



**Casedhole
Solutions**

DUAL INDUCTION LOG

Company		PHILLIPS EXPLORATION CO. L.C.	
Well		WERTH #1-30	
Field		WILDCAT	
County		TREGO	
State		KANSAS	
Company		PHILLIPS EXPLORATION COMPANY, L.C.	
Well		WERTH #1-30	
Field		WILDCAT	
County		TREGO	
State		KANSAS	
Location:		API # : 15-195-23002-0000	
Permanent Datum		GROUND LEVEL	
Log Measured From		KELLY BUSHING 5' A.G.L.	
Drilling Measured From		KELLY BUSHING	
SEC 30 TWP 13S RGE 25W		Elevation	
		K.B. 2410	
		D.F. 2408	
		G.L. 2405	
Date		12/9/15	
Run Number		ONE	
Depth Driller		4399	
Depth Logger		4400	
Bottom Logged Interval		4398	
Top Log Interval		00	
Casing Driller		8 5/8"@217'	
Casing Logger		217	
Bit Size		7 7/8"	
Type Fluid in Hole		CHEMICAL MUD	
Density / Viscosity		9.5/46	
pH / Fluid Loss		9.5/8.0	
Source of Sample		FLOWLINE	
Rim @ Meas. Temp		1.20@75F	
Rmf @ Meas. Temp		.900@75F	
Rmc @ Meas. Temp		1.44@75F	
Source of Rmf / Rmc		MEASUREMENT	
Rim @ BHT		750@120F	
Time Circulation Stopped		2.5 HOURS	
Time Logger on Bottom		8:45 A.M.	
Maximum Recorded Temperature		120F	
Equipment Number		4854	
Location		HAYS, KANSAS	
Recorded By		JEFF LUEBBERS	
Witnessed By		PAT DEENIHAN	

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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, KANSAS (785) 628-6395
DIRECTIONS
COLLYER, KS. & I-70 EXIT, 9S. TO "RD. Q", 1 1/2W., S. INTO AT TREE ROW



**Casedhole
Solutions**

MAIN SECTION

Database File: 30680ddn.db
Dataset Pathname: pass3.8
Presentation Format: dil2
Dataset Creation: Wed Dec 09 10:07:30 2015
Charted by: Depth in Feet scaled 1:600

0	Gamma Ray (GAPI)	150
-100	SP (mV)	100
0	RWA (Ohm-m)	1

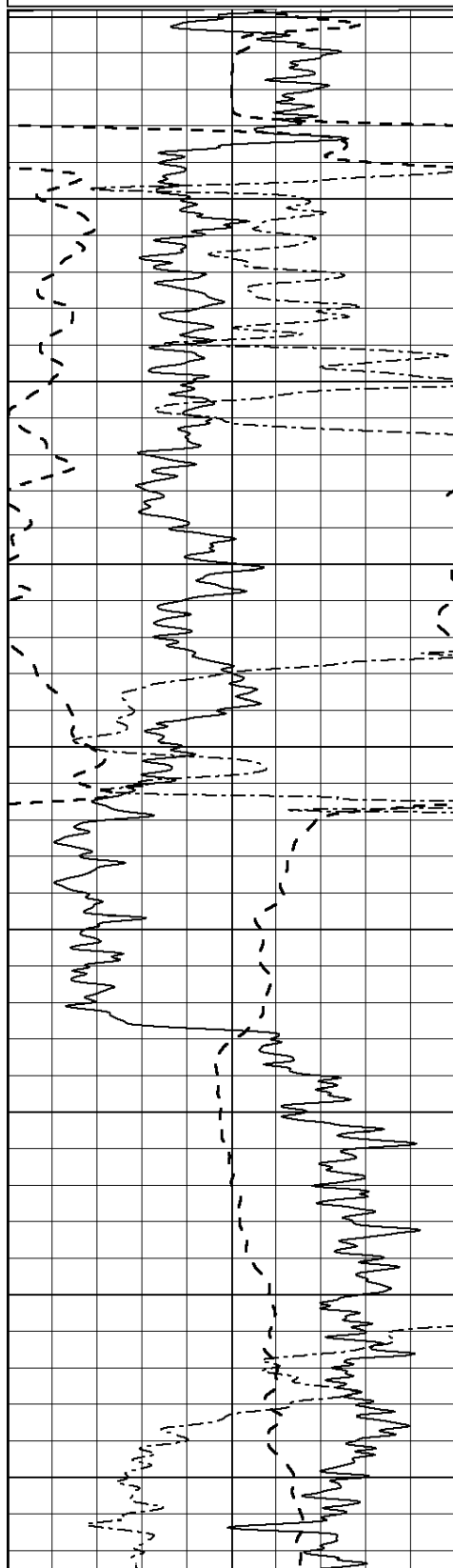
0	RLL3 (Ohm-m)	50
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0	RILD (Ohm-m)	50
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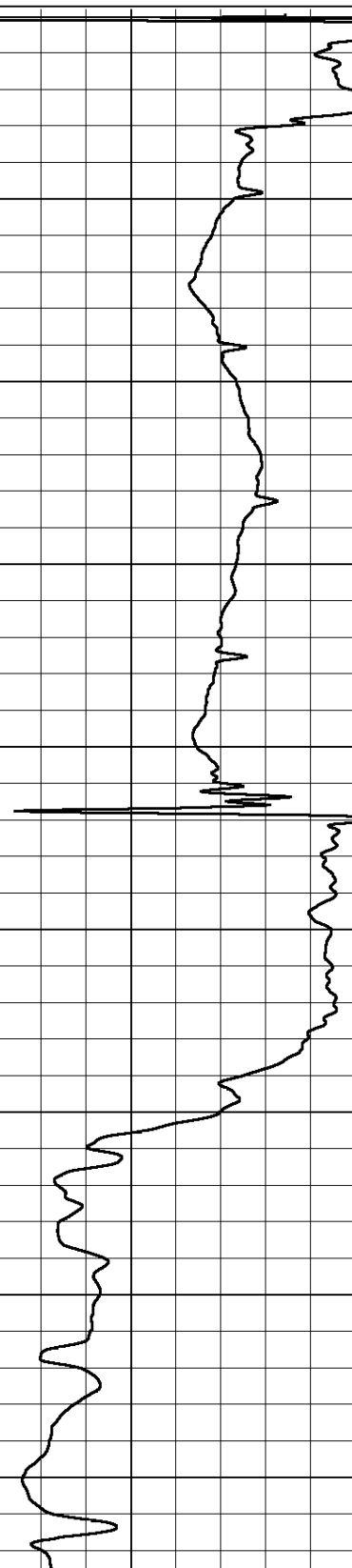
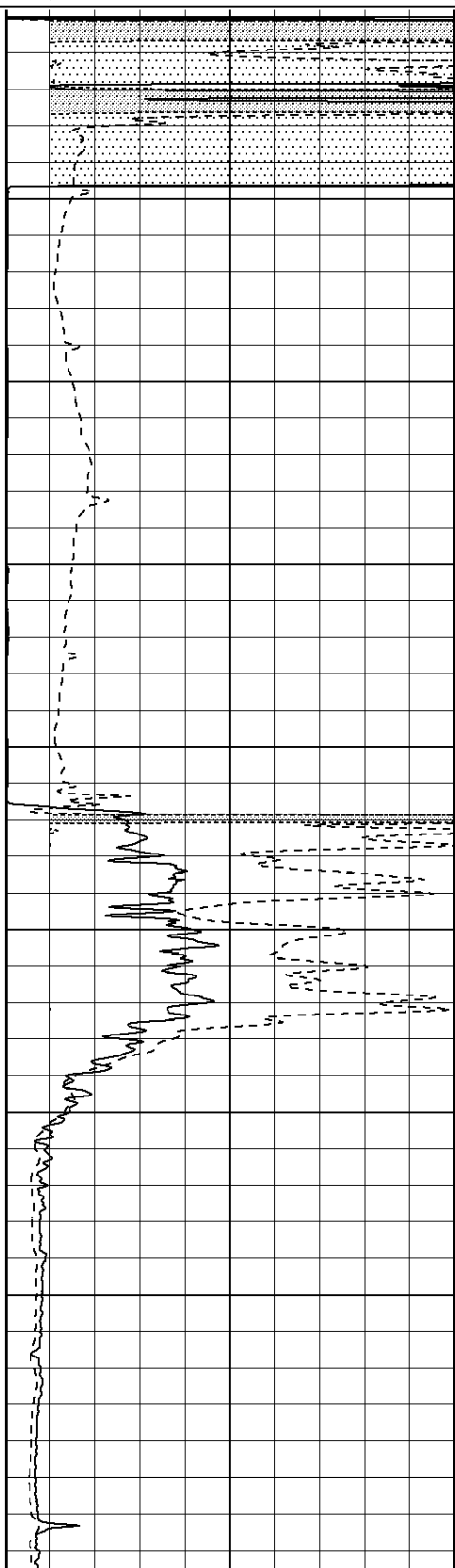
1000	CILD (mmho/m)	0
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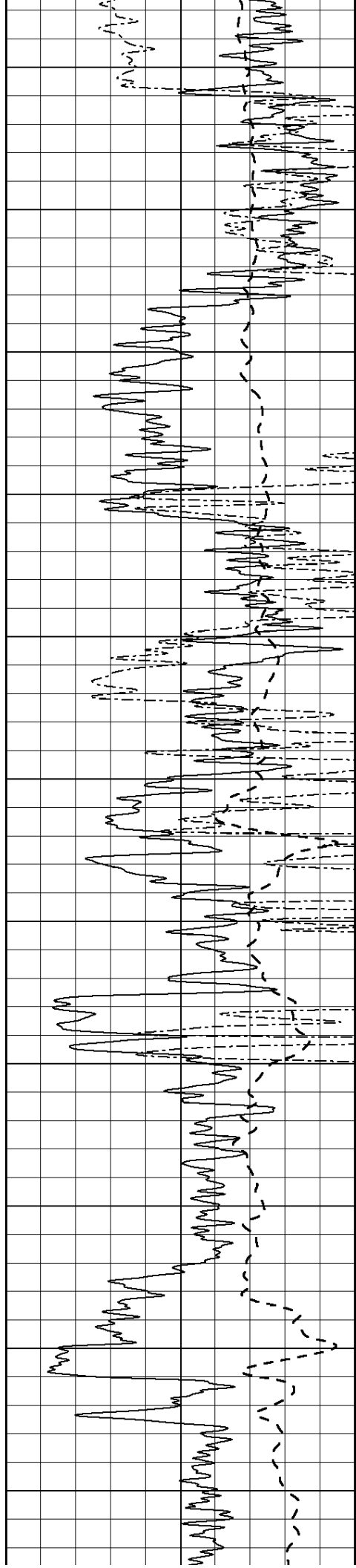
50	RILD X10 (Ohm-m)	500
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50	RLL3 X10 (Ohm-m)	500
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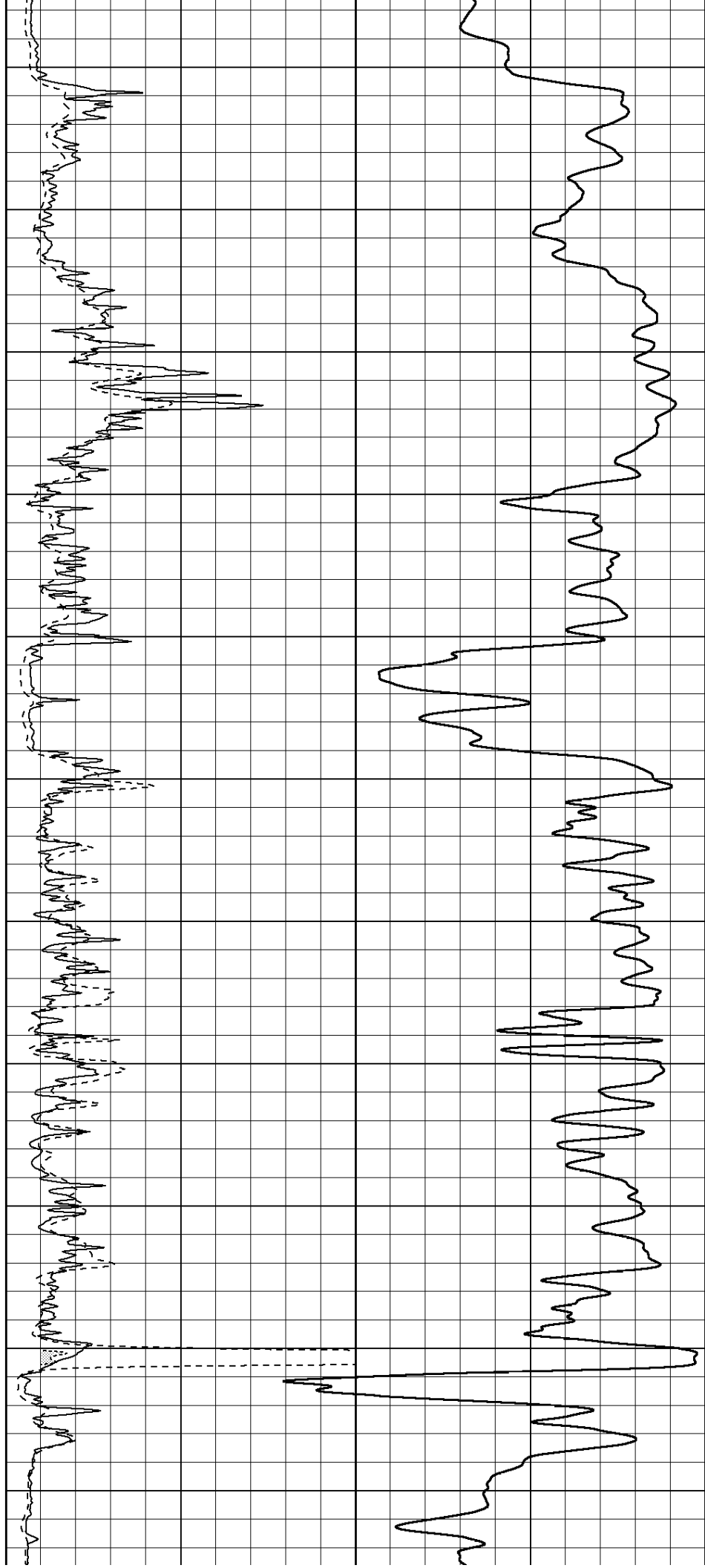


