



LWD MEMORY LOG

Azimuthal Gamma Ray

[illegible]

© 2017 Baker Hughes, a GE company, LLC - All rights reserved. Baker Hughes, a GE company, LLC and its affiliates ("BHGE") provides this information on an "as is" basis for general information purposes and believes it to be accurate as of the date of publication. BHGE does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. BHGE hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. The BHGE logo is a trademark of Baker Hughes, a GE company, LLC. GE and the GE monogram are trademarks of General Electric Company used under trademark license.

Log Run Summary

[illegible]

		(in)		(in)		(ft)	(ft)	(ft)	(ft)			(h)
1	1	13.500	PDC	6.00	Steerable	0.00	0.00	25.00	1805.00	2017-09-03 11:00	2017-09-04 04:30	5.66
2	2	8.500	PDC	3.00	AutoTrak Curve	1805.00	2015.00	1805.00	2027.00	2017-12-05 07:50	2017-12-05 09:28	2.37
3	3	8.500	PDC	3.00	AutoTrak Curve	2015.00	9776.00	2027.00	9788.00	2017-12-05 14:34	2017-12-07 11:15	37.67
4	4	8.500	PDC	3.00	AutoTrak Curve	9776.00	13465.00	9788.00	13478.00	2017-12-08 11:18	2017-12-09 07:49	24.87

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Matthew Leopold	2017-12-04	2017-12-09						

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+ (%)
2017-09-03 06:27	1	25.00	Water Based Mud	9.8	N/A	N/A	N/A	N/A	Active Pit	N/A	0.00
2017-12-04 16:54	2	1805.00	Diesel-Oil Based Mud	10.0	14	N/A	9.8	80/20	Active Pit	35000	0.00
2017-12-05 12:30	3	2027.00	Diesel-Oil Based Mud	10.0	26	N/A	10.0	82/18	Active Pit	42000	0.00
2017-12-05 16:00	3	2290.00	Diesel-Oil Based Mud	10.0	27	N/A	9.0	82/18	Active Pit	42000	0.00
2017-12-06 04:00	3	5128.00	Diesel-Oil Based Mud	10.0	28	N/A	9.0	82/18	Active Pit	43000	0.00
2017-12-06 16:00	3	7187.00	Diesel-Oil Based Mud	10.0	22	N/A	9.2	82/18	Active Pit	40000	0.00
2017-12-07 04:00	3	8886.00	Diesel-Oil Based Mud	10.0	27	N/A	9.2	82/18	Active Pit	42000	0.00
2017-12-07 22:54	4	9788.00	Diesel-Oil Based Mud	10.2	22	N/A	9.8	81/19	Active Pit	43000	0.00
2017-12-08 16:00	4	10942.00	Diesel-Oil Based Mud	10.1	25	N/A	10.0	82/18	Active Pit	42000	0.00
2017-12-09 04:00	4	13000.00	Diesel-Oil Based Mud	10.1	27	N/A	10.0	81/19	Active Pit	40000	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	Sensor Sub	ZAPS230939	Gamma (single)	9.99	53.66	8.000	3.250
1	Sensor Sub	ZAPS230939	VSS	11.23	54.90	8.000	3.250
1	Sensor Sub	ZAPS230939	Directional (mag)	11.23	54.90	8.000	3.250
1	Sensor Sub	ZAPS230939	Pressure	31.98	75.65	8.000	3.250
2	ATC_SU	14236912	Near Bit Inclination	5.93	6.73	7.000	4.330
2	ATC_SU	14236912	Near Bit VSS	5.93	6.73	7.000	4.330
2	ATC_MWD	12694813	Gamma (single)	2.20	12.35	7.000	3.250
2	ATC_MWD	12694813	Directional (mag)	12.27	22.42	7.000	3.250
3	ATC_SU	14262243	Near Bit VSS	5.93	6.73	7.000	4.330
3	ATC_SU	14262243	Near Bit Inclination	5.93	6.73	7.000	4.330
3	ATC_MWD	12168749	Gamma (single)	2.21	12.35	7.000	3.250
3	ATC_MWD	12168749	Directional (mag)	12.28	22.42	7.000	3.250
4	ATC_SU	13867780	Near Bit Inclination	5.93	6.73	7.000	4.330
4	ATC_SU	13867780	Near Bit VSS	5.93	6.73	7.000	4.330
4	ATC_MWD	12398256	Gamma (single)	2.75	12.90	7.000	3.250
4	ATC_MWD	12398256	Directional (mag)	12.27	22.42	7.000	3.250


Service and Tool Mnemonics

Mnemonic	Name	Description
GAM	APS	APS EM Module
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
<div> 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. </div> <div> 2 Baker Hughes LWD Run 1 utilized 8 inch NaviTrak service (Directional only) behind a 13 1/2 inch bit and steerable assembly from surface to 1805 feet MD (surface to 1729 feet TVD). No logging data was acquired during this run. </div> <div> 3 Baker Hughes LWD Runs 2, 3 and 4 utilized 6 ¾ inch NaviGamma services (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1805 to 13478 feet MD (1729 to 7269 feet TVD). </div> <div> 4 Gamma Ray Curves (GRAM-GRAUM-GRADM) are presented 0 to 300 API per customer request. </div>

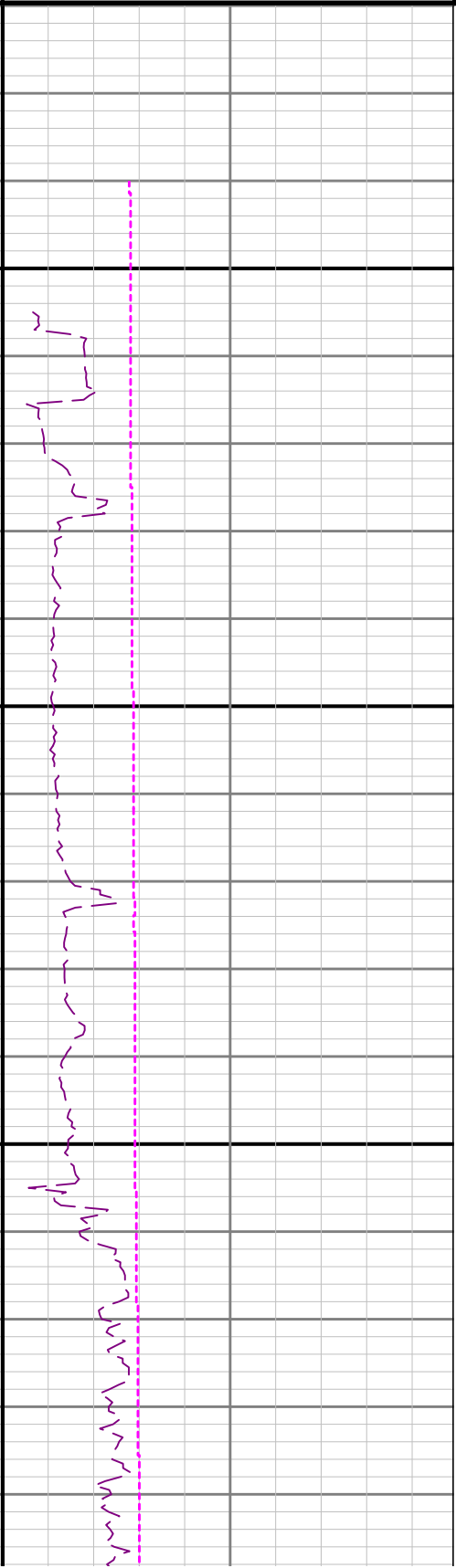
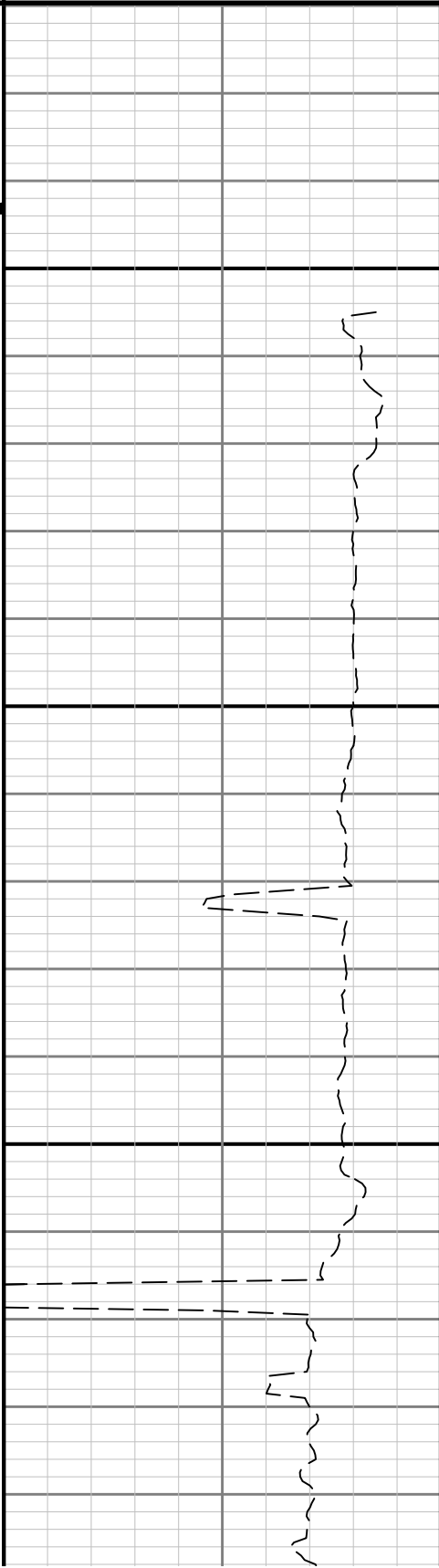
Remarks				
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1813.00	8.500	3	The interval from 1805 to 2015 feet MD (1729 to 1919 feet TVD) Azimuthal Gamma Ray data was not logged due to internal communication failure with the AutoTrak Curve.
2	9753.00	8.500	4	The interval from 9750 to 9788 feet MD (7259 feet TVD) was logged up to 24 hours after being drilled due to a trip out of the hole for a tool failure.
3	13473.00	8.500	4	The interval from 13465 to 13478 feet MD (7269 feet TVD) was not logged due to sensor to bit offset at well TD.

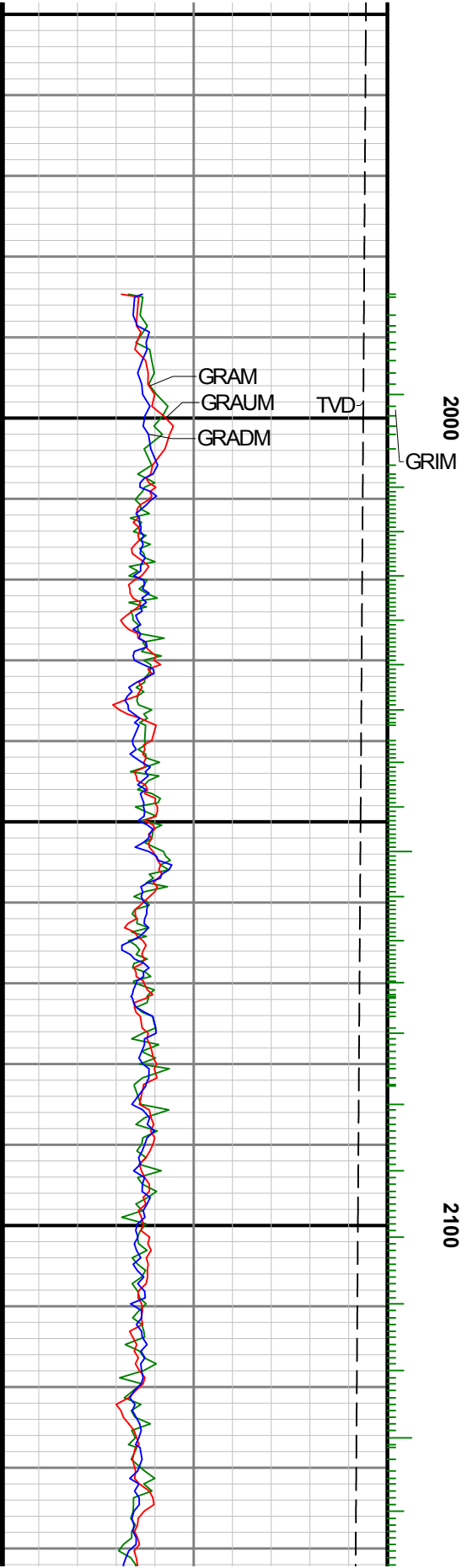
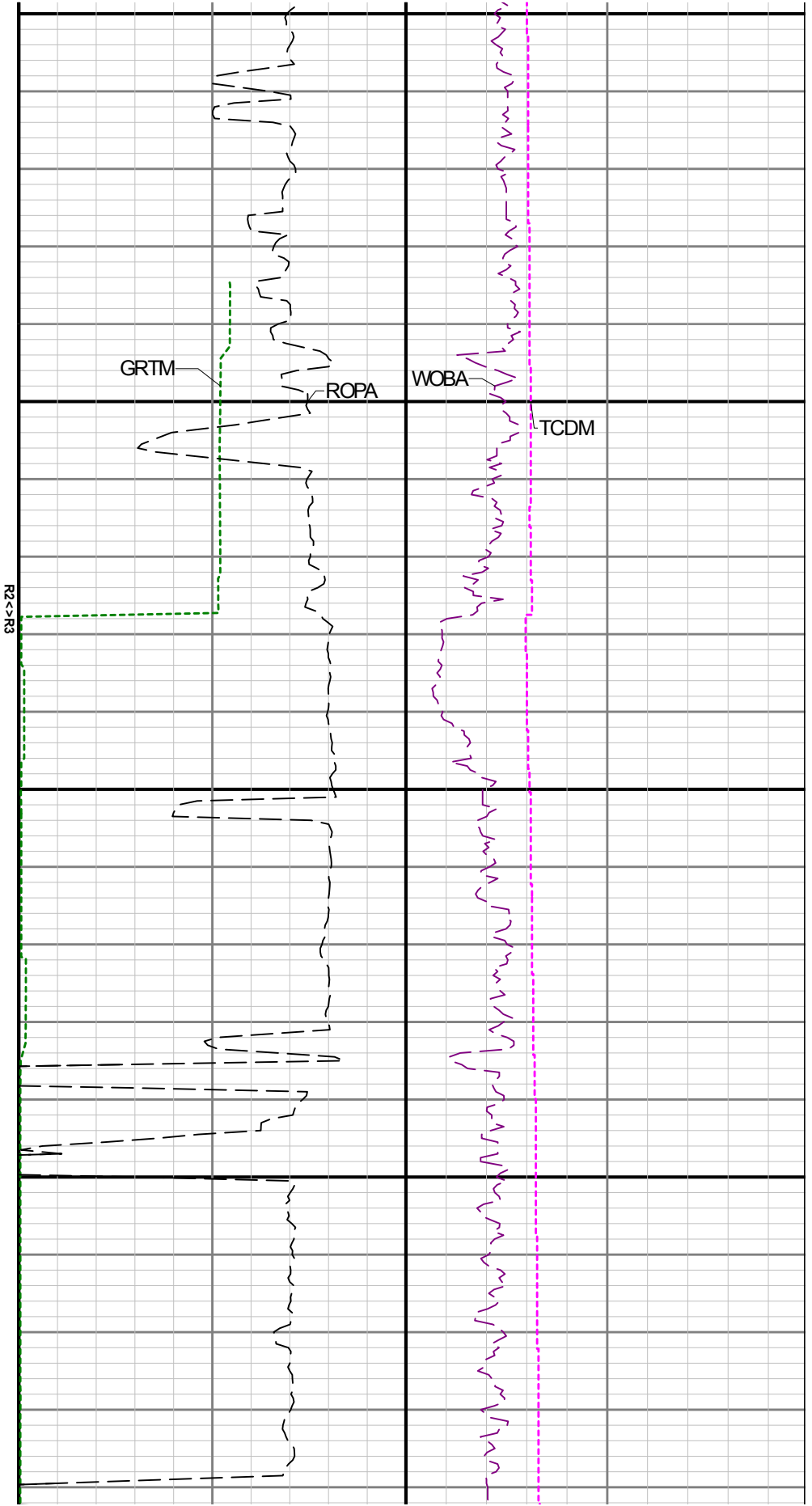
Curve Mnemonics		
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	OnTrak - Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	OnTrak - Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	OnTrak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

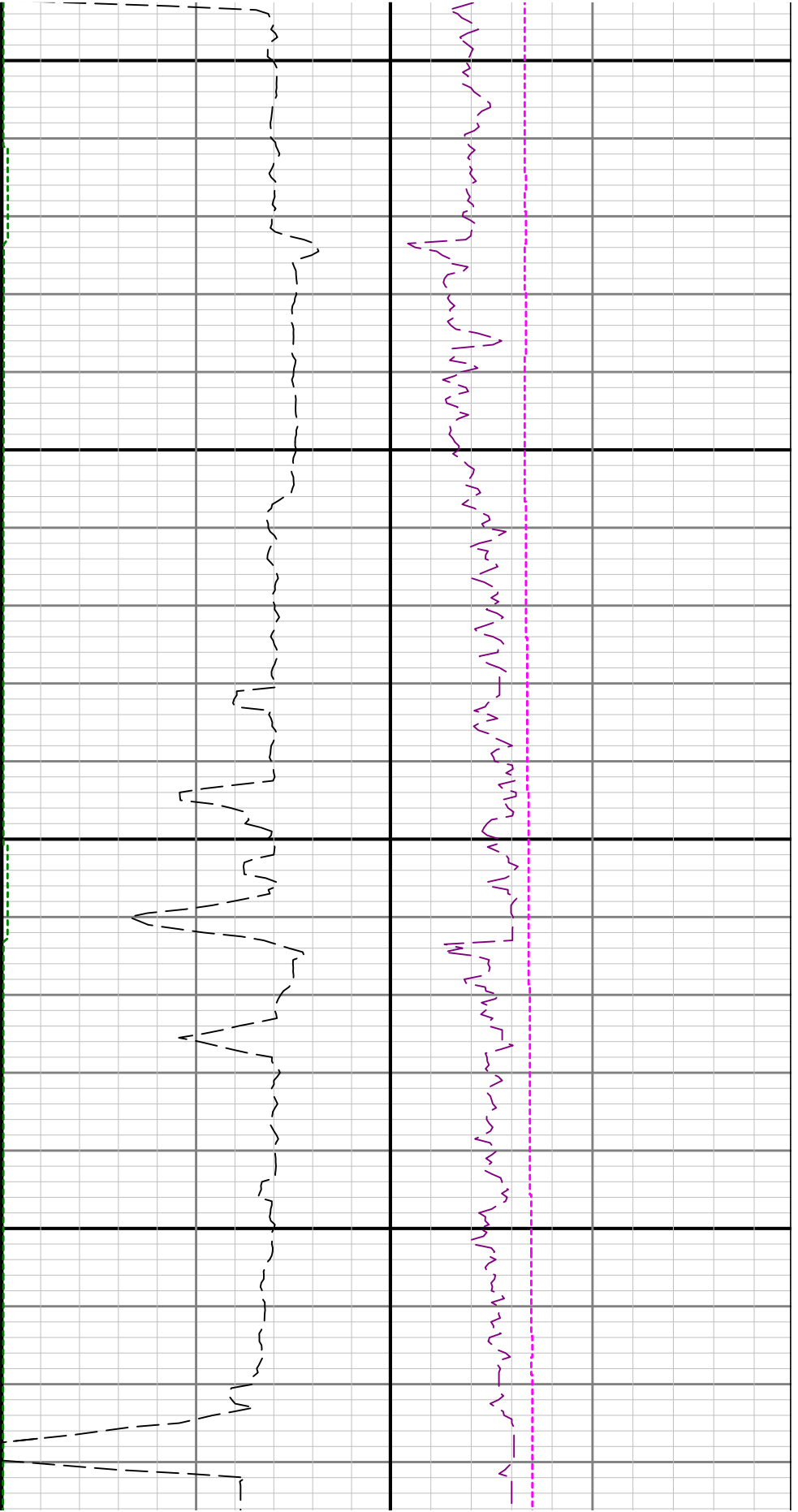
	Company	SRC Energy			
	Well	Falken 31C-14-S			
	Interval	Date From:	2017-12-05 00:50:10	Top:	1805.00
	Created	Date To:	2017-12-09 00:49:36	Bottom:	13478.00
		2017-12-10	16:07:20		

Gamma Ray - Apparent 0.5 ft Average GRAM API	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
True Vertical Depth TVD		Depth Averaged ROP 3 ft Average ROPA	Downhole Temperature TCDM
8000 1500		1000 0	0 275
ft		ft/h	degF
Gamma Ray Apparent UP 0.5 ft Average GRAUM			
0 300			

