



Weatherford®

**MEASURED DEPTH
ARRAY INDUCTION
LOG**

COMPANY		WHITTING OIL AND GAS CORPORATION			
WELL		HORSETAIL 33M-2804			
FIELD		REDTAIL			
PROVINCE/COUNTY		WELD			
COUNTRY/STATE		U.S.A. / COLORADO			
LOCATION		380' FSL & 750' FWL			
SEC 28	TWP 10N	RGE 57W	Other Services		
			MICRO IMAGER		
			SPECTRAL GAMMA		
			DENSITY/NEUTRON		
API Number		05-123-39240		Permanent Datum G.L., Elevation 4634 feet	
Log Measured From KB		Drilling Measured From K.B. @ 17 FEET			
Date	25-JULY-2014			Elevations: KB 4651.00 DF 4651.00 GL 4634.00	
Run Number	ONE				
Service Order	2577-93431527				
Depth Driller	14806.00			feet	
Depth Logger	13952.00			feet	
First Reading	13916.00			feet	
Last Reading	5812.00			feet	
Casing Driller	5812.00			feet	
Casing Logger	5812.00			feet	
Bit Size	6.000			inches	
Hole Fluid Type	WBM				
Density / Viscosity	10.00 lb/USg		41.00 type in		
PH / Fluid Loss	11.00		8.00 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.86 @123.0			ohm-m	
Rmf @ Measured Temp	1.48 @123.0			ohm-m	
Rmc @ Measured Temp	2.23 @123.0			ohm-m	
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	1.08 @214.0			ohm-m	
Time Since Circulation	NO DELAY				
Max Recorded Temp	214.00			deg F	
Equipment / Base	18086		Casper		
Recorded By	M.RICHINS				
Witnessed By	P. BUCKNAM				
WSL	B.J. HONEYCULT				

BOREHOLE RECORD					Last Edited: 24-JUL-2014 18:30
Bit Size inches		Depth From feet		Depth To feet	
6.000		5812.00		14806.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
INTERMED	7.000	0.00	5812.00	29.00	

REMARKS
LOGGED WITH WLS 14.01.3220
LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT
HARDWARE: MDN: MIS-A SINGLE BOWSPRING USED ABOVE MDN MPD: 4INCH PROFILE PLATE USED, MIS-A SINGLE BOWSPRING USED BELOW MPD CMI: OVER BODY BASKET AND MIS-D BASKETS PLACED ABOVE AND BELOW FOR CENTRALIZATION SGS: RAN BELOW CMI. ECCENTRALIZED WITH SKJ.
2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST
LONGITUDE:-103.760708
LATITUDE: 40.789036
MAGNETIC DECLINATION: EAST 7 93

MACHINE DECLARATION: EAST 700

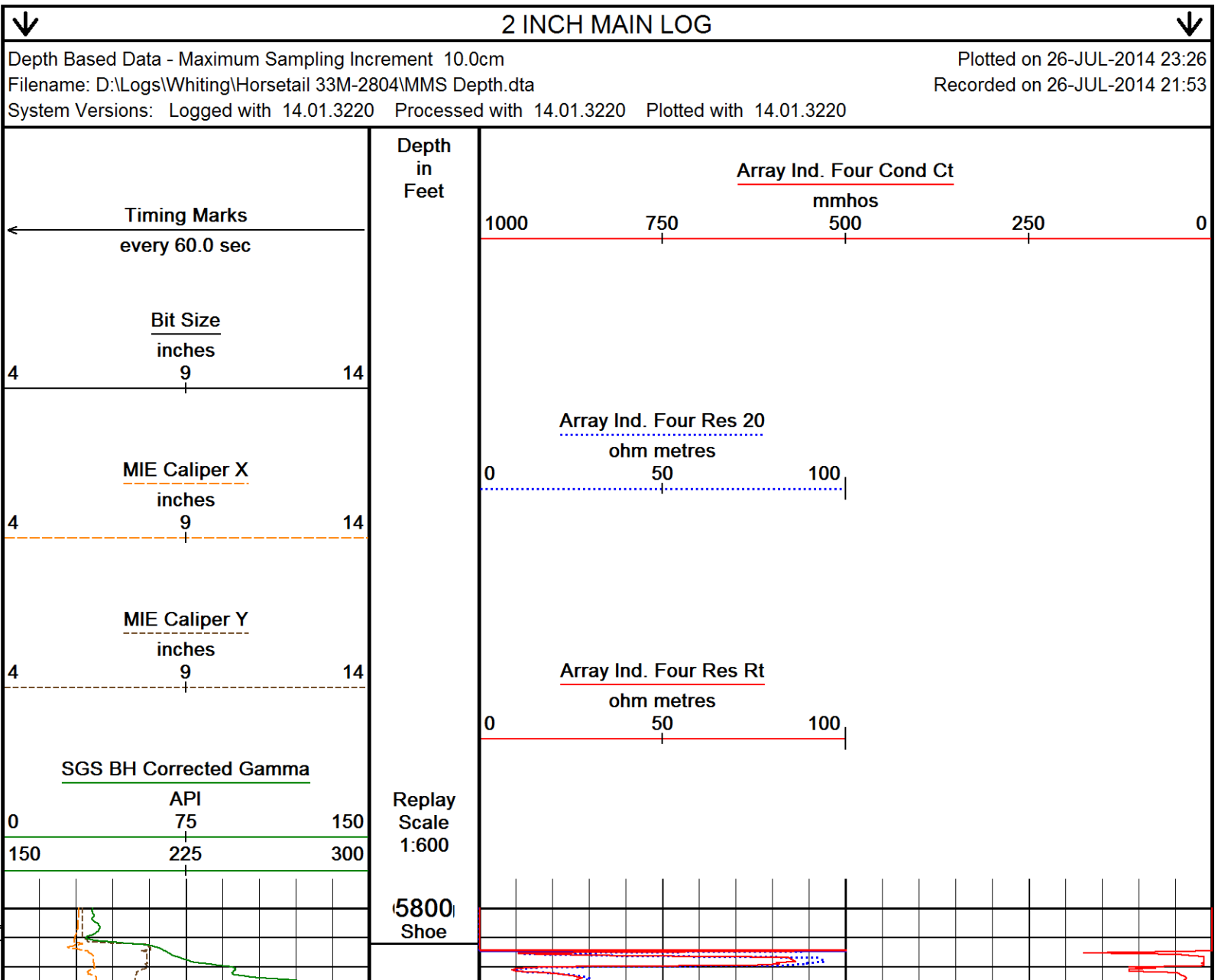
DRILL PIPE DEPTH DURING DEPLOYMENT: 13819.47
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 13919.34

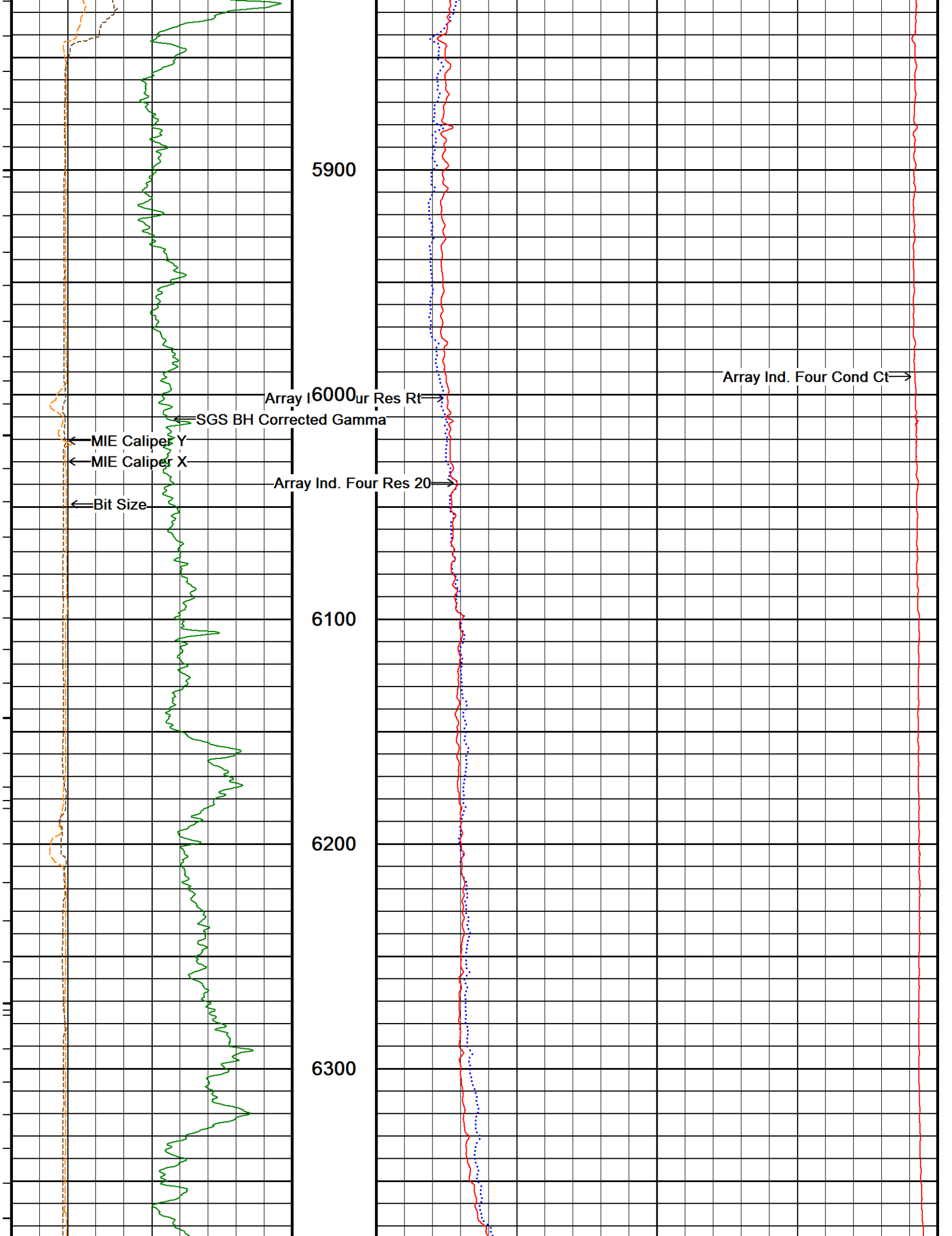
ANNULAR HOLE VOLUME FROM 13919 TO 7"-29# CASING AT 5812 FEET = 630 CUBIC FEET.
TOTAL HOLE VOLUME FROM 13919 TO 7"-29# CASING AT 5812 FEET = 1530 CUBIC FEET.

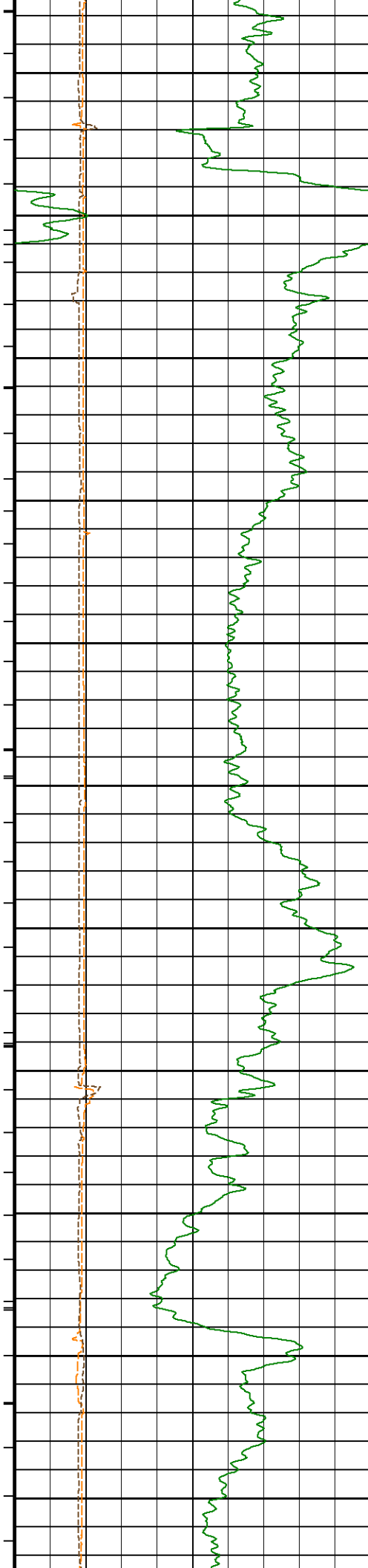
OPERATORS: C.WADLINGTON, S.LANDON

RIG:PIONEER 54

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.







