

**Weatherford**[®]**CML MESSENGER SHUTTLE
ARRAY INDUCTION LOG**

COMPANY				SANDRIDGE ENERGY	
WELL				SEAN 3119 4-18H	
FIELD				ARLIE	
PROVINCE/COUNTY				COMANCHE	
COUNTRY/STATE				U.S.A. / KANSAS	
LOCATION				SHL: 200' FSL & 2280' FWL BHL: 330' FNL & 1980' FWL	
SEC	TWP	RGE	Other Services		
18	31S	19W	MPD/MDN		
API Number		15-033-21695-01			
Permit Number					
Permanent Datum G.L., Elevation 2124 feet				Elevations:	
Log Measured From KB				KB	2143.60
Drilling Measured From K.B. @ 18.5 FEET				DF	
				GL	2124.00
Date	18-MAR-2013				
Run Number	ONE				
Service Order	3535473				
Depth Driller	9555.00				feet
Depth Logger	9555.00				feet
First Reading	9530.00				feet
Last Reading	5590.00				feet
Casing Driller	5584.00				feet
Casing Logger	5590.00				feet
Bit Size	6.125				inches
Hole Fluid Type	FWM				
Density / Viscosity	8.60 g/cc		23.00 CP		
PH / Fluid Loss	10.00				
Sample Source	FLOWLINE				
Rm @ Measured Temp	2.45 @ 66.2		ohm-m		
Rmf @ Measured Temp	1.96 @ 66.2		ohm-m		
Rmc @ Measured Temp	2.94 @ 66.2		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	1.34 @124.0		ohm-m		
Time Since Circulation	1 HOUR				
Max Recorded Temp	124.00		deg F		
Equipment / Base	18063		CASPER		
Recorded By	K. SALLER				
Witnessed By					
S.O. # / JOB #	3535473				

BOREHOLE RECORD

Last Edited: 18-MAR-2013 04:01

Bit Size inches	Depth From feet	Depth To feet
9.625	0.00	5584.00
6.125	5584.00	9555.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5584.00	29.00

REMARKS

LOGGED WITH WLS VER 13.04 SOFTWARE

WELL LOGGED USING 200V MEMORY MESSENGER DEPLOYMENT SYSTEM

HARDWARE: MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW
MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9534FT

TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY

4.5 INCH CASING USED TO CALCULATE ANNULAR HOLE VOLUME

BOREHOLE VOLUME TD TO INTERMEDIATE CASING = 840 CU FT

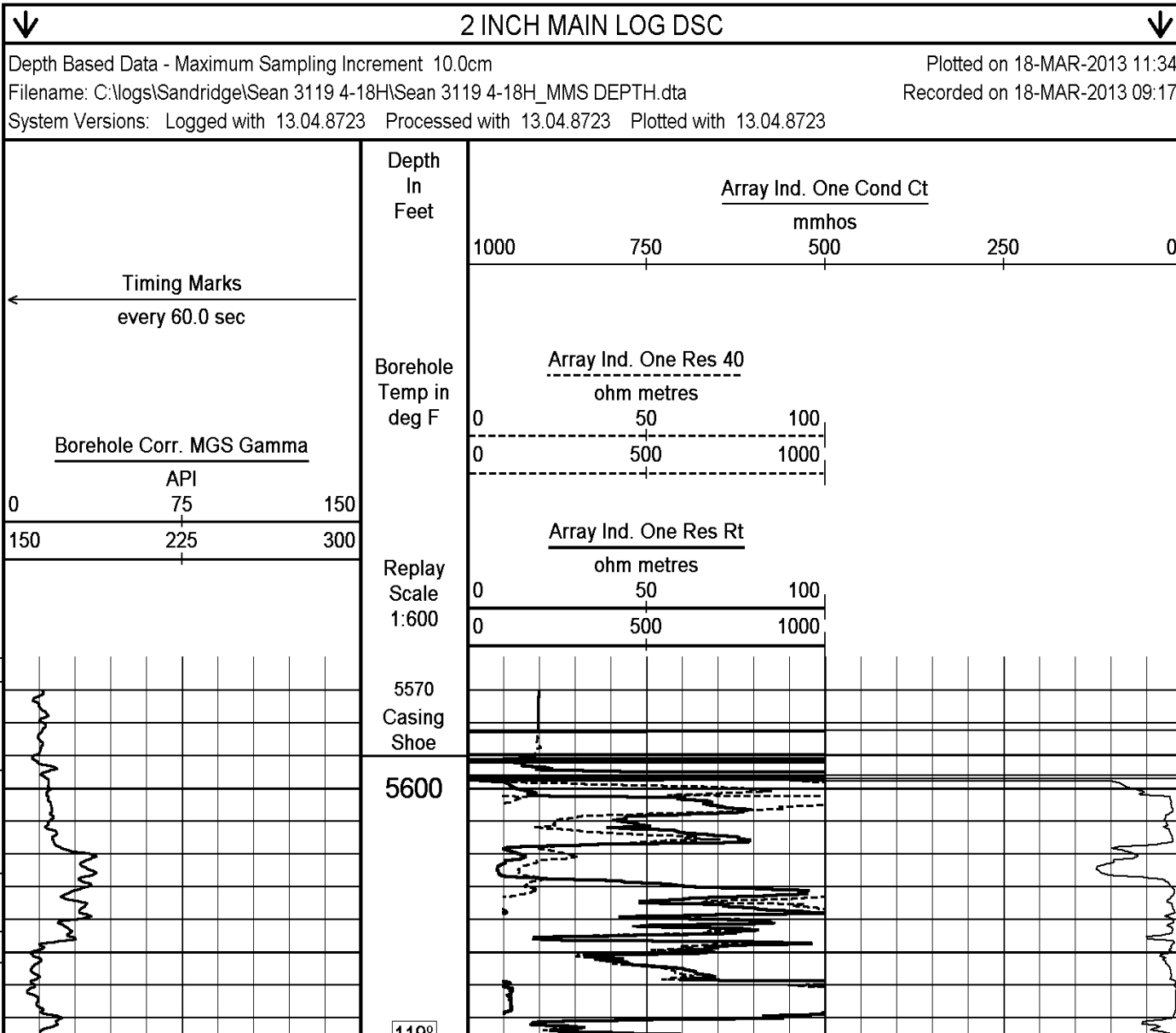
ANNULAR VOLUME FROM TD TO INTERMEDIATE CASING = 410 CU FT

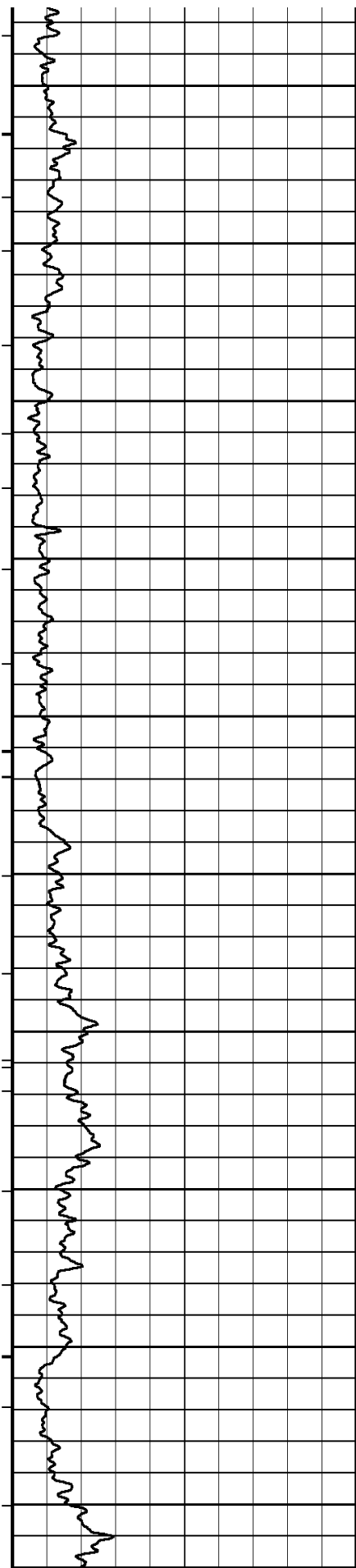
SERVICE ORDER #: 3535473

RIG: LARIAT 38

OPERATORS: J. GOODMAN, H. TAYLOR

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.





119

5700

119°

5800

120°

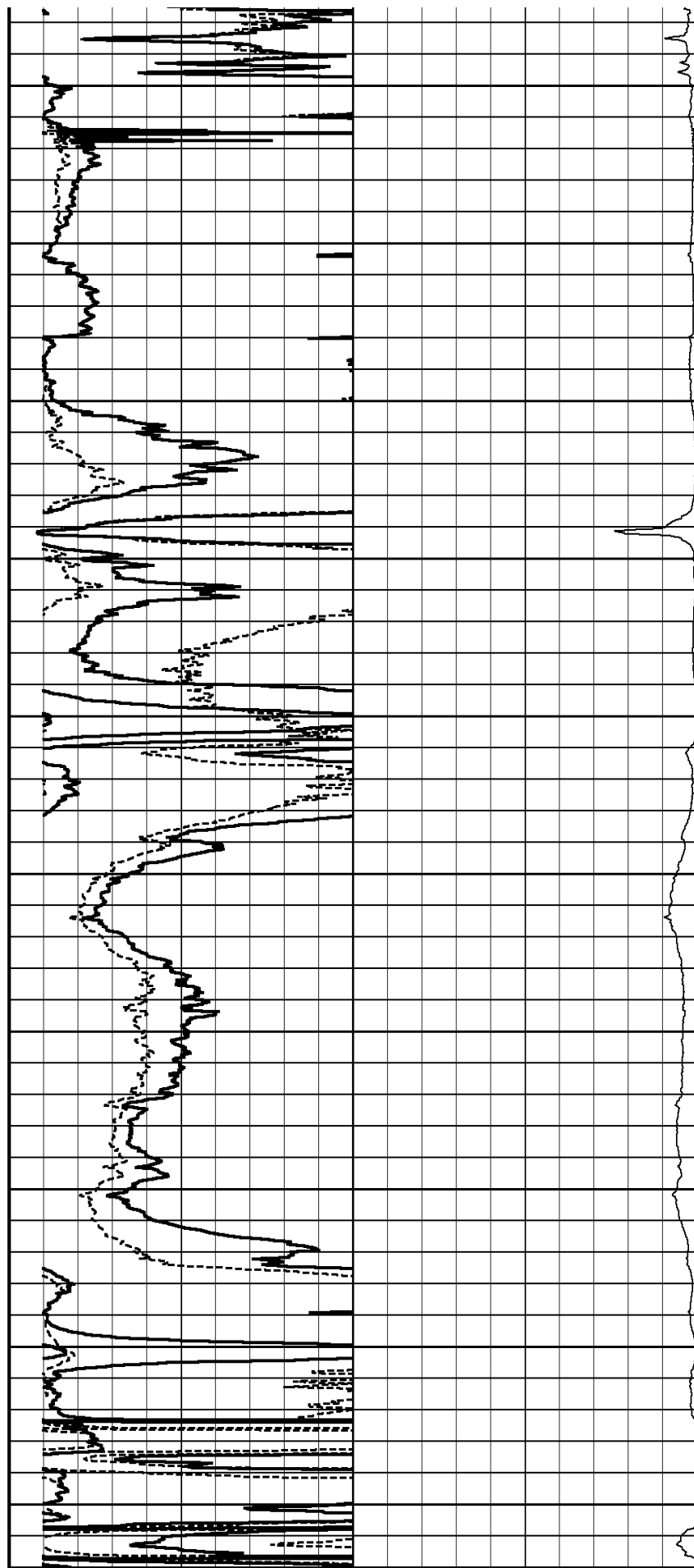
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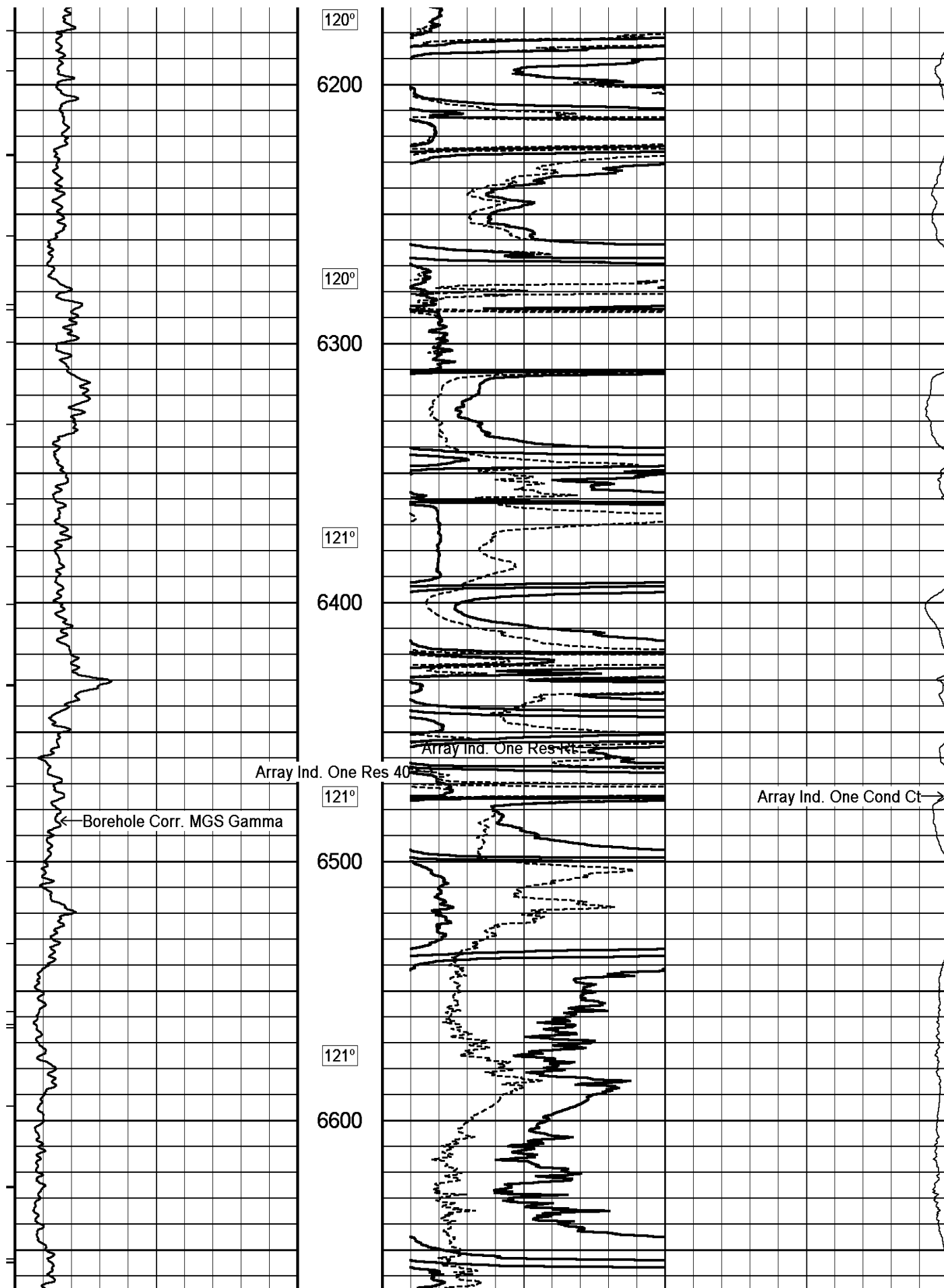
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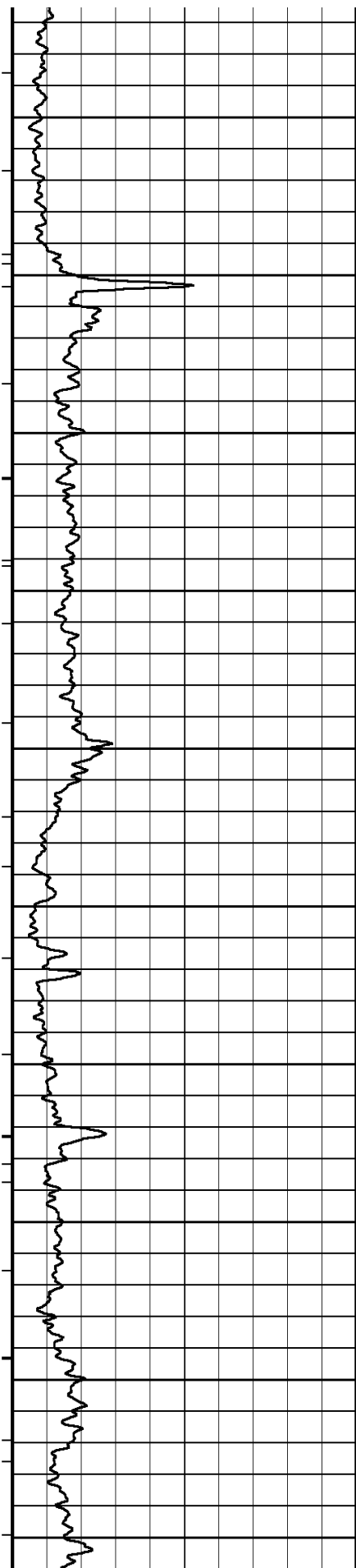
6000

120°

6100







121°

6700

121°

6800

122°

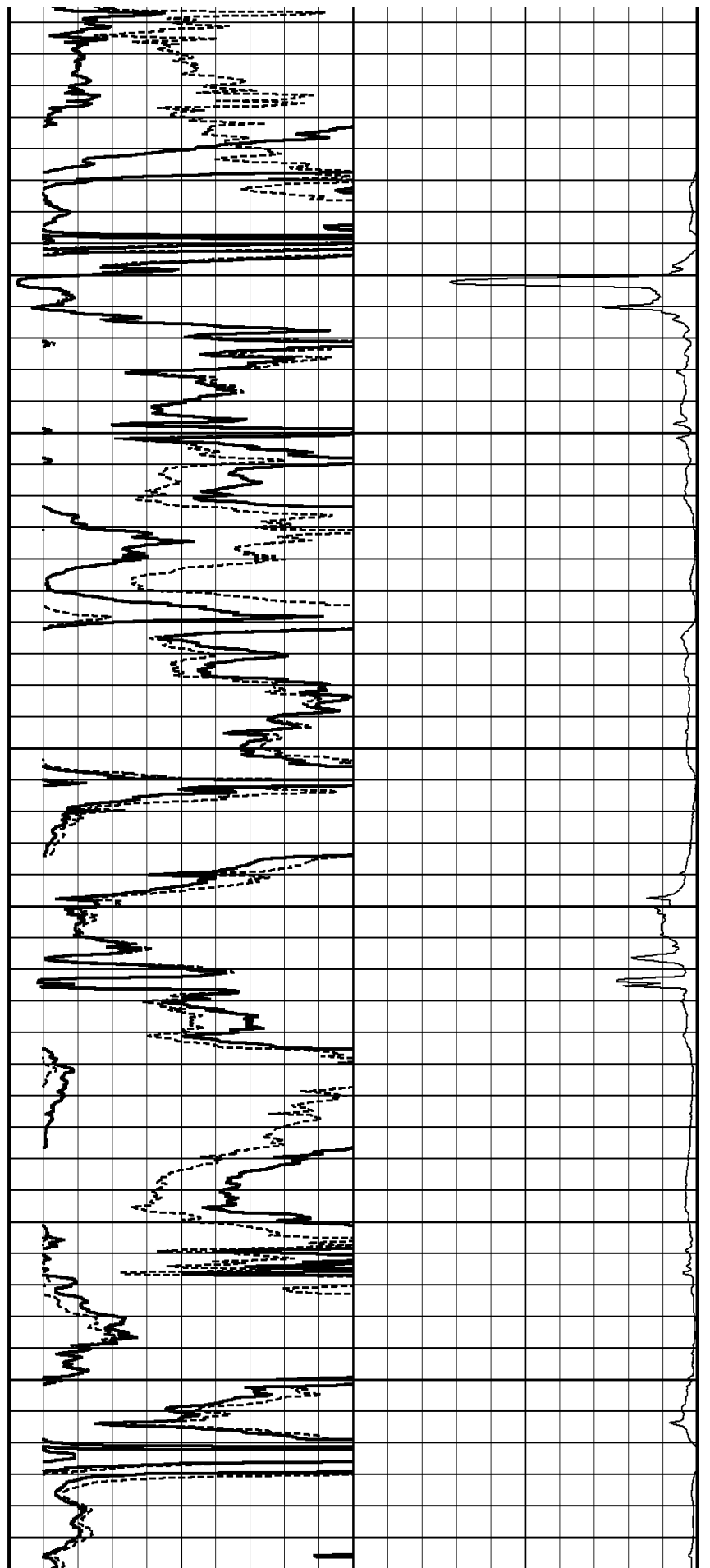
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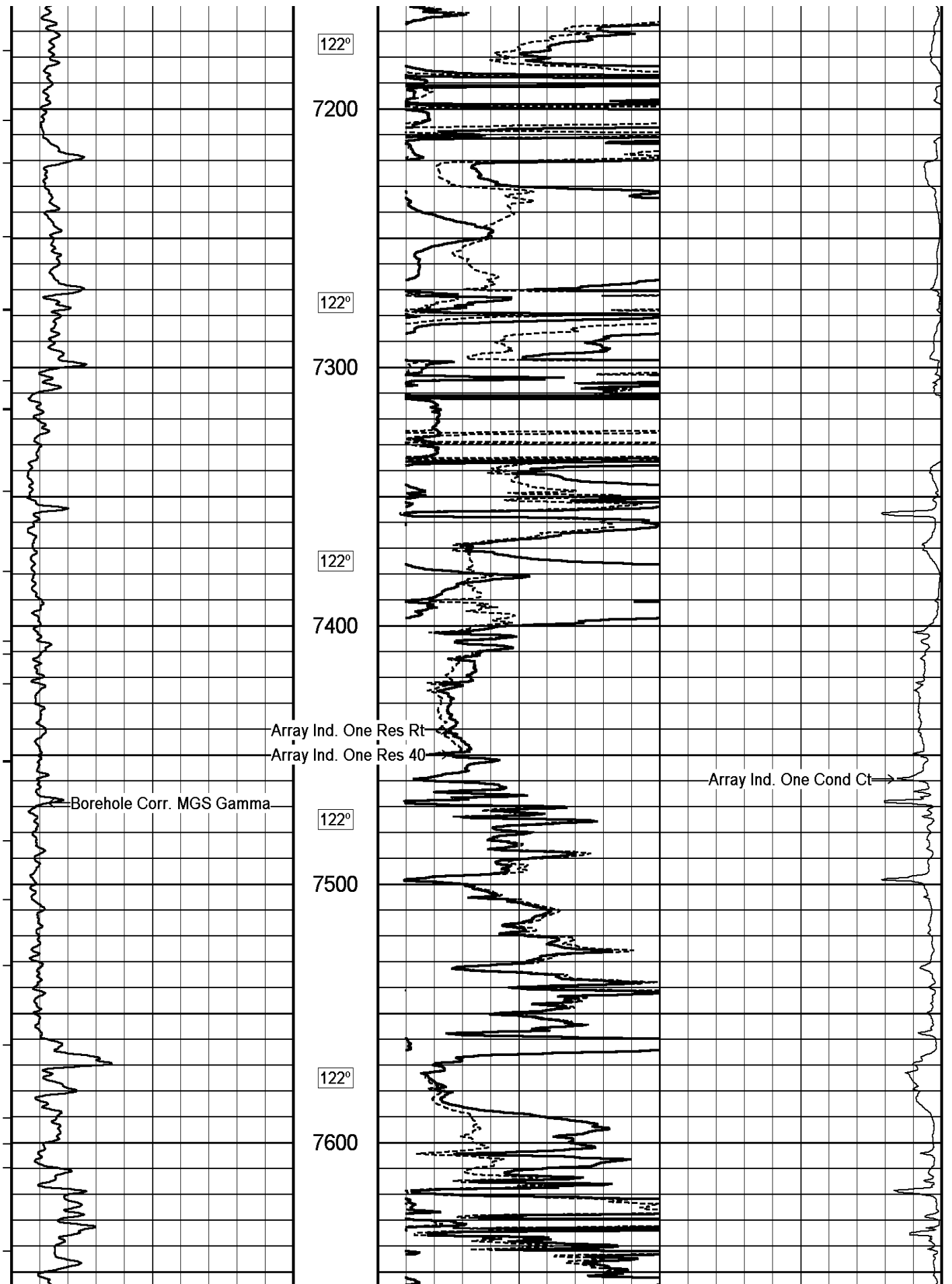
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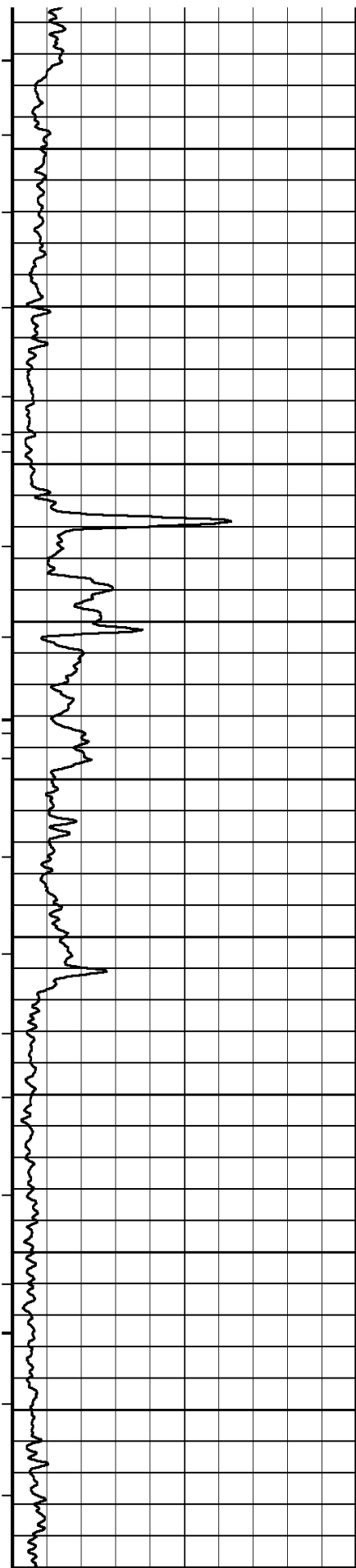
7000

