



LWD MEMORY LOG

Gamma Ray

| | | | | | | | | | | | | | | |
|--|--|------------------|-----------------|-------------------|--------------------------|--|--------------------|-----------------------|------------------|------------------|-------|----------------|--|--|
| Scale: Measured Depth | Company: Great Western Operating Company LLC | | | | | | | | | | | | | |
| | Well: Schneider HD 11-019HN | | | | | | | | | | | | | |
| | Field: Weld County | | | | | | | | | | | | | |
| | County: | | Weld County | | Country: United States | | | | | | | | | |
| | Depth Reference: | | State: Colorado | | | | | | | | | | | |
| Driller's Depth | | | | | | | Other Services: | | | | | | | |
| Status: | Final Print | | | Surface Location: | | | | | | | | | | |
| | | | | Latitude: | | | 40° 19' 26.500" N | | | | | | | |
| API No: 05-123-46404 | | | | Longitude: | | | 104° 49' 36.660" W | | | | | | | |
| Job ID: 110030473 | | | | SEC: 7 TWN: | | 4N RGE: 66W | | Directional | | | | | | |
| Permanent Datum (P.D.): Mean Sea Level | | | | Elevation: | | 0.00 ft | | N/A | | | | | | |
| Log Measured From: Rig Floor | | | | Above P.D.: | | 4755.00 ft | | Elev. KB: 4755.00 ft | | | | | | |
| | | | | | | Elev. GL: 4735.00 ft | | | | | | | | |
| Dates | | Interval | | | Magnetic Field Reference | | | | | | | | | |
| From: 2019-09-20 | | Drilled (ft) | | Logged (ft) | | Azi Reference North: | | True Dip Angle: (deg) | | | | | | |
| To: 2019-09-23 | | Top: 1574.00 | | Top: 1574.00 | | Total Magnetic Field Strength: (nT) | | 52078 | | | | | | |
| Spud: 2019-08-29 | | Bottom: 18296.00 | | Bottom: 18283.00 | | Mag to Reference North Correction: (deg) | | 8.19 | | | | | | |
| Borehole Record | | | | | | | | | Casing Record | | | | | |
| Hole Size (in) | | From (ft) | | To (ft) | | Size (in) | | Weight (lb/ft) | | From (ft) | | To (ft) | | |
| 13.500 | | 20.00 | | 1574.00 | | 9.625 | | 36.00 | | 20.00 | | 1574.00 | | |
| 8.500 | | 1574.00 | | 18296.00 | | | | | | | | | | |
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| Mud Record | | | | | | | | | Deviation Record | | | | | |
| Type | | From (ft) | | To (ft) | | Hole Size (in) | | Interval (ft) | | Inc Az (Start) | | Inc Az (End) | | |
| Oil Based Mud | | 1574.00 | | 18296.00 | | 8.500 | | 16722.00 | | 0.00 342.60 | | 90.31 268.83 | | |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| Acquisition System | | | | | | | | | Software Version | | Other | | | |
| Cadence | | RT 5.4 | | | | Rig: | | PD 460 | | | | | | |
| Plot Studio | | 5.4.8625.2 | | | | Contractor: | | Precision Drilling | | Unit: D&E | | | | |
| | | | | | | District: | | RMA | | | | | | |

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Log Run Summary

| Run No | Bit Run No. | Bit Size (in) | Bit Type | Bit Gauge Length (in) | Assembly Type | Logged Interval | | Bit Depth Interval | | Date / Time | | Circ. Hours |
|--------|-------------|------------------|----------|--------------------------|----------------|-----------------|----------|--------------------|----------|------------------|------------------|-------------|
| | | | | | | Top | Bottom | From | To | Start Logging | End Logging | |
| | | | | | | (ft) | (ft) | (ft) | (ft) | | | |
| 1 | 1 | 8.500 | PDC | 4.00 | AutoTrak Curve | 1574.00 | 18283.00 | 1574.00 | 18296.00 | 2019-09-20 08:44 | 2019-09-23 08:44 | 64.61 |

Crew

| Name | Arrive Wellsite | Depart Wellsite | Name | Arrive Wellsite | Depart Wellsite | Name | Arrive Wellsite | Depart Wellsite |
|--------------|--------------------|--------------------|-----------|--------------------|--------------------|------|--------------------|--------------------|
| Alain Atemoh | 2019-09-20 | 2019-09-23 | Will Roth | 2019-09-20 | 2019-09-22 | | | |

Mud Properties Record

| Date / Time | Run No. | Depth (ft) | Mud Type | Density (ppg) | Viscosity (cP) | pH | Fluid Loss (cm3) | Oil / Water | Source | Total Chlorides (ppm) | K+ (%) |
|------------------|---------|---------------|---------------|------------------|-------------------|-----|---------------------|-------------|--------------|--------------------------|-----------|
| 2019-09-20 12:00 | 1 | 2180.00 | Oil Based Mud | 10.5 | 28 | N/A | 10.0 | 65/20 | Active Pit | 23500 | 0.00 |
| 2019-09-20 19:00 | 1 | 4605.00 | Oil Based Mud | 10.5 | 25 | N/A | 10.0 | 61.4/21 | Shale Shaker | 24500 | 0.00 |
| 2019-09-21 01:00 | 1 | 5995.00 | Oil Based Mud | 10.5 | 23 | N/A | 10.0 | 61.5/21 | Shale Shaker | 24500 | 0.00 |
| 2019-09-21 12:00 | 1 | 8558.00 | Oil Based Mud | 10.5 | 24 | N/A | 10.0 | 60.6/22 | Shale Shaker | 25000 | 0.00 |
| 2019-09-21 19:00 | 1 | 10083.00 | Oil Based Mud | 10.5 | 25 | N/A | 10.0 | 60.4/22 | Shale Shaker | 24000 | 0.00 |
| 2019-09-22 01:00 | 1 | 11275.00 | Oil Based Mud | 10.5 | 27 | N/A | 10.0 | 60.5/22 | Active Pit | 24000 | 0.00 |
| 2019-09-22 12:00 | 1 | 13906.00 | Oil Based Mud | 10.6 | 29 | N/A | 10.0 | 59.7/22.3 | Shale Shaker | 24000 | 0.00 |
| 2019-09-22 19:00 | 1 | 15422.00 | Oil Based Mud | 10.5 | 30 | N/A | 10.0 | 60.1/22.3 | Shale Shaker | 23500 | 0.00 |
| 2019-09-23 01:00 | 1 | 16777.00 | Oil Based Mud | 10.5 | 29 | N/A | 10.0 | 60.2/22.3 | Active Pit | 23500 | 0.00 |

Equipment and Service Data

| Run No. | Tool | Serial Number | Measurement | Sensor Offset (ft) | Bit Offset (ft) | Max O.D. (in) | Min I.D. (in) |
|---------|------------------------------|---------------|----------------------|--------------------|-----------------|---------------|---------------|
| 1 | AutoTrak Curve Steering Unit | 14709022 | Near Bit VSS | 5.93 | 6.77 | 7.000 | 4.330 |
| 1 | AutoTrak Curve Steering Unit | 14709022 | Near Bit Inclination | 5.93 | 6.77 | 7.000 | 4.330 |
| 1 | AutoTrak Curve MWD | 14705407 | Gamma (single) | 2.72 | 12.94 | 7.000 | 3.250 |
| 1 | AutoTrak Curve MWD | 14705407 | Directional (mag) | 12.28 | 22.50 | 7.000 | 3.250 |

Service and Tool Mnemonics

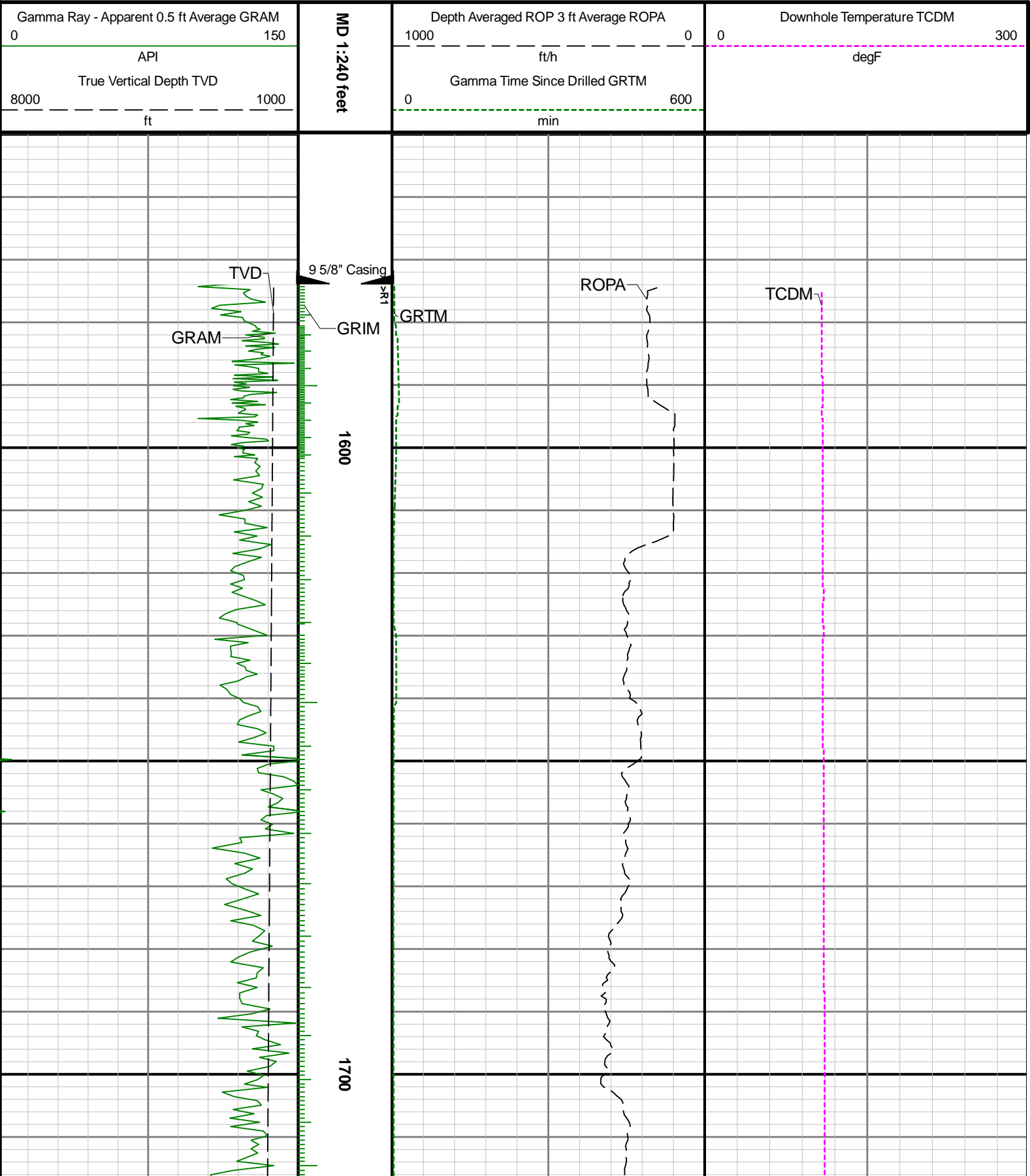
| Mnemonic | Name | Description |
|----------|------|-------------|
|----------|------|-------------|

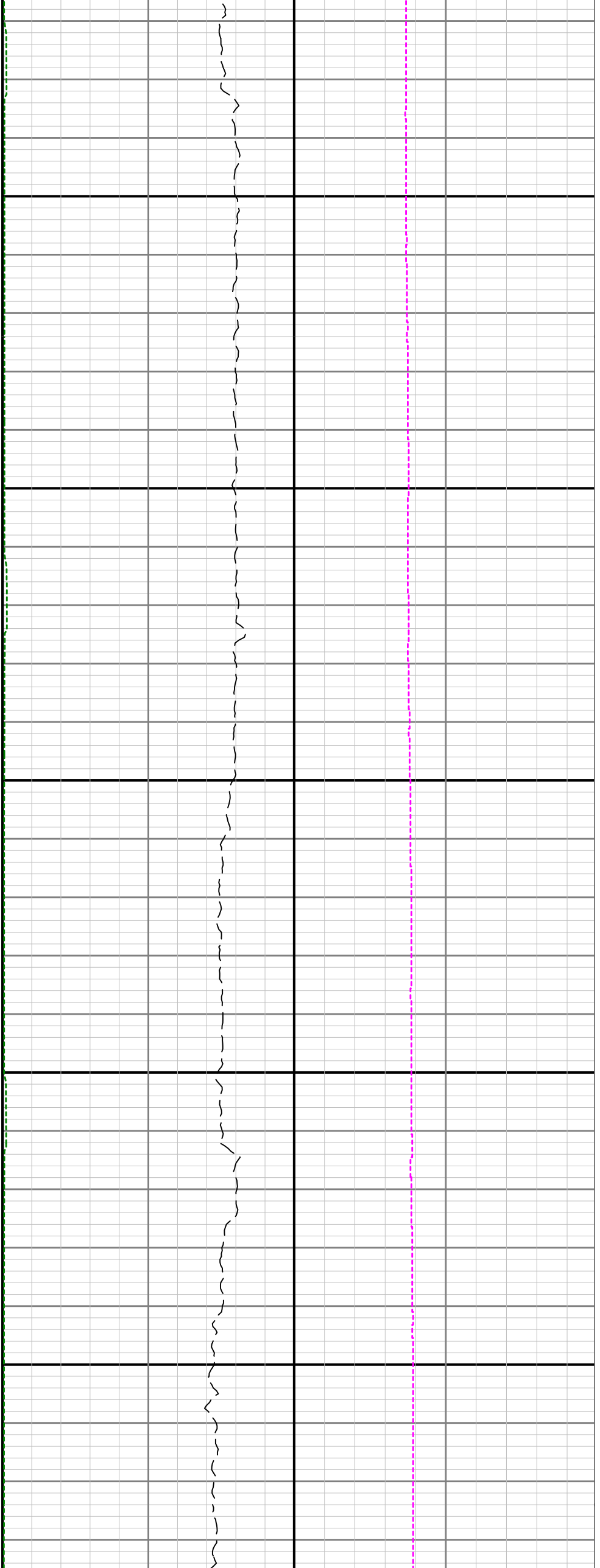
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|----------|---------------------|-------------------------------|
| ATC SU | AutoTrak Curve SU | Auto Trak Curve Steering Unit |
| ATC MWD | AutoTrak Curve MWD | Auto Trak Curve MWD |
| ATC LCPM | AutoTrak Curve LCPM | Auto Trak Curve LCPM |

| | | |
|----------|--|--|
| Comments | | |
| 1 | Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes, a GE Company (BHGE). Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified. | |
| 2 | BHGE LWD Run 1 utilized a 6.75 inch NaviGamma service (Directional and Gamma Ray) behind a 8.5 inch bit and rotary steerable assembly from 1574 to 18296 feet MD (1574 to 7106 feet TVD) | |
| 3 | "Date To" indicates the date and time the well reached Total Depth (TD) and logging services ended. | |

| | | | | |
|---------|----------|--------------|---------|--|
| Remarks | | | | |
| Number | Depth | Hole Section | Run No. | Remark |
| | (ft) | (in) | | |
| 1 | 18291.00 | 8.500 | 1 | The interval from 18283 to 18296 feet MD (7106 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD |

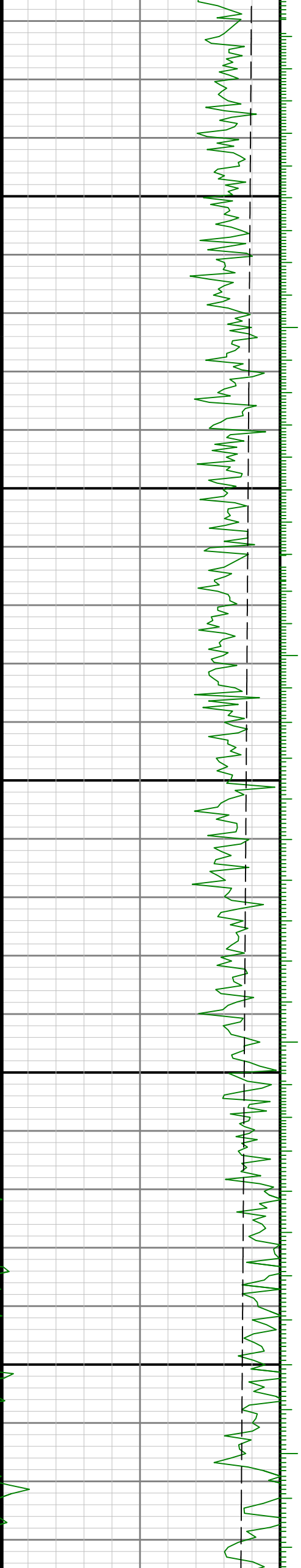
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|------------------|--|----------|
| Curve Mnemonics | | |
| Presented Curves | | Units |
| ROPA | | ft/h |
| TVD | | ft |
| GRAM | | API |
| GRIM | | unitless |
| GRTM | | min |
| TCDM | | degF |

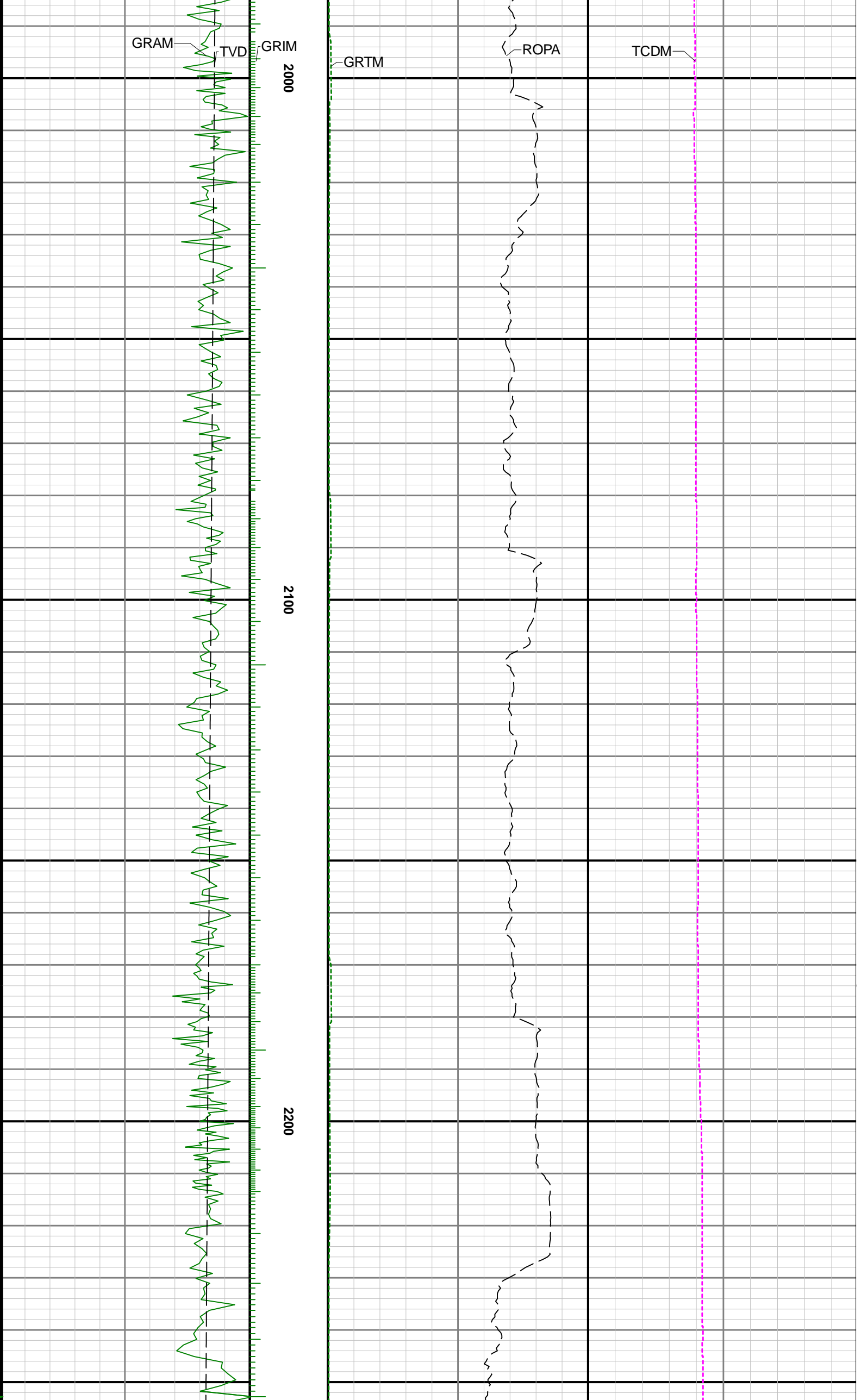


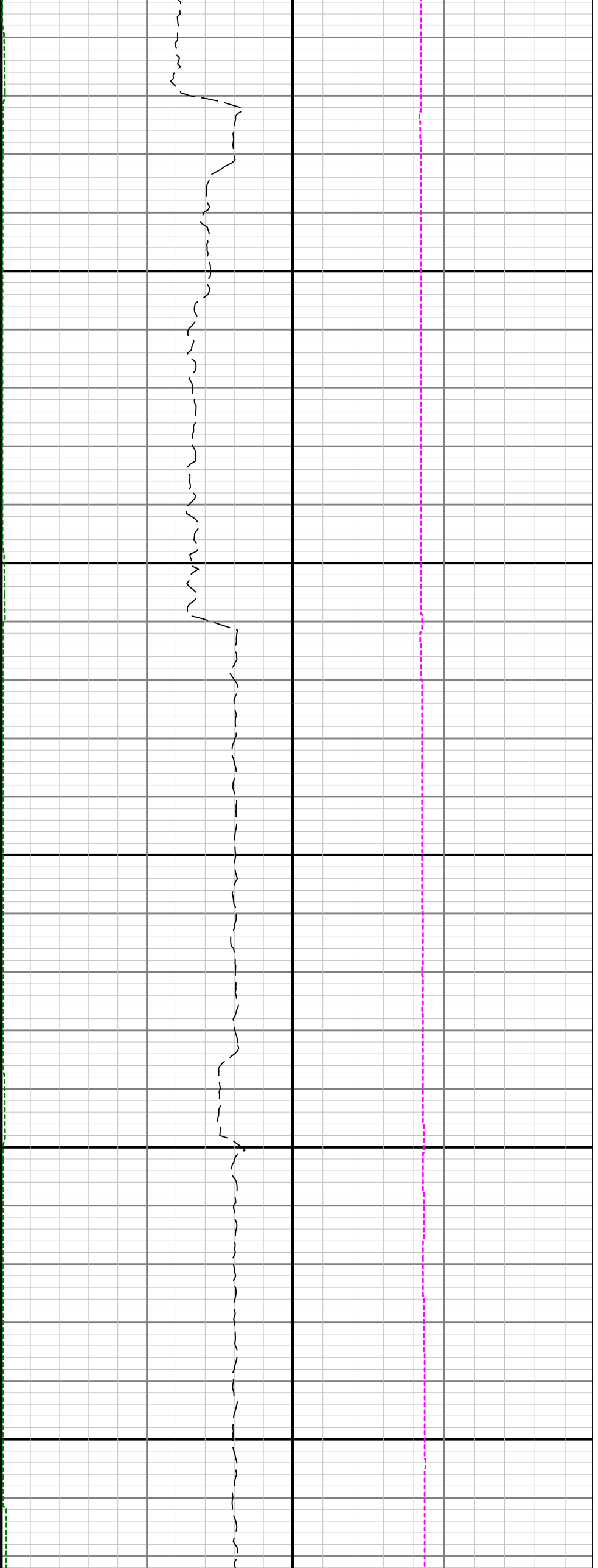


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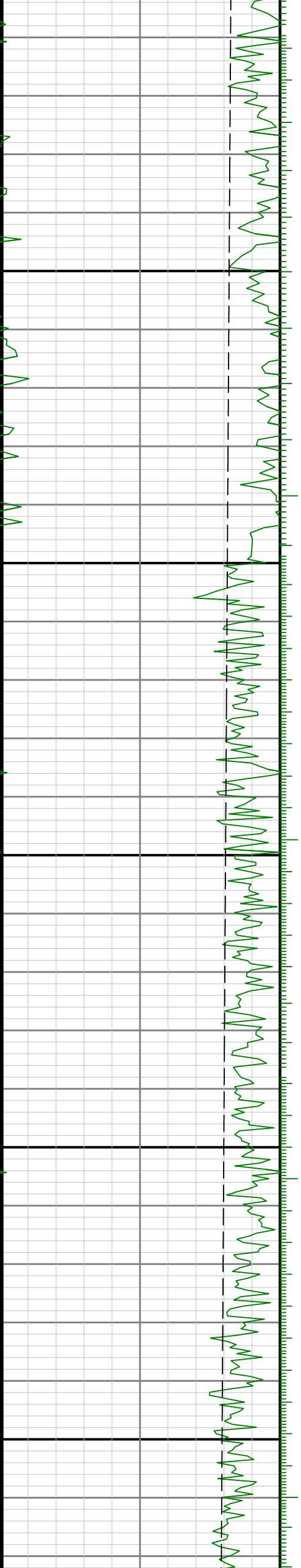


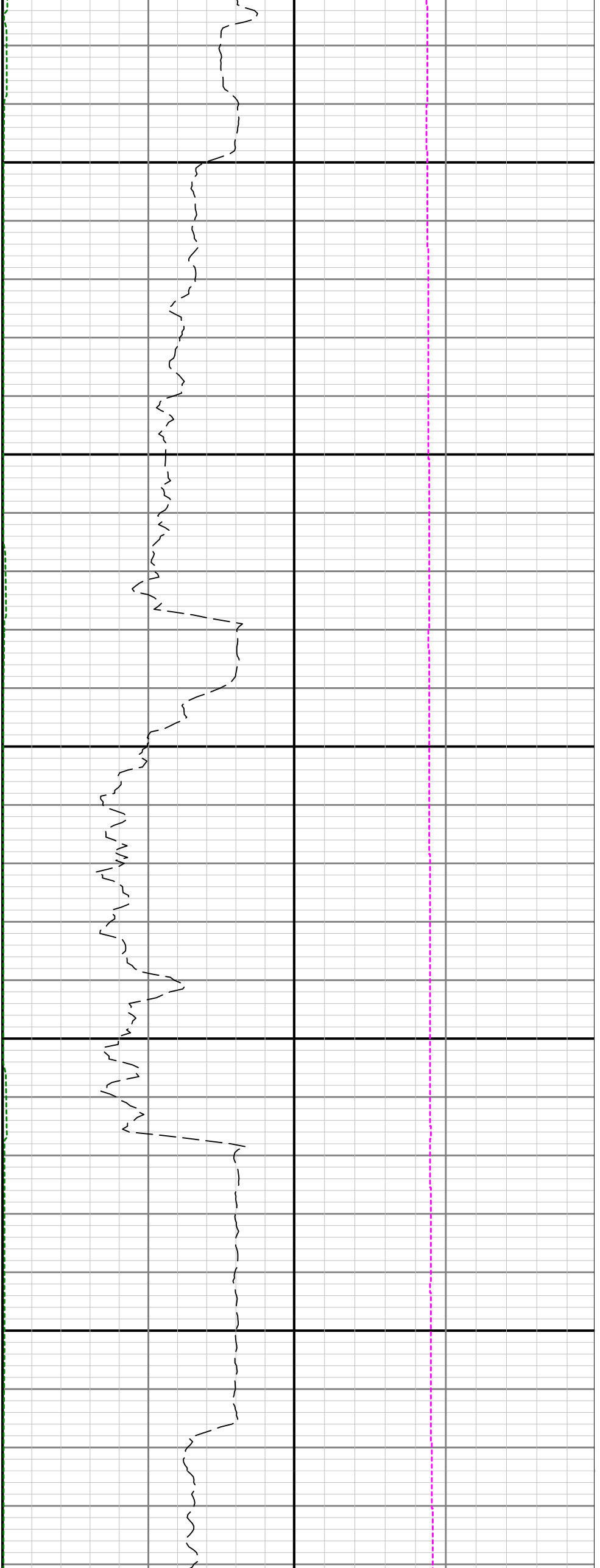


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2400

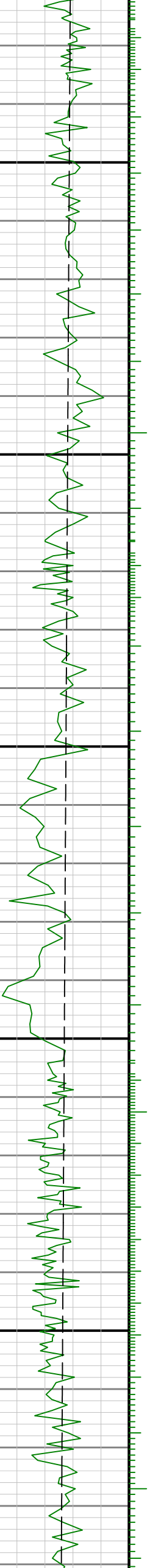
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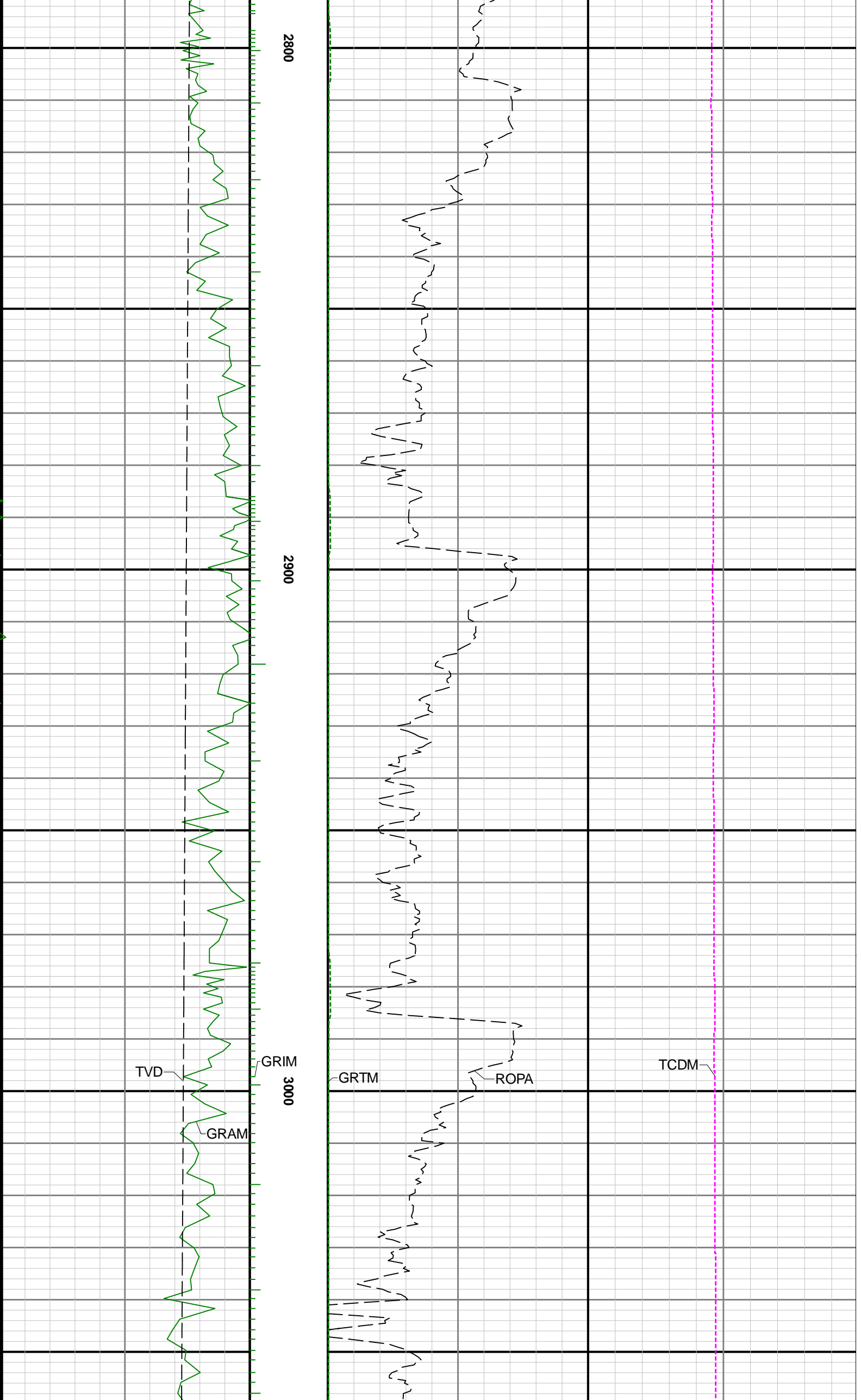


