BAKER HUGHES

Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale:

1:240
TRUE VERTICAL DEPTH

Company: Anadarko

Well: Kerbs 32N-13HZ

Field: Weld County

County: Weld County **State:** Colorado

Status:
FINAL PRINT

API Number:
05123381830000

Surface Location:
Latitude: 40° 13' 42.348" N
Longitude: 104° 56' 33.925" W
Section: 13 TWN: 3N Range: 68W

Other Services:
DIR
VSS

Permanent Datum (P.D.):	Mean Sea Level	Elevation:	0.00 ft.
Log Measured From:	Rig Floor	4898.00 ft.	Above P.D.
Depth Reference:	Driller's Depth		

Elevations:
KB: N/A
DF: 4898.00 ft.
GL: -22.00 ft.

Interval Logged		Dates		Magnetic Field Reference			
Top:	6500.0 ft.	Date From:	20/Feb/14	Dip Angle:	66.89 °	Azi Reference North:	True
Bottom:	11732.0 ft.	Date To:	28/Feb/14	Total		Mag to Reference	
		Spud Date:	19/Feb/14	Field Strength:	52613.0 nT	North Correction:	8.69 °

Borehole Record

Hole Size	From	To
13.500 in.	Surface	1094.0 ft.
8.750 in.	1094.0 ft.	7488.0 ft.
6.125 in.	7488.0 ft.	11732.0 ft.

Casing Record

Size	Weight	From	To
9.600 in.	36.00 lb/ft	Surface	1048.0 ft.
7.000 in.	26.00 lb/ft	Surface	7421.0 ft.

Mud Record

Type	From	To
Water Based Mud	Surface	11732.0 ft.

Deviation Record

Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
13.500 in.	Surface	0.0 ° / 0.0 °	0.6 ° / 180.6 °
8.750 in.	Vert/Curve	0.6 ° / 180.6 °	88.4 ° / 270.4 °
6.125 in.	Lateral	88.4 ° / 270.4 °	88.5 ° / 273.4 °
		/	/
		/	/
		/	/

Acquisition System	Software Version	Other	
Advantage	2.20U4	Rig: / Contractor:	H&P 307 / Helmerich & Payne Drilling CO
PATS	6.4.1.34	Job No:	6161800
		District: / Unit:	Rocky Mountains /

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 Top (ft.)	Logged Interval Bottom (ft.)	Bit Depth Interval From (ft.)	Bit Depth Interval To (ft.)	Date / Time Start	Date / Time End	Circ. Time (hrs.)
2	2	2	8.750	PDC		Steerable	6500.0	6970.0	6500.0	7030.0	22/Feb/2014 17:45	23/Feb/2014 01:00	34
3	3	3	8.750	PDC		Steerable	6970.0	7433.0	7030.0	7488.0	23/Feb/2014 17:03	24/Feb/2014 04:03	14
4	4	4	6.125	PDC		Steerable	7433.0	11670.0	7487.0	11732.0	26/Feb/2014 19:54	28/Feb/2014 11:01	40

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Nick Roosen	19/Feb/2014	01/Mar/2014	John Nguyen	19/Feb/2014	01/Mar/2014			

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (sec/qt)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (mg/L)	K+ (%)
21 Feb 2014 05:00	2	4100.0	Water Based Mud	9.1	29	7.2	N/A	N/A	Pit	4200	N/A
23 Feb 2014 21:45	3	7300.0	Water Based Mud	10.2	25	9.9	N/A	N/A	Pit	2600	N/A
25 Feb 2014 20:30	3	7488.0	Water Based Mud	10.1	51	8.3	N/A	N/A	Pit	2800	N/A
26 Feb 2014 21:30	4	7596.0	Water Based Mud	9.7	54	9.8	N/A	N/A	Pit	2300	N/A
27 Feb 2014 21:30	4	10050.0	Water Based Mud	9.6	50	9.9	N/A	N/A	Pit	1500	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRTX	Gamma Ray Time Since Drilled	Min.
GRIX	Gamma Ray Density, Points	unitless
GRSI	Gamma Ray Slide Indicator	unitless
ROPA	Rate of Penetration, 3.0 ft. Avg.	Ft./Hr.
TCDX	Downhole Temperature	Deg. F.
TVD	True Vertical Depth	Ft.
WOBA	Surface Weight on Bit, 1.0 ft. Avg.	K. lbs.

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
2	DIR	10152197	Directional	63.19	6.750	3.250
2	SRIG	ZSGM1289961	Gamma	59.81	6.750	3.250
3	DIR	12566669	Directional	58.68	6.750	3.250
3	SRIG	12554661	Gamma	55.31	6.750	3.250
4	DIR	12373466	Directional	64.90	4.750	2.750
4	SRIG	11814653	Gamma	61.52	4.750	2.750

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

(1) Baker Hughes INTEQ run 2 and 3 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1094 to 7488 feet MD (1094 to 7037 feet TVD).

(2) Baker Hughes INTEQ run 4 utilized 4 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 6 1/8 inch bit and steerable assembly from 7488 to 11732 feet MD (7037 to 7059 feet TVD).

(3) 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.

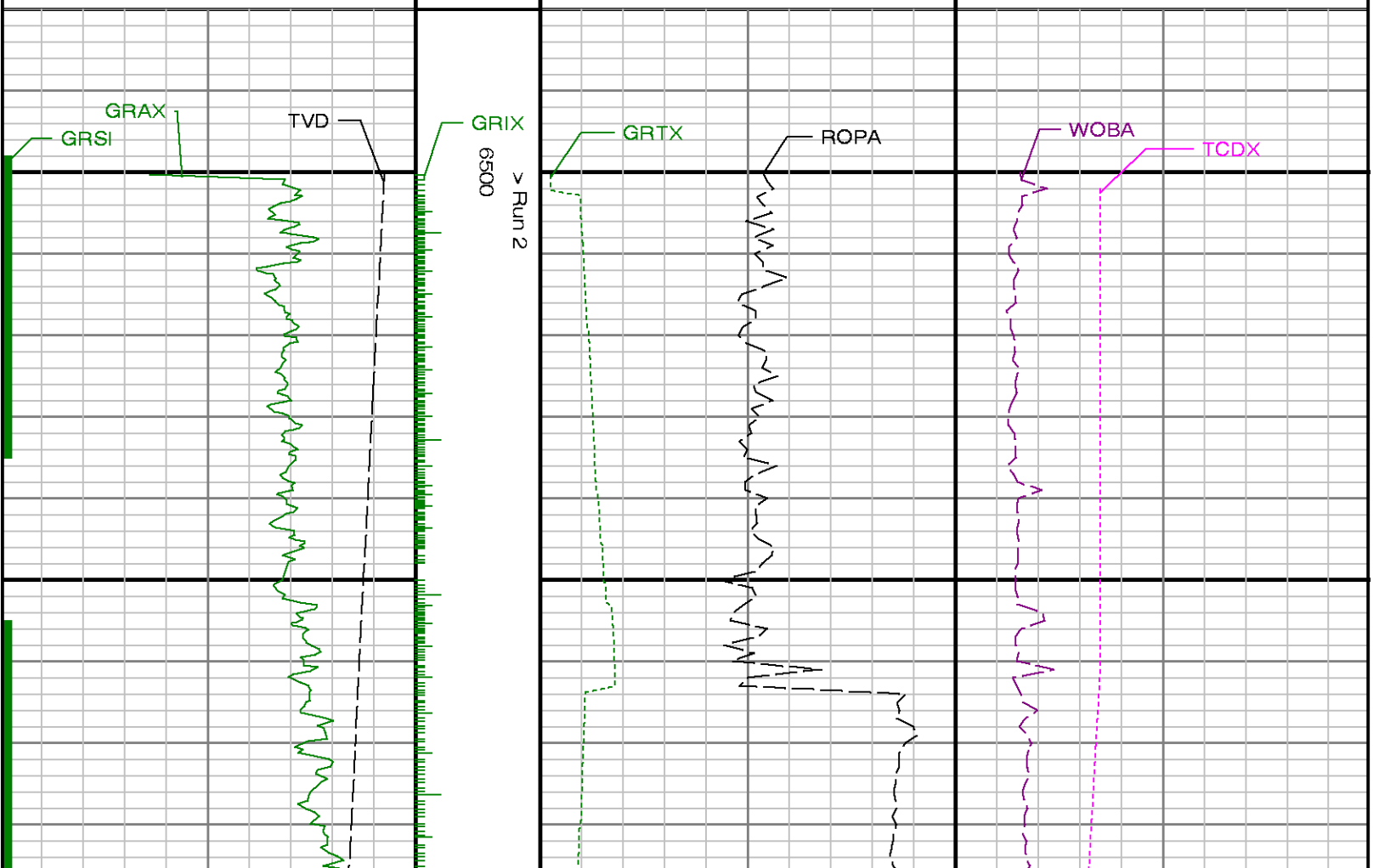
(4) A sliding indicator is shown to the right edge of track 1 as a heavy line.

Remarks

Number	Measured Depth (ft.)	Hole Section (in.)	LWD Run No.	Remark
1	7000	8.750	2	The interval from 6970 to 7030 feet MD (6819 to 6868 feet TVD) was logged up to 16 hours later due to trip out of hole to pick up a motor with 2.4° bend due to insufficient build rates of previous motor.
2	7460	6.125	3	The interval from 7433 to 7488 feet MD (7035 to 7037 feet TVD) was logged up to 64 hours later due to trip out of hole to run casing and pick up lateral BHA.
3	11730	6.125	4	The interval from 11670 to 11732 feet MD (7057 to 7059 feet TVD) was not logged due to sensor offset to bit at TD.

