



# Gamma Ray

1:240 MD	Well:	Raindance FD 20-242HN
----------	-------	-----------------------

**Depth Reference:**

Driller's Depth	County: Weld	Country: United States
-----------------	--------------	------------------------

State: Colorado

Status:	Surface Location:	Other Services
---------	-------------------	----------------

**Final Print**

API No:	€ £ ¢ ¤ ¥ ¦ § ¨ © ª « ¬ ® ¯ ° ± ² ³ ´ µ ¶ · ¸ ¹ º » ¼ ½ ¾	Directional
---------	---	-------------

Job ID: 11111HJ

SEC:	30	TWN:	6N	RGE:	67W
------	----	------	----	------	-----

Permanent Datum (P.D.):	Ground Level	Elevation:	All JEEC	Elev. KB:

Log Measured From:	Rig Floor	Above P.D.	AGEE€A€	Elav G1

Dates	Interval Logged	Magnetic Field Reference
1997-01-01	1000	1000
1997-01-02	1000	1000
1997-01-03	1000	1000
1997-01-04	1000	1000
1997-01-05	1000	1000
1997-01-06	1000	1000
1997-01-07	1000	1000
1997-01-08	1000	1000
1997-01-09	1000	1000
1997-01-10	1000	1000
1997-01-11	1000	1000
1997-01-12	1000	1000
1997-01-13	1000	1000
1997-01-14	1000	1000
1997-01-15	1000	1000
1997-01-16	1000	1000
1997-01-17	1000	1000
1997-01-18	1000	1000
1997-01-19	1000	1000
1997-01-20	1000	1000
1997-01-21	1000	1000
1997-01-22	1000	1000
1997-01-23	1000	1000
1997-01-24	1000	1000
1997-01-25	1000	1000
1997-01-26	1000	1000
1997-01-27	1000	1000
1997-01-28	1000	1000
1997-01-29	1000	1000
1997-01-30	1000	1000
1997-01-31	1000	1000
1997-02-01	1000	1000
1997-02-02	1000	1000
1997-02-03	1000	1000
1997-02-04	1000	1000
1997-02-05	1000	1000
1997-02-06	1000	1000
1997-02-07	1000	1000
1997-02-08	1000	1000
1997-02-09	1000	1000
1997-02-10	1000	1000
1997-02-11	1000	1000
1997-02-12	1000	1000
1997-02-13	1000	1000
1997-02-14	1000	1000
1997-02-15	1000	1000
1997-02-16	1000	1000
1997-02-17	1000	1000
1997-02-18	1000	1000
1997-02-19	1000	1000
1997-02-20	1000	1000
1997-02-21	1000	1000
1997-02-22	1000	1000
1997-02-23	1000	1000
1997-02-24	1000	1000
1997-02-25	1000	1000
1997-02-26	1000	1000
1997-02-27	1000	1000
1997-02-28	1000	1000
1997-02-29	1000	1000
1997-03-01	1000	1000
1997-03-02	1000	1000
1997-03-03	1000	1000
1997-03-04	1000	1000
1997-03-05	1000	1000
1997-03-06	1000	1000
1997-03-07	1000	1000
1997-03-08	1000	1000
1997-03-09	1000	1000
1997-03-10	1000	1000
1997-03-11	1000	1000
1997-03-12	1000	1000
1997-03-13	1000	1000
1997-03-14	1000	1000
1997-03-15	1000	1000
1997-03-16	1000	1000
1997-03-17	1000	1000
1997-03-18	1000	1000
1997-03-19	1000	1000
1997-03-20	1000	1000
1997-03-21	1000	1000
1997-03-22	1000	1000
1997-03-23	1000	1000
1997-03-24	1000	1000
1997-03-25	1000	1000
1997-03-26	1000	1000
1997-03-27	1000	1000
1997-03-28	1000	1000
1997-03-29	1000	1000
1997-03-30	1000	1000
1997-03-31	1000	1000
1997-04-01	1000	1000
1997-04-02	1000	1000
1997-04-03	1000	1000
19		

Date From:	2017-07-31	Top: (ft)	1543.00	Azi Reference North:	True	Dip Angle: (deg)	66.85
------------	------------	-----------	---------	----------------------	------	------------------	-------

Date 10:	2017-08-02	Bonnull. (iv)	12030.00	Total Magmatic Field Strength. (iii)	32430
----------	------------	---------------	----------	--------------------------------------	-------

Spud Date:	2017-07-03	Mag to Reference North Correction: (deg)	8.46
------------	------------	--	------

## Borehole Recc

# Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
----------------	-----------	---------	-----------	----------------	-----------	---------

13.500	20.00	1343.00	9.625	36.00	20.00	1333.00
--------	-------	---------	-------	-------	-------	---------

[illegible]



[illegible]

## Mud Record

## Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc   Az (Start)	Inc   Az (End)
------	-----------	---------	----------------	---------------	------------------	----------------

Oil Based Mud	1543.00	12/03.00	8.500	11160.00	0.10	23/.60	90.65	91.07
---------------	---------	----------	-------	----------	------	--------	-------	-------

[illegible][illegible][illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Acquisition System	Software Version
...	...

Baker Hughes Cadence

RT4.1

## Plot Studio

Rig: PD 460

Contractor: Precision Drilling

#### 4.1.7763.3

"These interpretations and analyses ("Interpretations") are opinions provided by Baker Hughes Oilfield Operations, Inc ("Baker Hughes"), based upon industry practice, empirical relationships, assumptions and measurements, (many of which may be provided by the customer). The Interpretations are not infallible and may be subject to different opinions. Vjwu."Dcmgt"JwiJgu"fqgu"pqv"ycttcpv"vjgkt"ceewtce{"."eqttgevpguu."qt"eqorngvgpguu."qt"vjcv"vjg"ewuvqogtøu"cpflqt"cp{"vjktf"rctv{øu"tgnkcpeg"qp"uwej"Kpvgtrtgvcvkqpu"yknn"ceeqornkuj"cp{"rctvkewnct"tguwnvu0"Vjg"ewuvqogt"cuuwogu"hwnn"responsibility for the use of the Interpretations and for decisions based thereon and the customer agrees to release, defend and indemnify Baker Hughes, its parent, subsidiaries and affiliated or related entities, and subcontractors, together with its and their officers, directors, employees, agents and invitees against, any and all claims, losses, damages, or expenses sustained by the customer or any third party arising out of reliance upon or use of the Interpretations, without regard to the cause(s) thereof, including without limitation any form of negligence on the part of Baker Hughes. Unless other contract terms have been agreed to by the parties, each party's liabilities and qdnkicvkqpu"ujcnn"dg"iqxgtpgf"d{"Dcmgt"JwiJgu"Kpeqtrgtcvgføu"Yqtnfykfg"Vgtou"cpf"Eqpfkvkqpu0\$""

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
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	3.00	AutoTrak Curve	1543.00	12690.00	1543.00	12703.00	2017-07-31 12:22	2017-08-03 02:30	45.89

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Andrew Clancy	2017-07-31	2017-08-03	Doug Rusco	2017-07-31	2017-08-01	Pierce Lovesee	2017-08-01	2017-08-03

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+ (%)
2017-07-31 19:00	1	3159.00	Oil Based Mud	10.0	53	N/A	16.0	72/28	Suction	23000	0.00
2017-08-01 19:00	1	7987.00	Oil Based Mud	10.0	50	N/A	15.5	74/26	Suction	23000	0.00
2017-08-02 19:00	1	11350.00	Oil Based Mud	10.0	53	N/A	15.3	74/26	Suction	23000	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	ATC_SU	1492928	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_SU	1492928	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_MWD	12398256	Gamma (single)	2.74	12.90	7.000	3.250
1	ATC_MWD	12398256	Directional (mag)	12.26	22.42	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
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 were 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	Corrosion rate (CR) is calculated as 0.0001 in/yr. This is based on a weight loss of 0.0001 lb/ft² over a period of 12703 feet MD (1542 to 7080 feet TVD).
3	Gaps in Gamma Ray data are present throughout the log due to downlinking while drilling ahead


Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	6912.00	8.500	1	Weight on Bit (WOBA) is not logged during the interval from 6912 to 7002 feet MD (6365 to 6443 feet TVD) due to relogging gamma

1	6912.00	8.300	1	caused from a surface gear malfunction.
2	12690.00	8.500	1	The interval from 12690 to 12703 feet MD (7080 feet TVD) was not logged due to sensor to bit offset at well TD.

Curve Mnemonics

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



Company

Well

Interval

Created

Great Western

Raindance FD 20-242HN

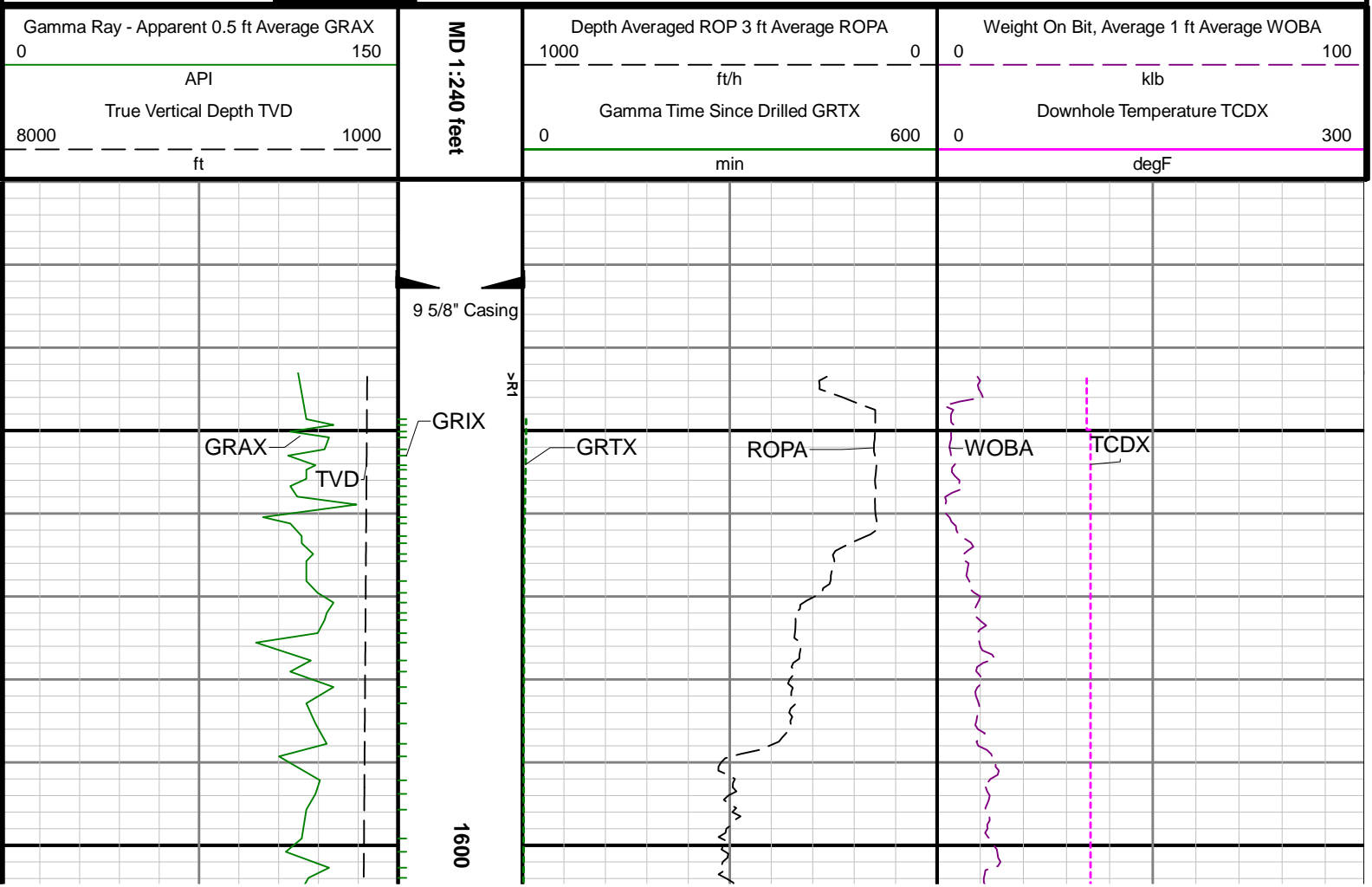
Date From: 2017-07-31 06:22:48

Date To: 2017-08-02 20:24:50

2017-08-03 05:15:08

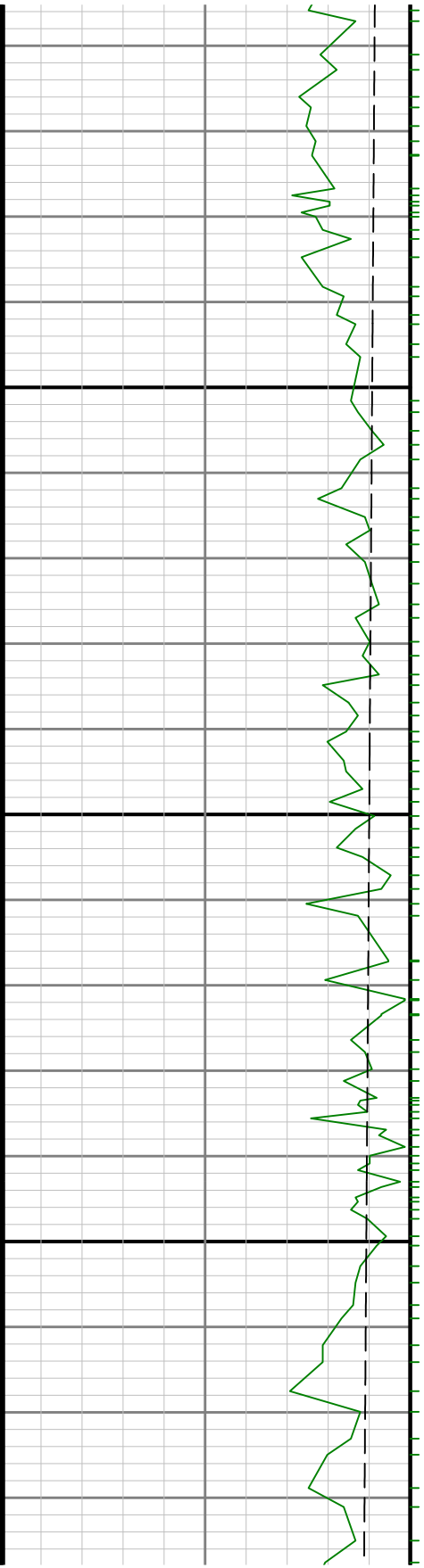
Top: 1543.00

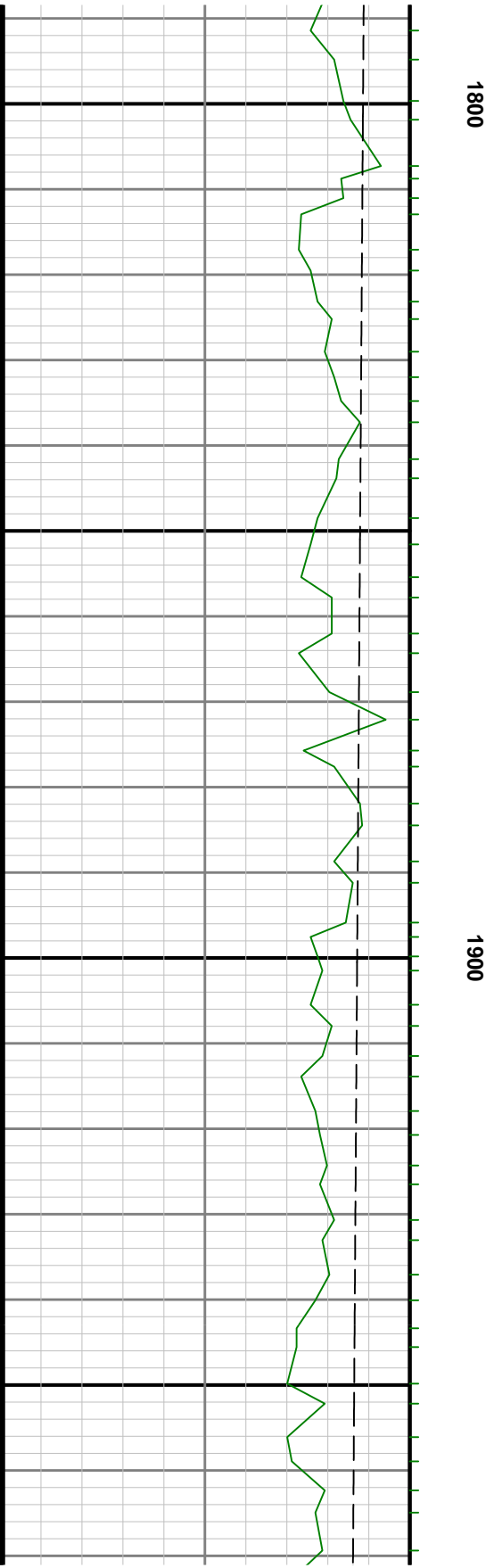
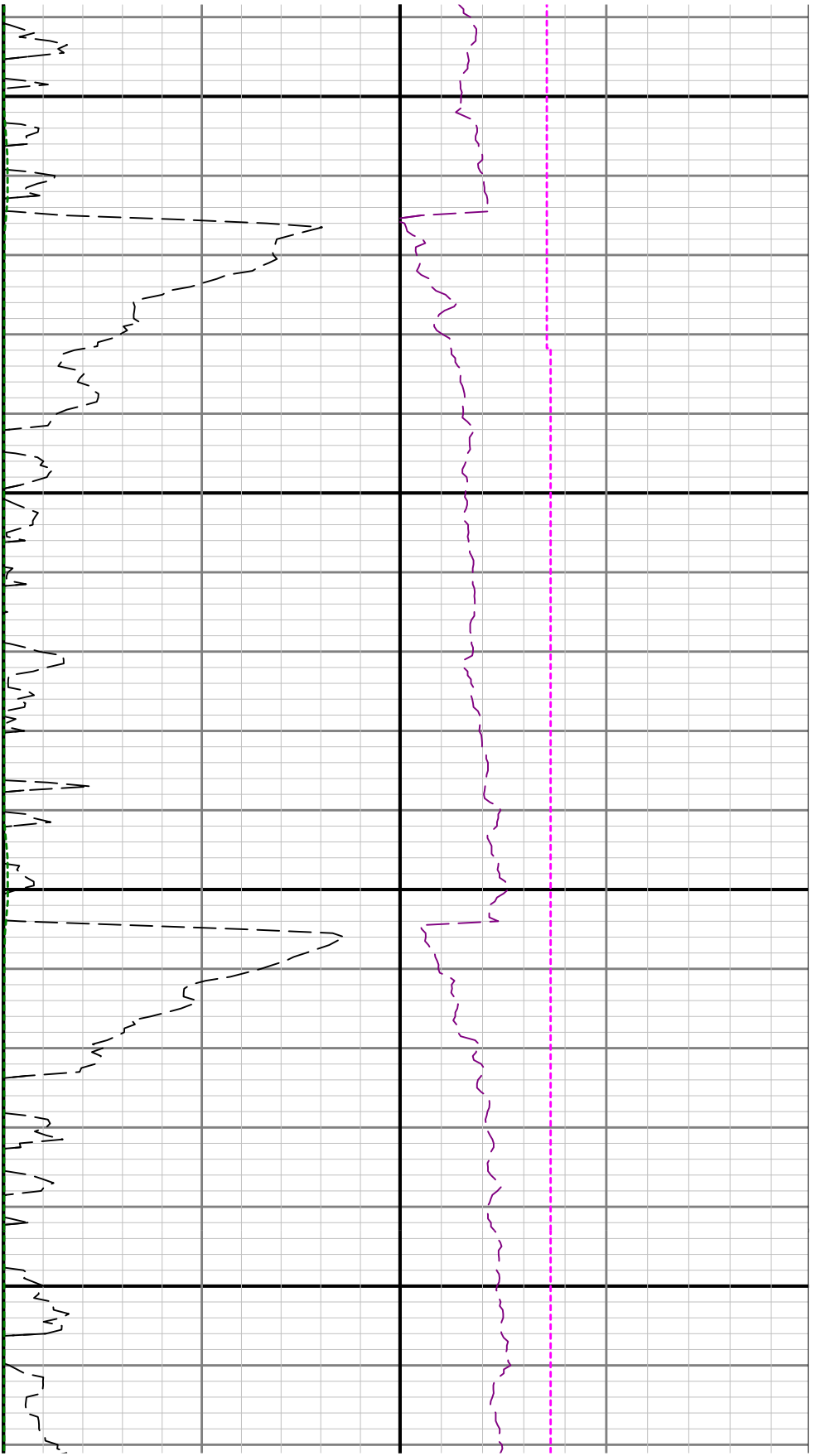
Bottom: 12703.00

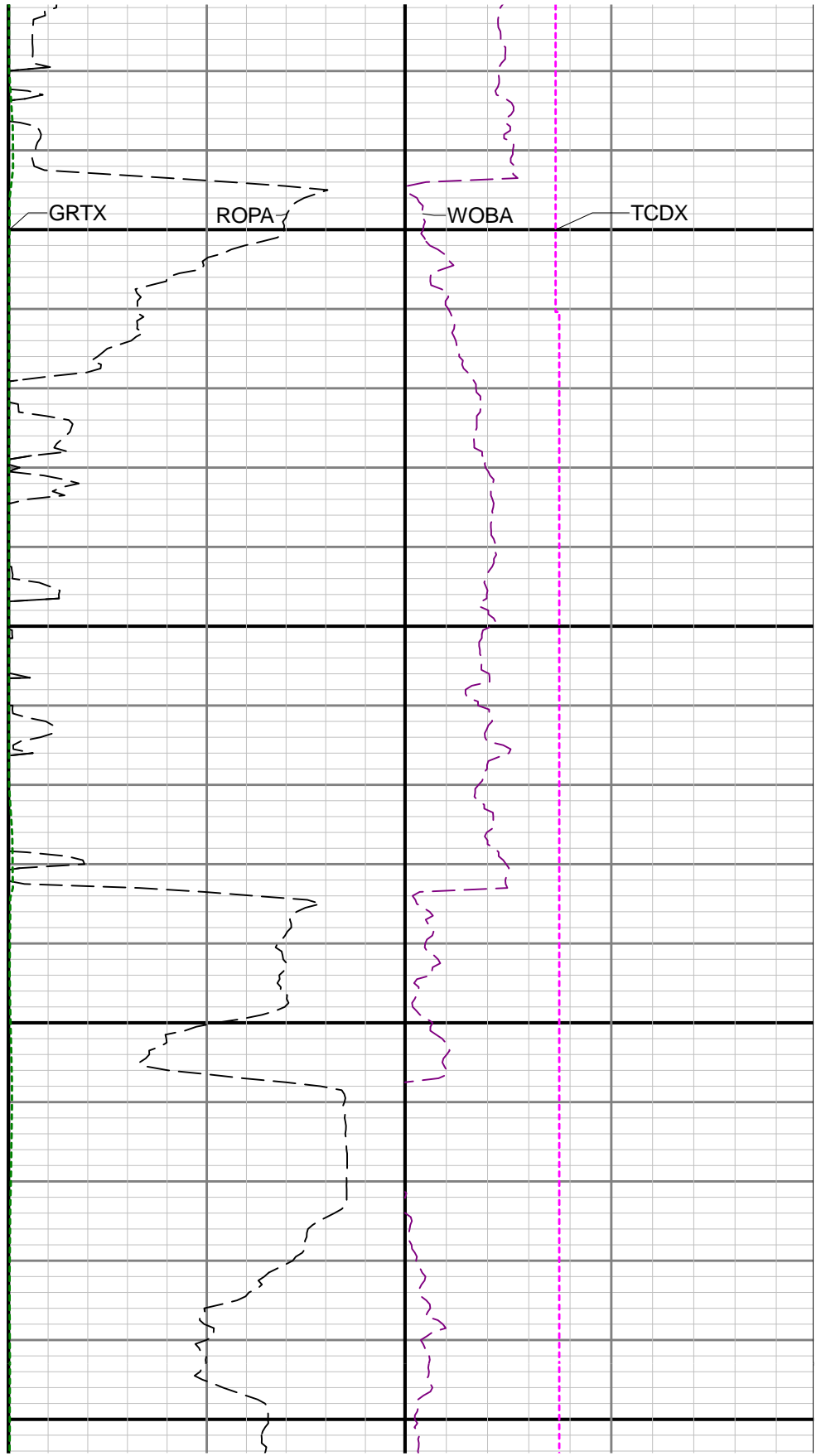
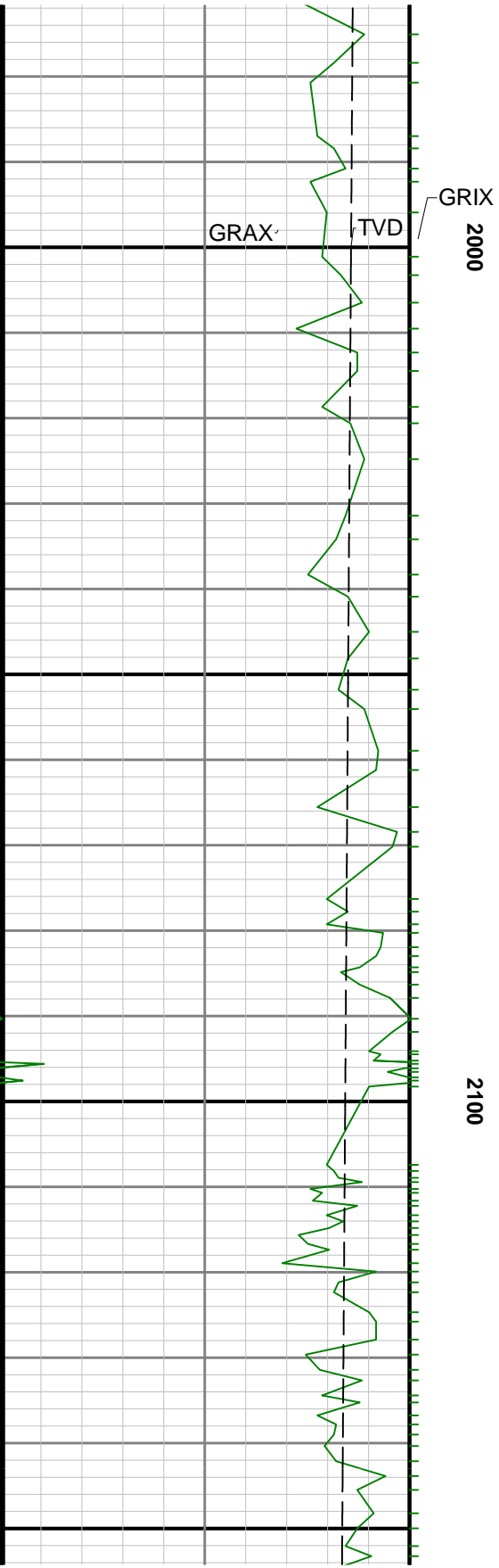


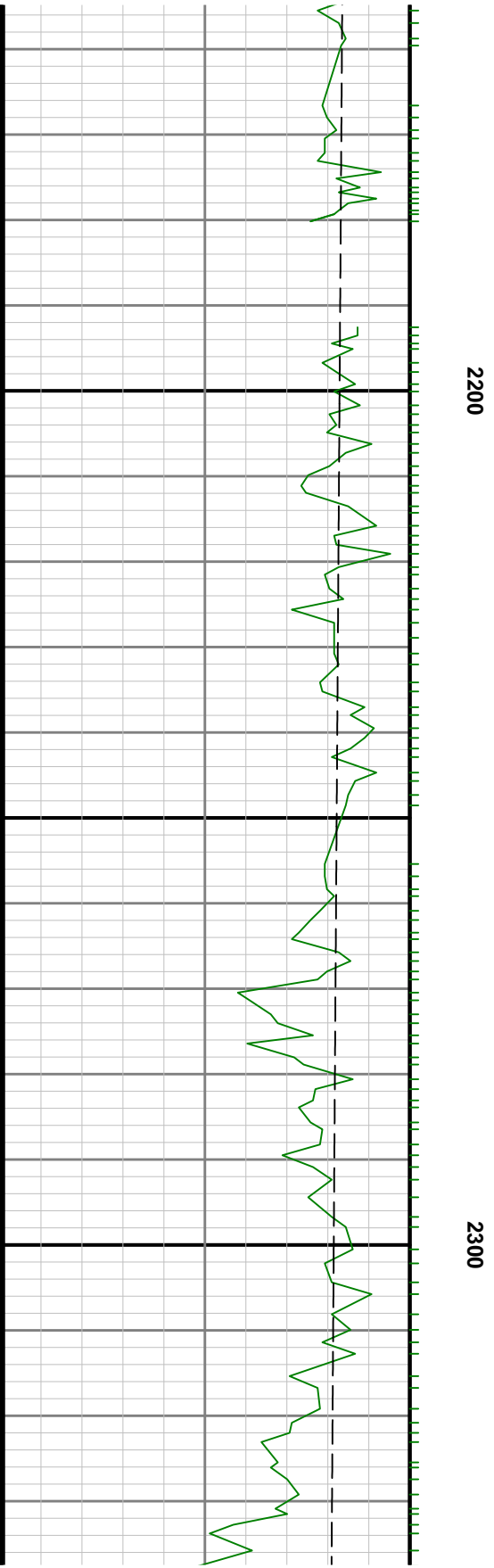
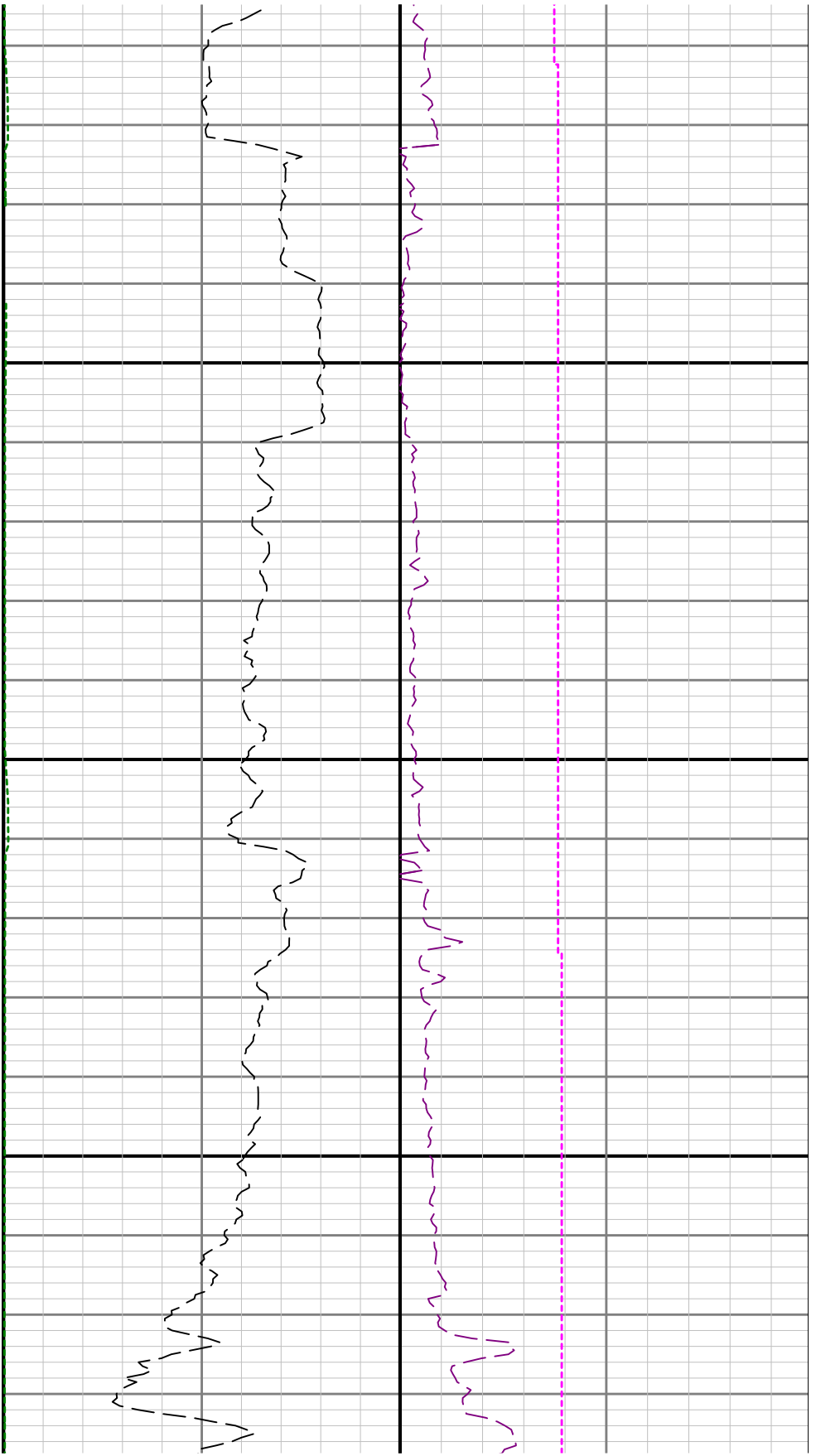


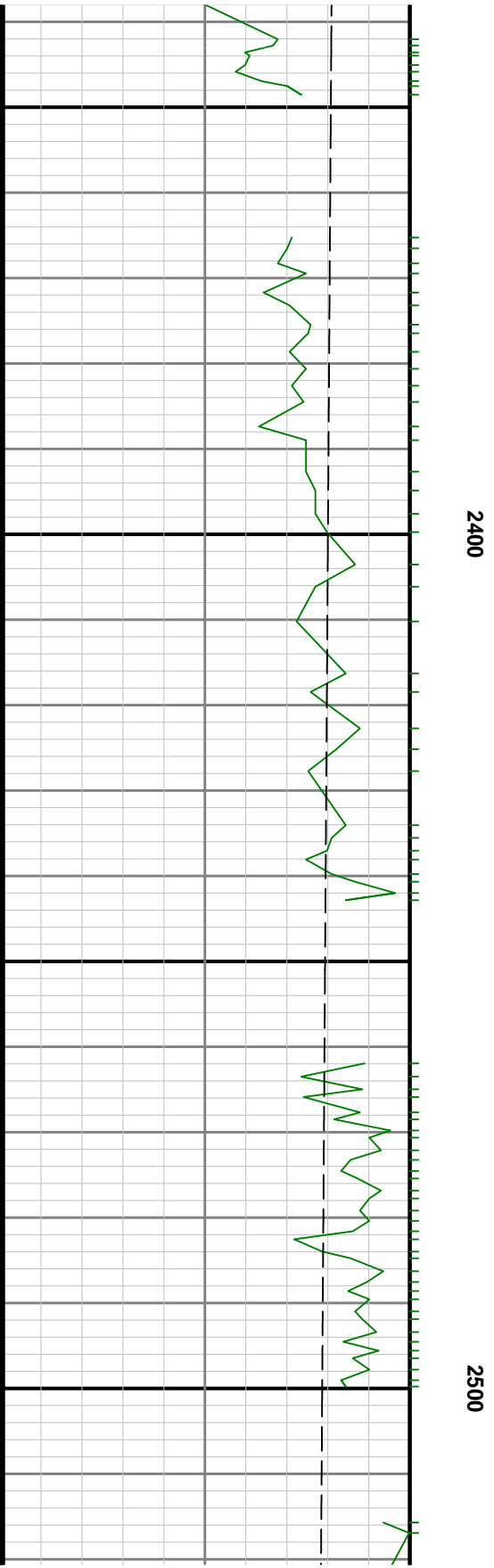
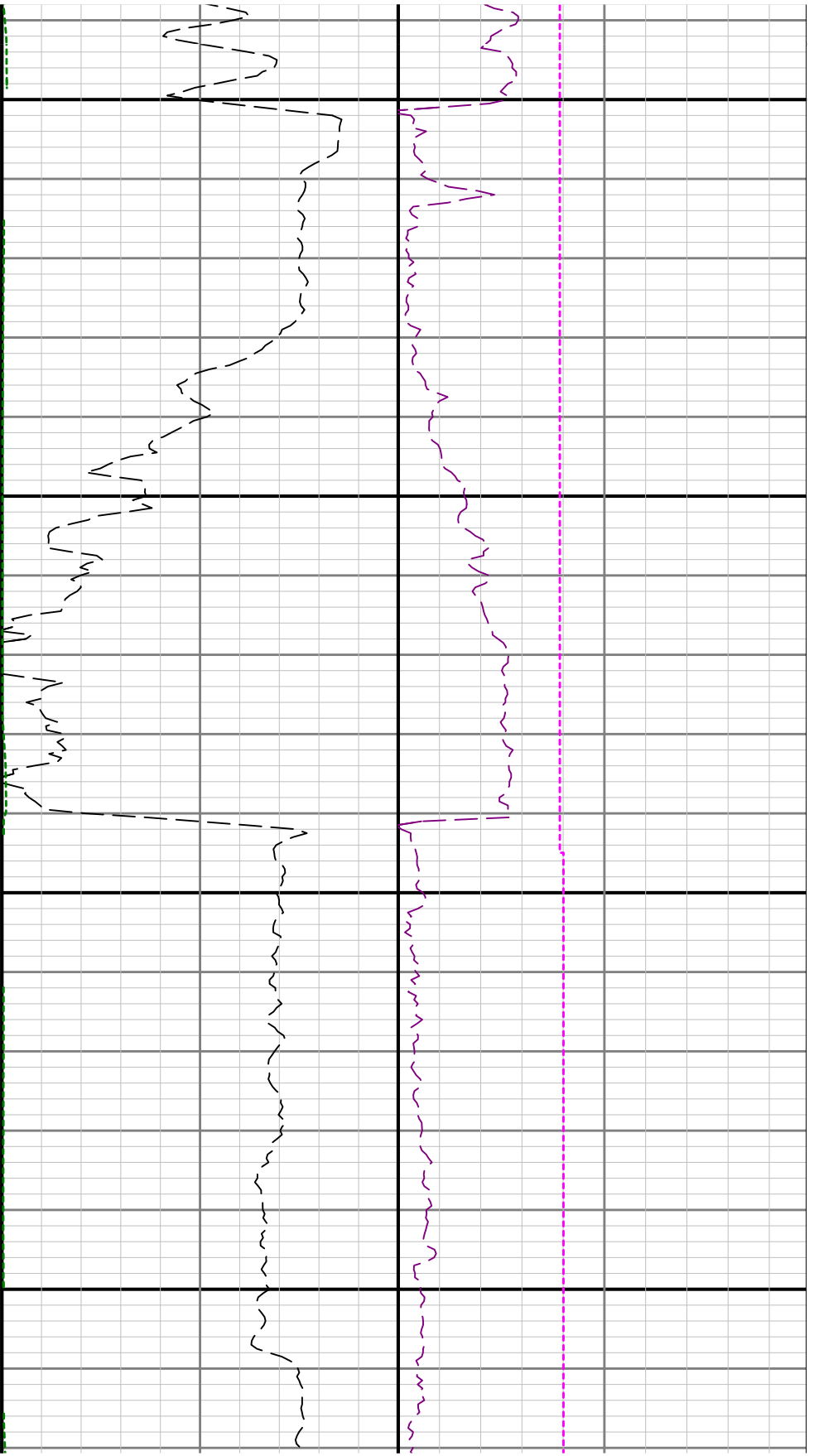
1700