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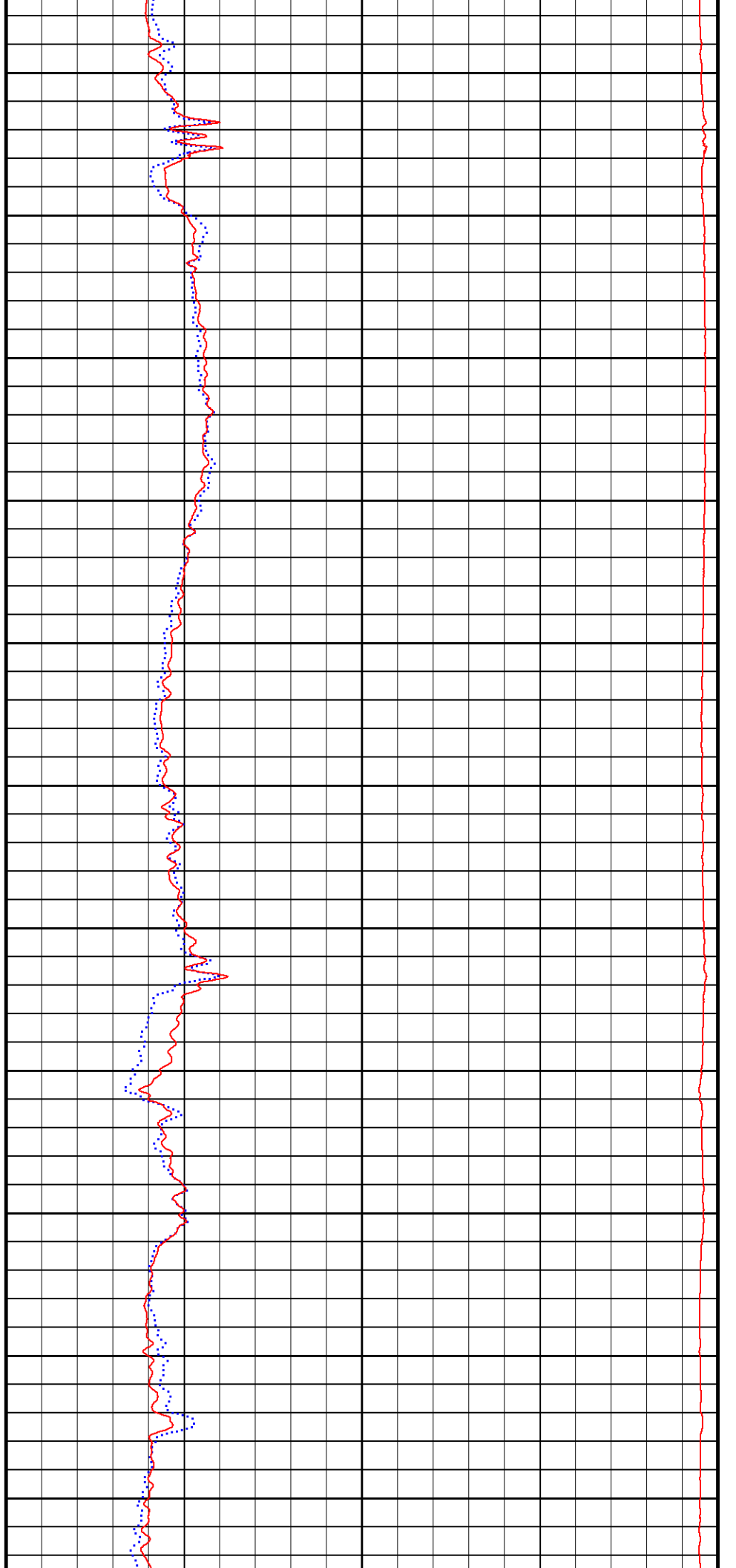
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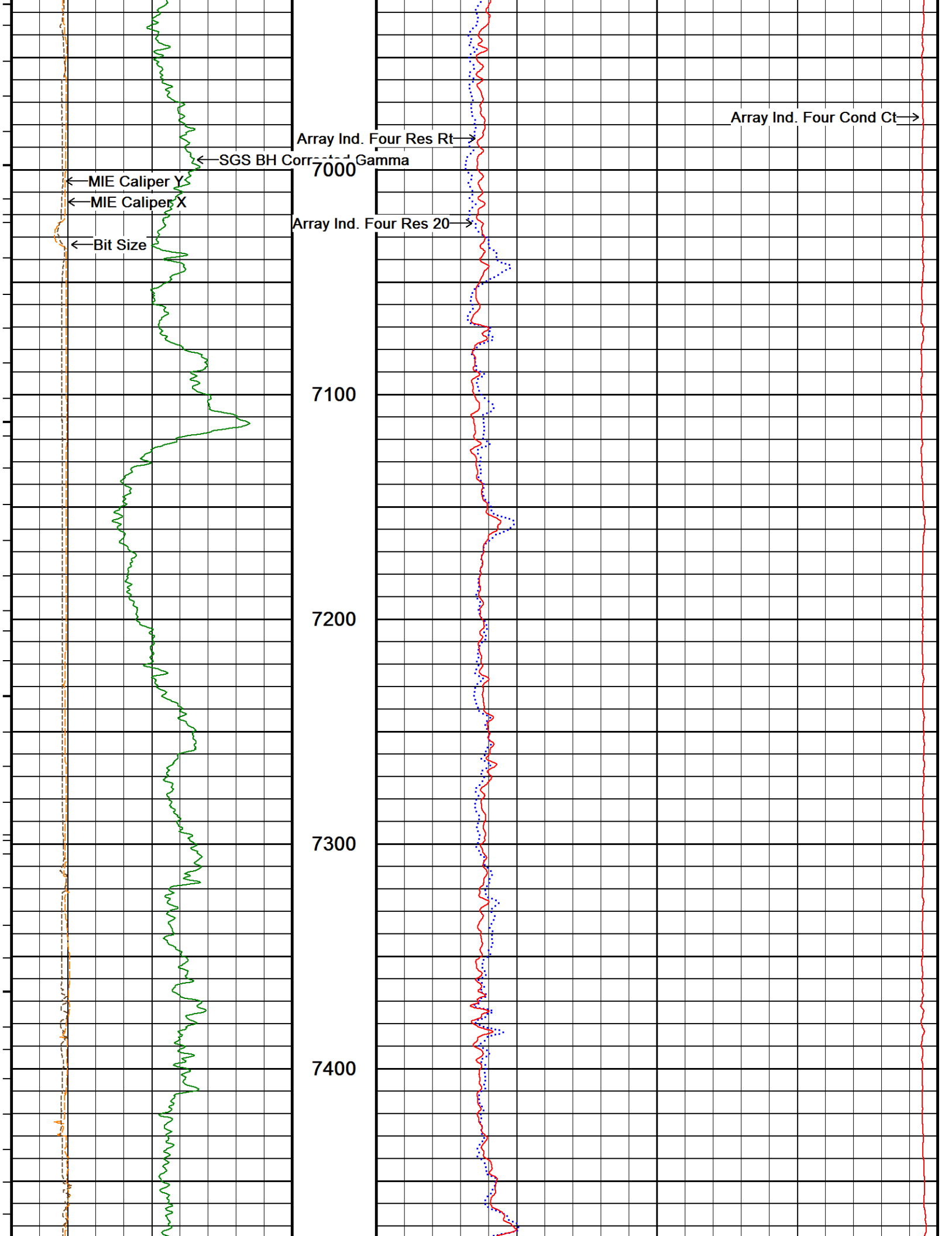
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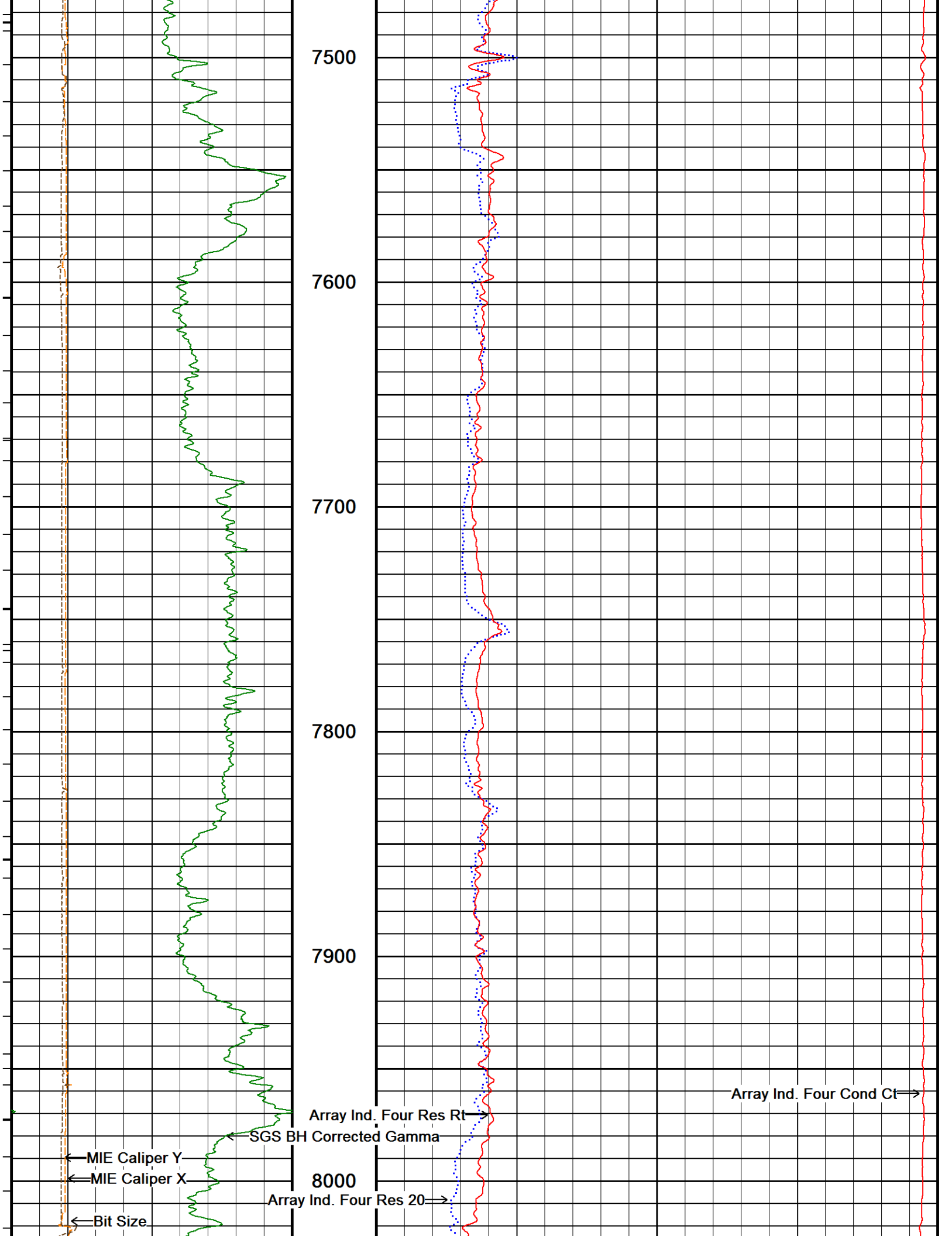
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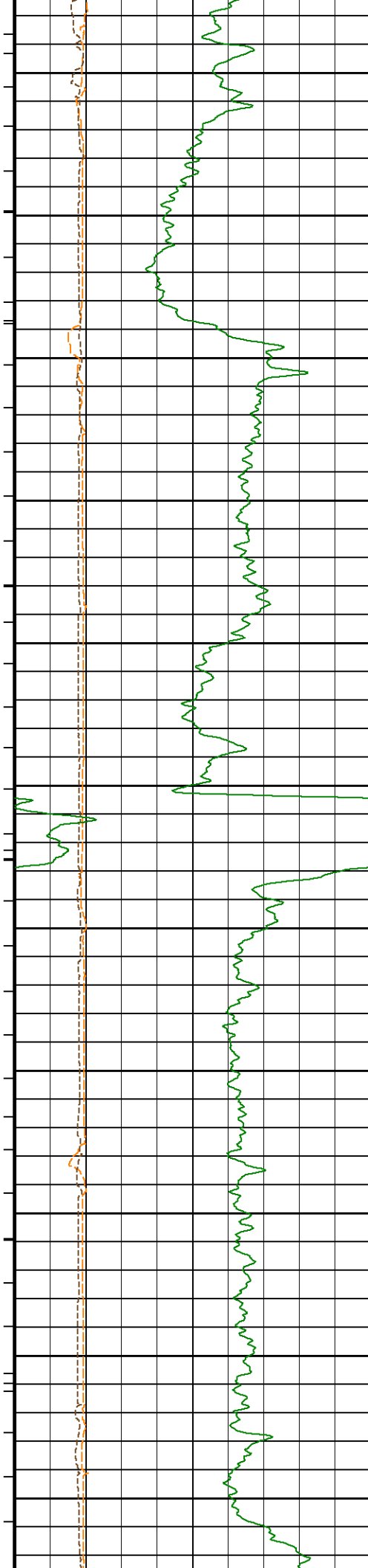
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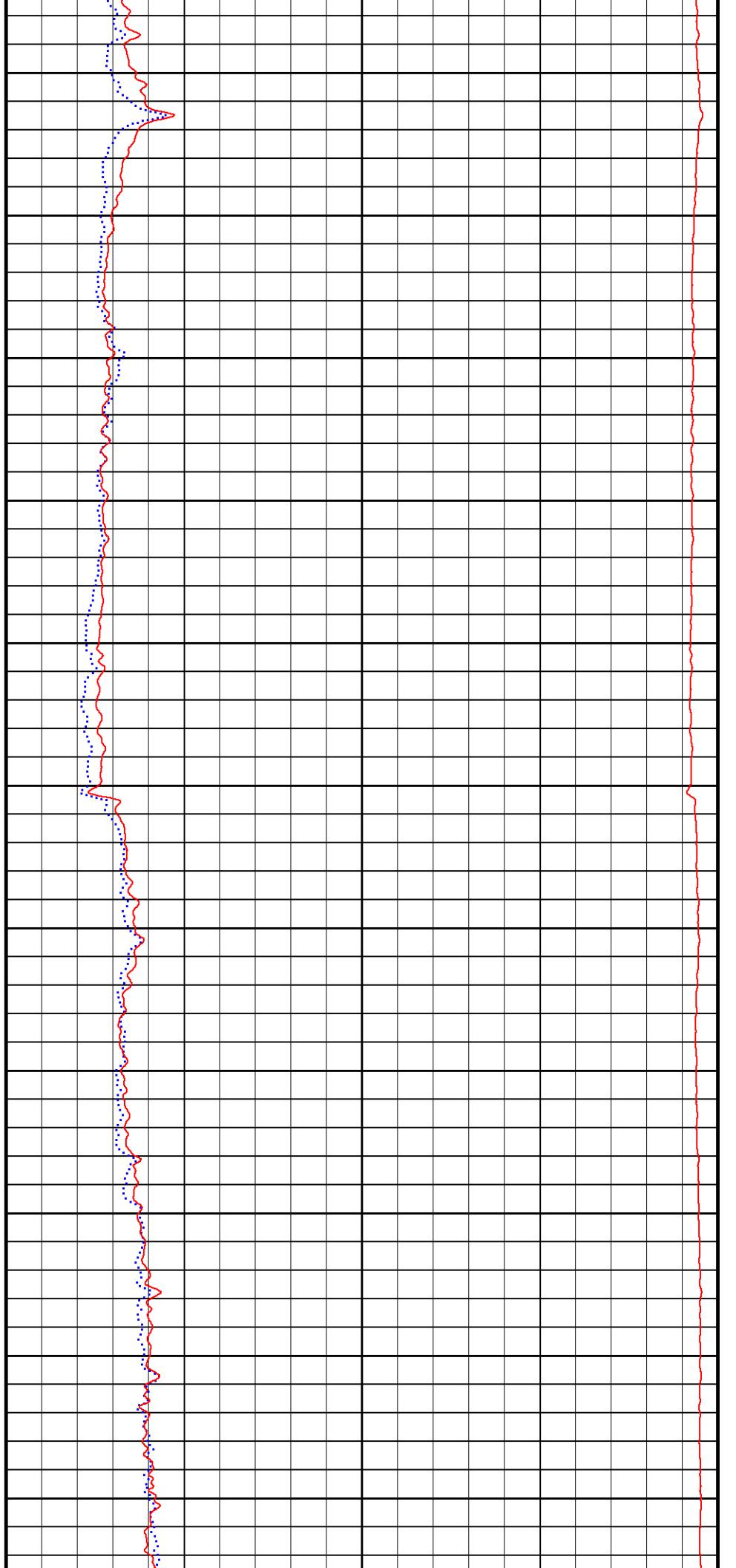
