



**COMPLETION
& PRODUCTION
SERVICES CO.**

**DUAL
INDUCTION
LOG**

Company	PIONEER RESOURCES	Company	PIONEER RESOURCES
Well	KNOPP #6	Well	KNOPP #6
Field		Field	
County	LOGAN	County	LOGAN
State	KANSAS	State	KANSAS
Location:	API # : 15-109-21179-00-00	Other Services	
	2590' FSL & 335' FWL	CDL/CNL	
	NE - NW - NW - SW		
	SEC 13 TWP 14S RGE 32W		
Permanent Datum	GROUND LEVEL	Elevation	
Log Measured From	KELLY BUSHING 10' A.G.L.	K.B. 2803	
Drilling Measured From	KELLY BUSHING	D.F. 2801	
		G.L. 2793	
Date	5/30/13		
Run Number	ONE		
Depth Driller	4520		
Depth Logger	4520		
Bottom Logged Interval	4518		
Top Log Interval	0		
Casing Driller	224		
Casing Logger	223		
Bit Size	7.875		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 3.300	
Density / Viscosity	9.2 / 50		
pH / Fluid Loss	10.0 / 8.0		
Source of Sample	FLOWLINE		
Rim @ Meas. Temp	0.60 @ 90F		
Rinf @ Meas. Temp	0.45 @ 90F		
Rmc @ Meas. Temp	0.72 @ 90F		
Source of Rinf / Rmc	MEASURED		
Rim @ BHT	0.45 @ 121F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom			
Maximum Recorded Temperature	121F		
Equipment Number	860		
Location	HAYS, KS.		
Recorded By	JEFF GRONEWEG		
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

NABORS COMPLETION & PRODUCTION SERVICES
785-628-6395
THANK YOU FOR YOUR BUSINESS
DIRECTIONS: OAKLEY, KS - SOUTH TO JAYHAWK RD - 1 MILE EAST
1/2 MILE NORTH - EAST INTO

0 Gamma Ray (GAPI) 150

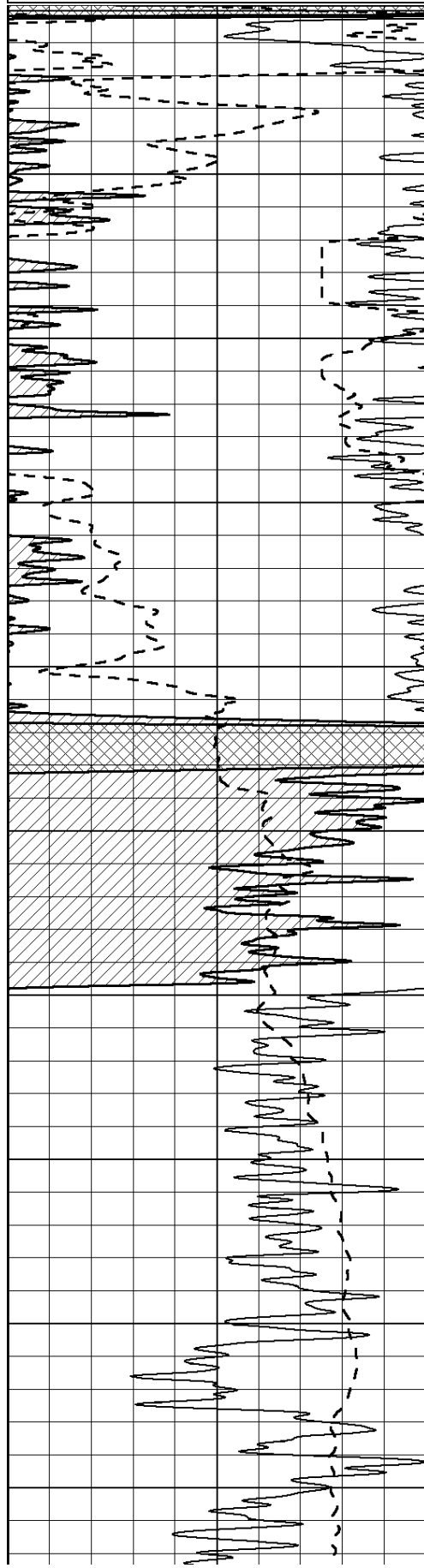
0 RLL3 (Ohm-m) 50

0 Deep Induction (Ohm-m) 50

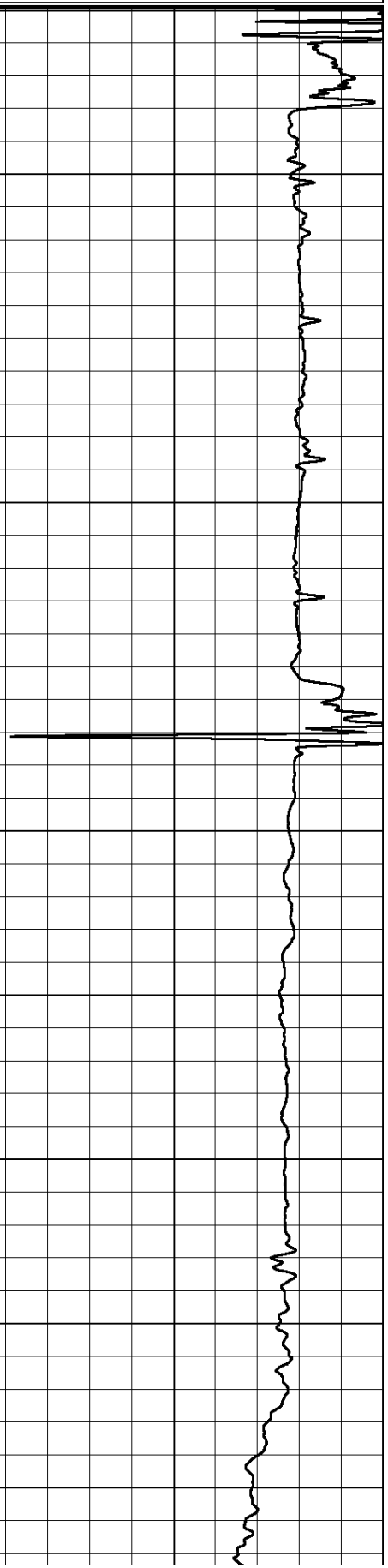
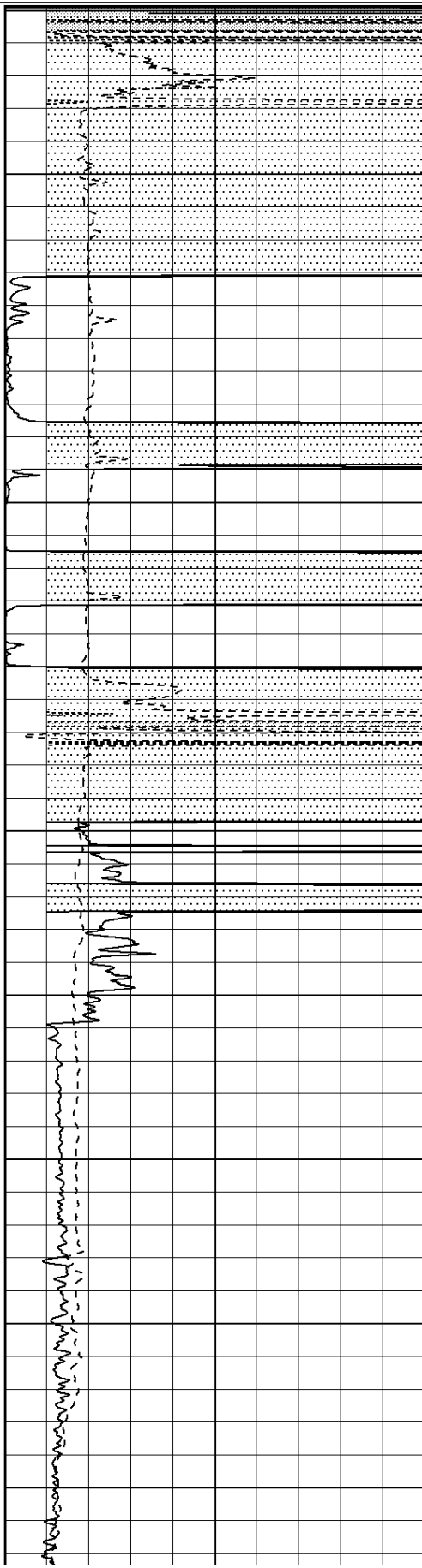
1000 CILD (mmho/m) 0