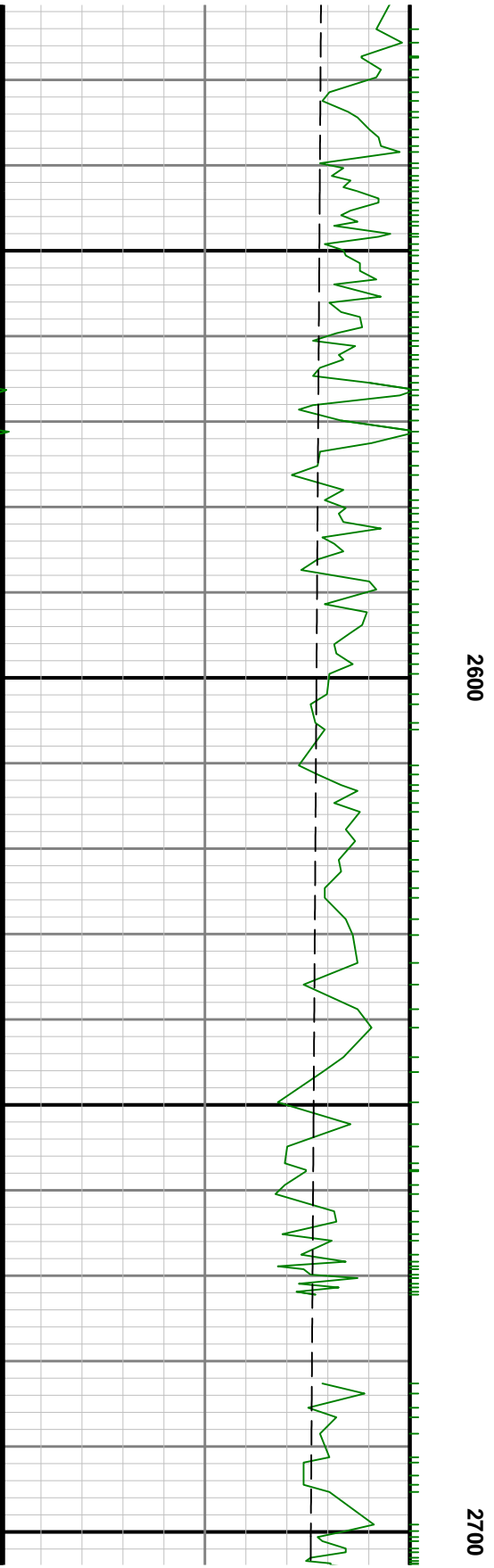
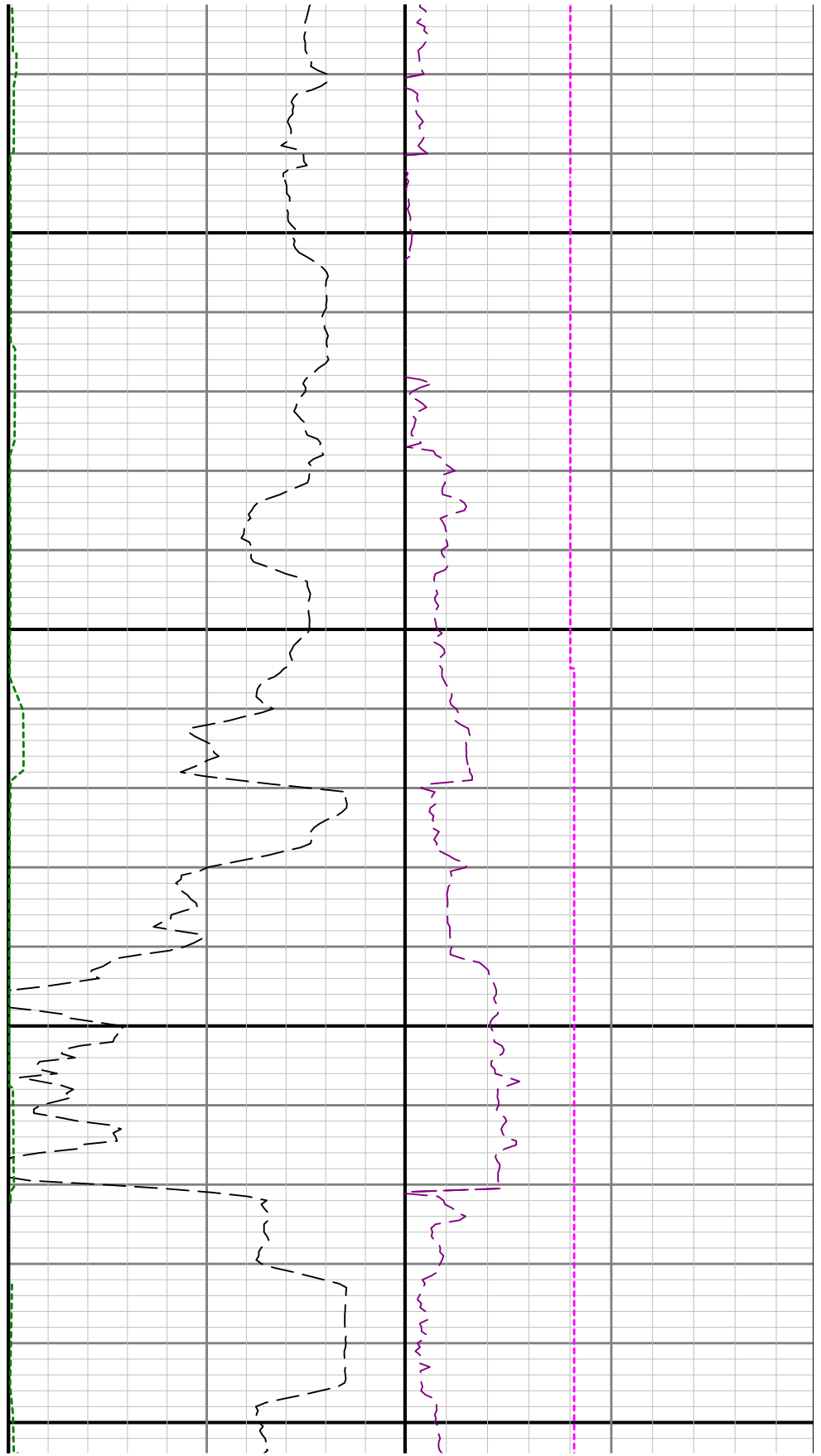


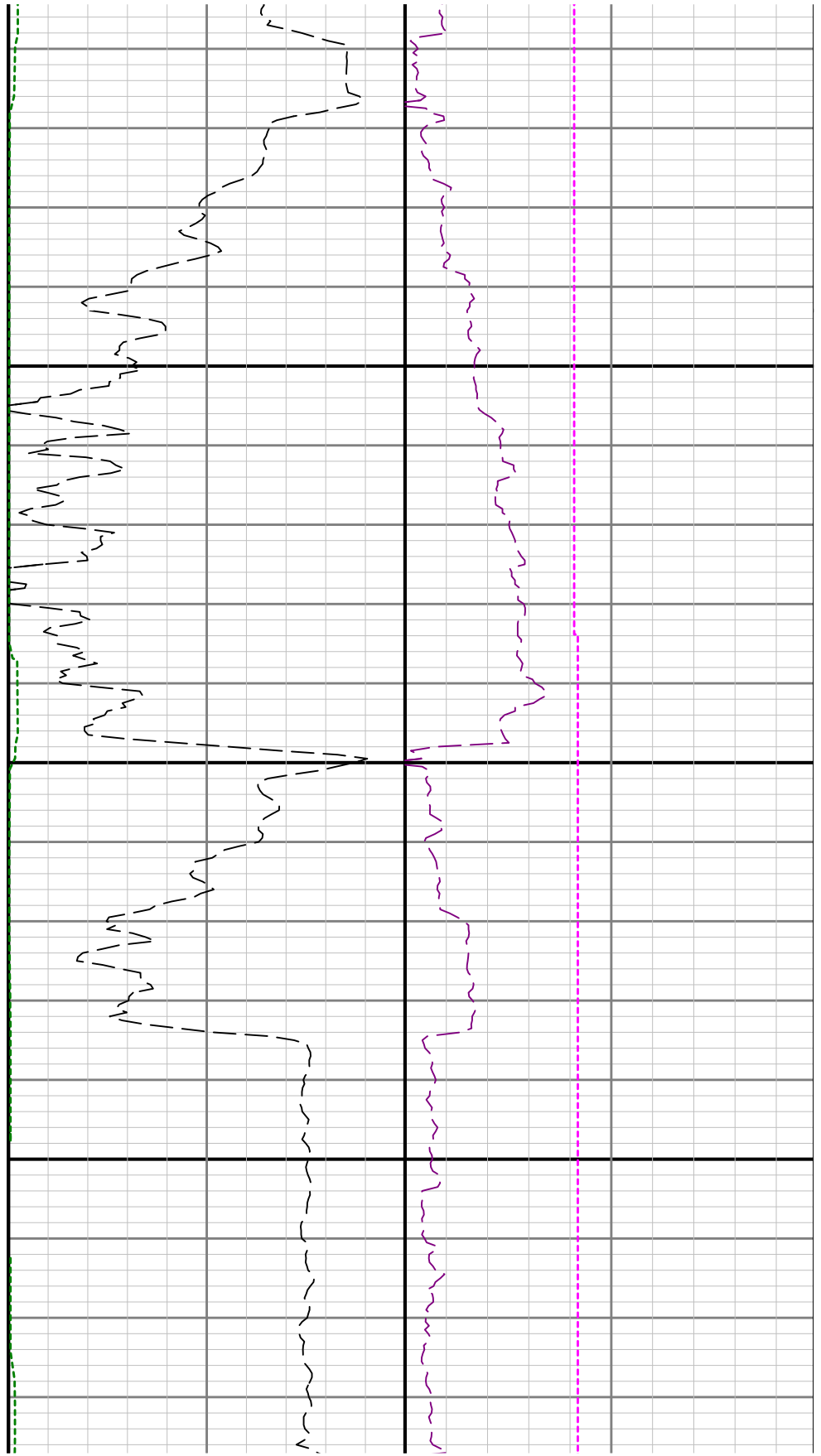




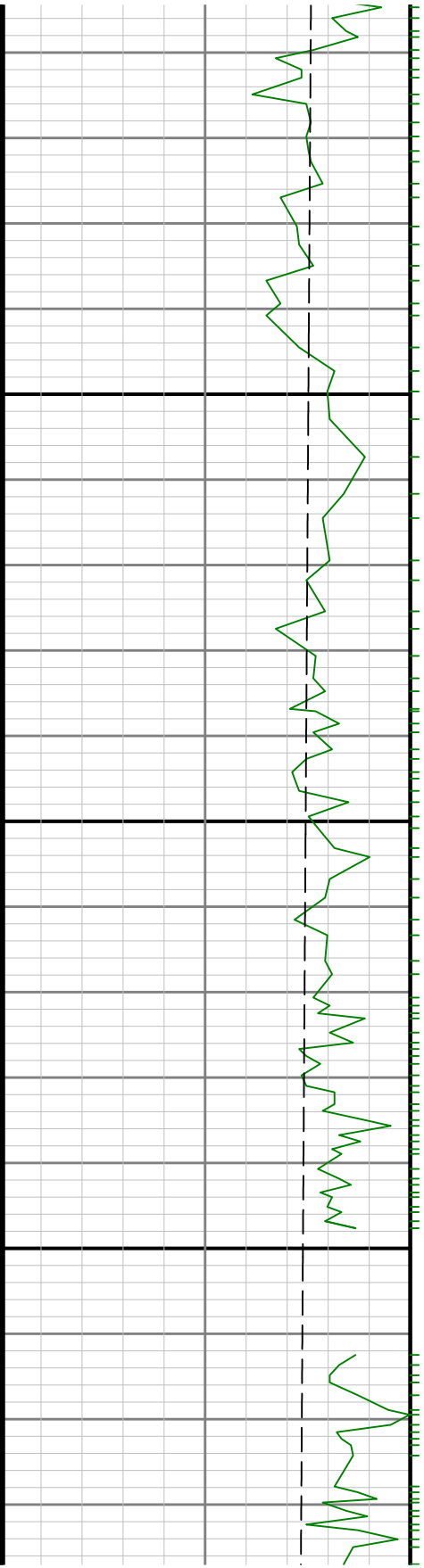


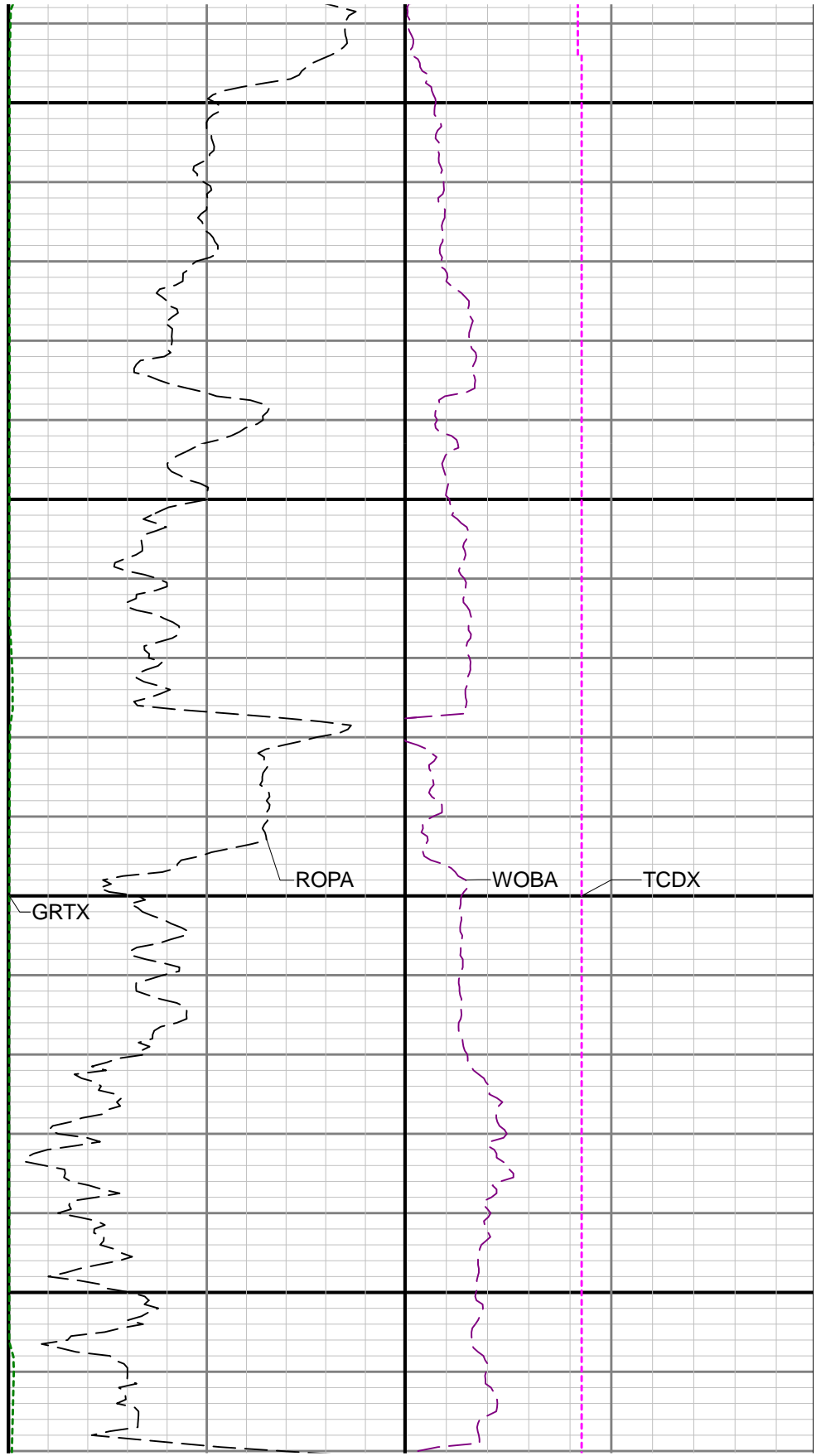
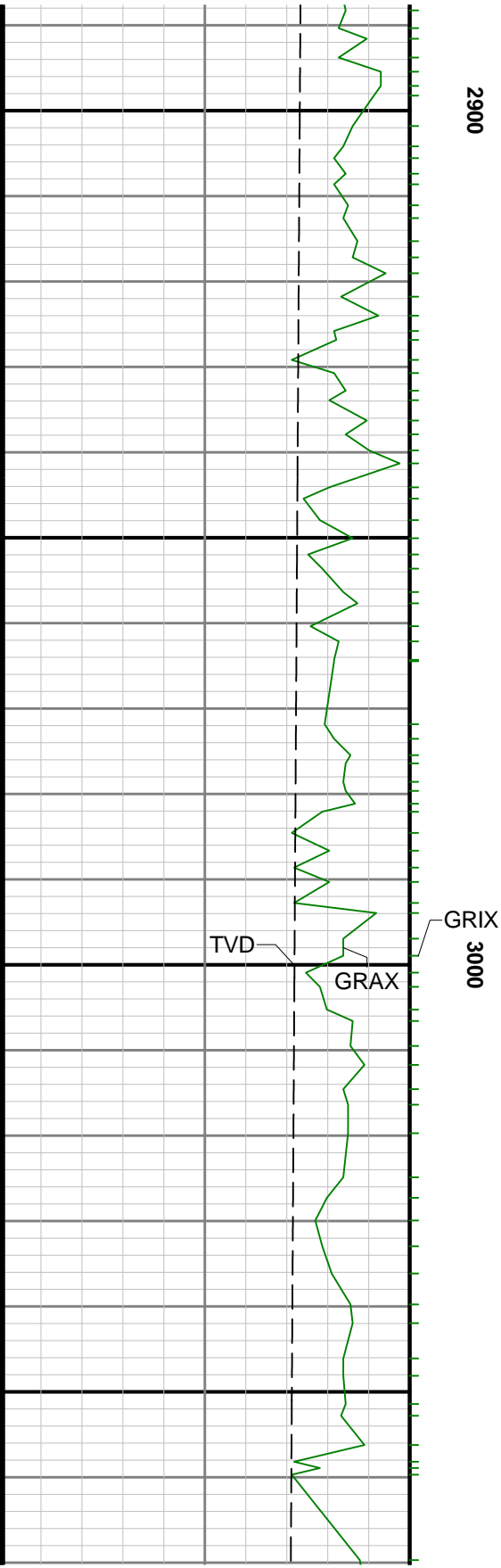


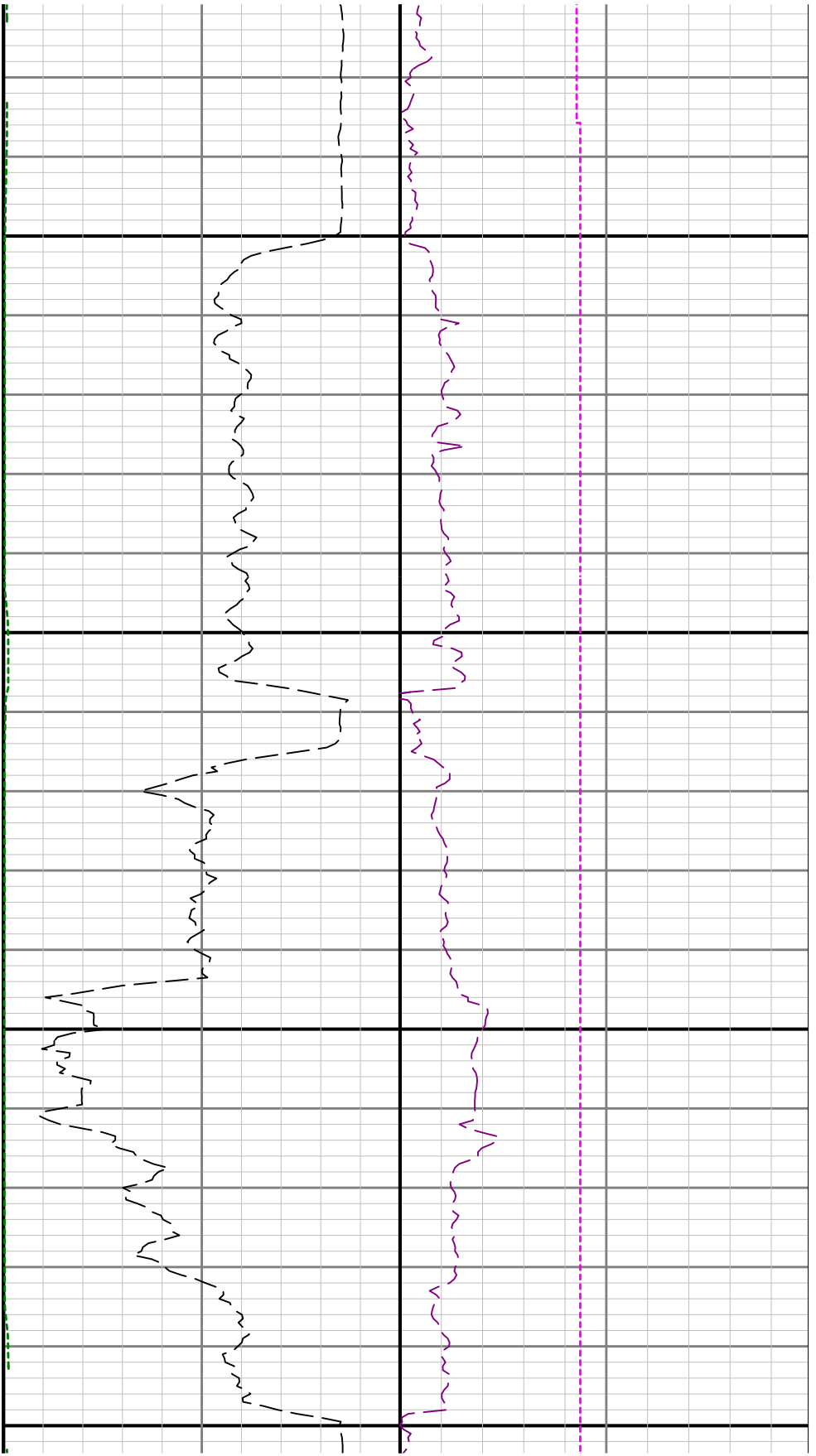




2800

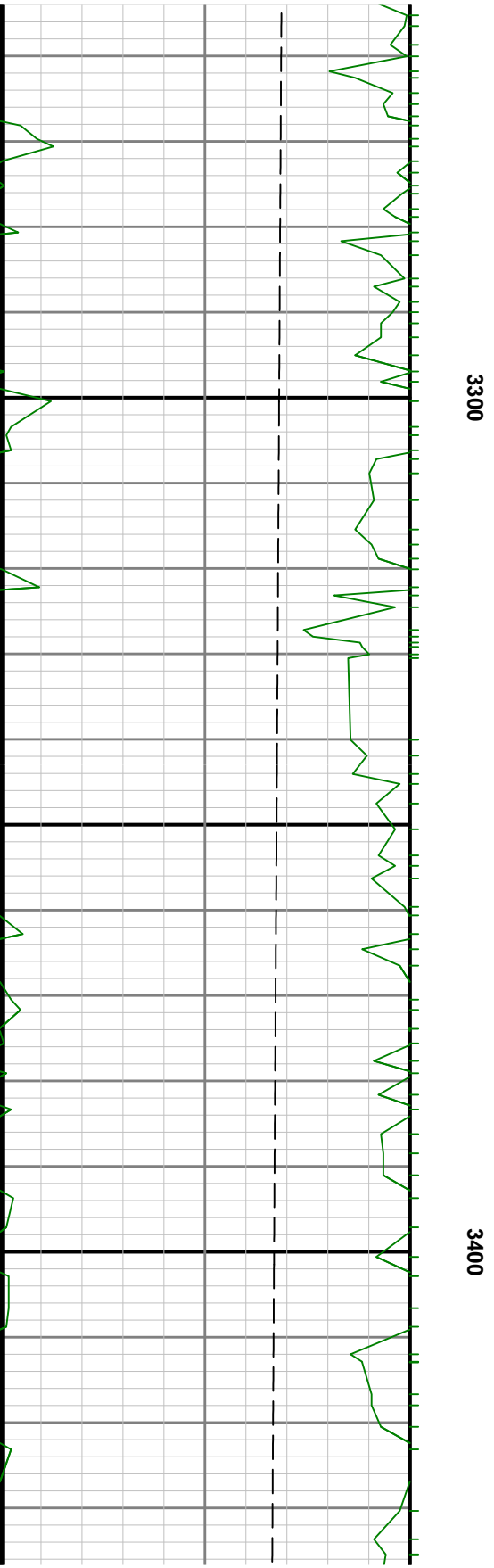
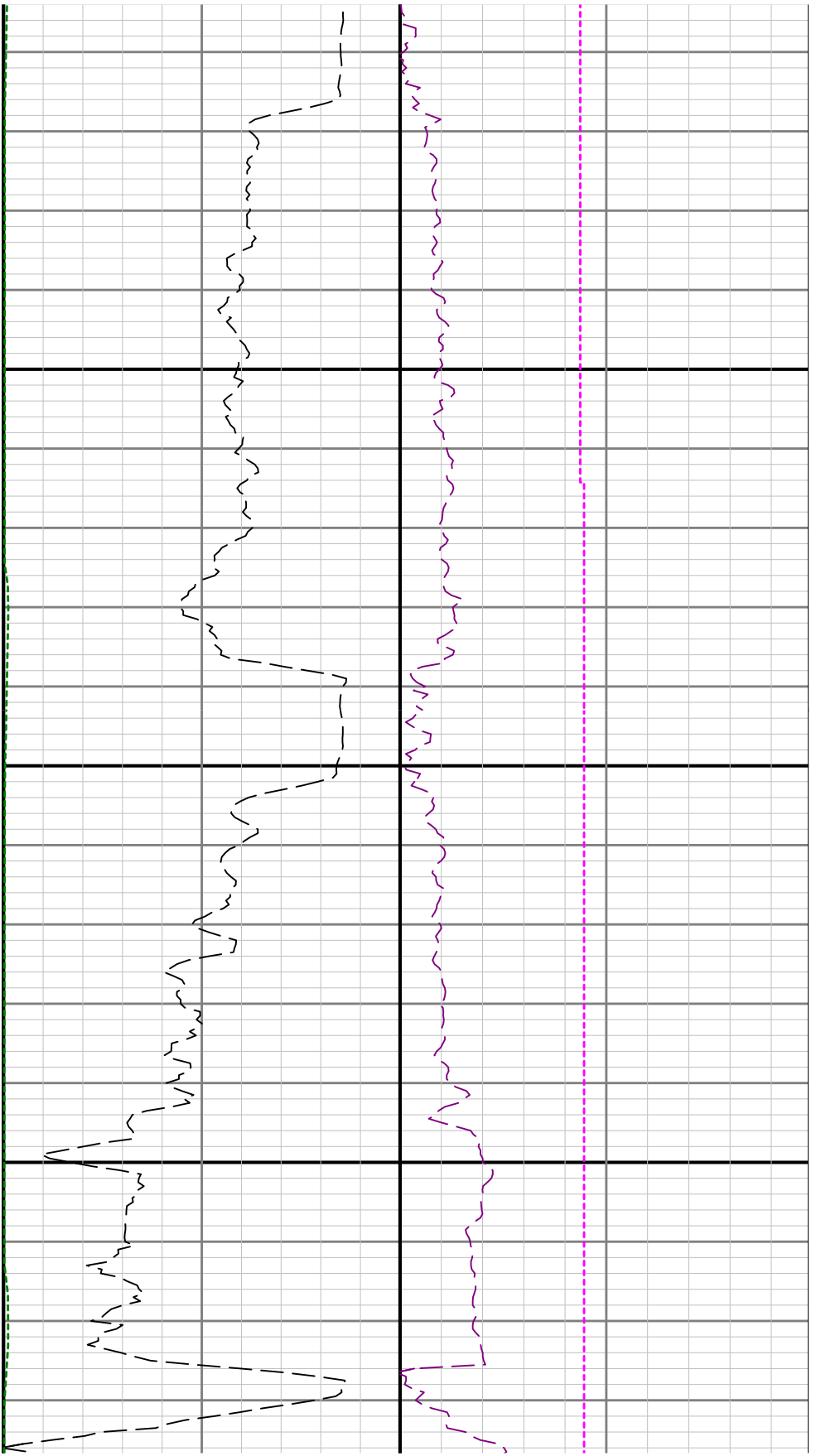


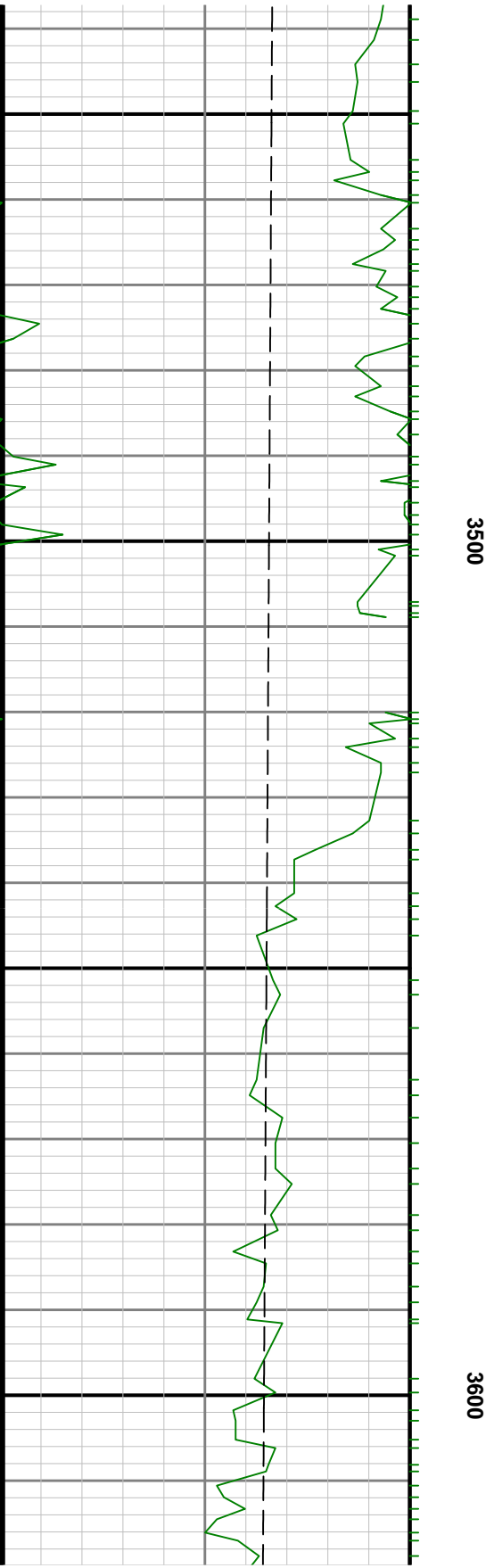
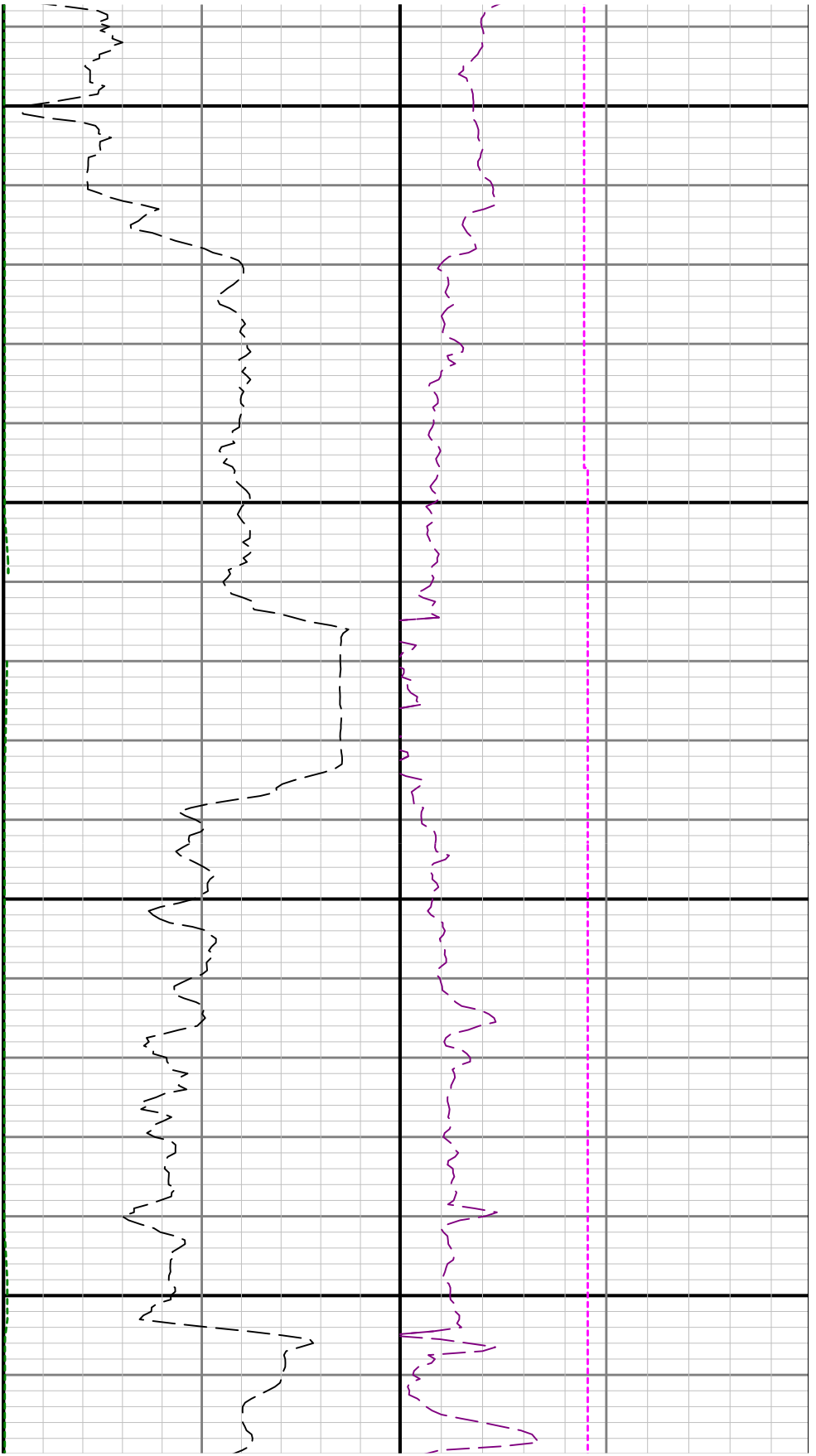


