



Natural Formation Evaluation
Multiple Propagation Resiliivity
Gamma Ray

Realtime and Memory Log

Scale: 1:240

Company: Kerr McGee Oil & Gas Onshore LP
Well: Jelts 36N-19HZ

MEASURED DEPTH
Field: Weld County (Kerr McGee)

Region: Continental US Country: United States

Status: Surface Location: Other Services:

Field Print

Latitude: 40° 02' 35.272" N

Longitude: 104° 55' 51.085" W

Directional
VSS

API Number: 05-123-36566

Section: 19 TOWN: 1N Range: 67W

Permanent Datum (P.D.): Ground Level Elevation: 5147.00 ft.

Log Measured From: Kelly Bushing 13ft. Above P.D.

Elevations: 5160.00 ft.
N/A

Depth Reference: Driller's Depth GL: 5147.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 7027.0 ft. Date From: 13 Jun 2013 Dip Angle: 66.63° Azi Reference North: True

Bottom: 12152.0 ft. Date To: 18 Jun 2013 Total Mag to Reference

Spud Date: 12 Jun 2013 Field Strength: 52675.0 nT North Correction: 8.71°

Borehole Record

Casing Record

| Hole Size | From | To | Size | Weight | From | To |
|------------|------------|-------------|-----------|-------------|---------|------------|
| 13.500 in. | Surface | 935.0 ft. | 9.625 in. | 36.00 lb/ft | Surface | 925.0 ft. |
| 8.750 in. | 935.0 ft. | 8100.0 ft. | 7.000 in. | 26.00 lb/ft | Surface | 8089.0 ft. |
| 6.125 in. | 8100.0 ft. | 12152.0 ft. | | | | |
| | | | | | | |
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Mud Record

Deviation Record

| Type | From | To | Hole Size | Interval | Inc / Az (Start) | Inc / Az (End) |
|-------------|---------|-------------|-----------|--------------|------------------|----------------|
| Water Based | Surface | 12152.0 ft. | 8.750 in. | Intermediate | 0.9 / 307.5° | 89.5° / 180.3° |
| | | | 6.125 in. | Lateral | 89.5° / 180.3° | 92.9° / 179.9° |
| | | | | | / | / |
| | | | | | / | / |
| | | | | | / | / |
| | | | | | / | / |
| | | | | | / | / |
| | | | | | / | / |

Acquisition System Software Version

Other

| | | | | |
|-----------|----------|--------------------|----------------|-------------------|
| Advantage | 2.20U4 | Rpt: / Contractor: | Ensign 145 | / Ensign Drilling |
| PATS | 6.4.1.34 | Job No: | 5490813 | |
| | | District: / Unit: | Rocky Mountain | / |

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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 (ft.) | Bottom (ft.) | From (ft.) | To (ft.) | Start | End | |
| 1 | 1 | 2 | 8.750 | PDC | 2.000 | Steerable | 7027.0 | 8051.0 | 935.0 | 8100.0 | 13 Jun 2013 16:48 | 14 Jun 2013 10:20 | 44.1 |
| 2 | 2 | 3 | 6.125 | PDC | 2.000 | Steerable | 8051.0 | 12110.0 | 8100.0 | 12152.0 | 17 Jun 2013 03:45 | 18 Jun 2013 18:35 | 40.3 |

Crew

| Name | Arrive | Depart | Name | Arrive | Depart | Name | Arrive | Depart |
|---------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|
| | Wellsite | Wellsite | | Wellsite | Wellsite | | Wellsite | Wellsite |
| Ian McCarrell | 09 Jun 2013 | 19 Jun 2013 | Matthew Dickey | 09 Jun 2013 | 14 Jun 2013 | Steven Cano | 14 Jun 2013 | 19 Jun 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 mg/l | K+ mg/l |
|-------------------|----------------|----------------------------|-------------|------------------|-------------------|-----|-----------------------|----------------|--------|----------------------------|------------|
| 12 Jun 2013 07:00 | 1 | 941.0 | Water Base | 9.4 | 38 | 8.0 | N/A | 0/100 | Pit | 1000 | 40.0 |
| 16 Jun 2013 07:45 | 1 | 8100.0 | Water Base | 9.6 | 37 | 9.5 | N/A | 0/94 | Pit | 1400 | 40.0 |
| 17 Jun 2013 07:30 | 2 | 10304.0 | Water Base | 10.1 | 39 | 9.0 | N/A | 0/94 | Pit | 1500 | 40.0 |
| 18 Jun 2013 15:00 | 2 | 11948.0 | Water Base | 10.1 | 47 | 8.5 | N/A | 0/92 | Pit | 1800 | 80.0 |

| Mud Resistivity Record | | | | | Surface | | | | Downhole | | |
|------------------------|--|----------------|----------------------------|----------------------------|---------|---------|---------|---------|--------------|---------------|---------------|
| | | | | | Rm | Rmf | Rmc | | Rm @ BHCT | Rmf @ BHCT | Rmc @ BHCT |
| Date / Time | | LWD Run No. | Measured Depth (ft.) | Surface Temp (deg F) | (ohm.m) | (ohm.m) | (ohm.m) | (deg F) | (ohm.m) | (ohm.m) | (ohm.m) |
| 17 Jun 2013 02:39 | | 2 | 8100.0 | 66 | 2.18 | N/A | N/A | 212 | 0.70 | N/A | N/A |
| 17 Jun 2013 16:01 | | 2 | 9718.0 | 68 | 0.92 | N/A | N/A | 218 | 0.30 | N/A | N/A |
| 18 Jun 2013 04:13 | | 2 | 10982.0 | 67 | 1.15 | N/A | N/A | 223 | 0.36 | N/A | N/A |

| Mnemonics | | |
|-----------|--|----------|
| Curve | Description | Units |
| CACHM | Conductivity, Attenuation – 2MHZ – LS – Compensated Borehole Corrected | mmoh/m |
| GRAM | Gamma Ray – Apparent, 0.5 ft. Avg. | API |
| GRAX | Gamma Ray – Apparent, 0.5 ft. Avg. | API |
| GRIM | Gamma Ray Point Indicator | Unitless |
| GRIX | Gamma Ray Point Indicator | Unitless |
| RACHM | Resistivity, Attenuation – 2MHz – LS – Compensated Borehole Corrected | ohm.m |
| RACLM | Resistivity, Attenuation – 400kHz – LS – Compensated Borehole Corrected | ohm.m |
| ROPA | Rate of Penetration, 3.0 ft. Avg. | ft/hr |
| RPCHM | Resistivity, Phase Difference – 2 MHz – LS – Compensated Borehole Corrected | ohm.m |
| RPCLM | Resistivity, Phase Difference – 400kHz – LS – Compensated Borehole Corrected | ohm.m |
| RPSIHM | Resistivity Sliding Indicator | Unitless |
| RPTHM | Resistivity Time Since Drilled | Min |
| TCDX | Downhole Temperature | deg F |
| TCDM | Downhole Temperature | deg F |

| Equipment and Service Data | | | | | | |
|----------------------------|------|------------------|-------------|------------------------|----------------------|----------------------|
| LWD Run No. | Tool | Serial Number | Measurement | Bit Offset (ft.) | Max O.D. (in.) | Min I.D. (in.) |
| 1 | DIR | 10170879 | Directional | 56.68 | 6.750 | 2.625 |
| 1 | SRIG | 11602059 | Gamma | 53.30 | 6.750 | 2.625 |
| 2 | CS | 110432076 | - | 74.14 | 5.000 | 2.250 |
| 2 | BCPM | 10214387 | Telemetry | 63.24 | 5.000 | 1.750 |
| 2 | STAB | 11863323 | - | 59.94 | 5.625 | 1.750 |
| 2 | OTK | 11827144 | Directional | 55.46 | 5.066 | 1.750 |
| 2 | OTK | 11827144 | Resistivity | 49.49 | 5.066 | 1.750 |
| 2 | OTK | 11827144 | Gamma | 43.30 | 5.066 | 1.750 |

| | | | | | | |
|---|-----|----------|----------|-------|-------|-------|
| 2 | OTK | 11827144 | Gamma | 42.30 | 5.066 | 1.750 |
| 2 | OTK | 11827144 | Pressure | 44.93 | 5.066 | 1.750 |
| 2 | CS | 10623947 | - | 37.99 | 5.000 | 2.250 |