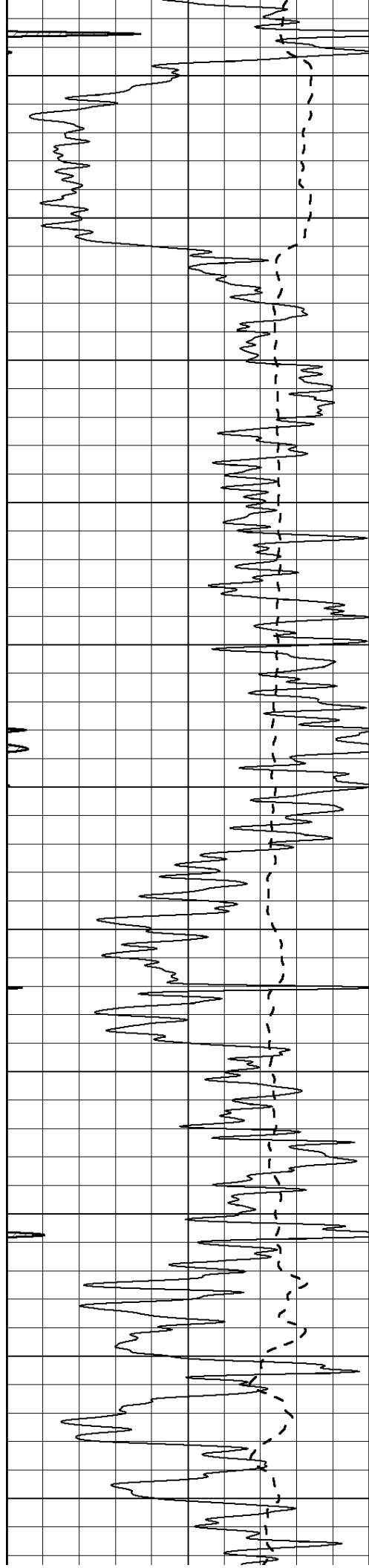
50 RILD X10 (Ohm-m) 500

50 RLL3 X10 (Ohm-m) 500



0
50
100
150
200
250
300
350
400
450





500

550

600

650

700

750

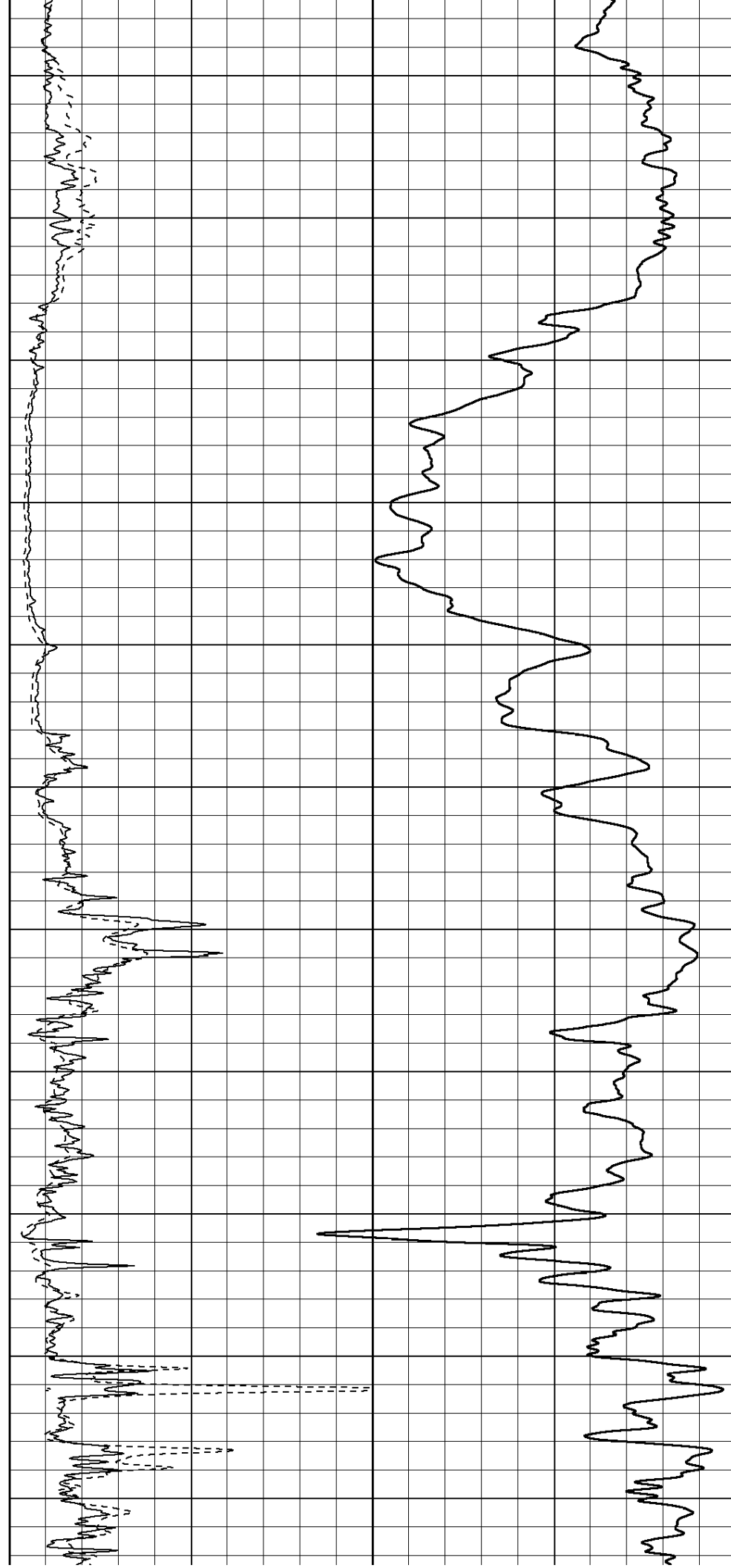
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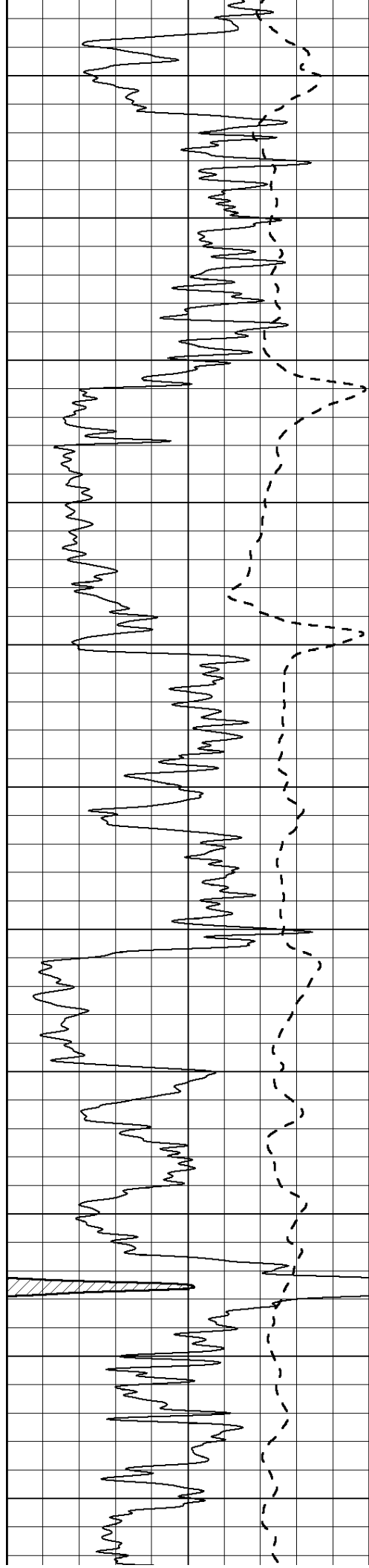
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900

950

1000





1050

1100

1150

1200

1250

1300

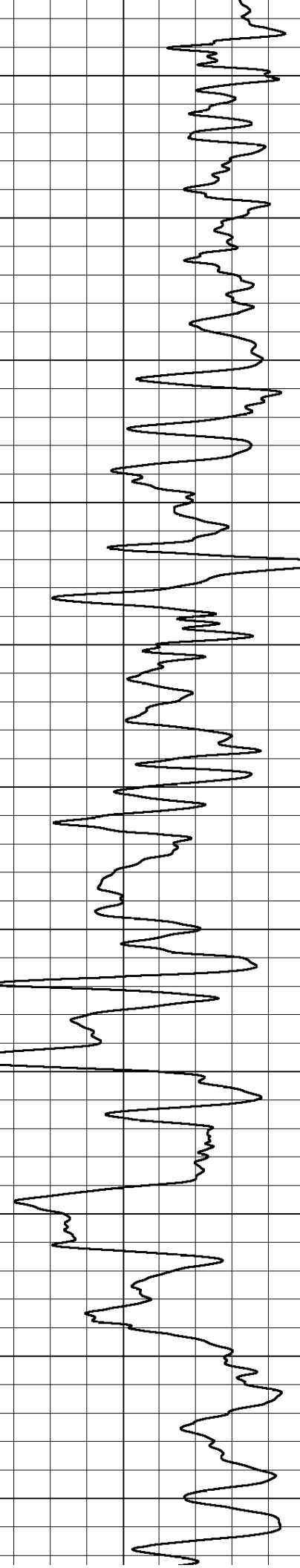
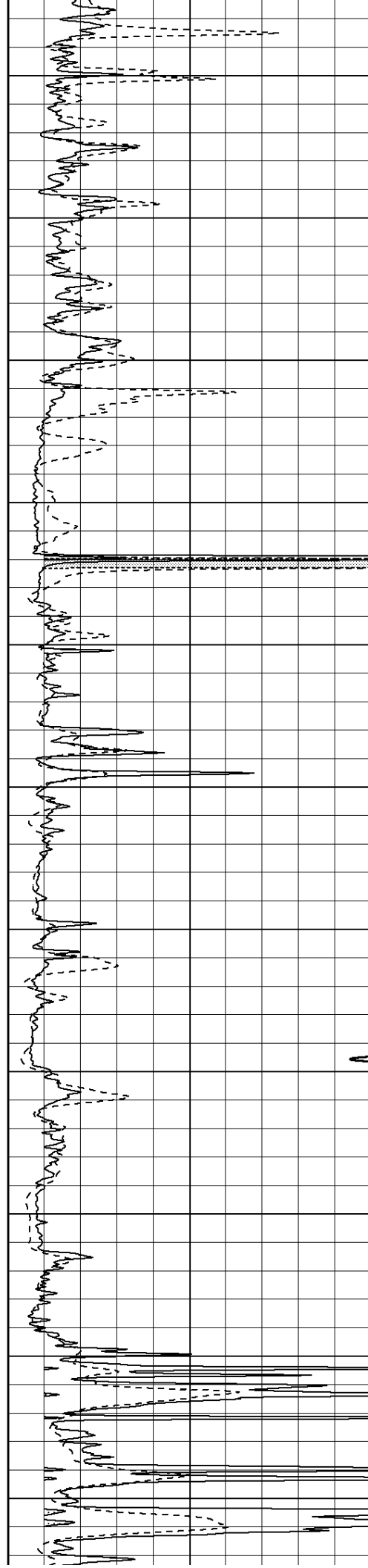
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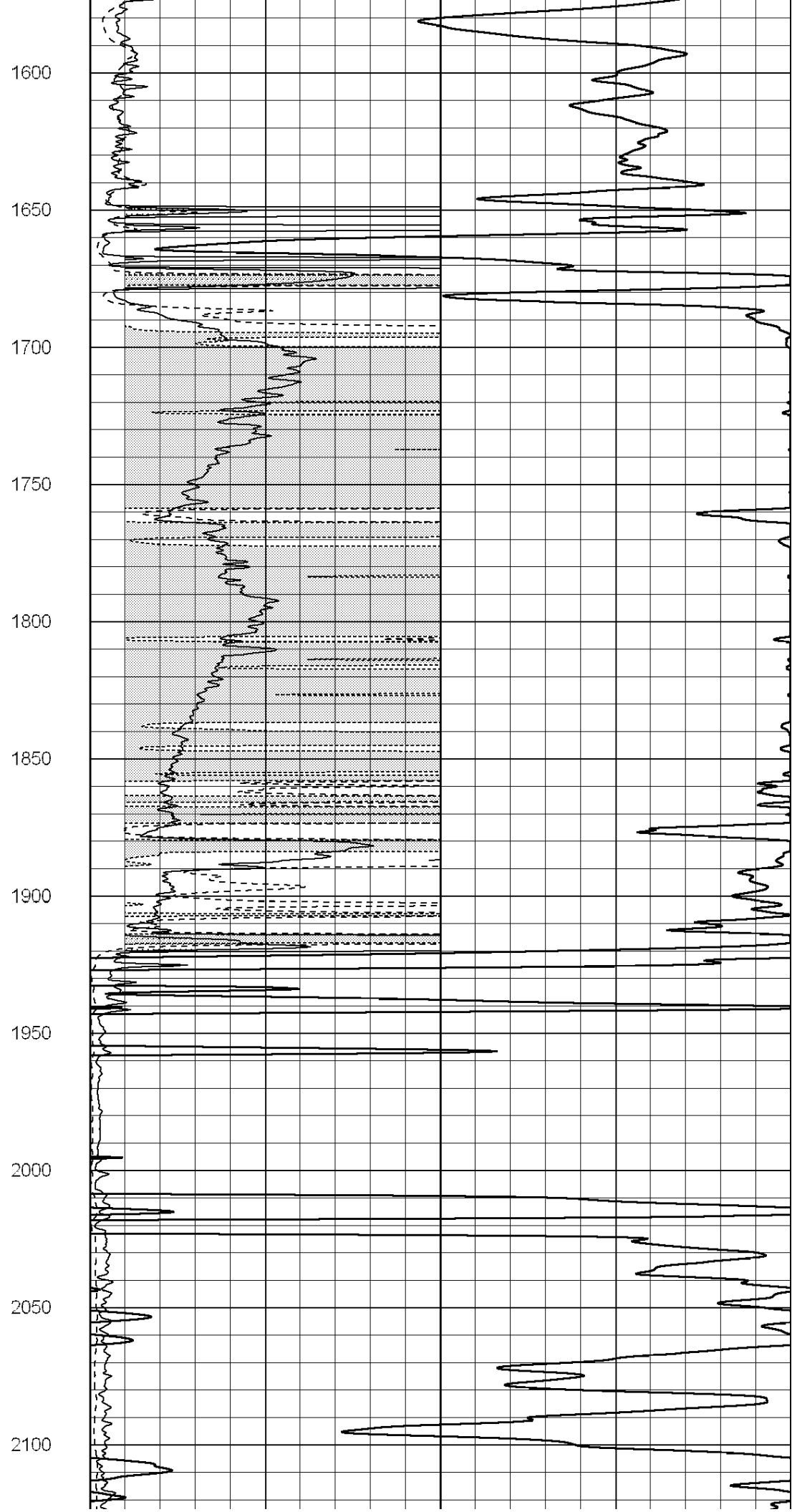
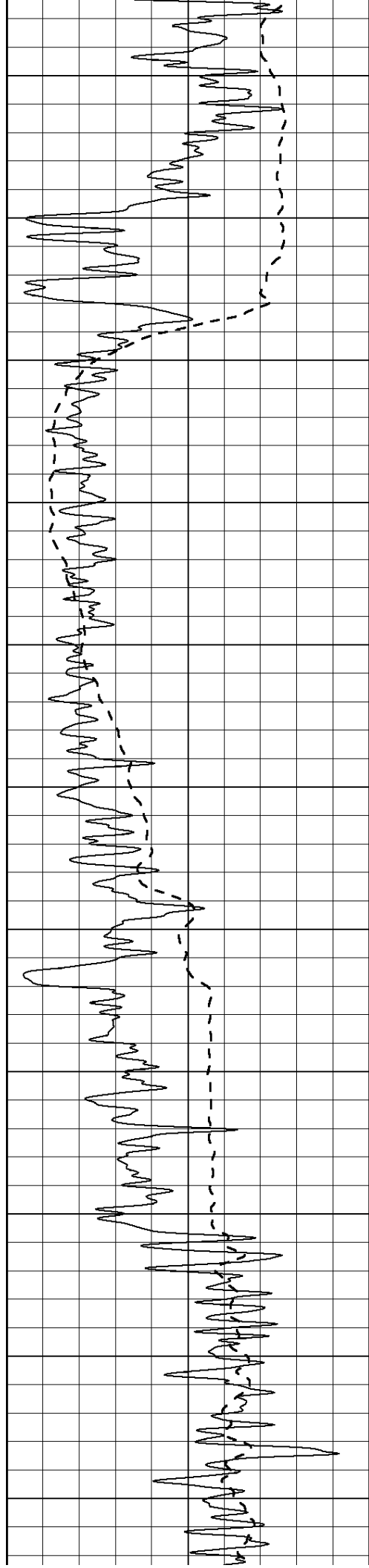
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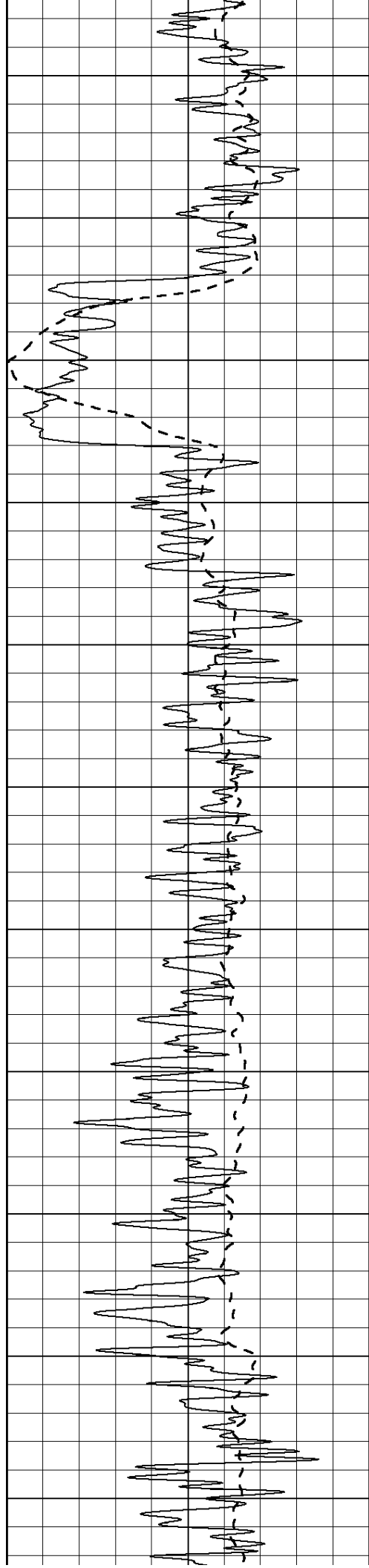
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1500