BAKER HUGHES

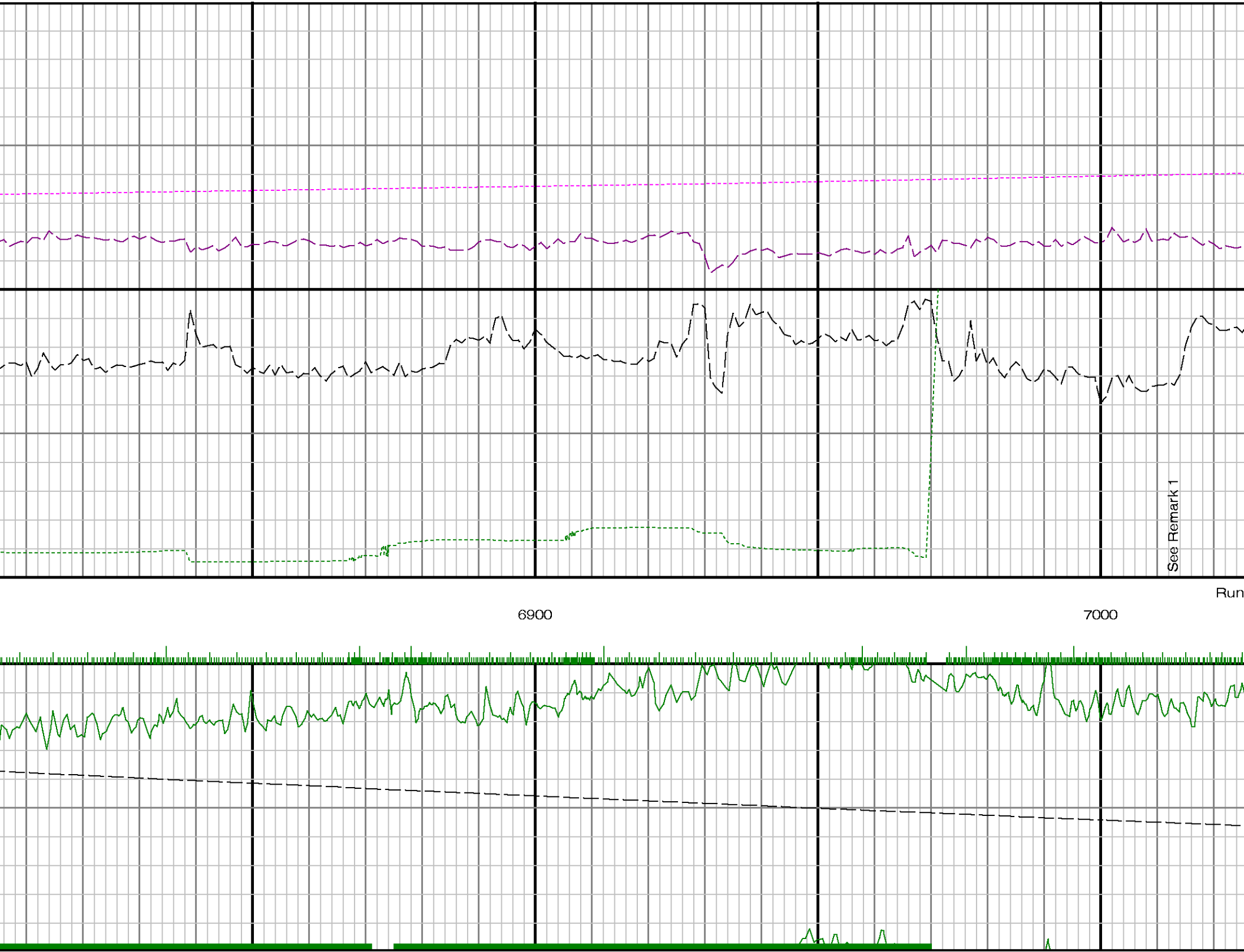
Company : Anadarko
Well : Kerbs 32N-13HZ
Interval : 6480.00 - 11750.00 feet
Created : 28/Mar/2014 8:59:37 AM



6600

6700

6800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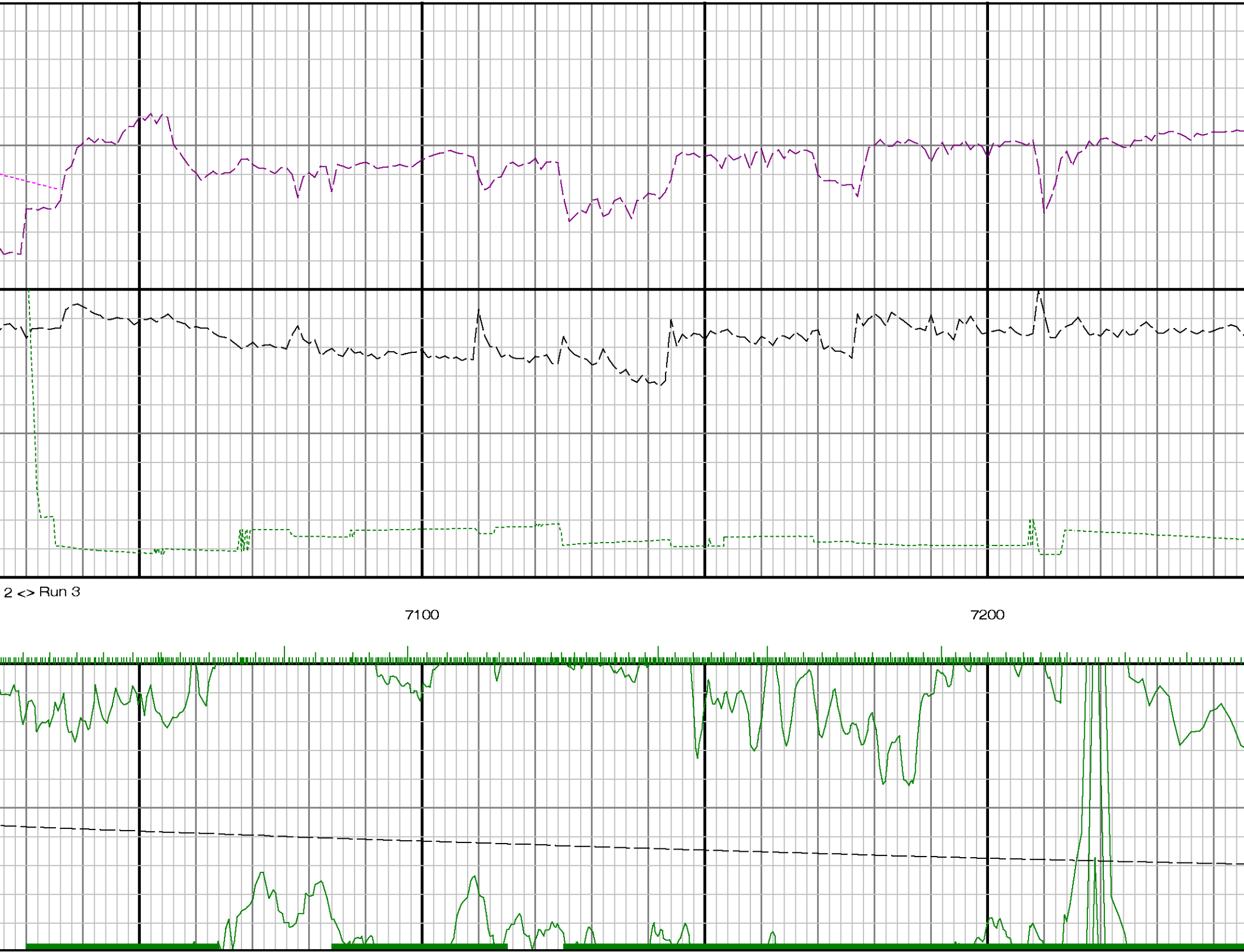
