



Weatherford[®]

**CML MESSENGER SHUTTLE
ARRAY INDUCTION**

COMPANY **SANDRIDGE ENERGY**
 WELL **HAZEL 3120 1-24H**
 FIELD **SIX MOONS EAST**
 PROVINCE/COUNTY **COMMANCHE**
 COUNTRY/STATE **USA /KANSAS**
 LOCATION **SHL: 2310' FSL & 660' FEL OF THE SE/4**
BHL: 3760' FNL & 660' FEL OF THE SE/4

SEC 24	TWP 31S	RGE 20W	Other Services MDNMMPD	Permanent Datum G.L., Elevation 2042 feet	Elevations: KB 2063.00 DF 2062.00 GL 2042.00
API Number 15-033-21684-01			Permit Number		
Log Measured From DF					
Drilling Measured From DF @ 21 FEET					
Date	25-FEB-2013				
Run Number	ONE				
Service Order	3539541				
Depth Driller	10773.00 feet				
Depth Logger	10773.00 feet				
First Reading	10729.00 feet				
Last Reading	5512.00 feet				
Casing Driller	5512.00 feet				
Casing Logger	5512.00 inches				
Bit Size	6.125				
Hole Fluid Type	WATER				
Density / Viscosity	8.40 lb/USg	28.00 CP			
PH / Fluid Loss	9.50	9.50			
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.68 @ 71.0 ohm-m				
Rmf @ Measured Temp	0.54 @ 71.0 ohm-m				
Rmc @ Measured Temp	0.82 @ 71.0 ohm-m				
Source Rmf / Rmc	CALC	CALC			
Rm @ BHT	0.37 @131.0 ohm-m				
Time Since Circulation	1 HOUR				
Max Recorded Temp	131.00	deg F			
Equipment / Base	18077	OKC			
Recorded By	M. JOHNSON				S. TOTTEY
Witnessed By	J. HILEMAN				
AFE #/ S.O.	DC12601				3539541

BOREHOLE RECORD

Last Edited: 25-FEB-2013 04:33

Bit Size inches	Depth From feet	Depth To feet
13.375	0.00	1022.00
8.750	1022.00	5512.00
6.125	5512.00	10773.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1022.00	36.00
INTERMED	7.000	0.00	5512.00	26.00

REMARKS

LOGGED WITH WLS VER 13.04.8492 SOFTWARE

WELL LOGGED USING MESSENGER METHOD OF DEPLOYMENT, AND MEMORY LOGGING SYSTEM

HARDWARE: MAI: ISA STANDOFF BELOW

MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW

MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE

2.71 G/CC DENSITY MATRIX USED TOCALCULATE POROSITY

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT - 10652

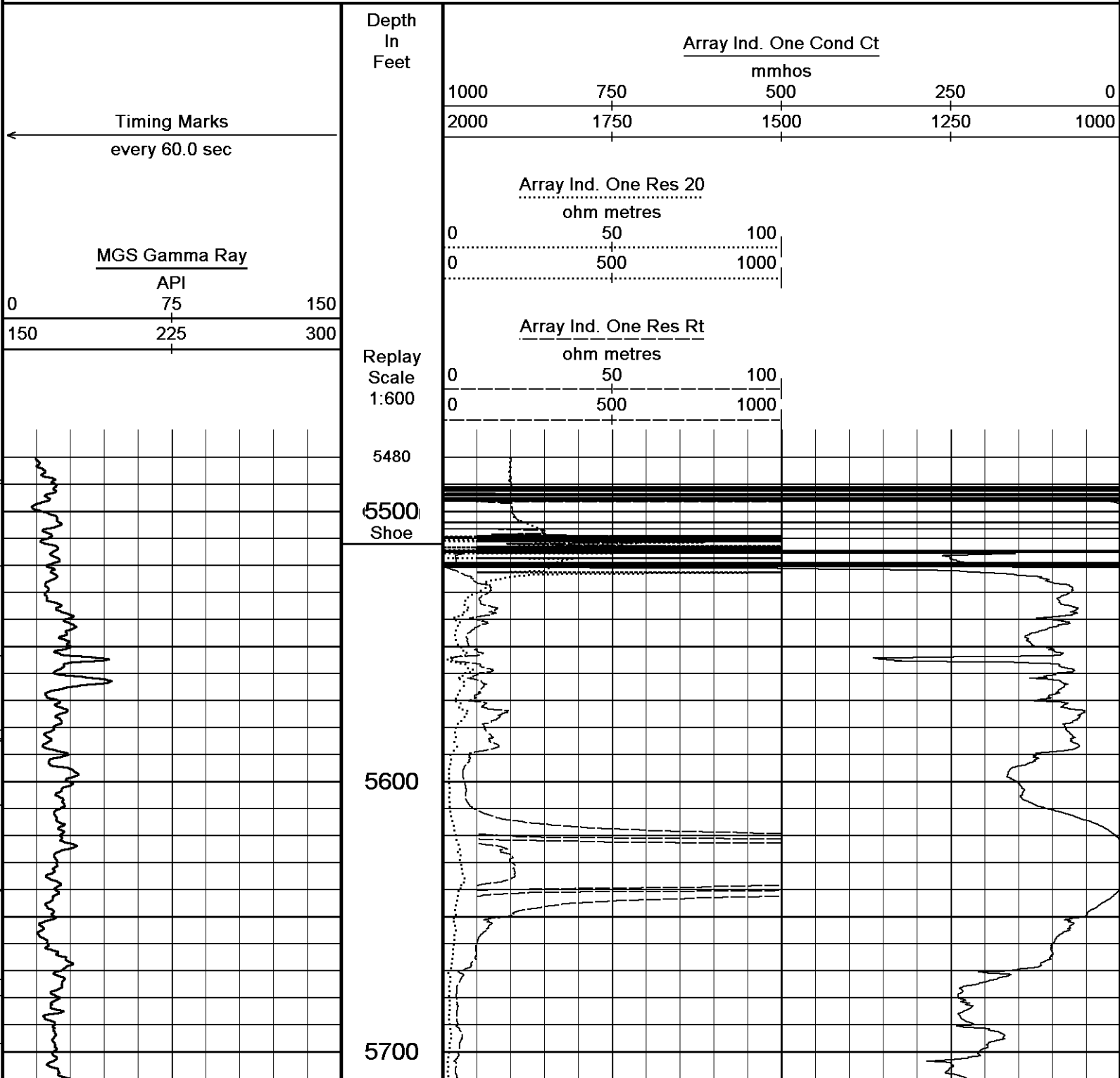
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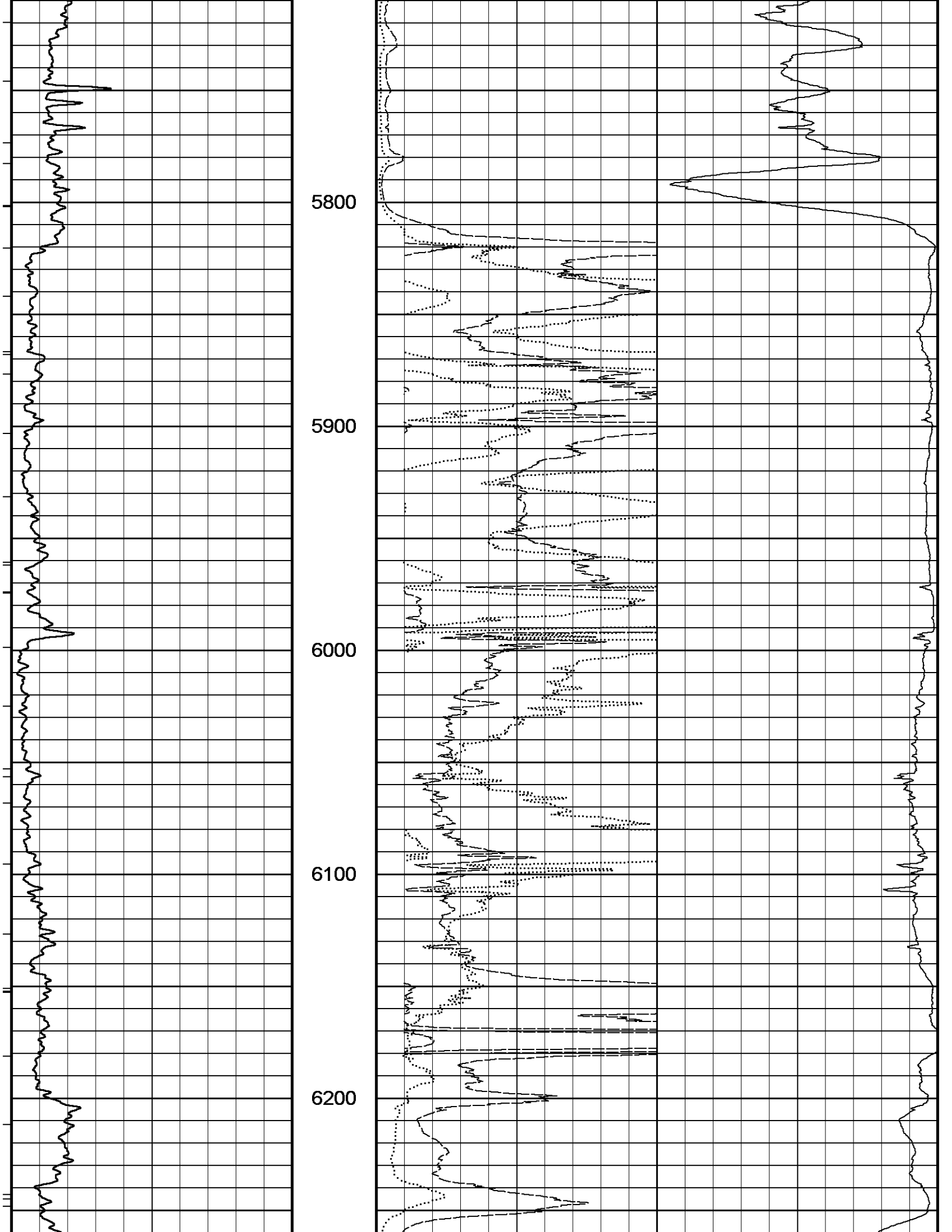
SERVICE ORDER # 3539541
RIG: LARIAT 45

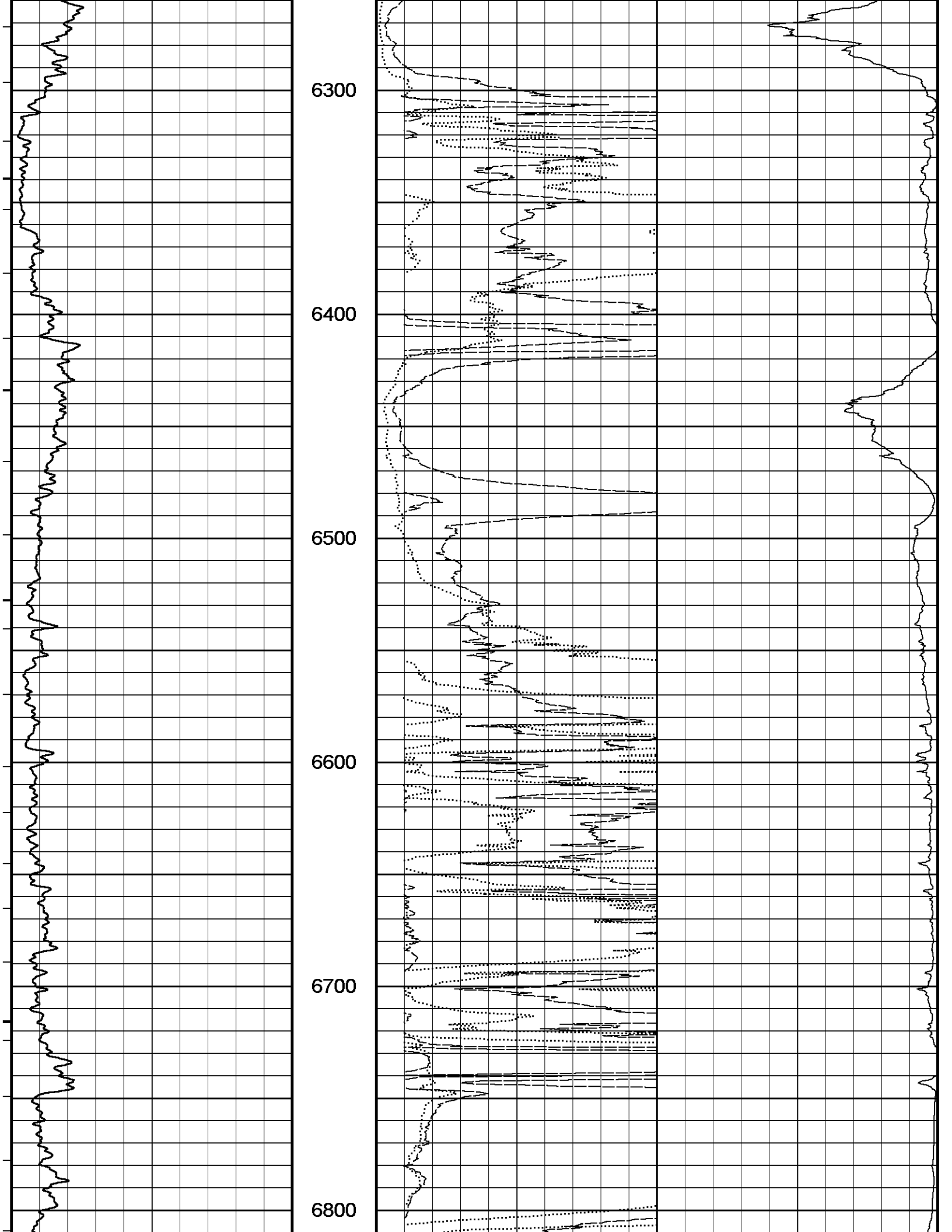
OPERATORS: M. SLOBODKIN

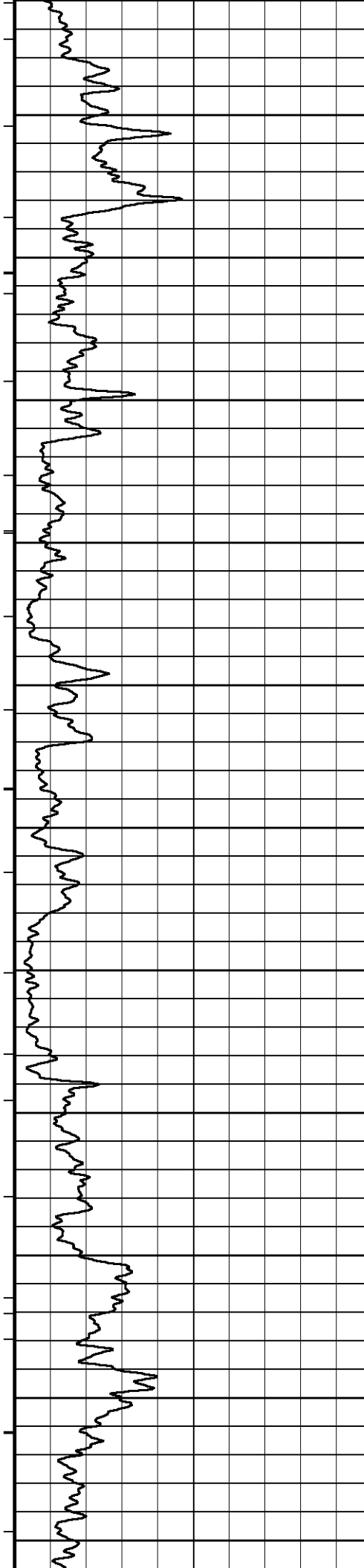
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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 in our price schedule.

↓ ↓
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-FEB-2013 04:37
Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
Recorded on 25-FEB-2013 04:14
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492









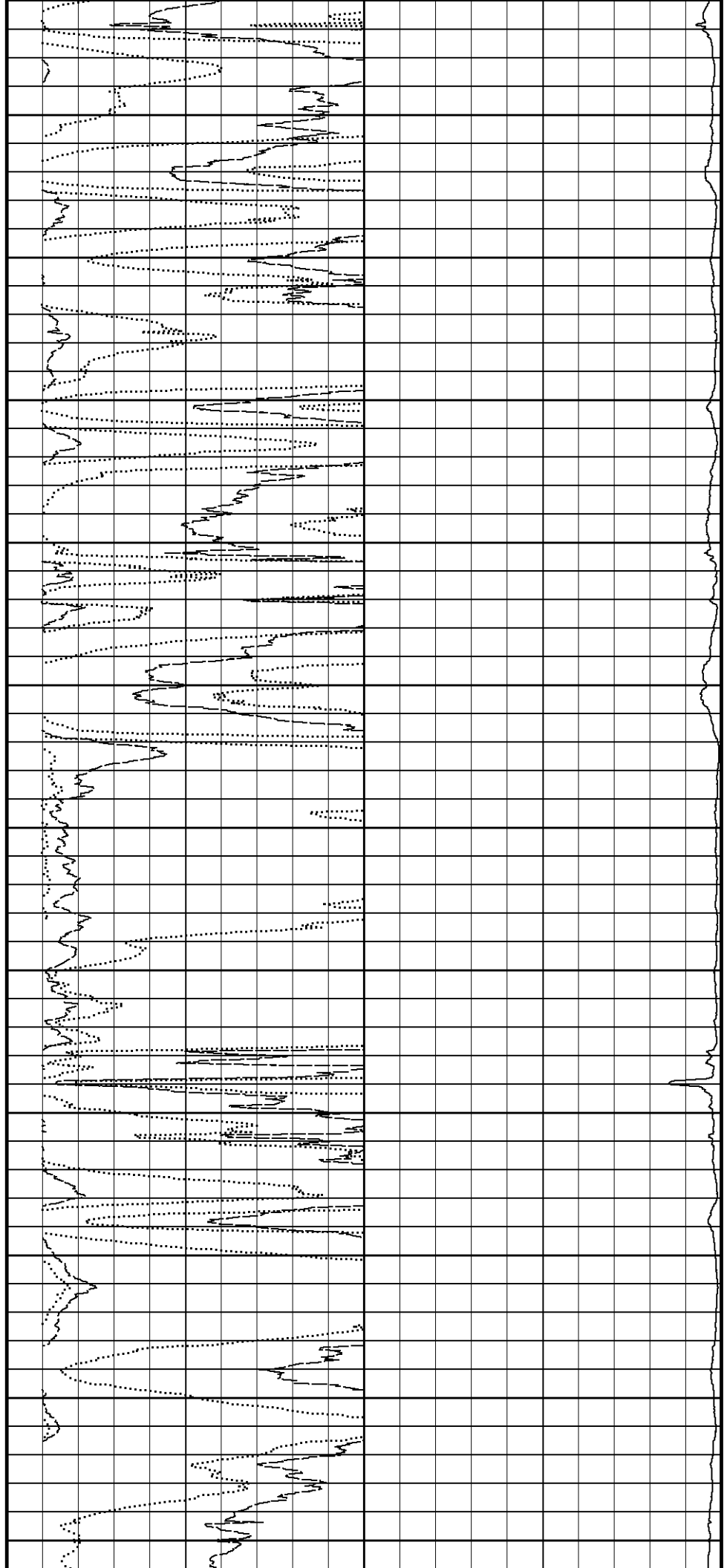
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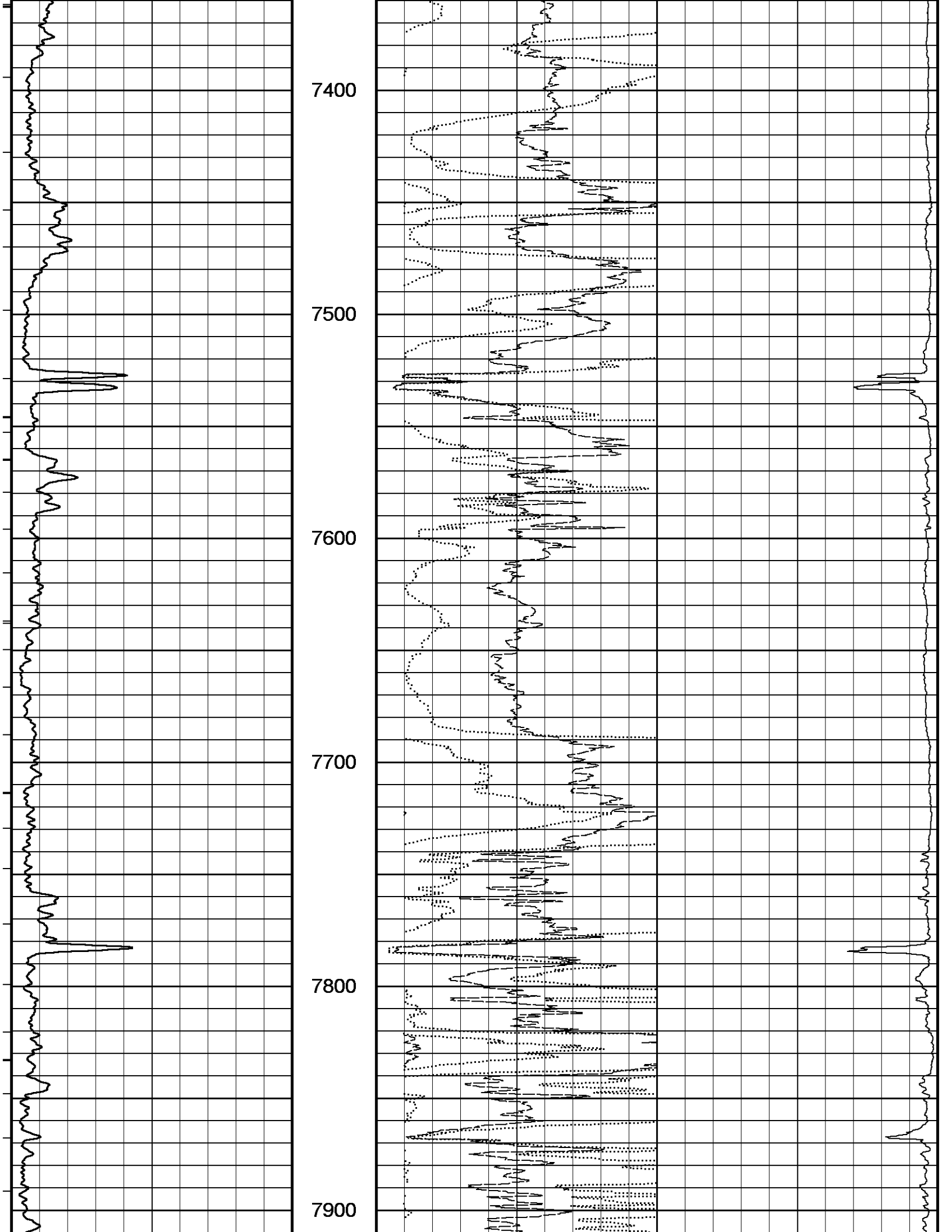
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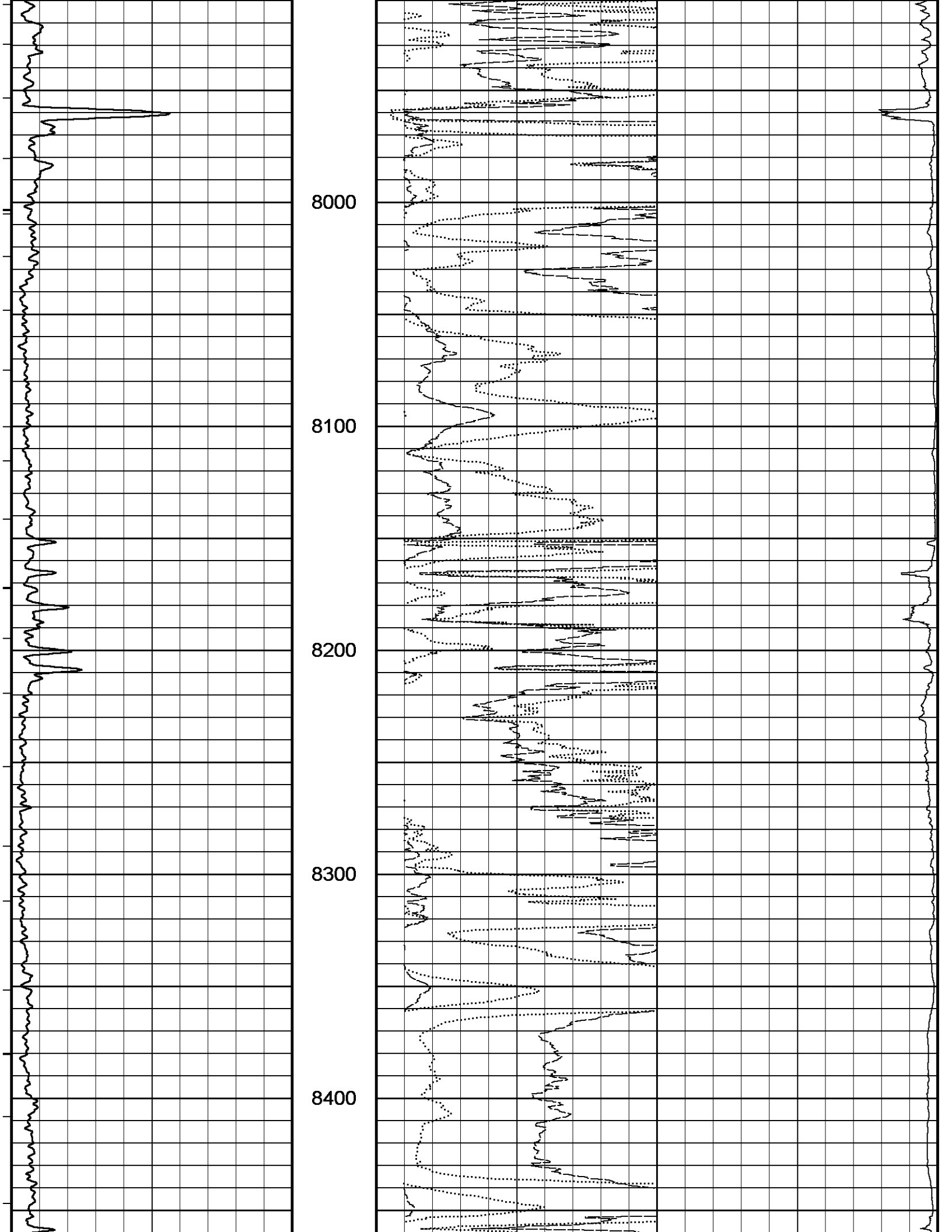
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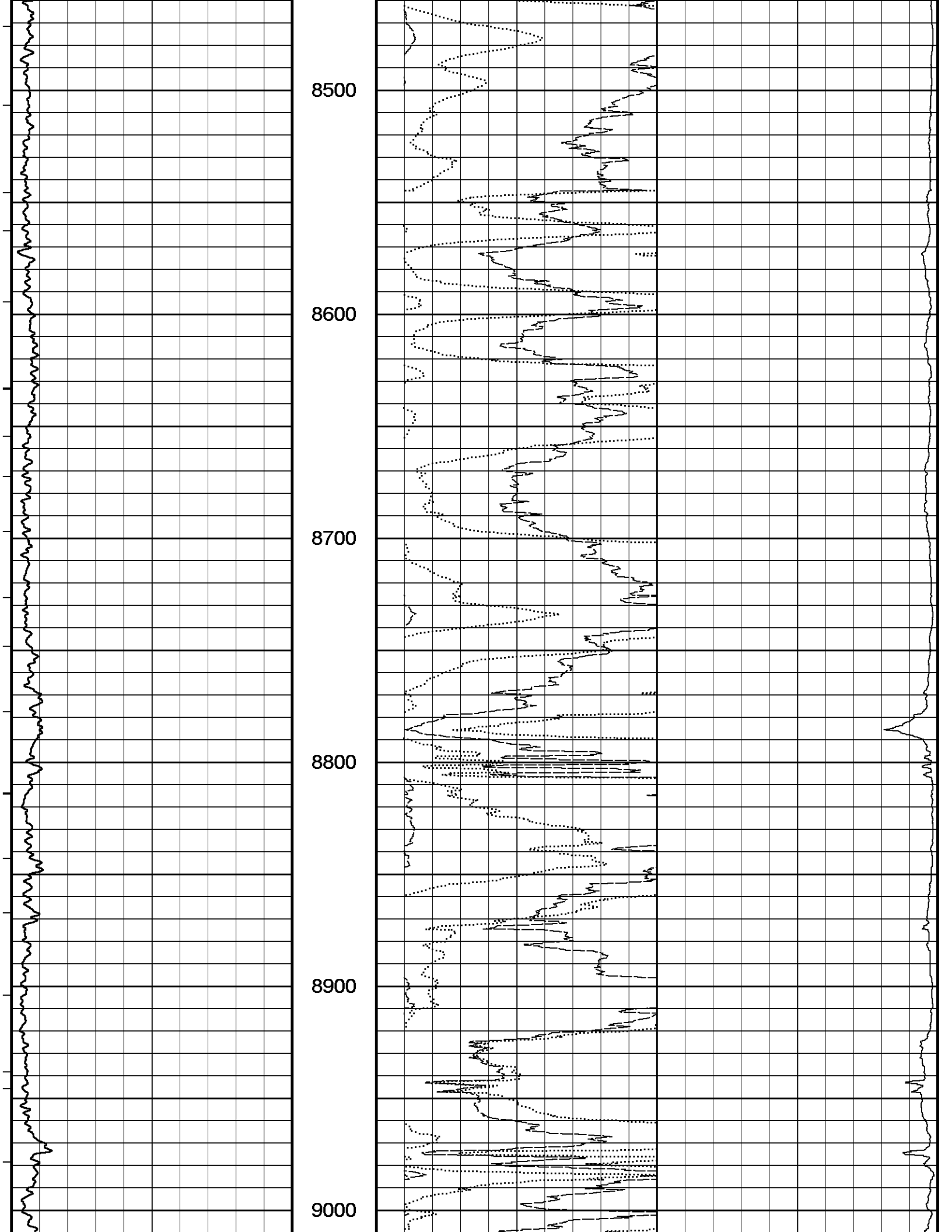
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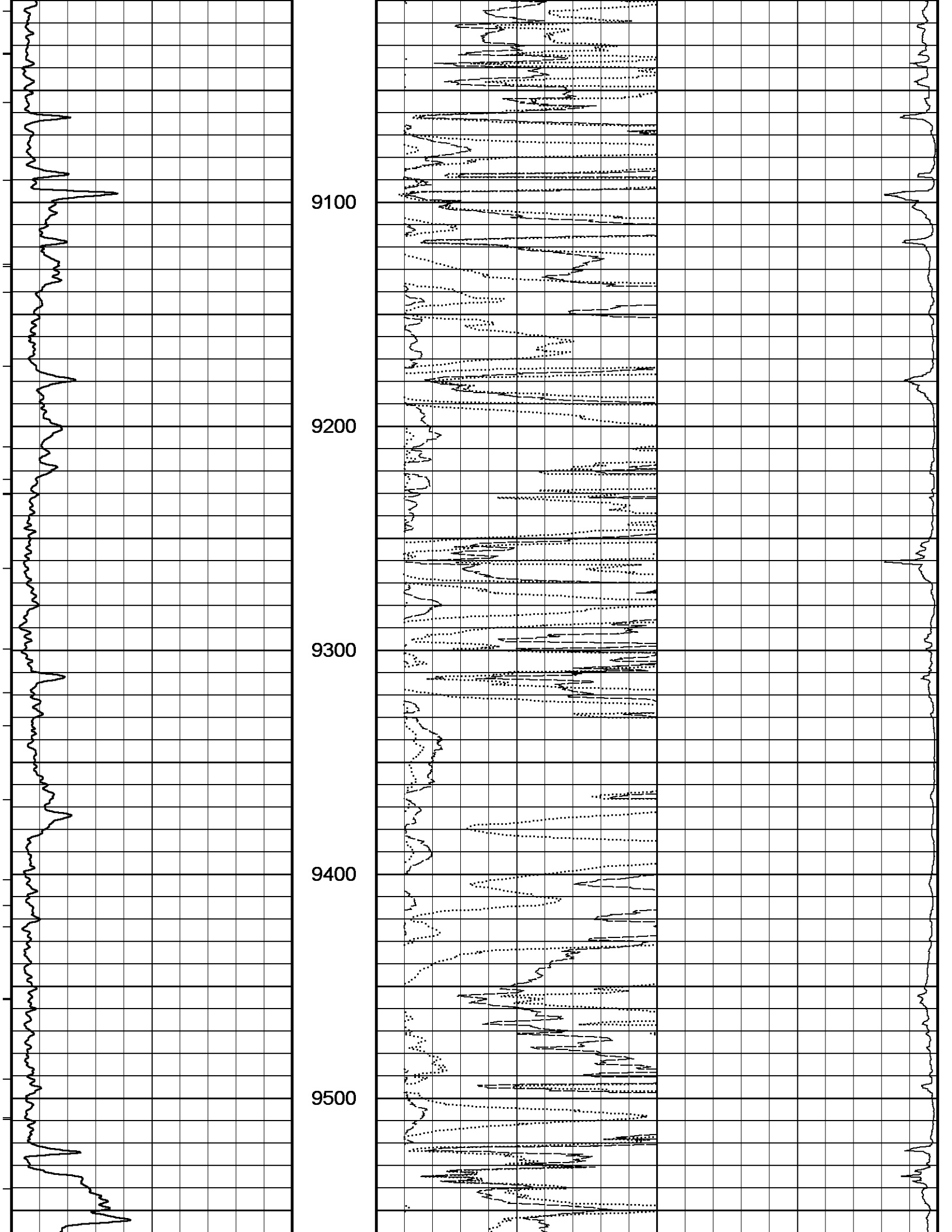
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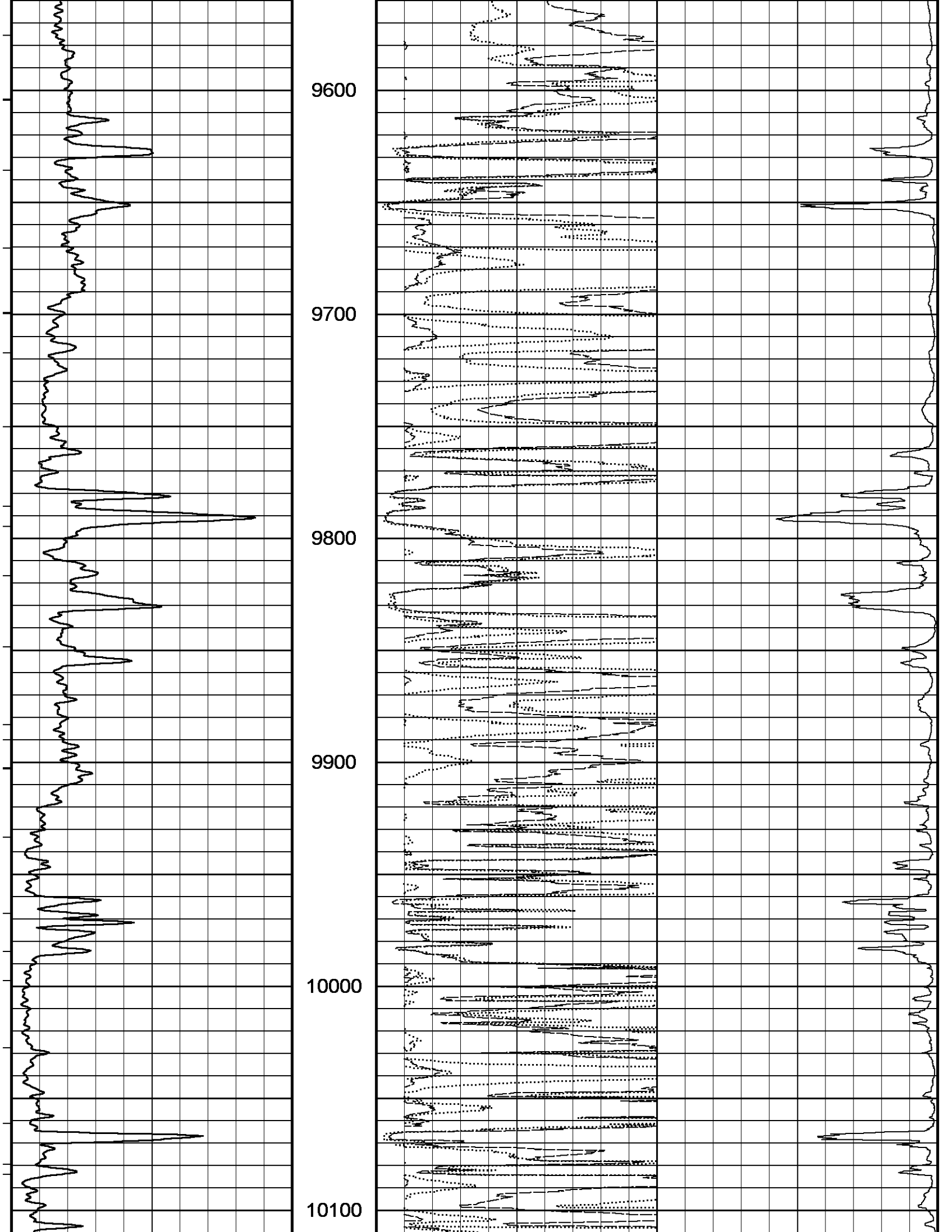