122°

7100







123°

7700

123°

7800

123°

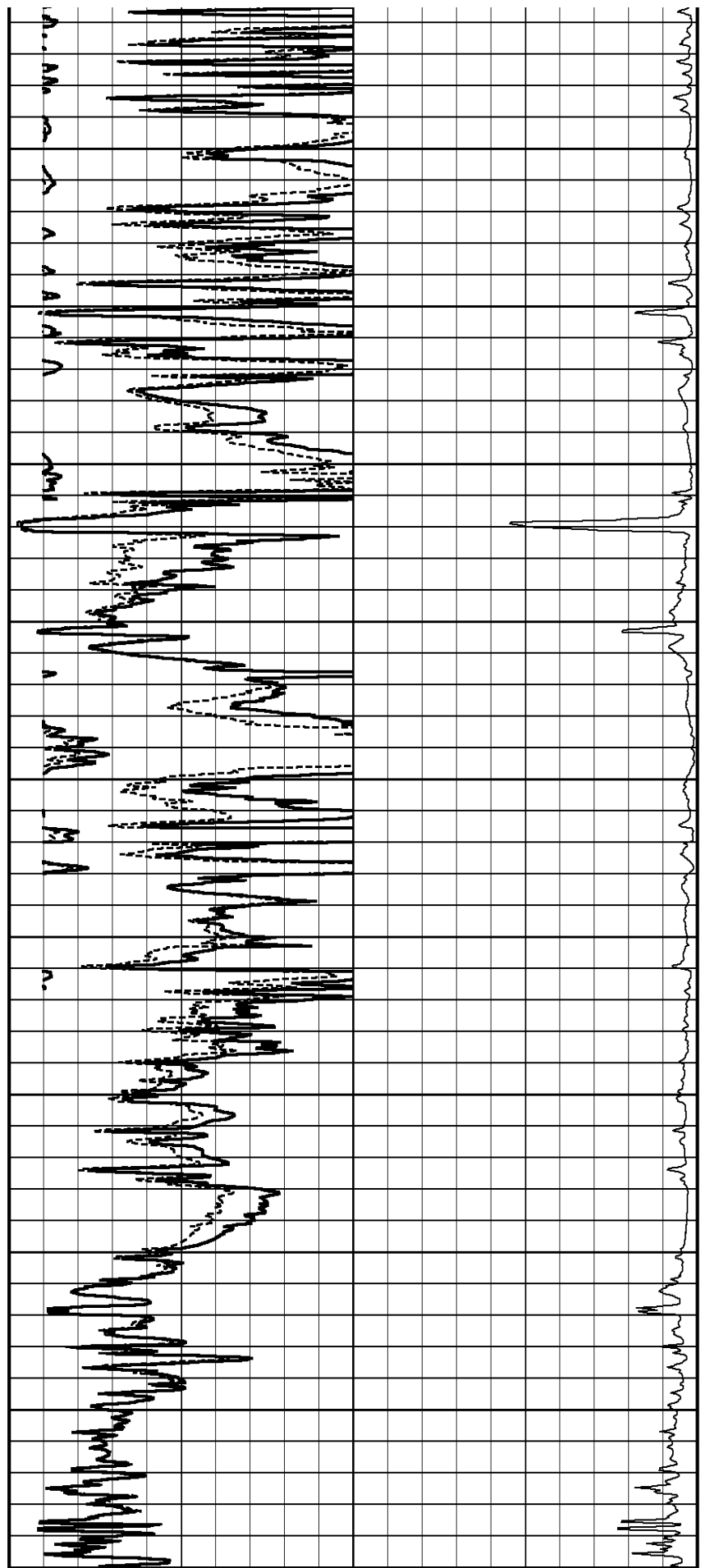
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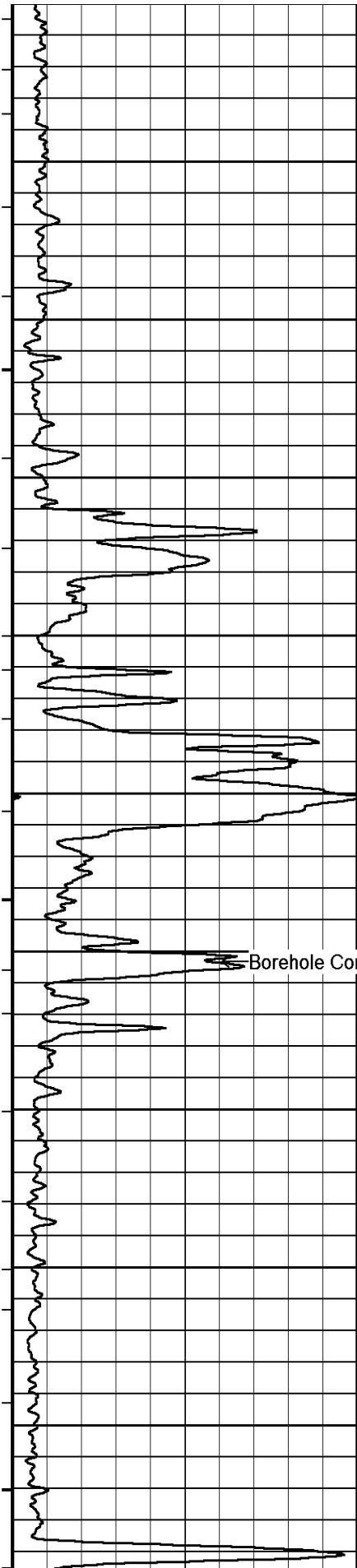
123°

8000

123°

8100





123°

8200

123°

8300

123°

8400

123°

8500

123°

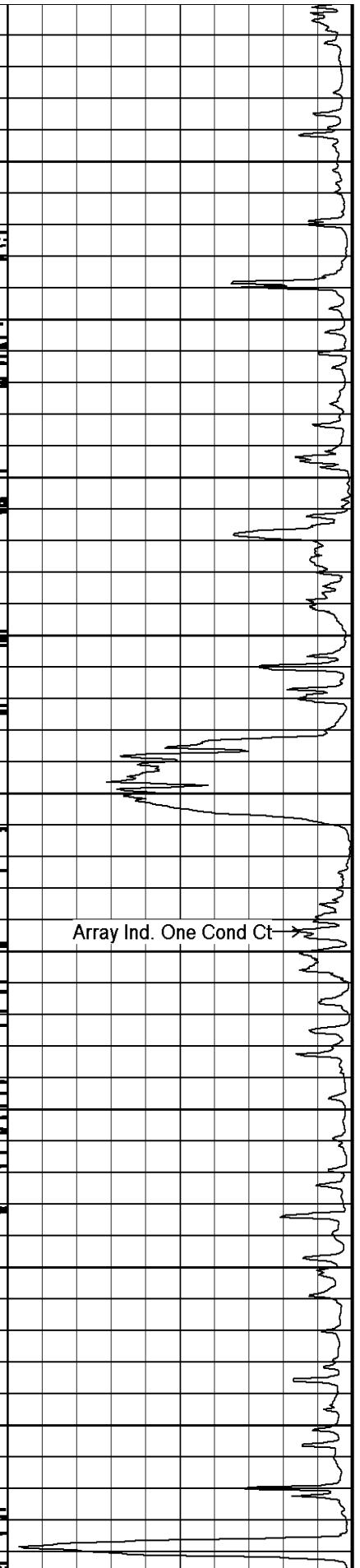
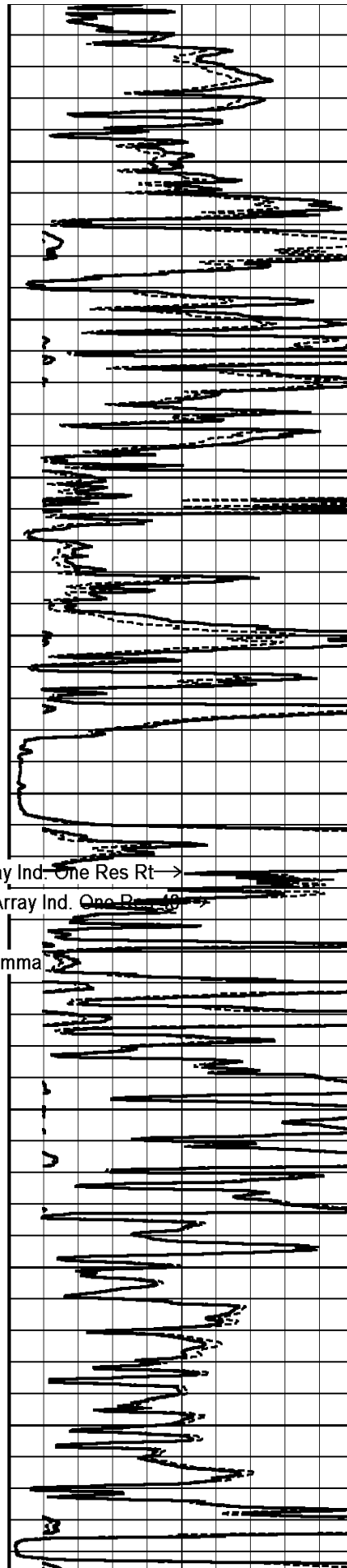
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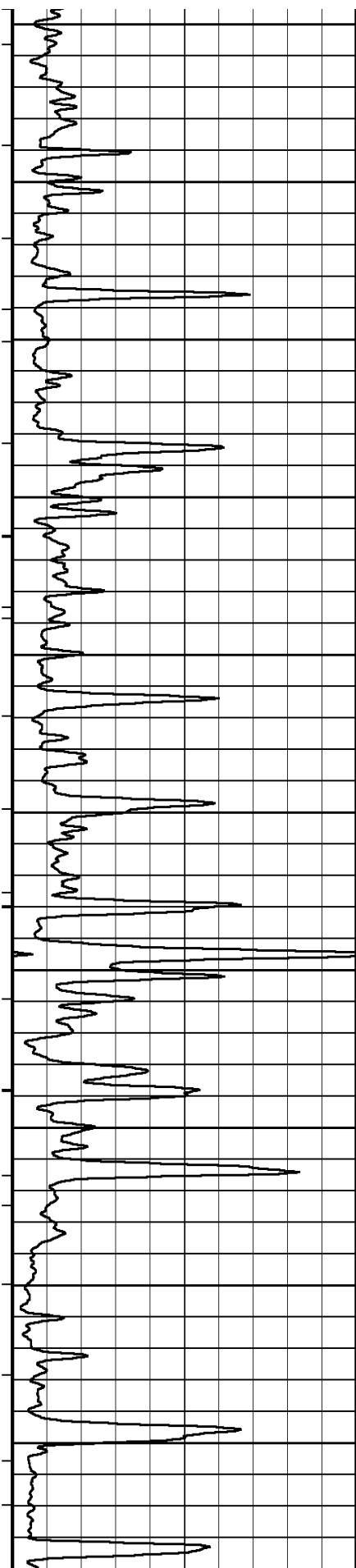
Borehole Corr. MGS Gamma

Array Ind. One Res Rt →

Array Ind. One Res Rt →

Array Ind. One Cond Ct →





123°

8700

123°

8800

123°

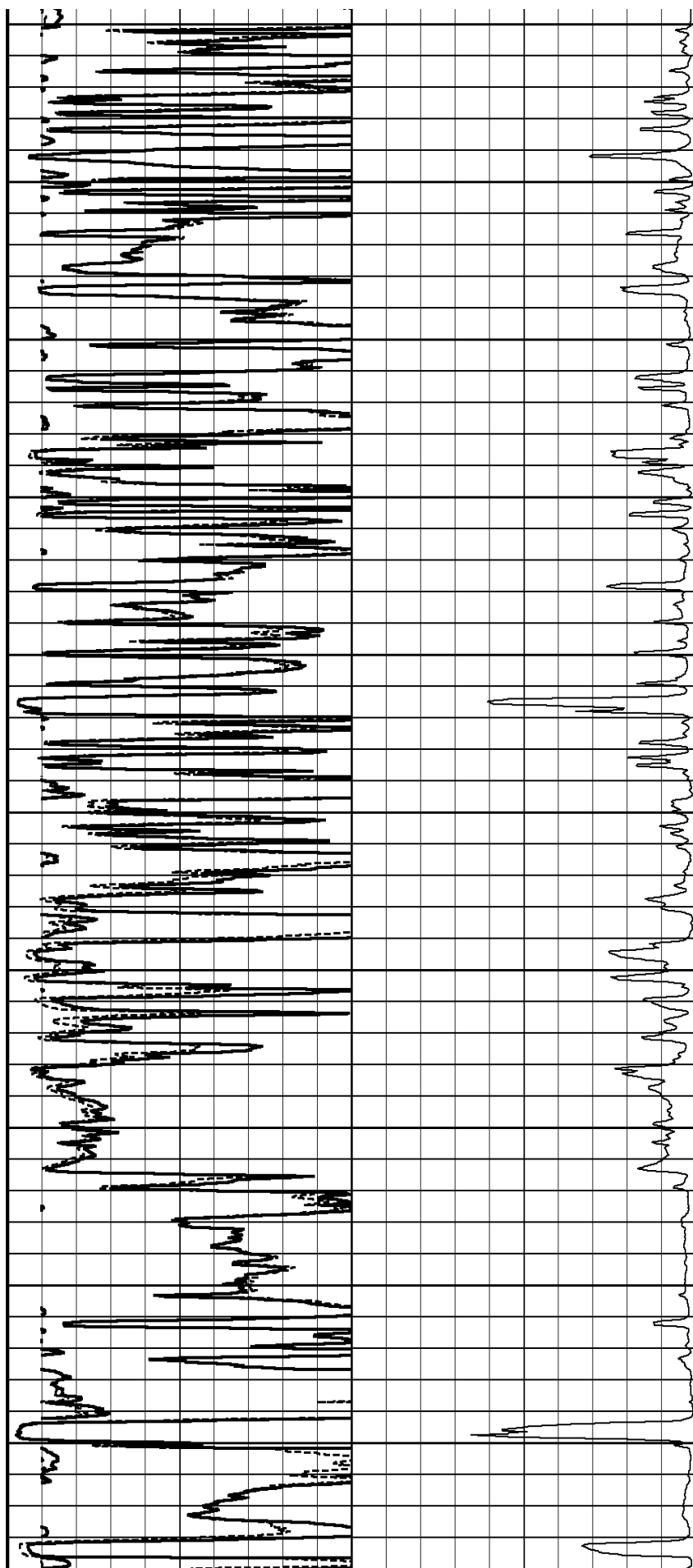
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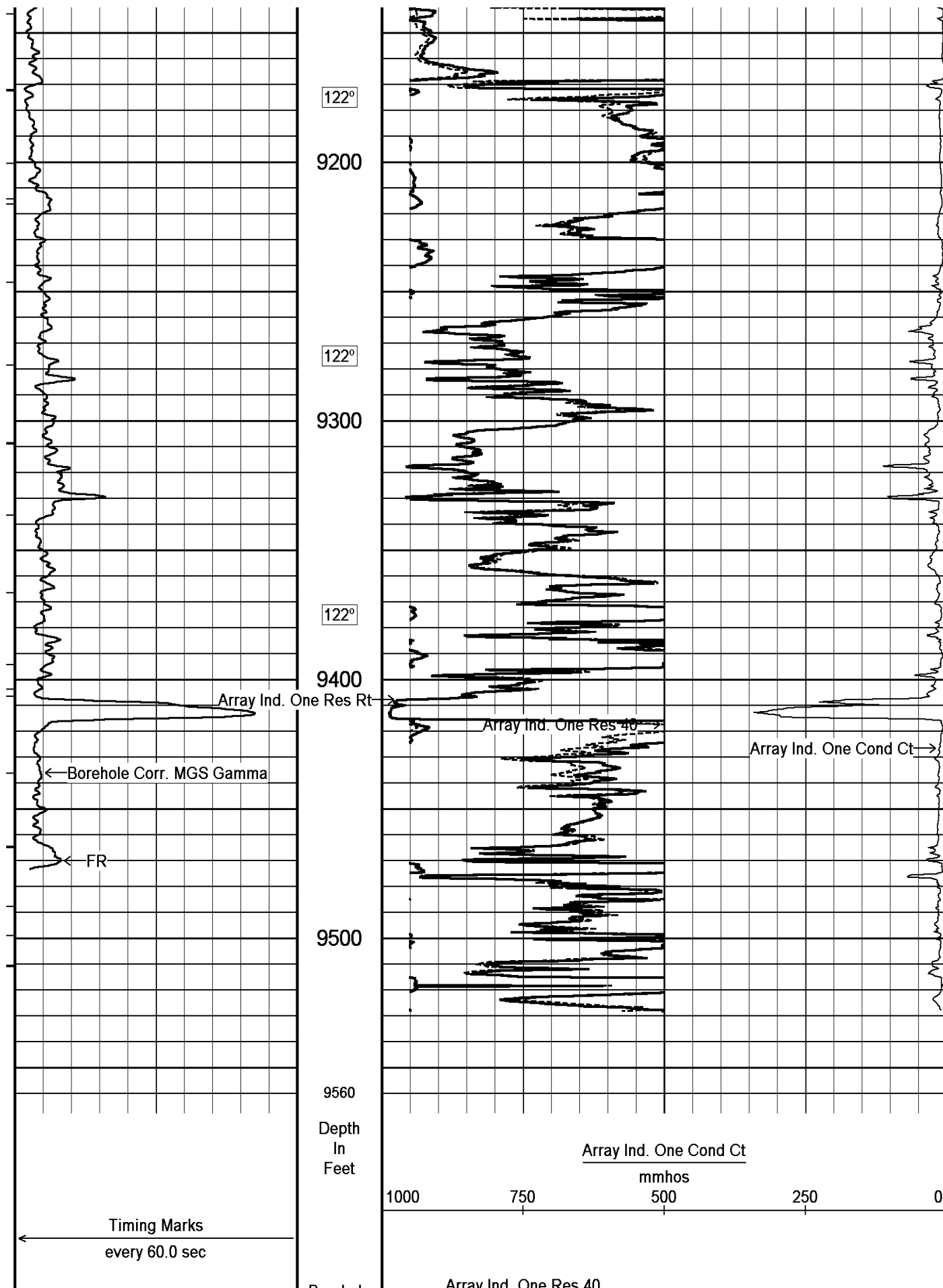
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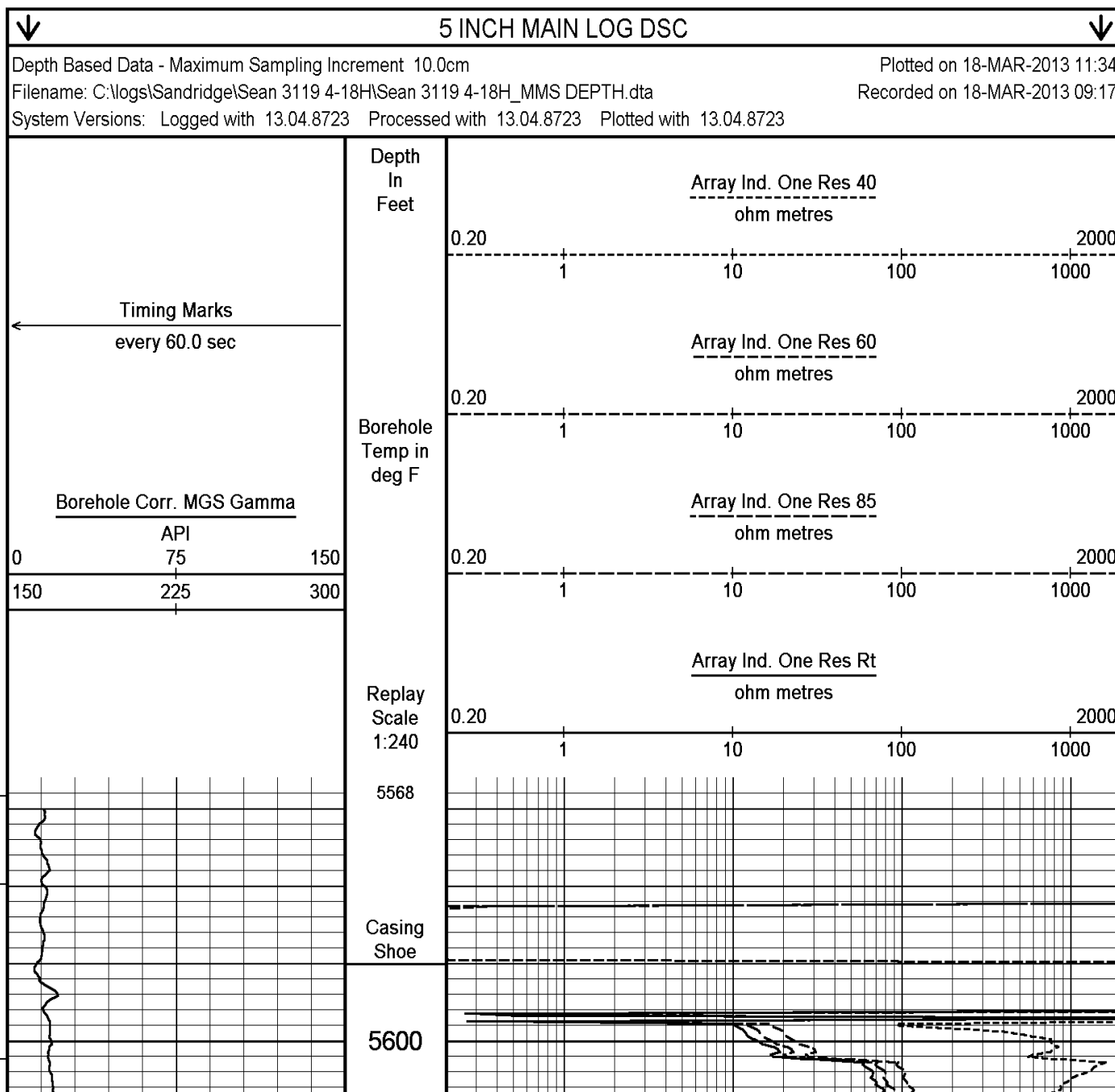
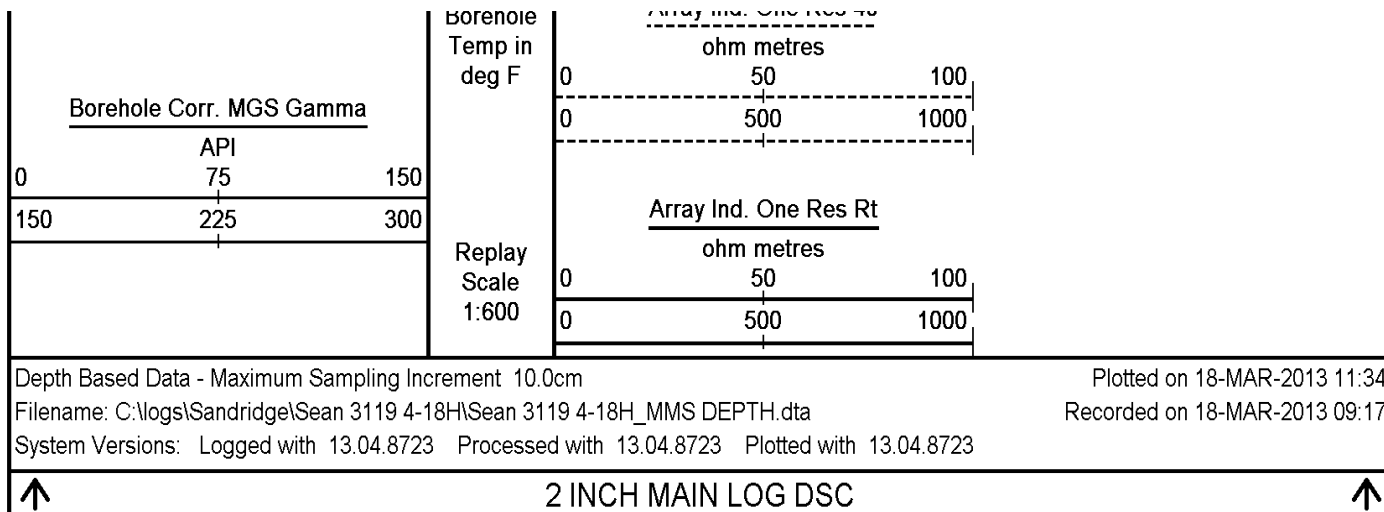
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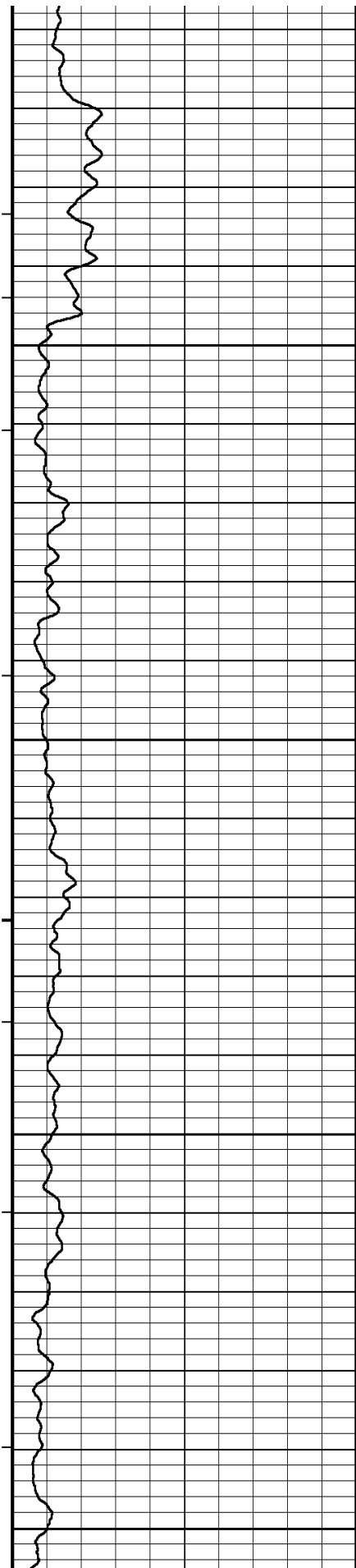
123°

