



REALTIME LOG

Natural Formation Evaluation
Gamma Ray

Scale: **Company: Anadarko**

1:240

Well: **Kerbs 5N-14HZ**

MEASURED DEPTH

Field: **Weld County (Kerr McGee)**

County: **Weld County** State: **Colorado**

Status: **Final Print** Surface Location: Latitude: 40° 13' 42.341" N Other Services:

API Number: 05123381880000 Longitude: 104° 56' 34.699" W Directional VSS

Section: 13 TWN: 3N Range 68W

Permanent Datum (P.D.): Mean Sea Level Elevation: 4898.00 ft. Elevations: N/A

Log Measured From: Rig Floor 4898.00 ft. Above P.D. DF: 4898.00 ft.

Depth Reference: Driller's Depth GL: 4872.00 ft.

Interval Logged Dates Magnetic Field Reference

Top: 6350.0 ft. Date From: 19/Mar/14 Dip Angle: 66.88 ° Azi Reference North: True

Bottom: 16856.0 ft. Date To: 27/Mar/14 Total Mag to Reference

Spud Date: 18/Mar/14 Field Strength: 52569.3 nT North Correction: 8.70 °

Borehole Record

Casing Record

| Hole Size | From | To | Size | Weight | From | To |
|------------|------------|-------------|-----------|-------------|---------|------------|
| 13.500 in. | Surface | 1094.0 ft. | 9.600 in. | 36.00 lb/ft | Surface | 1094.0 ft. |
| 8.750 in. | 1094.0 ft. | 7379.0 ft. | 7.000 in. | 26.00 lb/ft | Surface | 7369.0 ft. |
| 6.125 in. | 7379.0 ft. | 16856.0 ft. | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Mud Record

Deviation Record

| Type | From | To | Hole Size | Interval | Inc / Az (Start) | Inc / Az (End) |
|-----------------|---------|-------------|------------|------------|------------------|------------------|
| Water Based Mud | Surface | 16856.0 ft. | 13.500 in. | Surface | 0.0 ° / 176.4 ° | 0.4 ° / 143.7 ° |
| | | | 8.750 in. | Vert/Curve | 0.4 ° / 143.7 ° | 84.2 ° / 272.2 ° |
| | | | 6.125 in. | Lateral | 84.2 ° / 272.2 ° | 92.6 ° / 271.1 ° |
| | | | | | / | / |
| | | | | | / | / |
| | | | | | / | / |

Acquisition System Software Version

Other

| | | | | | | |
|-----------|----------|-------------------|-----------------|---------------------------------|--|--|
| Advantage | 2.20U4 | Rig / Contractor: | H&P 307 | / Helmerich & Payne Drilling Co | | |
| PATS | 6.4.1.34 | Job No: | 6161779 | / D & E | | |
| | | District / Unit: | Rocky Mountains | | | |

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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 | Bottom | From | To | Start | | End | | |
| | | | | | | | (ft.) | (ft.) | (ft.) | (ft.) | | | | | |
| 1 | 1 | 1 | 8.750 | PDC | | Steerable | 6350.0 | 7319.0 | 1094.0 | 7379.0 | 19/Mar/2014 | 23:54 | 20/Mar/2014 | 13:34 | 31 |
| 2 | 2 | 2 | 6.125 | PDC | | Steerable | 7319.0 | 16793.0 | 7379.0 | 16856.0 | 22/Mar/2014 | 18:24 | 27/Mar/2014 | 05:34 | 110 |

Crew

| Name | Arrive | Depart | Name | Arrive | Depart | Name | Arrive | Depart |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Wellsite | Wellsite | | Wellsite | Wellsite | | Wellsite | Wellsite |
| Nick Roosen | 18 Mar 2014 | 28 Mar 2014 | John Nguyen | 20 Mar 2014 | 28 Mar 2014 | Andrew King | 18 Mar 2014 | 20 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+ (%) |
|-------------|-------|----------------|----------------------------|-------------|------------------|-----------------------|------|-----------------------|----------------|--------|------------------------------|-----------|
| 19 Mar 2014 | 22:30 | 1 | 6248.0 | Water Based | 10.1 | 44 | 8.8 | N/A | 2/90 | Active | 300 | N/A |
| 20 Mar 2014 | 21:00 | 1 | 7379.0 | Water Based | 10.1 | 44 | 9.2 | N/A | 2/89 | Active | 300 | N/A |
| 22 Mar 2014 | 10:00 | 2 | 7846.0 | Water Based | 9.4 | 40 | 10.2 | N/A | 2/93 | Active | 500 | N/A |
| 23 Mar 2014 | 10:00 | 2 | 9152.0 | Water Based | 9.5 | 44 | 9.5 | N/A | 2/93 | Active | 500 | N/A |
| 25 Mar 2014 | 10:00 | 2 | 13720.0 | Water Based | 9.4 | 50 | 9.8 | N/A | 4/90 | Active | 300 | N/A |
| 26 Mar 2014 | 22:00 | 2 | 16255.0 | Water Based | 9.4 | 56 | 9.4 | N/A | 3/90 | Active | 500 | 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.) |
|-------------------|------|------------------|-------------|------------------------|----------------------|----------------------|
| 1 | DIR | 12168818 | Directional | 62.17 | 6.750 | 3.250 |
| 1 | SRIG | 12521741 | Gamma | 60.66 | 6.750 | 3.250 |
| 2 | DIR | 12373454 | Directional | 66.15 | 4.750 | 2.625 |
| 2 | SRIG | 12722372 | Gamma | 62.77 | 4.750 | 2.625 |

Service and Tool Mnemonics

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

Comments

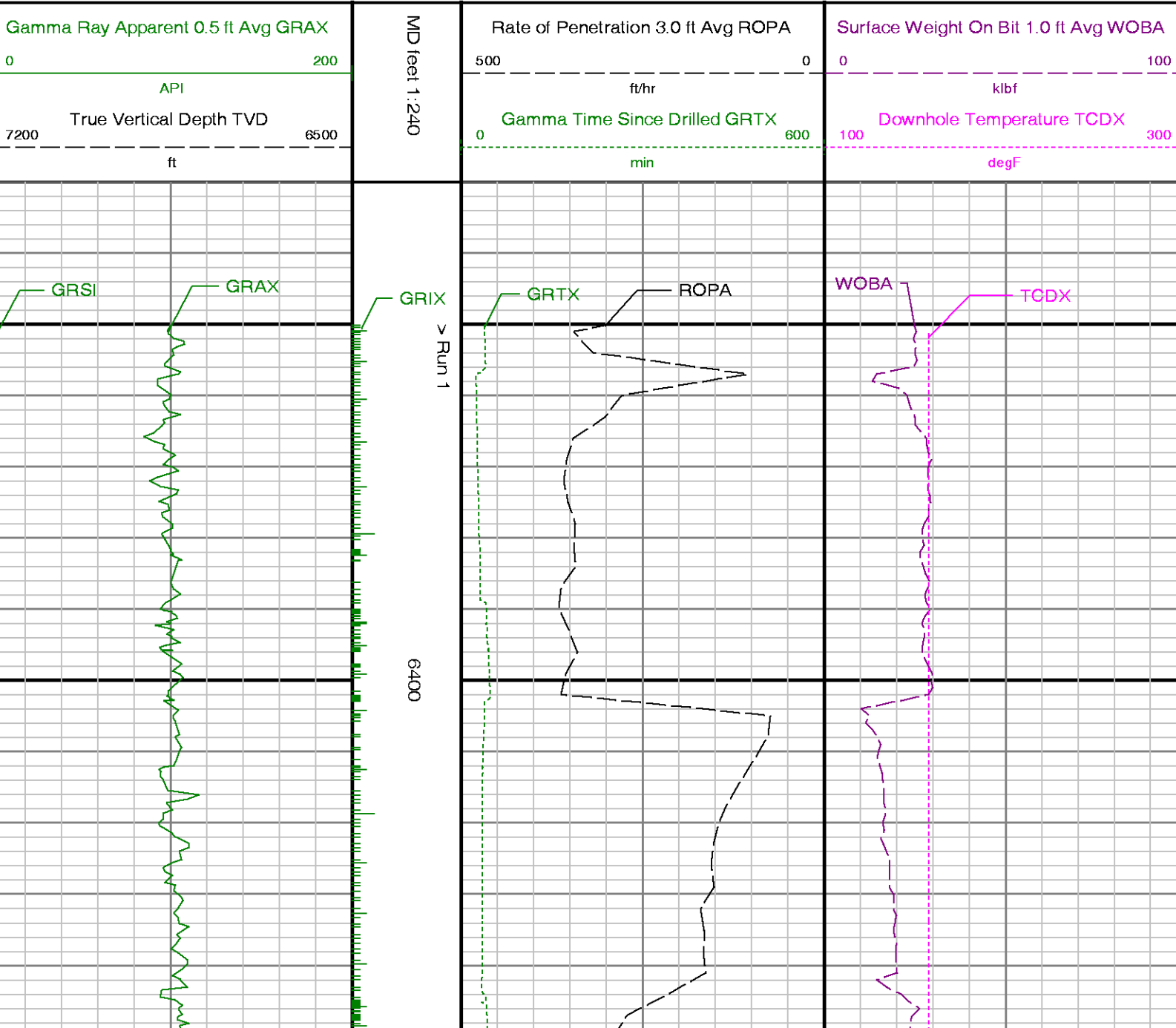
- (1) Baker Hughes INTEQ run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1094 to 7379 feet MD (1094 to 7012 feet TVD).
- (2) Baker Hughes INTEQ runs 2 utilized 4 3/4 inch NaviGamma services (Gamma Ray and Directional) behind a 6 1/8 inch bit and steerable assembly from 7379 to 16856 feet MD (7012 to 7062 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.

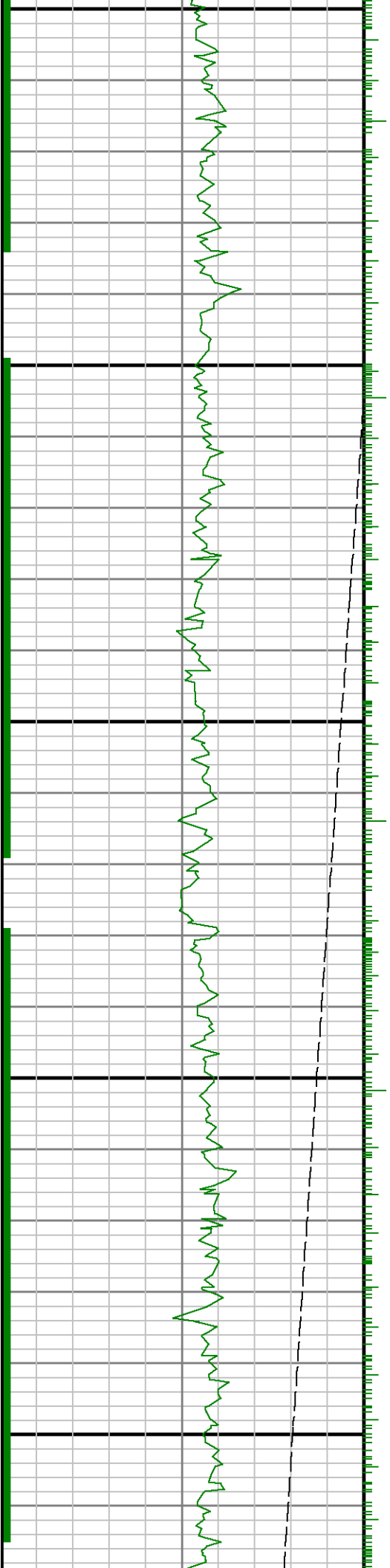
Remarks

| Number | Measured Depth (ft.) | Hole Section (in.) | LWD Run No. | Remark |
|--------|----------------------------|--------------------------|----------------|---|
| 1 | 7370 | 6.250 | 2 | The interval from 7319 to 7379 feet MD (7007 to 7012 feet TVD) was logged up to 54 hours after being drilled due to casing and cement operations prior to the beginning of Run 2. |
| 2 | 16850 | 6.250 | 2 | The interval from 16793 to 16856 feet MD (7065 to 7062 feet TVD) contains no logging data due to sensor offset from the bit at well TD. |



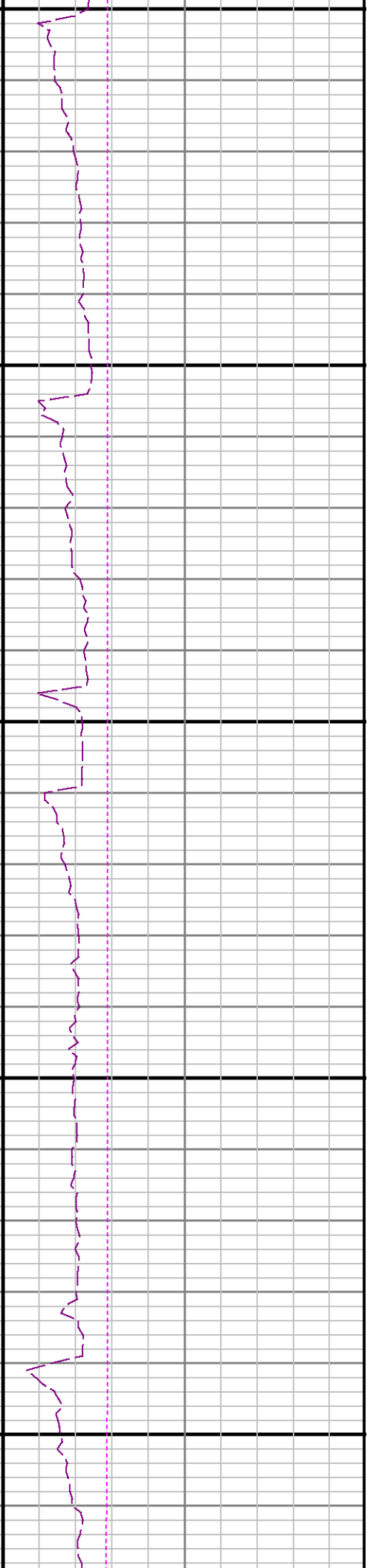
Company : Anadarko
Well : Kerbs 5N-14HZ
Interval : 6330.00 - 16880.00 feet
Created : 27/Mar/2014 8:05:03 AM

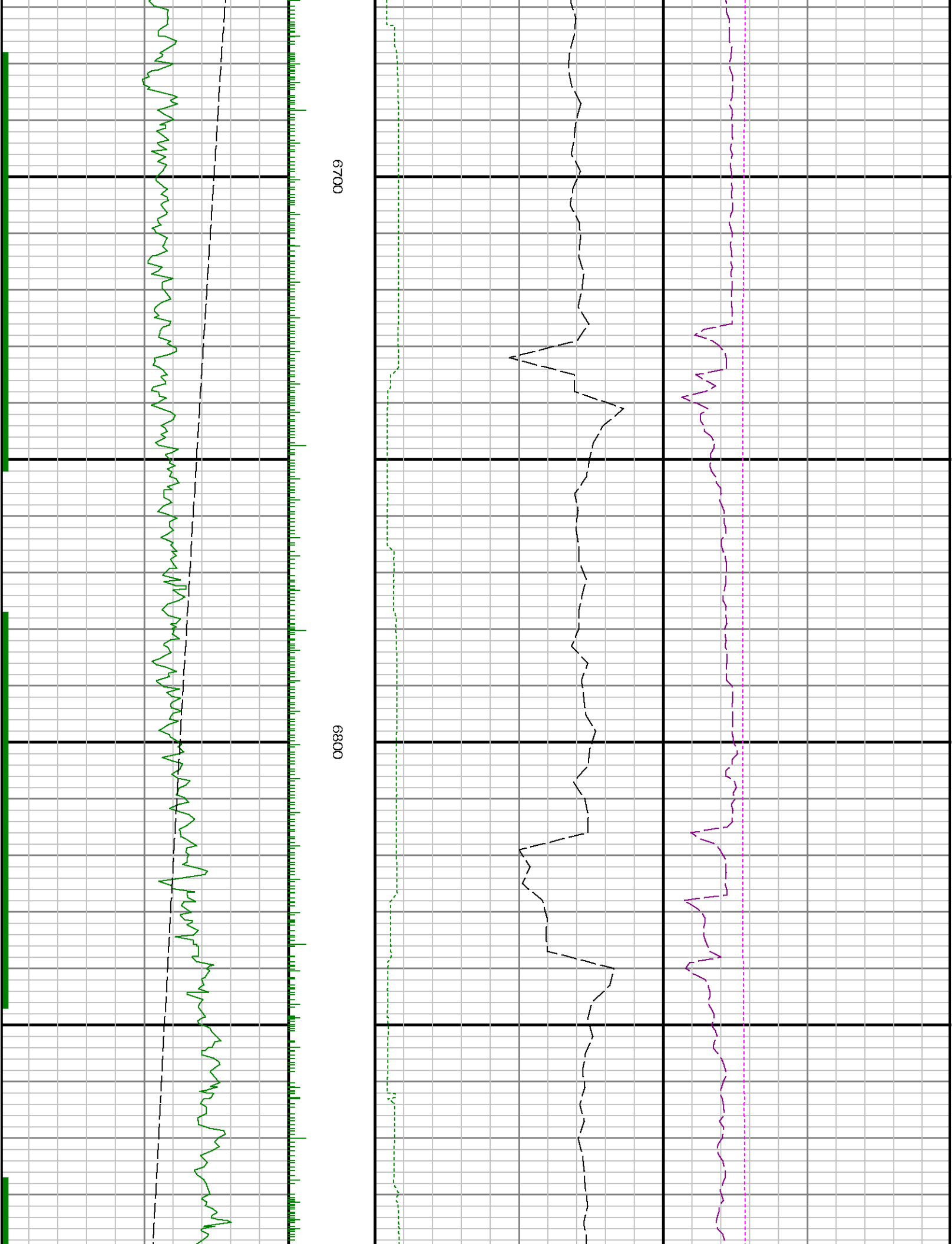


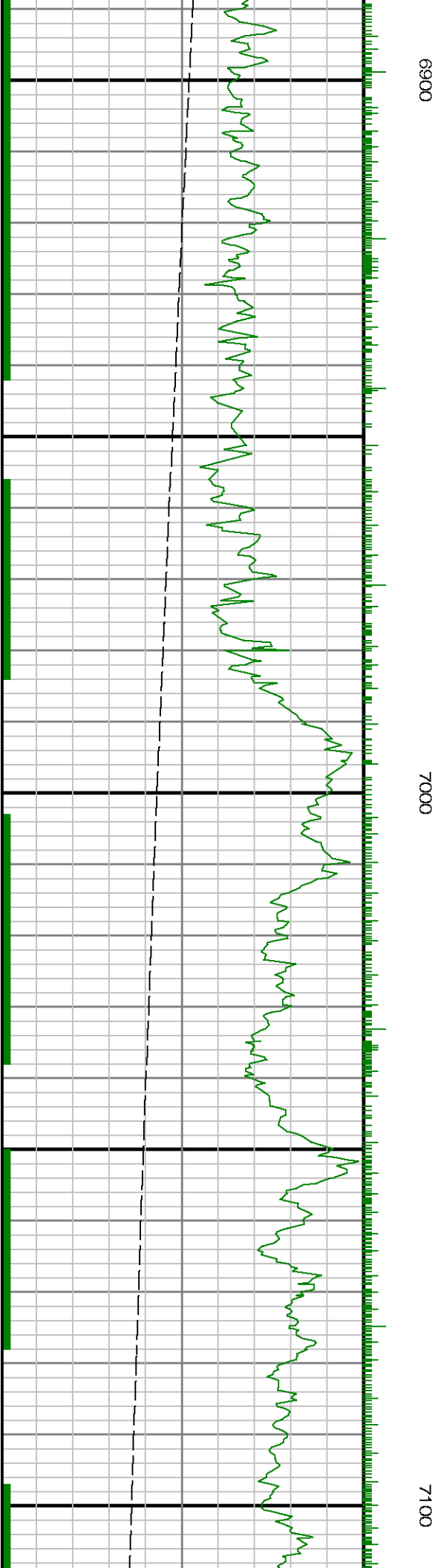
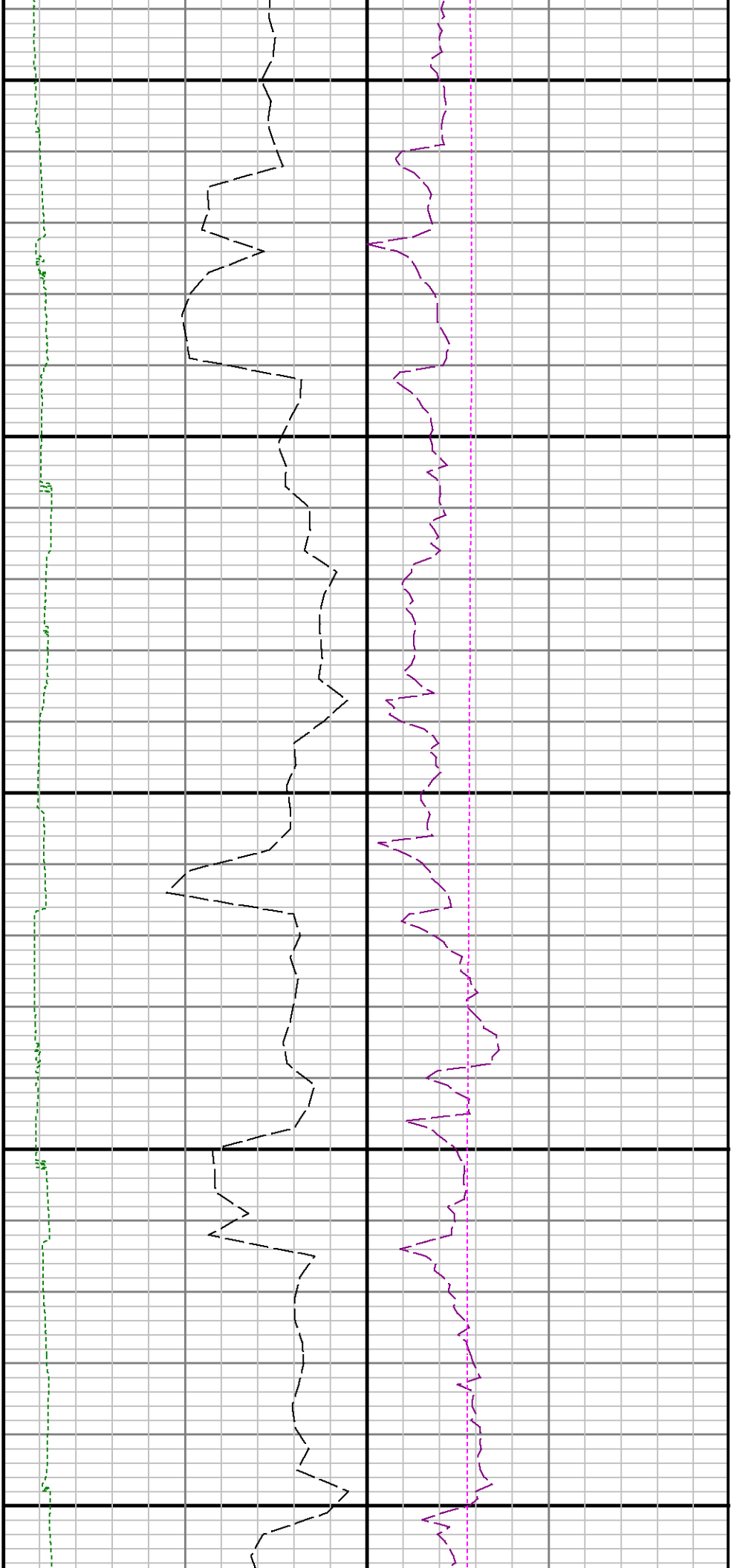