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 |

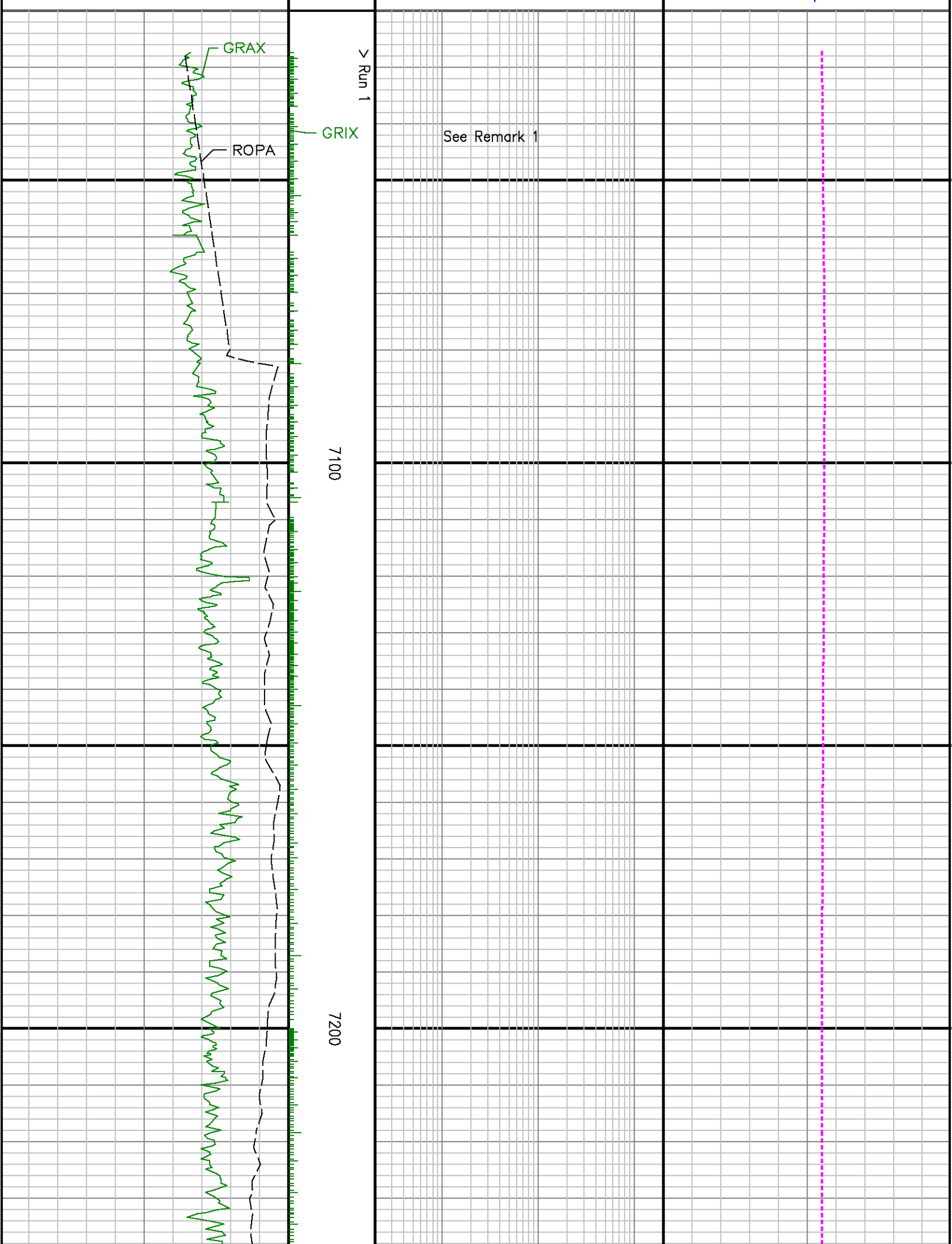
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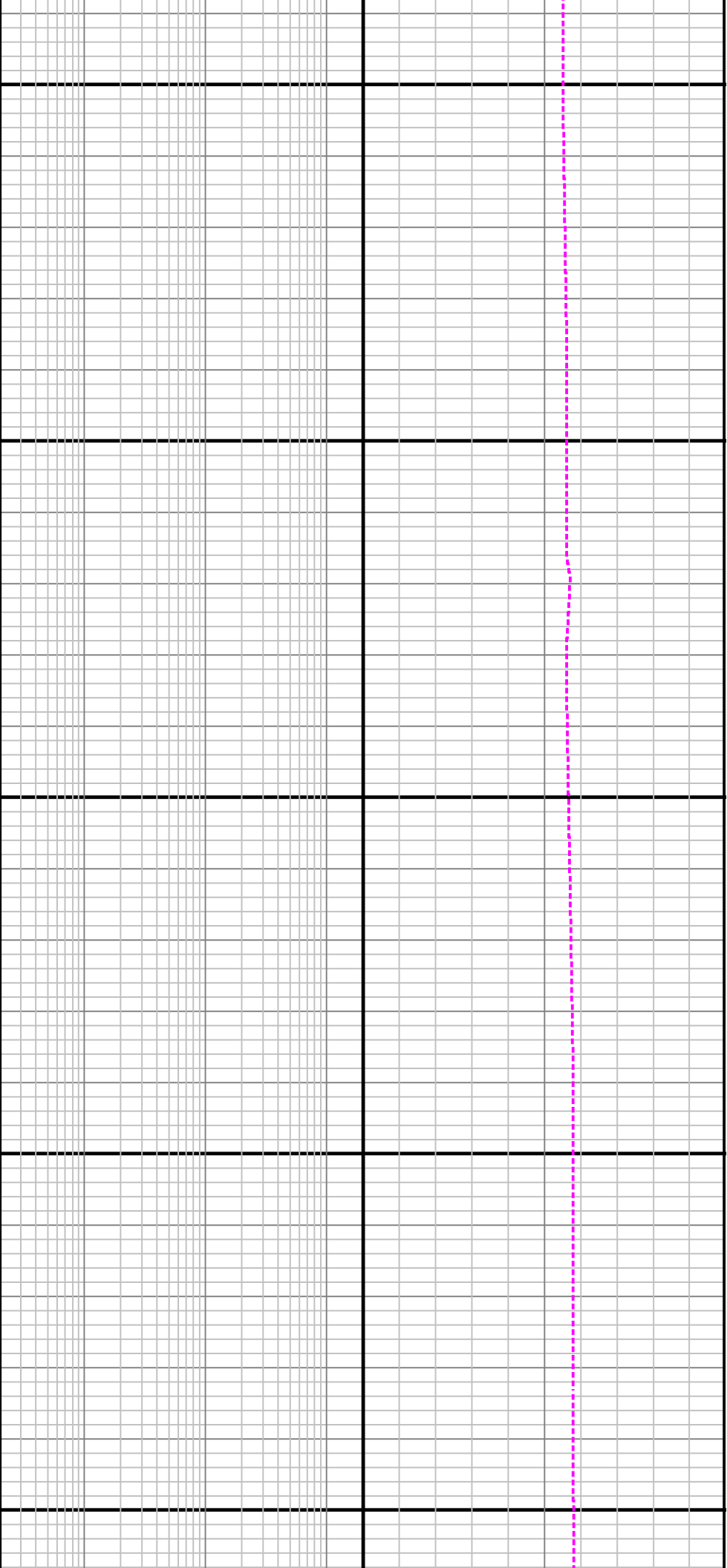
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|---|
| <p>1) Baker Hughes INTEQ run 1 utilized 6 1/2 inch NaviGamma services (Directional, Gamma Ray, and VSS) behind an 8 3/4 inch bit and steerable assembly from 935 to 8100 feet MD (935 to 7641 feet TVD).</p> <p>2) Baker Hughes INTEQ run 2 utilized 4 3/4 inch OnTrak (Gamma Ray, Multiple Propagation Resistivity, and Directional) behind a 6 1/8 inch bit and steerable assembly from 8100 to 12152 feet MD (7641 to 7628 ft TVD).</p> <p>3) A sliding indicator is shown to the right edge of track 2 as a heavy line. The indicator has been depth-shifted to the resistivity sensor offset to correspond to resistivity data acquired while sliding.</p> |
|---|

Remarks

| Number | Measured Depth (m.) | Hole Section (in.) | LWD Run No. | Remark |
|--------|---------------------------|--------------------------|----------------|--|
| 1 | 7000 | 8.750 | 1 | The interval from surface to 7027 feet MD (6973 feet TVD) was not logged since logging services began at the curve kick off point of 7080' MD. |
| 2 | 8075 | 6.125 | 2 | The interval from 8051 to 8100 feet MD (7638 to 7641 feet TVD) was logged up to 65.4 hours after being drilled due to a trip out of hole to run casing, cement, and pick up lateral tools. |
| 3 | 12140 | 6.125 | 2 | The interval from 12110 to 12152 feet MD (7631 to 7628 feet TVD) was not logged due to sensor to bit offset at well TD. |

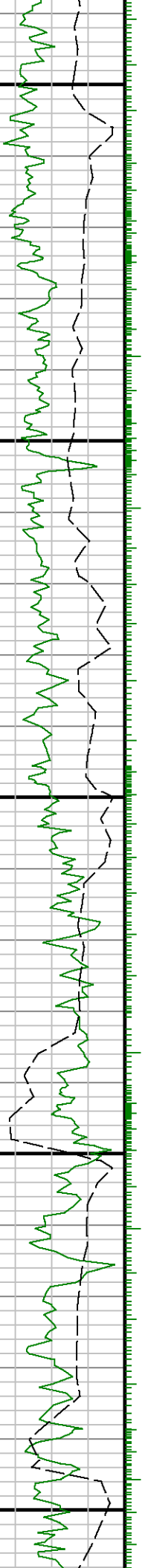
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|--|---------------|--|--|
|  <p>Company : Kerr McGee Oil & Gas Onshore LP Well : Jells 36N-19HZ Interval : 7020.00 - 12160.00 feet Created : 19/Jun/2013 11:18:28 AM</p> | | | |
| <p>0 Gamma Ray Apparent 0.5 ft Avg [GRAX] 150</p> <p>API</p> <p>Rate of Penetration 3.0 ft Avg [ROPA]</p> <p>1000 0</p> <p>ft/hr</p> <p>0 Gamma Ray Apparent 0.5 ft Avg GRAM 150</p> <p>API</p> | MD feet 1:240 | <p>0.2 Res PD LS 2MHz Corr RPCHM 200</p> <p>ohm.m</p> <p>0.2 Res AT LS 400kHz Corr RACLM 200</p> <p>ohm.m</p> <p>0.2 Res PD LS 400 kHz Corr RPCLM 200</p> <p>ohm.m</p> <p>0.2 Res AT LS 2MHz Corr RACHM 200</p> <p>ohm.m</p> | <p>0 Downhole Temperature [TCDX] 300</p> <p>degF</p> <p>0 Downhole Temperature [TCDM] 300</p> <p>degF</p> <p>0 Time Since Drilled [RPTHM] 600</p> <p>min</p> <p>4000 Con AT LS 2MHz Corr [CACHM] 0</p> <p>mmho/m</p> |