7000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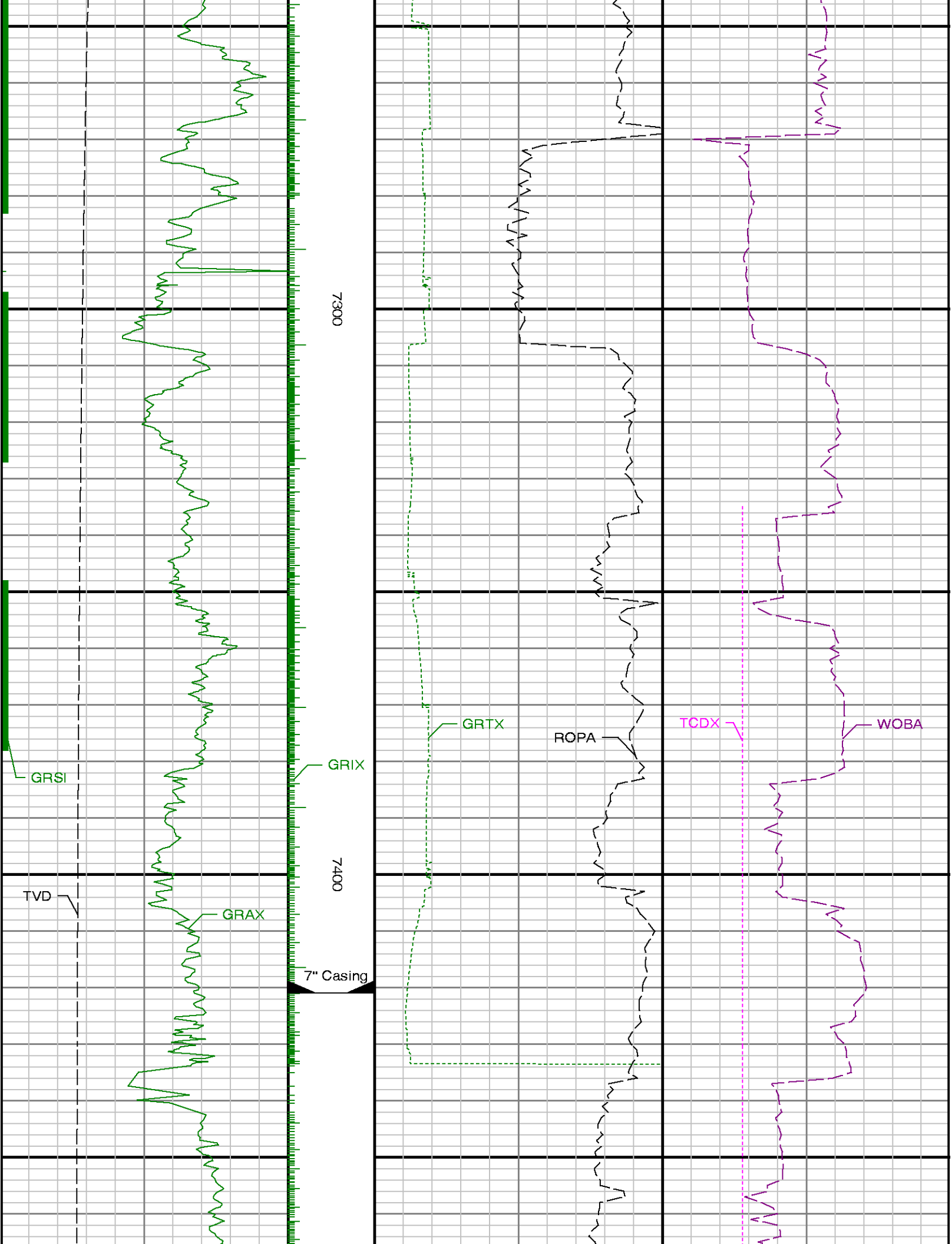
7100
7200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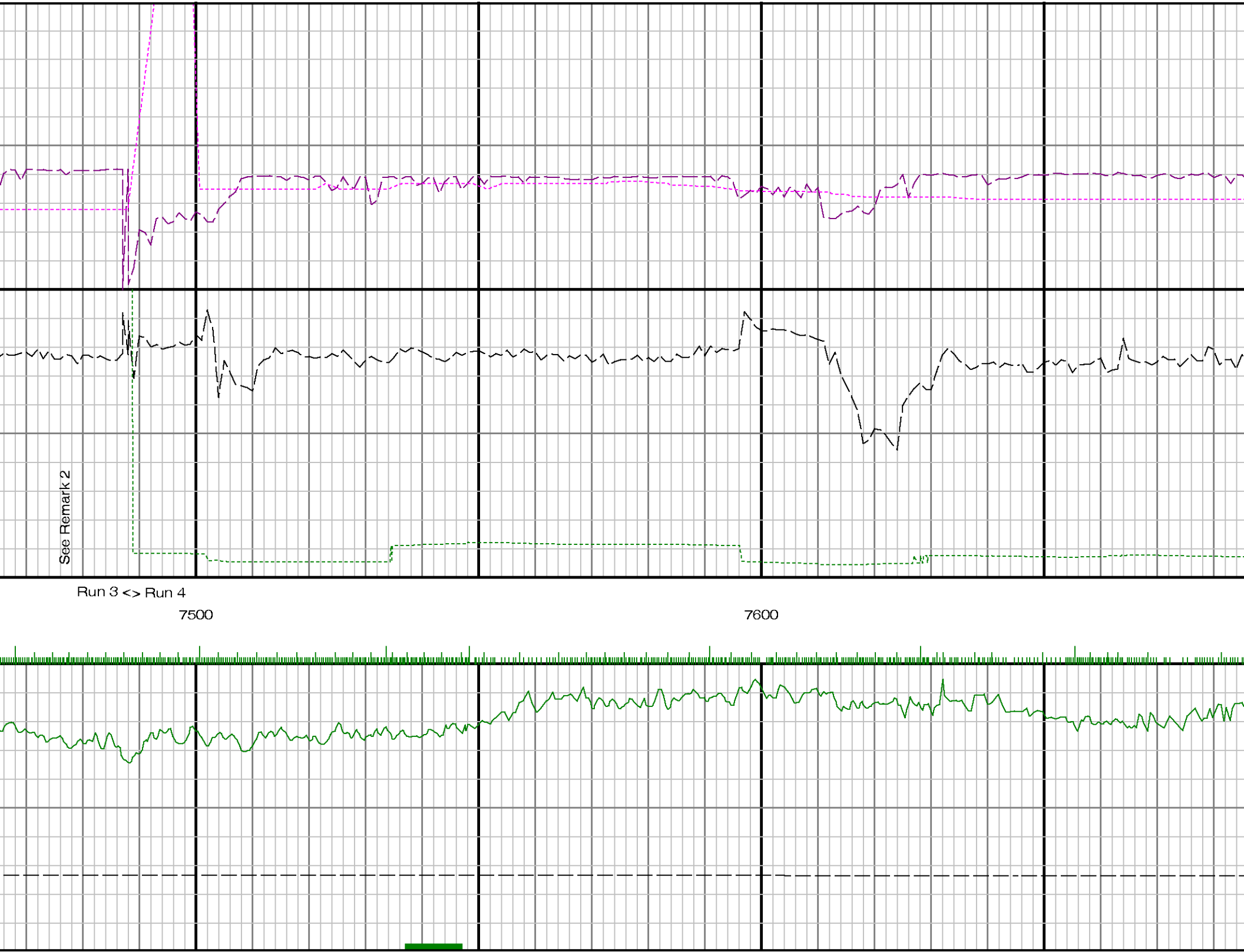
7400
GRSI
GRIX
GRAX
TVD
GRTX
ROPA
TCDX
WOBA
7" Casing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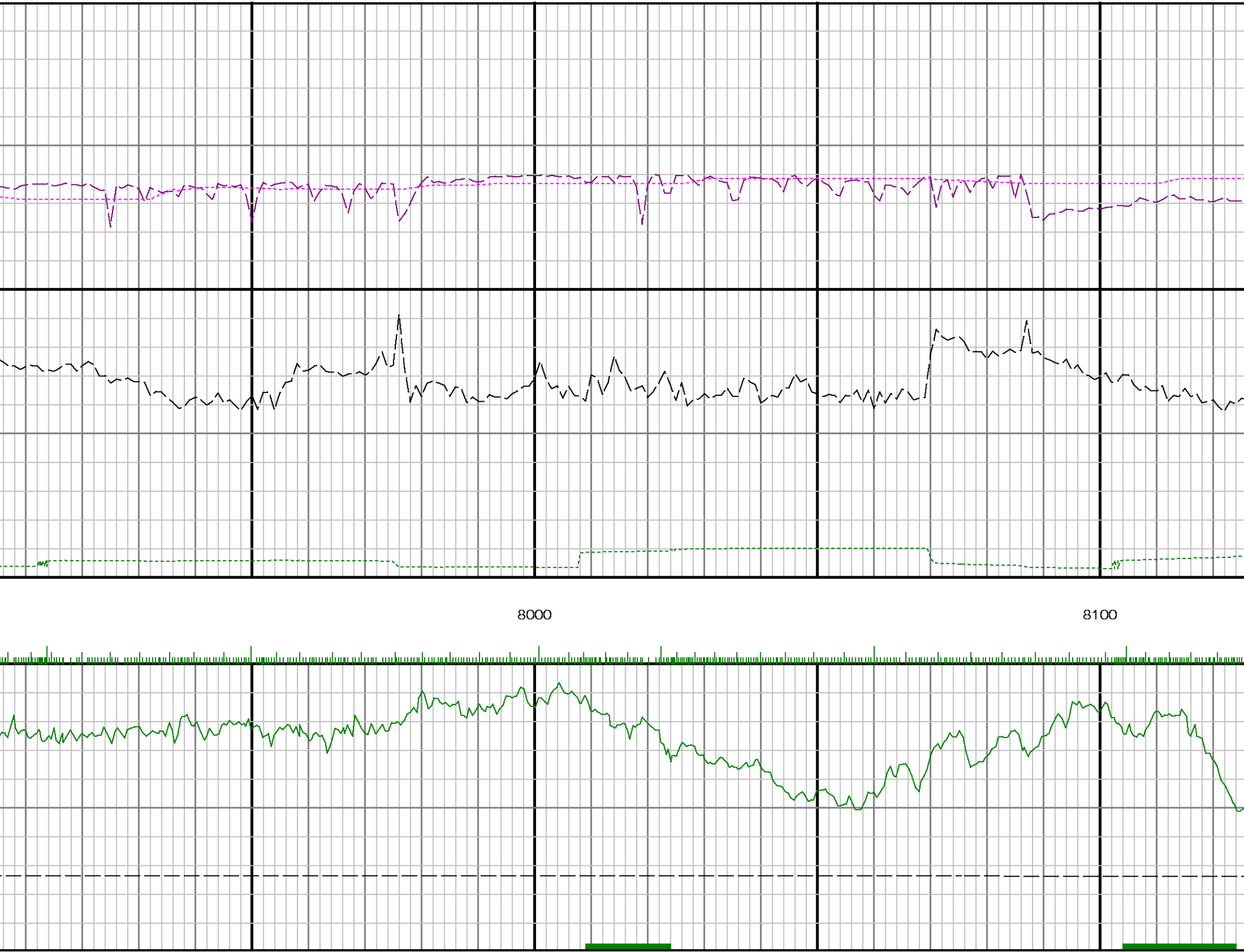
7600

