



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale: Company: Anadarko

1:240 MD Well: ENCORE 40N-12HZ

Measured Depth Field: Larimer County

Status: Final Print Surface Location: County: Larimer State: Colorado

API Number: 050690648000 SEC: 12 TWP: 5N RNG: 68W Other Services: Directional VSS

Permanent Datum (P.D.): Ground Level Elevation: 4990.00 ft. Elevations: N/A
Log Measured From: Rig Floor 5006.00 ft. Above P.D. DF: 5006.00 ft.
Depth Reference: Driller's Depth GL: 4990.00 ft.

Interval Logged Dates Magnetic Field Reference
Top: 6525 ft. Date From: 16/Aug/15 Dip Angle: 66.77° Azi Reference North: True
Bottom: 13274 ft. Date To: 20/Aug/15 Total Mag to Reference
Spud Date: 16/Aug/15 Field Strength: 52771.0 nT North Correction: 8.59°

| Borehole Record | | | | Casing Record | | | |
|-----------------|--------|----------|-----------|---------------|--------|----------|--|
| Hole Size | From | To | Size | Weight | From | To | |
| 13.500 in. | 16 ft. | 1858 ft. | 9.625 in. | 36.00 lb/ft | 16 ft. | 1841 ft. | |
| 8.500 in. | | 1858 ft. | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| Mud Record | | | | Deviation Record | | | |
|------------------|--------|-----------|------------|------------------|------------------|----------------|--|
| Type | From | To | Hole Size | Interval | Inc / Az (Start) | Inc / Az (End) | |
| Diesel-Oil Based | 16 ft. | 13274 ft. | 13.500 in. | 1842 ft. | 0.0° / 107.6° | 16.7° / 209.0° | |
| | | | 8.500 in. | 11416 ft. | 16.7° / 209.0° | 91.1° / 88.7° | |
| | | | | | / | / | |
| | | | | | / | / | |
| | | | | | / | / | |
| | | | | | / | / | |
| | | | | | / | / | |

| Acquisition System | | | | Software Version | | | | Other | | | |
|--------------------|----------|------------------|-----------|------------------|----------|--|--|-------|--|--|--|
| Advantage | 2.20U4 | Rig: | XTREME 23 | / | ANADARKO | | | | | | |
| PATS | 6.4.1.34 | Job No.: | 7422180 | / | D&E | | | | | | |
| | | District / Unit: | RMD | | | | | | | | |

INTEQ does not guarantee the accuracy or correctness of interpretations provided in or from this log. Since all interpretations are opinions based on measurements, INTEQ shall under no circumstances be responsible for consequential damages or any other loss, costs, damages or expenses incurred or sustained in connection with the use of any such interpretations. INTEQ disclaims all expressed and implied warranties related to this service. INTEQ's liabilities and obligations shall be governed by INTEQ's Standard Terms and Conditions.

| 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.) | | Length (in.) | | (ft.) | (ft.) | (ft.) | (ft.) | | | (hrs.) |
| 1 | 1 | 2 | 8.500 | PDC | 3.000 | Steerable | 6524 | 13274 | 1858 | 13274 | 16/Aug/2015 22:44 | 20/Aug/2015 03:18 | 58.5 |

| Crew | | | | | | | | |
|--------------|-------------|-------------|---------------|-------------|-------------|------------------|-------------|-------------|
| Name | Arrive | Depart | Name | Arrive | Depart | Name | Arrive | Depart |
| | Wellsite | Wellsite | | Wellsite | Wellsite | | Wellsite | Wellsite |
| Matt Delmore | 16/Aug/2015 | 18/Aug/2015 | Andrew Clancy | 19/Aug/2015 | 20/Aug/2015 | Sumanth Belawadi | 16/Aug/2015 | 20/Aug/2015 |

| Mud Properties Record | | | | | | | | | | | |
|-----------------------|-----|----------|-----|---------|-----------|----|-------|-------|--------|-------|----|
| Date / Time | LWD | Measured | Mud | Density | Viscosity | pH | Fluid | Oil / | Source | Total | K+ |

| | | Run No. | Depth (ft.) | Type | (ppg) | (cp) | | Loss (cc) | Water | | Chlorides (ppm) | (%) |
|-------------|-------|---------|----------------|------------------|-------|------|-----|--------------|---------|----------------|--------------------|-----|
| 16/Aug/2015 | 04:20 | 1 | 16 | Diesel-Oil Based | 9.6 | 13 | N/A | 9.0 | 61 / 27 | Active Mud Pit | 57000 | N/A |
| 17/Aug/2015 | 06:00 | 1 | 3674 | Diesel-Oil Based | 8.9 | 11 | N/A | 8.0 | 62 / 31 | Active Mud Pit | 62000 | N/A |
| 19/Aug/2015 | 06:00 | 1 | 11952 | Diesel-Oil Based | 9.2 | 11 | N/A | 9.0 | 62 / 28 | Active Mud Pit | 66000 | N/A |

Mnemonics

| Curve | Description | Units |
|-------|-------------------------------------|----------|
| GRAX | Gamma Ray Apparent, 0.5 ft. Avg. | API |
| GRIX | Gamma Ray Data Density | points |
| GRSI | Gamma Ray Sliding Indicator | unitless |
| GRTX | Gamma Ray Time Since Drilled | min |
| ROPA | Rate of Penetration, 3.0 ft. Avg. | ft/hr |
| TCDX | Downhole Temperature | degF |
| TVD | True Vertical Depth | ft. |
| WOBA | Surface Weight on Bit, 1.0 ft. Avg. | klbs |

Equipment and Service Data

| LWD Run No. | Tool | Serial Number | Measurement | Bit Offset (ft) | Max O.D. (in.) | Min I.D. (in.) |
|-------------|------|---------------|-------------|--------------------|-------------------|-------------------|
| 1 | DIR | 12479852 | Directional | 63.72 | 6.750 | 3.250 |
| 1 | SRIG | 12586753 | Gamma | 60.38 | 6.750 | 3.250 |

Service and Tool Mnemonics

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

Comments

| |
|---|
| <p>1.) Baker Hughes LWD run 1 utilized 6 3/4 inch NaviTrak Services (VSS, Directional) from 1857 to 6524 feet MD (1819.05 to 6256.90feet TVD) and NaviGamma Services (VSS, Directional, Gamma Ray) from 6525 to 13274 feet MD (6256.90 to 7174.33 feet TVD) behind an 8 1/2 inch bit and steerable assembly.</p> <p>2.) A sliding indicator is shown on the left edge of track 1 as a heavy line. This indicator has been depth-shifted to the gamma ray sensor offset to correspond with gamma ray data.</p> <p>3.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.</p> |
|---|

Remarks

| Number | Measured Depth (ft) | Hole Section (in.) | LWD Run No. | Remark |
|--------|------------------------|-----------------------|-------------|--|
| 1 | 6524 | 8.500 | 1 | Client decided to start logging from 6524 feet MD and hence no logging data prior to 6524 feet MD (6256.90 feet TVD) is available. |
| 2 | 13274 | 8.500 | 1 | The interval from 13212 to 13274 feet MD (7176.04 to 7174.35 feet TVD) does not contain gamma ray logging data due to the bit to sensor offset. |