9100









119°

5650

119°

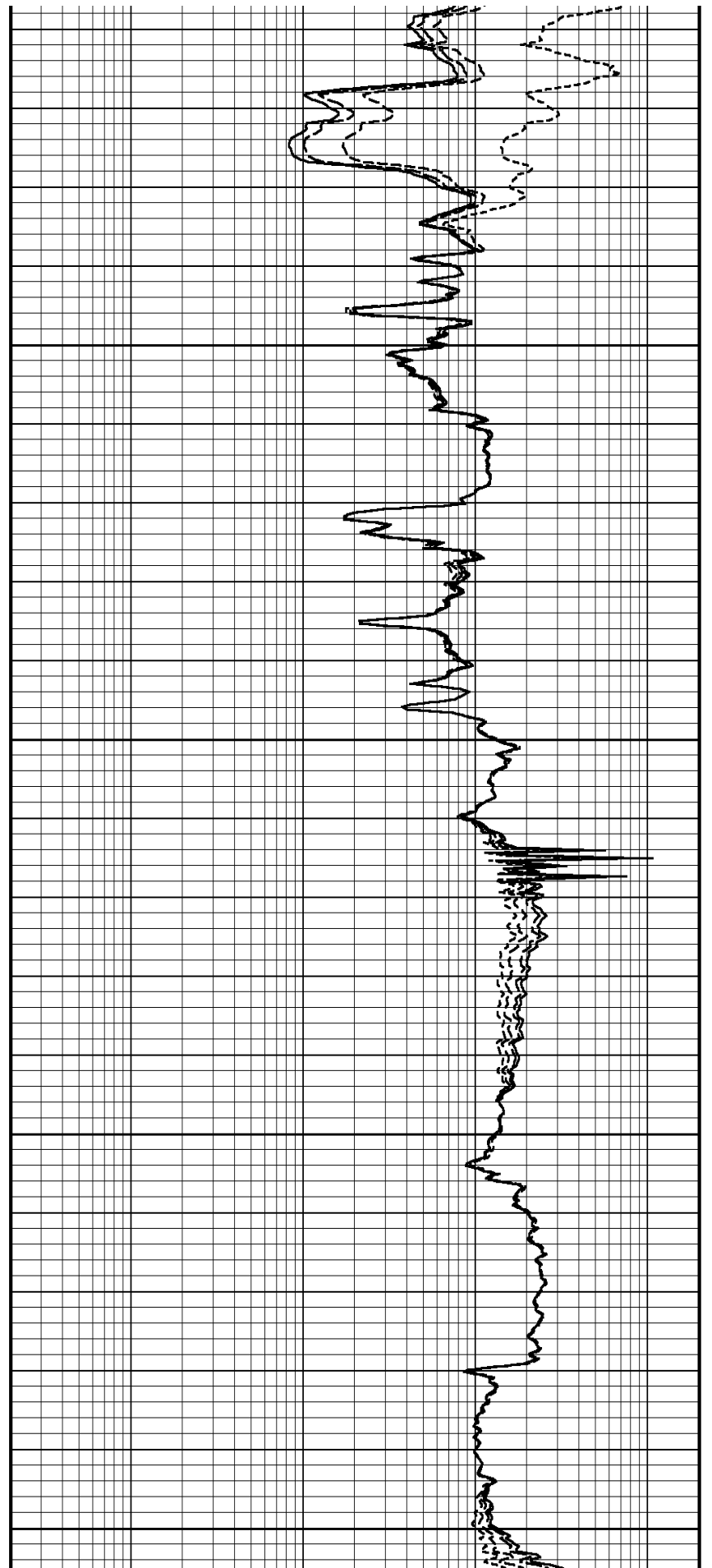
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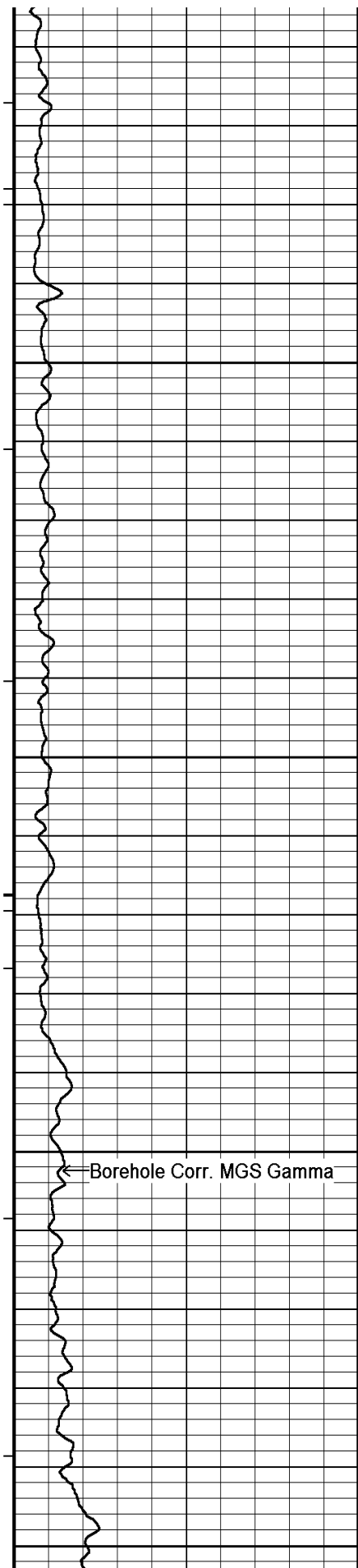
119°

5750

119°

5800





119°

5850

120°

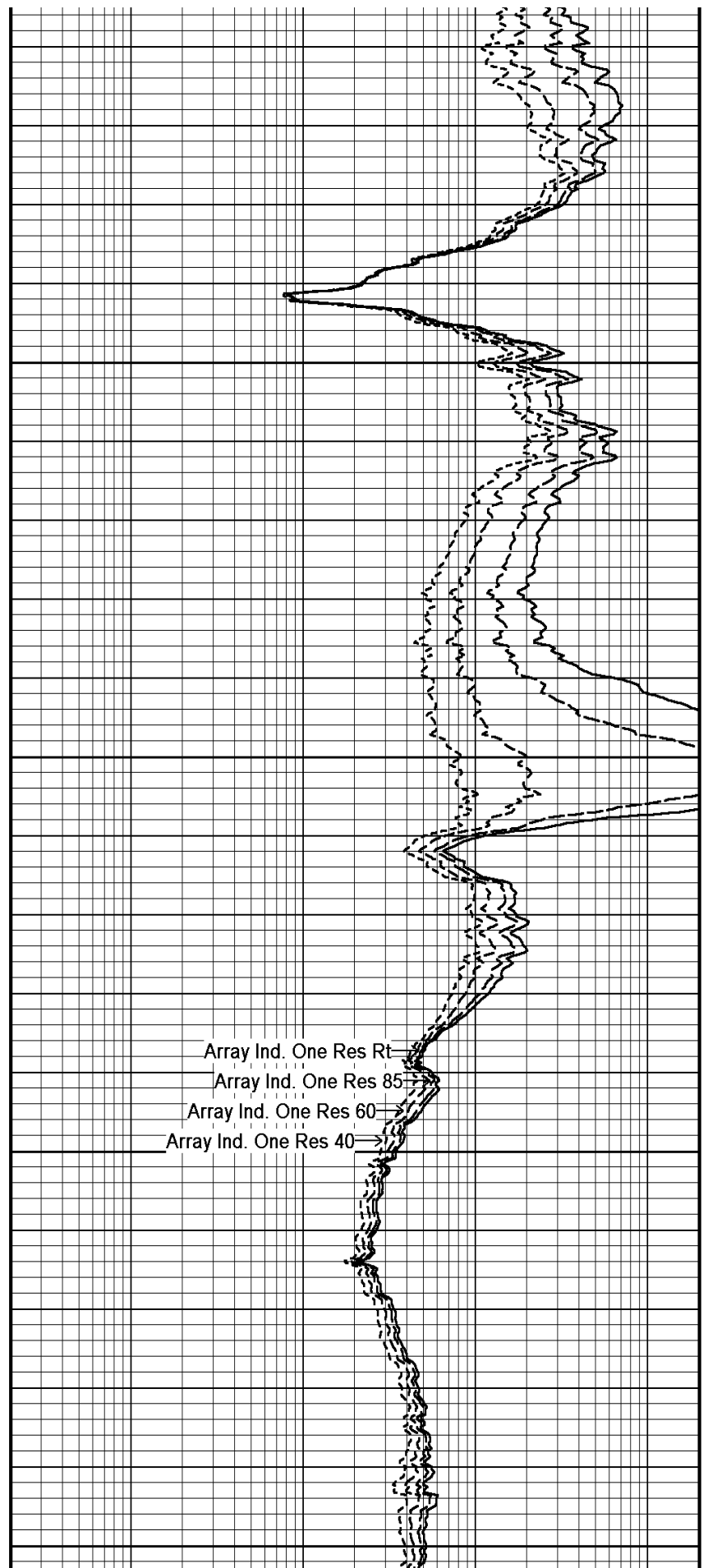
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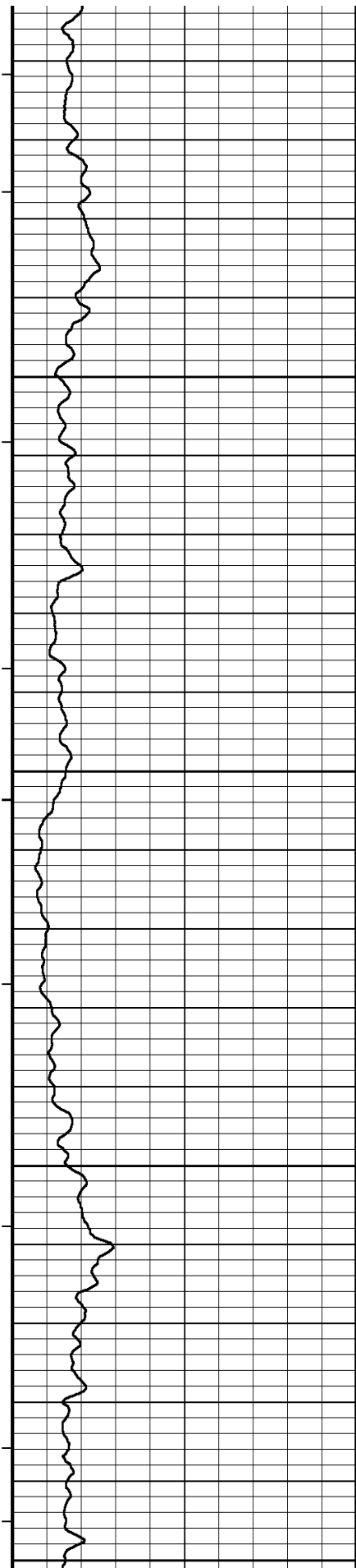
120°

5950

120°

6000





120°

6050

120°

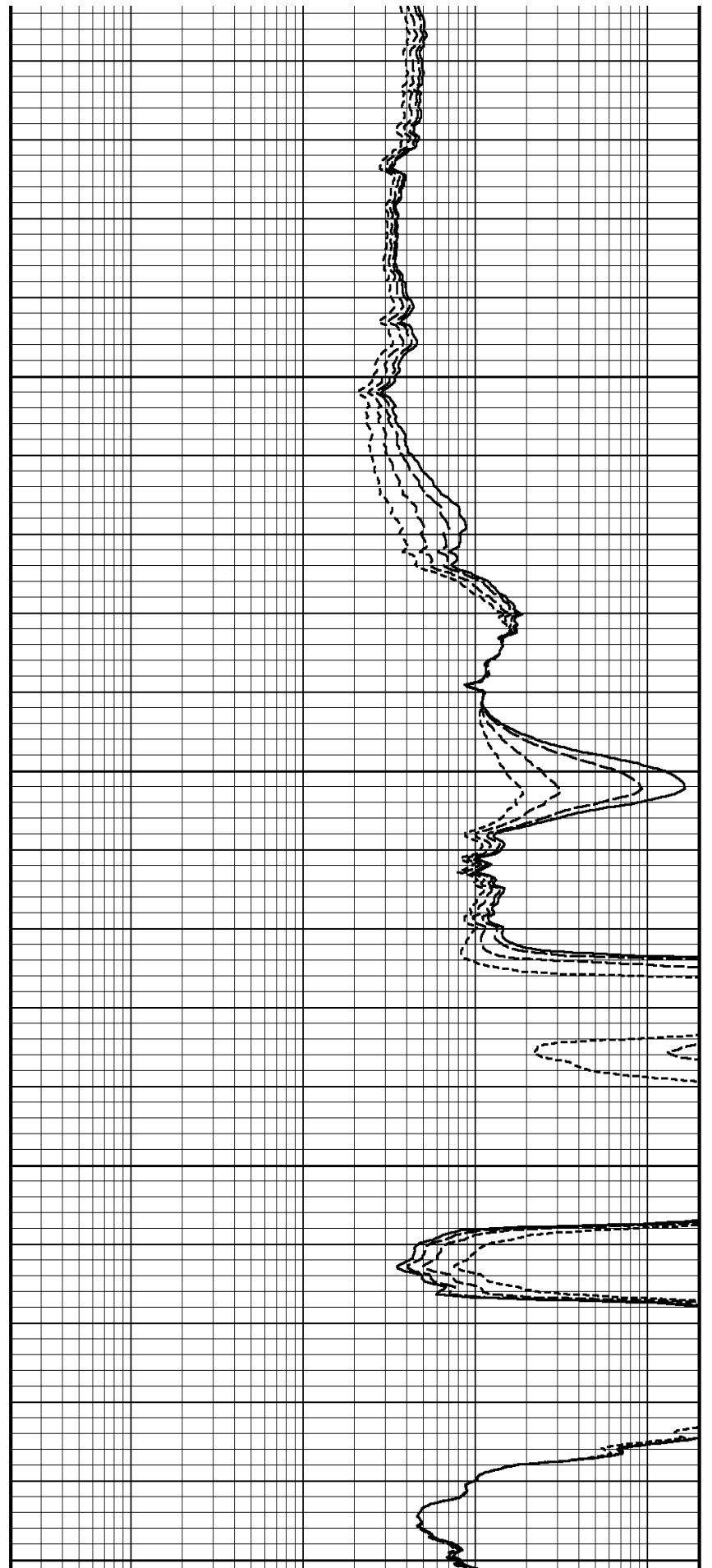
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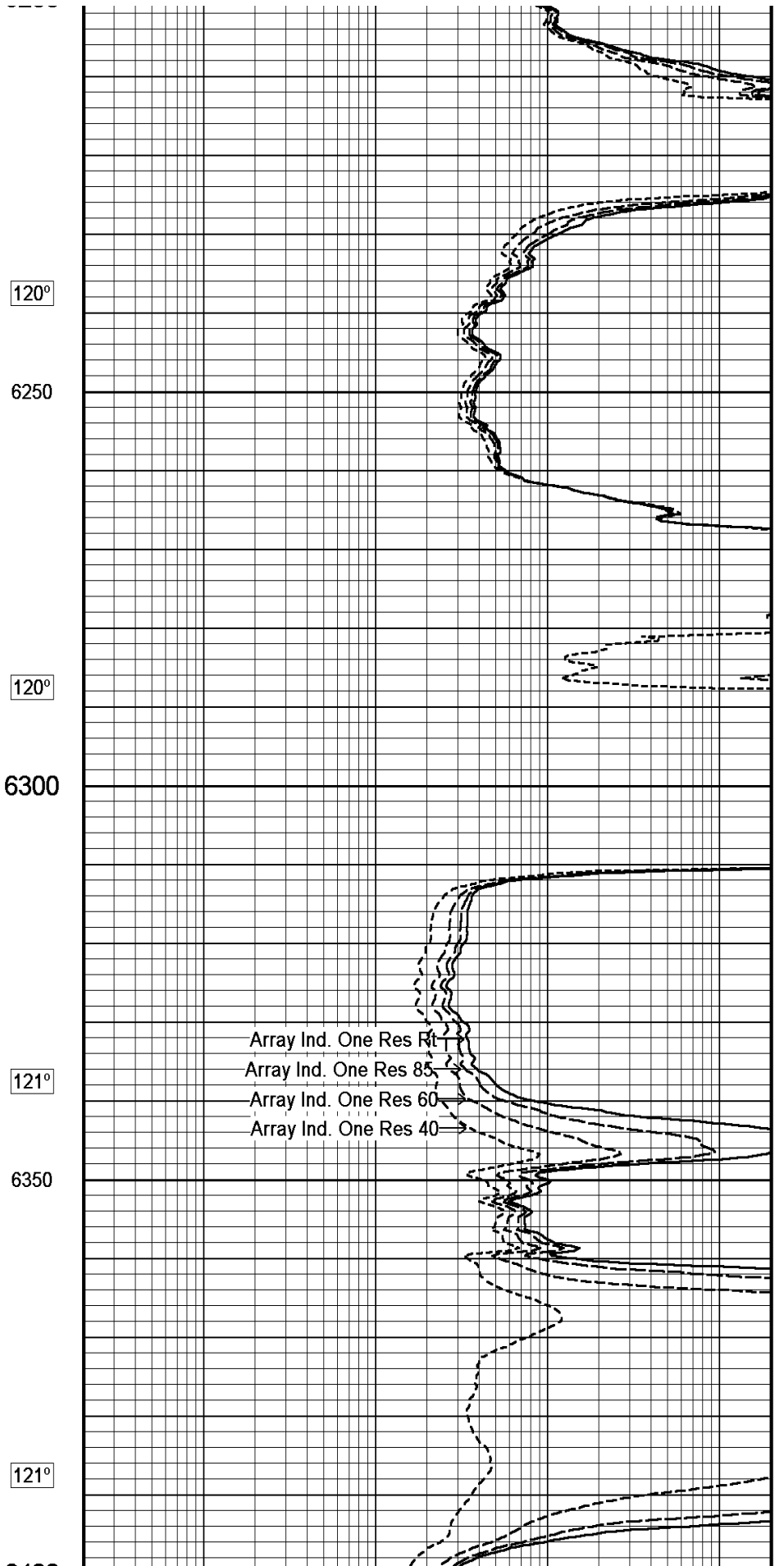
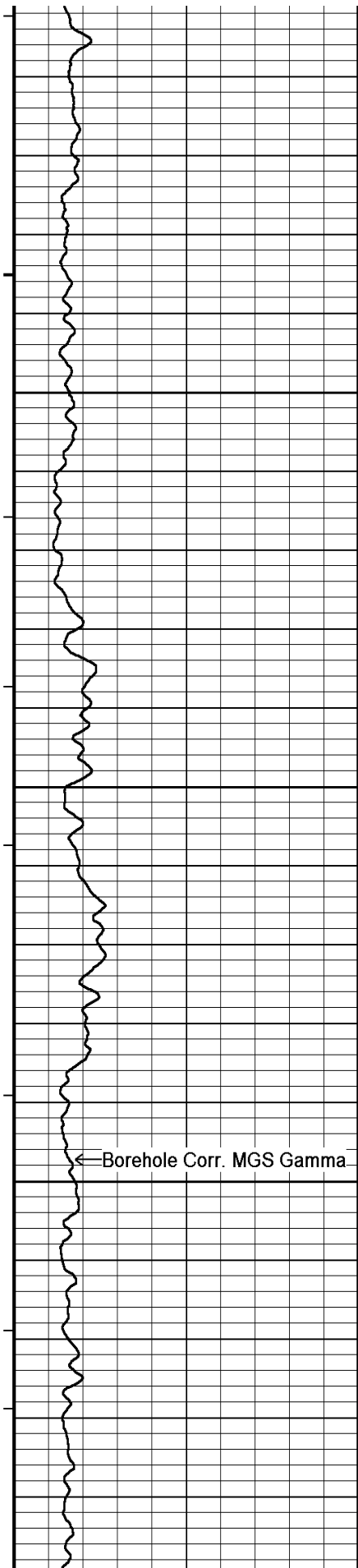
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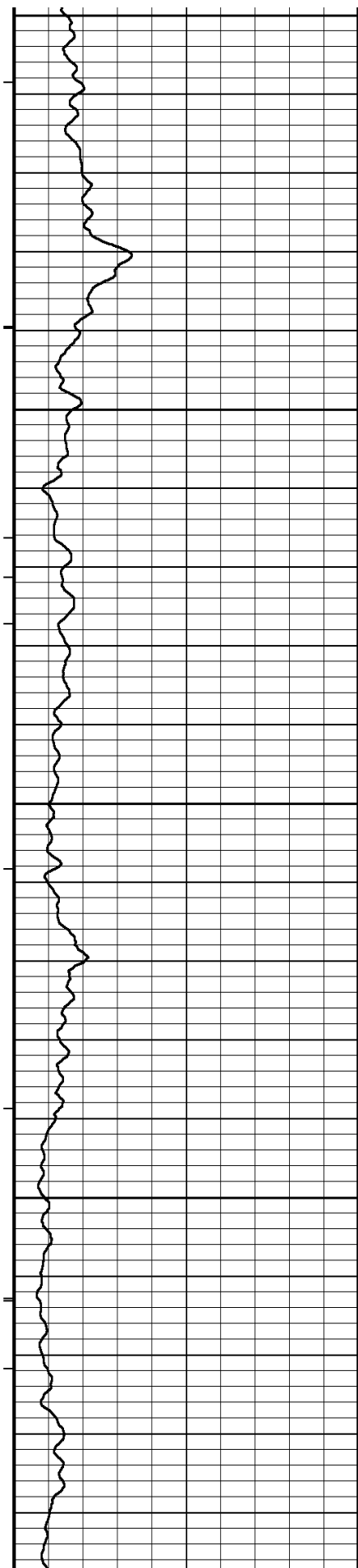
6150