1550







2150

2200

2250

2300

2350

2400

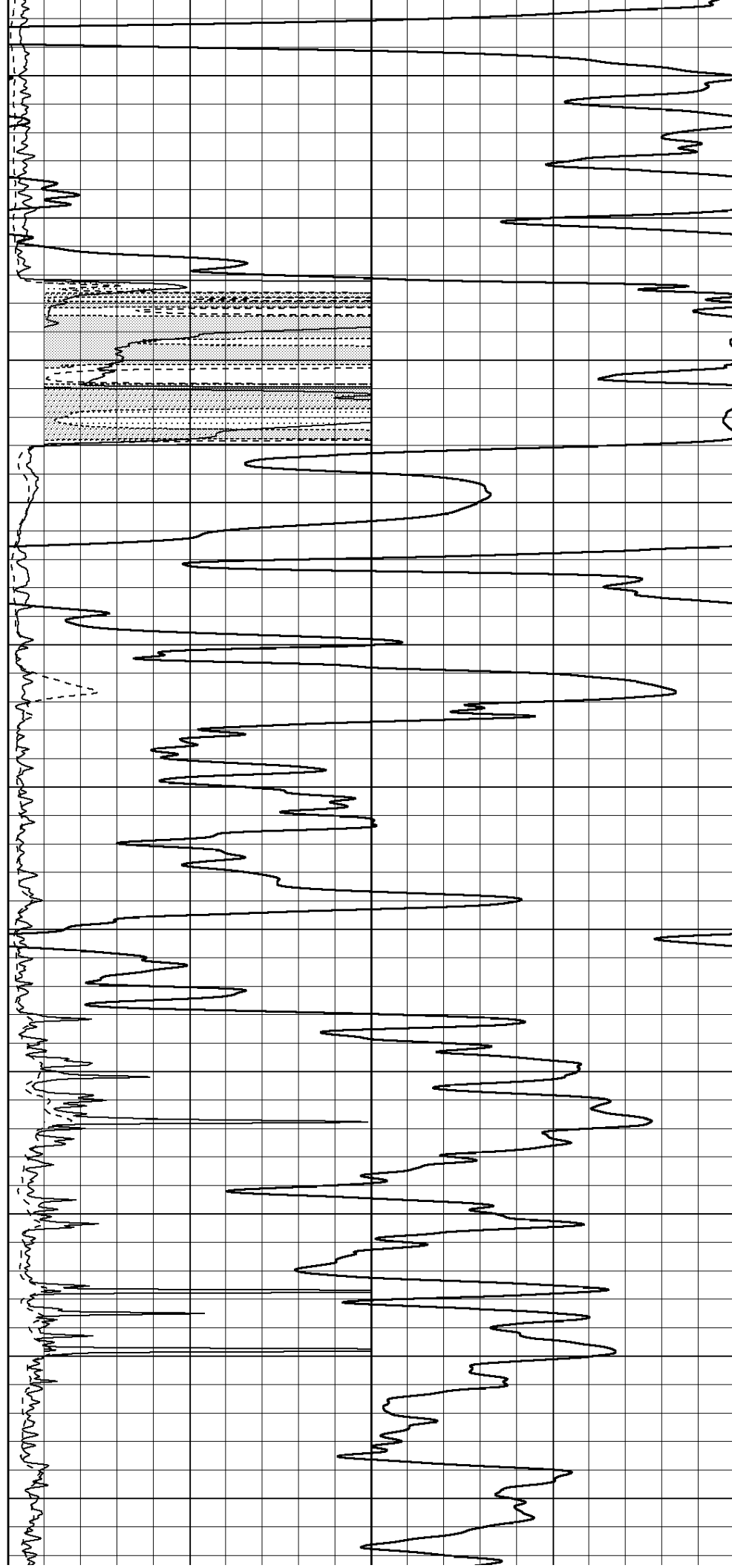
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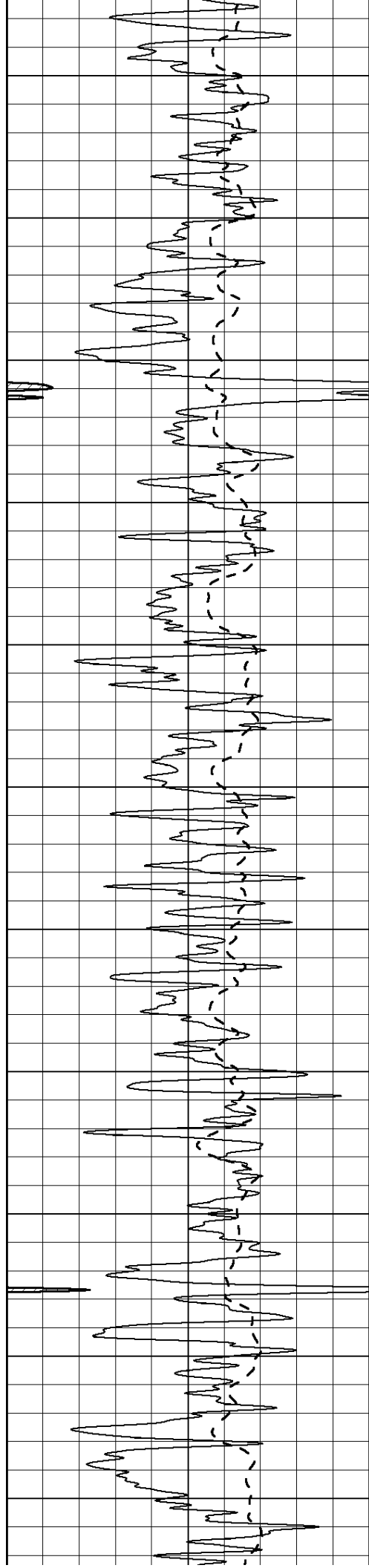
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2550

2600

2650





2700

2750

2800

2850

2900

2950

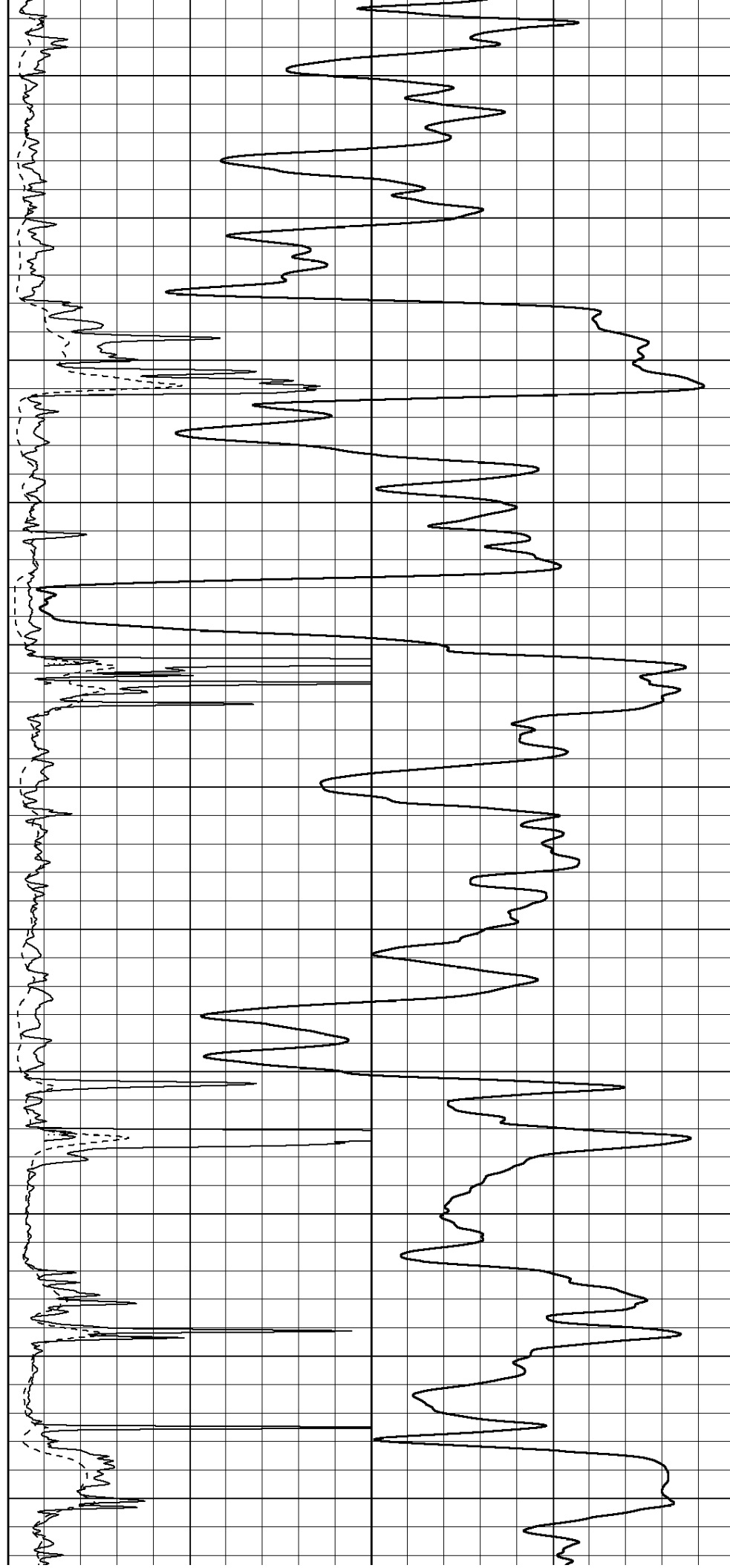
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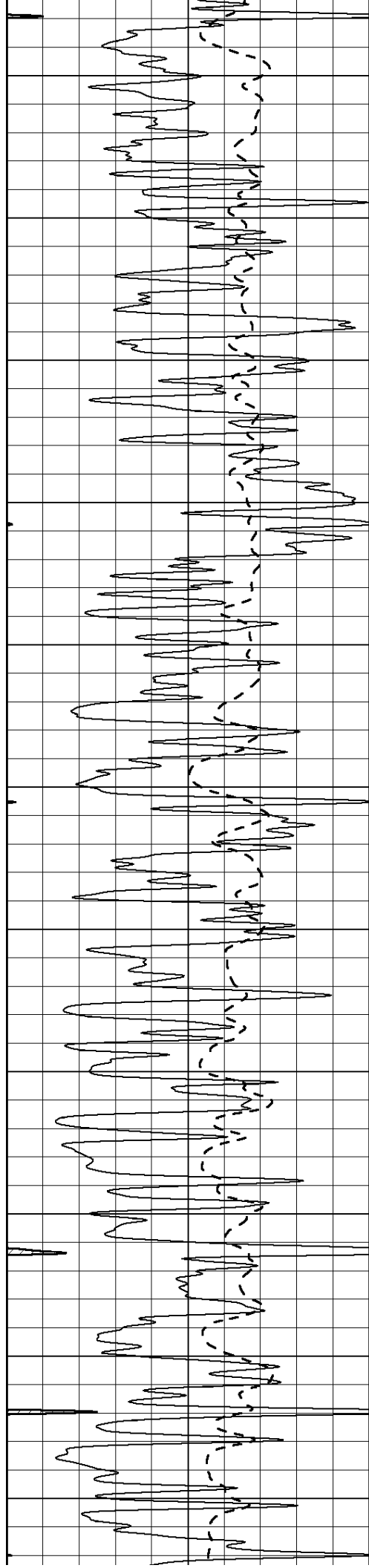
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3100

