

LWD MEMORY LOG							
<div><div><div>BAKER HUGHES</div><div></div></div><div>Gamma Ray</div></div>							
Scale:		Company: Noble Energy					
1:240 MD		Well: Beretta Federal LC24-760					
Depth Reference:		Field: Weld County (Noble NAD 83 Grid)					
Driller's Depth		County:		Weld County		State: Colorado	
Status:	Surface Location:			Other Services:			
Final Print	Latitude:			040° 44' 28.572" N			
API No: 0512342960	Longitude:			103° 55' 44.364" W			
Job ID: 8241849	SEC: 24	TWN: 9N	RGE: S9W	Directional			
Permanent Datum (P.D.): Mean Sea Level		Elevation:		0.00 ft		KB: N/A	
Log Measured From: Rig Floor		Above P.D.		4888.00 ft		DF: 4888.00 ft	
				GL: 4858.00 ft			
Dates	Interval Logged			Magnetic Field Reference			
Date From: 2016-12-02	Top: (ft) 1938.00	Azi Reference North:		Grid	Dip Angle: (deg)		67.14
Date To: 2016-12-03	Bottom: (ft) 10397.00	Total Magnetic Field Strength: (nT)					52649
Spud Date: 2016-12-01	Mag to Reference North Correction: (deg)		6.64 E				
Borehole Record				Casing Record			
Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)	
13.500	0.00	1950.00	9.625	36.00	0.00	1944.00	
8.500	1950.00	10397.00					
Mud Record							
Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)	
Oil Based Mud	1950.00	10397.00	8.500	8447.00	0.13 106.88	90.43 184.39	
Deviation Record							
Acquisition System Software Version Other							
Baker Hughes Cadence		G3.3	Rig: H&P 517				
Plot Studio		3.3.7410.1	Contractor: Helmerich & Payne Drilling Co				
			District: RMD 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 (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	2.00	AutoTrak Curve	1937.00	10384.00	1950.00	10397.00	2016-12-02 04:49	2016-12-03 13:58	31.46
Crew												
Name			Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name			Arrive Wellsite	Depart Wellsite
Alex Osborne			2016-12-01	2016-12-04	Emi Iyalla	2016-12-01	2016-12-04					

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+ (%)
2016-12-02 08:00	1	2732.00	Oil Based Mud	9.1	54	N/A	18.0	80/20	Active Pit	25000	N/A
2016-12-02 20:00	1	5750.00	Oil Based Mud	9.0	42	N/A	16.8	80/20	Active Pit	22500	N/A
2016-12-03 08:00	1	8730.00	Oil Based Mud	9.1	42	N/A	21.6	80/20	Active Pit	27500	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	ATC_SU	12273686	Near Bit Inclination	5.93	6.69	7.000	4.330

1	ATC_SU	12273686	Near Bit VSS	5.93	6.69	7.000	4.330
1	ATC_MWD	12118937	Gamma (single)	2.76	12.86	7.000	3.250
1	ATC_MWD	12118937	Directional (mag)	12.27	22.37	7.000	3.250

Comments

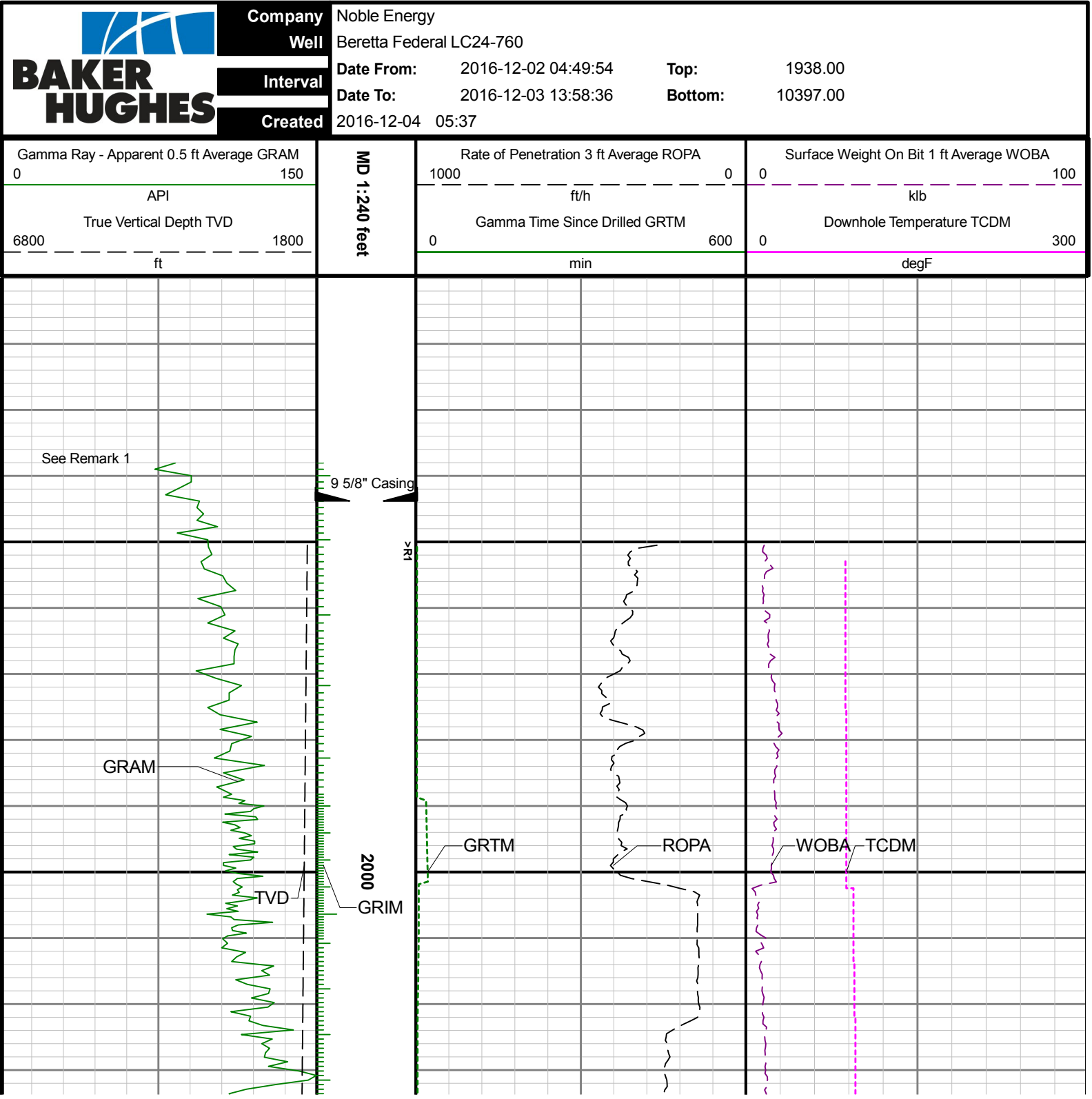
- 1
- Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2
- Baker Hughes LWD Run 1 utilized 6 3/4 inch NaviGamma Services (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1950 to 10397 ft MD (1950 to 5911 ft TVD).

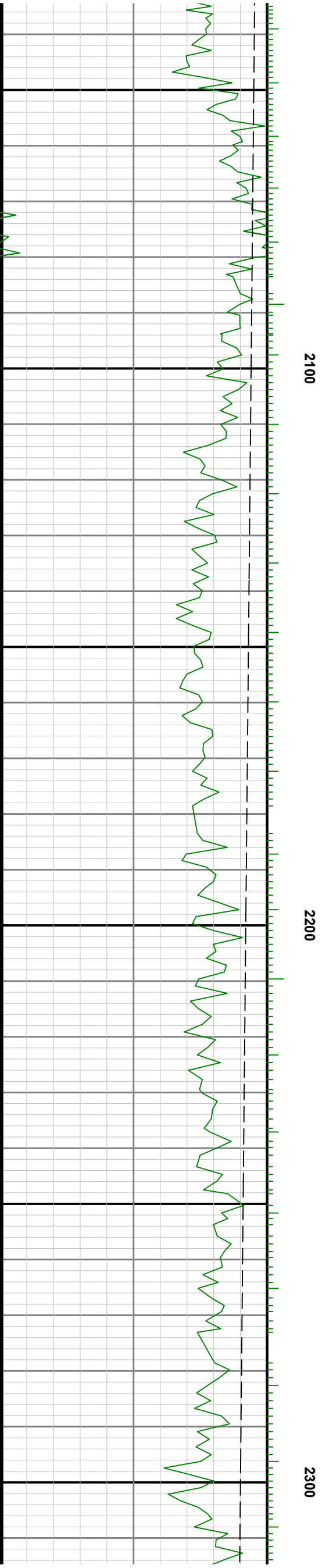
Remarks

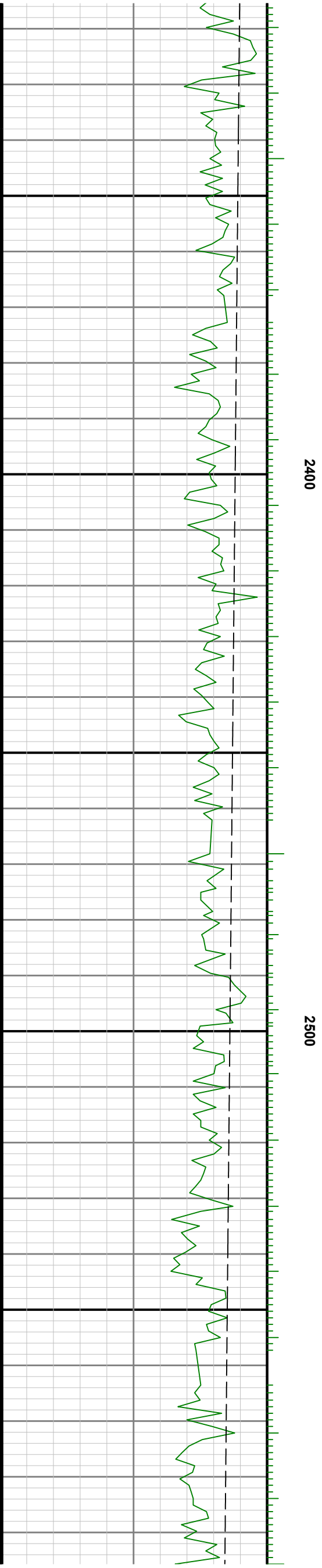
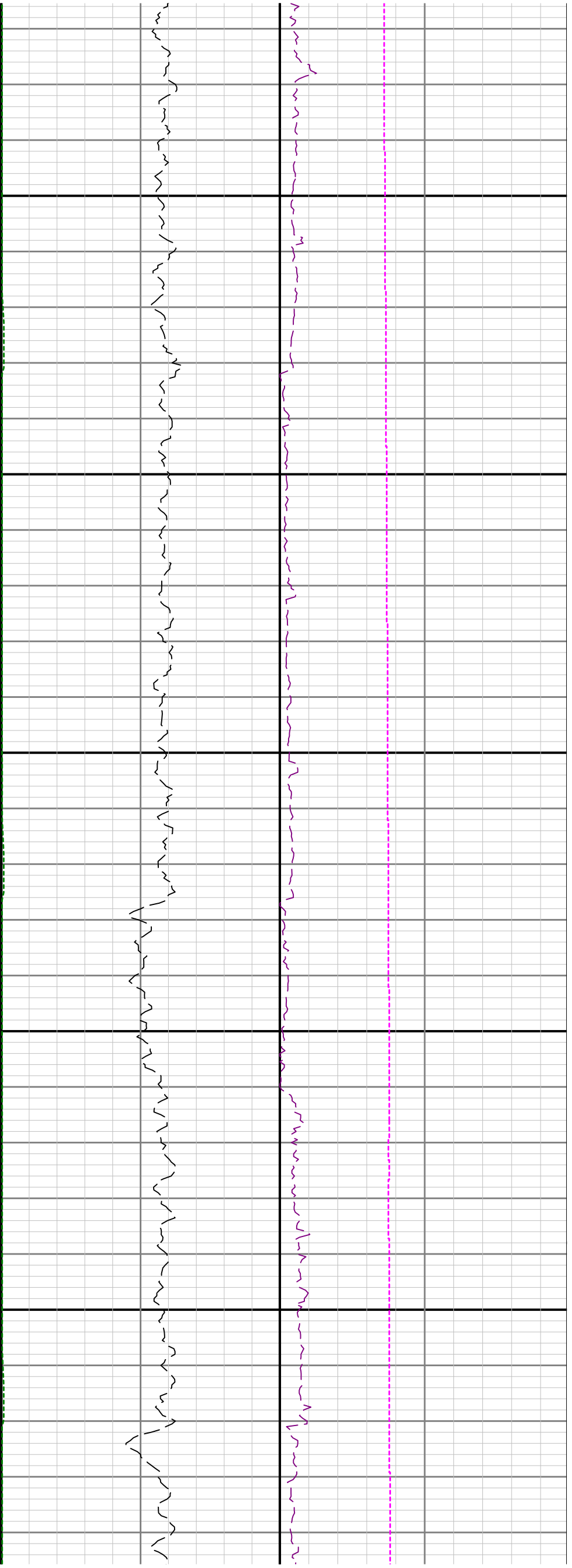
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1937.00	8.500	1	Gamma Ray logging operations began at 1937 feet MD (1937 feet TVD)