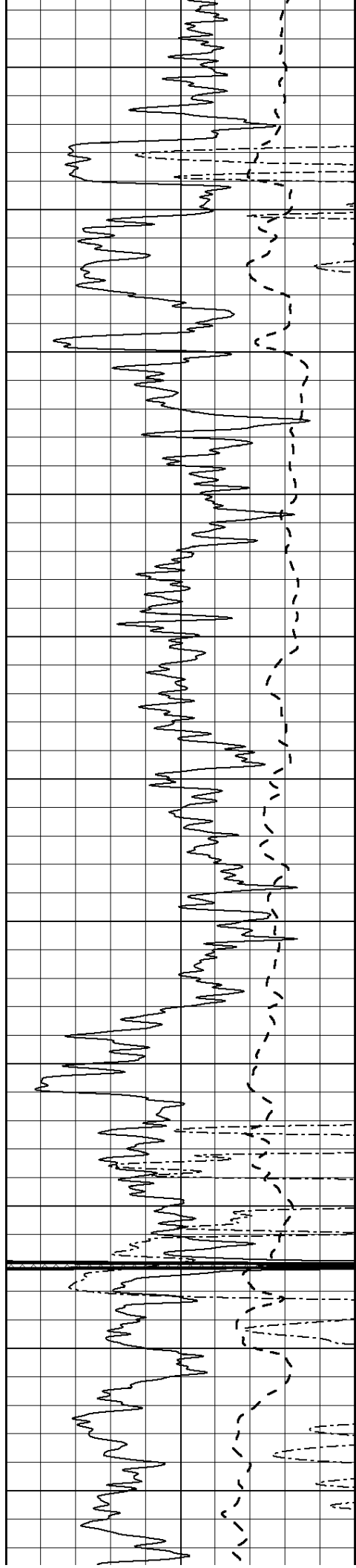
0
50
100
150
200
250
300
350
400





450
500
550
600
650
700
750
800
850
900
950





1000

1050

1100

1150

1200

1250

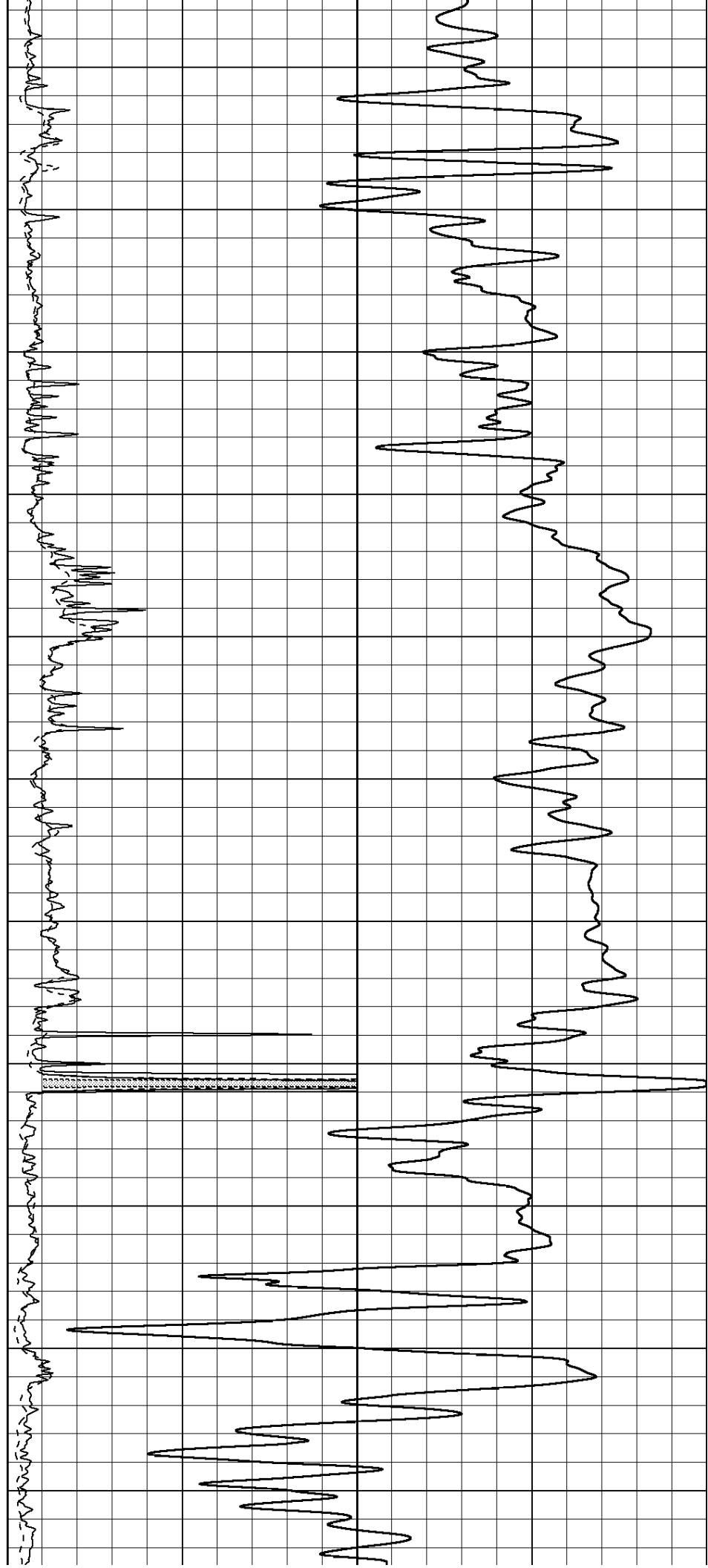
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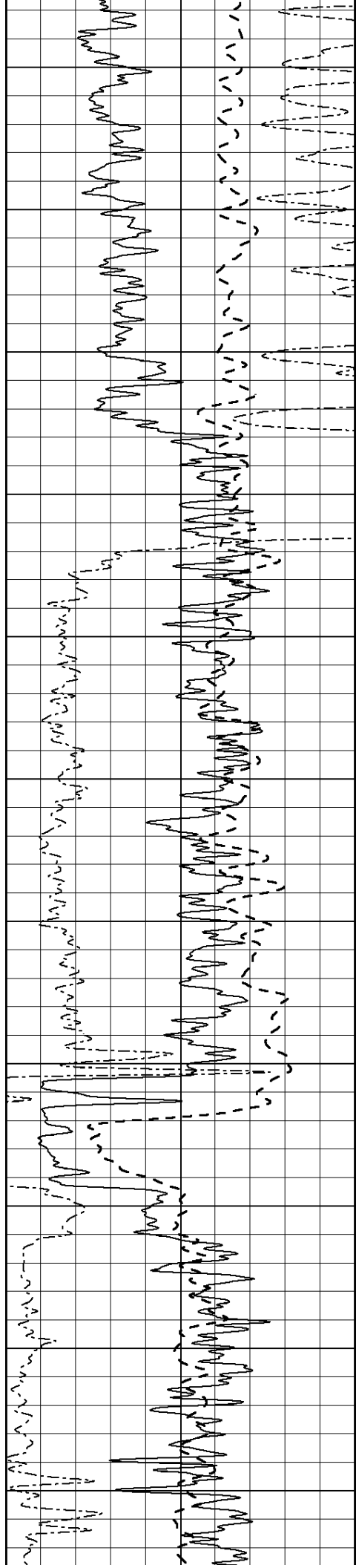
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1400

