



LWD MEMORY LOG COMPOSITE

Gamma Ray

Scale:		Company: Confluence				
1:240 MD		Well: Buford 33-9-3L				
Depth Reference:		Field: Weld County				
Driller's Depth		County: Weld County				
State: Colorado		Country: United States				
Block: 1						
Status:		Other Services:				
Final Print						
API No: 05123455440000		Latitude: 39° 46' 47" N				
Job ID: 8855268		Longitude: 106° 54' 15" W				
Permanent Datum (P.D.): Mean Sea Level		Elevation: 0.00 ft				
Log Measured From: Rig Floor		Above P.D. 5100.00 ft				
		Elev. KB: N/A				
		Elev. DF: 5100.00 ft				
		Elev. GL: 5077.00 ft				
Dates		Magnetic Field Reference				
Interval Logged						
Date From: 2017-11-05		Top: (ft) 1565.00				
Date To: 2017-11-09		Bottom: (ft) 17367.00				
Spud Date: 2017-11-02		Total Magnetic Field Strength: (nT) 52188				
		Mag to Reference North Correction: (deg) 8.29 E				
Borehole Record		Casing Record				
Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
12.250	23.00	1565.00	13.500	42.00	23.00	105.00
8.500	1565.00	17367.00	9.625	36.00	23.00	1545.00
Mud Record		Deviation Record				
Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
Water Based Mud	105.00	1565.00	12.250	1460.00	0.54 78.78	0.49 157.09
Oil Based Mud	1565.00	17367.00	8.500	15802.00	0.49 157.09	90.34 356.00
Acquisition System		Software Version		Other		
Baker Hughes Cadence	RT4.1		Rig:	Ensign 160		
PlotStudio	4.1.7763.3		Contractor:	Ensign Drilling		
			District:	RMA		
			Unit:	D&E		

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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 (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	12.250	PDC	3.00	Steerable	0.00	0.00	105.00	1567.00	2017-11-02 17:18	2017-11-03 00:11	7.18
2	2	8.500	PDC	3.00	AutoTrak Curve	1554.00	17354.00	1567.00	17367.00	2017-11-05 10:38	2017-11-10 07:08	98.42

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Andrew Chersin	2017-11-03	2017-11-11						

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2017-11-02 18:38	1	476.00	Water Based Mud	8.5	28	8.85	N/A	1/99	Active Pit	660	0.00
2017-11-04 18:38	2	1567.00	Oil Based Mud	9.6	72	N/A	N/A	72/28	Active Pit	26800	0.00

2017-11-05 17:50	2	2787.00	Oil Based Mud	9.6	71	N/A	N/A	72/28	Active Pit	64000	0.00
2017-11-06 03:30	2	5088.00	Oil Based Mud	9.2	55	N/A	N/A	74/26	Active Pit	66000	0.00
2017-11-07 03:30	2	8825.00	Oil Based Mud	10.0	55	N/A	N/A	75/25	Active Pit	60000	0.00
2017-11-08 10:37	2	13290.00	Oil Based Mud	10.1	54	N/A	N/A	75/25	Active Pit	50000	0.00
2017-11-09 15:30	2	17229.00	Oil Based Mud	10.2	58	N/A	N/A	73/27	Active Pit	47000	0.00

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	NaviTrak	11753275	VSS	16.51	54.45	8.250	3.000
1	NaviTrak	11753275	Directional (mag)	16.51	54.45	8.250	3.000
2	ATC_SU	14192924	Near Bit Inclination	5.93	6.70	7.000	4.330
2	ATC_SU	14192924	Near Bit VSS	5.93	6.70	7.000	4.330
2	ATC_MWD	12332940	Gamma (single)	2.20	12.32	7.000	3.250
2	ATC_MWD	12332940	Directional (mag)	12.27	22.39	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


1	Depth measurements 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 drilling services run 1 utilized an 8 inch Navitrak service (Directional only) behind a 12 1/4 inch bit and steerable assembly from 105 to 1565 feet MD (105 to 1565 feet TVD)
3	Baker Hughes drilling services run 2 utilized a 6 3/4 inch Navigamma service (Directional and Gamma Ray) behind an 8 1/2 inch bit and rotary steerable assembly from 1565 to 17367 feet MD (1565 to 7334 feet TVD)

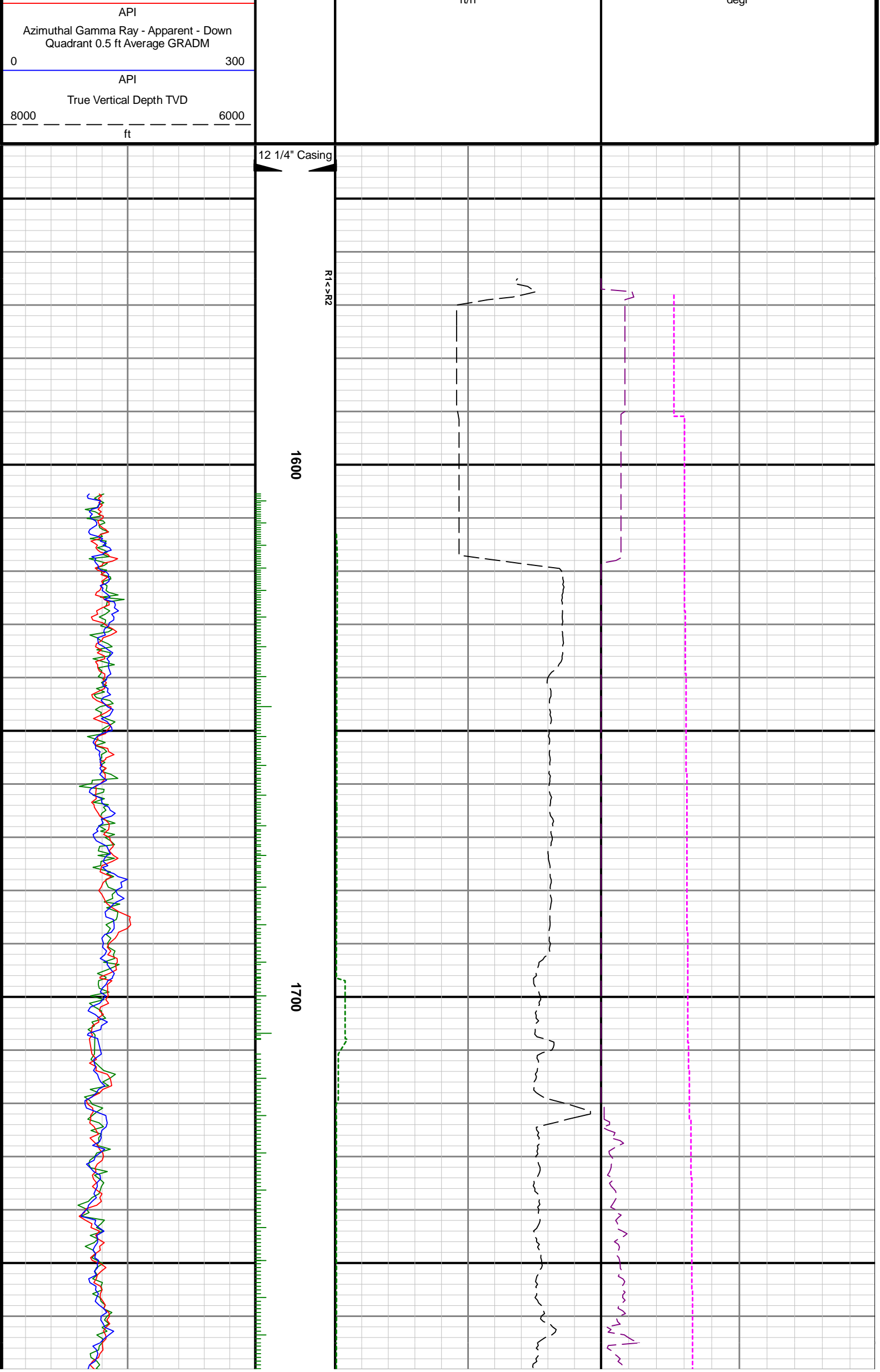
Remarks

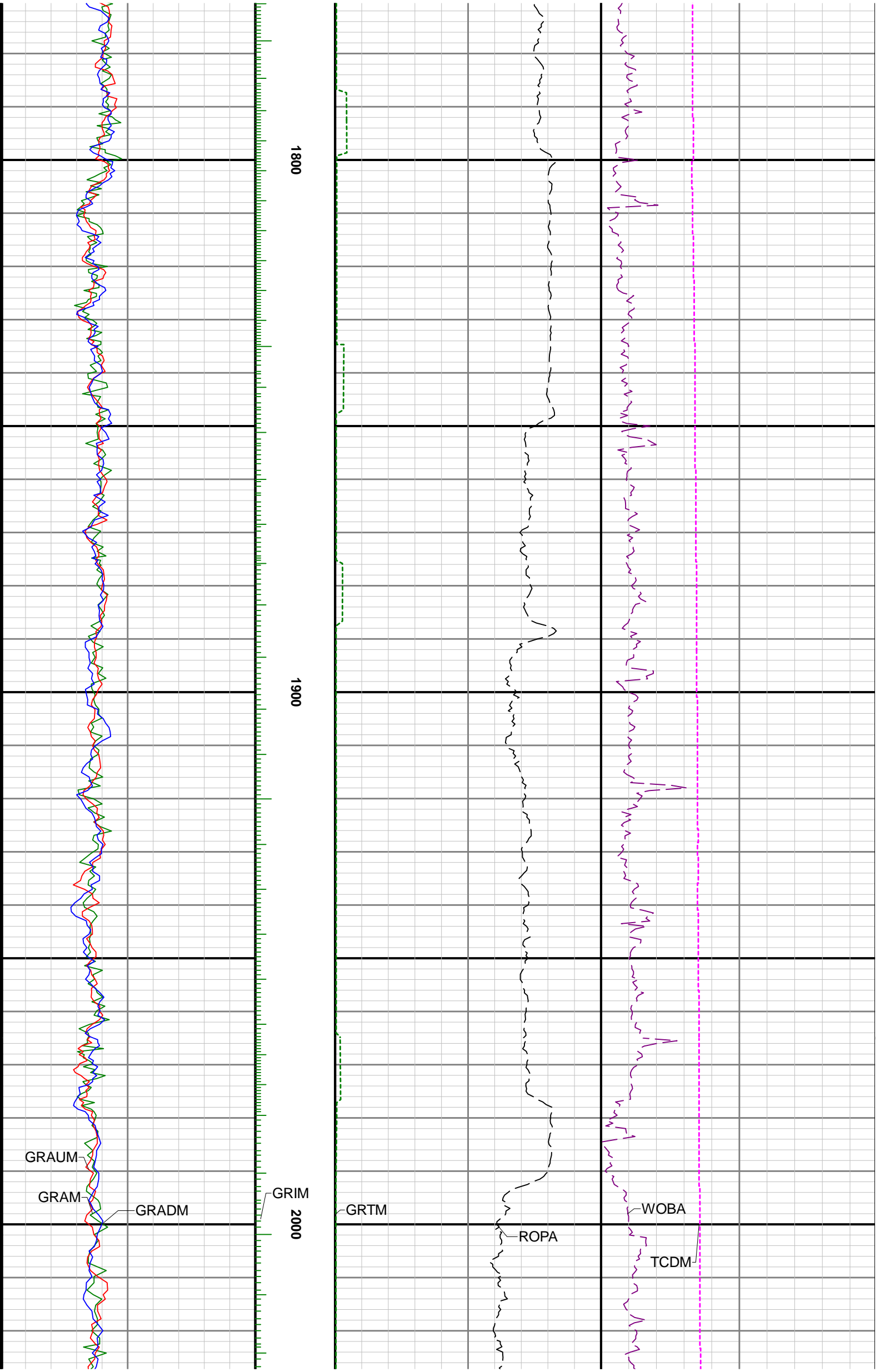
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	2175.00	8.500	2	A gap is present in the gamma curves over the interval of 2159 to 2184 feet MD (2148 to 2173 feet TVD) due to a error in the system tool memory.
2	17360.00	8.500	2	The interval from 17354 to 17367 feet MD (7334 feet TVD) was not logged due to sensor to bit offset at TD.

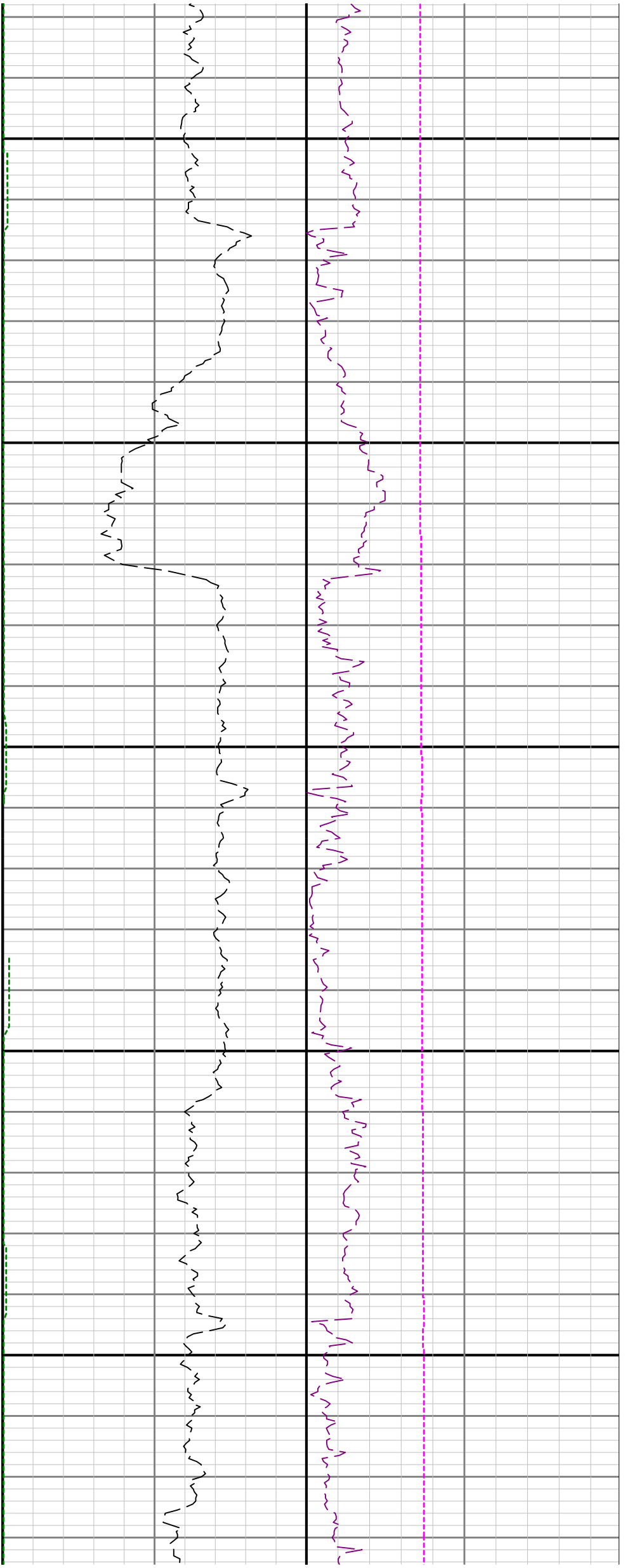
Curve Mnemonics

Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
GRADM	Gamma Ray - Apparent - Down Quadrant - Memory 0.5 ft Average	API
GRAUM	Gamma Ray - Apparent - Up Quadrant - Memory 0.5 ft Average	API
TCDM	Downhole Temperature	degF

<div><div><div>BAKER HUGHES</div><div>a GE company</div></div><div></div></div>	Company	Confluence				
	Well	Buford 33-9-3L				
	Interval	Date From:	2017-11-05 04:53:13	Top:	1565.00	
	Created	Date To:	2017-11-09 09:59:28	Bottom:	17367.00	
		2017-12-12 16:39:34				
Gamma Ray - Apparent 0.5 ft Average GRAM		MD 1-240 feet	Gamma Time Since Drilled GRTM		Weight On Bit, Average 1 ft Average WOBA	
0	300		0	600	0	50
API			min		klb	
Azimuthal Gamma Ray - Apparent - Up Quadrant 0.5 ft Average GRAUM			Depth Averaged ROP 3 ft Average ROPA		Downhole Temperature TCDM	
0	300		1000	0	0	300
			ft/h		degF	



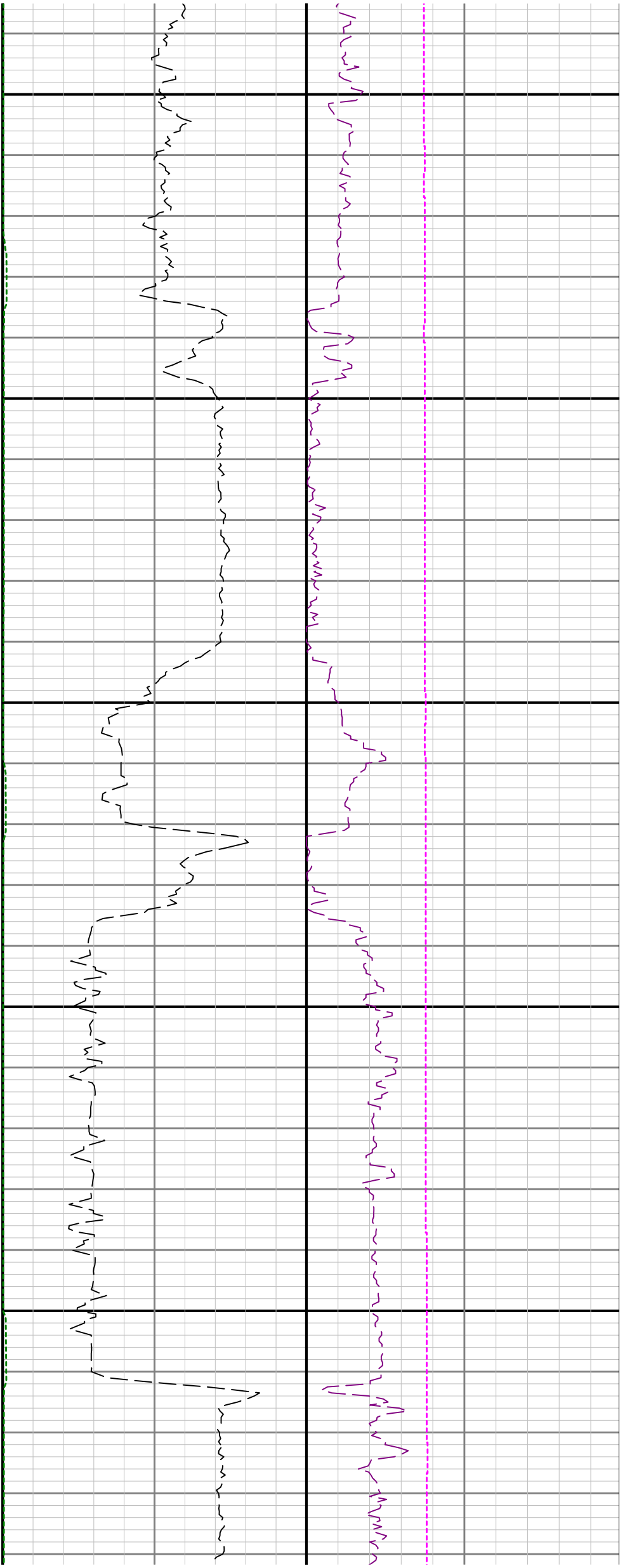




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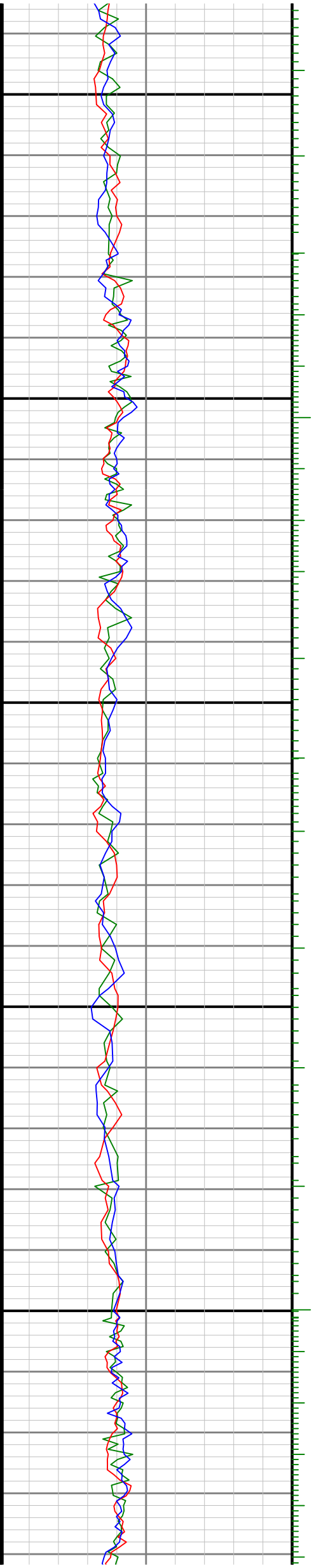
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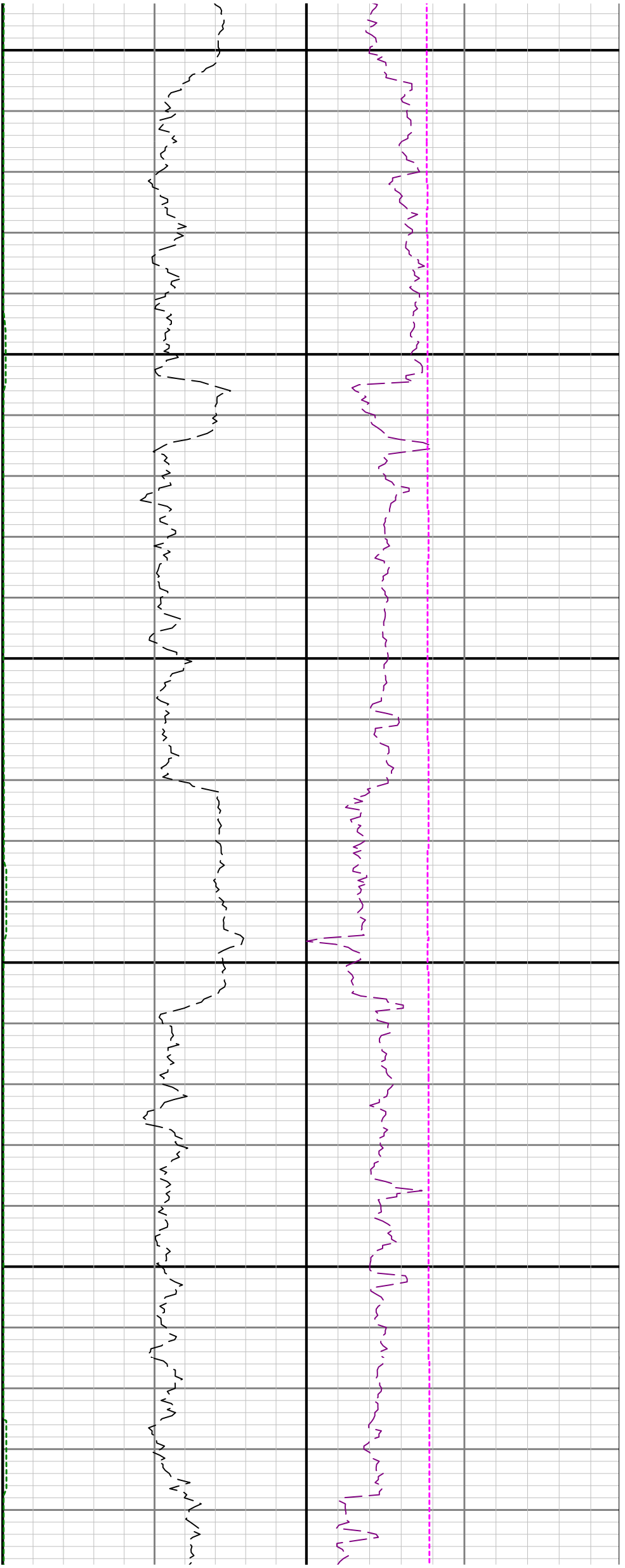


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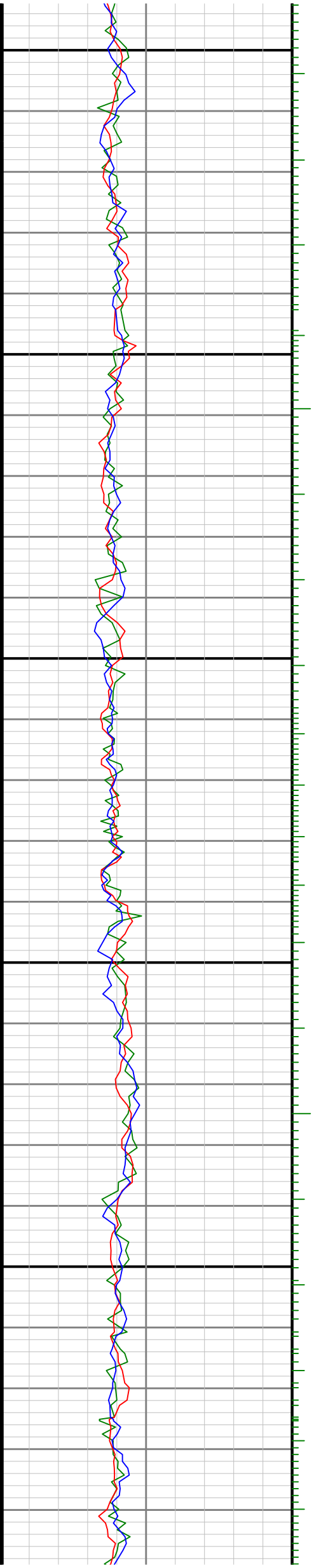