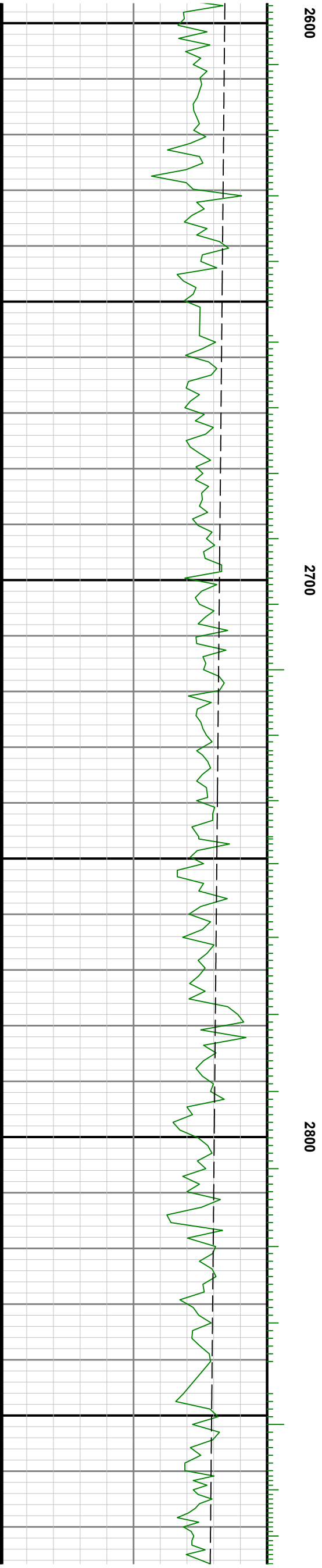
Curve Mnemonics

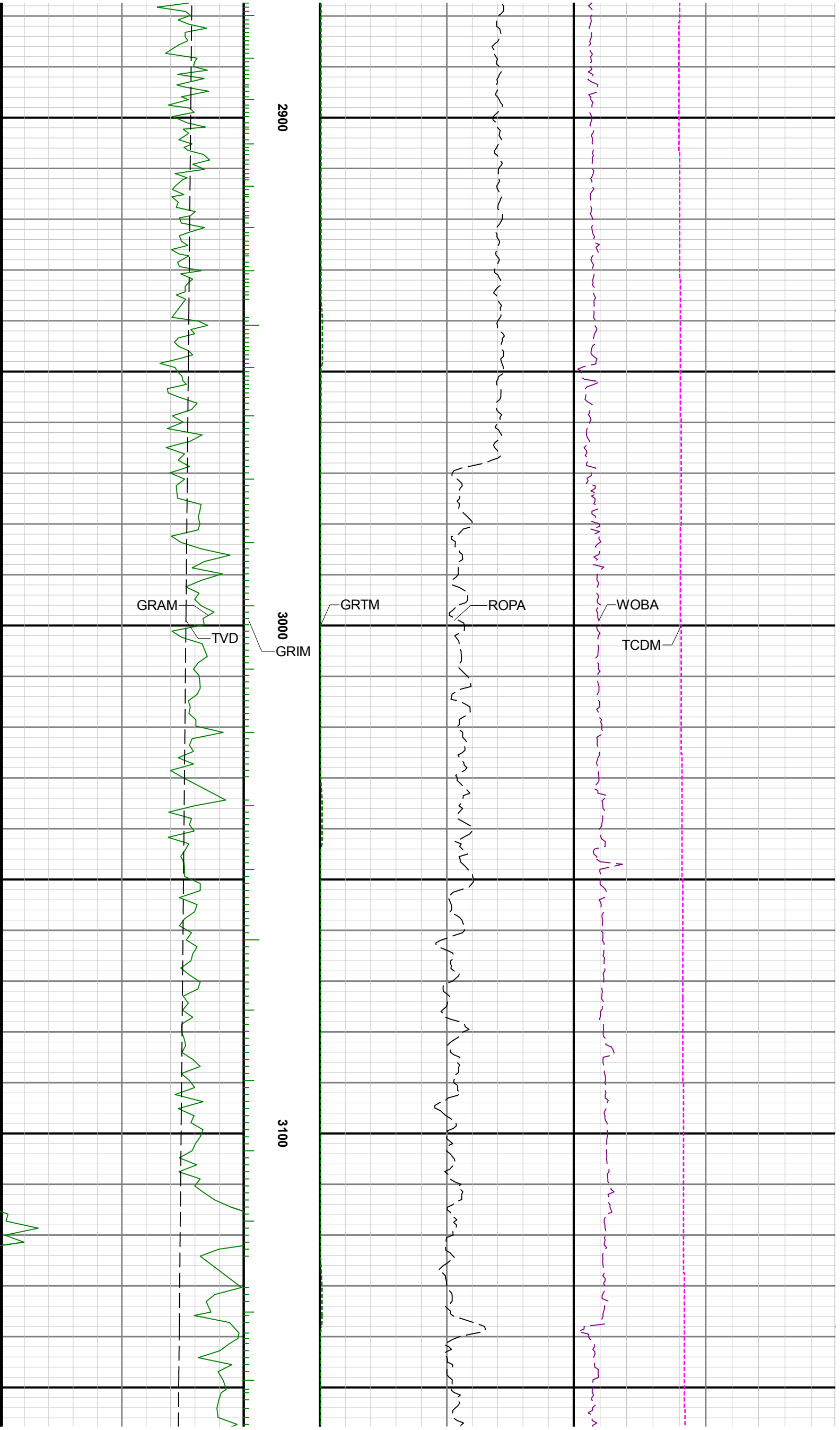
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRAM	Gamma Ray - Apparent 0.5 ft Average	API
GRIM	Gamma Ray Data Point Indicator	unitless
GRTM	Gamma Time Since Drilled	min
TCDM	Downhole Temperature	degF
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb

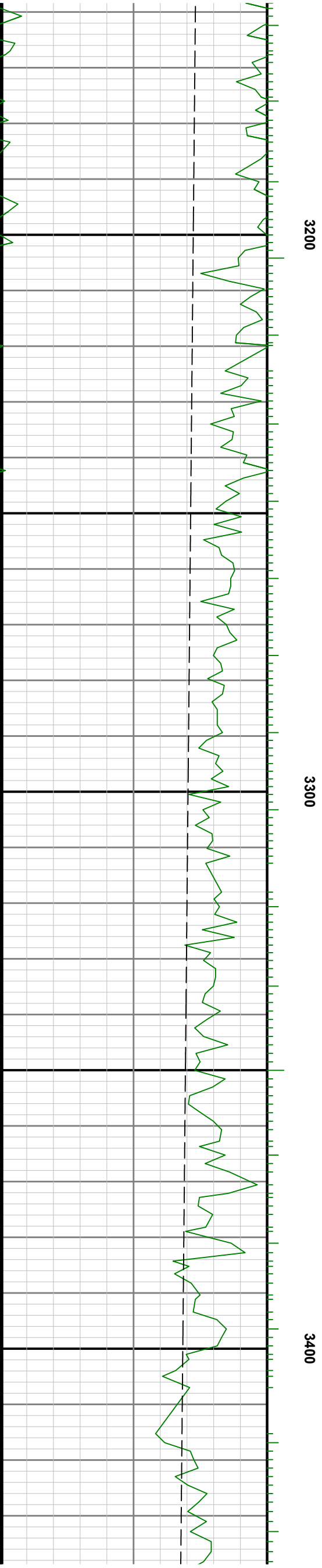
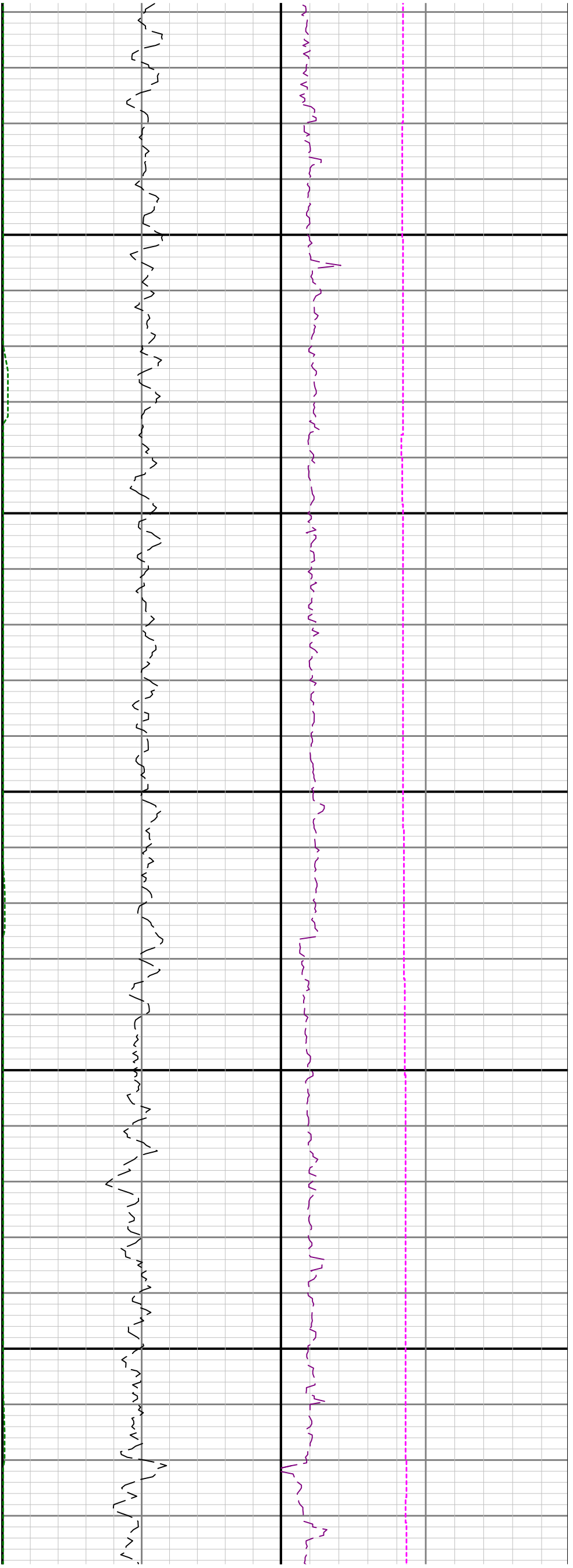


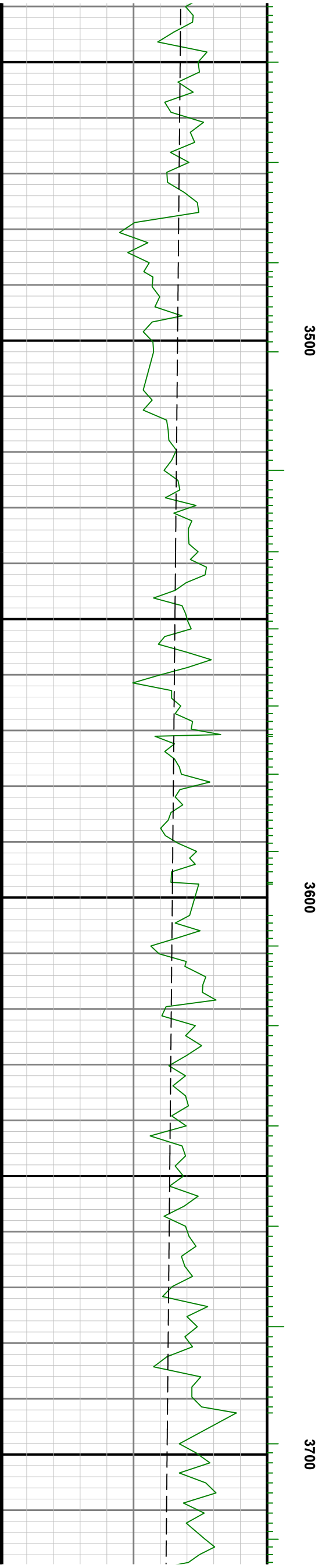
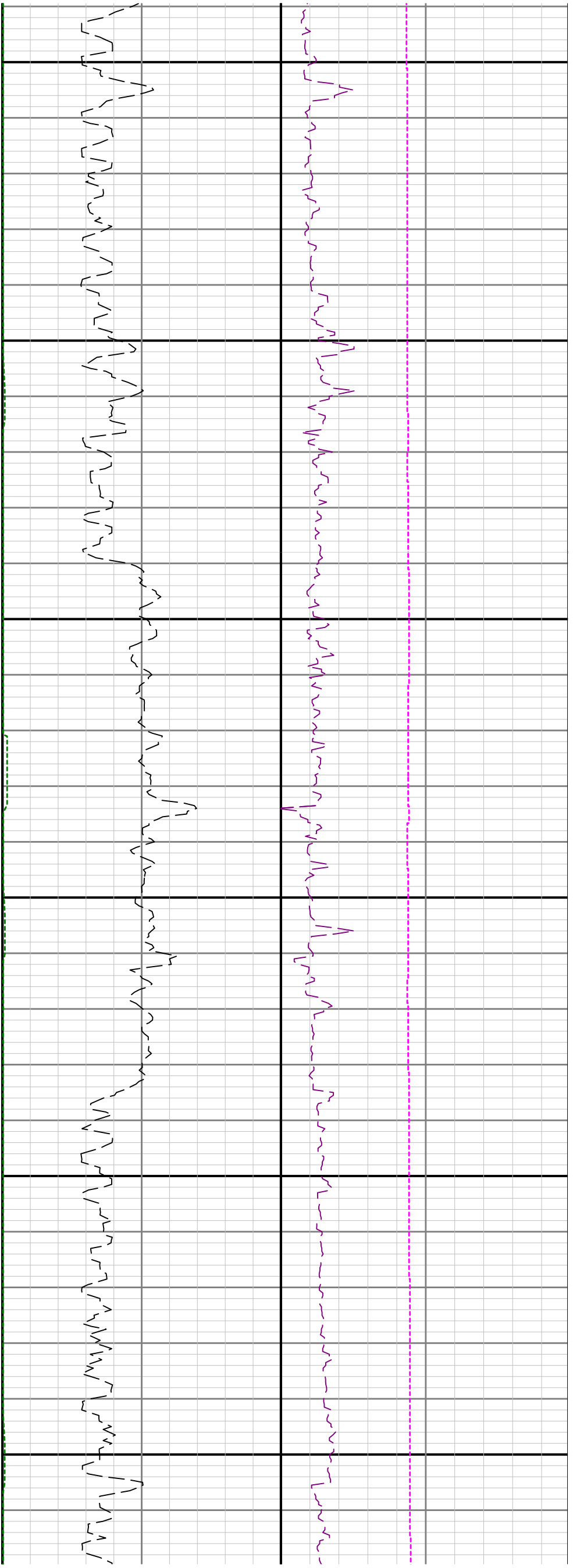


