



Memory and Realtime Log

Multiple Propagation Resistivity

Scale:

Company: Anadarko

1:240

Well: BADDING 13C-2HZ

Measured Depth

Field: WELD COUNTY (KERR MCGEE)

Region: RMD Country: U.S.A.

Status: Surface Location: Other Services:

Final Print

Latitude: 40° 5' 38.105" N

Longitude: 104° 45' 2.110" W

Directional VSS

API Number: 05-123-38288

SEC: 35 TWN: 2N RNG: 66W

Permanent Datum (P.D.): Ground Level Elevation: 5114.00 ft.

Elevations: N/A

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

KB: 5127.00 ft.

Depth Reference: Driller's Depth GL: 5114.00 ft.

Interval Logged Dates Magnetic Field Reference

Top: 6935.0 ft. Date From: 15/Dec/2013 Dip Angle: 66.60° Azi Reference North: True

Bottom: 15341.0 ft. Date To: 26/Dec/2013 Total Mag to Reference

Spud Date: 15/Dec/2013 Field Strength: 52965.0 nT North Correction: 8.33°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1257.0 ft.	9.625 in.	36.00 lb/ft	Surface	1248.0 ft.
8.750 in.	1257.0 ft.	7955.0 ft.	7.000 in.	26.00 lb/ft	Surface	7946.0 ft.
6.125 in.	7955.0 ft.	15341.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	Surface	1257.0 ft.	13.500 in.	1257.0 ft.	0.0° / 71.1°	0.6° / 244.3°
Water Based	1257.0 ft.	7955.0 ft.	8.750 in.	6698.0 ft.	0.7° / 207.8°	84.8° / 182.1°
Water Based	7955.0 ft.	15383.0 ft.	6.125 in.	7428.0 ft.	89.2° / 183.6°	88.9° / 180.9°
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig / Contractor:	Ensign 145	/
PATS	6.4.1.34	Job No:	5994915	/ D&E
		District / Unit:	RMD	

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Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Time (hrs.)
							Top (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start	End	
1	1	1	8.750	PDC	1.000	Steerable	6935.0	7185.0	1257.0	7235.0	16/Dec/2013 01:30	17/Dec/2013 19:30	24.7
2	2	2	8.750	PDC	1.000	Steerable	7185.0	7950.0	7235.0	7955.0	17/Dec/2013 20:00	18/Dec/2013 20:40	10.7
3	3	3	6.125	PDC	6.000	Steerable	7950.0	13240.0	7955.0	13295.0	19/Dec/2013 20:15	23/Dec/2013 06:30	43.3
4	4	4	6.125	PDC	3.000	Steerable	13240.0	15341.0	13295.0	15383.0	23/Dec/2013 08:30	26/Dec/2013 23:00	31.1

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Michael Gurnsey	15/Dec/2013	26/Dec/2013	Donald Delay	15/Dec/2013	25/Dec/2013	Thanh Hoang Nguyen	22/Dec/2013	26/Dec/2013

Alexander Janorschke	15/Dec/2013	26/Dec/2013	David Browning	25/Dec/2013	26/Dec/2013	Steven Cano	15/Dec/2013	22/Dec/2013
Peter Adebayo	18/Dec/2013	24/Dec/2013						

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (cp)	pH	Fluid Loss (cc/30min)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
16/Dec/2013	22:00	1	4467.0	Water Based	8.6	29	8.5	N/A	0 / 99	Active Mud Pit	1100	N/A
20/Dec/2013	21:00	3	9789.0	Water Based	9.5	48	9.5	N/A	2 / 92	Active Mud Pit	1700	N/A
22/Dec/2013	20:00	3	13209.0	Water Based	9.6	46	9.5	N/A	3 / 91	Active Mud Pit	1800	N/A
23/Dec/2013	20:00	4	13480.0	Water Based	9.6	45	9.5	N/A	3 / 91	Active Mud Pit	1800	N/A

Mnemonics

Curve	Description	Units
CACHM	Conductivity (AT) (LS) 2 MHZ - Compensated Borehole Corrected	mho/o
GRAM	Gamma Ray Apparent, 0.5 ft. Avg	API
GRAX	Gamma Ray Apparent, 0.5 ft. Avg	API
GRIM	Gamma Ray Data Density	points
GRIX	Gamma Ray Data Density	Points
RACHM	Resistivity, Attenuation (LS) 2 MHZ - Compensated Borehole Corrected	ohm.m
RACLM	Resistivity, Attenuation (LS) 400 kHz - Compensated Borehole Corrected	ohm.m
ROPA	Rate of Penetration, 3.0 ft. Avg	ft/hr
RPCHM	Resistivity, Phase Difference (LS) 2 MHZ - Compensated Borehole Corrected	ohm.m
RPCLM	Resistivity, Phase Difference (LS) 400 kHz -Compensated Borehole Corrected	ohm.m
RPSIHM	Resistivity Slide Indicator	unitless

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	10427973	Directional	56.24	6.750	2.750
1	SRIG	12376056	Gamma	52.86	6.750	0.000
2	DIR	10427973	Directional	53.69	6.750	2.750
2	SRIG	12376056	Gamma	50.32	6.750	0.000
3	CS	105687	-	74.98	4.843	2.569
3	BCPM	12426121	Telemetry	63.82	4.843	2.569
3	STAB	12401251	-	60.62	0.000	0.000
3	OTK	13127855	Directional	56.14	4.843	2.569
3	OTK	13127855	Resistivity	50.17	4.843	2.569
3	OTK	13127855	Gamma	42.98	4.843	2.569
3	OTK	13127855	Pressure	45.61	4.843	2.569
3	CS	12072904	-	37.78	4.843	2.569
4	CS	12114978	-	73.79	4.843	2.569
4	BCPM	12352126	Telemetry	62.79	4.843	2.569

4	STAB	11863323	-	59.67	0.000	2.569
4	OTK	10238658	Directional	55.04	4.843	2.569
4	OTK	10238658	Resistivity	49.07	4.843	2.569
4	OTK	10238658	Gamma	41.88	4.843	2.569
4	OTK	10238658	Pressure	44.51	4.843	2.569
4	CS	10432083	-	37.78	4.843	2.569

Service and Tool Mnemonics

Mnemonic	Name	Description
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

Comments

<p>1 . Baker Hughes run 1 utilized 6 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) behind an 8 3/4 inch bit and steerable assembly from 1257 to 7235 feet MD (1256.93 to 7184.07 feet TVD).</p> <p>2. Baker Hughes run 2 utilized 6 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) behind an 8 3/4 inch bit and steerable assembly from 7235 to 7955 feet MD (7184.07 to 7552.55 feet TVD).</p> <p>3. Baker Hughes run 3 utilized 4 3/4 inch OnTrak Services (Multiple Propagation Resistivity, Gamma Ray, Azimuthal Gamma Ray, VSS, Directional) behind a 6 1/8 inch bit and steerable assembly from 7955 to 13295 feet MD (7552.55 to 7580.79 feet TVD).</p> <p>4. Baker Hughes run 4 utilized 4 3/4 inch OnTrak Services (Multiple Propagation Resistivity, Gamma Ray, Azimuthal Gamma Ray, VSS, Directional) behing a 6 1/8 inch bit and steerable assembly from 13295 to 15383 feet MD (7580.79 to 7592 feet TVD).</p> <p>5. Depth Measurements were obtained from a depth tracking system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes LWD logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.</p> <p>6. A sliding indicator is being shown as a heavy line on the right of track 2. The indicator has been depth shifted to the resistivity sensor offset to correspond with data acquired while sliding.</p>
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Remarks

Number	Measured	Hole	LWD	Remark
	Depth	Section	Run No.	
	(ft.)	(in.)		
1	6935	8.750	1	Logging services begin. No logging data acquired prior to 6935 feet MD (6892 feet TVD) as per client request.
2	7905	8.750	2	The interval from 7905 to 7911 feet MD (7548 to 7549 feet TVD) was not logged due to difference in sensor offsets between runs 1 and 2. OnTrak memory logs begin. Logged resistivity and conductivity values wrap due to logging while in casing cement shoe.
3	9170	6.125	3	The interval from 9170 to 9230 feet MD (7562 to 7562 feet TVD) was not logged due to insufficient flow rates from the rig due to pump issues.
4	9730	6.125	3	The interval from 9730 to 9744 feet MD (7555 to 7555 feet TVD) was not logged due to insufficient flow rates from the rig due to pump issues.
5	9783	6.125	3	The interval from 9783 to 9818 feet MD (7555 to 7555 feet TVD) was not logged due to insufficient flow rates from the rig due to pump issues.
6	15341	6.125	4	The interval from 15341 to 15383 feet MD (7591 to 7592 feet TVD) was not logged due to sensor to bit offset at terminal depth.

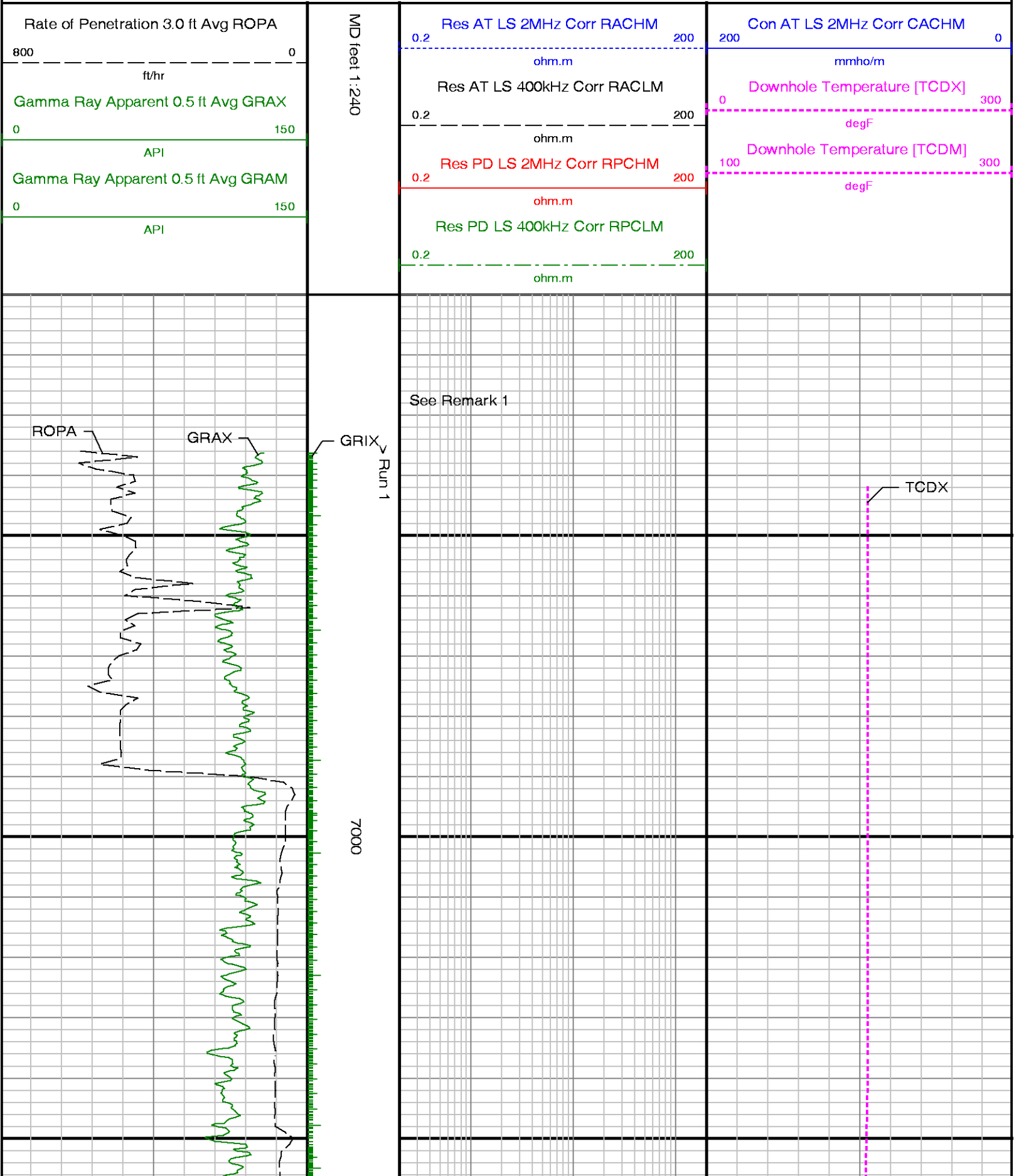


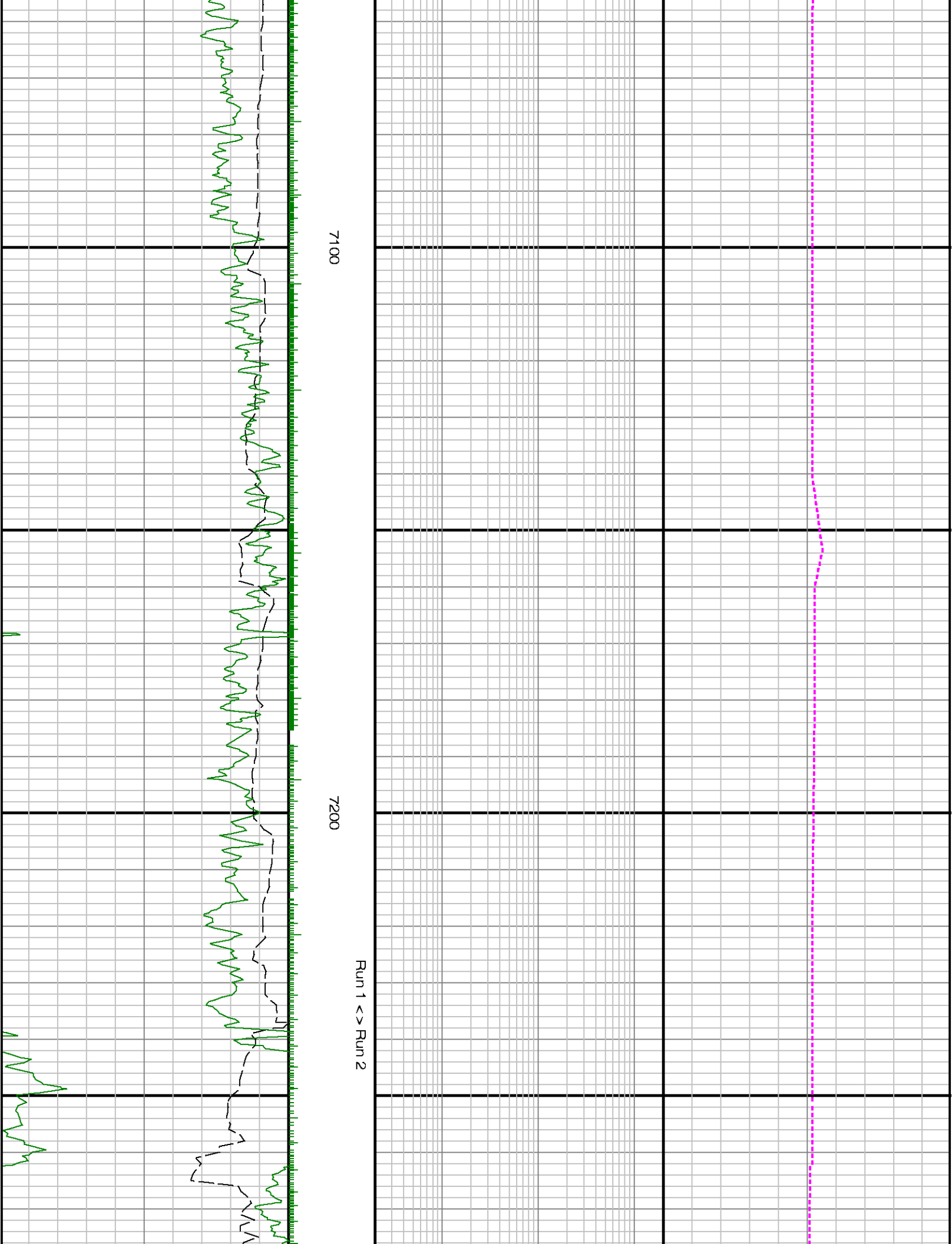
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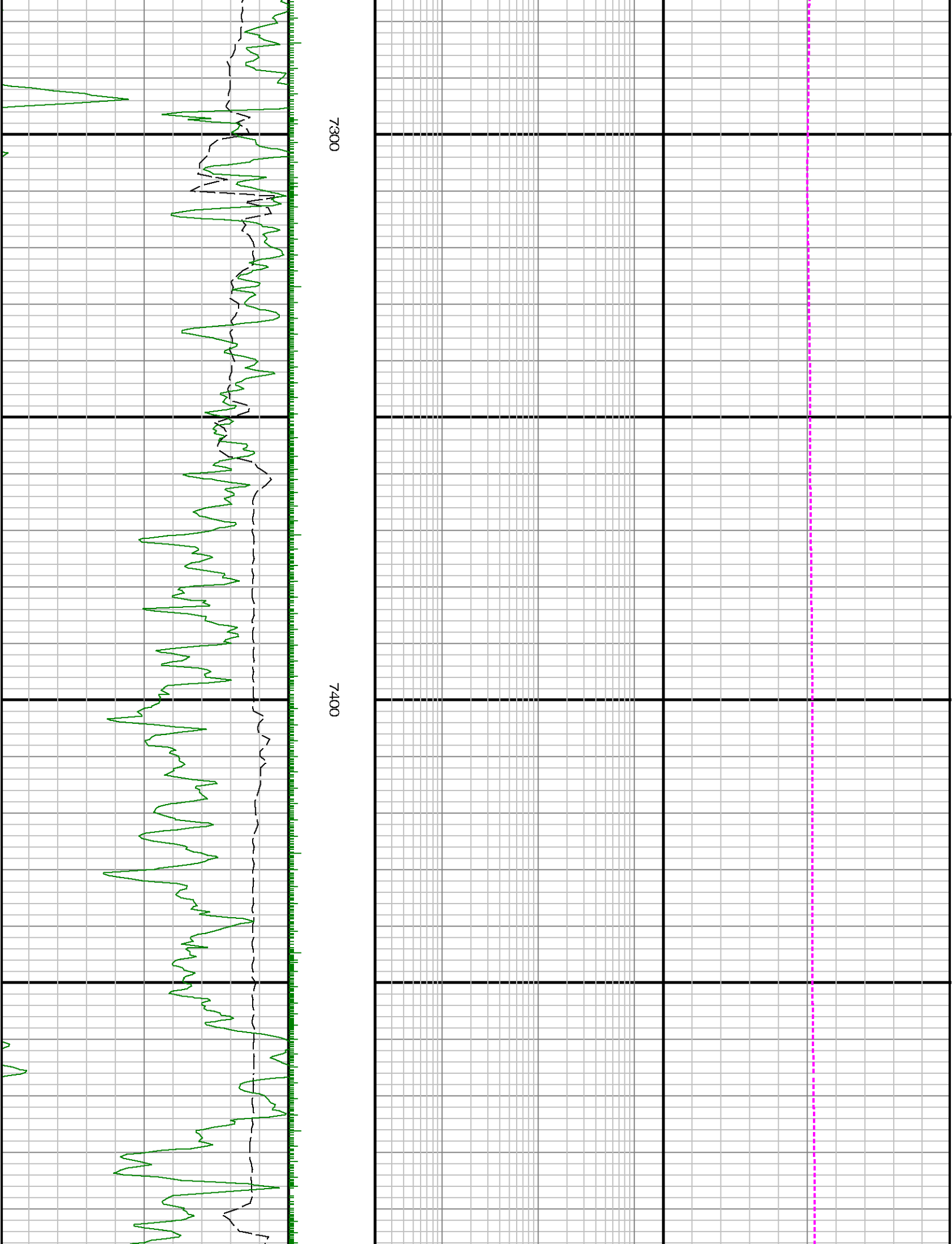
Well : BADDING 13C-2HZ