0	API	300
Gamma Ray Apparent	DOWN 0.5 ft Average GRADIM	
0		300
	API	

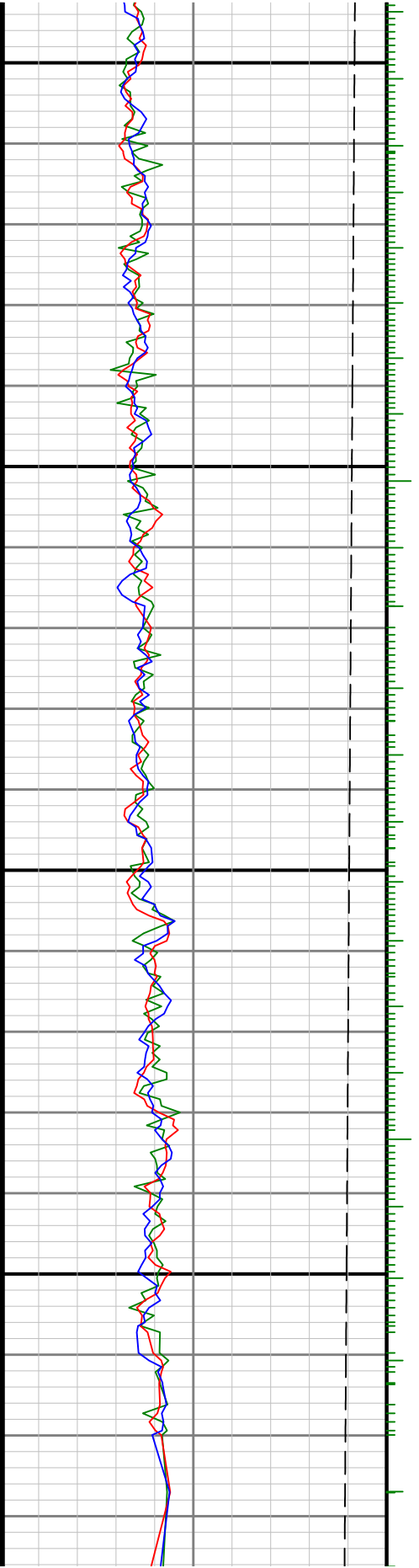


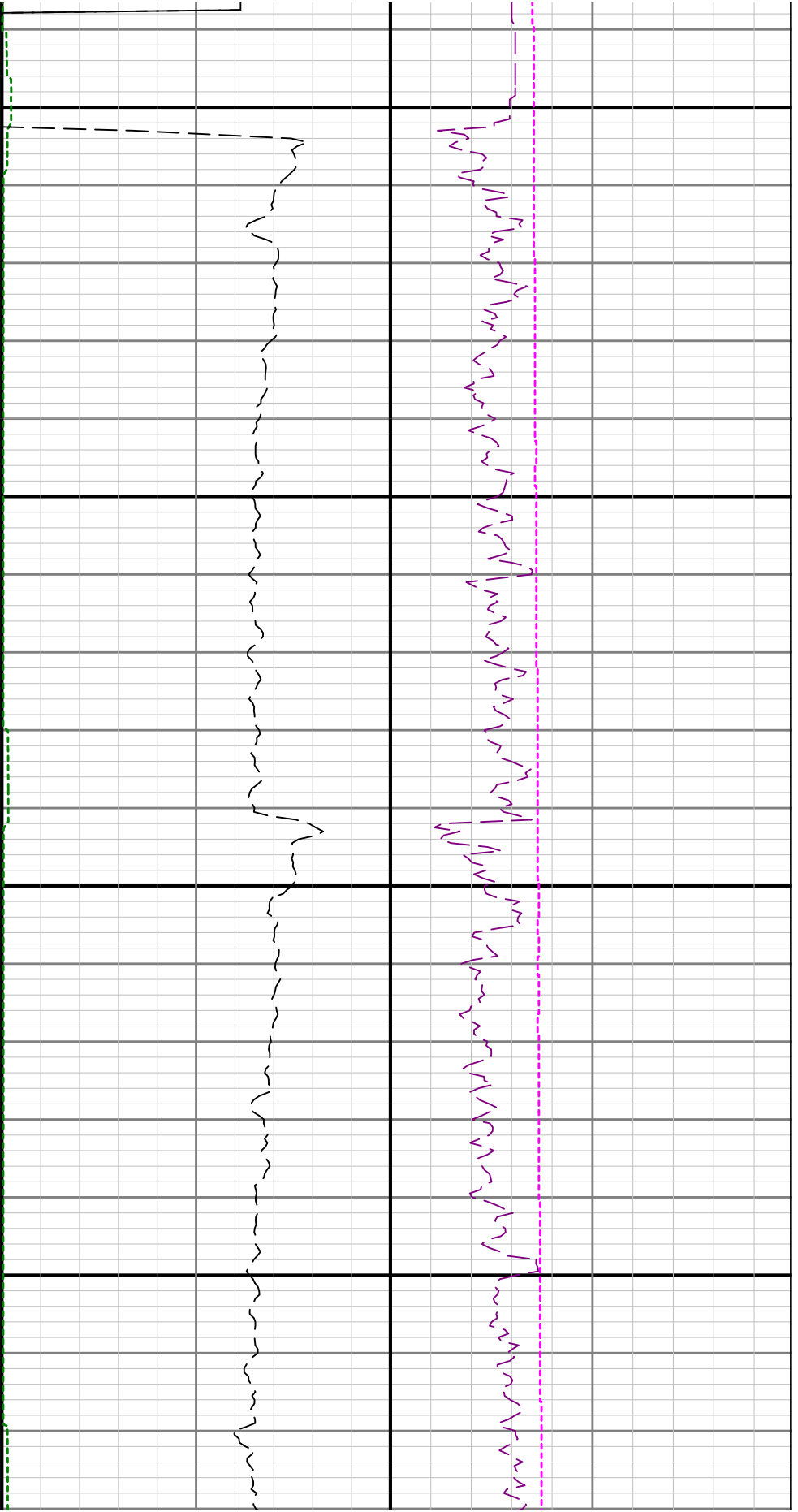




2200

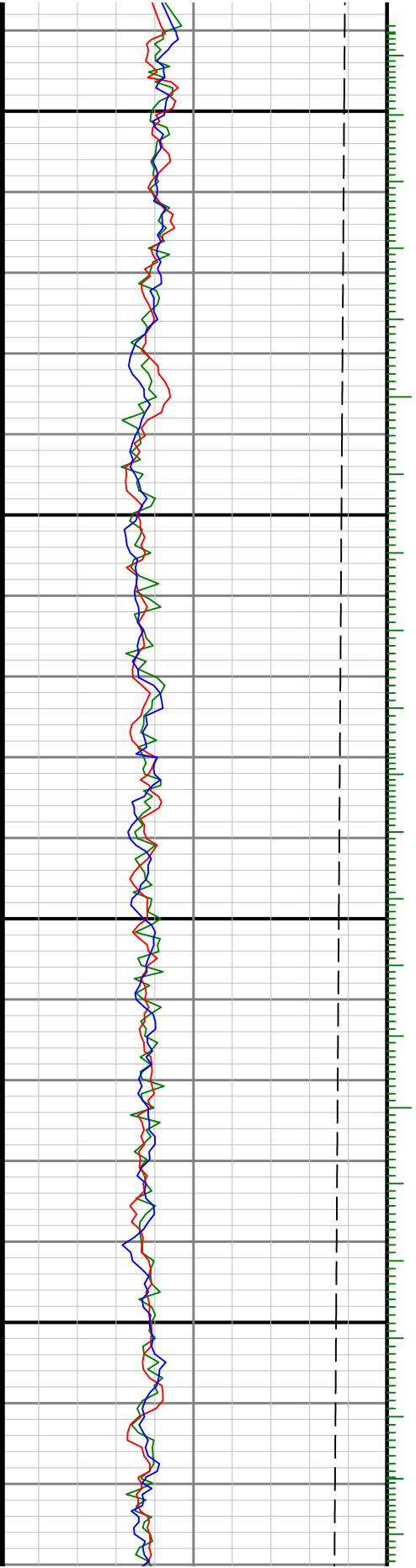
2300

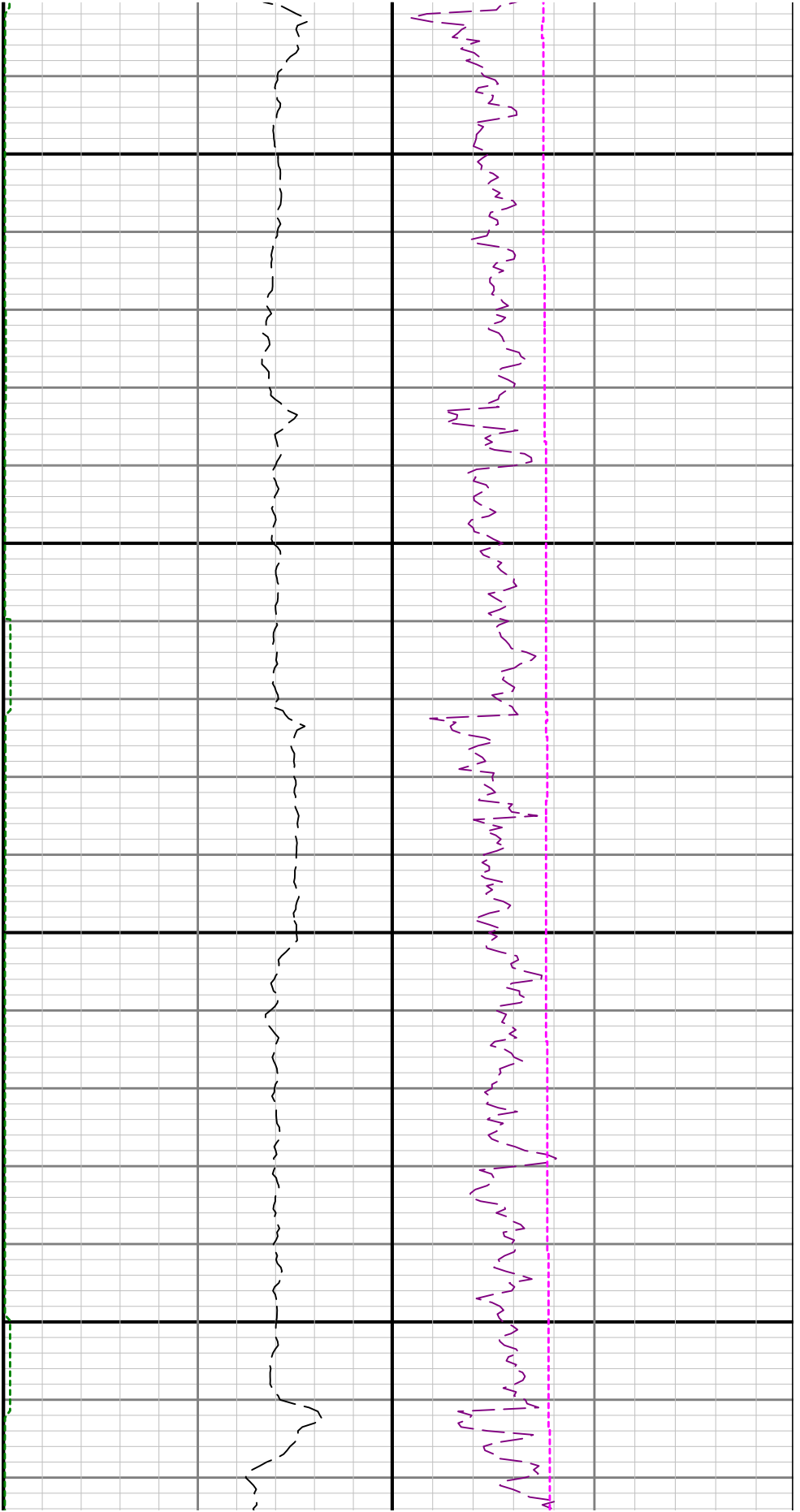




2400

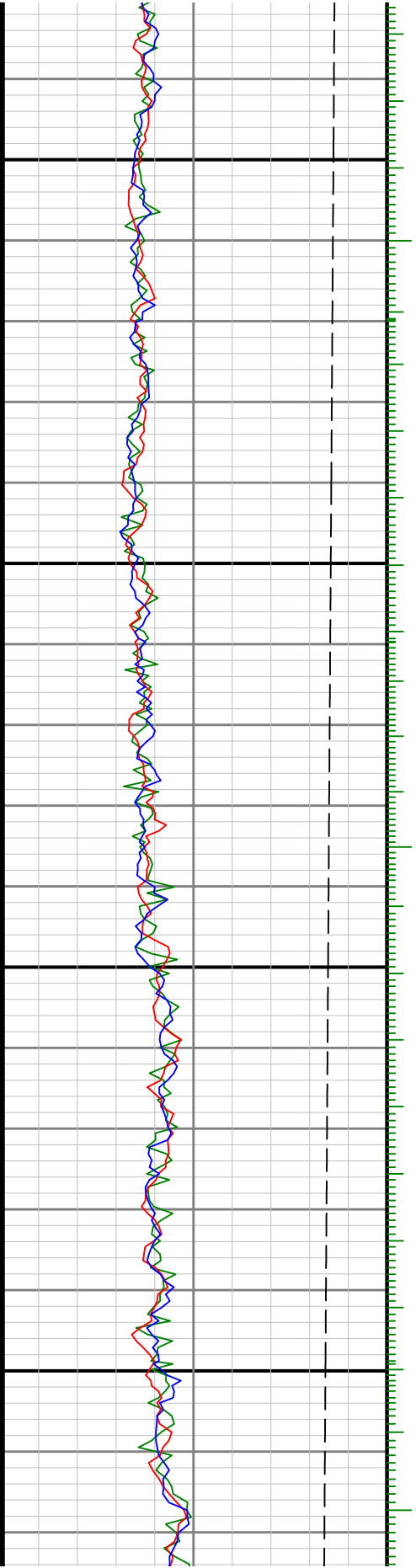
2500

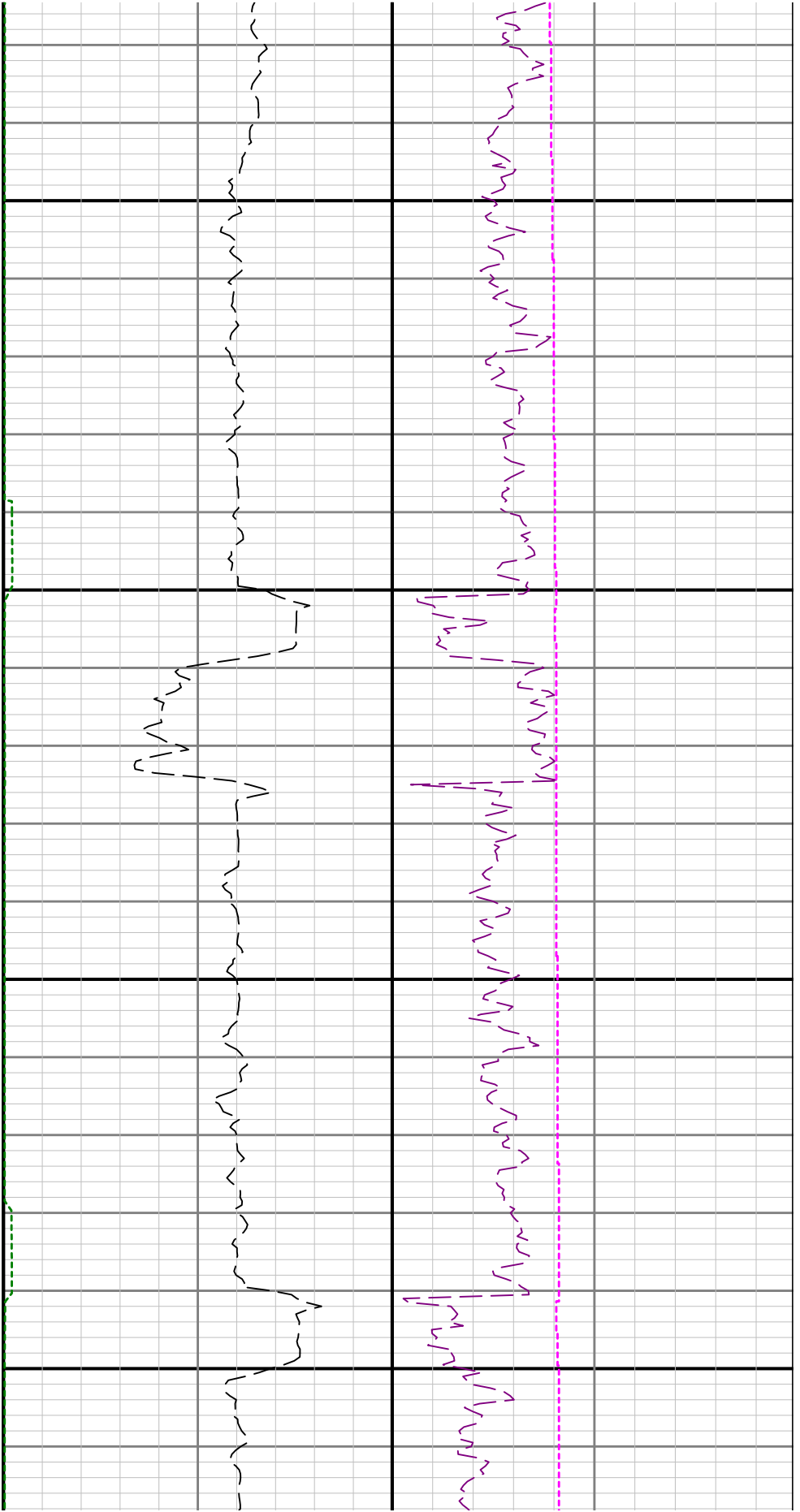




2600

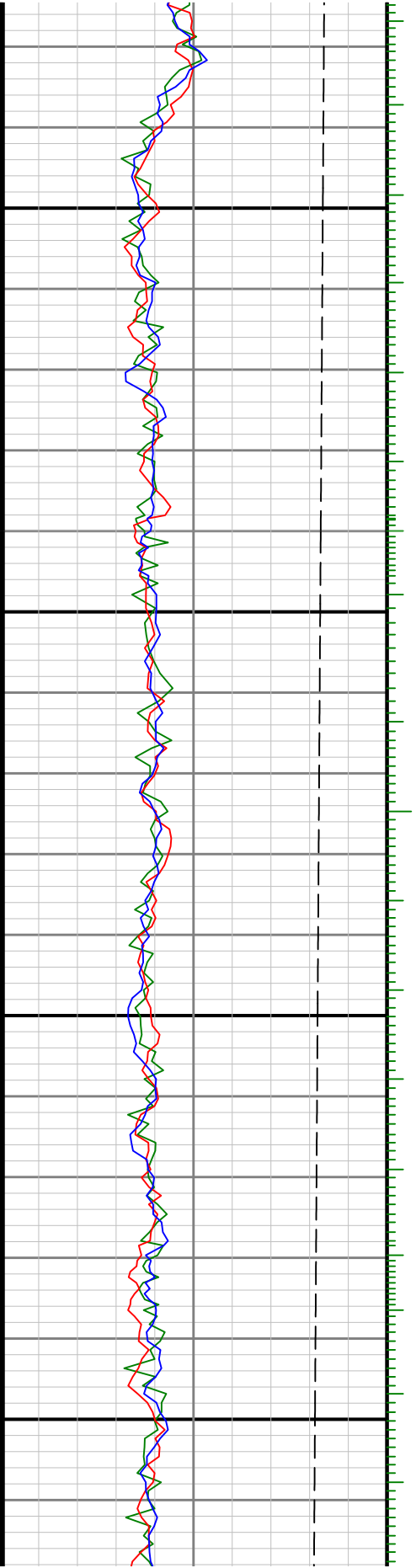
2700

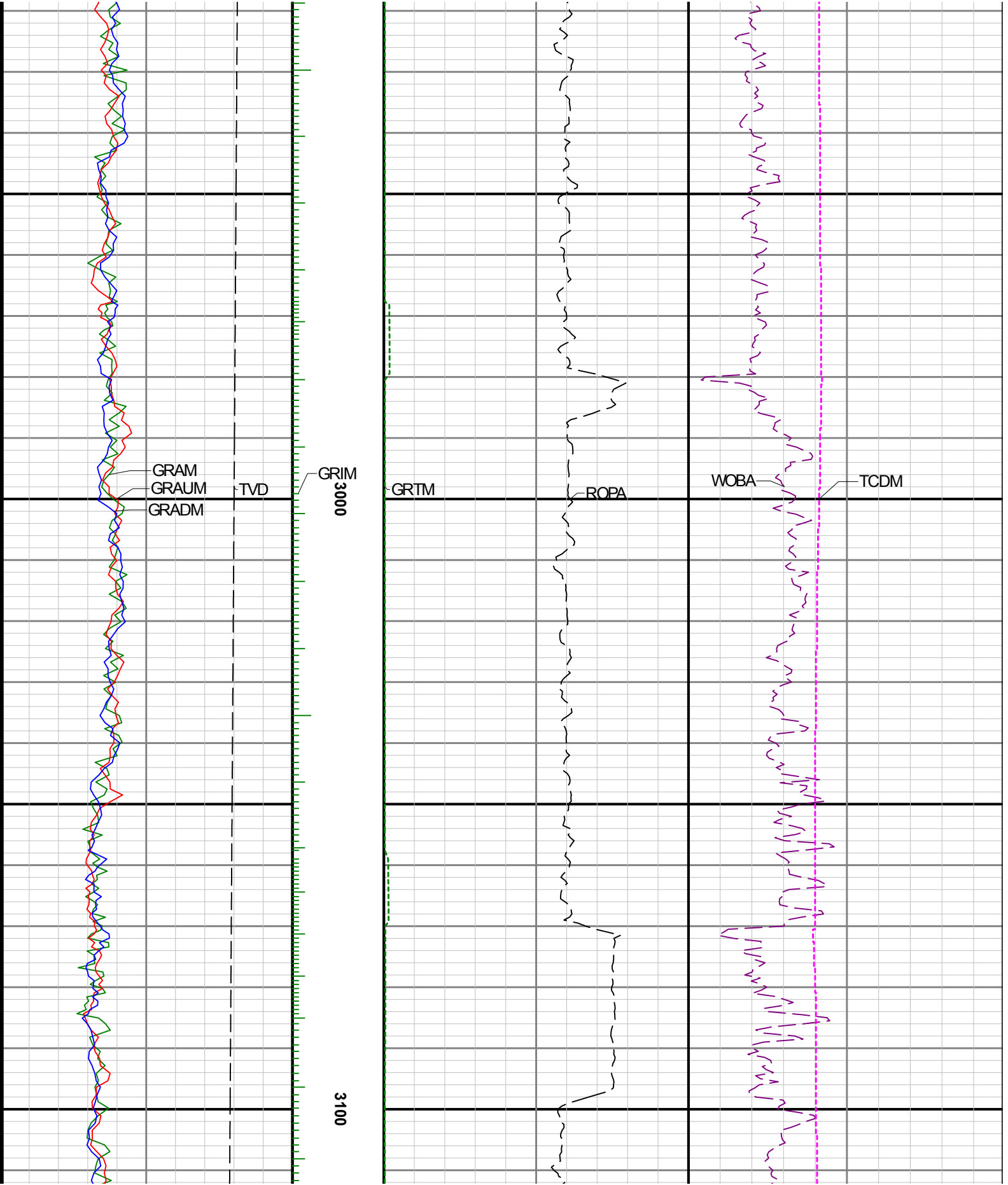


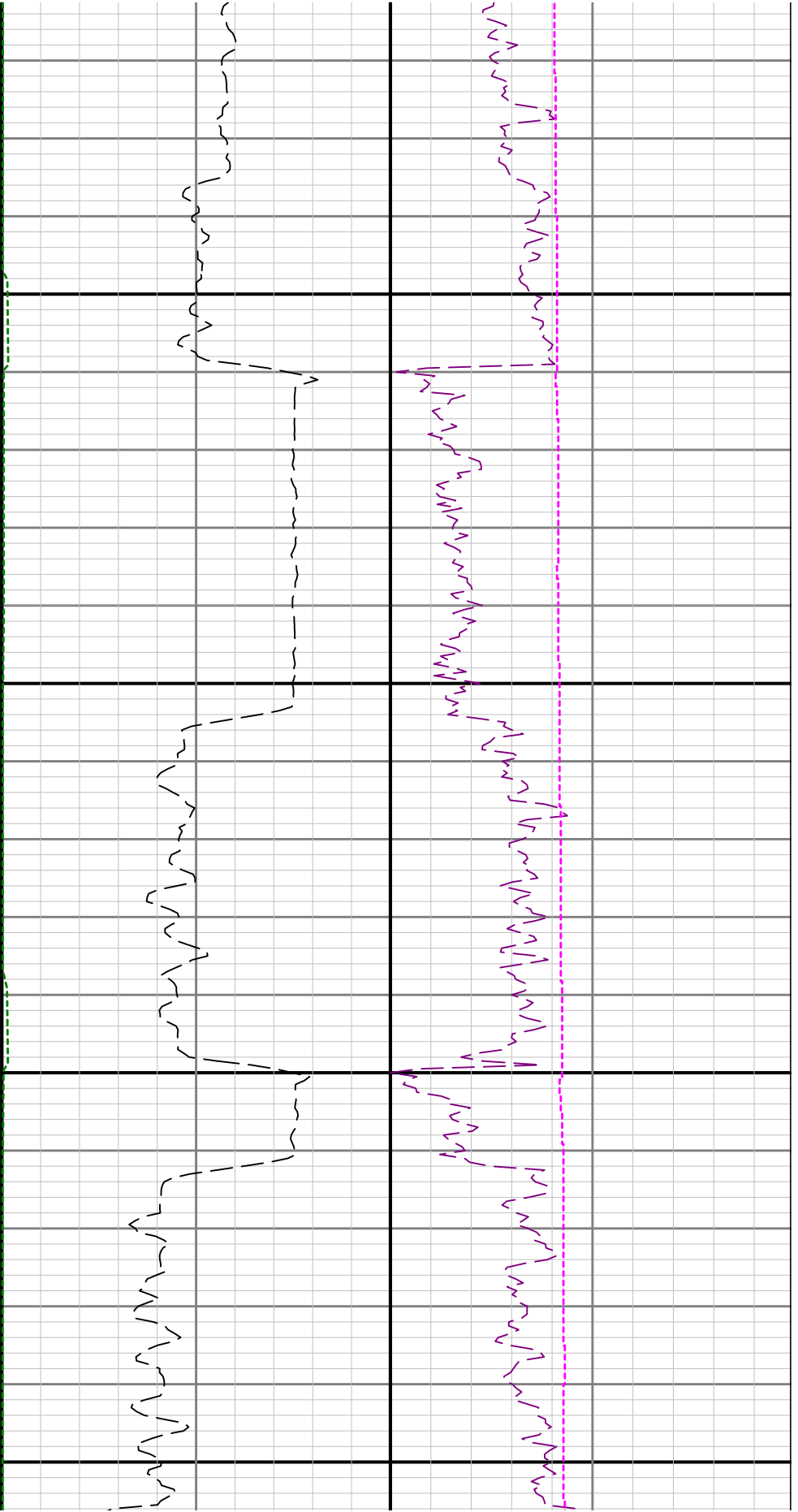


2800

2900

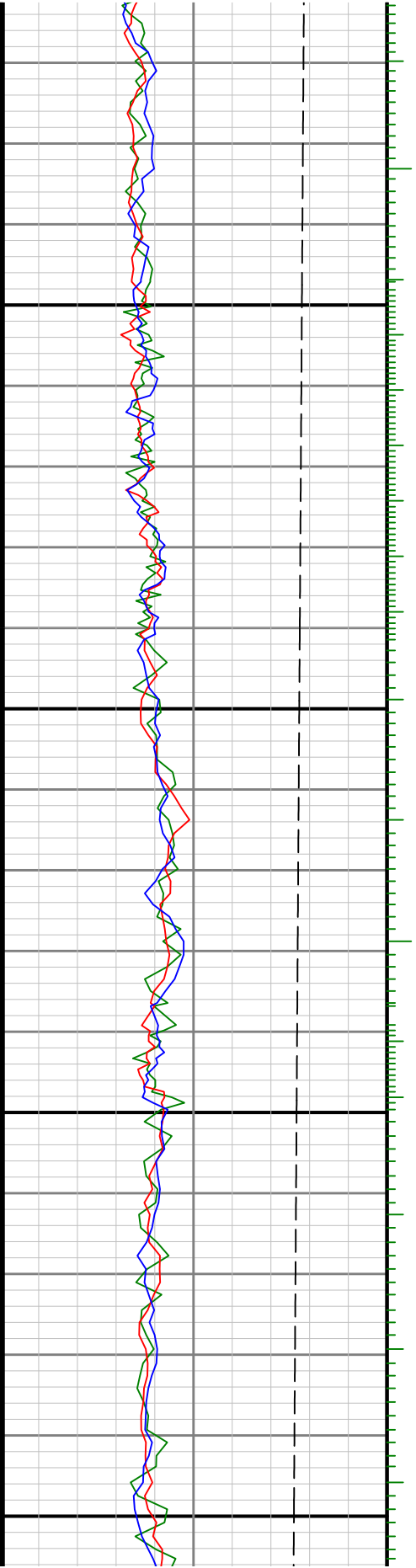


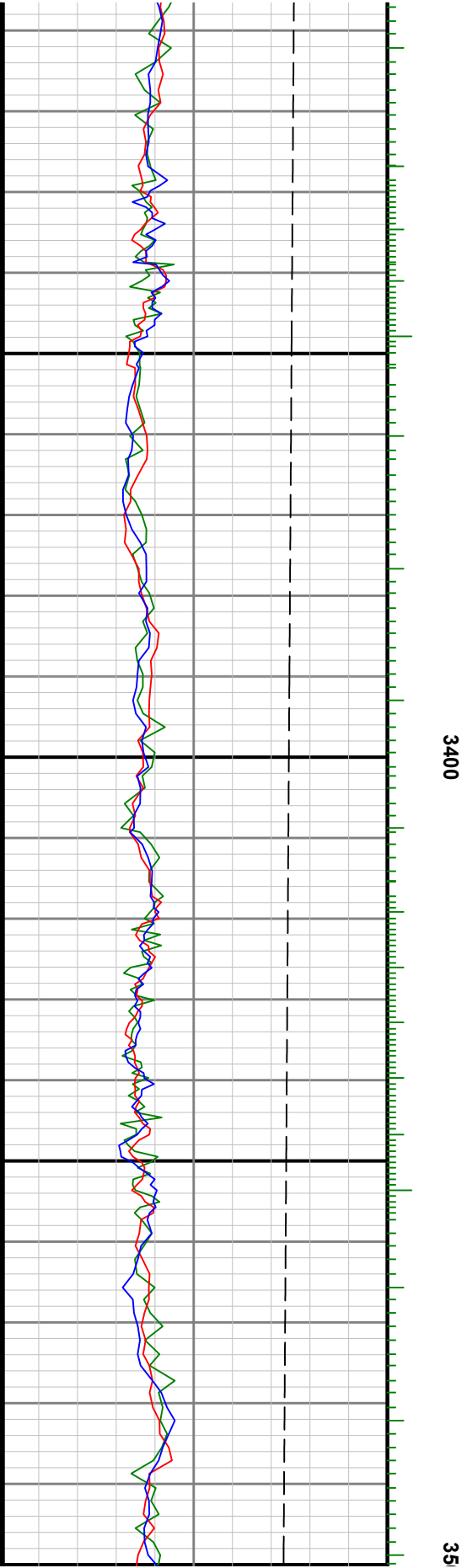
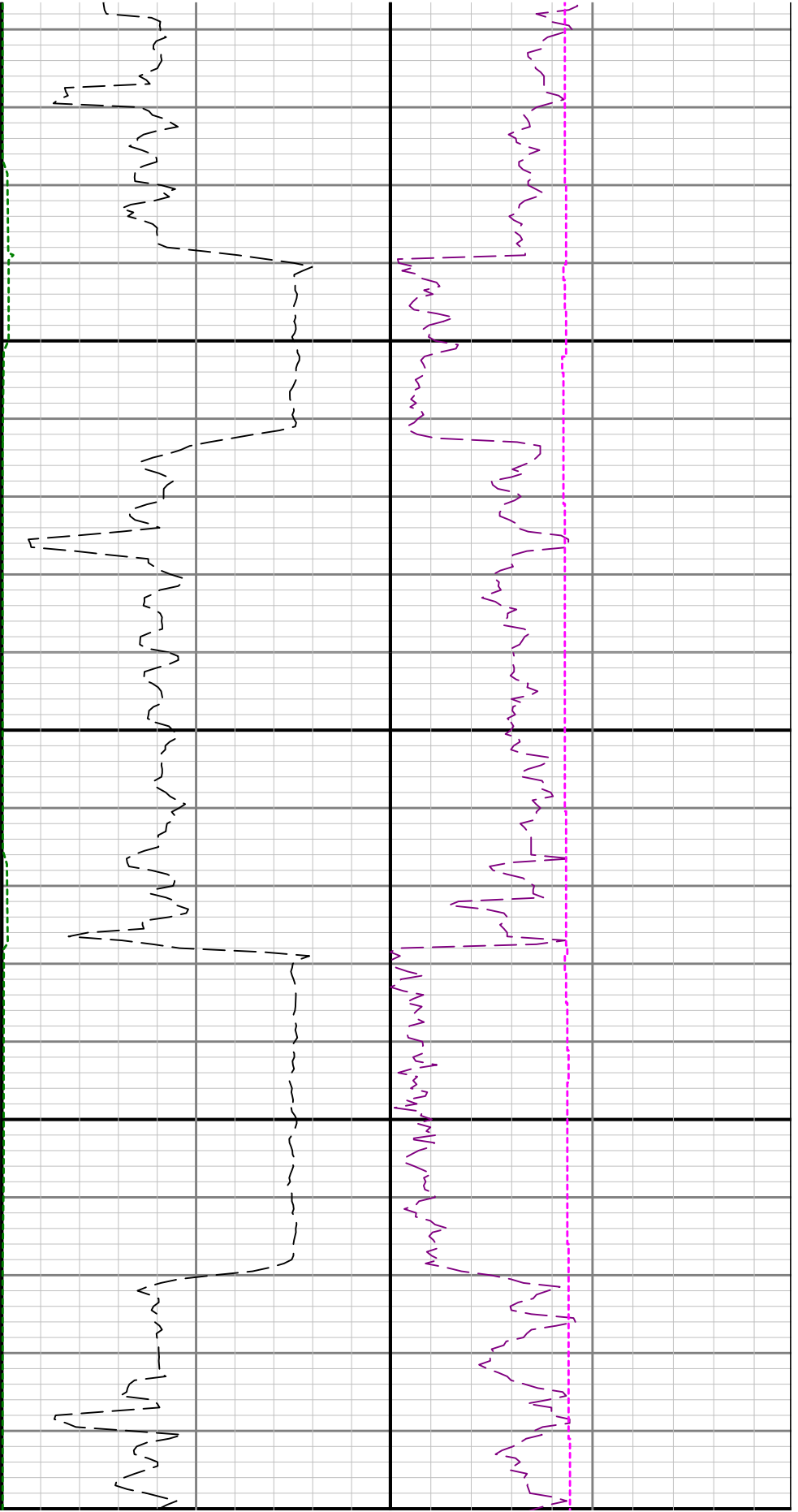


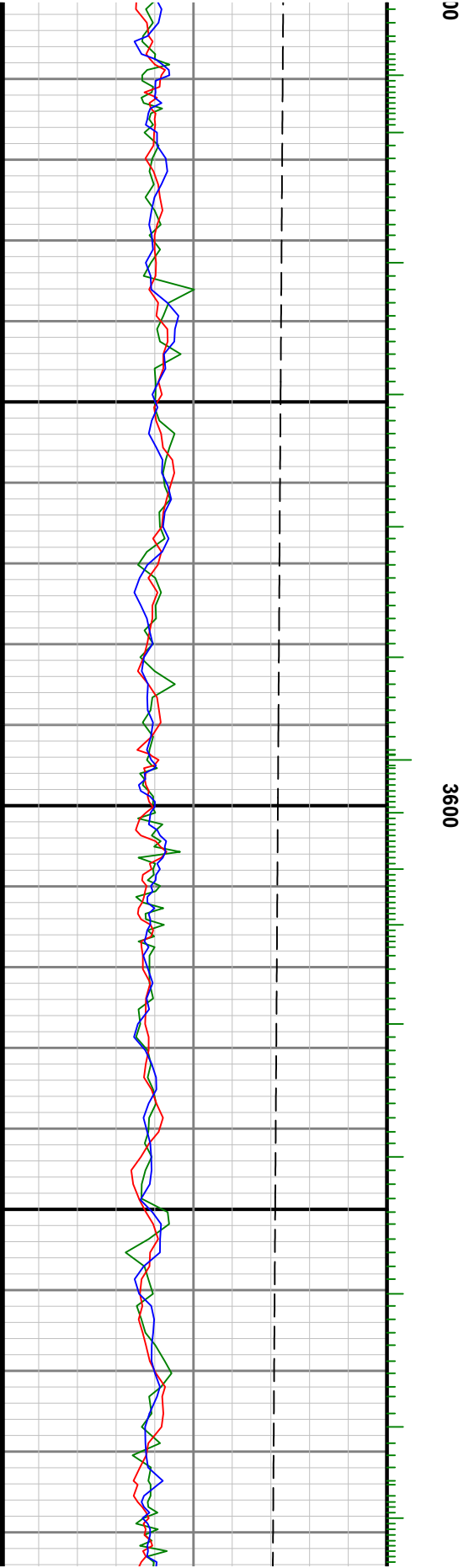
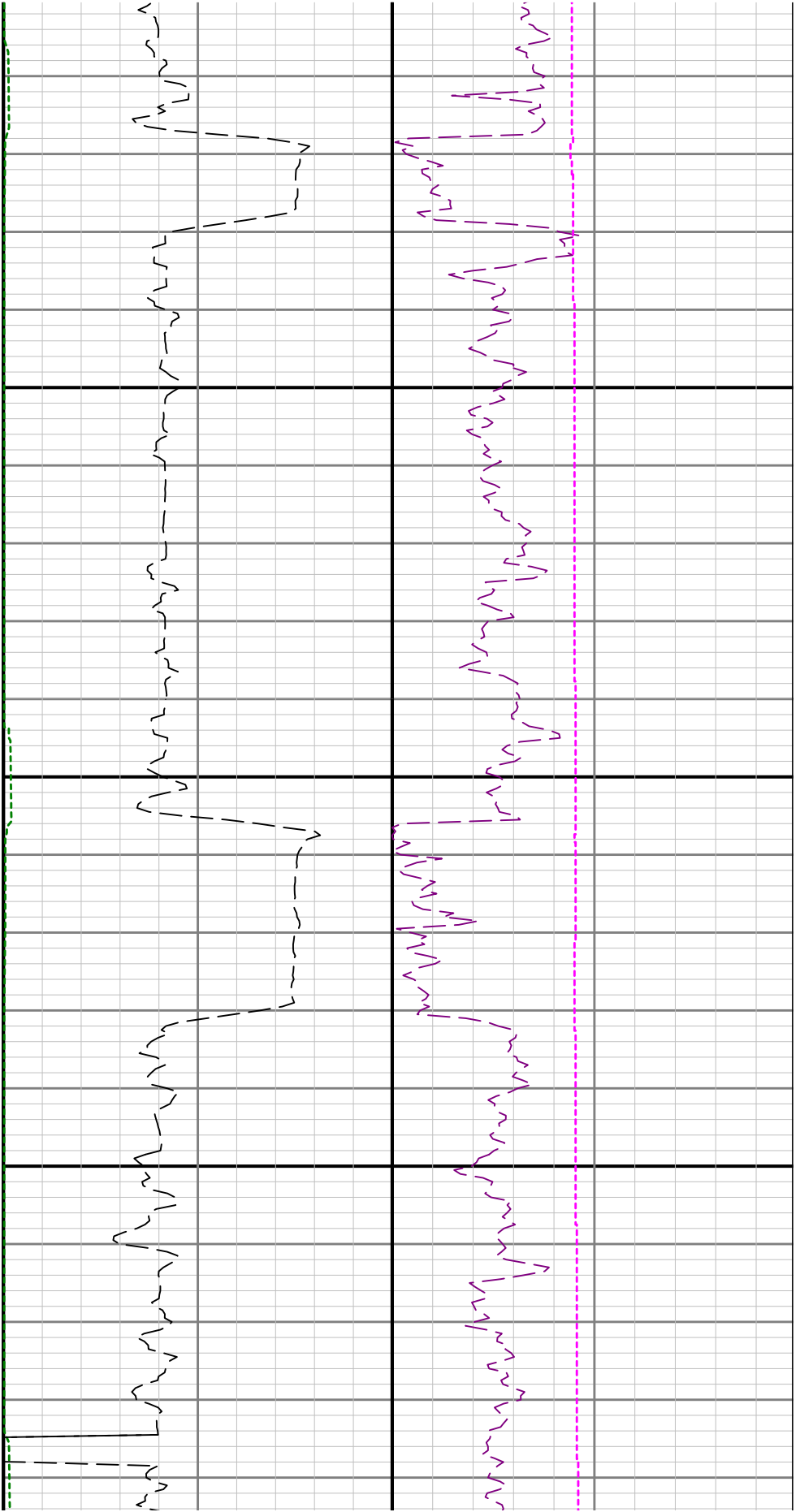


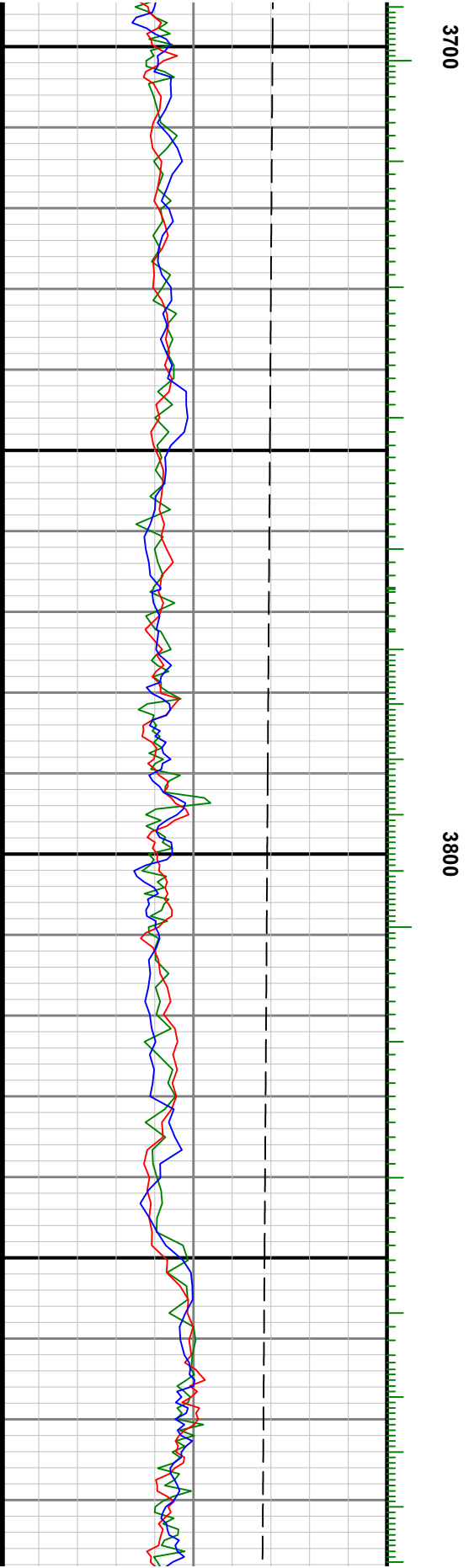
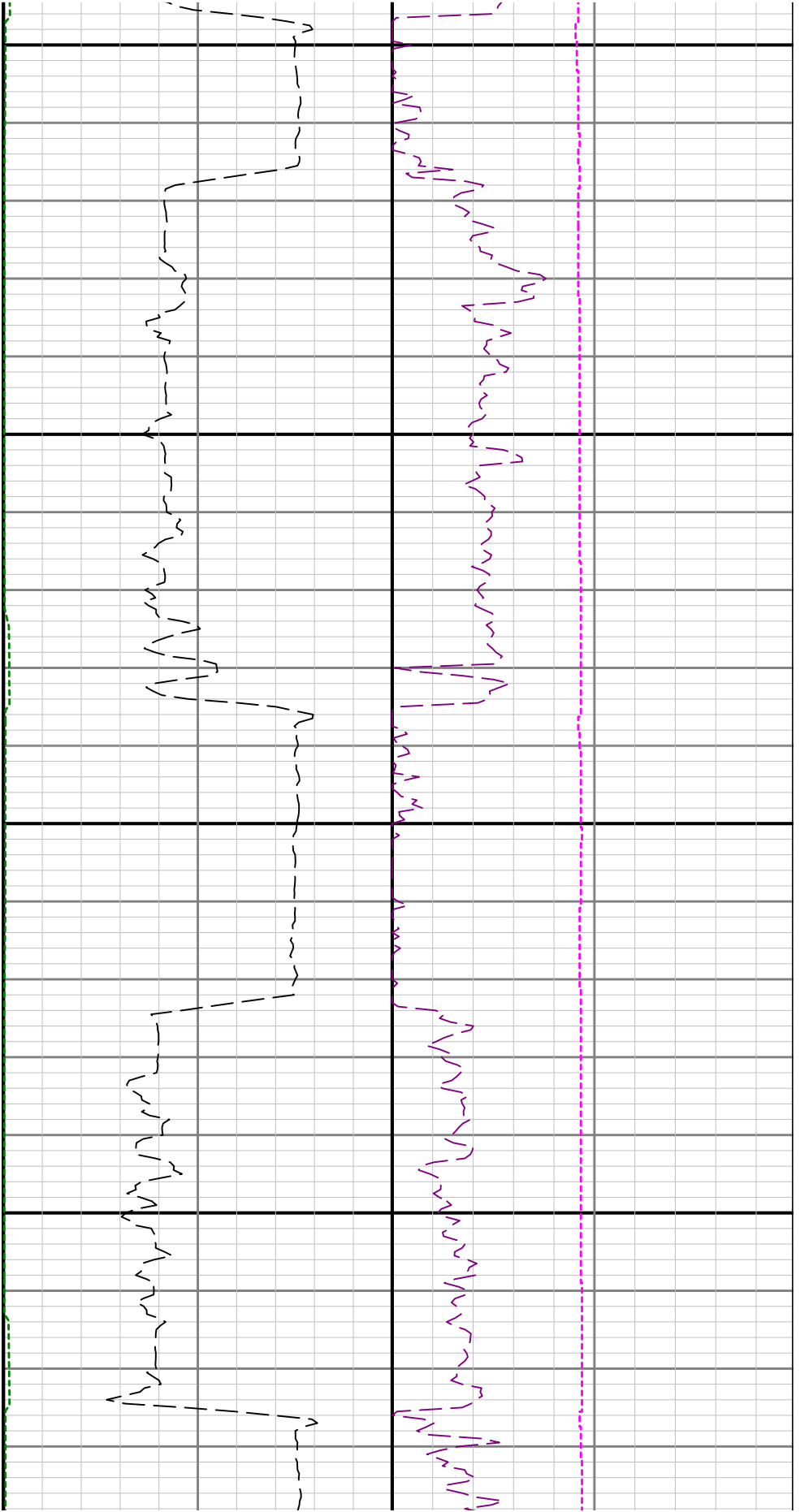
3200

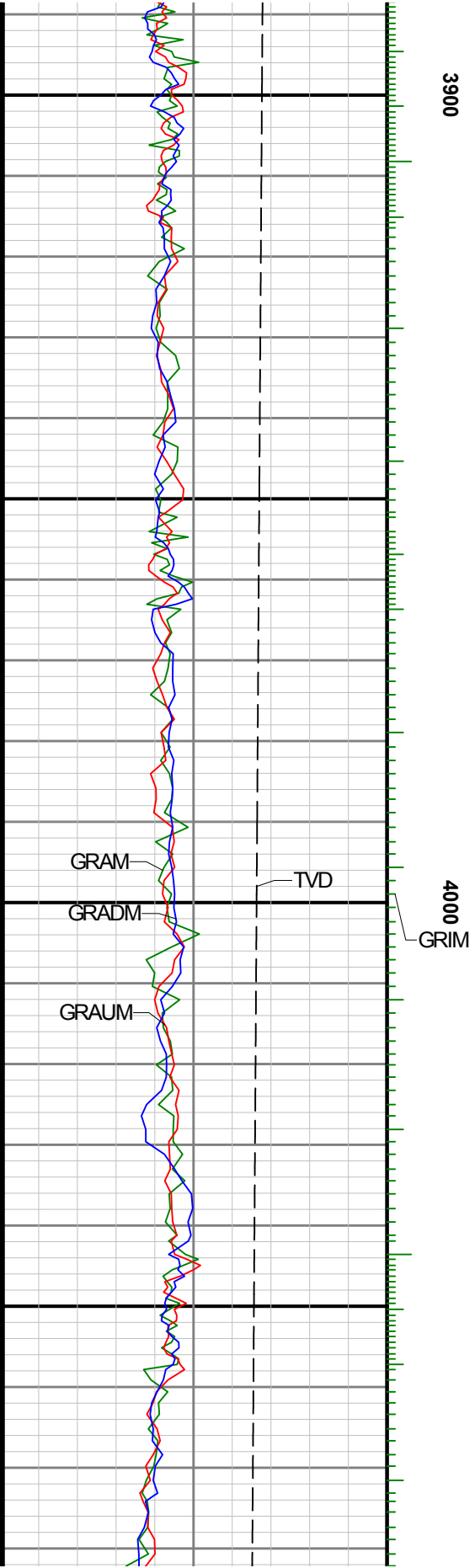
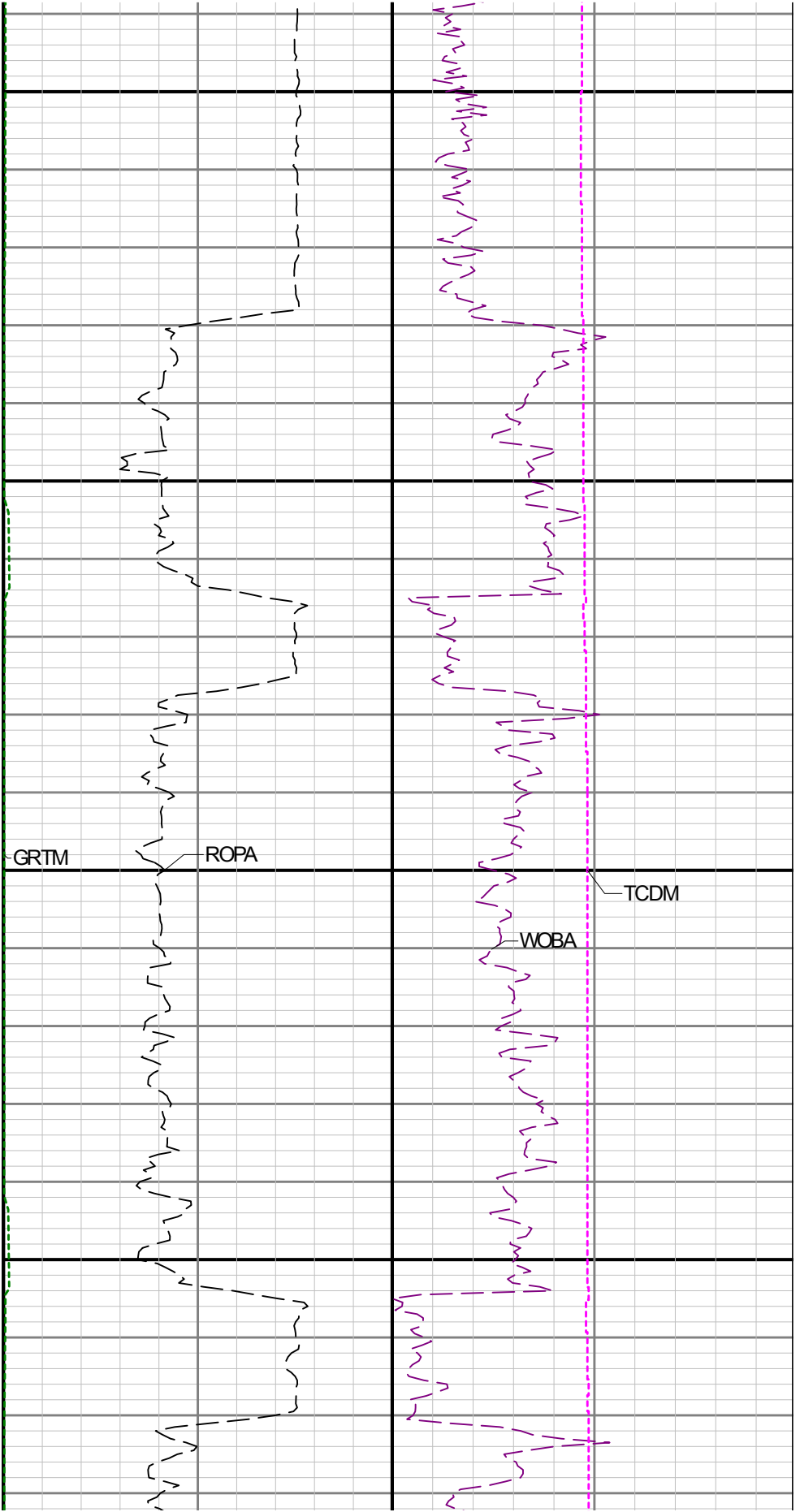
3300