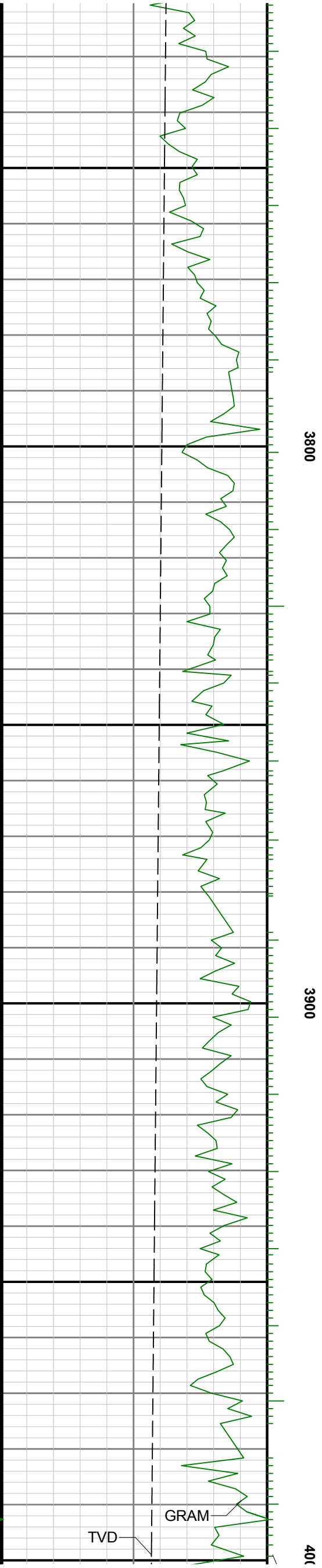
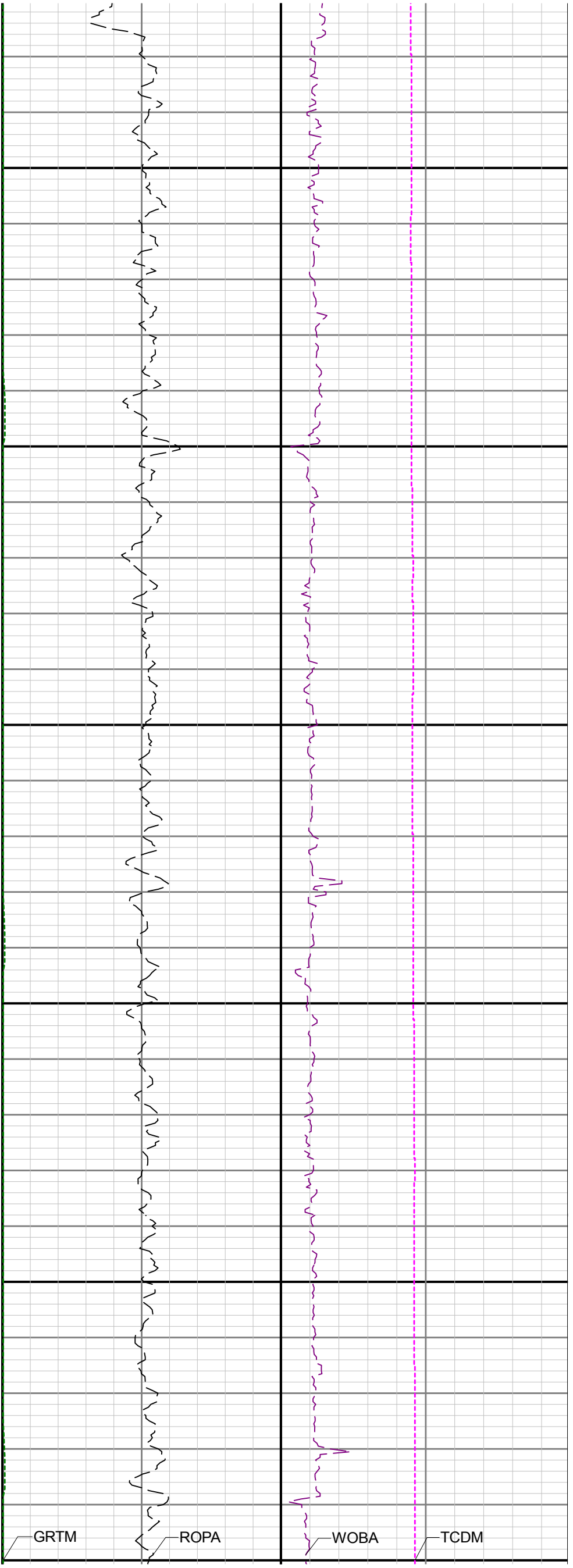


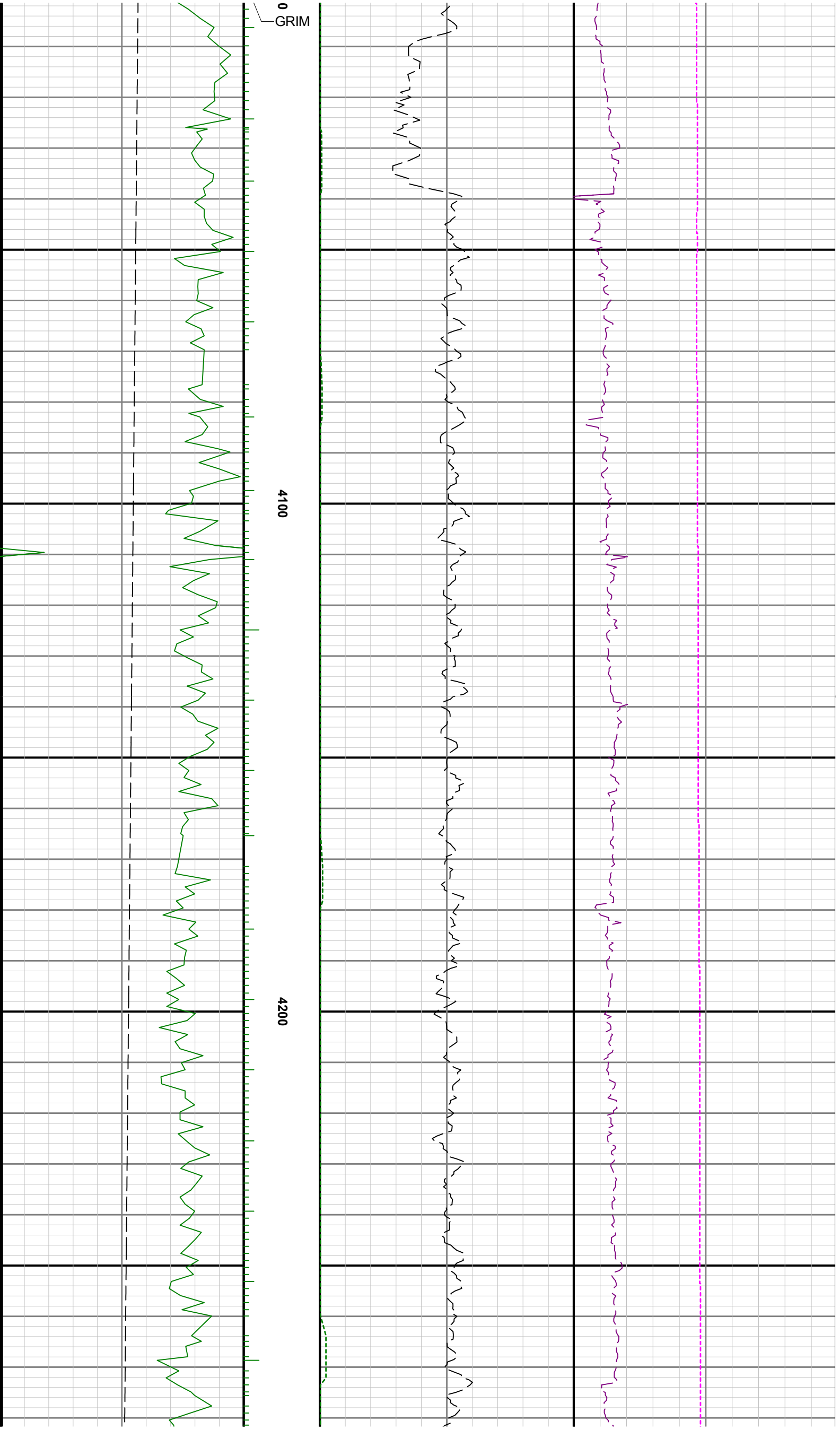


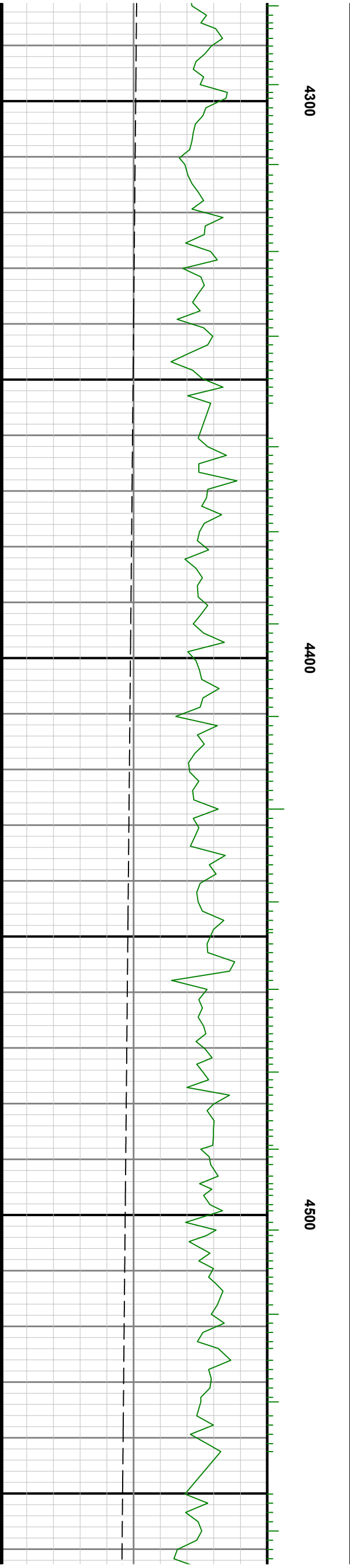
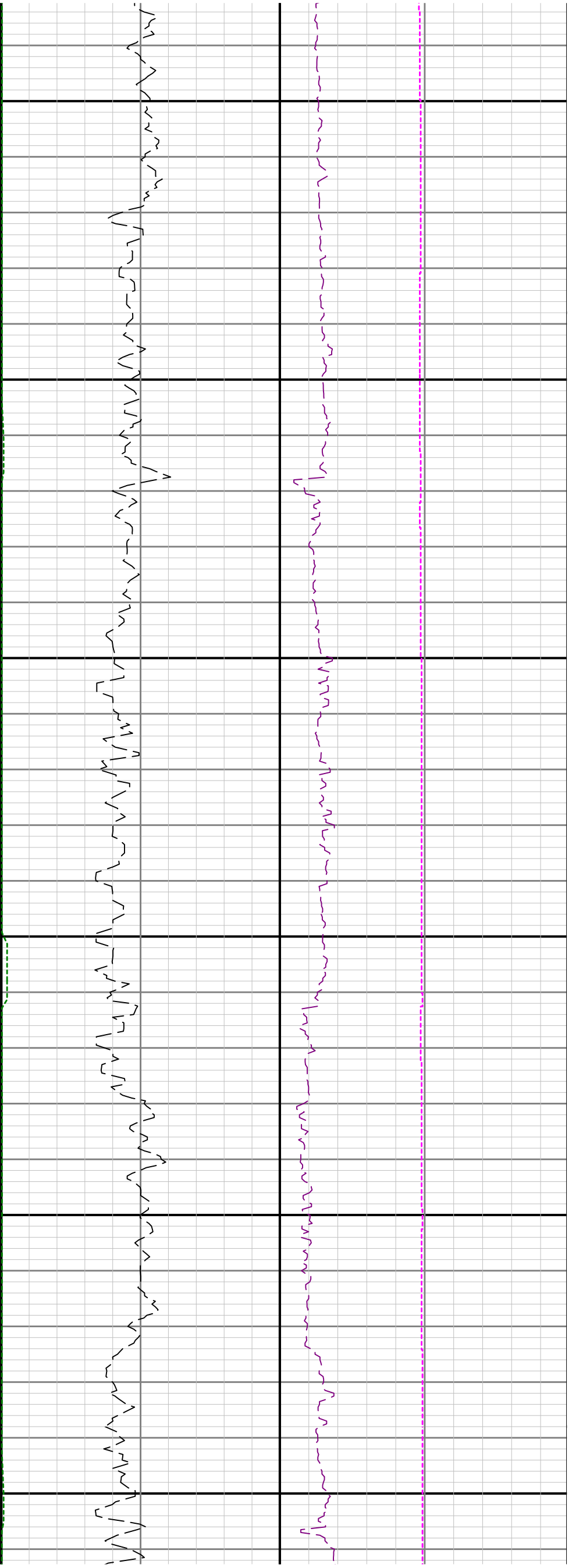


