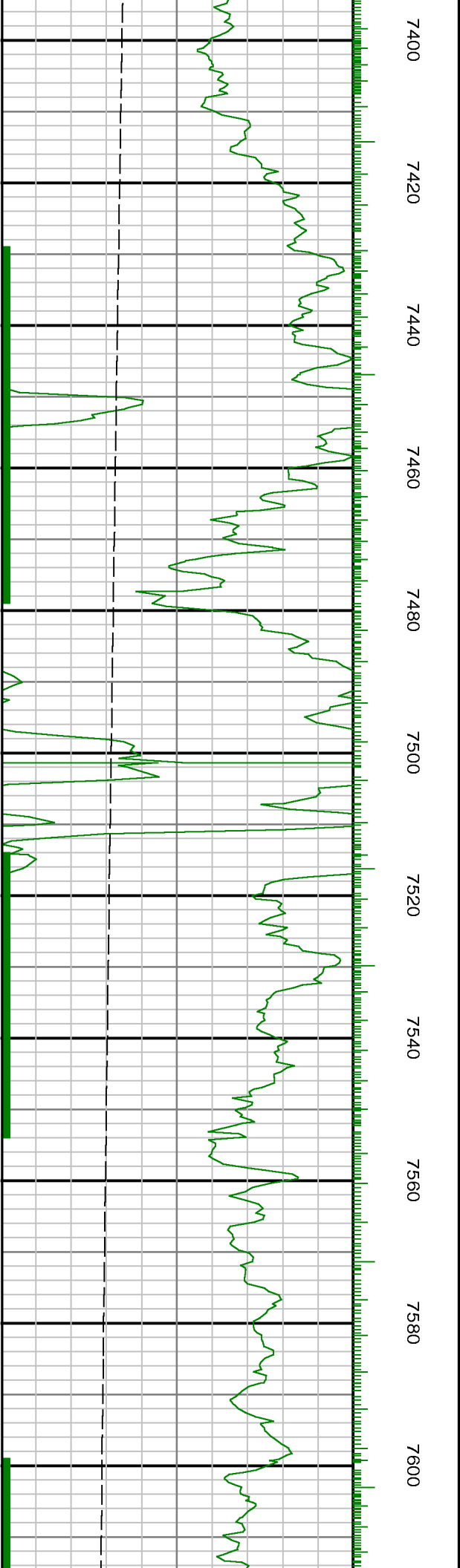
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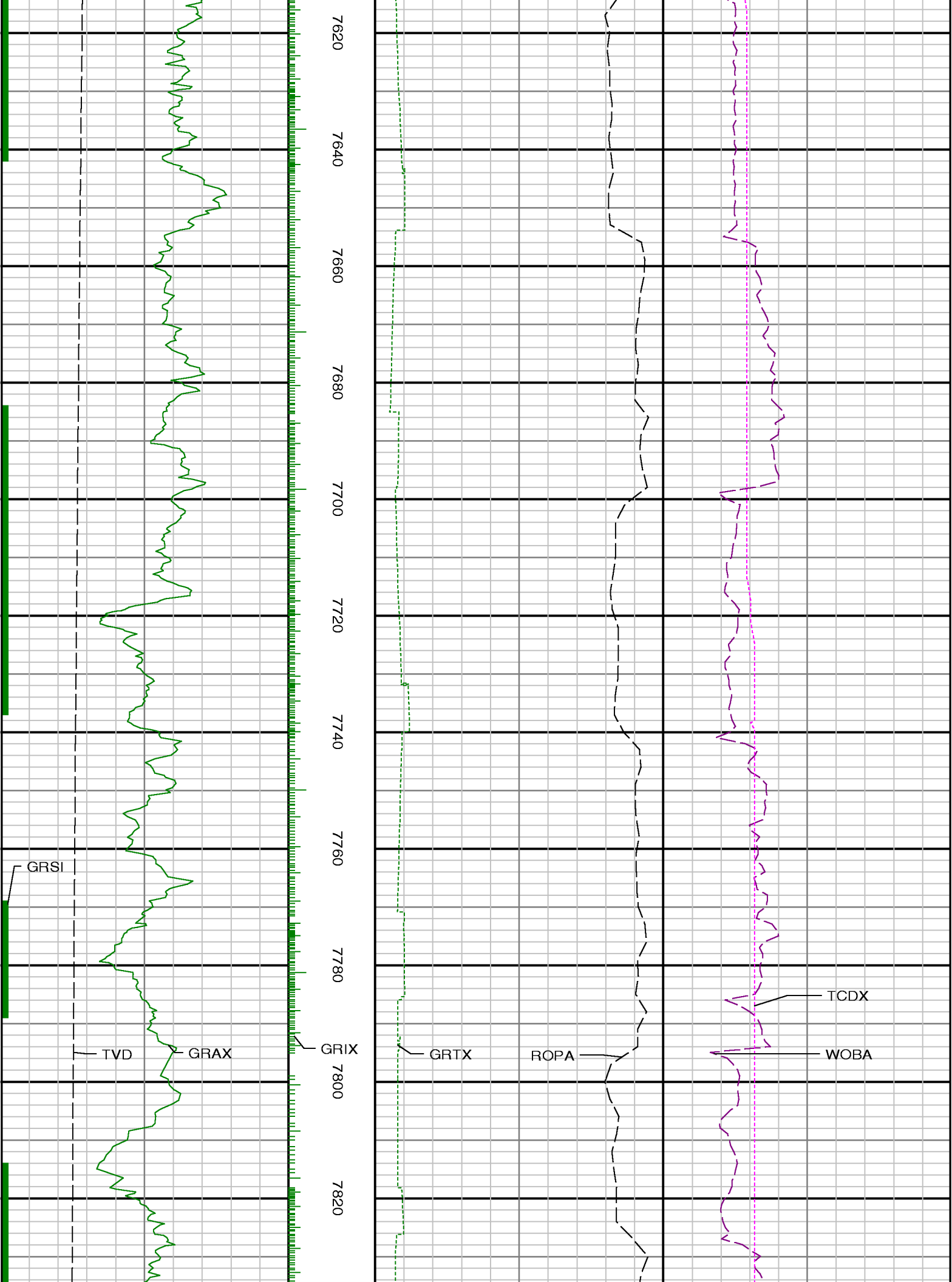
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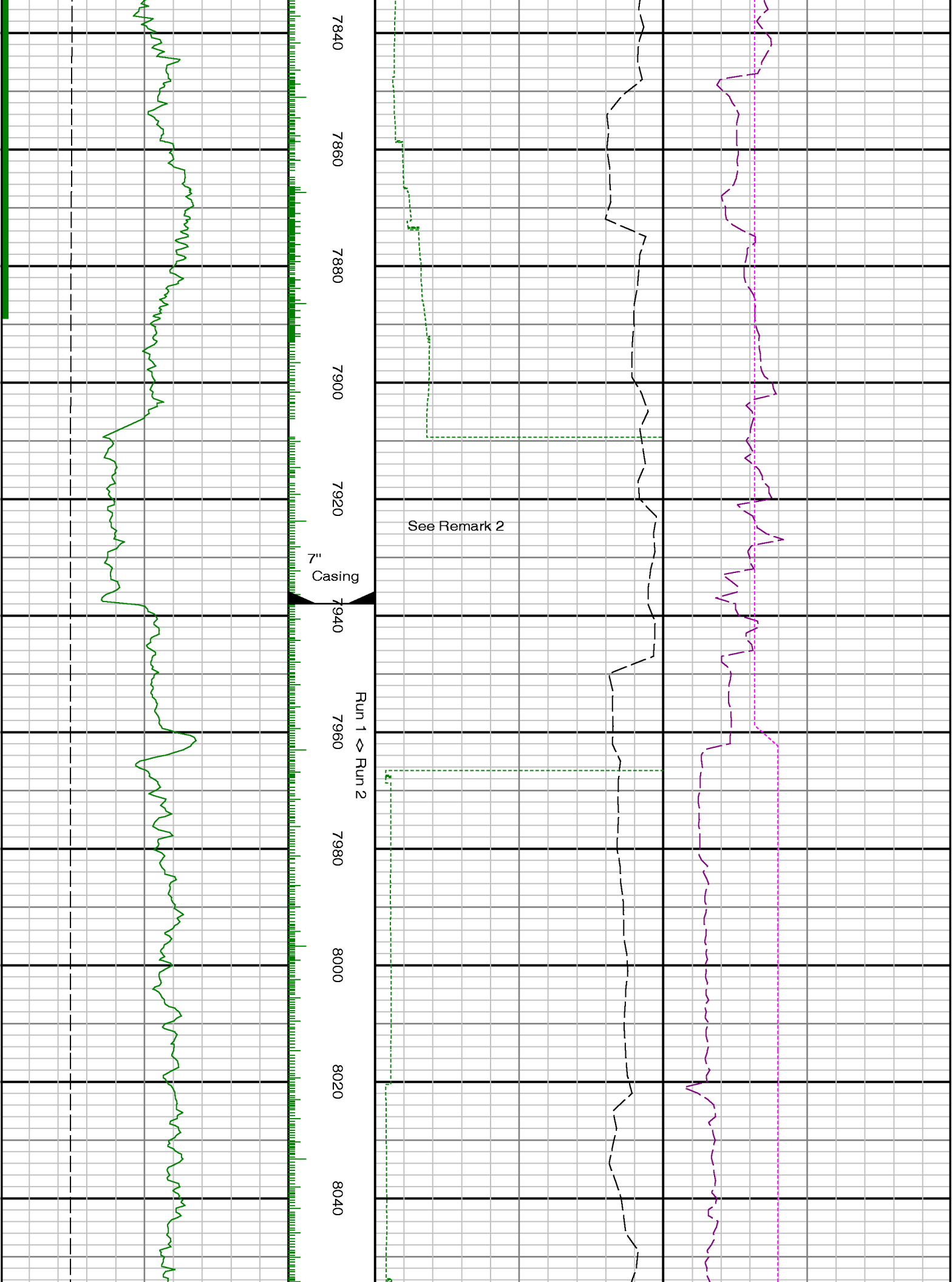