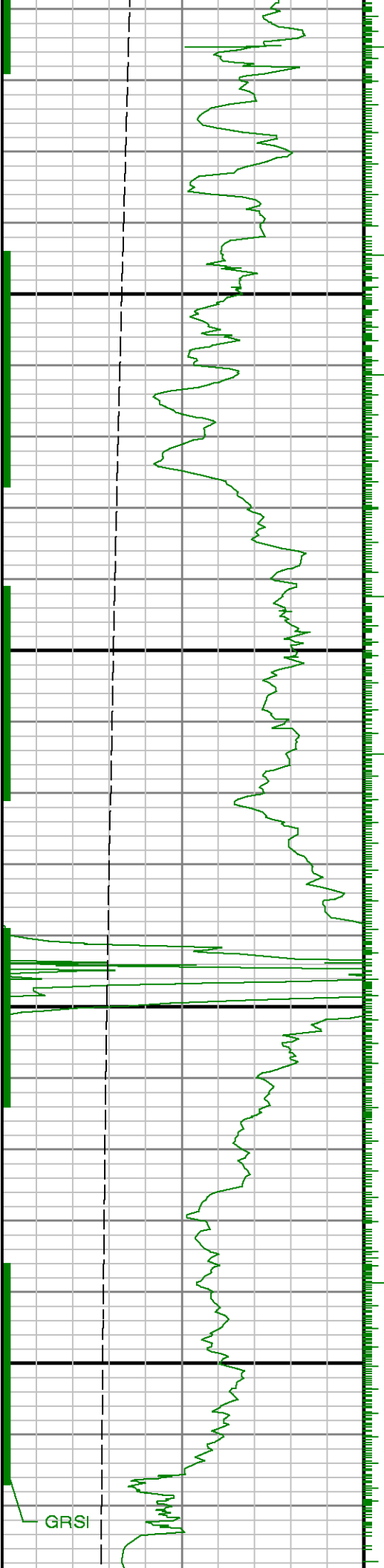
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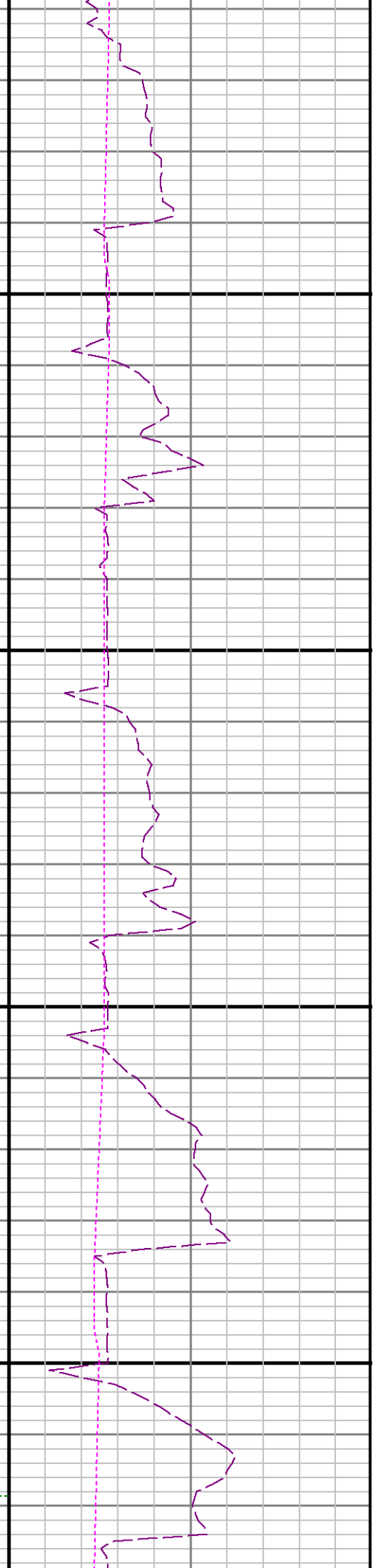


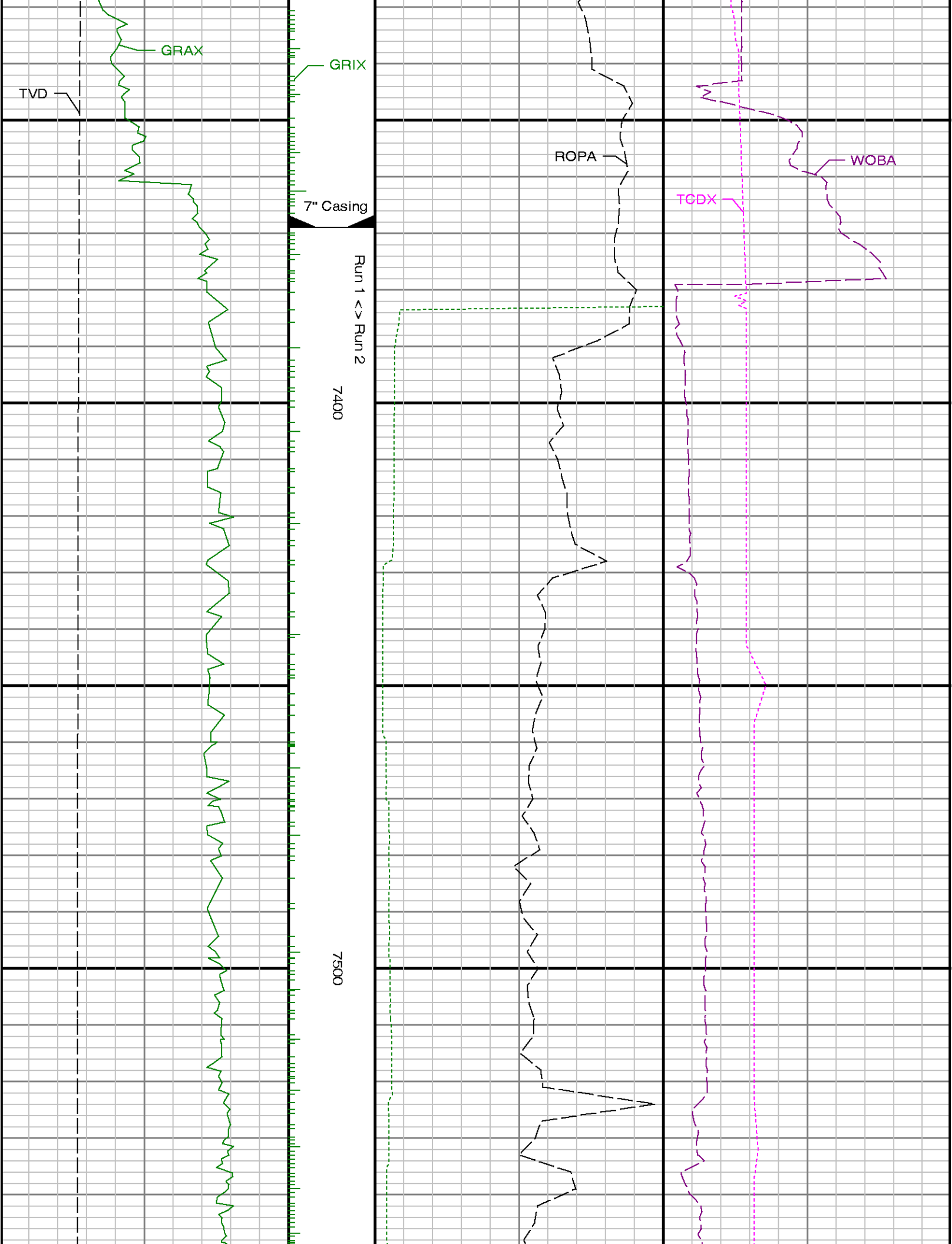
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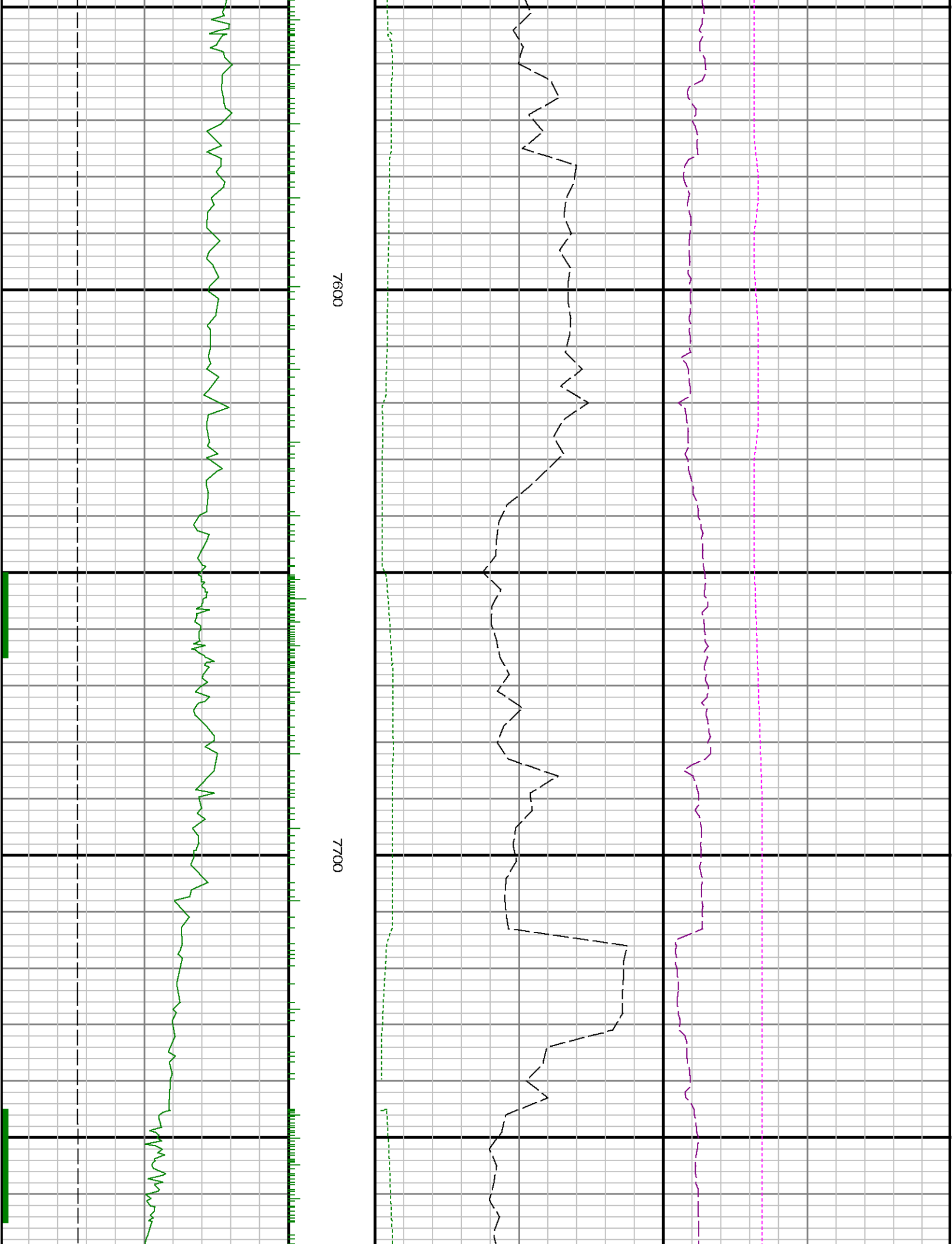
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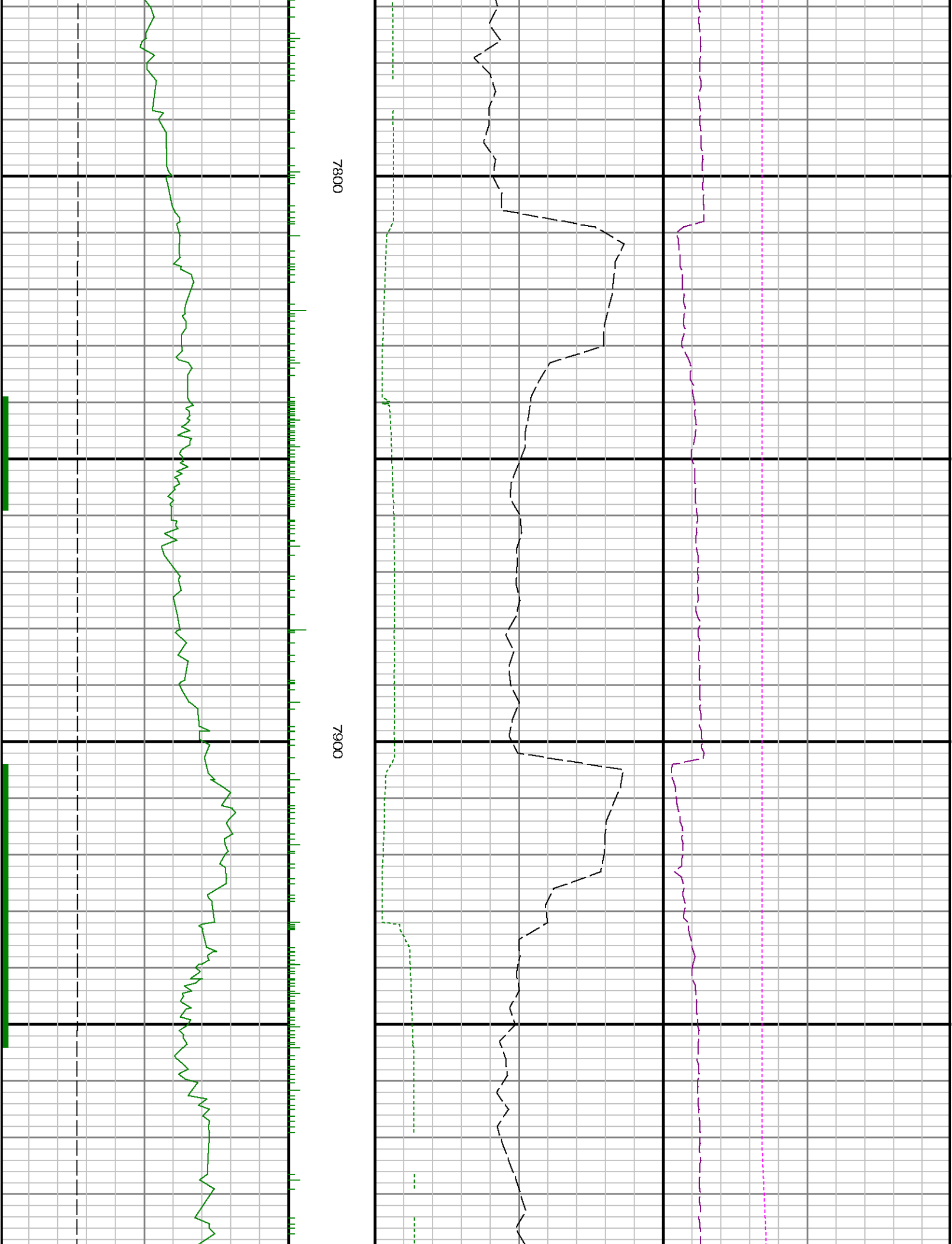


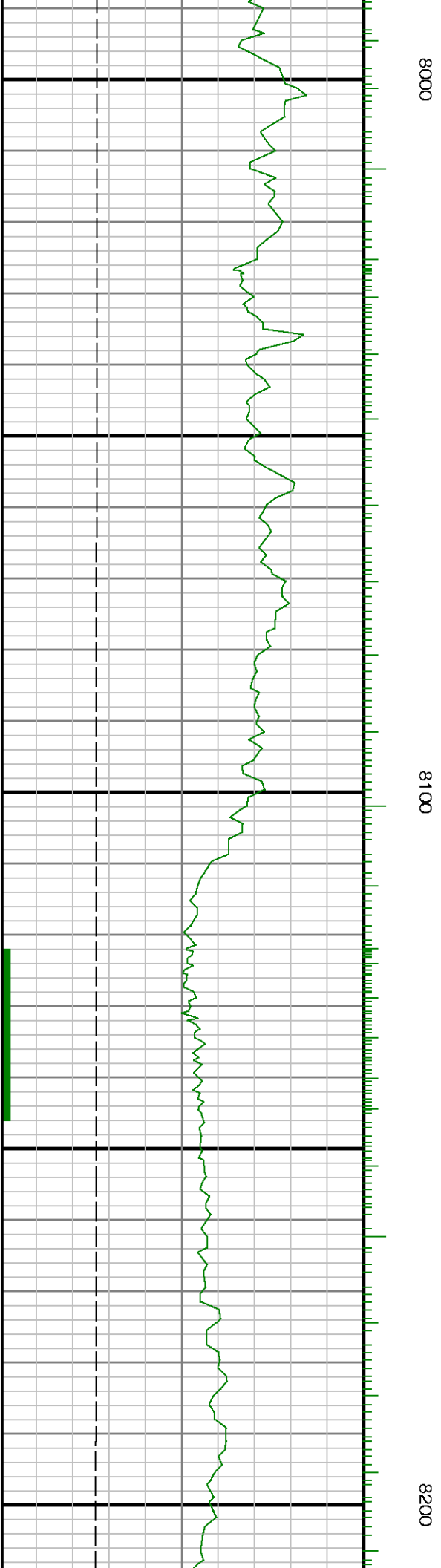
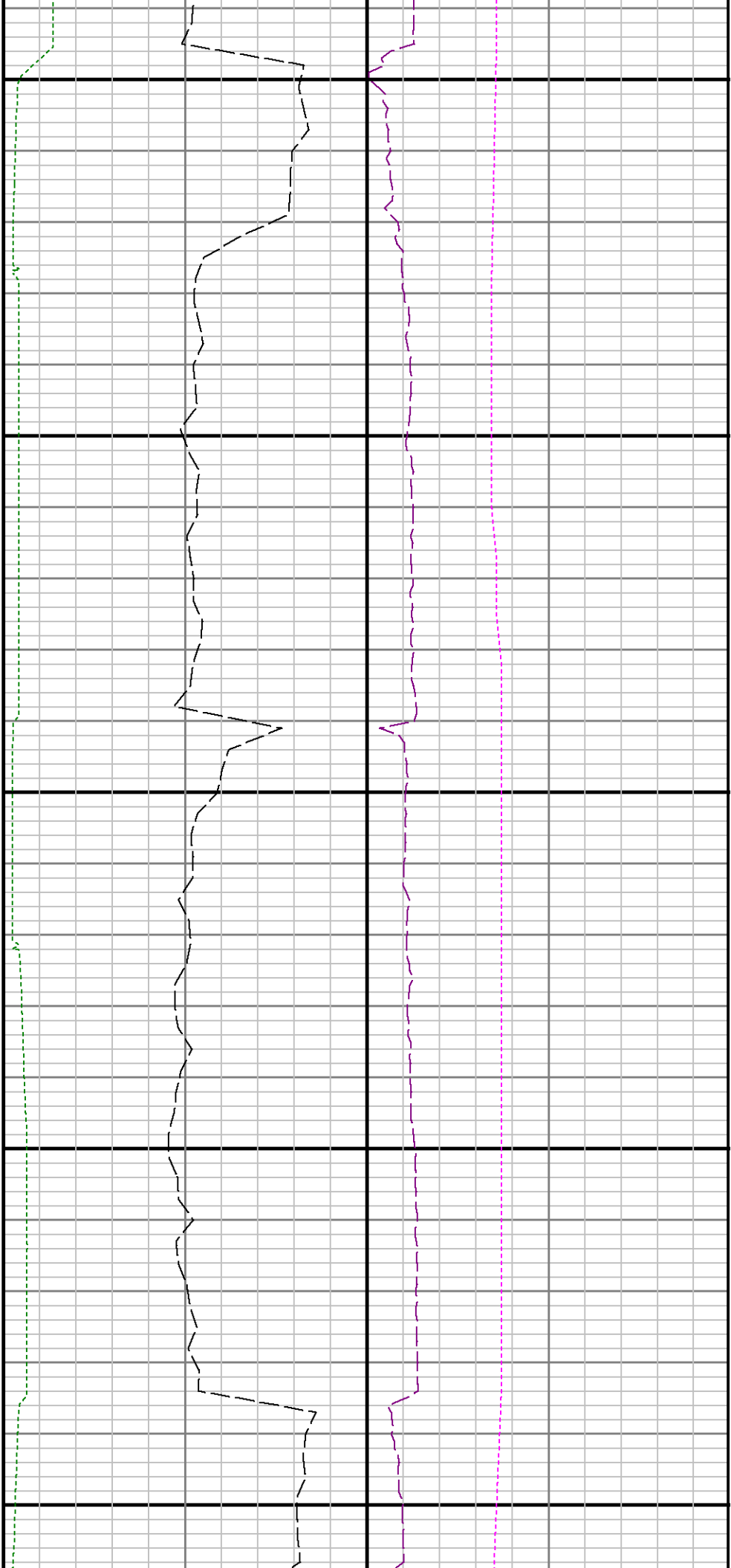
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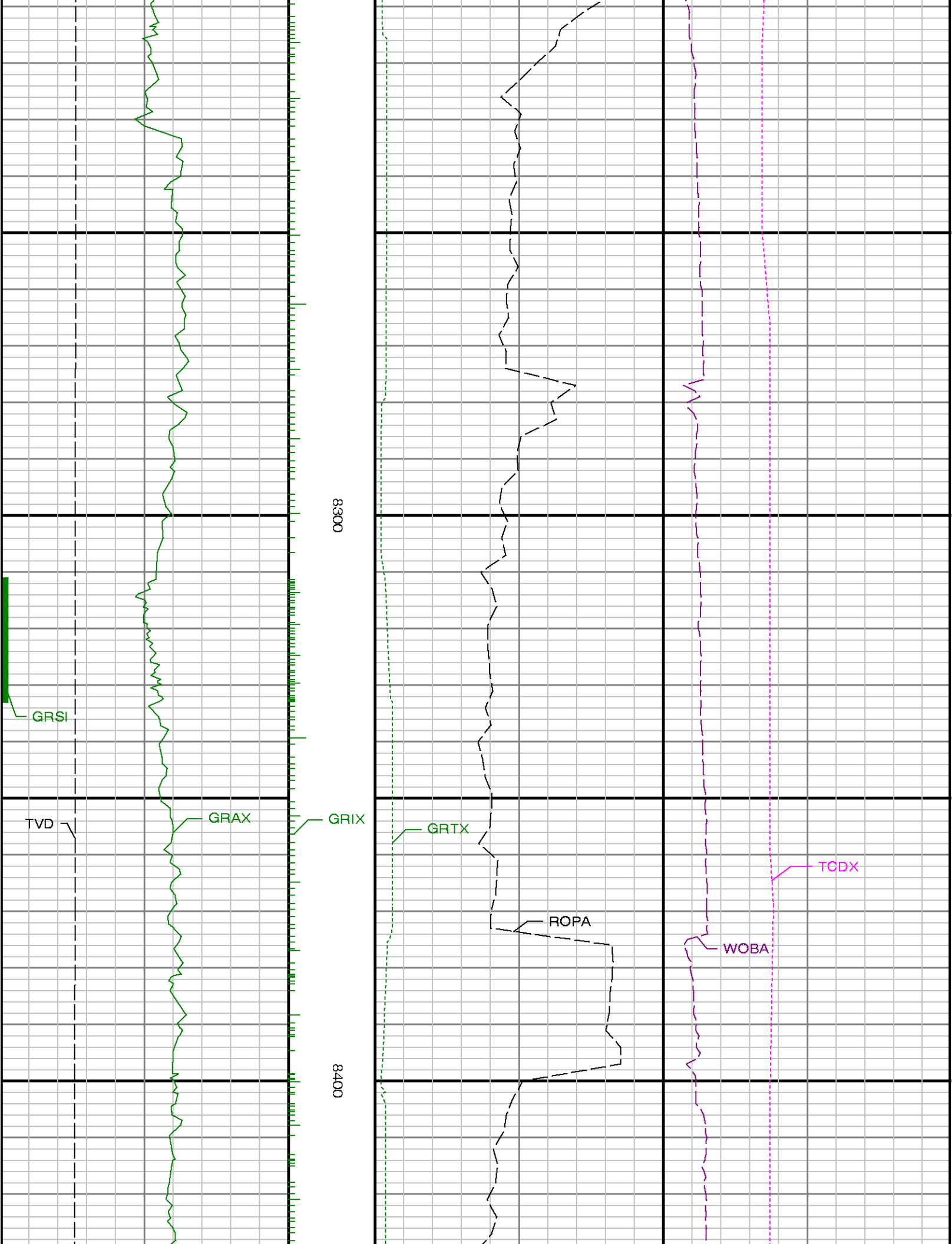