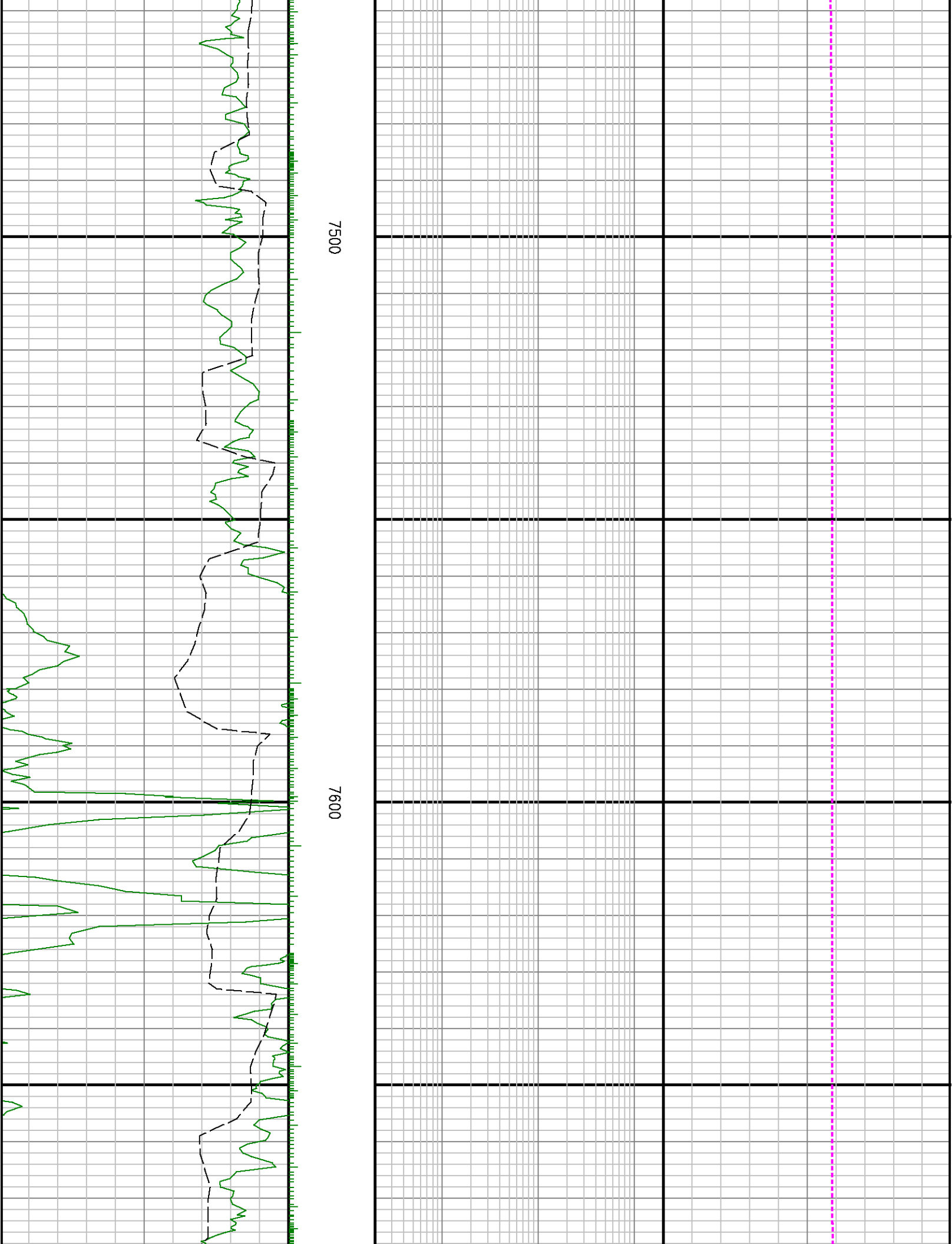


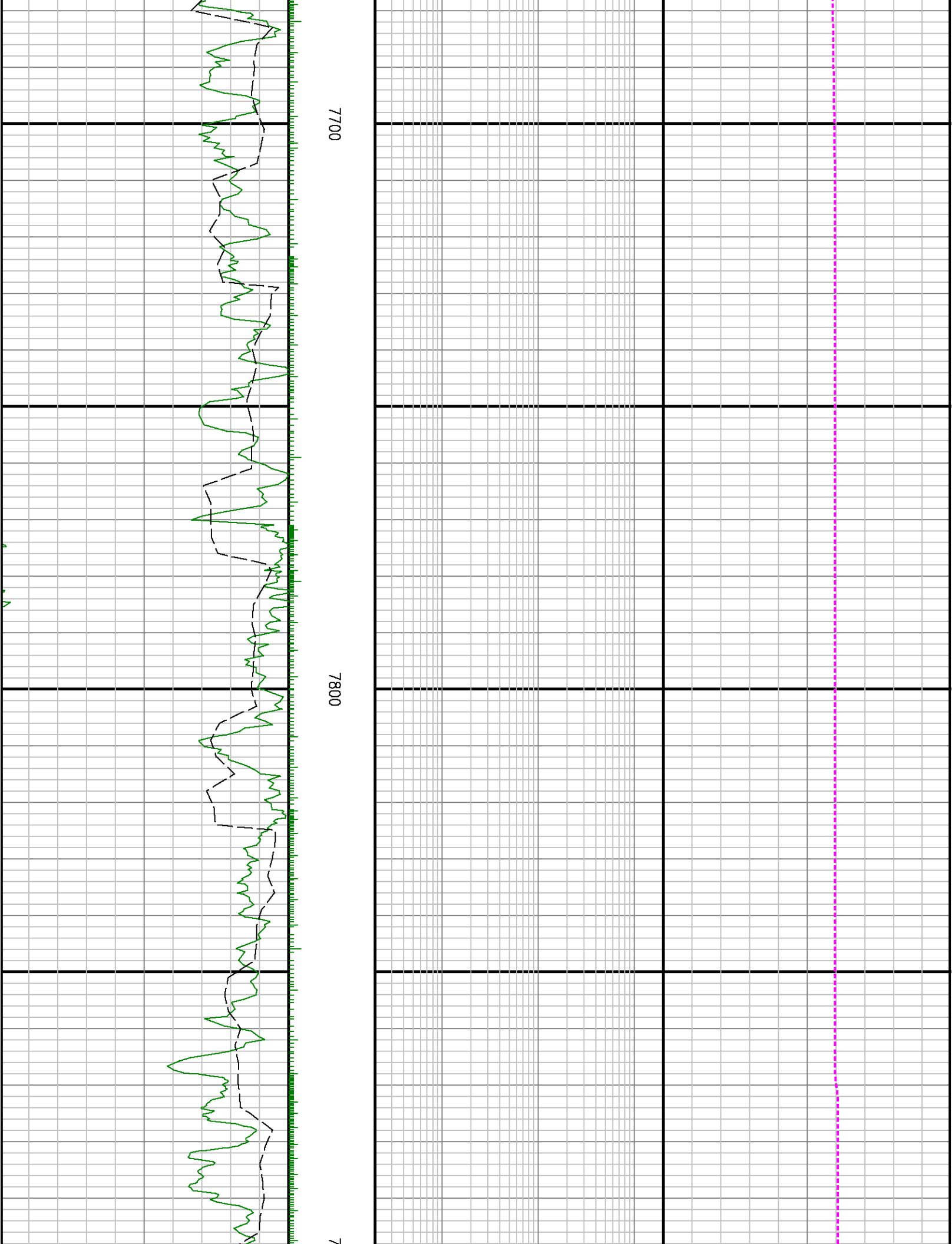


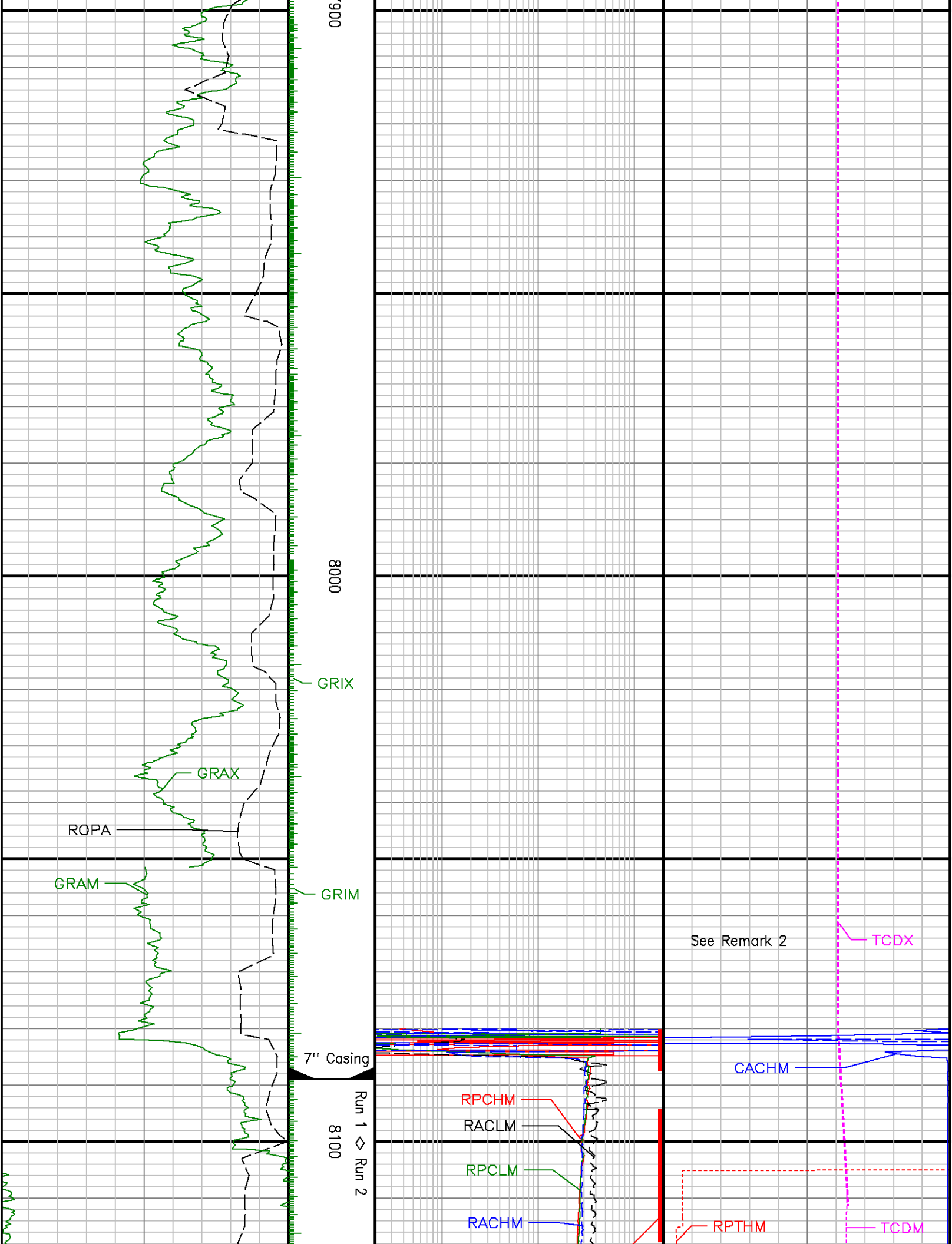
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