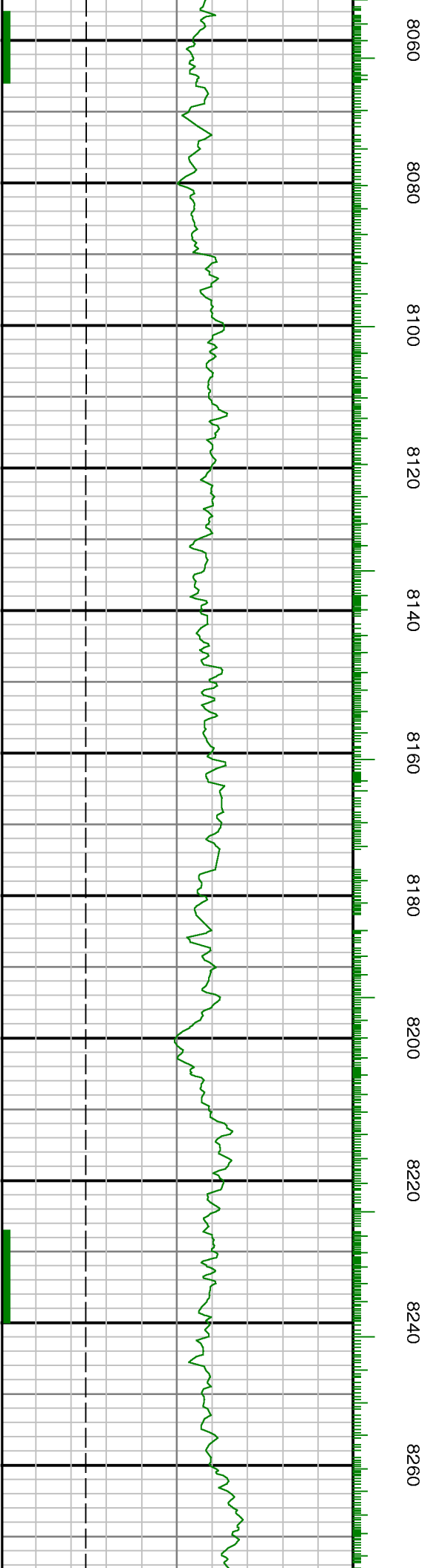
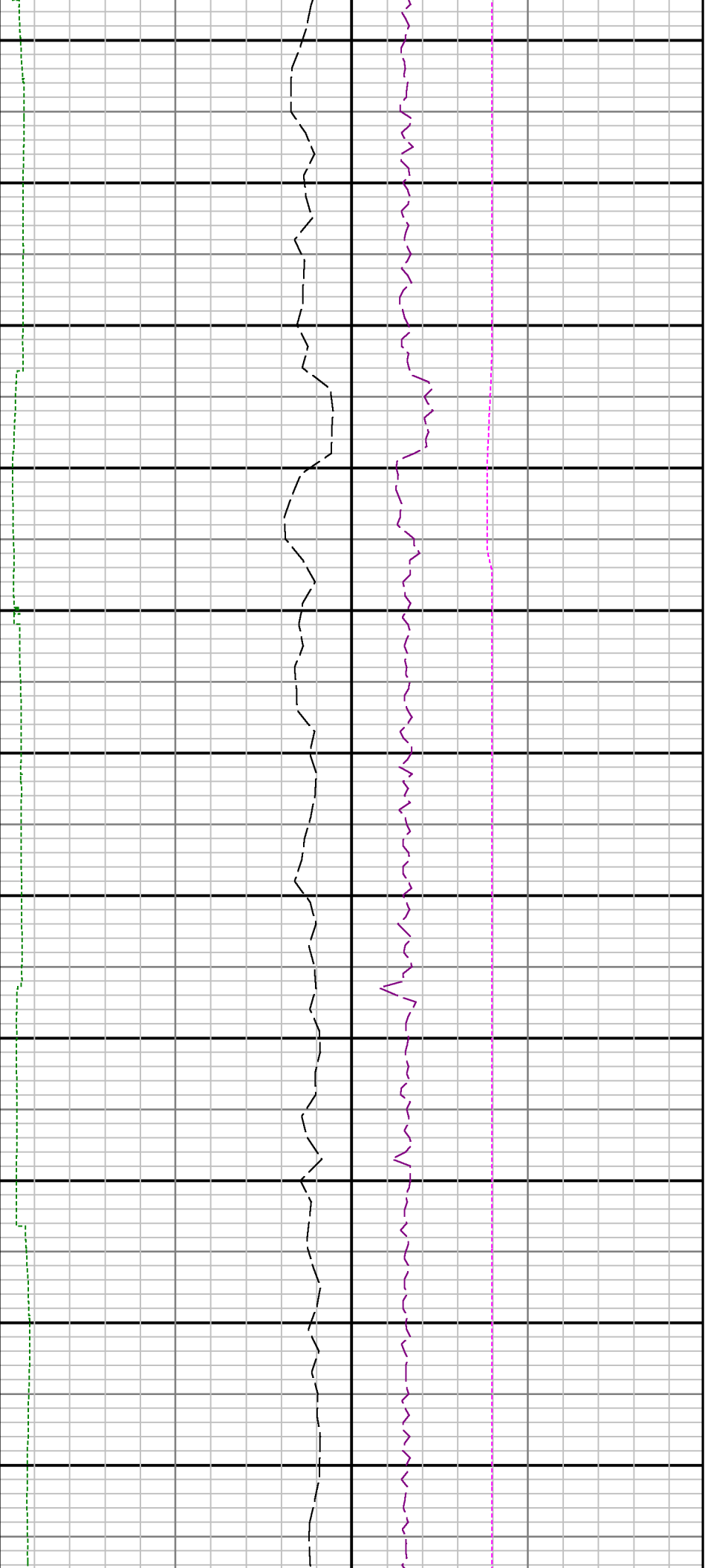