1450

1500





1550

1600

1650

1700

1750

1800

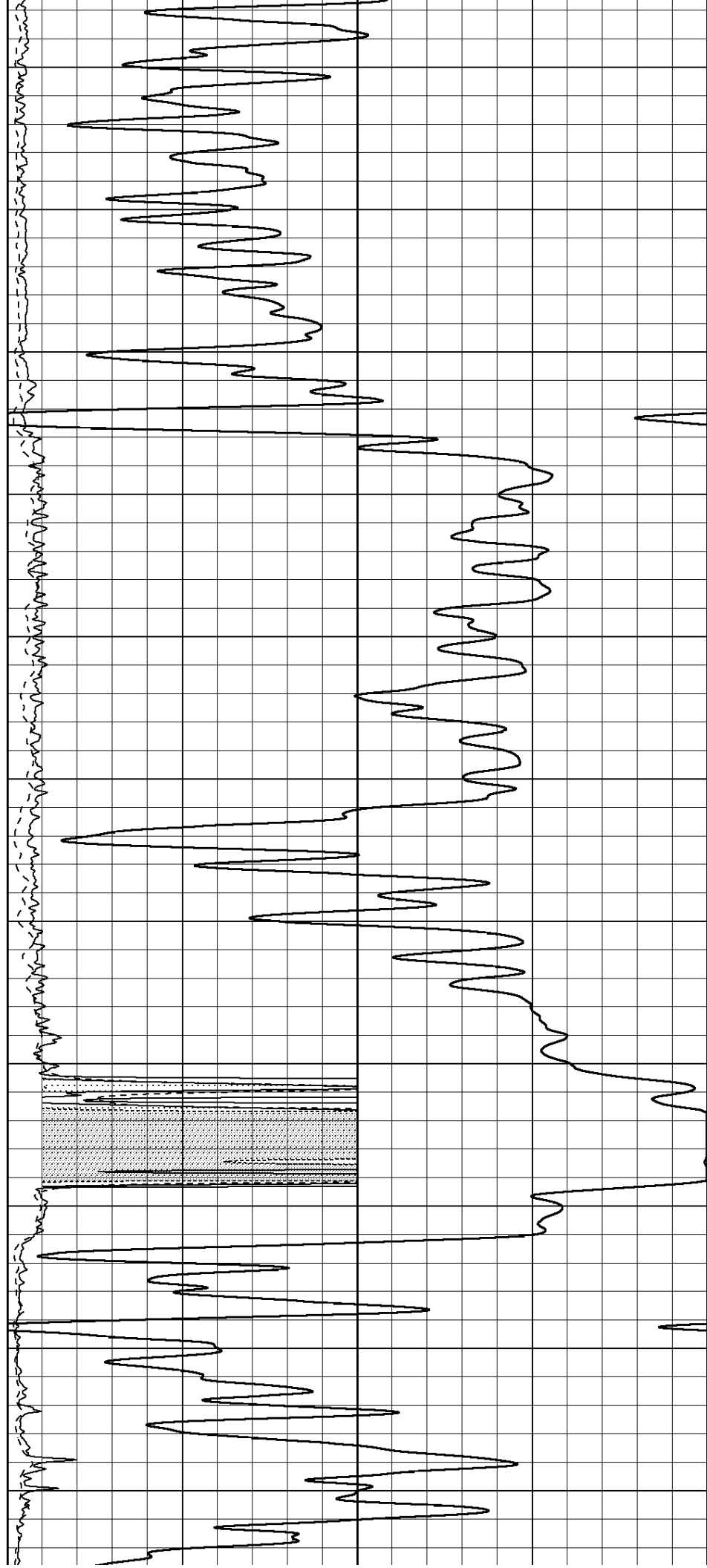
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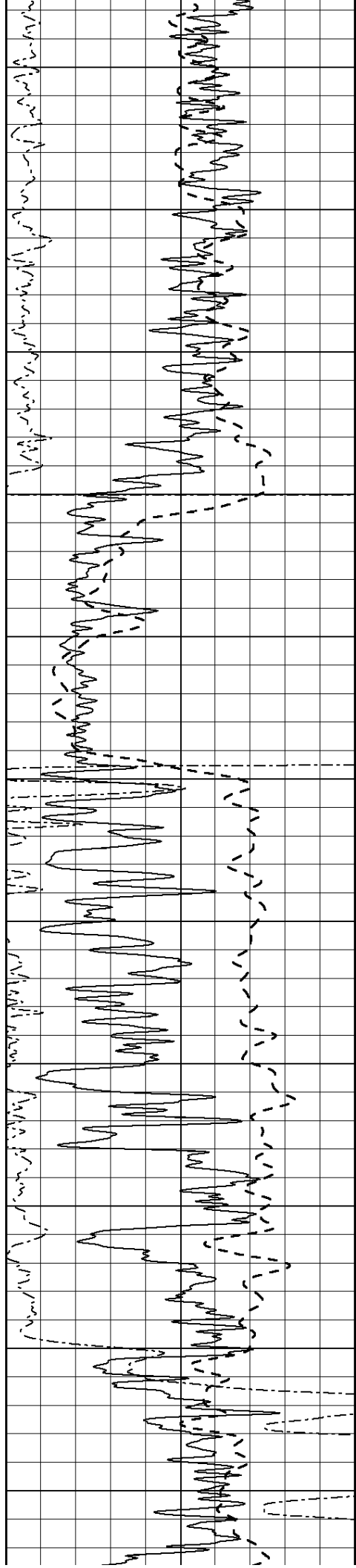
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1950

2000

2050





2100

2150

2200

2250

2300

2350

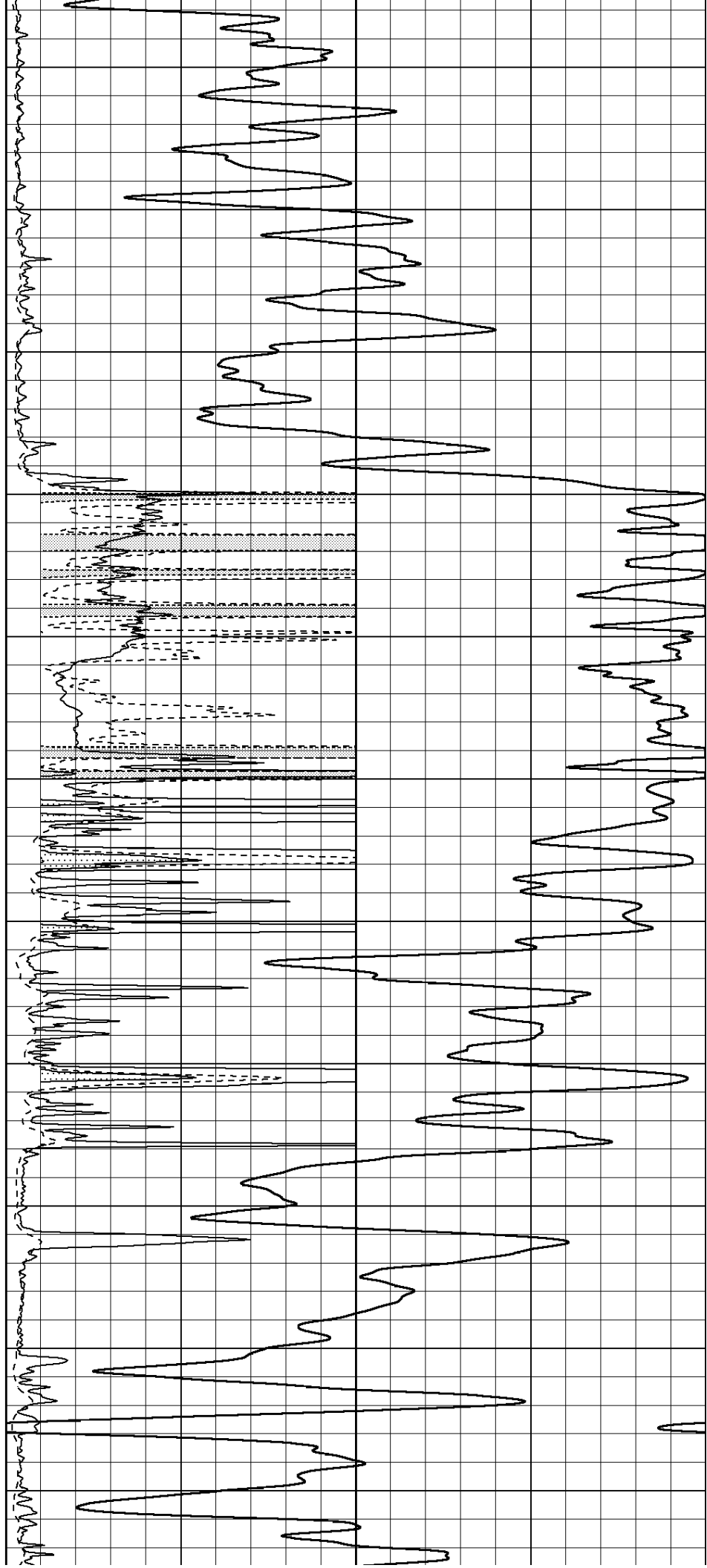
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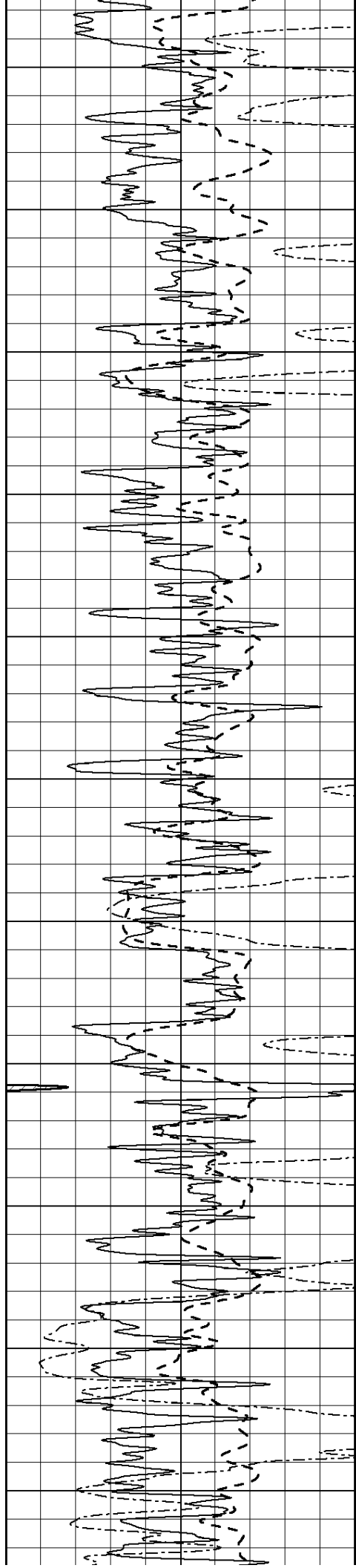
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2500

2550

2600





2650

2700

2750

2800

2850

2900

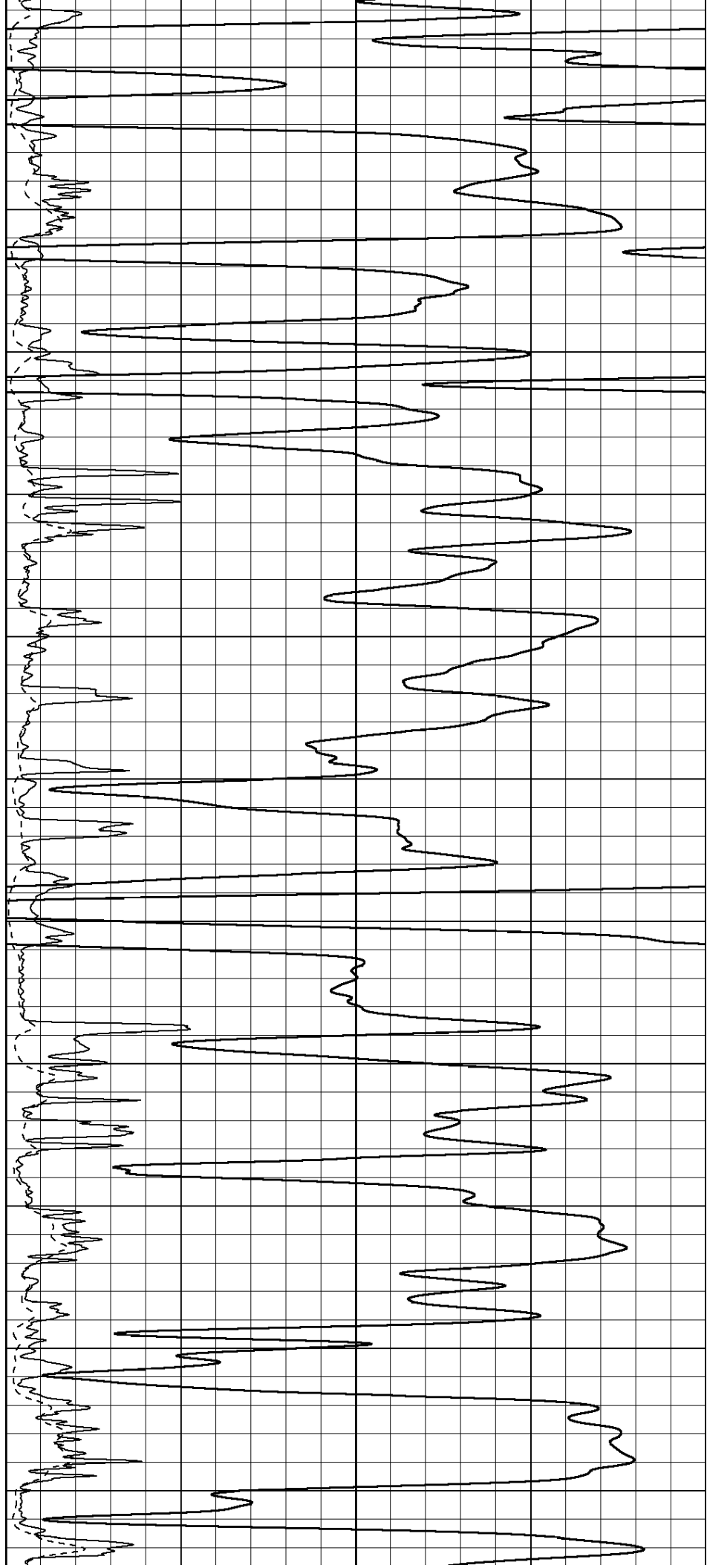
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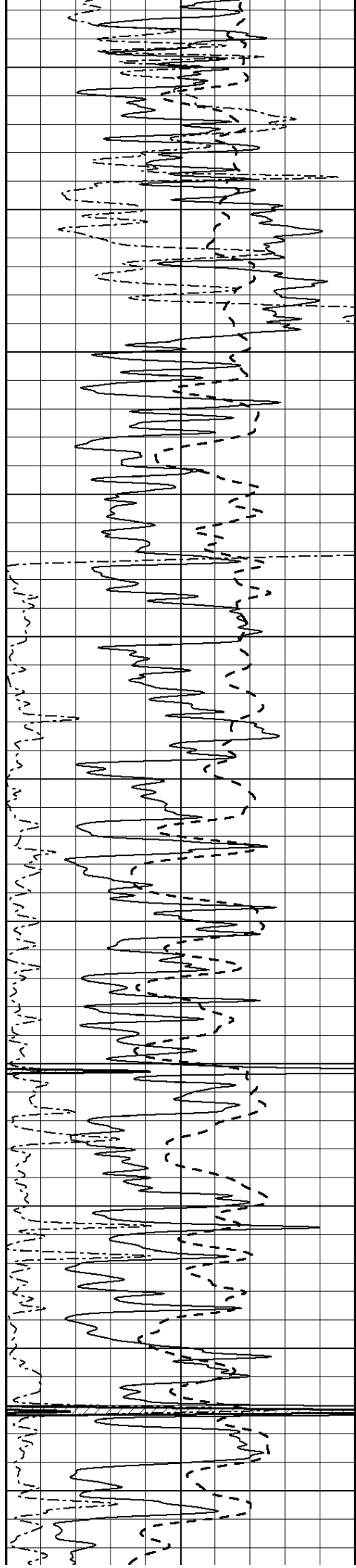
3000

