



Memory/ Realtime Log

Multiple Propagation Resistivity Gamma Ray

Scale: 1:240 Measured Depth	Company: Kerr-McGee Oil & Gas Onshore LP				
	Well:		Ziemer 35C-5HZ		
	Field:		Weld County (Kerr McGee)		
	Region:		Continental US	Country: United States	
	Status:				
Final Print		Surface Location:		Other Services:	
API Number:		Latitude: 40° 5' 11.920" N		2 Sector Gamma Ray Directional VSS	
051233782800		Longitude: 104° 41' 17.930" W			
		Section 5		TWN: 1N Range 6SE	
Permanent Datum (P.D.):		Ground Level	Elevation:	4944.00 ft.	
Log Measured From:		Kelly Bushing	13.00 ft.	Above P.D.	
Depth Reference:		Driller's Depth			
			KB:	Elevations:	
			D.F:	4957.00 ft.	
			G.L:	N/A	
			4944.00 ft.		

Interval Logged		Dates	Magnetic Field Reference		
Top:	6600 ft.	Date From: 10/Oct/13	Dip Angle: 66.63 °	Azi Reference North:	True
Bottom:	11366 ft.	Date To: 15/Oct/13	Total	Mag to Reference	
	Spud Date: 10/Oct/13	Field Strength: 52923.0 nT	North Correction:	8.18 °	

[illegible]

Mud Record			Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based Mud	1009 ft.	11408 ft.	8.750 in.	6750 ft.	0.2 ° / 79.7 °	89.3 ° / 181.1 °
			6.125 in.	4658 ft.	89.3 ° / 181.1 °	90.7 ° / 181.9 °
					/	/
					/	/
					/	/
					/	/

Acquisition System	Software Version	Other
Advantage	2.20U4	Rig: / Contractor: Ensign 138 / Kerr-McGee Oil & Gas Onshore LP
PATS	6.4.1.34	Job No: 5828562
		District: / Unit: RMD / D & E

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Log Run Summary															
LWD	BHA	Bit	Bit	Bit	Bit	Assembly	Logged Interval		Bit Depth Interval		Date / Time				Circ.
Run	Run	Run	Size	Type	Gauge	Type	Top	Bottom	From	To	Start		End		Time
No.	No.	No.	(in.)		(in.)		(ft.)	(ft.)	(ft.)	(ft.)					(hrs.)
1	1	1	8.750	PDC	3.000	Steerable	6600	6893	1040	7140	10/Oct/2013 10:05	10/Oct/2013 10:05	10/Oct/2013 10:05	23.25	
2	2	2	8.750	PDC	2.000	Steerable	6893	7698	6950	7758	13/Oct/2013 14:57	13/Oct/2013 14:57	13/Oct/2013 14:57	12.86	
3	3	3	6.125	PDC	6.000	Steerable	7698	11366	7750	11408	15/Oct/2013 14:36	15/Oct/2013 14:36	15/Oct/2013 14:36	38	

Crew								
Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Robert Bartlett	09/Oct/2013	19/Oct/2013	Will Drake	09/Oct/2013	19/Oct/2013	Edward Beaty	09/Oct/2013	19/Oct/2013
Tyler Wall	09/Oct/2013	19/Oct/2013	Andrew Overbey	09/Oct/2013	19/Oct/2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
12/Oct/2013	02:43	1	1009	Water Based Mud	8.4	1	9.0	35.0	0 / 99	Active Mud Pit	800	0.0
14/Oct/2013	03:52	2	6960	Water Based Mud	9.9	10	9.0	9.0	0 / 92	Active Mud Pit	1600	0.0
15/Oct/2013	21:00	3	7750	Water Based Mud	9.9	34	9.0	8.0	0 / 92	Active Mud Pit	2000	0.0
16/Oct/2013	21:00	3	7750	Water Based Mud	9.4	35	10.2	8.0	0 / 94	Active Mud Pit	2400	0.0
18/Oct/2013	00:42	3	10350	Water Based Mud	9.3	39	8.5	7.0	0 / 94	Active Mud Pit	800	0.0

Mnemonics

Curve	Description	Units
CACLM	Conductivity Attenuation - Corrected - 400kHz	mmho/m
GRAM	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIM	Gamma Ray Data Density	point
GRIX	Gamma Ray Data Density	point
RACHM	Resistivity Attenuation - Corrected - 2MHz	ohm.m
RACLM	Resistivity Attenuation - Corrected - 400kHz	ohm.m
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
RPCLM	Resistivity Phase - Corrected - 400kHz	ohm.m
RPCHM	Resistivity Phase - Corrected - 2MHz	ohm.m
RPSIHM	Resistivity Sliding Indicator	unless
RPTHM	Resistivity Time Since Drilled	min

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12373466	Directional	58.81	6.750	3.313
1	SRIG	12376001	Gamma	55.43	6.750	3.313
2	DIR	12373466	Directional	55.69	6.750	3.313
2	SRIG	12376001	Gamma	52.31	6.750	3.313
3	CS	12114979	-	73.12	4.880	1.500
3	BCPM	11845221	-	62.00	5.000	2.250
3	STAB	10354301	-	59.44	5.625	0.000
3	OTK	11827144	Directional	54.91	4.960	2.569
3	OTK	11827144	Resistivity	48.94	4.960	2.569
3	OTK	11827144	Gamma	41.75	4.960	2.569
3	OTK	11827144	-	44.38	4.960	2.569
3	CS	10369034	-	37.83	5.020	2.250

Gauging and Tool Measurement

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

- 1.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2.) Baker Hughes run 1 utilized 6 3/4 inch NaviTrak services (Directional only) behind an 8 3/4 inch bit and steerable assembly from 1000 to 6722 feet MD (1000 to 6690 feet TVD).
- 3.) Baker Hughes runs 1 and 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 6722 to 7750 feet MD (6690 to 7325 feet TVD).
- 4.) Baker Hughes run 4 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, 2 Sector Azimuthal Gamma Ray, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7750 to 11408 feet MD (7325 to 7325 feet TVD).
- 5.) The interval from 1000 to 6722 feet MD (1000 to 6690 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes run 1.
- 6.) A sliding indicator is shown on the right side of track 2 as a heavy line. This indicator has been depth shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.

Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	7750	8.750	2	The interval from 7750 to 7802 feet MD (7325 to 7325 feet TVD) was logged up to 45.8 hours after being drilled due to a trip out of the hole to lay down the curve assembly, intermediate casing and cement operations, and to pick up the lateral assembly.
2	11408	6.125	3	The interval from 11366 to 11408 feet MD (7092 to 7092 feet TVD) was not logged due to sensor to bit offsets at well TD.



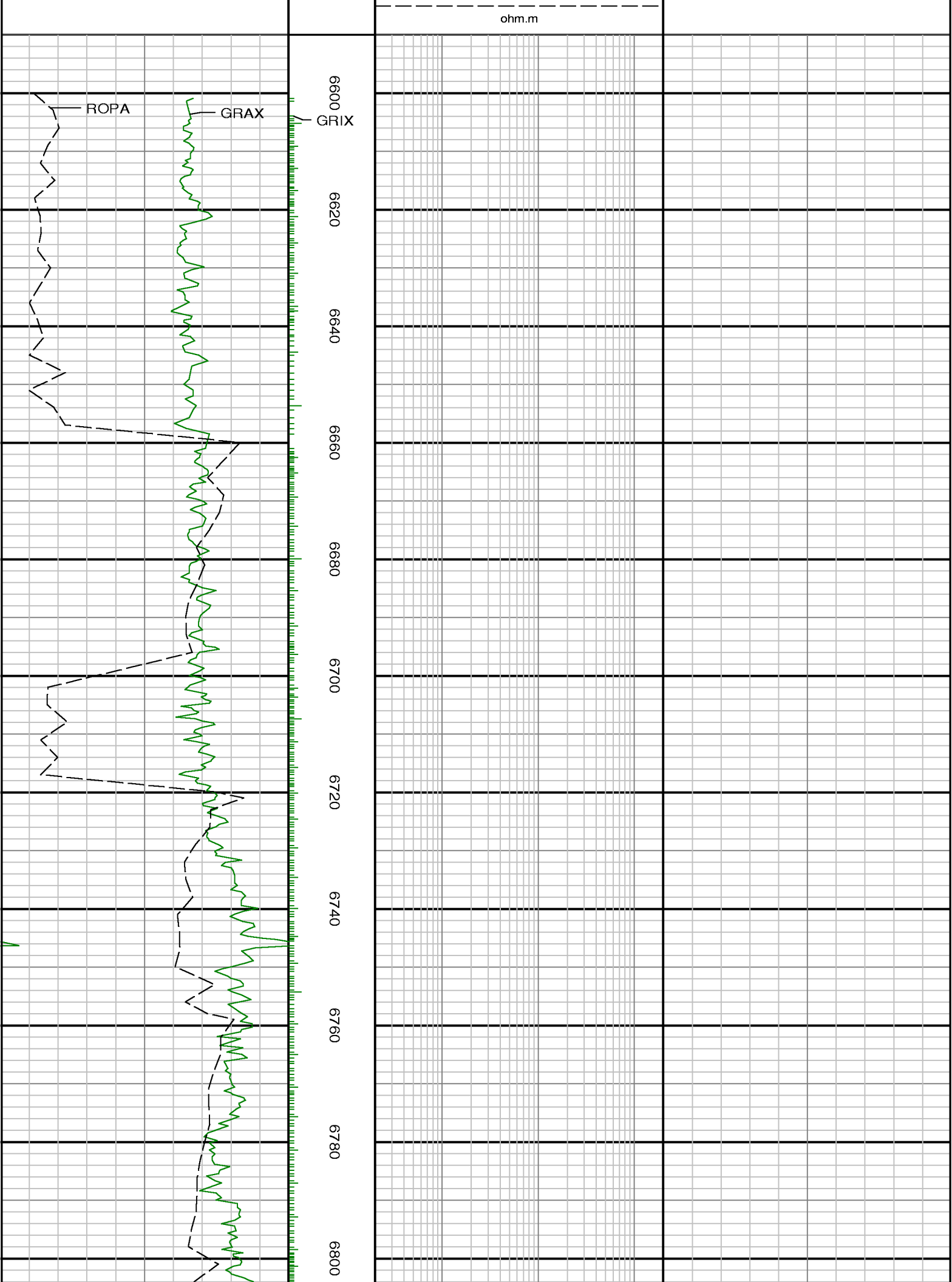
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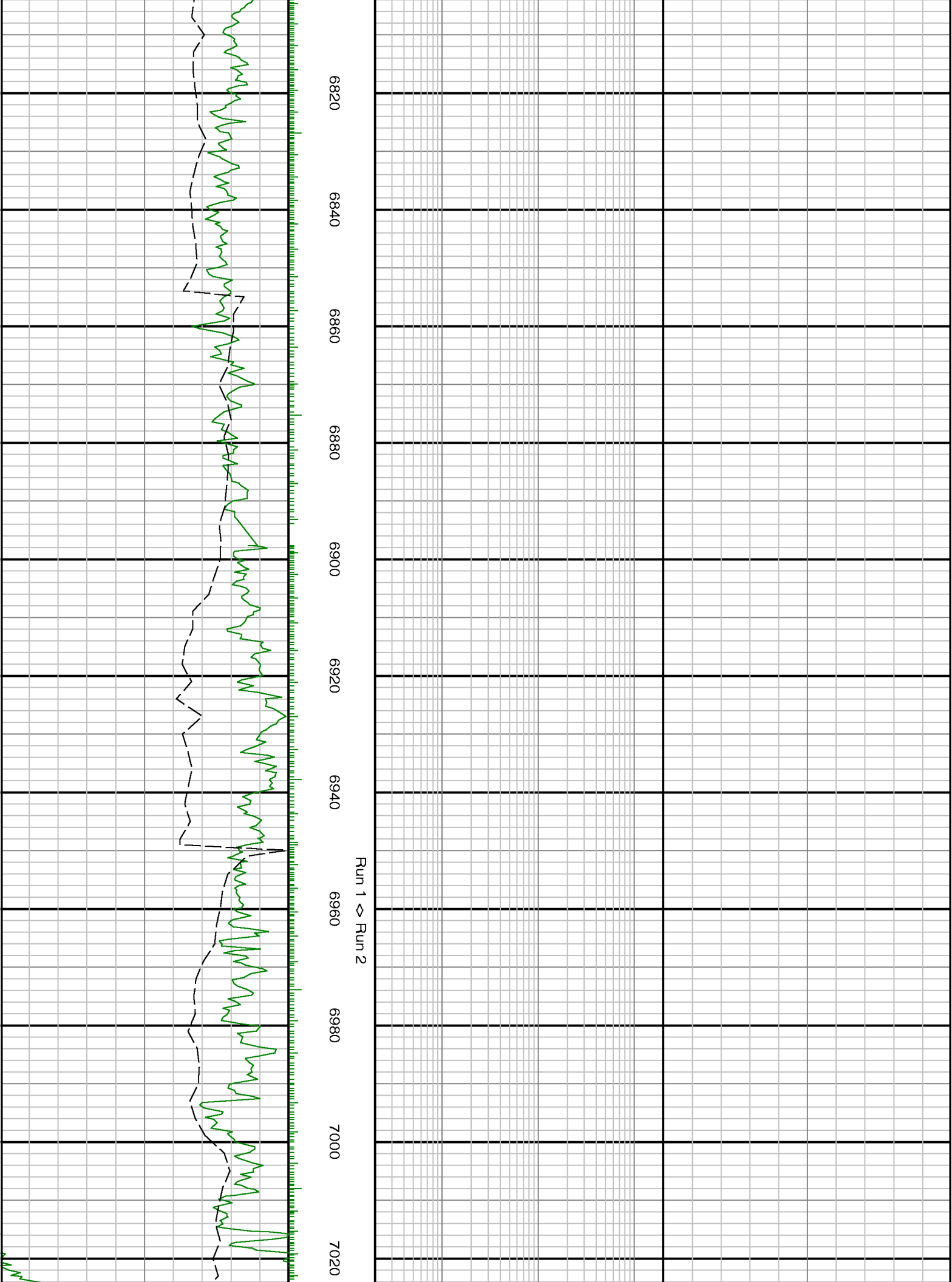
Well : Ziemer 35C-5HZ