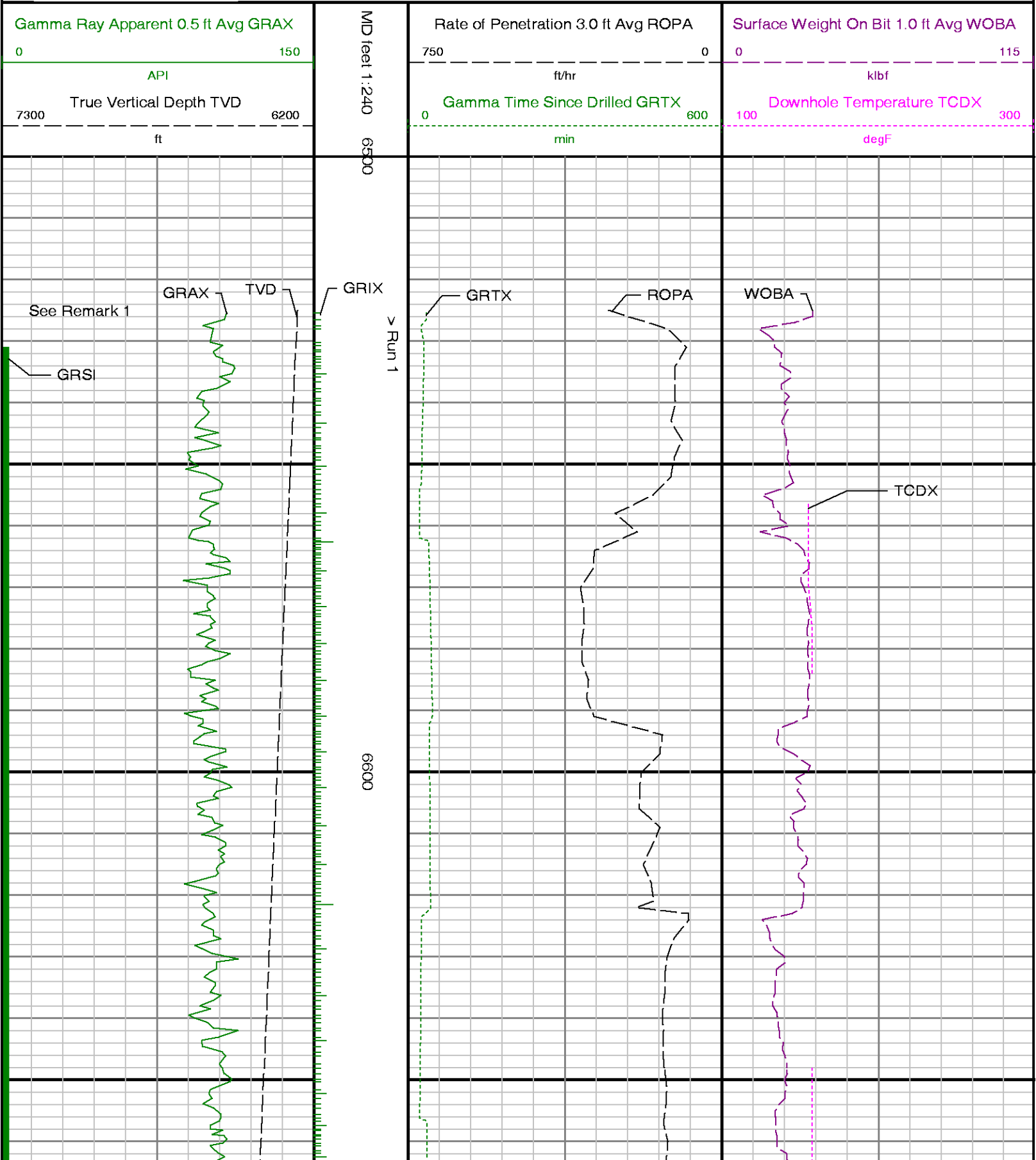


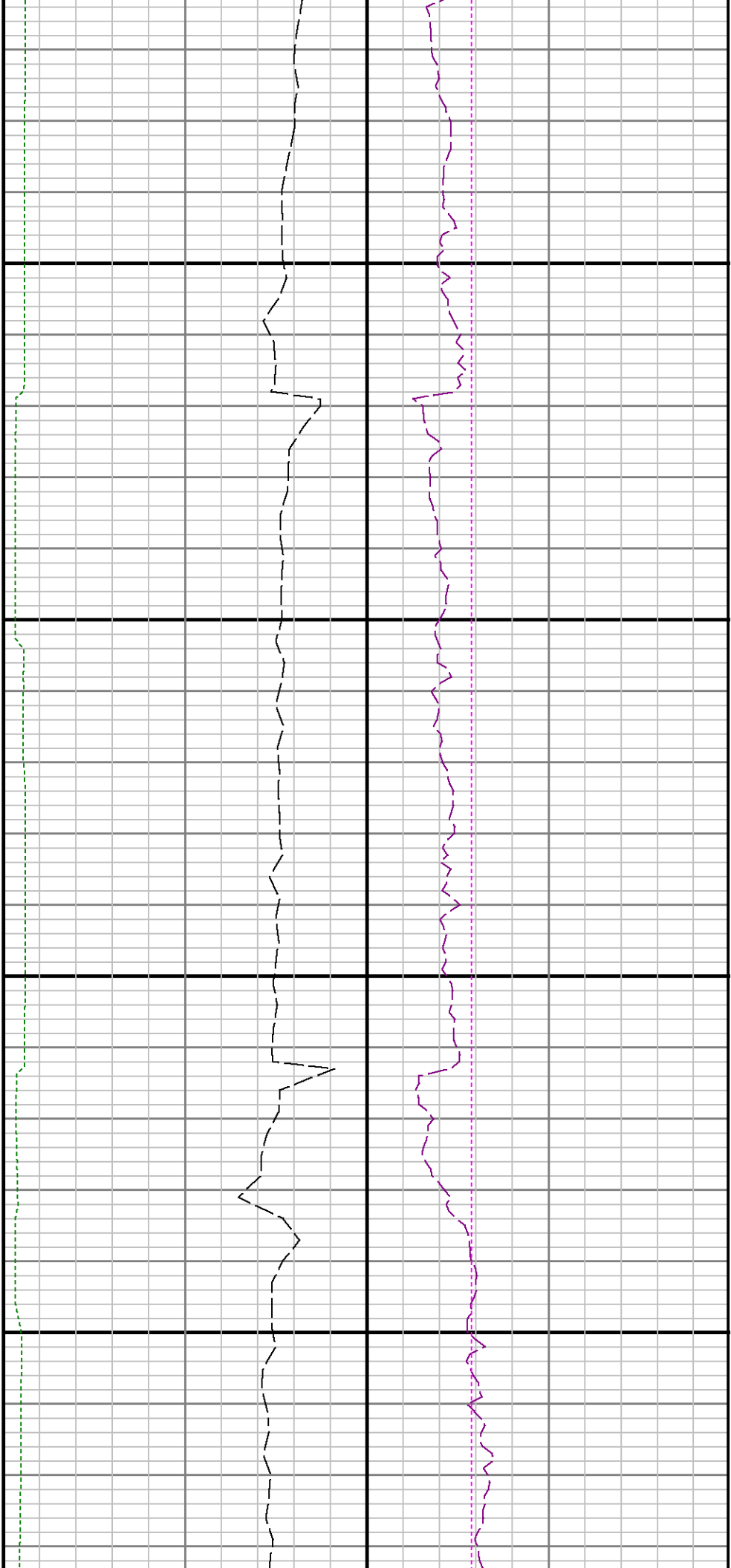
Company : Anadarko

Well : ENCORE 40N-12HZ

Interval : 6500.00 - 13285.00 feet

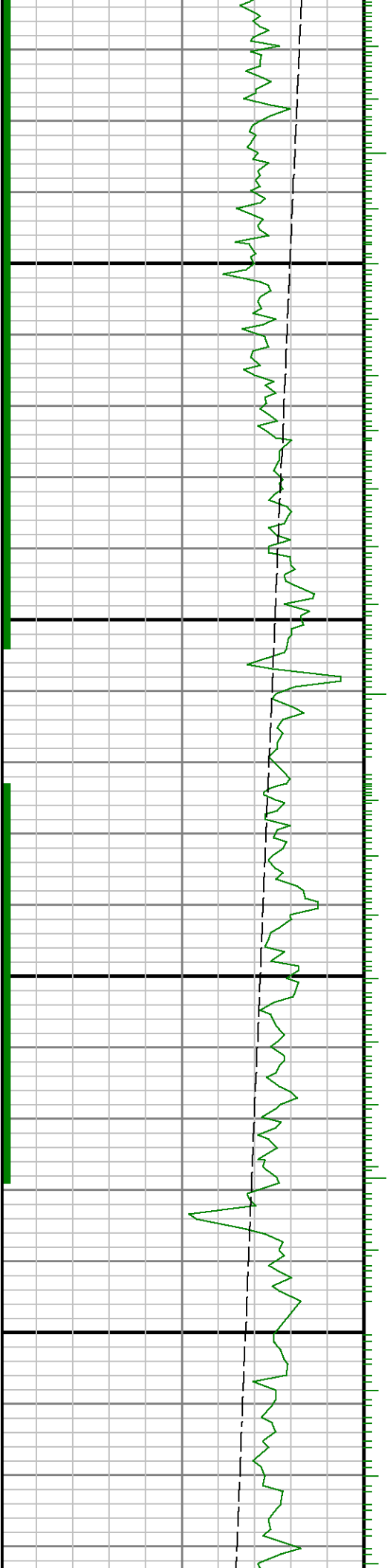
Created : 20/Aug/2015 4:15:03 AM

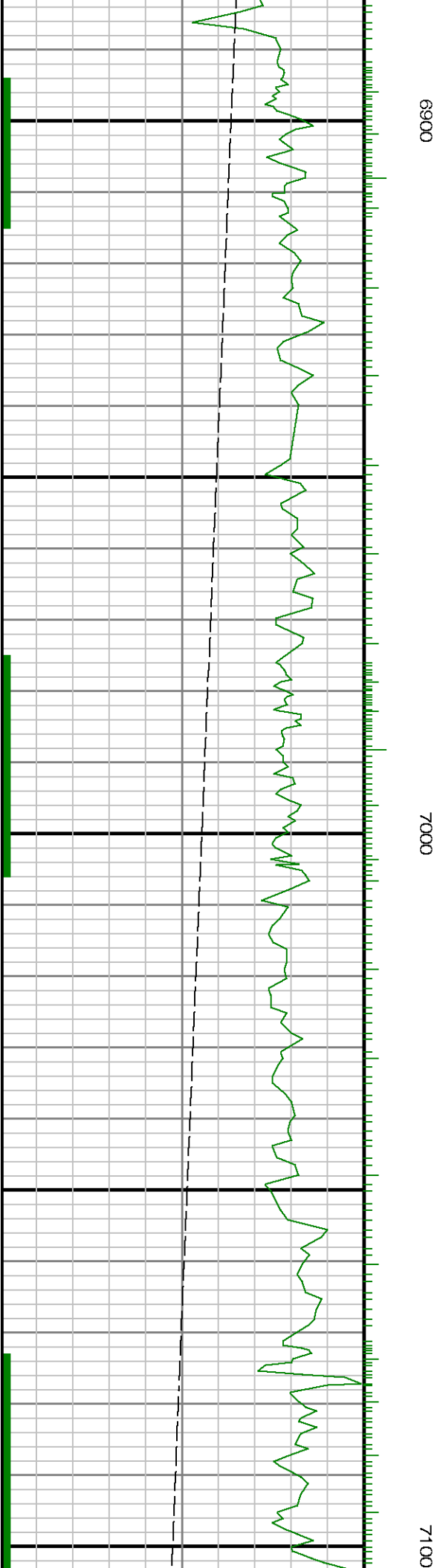
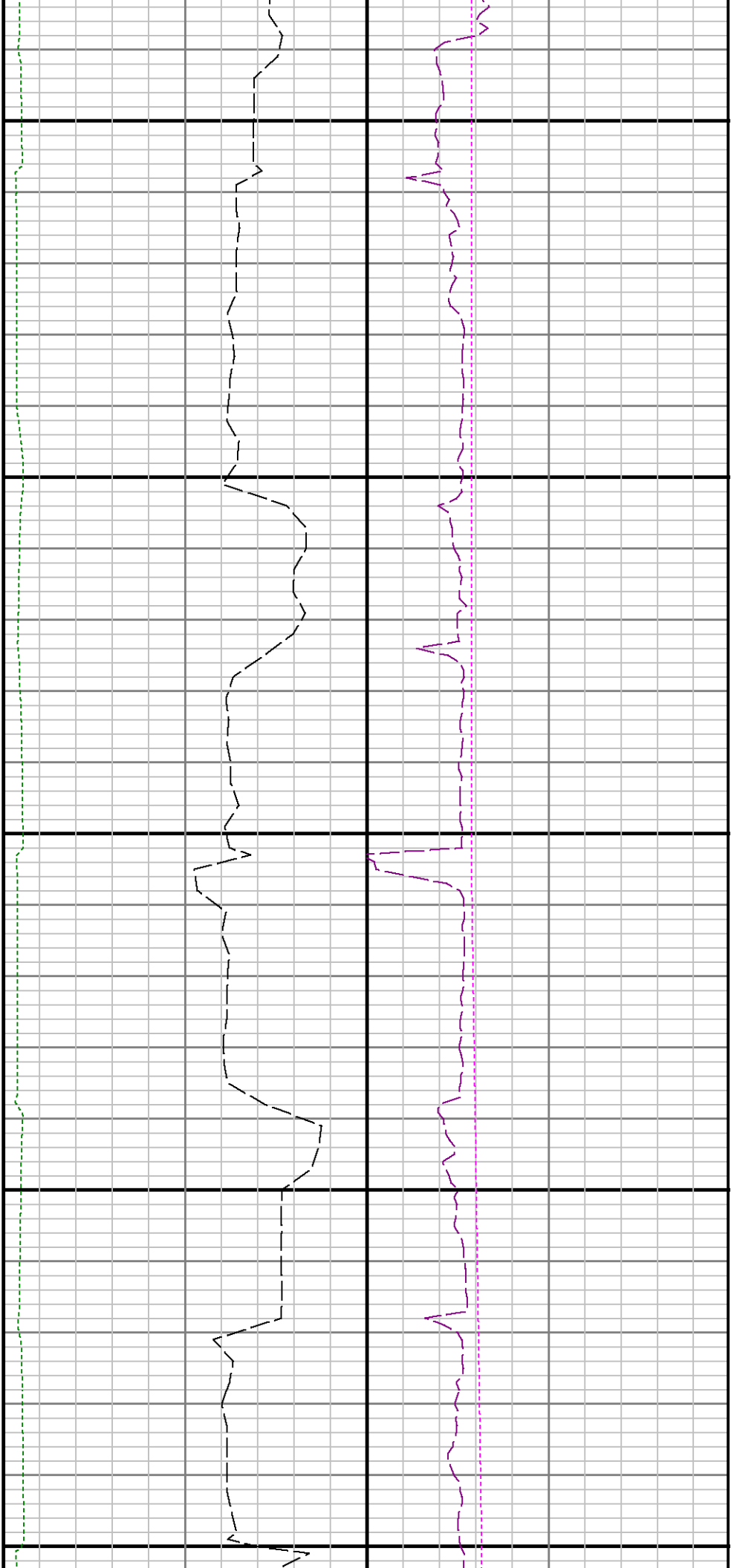


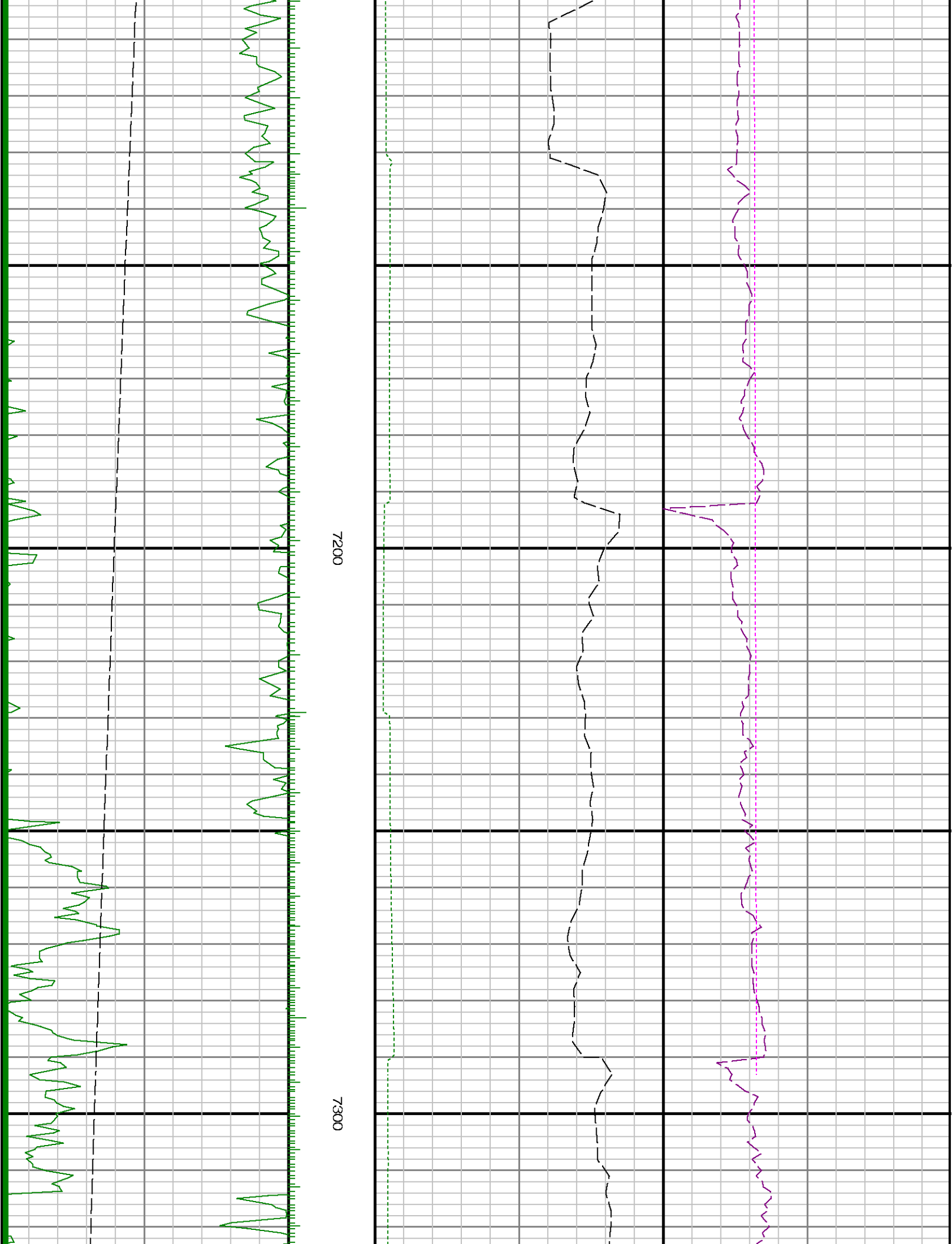


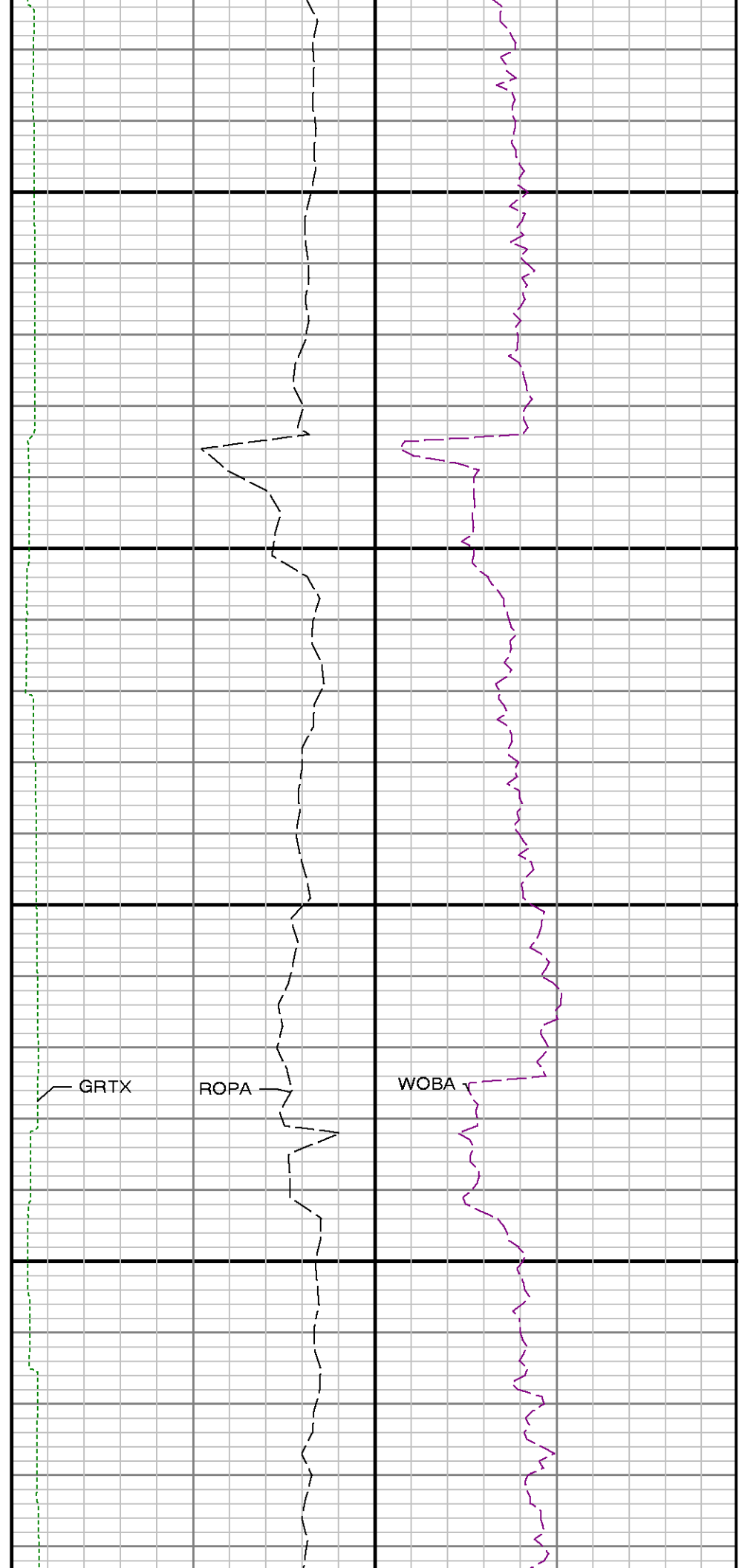
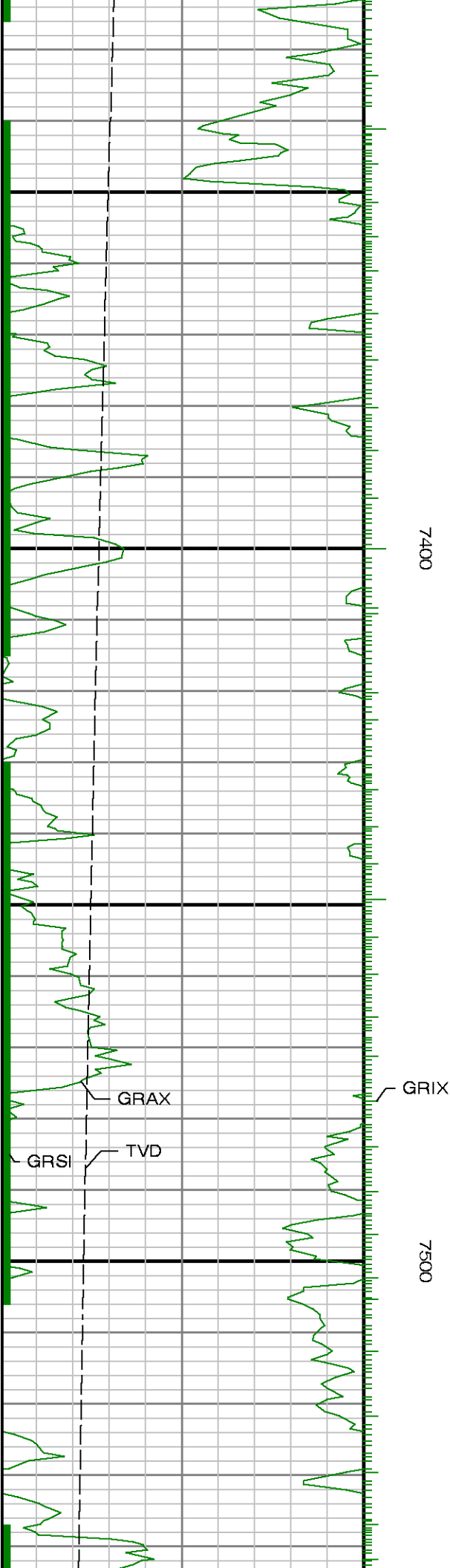
6700