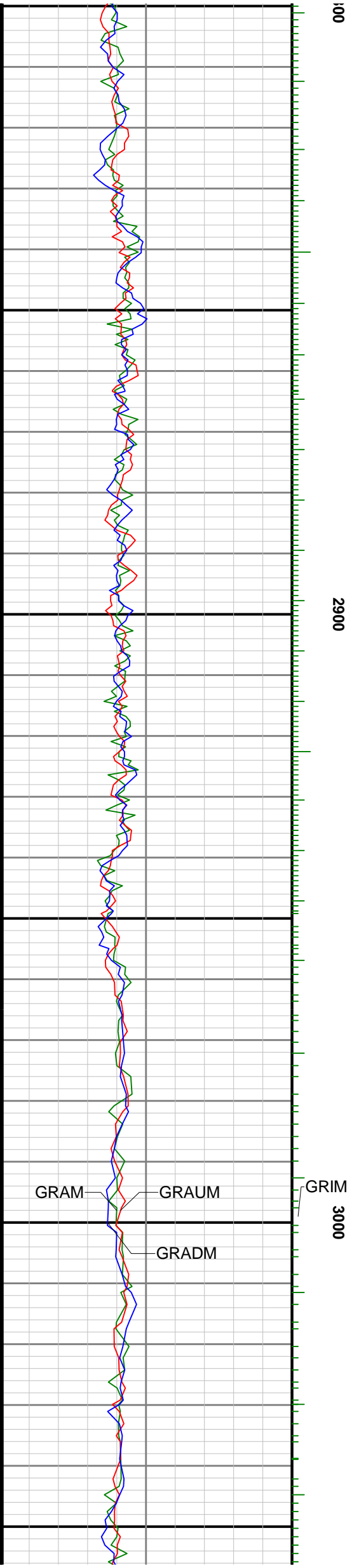
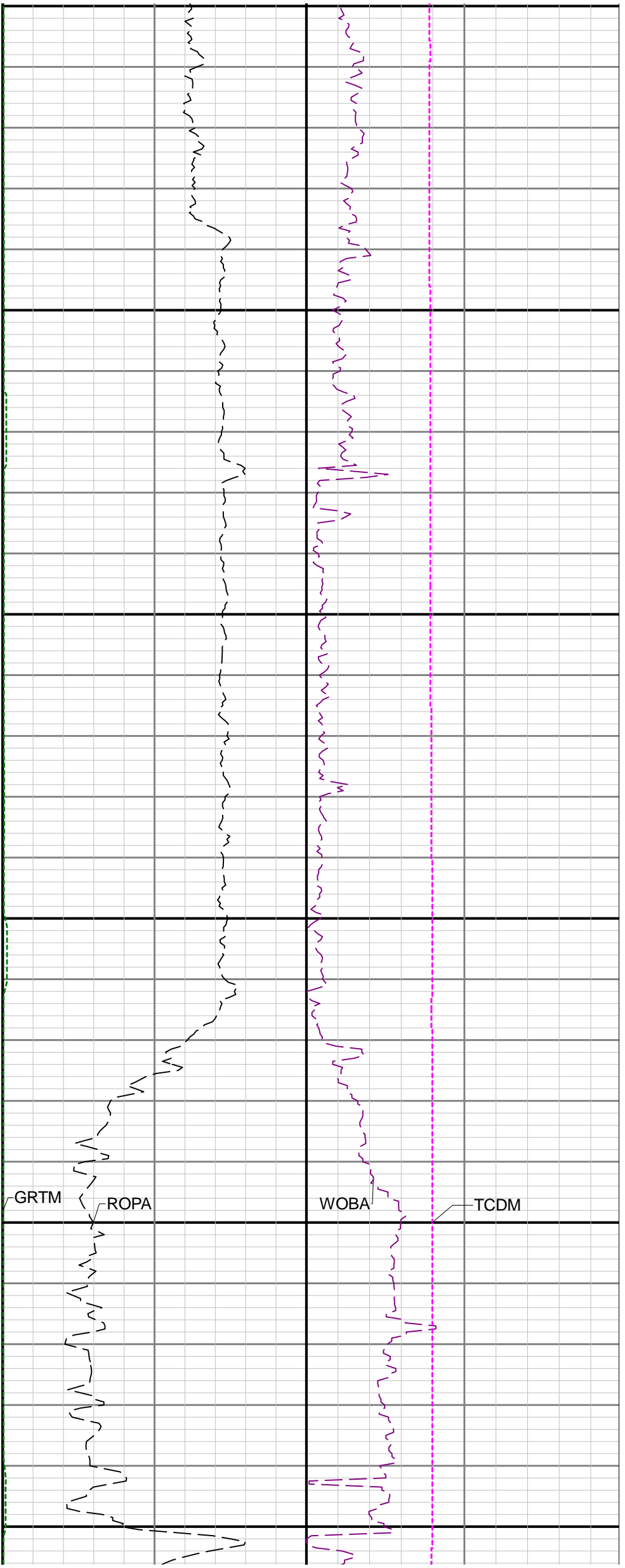


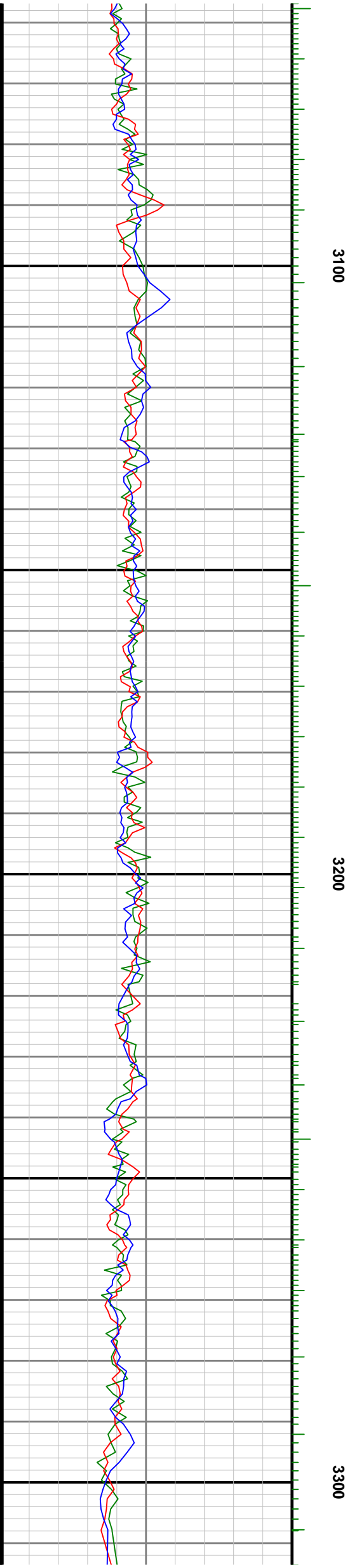
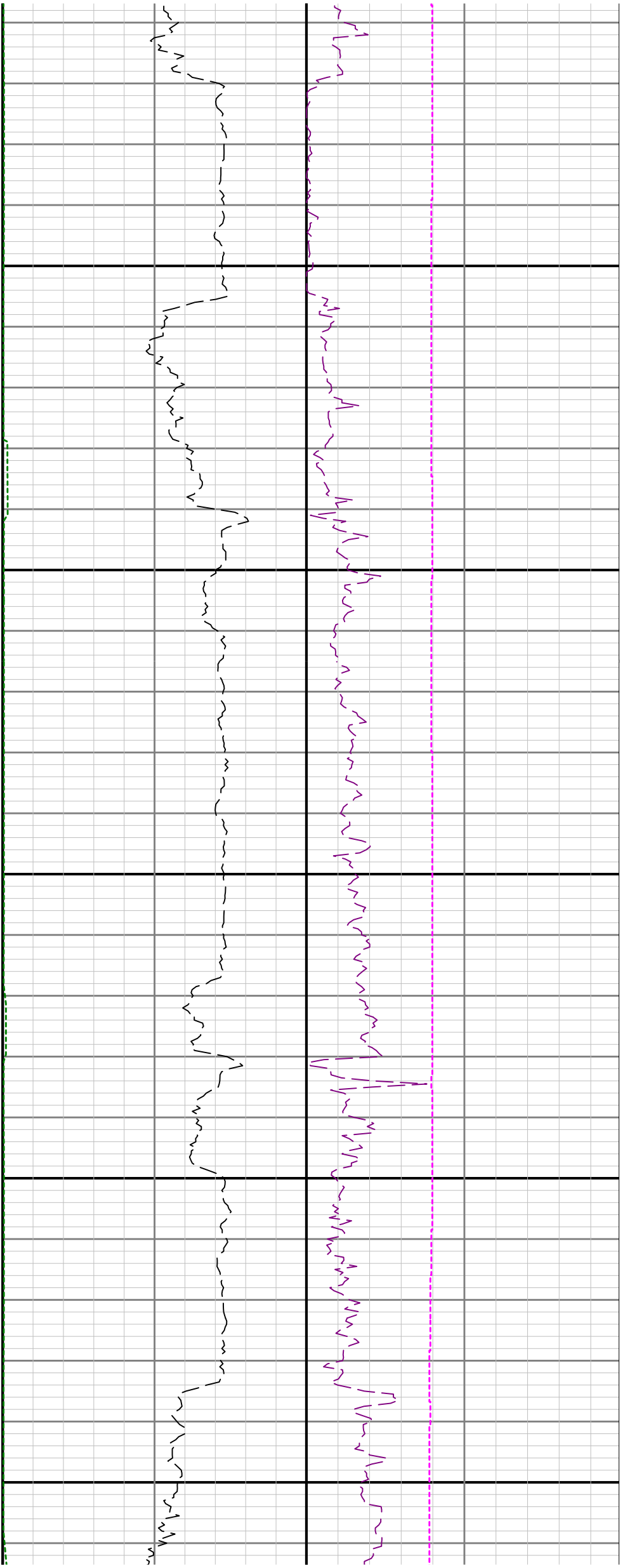
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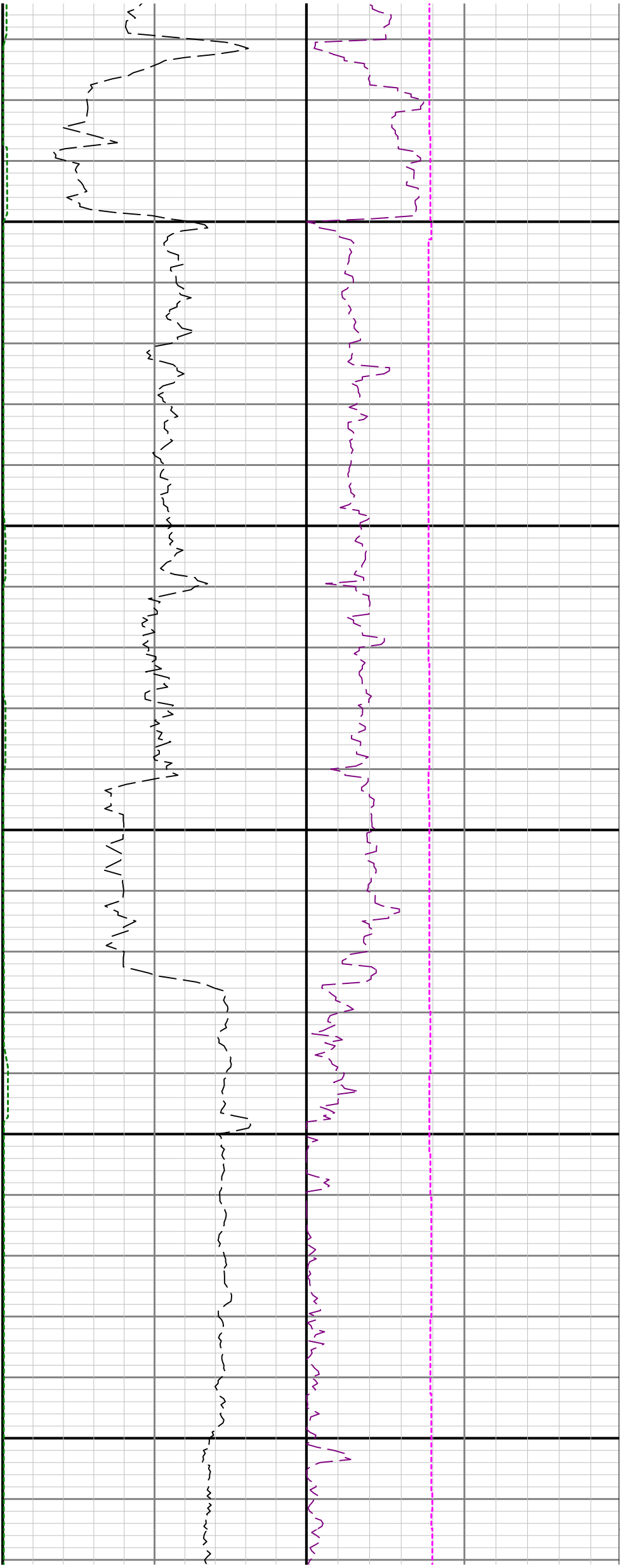
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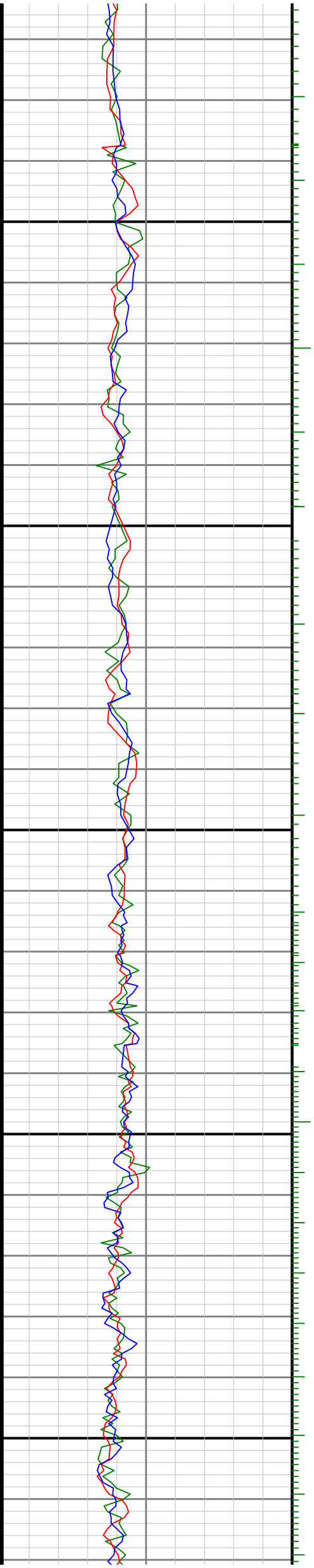


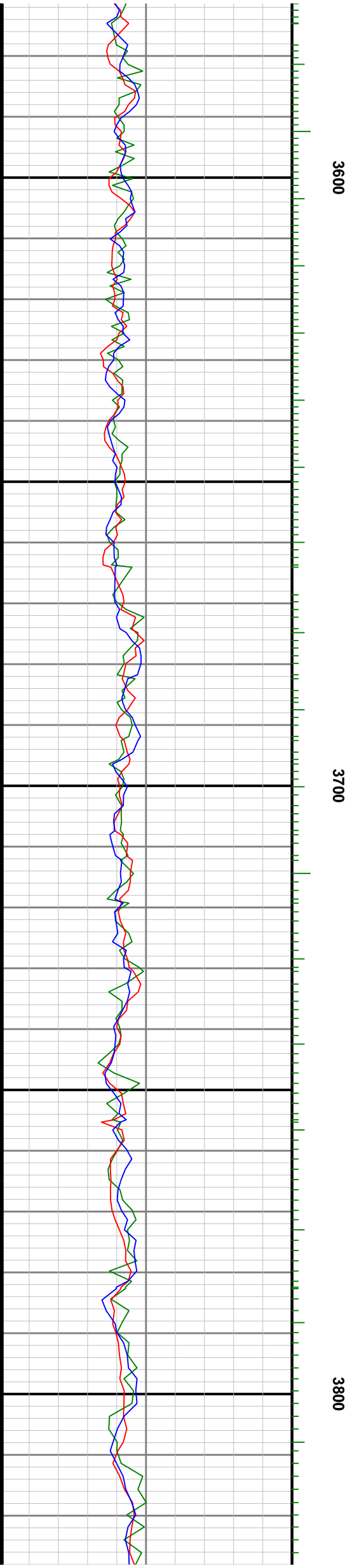
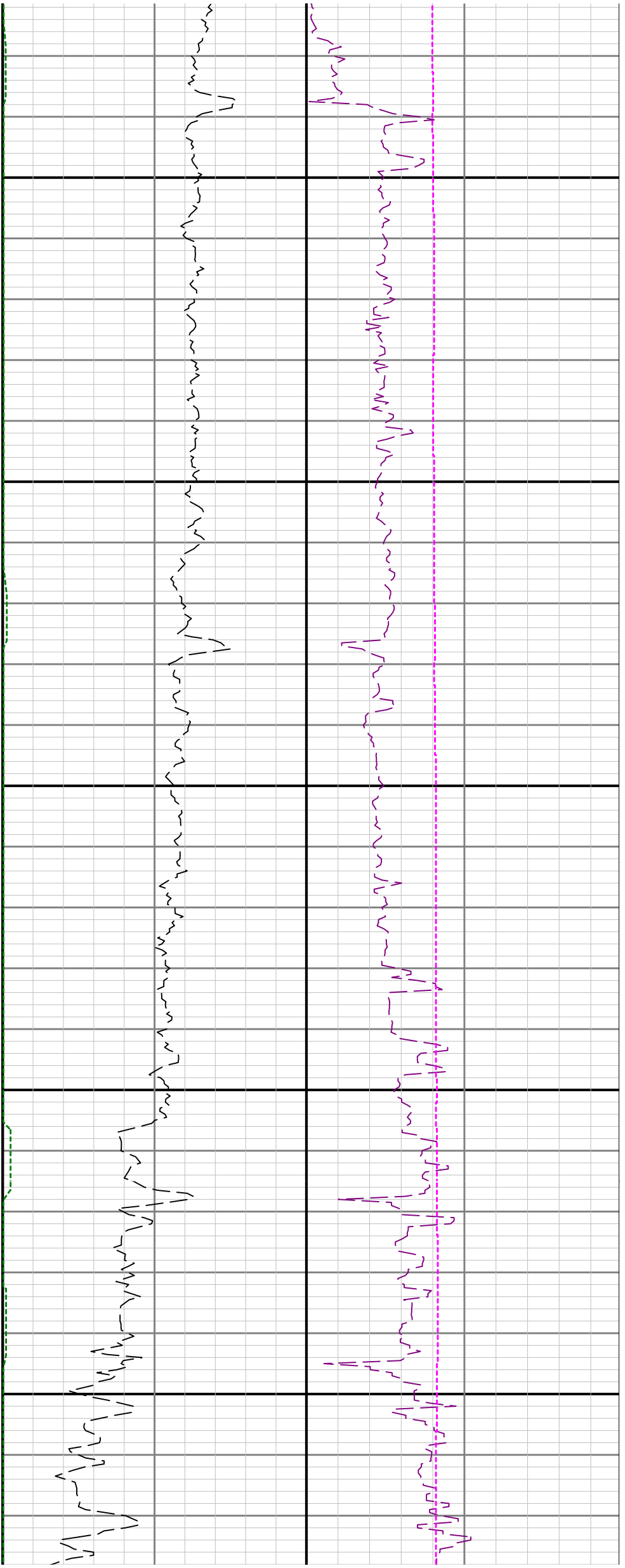


