



**SUPERIOR**  
Hays,  
Kansas

**DUAL INDUCTION  
LOG**

Company PIONEER RESOURCES  
Well KNOPP #4  
Field WILDCAT  
County LOGAN  
State KANSAS

Company PIONEER RESOURCES  
Well KNOPP #4  
Field WILDCAT  
County LOGAN State KANSAS

Location: API # : 15-109-21084-0000  
SEC 13 TWP 14S RGE 32W  
GROUND LEVEL Elevation 2816  
Log Measured From KELLY BUSHING 5' A.G.L.  
Drilling Measured From KELLY BUSHING  
Other Services  
CDL/CNL  
MEL  
Elevation  
K.B. 2821  
D.F. 2819  
G.L. 2816

|                              |               |
|------------------------------|---------------|
| Date                         | 5/16/12       |
| Run Number                   | ONE           |
| Depth Driller                | 4570          |
| Depth Logger                 | 4572          |
| Bottom Logged Interval       | 4570          |
| Top Log Interval             | 00            |
| Casing Driller               | 8 5/8"@220'   |
| Casing Logger                | 220           |
| Bit Size                     | 7 7/8"        |
| Type Fluid in Hole           | CHEMICAL MUD  |
| Density / Viscosity          | 9.2/66        |
| pH / Fluid Loss              | 10.0/9.8      |
| Source of Sample             | FLOWLINE      |
| Rm @ Meas. Temp              | .600@90F      |
| Rmt @ Meas. Temp             | .450@90F      |
| Rmc @ Meas. Temp             | .720@90F      |
| Source of Rmf / Rmc          | MEASUREMENT   |
| Rm @ BHT                     | .448@121F     |
| Time Circulation Stopped     | 2.5 HOURS     |
| Time Logger on Bottom        | 6:15 A.M.     |
| Maximum Recorded Temperature | 121F          |
| Equipment Number             | 4010          |
| Location                     | HAYS, KANSAS  |
| Recorded By                  | JEFF LUEBBERS |
| Witnessed By                 | STEVE MURPHY  |

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

THANK YOU FOR SING SUPERIOR WELL SERVICE HAYS, KANSAS (785) 628-6395  
DIRECTIONS  
OAKLEY, KS. (OLD 40 & HWY 83 JUNCTION) 20S. ON HWY 83 TO "JAYHAWK RD.", 1E., 3/4N., E. INTO



**SUPERIOR**  
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**MAIN SECTION**

Database File: 408768ddn.db  
 Dataset Pathname: pass3.10  
 Presentation Format: dil2  
 Dataset Creation: Wed May 16 08:05:30 2012 by Calc Open-Cased 110302  
 Charted by: Depth in Feet scaled 1:600

0 Gamma Ray (GAPI) 150  
 -100 SP (mV) 100

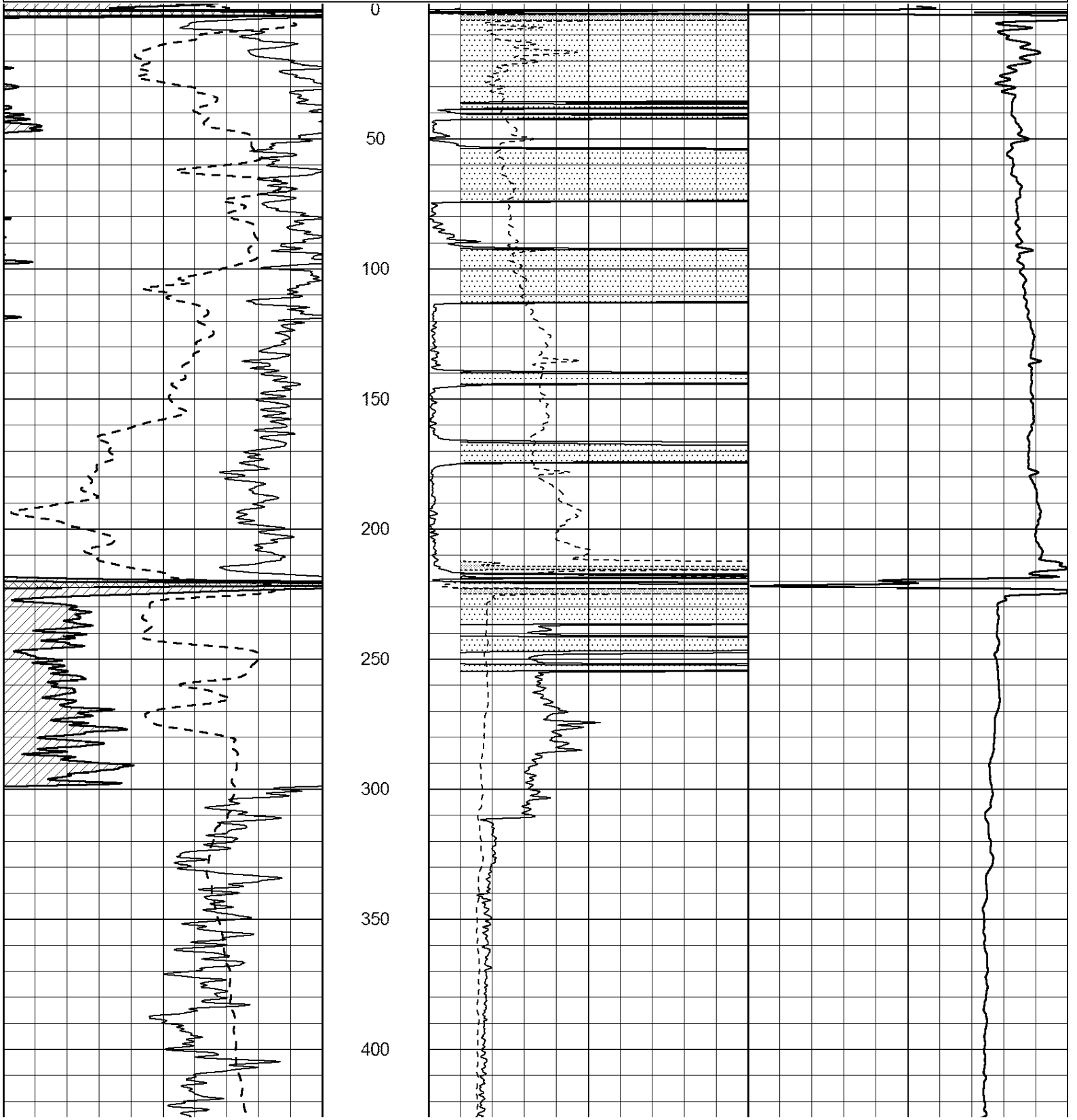
0 RLL3 (Ohm-m) 50

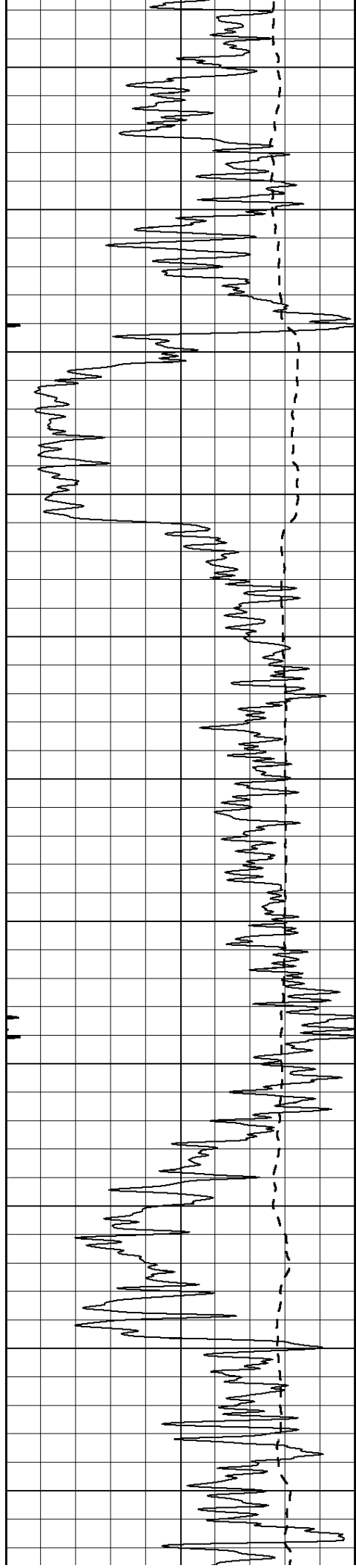
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1000 CILD (mmho/m) 0

50 RILD X10 (Ohm-m) 500

50 RLL3 X10 (Ohm-m) 500





450

500

550

600

650

700

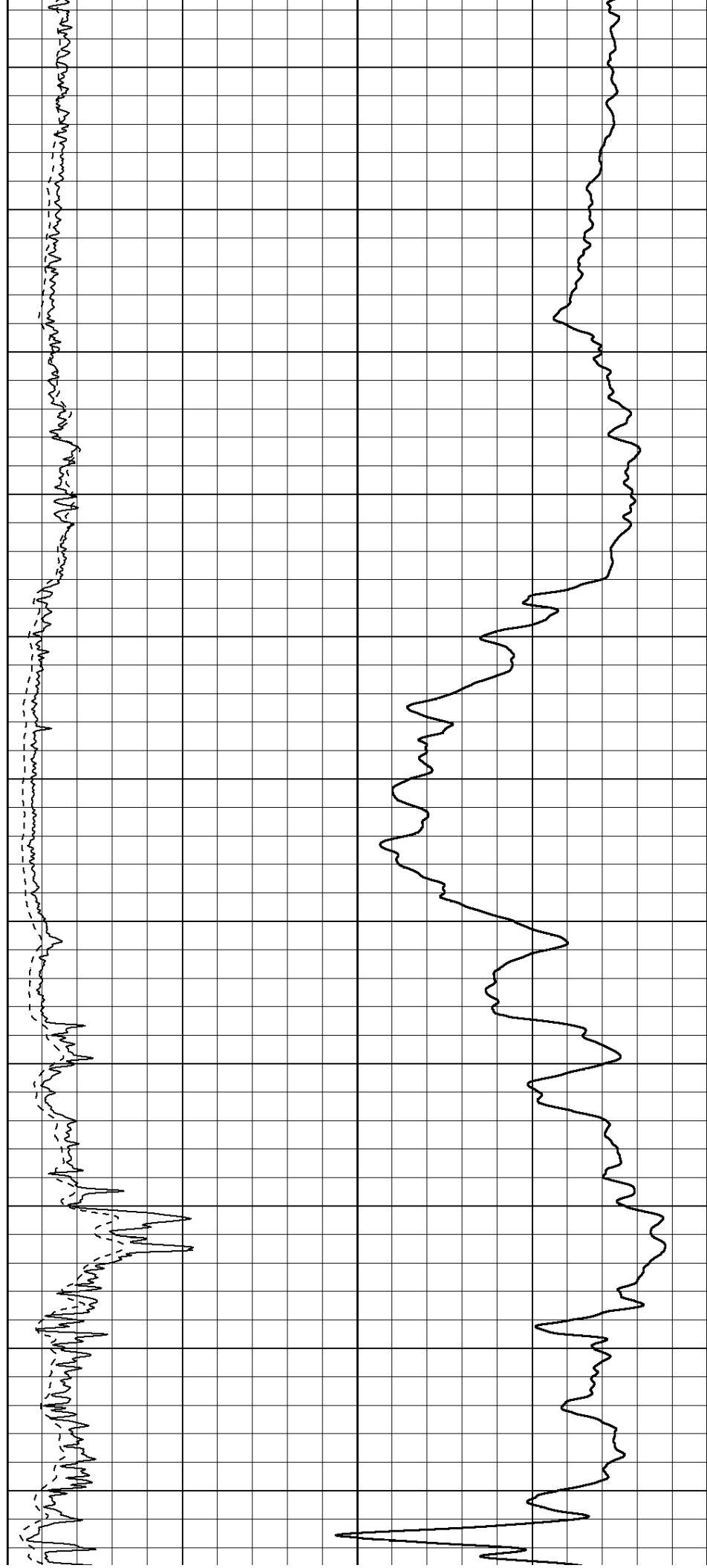
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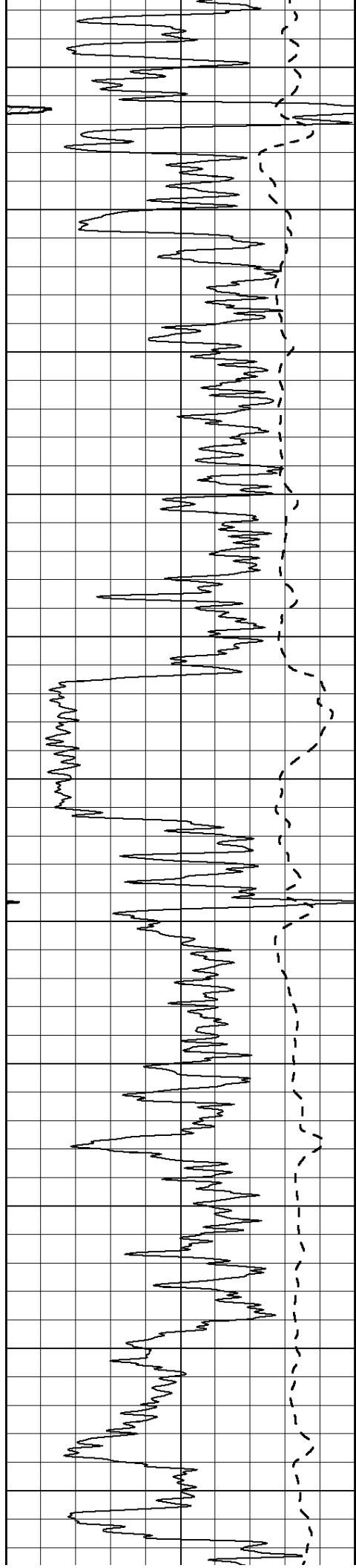
800