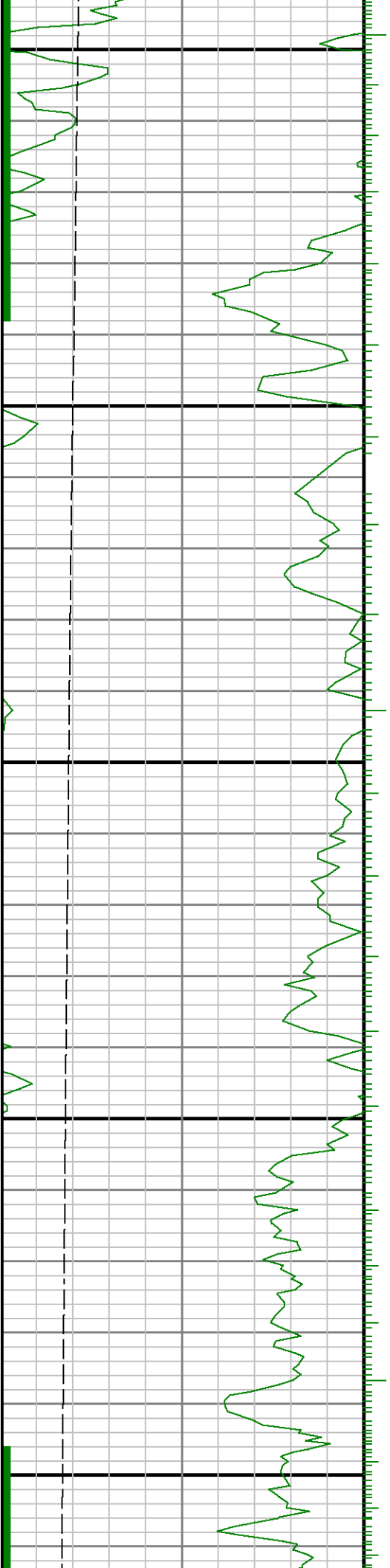
6800





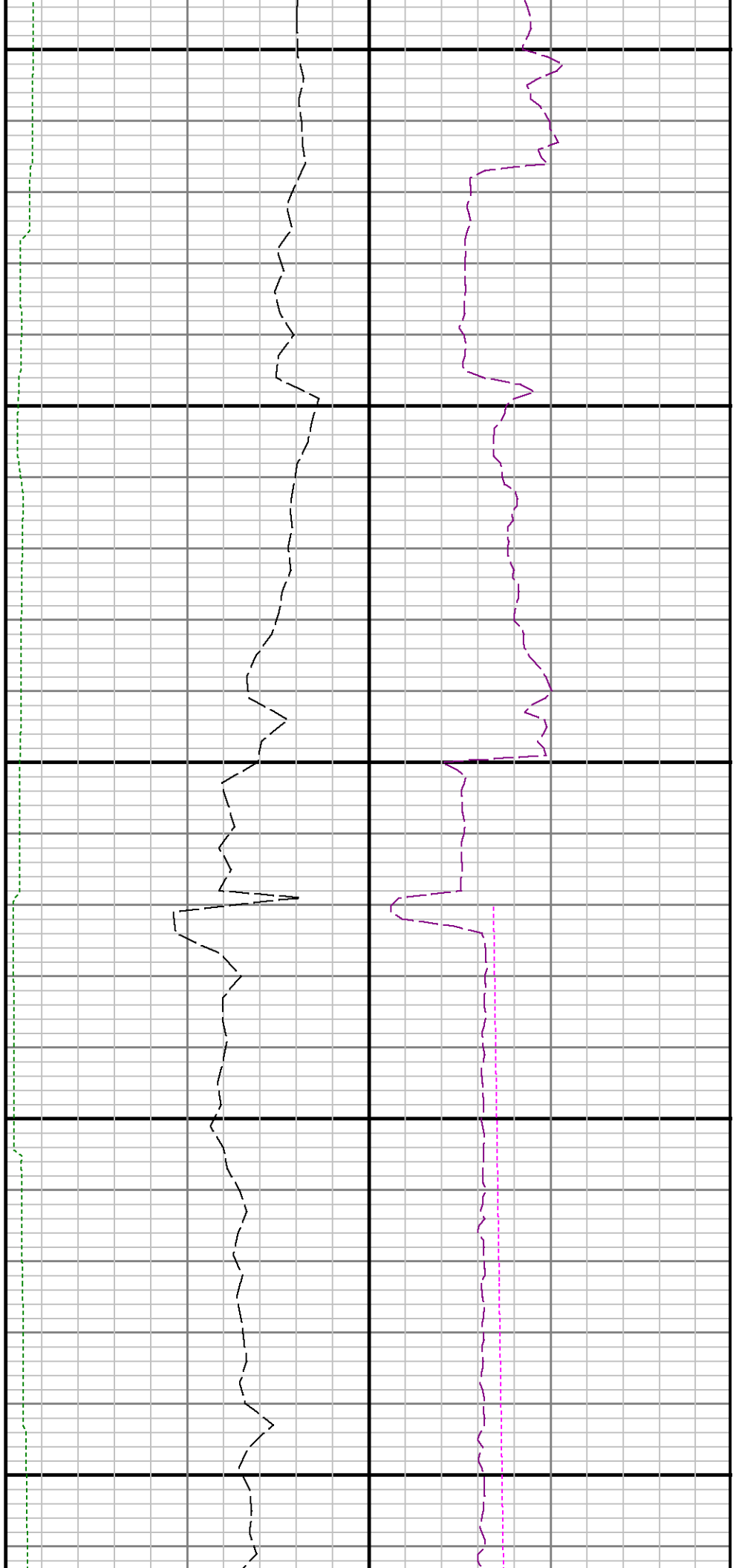


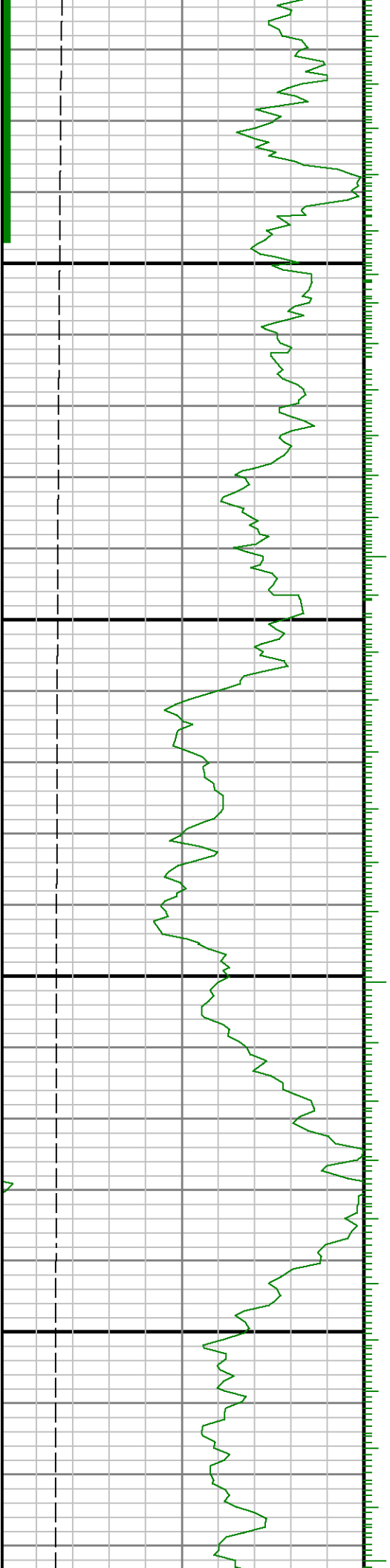




7600

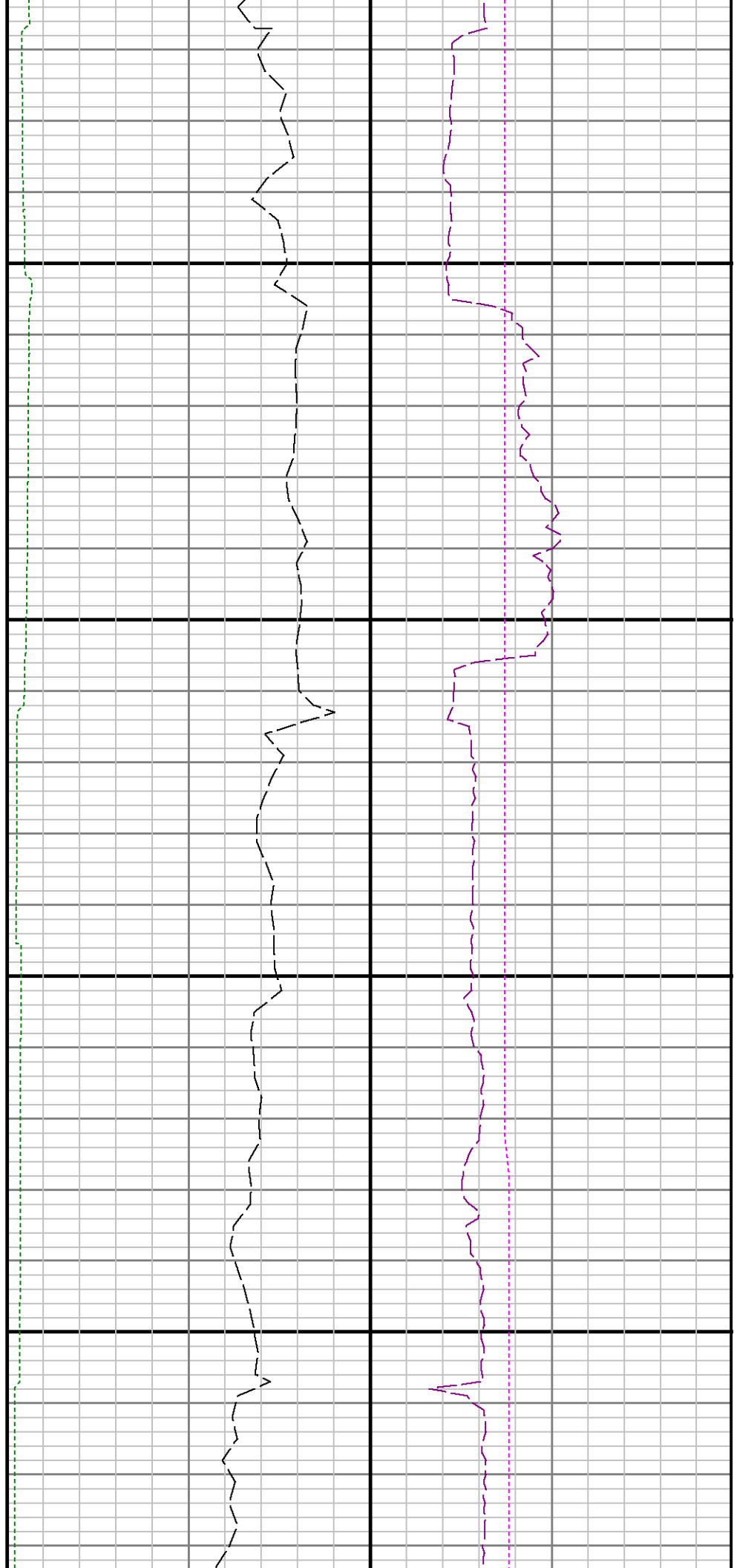
7700

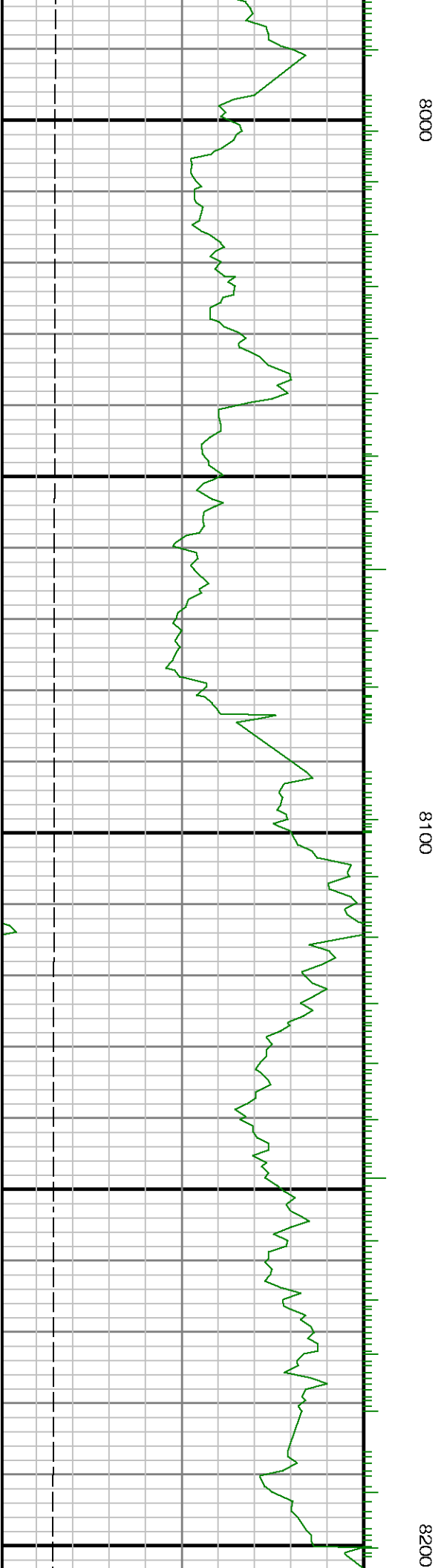
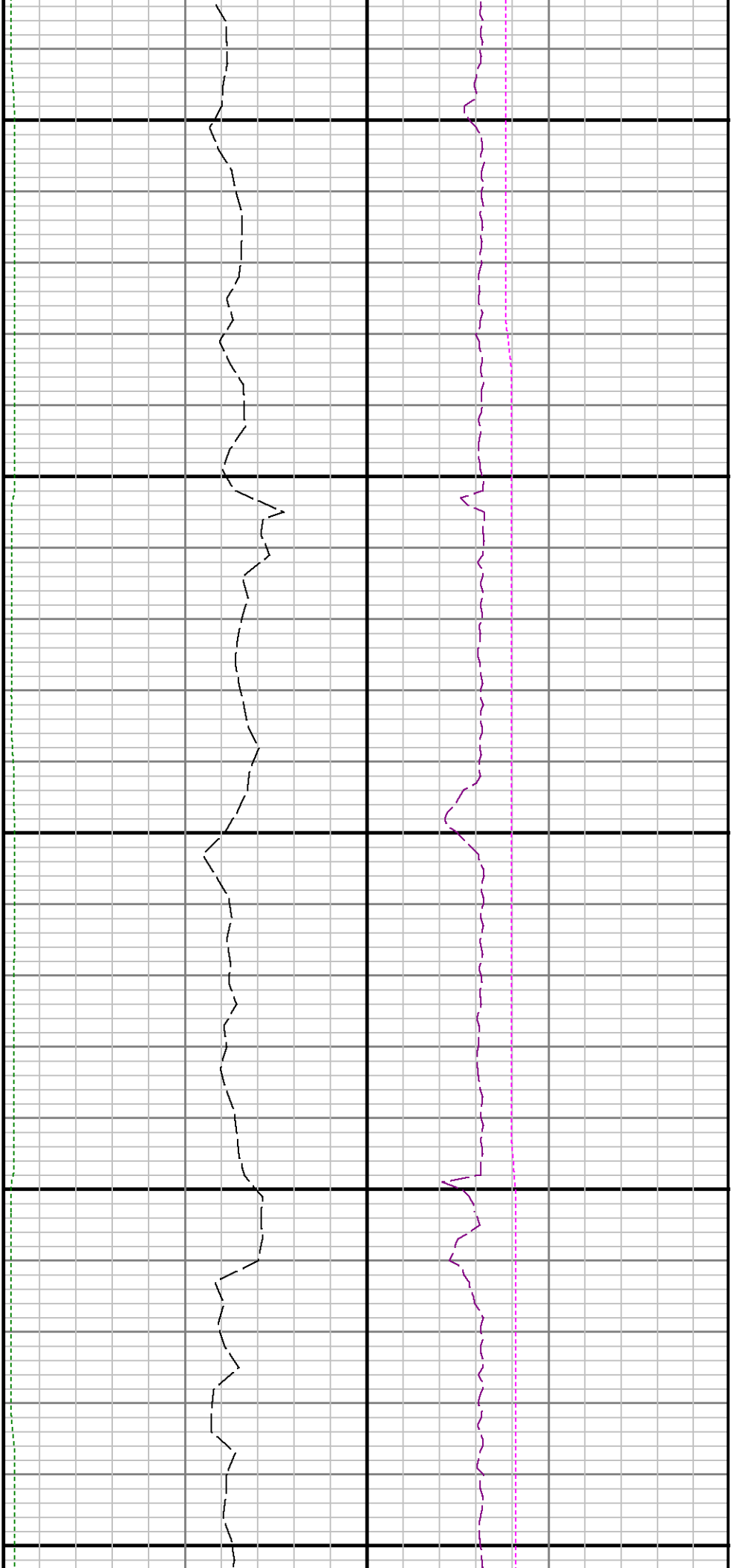


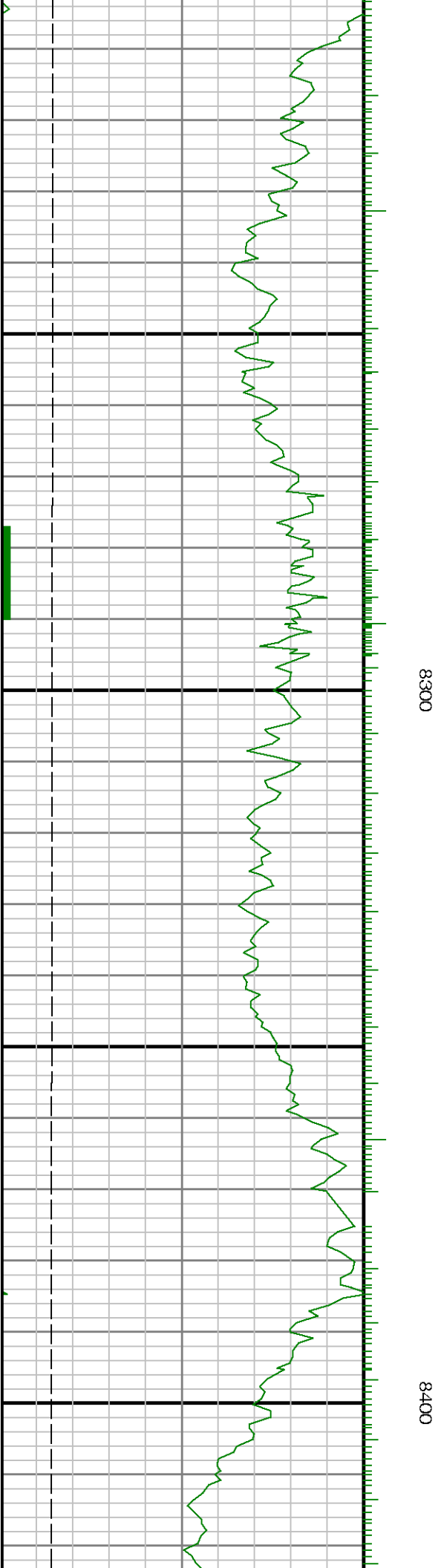
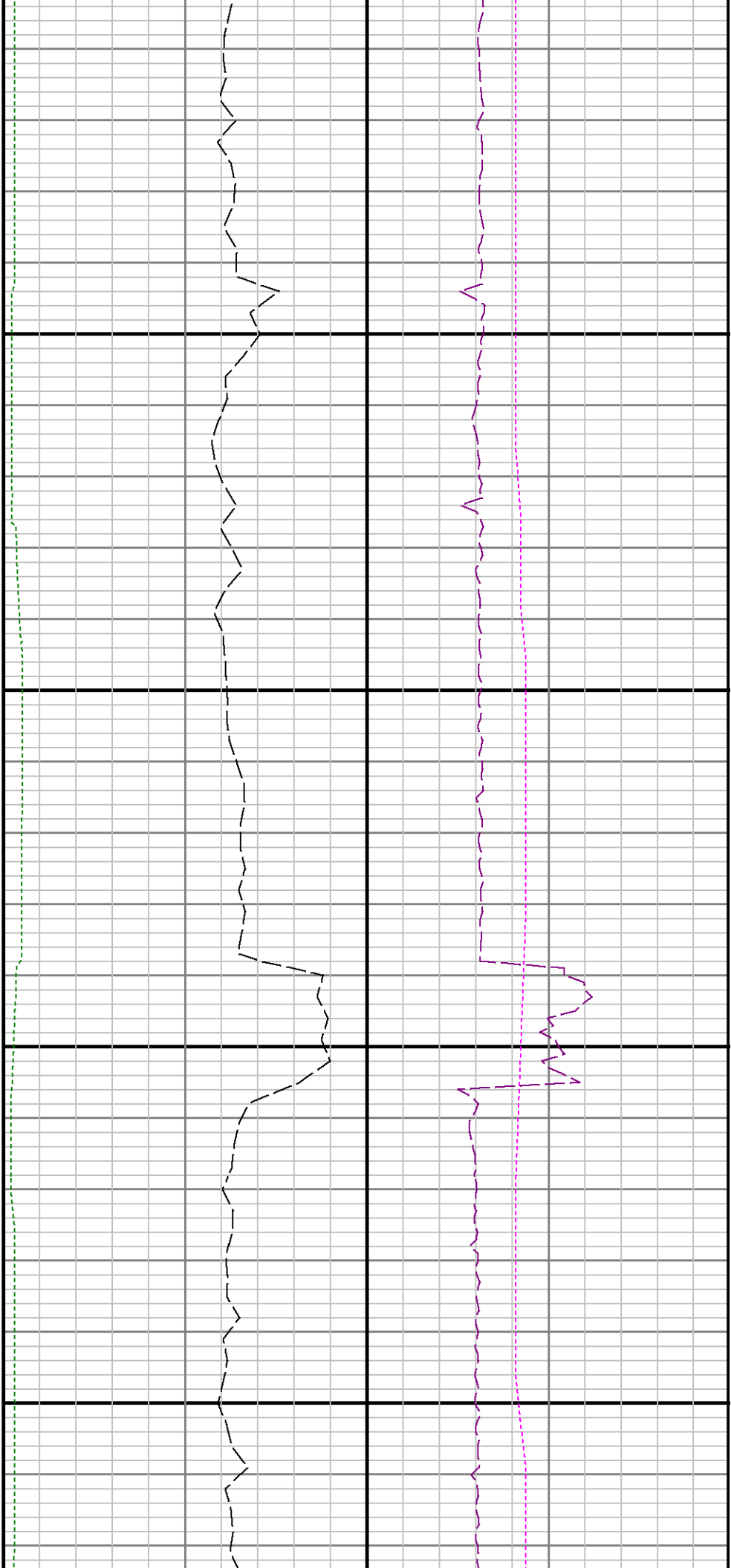