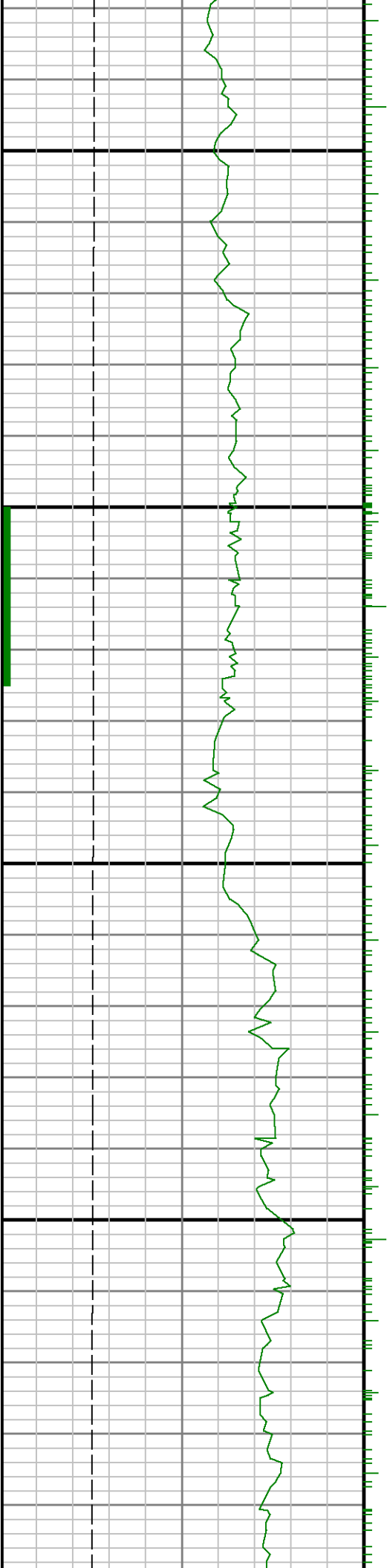






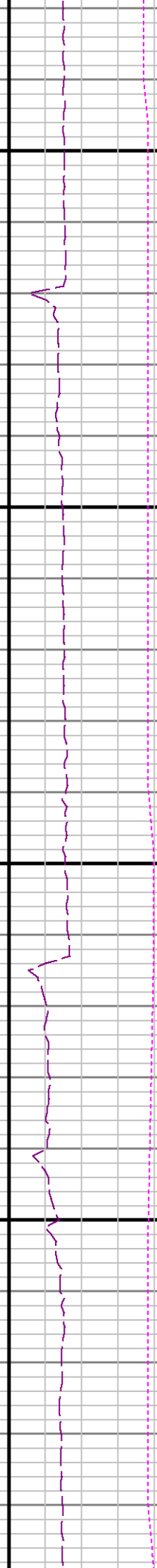
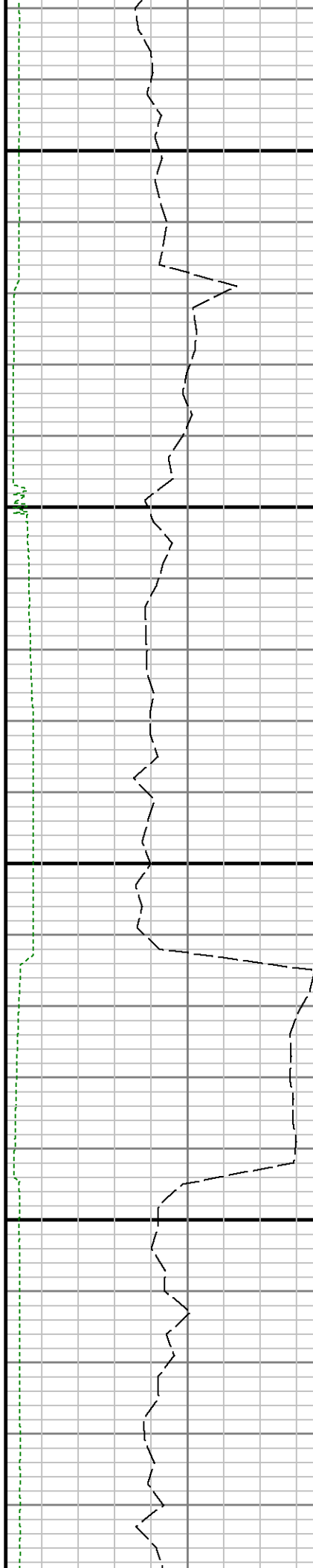


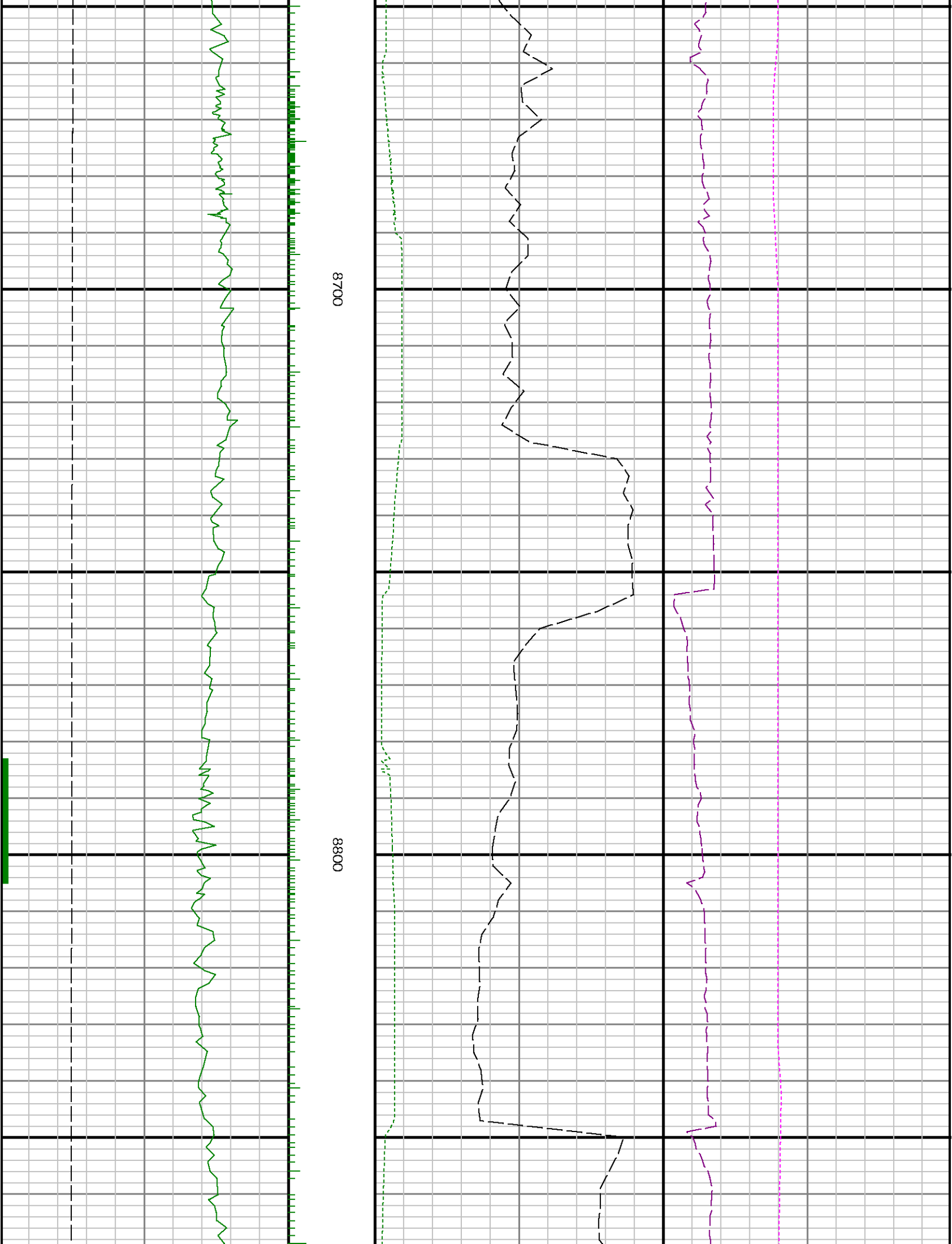


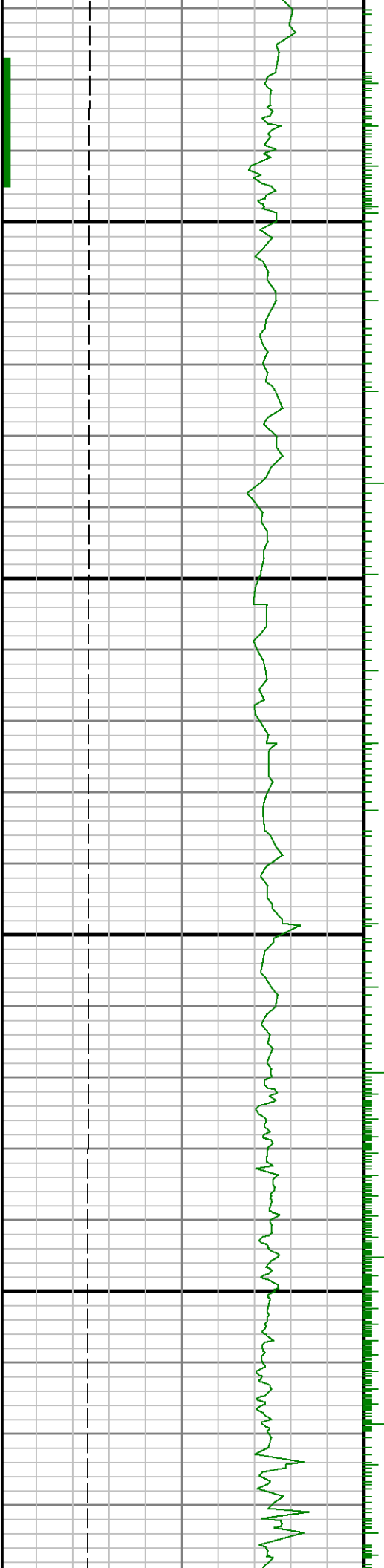


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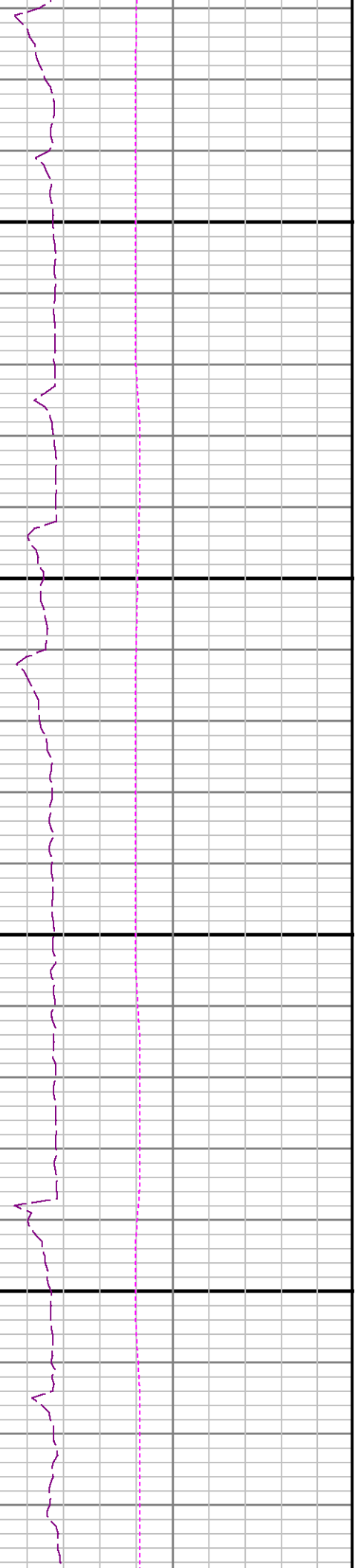


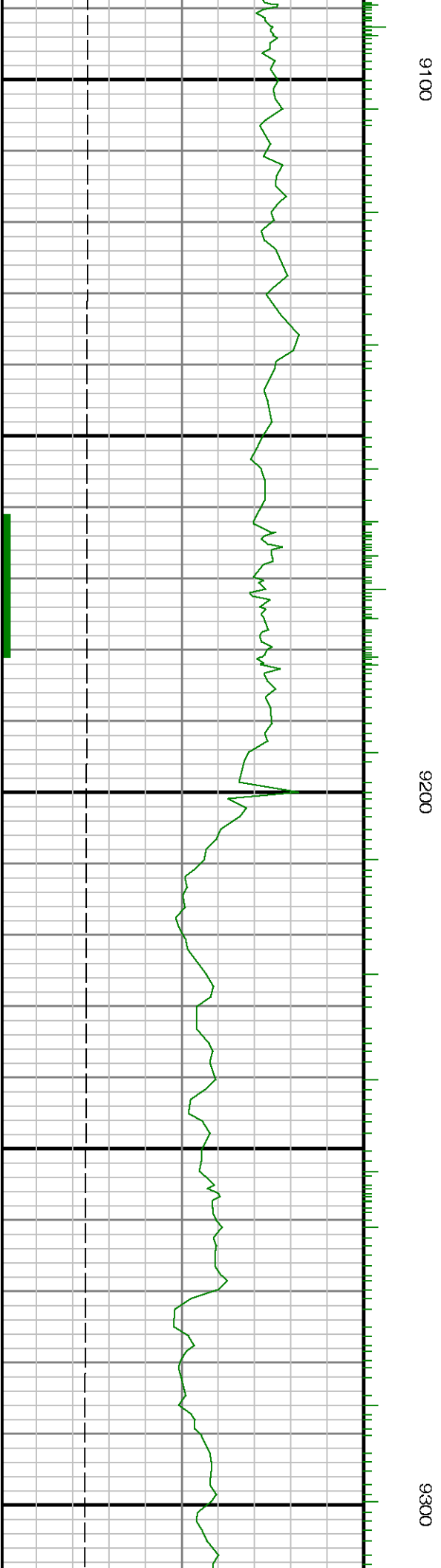
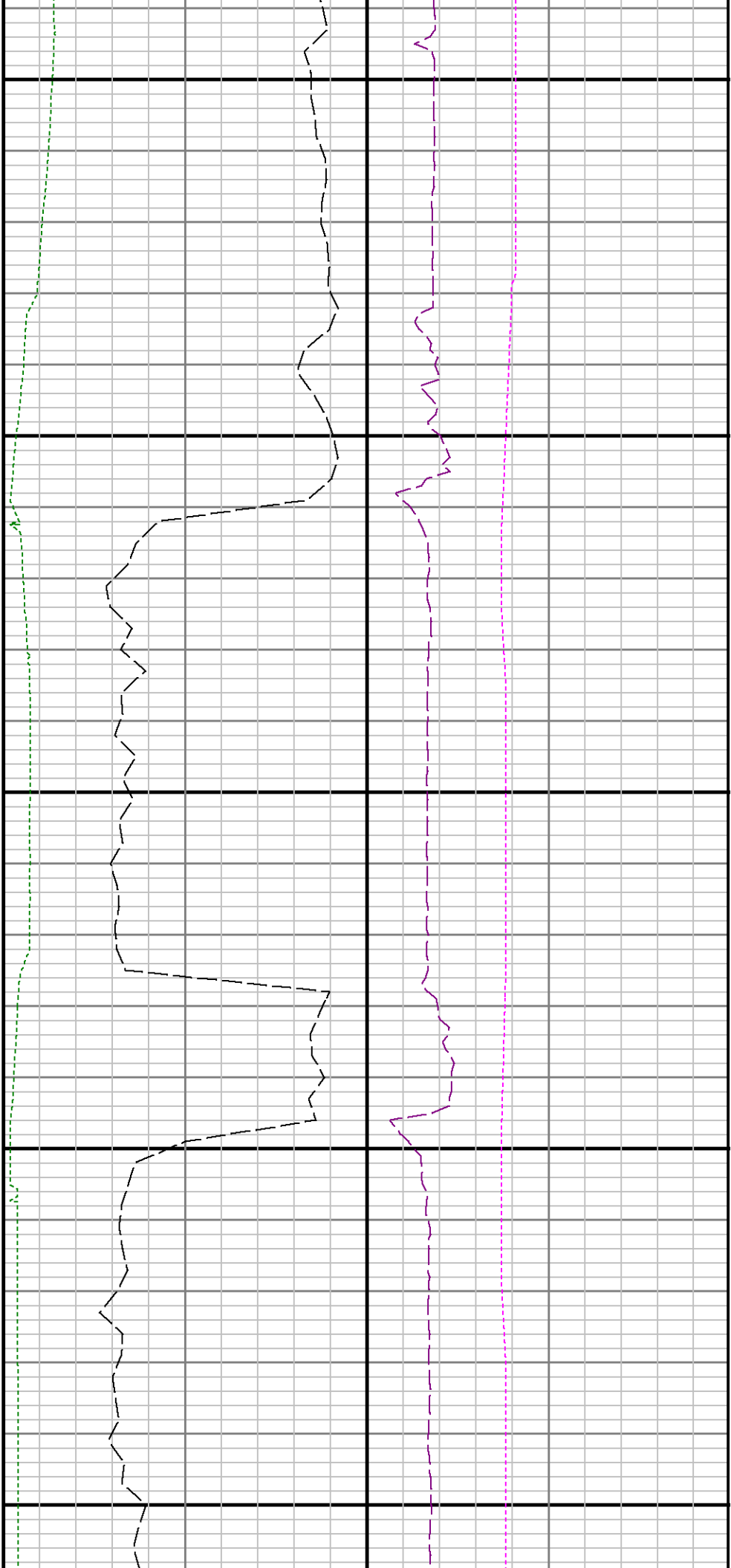


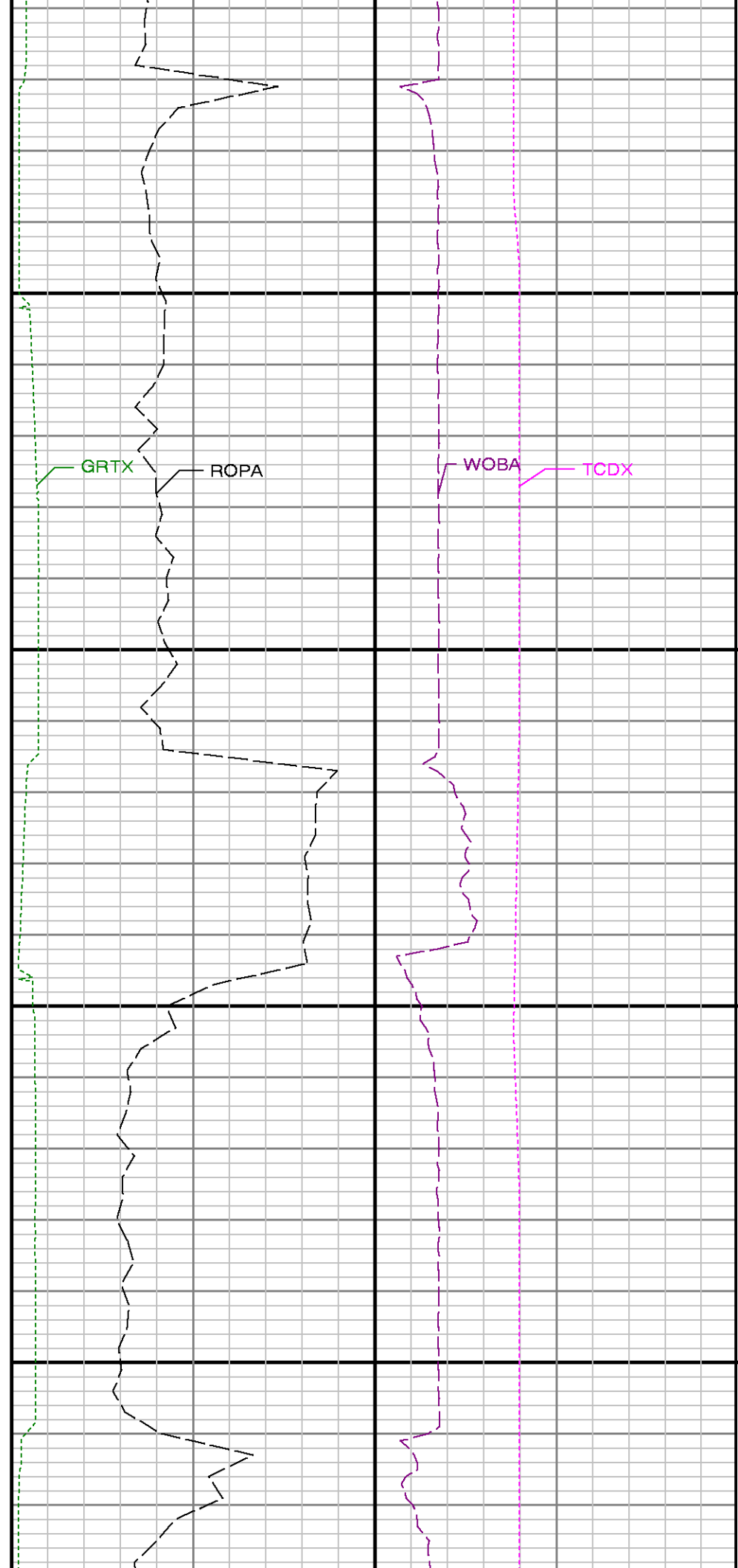
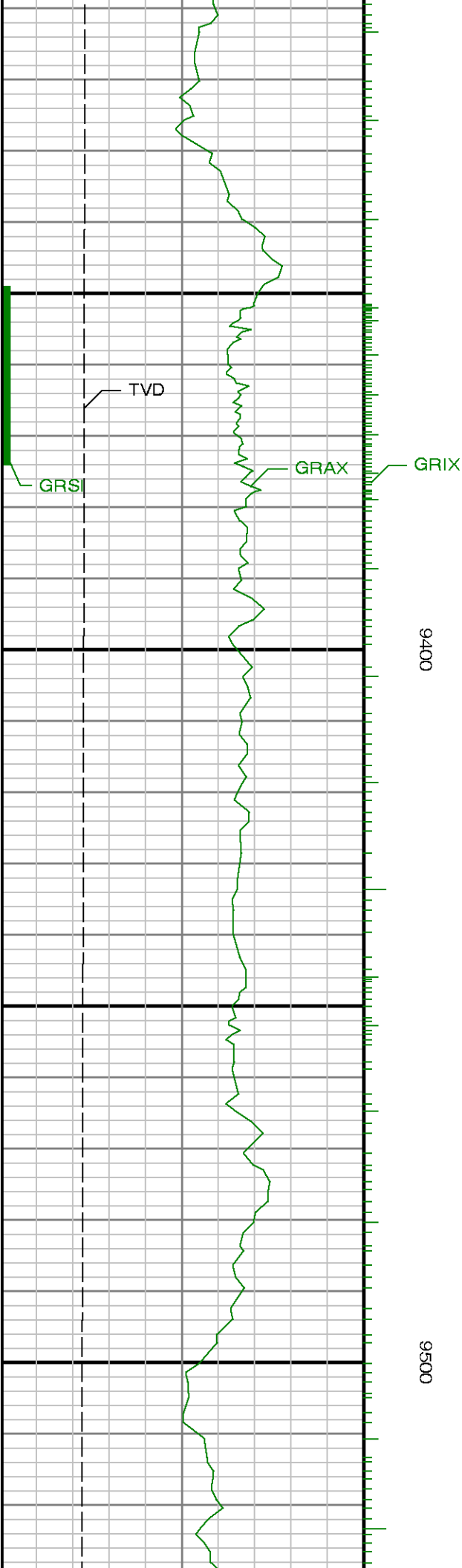