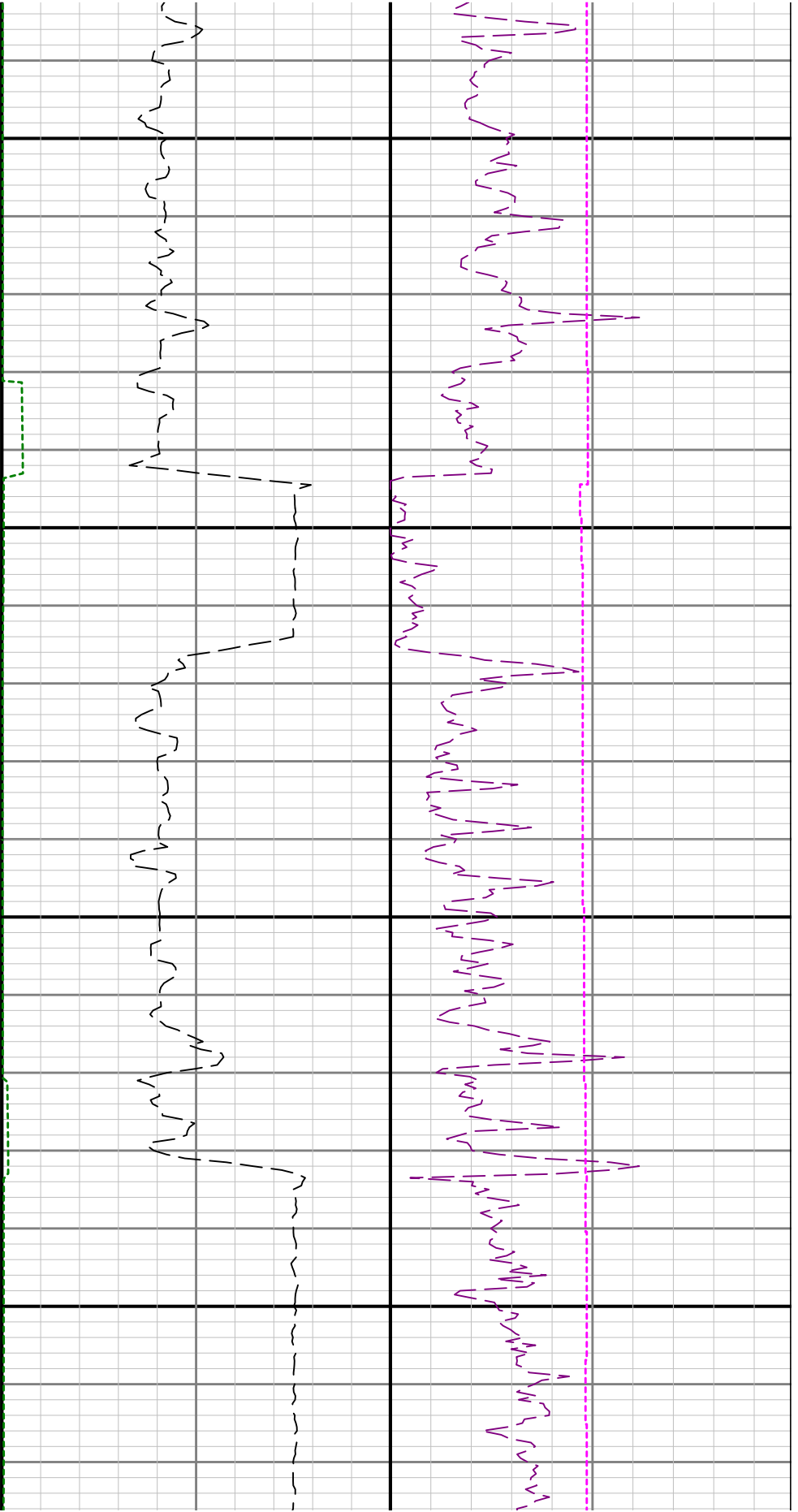






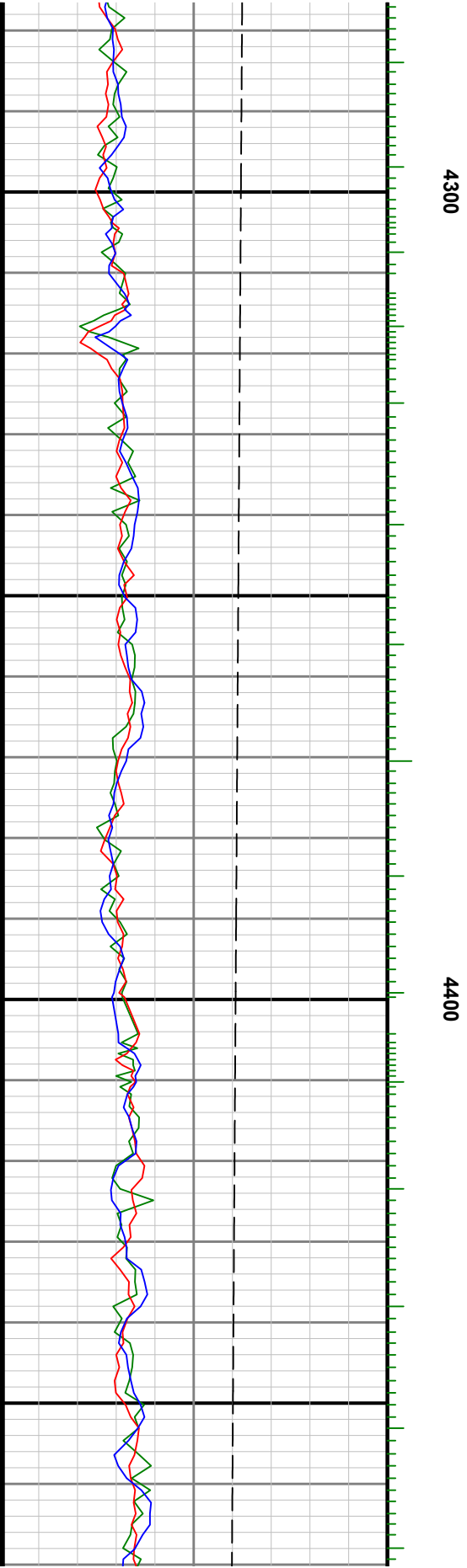
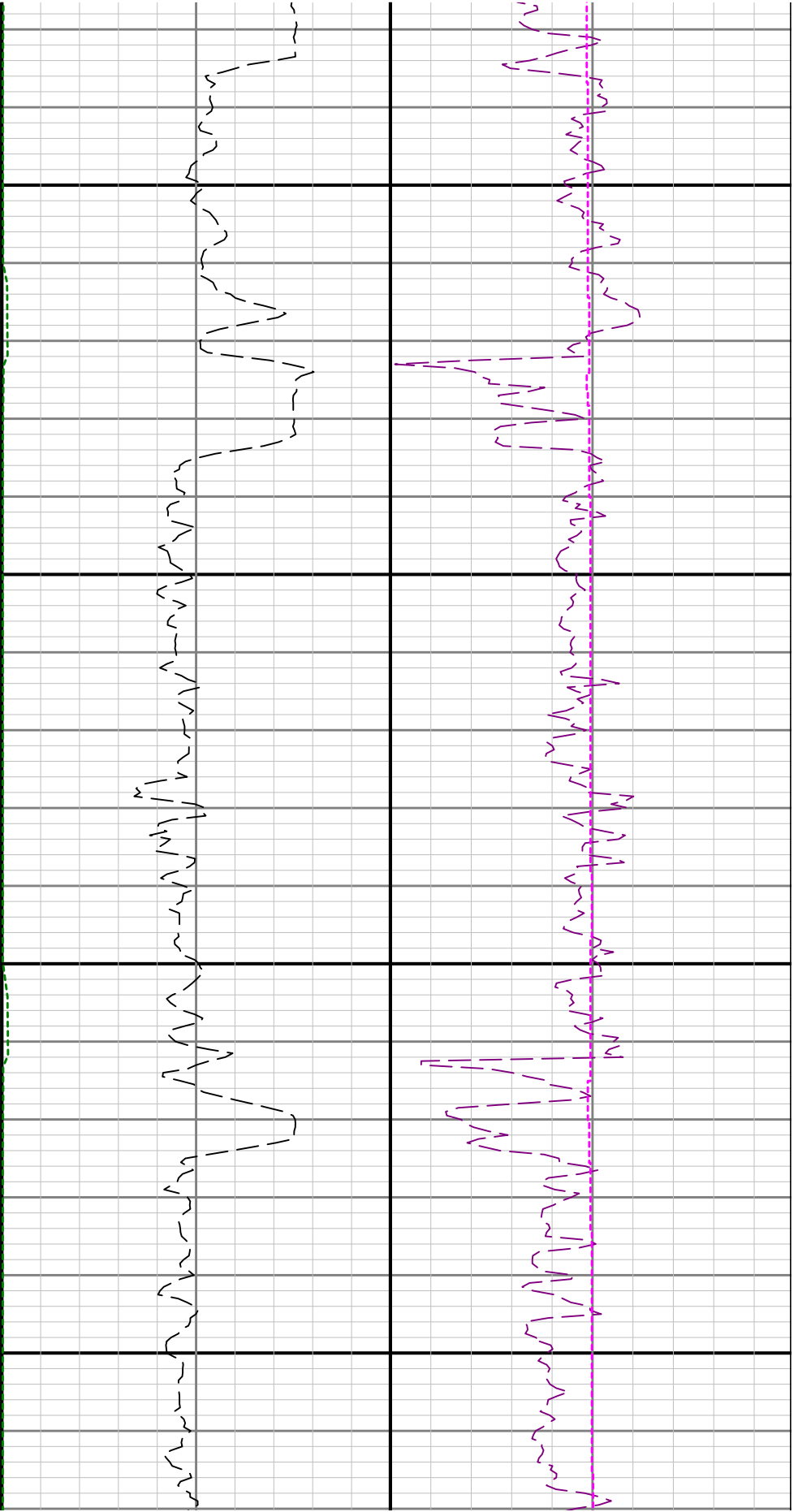


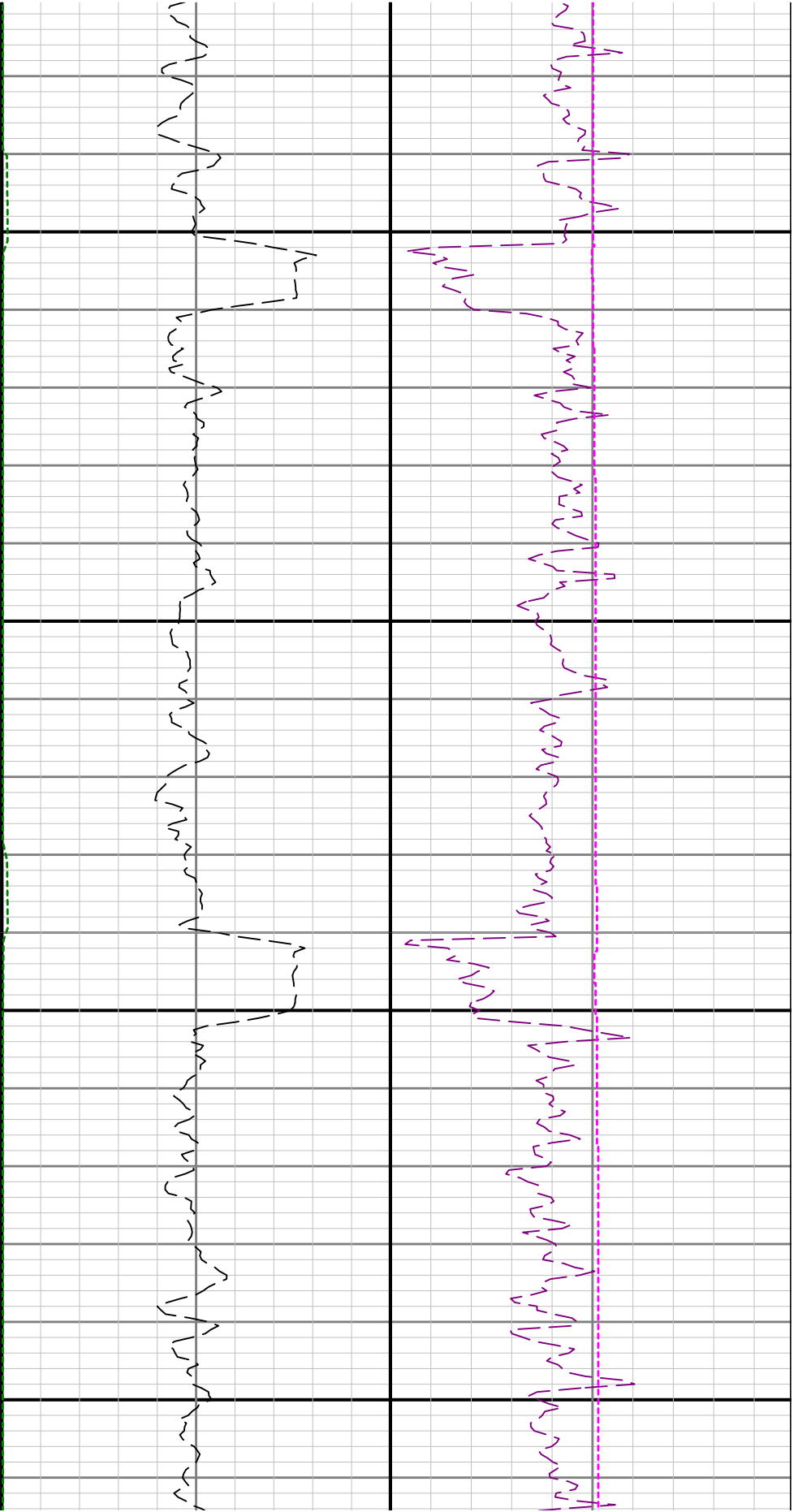




4100

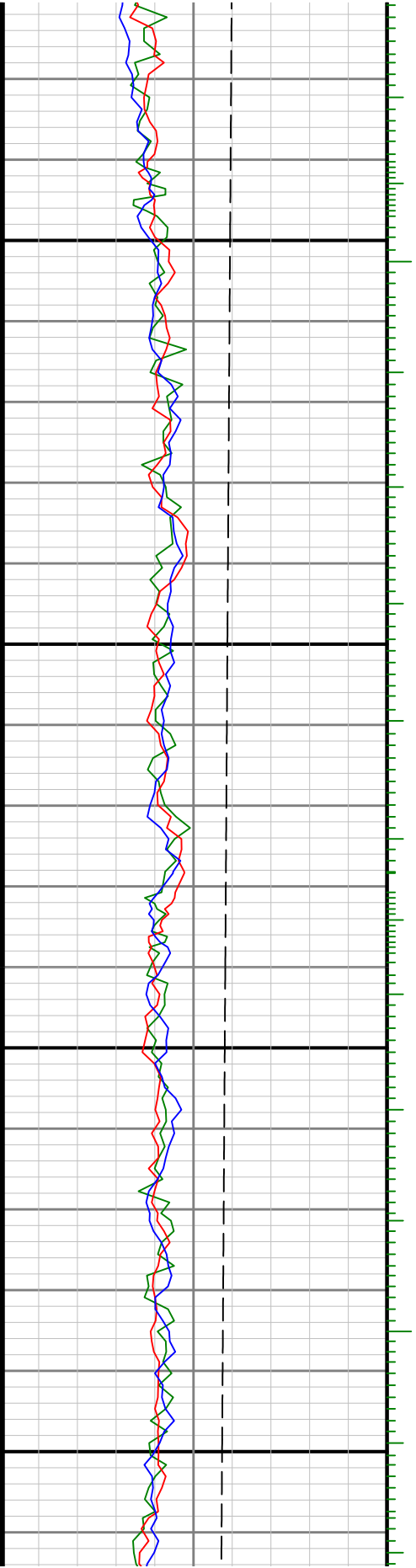
4200

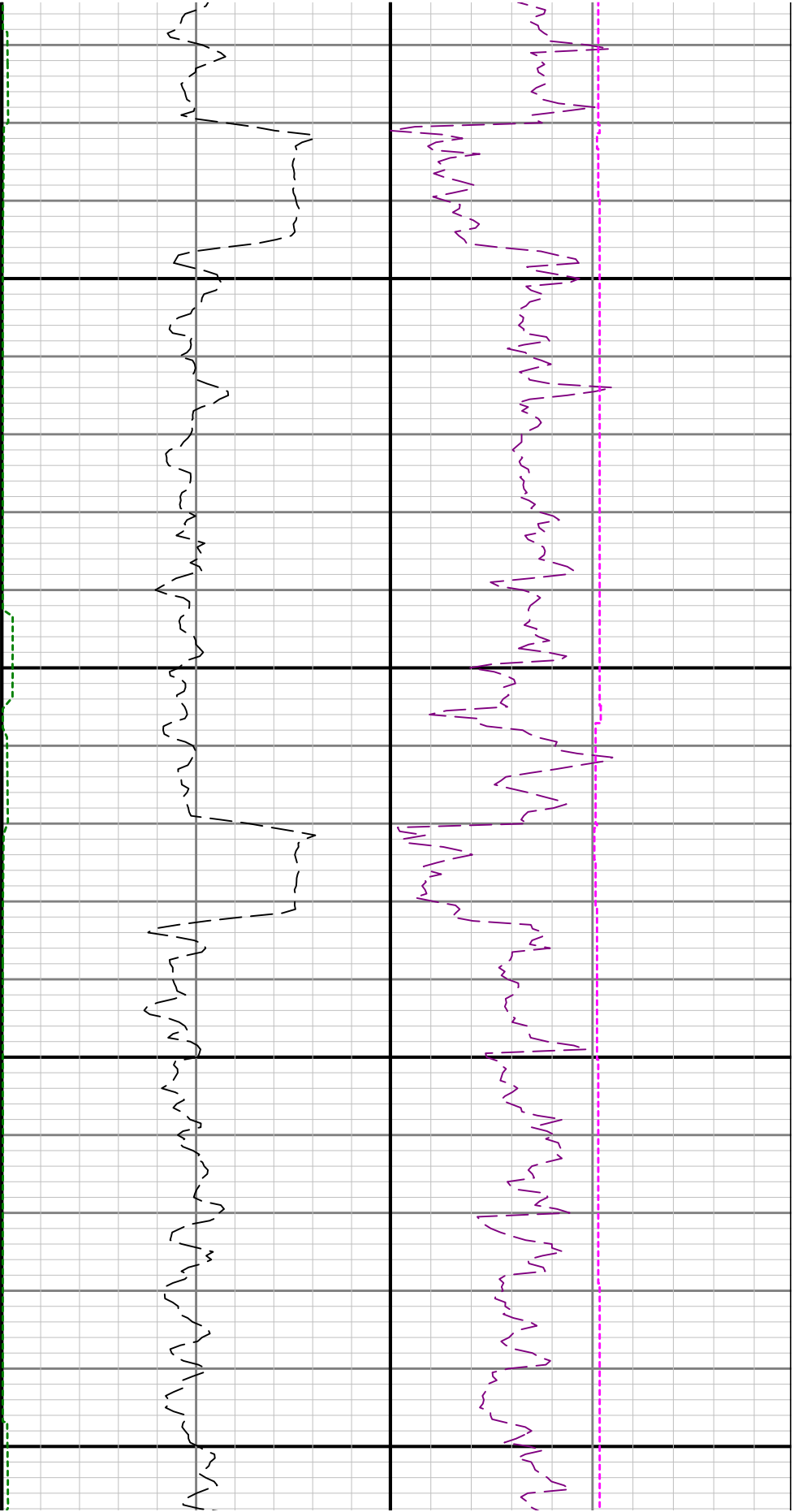




4500

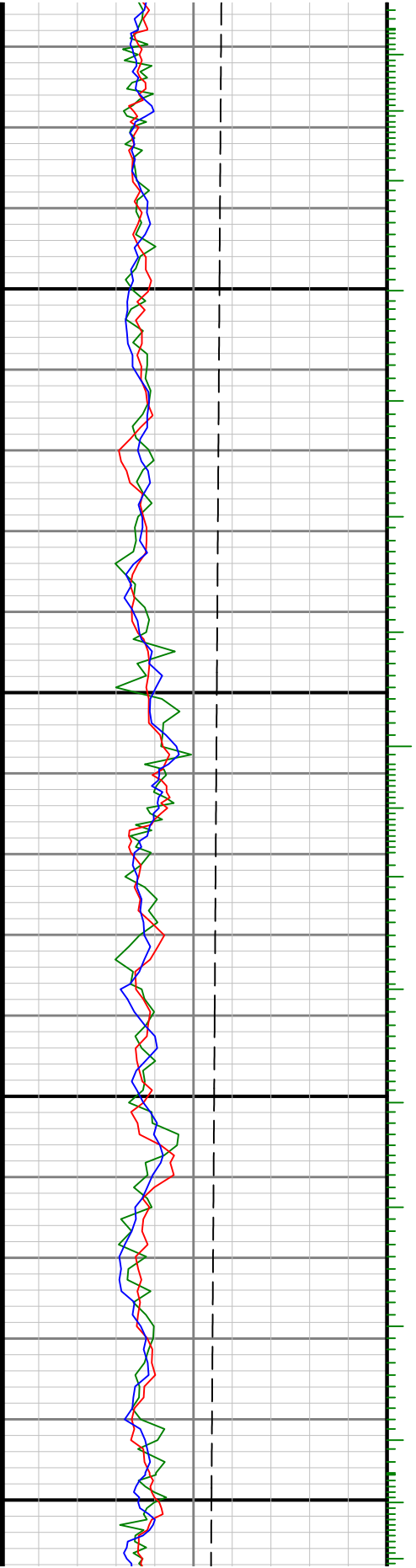
4600

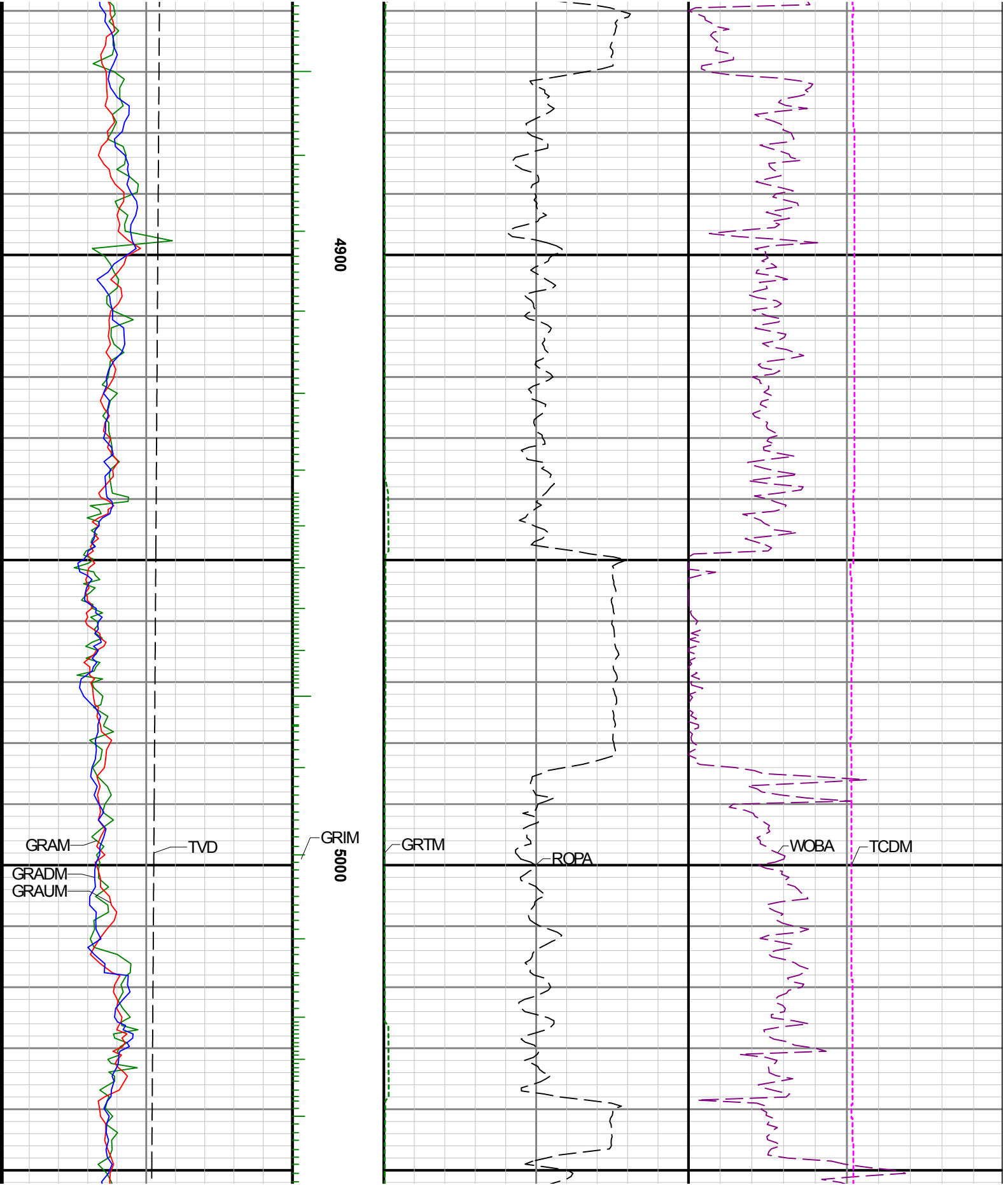


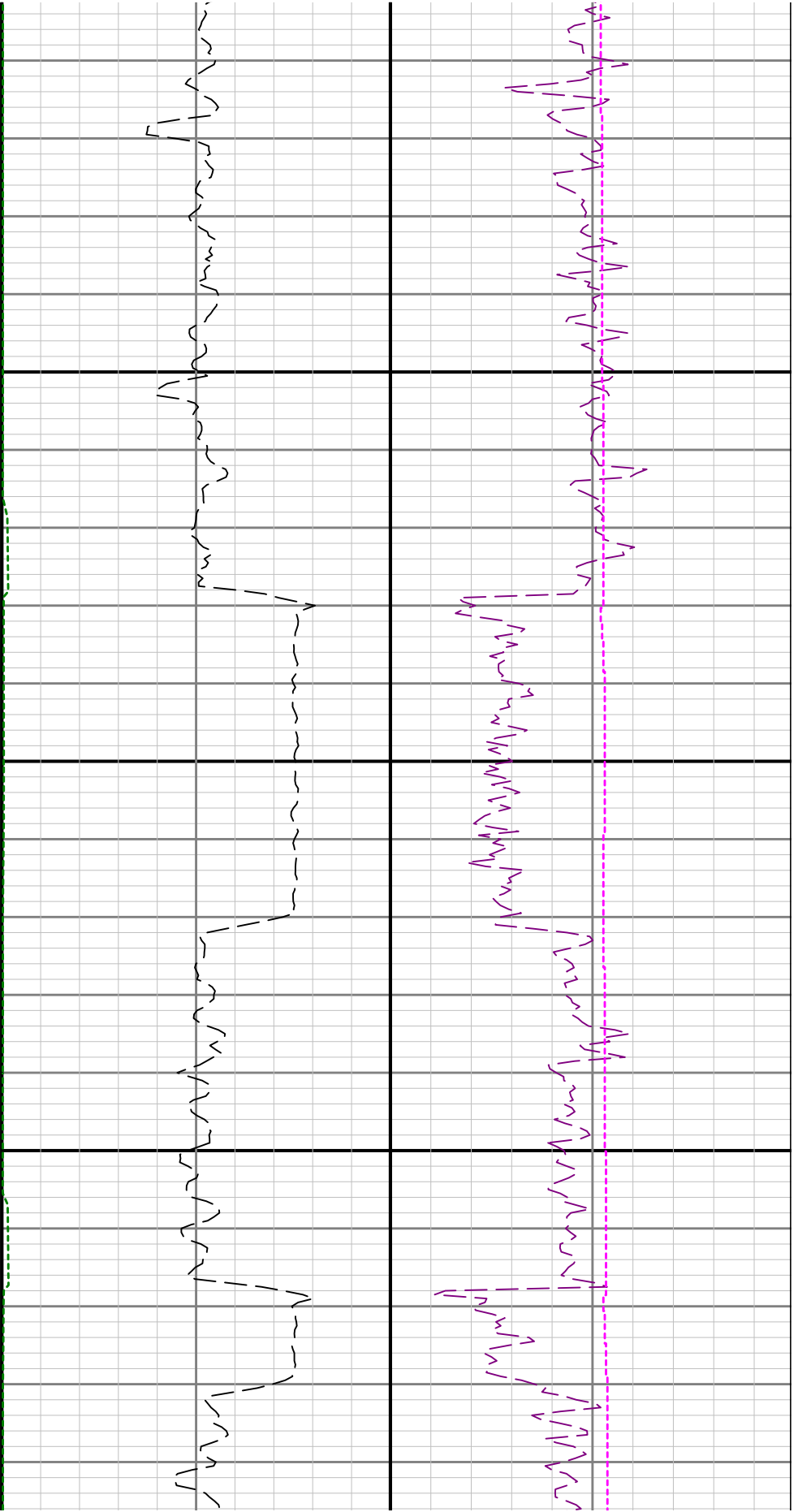


4700

4800

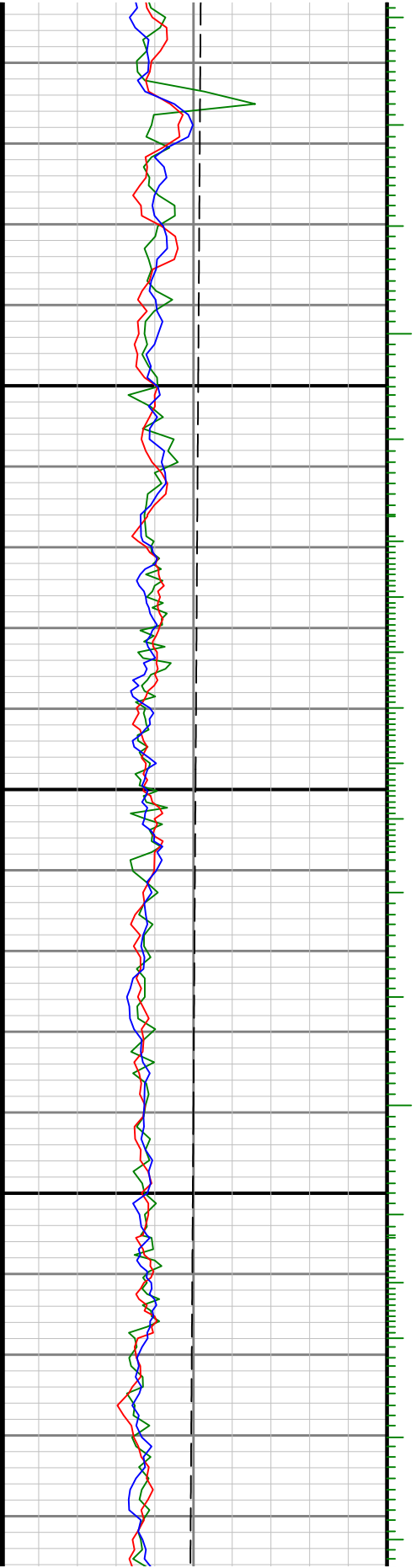


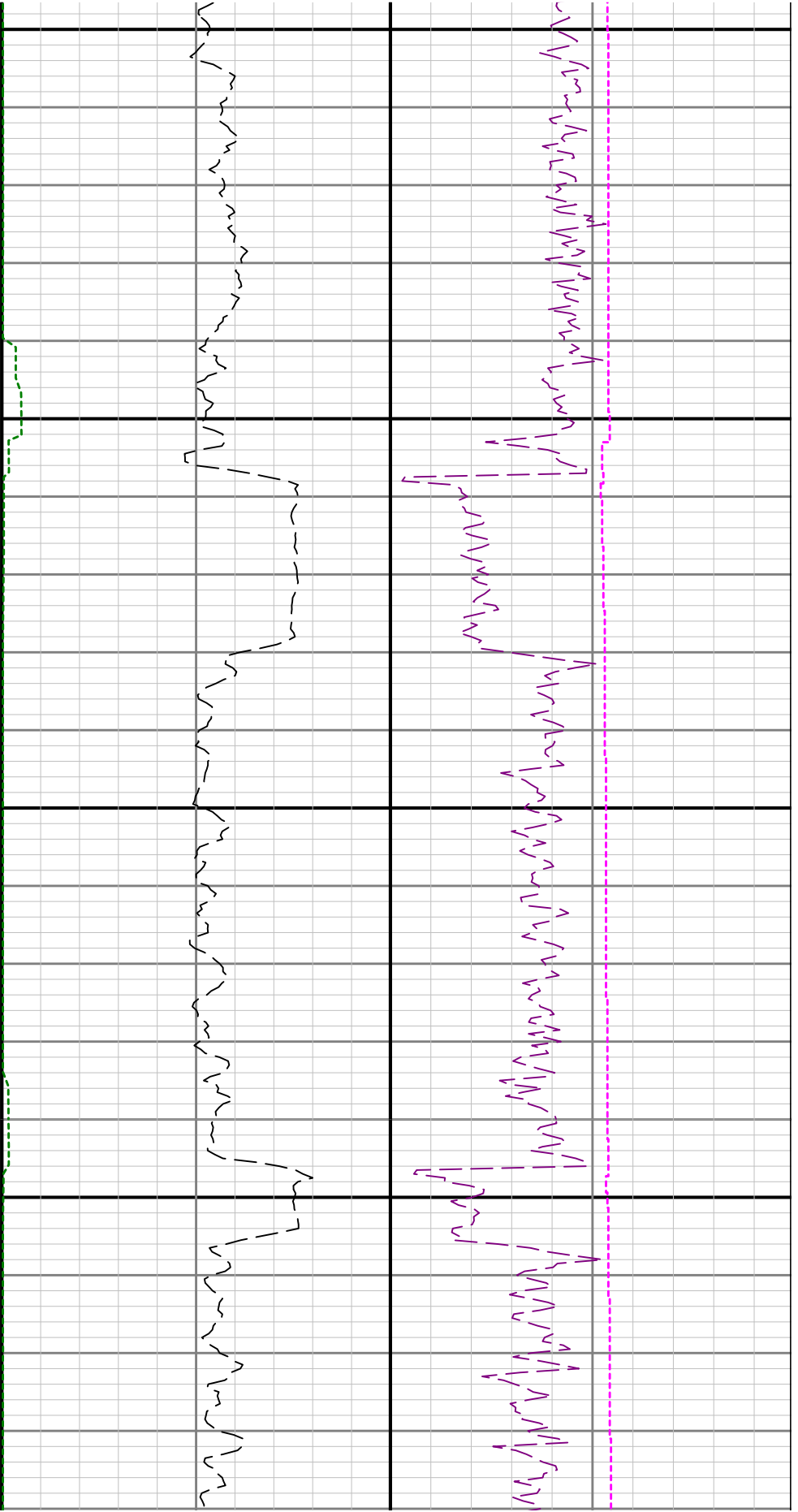




5100

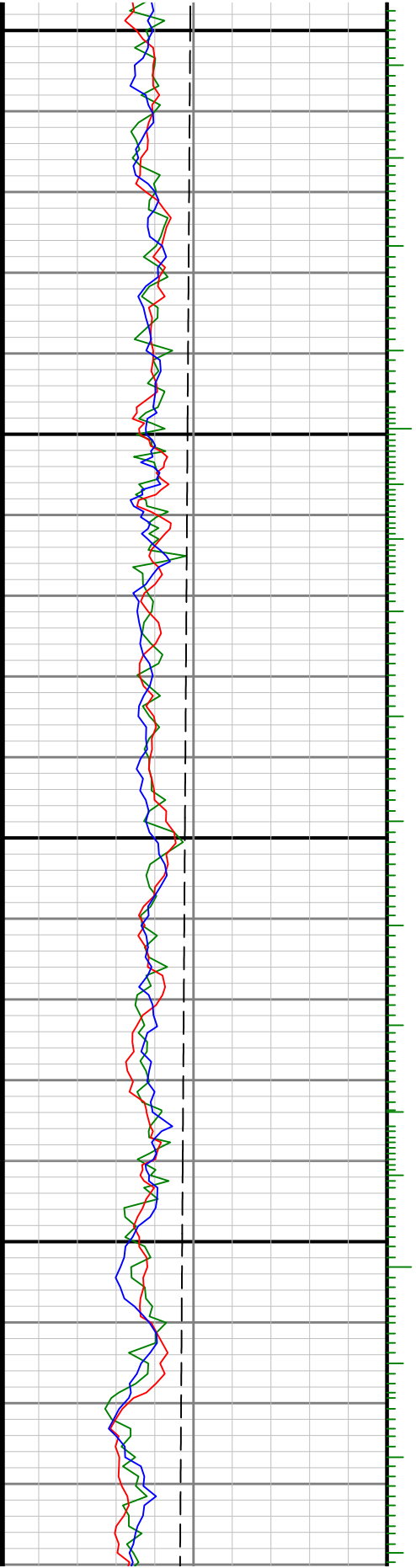
5200

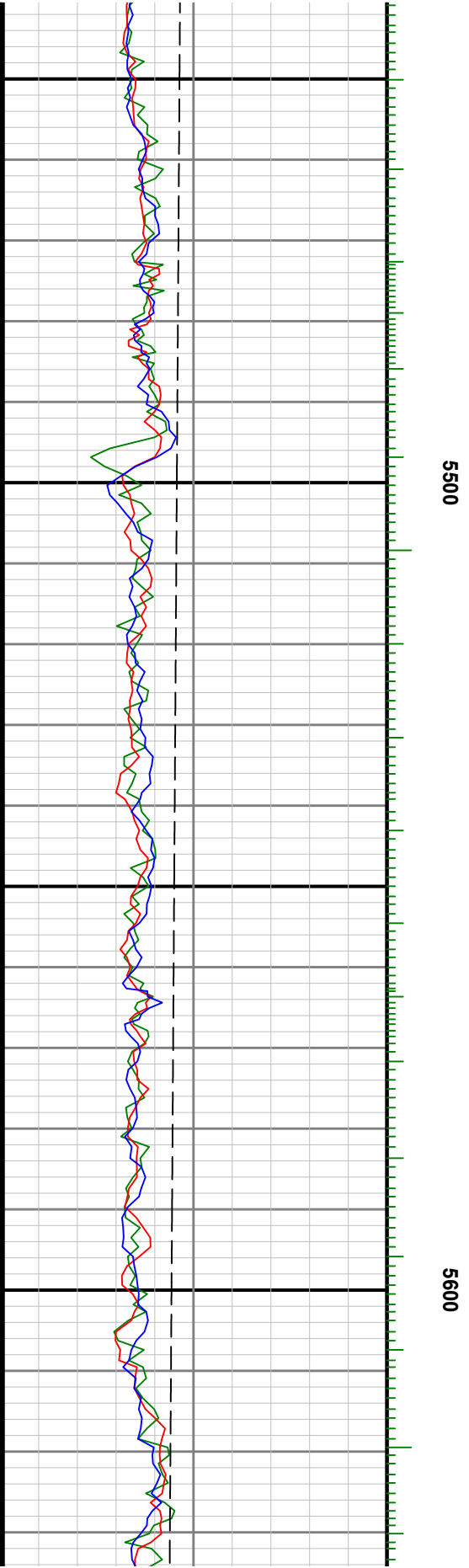
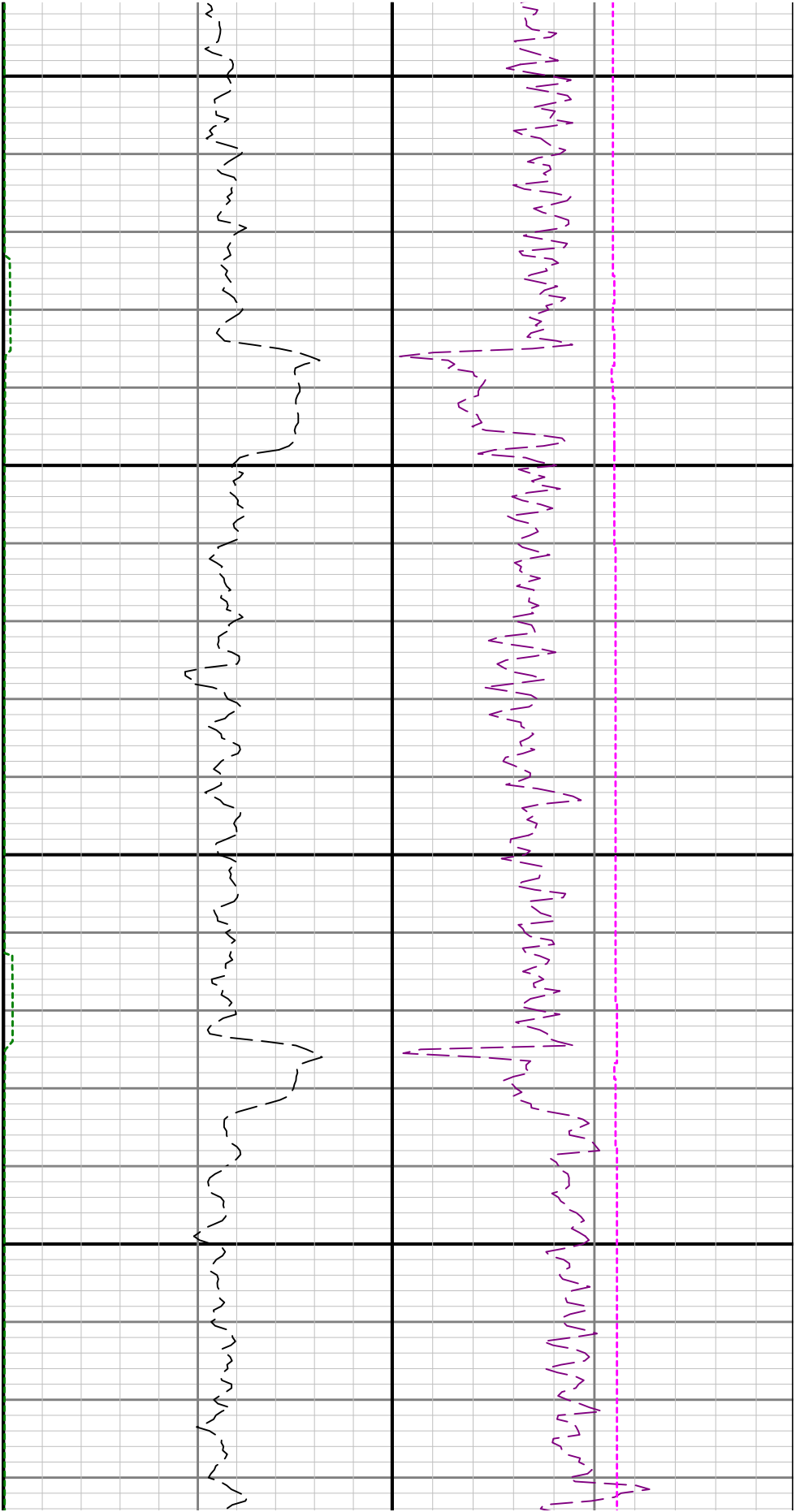


