



**COMPLETION  
& PRODUCTION  
SERVICES CO.**

**DUAL  
INDUCTION  
LOG**

Company RITCHIE EXPLORATION, INC.  
Well KUHN UNIT #1  
Field CASTLE BLUFF  
County GOVE  
State KANSAS

Company RITCHIE EXPLORATION, INC.  
Well KUHN UNIT #1  
Field CASTLE BLUFF  
County GOVE State KANSAS

Location: 400' FNL & 2340' FWL  
NE - NE - NW  
AP1 # : 15-063-22218-0000  
SEC 19 TWP 12S RGE 28W  
Permanent Datum GROUND LEVEL Elevation 2757  
Log Measured From KELLY BUSHING 5' A.G.L.  
Drilling Measured From KELLY BUSHING  
Other Services CDL/CNL  
Elevation K.B. 2762  
D.F. 2760  
G.L. 2757

Date	10/7/14
Run Number	ONE
Depth Driller	4625
Depth Logger	4626
Bottom Logged Interval	4624
Top Log Interval	0
Casing Driller	8 5/8" @ 255
Casing Logger	254
Bit Size	7 7/8"
Type Fluid in Hole	CHEMICAL MUD
Density / Viscosity	9.465
pH / Fluid Loss	10.5/7.2
Source of Sample	FLOWLINE
Rm @ Meas. Temp	1.50 @ 66F
Rmt @ Meas. Temp	1.13 @ 66F
Rmc @ Meas. Temp	1.80 @ 66F
Source of Rmf / Rmc	MEASUREMENT
Rm @ BHT	0.81 @ 122F
Time Circulation Stopped	2 HOURS
Time Logger on Bottom	
Maximum Recorded Temperature	122F
Equipment Number	4010
Location	HAYS, KANSAS
Recorded By	JEFF GRONWEG
Witnessed By	MAX LOVELY

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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 NABORS, HAYS, KS. (785) 628-6395  
DIRECTIONS:  
GRAINFIELD, KS - SOUTH 6 MILES TO RD V - 1/2 MILE EAST  
SOUTH INTO

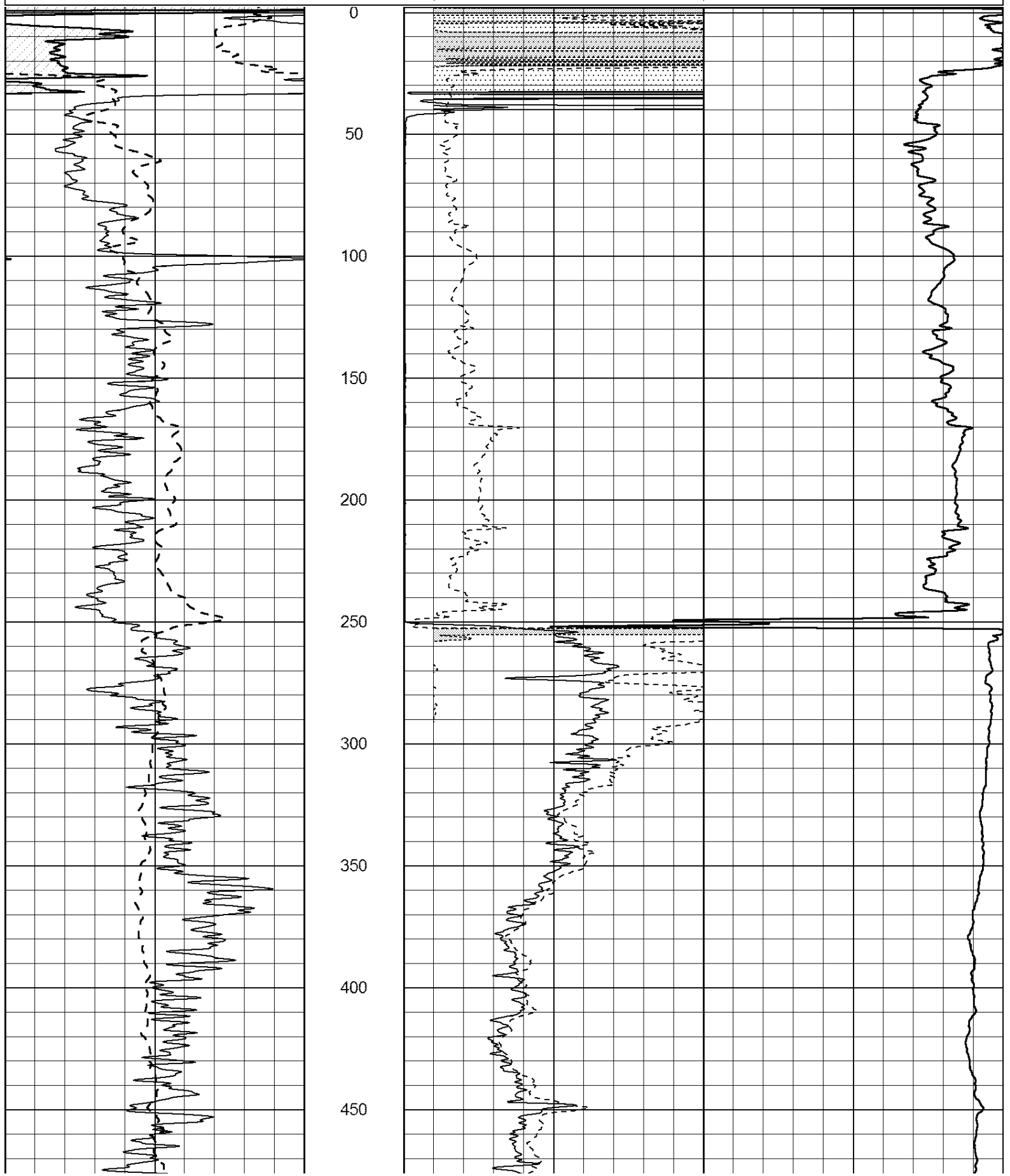
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Presentation Format: \_dil2  
Dataset Creation: Tue Oct 07 08:30:40 2014 by Calc Open-Cased 090629  
Charted by: Depth in Feet scaled 1:600

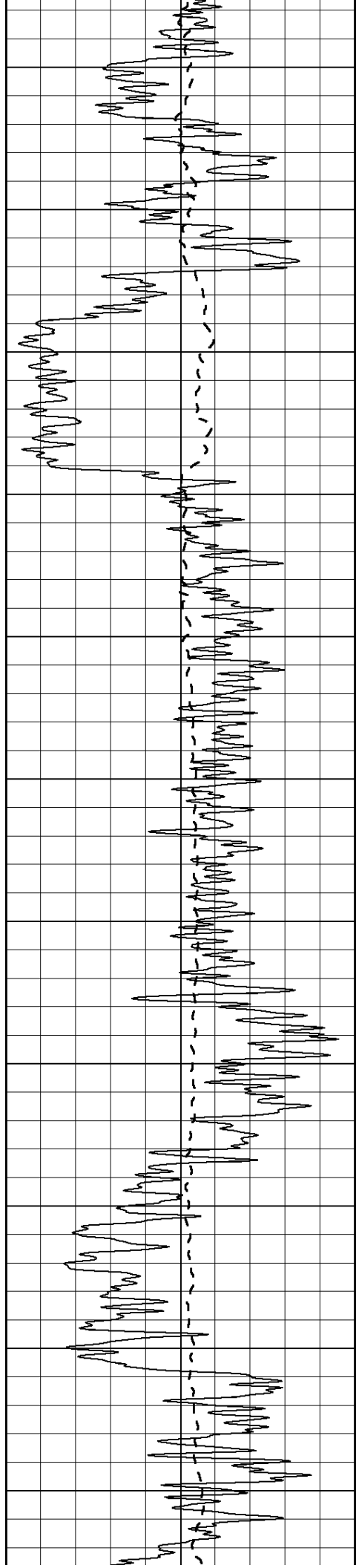
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-100	SP (mV)	100

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

1000	CILD (mmho/m)	0
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50	RILD X10 (Ohm-m)	500
50	RLL3 X10 (Ohm-m)	500





500

550

600

650

700

750

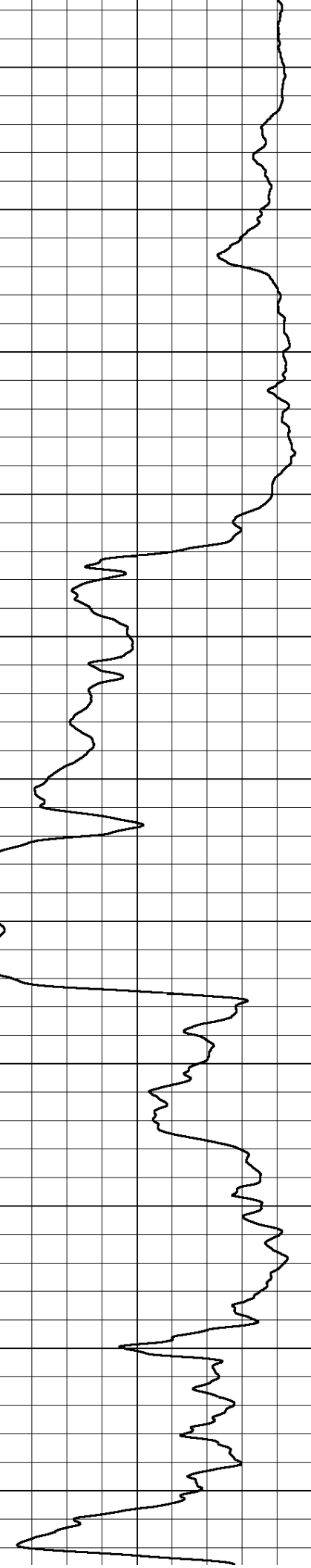
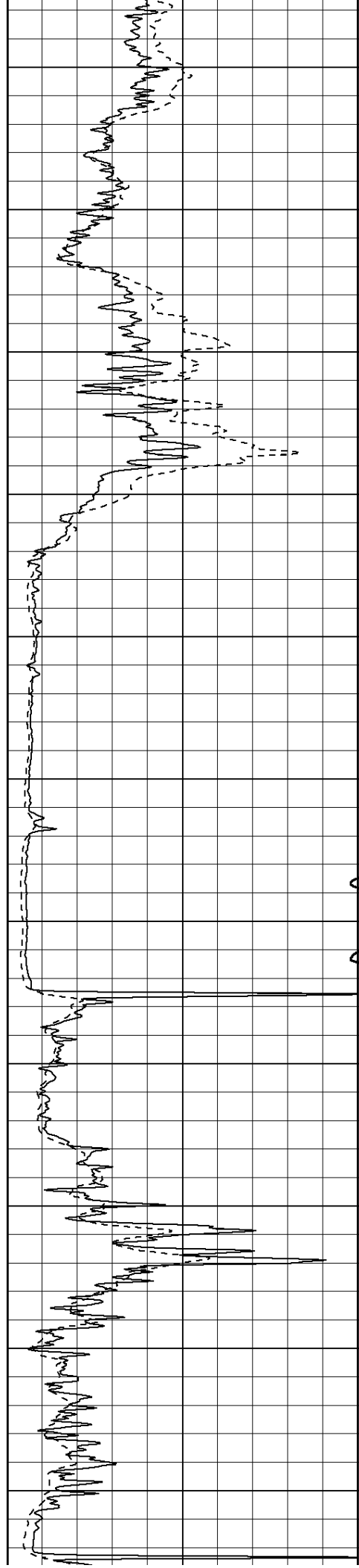
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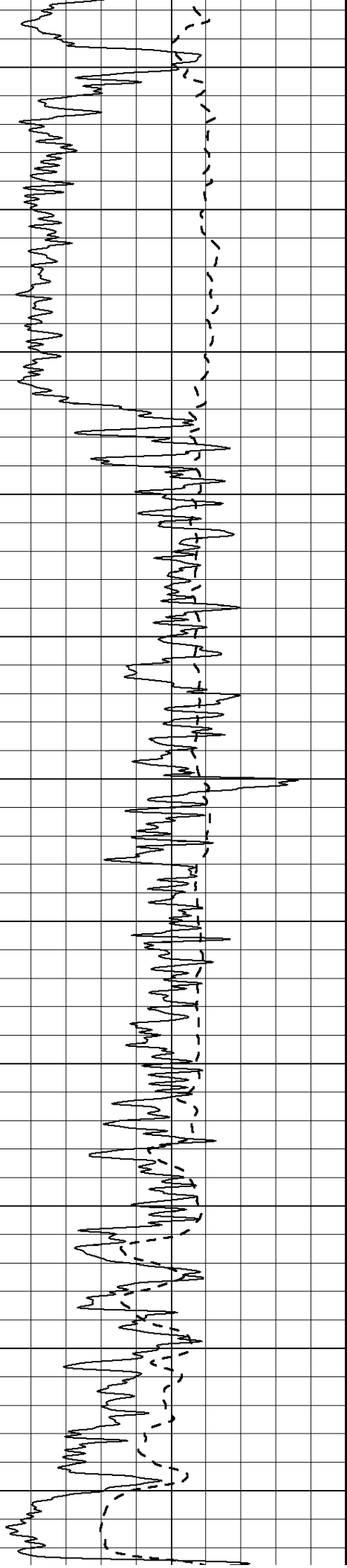
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900

950

1000





1050

1100

1150

1200

1250

1300

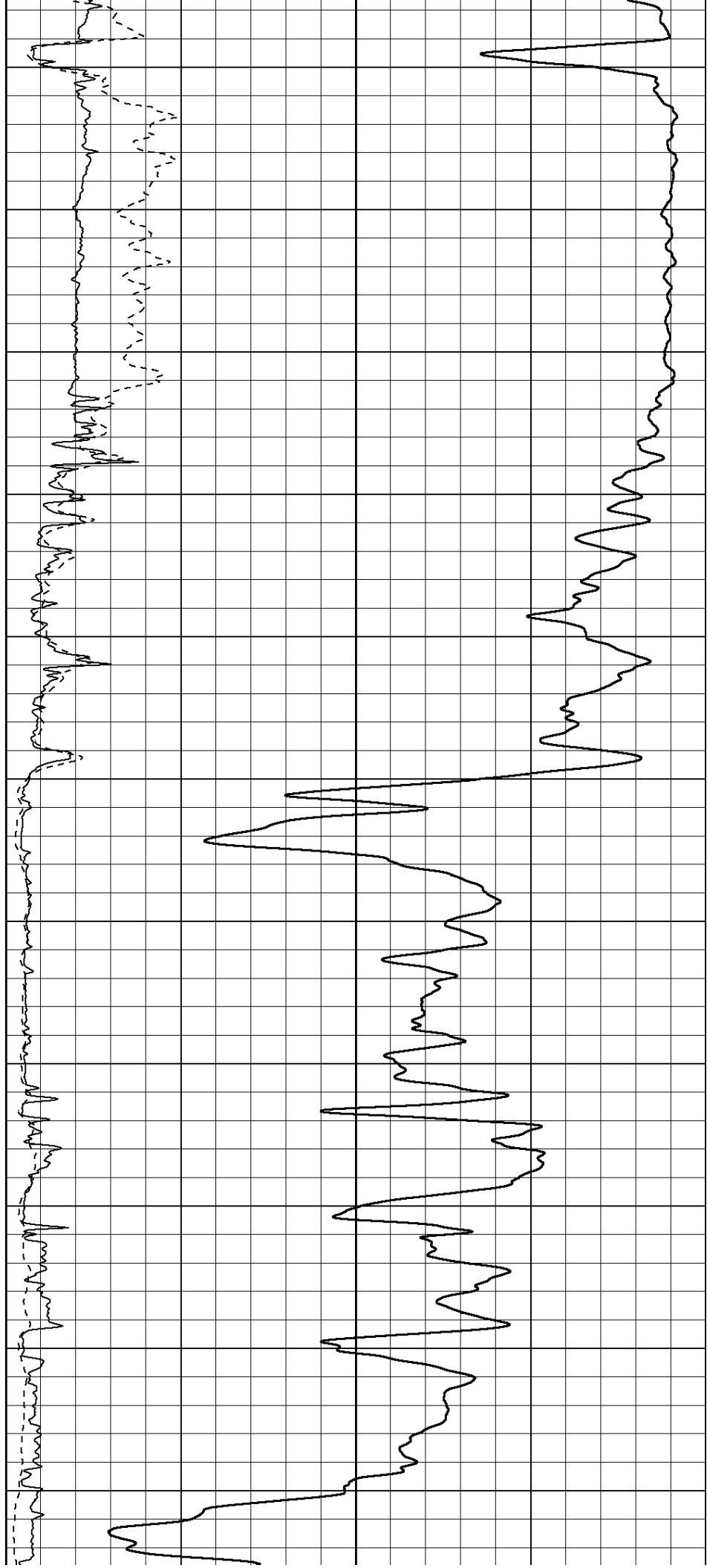
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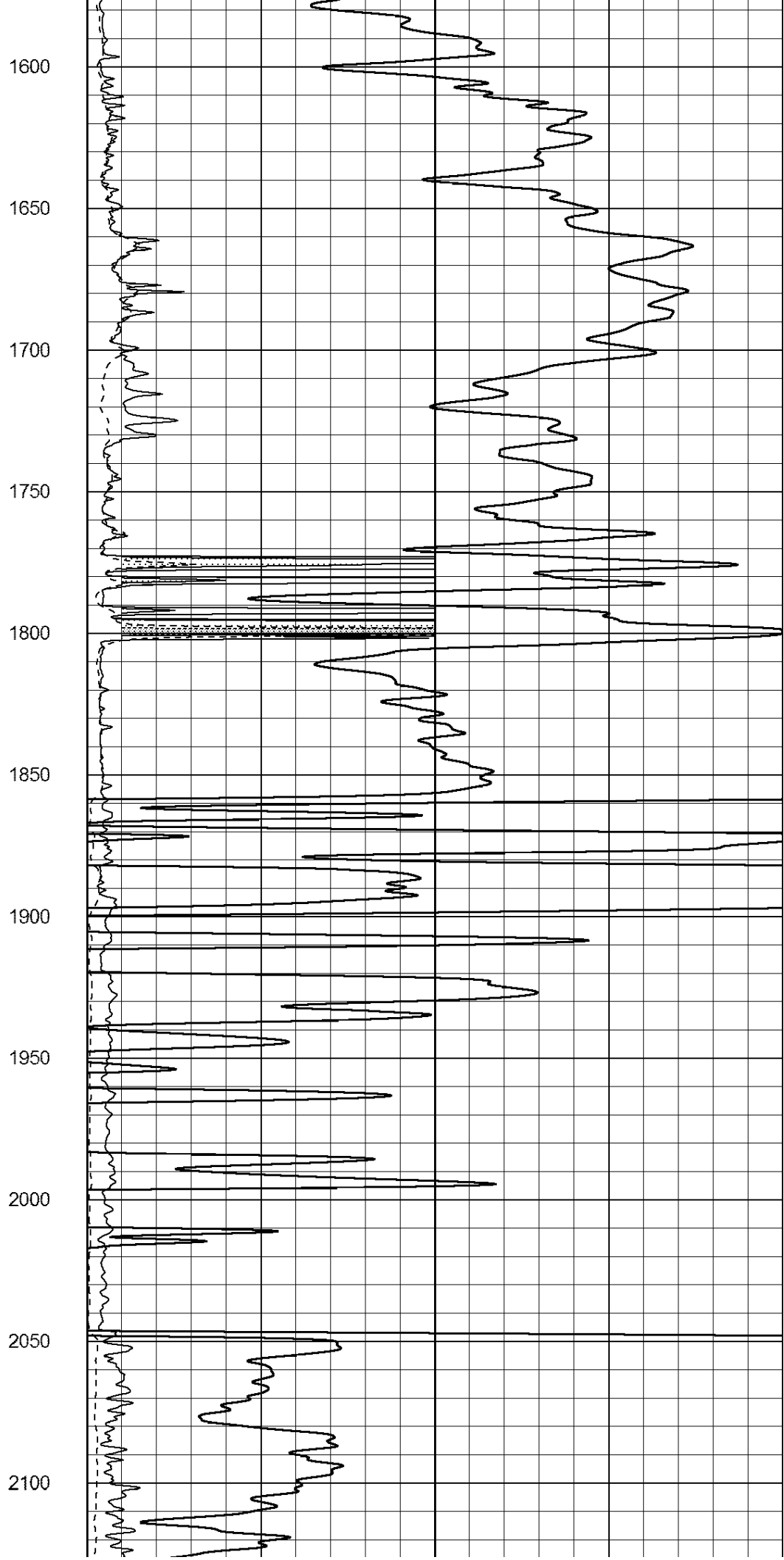
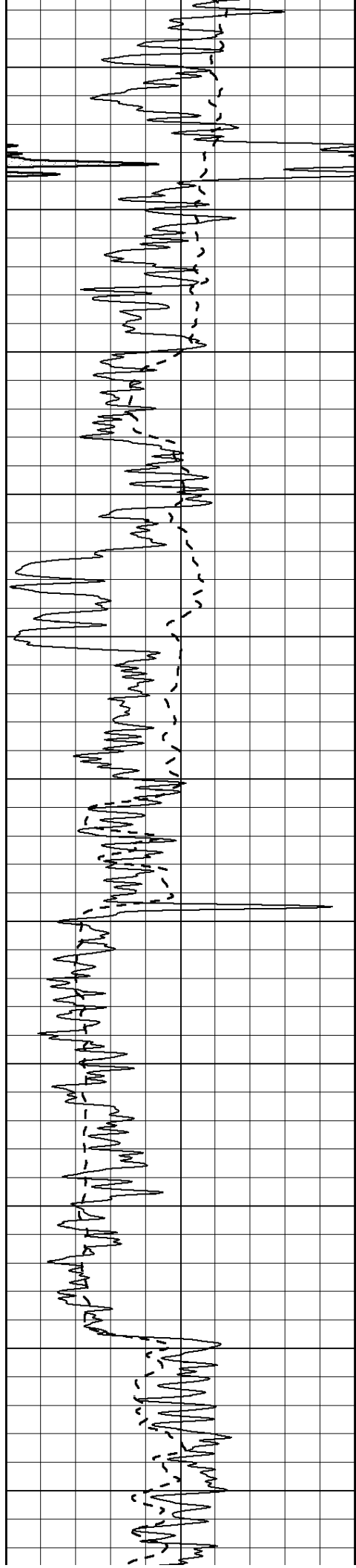
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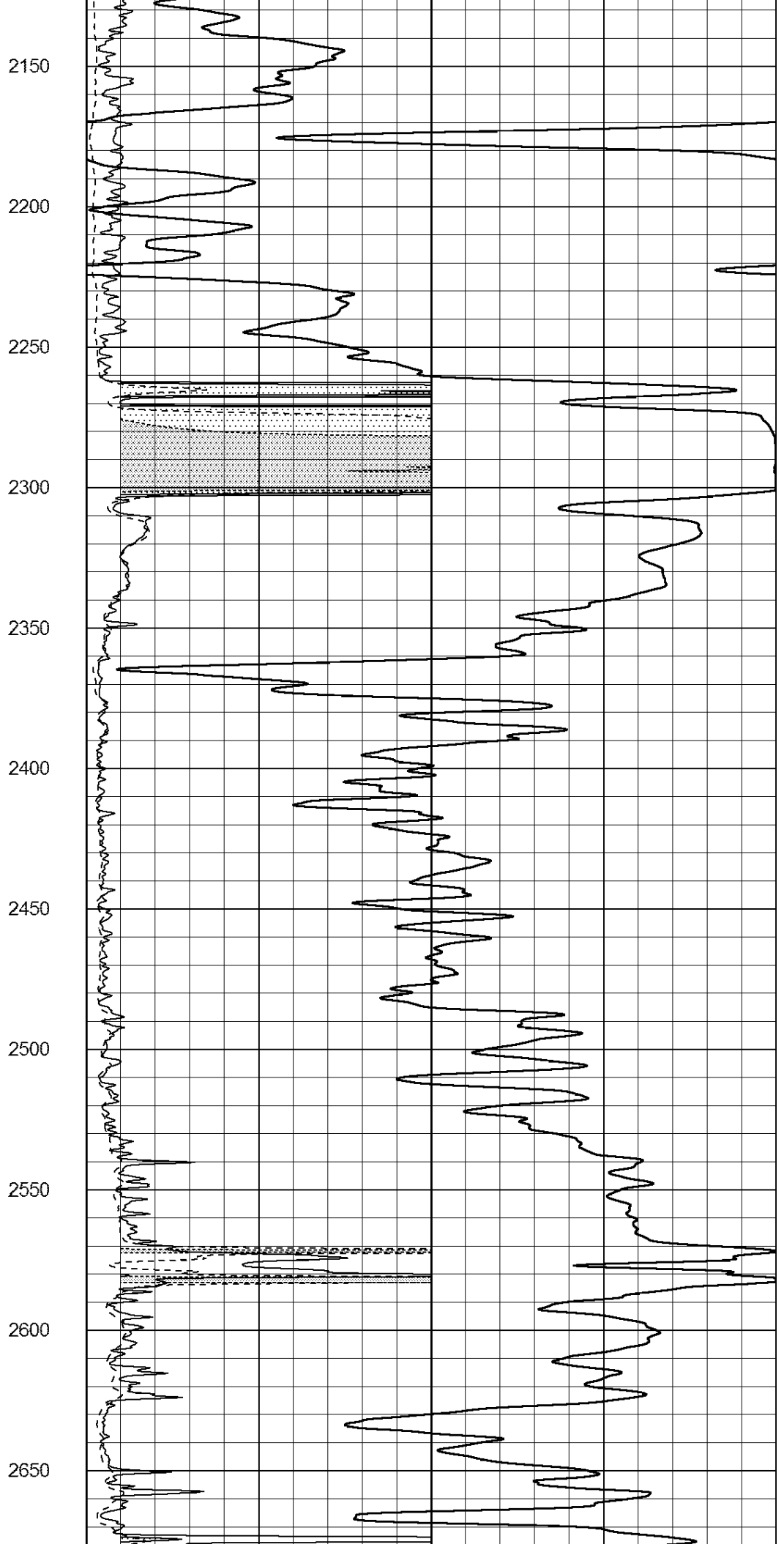
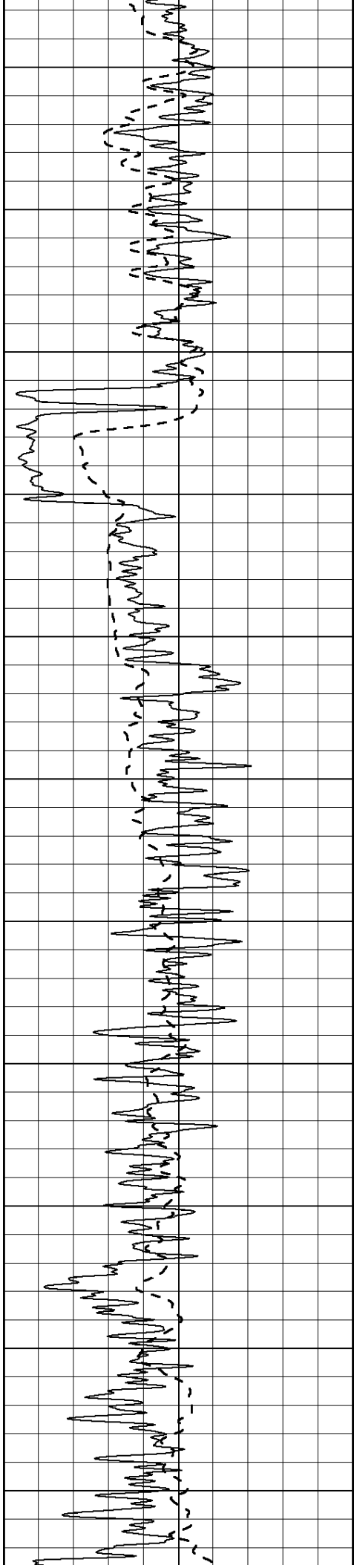
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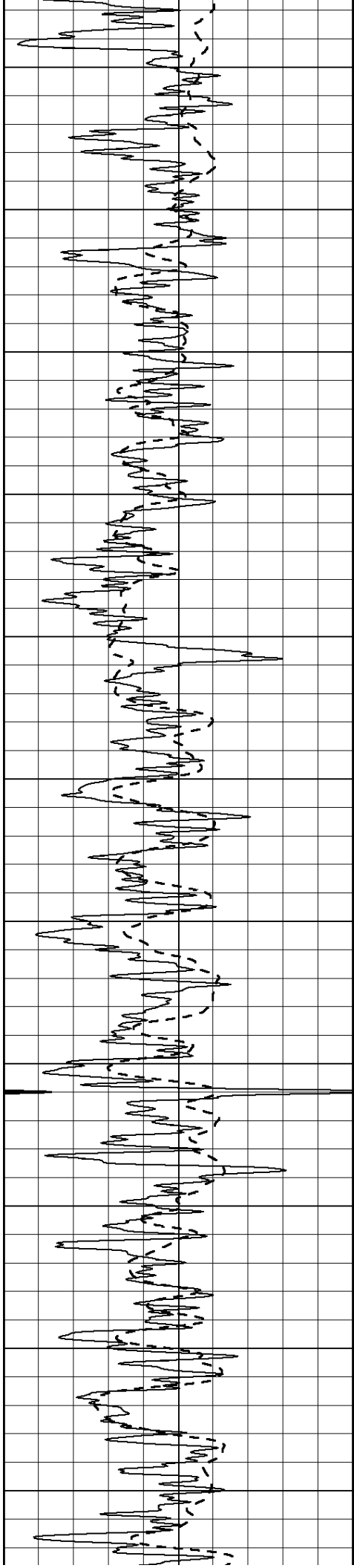
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1550









2700

2750

2800

2850

2900

2950

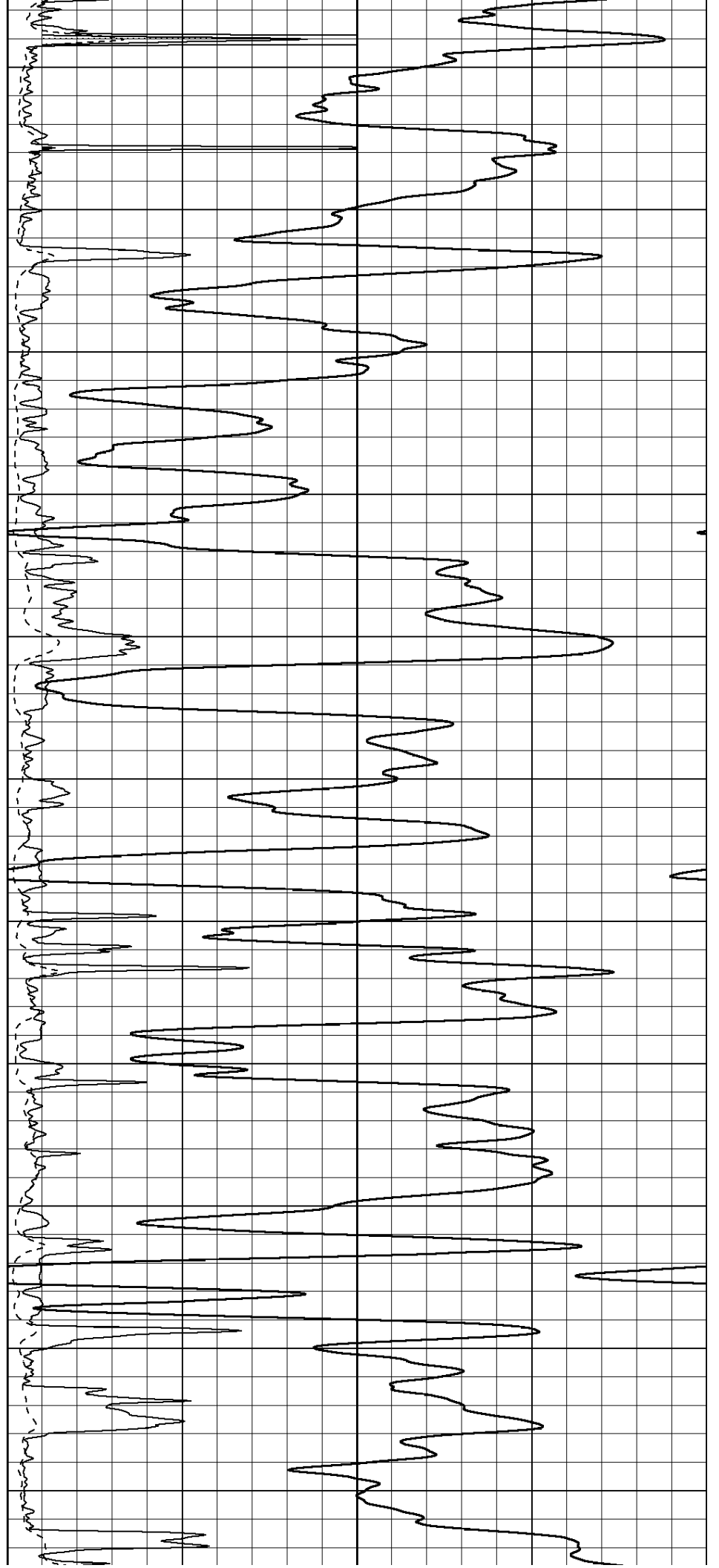
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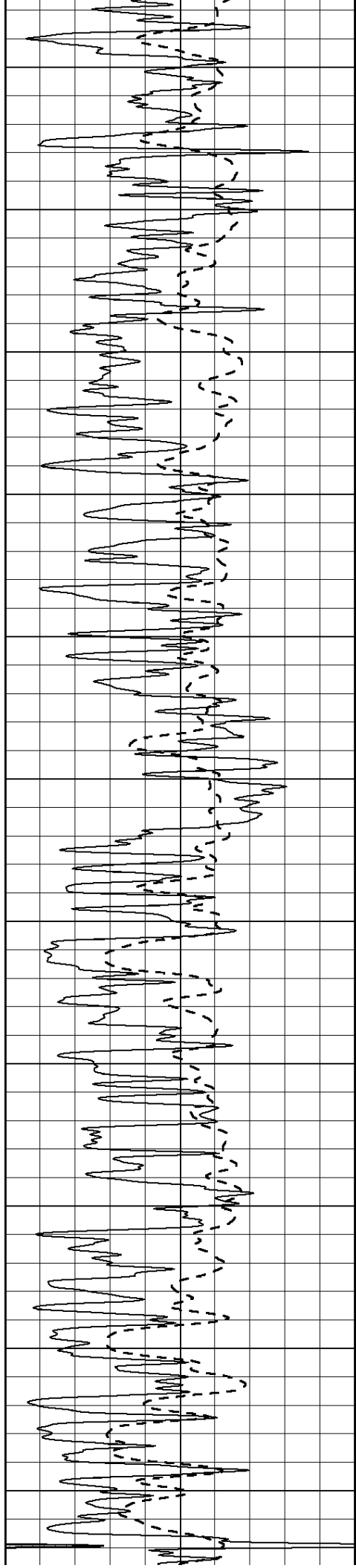
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3100

3150

3200





3250

3300

3350

3400

3450

3500

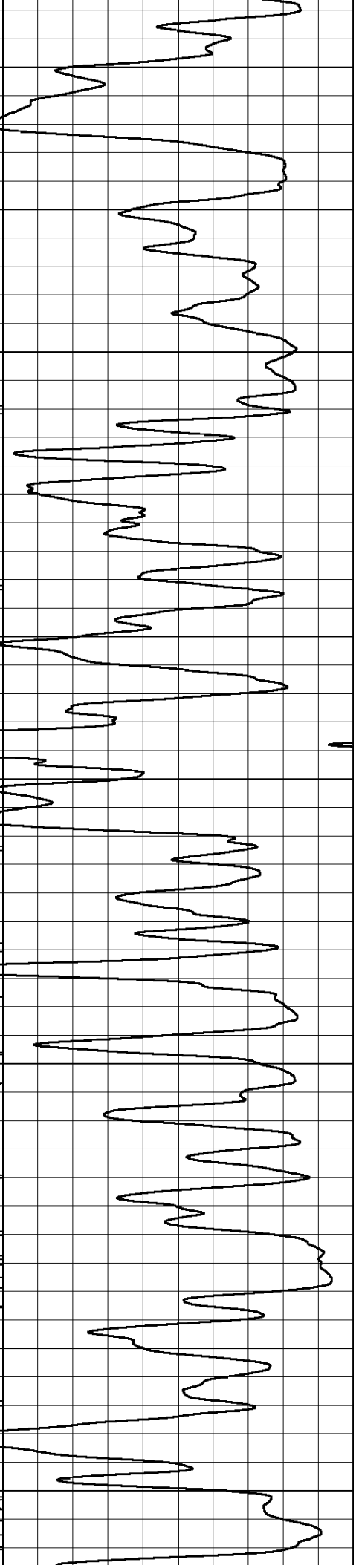
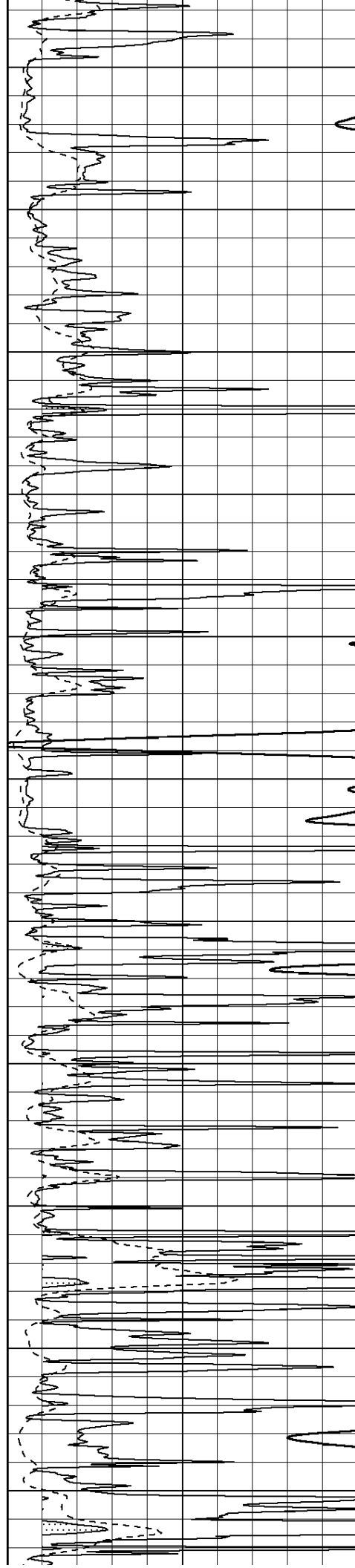
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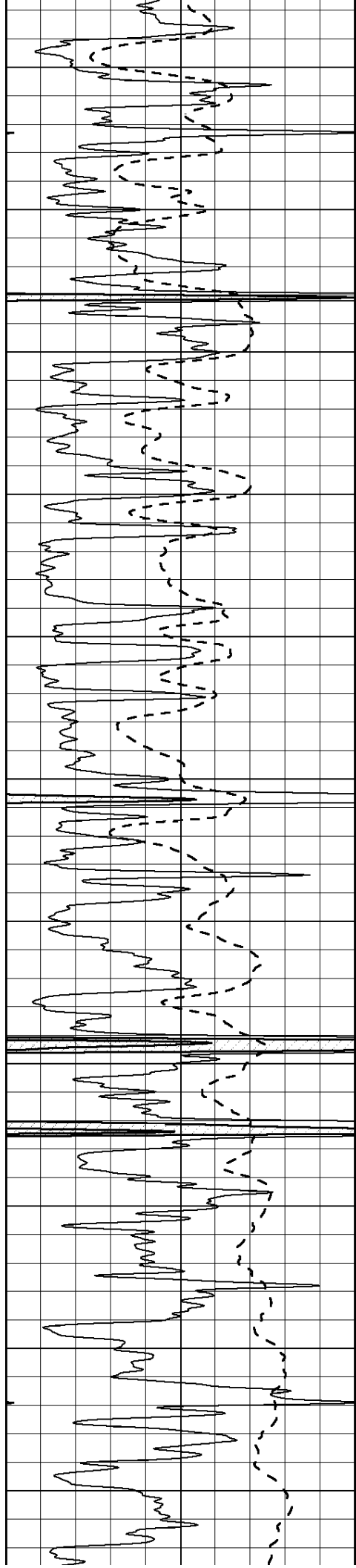
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3650

3700

3750





3800

3850

3900

3950

4000

4050

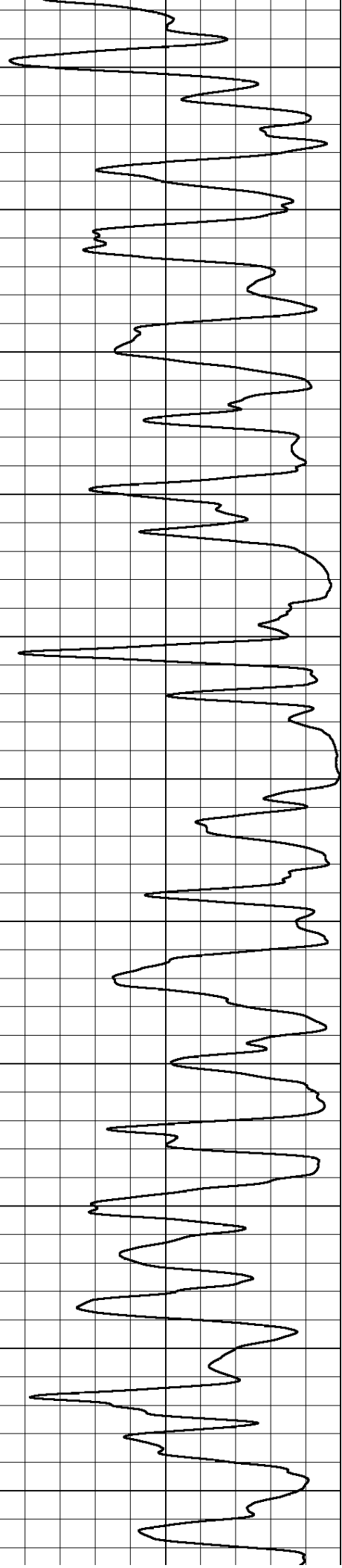
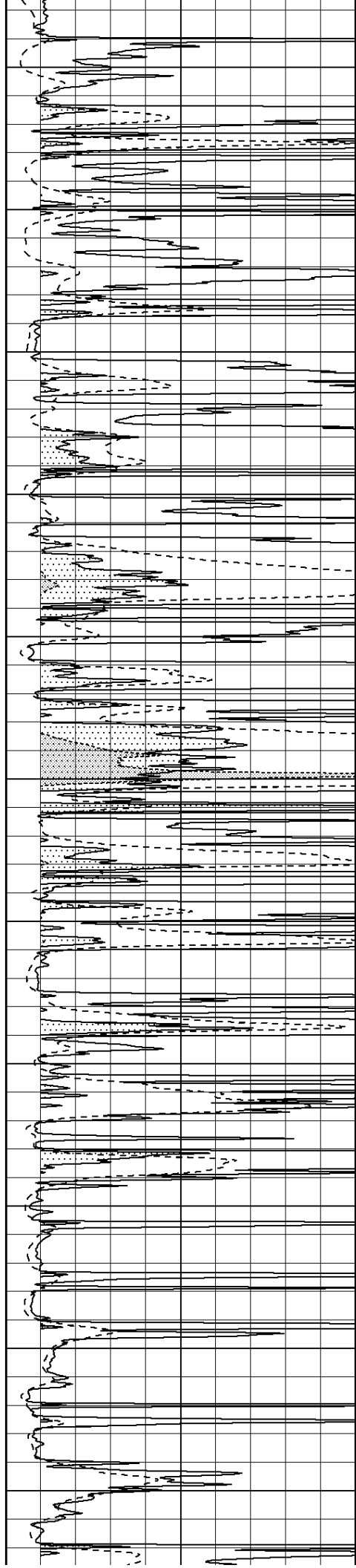
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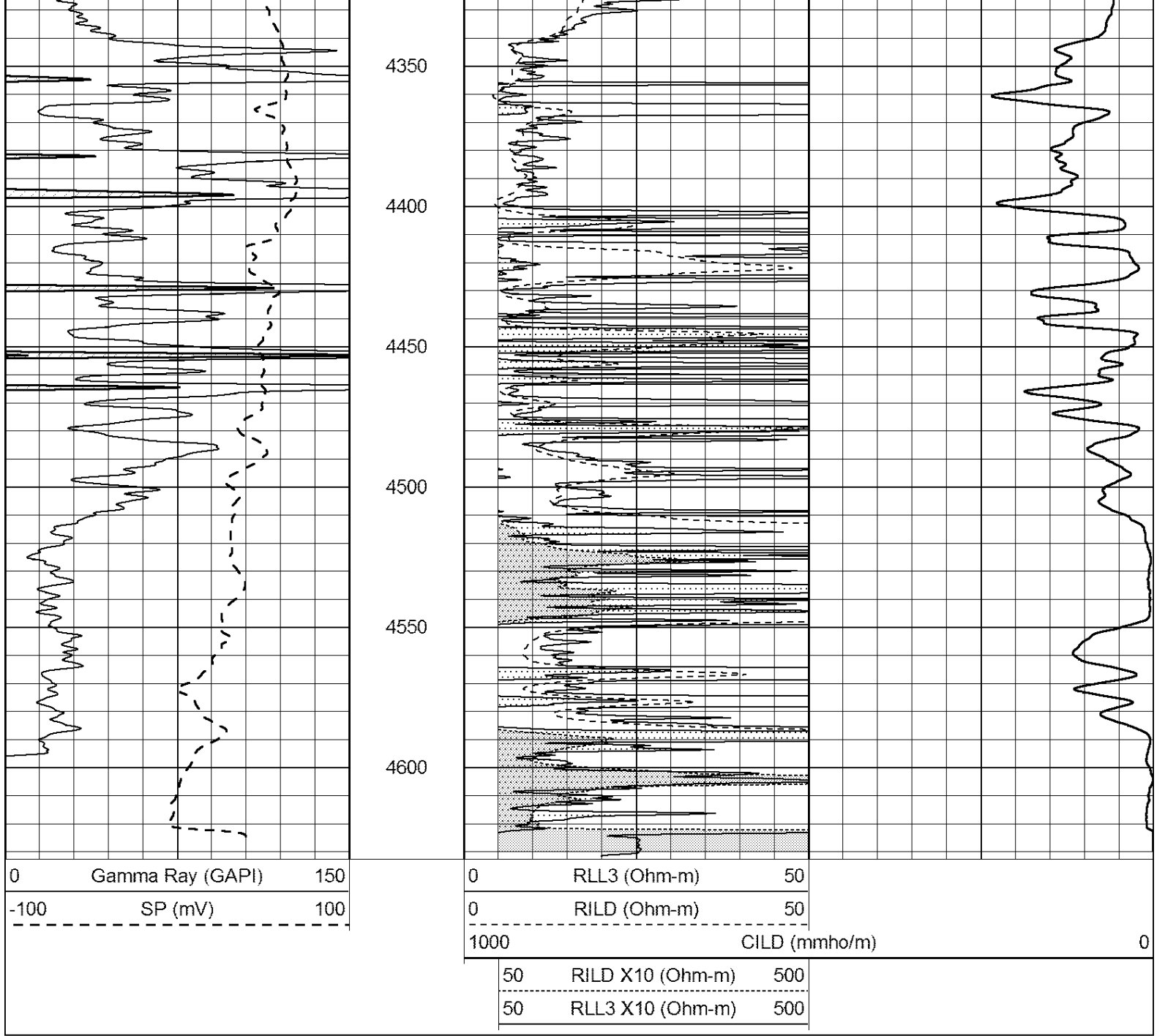
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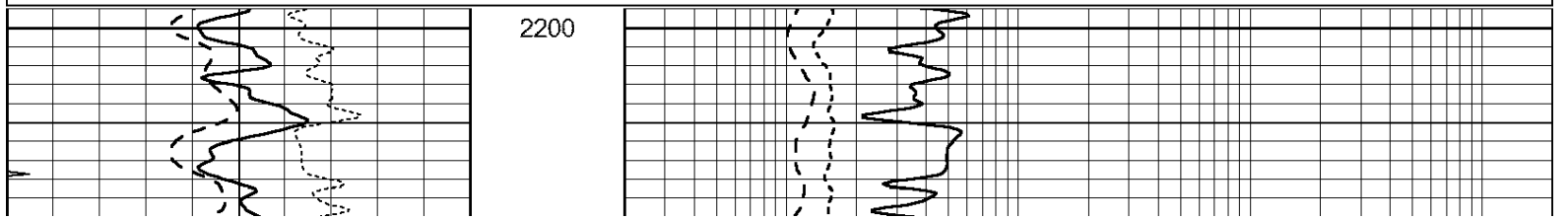
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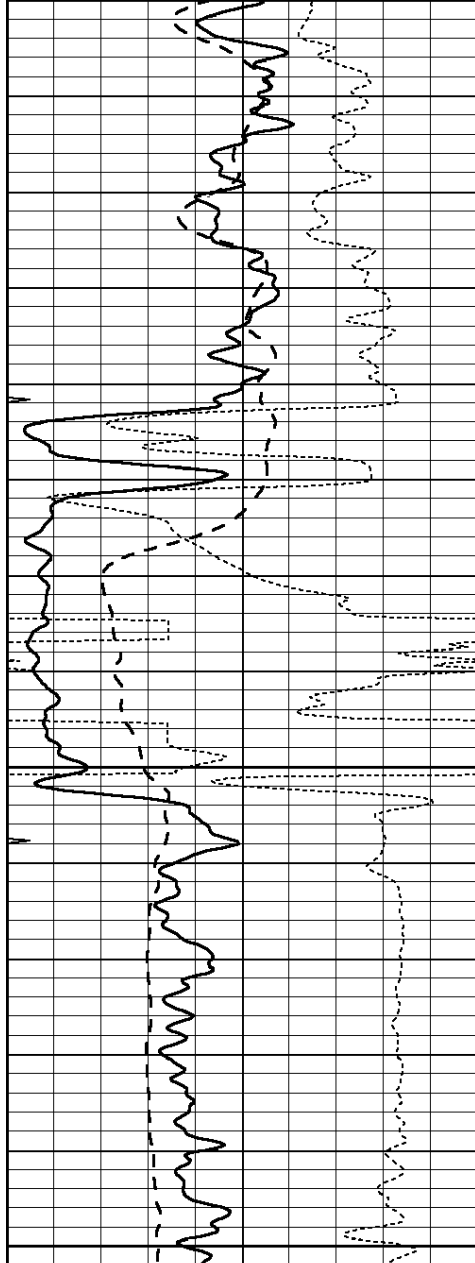




Database File: 26204ddn.db  
 Dataset Pathname: pass3.2  
 Presentation Format: \_dil  
 Dataset Creation: Tue Oct 07 08:30:40 2014 by Calc Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

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			



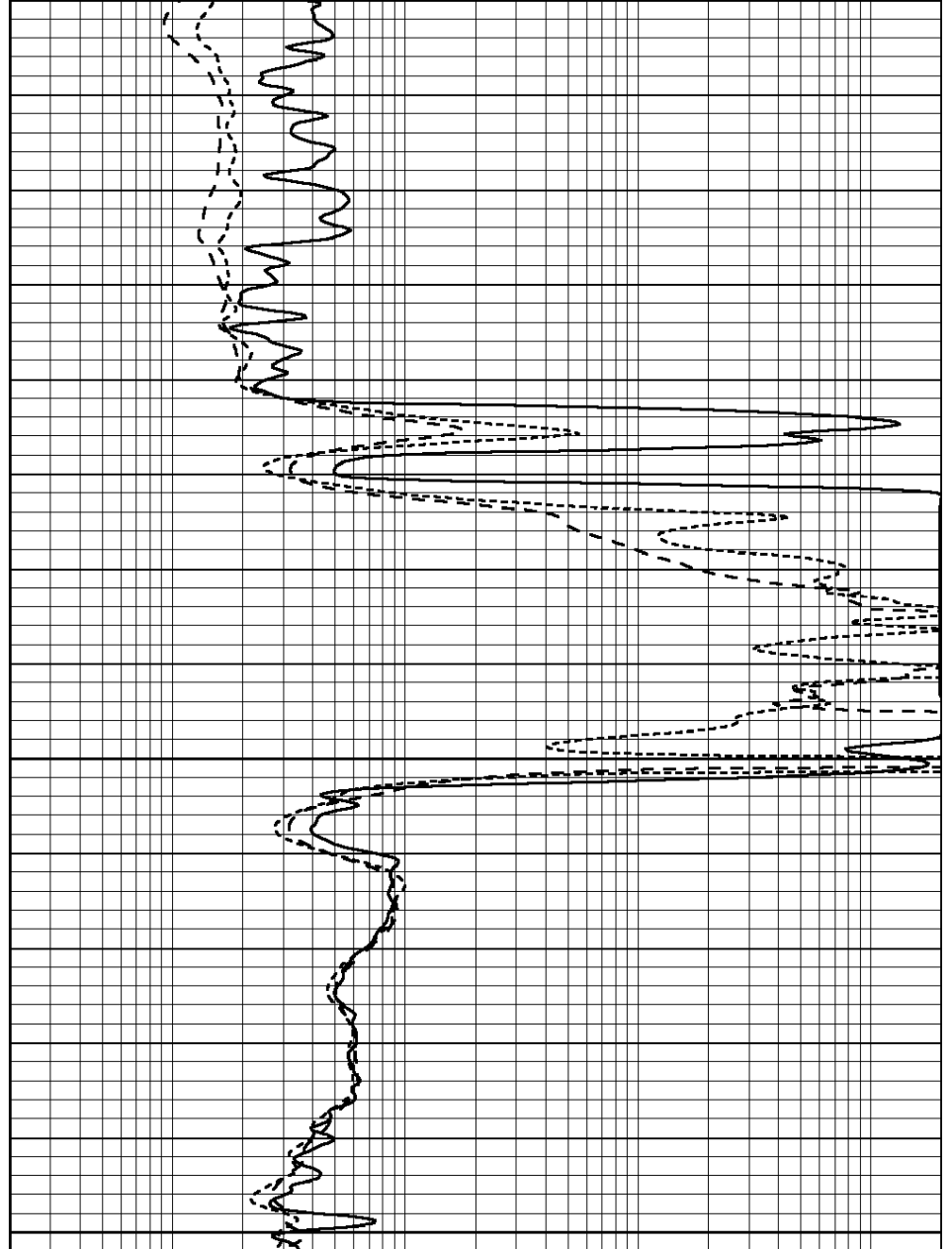


0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

2250

2300

2350

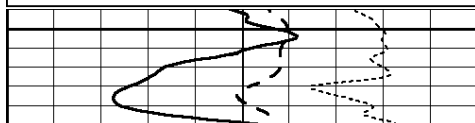


0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

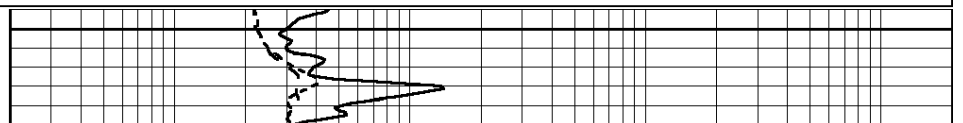
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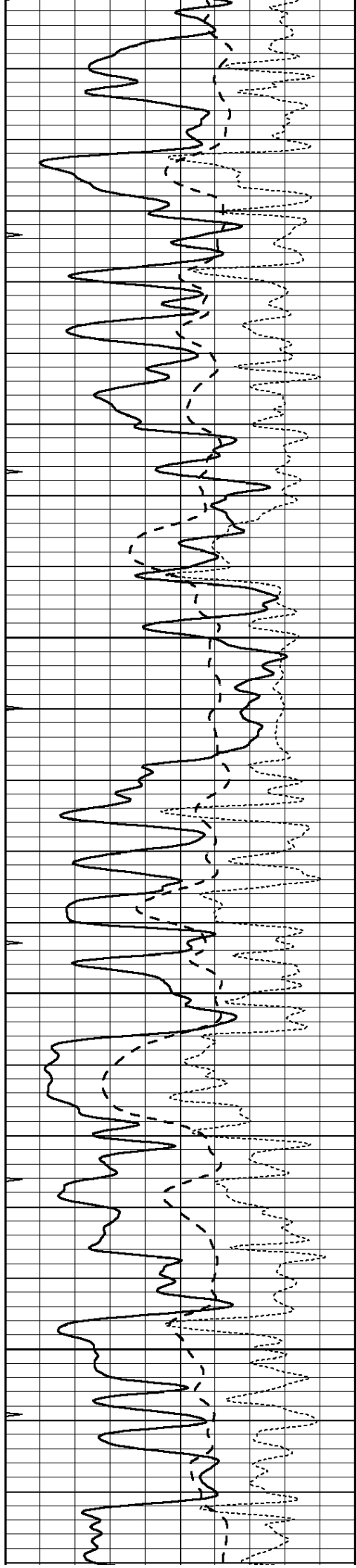
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

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



3400



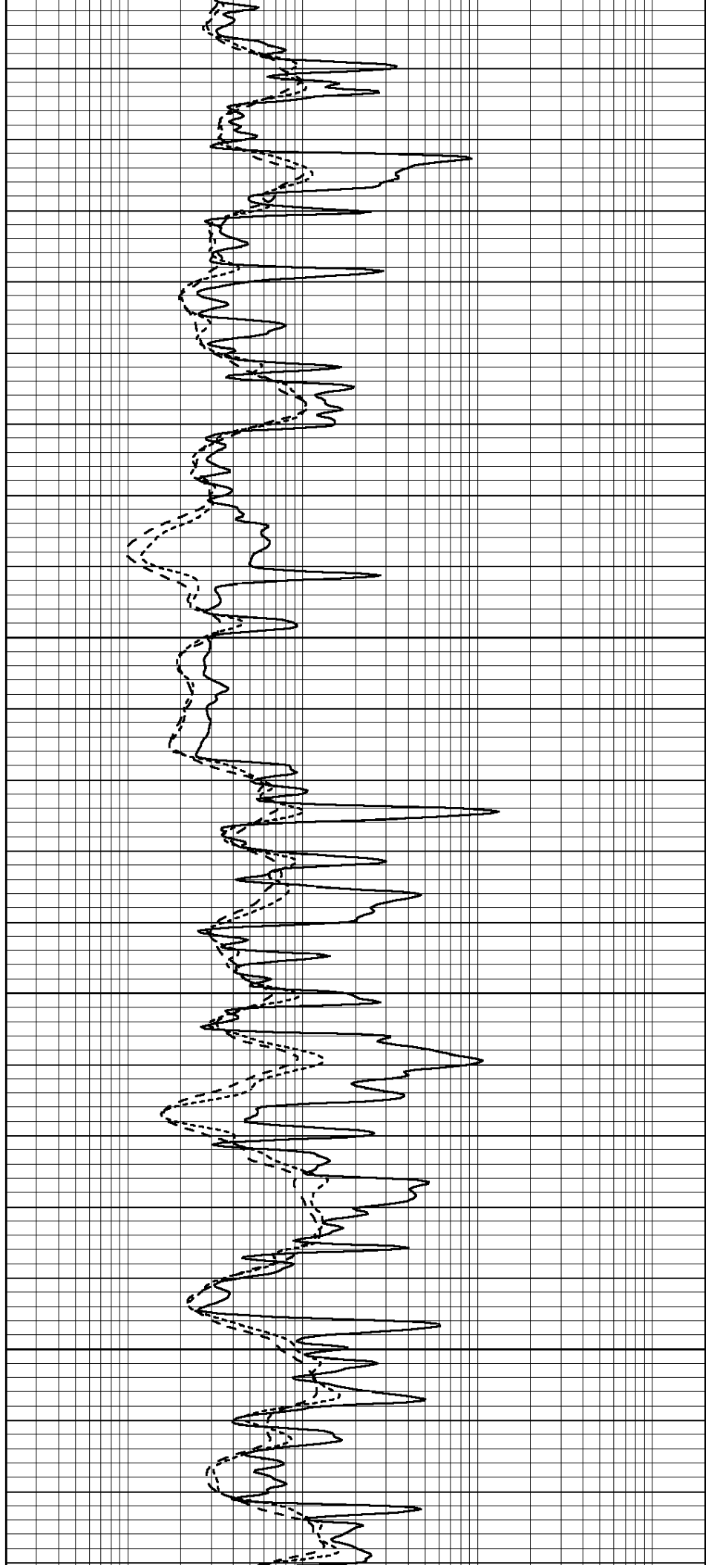


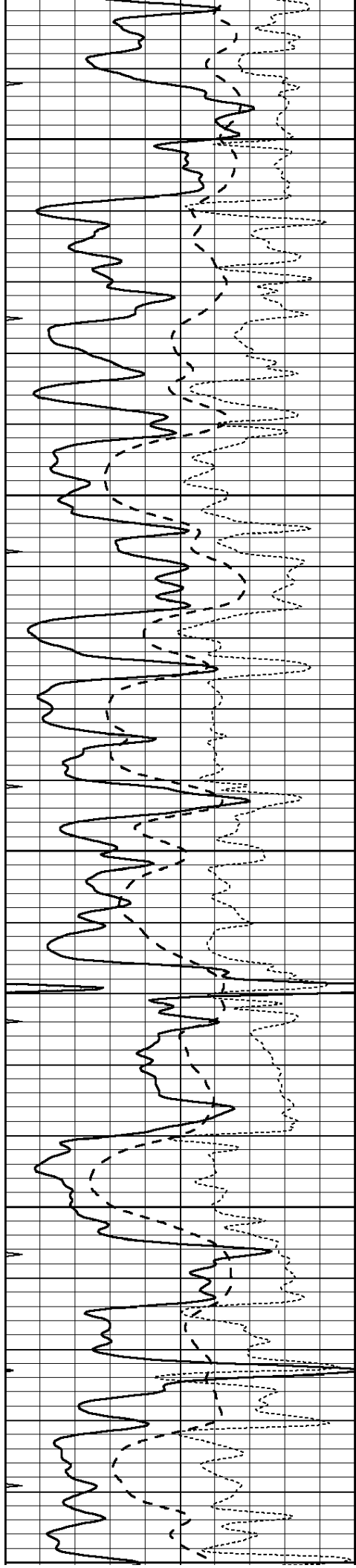
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3500

3550

3600





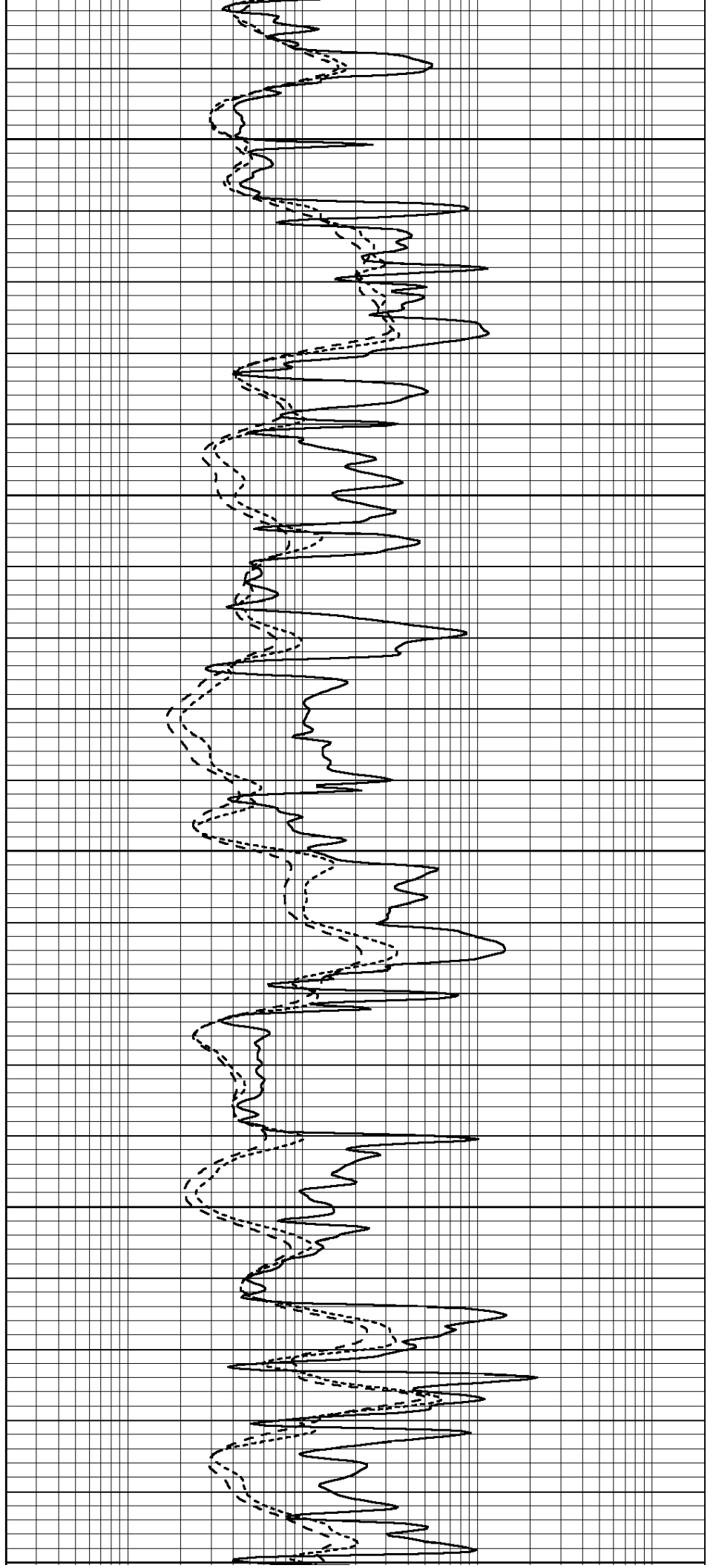
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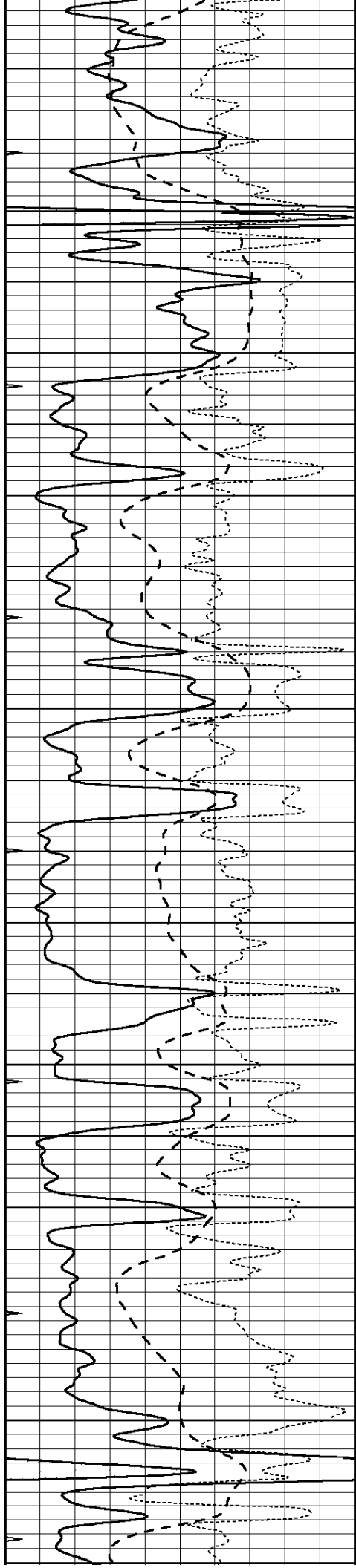
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3750

3800

3850





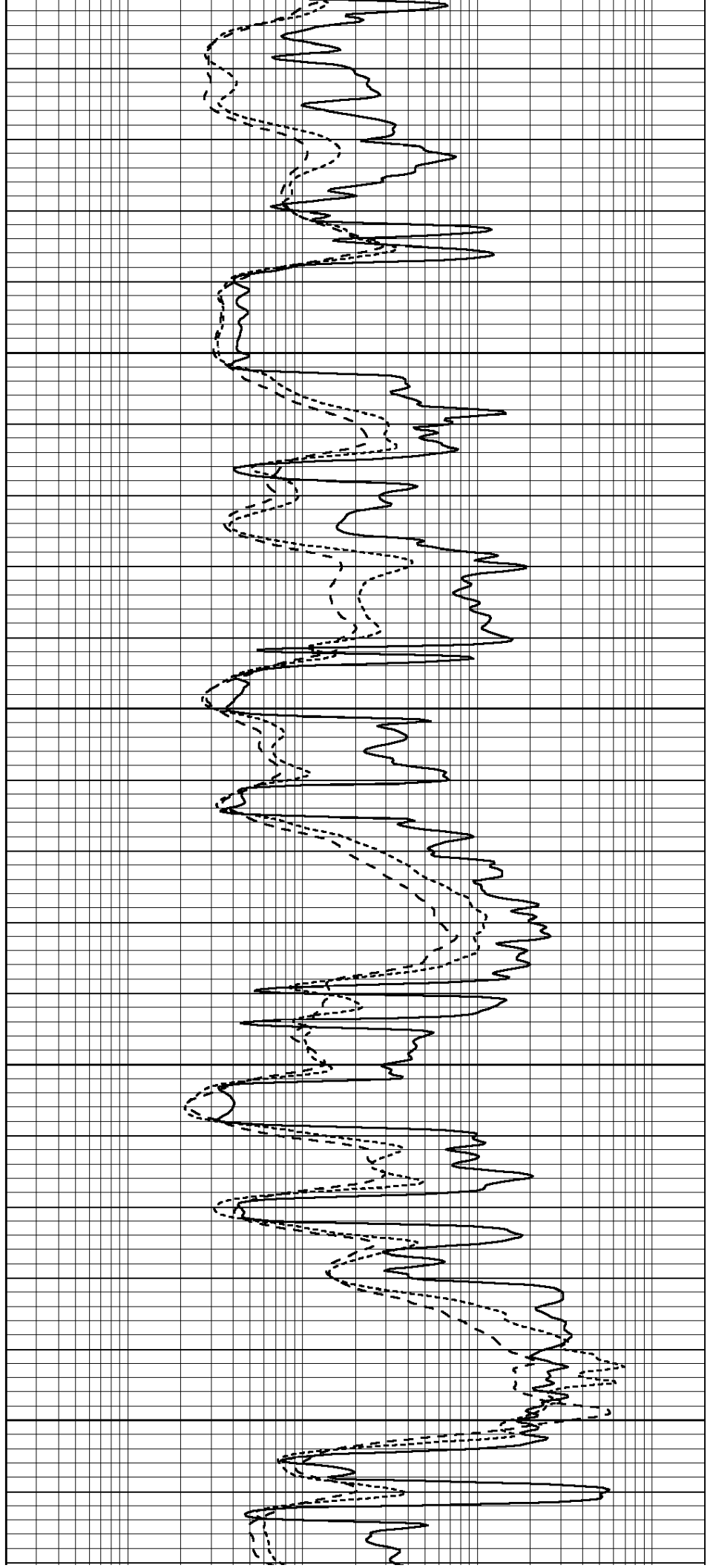
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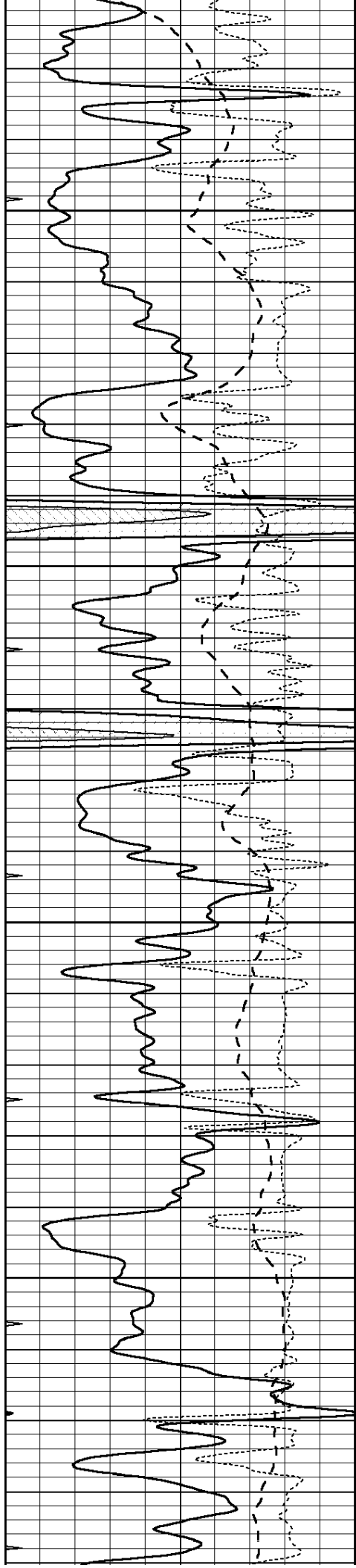
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3950