850

900

950





1000

1050

1100

1150

1200

1250

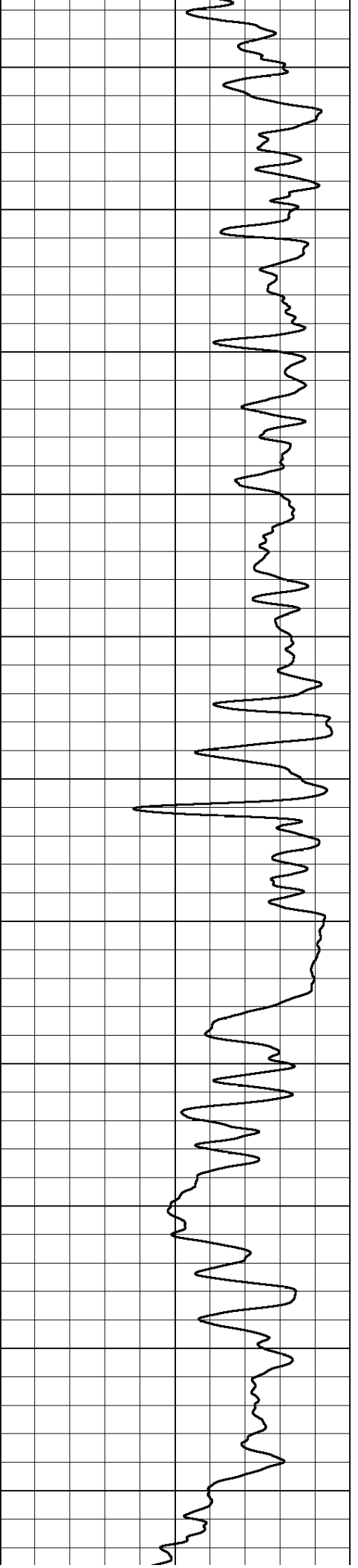
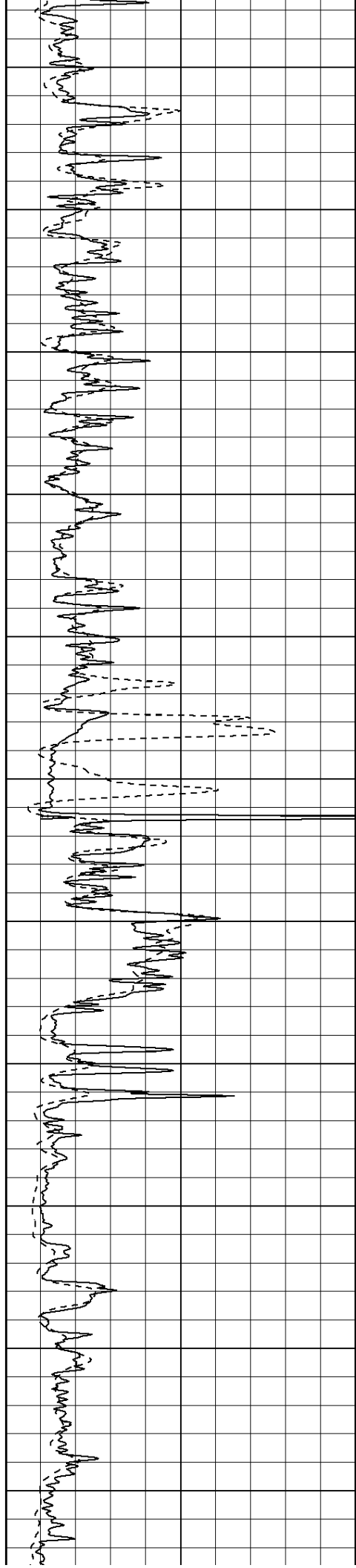
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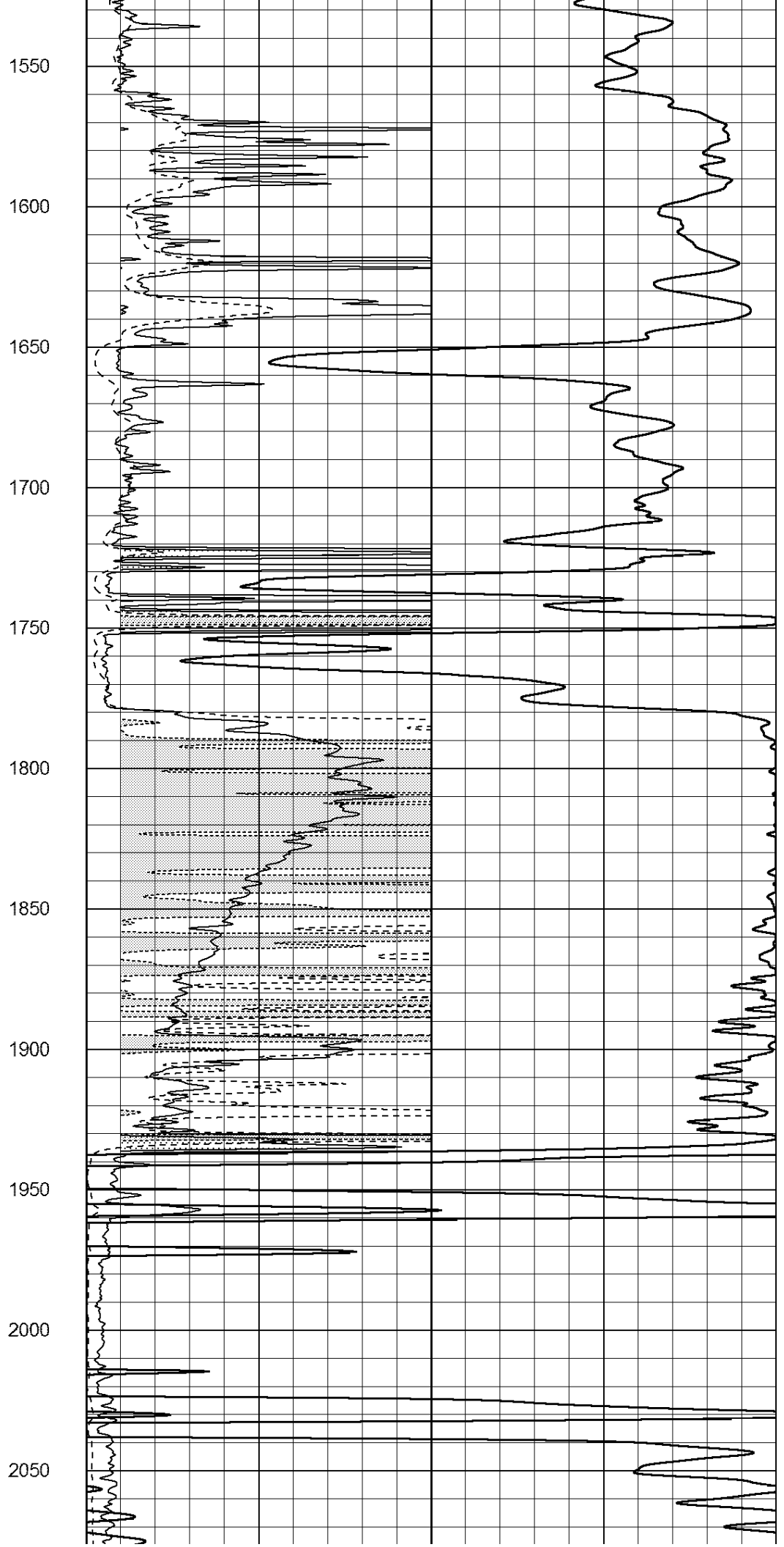
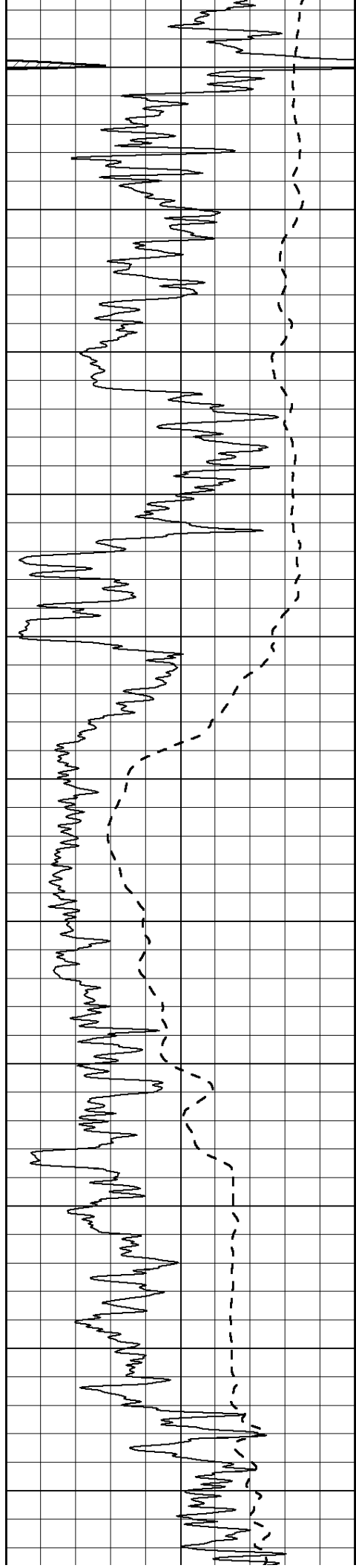
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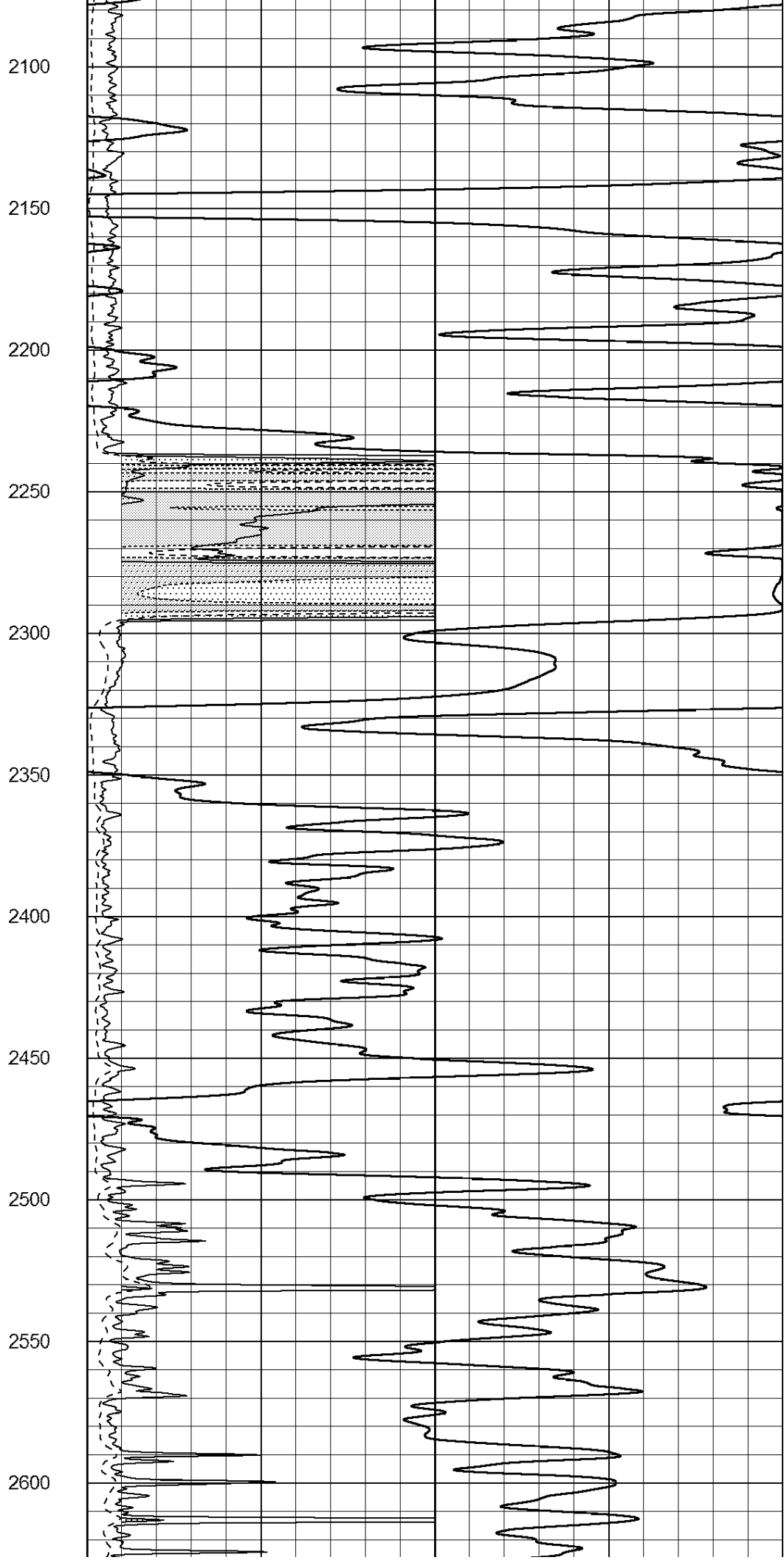
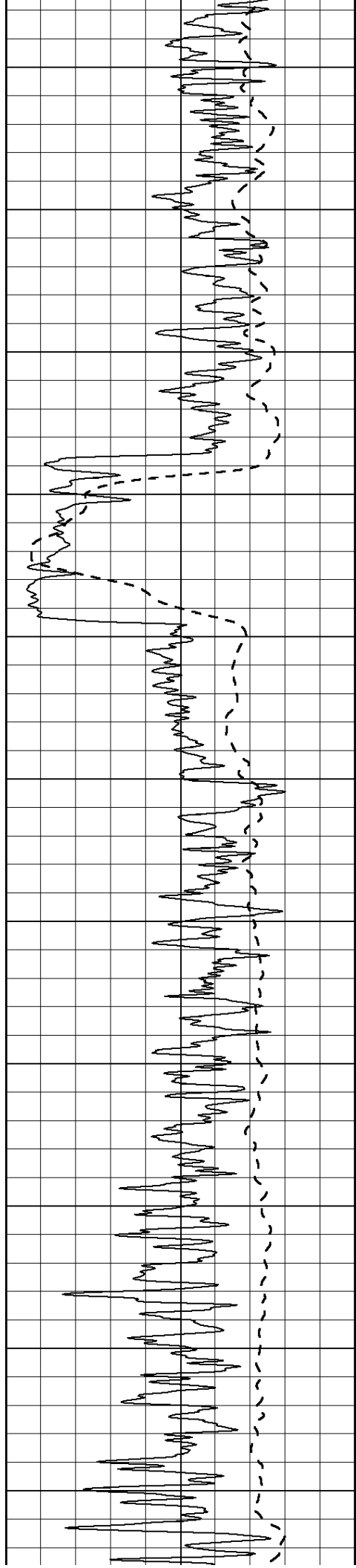
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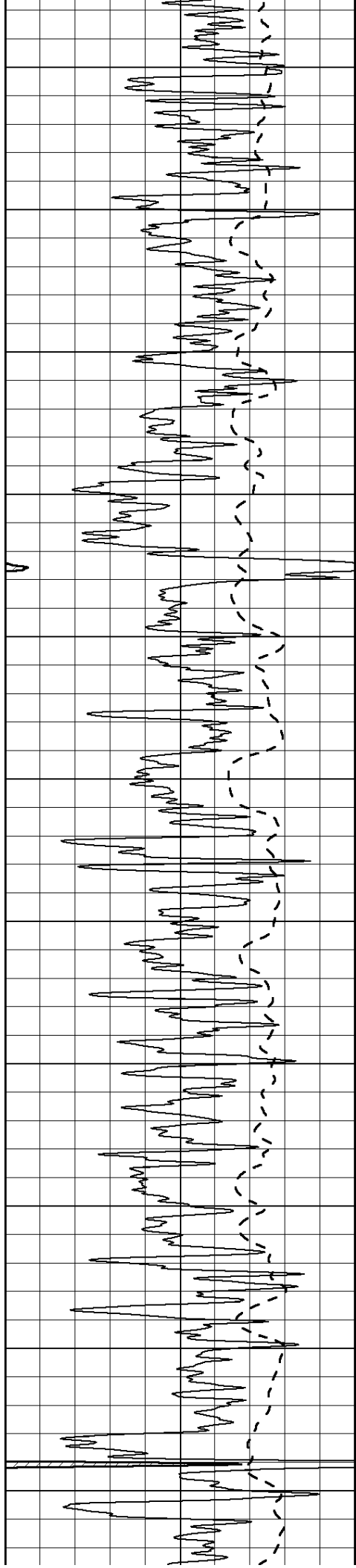
1450