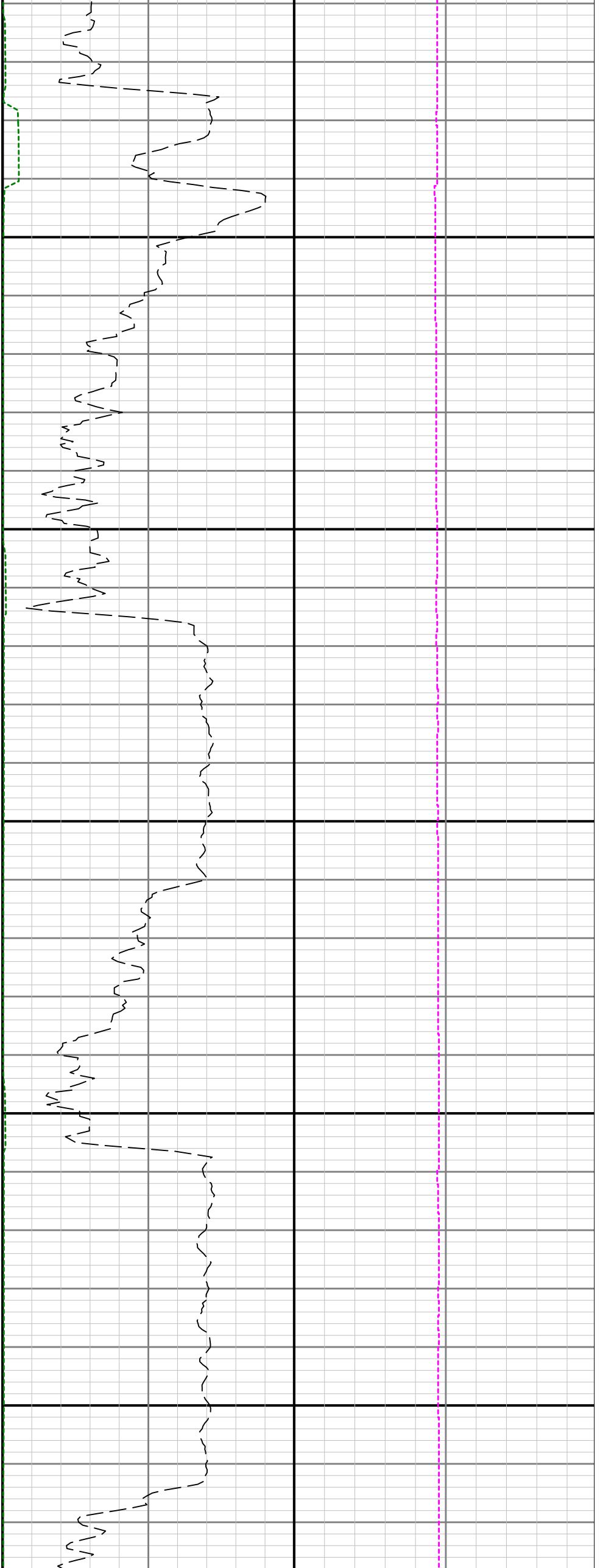


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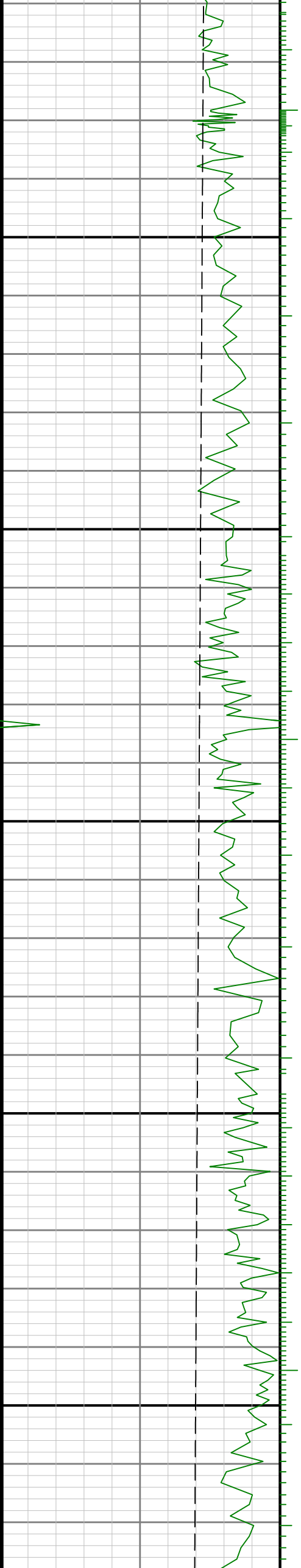


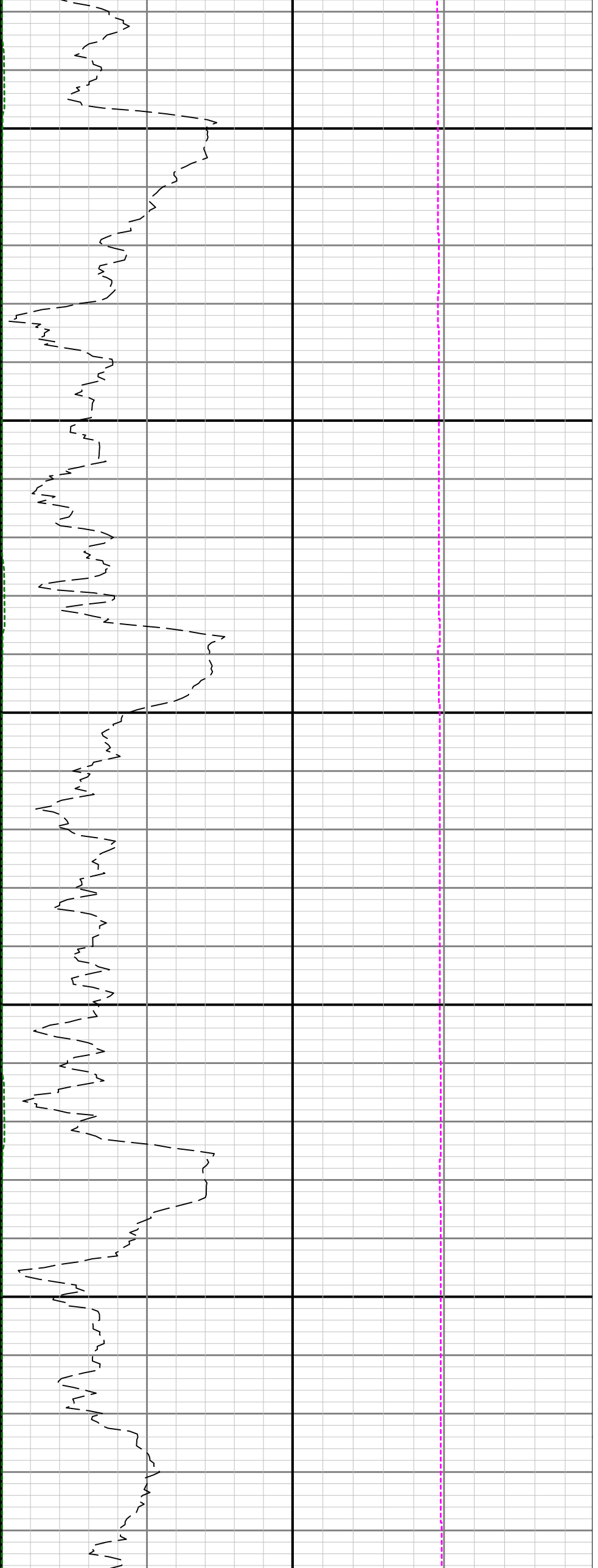


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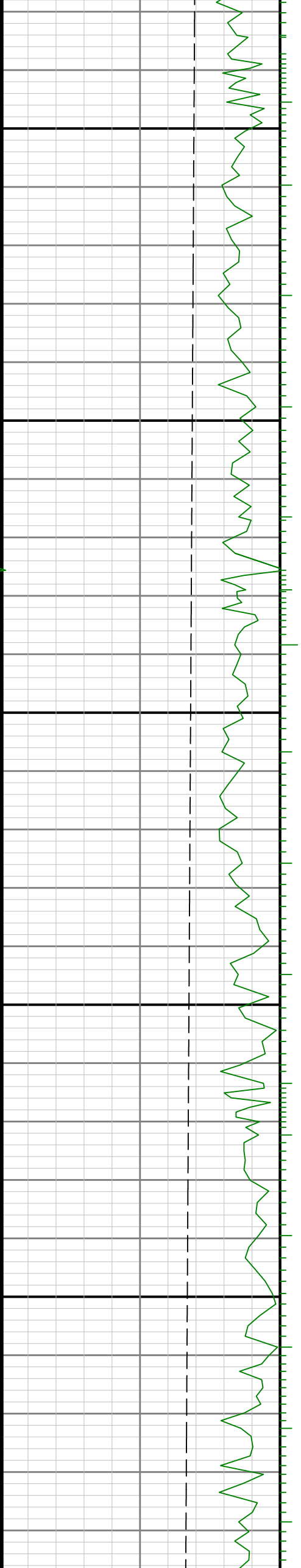
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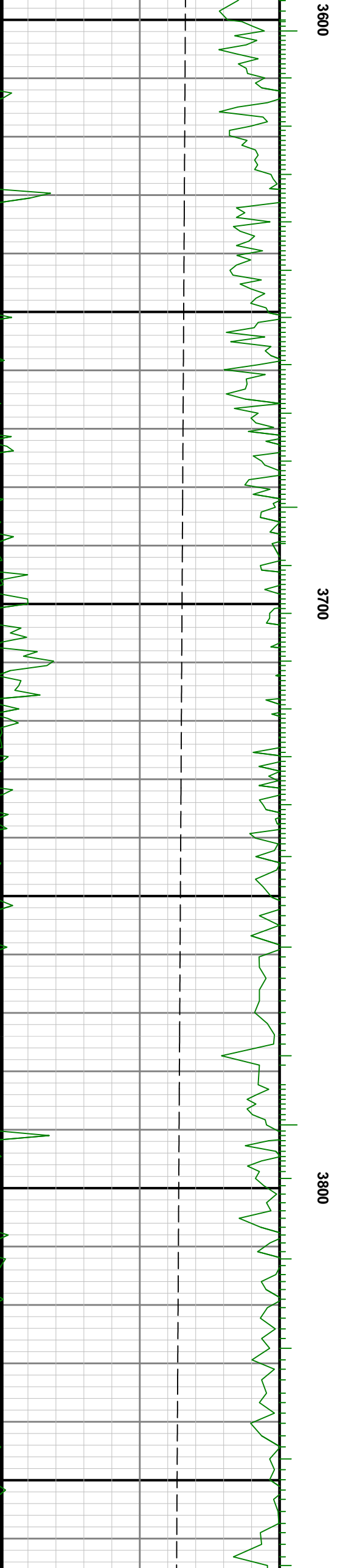
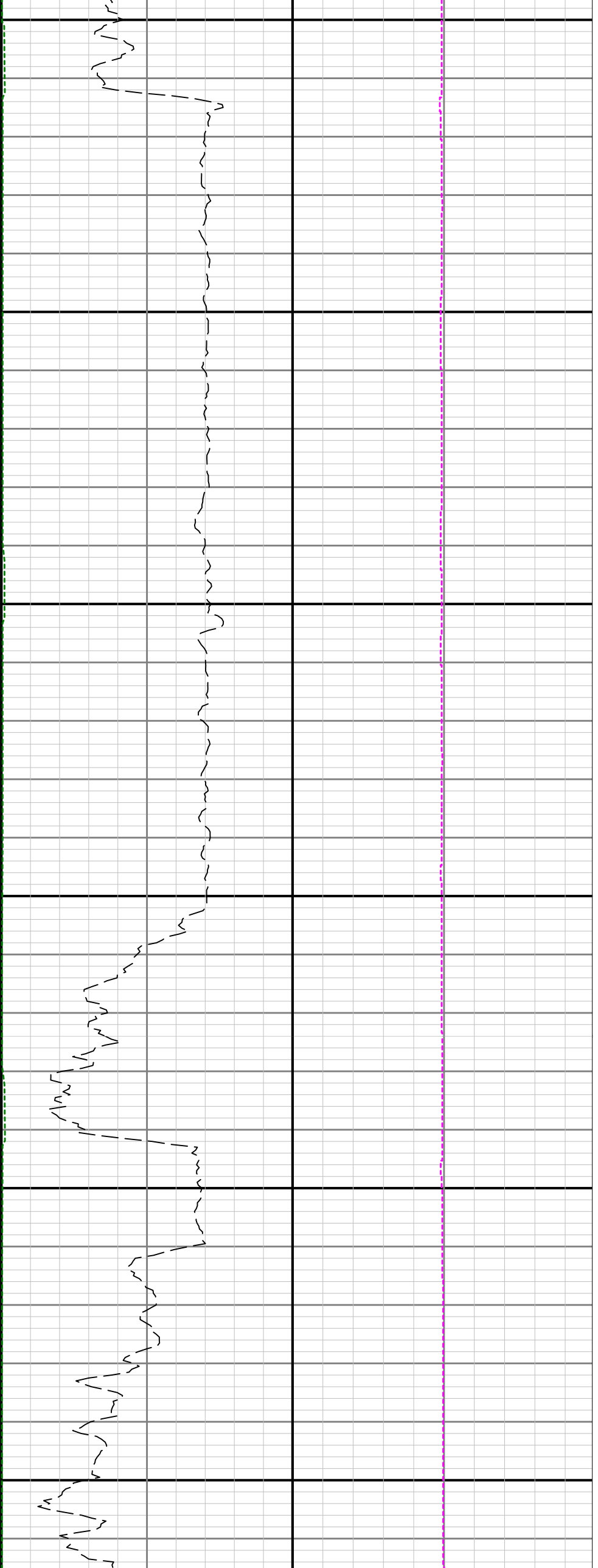


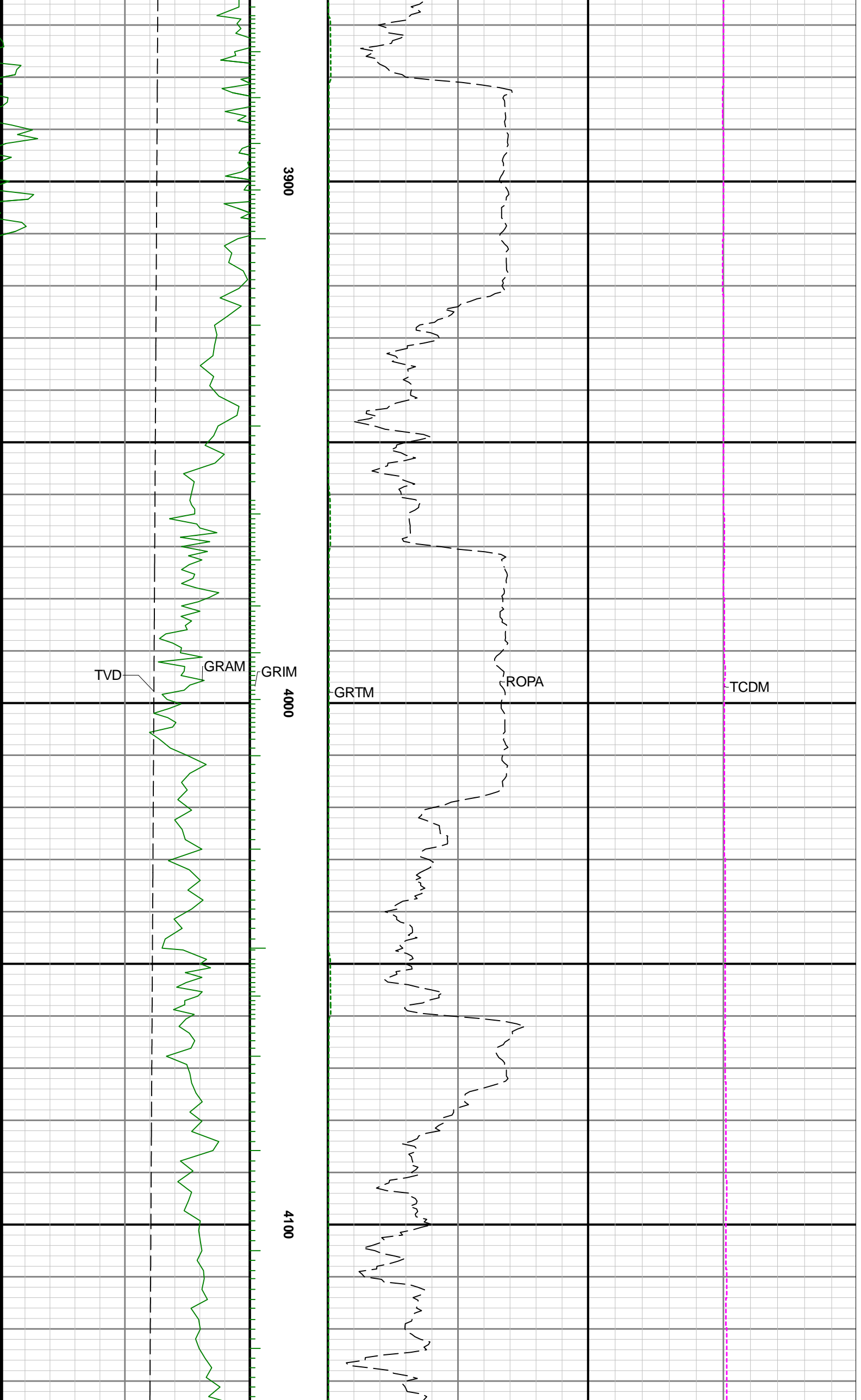


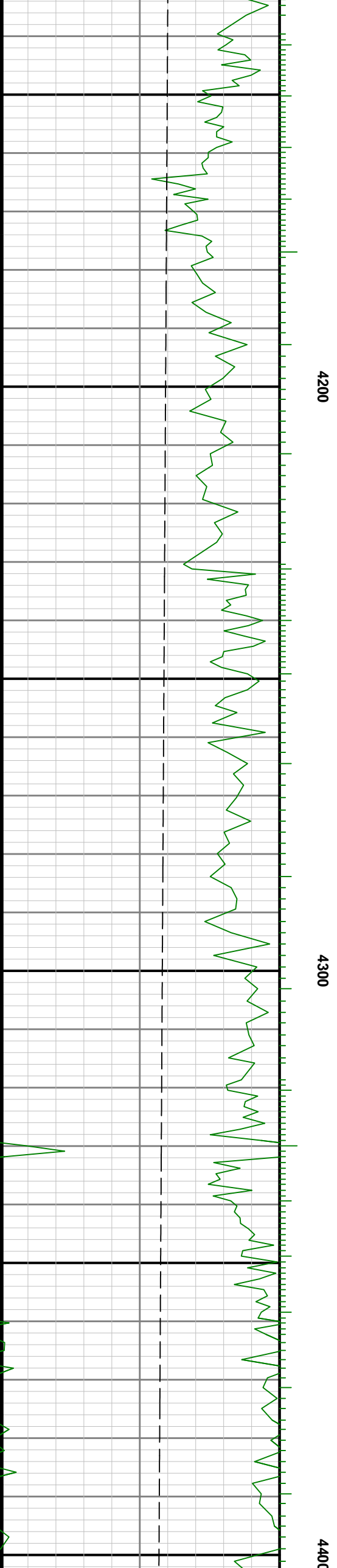
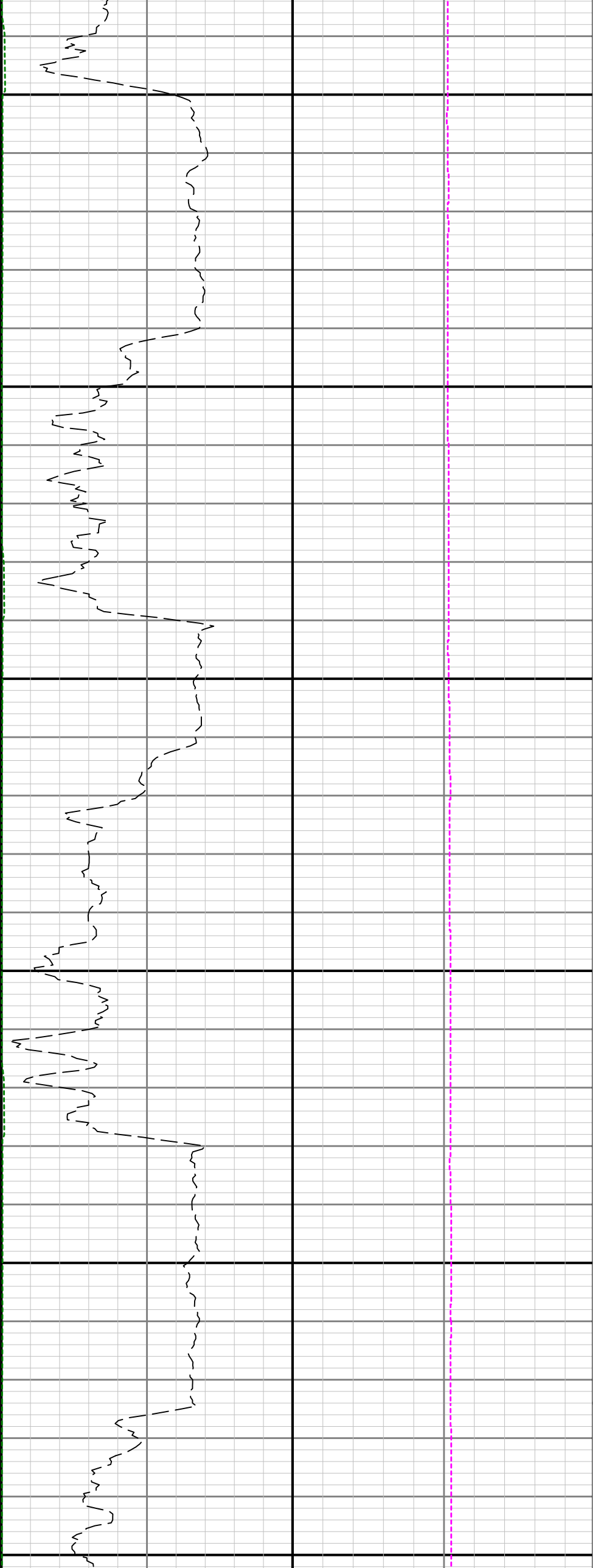
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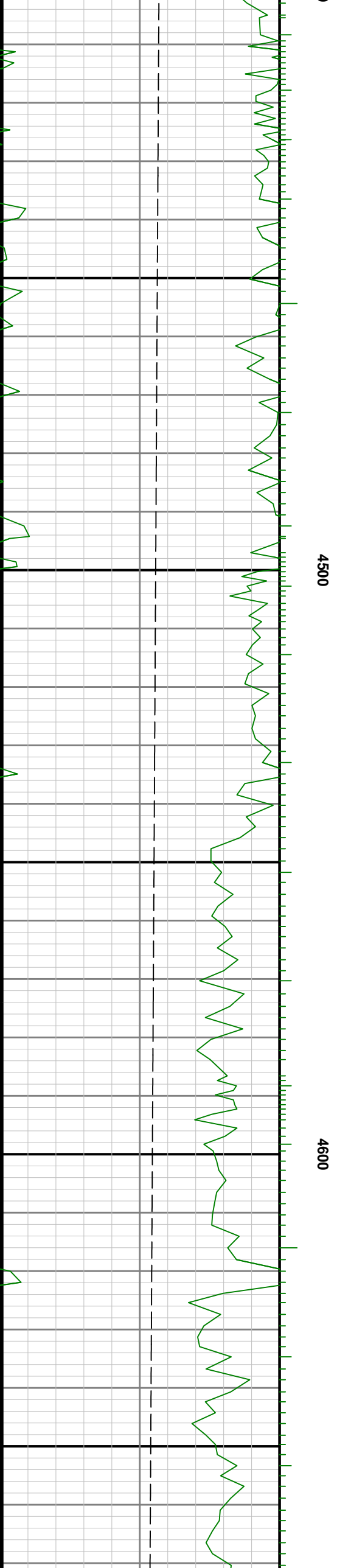
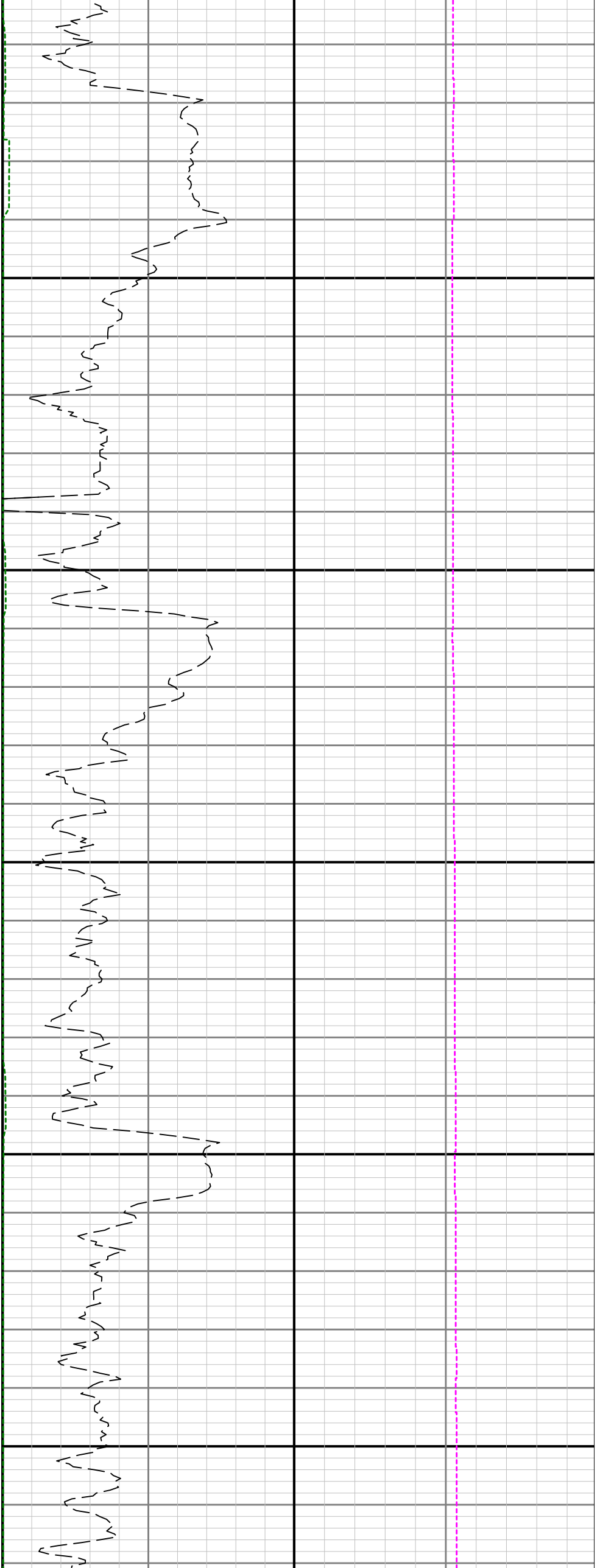
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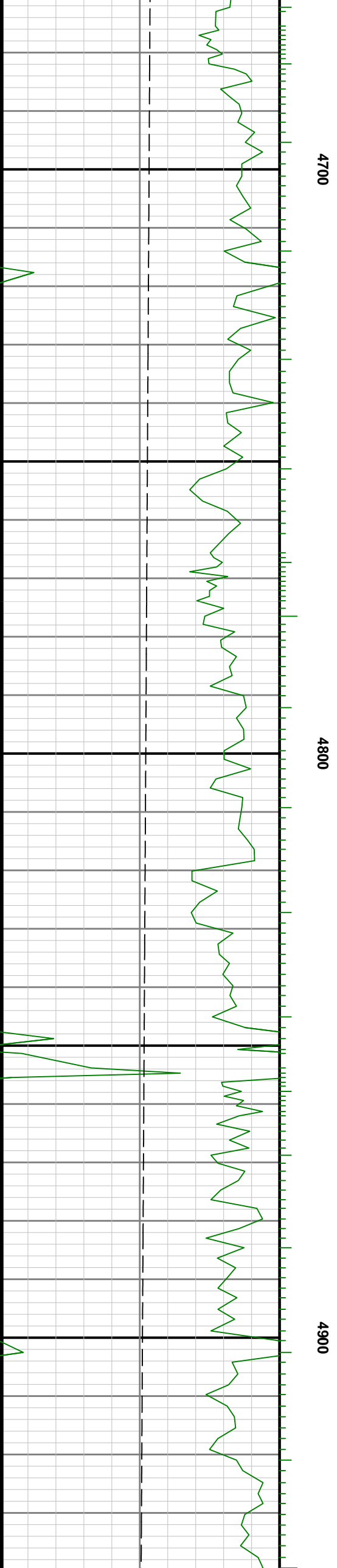
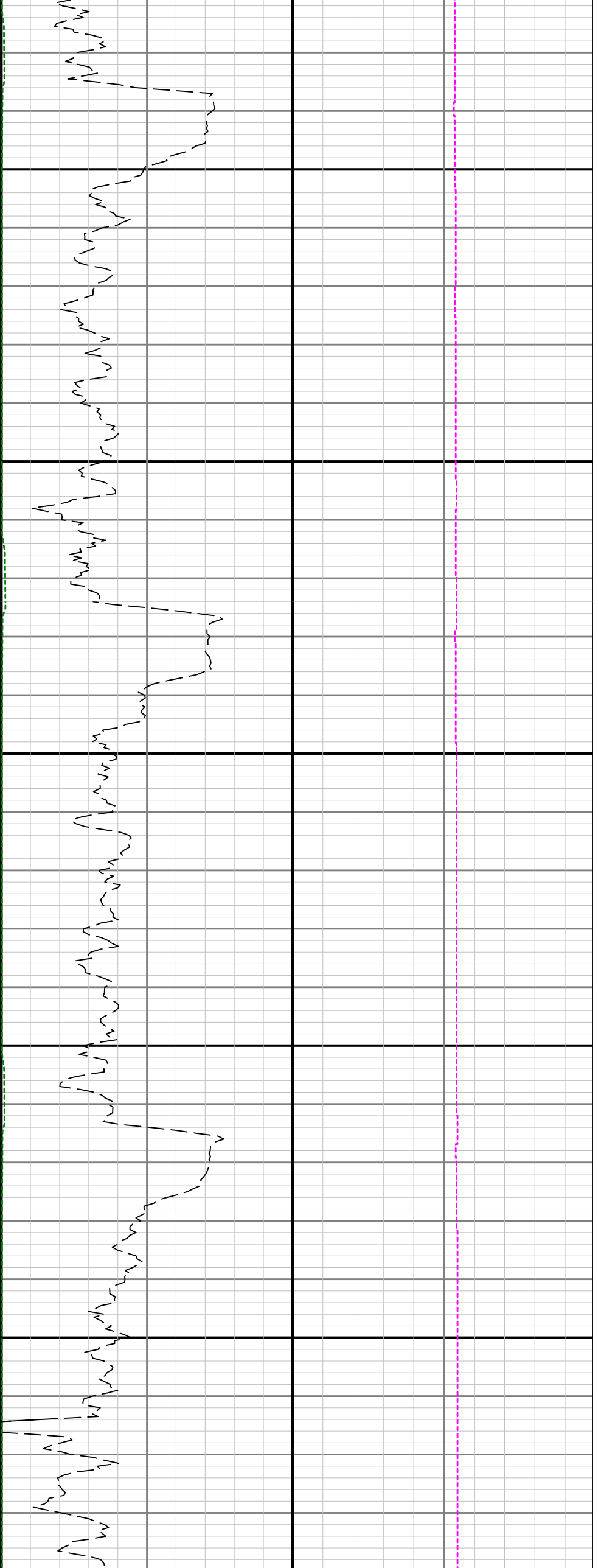