7700

7800

7900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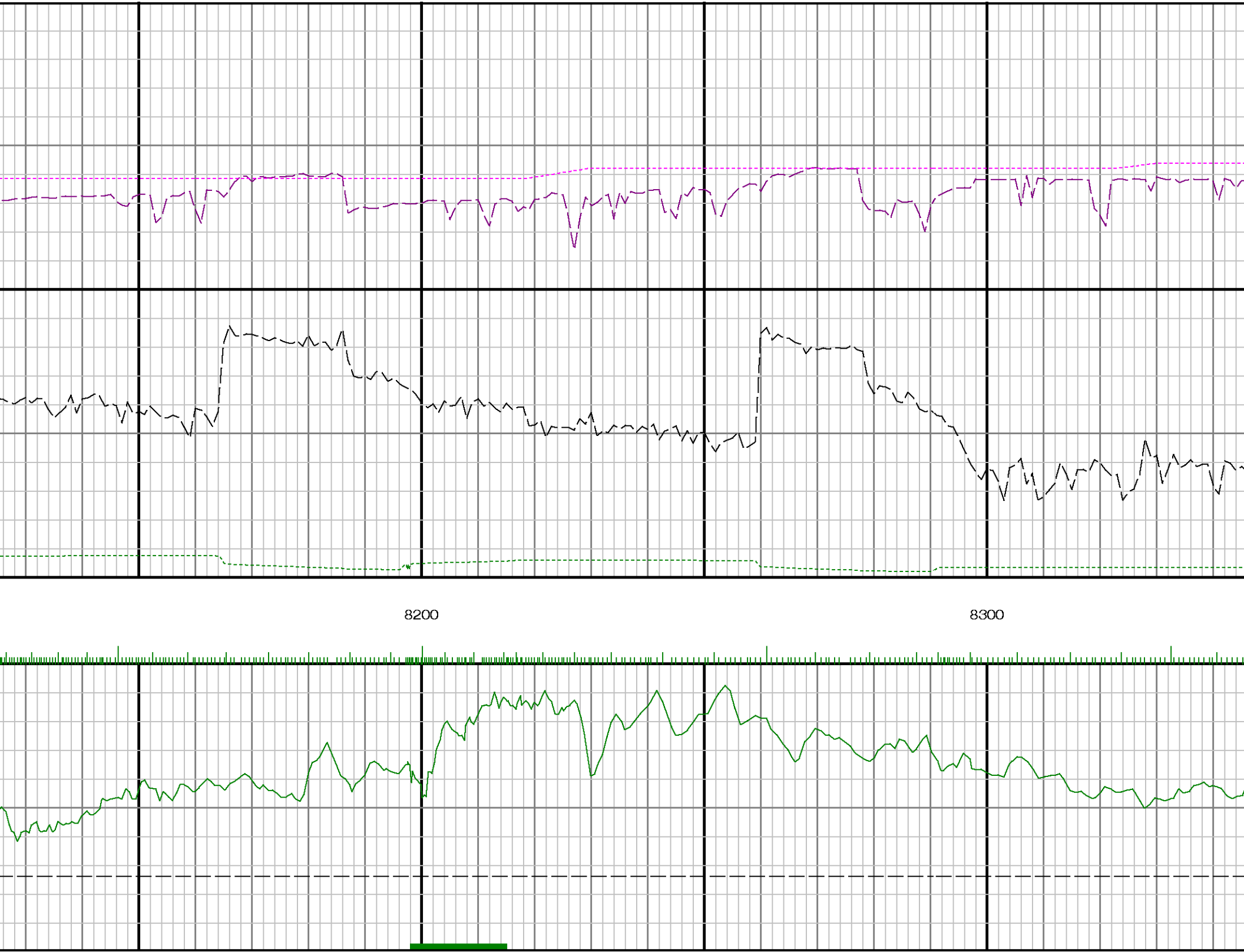
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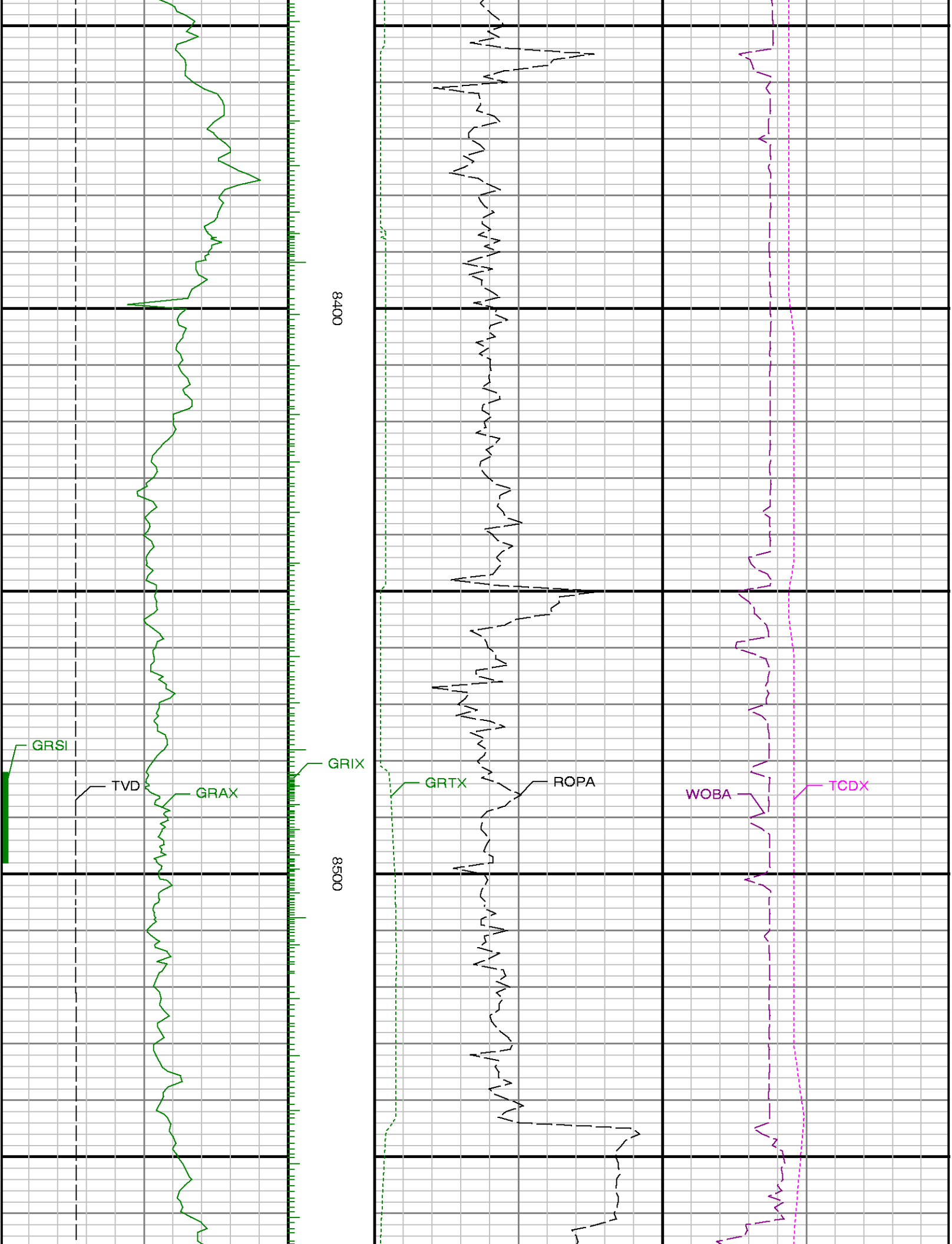
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8500
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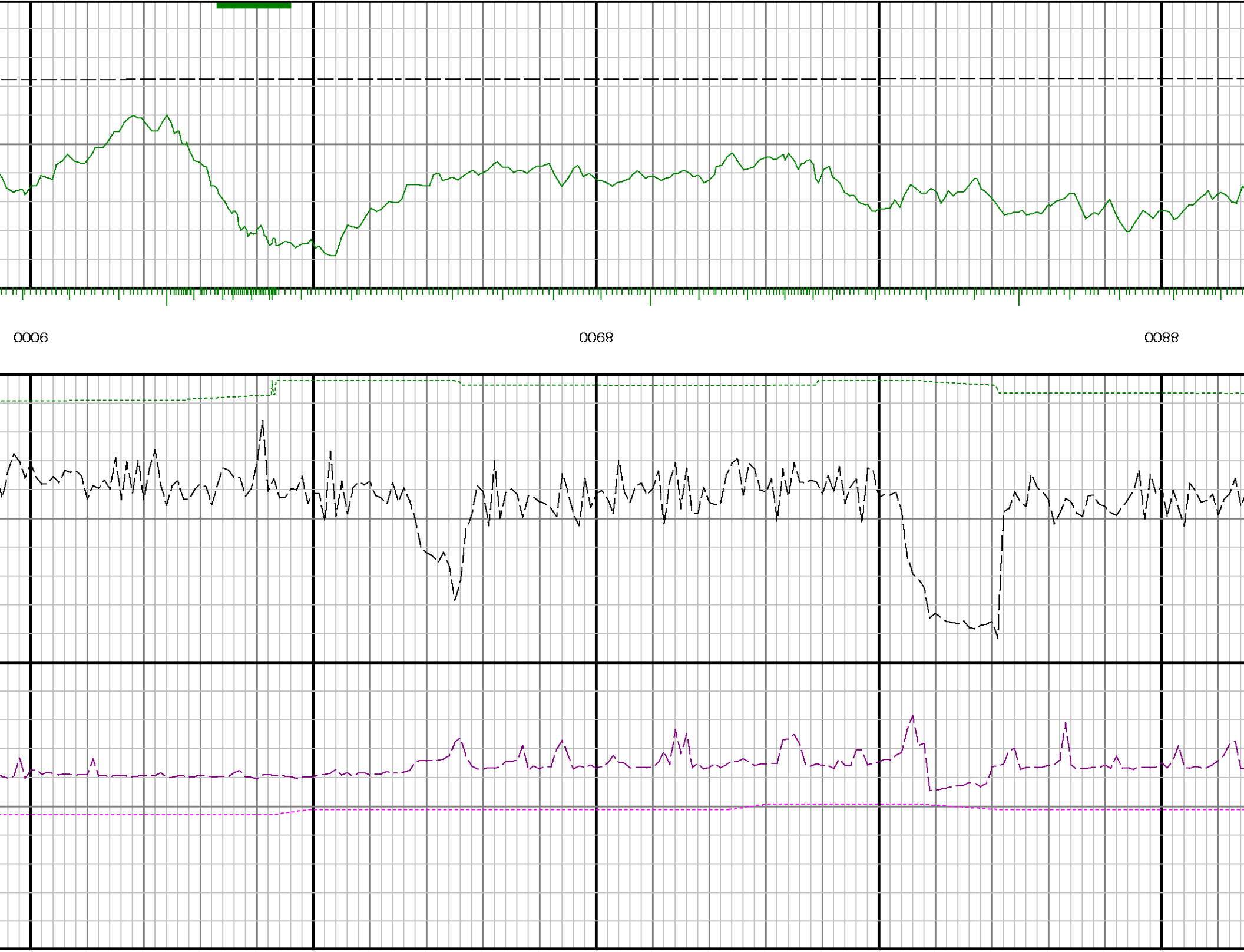
GRIX
GRTX
ROPA
WOBA
TCDX