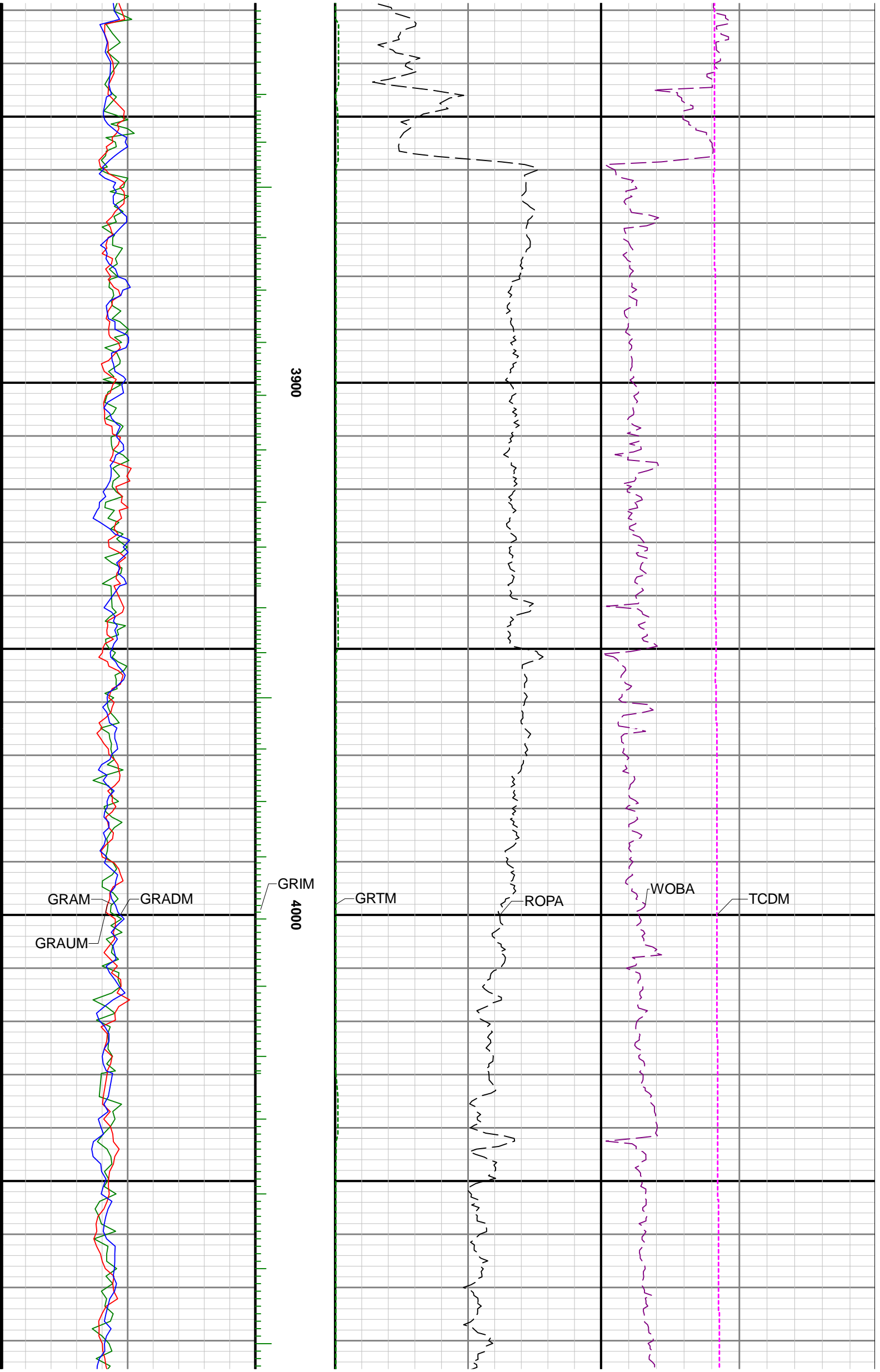


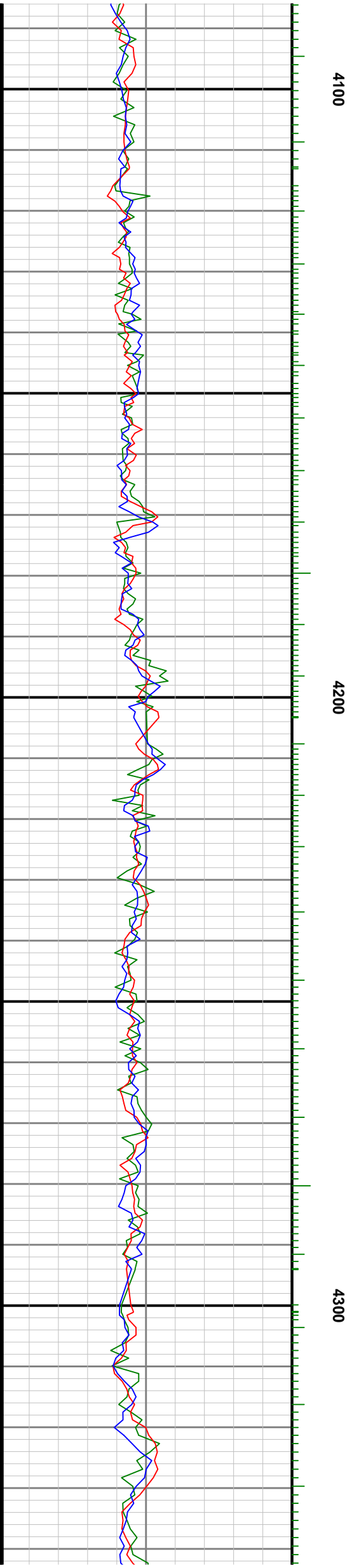
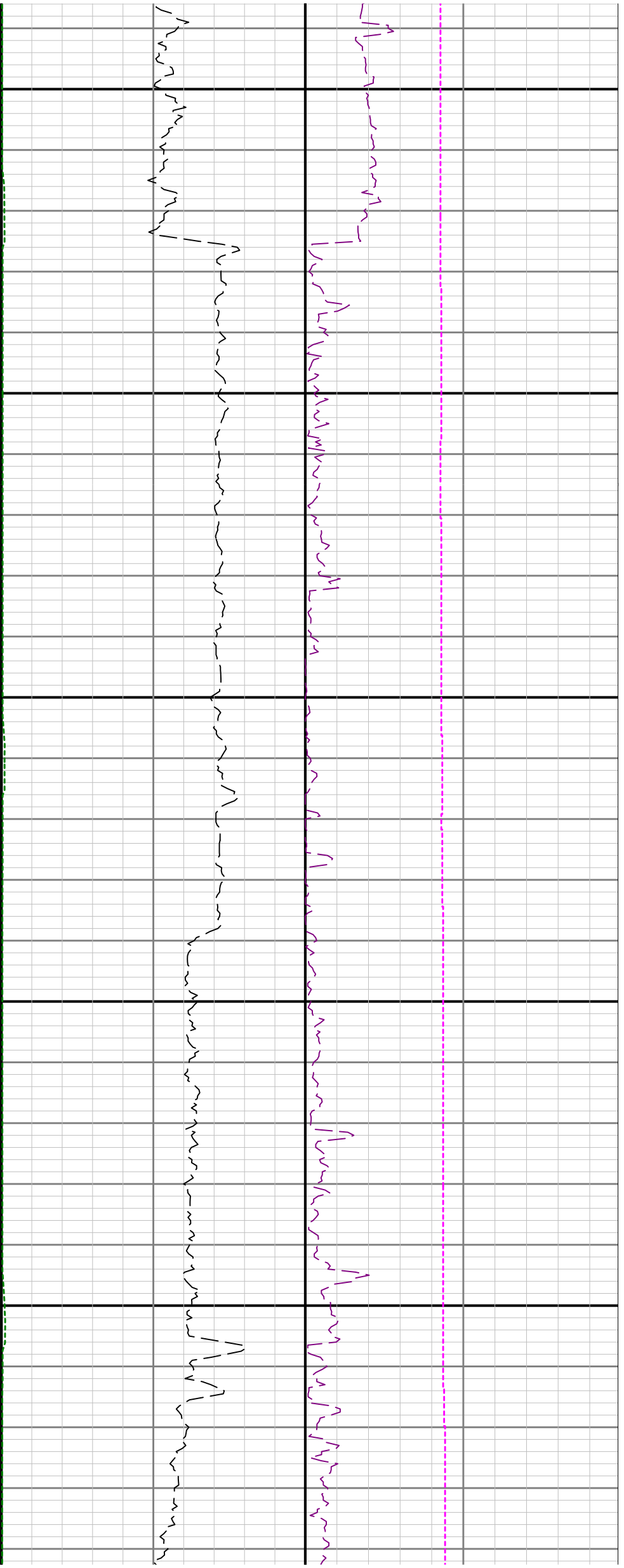
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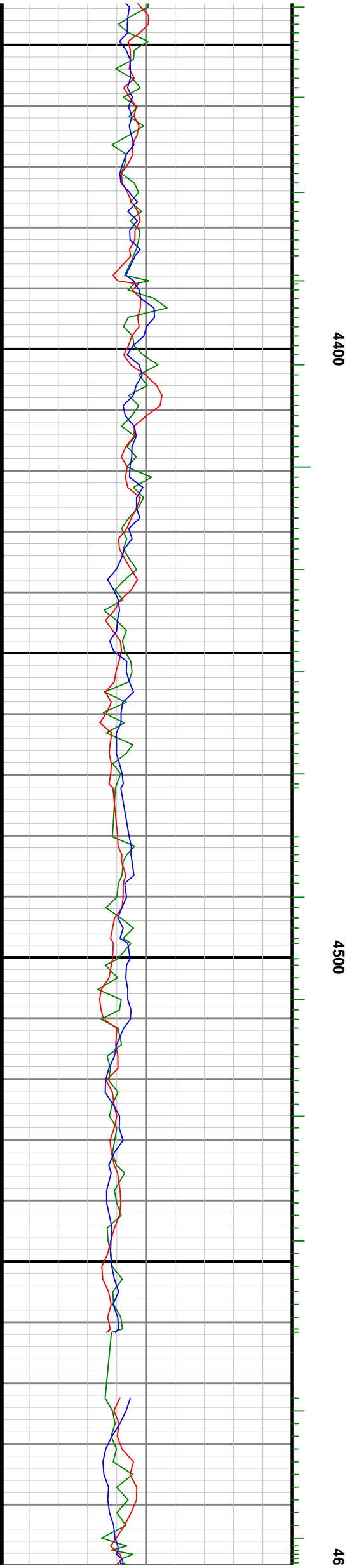
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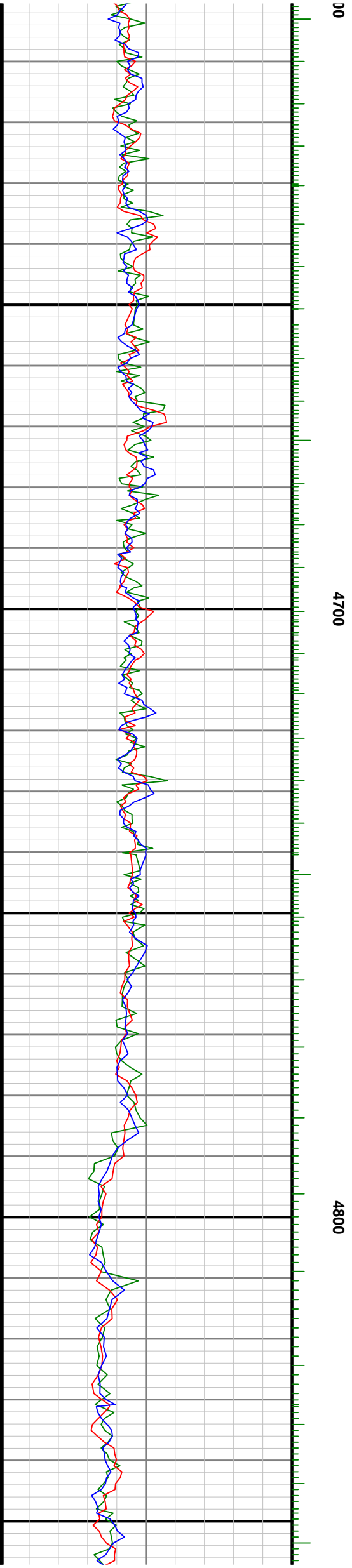
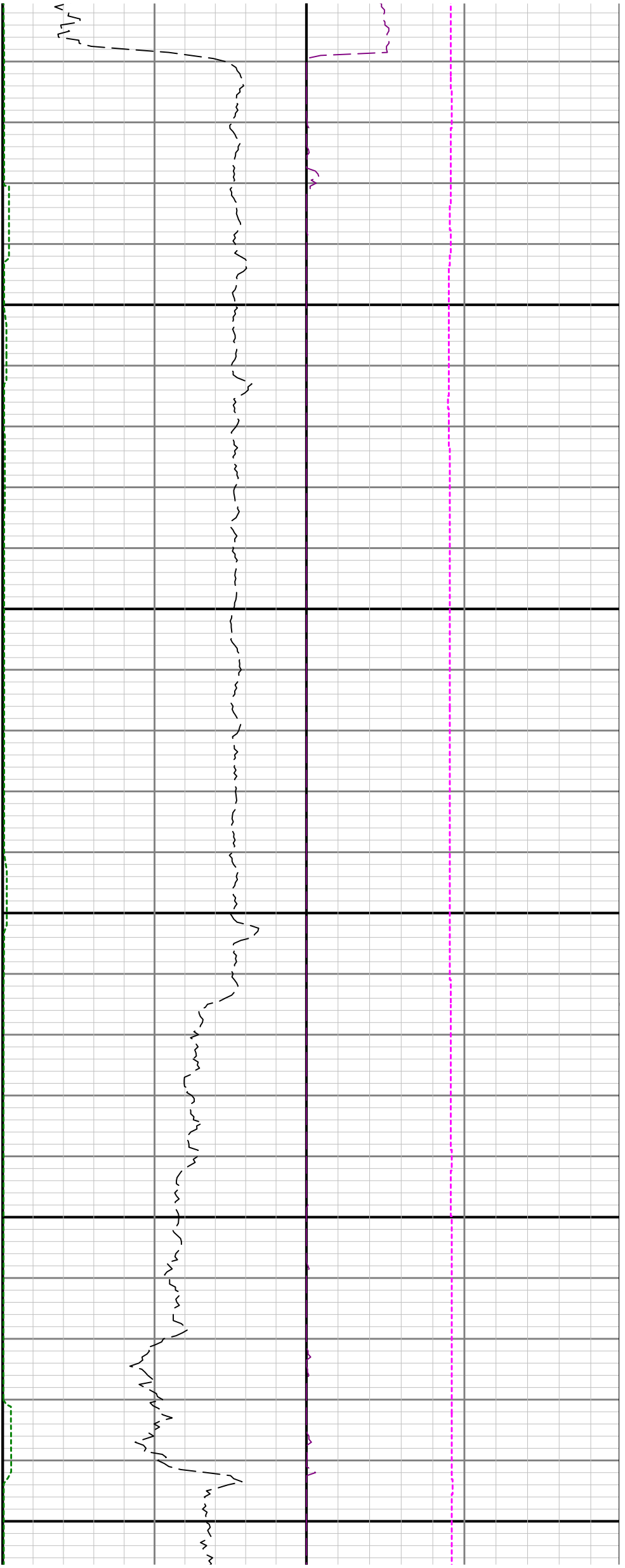


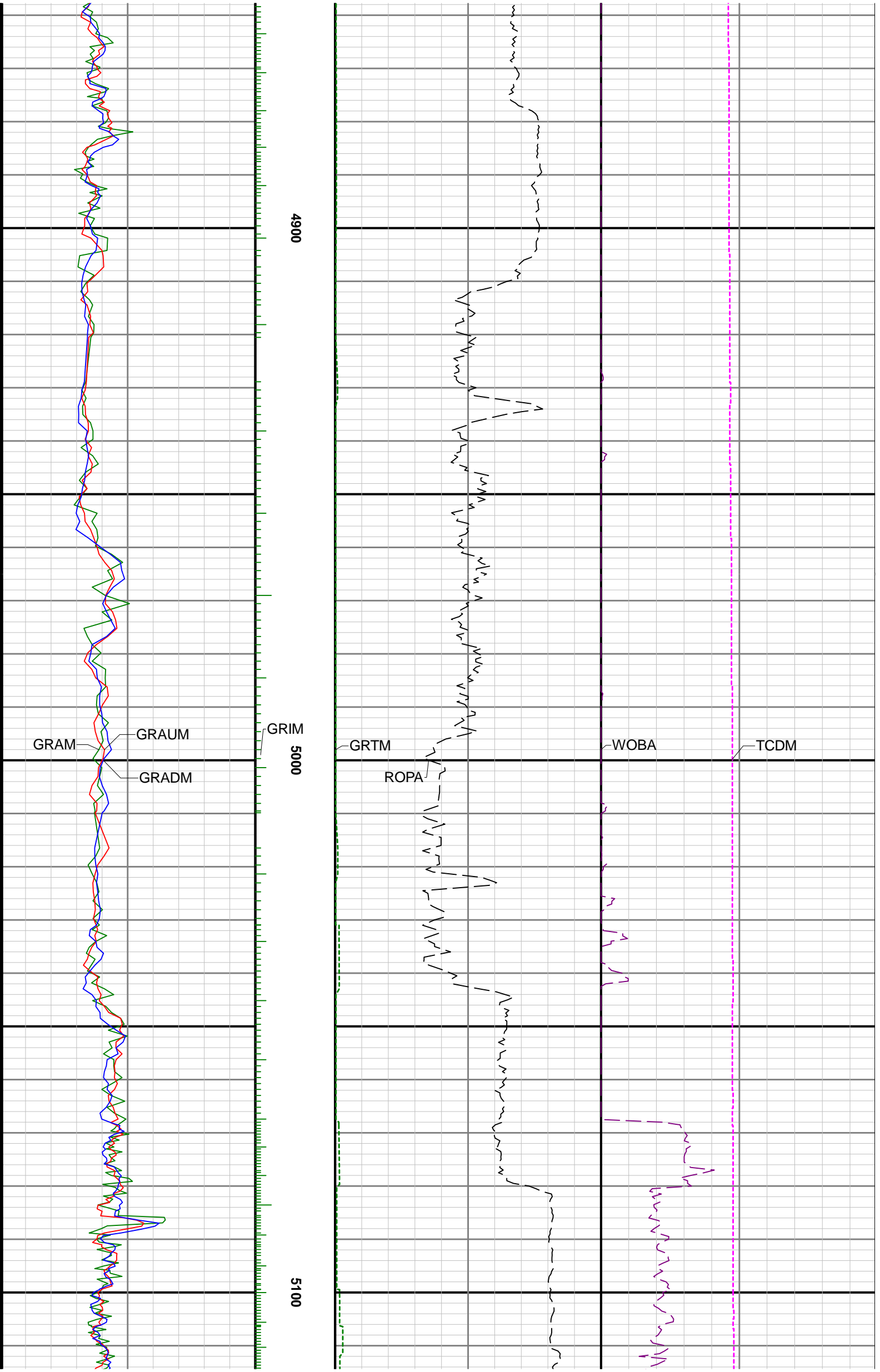


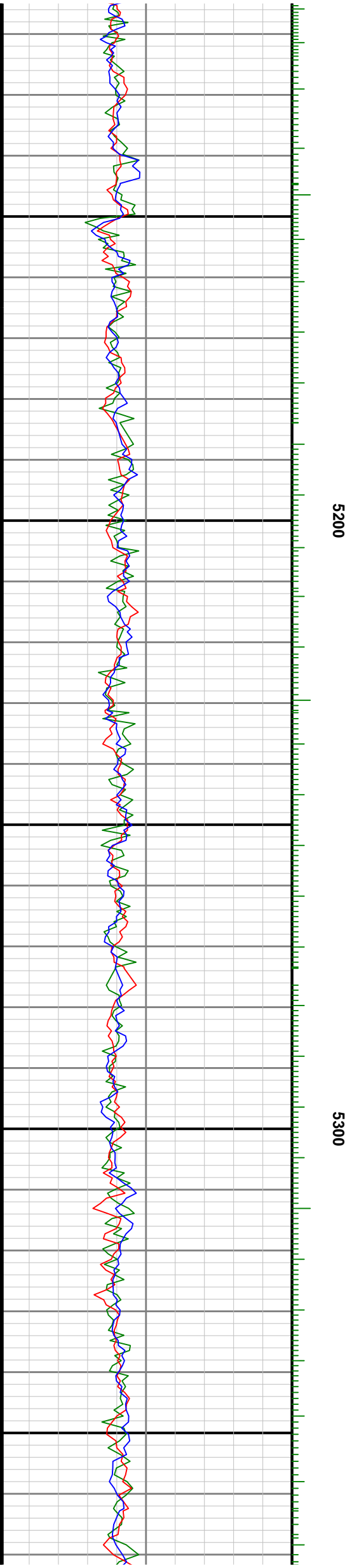
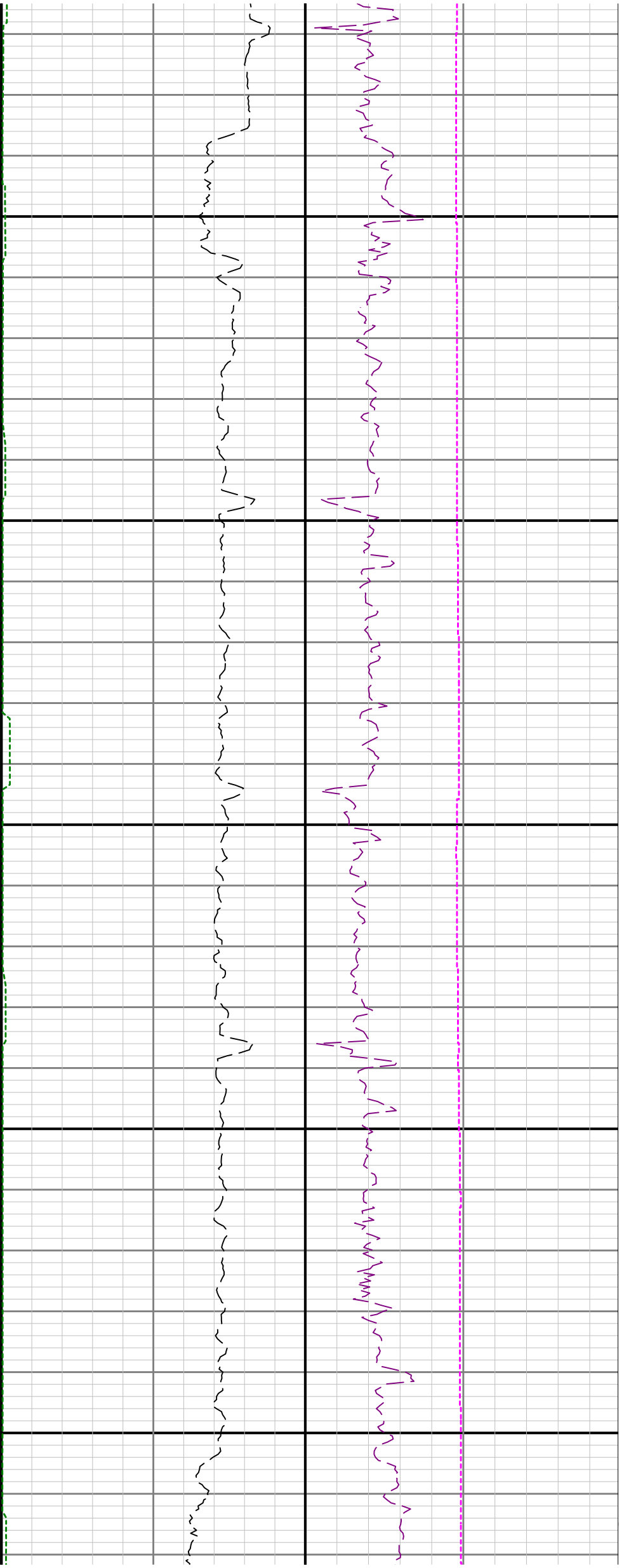


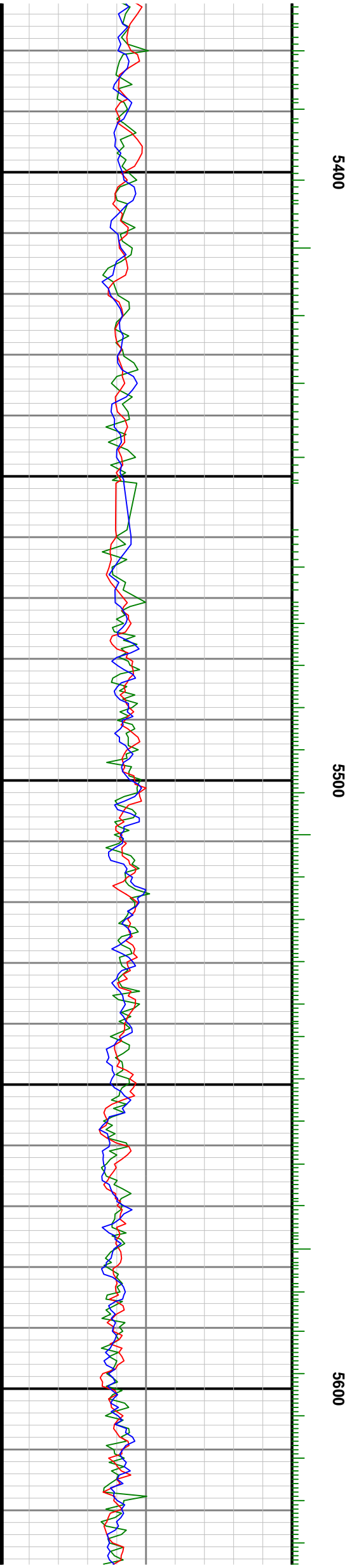
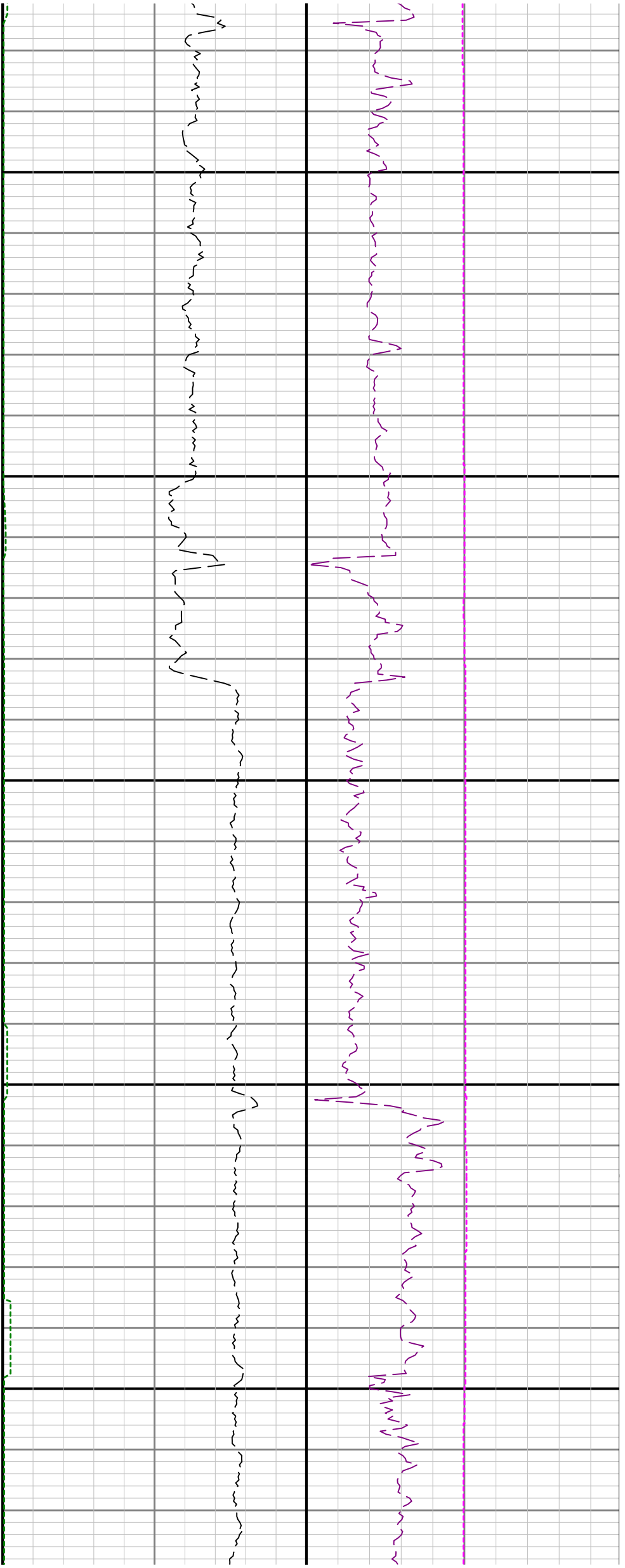


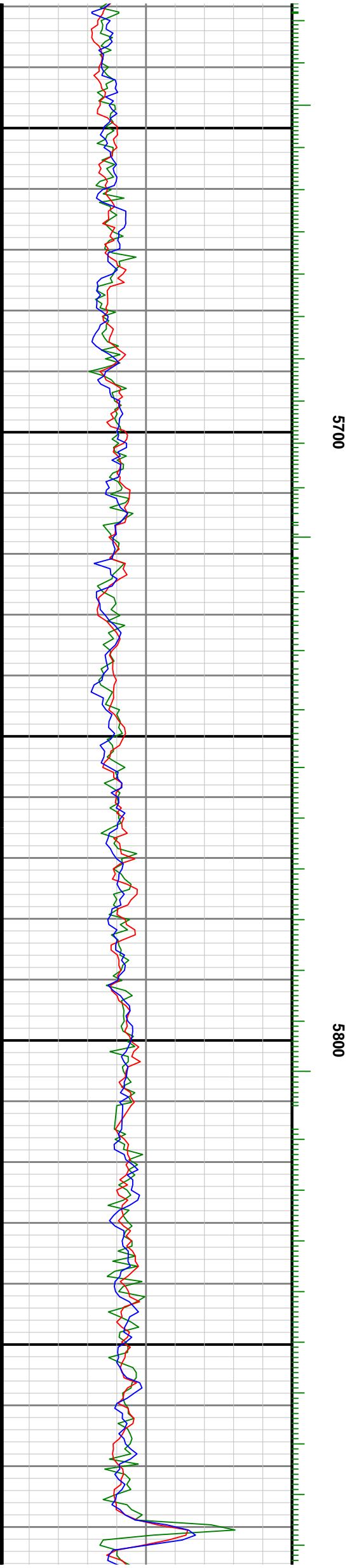
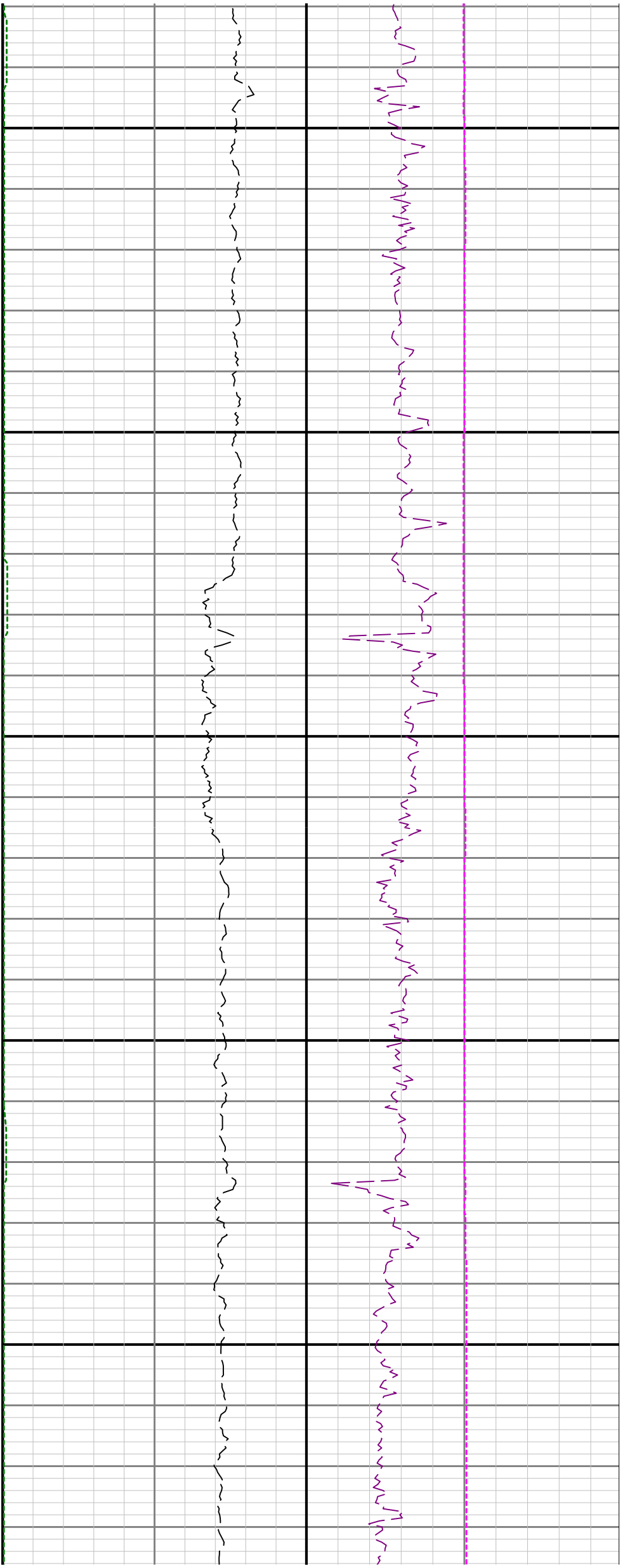