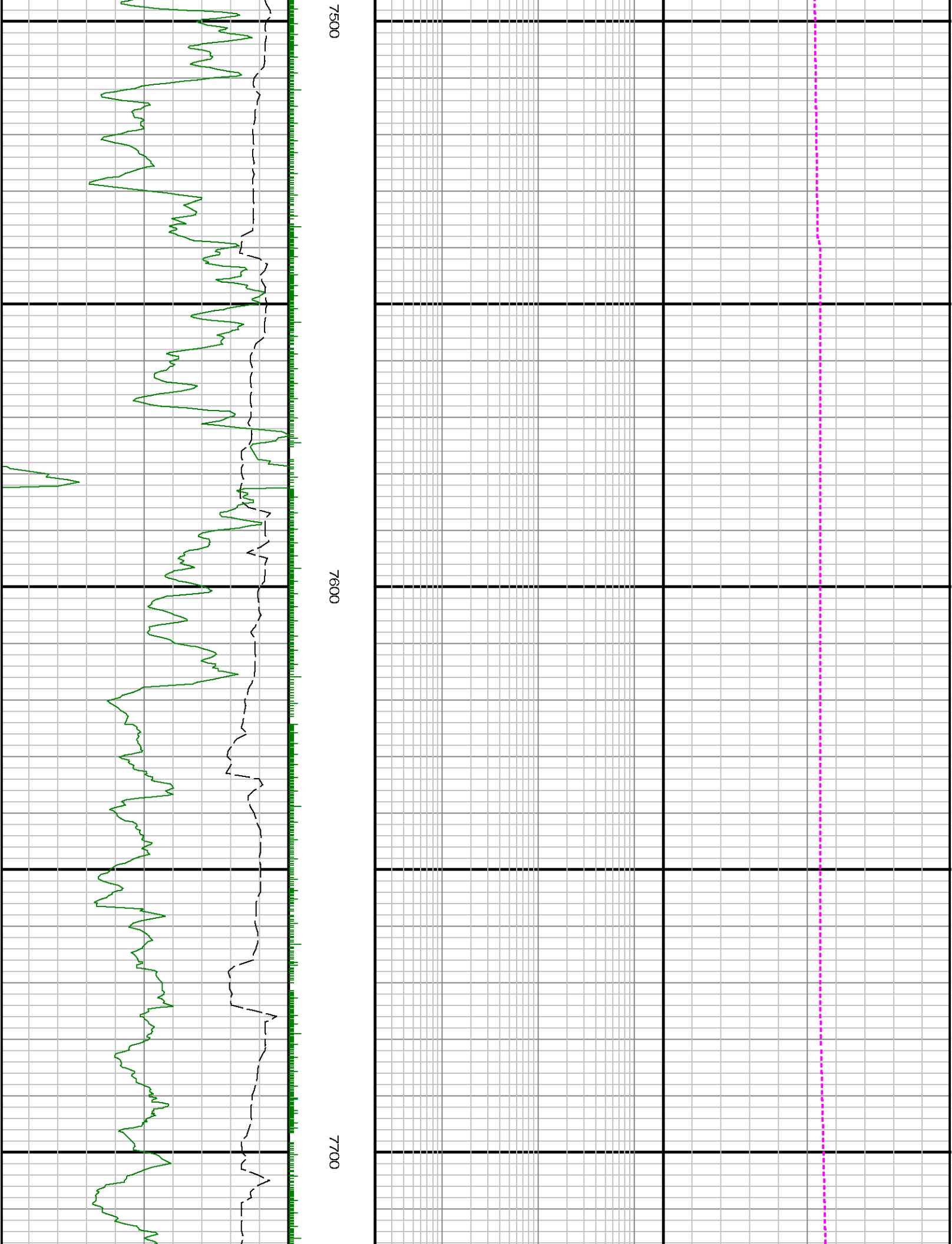
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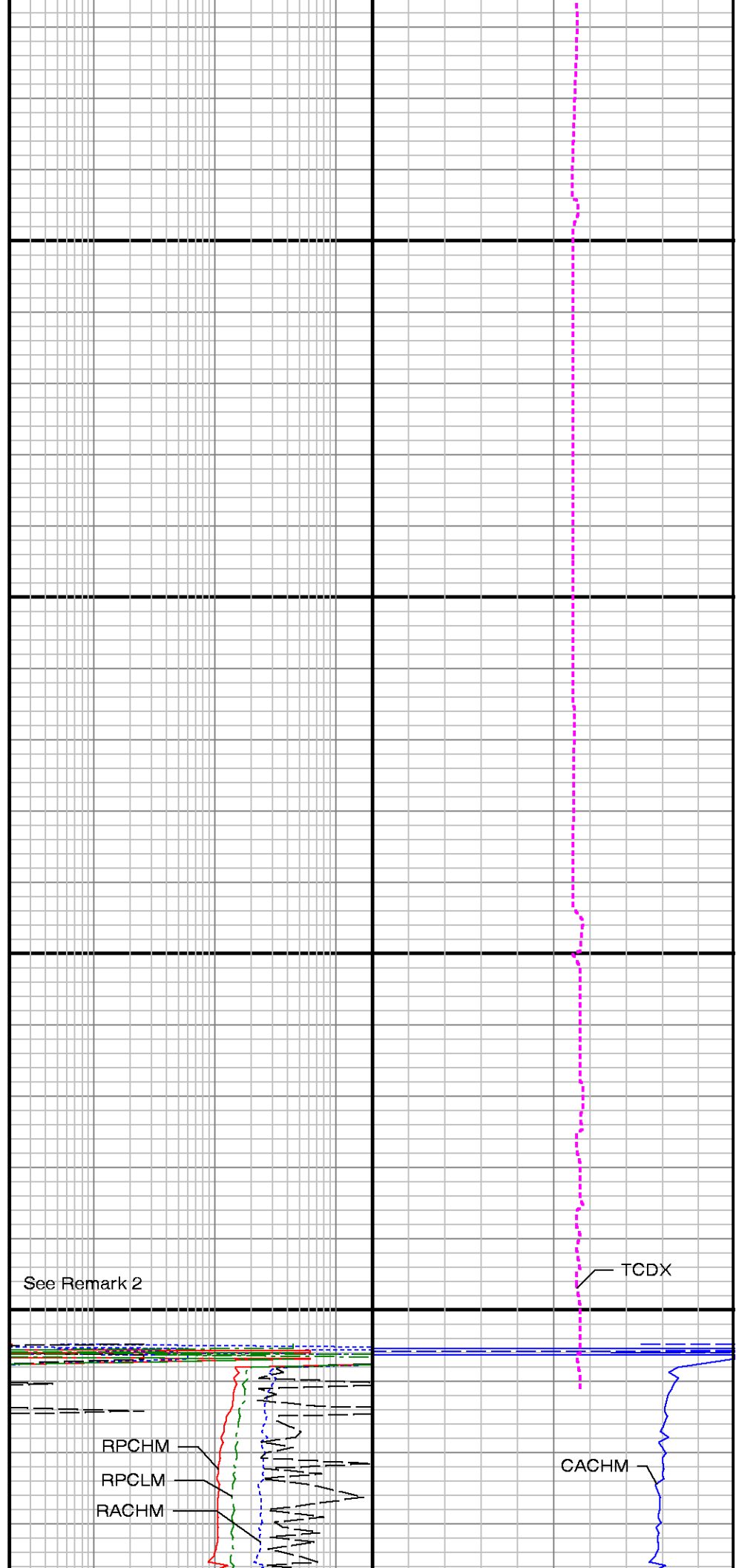
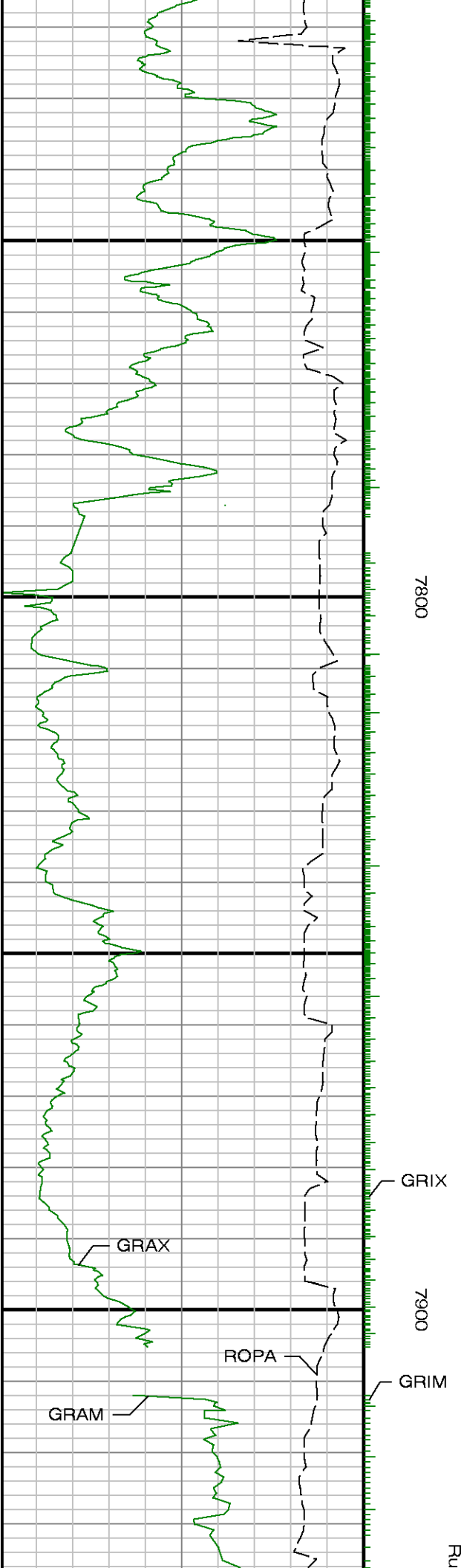
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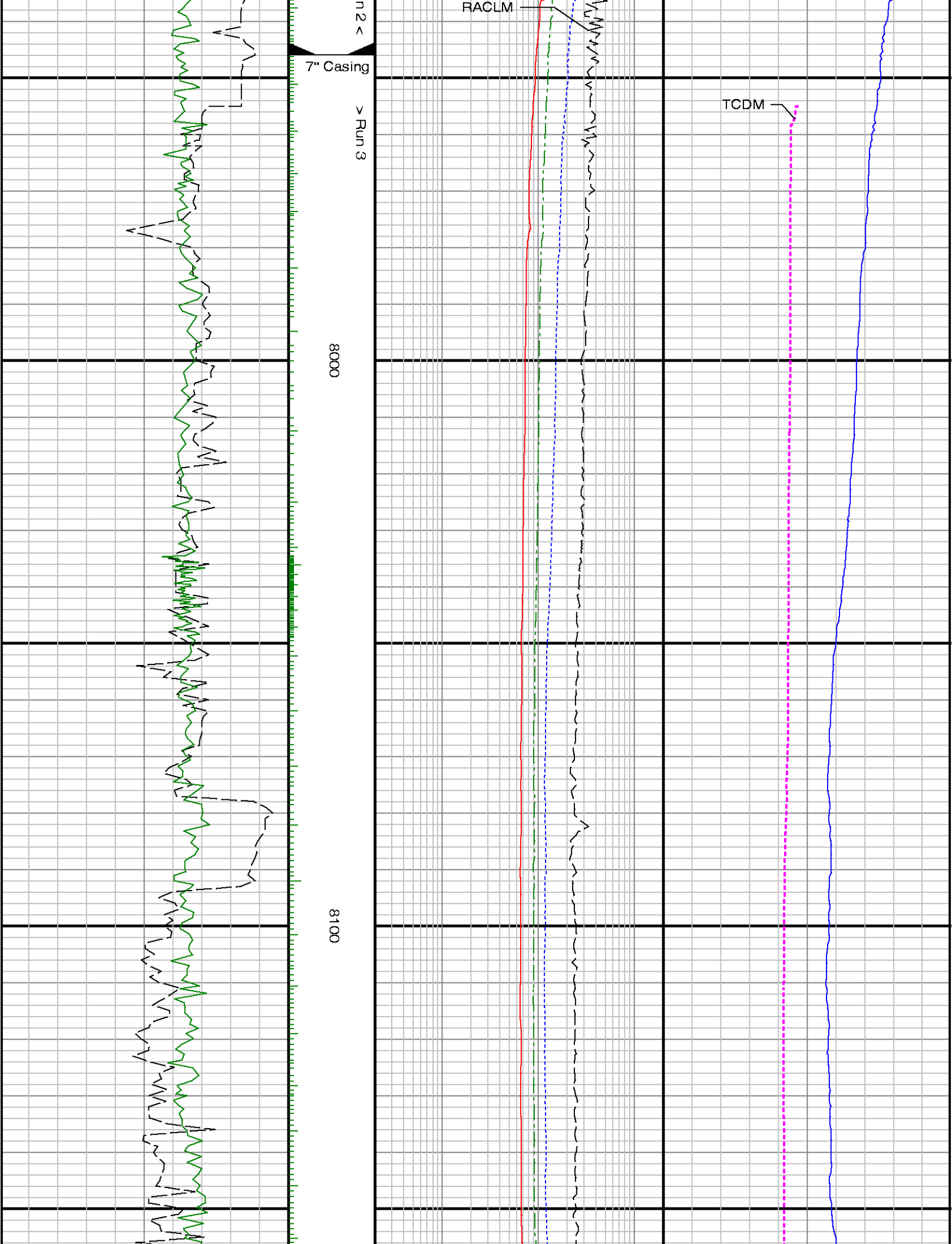


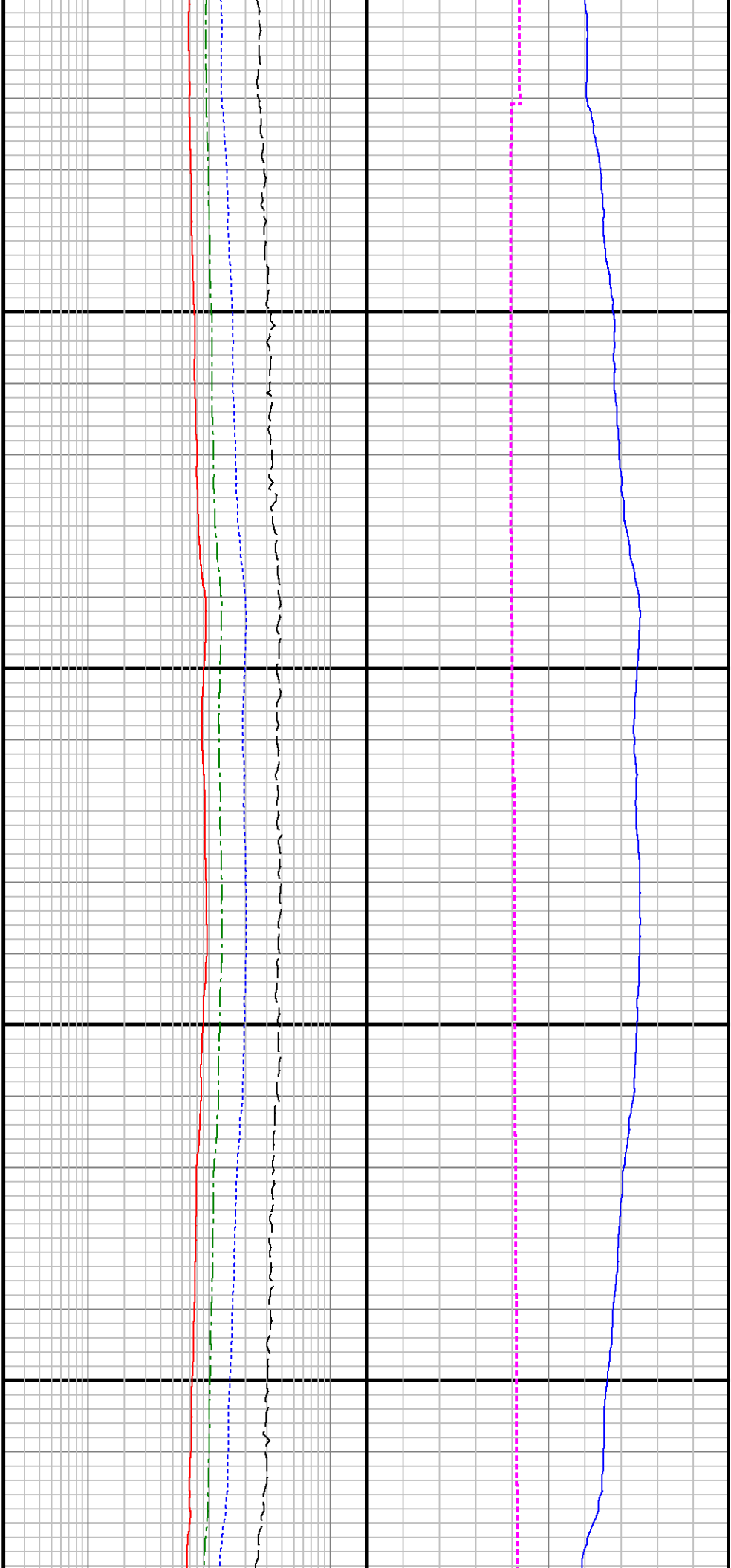






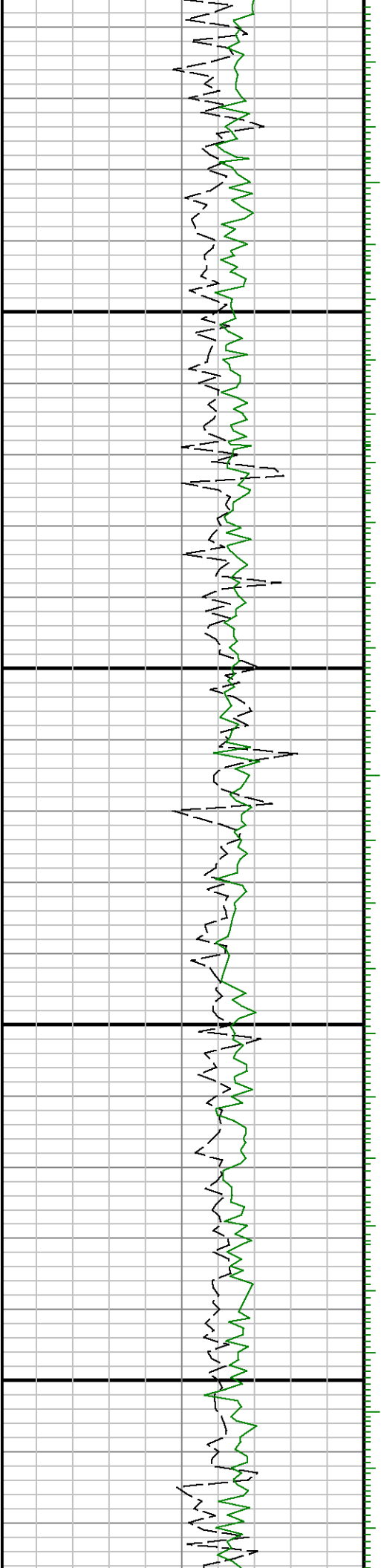


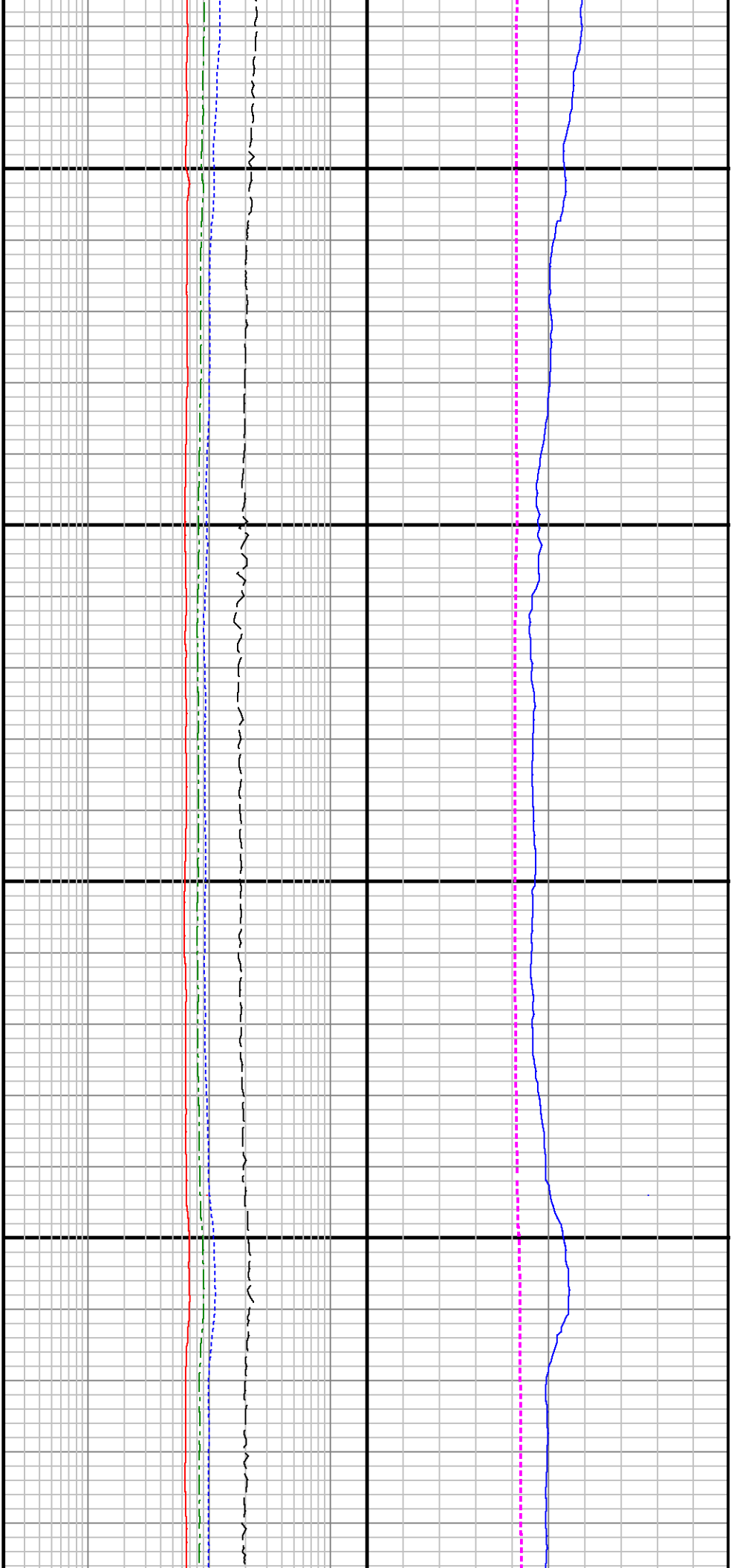




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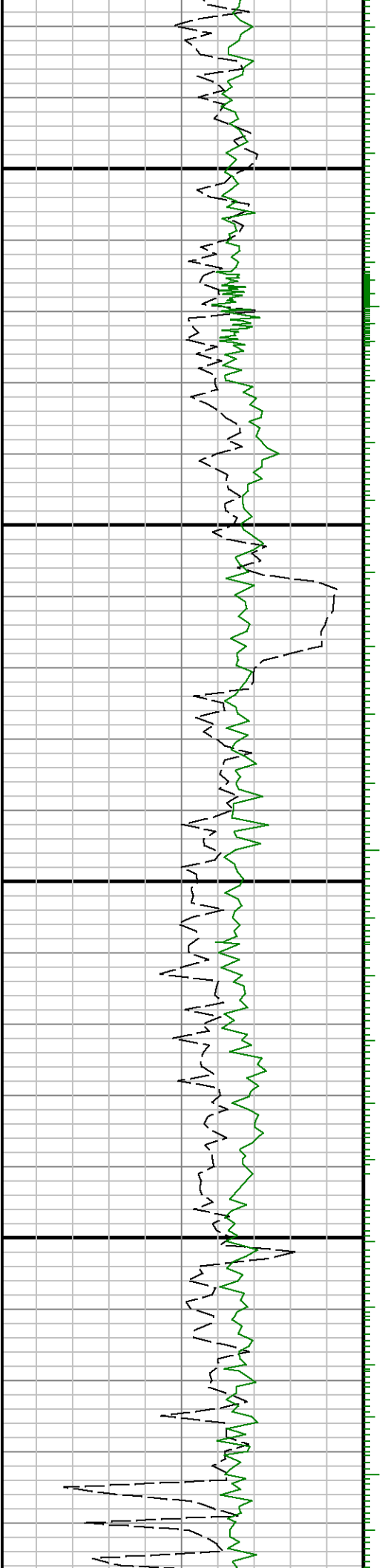
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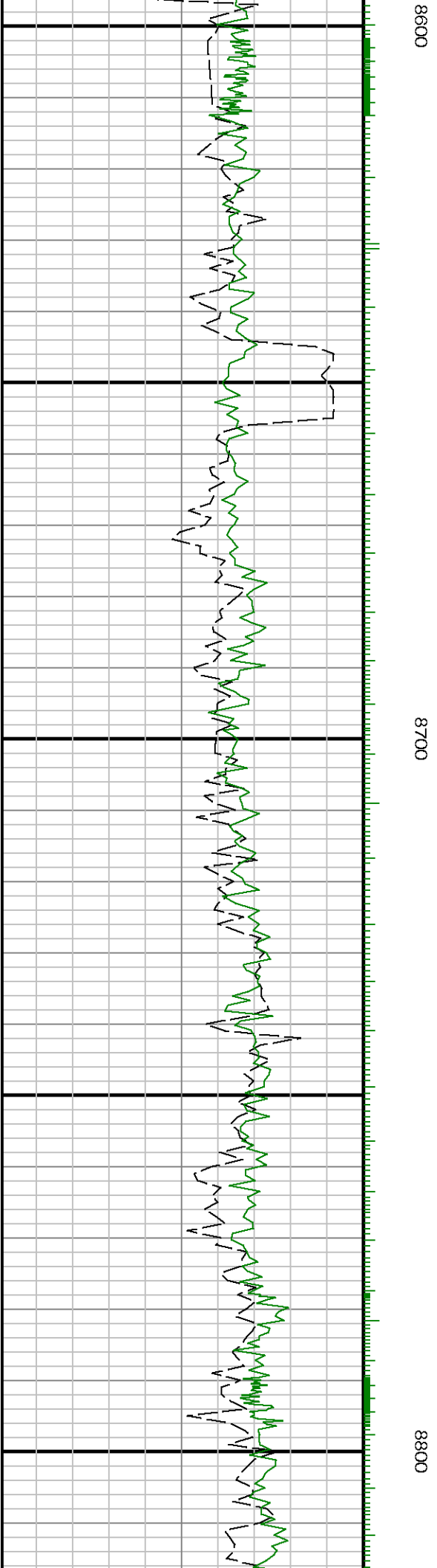
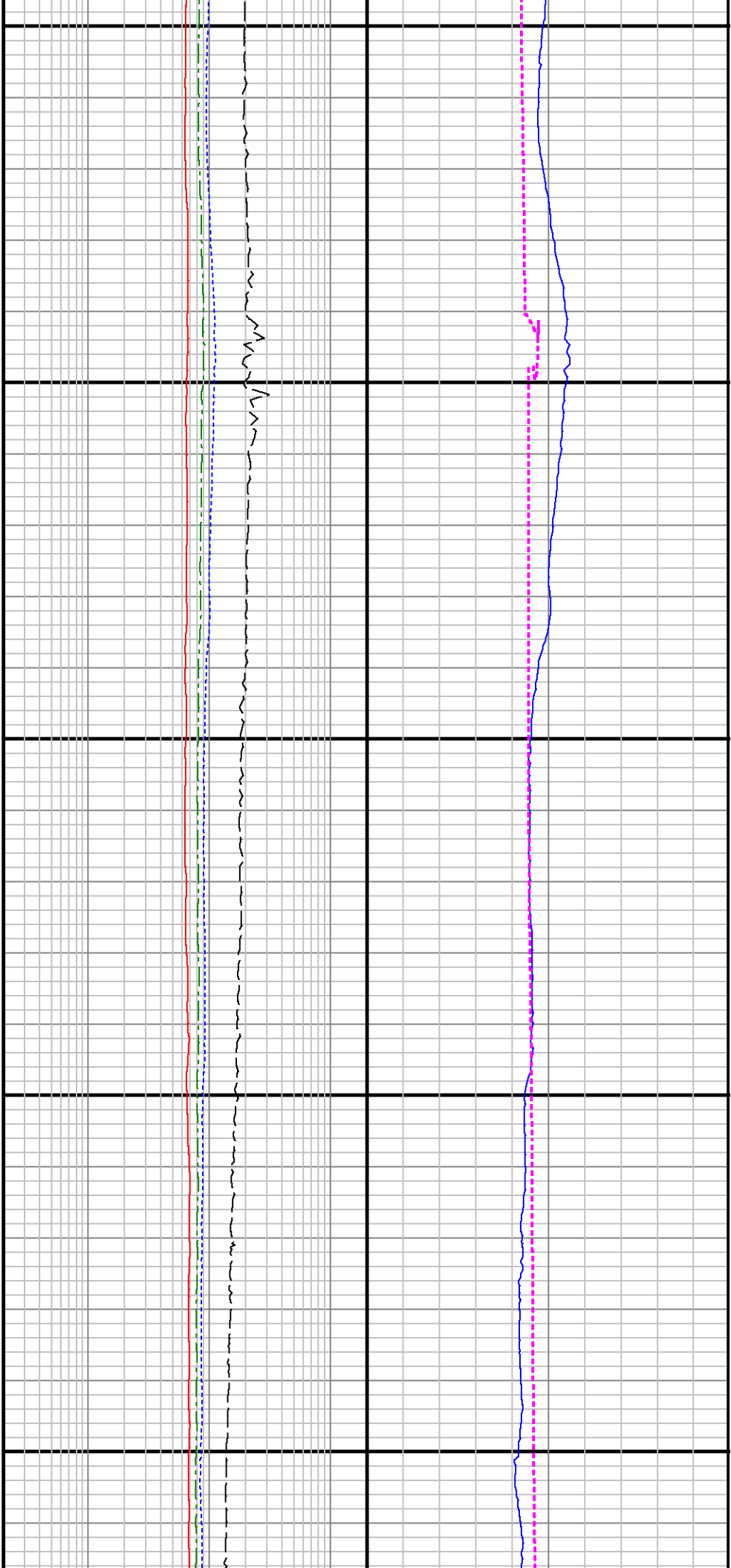