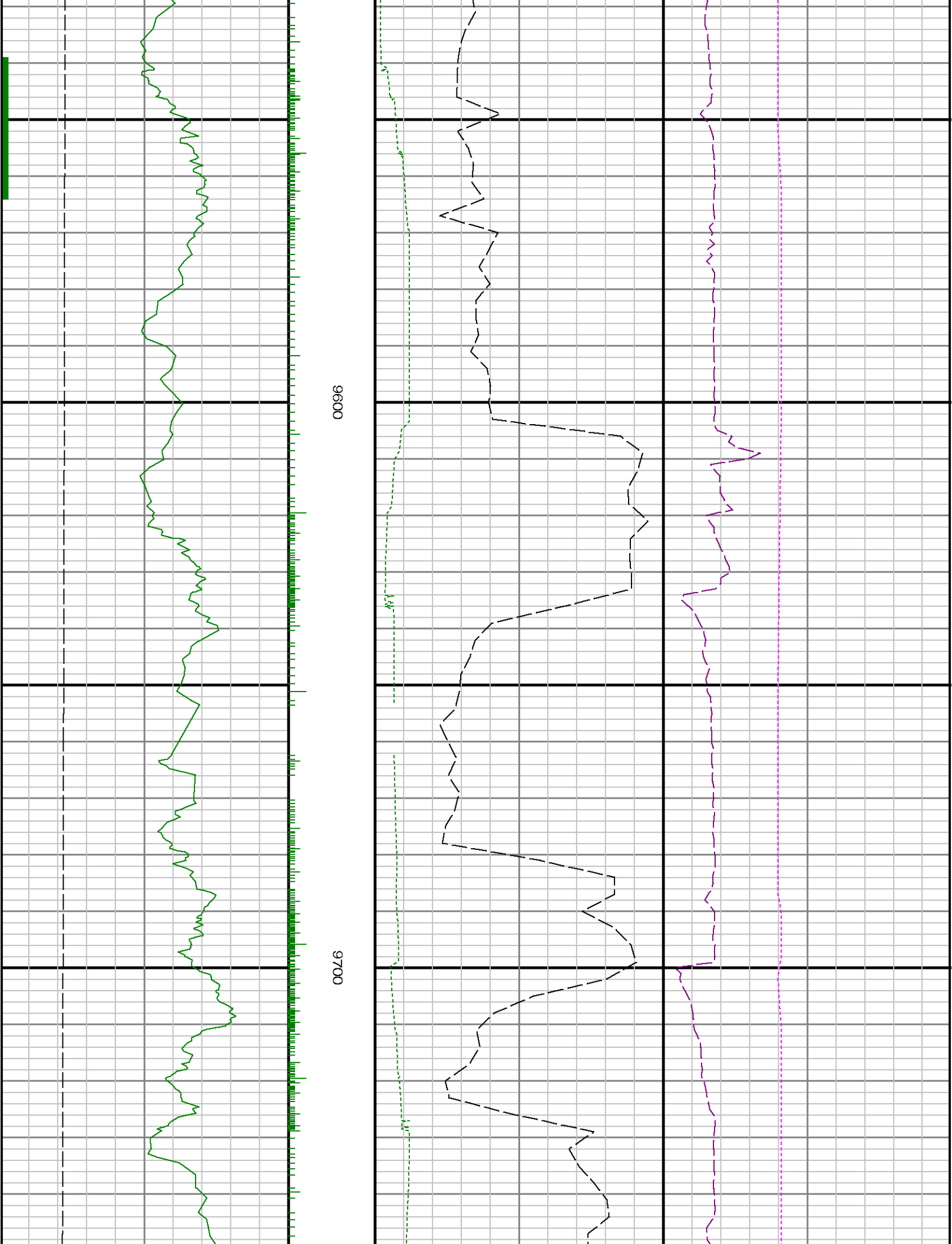
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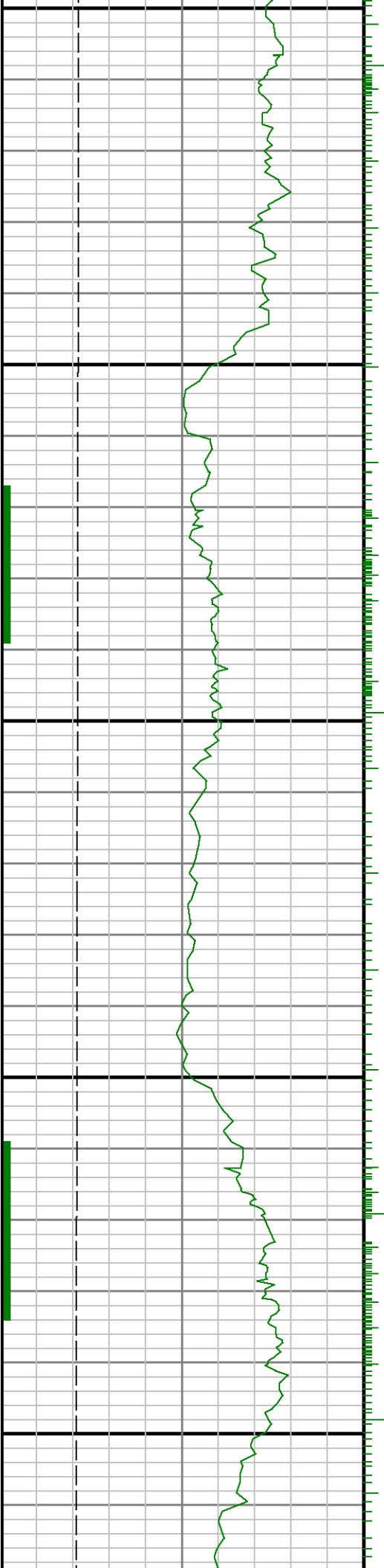
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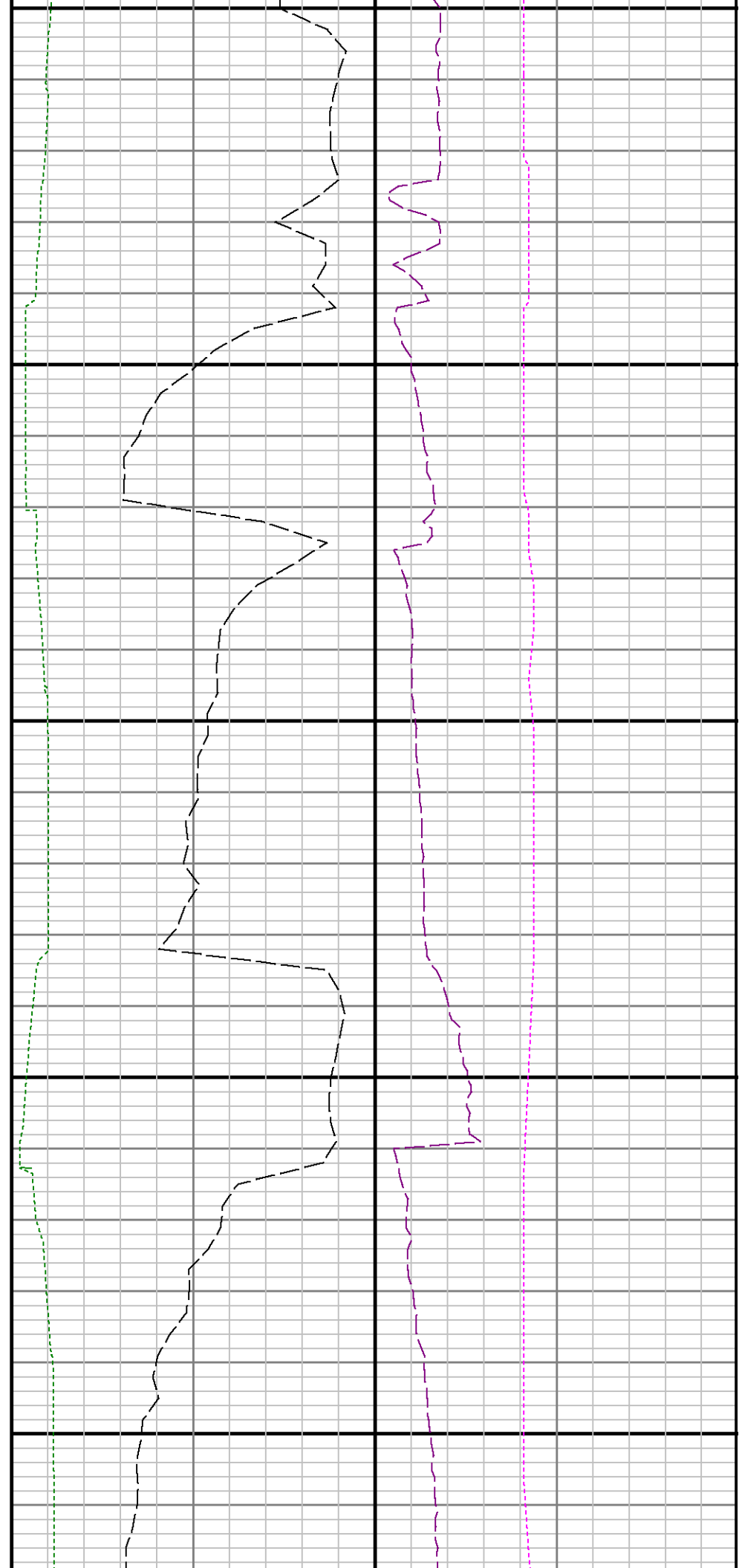


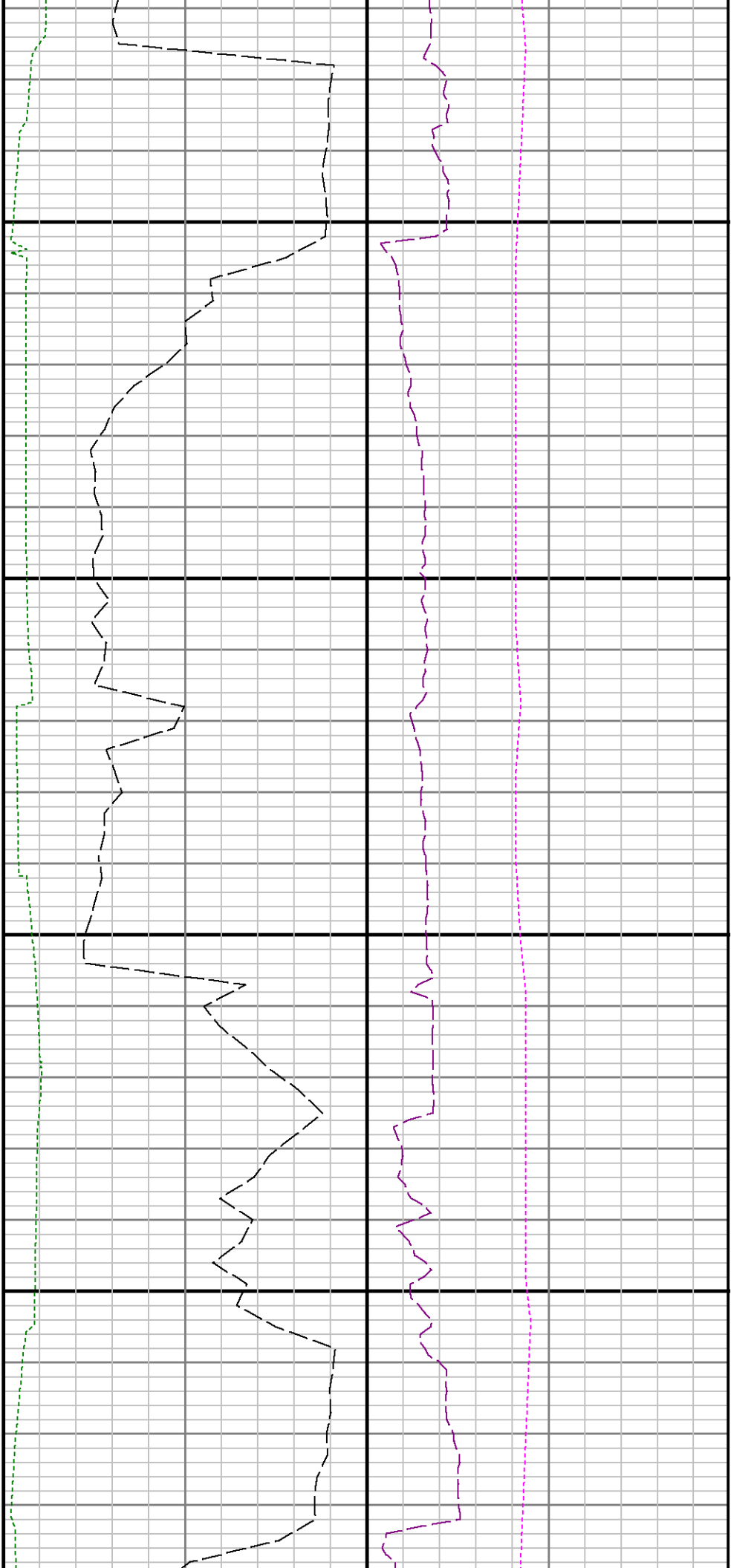




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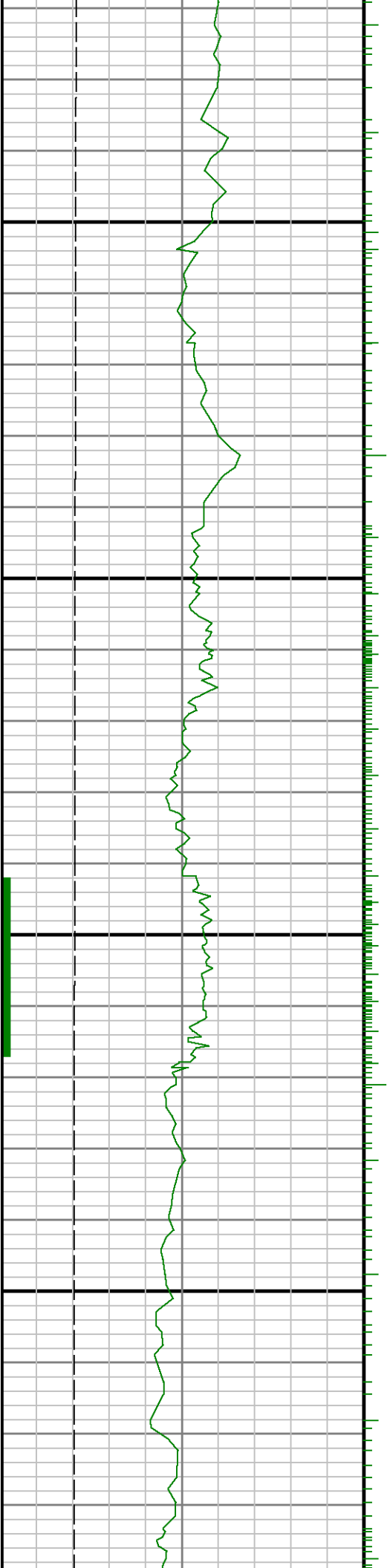
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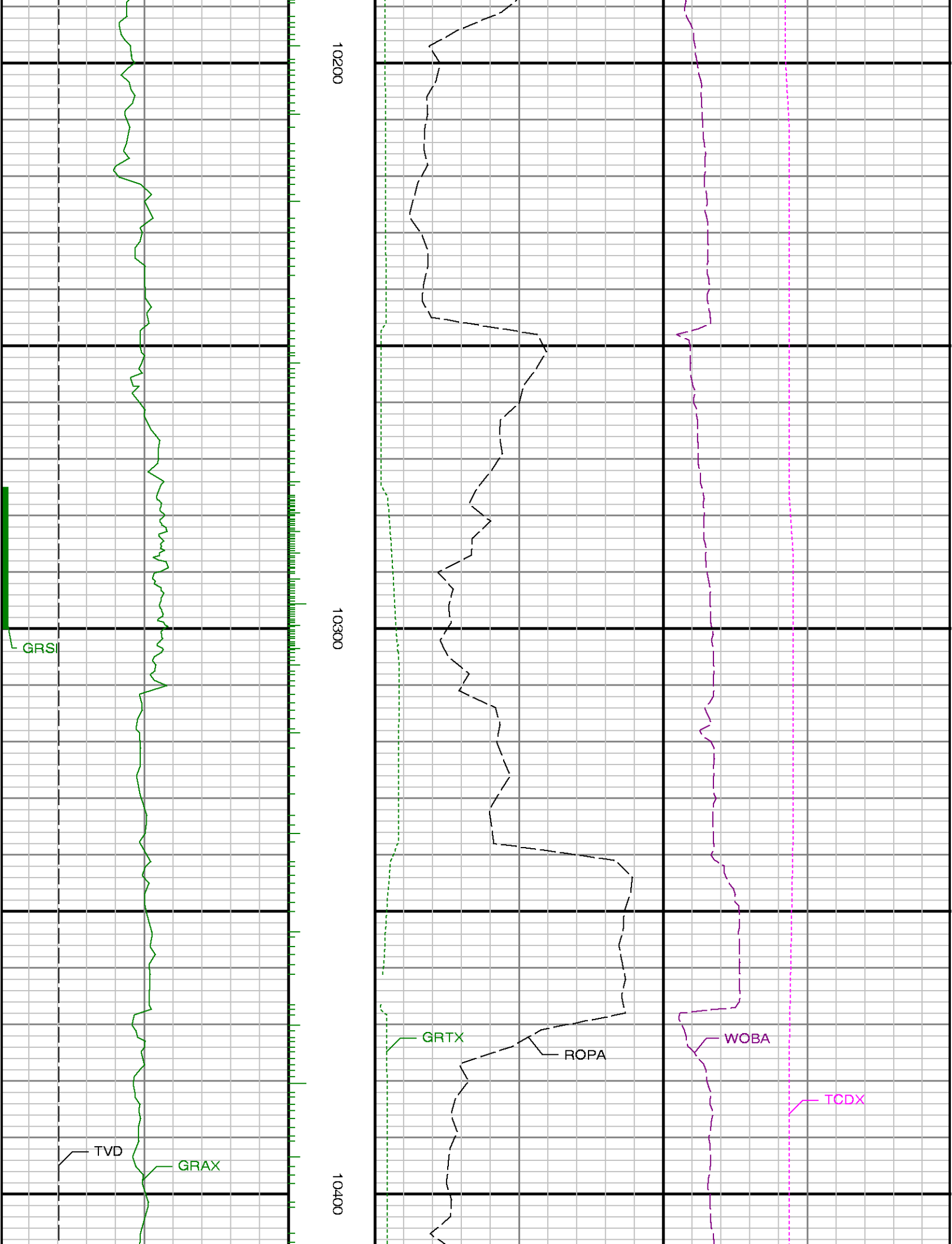


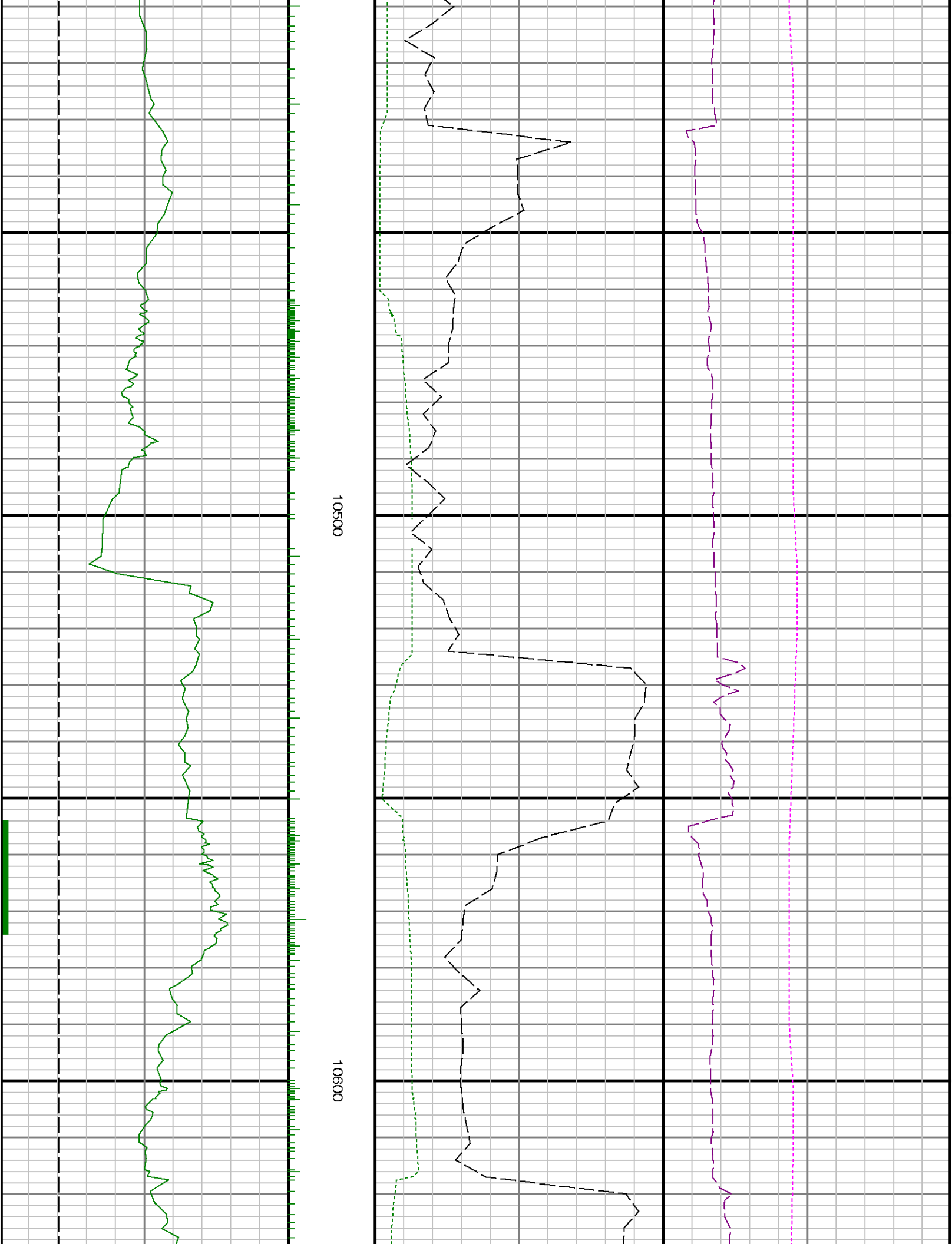


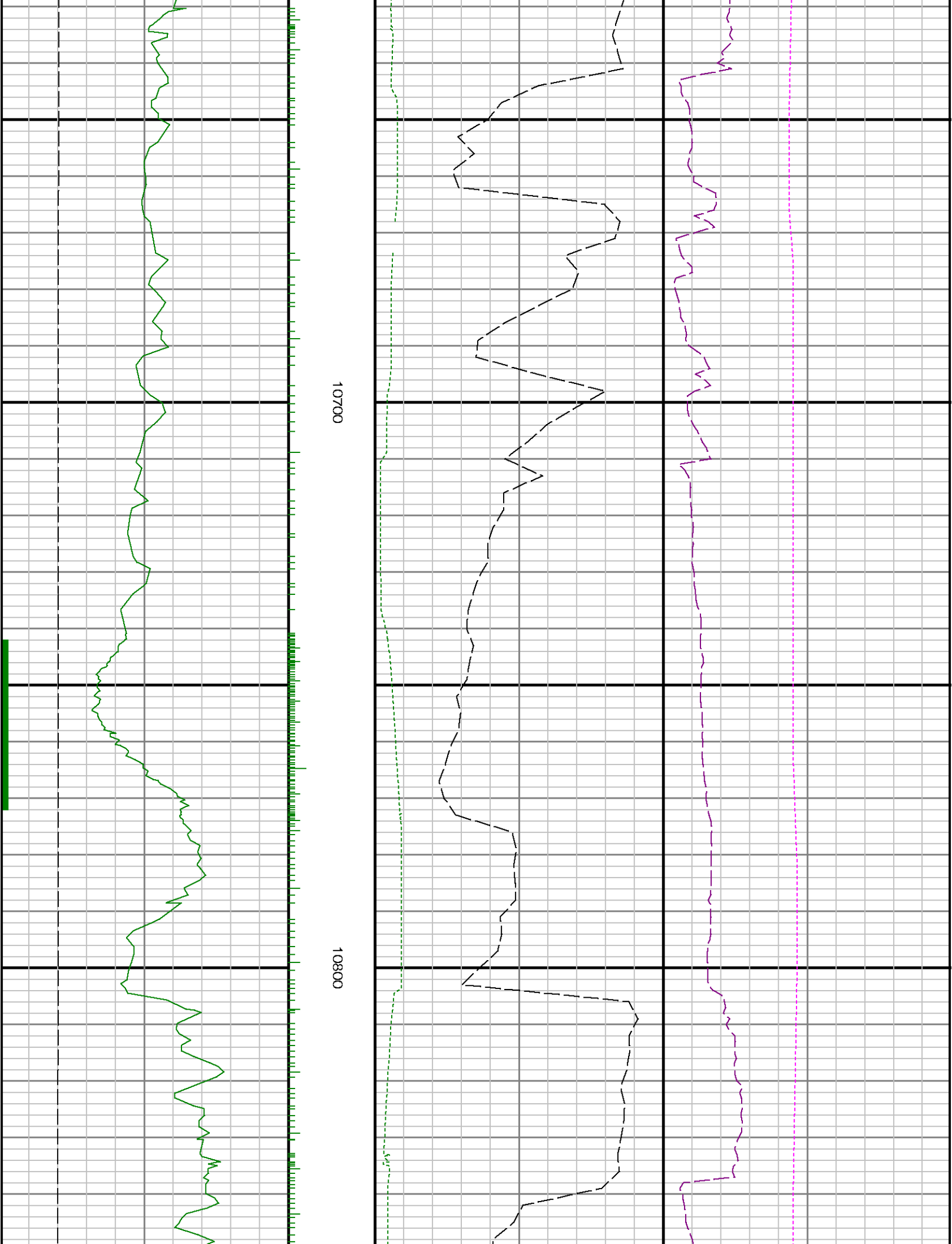
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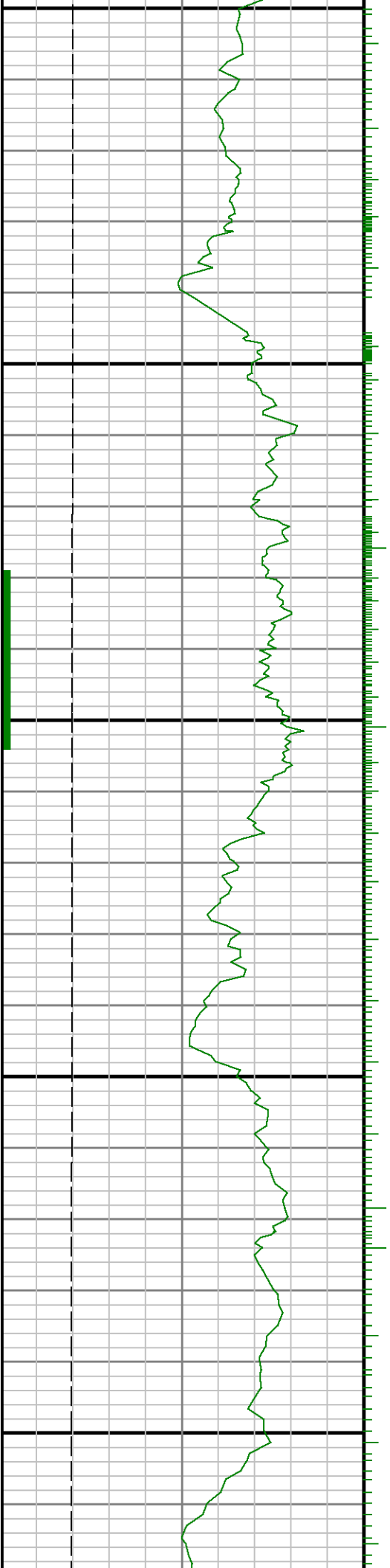