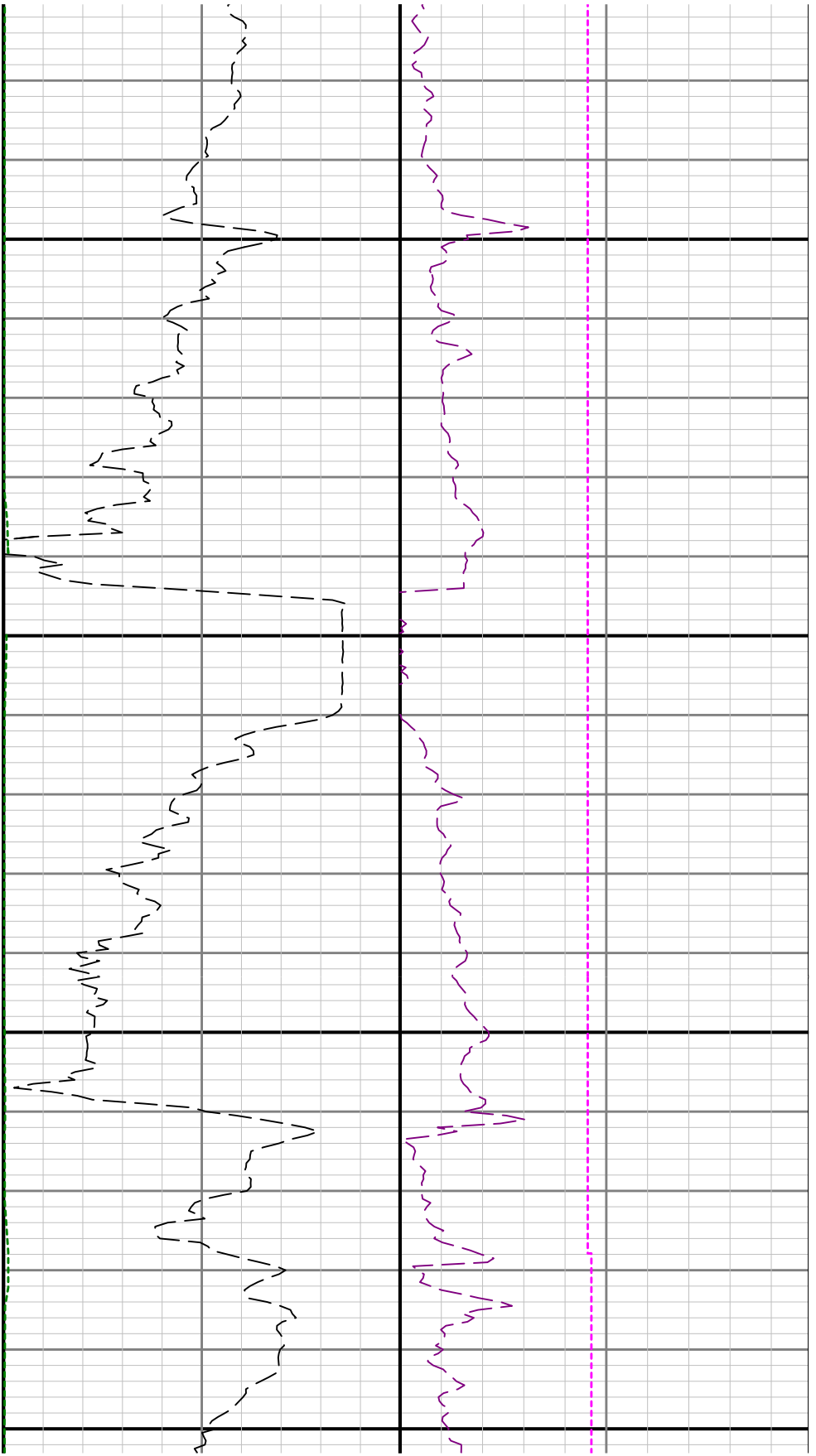


3100

3200

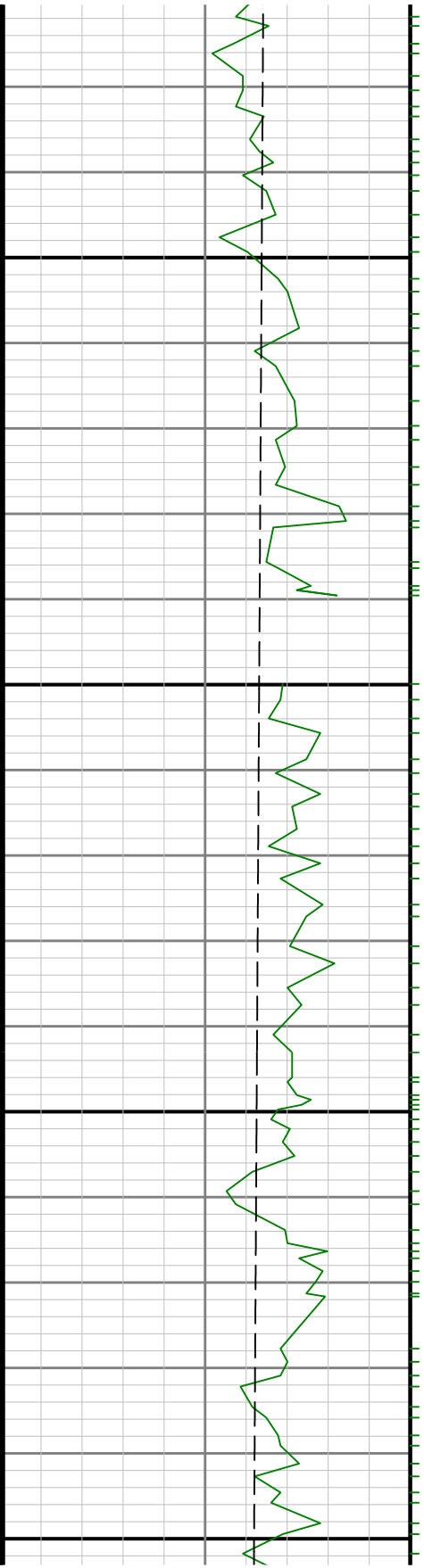


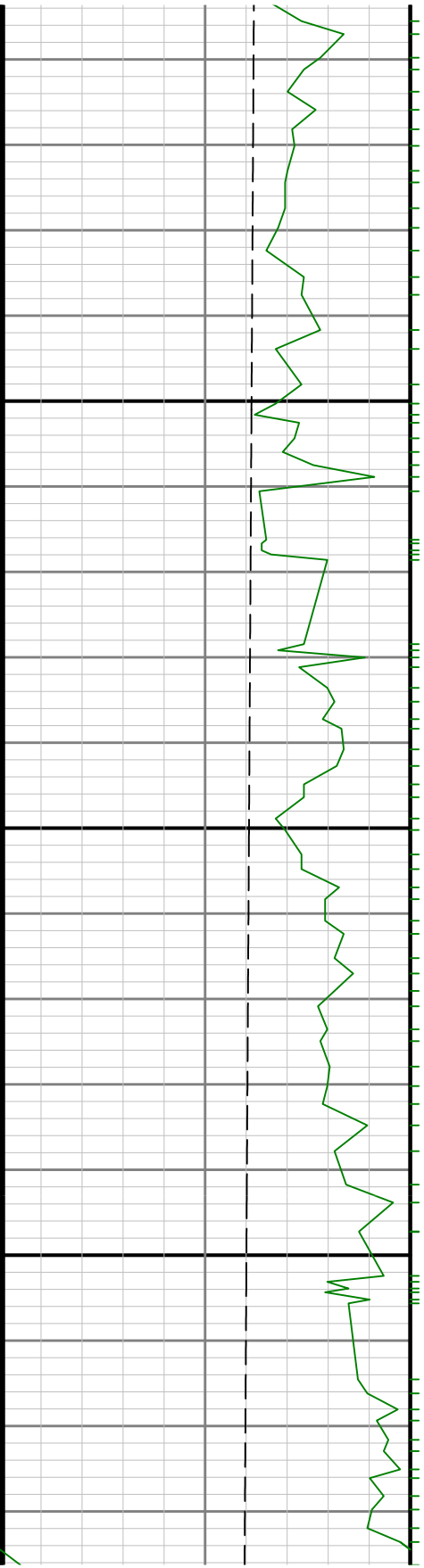




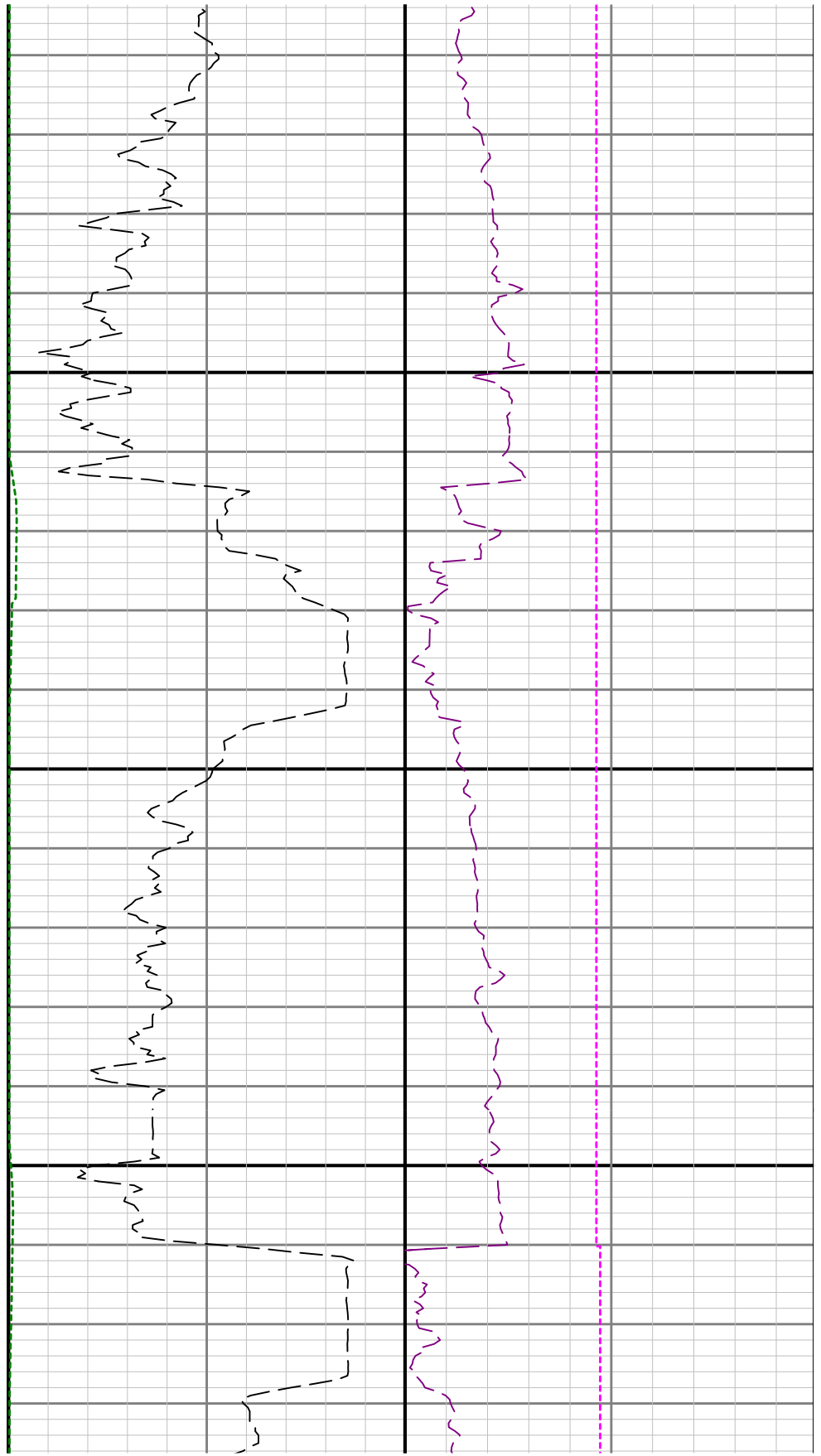
3700

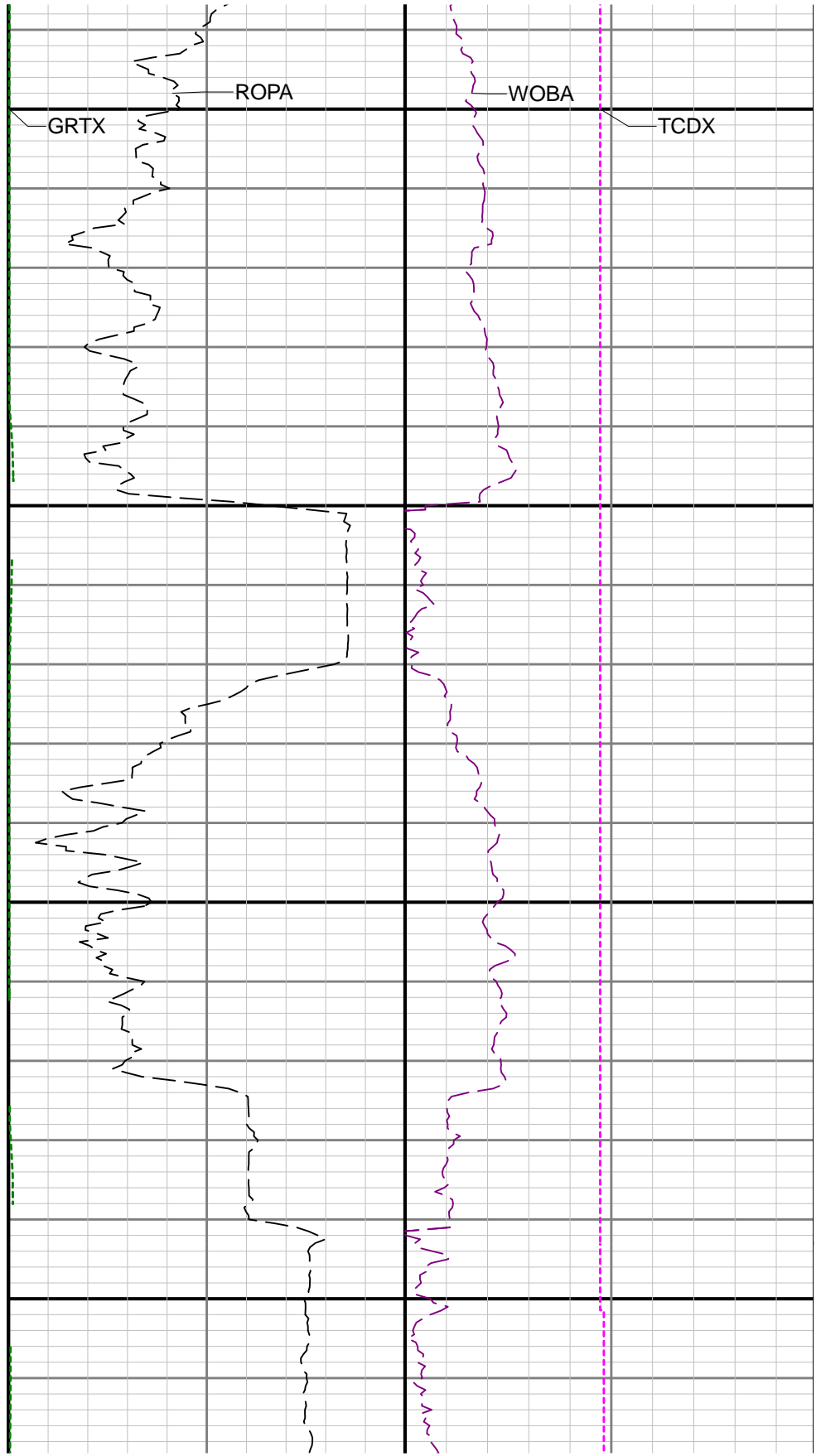
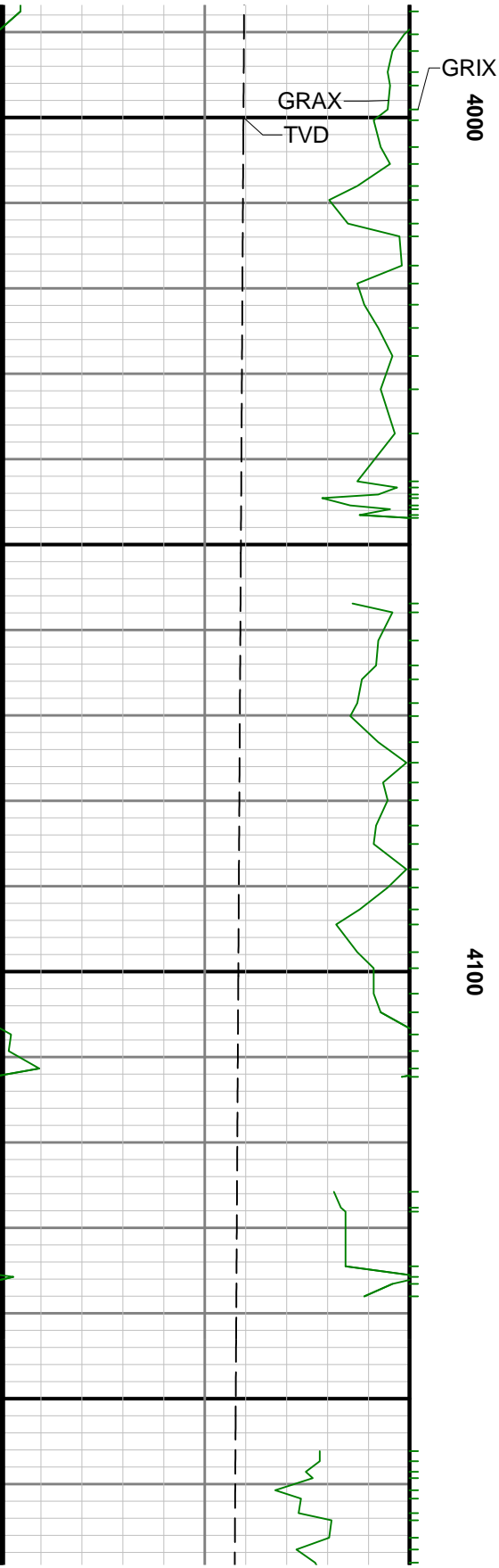
3800

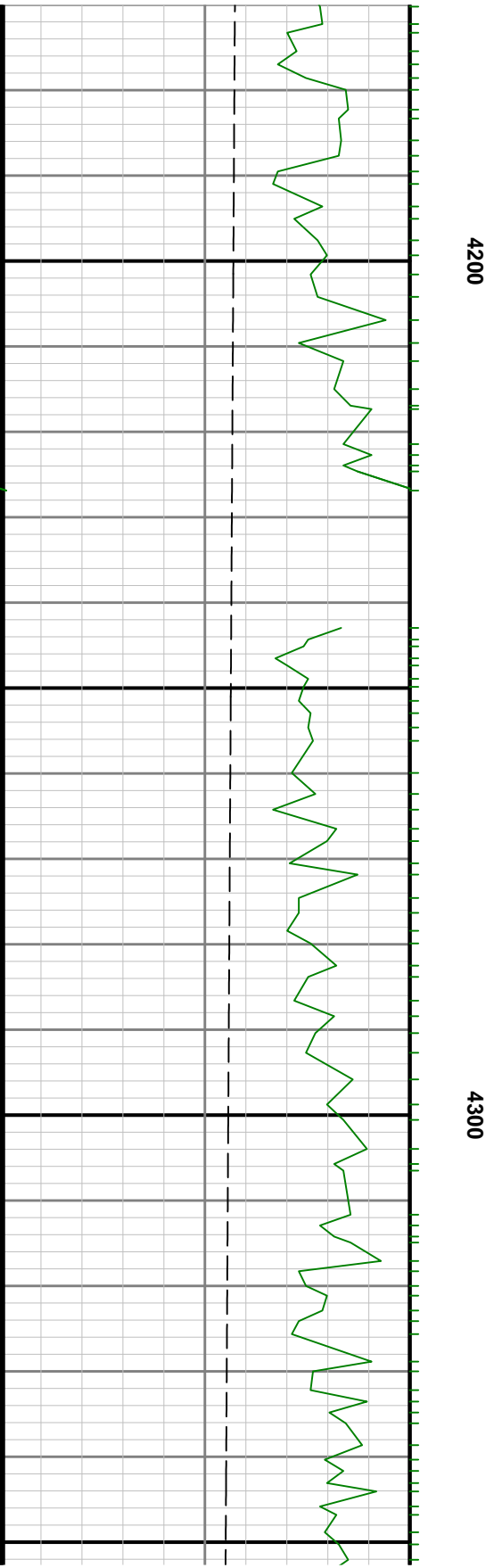
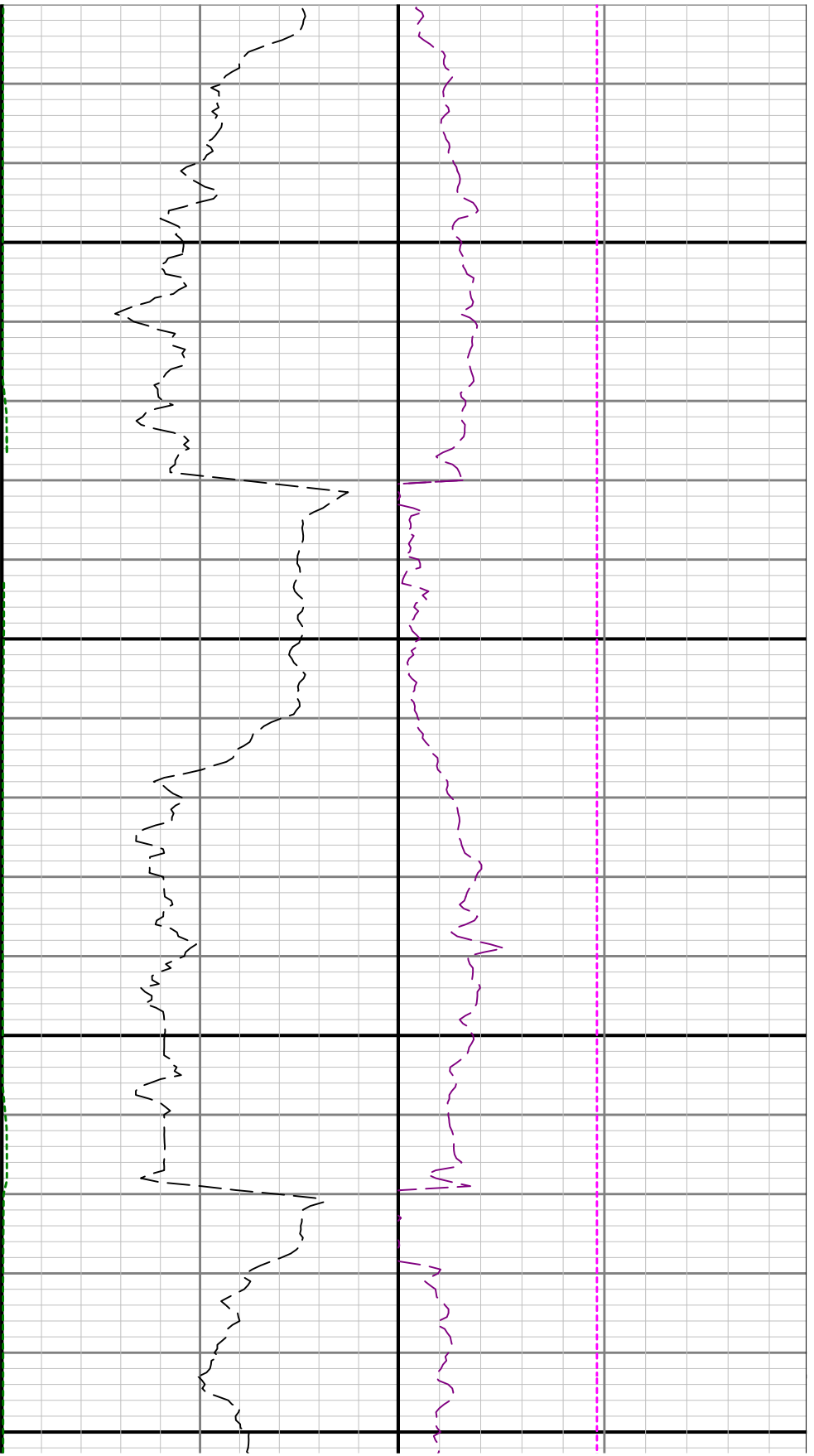


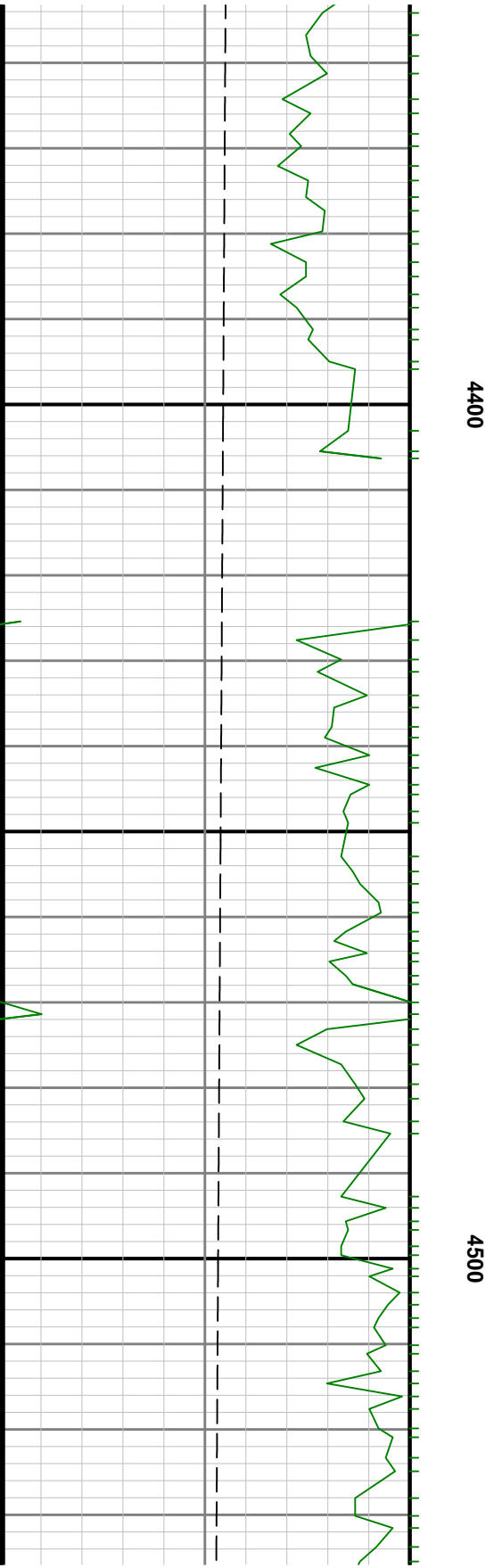
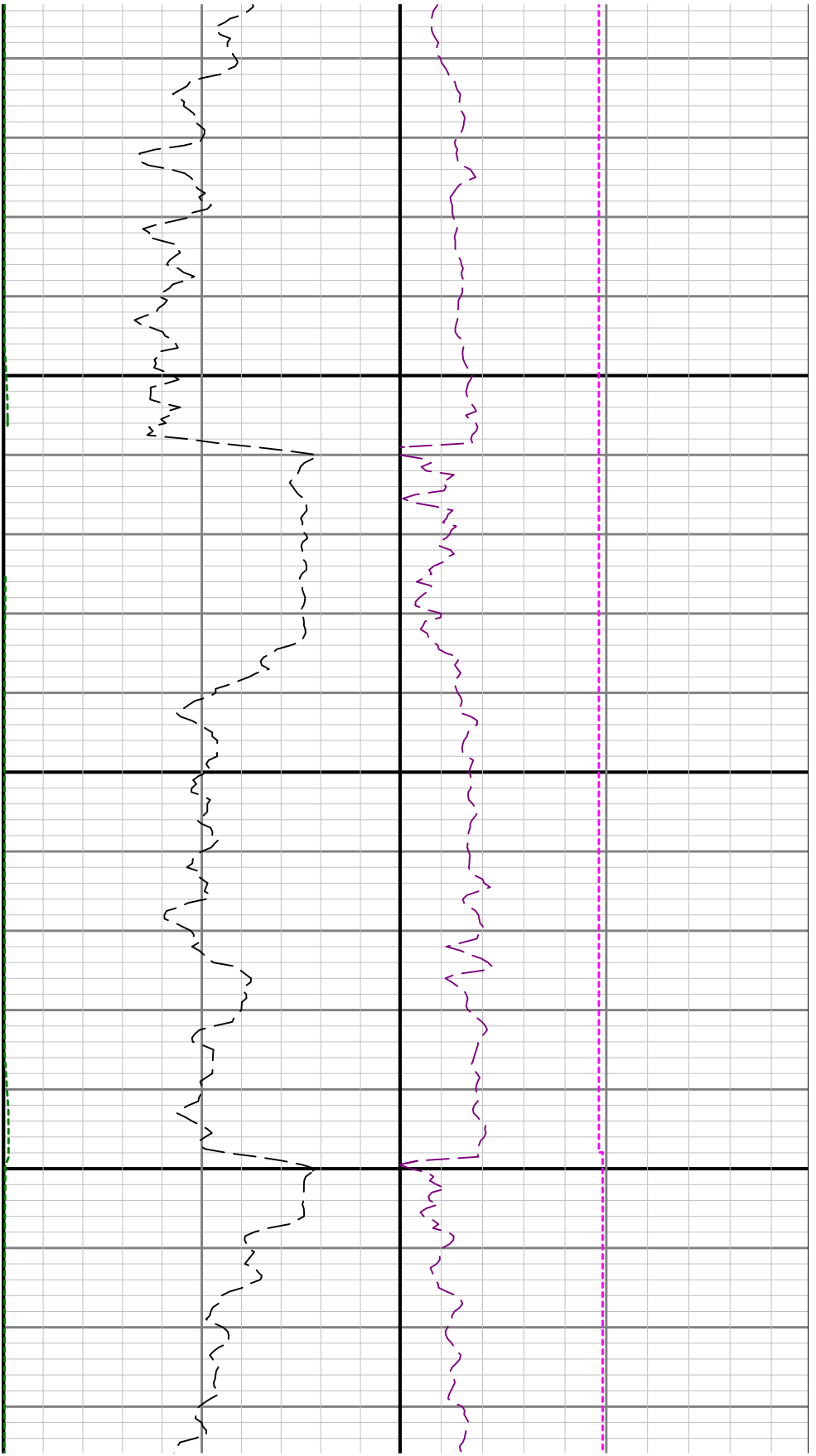


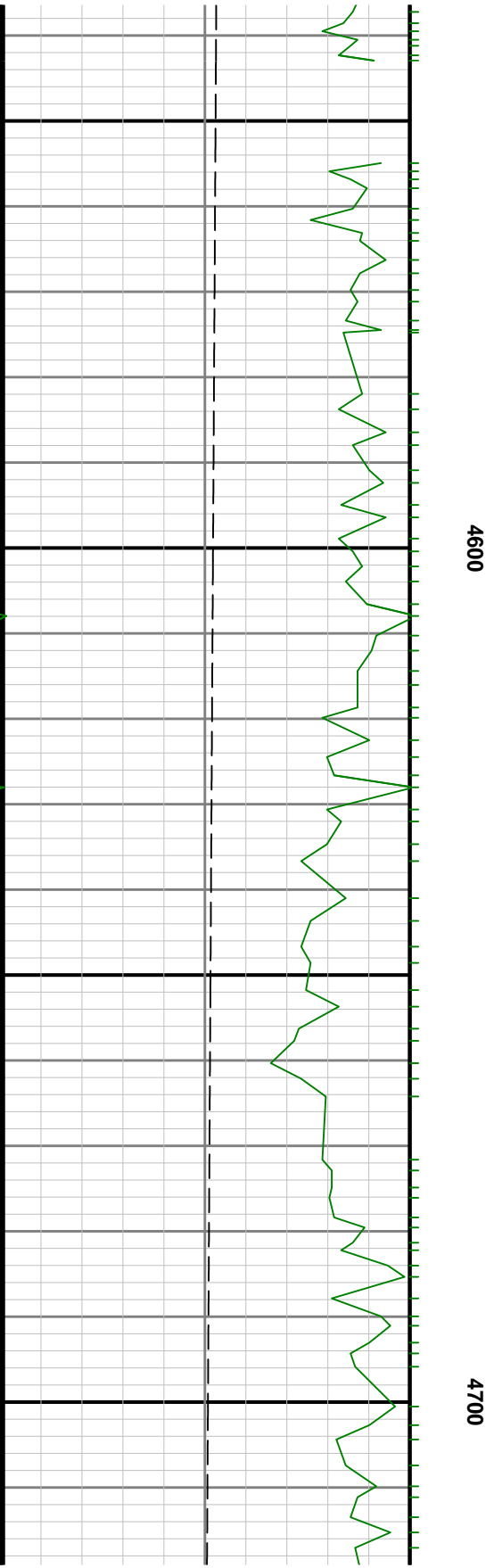
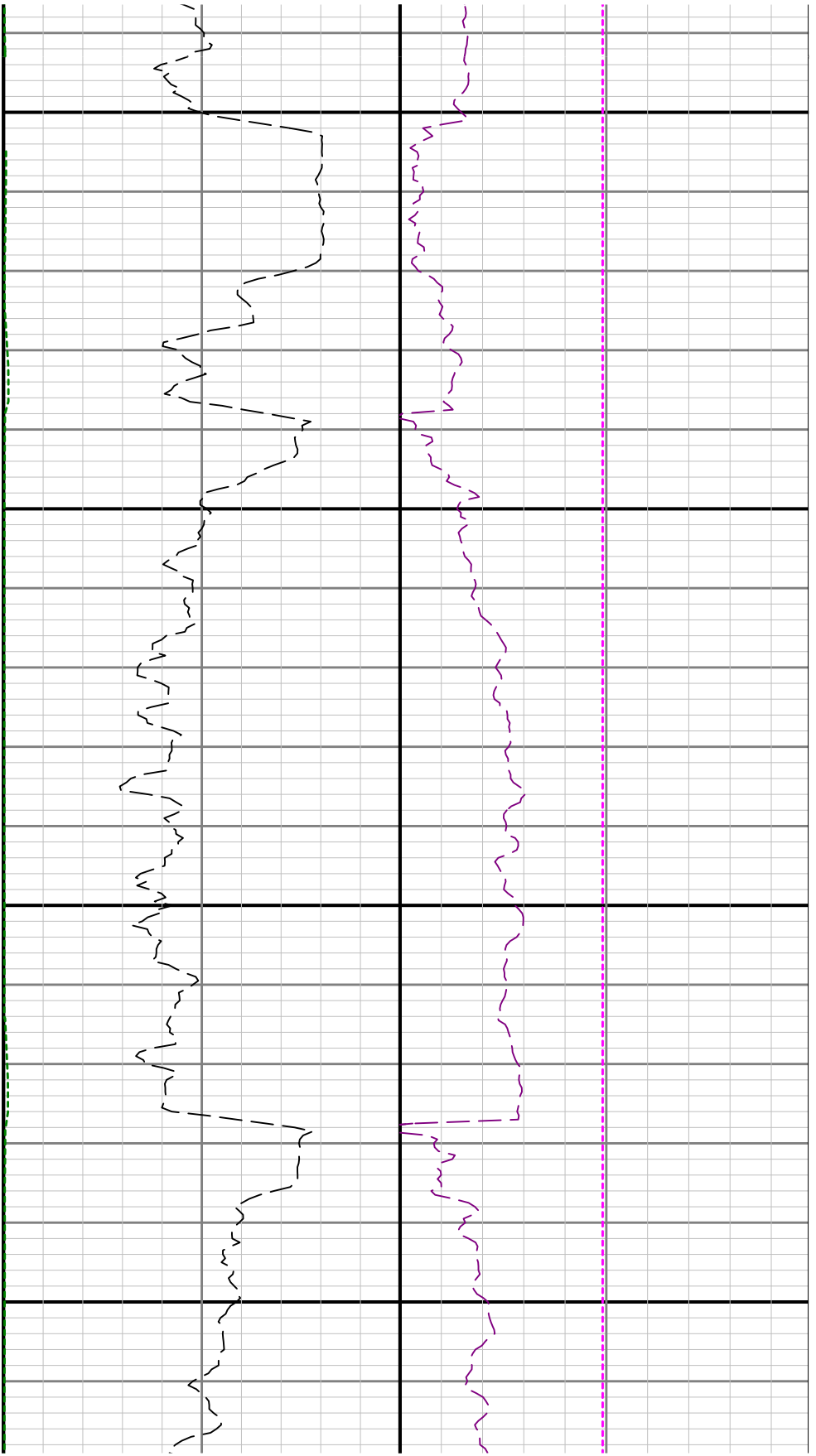
3900