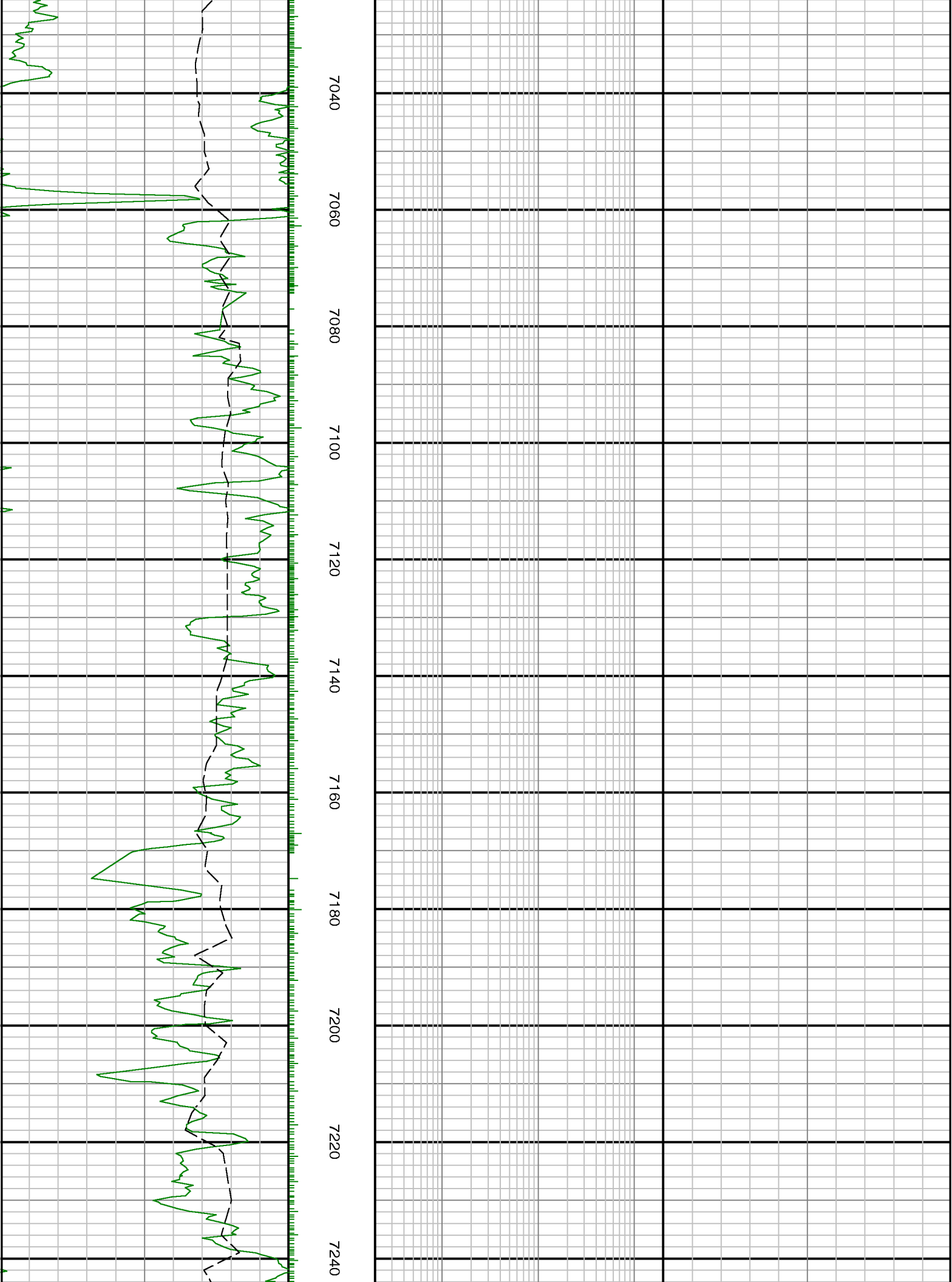
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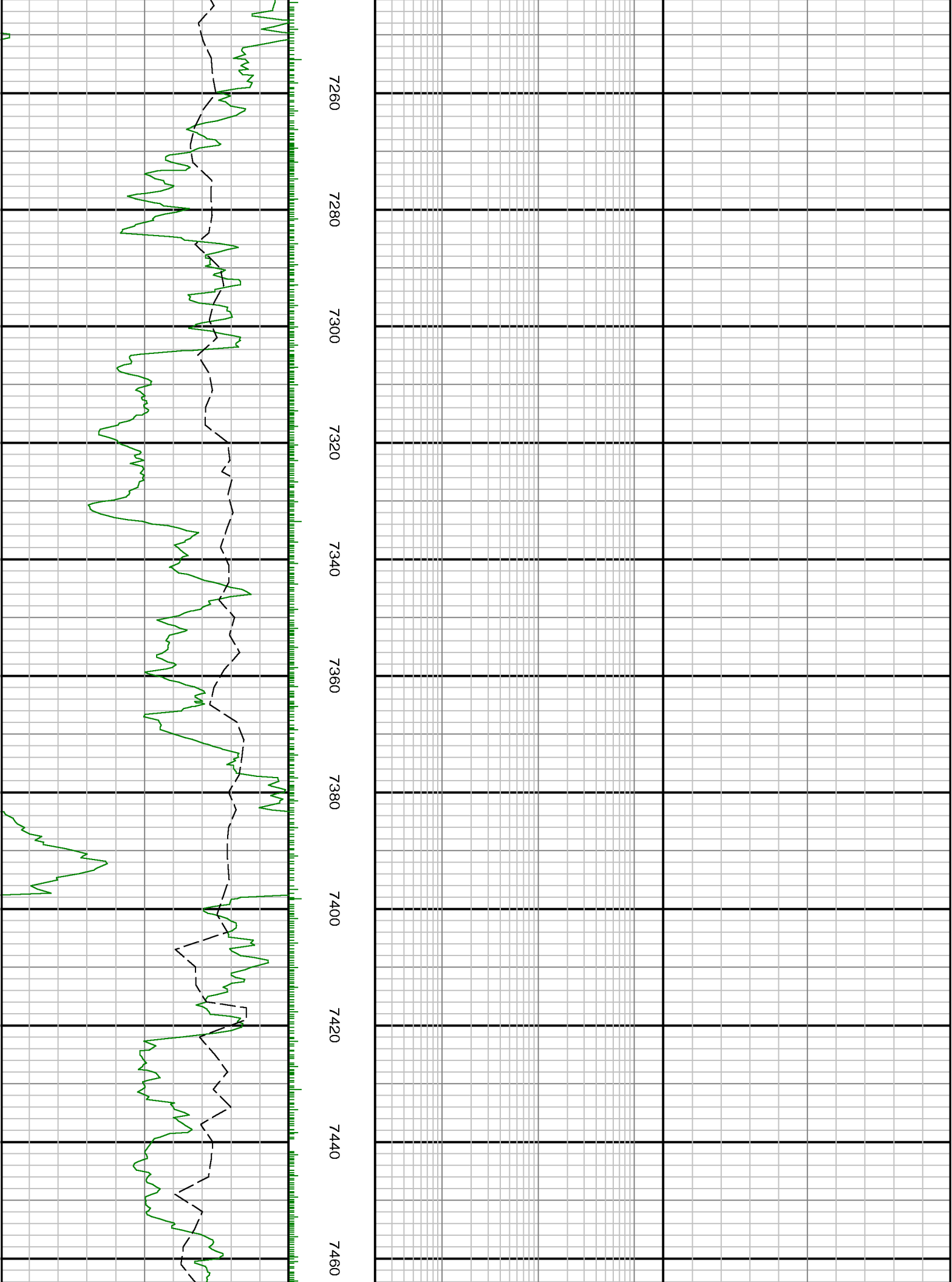
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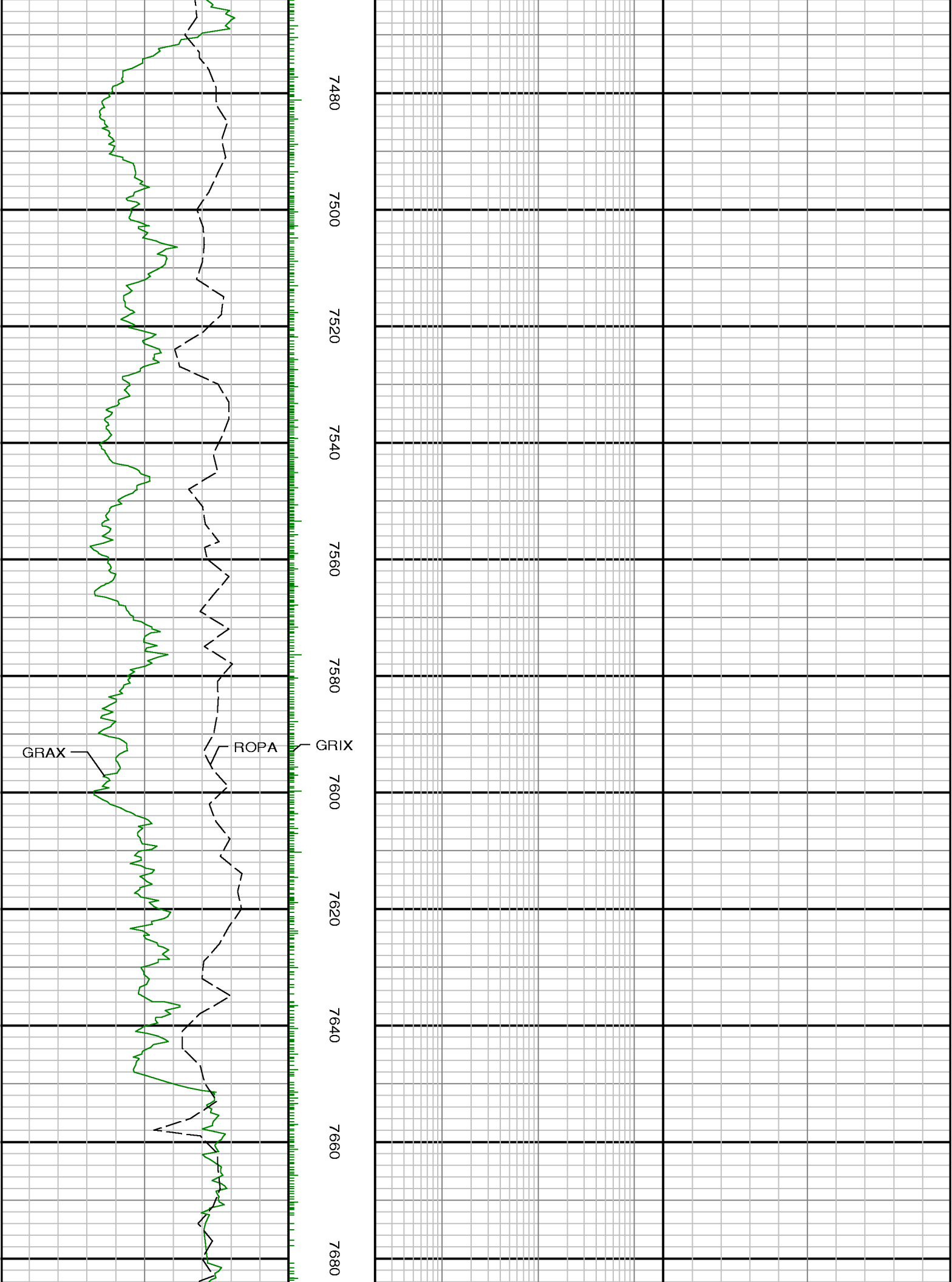
Gamma Ray Apparent 0.5 ft Avg [GRAX] 0 150 API Rate of Penetration 3.0 ft Avg [ROPA] 400 0 ft/hr Gamma Ray Apparent 0.5 ft Avg [GRAM] 0 150 API	MD feet 1:240	2 Res PD LS 2MHz Corr [RPCHM] 2000 ohm.m 2 Res PD LS 400kHz Corr [RPCLM] 2000 ohm.m 2 Res AT LS 2MHz Corr [RACHM] 2000 ohm.m 2 Res AT LS 400kHz Corr [RACLM] 2000	0 Time Since Drilled [RPTHM] 600 min 40 Con AT LS 400kHz Corr [CACLM] 0 mmho/m