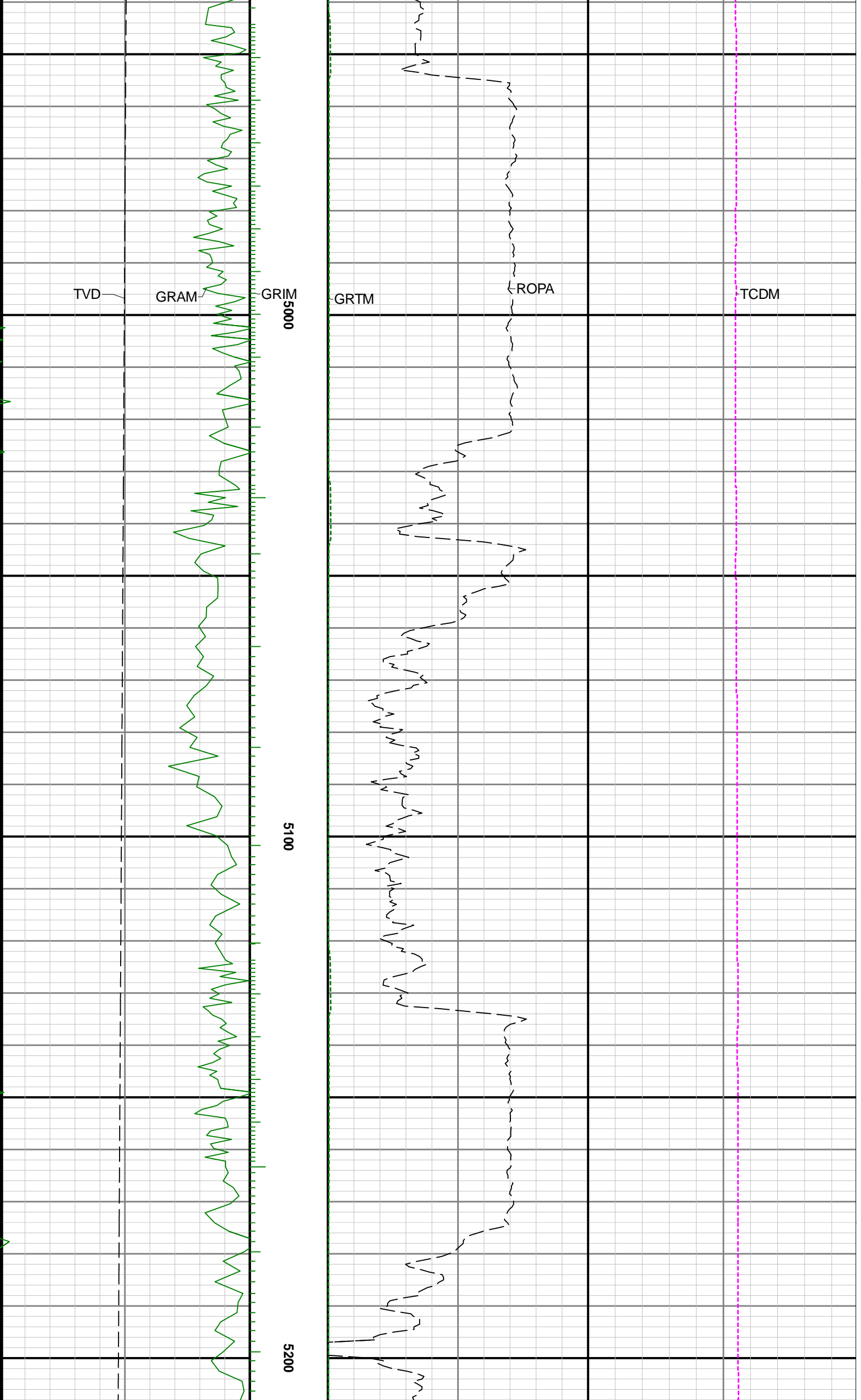


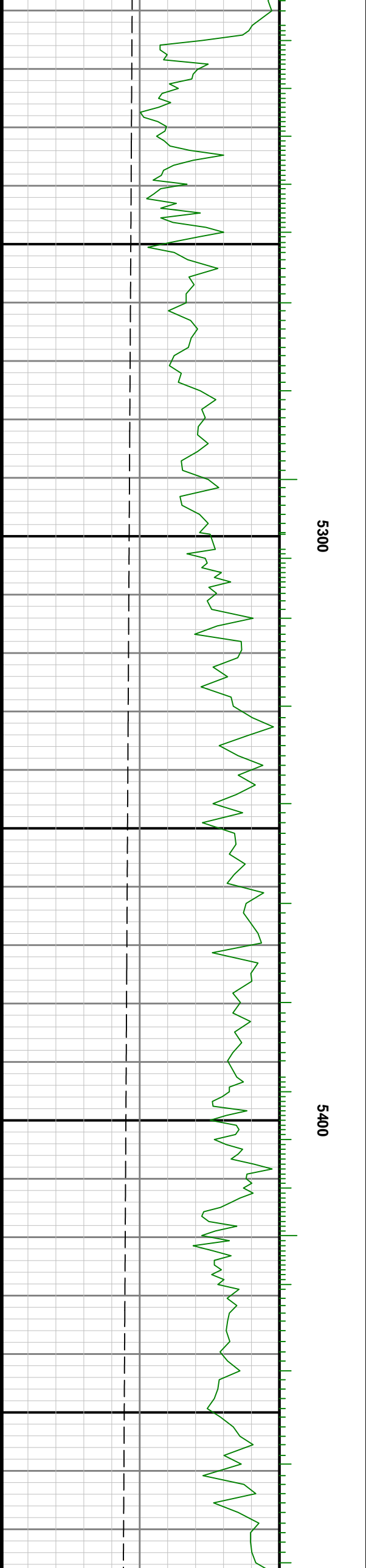
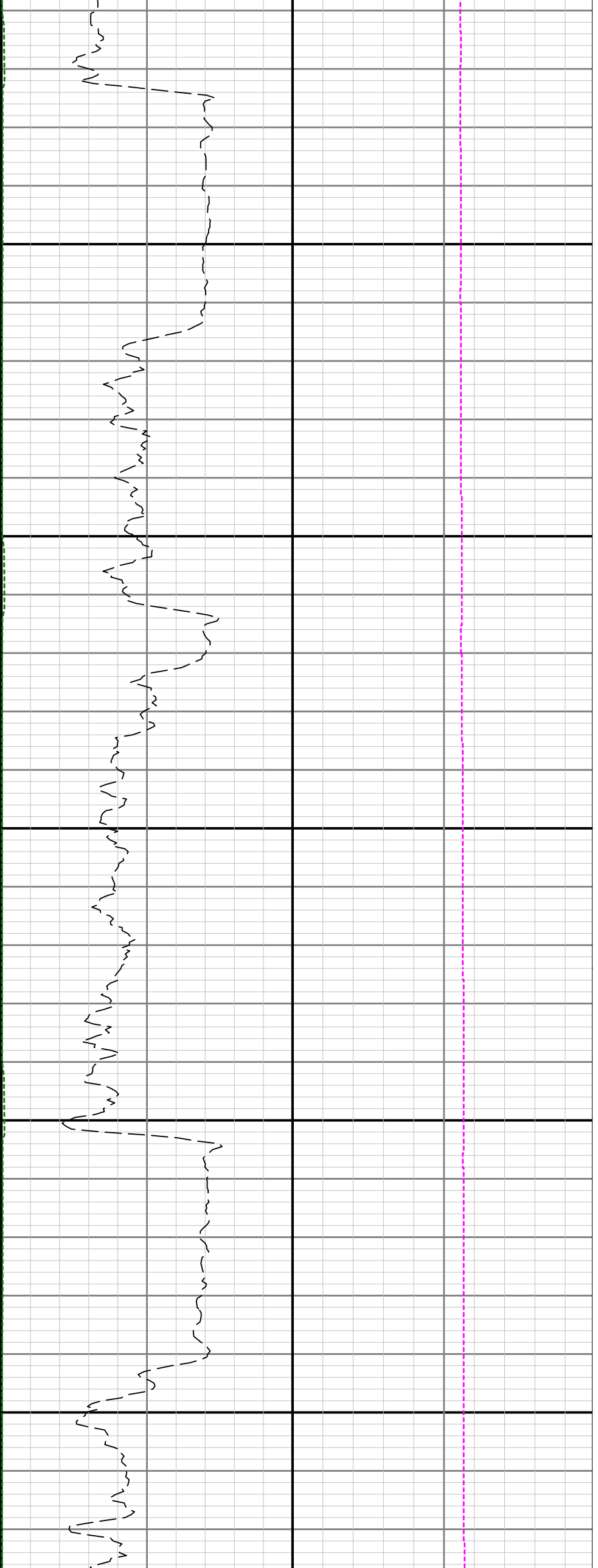


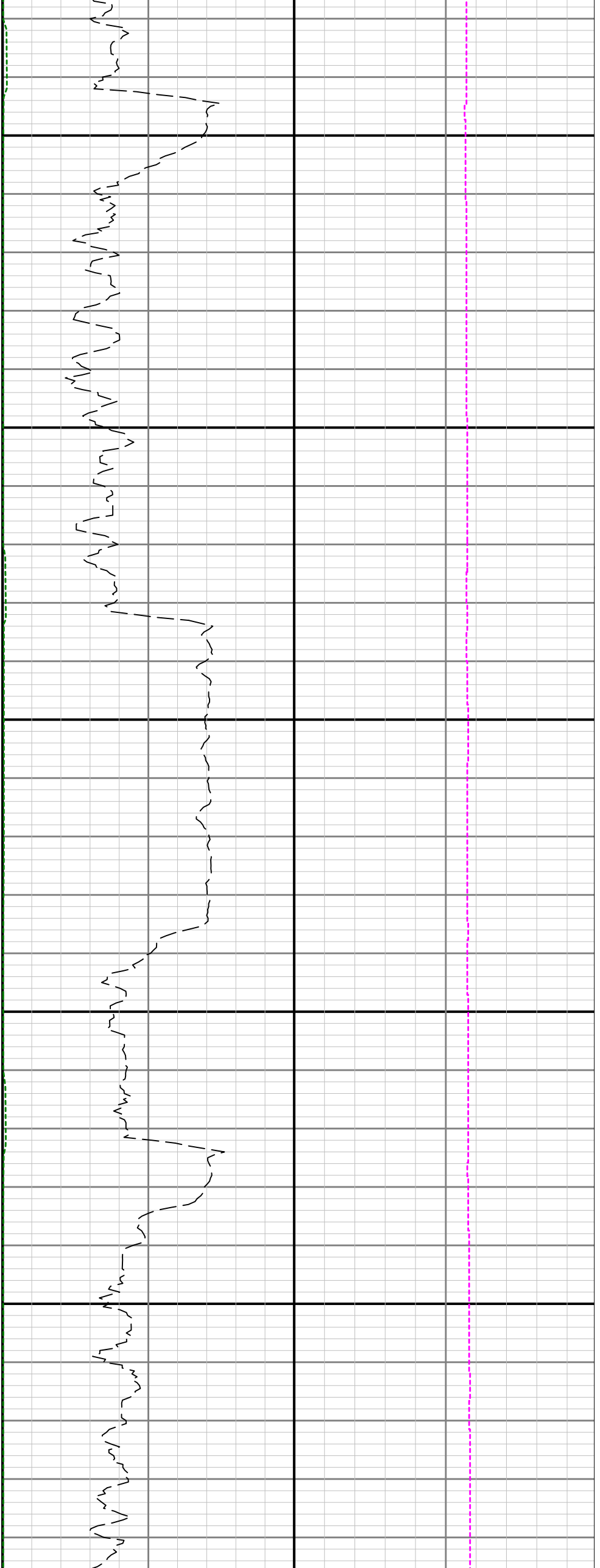








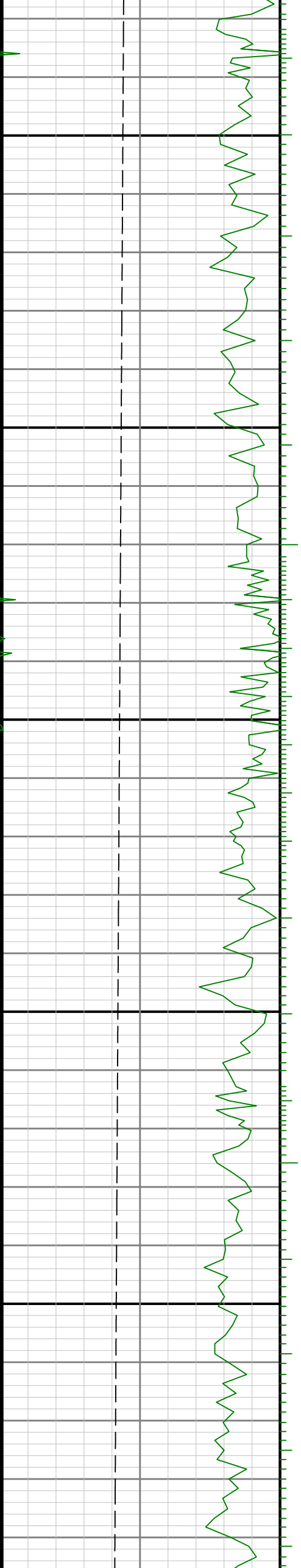


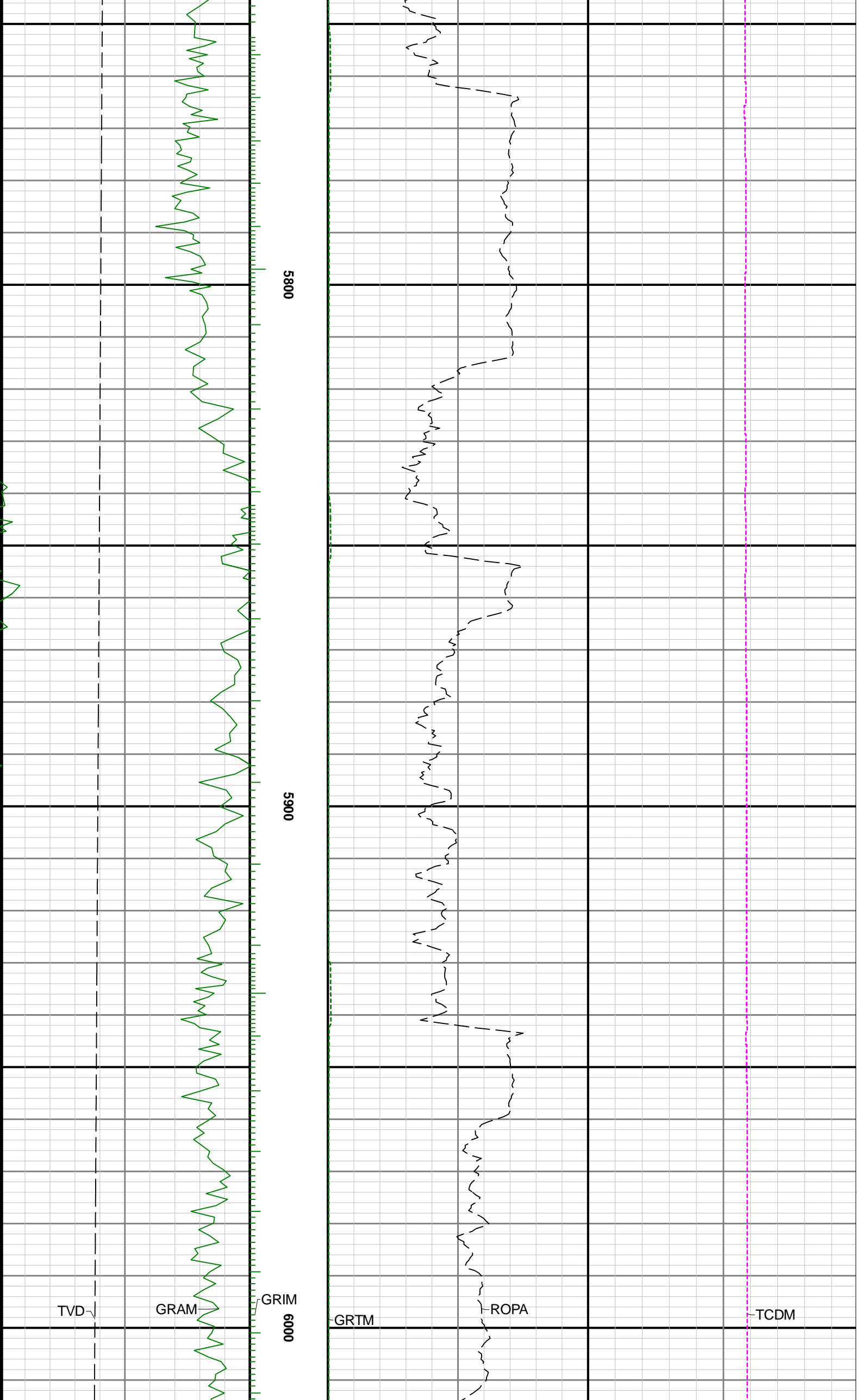


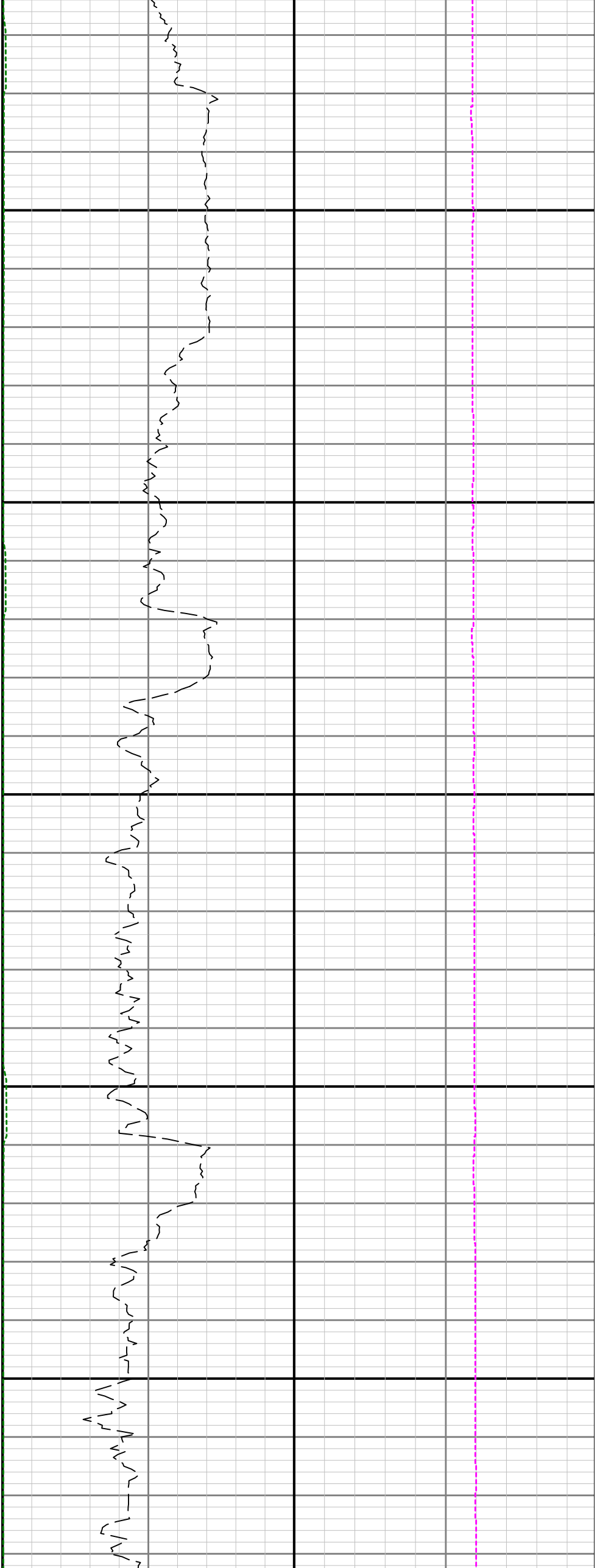
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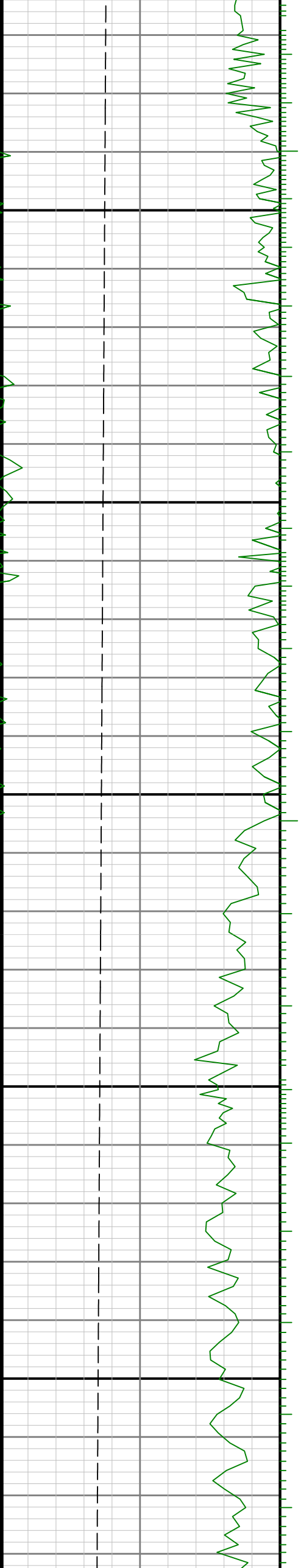


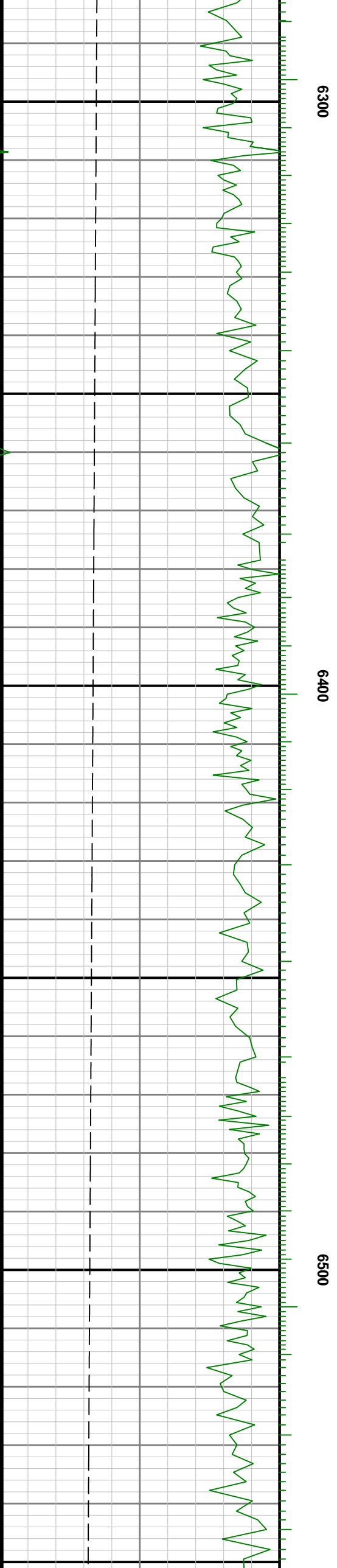
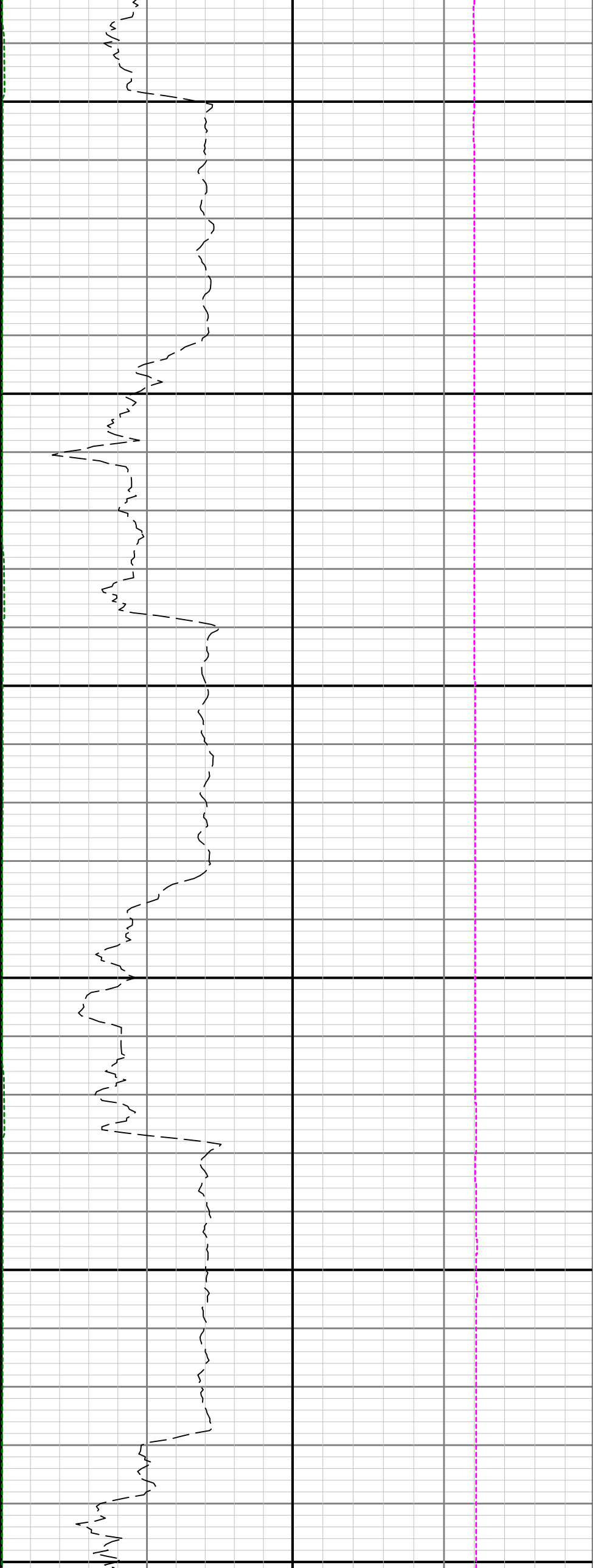