3050

3100

3150





3200

3250

3300

3350

3400

3450

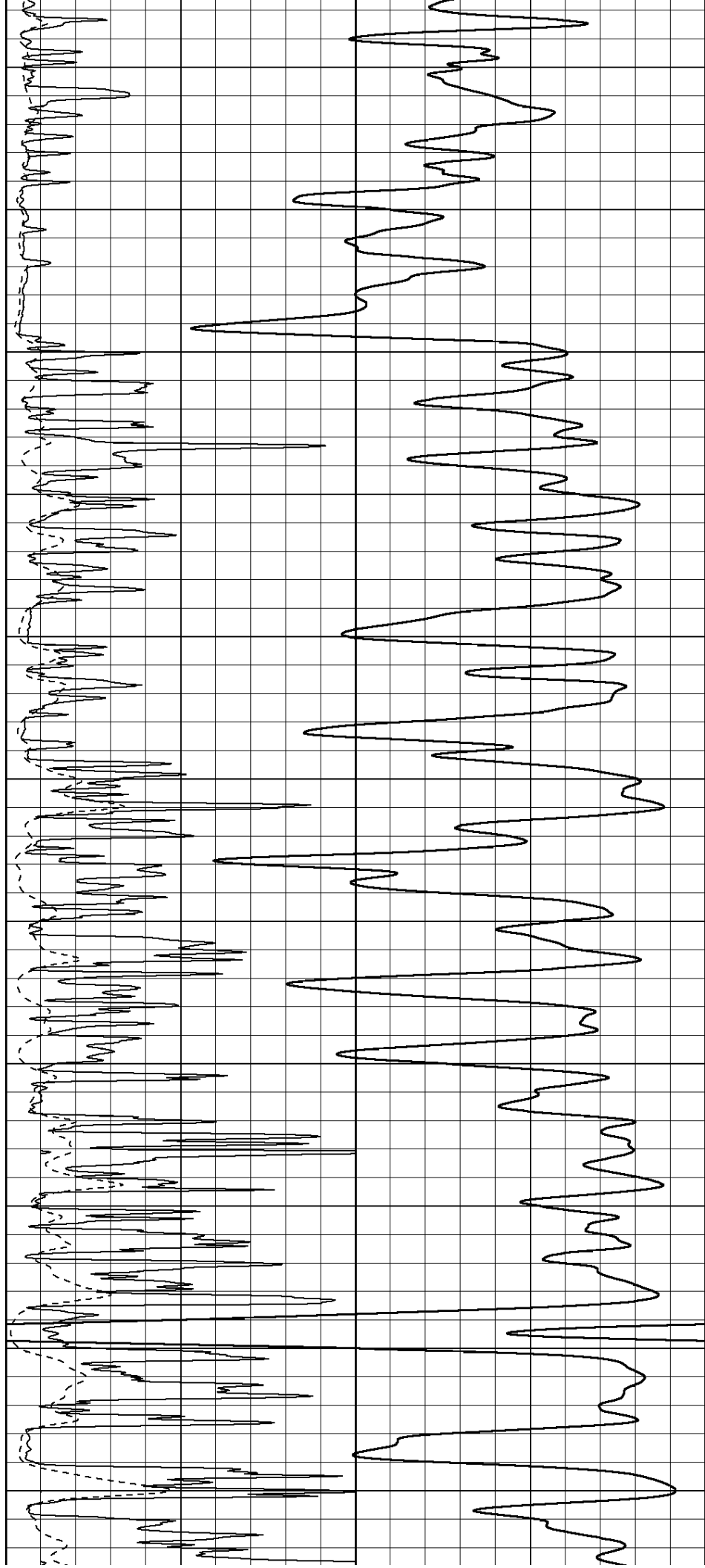
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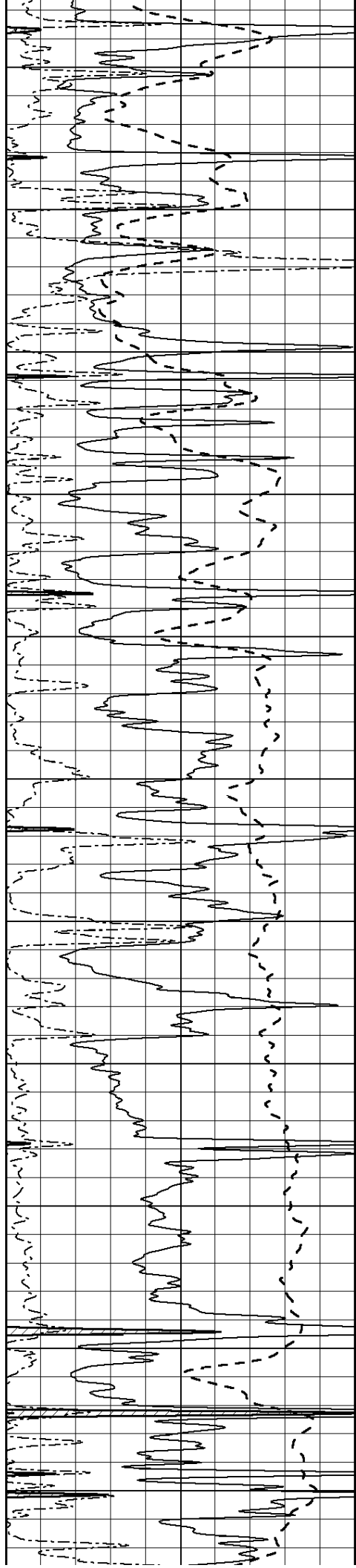
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3600

3650

3700





3750

3800

3850

3900

3950

4000

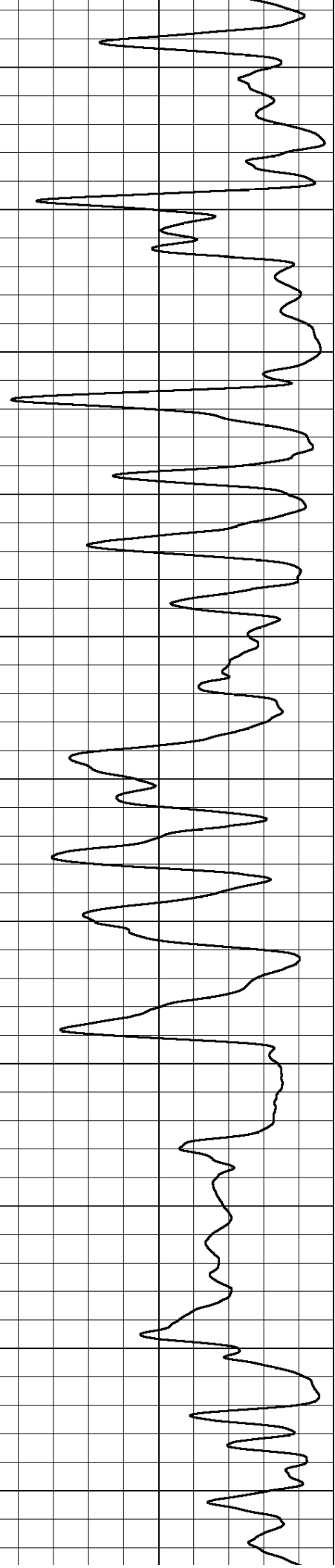
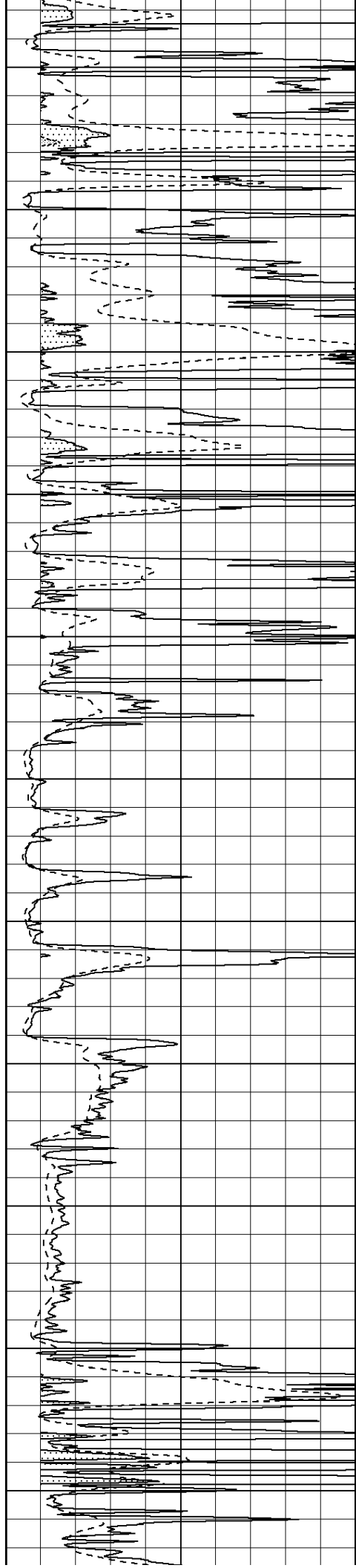
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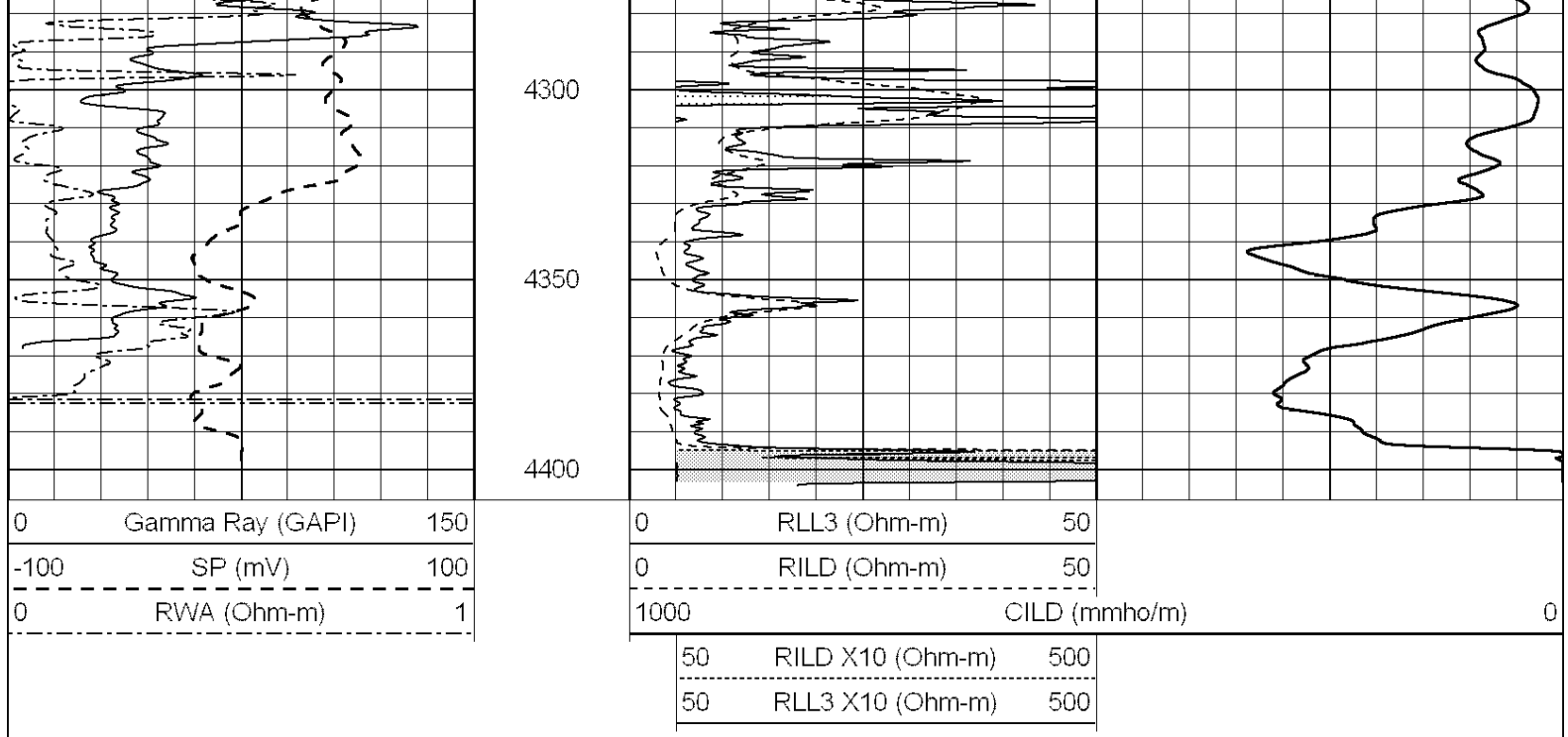
4100