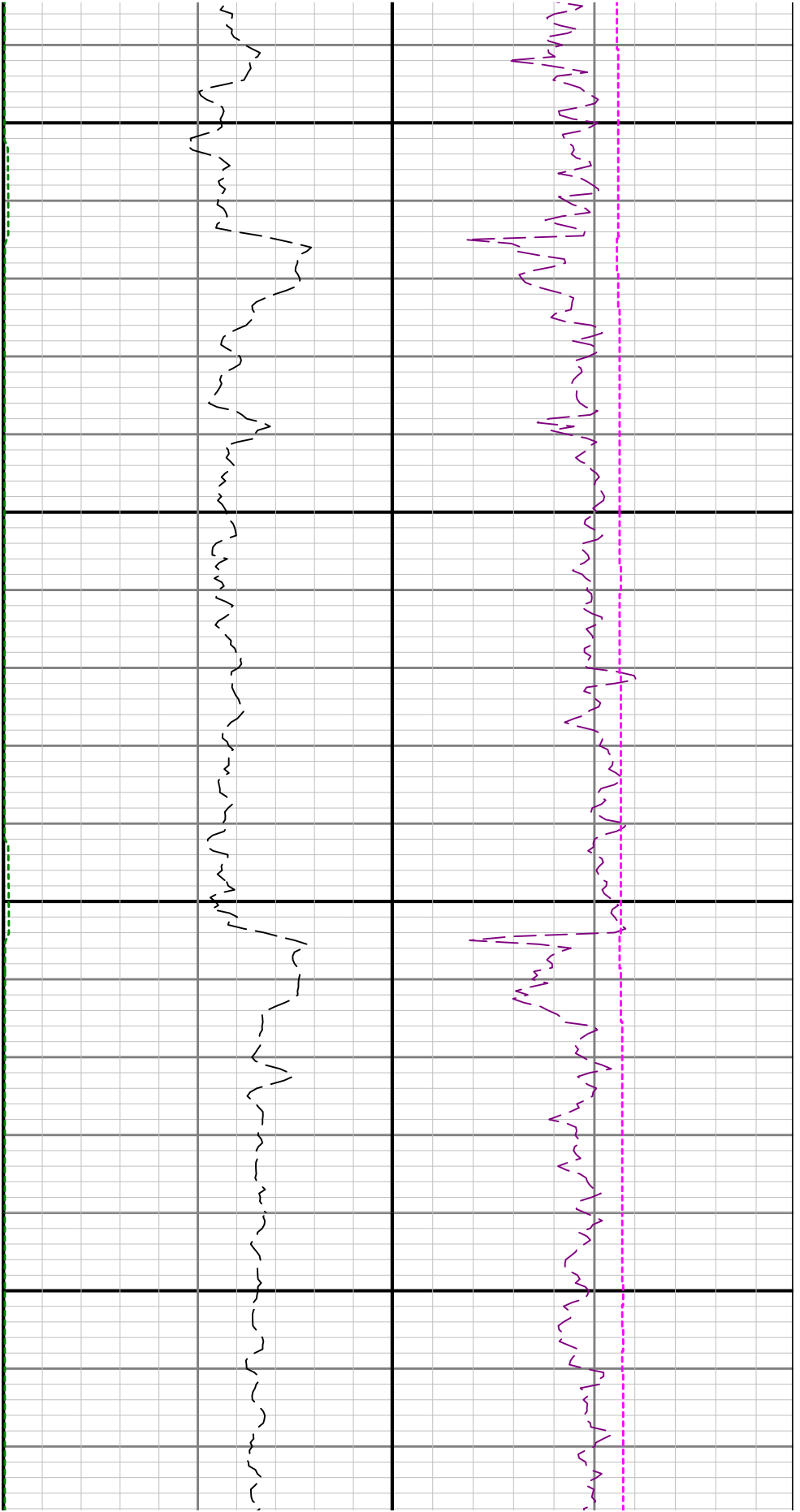


5300

5400

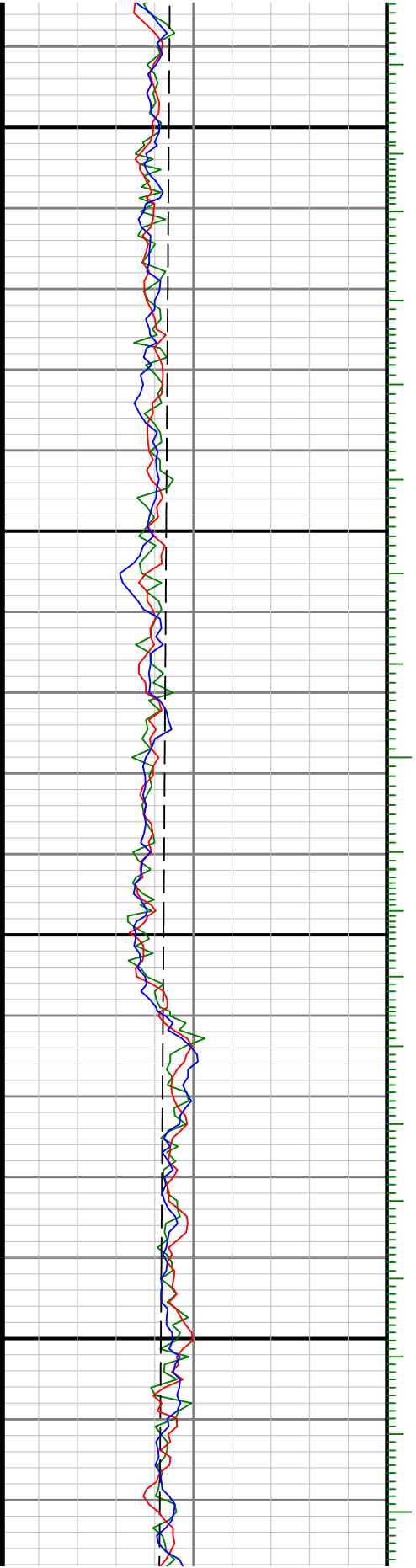


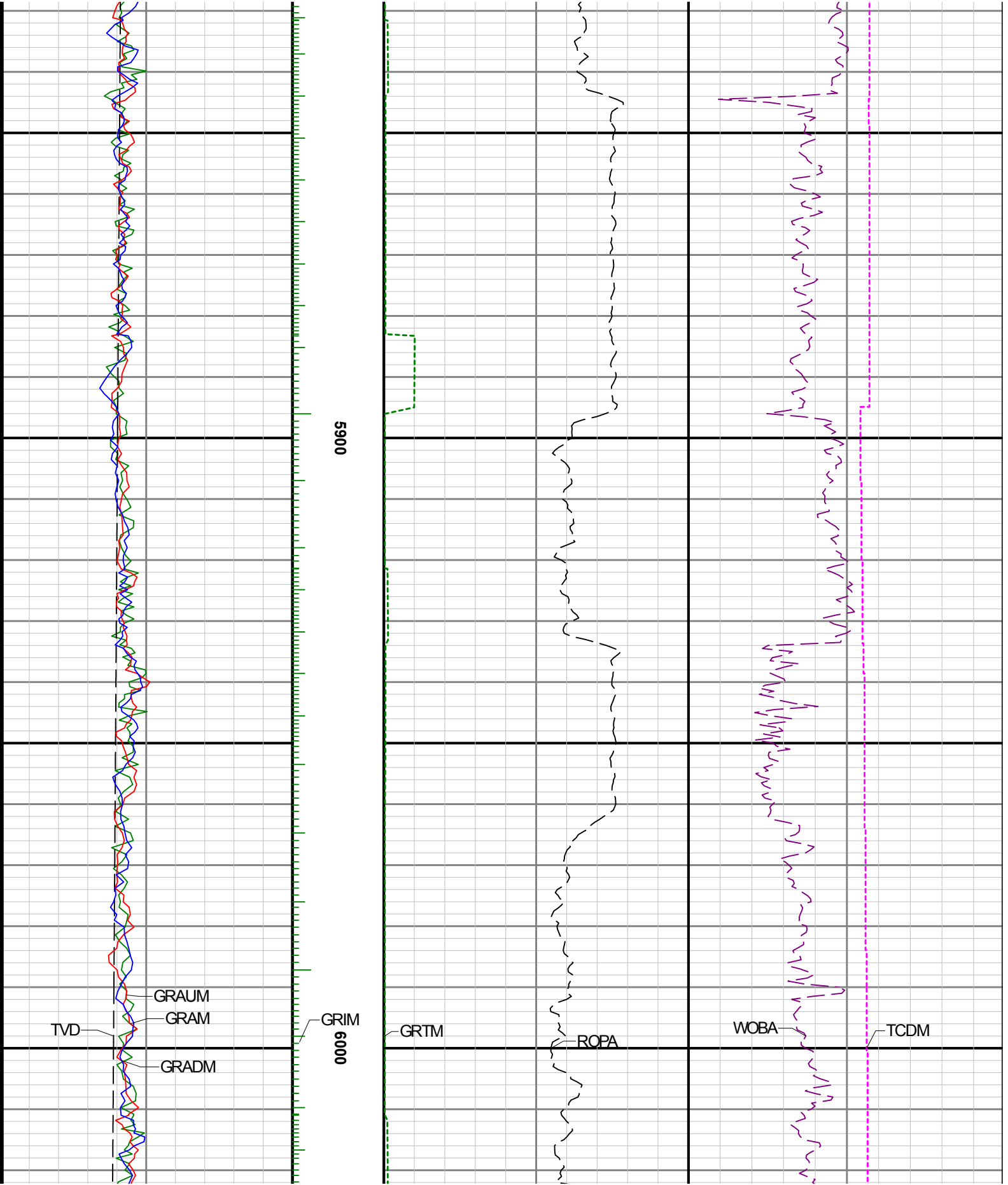


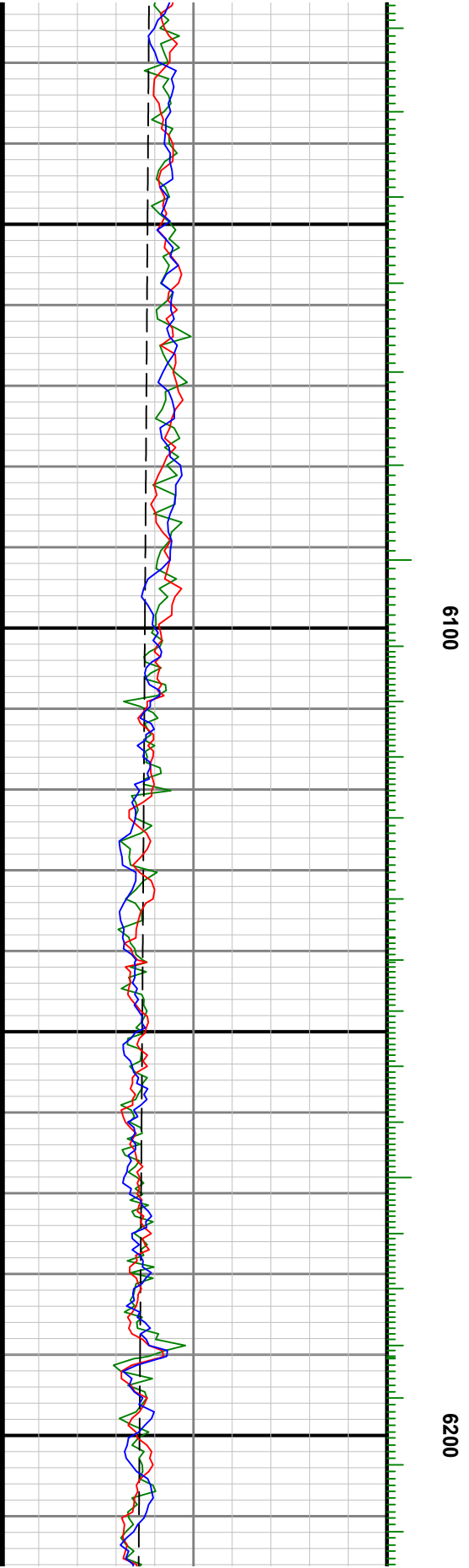
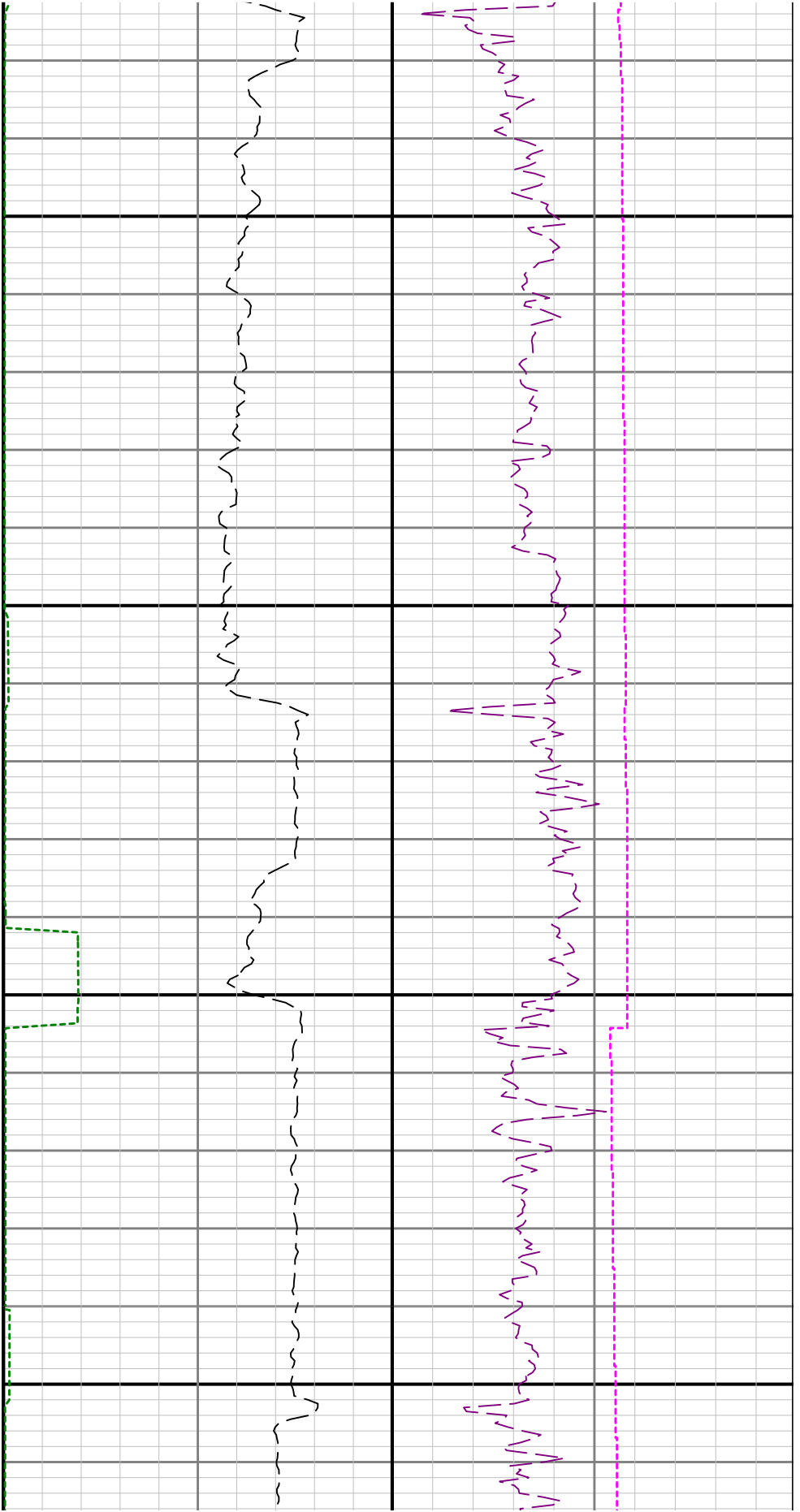


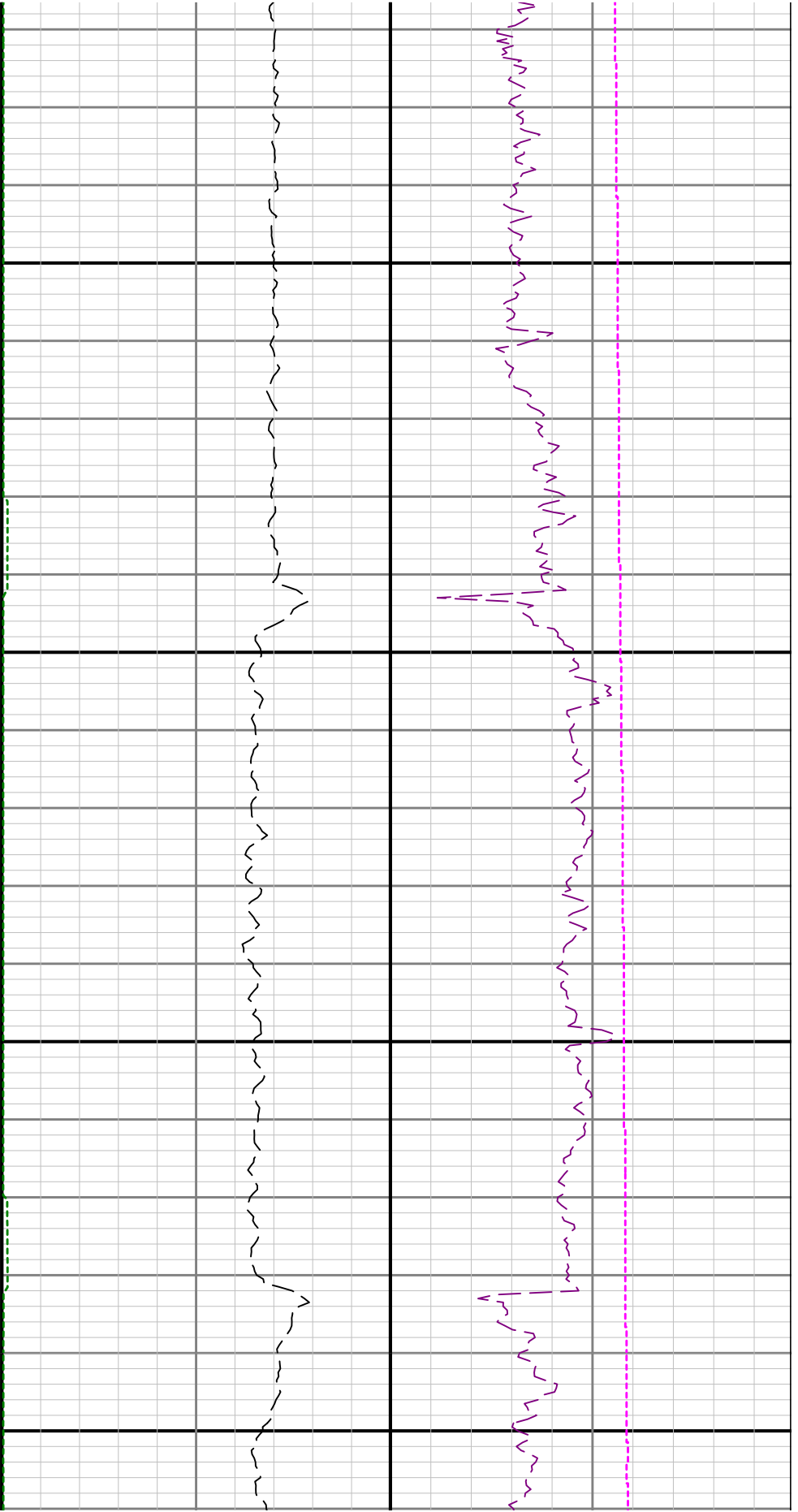
5700

5800



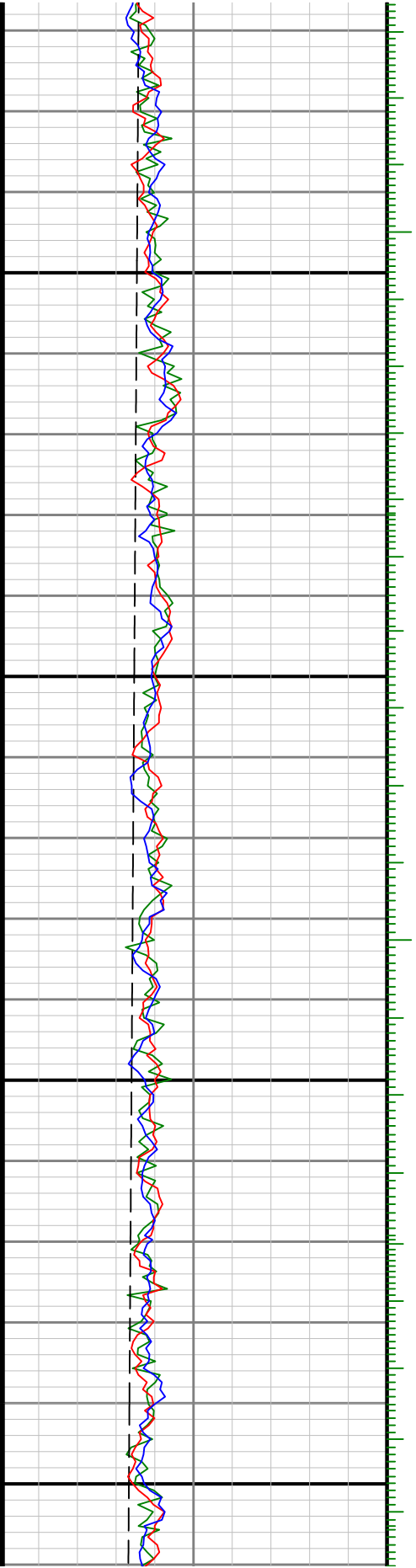


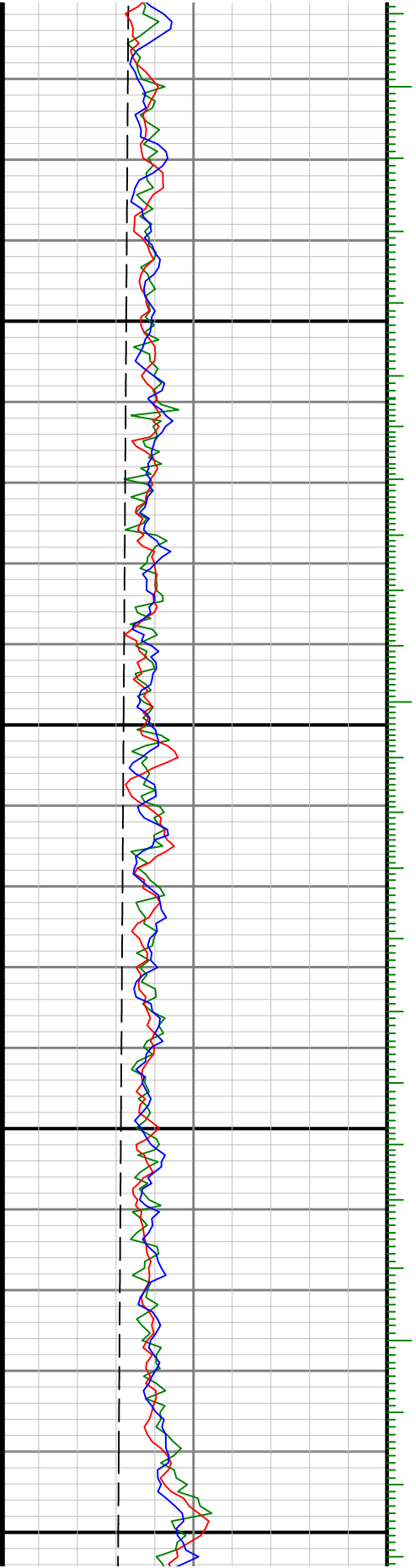




6300

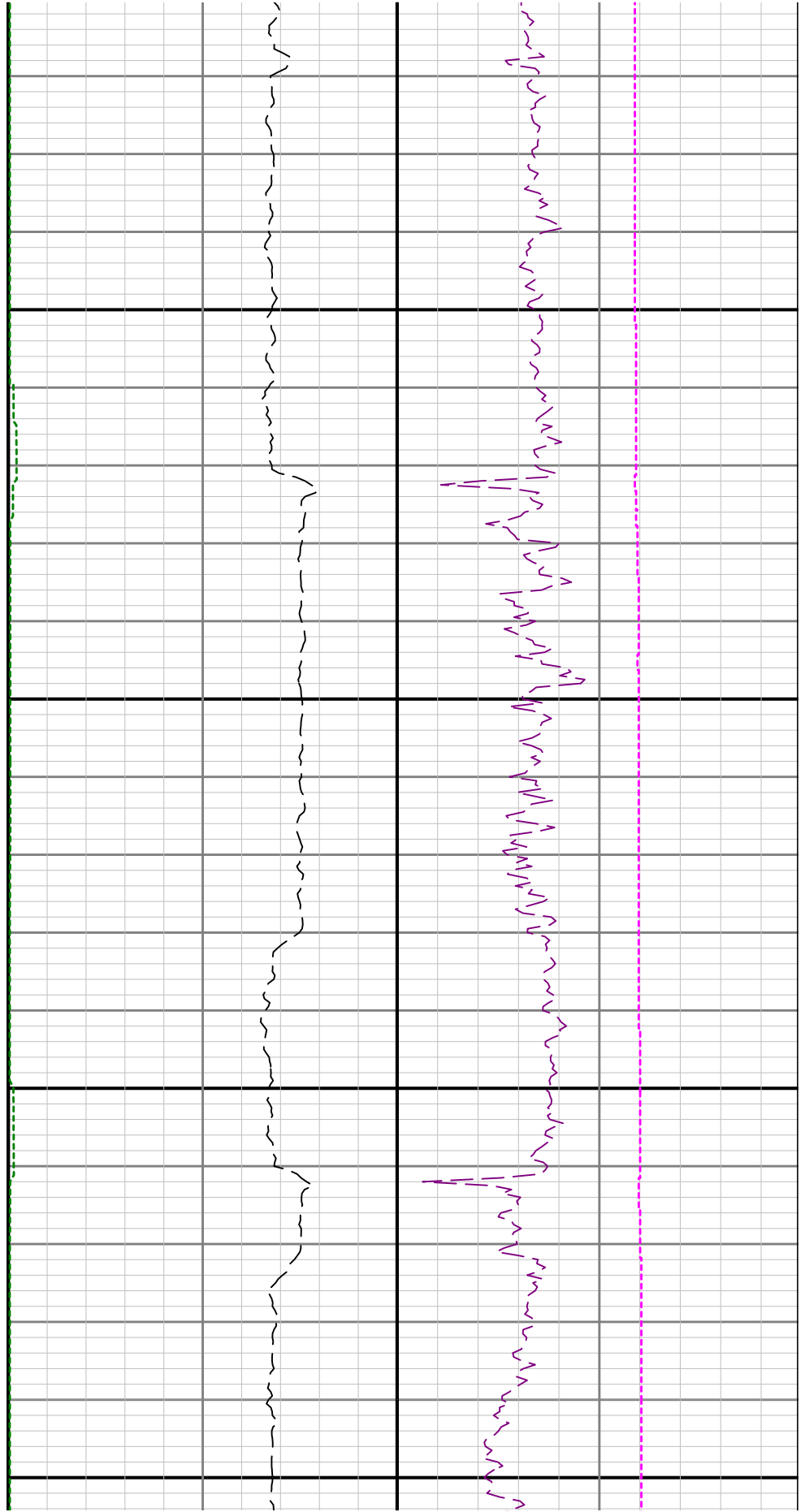
6400

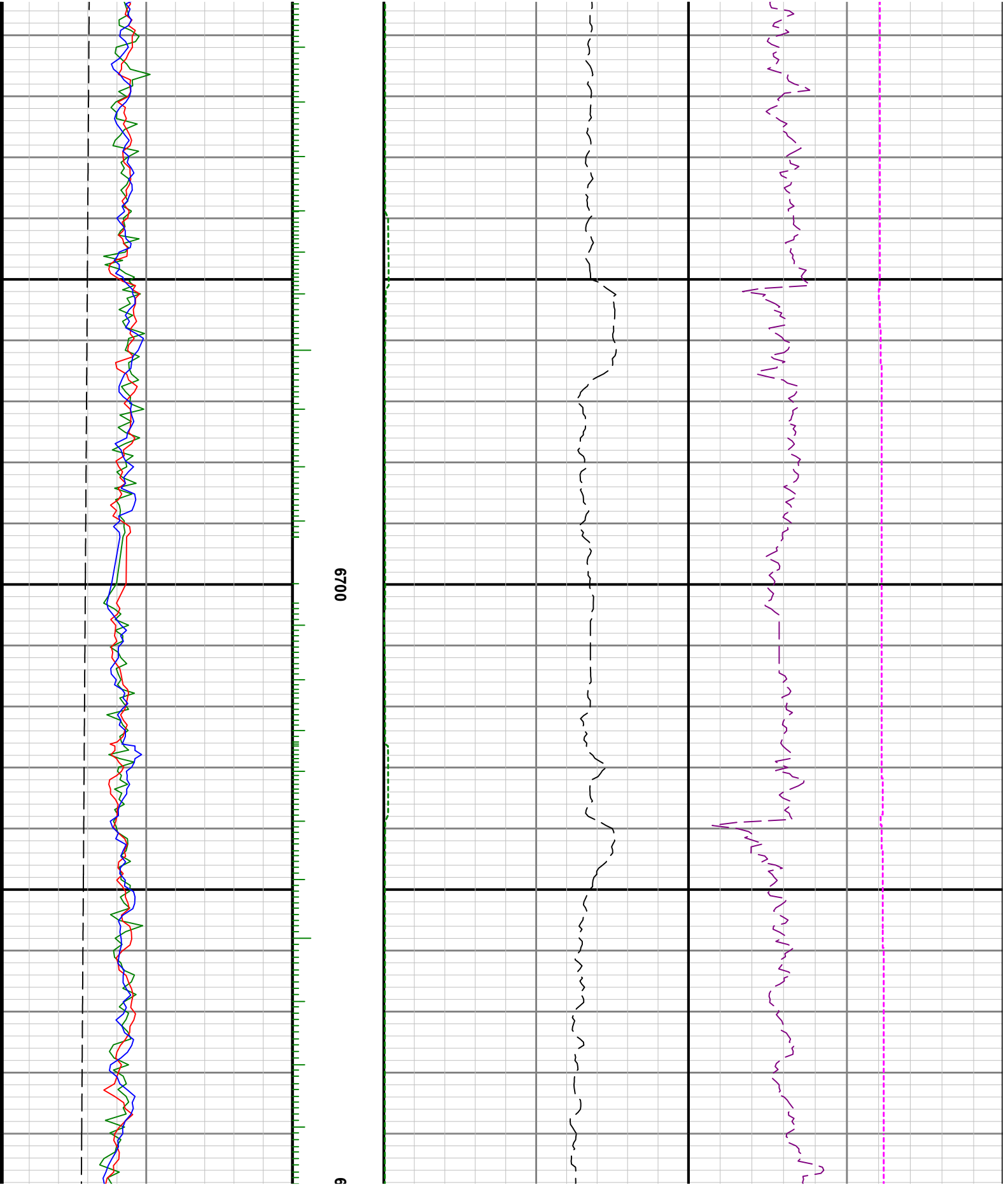


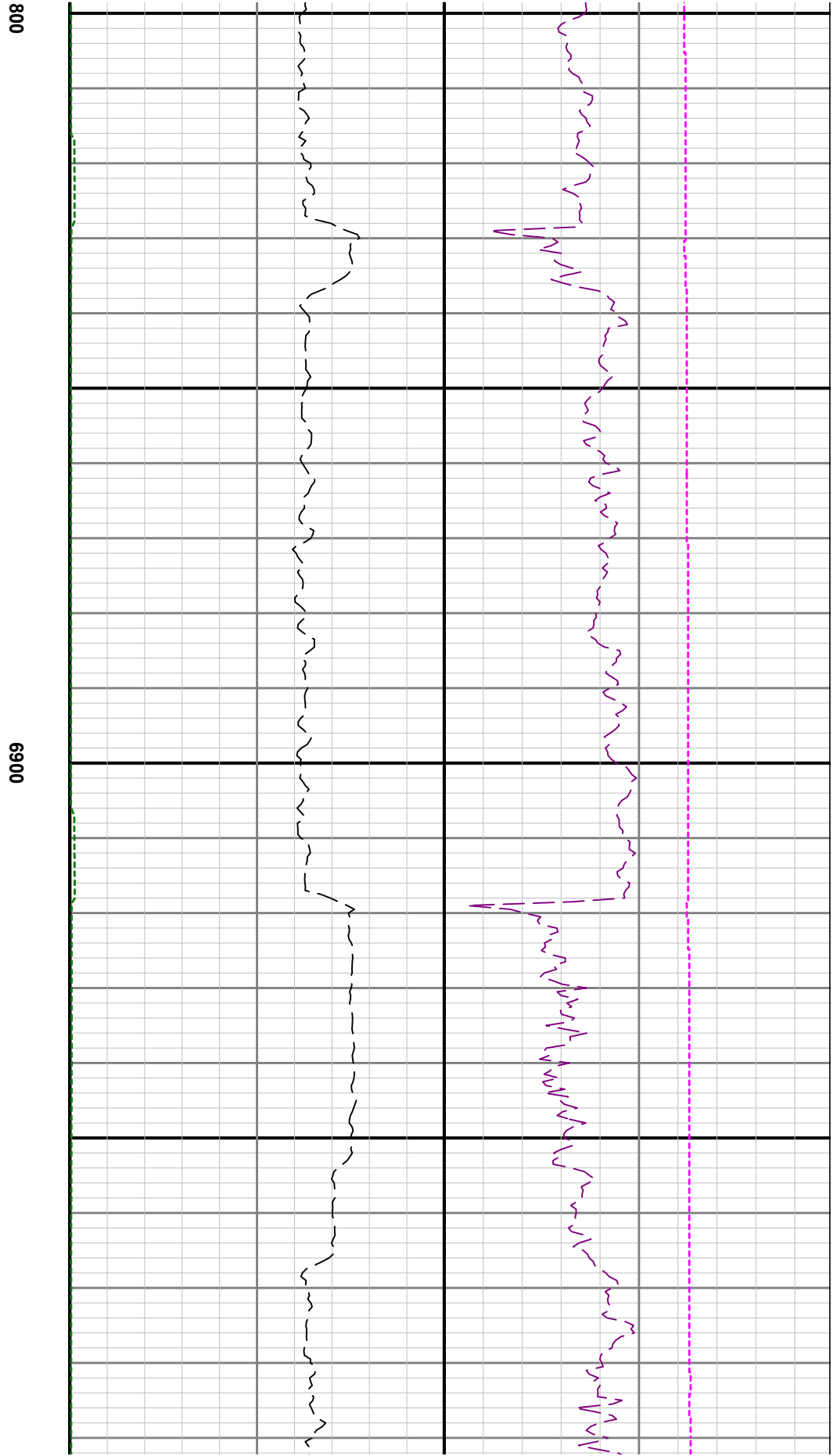
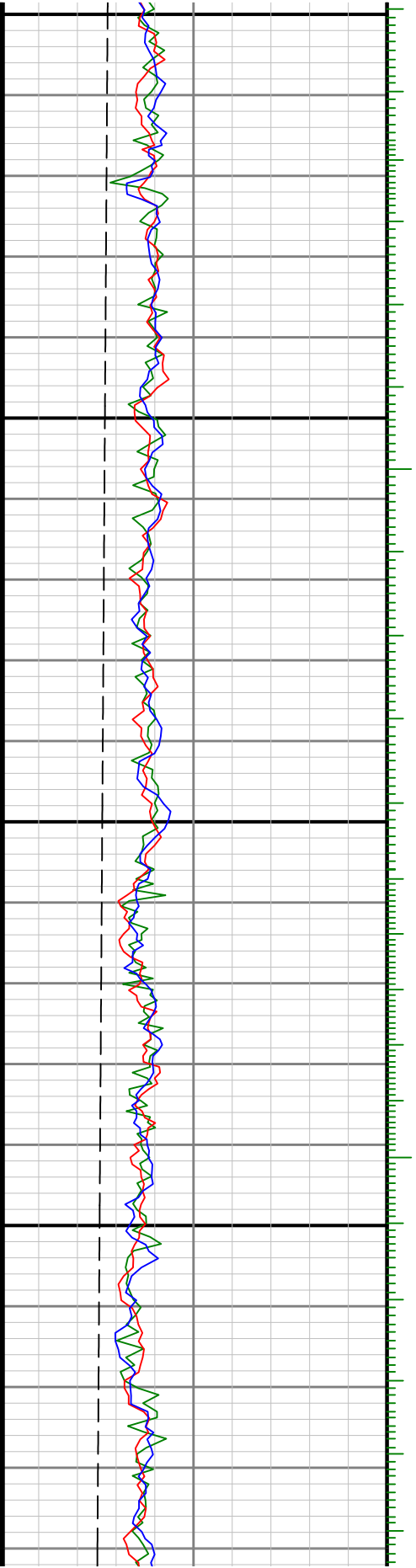