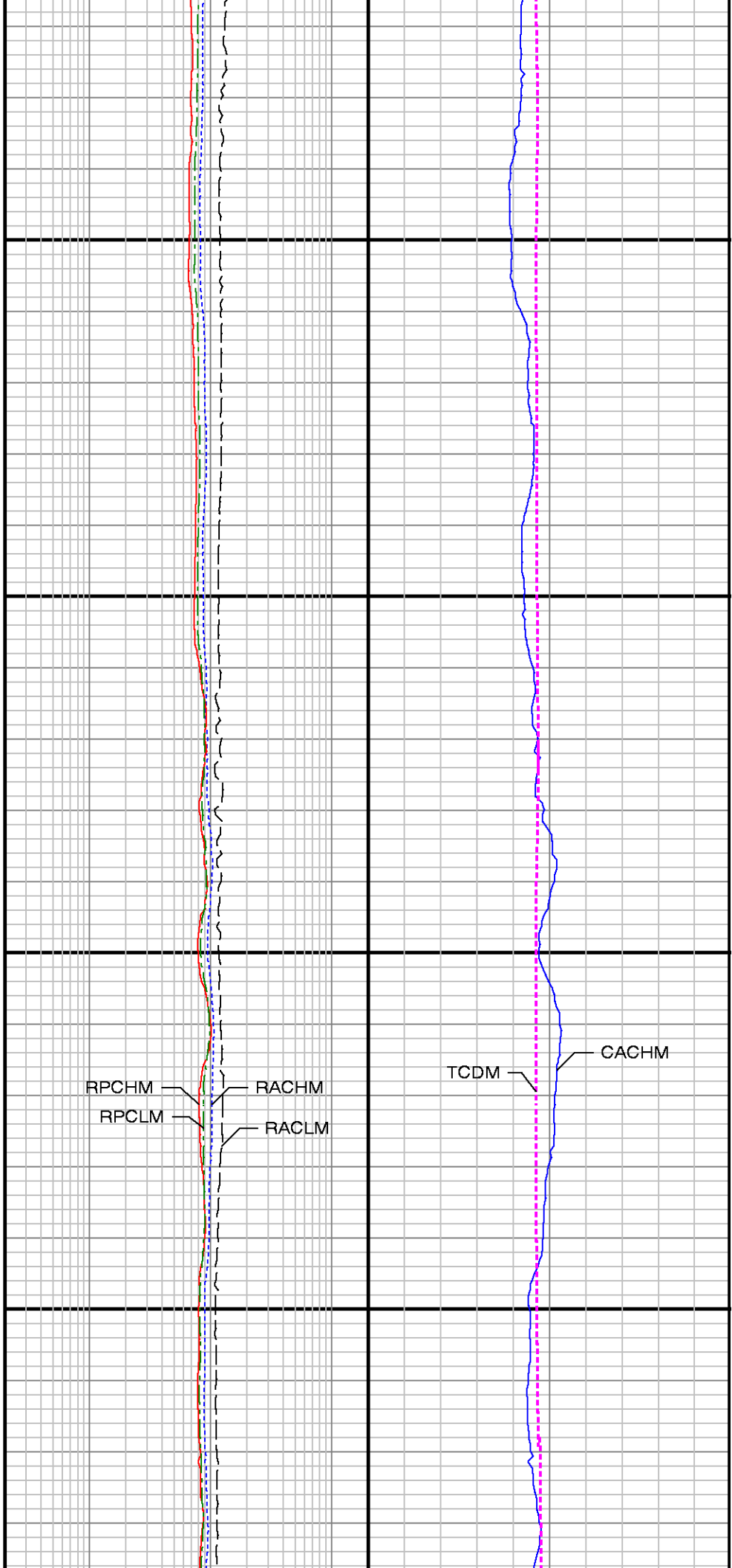
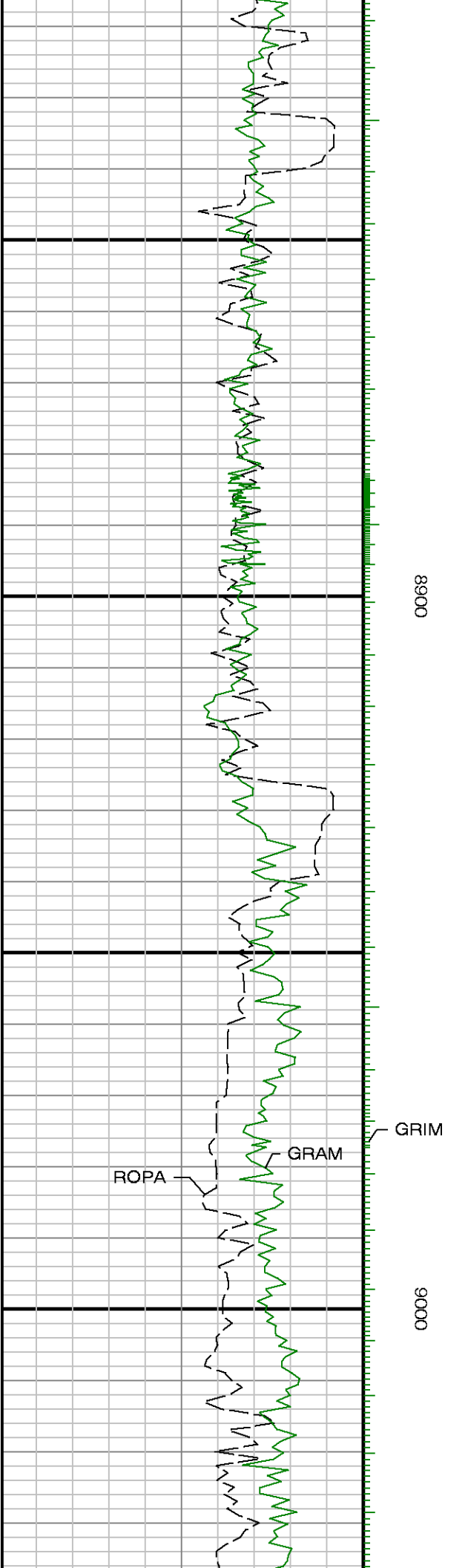


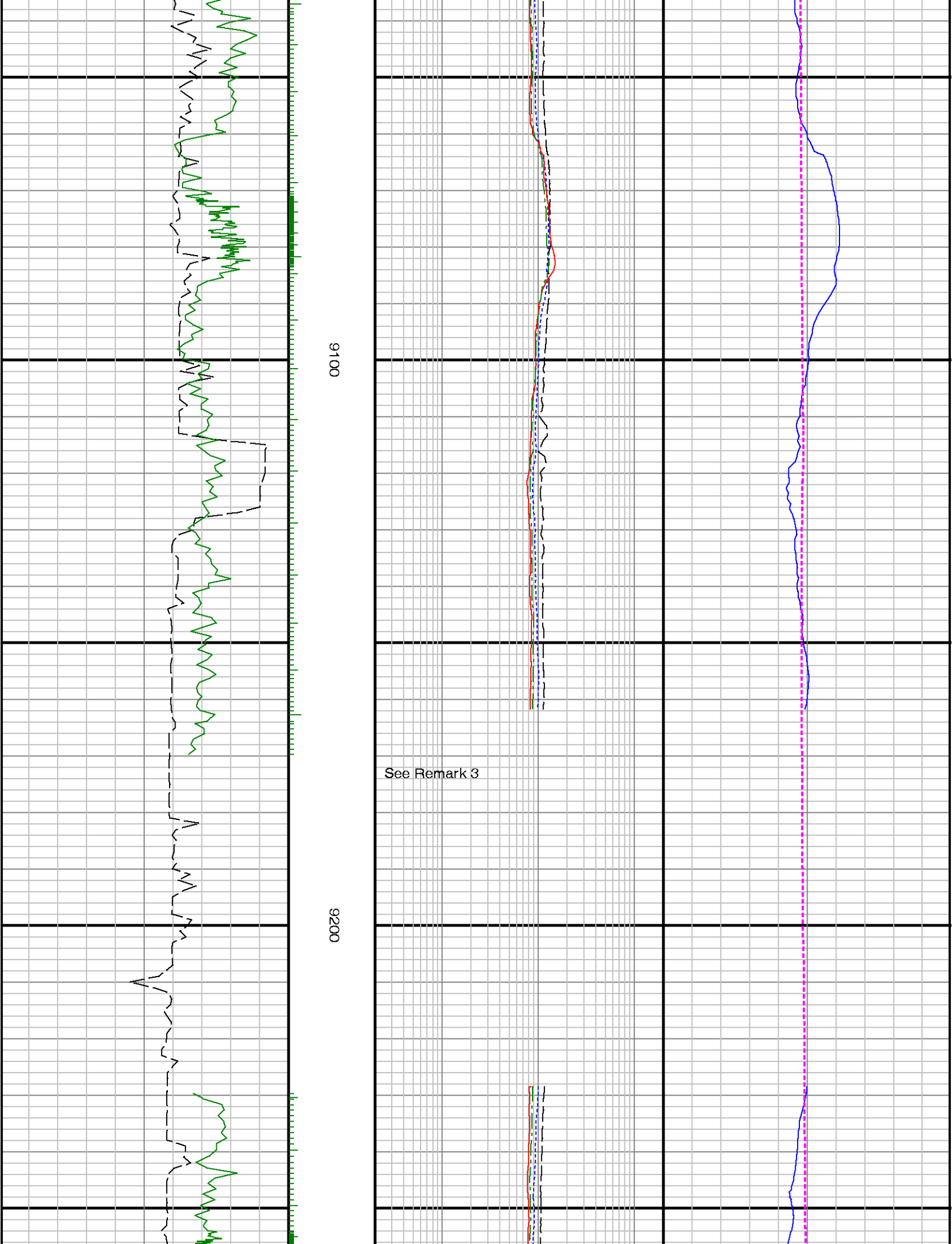
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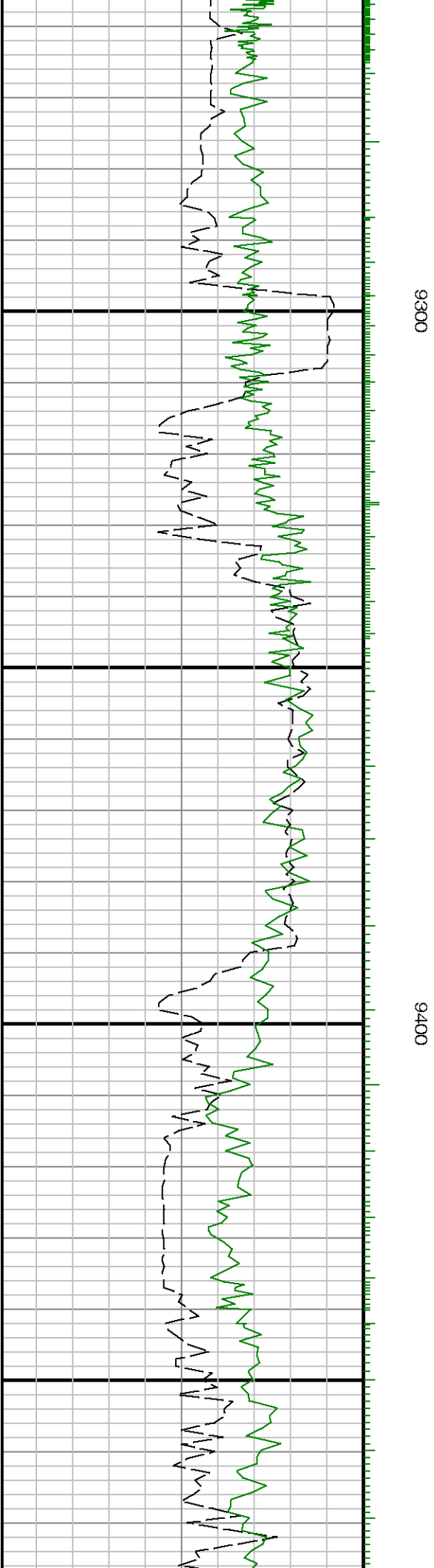
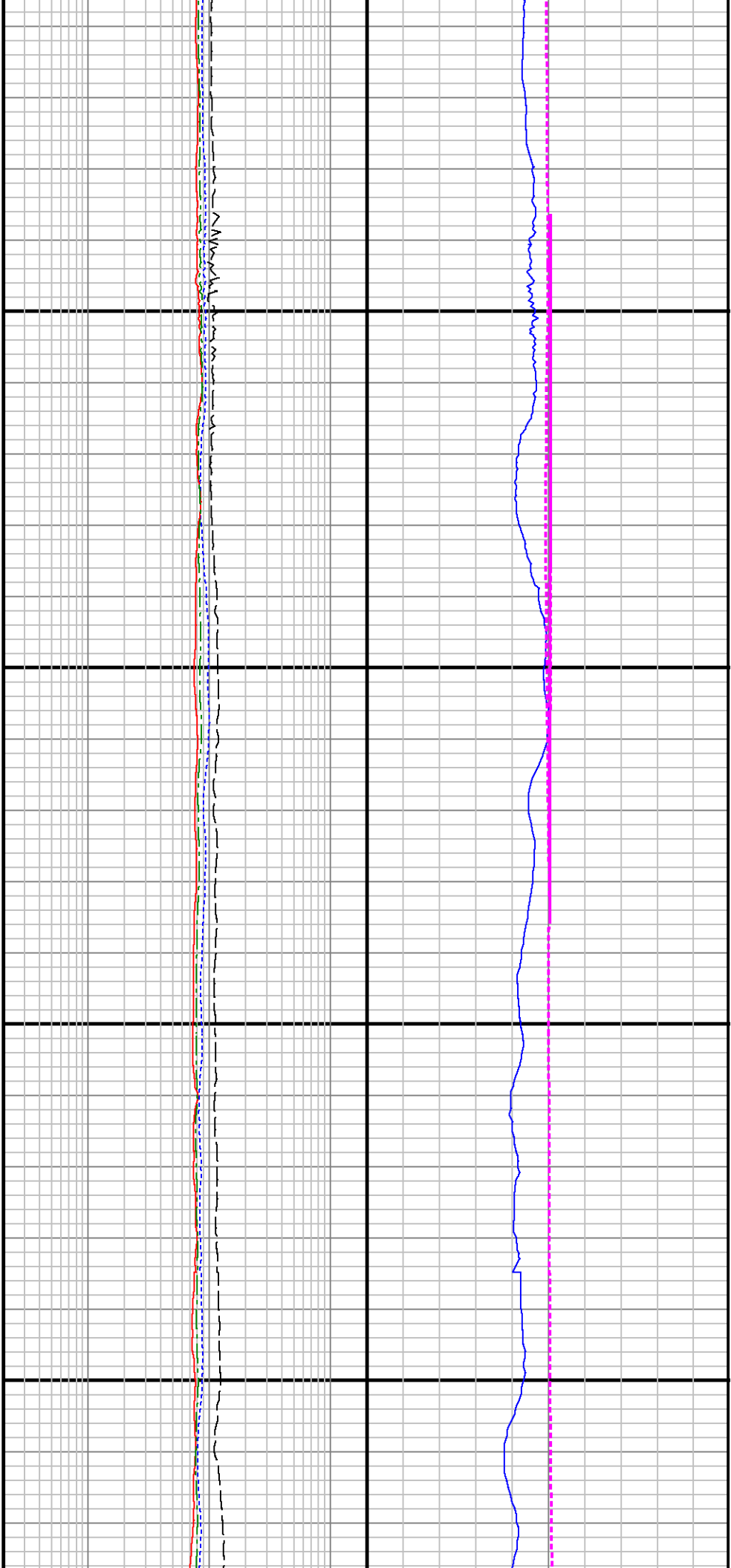
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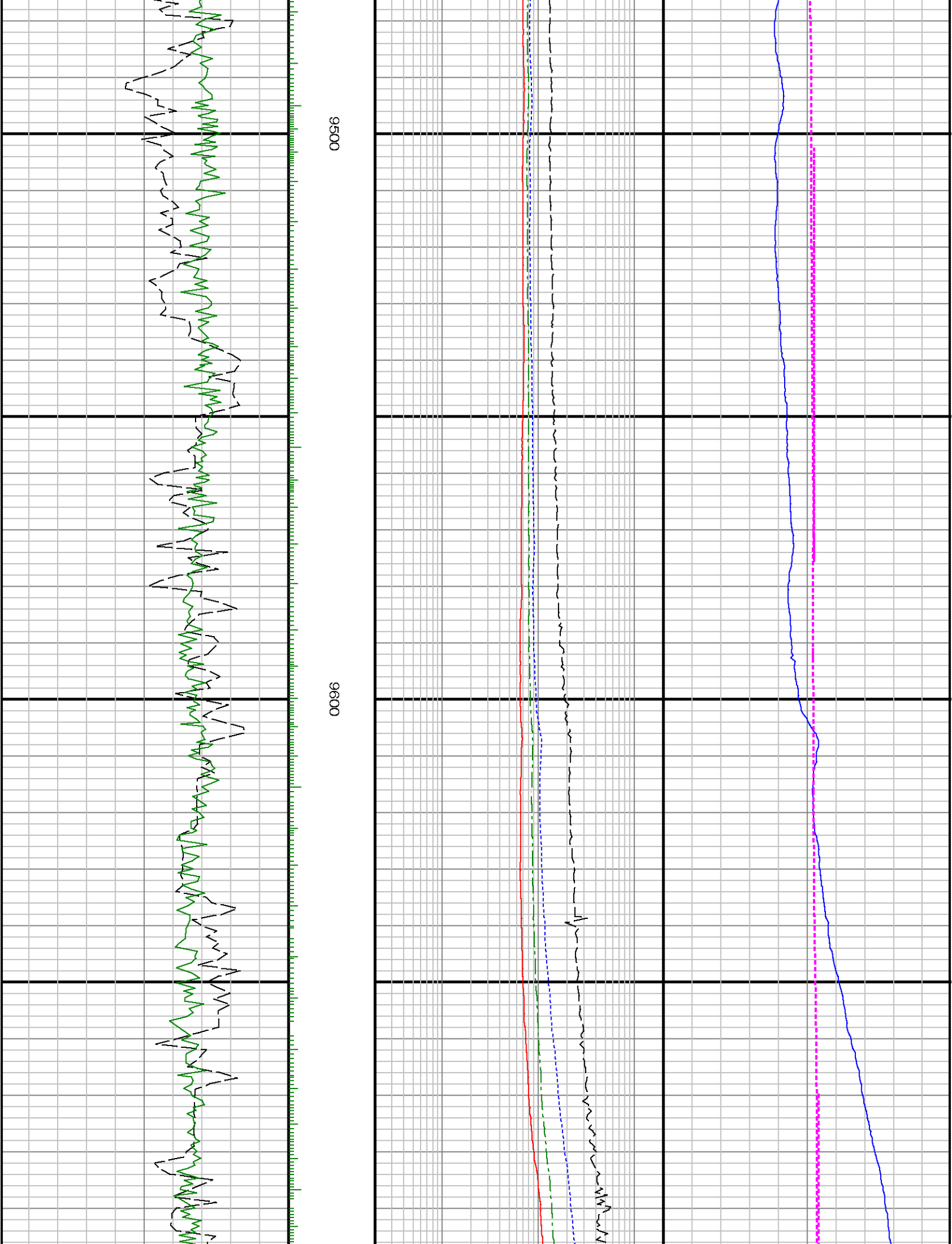


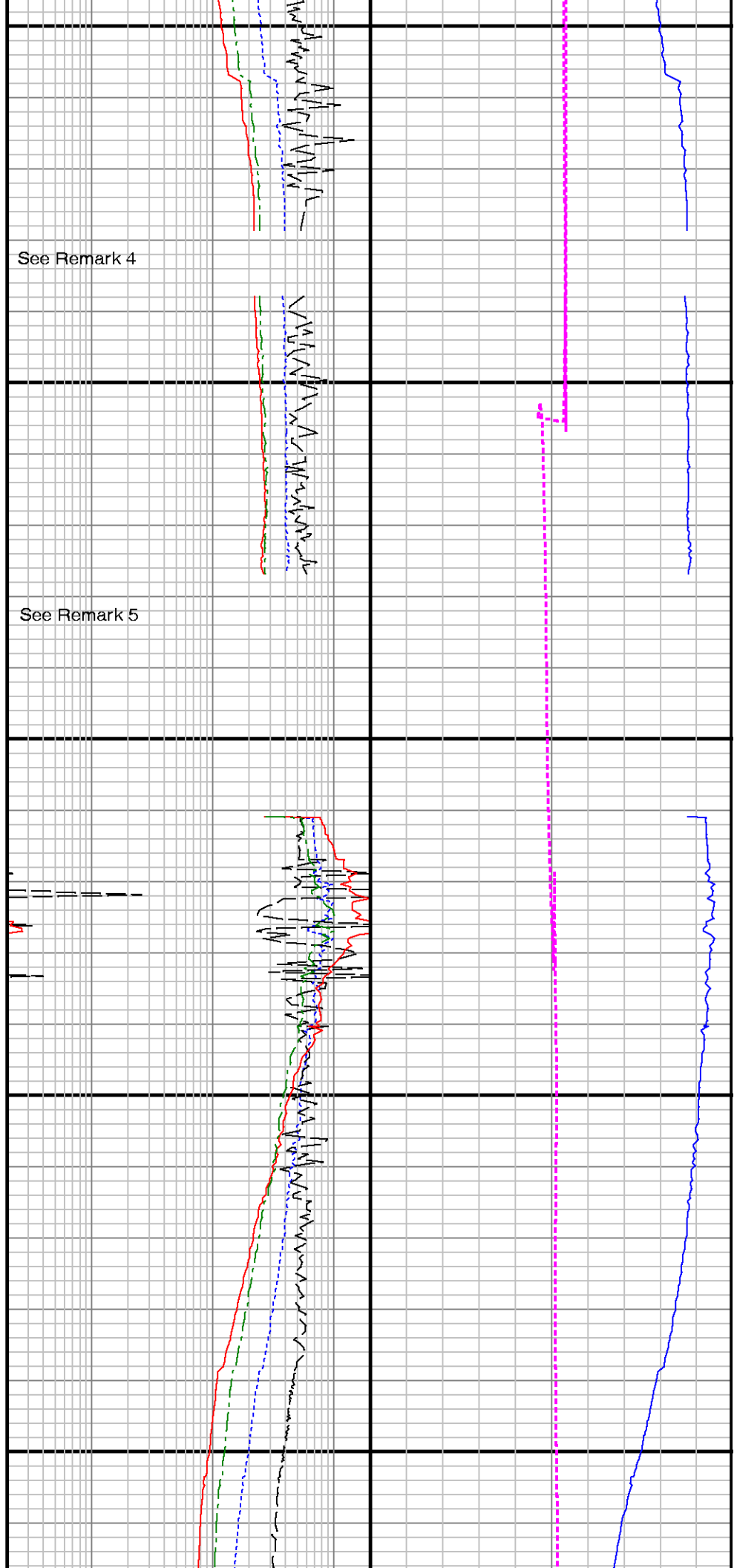
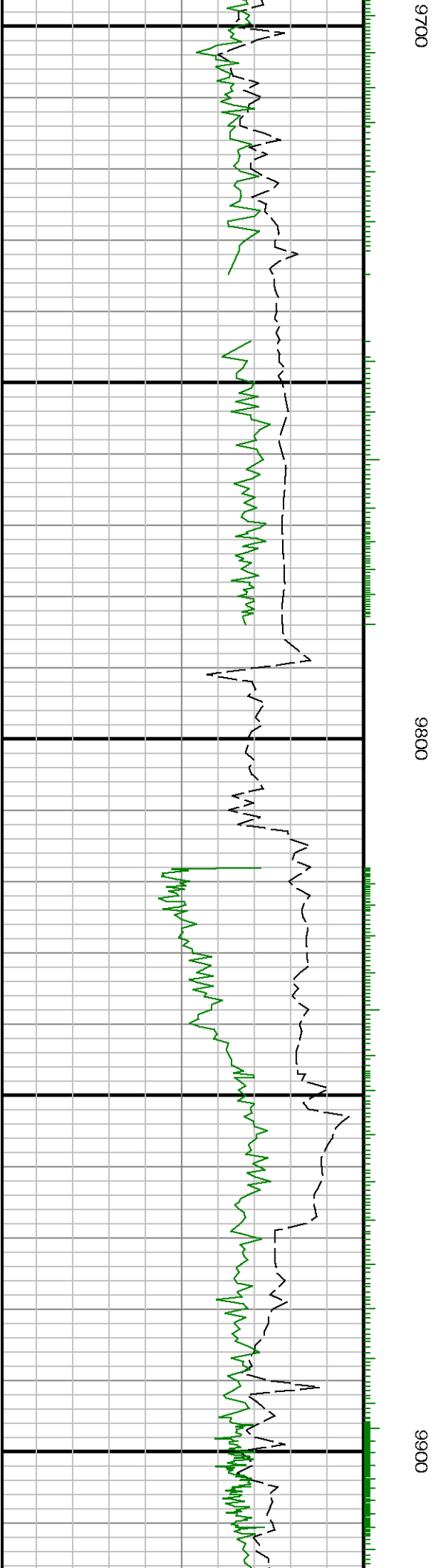


