

BAKER HUGHES				Memory and Realtime Log			
<div>Scale: 1:240</div> <div>Measured Depth</div>				Multiple Propagation Resistivity Gamma Ray			
				Company: Anadarko			
				Well: Ralph 34C-19HZ			
				Field: Weld County			
				Region: Continental US Country: United States			
Status:	Field Print	Surface Location: Latitude: 40 ° 2' 35.484" N Longitude: 104 ° 56' 17.470" W		Other Services: Directional VSS Annular Pressure			
API Number:	05-123-36923	Section: 19 TWN: 1N Range: 67W					
Permanent Datum (P.D.):		Ground Level	Elevation:	Elevations: N/A			
Log Measured From:		Rig Floor	17.00 ft.	Above P.D.			
Depth Reference:		Driller's Depth		KB: N/A DF: 5133.00 ft. GL: 5116.00 ft.			
Interval Logged				Magnetic Field Reference			
Top:	7306.0 ft.	Date From:	11/Aug/13	Dip Angle:	66.63 °	Azi Reference North:	True
Bottom:	12348.0 ft.	Date To:	19/Aug/14	Total	Mag to Reference		
		Spud Date:	09/Aug/13	Field Strength:	52650.2 nT	North Correction:	8.69 °
Borehole Record				Casing Record			
Hole Size	From	To	Size	Weight	From	To	
13,500 in.	Surface	931.0 ft.	9.625 in.	36.00 lb/ft	Surface	921.0 ft.	
8,750 in.	931.0 ft.	8355.0 ft.	7.000 in.	26.00 lb/ft	Surface	8346.0 ft.	
6,125 in.	8355.0 ft.	12396.0 ft.					
Mud Record				Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)	
Water Based Mud	Surface	12396.0 ft.	13,500 in.	931.0 ft.	0.0 ° / 0.0 °	0.4 ° / 188.4 °	
			8,750 in.	7424.0 ft.	1.0 ° / 47.1 °	86.5 ° / 176.9 °	
			6,125 in.	4041.0 ft.	90.6 ° / 176.9 °	90.2 ° / 180.3 °	
					/	/	
					/	/	
					/	/	
Acquisition System				Other			
Software Version	2.20U4	Rig / Contractor:	Xtreme 6	/ Xtreme Coil Services			
Advantage	6.4.1.34	Job No:	5460222				
PATS		District / Unit:	RMD	/ D & E			

INTEQ does not guarantee the accuracy or correctness of interpretations provided in or from this log. Since all interpretations are opinions based on measurements, INTEQ shall under no circumstances be responsible for consequential damages or any other loss, costs, damages or expenses incurred or sustained in connection with the use of any such interpretations. INTEQ disclaims all expressed and implied warranties related to this service. INTEQ's liabilities and obligations shall be governed by INTEQ's Standard Terms and Conditions.

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	Bottom	From	To	Start	End	
							(ft.)	(ft.)	(ft.)	(ft.)			
1	1	2	8.750	PDC	0.750	Steerable	7306.0	8112.0	7356.0	8152.0	11/Aug/2013 10:40	12/Aug/2013 18:43	55.6
2	2	3	8.750	PDC	0.750	Steerable	8112.0	8315.0	8152.0	8355.0	13/Aug/2013 19:57	14/Aug/2013 11:01	20.3
3	3	4	6.125	PDC	0.750	Steerable	8315.0	12348.0	8355.0	12396.0	16/Aug/2013 23:11	19/Aug/2013 08:00	64.1

Crew								
Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Jeremiah Davidson	08/Aug/13	10/Aug/13	Matthew Delmore	08/Aug/13	18/Aug/13	Donald Delay	10/Aug/13	20/Aug/13
Jeremiah Davidson	18/Aug/13	20/Aug/13	Nathan Leopold	14/Aug/13	16/Aug/13			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (sec/quart)	pH	Fluid Loss (bbl)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
16/Aug/2013	09:00	3	8355.0	Water Based Mud	9.8	42	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
16/Aug/2013	15:00	3	8355.0	Water Based Mud	9.8	42	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
16/Aug/2013	21:00	3	8355.0	Water Based Mud	9.8	41	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
17/Aug/2013	09:00	3	9233.0	Water Based Mud	9.8	48	9.5	5.9	3 / 88	Active Mud Pit	300	0.0
17/Aug/2013	11:00	3	9655.0	Water Based Mud	9.8	45	9.2	6.0	3 / 89	Active Mud Pit	300	0.0
17/Aug/2013	11:00	3	9926.0	Water Based Mud	9.8	42	9.2	6.0	4 / 89	Active Mud Pit	300	0.0
18/Aug/2013	23:26	3	10616.0	Water Based Mud	9.8	43	9.0	6.0	4 / 89	Active Mud Pit	300	0.0
18/Aug/2013	23:26	3	11113.0	Water Based Mud	9.8	44	9.0	5.9	4 / 88	Active Mud Pit	500	0.0
18/Aug/2013	23:26	3	11625.0	Water Based Mud	9.9	44	9.0	5.9	4 / 88	Active Mud Pit	500	0.0

Mud Resistivity Record

				Surface				Downhole			
Date / Time		LWD Run No.	Measured Depth (ft.)	Surface Temp (deg F)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg F)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
16/Aug/2013	12:36	3	8355.0	75	1.00	N/A	N/A	125	0.61	N/A	N/A
16/Aug/2013	23:22	3	8376.0	73	0.84	N/A	N/A	183	0.35	N/A	N/A
17/Aug/2013	03:21	3	8662.0	68	0.88	N/A	N/A	188	0.33	N/A	N/A
17/Aug/2013	14:33	3	9511.0	72	1.01	N/A	N/A	294	0.26	N/A	N/A
18/Aug/2013	03:15	3	10450.0	73	1.14	N/A	N/A	215	0.40	N/A	N/A
18/Aug/2013	14:01	3	11016.0	73	1.03	N/A	N/A	218	0.36	N/A	N/A
18/Aug/2013	23:14	3	11730.0	78	1.12	N/A	N/A	228	0.40	N/A	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 Density	points
GRIX	Gamma Ray Density	points
RACHM	Resistivity, Attenuation (LS) 2 MHZ - Compensated Borehold Corrected	ohm.m
RACLM	Resistivity, Attenuation (LS) 400 kHz - Compensated Borehold 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
RPTHM	Time Since Drilled (RPCHM)	min

Equipment and Service Data

LWD	Tool	Serial	Measurement	Bit	Max	Min
Drill Pipe	Tool Joint	Tool Joint	Tool Joint	Tool Joint	Tool Joint	Tool Joint

Run		Number		Offset	O.D.	I.D.
No.				(ft.)	(in.)	(in.)
1	DIR	11730418	Directional	46.98	6.750	2.750
1	SRIG	12722372	Gamma	43.60	6.750	2.750
2	DIR	11730418	Directional	43.67	6.750	2.750
2	SRIG	12722372	Gamma	40.30	6.750	2.750
3	CS	12187052	-	73.67	4.843	2.569
3	BCPM	11904944	Telemetry	62.66	4.843	2.569
3	STAB	11863323	-	59.34	5.625	2.569
3	OTK	11805184	Directional	54.83	4.843	2.569
3	OTK	11805184	Resistivity	48.86	4.843	2.569
3	OTK	11805184	Gamma	41.67	4.843	2.569
3	OTK	11805184	Pressure	44.30	4.843	2.569
3	CS	12202693	-	36.54	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

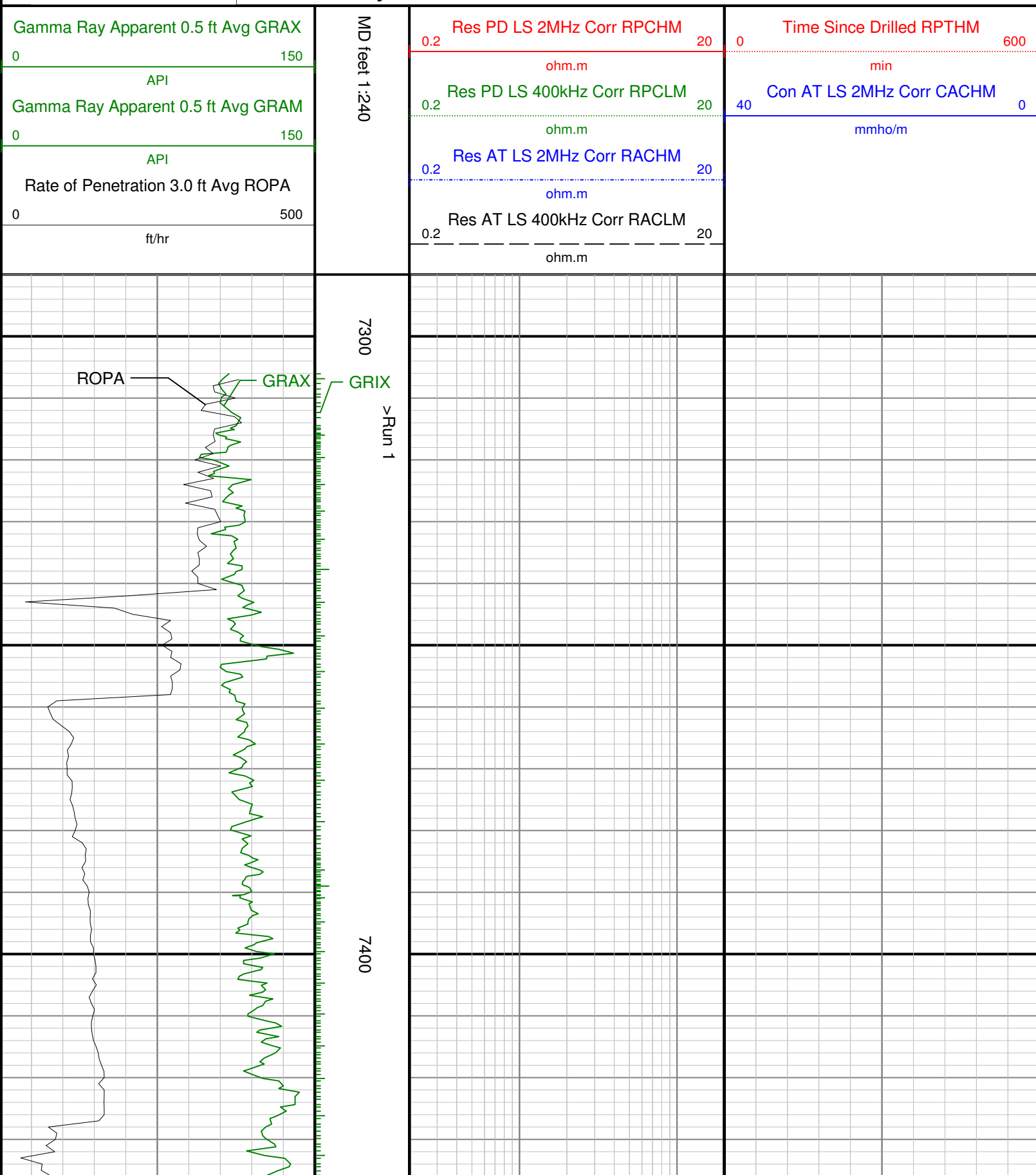
<p>1.) Baker Hughes INTEQ run 1 utilized 6 ¾ inch NaviTrak and NaviGamma Services. NaviTrak Services (VSS, Directional) were provided behind an 8 3/4 inch bit and steerable assembly from 931 to 8152 feet MD (930.90 to 7795.72 feet TVD). NaviGamma Services (VSS, Directional, Gamma Ray) were provided behind an 8 3/4 inch bit and steerable assembly from 8152 to 8355 feet MD (7795.72 to 7830.52 feet TVD).</p> <p>2.) Baker Hughes INTEQ run 3 utilized 4 ¾ inch Ontrak Services (Multiple Propagation Resistivity, Azimuthal Gamma Ray, VSS, Directional, Annular Pressure) behind an 6 1/8 inch bit and steerable assembly from 8355 to 12396 feet MD (7830.52 to 7866.93 feet TVD).</p> <p>3.) A sliding indicator is shown to the right of track 2 as a heavy red line. The indicator has been depth-shifted to the resistivity sensor offset to correspond with data acquired while drilling.</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>