4150

4200

4250



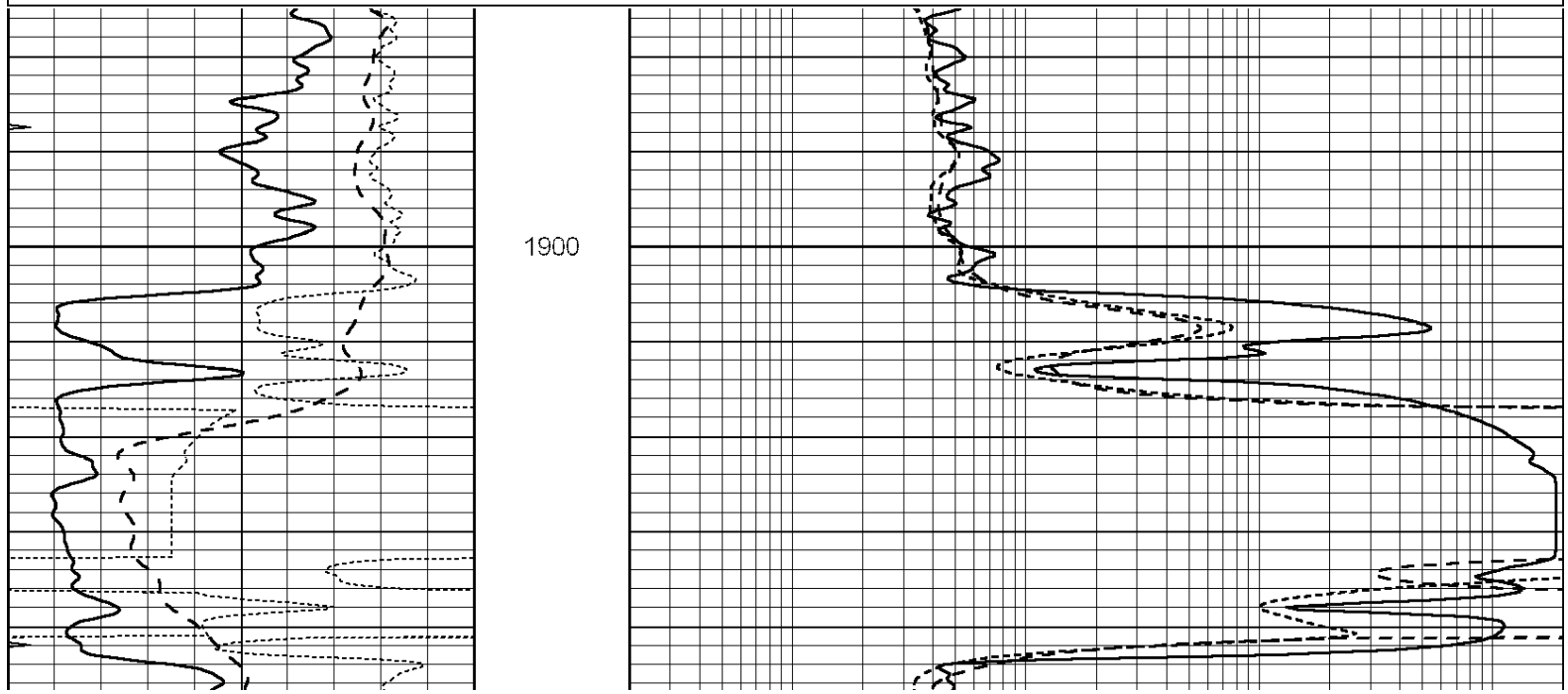


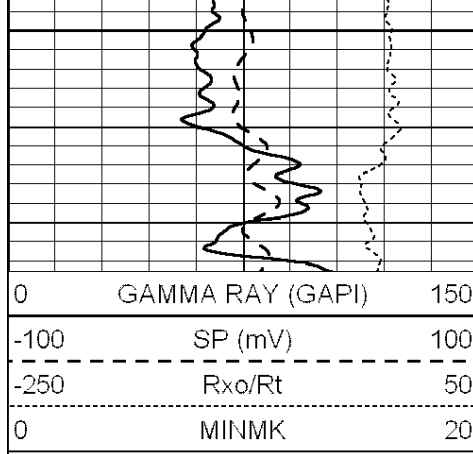
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ANHYDRITE

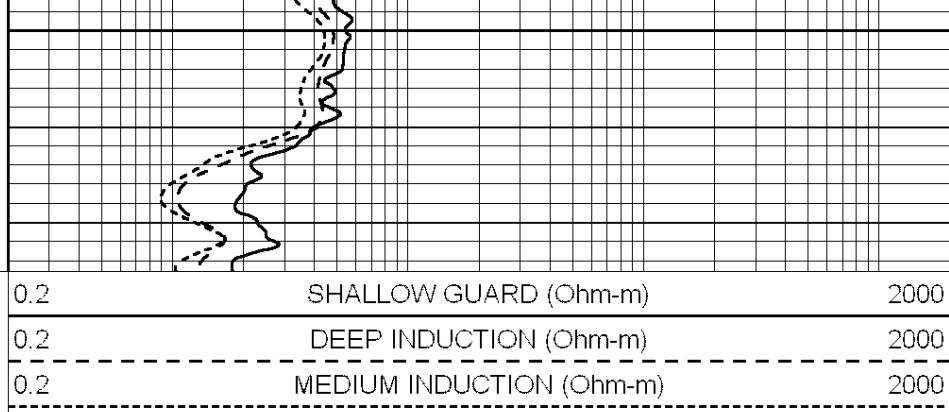
Database File: 30680ddn.db
 Dataset Pathname: pass3.9
 Presentation Format: _dil
 Dataset Creation: Wed Dec 09 10:07:43 2015
 Charted by: Depth in Feet scaled 1:240

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			





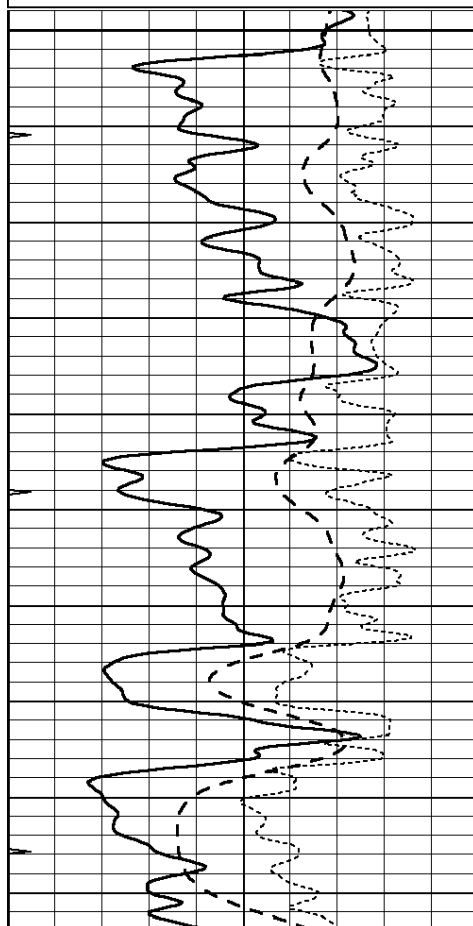
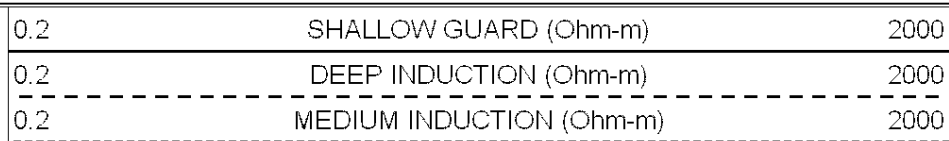
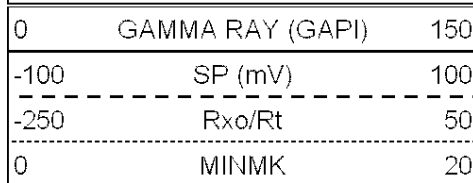
1950



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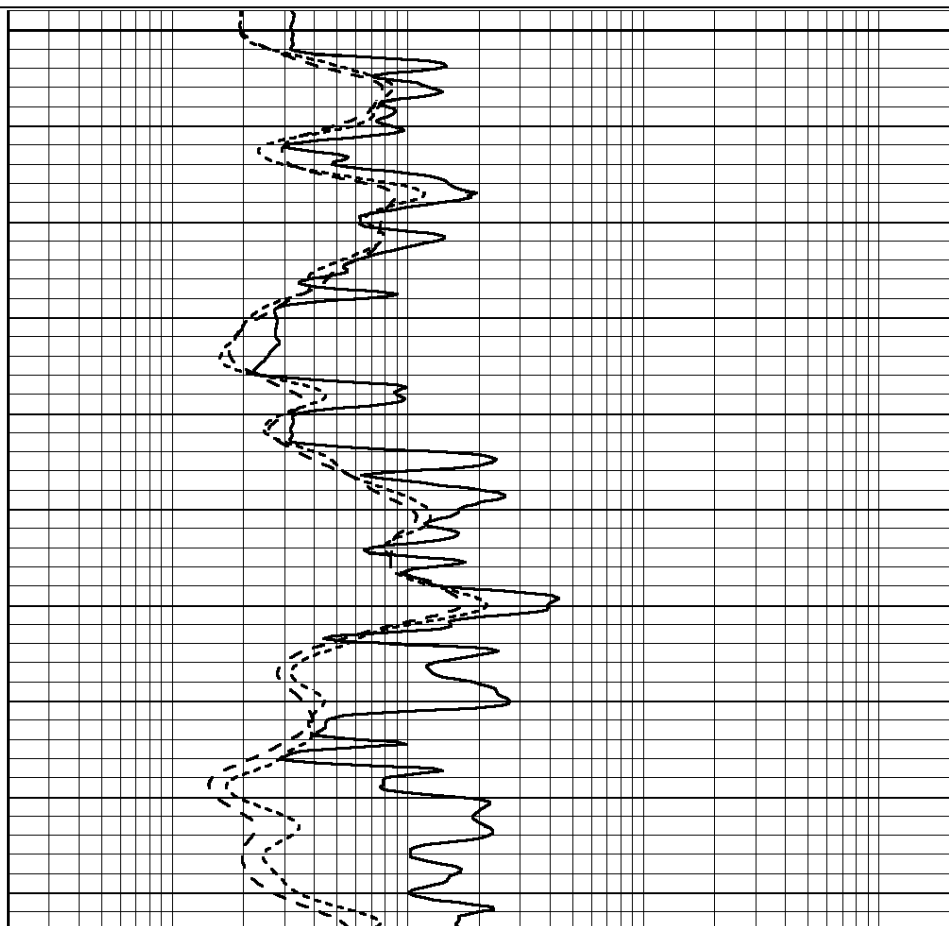
MAIN SECTION