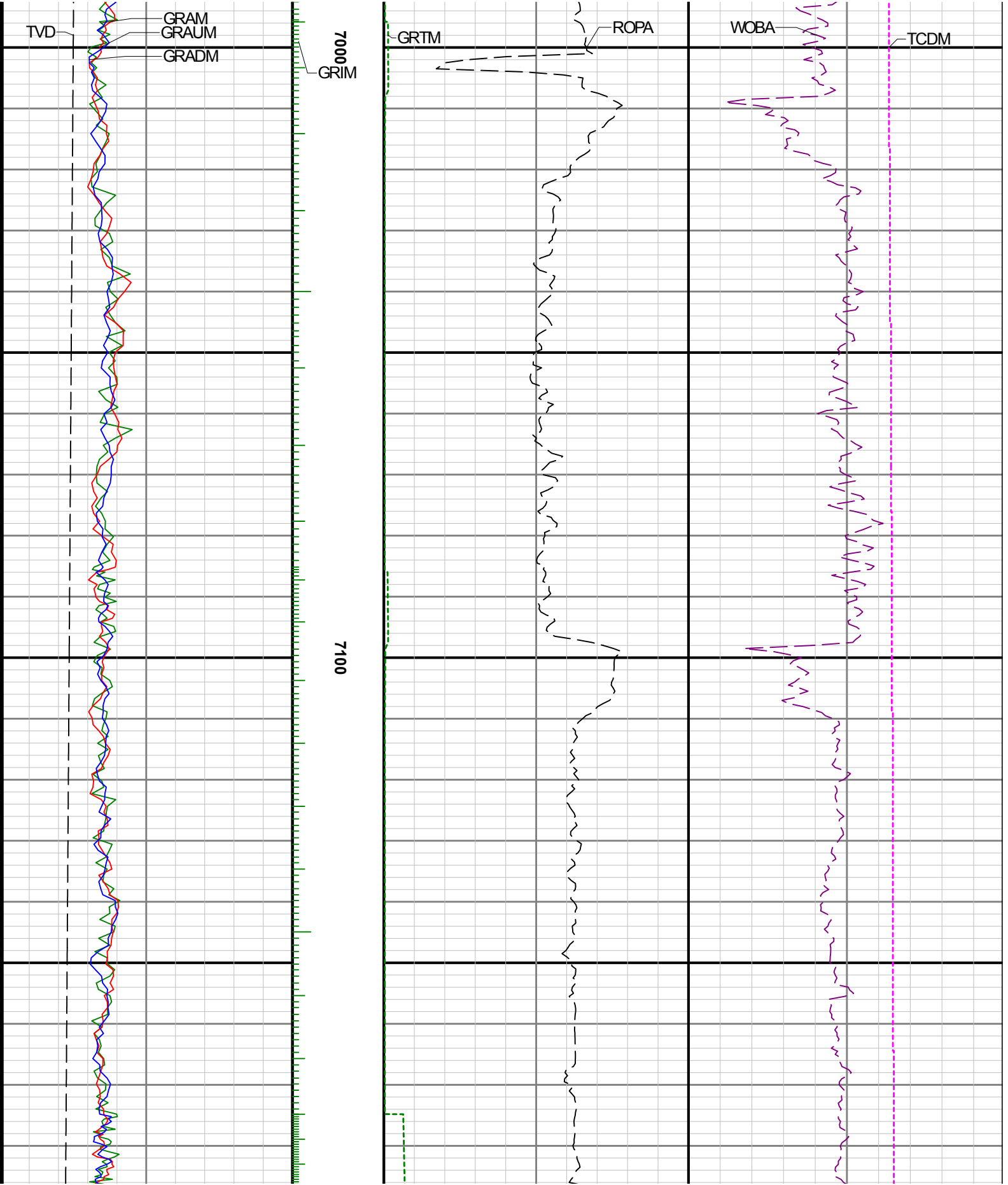
6500

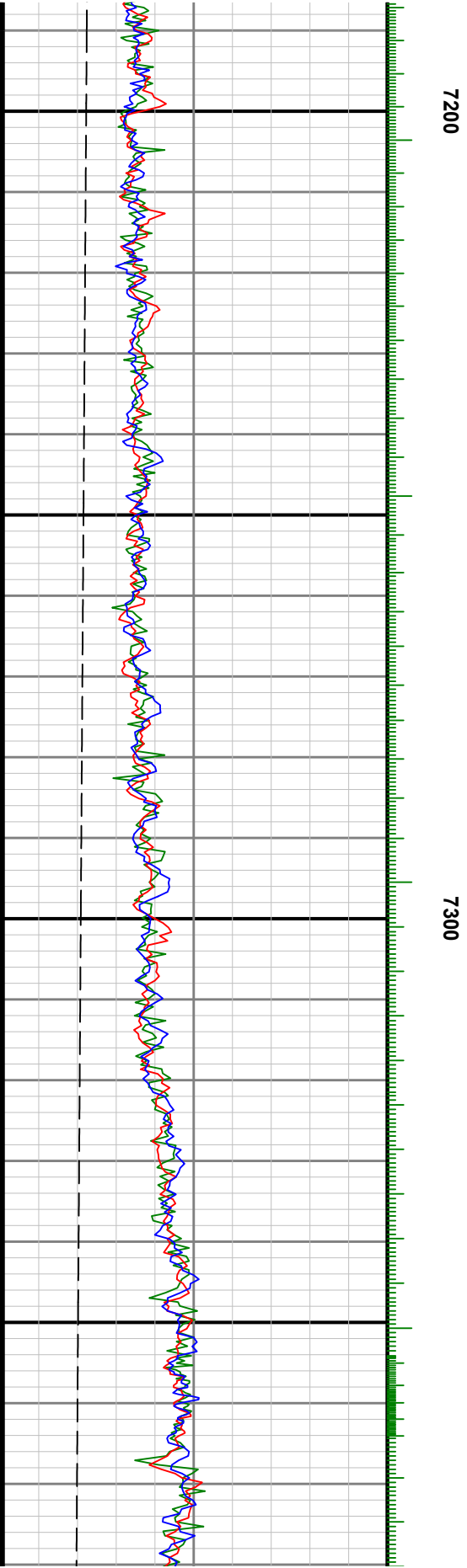
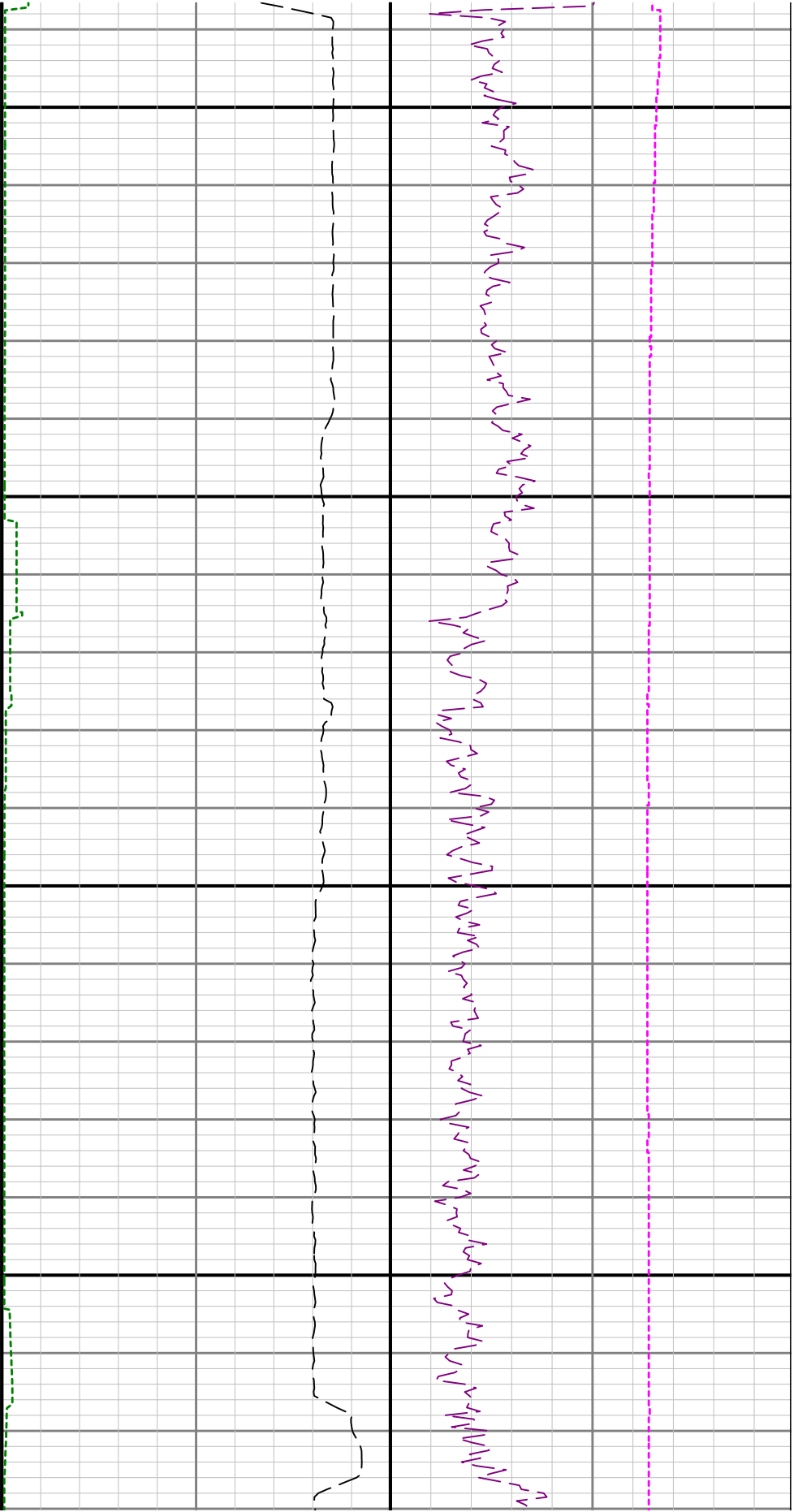
0099

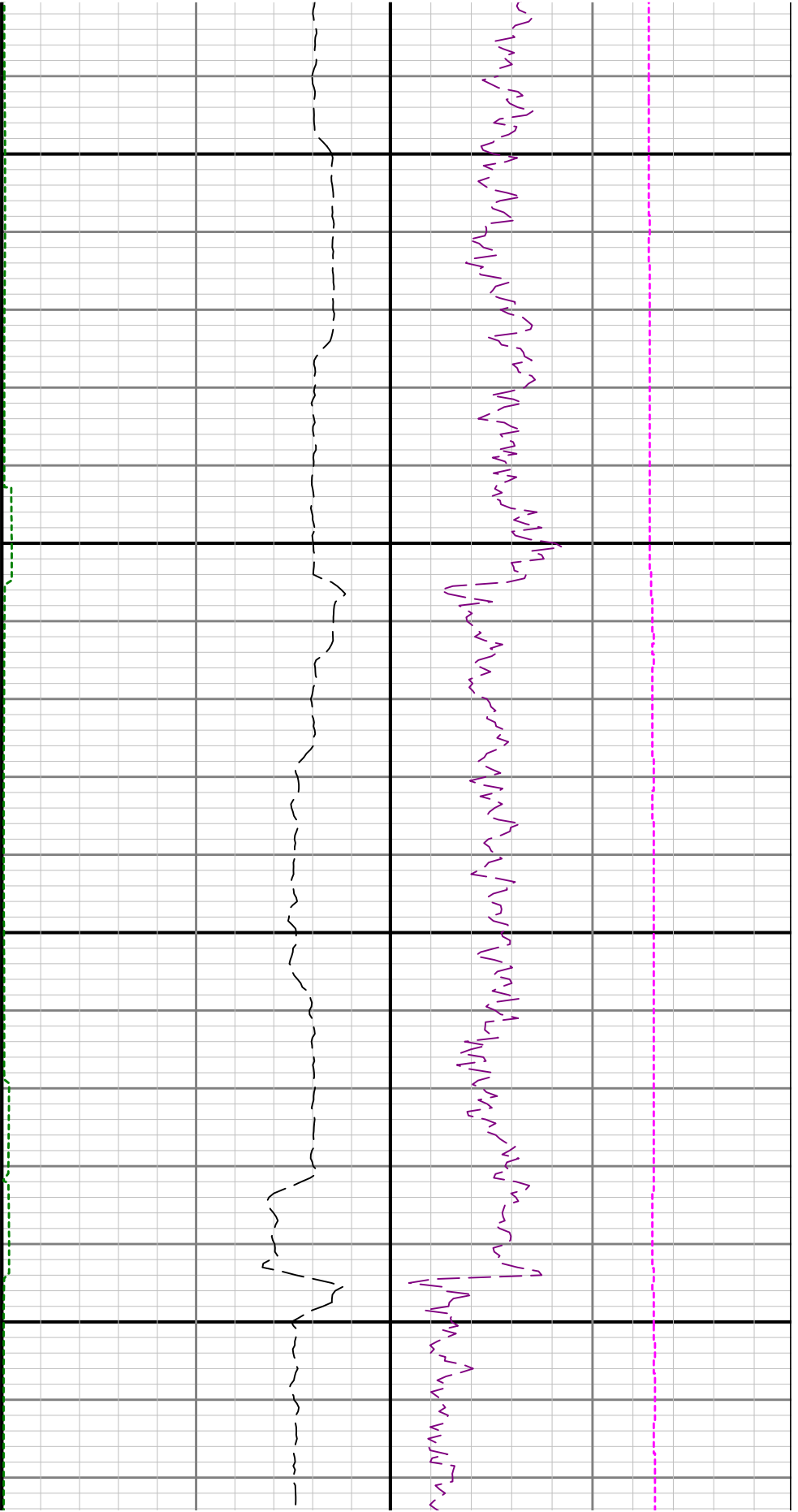






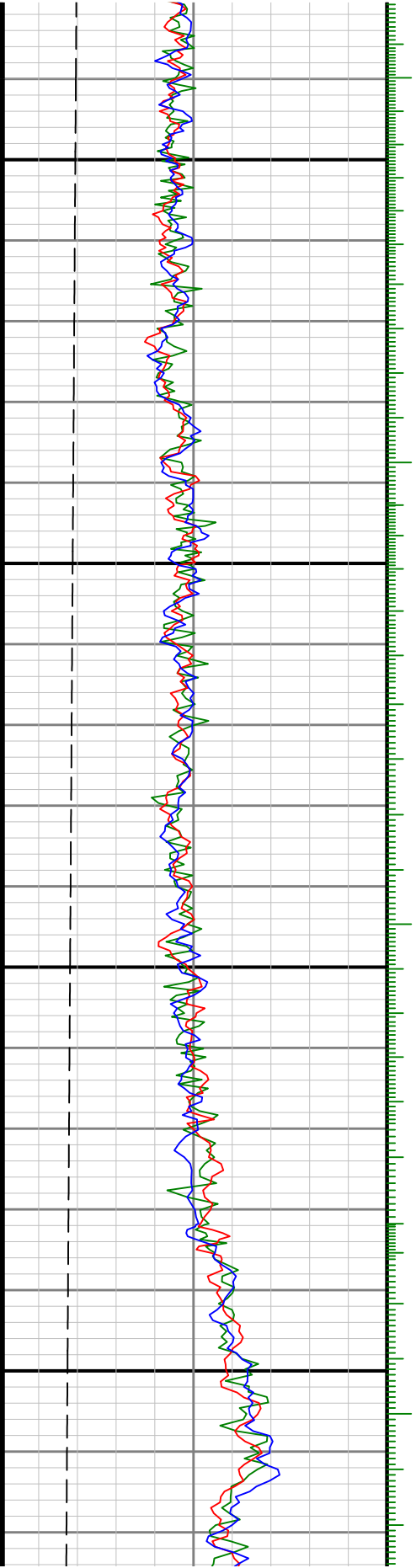


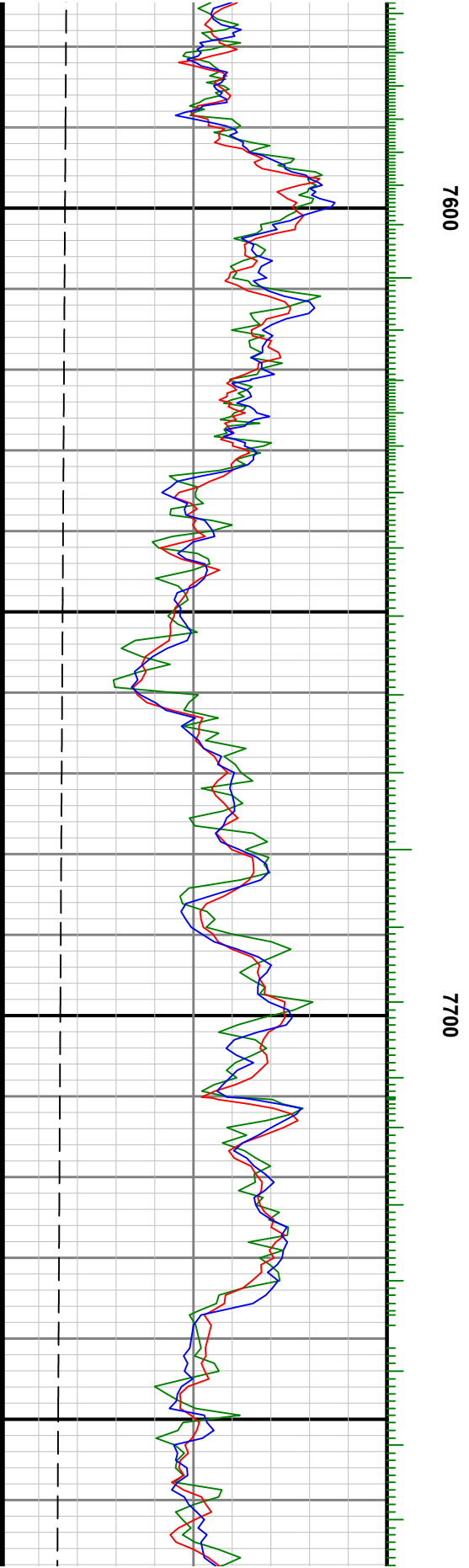
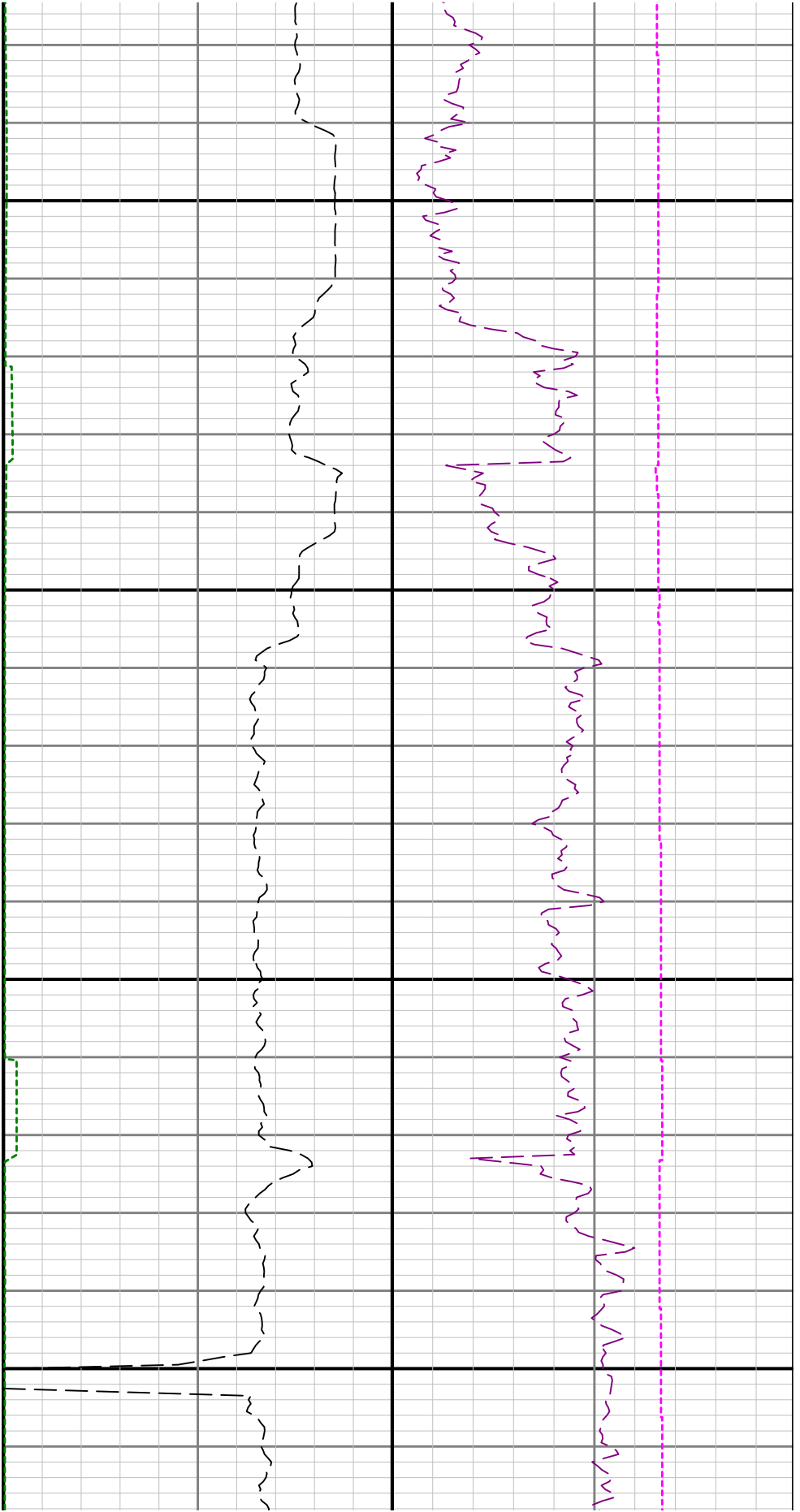


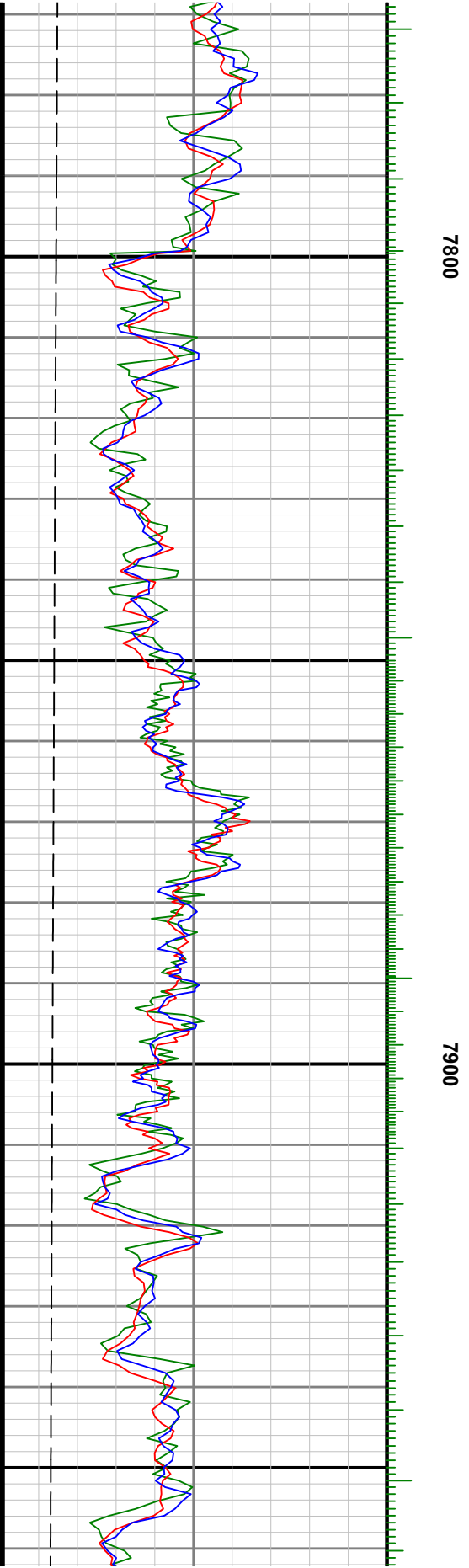
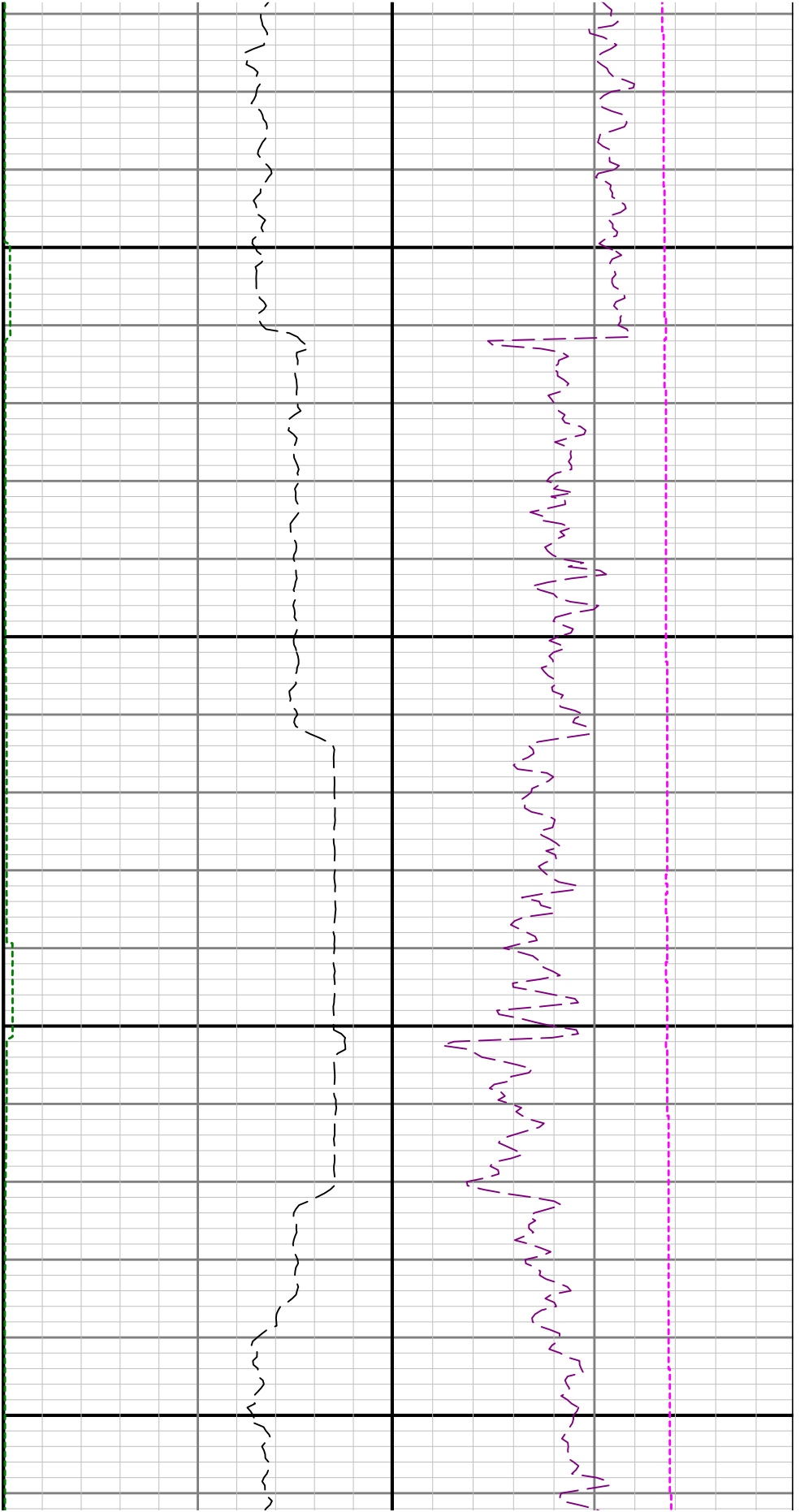


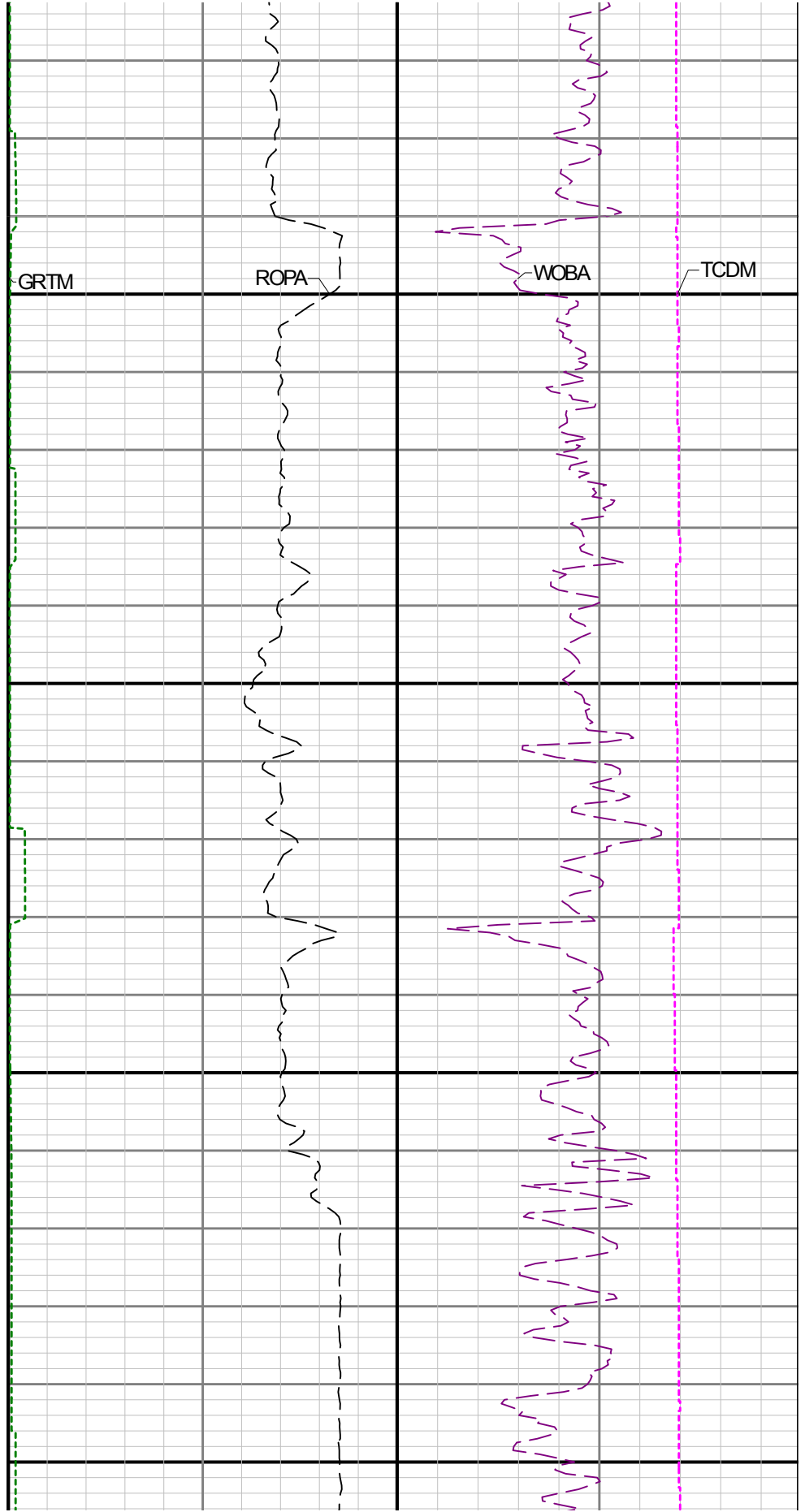
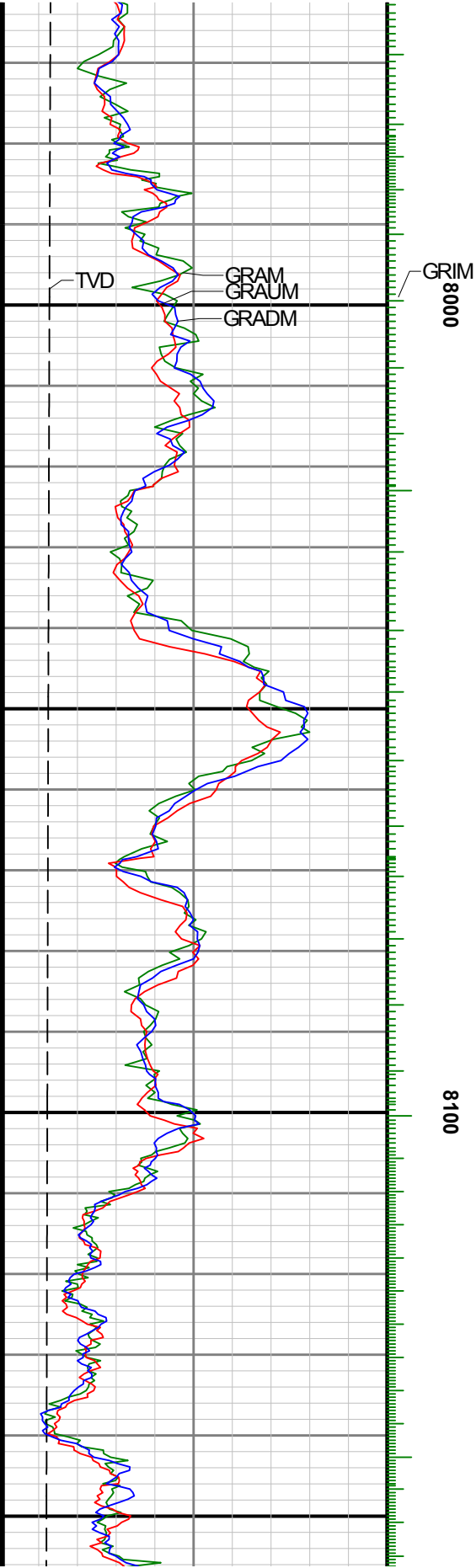
7400

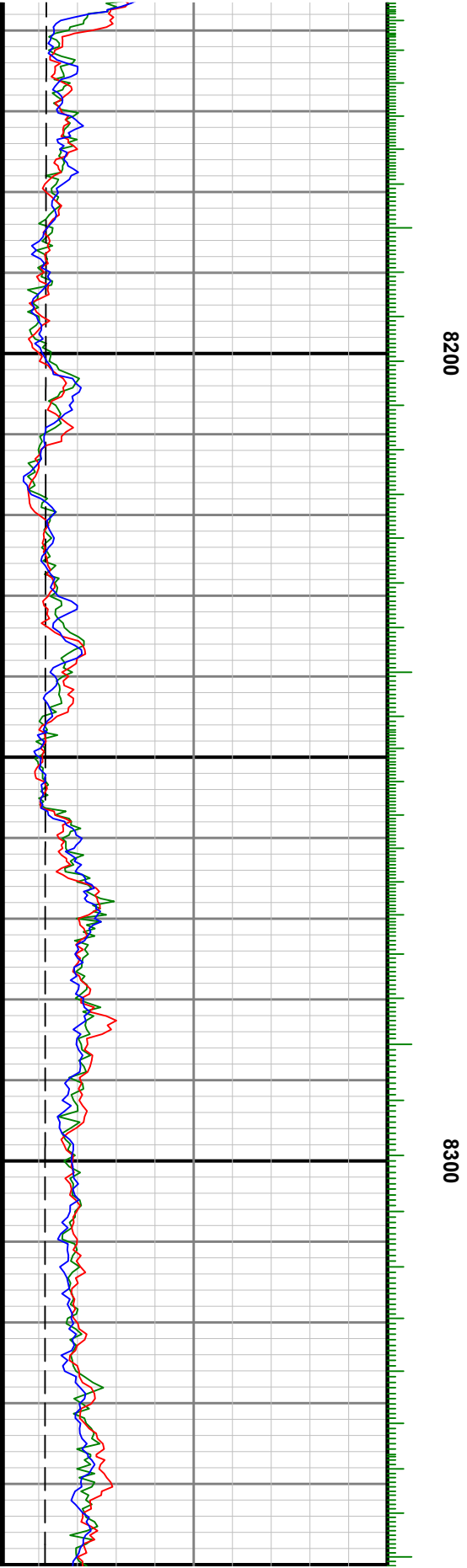
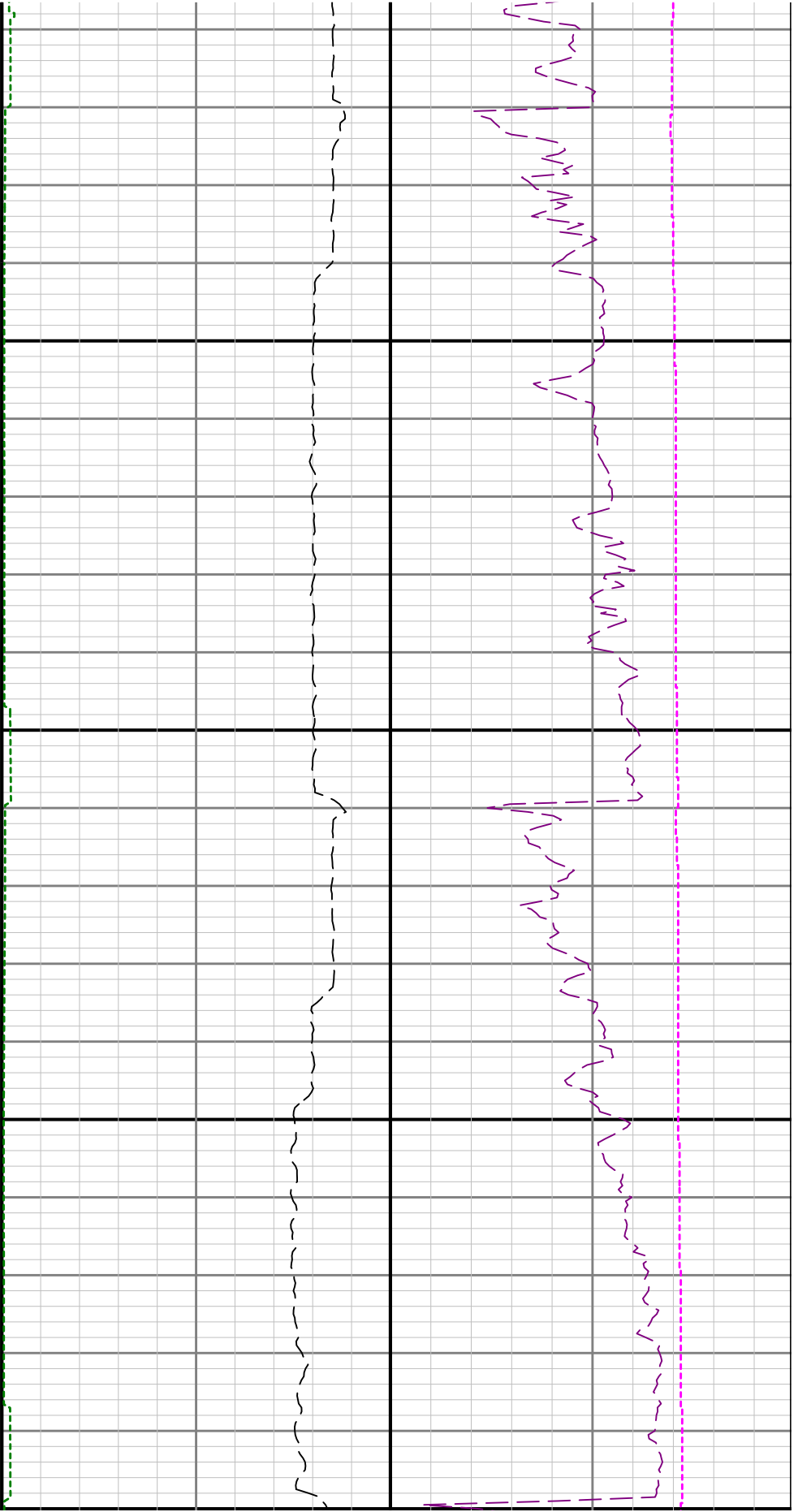
7500