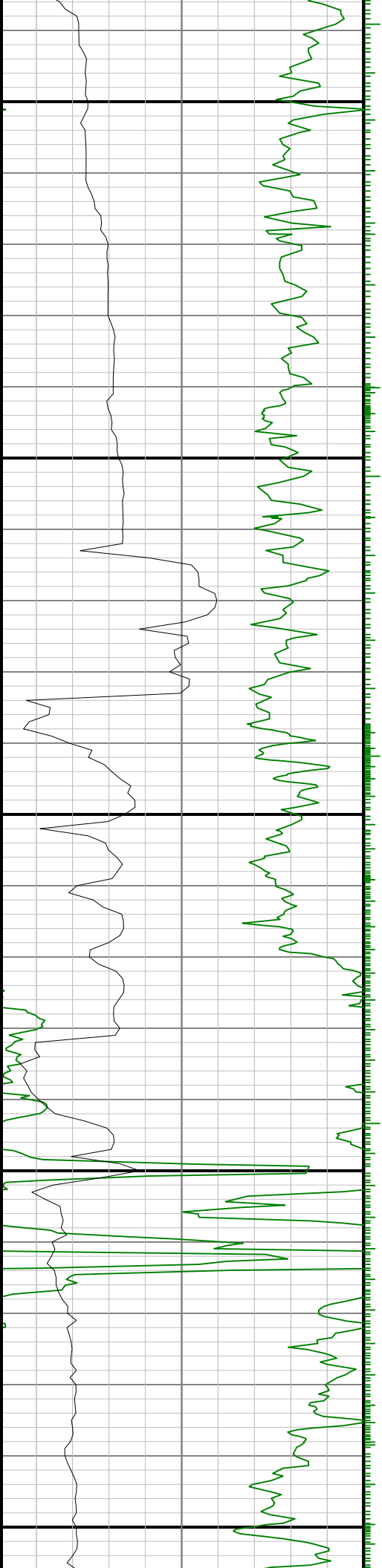
Remarks

Number	Measured	Hole	LWD	Remark
	Depth	Section	Run No.	
	(ft.)	(in.)		
1	8112	8.750	1	The interval between 8112 and 8152 feet MD (7781.02 to 7795.72 feet TVD) was logged up to 25 hours after being drilled to pull out of hole and change BHA.
2	8315	8.750	3	The interval between 8315 and 8355 feet MD (7828.98 to 7830.52 feet TVD) was logged up to 60 hours after being drilled to lay down BHA and for casing operations.
3	8315	8.750	3	The interval between 8315 and 8346 feet MD (7828.98 to 7830.30 feet TVD) shows sporadic resistivity readings due to sensor being inside metal casing.
4	12348	6.125	3	The interval between 12348 and 12396 feet MD (7867.40 and 7866.93 feet TVD) has no logging data due to sensor to bit offset.



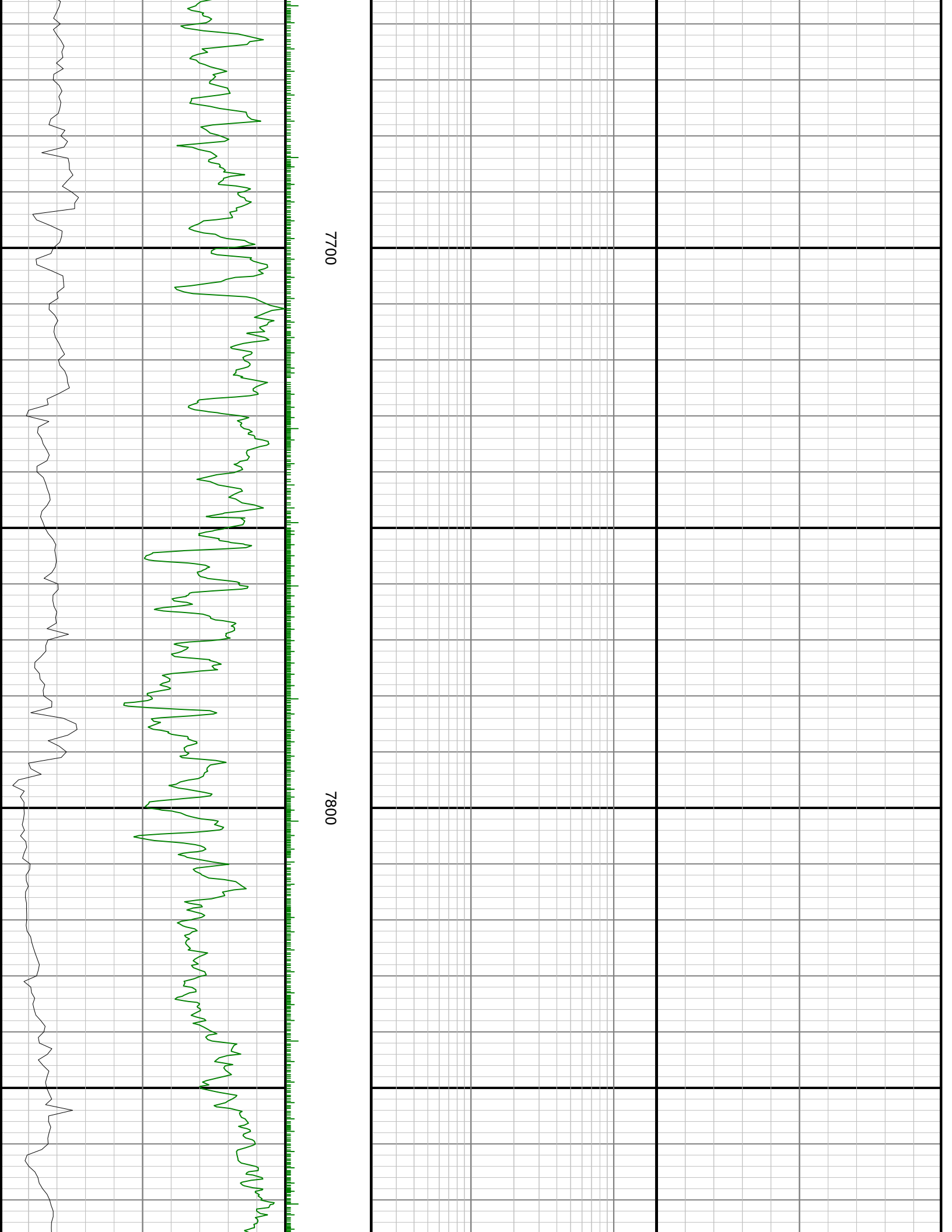
Company : Anadarko
Well : Ralph 34C-19HZ
Interval : 7290.00 - 12430.00 feet
Created : 20/Aug/2013 6:09:09 AM