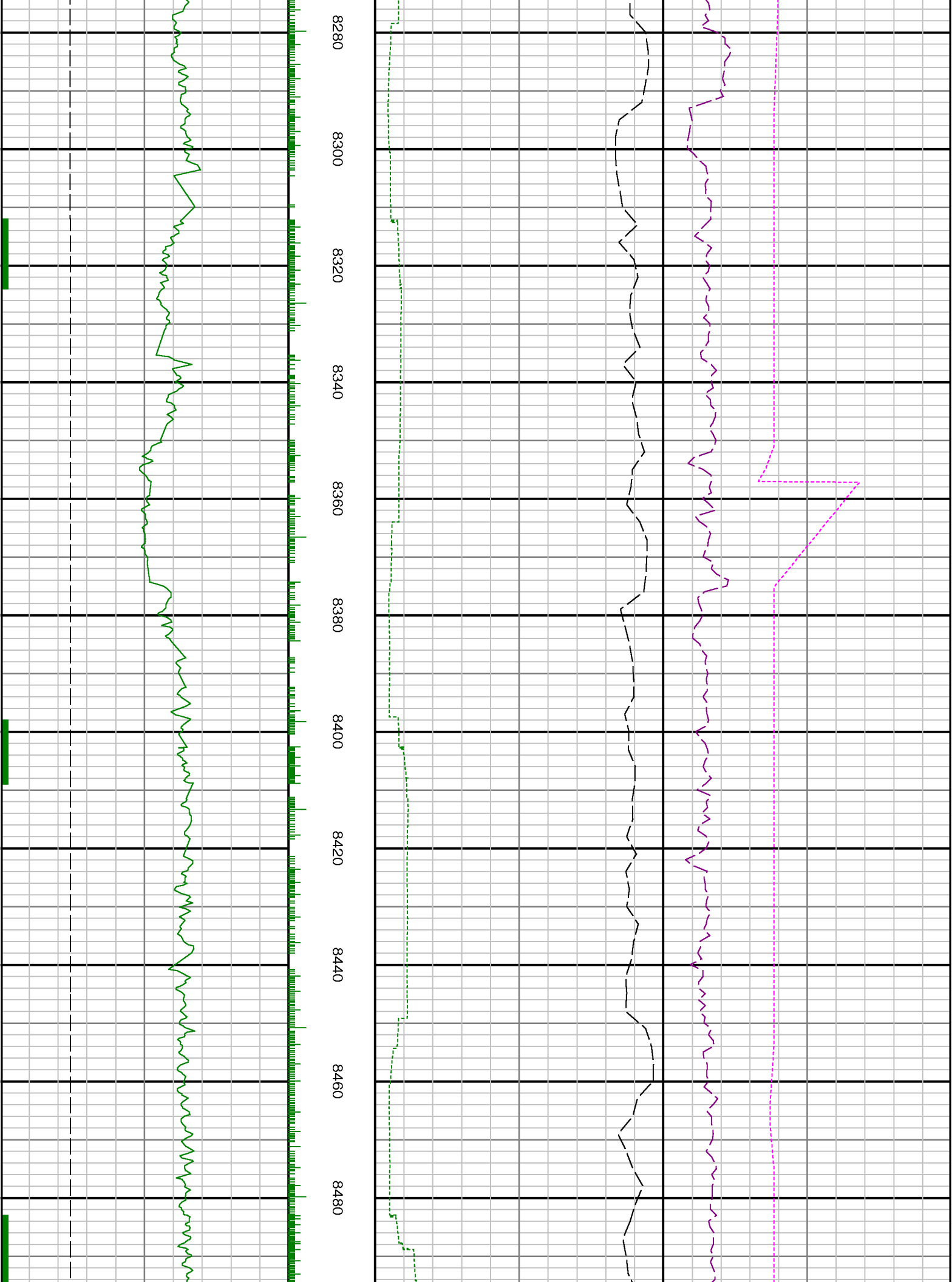


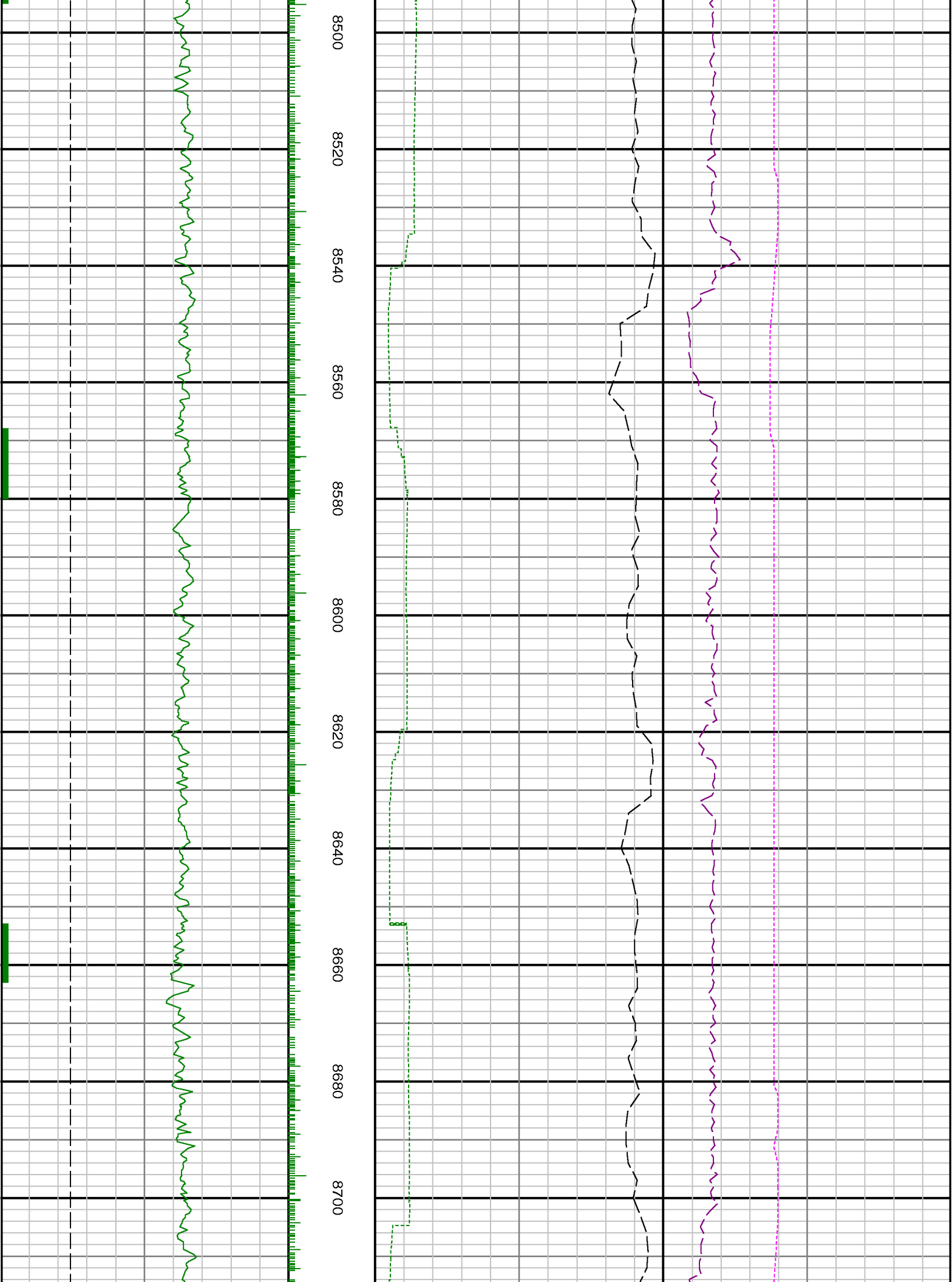


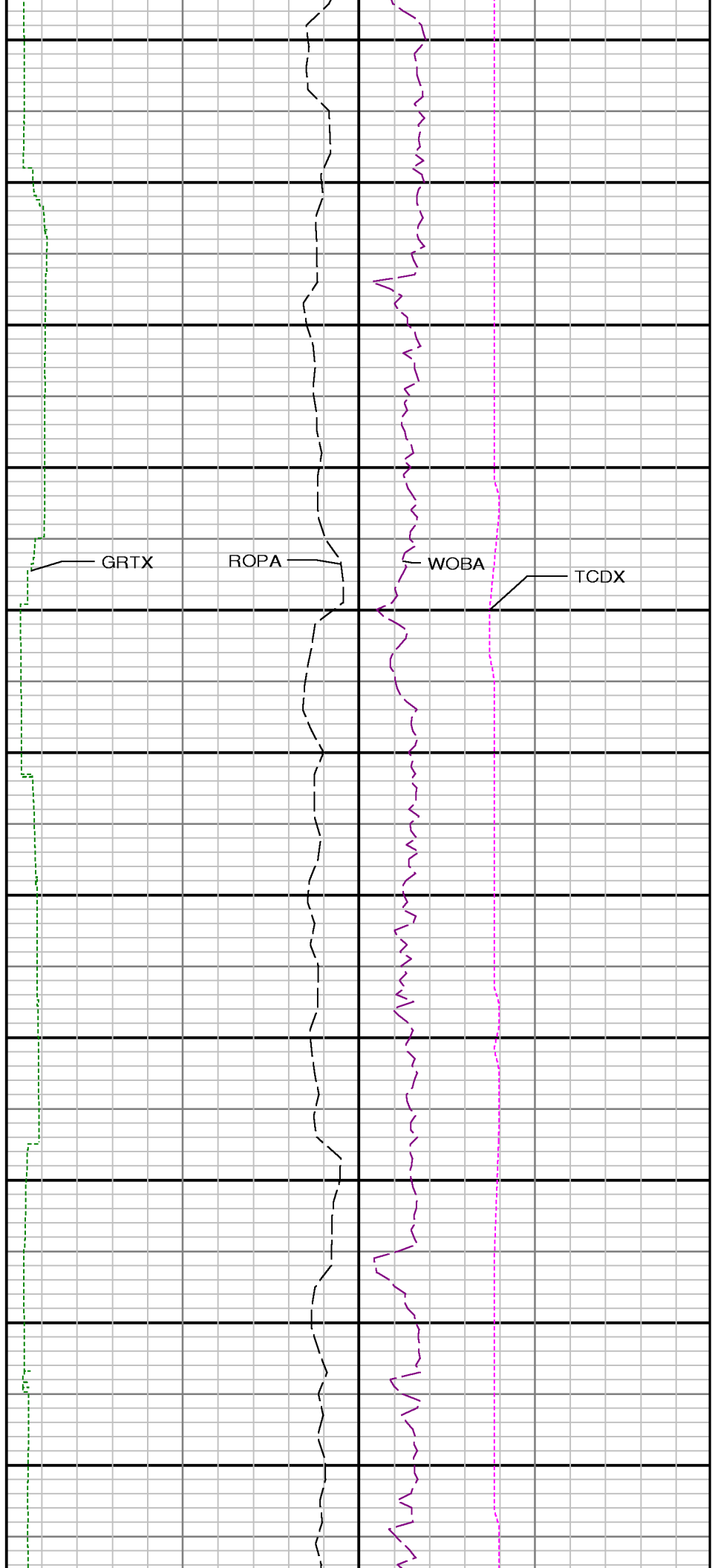
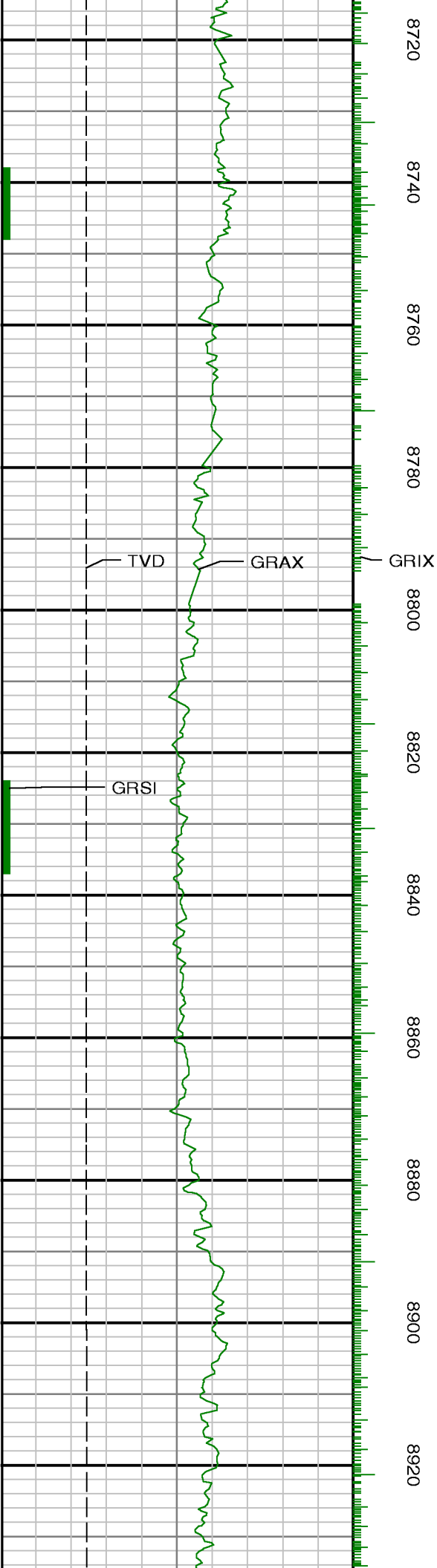