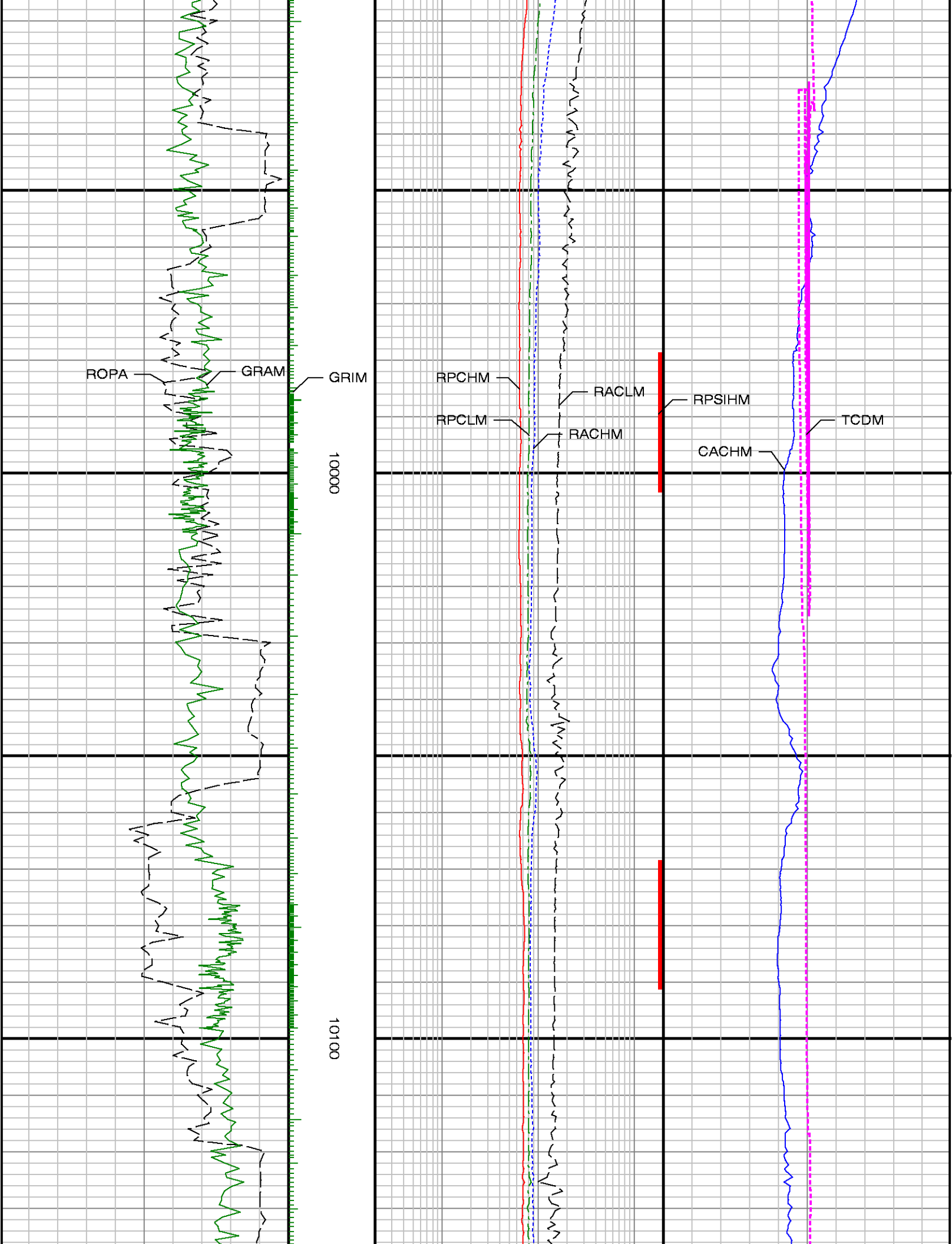


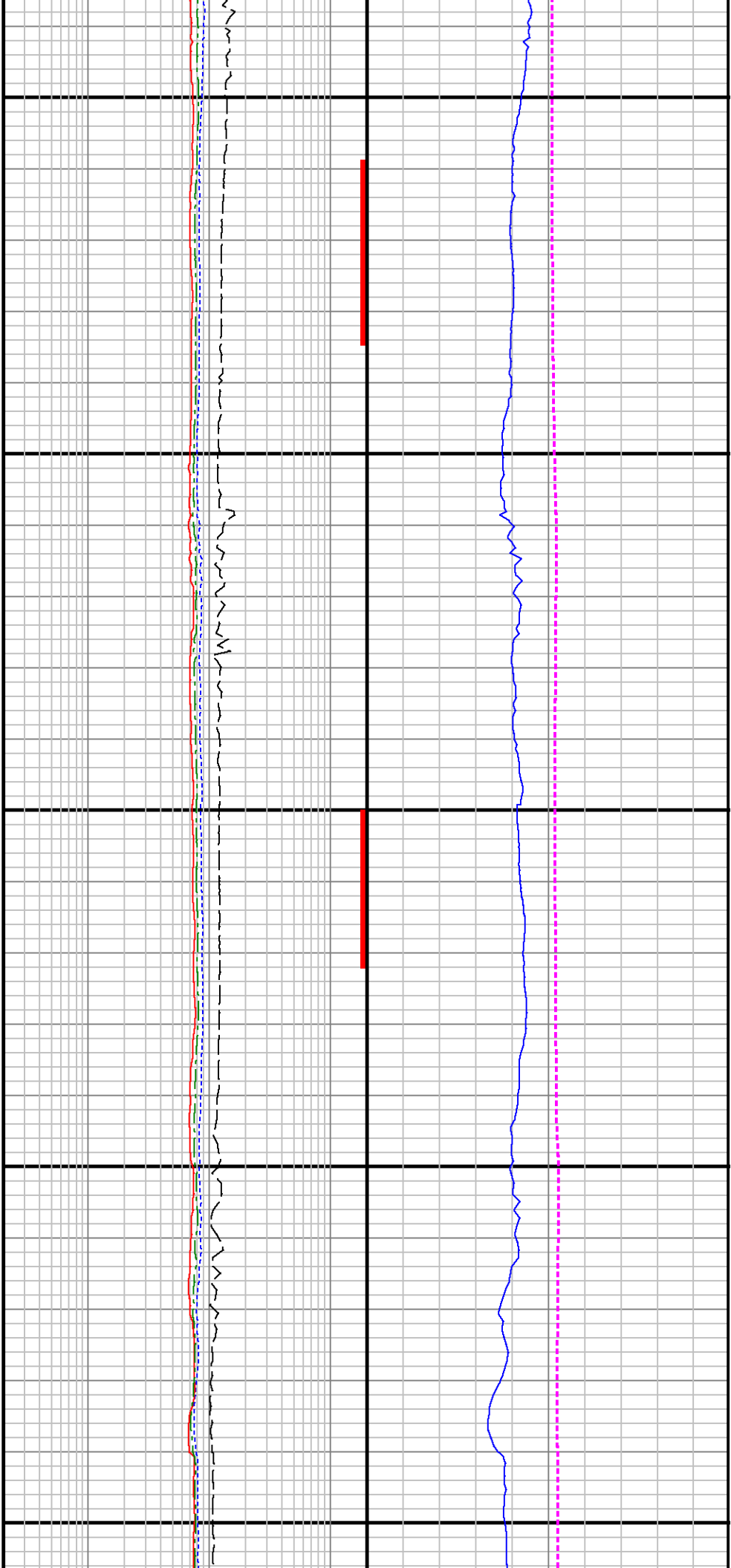






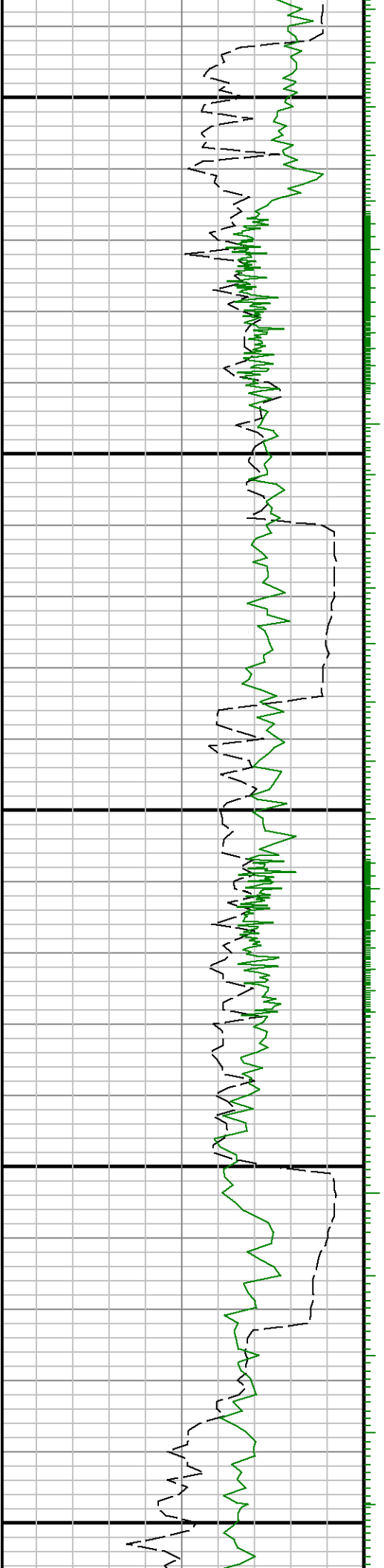


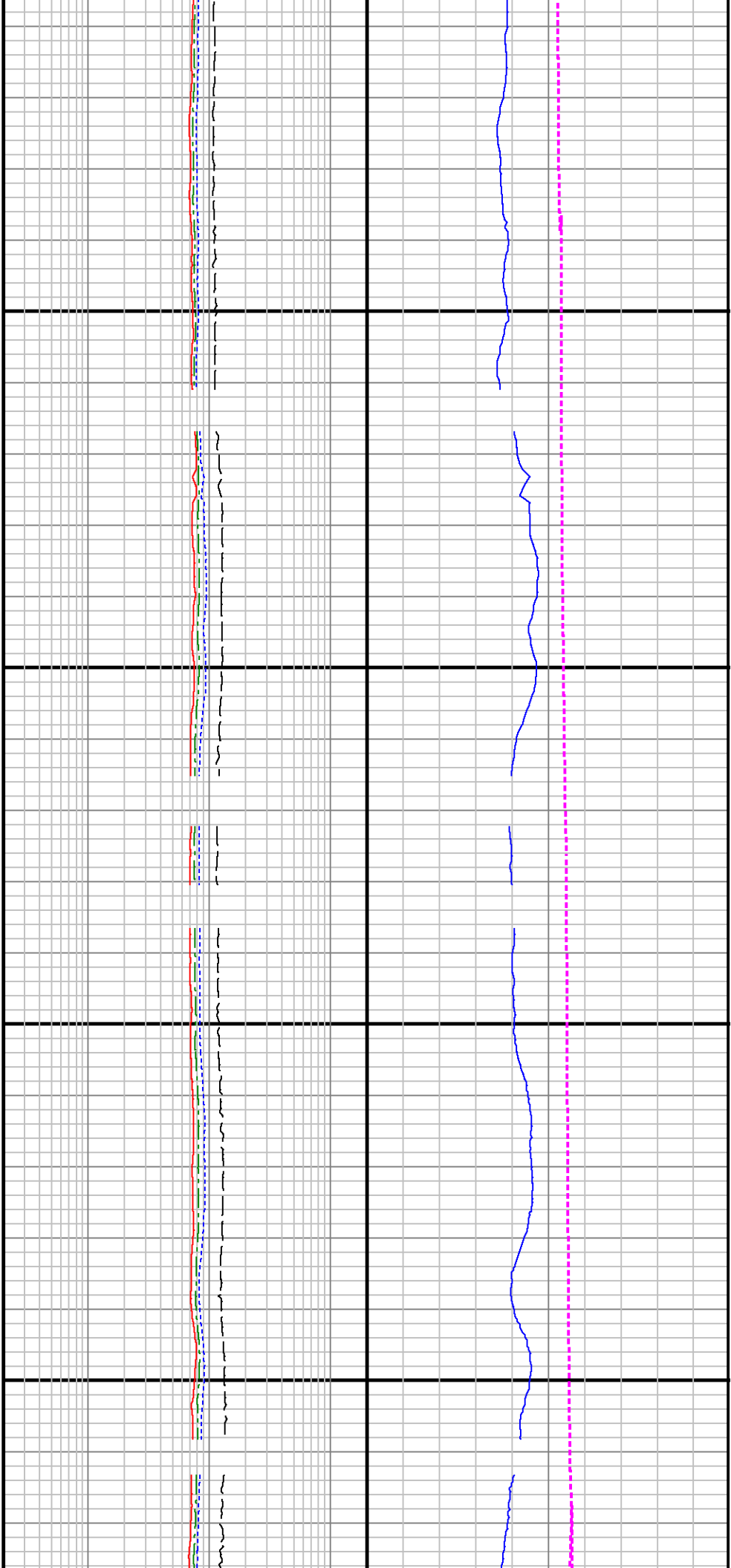




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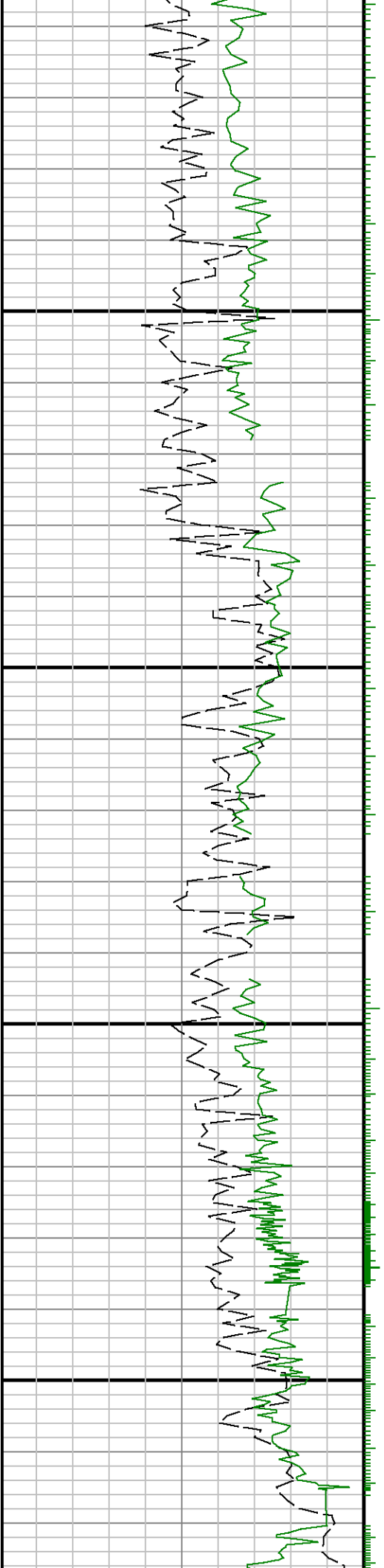
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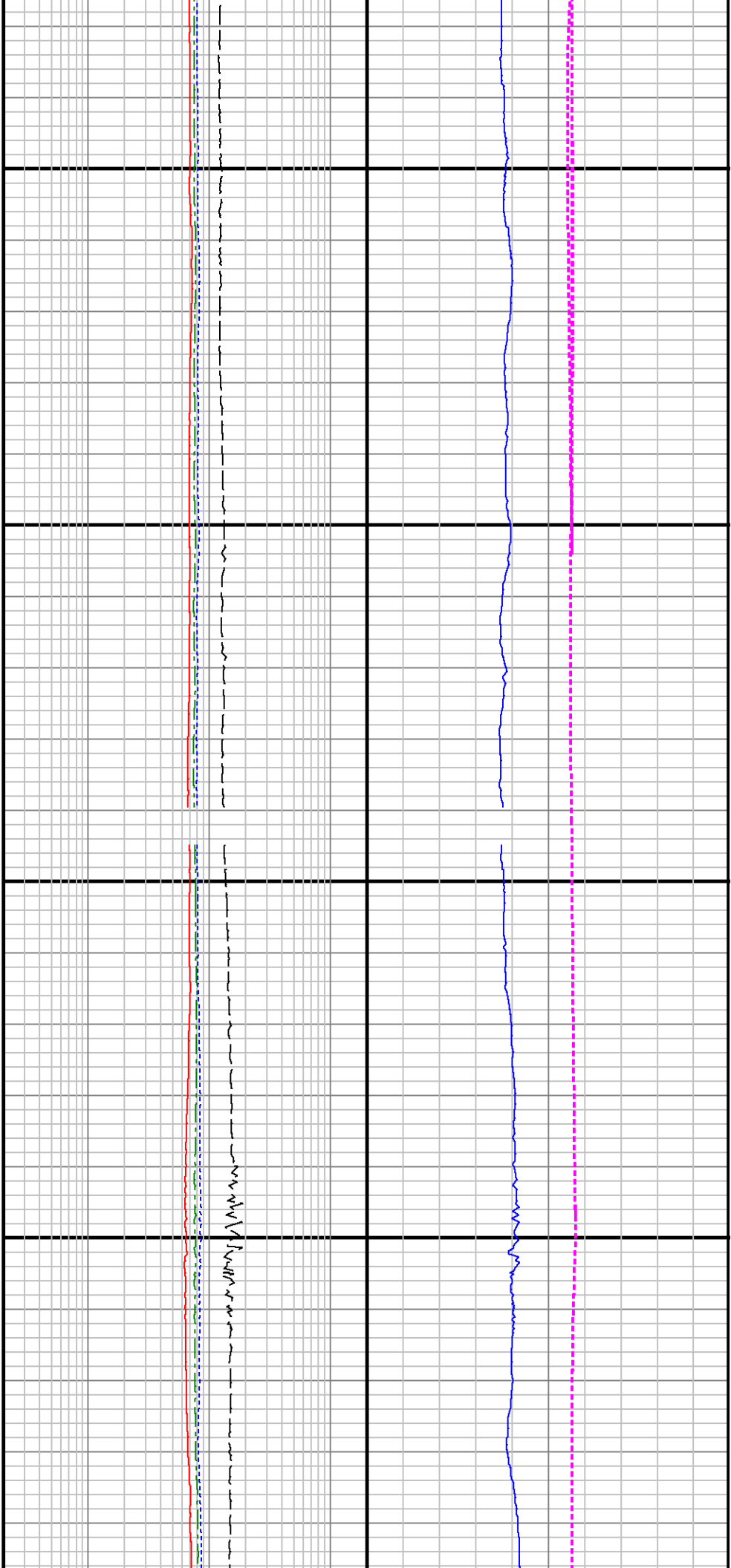




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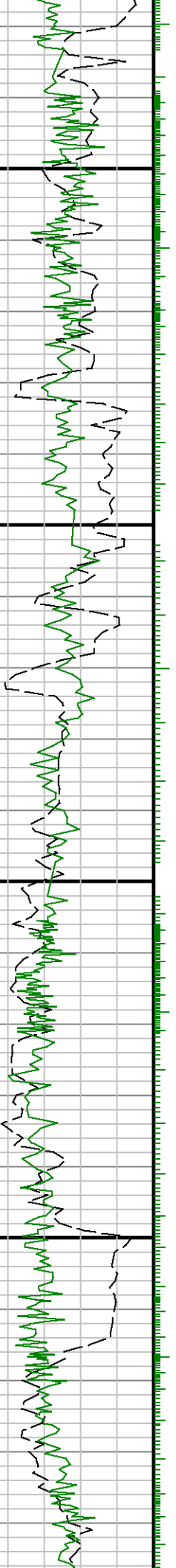
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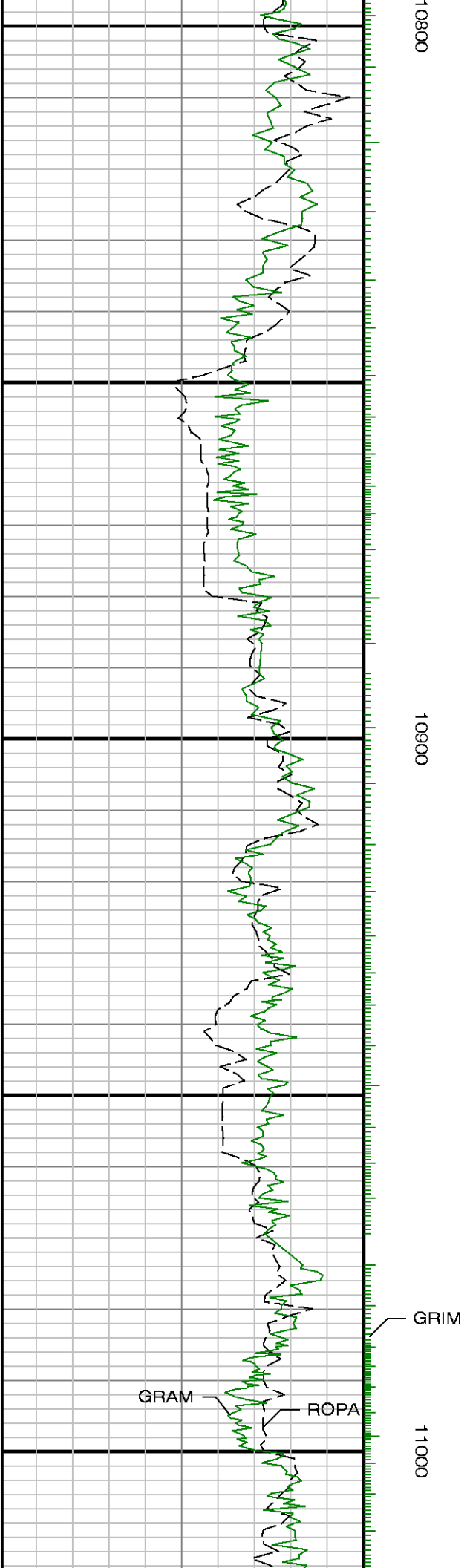
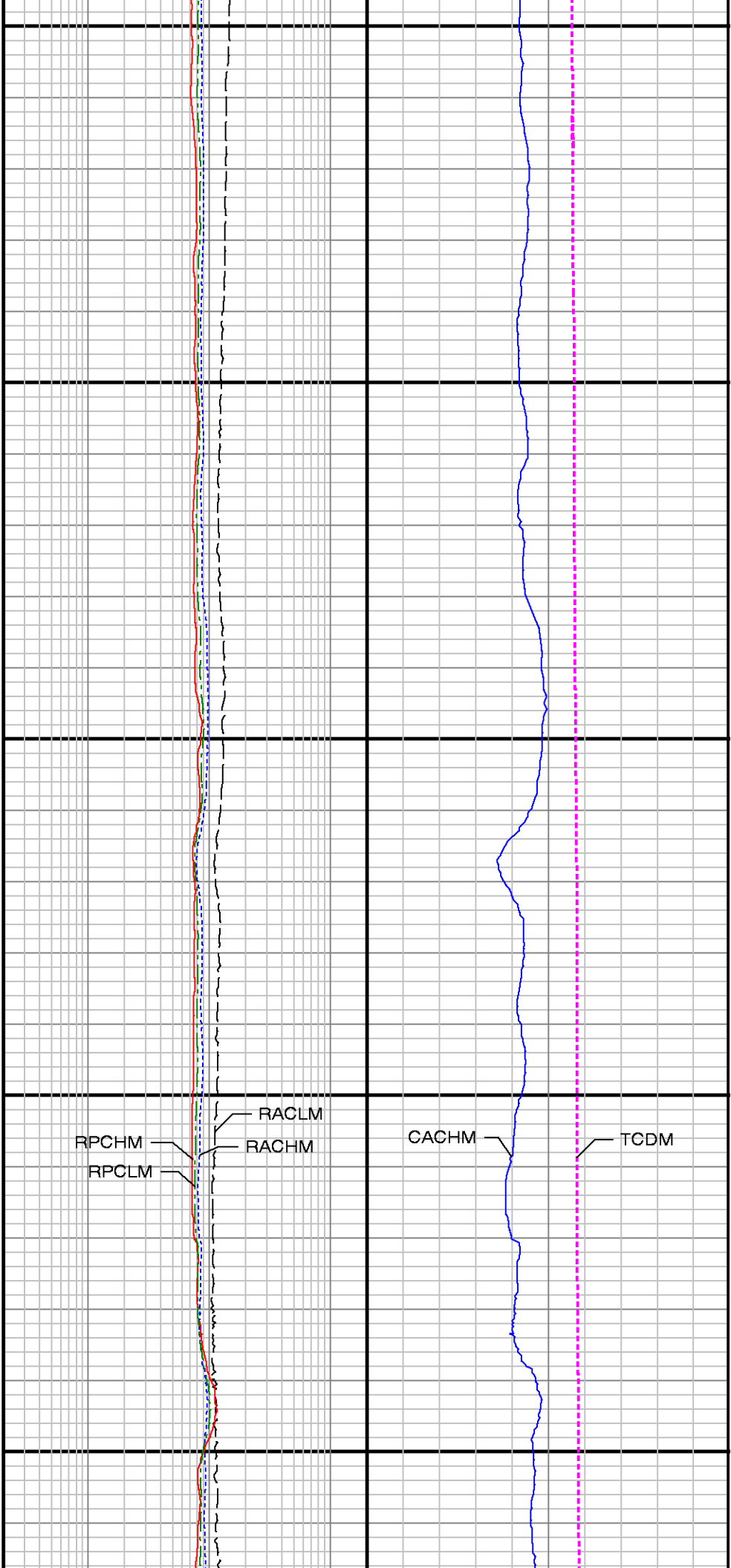