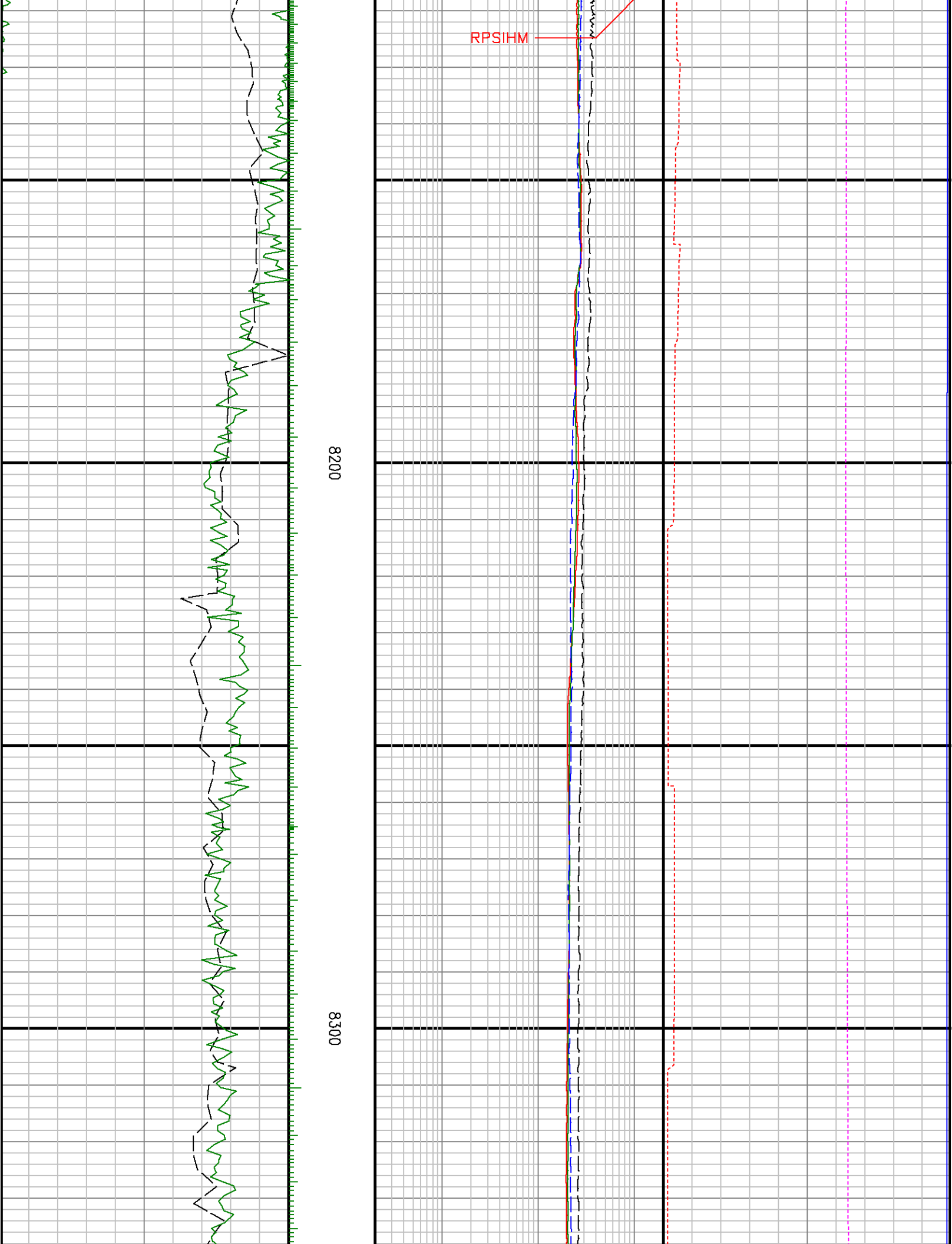
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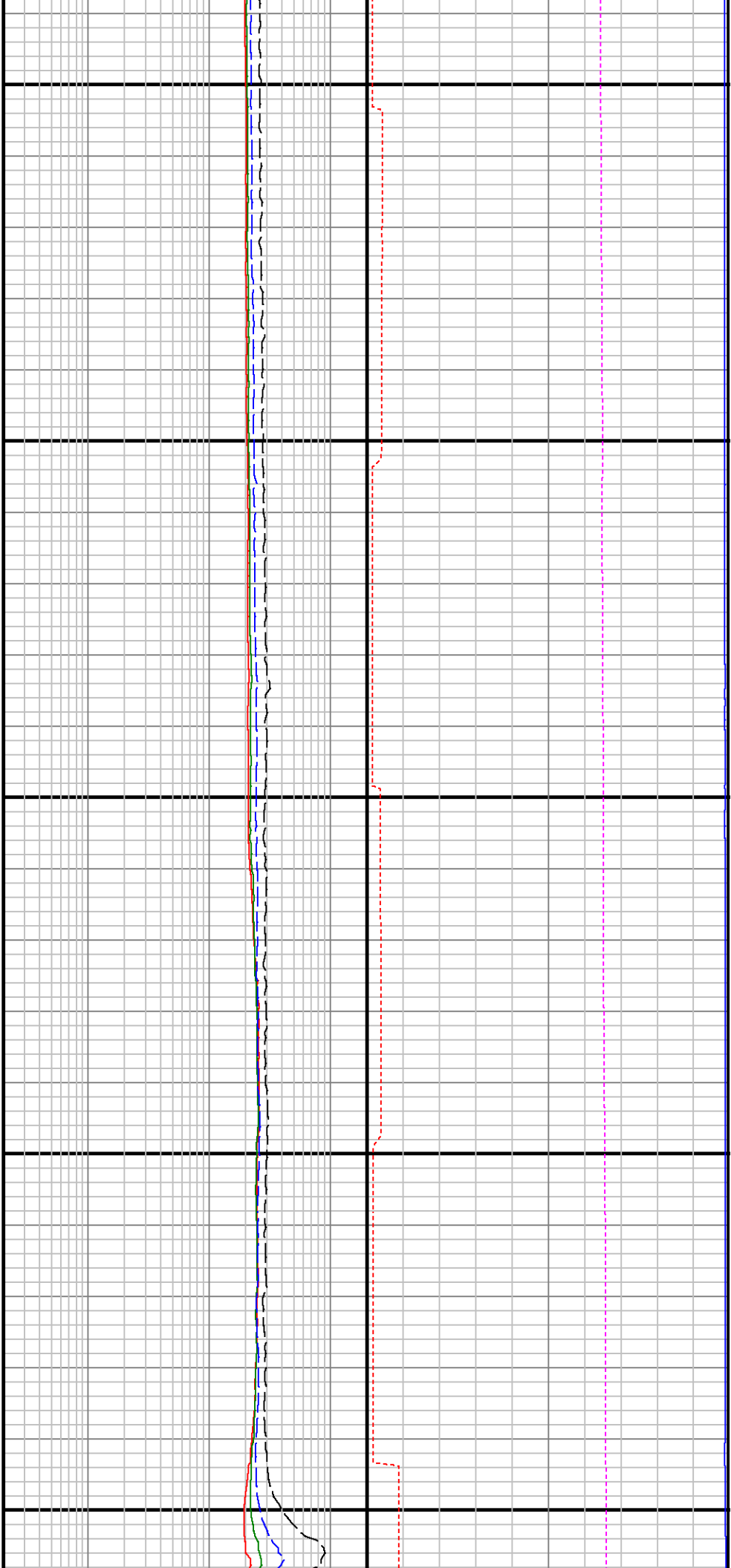