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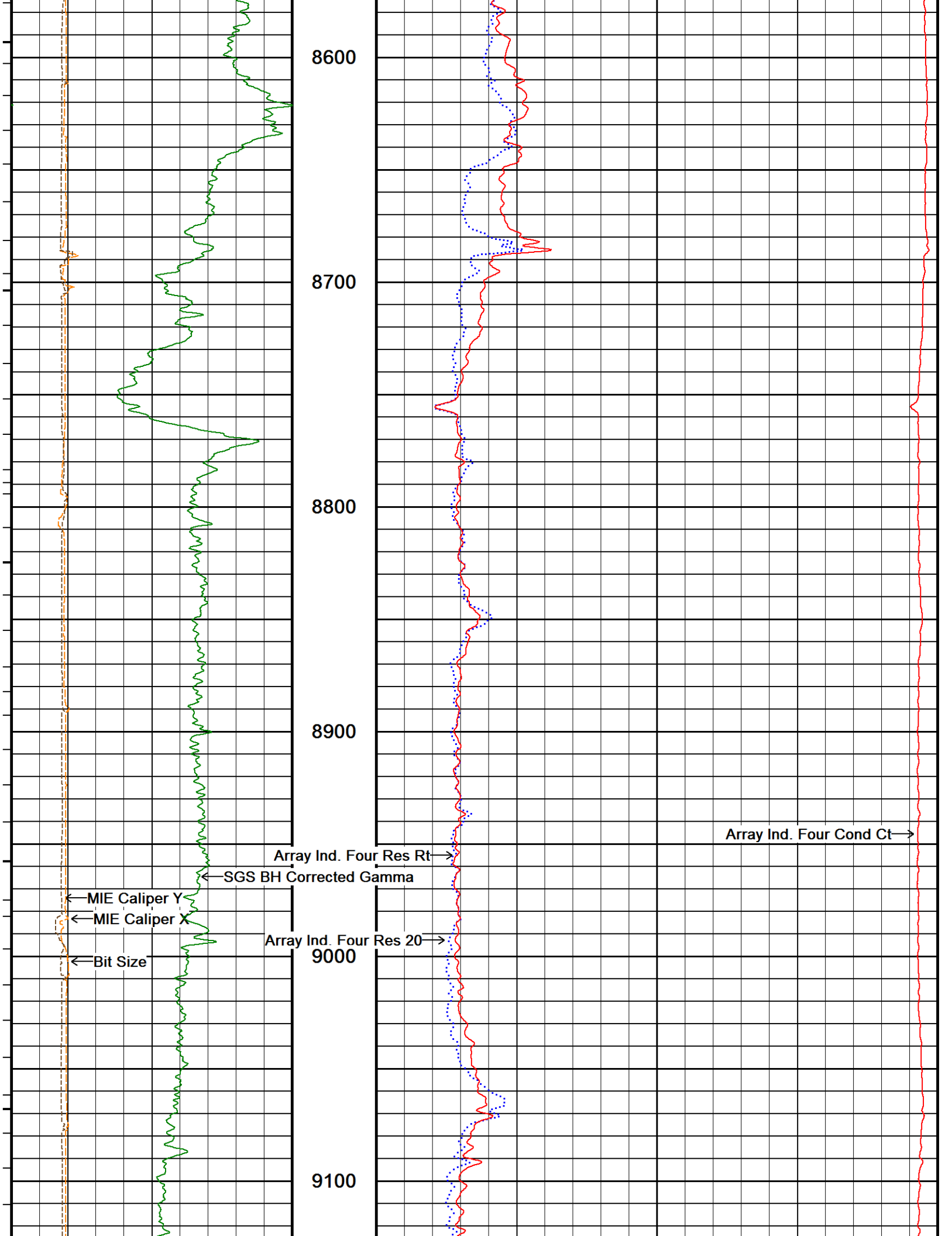
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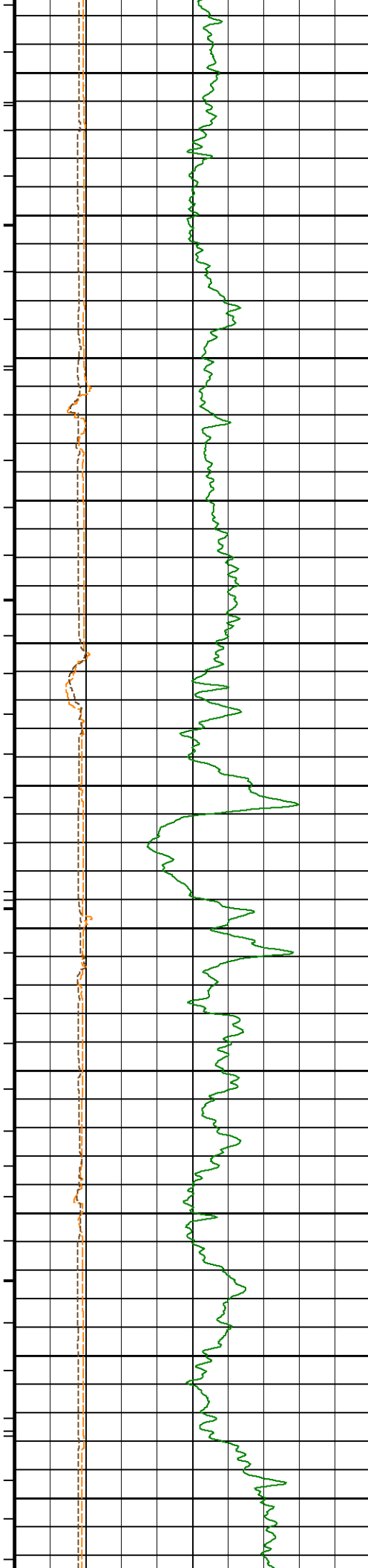
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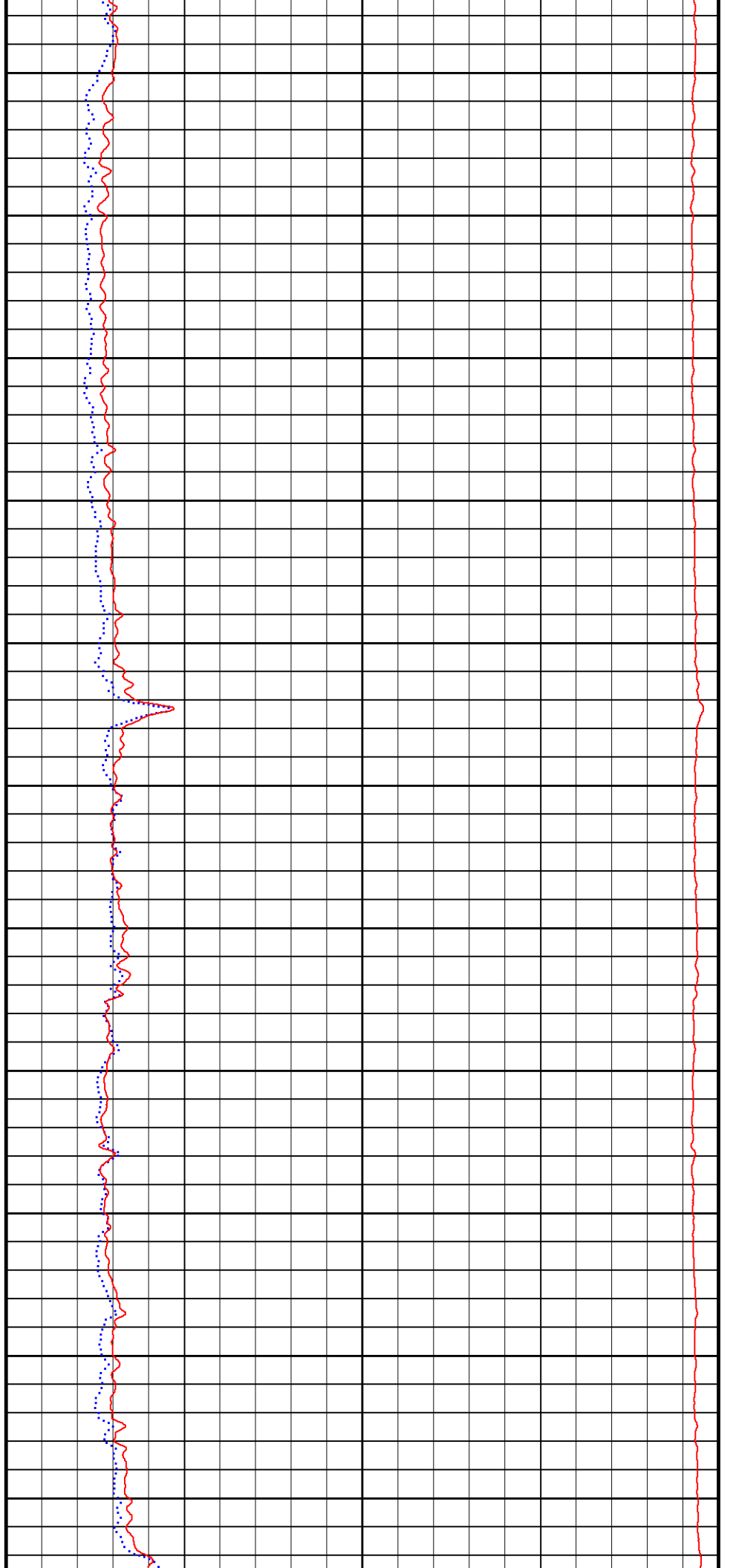
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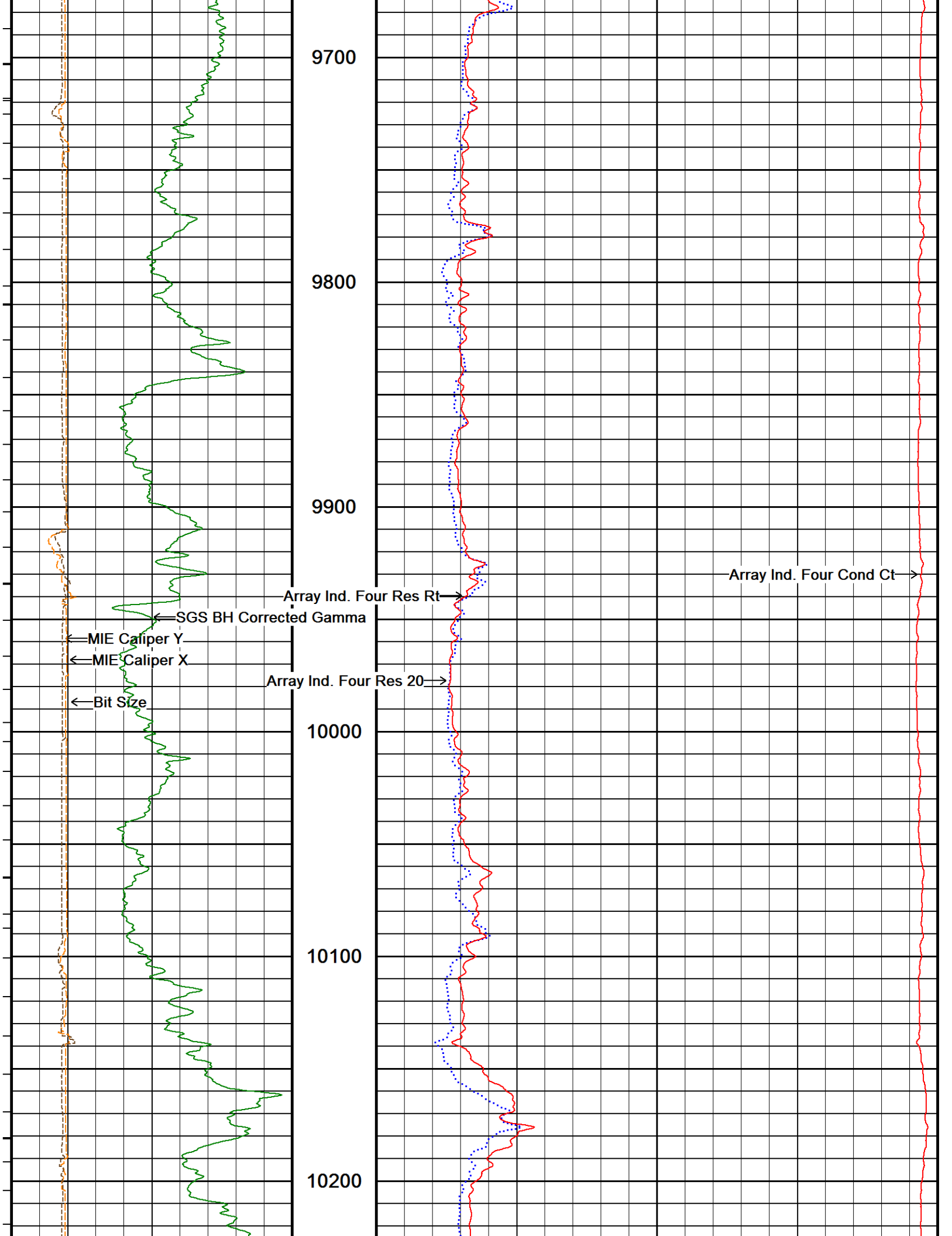
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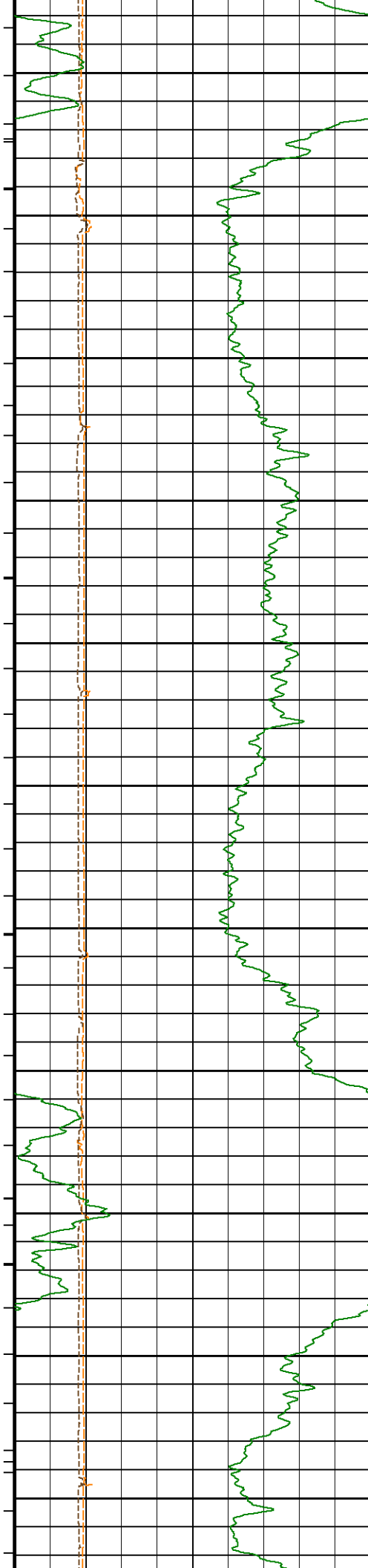