1500









2650

2700

2750

2800

2850

2900

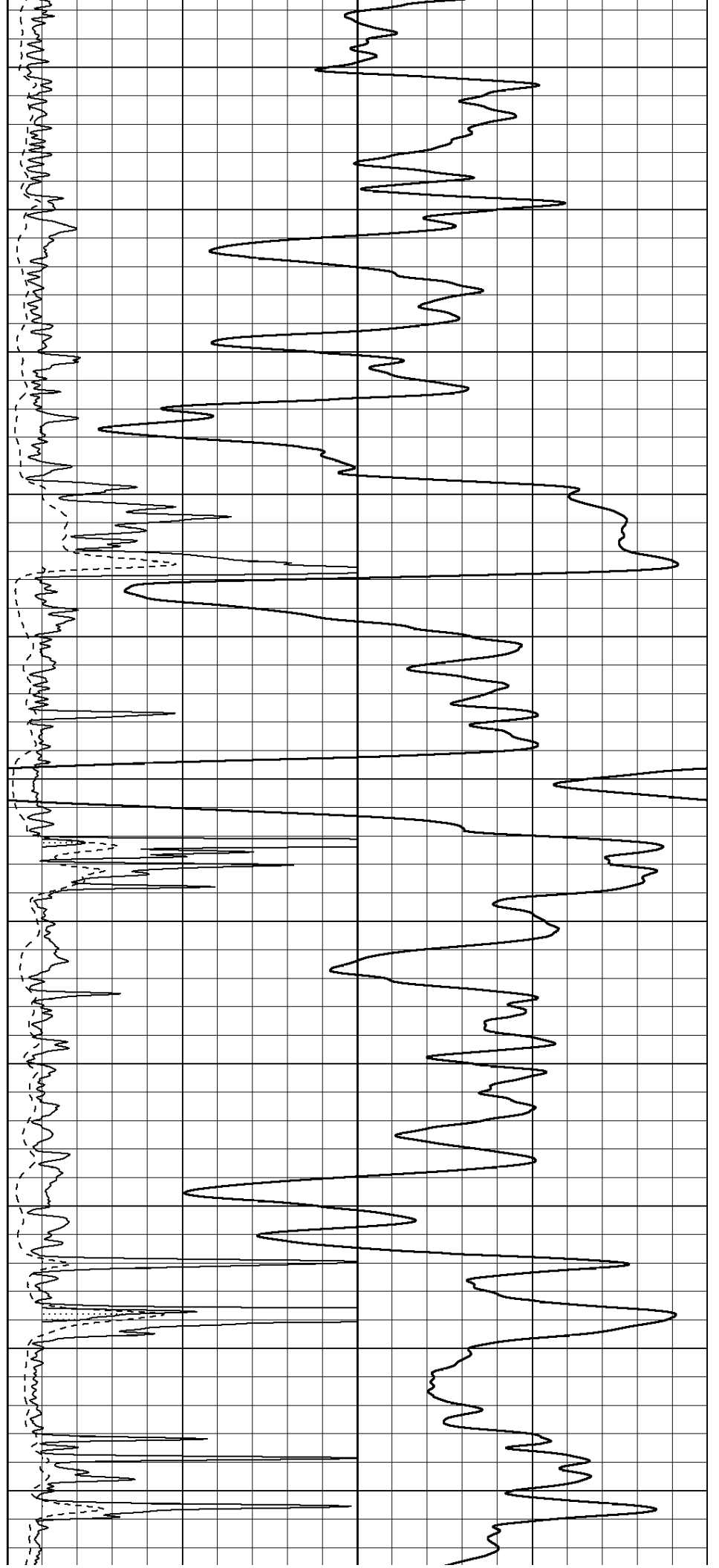
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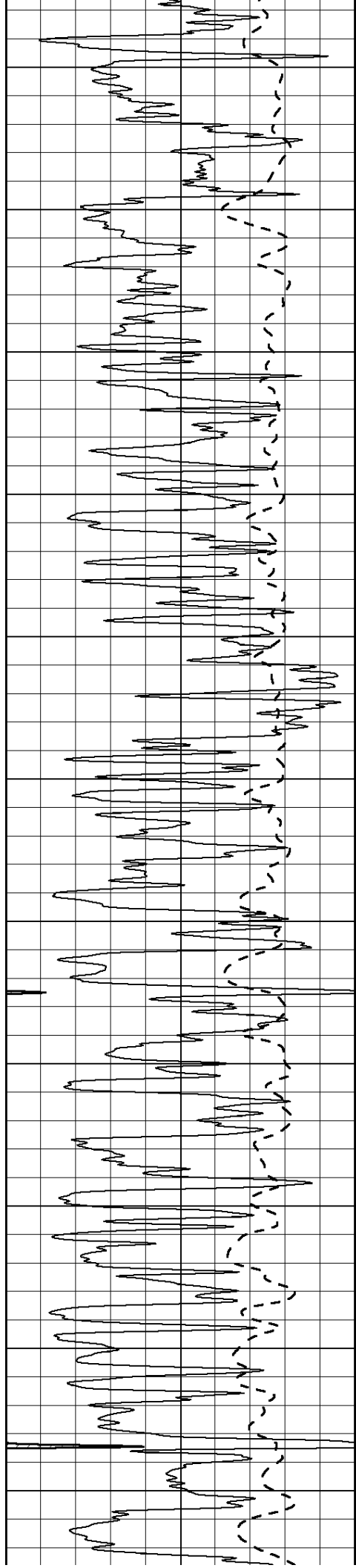
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3050