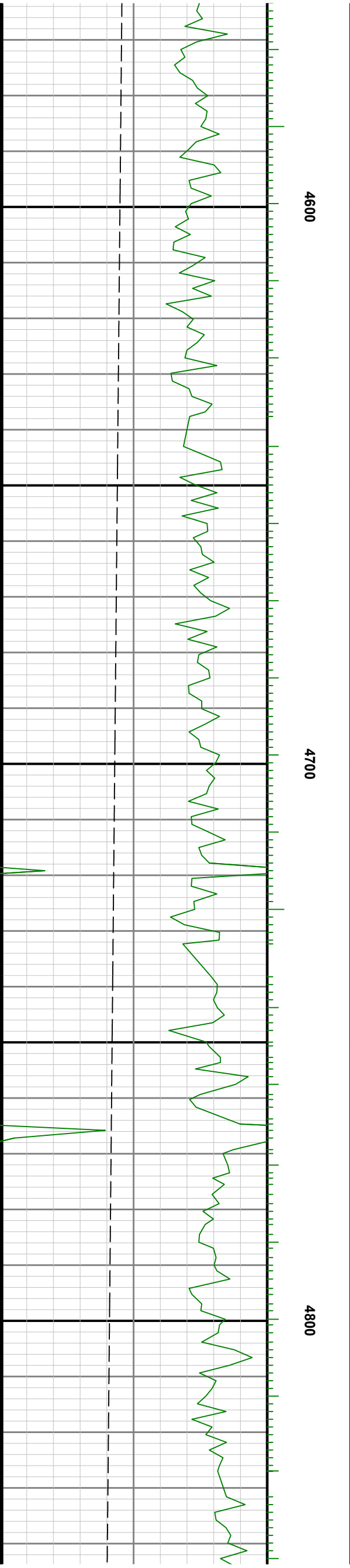


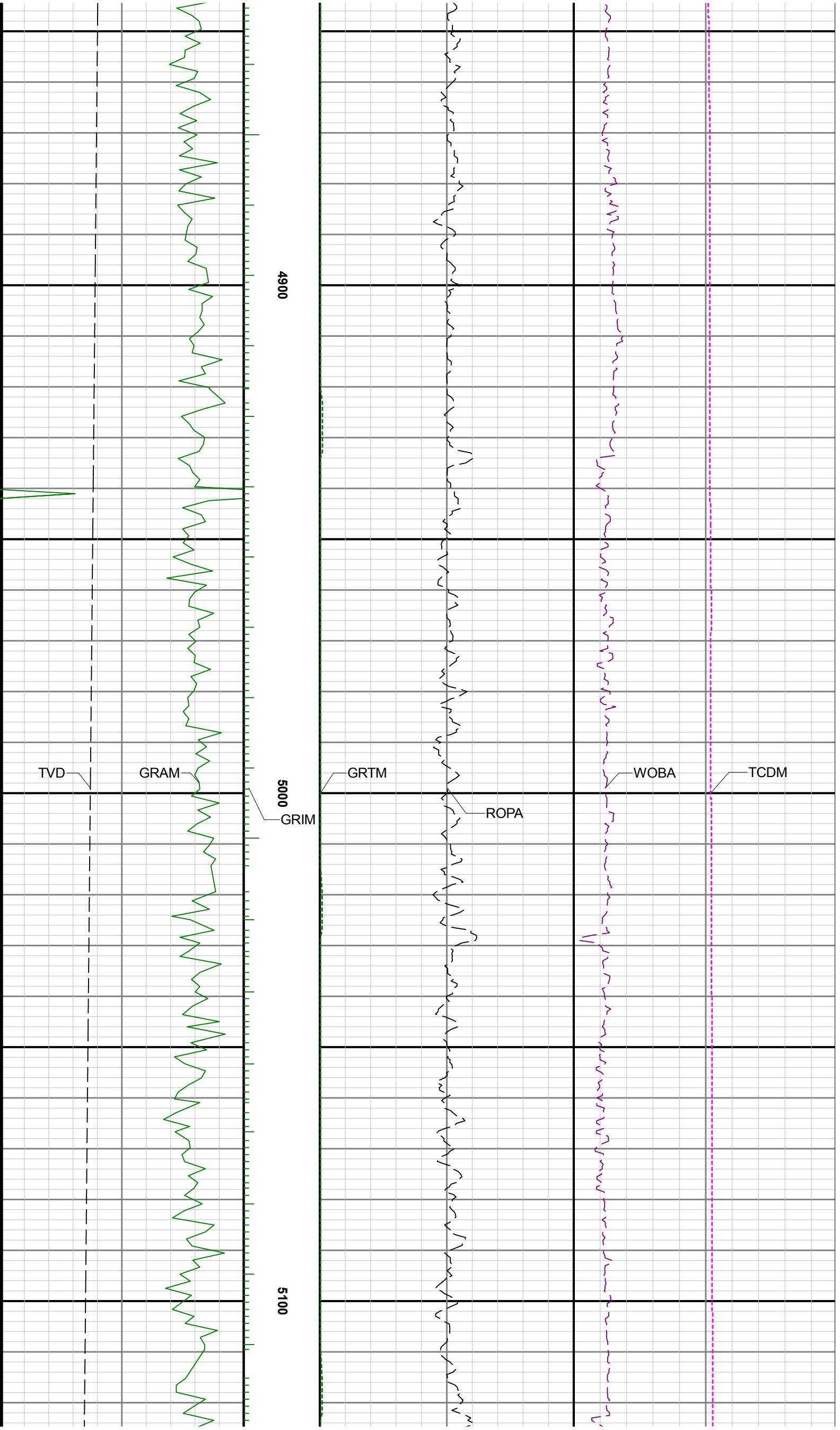


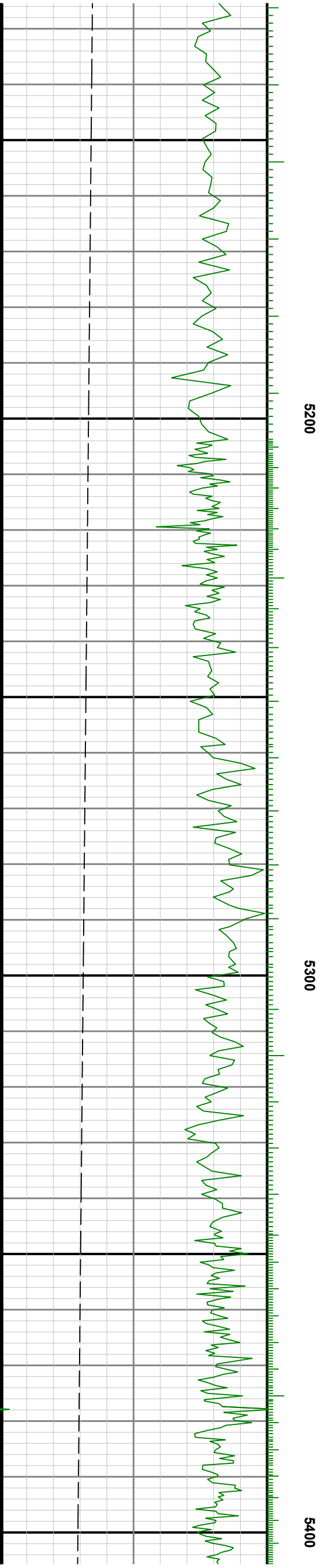
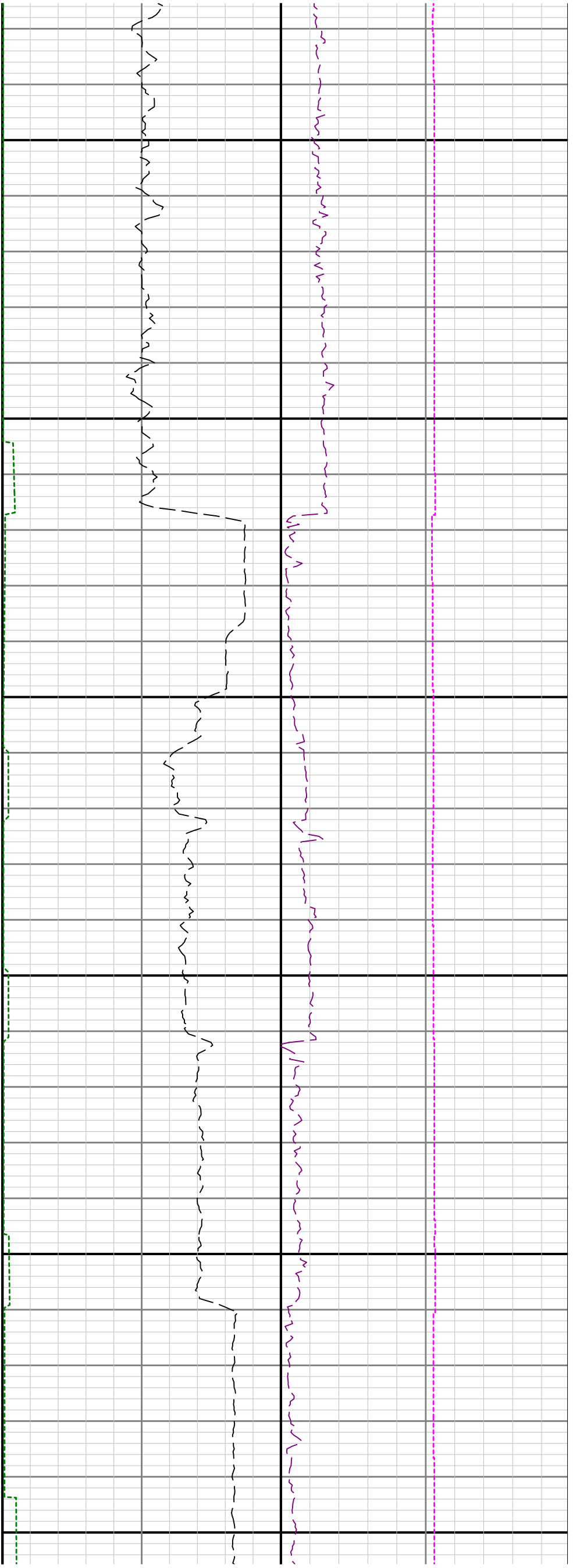


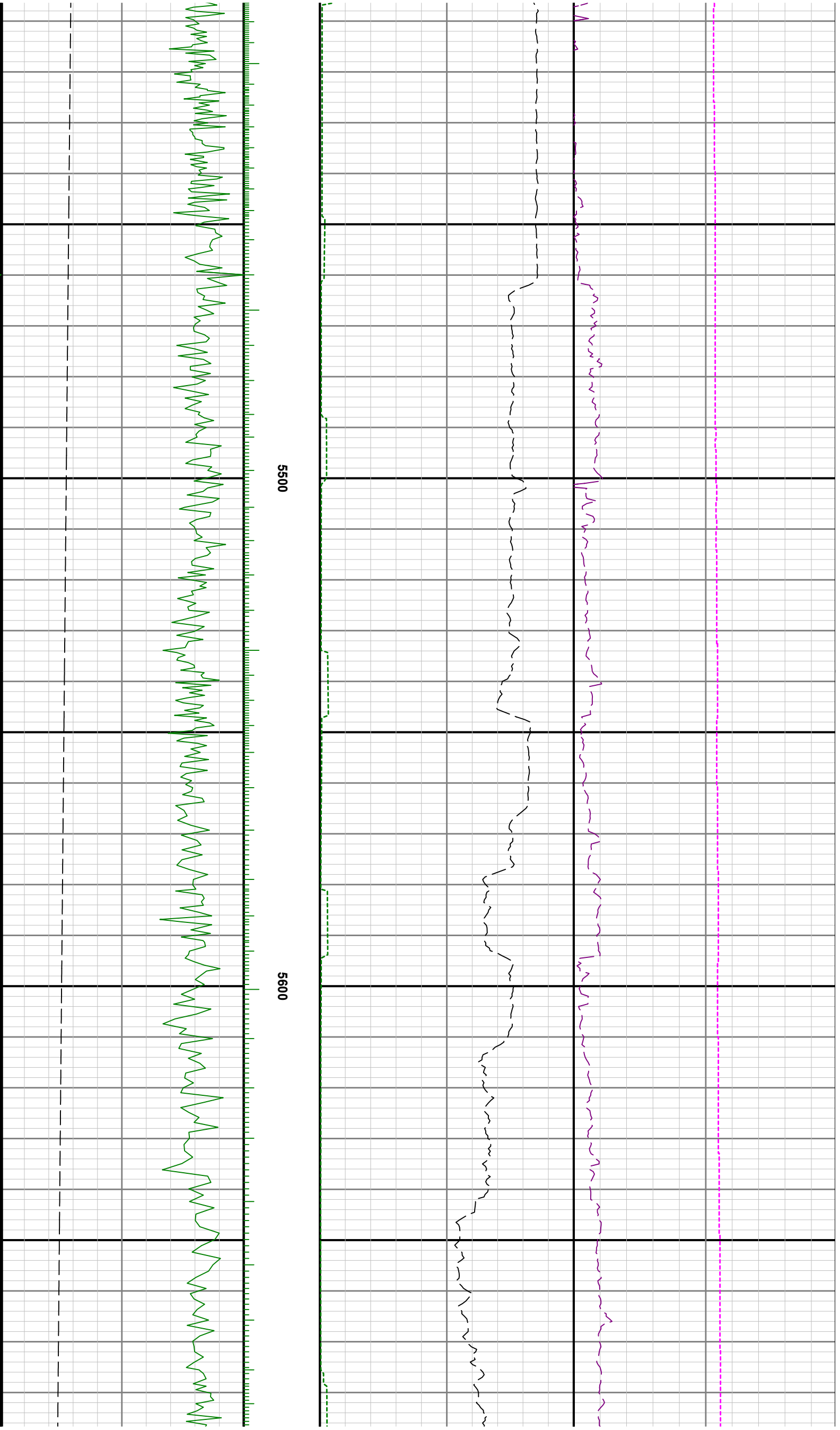


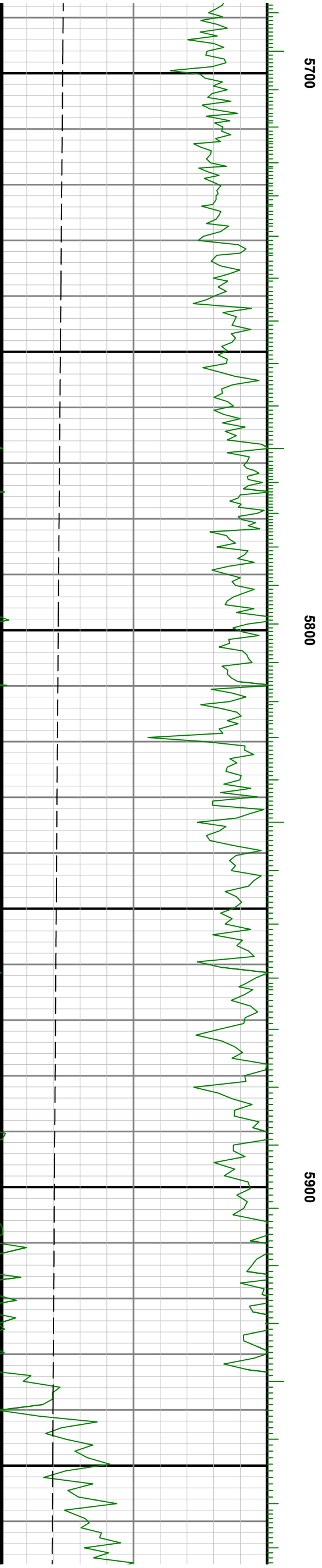
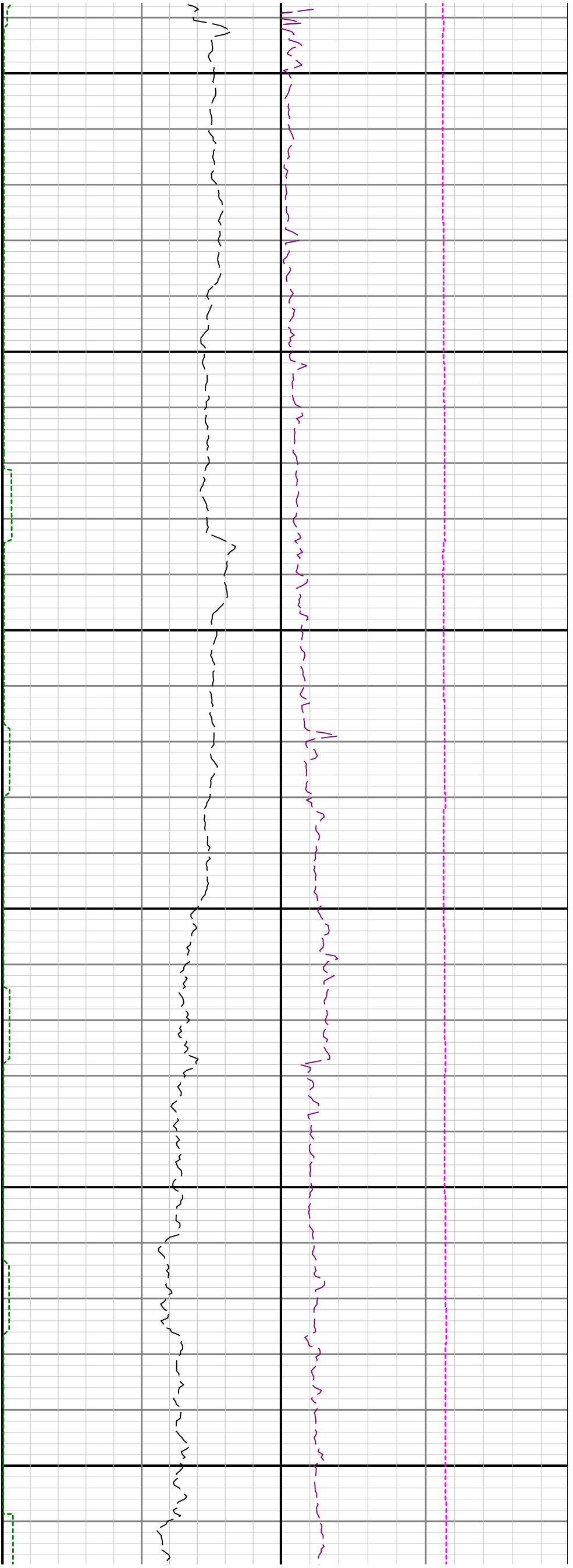