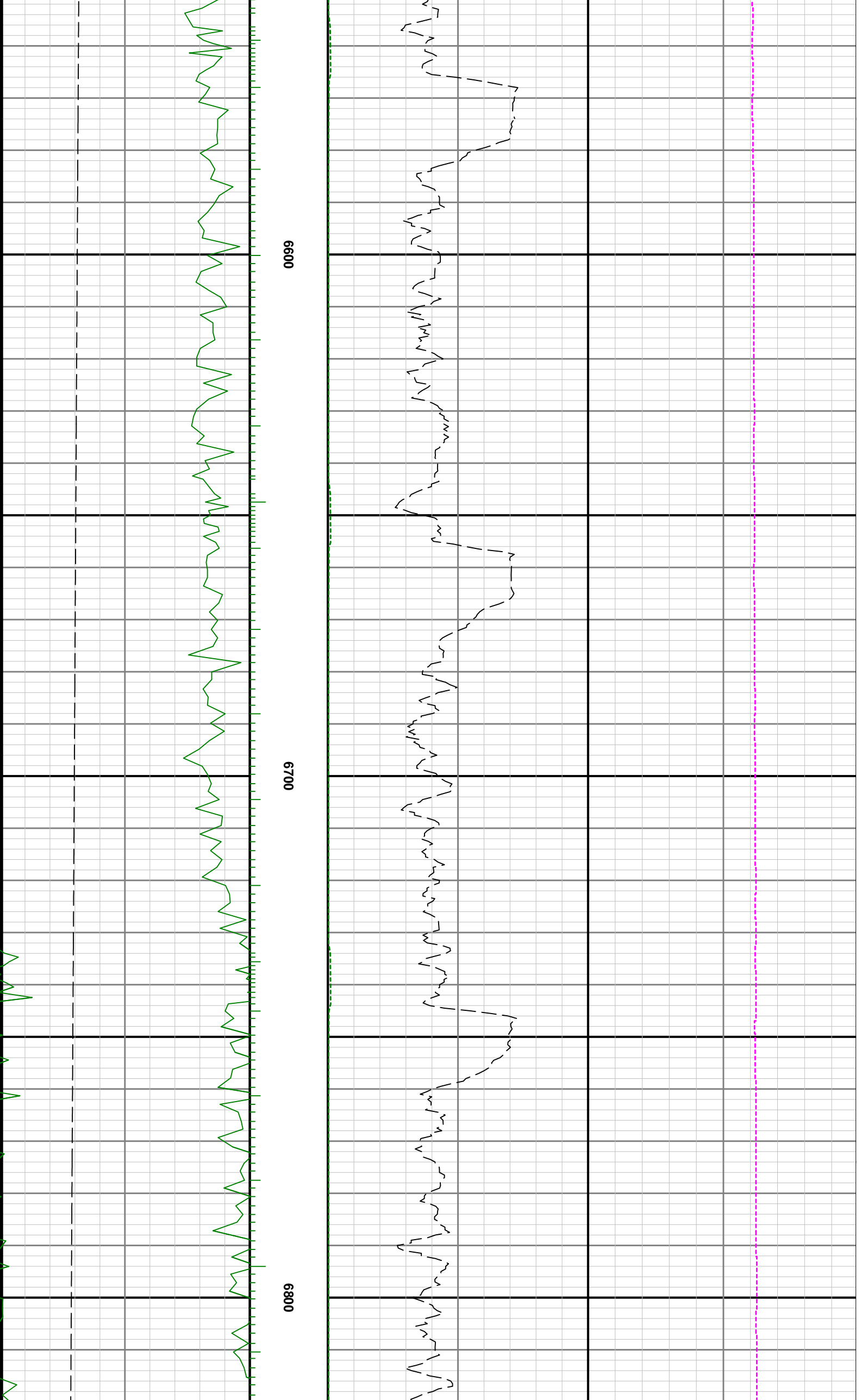


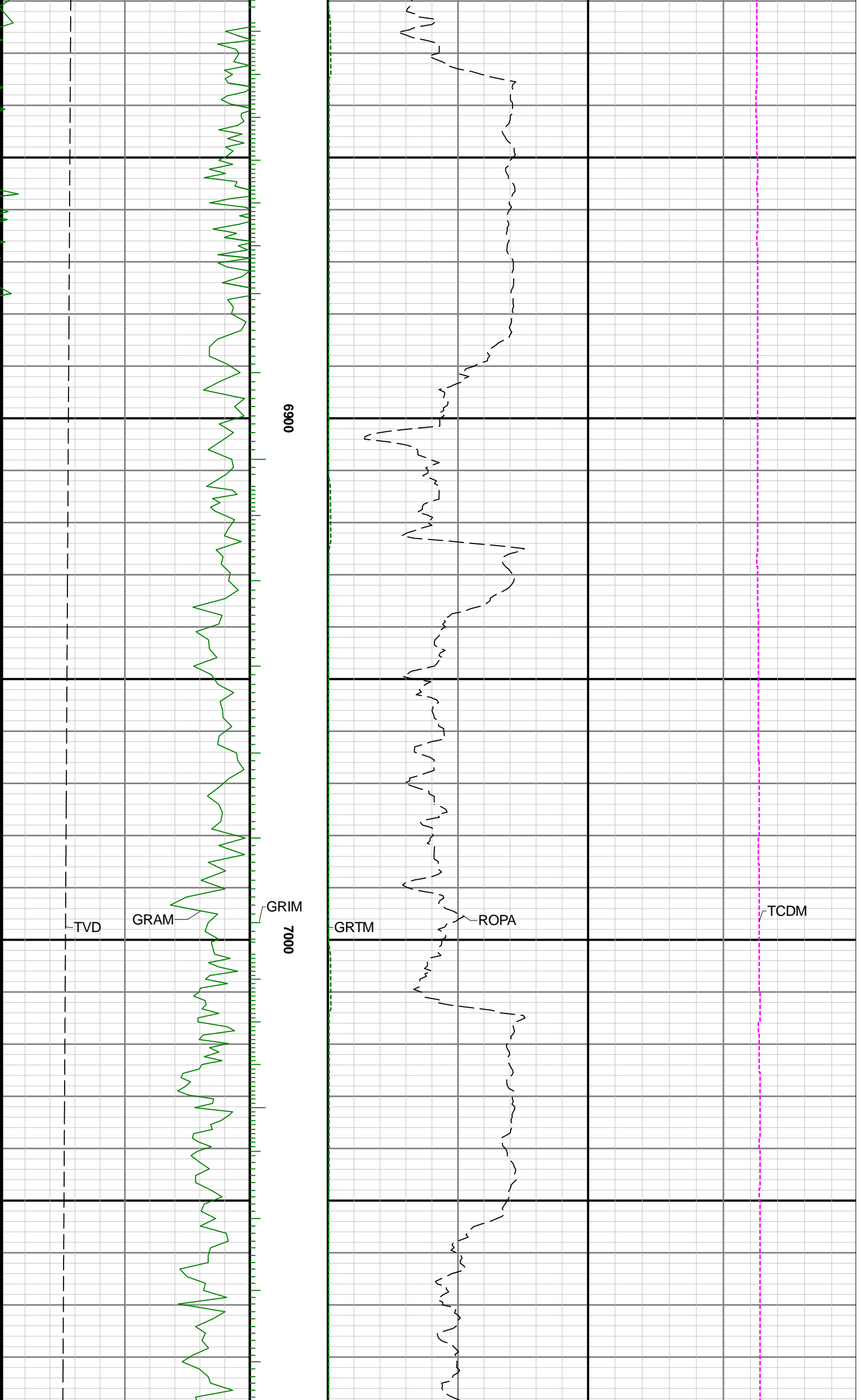
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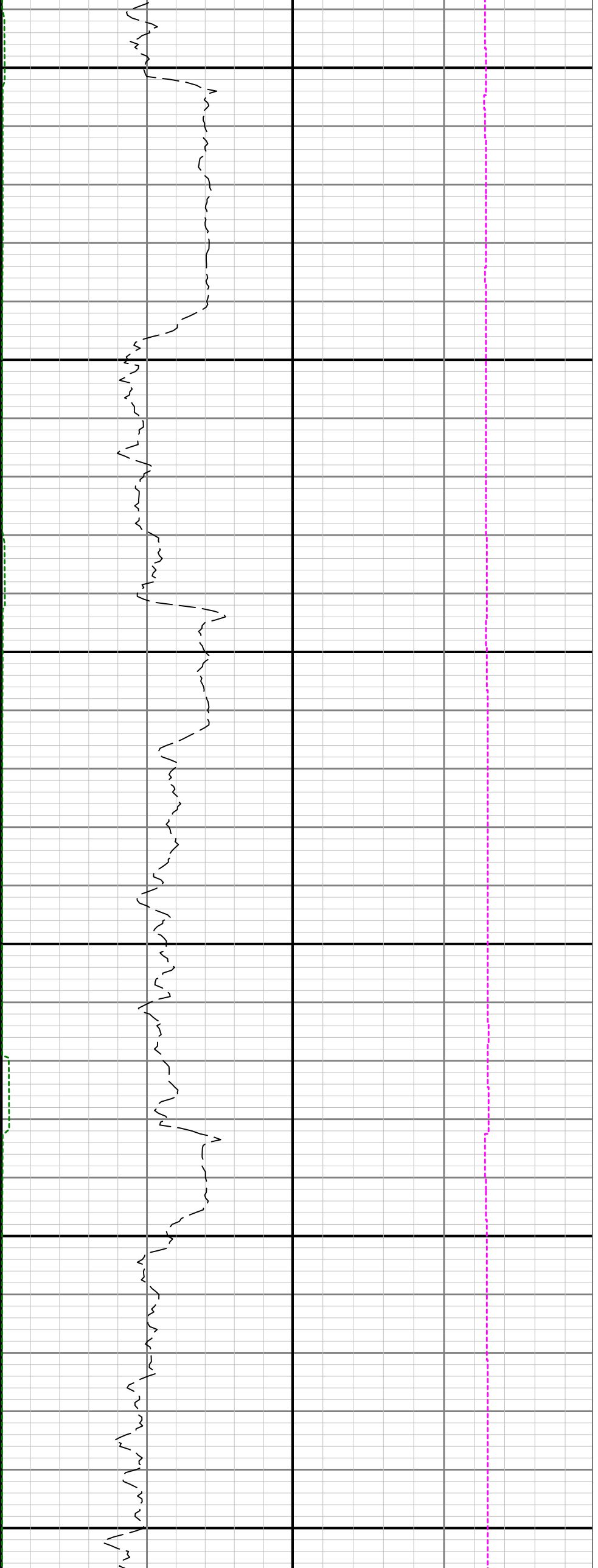
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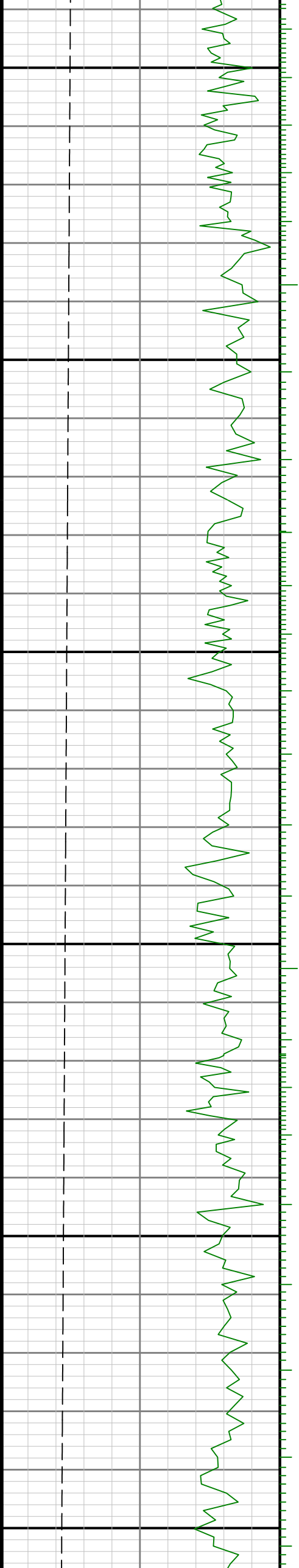


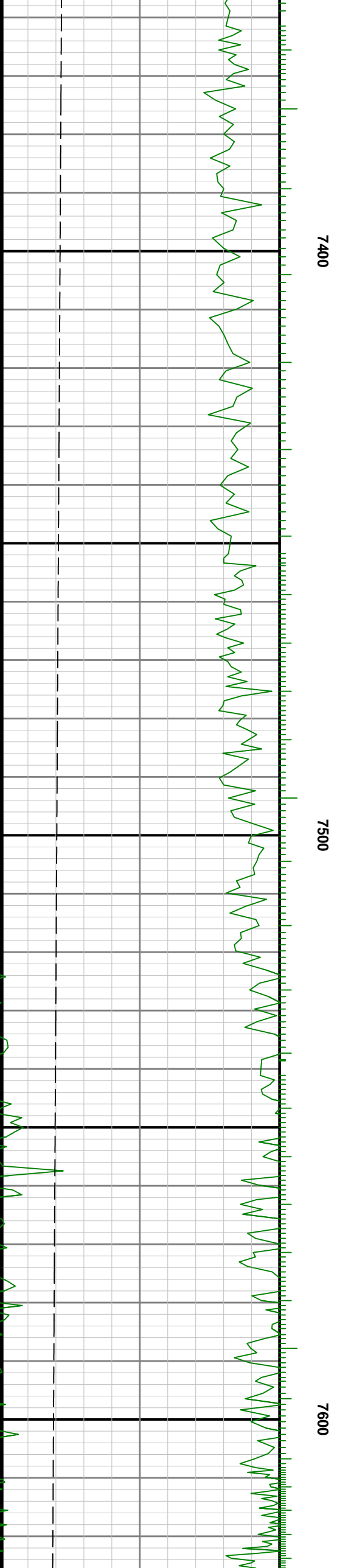


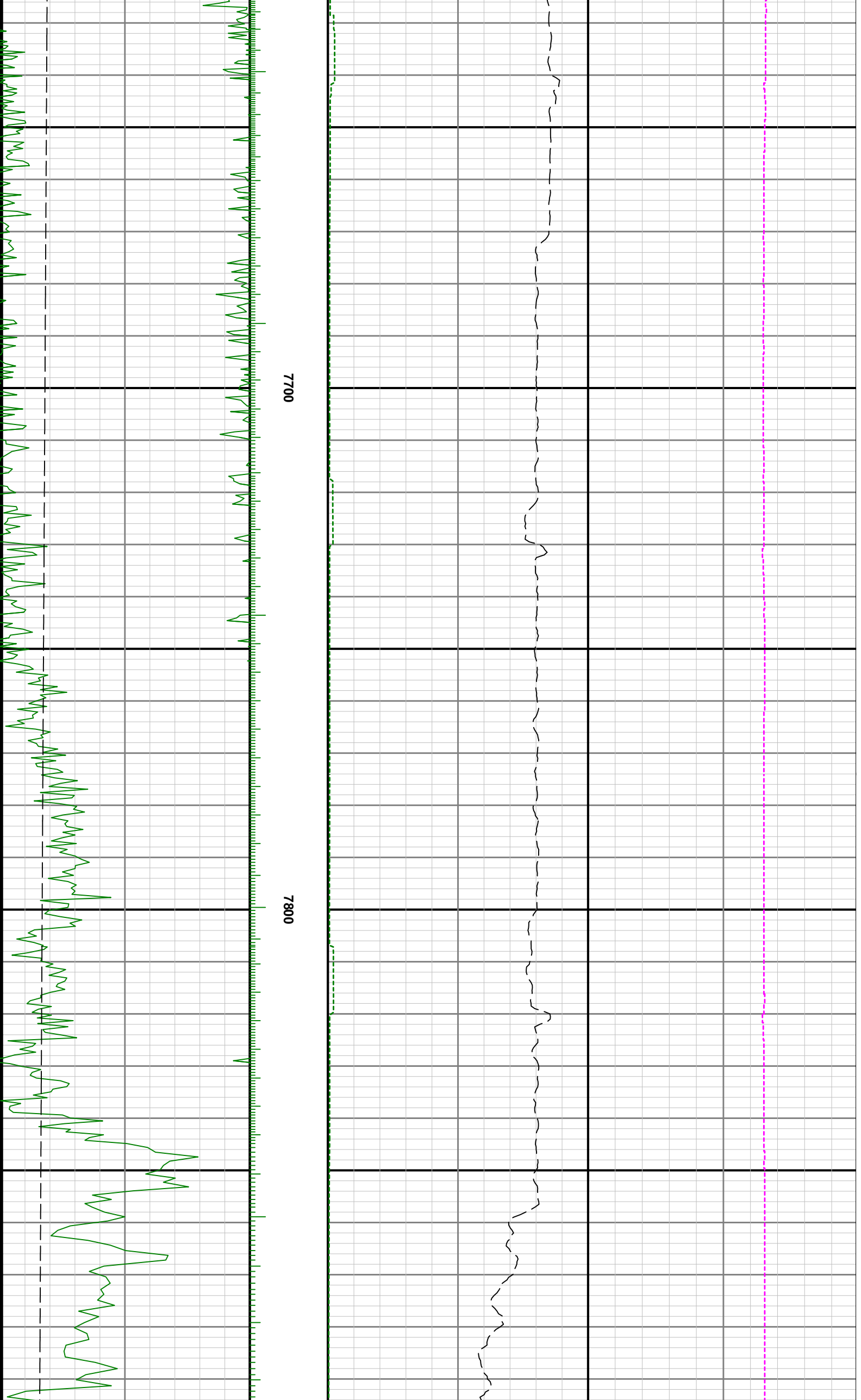
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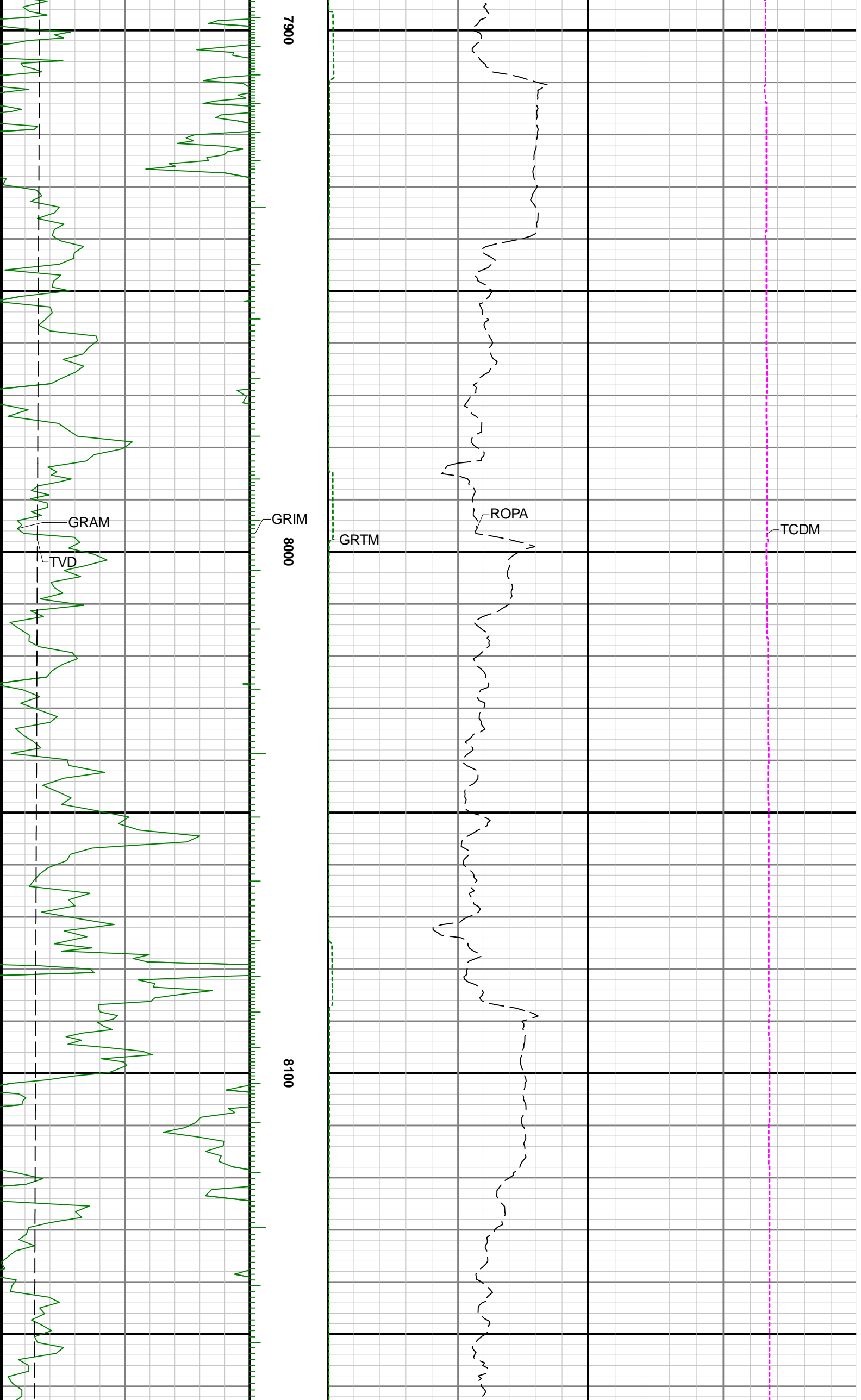
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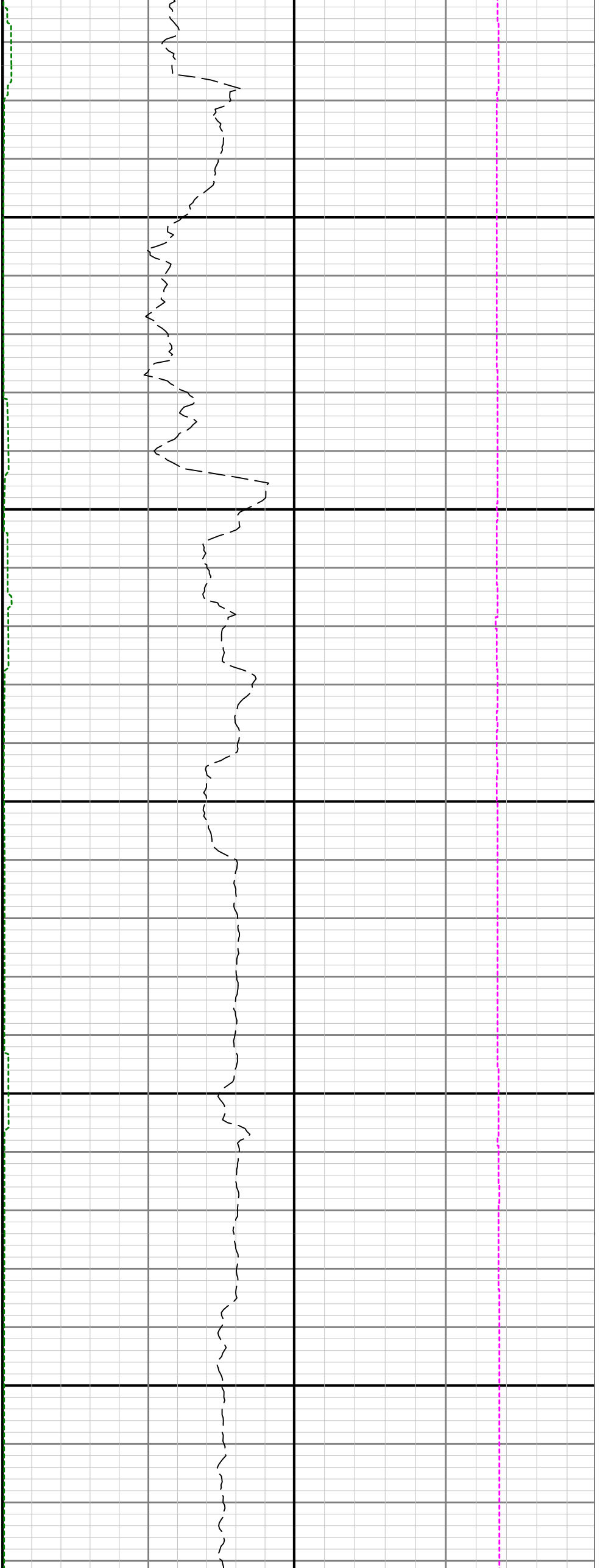
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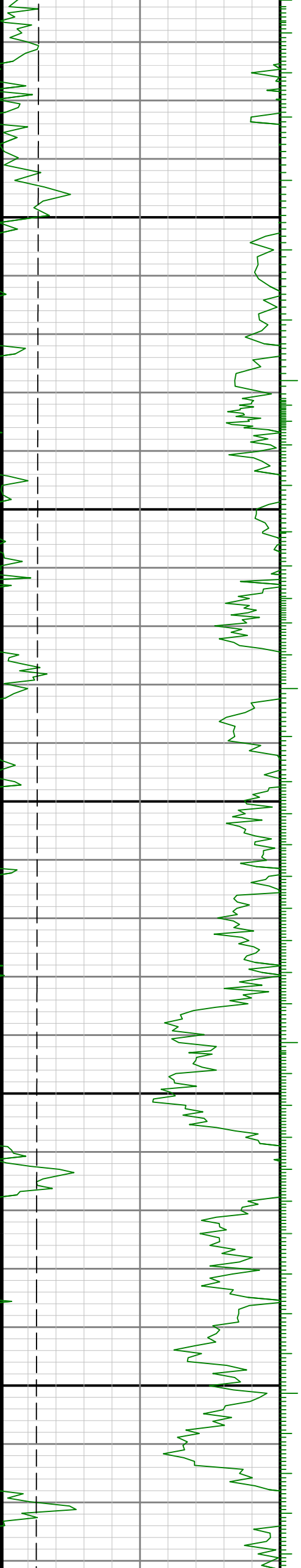


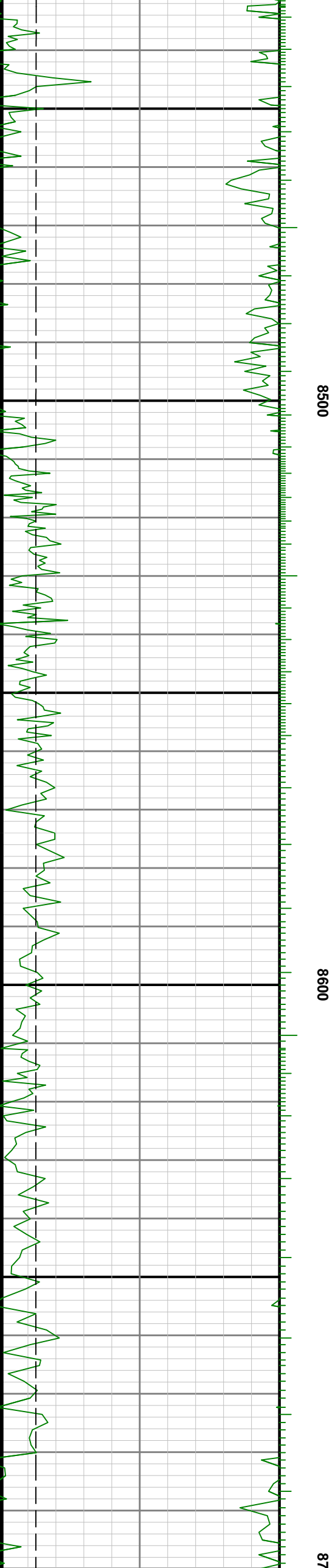
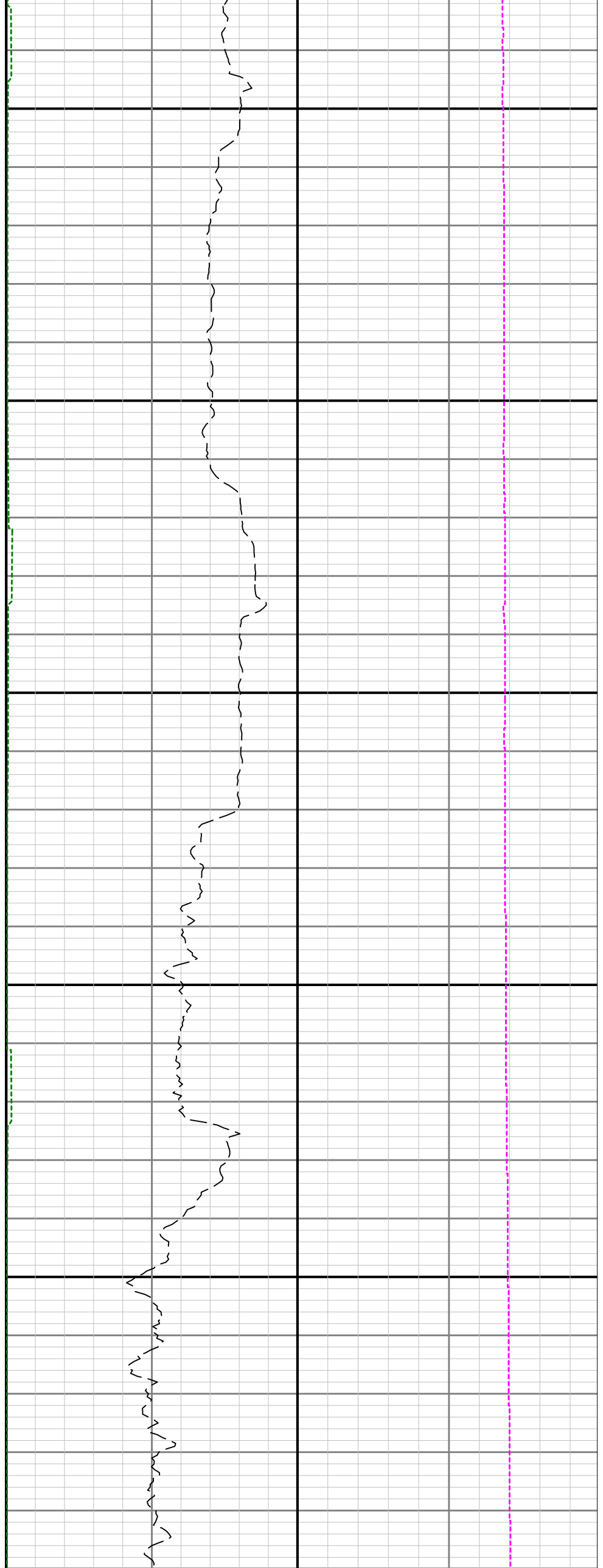