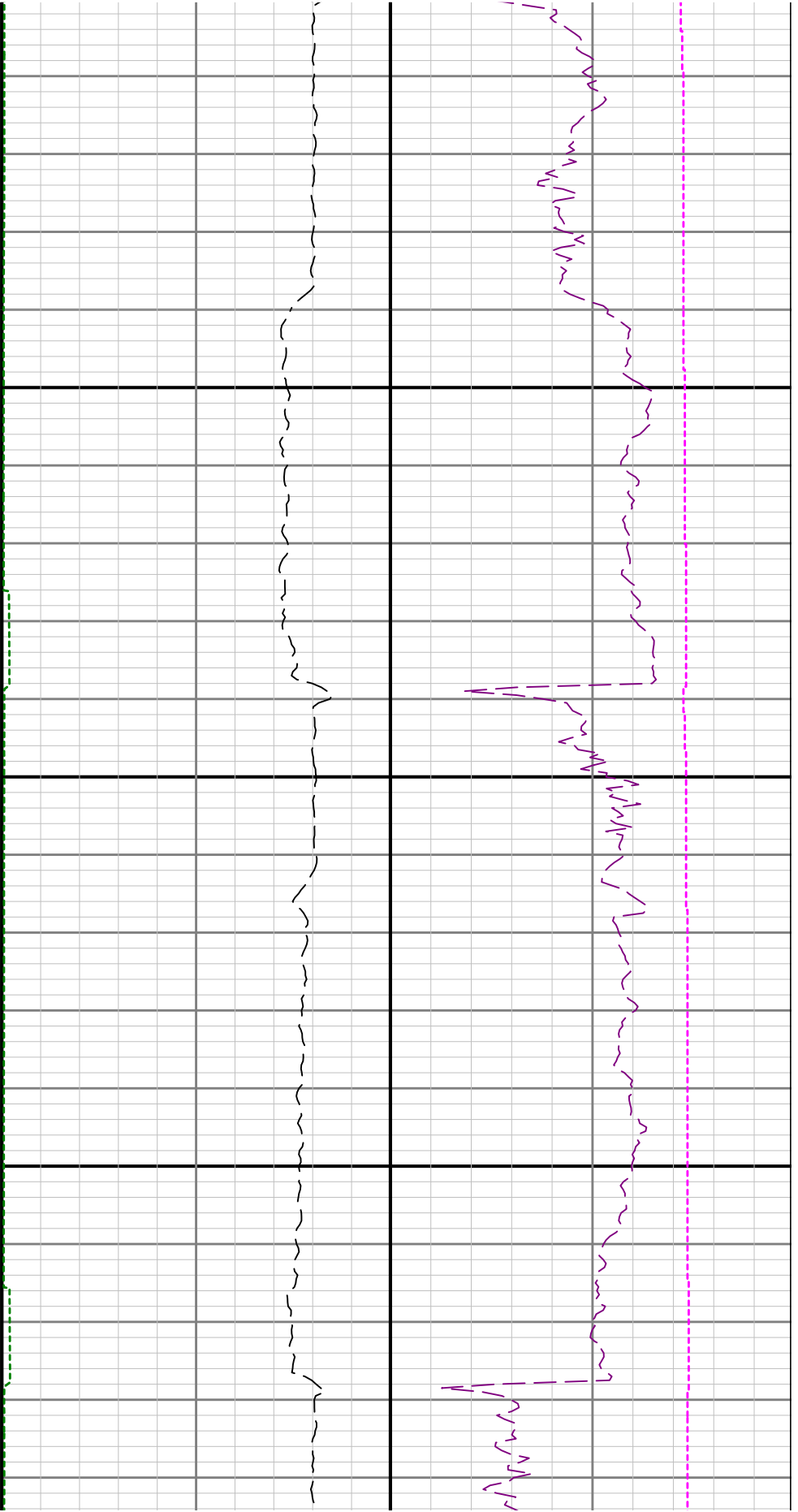






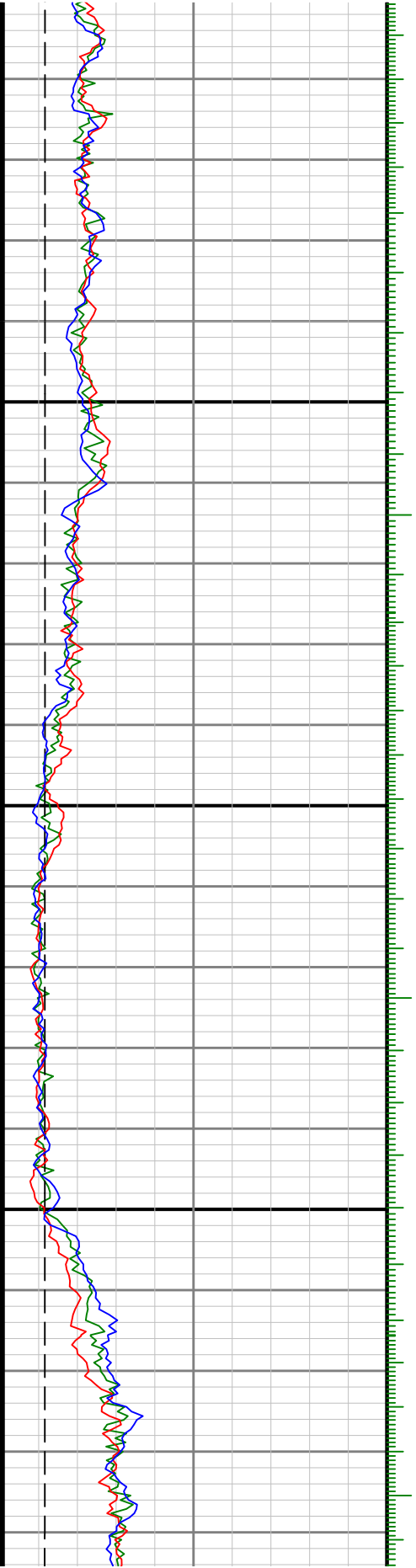


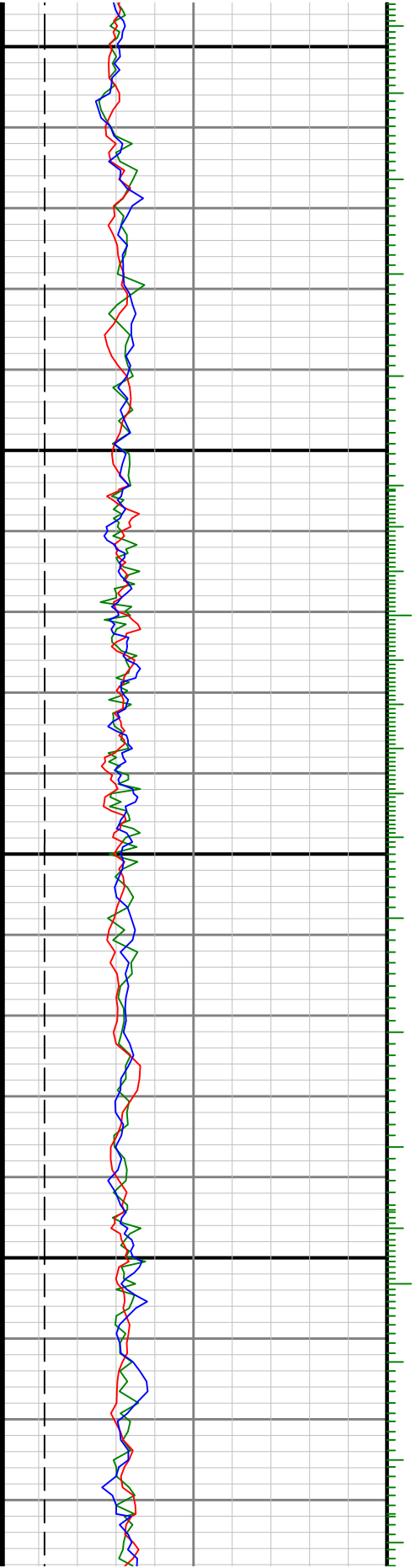




8400

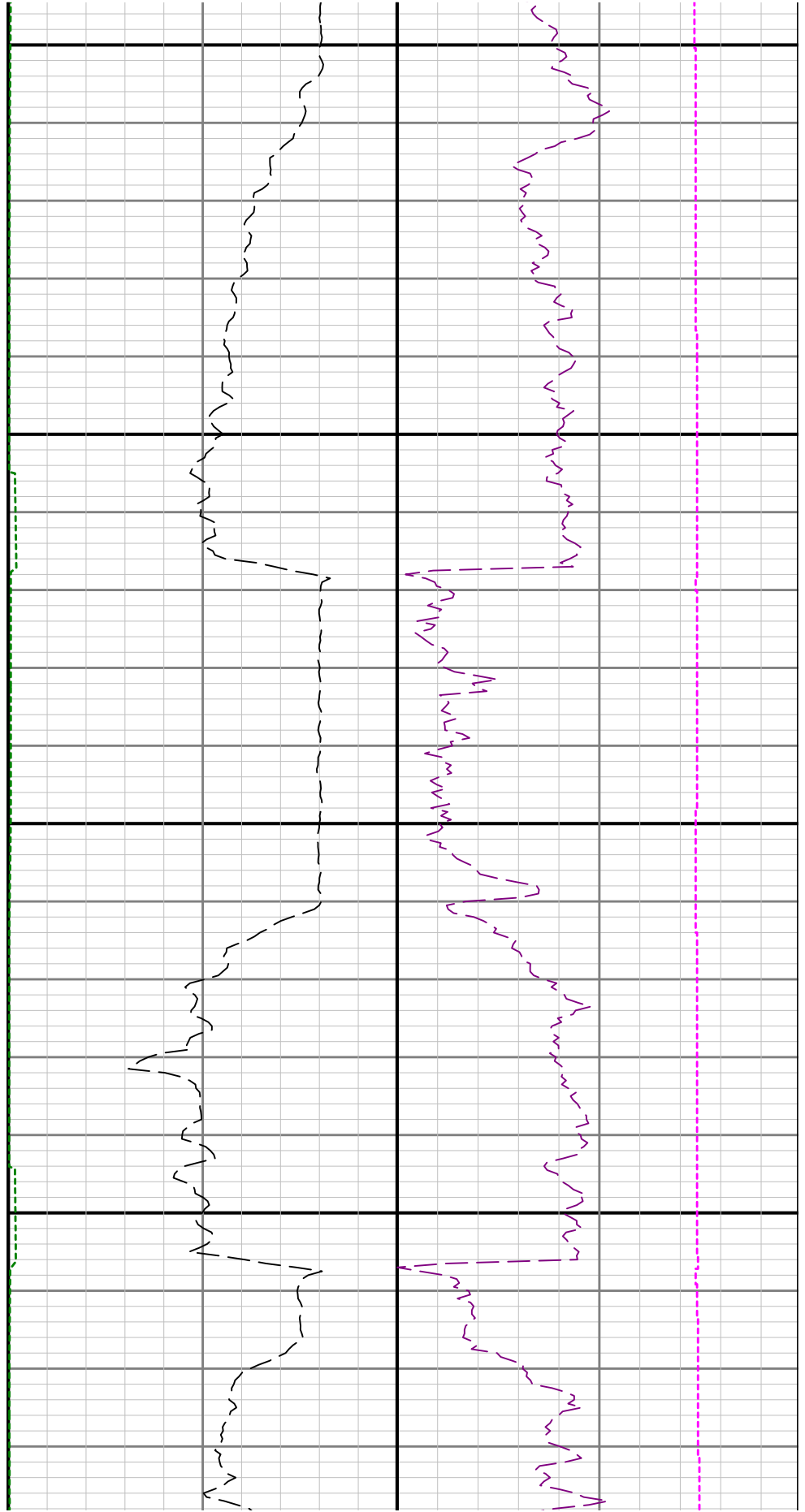
8500

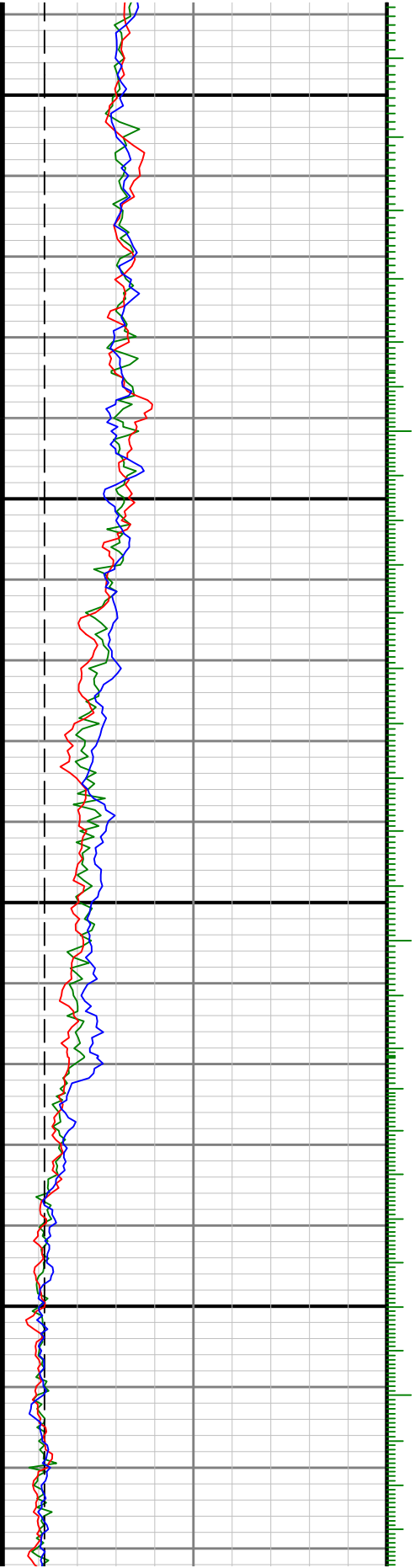




8600

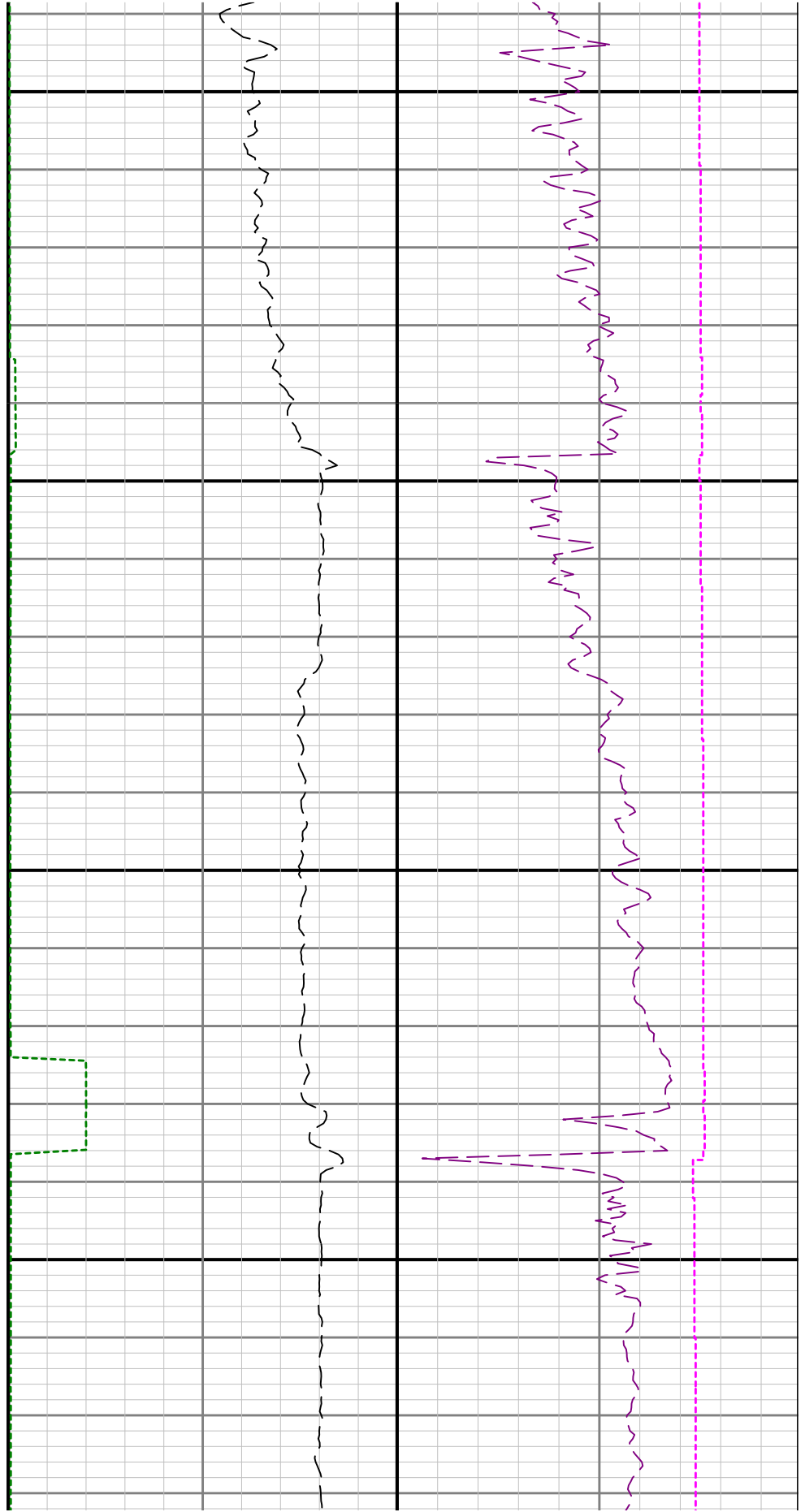
8700

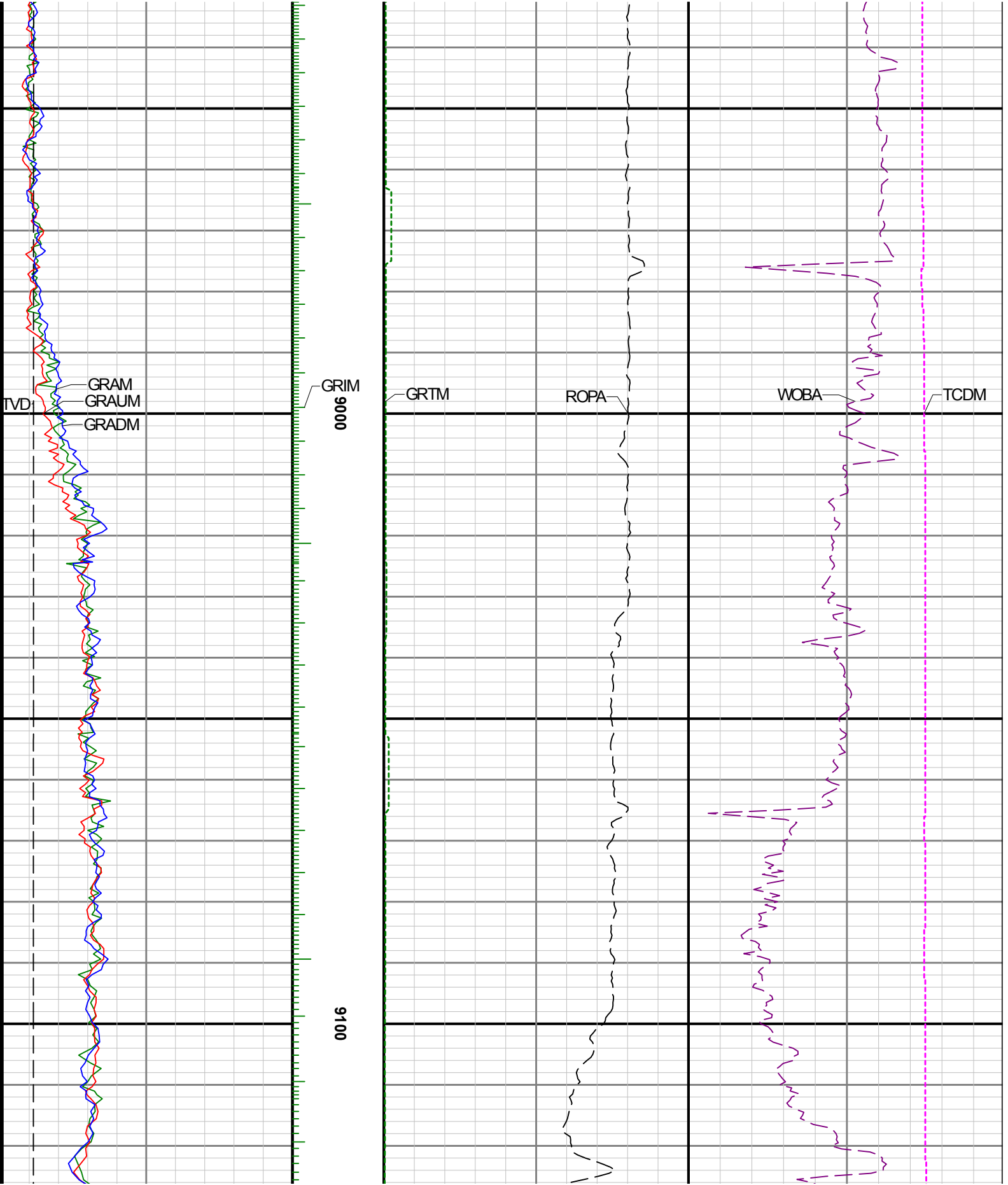


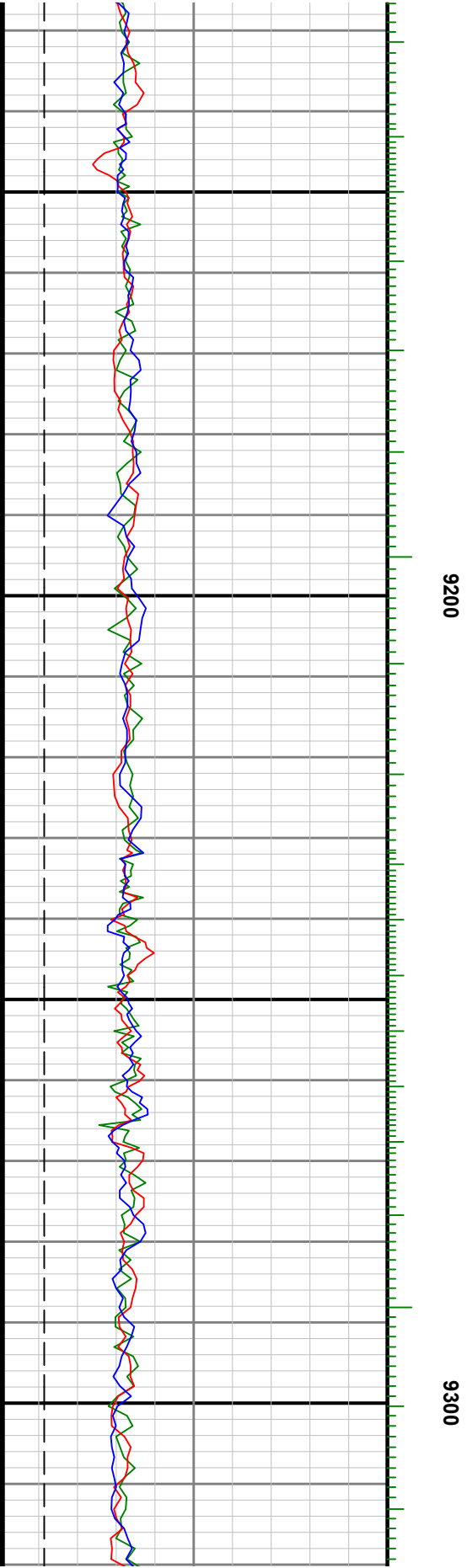
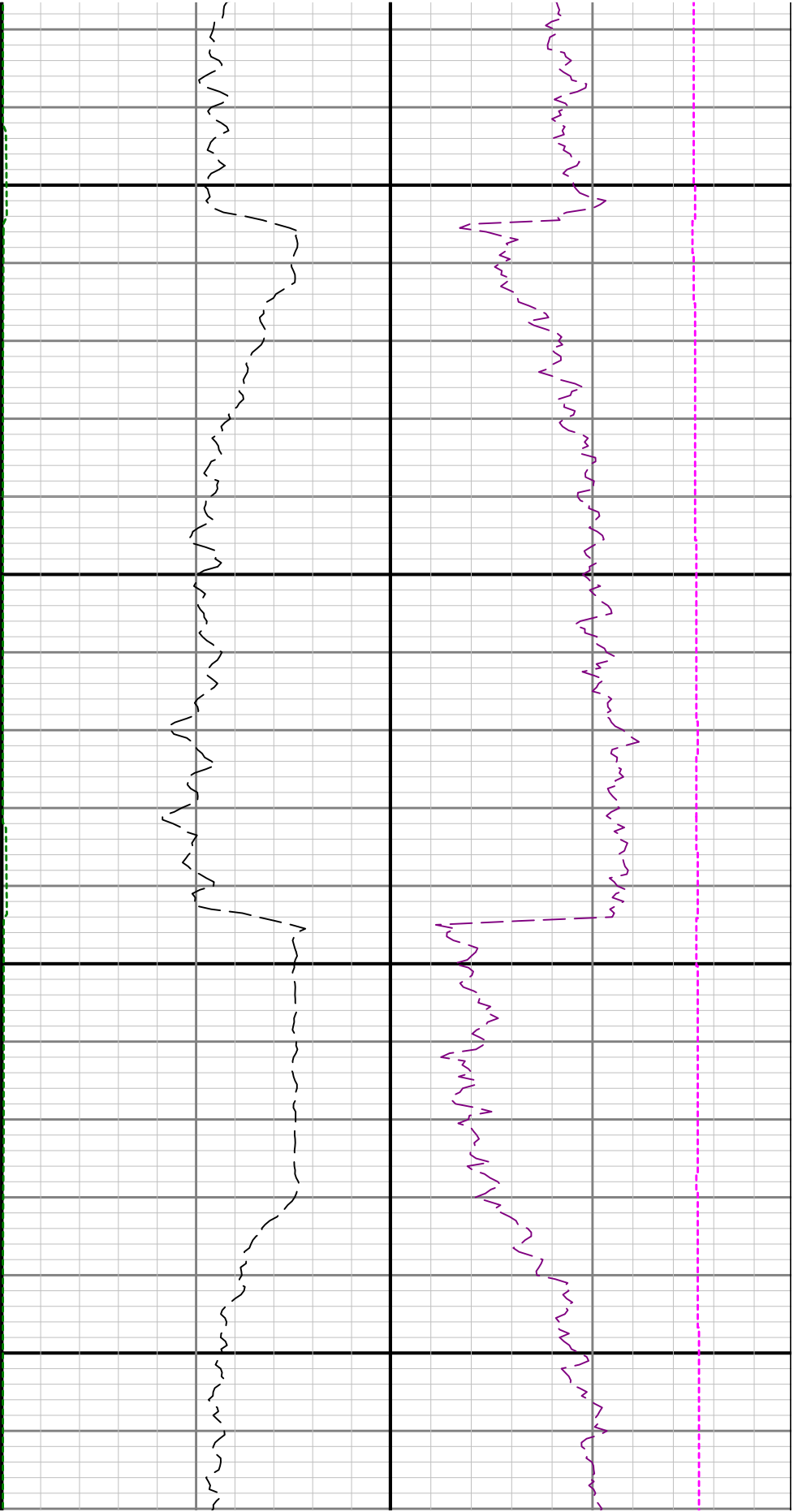


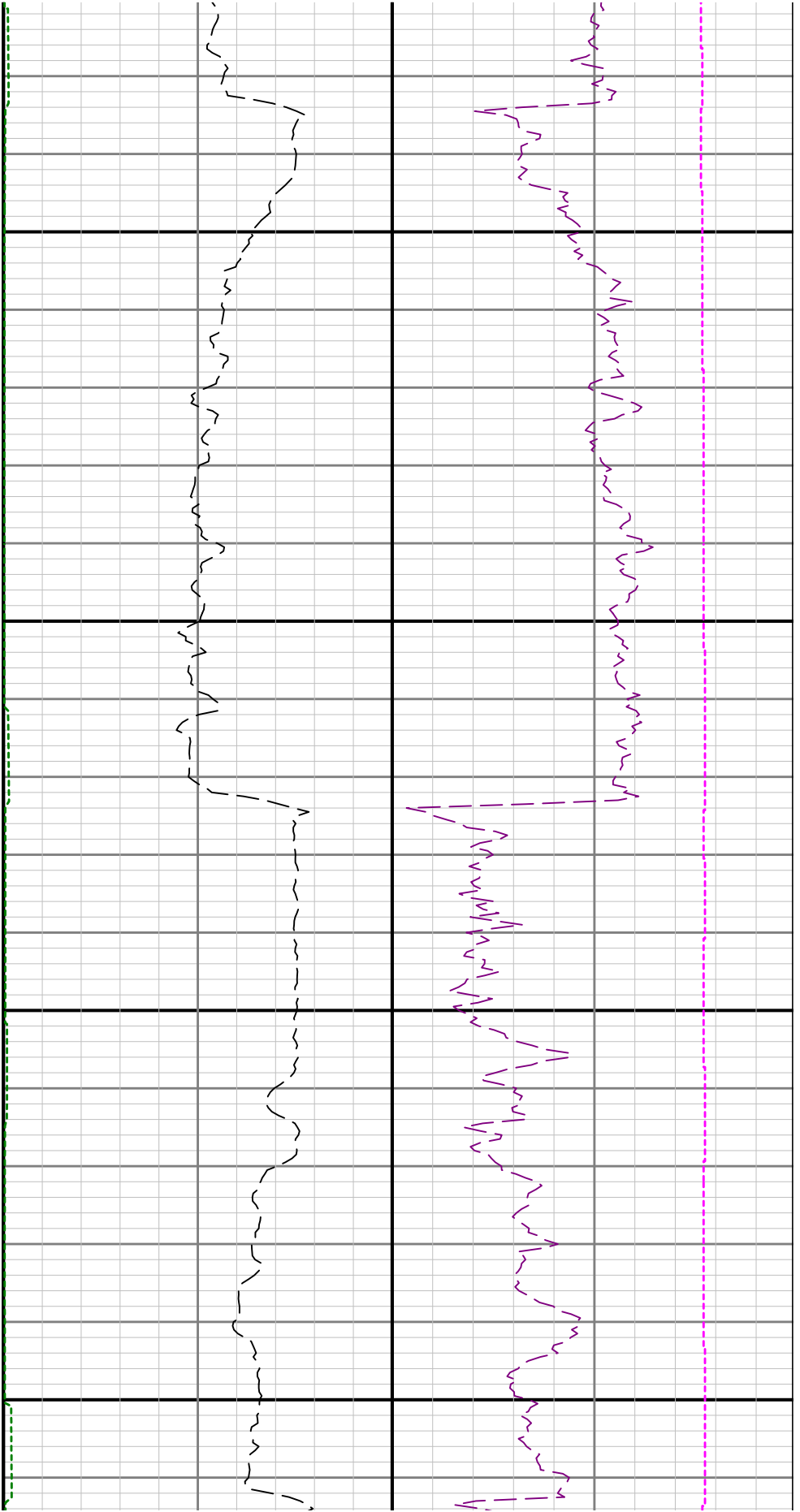
0068

0088



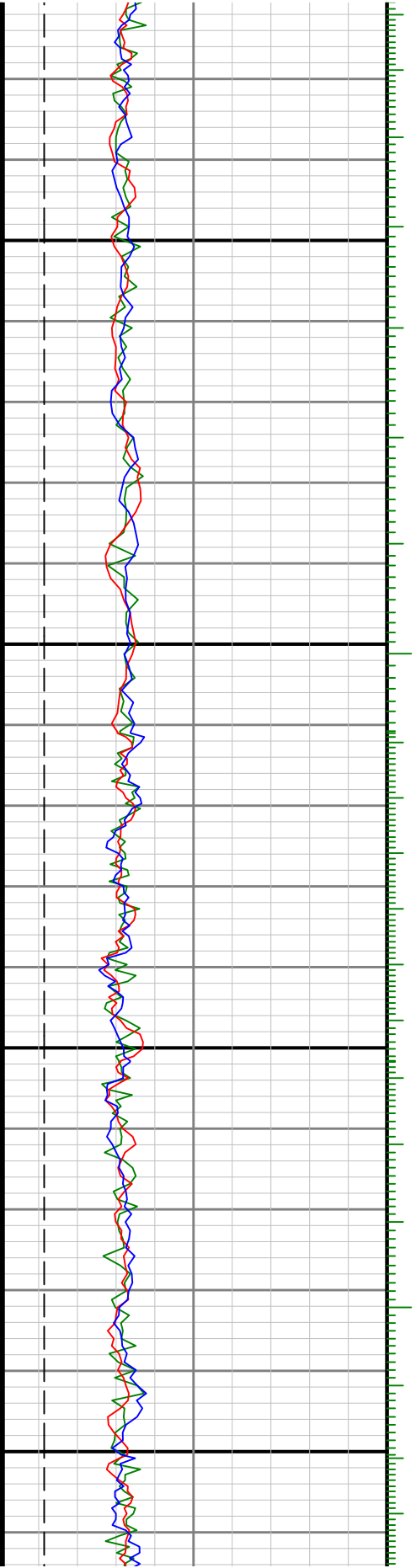


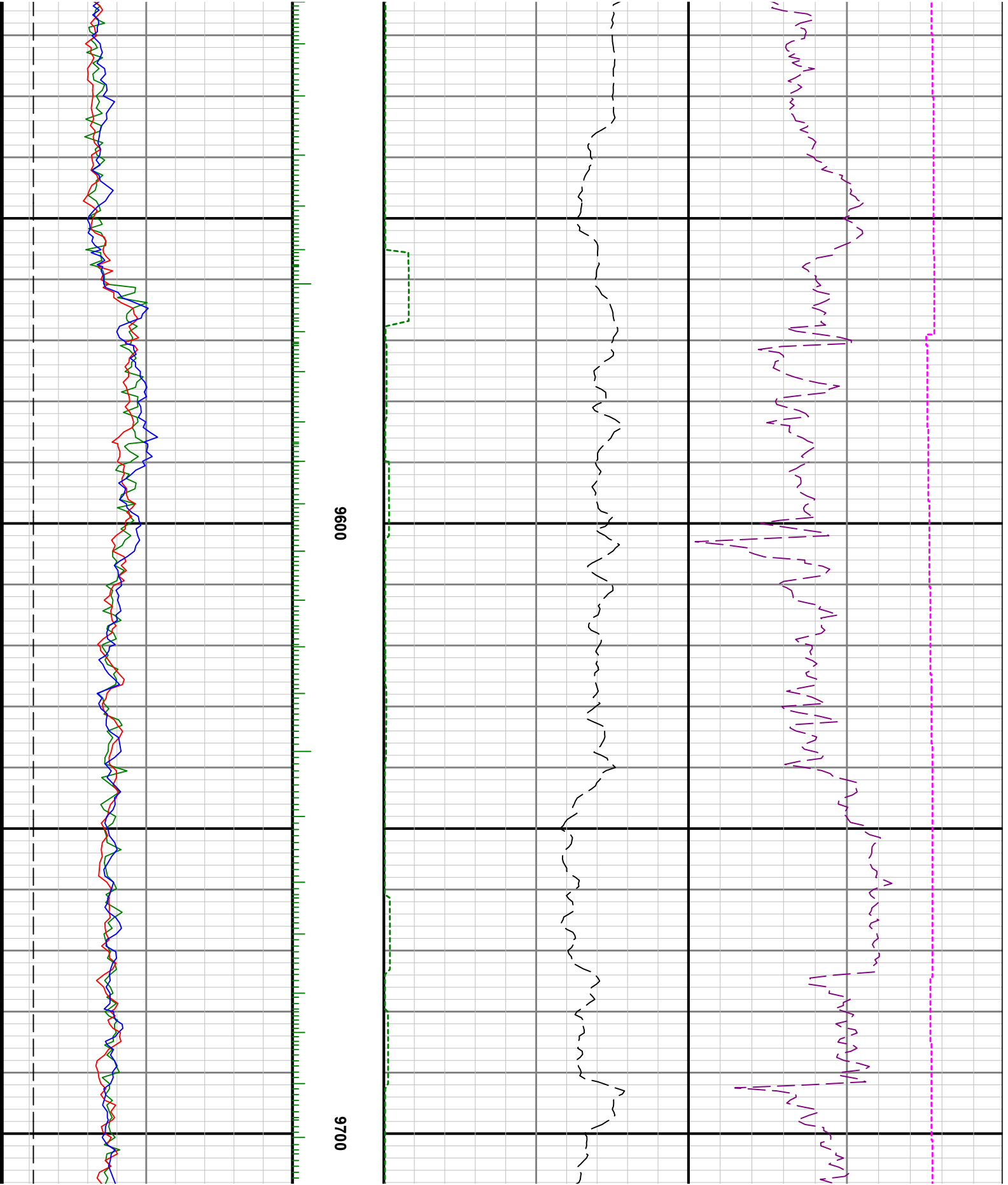


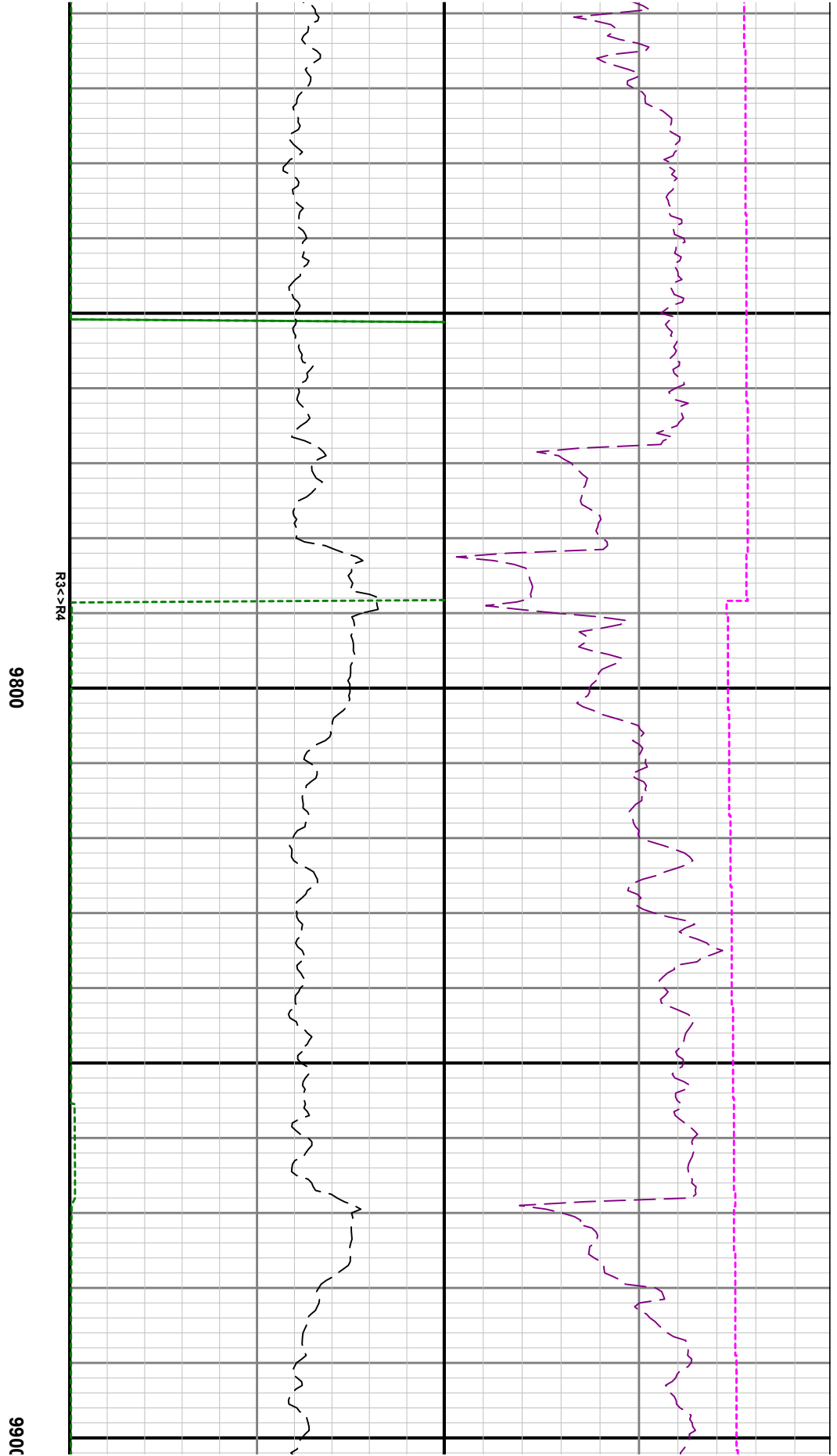
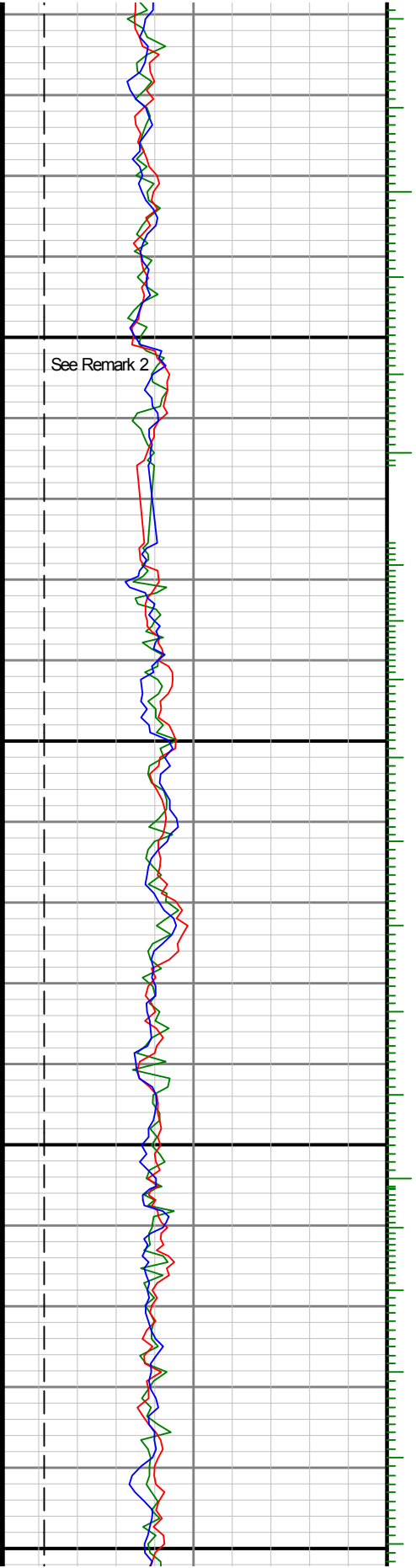