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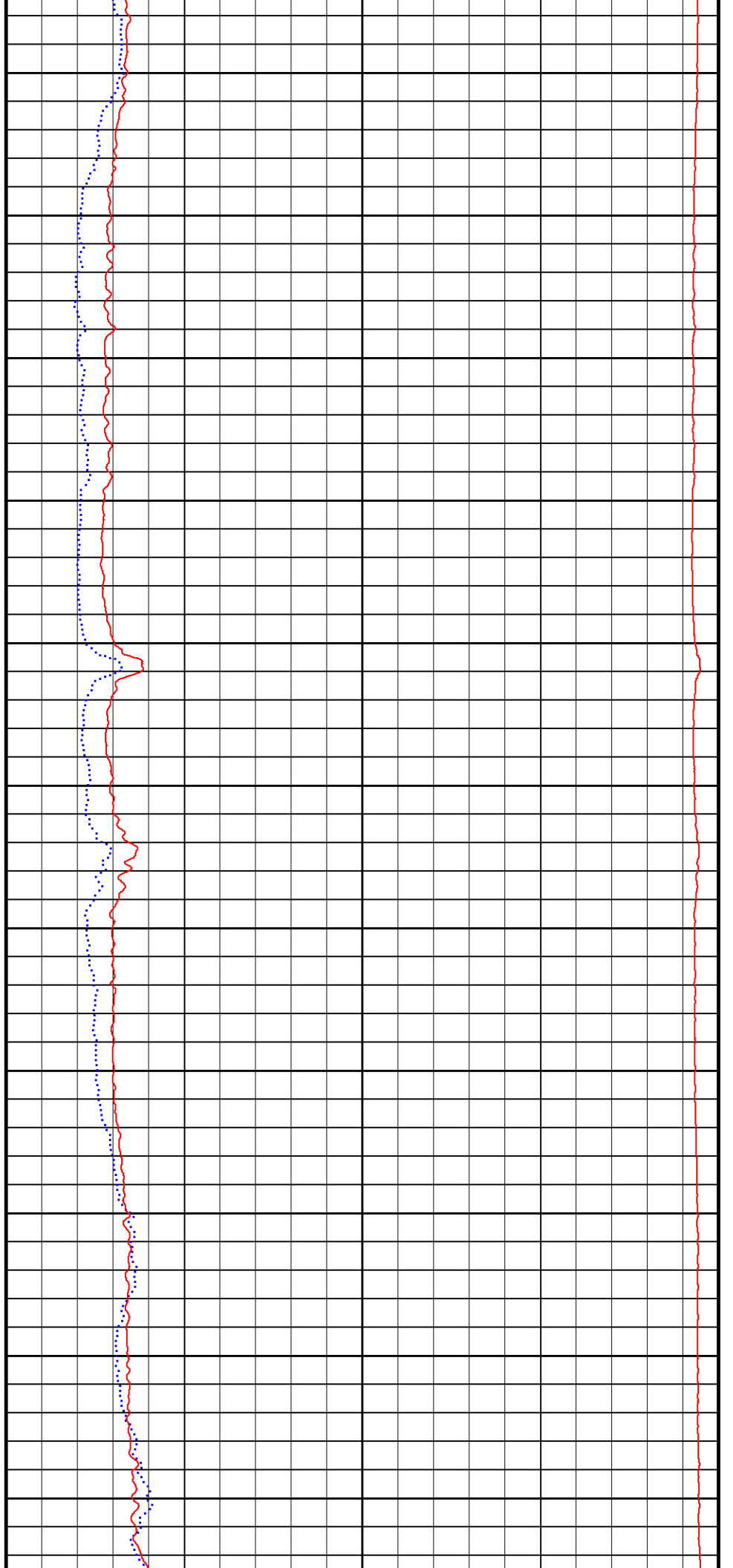
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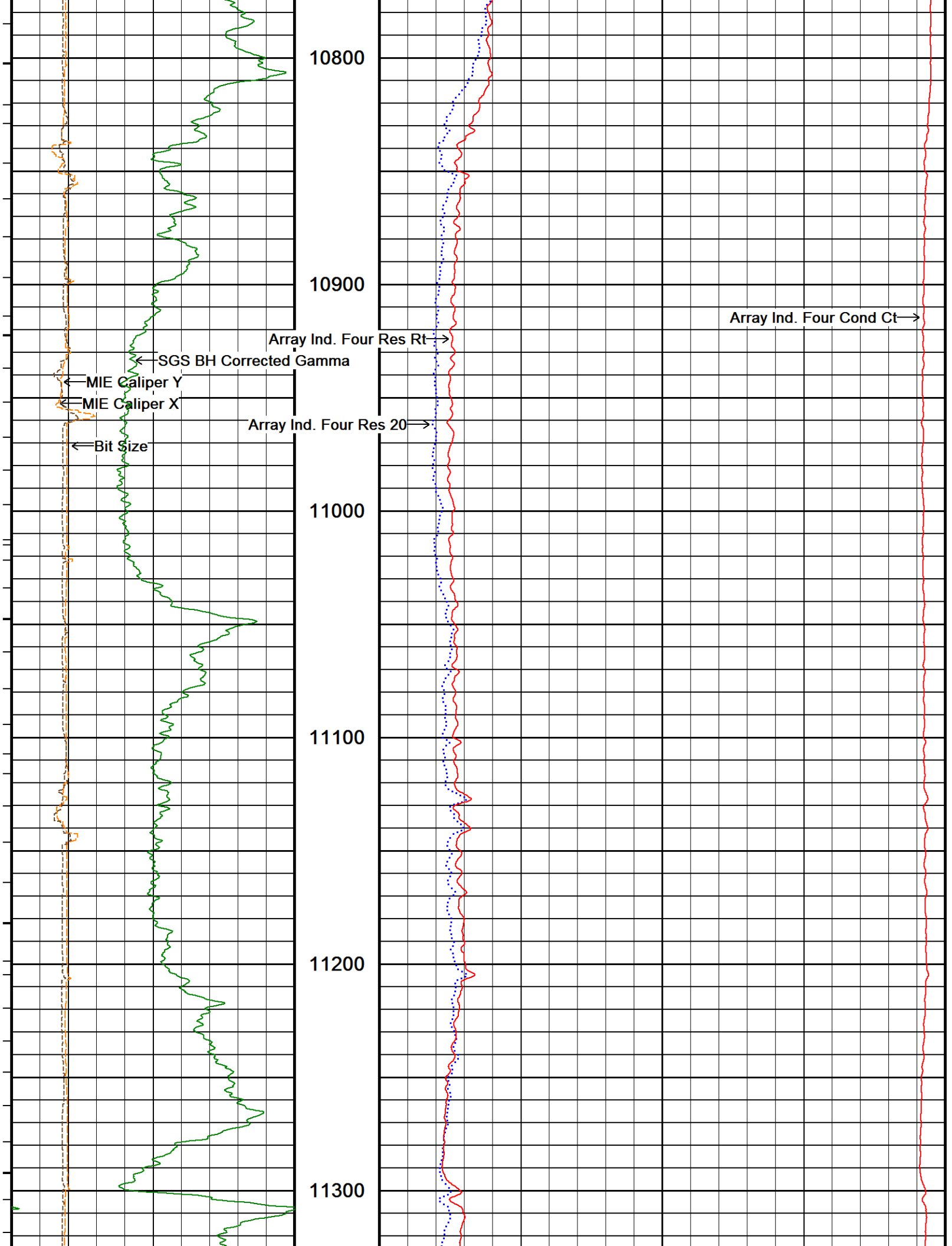
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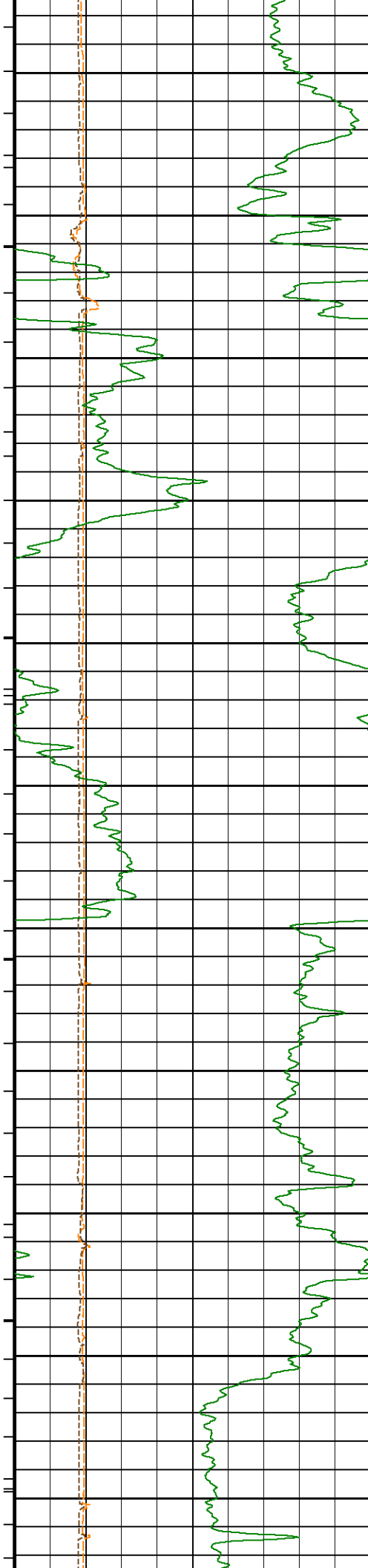
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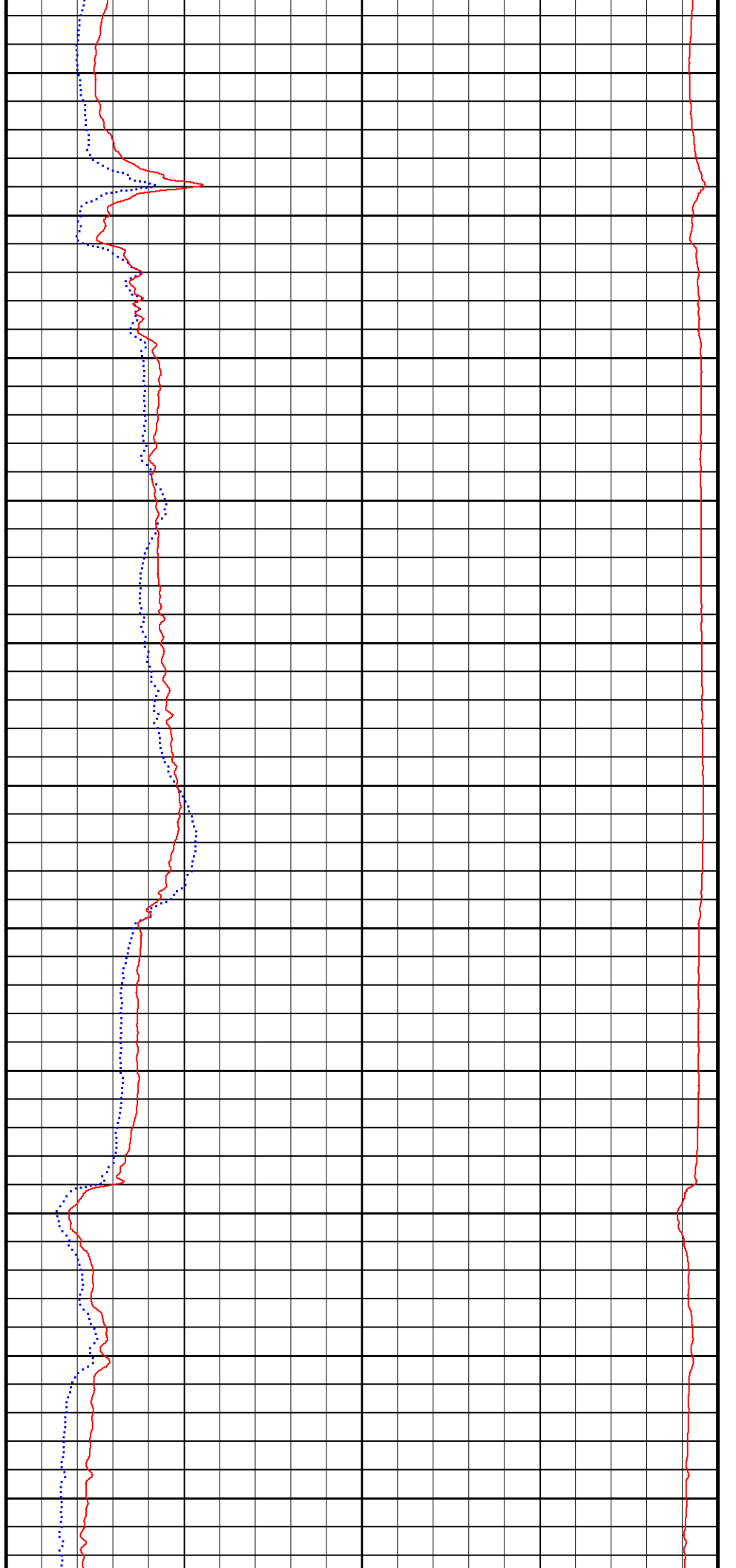
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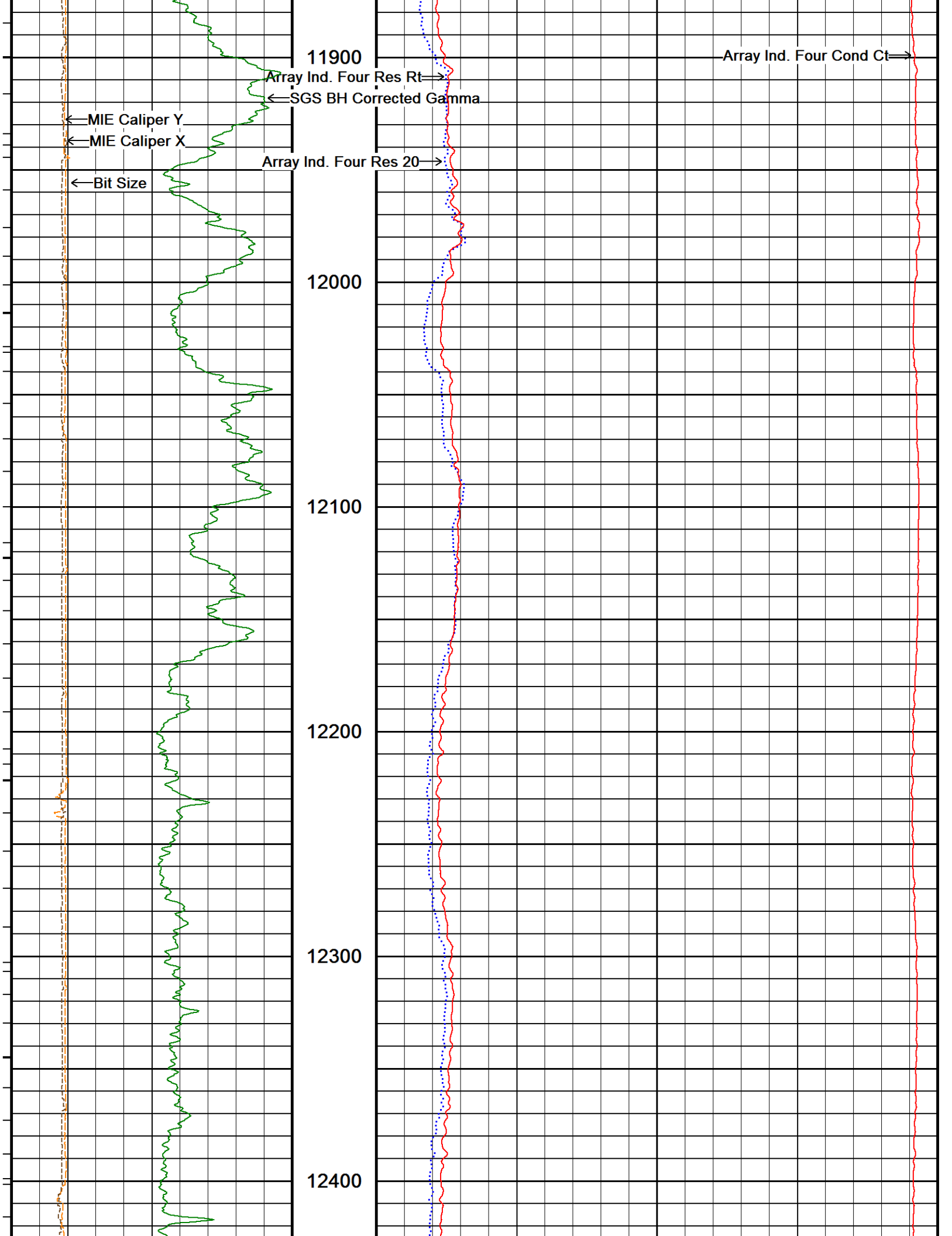