3150

3200





3250

3300

3350

3400

3450

3500

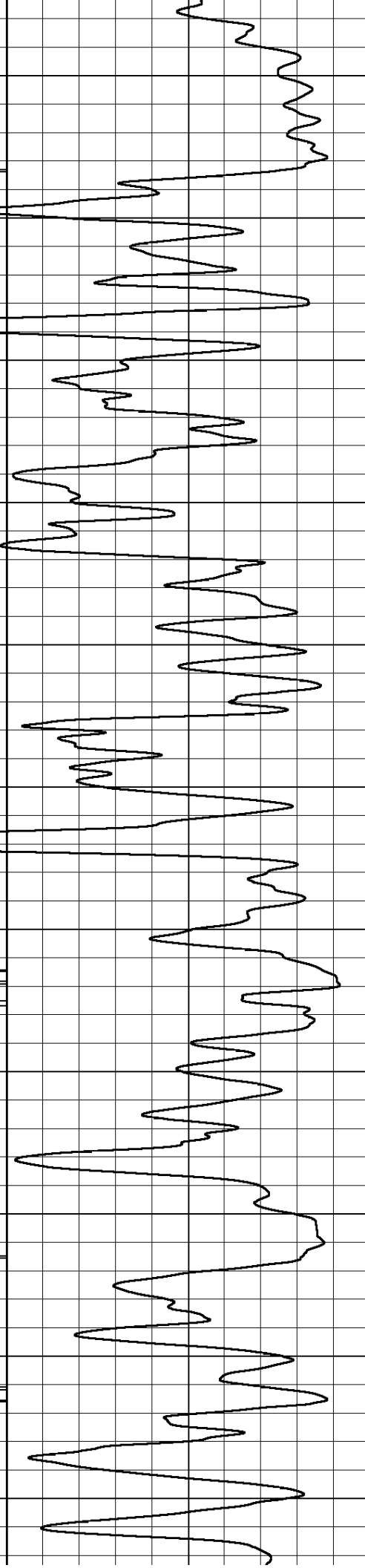
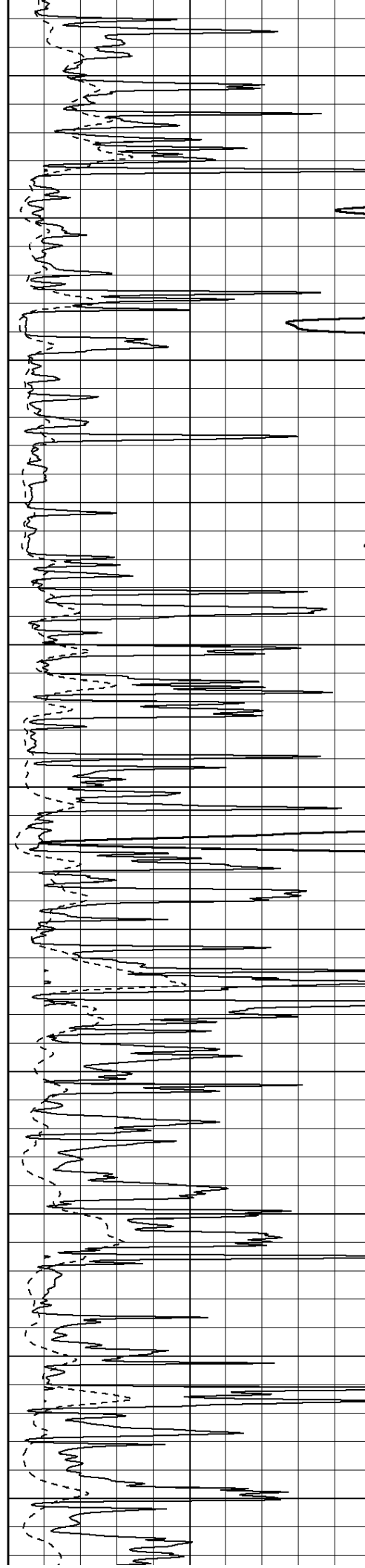
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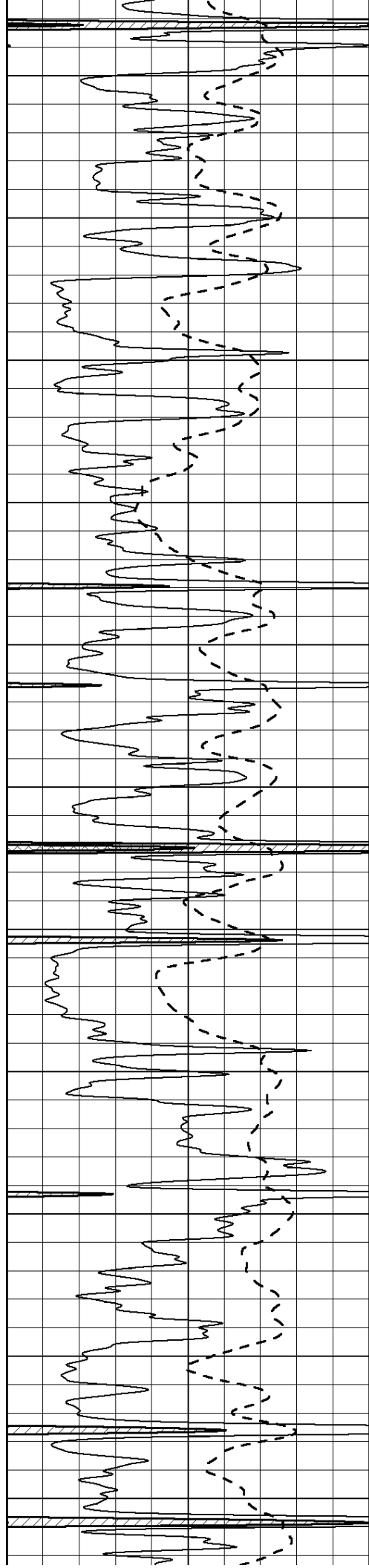
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3650

3700

3750





3800

3850

3900

3950

4000

4050

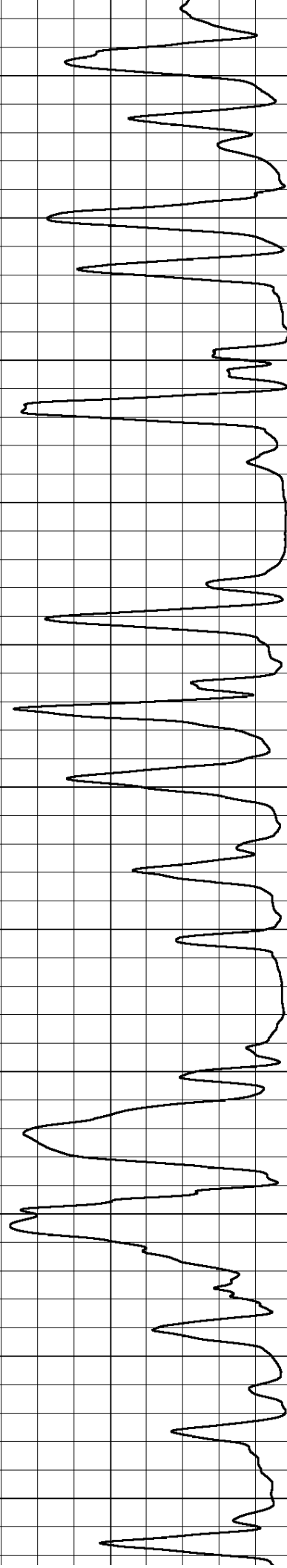
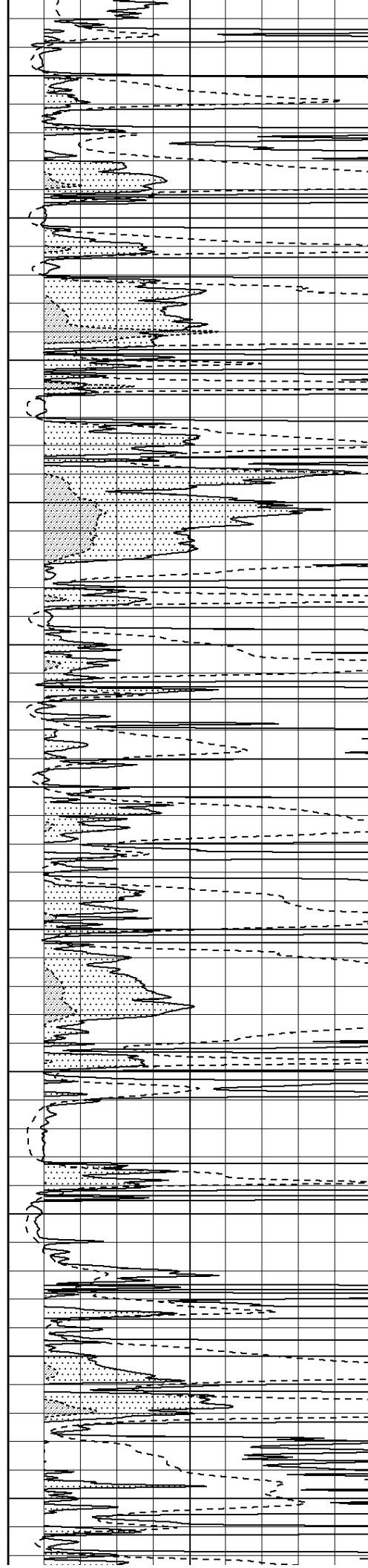
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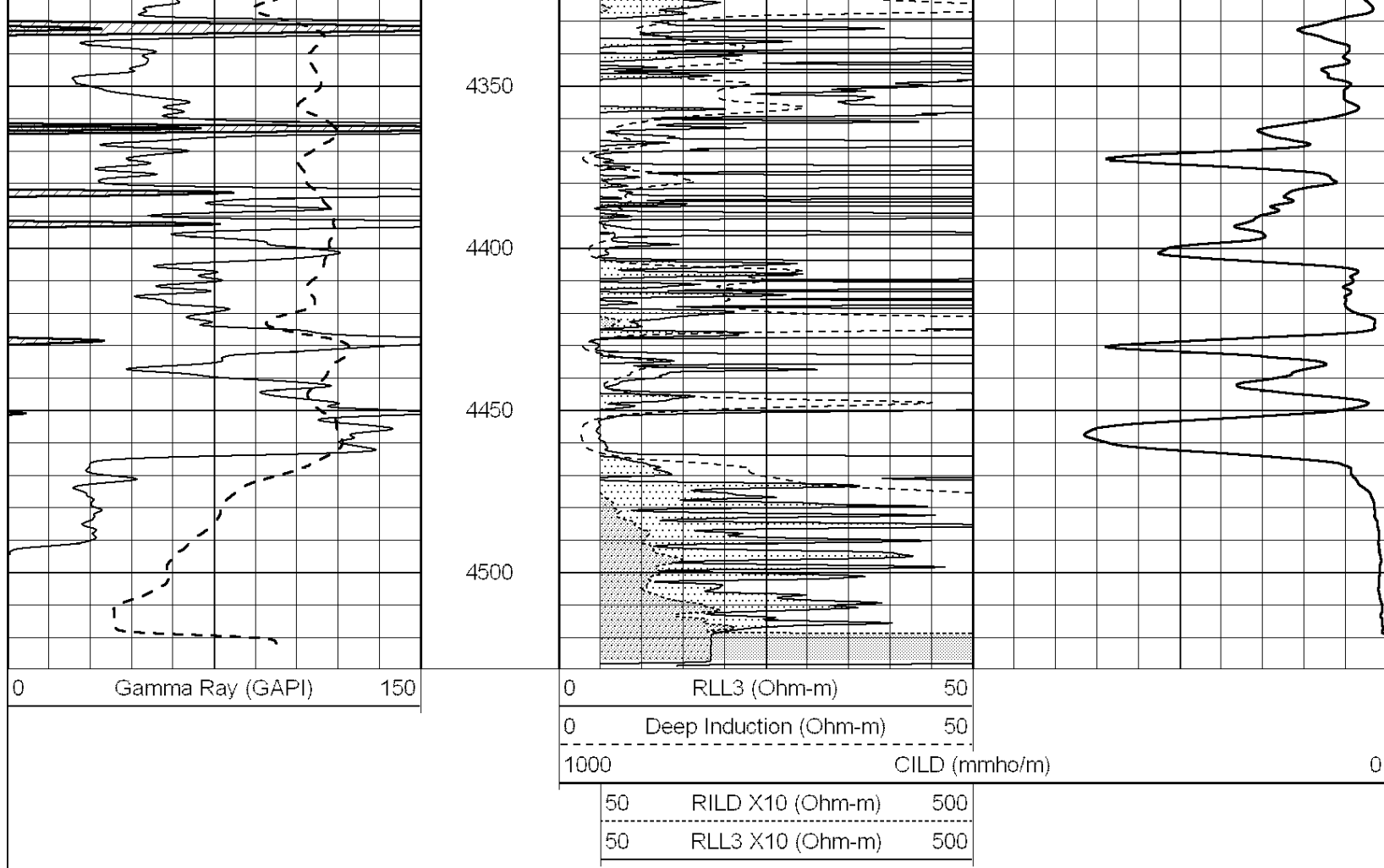
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4200