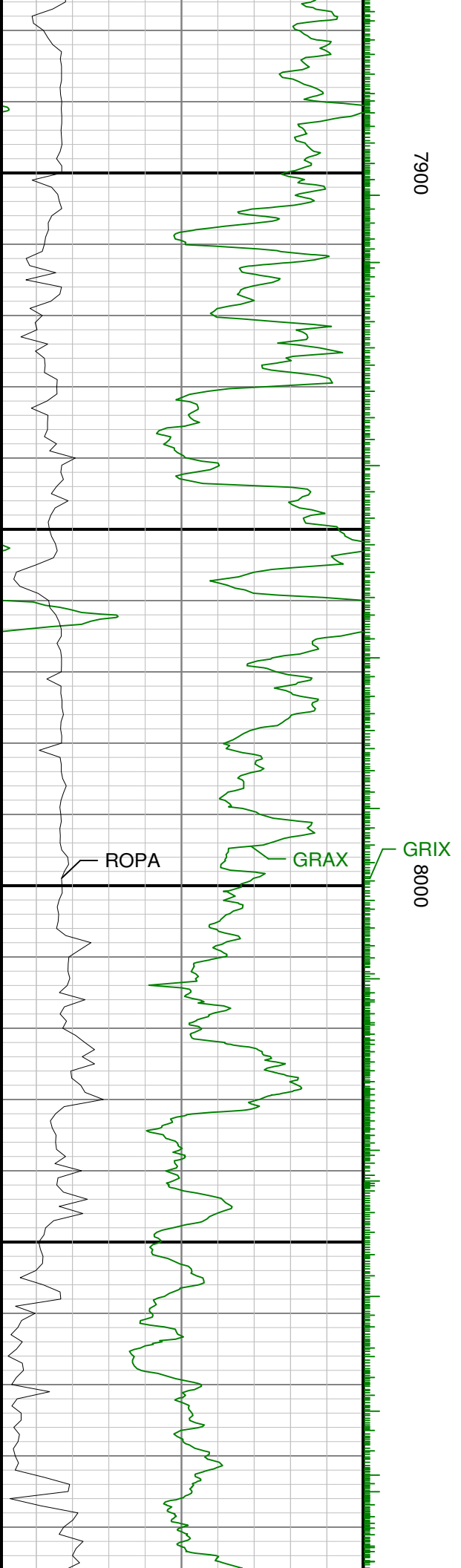


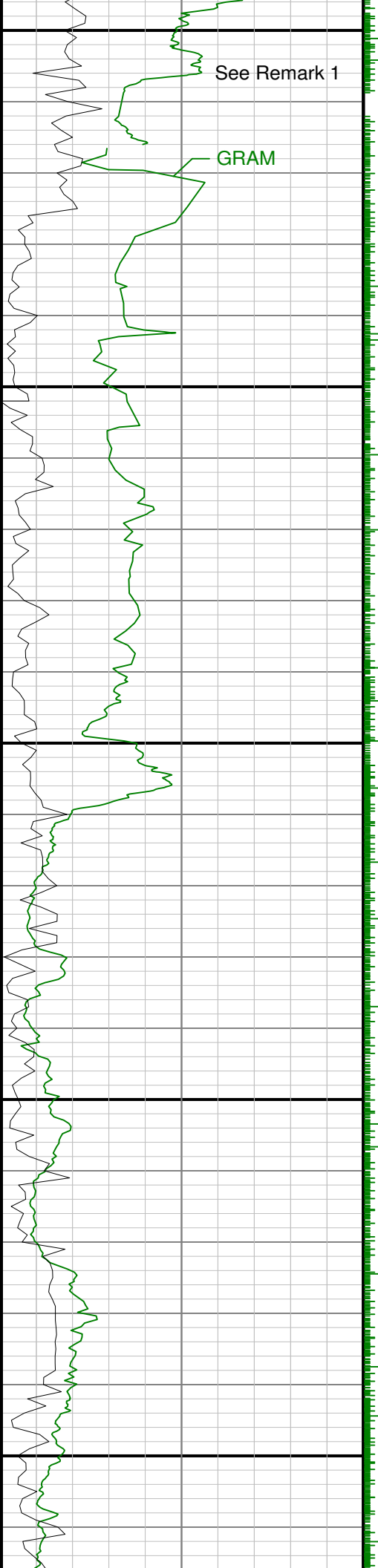


7500

7600







8100

Run 1 <=> Run 2

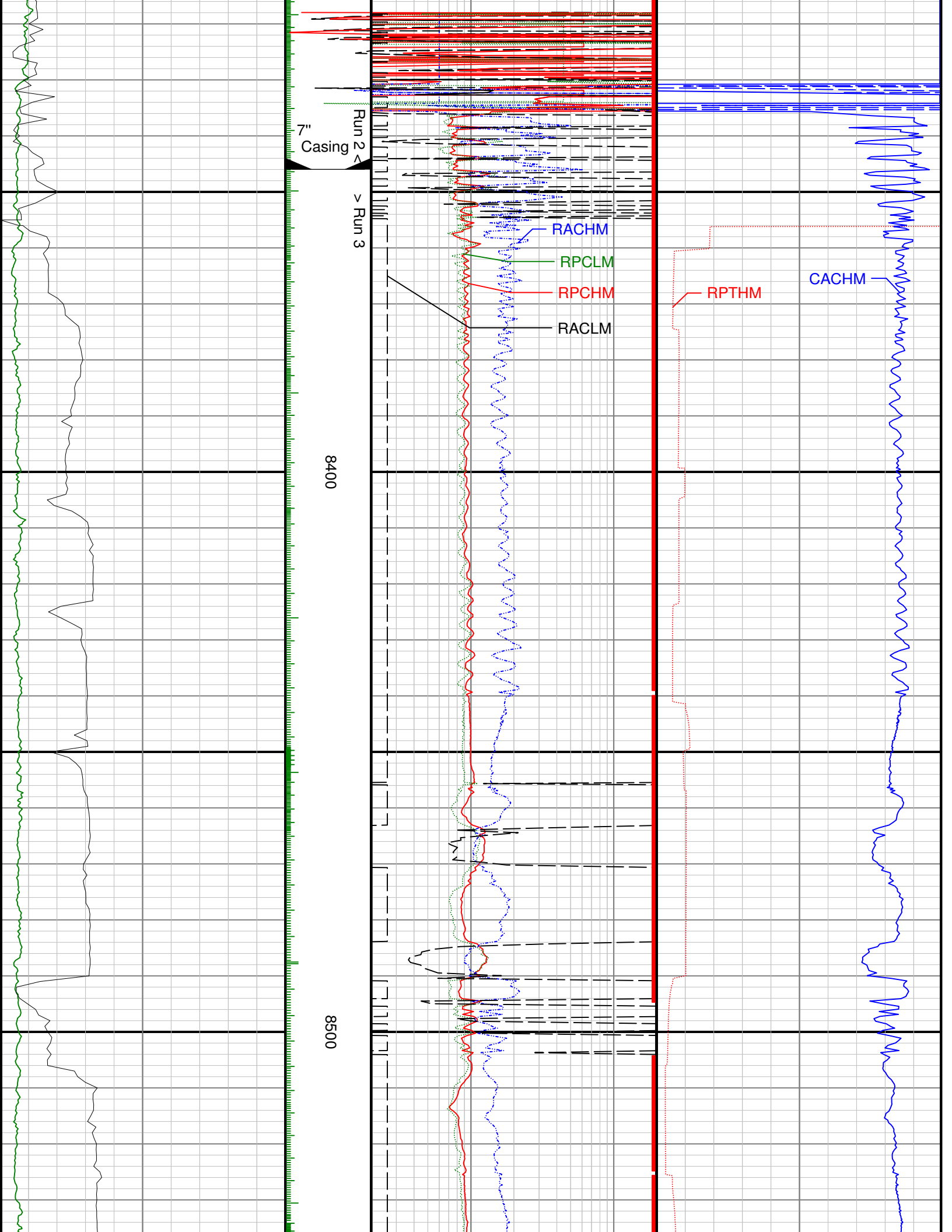
8200

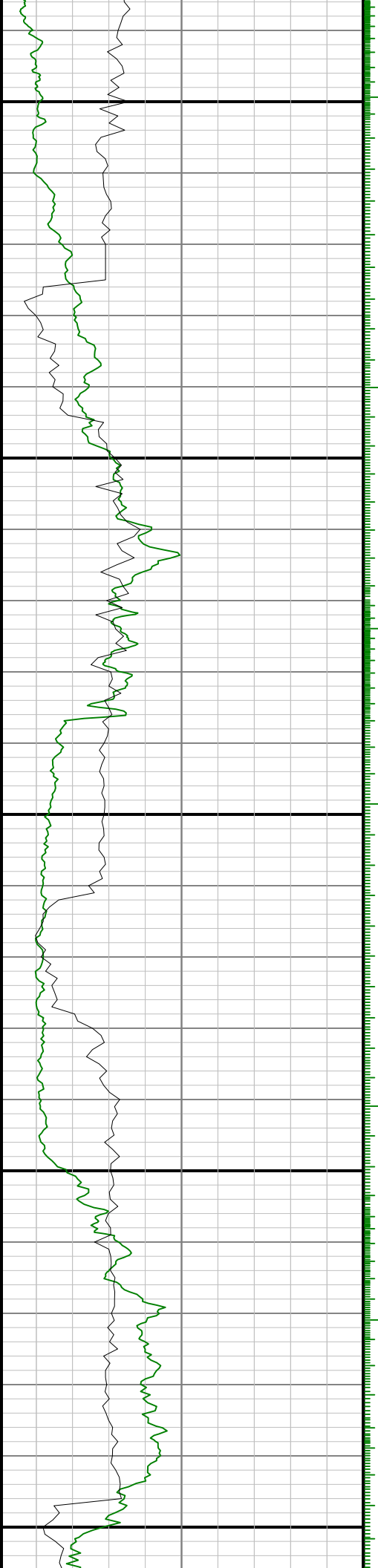
8300

RPSIHM

