



Weatherford[®]

**CML MESSENGER SHUTTLE
ARRAY INDUCTION
LOG**

COMPANY **SANDRIDGE ENERGY**
 WELL **TURNER 3406 1-7H**
 FIELD **EASTHAM**
 PROVINCE/COUNTY **HARPER**
 COUNTRY/STATE **USA / KANSAS**
 LOCATION **SHL: 250' FSL & 660' FEL SEC 7**
BHL: 2310' FSL & 660' FEL SEC 6

SEC	TWP	RGE	Other Services
7	34S	6W	MA/IM/FE
API Number	15-077-21868-01		
Permit Number			
Permanent Datum G.L., Elevation 1316 feet			
Log Measured From KB			
Drilling Measured From K.B. @ 19 FEET			
Date	08-OCT-2012		
Run Number	ONE		
Depth Driller	11858.00	feet	
Depth Logger	11858.00	feet	
First Reading	11570.00	feet	
Last Reading	3000.00	feet	
Casing Driller	5045.00	feet	
Casing Logger	5045.00	feet	
Bit Size	6.125	inches	
Hole Fluid Type	WATER		
Density / Viscosity	1.01 g/c3	27.00 CP	
PH / Fluid Loss	8.50	35.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	1.50 @ 50.0	ohm-m	
Rmf @ Measured Temp	1.20 @ 50.0	ohm-m	
Rmc @ Measured Temp	1.80 @ 50.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.50 @ 149.0	ohm-m	
Time Since Circulation	0 HOURS		
Max Recorded Temp	149.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	18006	OKC	
Recorded By	D. ROWEL		
Witnessed By	T. ALCORN		
S.O.# / AFE	3538627 / DC12304		

Elevations:	feet
KB	1335.00
DF	1335.00
GL	1316.00

BOREHOLE RECORD

Last Edited: 08-OCT-2012 22:59

Bit Size inches	Depth From feet	Depth To feet
6.125	5054.00	11858.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5054.00	26.00

REMARKS

LOGGED WITH WLS VER 13.02.6600 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

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

LOGS WERE PUT BACK TO DEPTH USING MWD GAMMA RAY PROVIDED BY CUSTOMER

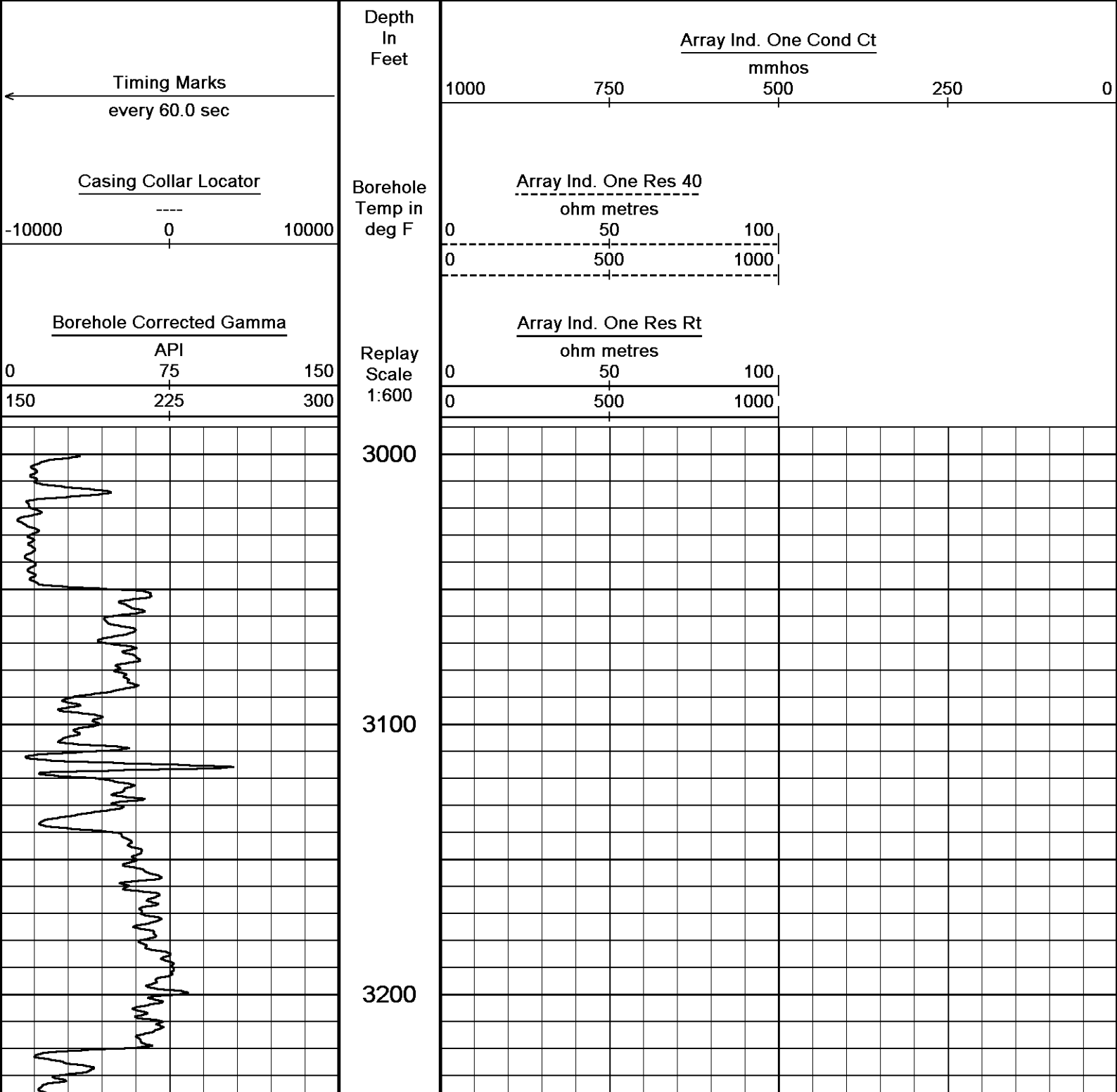
DRILL PIPE DEPTH DURING DEPLOYMENT - 11487
 LOGGING TOOL DEPTH AFTER DEPLOYMENT: 11570

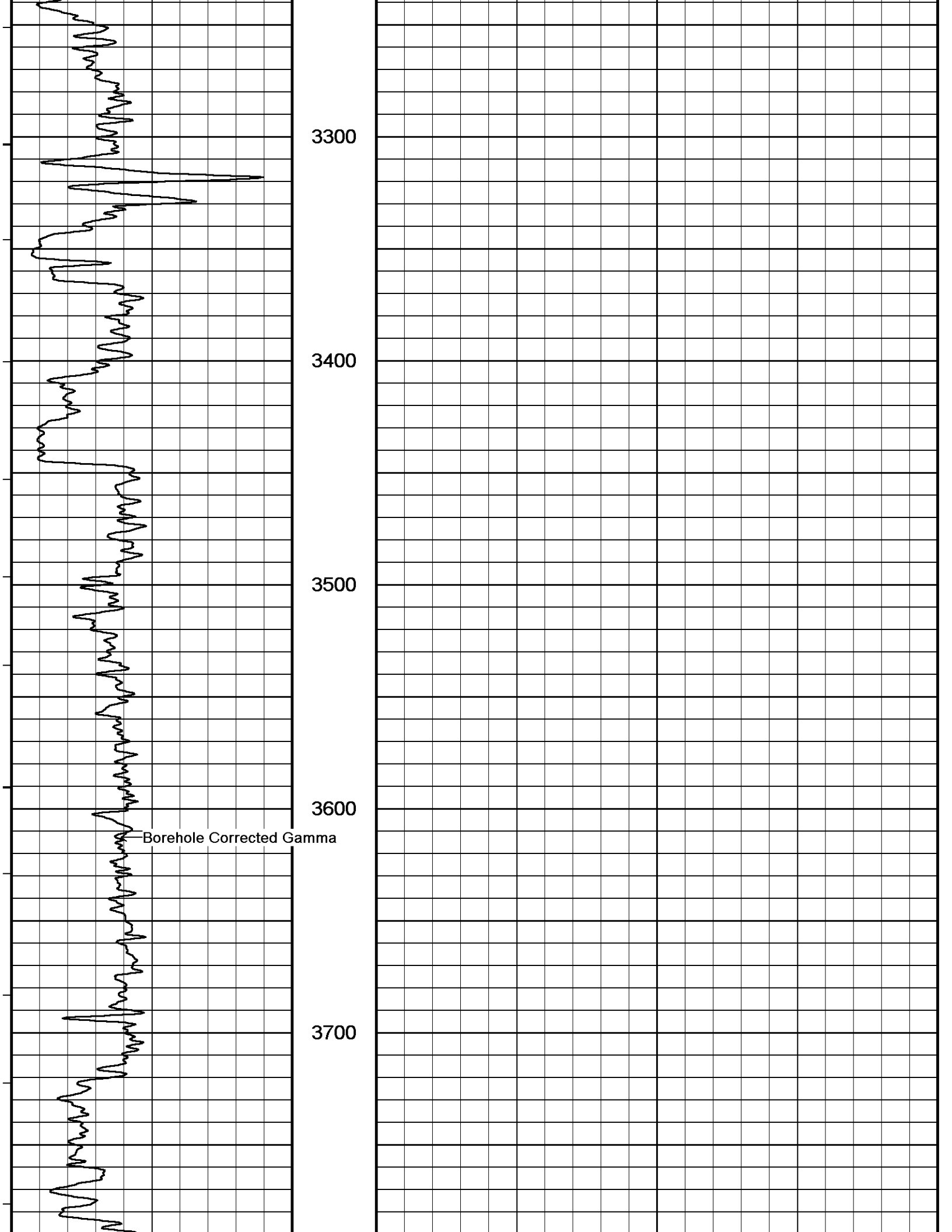
CHOLORIDES = 4000

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.

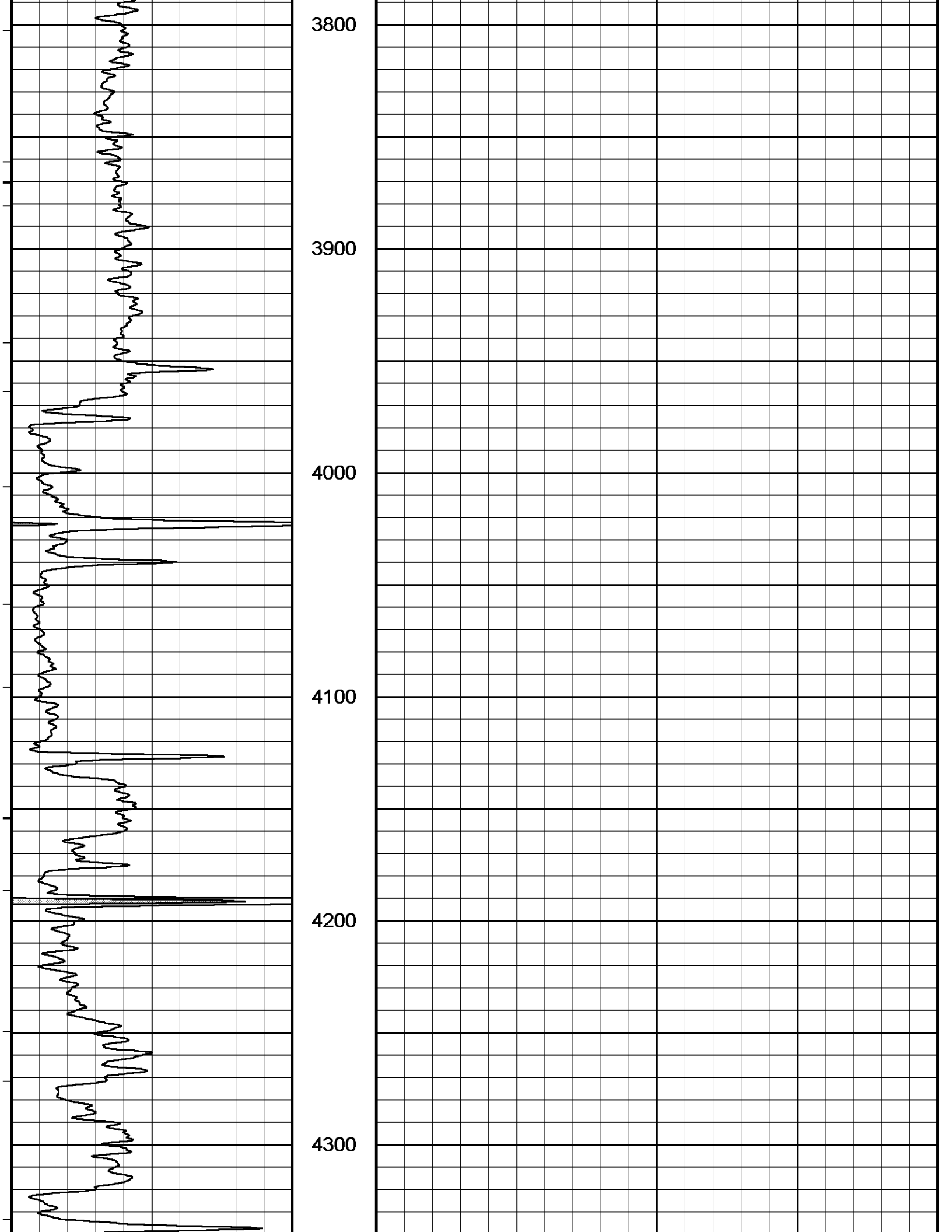
2 INCH MAIN LOG DSC

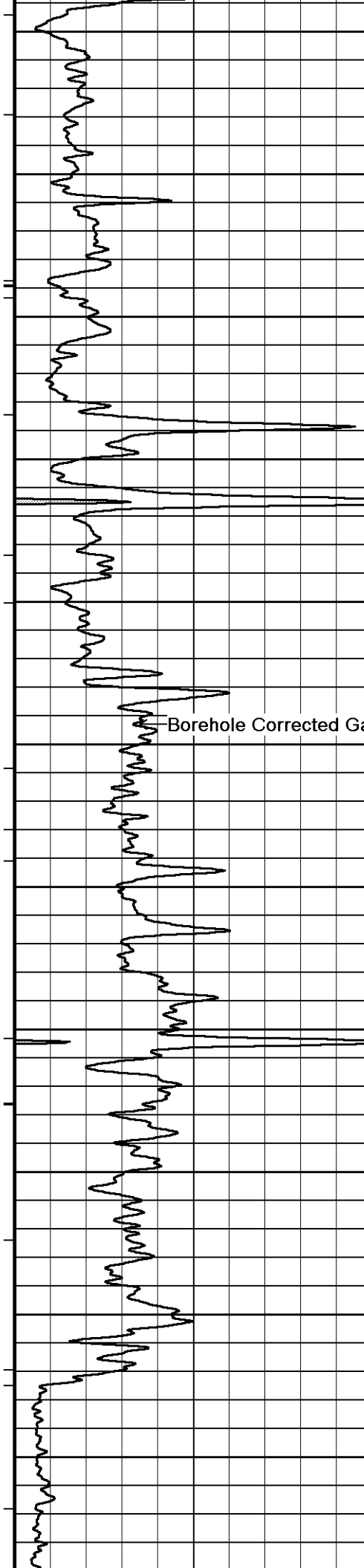
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-OCT-2012 23:01
 Filename: C:\Minimus 13.02.066\Data\SDRGE (TURNER)\35292 RTAP.dta Recorded on 08-OCT-2012 21:28
 System Versions: Processed with 13.02.6600 Plotted with 13.02.6600





Borehole Corrected Gamma





4400

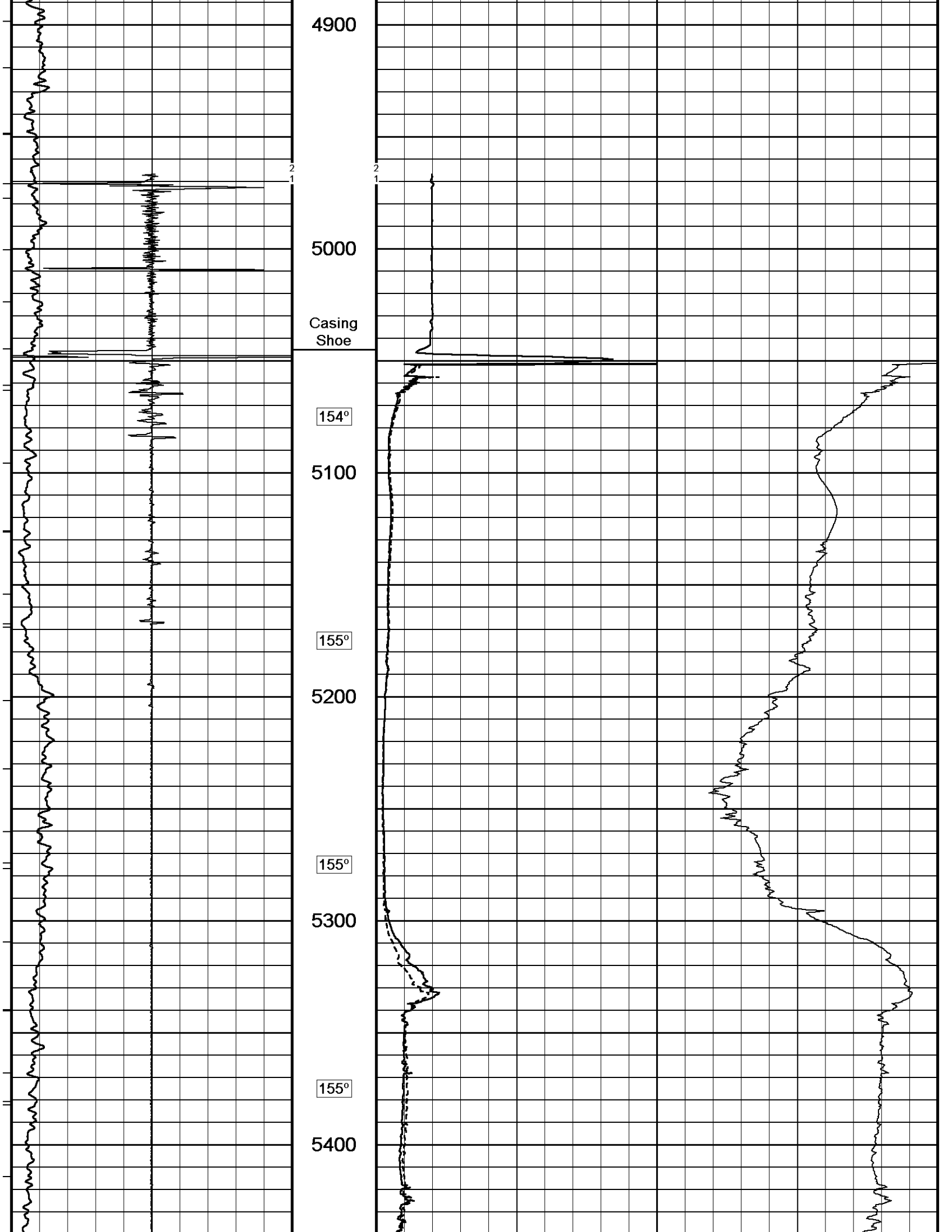
4500

4600

4700

4800

Borehole Corrected Gamma



4900

5000

Casing
Shoe

154°

5100

155°

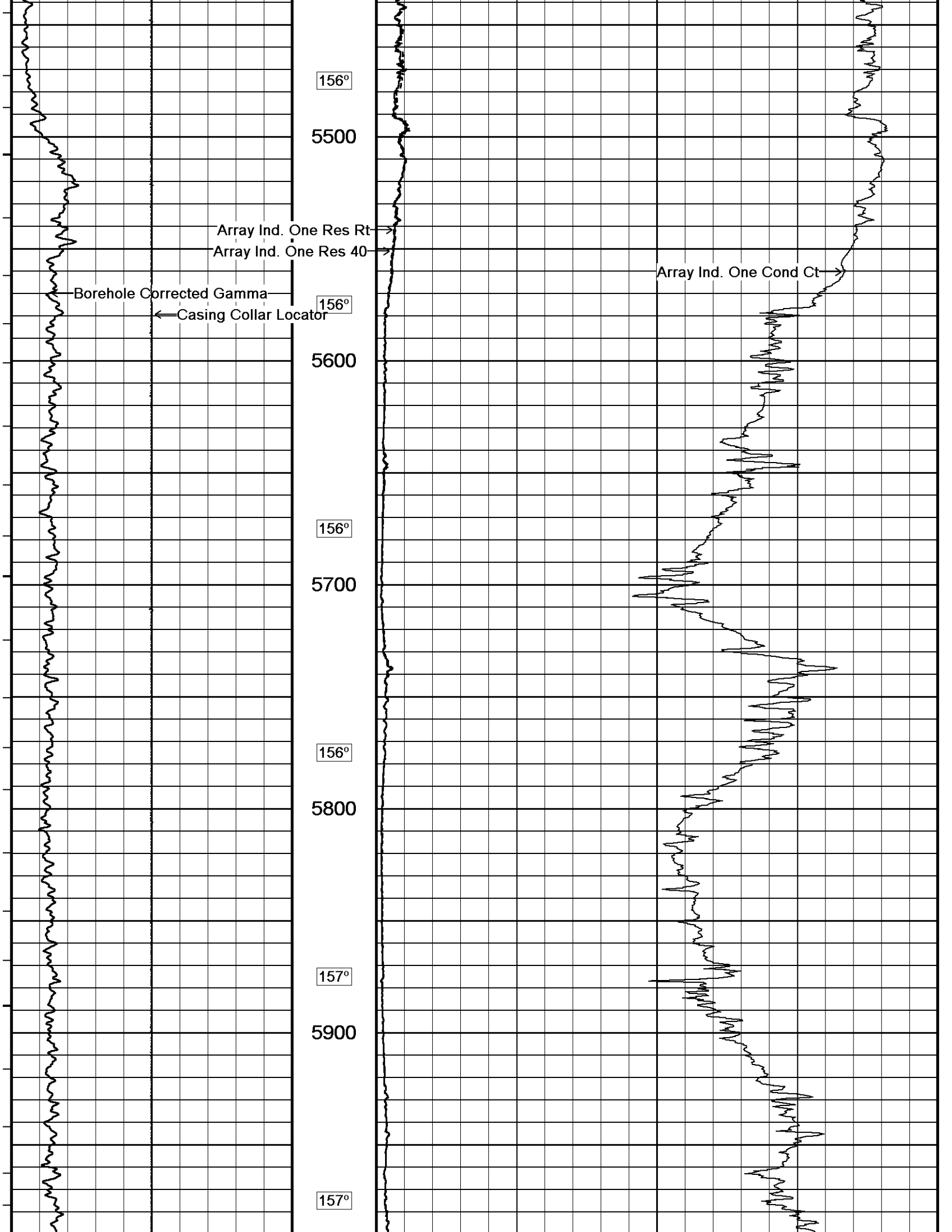
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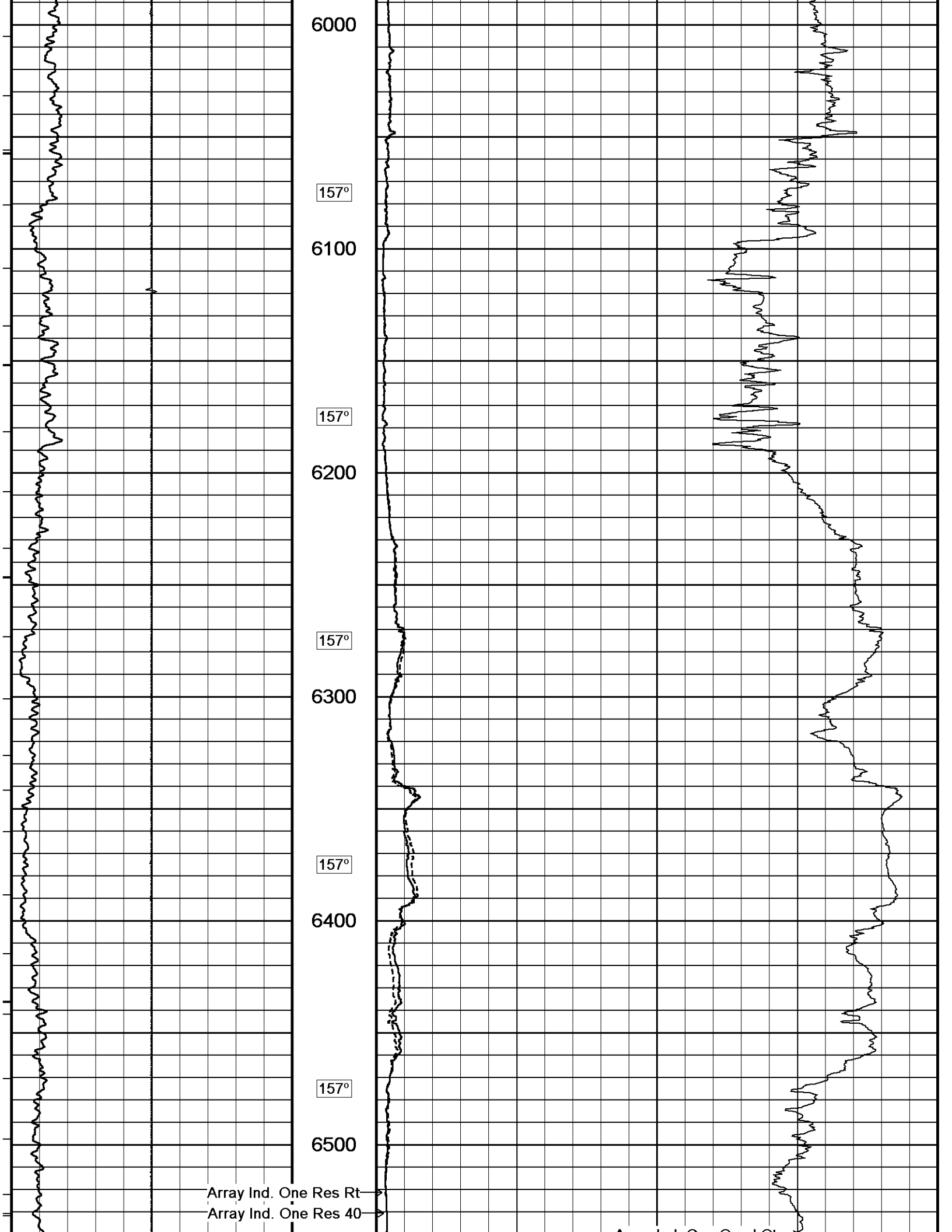
155°

5300

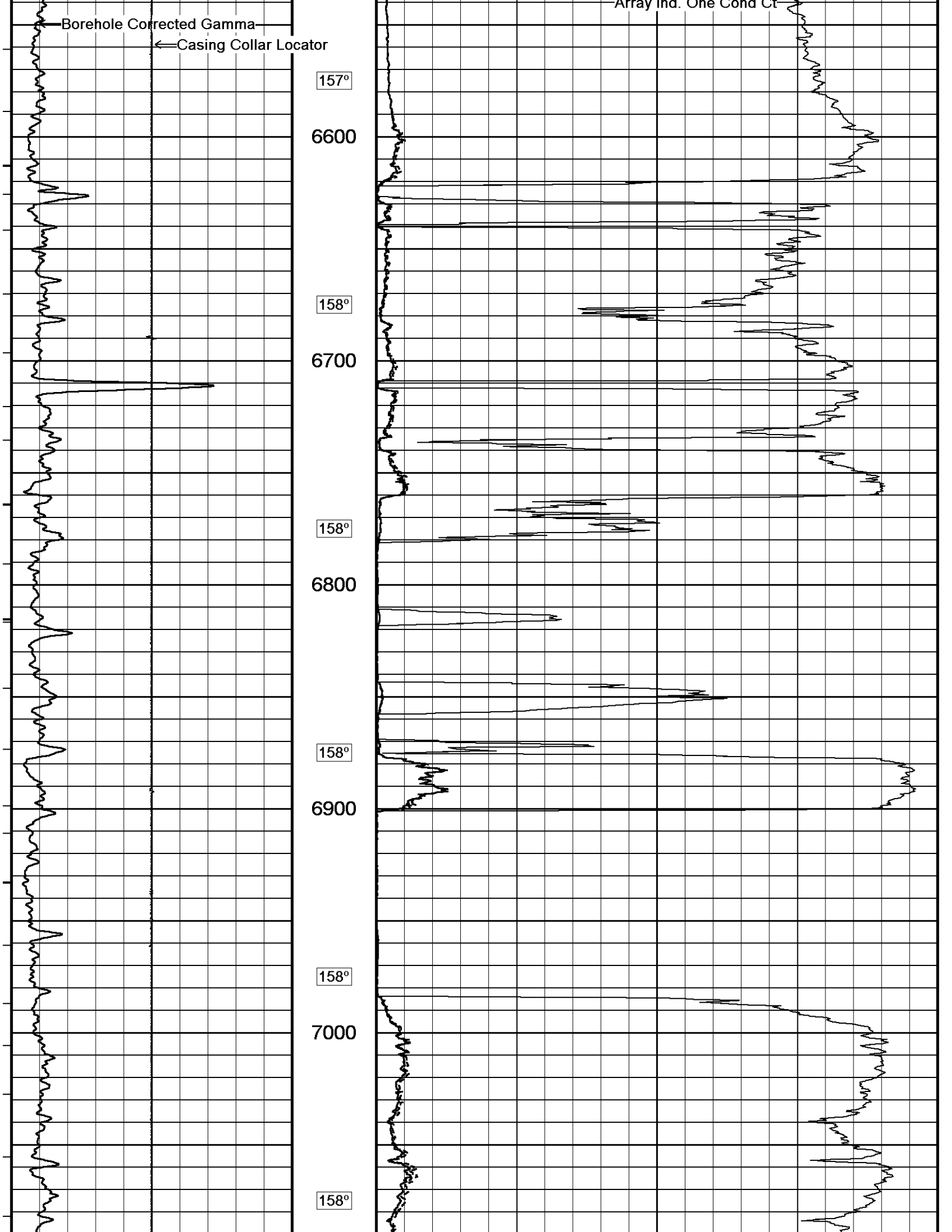
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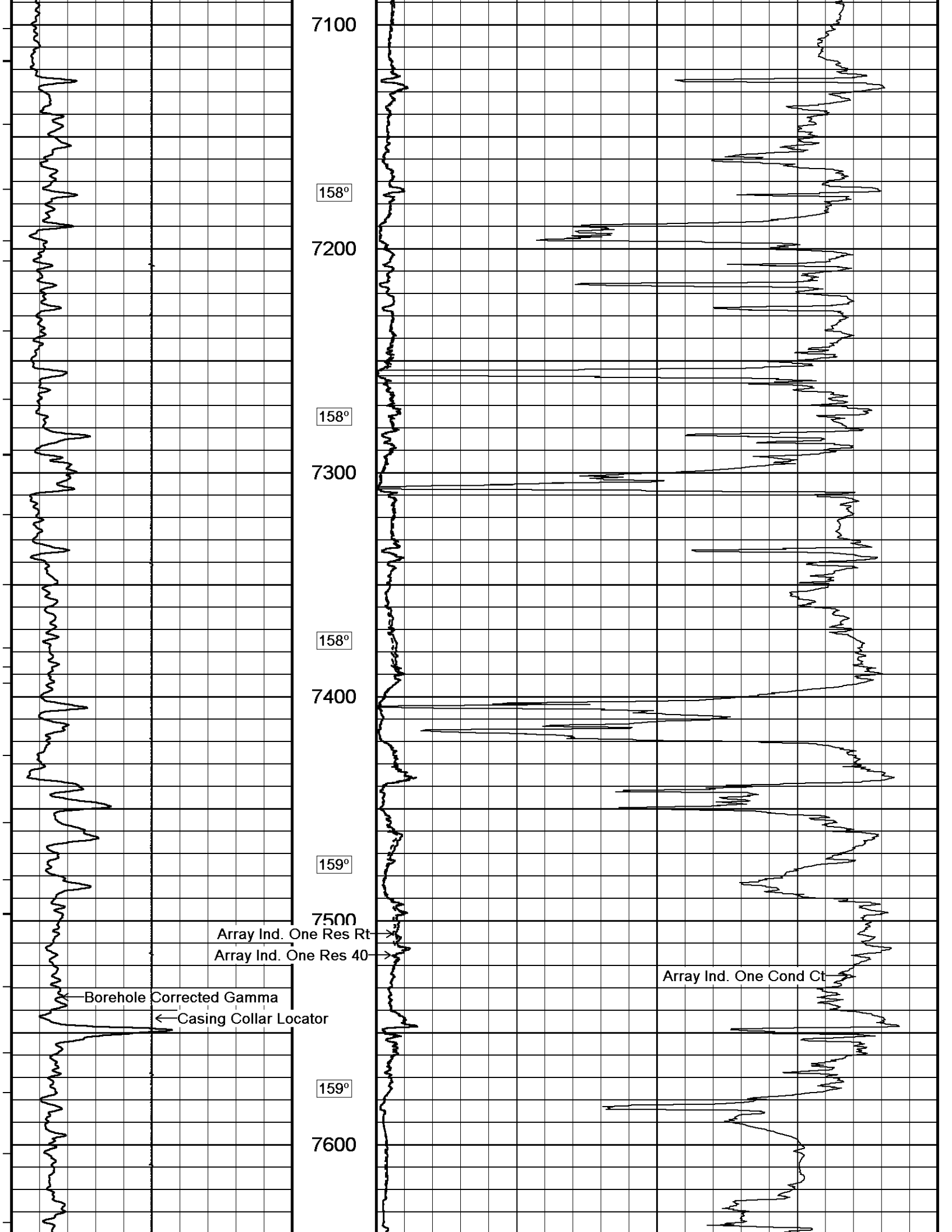
5400





Borehole Corrected Gamma
← Casing Collar Locator





7100

158°

7200

158°

7300

158°

7400

159°

7500

Array Ind. One Res Rt

Array Ind. One Res 40

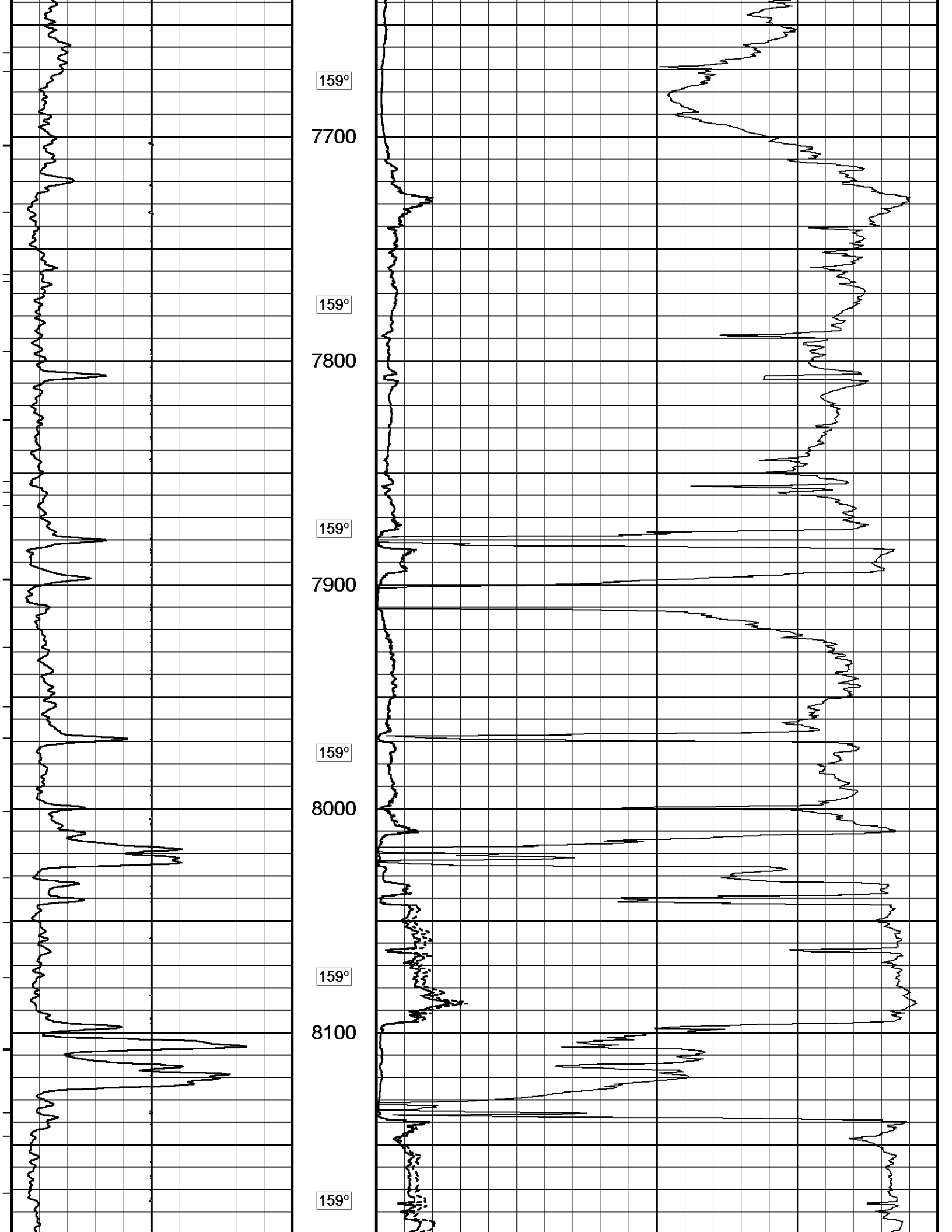
Borehole Corrected Gamma

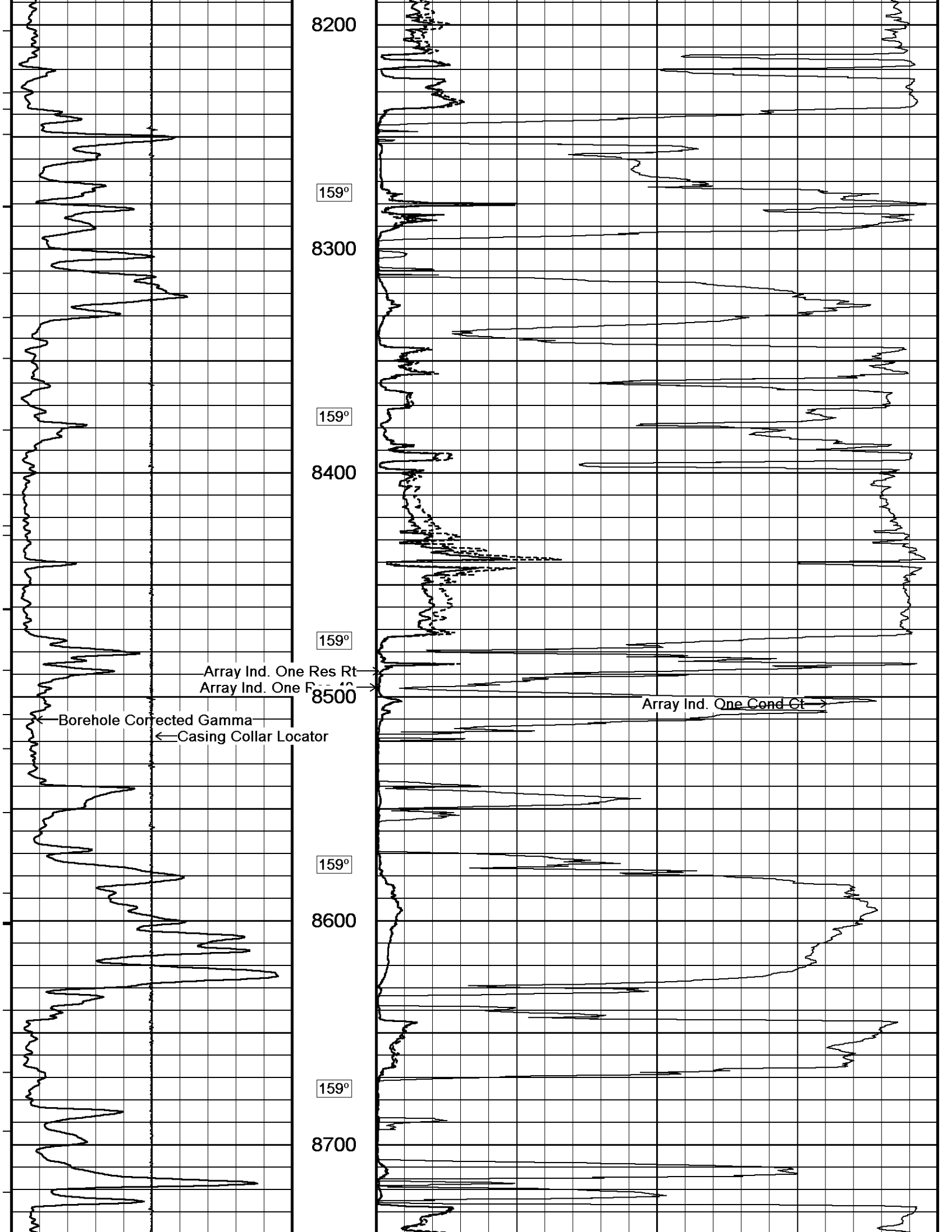
← Casing Collar Locator

Array Ind. One Cond Ct

159°

7600







159°

8800

159°

8900

159°

9000

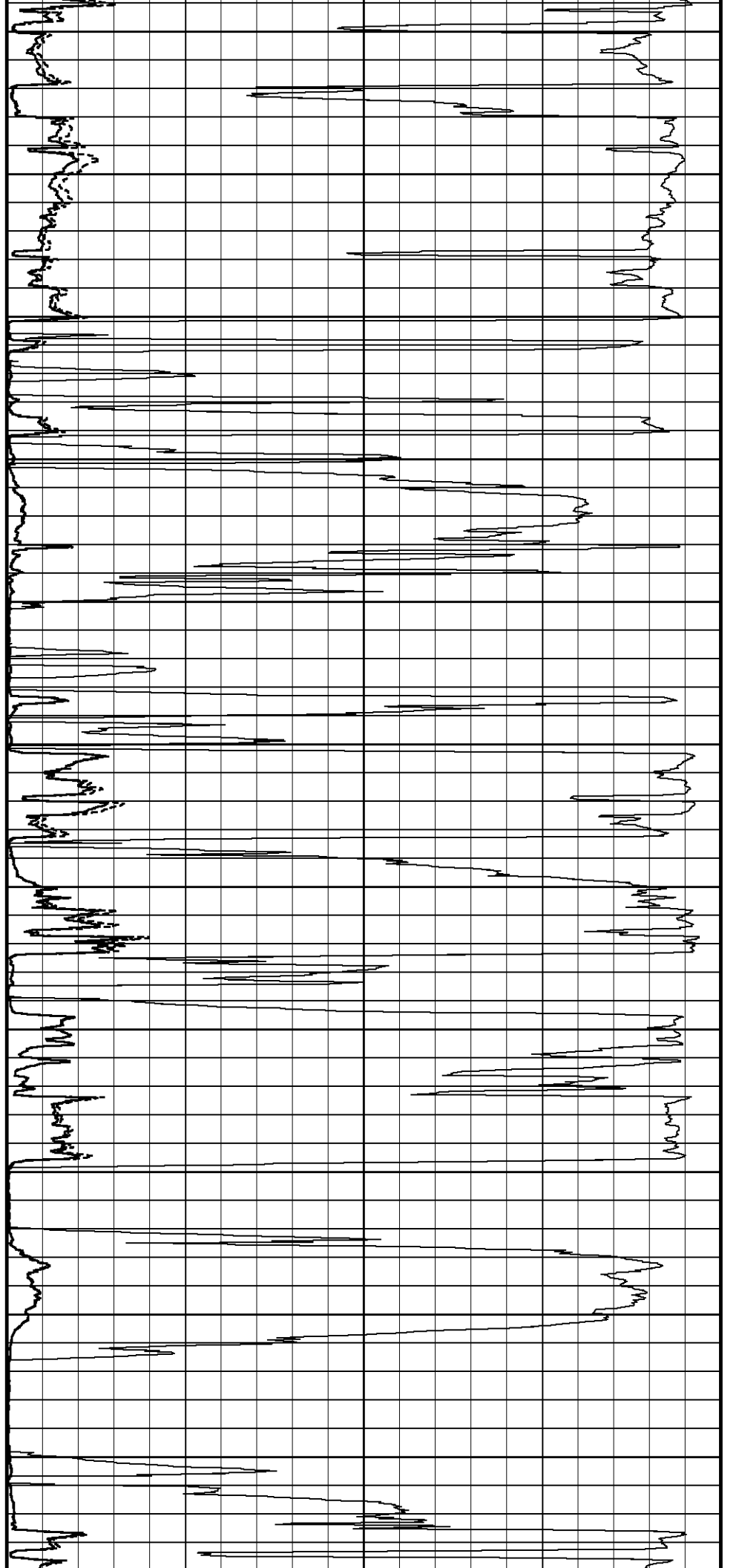
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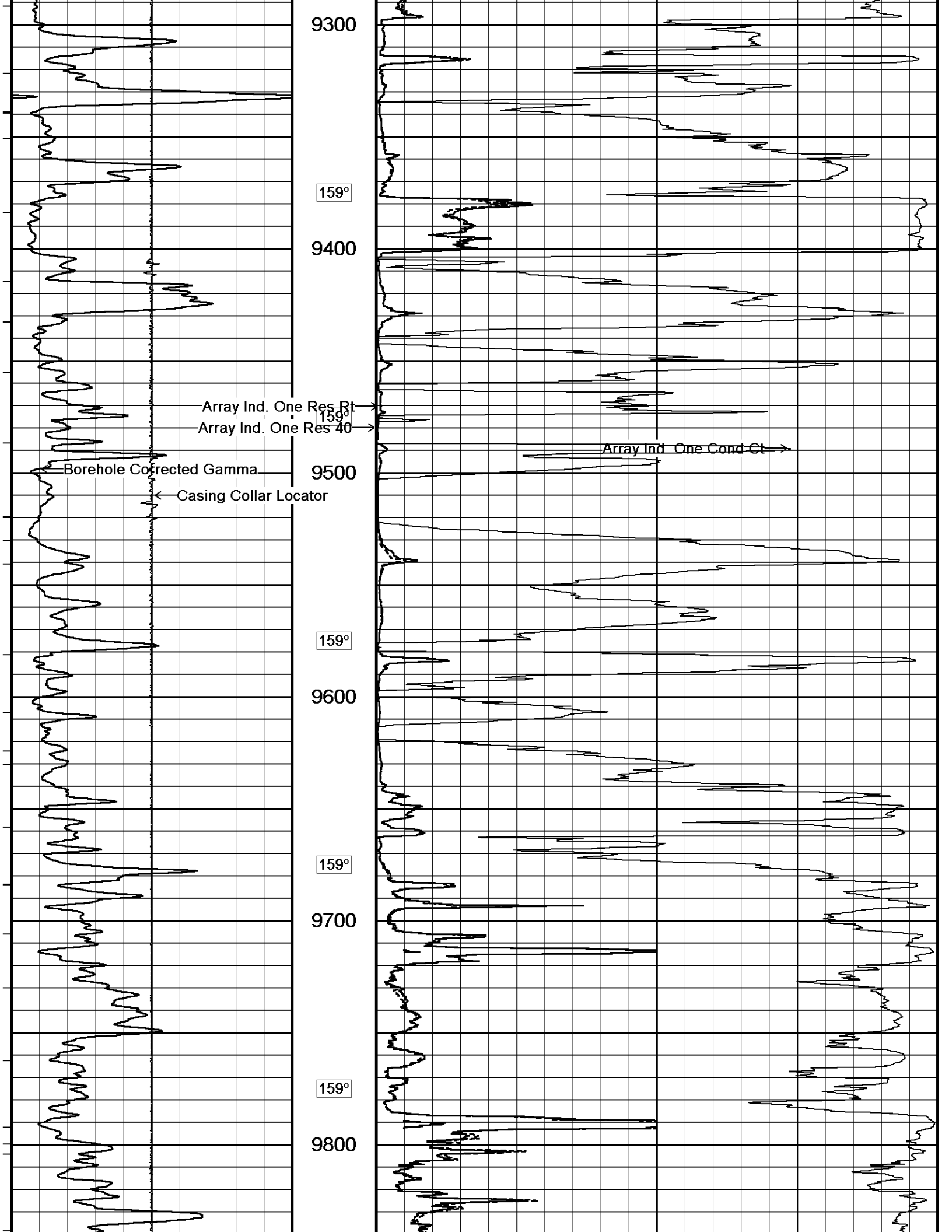
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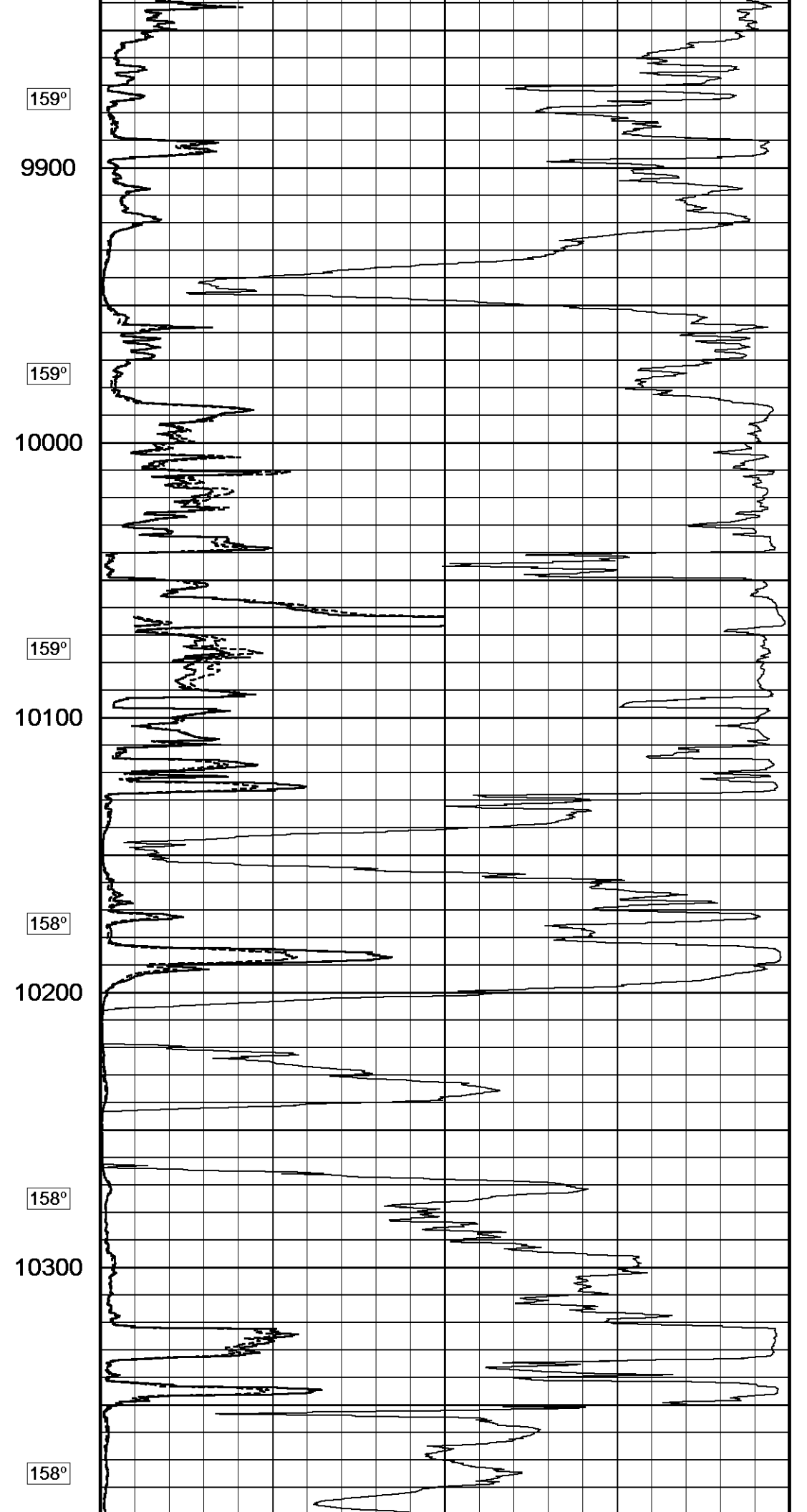
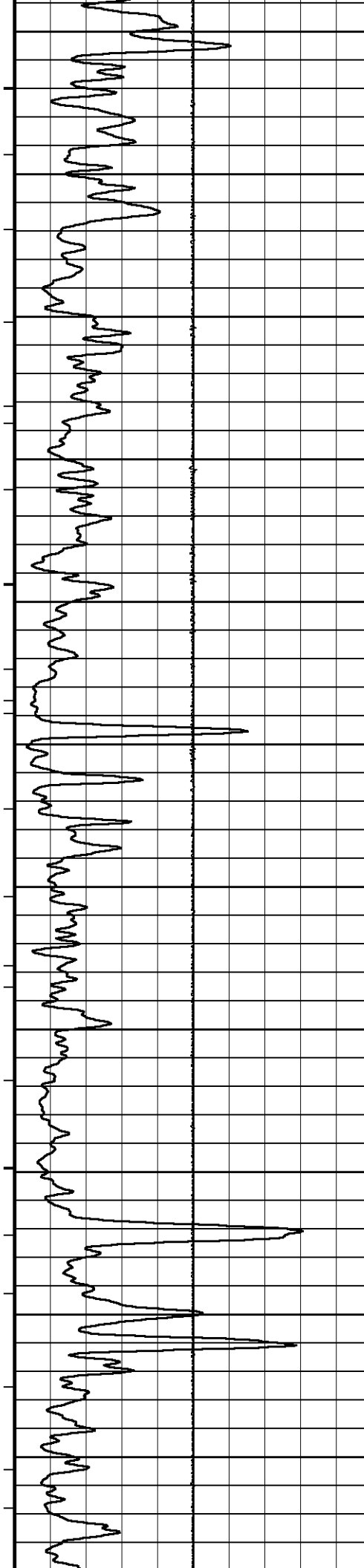
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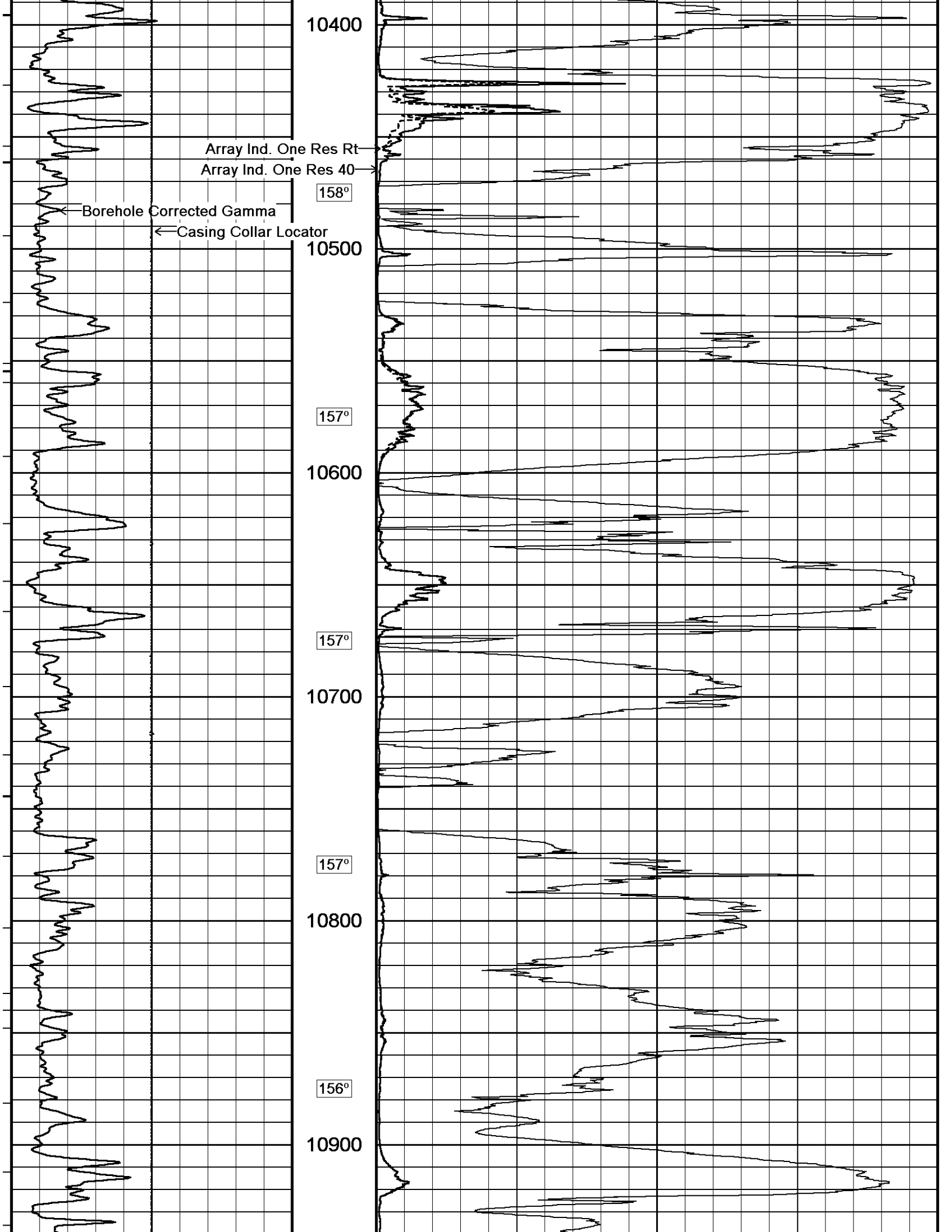
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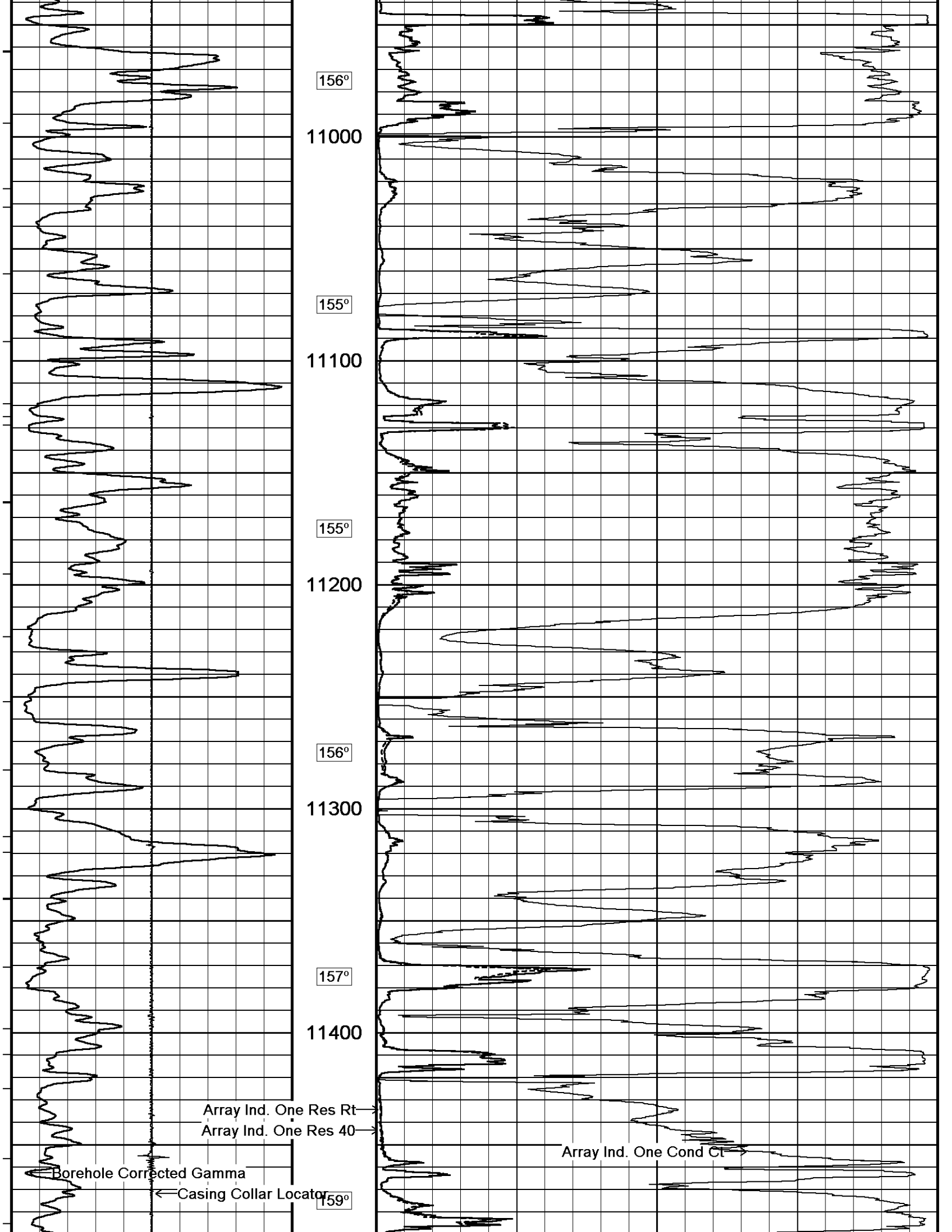
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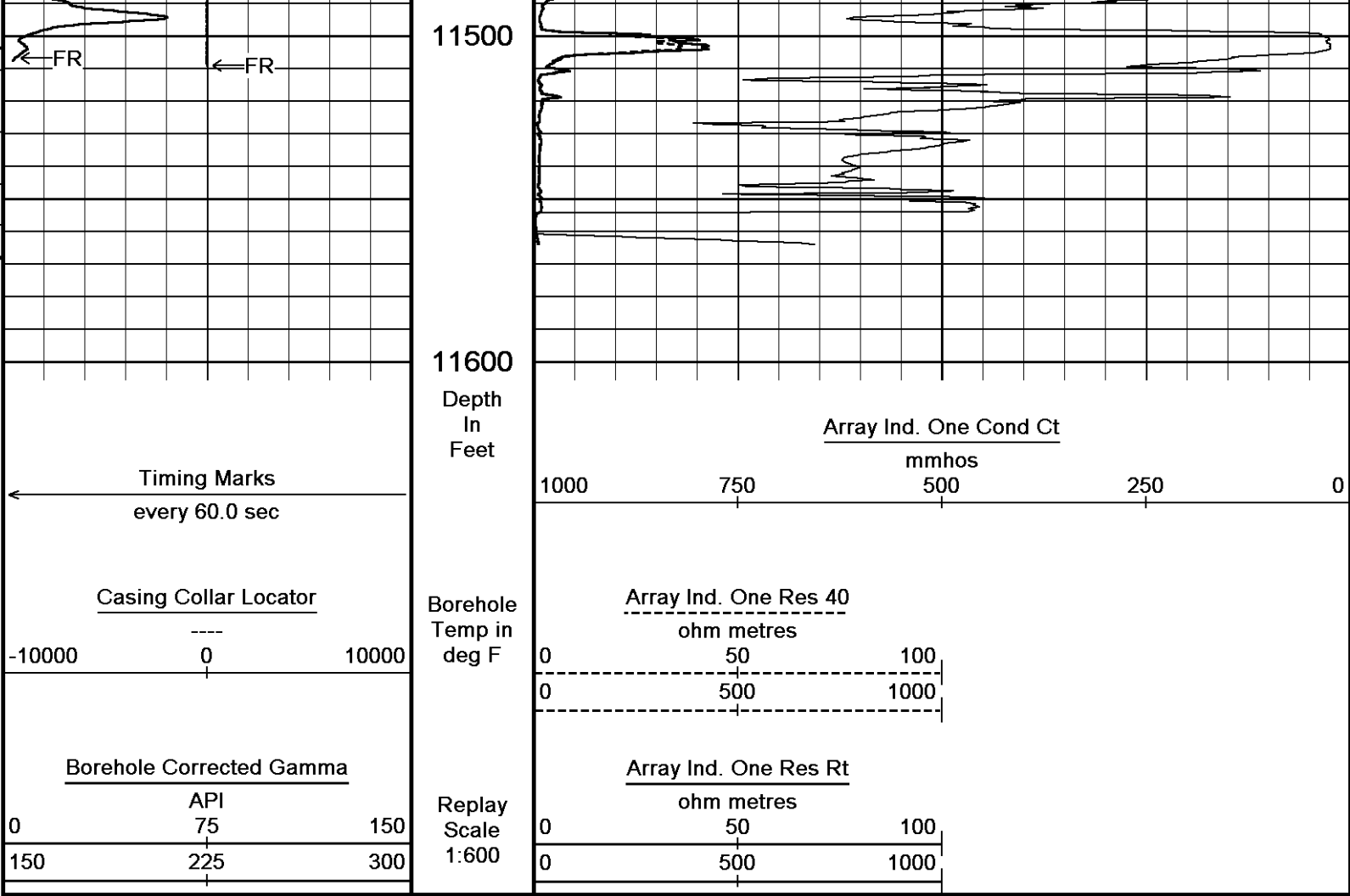








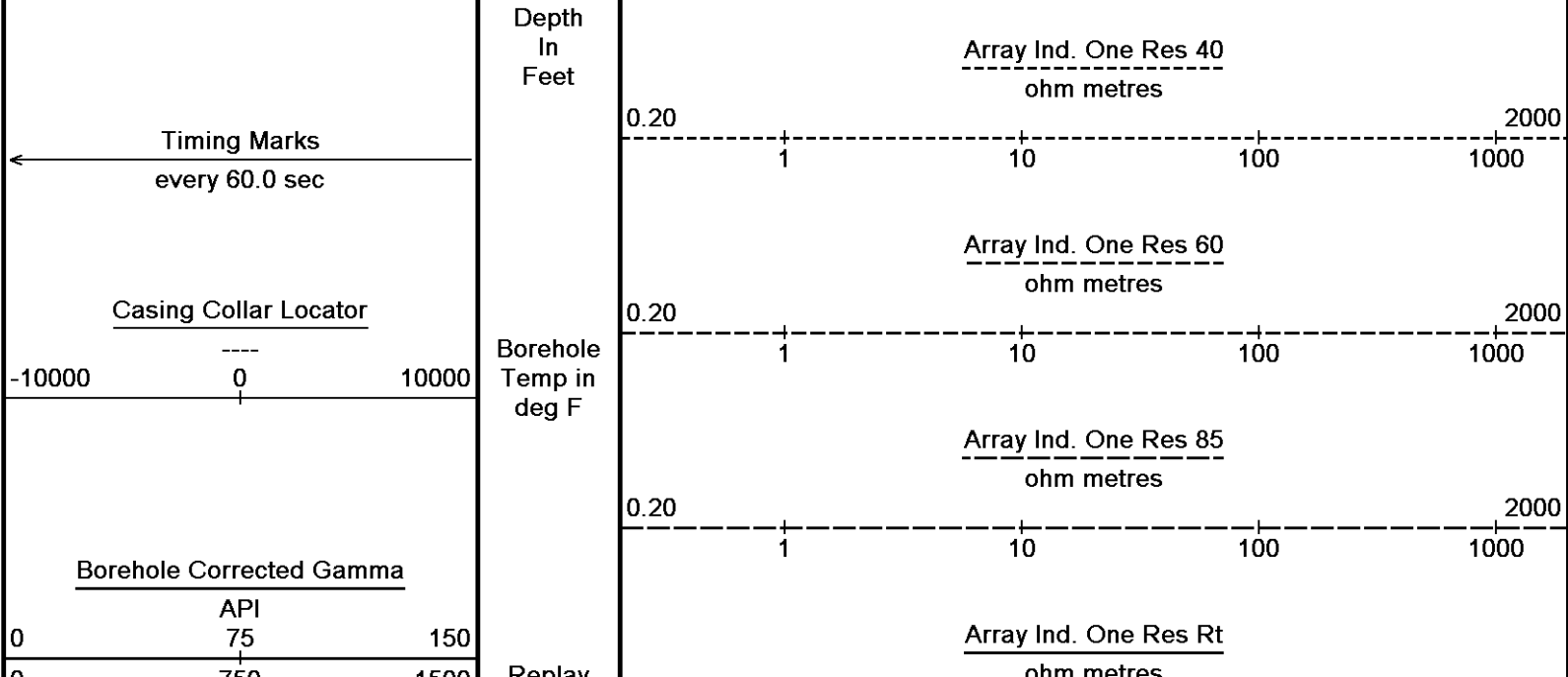


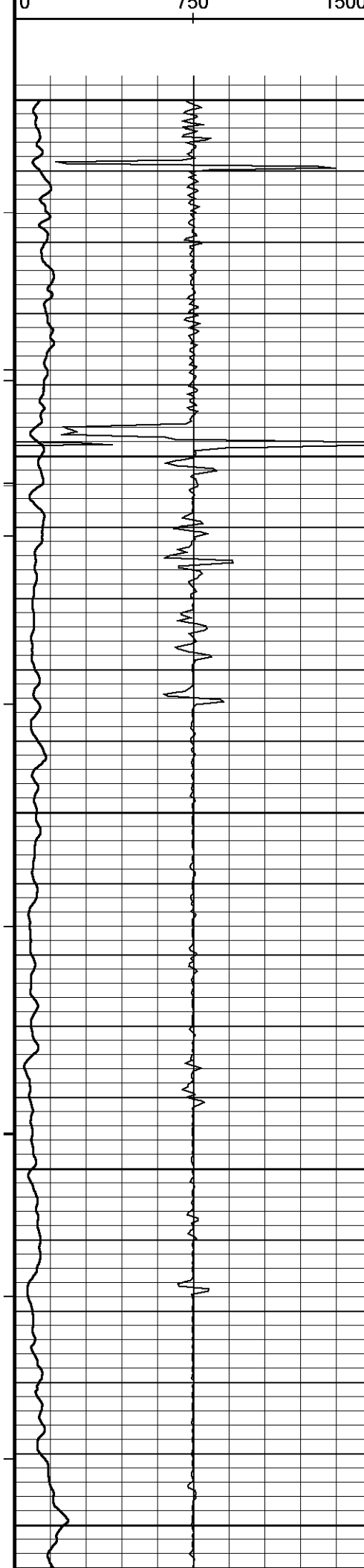


↑ 2 INCH MAIN LOG DSC ↑

↓ 5 INCH MAIN LOG DSC ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 08-OCT-2012 23:01
 Filename: C:\Minimus 13.02.066\Data\SDRGE (TURNER)\35292 RTAP.dta
 Recorded on 08-OCT-2012 21:28
 System Versions: Processed with 13.02.6600 Plotted with 13.02.6600





Replay
Scale
1:240

5000

154°
Casing
Shoe

5050

154°

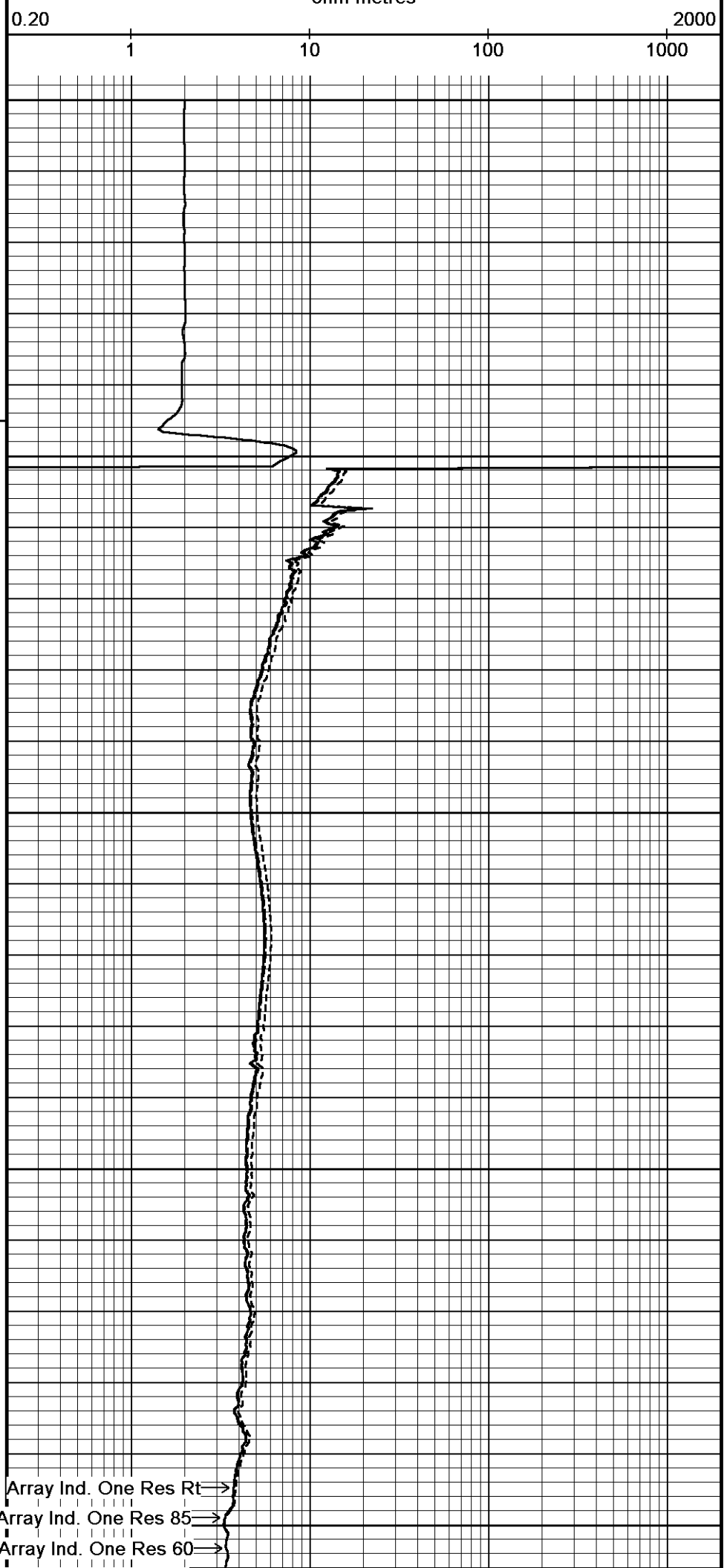
5100

155°

5150

155°

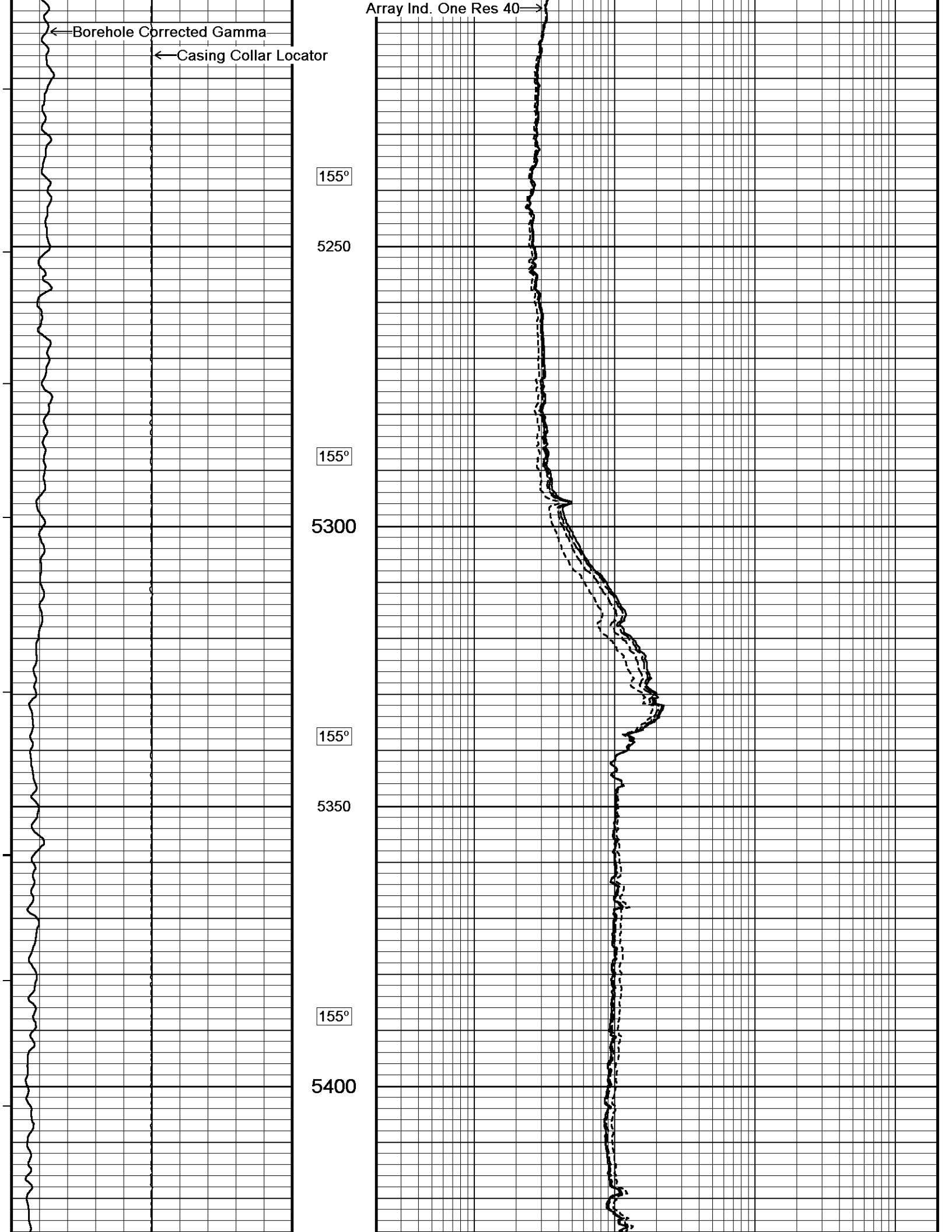
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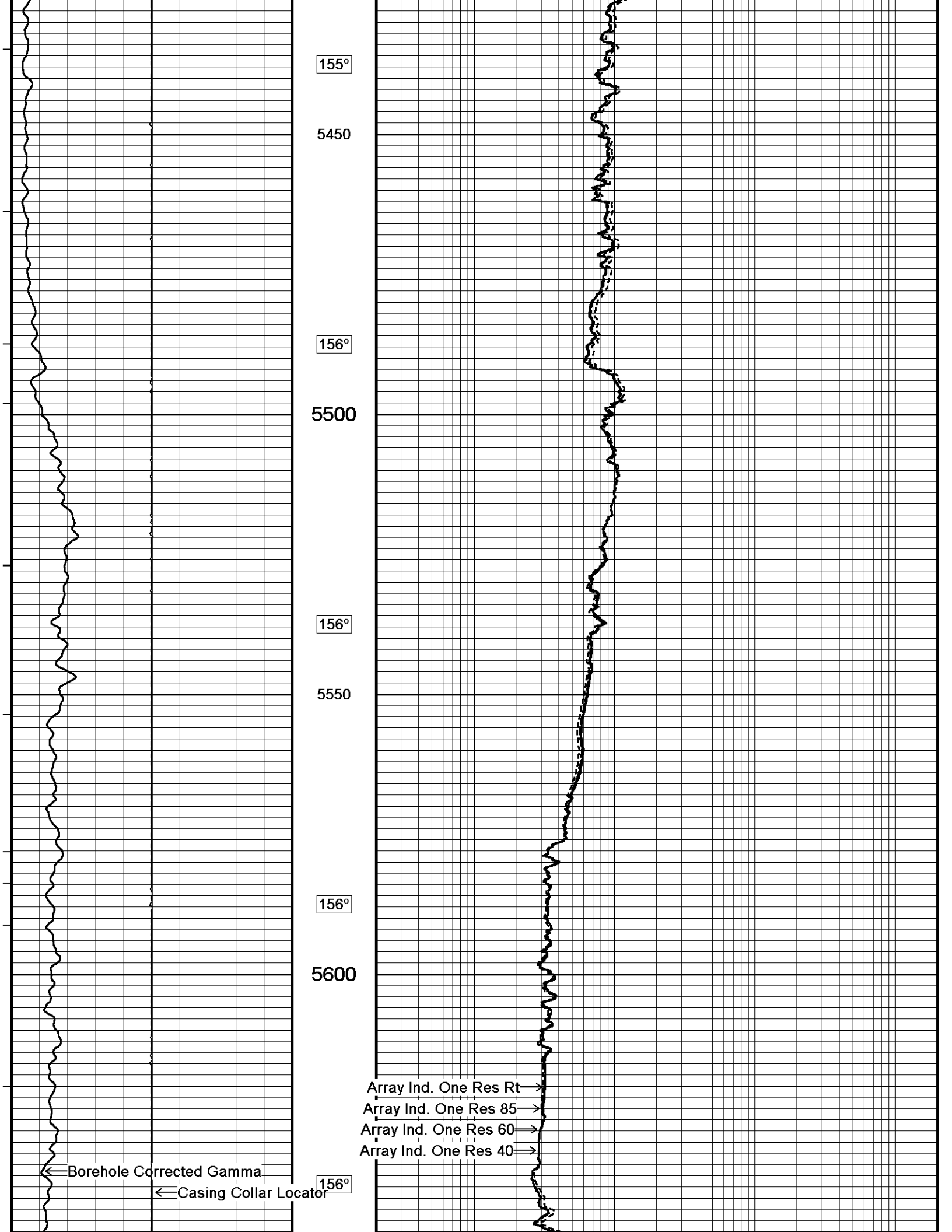


Array Ind. One Res Rt →

Array Ind. One Res 85 →

Array Ind. One Res 60 →





155°

5450

156°

5500

156°

5550

156°

5600

Array Ind. One Res Rt →

Array Ind. One Res 85 →

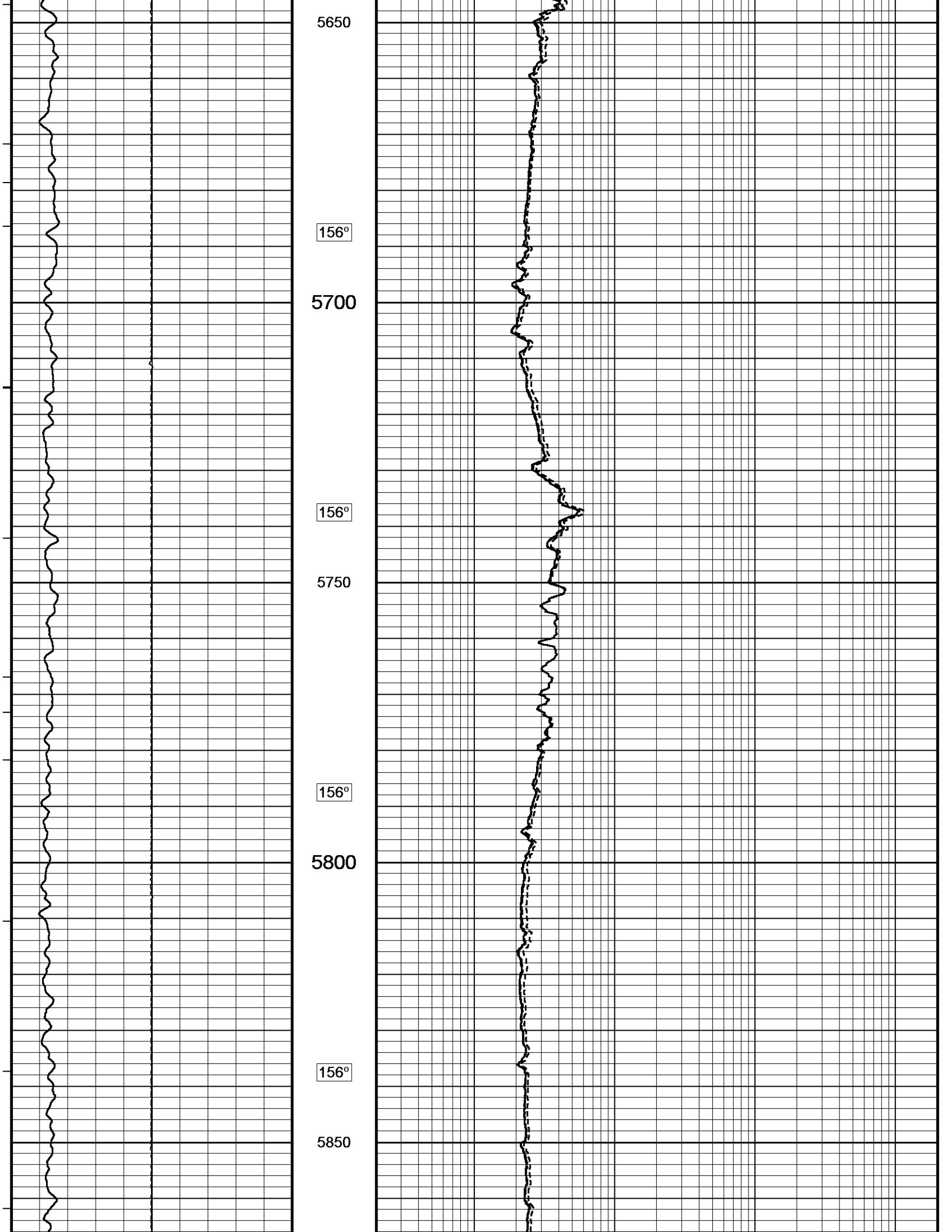
Array Ind. One Res 60 →

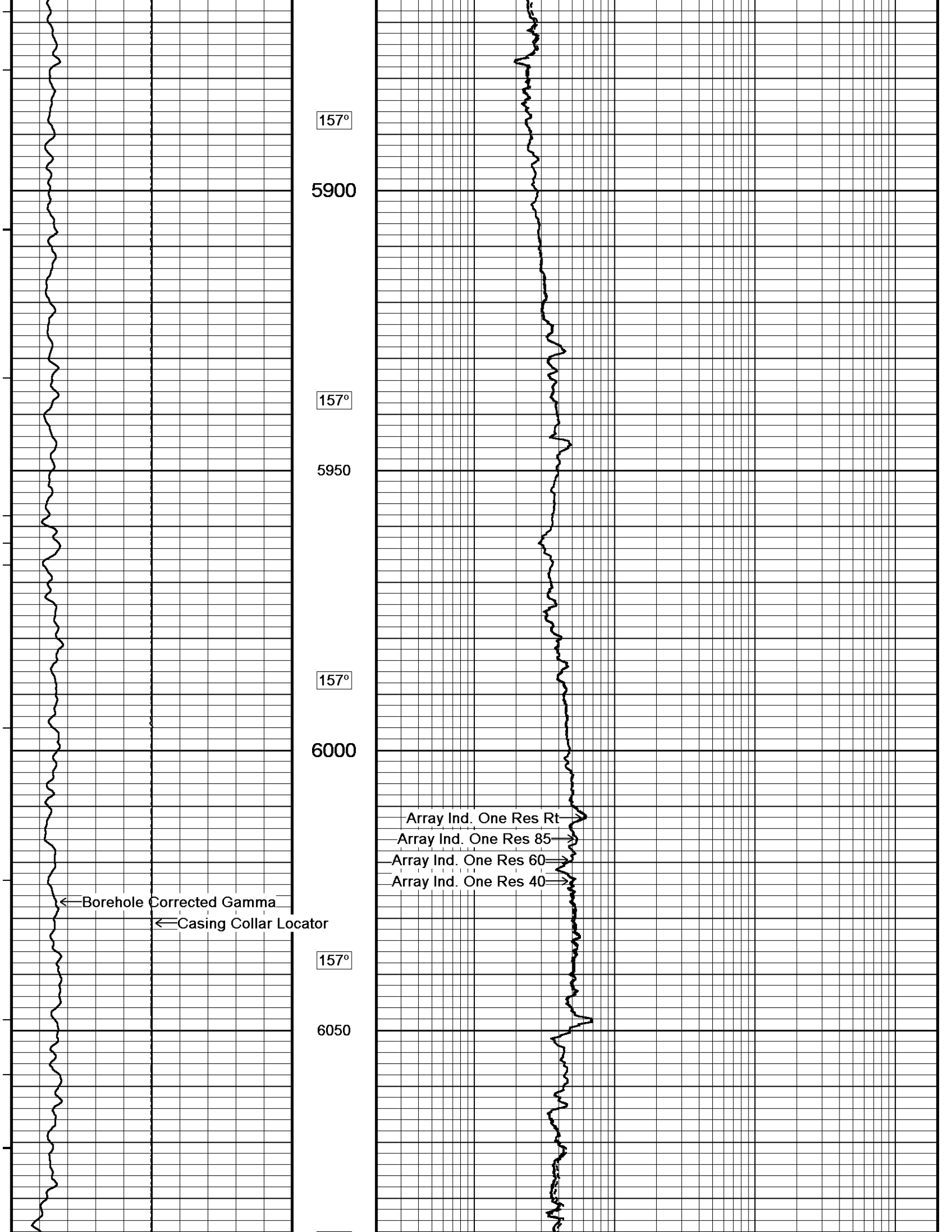
Array Ind. One Res 40 →

← Borehole Corrected Gamma

← Casing Collar Locator

156°





157°

5900

157°

5950

157°

6000

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

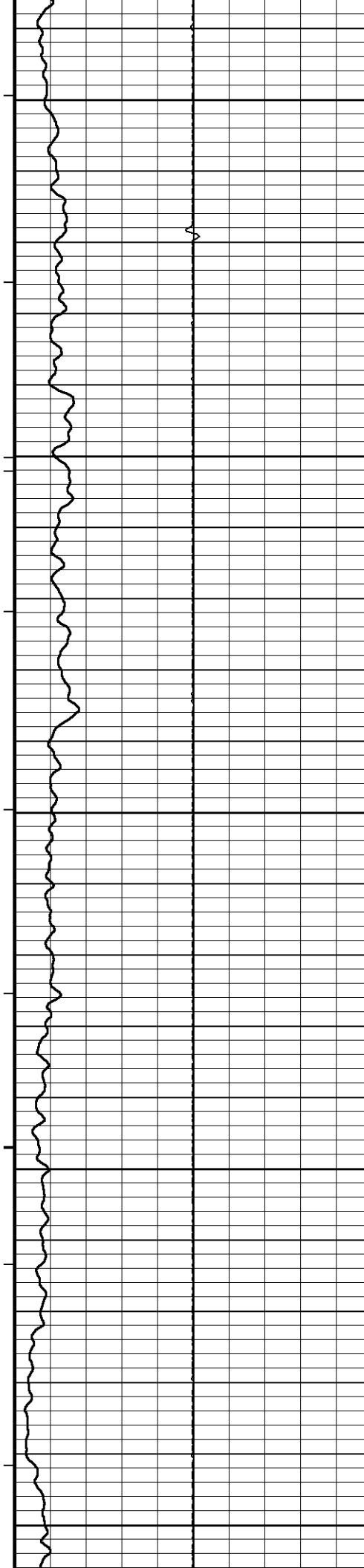
Array Ind. One Res 40

Borehole Corrected Gamma

Casing Collar Locator

157°

6050



157°

6100

157°

6150

157°

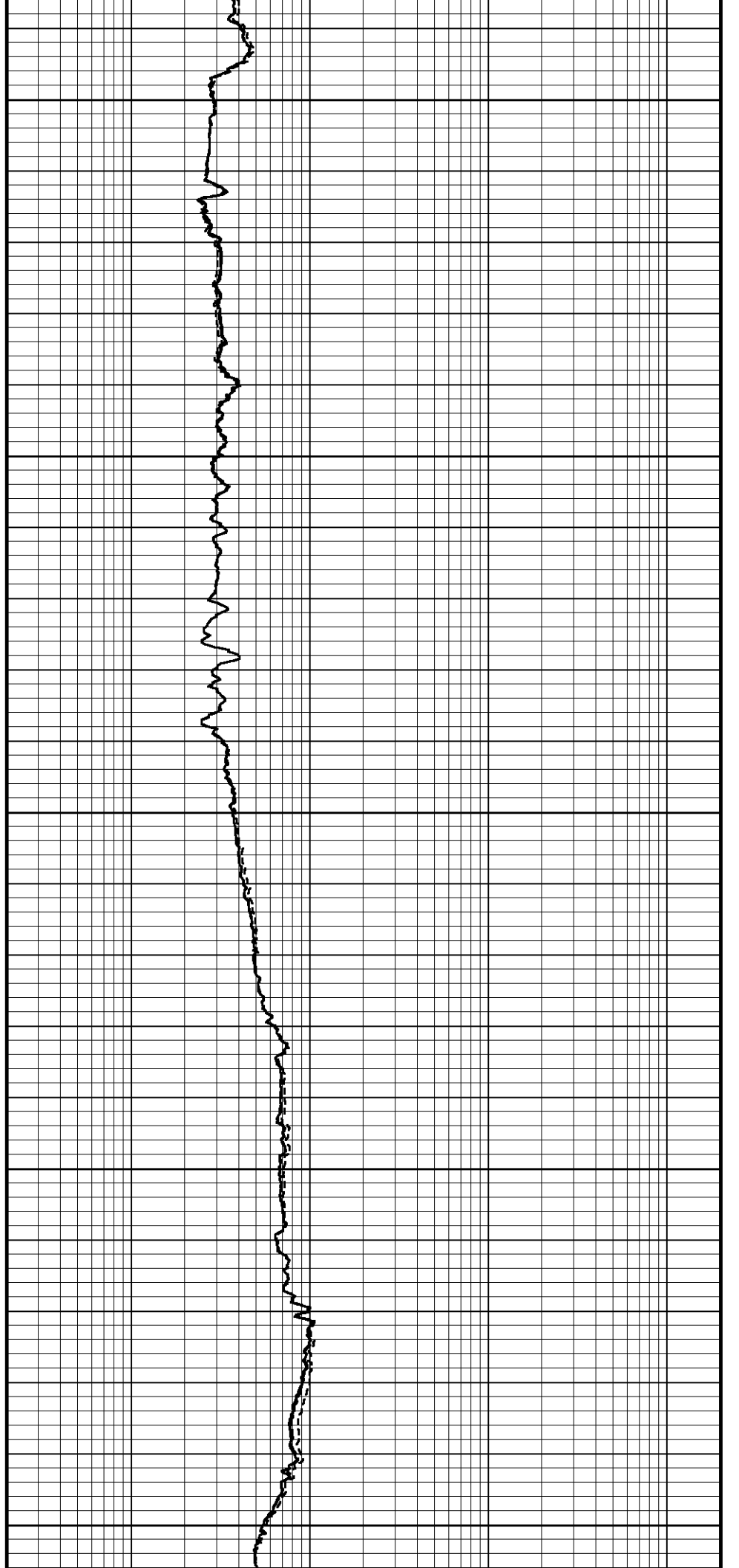
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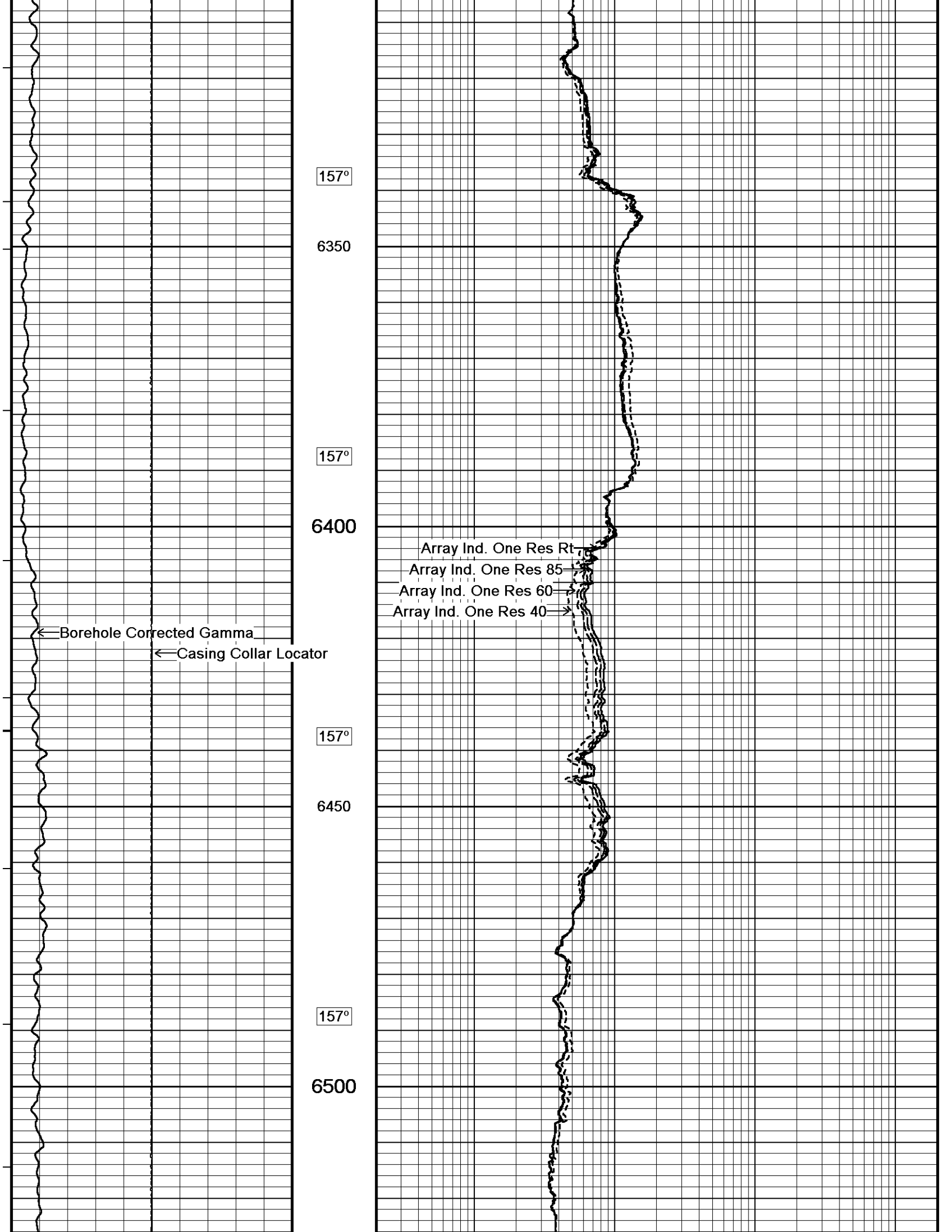
157°

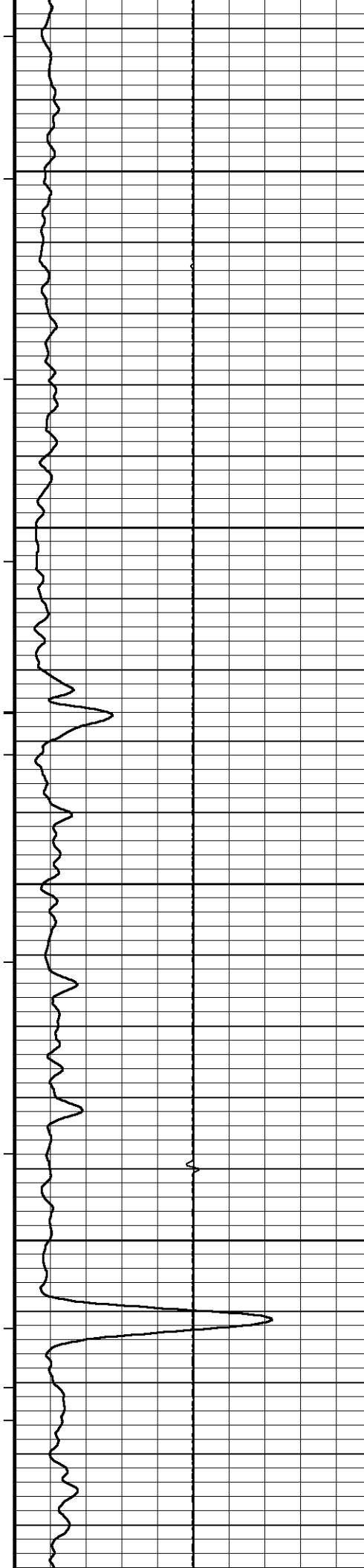
6250

157°

6300







157°

6550

157°

6600

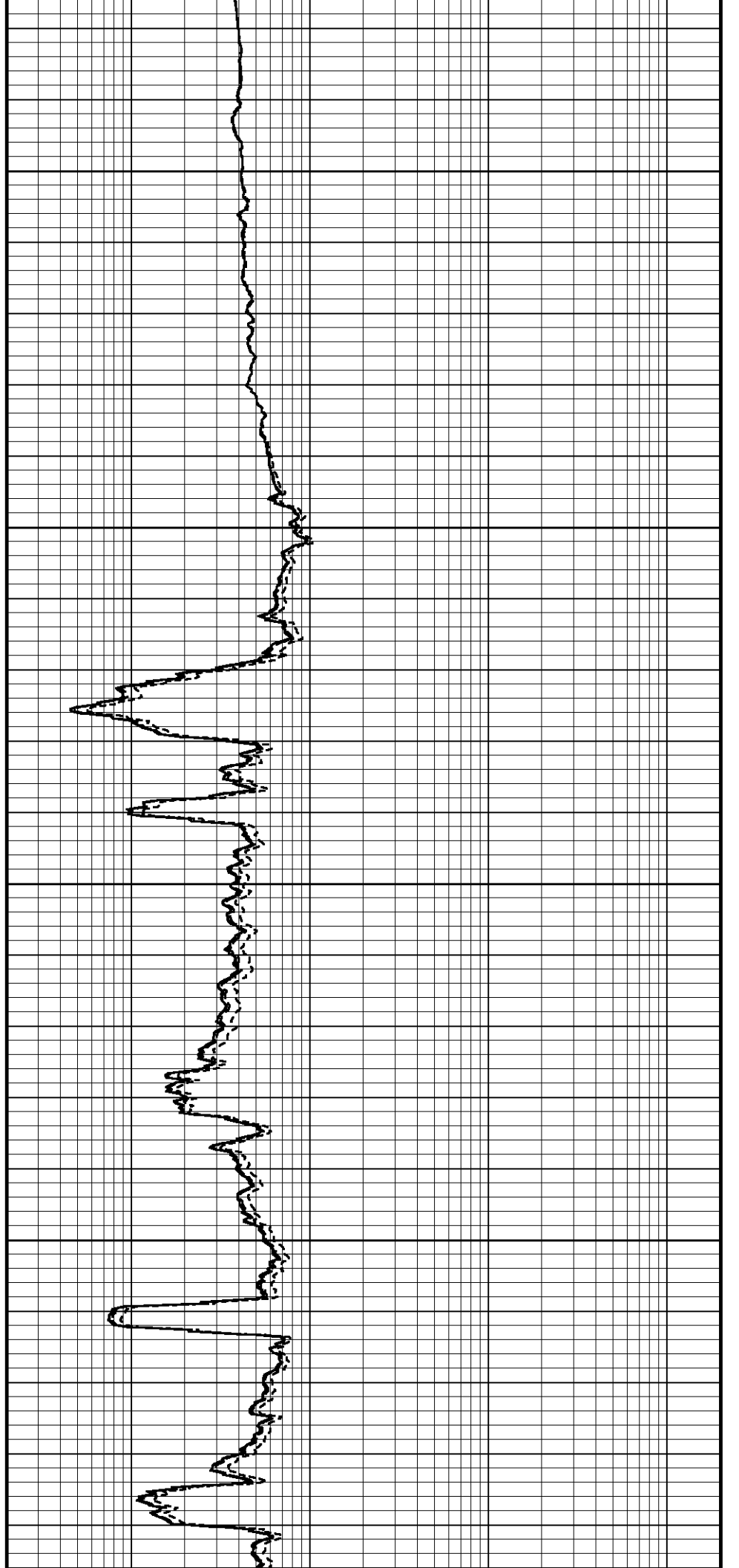
158°

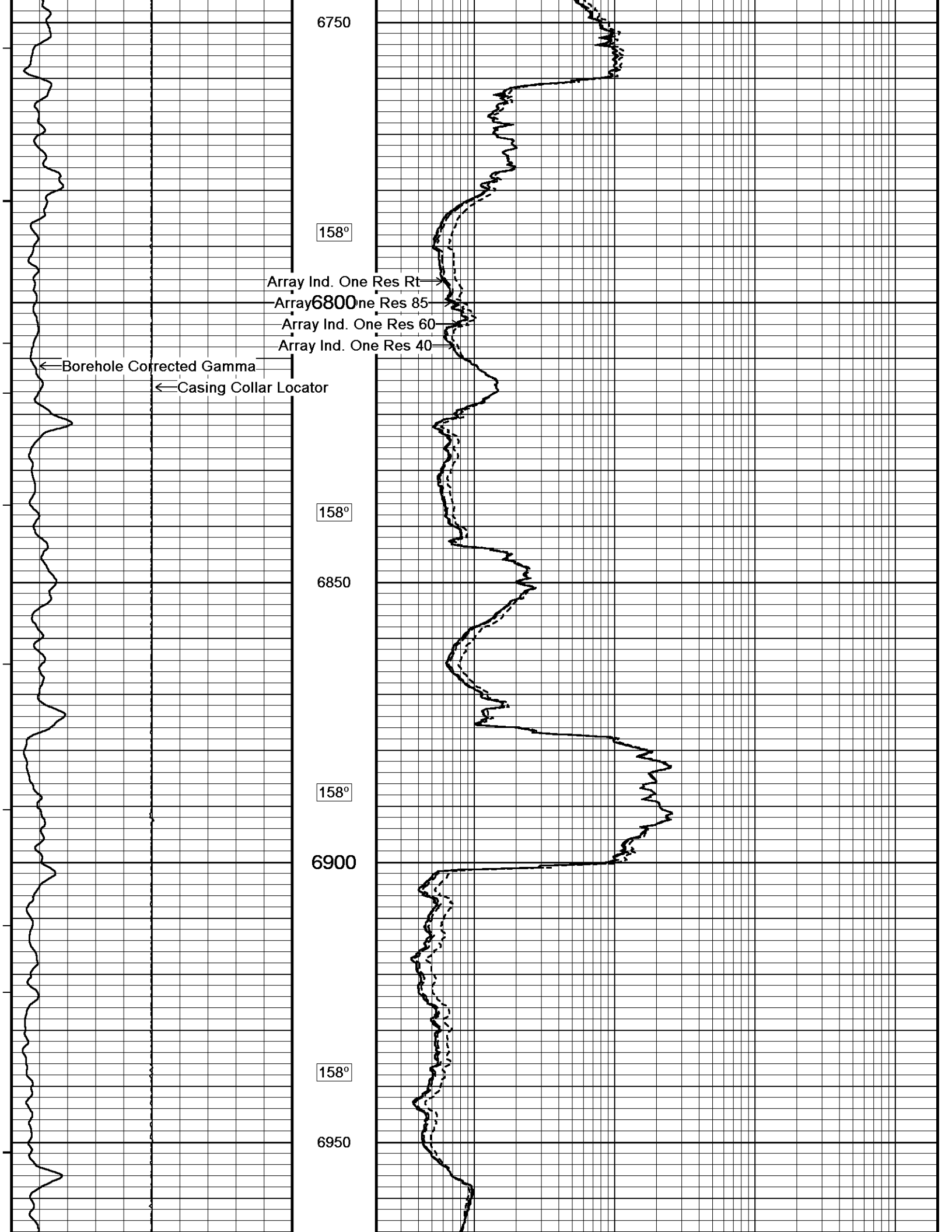
6650

158°

6700

158°





6750

158°

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

158°

6850

158°

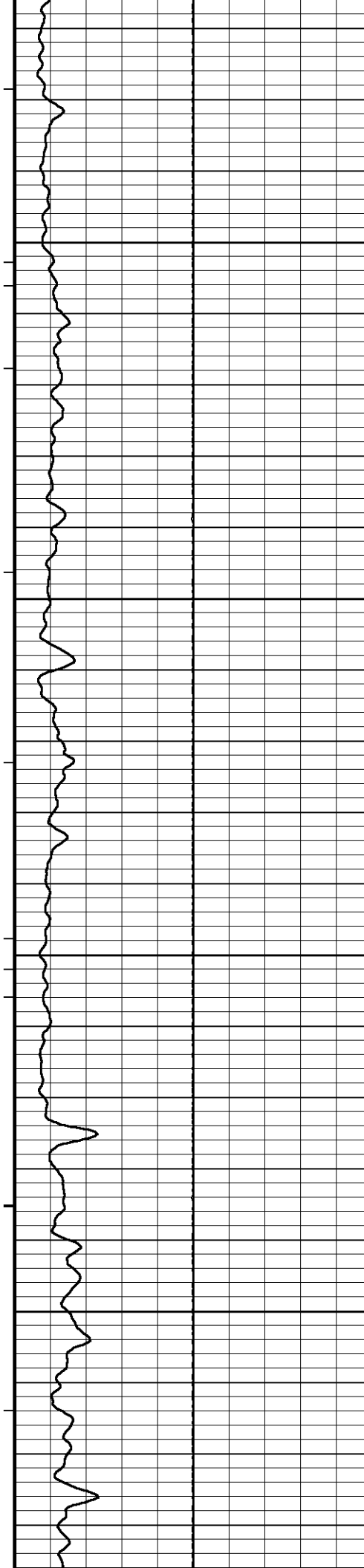
6900

158°

6950

← Borehole Corrected Gamma

← Casing Collar Locator



158°

7000

158°

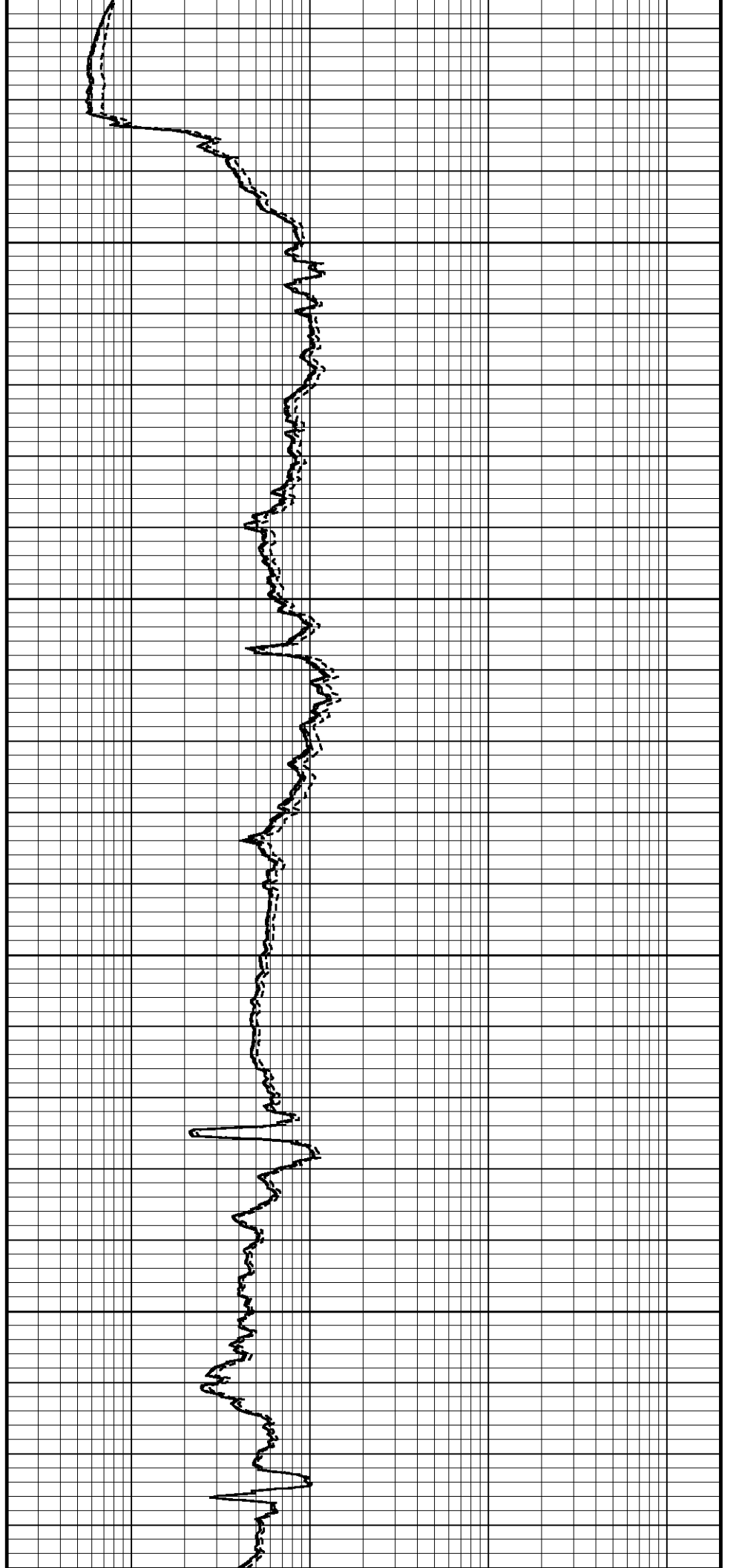
7050

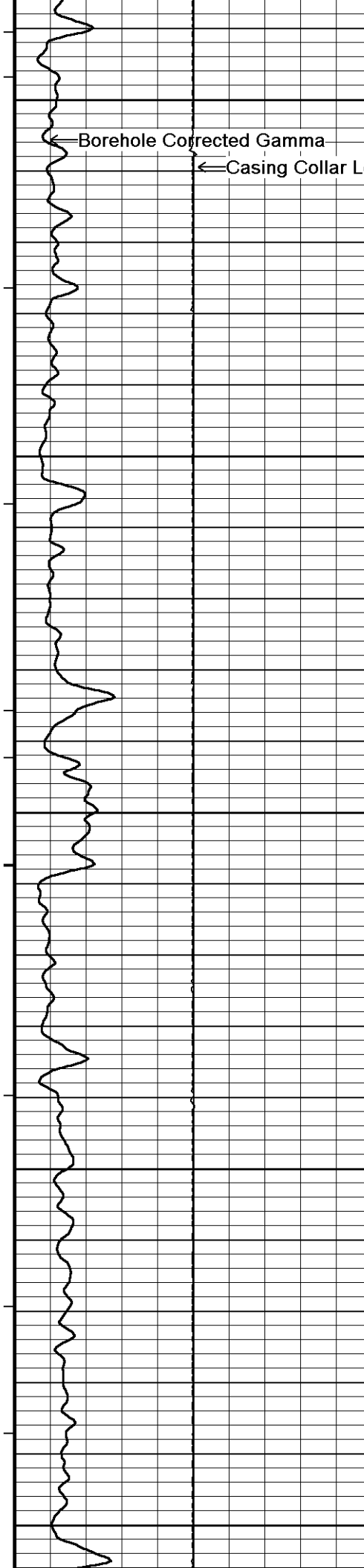
158°

7100

158°

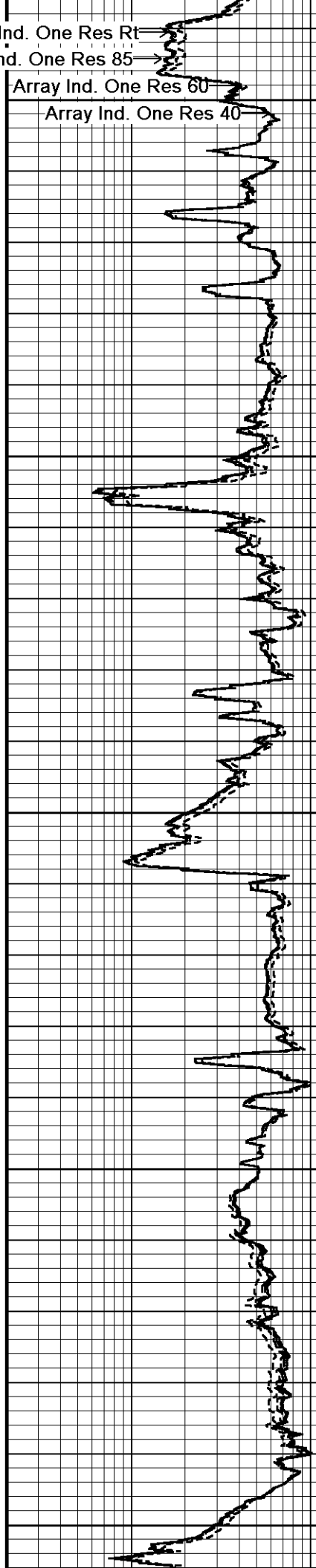
7150



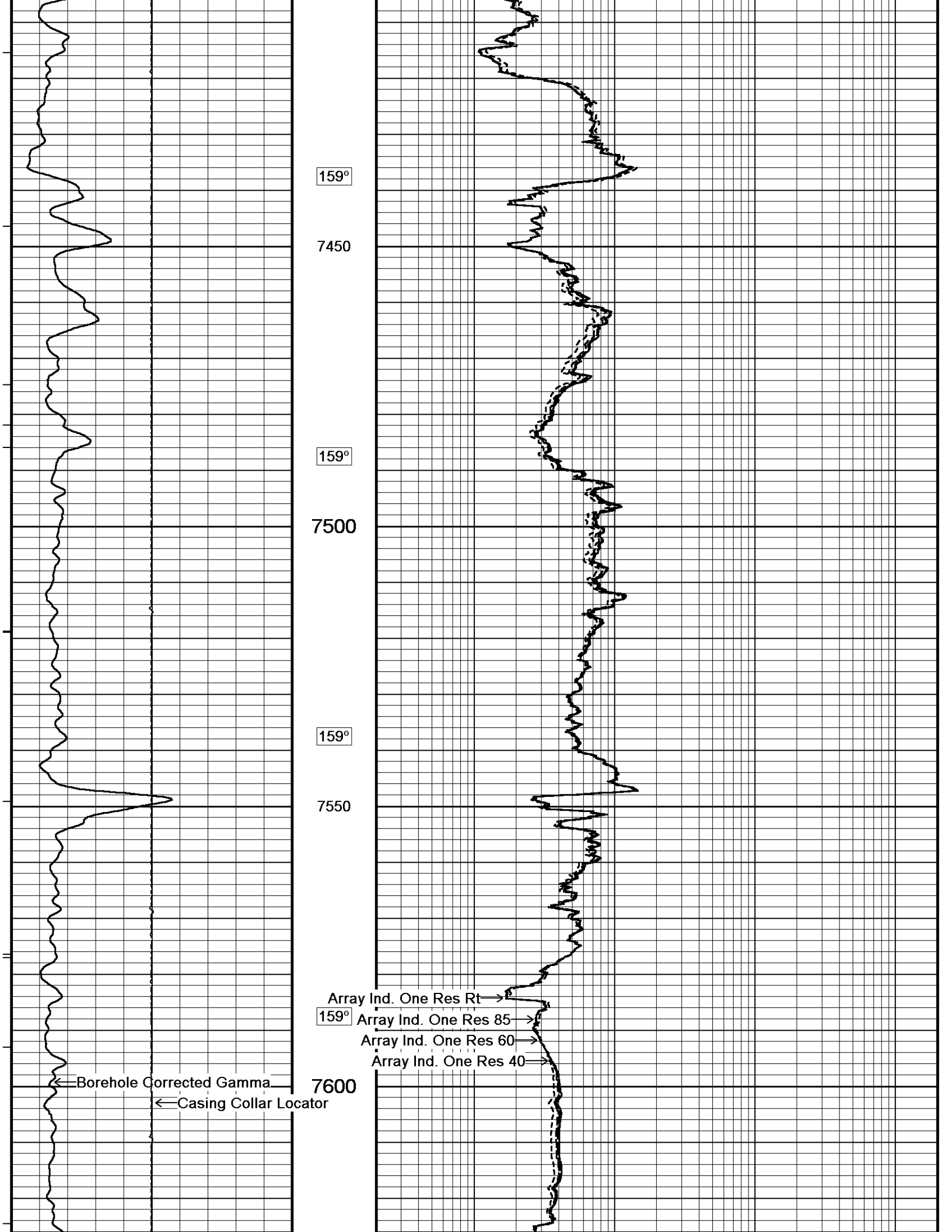


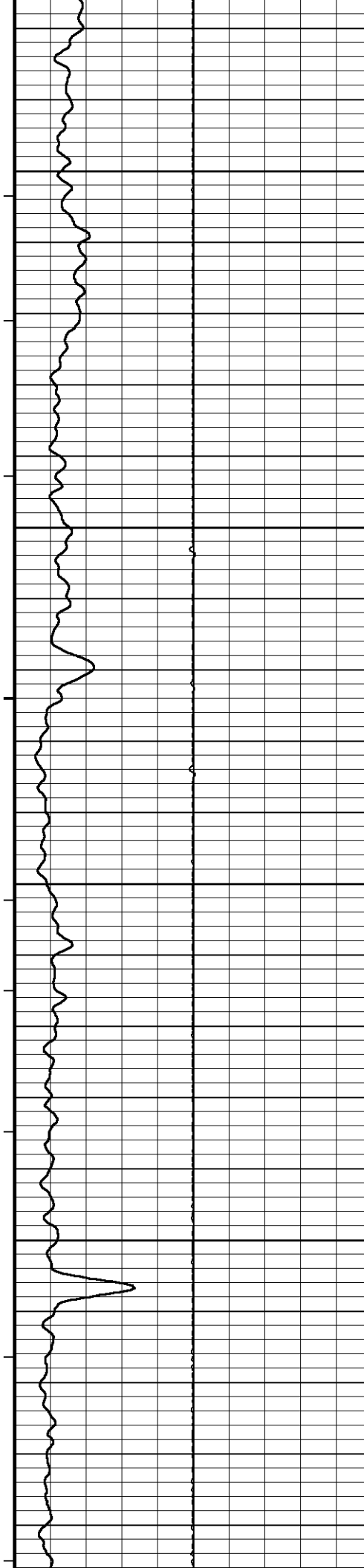
158°
7200
158°
7250
158°
7300
159°
7350
158°
7400

← Borehole Corrected Gamma
← Casing Collar Locator



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





159°

7650

159°

7700

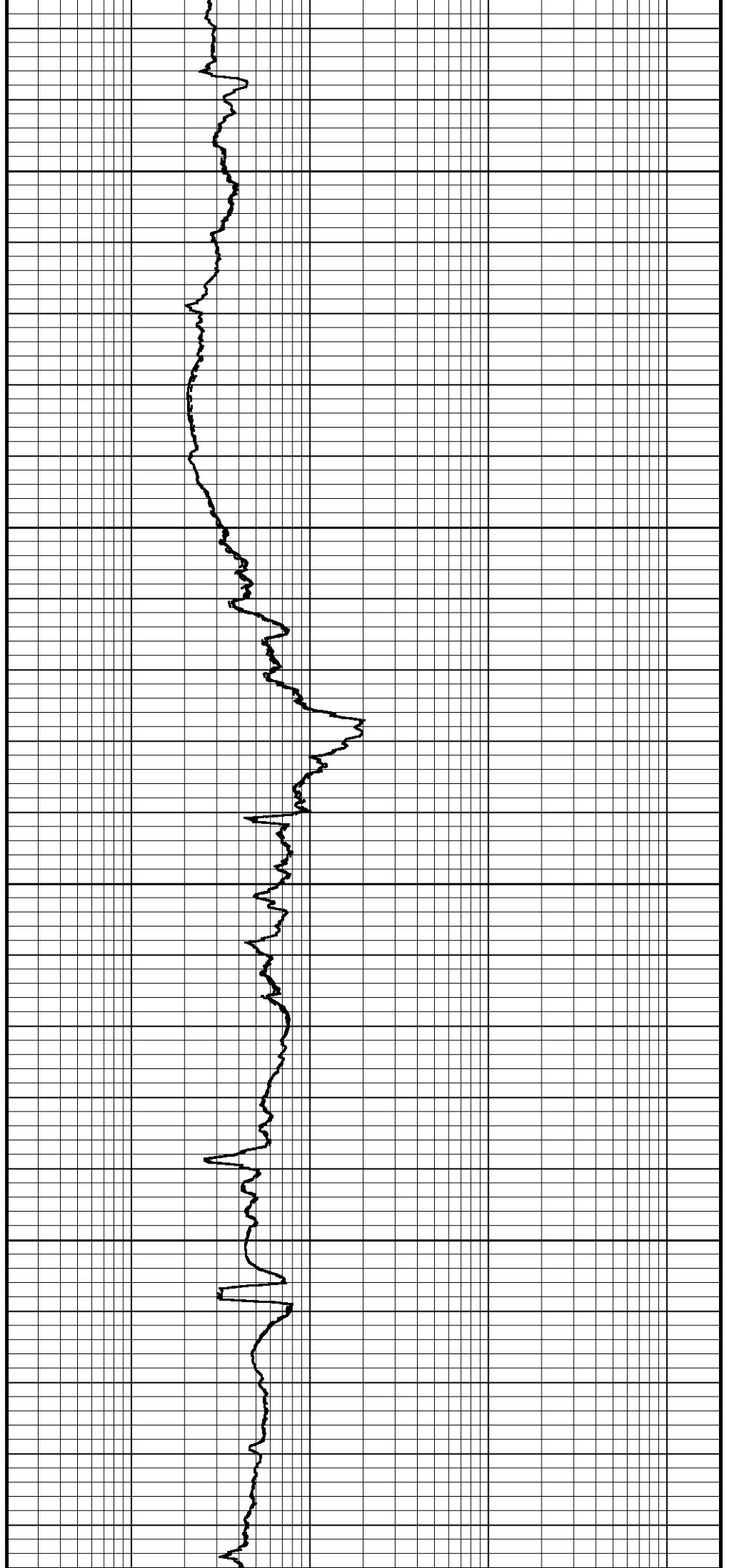
159°

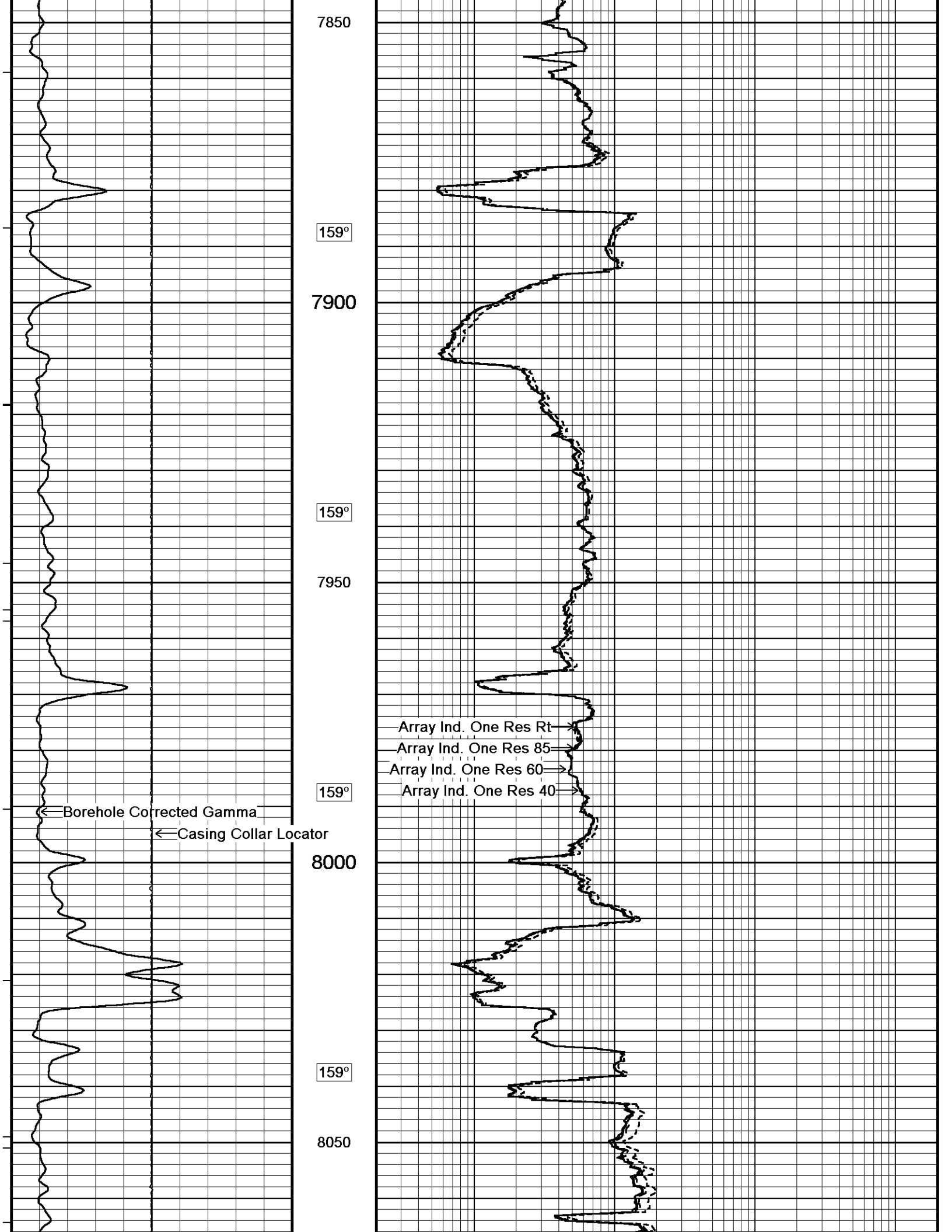
7750

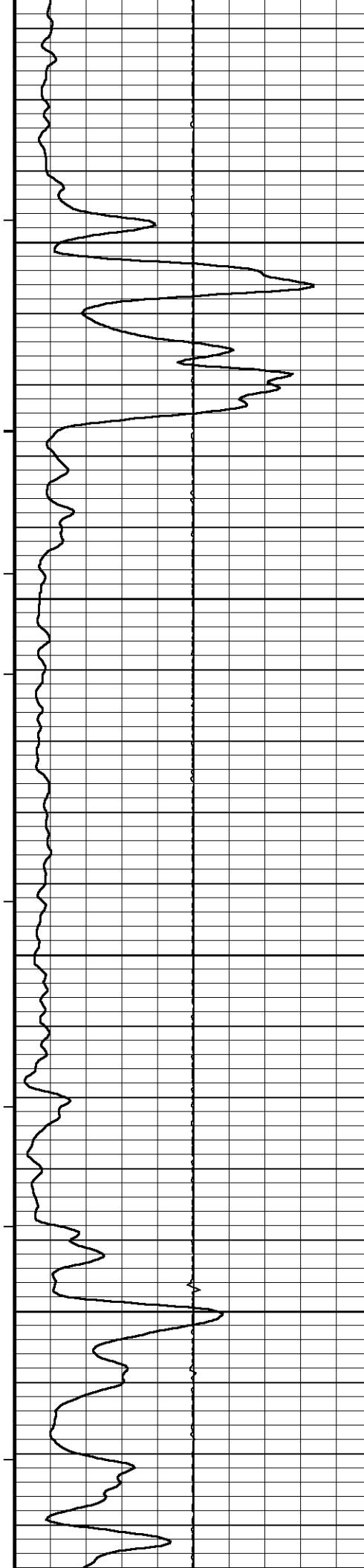
159°

7800

159°







159°

8100

159°

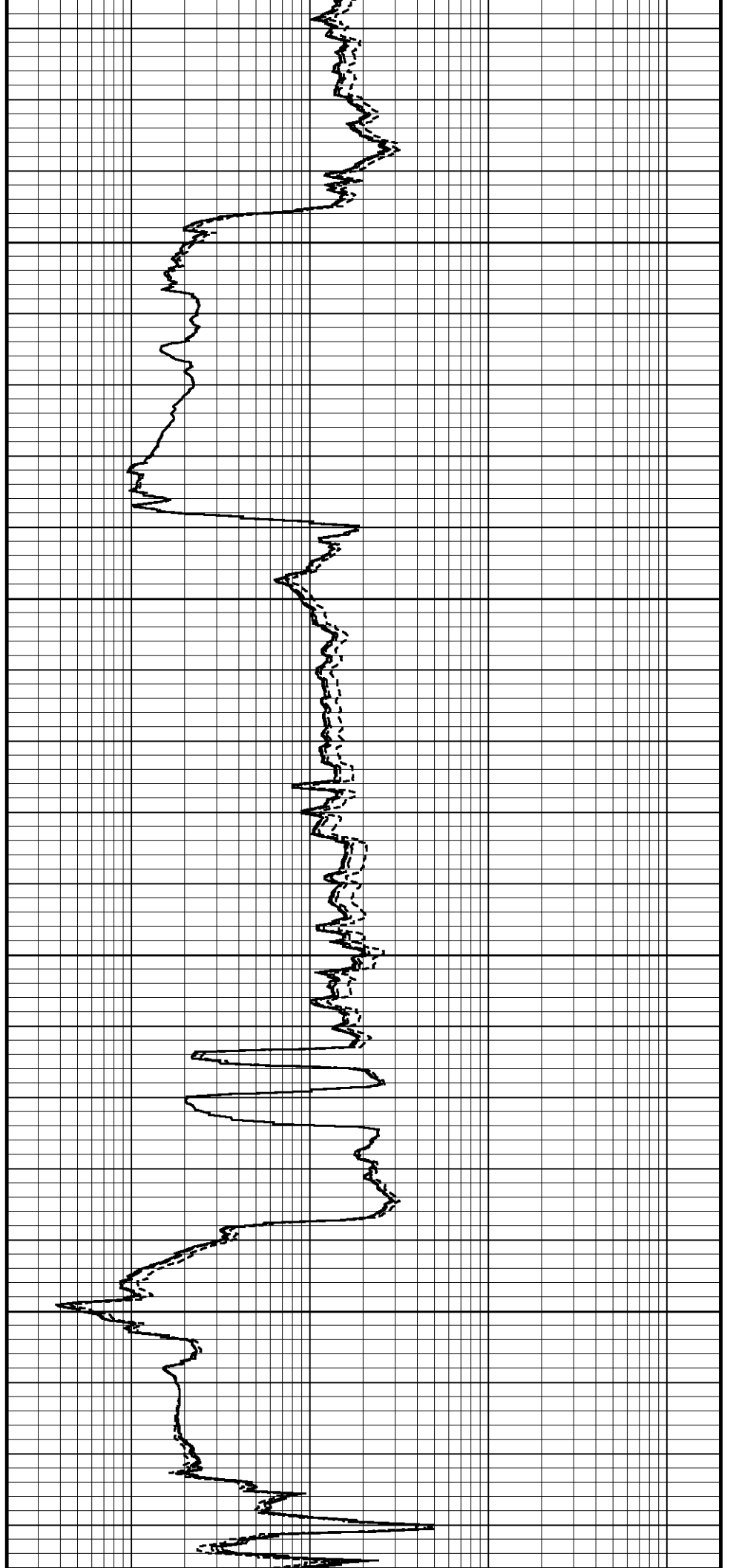
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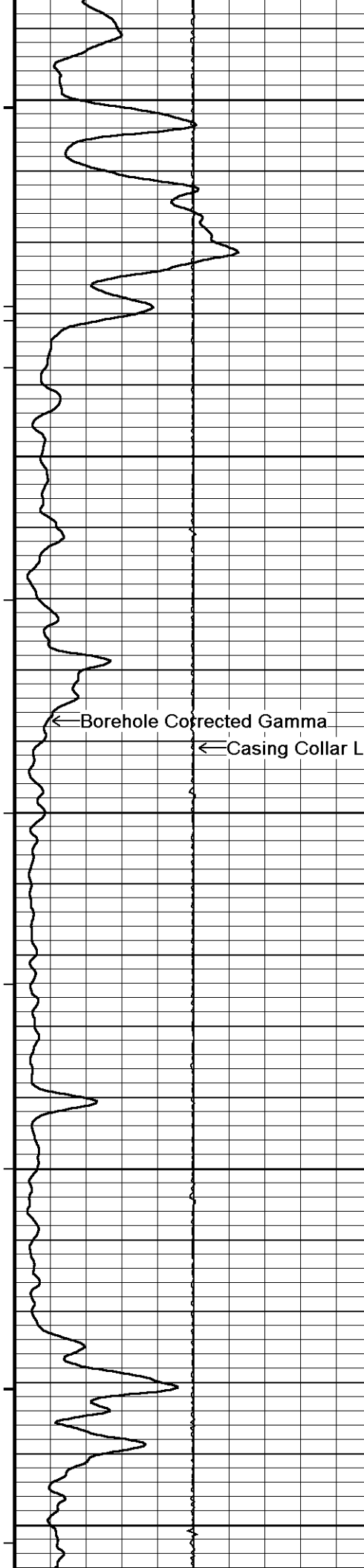
159°

8200

159°

8250





159°

8300

159°

8350

159°

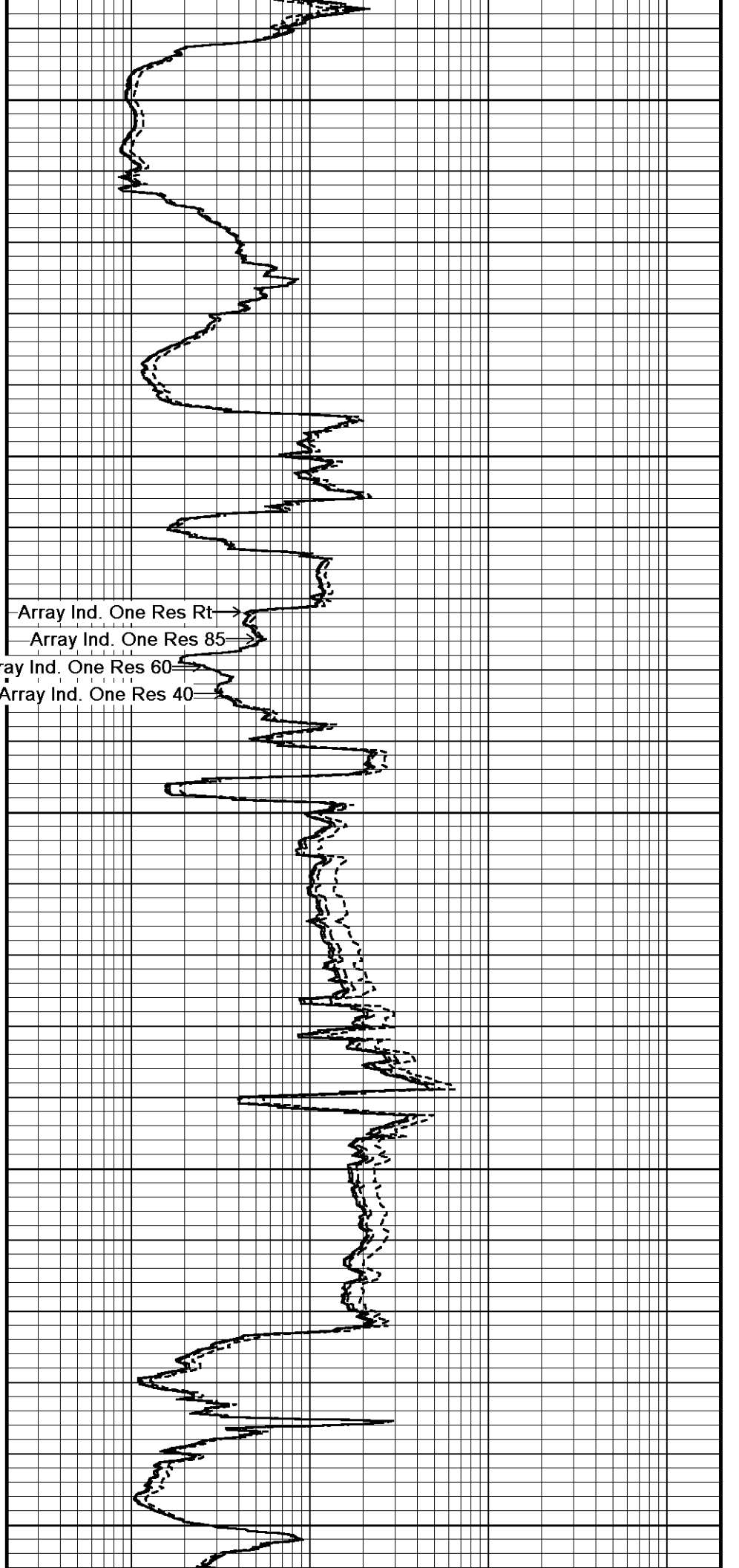
8400

159°

8450

159°

8500



Array Ind. One Res Rt

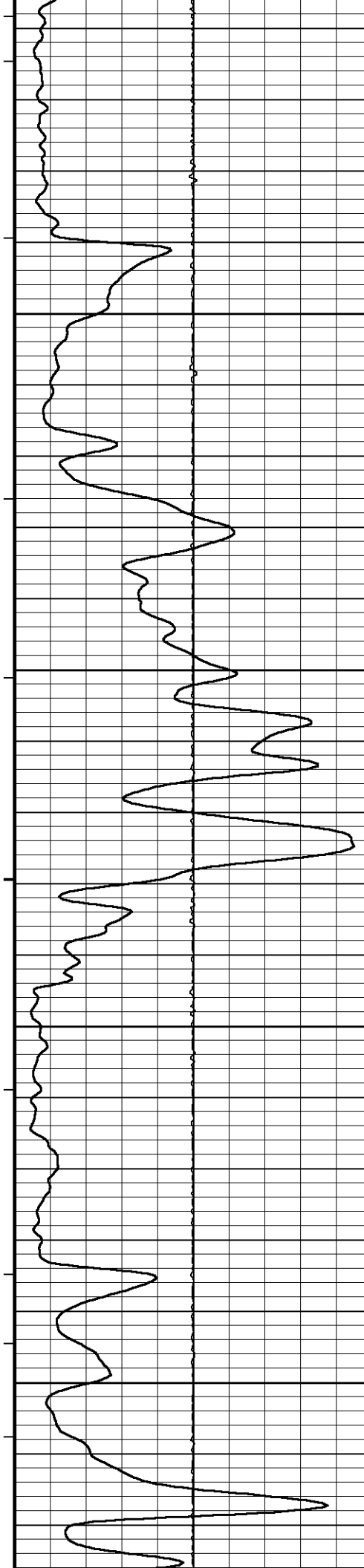
Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

Borehole Corrected Gamma

Casing Collar Locator



159°

8550

159°

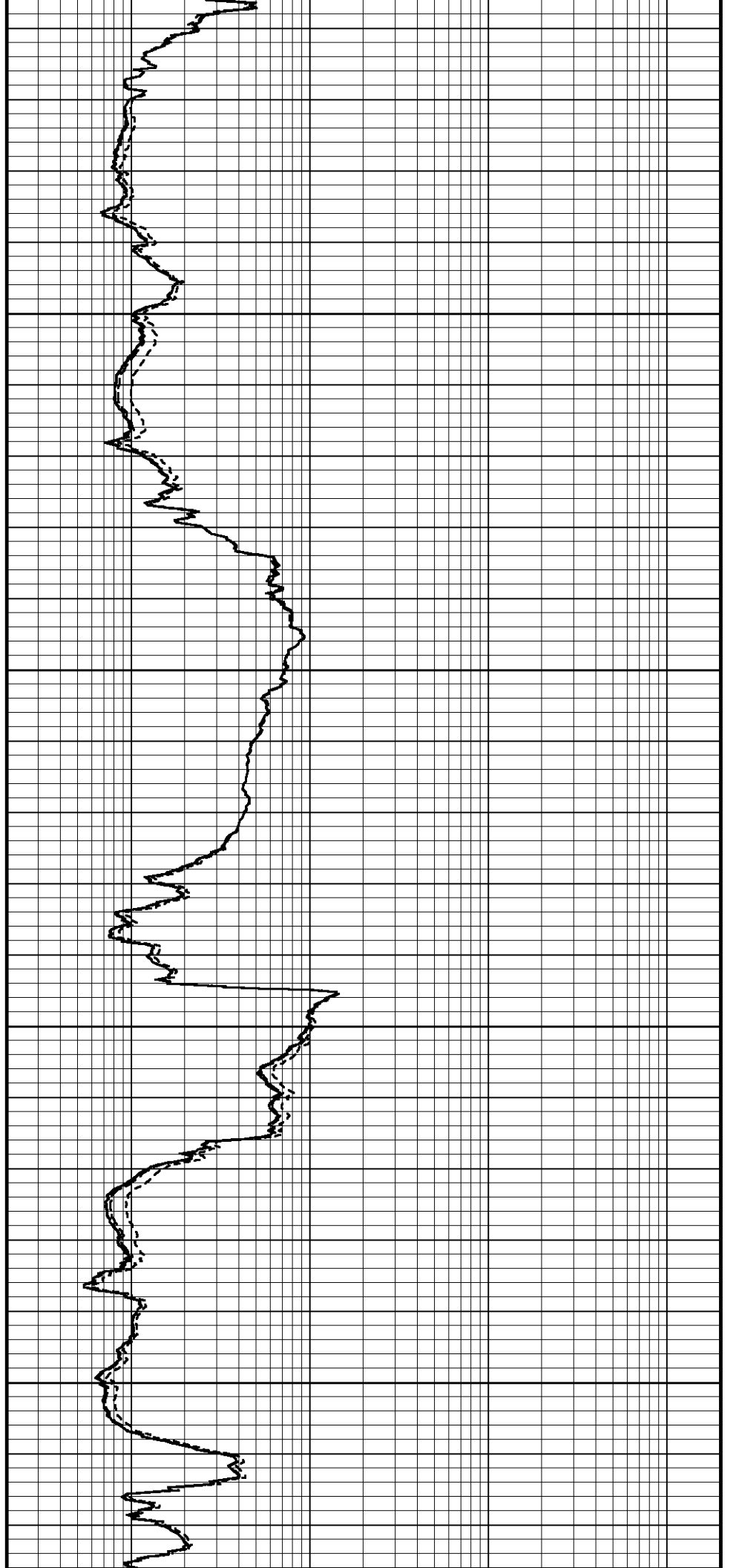
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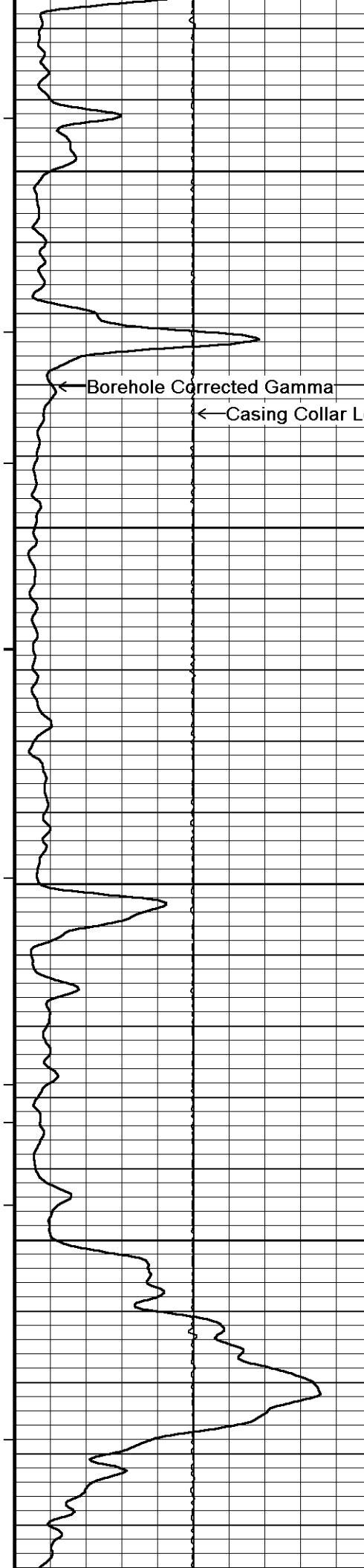
159°

8650

159°

8700





159°

8750

159°

8800

159°

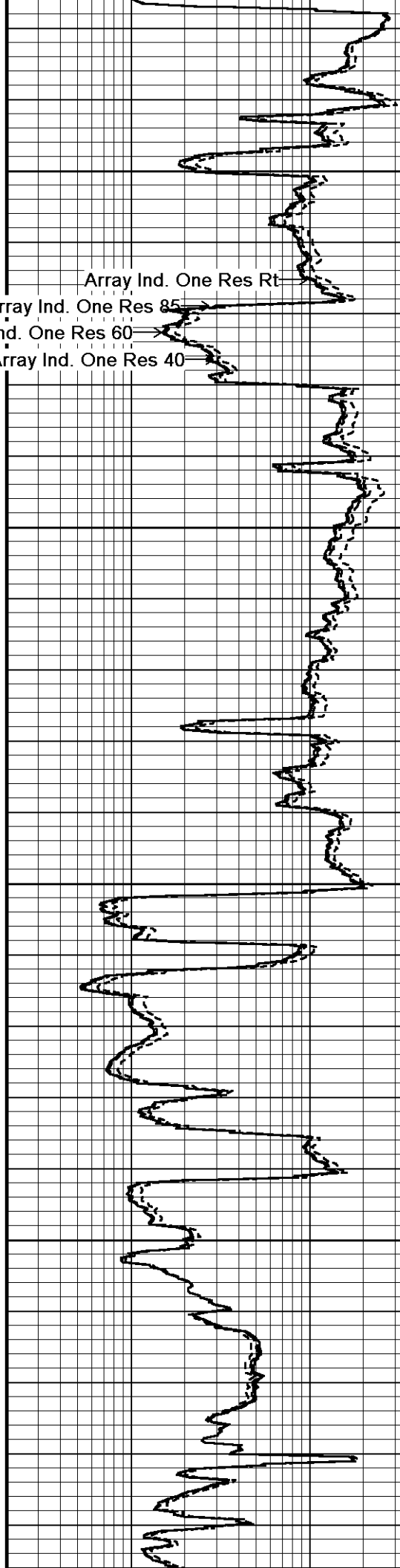
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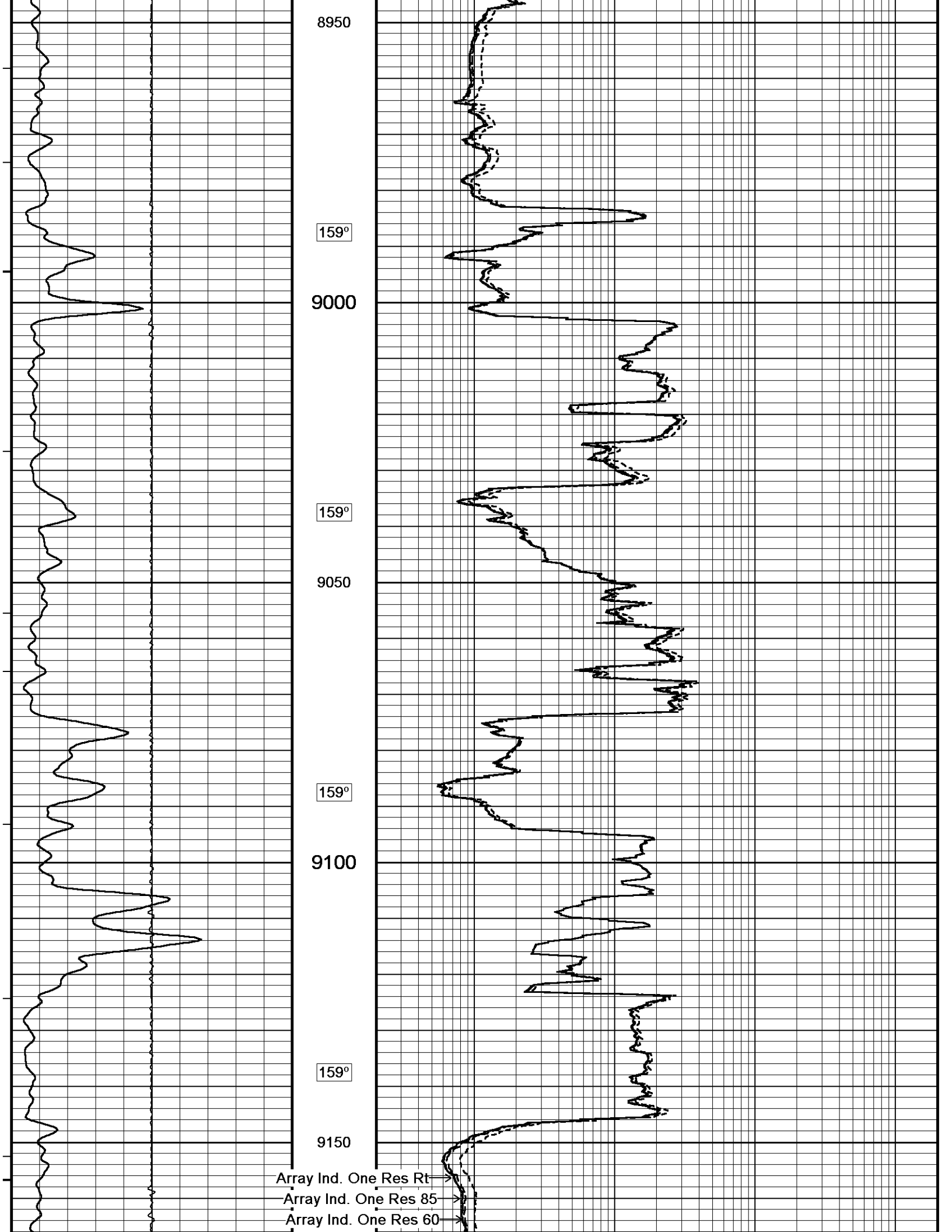
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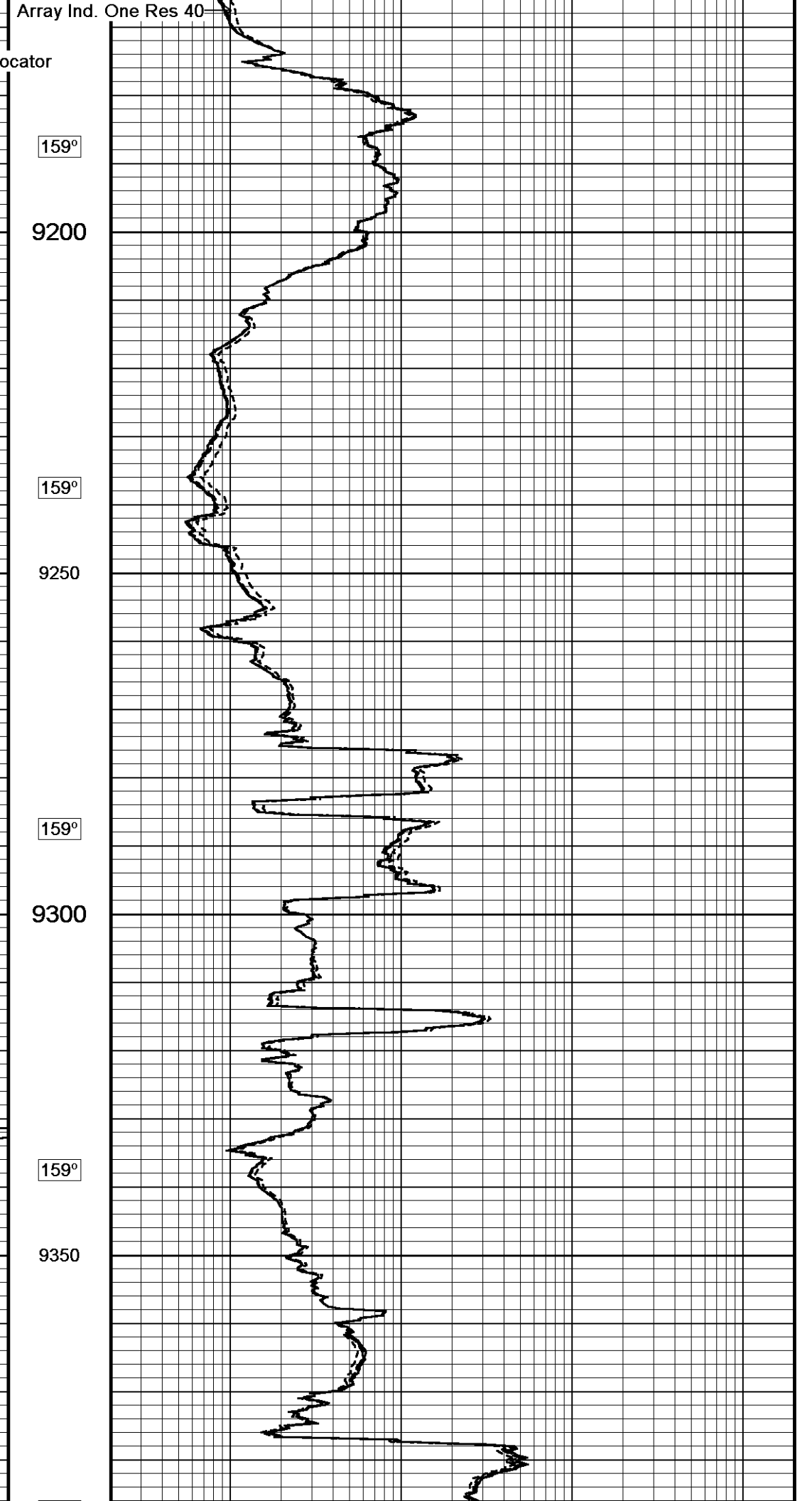
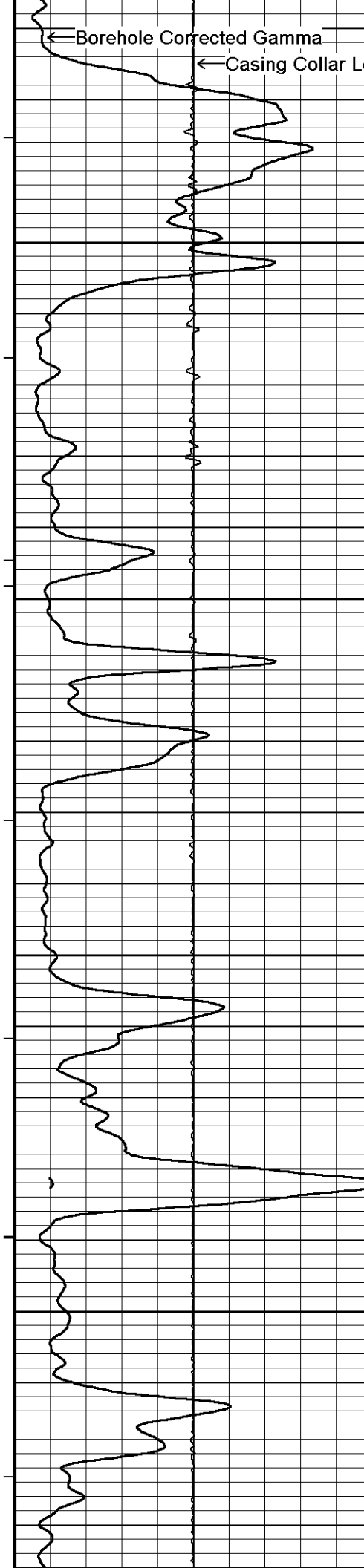
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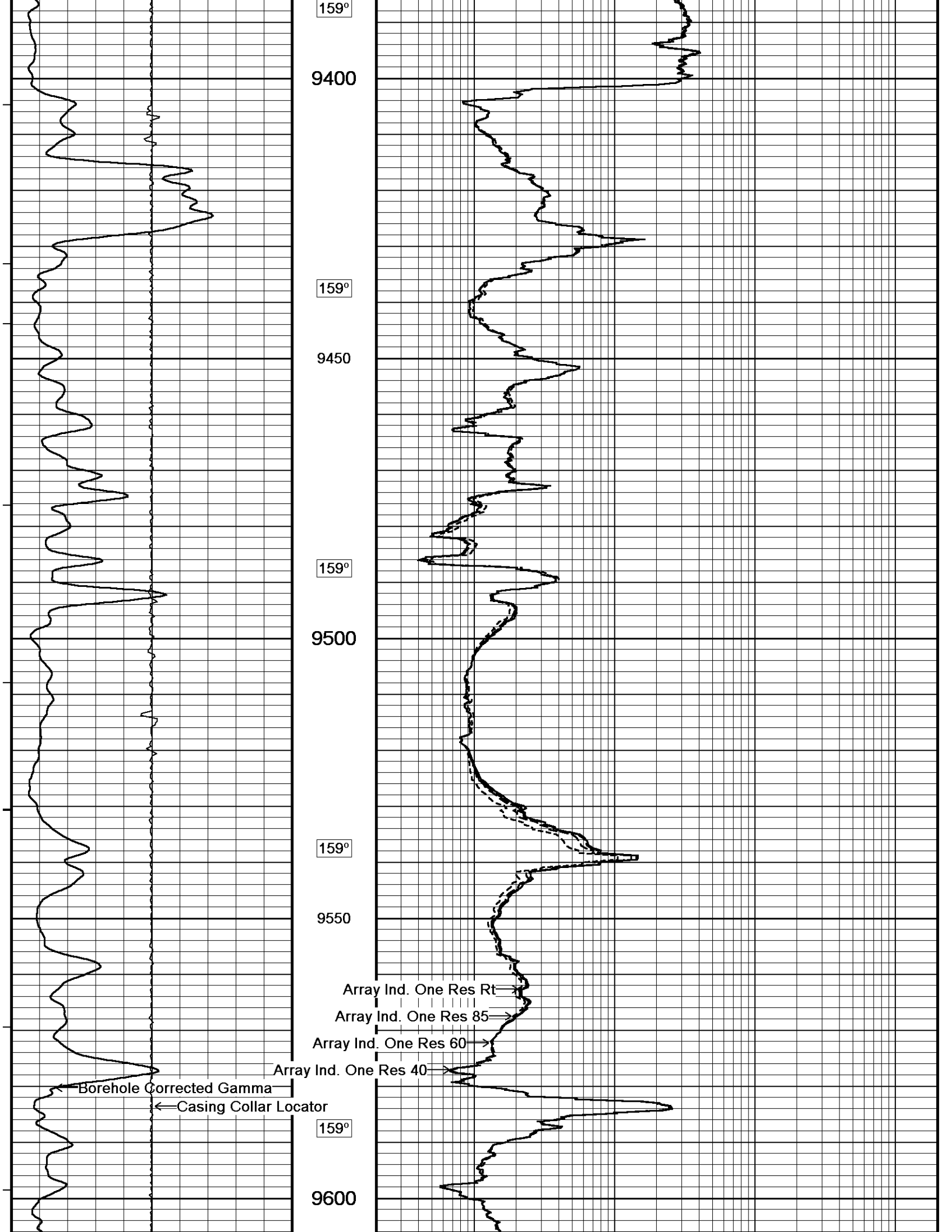
159°

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









159°

9400

159°

9450

159°

9500

159°

9550

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

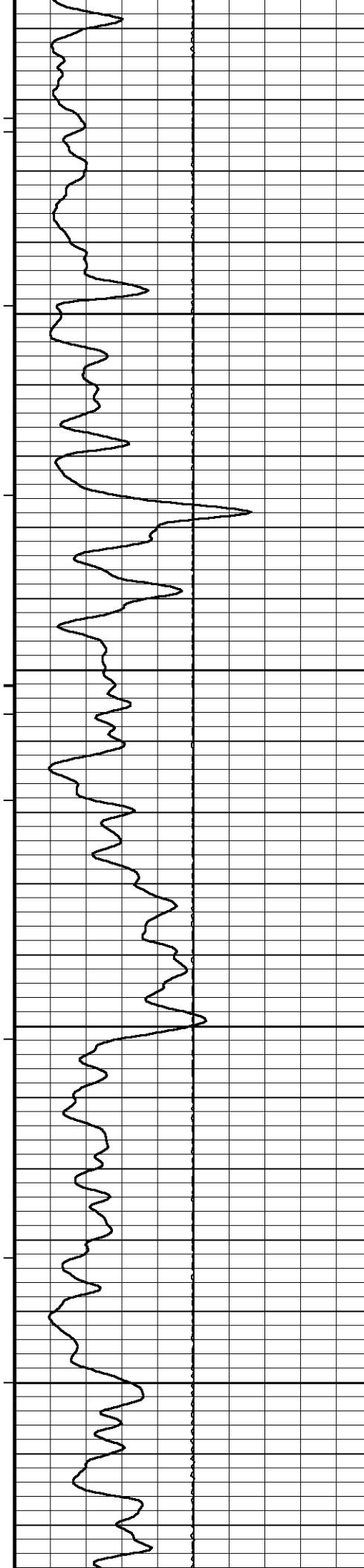
Array Ind. One Res 40

Borehole Corrected Gamma

Casing Collar Locator

159°

9600



159°

9650

159°

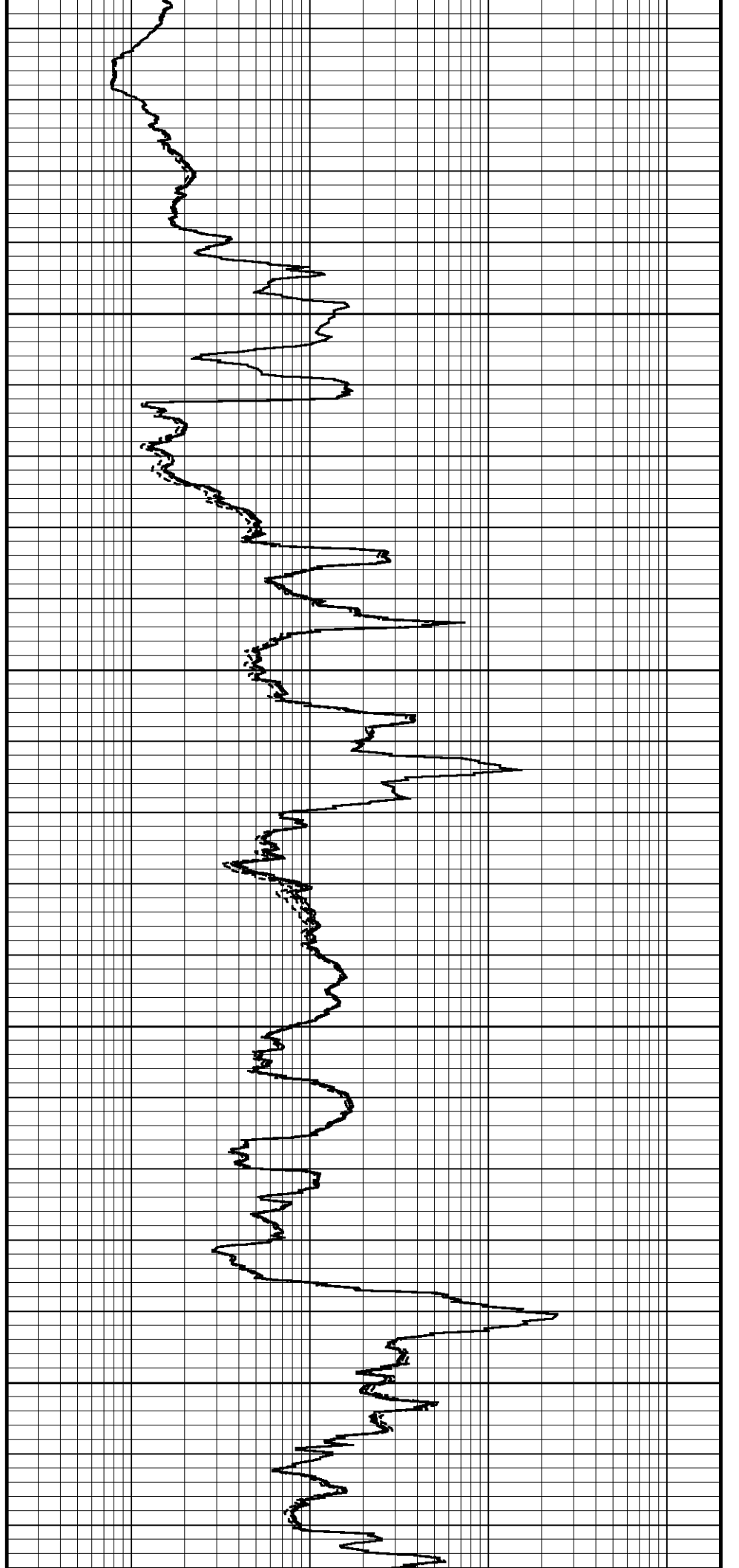
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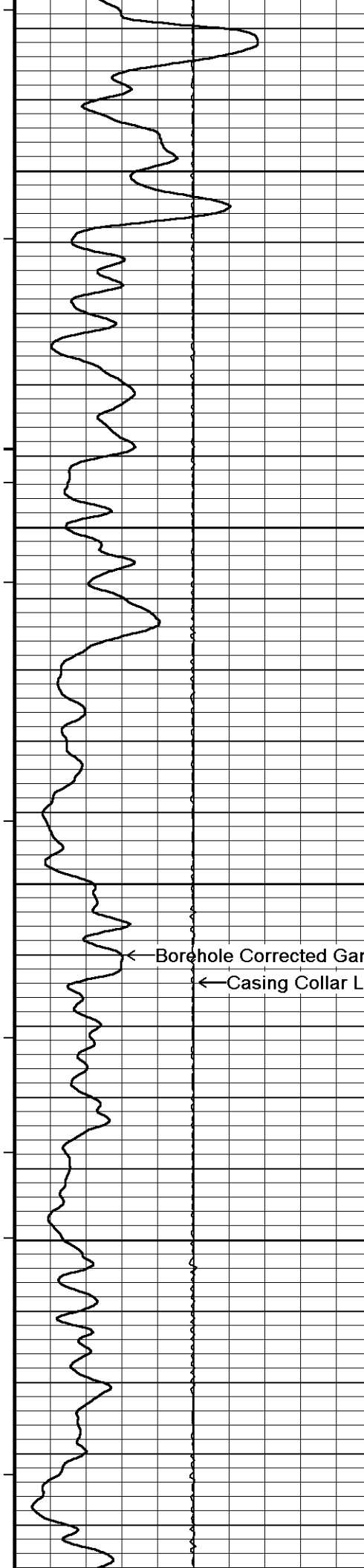
159°

9750

159°

9800





159°

9850

159°

9900

159°

Array Ind. One Res Rt

9950 Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

← Borehole Corrected Gamma
← Casing Collar Locator

159°

10000

159°

←

→



10050

159°

10100

158°

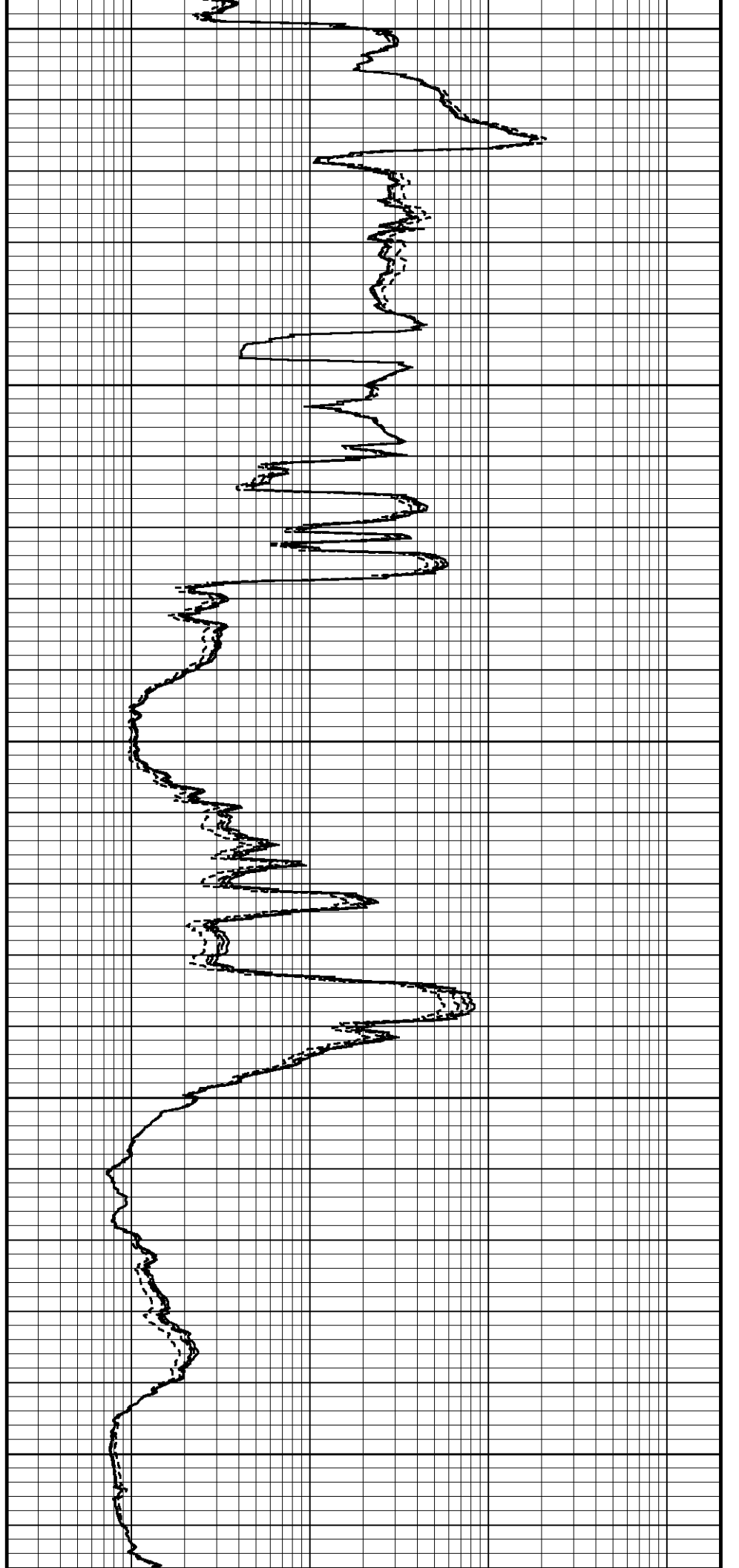
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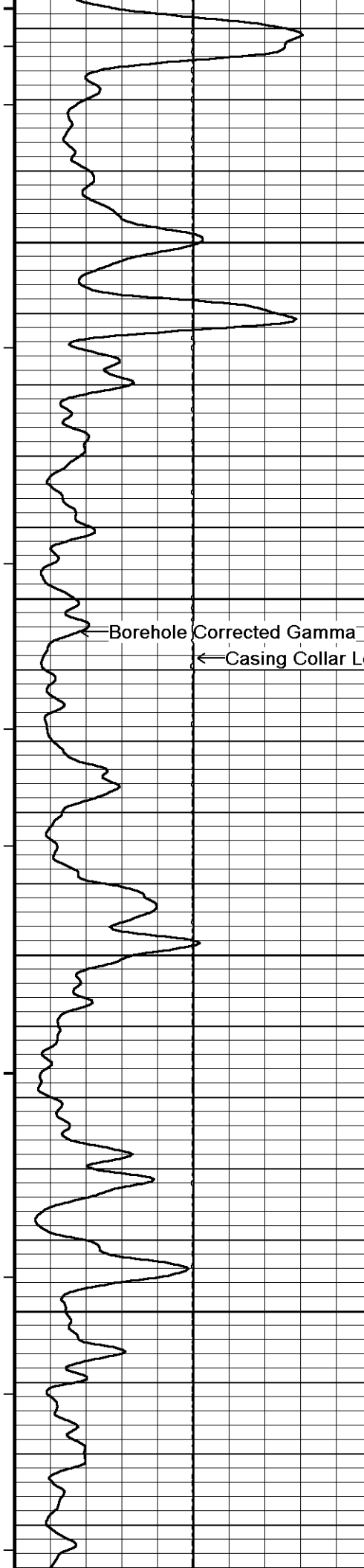
158°

10200

158°

10250





158°

10300

158°

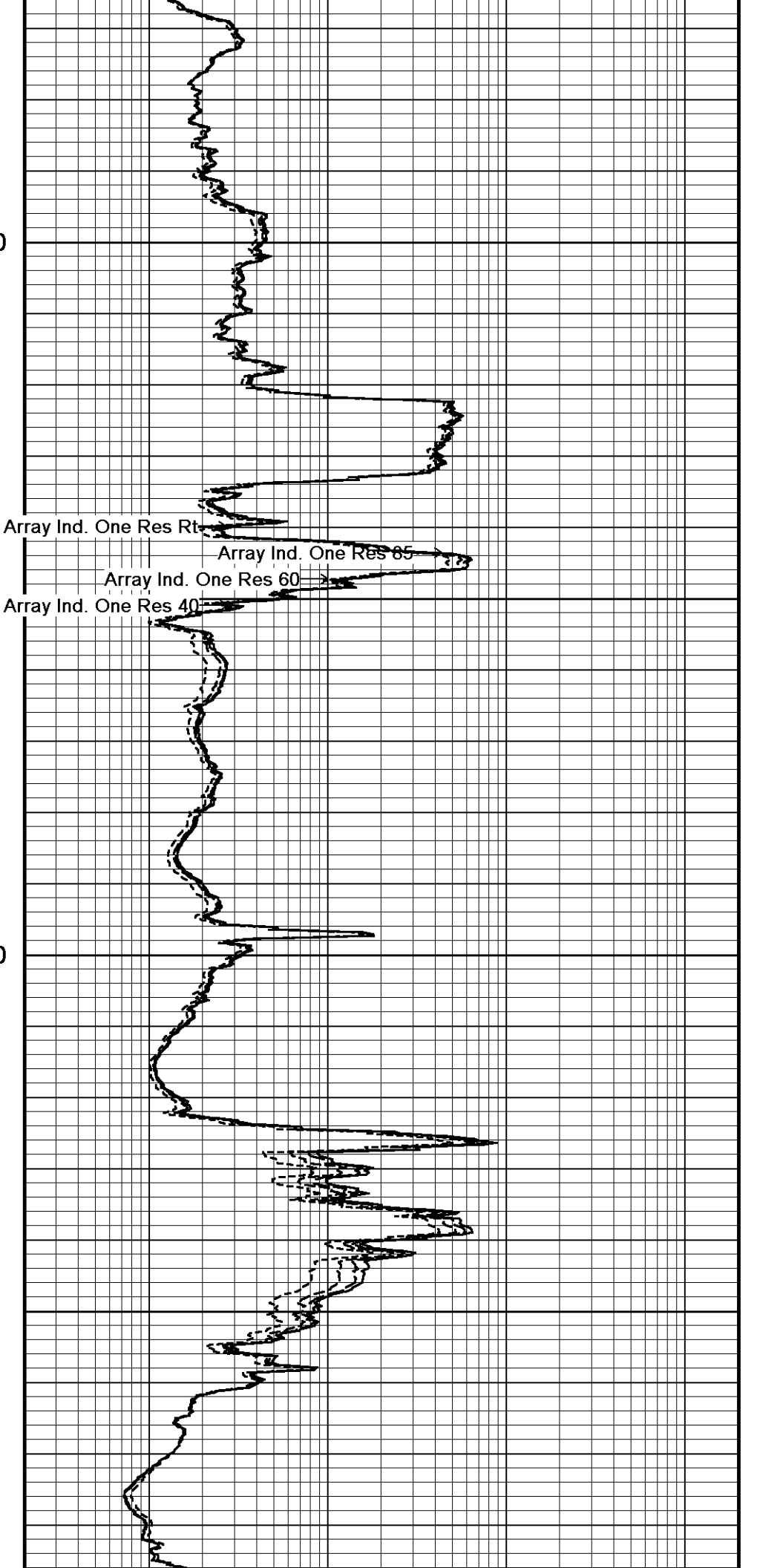
10350

158°

10400

158°

10450



Array Ind. One Res Rt

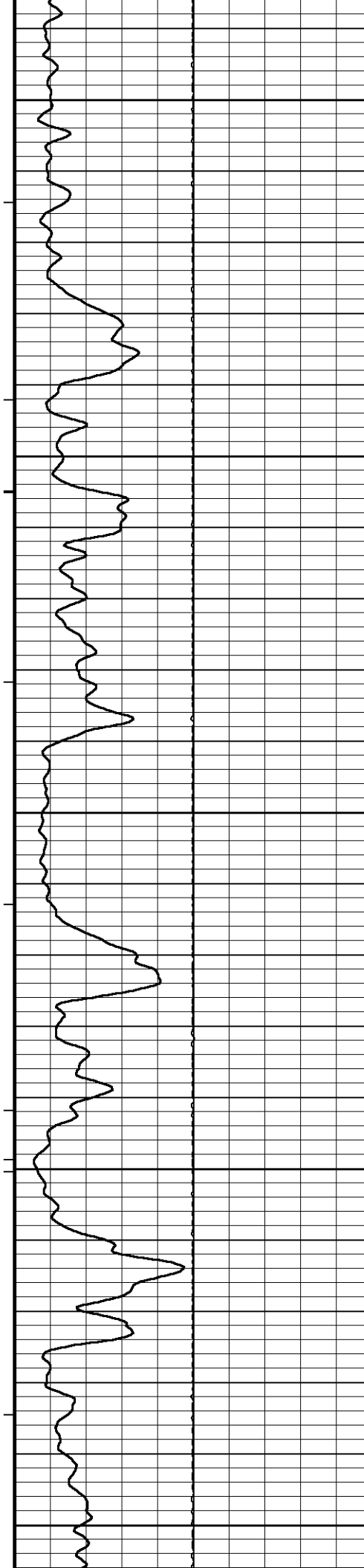
Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

Borehole Corrected Gamma

Casing Collar Locator



158°

10500

157°

10550

157°

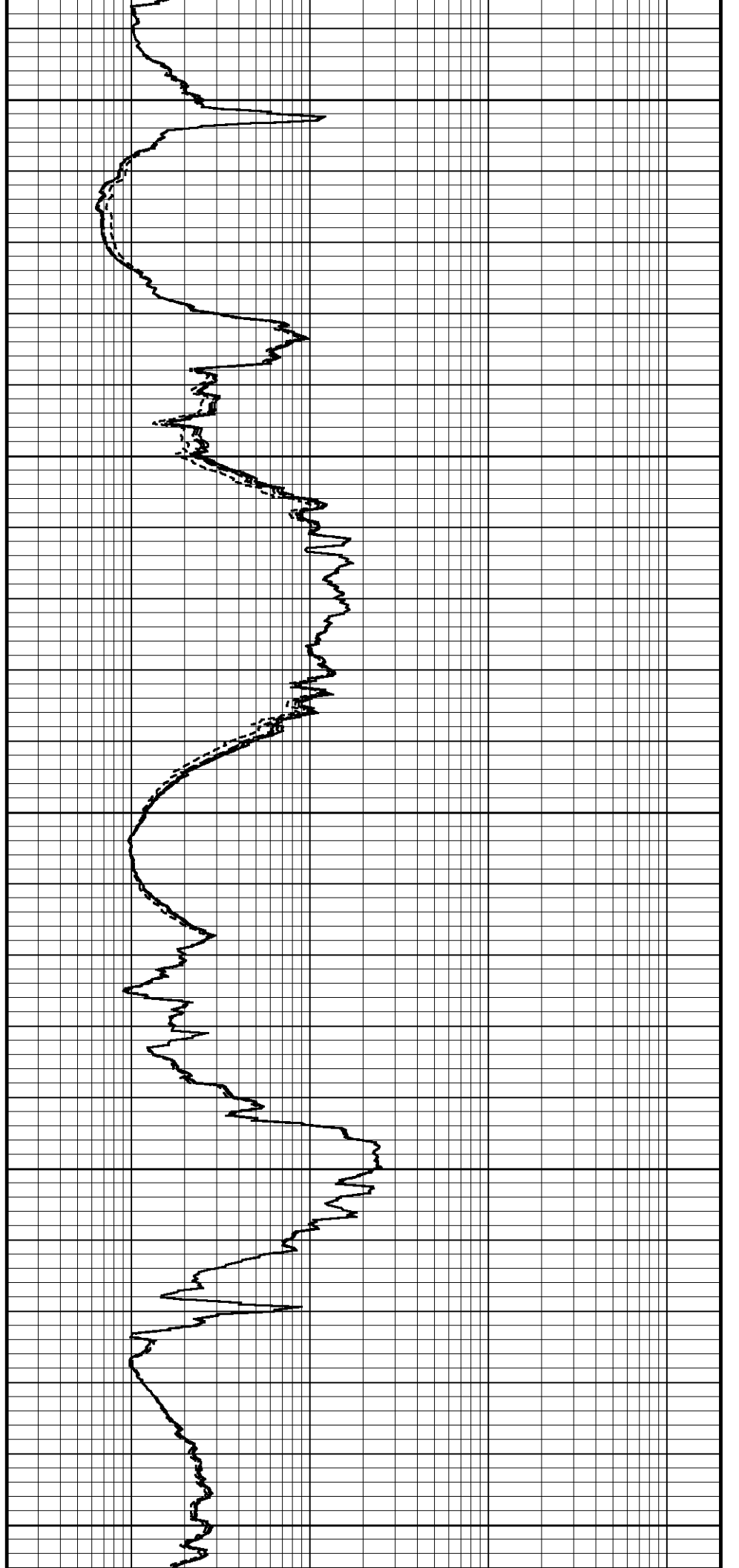
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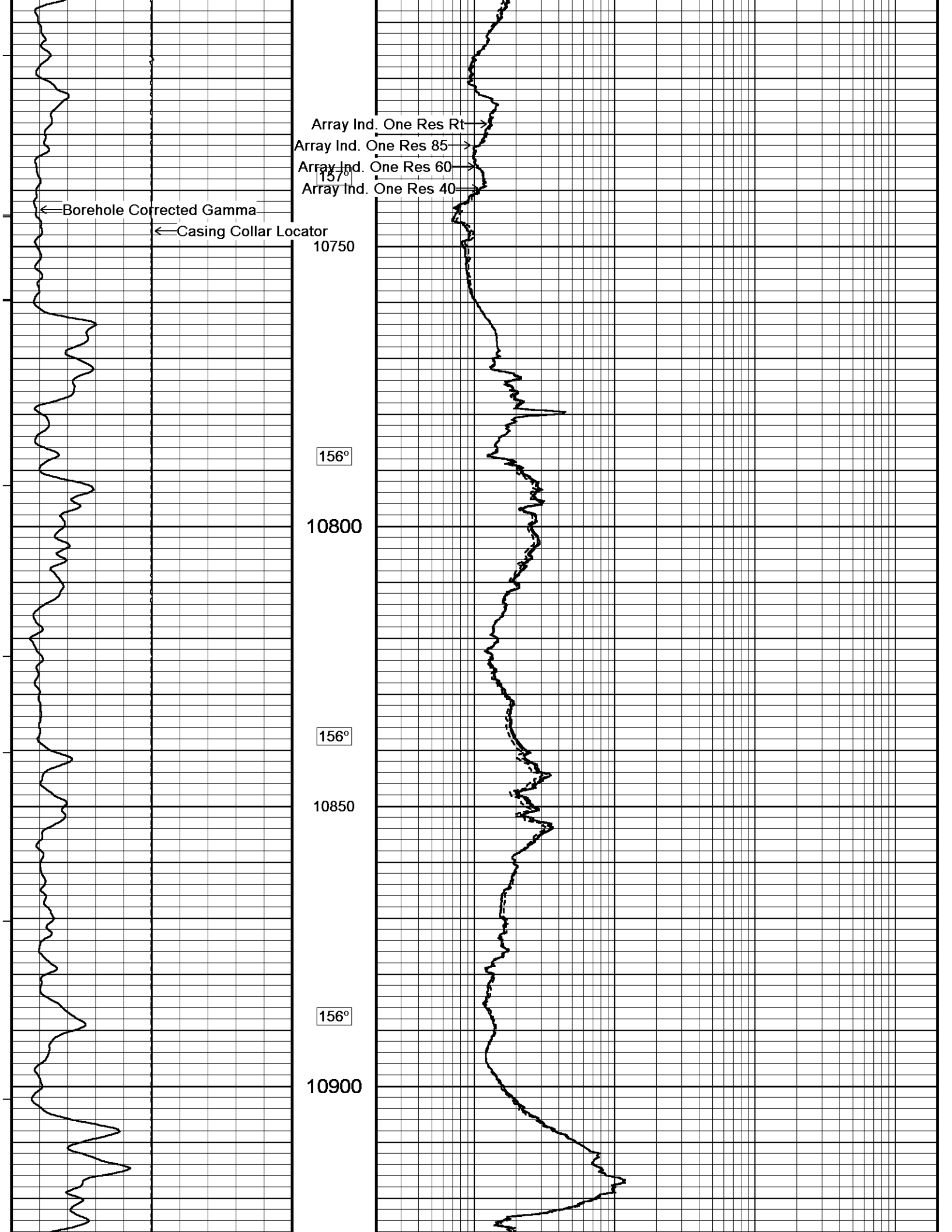
157°

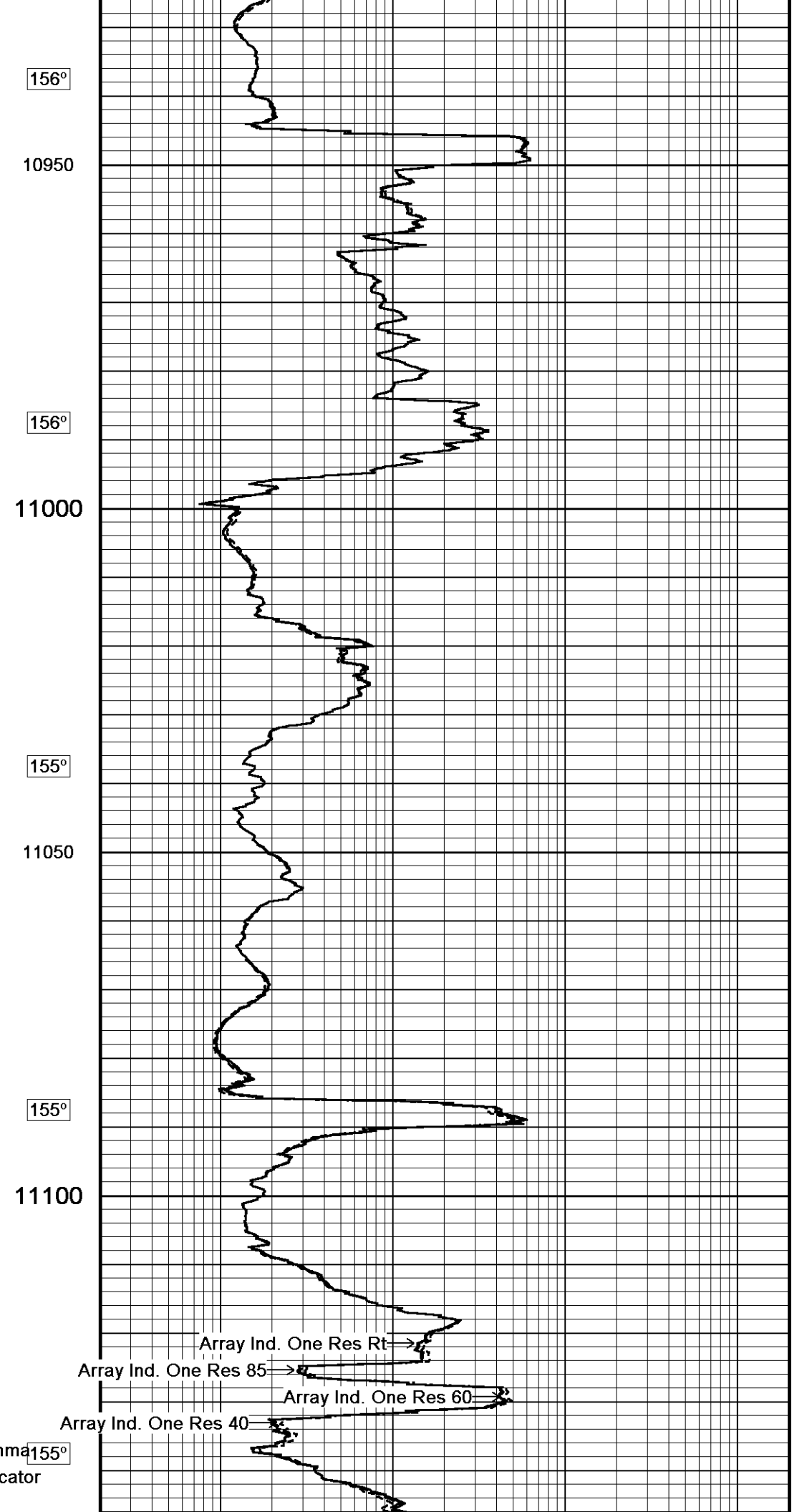
10650

157°

10700







156°

10950

156°

11000

155°

11050

155°

11100

Array Ind. One Res Rt

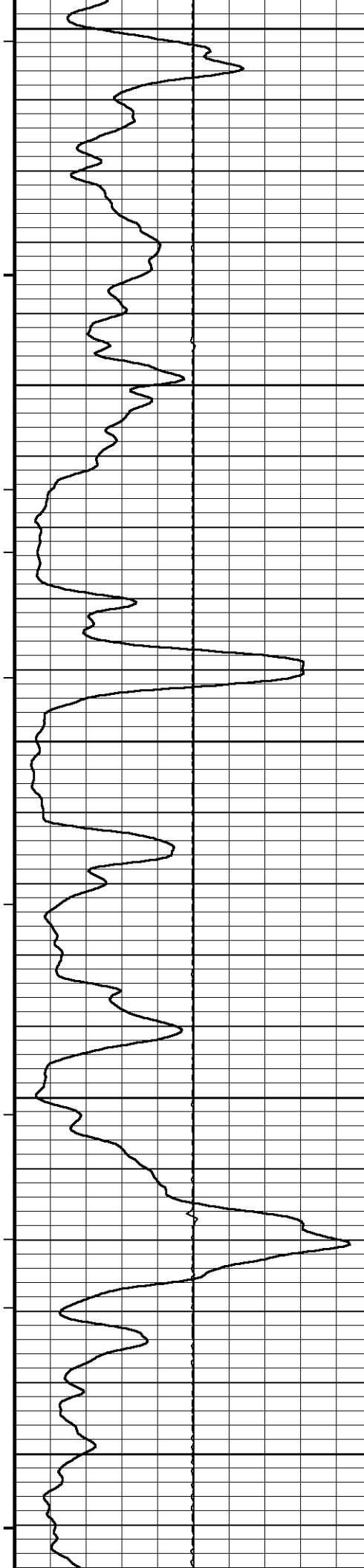
Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

← Borehole Corrected Gamma 155°

← Casing Collar Locator



11150

155°

11200

156°

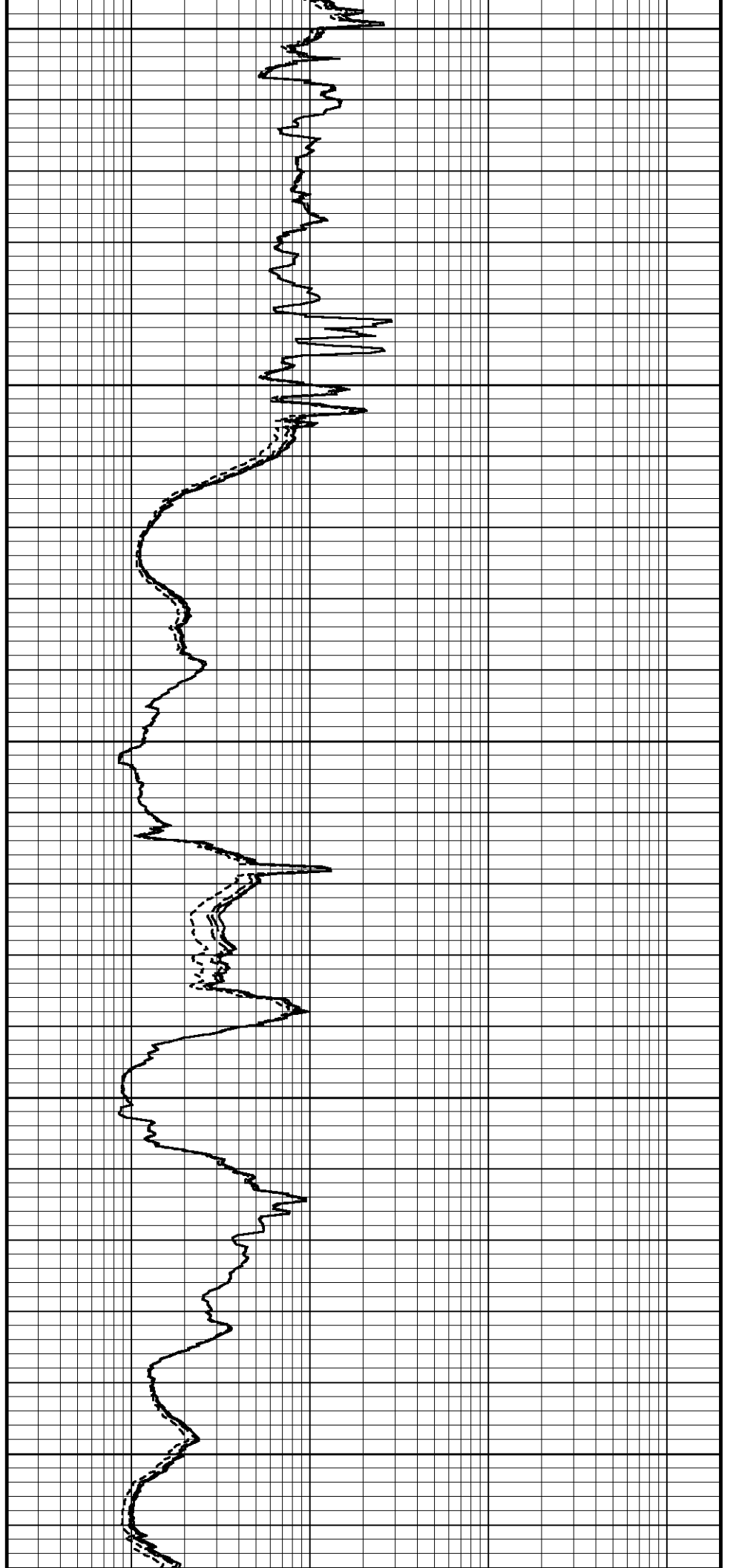
11250

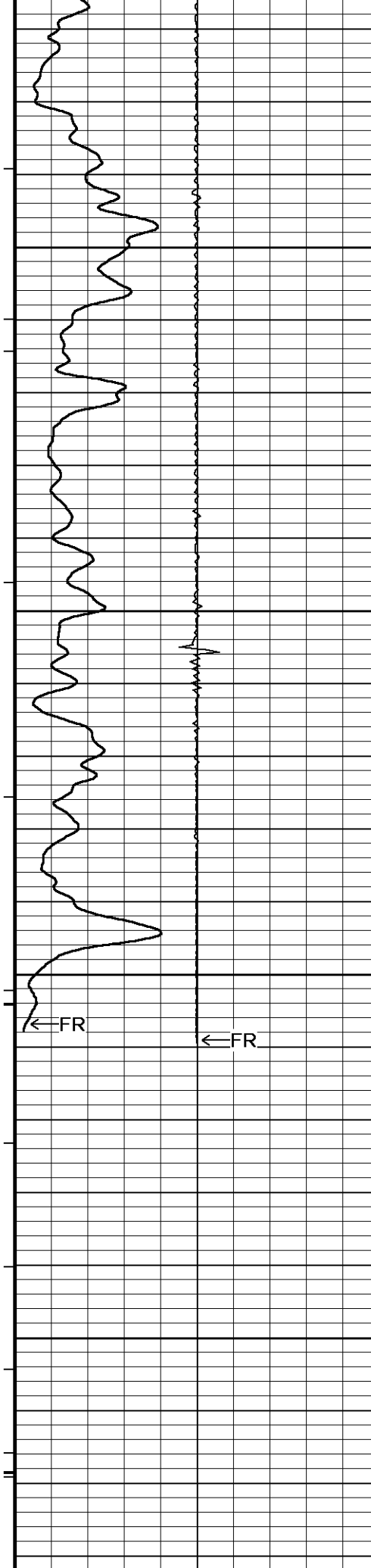
156°

11300

157°

11350





157°

11400

159°

11450

159°

11500

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

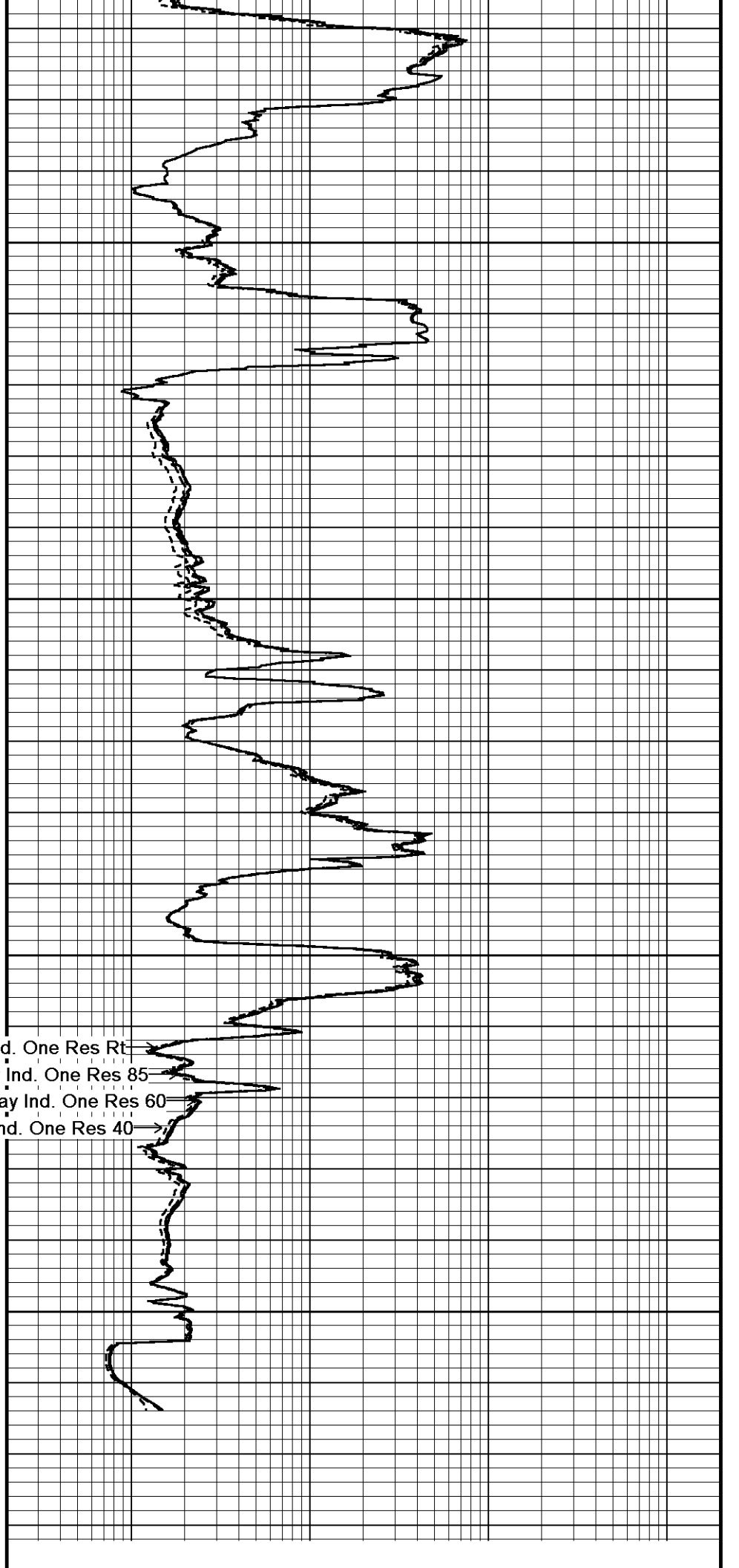
Array Ind. One Res 40

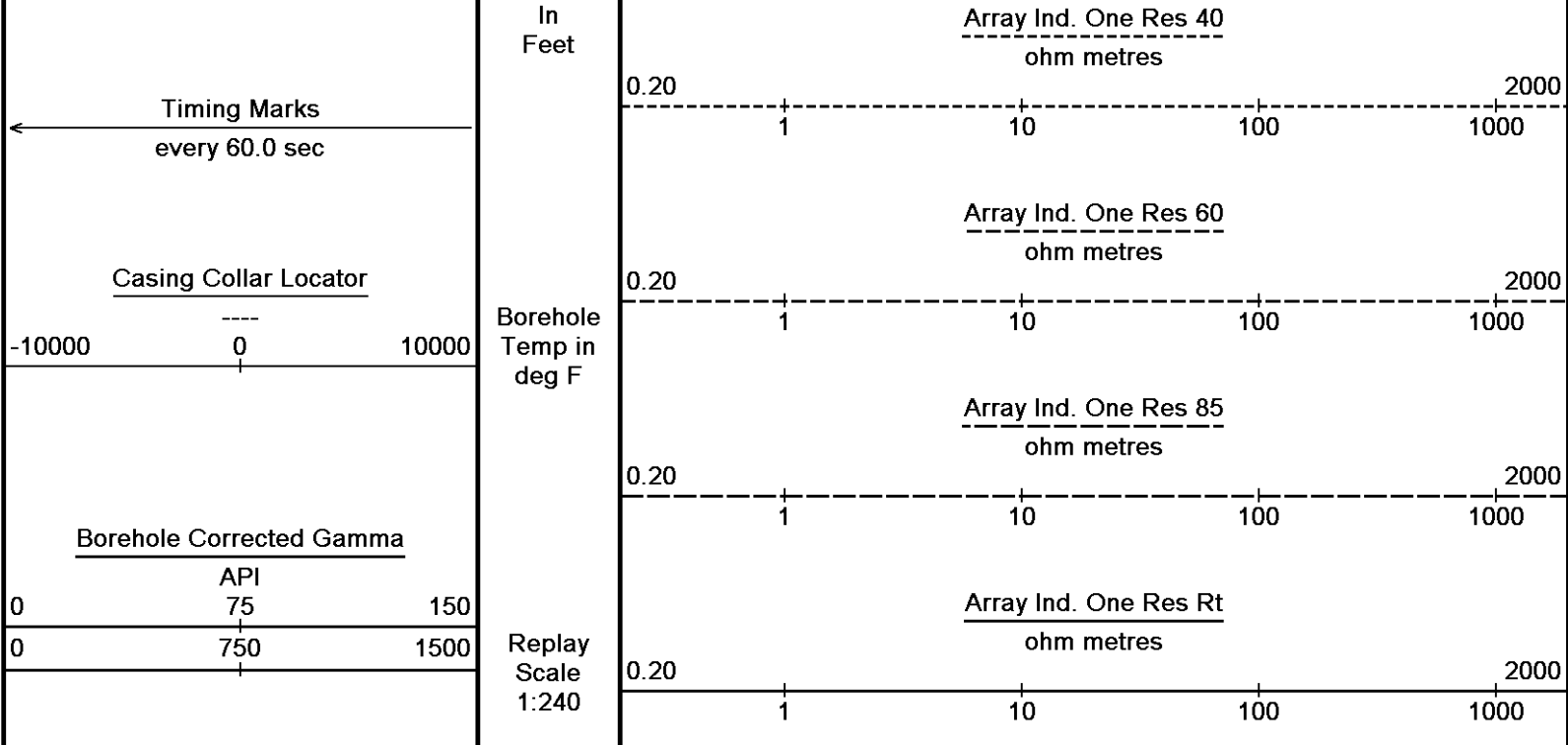
162°

11550

11580

Depth





Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 13.02.066\Data\SDRGE (TURNER)\35292 RTAP.dta
 System Versions: Processed with 13.02.6600 Plotted with 13.02.6600
 Plotted on 08-OCT-2012 23:01
 Recorded on 08-OCT-2012 21:28

5 INCH MAIN LOG DSC

BEFORE SURVEY CALIBRATION
 C:\Minimus 13.02.066\Data\SDRGE (TURNER)\35292 RTAP.dta

Down-hole Tension Calibration All 000 Field Calibration on 24-FEB-2009 00:00

Reading No	Measured	0
1	14953.75	0.00
2	17846.38	1500.00

General Constants All 000 Last Edited on 08-OCT-2012,18:49

General Parameters		
Mud Resistivity	1.500	ohm-metres
Mud Resistivity Temperature	50.000	degrees F
Water Level	0.000	feet
Density/Neutron 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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0 Field Calibration on 29-MAR-2011 00:00

Reading No	Measured	0
1	15152.07	0.00
2	19175.97	2000.00

High Resolution Temperature Calibration MCG-D.A 242 Field Calibration on 12-SEP-2012,19:54

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

High Resolution Temperature Constants MCG-D.A 242 Last Edited on

Pre-filter Length 11

SP Calibration MCG-D.A 242 Field Calibration on 19-JUL-2012 11:23

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

Gamma Calibration MCG-D.A 242 Field Calibration on 20-SEP-2012 20:36

	Measured	Calibrated (API)
Background	126	88
Calibrator (Gross)	1947	1349
Calibrator (Net)	1820	1261

Gamma Constants MCG-D.A 242 Last Edited on 08-OCT-2012,18:41

Gamma Calibrator Number blue

Mud Density 1.01 gm/cc

Caliper Source for Processing Density Caliper

Tool Position Eccentred

Concentration of KCl 0.00 kppm

Neutron Calibration MDN-B.J 390 Base Calibration on 11-SEP-2012 09:59
Field Check on 20-SEP-2012 20:41

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3051	92	3714	110
	33.011		33.764	

Field Calibrator at Base

	Calibrated (cps)	
Ratio	1253	1859
	0.674	

Field Check

	Calibrated (cps)	
Ratio	1244	1880
	0.662	

Neutron Constants MDN-B.J 390 Last Edited on 08-OCT-2012,21:39

Neutron Source Id P31112B

Neutron Jig Number EC13 BLUE

Epithermal Neutron No

Caliper Source for Processing Density Caliper

Stand-off 0.00 inches

Mud Density 1.01 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 MCG External Temperature

Temperature N/A degrees F

Mud Salinity 5.49 kppm

Salinity Correction Applied

Formation Fluid Salinity Source None

Formation Fluid Salinity N/A kppm

Barite Mud Correction Not Applied

FE Calibration MFE-B.J 329 Base Calibration on 31-AUG-2012 13:33
Field Check on 23-SEP-2012 00:24

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	961.8	126.8
Base Check		281.9

FE Constants MFE-B.J 329

Last Edited on 08-OCT-2012,18:41

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.	MCG External Temperature	
Stand-off	0.5	inches

High Resolution Temperature Calibration MAI-B.J 389

Field Calibration on 19-OCT-2011 09:44

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI-B.J 389

Last Edited on

Pre-filter Length 11

Induction Calibration MAI-B.J 389

Base Calibration on 01-SEP-2012,07:44

Field Check on 23-SEP-2012 00:23

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.7	465.5	9.3	966.2
2	6.4	384.0	7.6	821.4
3	3.1	258.9	5.2	566.0
4	1.8	133.7	2.6	279.2

Array Temperature 78.1 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	14.1	3895.8
2	0.0	0.0	29.3	3506.4
3	0.0	0.0	29.3	3047.1
4	0.0	0.0	19.6	2061.5
Deep	0.0	0.0	19.1	2011.4
Medium	0.0	0.0	42.2	4000.8
Shallow	0.0	0.0	41.9	5148.8

Array Temperature 0.0 77.5 Deg F

Induction Constants MAI-B.J 389

Last Edited on 08-OCT-2012,18:49

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.	MCG 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 435

Base Calibration on 31-AUG-2012 15:14
Field Calibration on 23-SEP-2012 00:38

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16672	4.01
2	26192	5.96
3	36288	7.98
4	46016	9.86
5	56865	11.88
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.92	5.96

Photo Density Calibration MPD-C.J 435

Base Calibration on 31-AUG-2012 17:03
Field Check on 23-SEP-2012 00:29

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	56922	28137	59869	31110
Reference 2	23873	2636	24557	2522

Field Check at Base

1304.9	1353.6
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Field Check

1298.0	1349.4
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PE Calibration

Base Calibration	WS	Measured		Calibrated Ratio
		WH	Ratio	
Background	238	1169		
Reference 1	22710	56709	0.405	0.369
Reference 2	6509	23724	0.278	0.271

Field Check at Base

237.7	1169.4
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Field Check

237.0	1162.5
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Density Constants MPD-C.J 435

Last Edited on 08-OCT-2012,21:39

Density Source Id	p31112b	
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	1.01	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

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.066\Data\SDRGE (TURNER)\35292 RTAP.dta

RUNNING TOOL

MLK-A 1 LG: 4.87 ft WT: 30.9 lb OD: 2.24 in

MBS-A 400v Compact Battery Sub

MBS-A 13 LG: 7.84 ft WT: 57.3 lb OD: 2.24 in

Compact Comms Gamma

MCG-D.A 242 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Memory Sub. A.C

MMS-A.C 13 LG: 3.12 ft WT: 22.0 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint

SKJ-D.A 166 LG: 2.17 ft WT: 24.3 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

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 596 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron

MDN-B.J 390 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-C.J 435 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub

MIS-D.A 609 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-F Compact Swivel Head Adaptor

SHA-F 33 LG: 2.74 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

MIS-E.B Compact Inline Standoff sub

MIS-E.B 573 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric

MFE-B.J 329 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

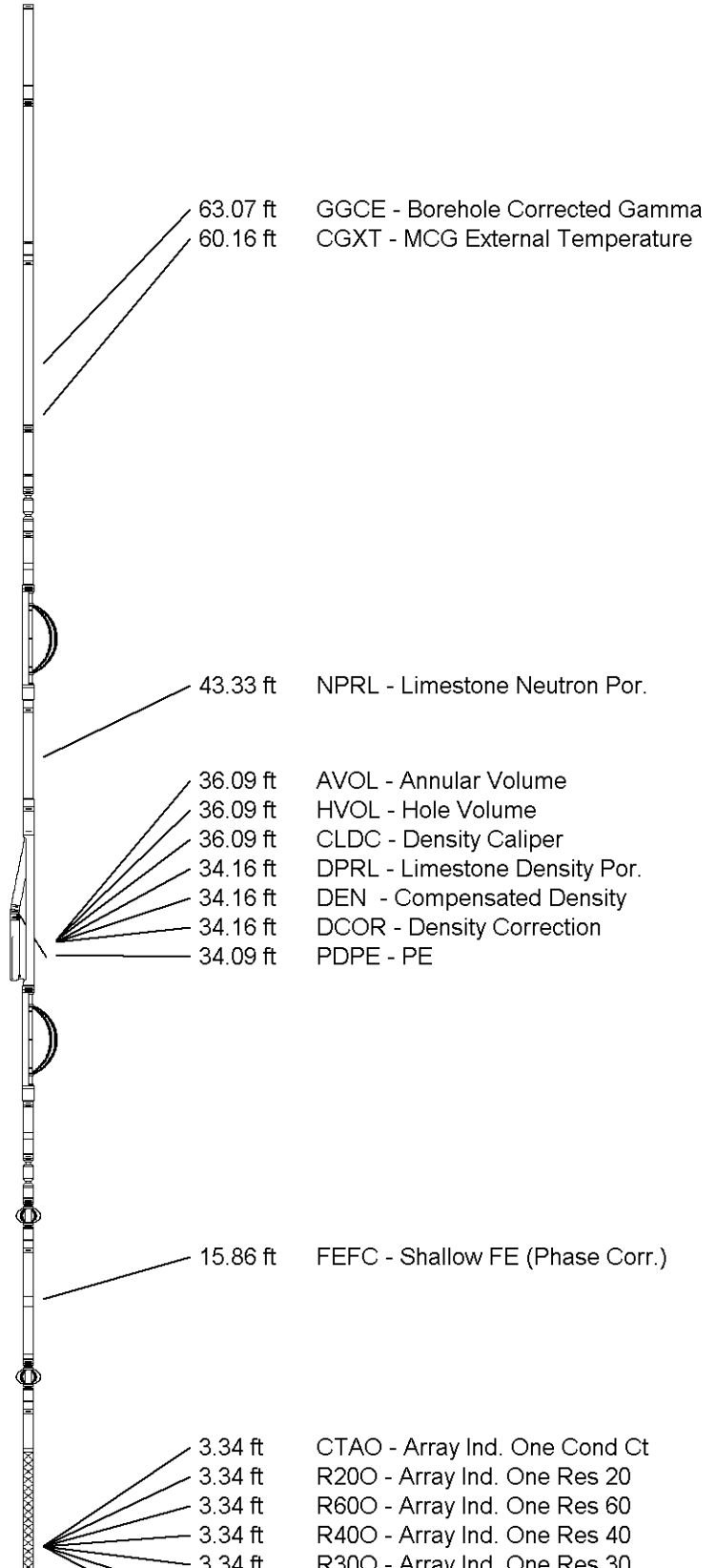
MIS-E.B Compact Inline Standoff sub

MIS-E.B 577 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction

MAI-B.J 389 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 82.78 ft Weight: 606.3 lb





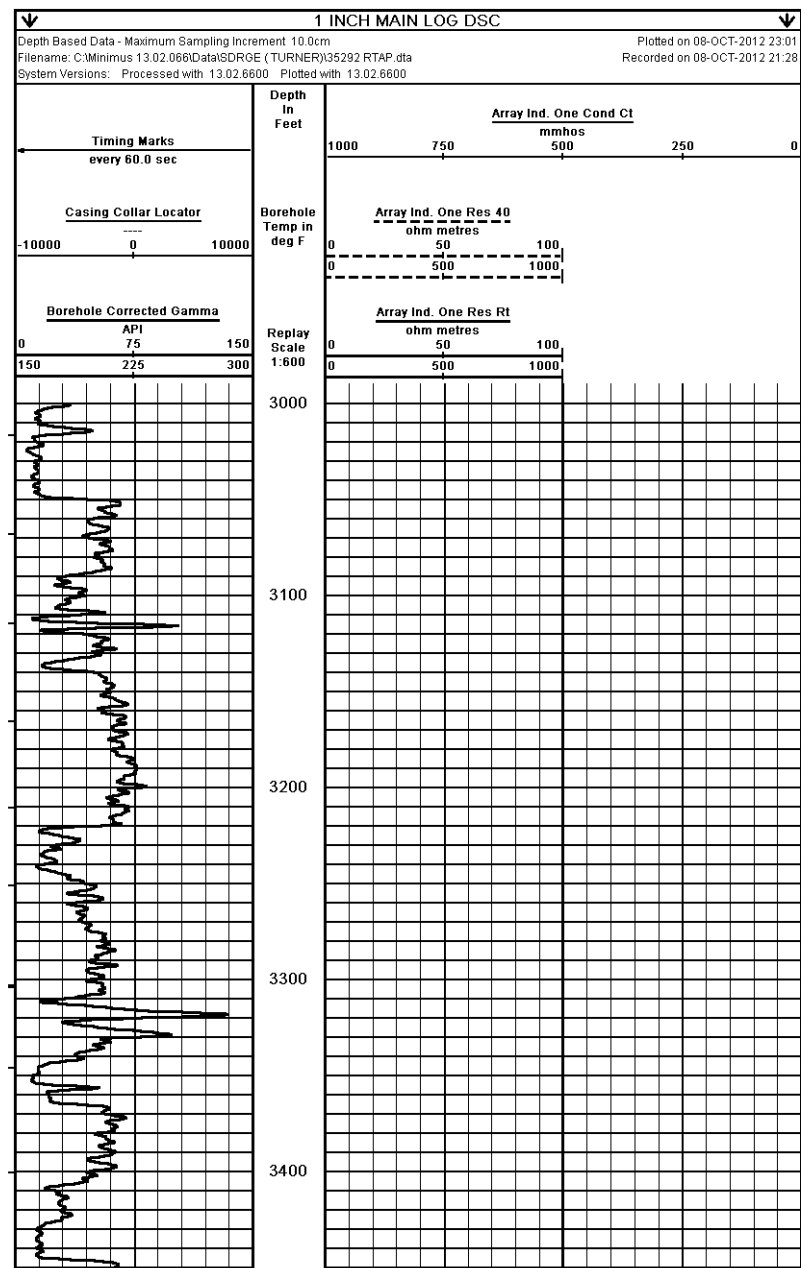
3.34 ft RTAO - Array Ind. One Res 85
 3.34 ft RTAO - Array Ind. One Res 85
 3.34 ft RTAO - Array Ind. One Res 85
 Tool Zero (1.84ft from bottom)
 All measurements relative to tool zero.

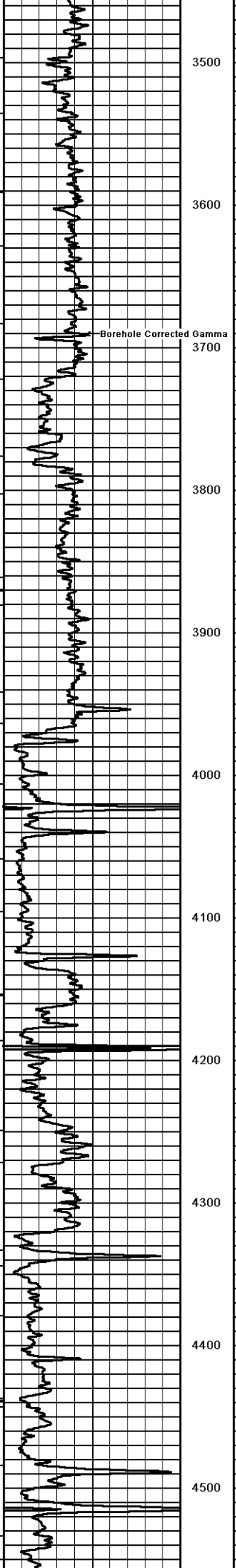
COMPANY	SANDRIDGE ENERGY				
WELL	TURNER 3406 1-7H				
FIELD	EASTHAM				
PROVINCE/COUNTY	HARPER				
COUNTRY/STATE	USA / KANSAS				
Elevation Kelly Bushing	1335.00	feet	First Reading	11570.00	feet
Elevation Drill Floor	1335.00	feet	Depth Driller	11858.00	feet
Elevation Ground Level	1316.00	feet	Depth Logger	11858.00	feet

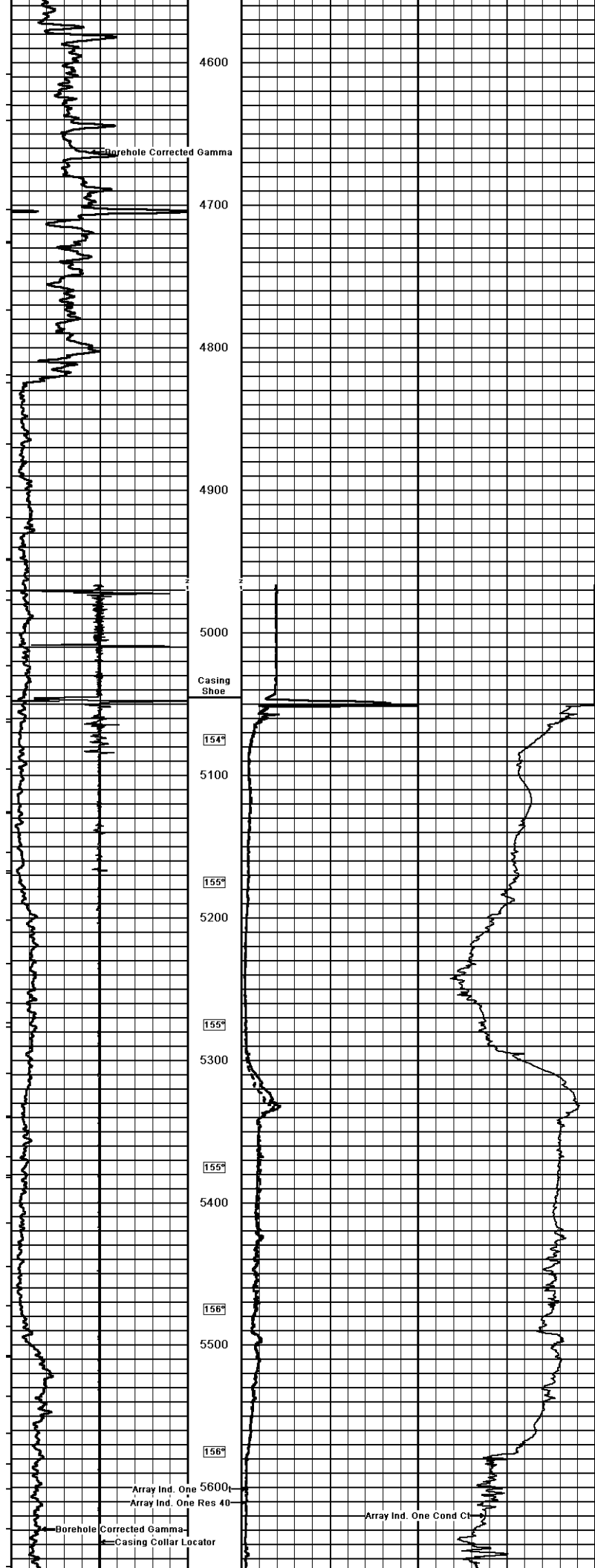


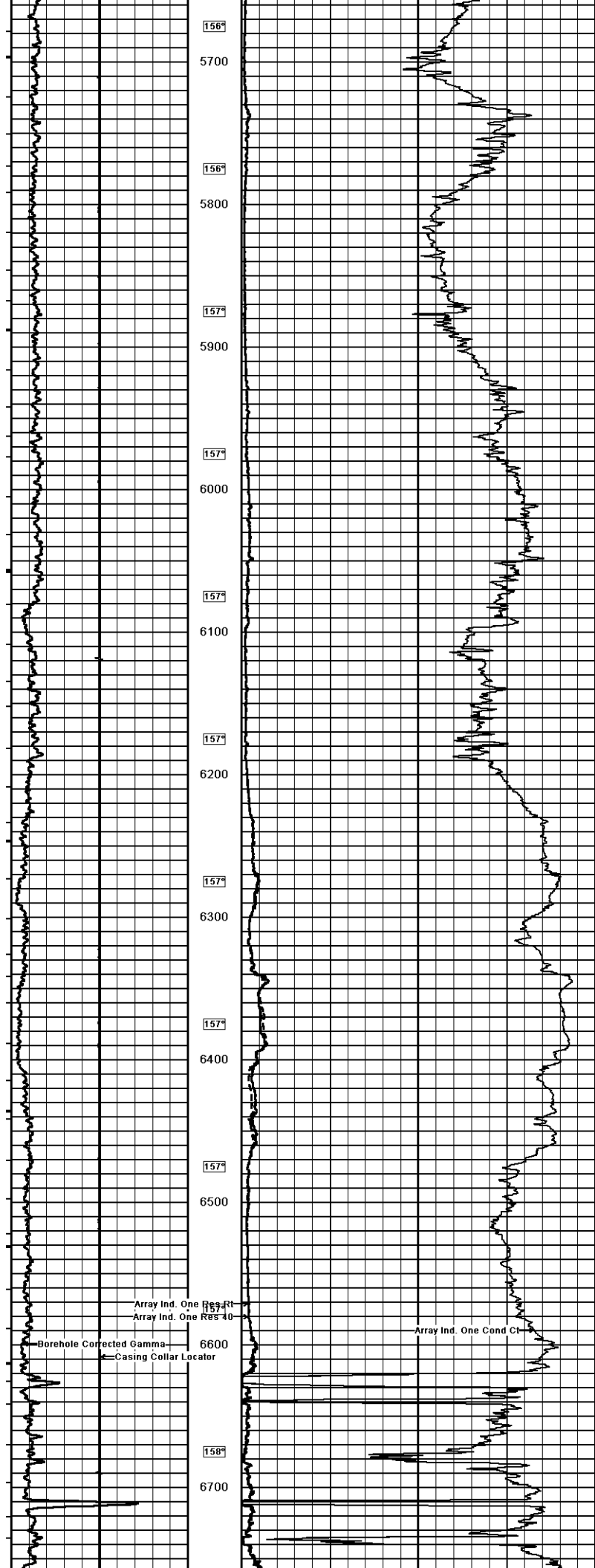
Weatherford[®]

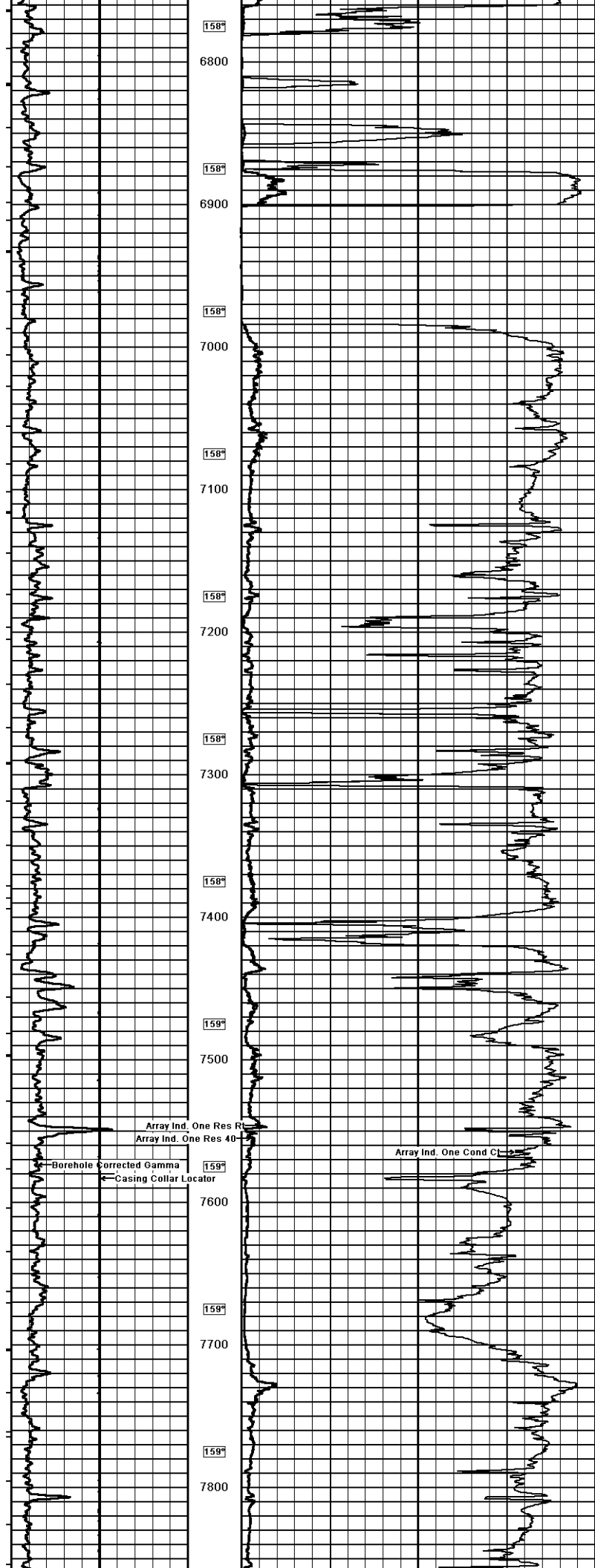
CML MESSENGER SHUTTLE
 ARRAY INDUCTION
 LOG

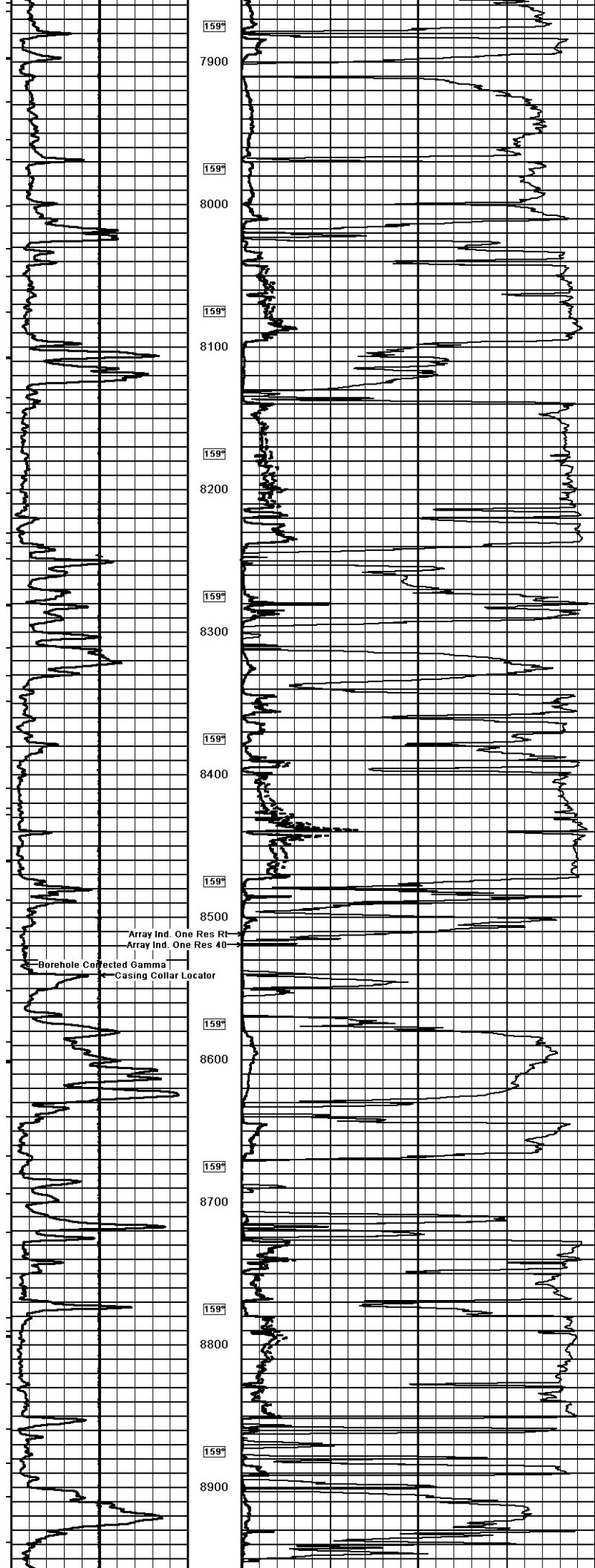


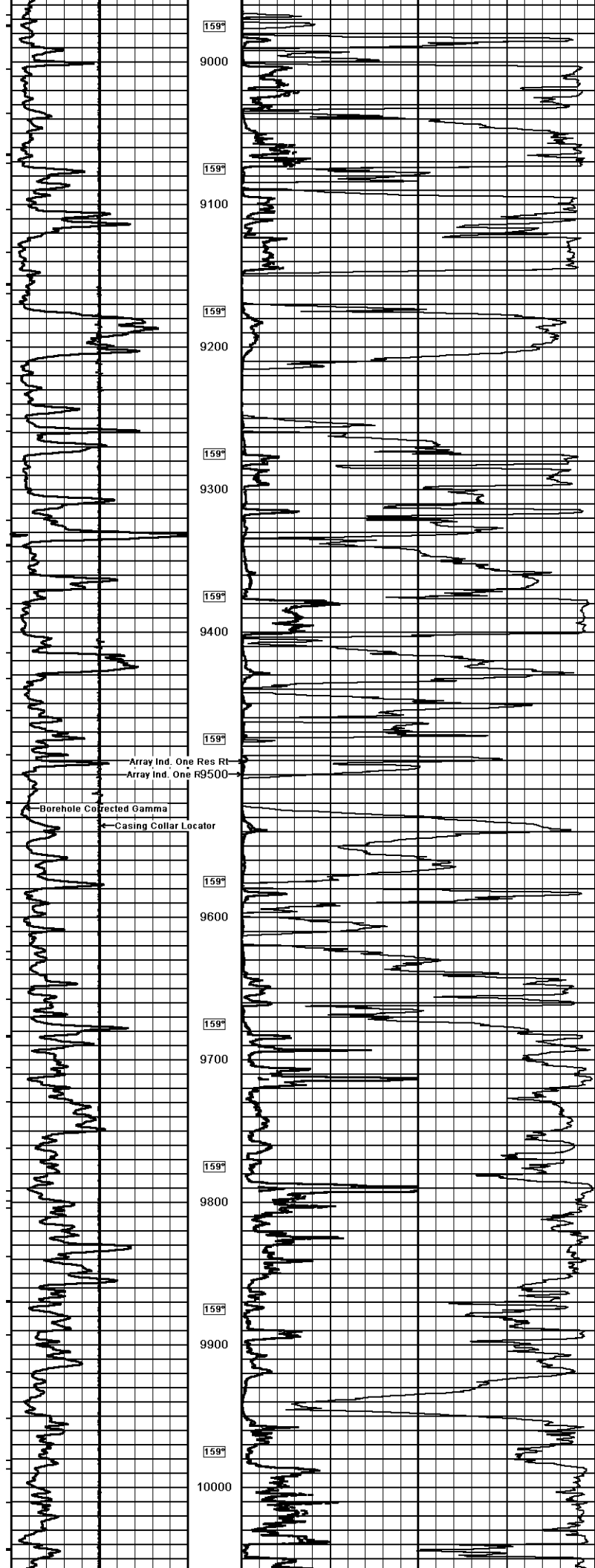


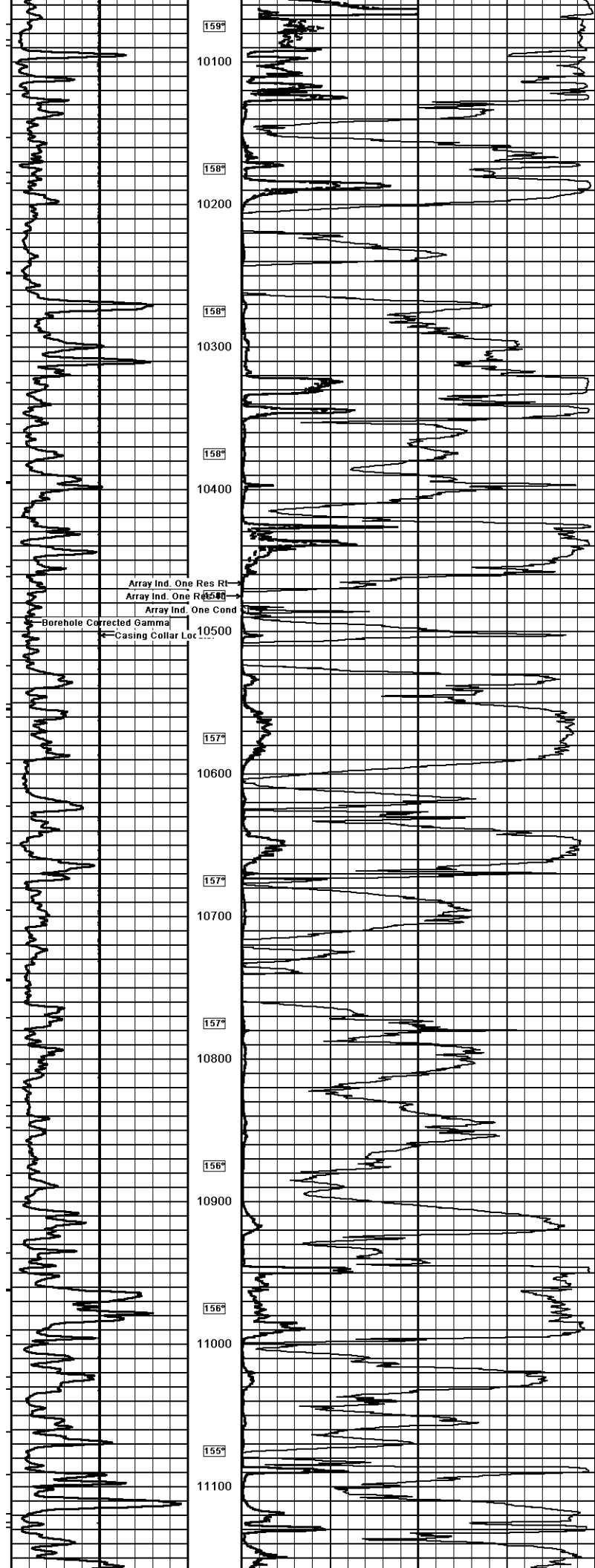


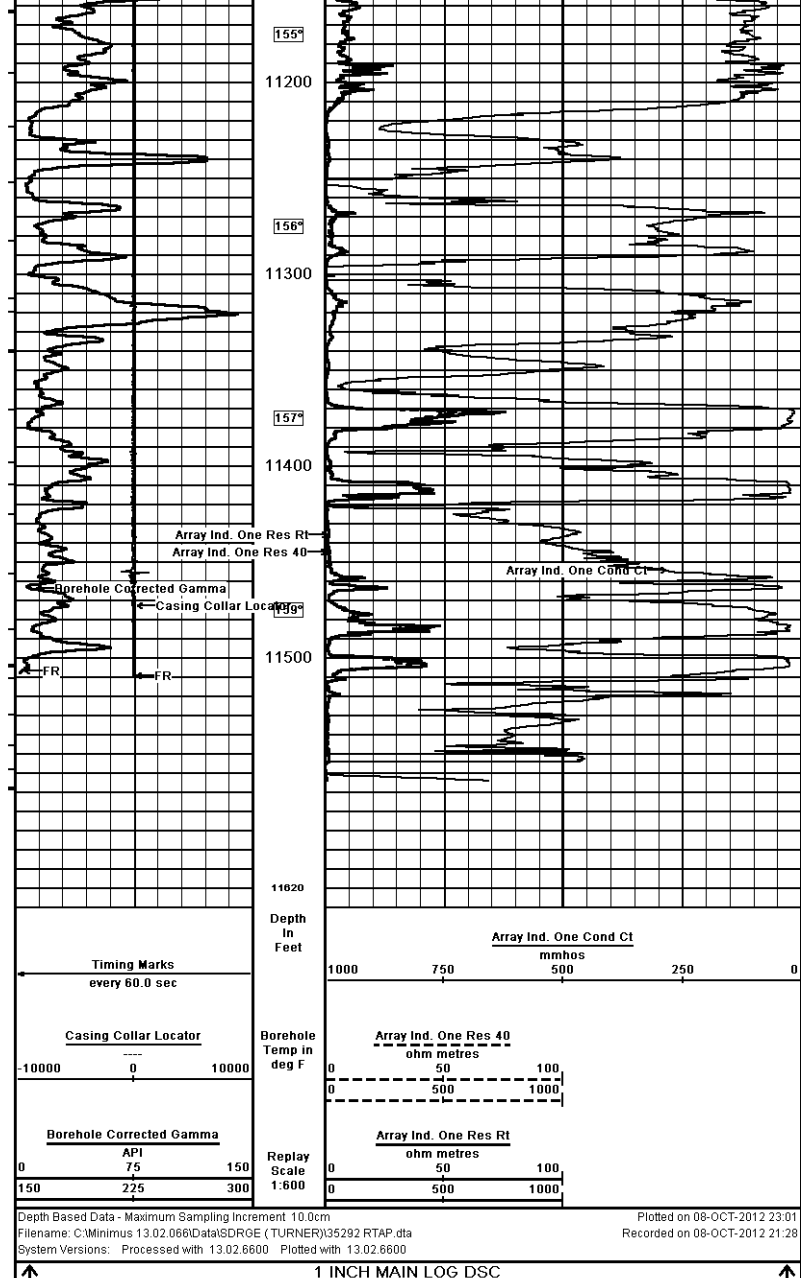












Depth Based Data - Maximum Sampling Increment: 10.0cm		Plotted on 08-OCT-2012 23:01	
Filename: C:\Minimus 13.02.0660\data\SDROE (TURNER)\35292 RTAP.dta		Recorded on 08-OCT-2012 21:28	
System Versions: Processed with 13.02.6600 Plotted with 13.02.6600			

COMPANY	SANDRIDGE ENERGY		
WELL	TURNER 3406 1-7H		
FIELD	EASTHAM		
PROVINCE/COUNTY	HARPER		
COUNTRY/STATE	USA / KANSAS		
Elevation Kelly Bushing	1335.00 feet	First Reading	11570.00 feet
Elevation Drill Floor	1335.00 feet	Depth Driller	11858.00 feet
Elevation Ground Level	1316.00 feet	Depth Logger	11858.00 feet

 CML MESSENGER SHUTTLE
ARRAY INDUCTION
LOG