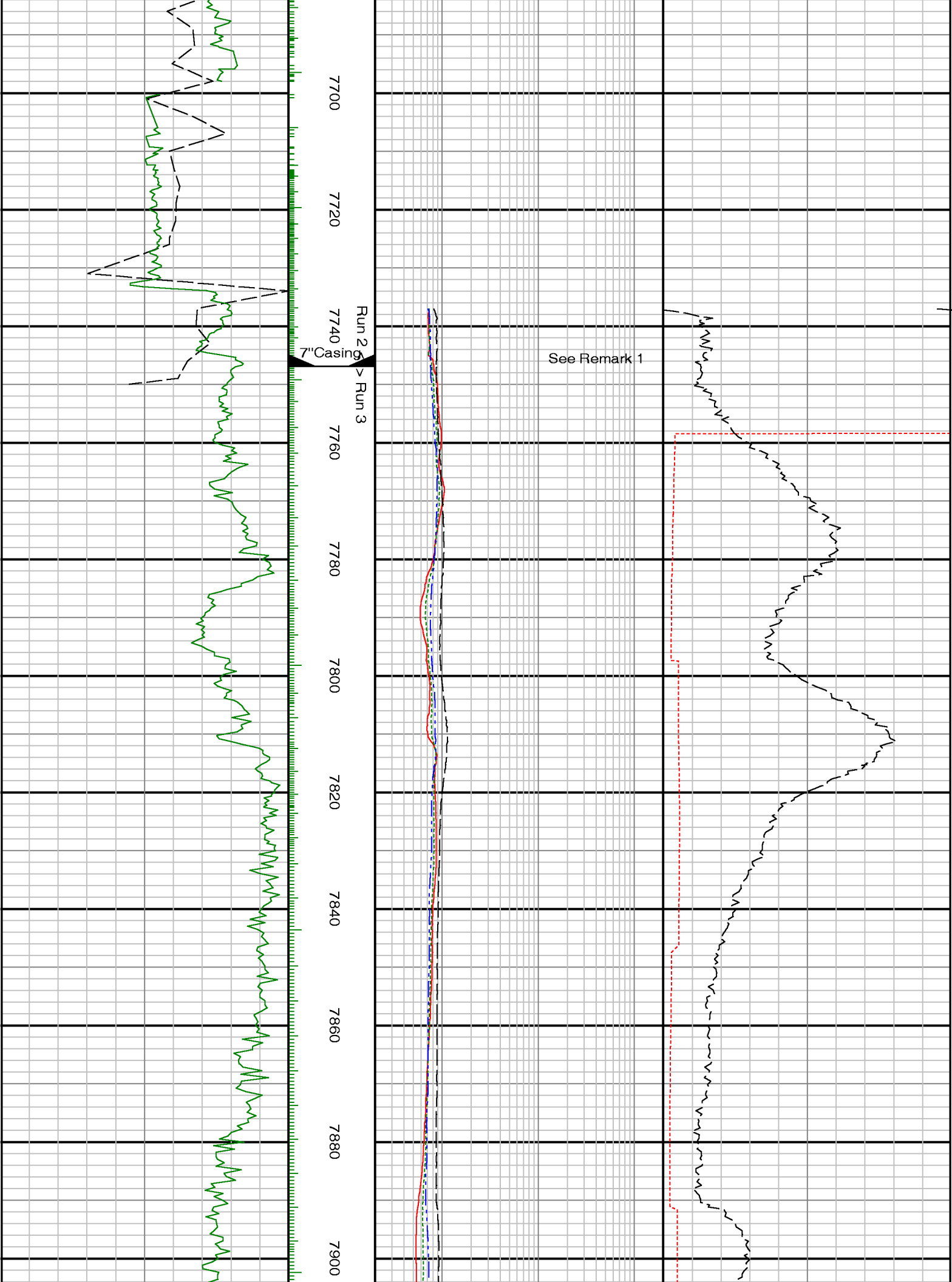


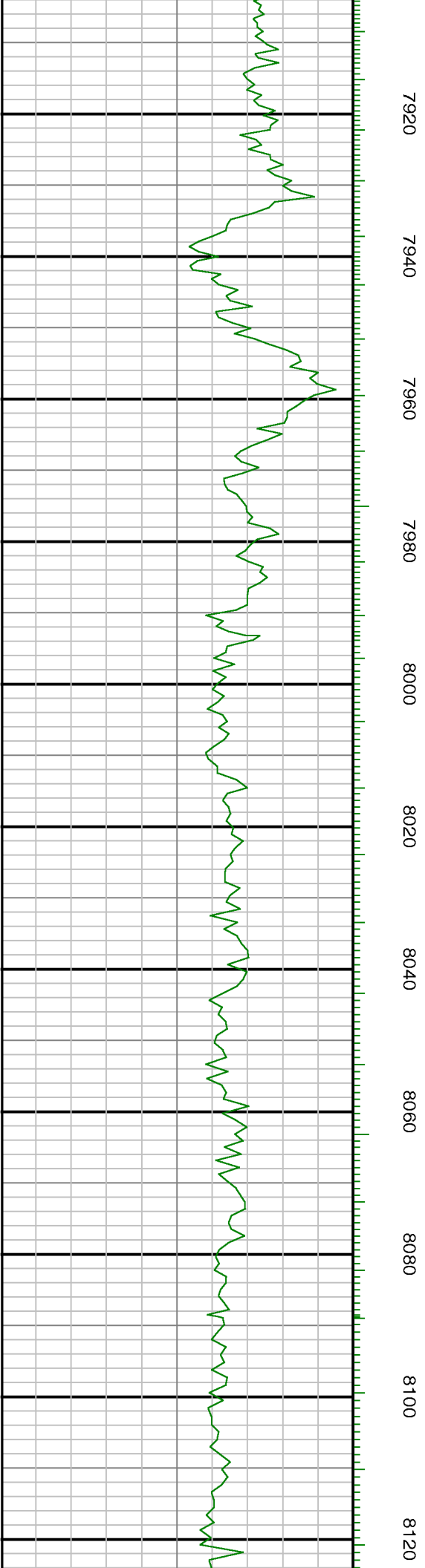
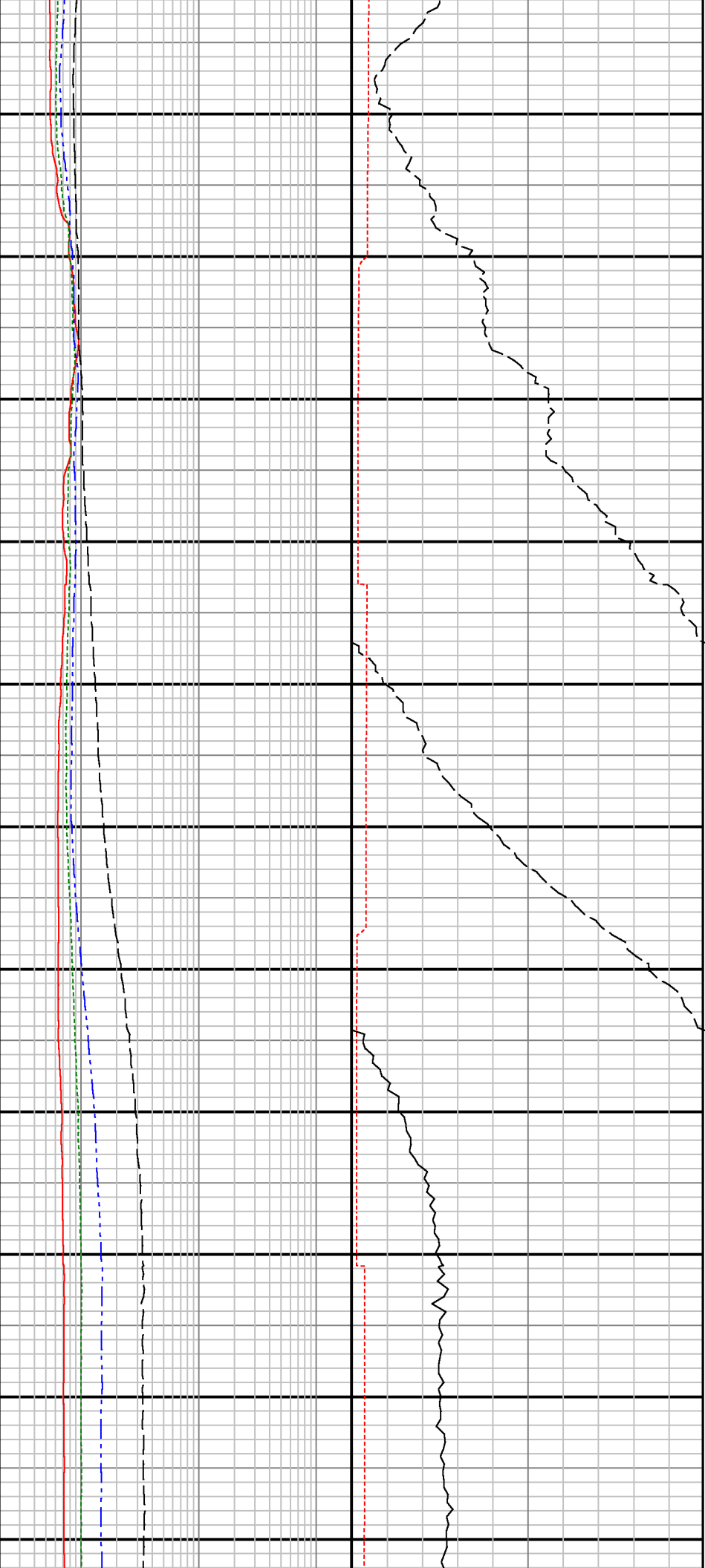