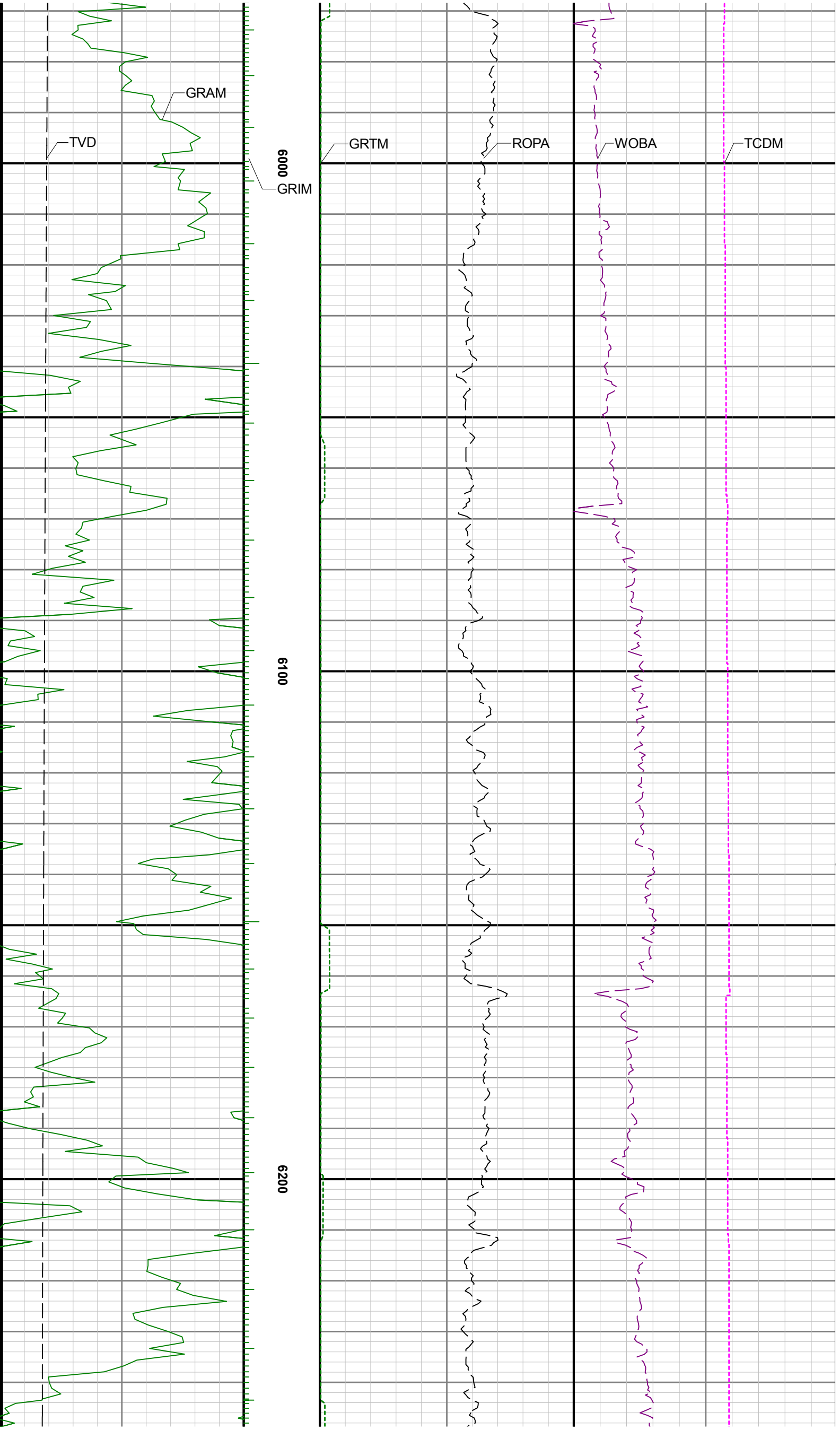


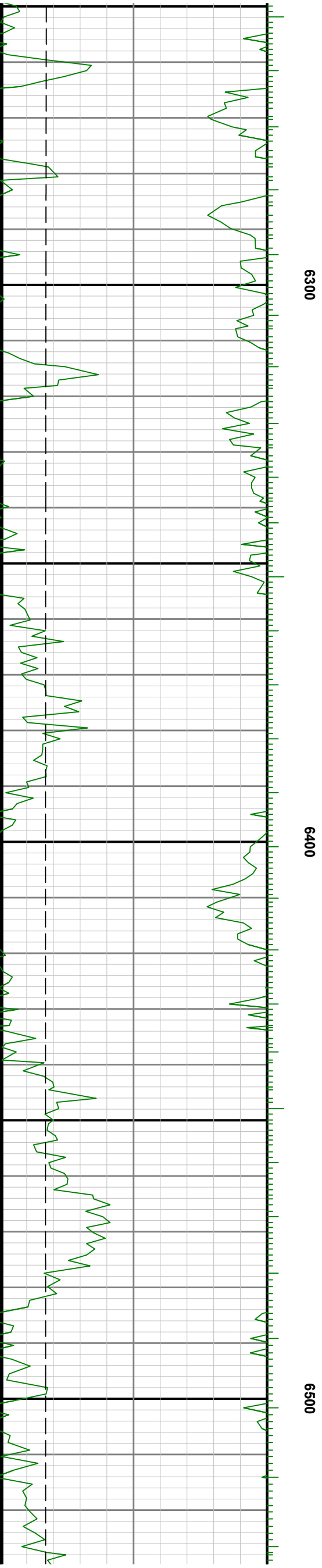
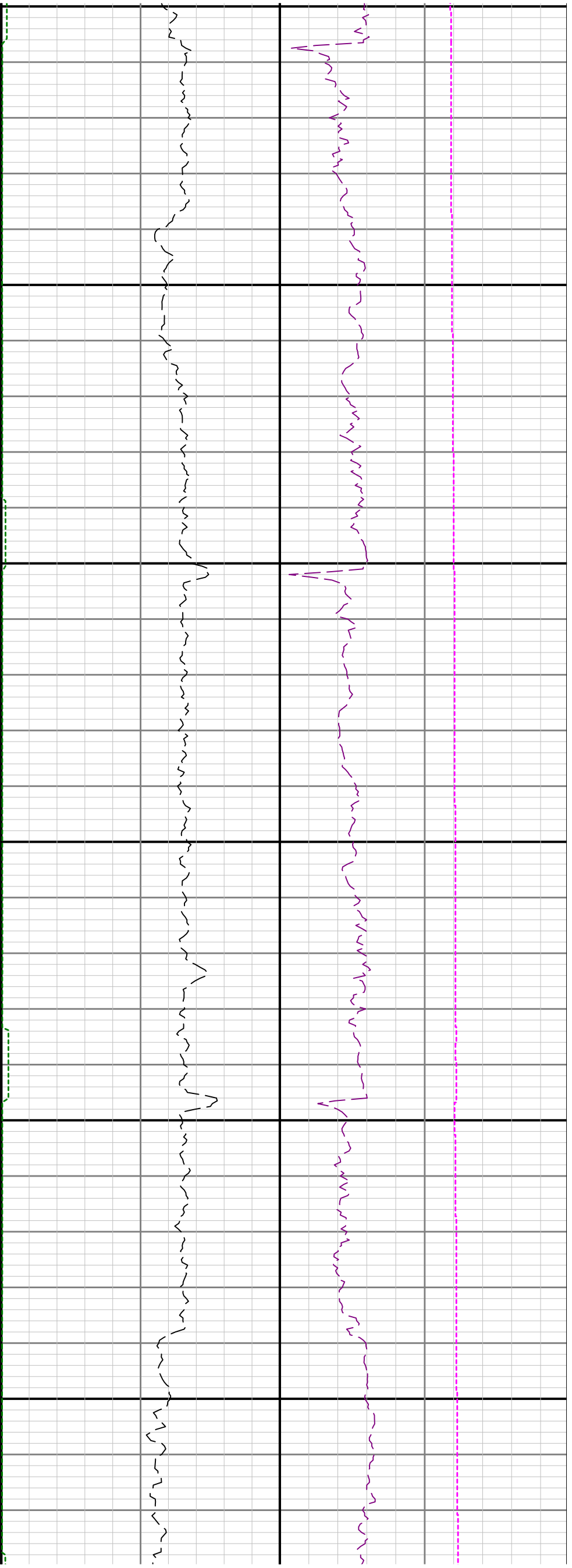