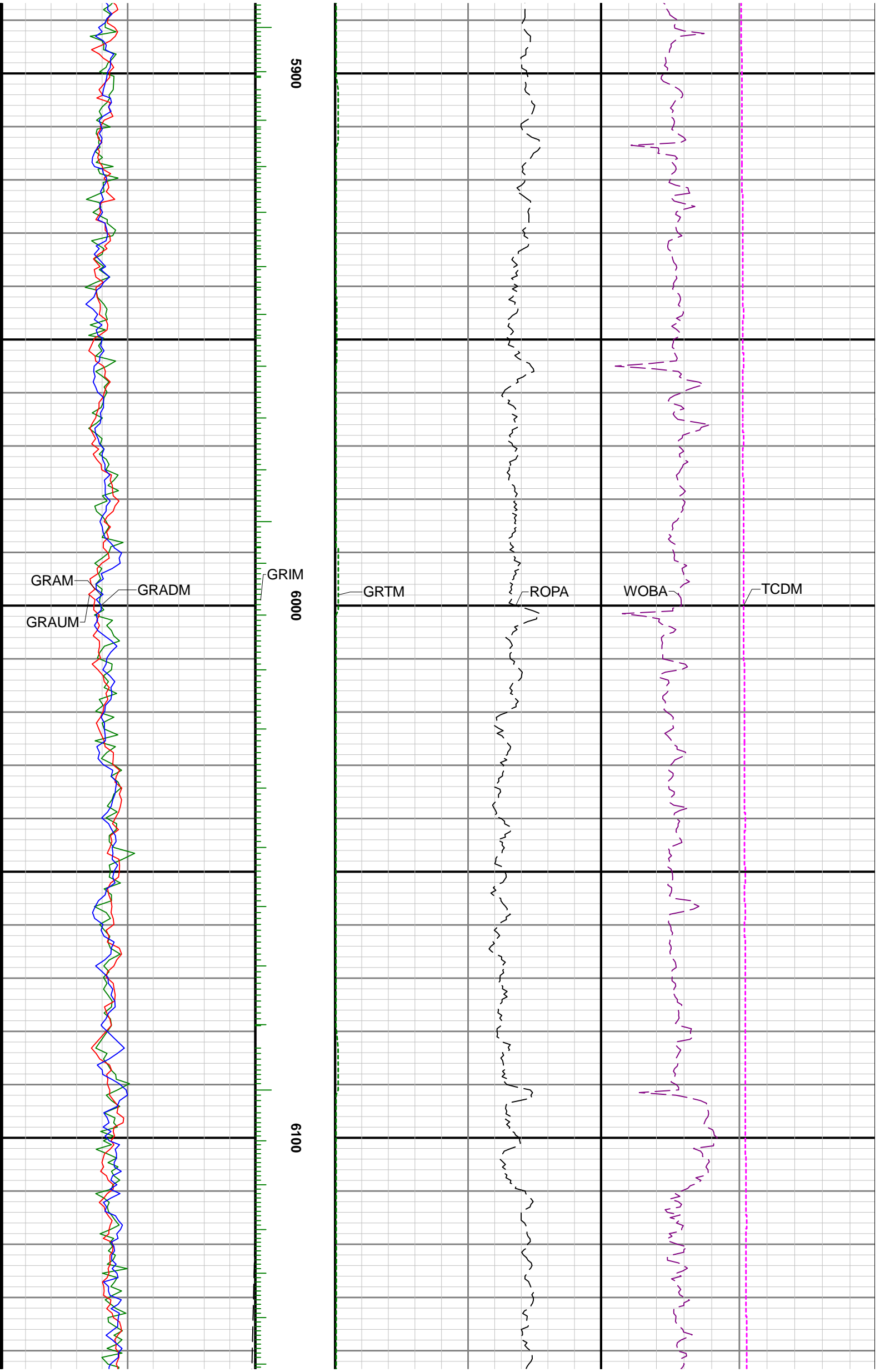


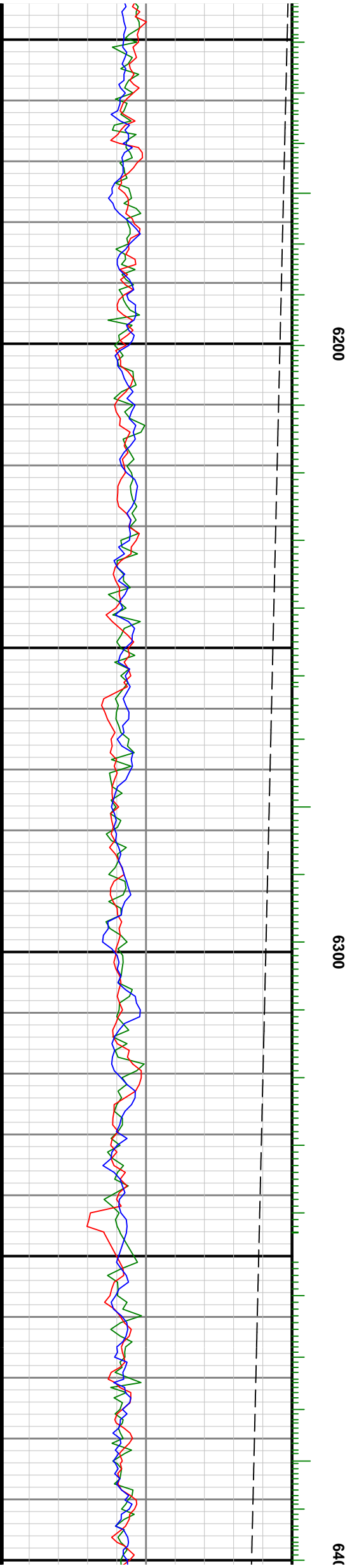
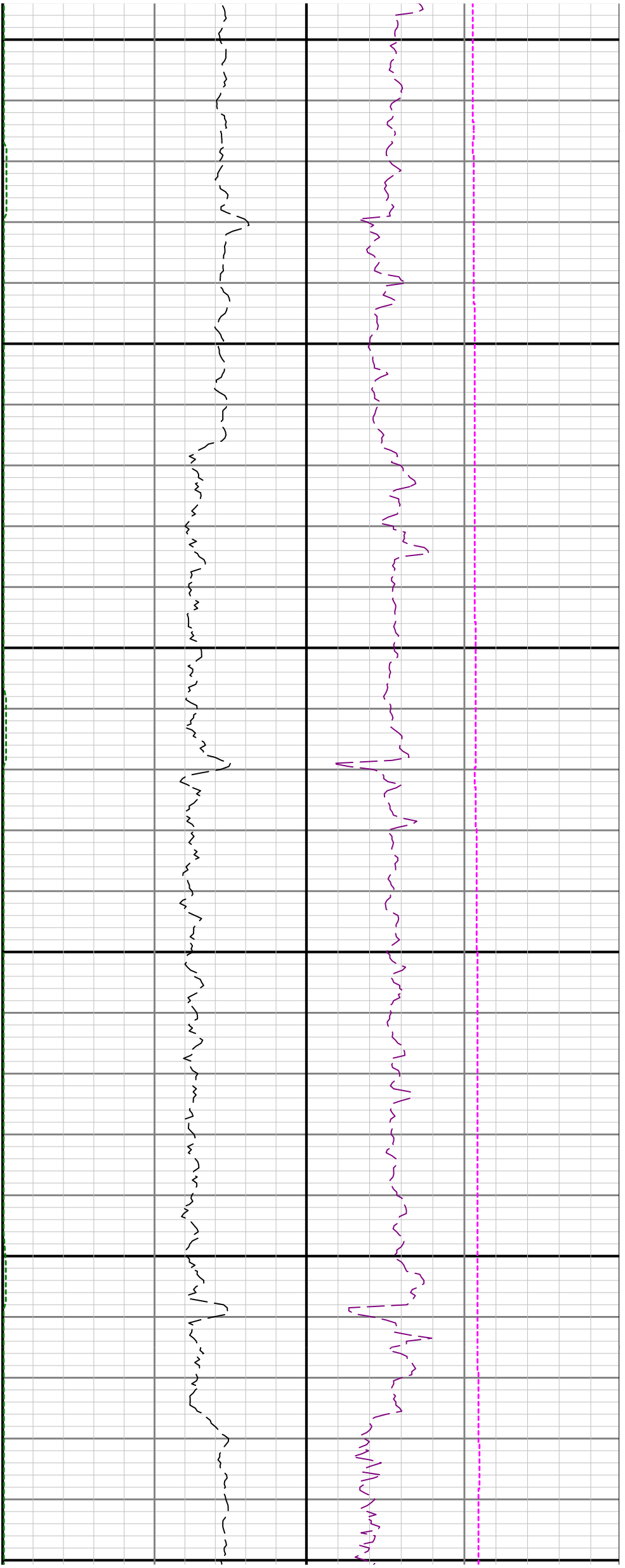


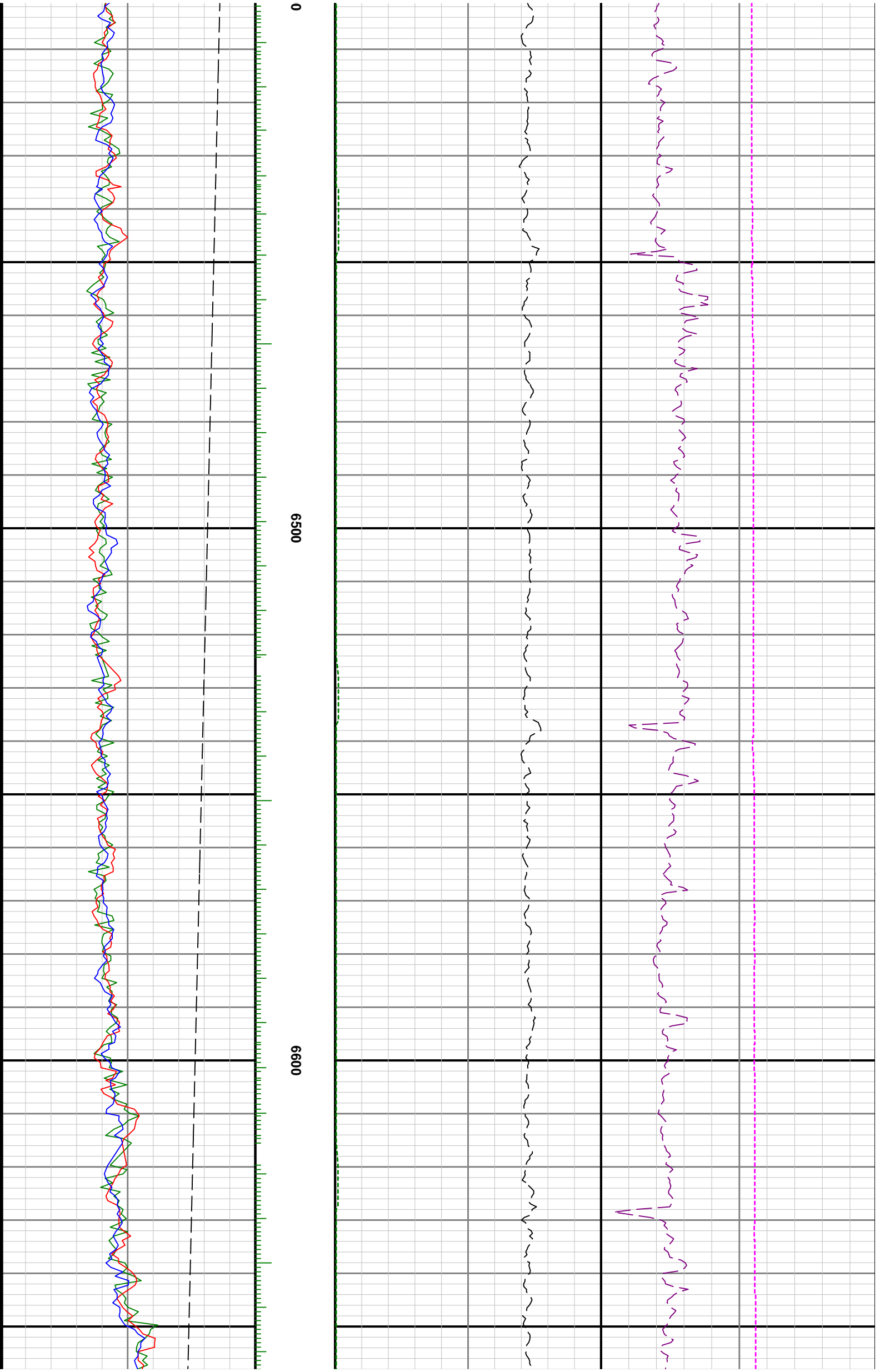


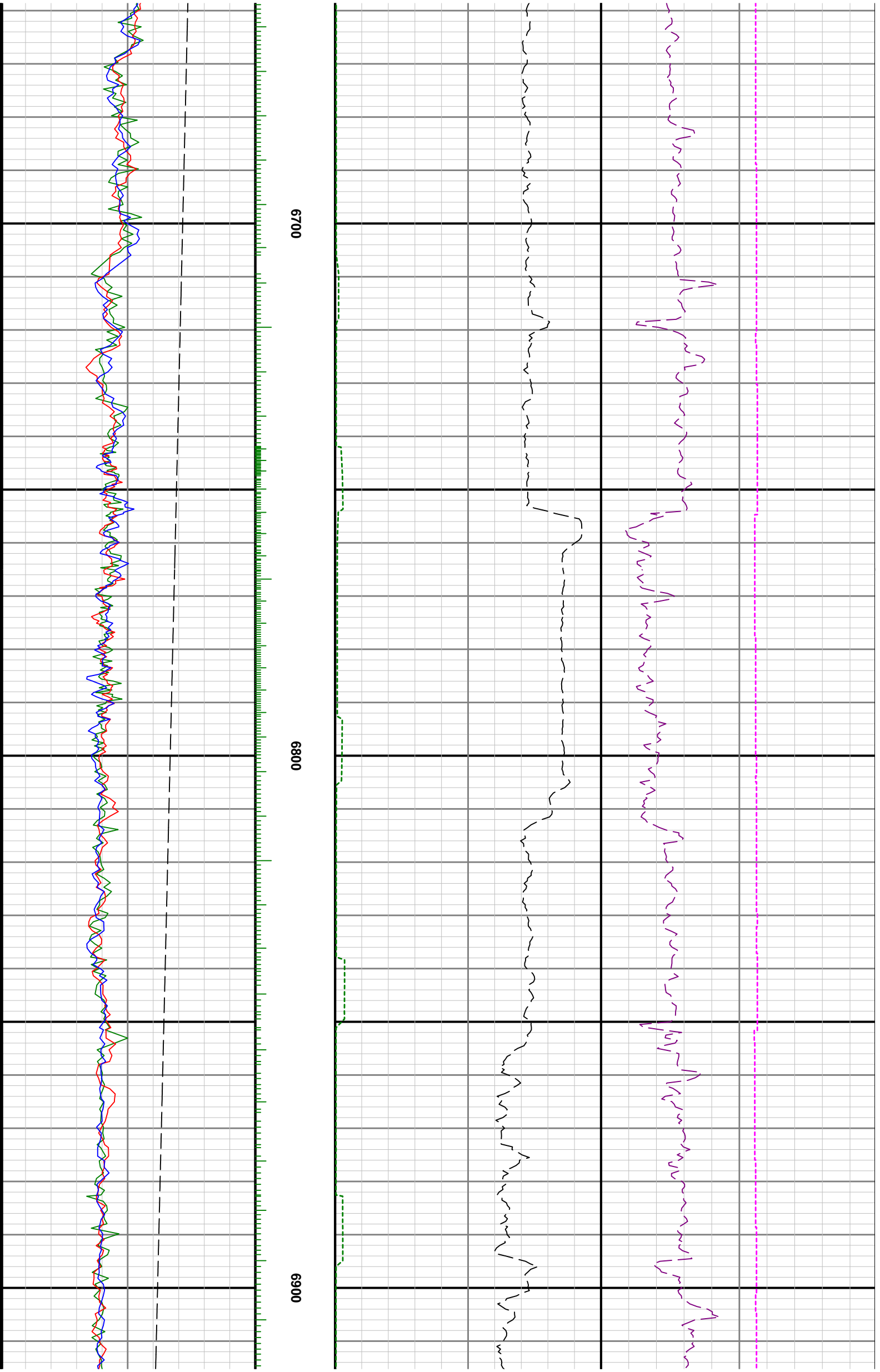


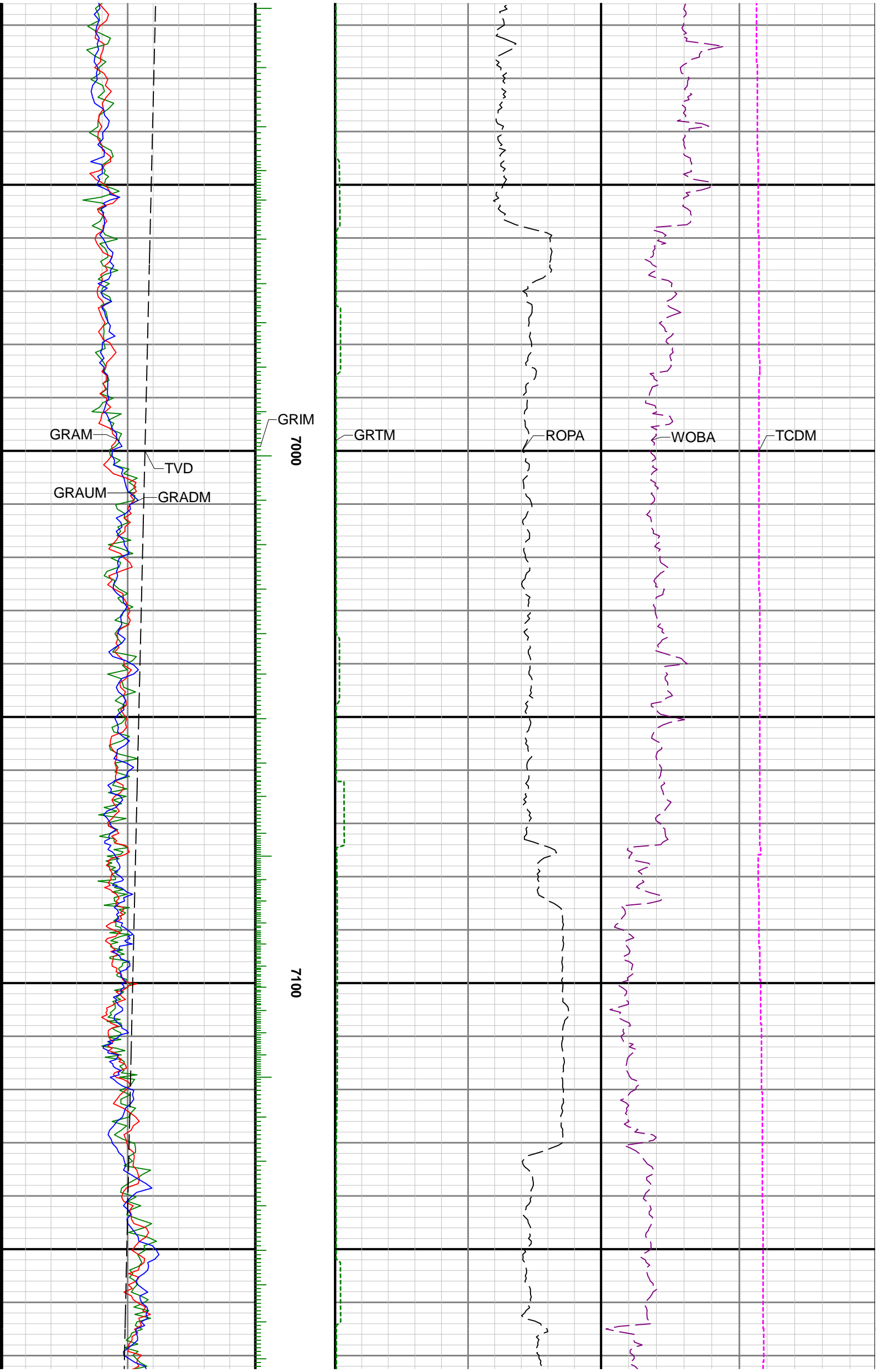


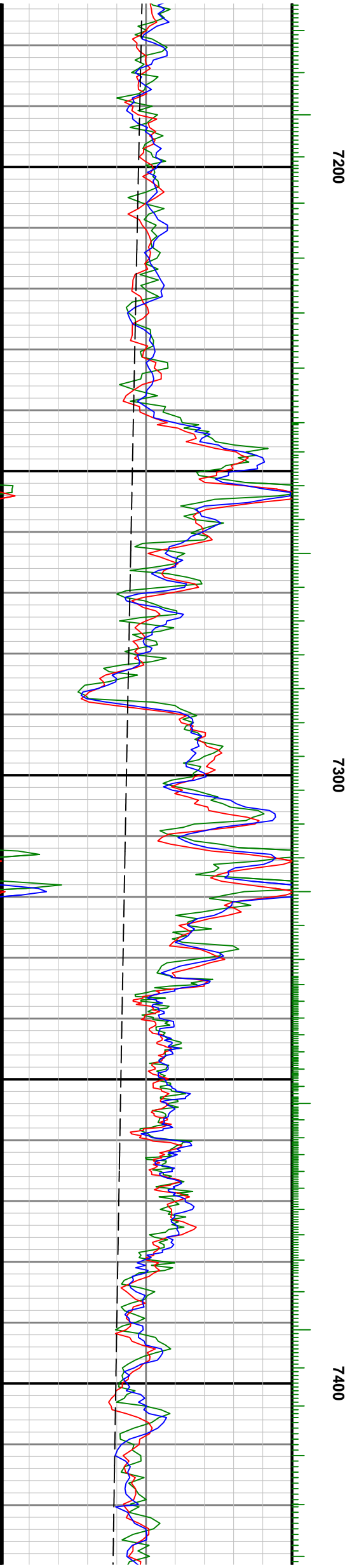
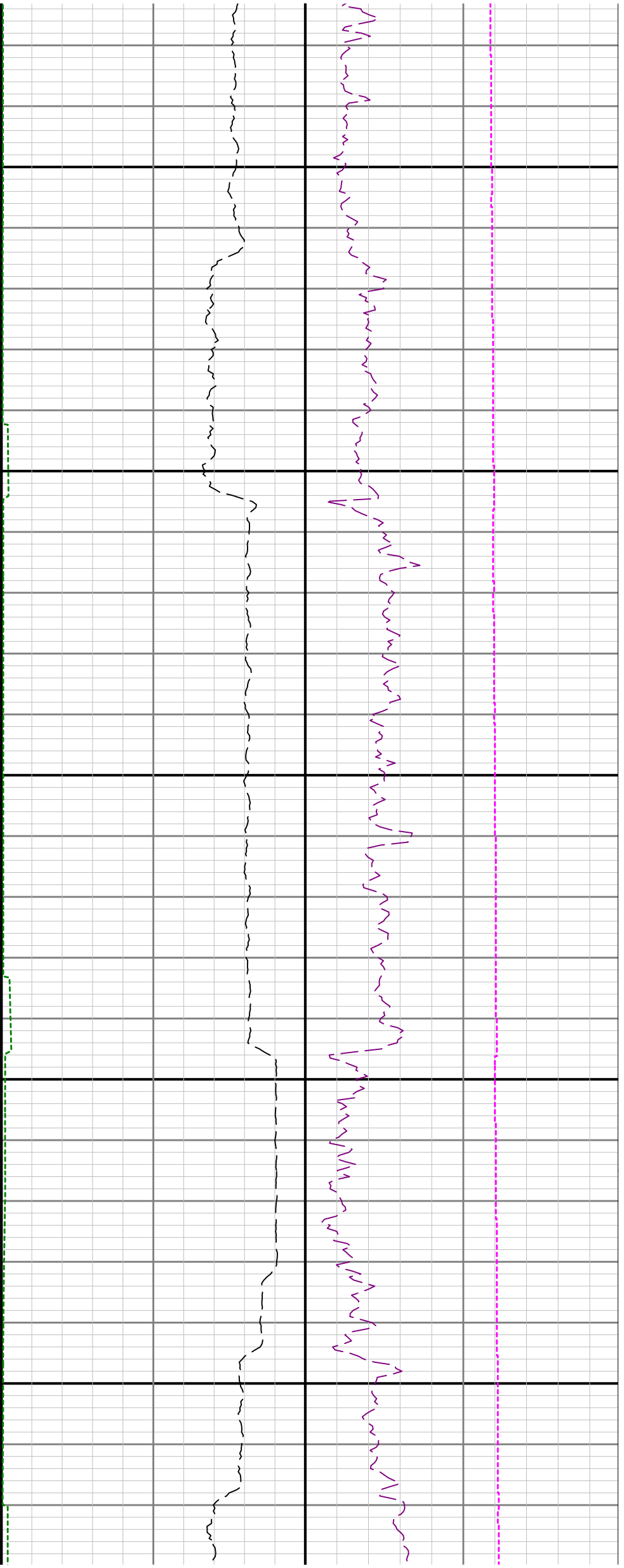