4000

4050



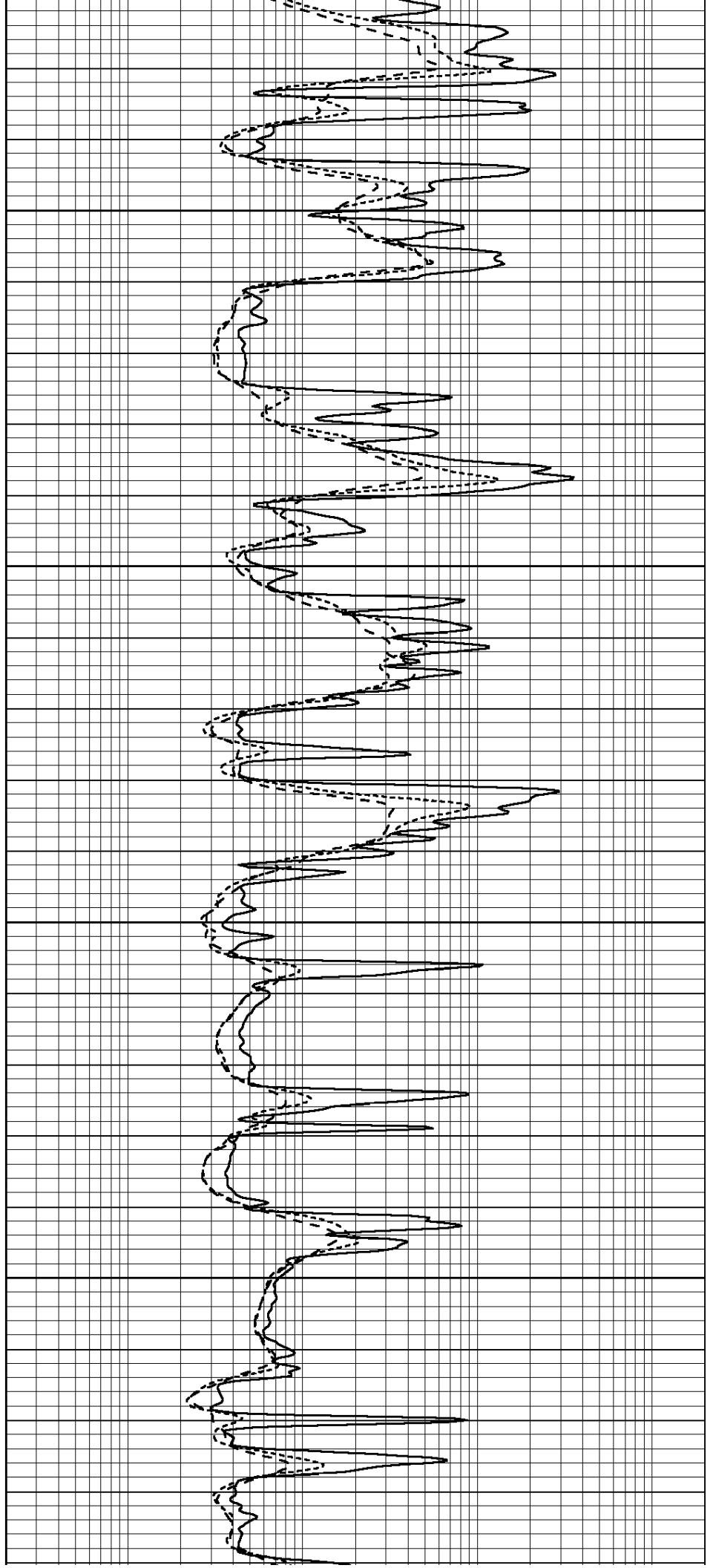


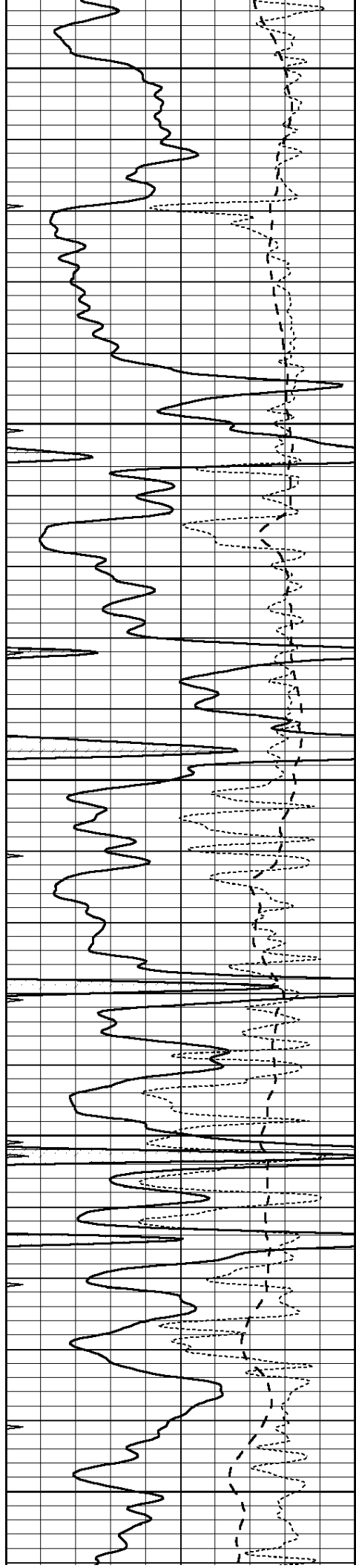
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4150

4200

4250





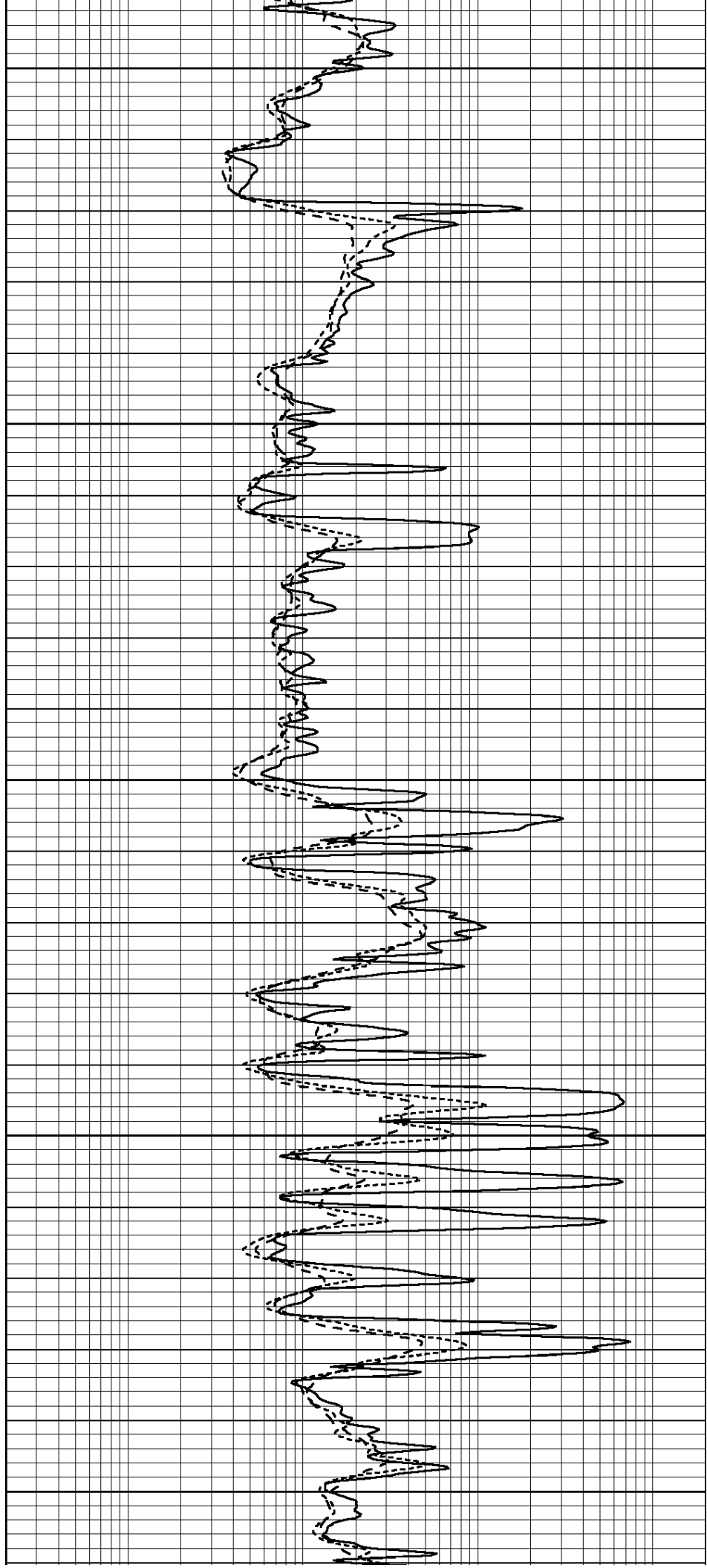
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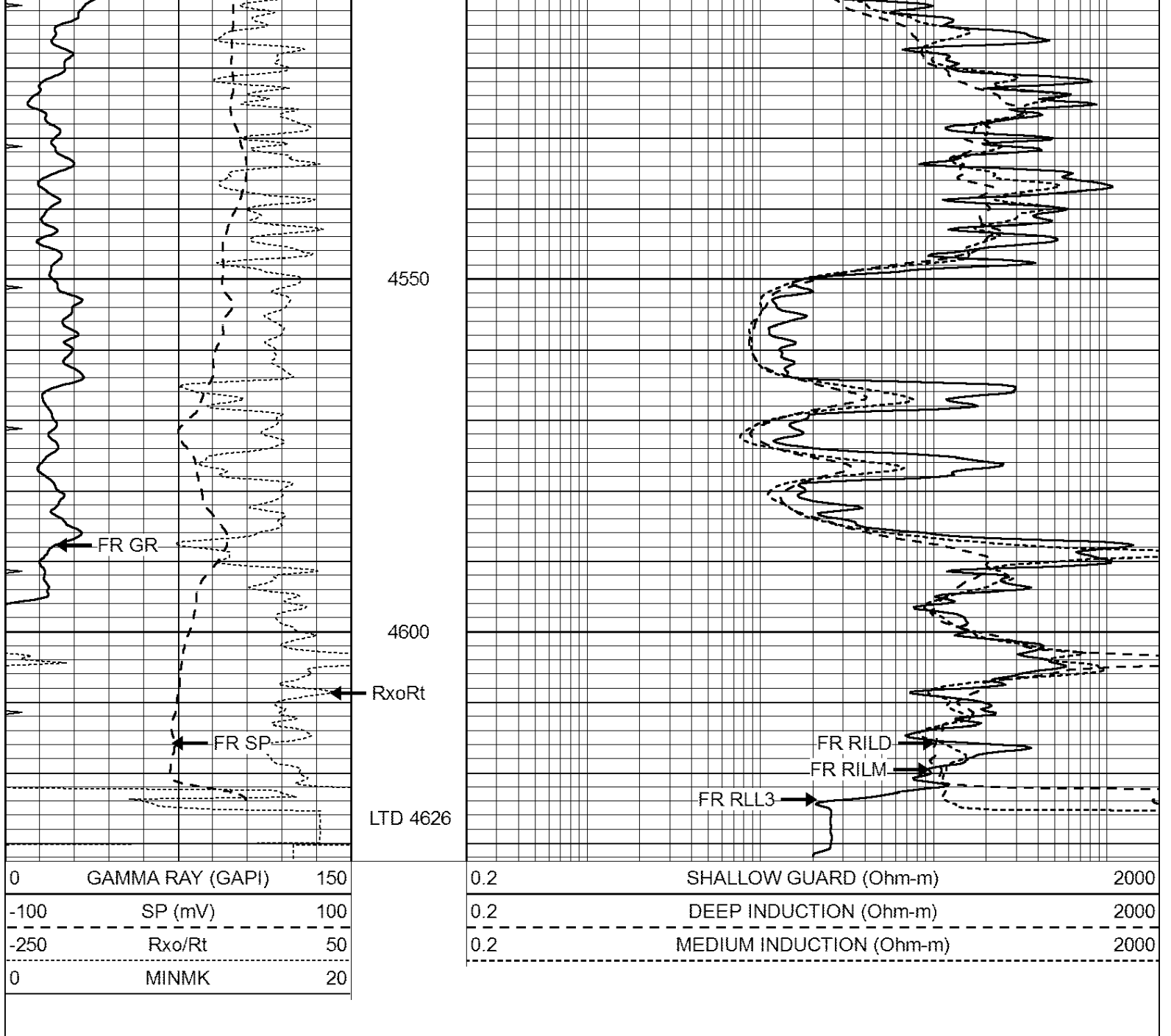
4350

4400

4450

4500





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

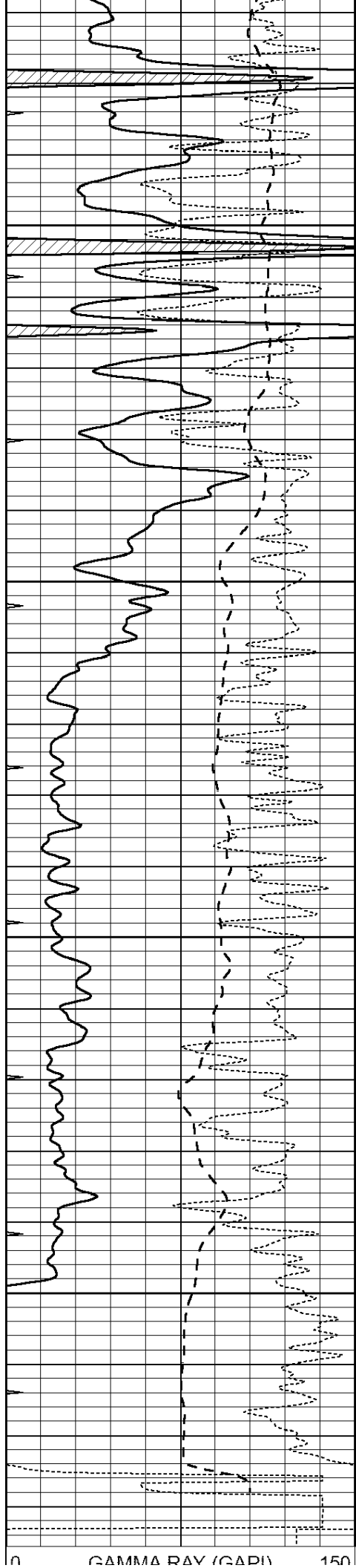


# REPEAT SECTION

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 Dataset Pathname: pass2.2  
 Presentation Format: \_dil  
 Dataset Creation: Tue Oct 07 06:48:49 2014 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	20

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



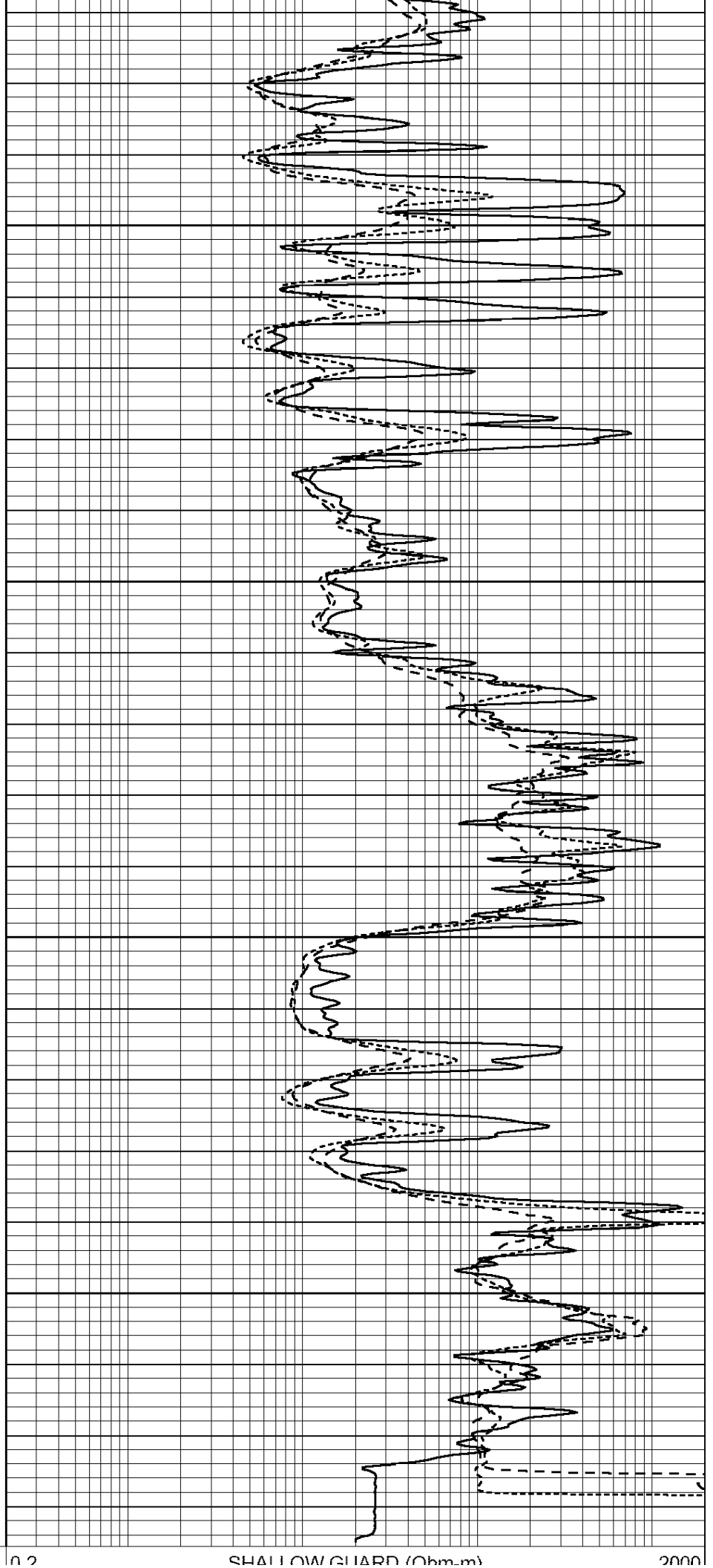
4450

4500

4550

4600

0 GAMMA RAY (GAPI) 150



0 2 SHALLOW GUARD (Ohm.m) 2000

-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

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

### Calibration Report

Database File: 26204ddn.db  
 Dataset Pathname: pass3.2  
 Dataset Creation: Tue Oct 07 08:30:40 2014 by Calc Open-Cased 090629

### Dual Induction Calibration Report

Serial-Model: PROBE8-DILG  
 Surface Cal Performed: Sun Aug 17 08:09:53 2014  
 Downhole Cal Performed: Mon Jul 28 11:08:27 2008  
 After Survey Verification Performed: Mon Jul 28 11:08:27 2008

#### Surface Calibration

Loop:	Readings			References			Results	
	Air	Loop		Air	Loop		m	b
Deep	0.015	0.648	V	0.000	400.000	mmho/m	620.000	-2.000
Medium	0.029	0.796	V	0.000	464.000	mmho/m	590.000	-16.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.017	0.657	V	0.000	400.000	mmho/m	625.153	-10.619
Medium	0.016	0.757	V	0.000	464.000	mmho/m	625.992	-9.739

#### Downhole Calibration

	Readings			References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	2.011	405.777	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	7.590	503.393	mmho/m	1.000	0.000
LL3		7.500	V		1500.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		3800.000	mmho-m		

#### After Survey Verification

	Readings			Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
Medium	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
LL3		1.000	Ohm-m		1.000	Ohm-m		
		0.000	Ohm-m		0.000	Ohm-m		
		1.000	mmho-m		1.000	mmho-m		

### Compensated Density Calibration Report

Serial-Model: GEAR3-GEARHART  
 Source / Verifier: 143 / 143  
 Master Calibration Performed: Sun Aug 17 08:09:42 2014  
 Before Survey Verification Performed:  
 After Survey Verification Performed:

#### Master Calibration

	Density		g/cc	Far Detector		Near Detector	
Magnesium	1.710			935.36	501.55	cps	

Aluminum

2.580 g/cc

209.32

357.01 cps

Spine Angle = 77.21

Density/Spine Ratio = 0.567

Size

Reading

Small Ring  
Large Ring

8.00 in  
14.00 in

4.29 V  
6.24 V

Before Survey Verification

Target

Measured

g/cc  
g/cc  
g/cc

g/cc  
g/cc  
g/cc

After Survey Verification

Target

Measured

g/cc  
g/cc  
g/cc

g/cc  
g/cc  
g/cc

Compensated Neutron Calibration Report

Serial Number: 6I  
Tool Model: G

CALIBRATION

Detector	Readings	Target	Normalization
Short Space	1.00 cps	1.00 cps	1.0000
Long Space	1.00 cps	1.00 cps	1.0000

PRE-SURVEY VERIFICATION

Detector	Readings	Measured	Target
1) Short Space	cps		
Long Space	cps	pu	pu
2) Short Space	cps		
Long Space	cps	pu	
3) Short Space	cps		
Long Space	cps	pu	

POST-SURVEY VERIFICATION

Detector	Readings	Measured	Target
1) Short Space	cps		
Long Space	cps	pu	pu
2) Short Space	cps		
Long Space	cps	pu	pu
3) Short Space	cps		
Long Space	cps	pu	pu

Gamma Ray Calibration Report

Serial Number: GR6  
Tool Model: OPEN  
Performed: Sun Aug 17 15:23:09 2014

Calibrator Value: 150.0 GAPI

Background Reading:  
Calibrator Reading:

0.0  
276.0

cps  
cps

Sensitivity:

0.7000

GAPI/cps