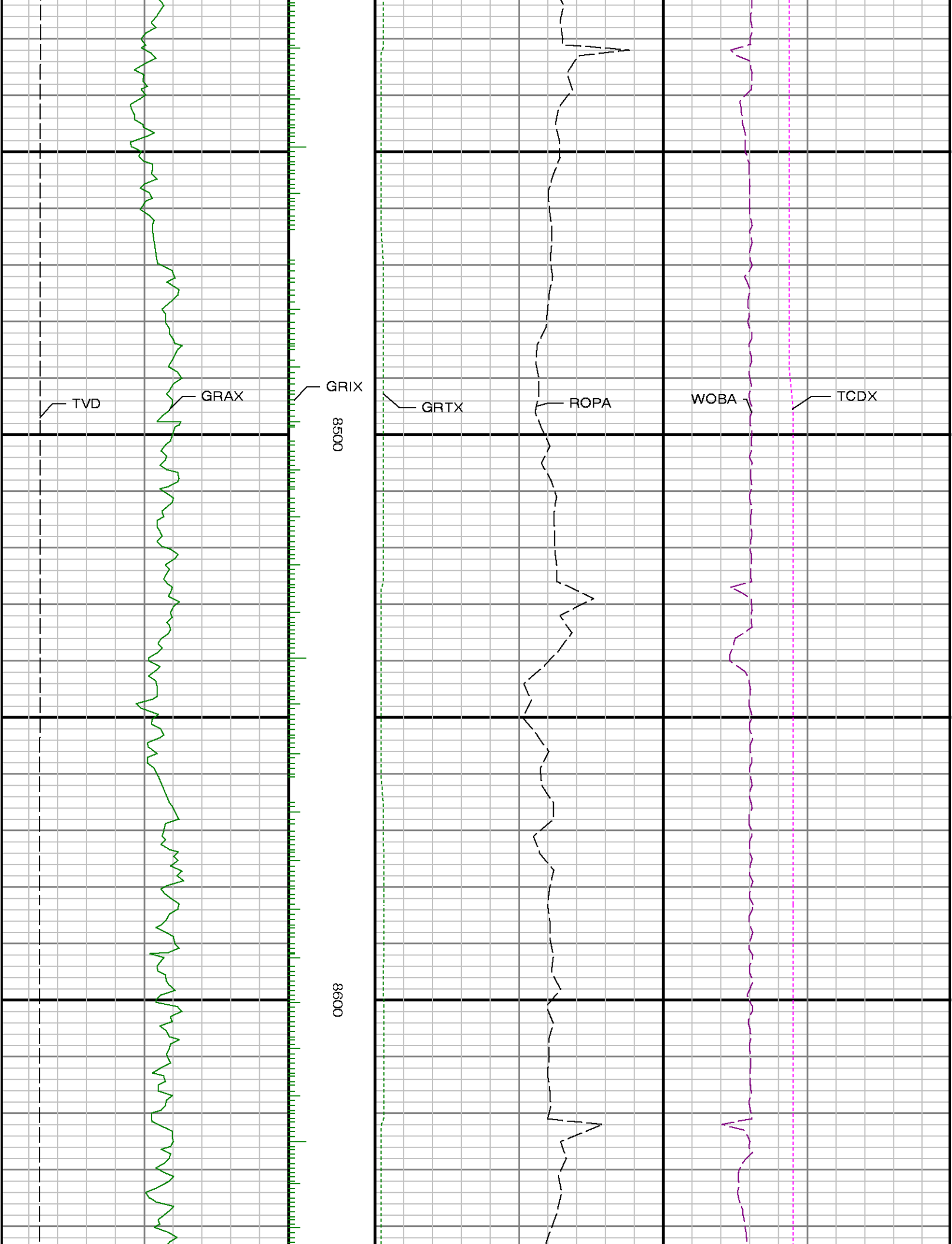
7800

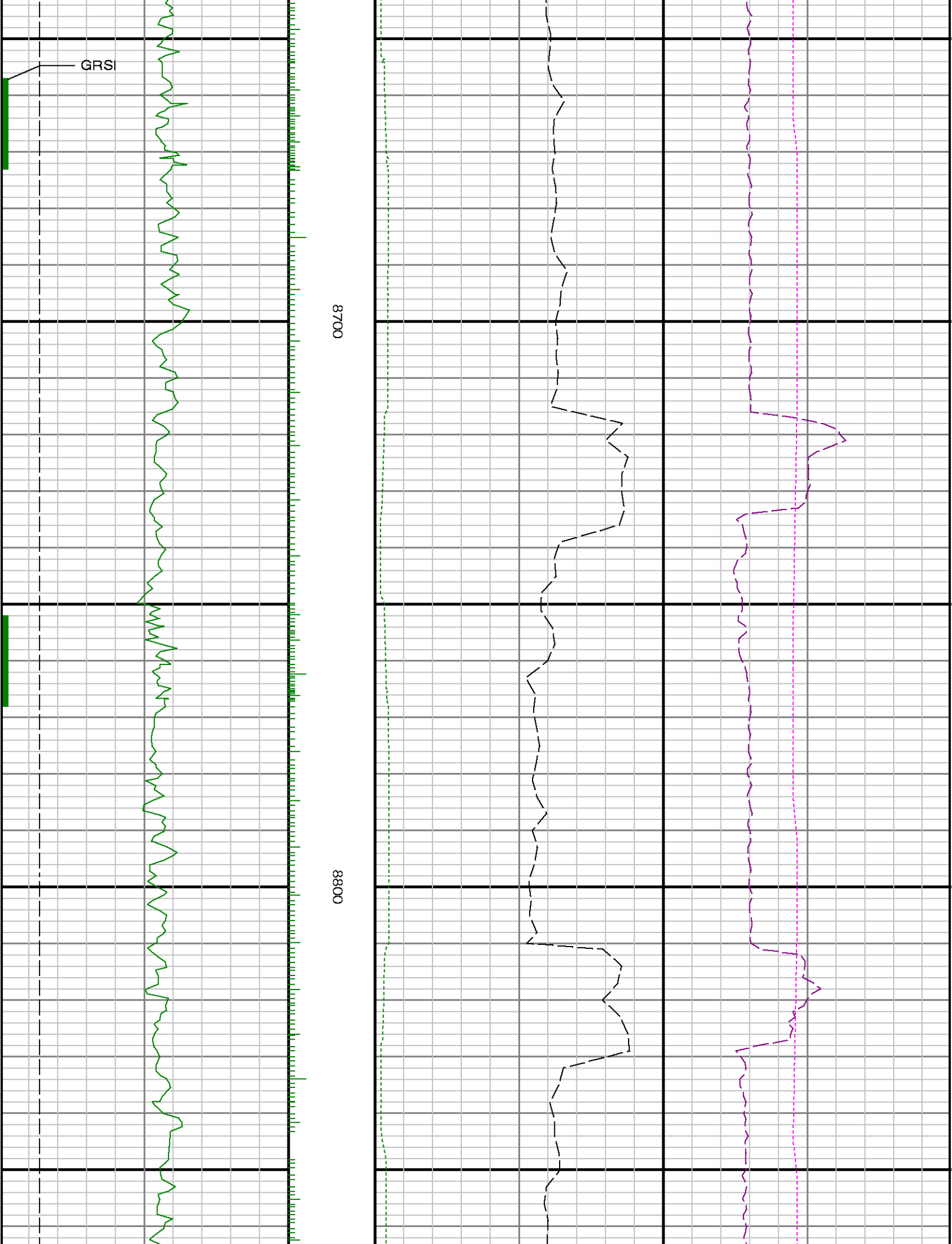
7900

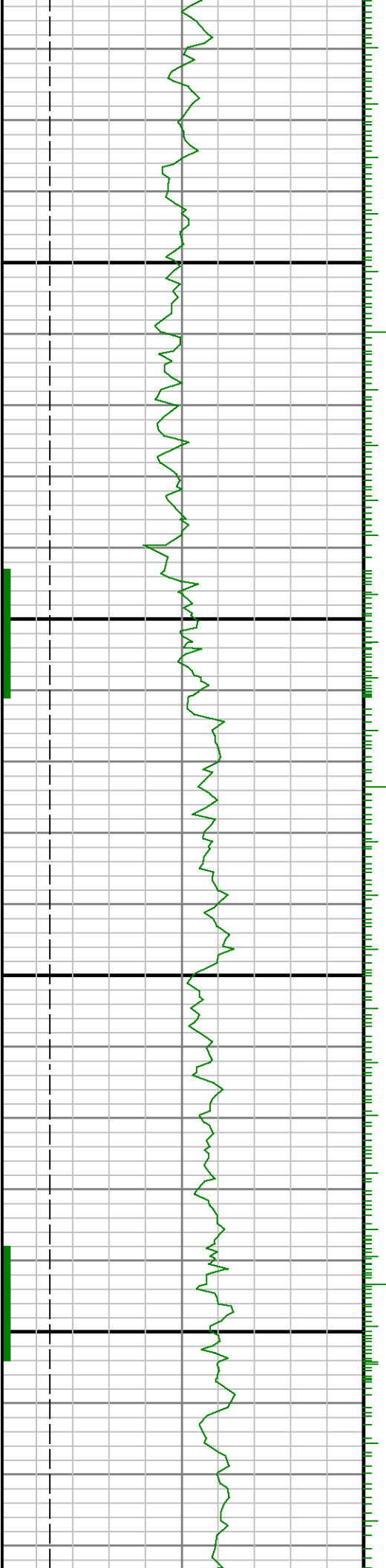






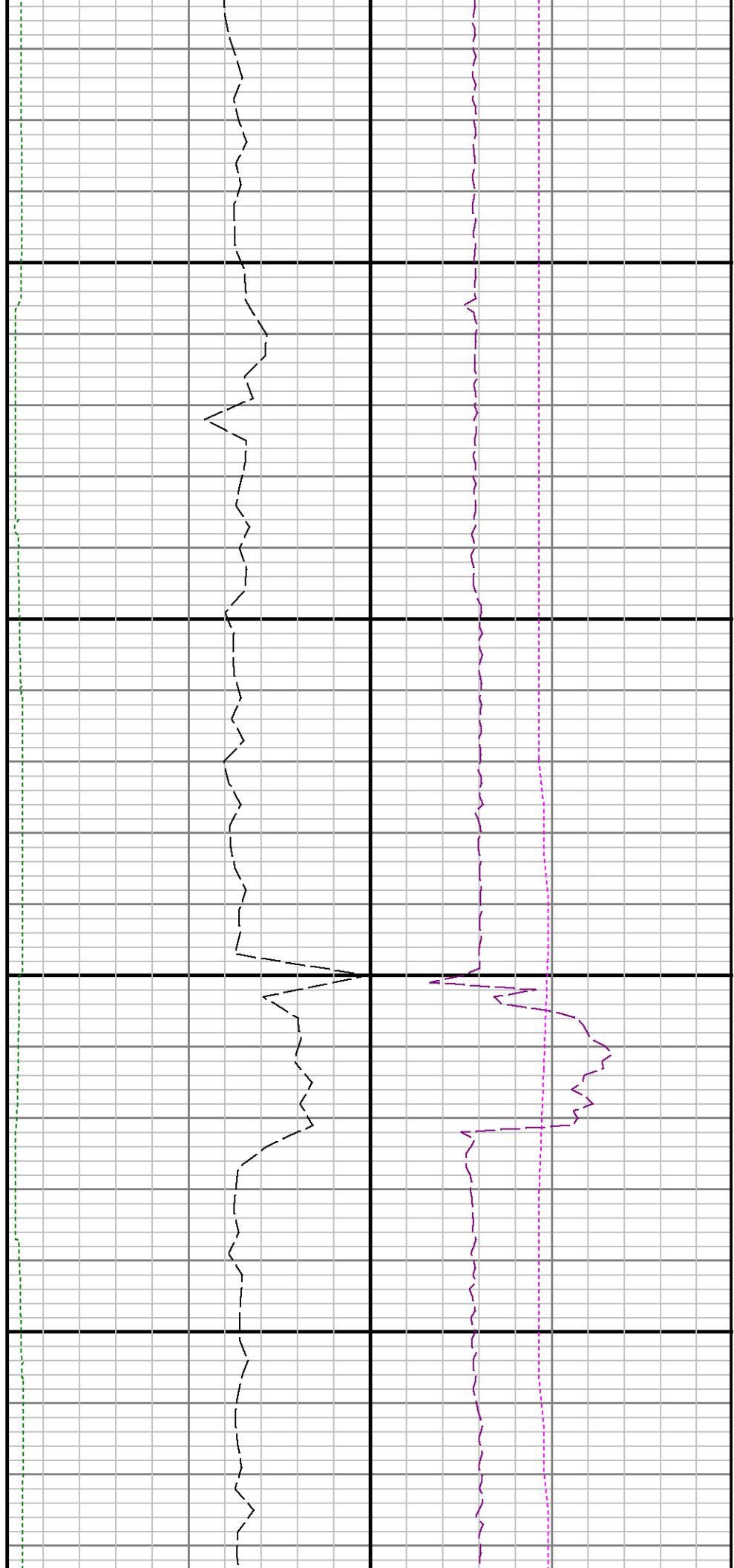






9006

0068

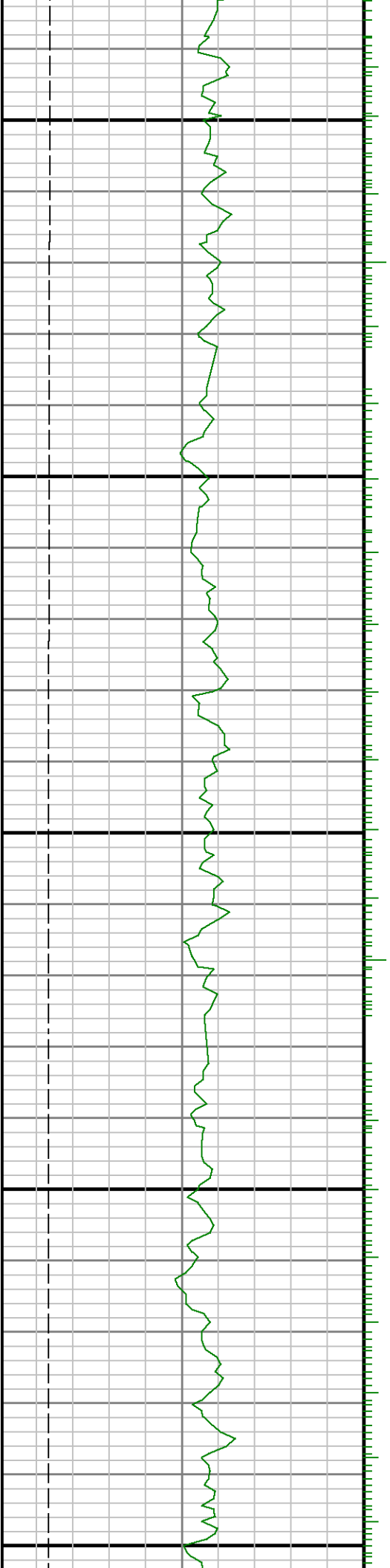


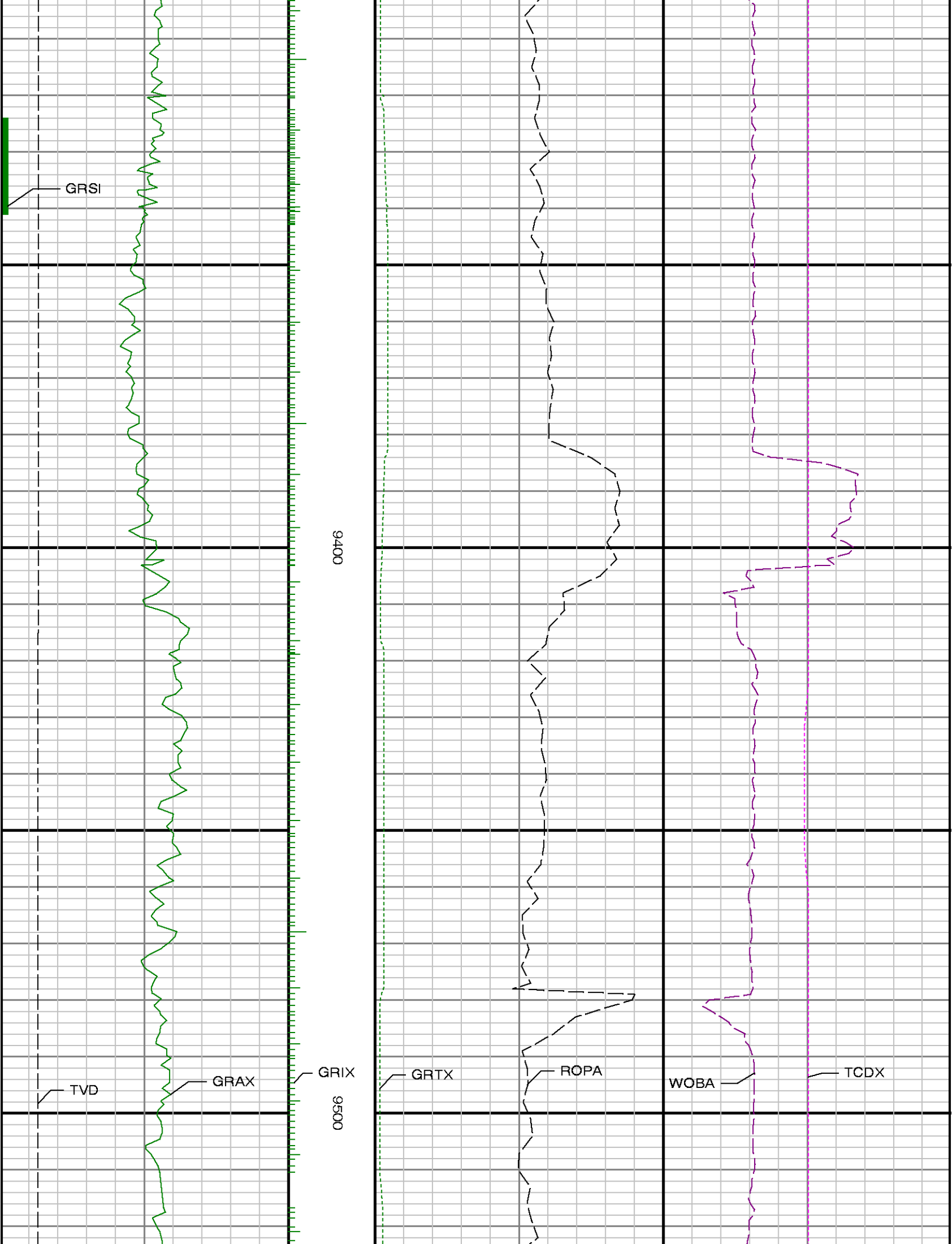