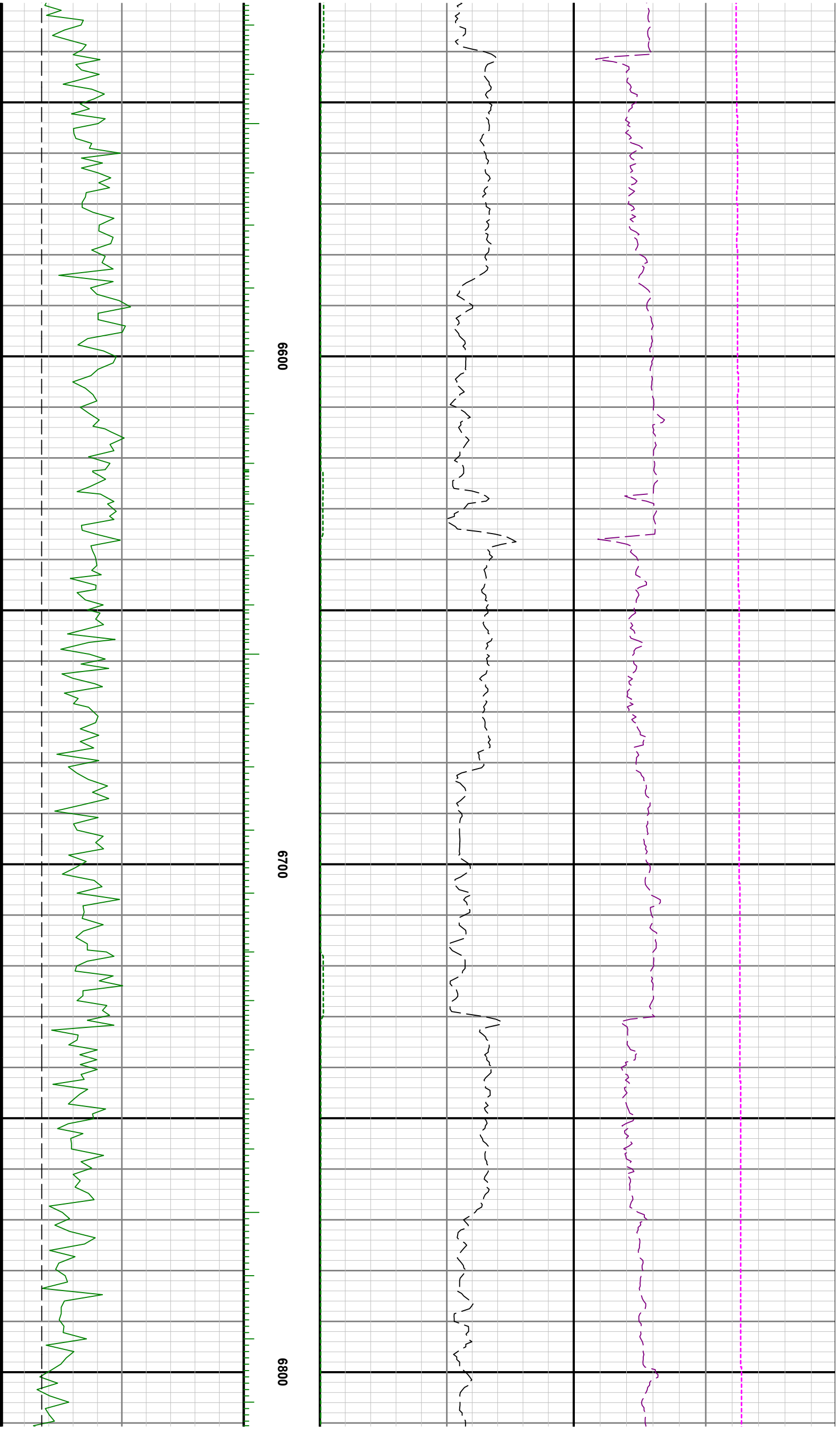


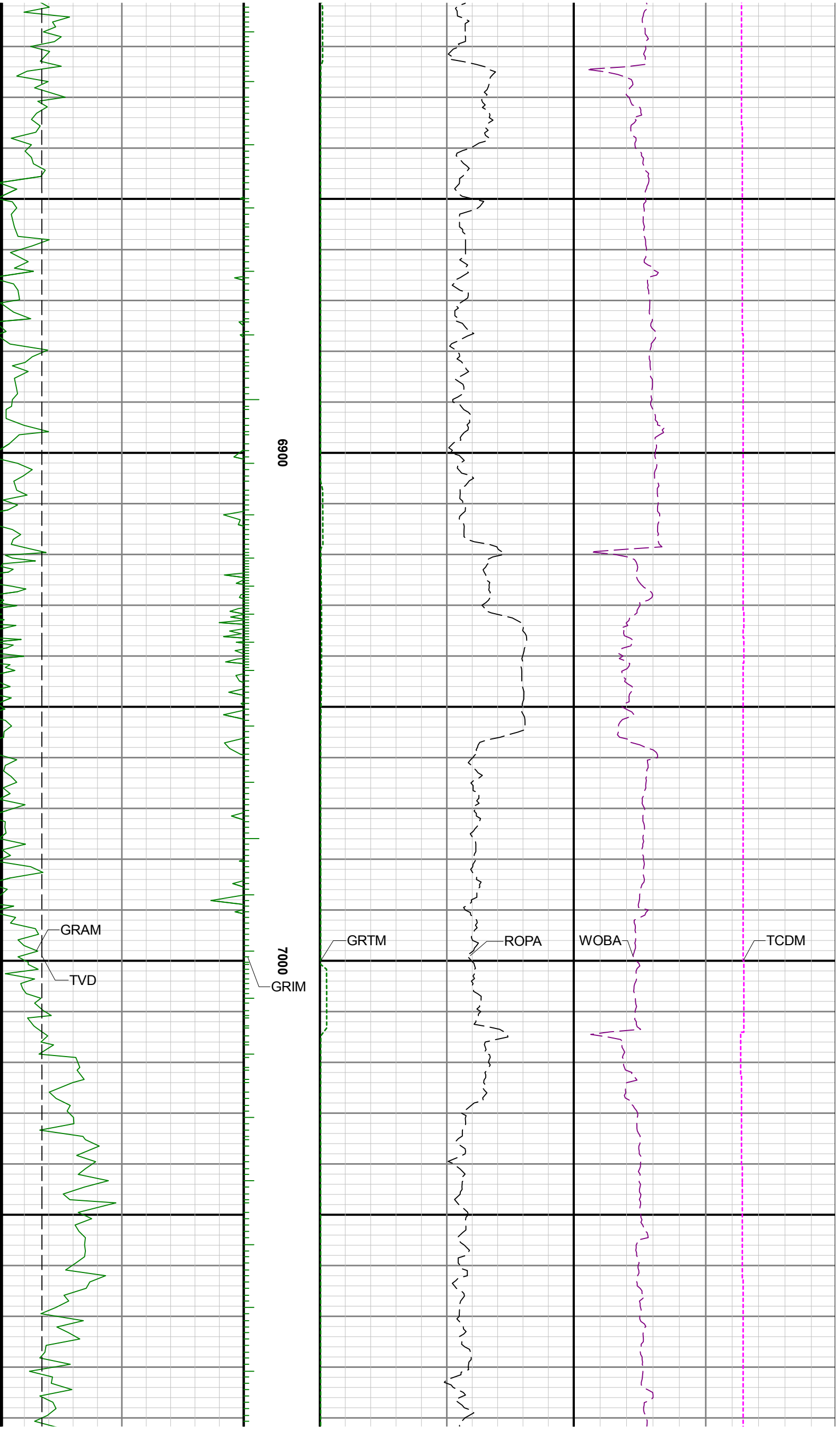


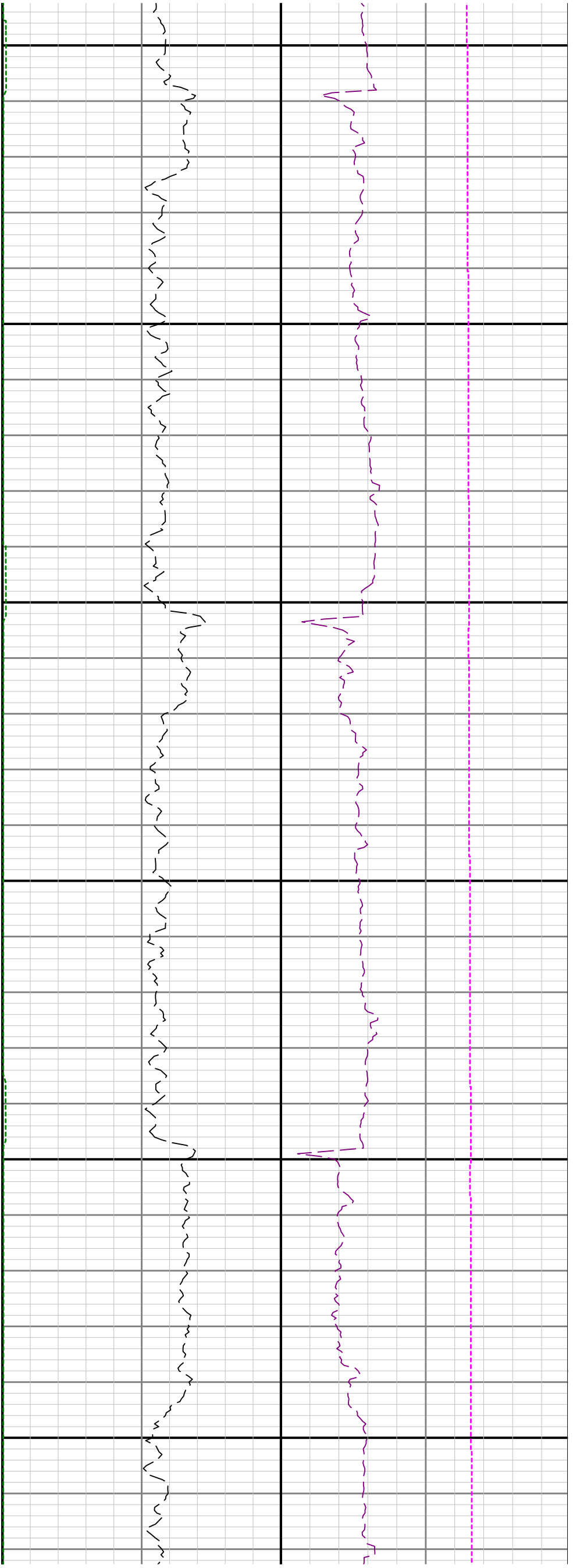








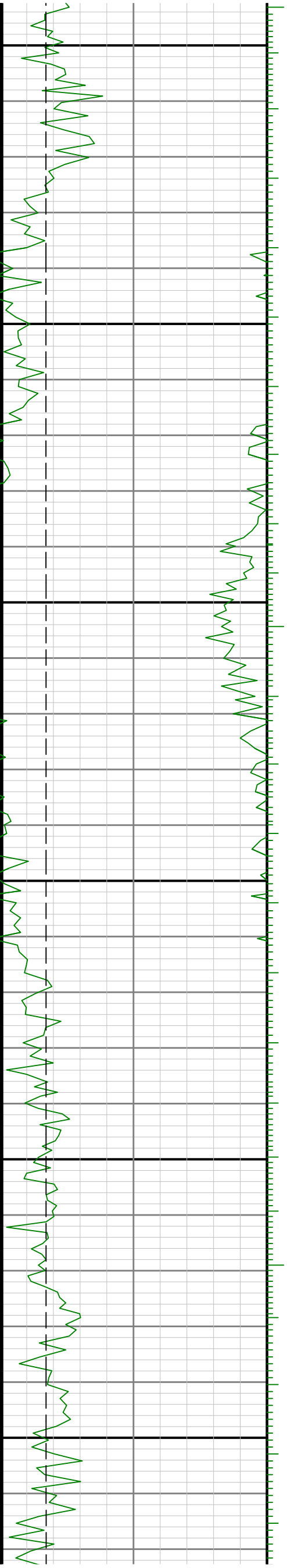


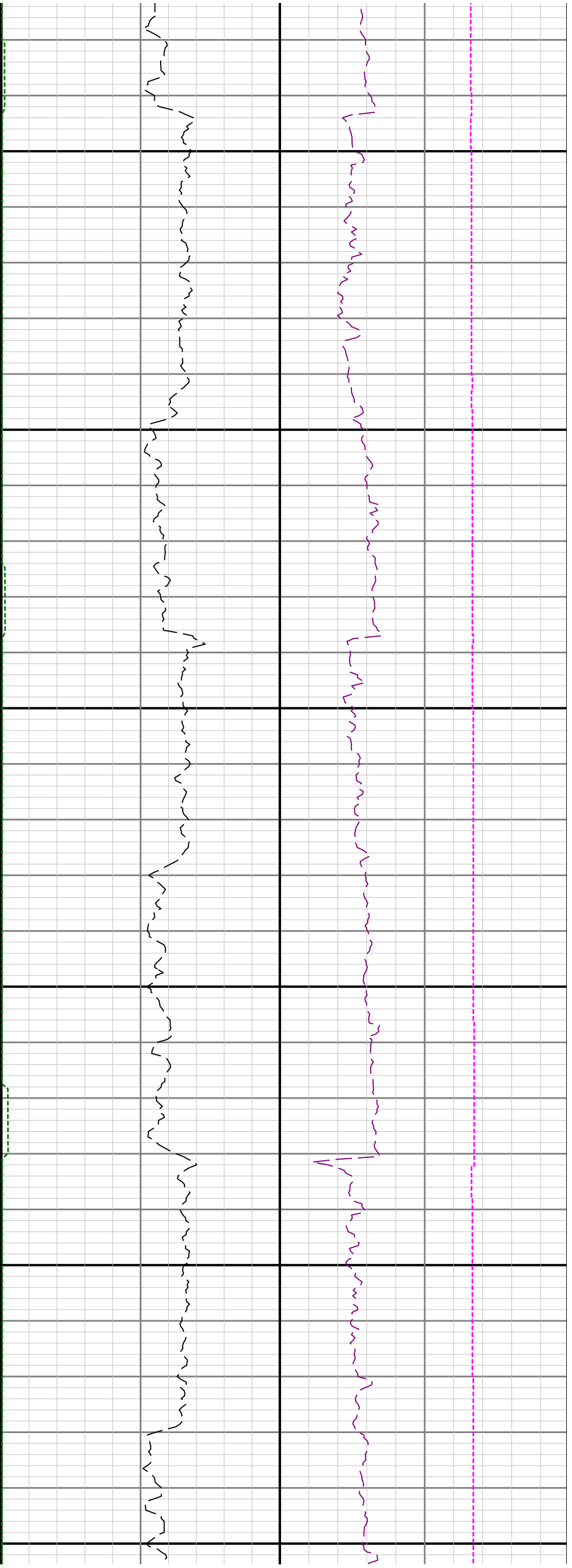


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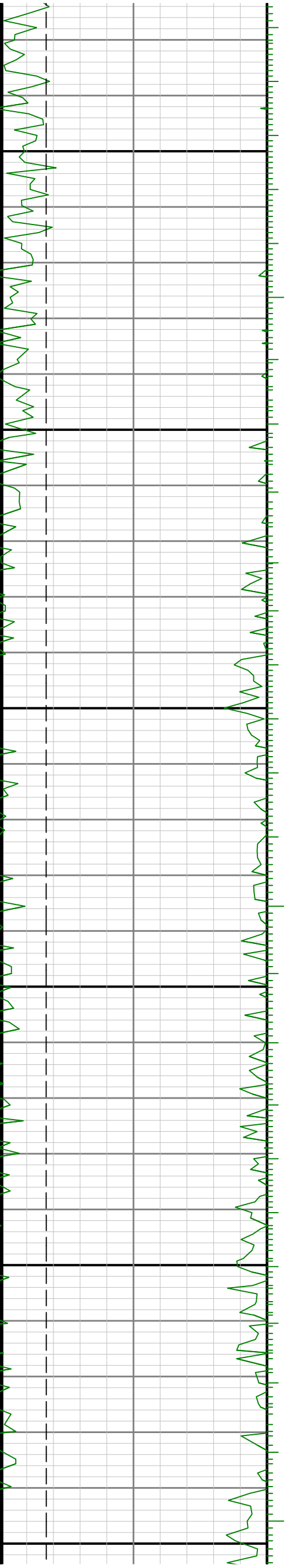


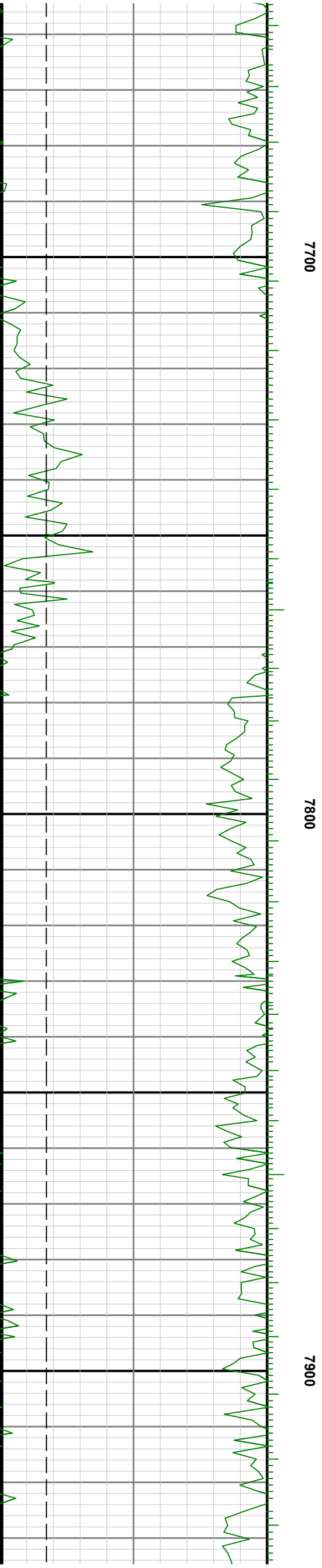
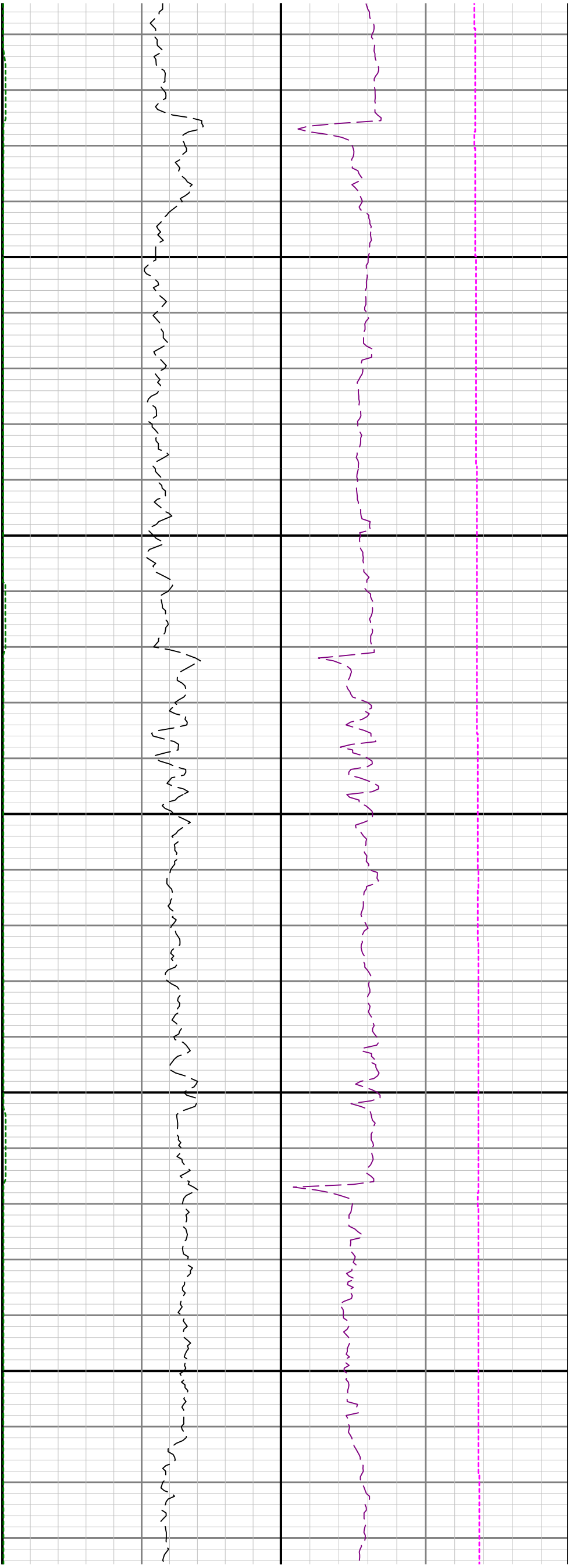