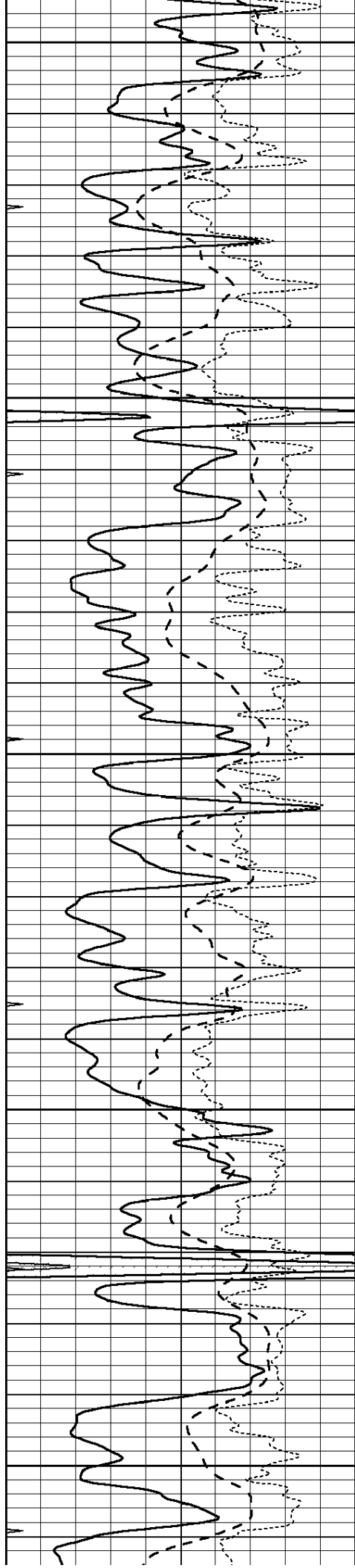
Database File: 30680ddn.db
 Dataset Pathname: pass3.8
 Presentation Format: _dil
 Dataset Creation: Wed Dec 09 10:07:30 2015
 Charted by: Depth in Feet scaled 1:240



3400

3450





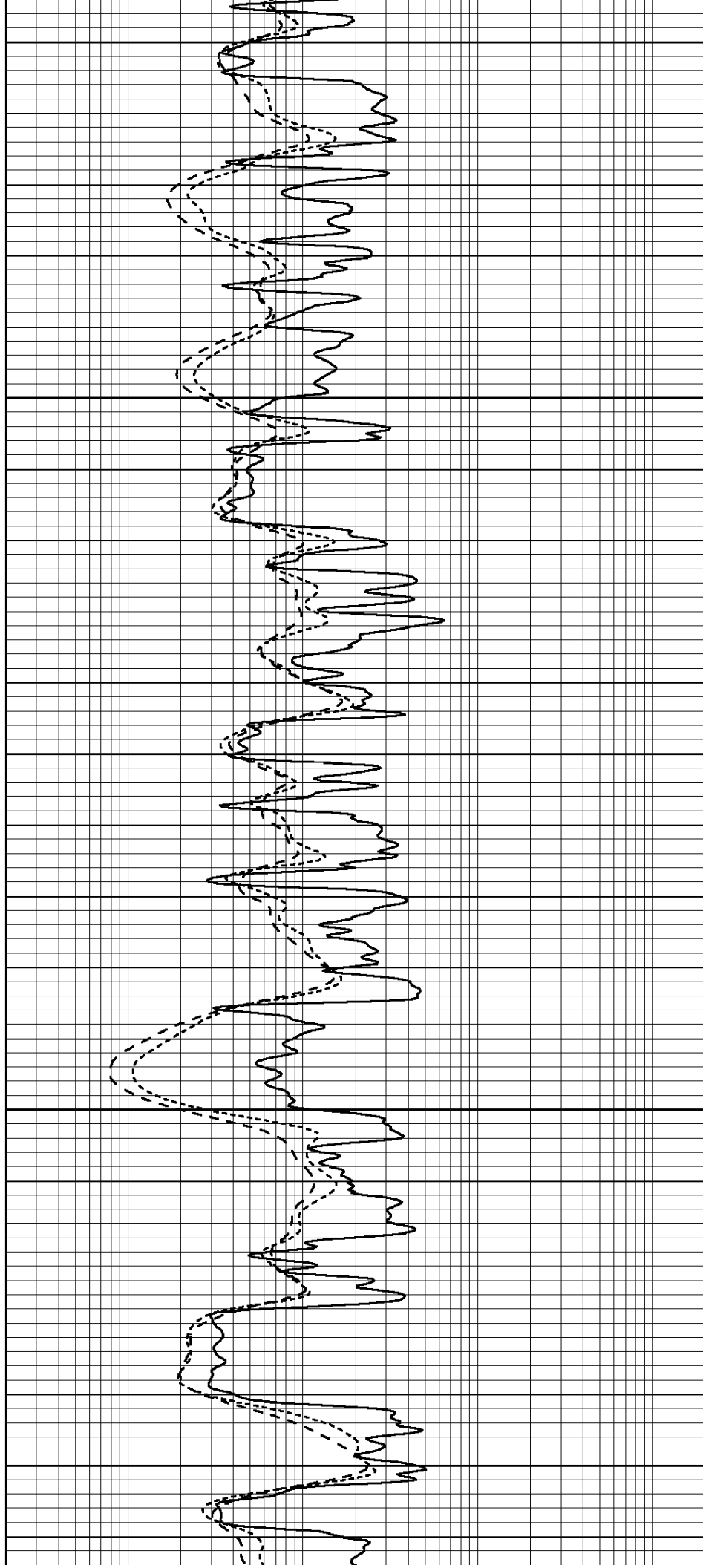
3500

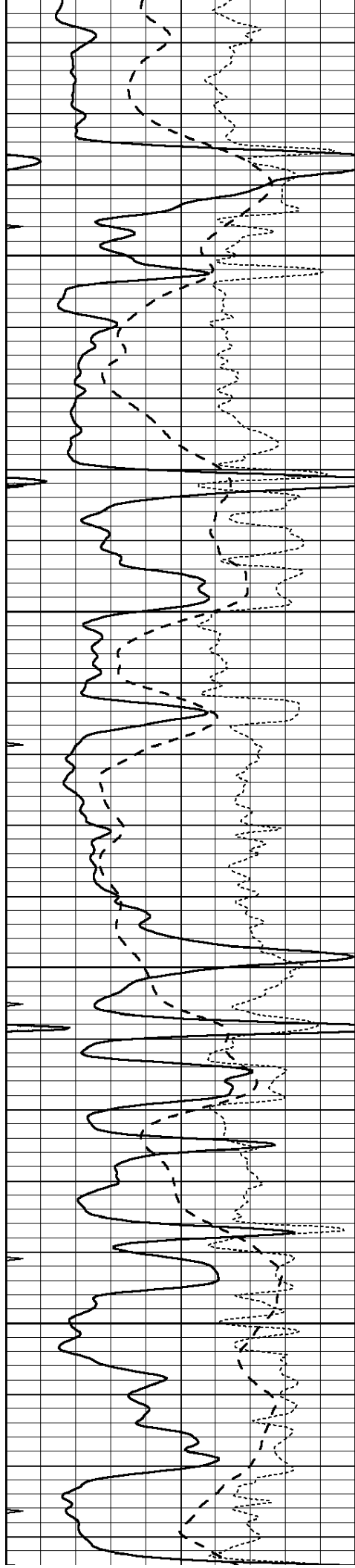
3550

3600

3650

3700



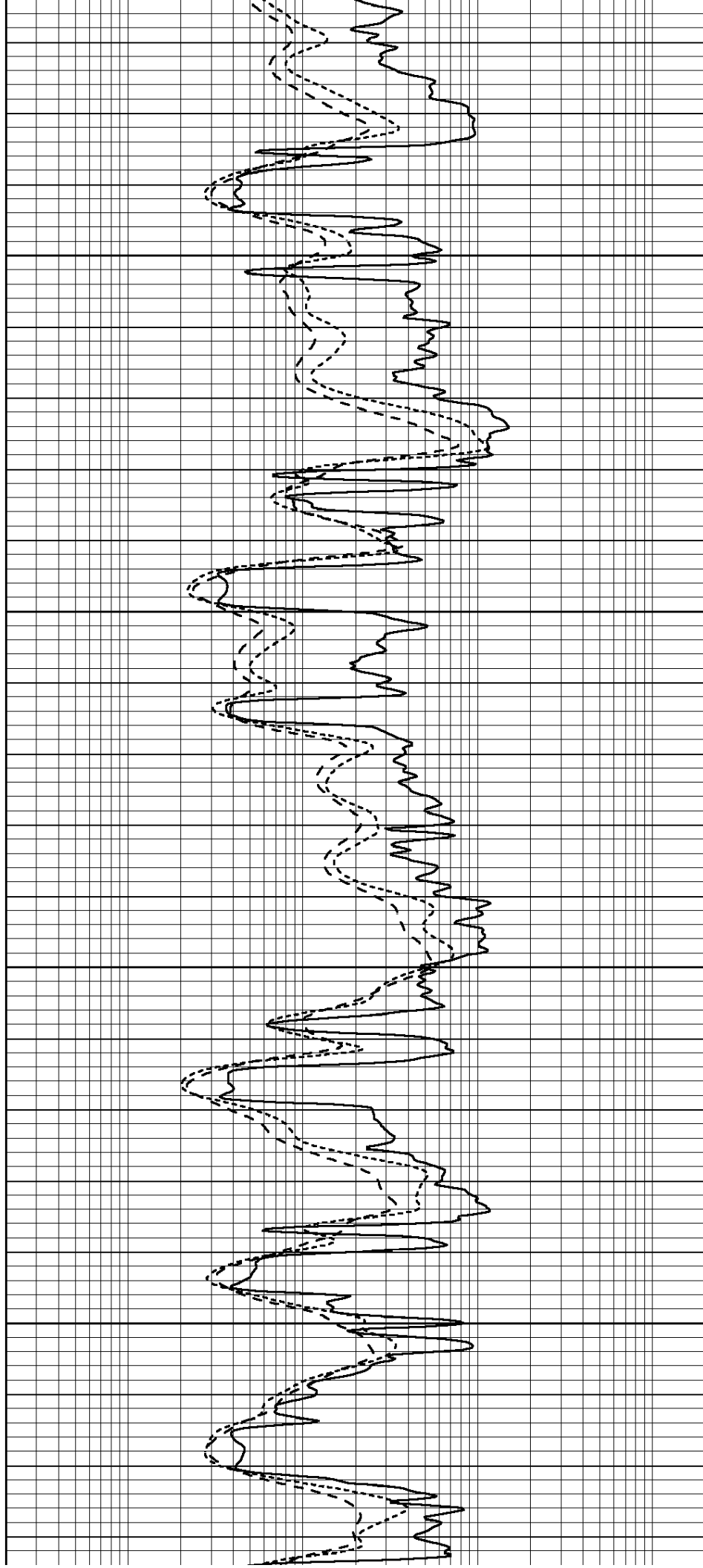


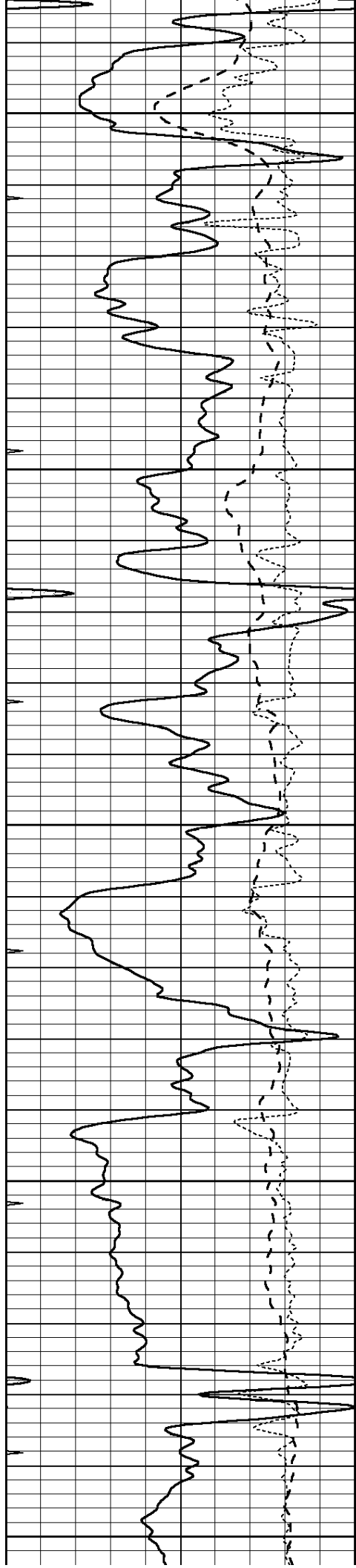
3750

3800

3850

3900





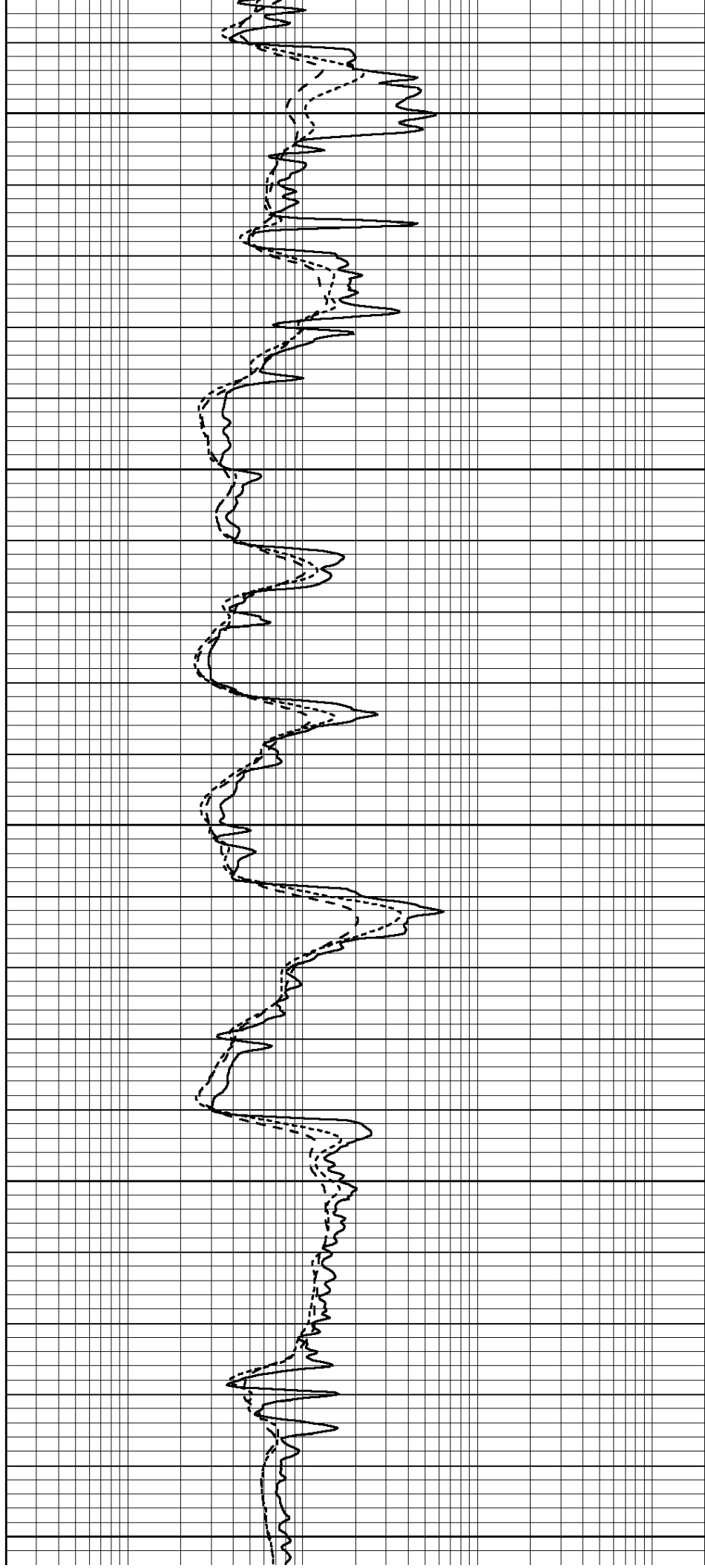
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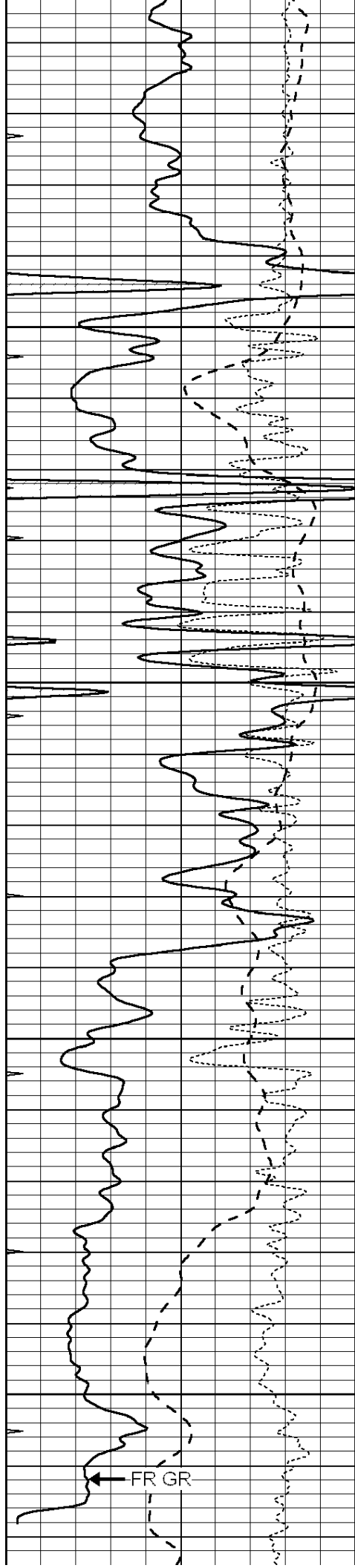
4000

4050

4100

4150



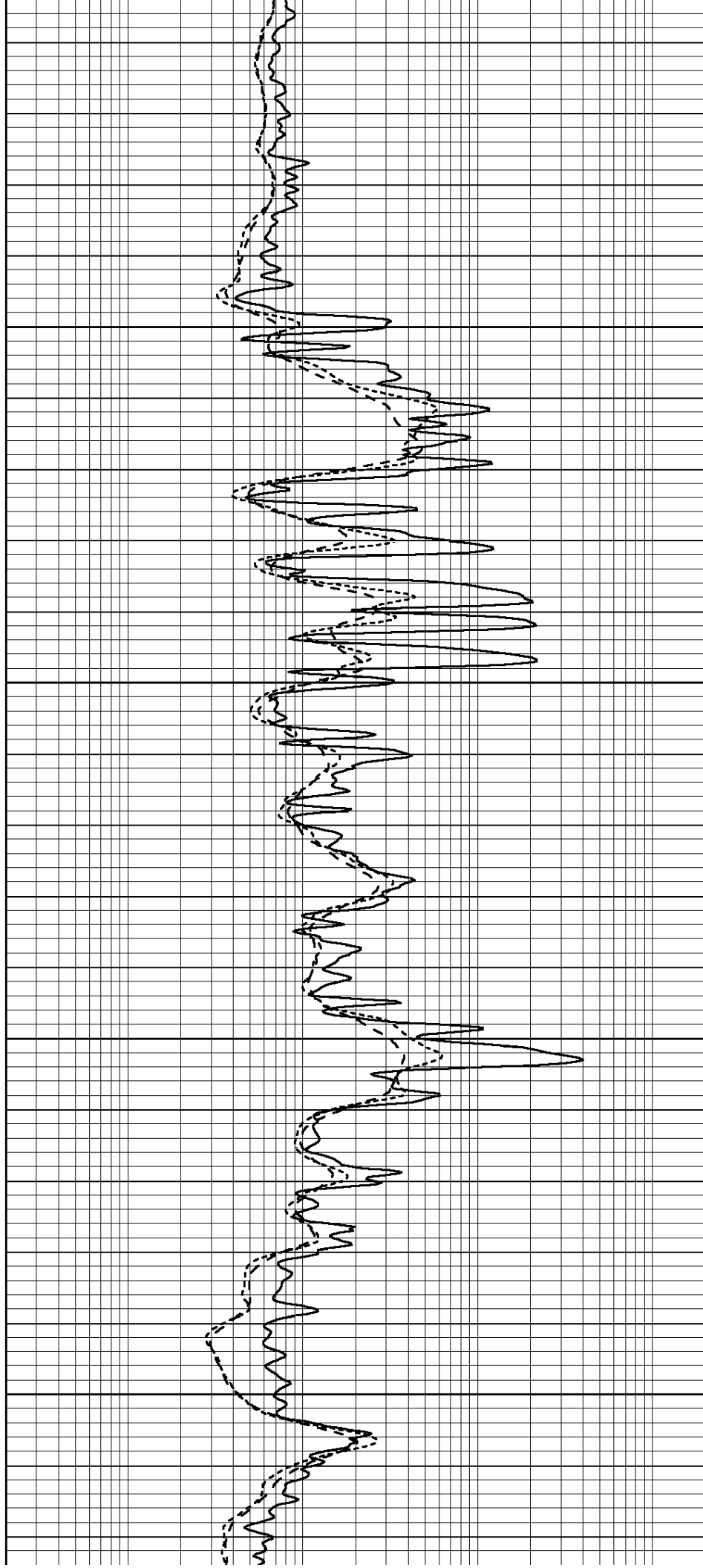


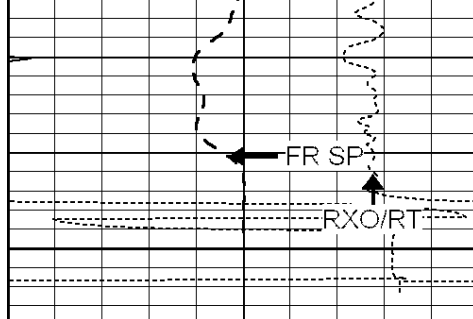
4200

4250

4300

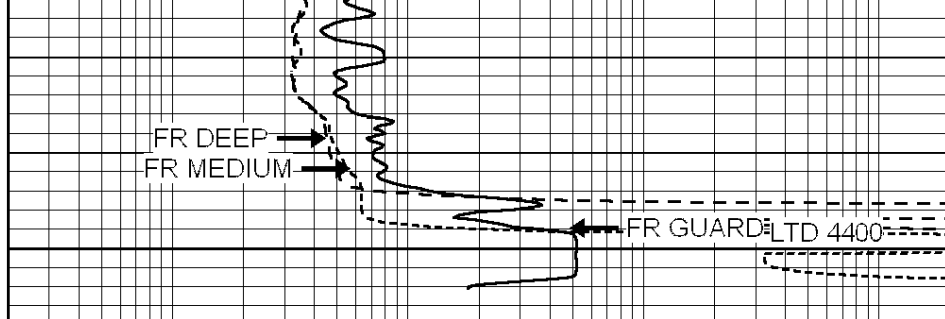
4350





4400

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



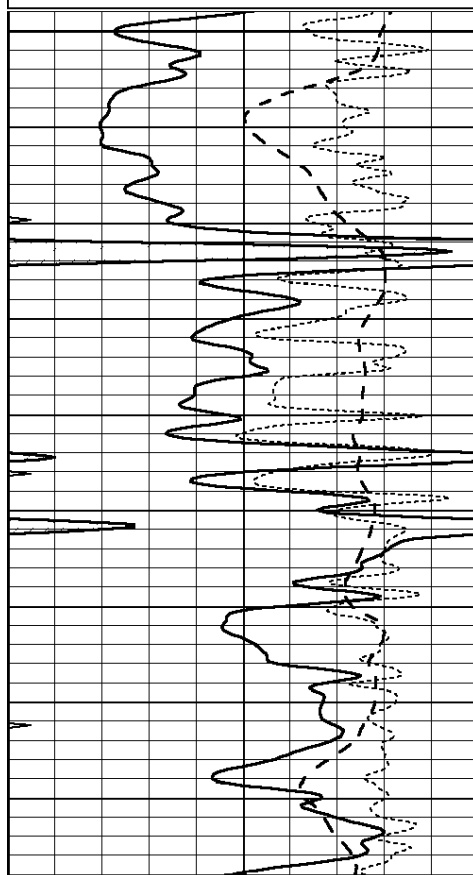
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REPEAT SECTION

Database File: 30680ddn.db
 Dataset Pathname: pass2.3
 Presentation Format: _dil
 Dataset Creation: Wed Dec 09 09:45:34 2015 by Calc SOC 120430
 Charted by: Depth in Feet scaled 1:240

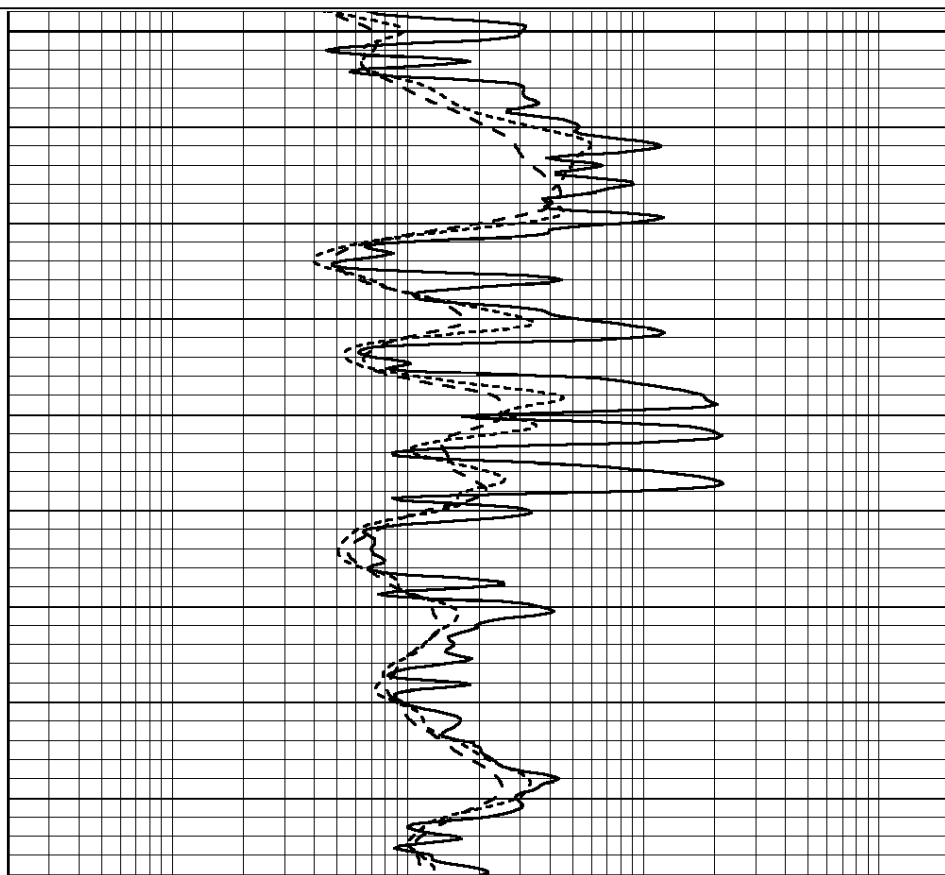
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

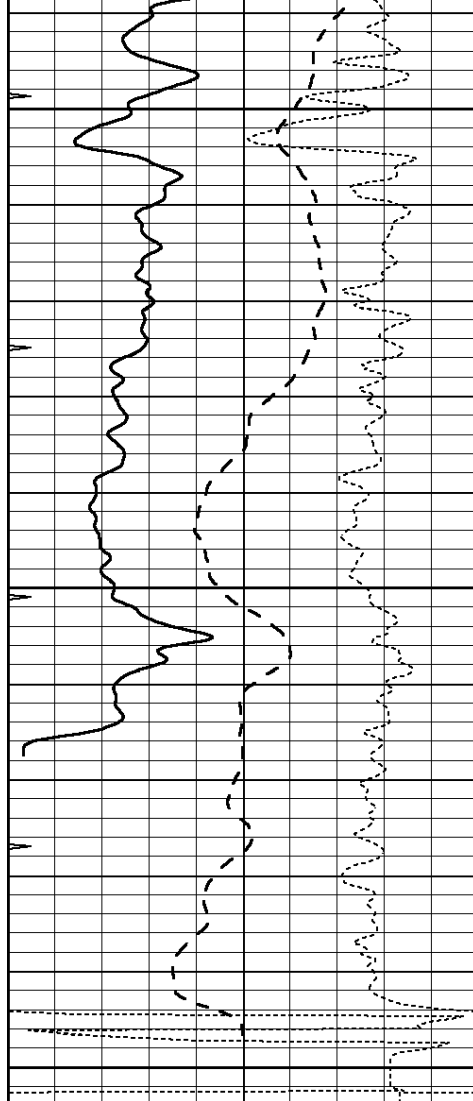
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



4200

4250



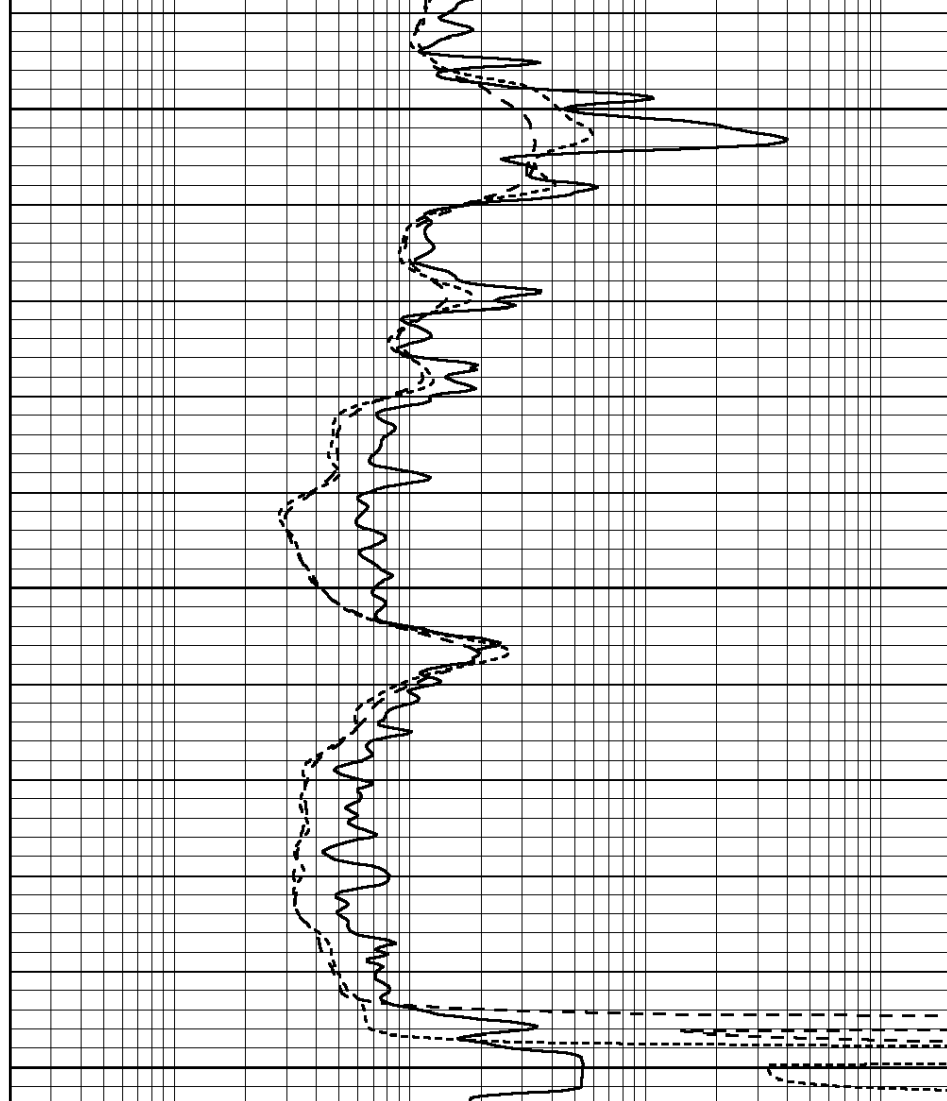


0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

4300

4350

4400



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: 30680ddn.db
 Dataset Pathname: pass3.8
 Dataset Creation: Wed Dec 09 10:07:30 2015

Dual Induction Calibration Report

Serial-Model: PROBE9-DILG
 Surface Cal Performed: Wed Dec 09 07:37:49 2015
 Downhole Cal Performed: Mon Jul 28 12:02:56 2008
 After Survey Verification Performed: Mon Jul 28 12:02:56 2008

Surface Calibration

Readings			References			Results		
Loop:	Air	Loop		Air	Loop	m	b	
Deep	-0.014	0.629	V	0.000	400.000	mmho/m	670.000	-20.000
Medium	0.039	0.728	V	0.000	464.000	mmho/m	685.000	-30.000
Internal:	Zero	Cal		Zero	Cal	m	b	
Deep	0.011	0.610	V	0.000	400.000	mmho/m	667.135	-7.256

Medium	0.005	0.712	V	0.000	464.000	mmho/m	655.677	-3.102
Downhole Calibration								
Readings			References			Results		
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	14.508	388.384	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	166.367	504.400	mmho/m	1.000	0.000
LL3		7.500	V		1400.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		4000.000	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		
Litho Density Calibration Report Serial: 004N Model: PRB								
Master Calibration			Performed Fri May 30 11:01:00 2014					
	Background	Magnesium		Aluminum		Sandstone		
Window 1	1378.8	10804.6		3492.0		12453.4		cps
Window 2	1262.4	9313.5		3076.7		10594.7		cps
Window 3	1077.6	5668.7		2076.0		6314.8		cps
Window 4	306.4	313.0		306.4		315.6		cps
Long Space	0.0	8051.0		1814.3		9332.3		cps
Short Space	1.9	1706.1		1146.0		1707.6		cps
Rho		1.7100		2.5900		1.3800		g/cc
Pe		0.0000		2.5700		1.5500		
Rib Angle	: 45.0	Rib Slope	: 1.002	Density/Spine Ratio			: 0.571	
Spine Angle	: 75.0	Spine Slope	: 3.745	Spine Intercept			: -18.9	
Before Survey Verification			Performed Wed Dec 31 18:00:00 1969					
Window 1	0.0	0.0		0.0		0.0		cps
Window 2	0.0	0.0		0.0		0.0		cps
Window 3	0.0	0.0		0.0		0.0		cps
Window 4	0.0	0.0		0.0		0.0		cps
Long Space	0.0	0.0		0.0		0.0		cps
Short Space	0.0	0.0		0.0		0.0		cps
Measured Rho		0.0000		0.0000		0.0000		g/cc
Measured Correction		0.0000		0.0000		0.0000		g/cc
Measured Pe				0.0000		0.0000		
After Survey Verification			Performed Wed Dec 31 18:00:00 1969					
Window 1	0.0	0.0		0.0		0.0		cps
Window 2	0.0	0.0		0.0		0.0		cps
Window 3	0.0	0.0		0.0		0.0		cps
Window 4	0.0	0.0		0.0		0.0		cps
Long Space	0.0	0.0		0.0		0.0		cps
Short Space	0.0	0.0		0.0		0.0		cps
Measured Rho		0.0000		0.0000		0.0000		g/cc

Measured K _{inf}	0.0000	0.0000	0.0000	g/cc
Measured Correction	0.0000	0.0000	0.0000	
Measured Pe		0.0000	0.0000	
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:	070558			
Tool Model:	OPEN_GR			
Performed:	Wed Dec 02 21:48:59 2015			
Calibrator Value:	1.0	GAPI		
Background Reading:	0.0	cps		
Calibrator Reading:	1.0	cps		
Sensitivity:	0.2800	GAPI/cps		