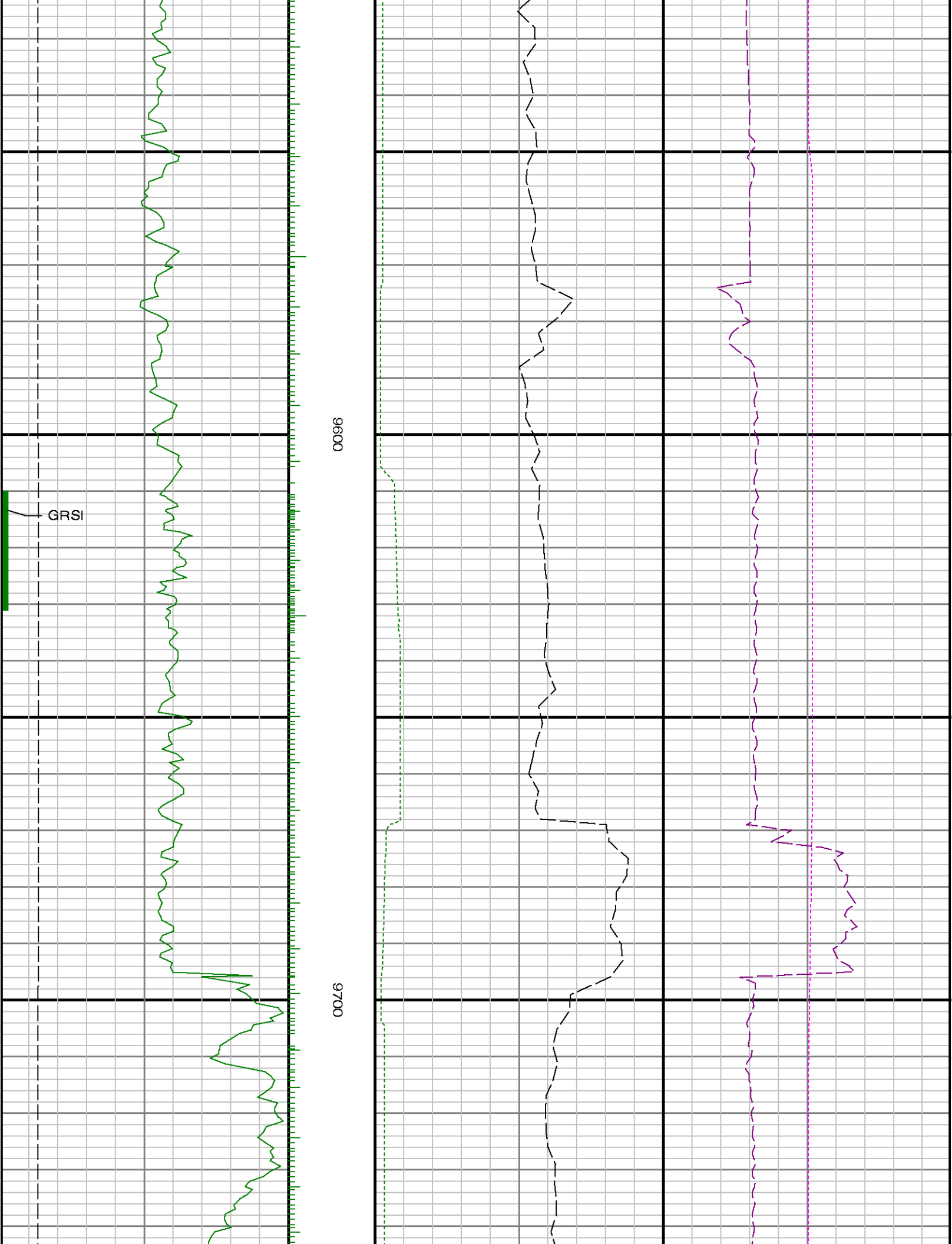
9100

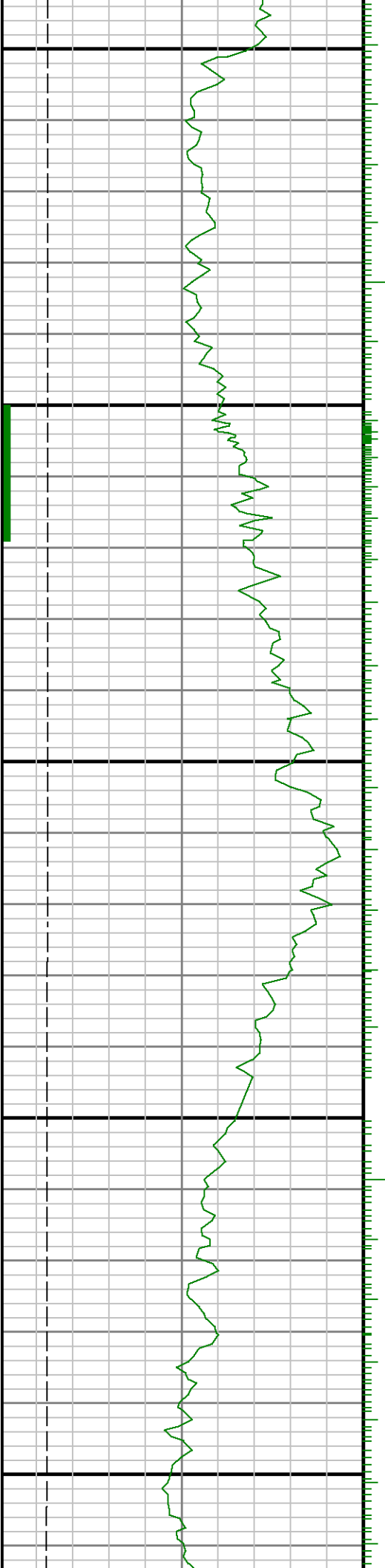
9200

9300



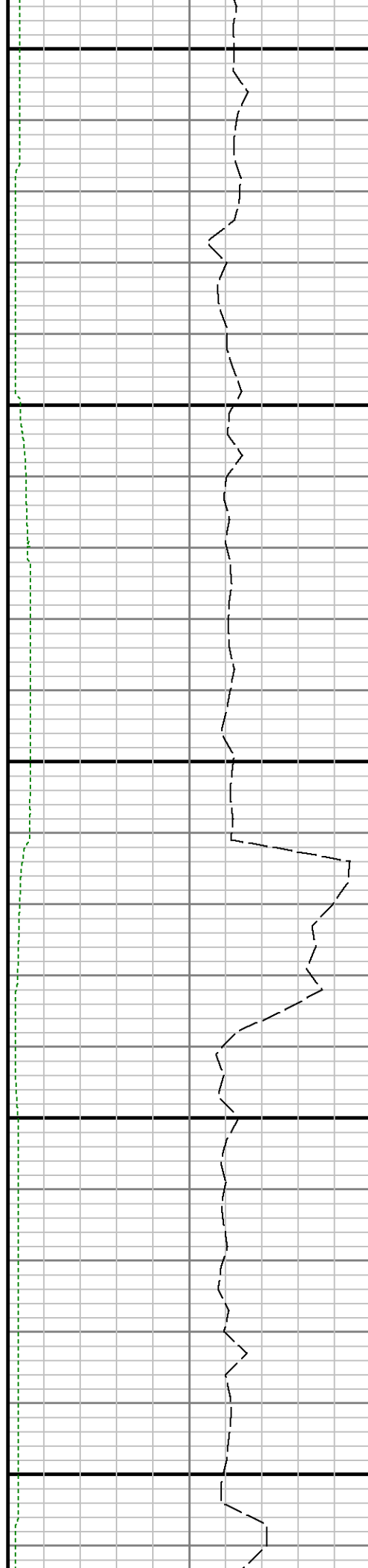


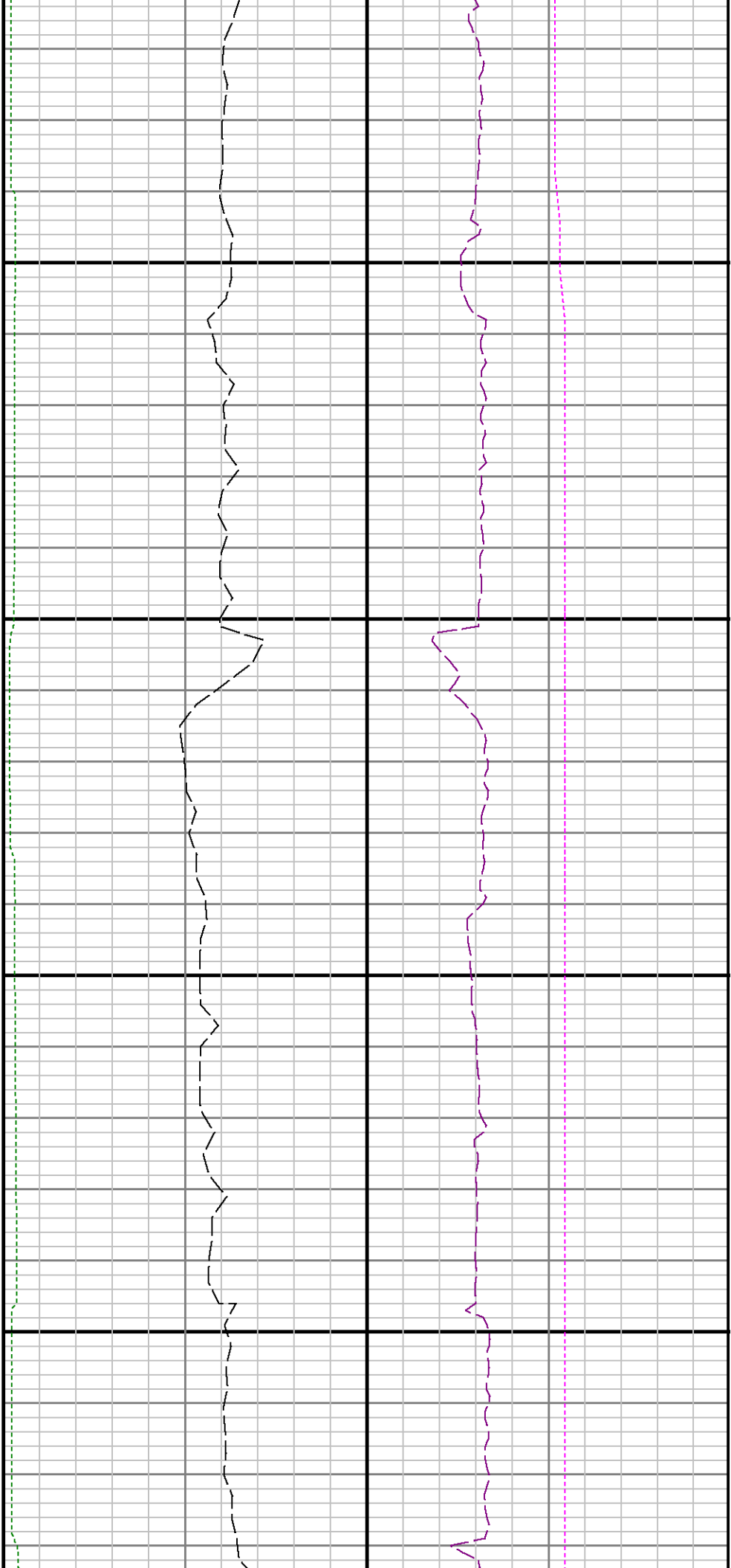




0086

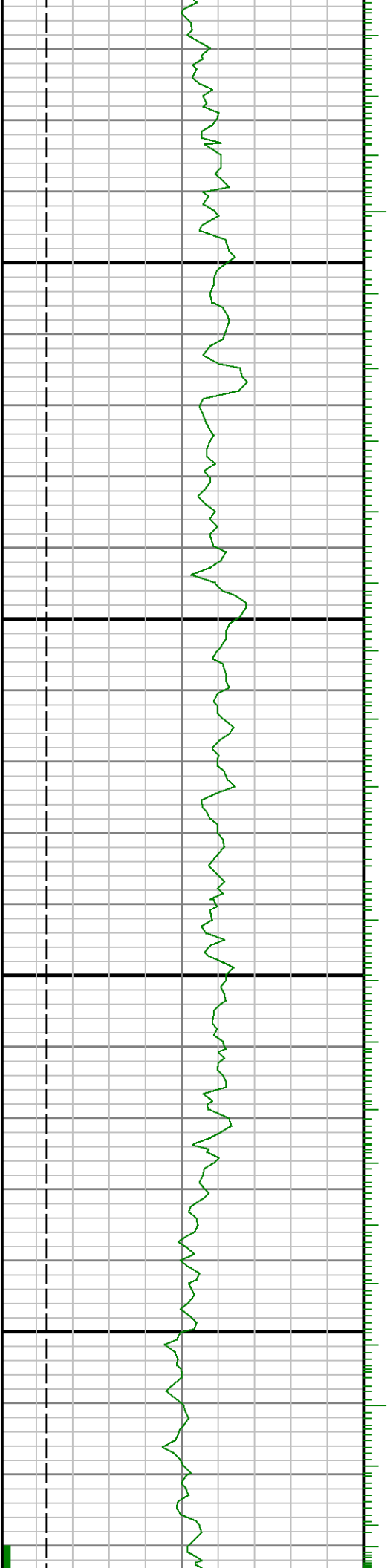
0066

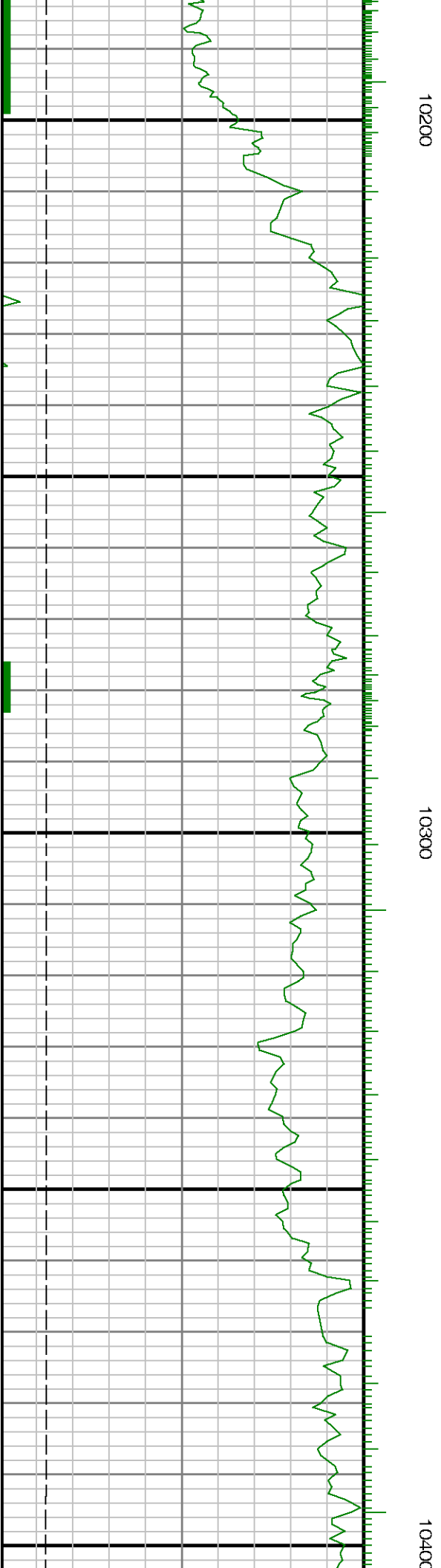
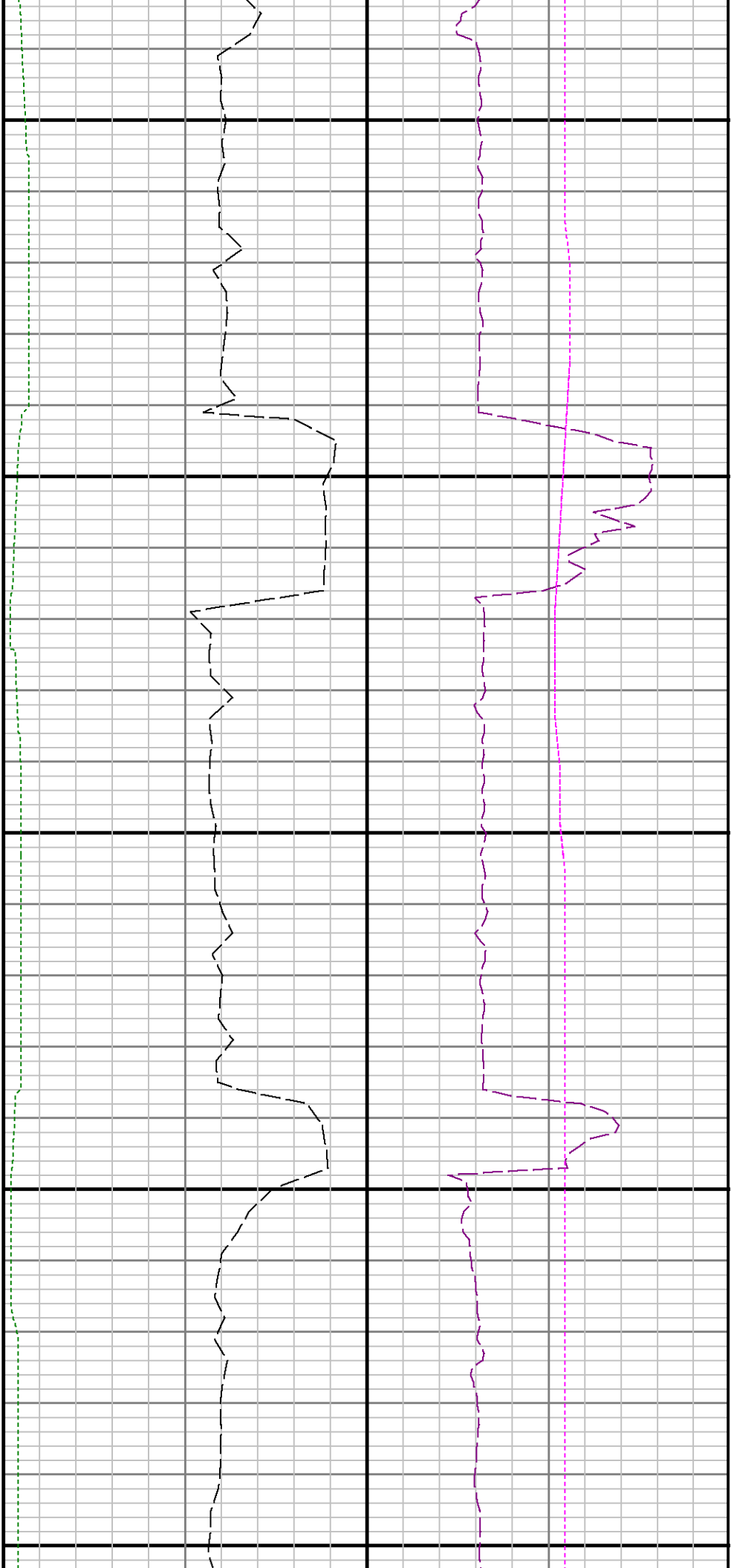