See Remark 3

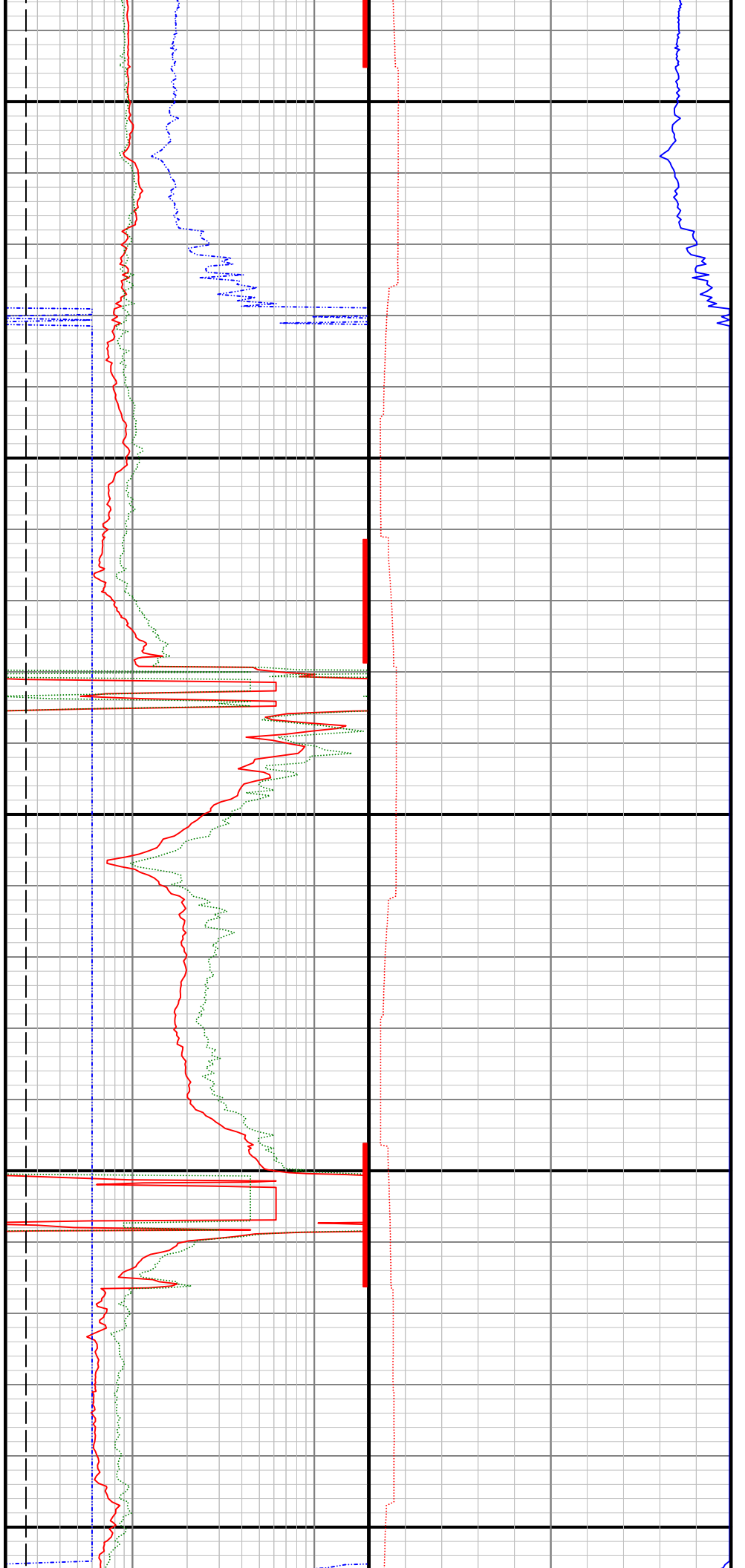
See Remark 2

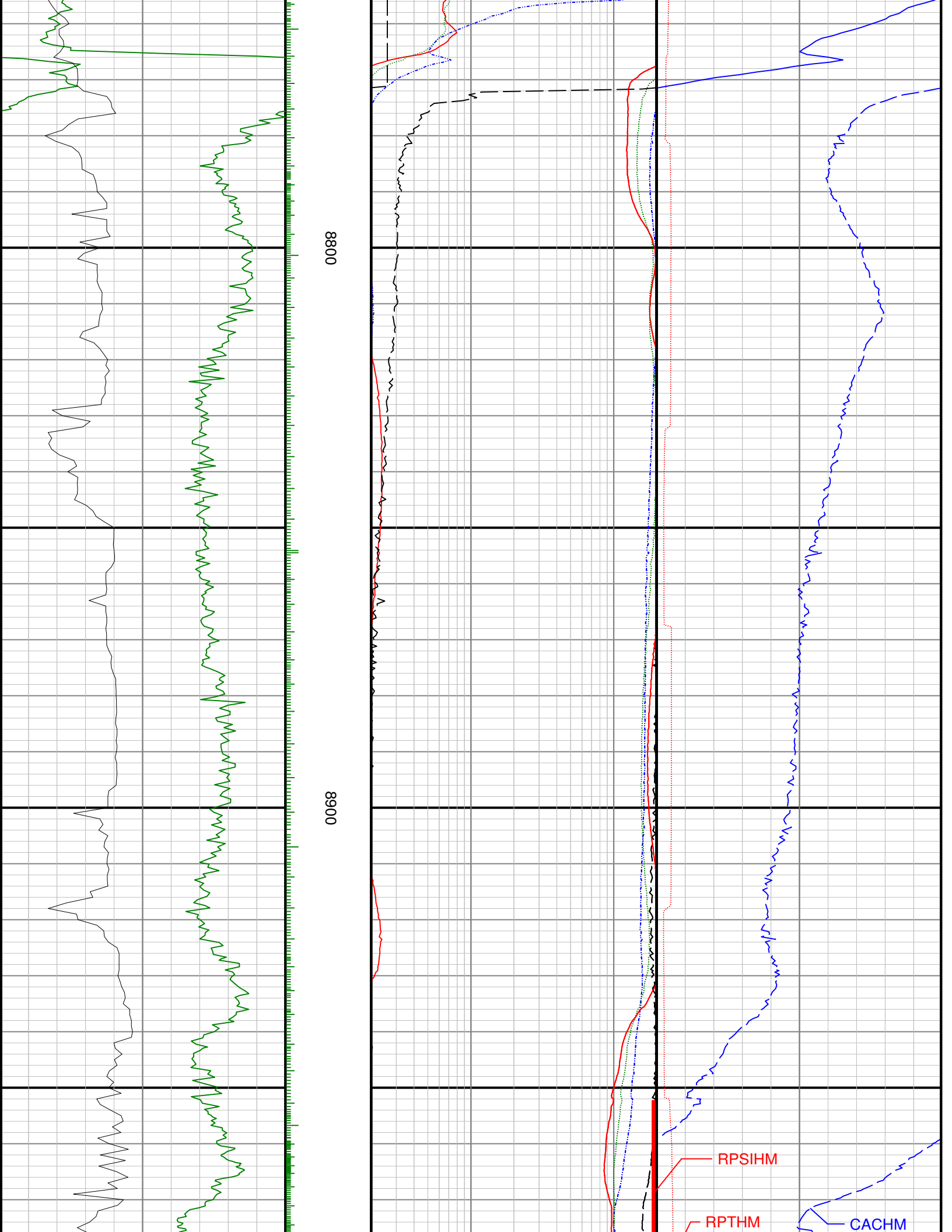


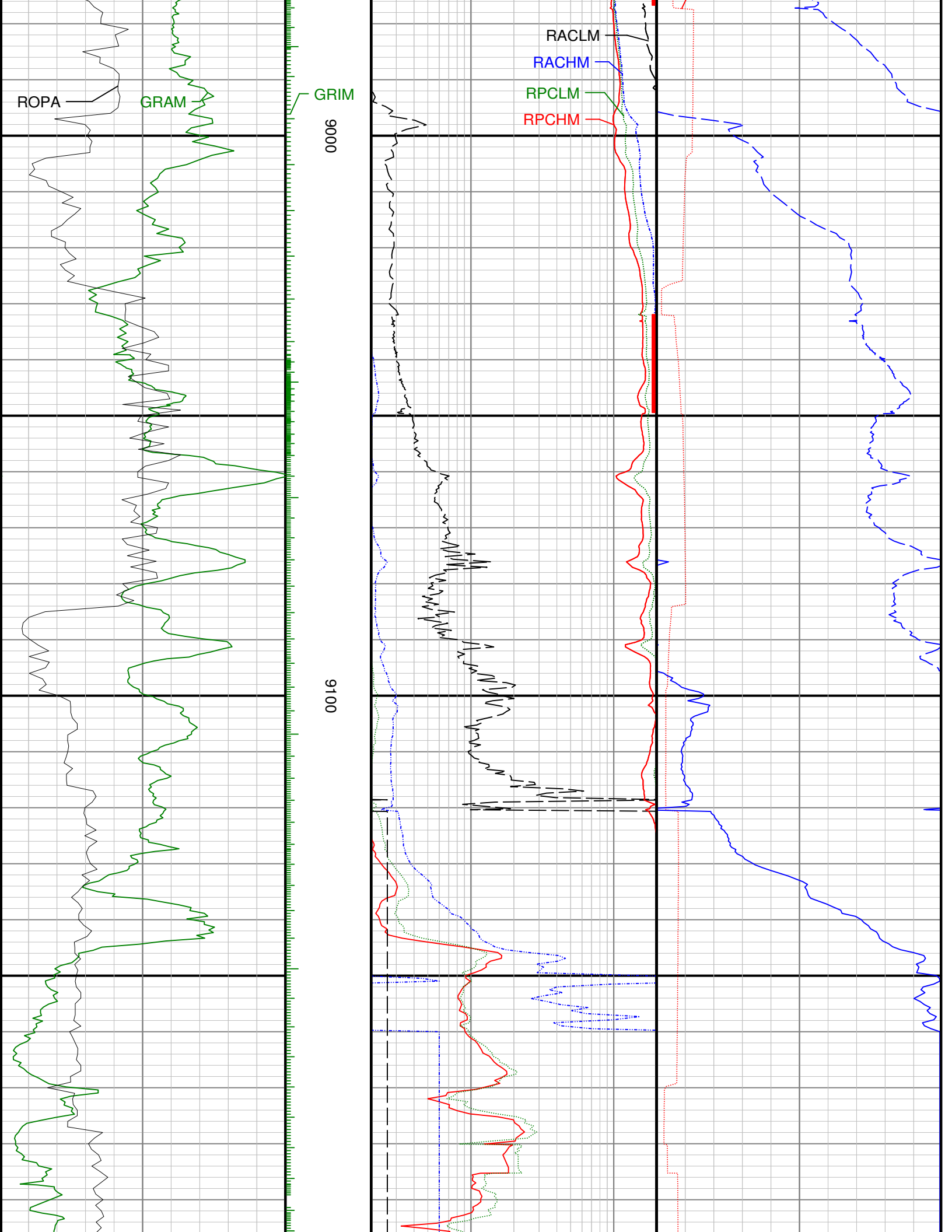


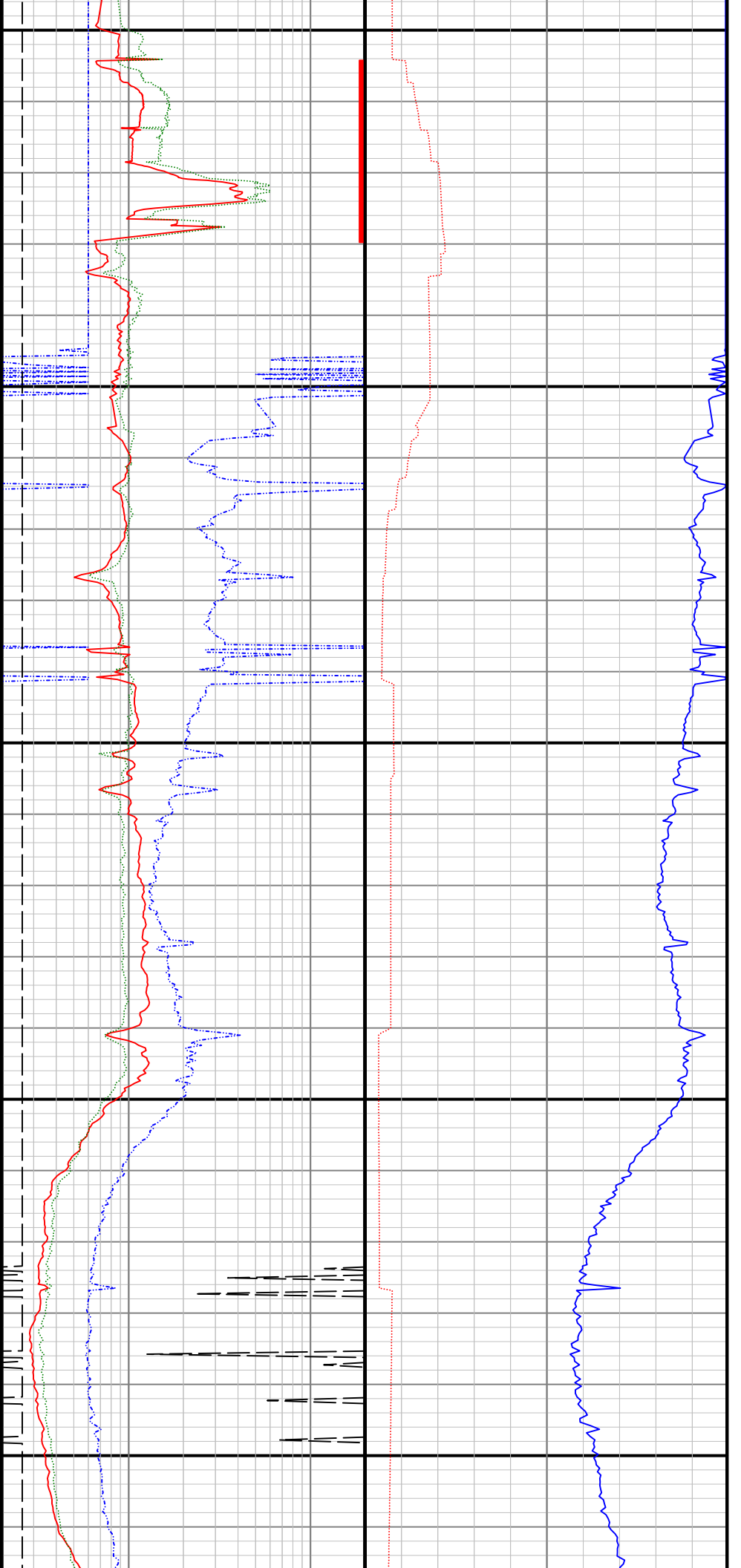
8600

8700





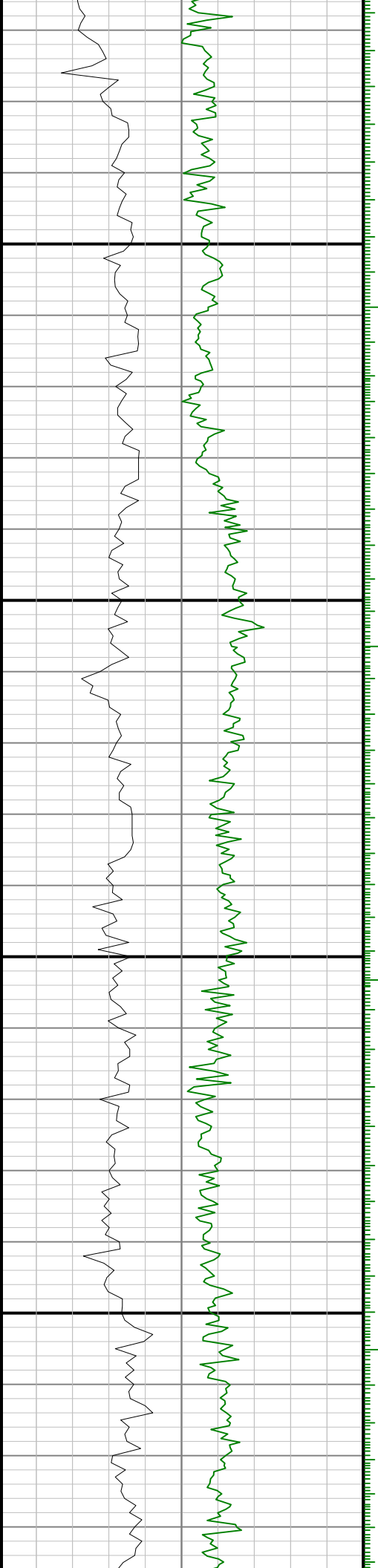