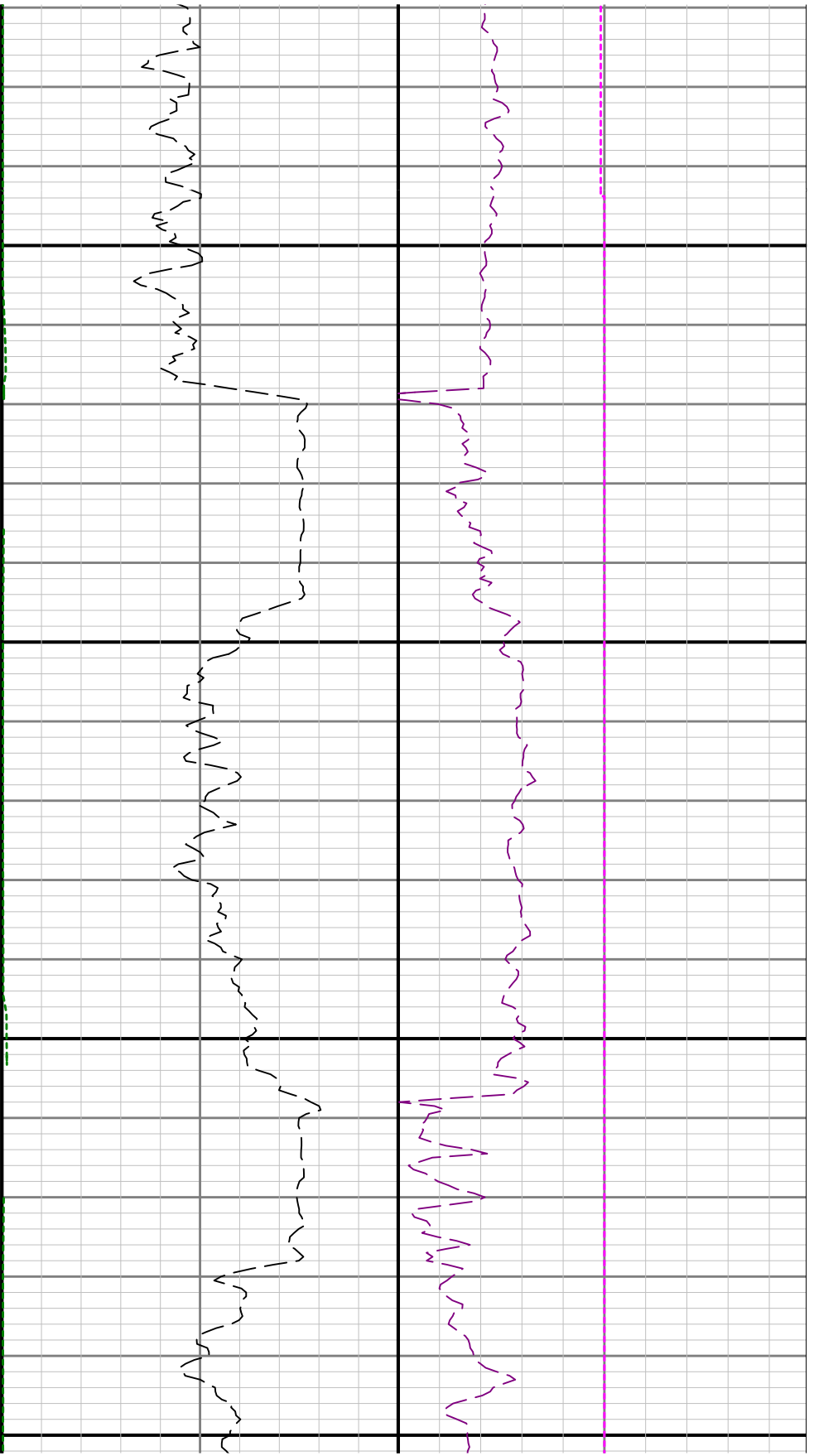






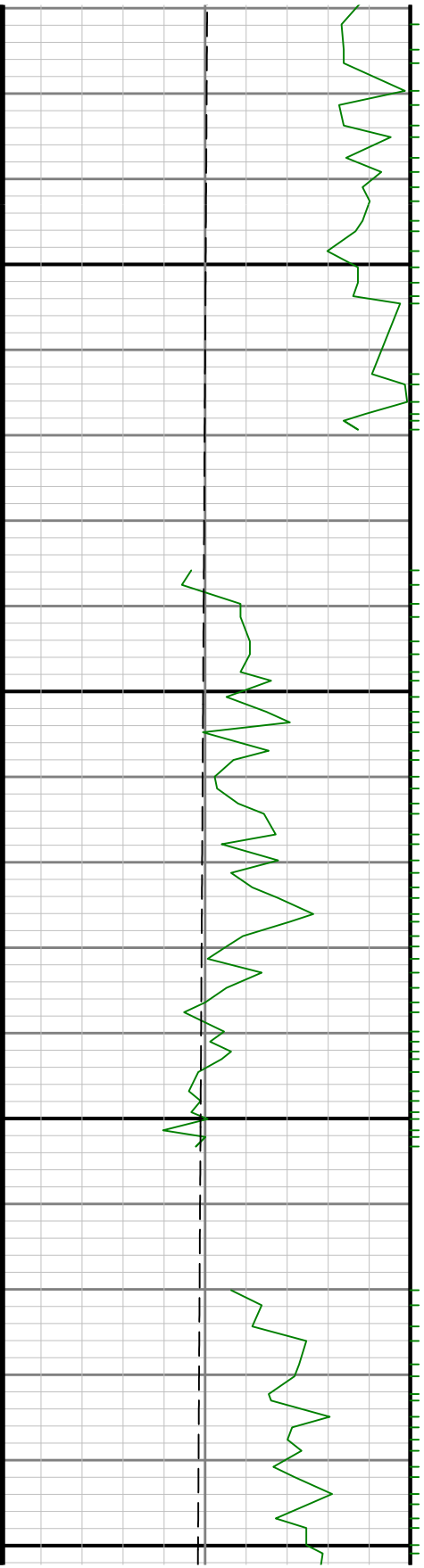


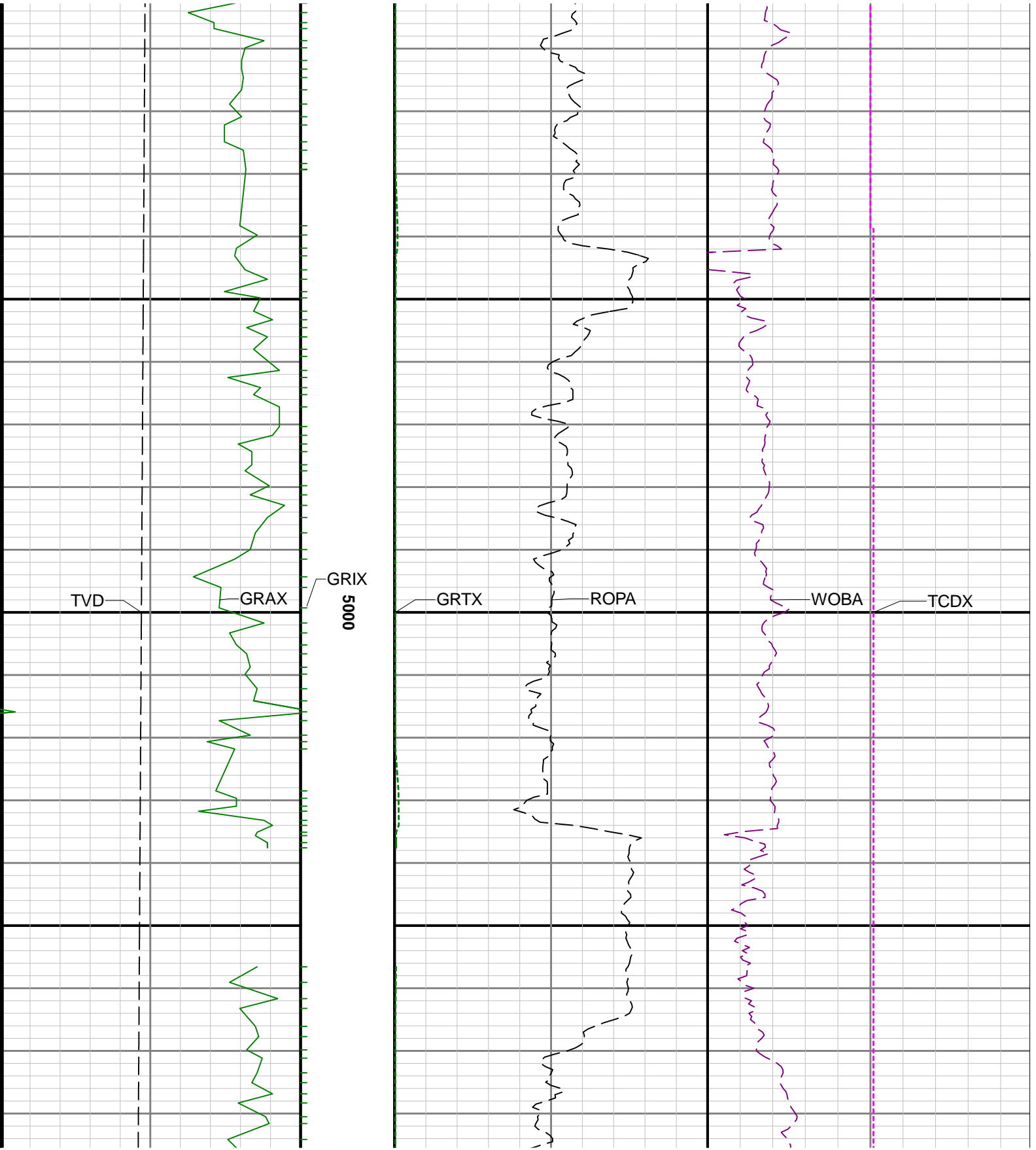


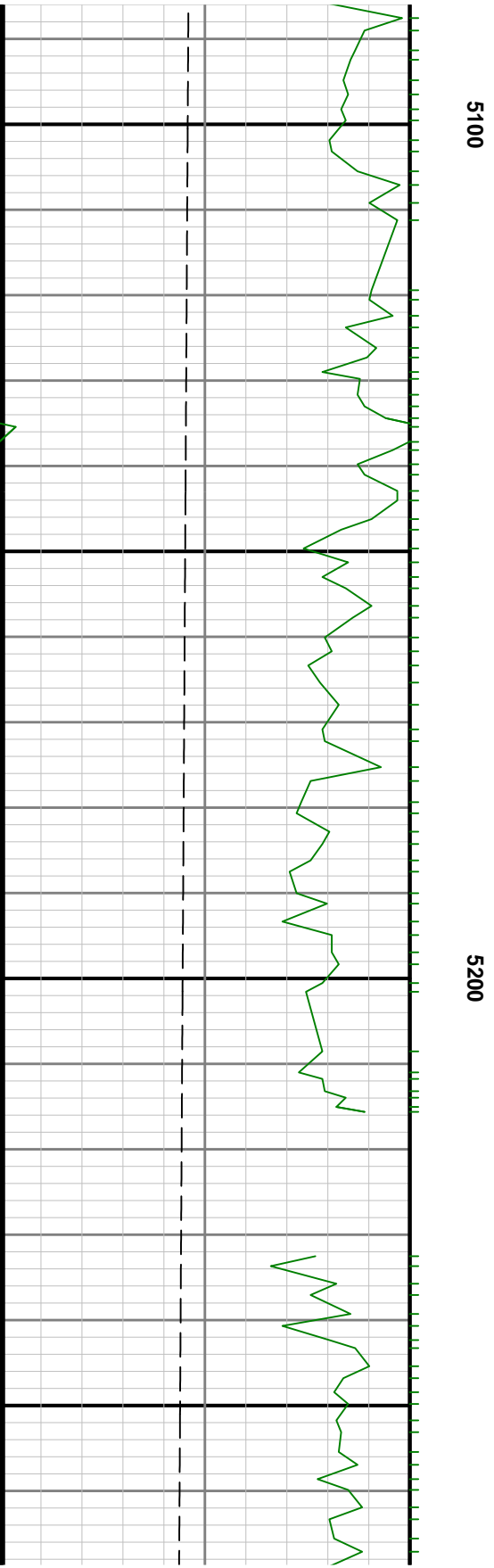
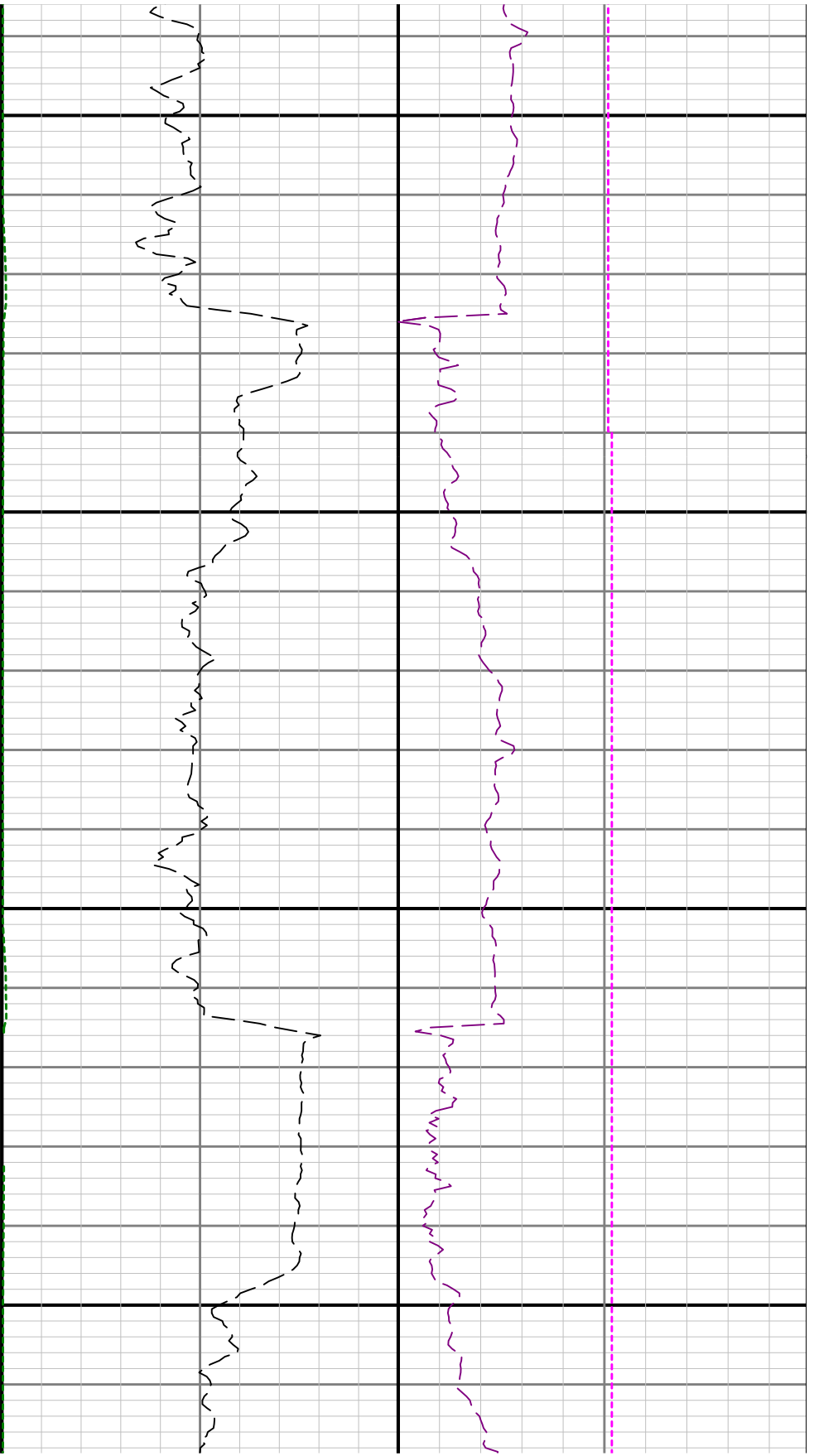


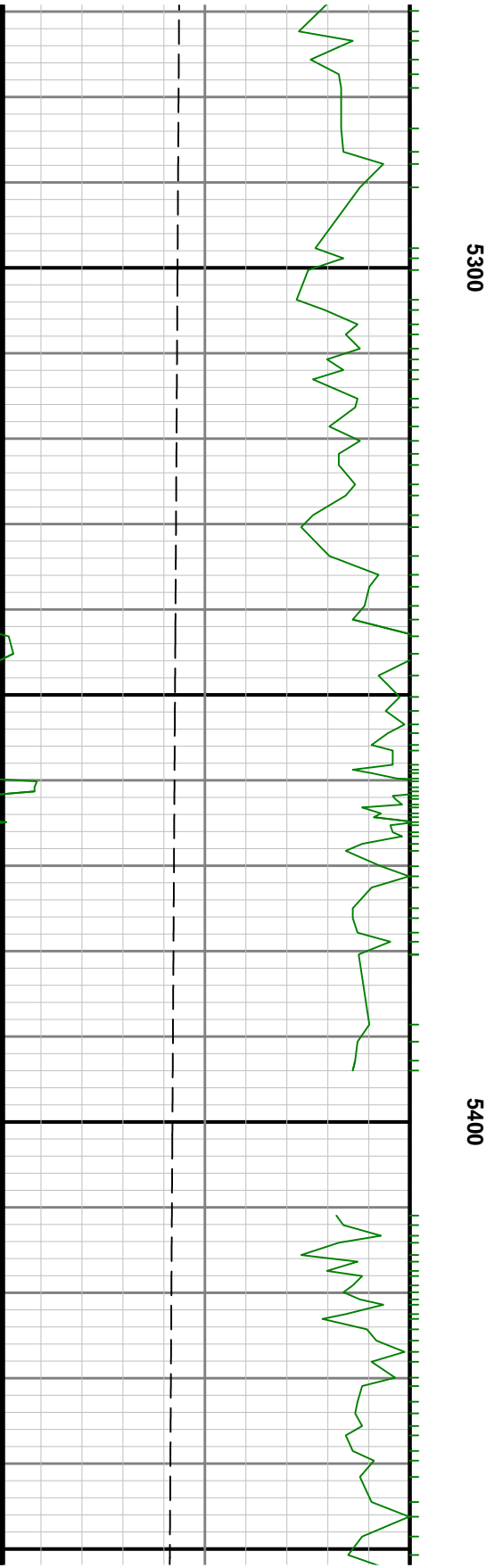
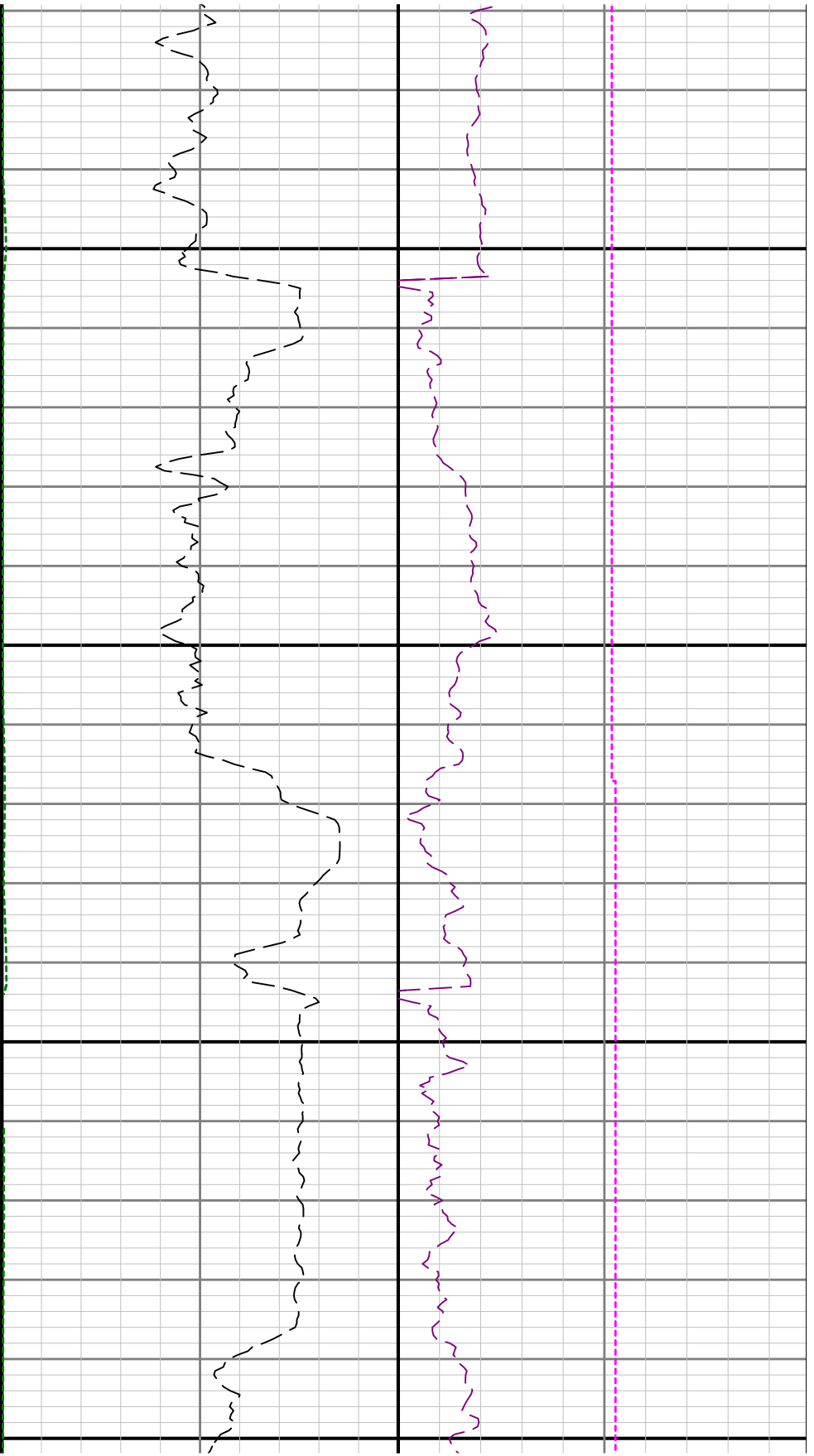
4800

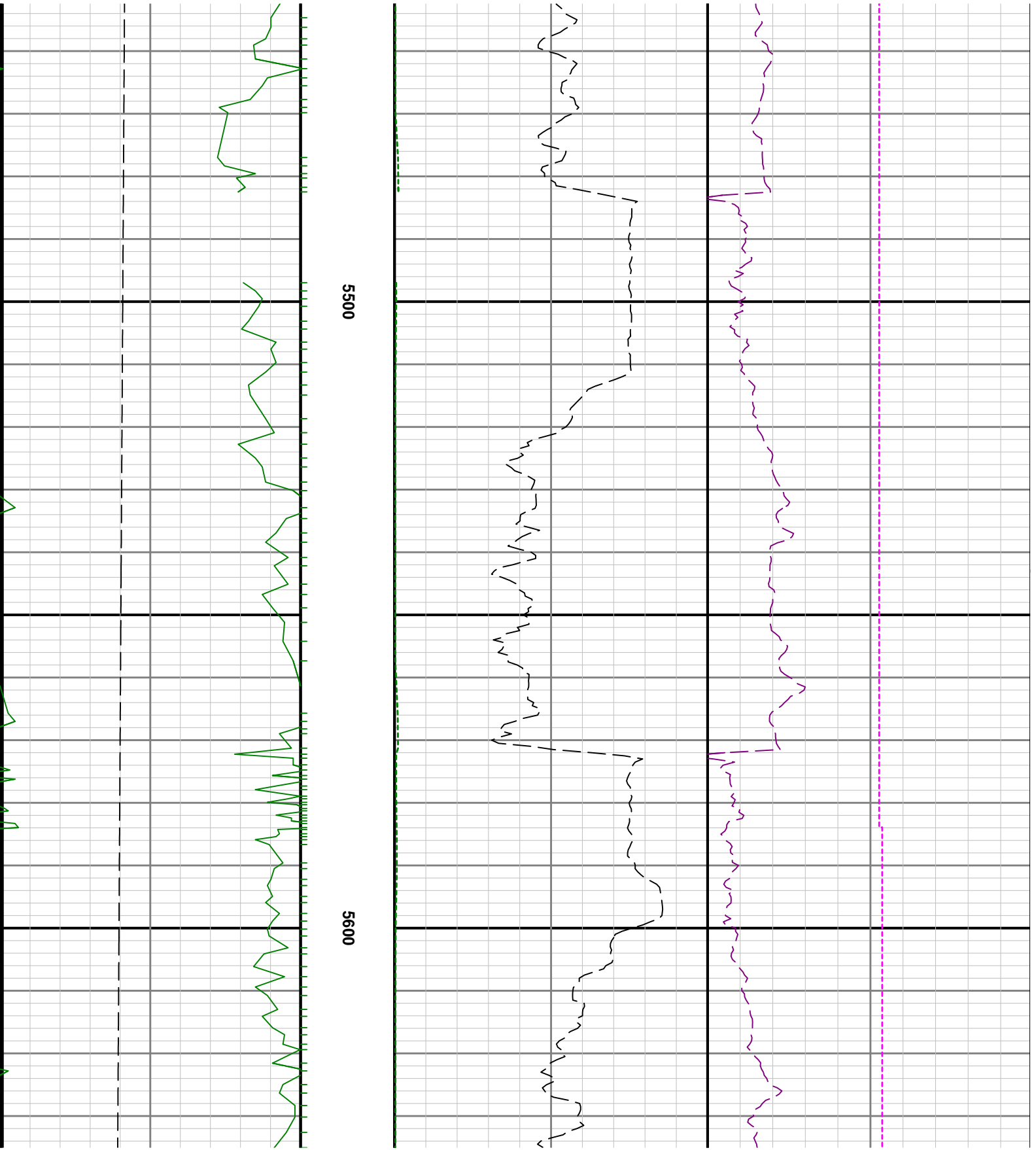
4900

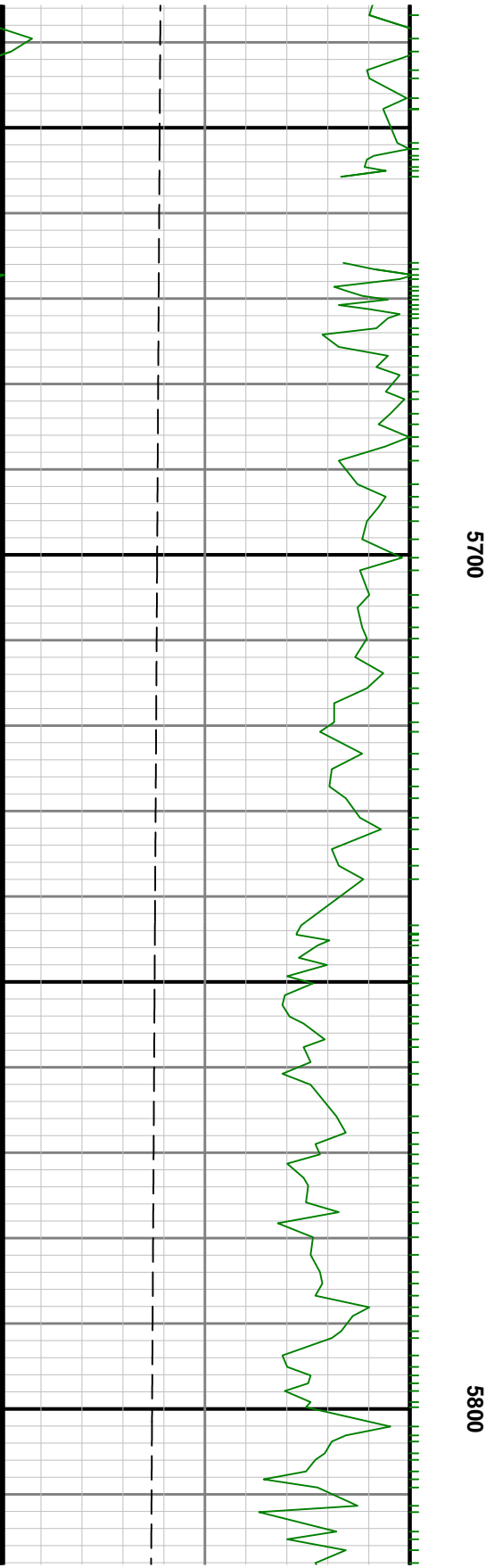
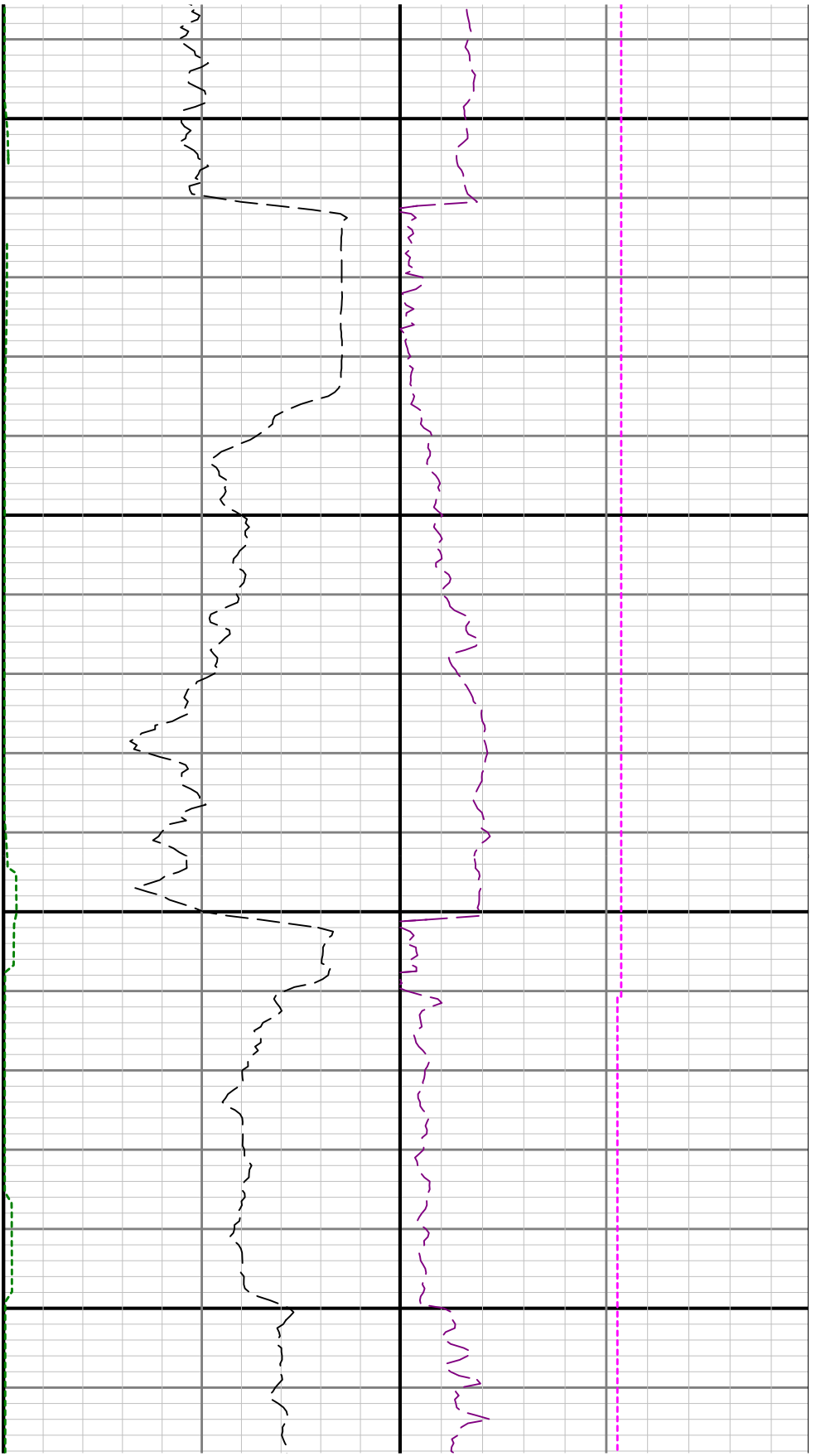


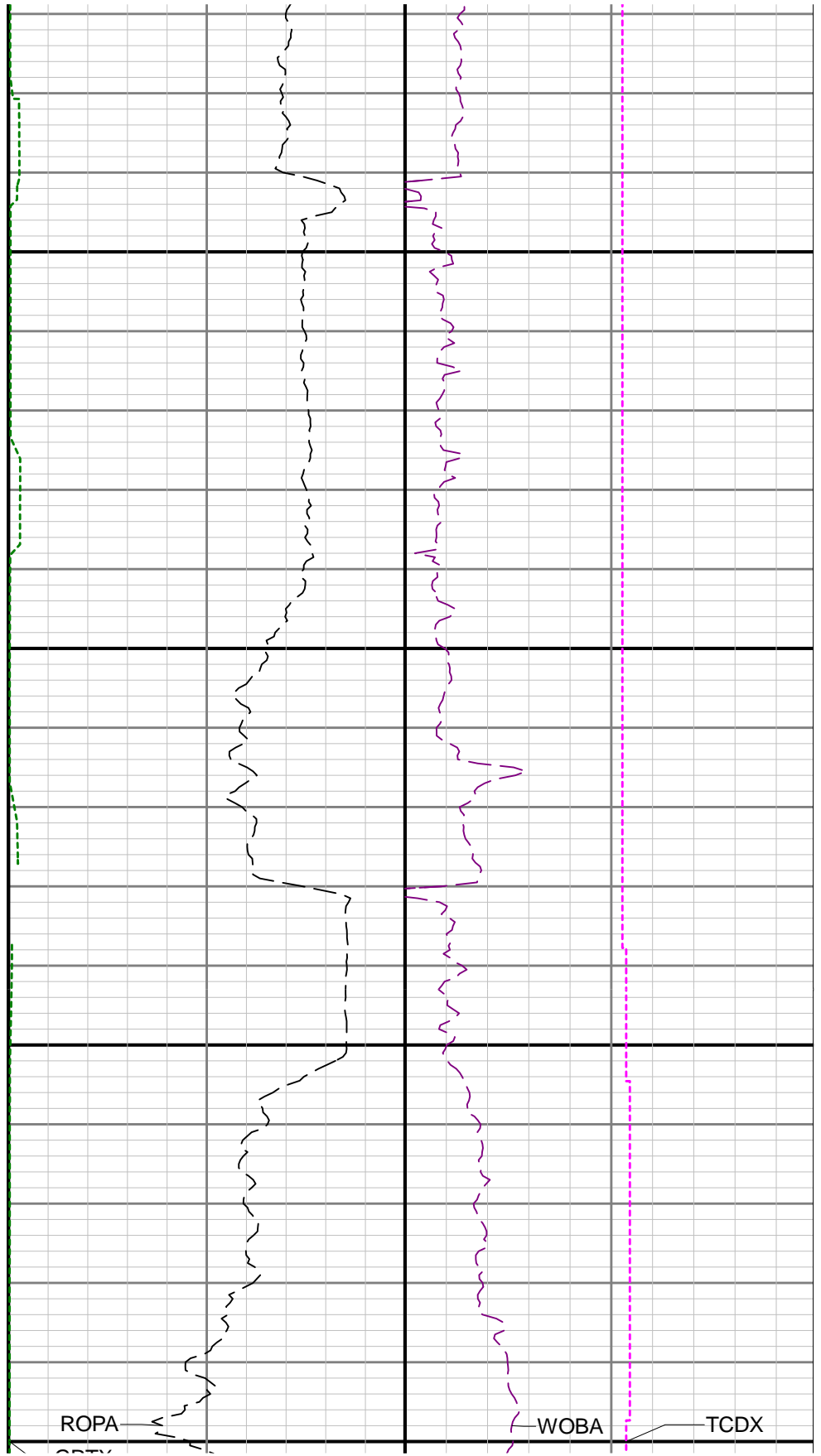
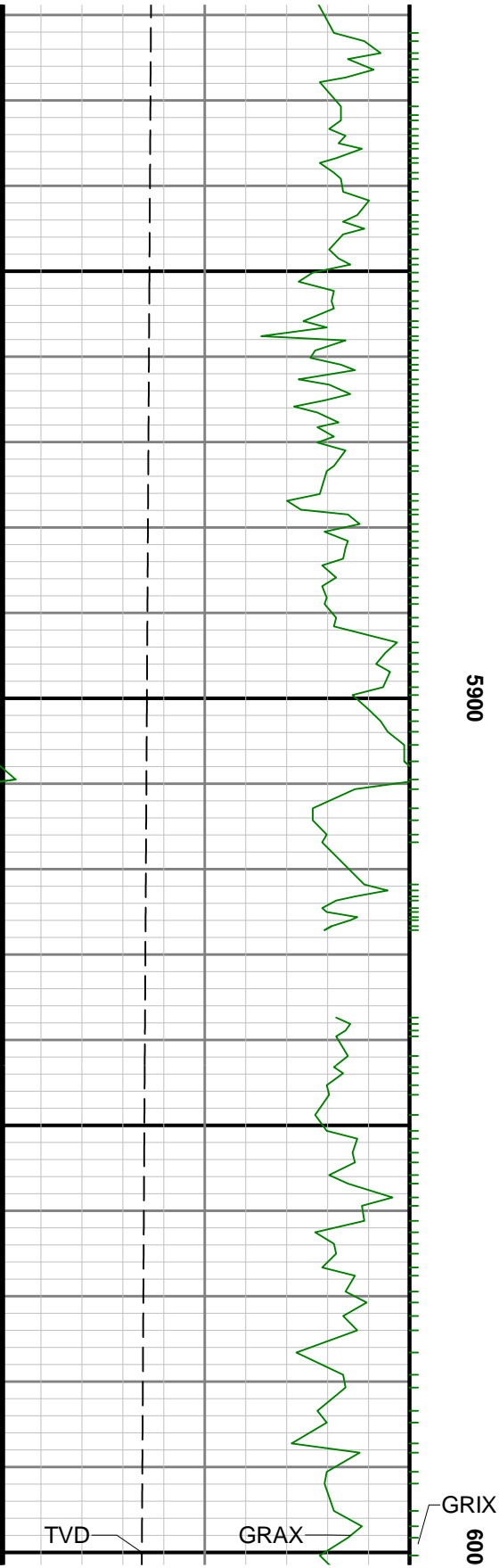


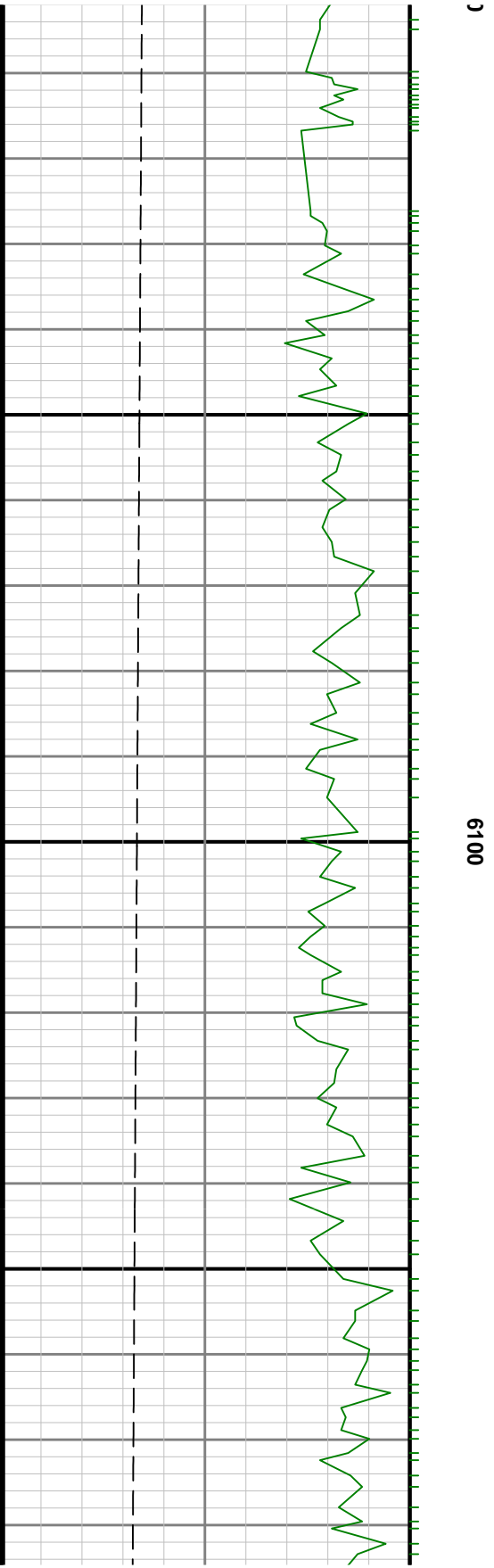
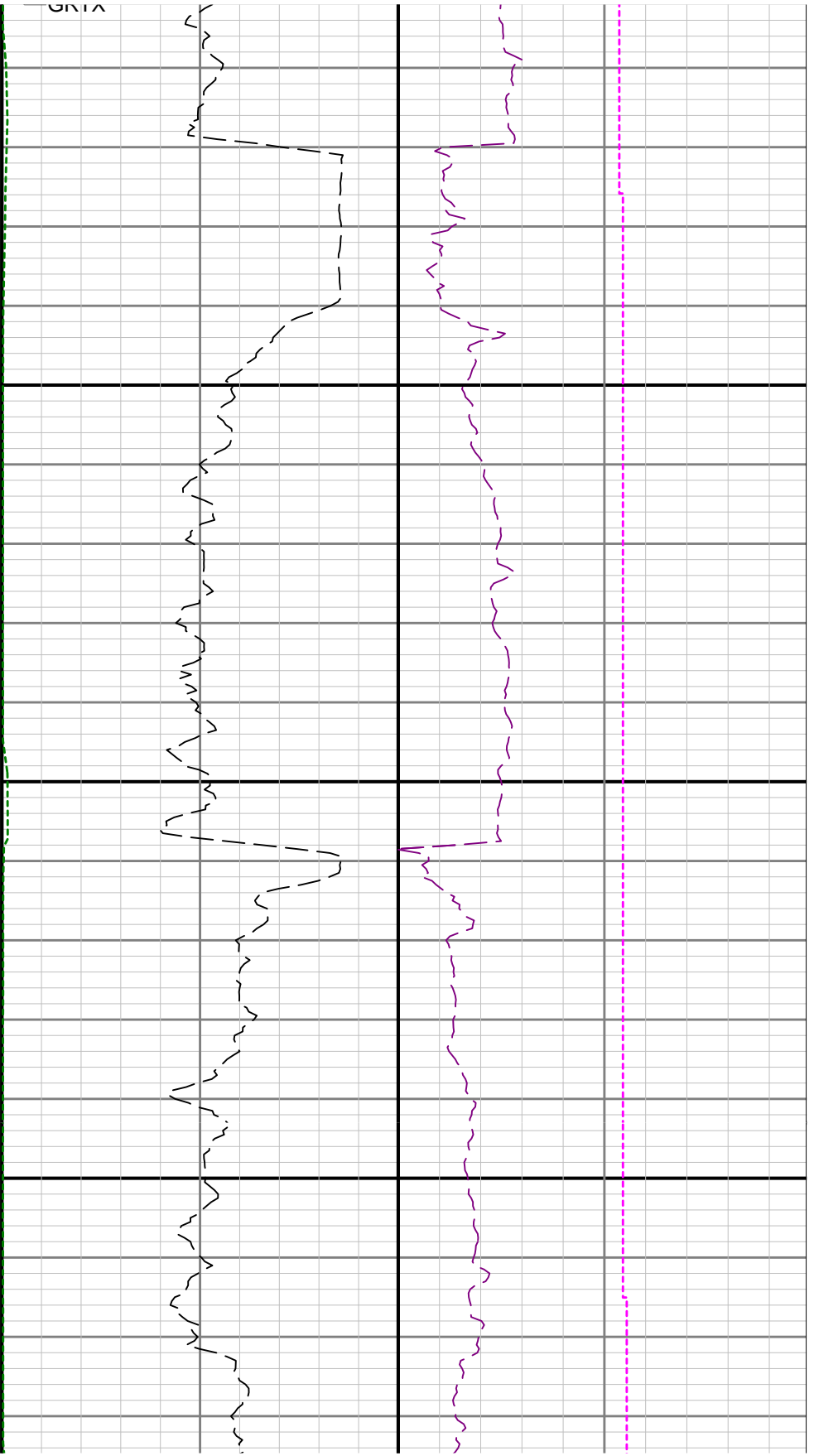