3100

3150





3200

3250

3300

3350

3400

3450

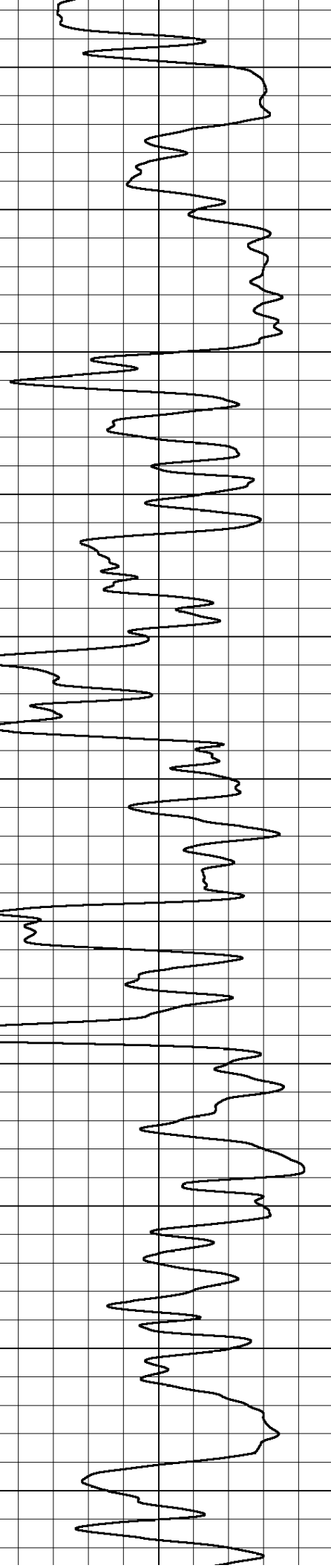
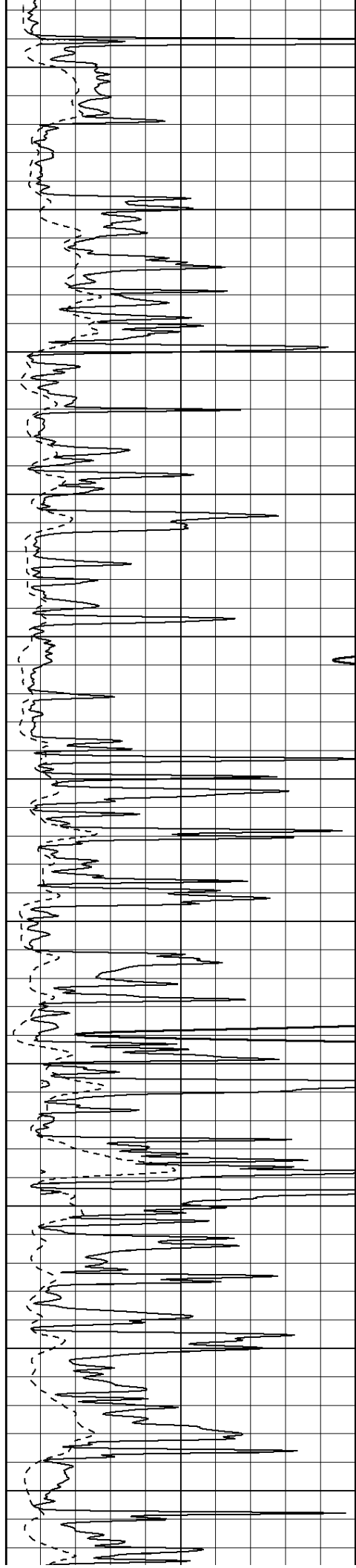
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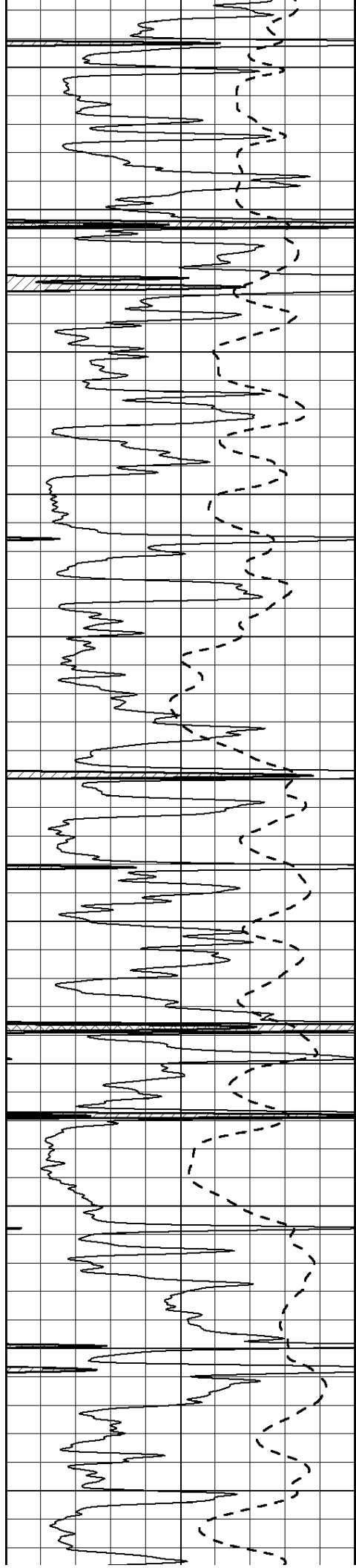
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3600

3650

3700





3750

3800

3850

3900

3950

4000

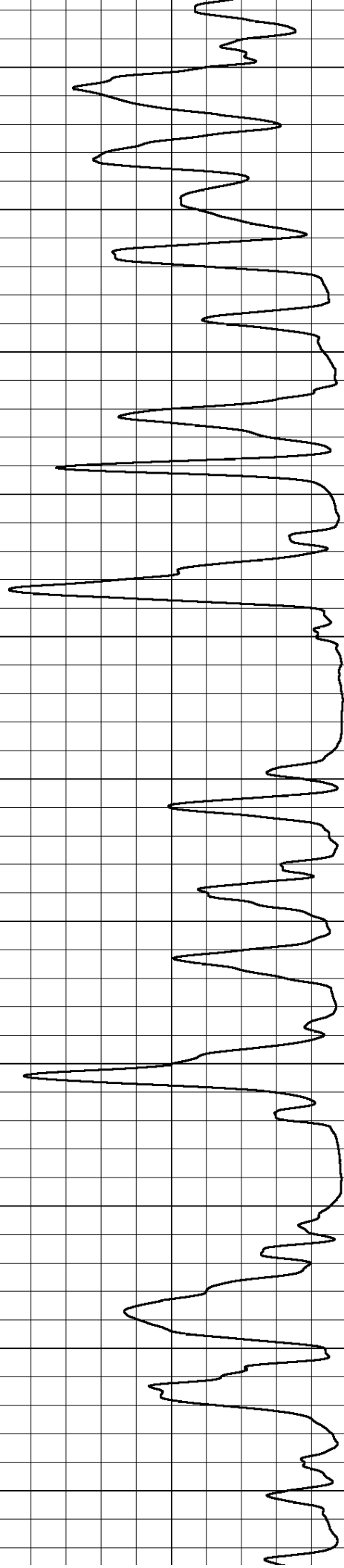
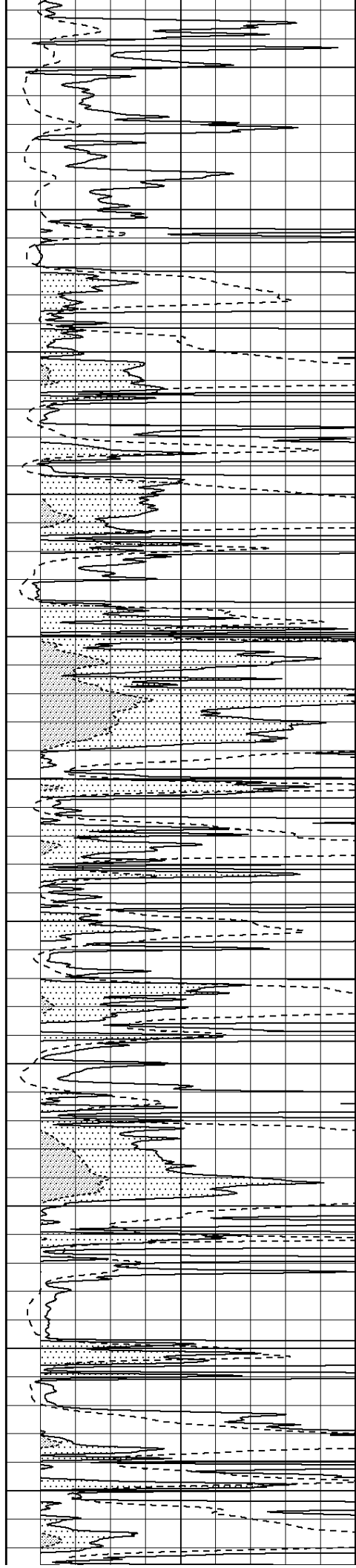
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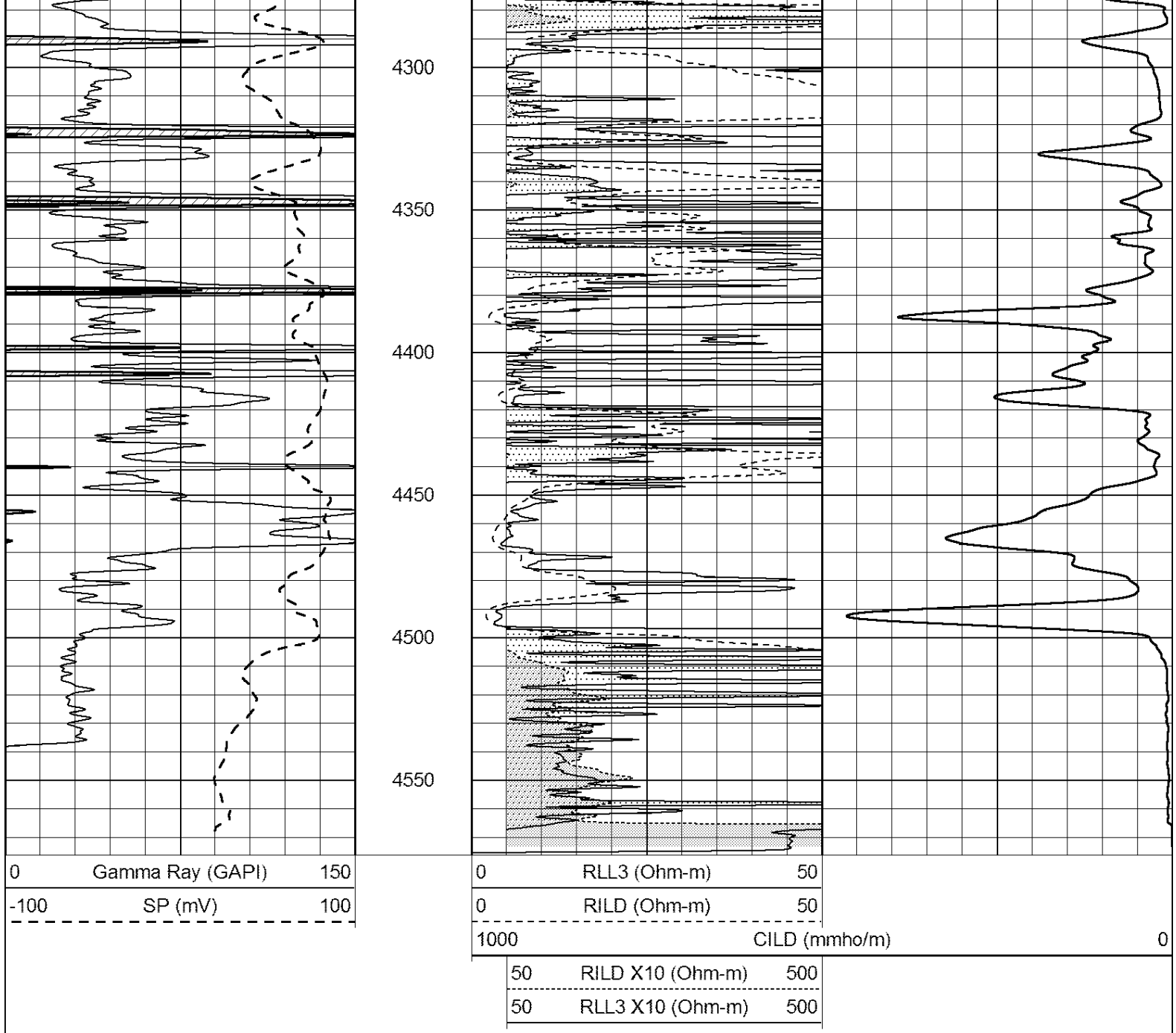
4100