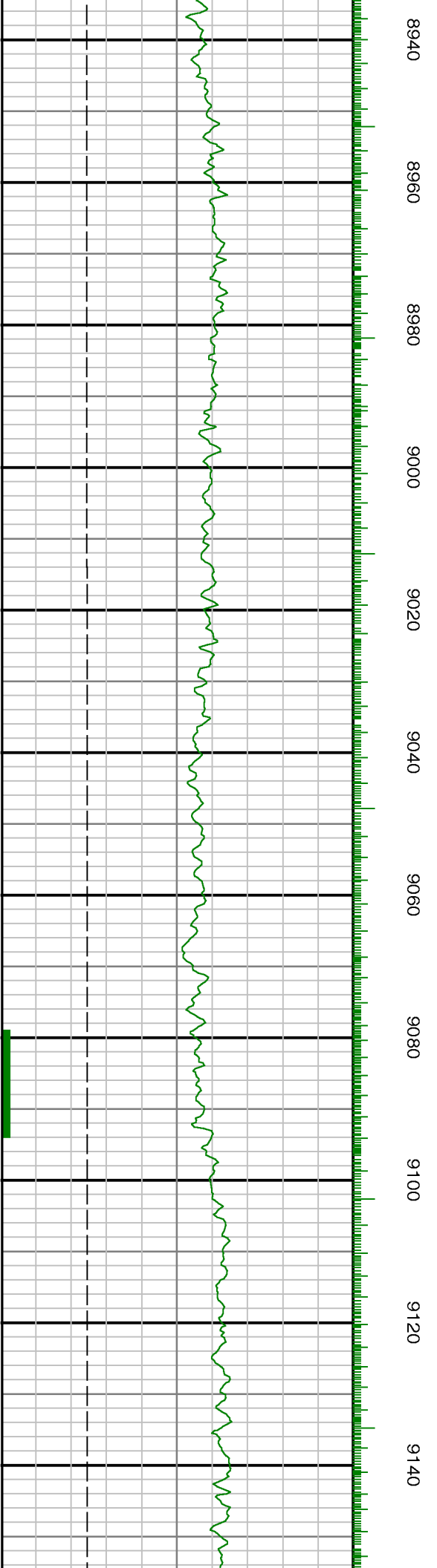
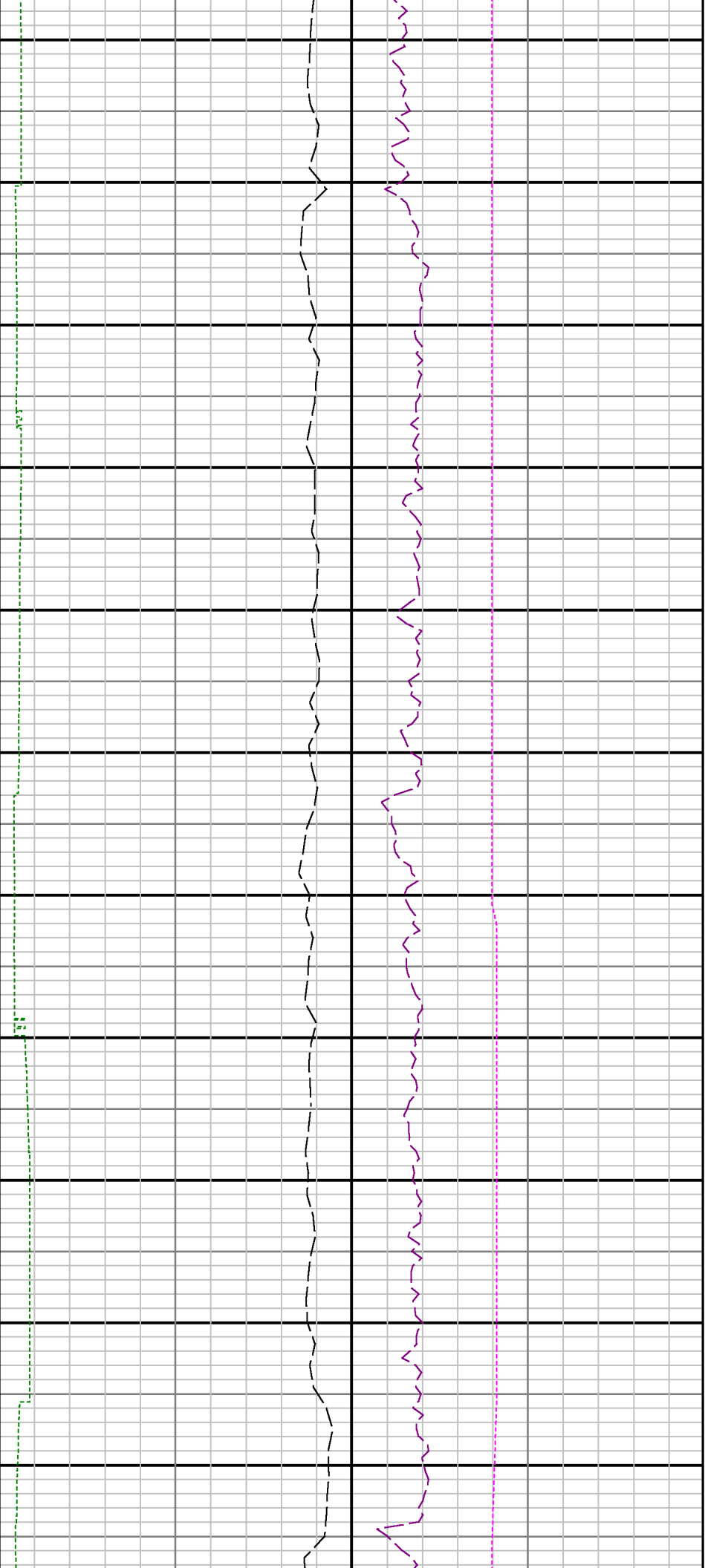


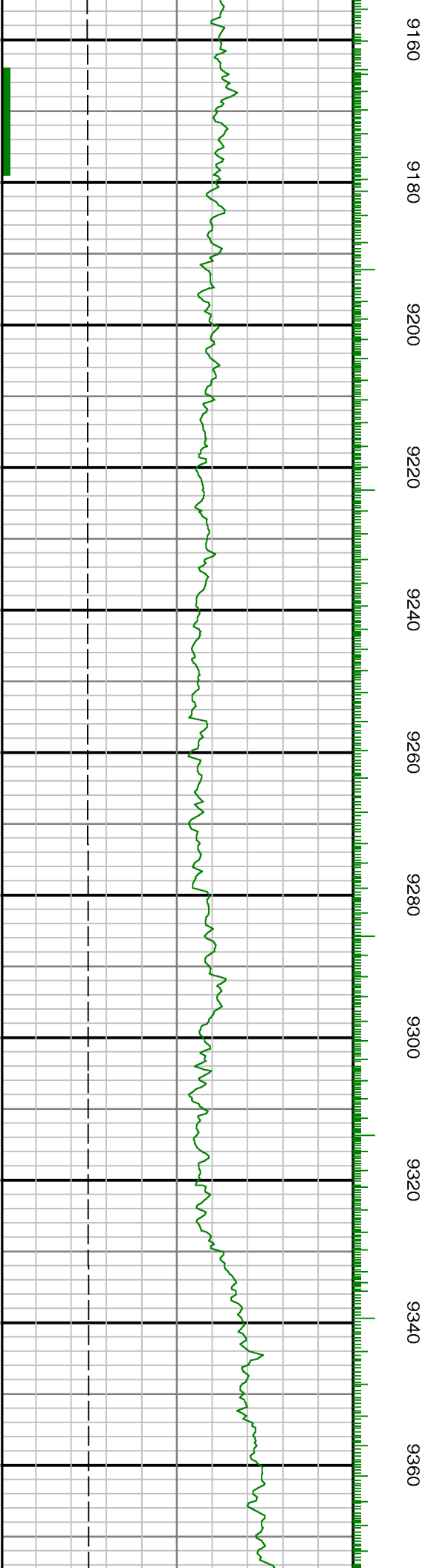
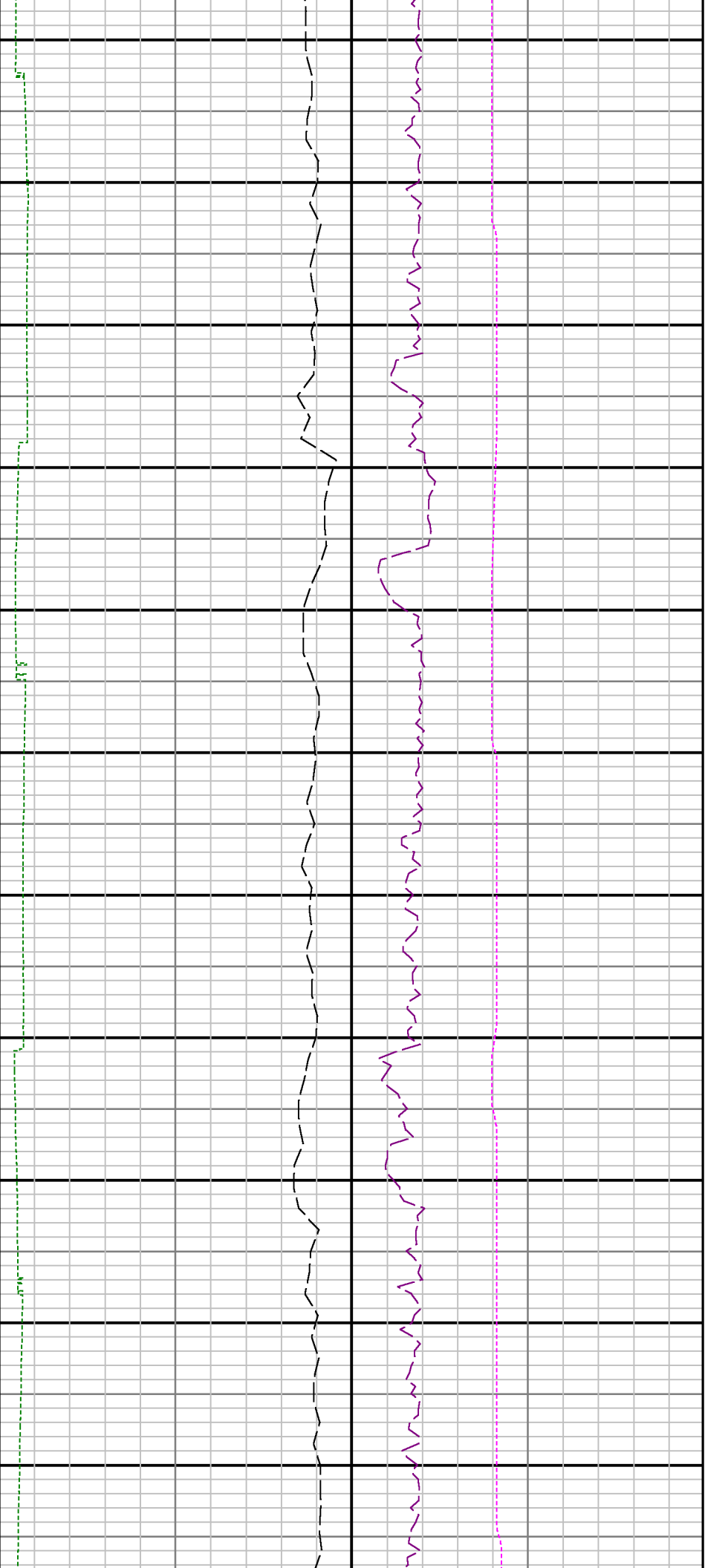