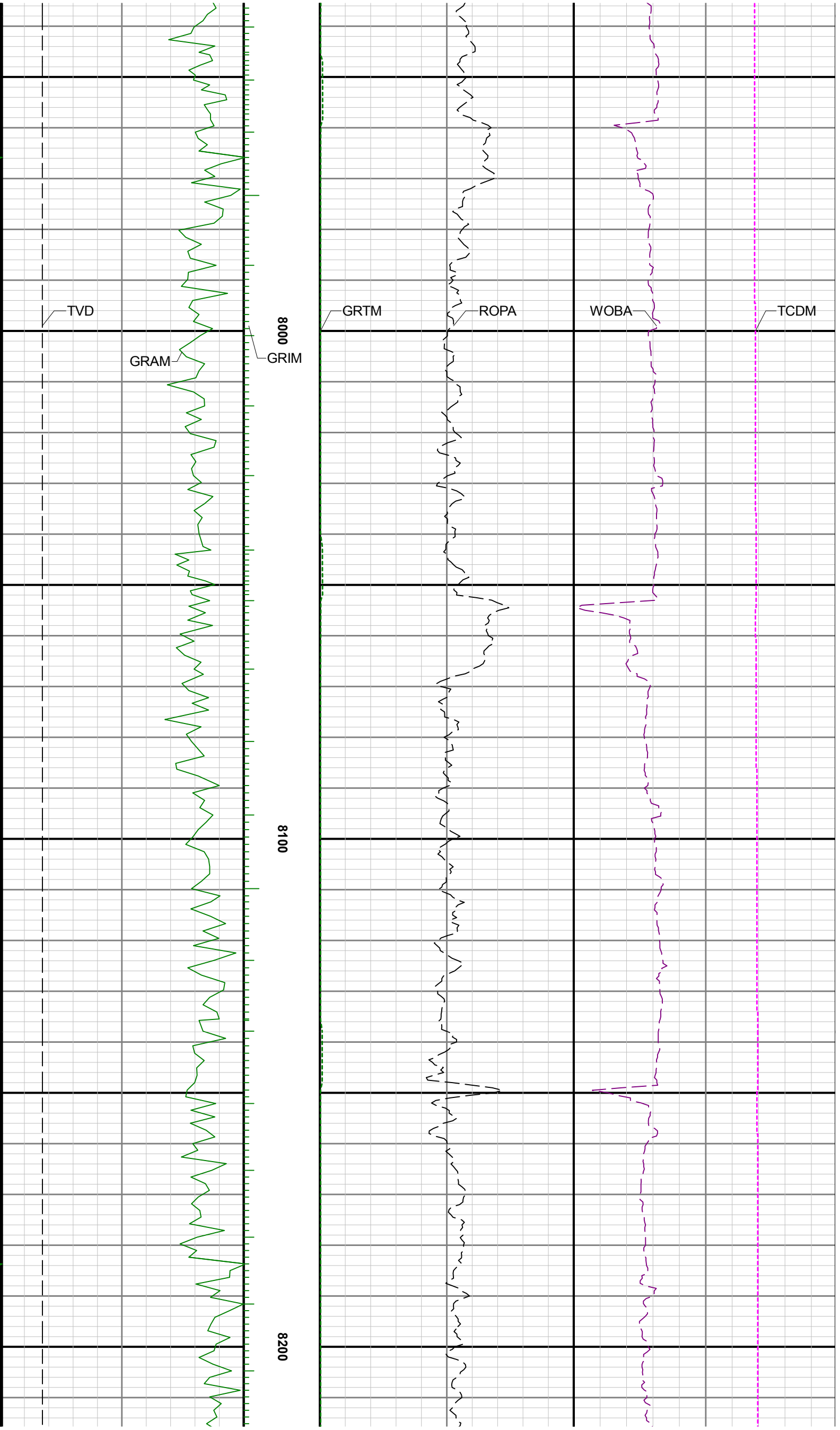
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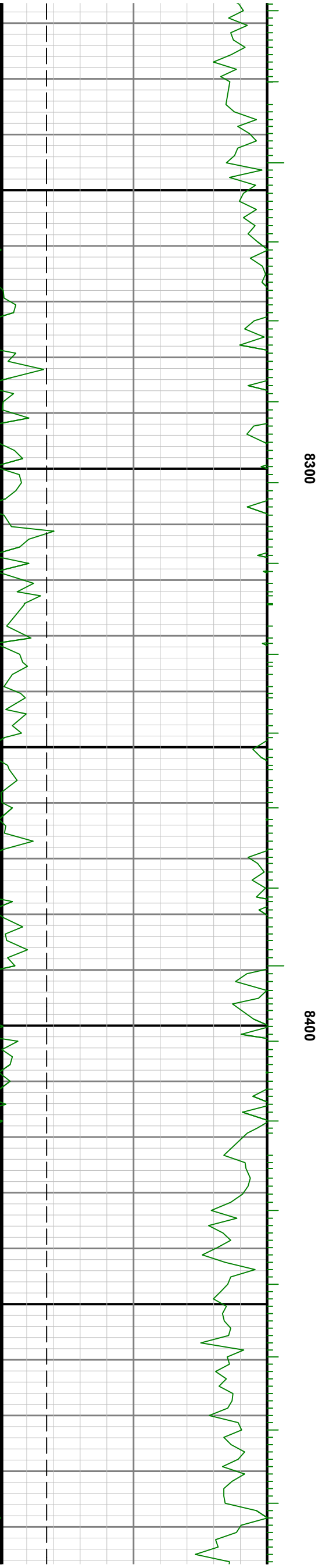
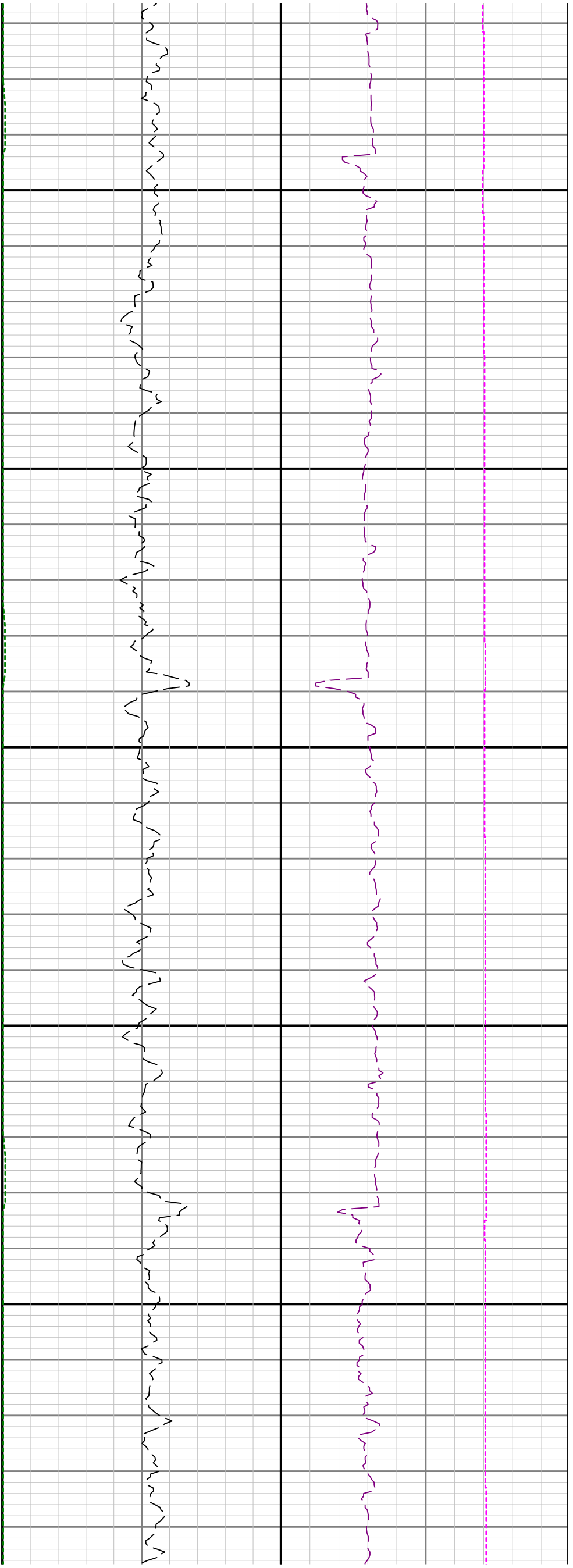
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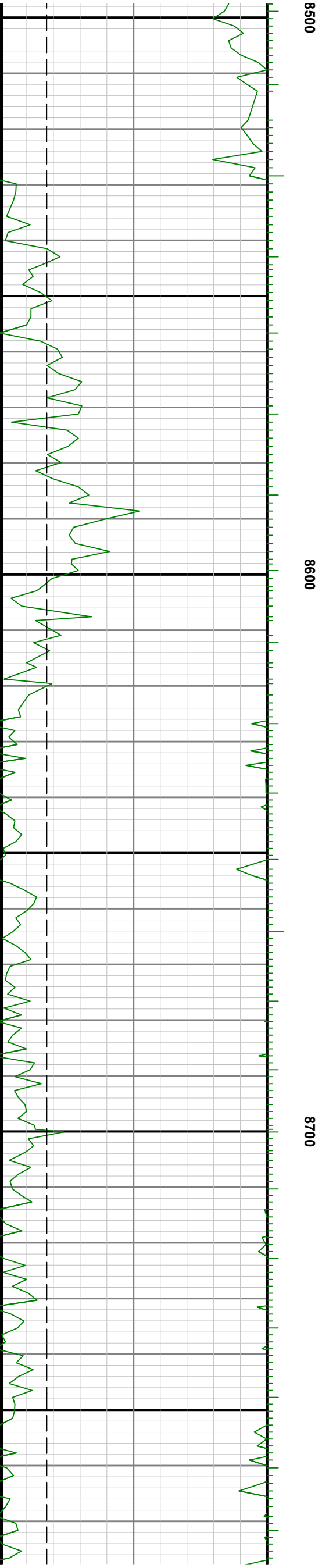
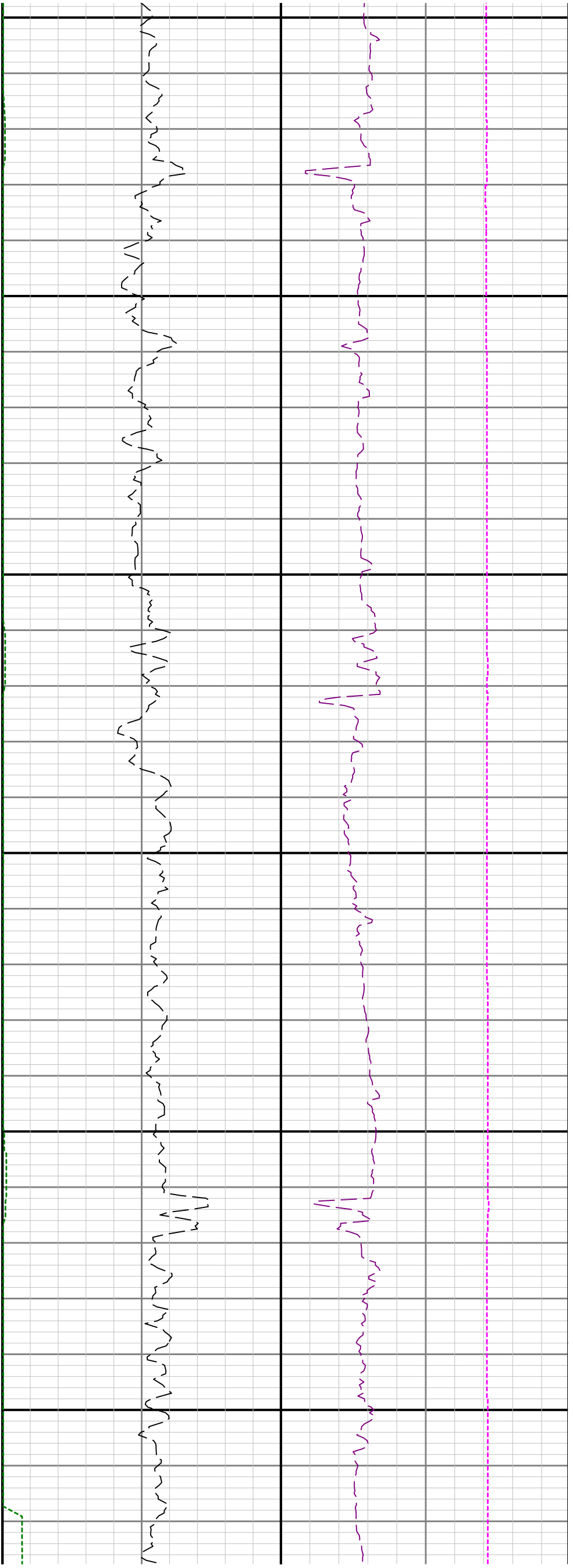
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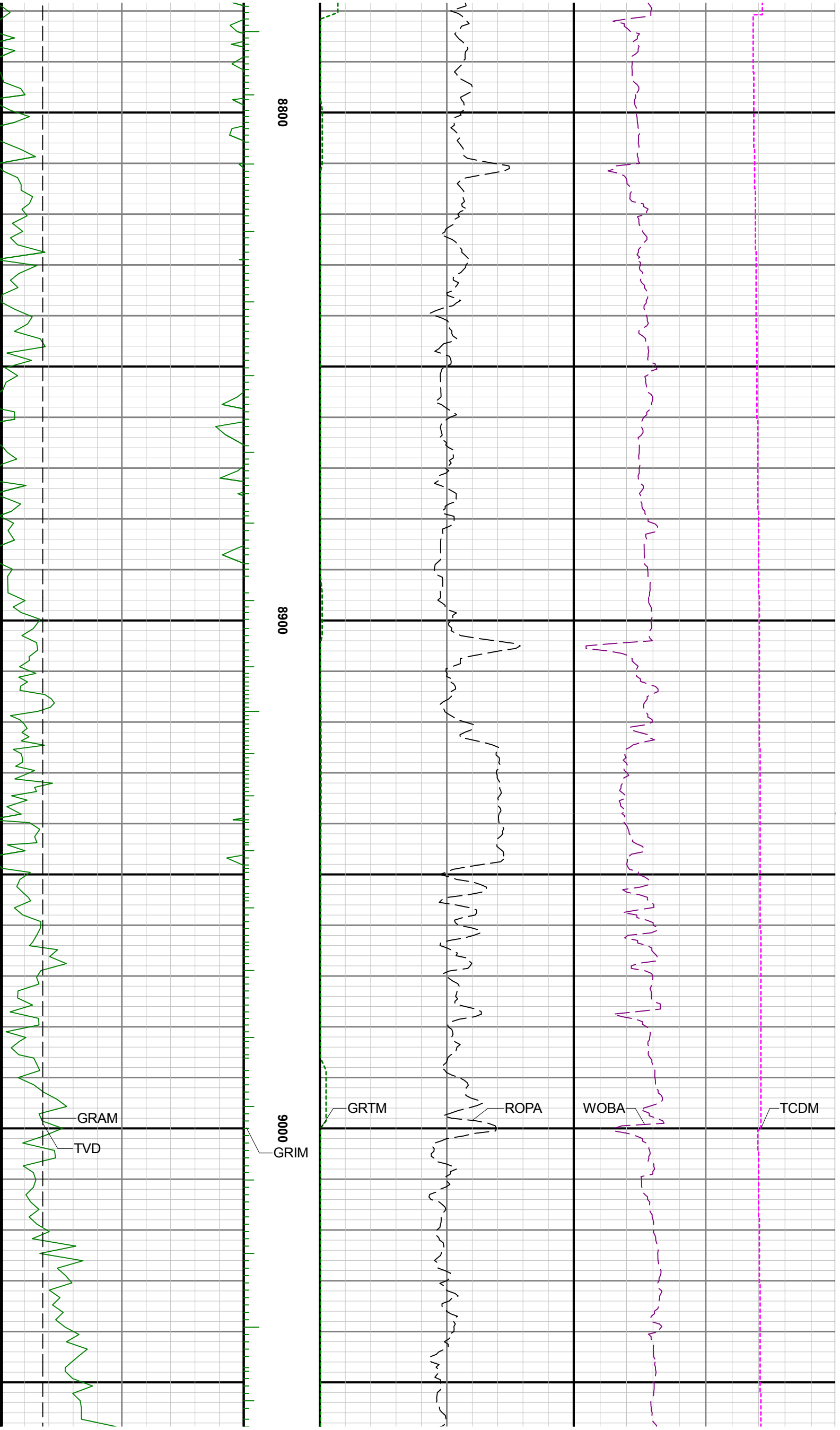