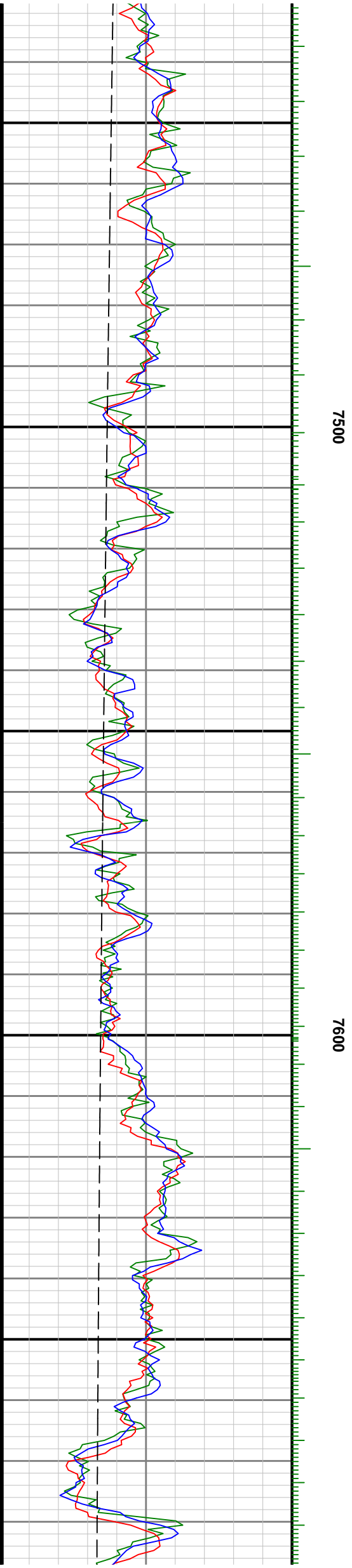
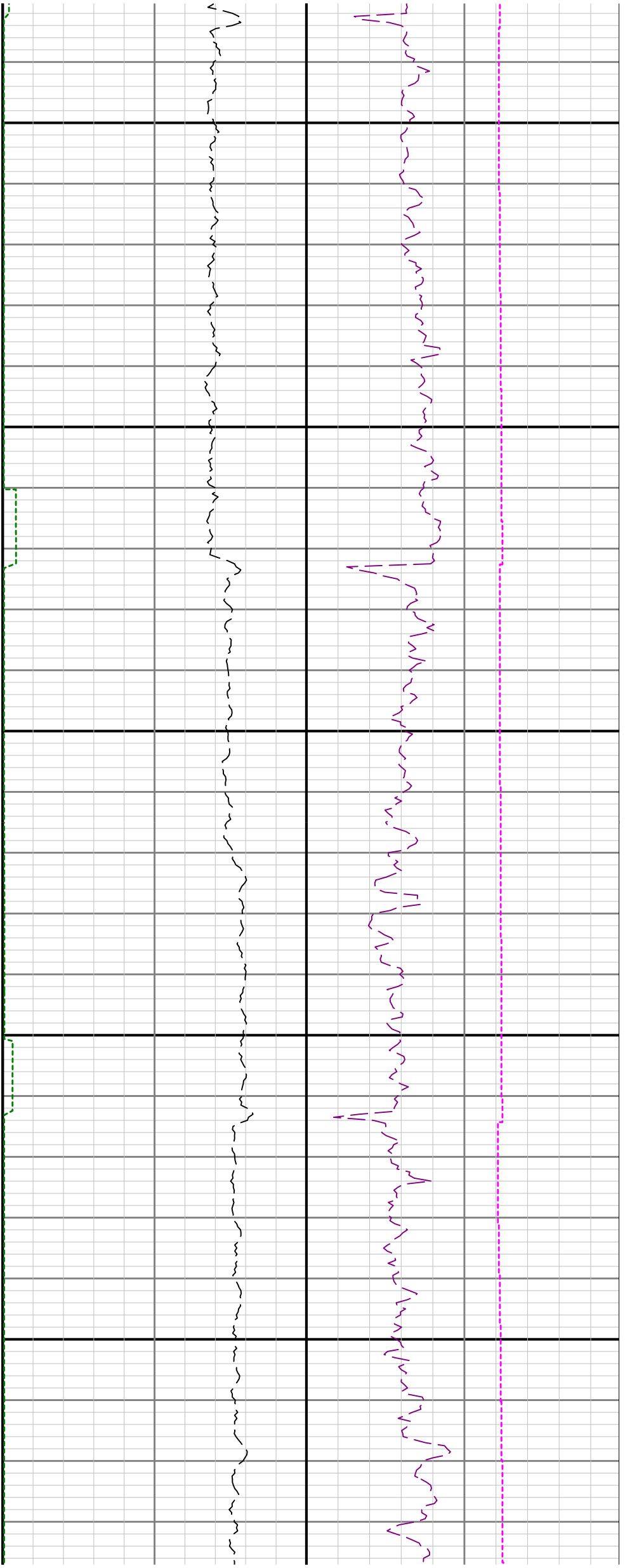


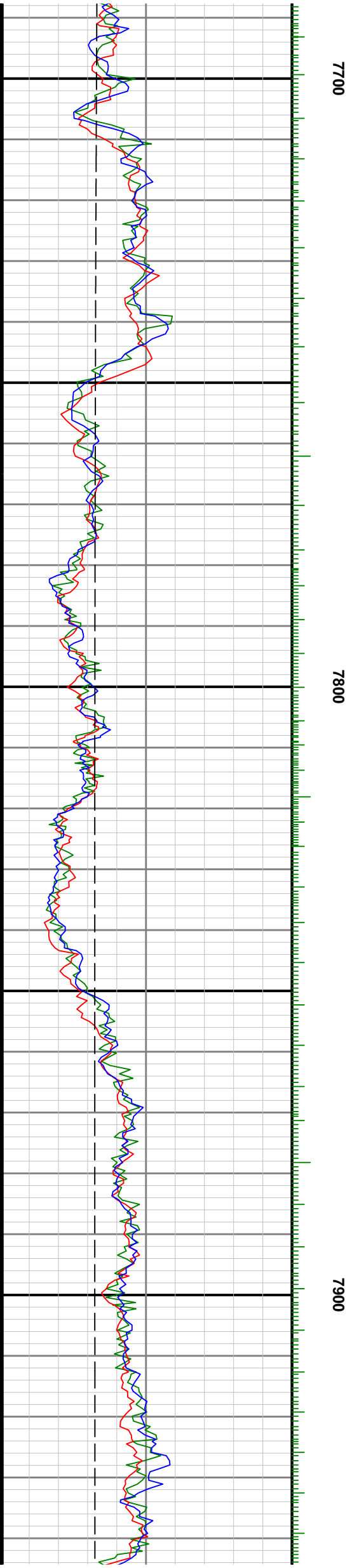
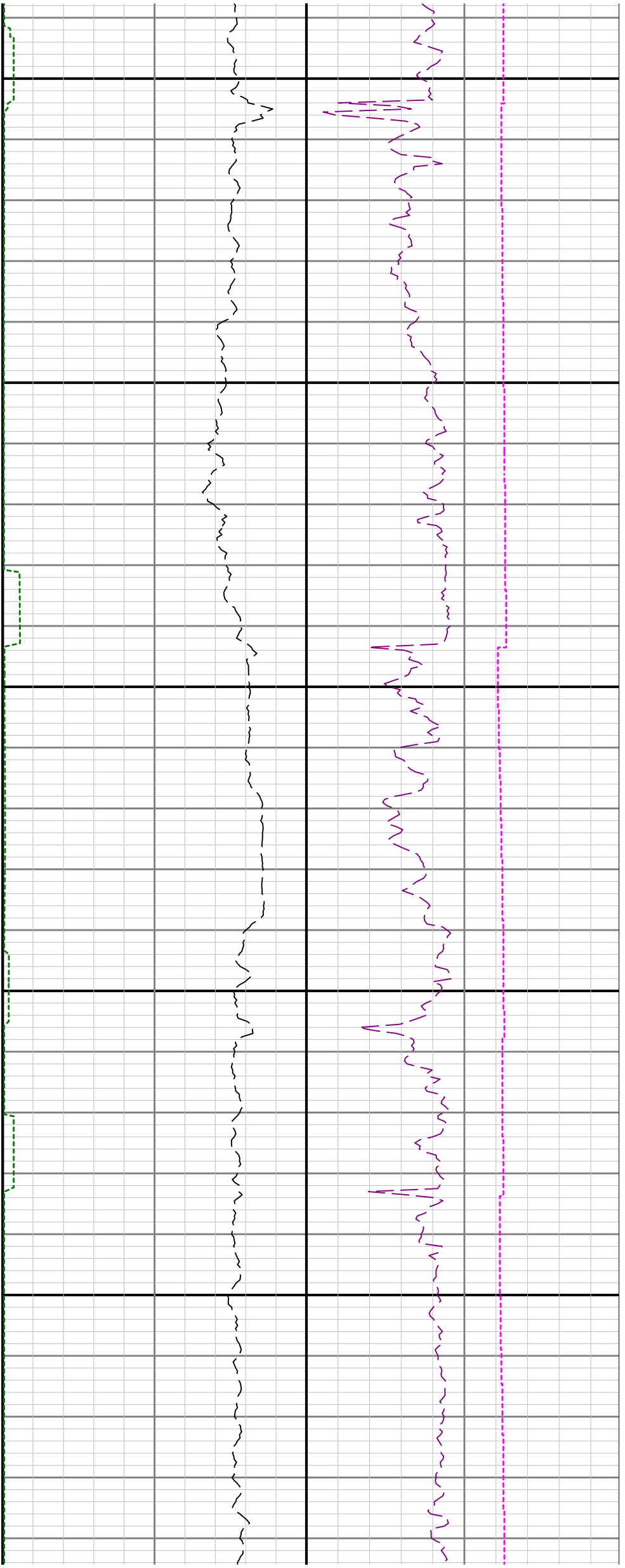


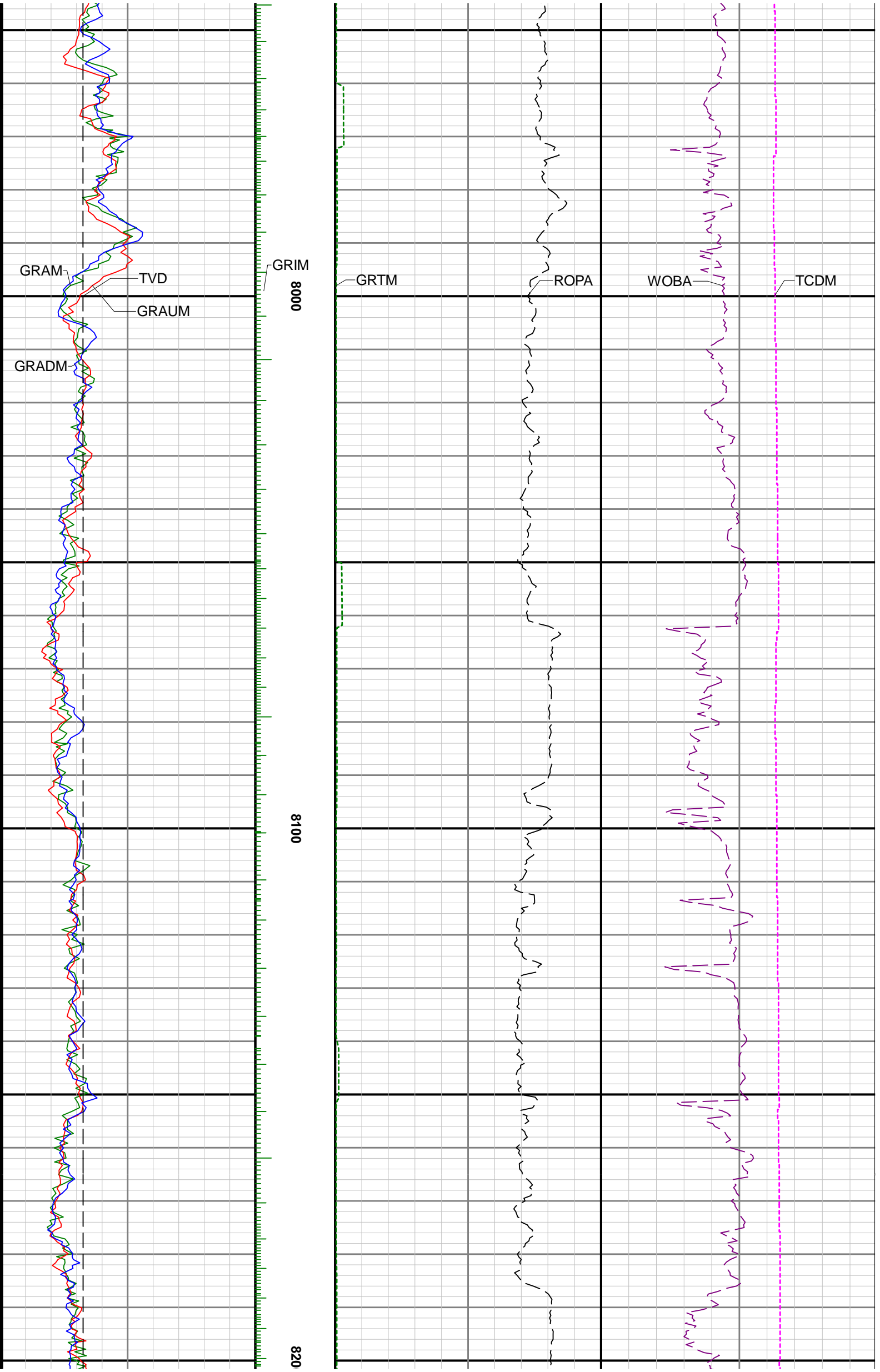








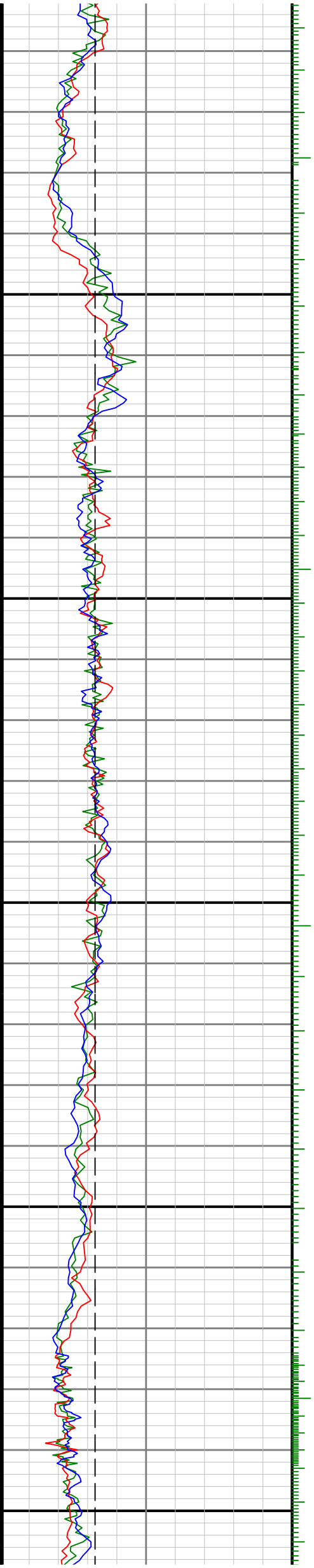


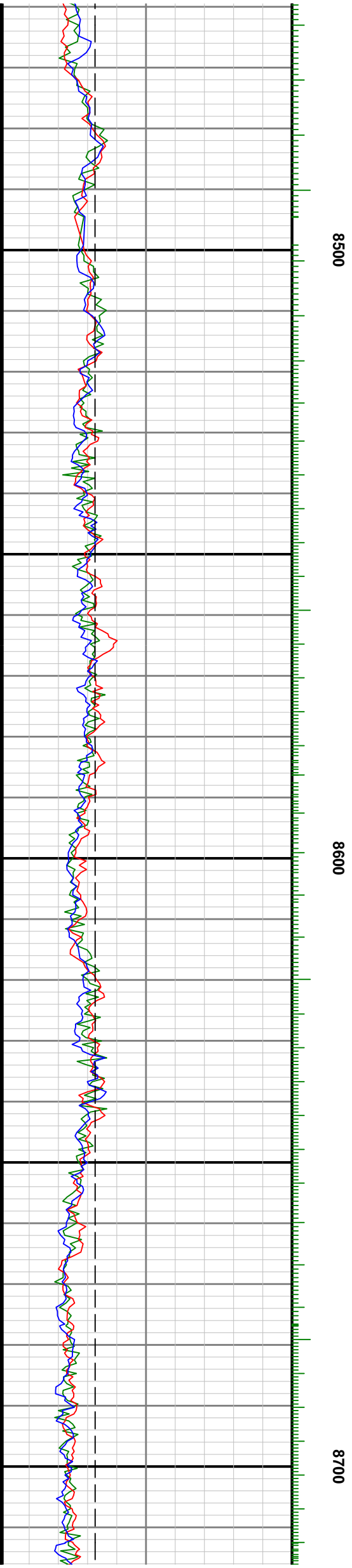
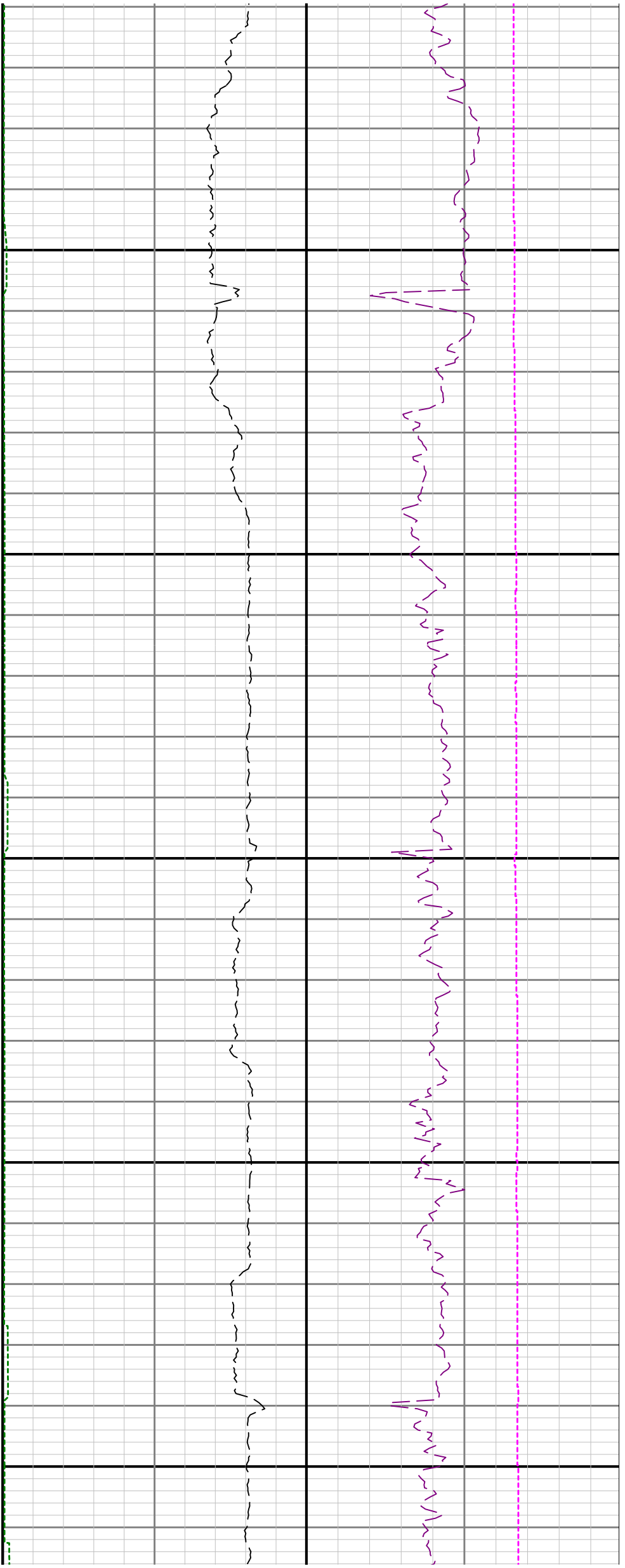


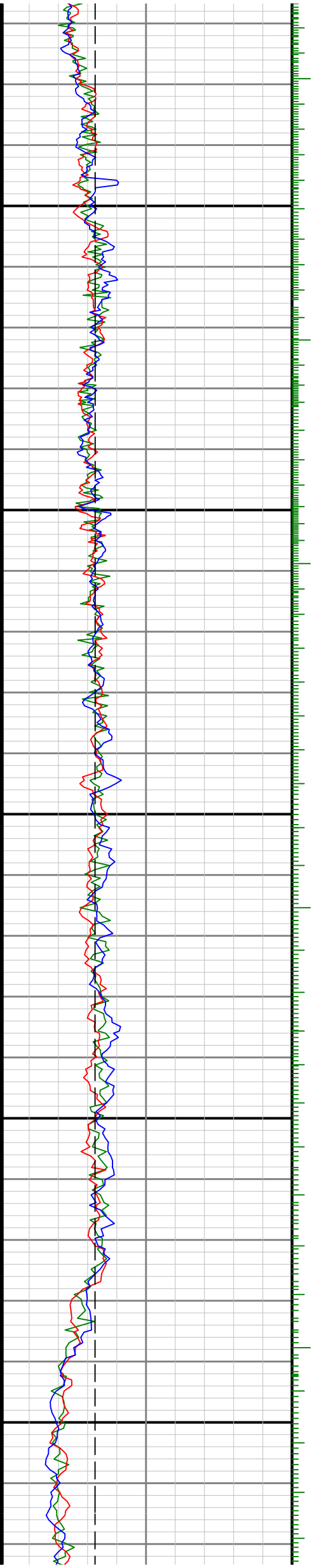


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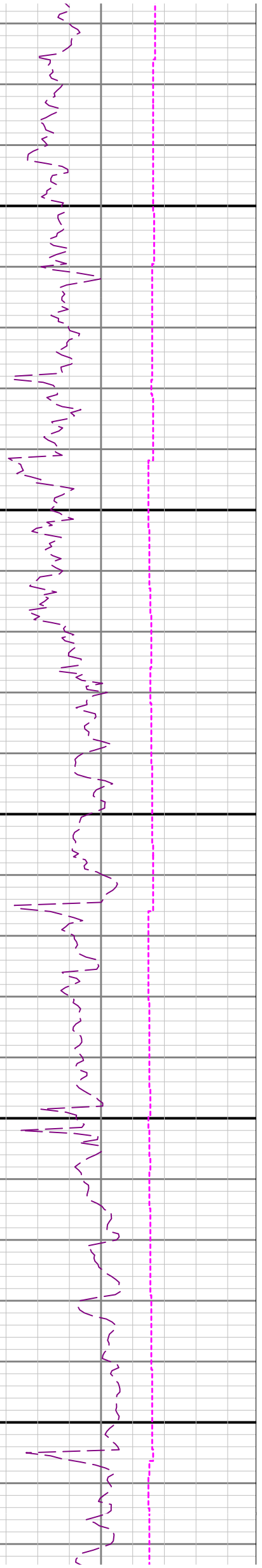


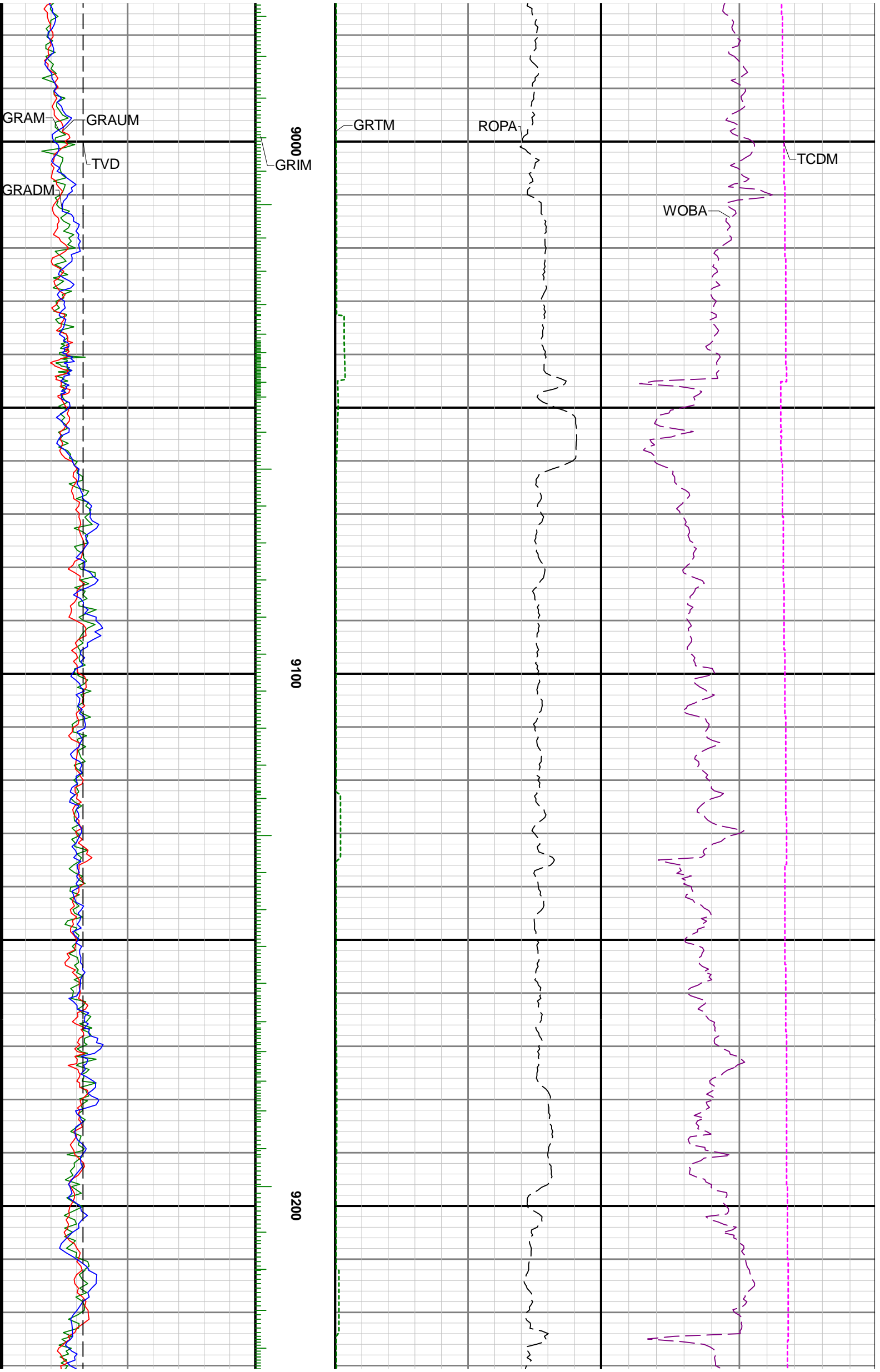


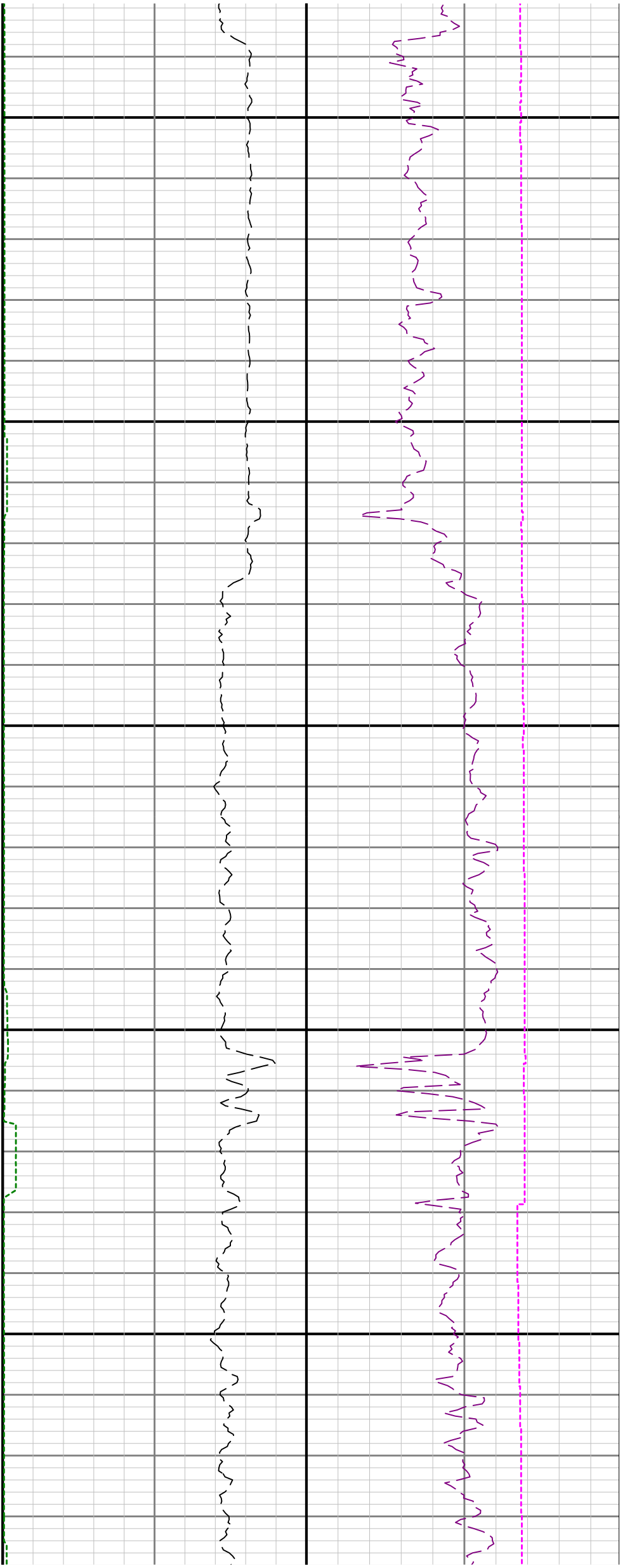


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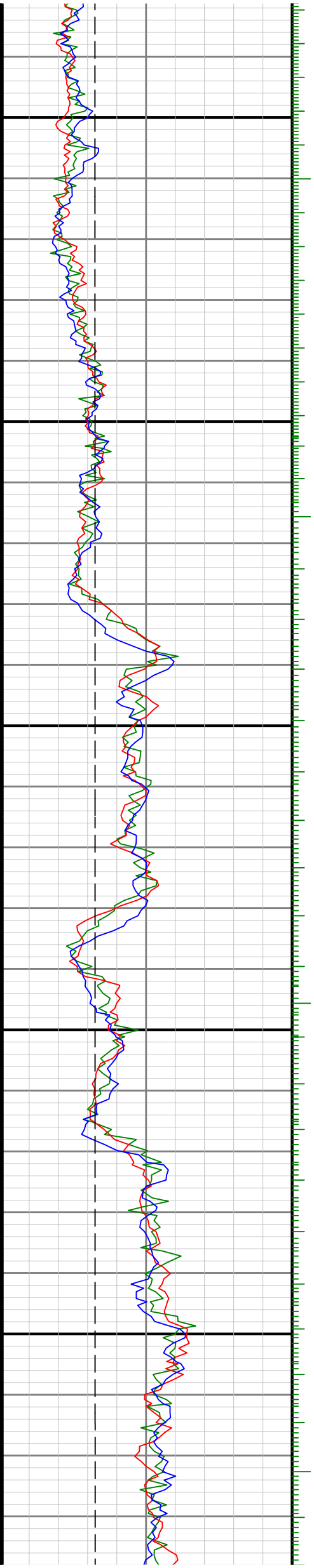