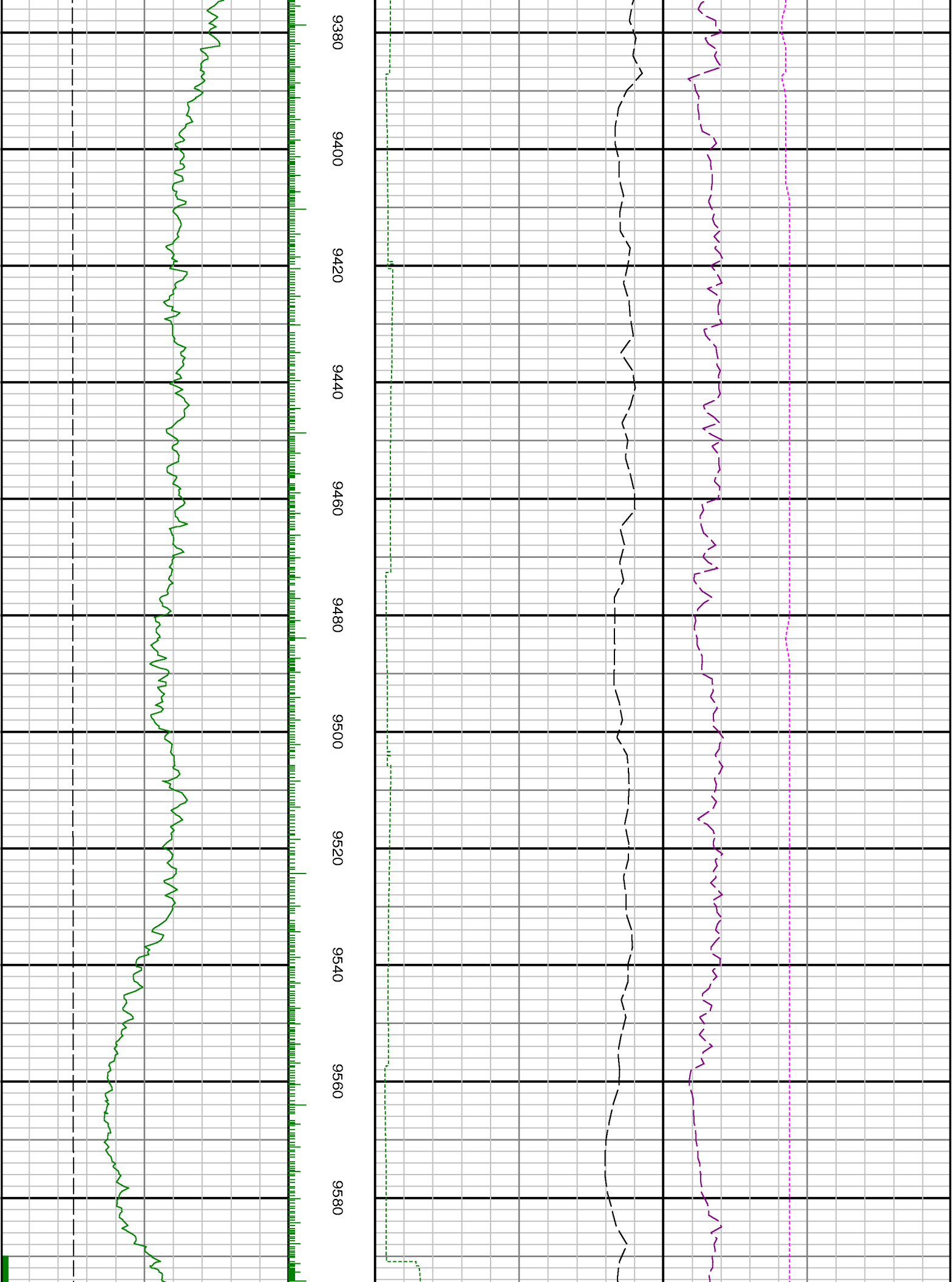


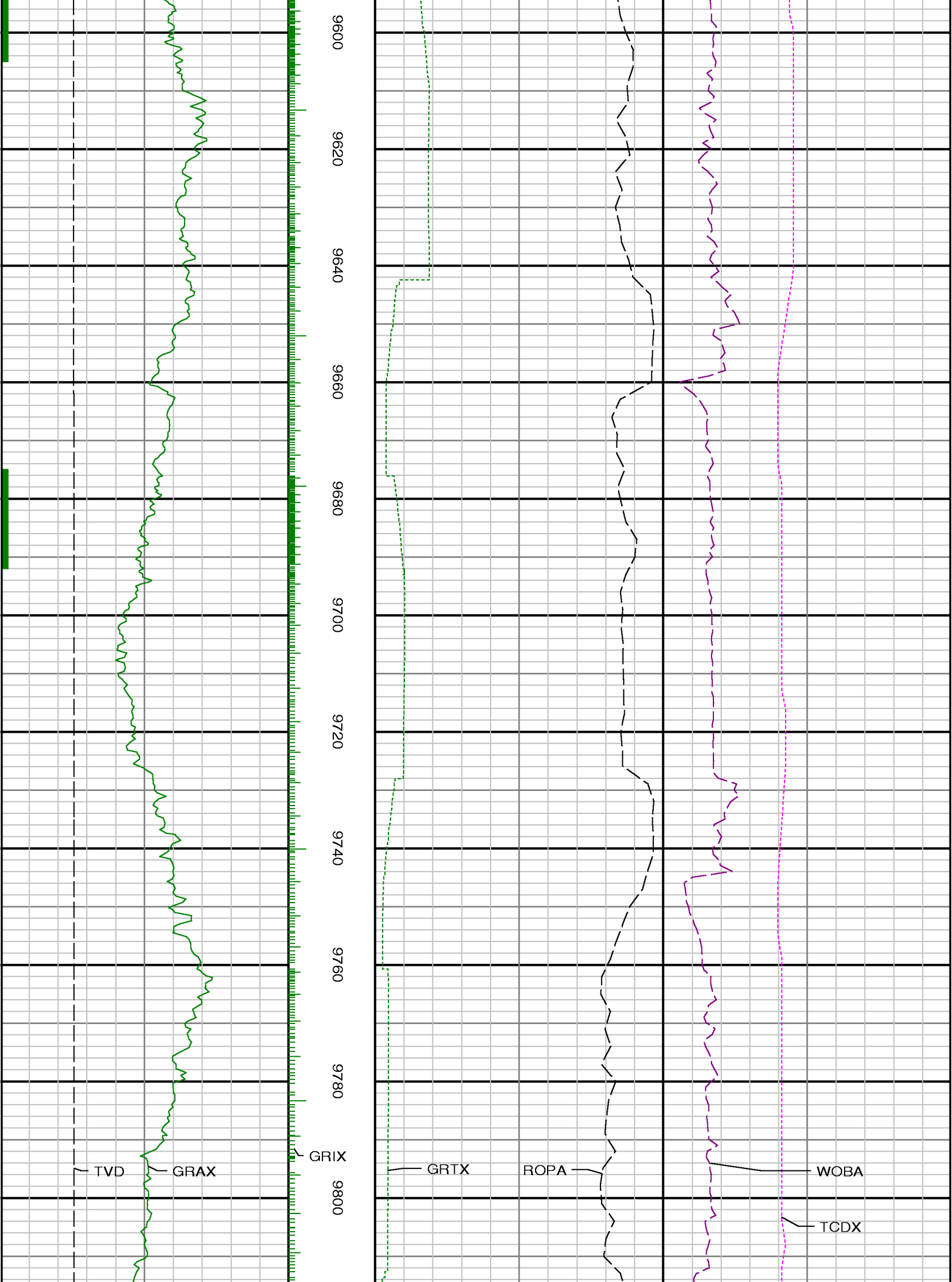


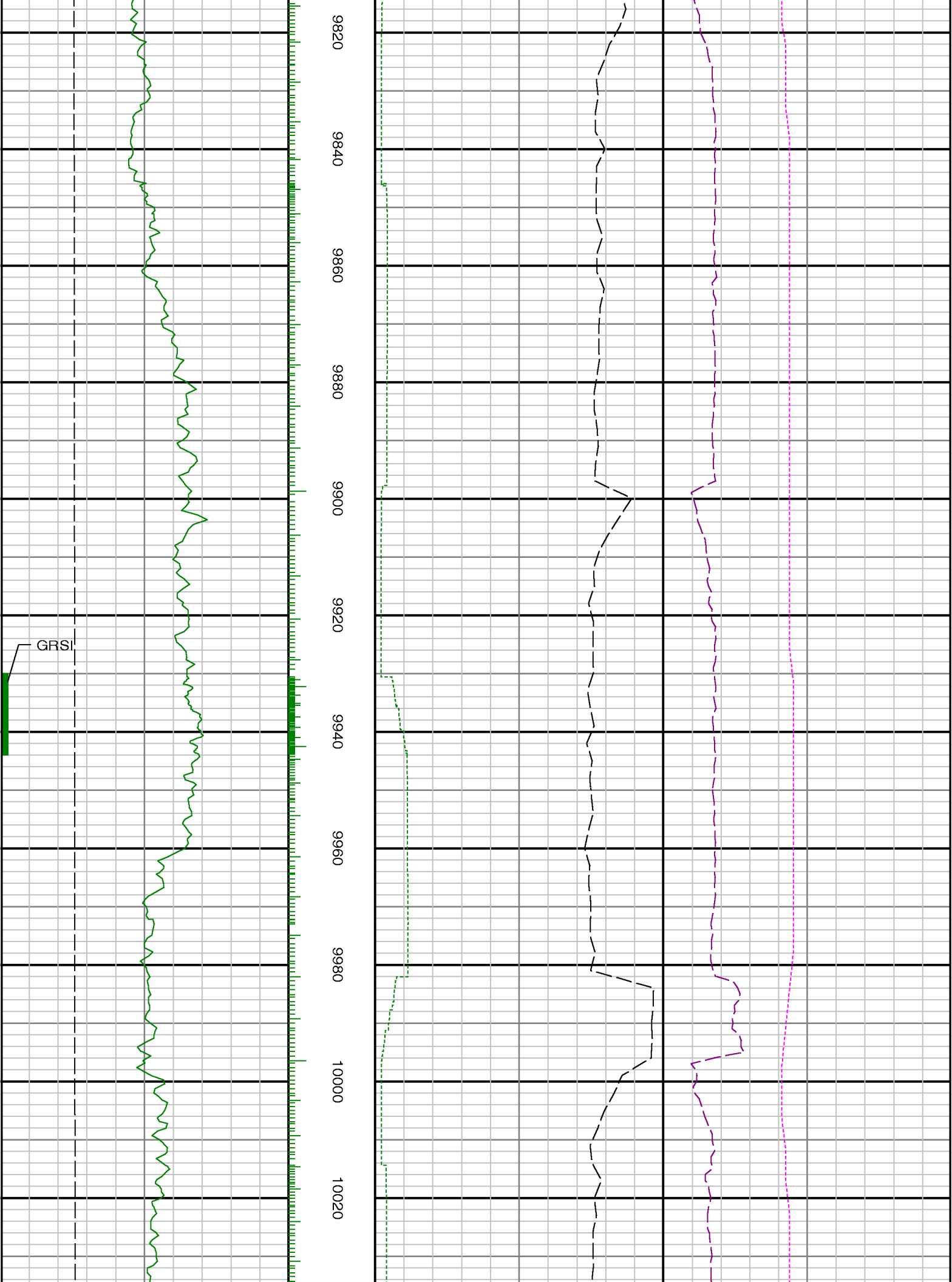