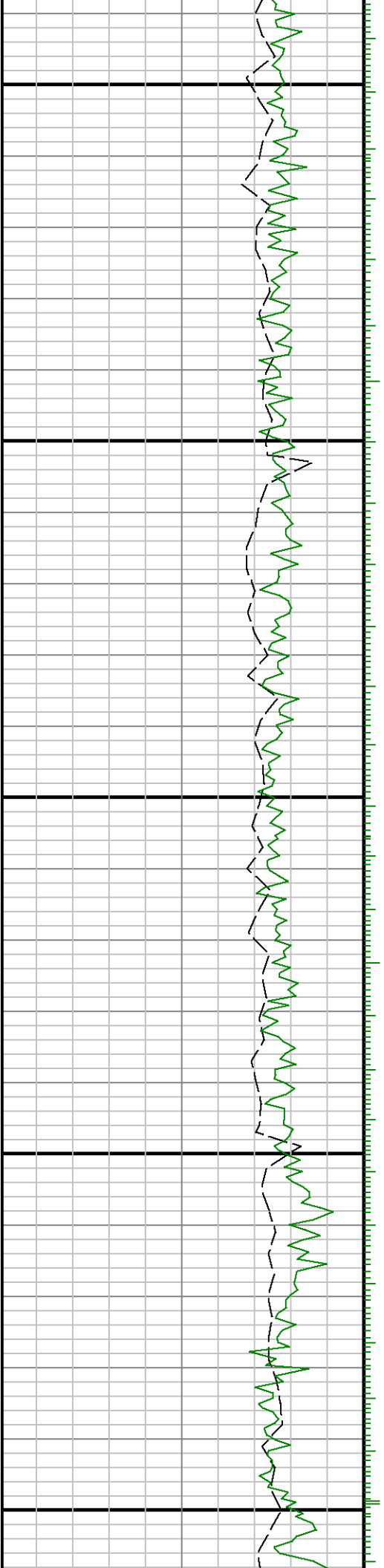


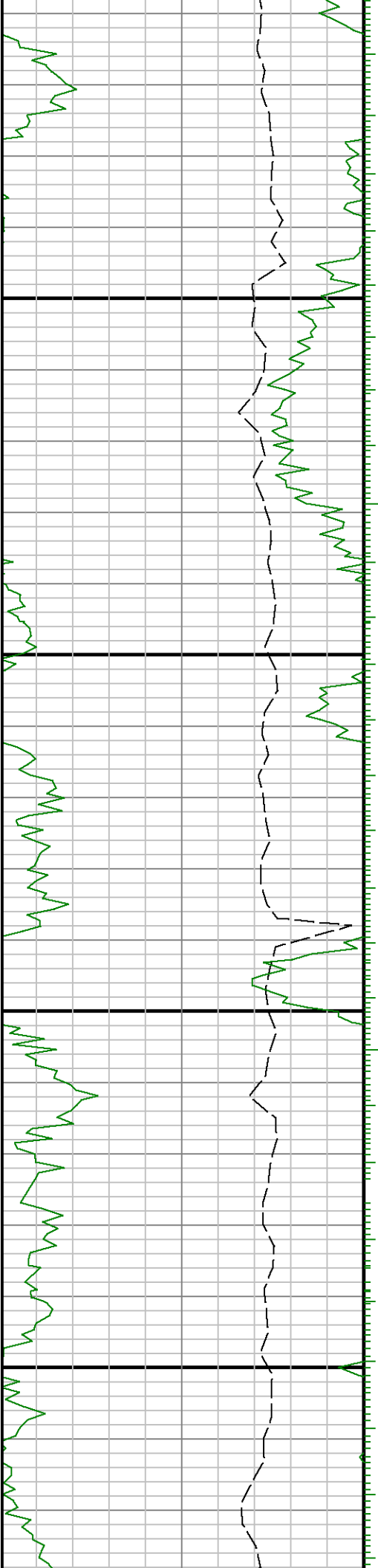




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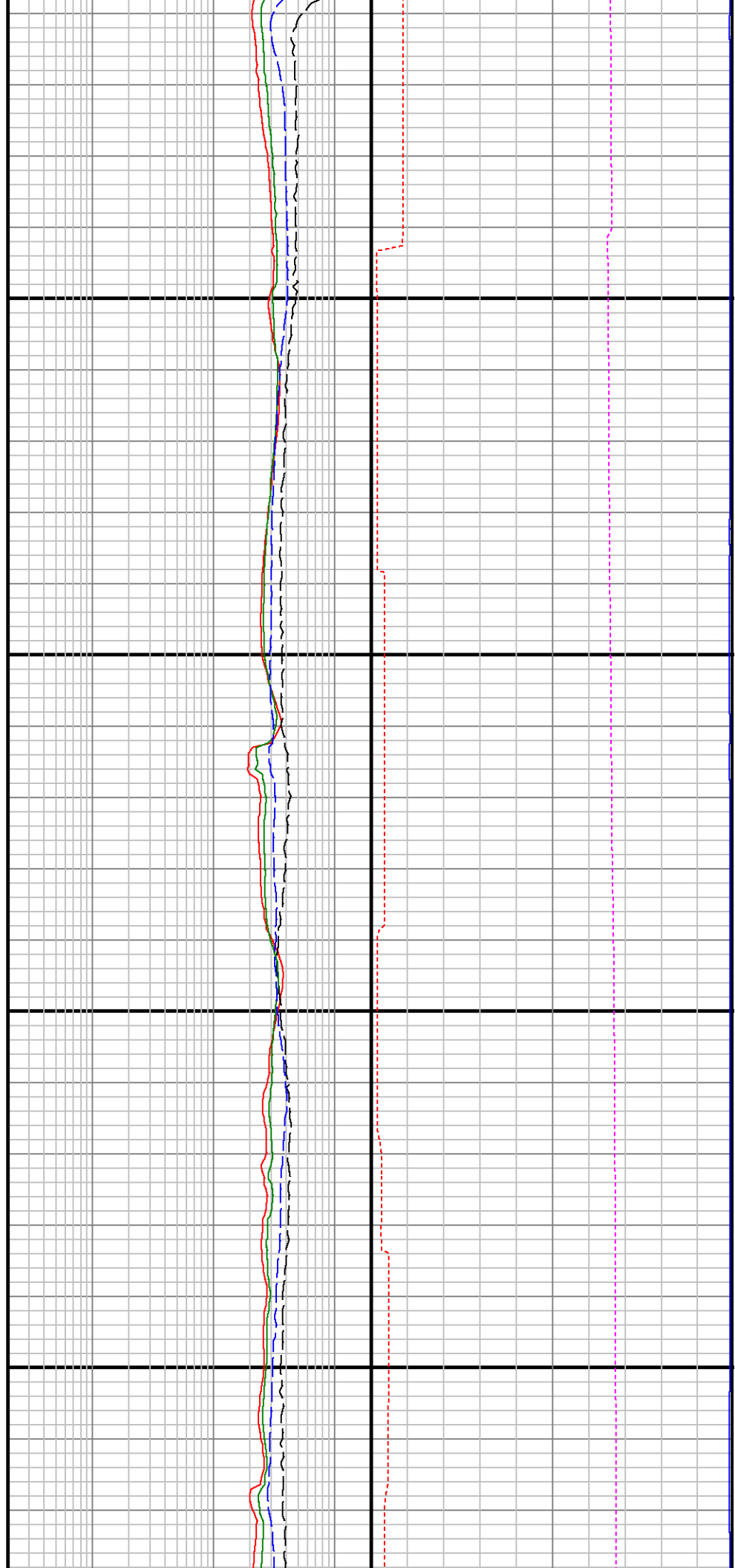
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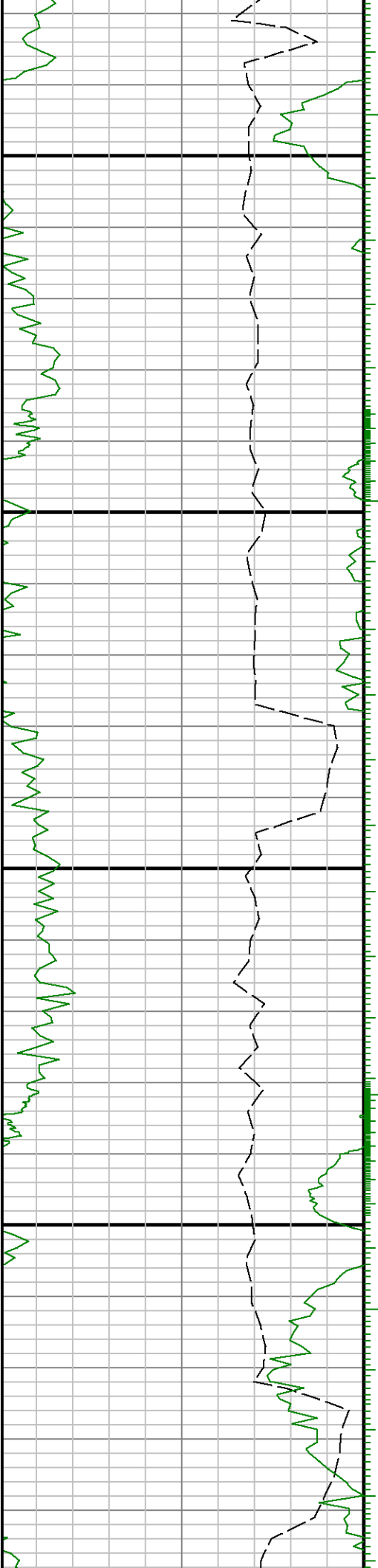




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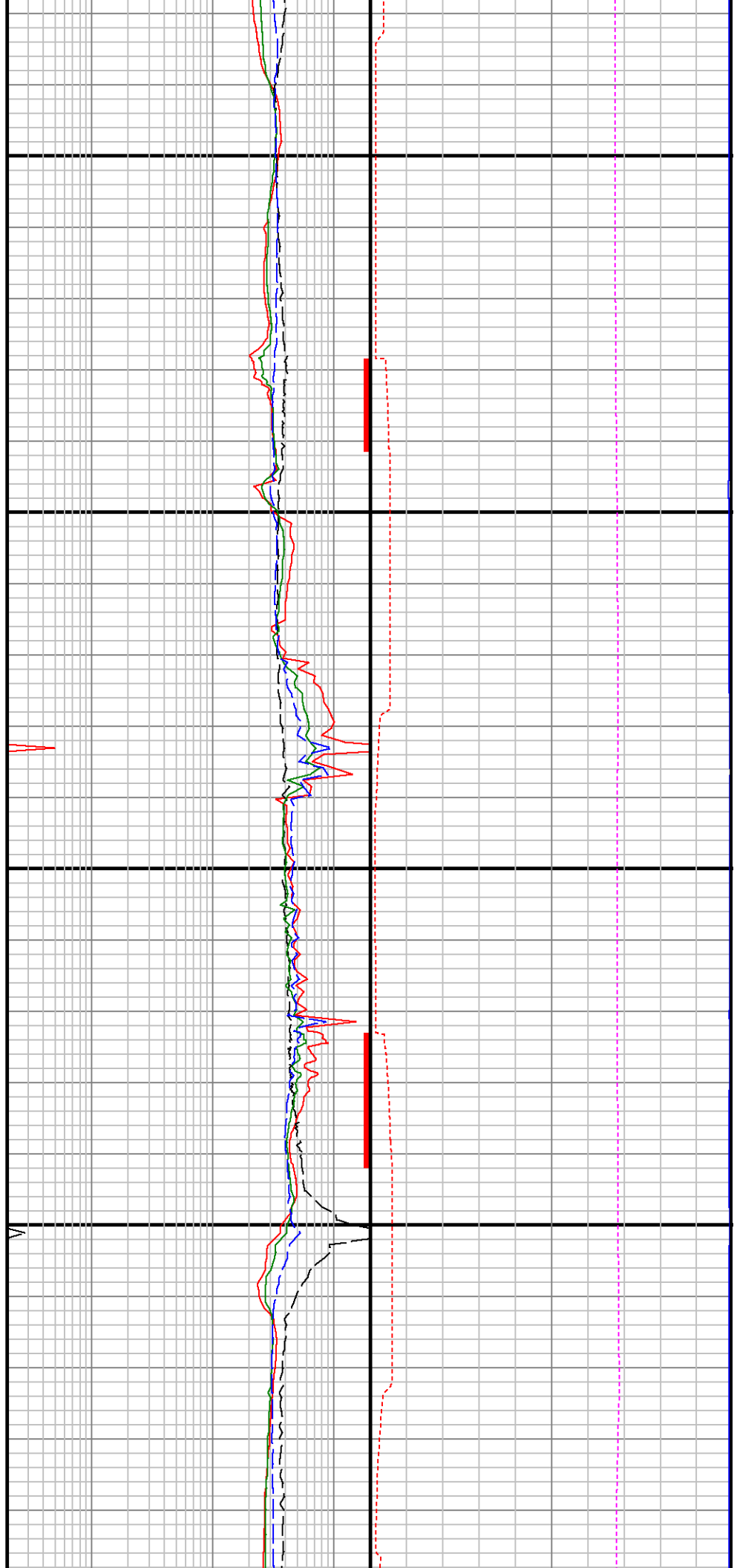