4150

4200

4250





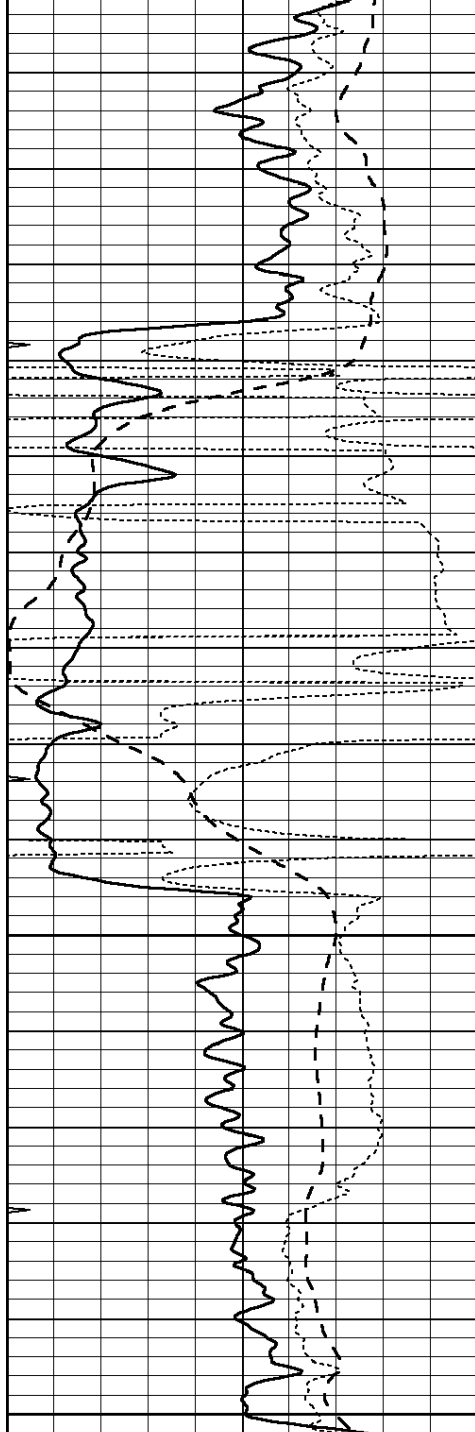
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# ANHYDRITE

Database File: 408768ddn.db  
 Dataset Pathname: pass3.8  
 Presentation Format: dil  
 Dataset Creation: Wed May 16 08:00:58 2012 by Calc Open-Cased 110302  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |     |                          |      |
|------|------------------|-----|-----|--------------------------|------|
| 0    | GAMMA RAY (GAPI) | 150 | 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| -100 | SP (mV)          | 100 | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| -250 | Rxo/Rt           | 50  | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| 0    | MINMK            | 20  |     |                          |      |

2200

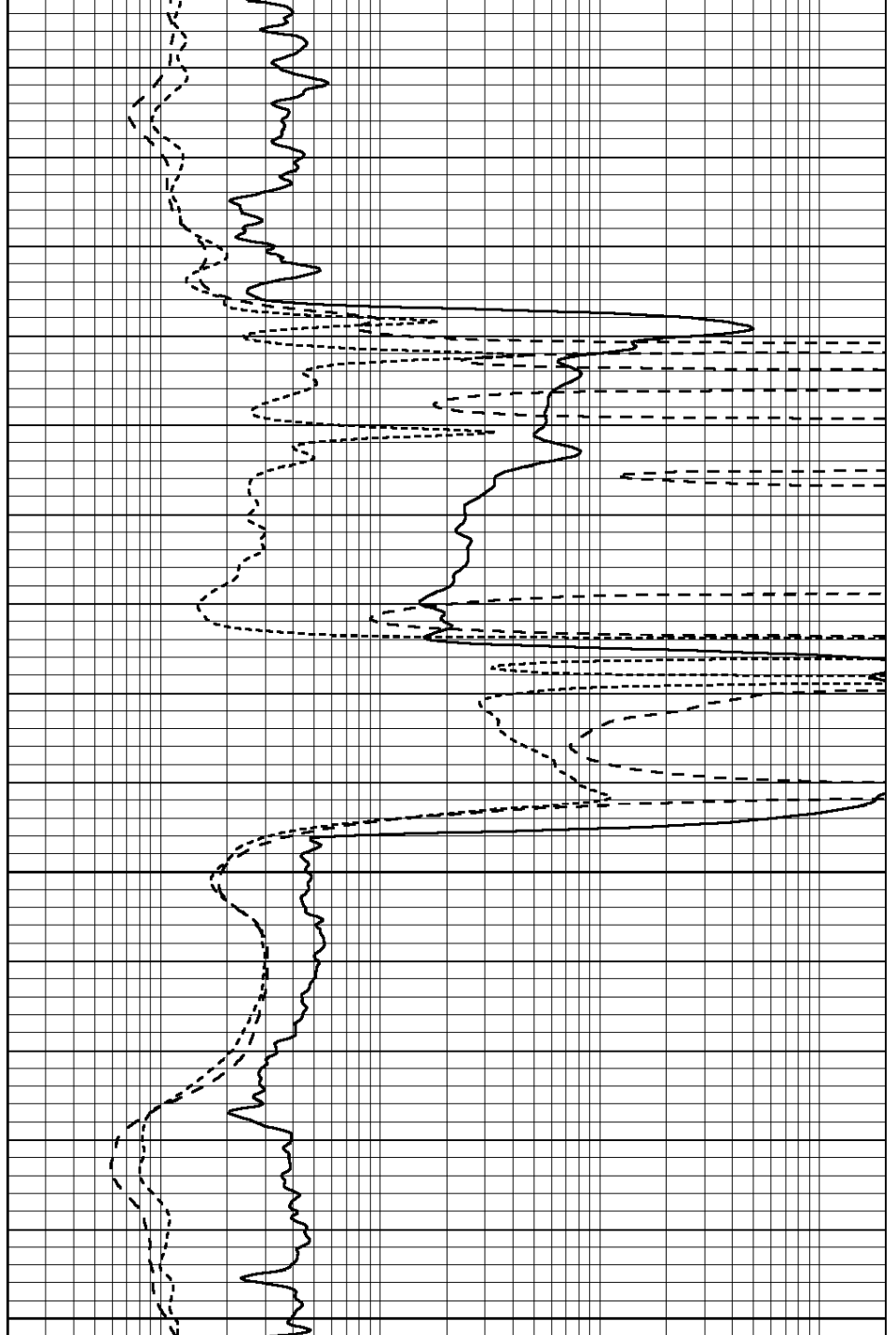


2250

2300

2350

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |



|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



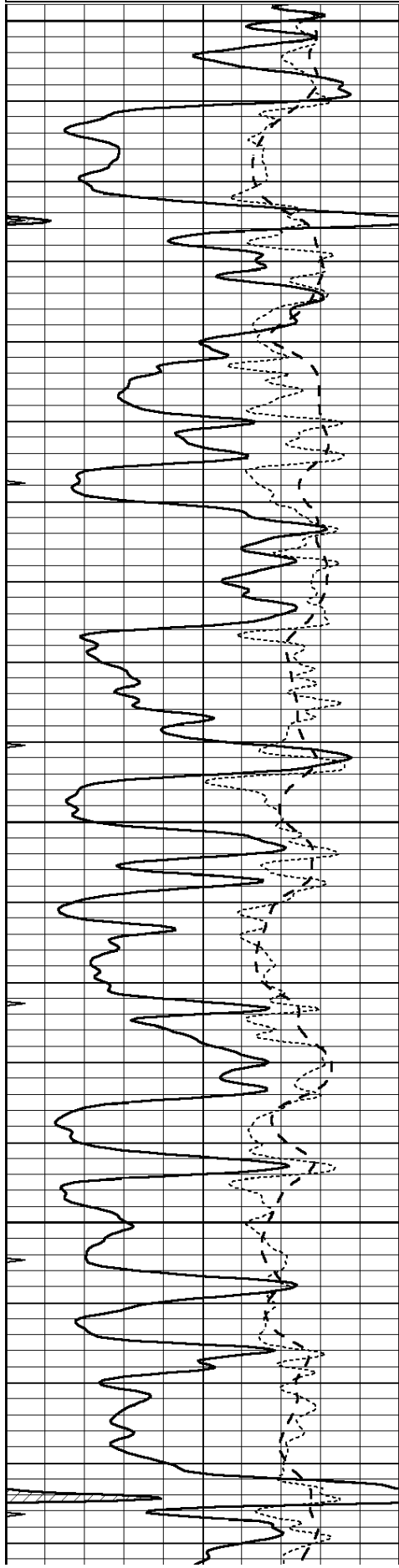
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Hays,  
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# MAIN SECTION

Database File: 408768ddn.db  
 Dataset Pathname: pass3.10  
 Presentation Format: dil  
 Dataset Creation: Wed May 16 08:05:30 2012 by Calc Open-Cased 110302  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |

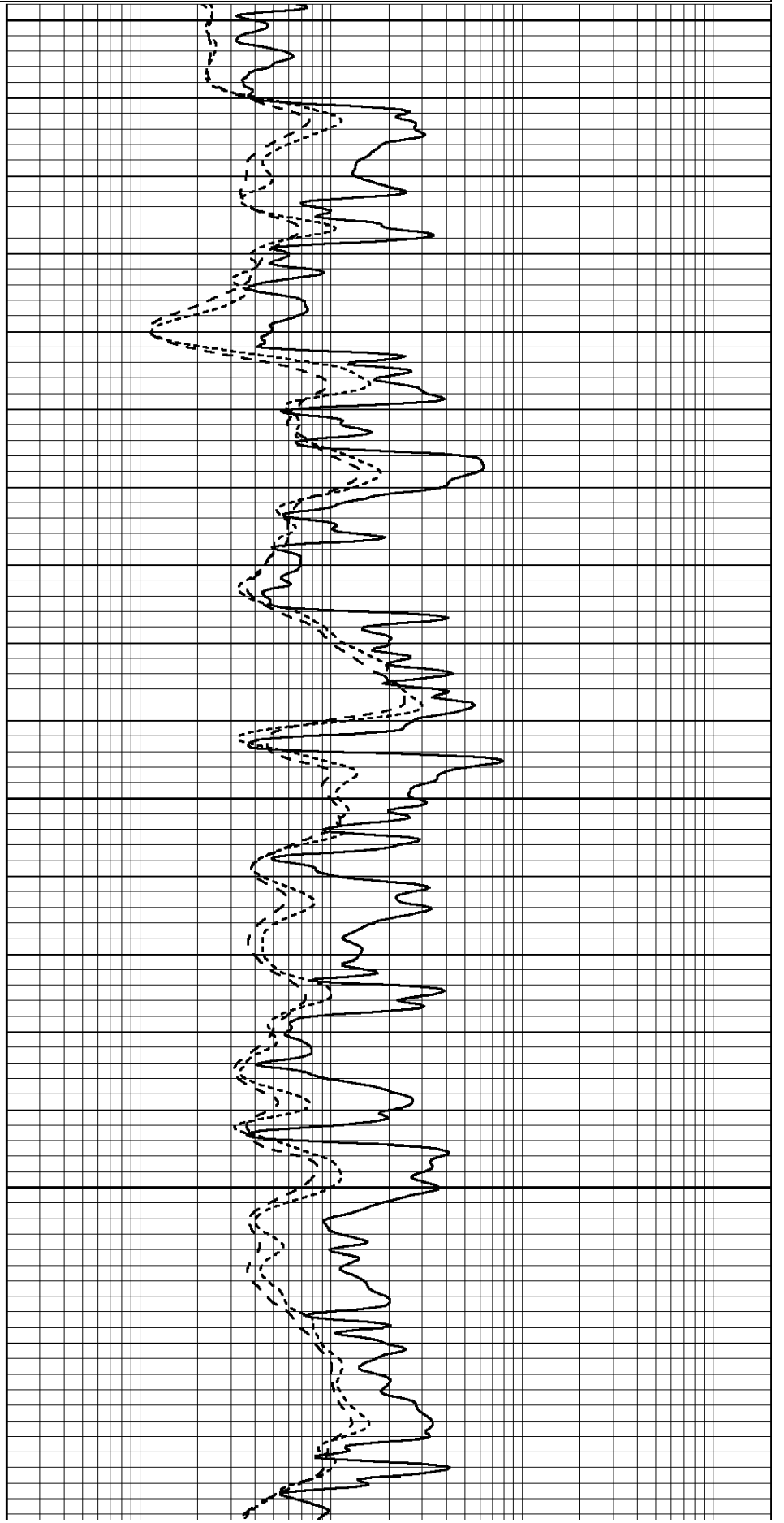


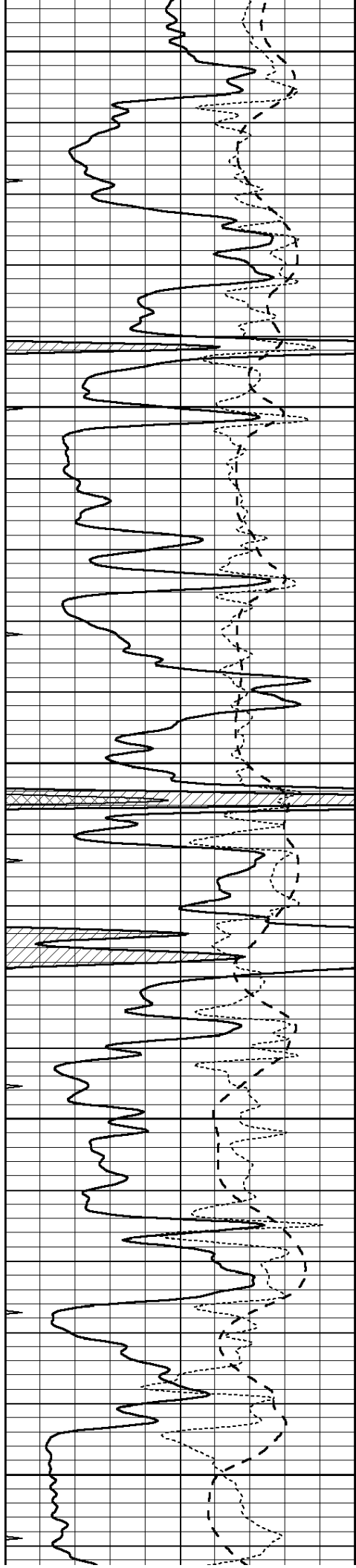
3500

3550

3600

3650





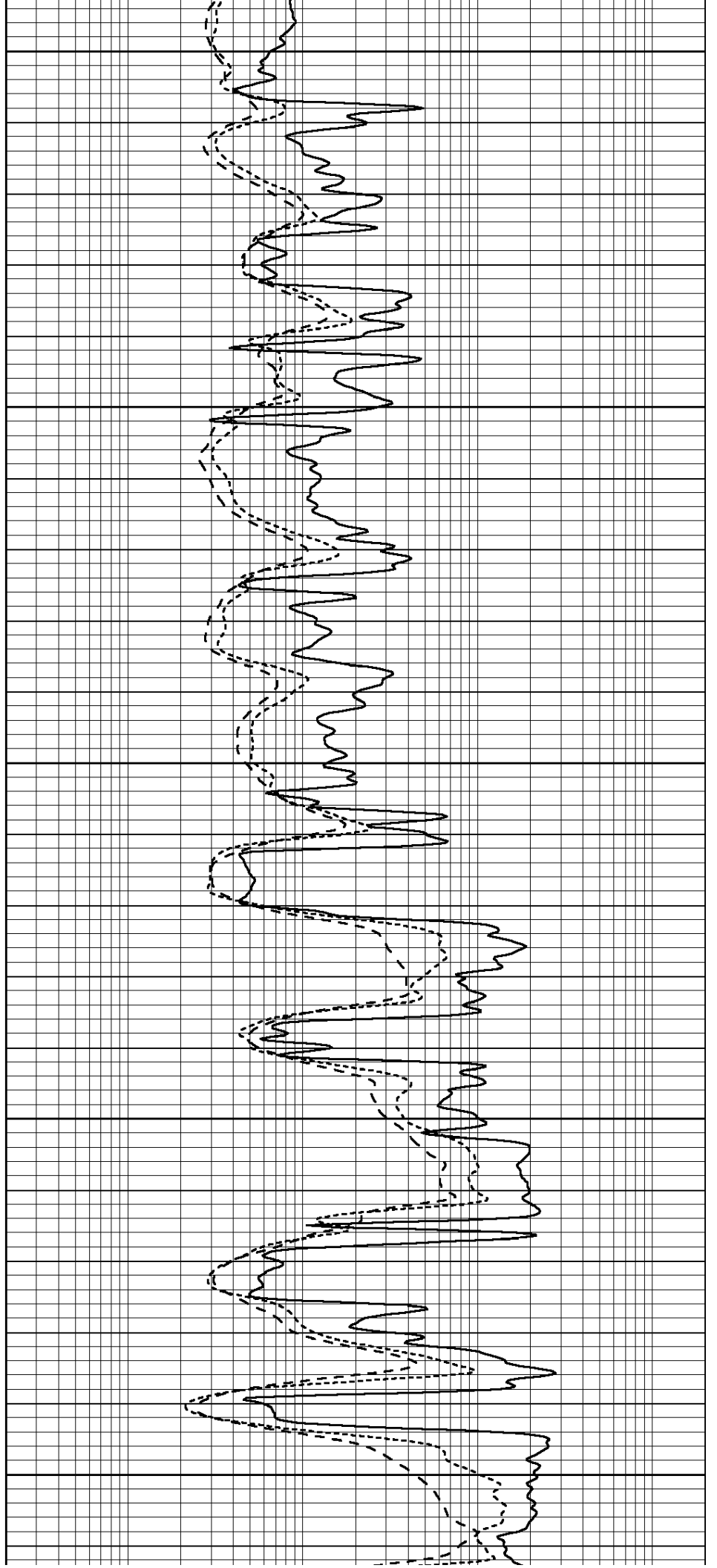
3700

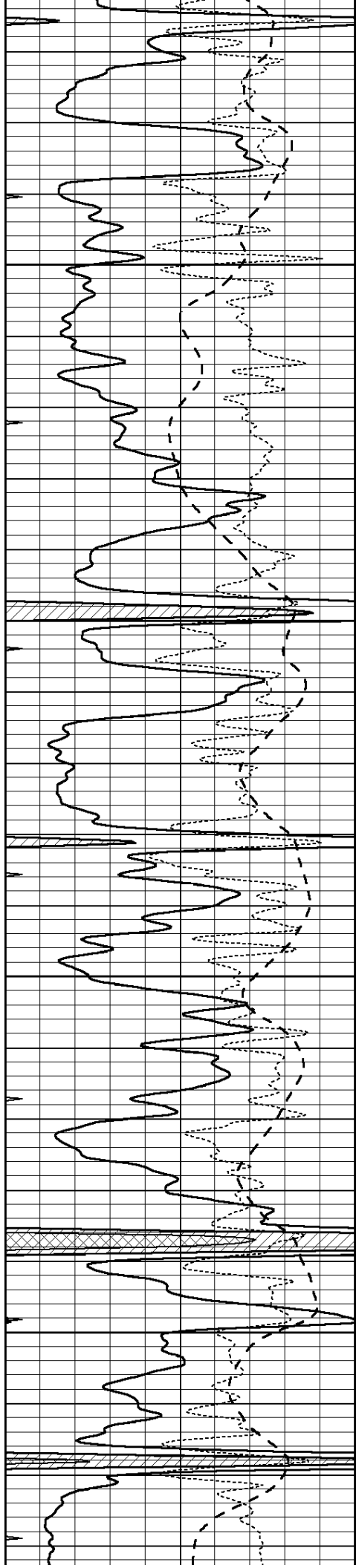
3750

3800

3850

3900



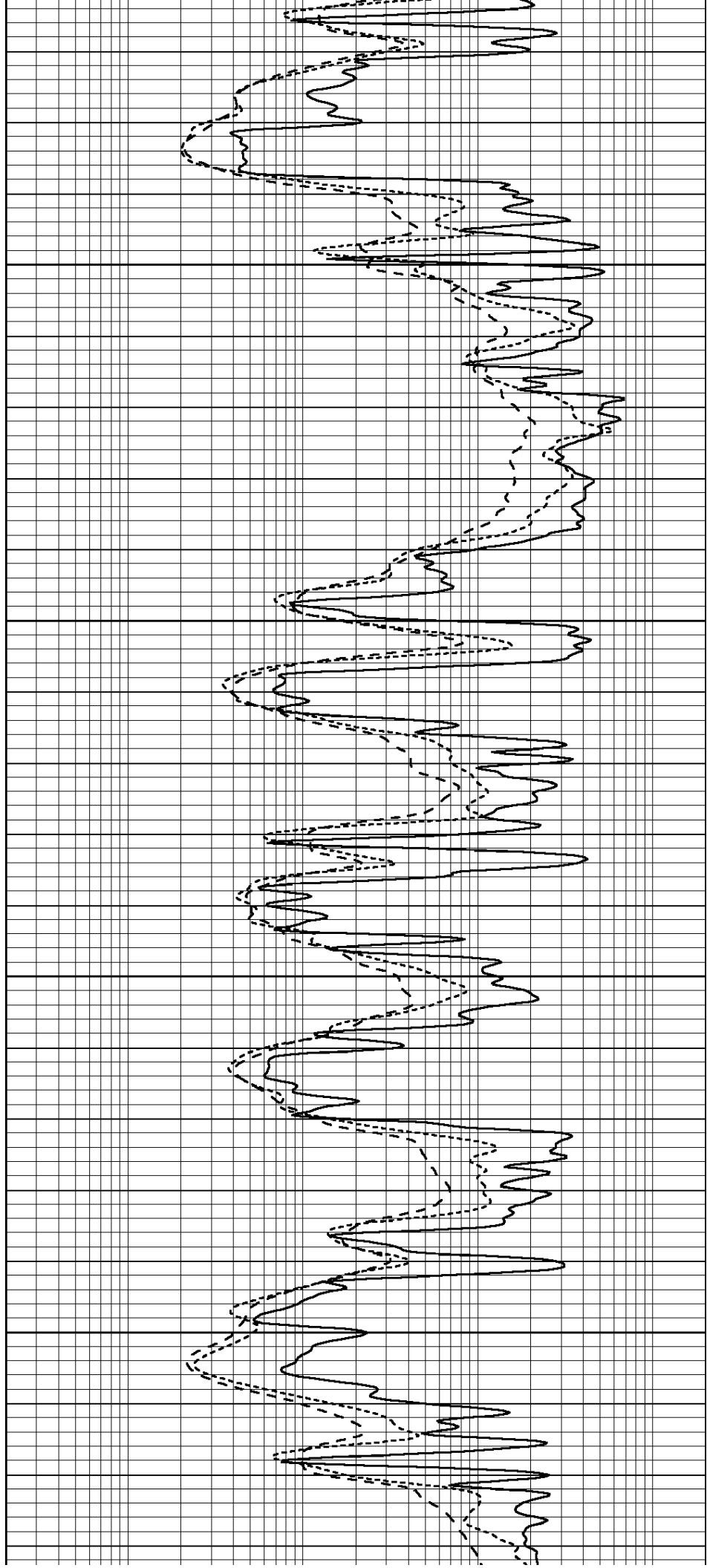


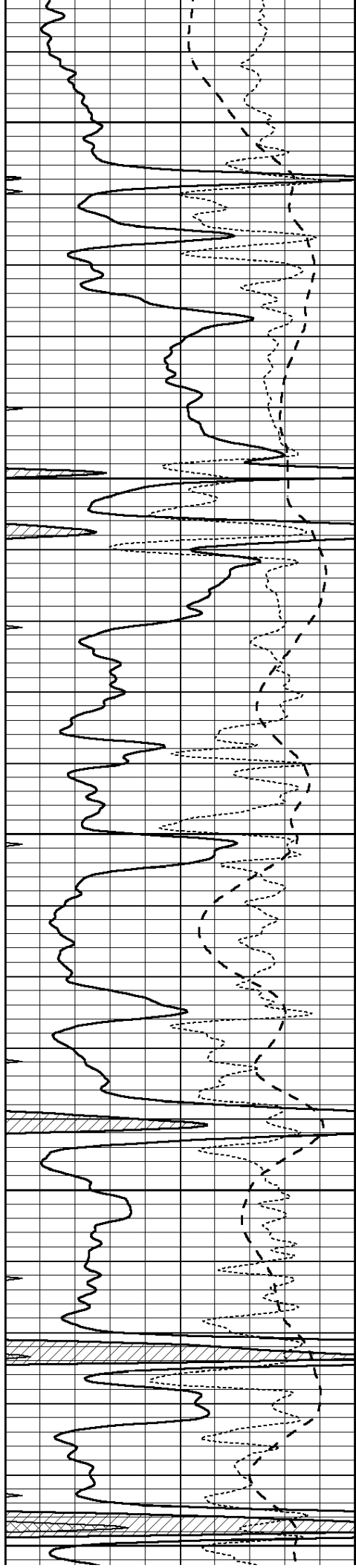
3950

4000

4050

4100





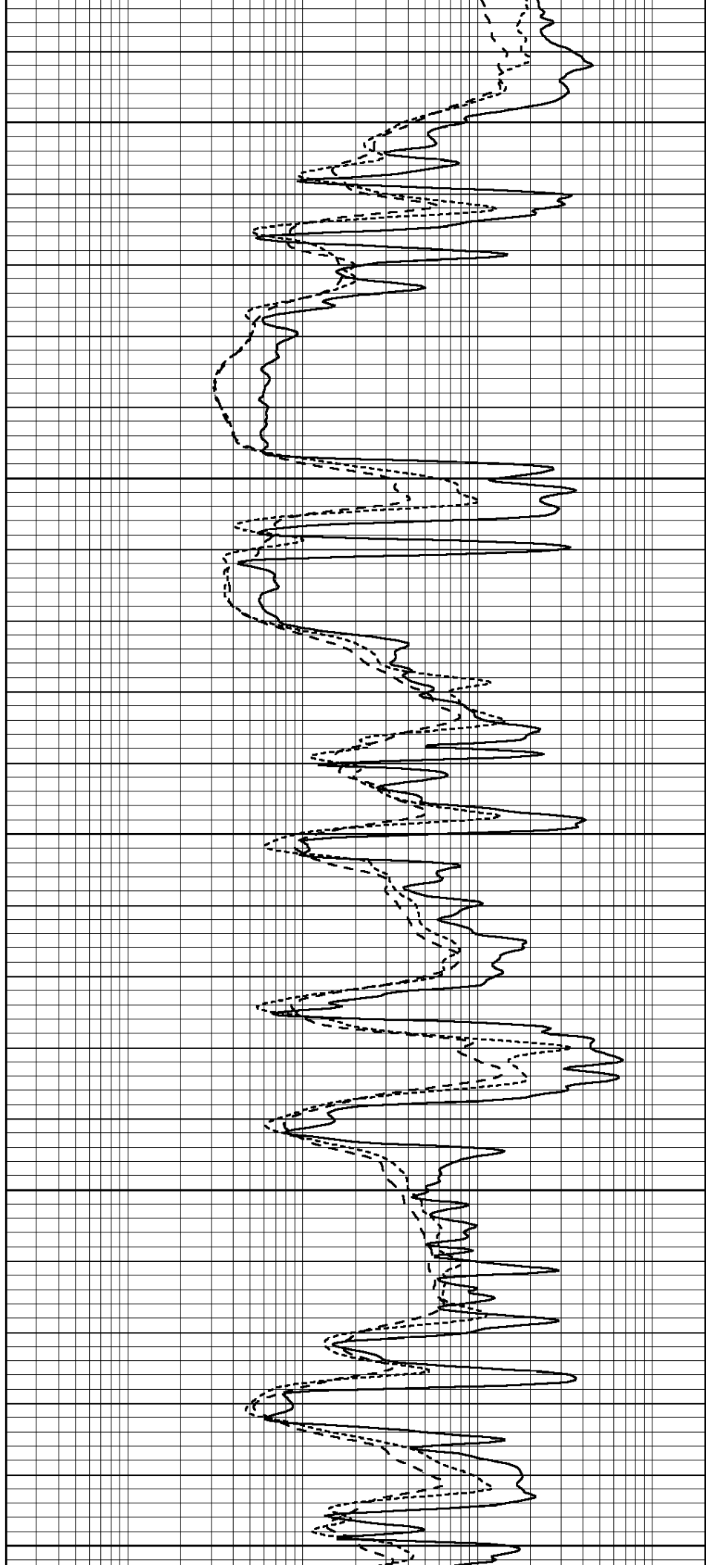
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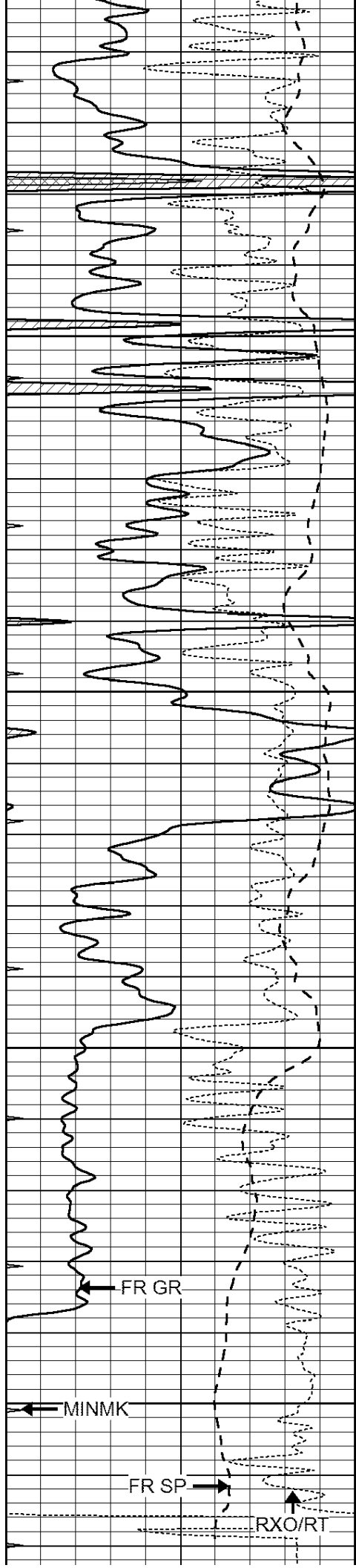