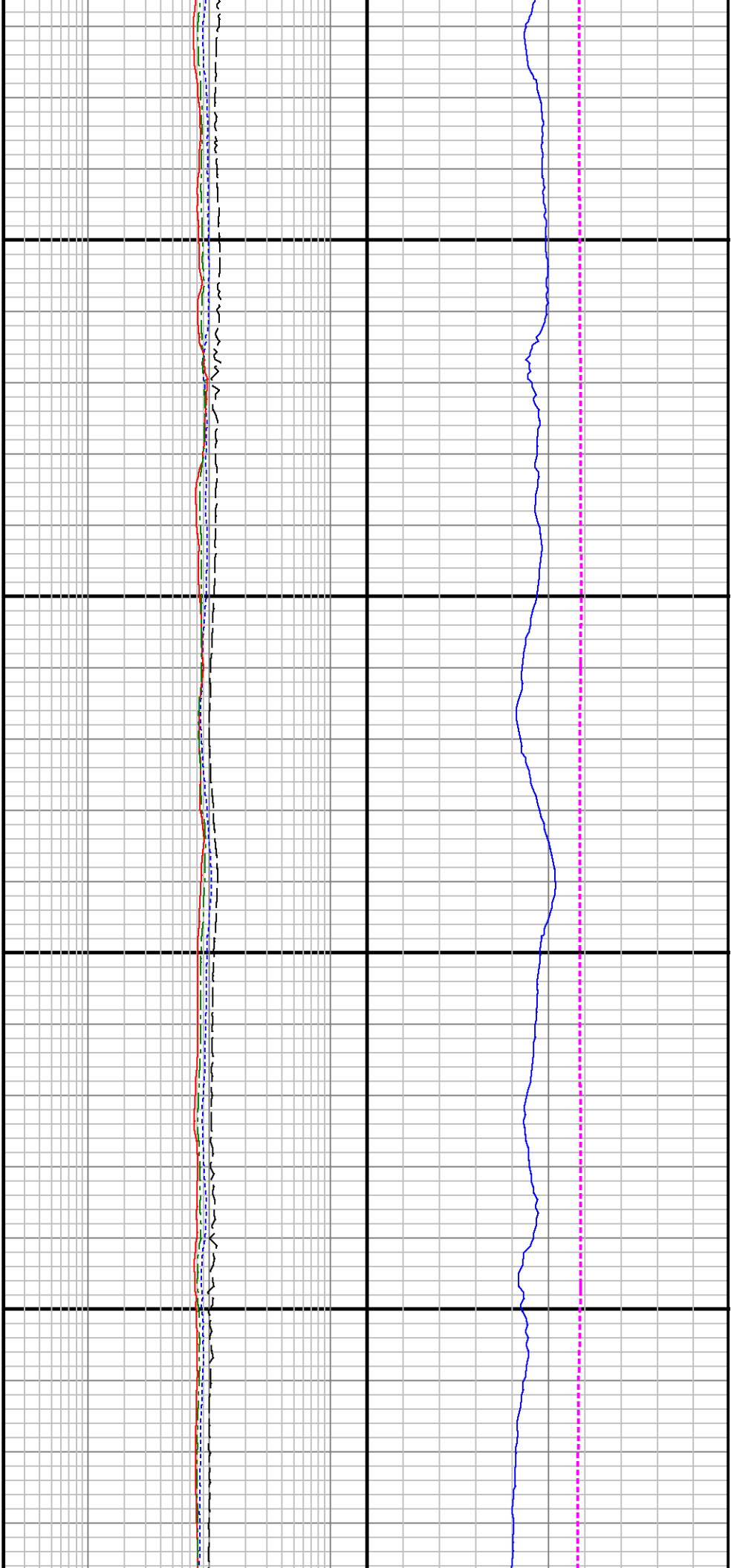


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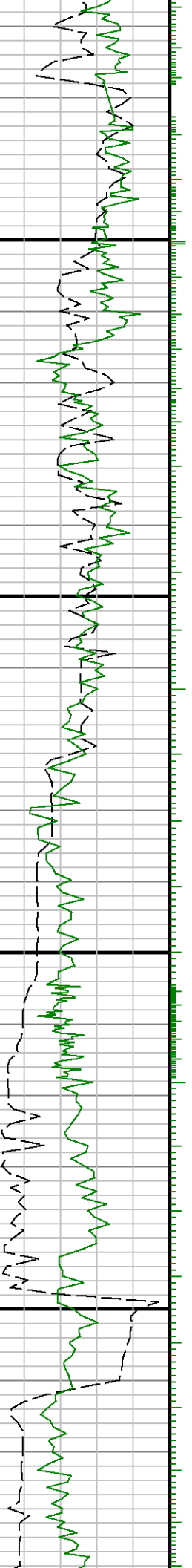


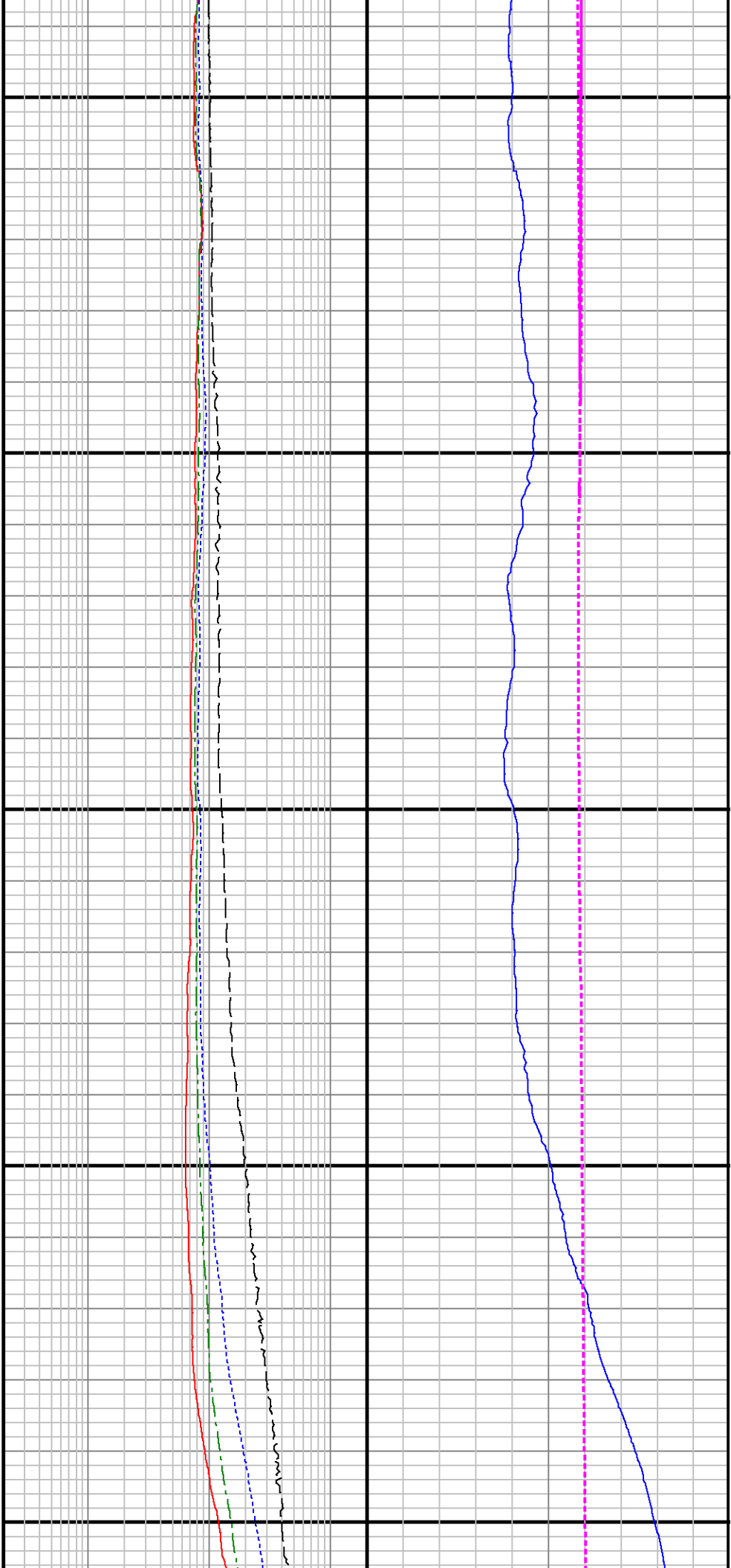




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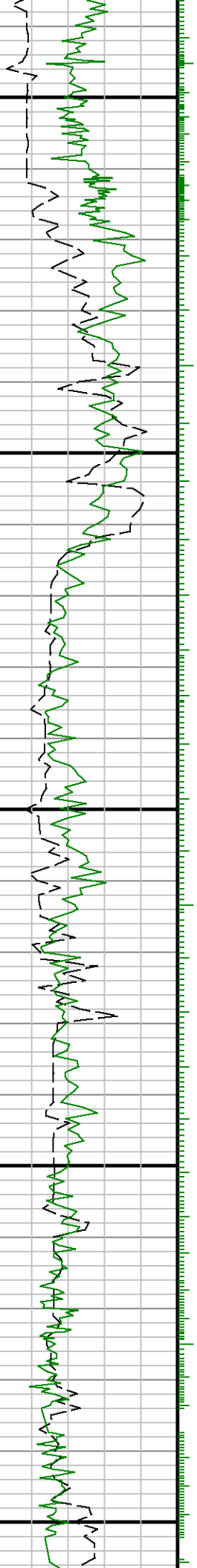
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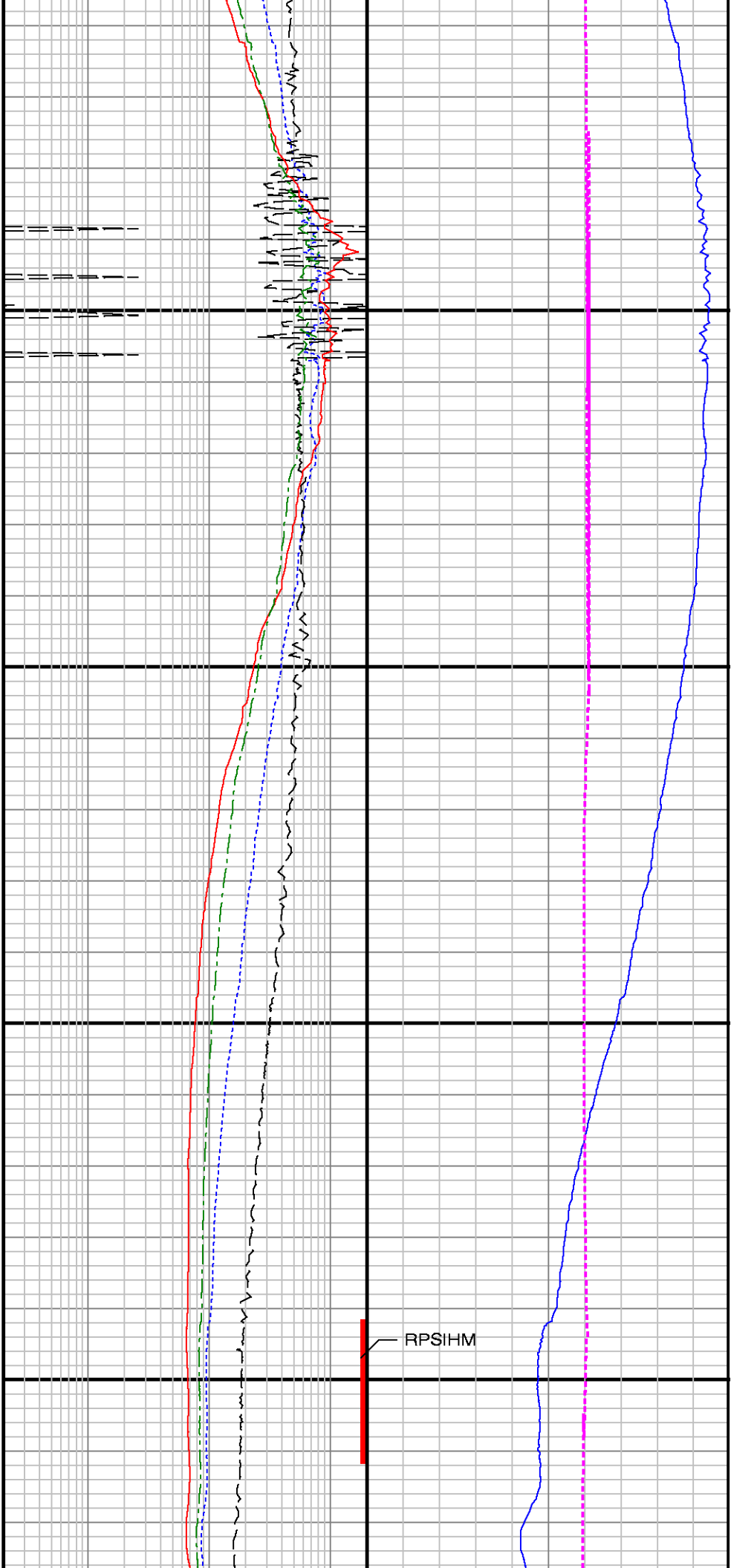




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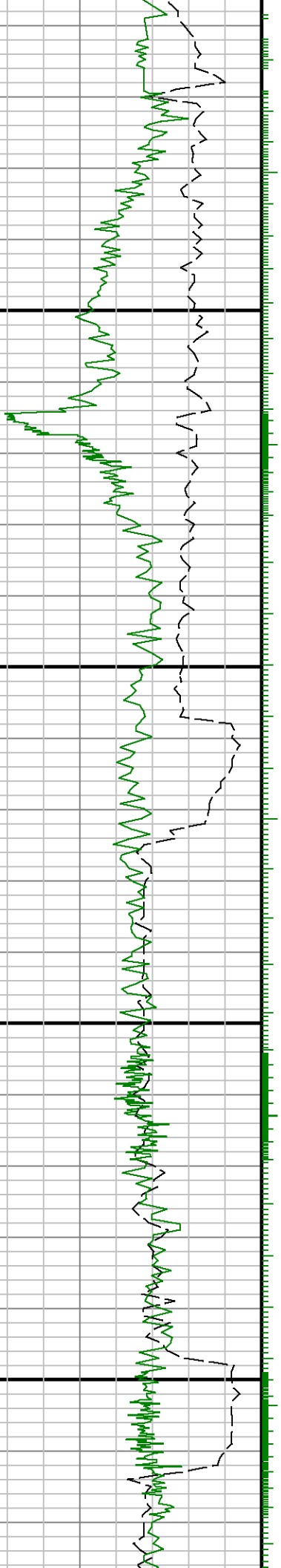
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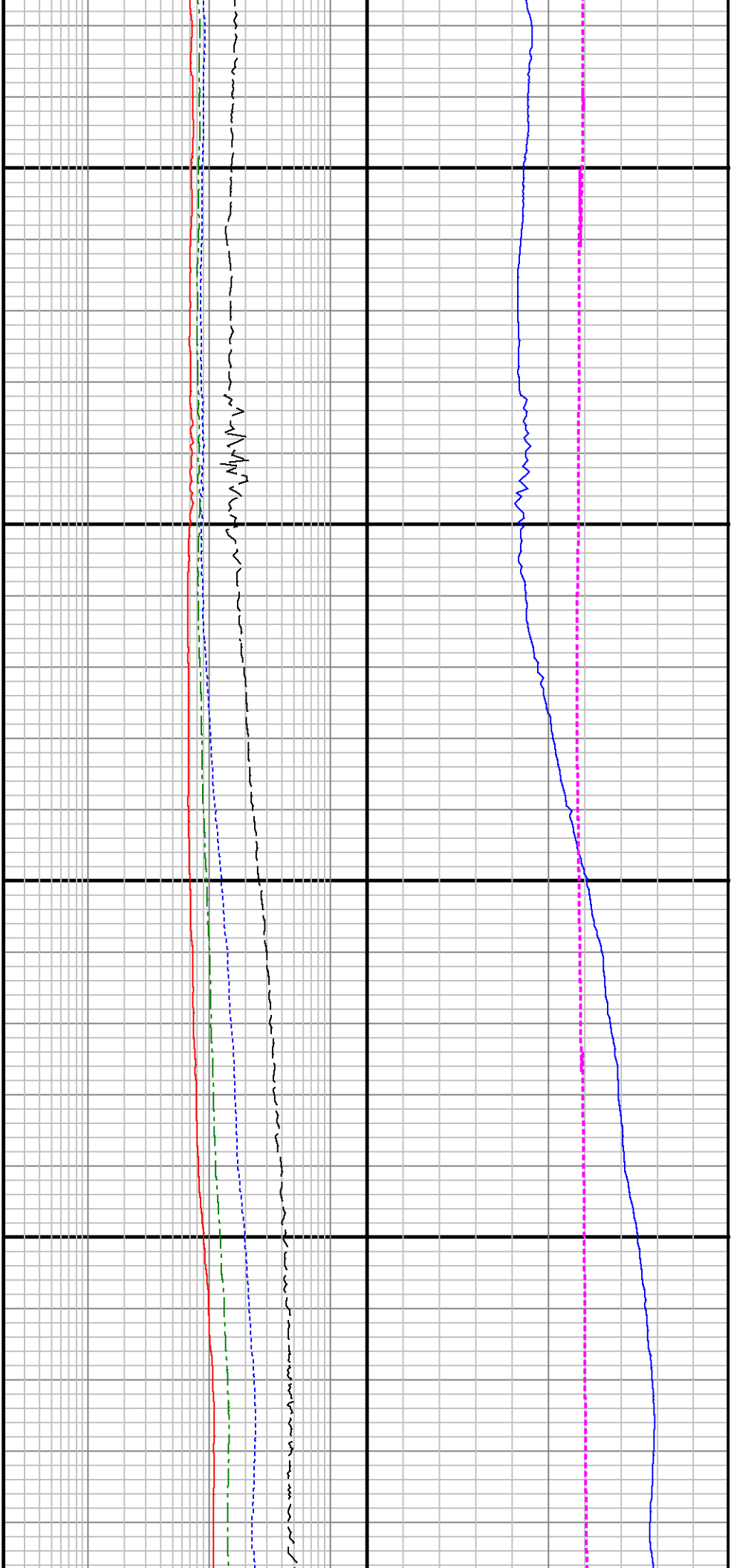




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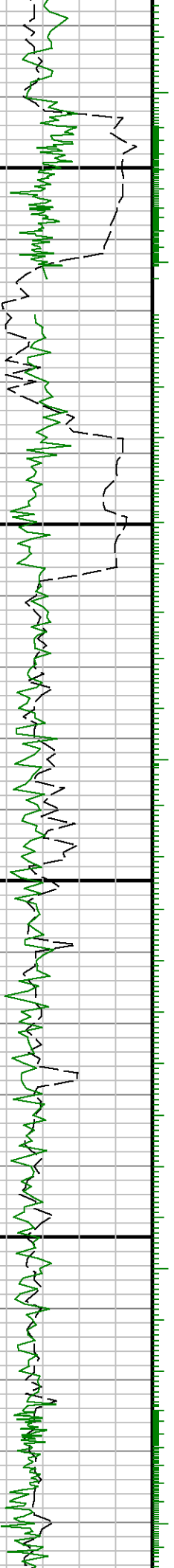
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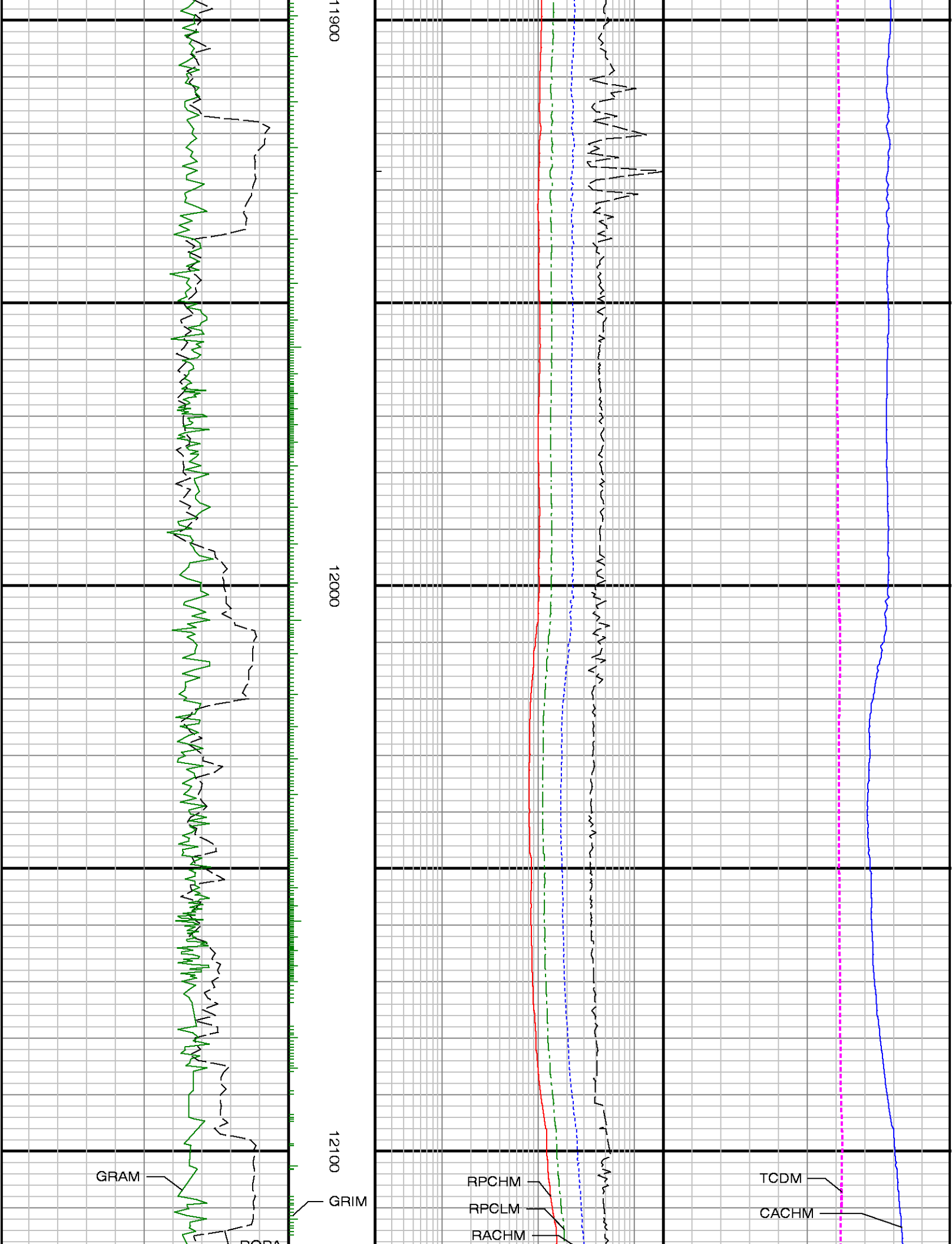