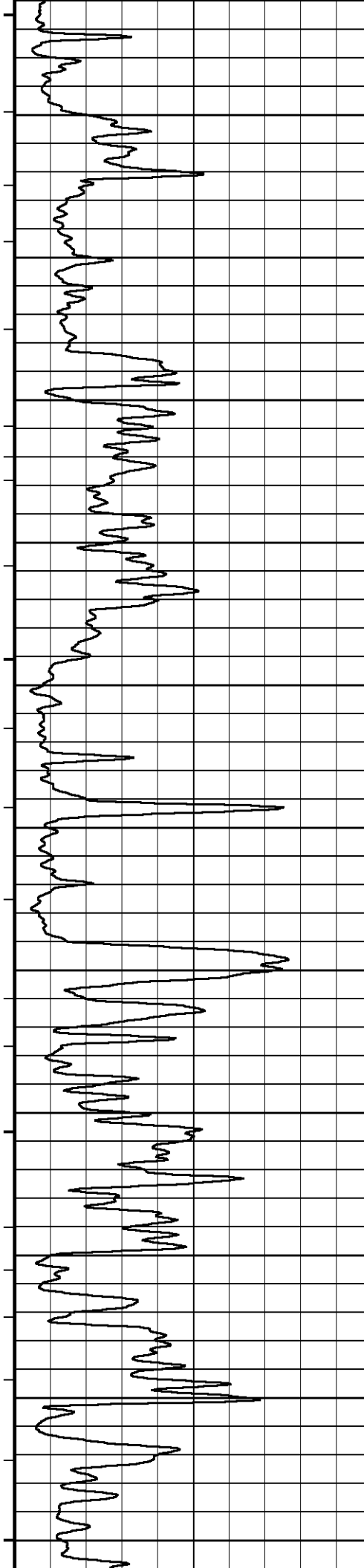












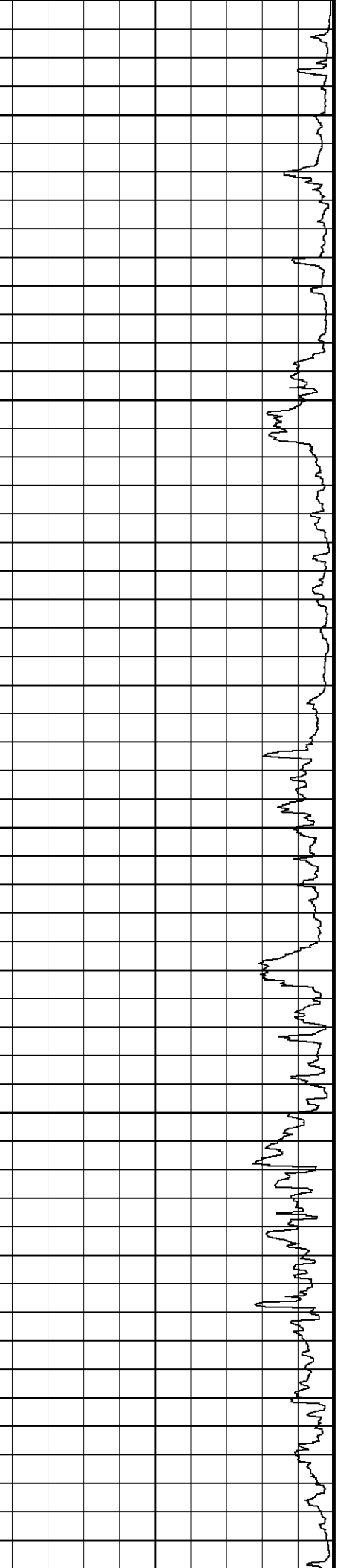
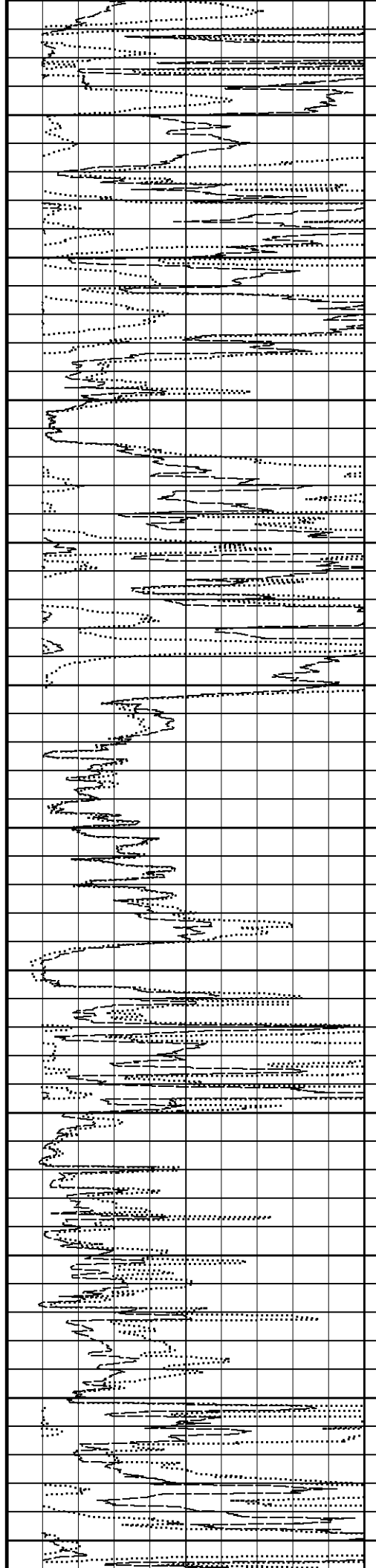
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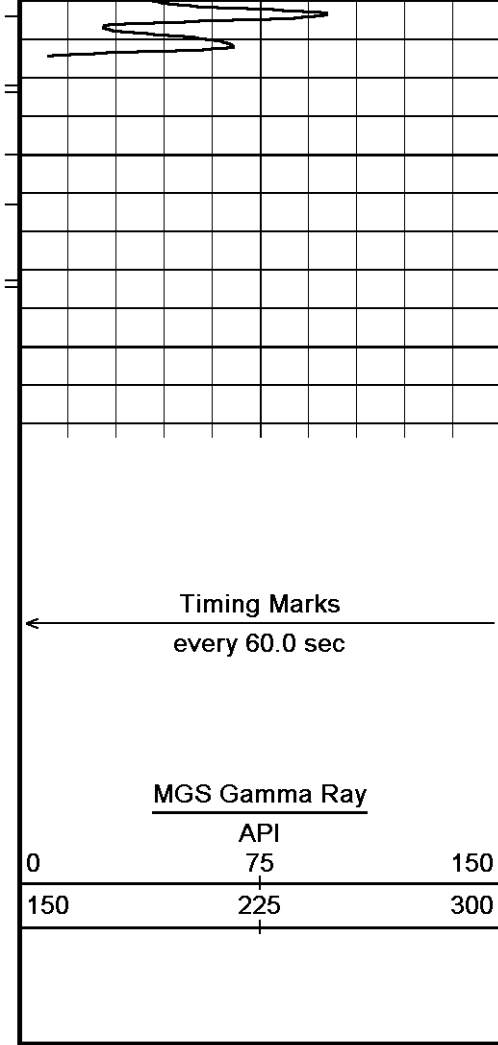
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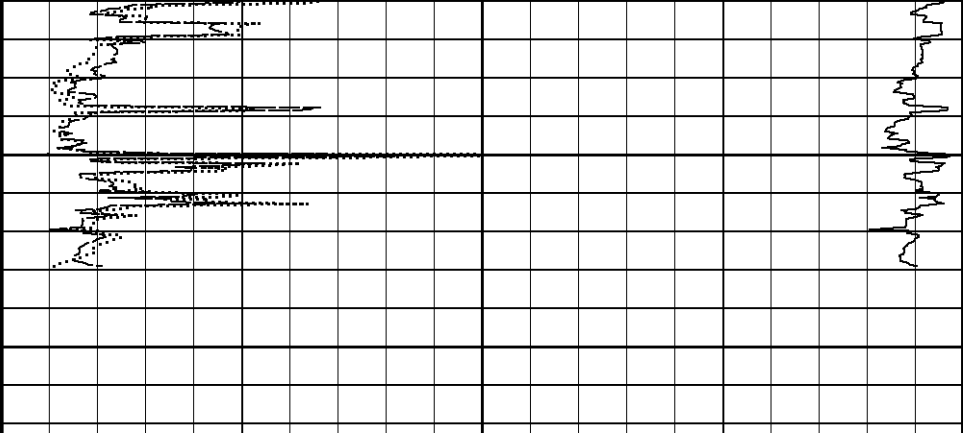
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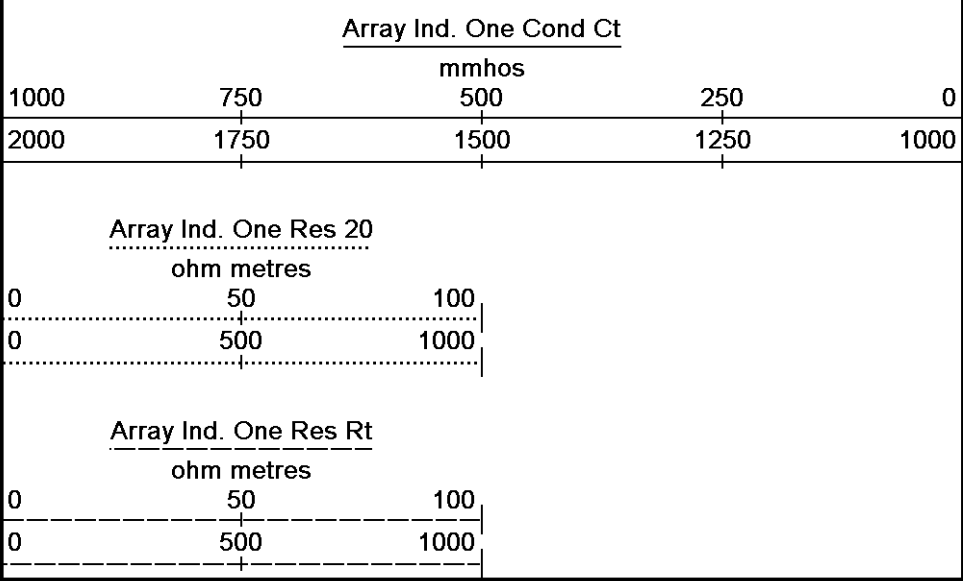




10700



10770
Depth
In
Feet

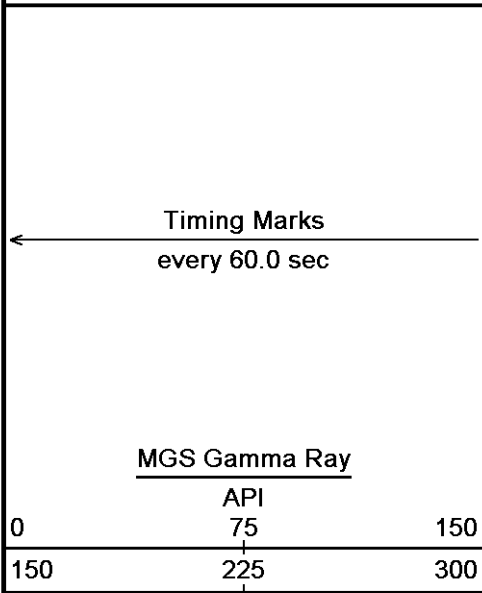


Replay
Scale
1:600

Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
 System Versions: Processed with 13.04.8492 Plotted with 13.04.8492
 Plotted on 25-FEB-2013 04:37
 Recorded on 25-FEB-2013 04:14



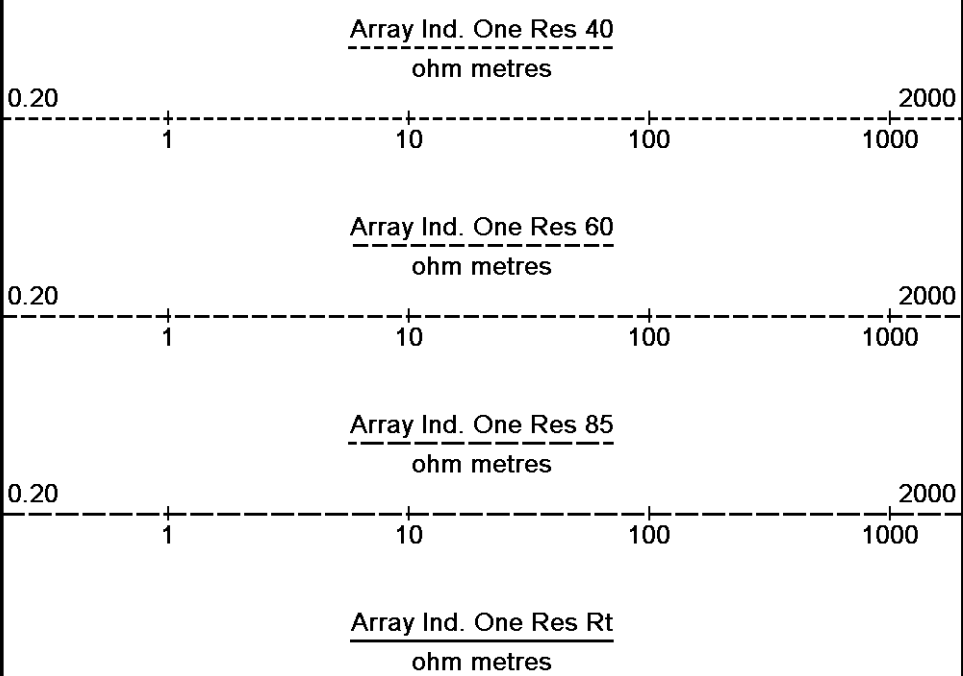
Depth Based Data - Maximum Sampling Increment 10.0cm
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 Plotted on 25-FEB-2013 04:37
 Recorded on 25-FEB-2013 04:14



Depth
In
Feet

Borehole
Temp in
deg F

Replay



Scale
1:240

0.20

1

10

100

1000

2000

5478

5500

Casing
Shoe

124°

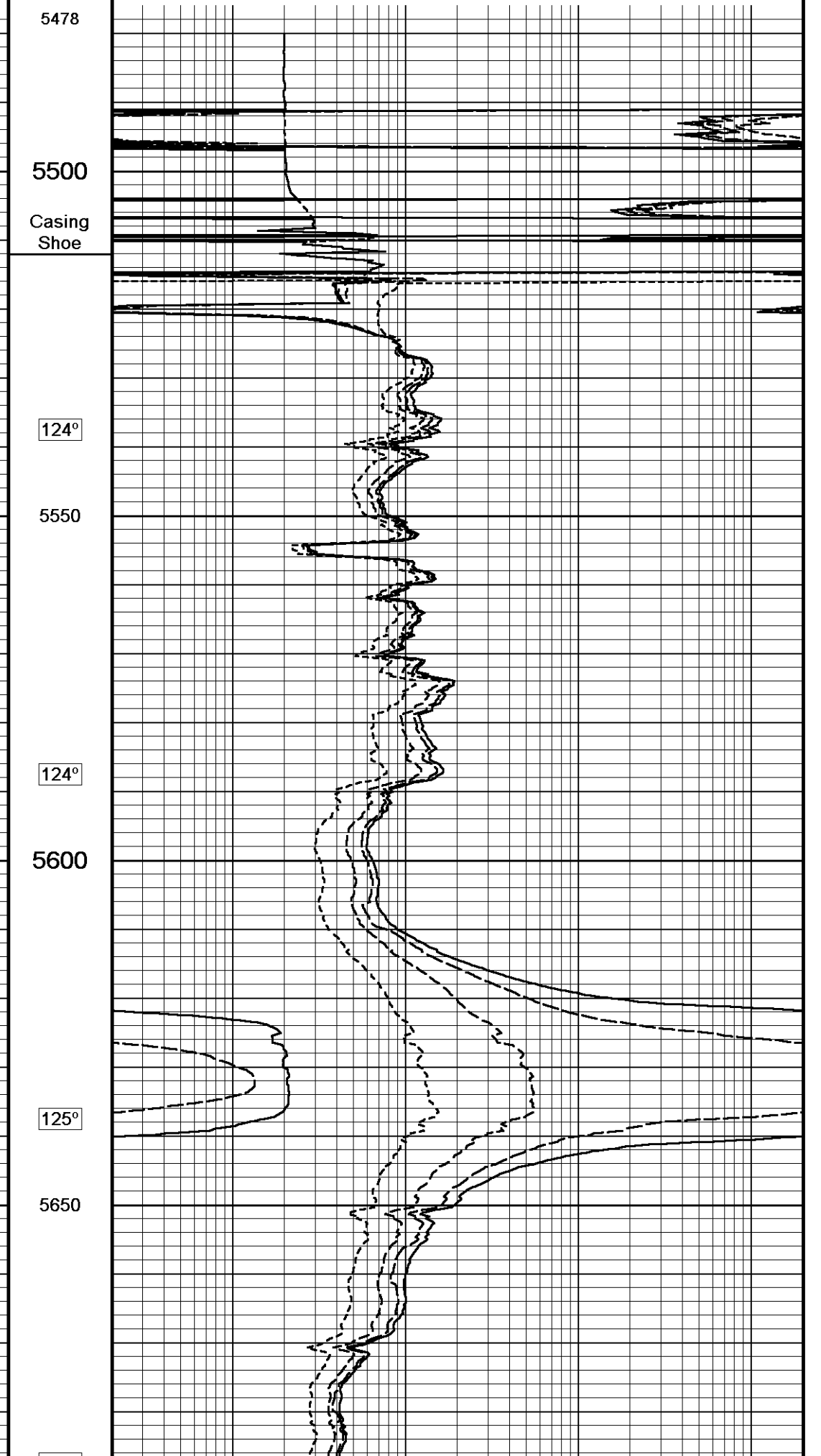
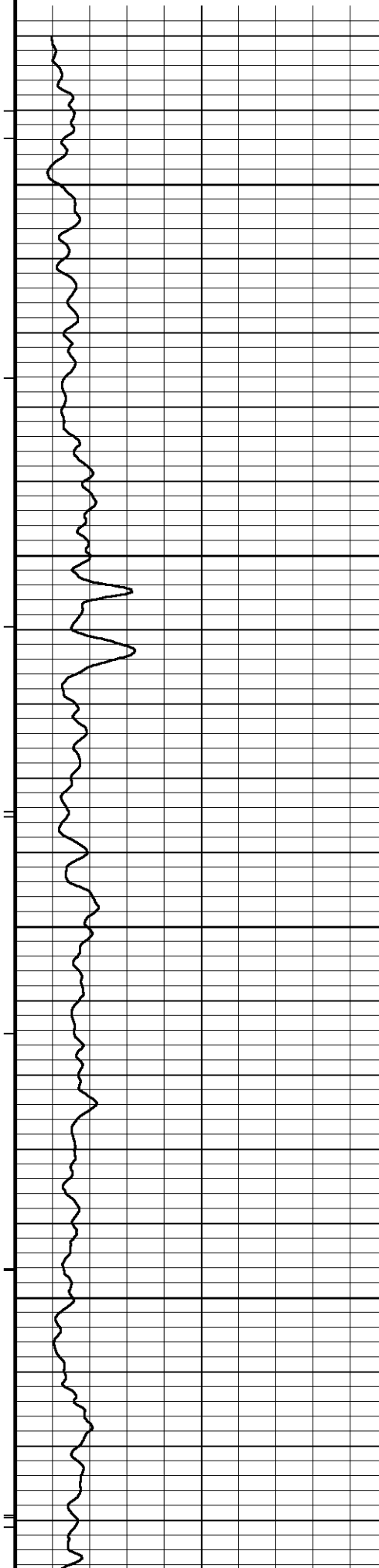
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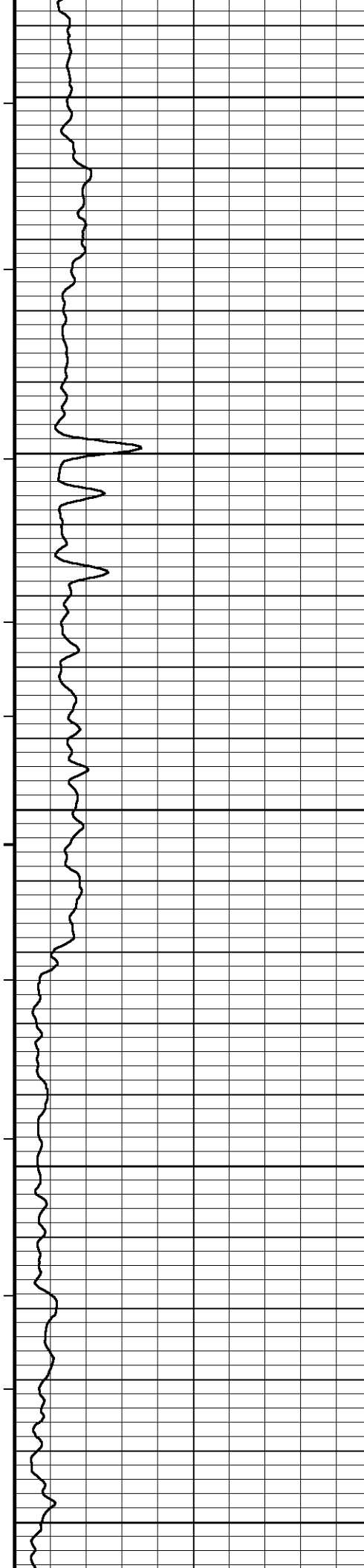
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5600

125°

5650





125°

5700

125°

5750

125°

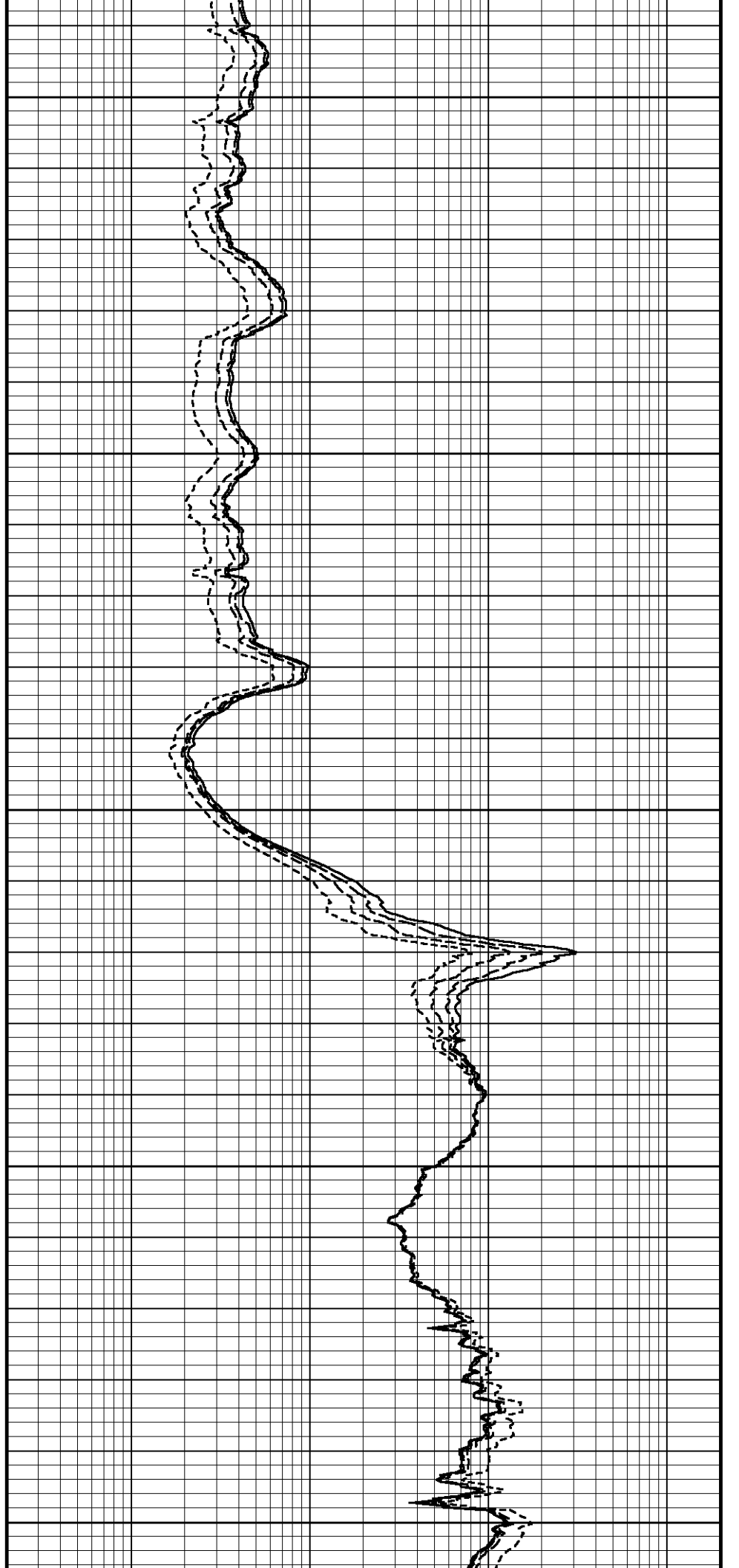
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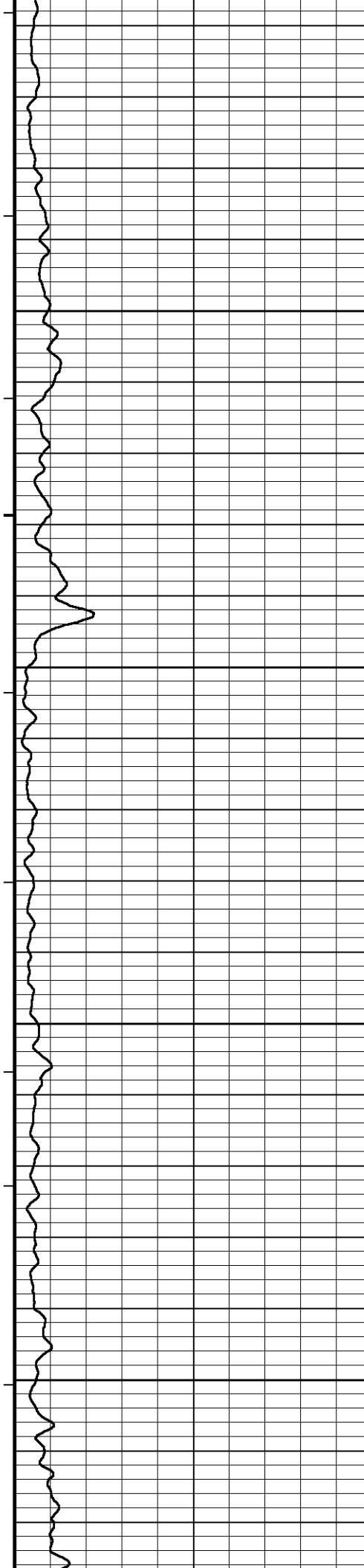
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5850

126°

5900





126°

5950

126°

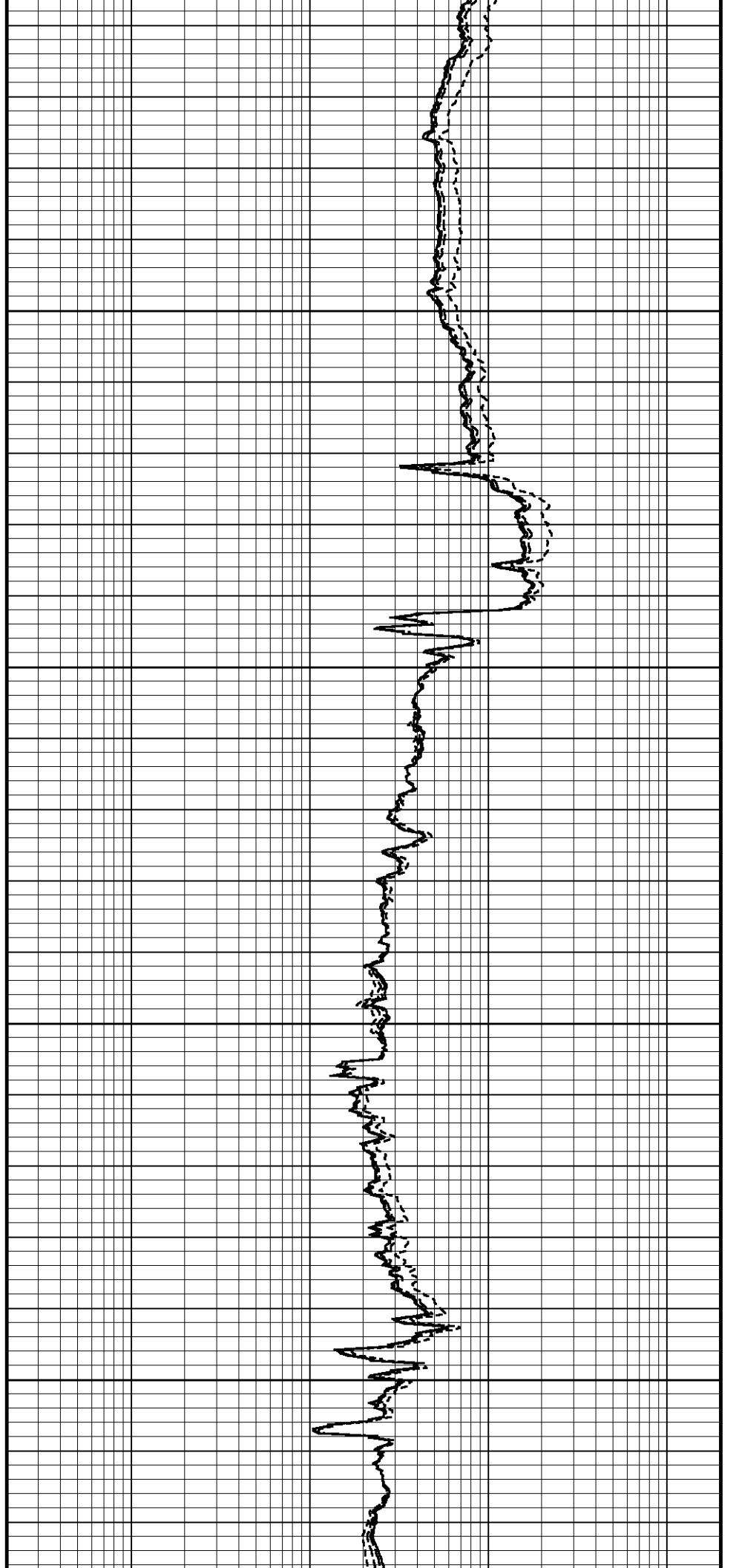
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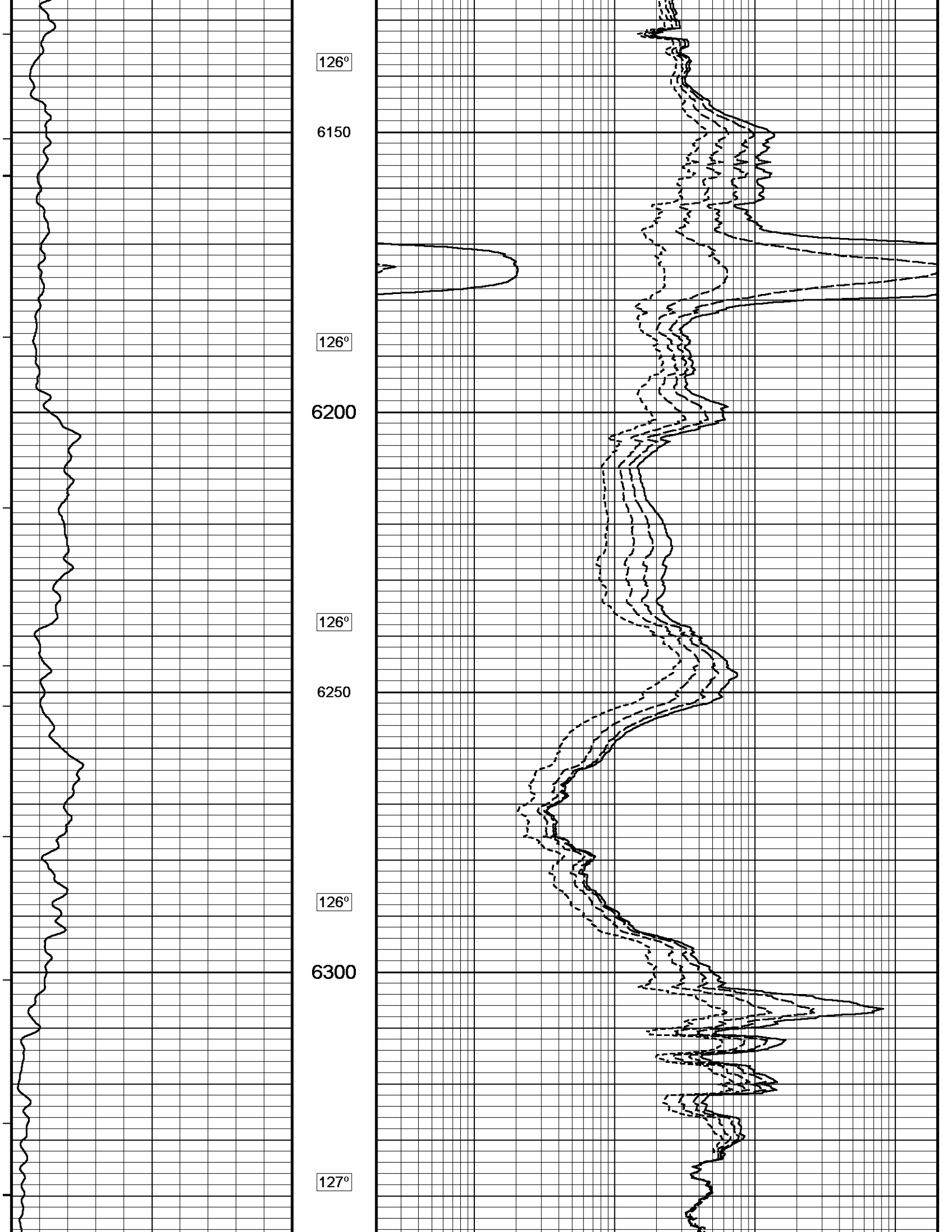
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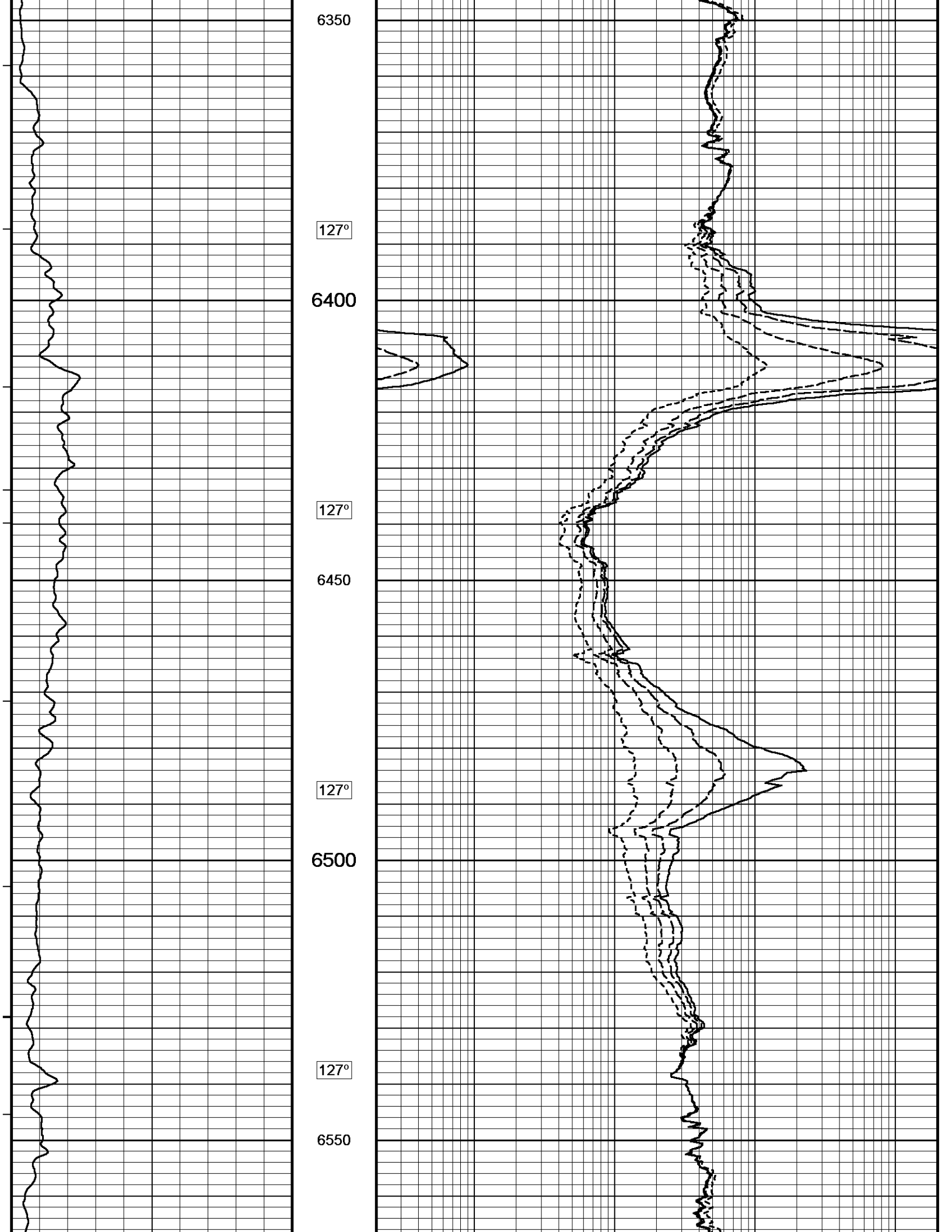
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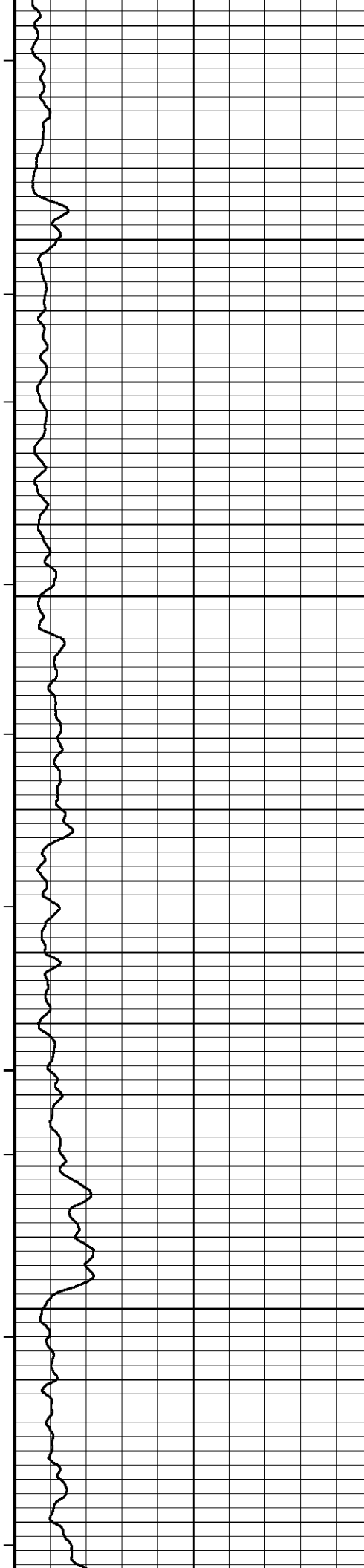
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6100









127°

6600

127°

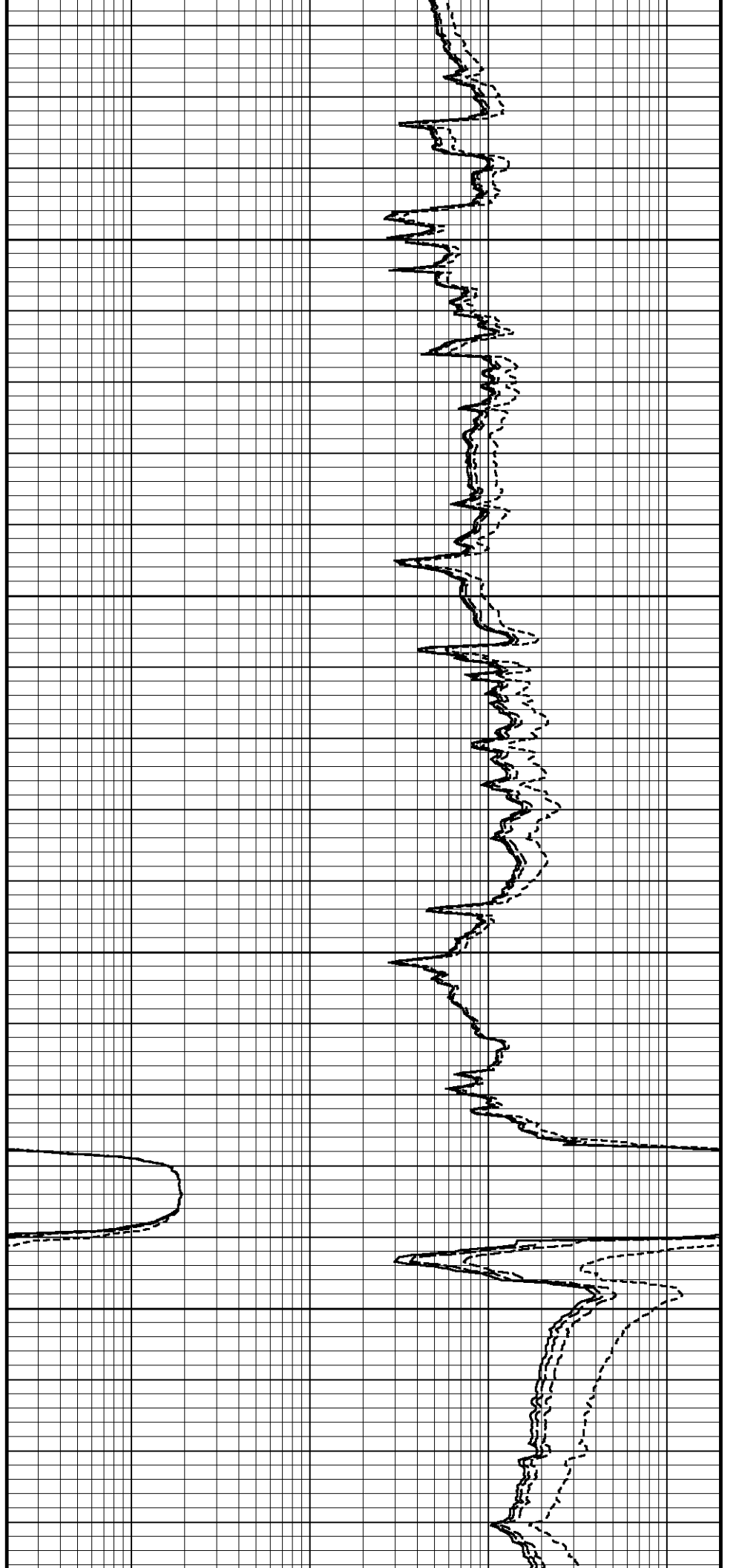
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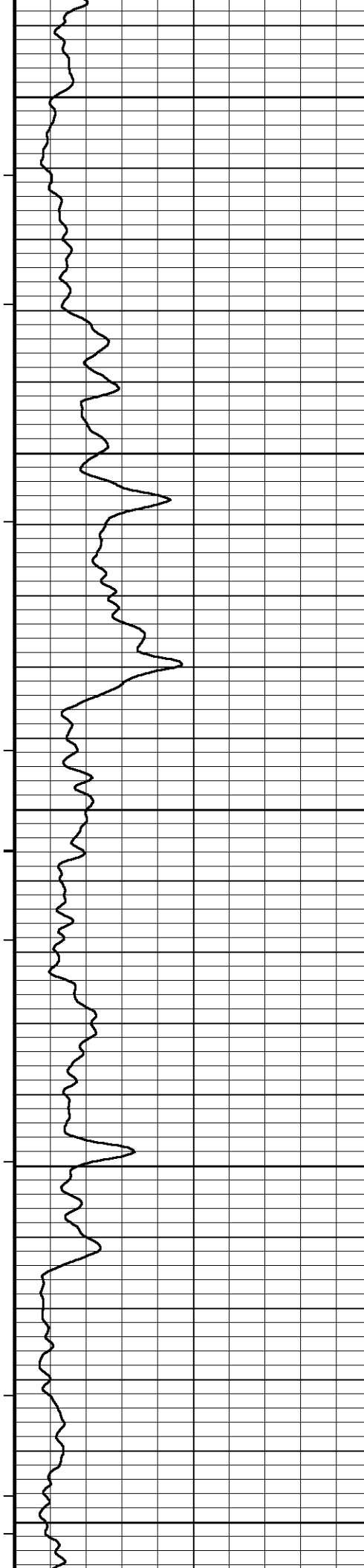
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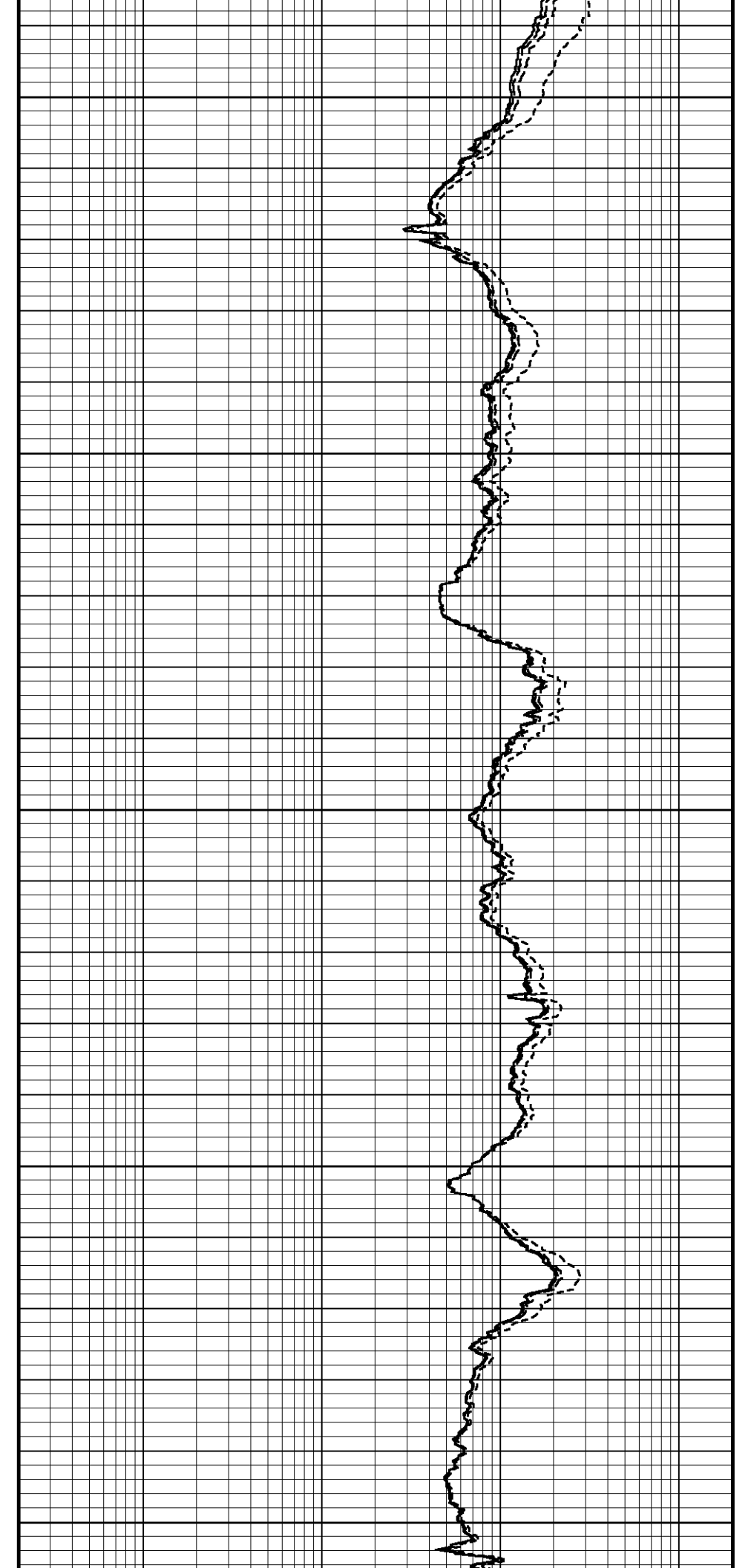
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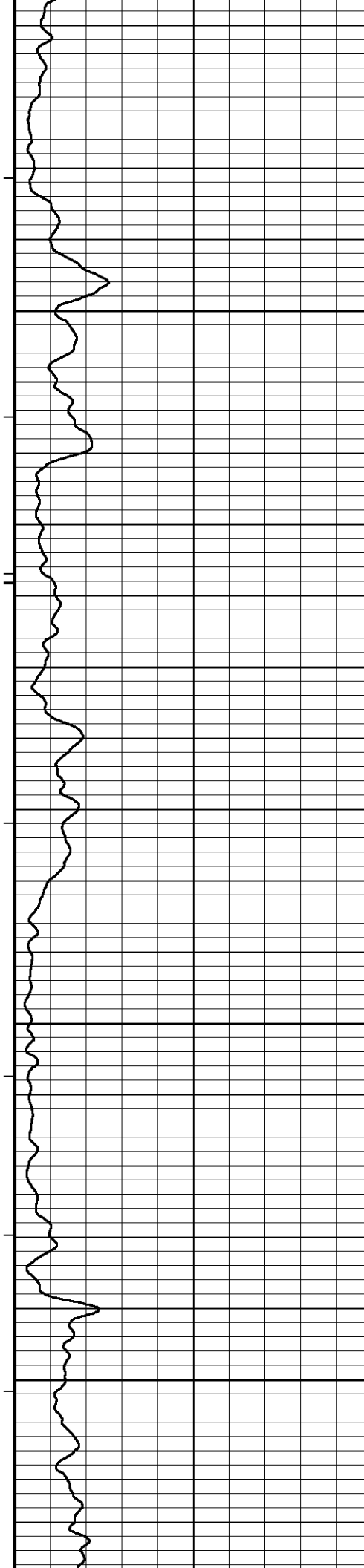
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127°
6800
128°
6850
128°
6900
128°
6950
128°
7000





128°

7050

128°

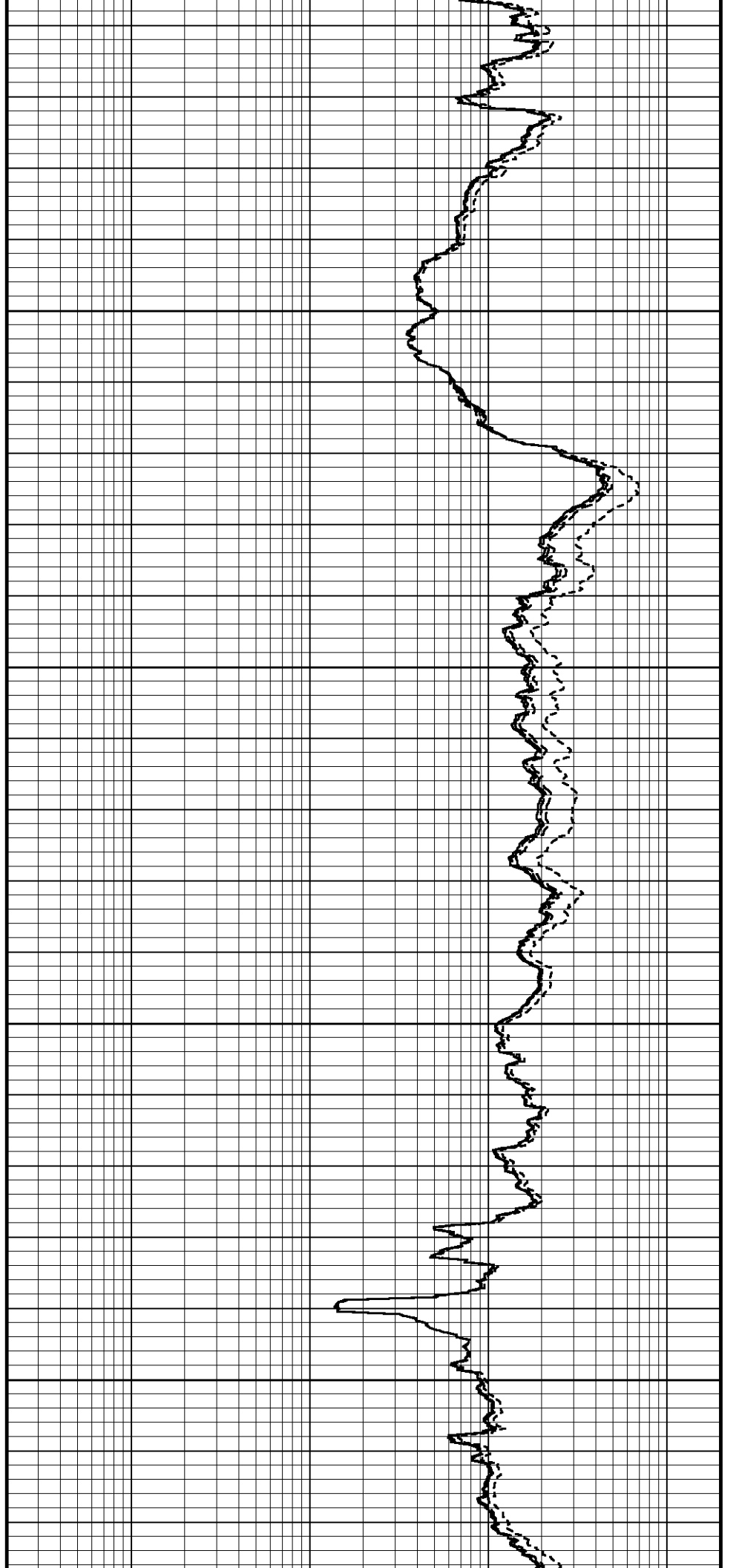
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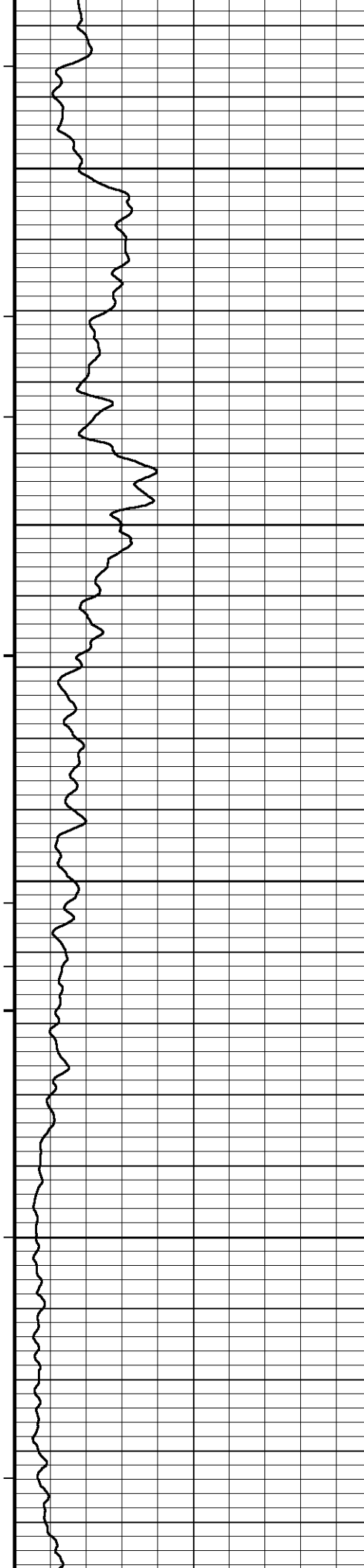
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7150

128°

7200





128°

7250

128°

7300

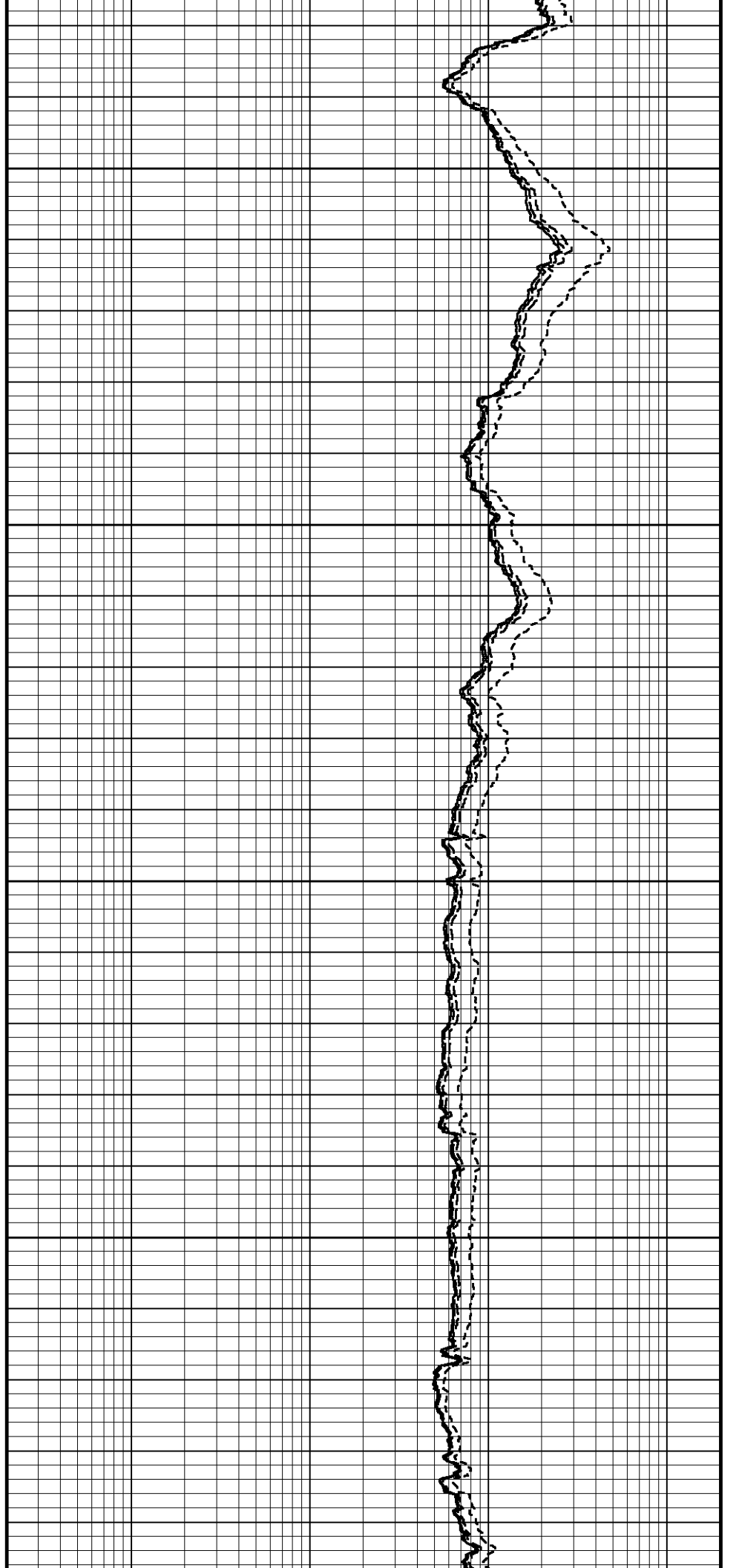
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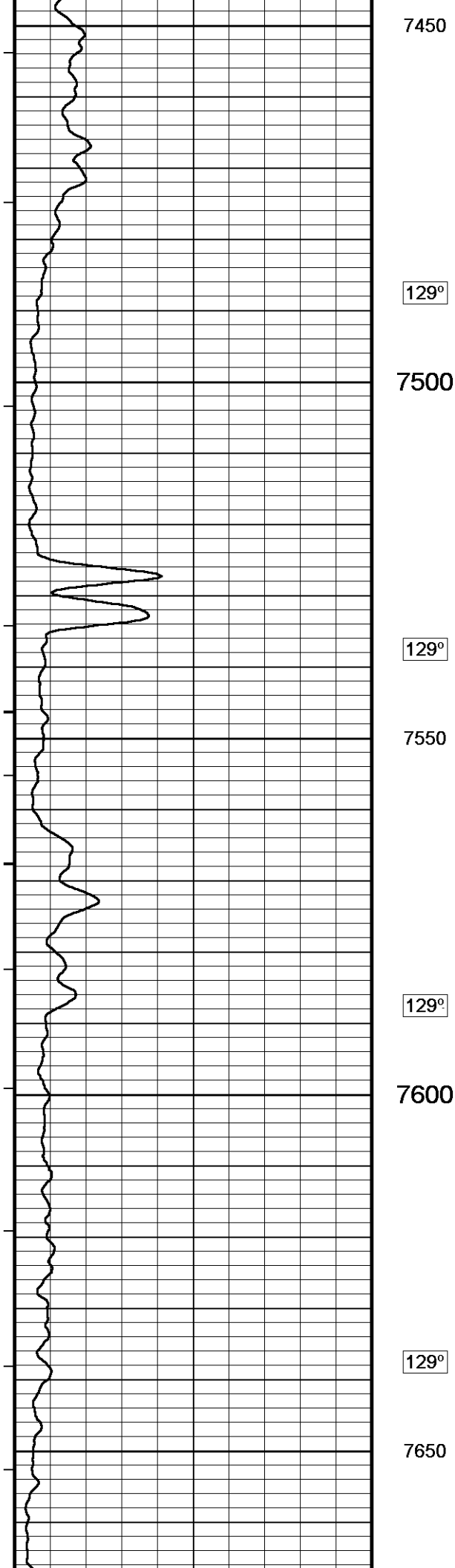
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7400

129°





7450

129°

7500

129°

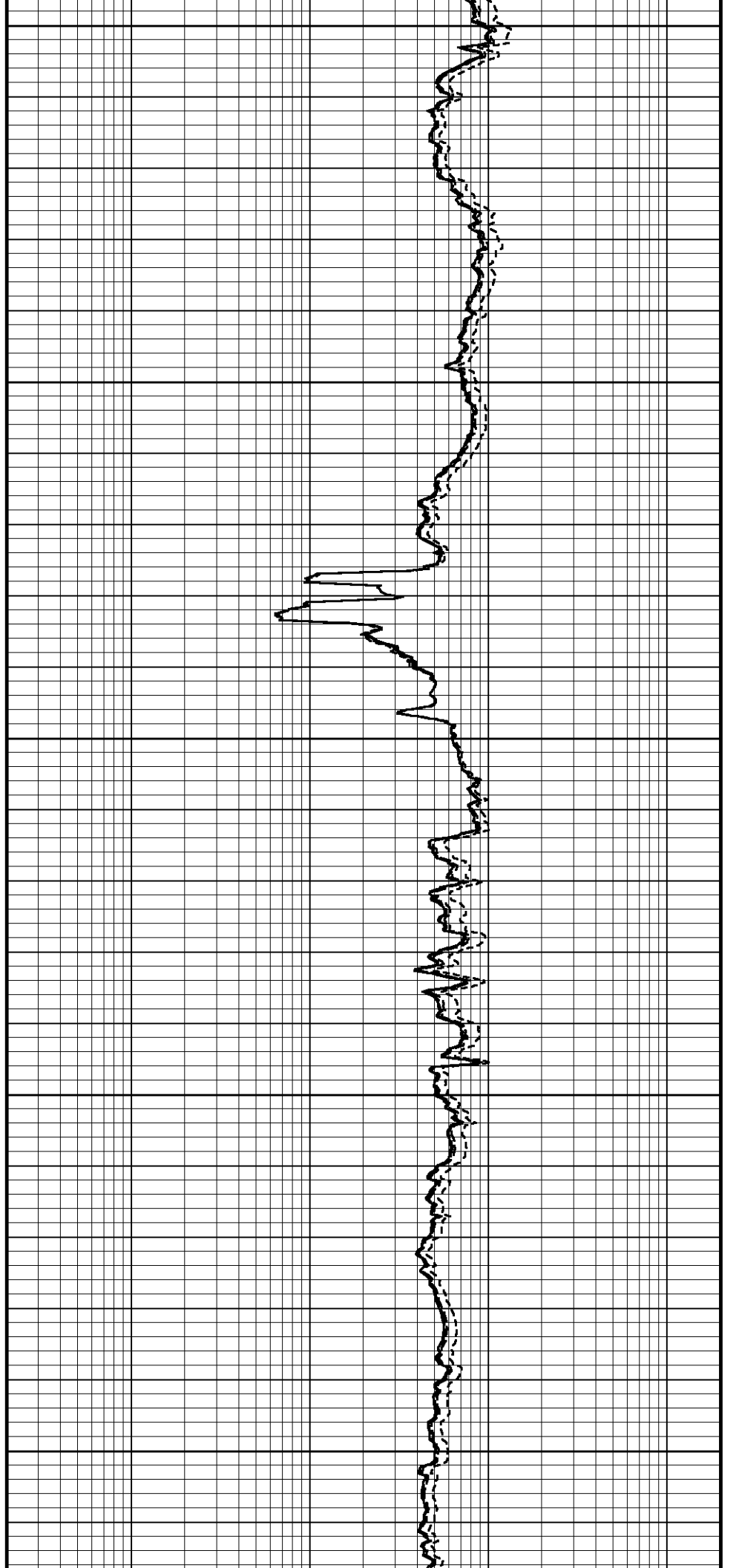
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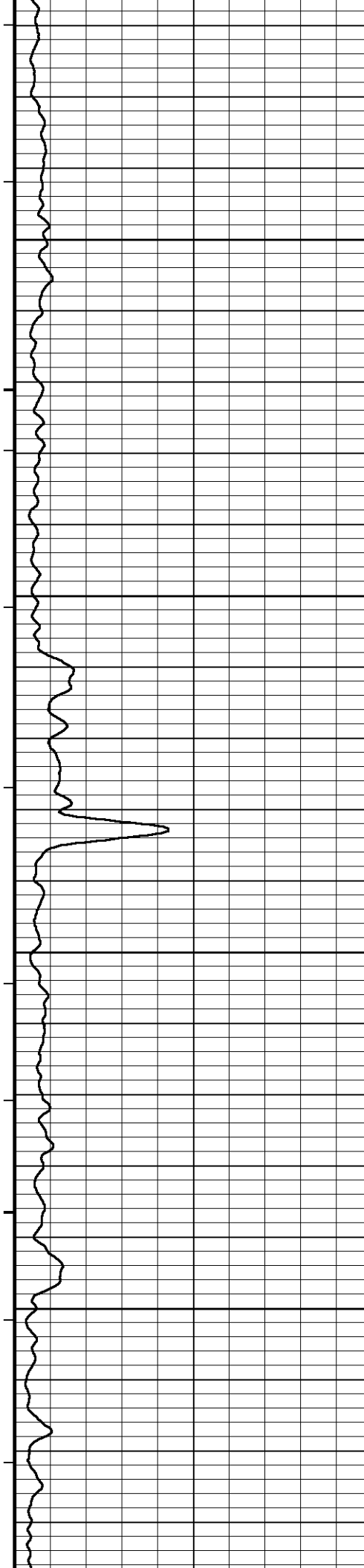
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129°

7700

129°

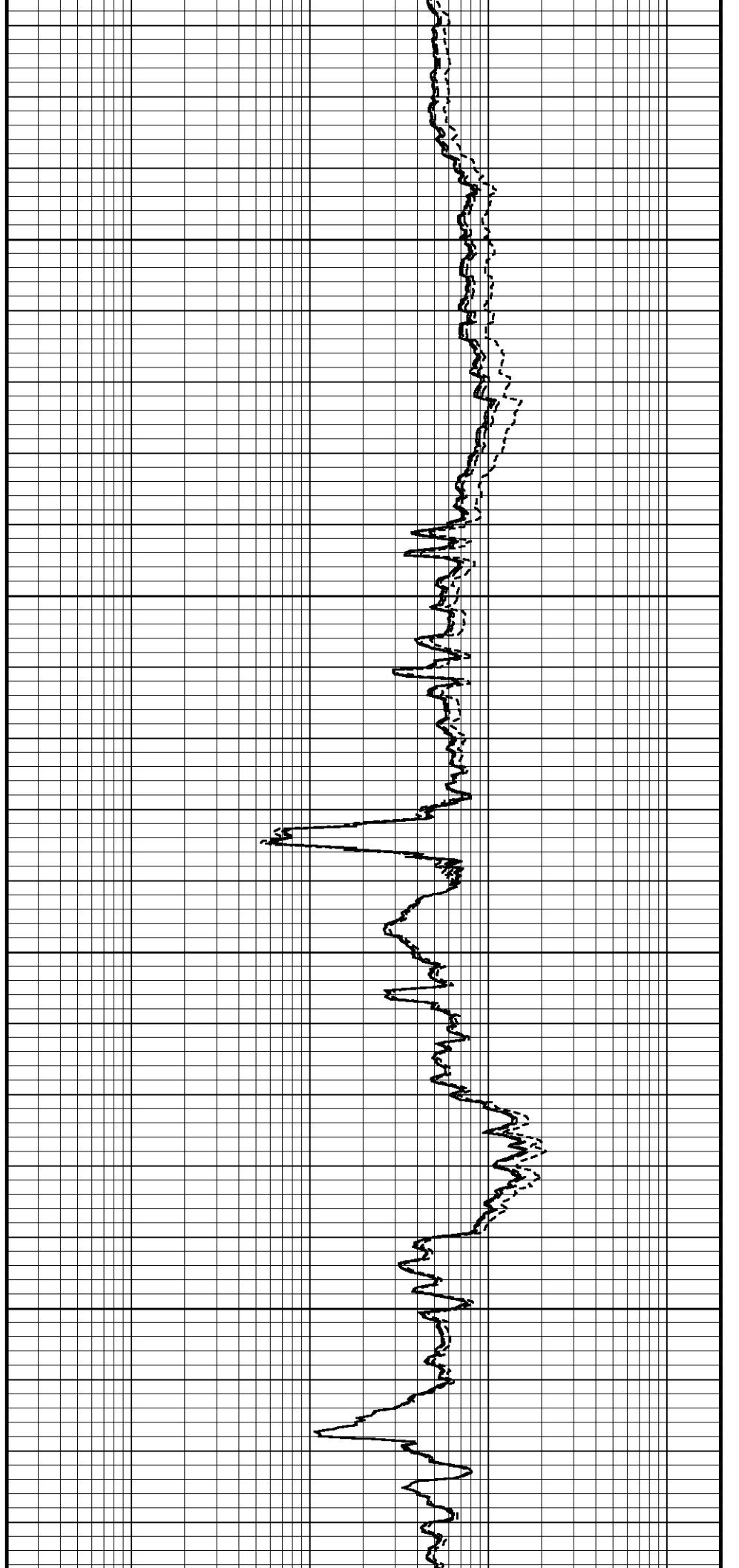
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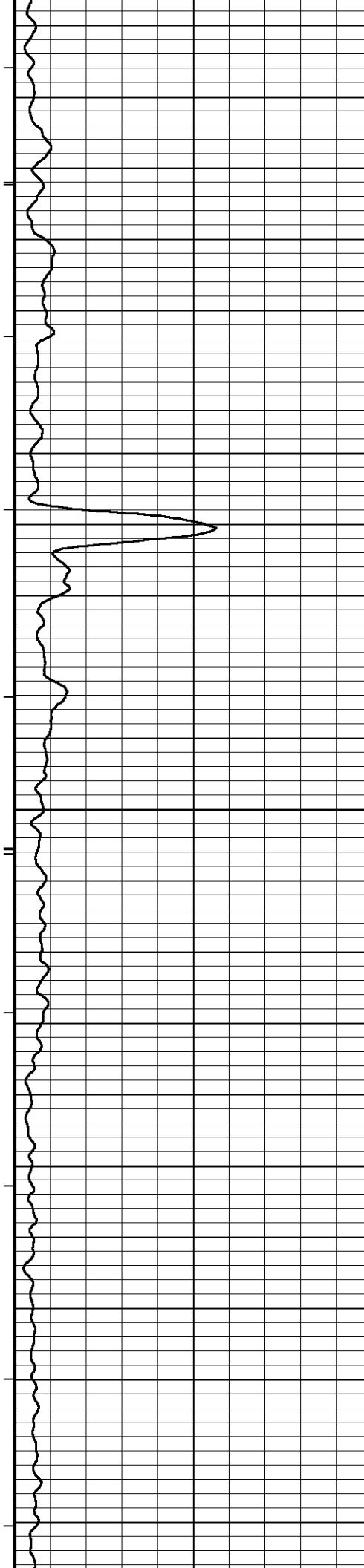
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7800

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7850





129°

7900

129°

7950

129°

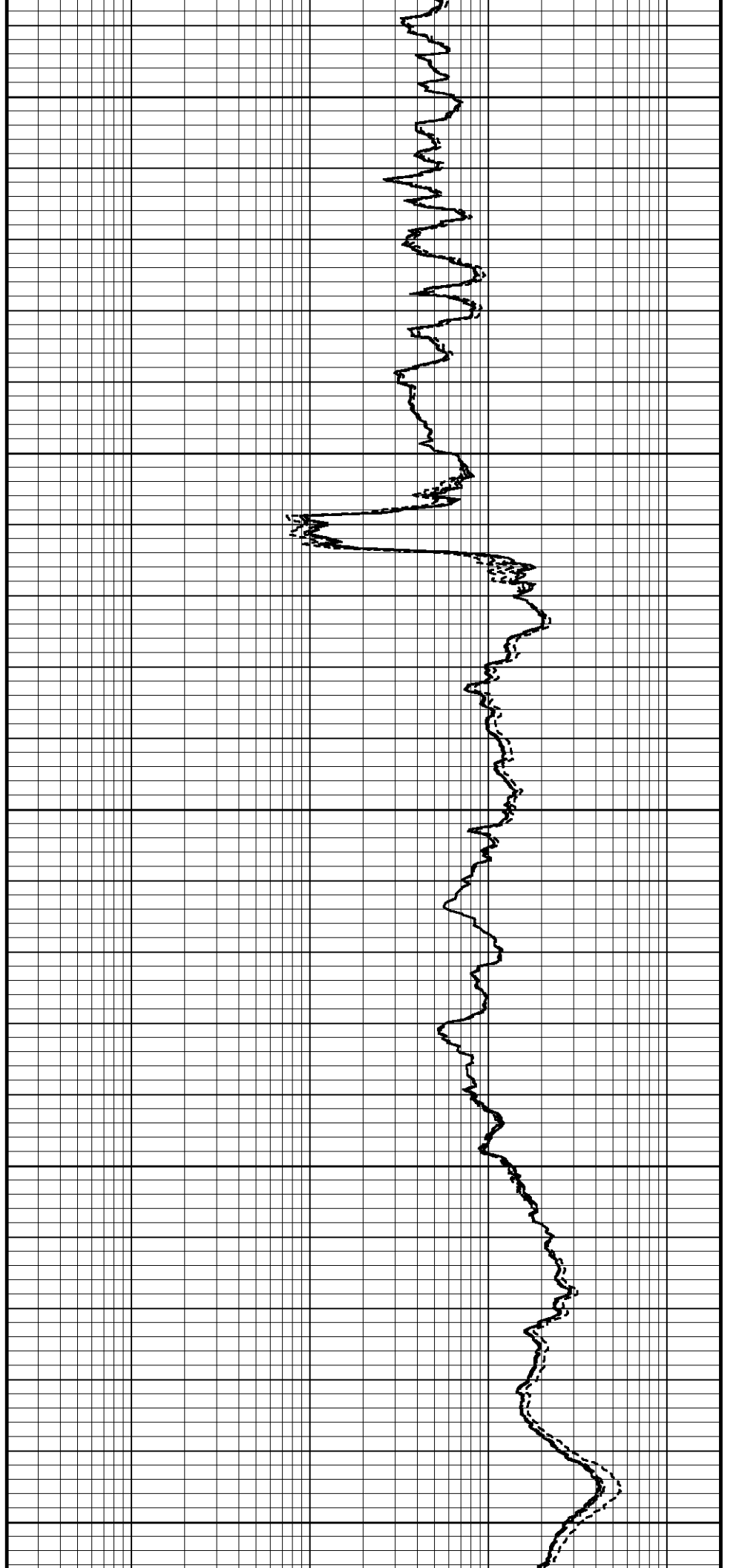
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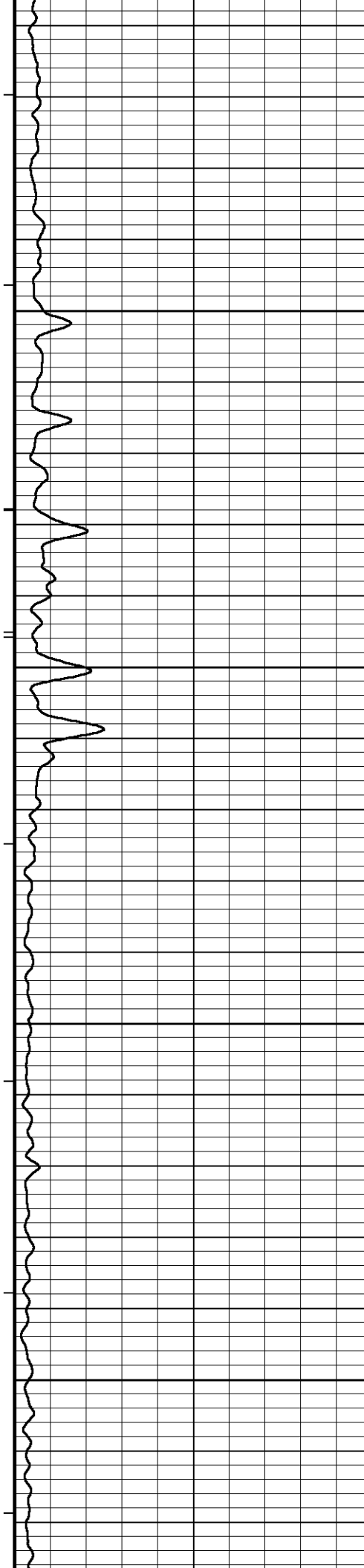
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129°

8100





129°

8150

129°

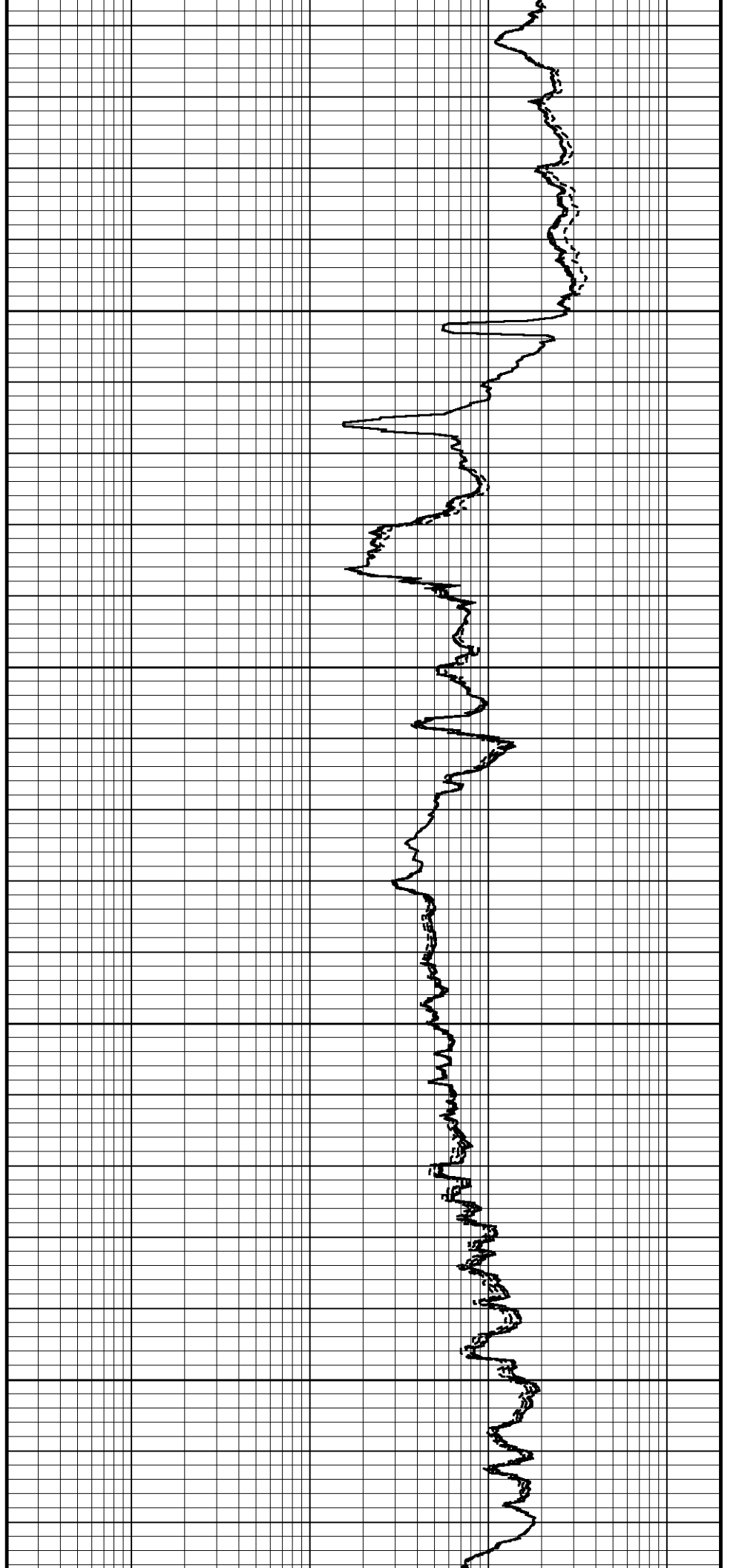
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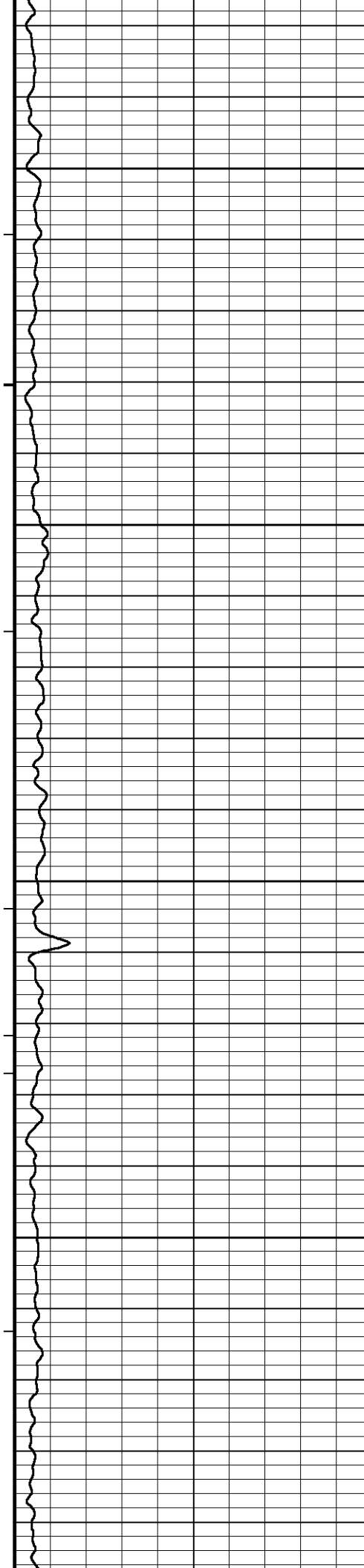
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8250

129°

8300





129°

8350

130°

8400

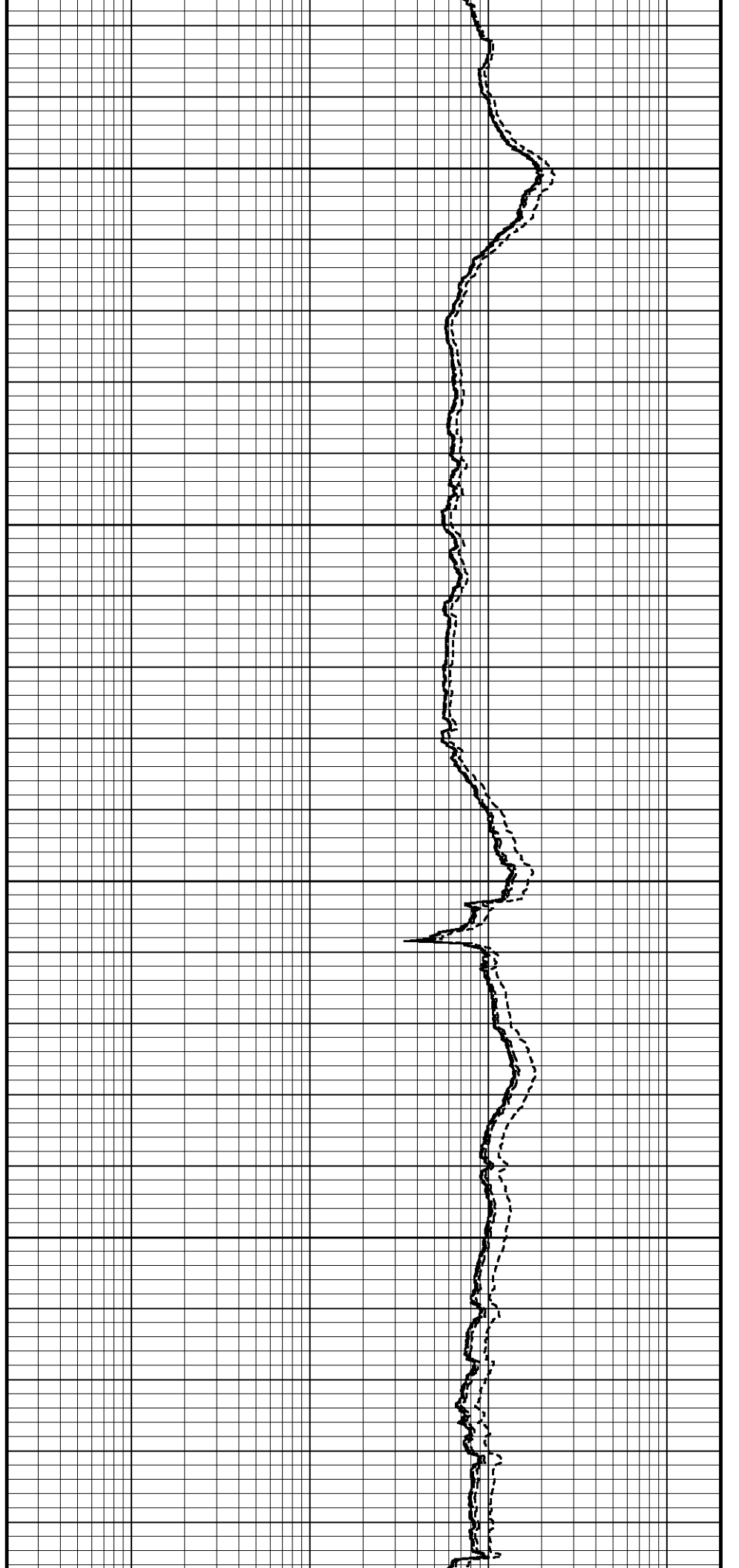
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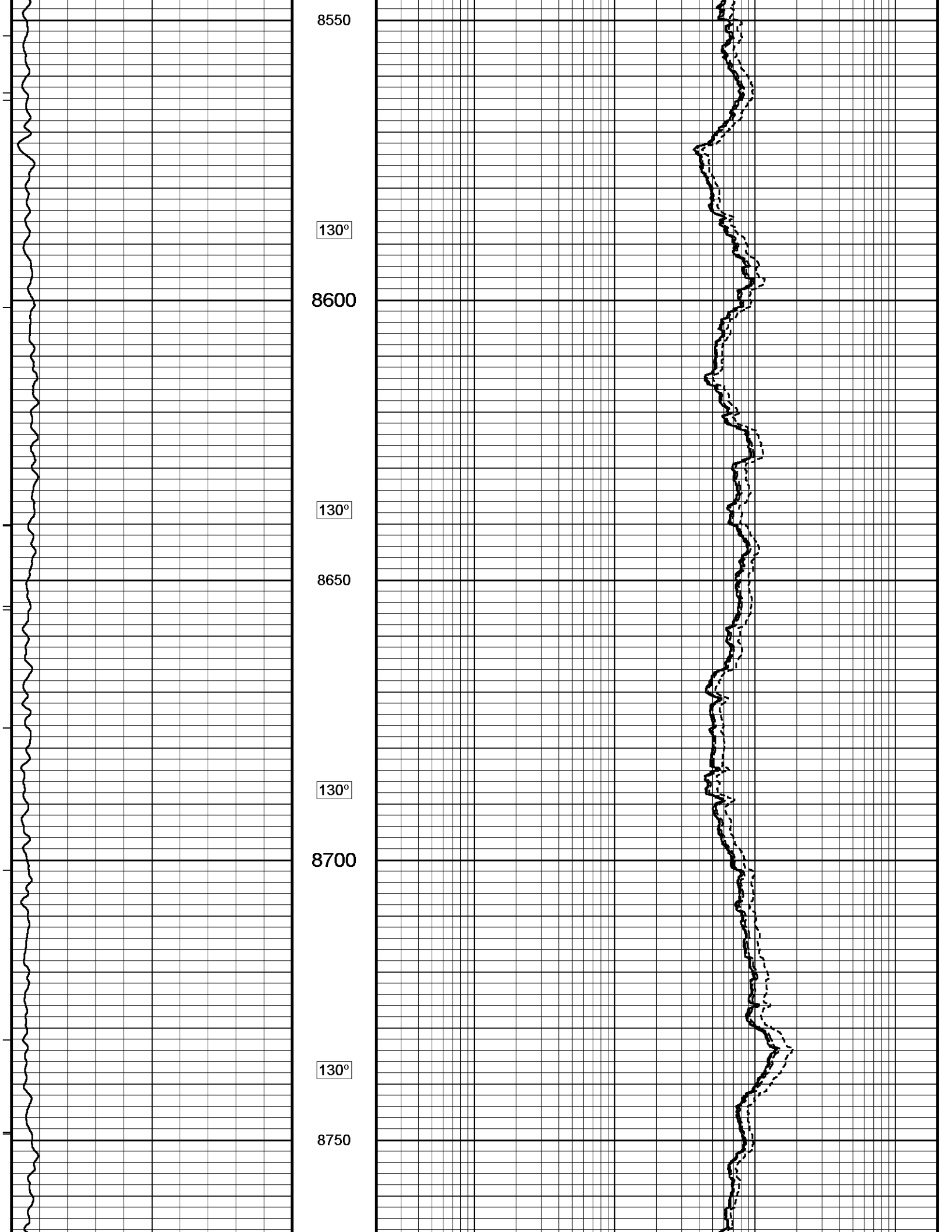
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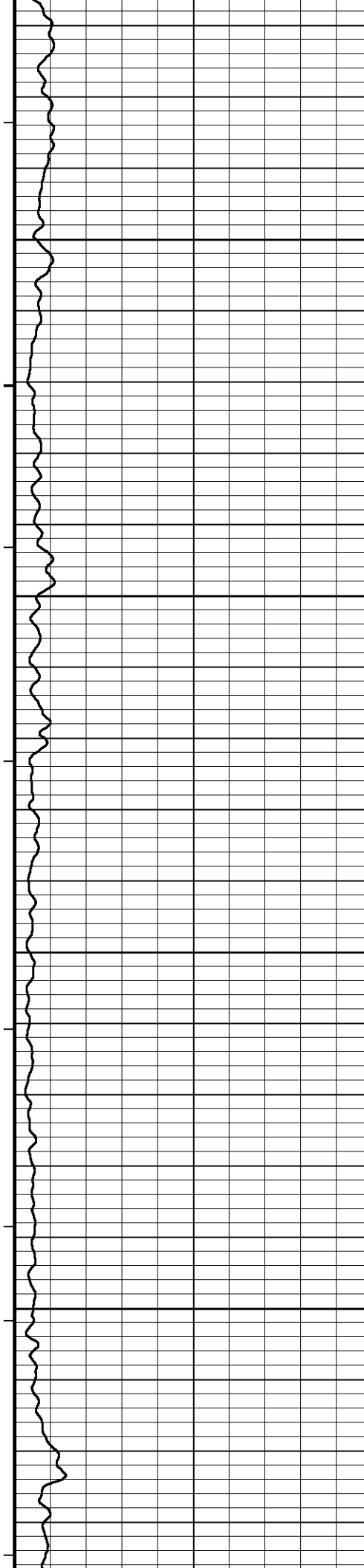
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130°







130°

8800

130°

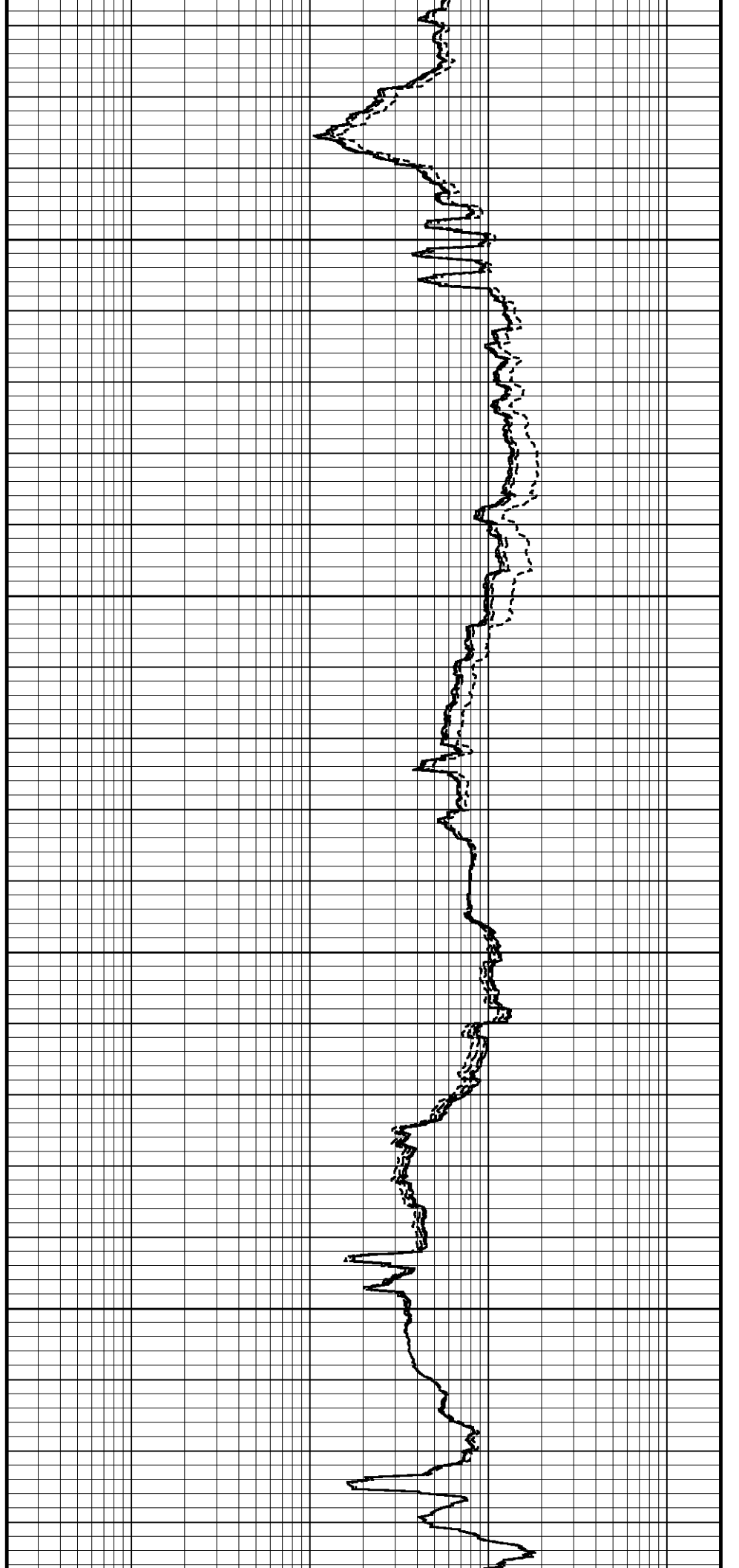
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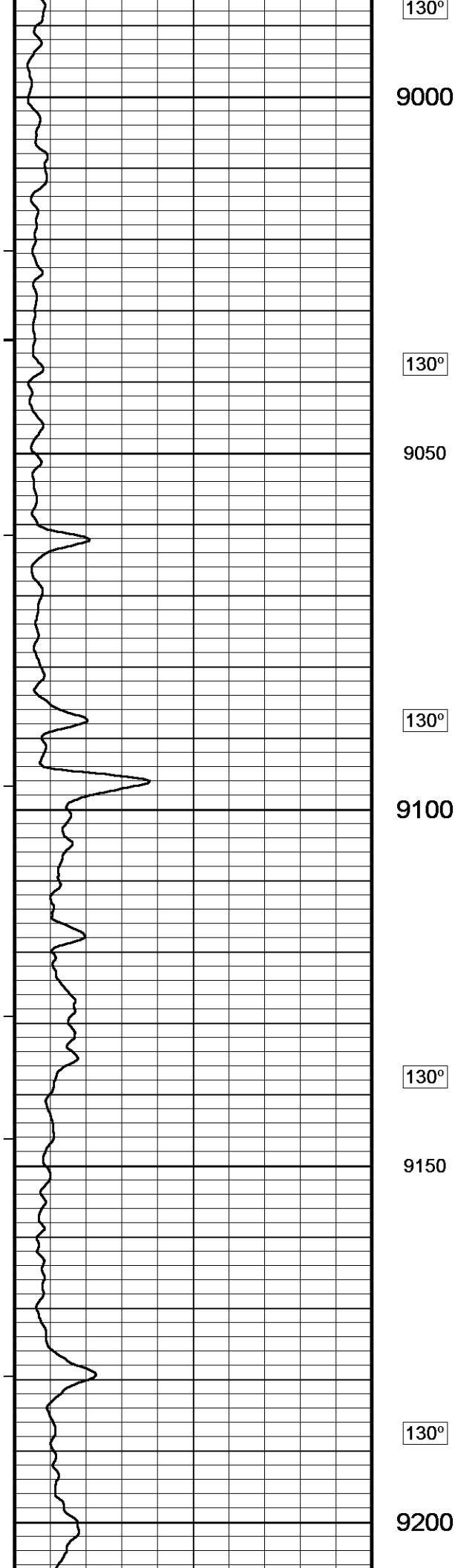
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8950





130°

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130°

9050

130°

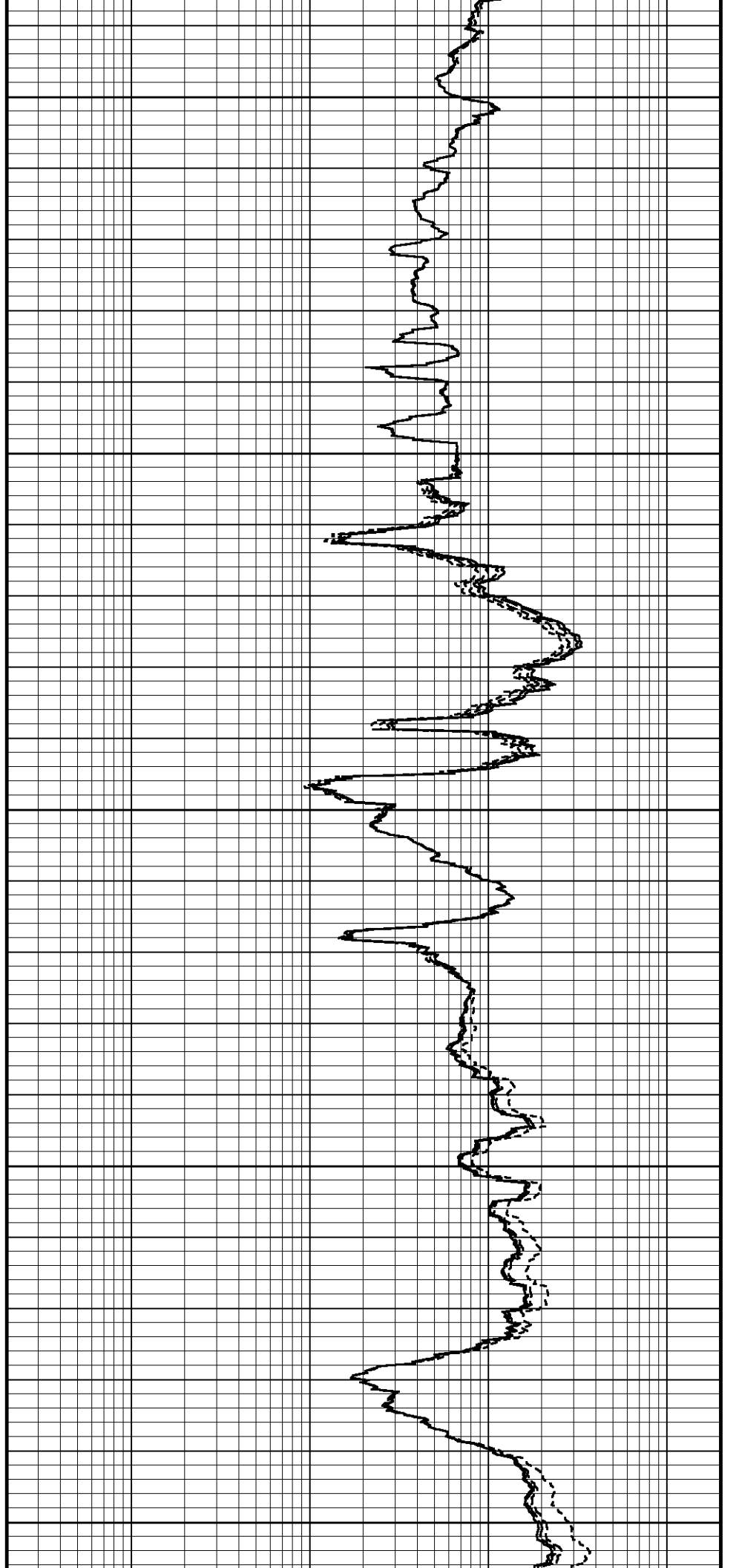
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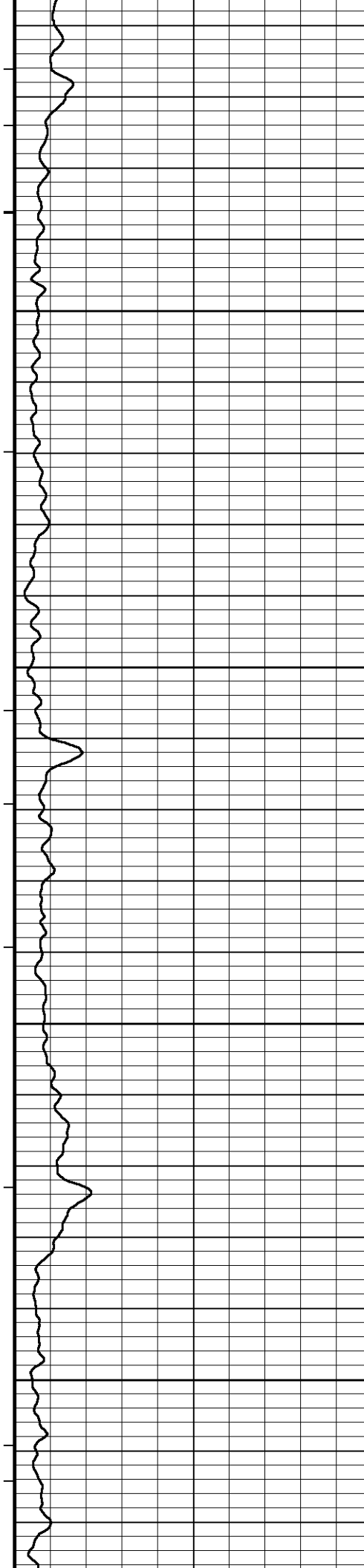
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9150

130°

9200





130°

9250

130°

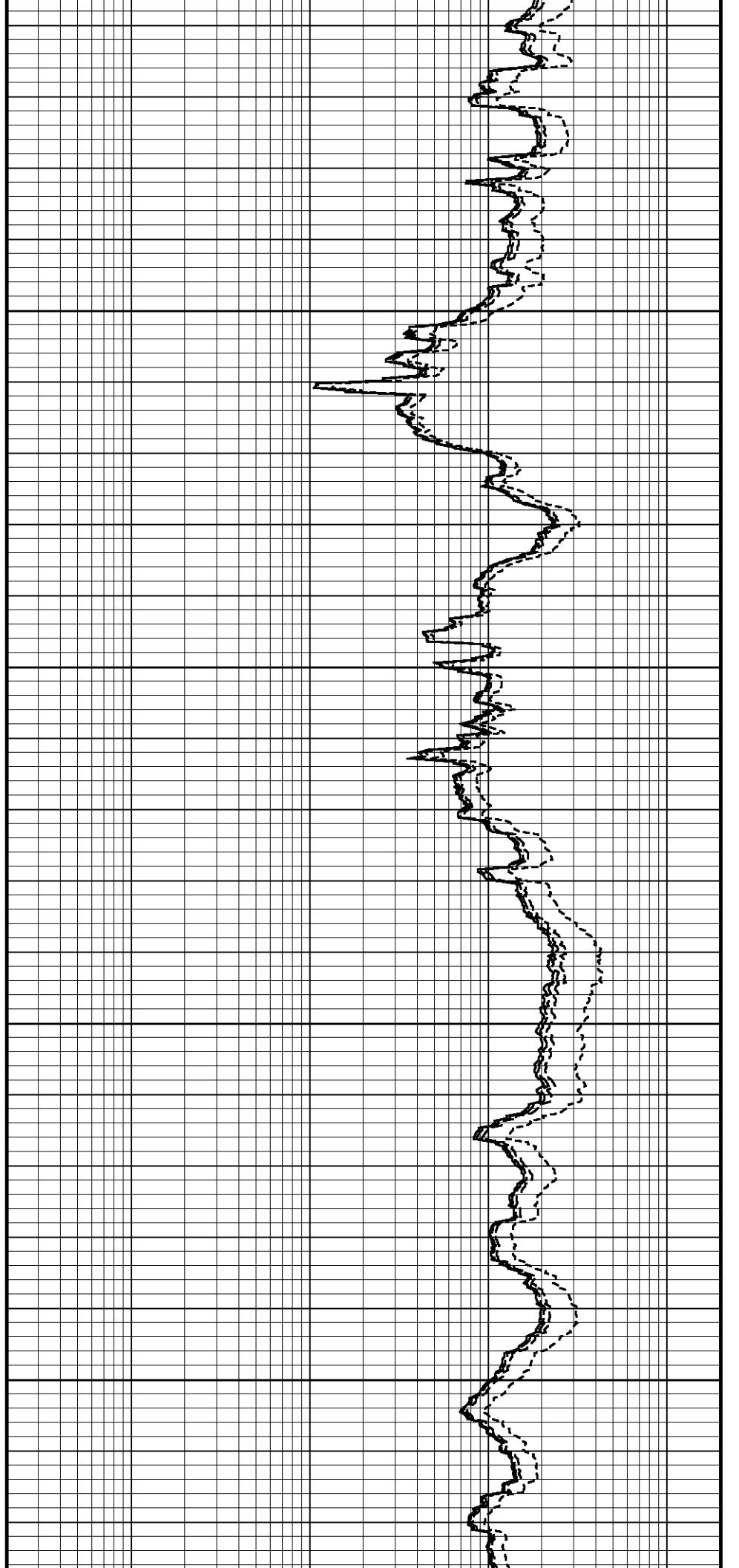
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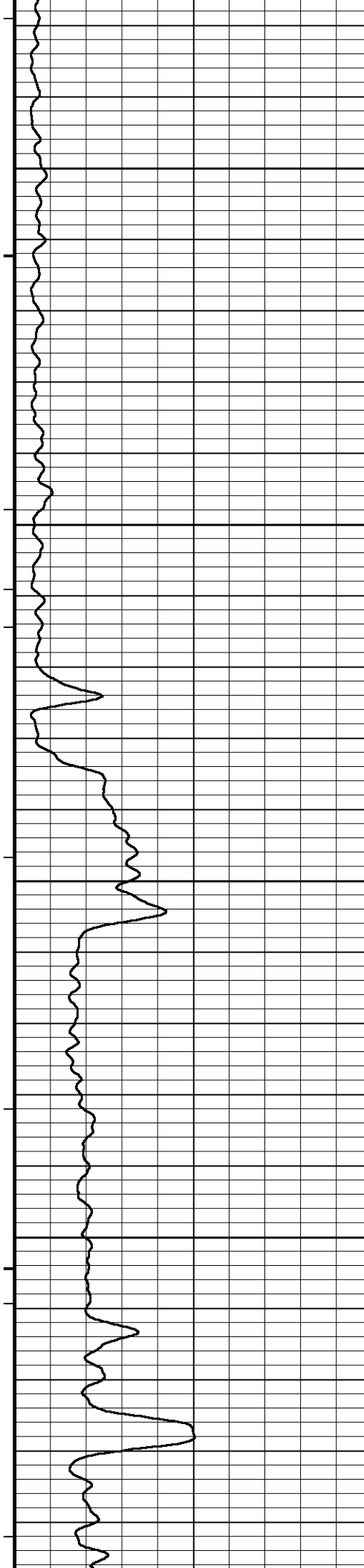
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131°

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9450

131°

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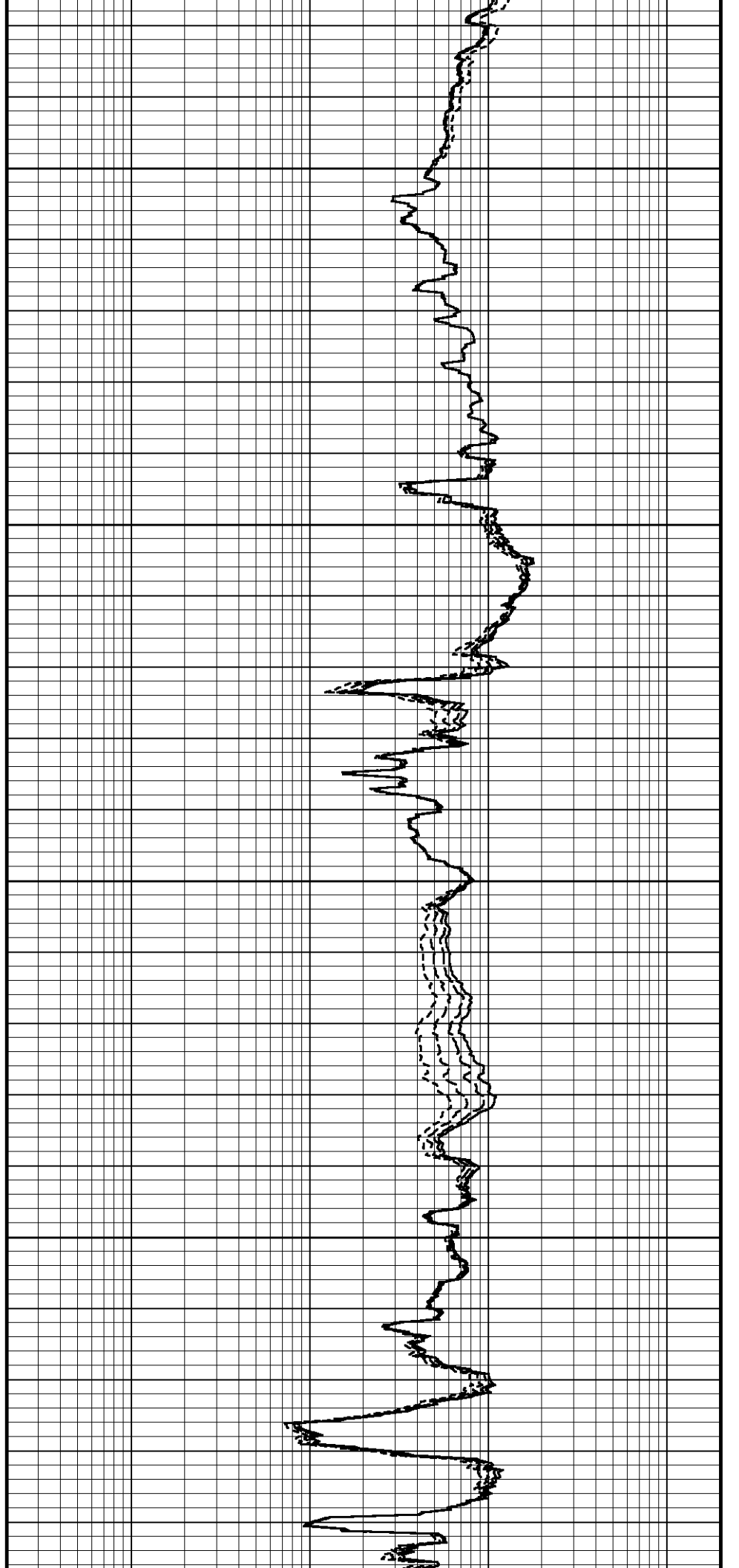
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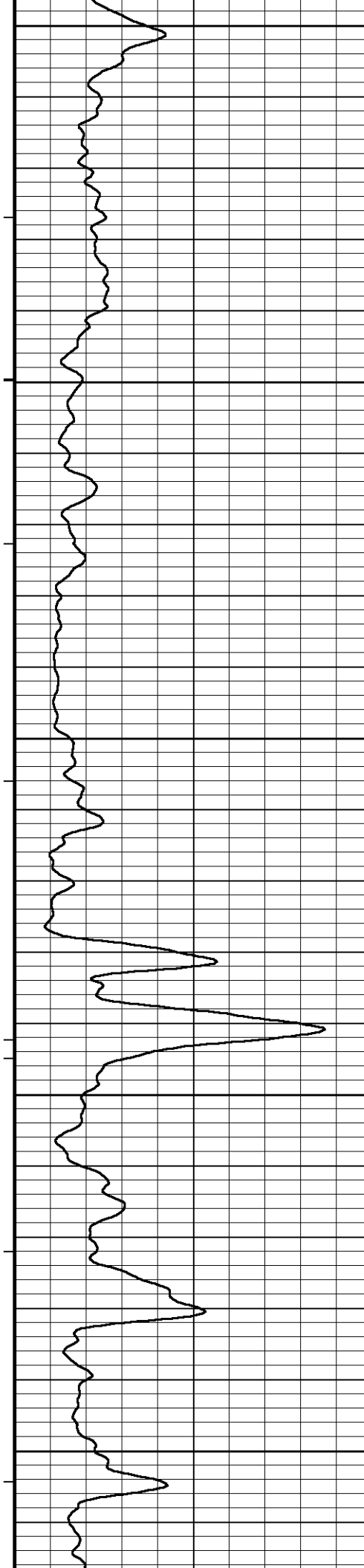
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131°





9650

131°

9700

131°

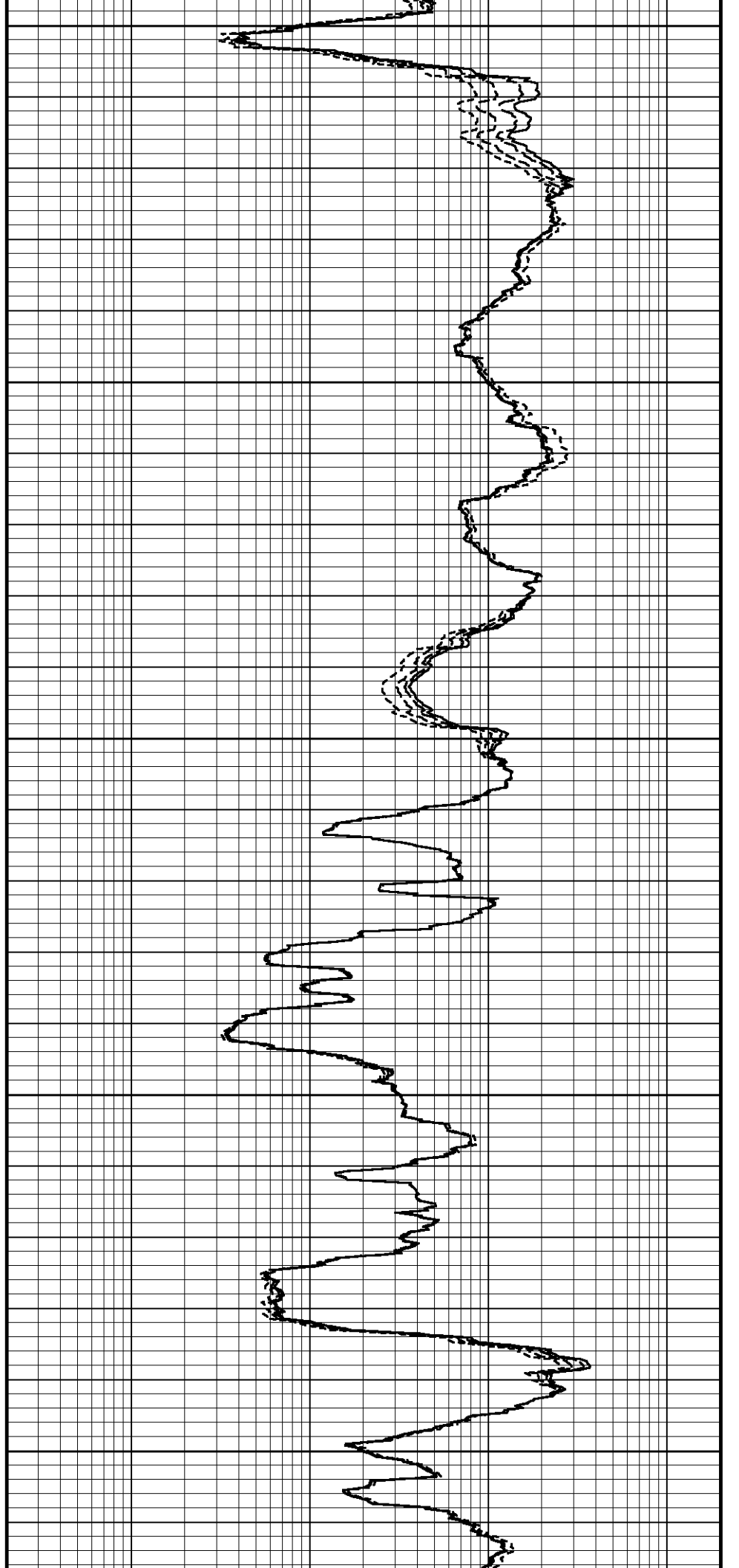
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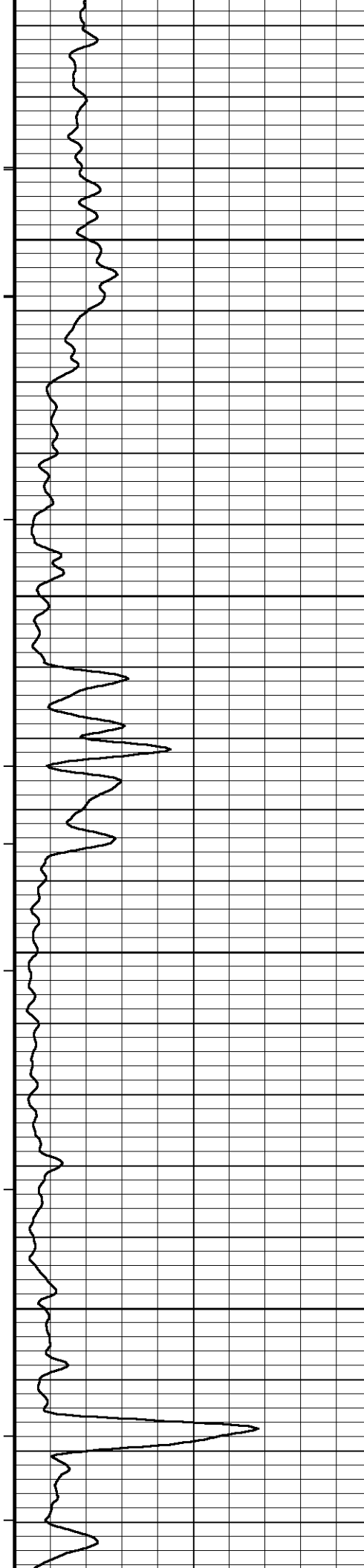
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131°

9850





131°

9900

131°

9950

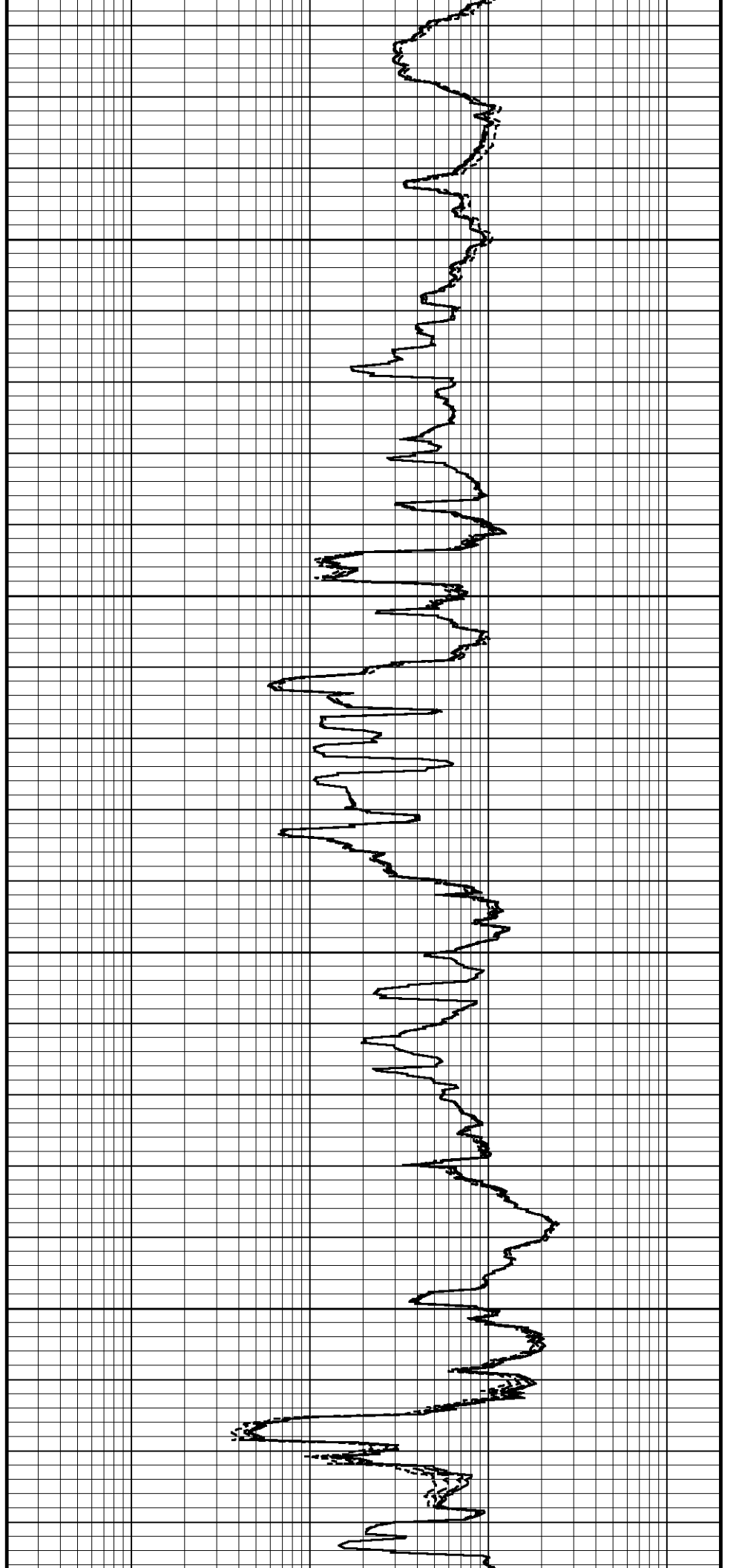
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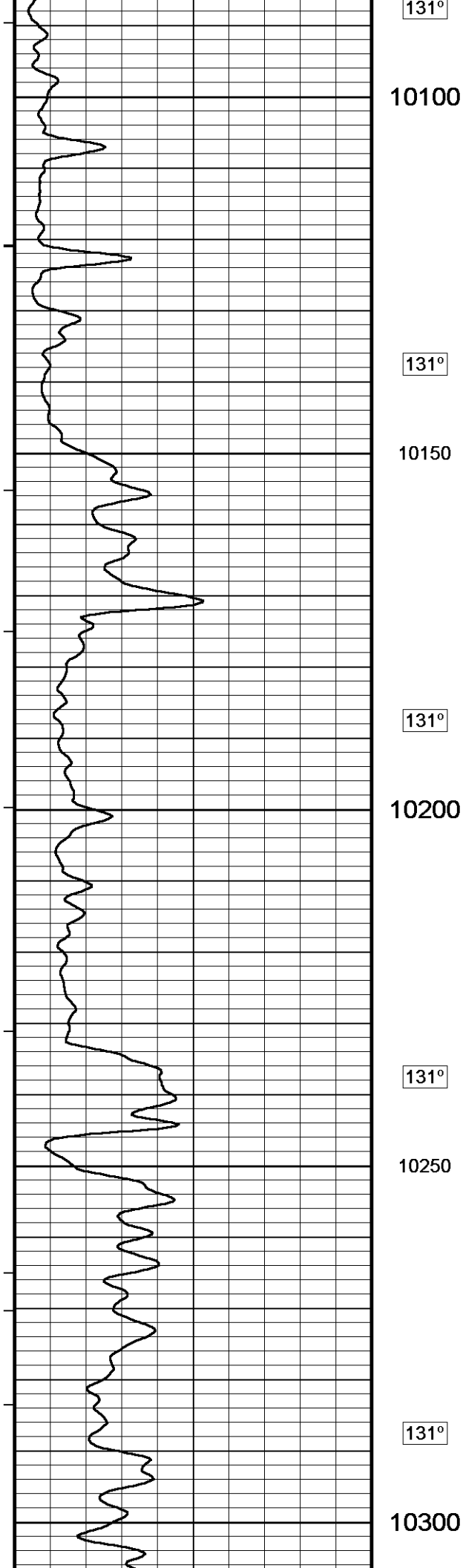
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131°

10050

131°





131°

10100

131°

10150

131°

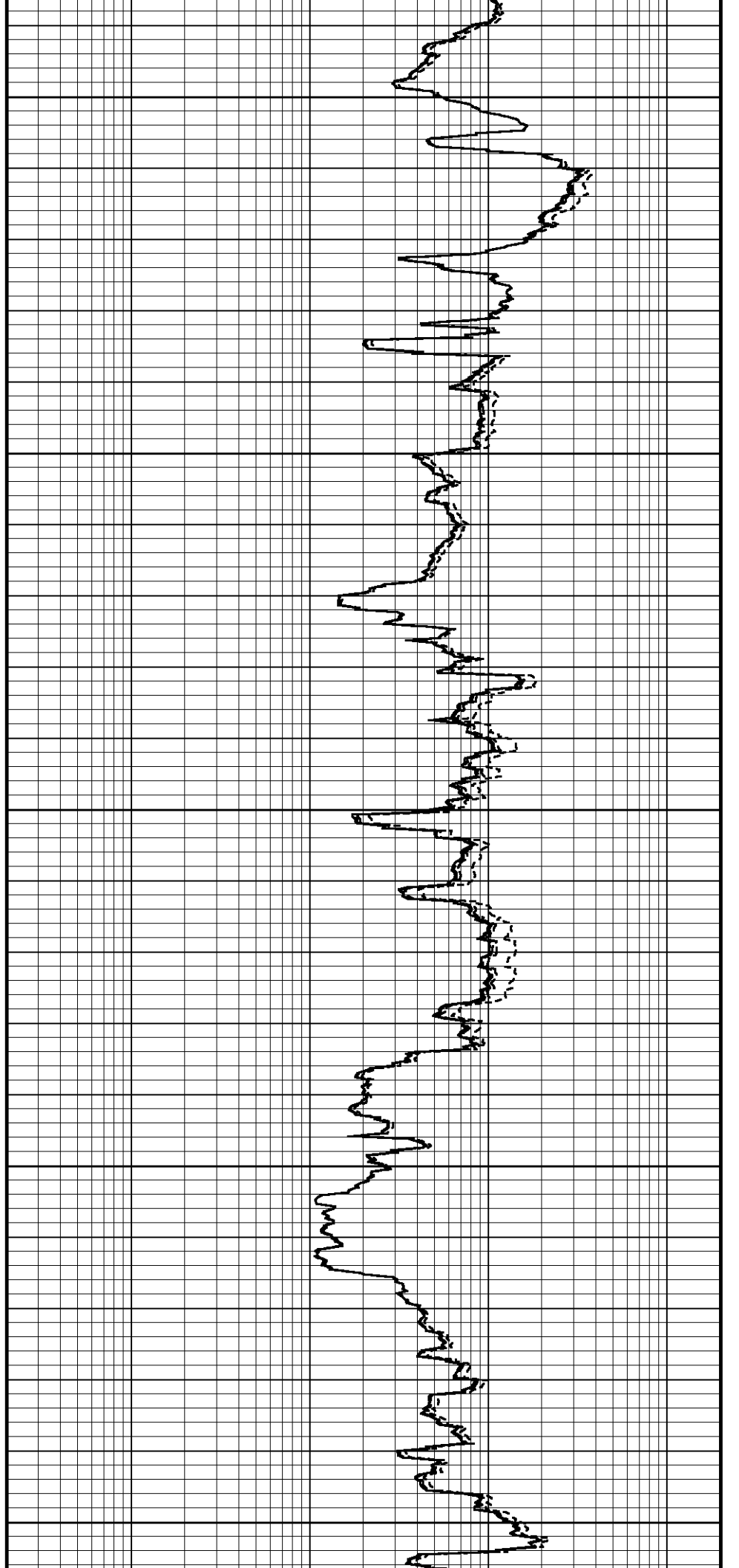
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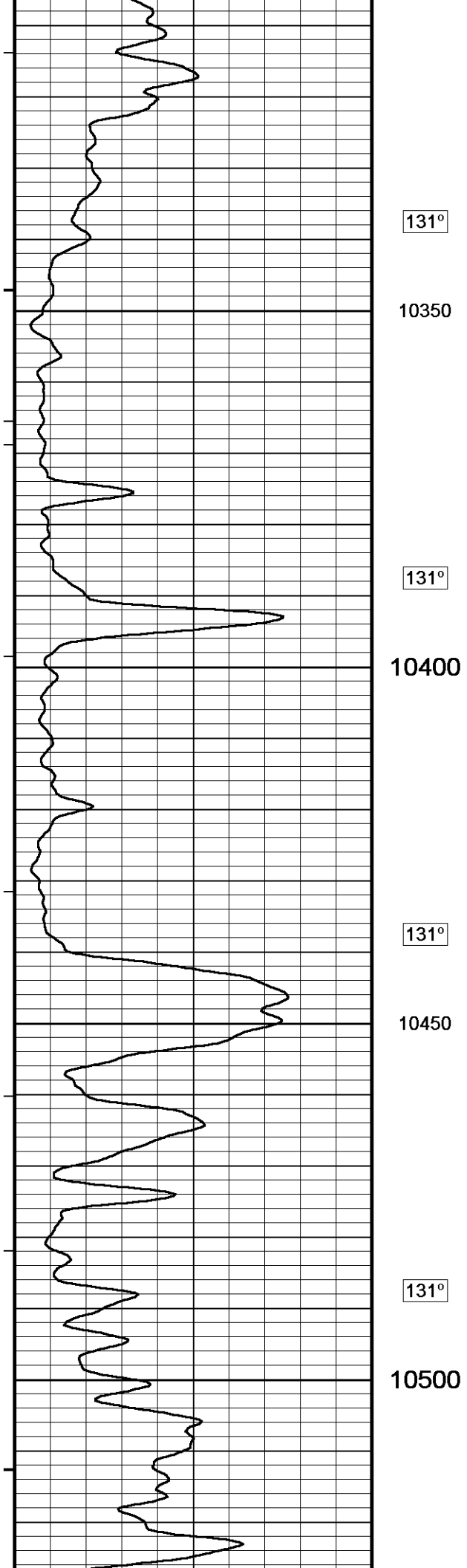
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10250

131°

10300





131°

10350

131°

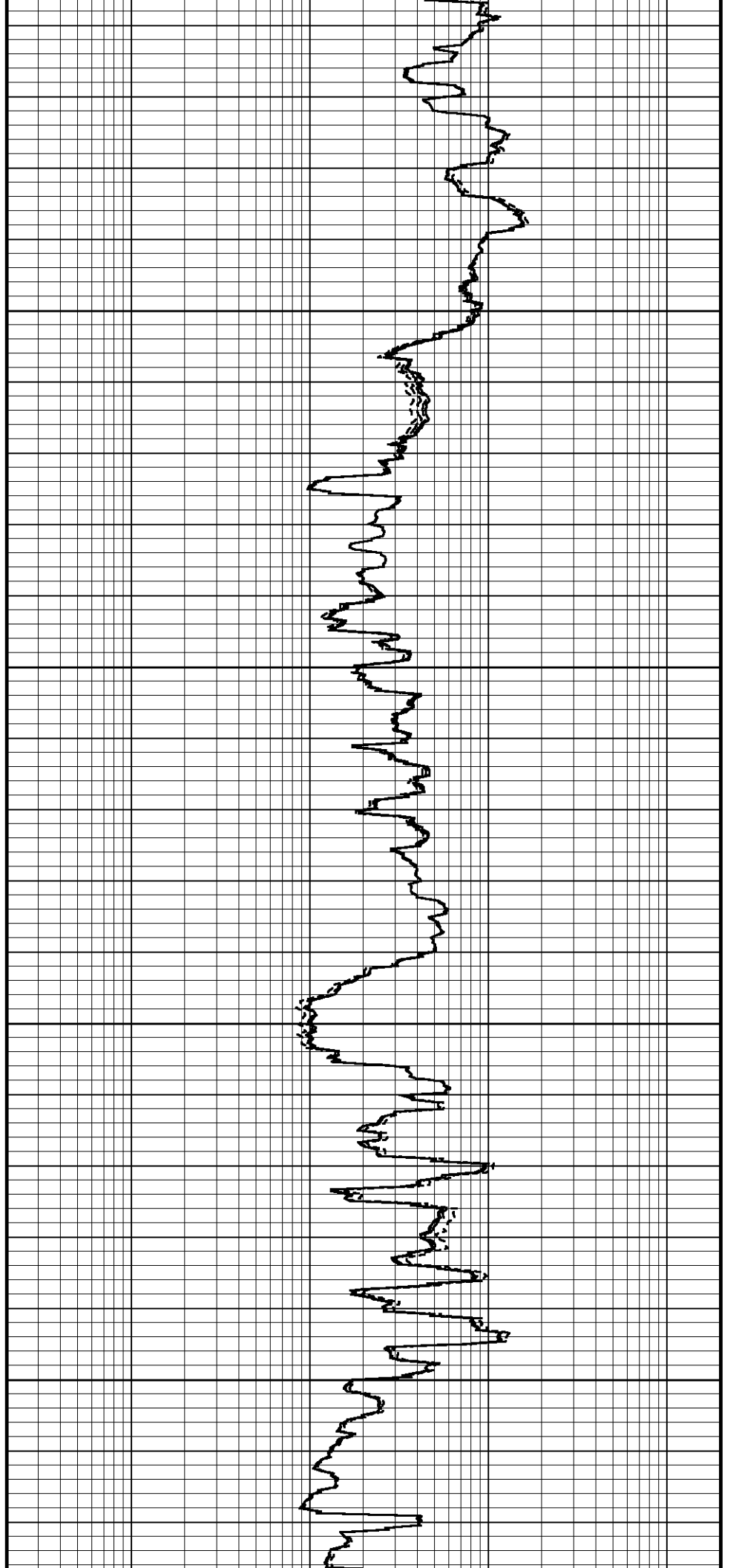
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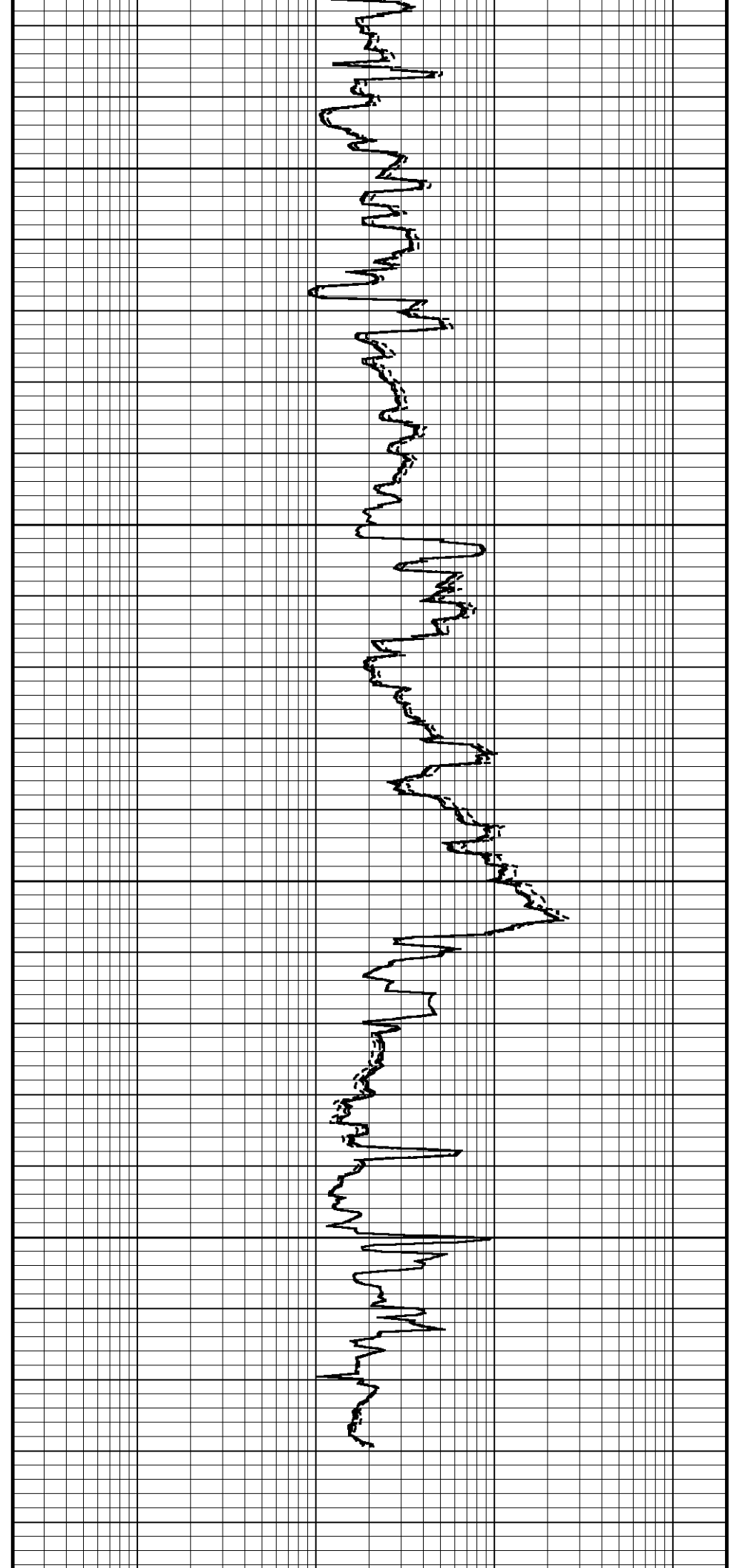
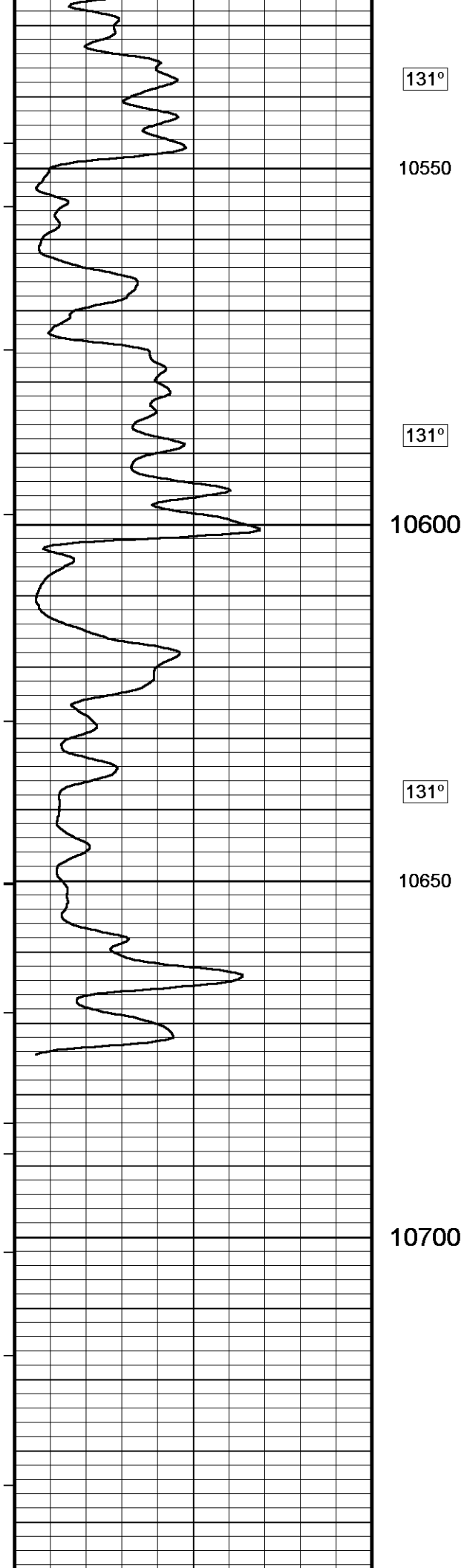
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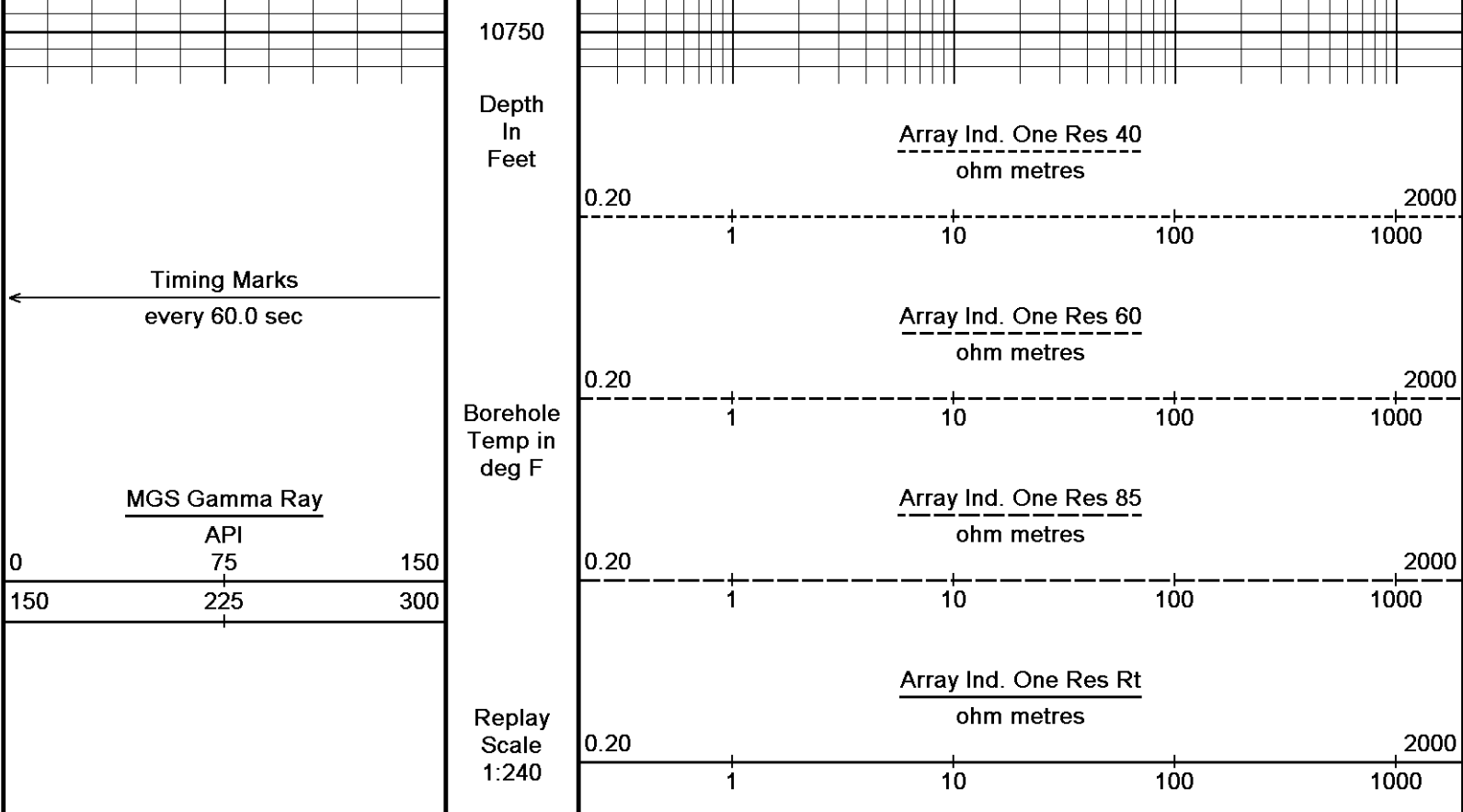
10450

131°

10500







Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 25-FEB-2013 04:37
 Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta Recorded on 25-FEB-2013 04:14
 System Versions: Processed with 13.04.8492 Plotted with 13.04.8492



BEFORE SURVEY CALIBRATION

C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\Legacy.dta

General Constants All 000

Last Edited on 21-FEB-2013,04:55

General Parameters

Mud Resistivity	1000.000	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Deep Induction
RWA Constant A	0.610
RWA Constant M	2.150

SP Calibration MGS-C.J 142

Field Calibration on 18-JAN-2013,11:54

	Measured	Calibrated (mV)
Reference 1	100.0	100.0
Reference 2	-100.0	-100.0

High Resolution Temperature Calibration MGS-C.J 142

Field Calibration on 18-JAN-2013,11:54

	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	2.00	2.00

0.00

0.00

High Resolution Temperature Constants MGS-C.J 142

Last Edited on 18-JAN-2013,11:54

Pre-filter Length 11

Gamma Calibration MGS-C.J 142

Field Calibration on 24-FEB-2013 00:00

	Measured	Calibrated (API)
Background	41	28
Calibrator (Gross)	1071	724
Calibrator (Net)	1029	696

Gamma Constants MGS-C.J 142

Last Edited on 31-JAN-2013,15:26

Gamma Calibrator Number	036	
Mud Density	1.02	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Neutron Calibration MDN-B.J 391

Base Calibration on 04-FEB-2013 09:37

Field Check on 24-FEB-2013 00:07

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3127	94	3714	110
Ratio	33.324		33.764	

Field Calibrator at Base

	Calibrated (cps)
	2292 3445
Ratio	0.665

Field Check

	Calibrated (cps)
	2085 3126
Ratio	0.667

Neutron Constants MDN-B.J 391

Last Edited on 24-FEB-2013,00:02

Neutron Source Id	N1055	
Neutron Jig Number	N639	
Epithermal Neutron	No	
Caliper Source for Processing	Bit Size	
Stand-off	0.00	inches
Mud Density	1.02	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	20.00	degrees F
Mud Salinity	4.40	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 134

Base Calibration on 06-JAN-2013,21:47

Field Check on 23-FEB-2013 23:43

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	972.5	126.8

Base Check 279.1

Field Check 279.1

FE Constants MFE-A.A 134

Last Edited on 23-FEB-2013,23:42

Running Mode	No Sleeve
MFE K Factor	0.1268
Caliper Source for FE correction	Density Caliper

Caliper Source for FE correction	Density Caliper	N/A	inches
Caliper Value for FE correction			
Rm Source for FE correction	Temperature Corr		
Temp. for Rm Corr.	MGS External Temperature		
Stand-off		0.5	inches

High Resolution Temperature Calibration MAI-A.A 170

Field Calibration on 14-JAN-2013,12:49

	Measured	Calibrated(Deg F)
Lower	0.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 170

Last Edited on 18-FEB-2013,09:48

Pre-filter Length 11

Induction Calibration MAI-A.A 170

Base Calibration on 02-FEB-2012 17:42

Field Check on 23-FEB-2013 23:50

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.7	487.1	9.3	966.2
2	6.2	384.7	7.6	821.4
3	3.7	266.1	5.2	566.0
4	2.2	136.5	2.6	279.2

Array Temperature 72.1 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	10.3	3752.9
2	0.0	0.0	29.9	3530.6
3	0.0	0.0	27.6	2998.0
4	0.0	0.0	18.8	2043.4
Deep			15.6	1905.7
Medium			41.5	3982.5
Shallow			46.4	5293.0

Array Temperature 0.0 38.1 Deg F

Induction Constants MAI-A.A 170

Last Edited on 23-FEB-2013,23:48

Induction Model	VECTAR	
Caliper for Borehole Corr.	Bit Size	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	6.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	MGS External Temperature	
Squasher Start	0.0020	mhos/metre
Squasher Offset	0.0000	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00
Cementation Exponent (M)	2.00

Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

Strain Gauge Constants MMS-E.B 133

Last Edited on 07-DEC-2012,11:16

Atmospheric Pressure	14.70	psi						
Serial Number	241946							
Calibration Date	09-JUL-08							
Base Check Date								
Dead Weight Serial Number	0							
Dead Weight Gravitational Correction	1.0							
Temperature	75.0	150.0	250.0	350.0	degrees F			
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.069	0.073	0.062	0.063	0.042	0.042	0.021	0.021
3000.0	5.240	5.253	5.235	5.245	5.219	5.228	5.199	5.209
6000.0	10.422	10.442	10.421	10.439	10.408	10.425	10.388	10.406
9000.0	15.616	15.637	15.619	15.638	15.609	15.627	15.593	15.610
12000.0	20.827	20.839	20.834	20.843	20.828	20.838	20.815	20.823
15000.0	26.051		26.060		26.056		26.046	

MMS Parameters MMS-E.B 133

Last Edited on 24-FEB-2013 00:46

Logging Parameters

Firmware Version	2v40	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	60.0	seconds
Pulse Duration Status Pulse From	20.0	seconds
Pulse Duration Caliper Close From	145.0	seconds
Pulse Duration Caliper Open From	150.0	seconds
Pulse Duration Release Pulse From	215.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	19312.0	seconds
Pulse Pressure Discriminator	44271.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	80.0	seconds
Caliper Close To		seconds
Caliper Open To	210.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MFE,MAI

Photo Density Calibration MPD-C.J 394

Base Calibration on 04-FEB-2013 11:05

Field Check on 23-FEB-2013 23:48

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far

Reference 1	52280	25673	59869	31110
Reference 2	21633	2514	24557	2522

Field Check at Base
1060.0 1299.4

Field Check
1065.5 1295.6

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	190	940		
Reference 1	21271	52102	0.412	0.369
Reference 2	6006	21507	0.283	0.271

Field Check at Base
190.1 939.9

Field Check
190.3 945.1

Density Constants MPD-C.J 394

Last Edited on 20-JAN-2013,18:20

Density Source Id	236	
Nylon Calibrator Number	633	
Aluminium Calibrator Number	633	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.02	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.71	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	

Caliper Calibration MPD-C.J 394

Base Calibration on 04-FEB-2013 10:49
Field Calibration on 24-FEB-2013 00:09

Base Calibration Reading No	Measured	Calibrator Size (in)
1	17044	4.02
2	25296	6.00
3	33704	8.03
4	42177	10.02
5	51088	12.01
6	N/A	N/A

Field Calibration	Measured Caliper (in)	Actual Caliper (in)
	5.96	6.00

DOWNHOLE EQUIPMENT

C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\Legacy.dta

Shuttle Running Tool 3.5")
SRT-A.A 69 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in



MBS-F.A 200v Compact Battery Sub
 MBS-F.A 131 LG: 10.61 ft WT: 70.5 lb OD: 2.24 in

Compact Memory Sub E.B
 MMS-E.B 133 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
 MTI-B.A 76 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
 MGS-C.J 142 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
 MCL-B.J 63 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
 SKJ-E.B 472 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
 SHA-J.A 451 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
 MIS-D.A 435 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
 MDN-B.J 391 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
 MPD-C.J 394 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
 MIS-D.B 607 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
 SHA-H 167 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
 SKJ-E.B 479 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

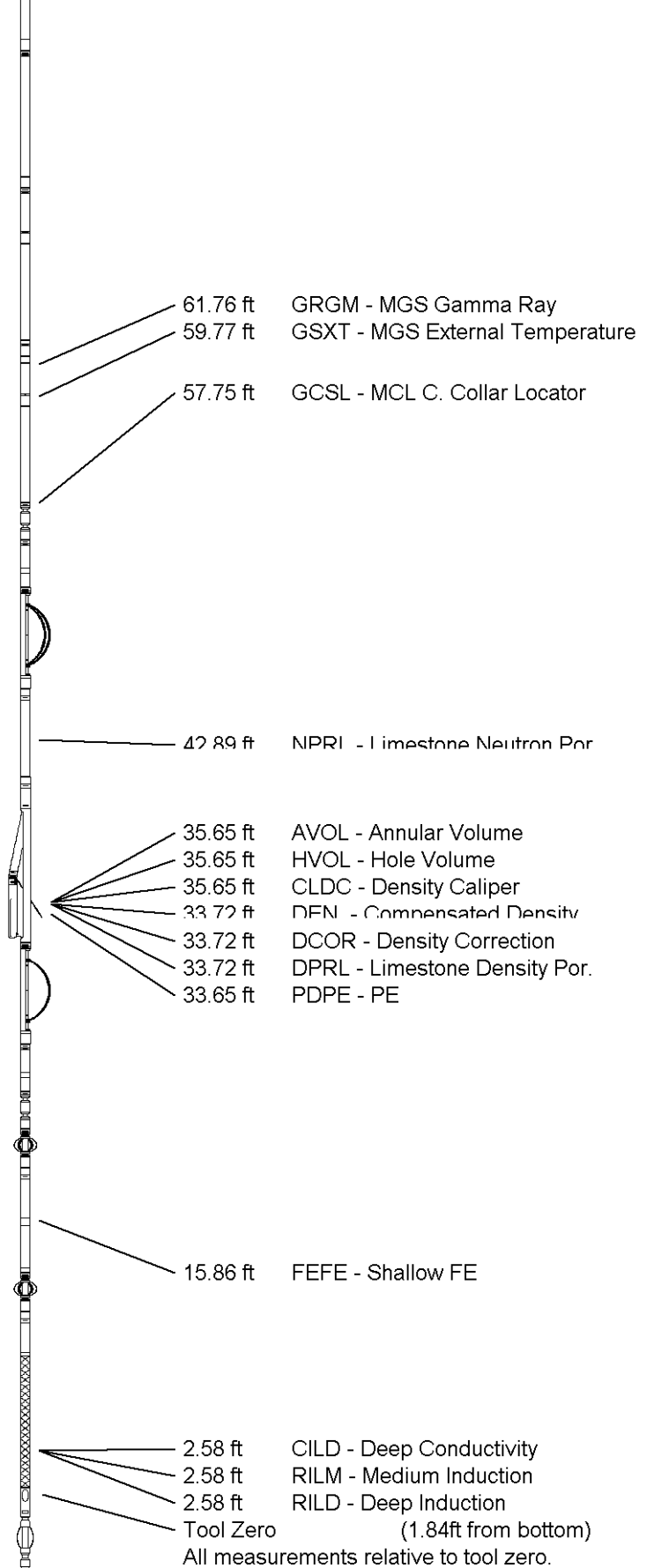
MIS-E.B Compact Inline Standoff sub
 MIS-E.B 578 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric
 MFE-A.A 134 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 596 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
 MAI-A.A 170 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 88.36 ft Weight: 637.1 lb



COMPANY	SANDRIDGE ENERGY
WELL	HAZEL 3120 1-24H
FIELD	SIX MOONS EAST
PROVINCE/COUNTY	COMMANCHE
COUNTRY/STATE	USA /KANSAS

Elevation Kelly Bushing	2063.00	feet
Elevation Drill Floor	2062.00	feet
Elevation Ground Level	2042.00	feet

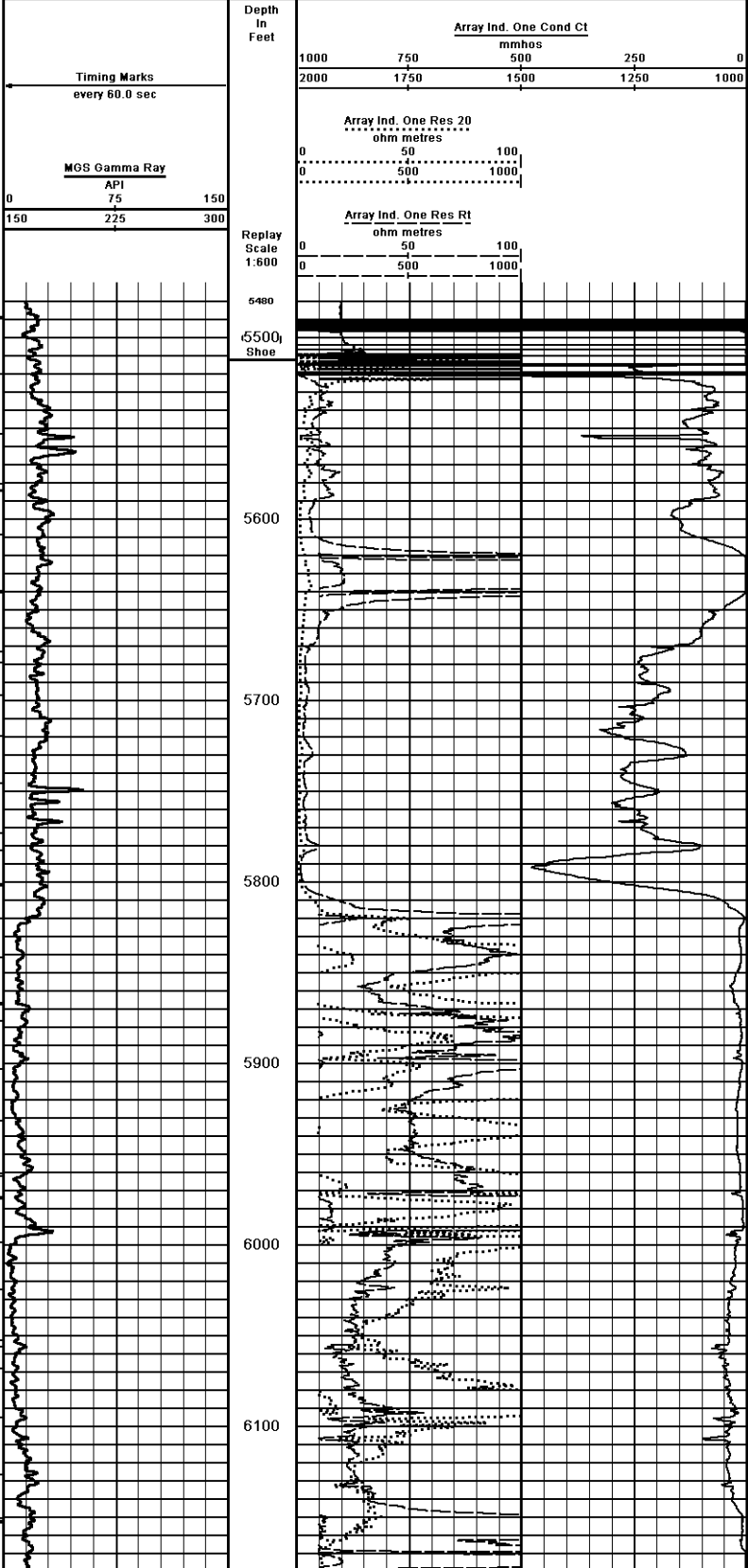
First Reading	10729.00	feet
Depth Driller	10773.00	feet
Depth Logger	10773.00	feet

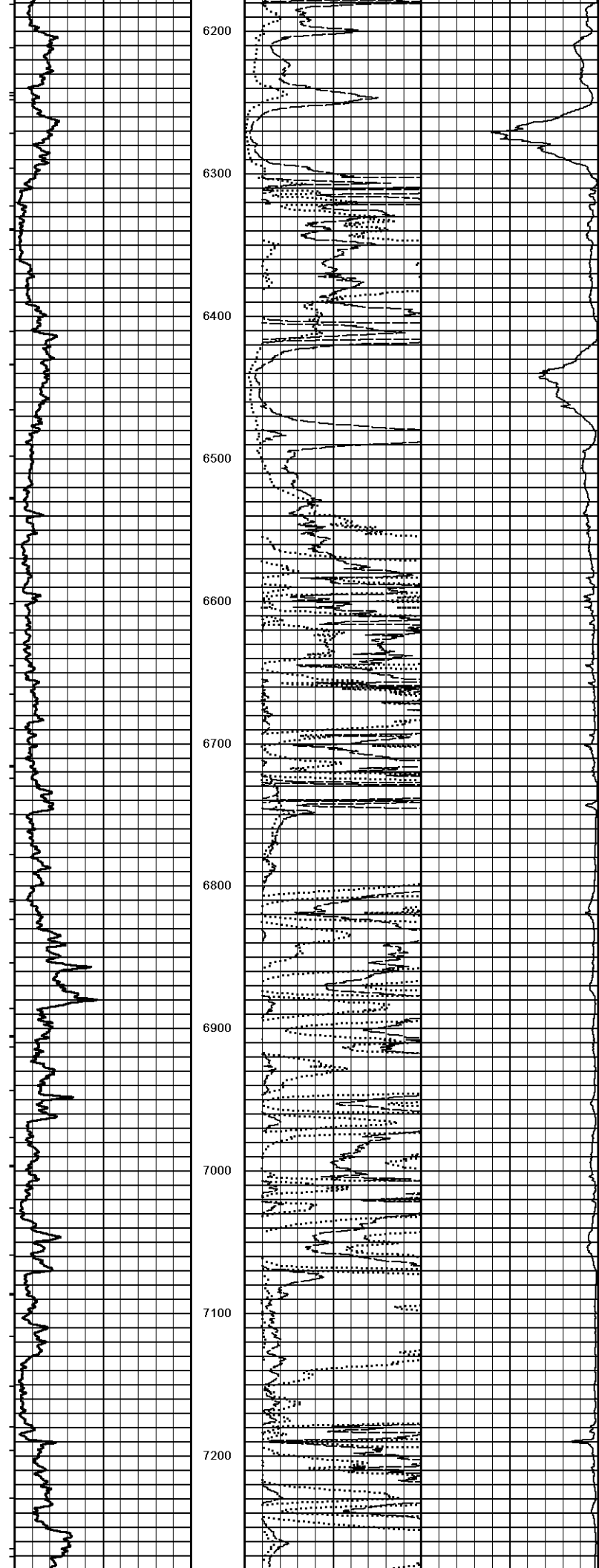


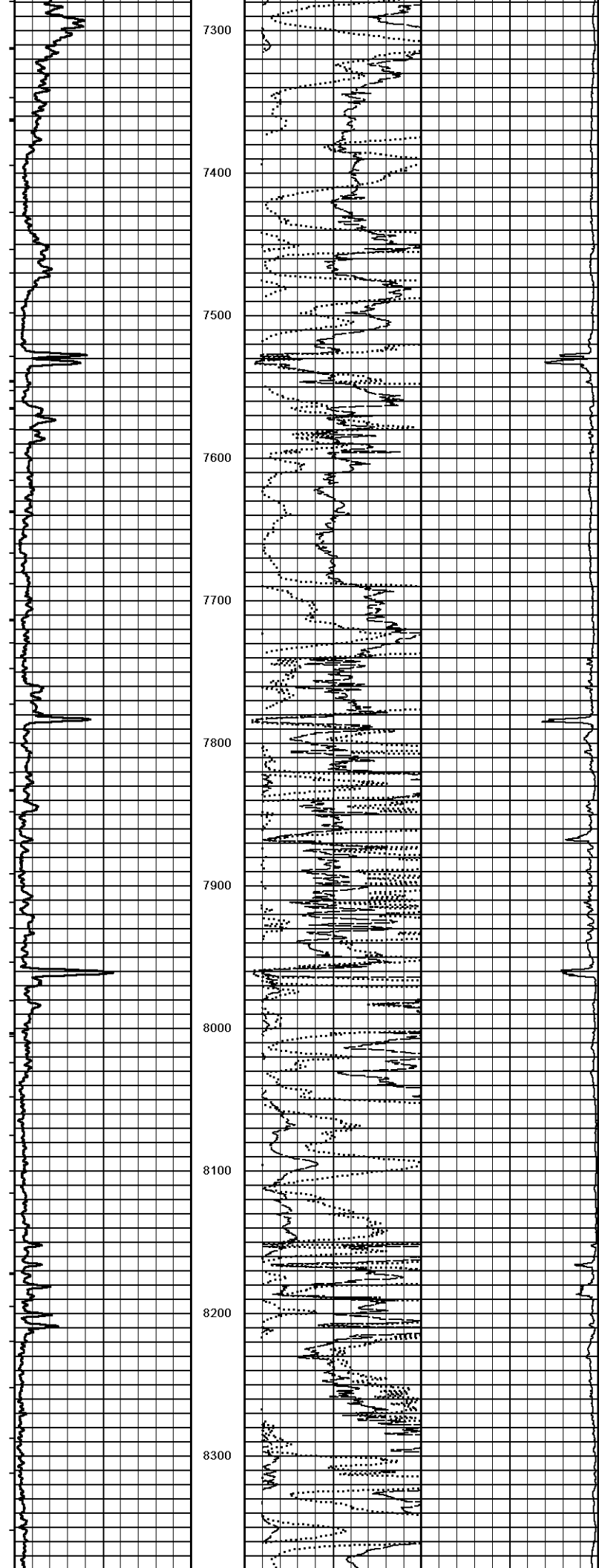
CML MESSENGER SHUTTLE
ARRAY INDUCTION

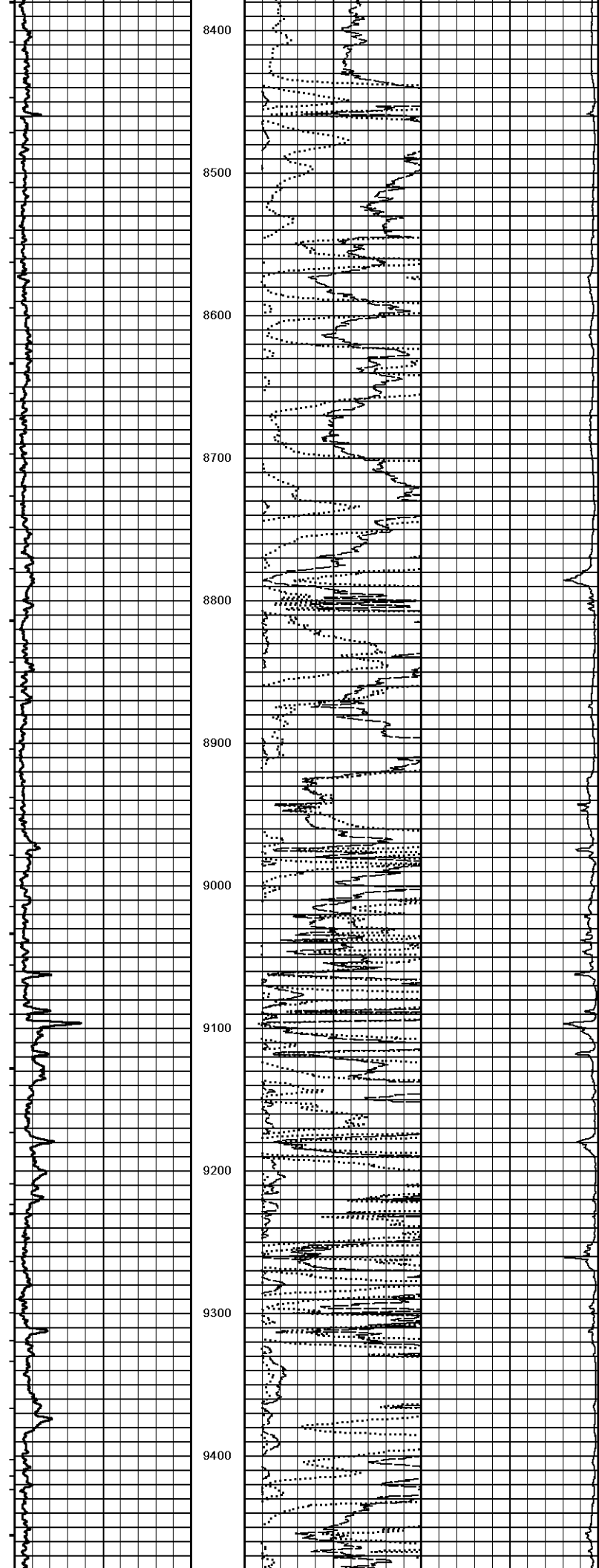
Weatherford®

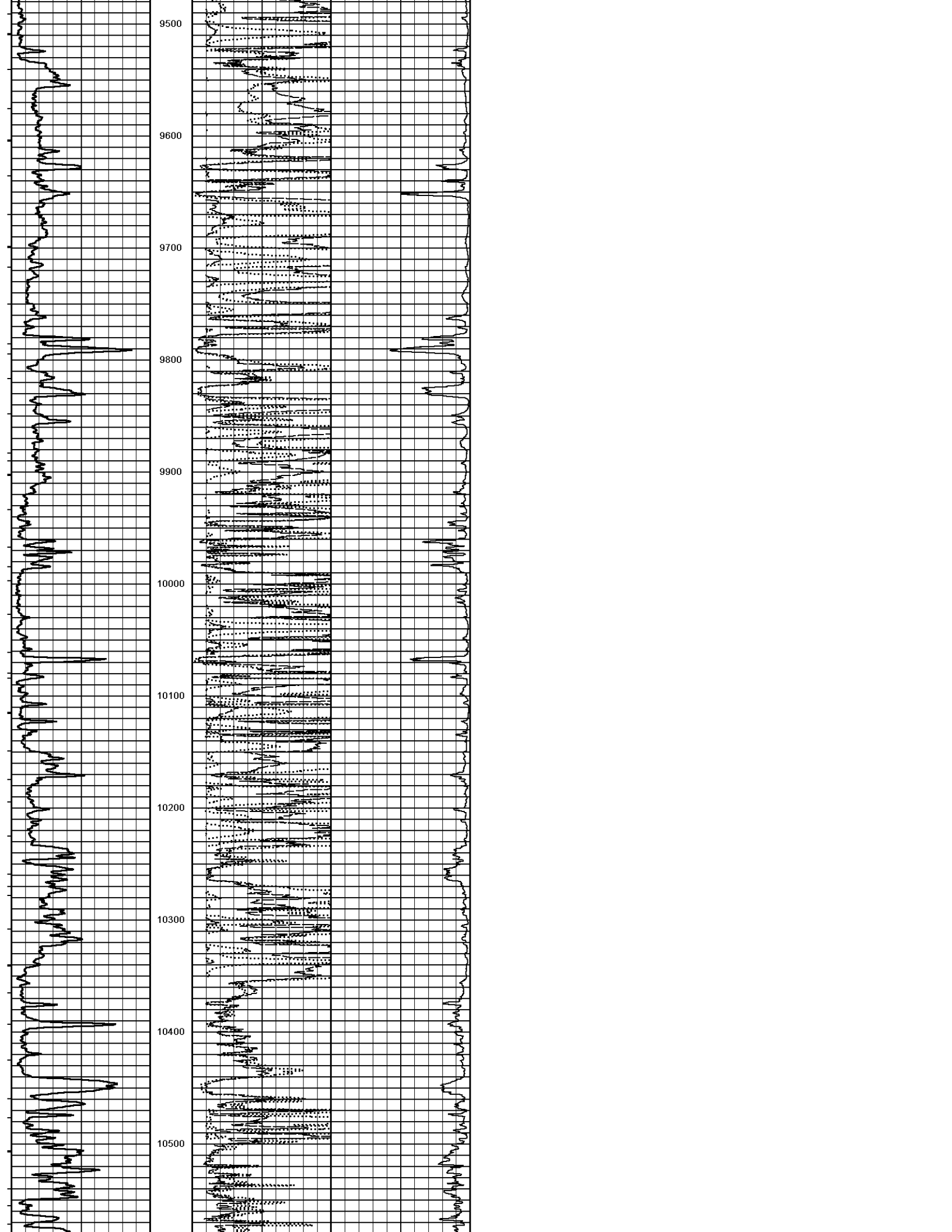
Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 25-FEB-2013 04:37
 Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
 Recorded on 25-FEB-2013 04:14
 System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

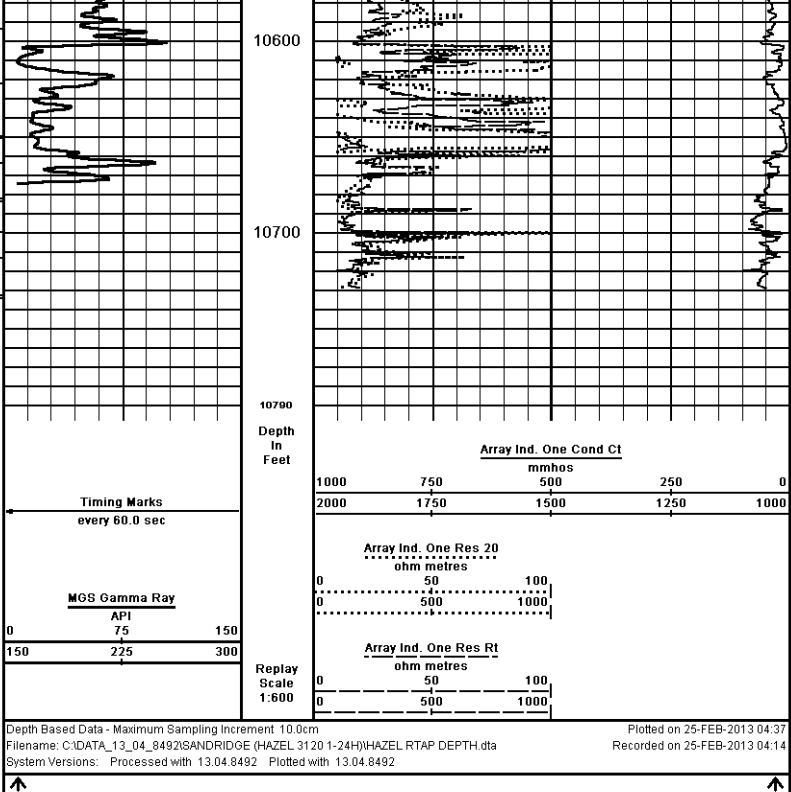













COMPANY SANDRIDGE ENERGY
 WELL HAZEL 3120 1-24H
 FIELD SIX MOONS EAST
 PROVINCE/COUNTY COMMANCHE
 COUNTRY/STATE USA /KANSAS

Elevation Kelly Bushing	2063.00	feet	First Reading	10729.00	feet
Elevation Drill Floor	2062.00	feet	Depth Driller	10773.00	feet
Elevation Ground Level	2042.00	feet	Depth Logger	10773.00	feet



CML MESSENGER SHUTTLE
 ARRAY INDUCTION