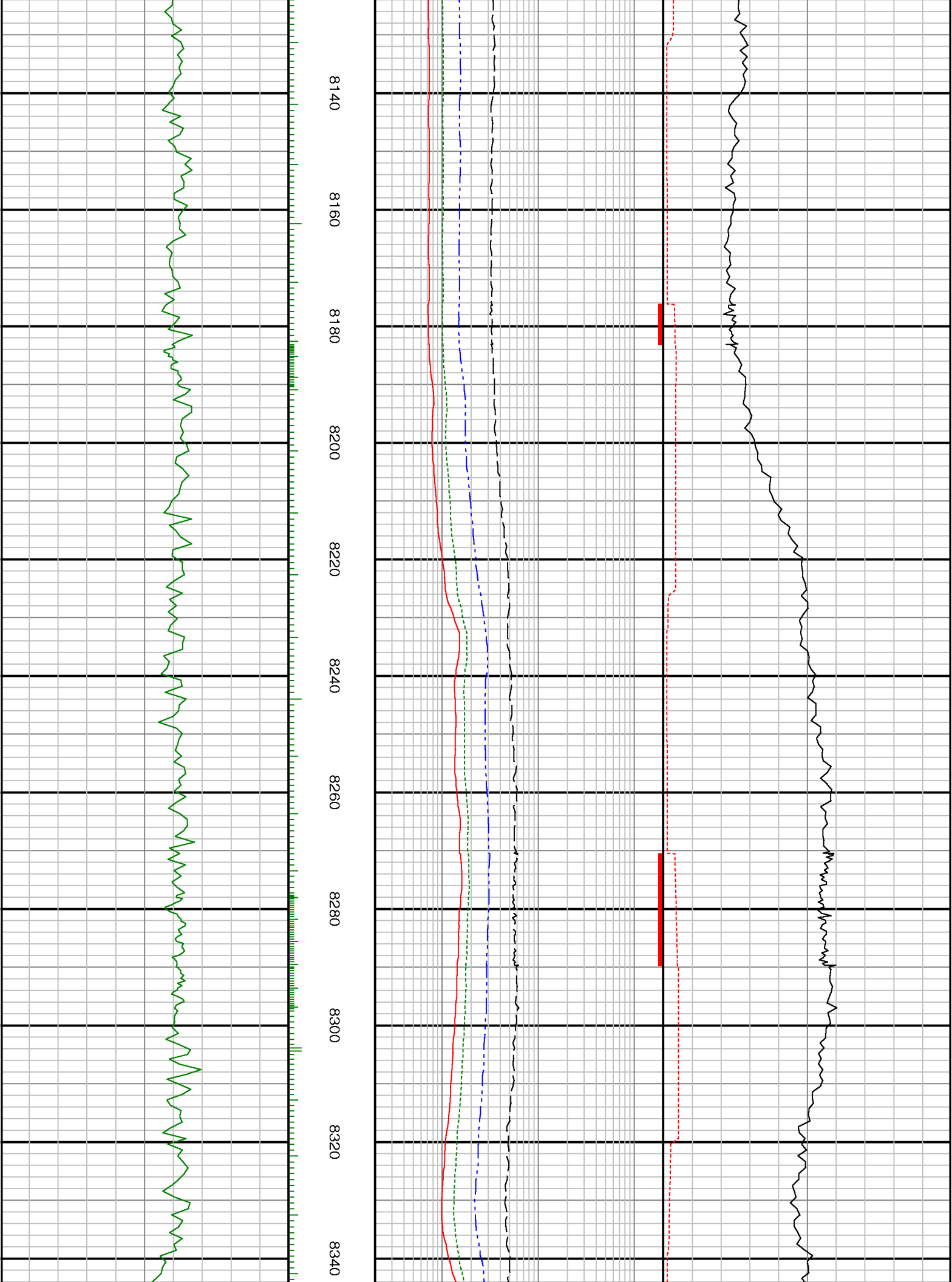


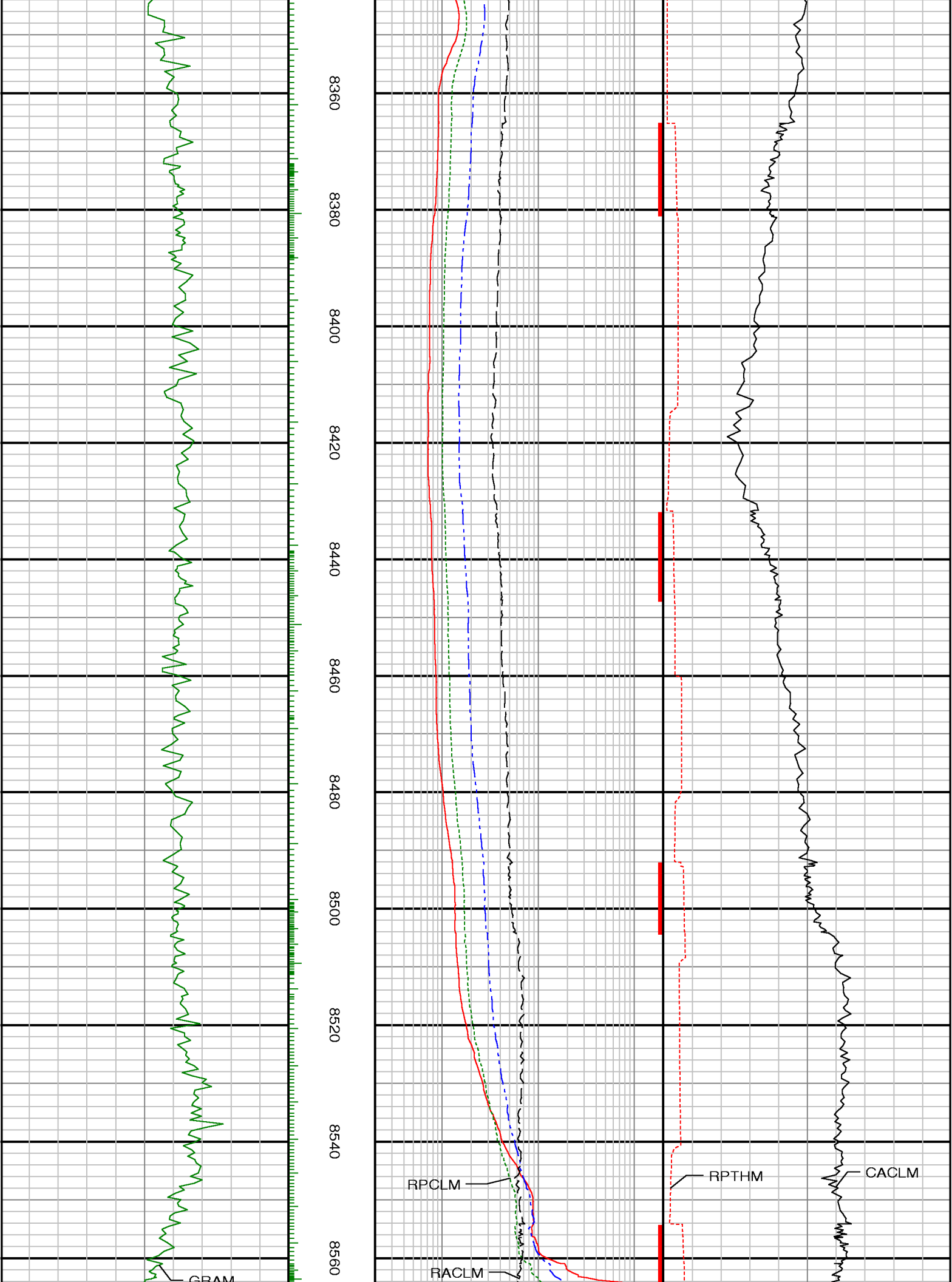


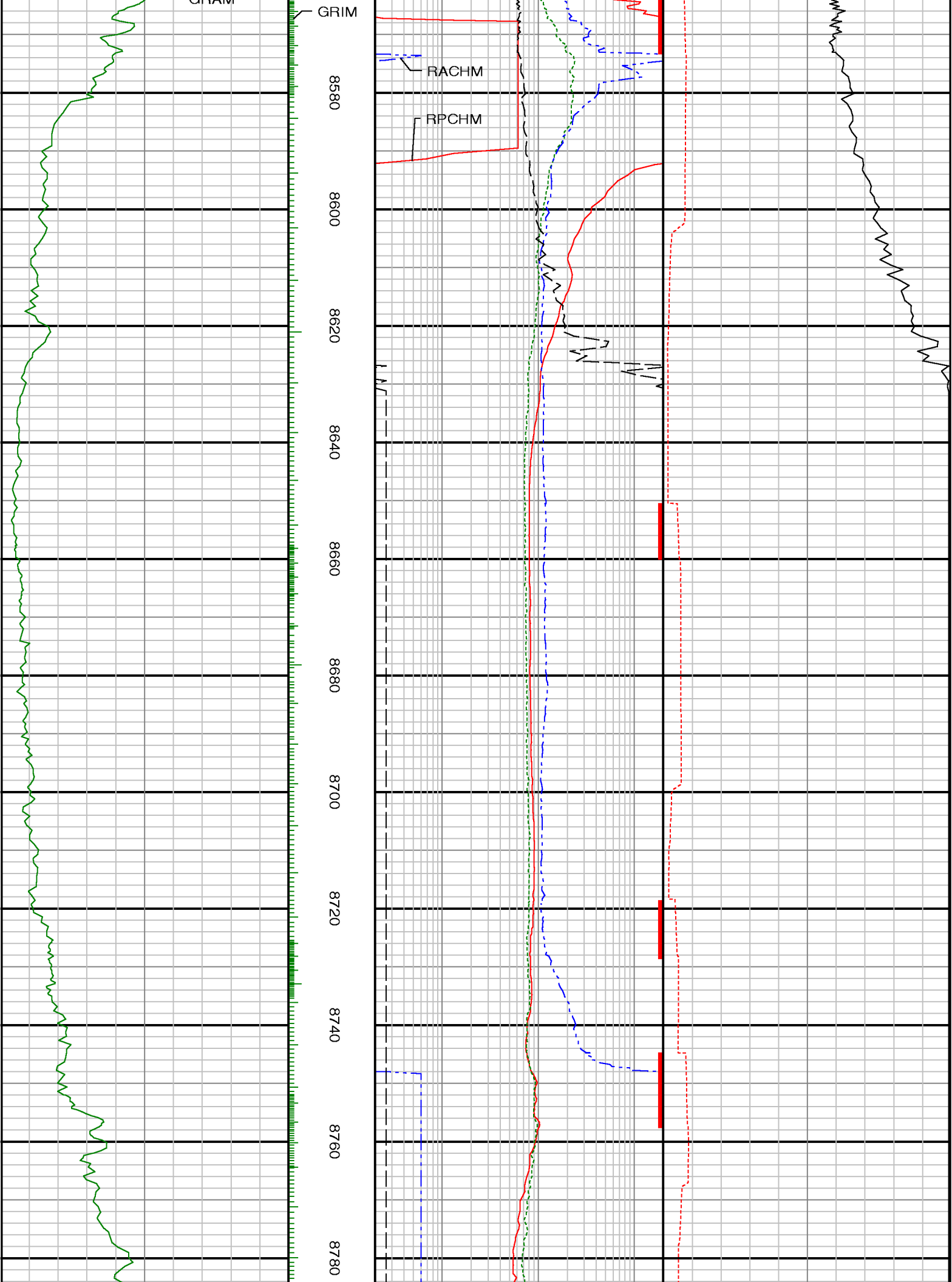


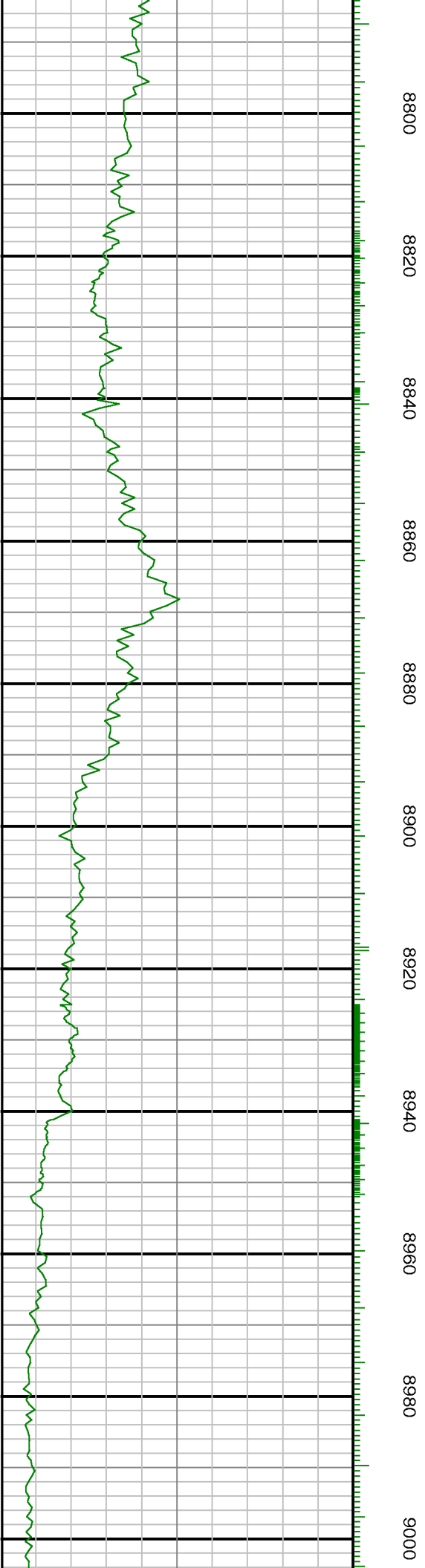