120°

6200







6400

121°

6450

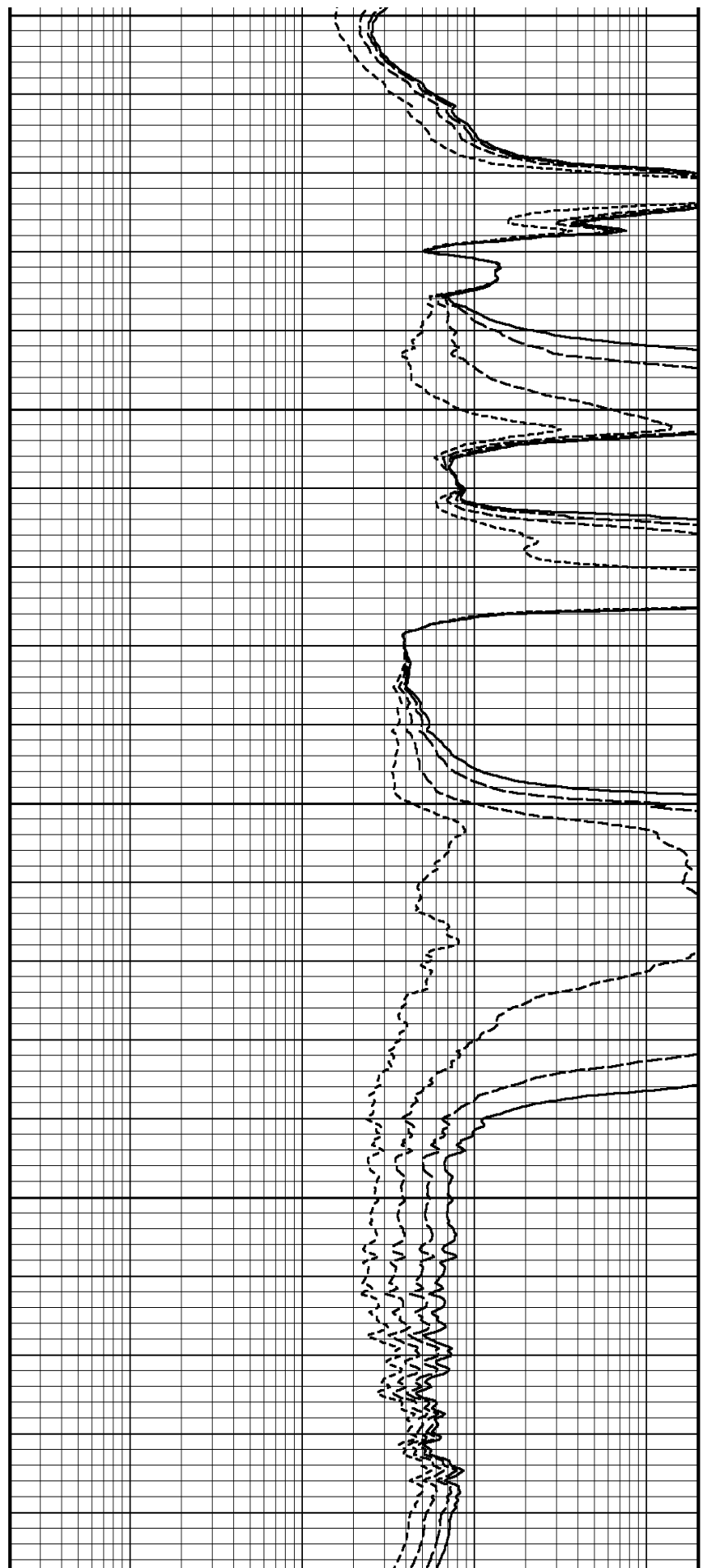
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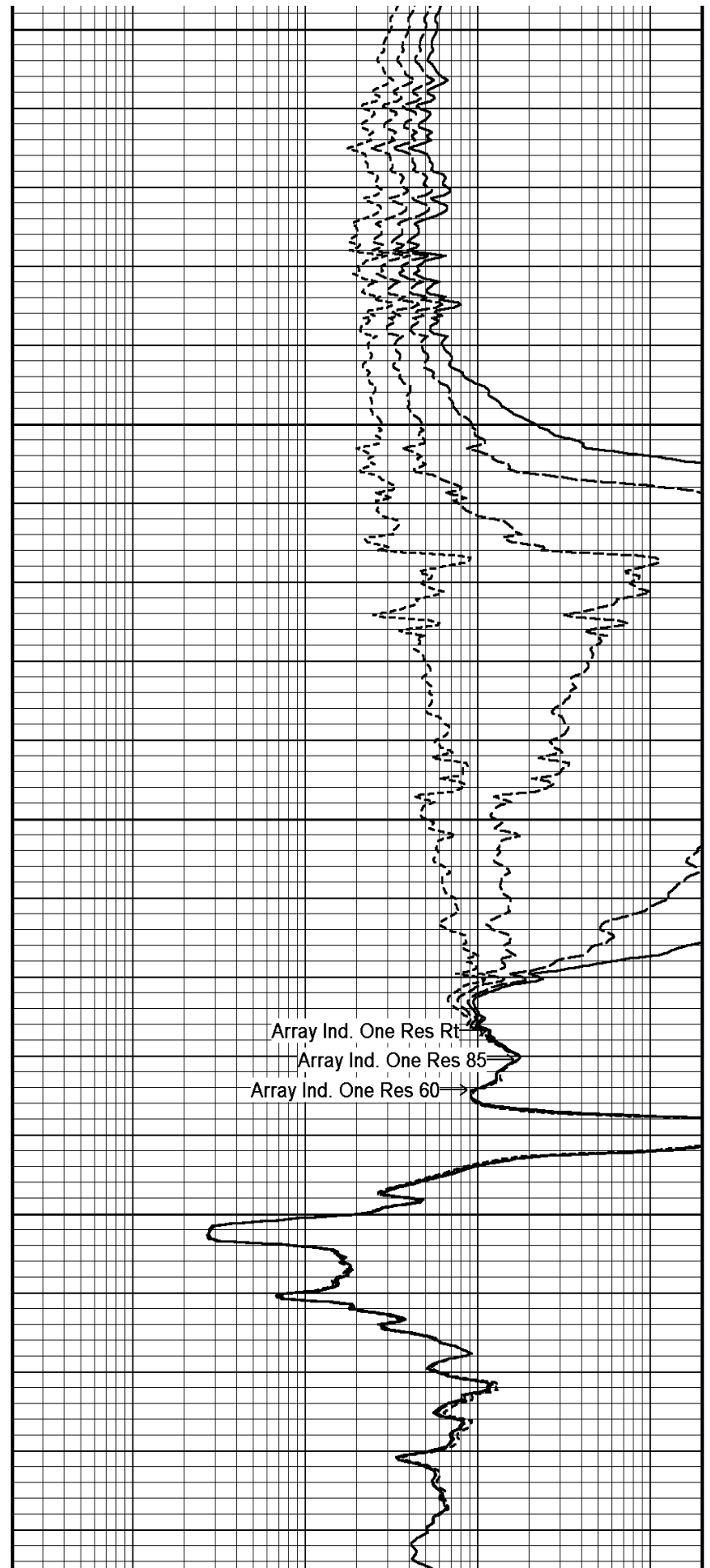
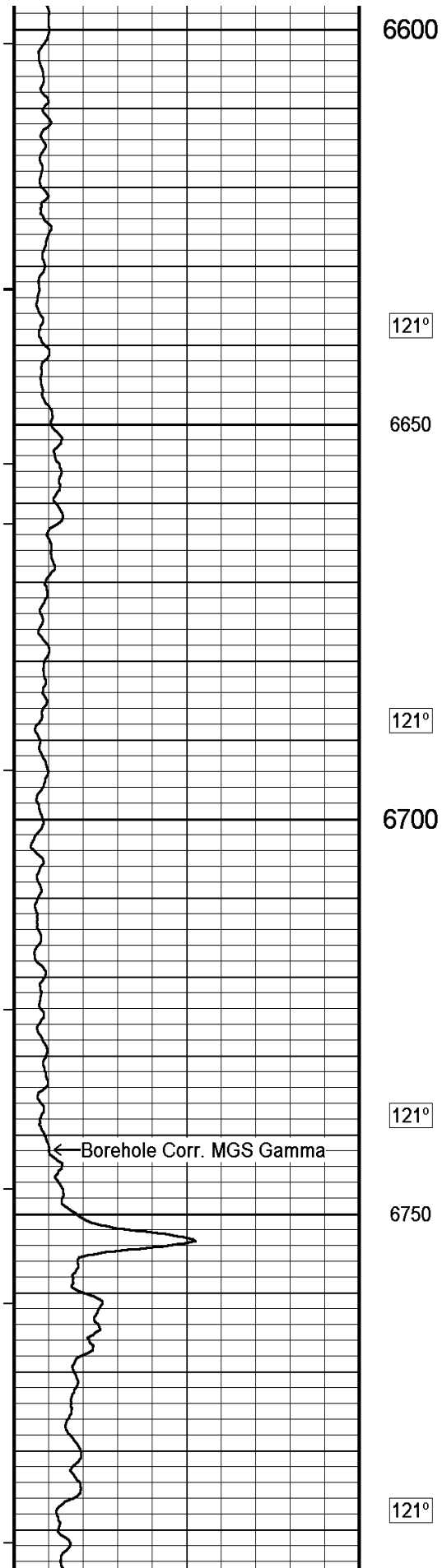
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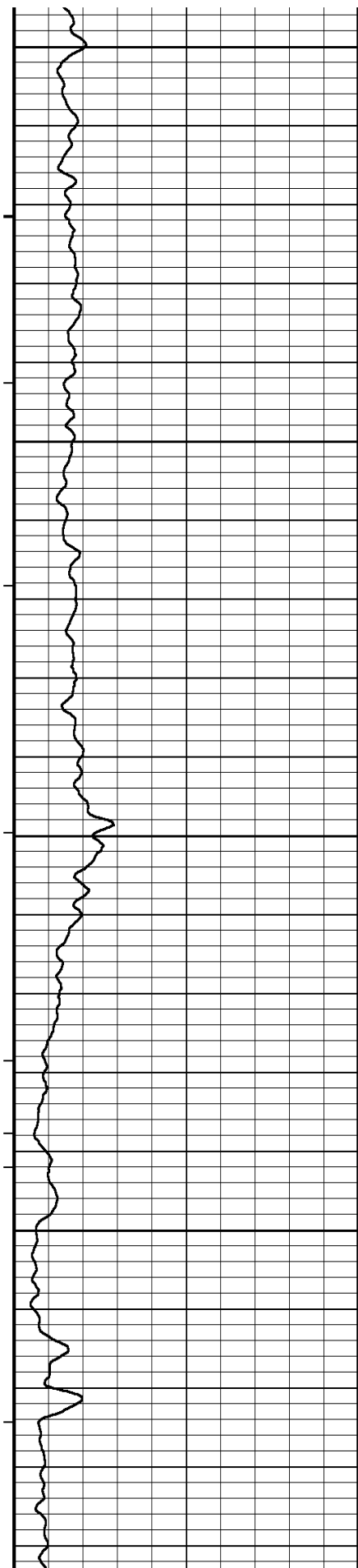
121°

6550

121°







6800

122°

6850

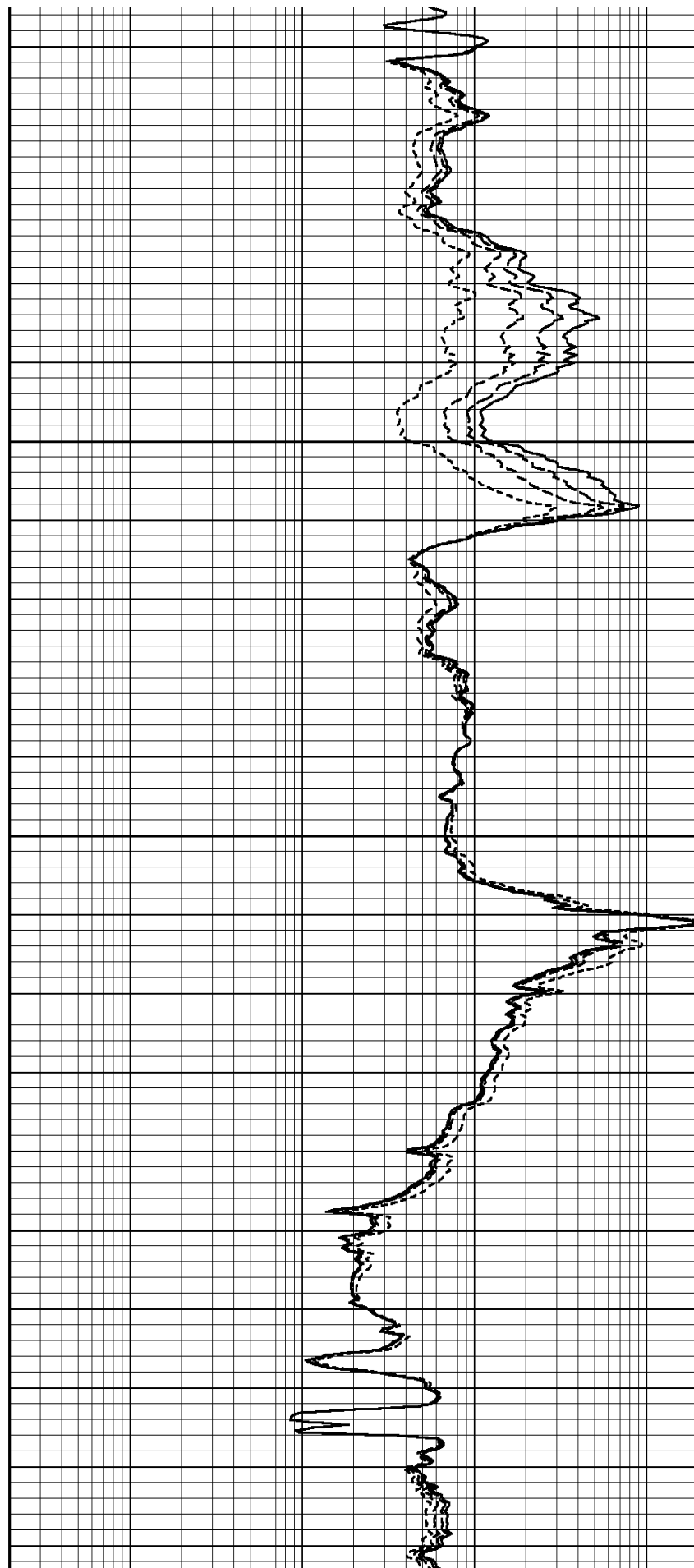
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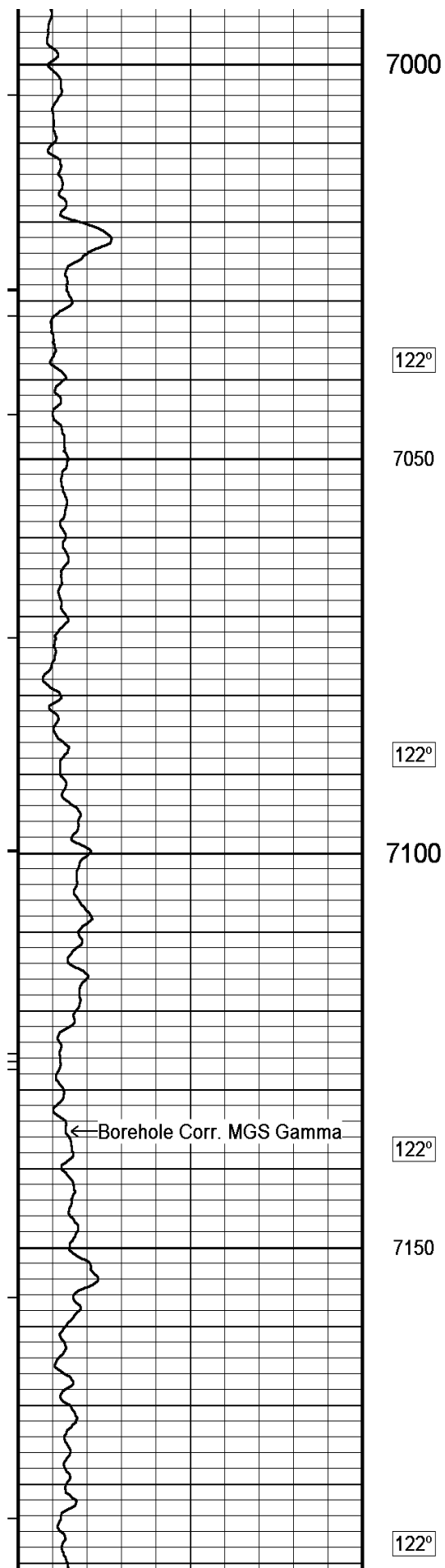
6900