9200

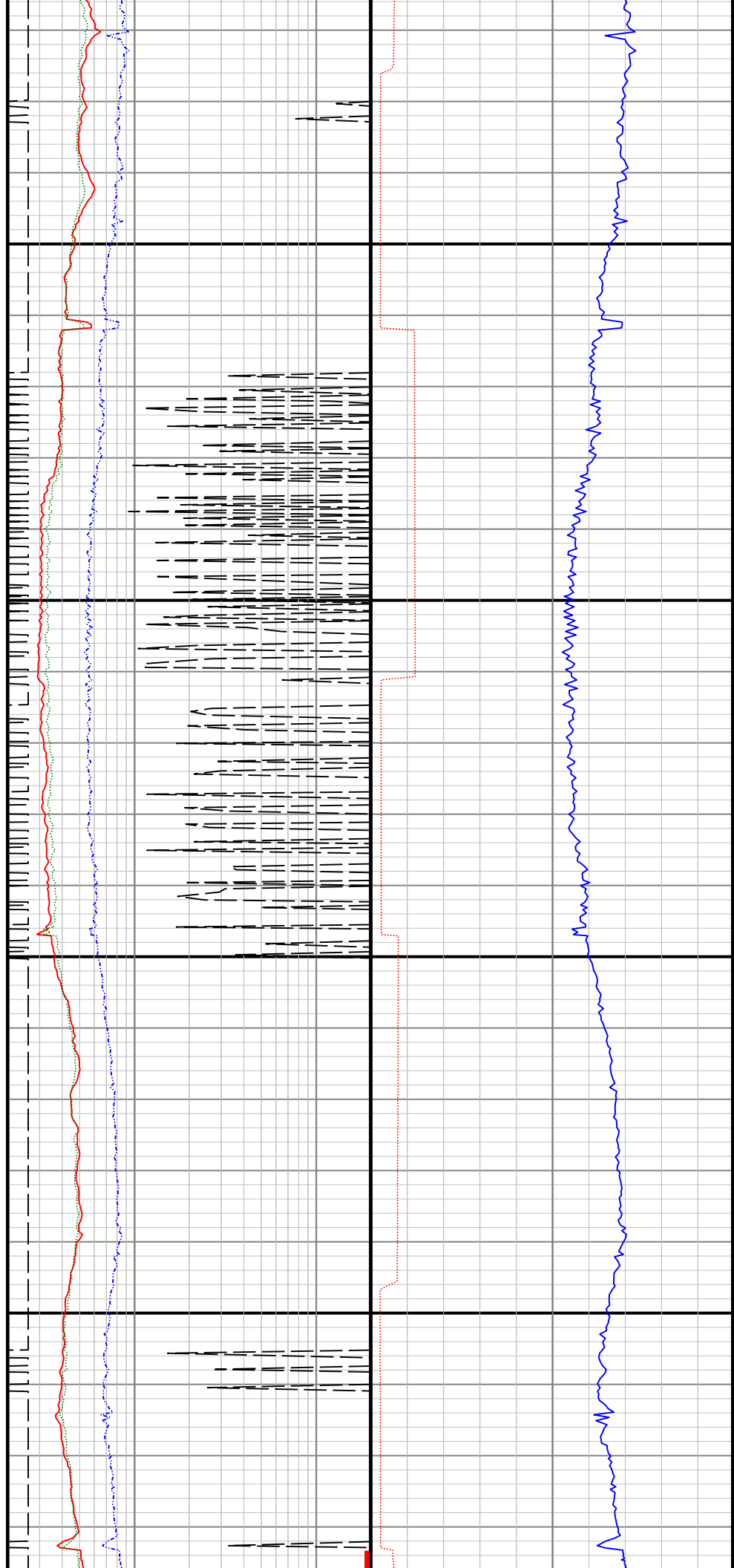
9300

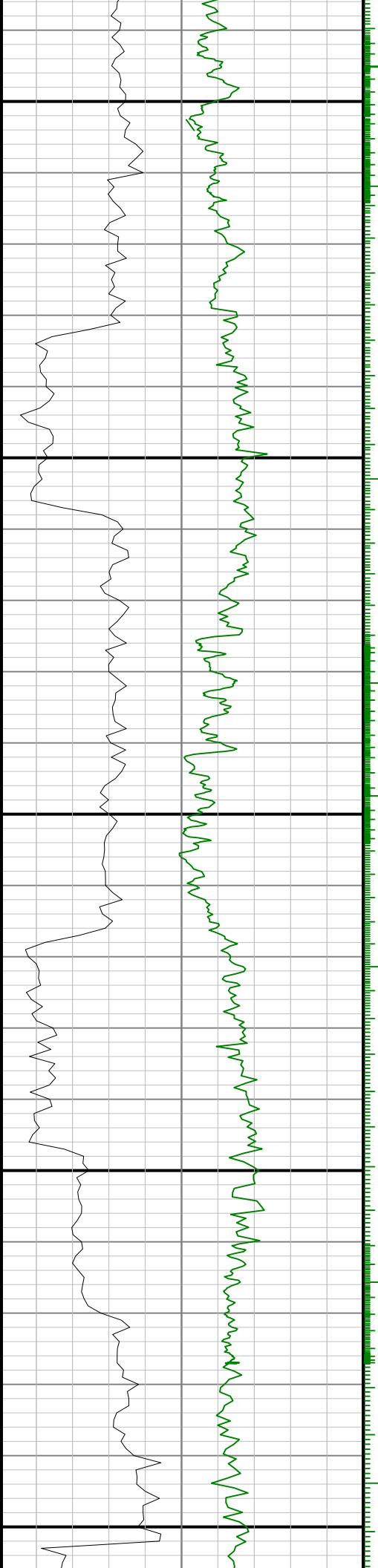
9400



0050

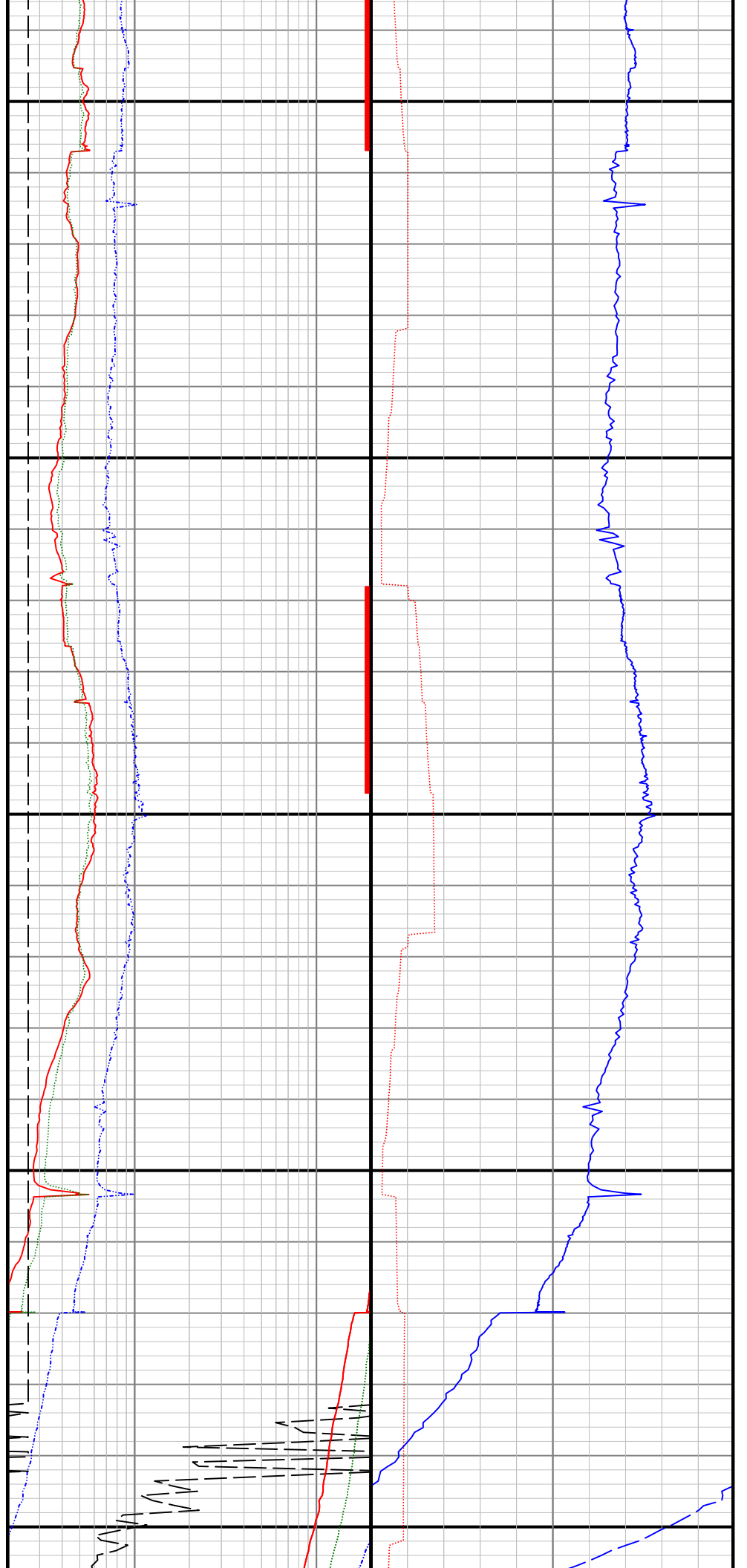
0060

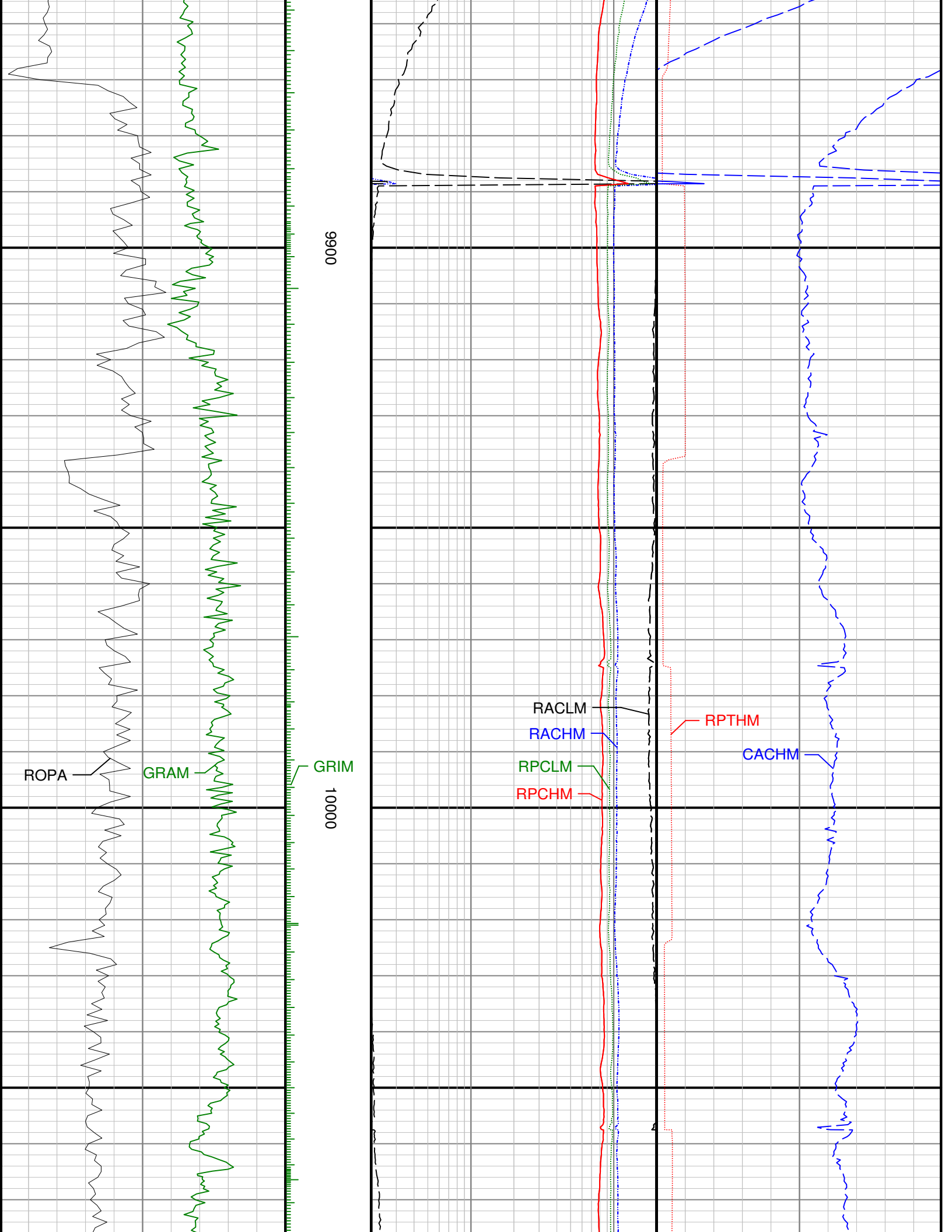