8600

8700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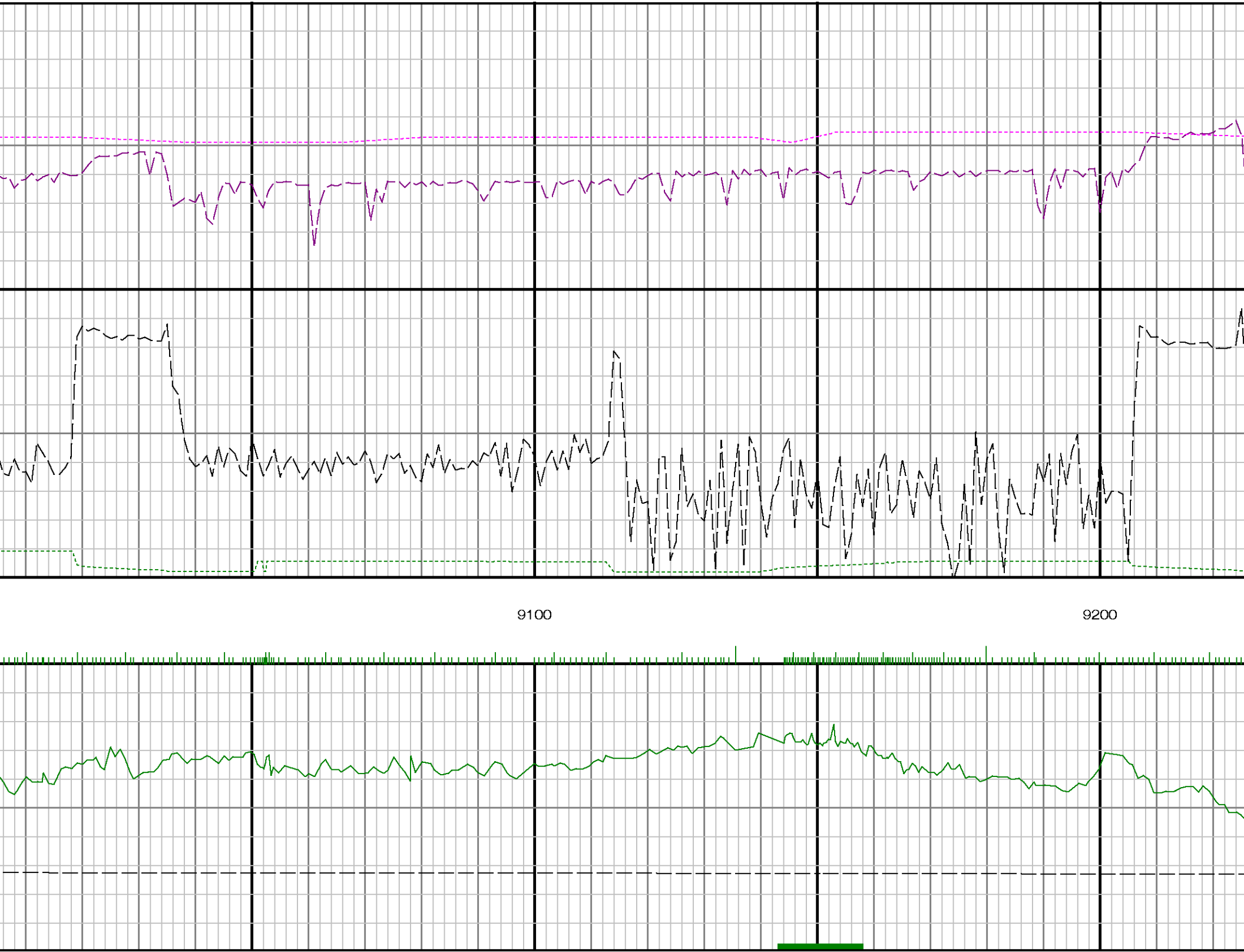
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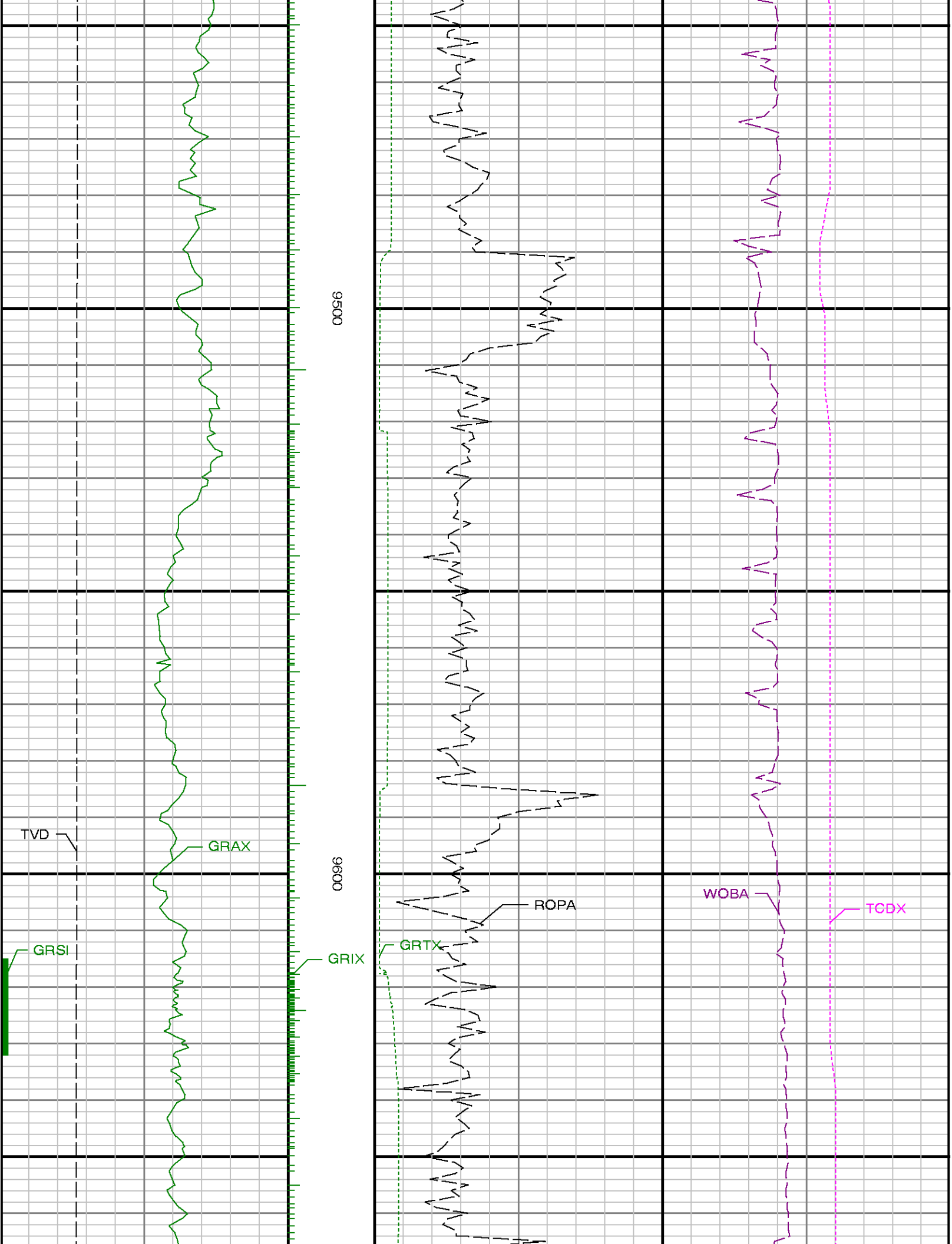
9200