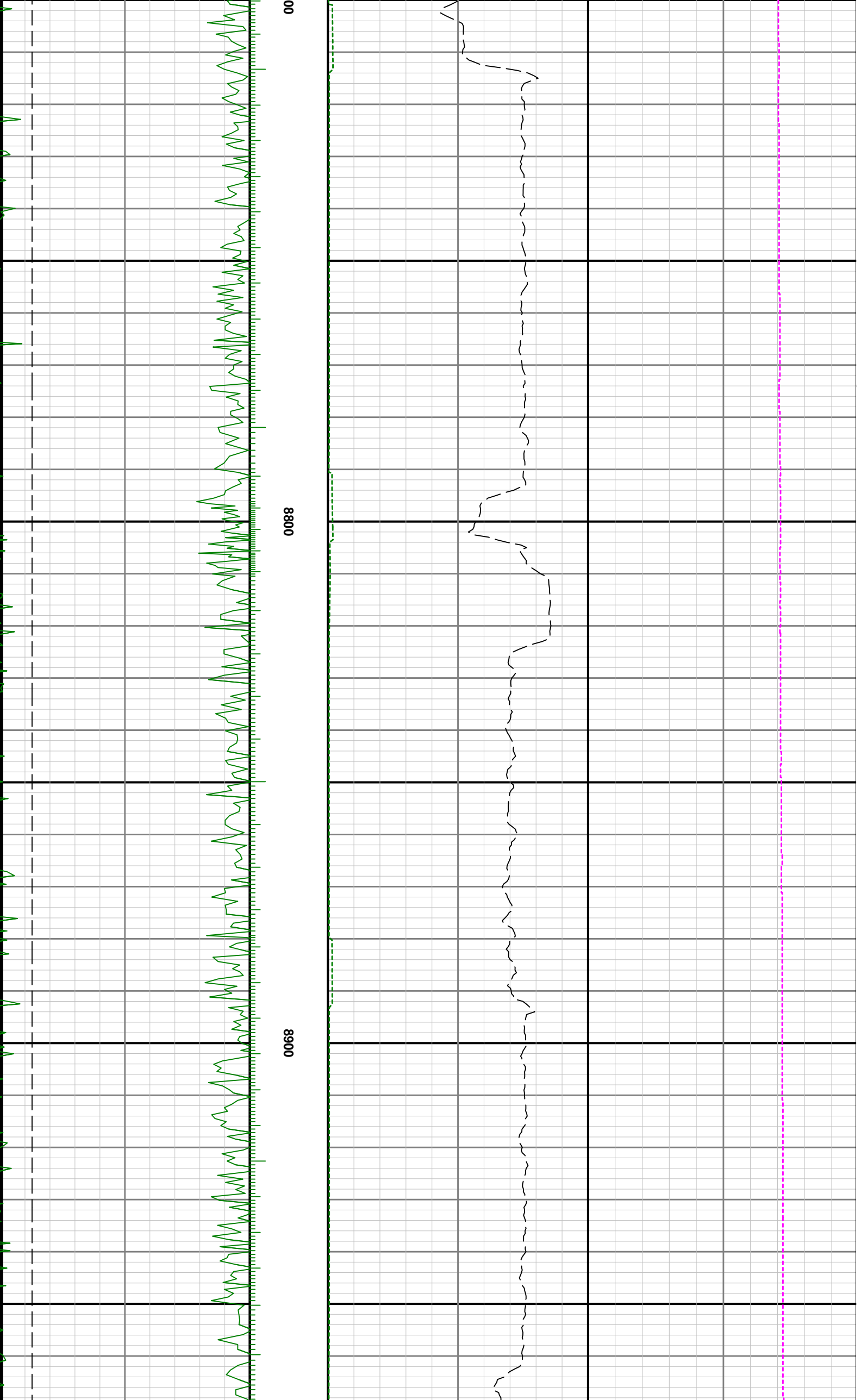
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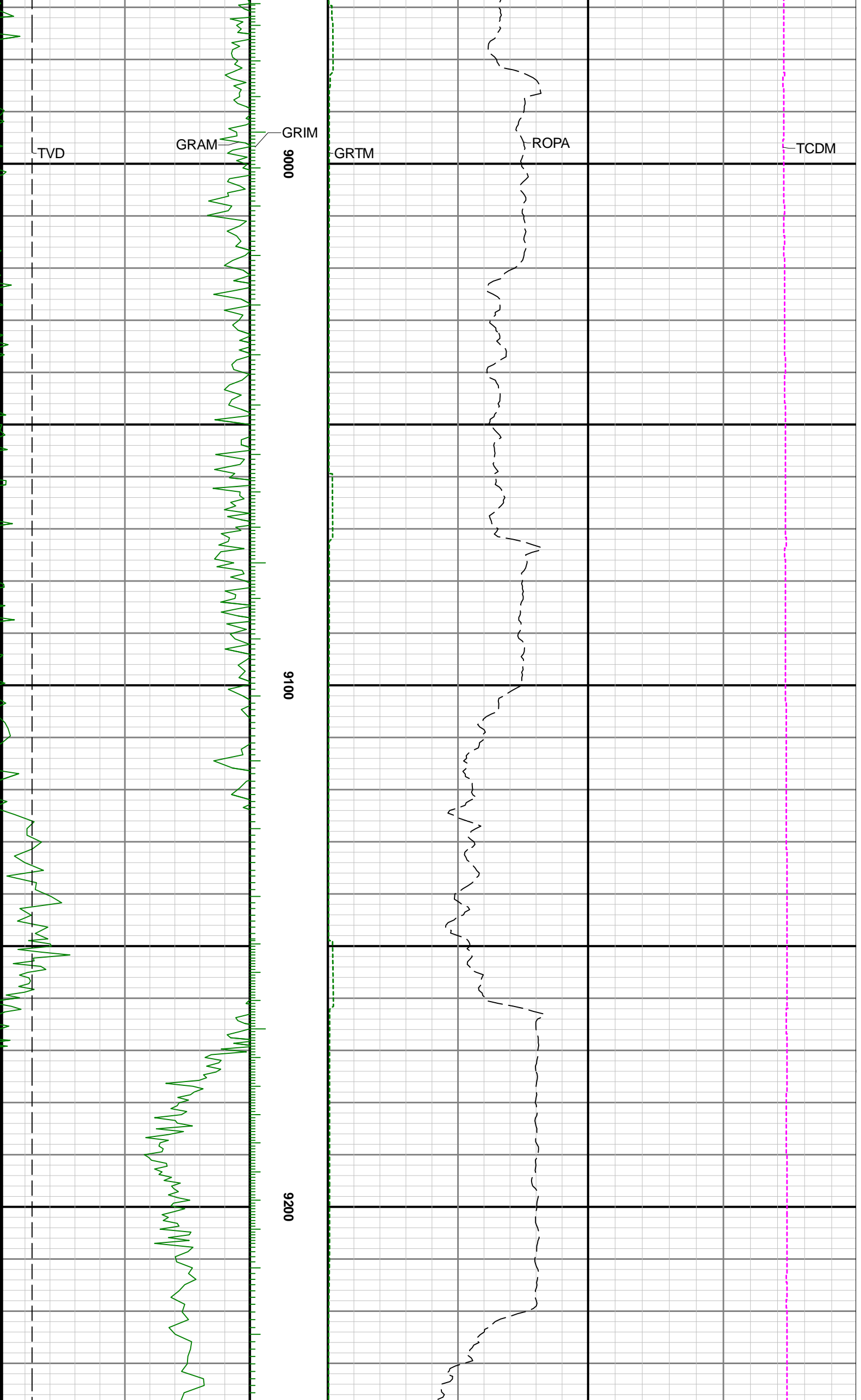
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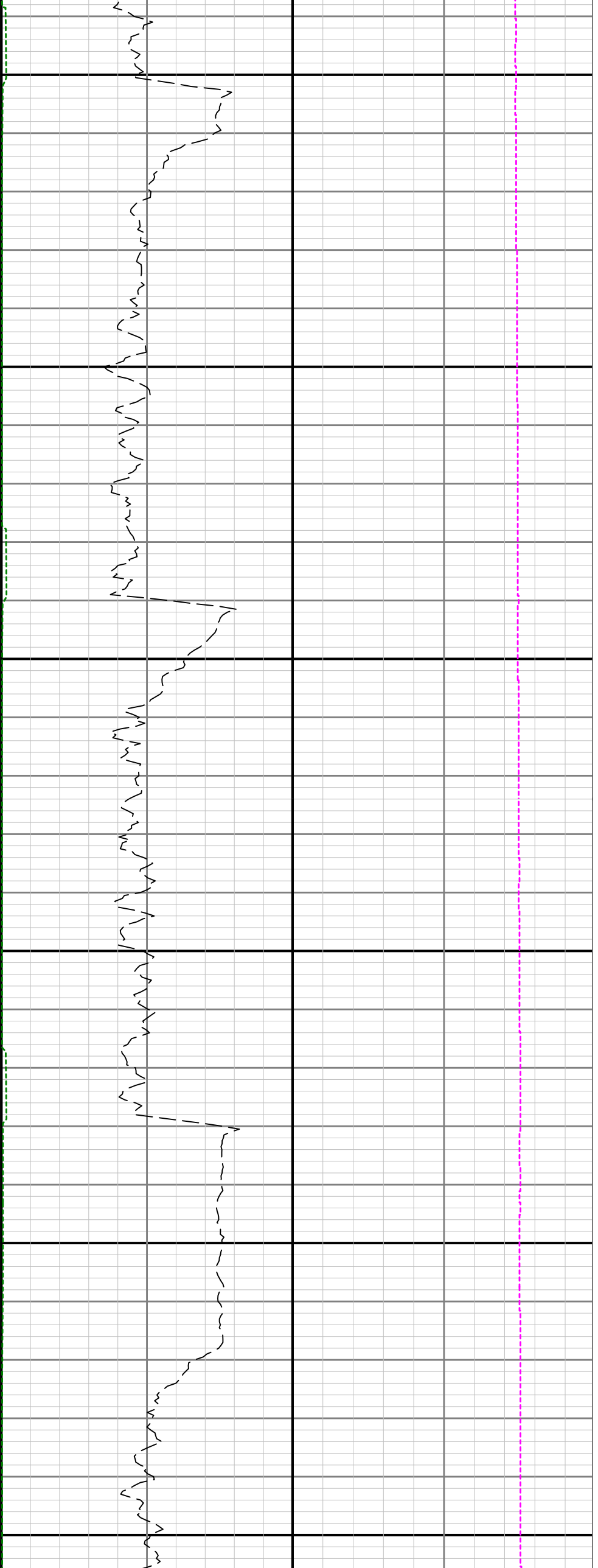
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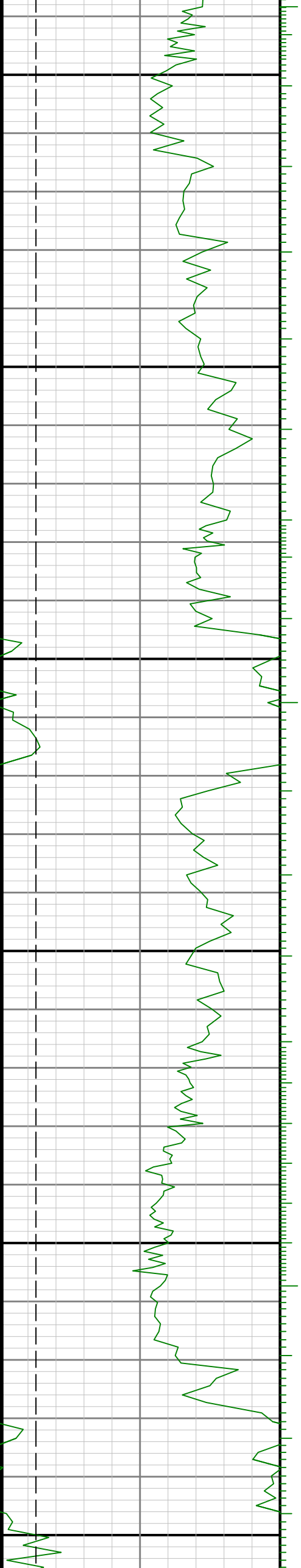


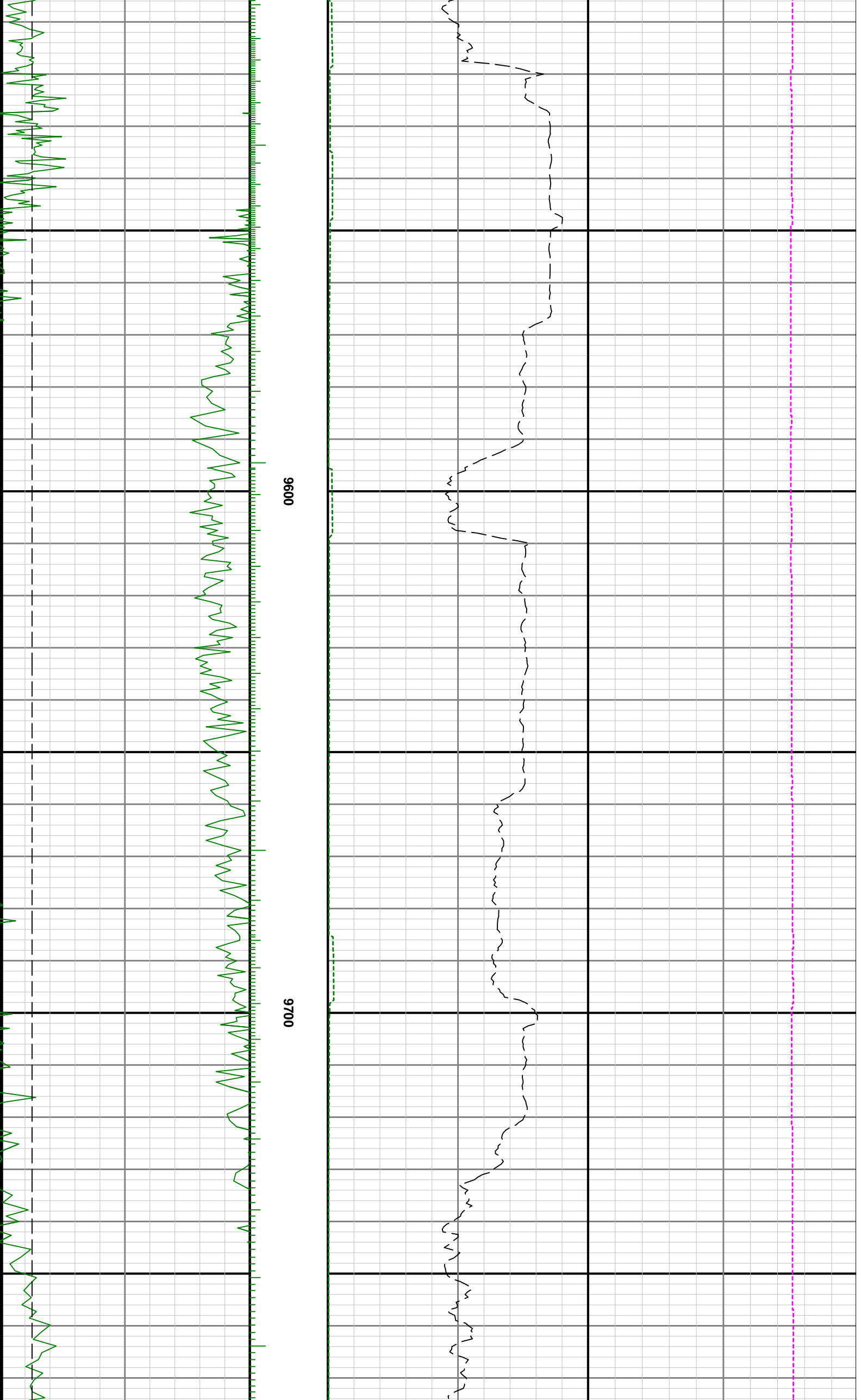


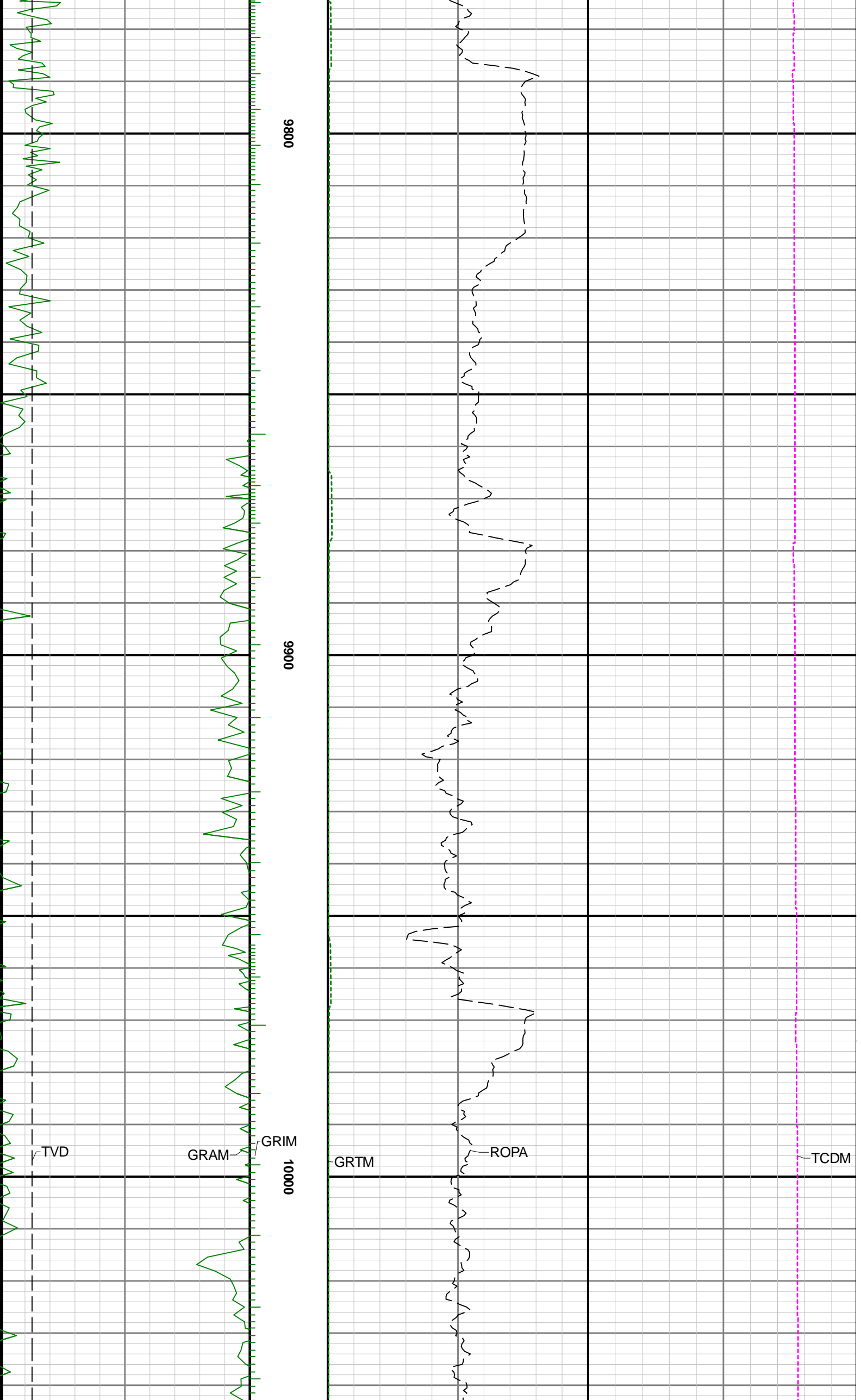
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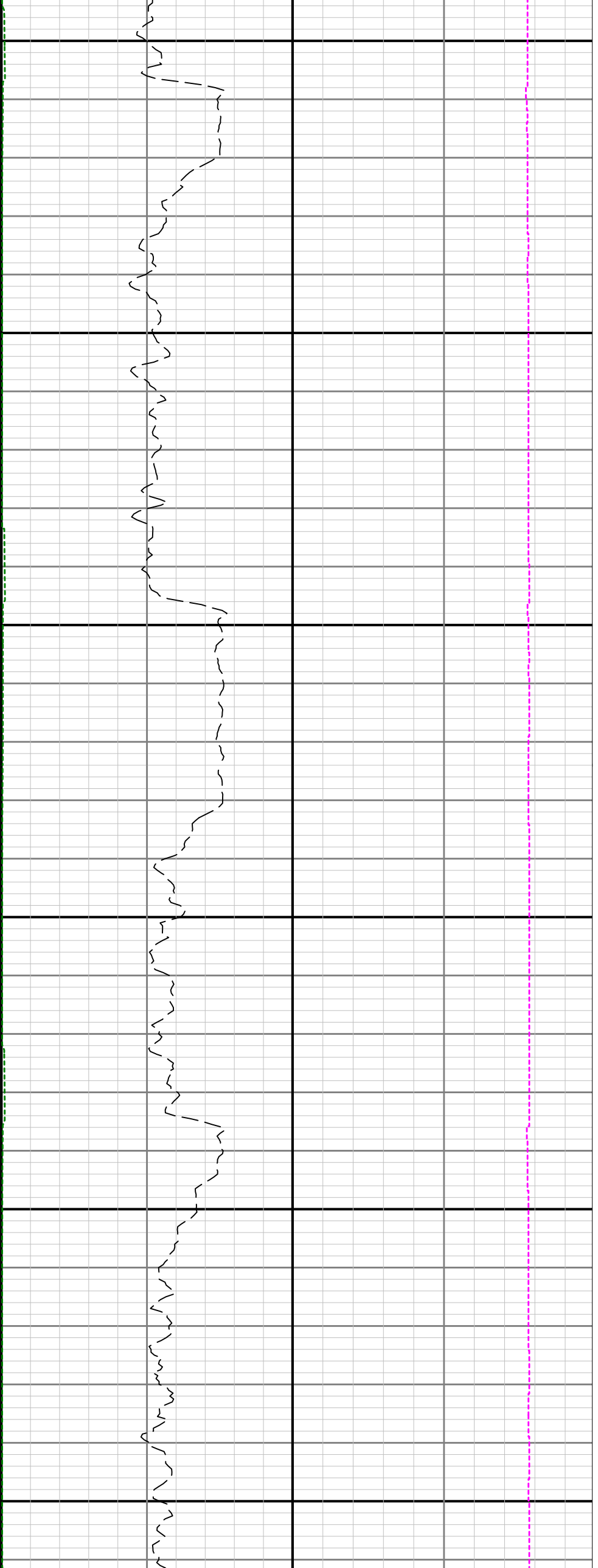
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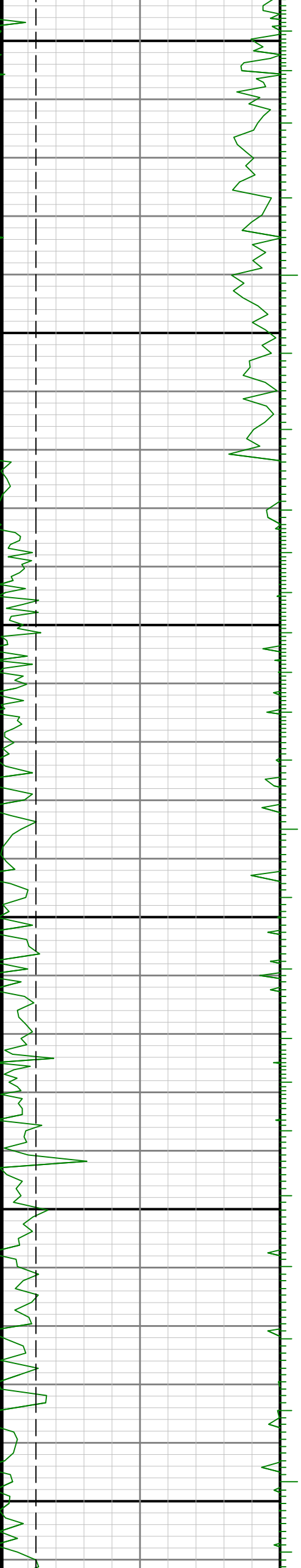


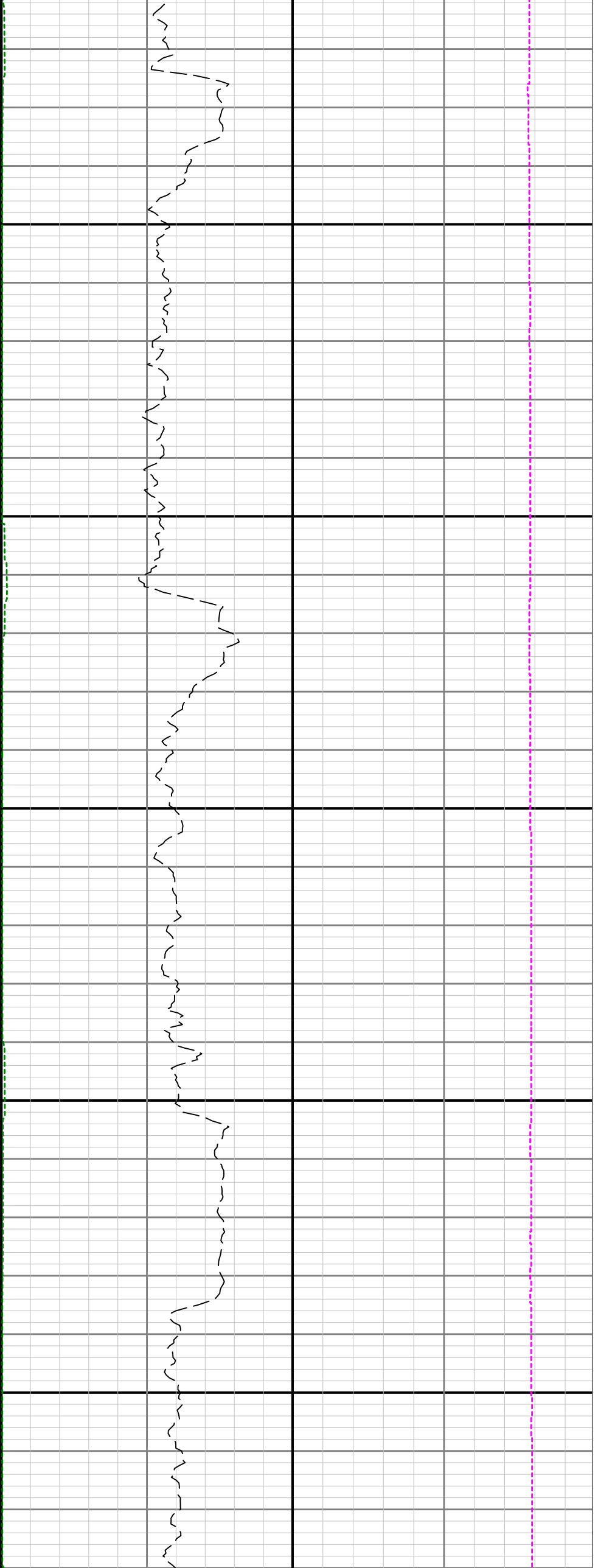


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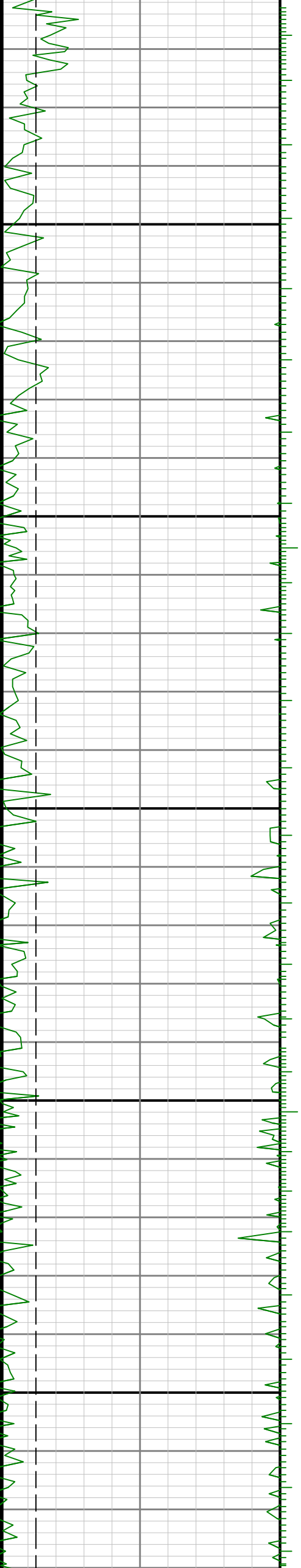
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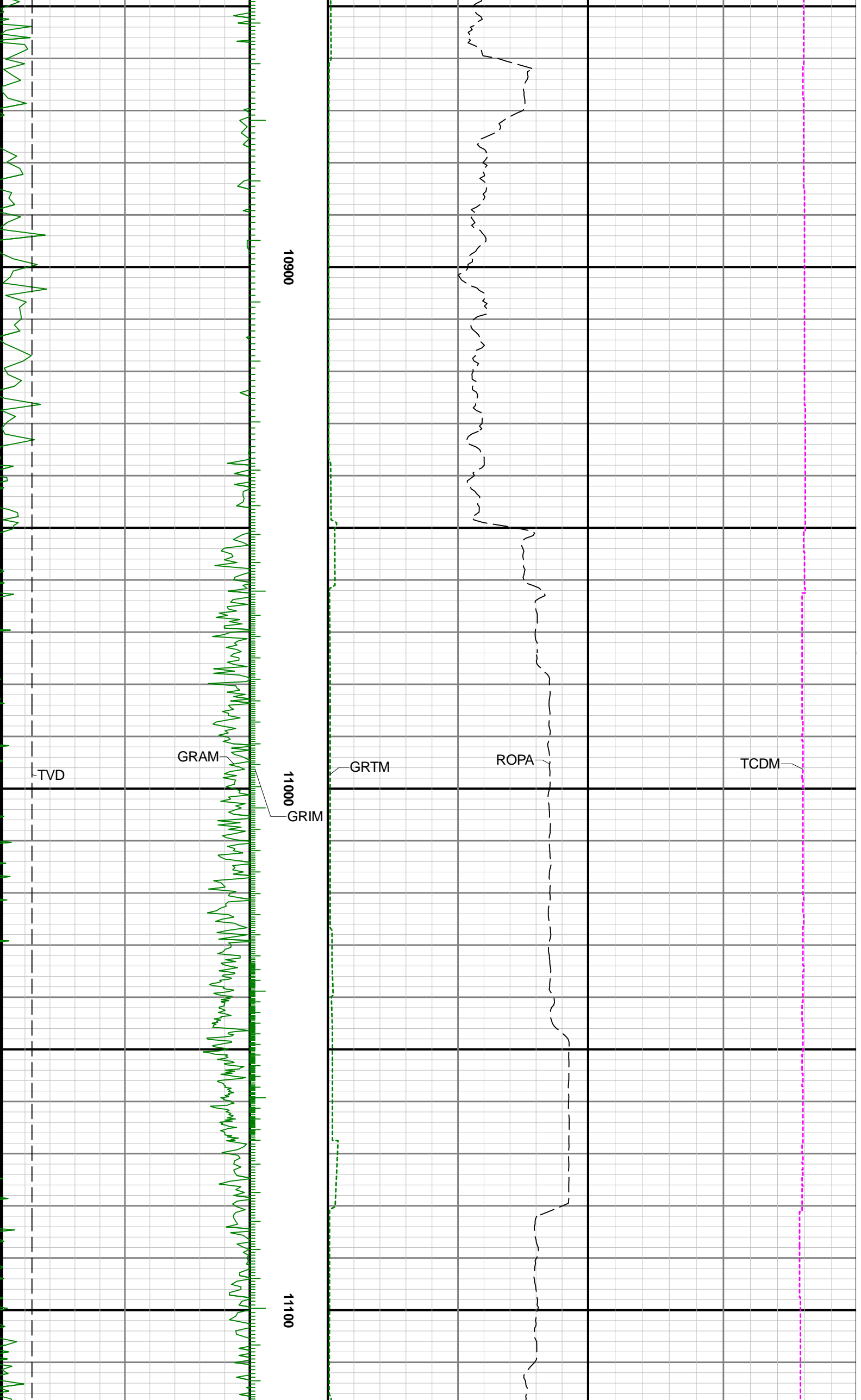