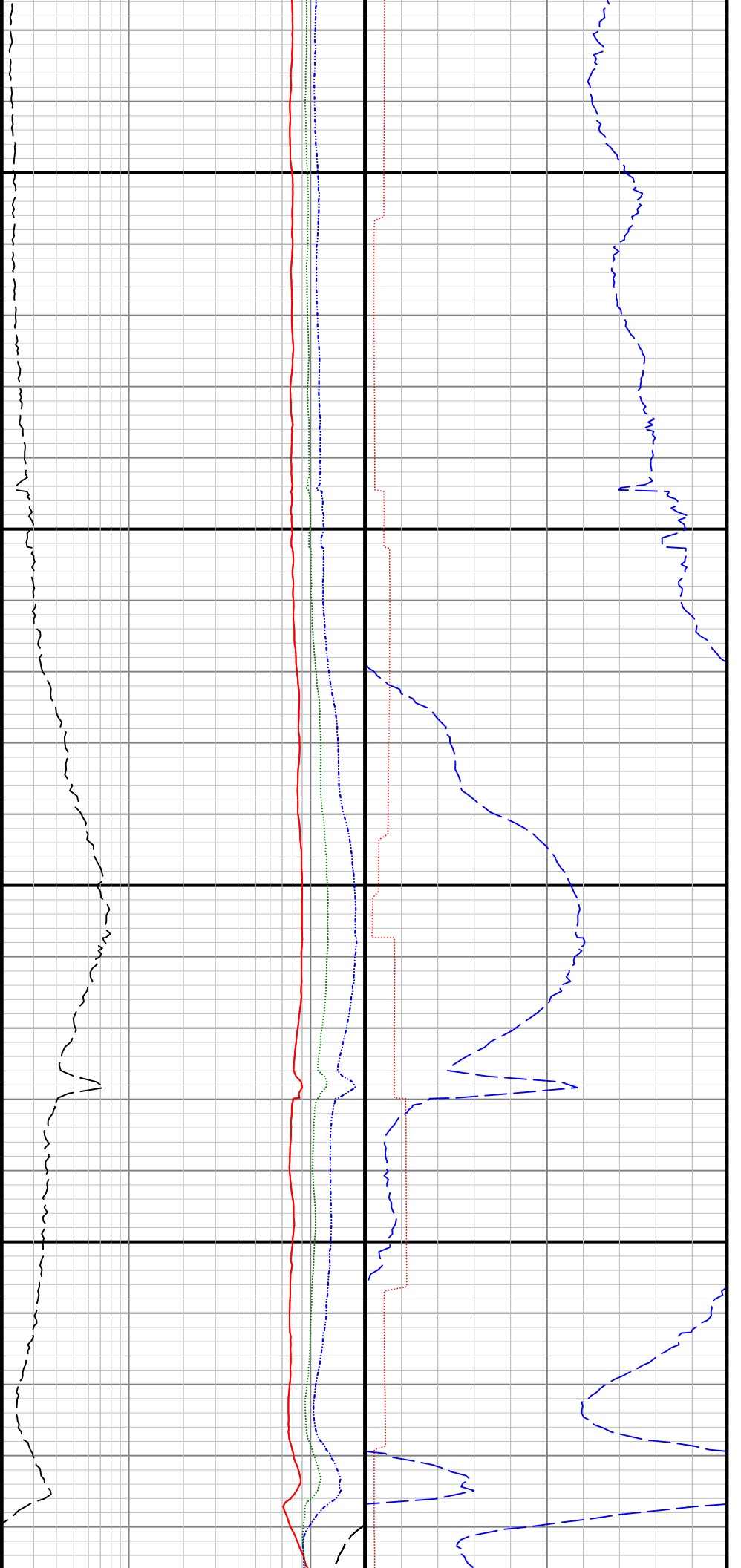


9700

9800

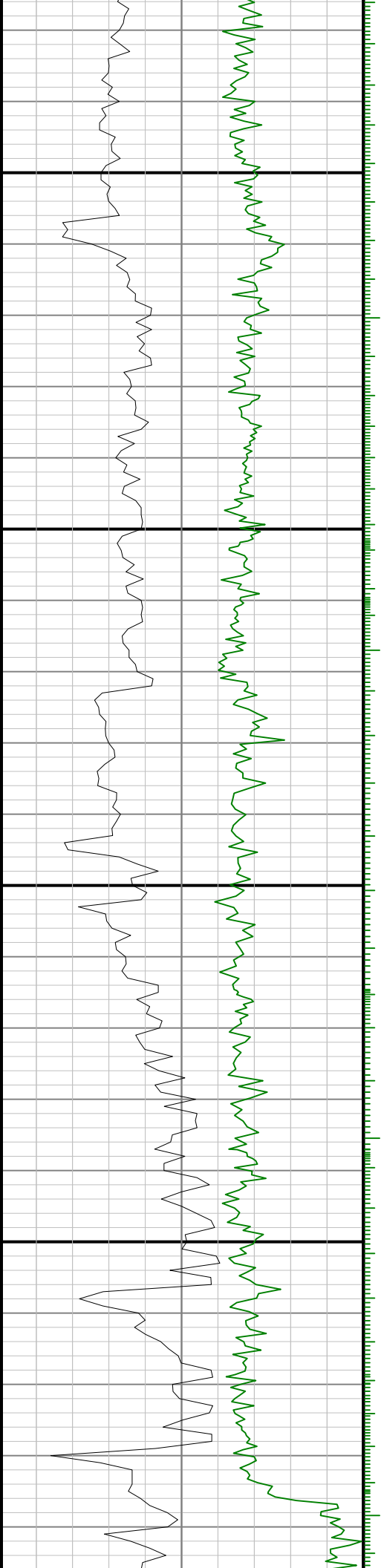


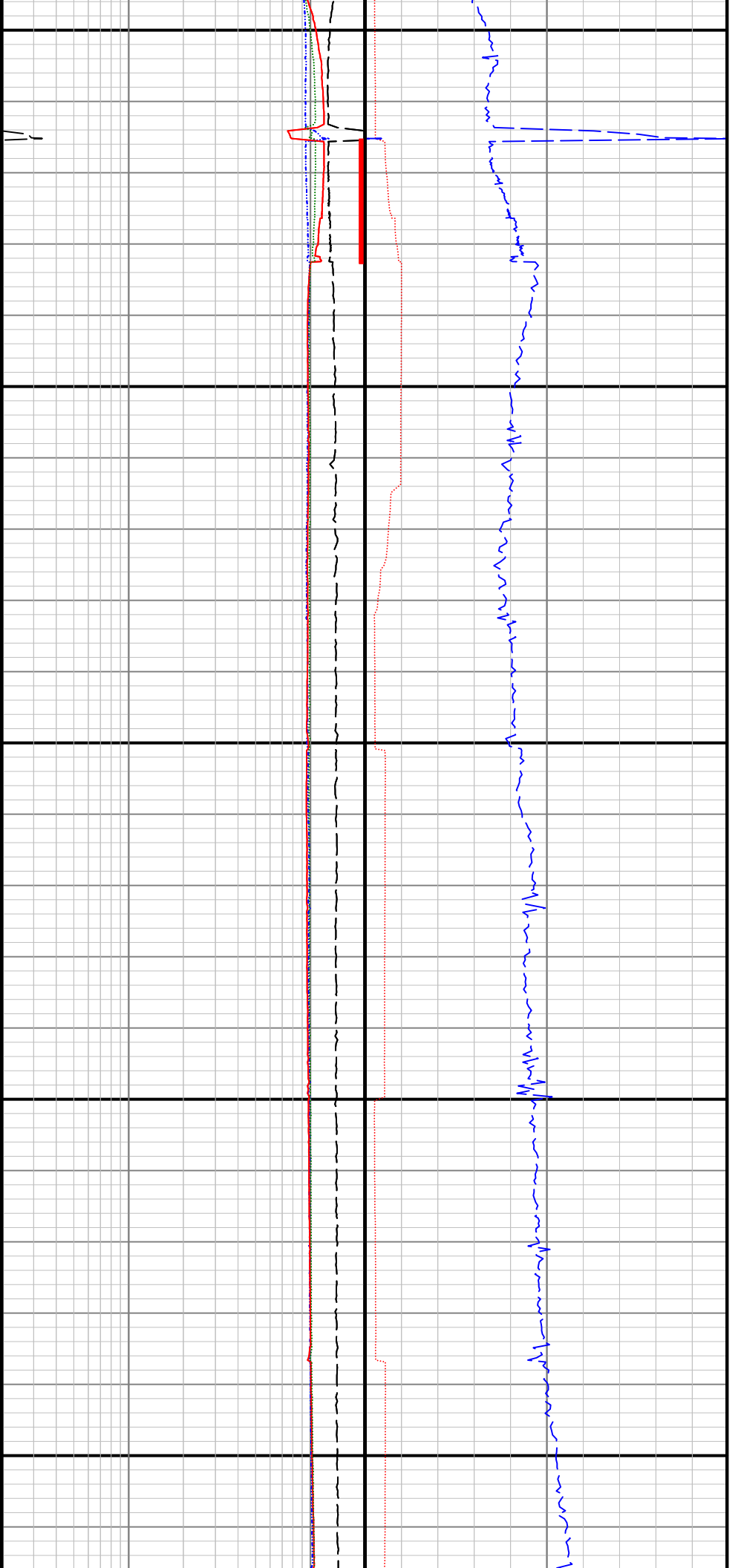




10100

10200

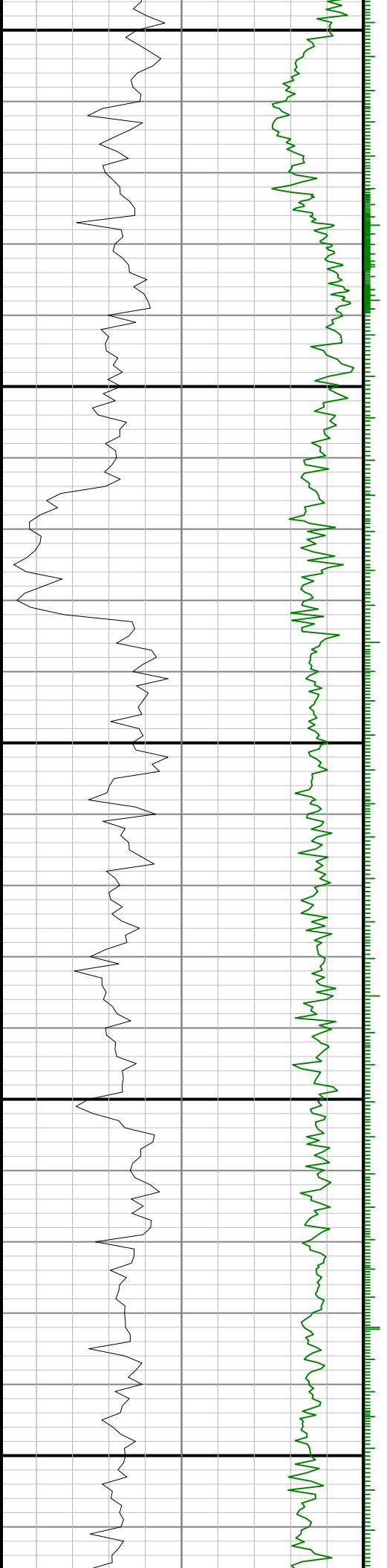


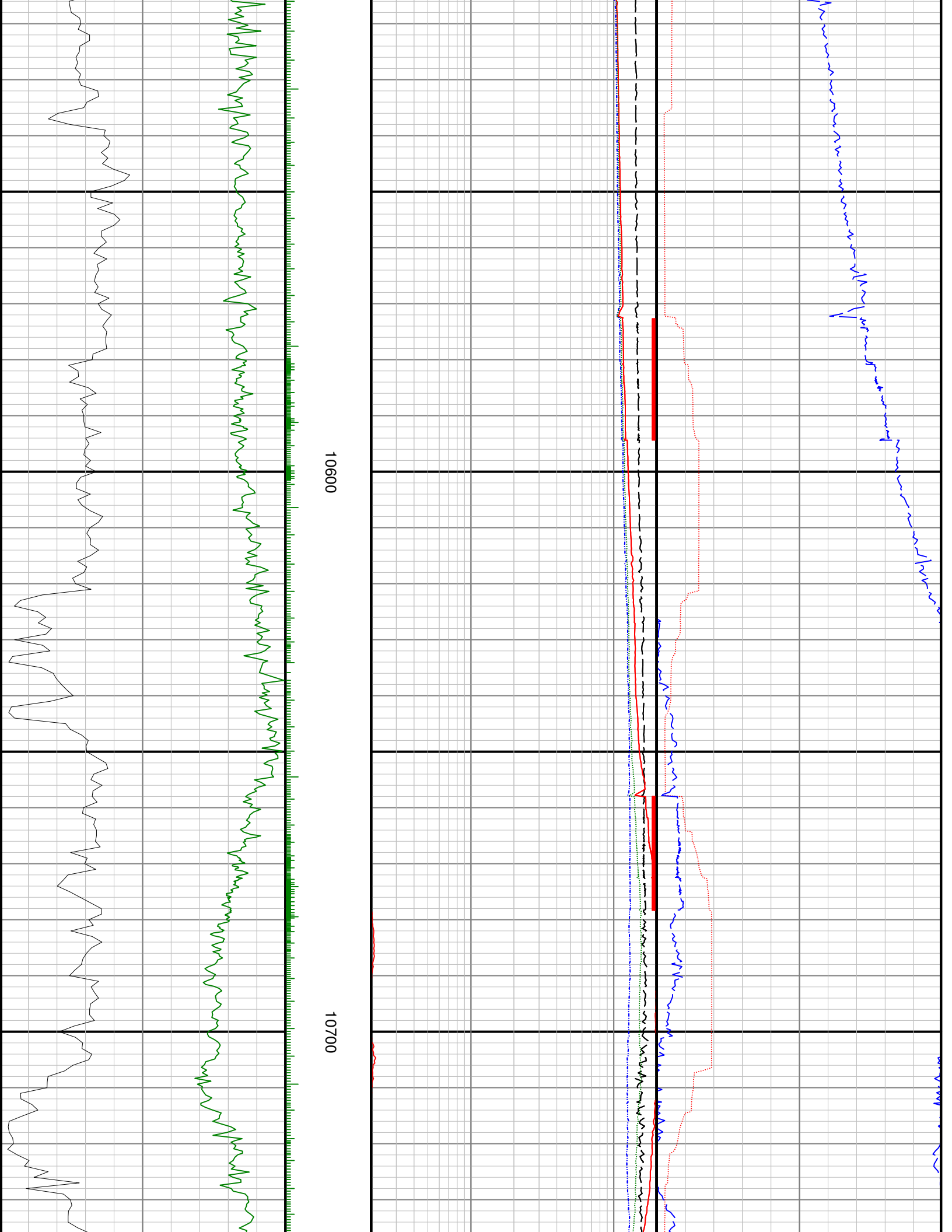