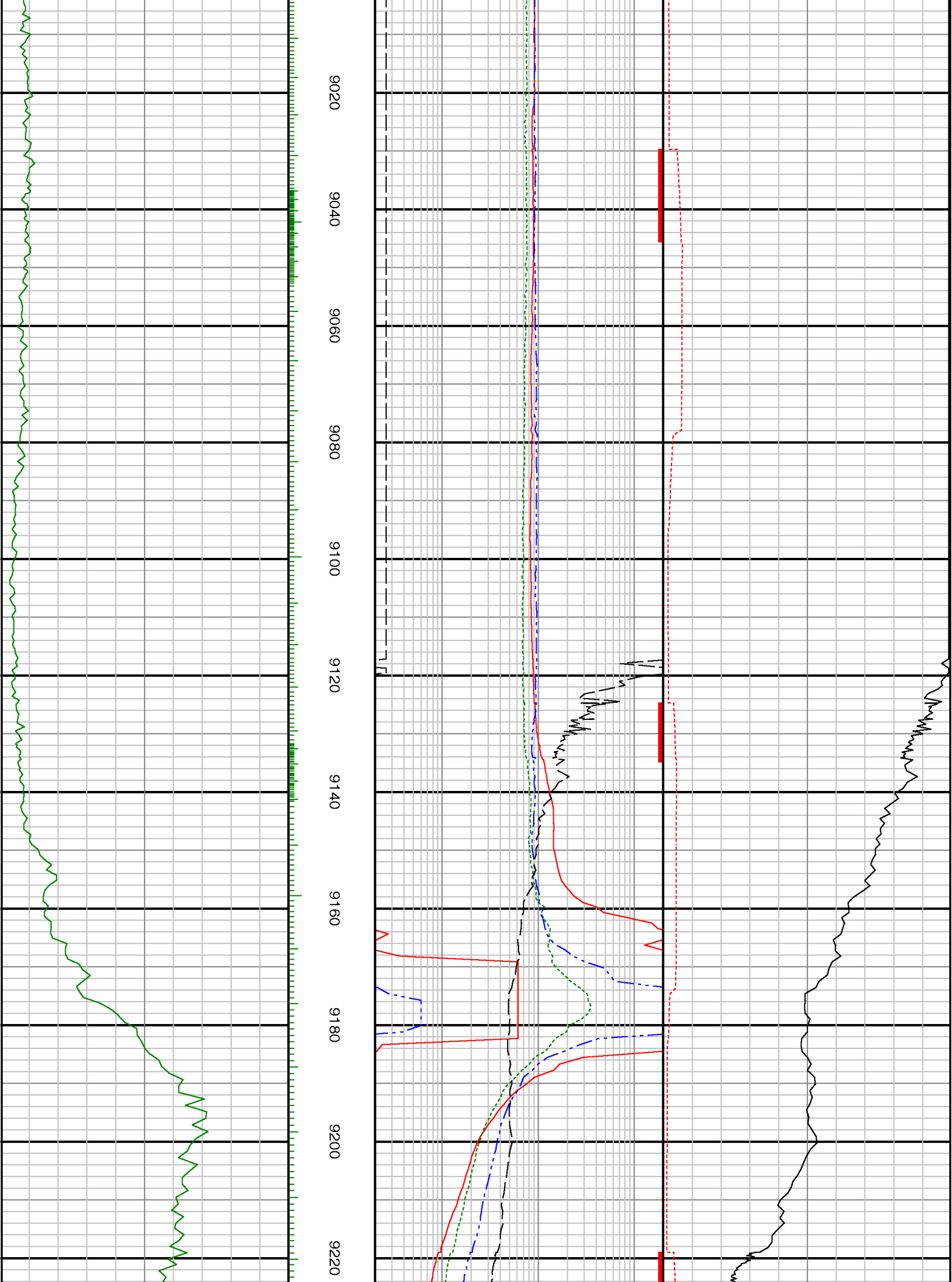


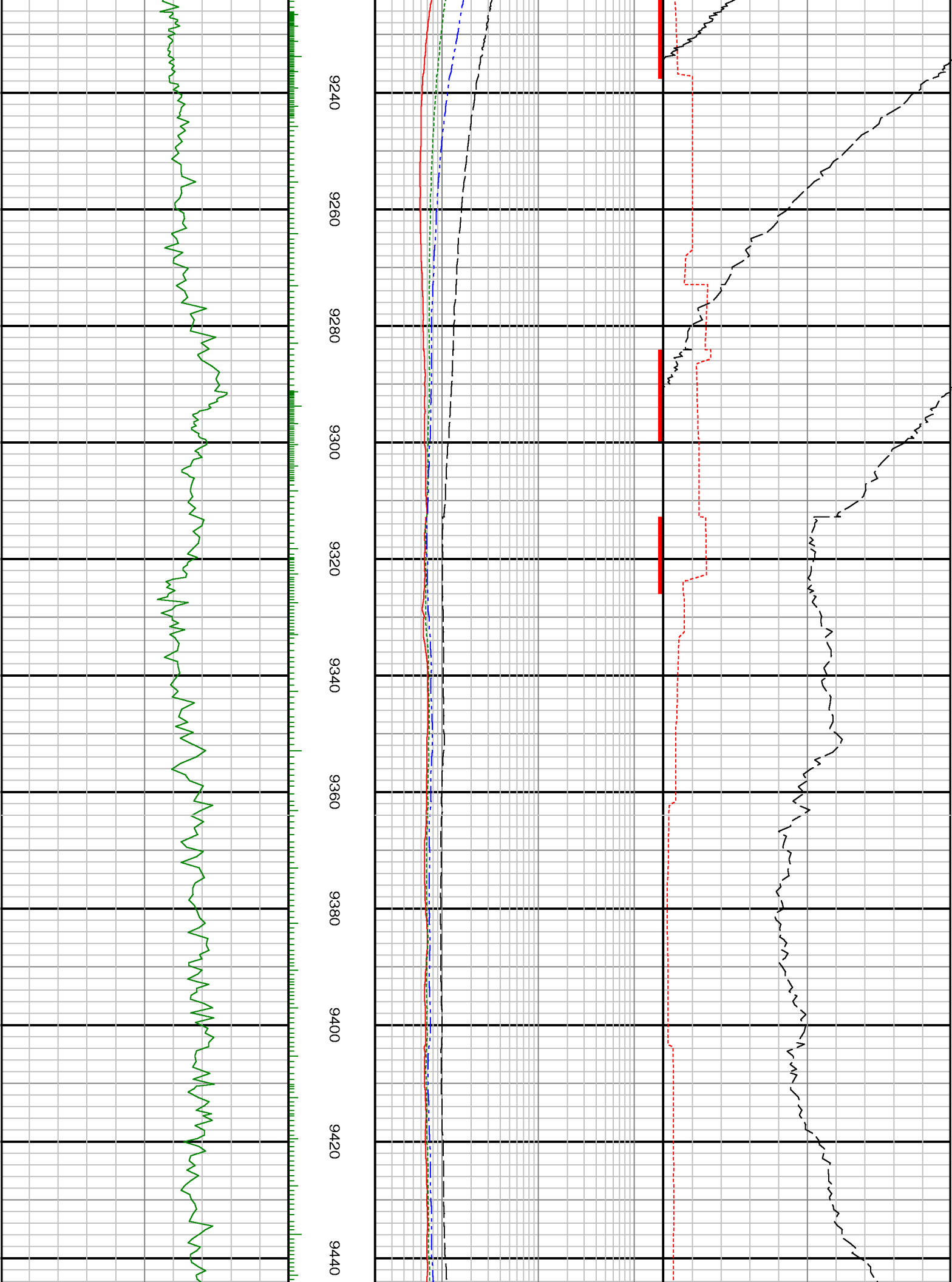


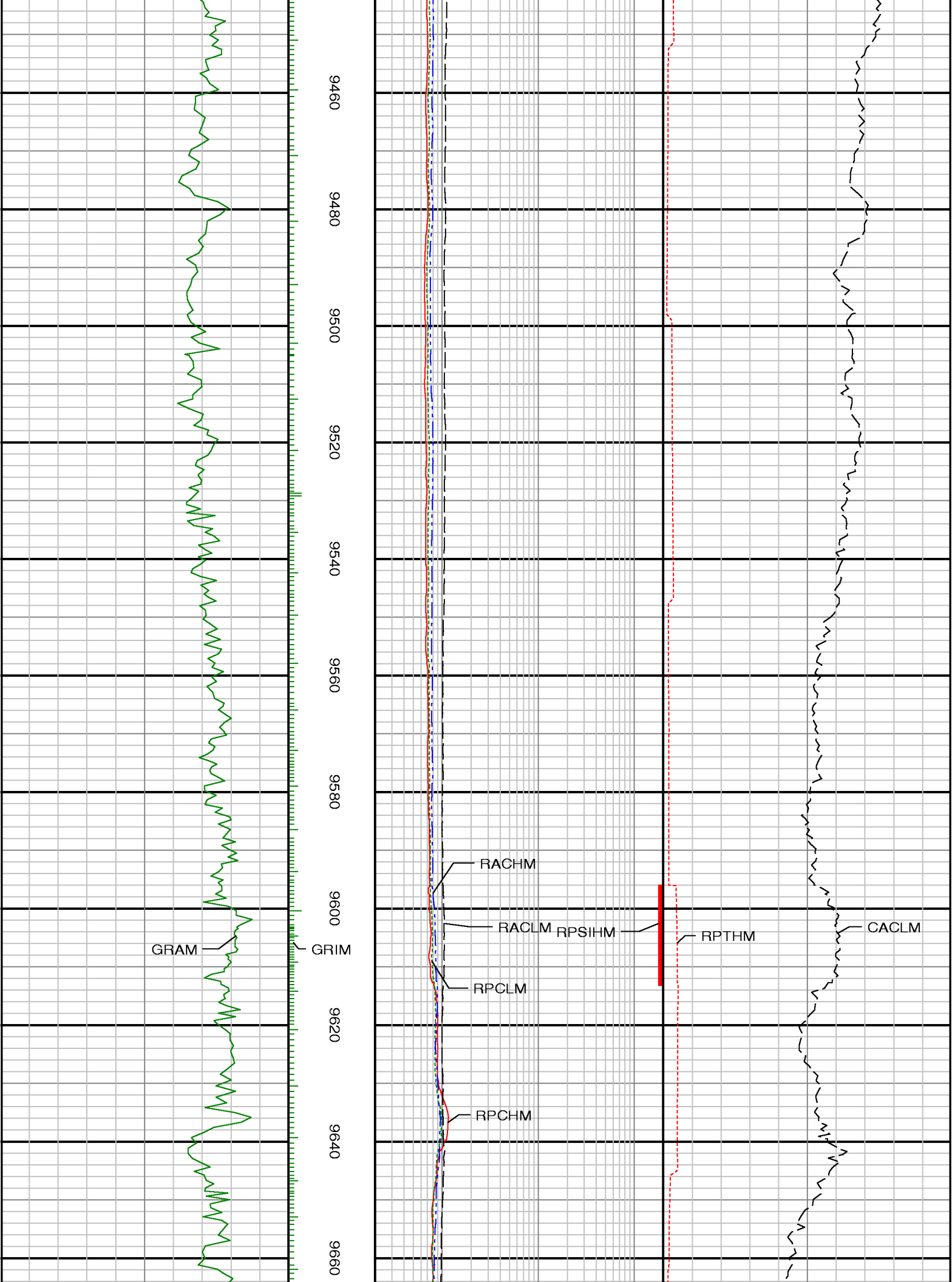


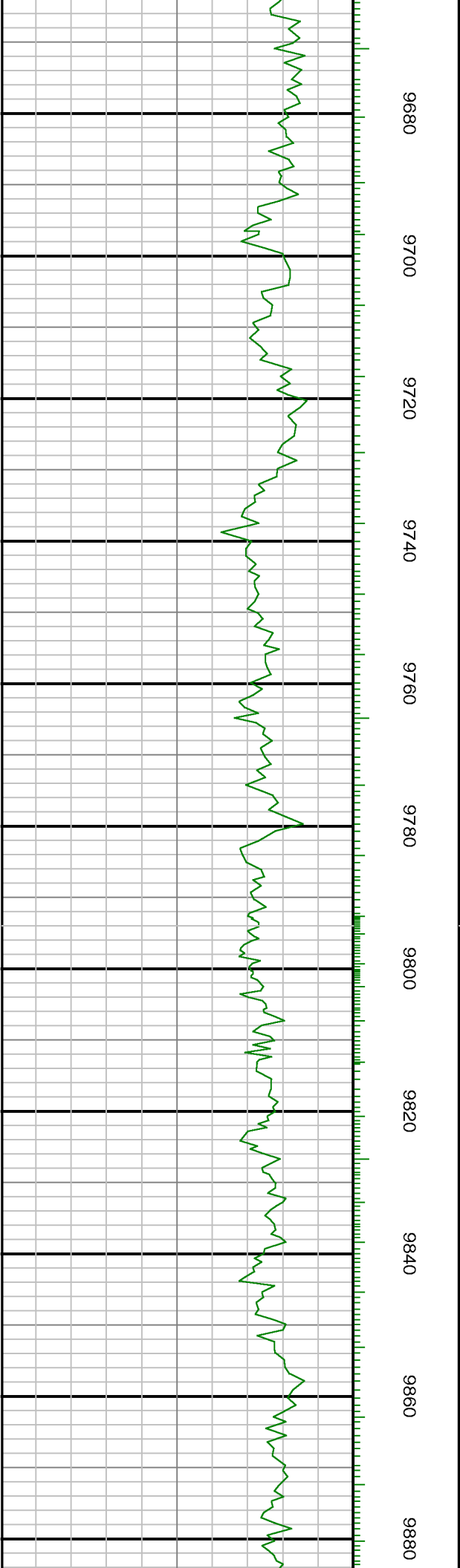
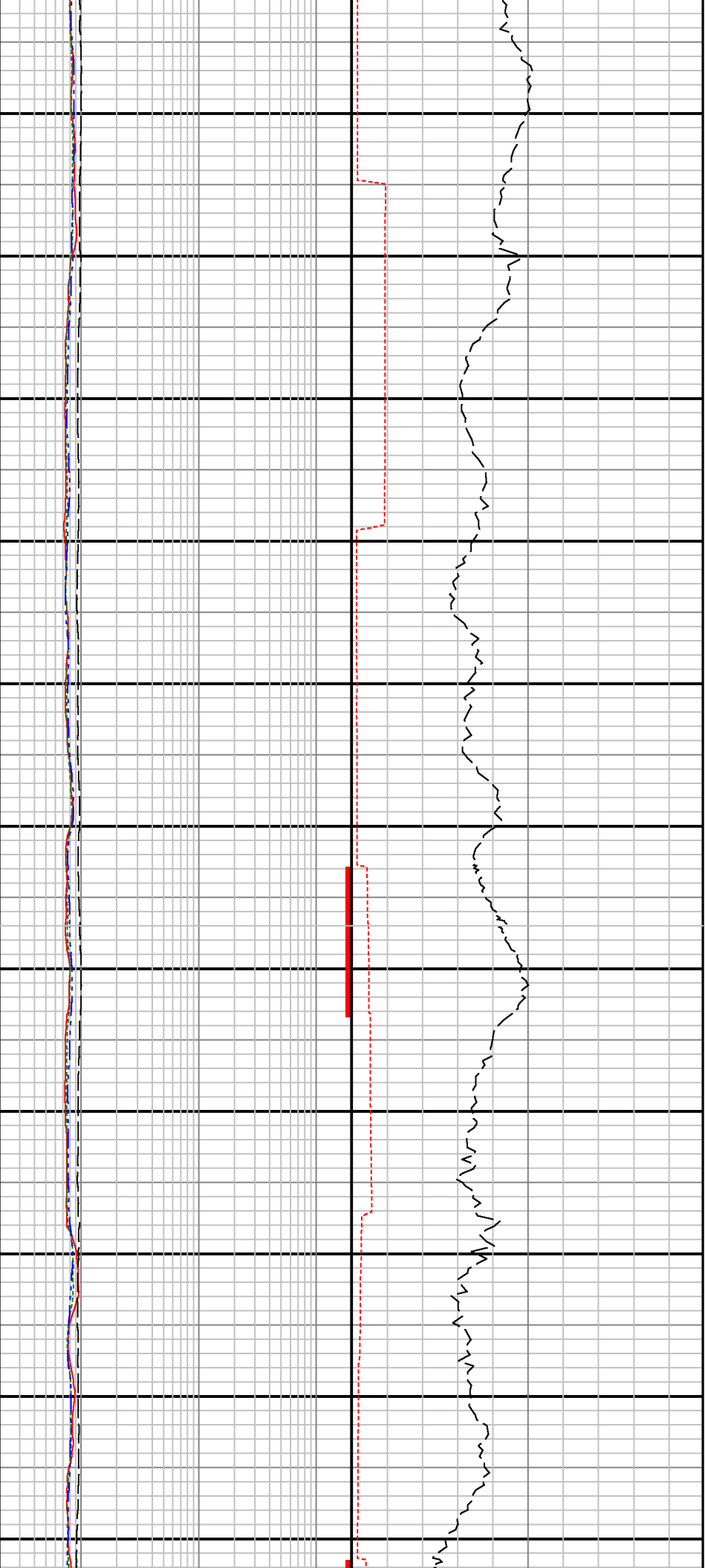


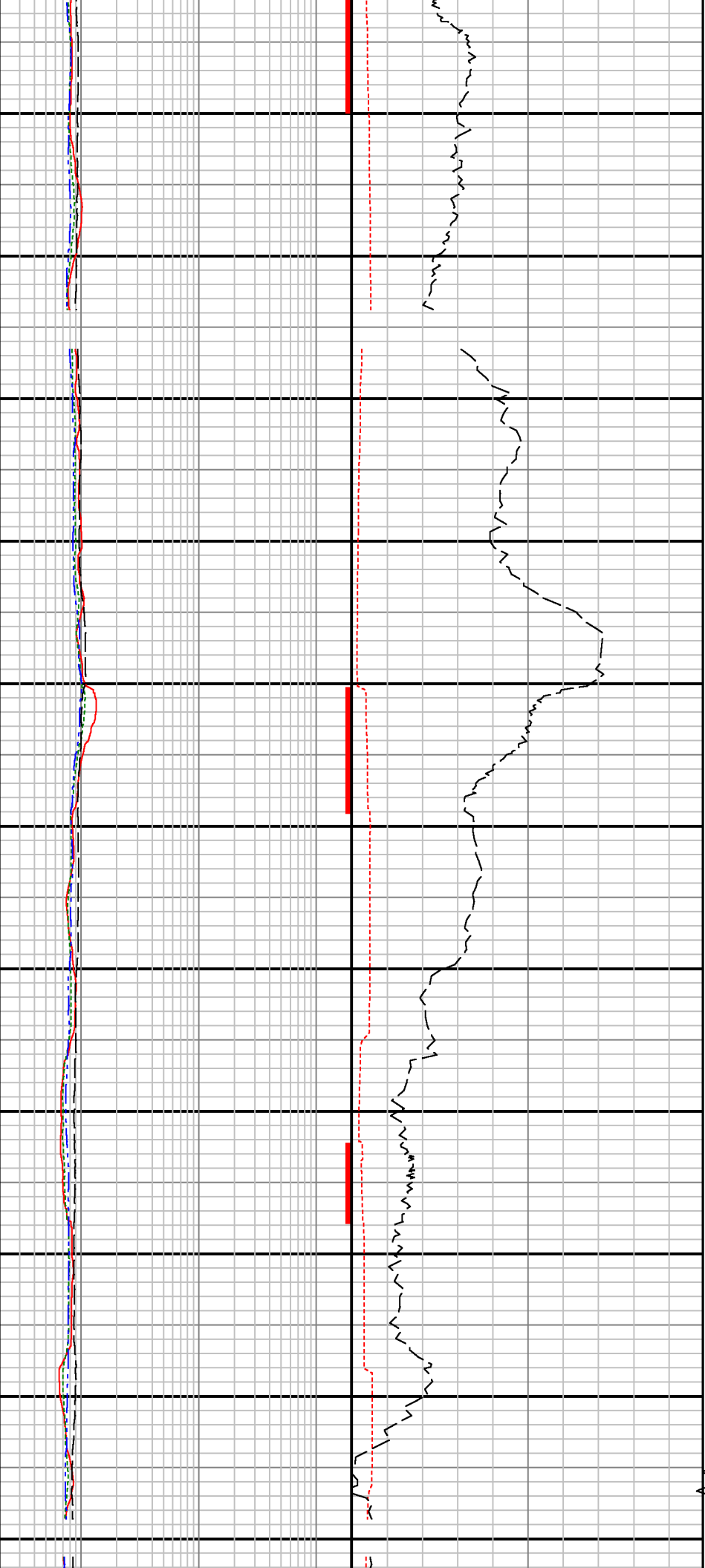




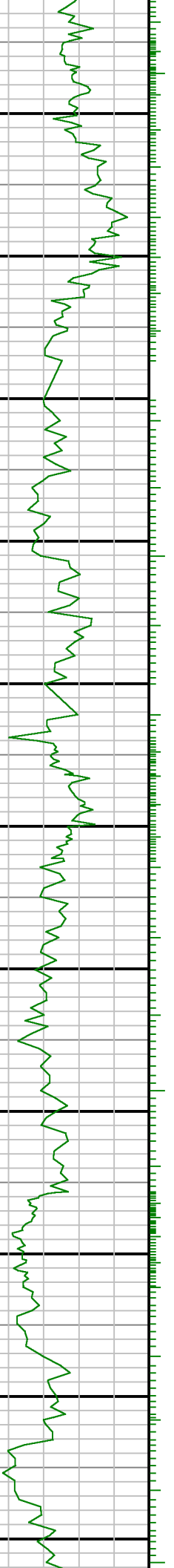


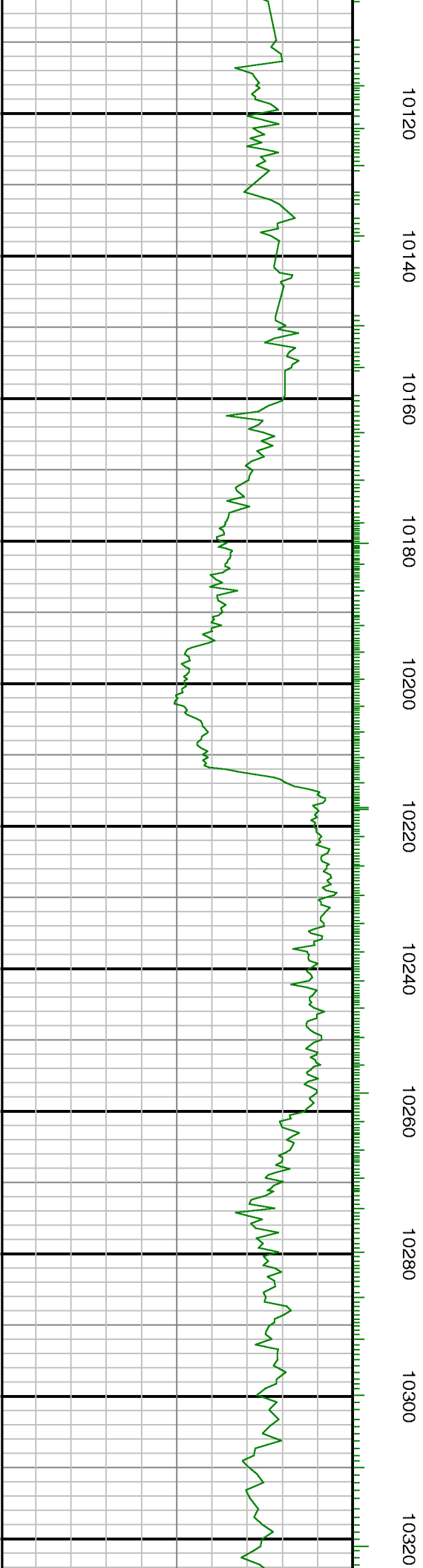
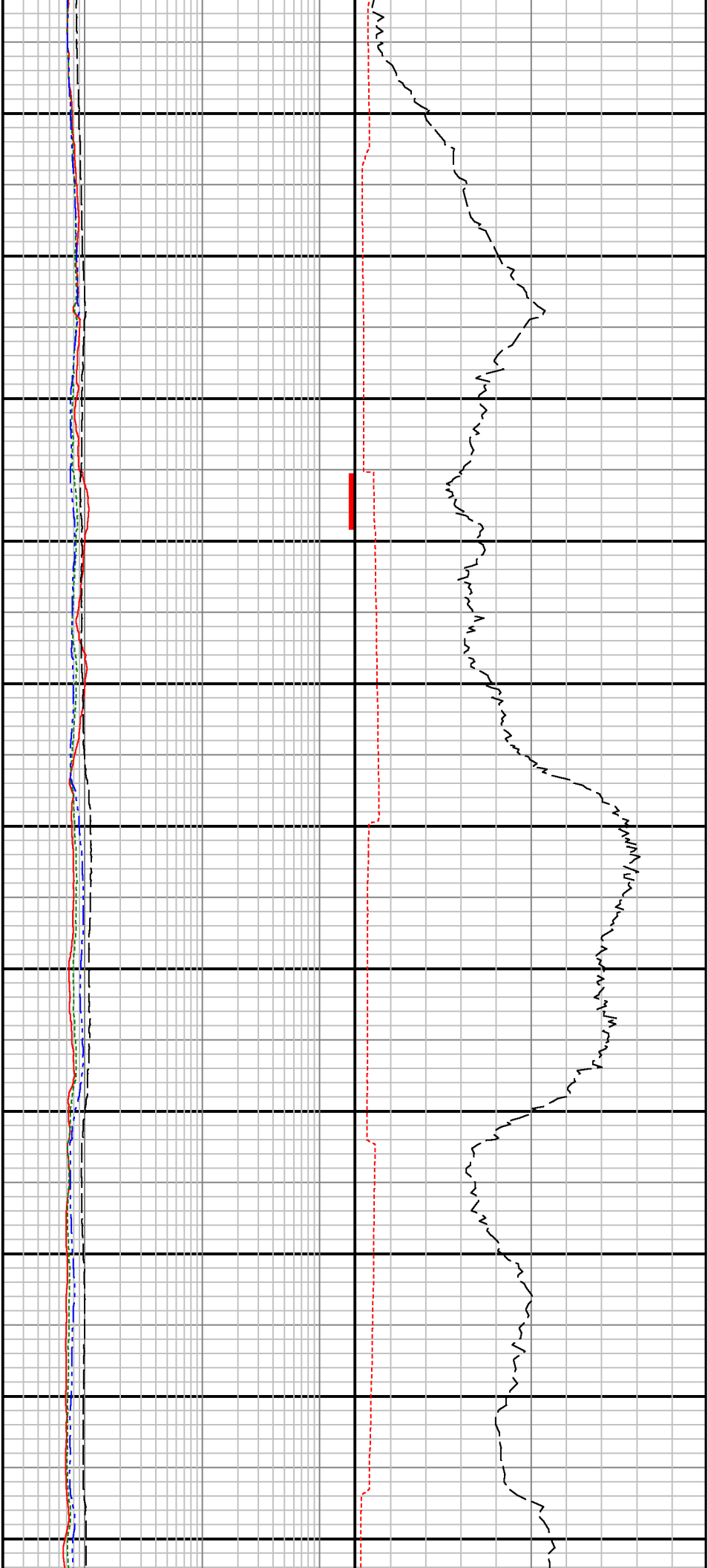