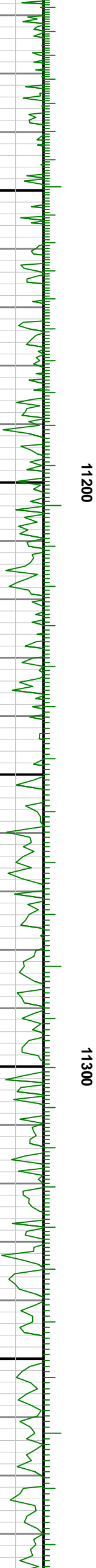
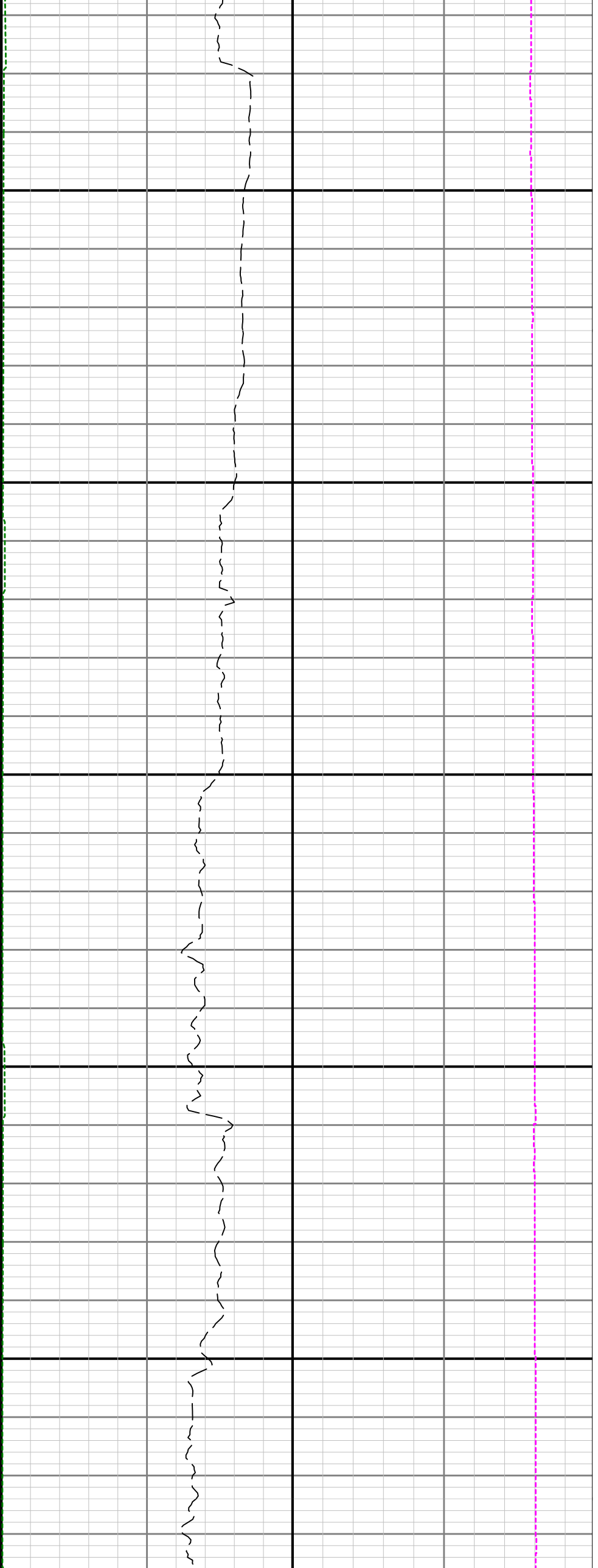
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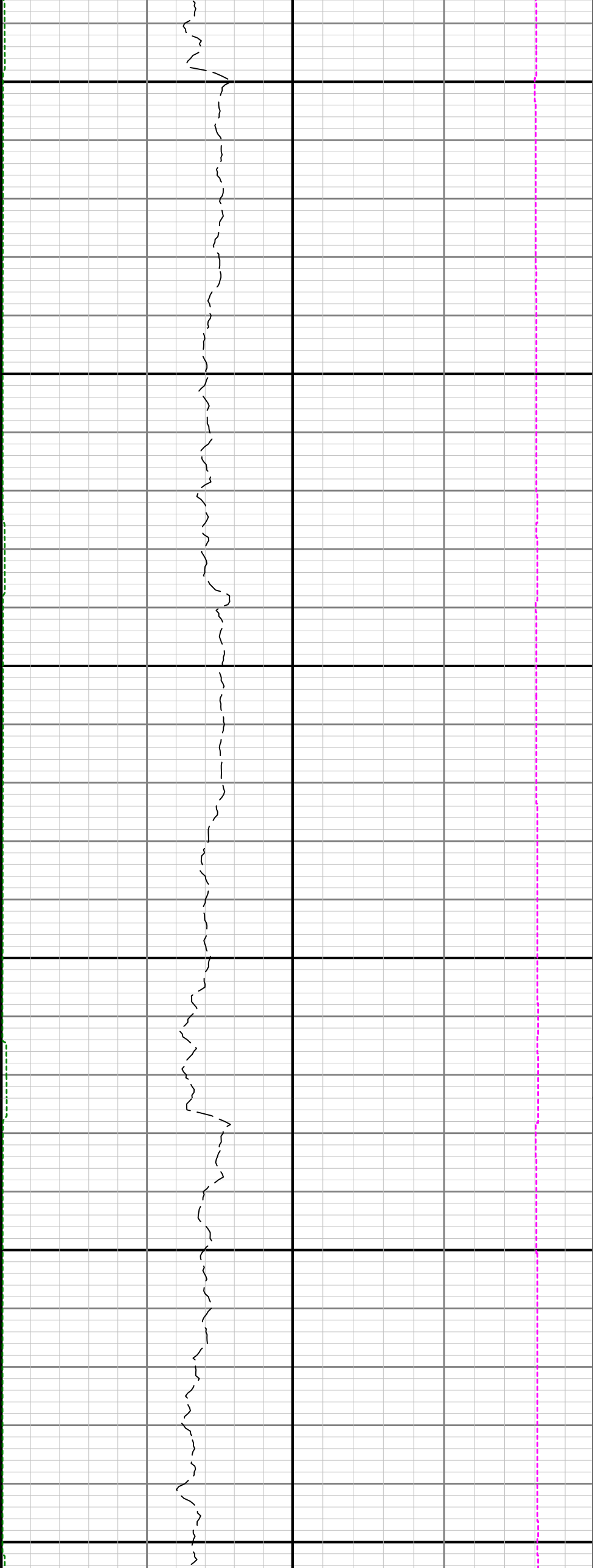
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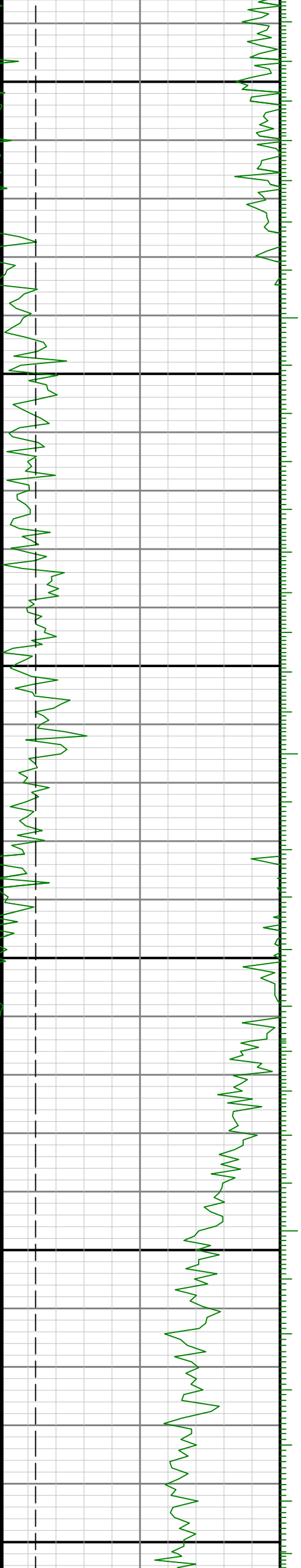


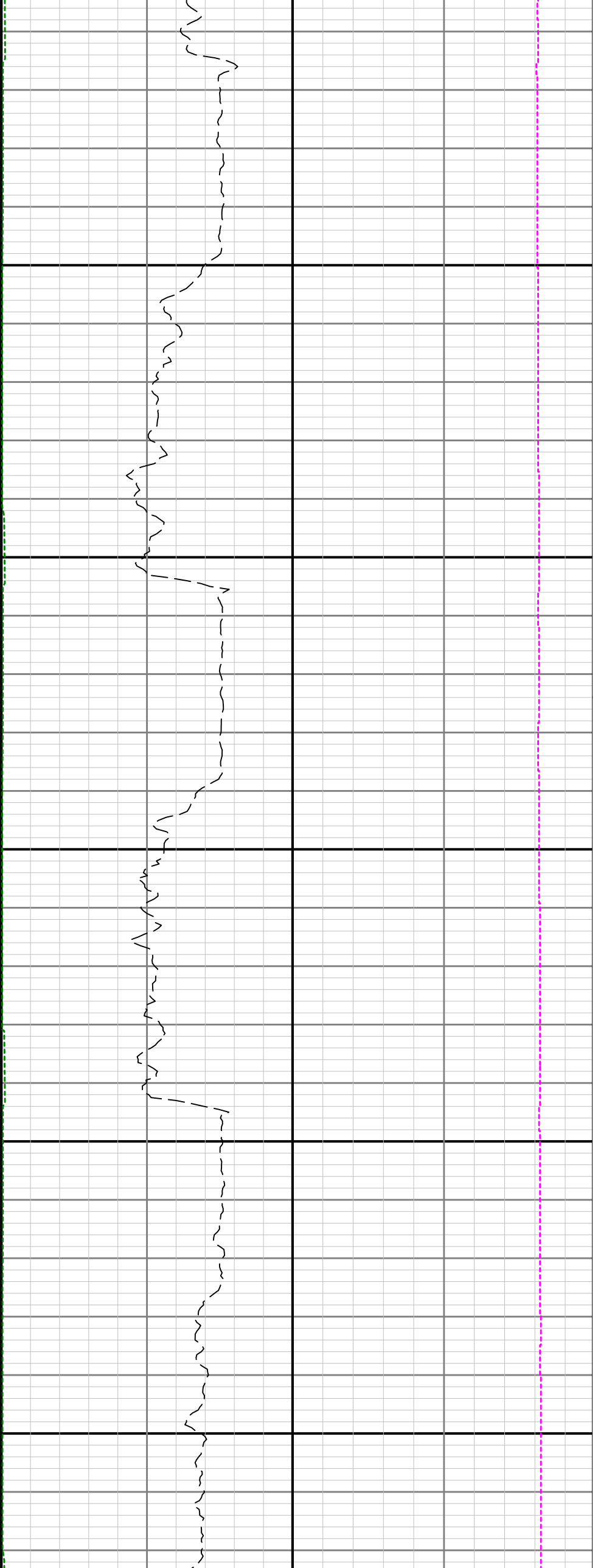


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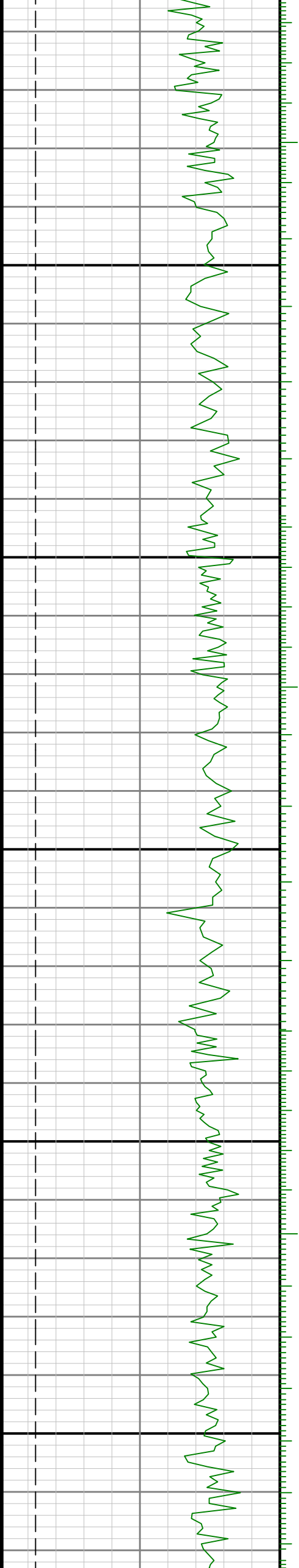


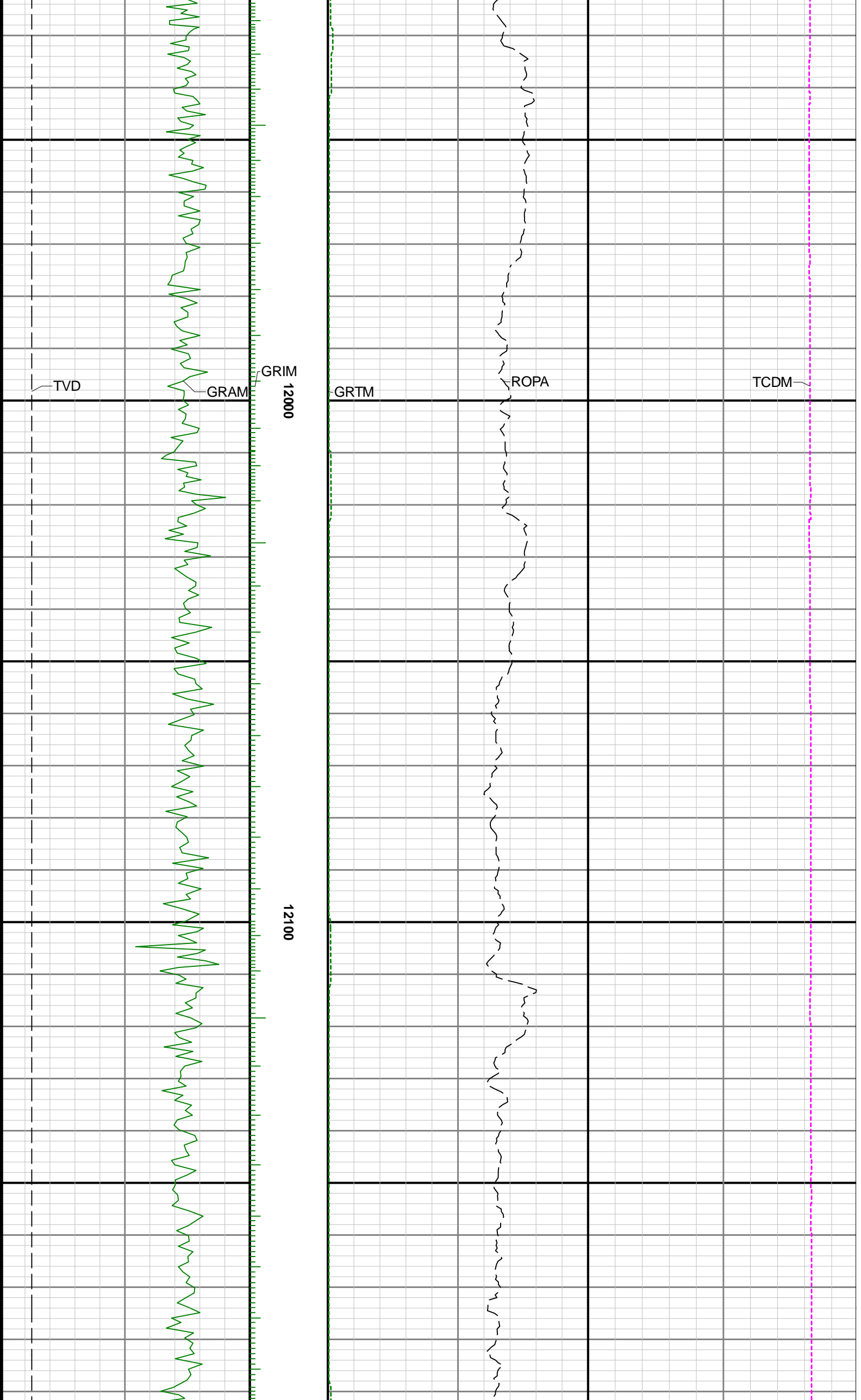


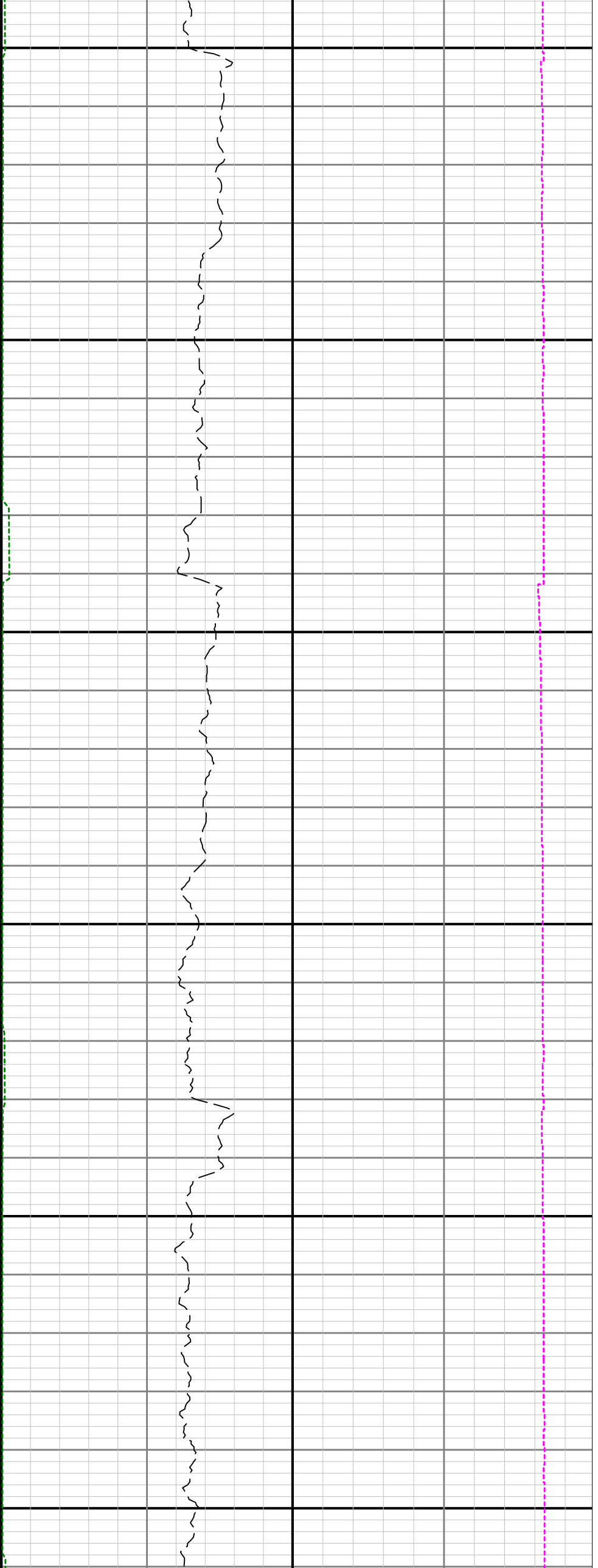
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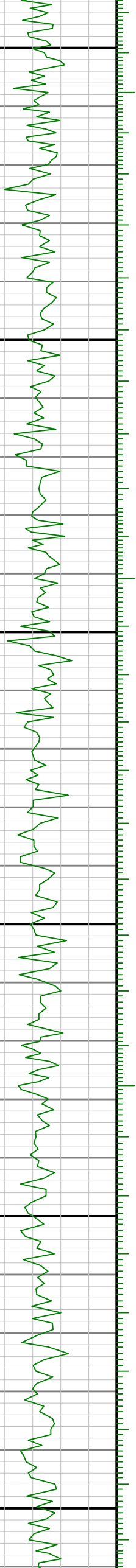


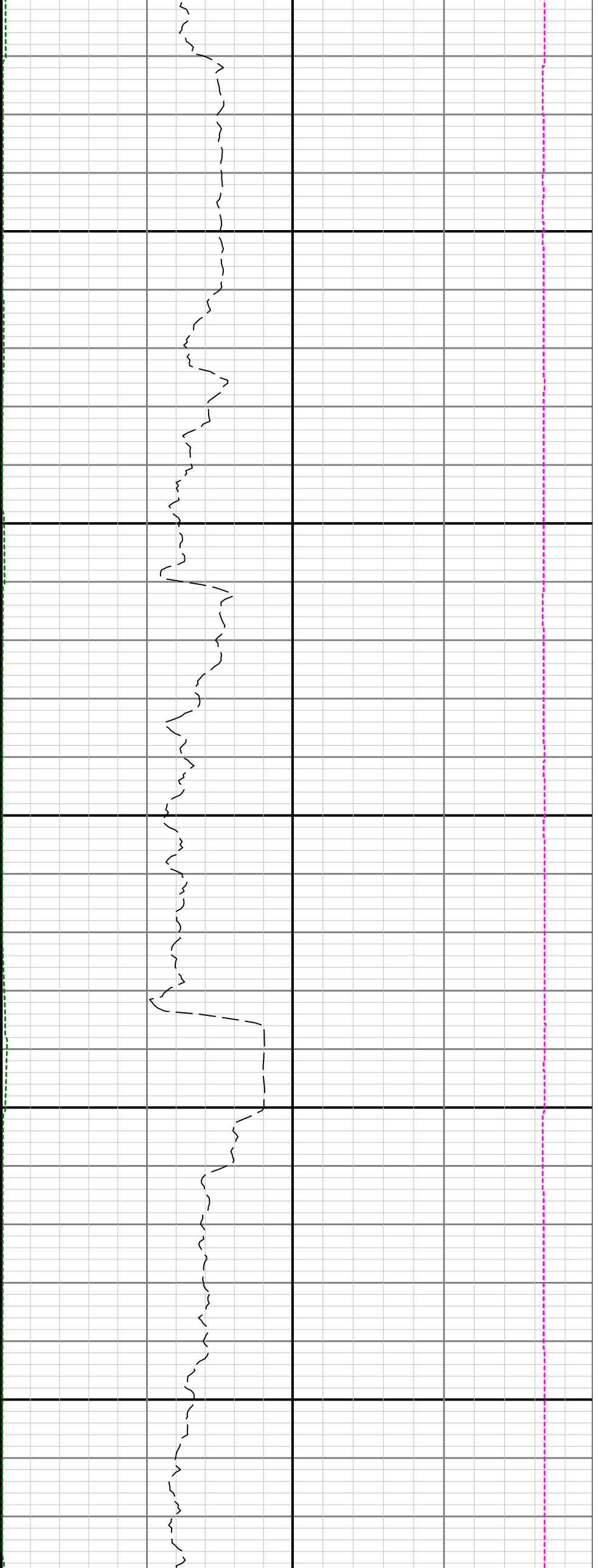


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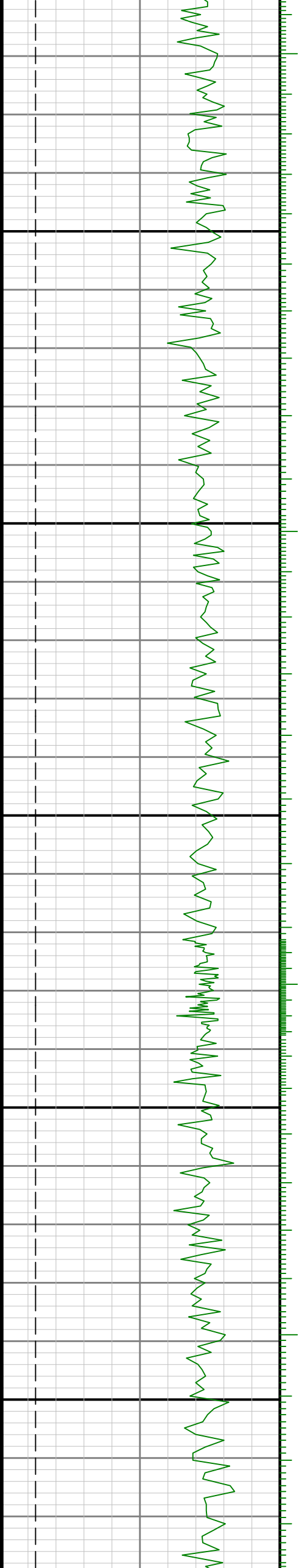