4250

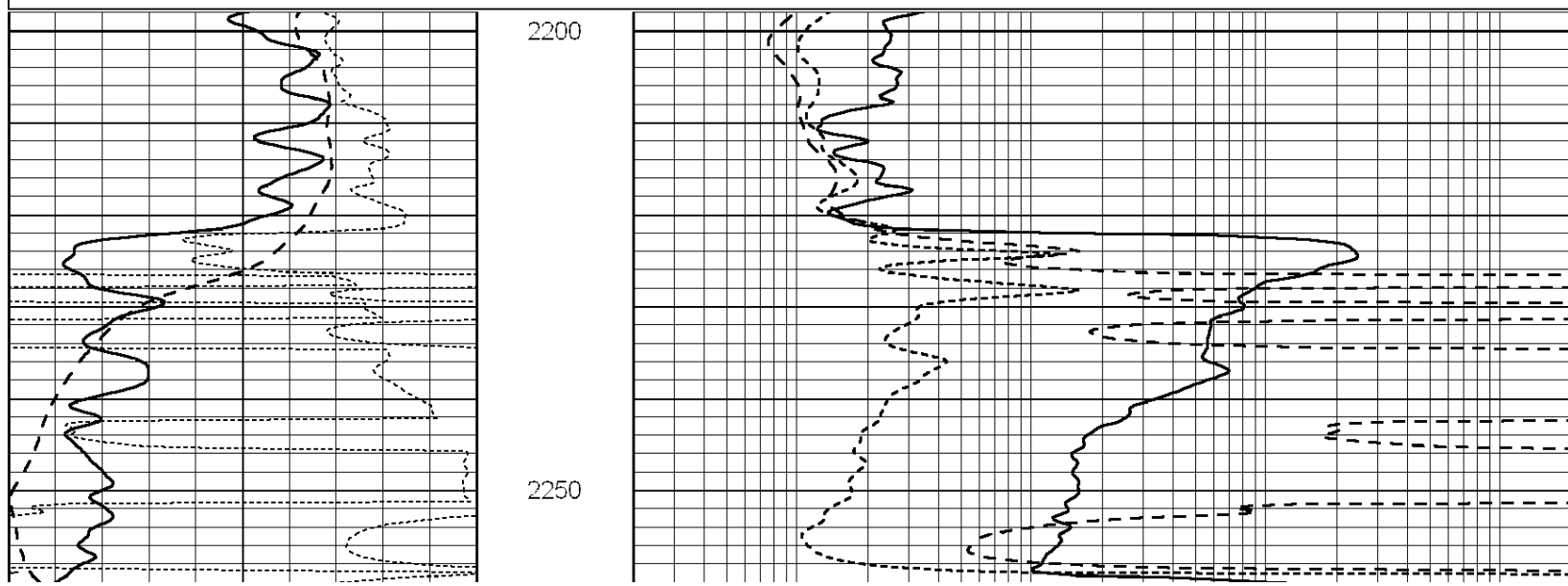
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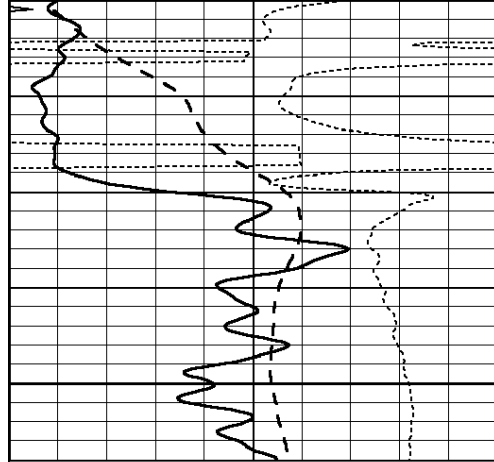




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Presentation Format: _dil
Dataset Creation: Thu May 30 18:03:49 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240

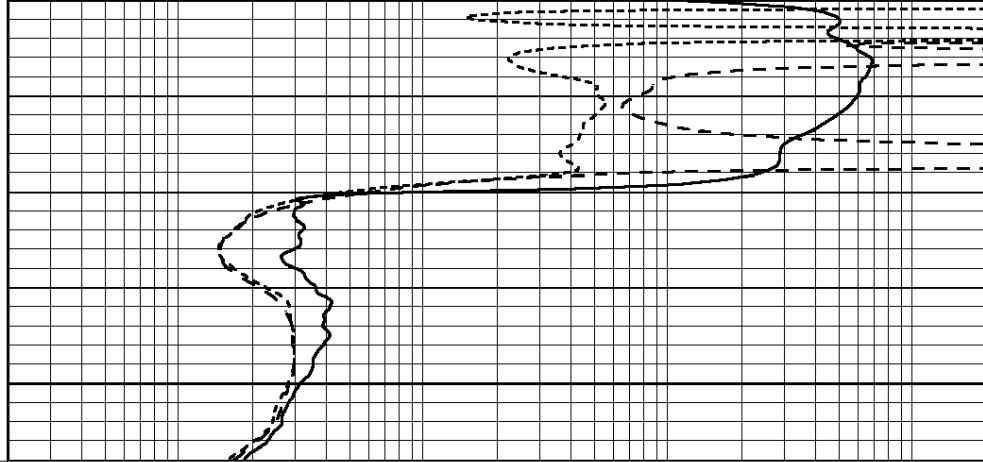
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-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	RxoRt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			





2300

0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	RxoRt	50
0	MINMK	20

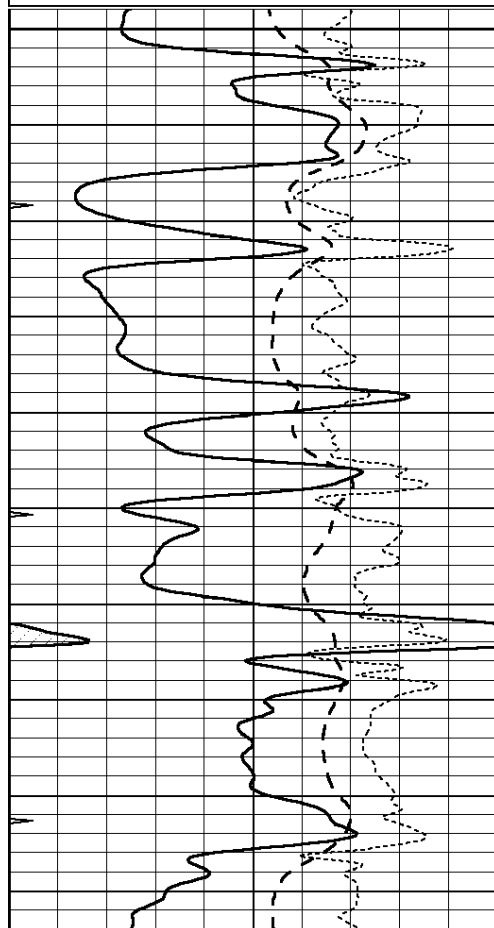


0.2	RLL3 (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

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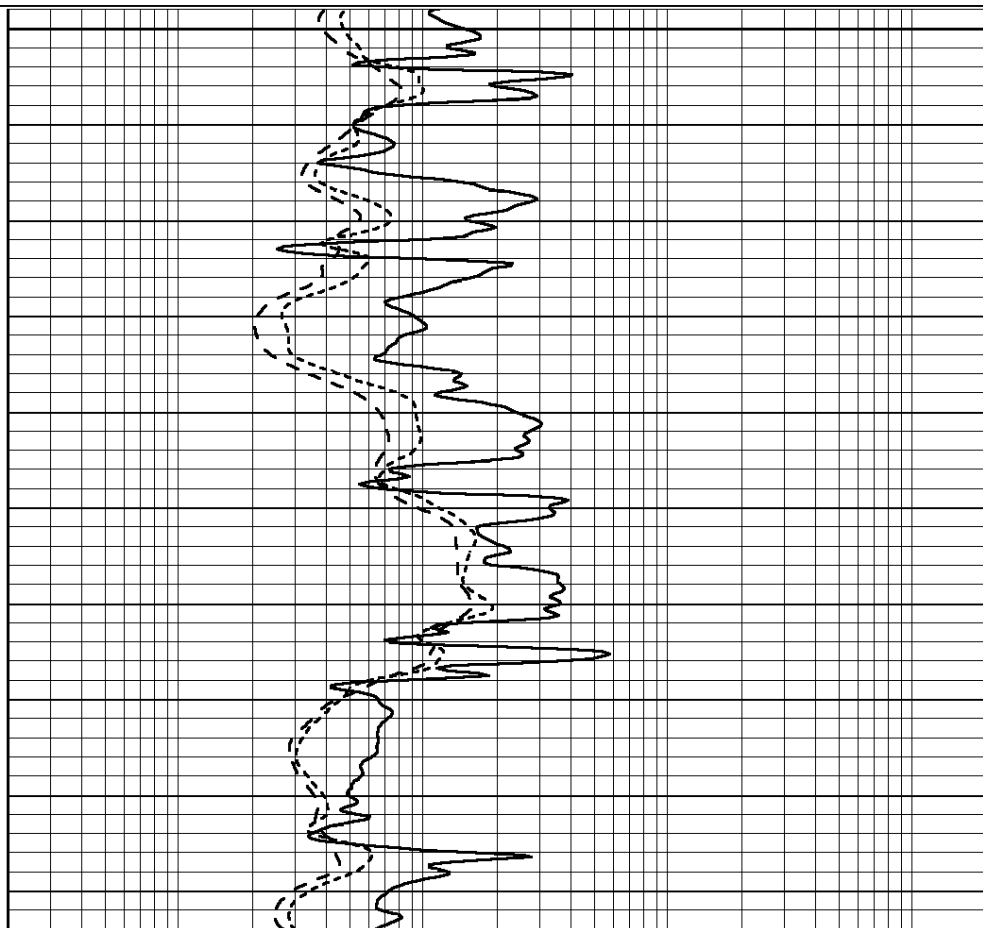
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0	MINMK	20