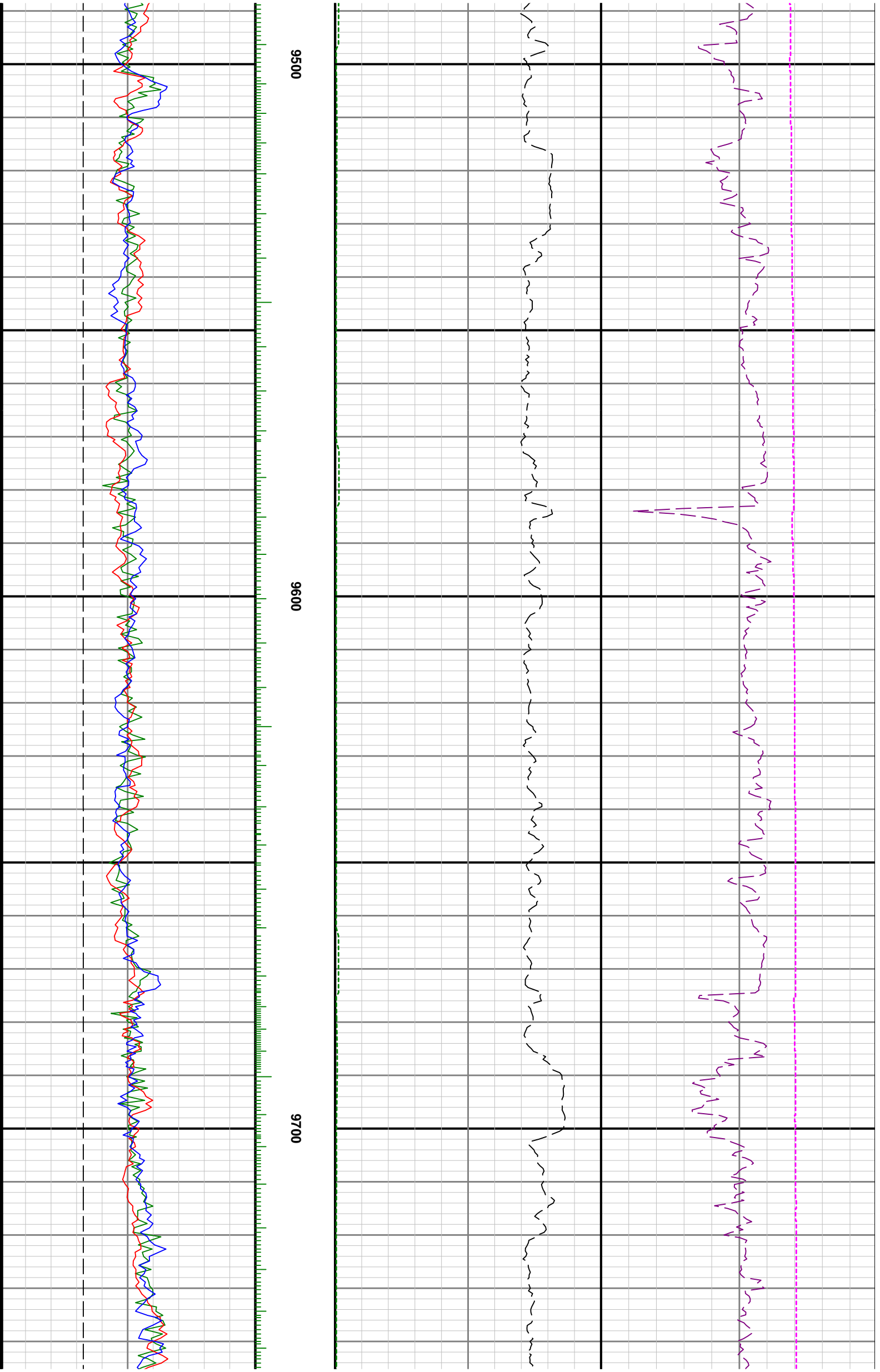


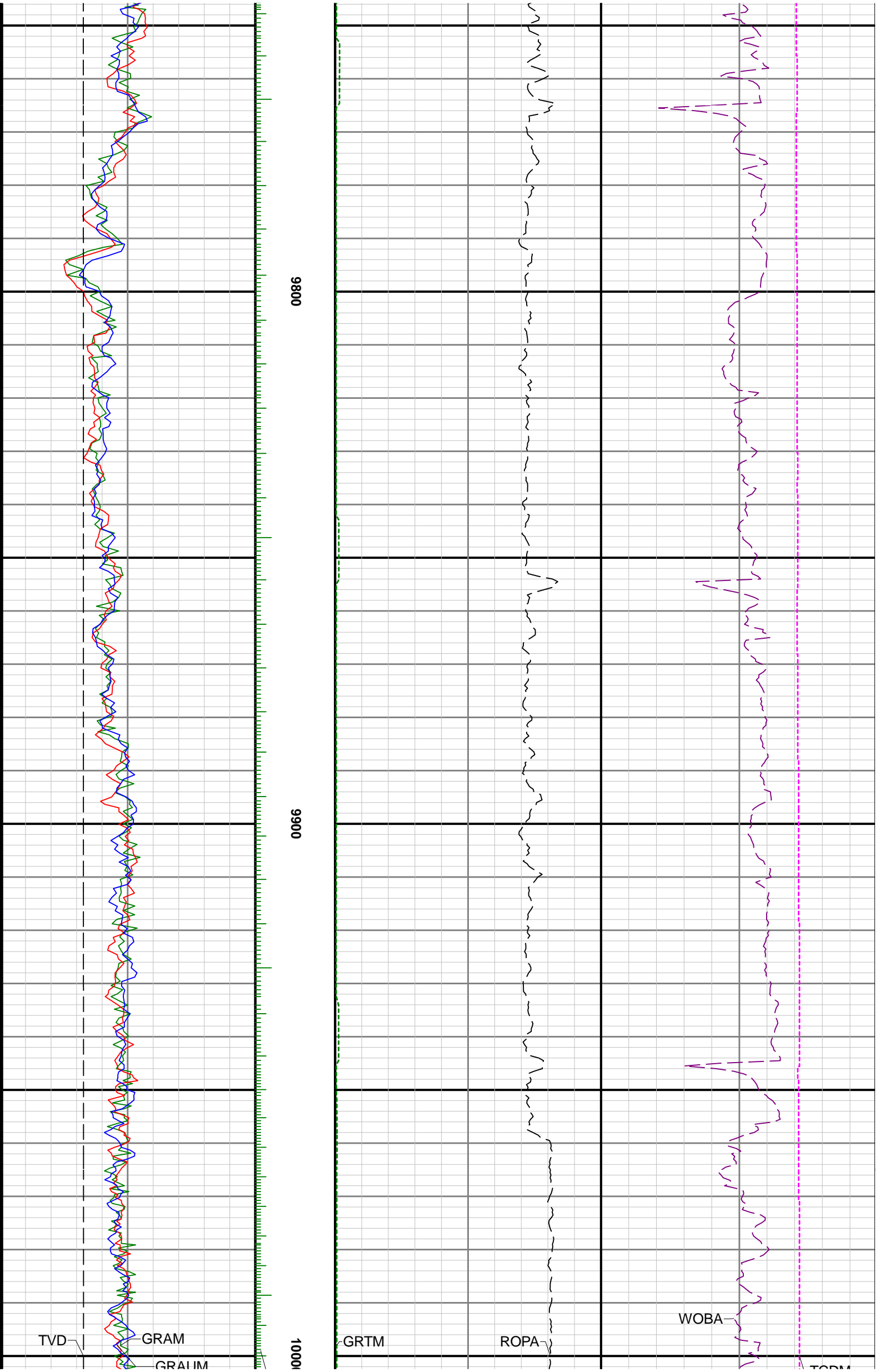


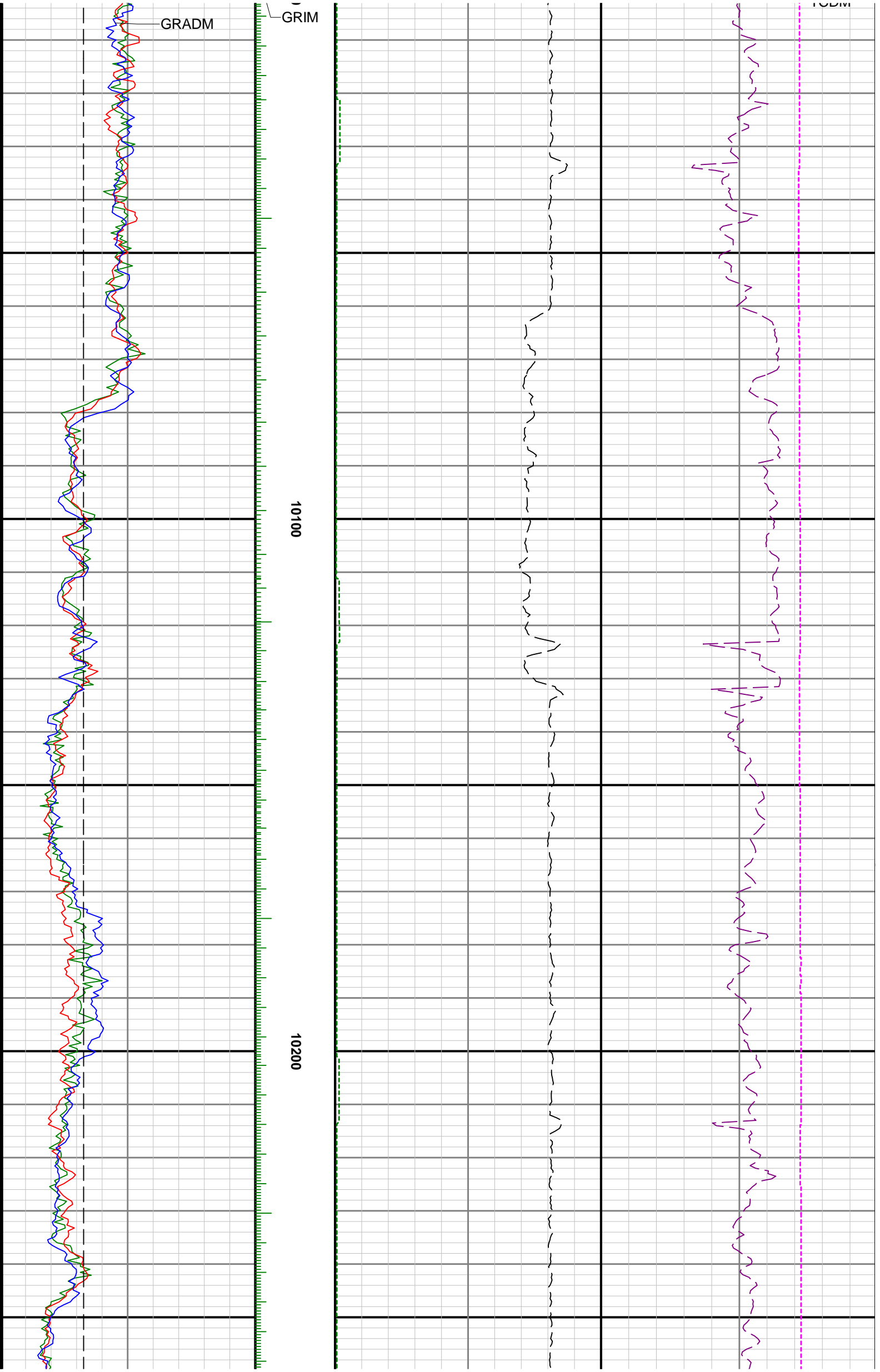
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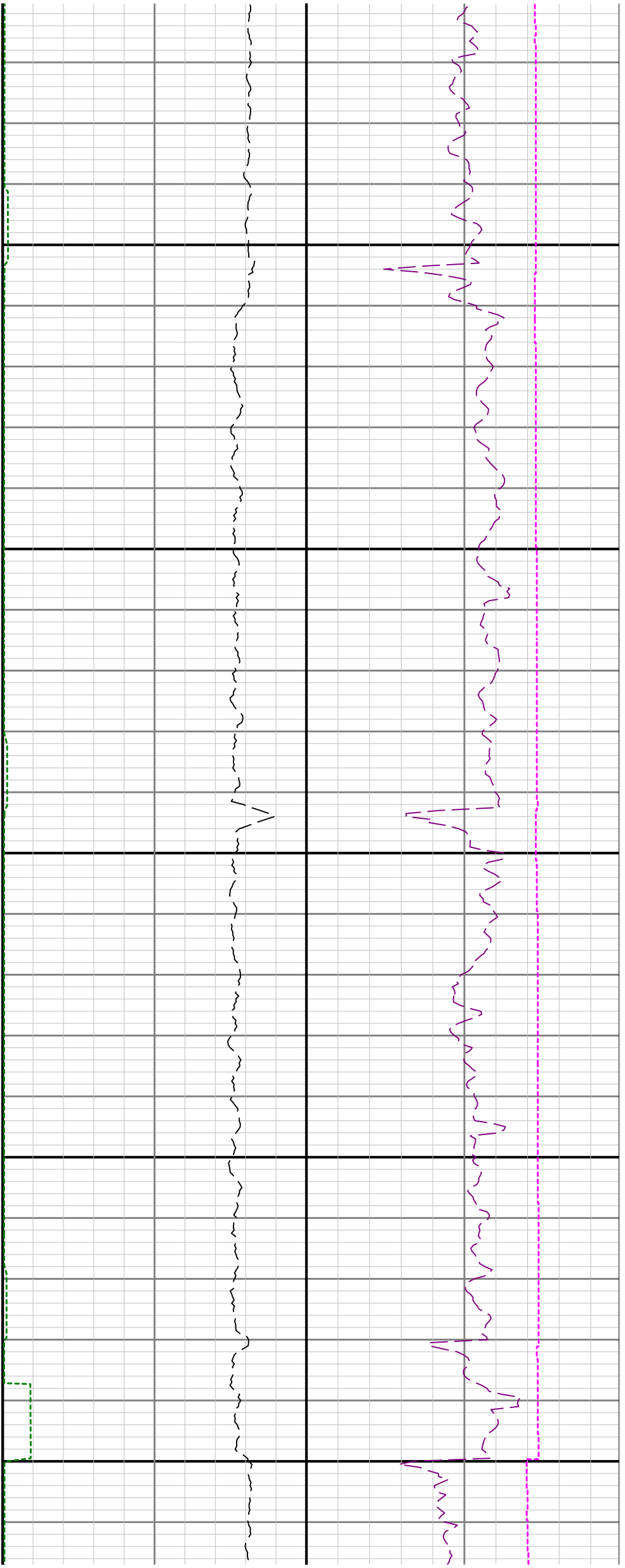
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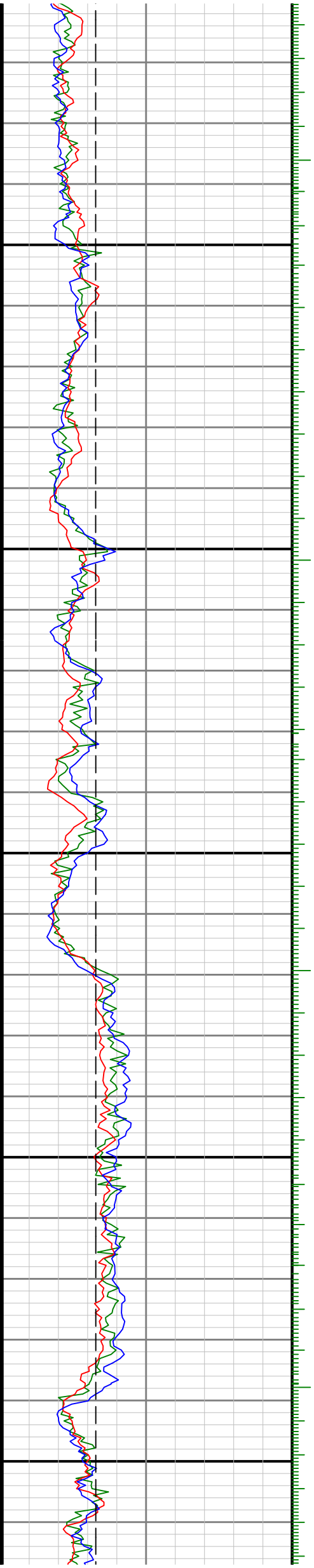


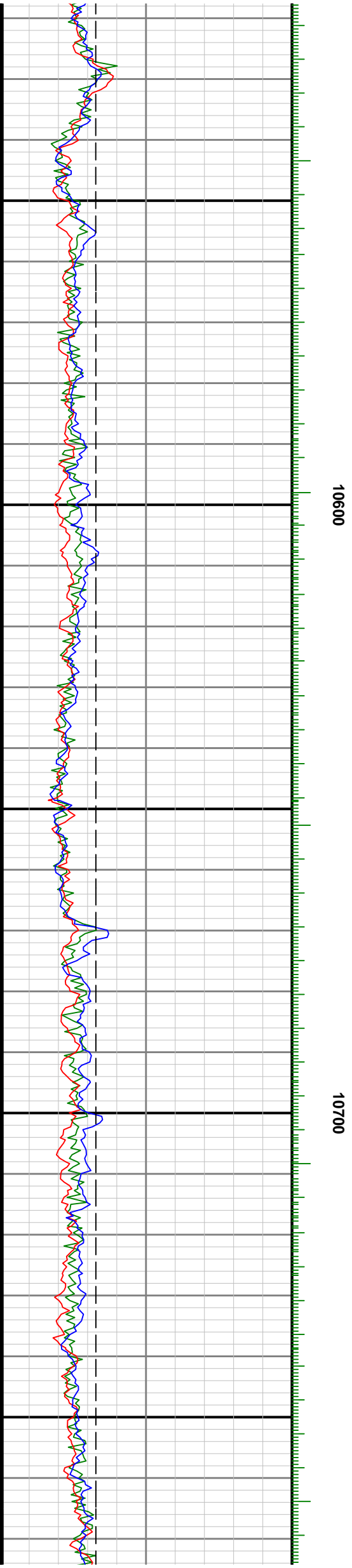
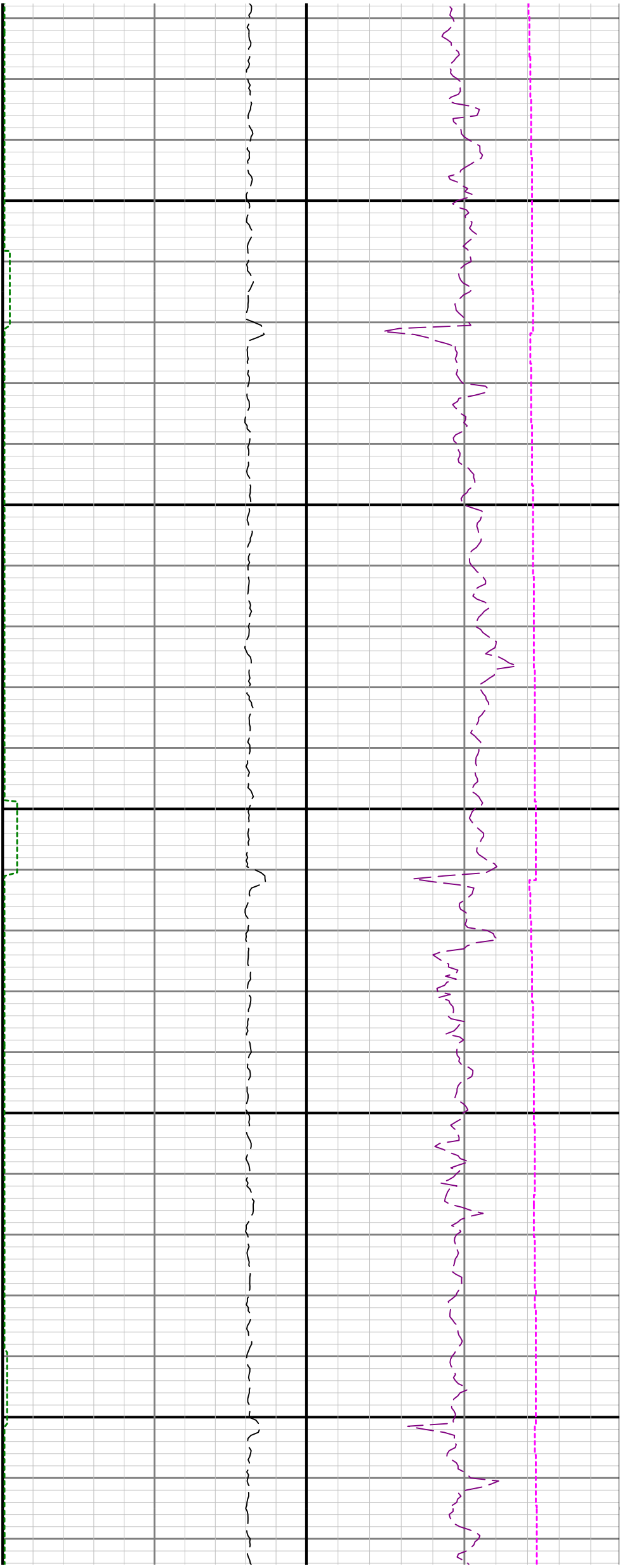