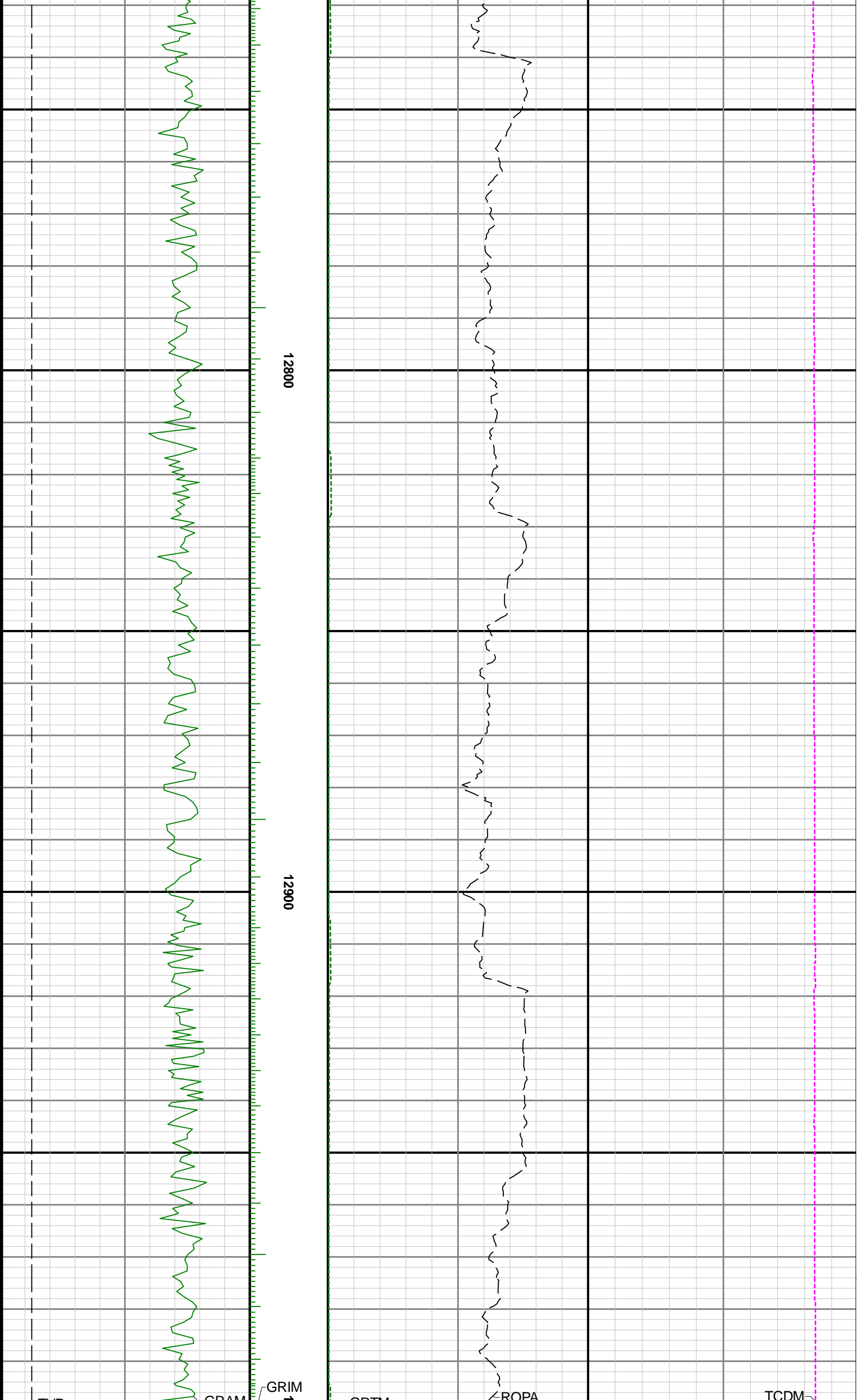


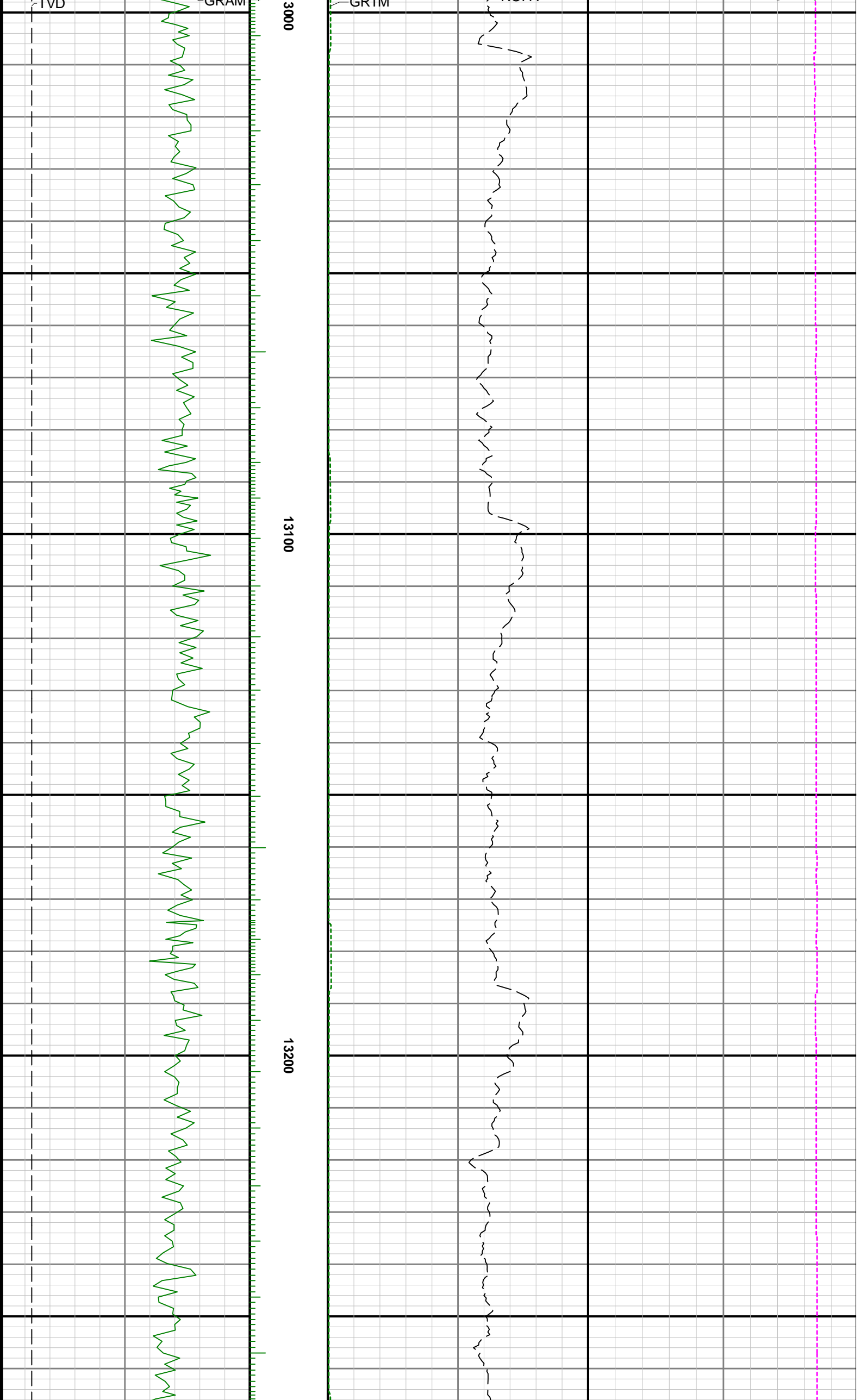
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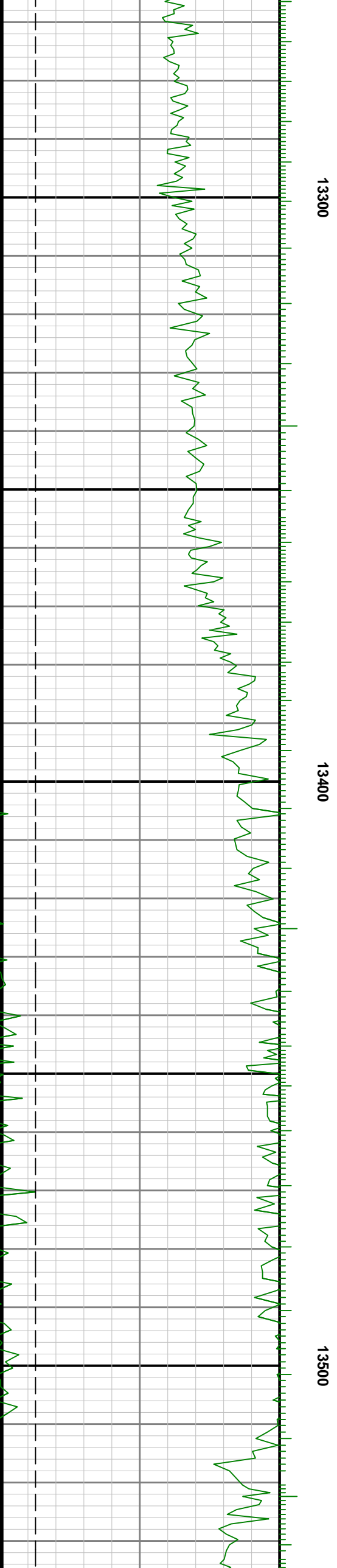
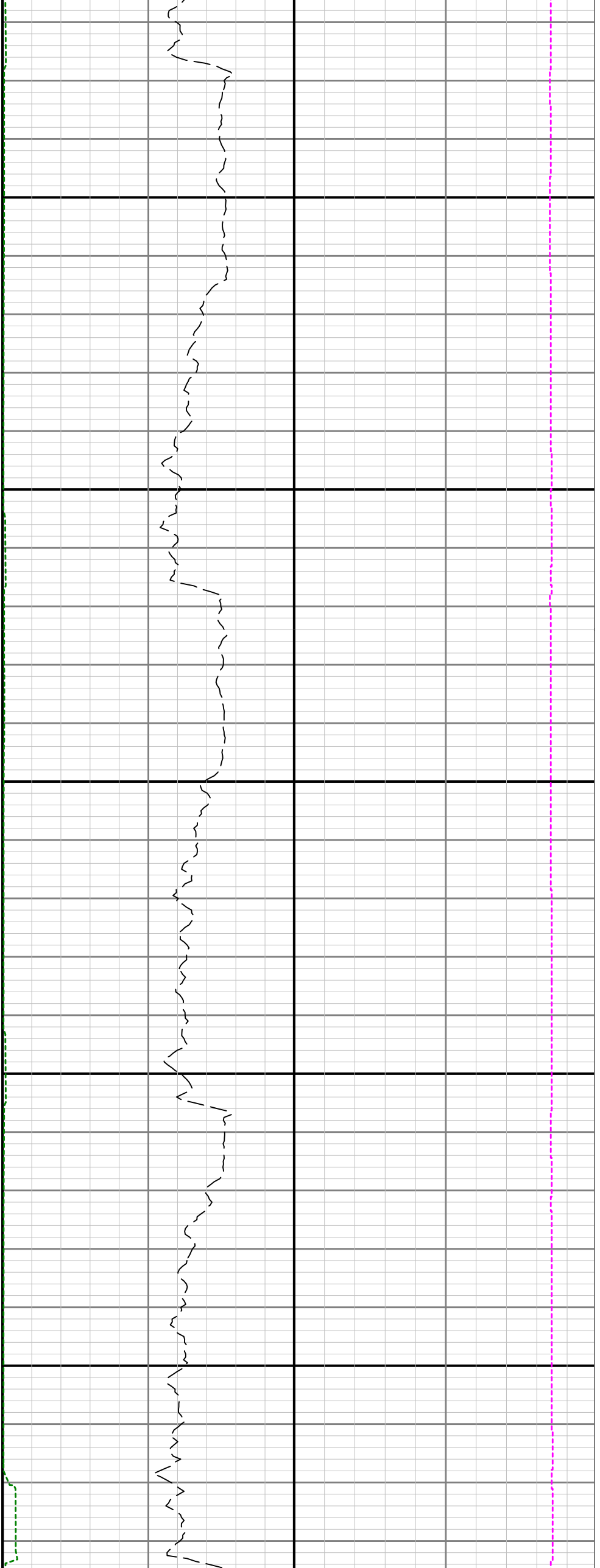
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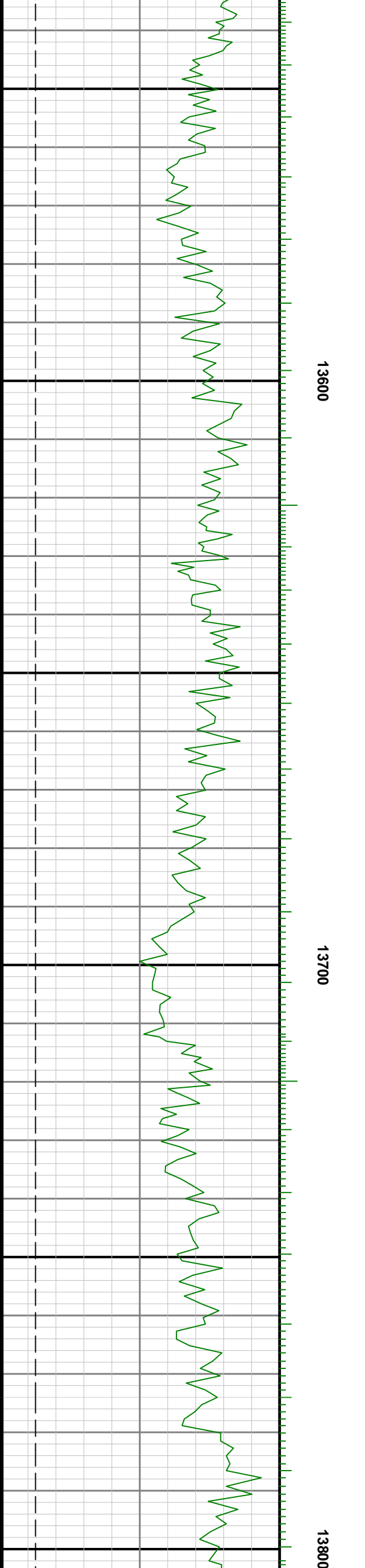
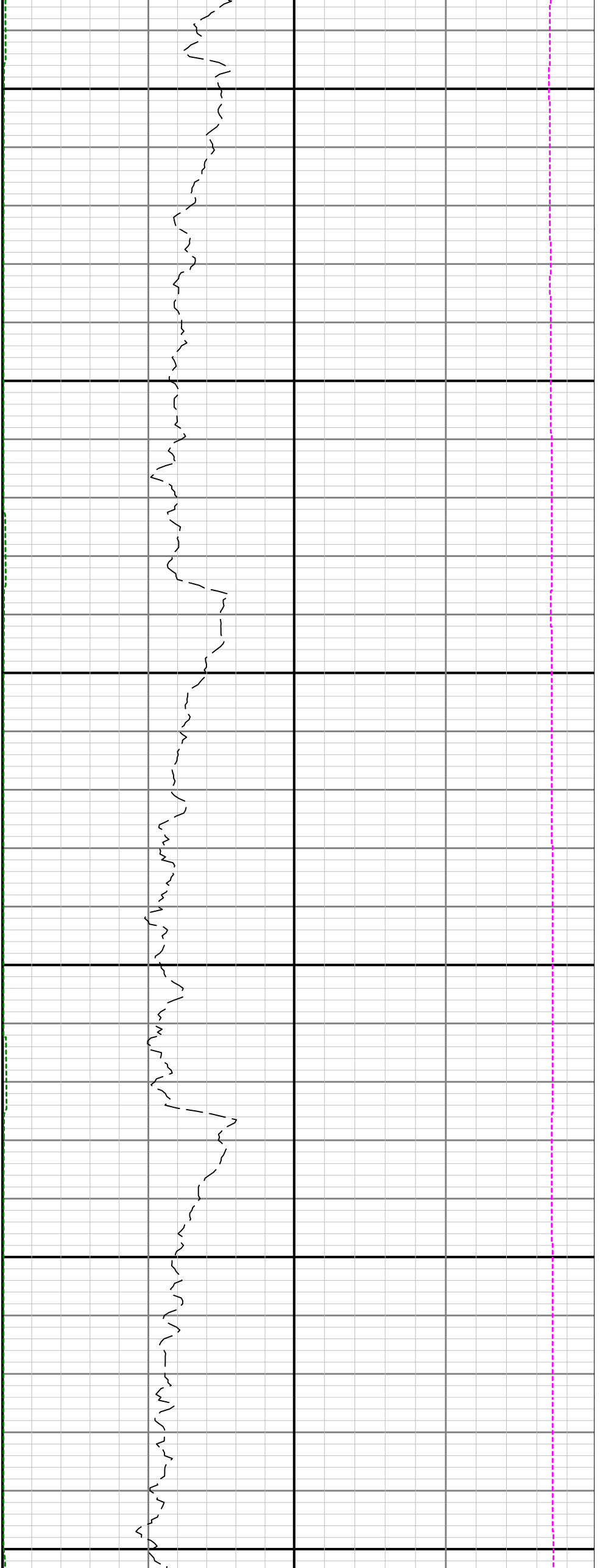
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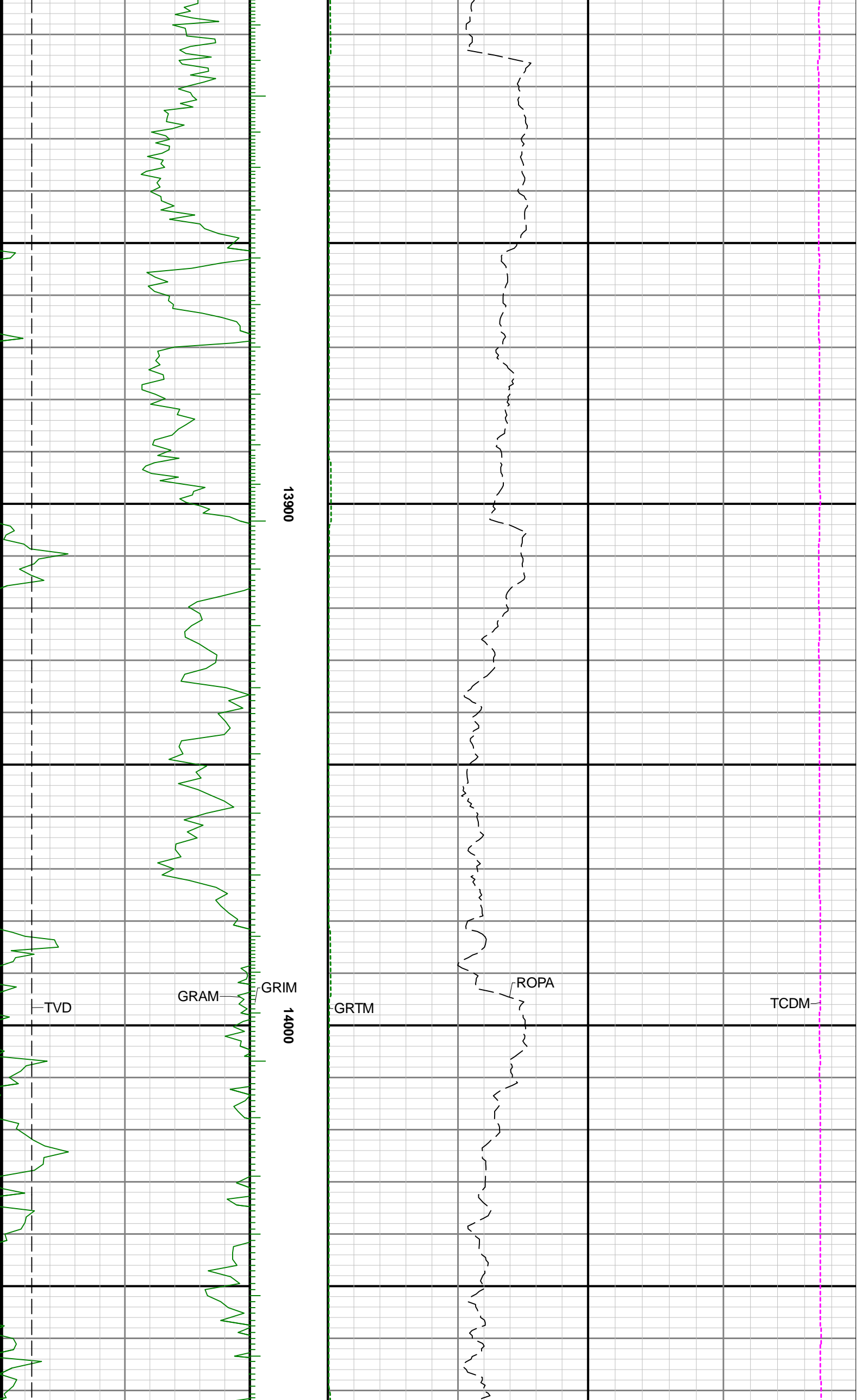


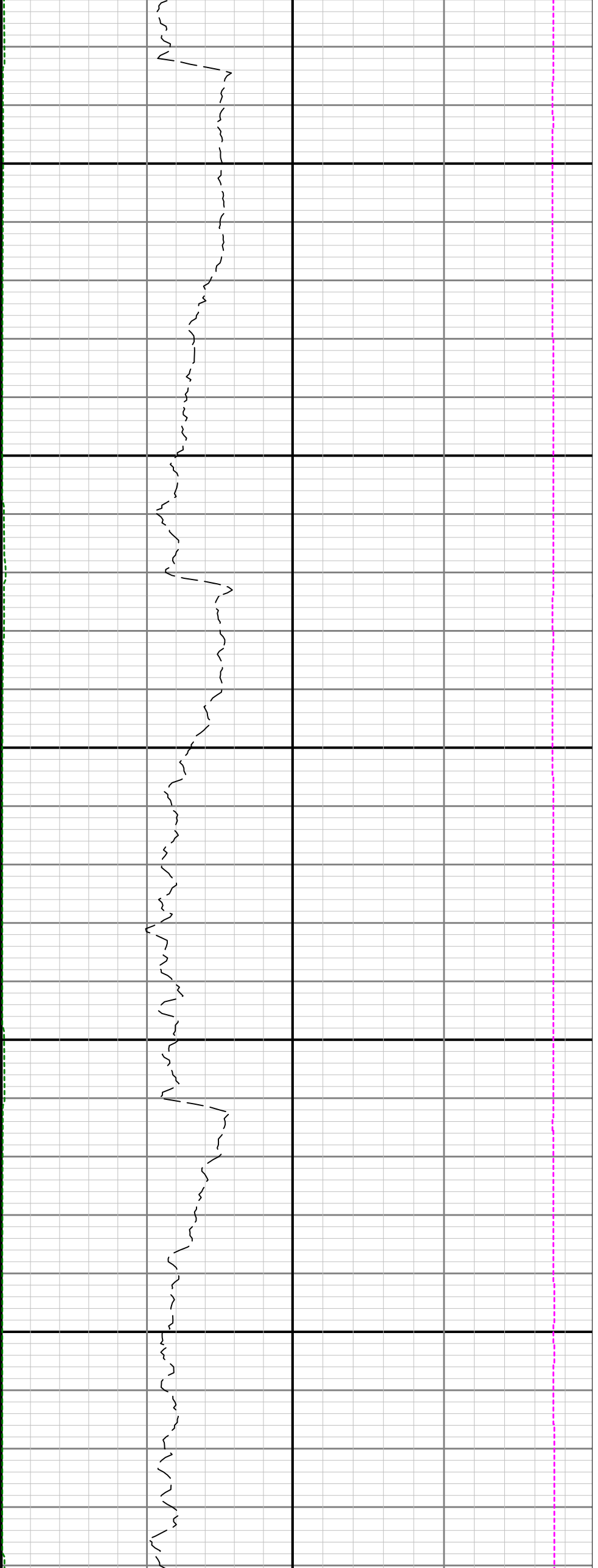








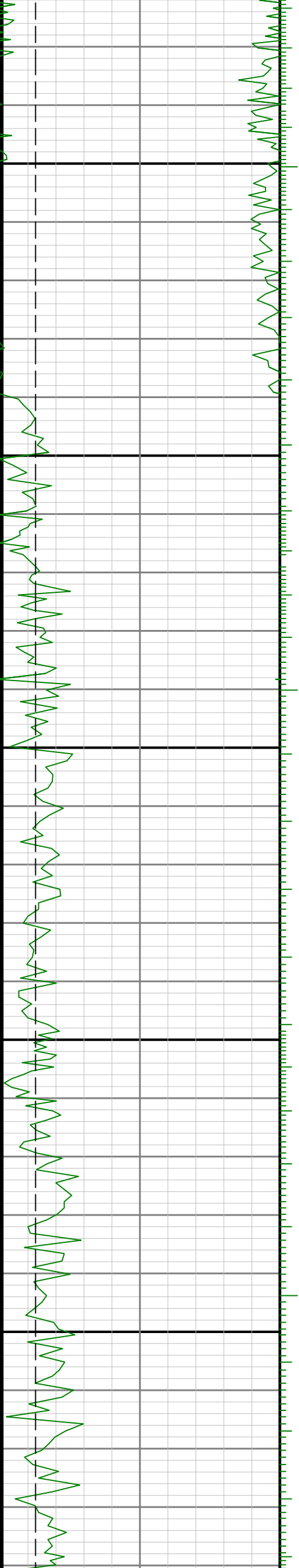


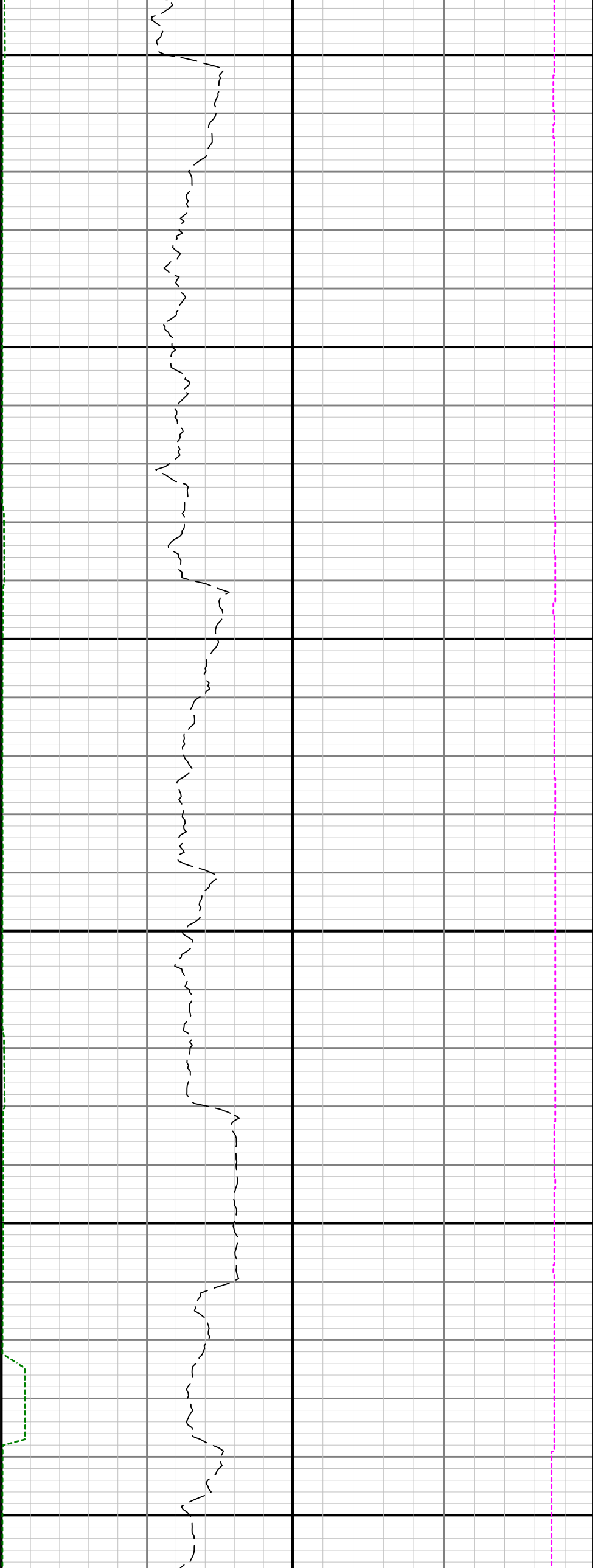


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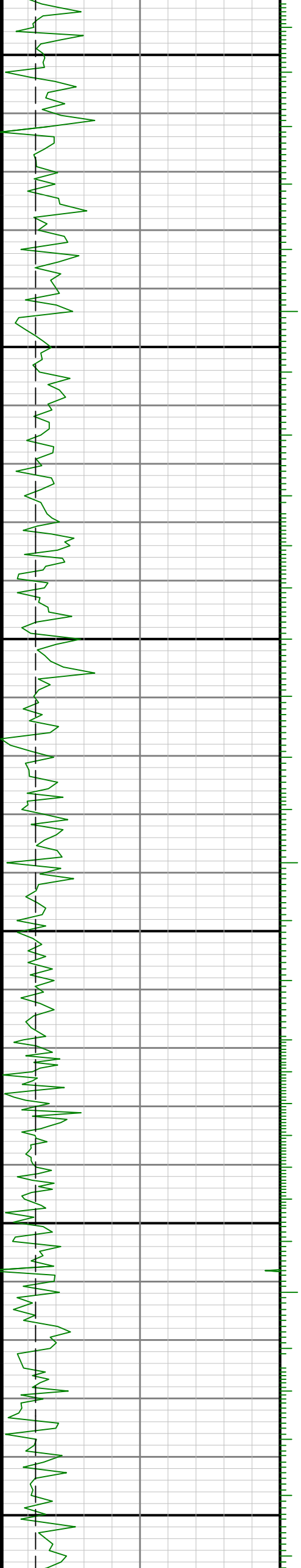