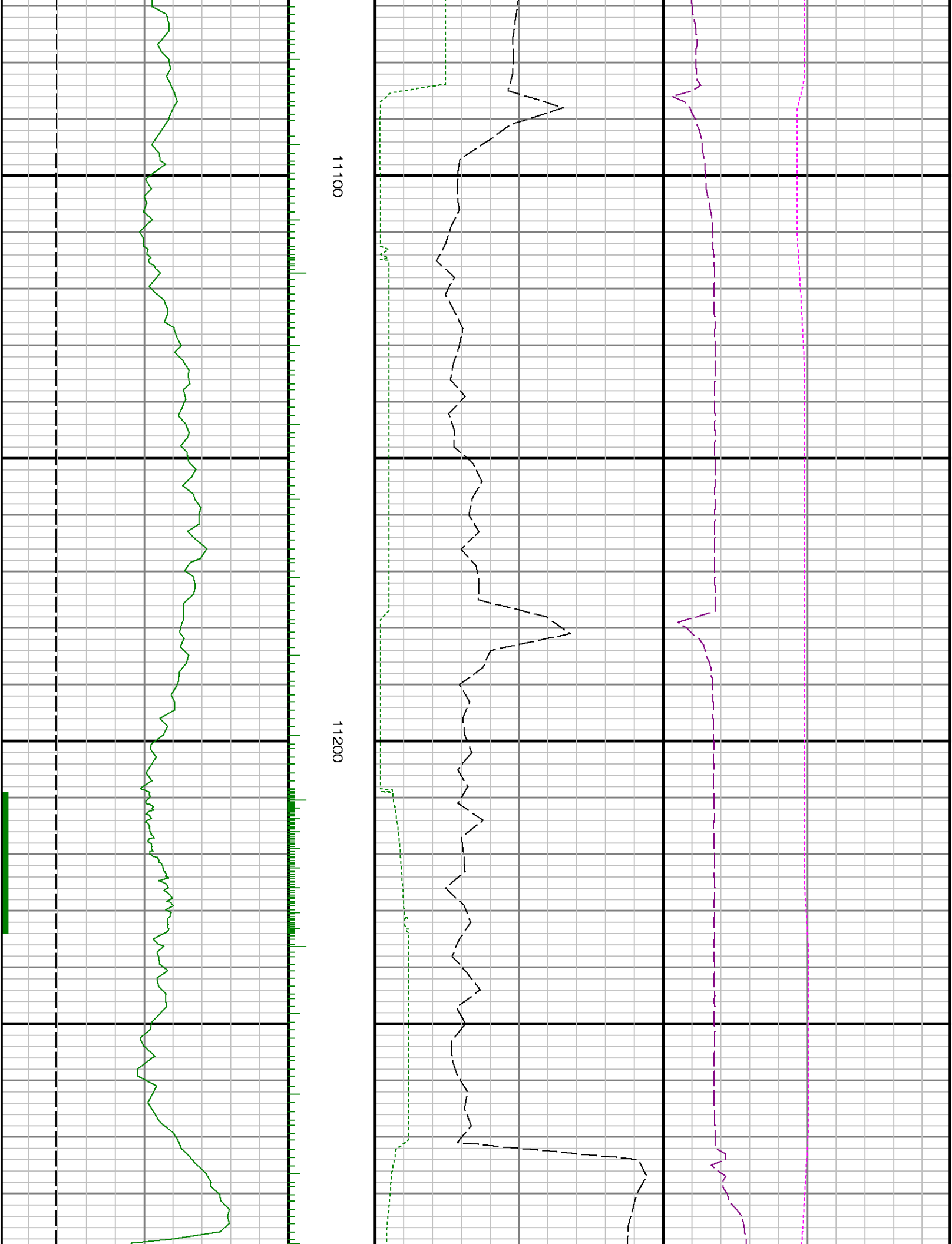


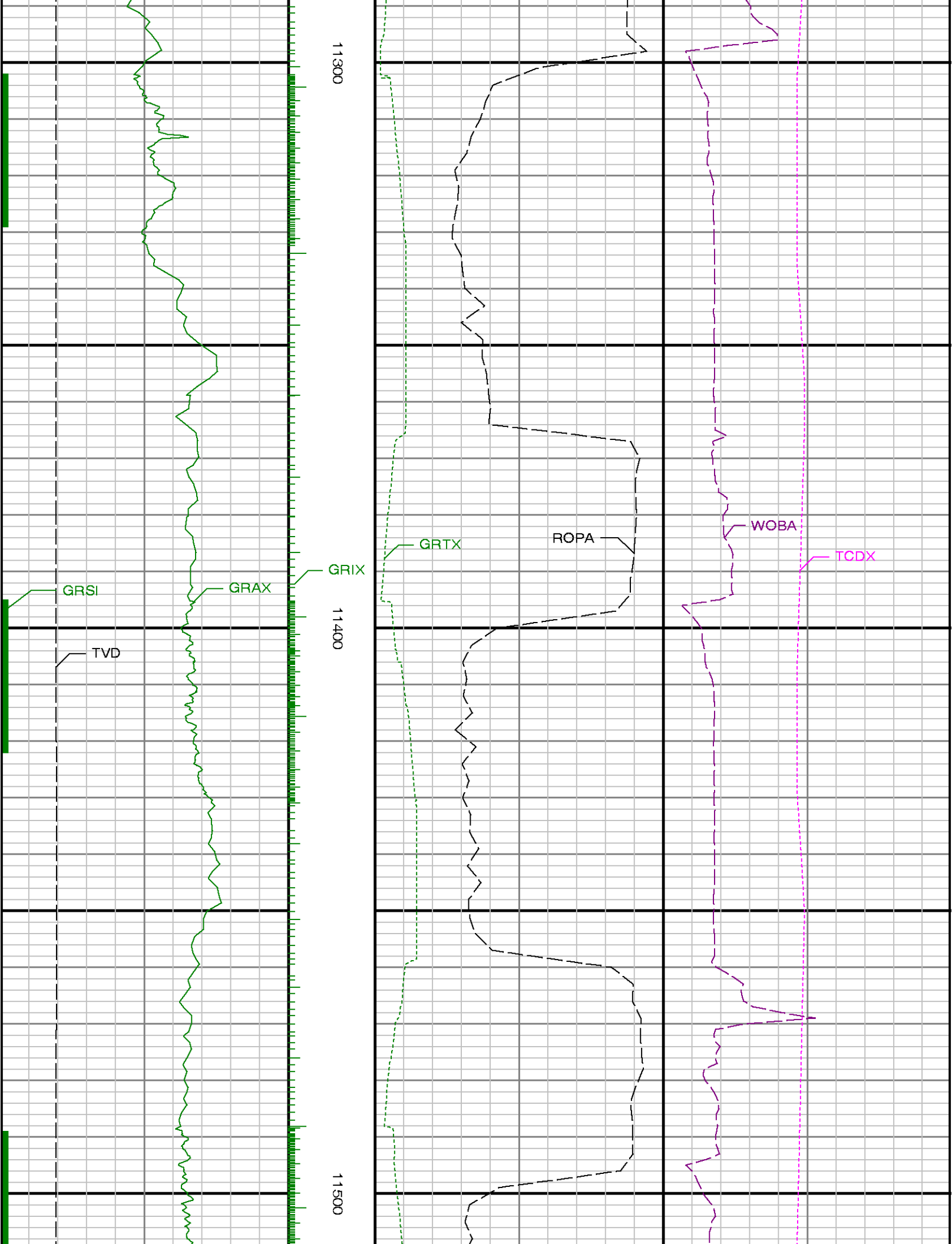


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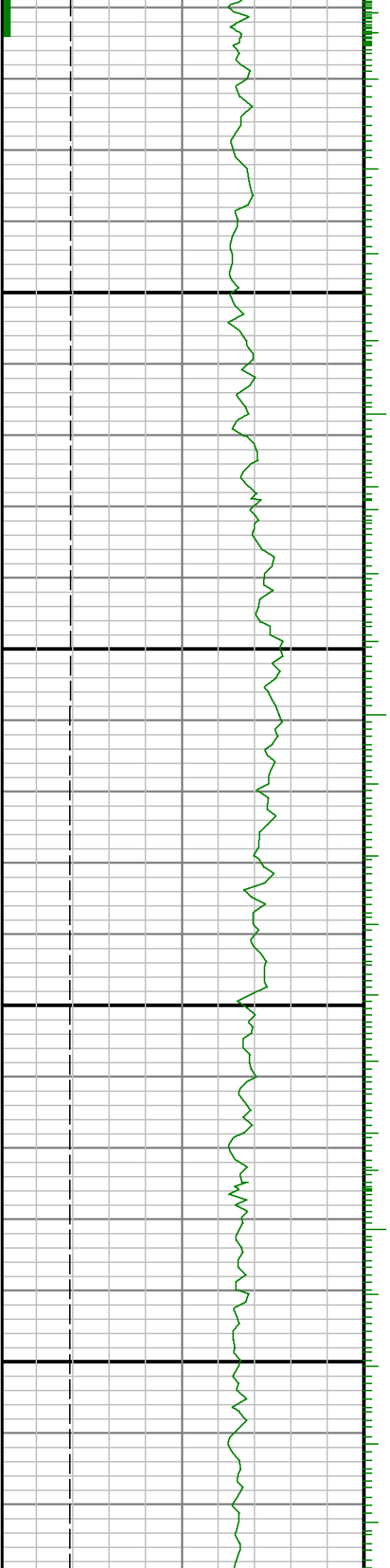


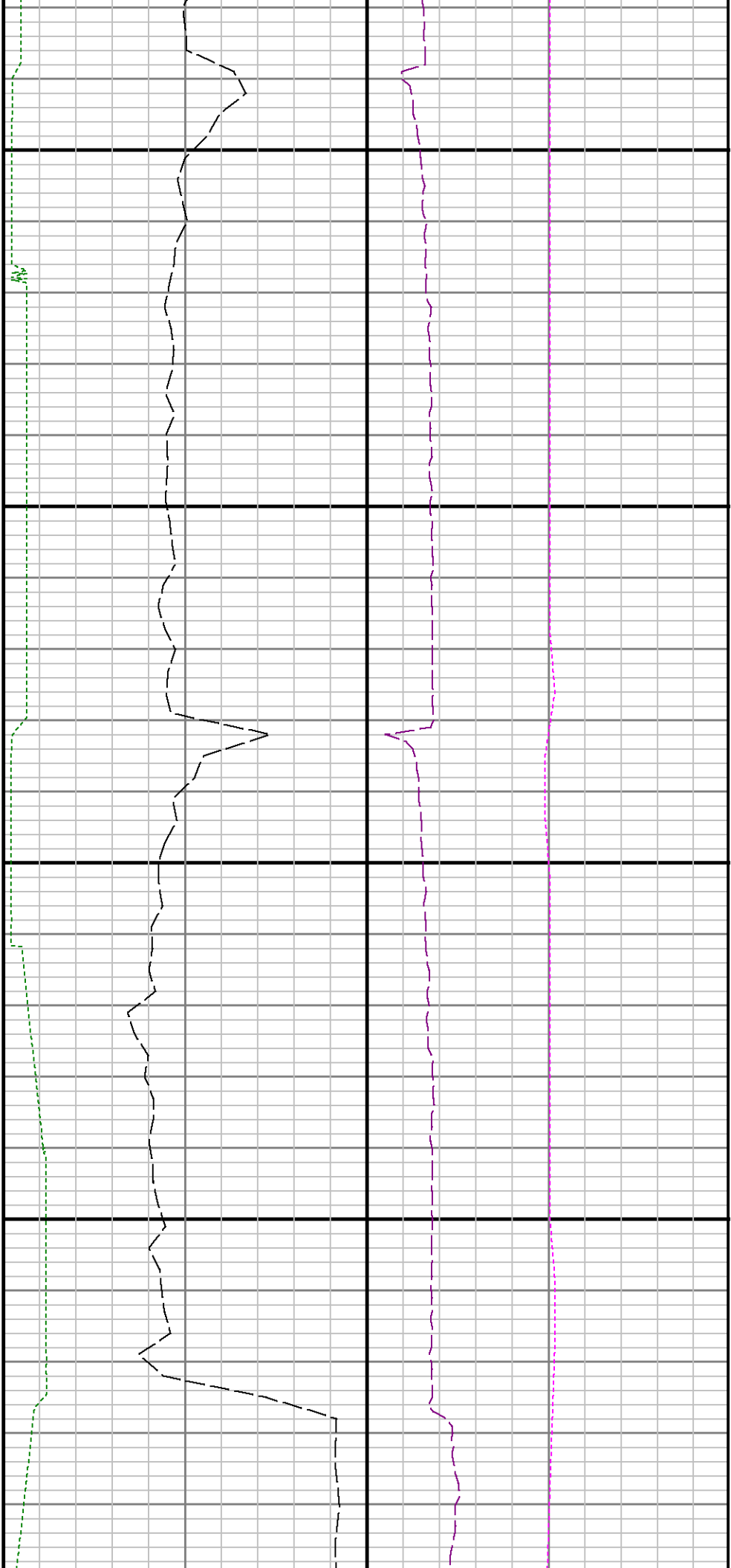




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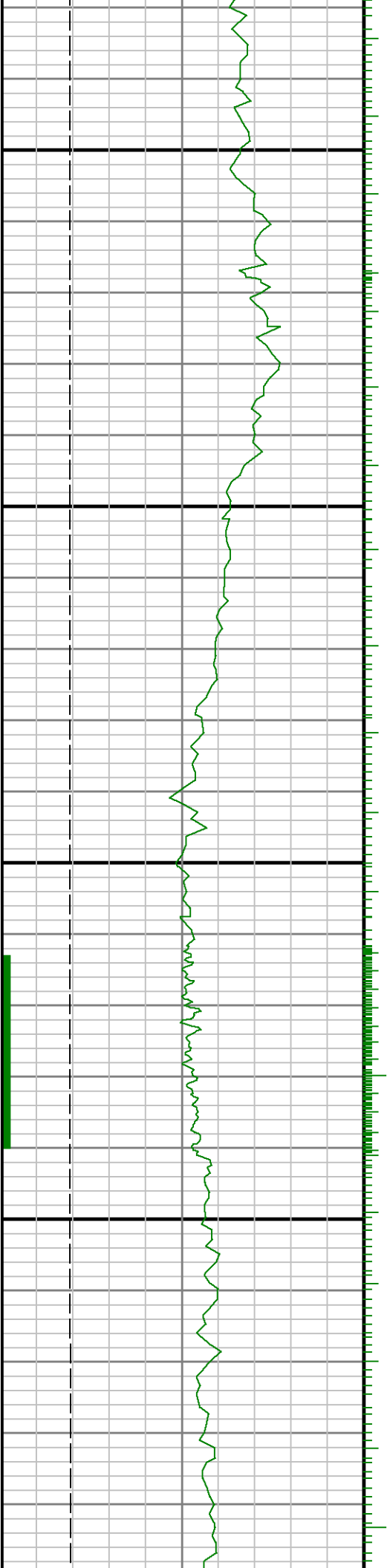
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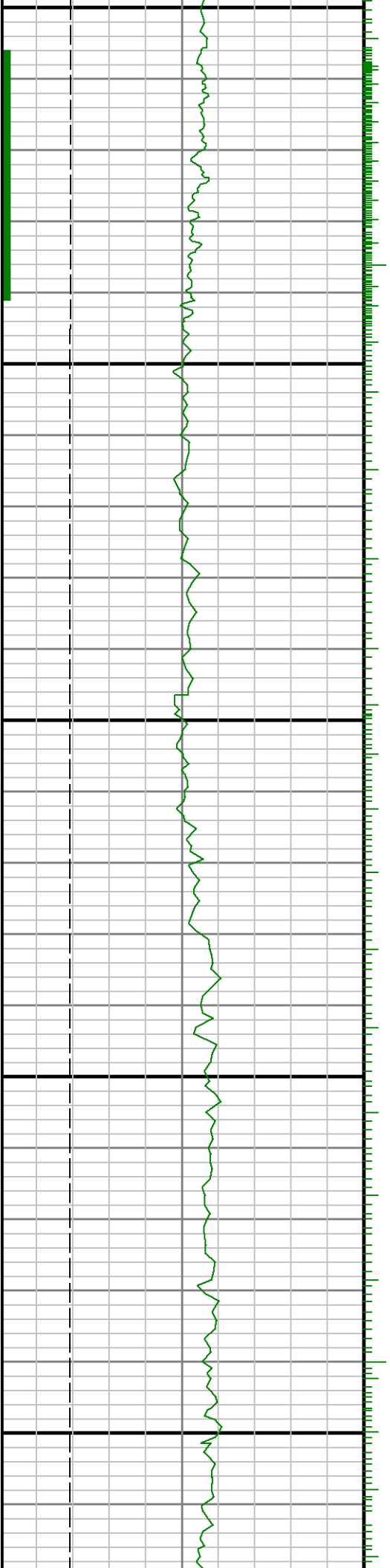
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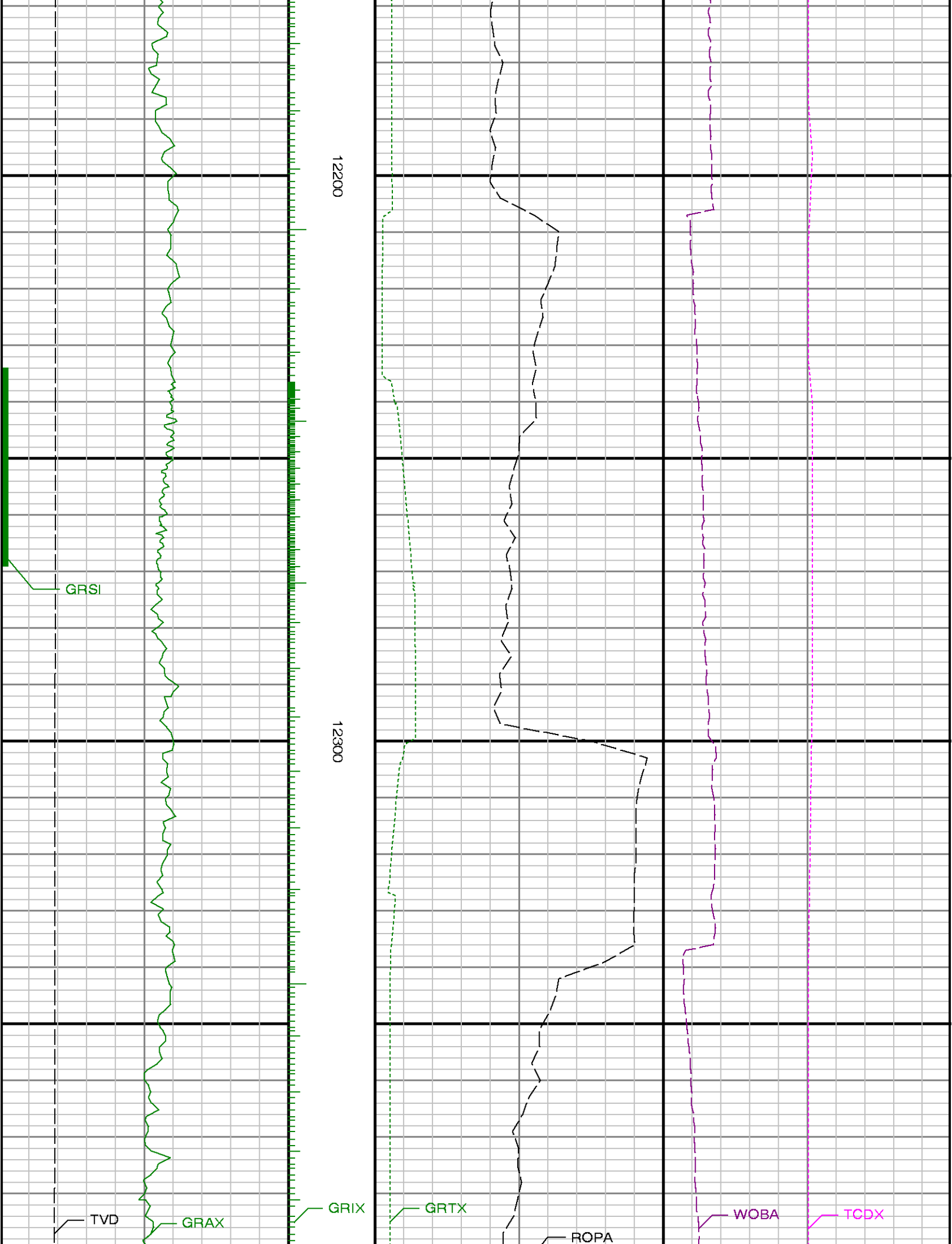


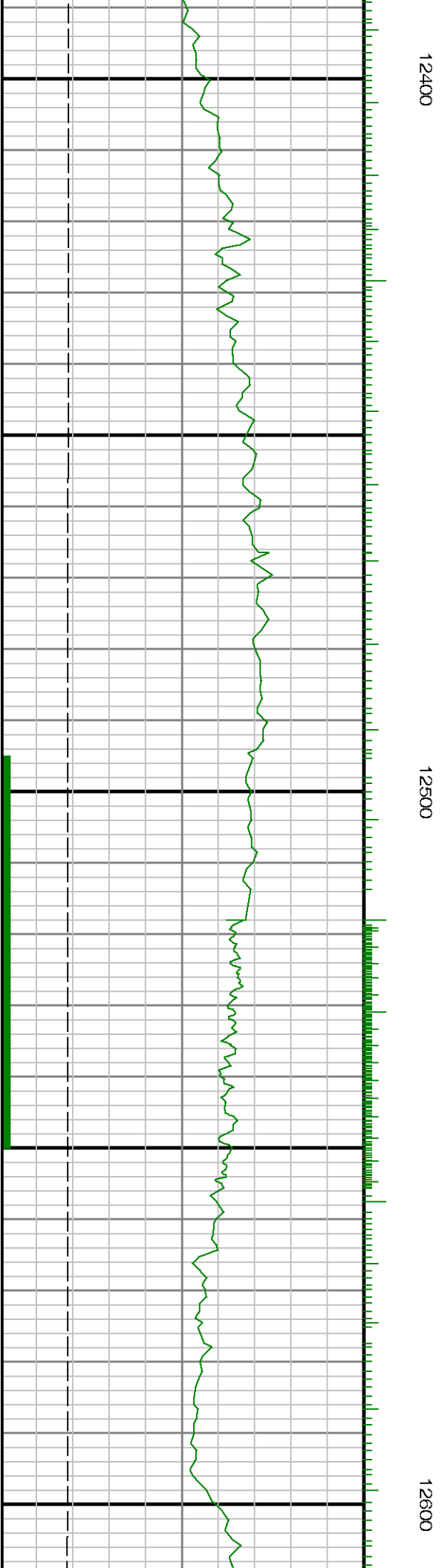
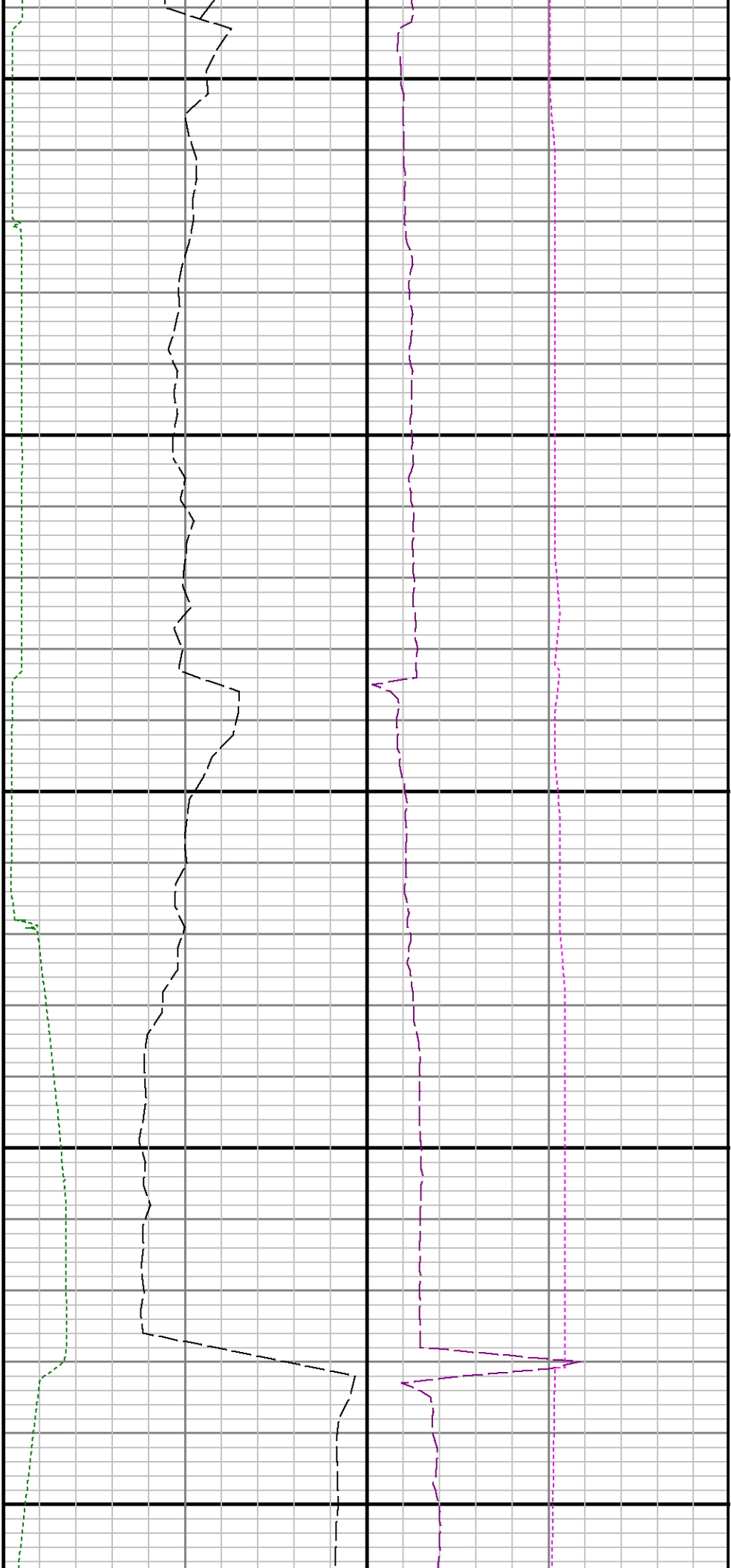