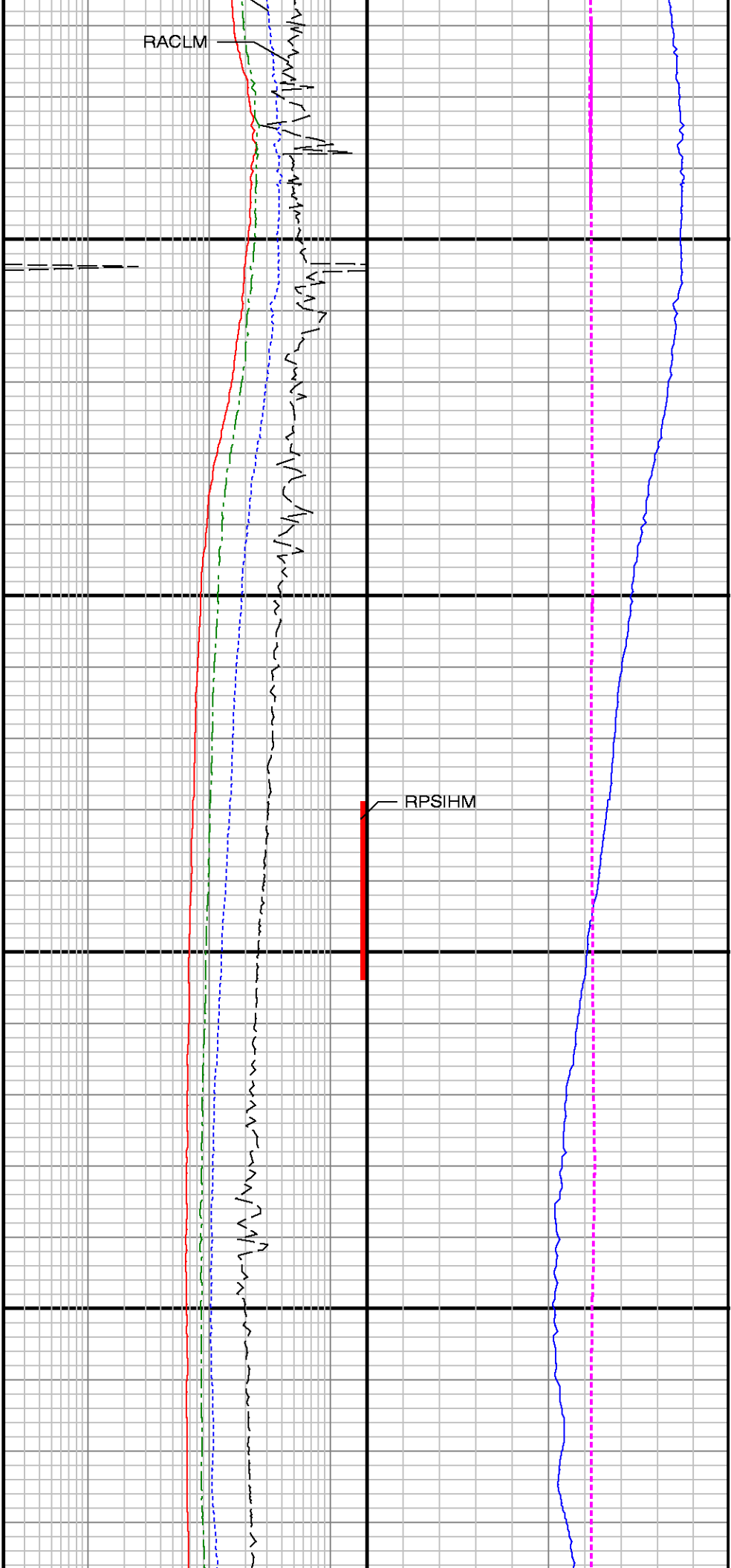


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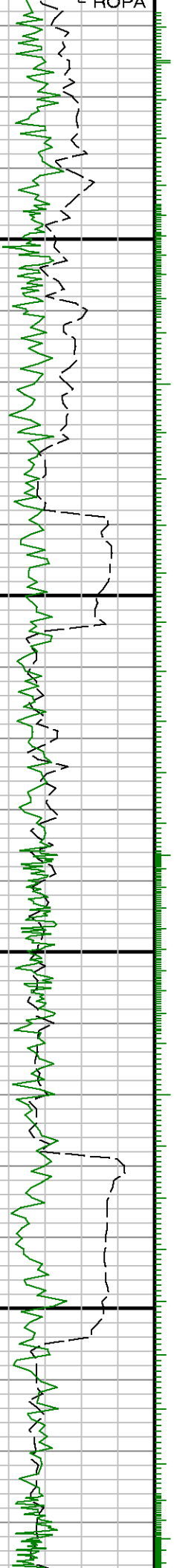


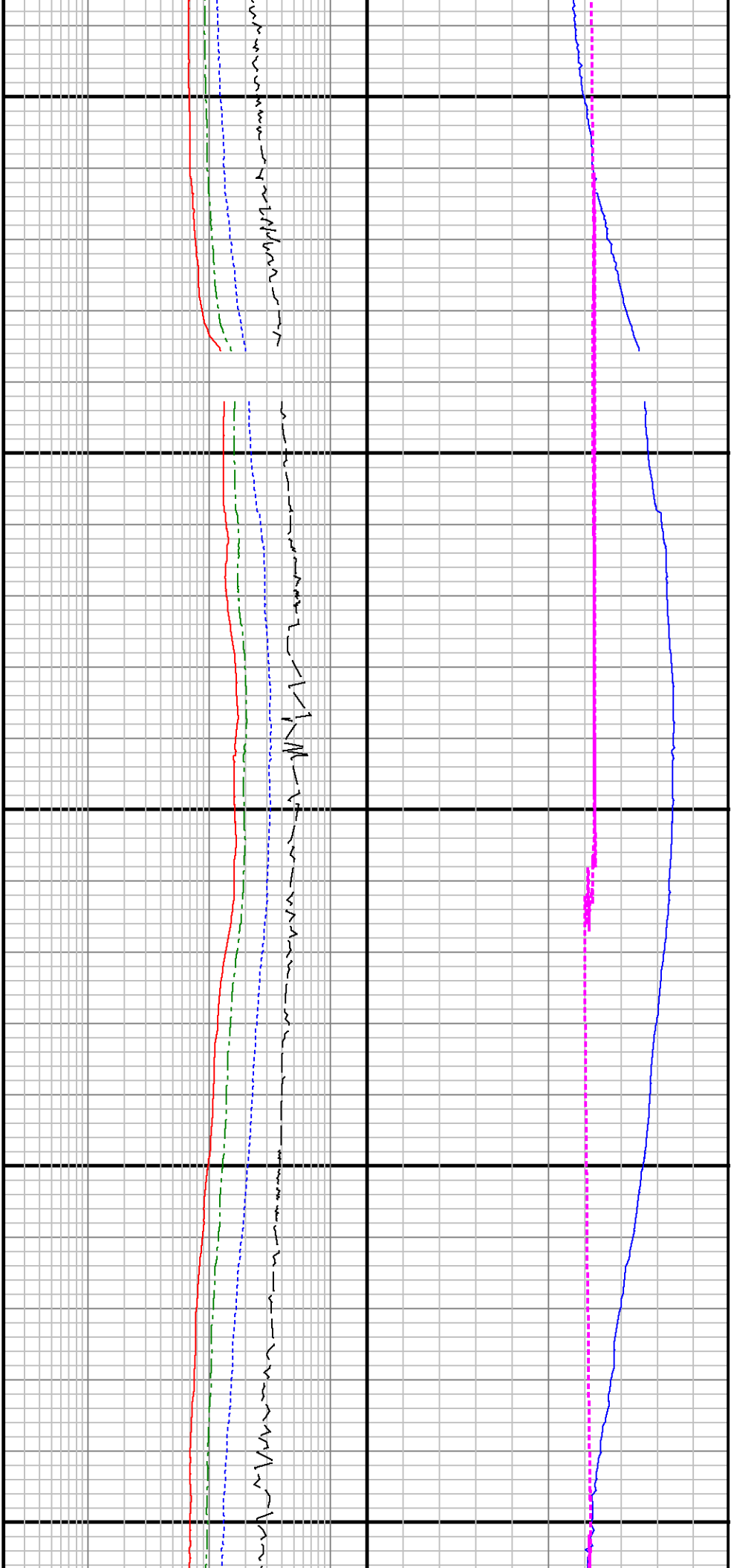




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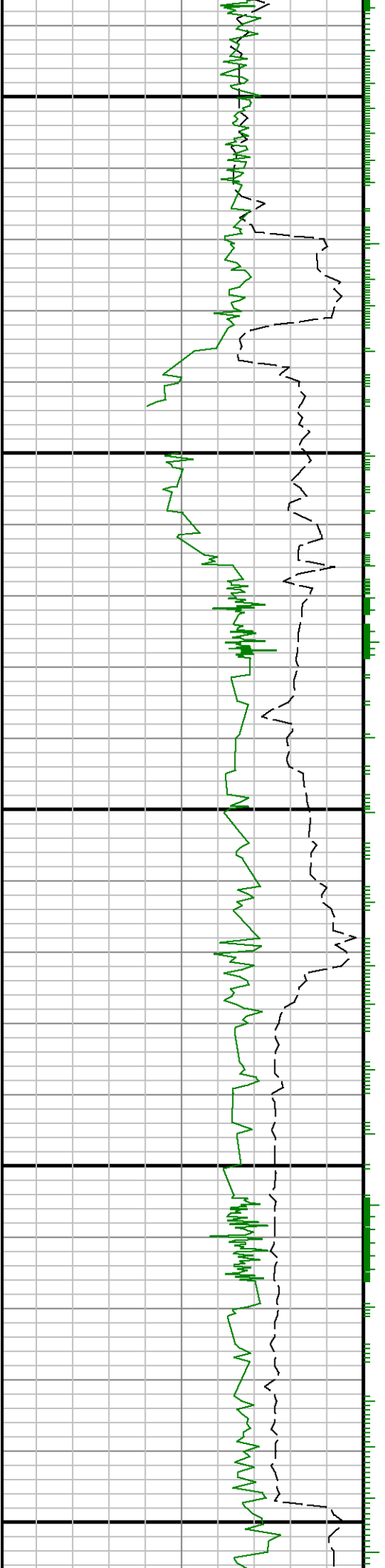
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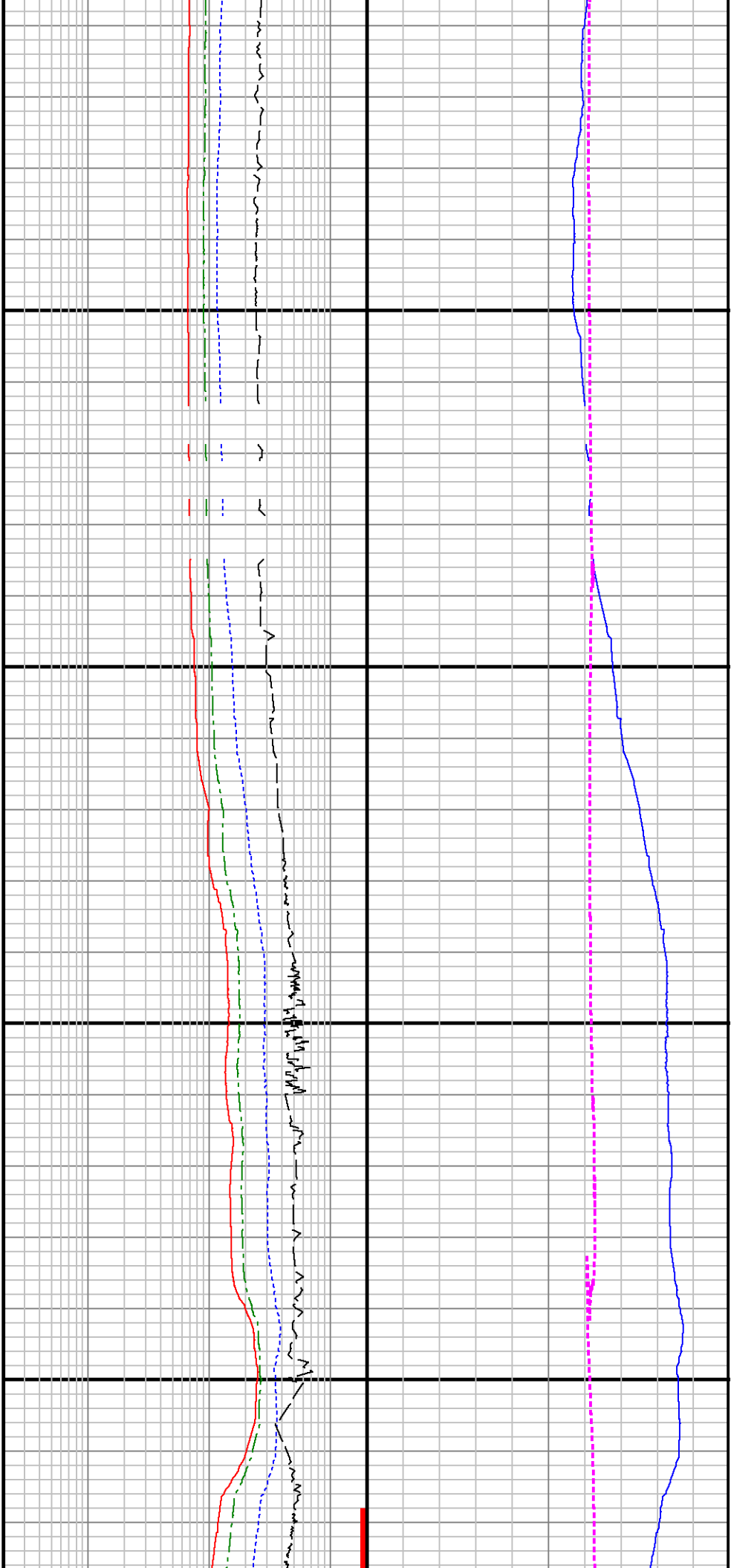




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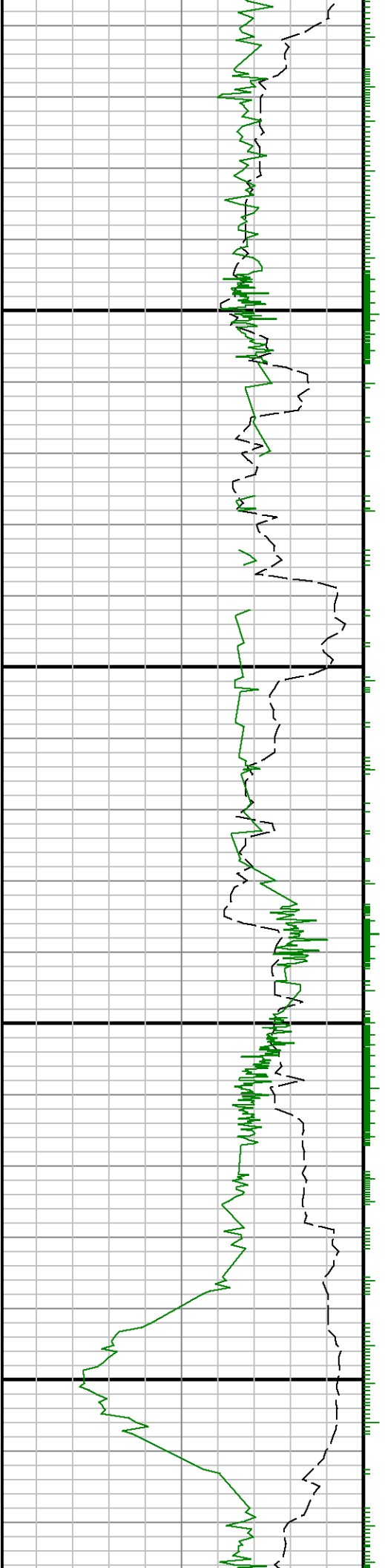
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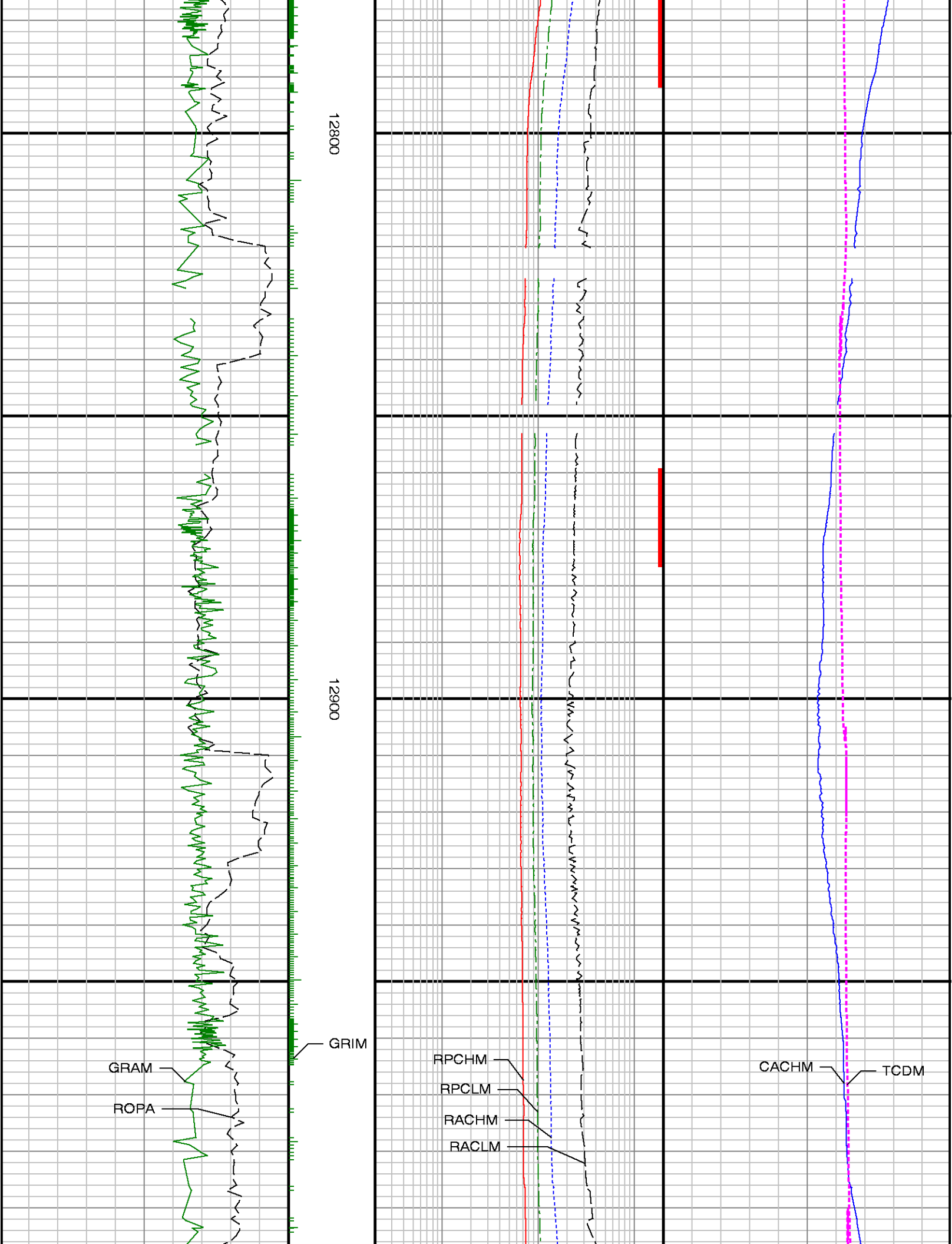


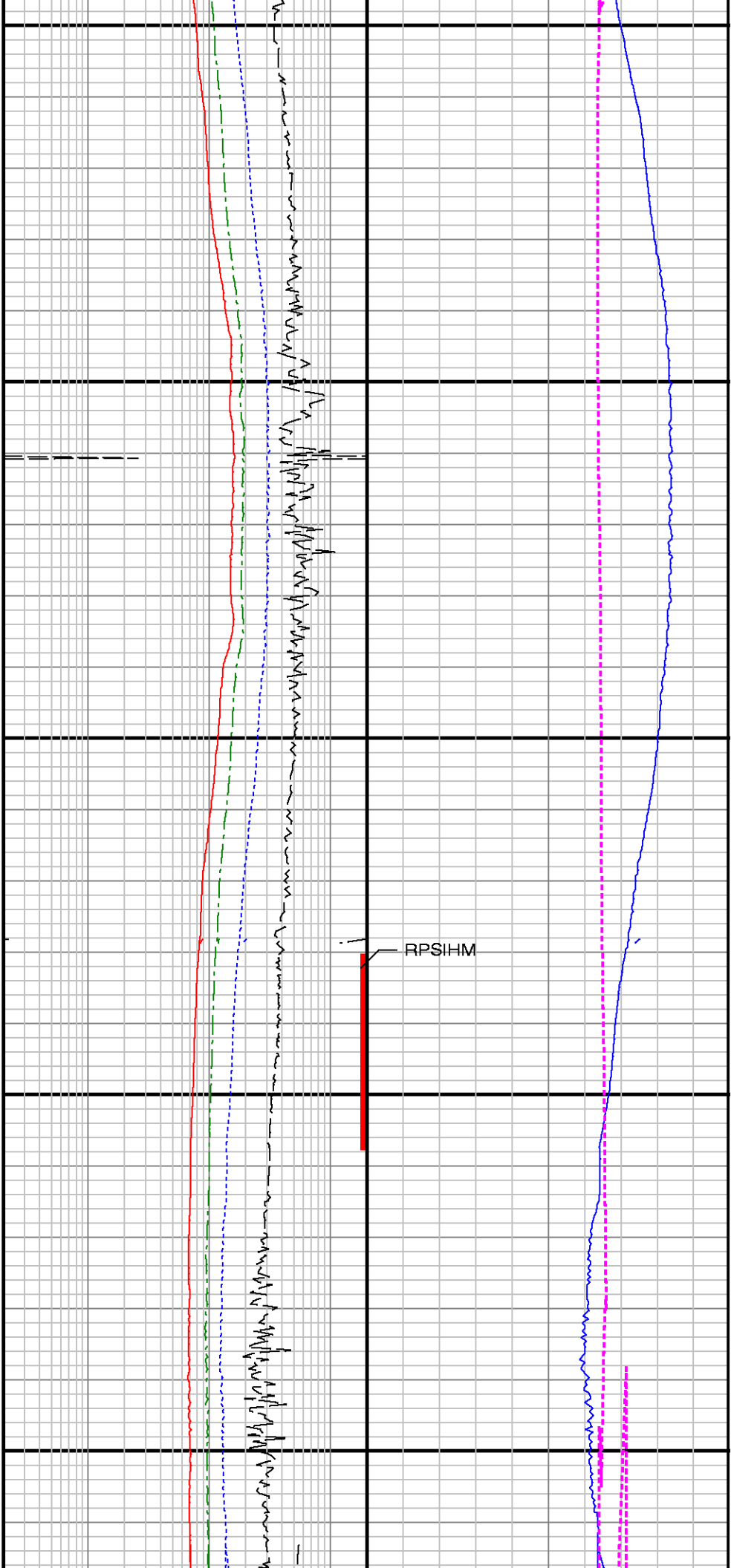


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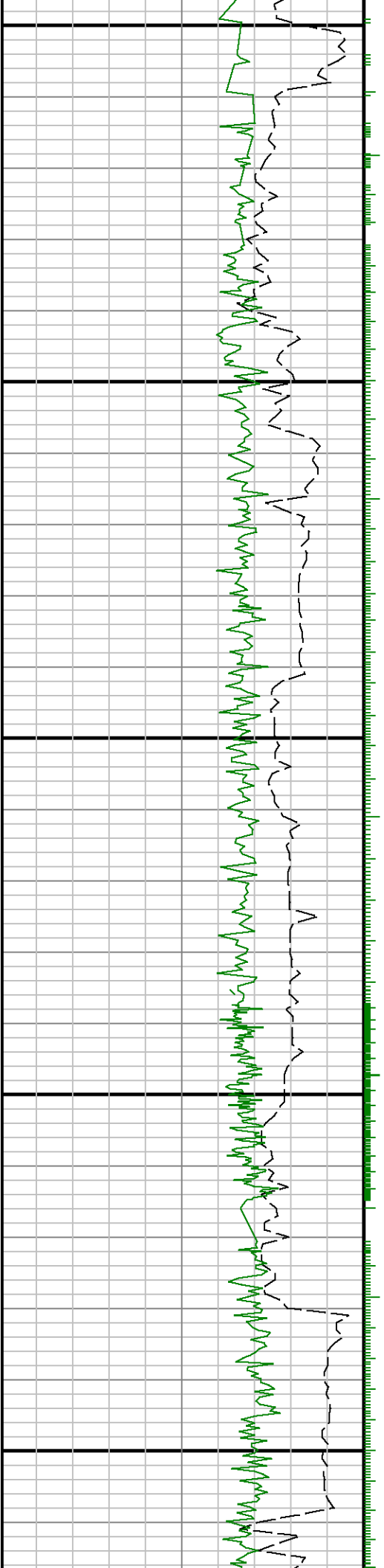