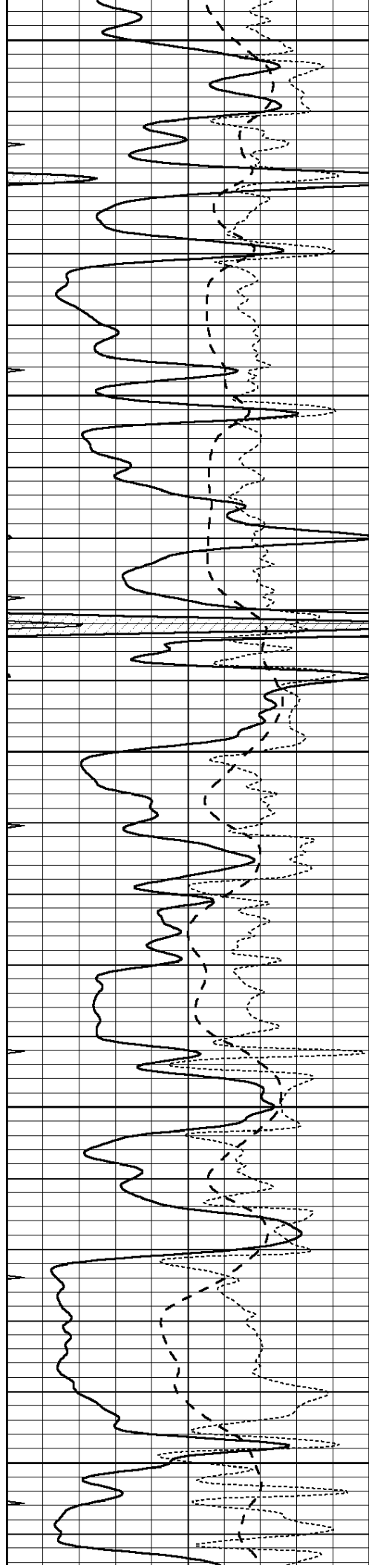
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0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



3600

3650





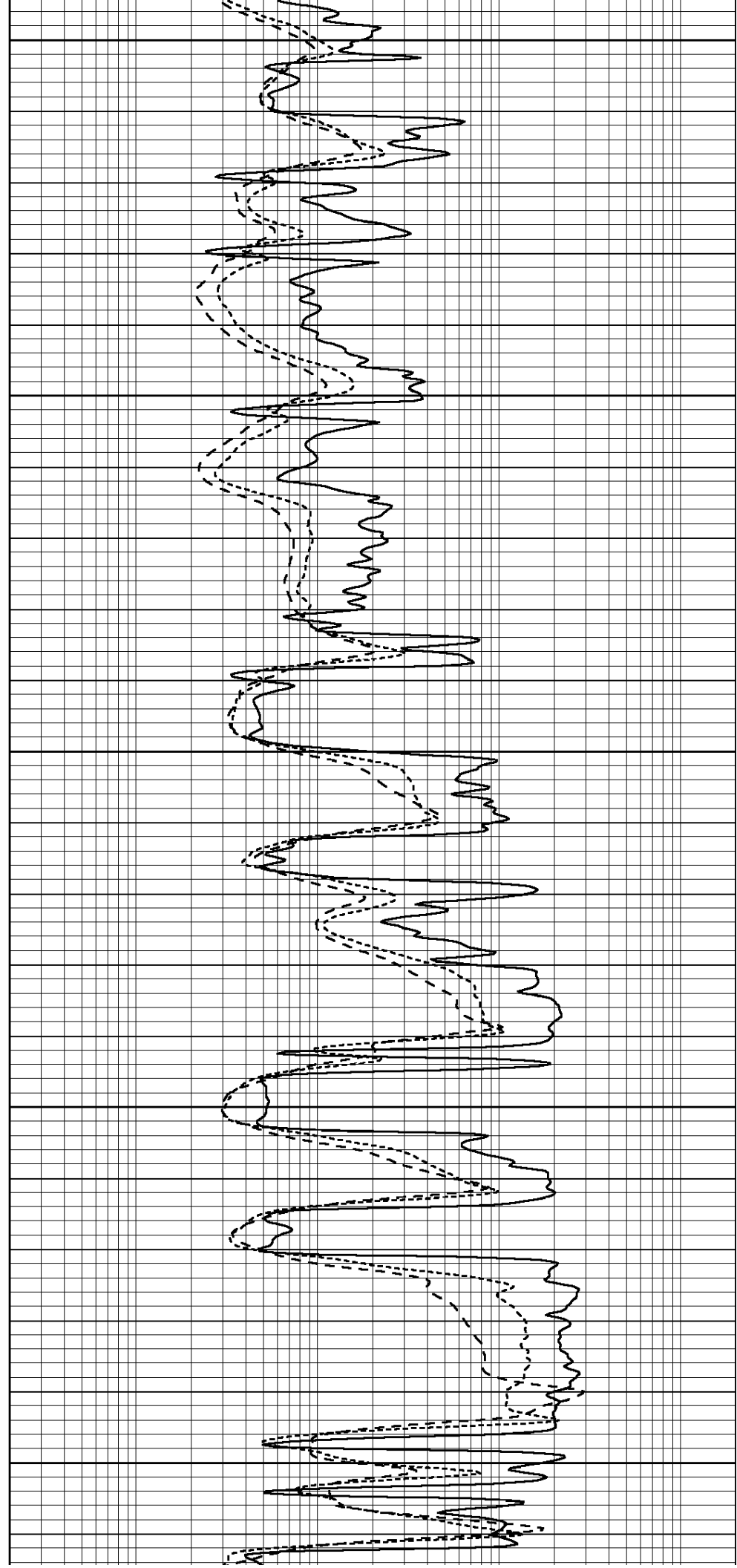
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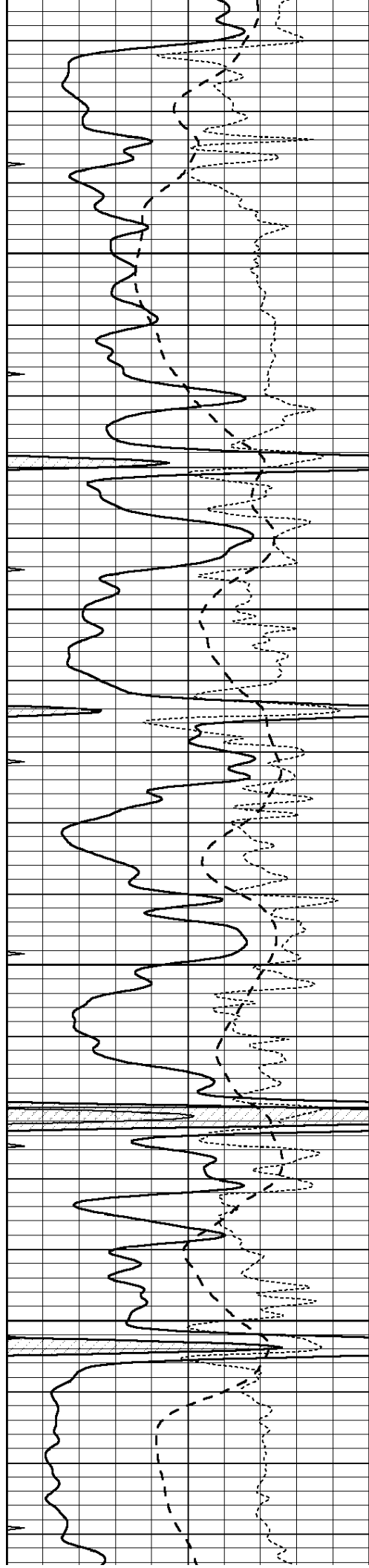
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3800