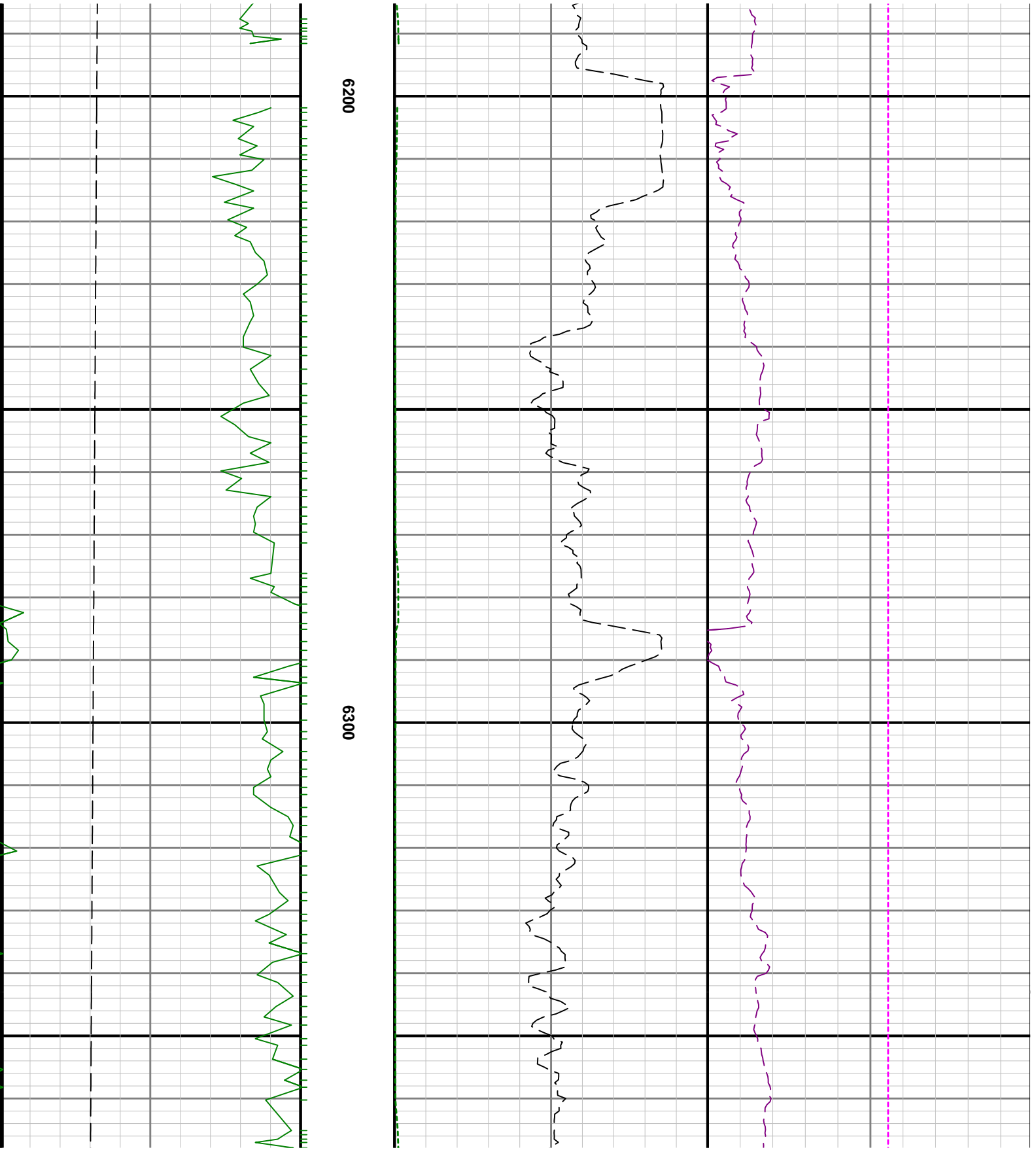


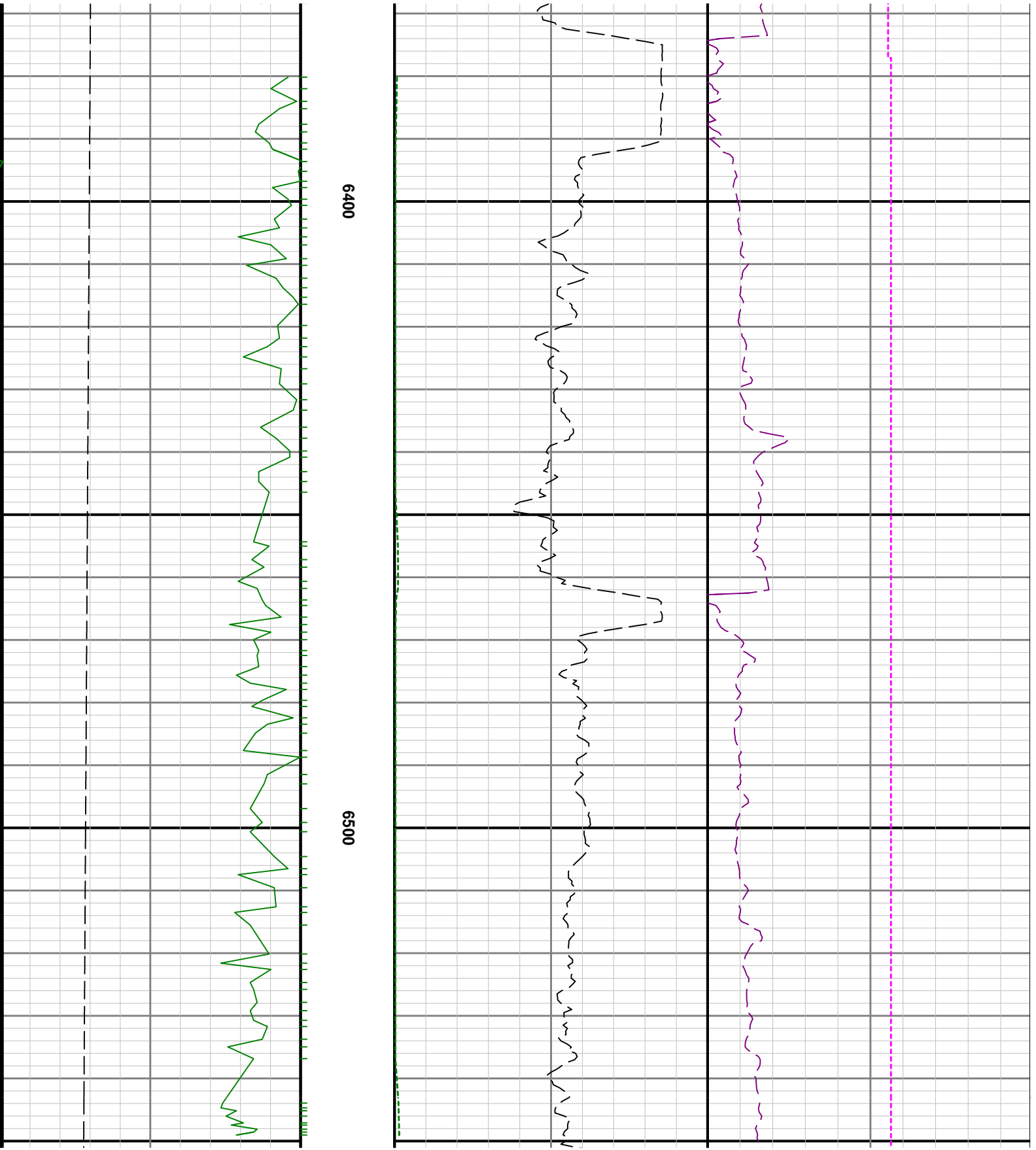


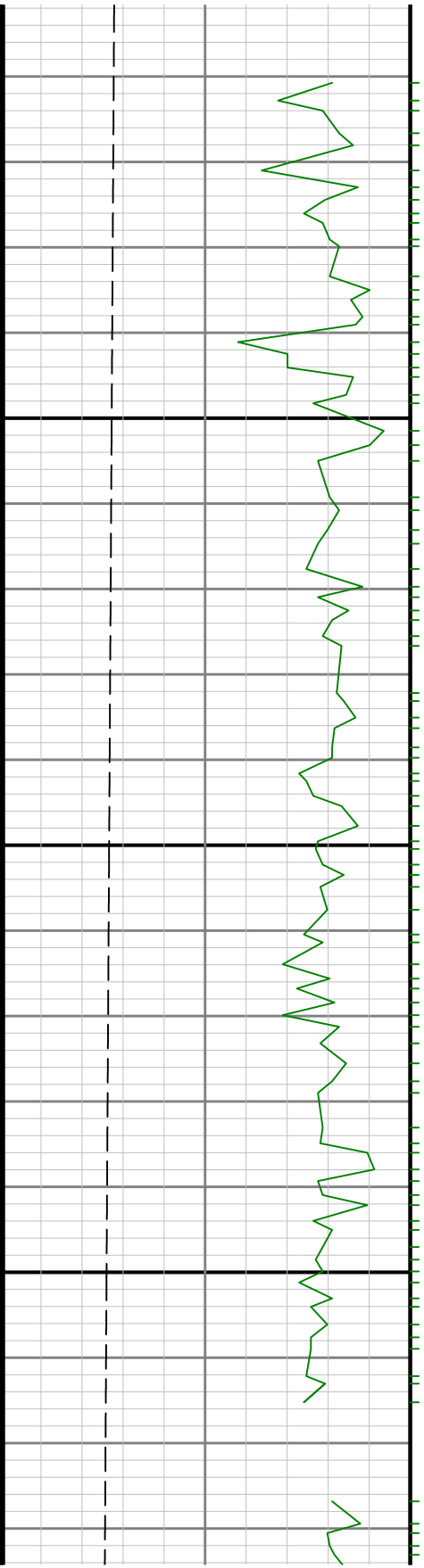












0099

6700

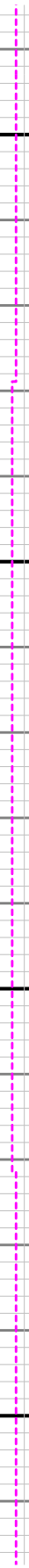
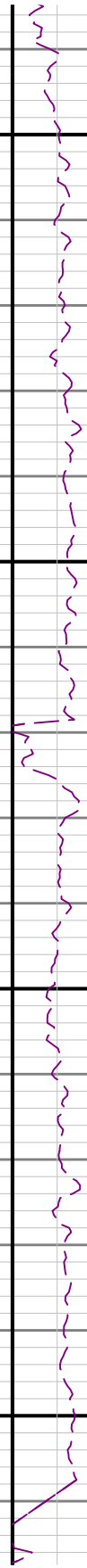


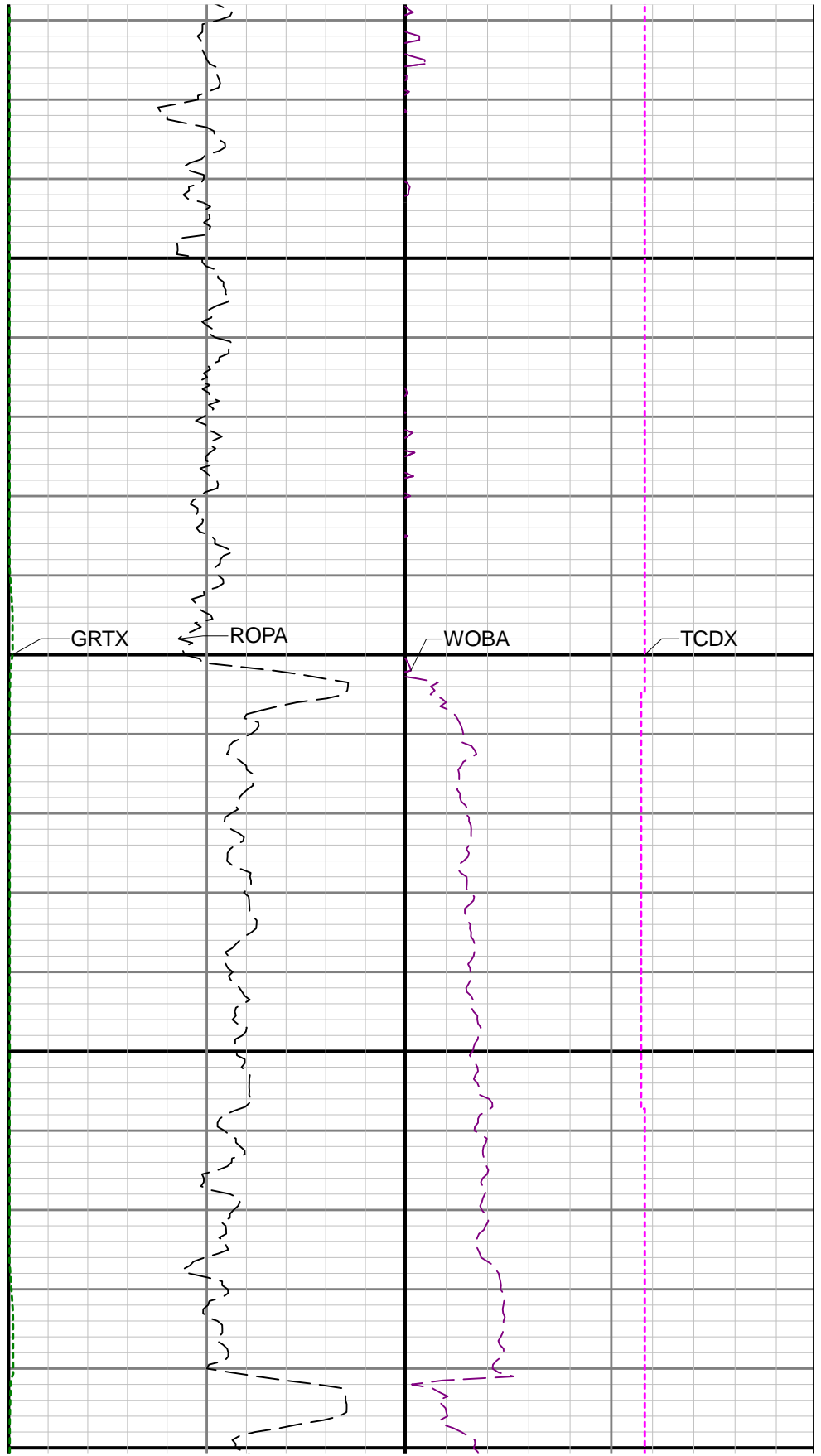
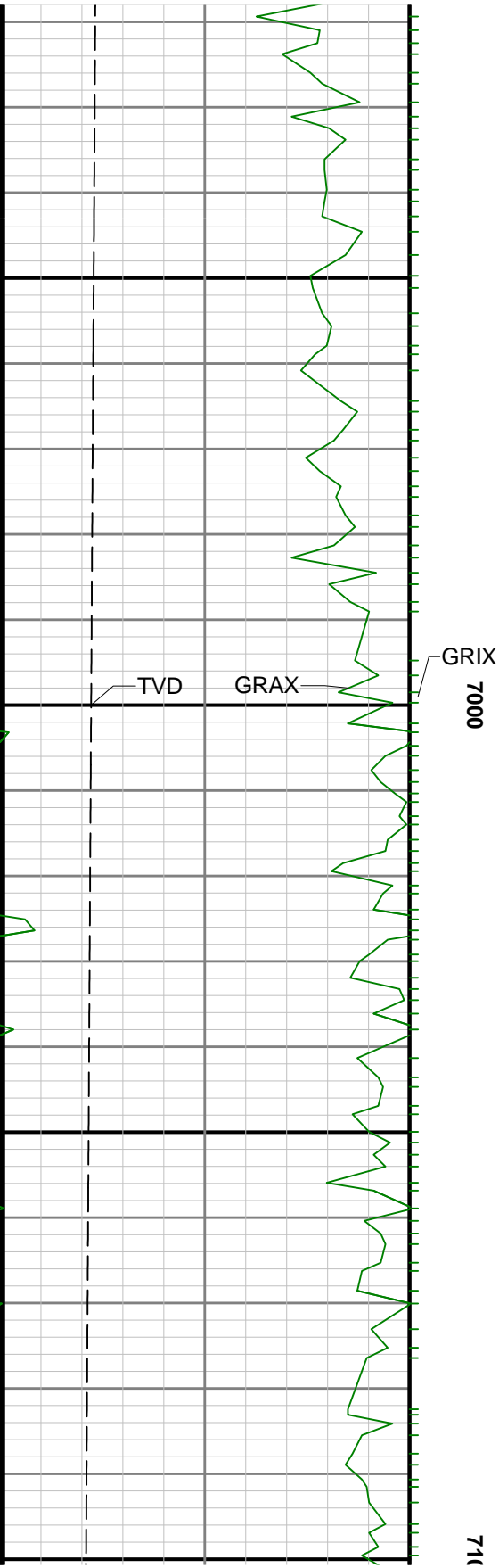
See Remark 1

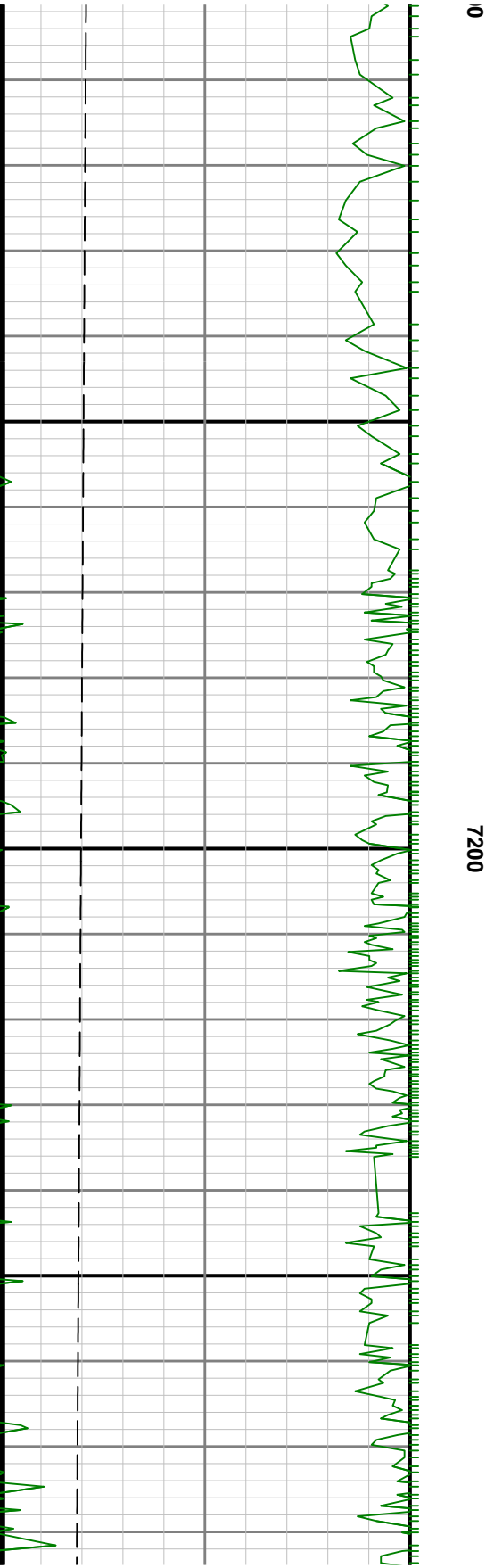
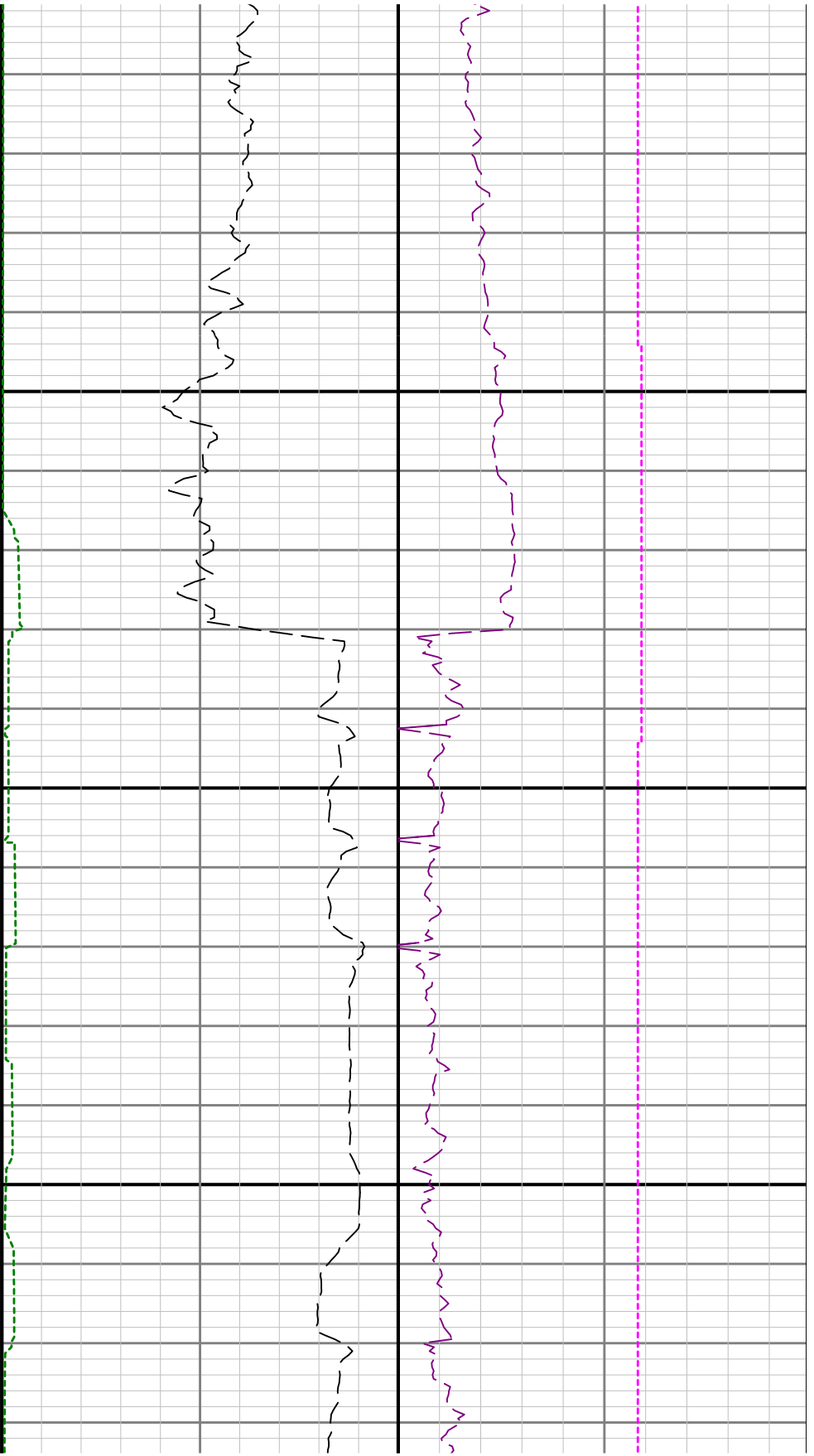


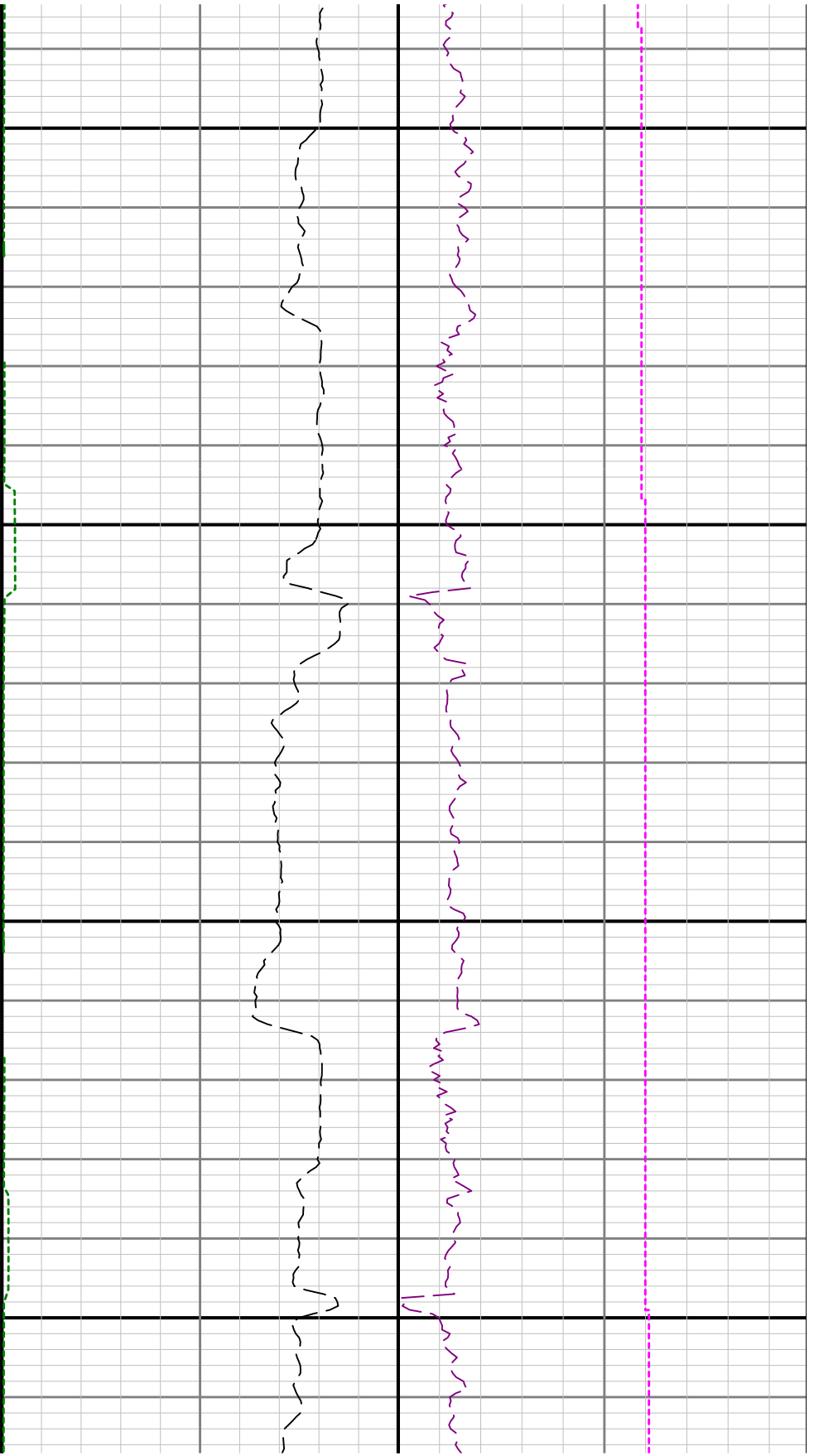
0069

0089



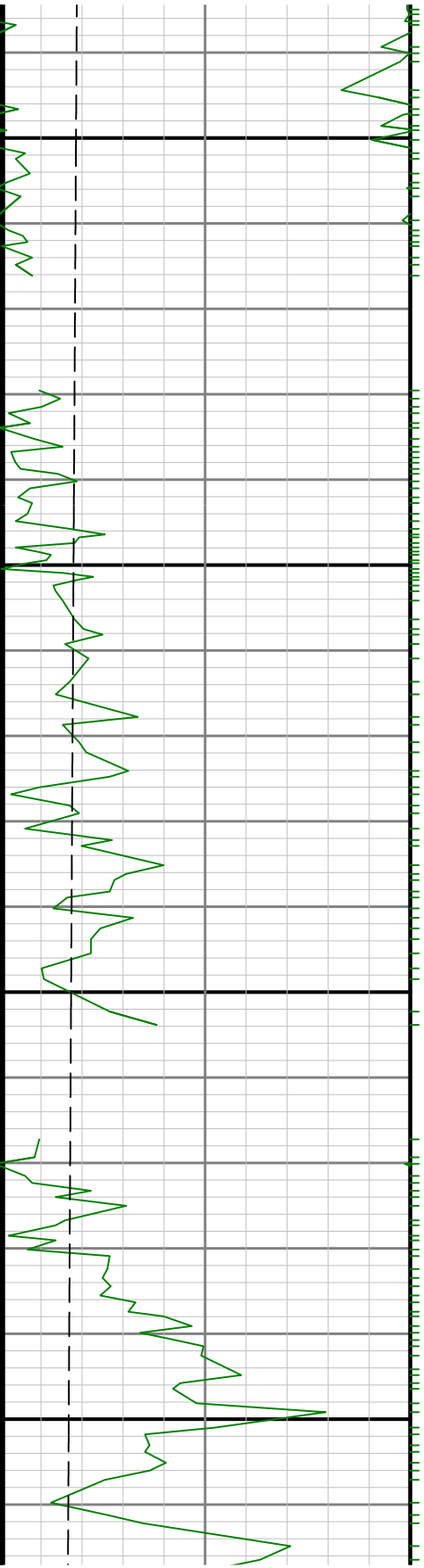




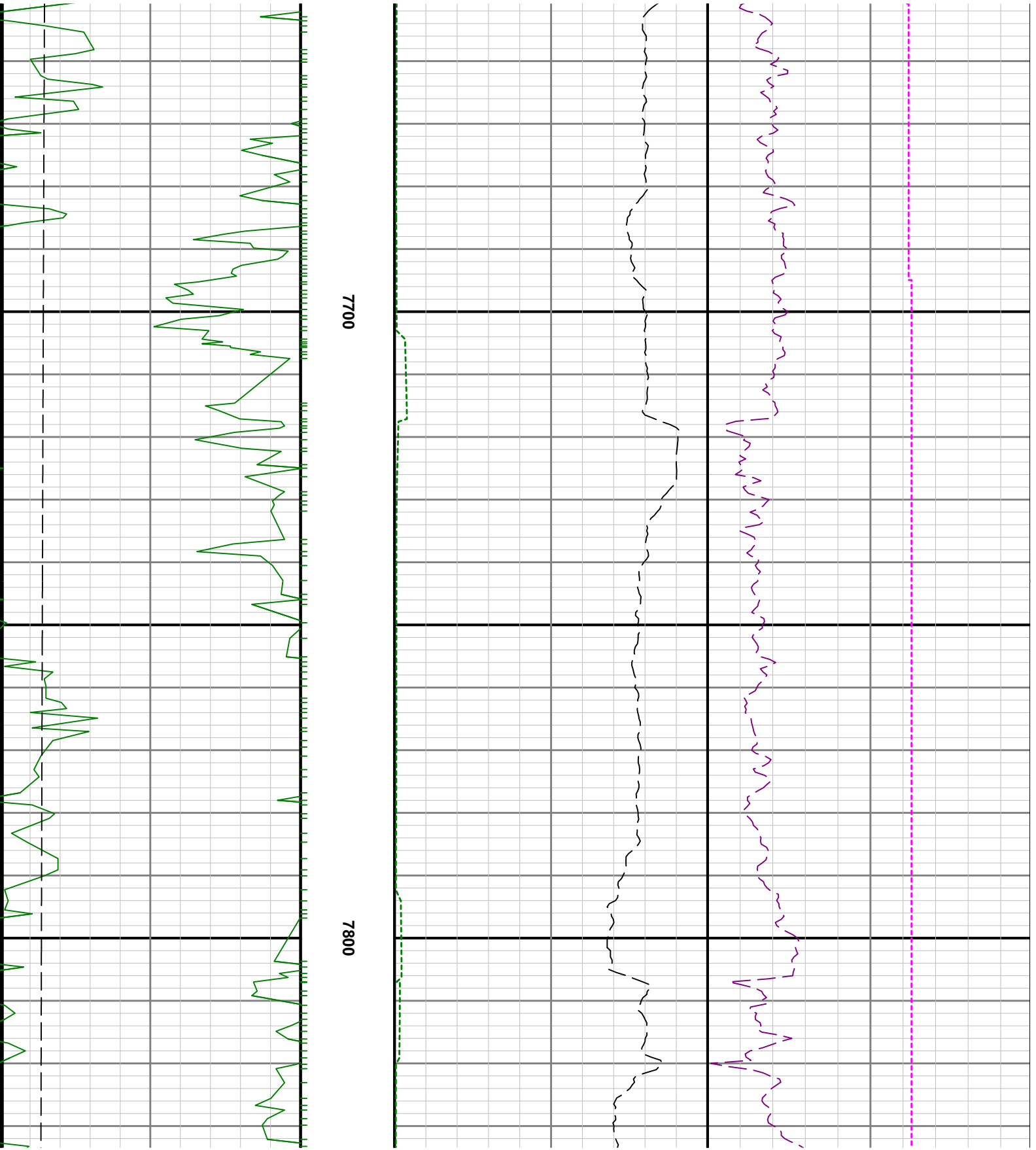


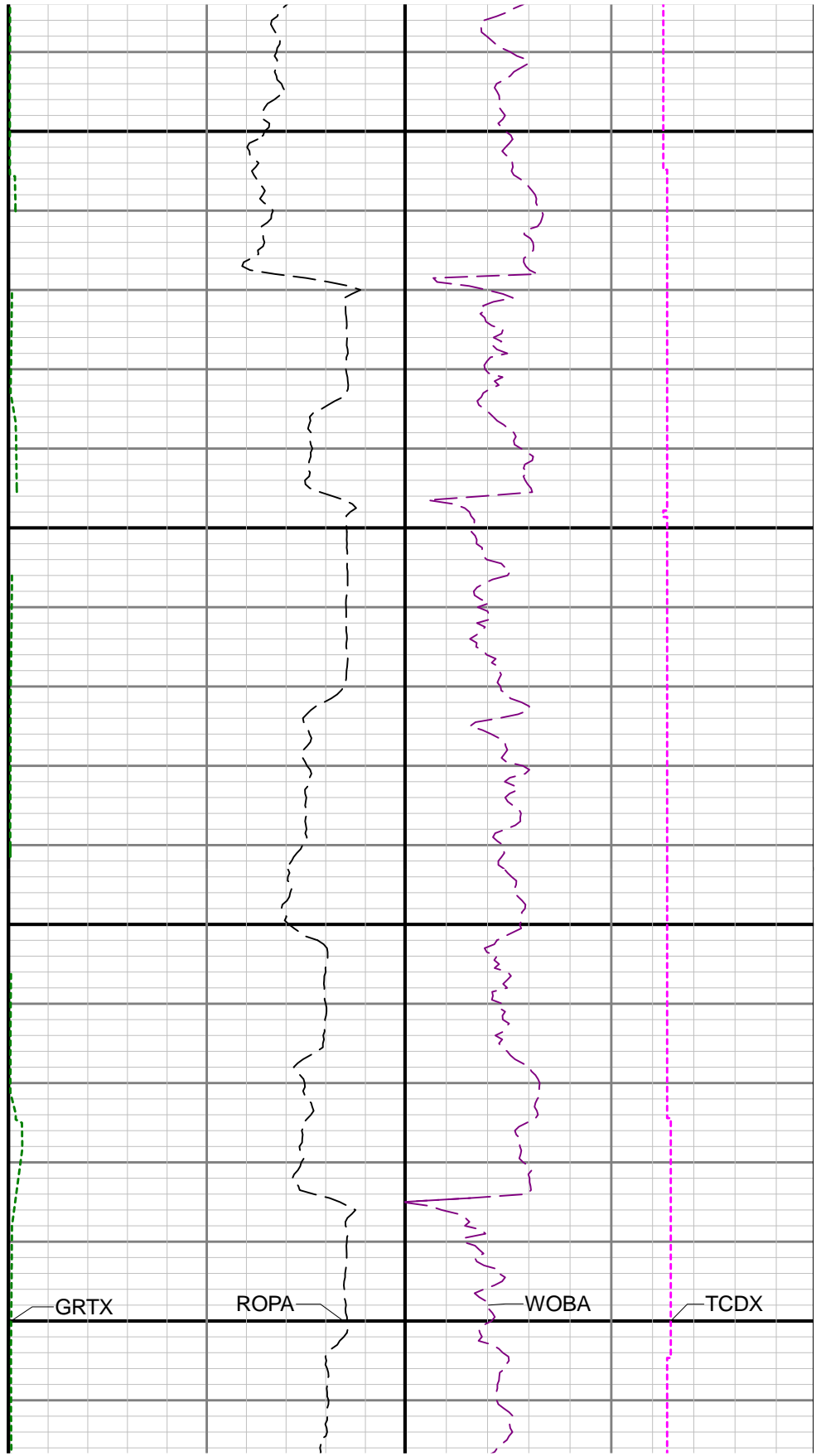
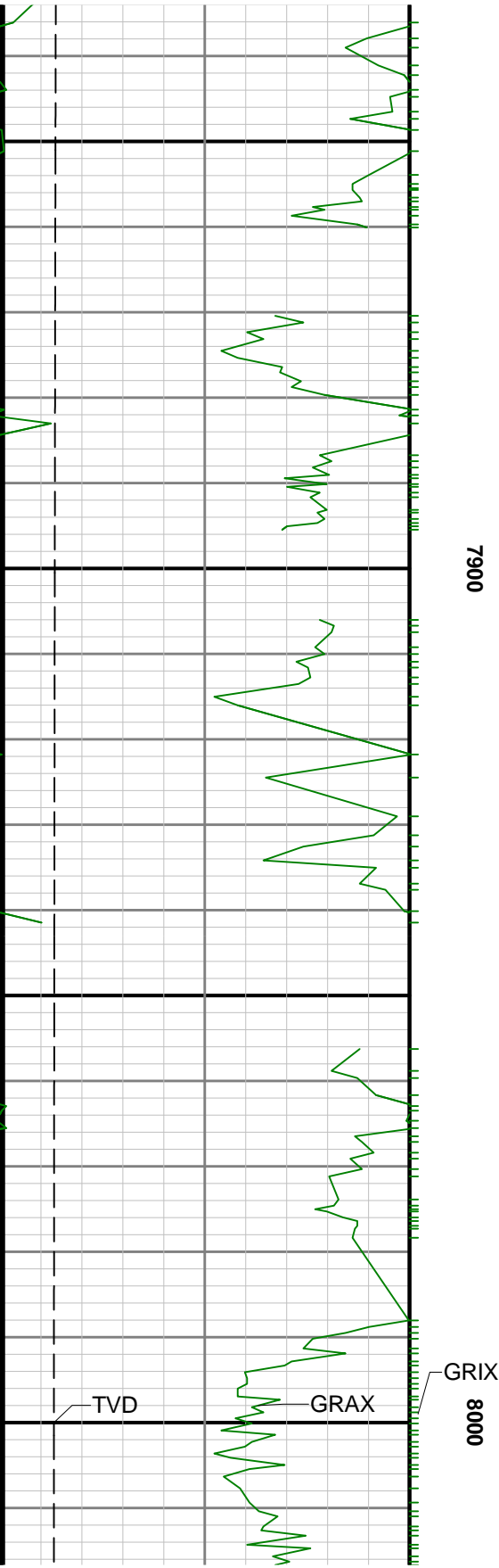
7300