9300

9400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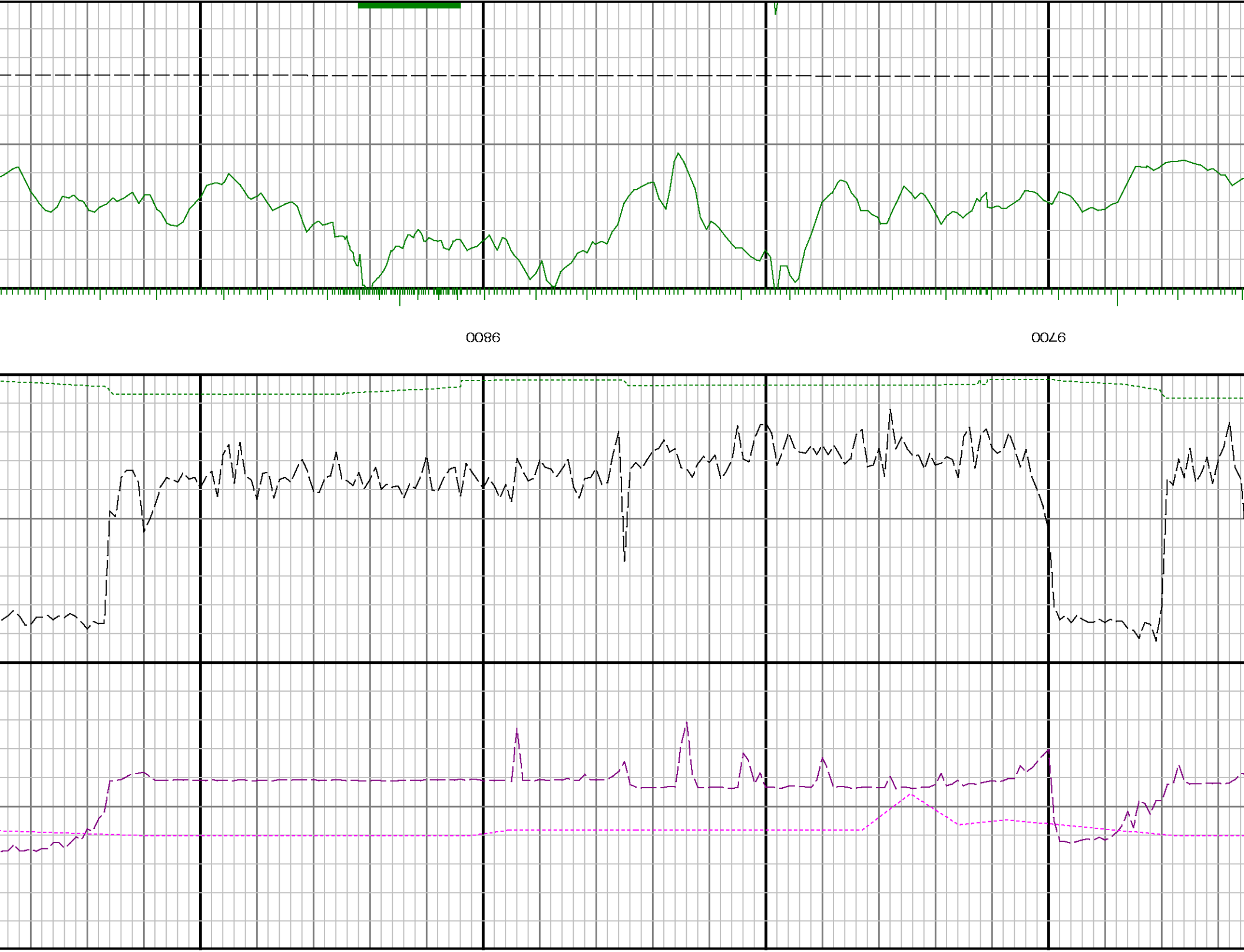
GRIX
GRTX
ROPA
WOBA
TCDX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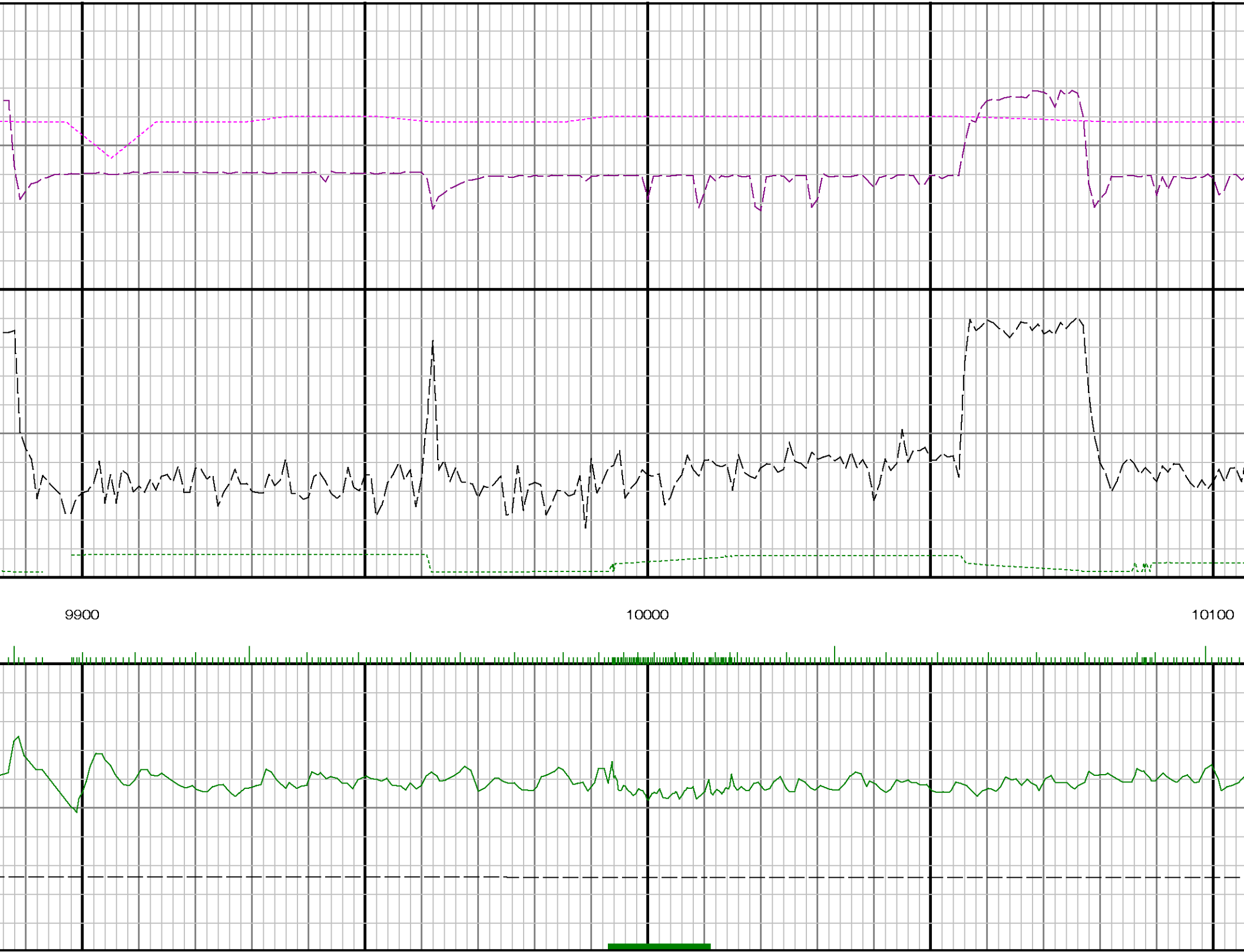
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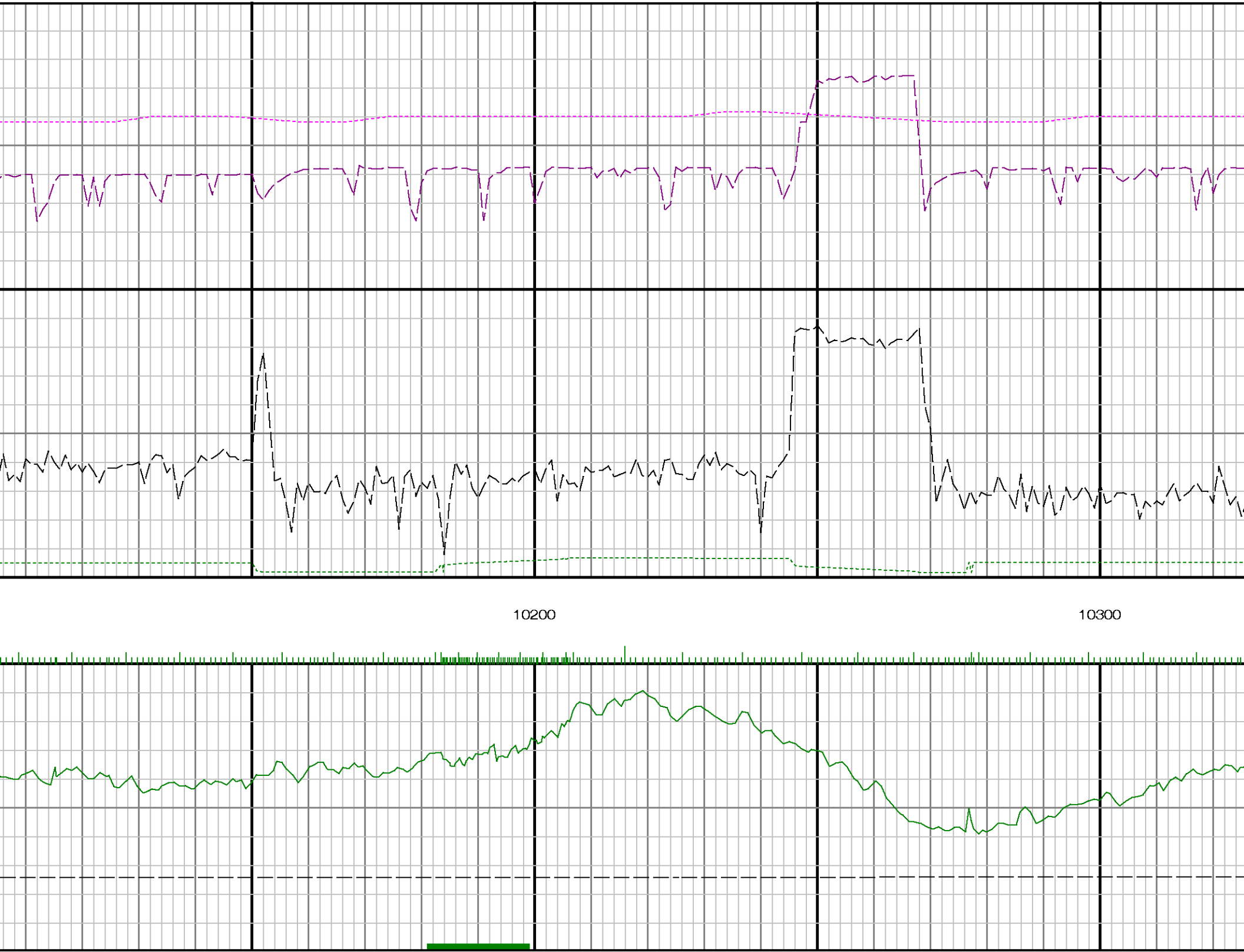
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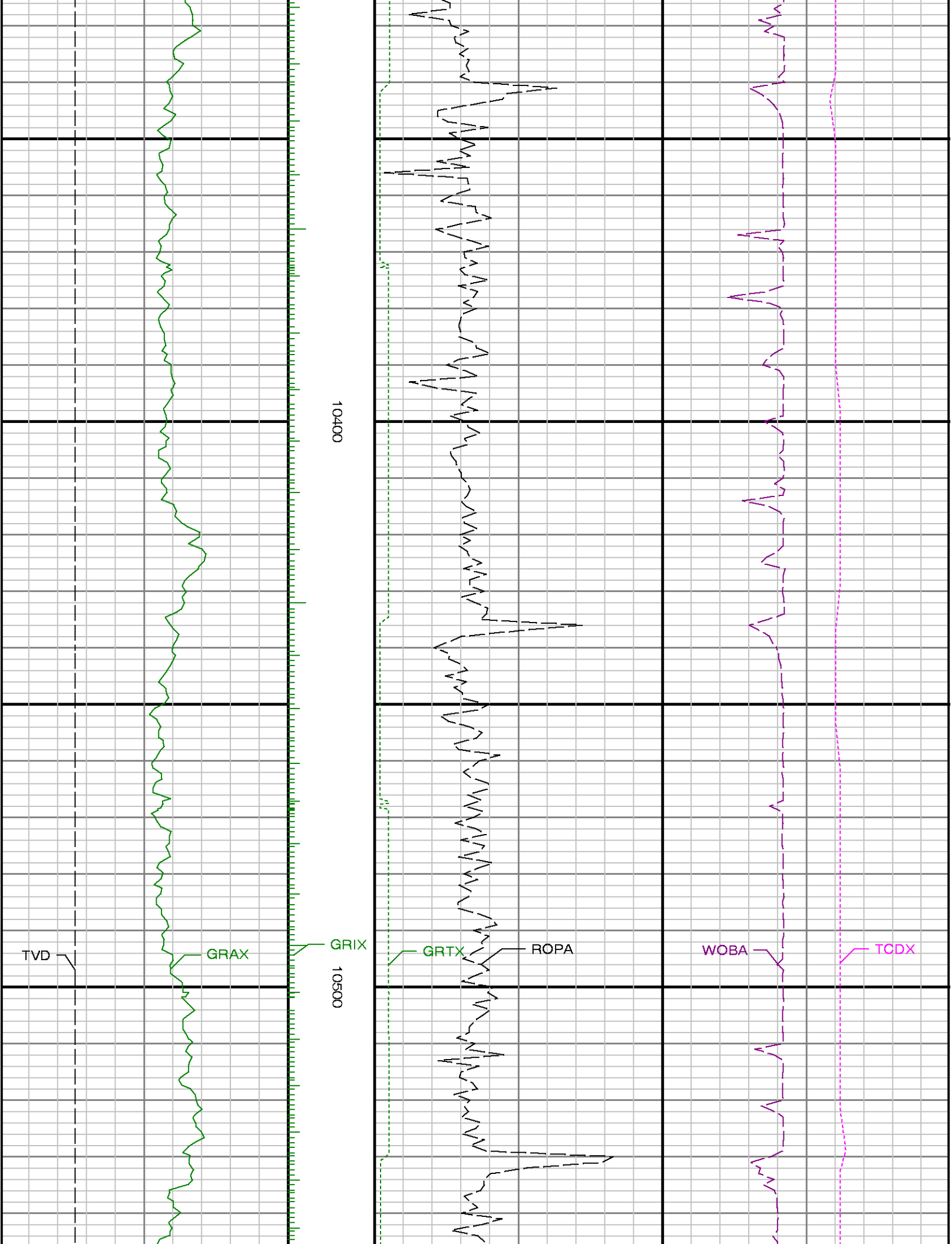
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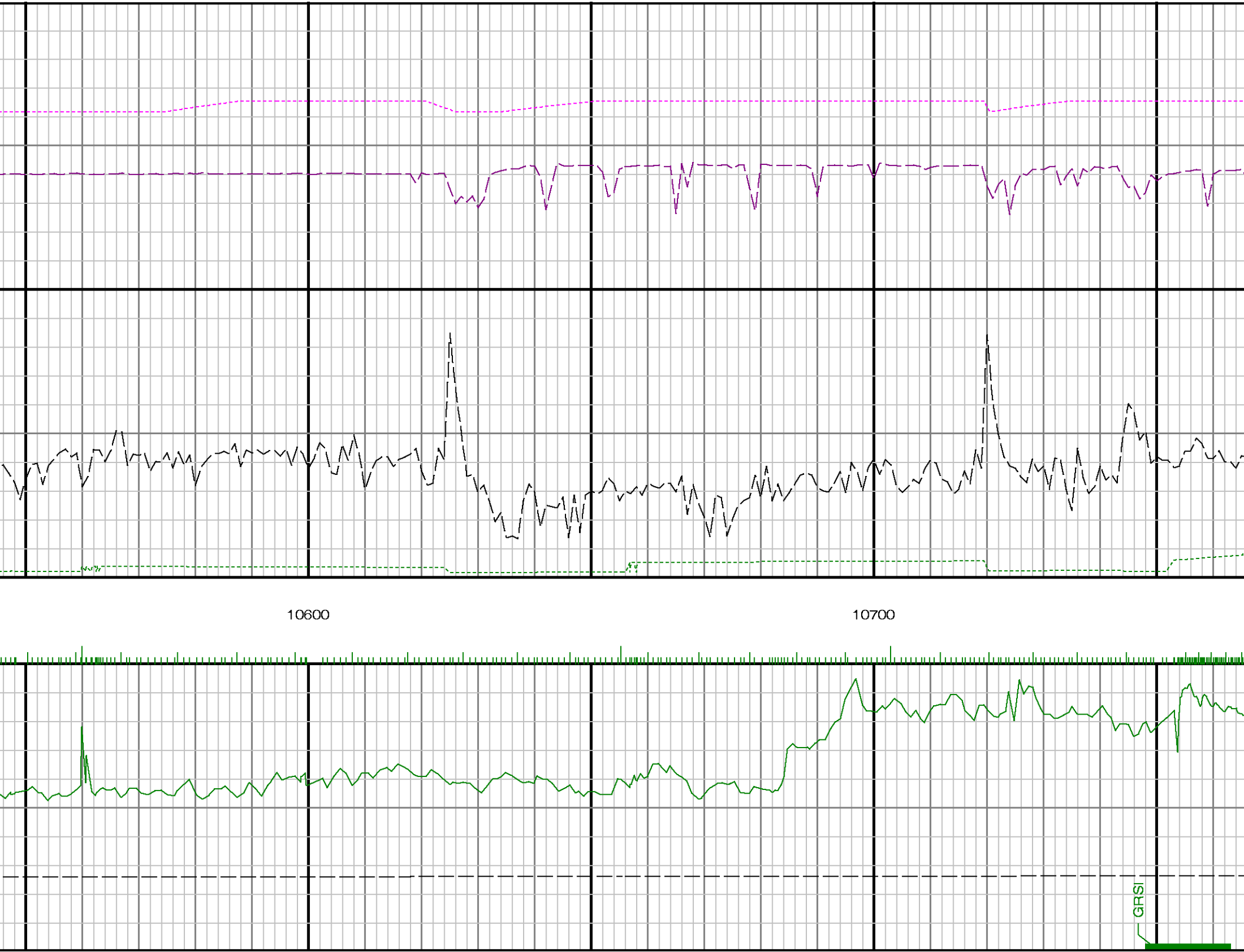