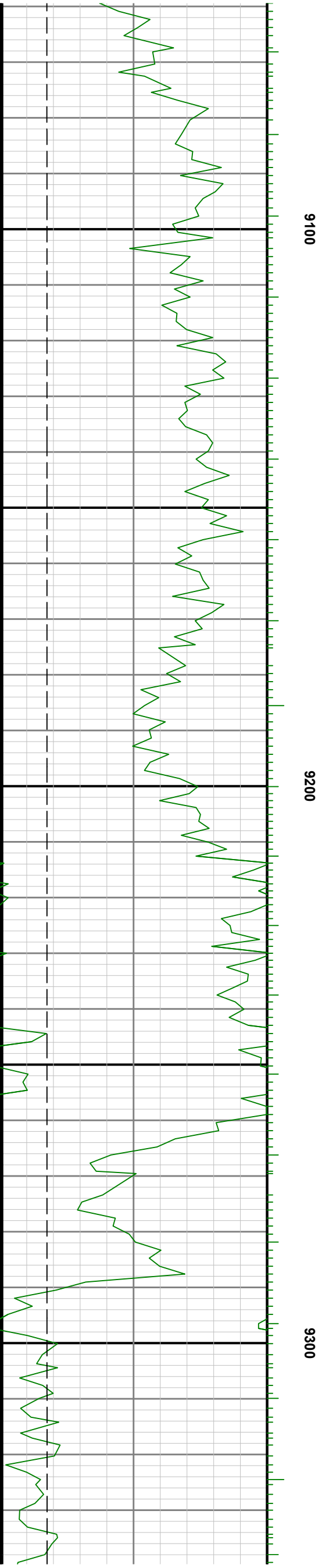
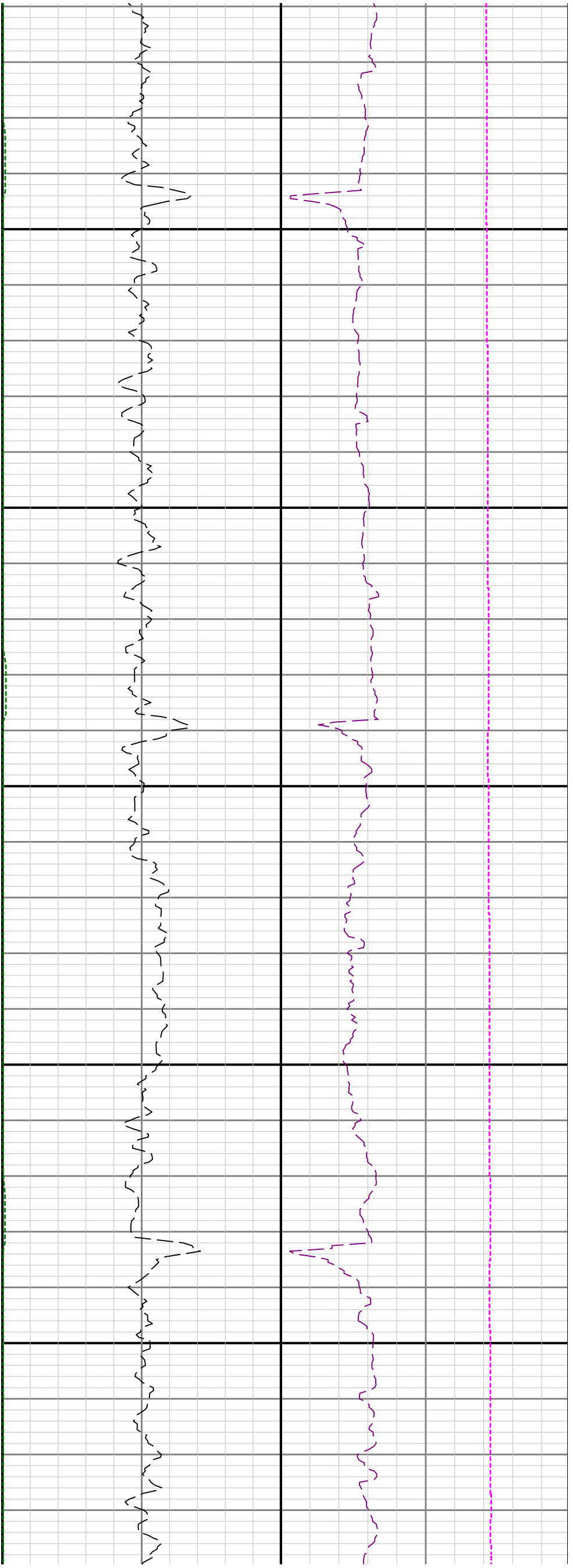


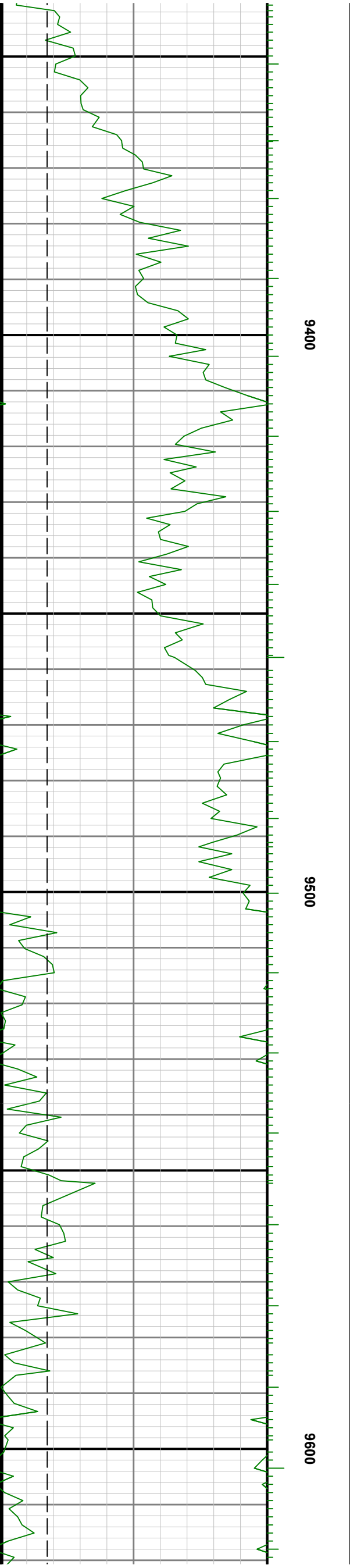
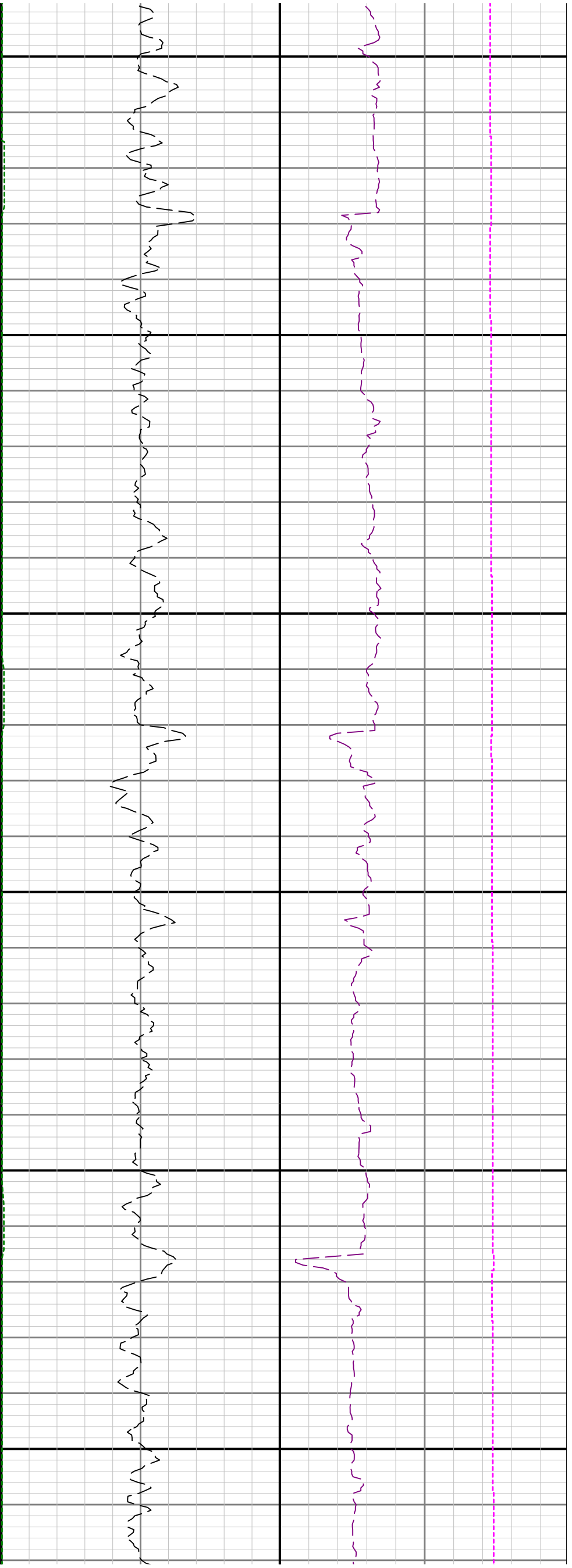


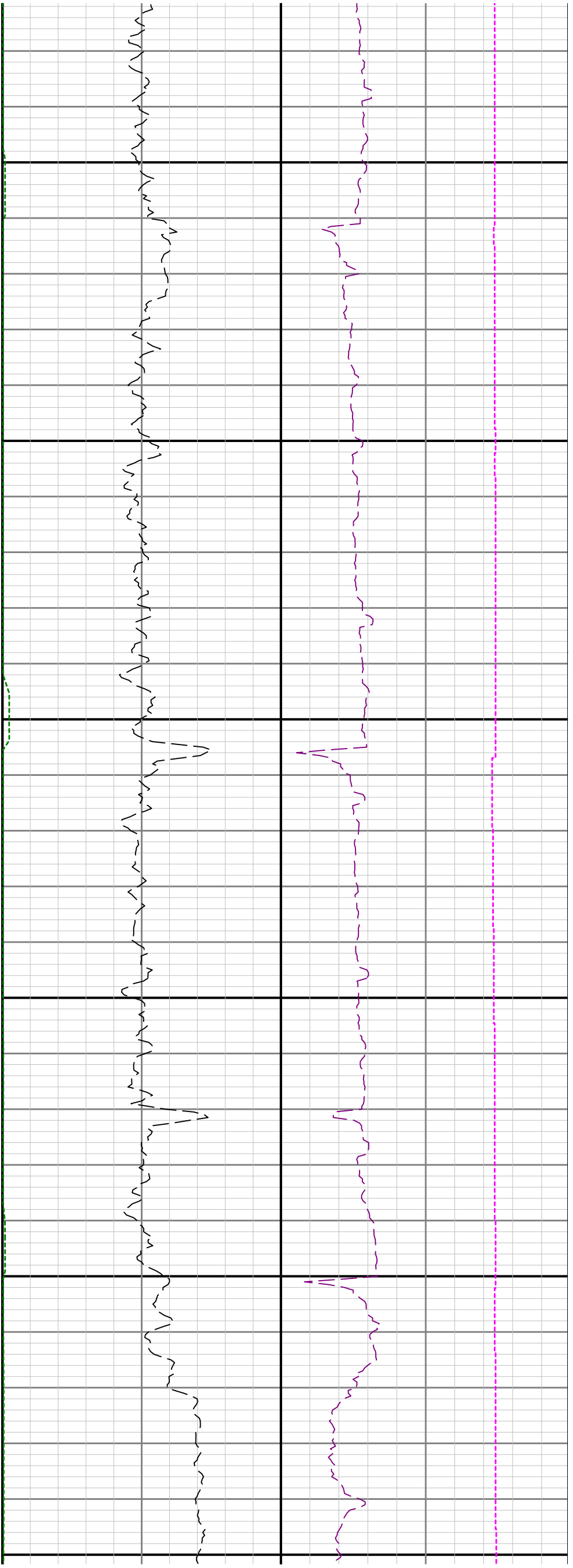












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