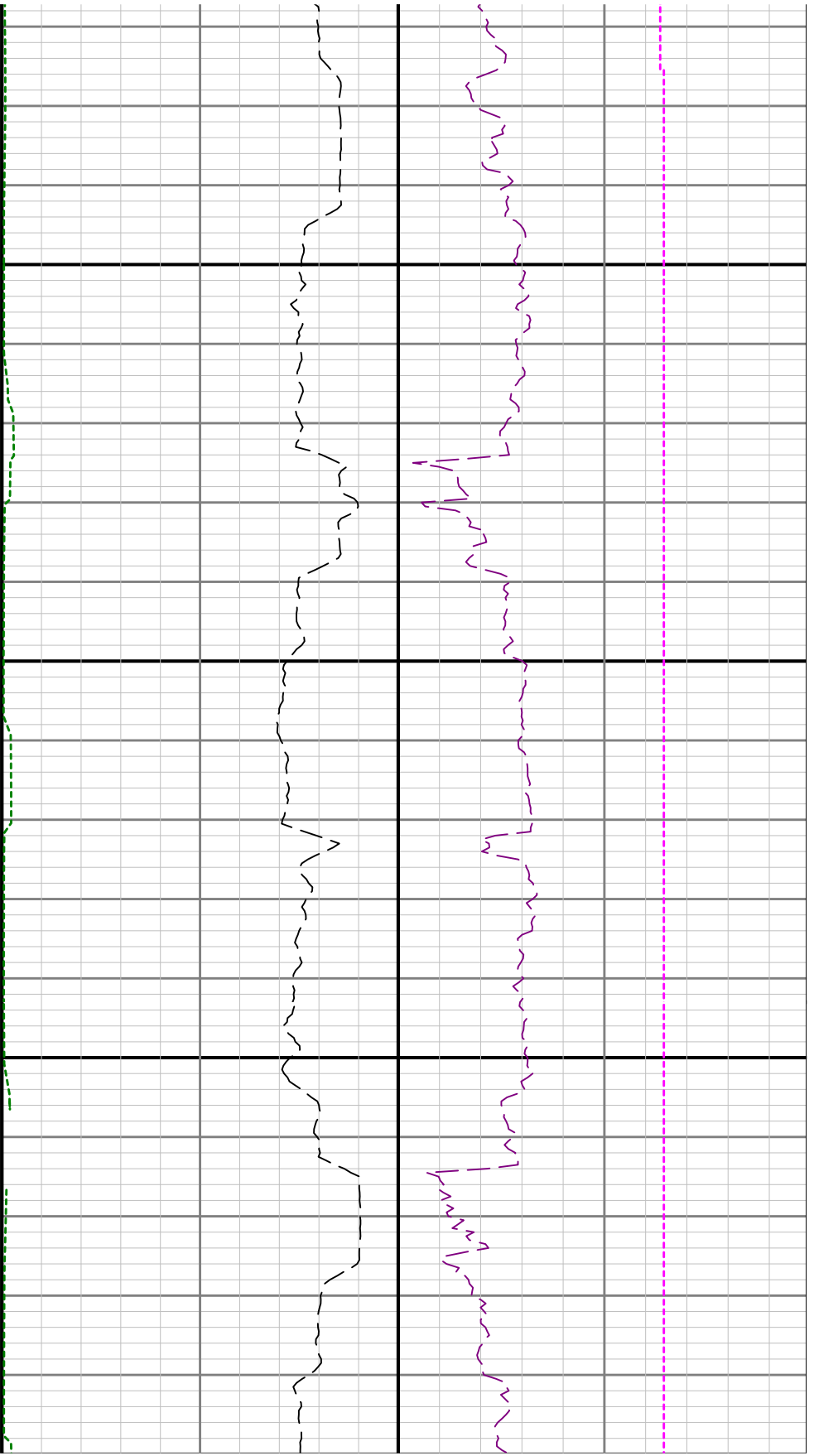
7400





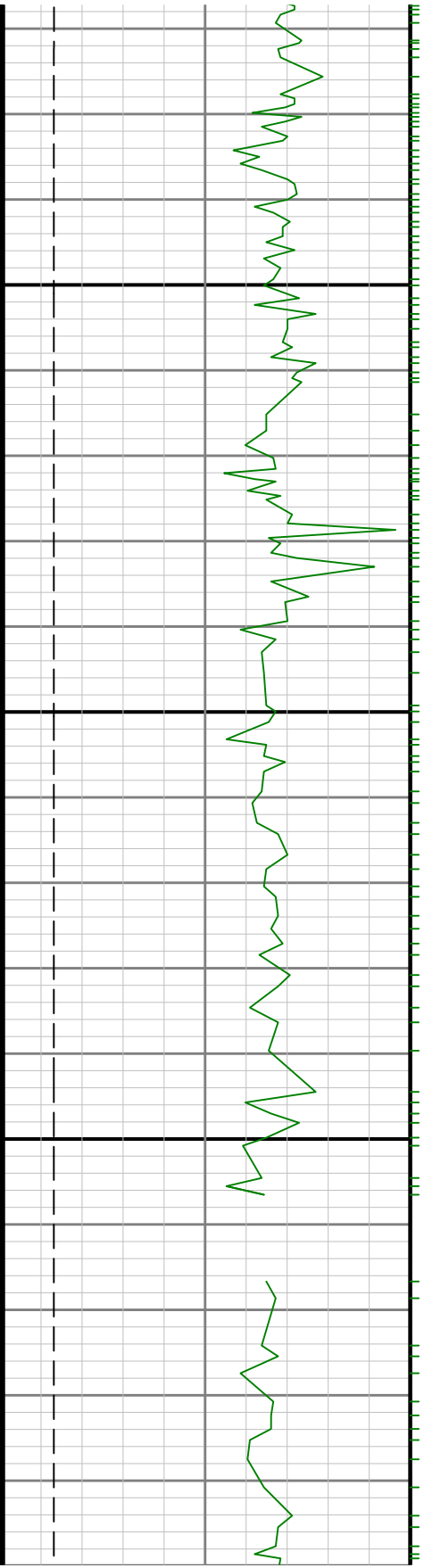




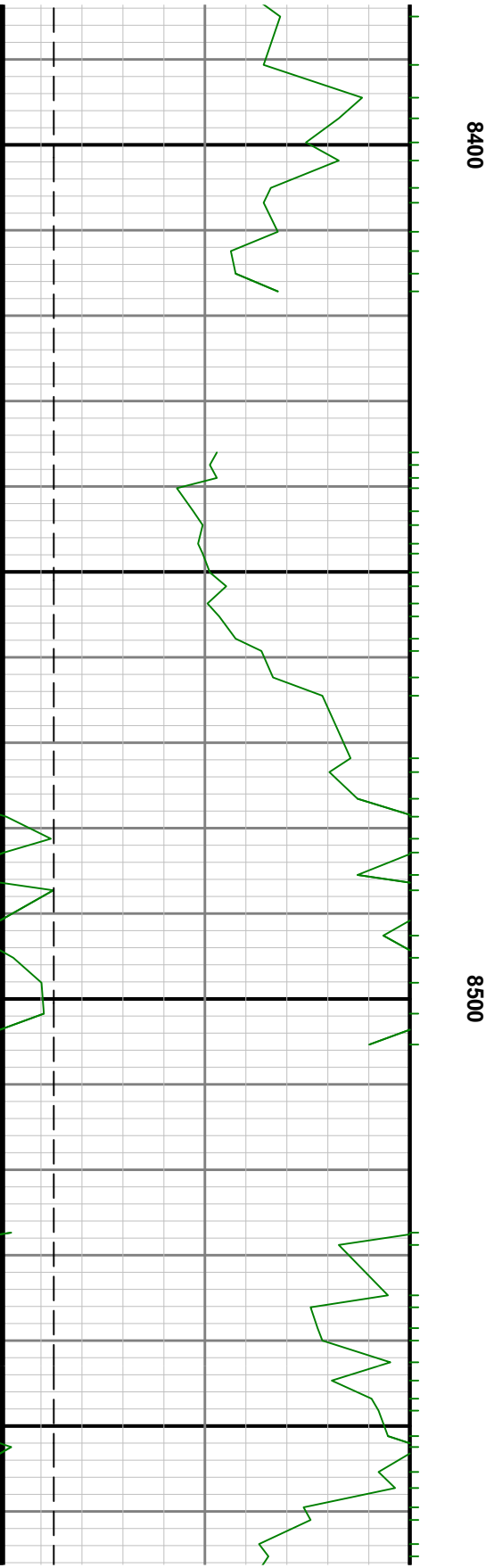
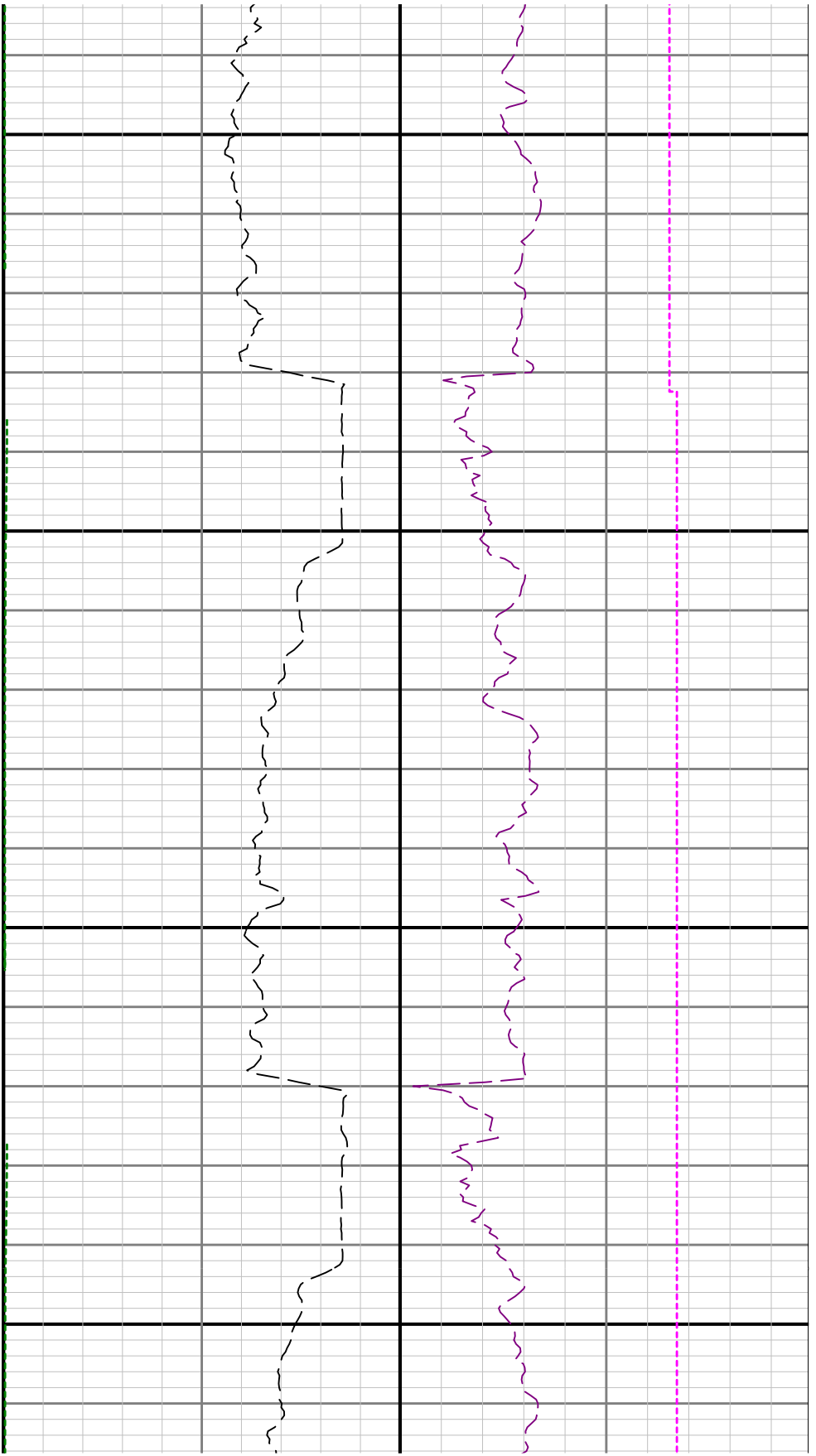


8100

82



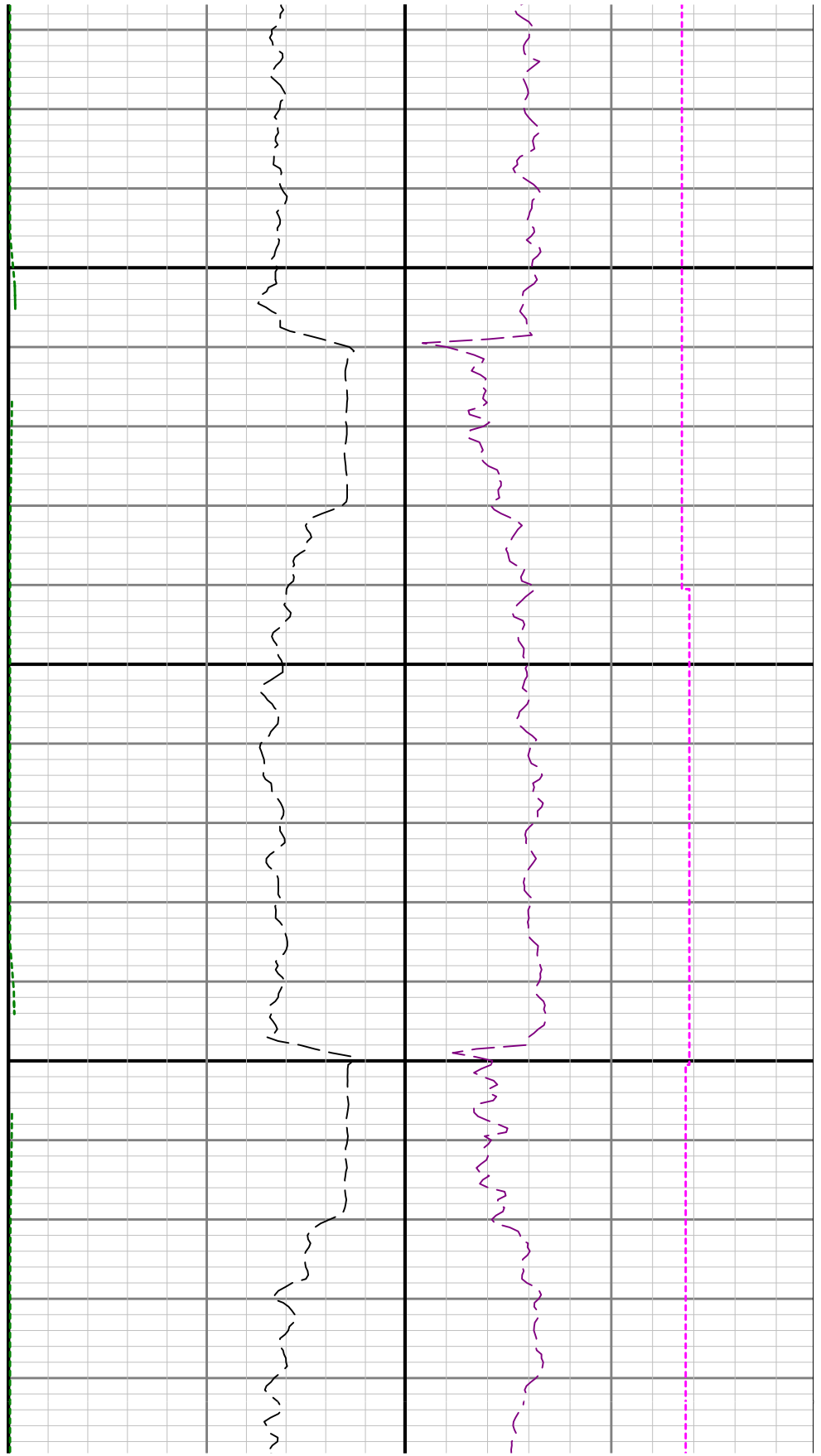


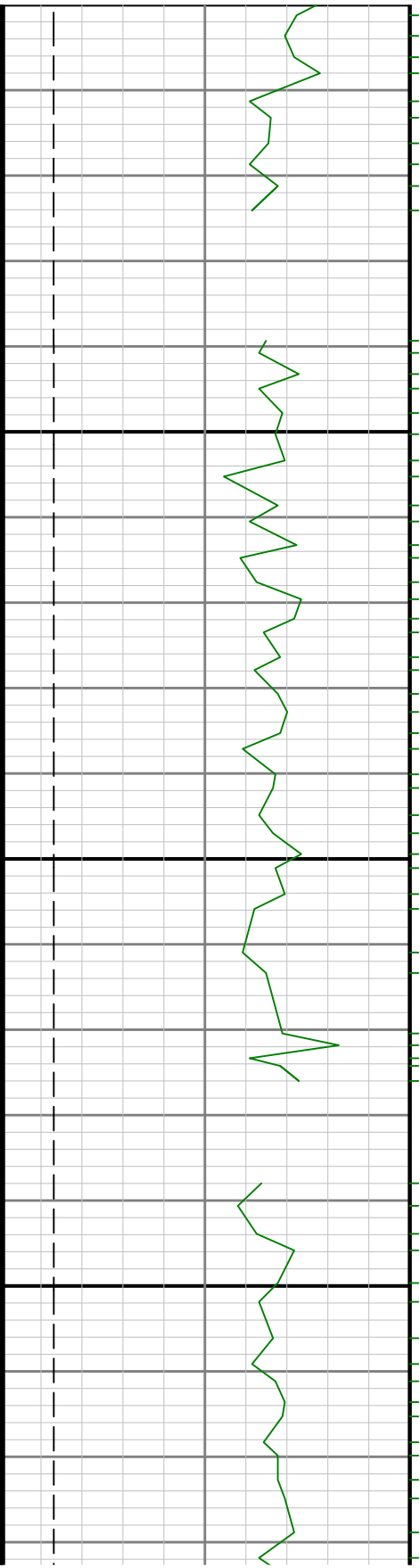




0098

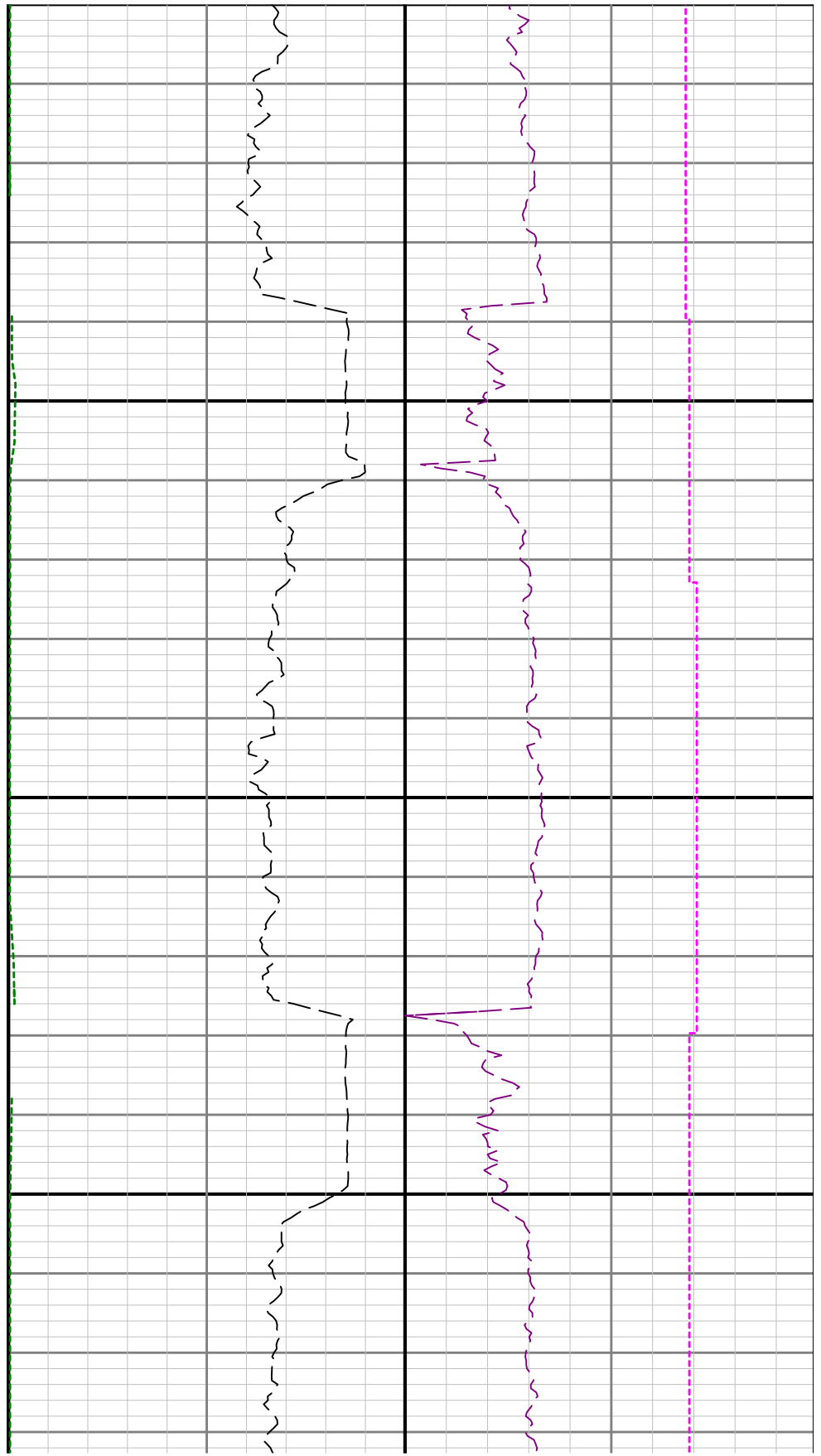
8700

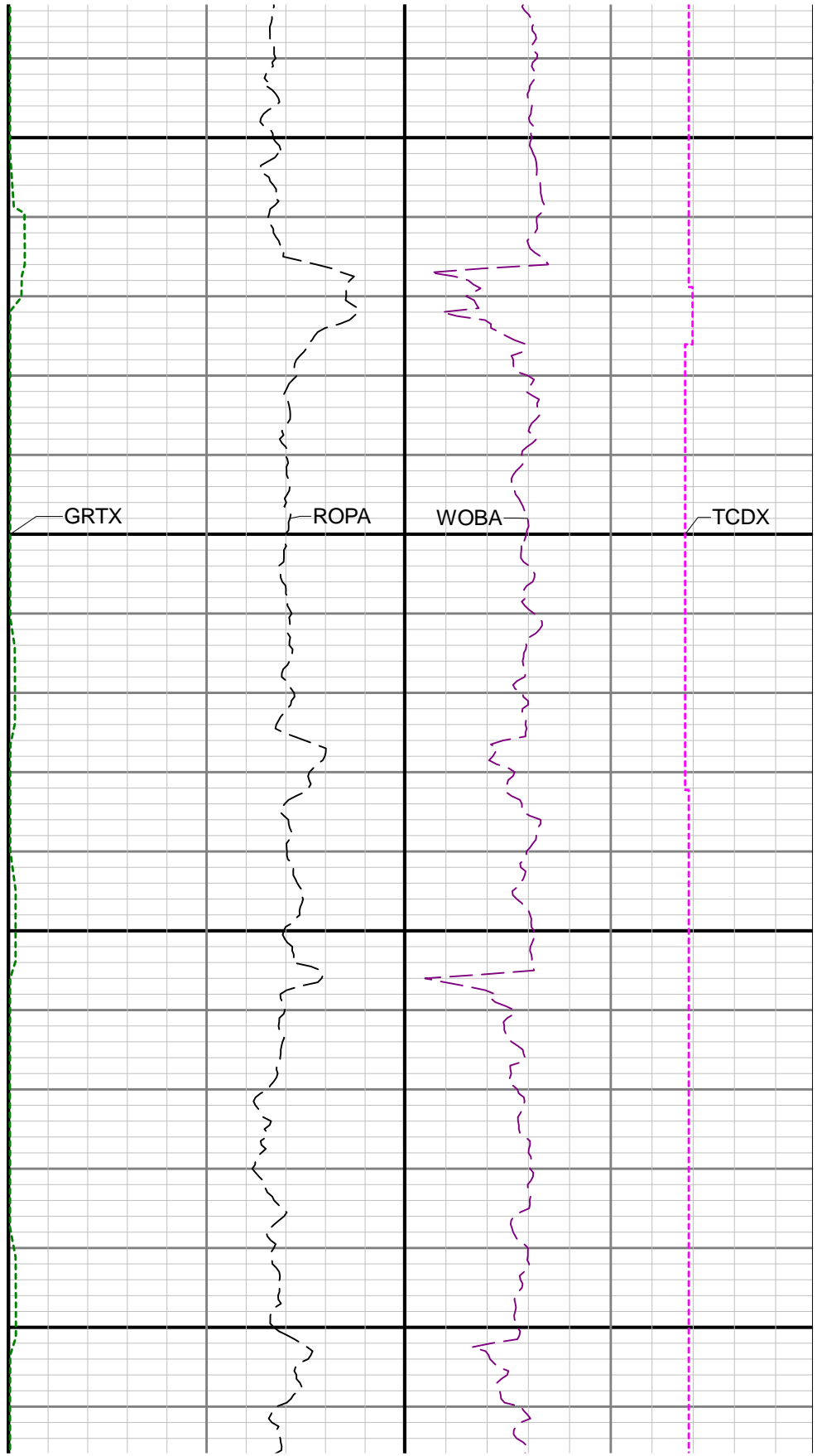
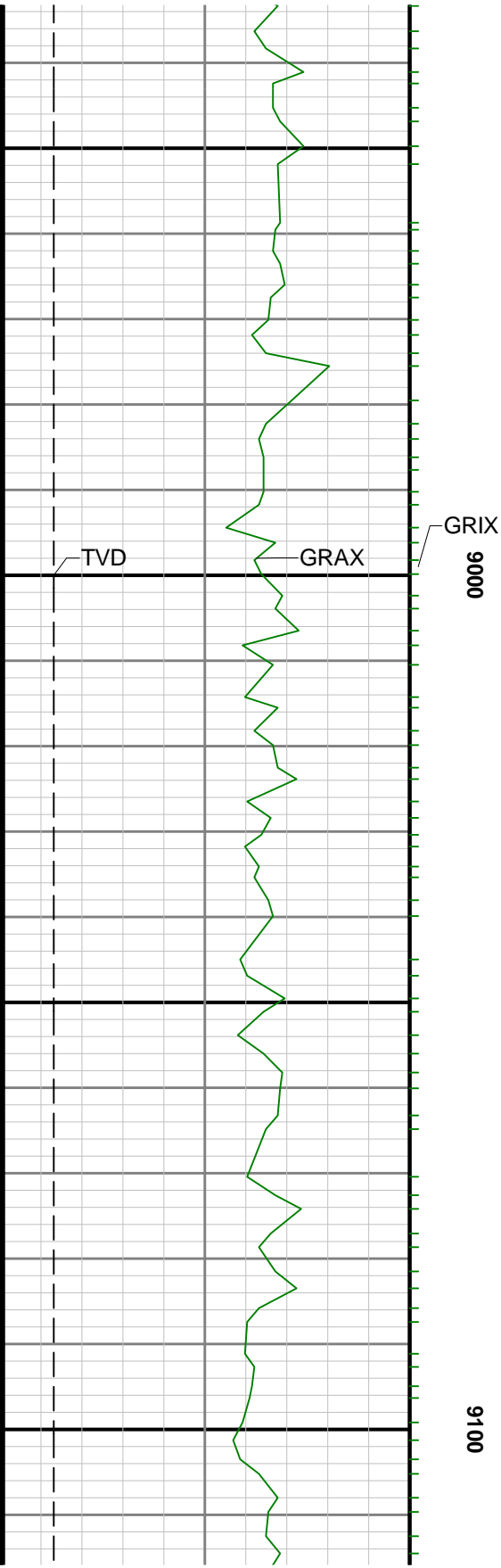


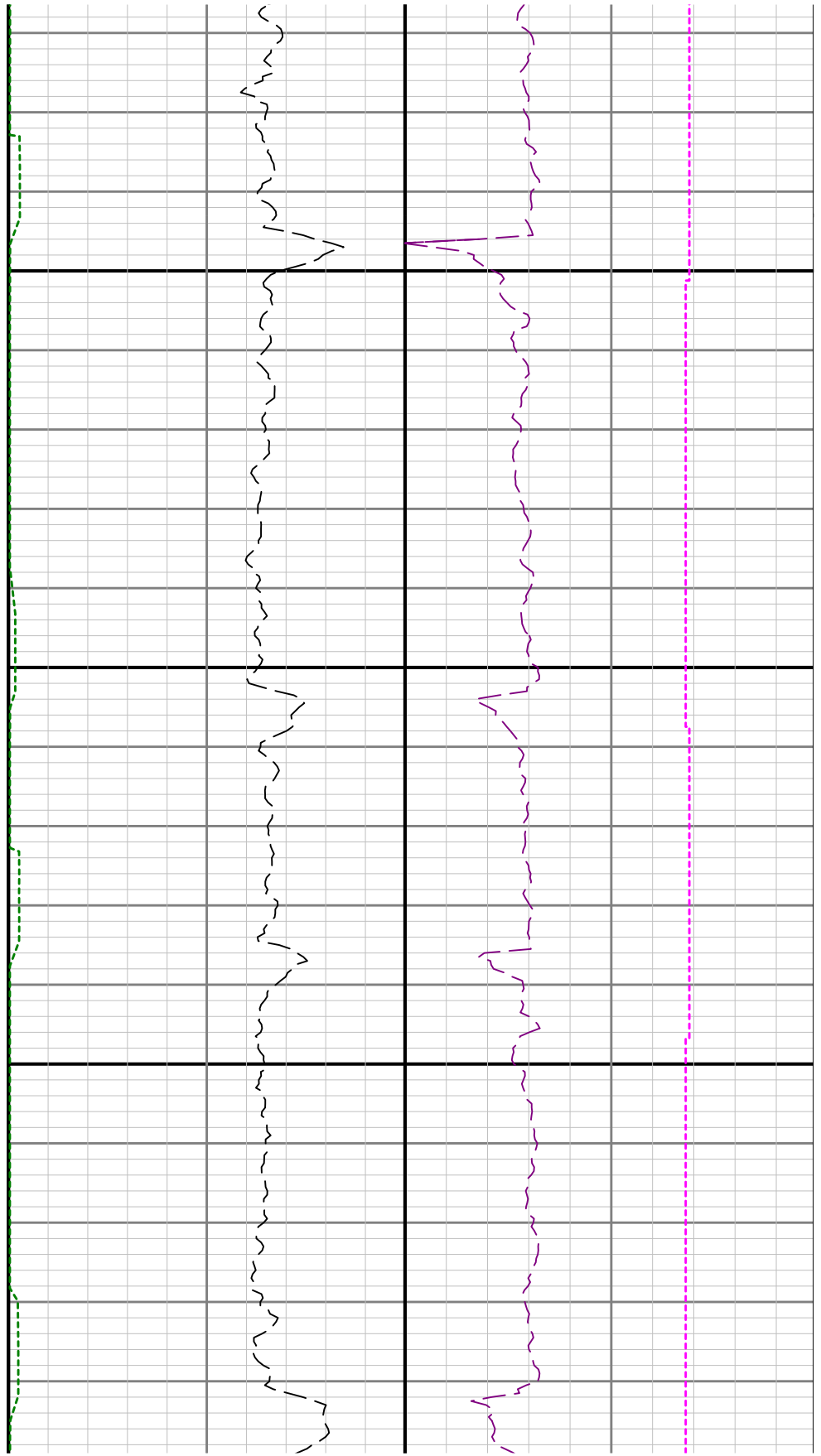


0088

0068

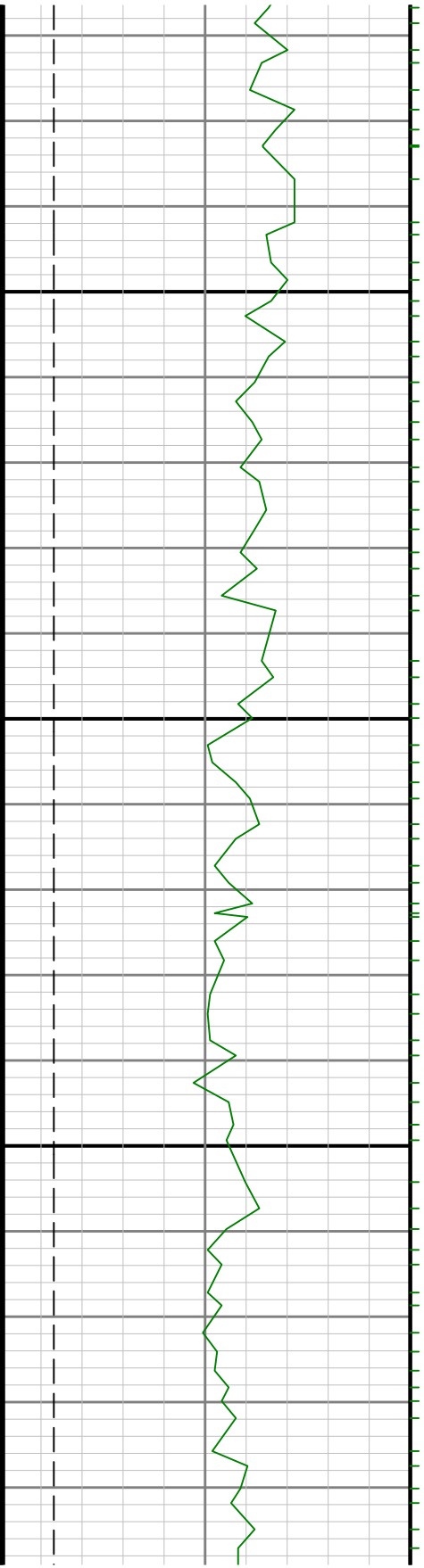


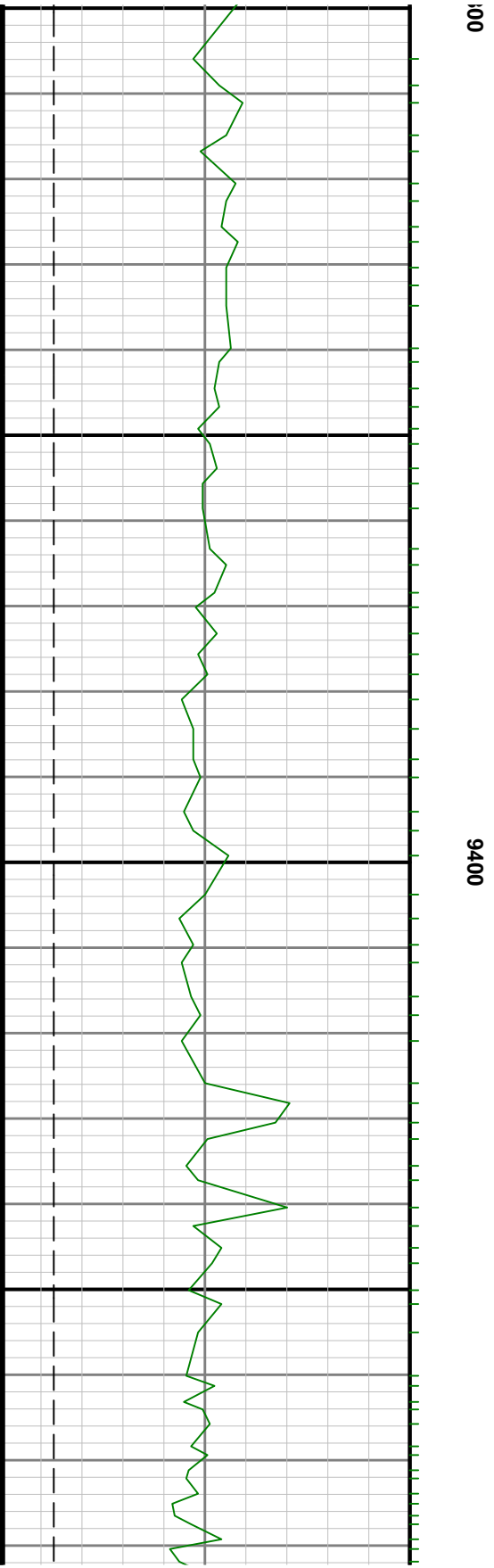
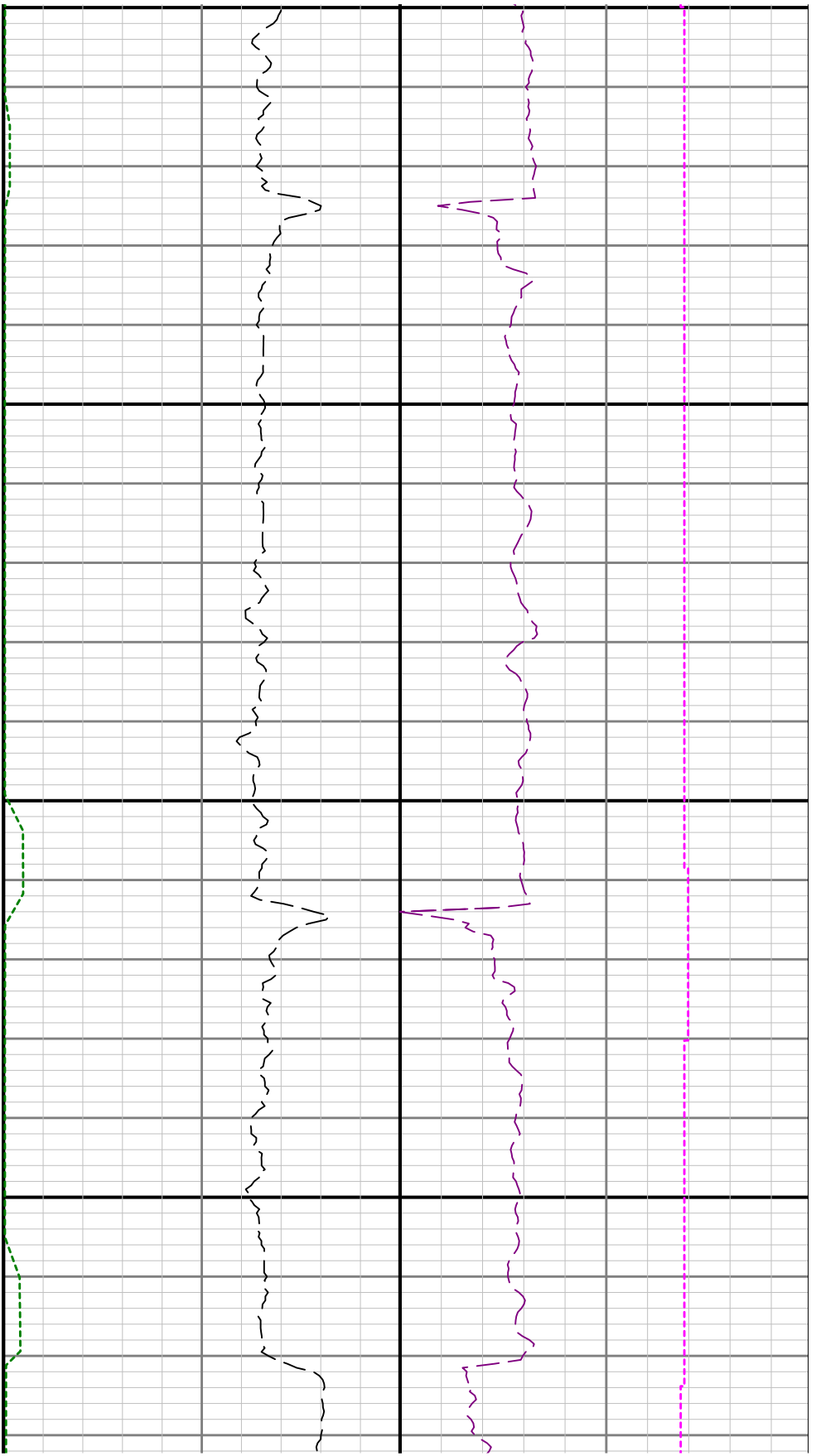