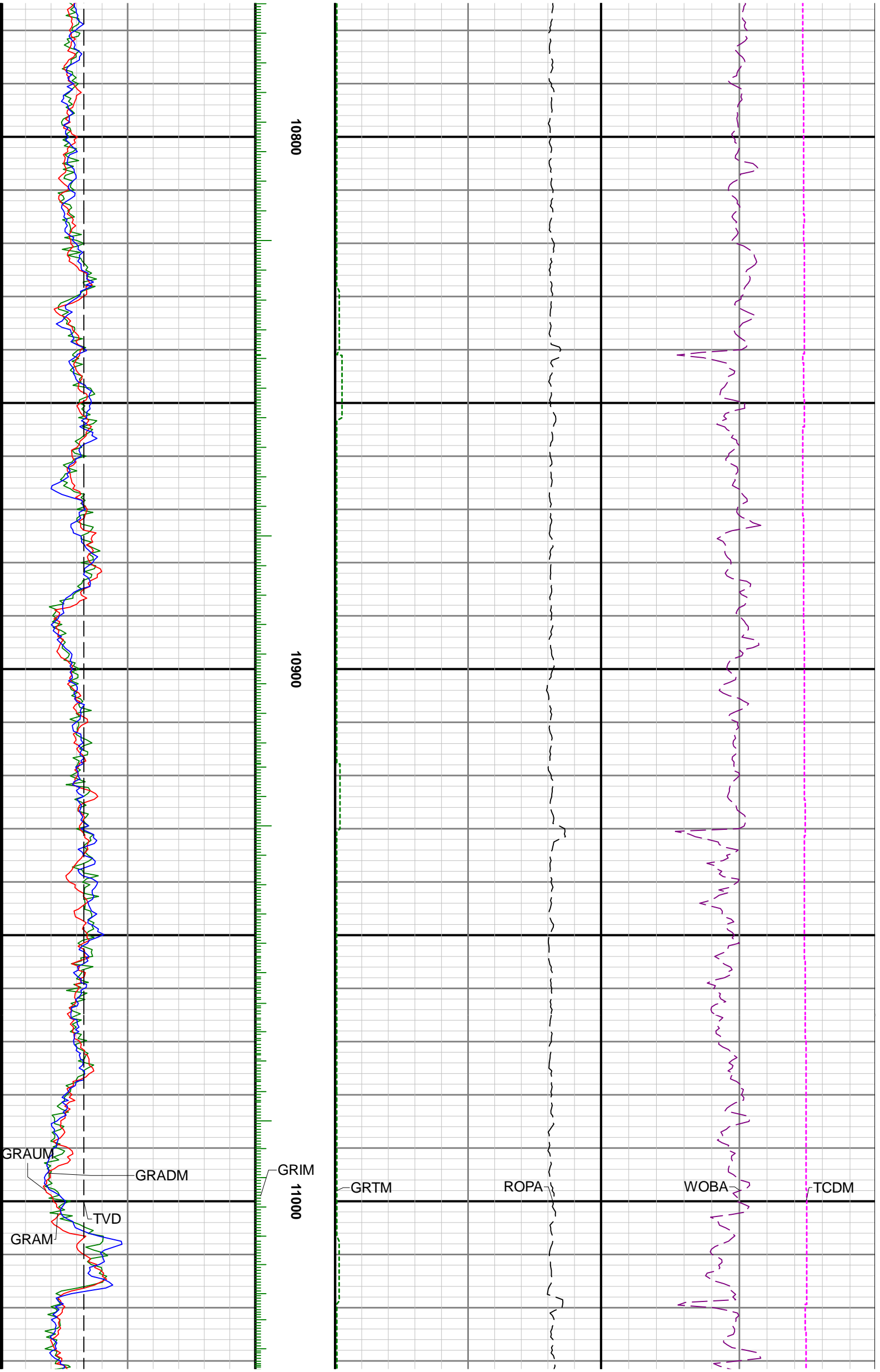
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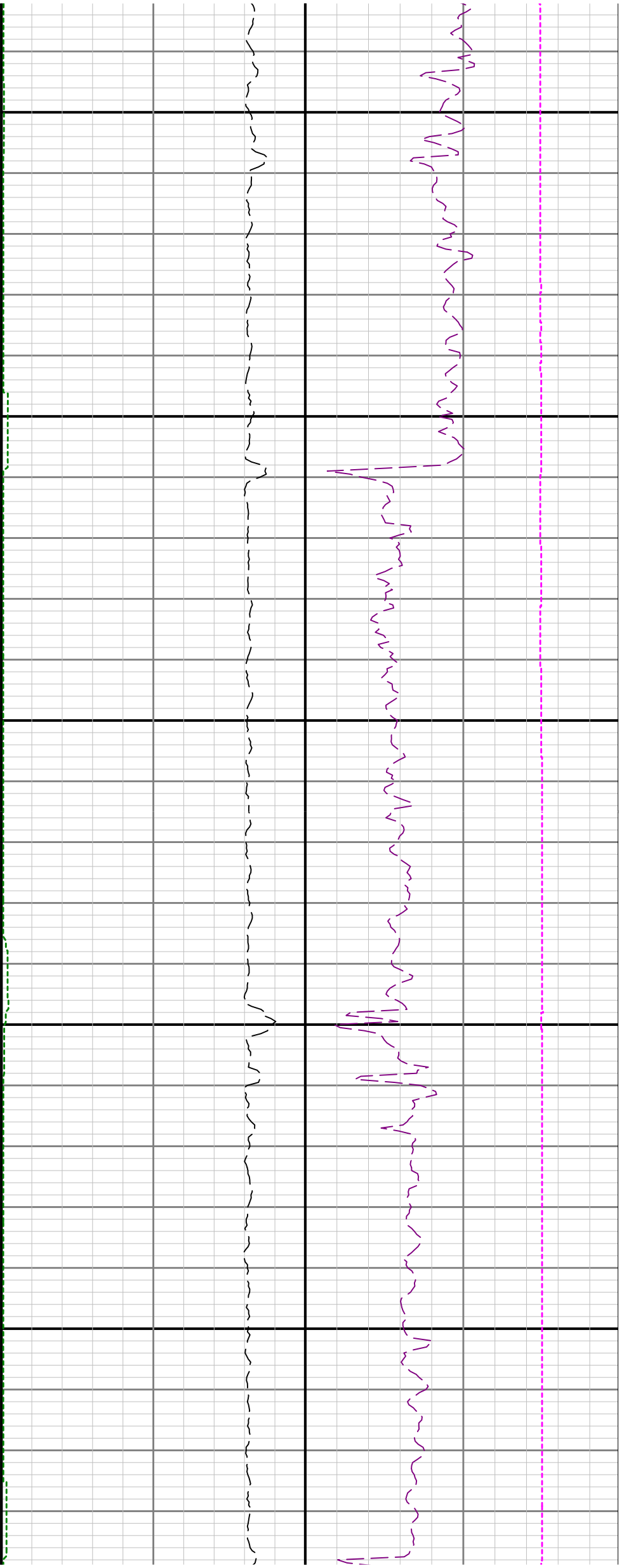
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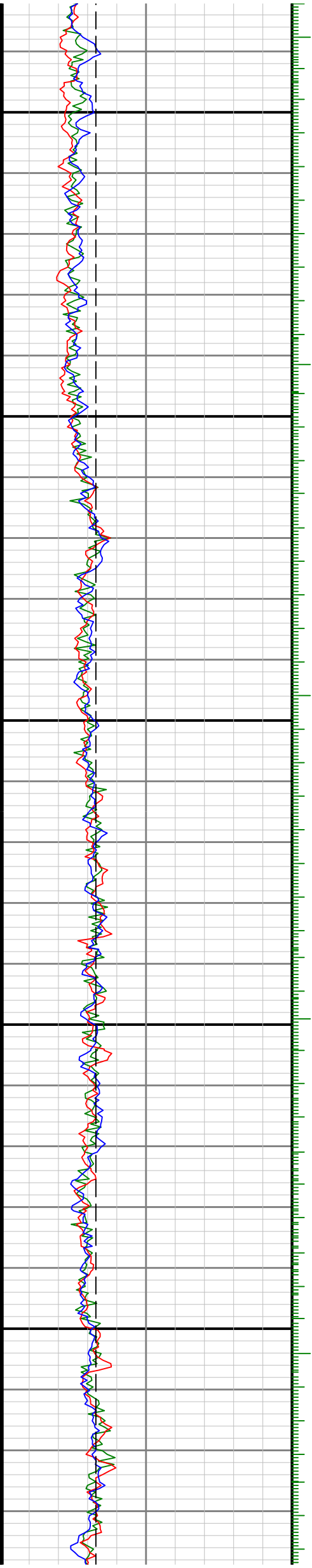


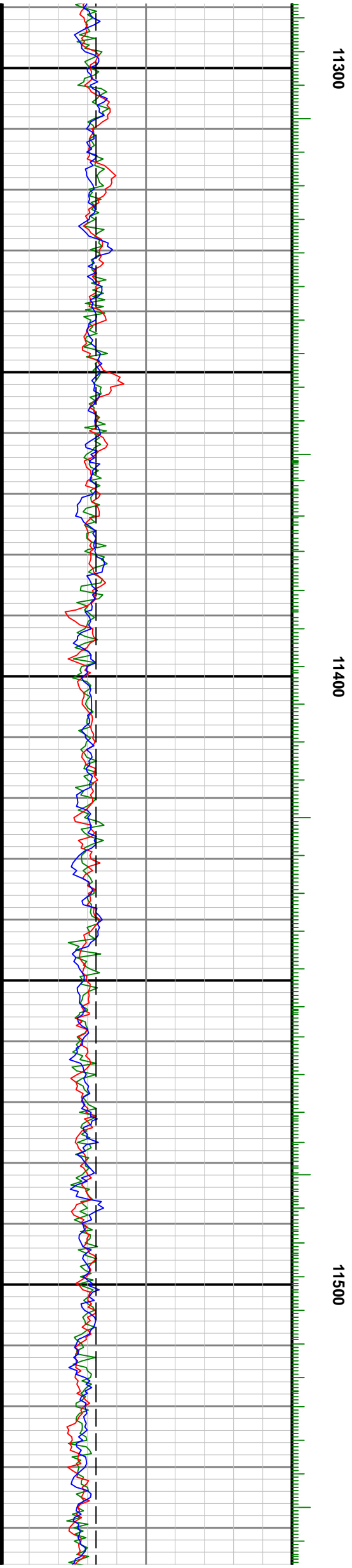


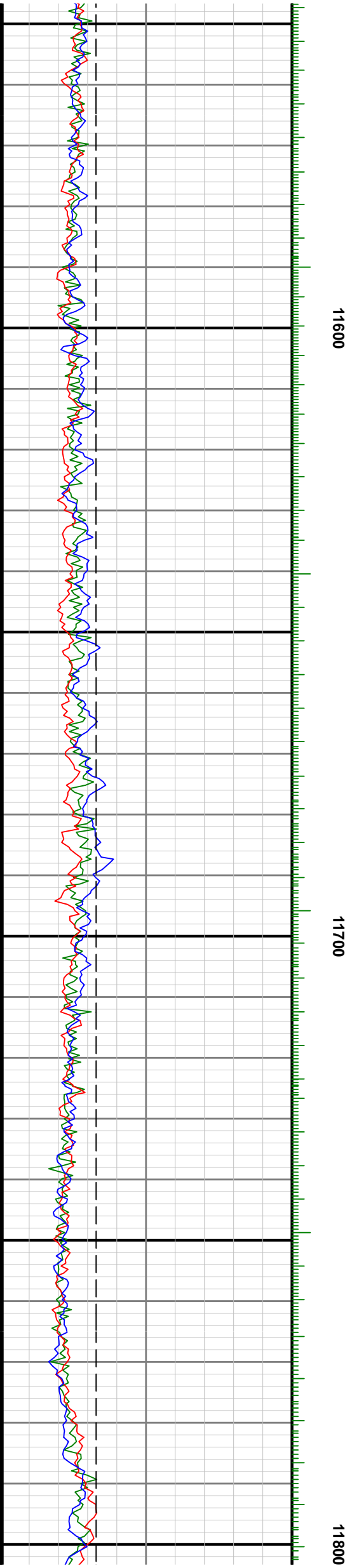
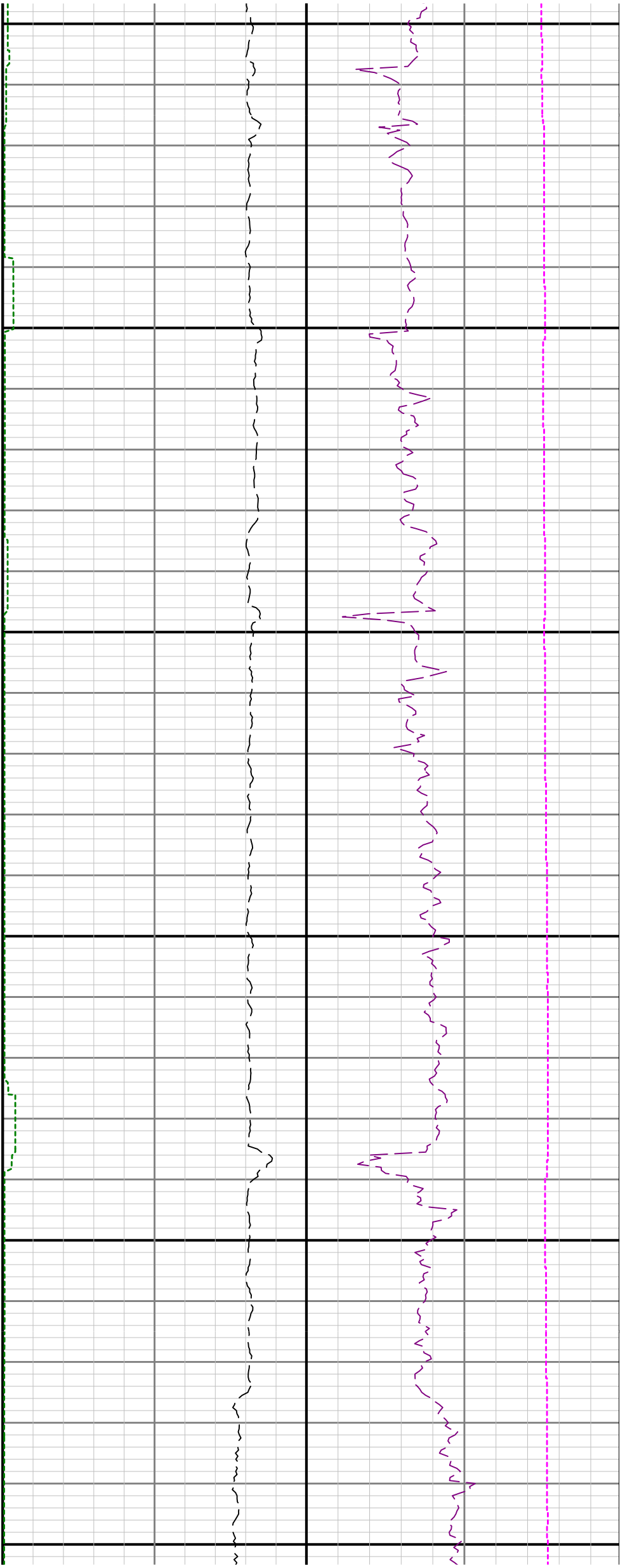


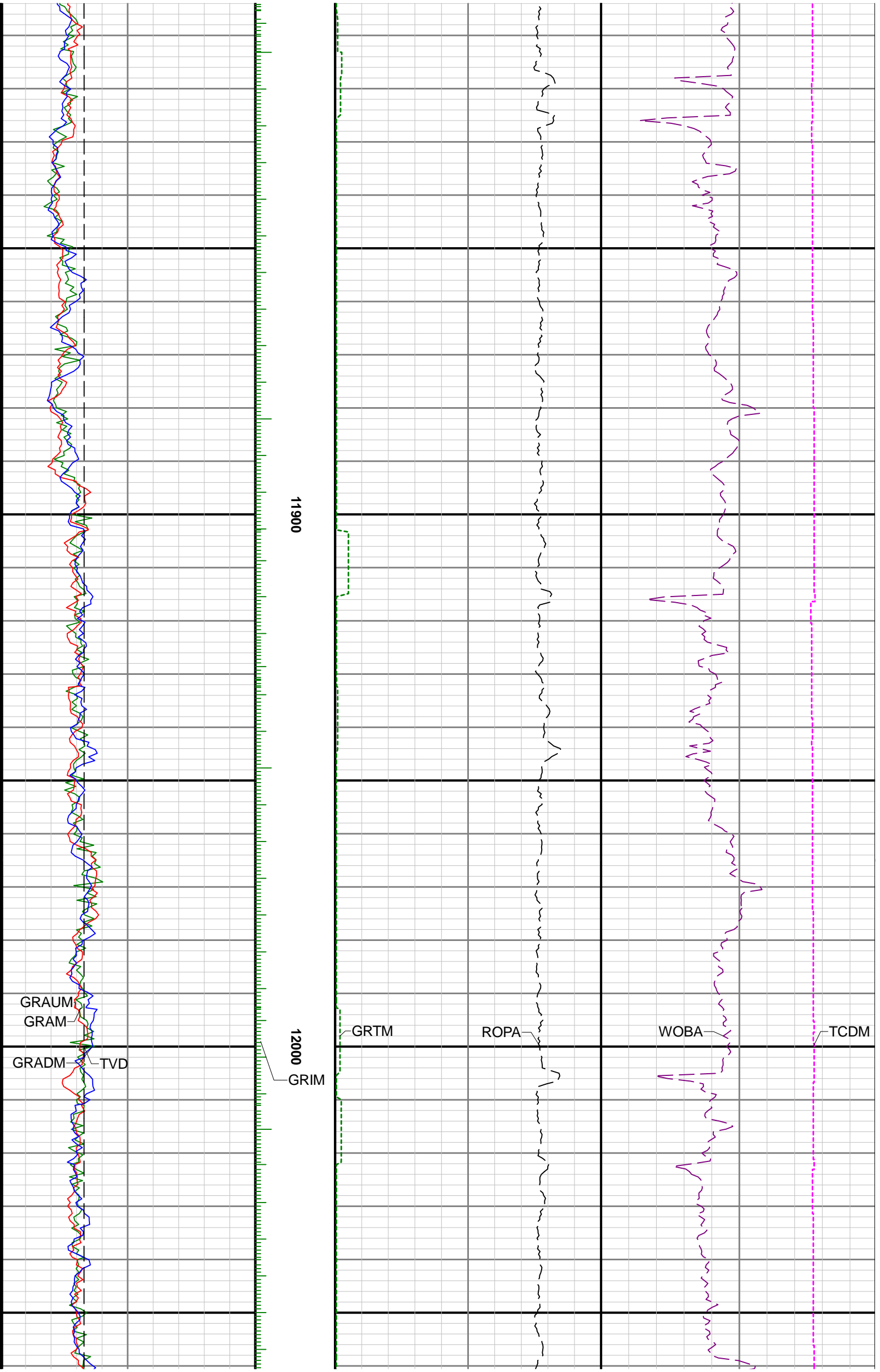
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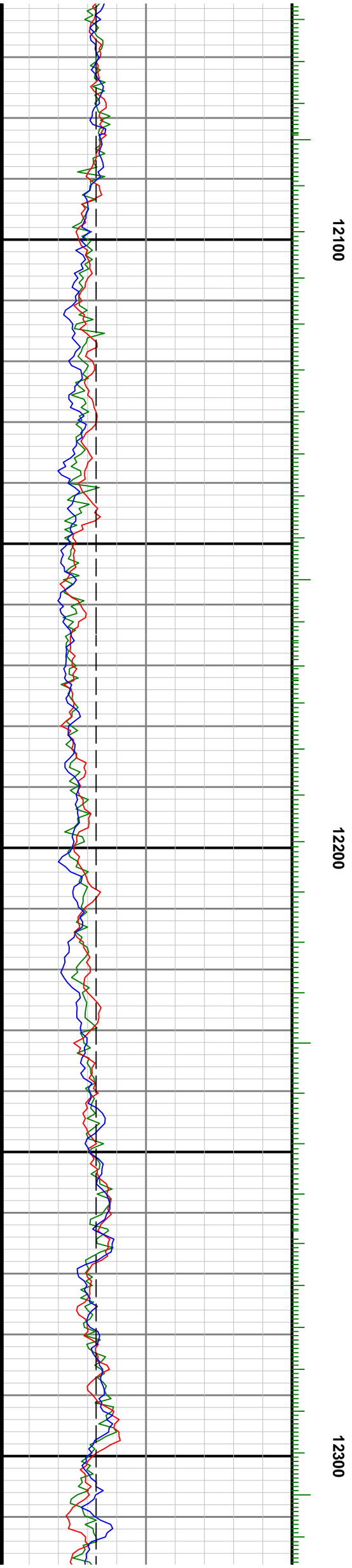
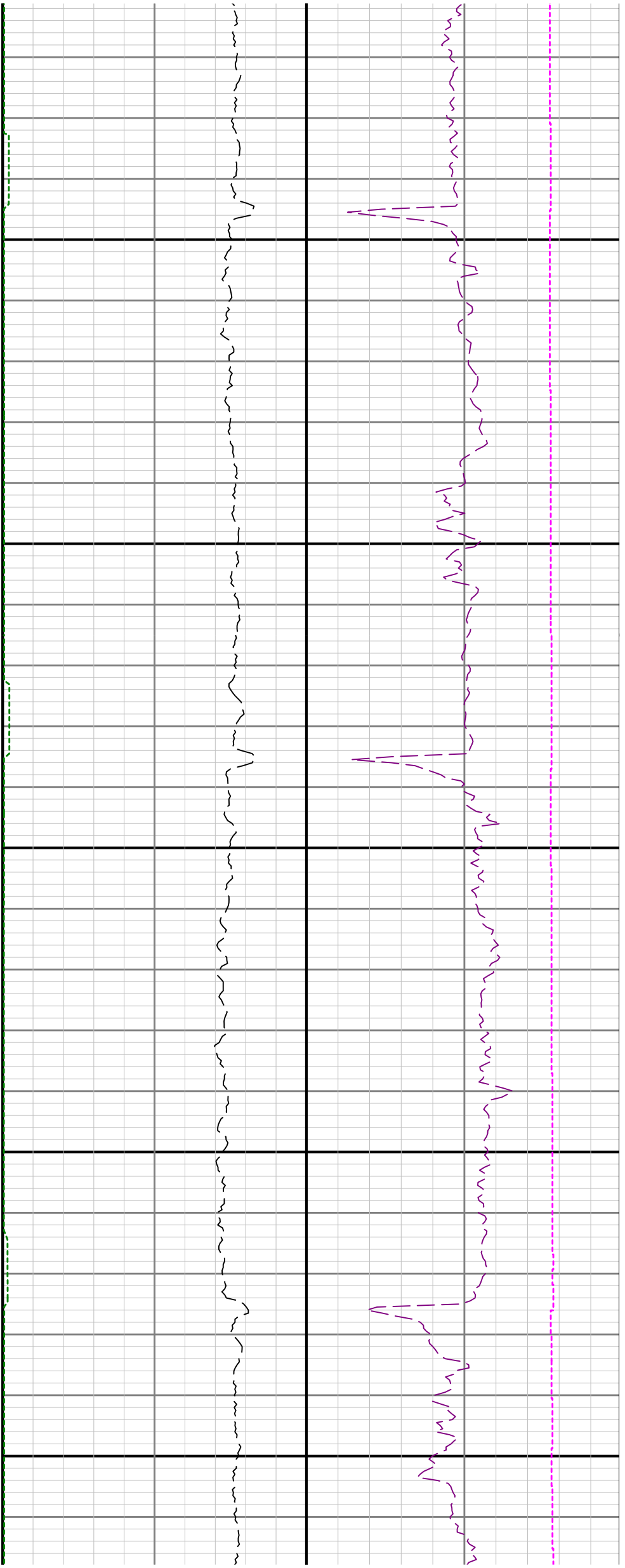
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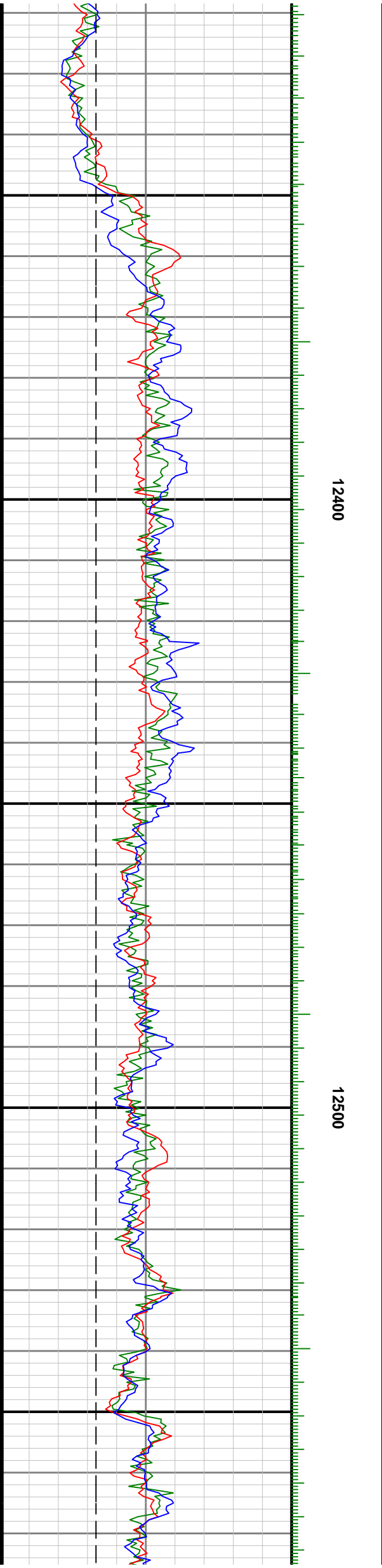
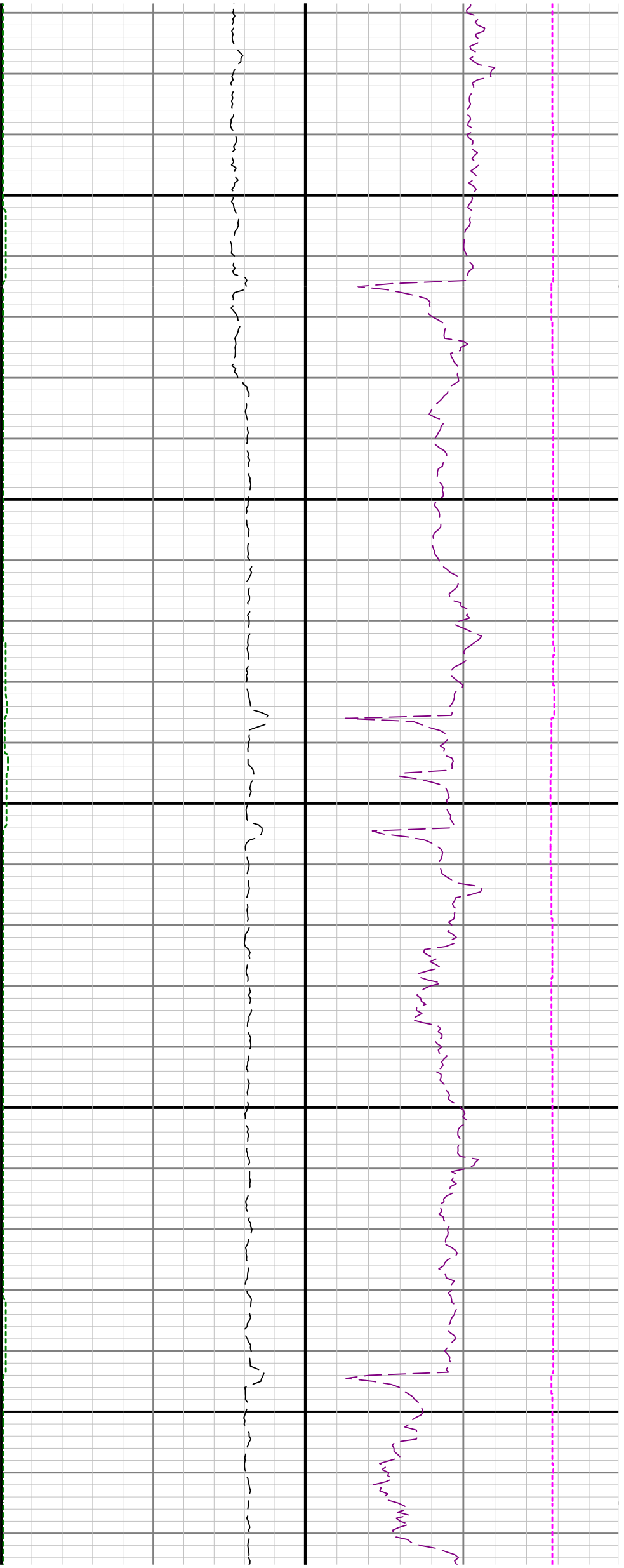