4200

4250

4300

4350





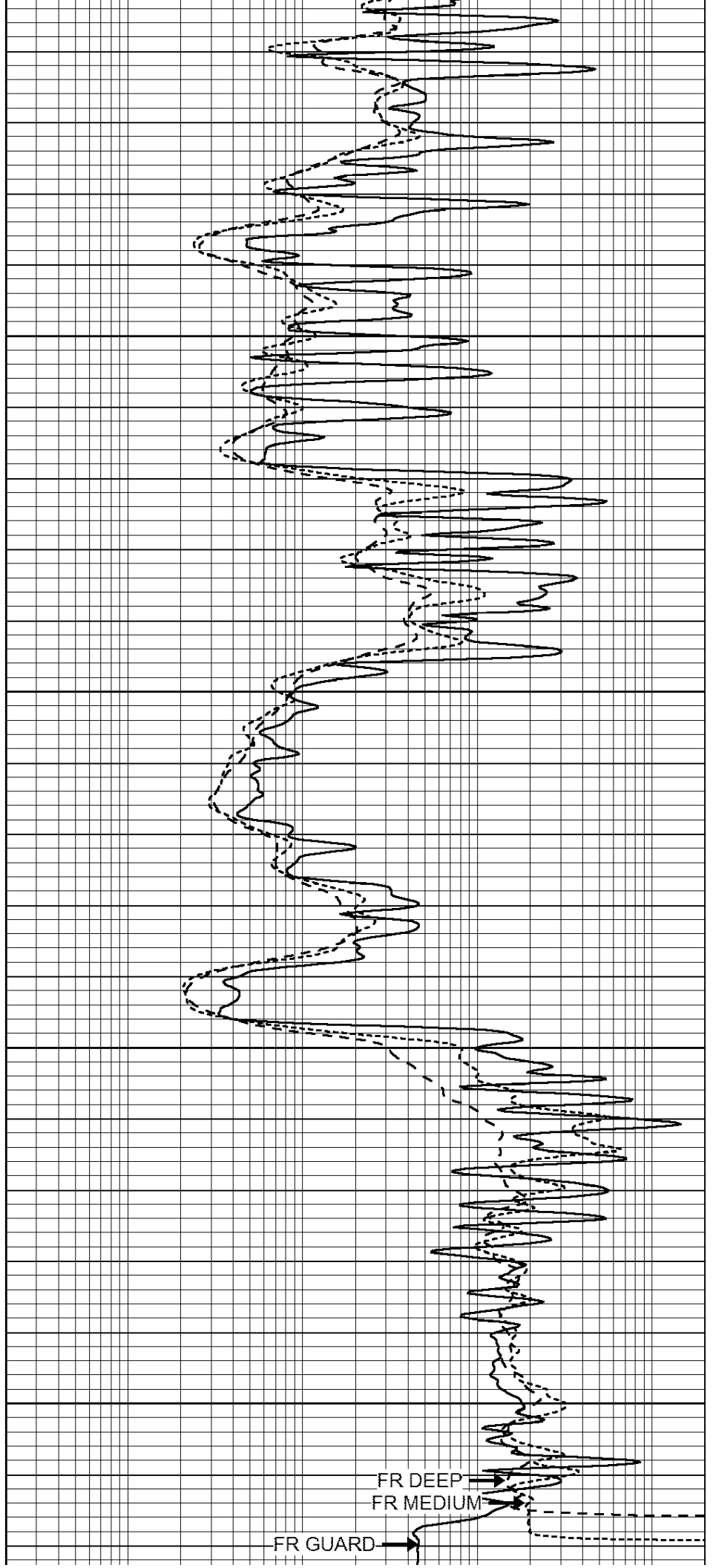
4400

4450

4500

4550

LTD 4572



|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



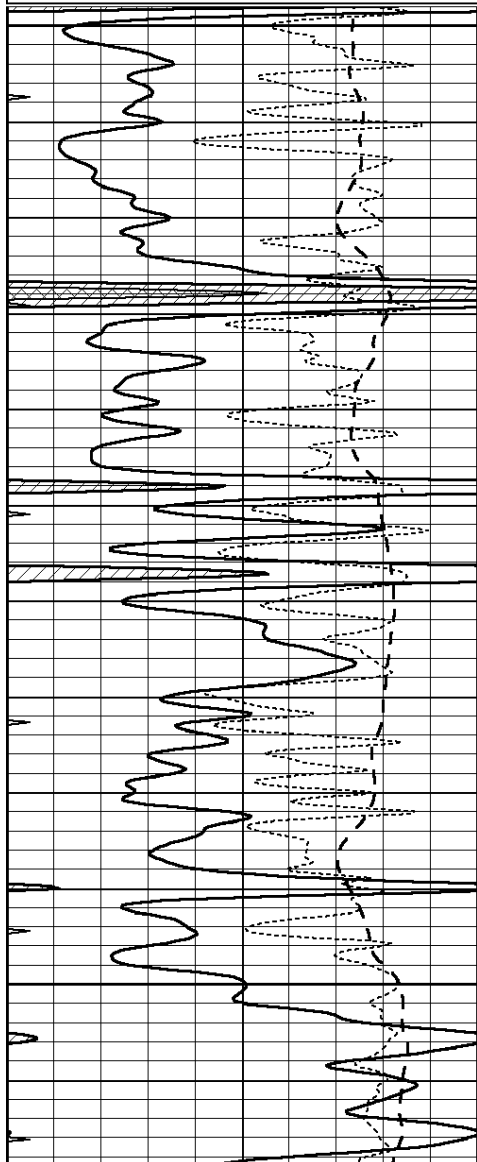
SUPERIOR  
Hays,  
Kansas

# REPEAT SECTION

Database File: 408768ddn.db  
 Dataset Pathname: pass2.4  
 Presentation Format: dil  
 Dataset Creation: Wed May 16 08:13:24 2012 by Calc Open-Cased 110302  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