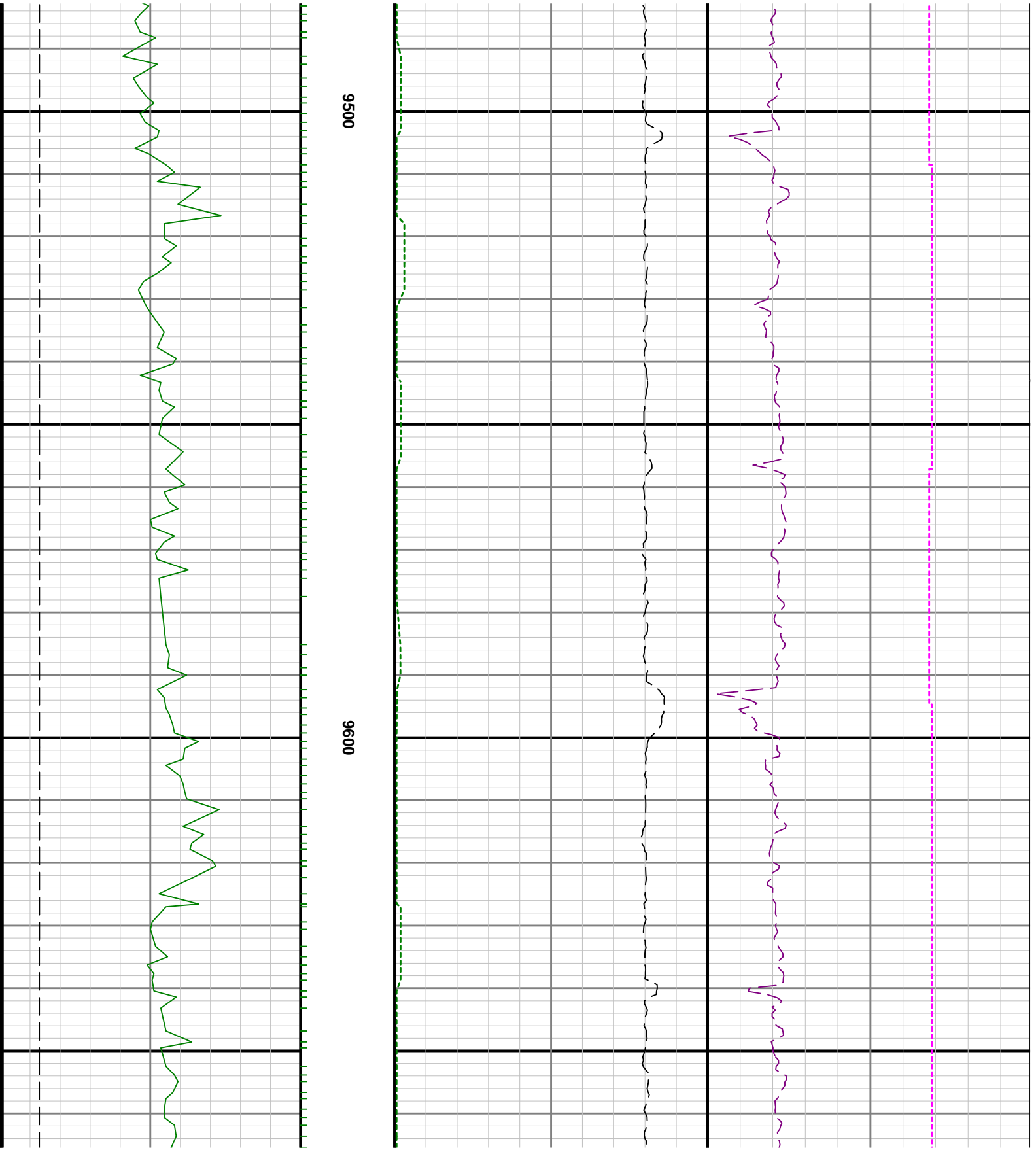


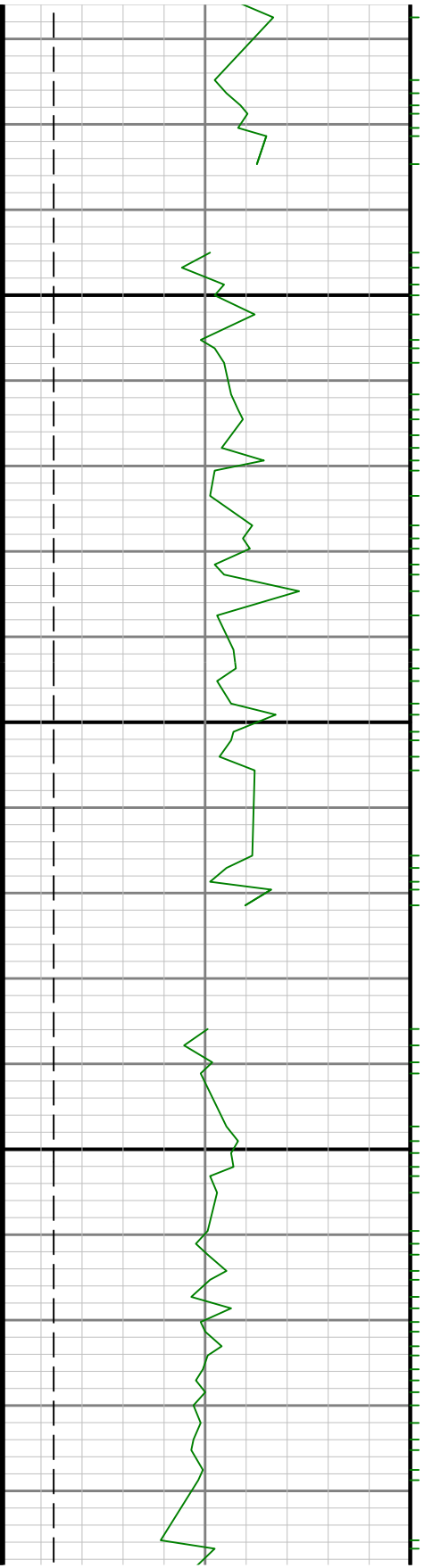
9200

9



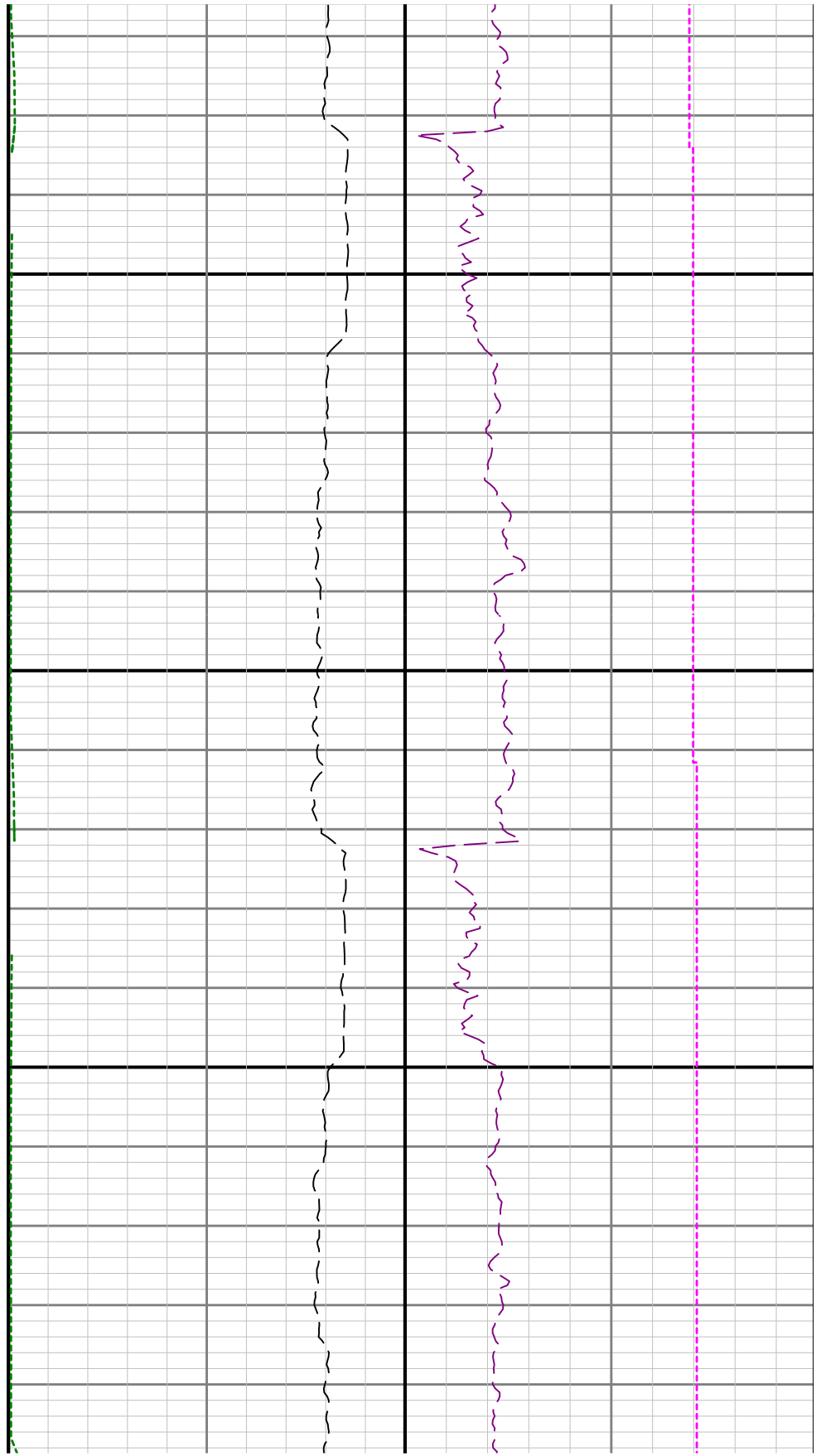


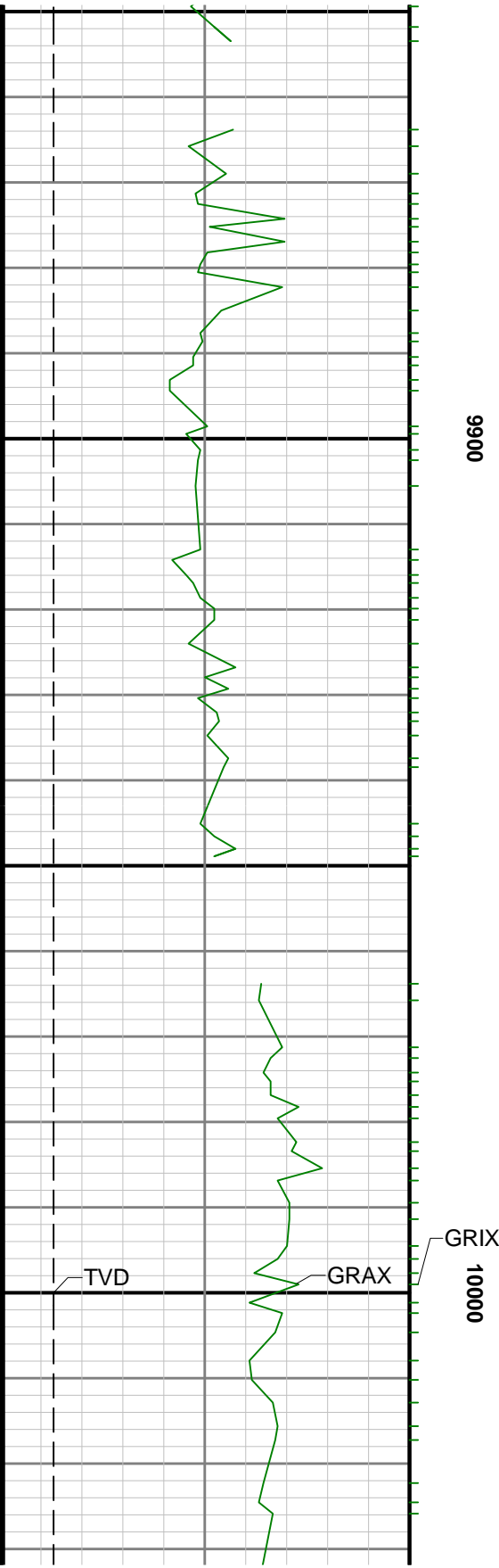


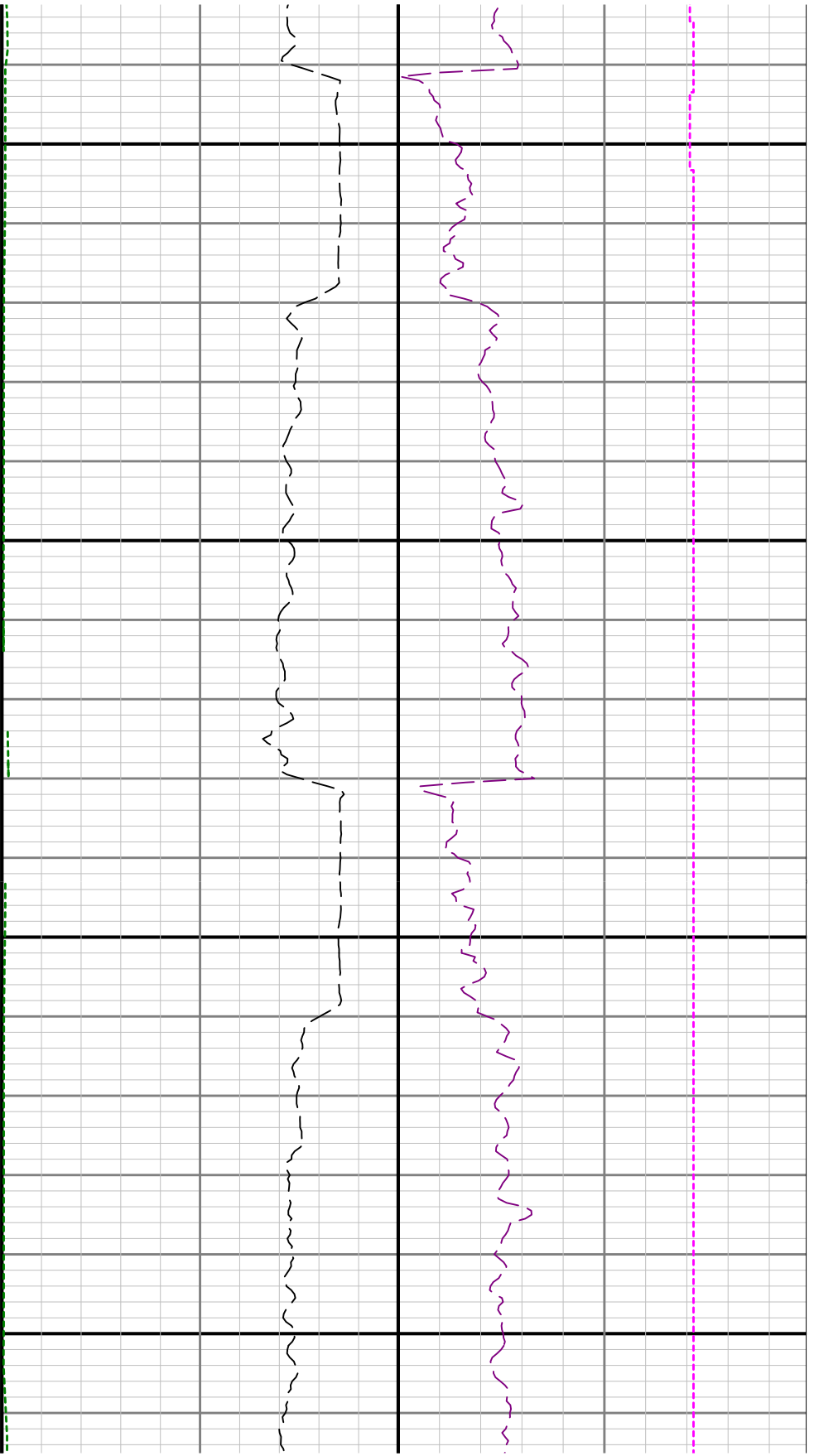


9700

0086

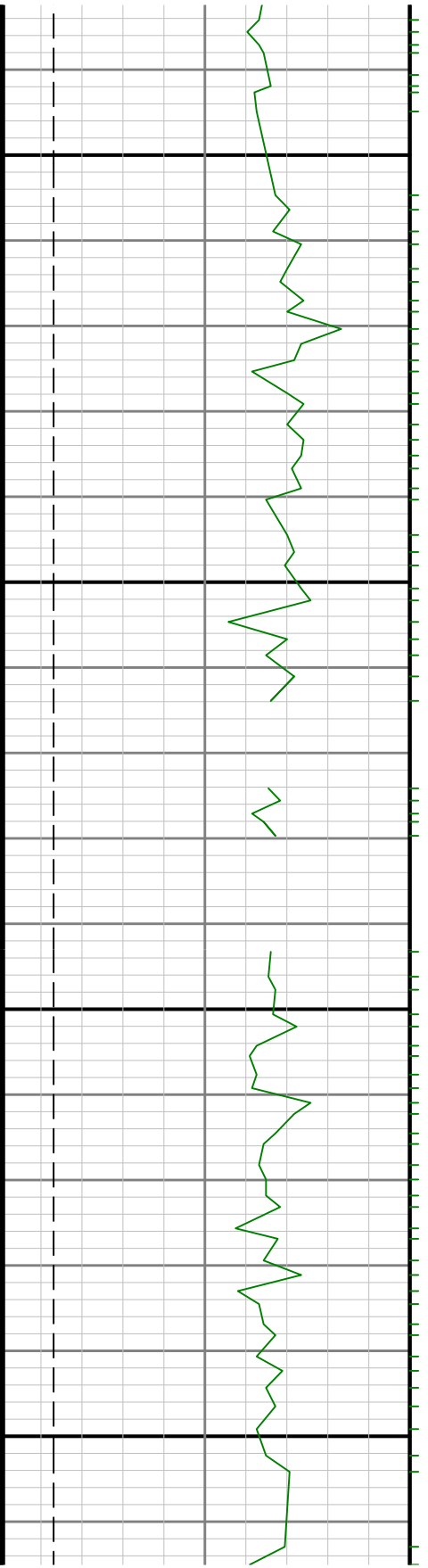




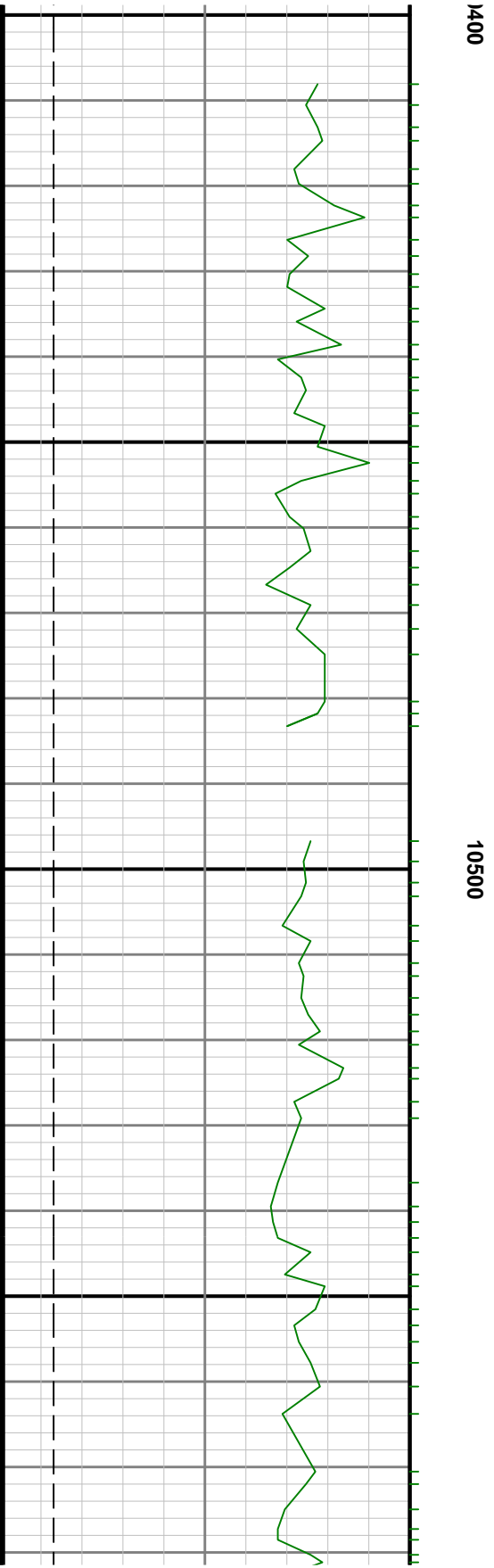
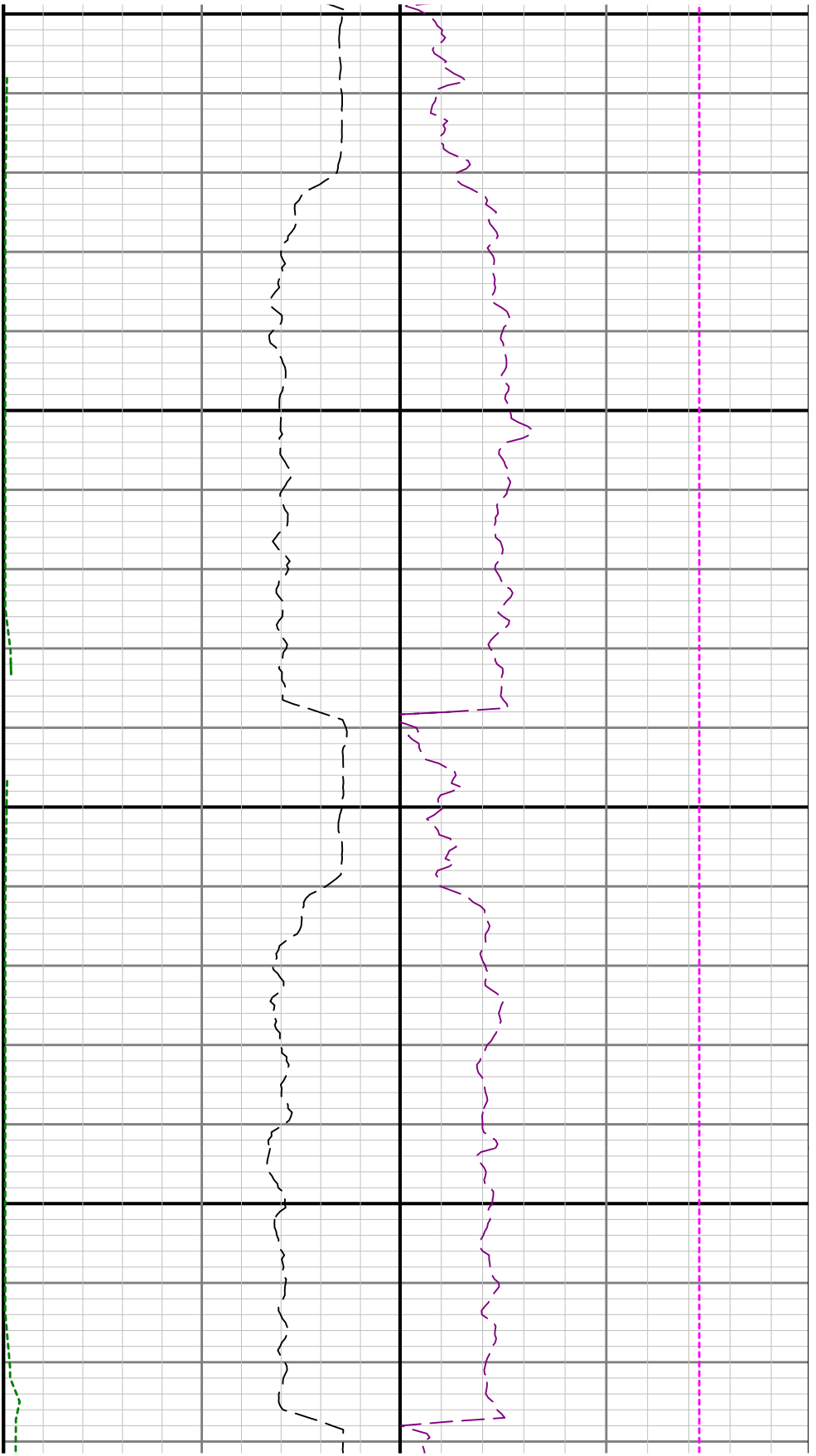


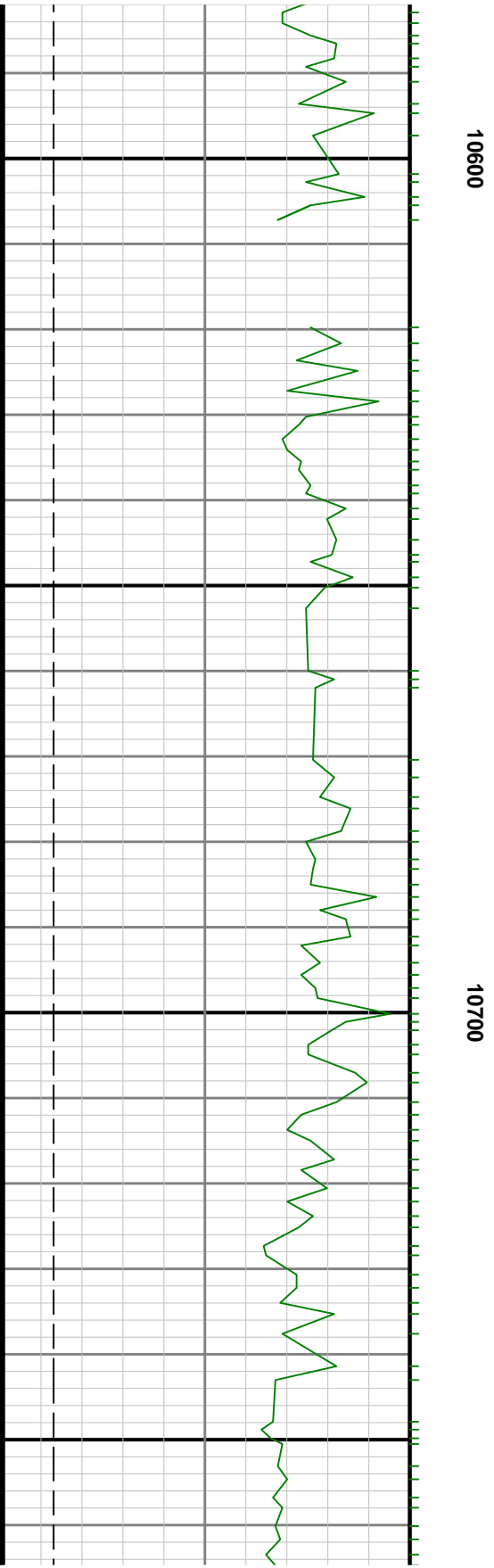
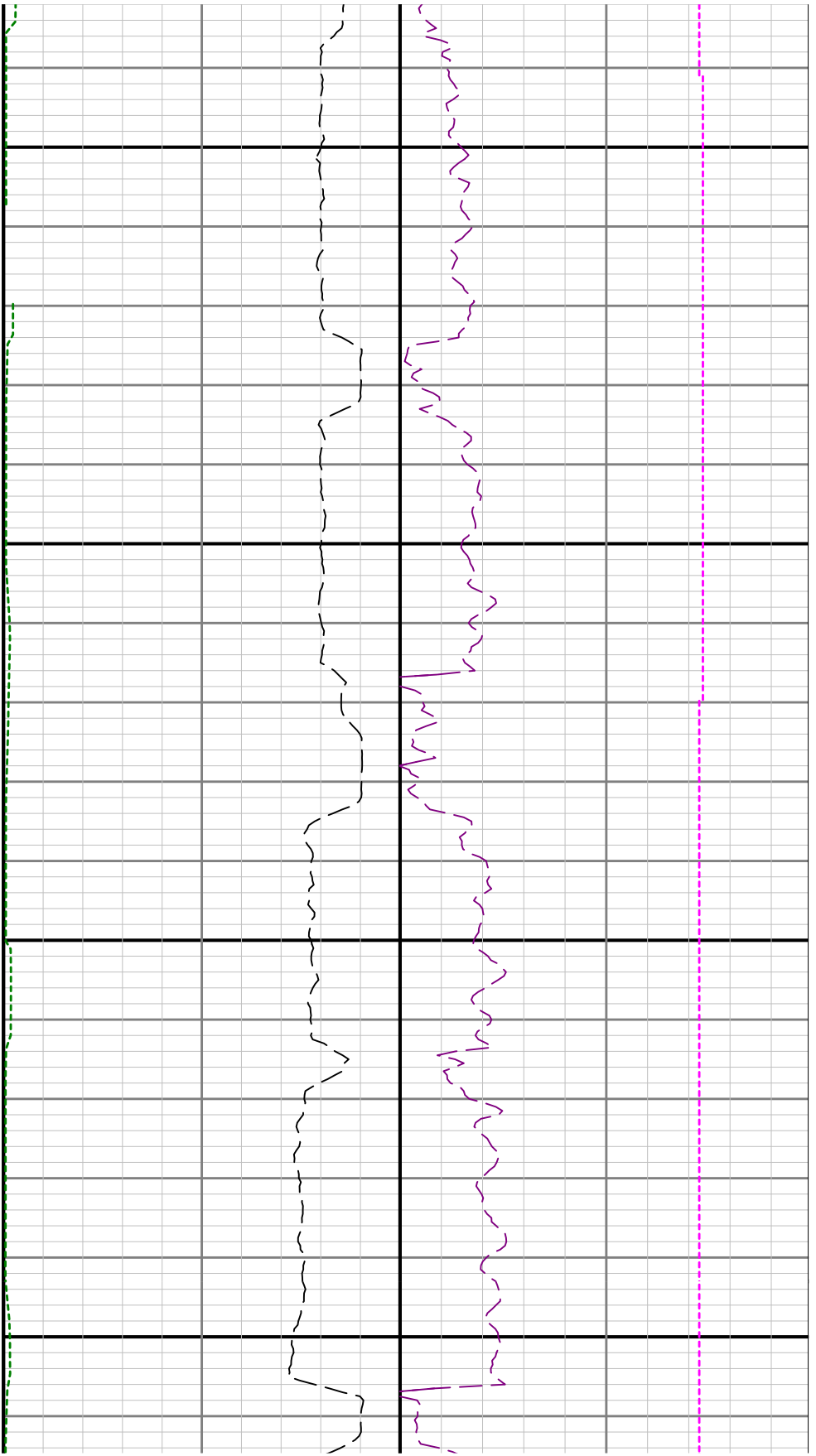
10100