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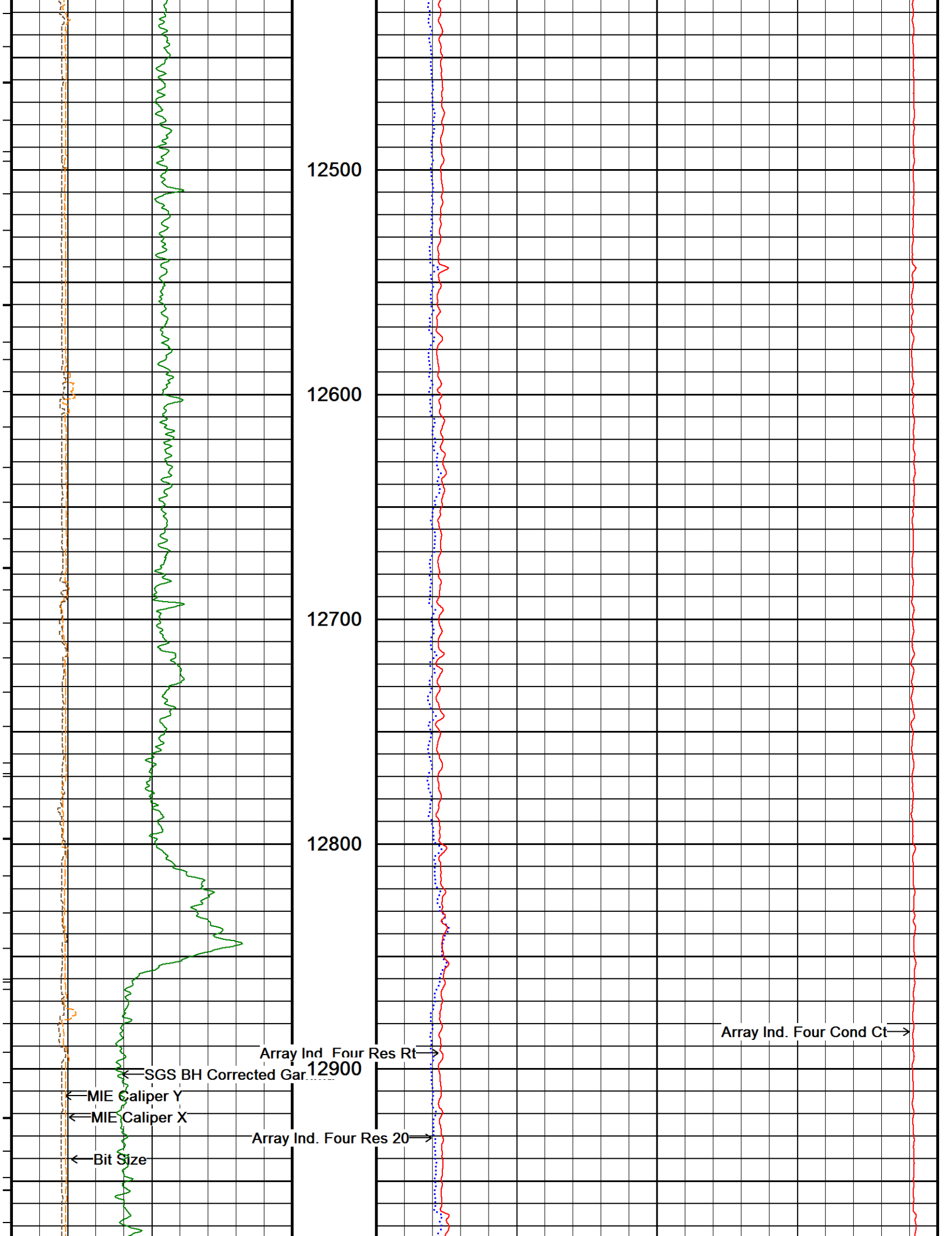
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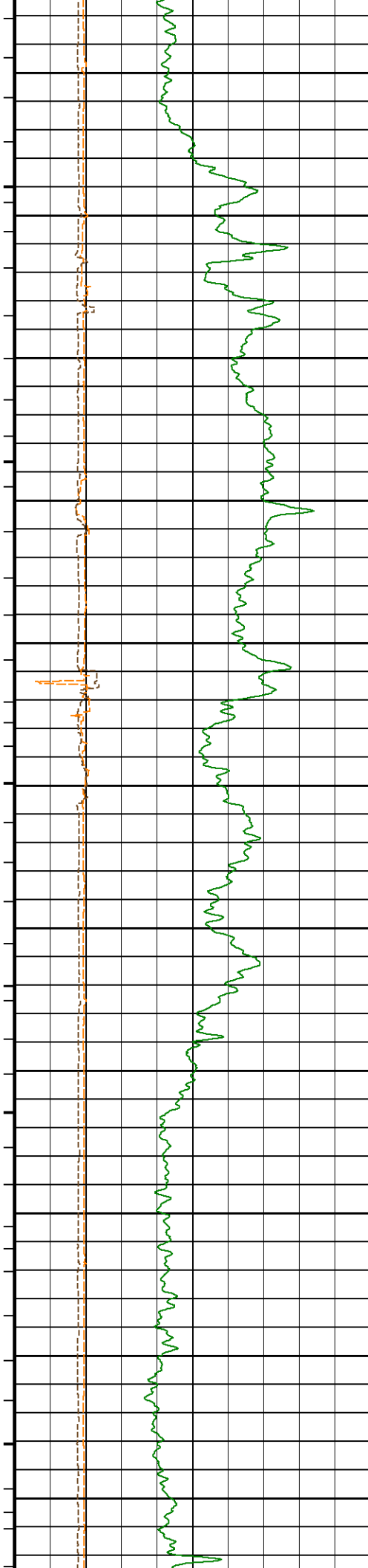
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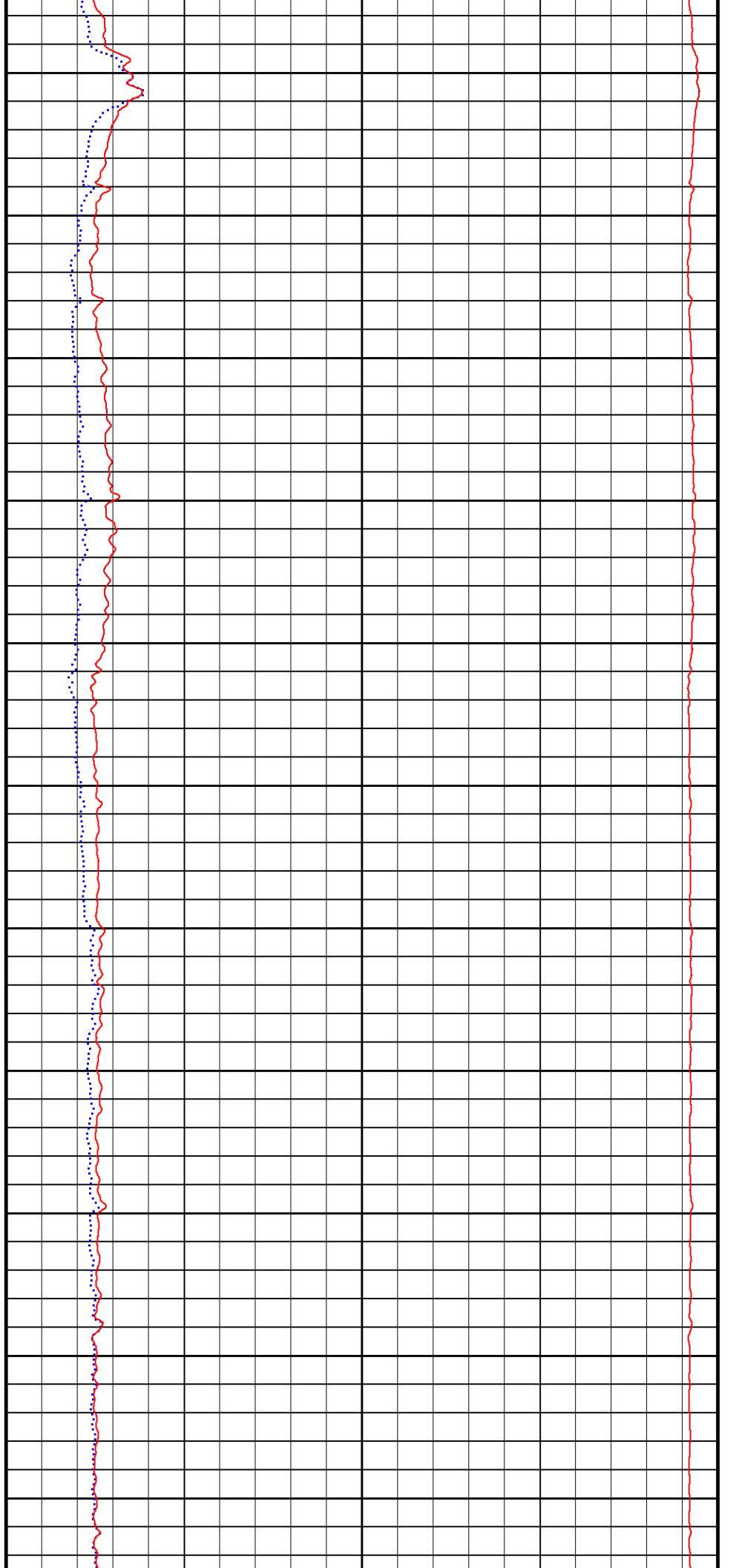
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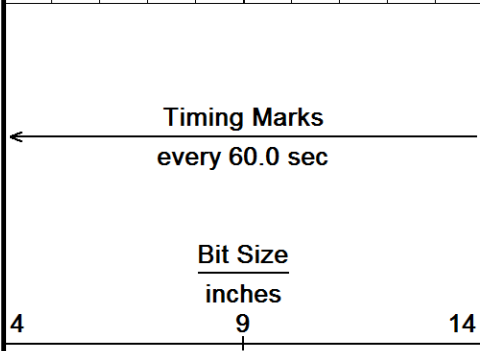
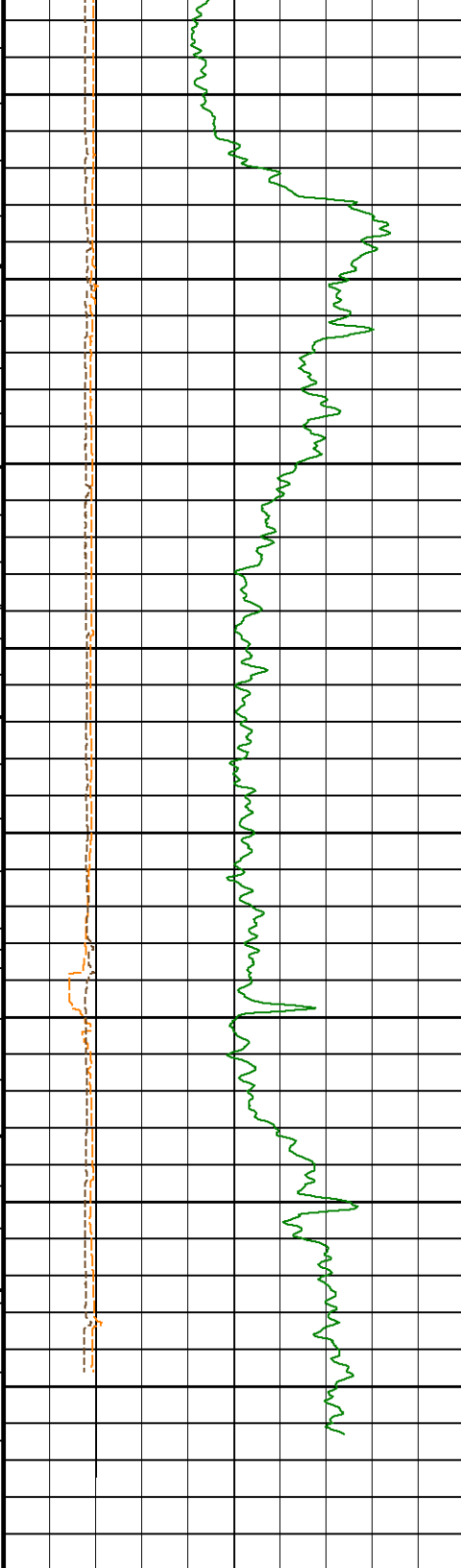
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13400