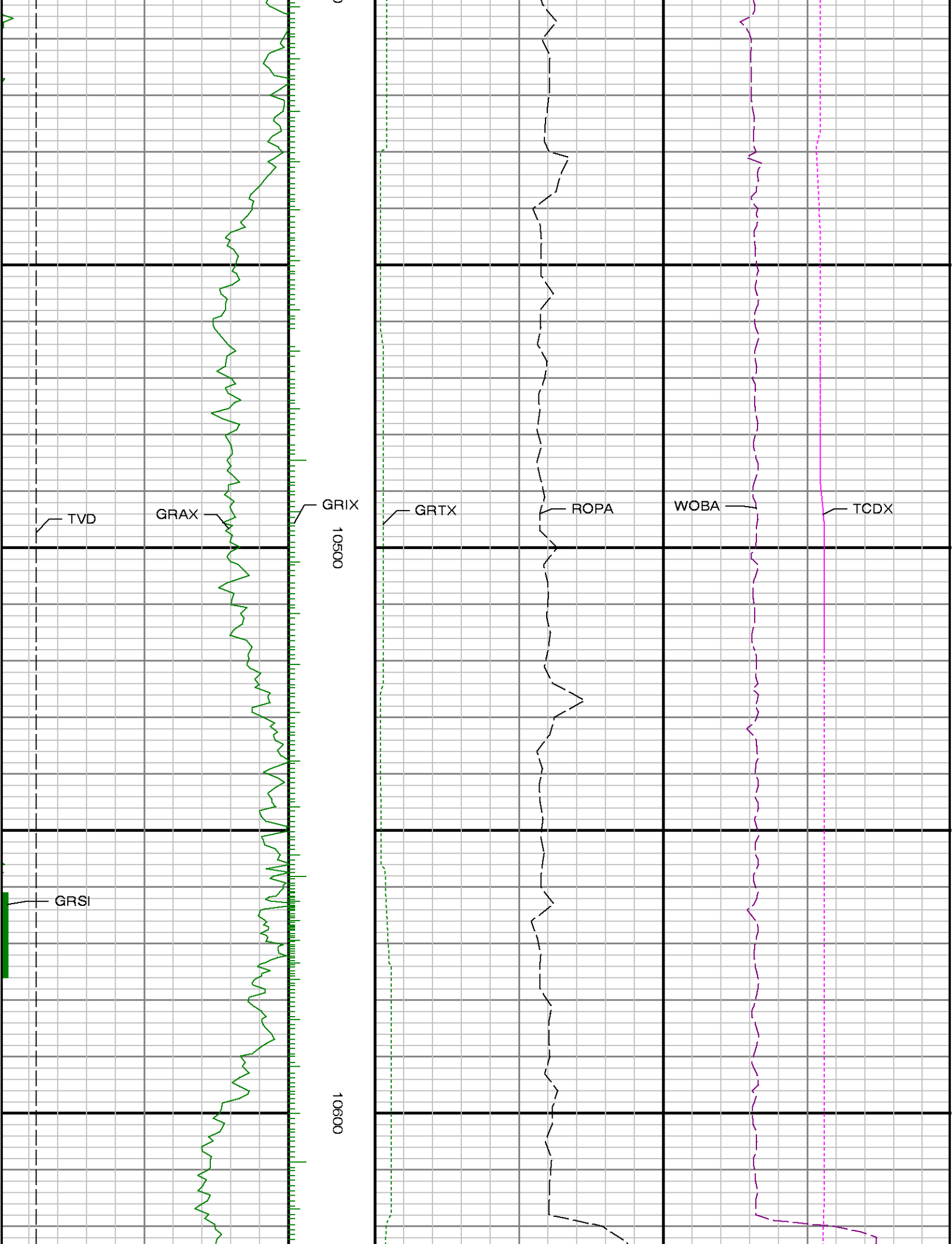


10000

10100



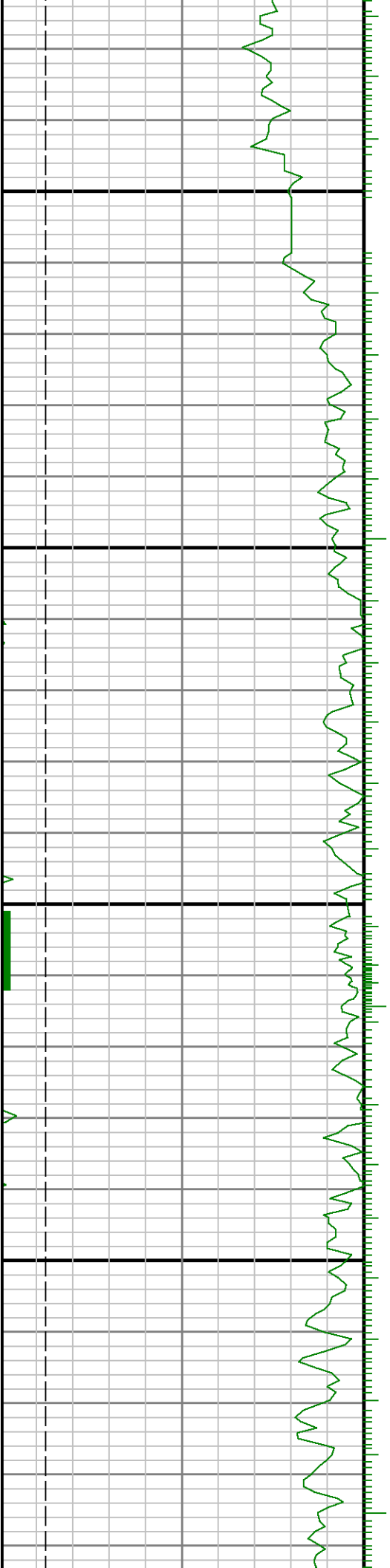


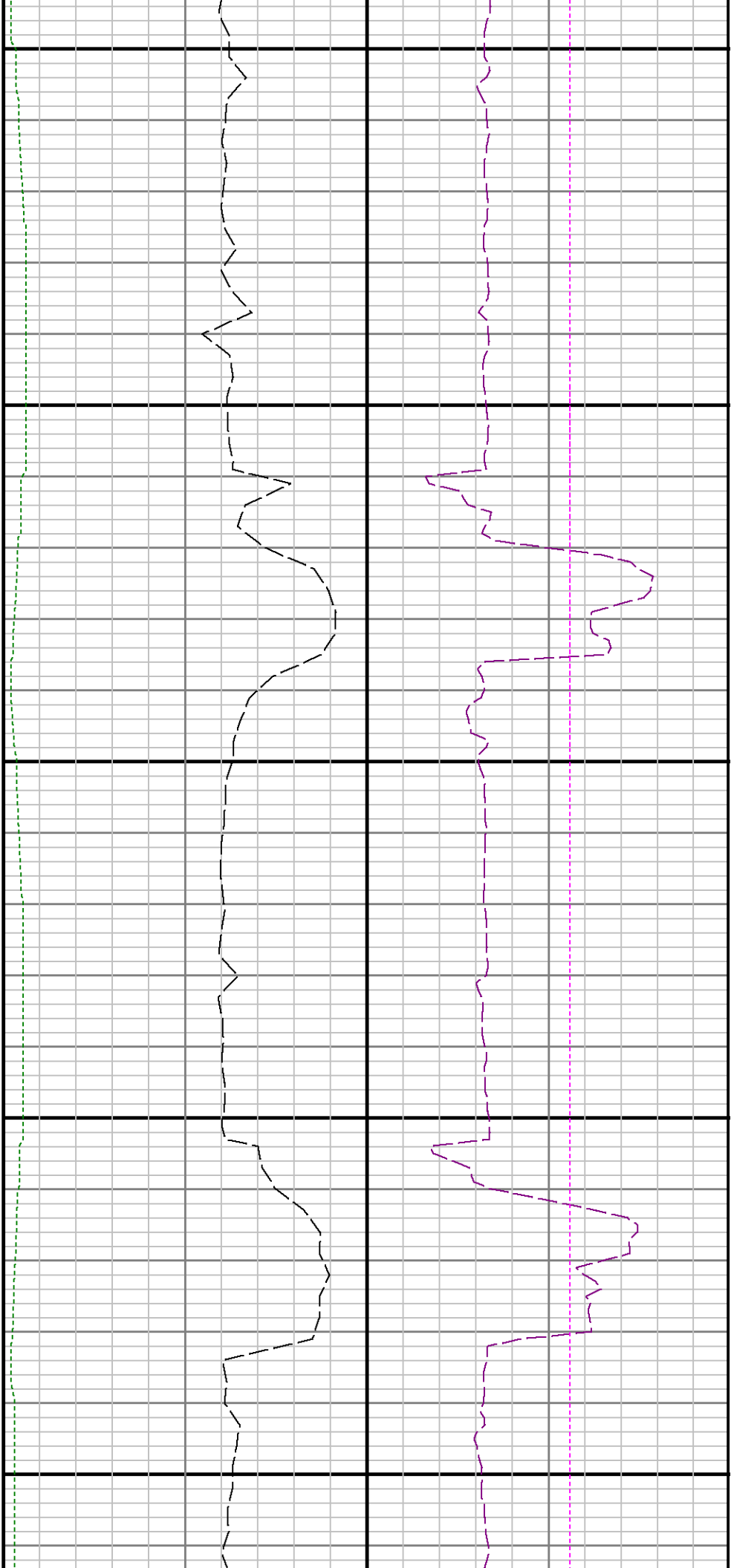




10700

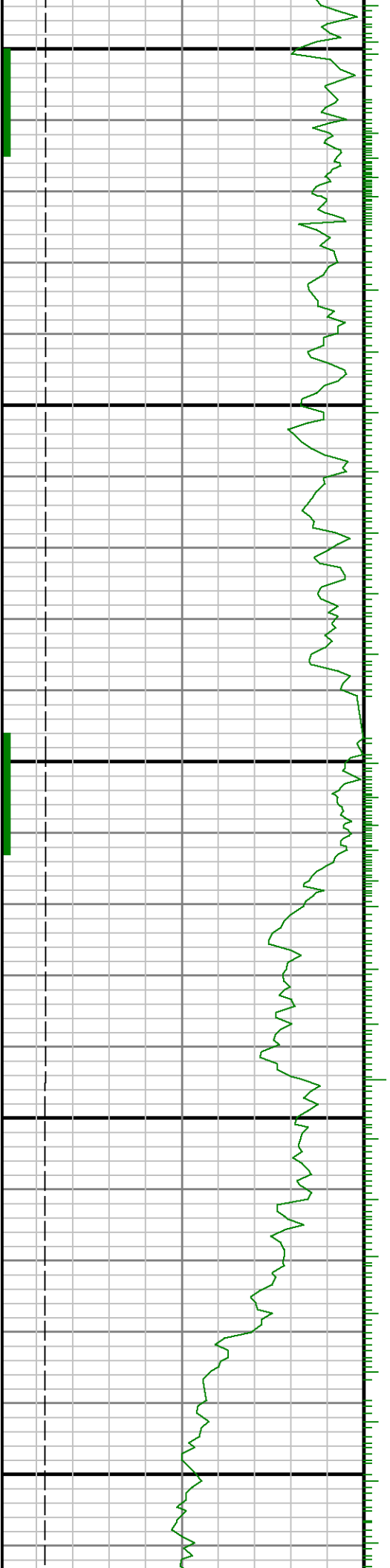
10800

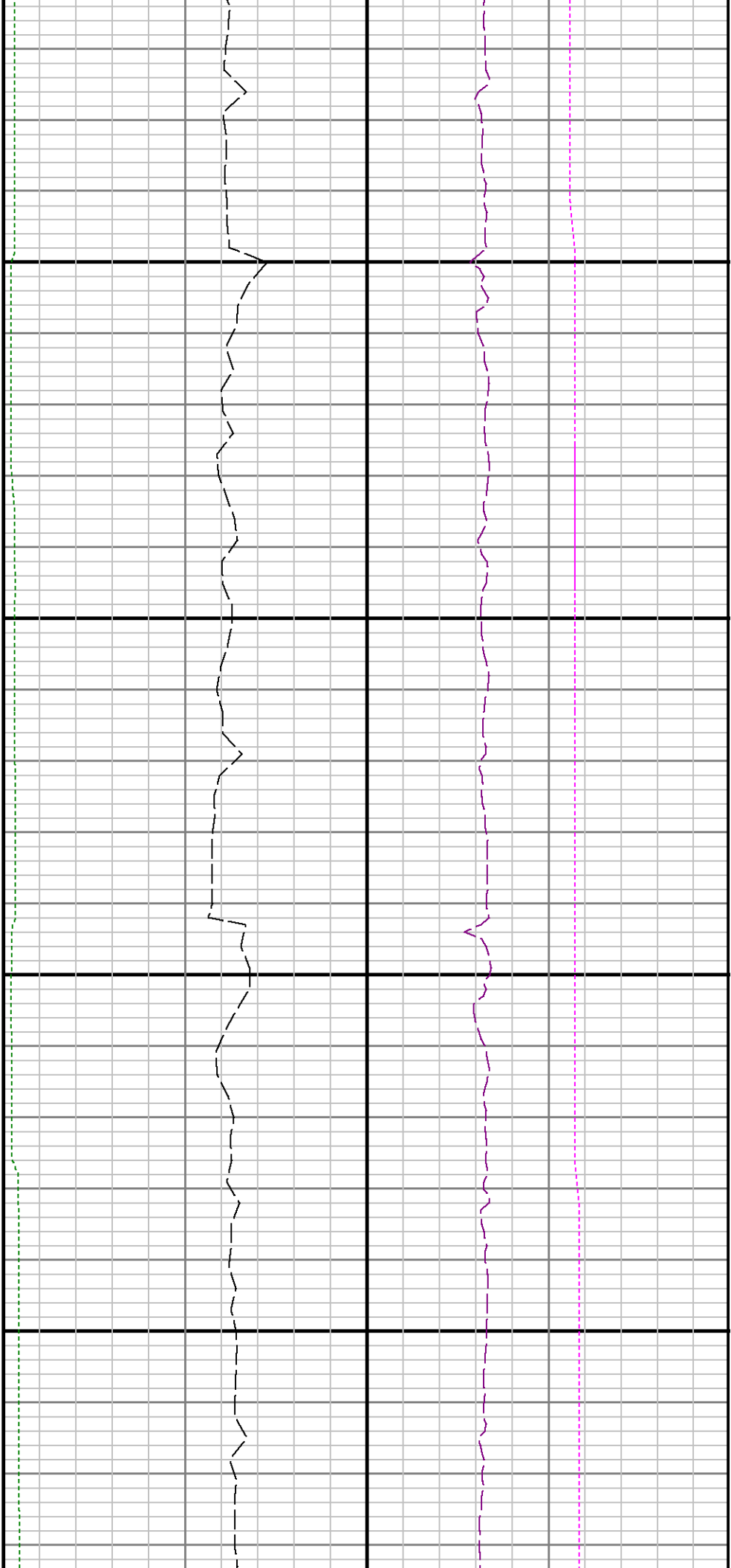




10900

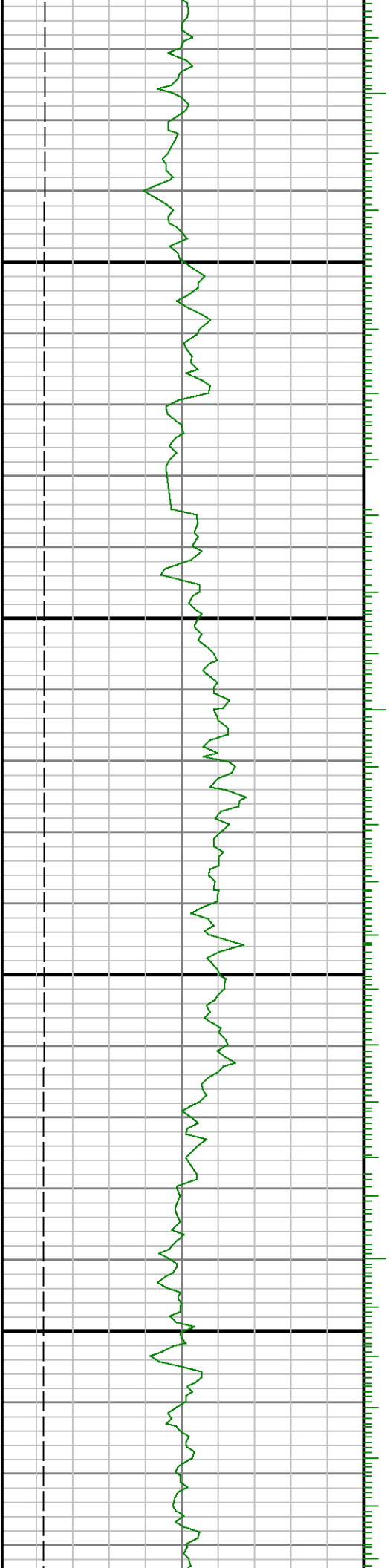
11000

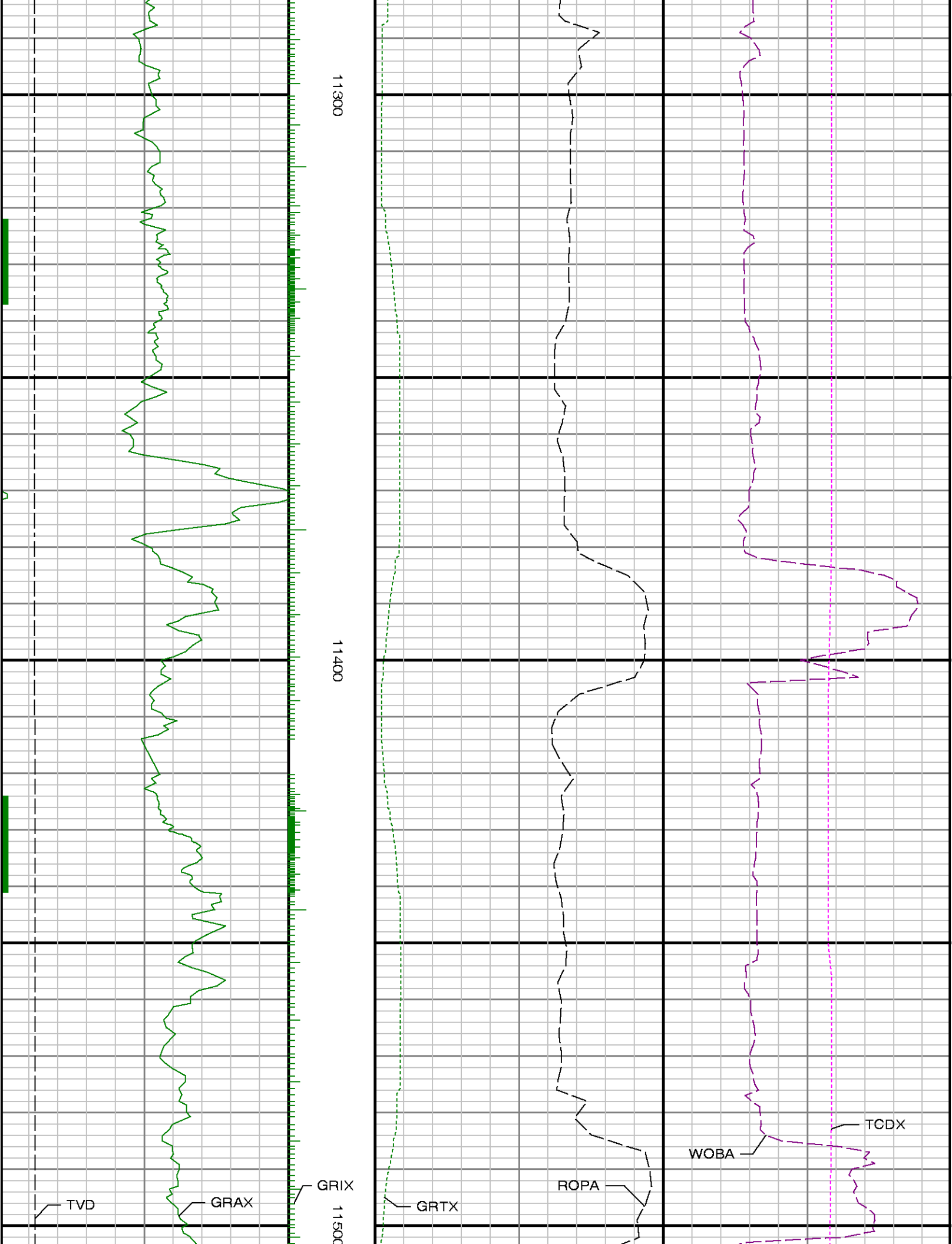


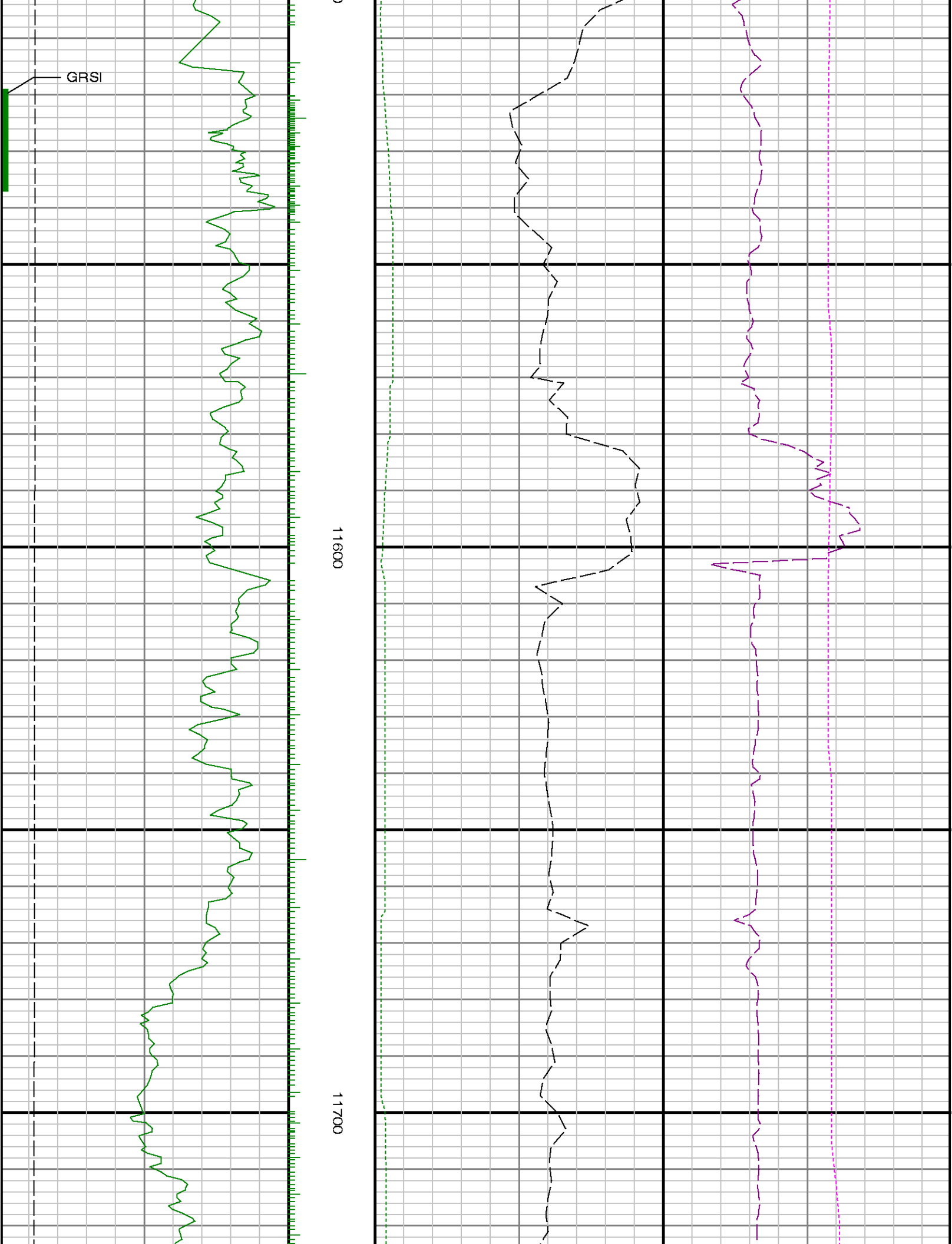


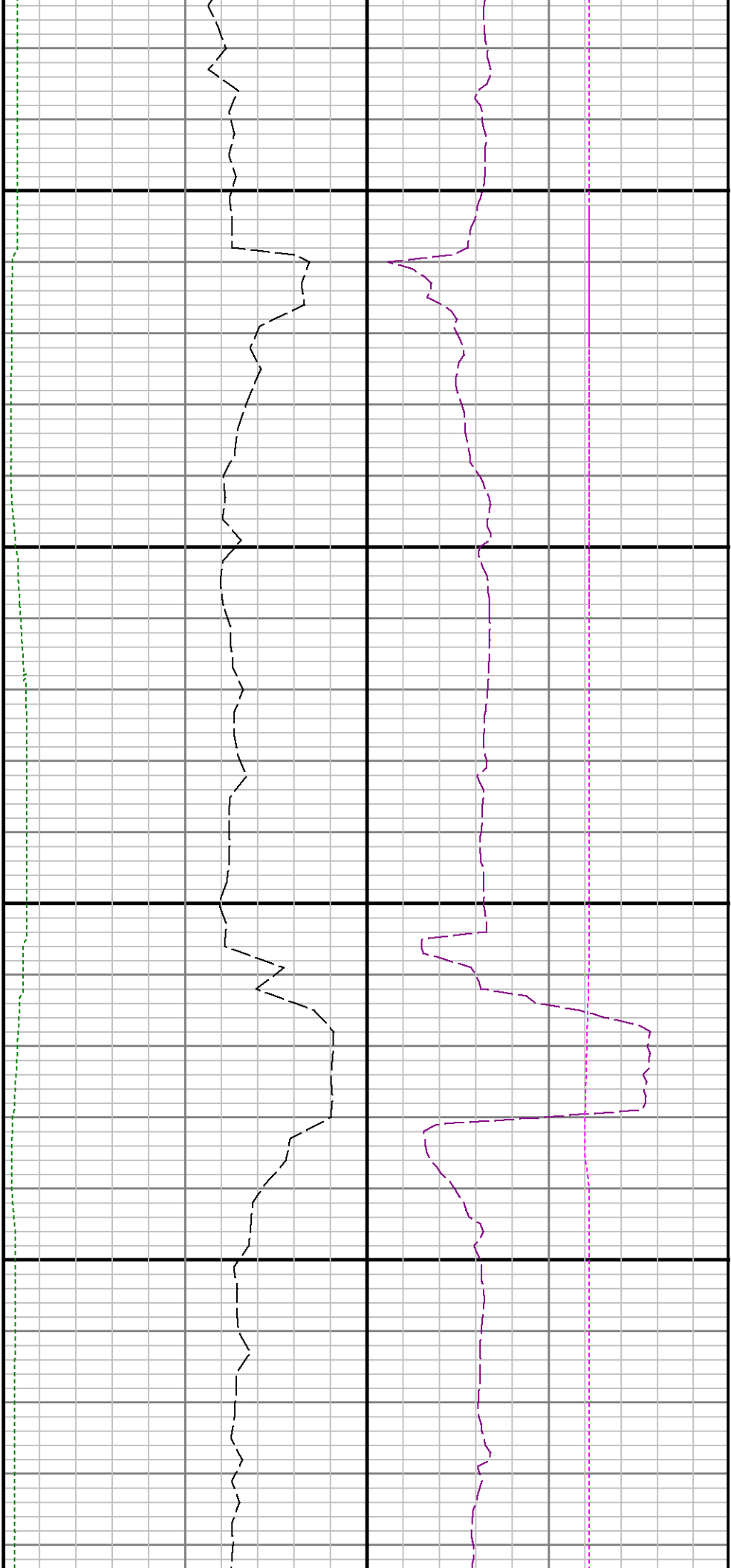
1100

1200



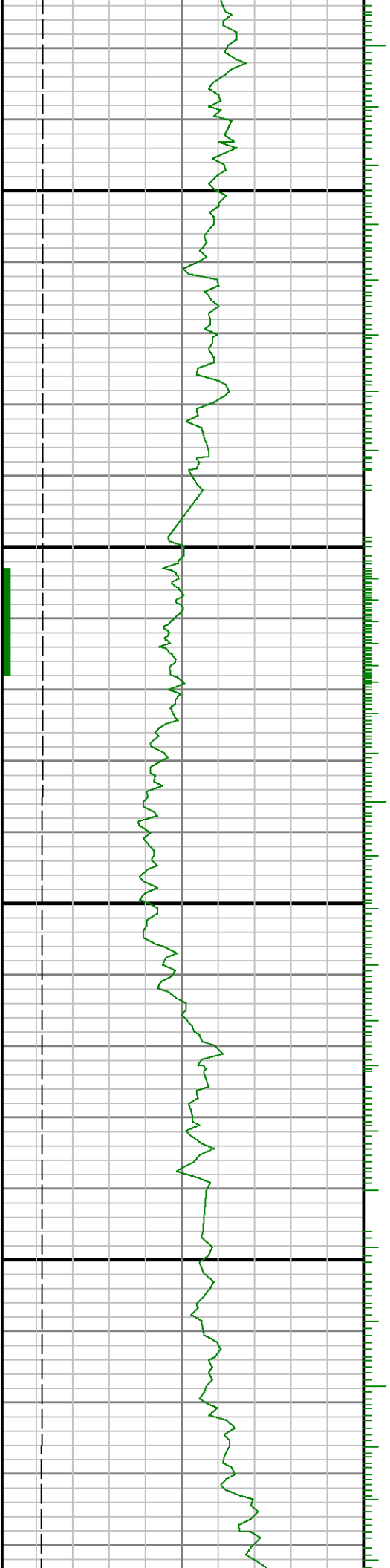


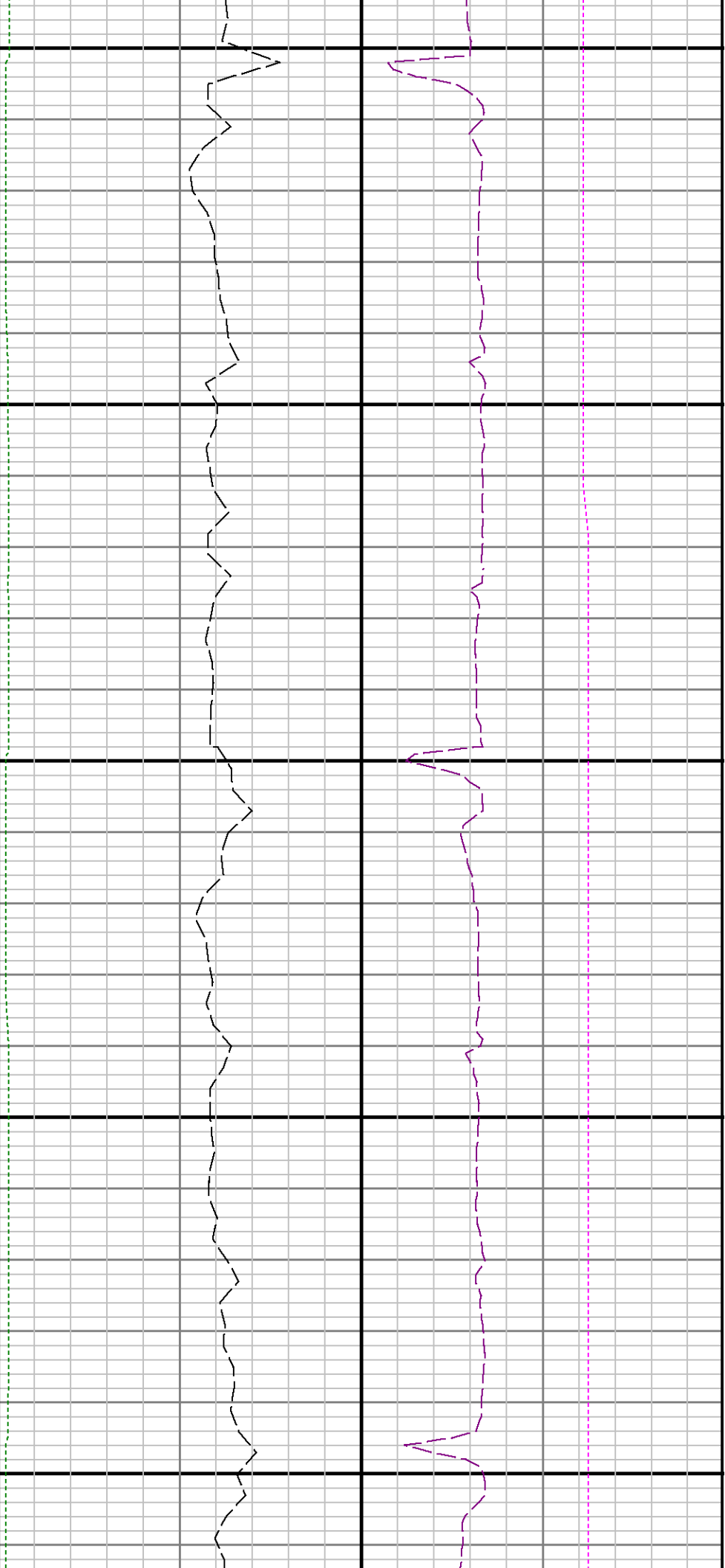




11800