122°

6950

122°





7000

122°

7050

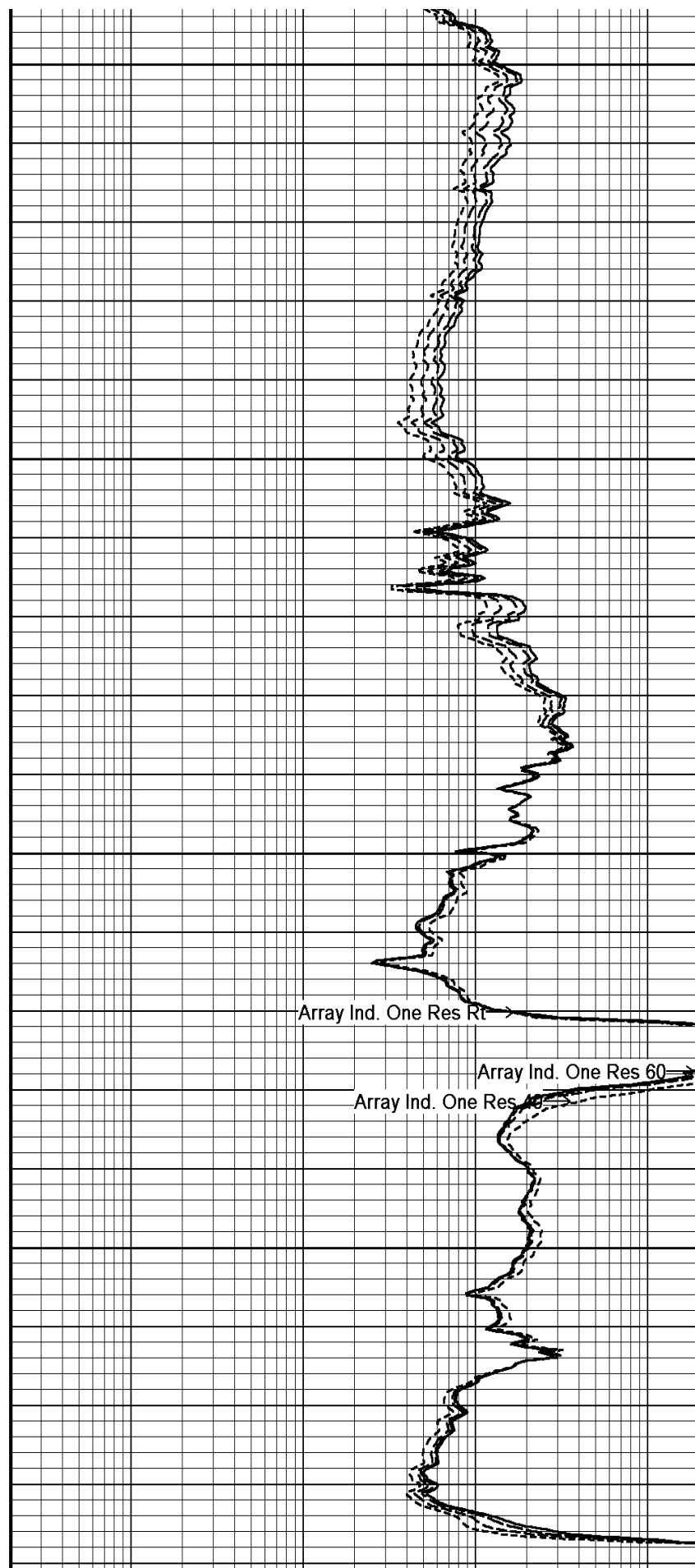
122°

7100

122°

7150

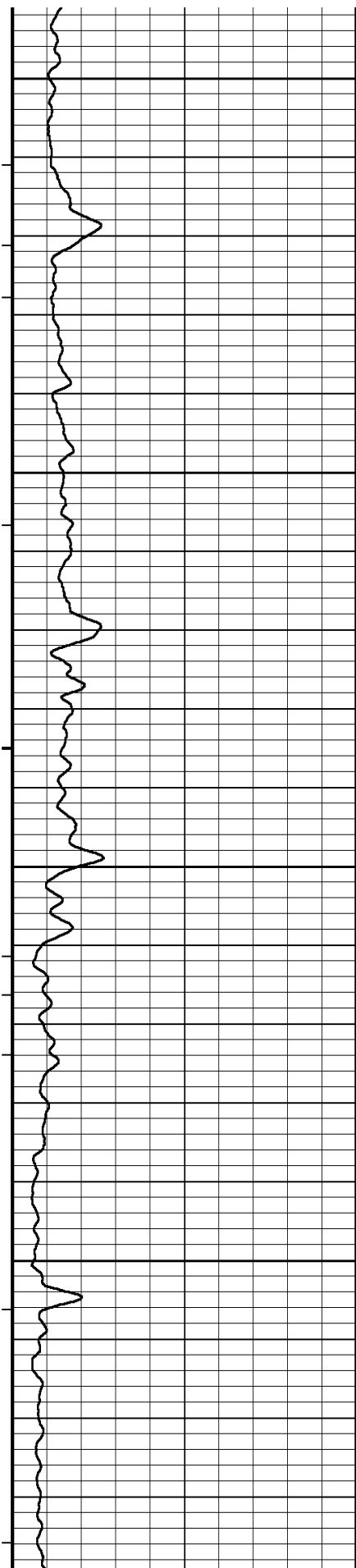
122°



Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40



7200

122°

7250

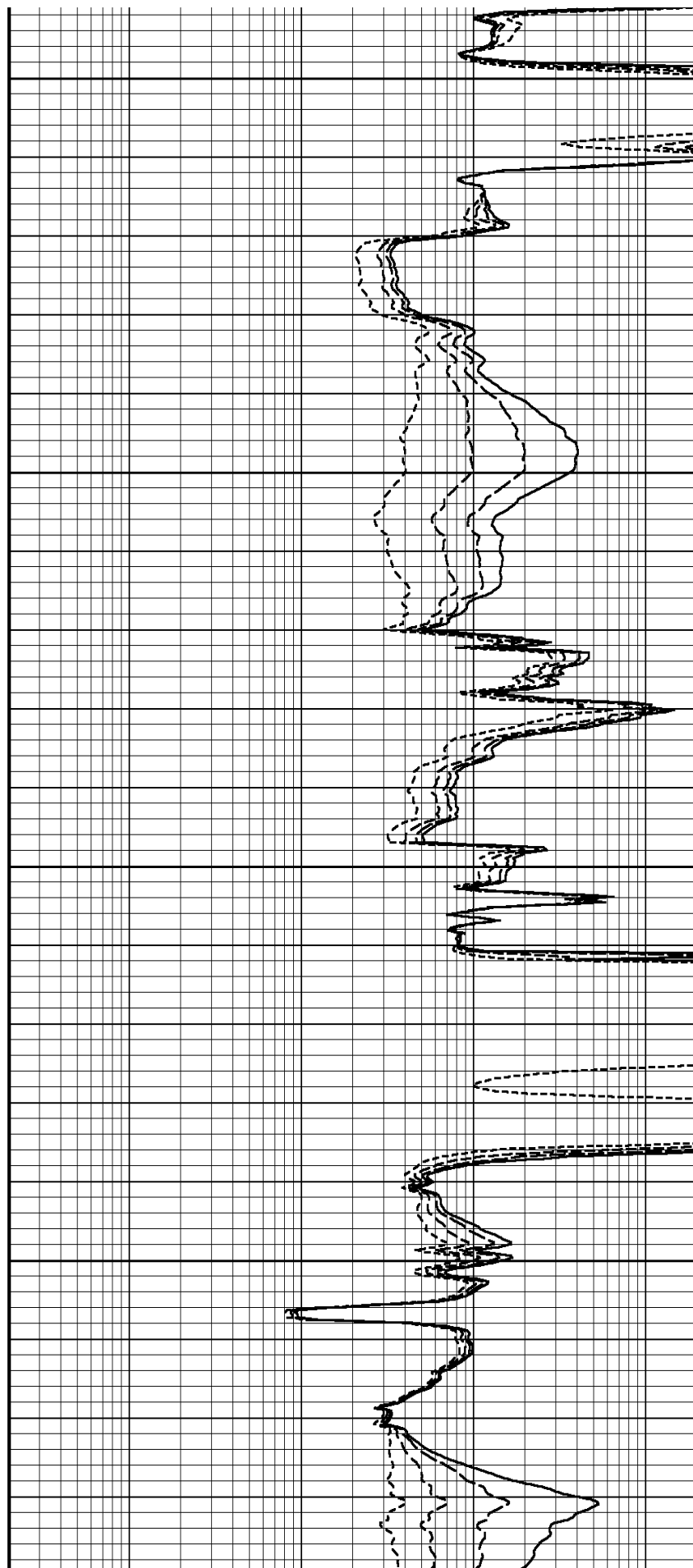
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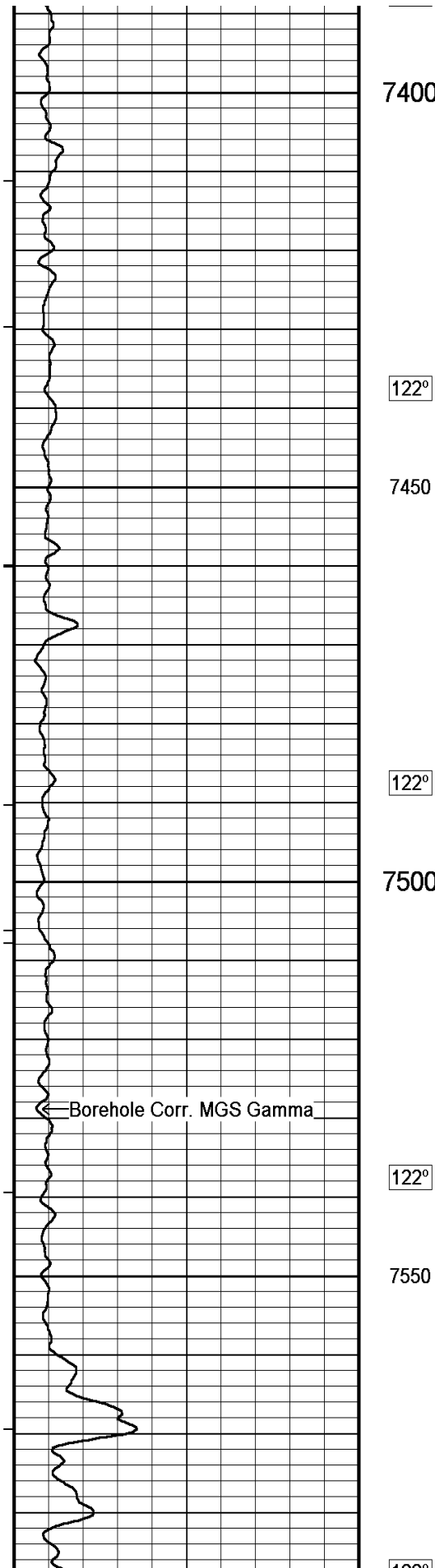
7300

122°

7350

122°





7400

122°

7450

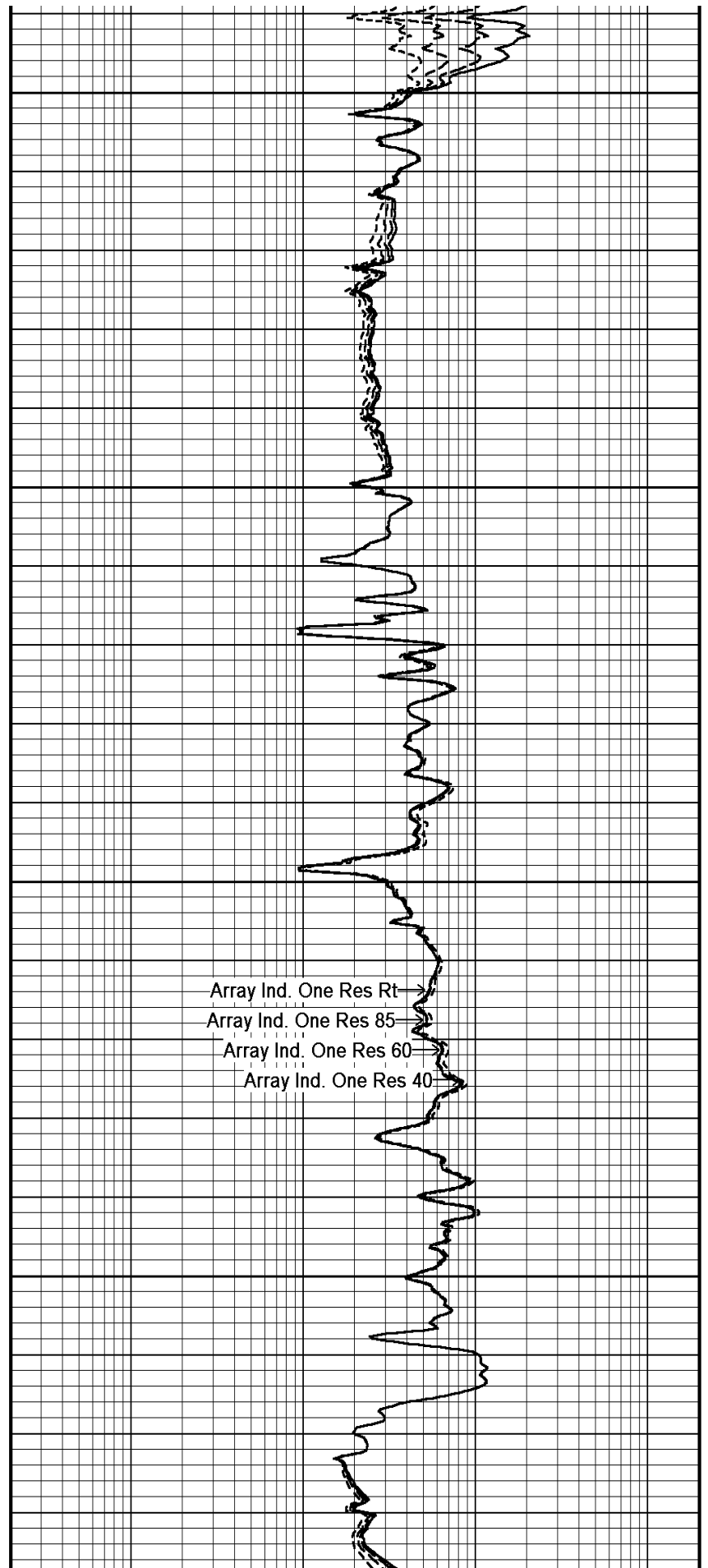
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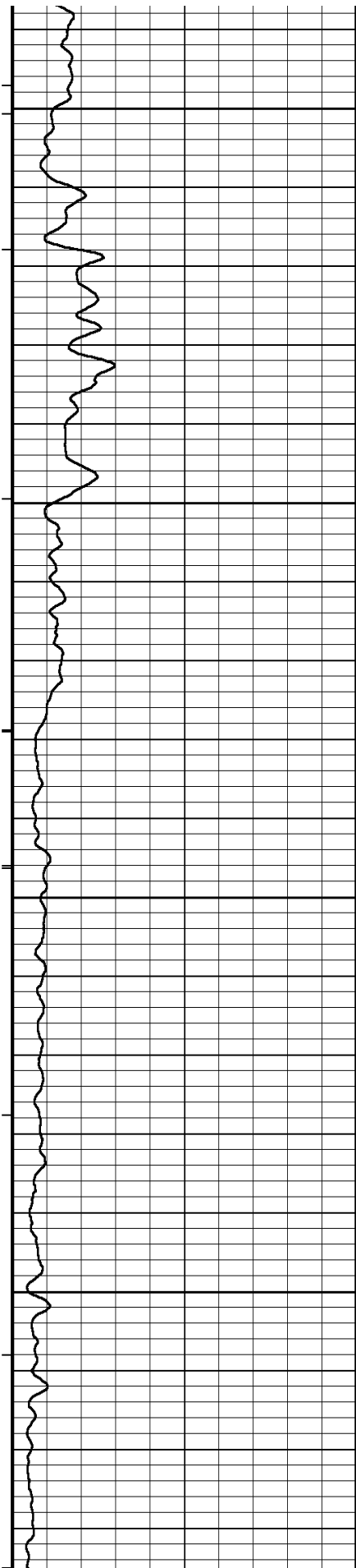
7500

122°

7550

7600





122°

7600

123°

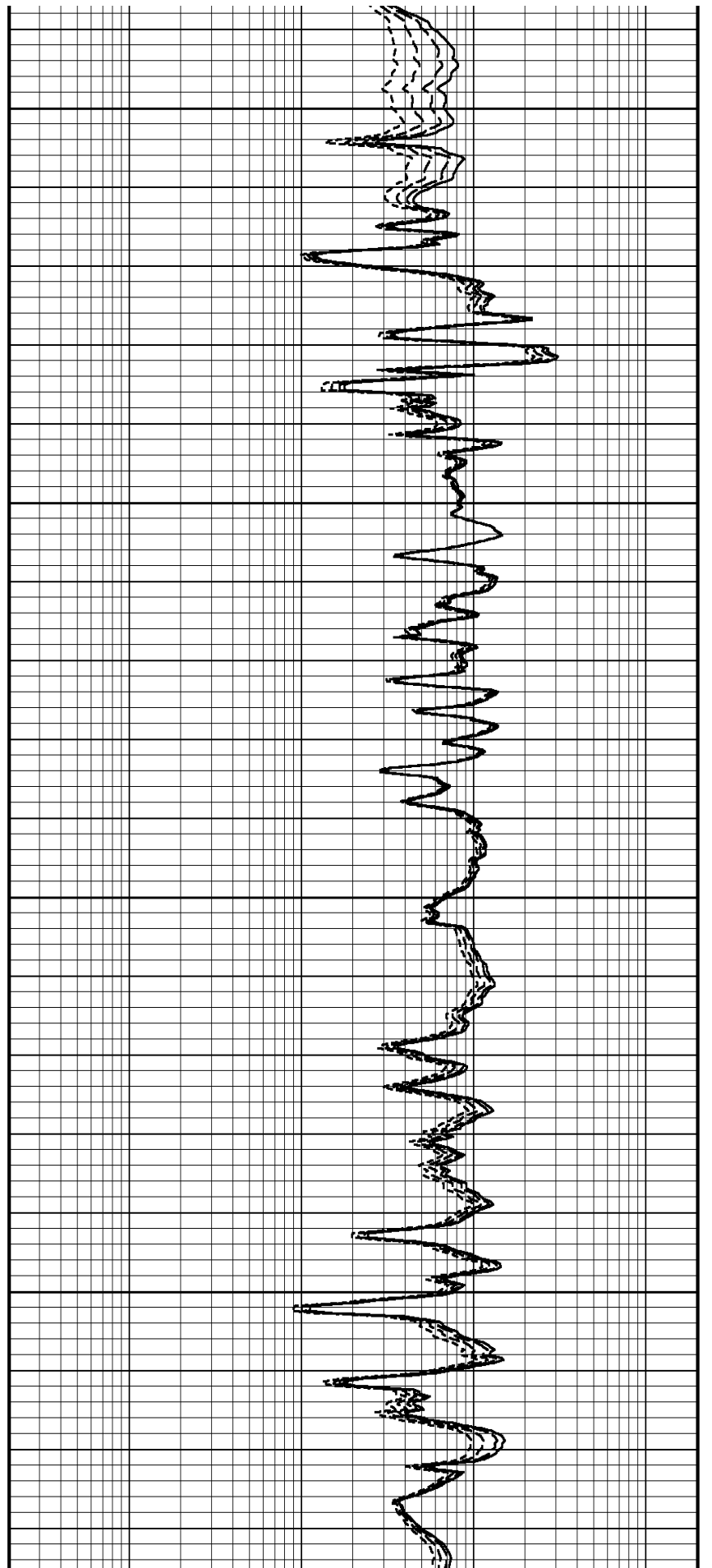
7650

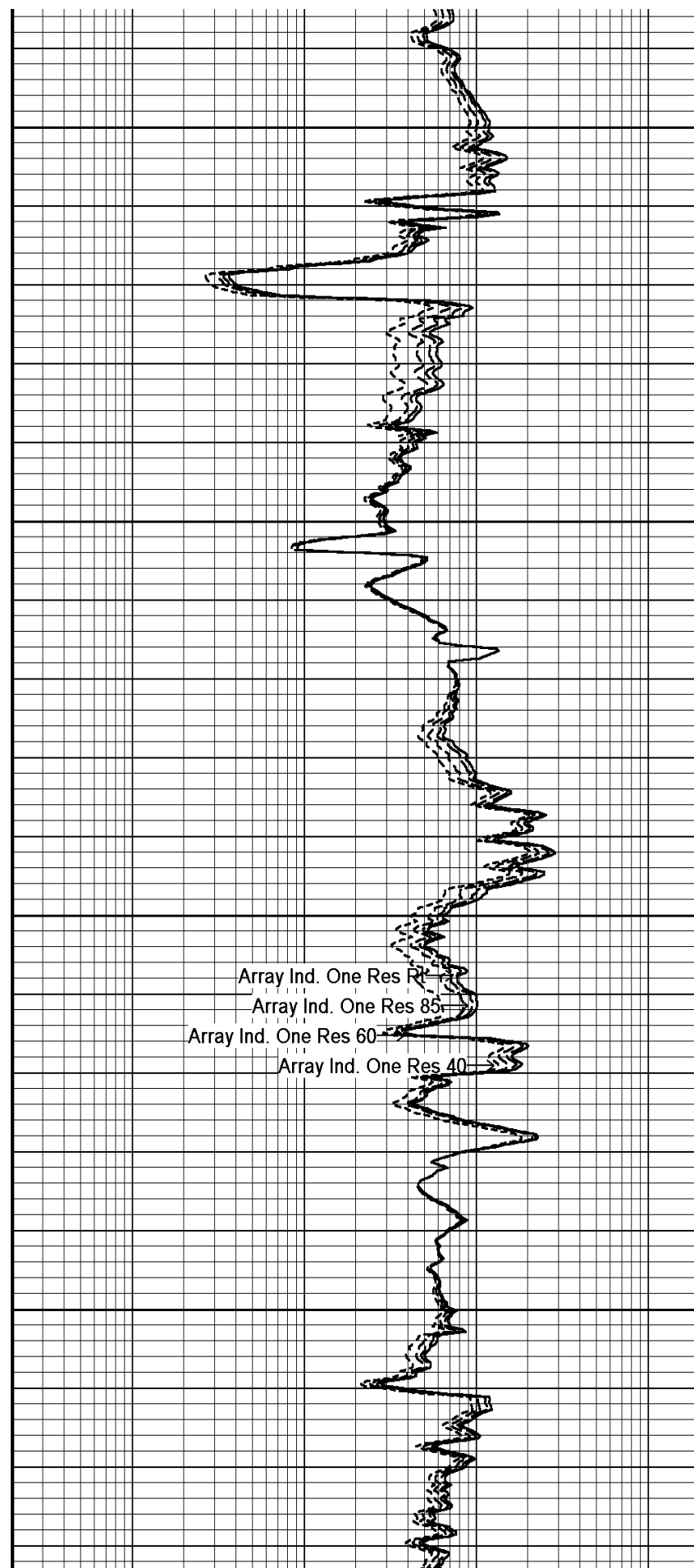
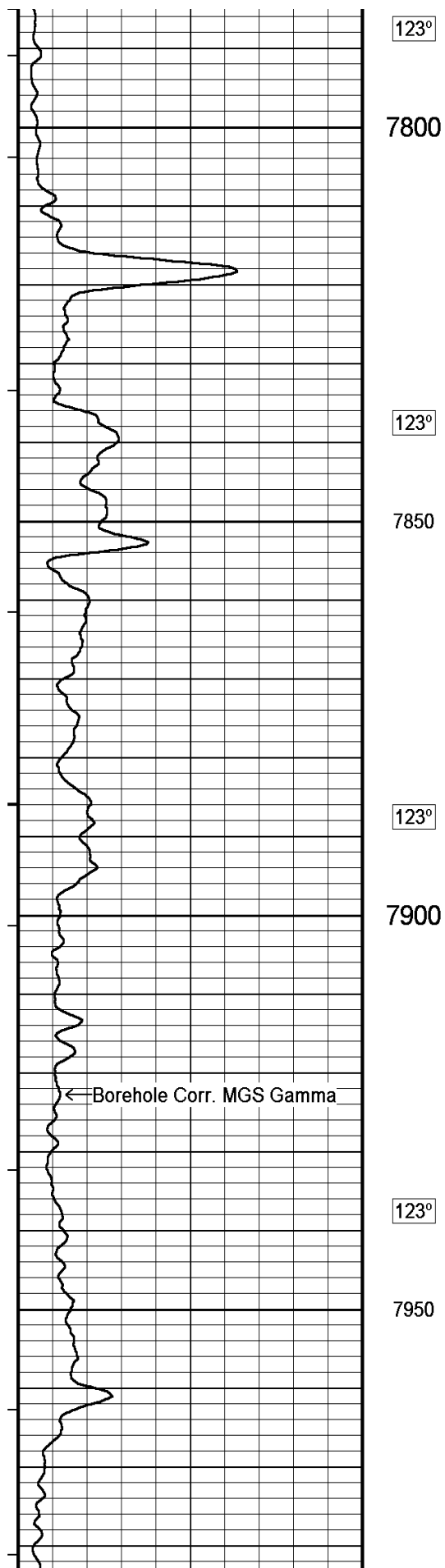
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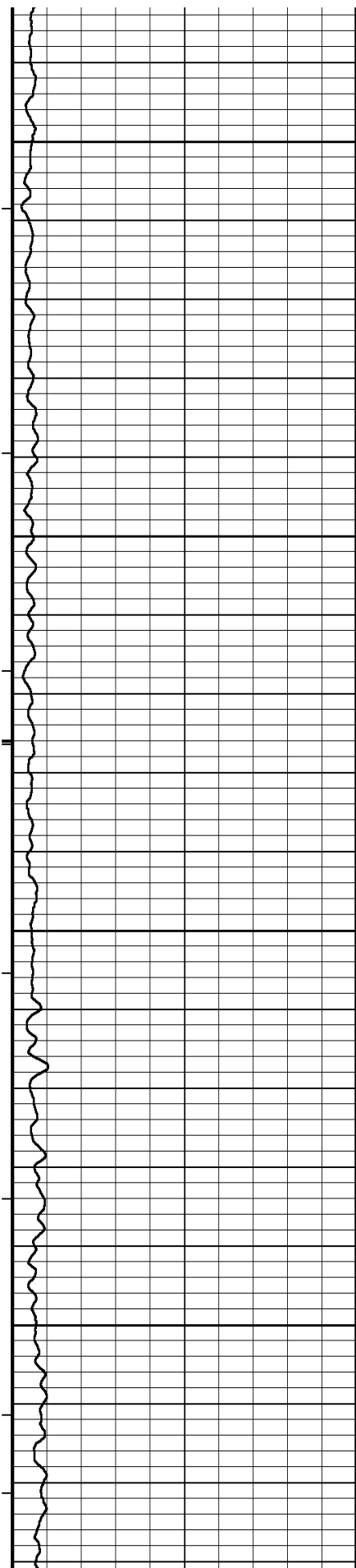
7700