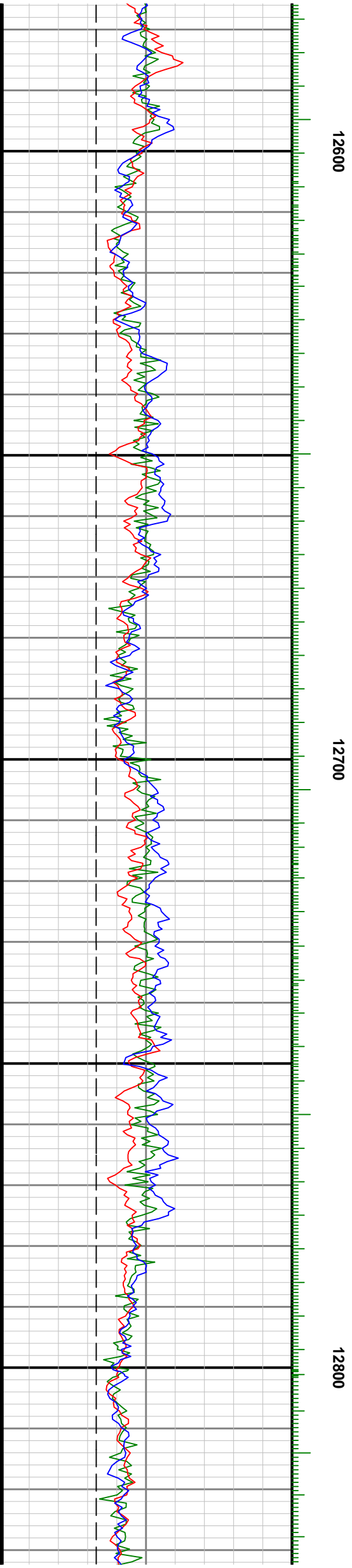
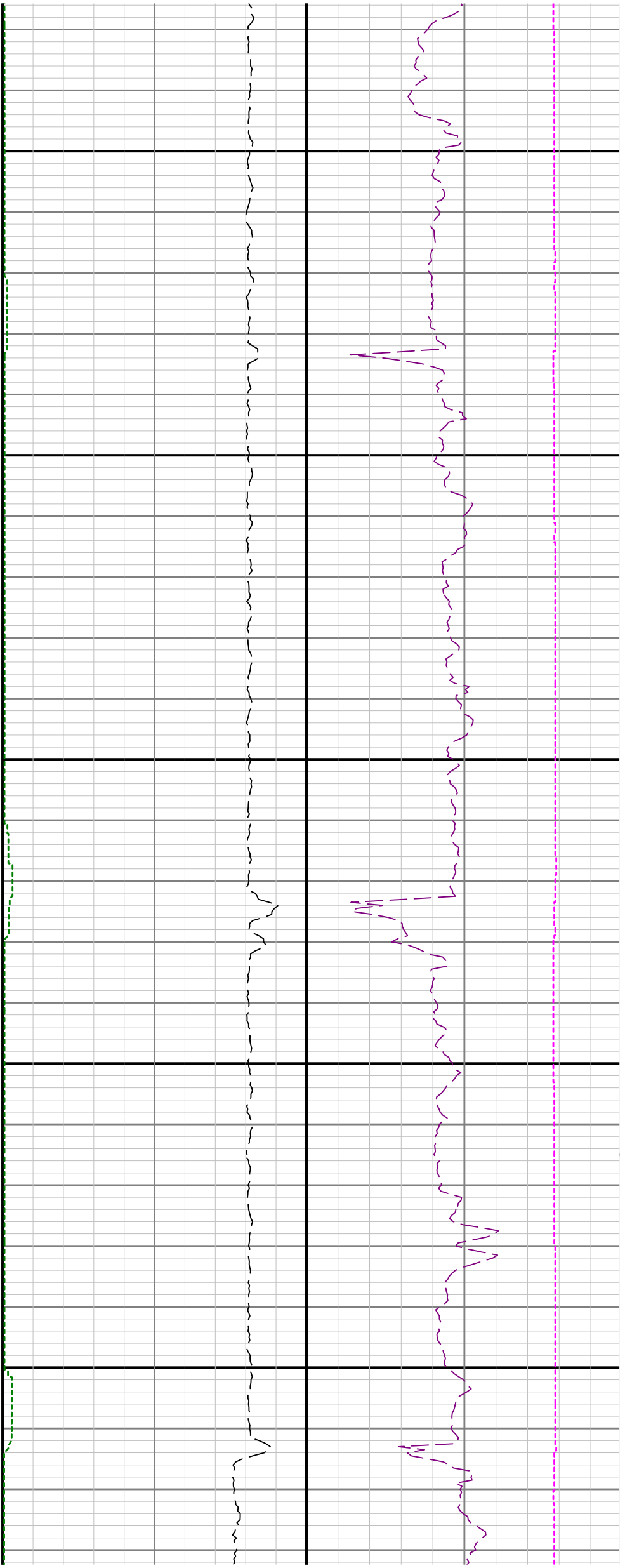


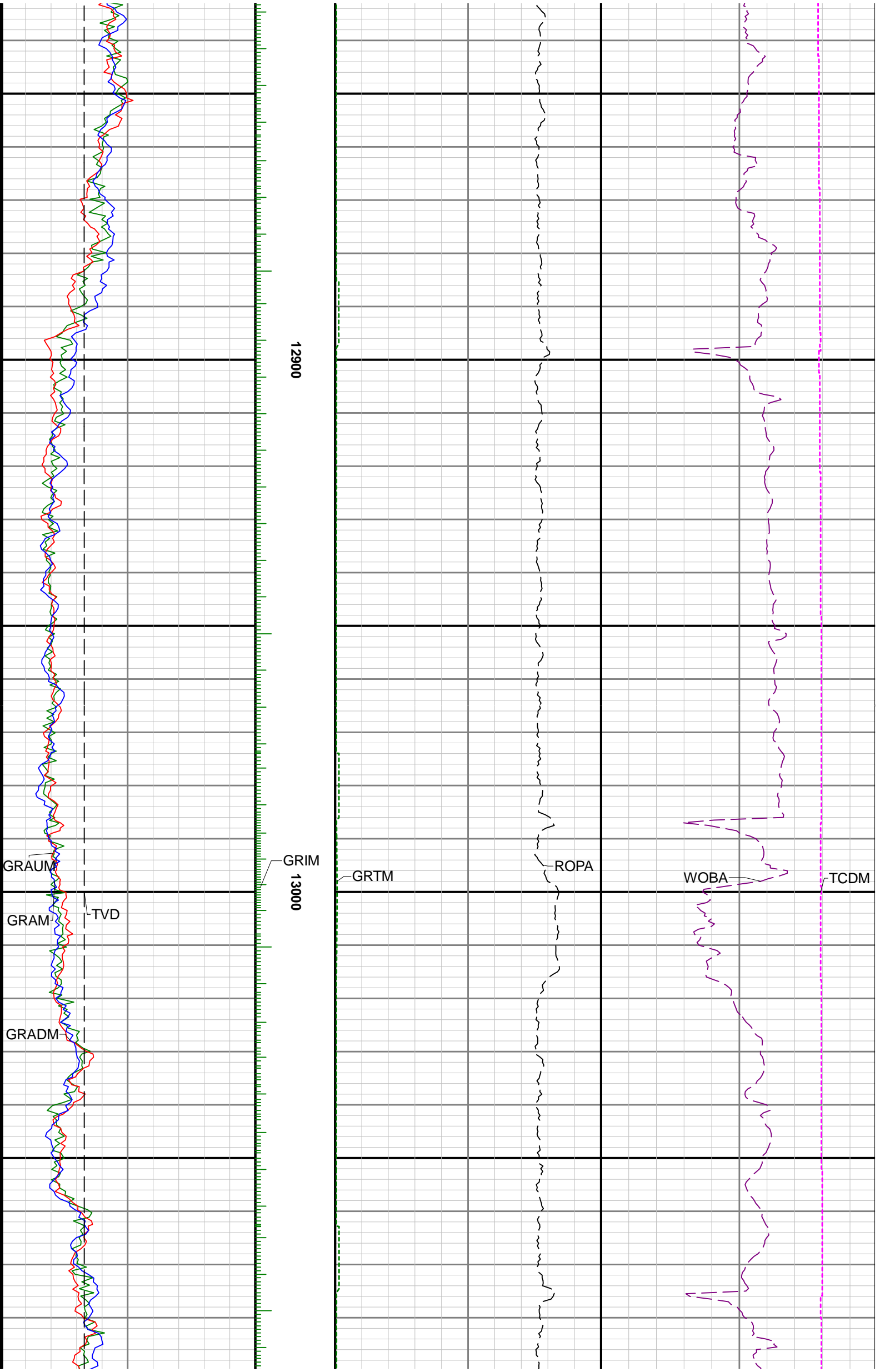


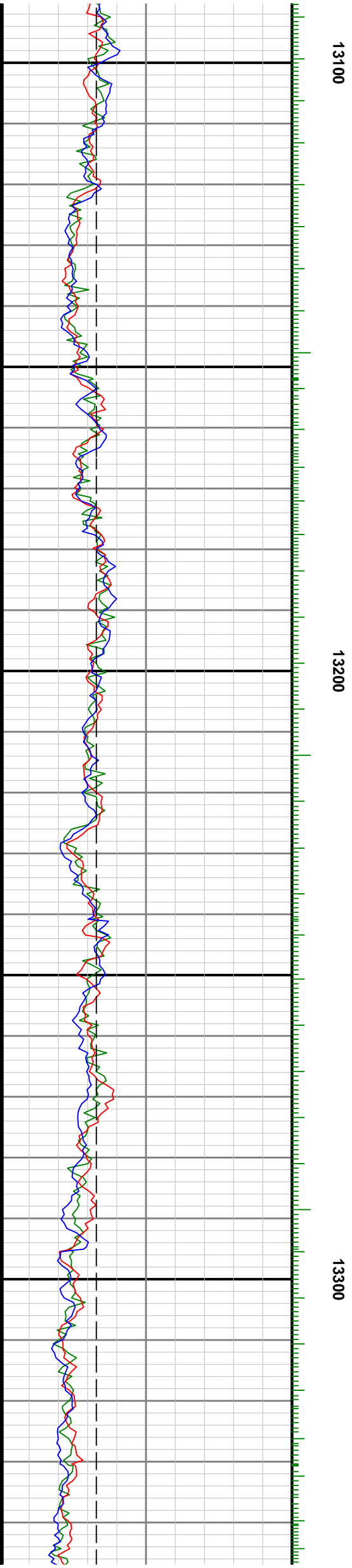
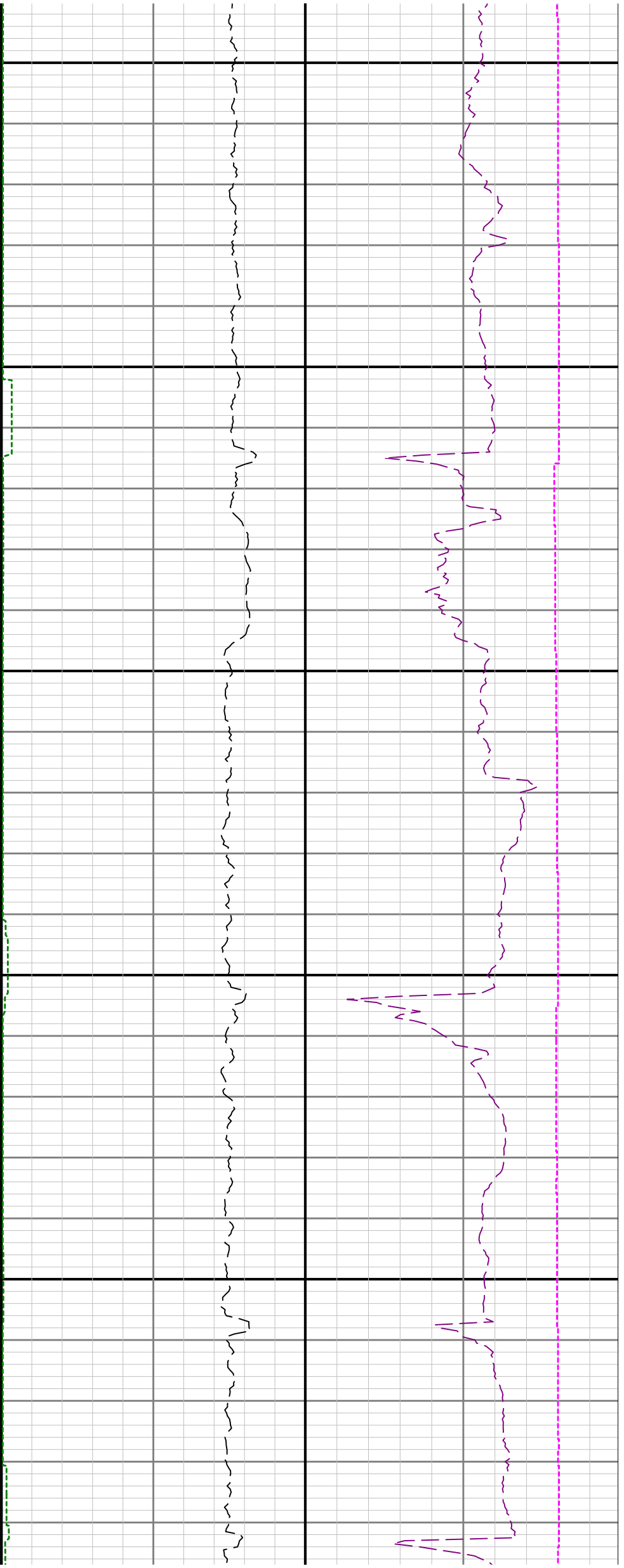


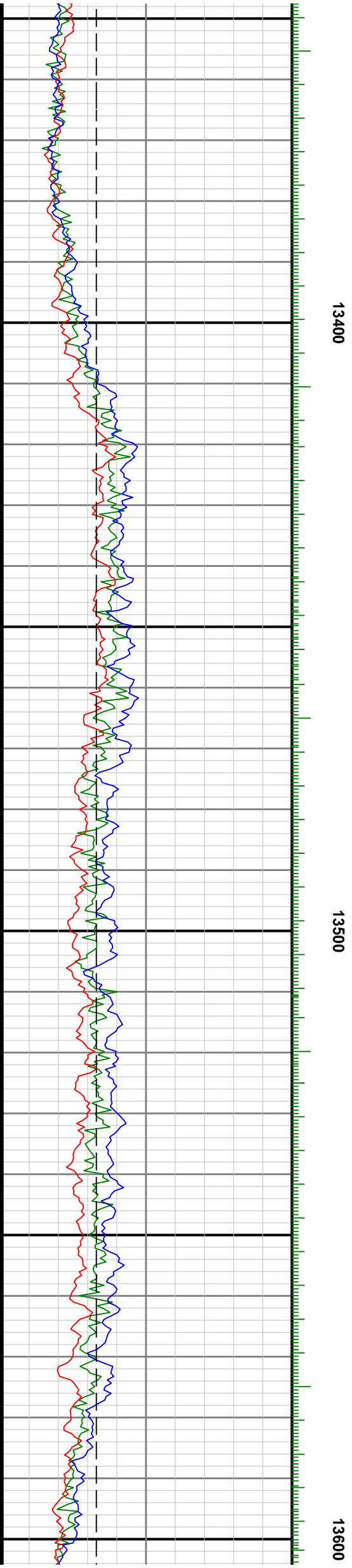
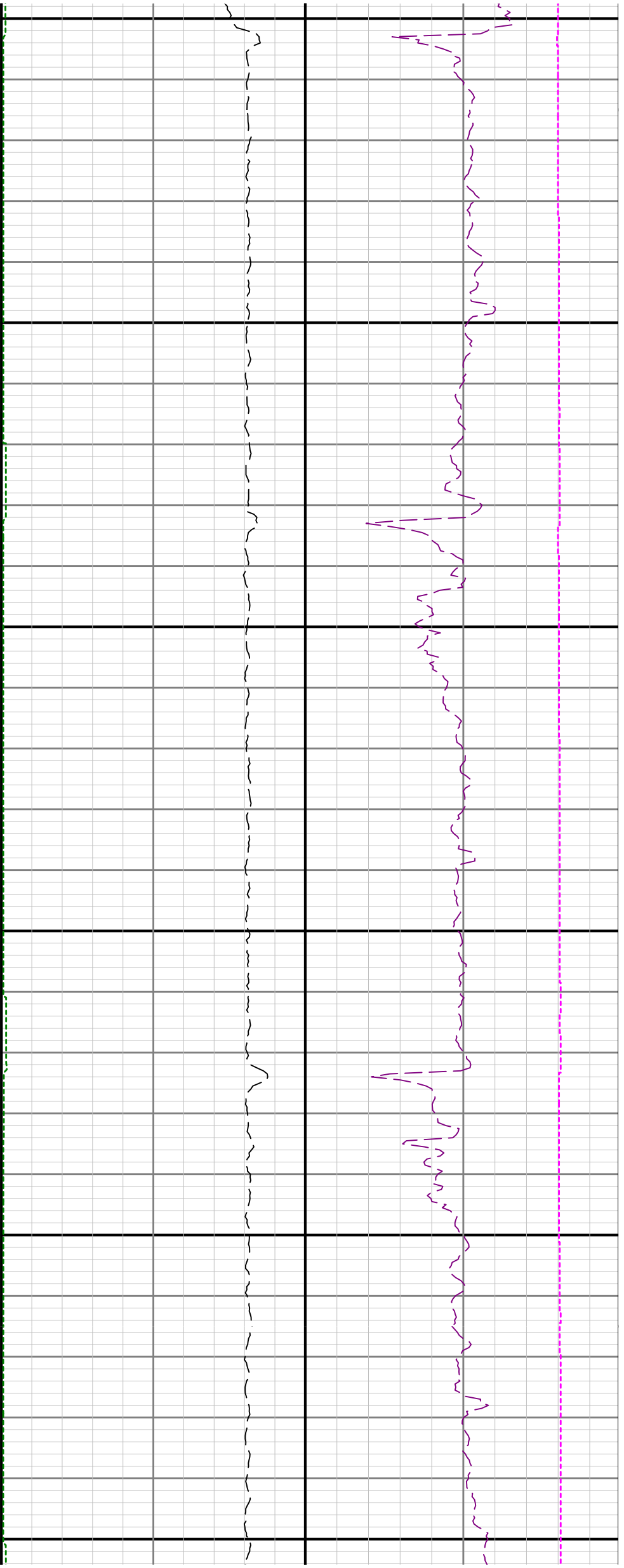








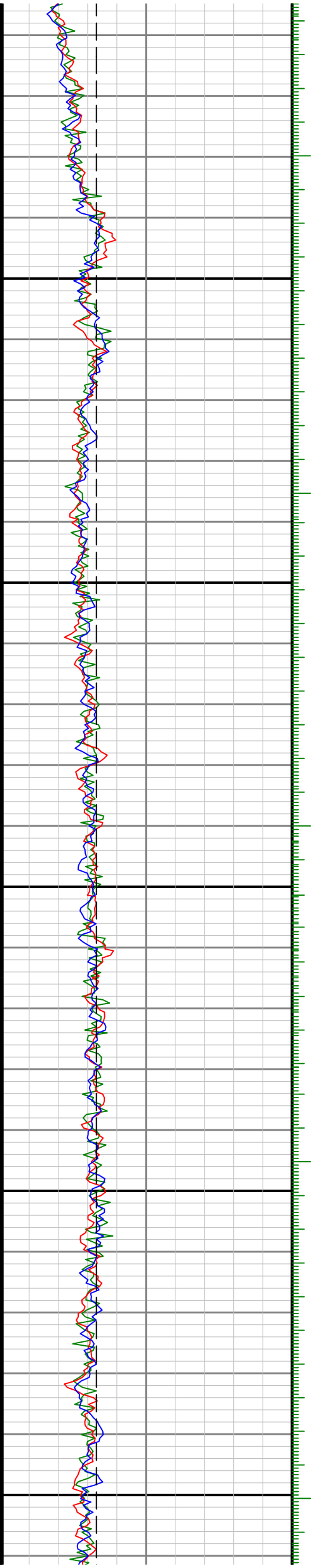


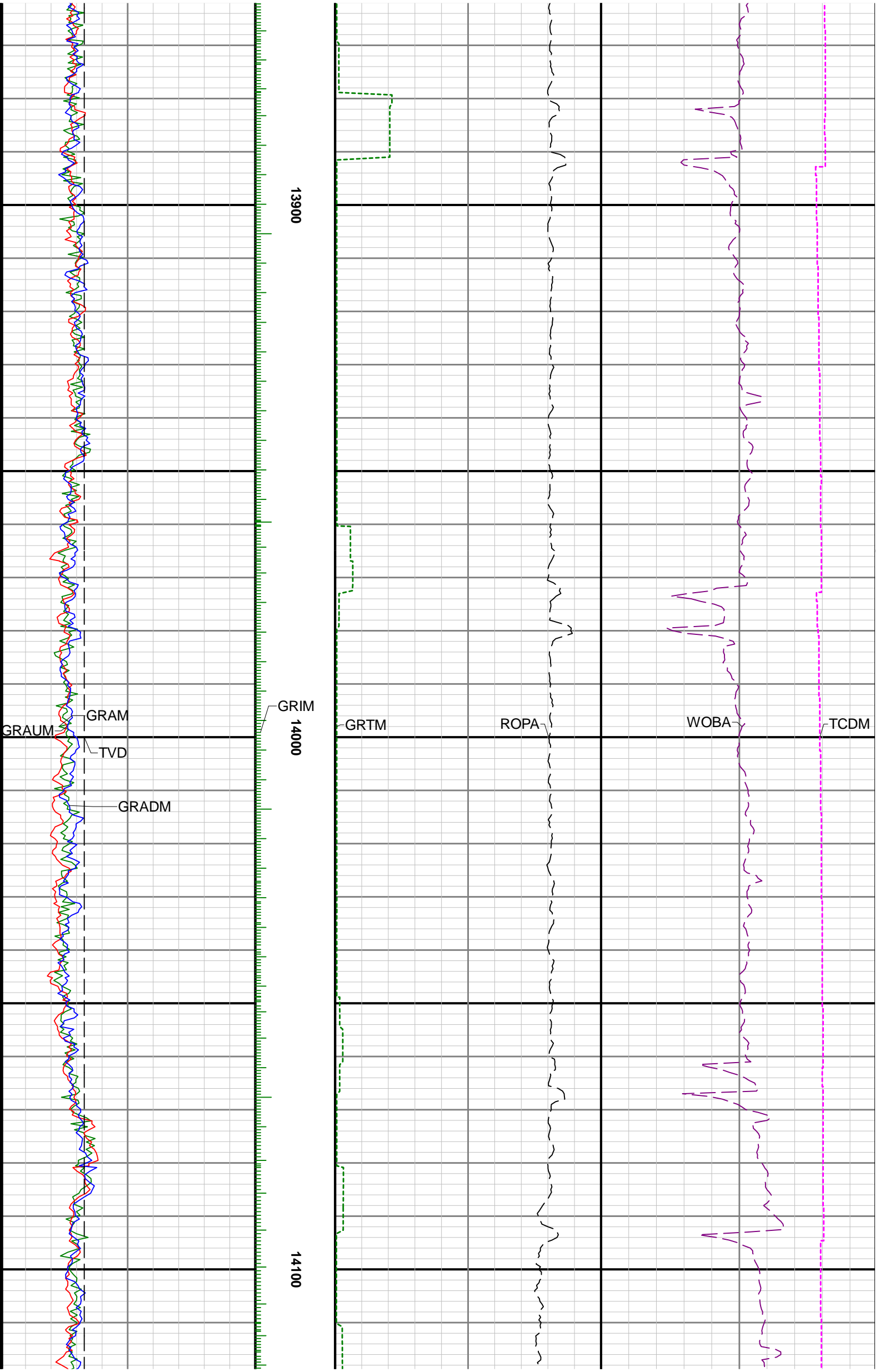


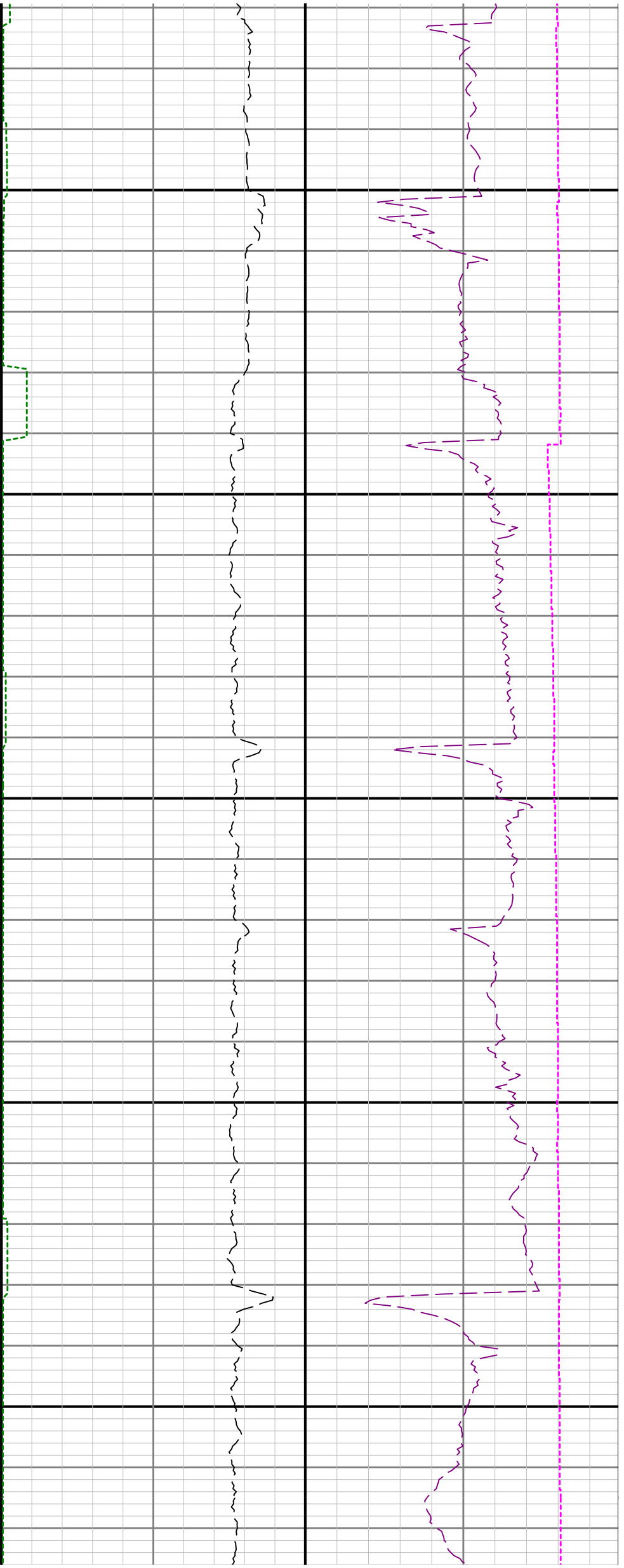


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