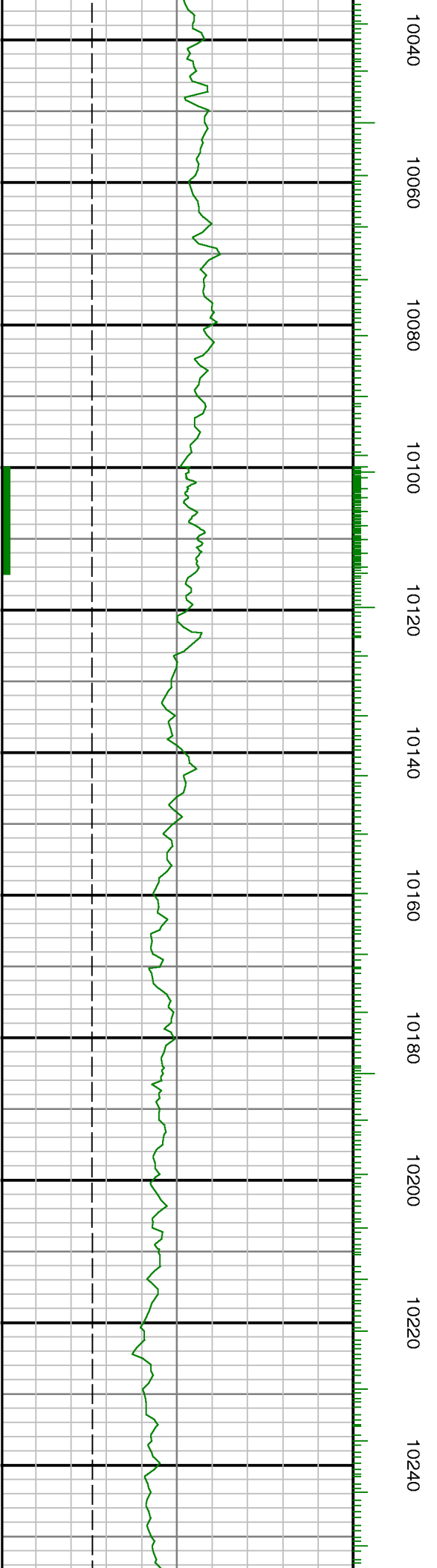


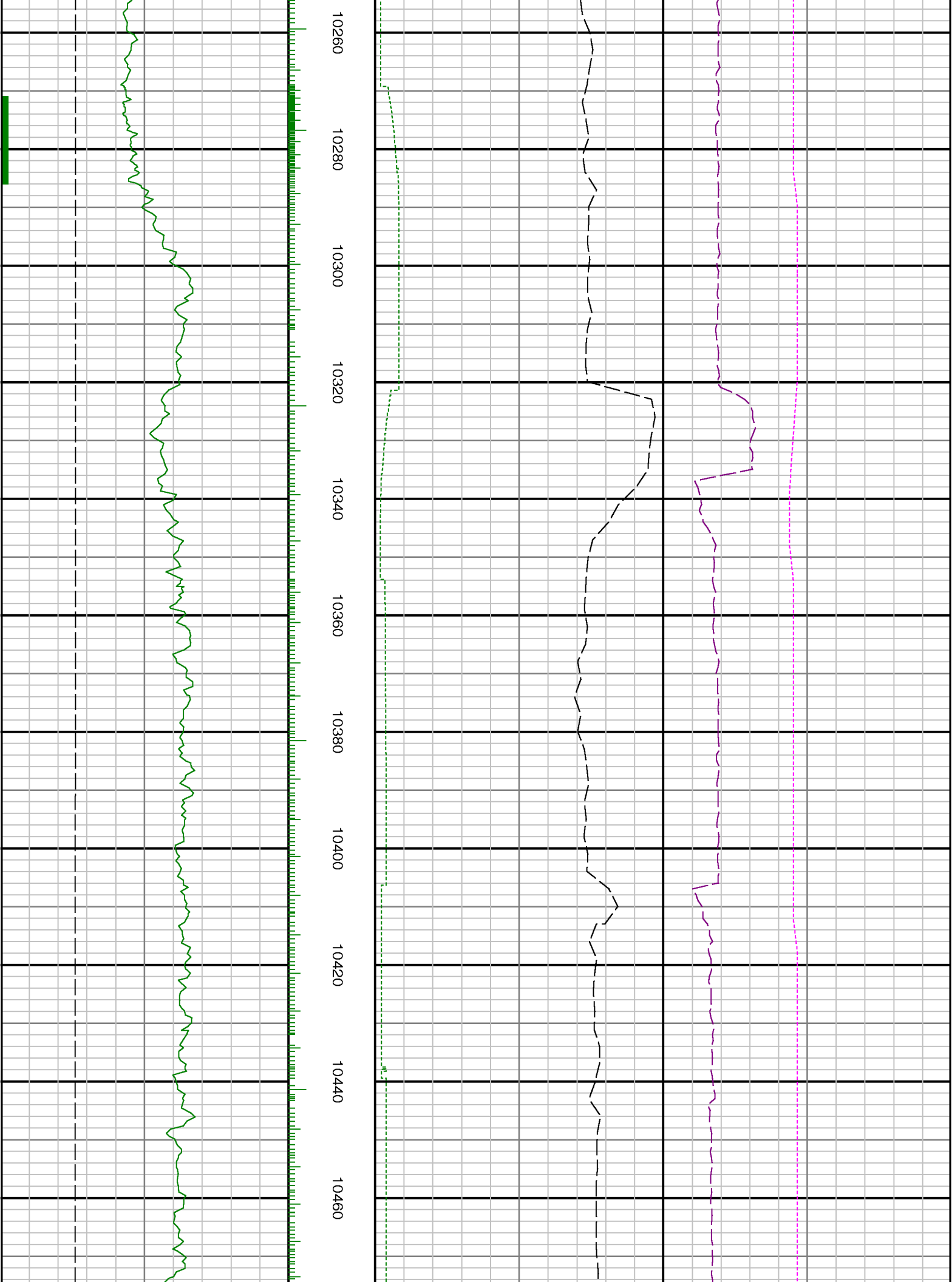


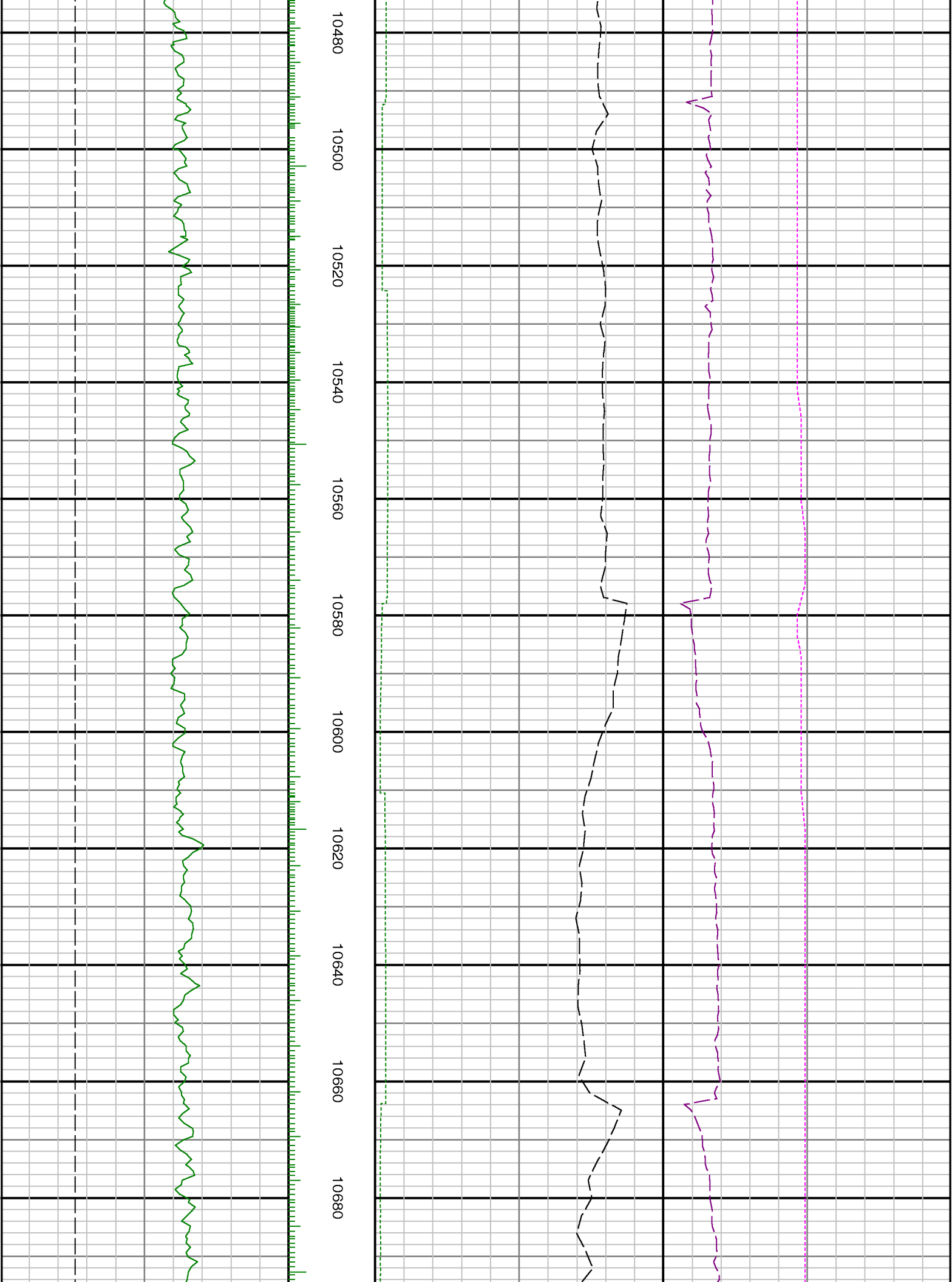


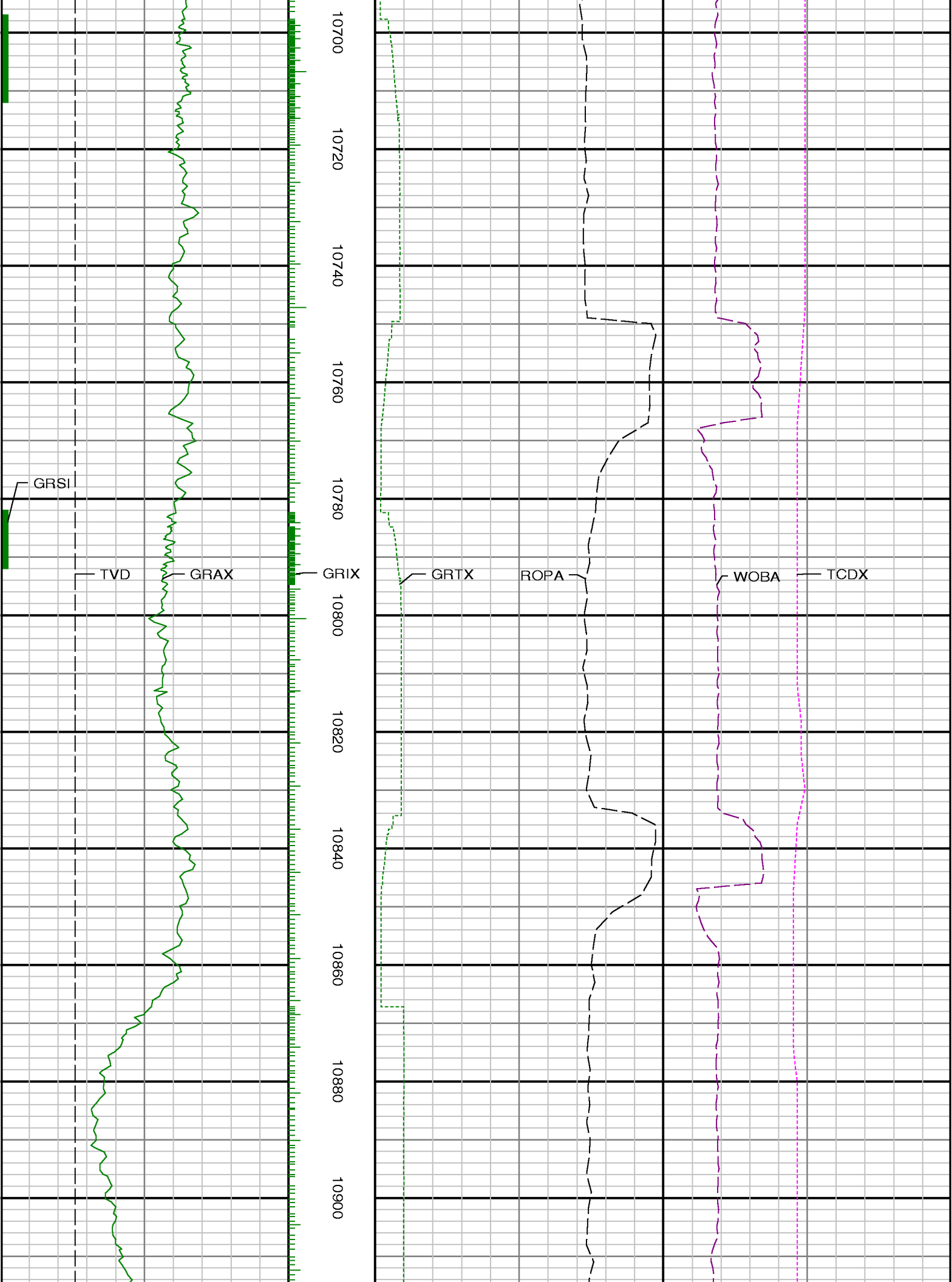