123°

7750







123°

8000

123°

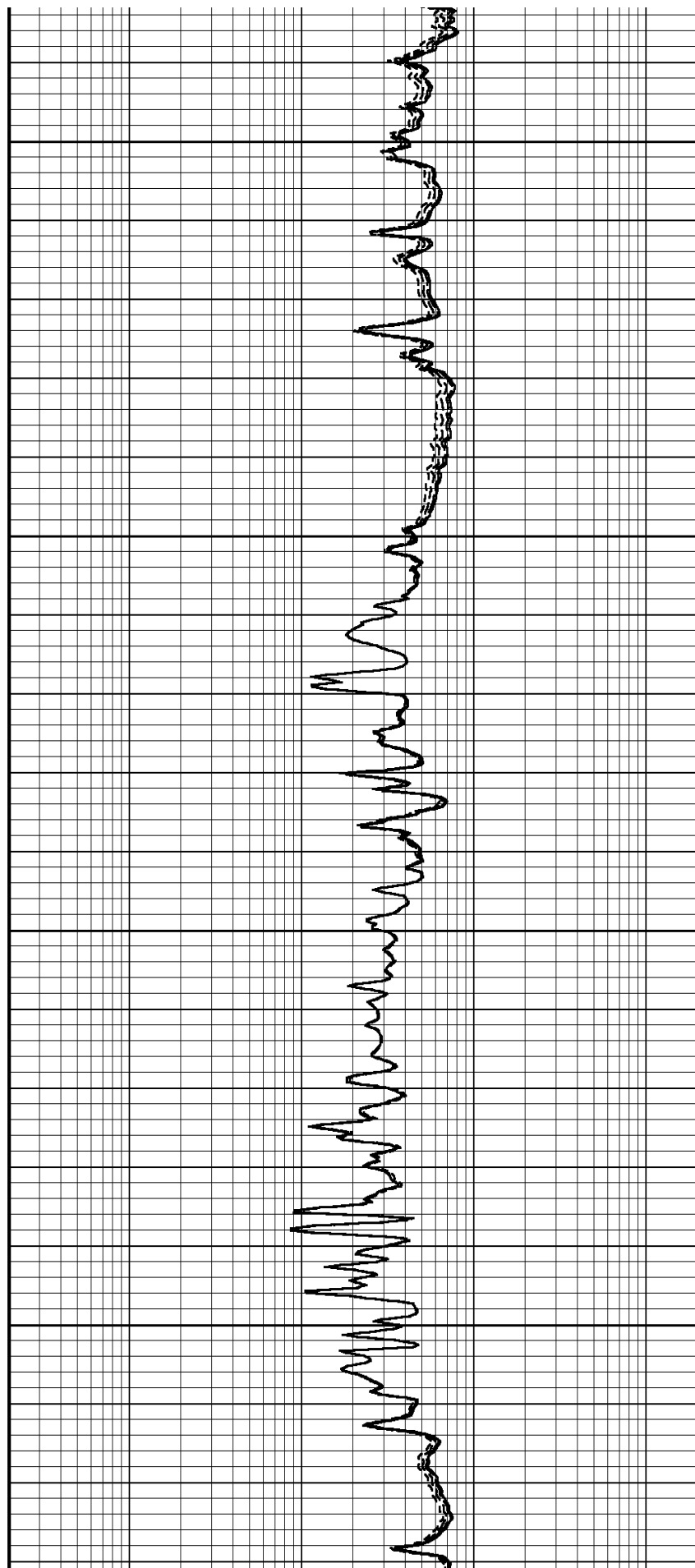
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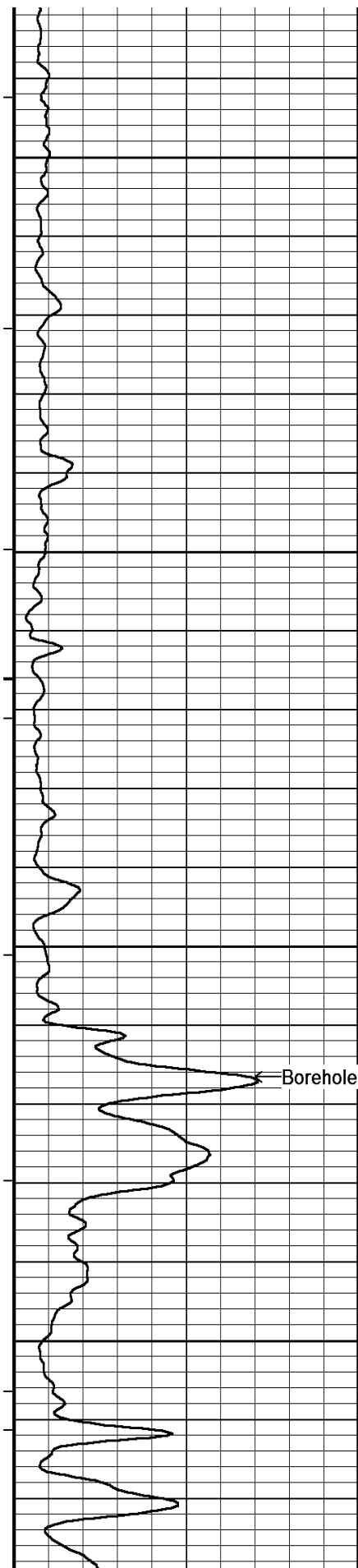
123°

8100

123°

8150





123°

8200

123°

8250

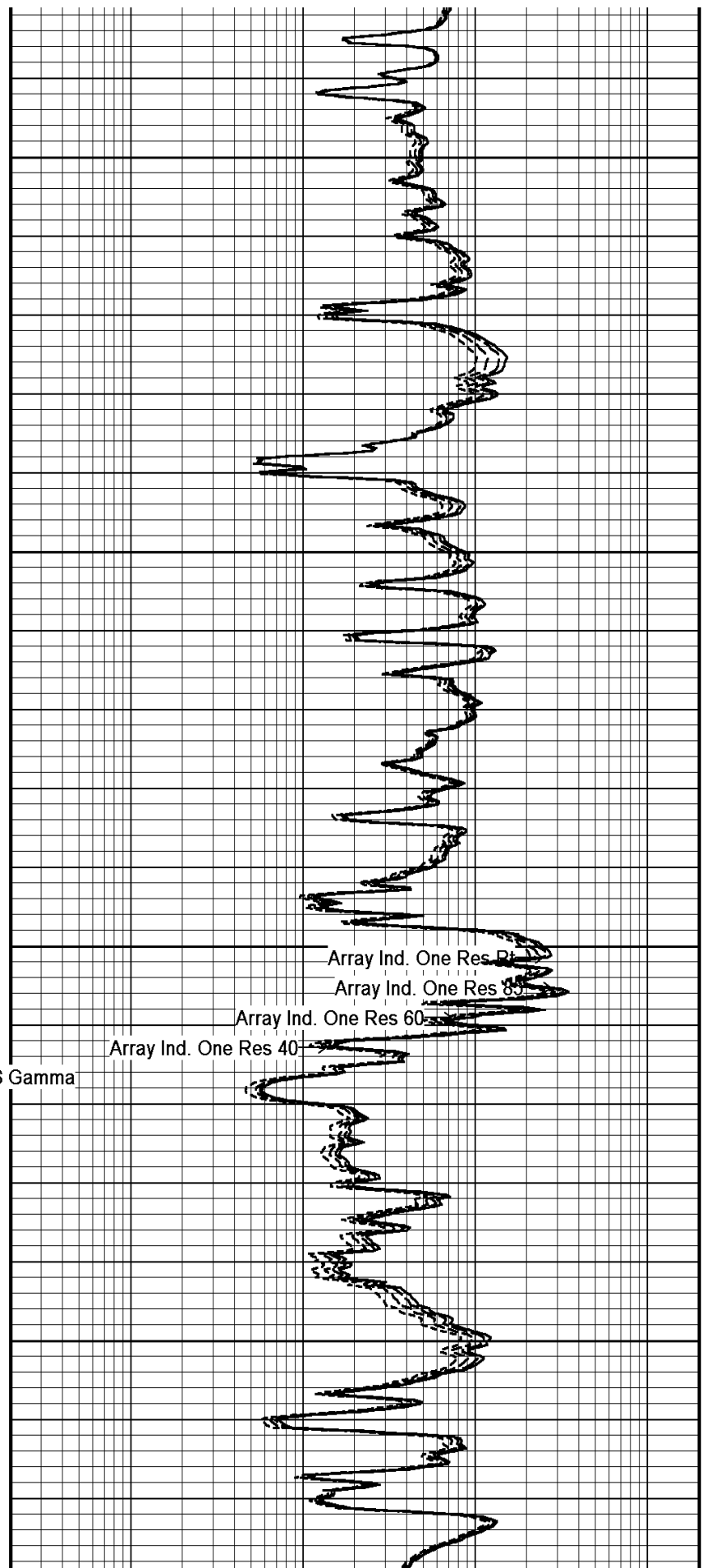
123°

8300

Borehole Corr. MGS Gamma

123°

8350

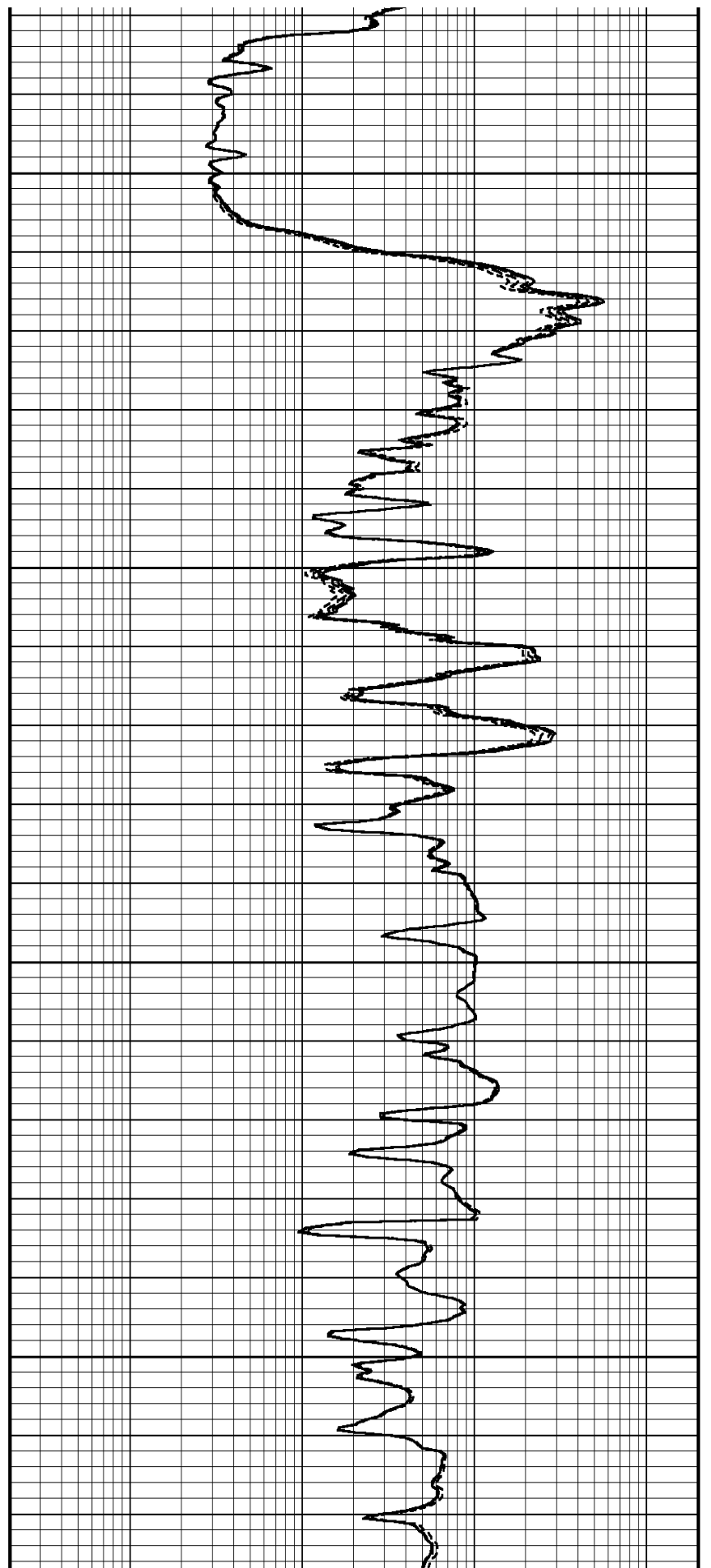
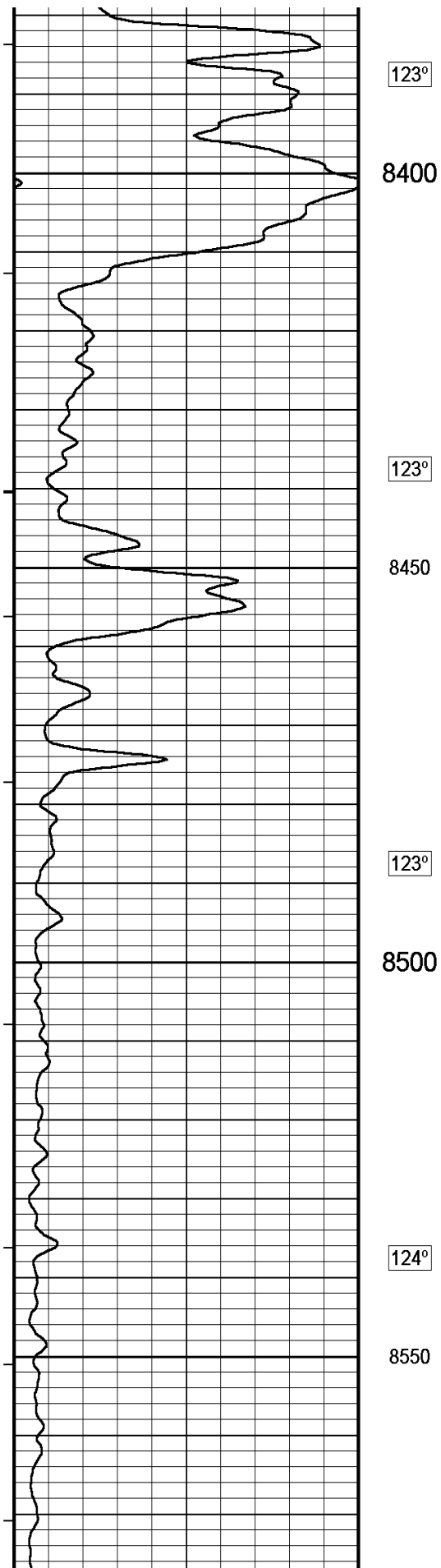