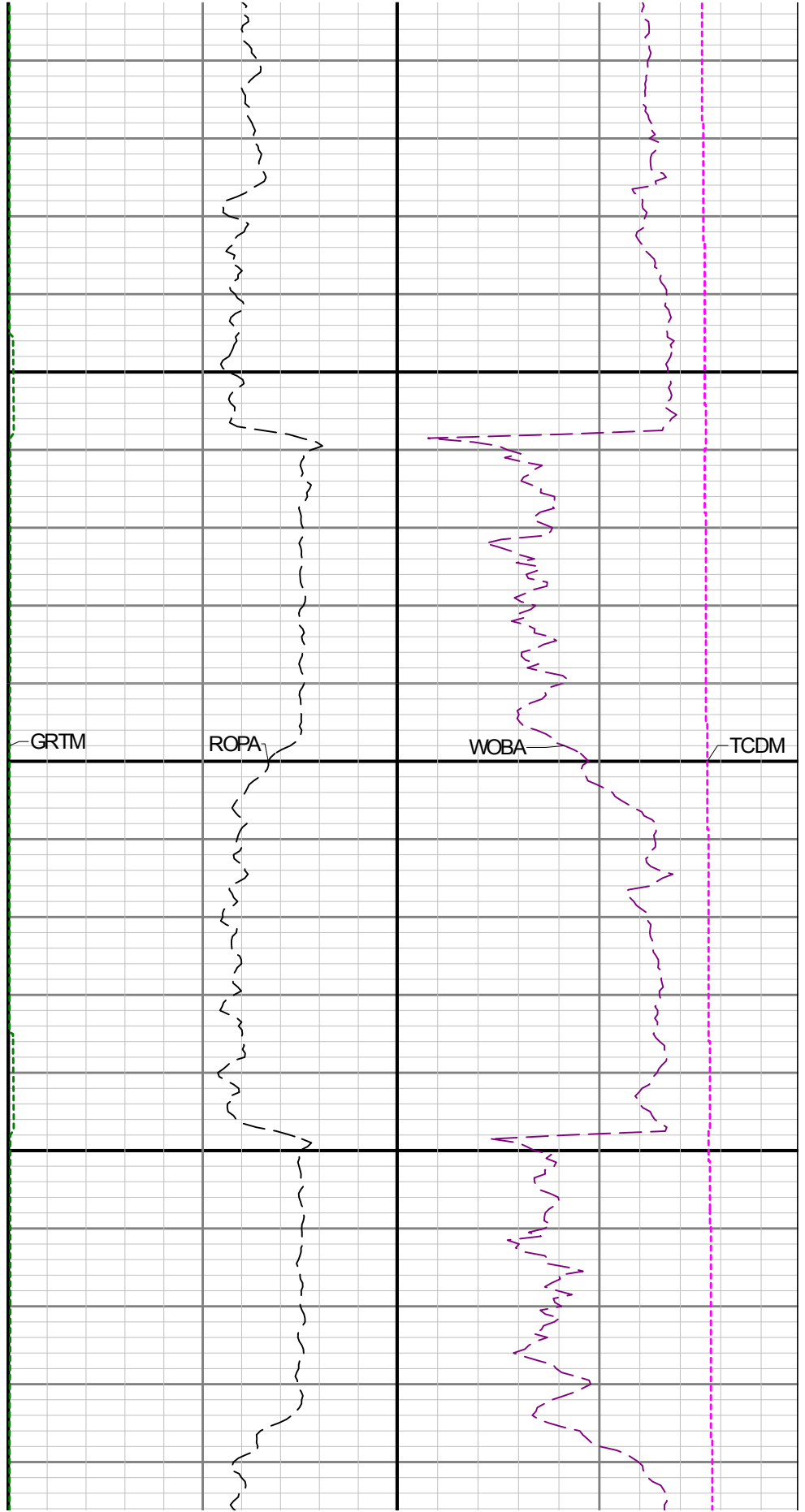
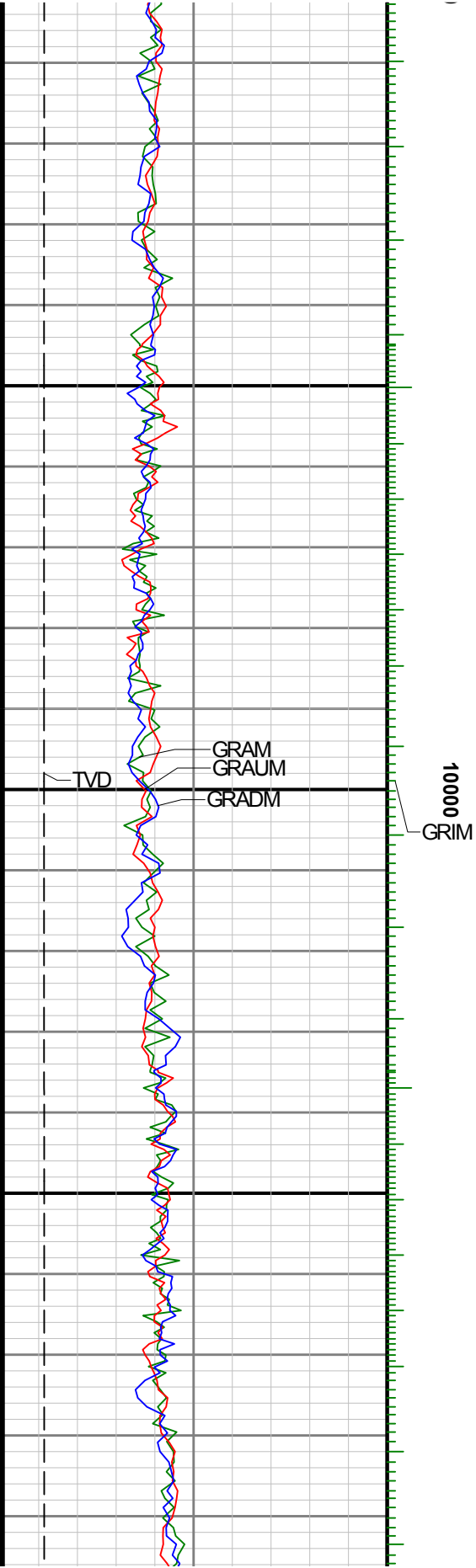
9400

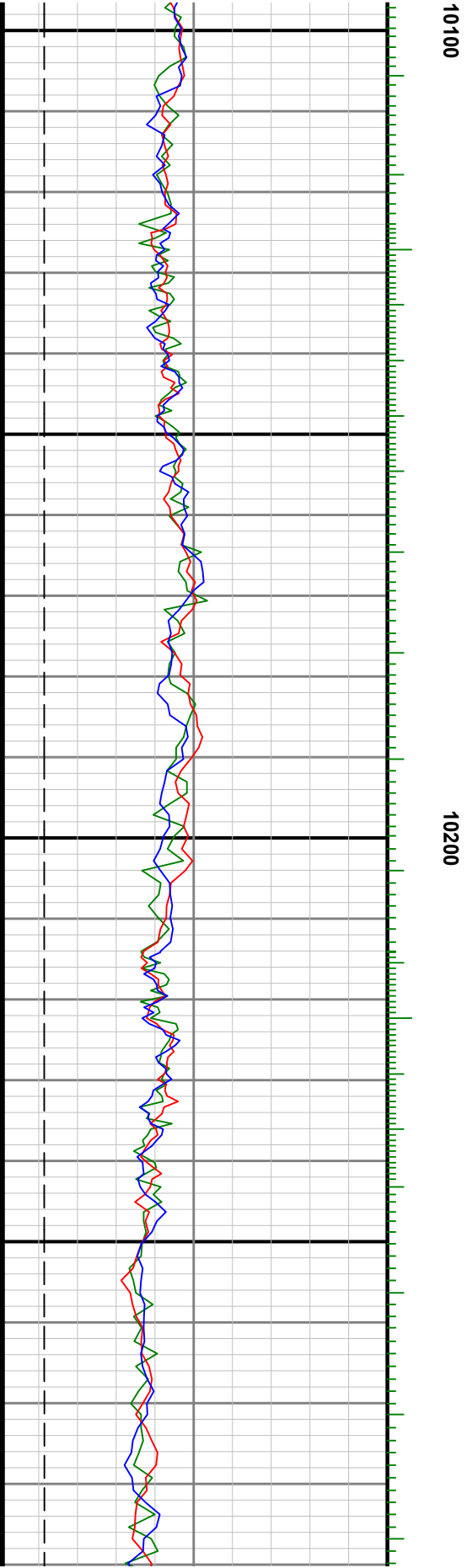
9500

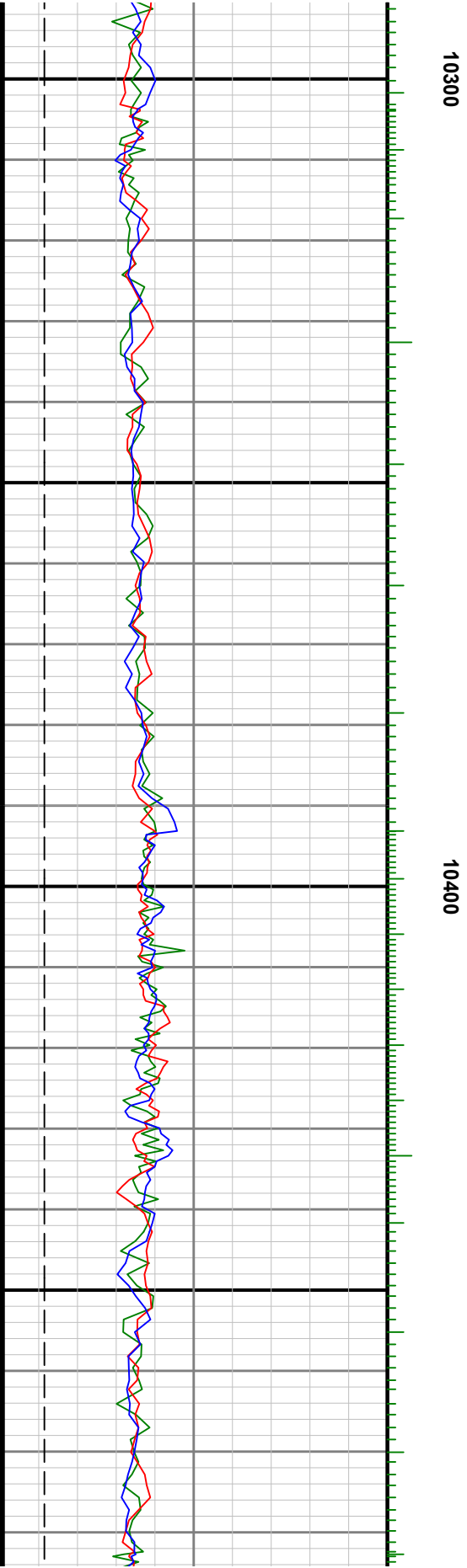
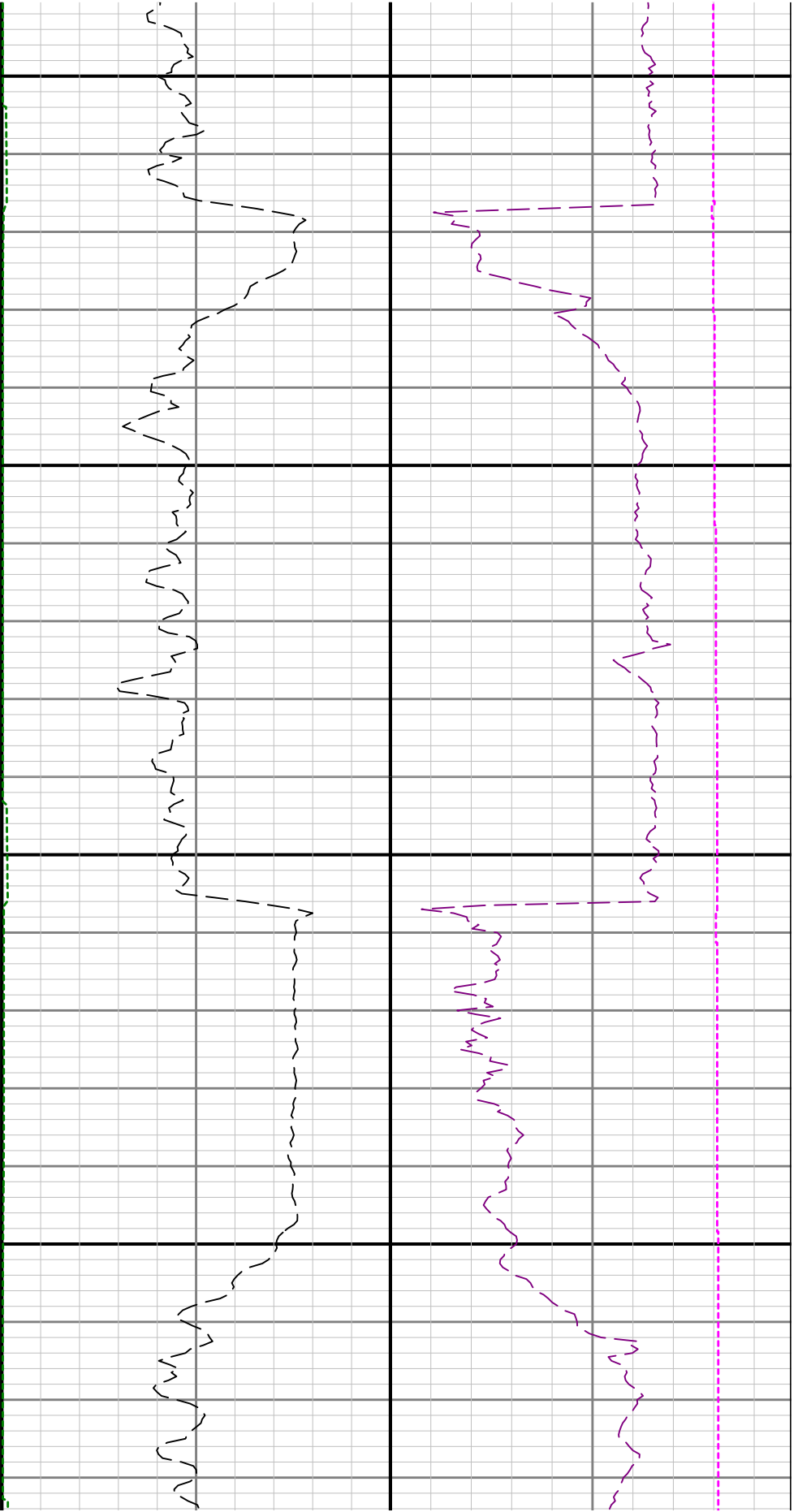


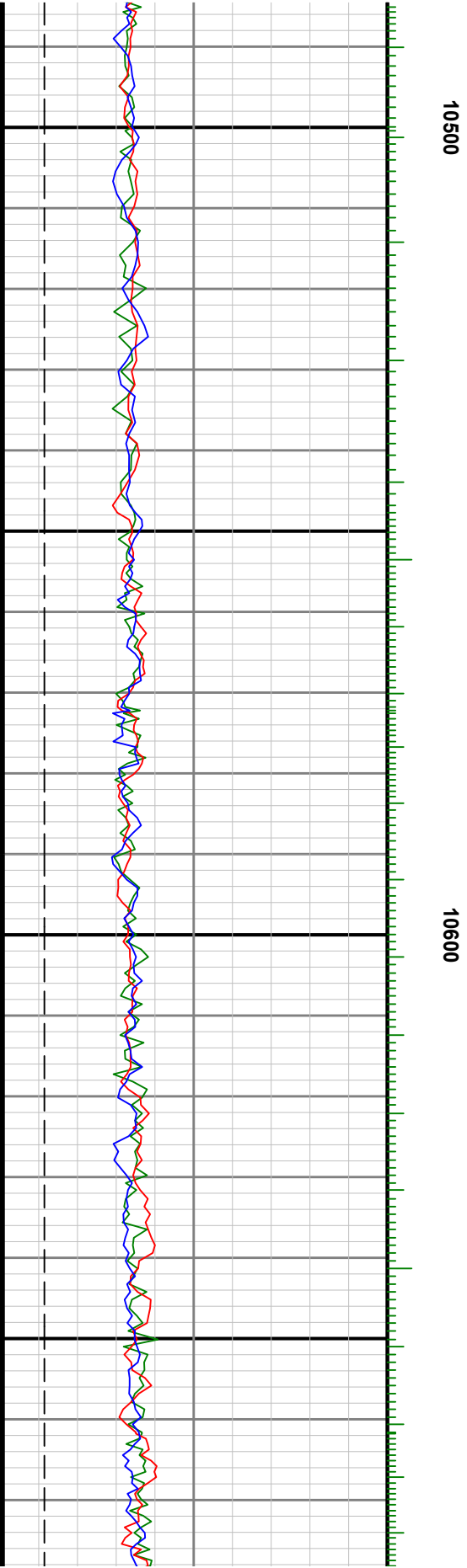
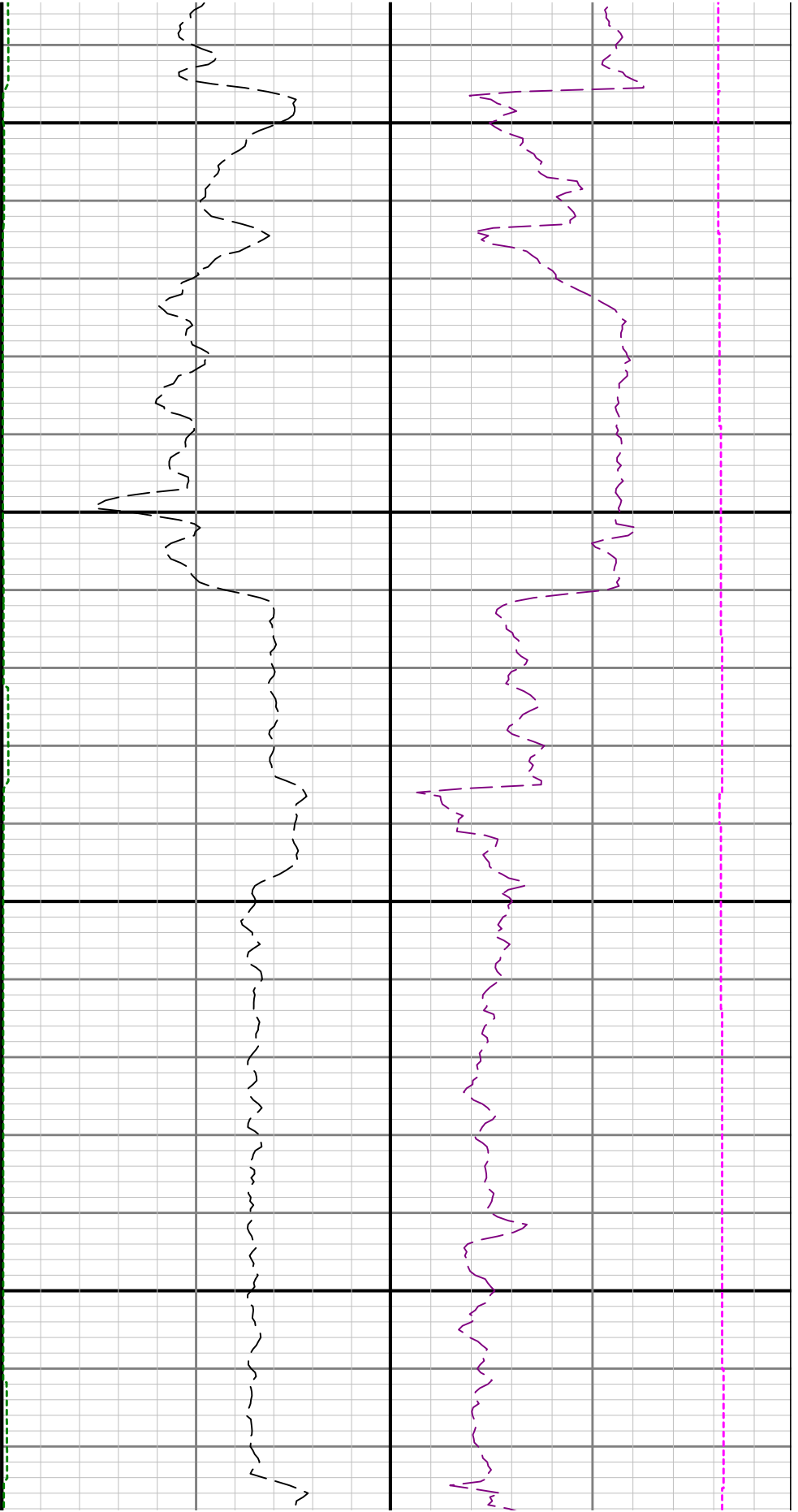


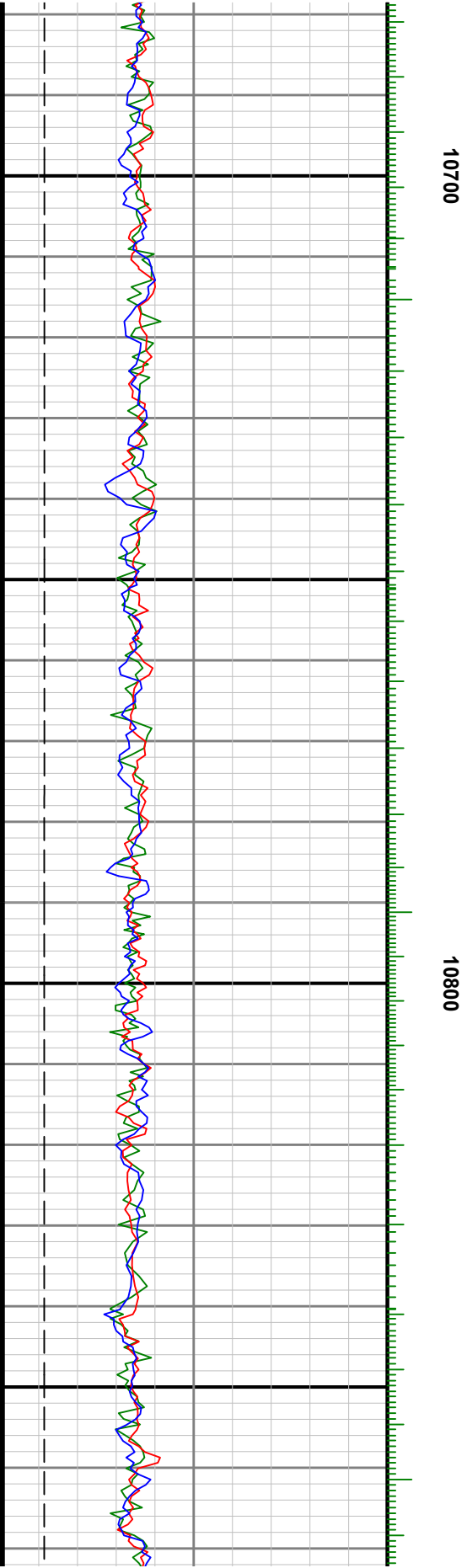
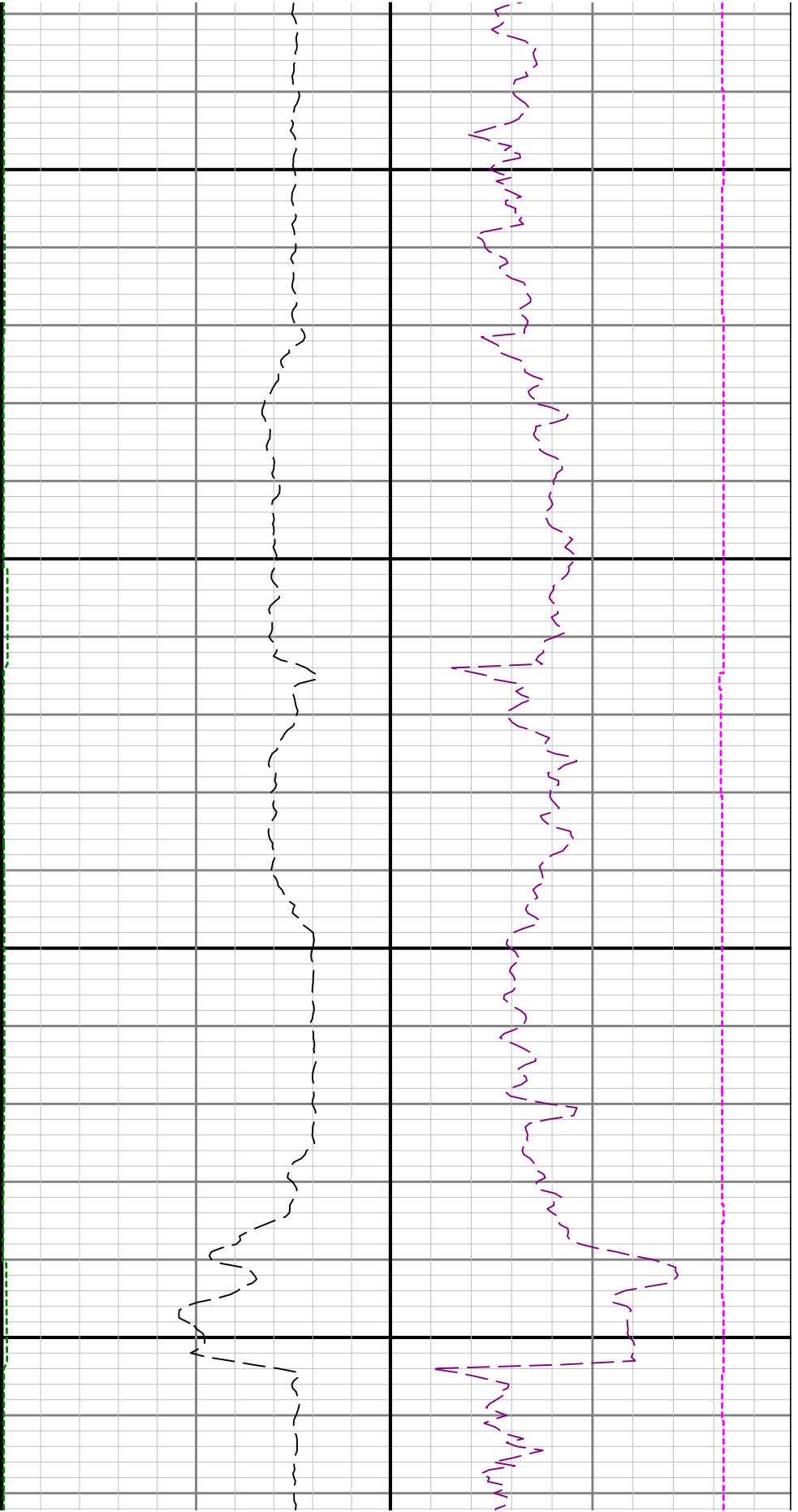


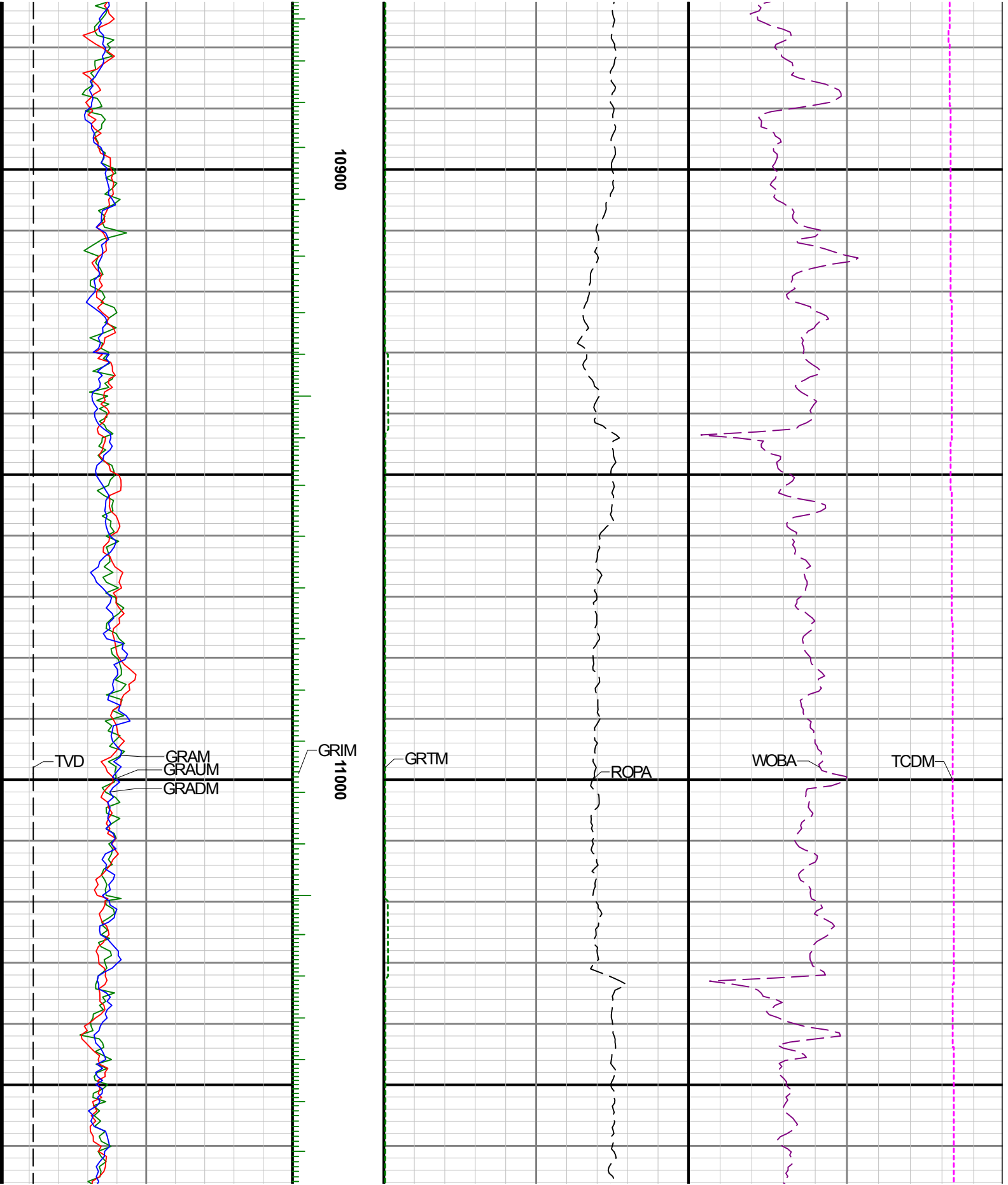


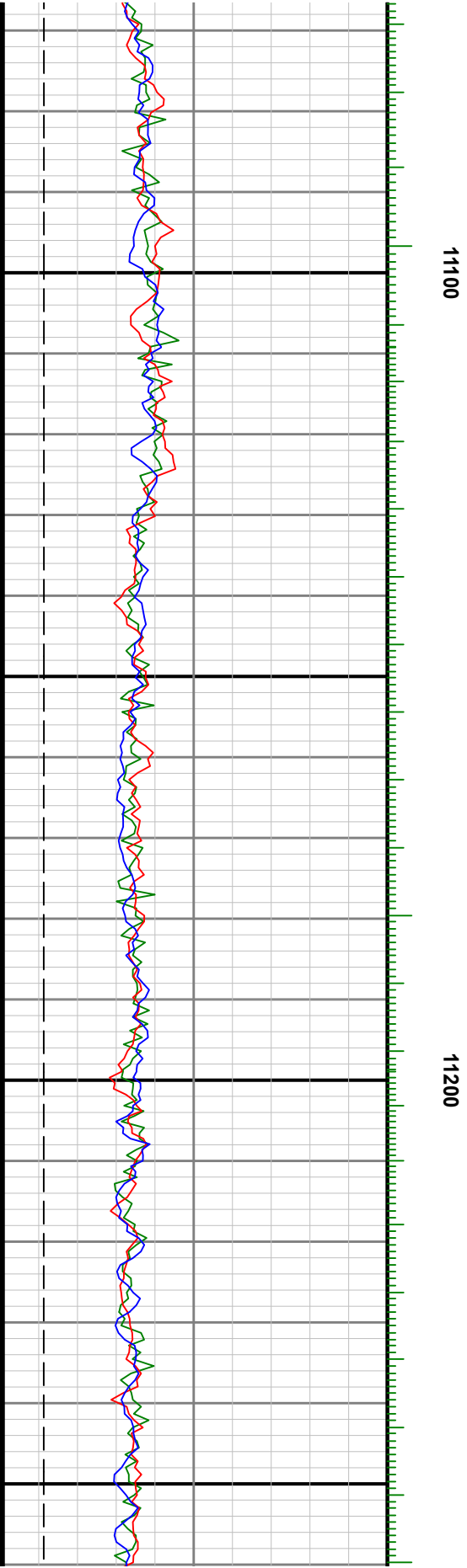
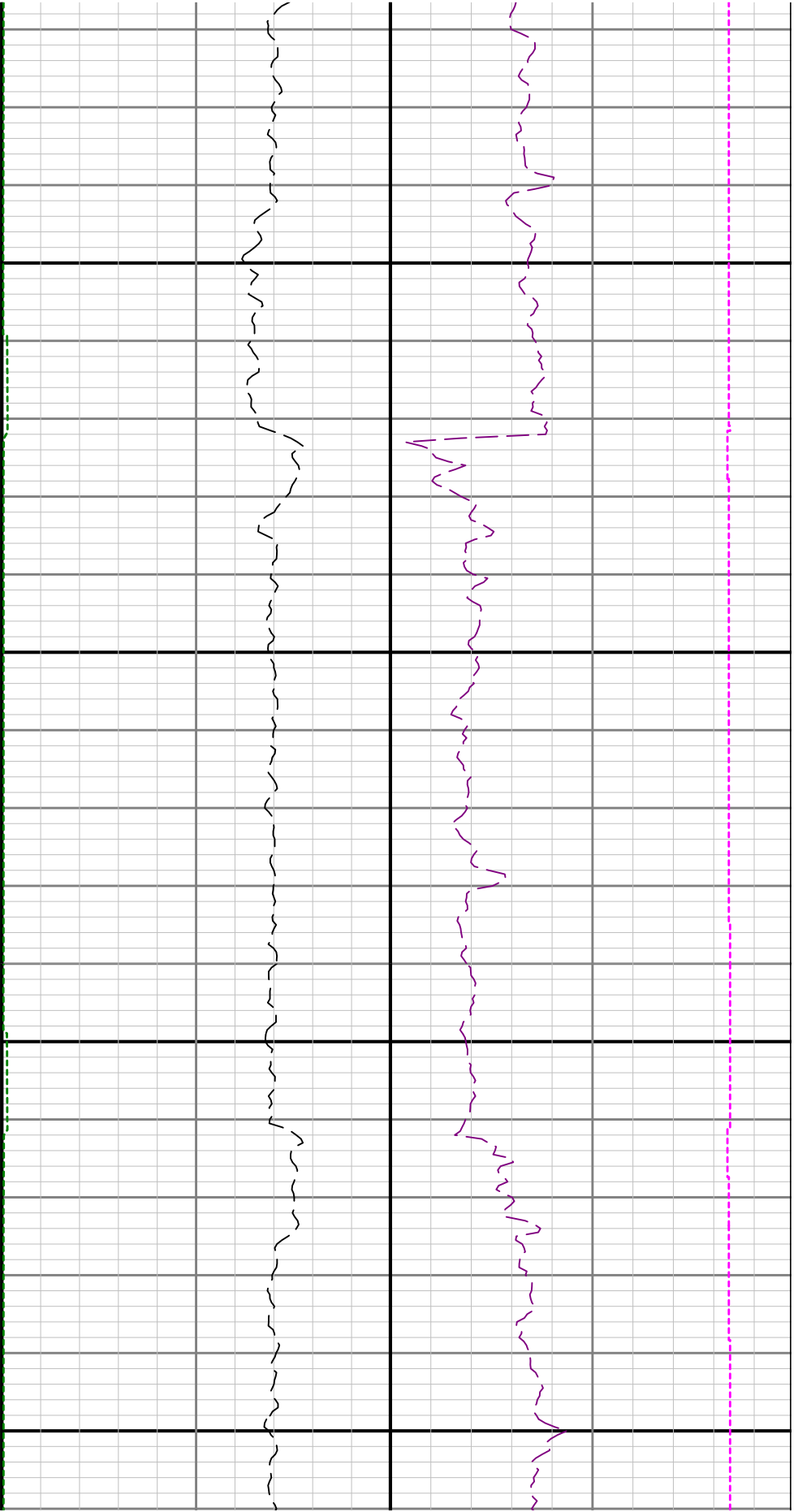