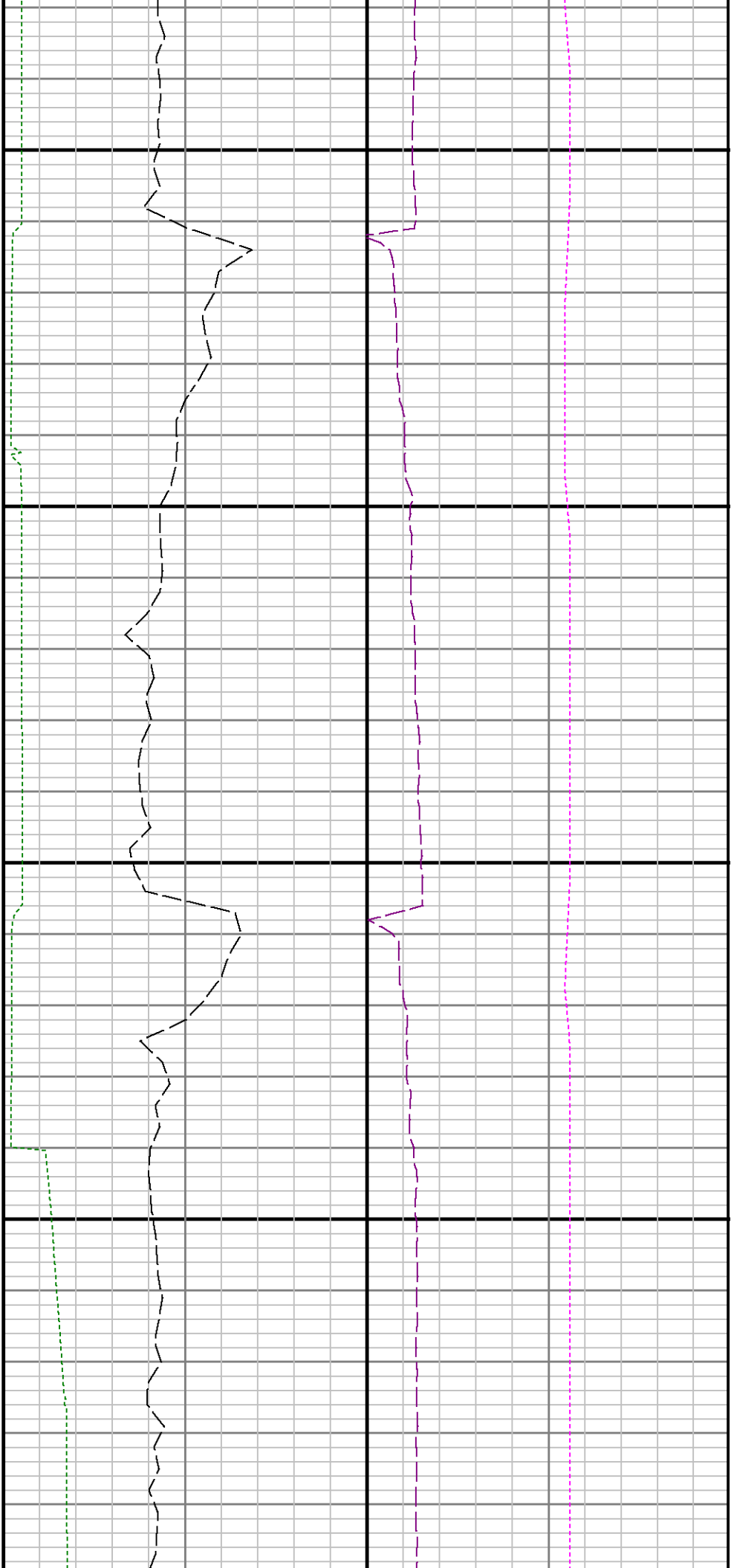
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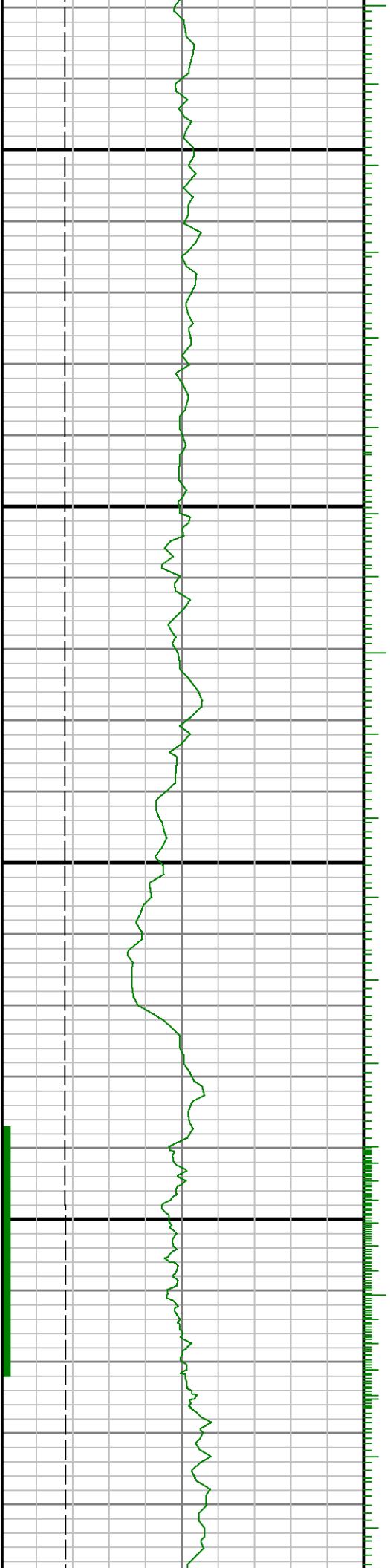


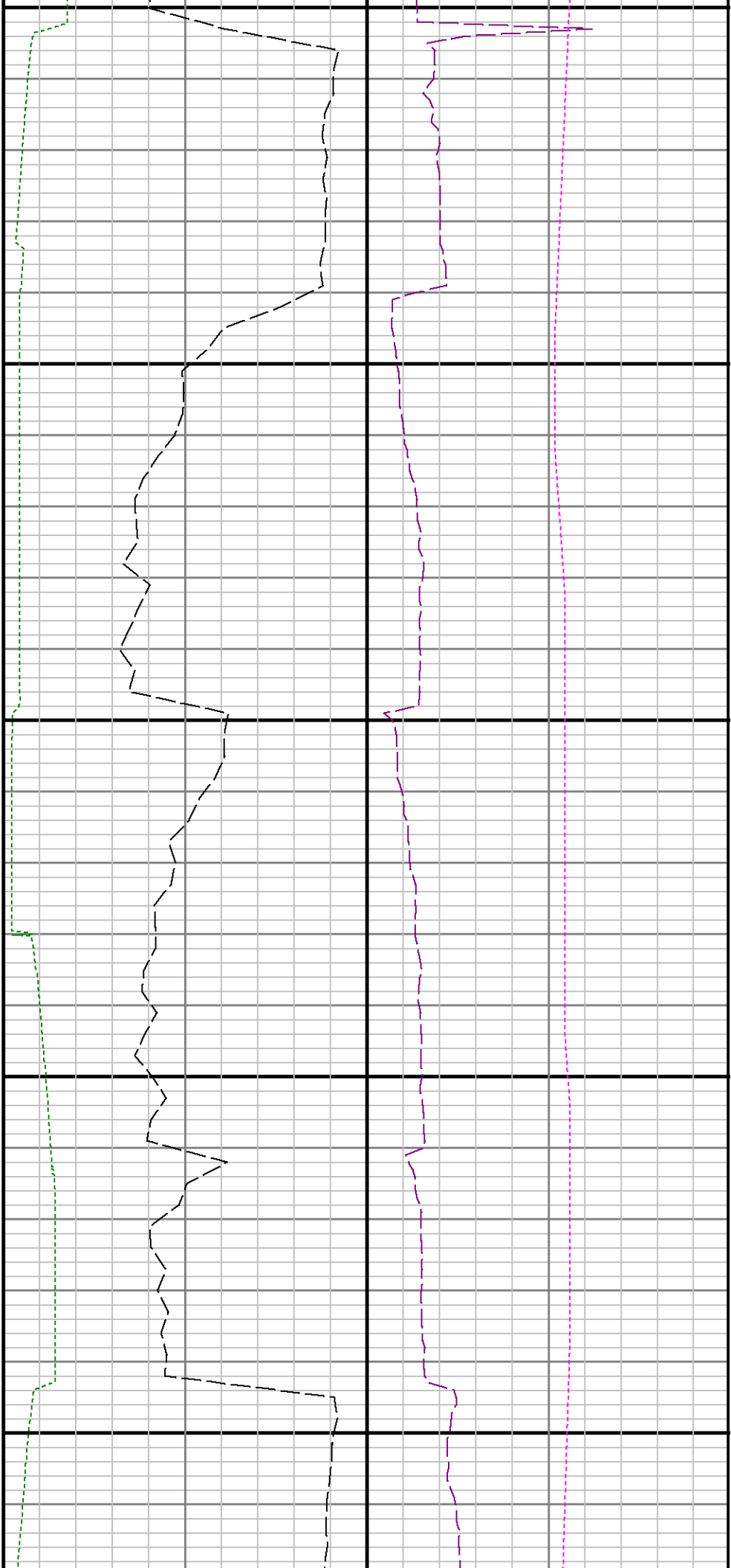




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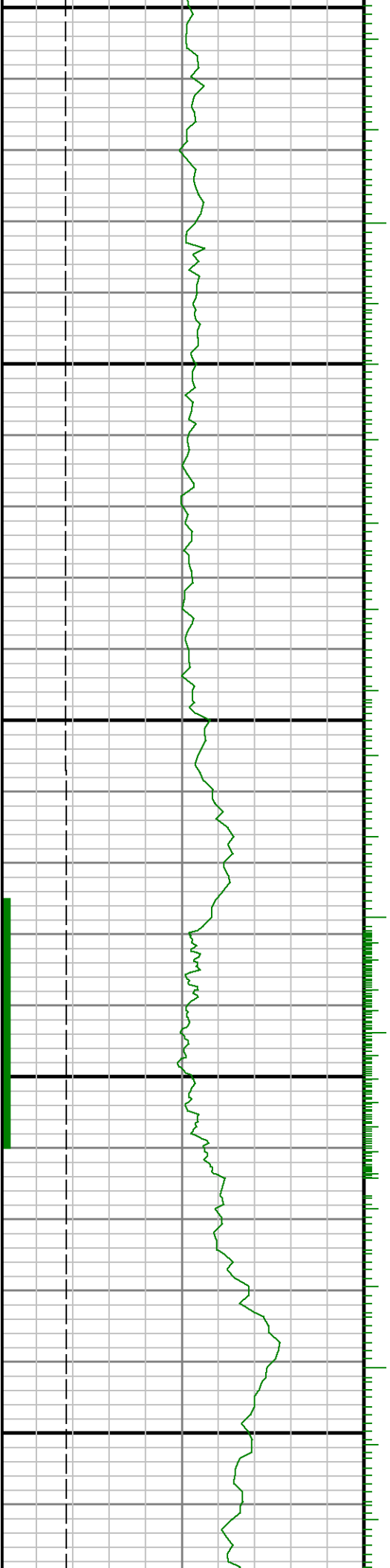
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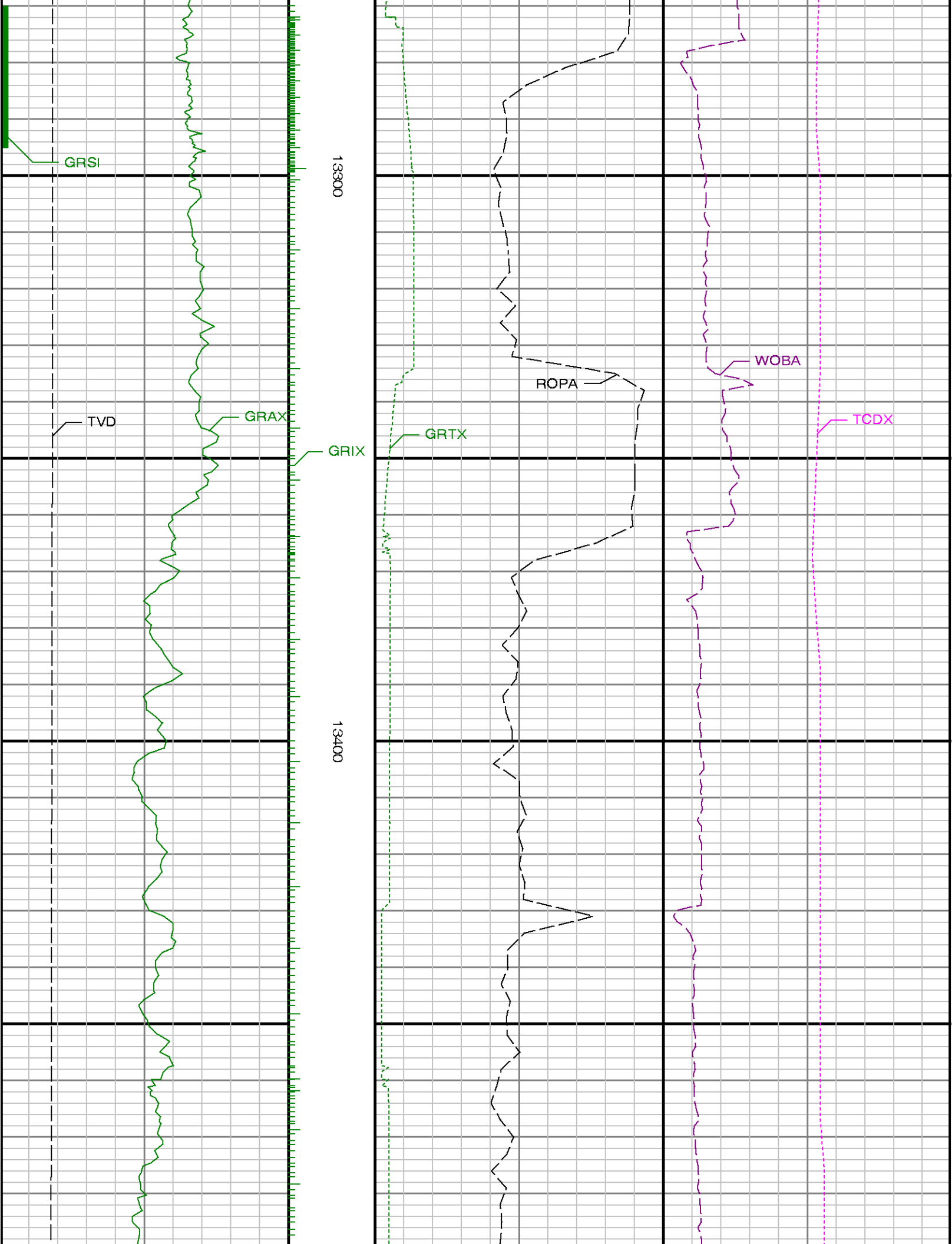


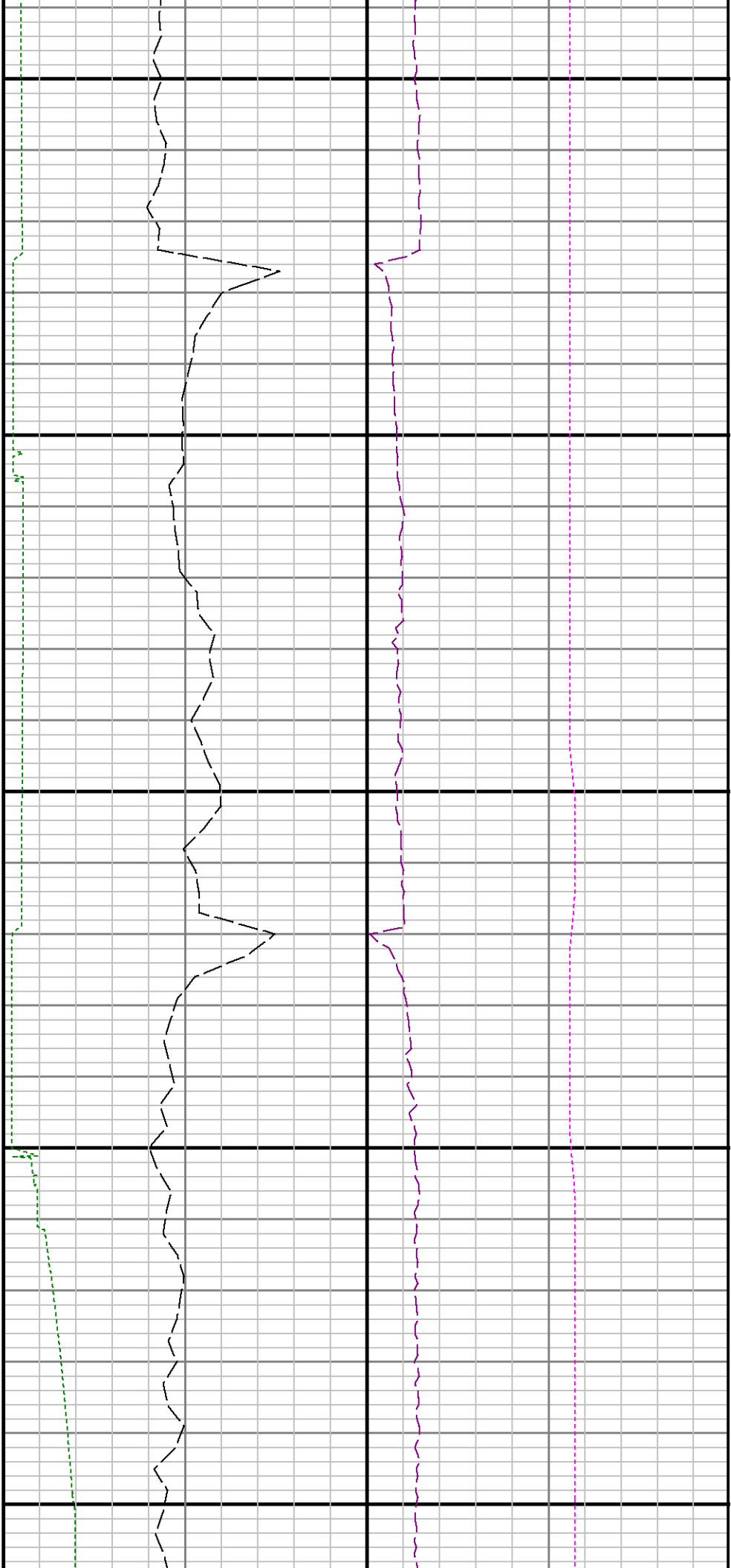


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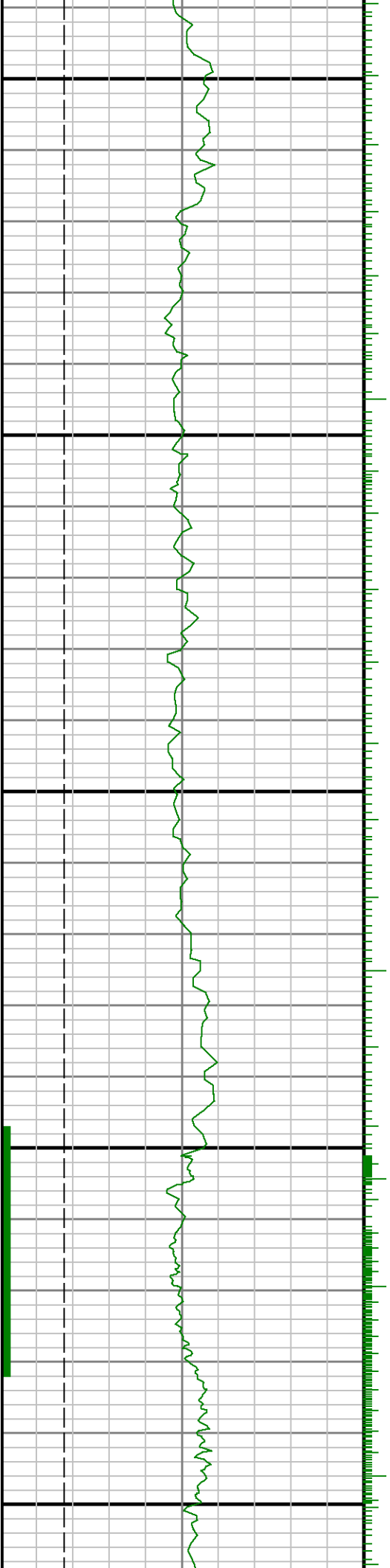


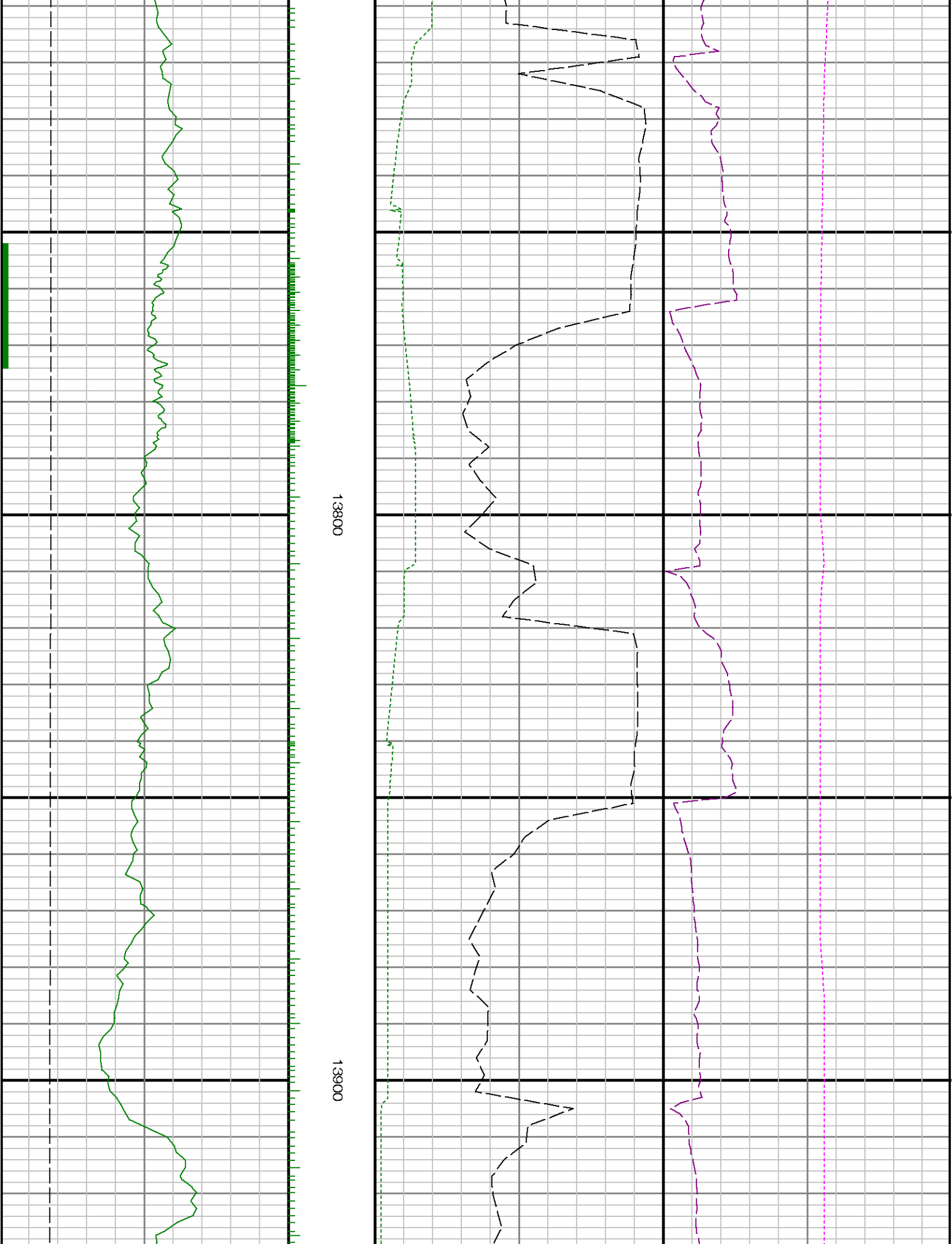


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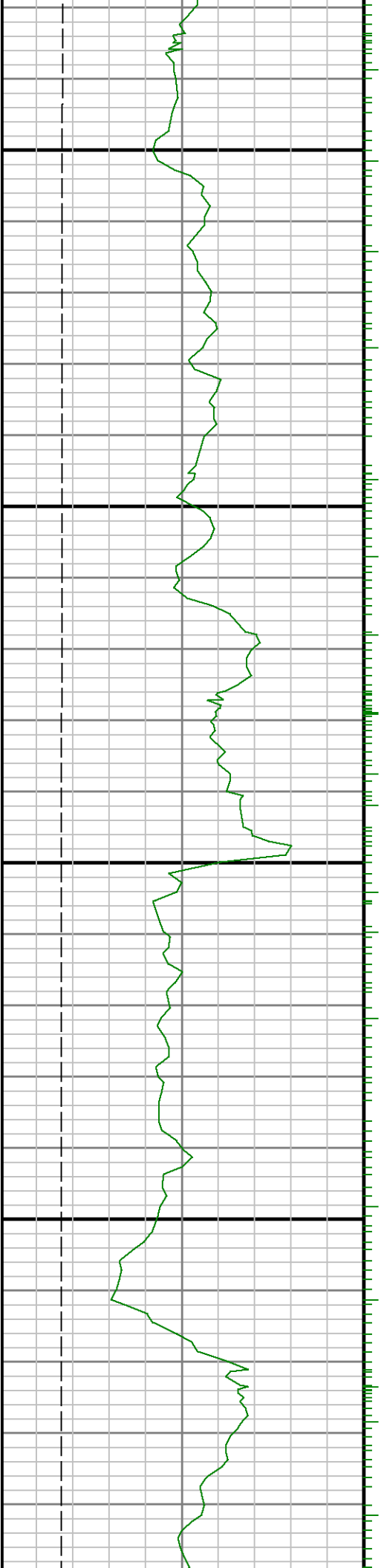