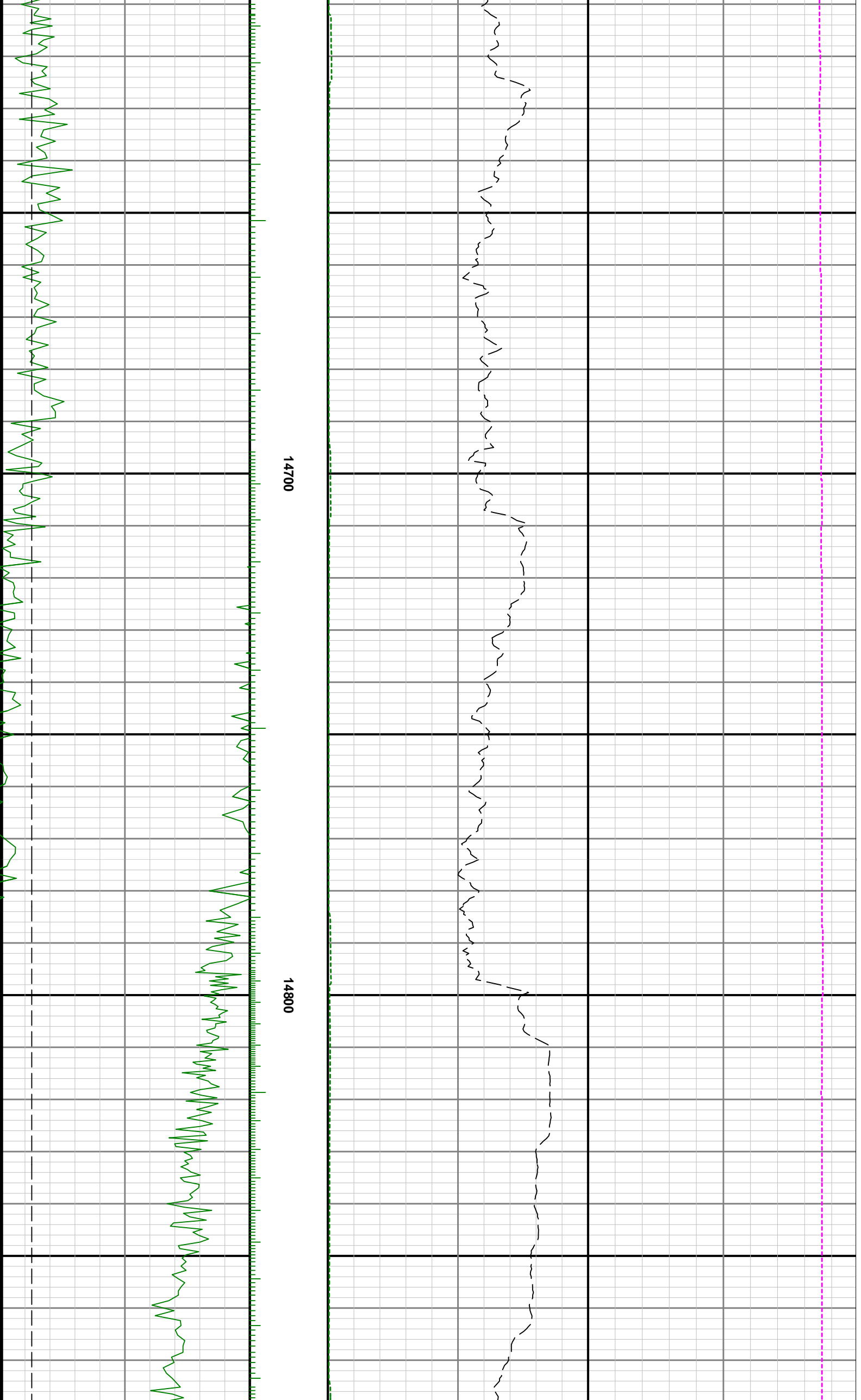


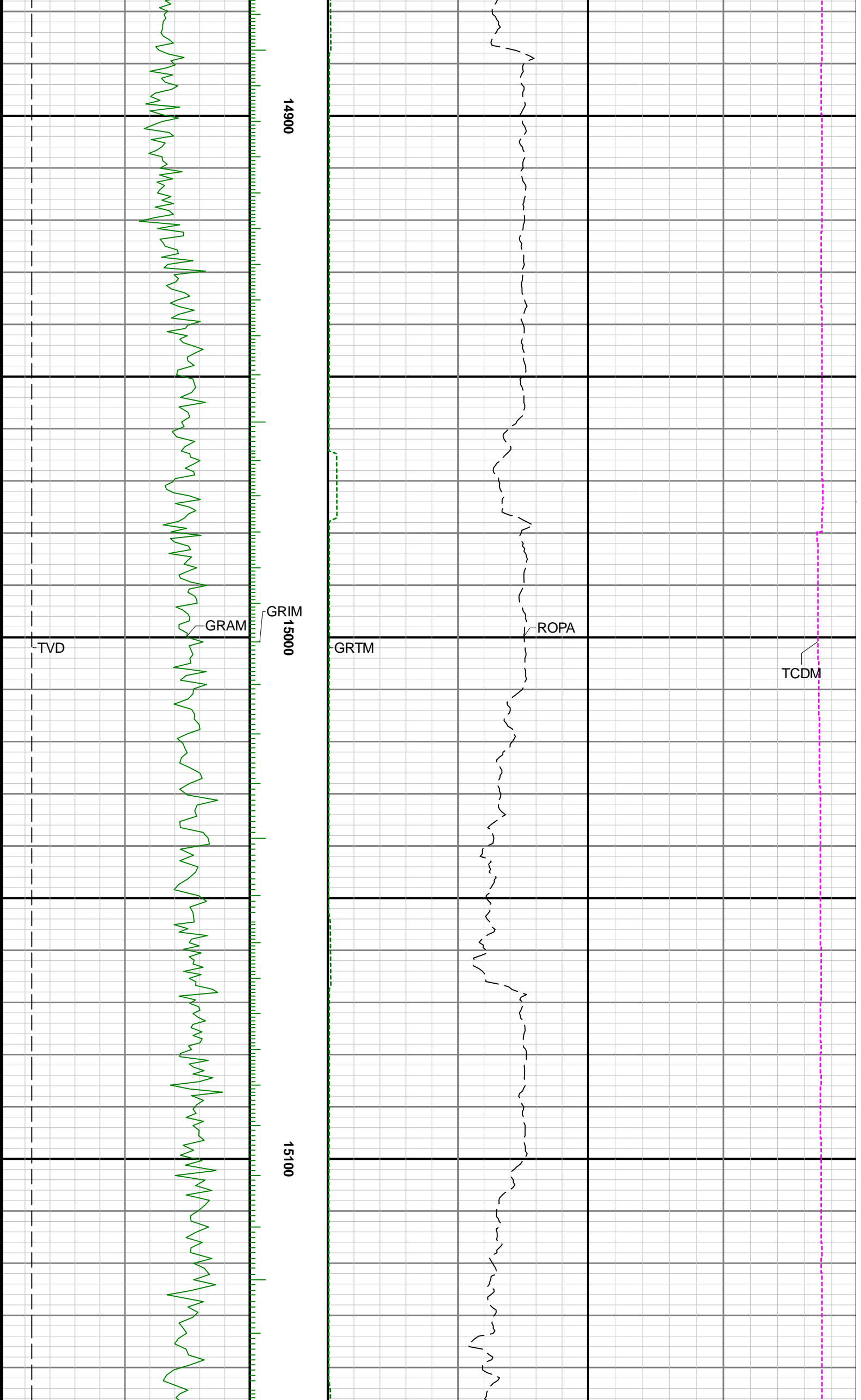
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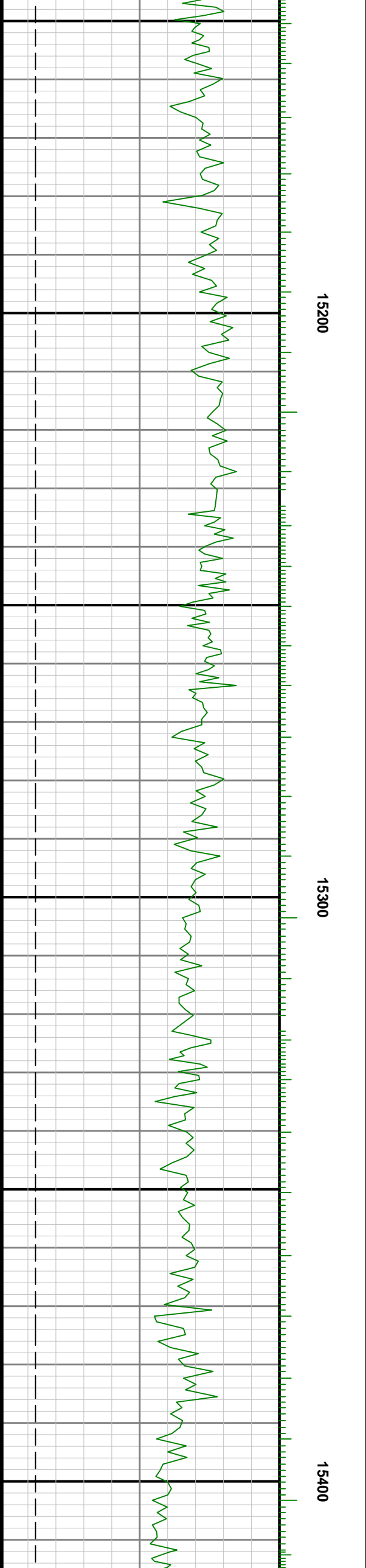
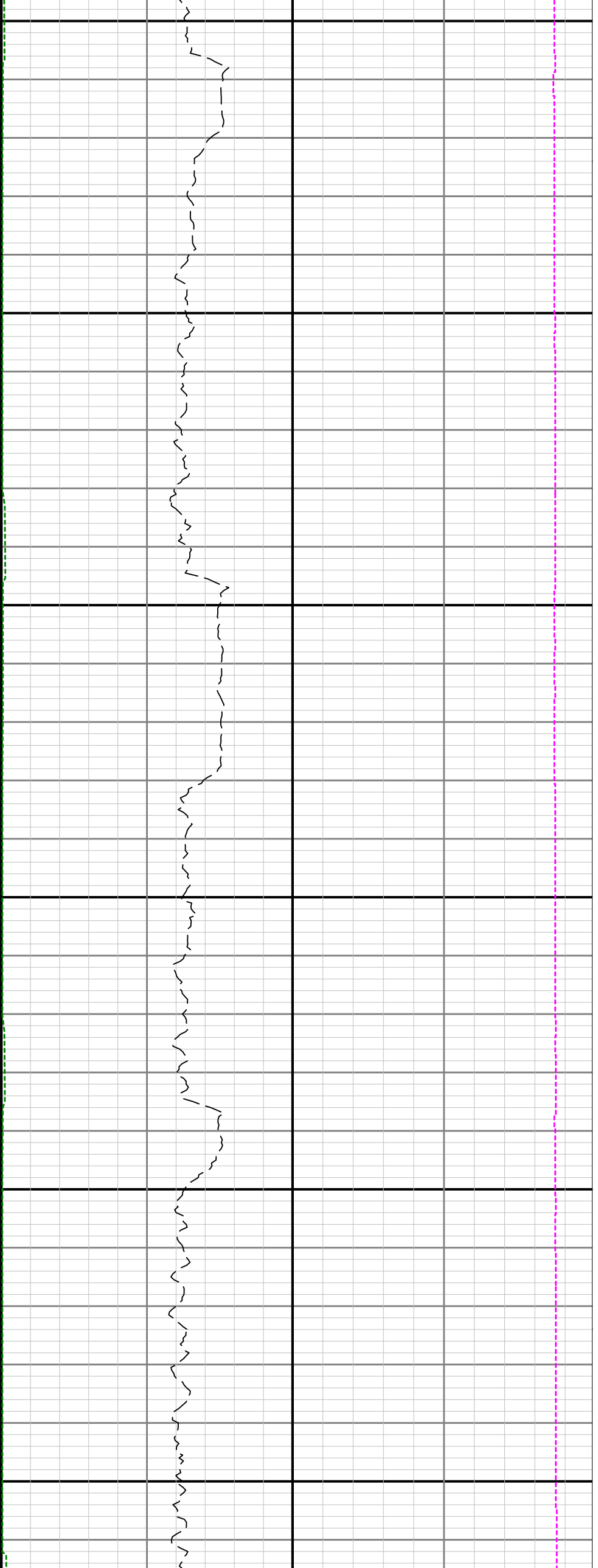
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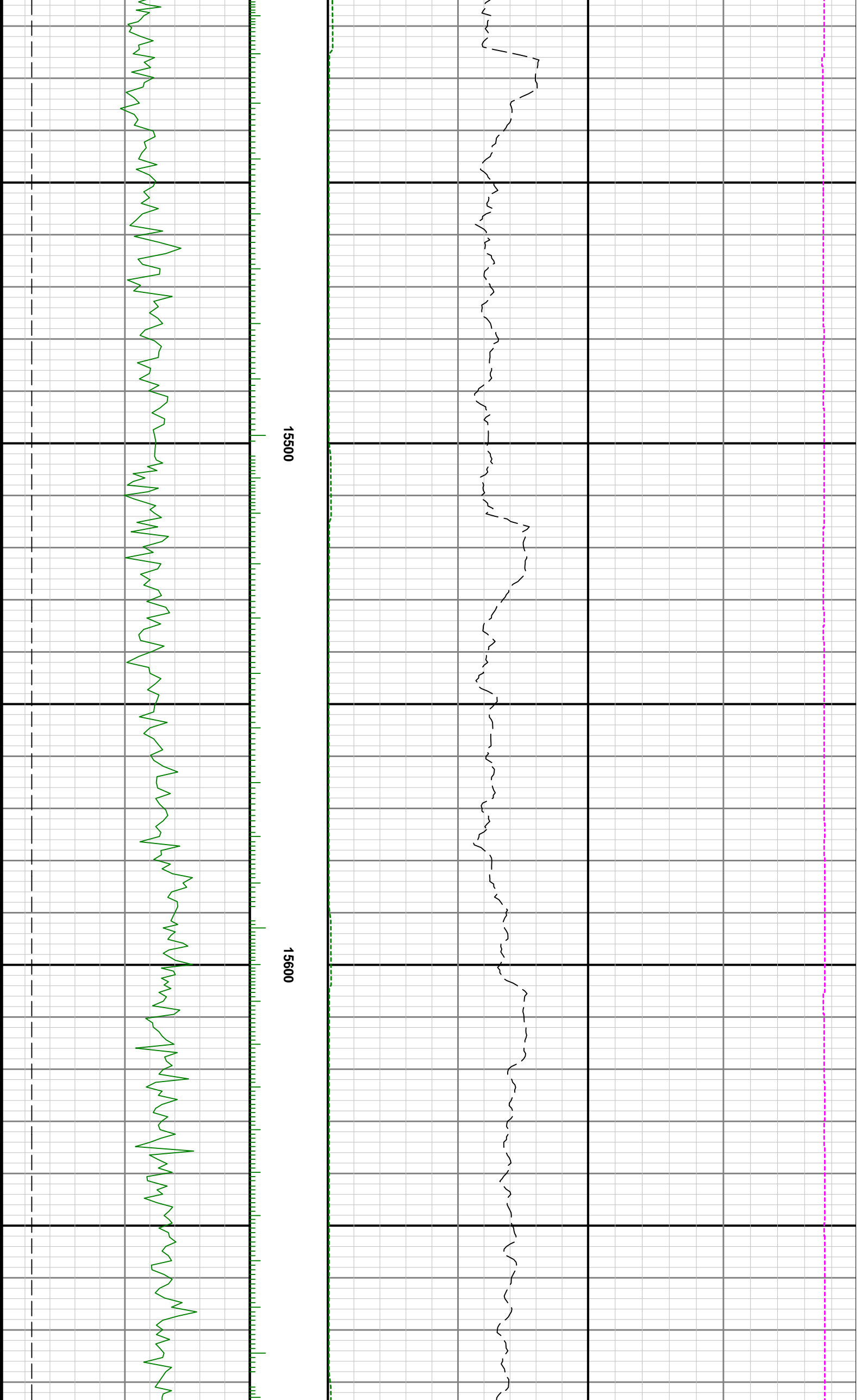
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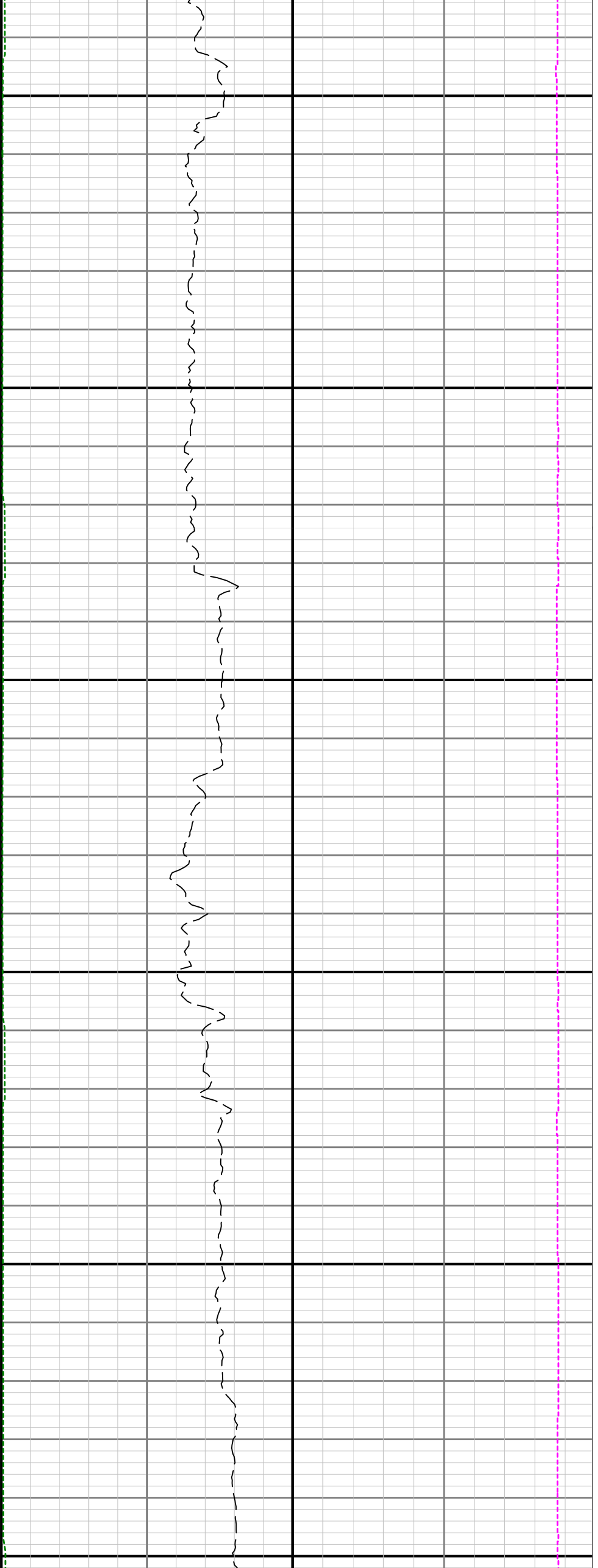








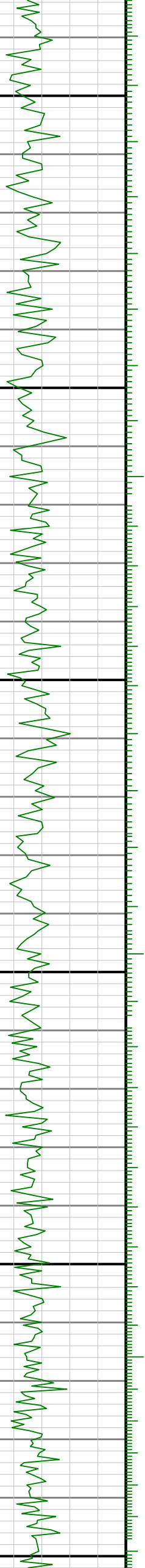


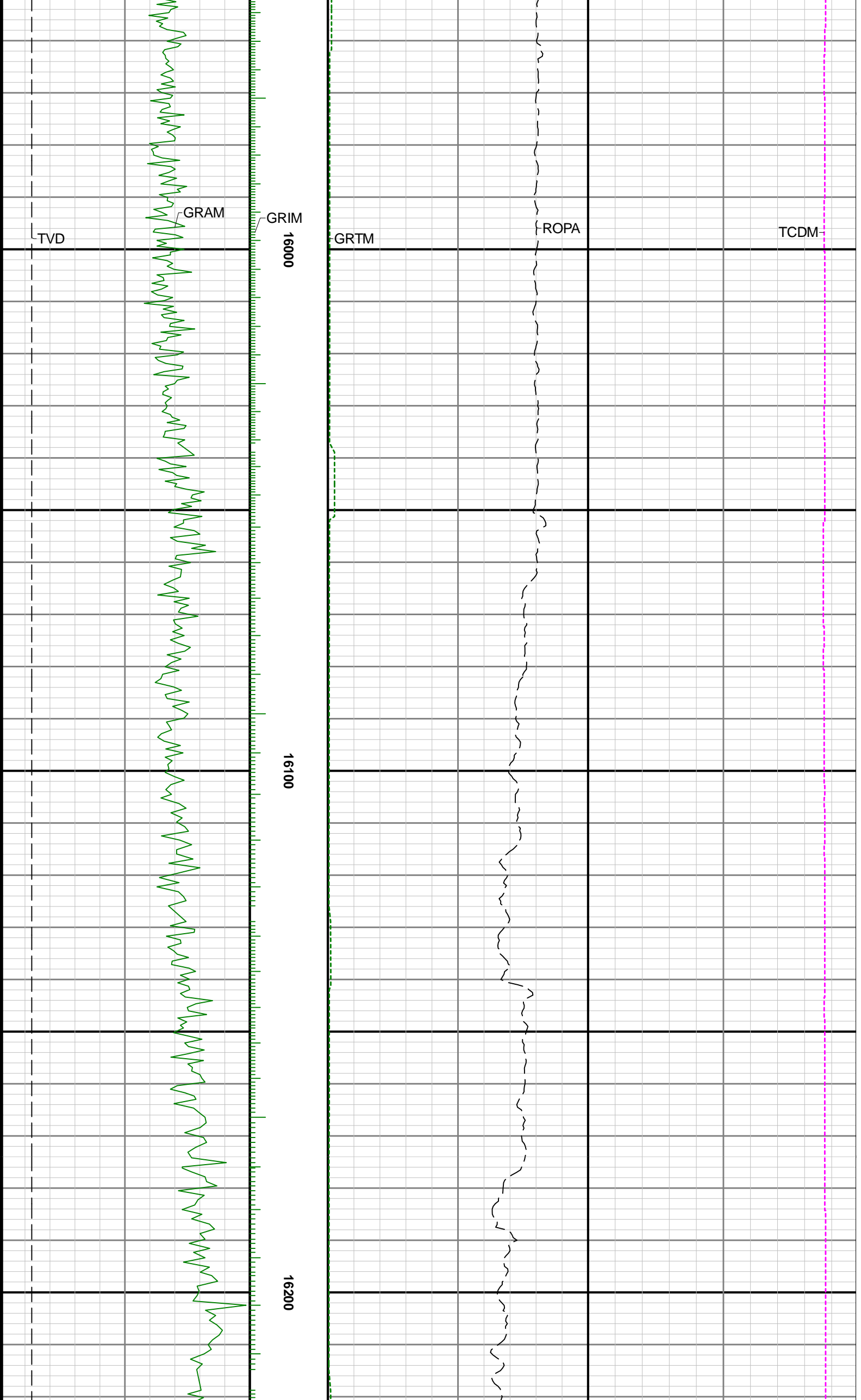


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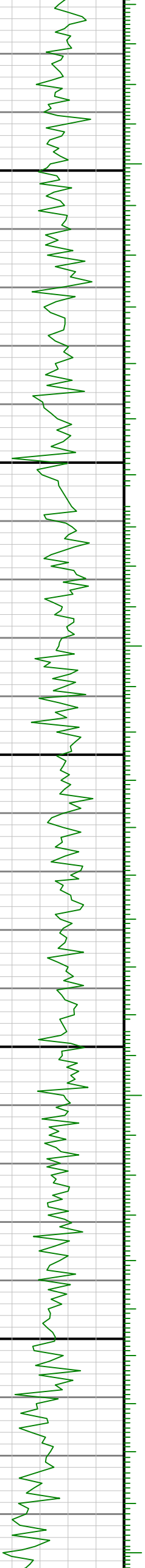


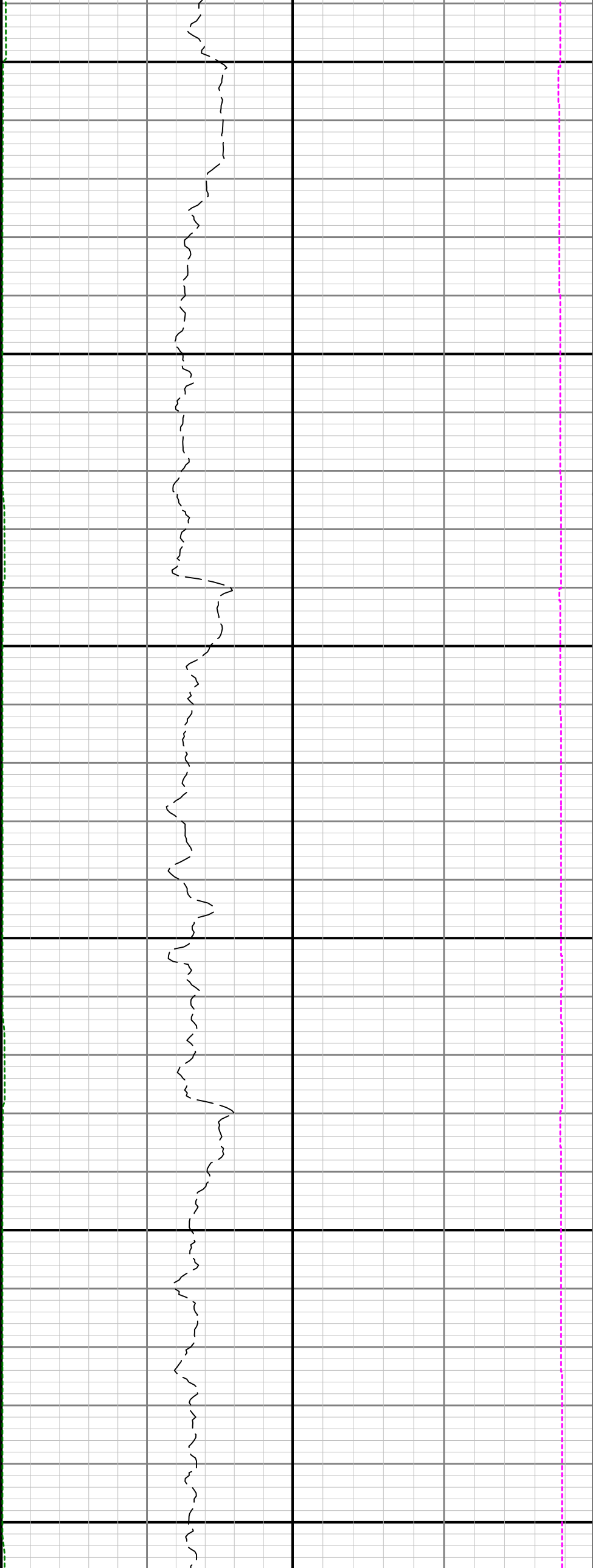




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16400

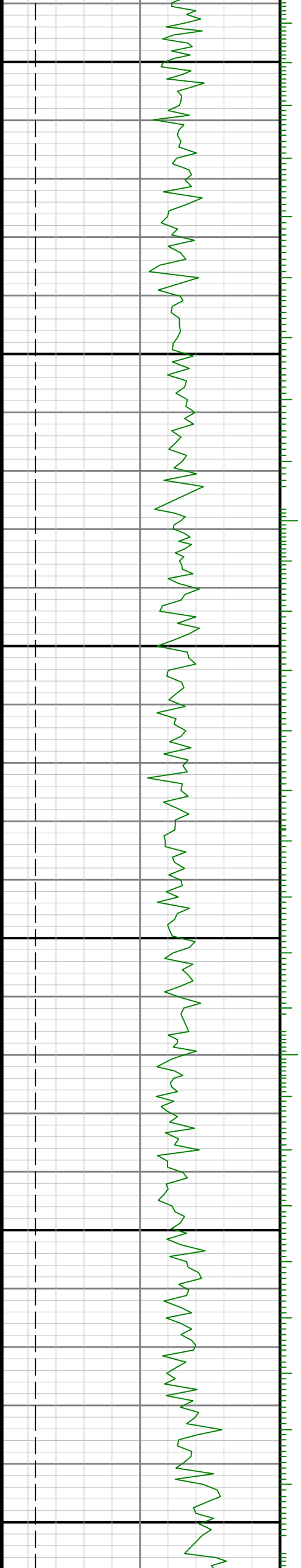


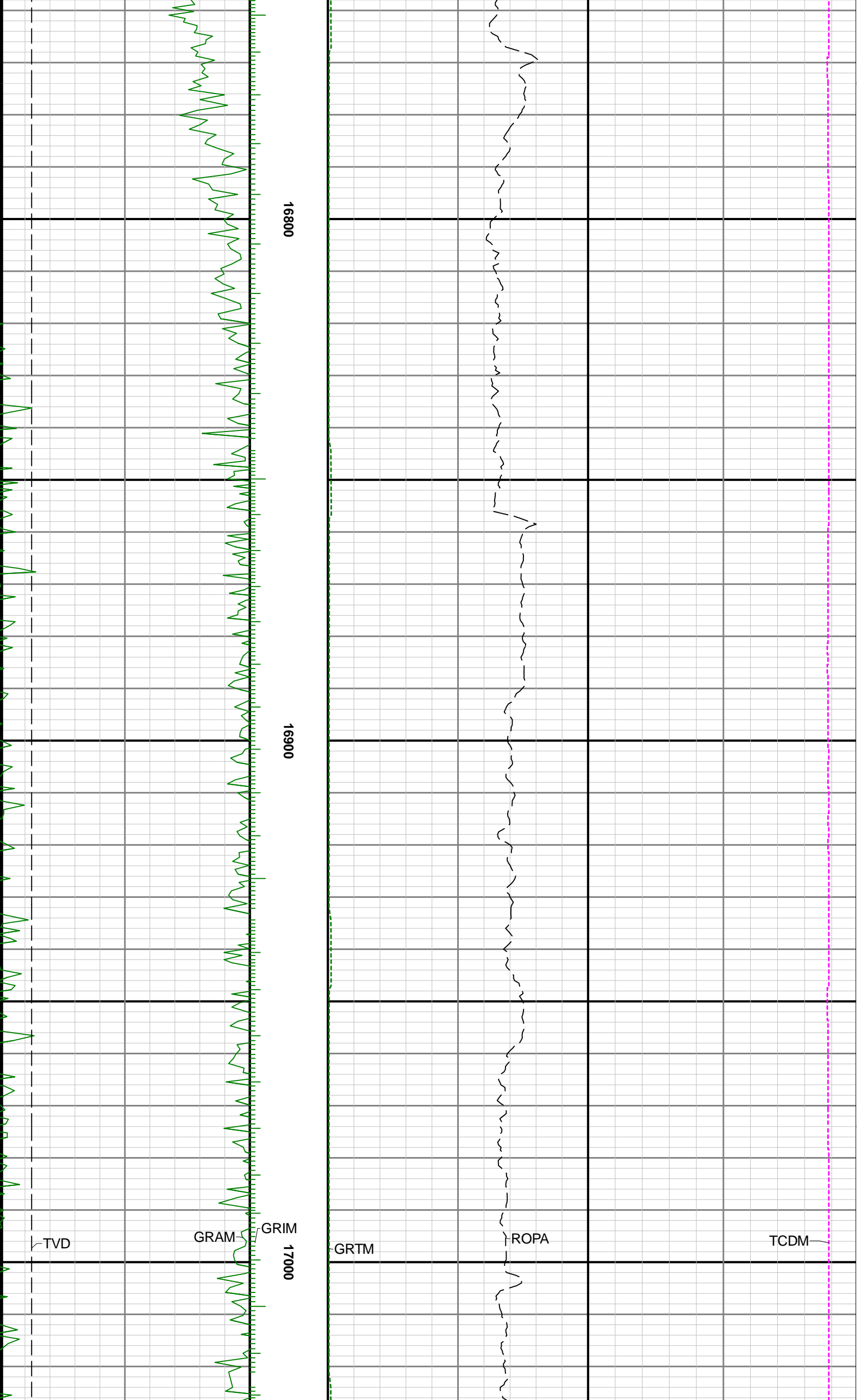


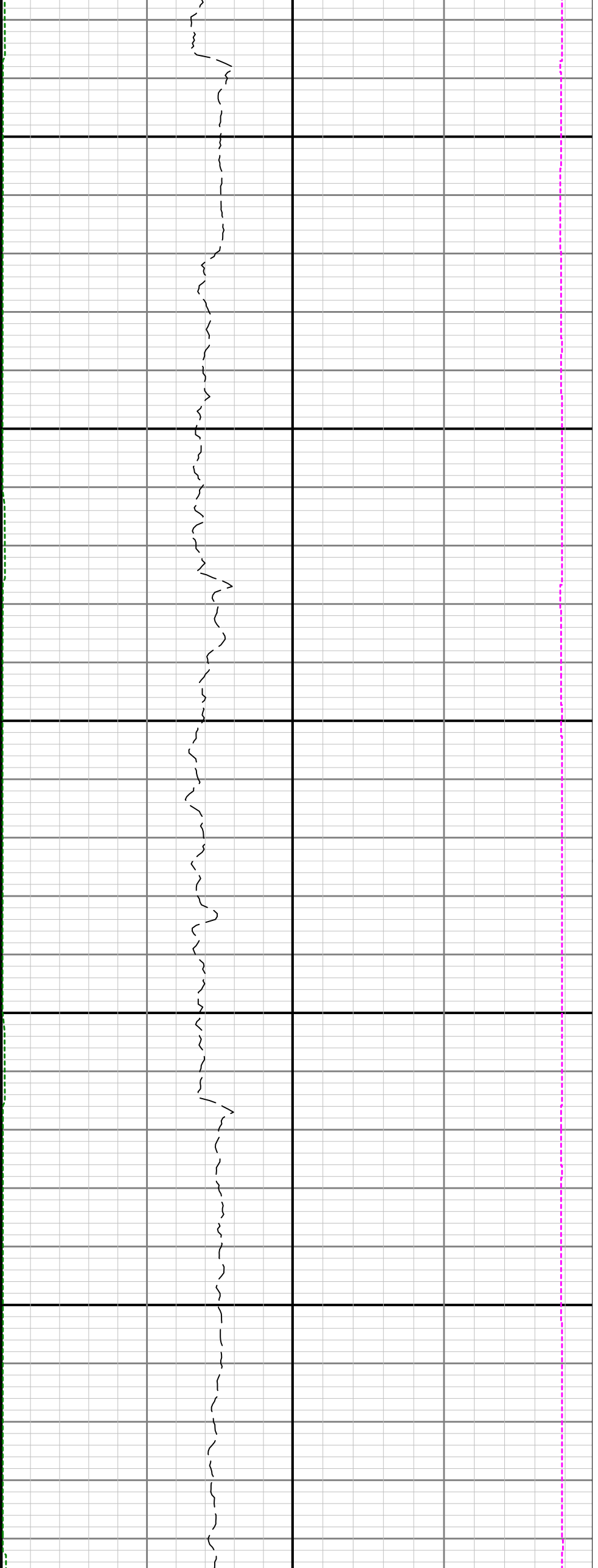
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16600

16700







17100

17200