13500





MIE Caliper X

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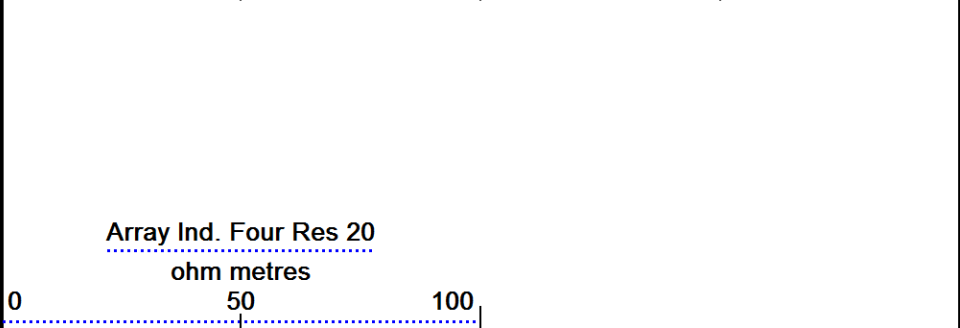
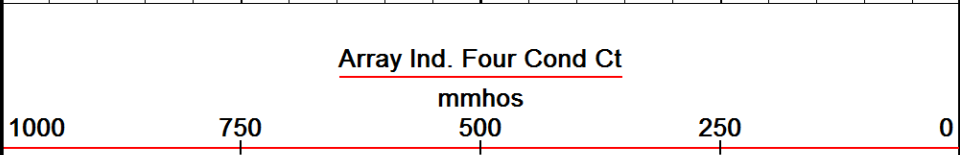
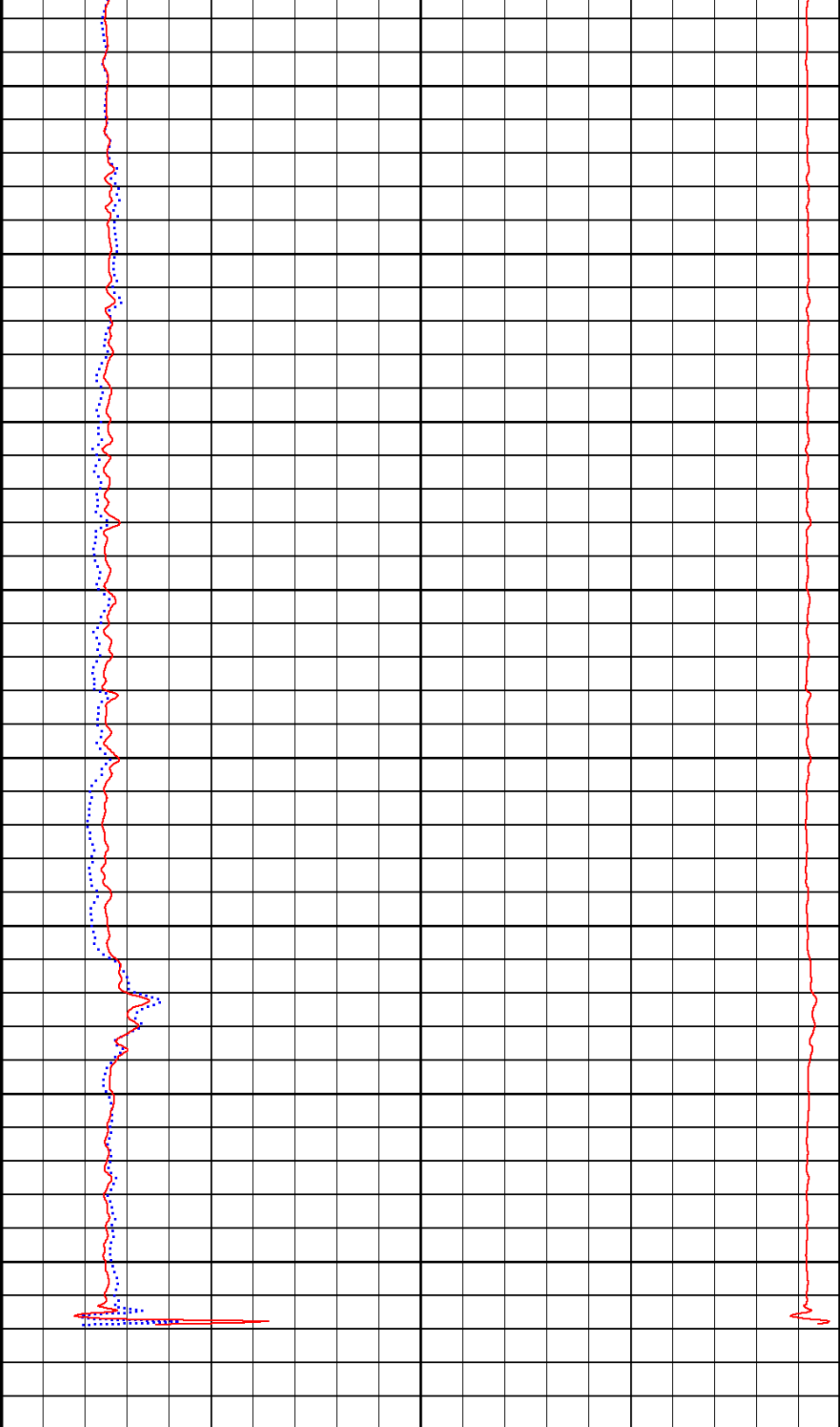
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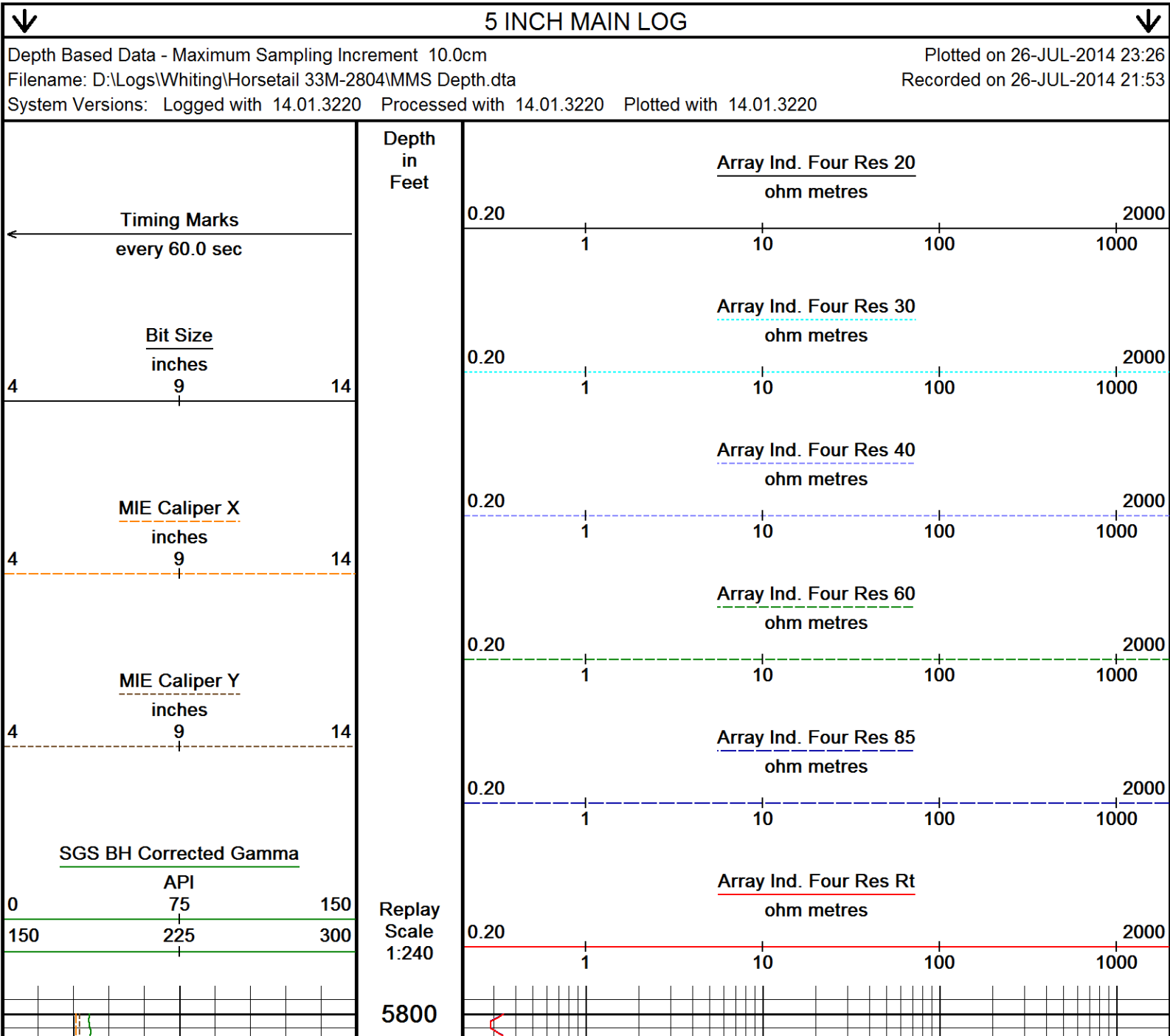
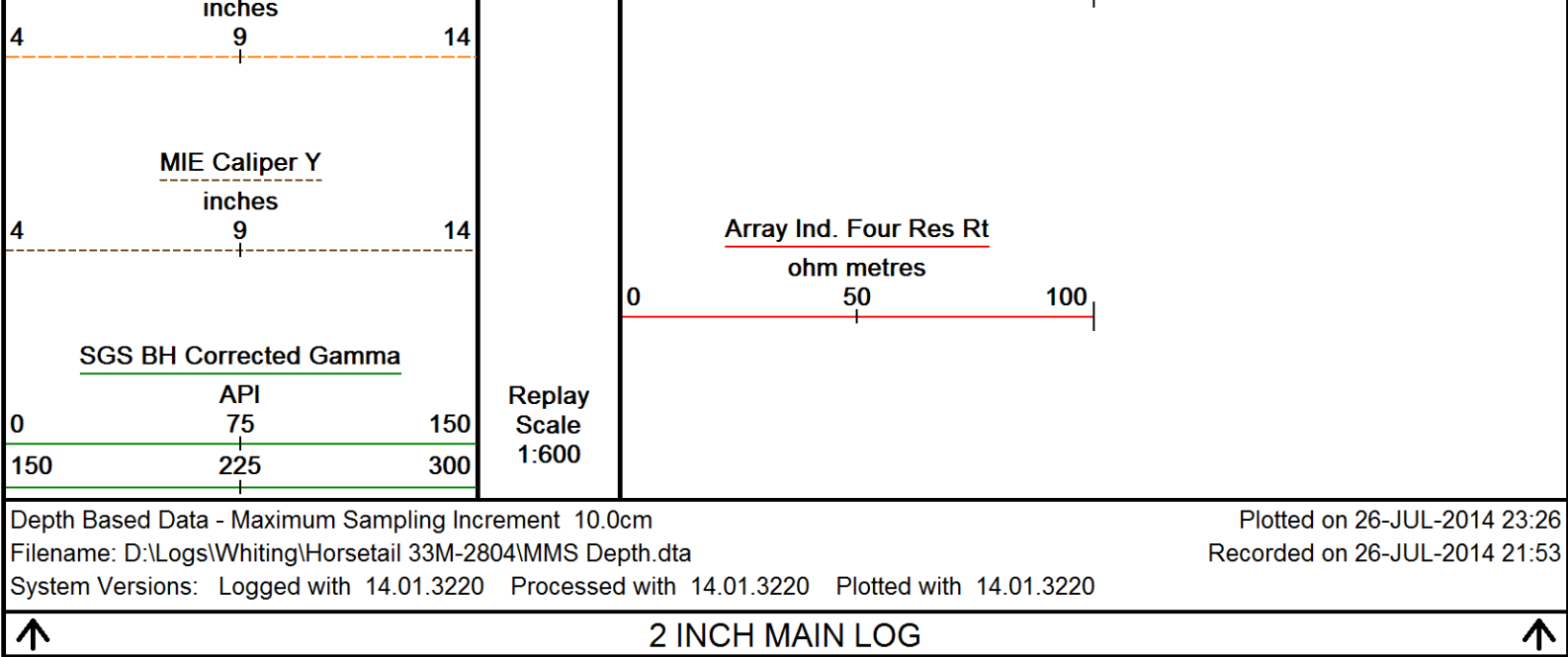
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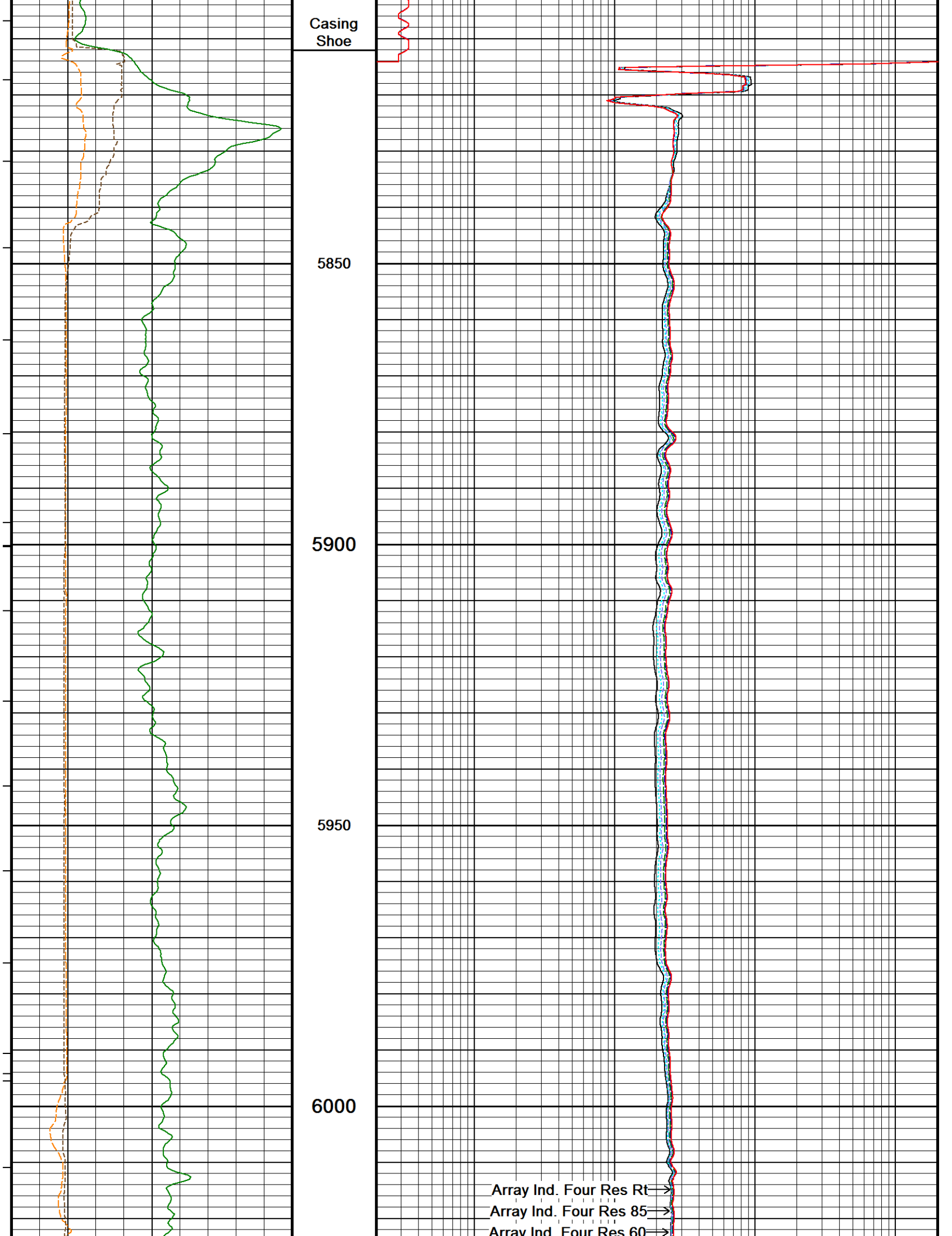
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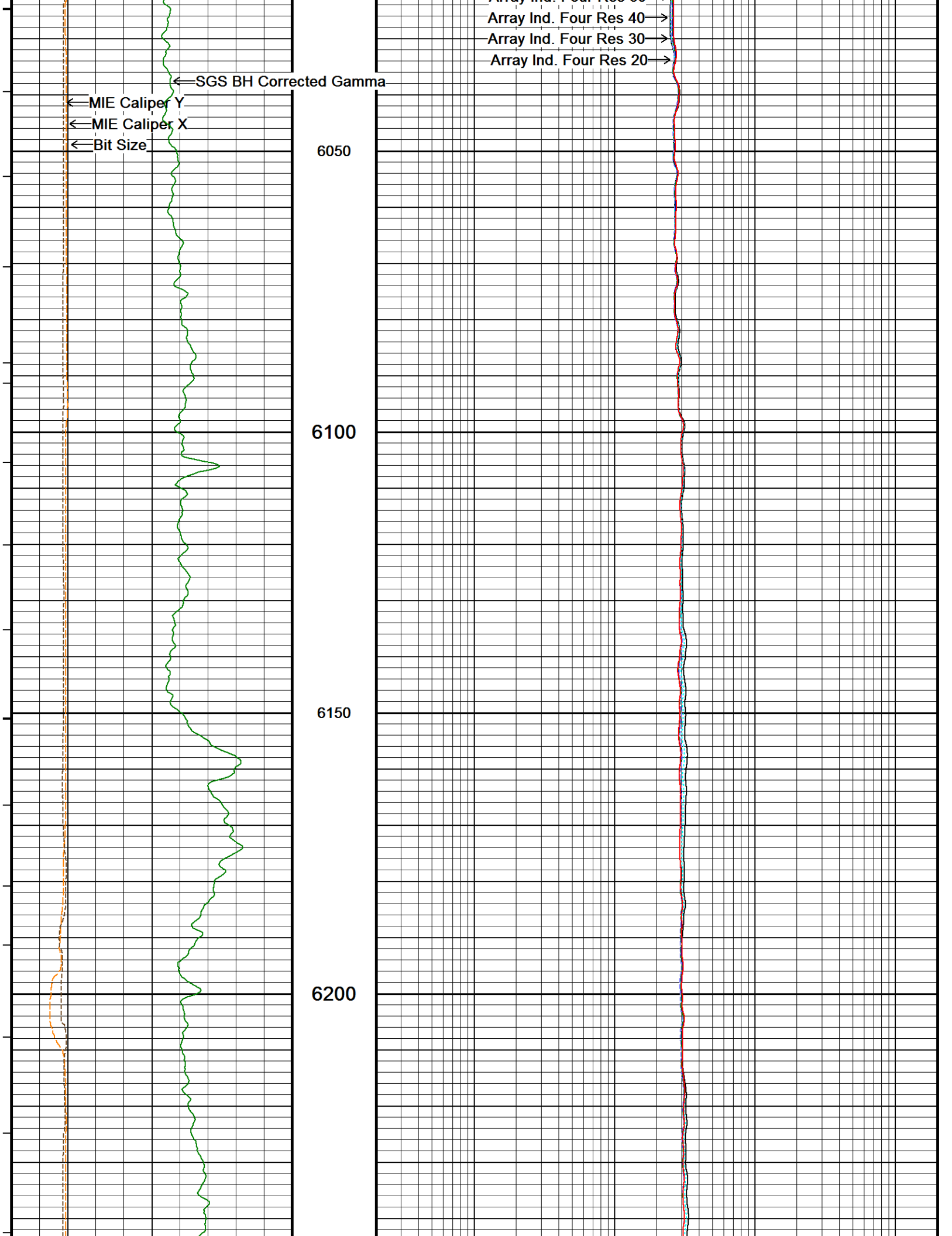
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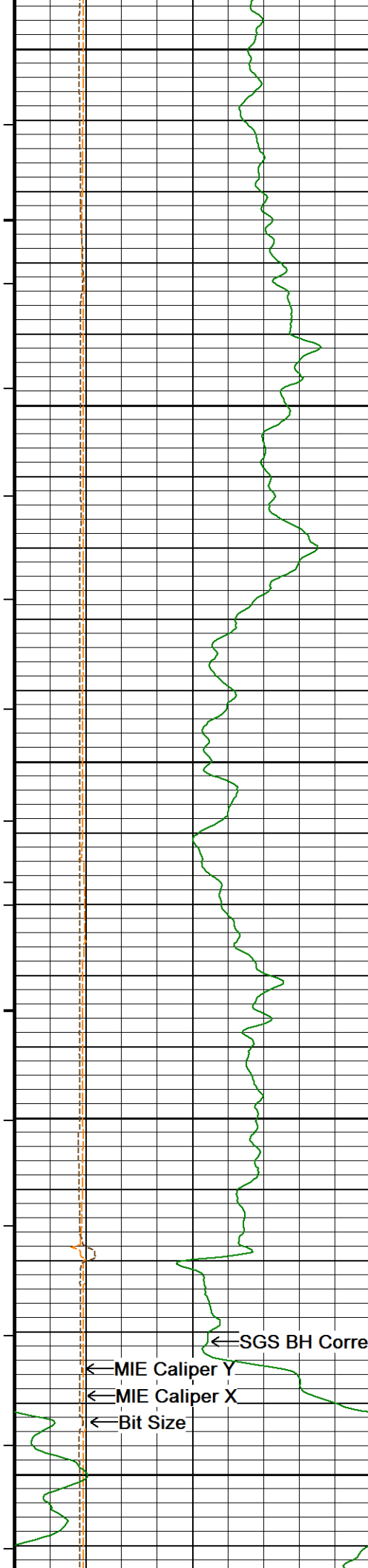
Depth
in
Feet











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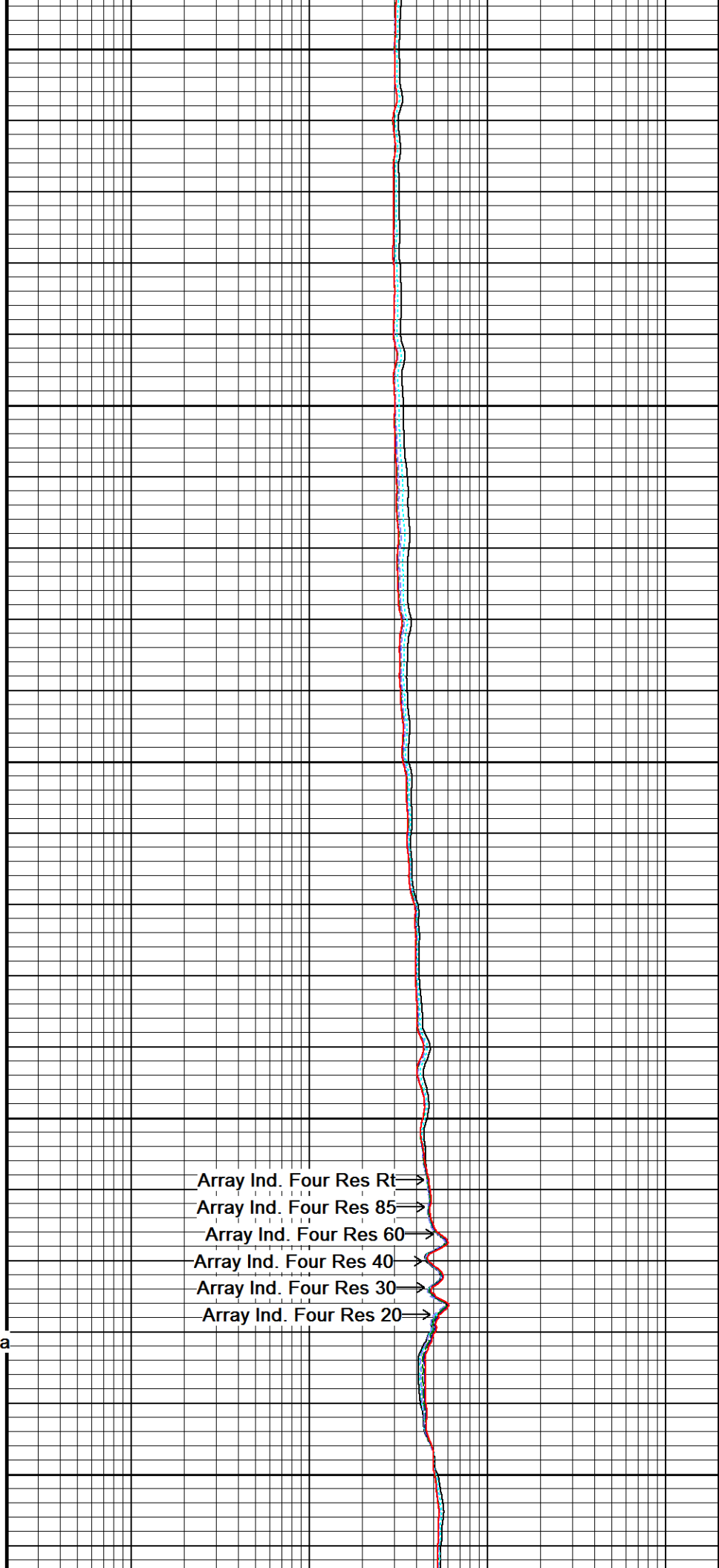
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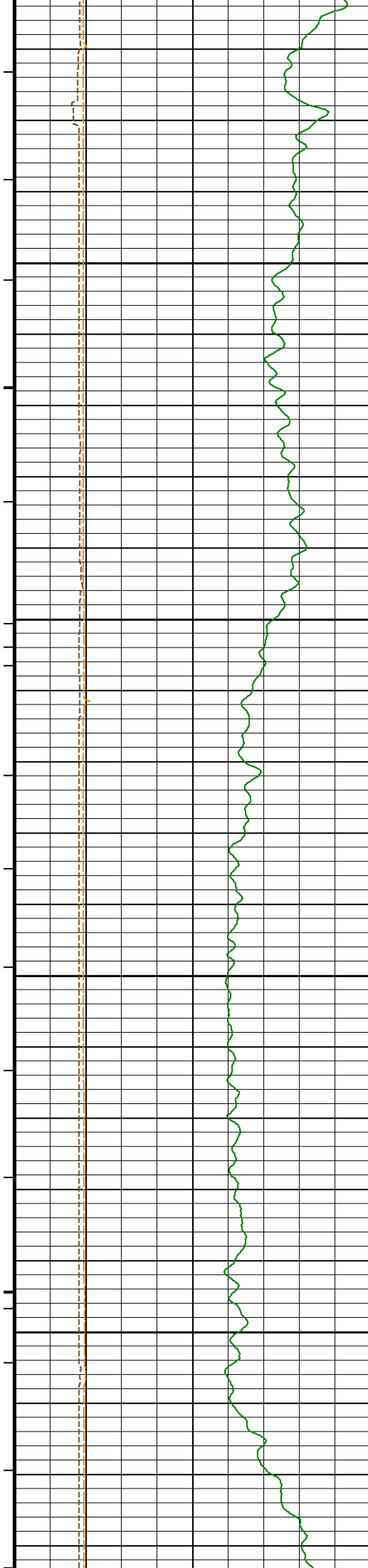
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← MIE Caliper Y
← MIE Caliper X
← Bit Size
← SGS BH Corrected Gamma