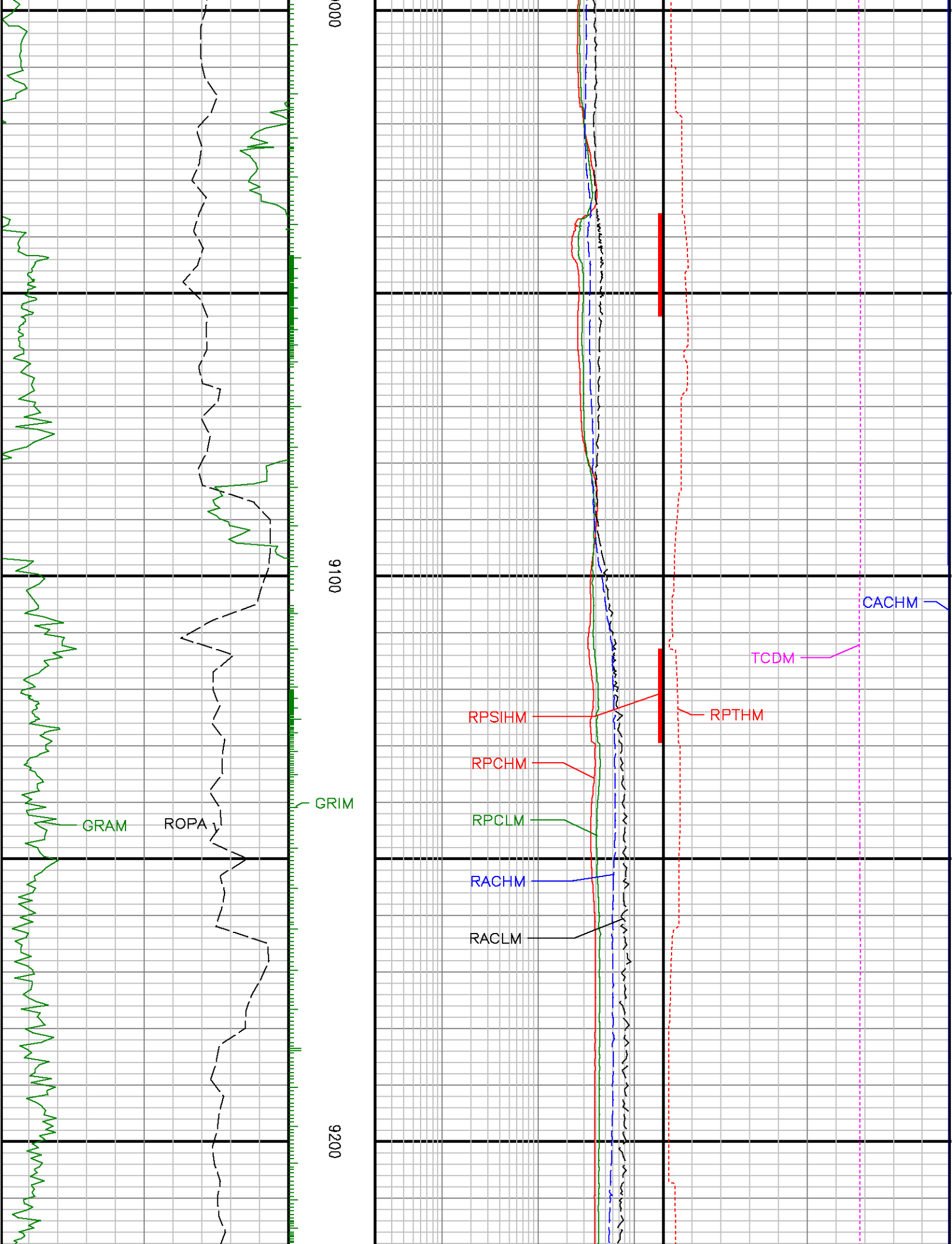


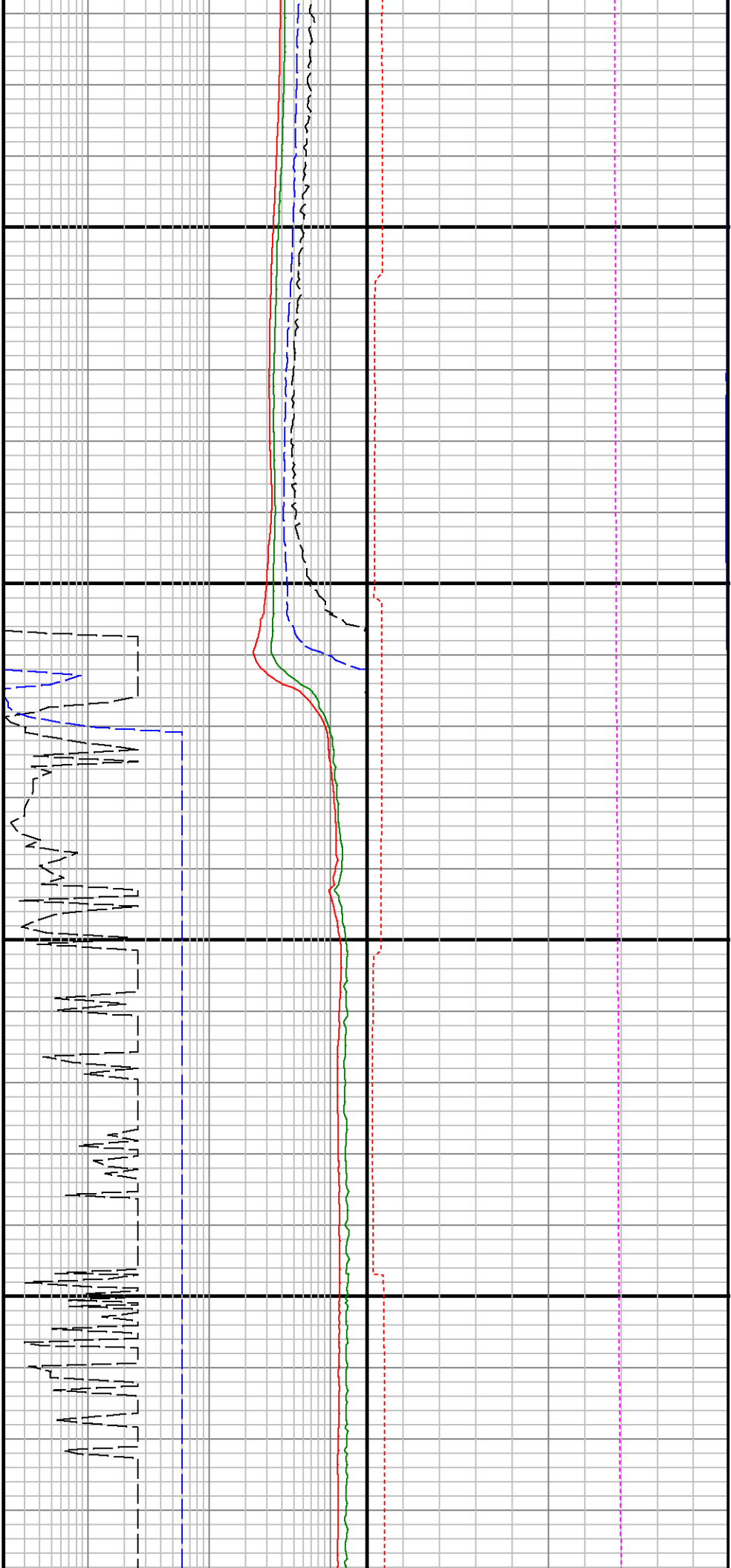
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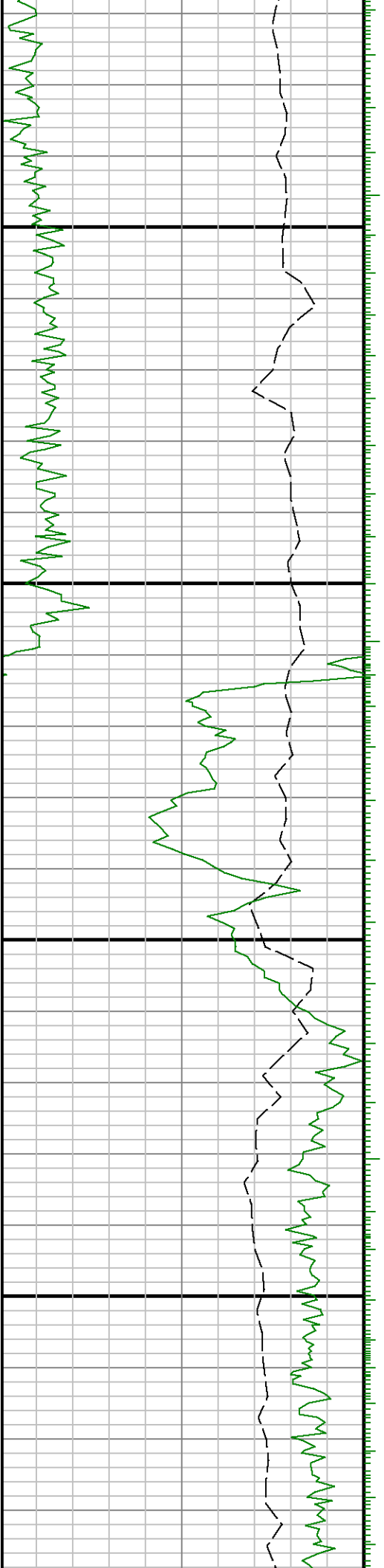