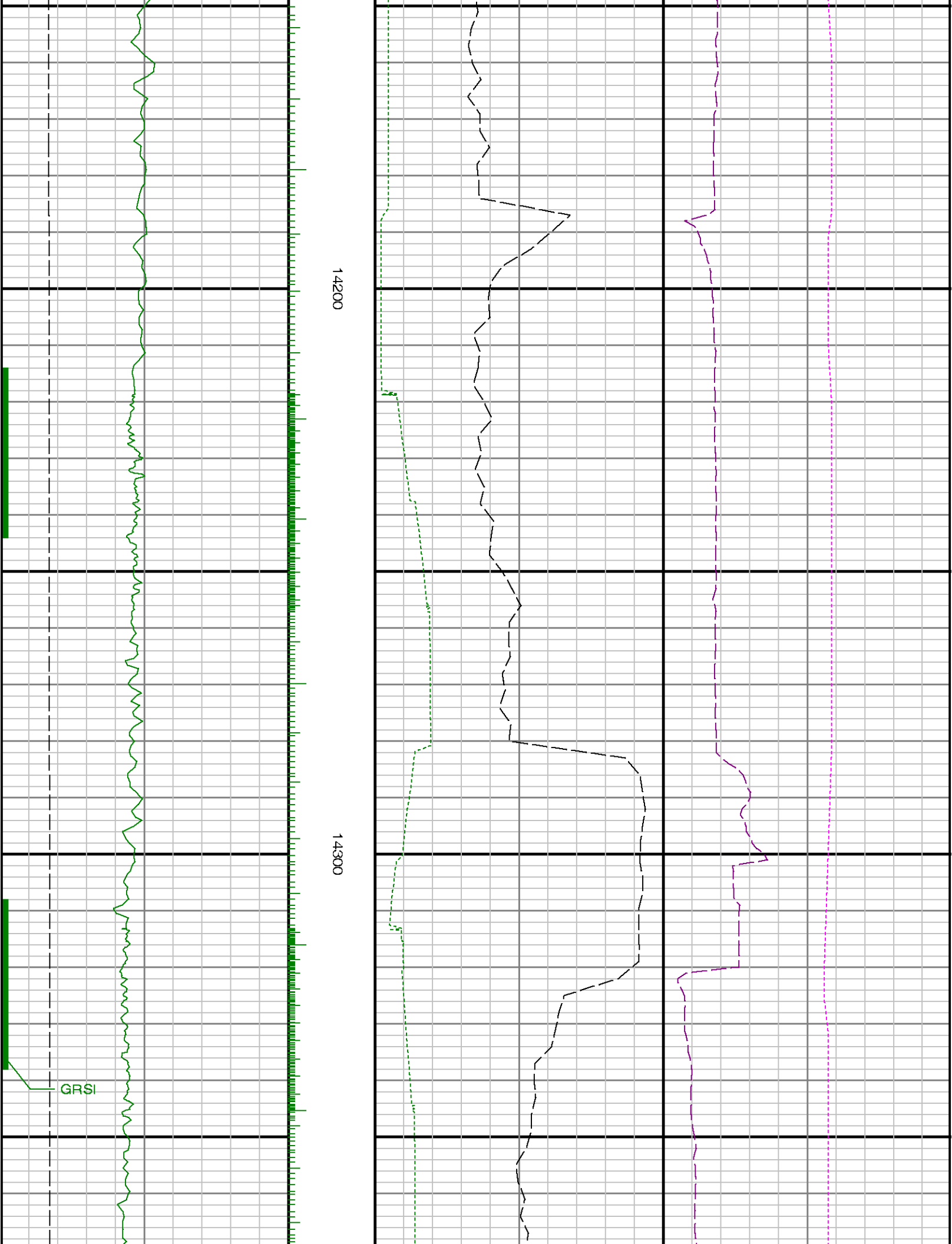


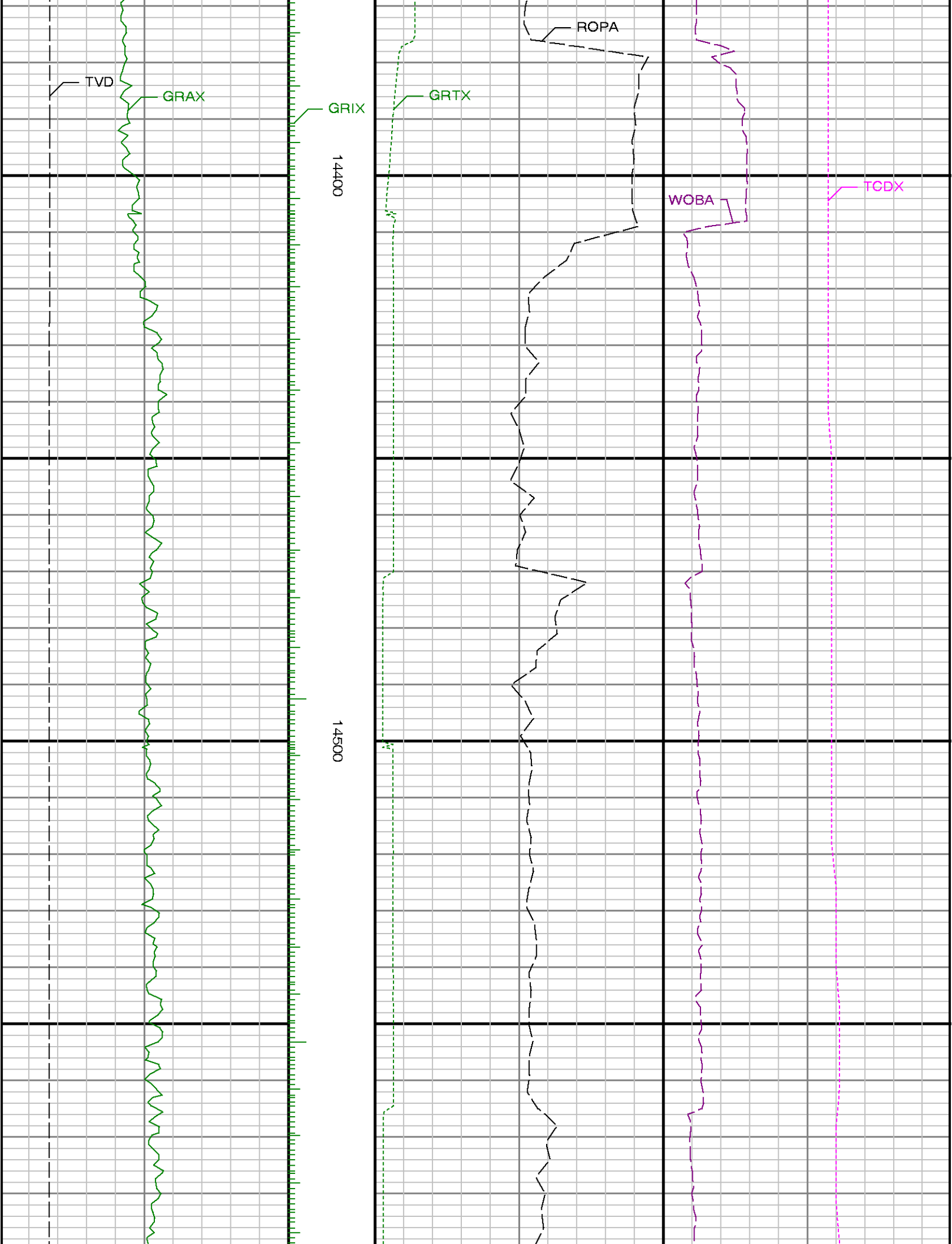


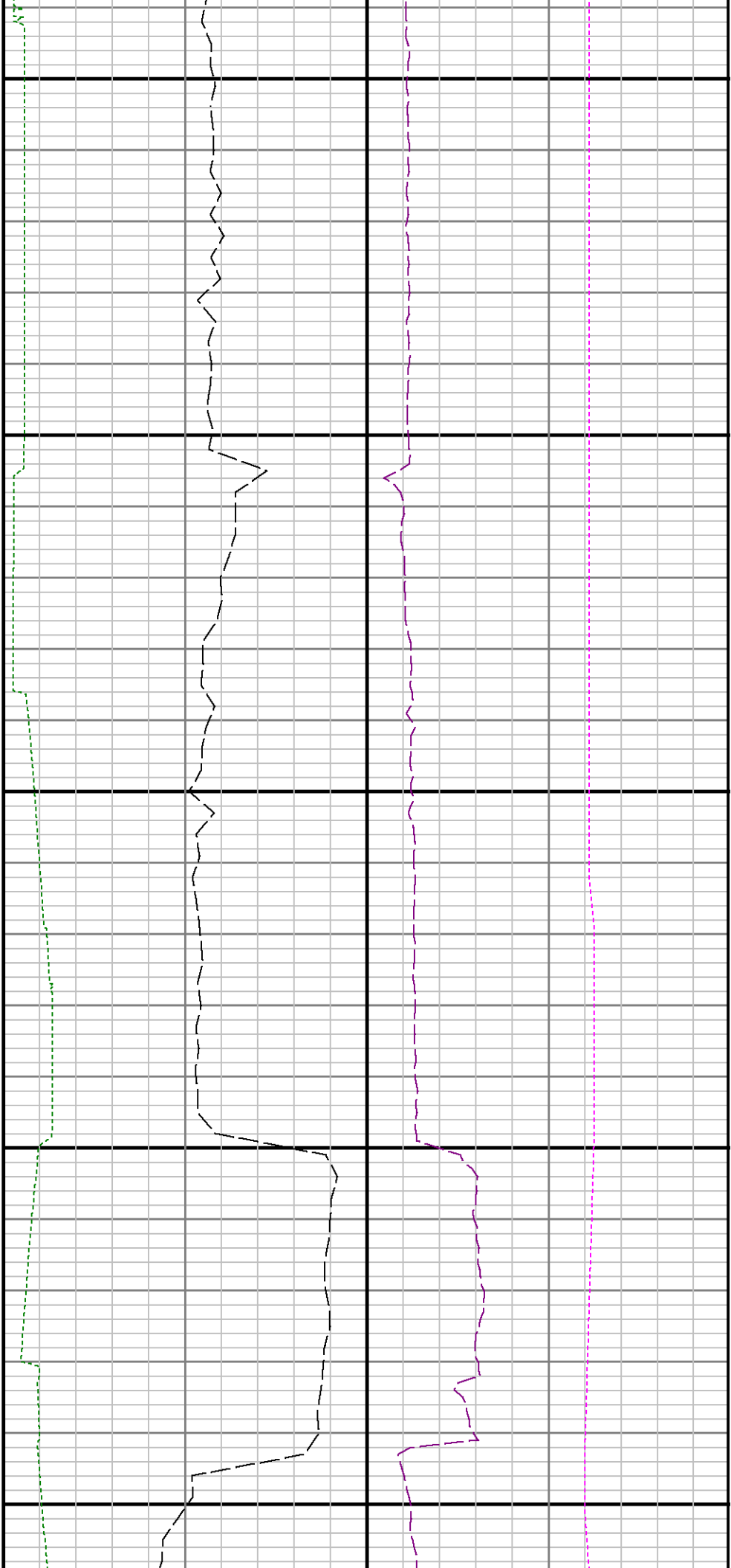
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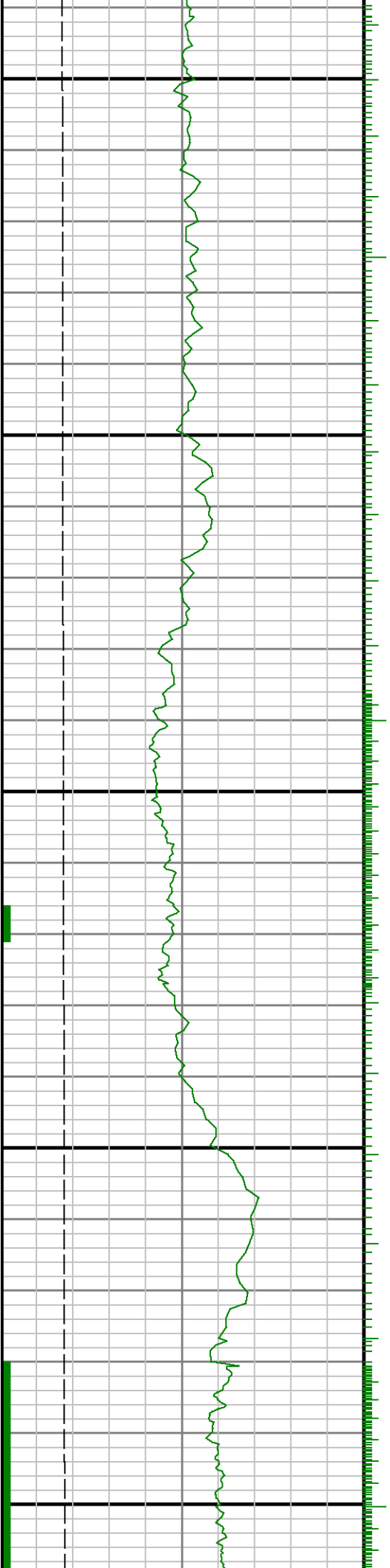


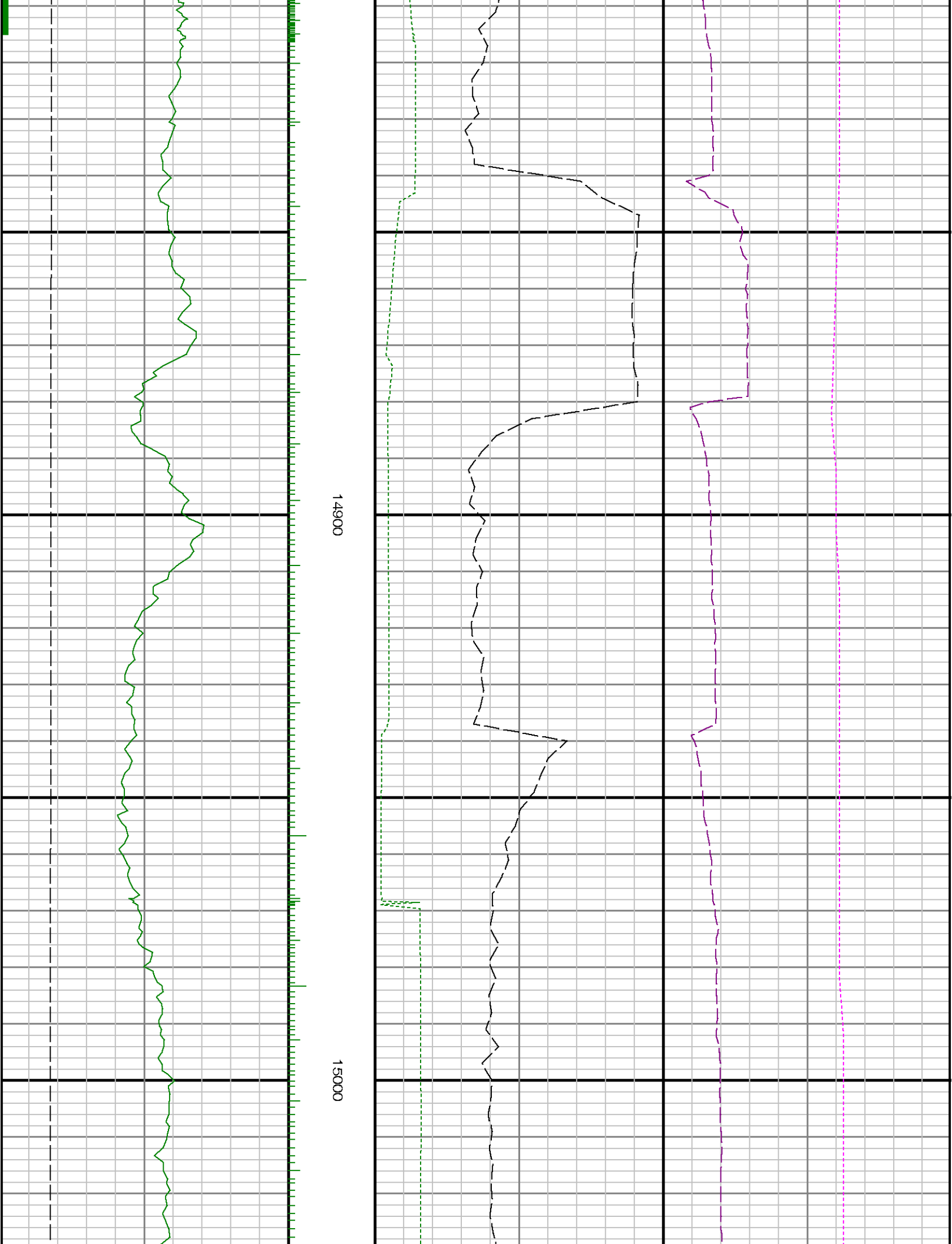


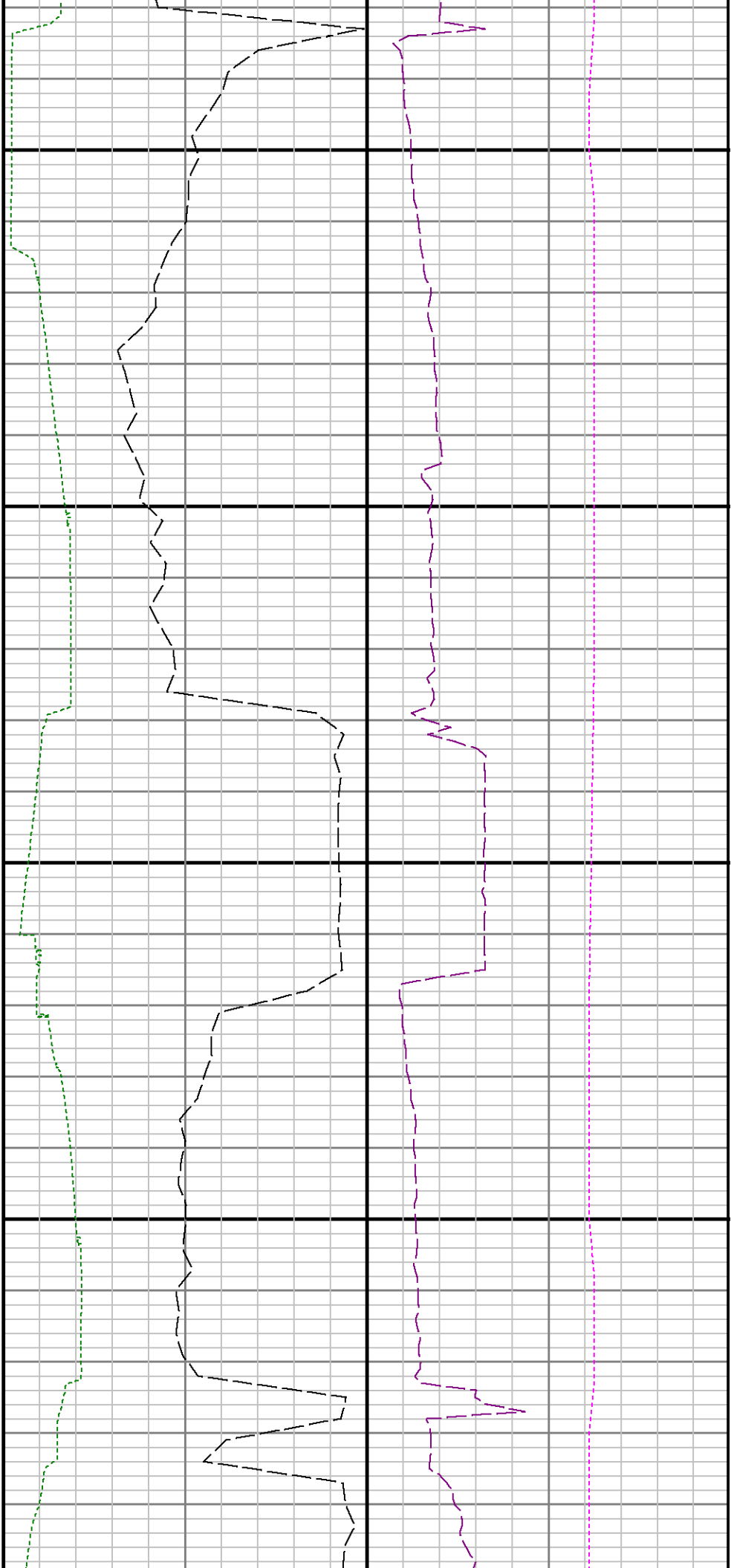
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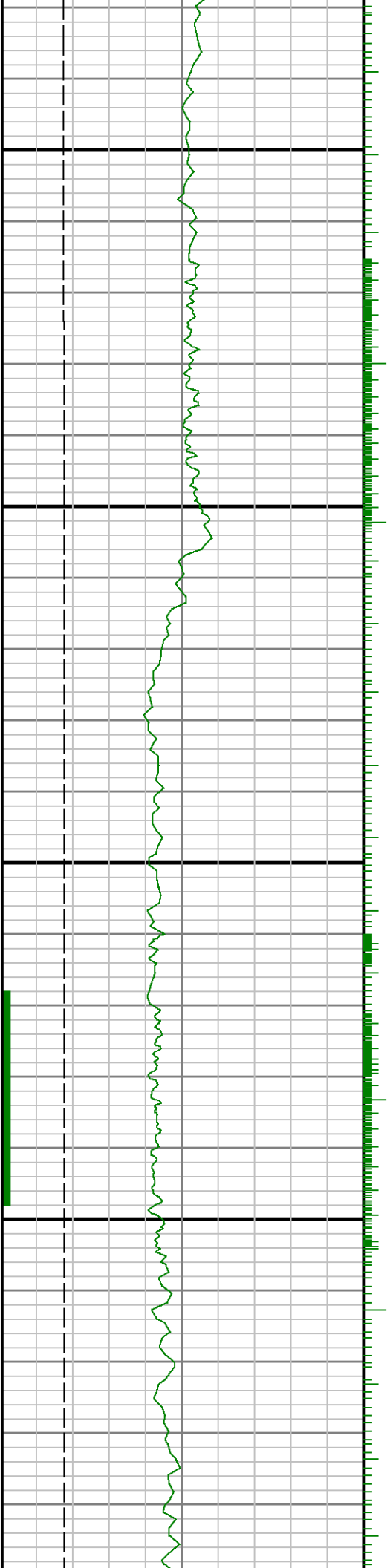