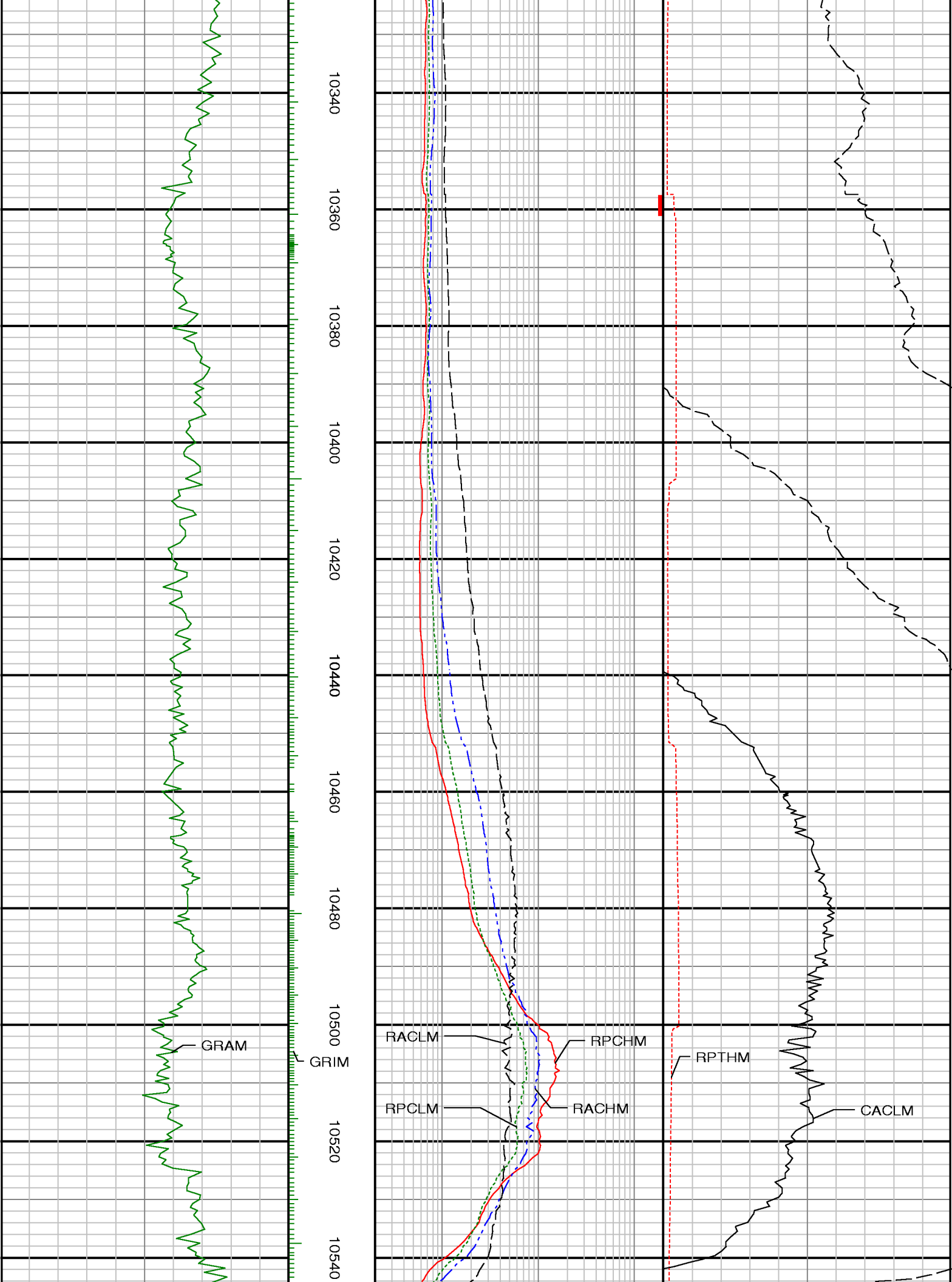


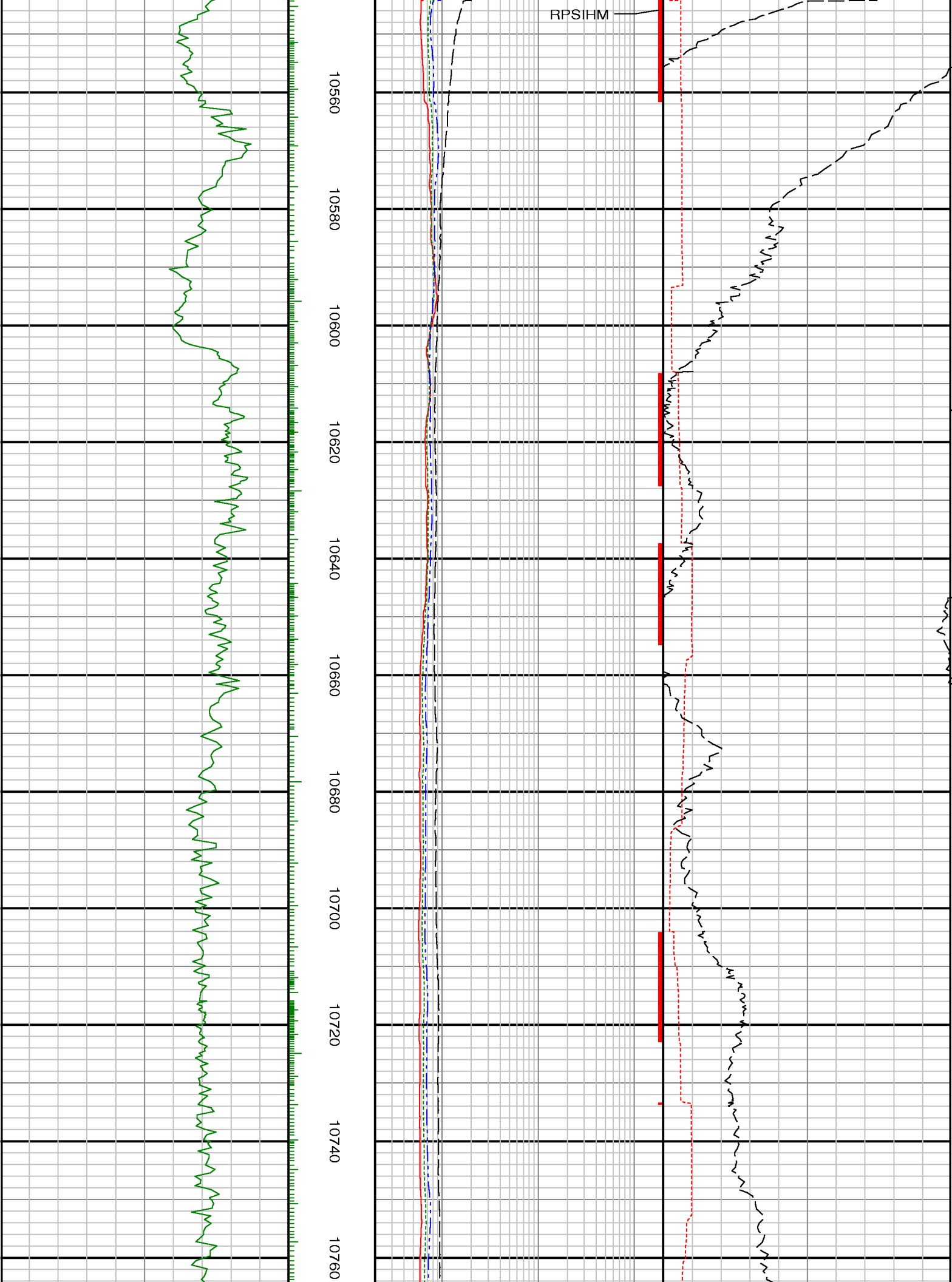


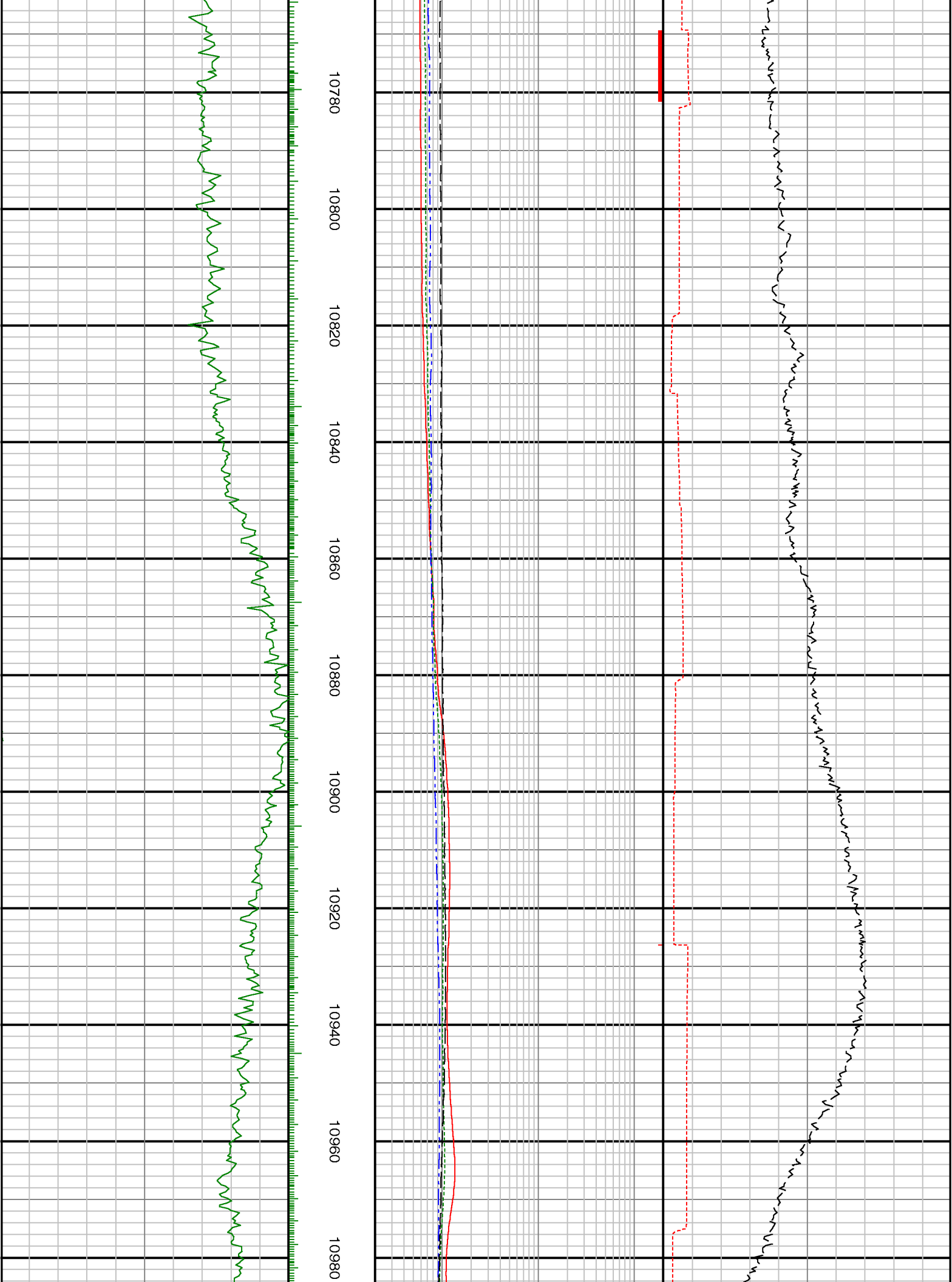
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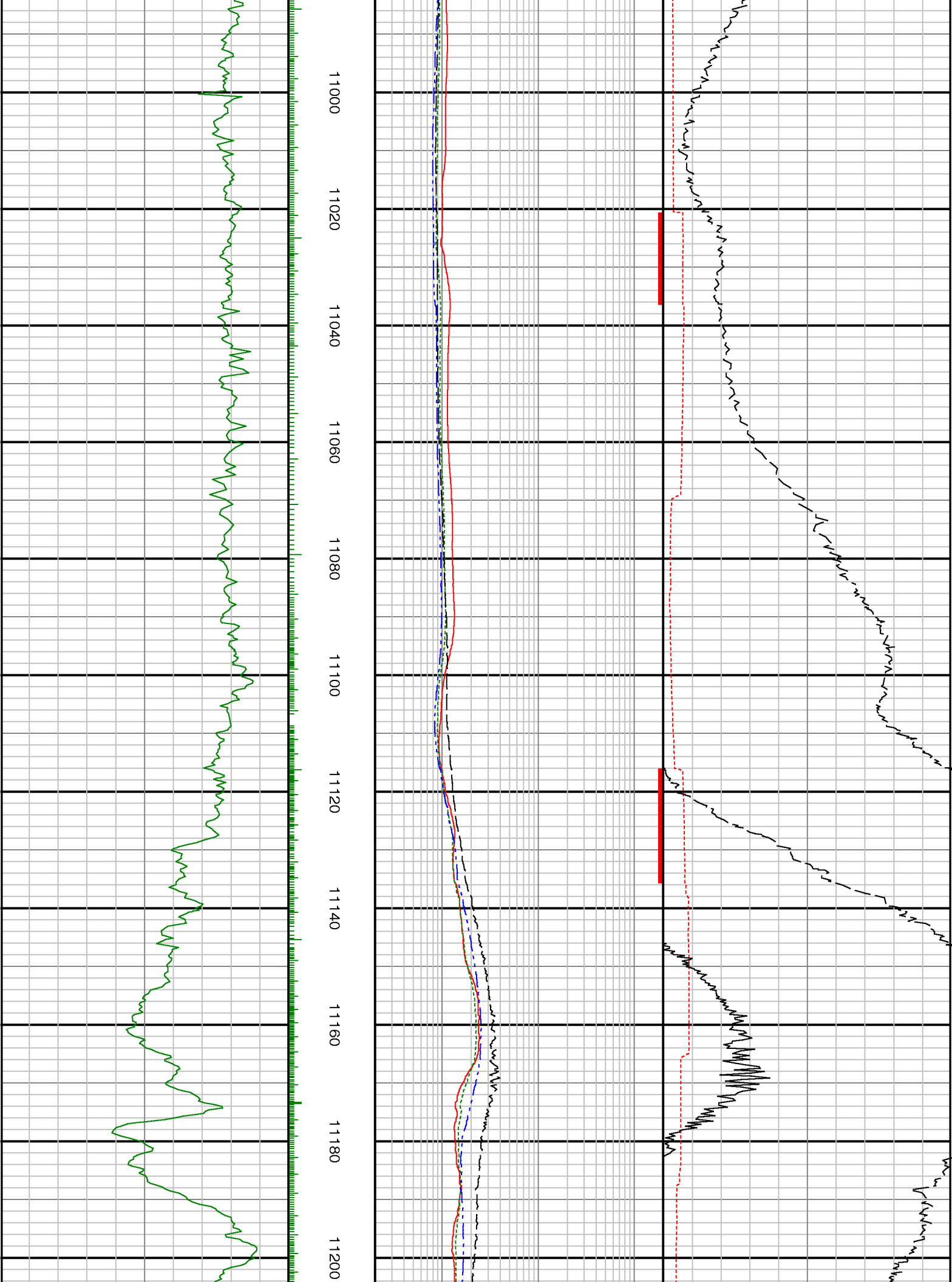