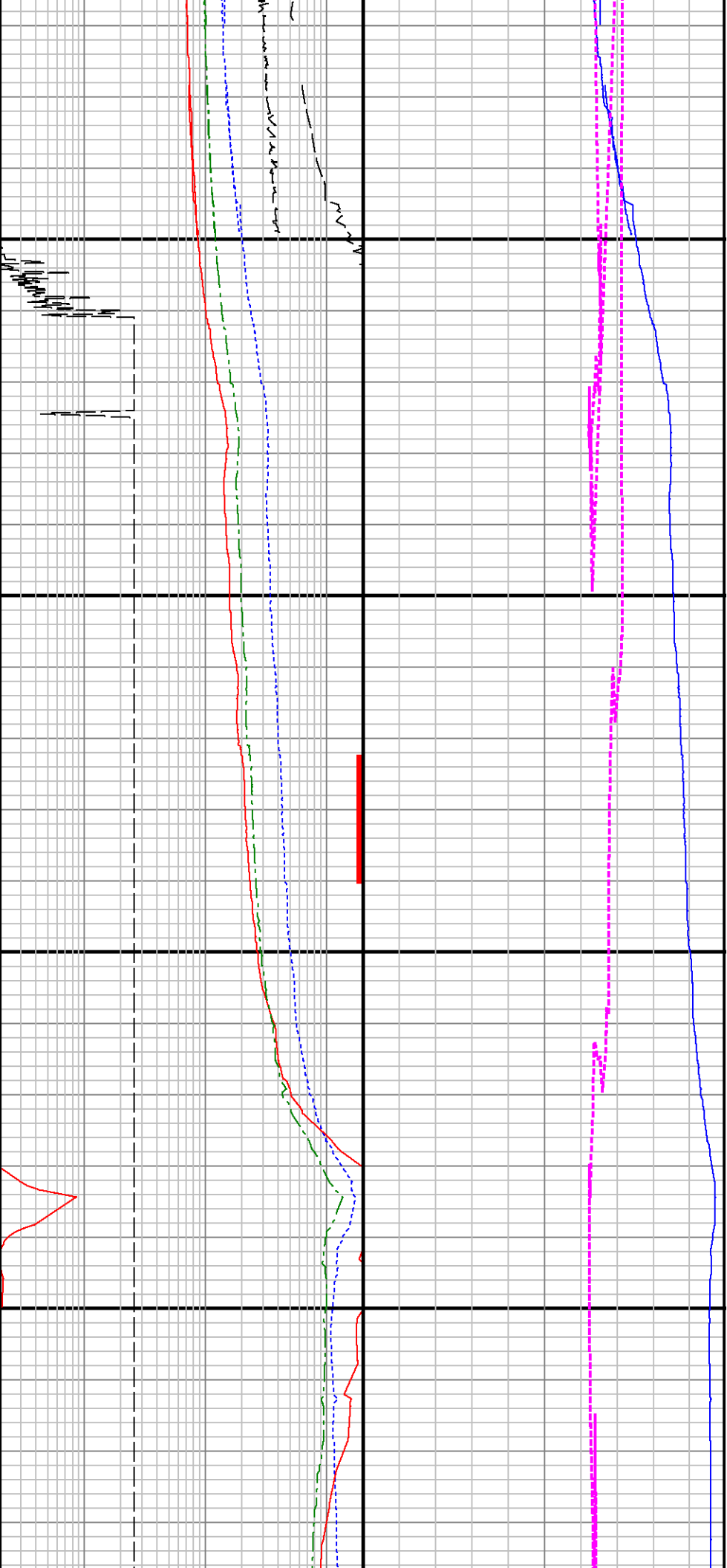


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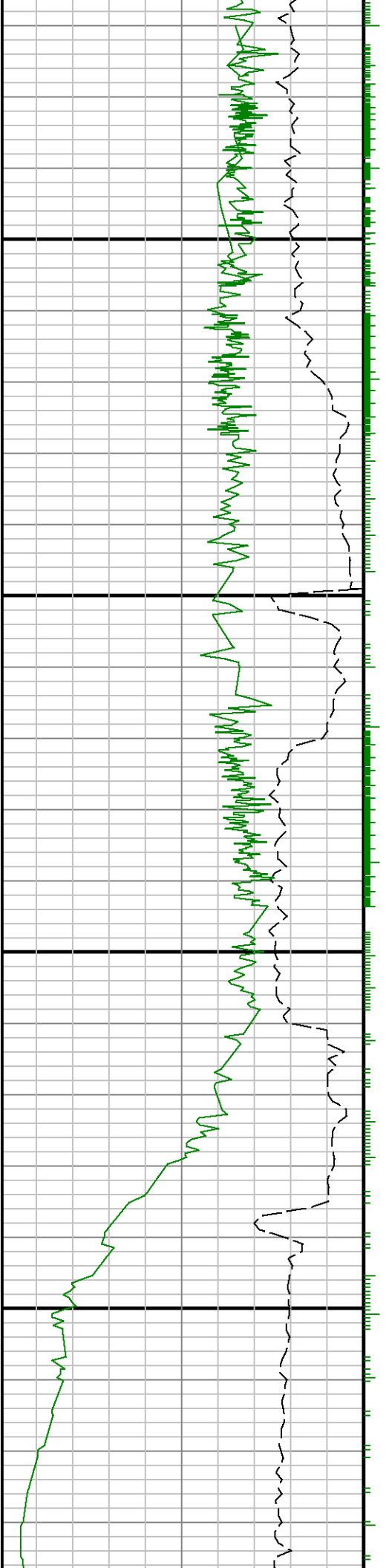
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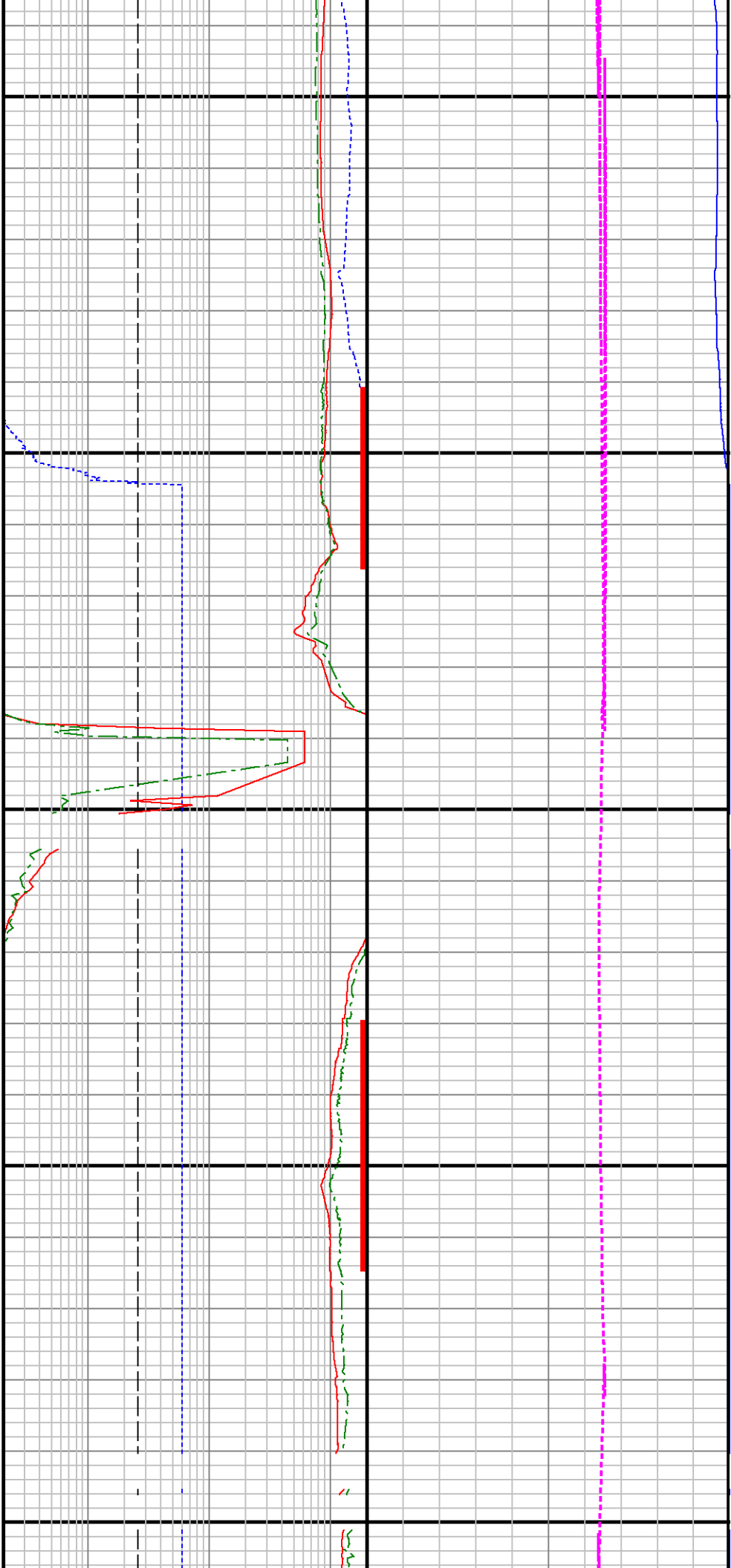
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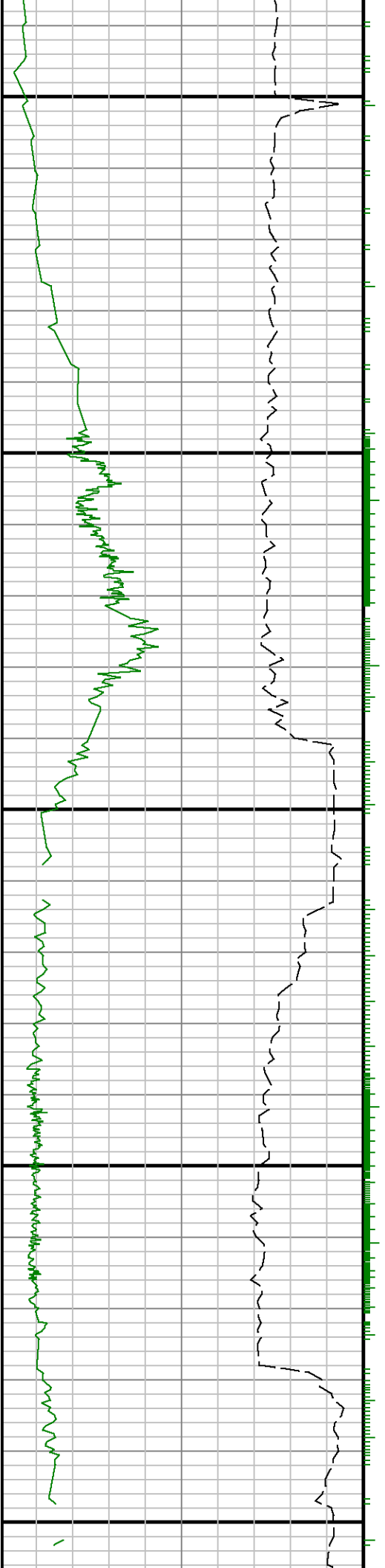
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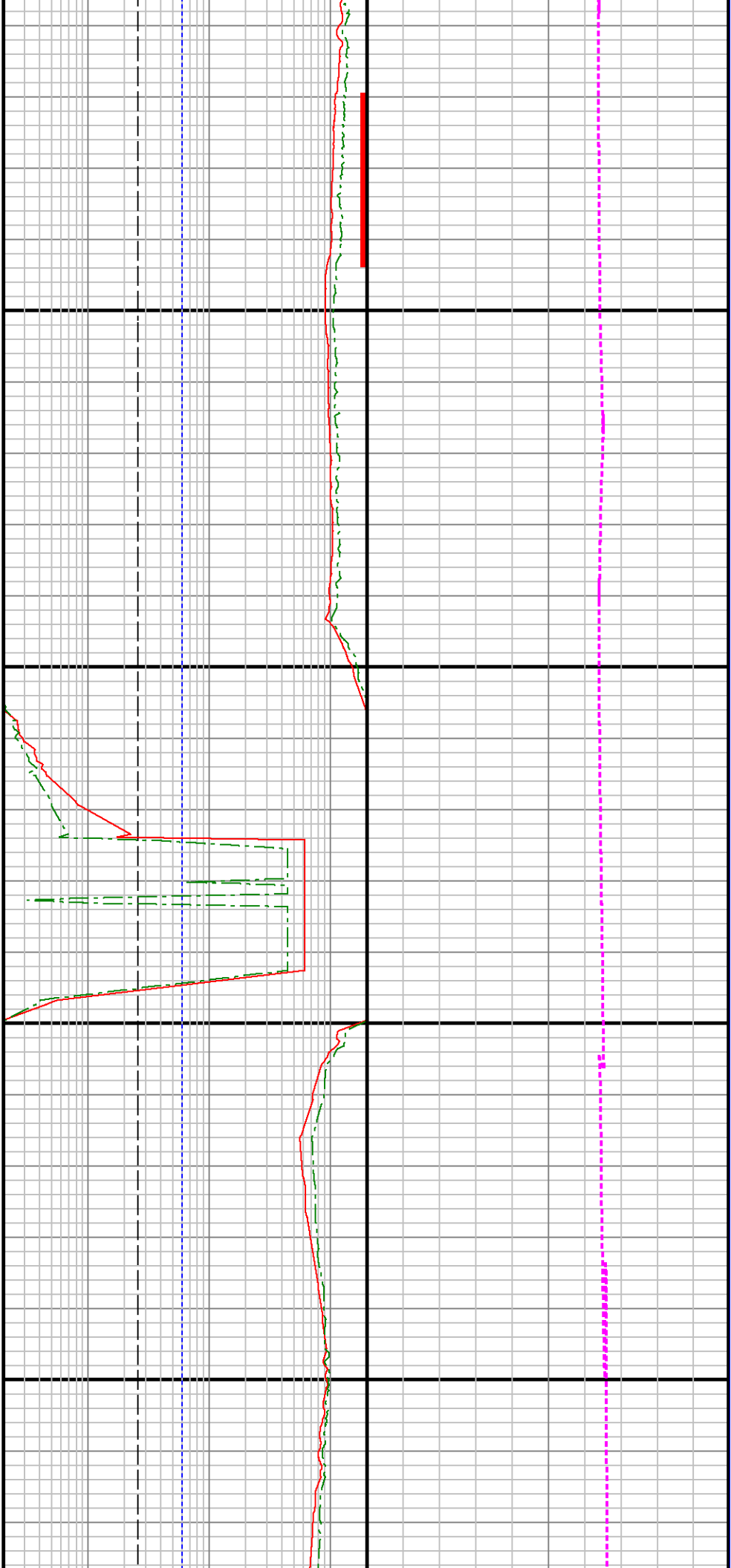




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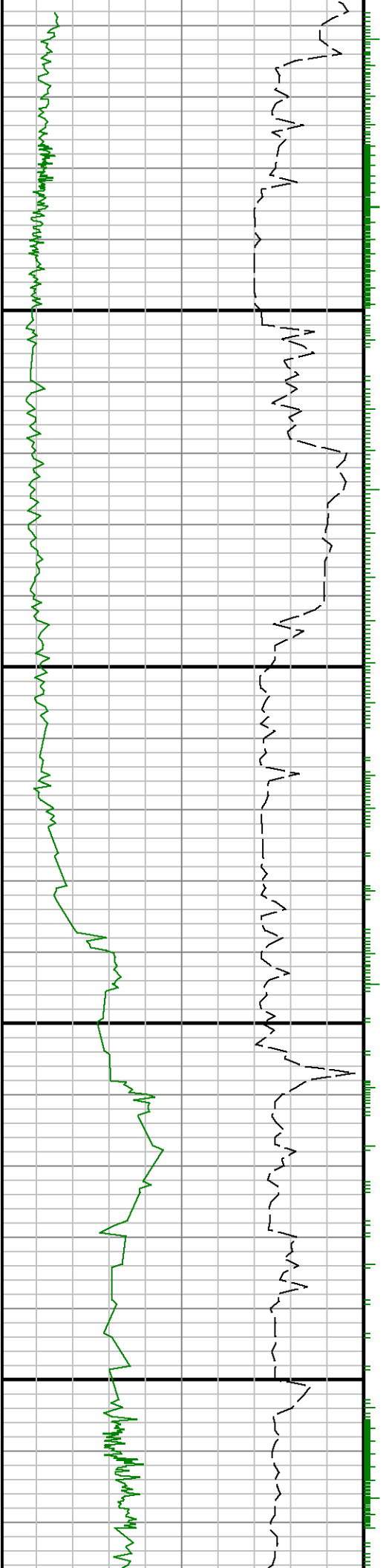
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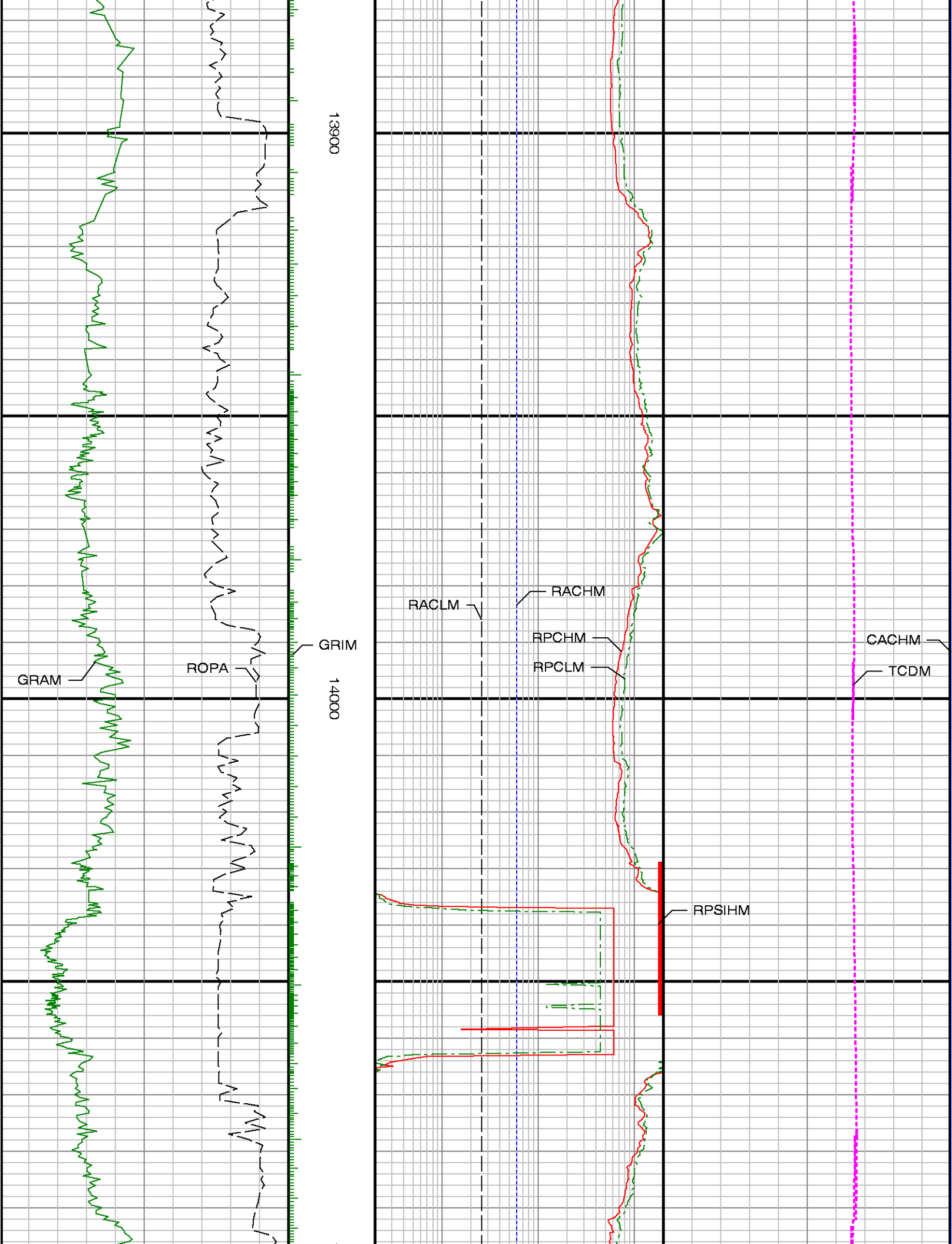