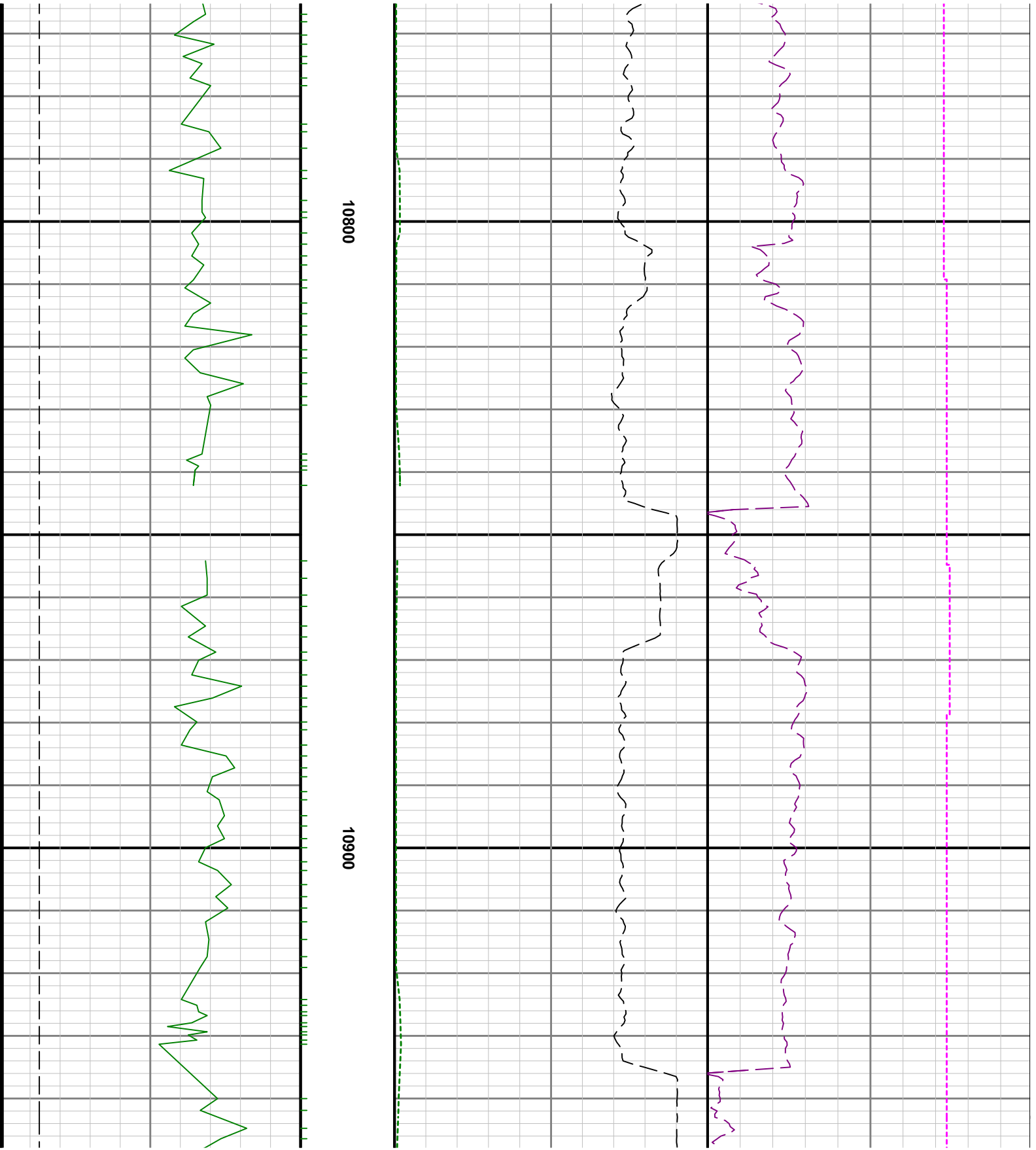
10200

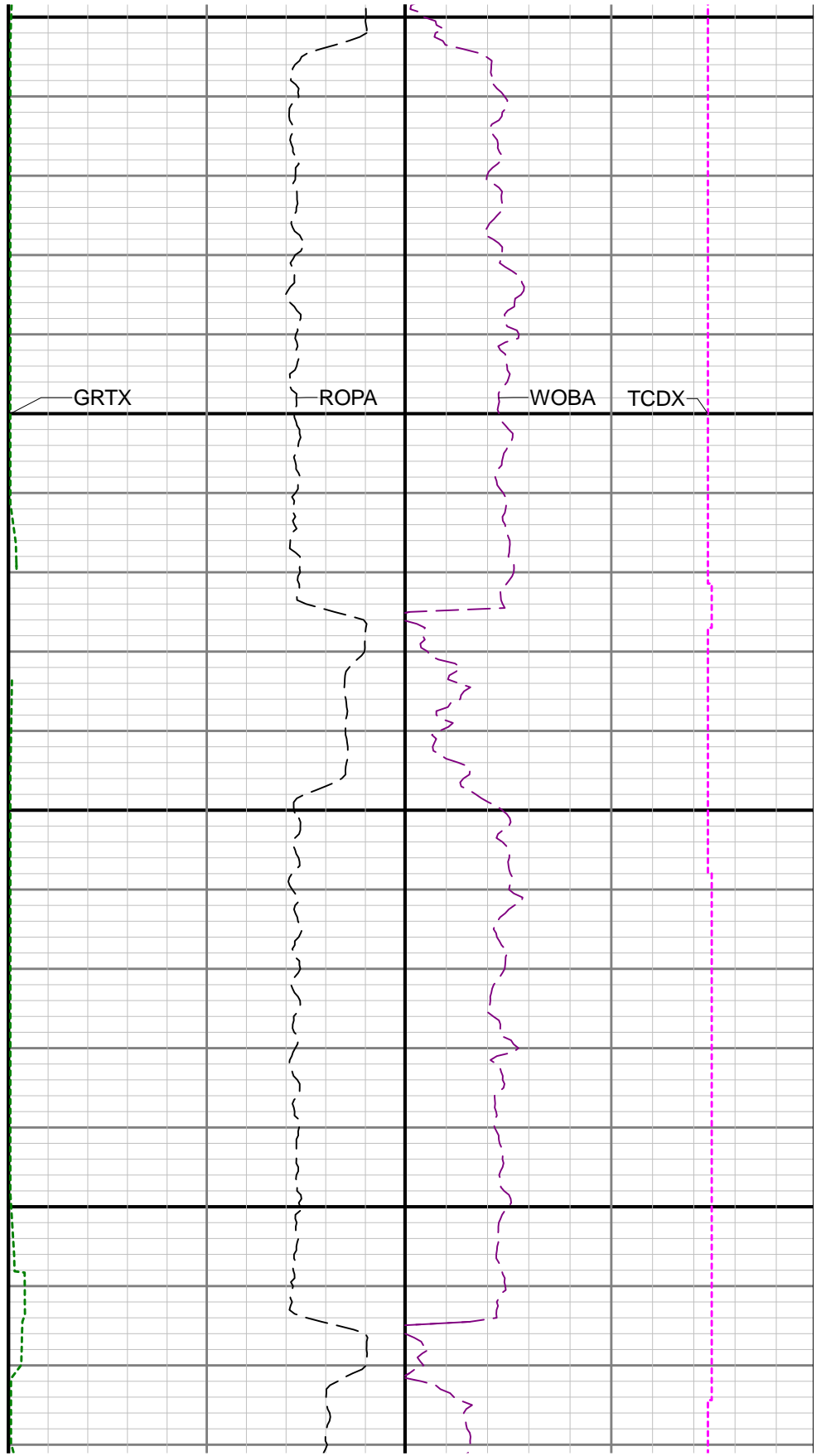
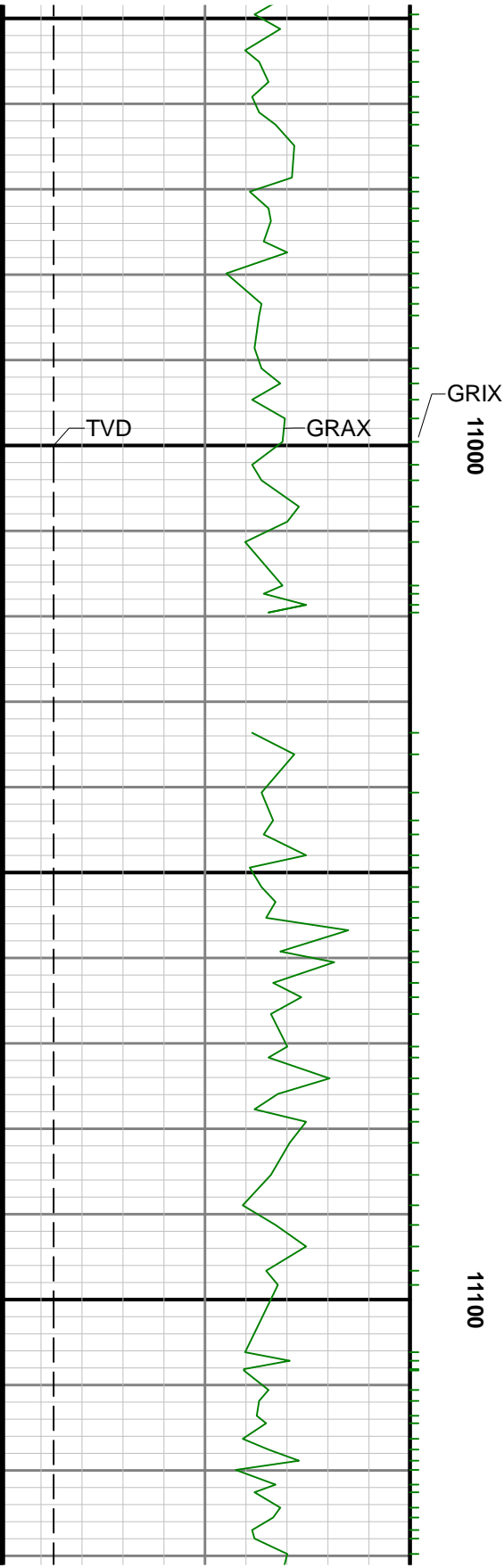


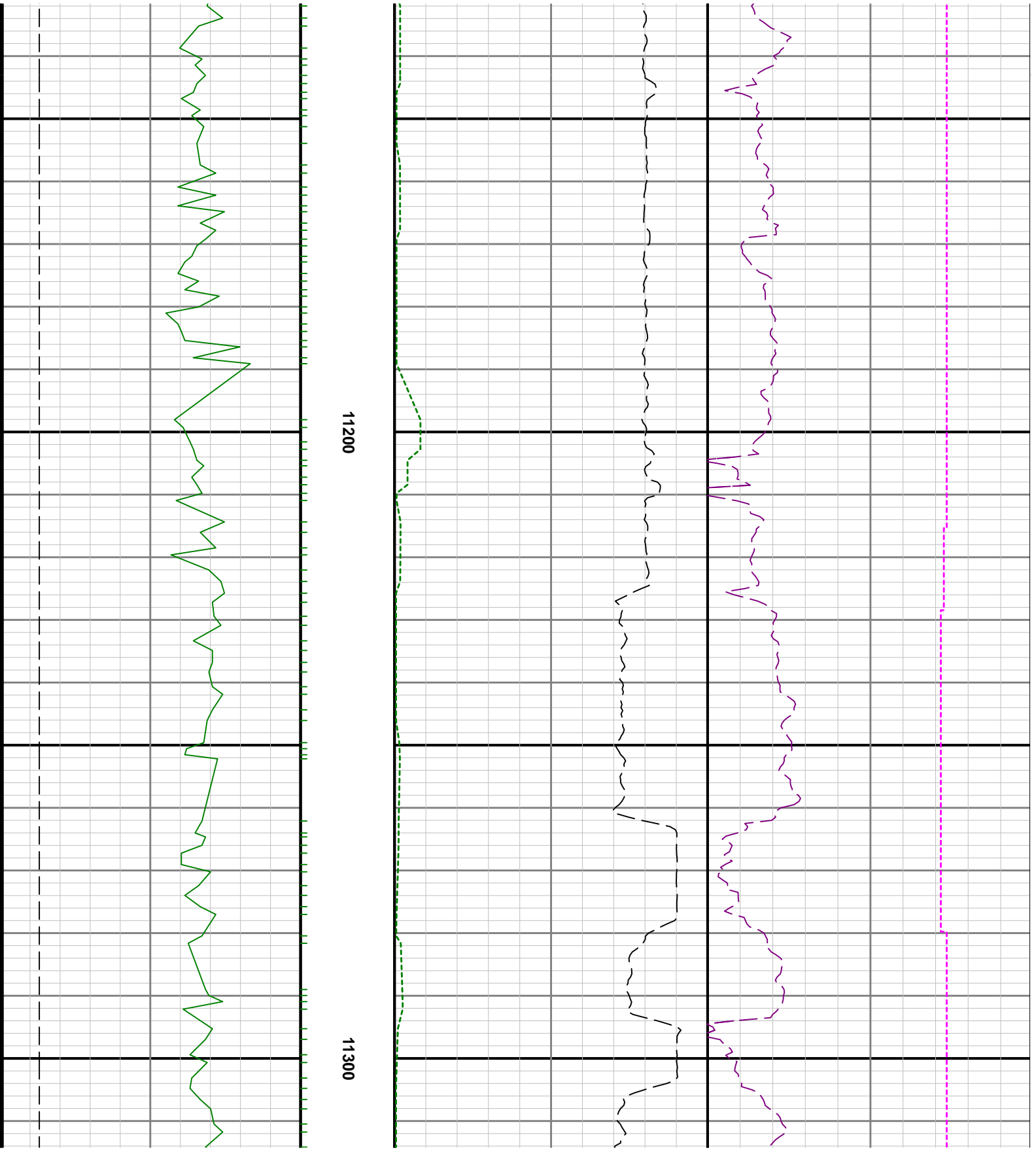


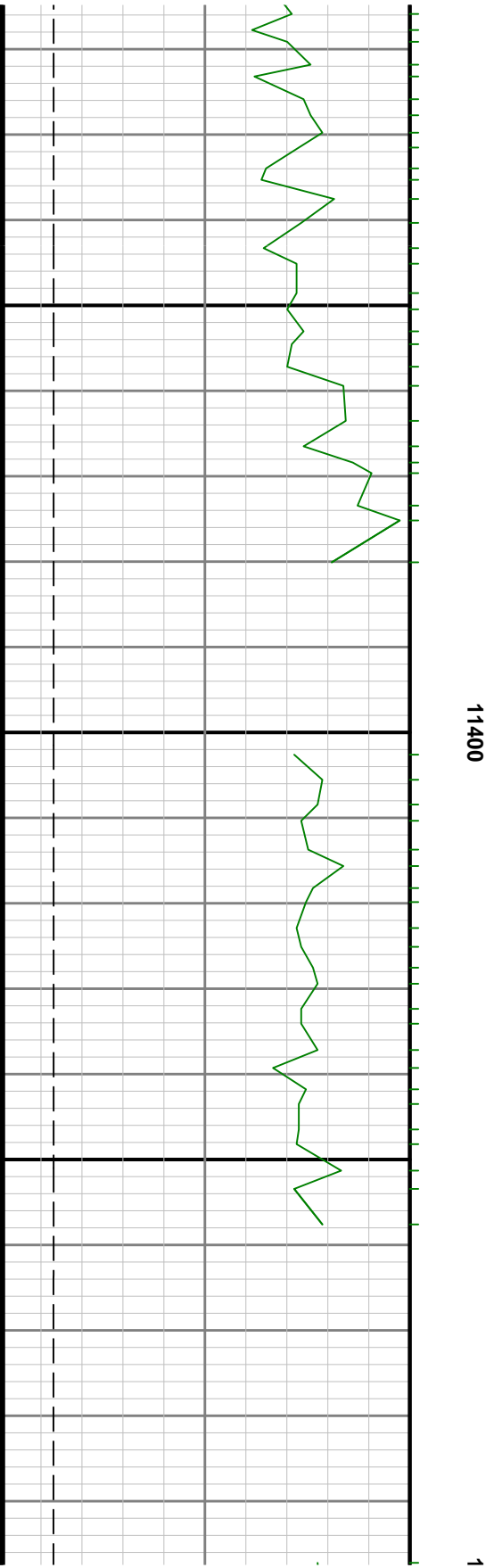
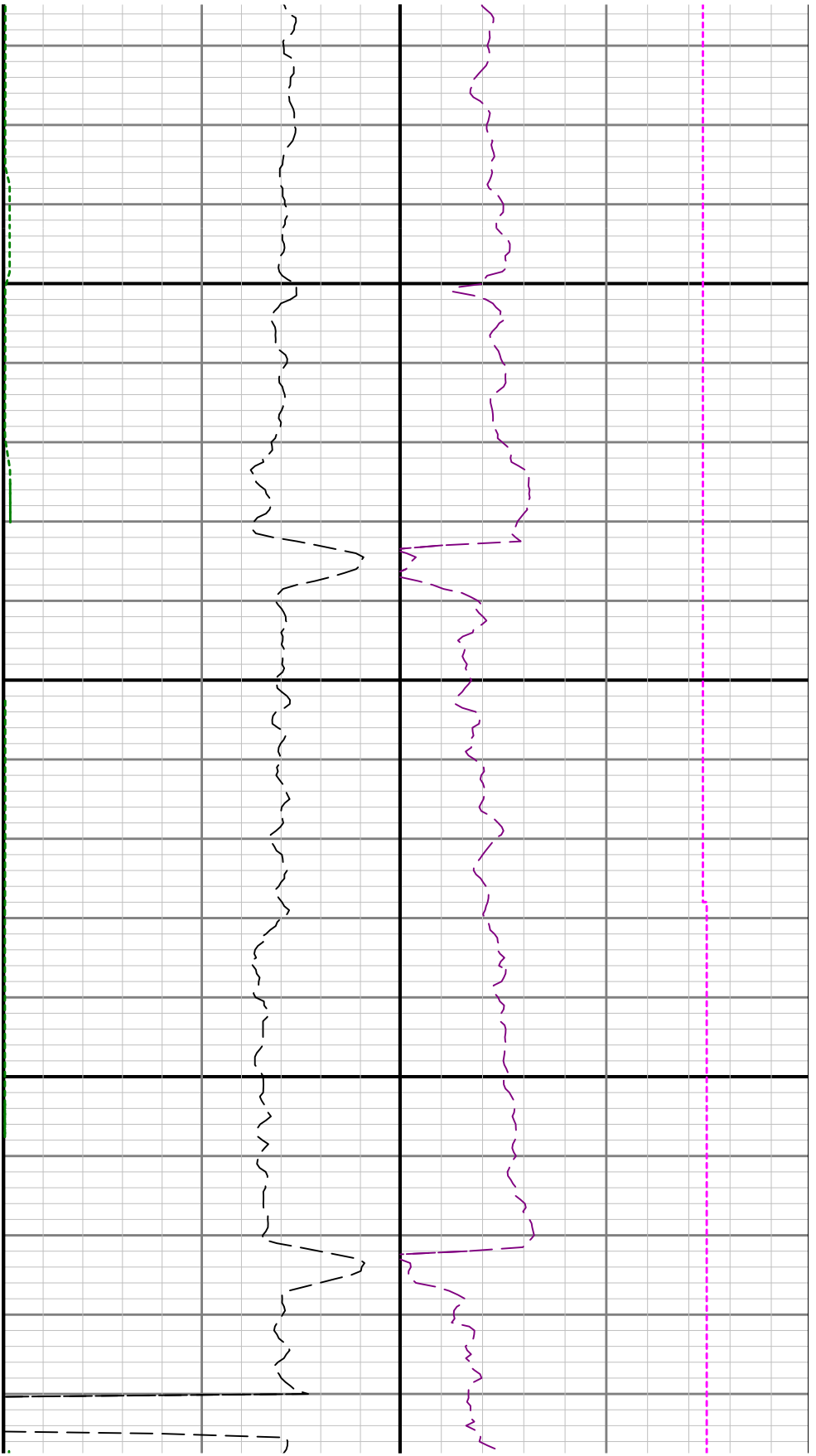


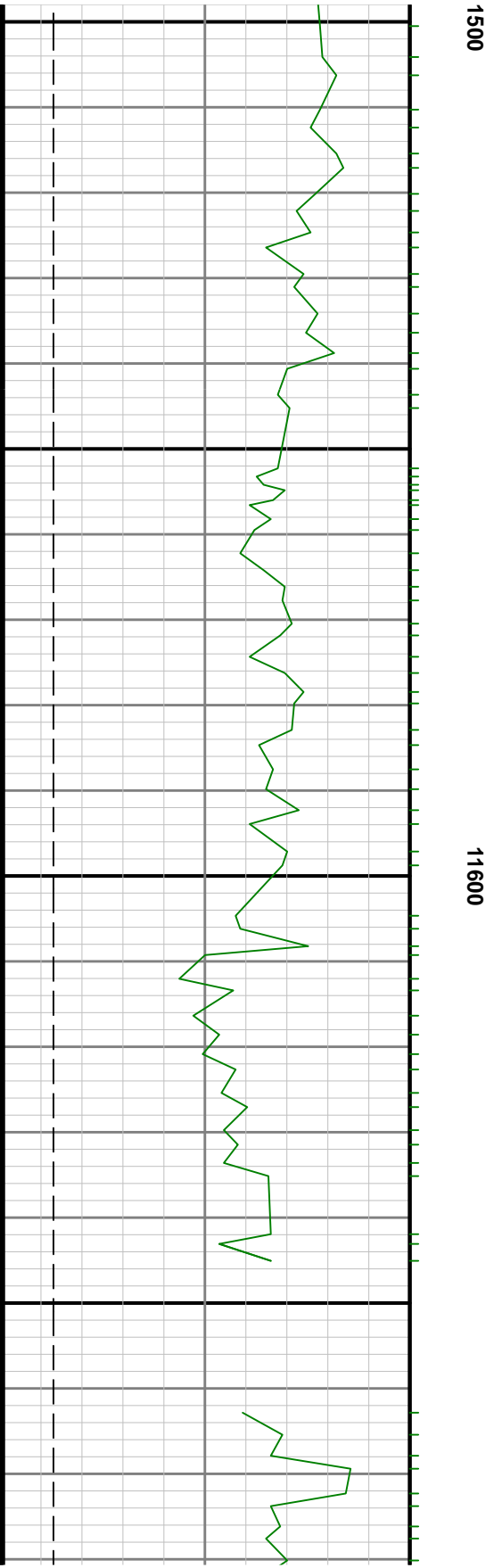
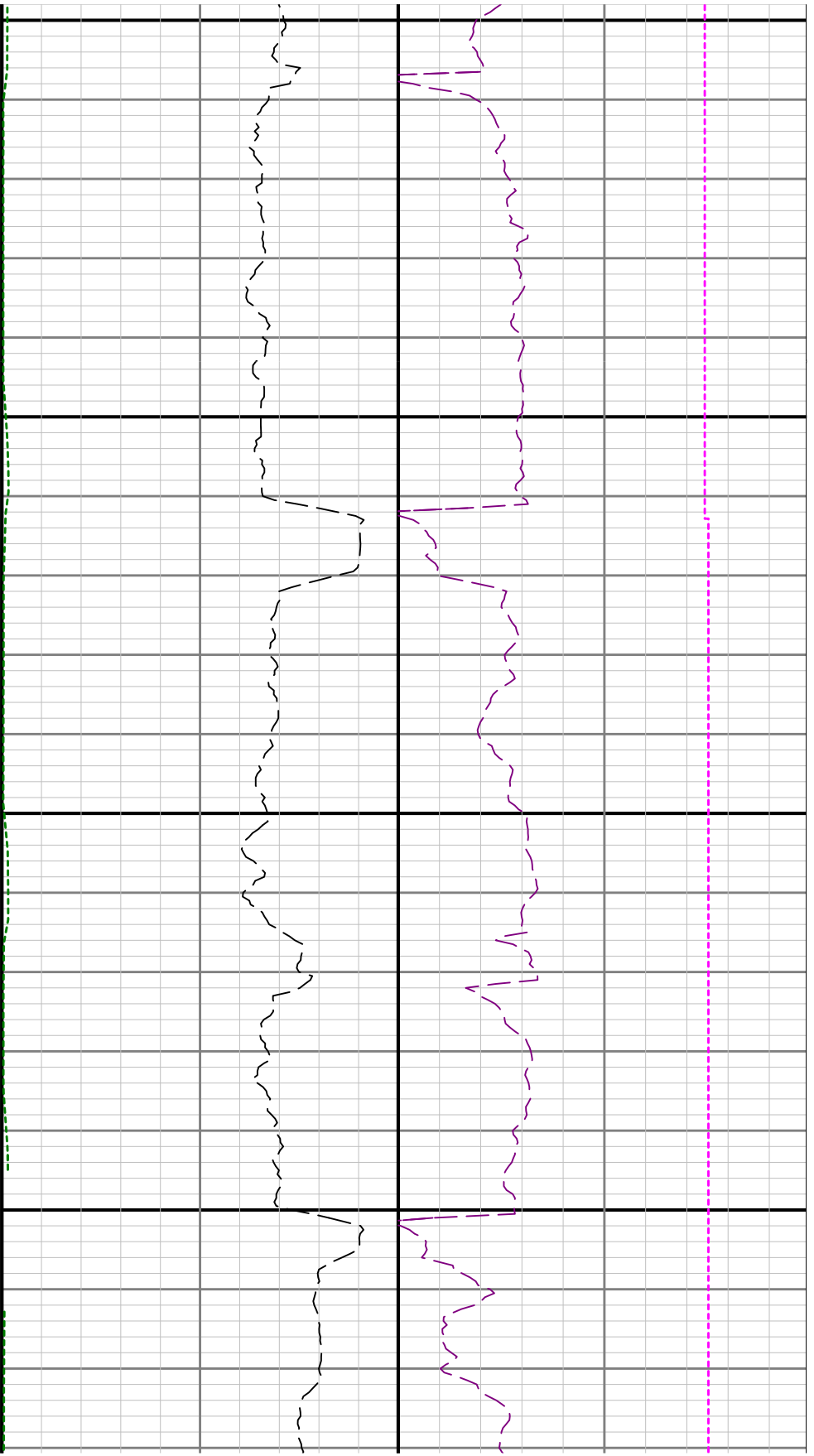


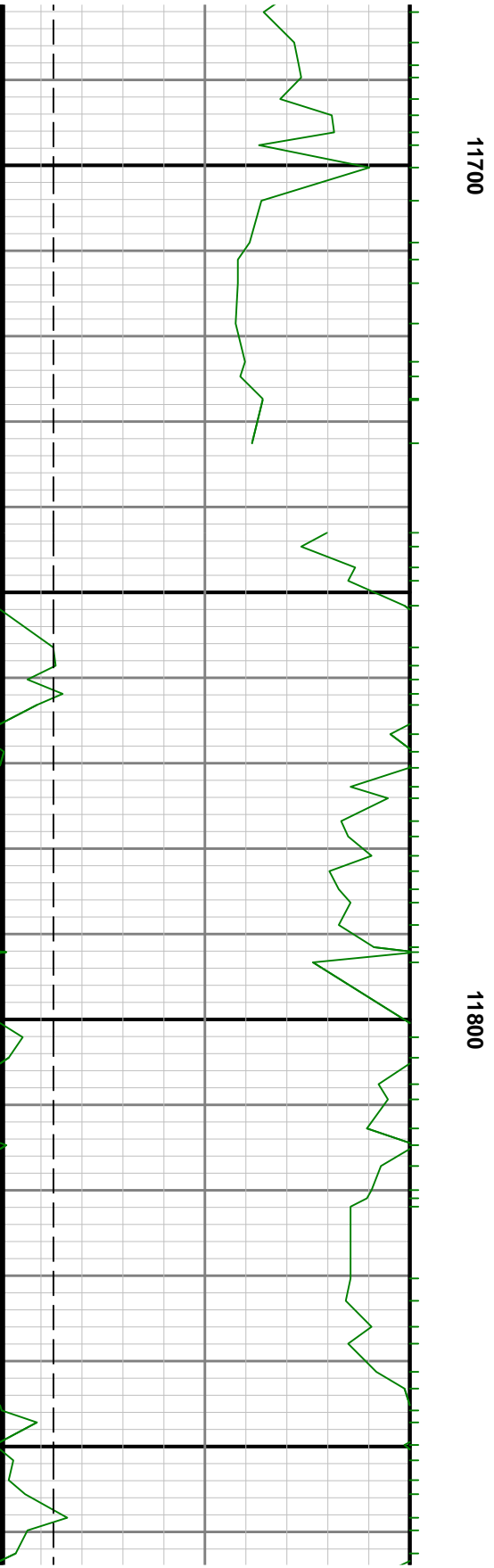
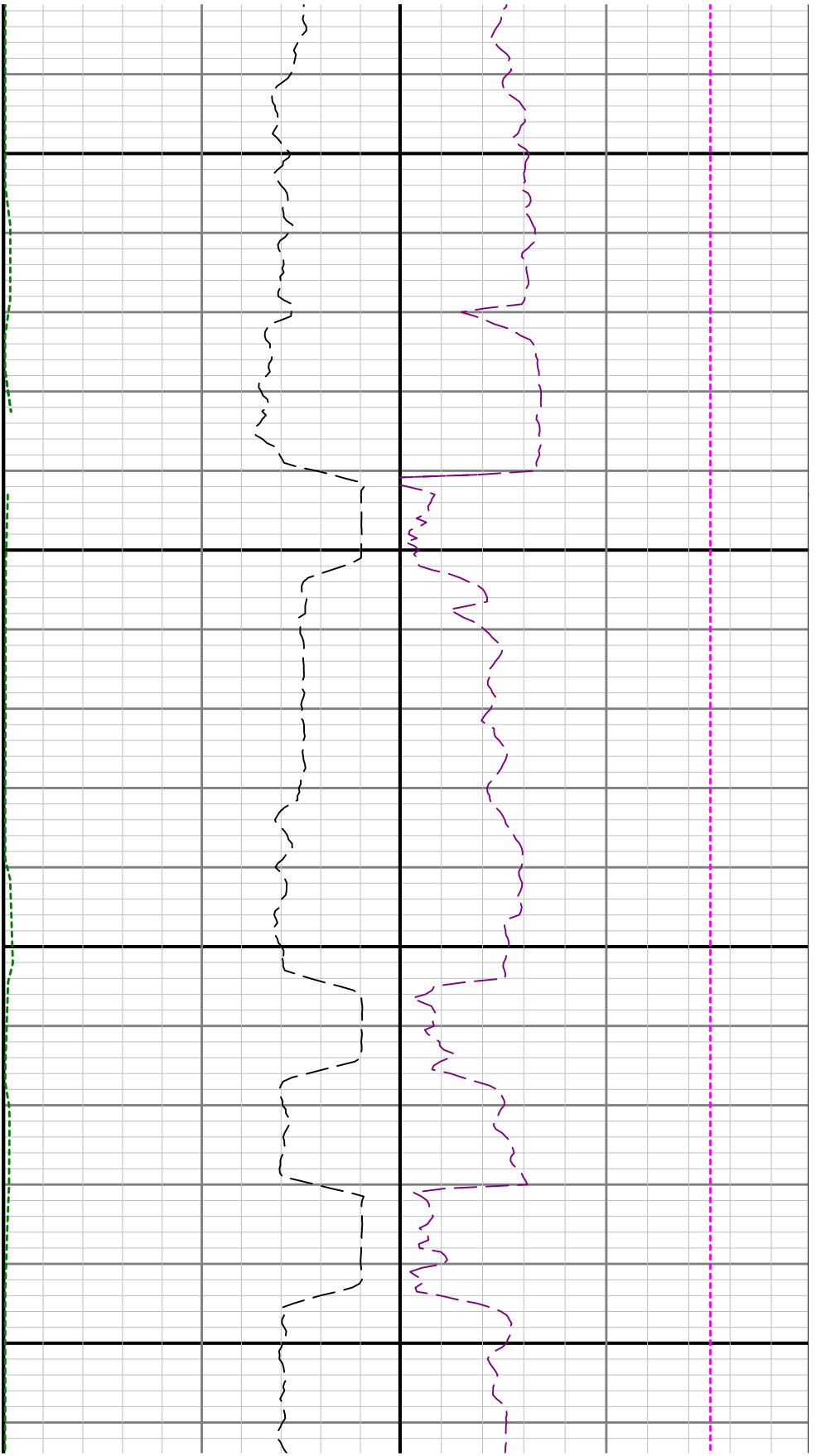


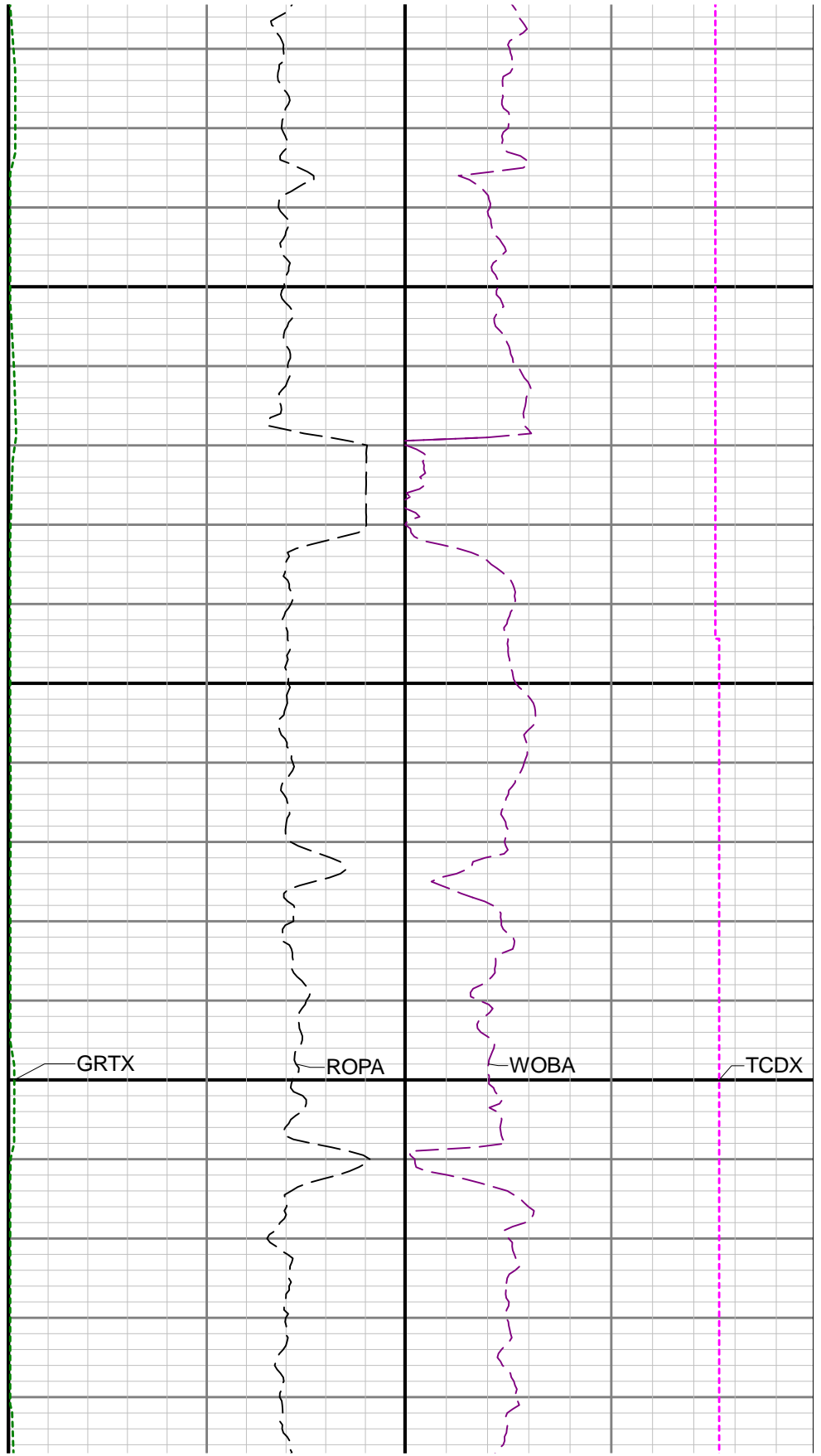
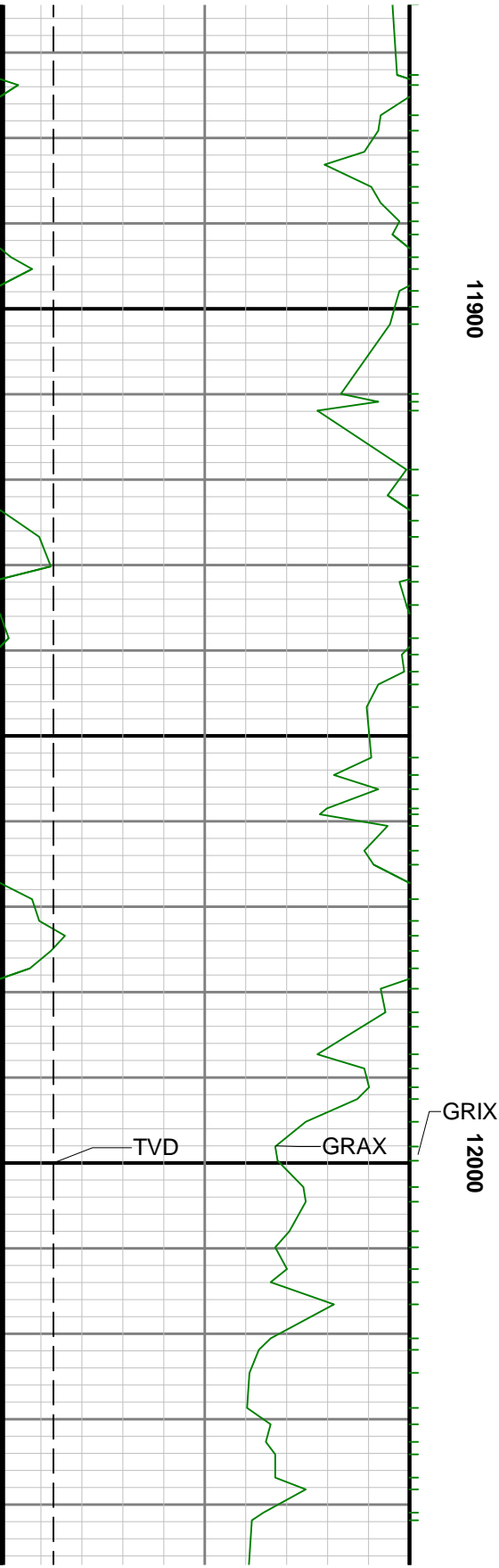


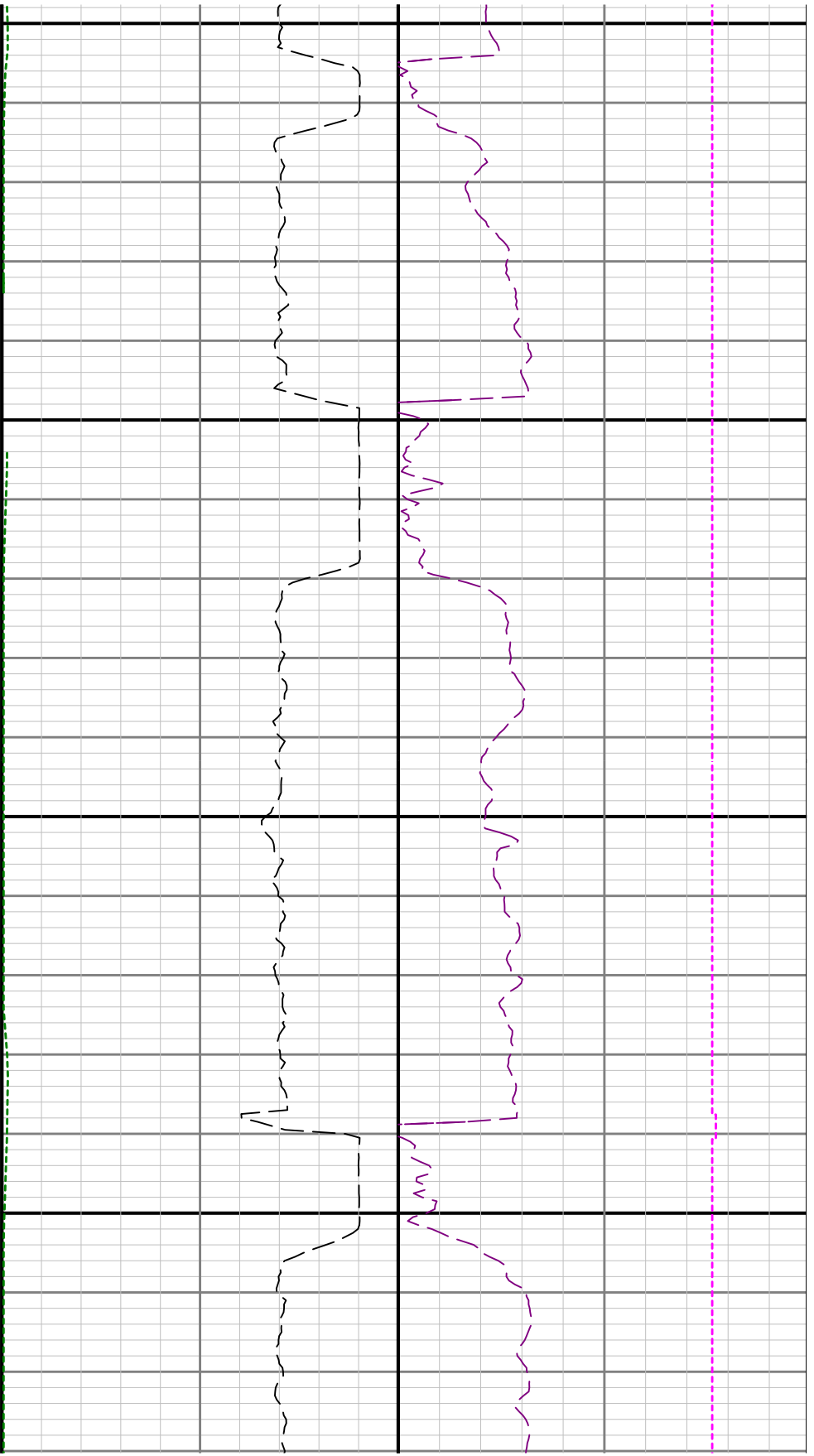












12100

12200