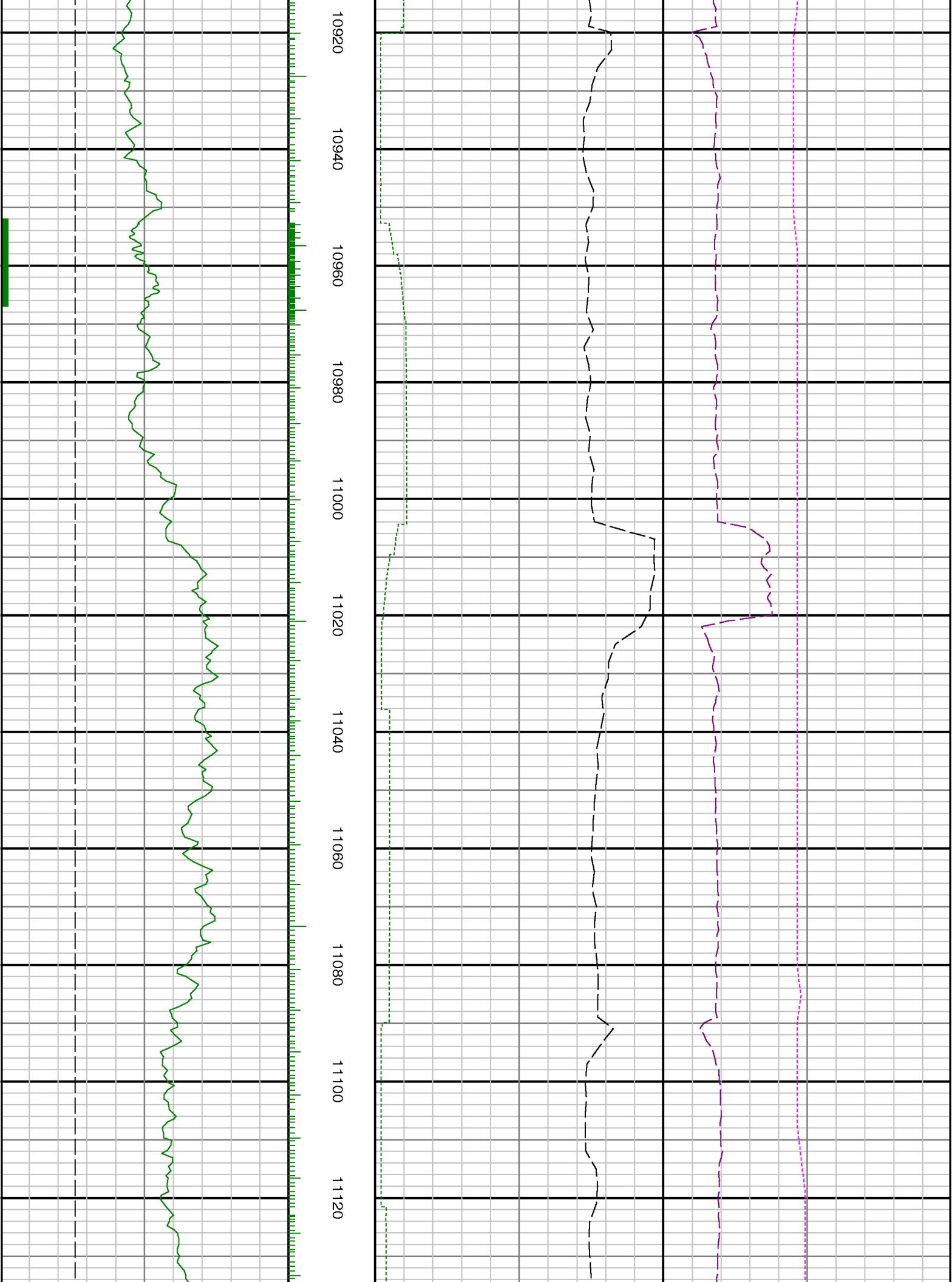


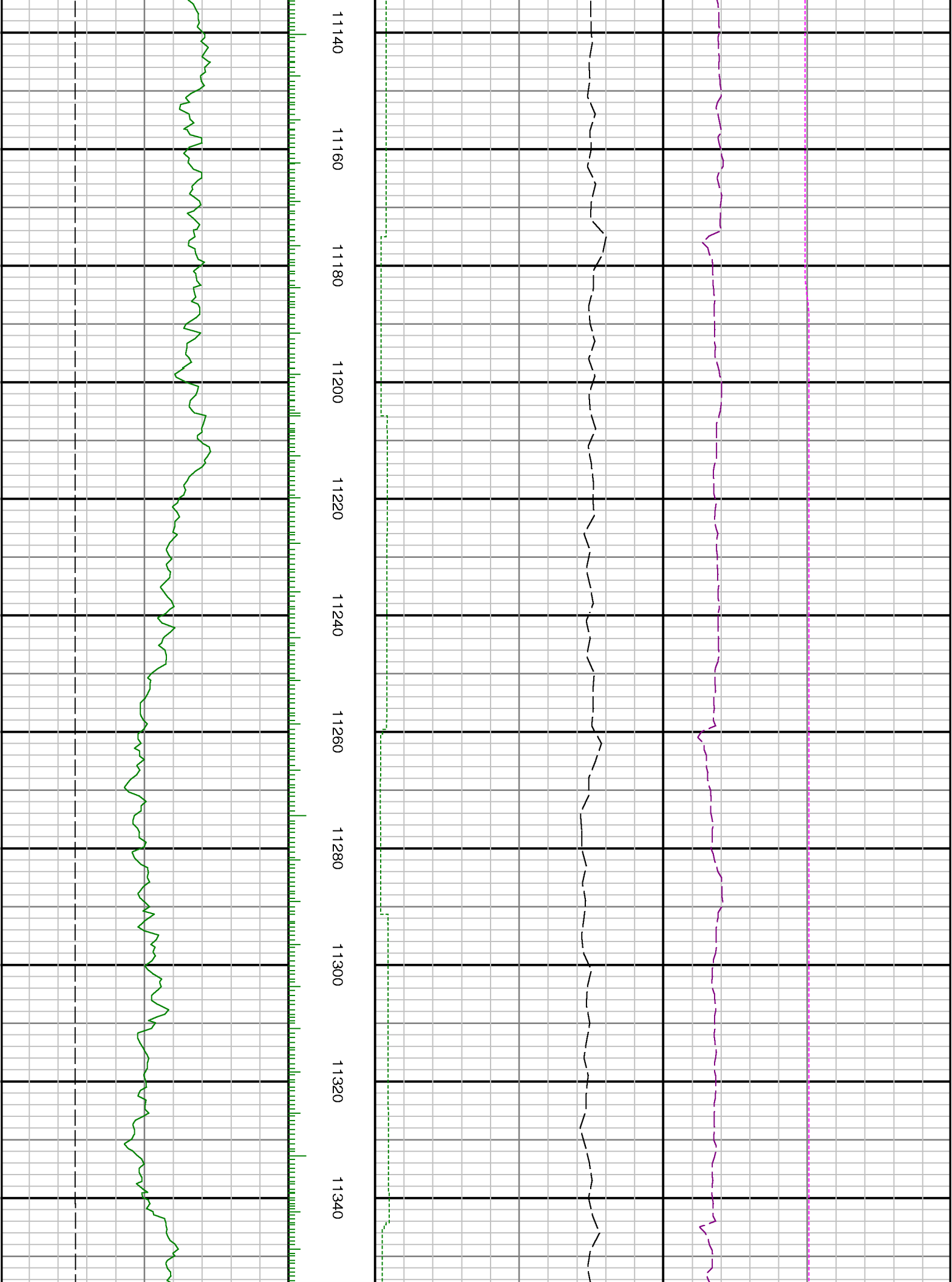


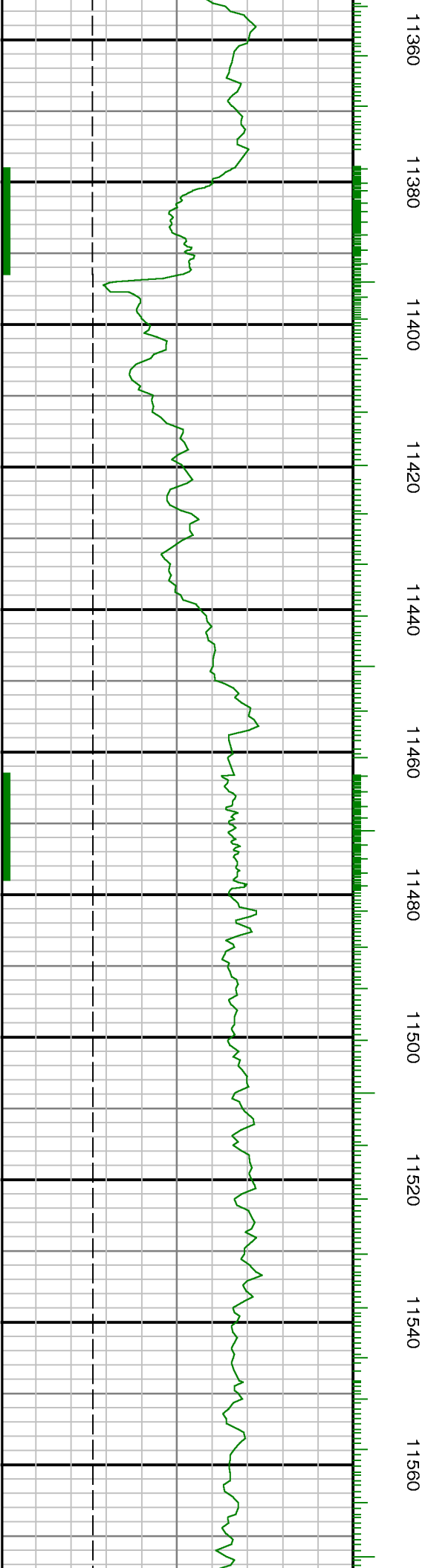