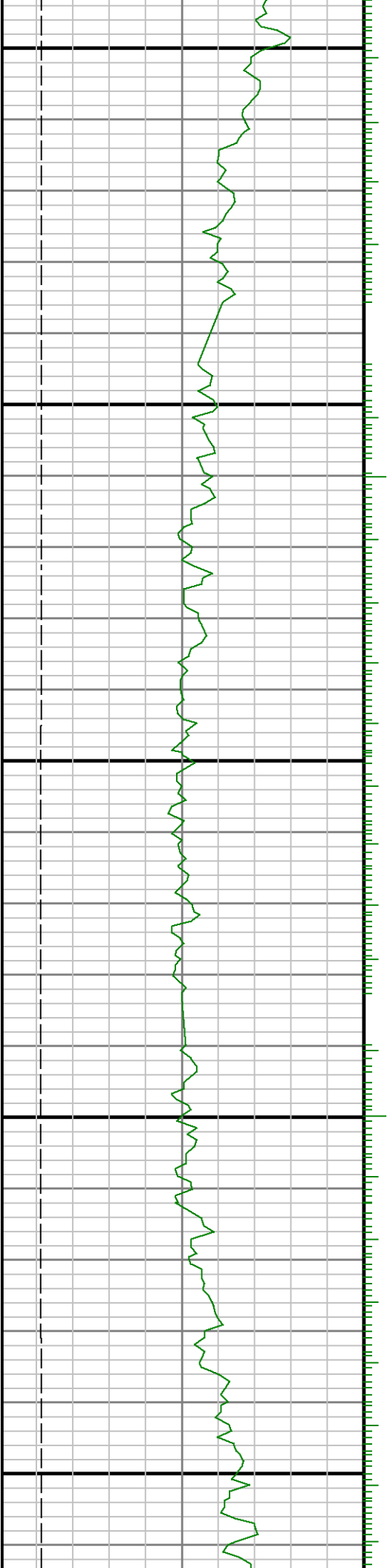
11900

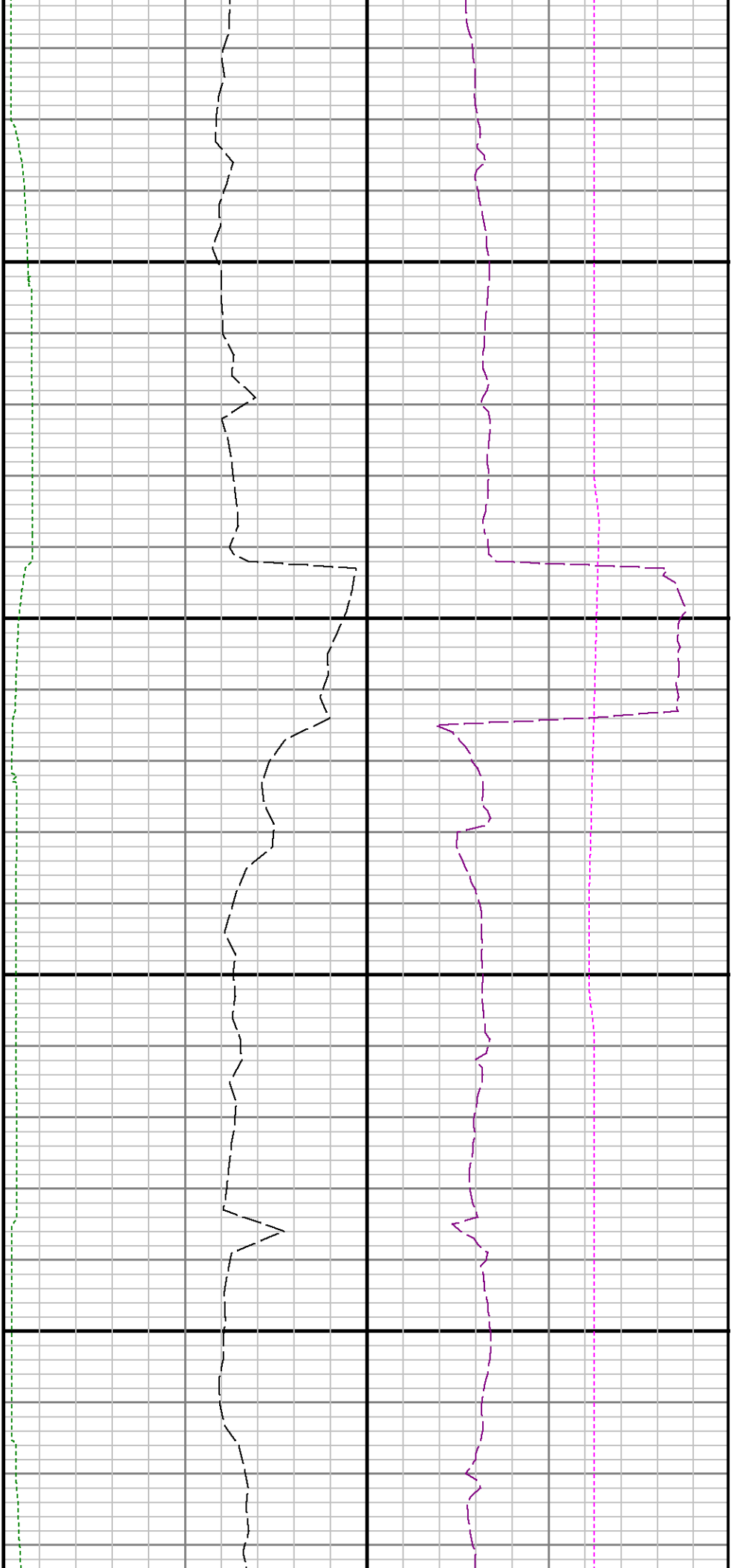




12000

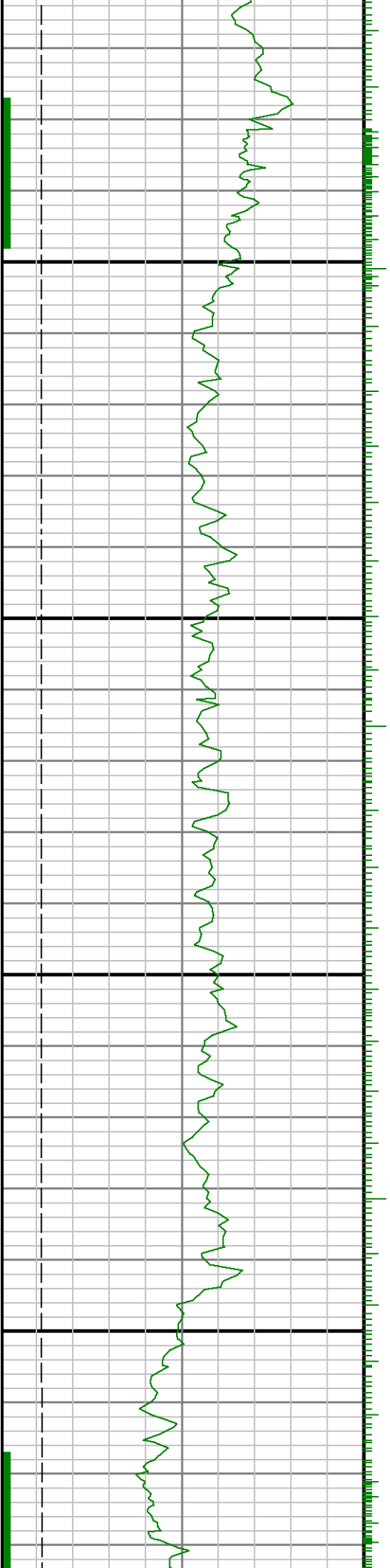
12100

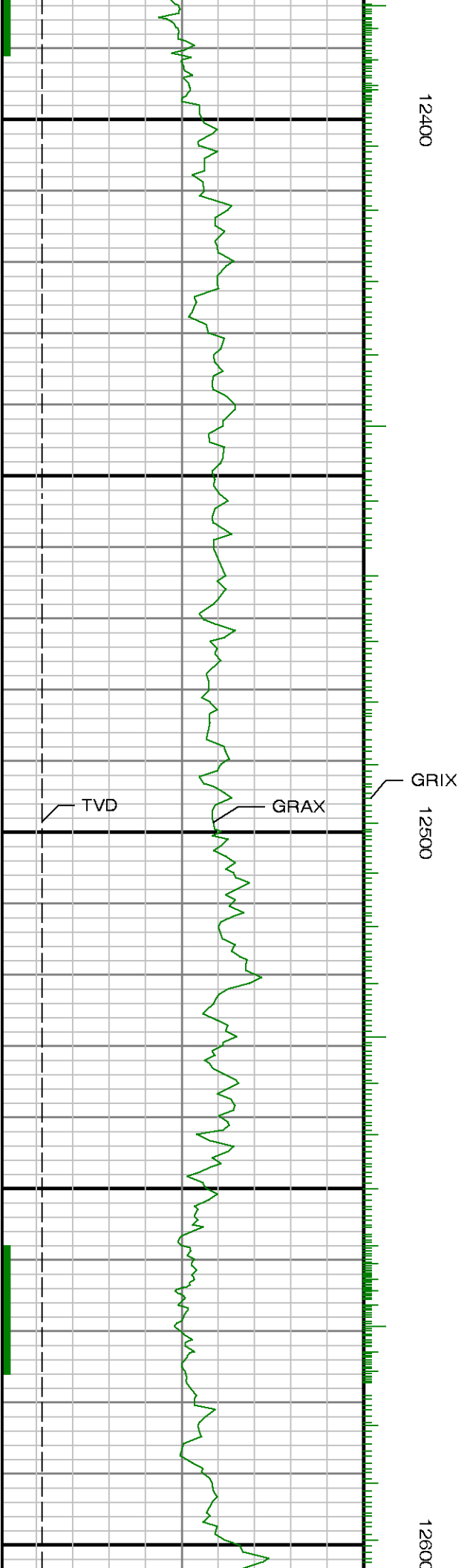
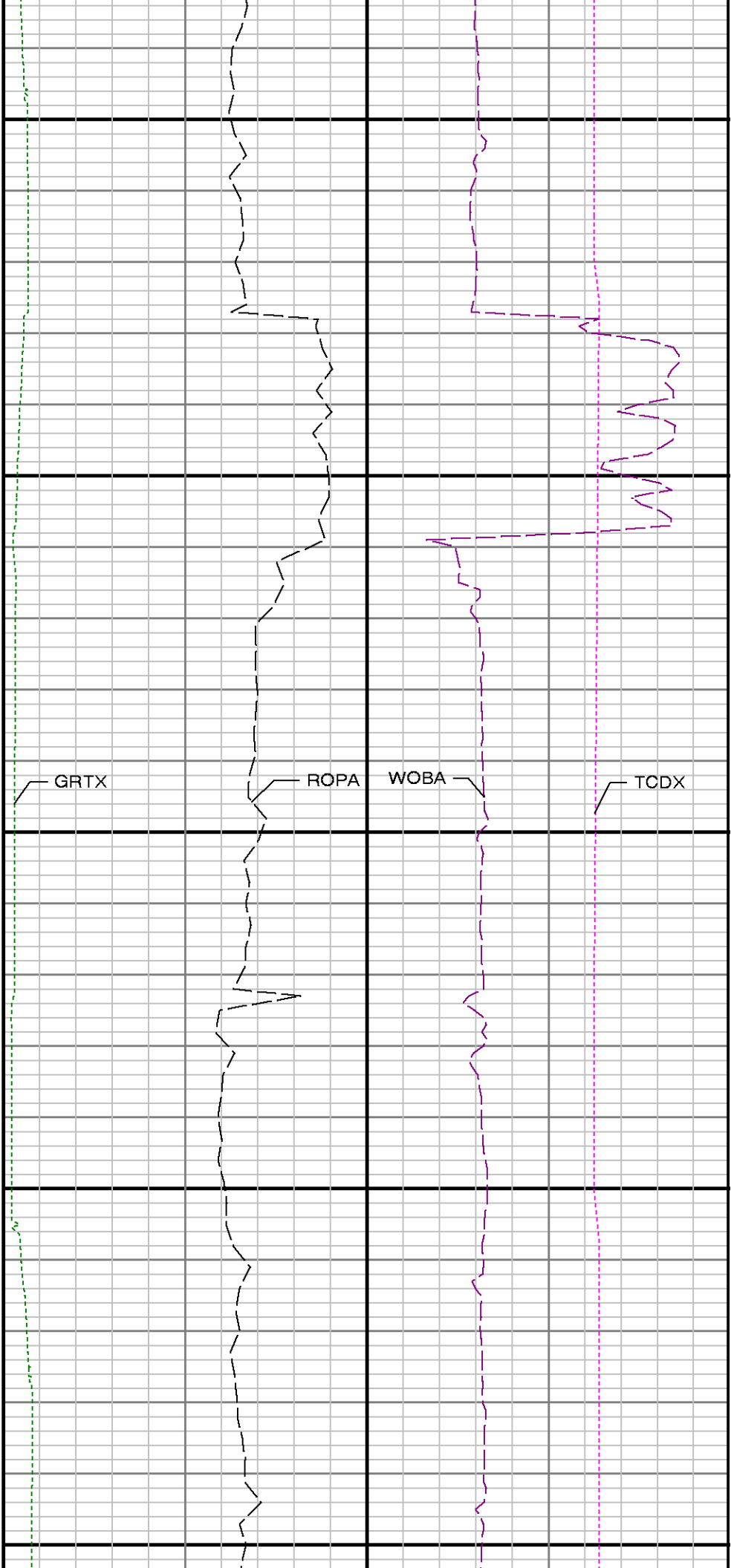


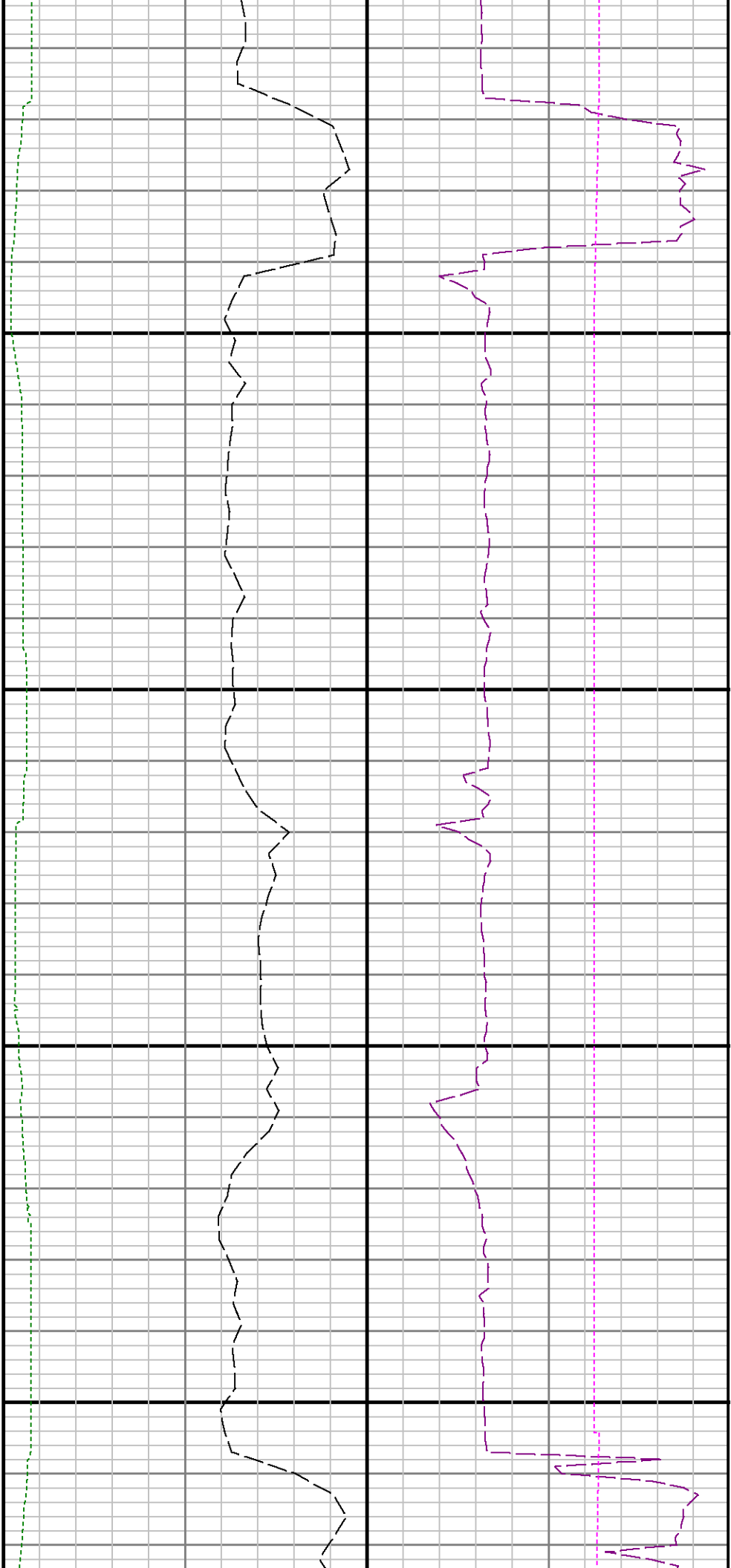


12200

12300

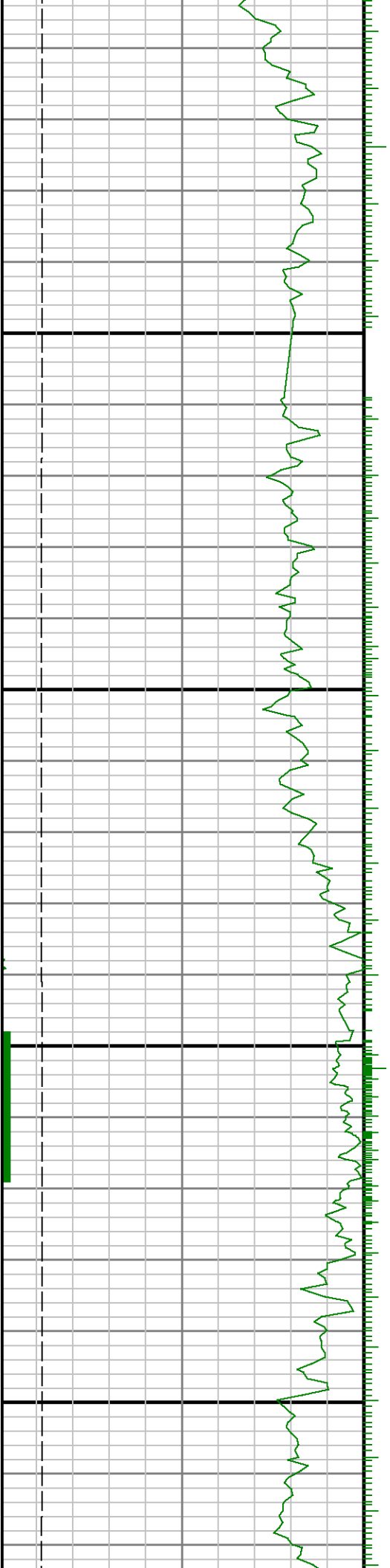


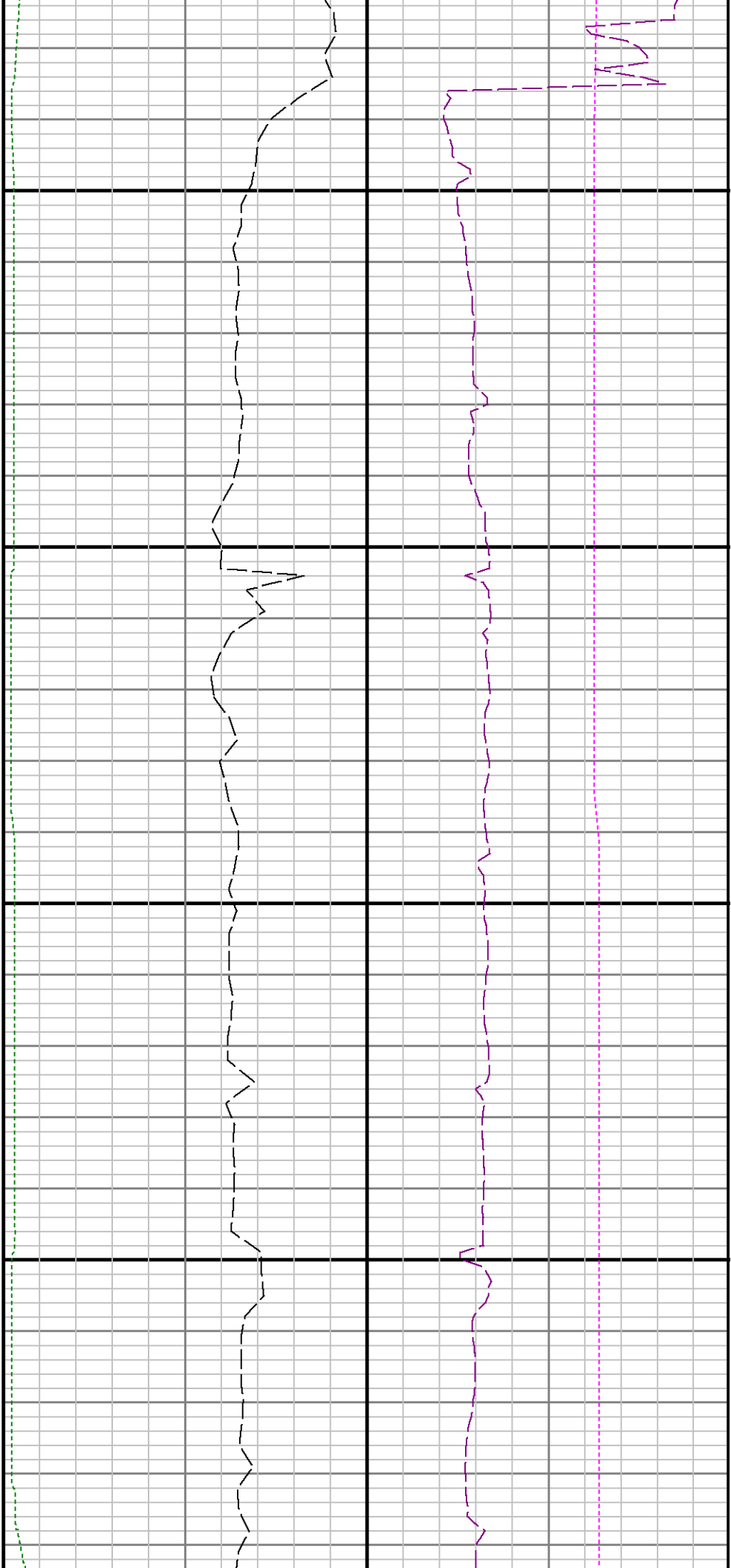




12700

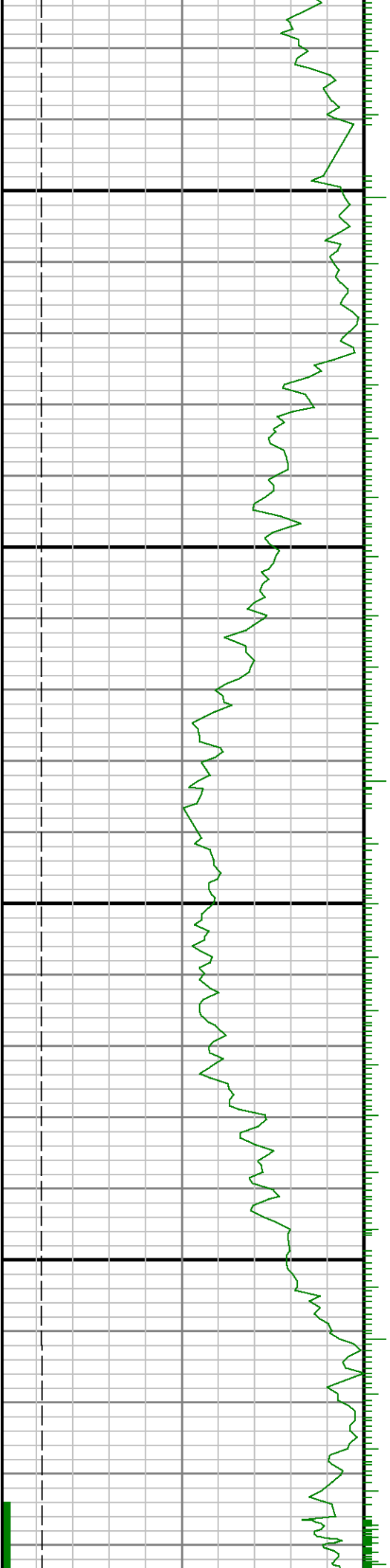
12800

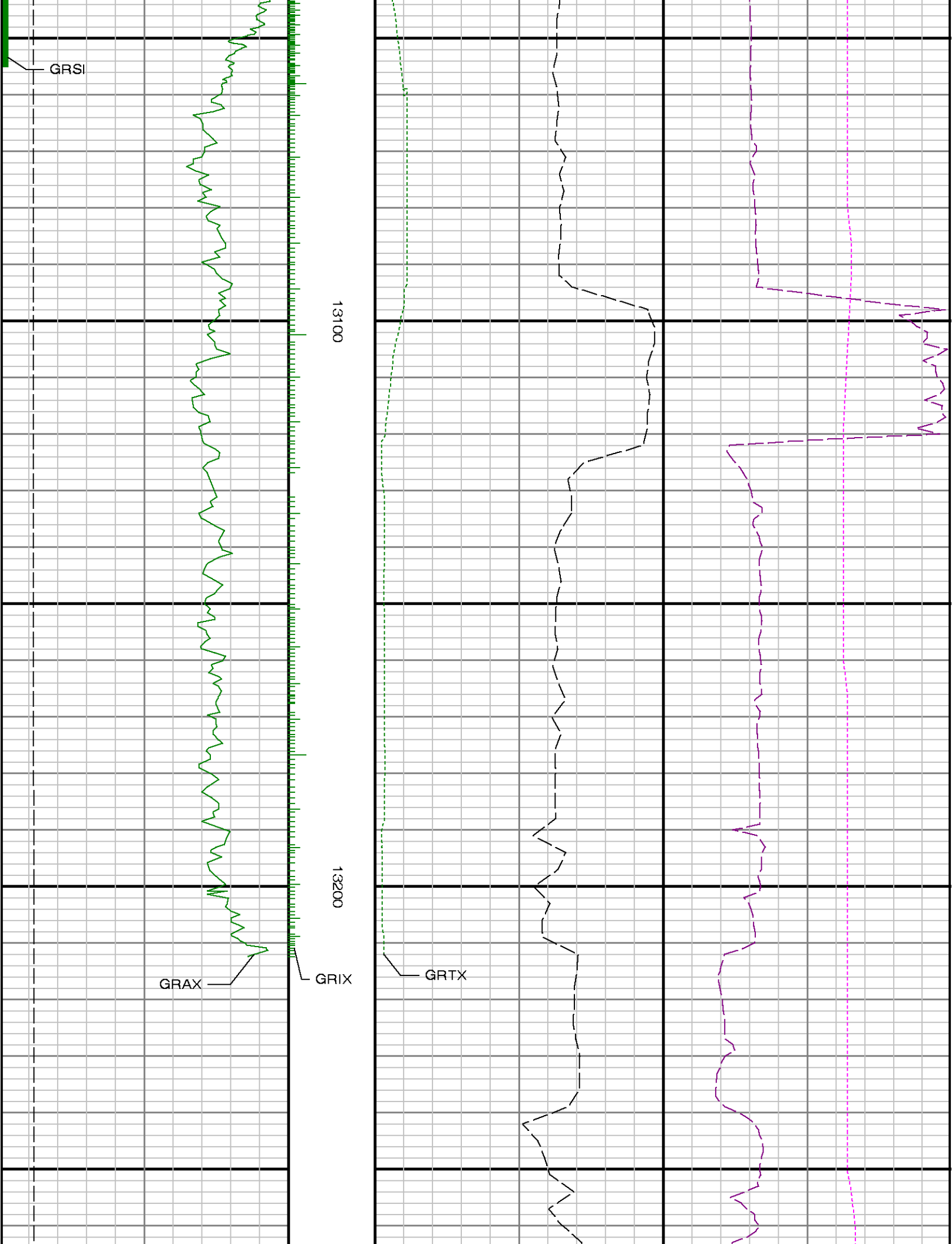




12900

13000





| | | | |
|---|---------------|---|---|
| <div>TVD</div> <div>See Remark 2</div> | | <div>ROPA</div> | <div>WOBA</div> <div>TCDX</div> |
| <div>Gamma Ray Apparent 0.5 ft Avg GRAX</div> <div>0150</div> <div>API</div> <div>True Vertical Depth TVD</div> <div>73006200</div> <div>ft</div> | MD feet 1:240 | <div>Rate of Penetration 3.0 ft Avg ROPA</div> <div>7500</div> <div>ft/hr</div> <div>Gamma Time Since Drilled GRTX</div> <div>0600</div> <div>min</div> | <div>Surface Weight On Bit 1.0 ft Avg WOBA</div> <div>0115</div> <div>klbf</div> <div>Downhole Temperature TCDX</div> <div>100300</div> <div>degF</div> |