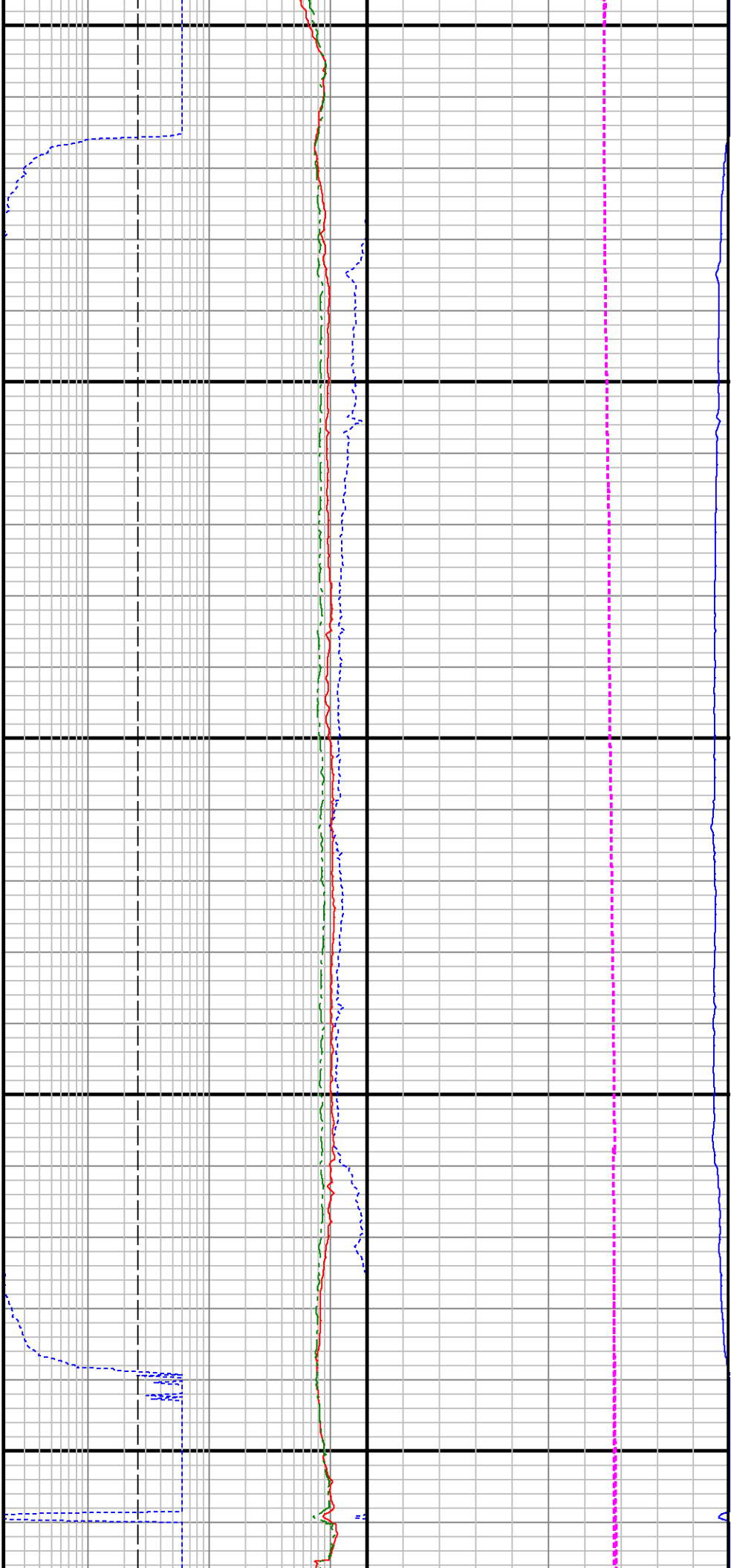


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13800



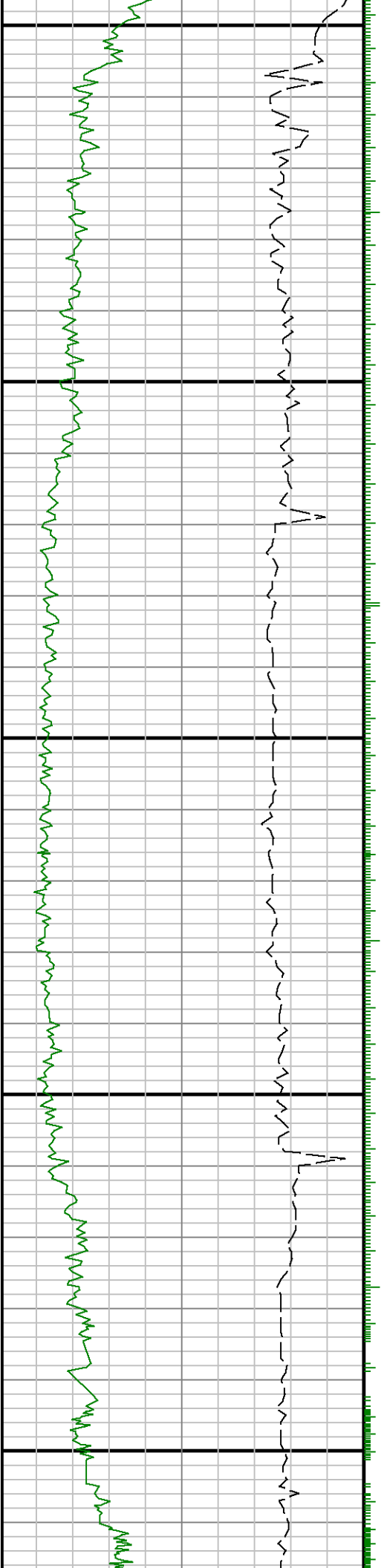


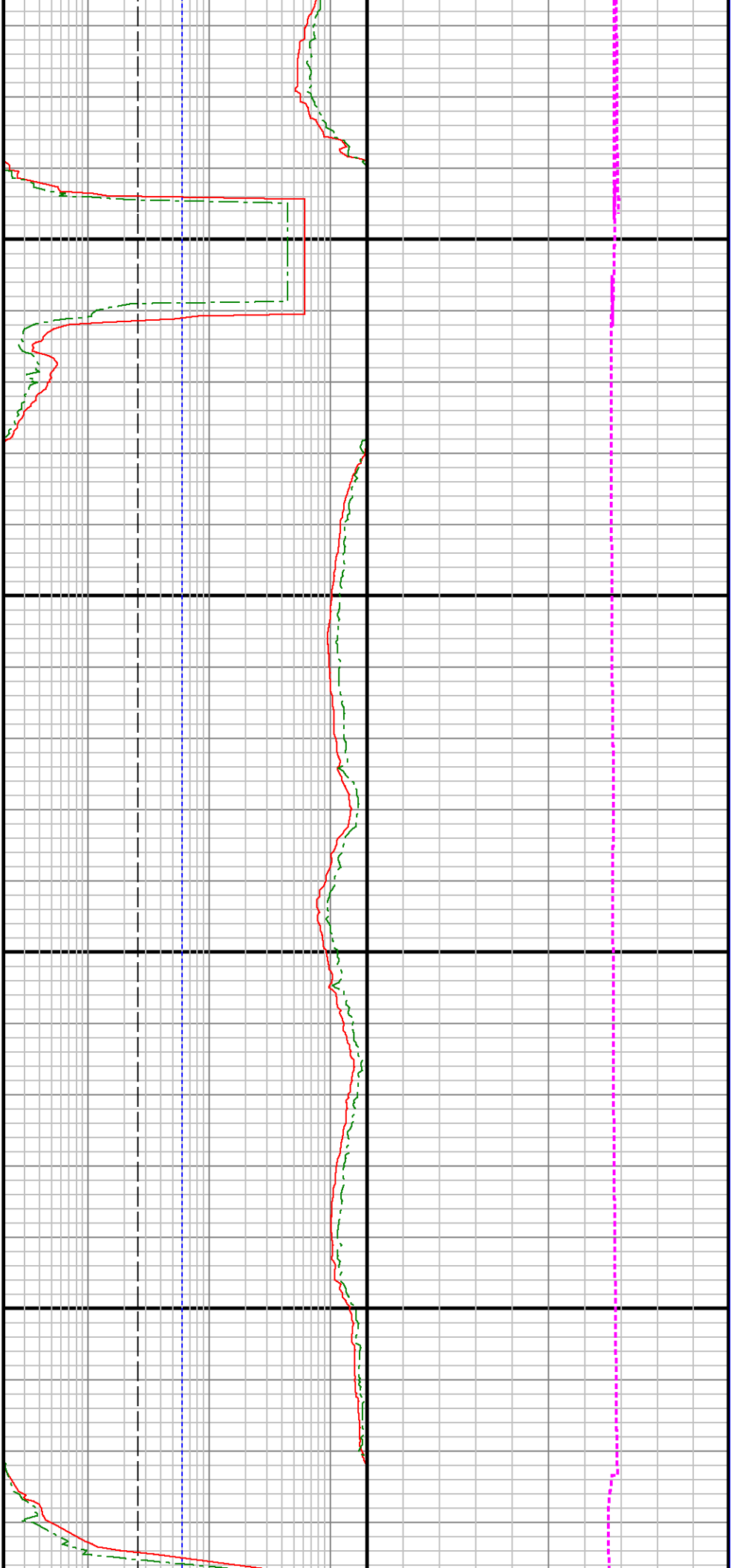


14100

14200

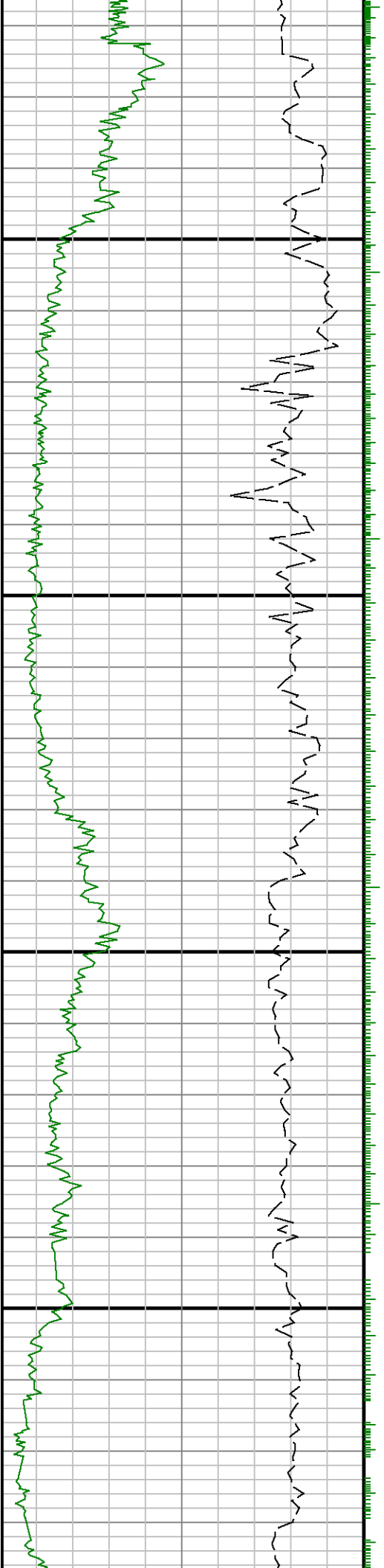
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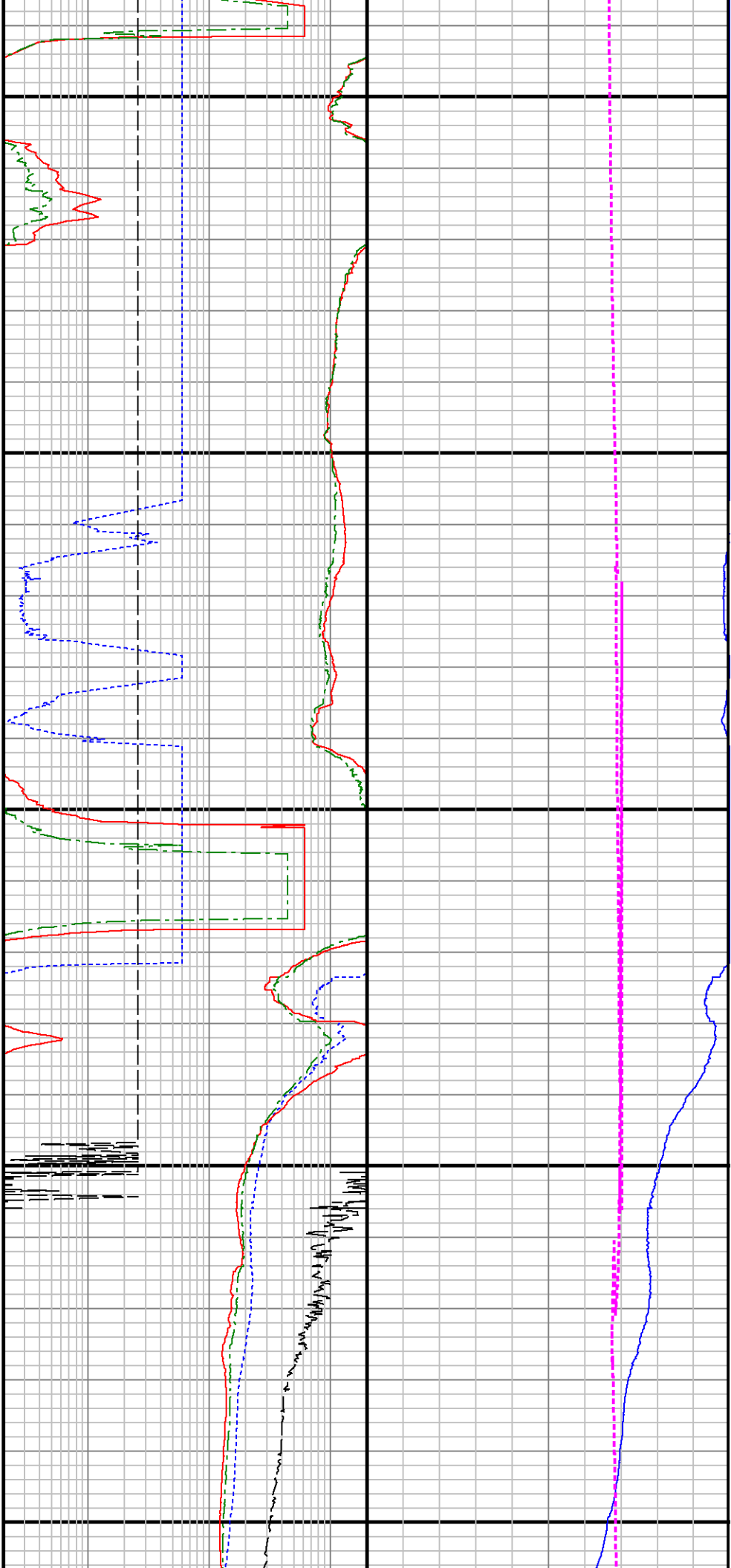




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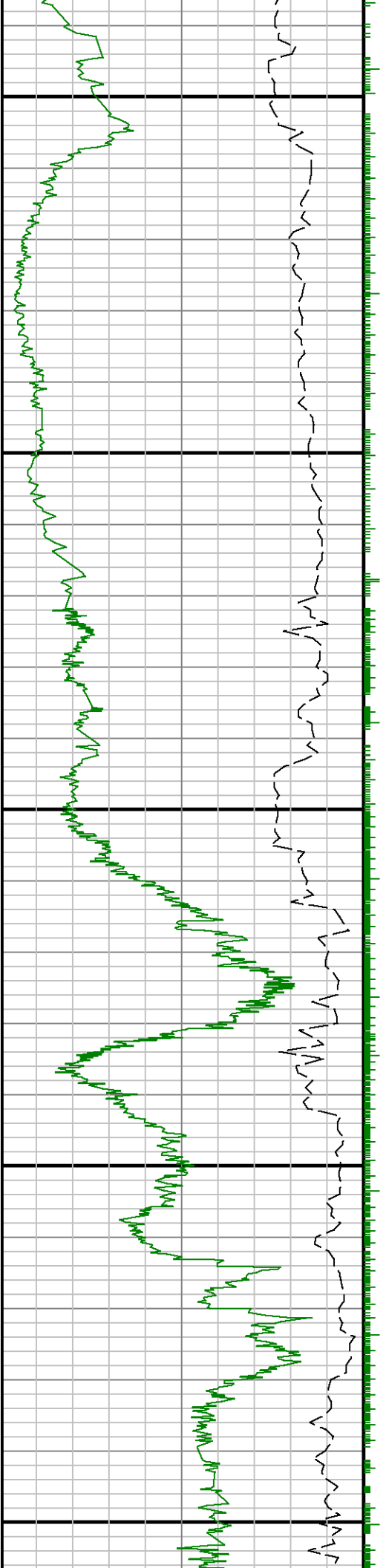
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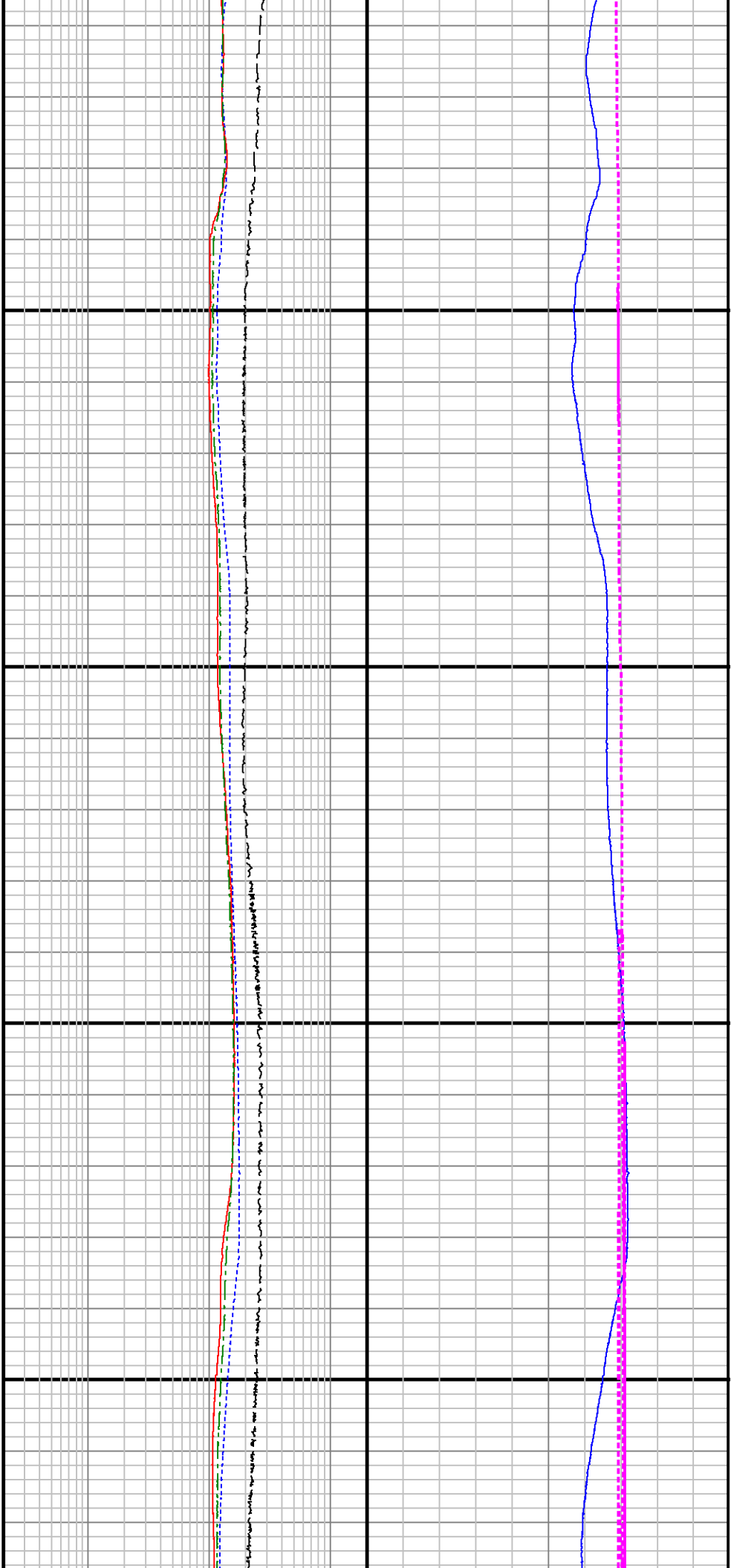




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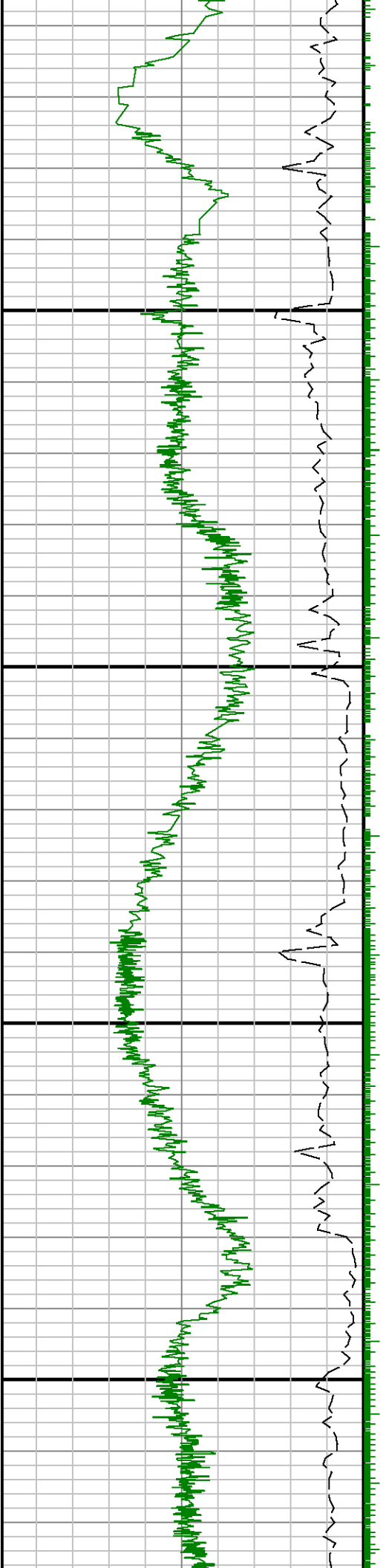
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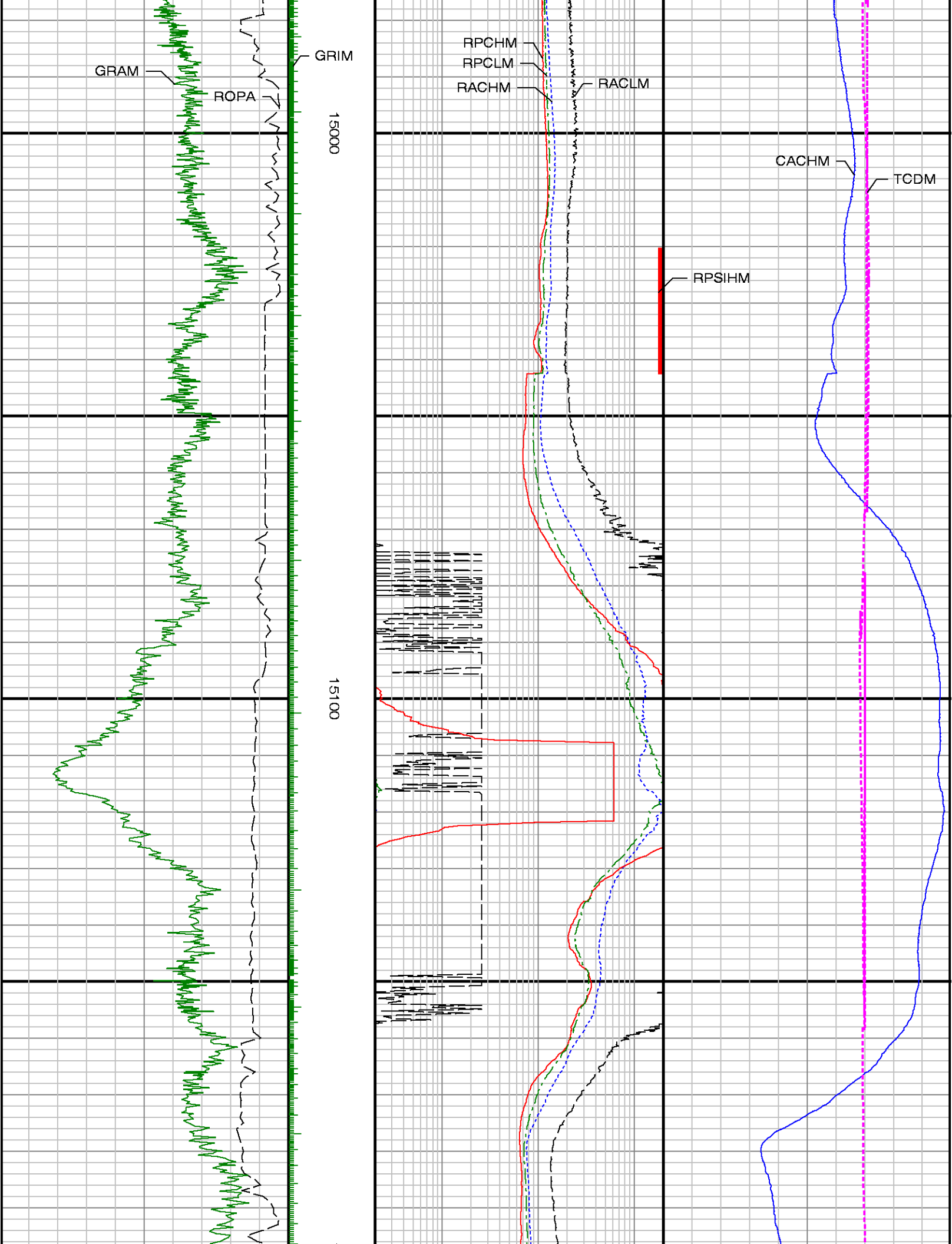


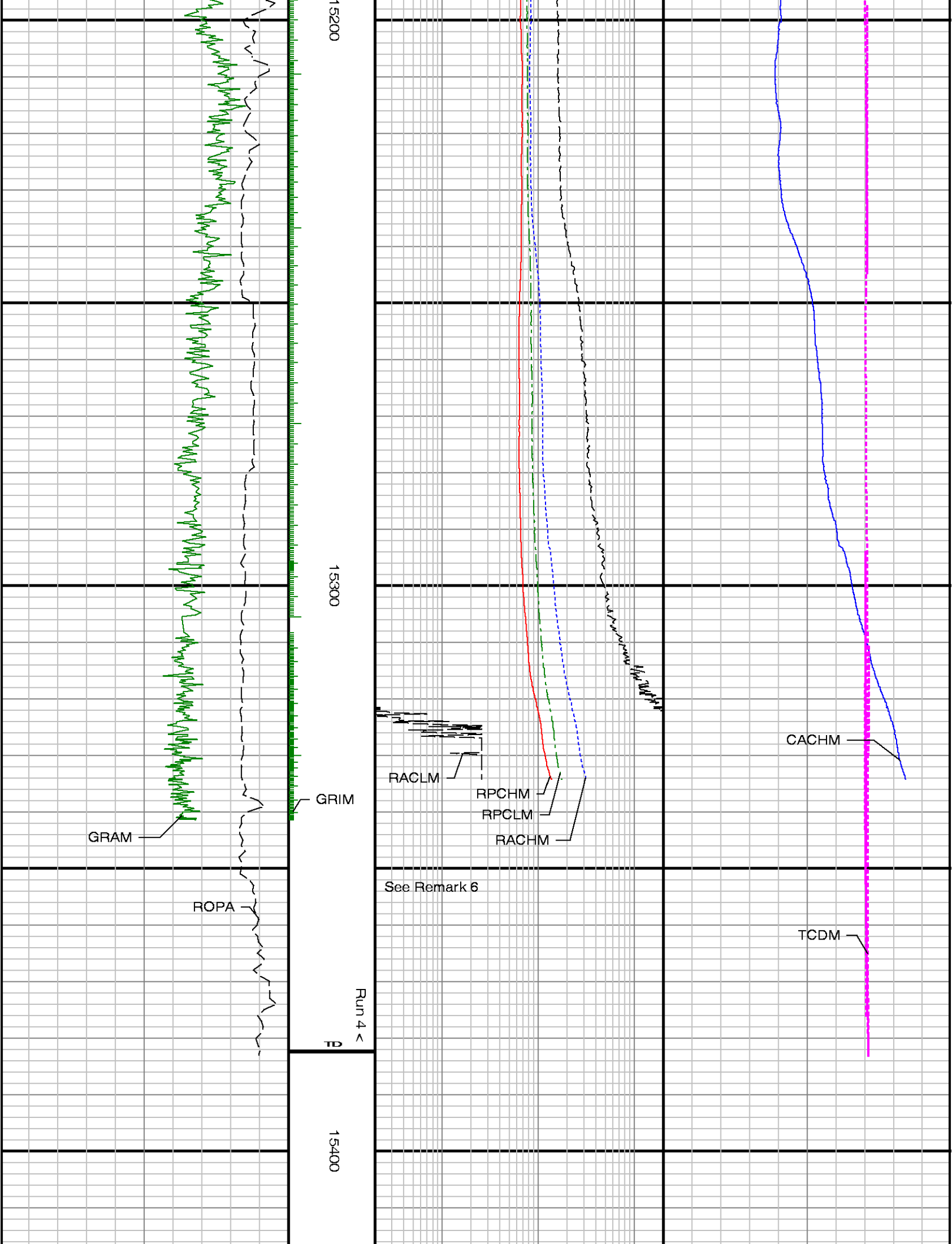


14800

14900







<p>Rate of Penetration 3.0 ft Avg ROPA</p> <p>800 0</p> <p>ft/hr</p> <p>Gamma Ray Apparent 0.5 ft Avg GRAX</p> <p>0 150</p> <p>API</p> <p>Gamma Ray Apparent 0.5 ft Avg GRAM</p> <p>0 150</p> <p>API</p>	MD feet 1:240	<p>Res AT LS 2MHz Corr RACHM</p> <p>0.2 200</p> <p>ohm.m</p> <p>Res AT LS 400kHz Corr RACLM</p> <p>0.2 200</p> <p>ohm.m</p> <p>Res PD LS 2MHz Corr RPCHM</p> <p>0.2 200</p> <p>ohm.m</p> <p>Res PD LS 400kHz Corr RPCLM</p> <p>0.2 200</p> <p>ohm.m</p>	<p>Con AT LS 2MHz Corr CACHM</p> <p>200 0</p> <p>mmho/m</p> <p>Downhole Temperature [TCDX]</p> <p>0 300</p> <p>degF</p> <p>Downhole Temperature [TCDM]</p> <p>100 300</p> <p>degF</p>
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