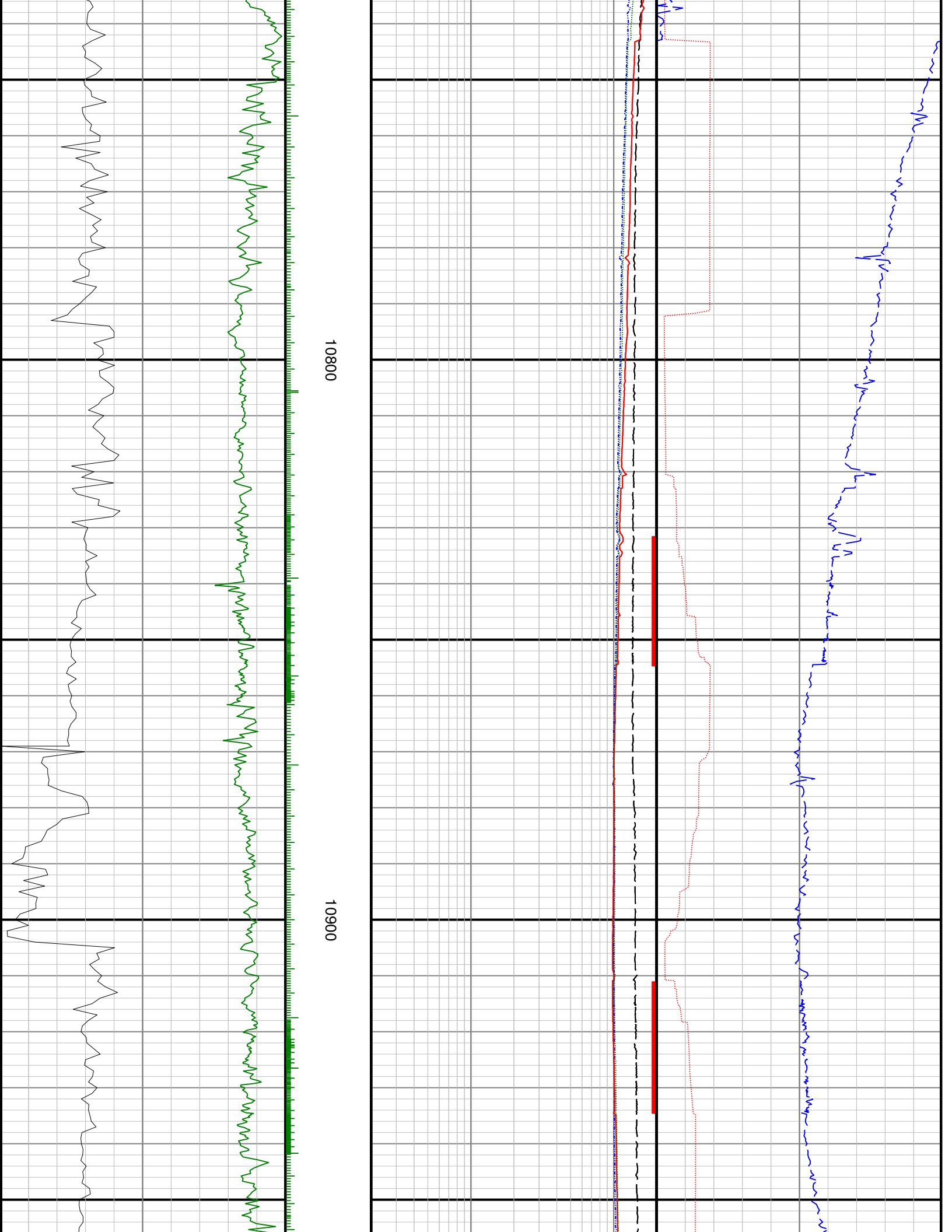
10300

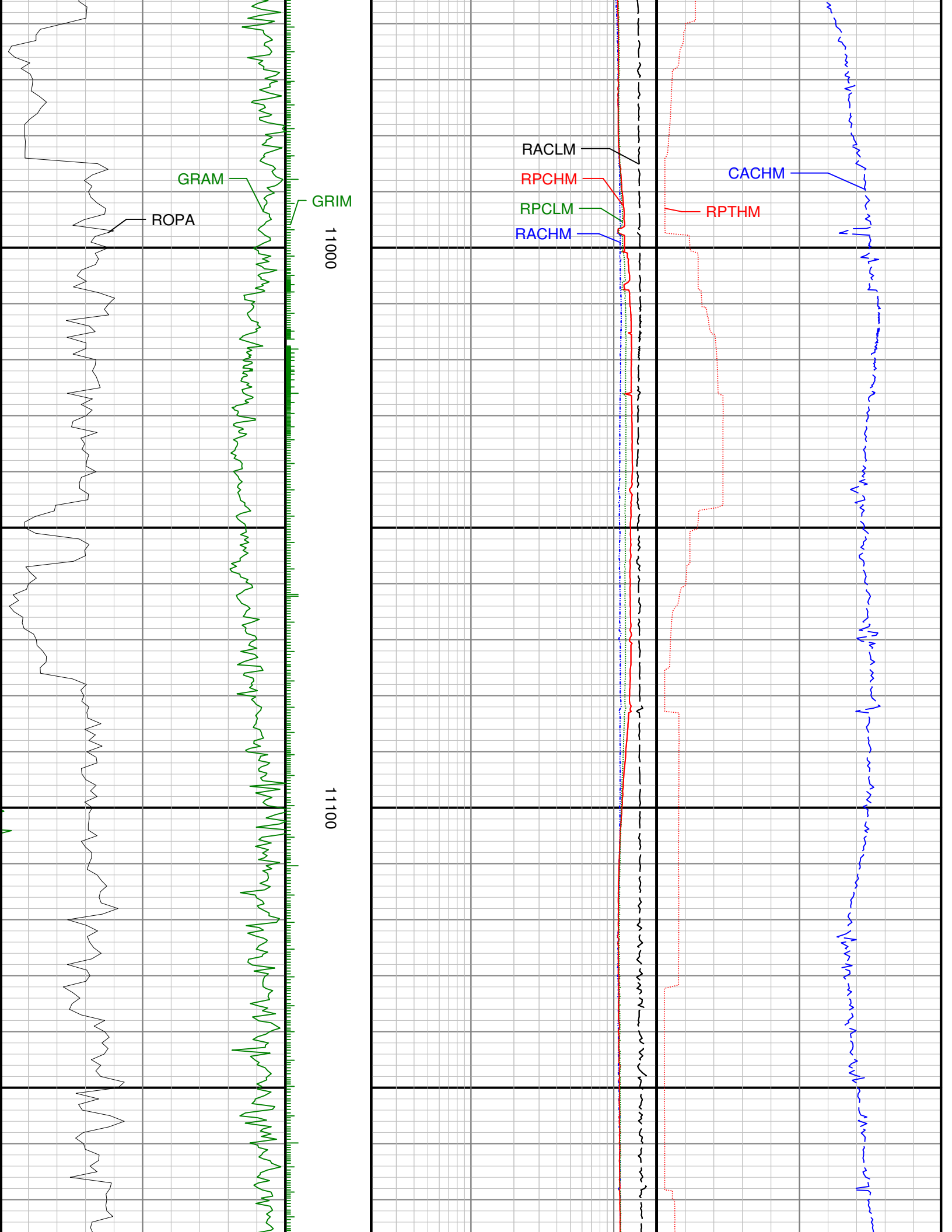
10400

10500





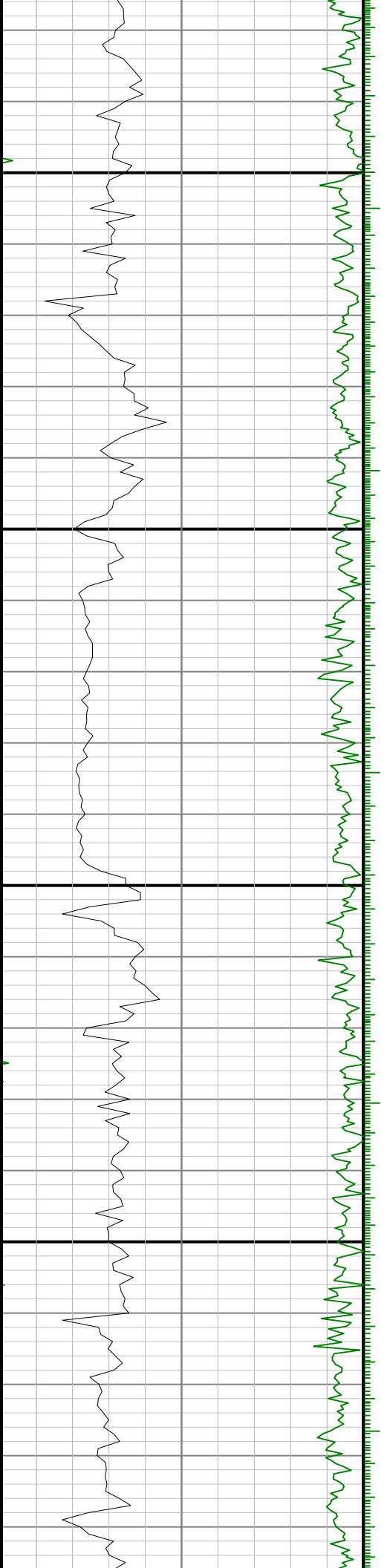


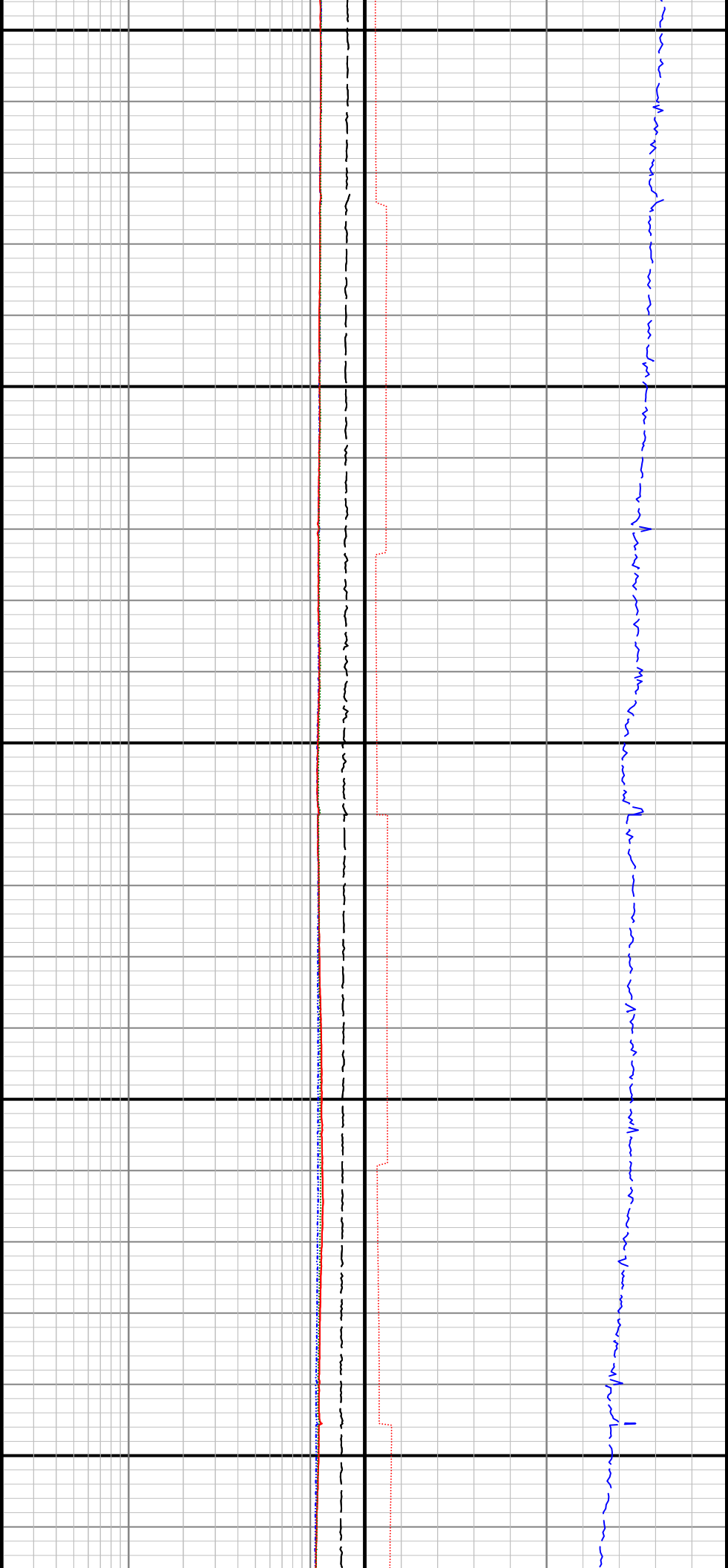




11200

11300

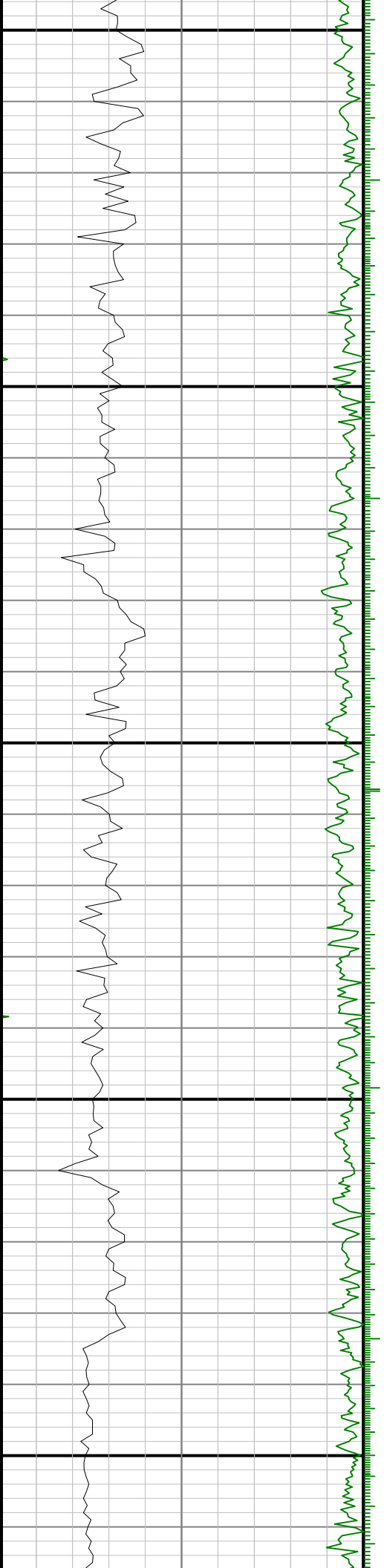