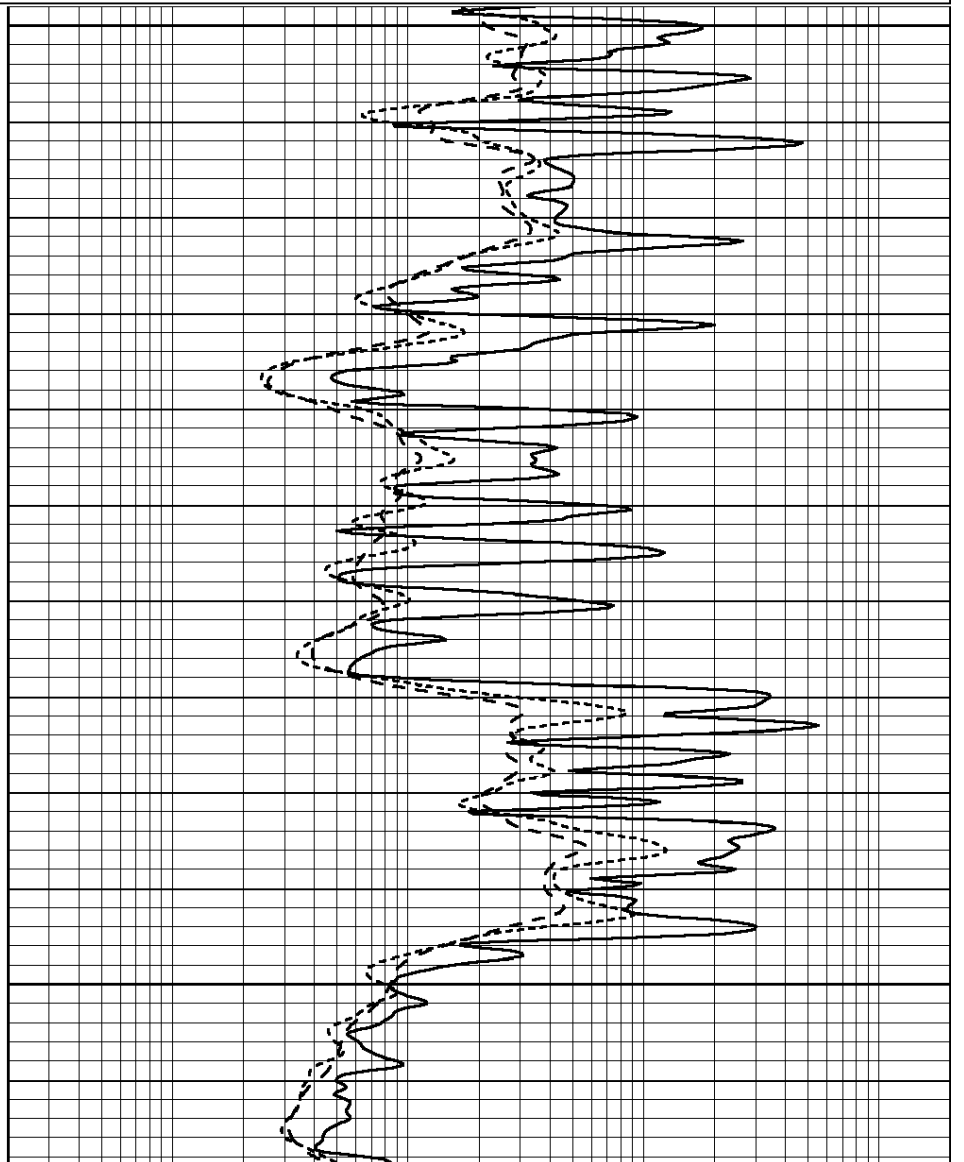
|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |

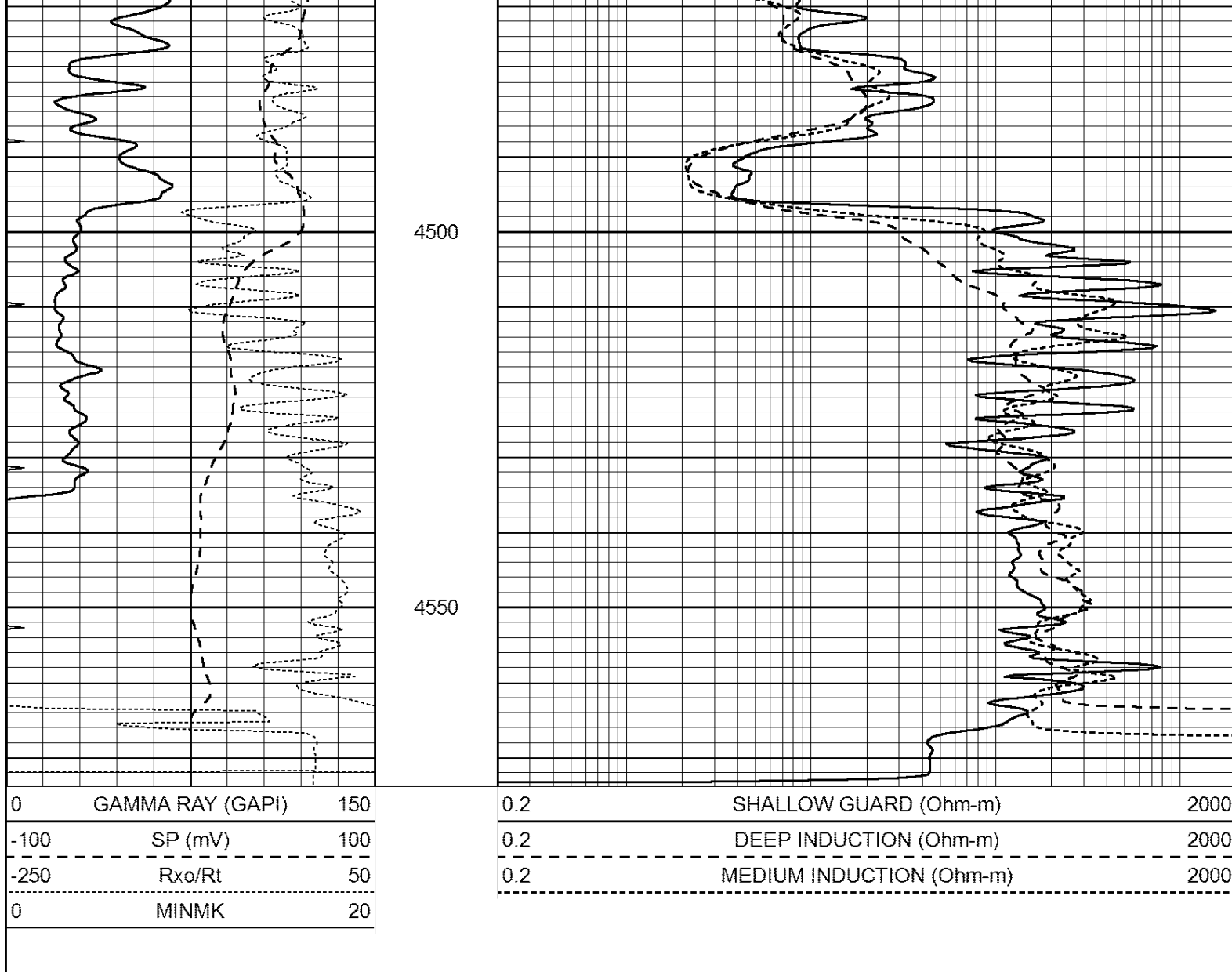


4350

4400

4450





### Calibration Report

Database File: 408768ddn.db  
 Dataset Pathname: pass3.10  
 Dataset Creation: Wed May 16 08:05:30 2012 by Calc Open-Cased 110302

### Dual Induction Calibration Report

Serial-Model: DIL4-GEAR  
 Performed: Mon May 14 21:35:43 2012

|           | Readings |       |   |       | References |        | Results |         |
|-----------|----------|-------|---|-------|------------|--------|---------|---------|
| Loop:     | Air      | Loop  |   | Air   | Loop       |        | m       | b       |
| Deep      | 0.008    | 0.666 | V | 0.000 | 400.000    | mmho/m | 570.000 | -2.000  |
| Medium    | -0.003   | 0.769 | V | 0.000 | 462.500    | mmho/m | 560.000 | -3.000  |
| Internal: | Zero     | Cal   |   | Zero  | Cal        |        | m       | b       |
| Deep      | 0.013    | 0.651 | V | 0.000 | 400.000    | mmho/m | 627.541 | -8.365  |
| Medium    | 0.020    | 0.754 | V | 0.000 | 462.500    | mmho/m | 630.311 | -12.549 |

Litho Density Calibration Report  
 Serial: 003N Model: PRB  
 Performed Tue Sep 08 14:14:44 2009

Litho Density Calibration

|             | Background | Magnesium   | Aluminum | Sandstone           |         |
|-------------|------------|-------------|----------|---------------------|---------|
| Window 1    | 2042.6     | 12312.8     | 4225.8   | 13758.4             | cps     |
| Window 2    | 1855.8     | 10134.7     | 3624.2   | 11113.1             | cps     |
| Window 3    | 1639.4     | 6760.2      | 2716.3   | 7260.3              | cps     |
| Window 4    | 466.4      | 469.2       | 466.1    | 476.5               | cps     |
| Long Space  | 0.0        | 8278.9      | 1768.4   | 9257.4              | cps     |
| Short Space | 2.2        | 2377.3      | 1544.1   | 2574.2              | cps     |
| Rho         |            | 1.7100      | 2.5900   | 1.3800              | g/cc    |
| Pe          |            |             | 2.5700   | 1.5500              |         |
| Rib Angle   | : 44.4     | Rib Slope   | : 0.979  | Density/Spine Ratio | : 0.549 |
| Spine Angle | : 74.4     | Spine Slope | : 3.577  | Spine Intercept     | : -18.8 |

| Caliper  | Readings  | Reference |              |
|----------|-----------|-----------|--------------|
| Low Ref  | 3.4       | 7.9       |              |
| High Ref | 5.5       | 15.0      |              |
|          | Gain: 3.4 |           | Offset: -3.5 |

Compensated Neutron Calibration Report

Serial Number: 070808  
 Tool Model: Probe

PRE-SURVEY VERIFICATION

| Detector    | Readings | Measured | Target |
|-------------|----------|----------|--------|
| Short Space | cps      |          |        |
| Long Space  | cps      | pu       | pu     |

POST-SURVEY VERIFICATION

| Detector    | Readings | Measured | Target |
|-------------|----------|----------|--------|
| Short Space | cps      |          |        |
| Long Space  | cps      | pu       | pu     |

Gamma Ray Calibration Report

Serial Number: 070559  
 Tool Model: OPEN\_GR  
 Performed: Wed May 16 05:29:35 2012

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 1.0 cps

Sensitivity: 0.3000 GAPI/cps