→ Array Ind. Four Res Rt
→ Array Ind. Four Res 85
→ Array Ind. Four Res 60
→ Array Ind. Four Res 40
→ Array Ind. Four Res 30
→ Array Ind. Four Res 20

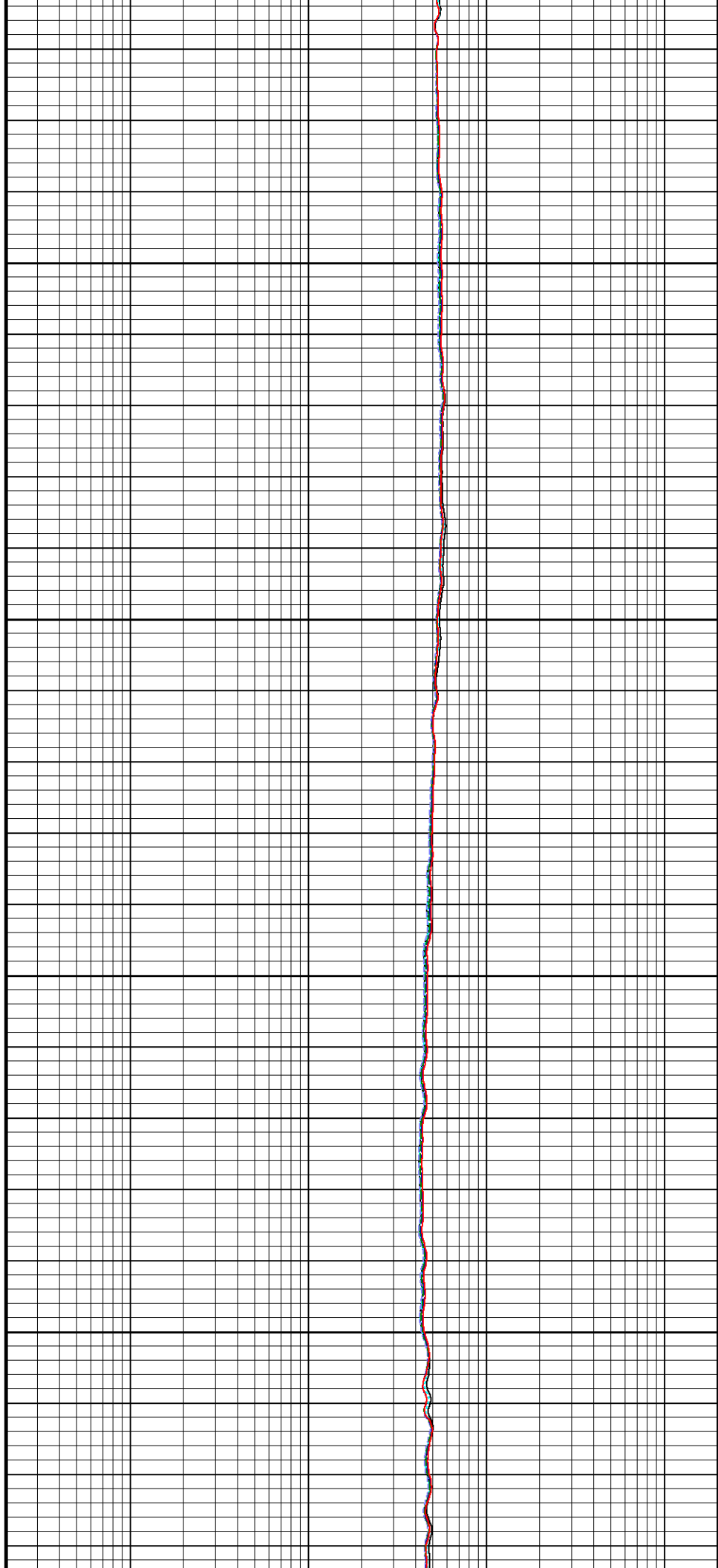


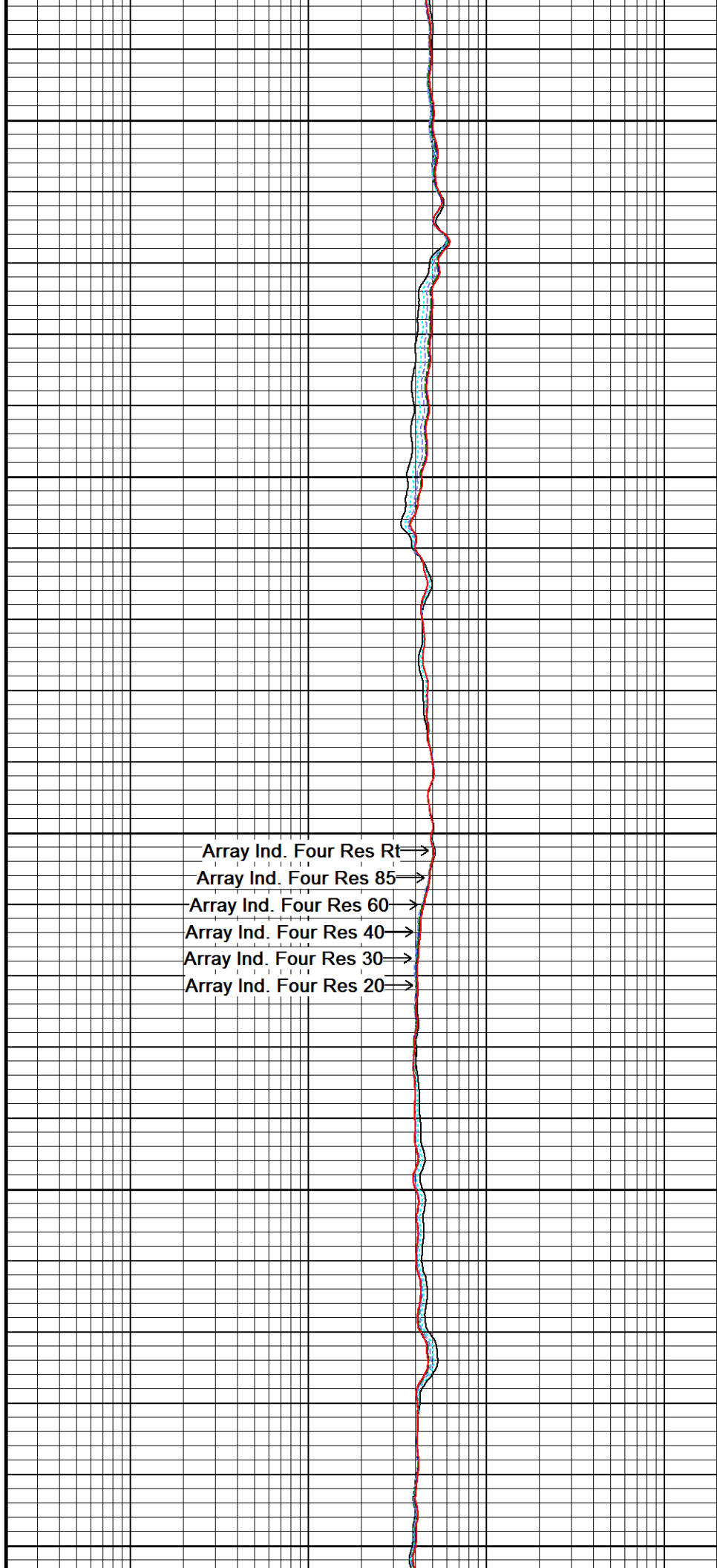
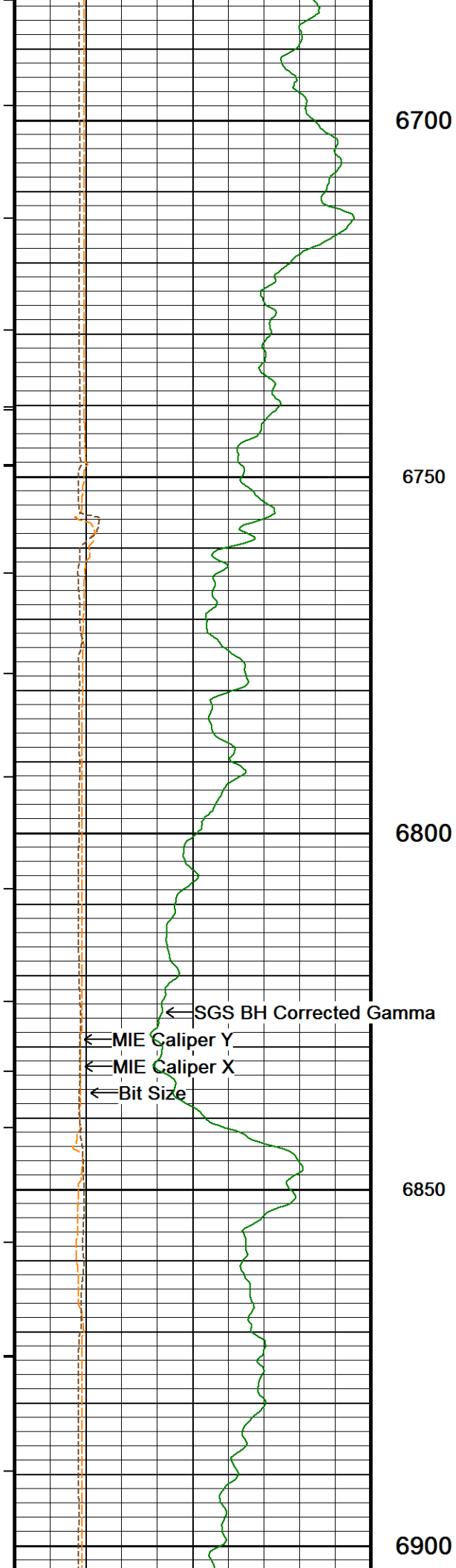
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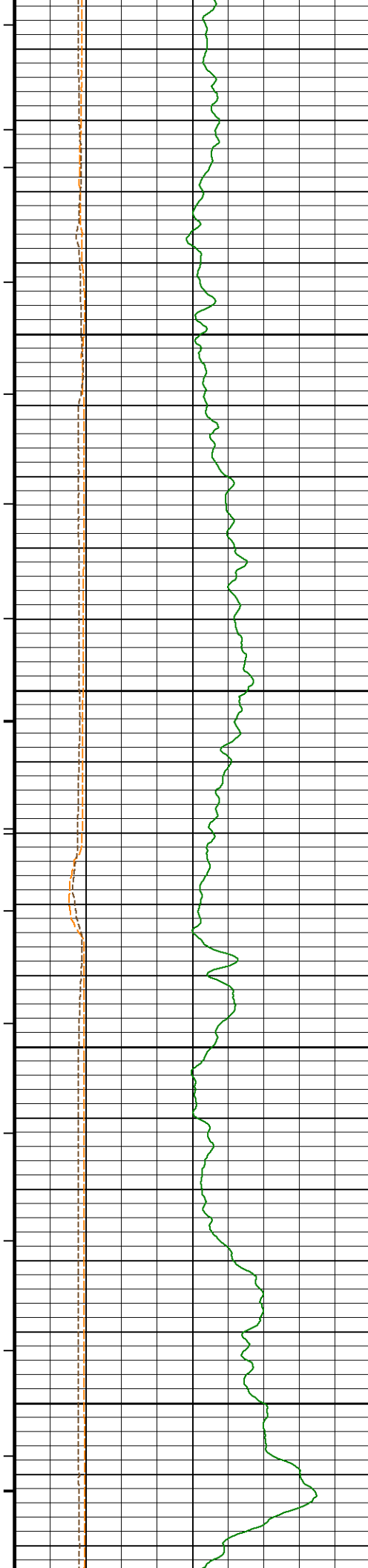
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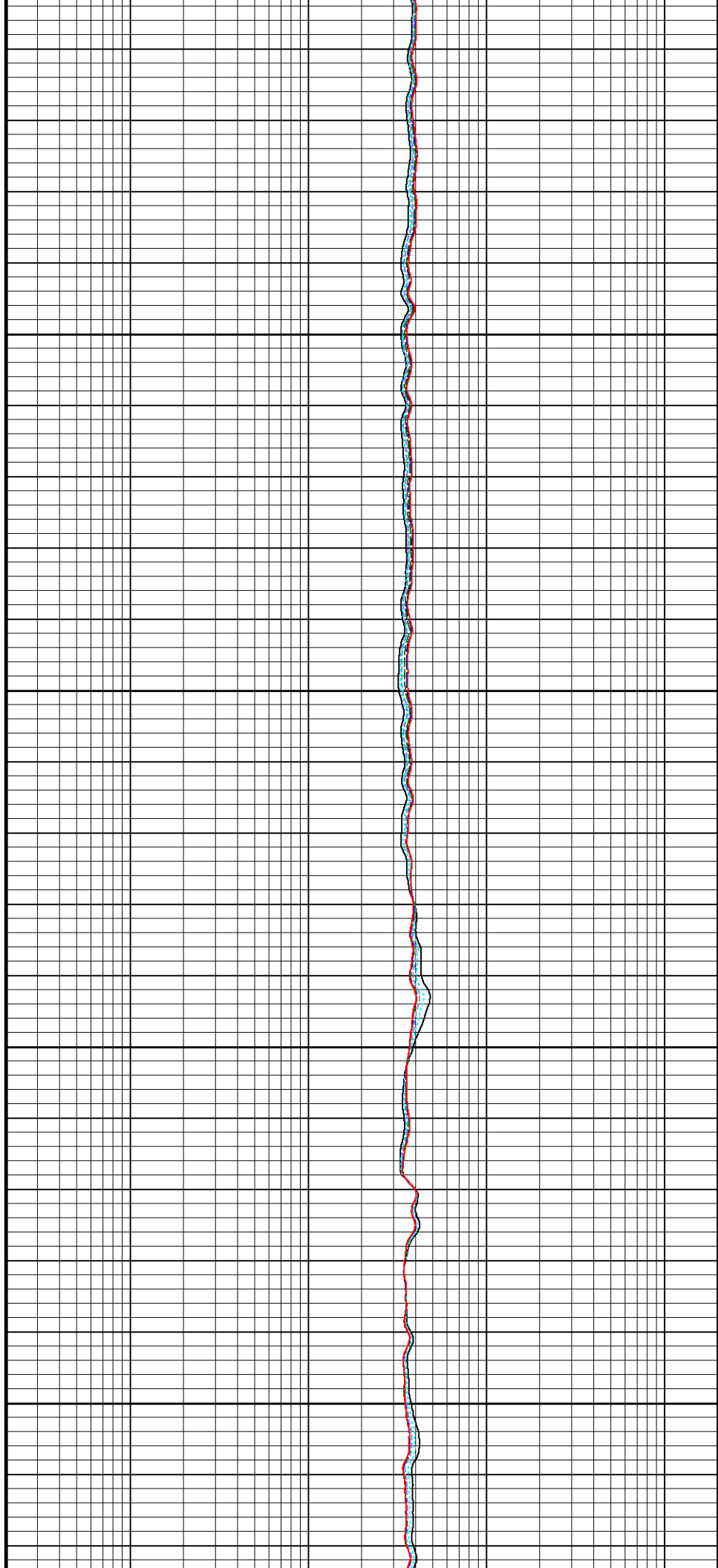