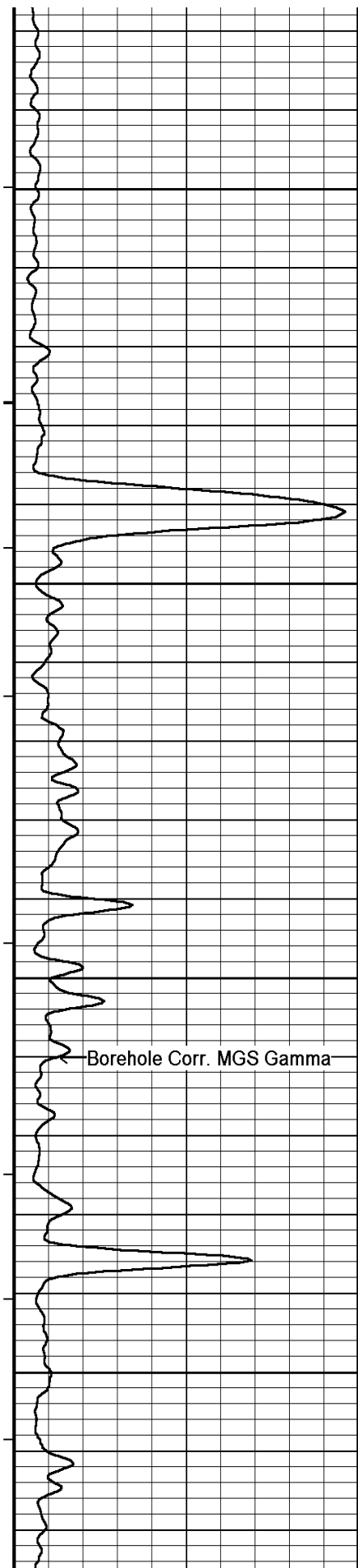
Array Ind. One Res 40

Array Ind. One Res 60

Array Ind. One Res 80

Array Ind. One Res 100





124°

8600

123°

8650

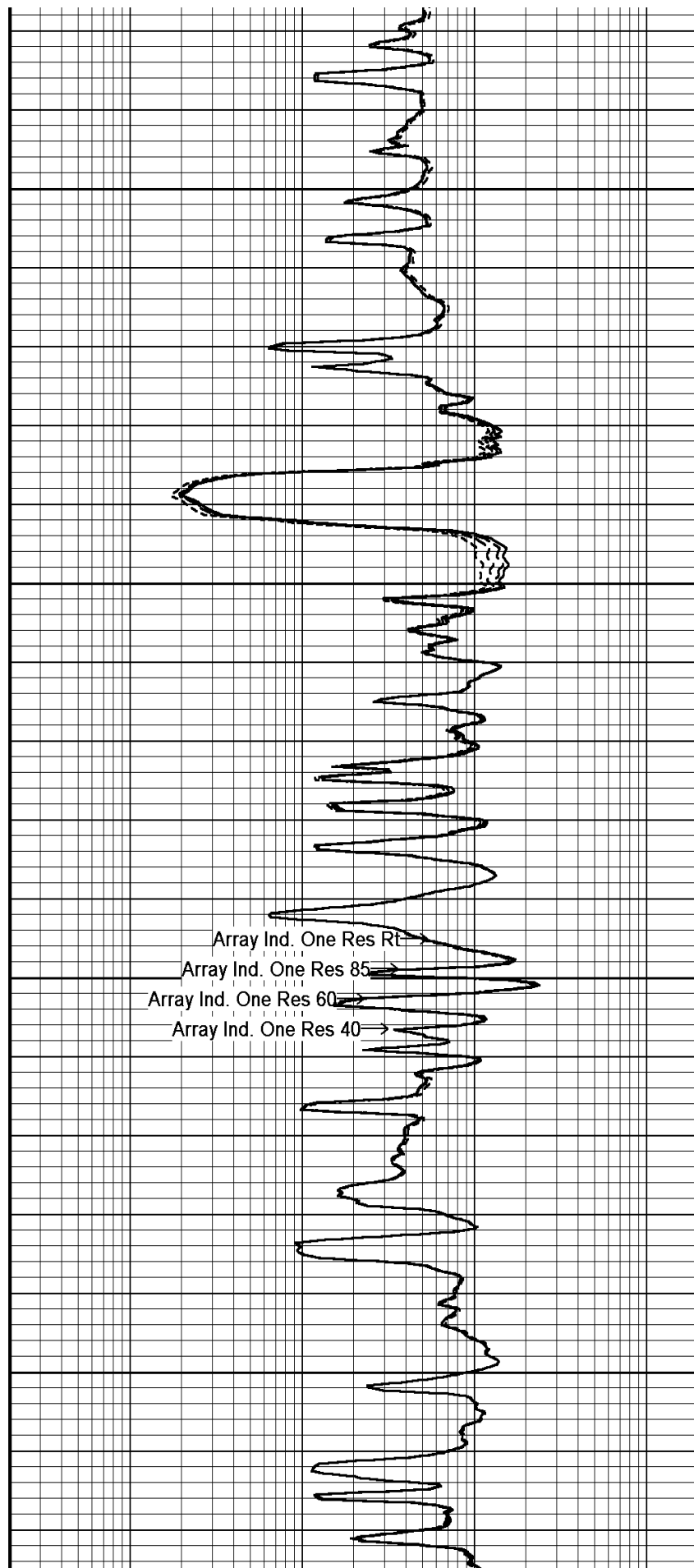
123°

8700

Borehole Corr. MGS Gamma

123°

8750

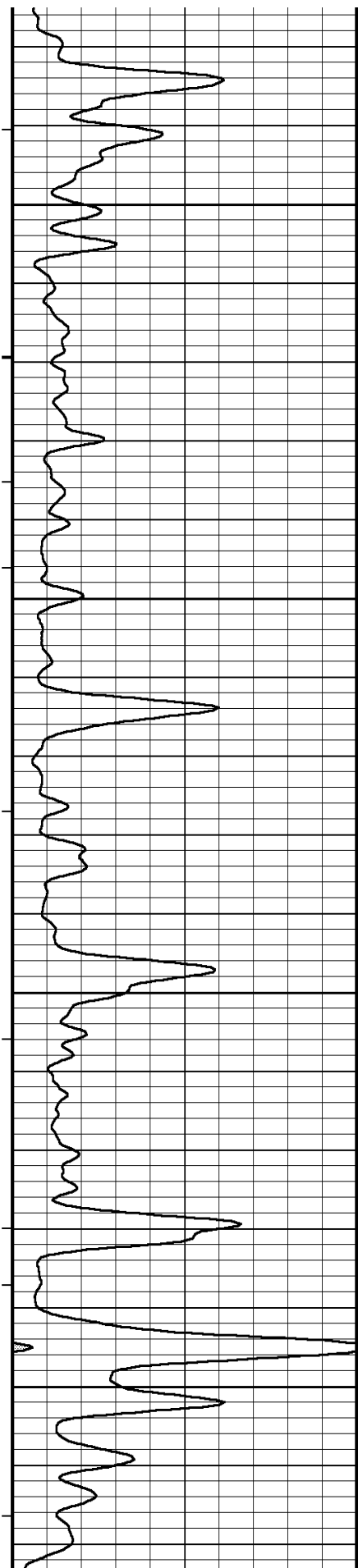


Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40



123°

8800

123°

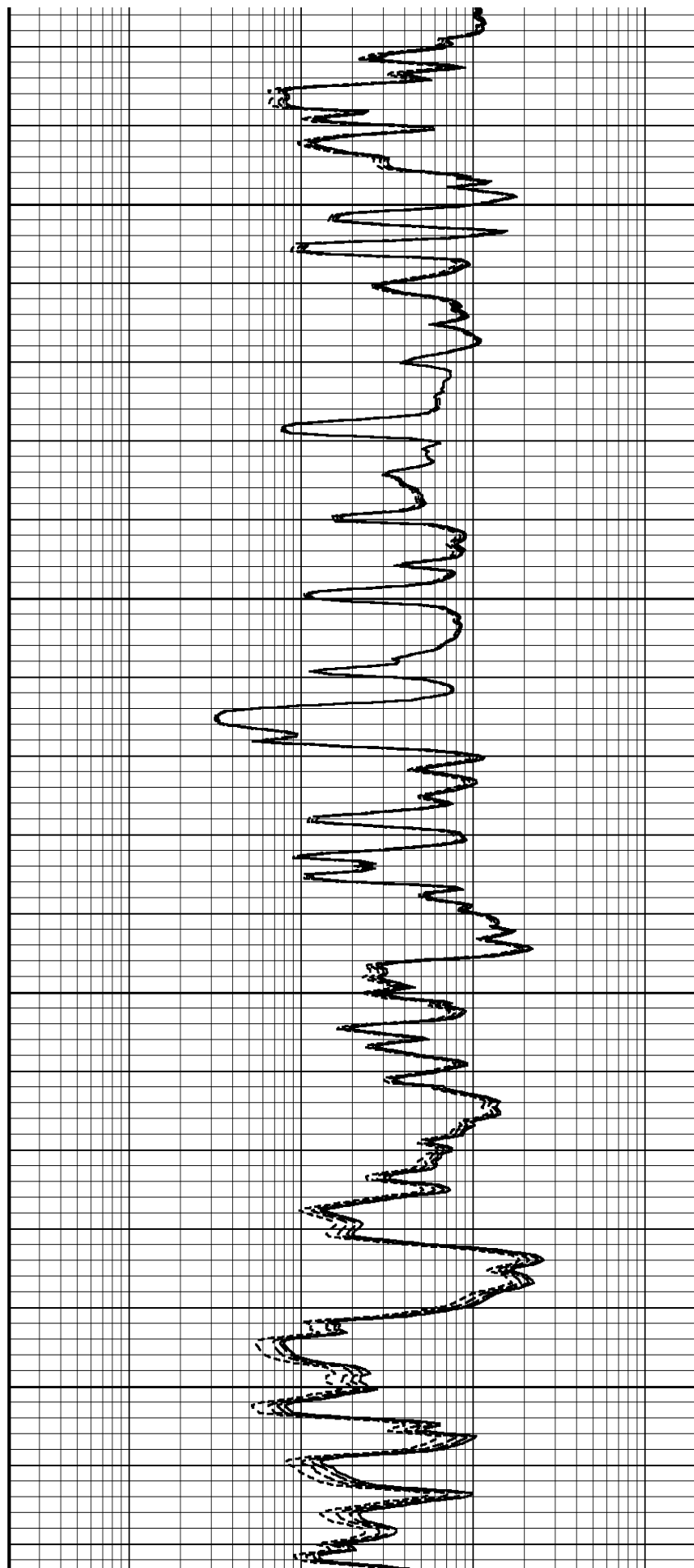
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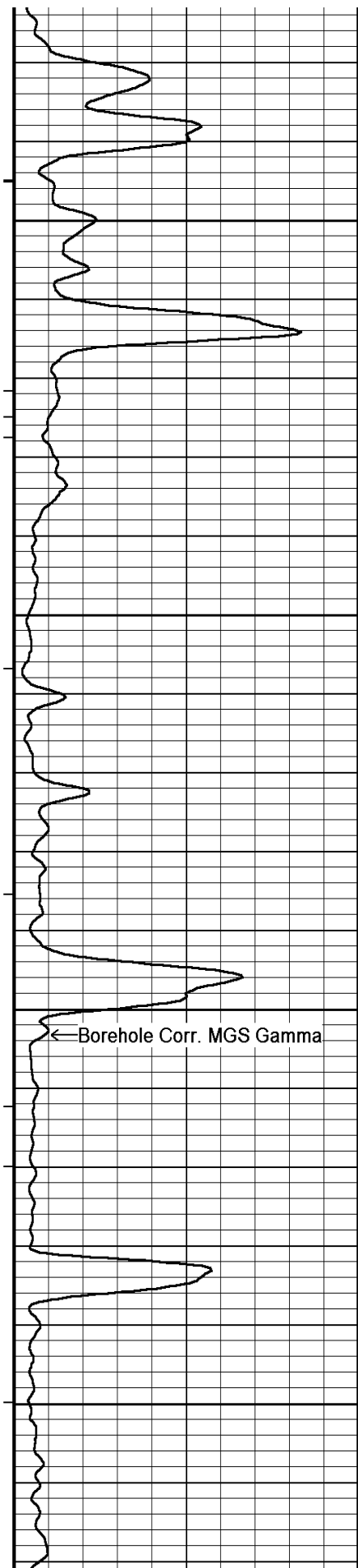
123°

8900

123°

8950





123°

9000

123°

9050

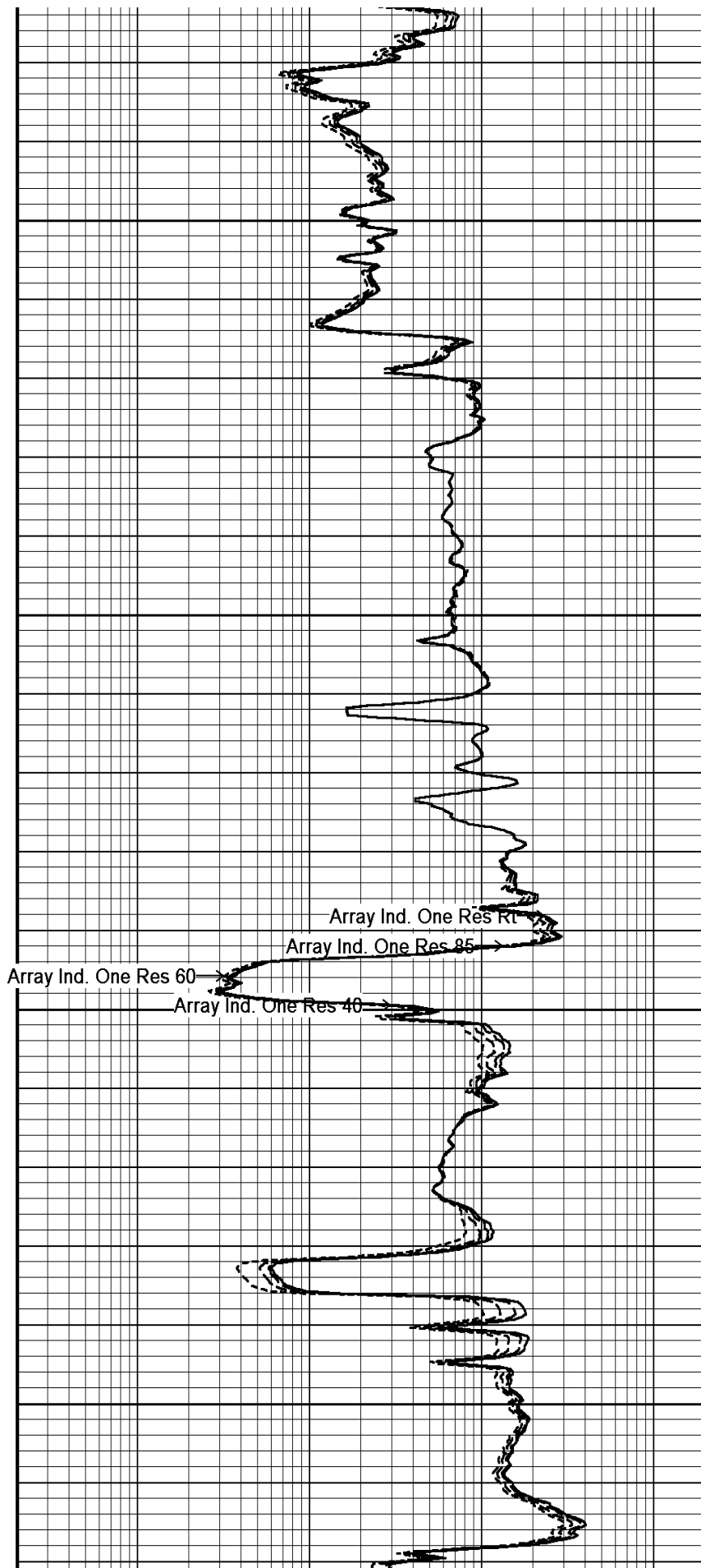
123°

9100

← Borehole Corr. MGS Gamma

123°

9150

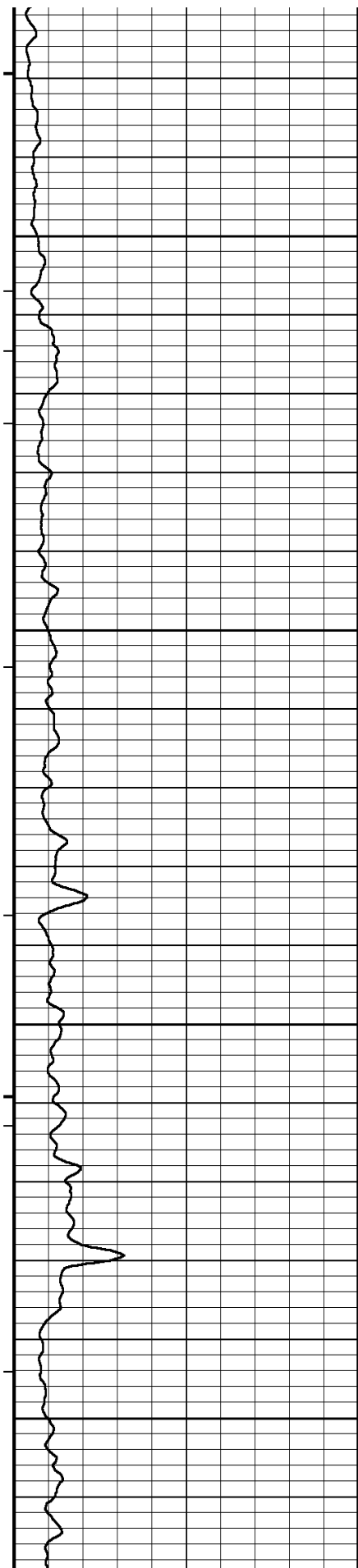


Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40



122°

9200

122°

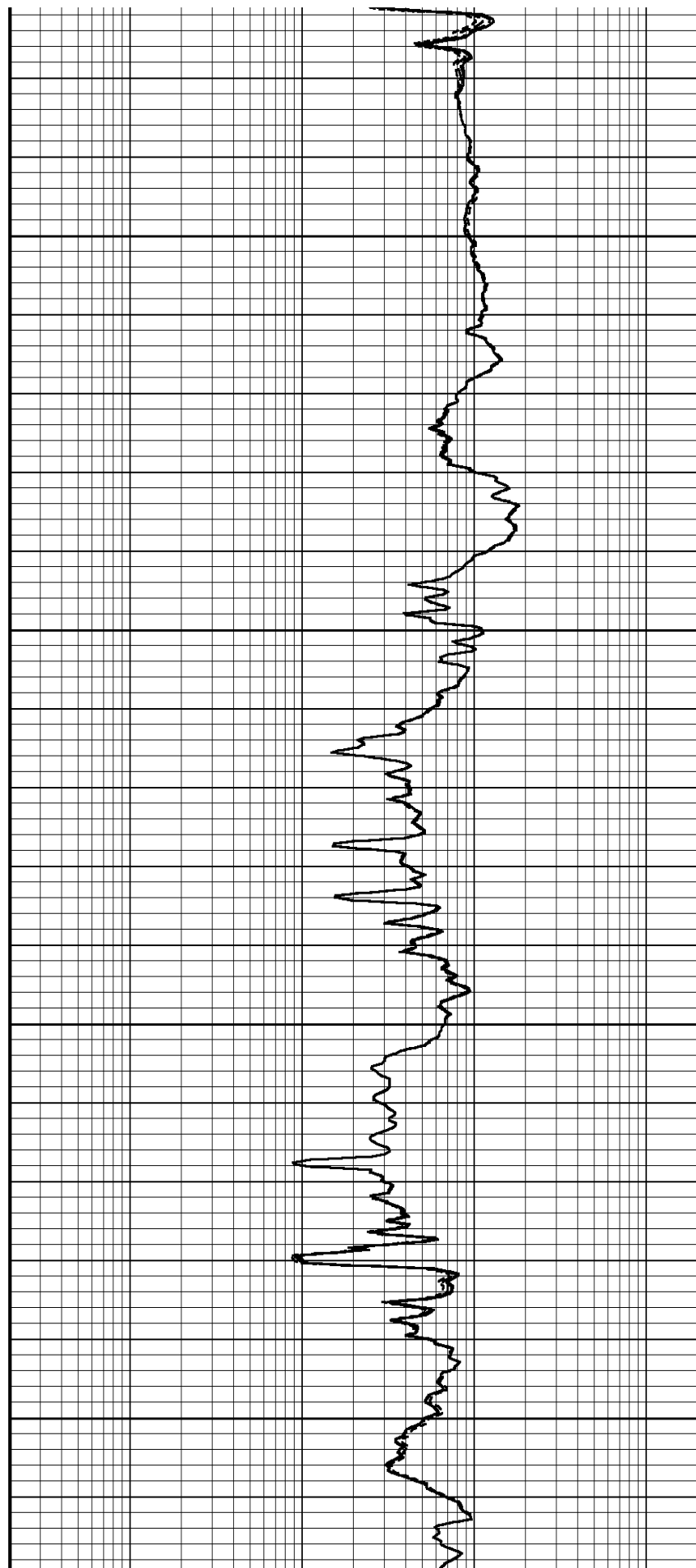
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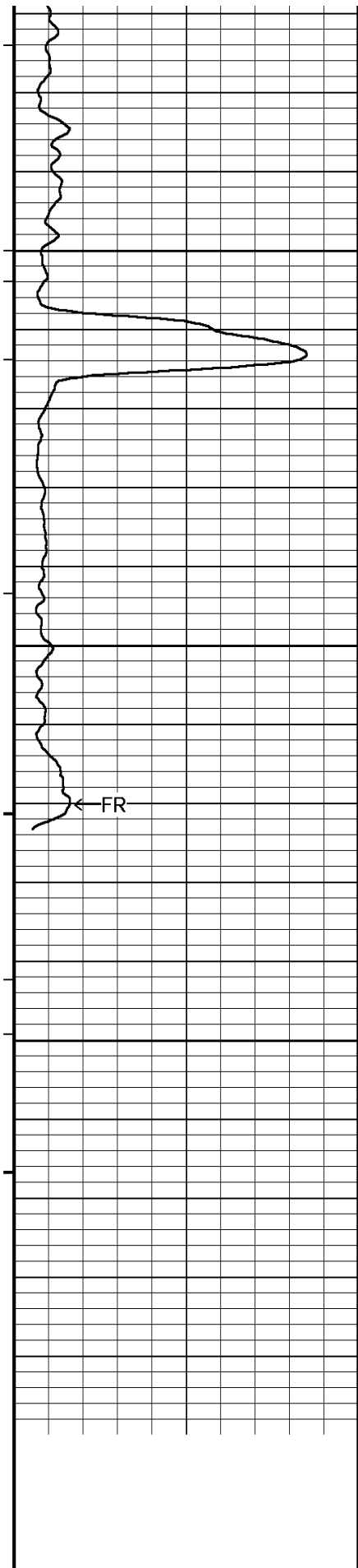
122°

9300

122°

9350





122°

9400

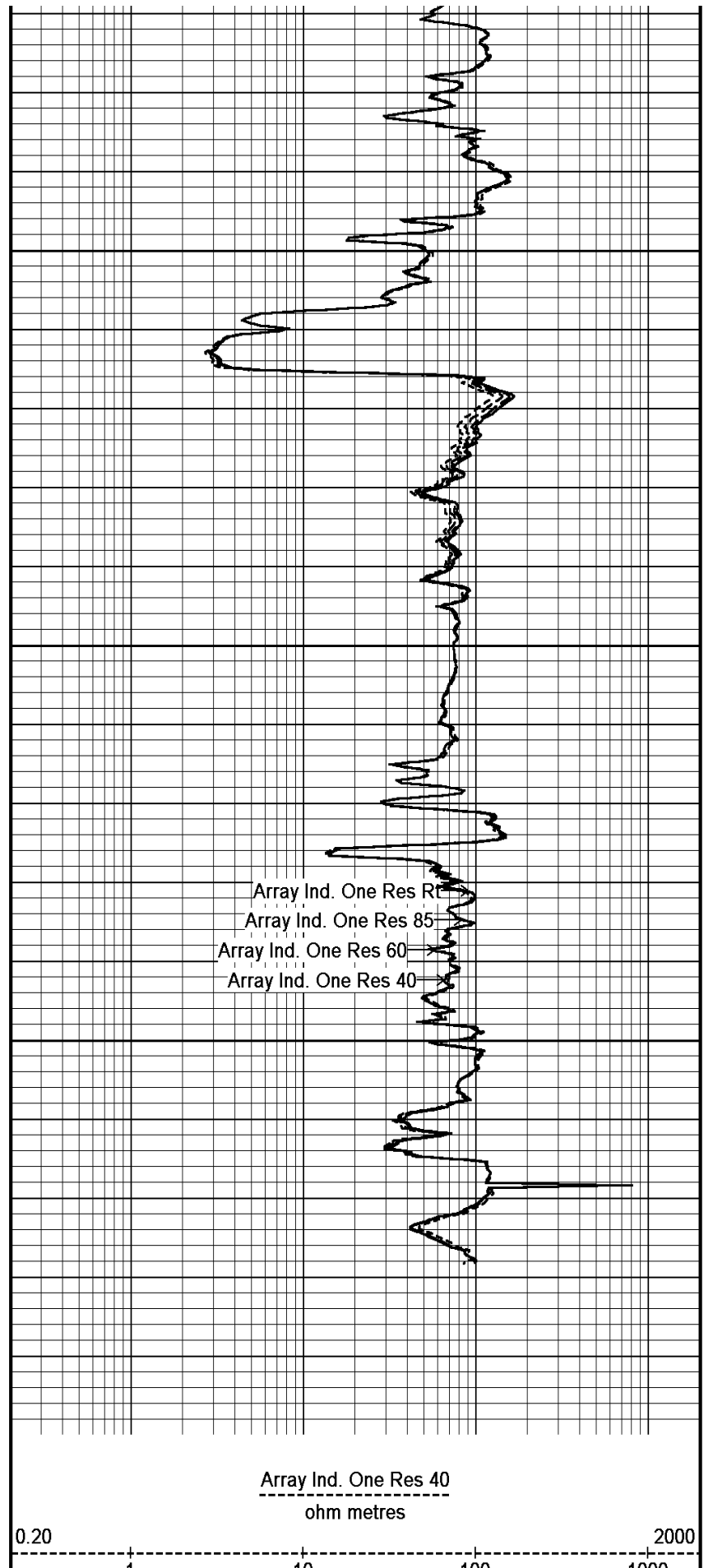
123°

9450

← FR

9500

9548
Depth
In
Feet



Array Ind. One Res Rt
Array Ind. One Res 85
Array Ind. One Res 60
Array Ind. One Res 40

Array Ind. One Res 40
ohm metres

0.20

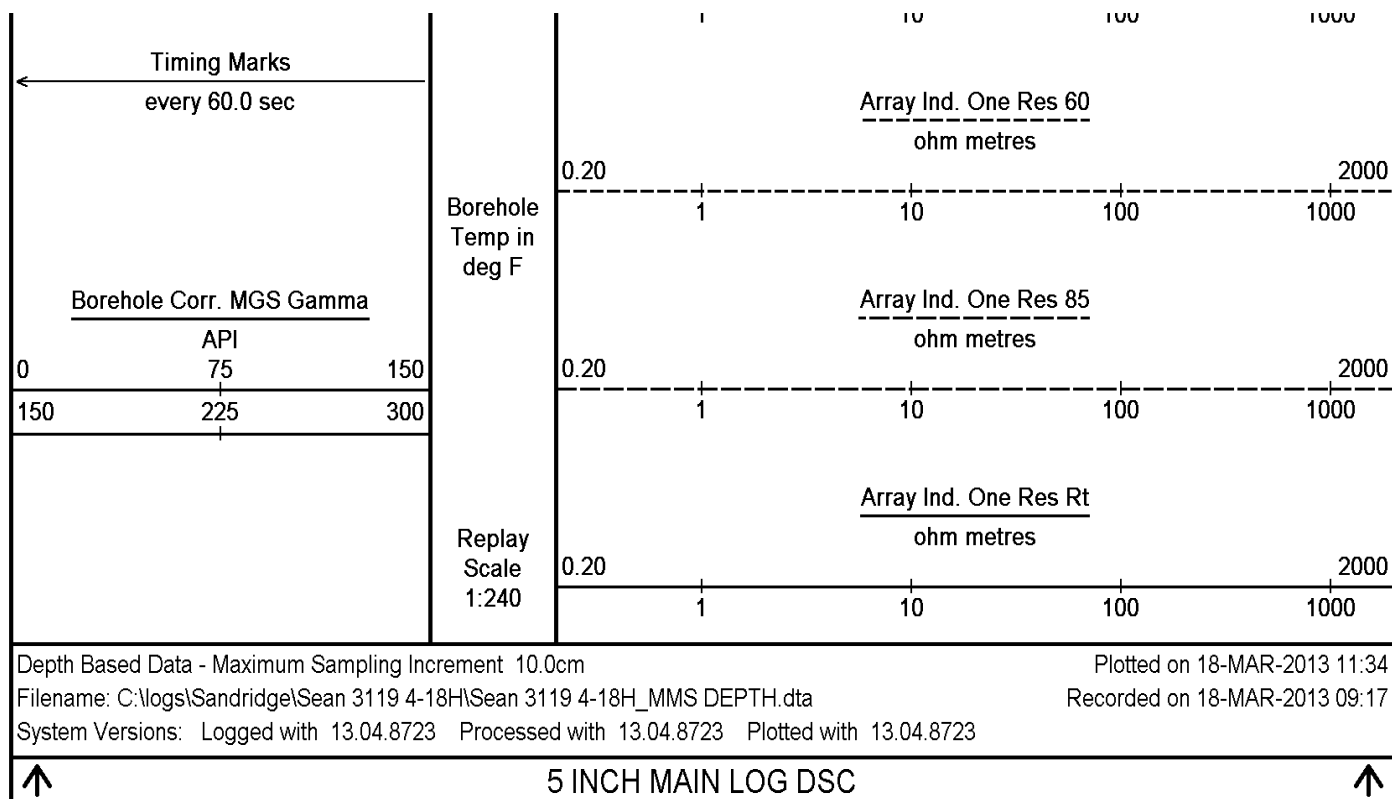
4

40

400

4000

2000



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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
2000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
4000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
6000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
8000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10000.0	0.000		0.000		0.000		0.000		