3850

3900



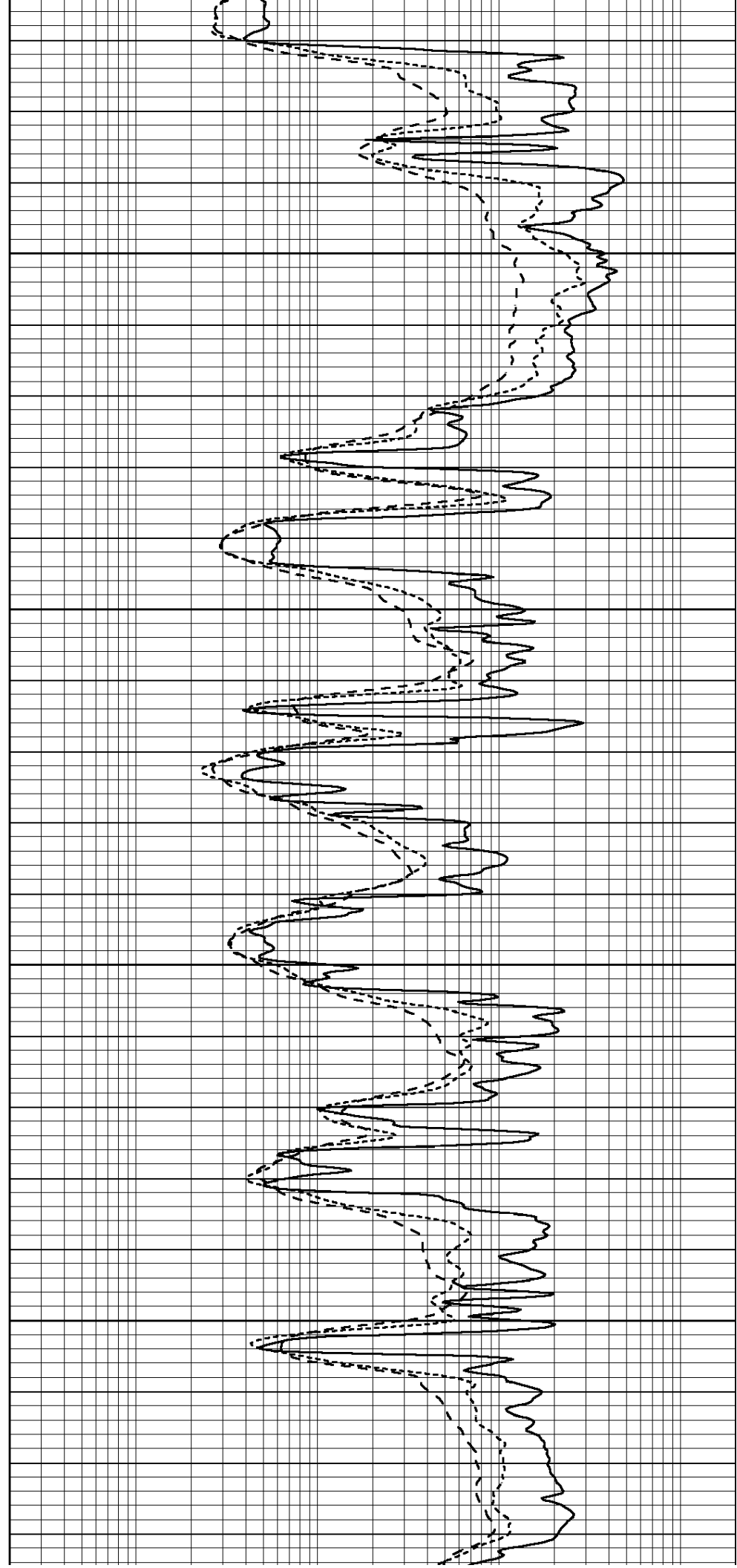


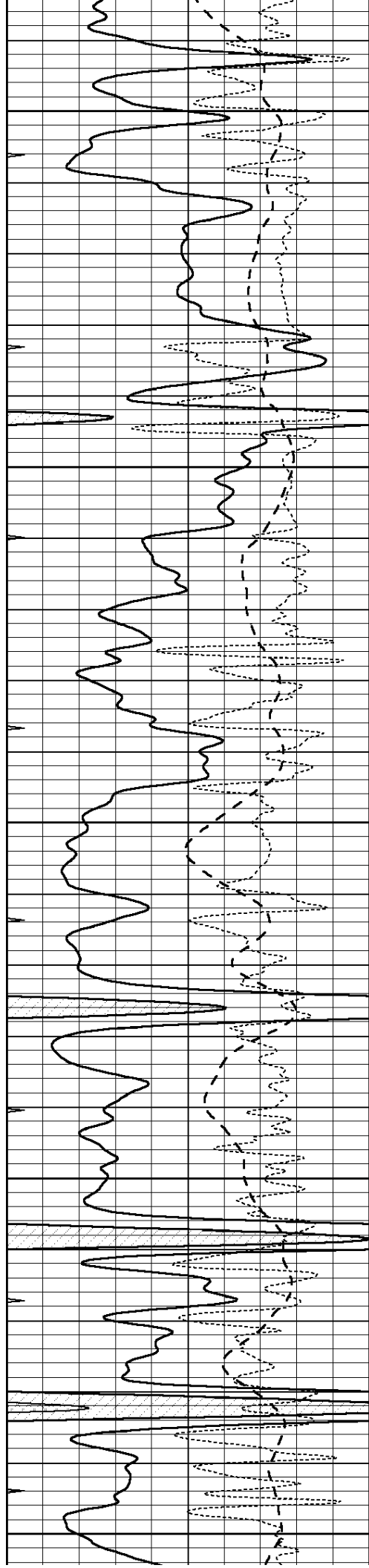
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4000

4050

4100





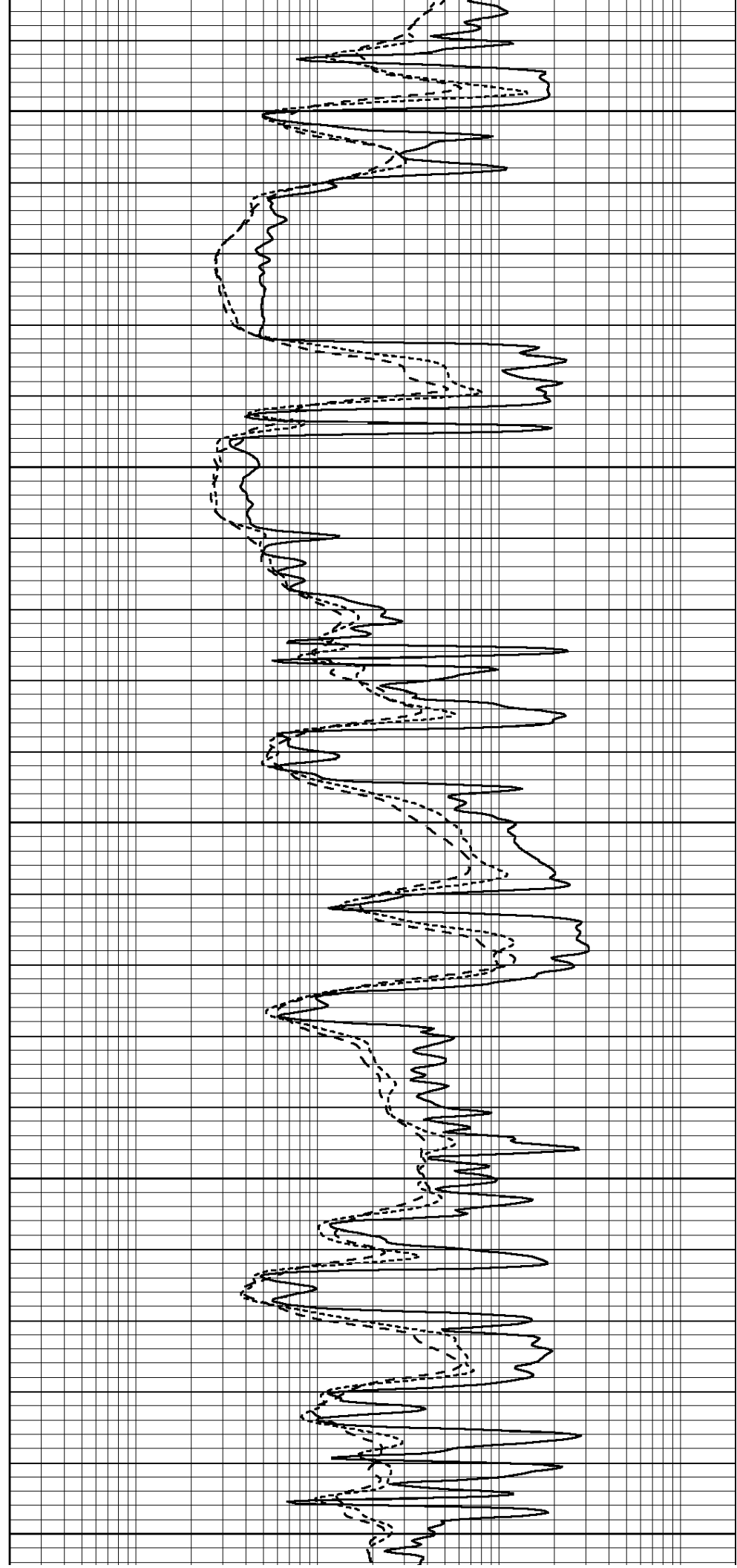
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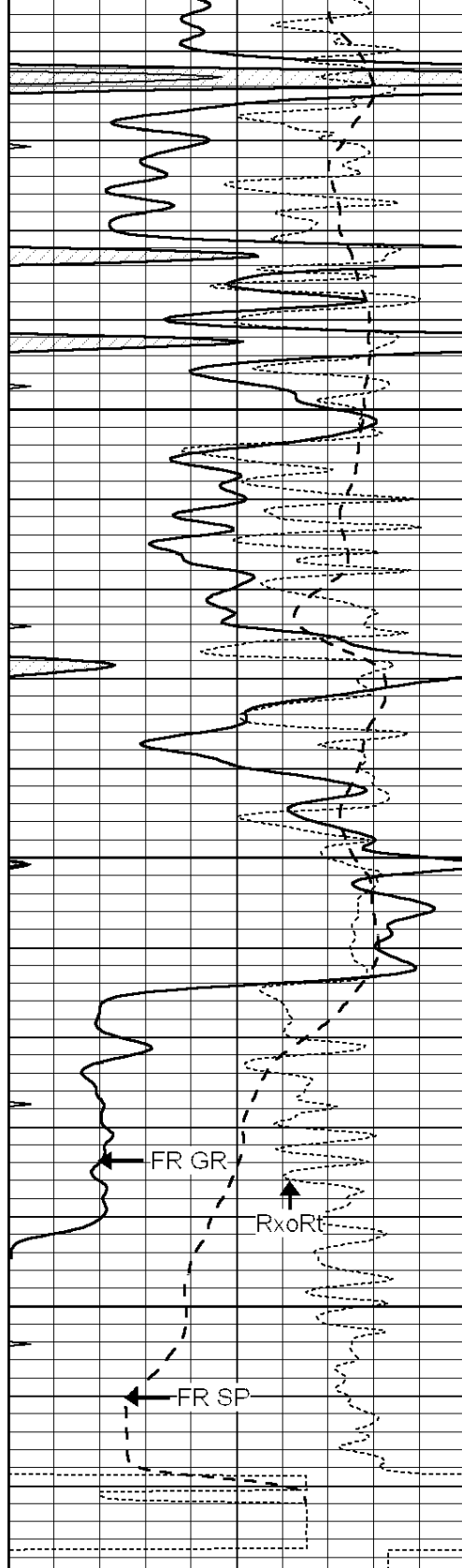
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4250

4300

4350





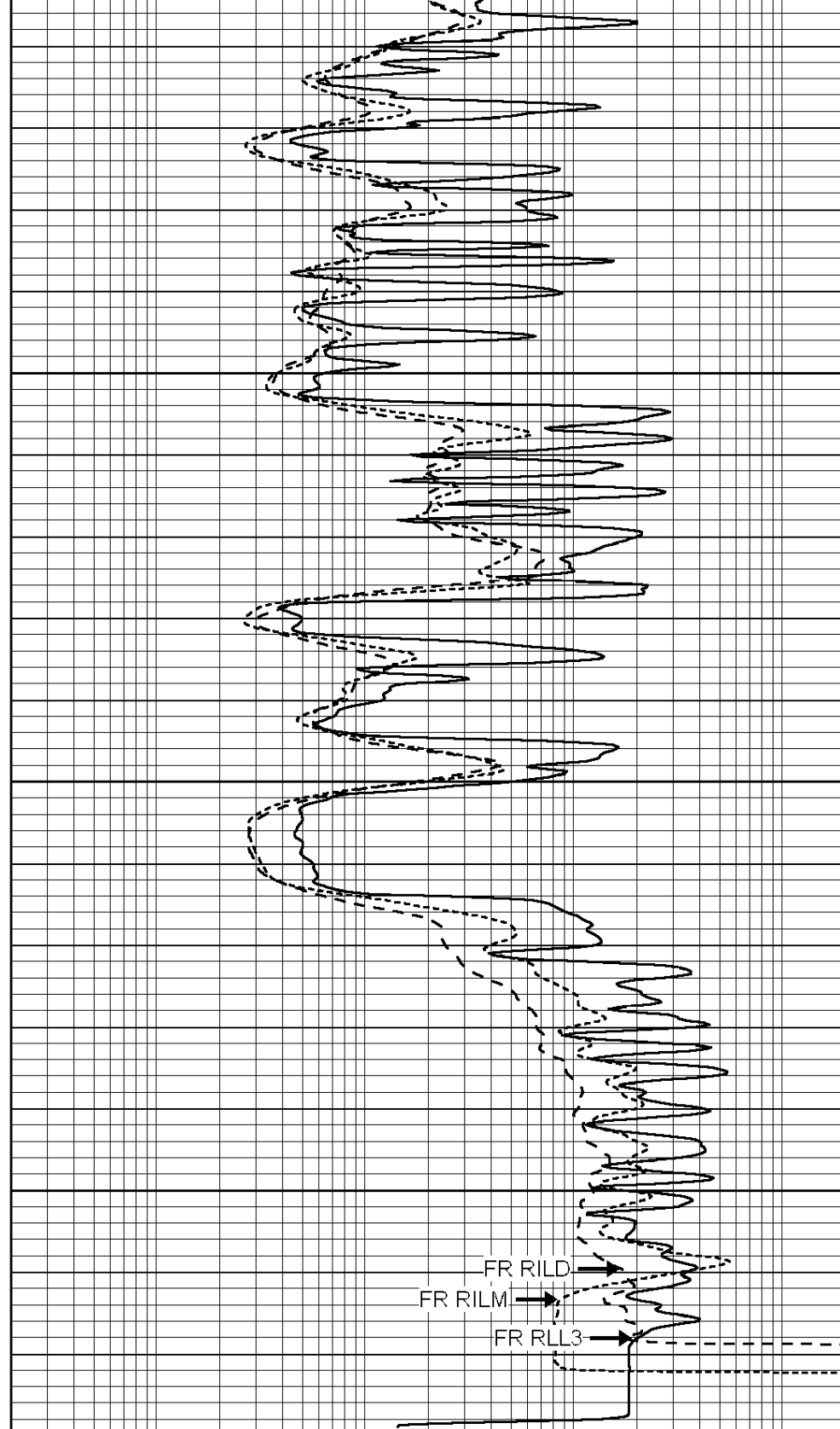
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-250	RxoRt	50
0	MINMK	20