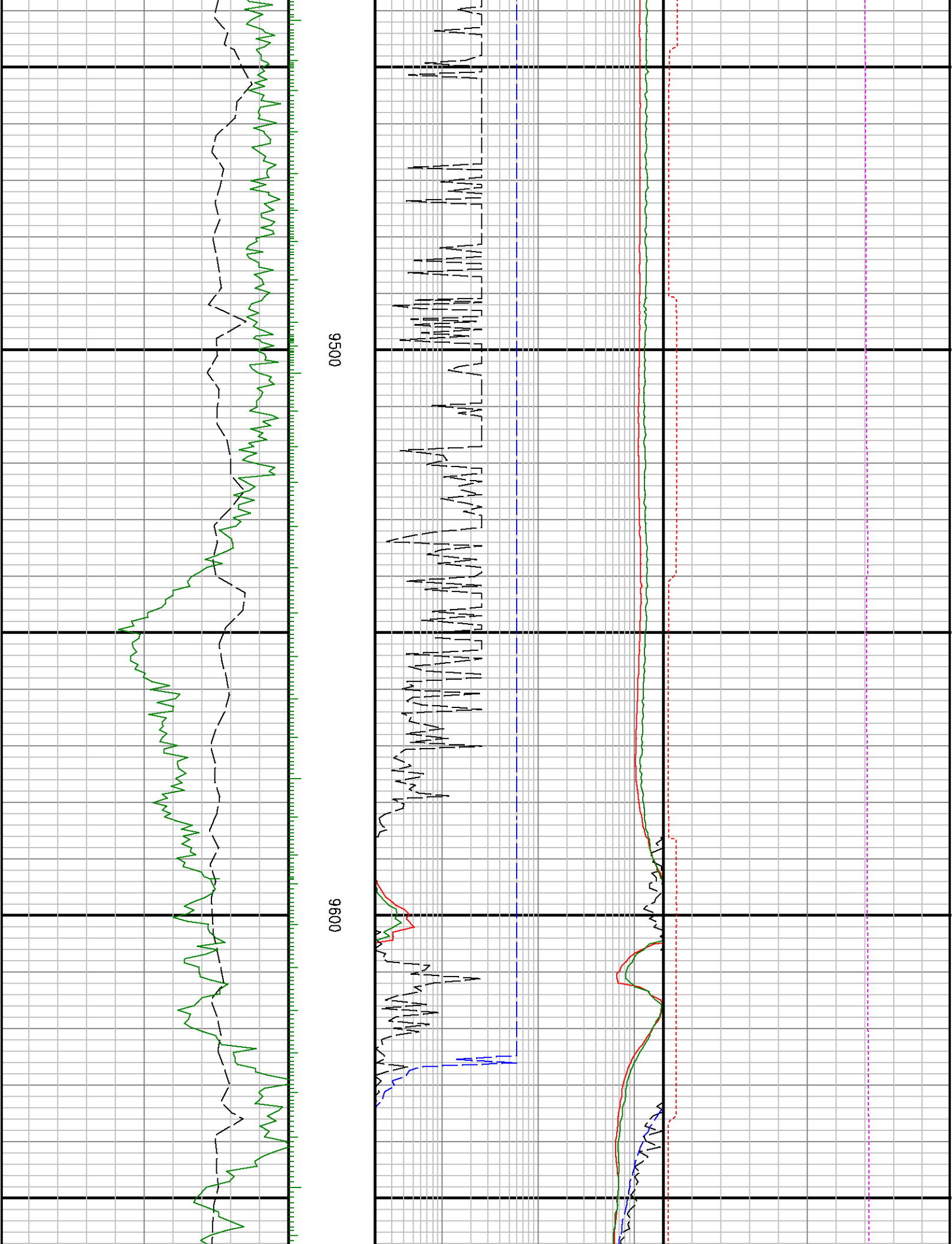


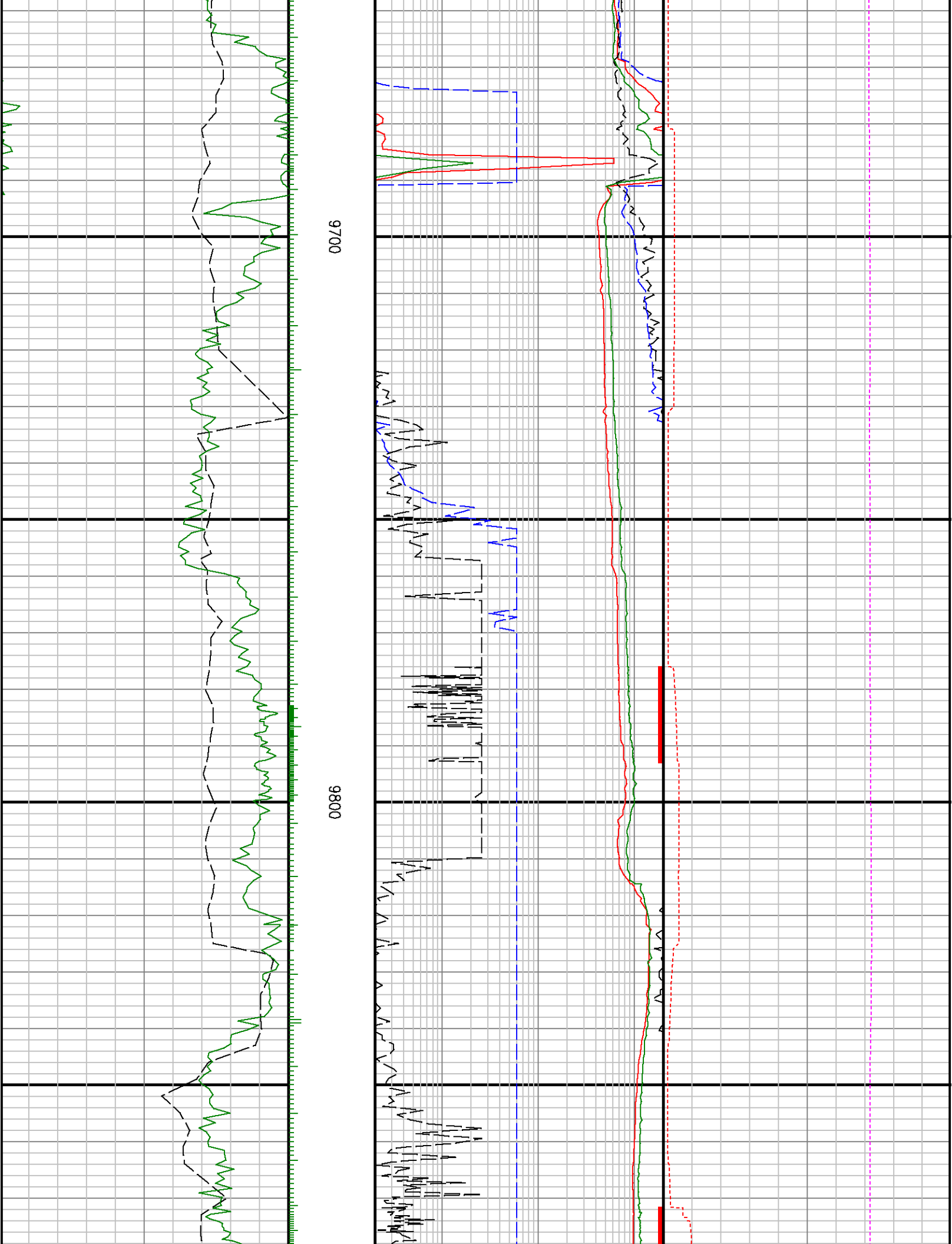


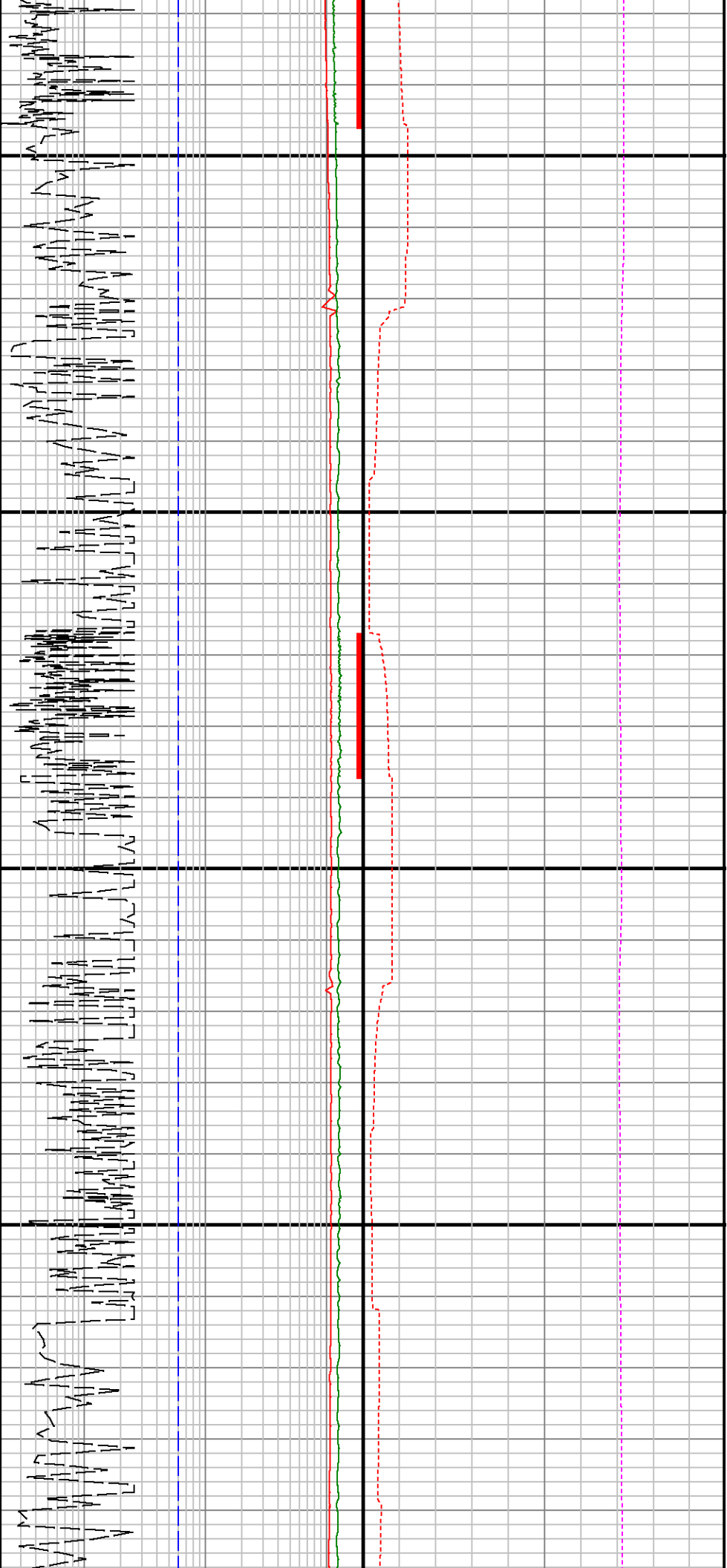
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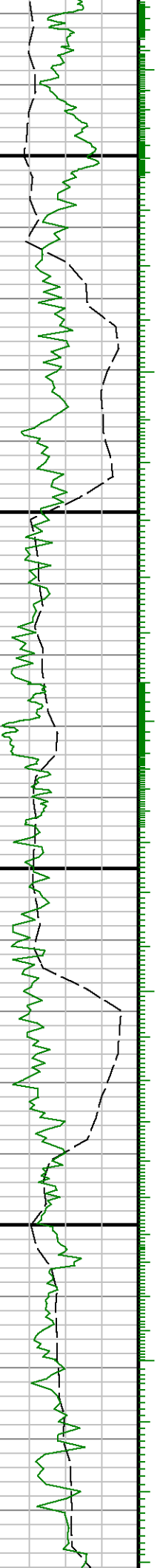