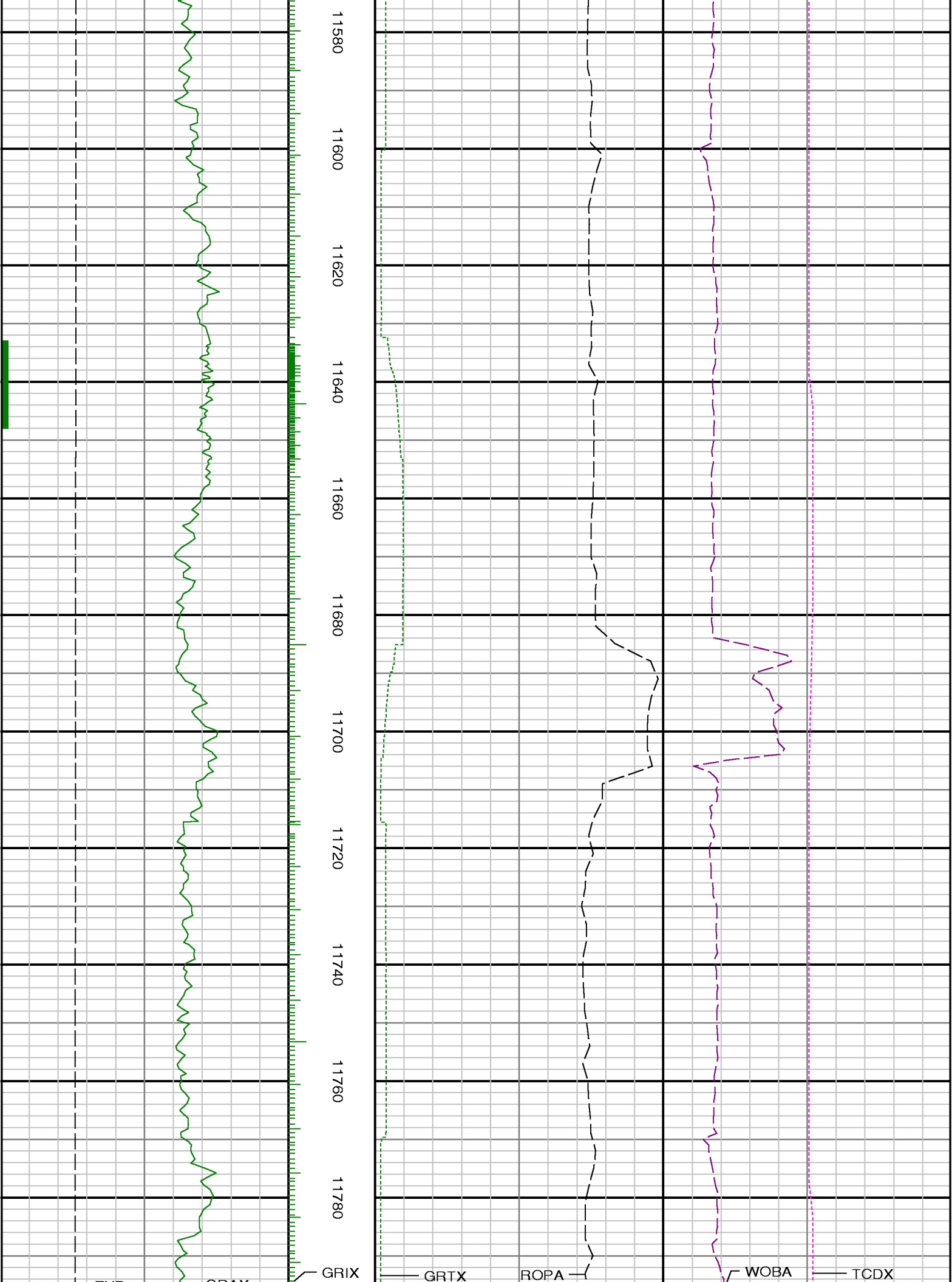


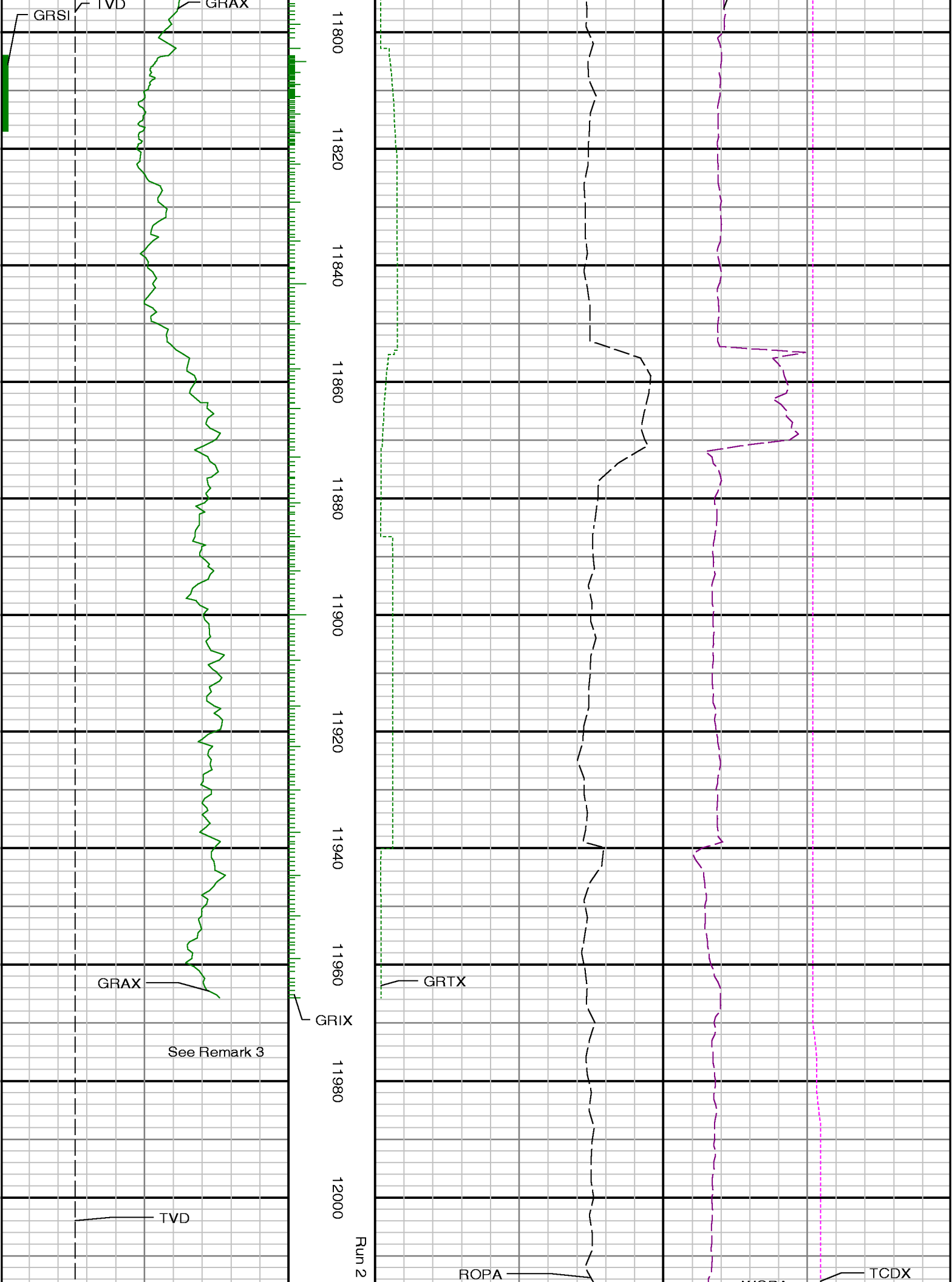












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