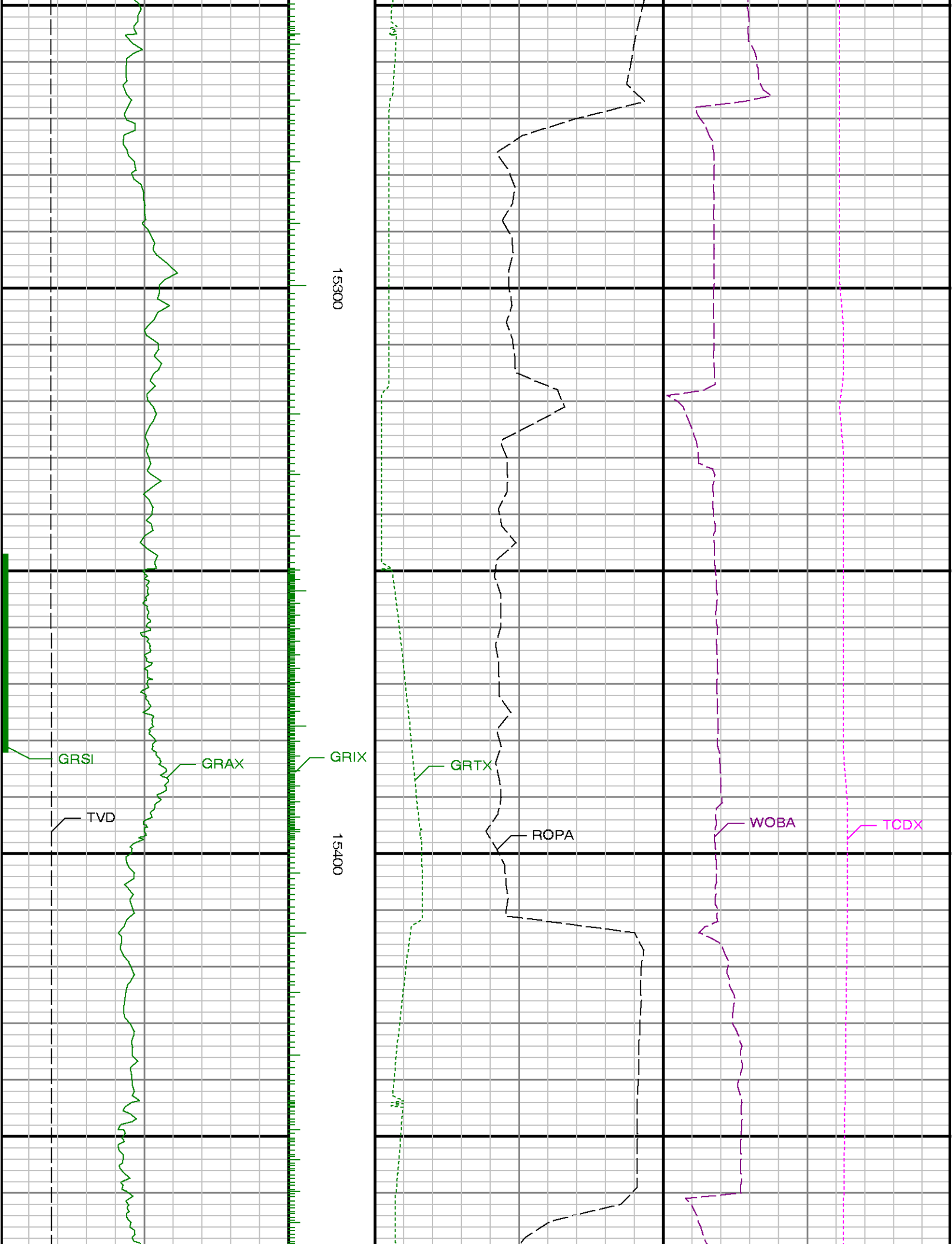


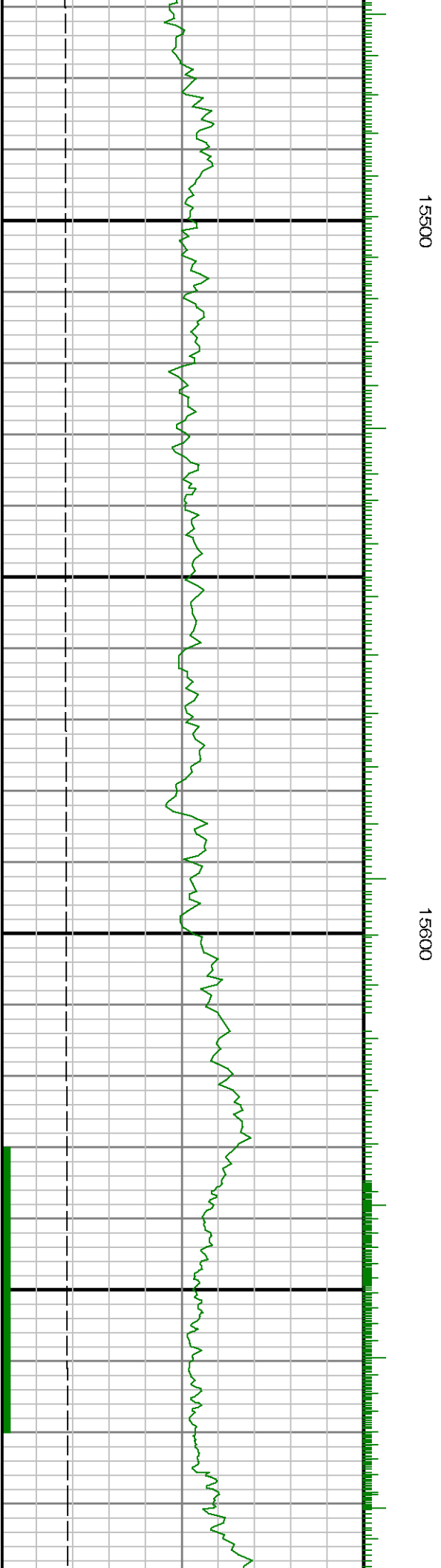
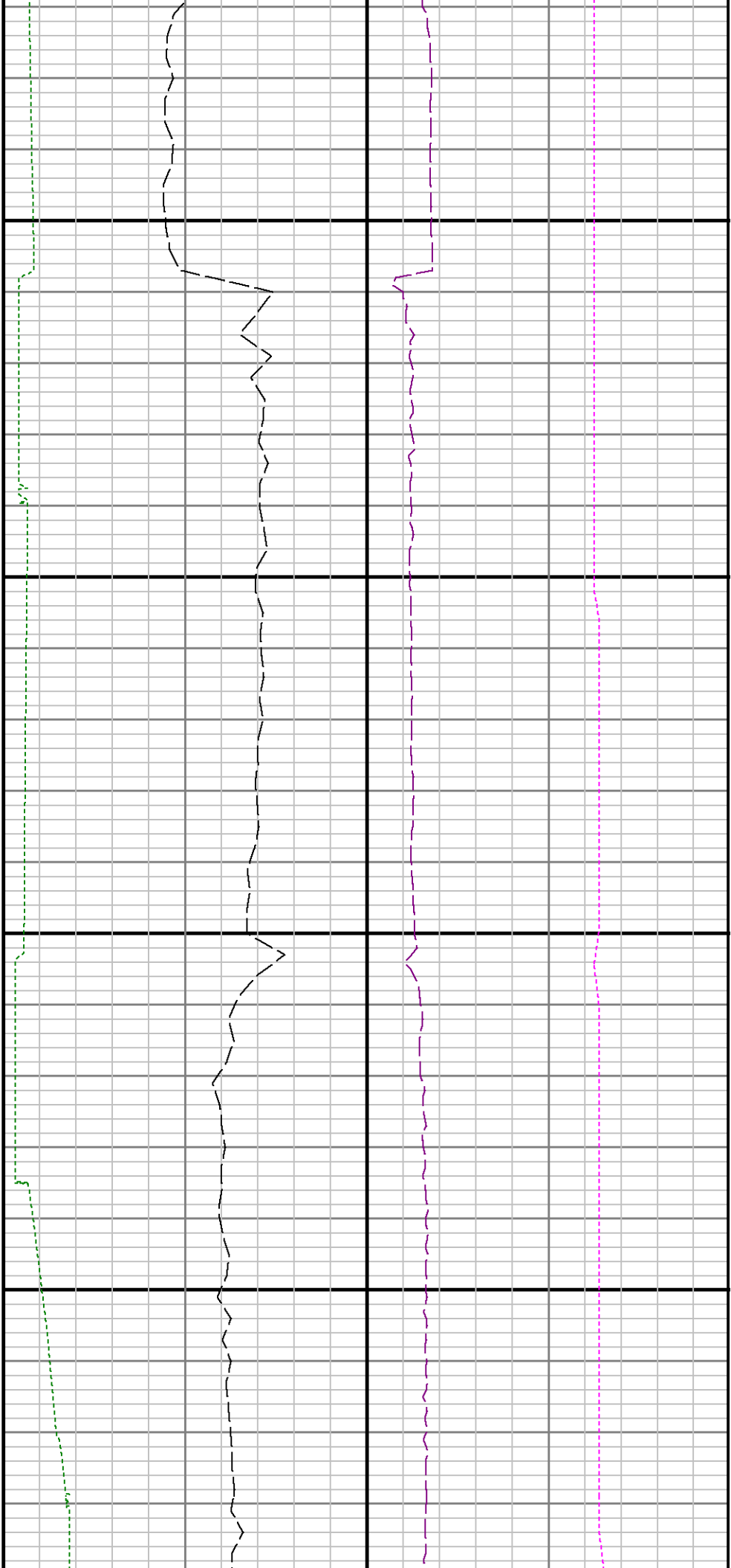


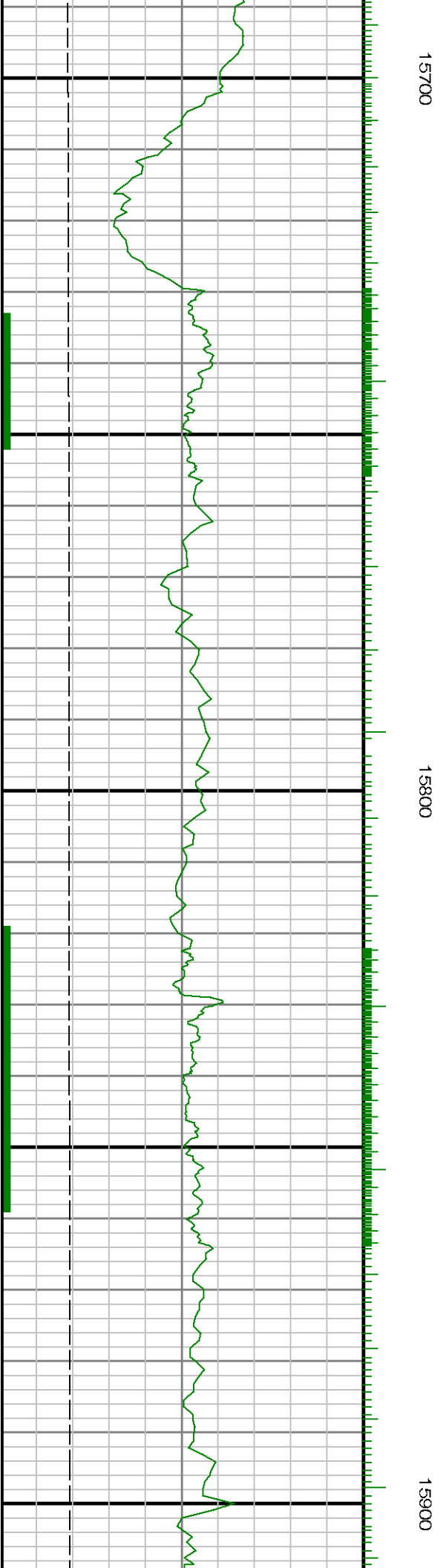
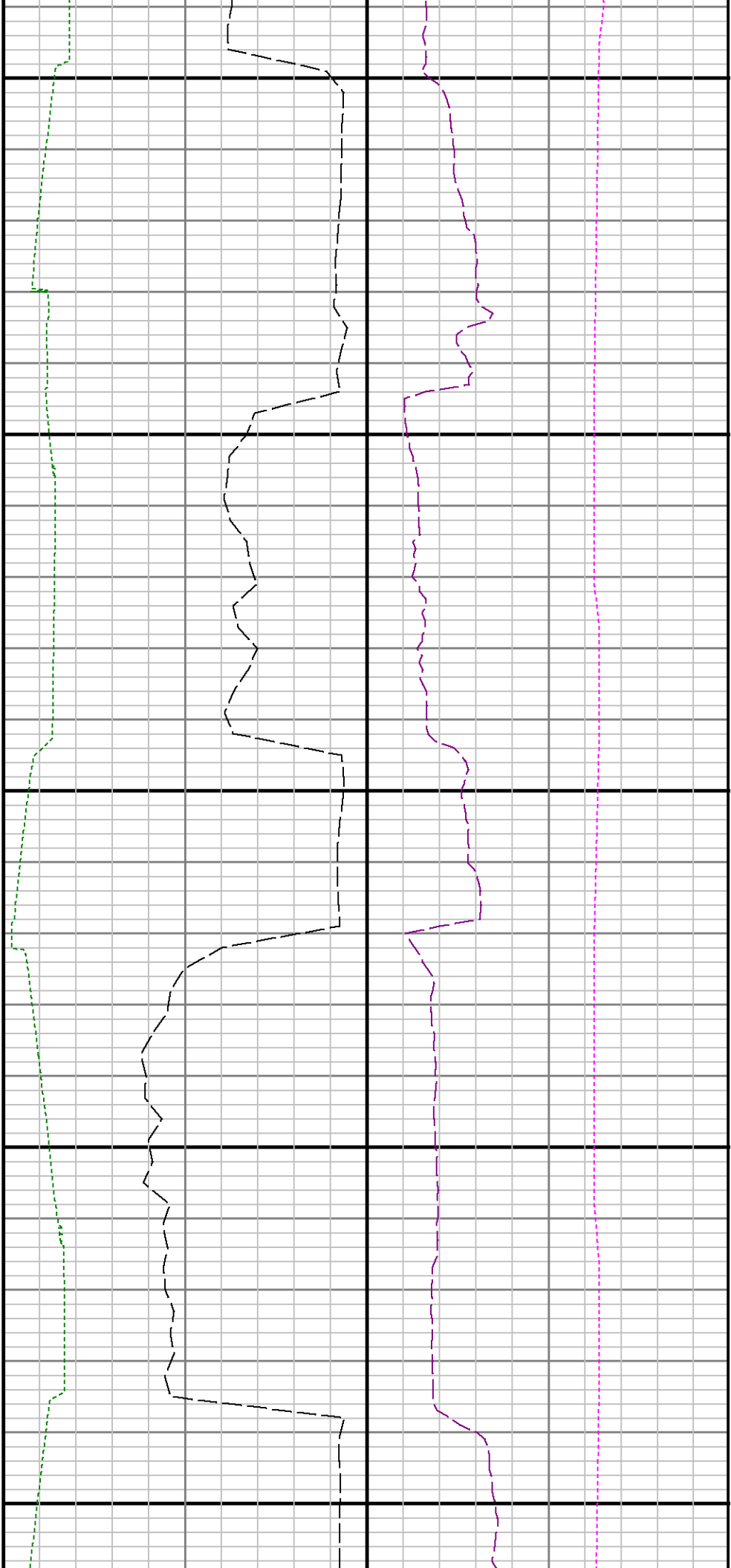
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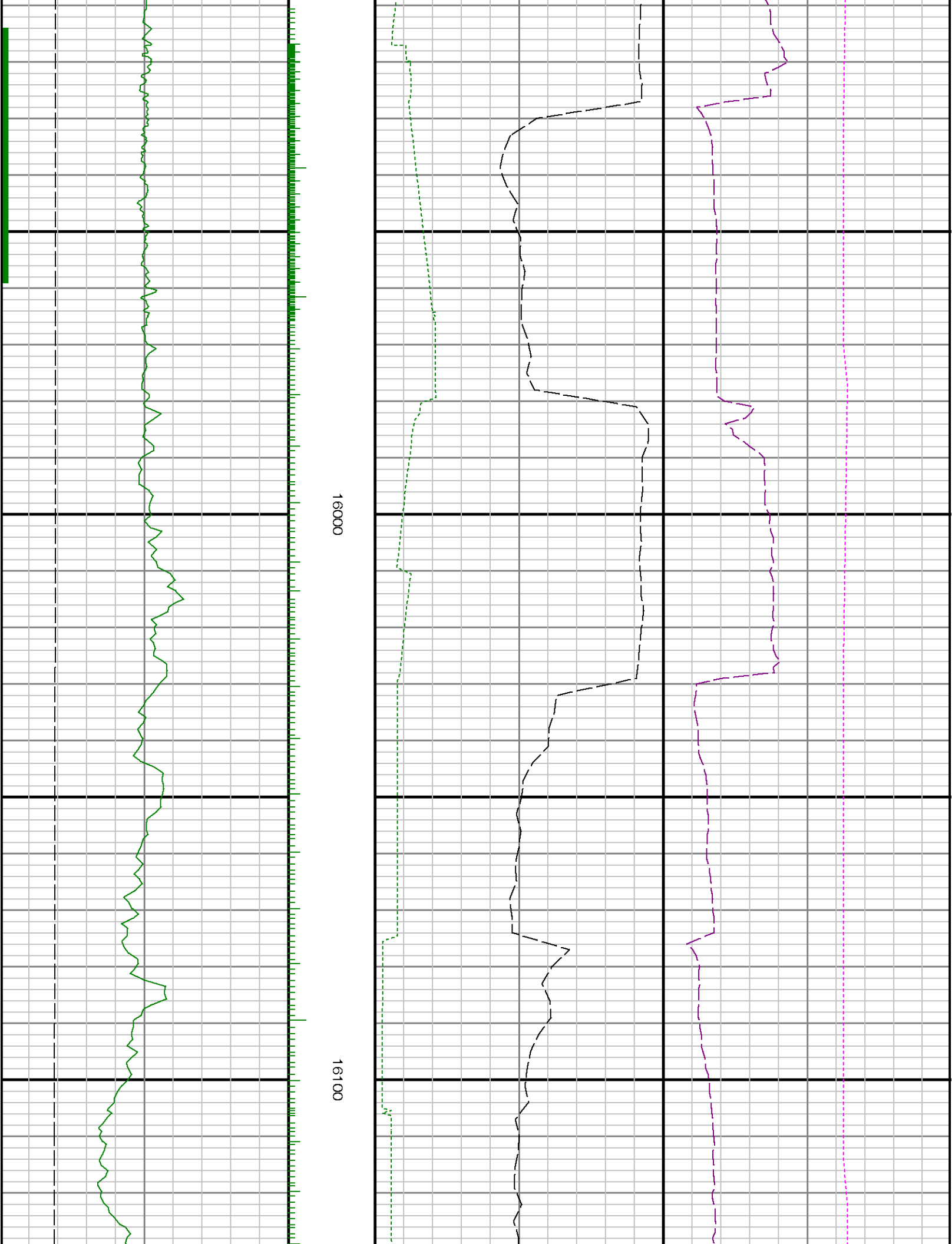
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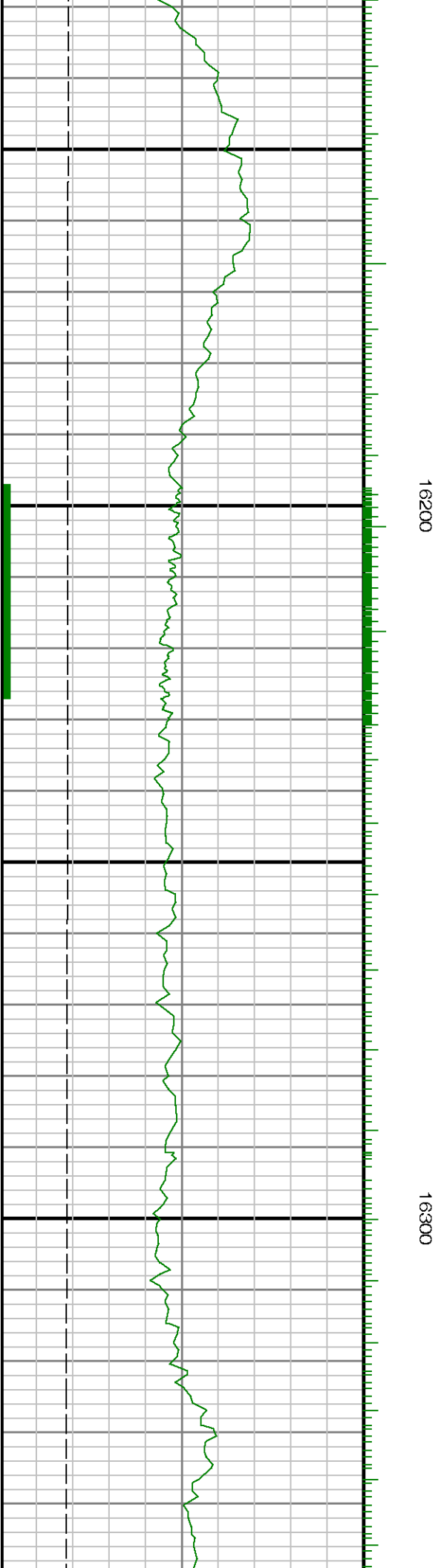
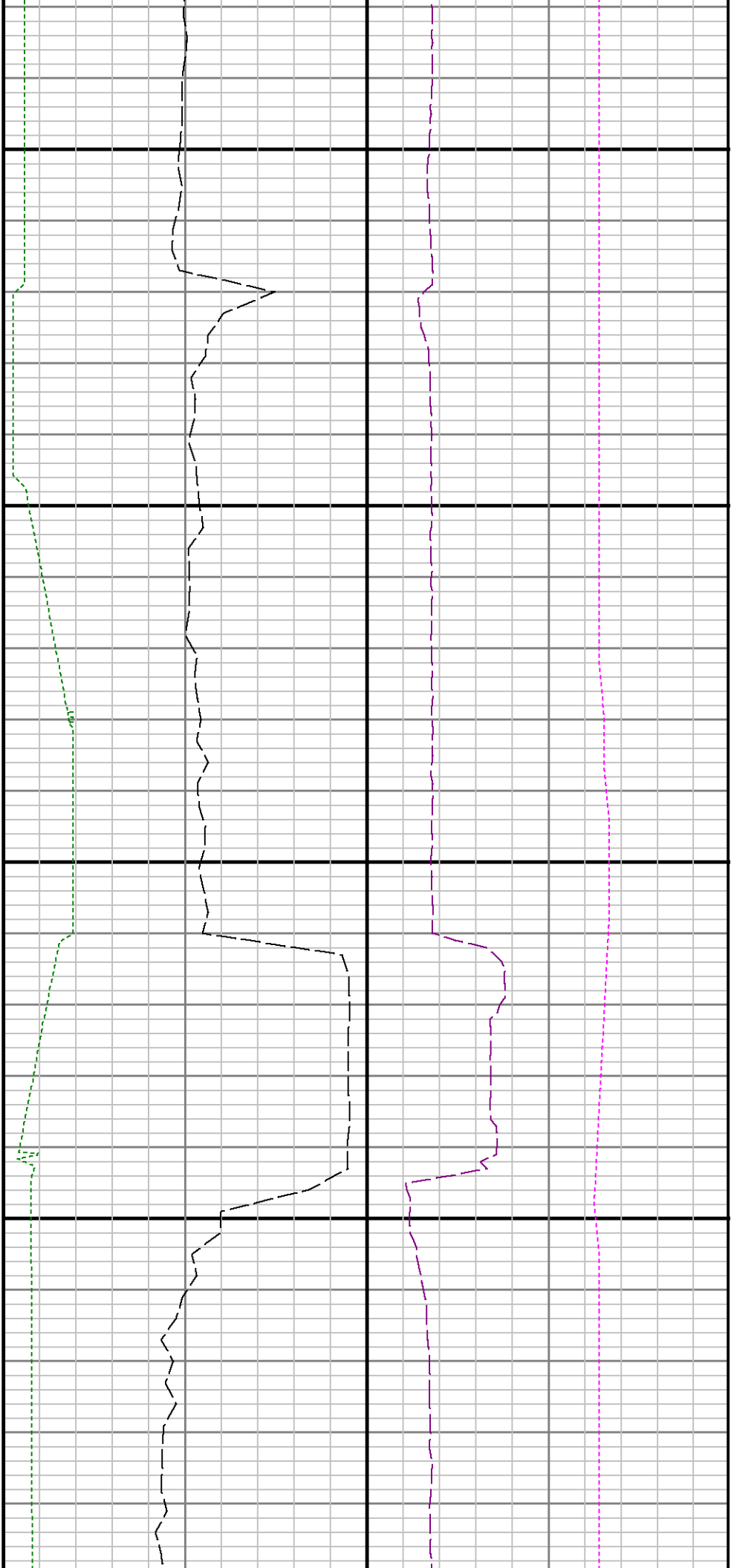














16400

16500