TVD
GRAX
GRIX
GRTX
ROPA
WOBA
TCDX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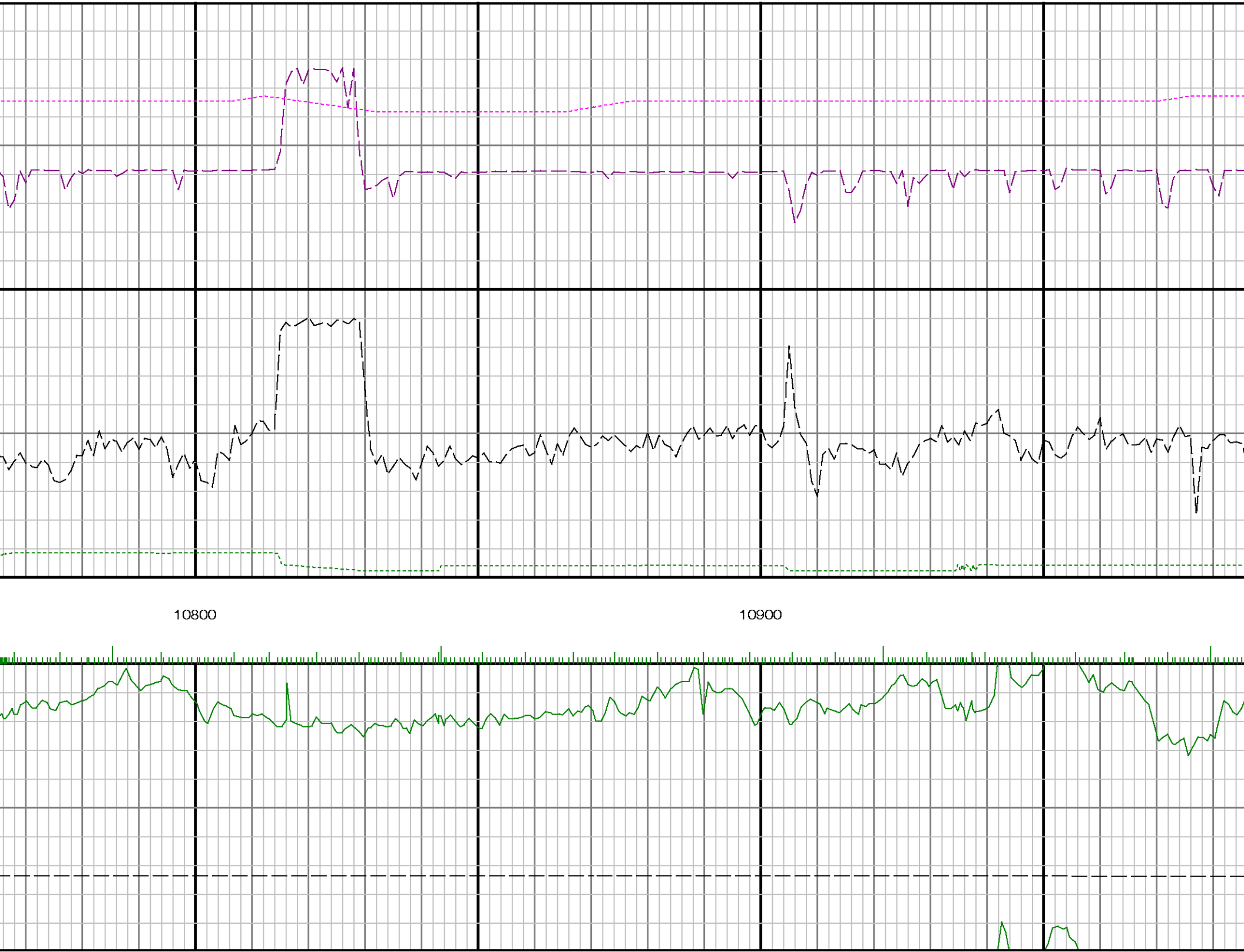
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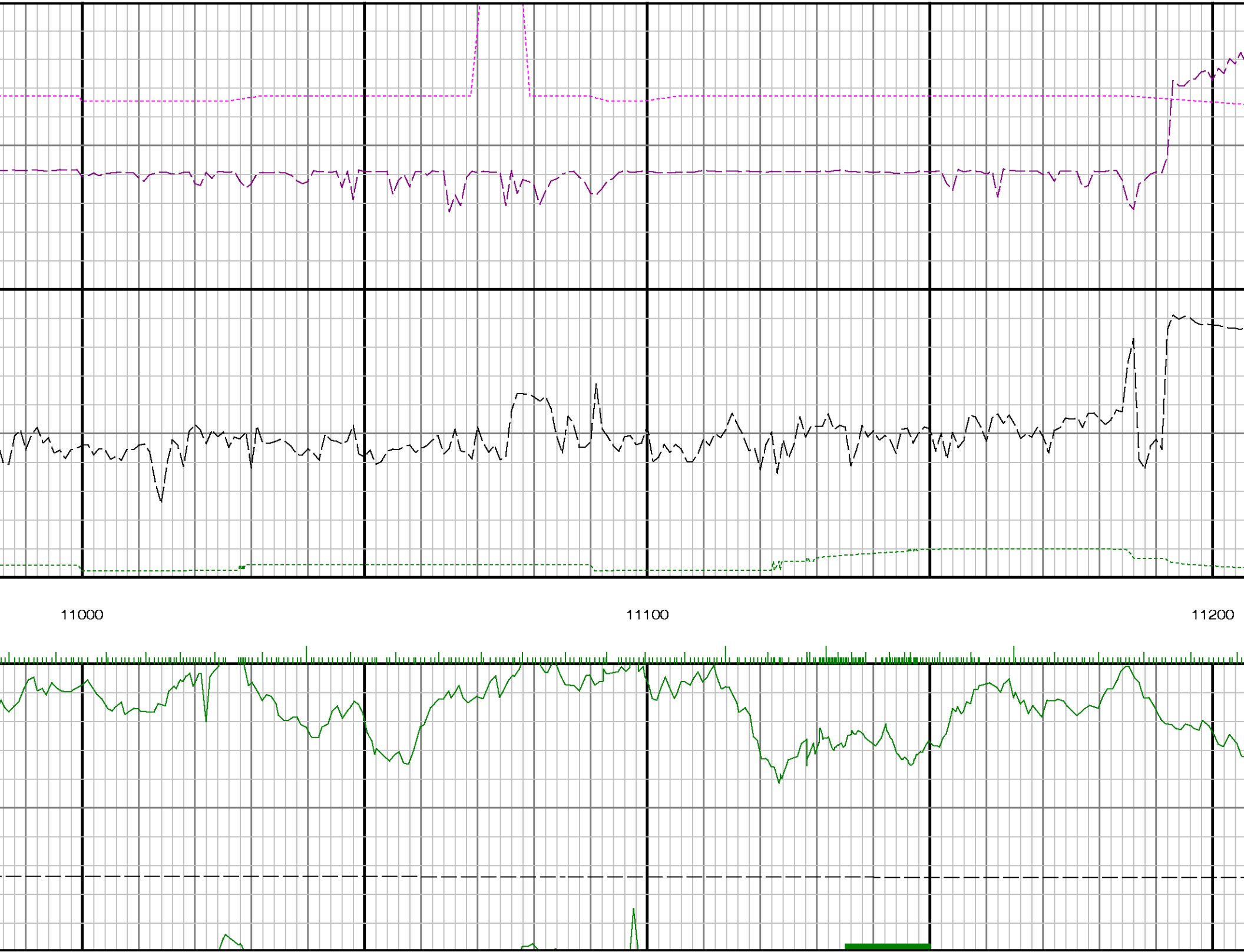
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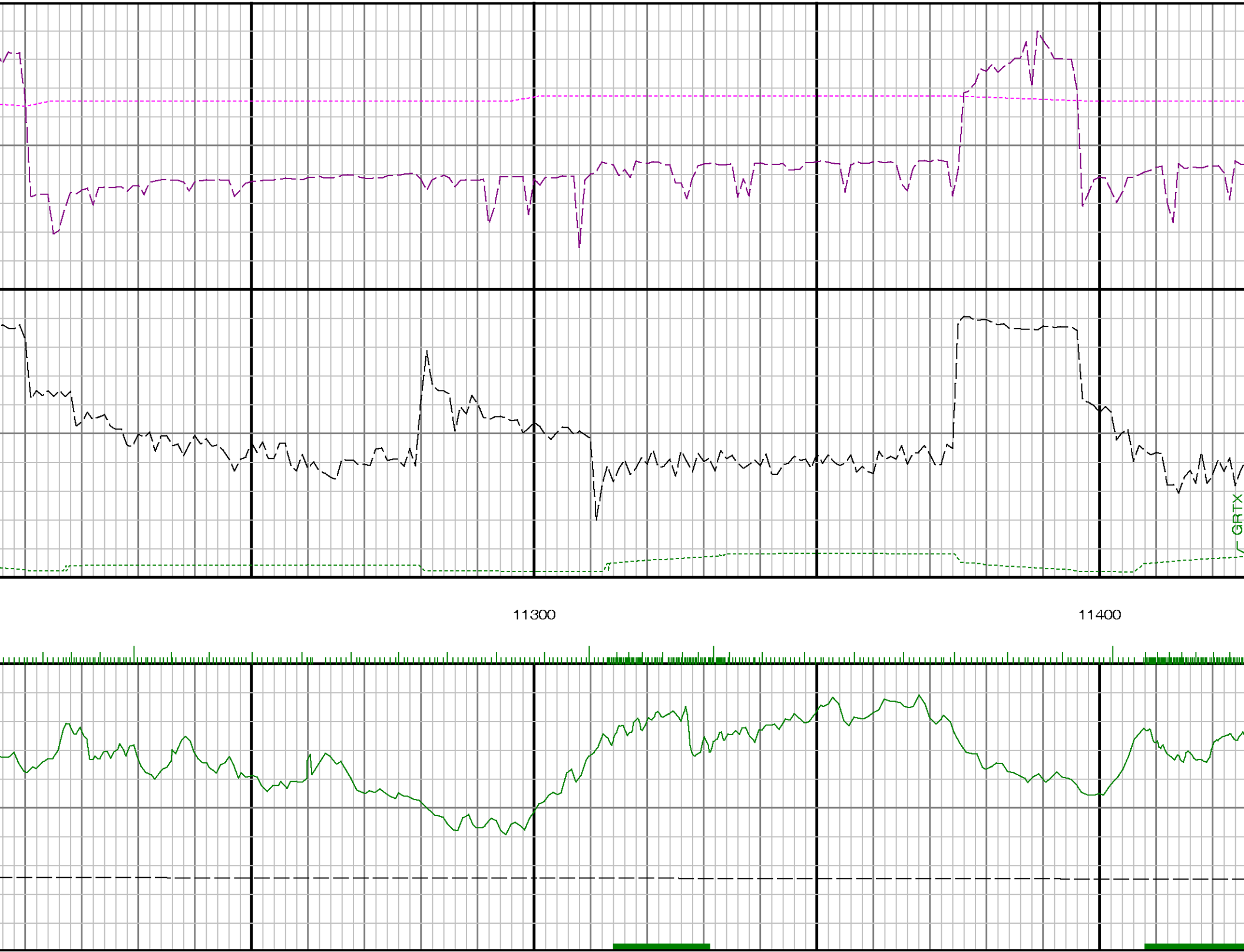
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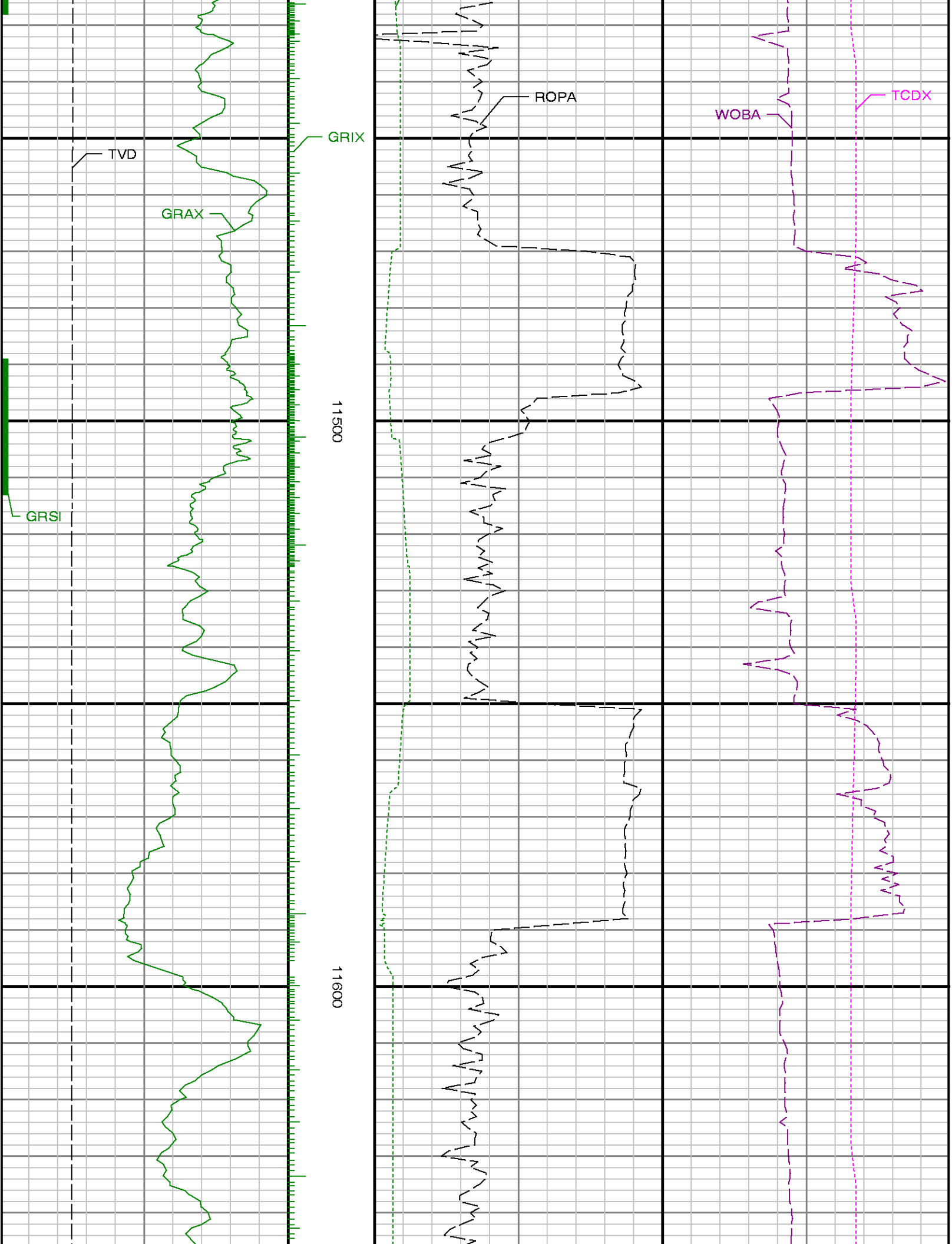