MMS Parameters MMS-E.B 160

Last Edited on 17-MAR-2013 14:50

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

0.50

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

40.0

seconds

Pulse Duration Transition Time

20.0

seconds

Pulse Duration Status Pulse From

40.0

seconds

Pulse Duration Caliper Close From

140.0

seconds

Pulse Duration Caliper Open From

200.0

seconds

Pulse Duration Release Pulse From

280.0

seconds

Pulse Duration Release Pulse To

400.0

seconds

Pulse Release Duration

120.0

seconds

Pulse Discriminator Pressure Band

269.0

seconds

Pulse Pressure Discriminator

607.0

seconds

Use Negative Pulsing

No

Good Status Reply Open Hole

65535.0

seconds

Good Status Reply Cased Hole

40.0

seconds

Bad Status Reply

100.0

seconds

Status Pulse To

60.0

seconds

Caliper Close To

seconds

Caliper Open To

220.0

seconds

Configuration

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

High Resolution Temperature Calibration MGS-C.J 141

Field Calibration on 18-MAR-2013,04:01

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	50.00	50.00

High Resolution Temperature Constants MGS-C.J 141

Last Edited on 18-MAR-2013,04:00

Pre-filter Length	11
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Gamma Calibration MGS-C.J 141

Field Calibration on 17-MAR-2013 14:50

		Field Calibration on 17-MAR-2013 13:59	
	Measured	Calibrated (API)	
Background	139	102	
Calibrator (Gross)	870	636	
Calibrator (Net)	731	534	
Gamma Constants MGS-C.J 141		Last Edited on 18-MAR-2013,04:00	
Gamma Calibrator Number	GRCC225		
Mud Density	1.03	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
Neutron Calibration MDN-B.J 430		Base Calibration on 13-MAR-2013 14:27 Field Check on 17-MAR-2013 13:54	
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near	Far
	2863 88	3714	110
Ratio	32.451	33.764	
Field Calibrator at Base		Calibrated (cps)	
		0	0
Ratio			
Field Check		Calibrated (cps)	
		2347	3465
Ratio		0.678	
Neutron Constants MDN-B.J 430		Last Edited on 18-MAR-2013,04:00	
Neutron Source Id	P31131B		
Neutron Jig Number	NJ6630		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	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	None		
Temperature	N/A	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
FE Calibration MFE-B.J 314		Base Calibration on 13-MAR-2013 17:21 Field Check on 17-MAR-2013 13:49	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	971.4	126.8	
Base Check		278.3	
Field Check		278.1	
FE Constants MFE-B.J 314		Last Edited on 18-MAR-2013,03:58	
Running Mode	No Sleeve		
MFE K Factor	0.1268		

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

High Resolution Temperature Calibration MAI-B.J 376			Field Calibration on 11-OCT-2012,22:38	
	Measured	Calibrated(Deg F)		
Lower	0.00	0.00		
Upper	50.00	50.00		

High Resolution Temperature Constants MAI-B.J 376			Last Edited on	
Pre-filter Length	11			

Induction Calibration MAI-B.J 376			Base Calibration on 22-FEB-2012 08:07	
			Field Check on 17-MAR-2013 13:46	
Base Calibration				
Test Loop Calibration		Measured	Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	16.4	461.5	9.3	966.2
2	5.9	377.0	7.6	821.4
3	3.1	255.4	5.2	566.0
4	1.7	130.3	2.6	279.2
Array Temperature		73.8	Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	13.8	3944.6
2	0.0	0.0	30.7	3583.4
3	0.0	0.0	29.8	3102.6
4	0.0	0.0	20.5	2124.1
Deep			18.8	2052.3
Medium			43.1	4062.1
Shallow			45.0	5259.0
Array Temperature		0.0	54.2	Deg F

Induction Constants MAI-B.J 376			Last Edited on 18-MAR-2013,05:01	
Induction Model		RtAP-WBM		
Caliper for Borehole Corr.		Density Caliper		
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		N/A	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	
Caliper Calibration MPD-C.J 378		
		Base Calibration on 14-MAR-2013 14:43
		Field Calibration on 17-MAR-2013 13:42
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14752	4.01
2	22768	5.97
3	30992	7.96
4	39120	9.86
5	48416	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.97
Photo Density Calibration MPD-C.J 378		
		Base Calibration on 14-MAR-2013, 14:32
		Field Check on 17-MAR-2013 13:38
Density Calibration		
Base Calibration		
	Measured	Calibrated (sdu)
	Near Far	Near Far
Reference 1	55428 25934	59443 30683
Reference 2	22287 2417	25113 2508
Field Check at Base		
	1182.5 1274.0	
Field Check		
	1185.8 1272.3	
PE Calibration		
Base Calibration		
	Measured	Calibrated
WS WH Ratio		Ratio
Background 217 1057		
Reference 1 22725 55230 0.415		0.372
Reference 2 6229 22151 0.285		0.268
Field Check at Base		
	217.2 1057.3	
Field Check		
	217.6 1058.9	
Density Constants MPD-C.J 378		
		Last Edited on 18-MAR-2013,03:59
Density Source Id	P21136B	
Nylon Calibrator Number	DNCE 652	
Aluminium Calibrator Number	DACD 659	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	

PE Correction to Density	Not Applied	
Mud Density	1.03	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)
2.68	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

DOWNHOLE EQUIPMENT

C:\logs\Sandridge\Sean 3119 4-18H\Sean 3119 4-18H_MMS DEPTH.dta

Shuttle Running Tool 3.5")
SRT-A.A 34 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-F.A 200v Compact Battery Sub
MBS-F.A 123 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in

Compact Memory Sub E.B
MMS-E.B 160 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
MTI-B.A 64 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
MGS-C.J 141 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 53 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 537 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

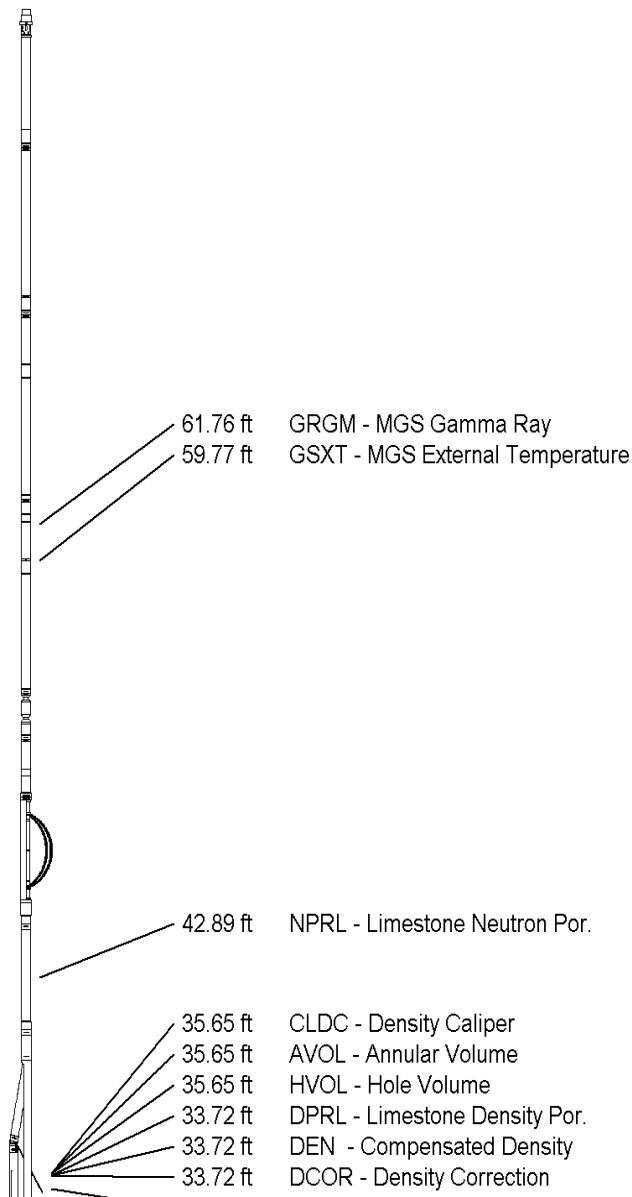
SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 597 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 702 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-B.J 430 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.J 378 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 654 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in



SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 397 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 611 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

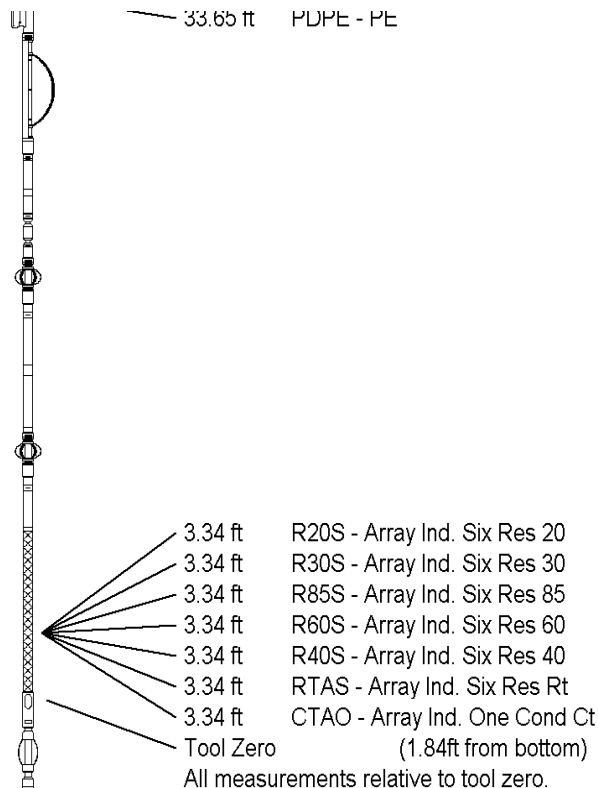
MIS-E.B Compact Inline Standoff sub
MIS-E.B 692 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric
MFE-B.J 314 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 689 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-B.J 376 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 94.81 ft Weight: 690.0 lb



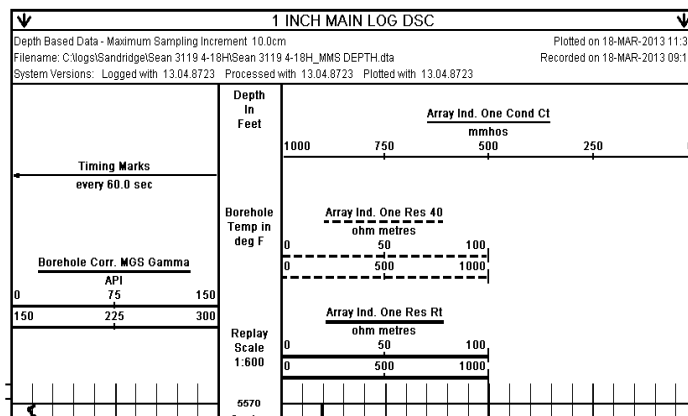
COMPANY	SANDRIDGE ENERGY
WELL	SEAN 3119 4-18H
FIELD	ARLIE
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS

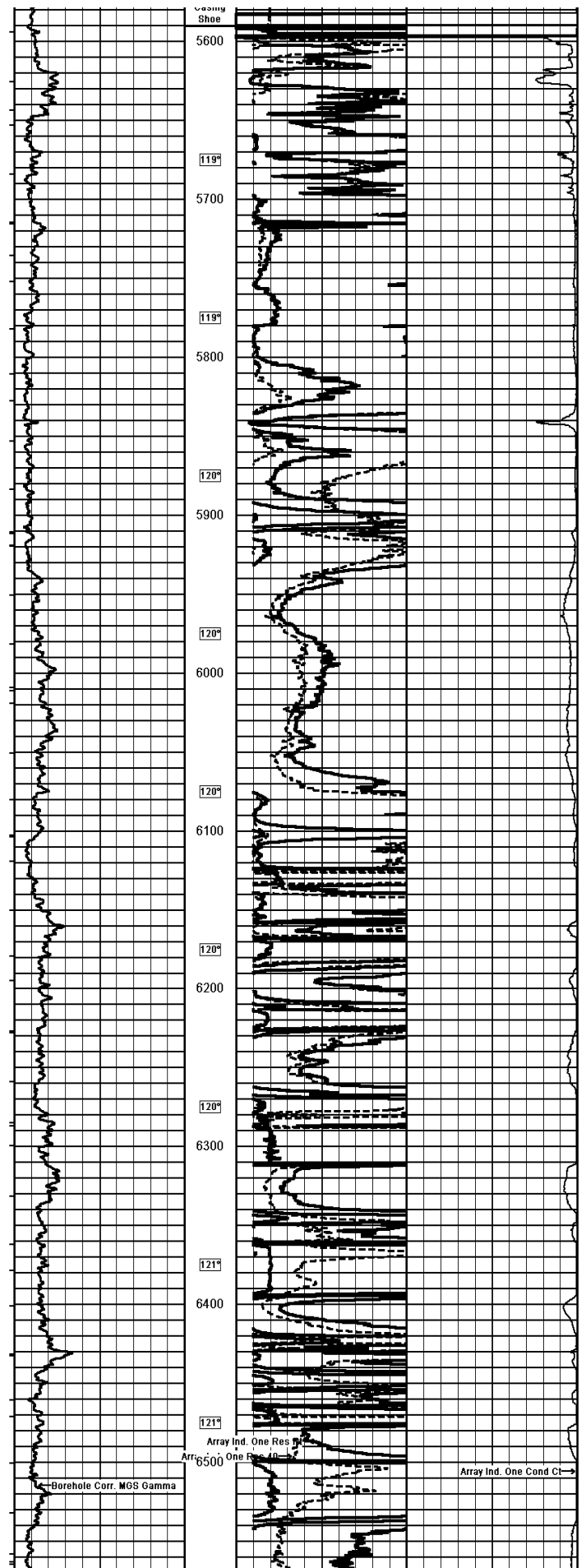
Elevation Kelly Bushing	2143.60	feet	First Reading	9530.00	feet
Elevation Drill Floor		feet	Depth Driller	9555.00	feet
Elevation Ground Level	2124.00	feet	Depth Logger	9555.00	feet

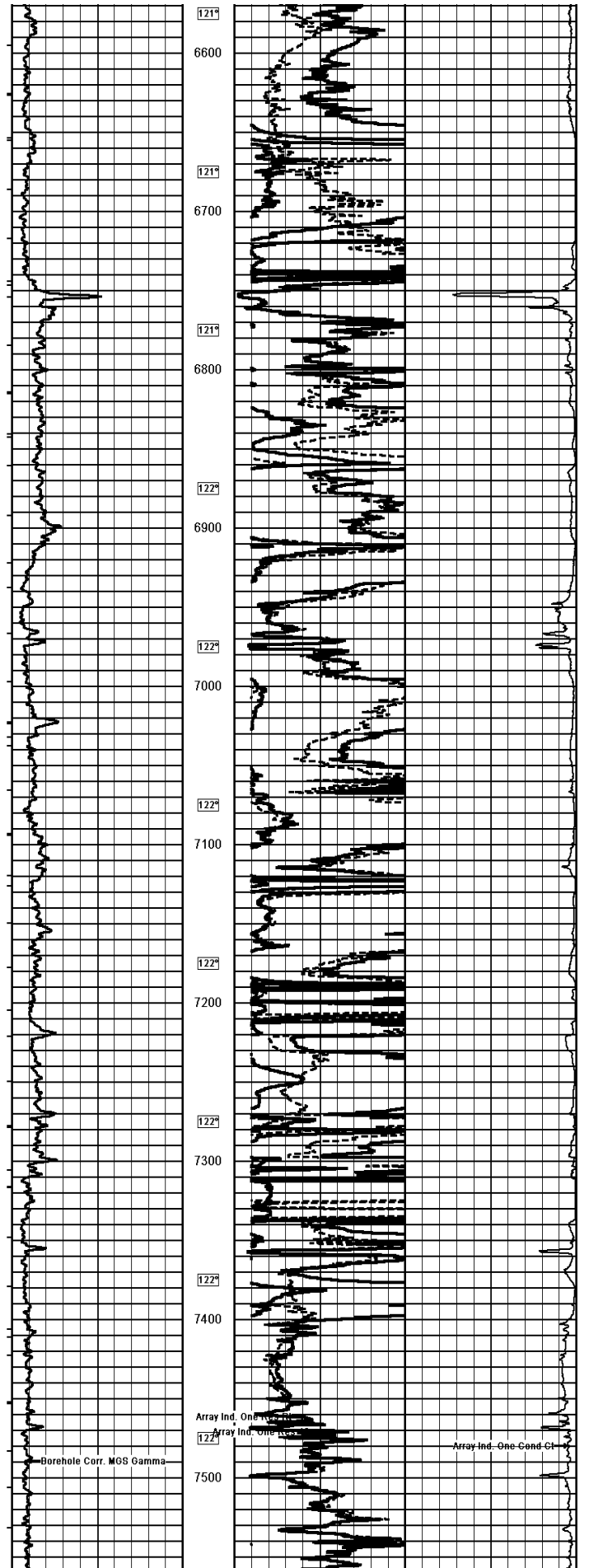


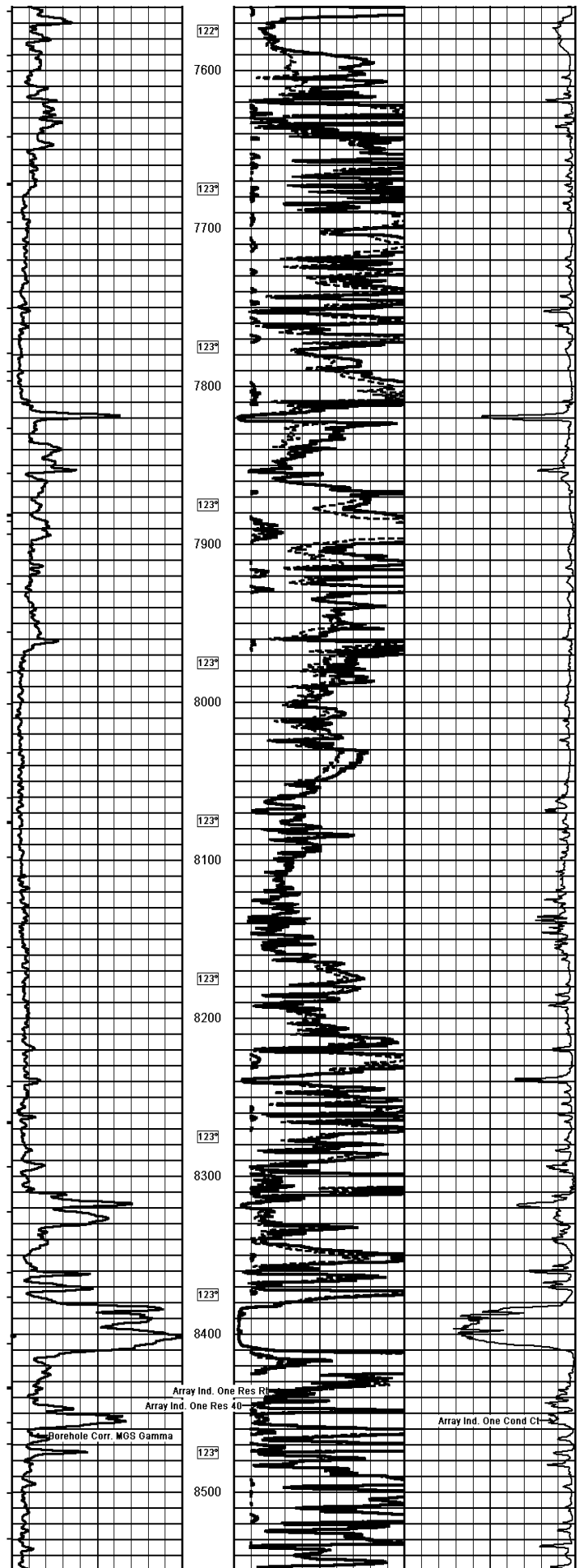
Weatherford®

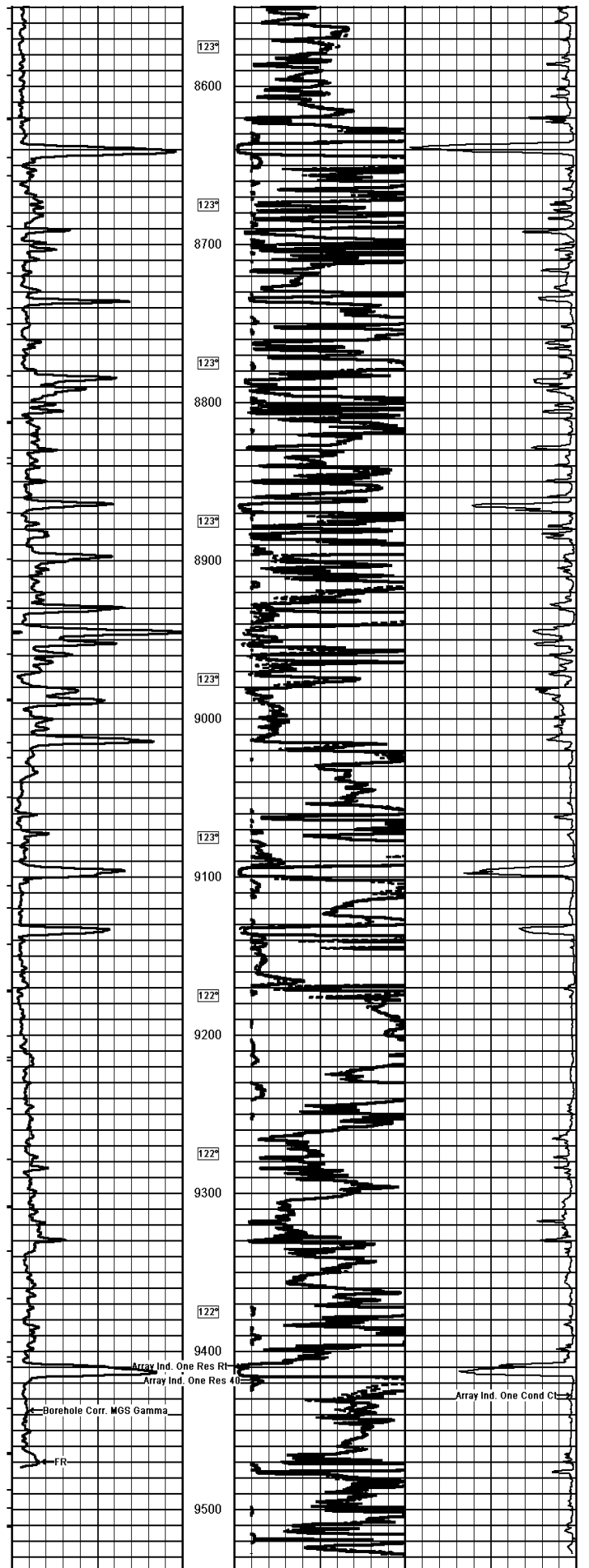
CML MESSENGER SHUTTLE ARRAY INDUCTION LOG

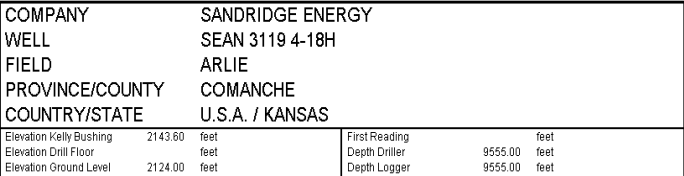












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CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG