



**SUPERIOR**  
**Hays,**  
**Kansas**

## DUAL INDUCTION LOG

|                              |                             |                     |                                           |
|------------------------------|-----------------------------|---------------------|-------------------------------------------|
| Company                      | MULL DRILLING COMPANY, INC. |                     |                                           |
| Well                         | #1-17 WIERMAN 'B'           |                     |                                           |
| Field                        | WILDCAT                     |                     |                                           |
| County                       | NESS                        | State               | KANSAS                                    |
| Location:                    | API # : 15-135-25210-0000   |                     | Other Services<br>CDL/CNL/PE<br>MEL/SONIC |
| Permanent Datum              | GROUND LEVEL                | Elevation           | 2444                                      |
| Log Measured From            | KELLY BUSHING 5' A.G.L.     | Elevation           | K.B. 2449<br>D.F. 2447<br>G.L. 2444       |
| Drilling Measured From       | KELLY BUSHING               |                     |                                           |
| Date                         | 2/22/11                     |                     |                                           |
| Run Number                   | ONE                         |                     |                                           |
| Depth Driller                | 4530                        |                     |                                           |
| Depth Logger                 | 4530                        |                     |                                           |
| Bottom Logged Interval       | 4528                        |                     |                                           |
| Top Log Interval             | 00                          |                     |                                           |
| Casing Driller               | 8 5/8" @ 227'               |                     |                                           |
| Casing Logger                | 224                         |                     |                                           |
| Bit Size                     | 7 7/8"                      |                     |                                           |
| Type Fluid in Hole           | CHEMICAL MUD                | CHLORIDES 4,500 PPM |                                           |
| Density / Viscosity          | 9.0/69                      |                     |                                           |
| pH / Fluid Loss              | 10.0/8.4                    |                     |                                           |
| Source of Sample             | FLOWLINE                    |                     |                                           |
| Rin @ Meas. Temp             | .950 @ 65F                  |                     |                                           |
| Rinf @ Meas. Temp            | .713 @ 65F                  |                     |                                           |
| Rinc @ Meas. Temp            | 1.14 @ 65F                  |                     |                                           |
| Source of Rinf / Rinc        | MEASUREMENT                 |                     |                                           |
| Rin @ BHT                    | .510 @ 121F                 |                     |                                           |
| Time Circulation Stopped     | 2 HOURS                     |                     |                                           |
| Time Logger on Bottom        | 1:00 P.M.                   |                     |                                           |
| Maximum Recorded Temperature | 121F                        |                     |                                           |
| Equipment Number             | 0836                        |                     |                                           |
| Location                     | HAYS, KANSAS                |                     |                                           |
| Recorded By                  | JEFF LUEBBERS               |                     |                                           |
| Witnessed By                 | KEVIN KESSLER               |                     |                                           |

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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 USING SUPERIOR WELL SERVICE HAYS, KANSAS (785) 628-6395  
DIRECTIONS  
BROWNELL, KS. 2W. ON HWY 4 TO "RD. Y", 1N., E. INTO



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# MAIN SECTION

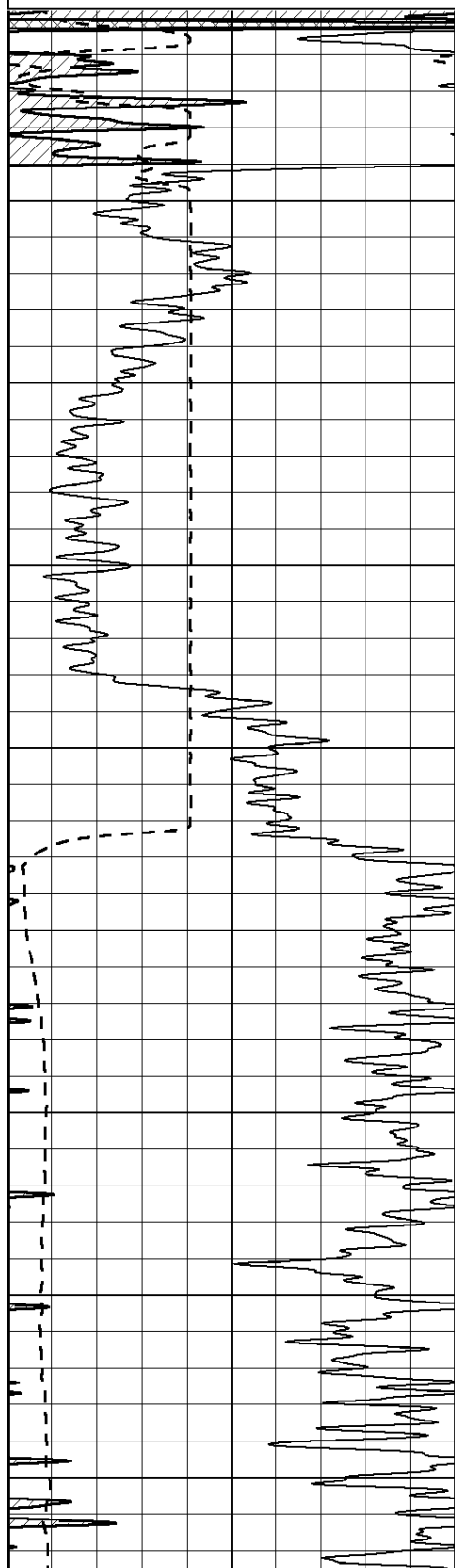
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Dataset Pathname: pass3.3  
Presentation Format: dil2  
Dataset Creation: Tue Feb 22 14:36:41 2011 by Calc Open-Cased 090629  
Charted by: Depth in Feet scaled 1:600

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

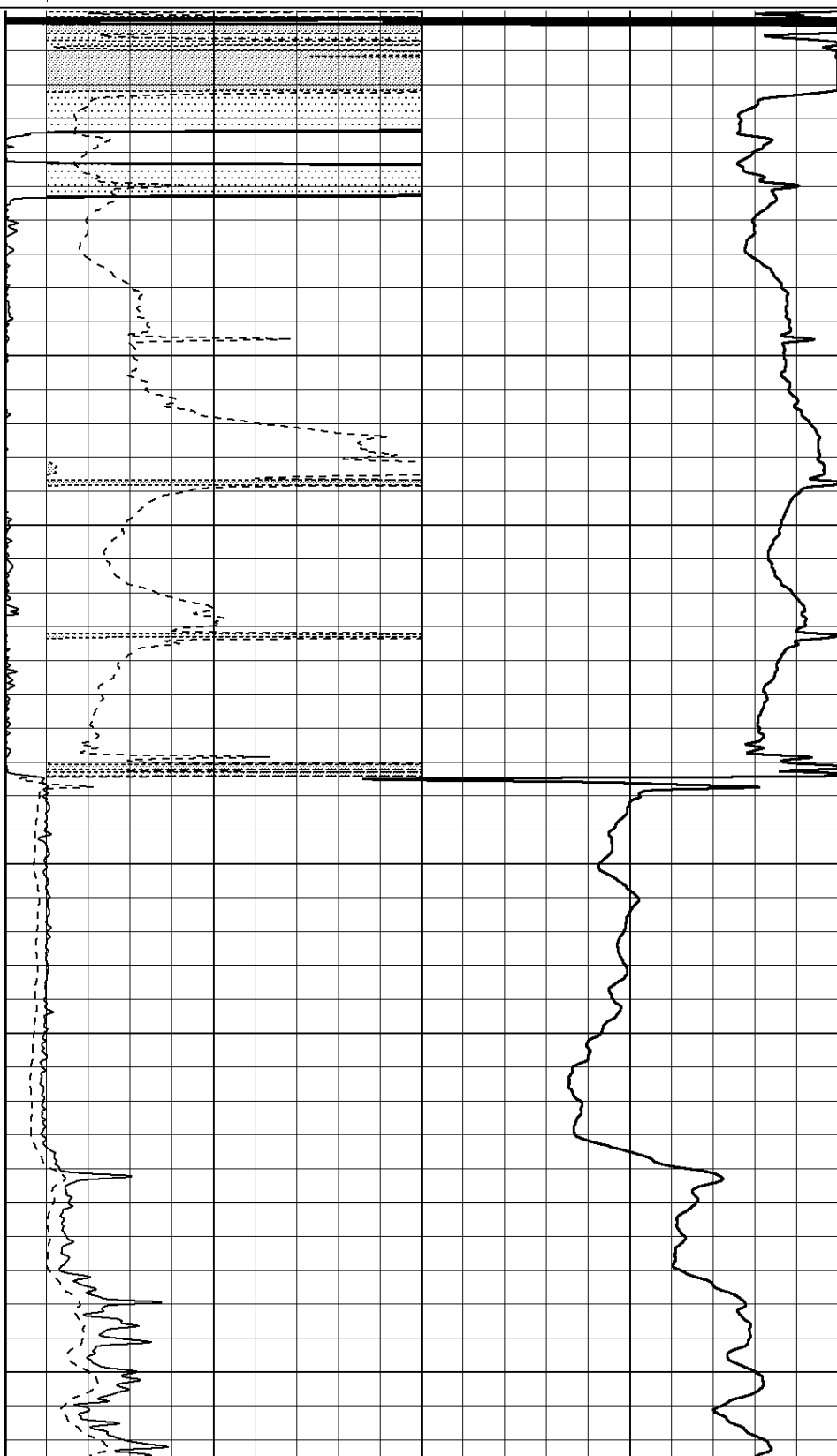
|   |              |    |
|---|--------------|----|
| 0 | RLL3 (Ohm-m) | 50 |
| 0 | RILD (Ohm-m) | 50 |

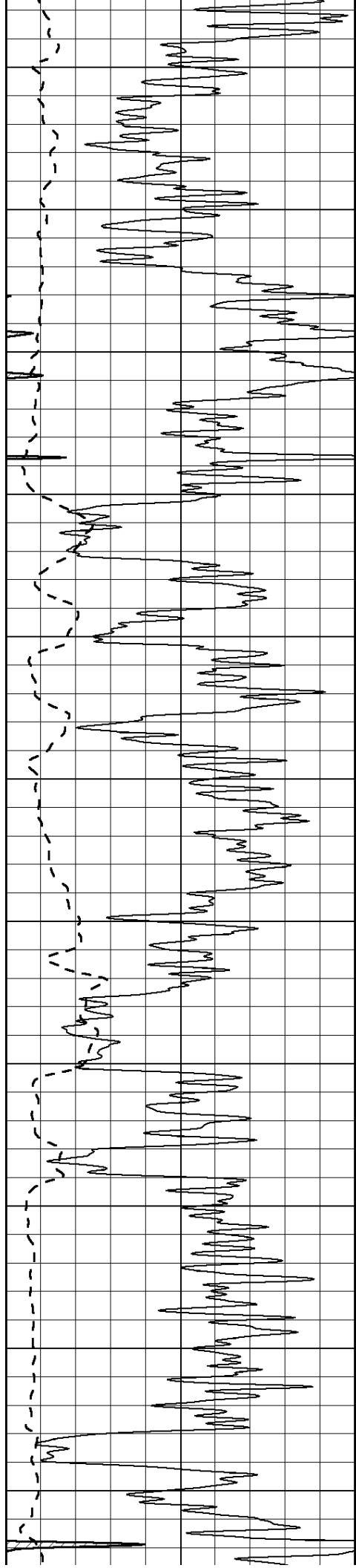
|      |               |   |
|------|---------------|---|
| 1000 | CILD (mmho/m) | 0 |
|------|---------------|---|

|    |                  |     |
|----|------------------|-----|
| 50 | RILD X10 (Ohm-m) | 500 |
| 50 | RLL3 X10 (Ohm-m) | 500 |

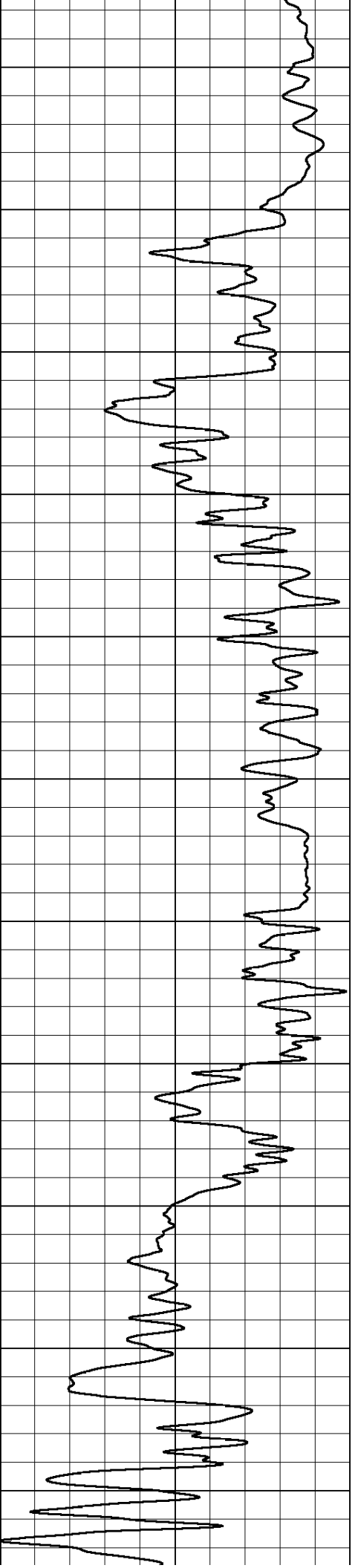
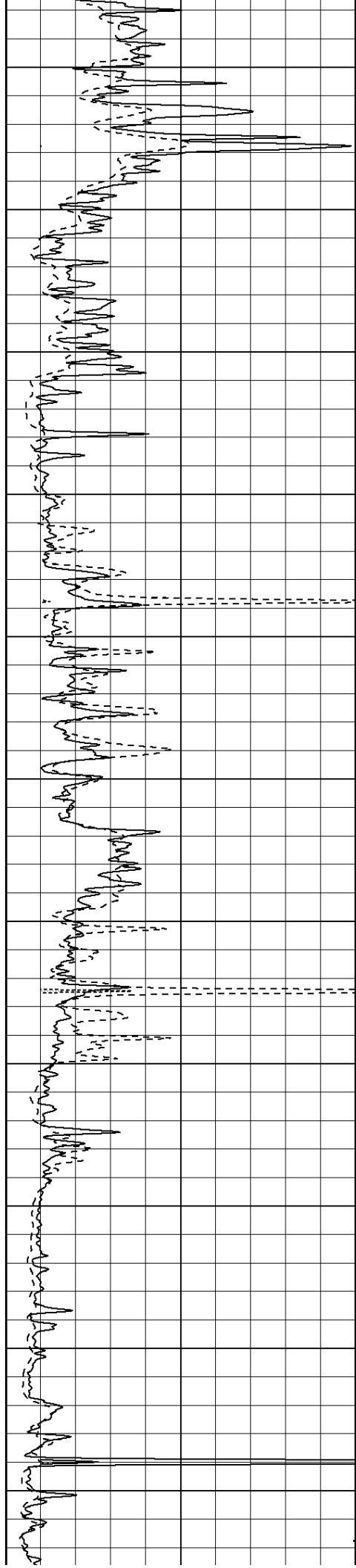


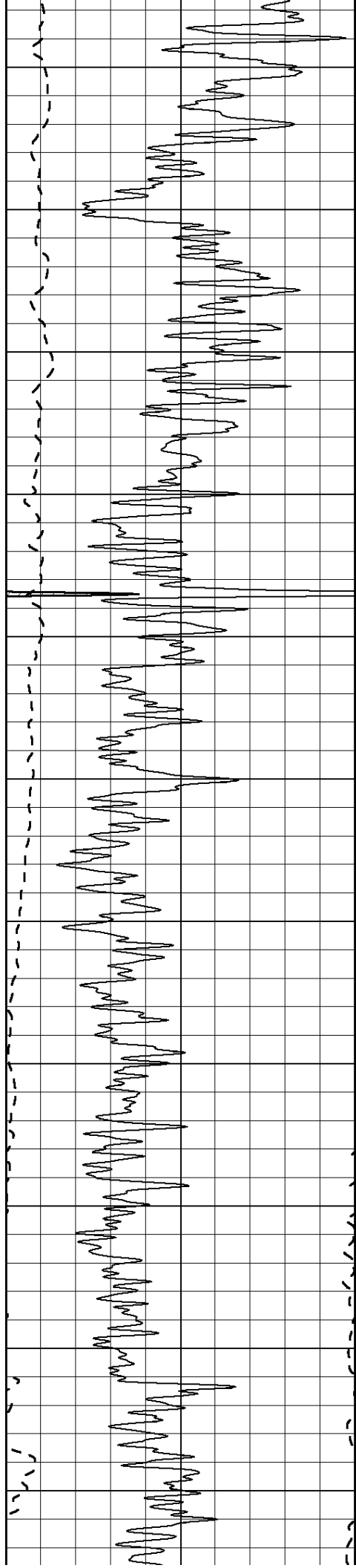
0  
50  
100  
150  
200  
250  
300  
350  
400





450  
500  
550  
600  
650  
700  
750  
800  
850  
900  
950





1000

1050

1100

1150

1200

1250

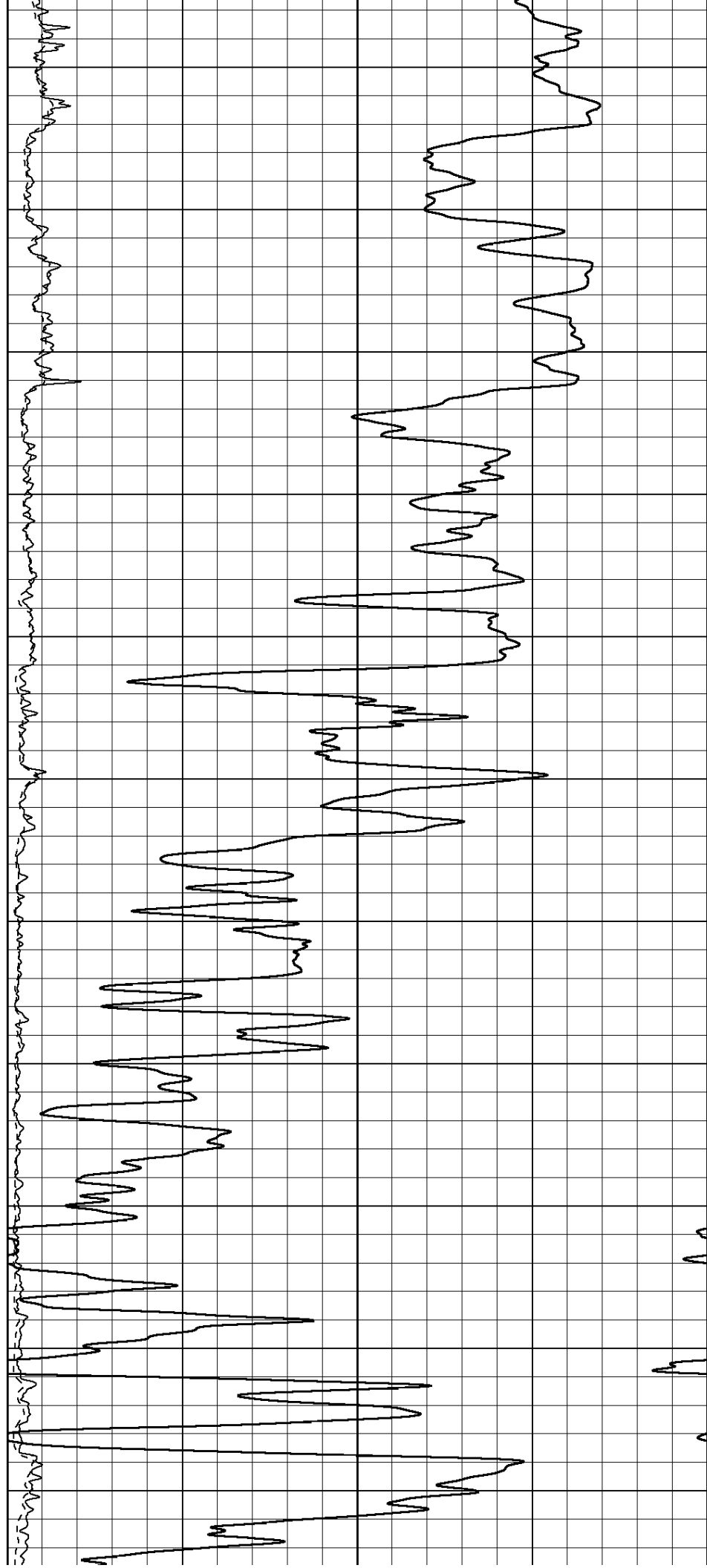
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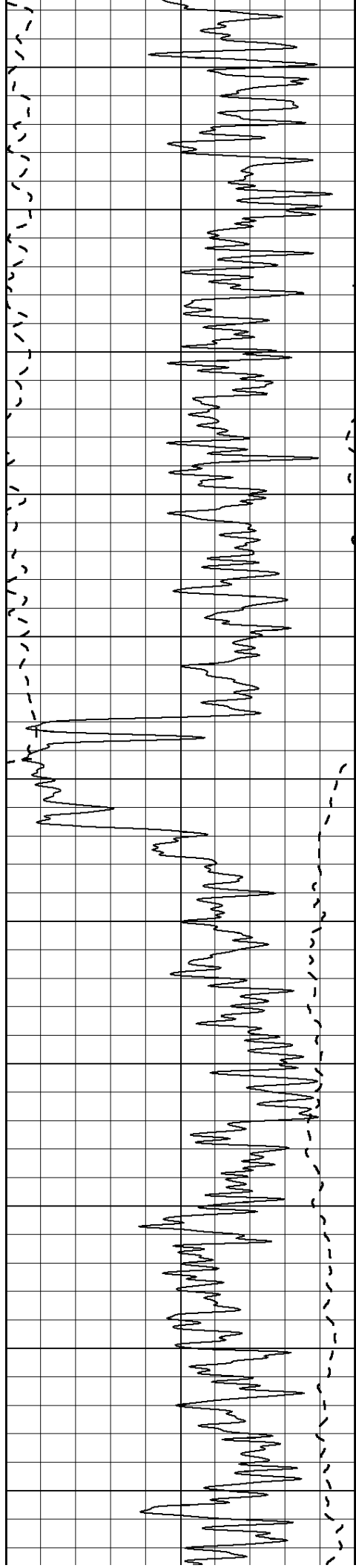
1350

1400

1450

1500





1550

1600

1650

1700

1750

1800

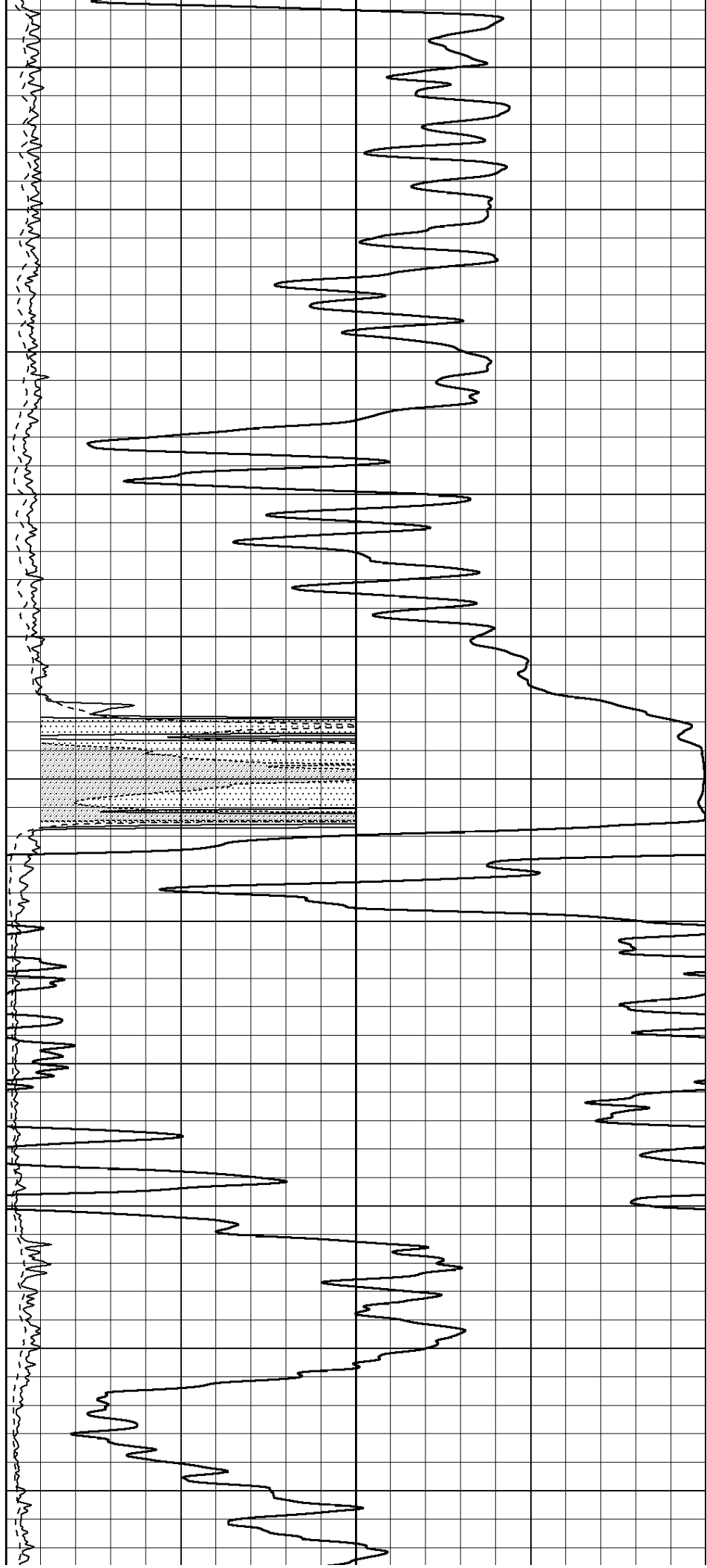
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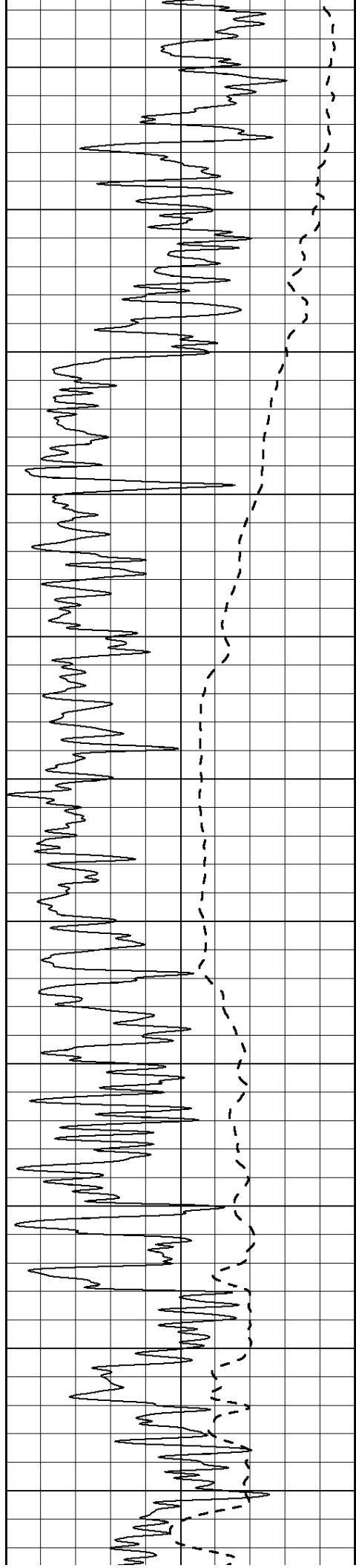
1900

1950

2000

2050





2100

2150

2200

2250

2300

2350

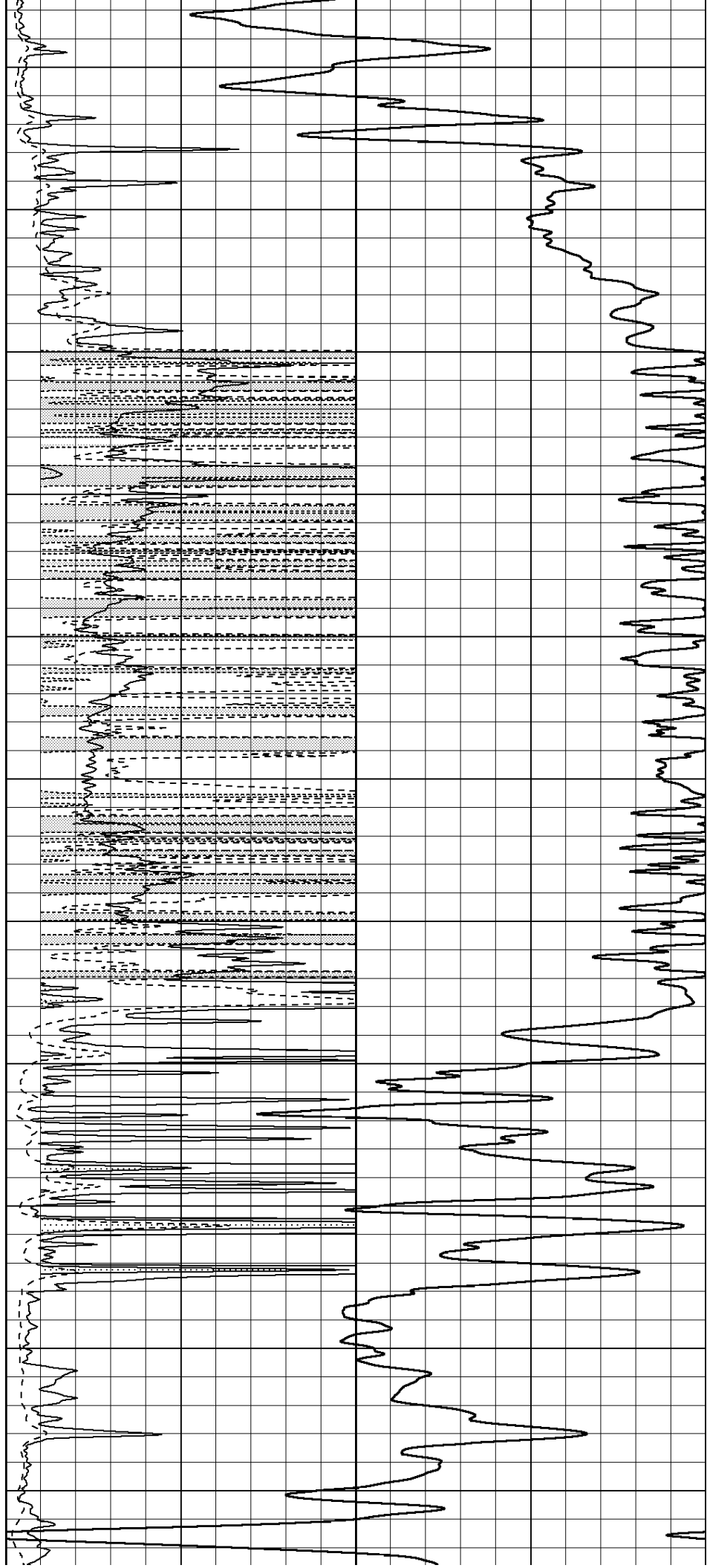
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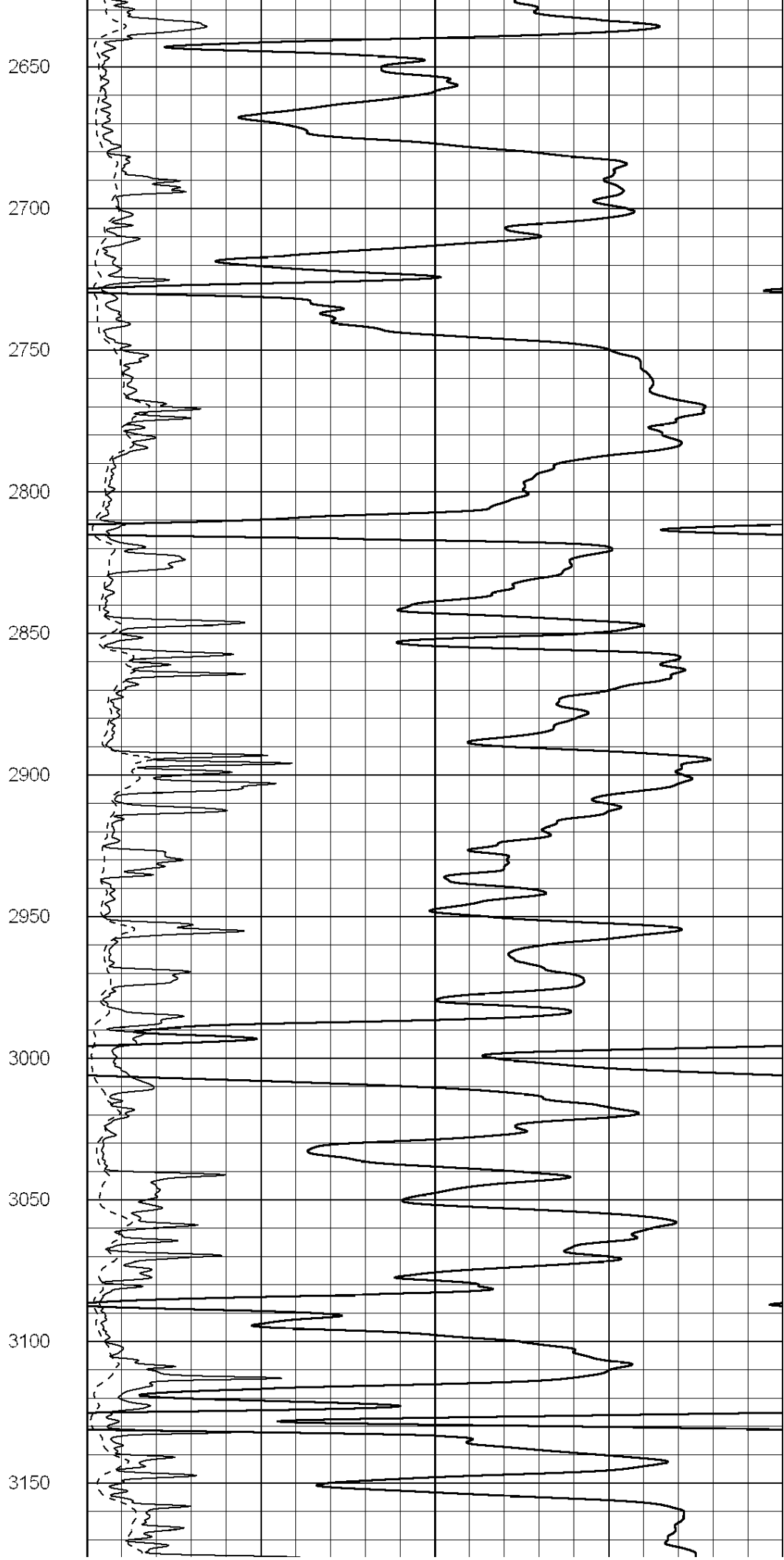
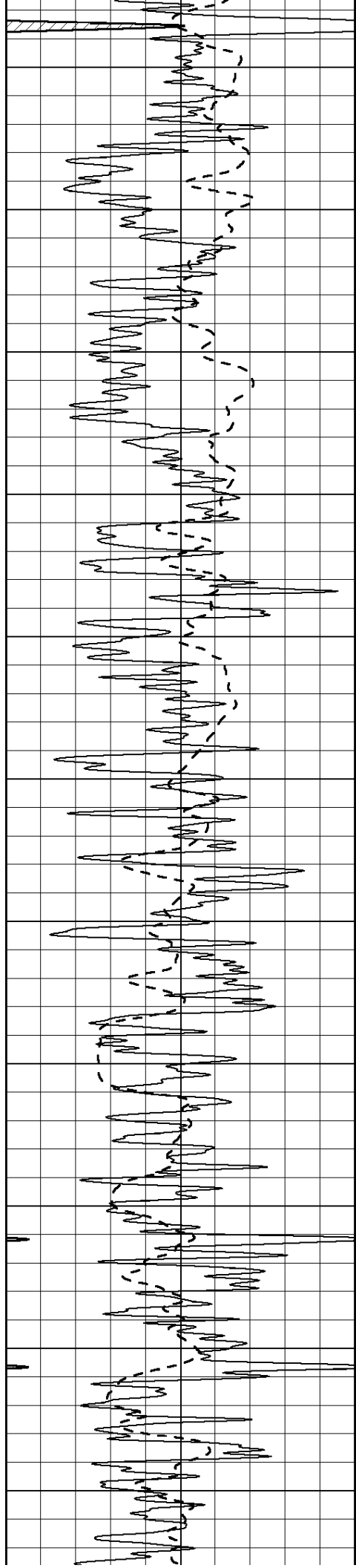
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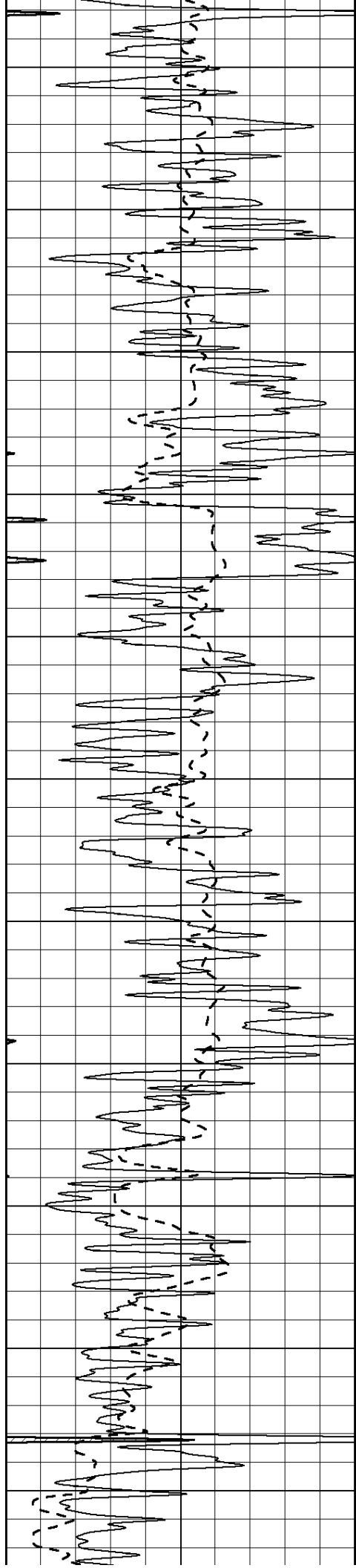
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2550

2600







3200

3250

3300

3350

3400

3450

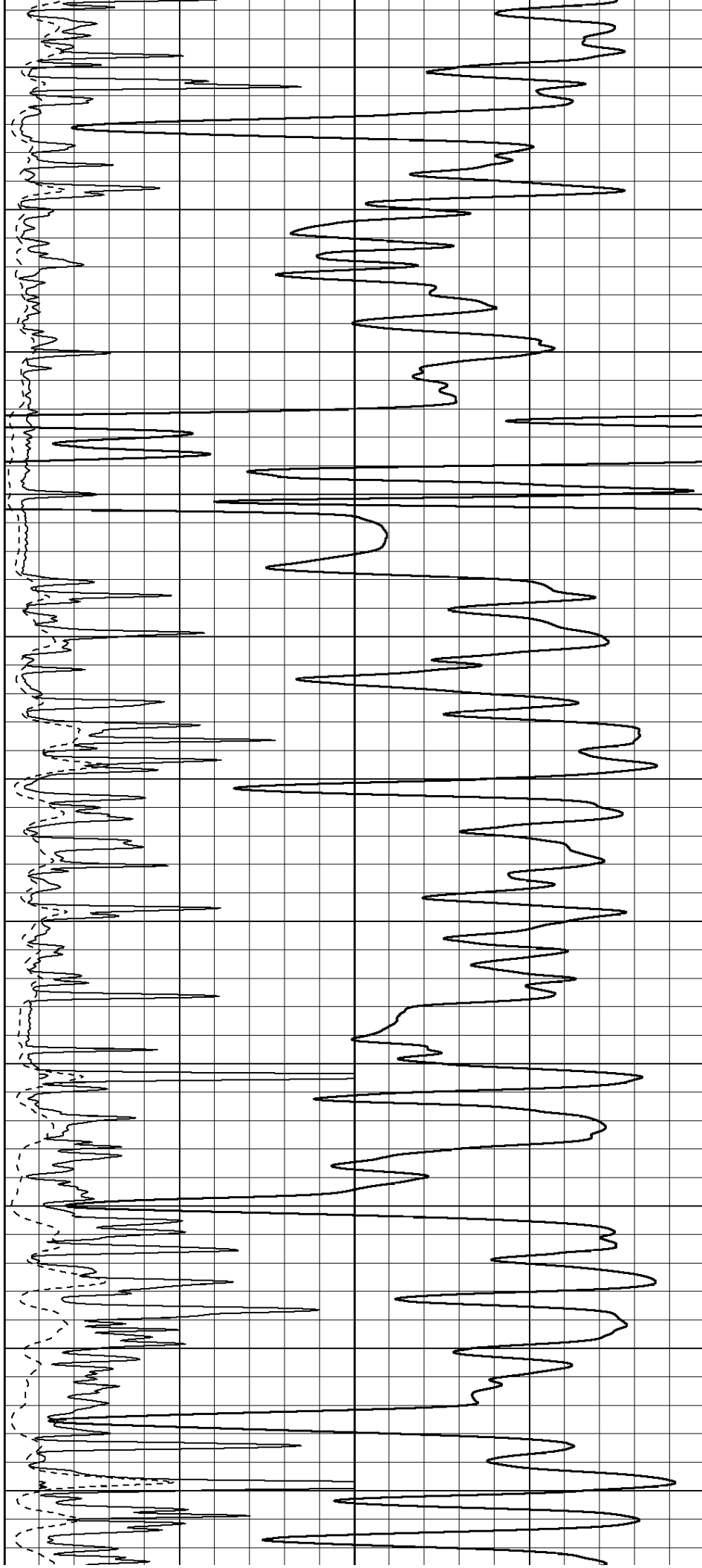
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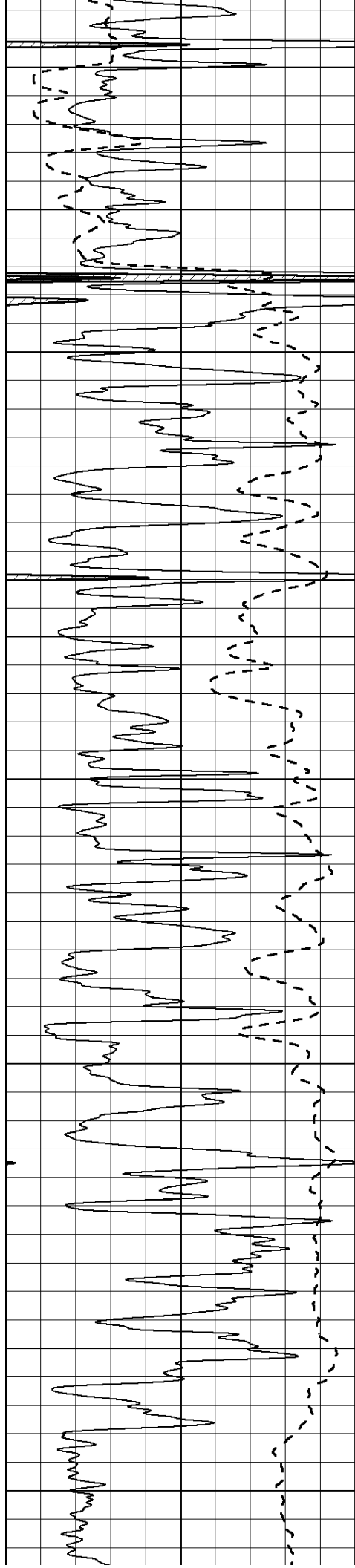
3550

3600

3650

3700





3750

3800

3850

3900

3950

4000

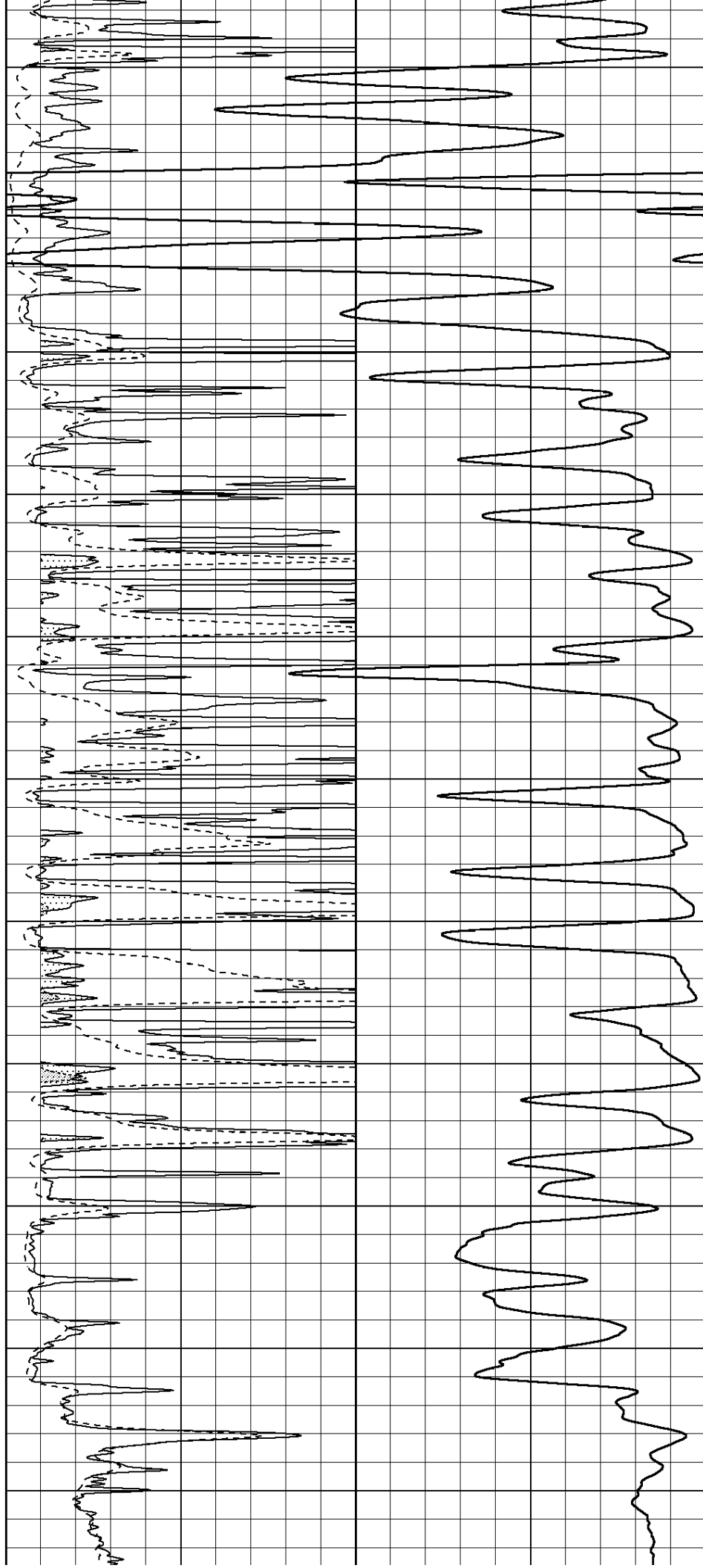
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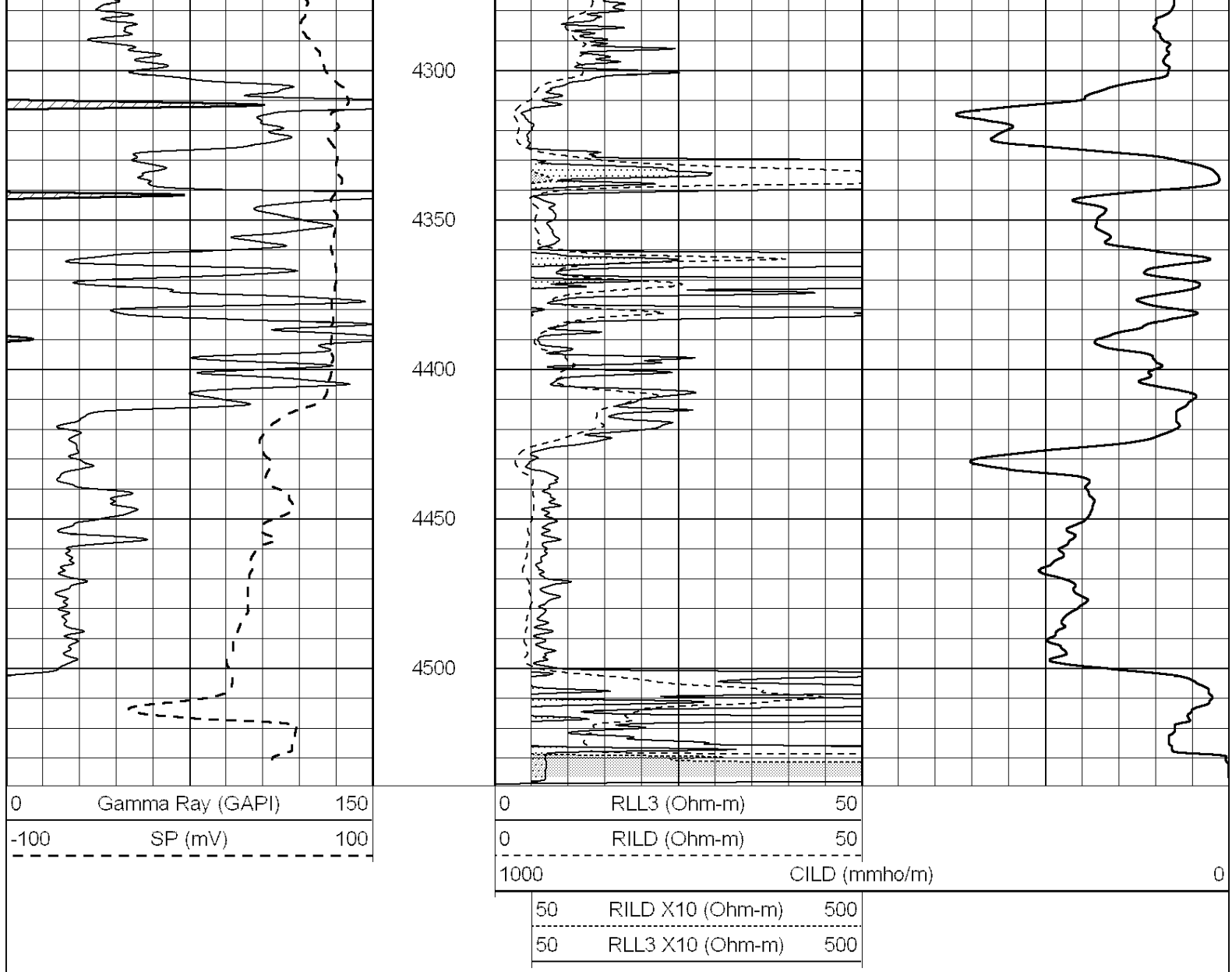
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4150

4200

4250





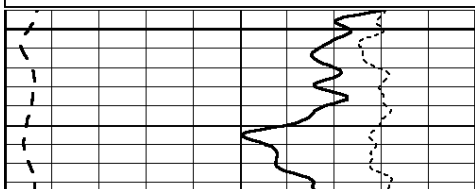
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# ANHYDRITE

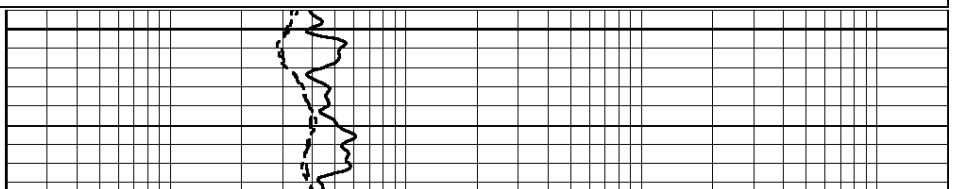
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 Presentation Format: dil  
 Dataset Creation: Tue Feb 22 14:41:56 2011 by Calc Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

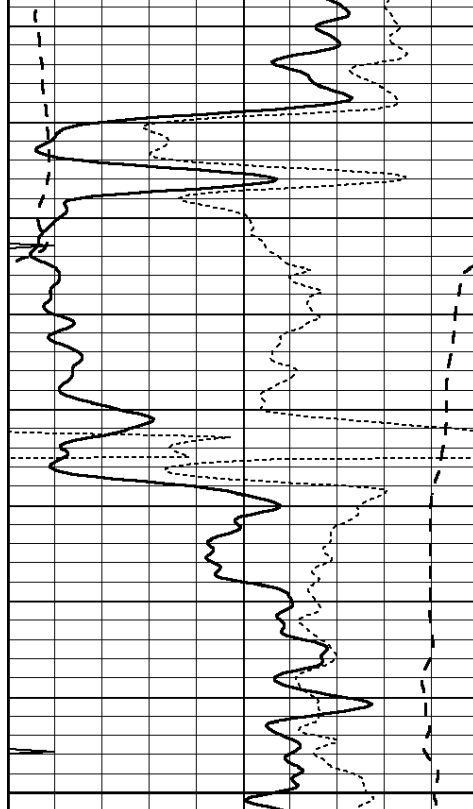
|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 10  |

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



1750

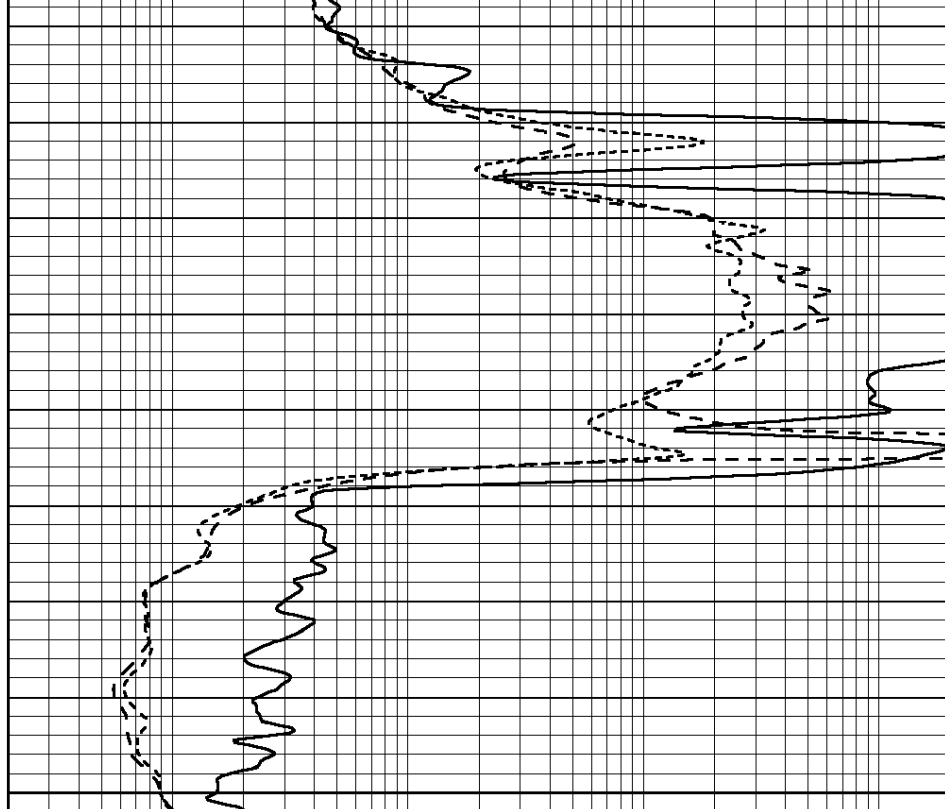




1800

1850

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 10  |



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



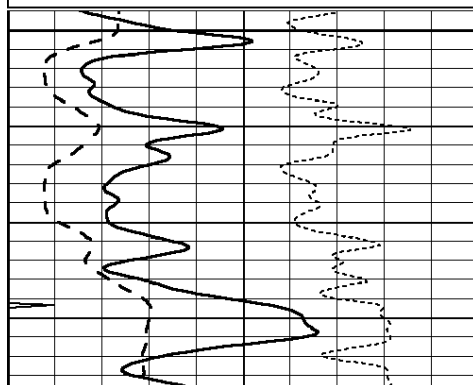
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# MAIN SECTION

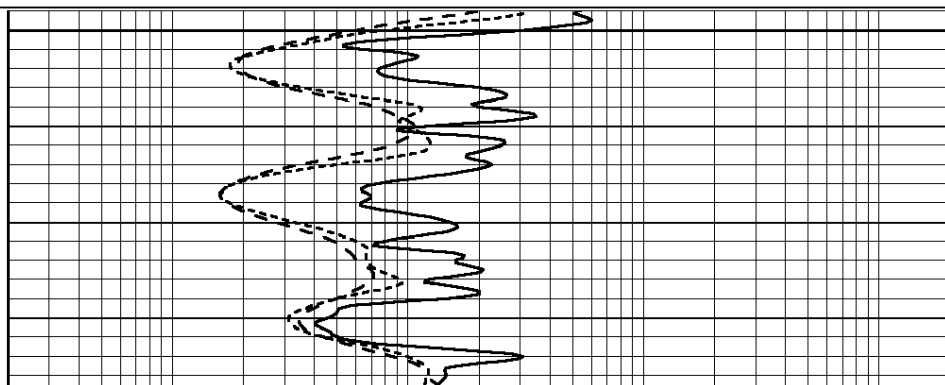
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Dataset Pathname: pass3.3  
Presentation Format: dil  
Dataset Creation: Tue Feb 22 14:36:41 2011 by Calc Open-Cased 090629  
Charted by: Depth in Feet scaled 1:240

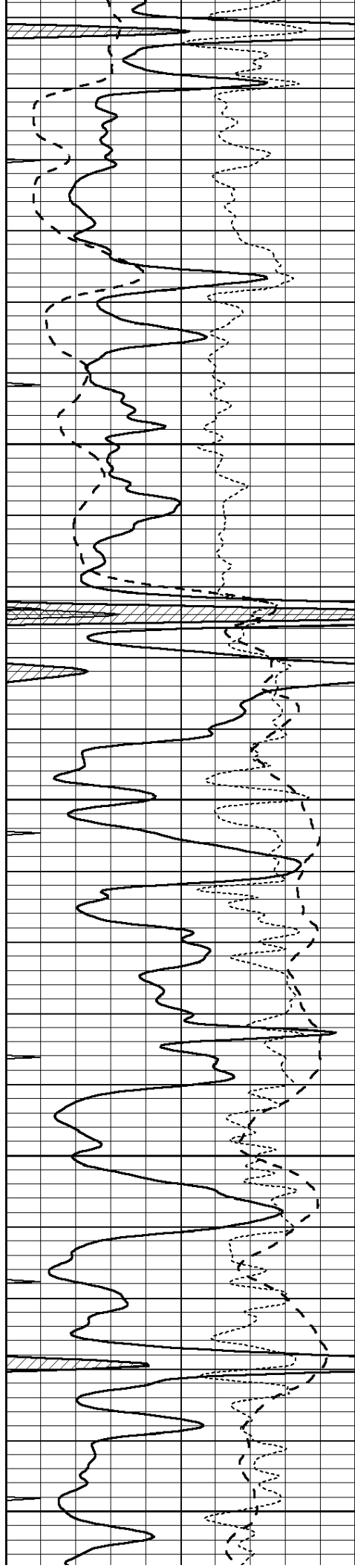
|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 10  |

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



3700





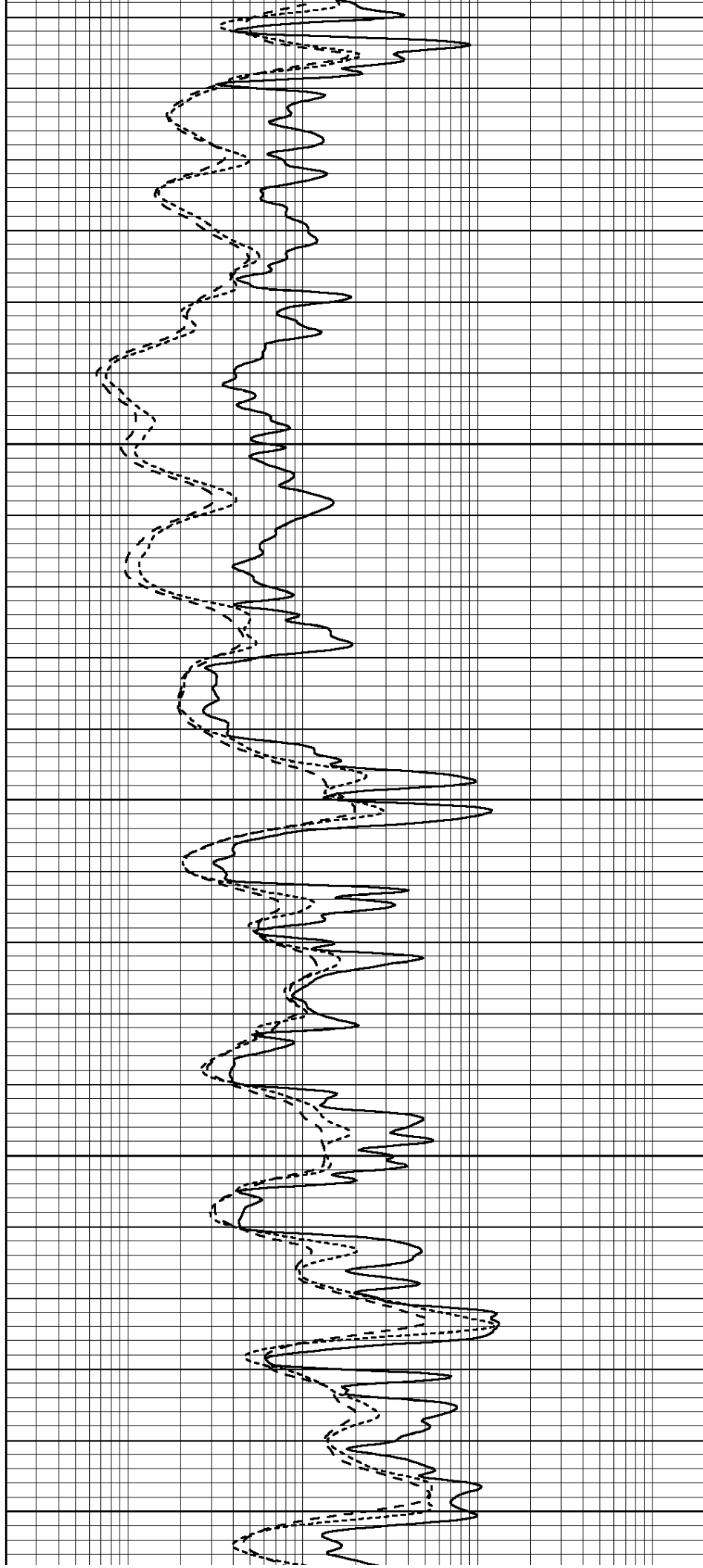
3750

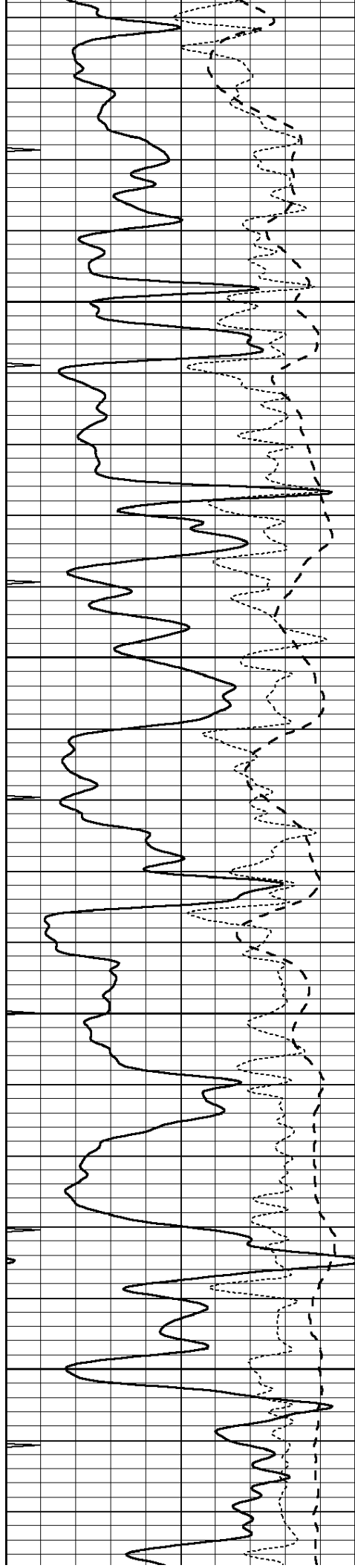
3800

3850

3900

3950



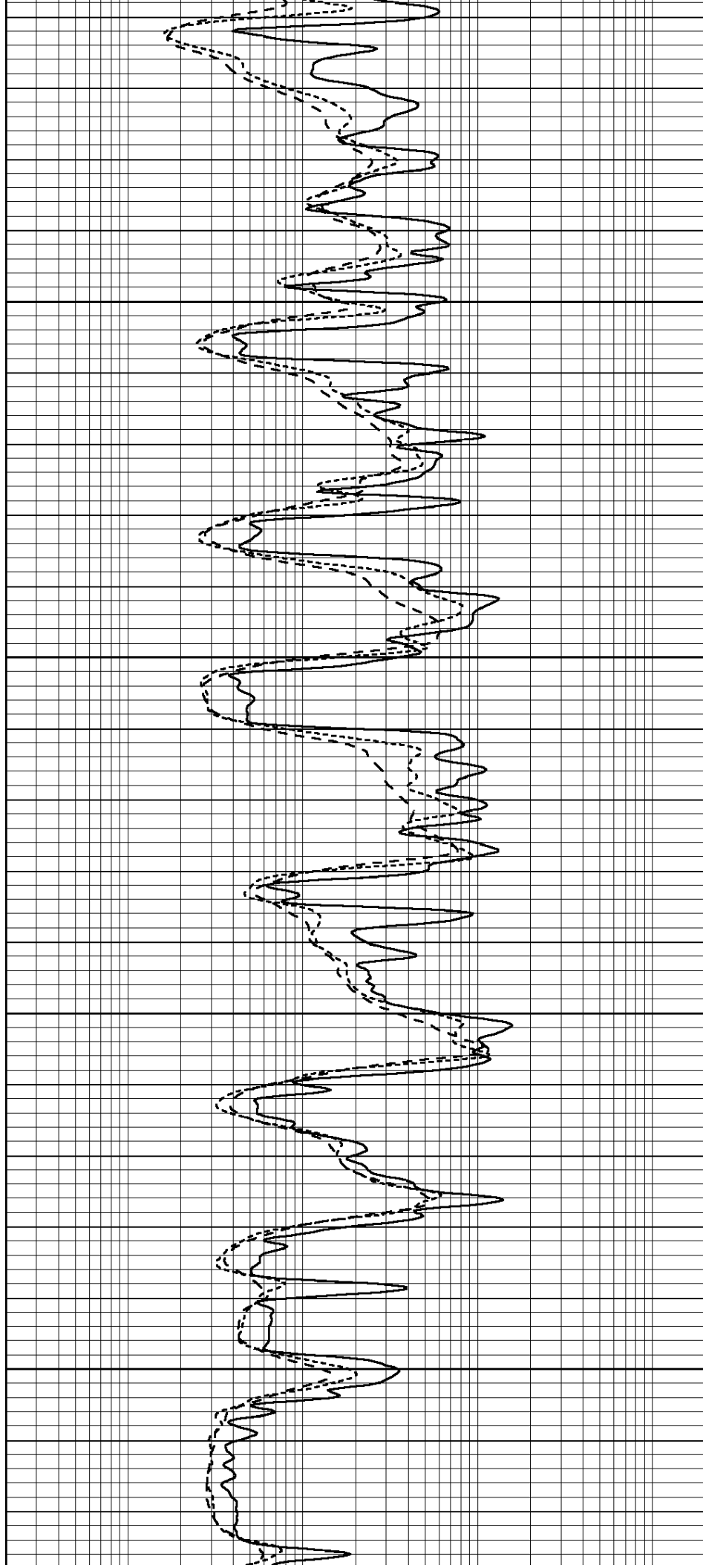


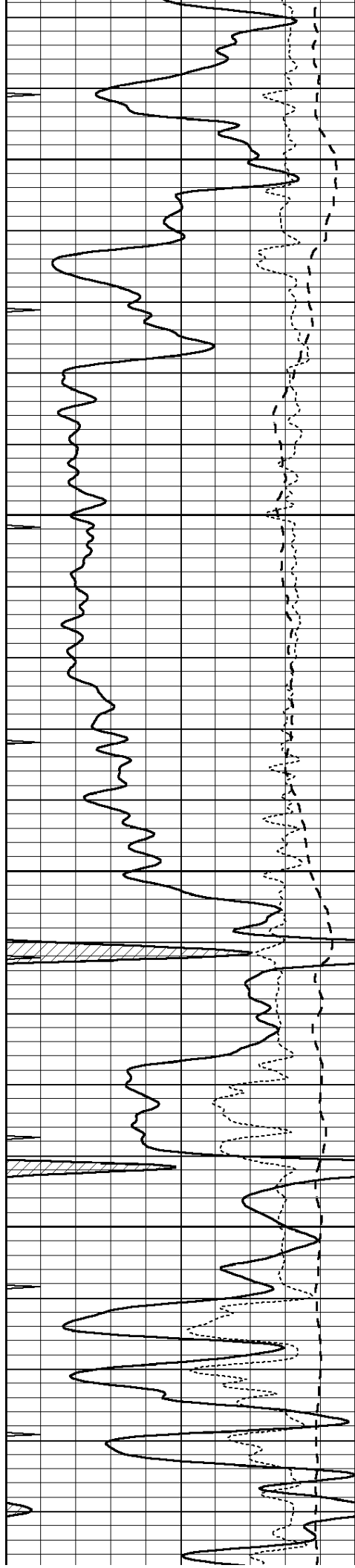
4000

4050

4100

4150



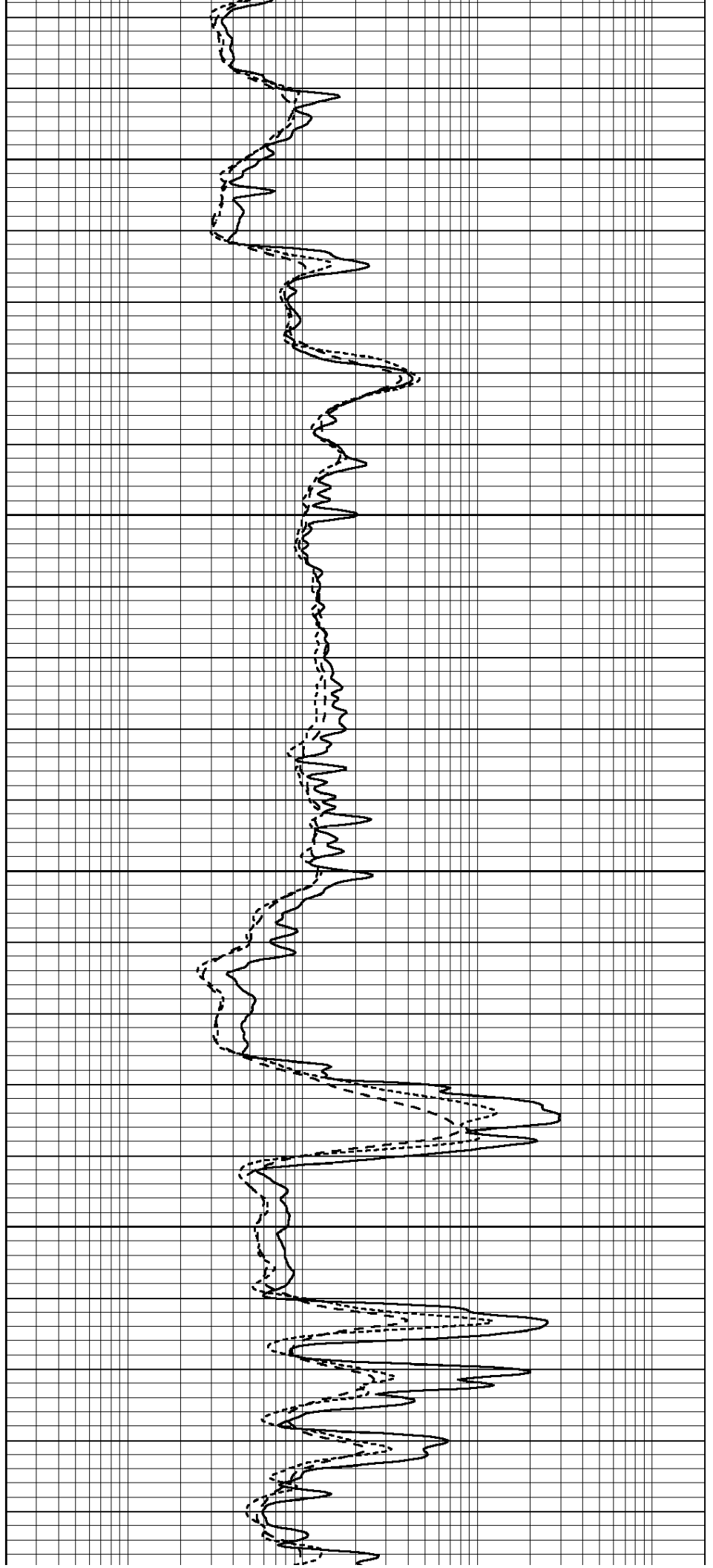


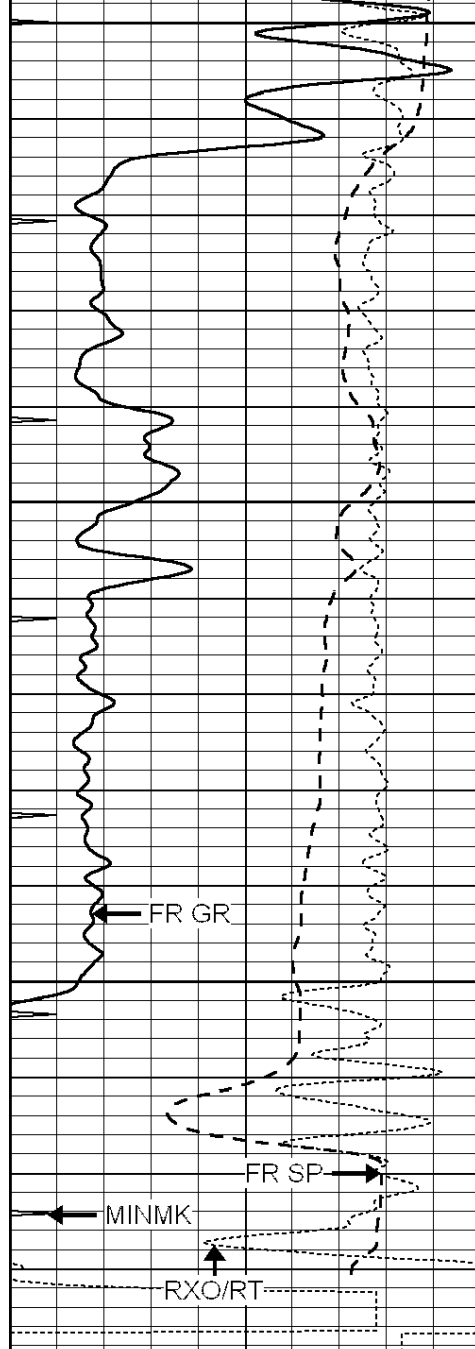
4200

4250

4300

4350





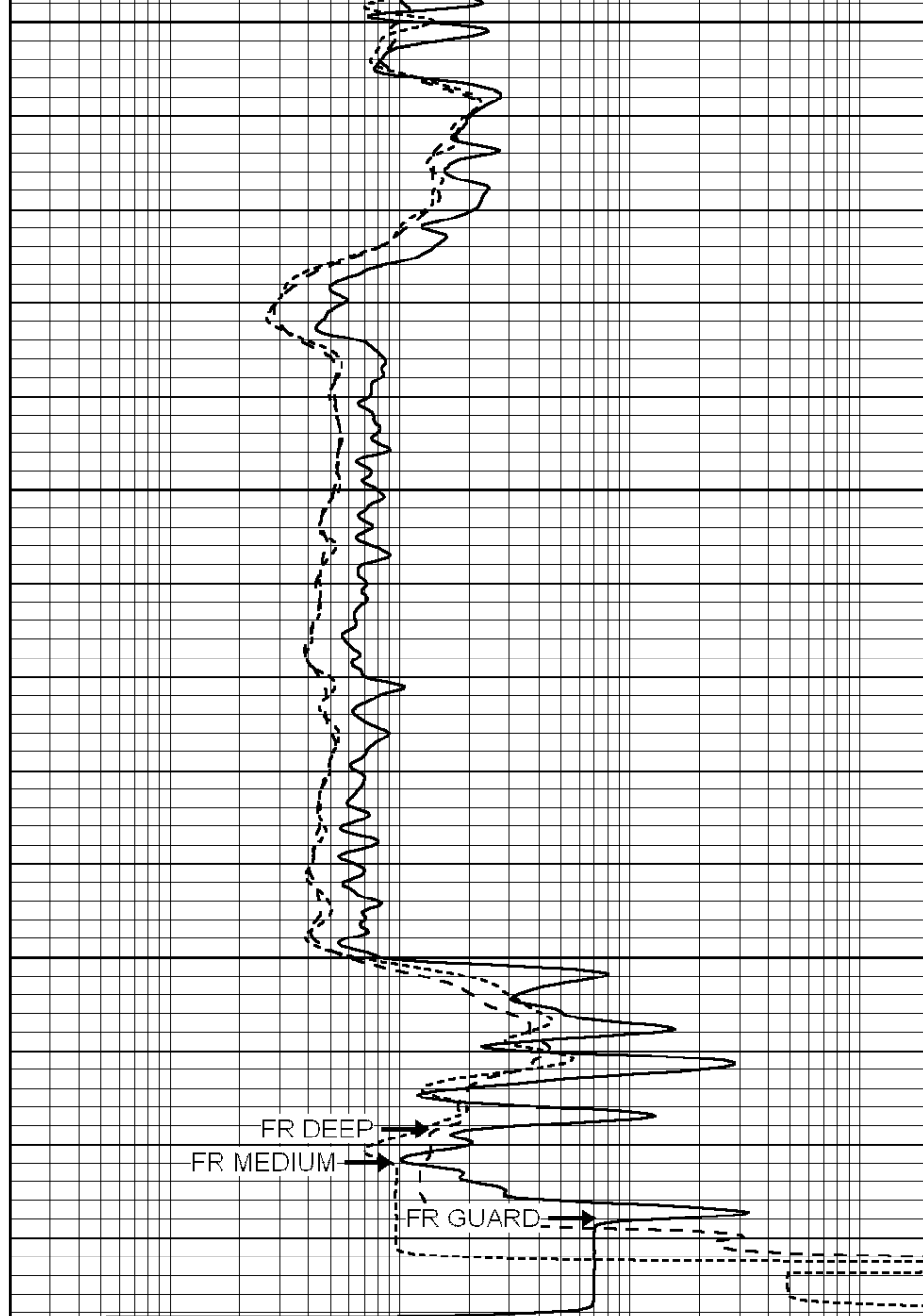
|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 10  |

4400

4450

4500

LTD 4530



|     |                          |      |
|-----|--------------------------|------|
| 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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# REPEAT SECTION

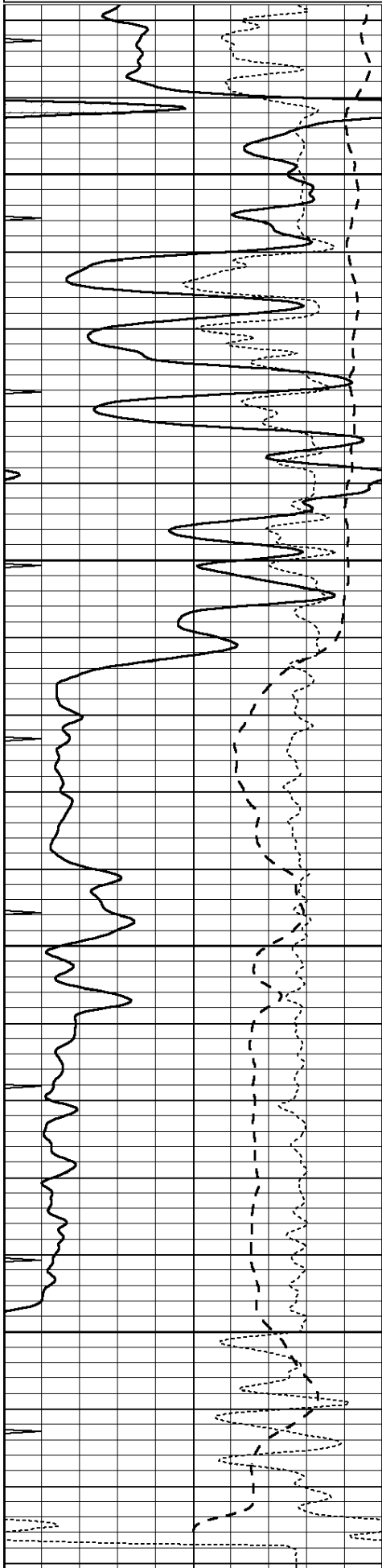
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 Presentation Format: dil  
 Dataset Creation: Tue Feb 22 14:01:32 2011 by Calc Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |

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

|      |        |    |
|------|--------|----|
| -250 | Rxo/Rt | 50 |
| 0    | MINMK  | 10 |

|     |                          |      |
|-----|--------------------------|------|
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
|-----|--------------------------|------|

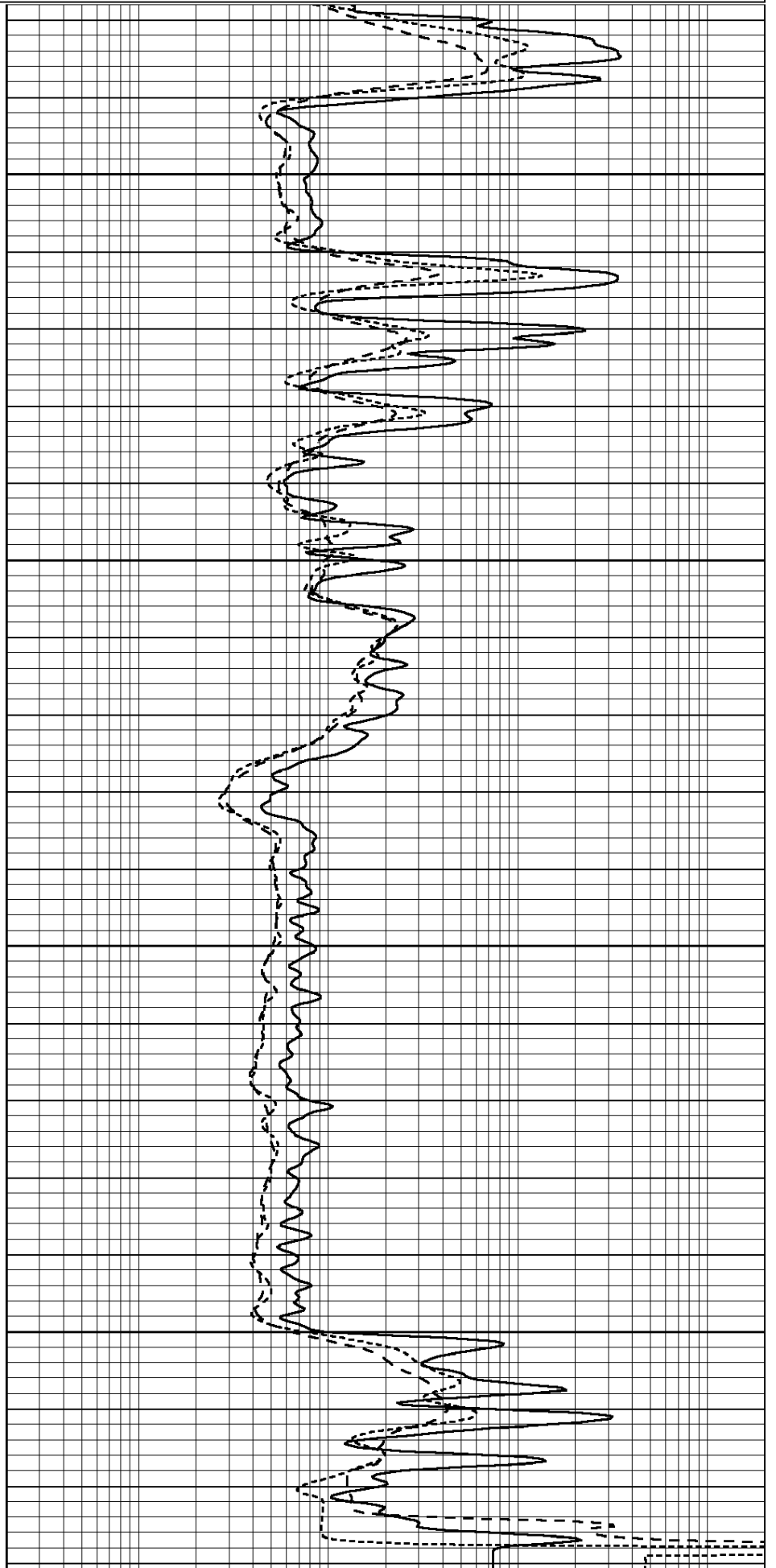


4350

4400

4450

4500



|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 10  |

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

### Calibration Report

Database File: 006294pe.db  
Dataset Pathname: pass3.3  
Dataset Creation: Tue Feb 22 14:36:41 2011 by Calc Open-Cased 090629

### Dual Induction Calibration Report

Serial-Model: DIL3-GEAR  
Performed: Tue Feb 22 12:38:57 2011

|           |       | Readings |   | References |         |        | Results |         |
|-----------|-------|----------|---|------------|---------|--------|---------|---------|
| Loop:     | Air   | Loop     |   | Air        | Loop    |        | m       | b       |
| Deep      | 0.011 | 0.656    | V | 0.000      | 400.000 | mmho/m | 640.000 | -1.000  |
| Medium    | 0.013 | 0.740    | V | 0.000      | 462.500 | mmho/m | 700.000 | -13.000 |
| Internal: | Zero  | Cal      |   | Zero       | Cal     |        | m       | b       |
| Deep      | 0.002 | 0.645    | V | 0.000      | 400.000 | mmho/m | 622.059 | -1.071  |
| Medium    | 0.007 | 0.740    | V | 0.000      | 462.500 | mmho/m | 631.393 | -4.555  |

### 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   | 1.8      | 5.6         |
| High Ref  | 4.6      | 14.0        |
| Gain: 3.0 |          | Offset: 0.4 |

### Compensated Neutron Calibration Report

Serial Number: NEU\_3I  
Tool Model: G

#### CALIBRATION

| Detector | Readings | Target  | Normalization |
|----------|----------|---------|---------------|
| Si 1.0   | 207.00   | 1000.00 | 1.0000        |

|                              |                          |          |         |     |        |
|------------------------------|--------------------------|----------|---------|-----|--------|
| Short Space                  | 997.00                   | cps      | 1000.00 | cps | 1.0000 |
| Long Space                   | 986.00                   | cps      | 1000.00 | cps | 1.0000 |
| Gamma Ray Calibration Report |                          |          |         |     |        |
| Serial Number:               | GR3                      |          |         |     |        |
| Tool Model:                  | OPEN                     |          |         |     |        |
| Performed:                   | Tue Feb 22 12:38:38 2011 |          |         |     |        |
| Calibrator Value:            | 200.0                    | GAPI     |         |     |        |
| Background Reading:          | 3.0                      | cps      |         |     |        |
| Calibrator Reading:          | 186.0                    | cps      |         |     |        |
| Sensitivity:                 | 0.6000                   | GAPI/cps |         |     |        |