4400

4450

4500

LTD 4520



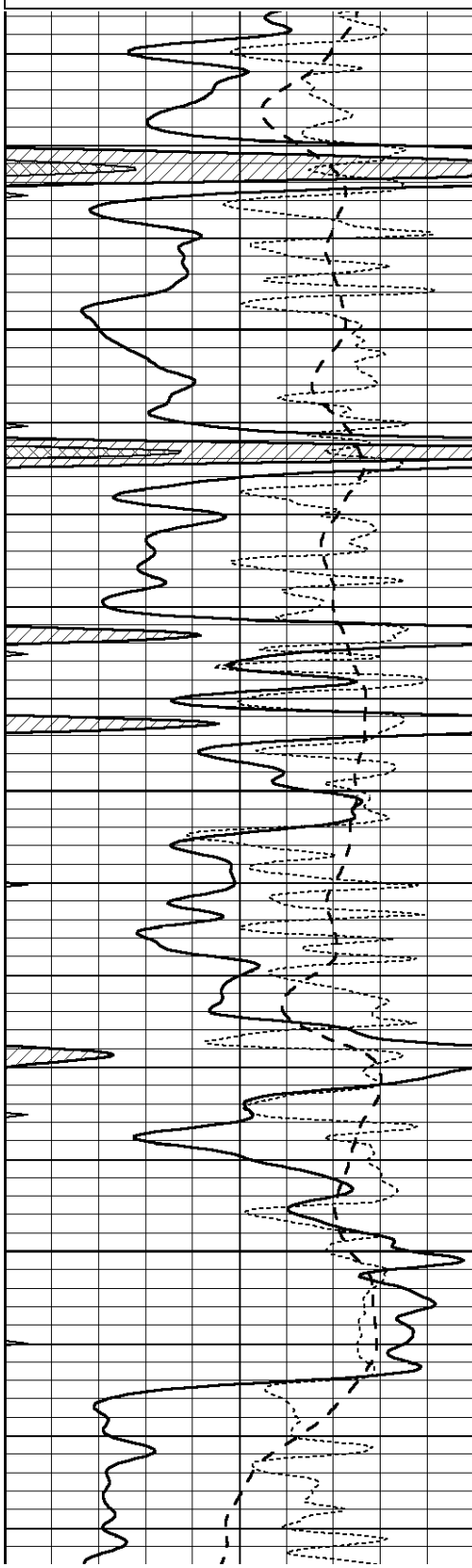
0.2	RLL3 (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

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Database File: 010184ddn.db
 Dataset Pathname: pass2.3
 Presentation Format: _dil
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 Charted by: Depth in Feet scaled 1:240

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0	MINMK	20

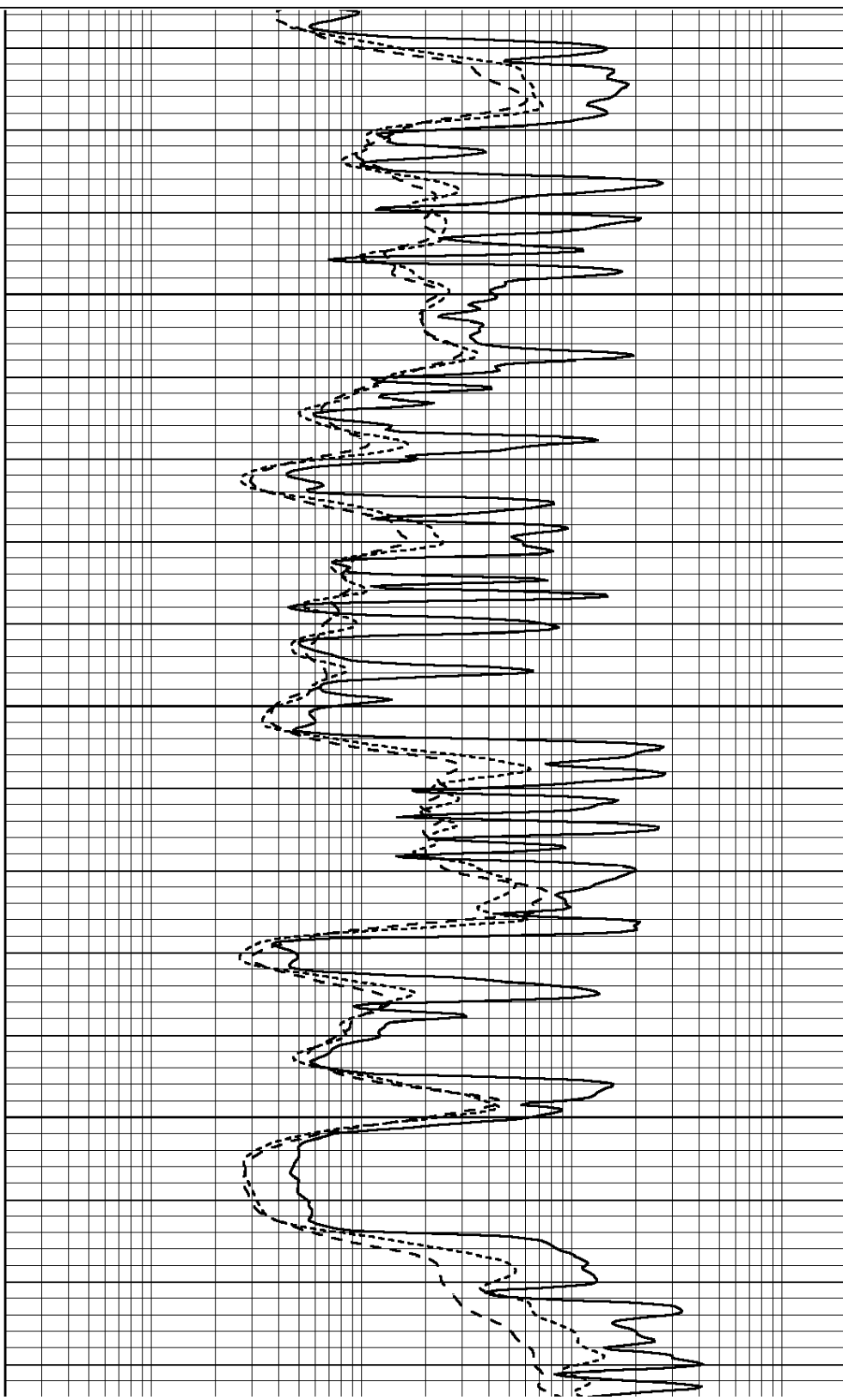
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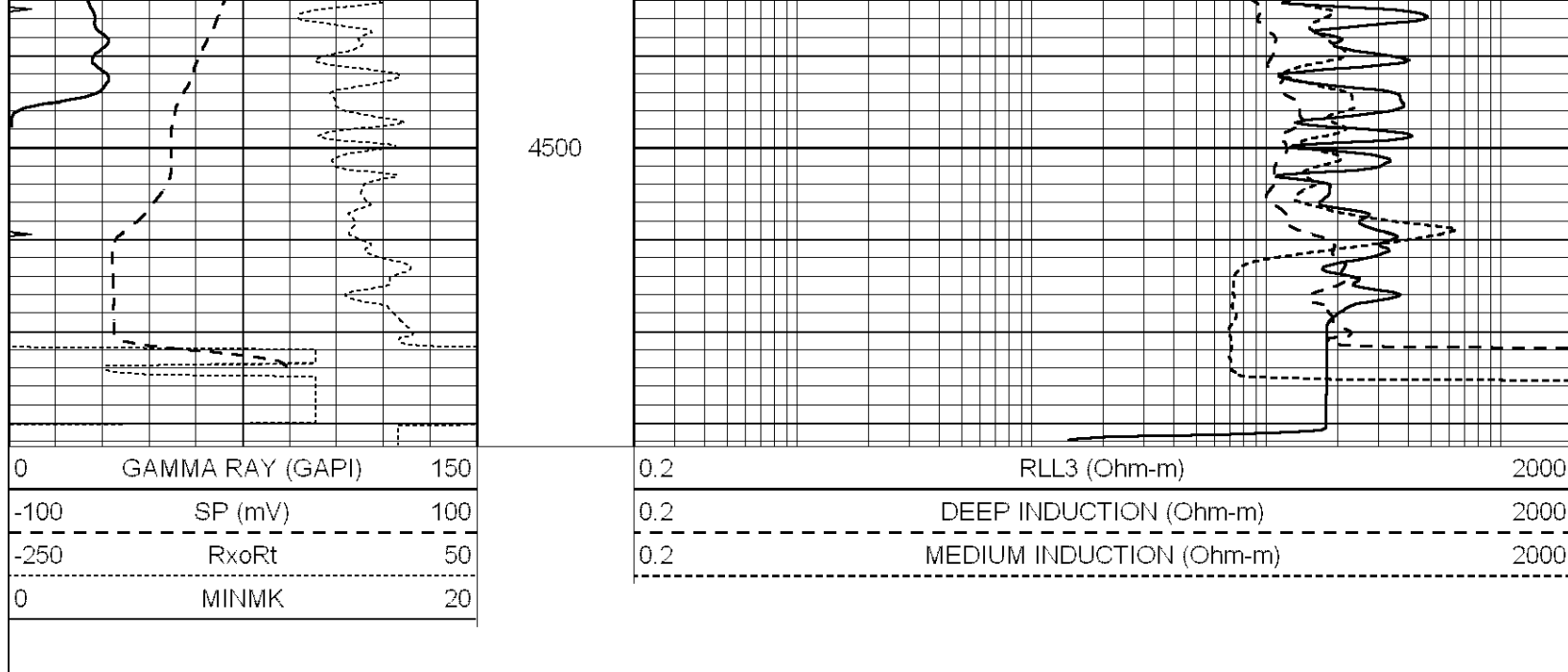


4350

4400

4450





Calibration Report

Database File: 010184ddn.db
 Dataset Pathname: pass3.3
 Dataset Creation: Thu May 30 18:03:49 2013 by Calc Open-Cased 090629

Dual Induction Calibration Report

Serial-Model: PROBE7-DILG
 Surface Cal Performed: Sun May 19 13:30:40 2013
 Downhole Cal Performed: Sat Jan 19 19:51:38 2013
 After Survey Verification Performed: Sat Jan 19 19:51:38 2013

Surface Calibration

Readings				References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.793	0.790	V	0.000	400.000	mmho/m	620.000	7.000
Medium	0.992	1.002	V	0.000	464.000	mmho/m	660.000	-38.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.041	0.642	V	0.000	400.000	mmho/m	664.874	-27.011
Medium	0.035	0.802	V	0.000	464.000	mmho/m	604.936	-21.367

Downhole Calibration

Readings				References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	135384.000	27094.500	mmho/m	135400.000	27082.400	mmho/m	1.000	-19.259
Medium	-47330.100	-9381.740	mmho/m	-47327.100	-9389.280	mmho/m	1.000	-10.154
LL3		7.322	V		1400.000	Ohm-m		
		0.038	V		20.000	Ohm-m		
		-7.273	V		4000.000	mmho-m		

After Survey Verification

Readings				Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	135384.000	27094.500	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	-47330.100	-9381.740	mmho/m	1.000	0.000
LL3		0.000	Ohm-m		1400.000	Ohm-m		

0.000	Ohm-m	20.000	Ohm-m
0.000	mmho-m	4000.000	mmho-m

Compensated Density Calibration Report

Serial-Model:	GEAR1-GEARHART
Source / Verifier:	147 / 147
Master Calibration Performed:	Mon May 13 17:25:39 2013

Master Calibration

	<u>Density</u>		<u>Far Detector</u>	<u>Near Detector</u>	
Magnesium	1.710	g/cc	1205.77	610.74	cps
Aluminum	2.600	g/cc	271.21	419.72	cps
	Spine Angle = 75.89		Density/Spine Ratio = 0.579		
	<u>Size</u>		<u>Reading</u>		
Small Ring	7.70	in	4.69	V	
Large Ring	14.00	in	6.52	V	

Compensated Neutron Calibration Report

Serial Number:	NEU_4I
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

Gamma Ray Calibration Report

Serial Number:	GR1	
Tool Model:	OPEN	
Performed:	Mon May 20 17:04:25 2013	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.9500	GAPI/cps