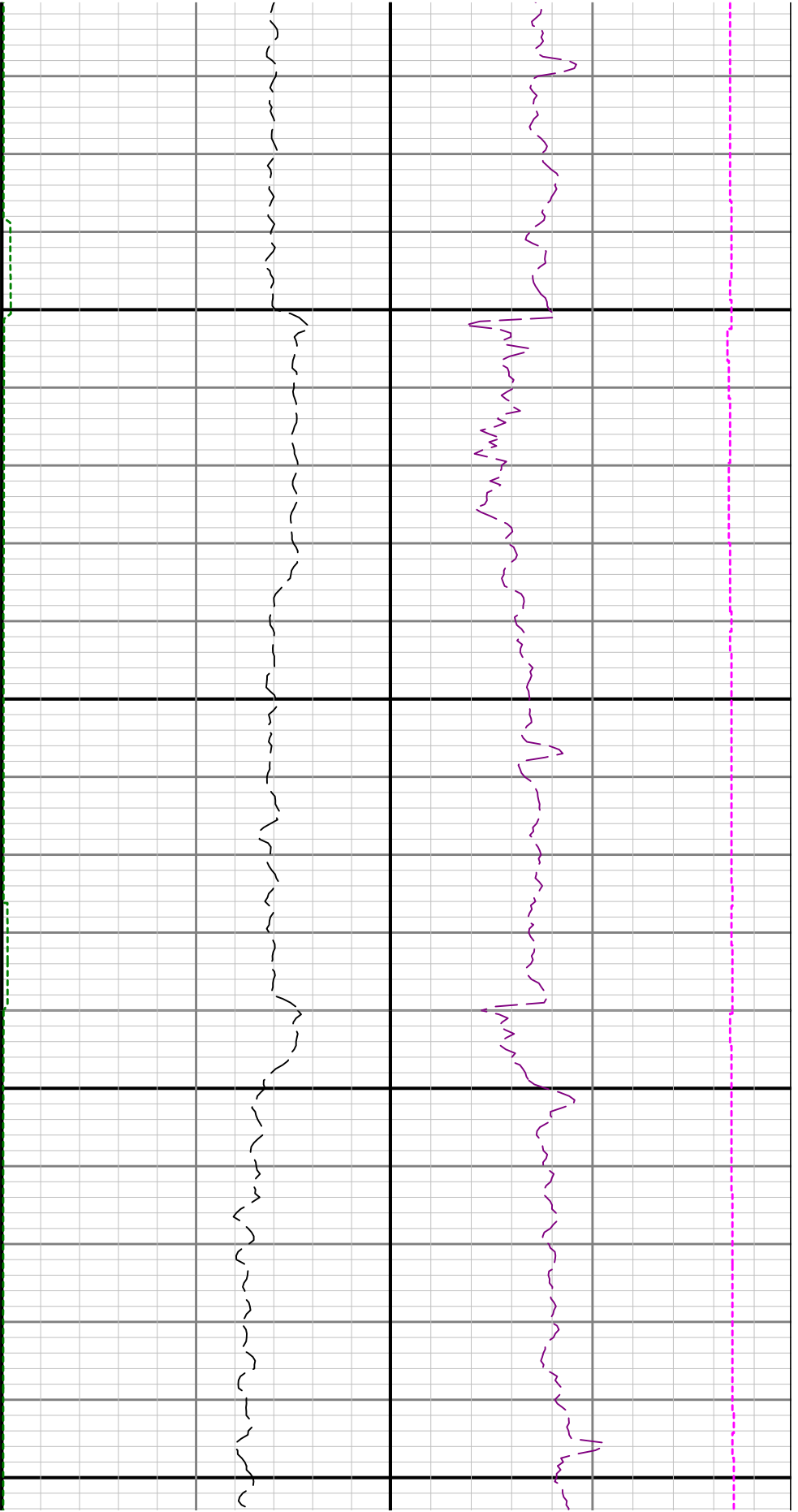






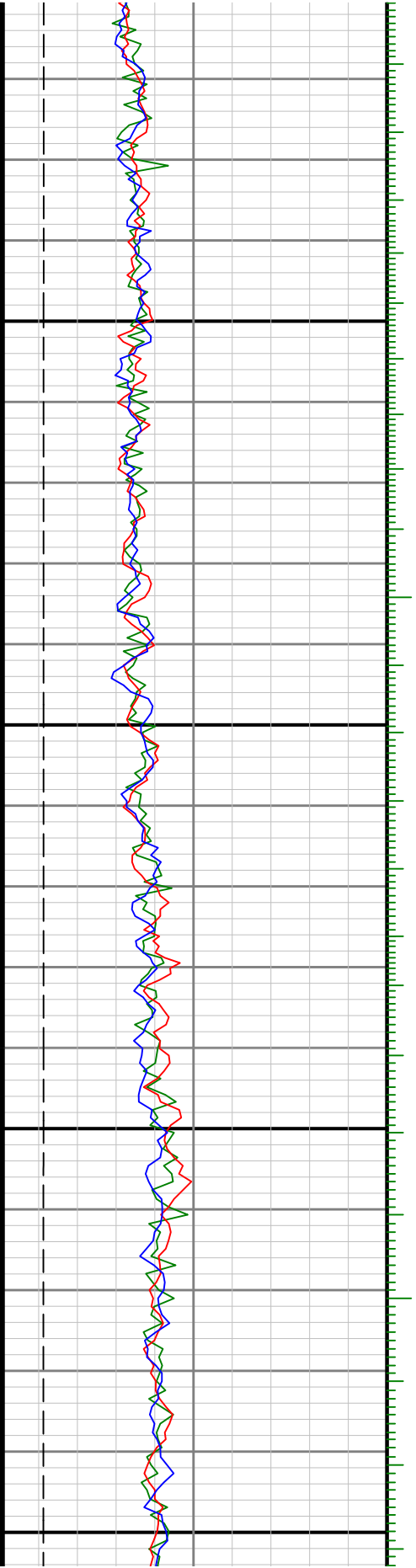


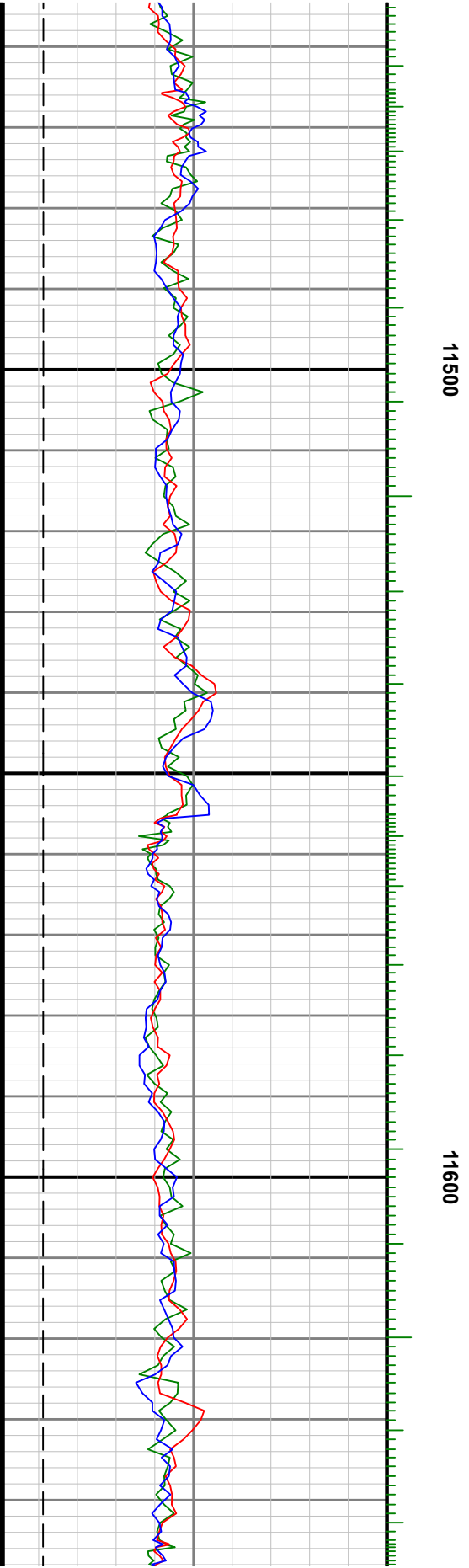
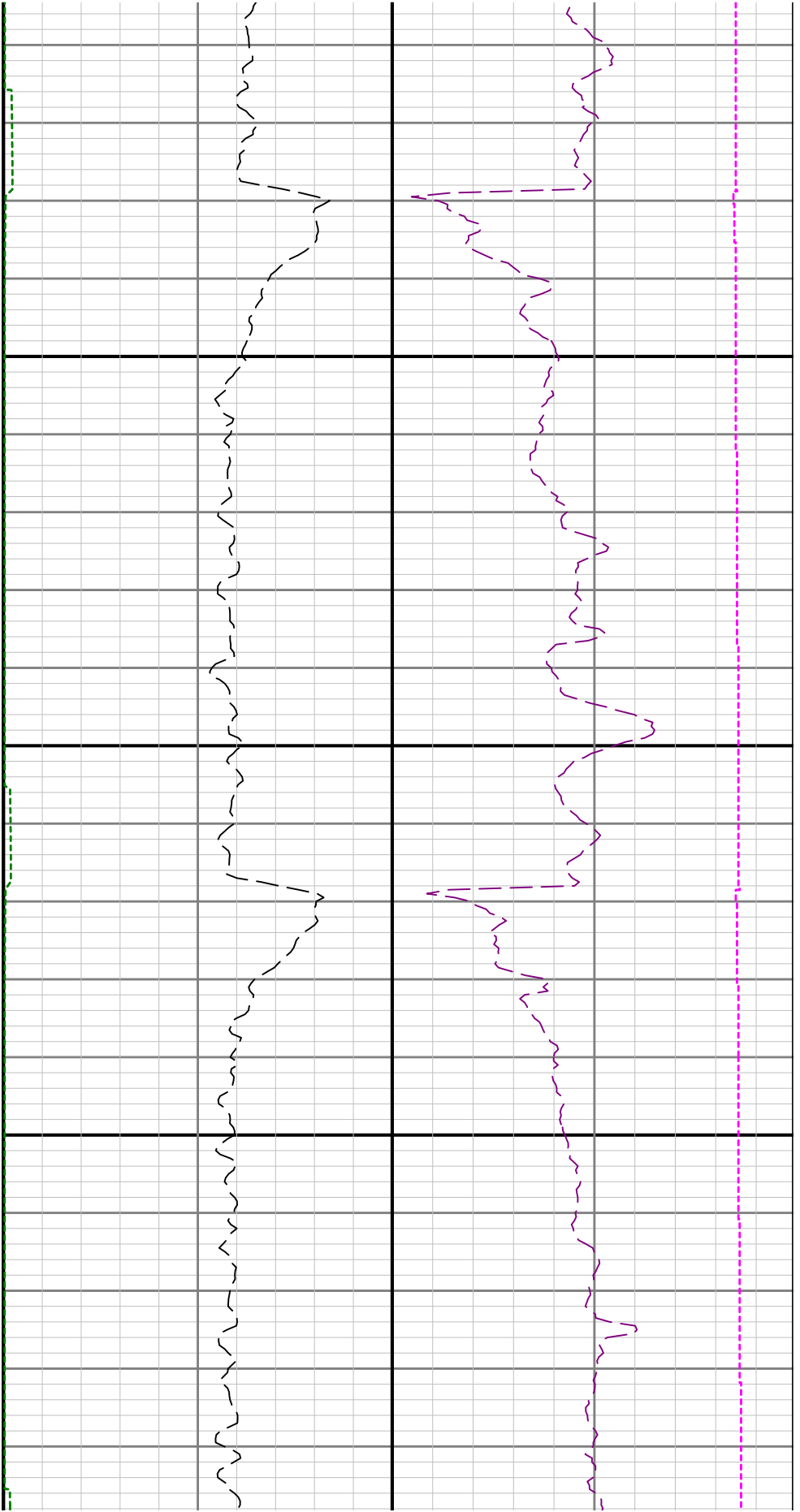


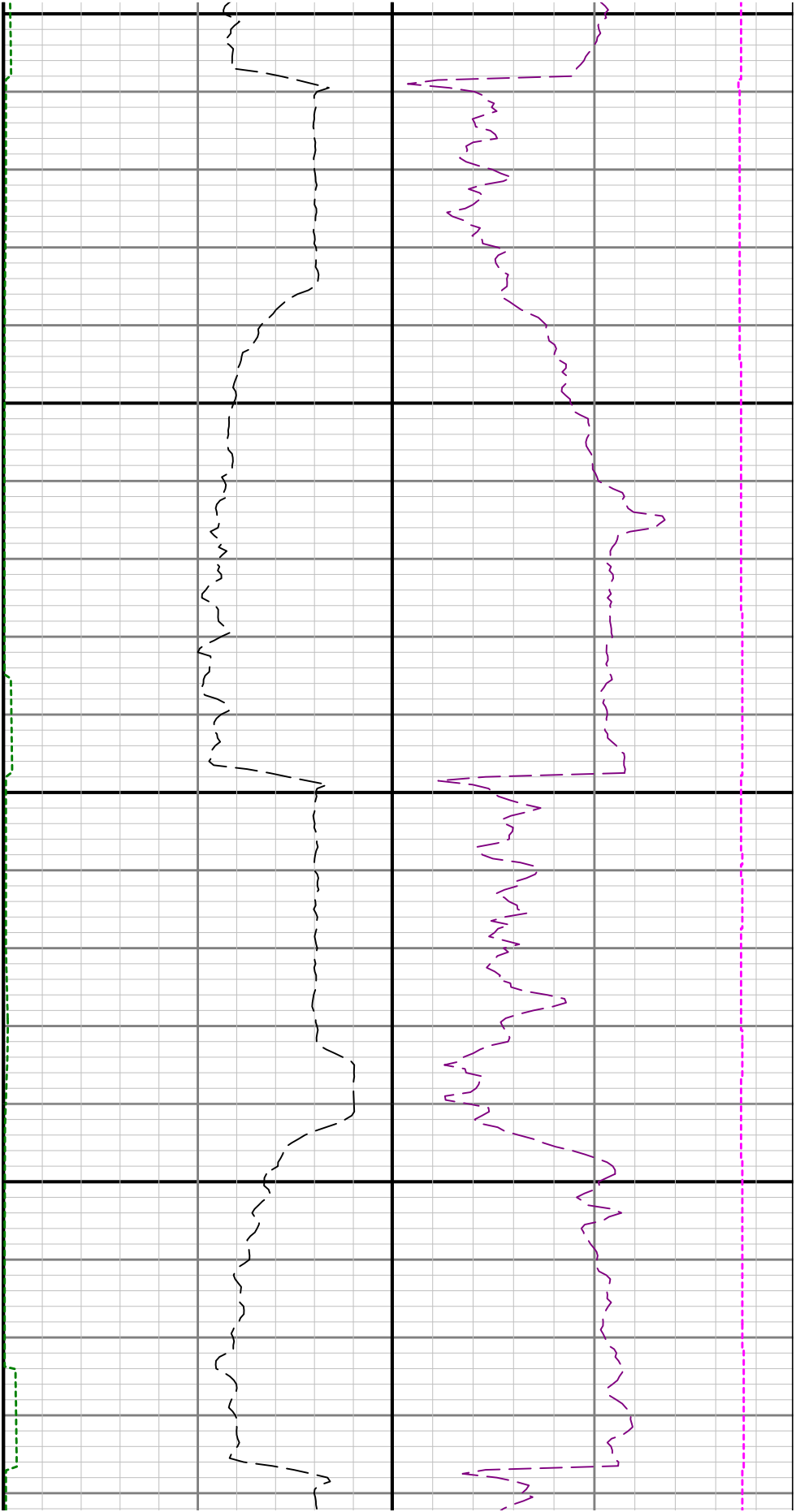


11300

11400

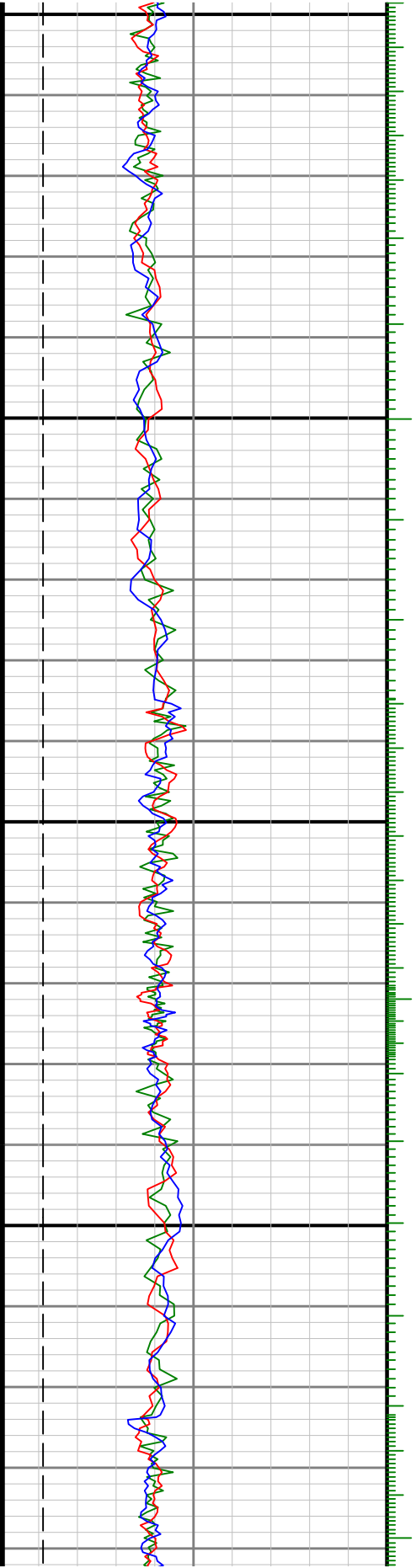


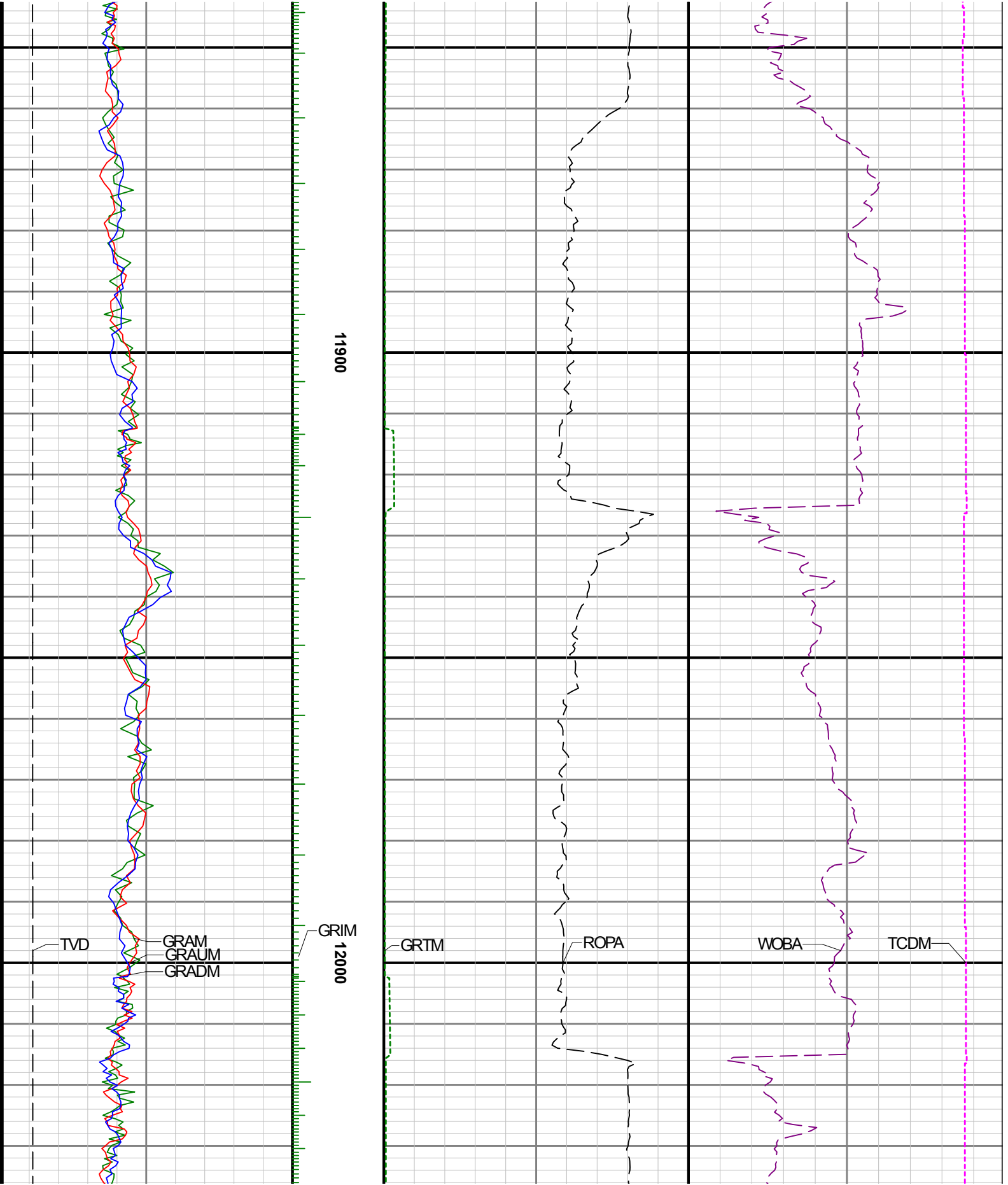


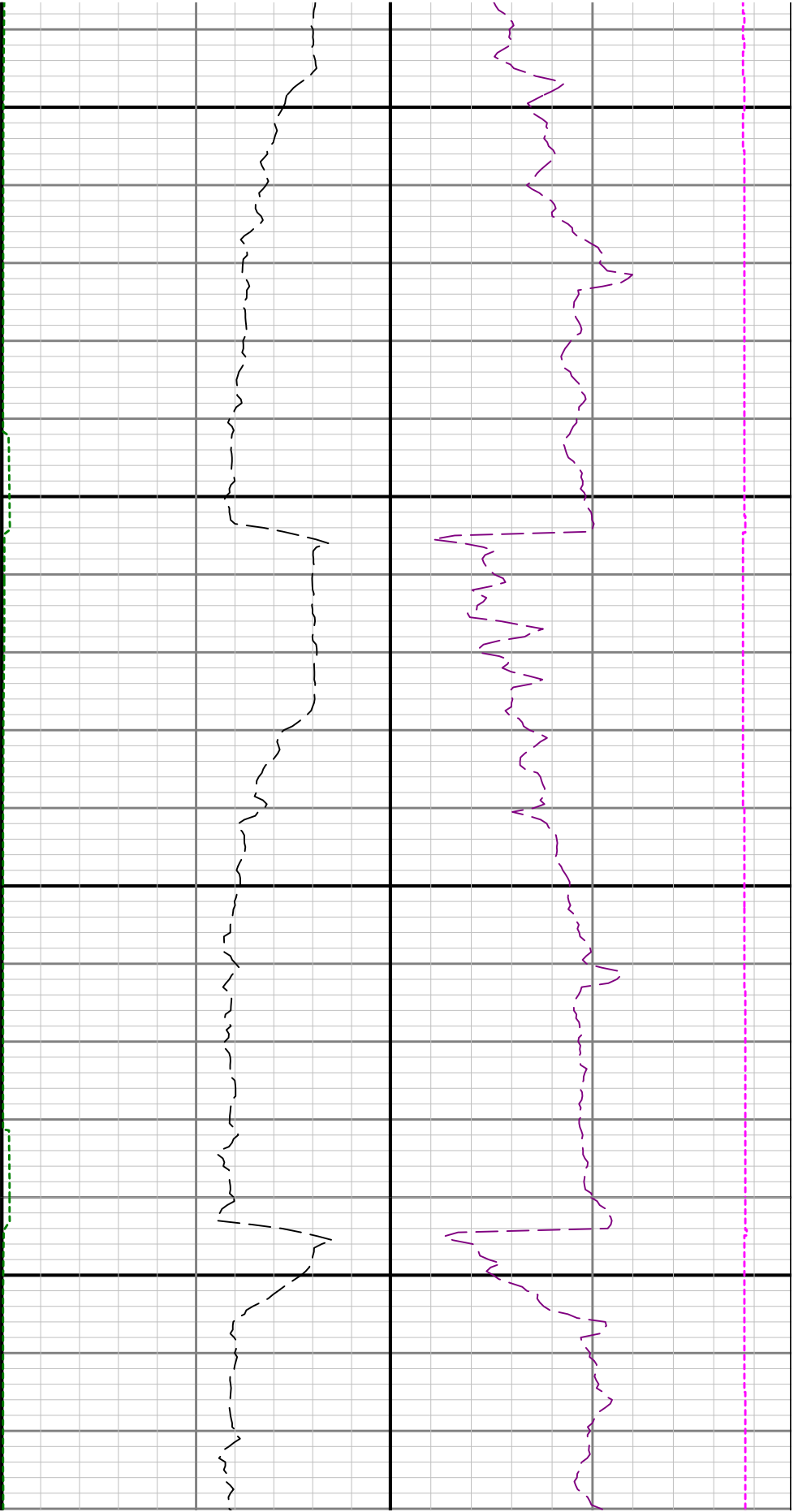


11700

11800

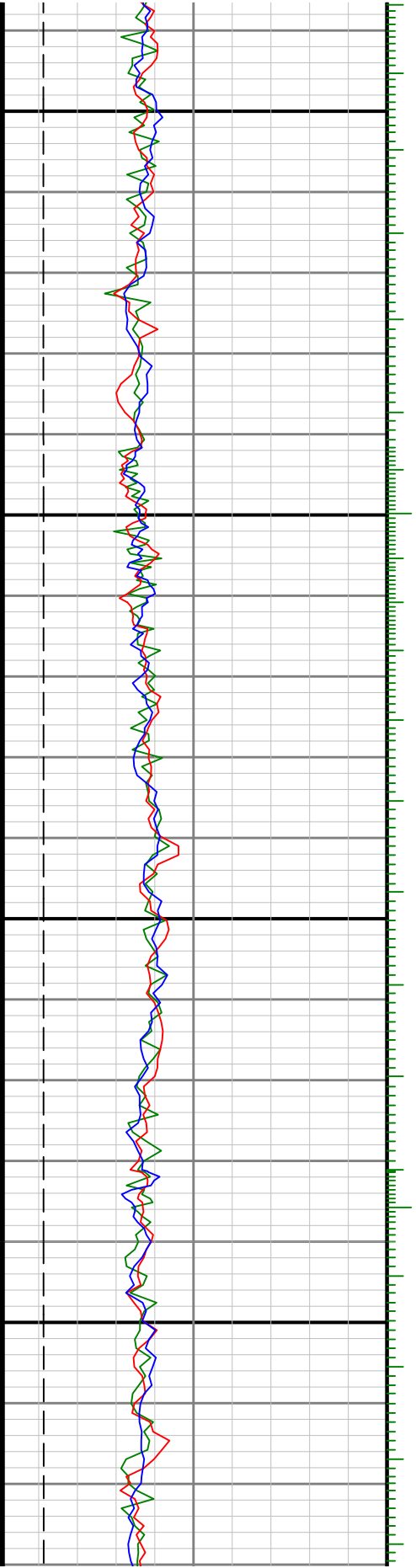


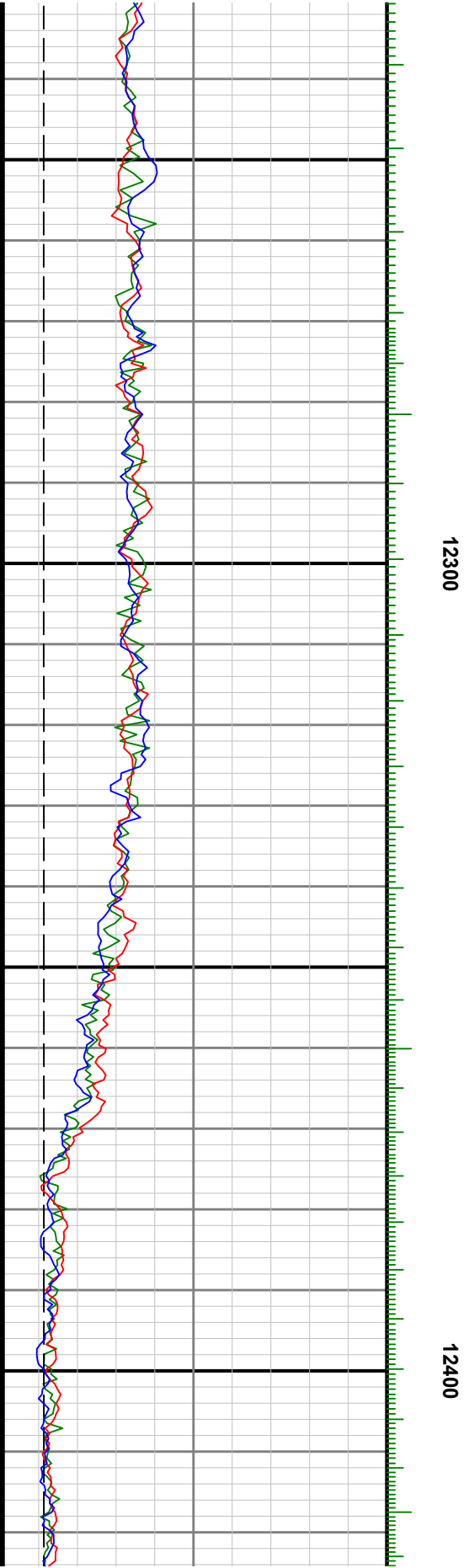
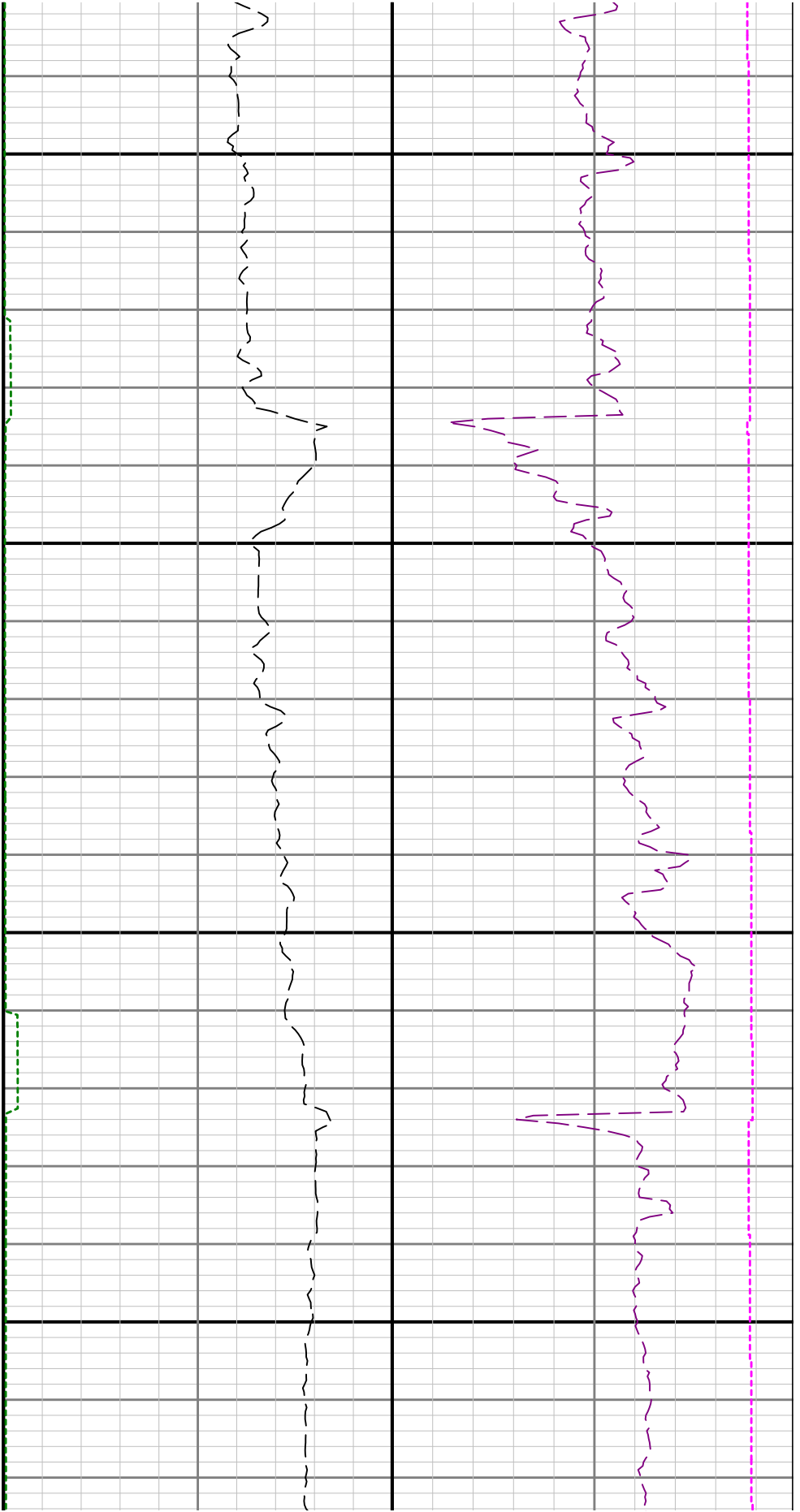


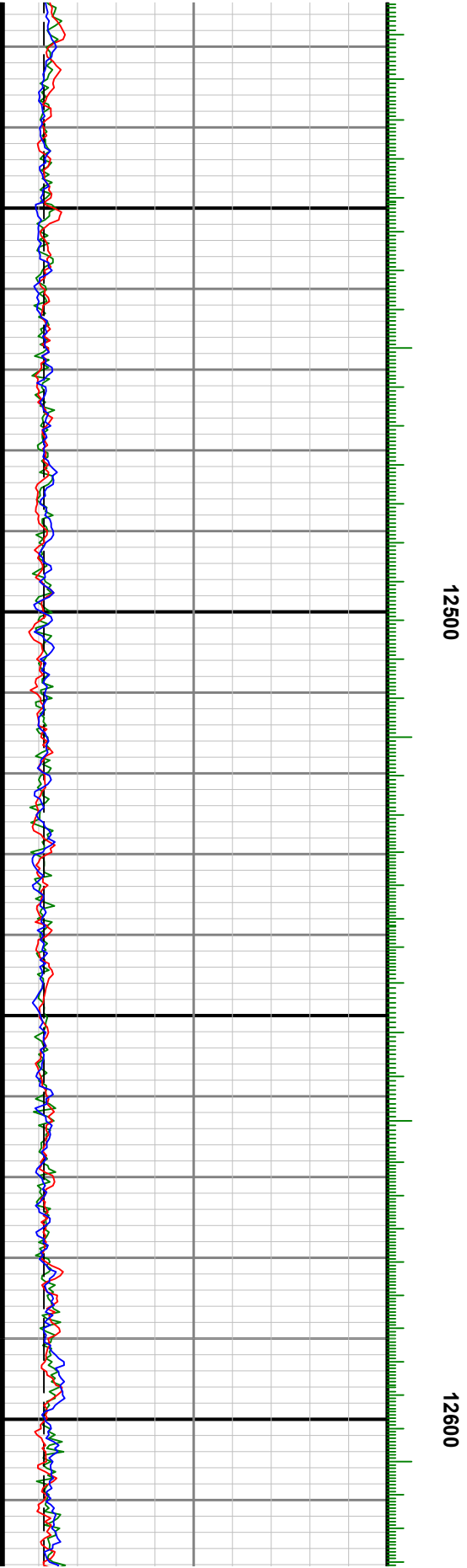


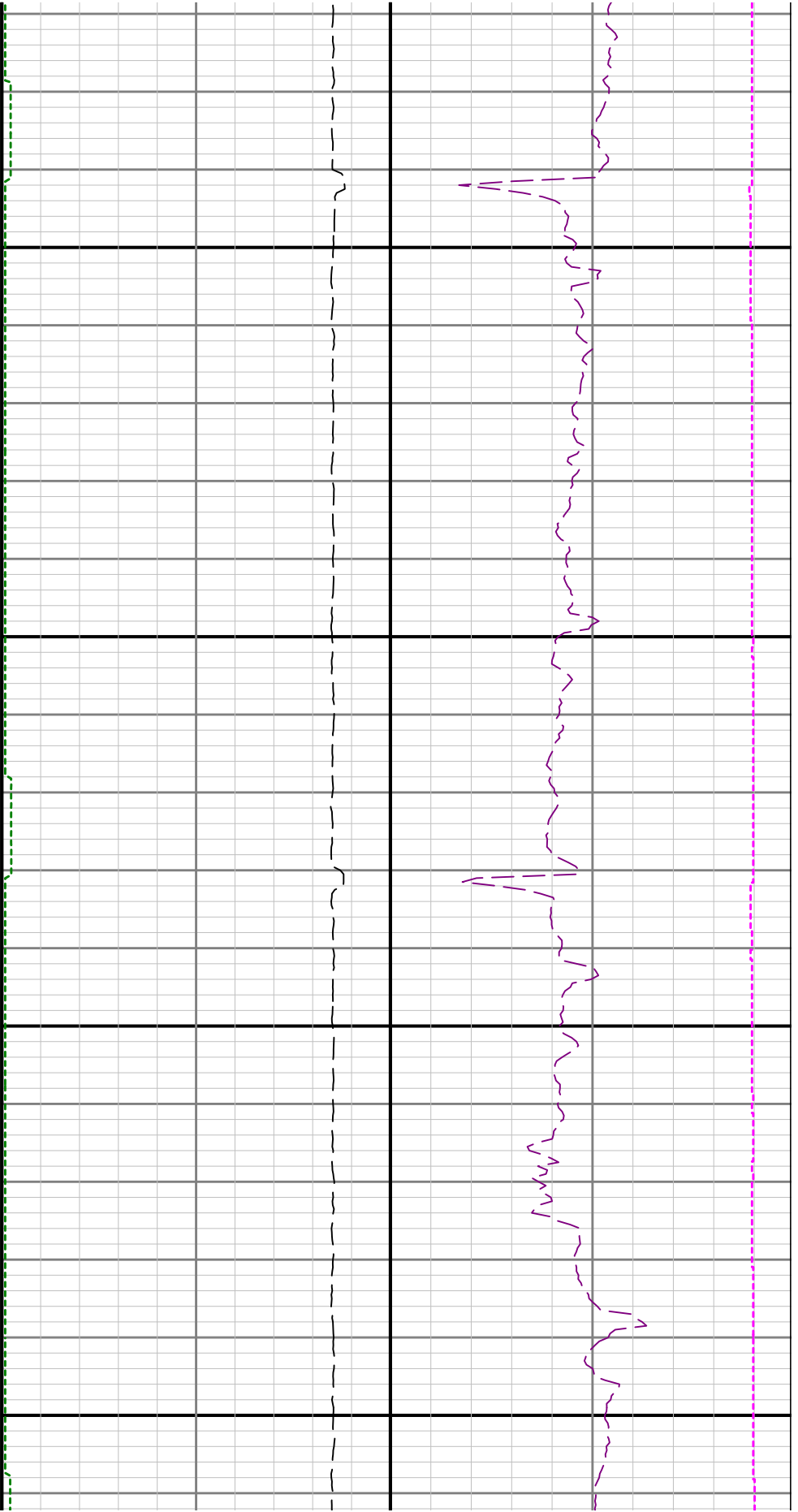
12100

12200









12700

12800