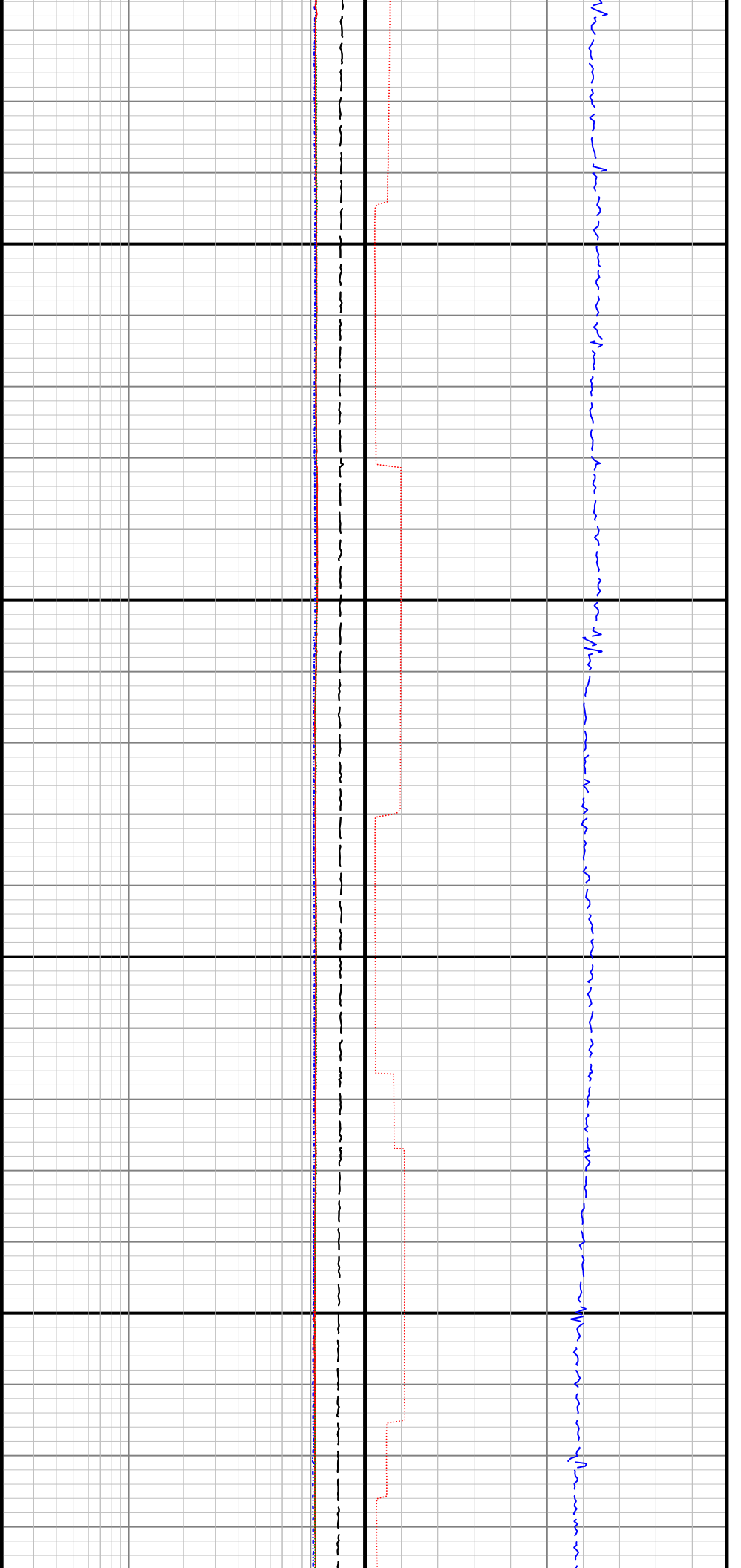


1400

1500

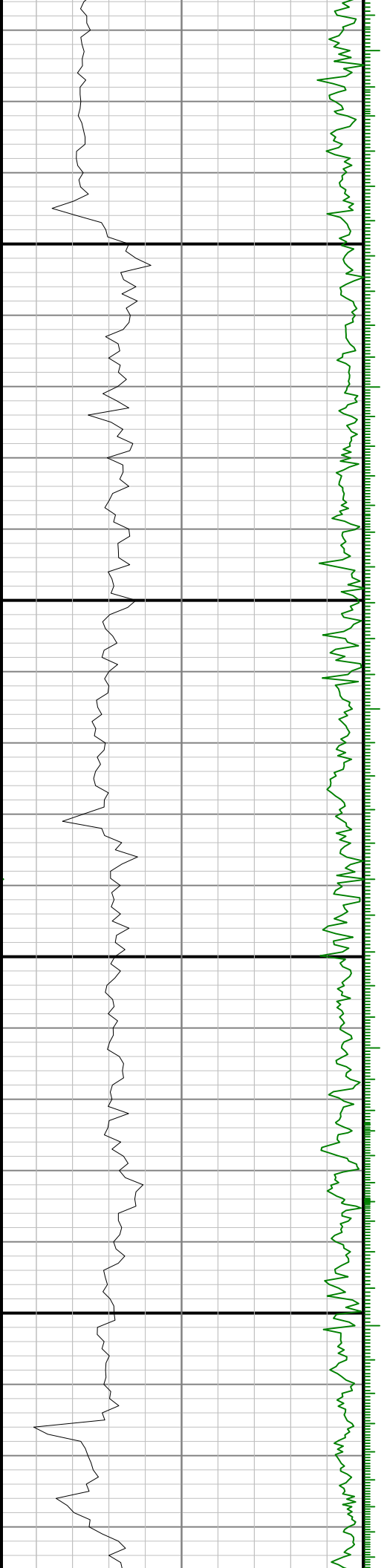
1600

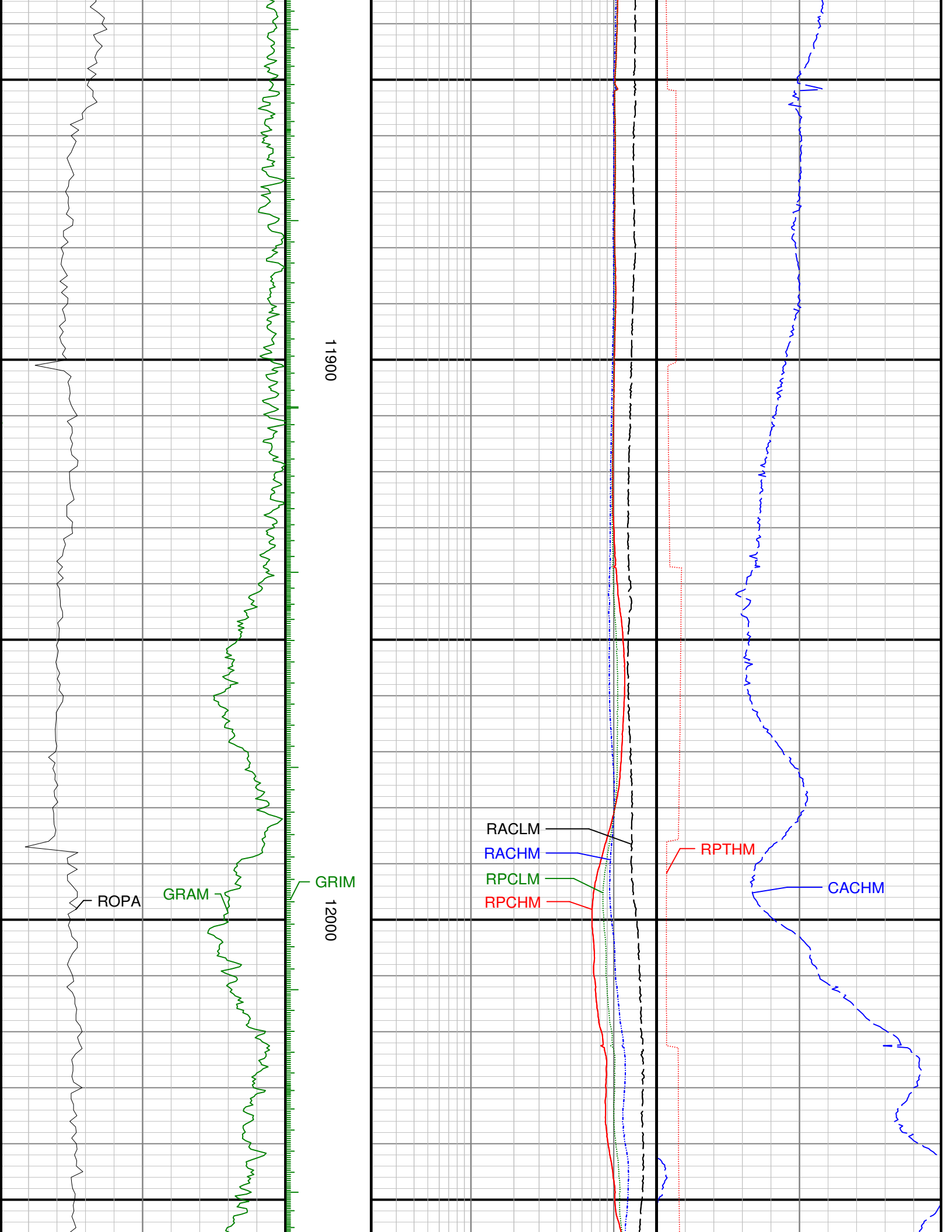


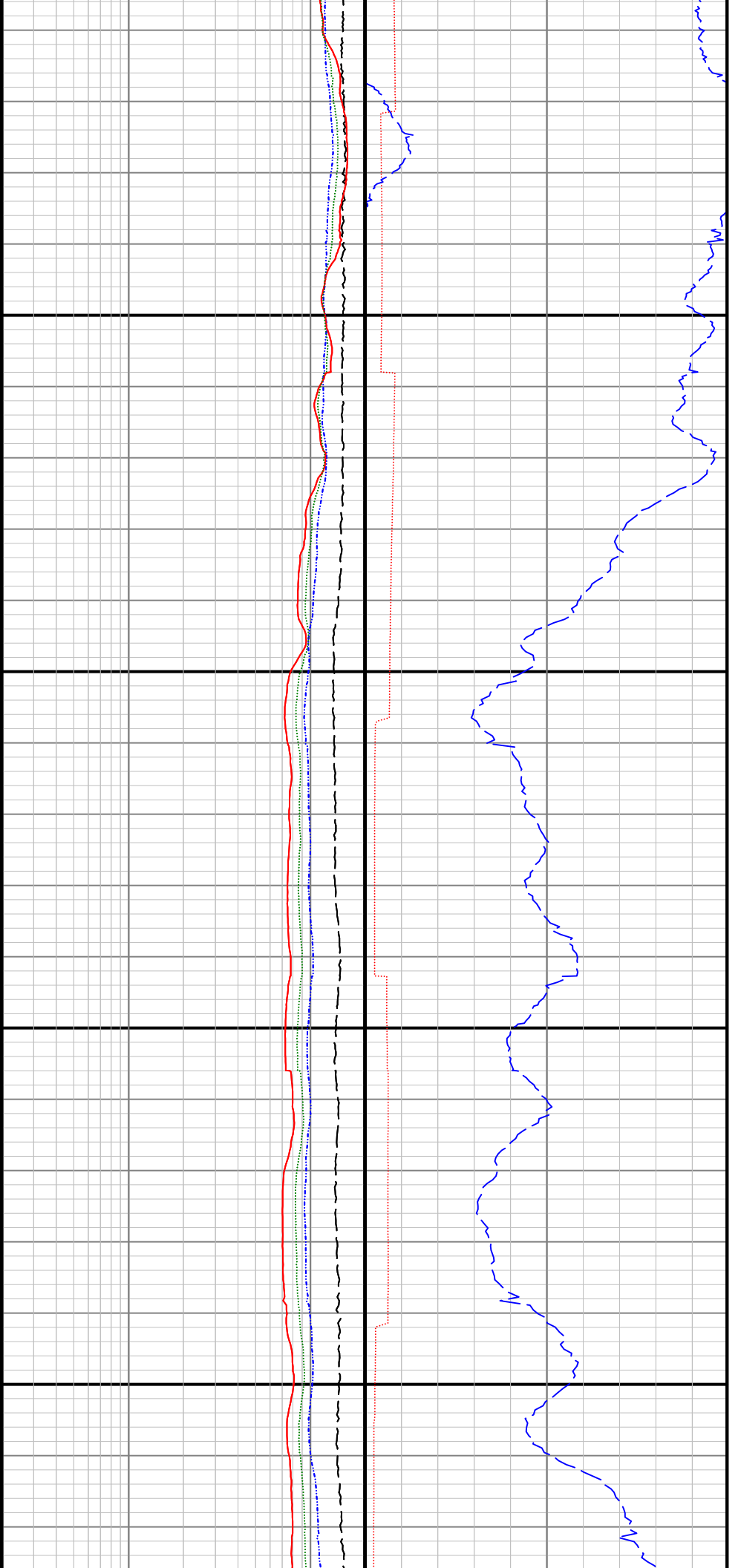


11700

11800







12100

12200