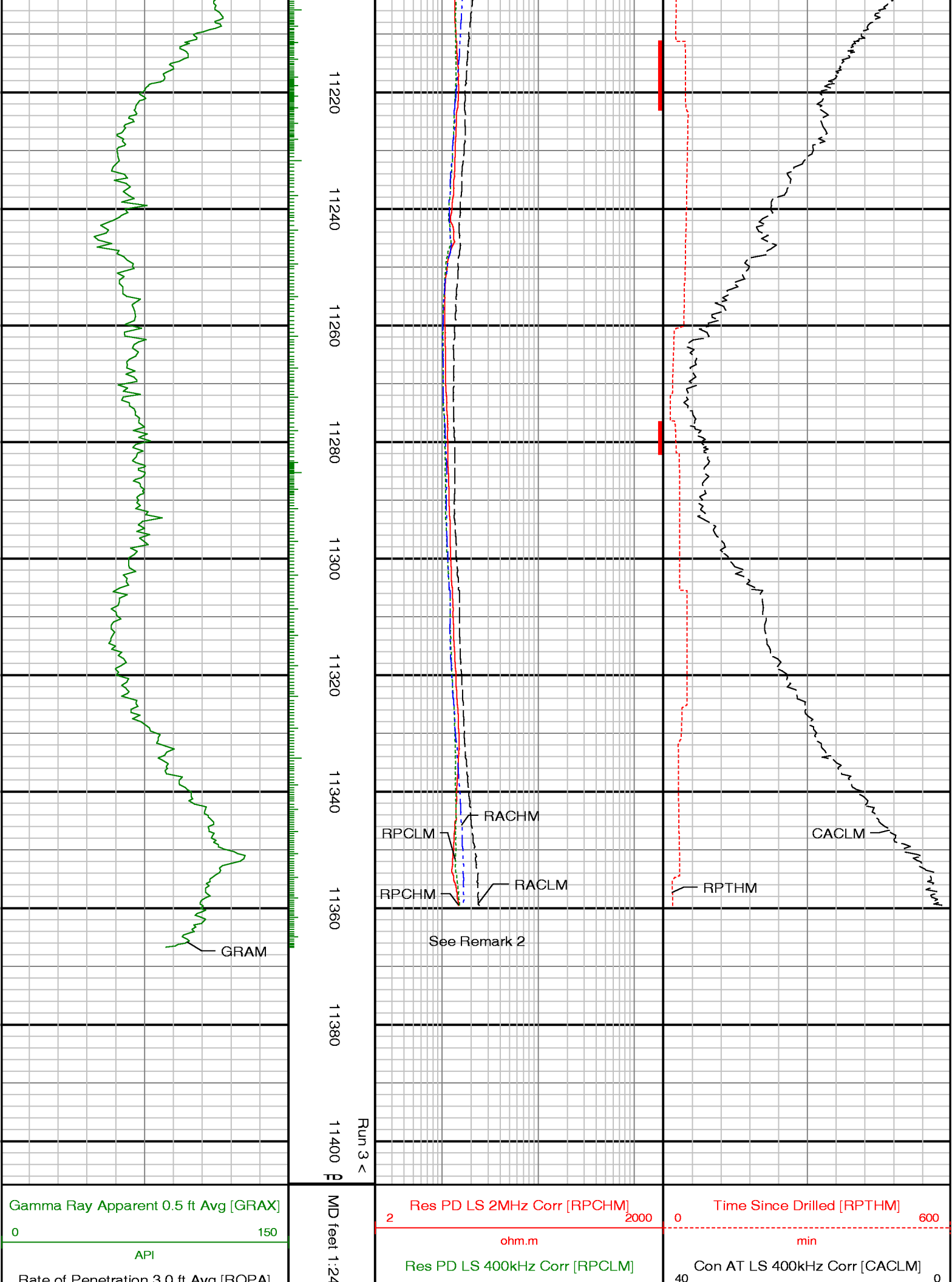












Rate of Penetration 0.5 ft Avg [RSPA]	0	2	2000	ohm.m	mmho/m
ft/hr					
Gamma Ray Apparent 0.5 ft Avg [GRAM]		2	2000	Res AT LS 2MHz Corr [RACHM]	
0	150			ohm.m	
API				Res AT LS 400kHz Corr [RACLM]	
		2	2000	ohm.m	