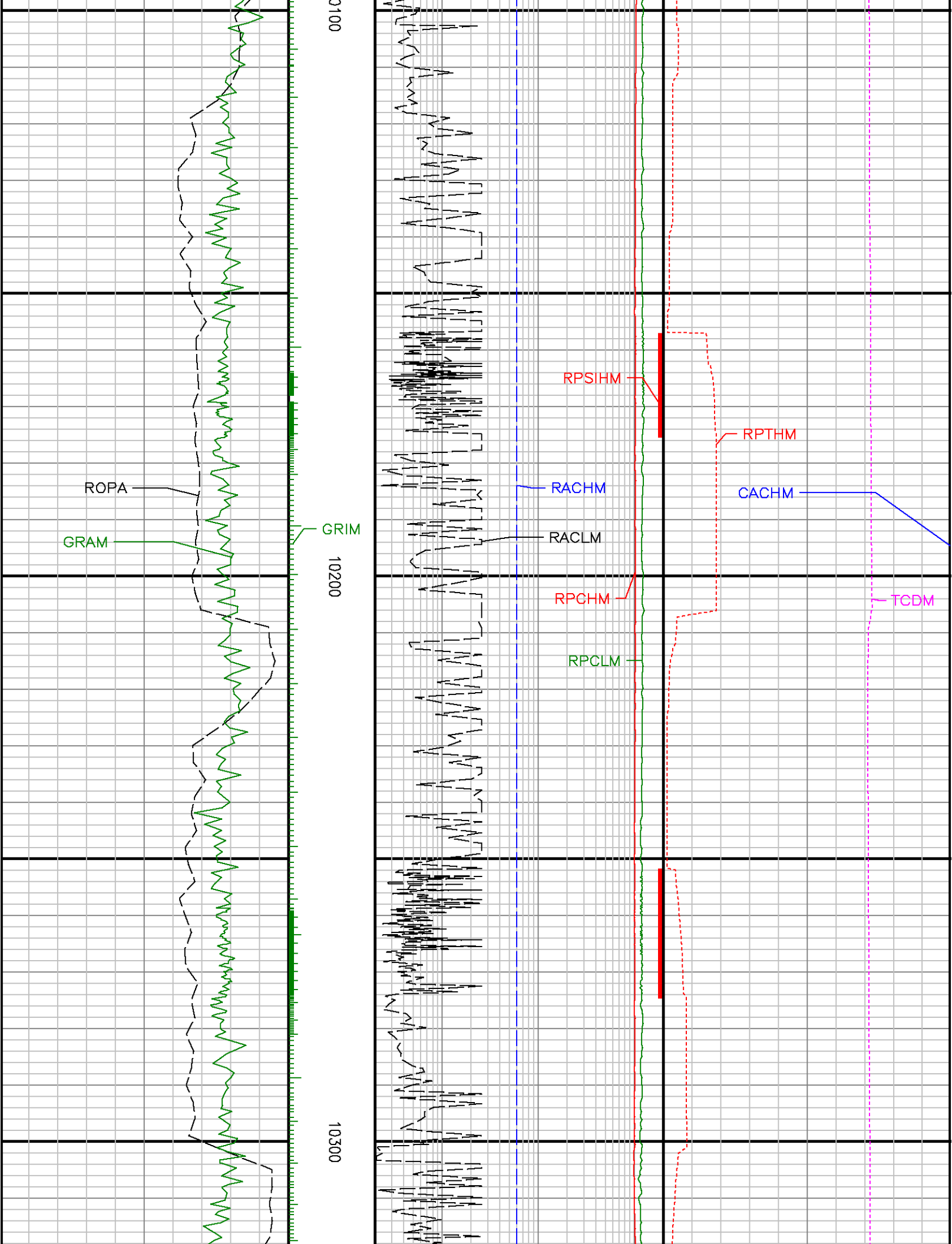


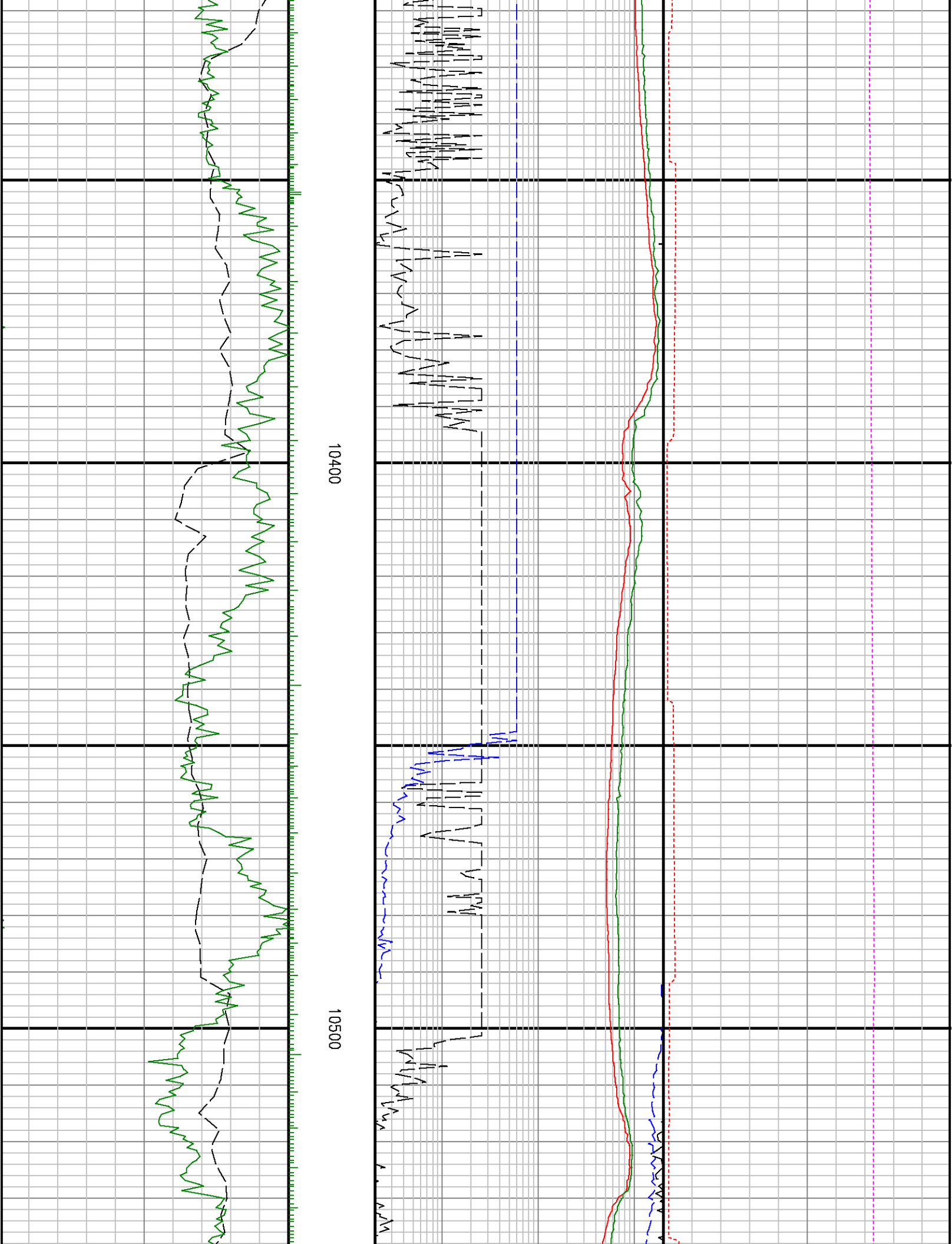
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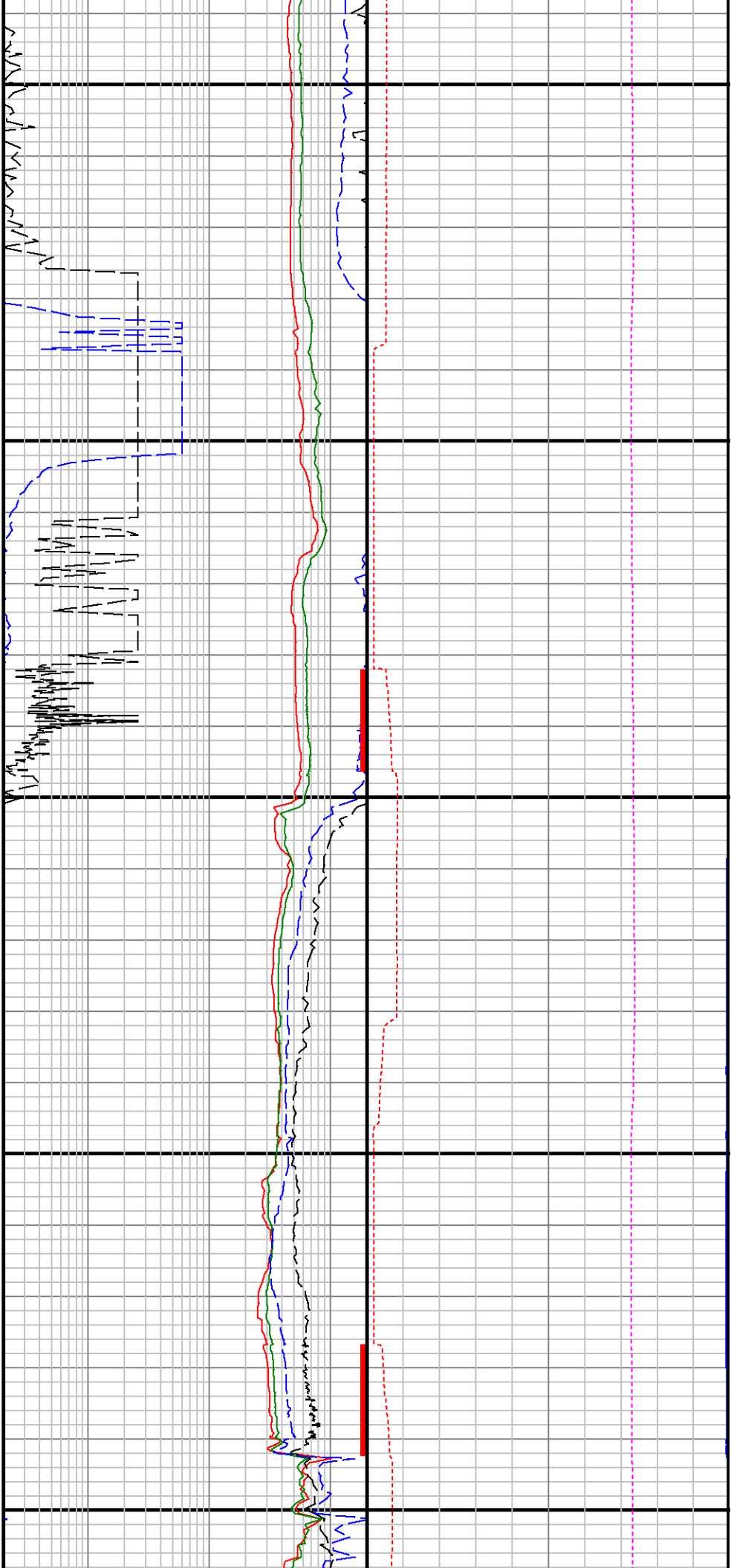
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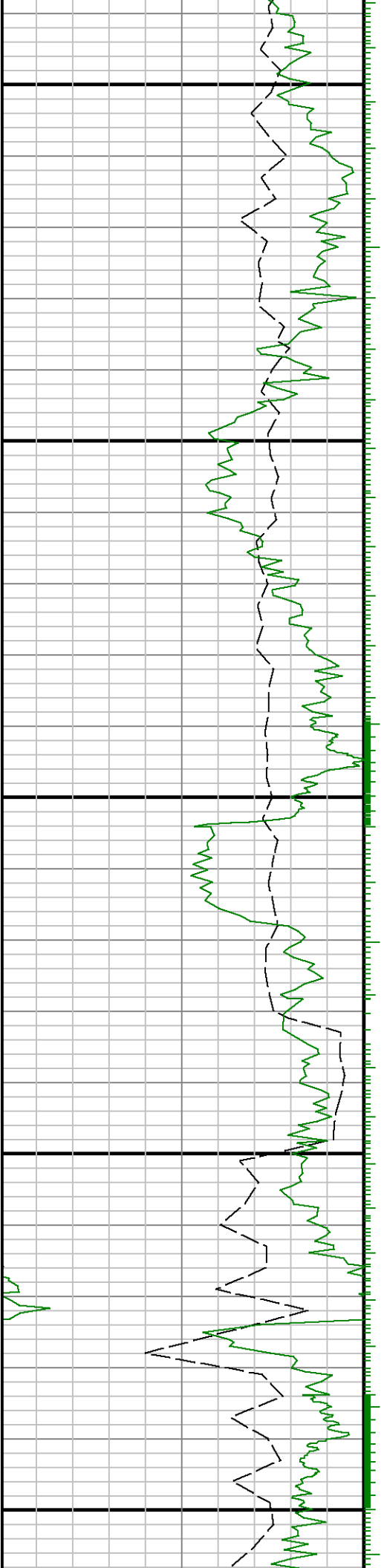


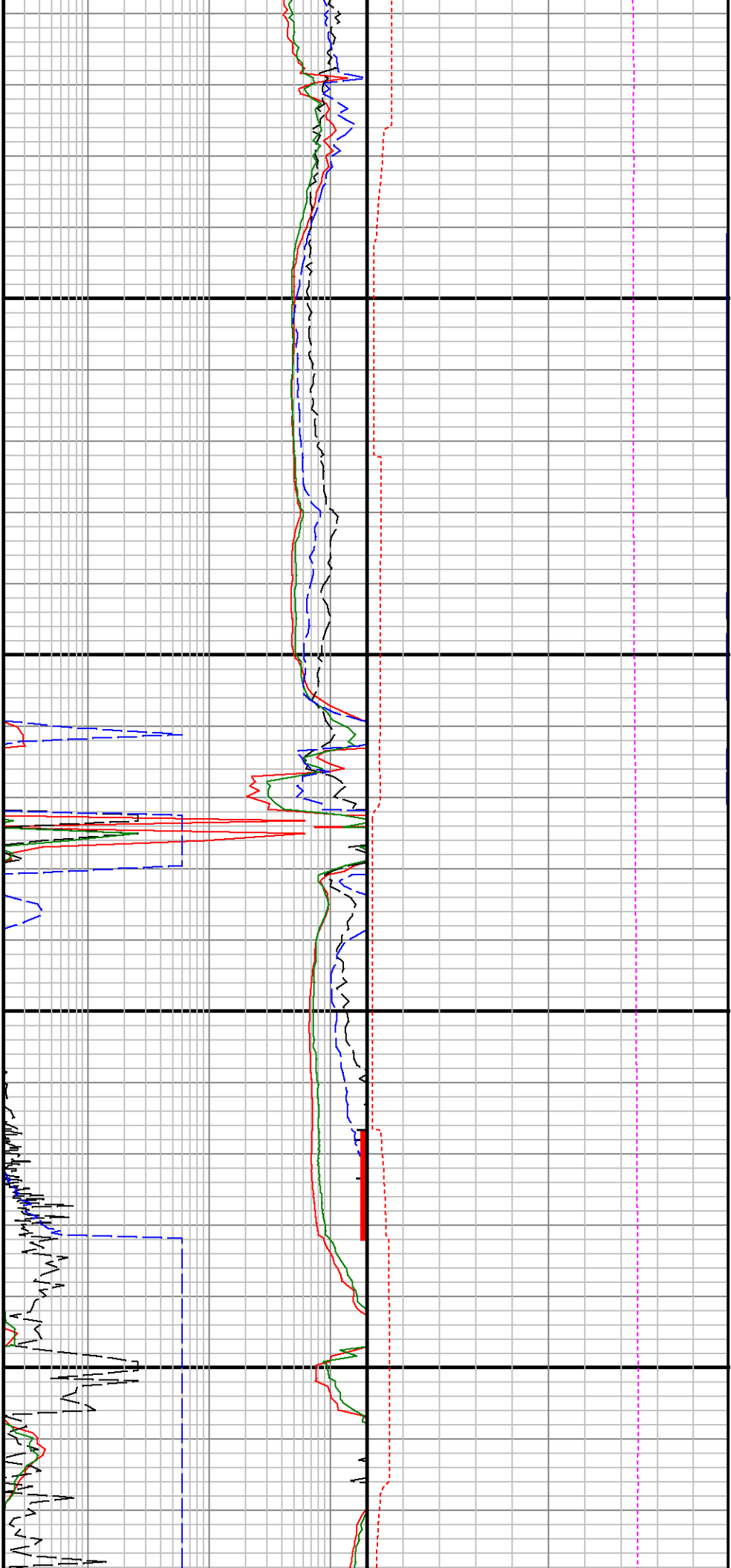




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