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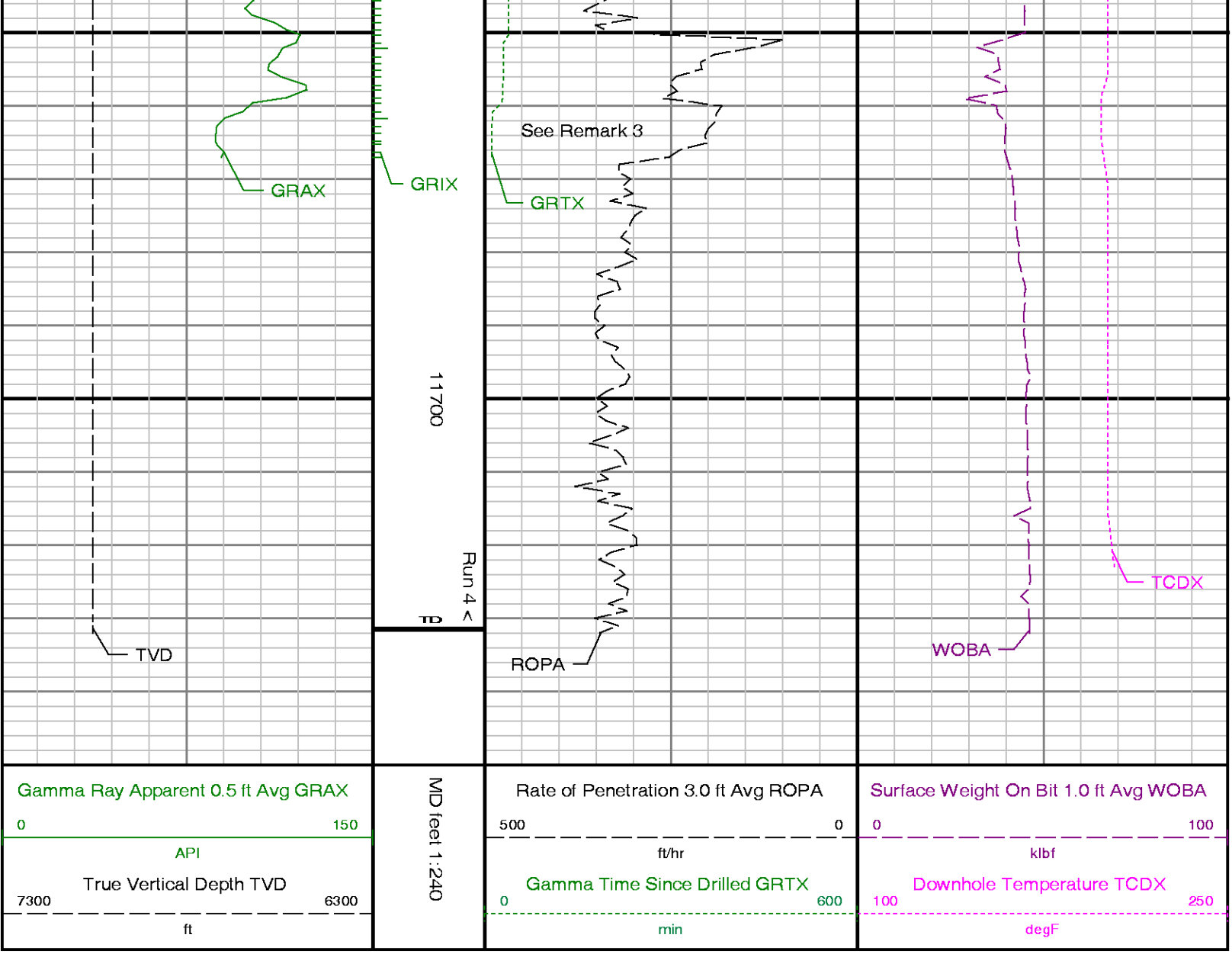
GRAX
GRIX
GRSI
ROPA
WOBA
TCDX
11500
11600


GRAX
GRIX
See Remark 3
GRTX
TVD
11700
Run 4 <
ROPA
WOBA
TCDX
Gamma Ray Apparent 0.5 ft Avg GRAX
0
150
API
True Vertical Depth TVD
7300
6300
ft
MD feet 1:240
Rate of Penetration 3.0 ft Avg ROPA
500
0
ft/hr
Gamma Time Since Drilled GRTX
0
600
min
Surface Weight On Bit 1.0 ft Avg WOBA
0
100
klbf
Downhole Temperature TCDX
100
250
degF