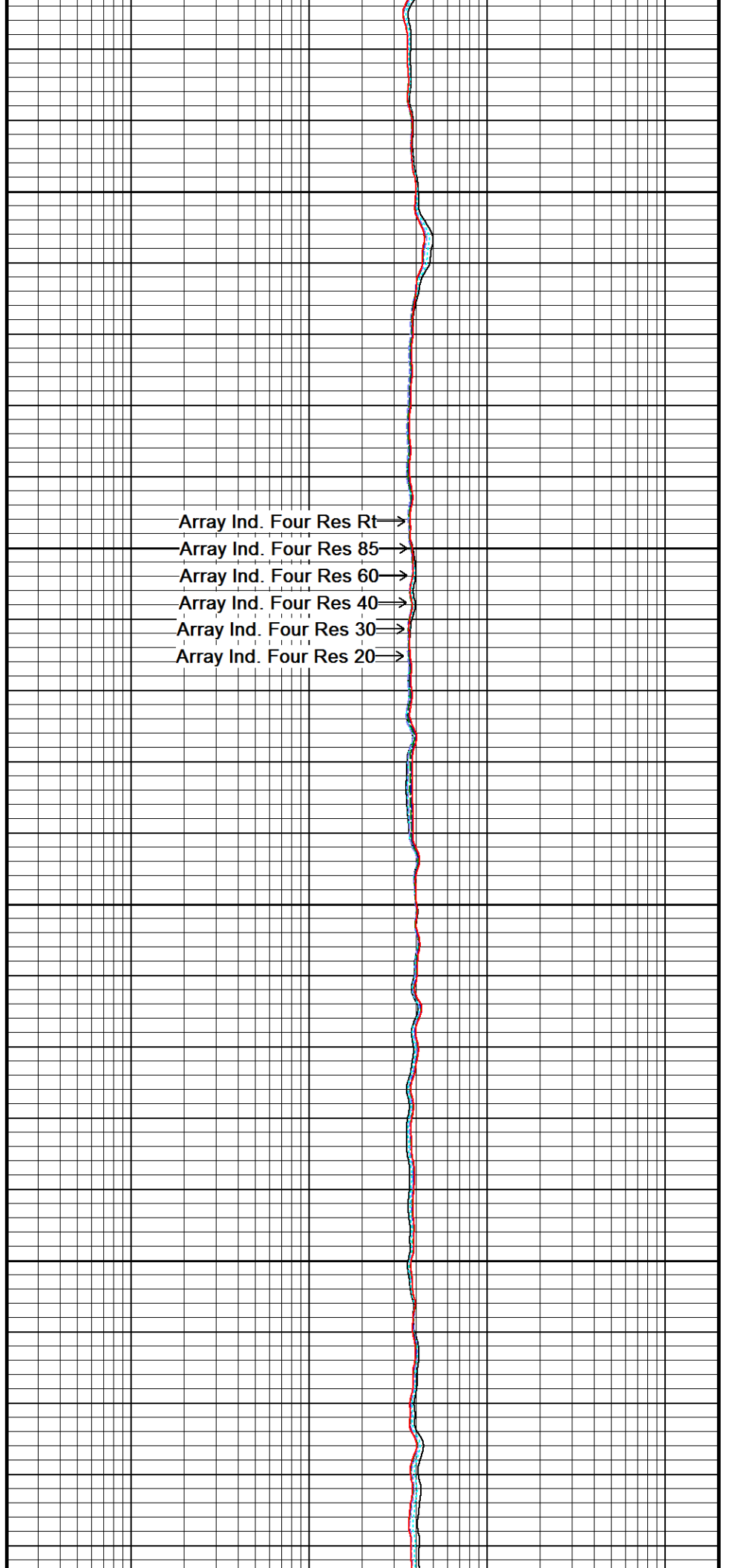
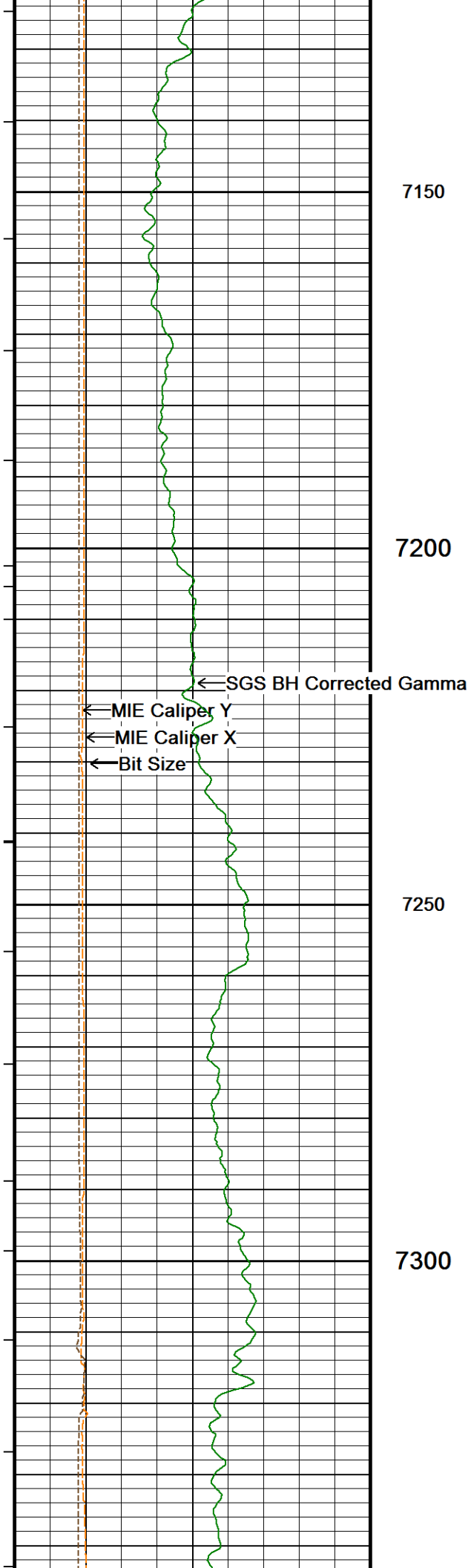
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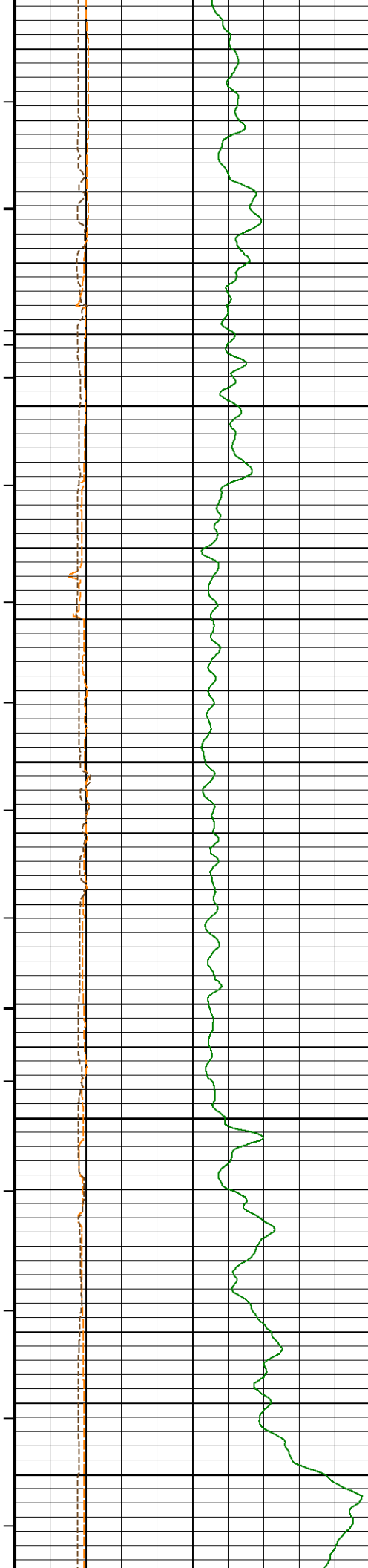
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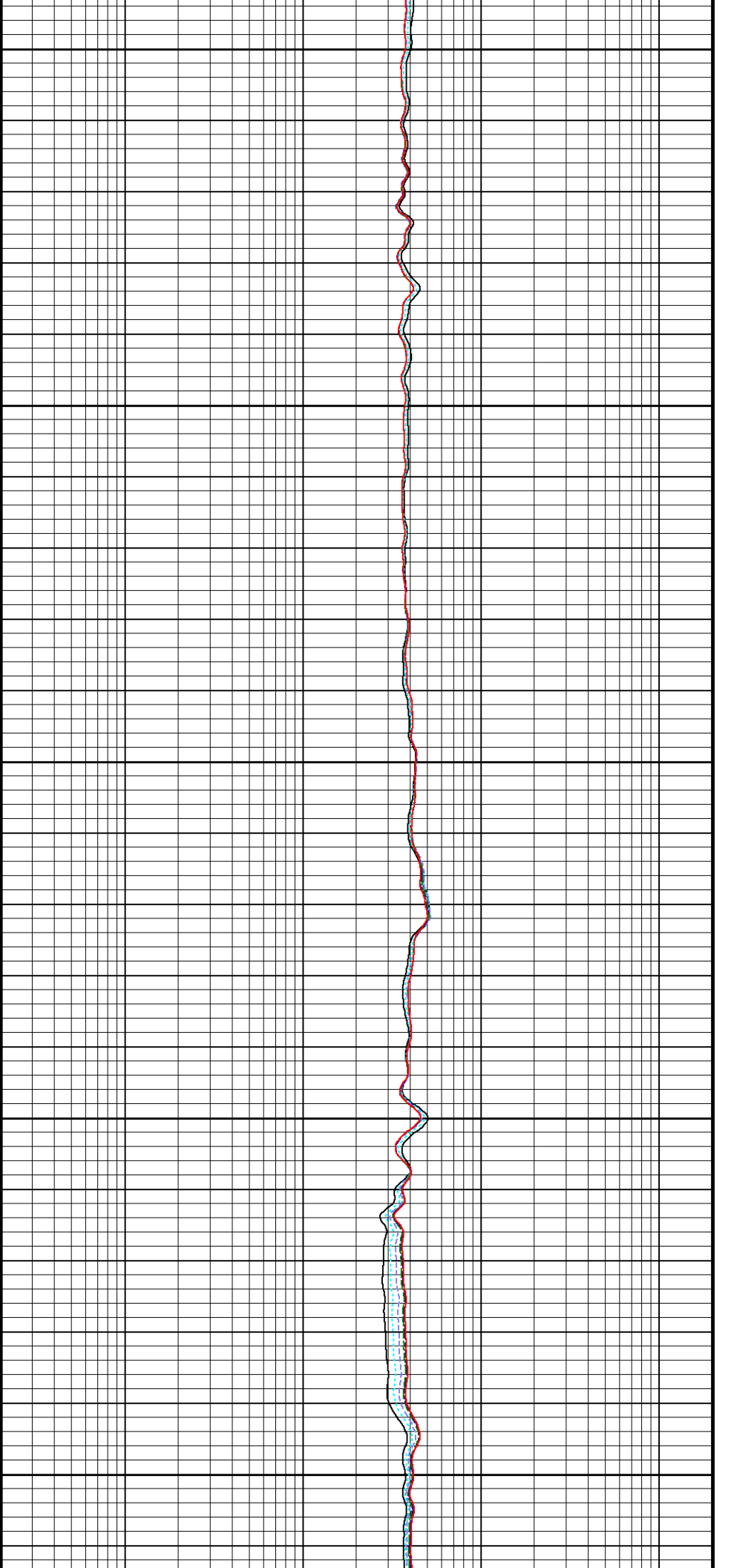
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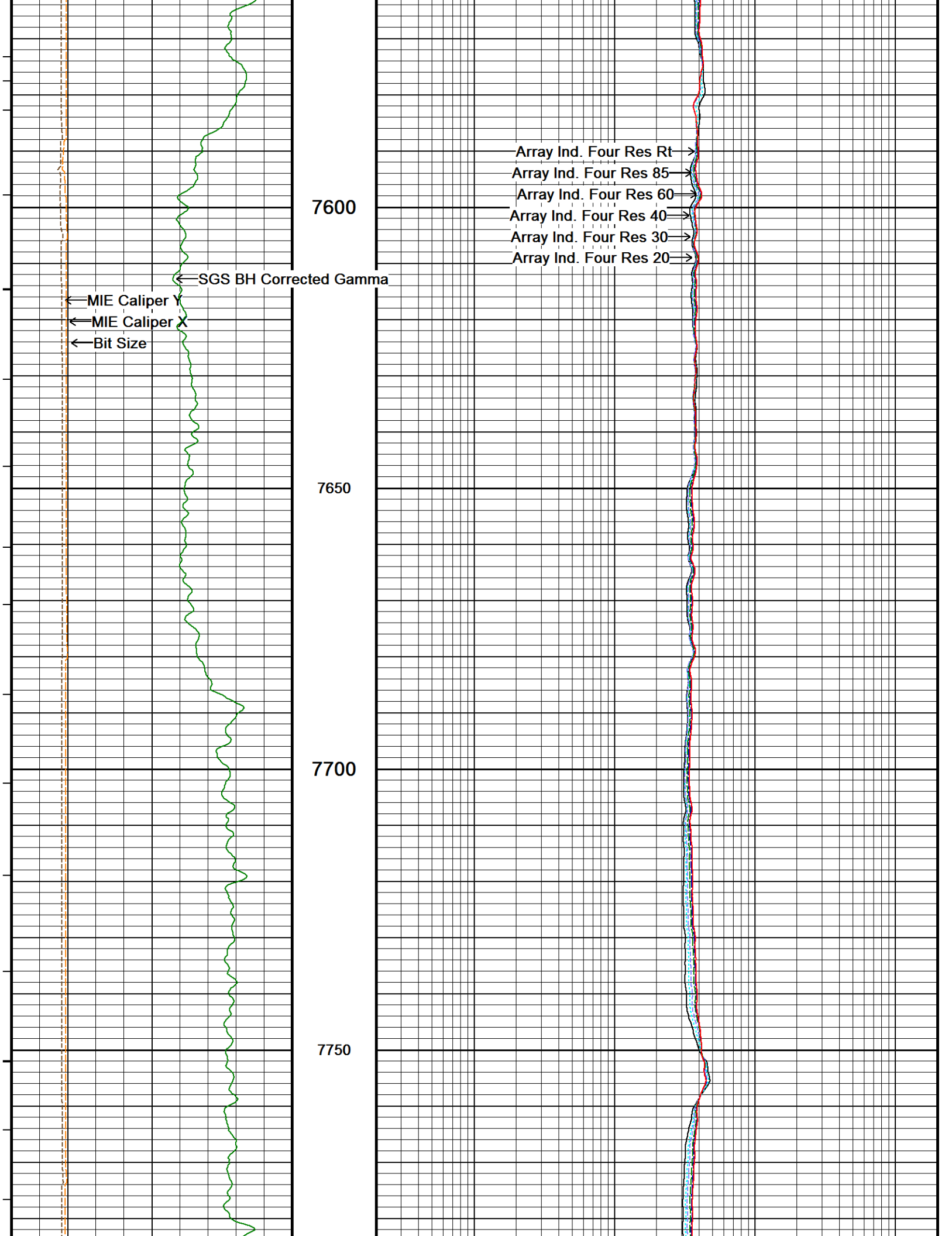
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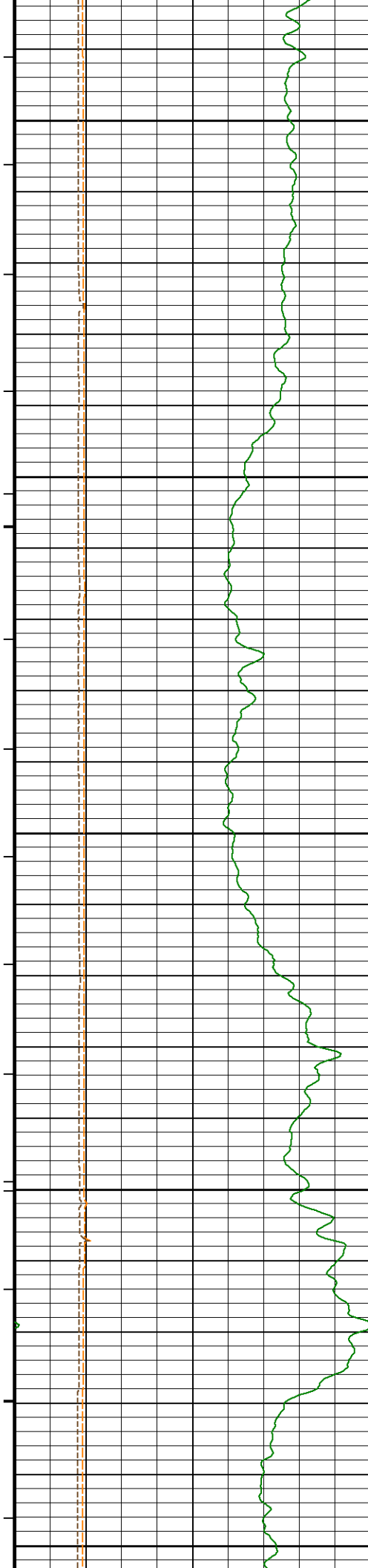
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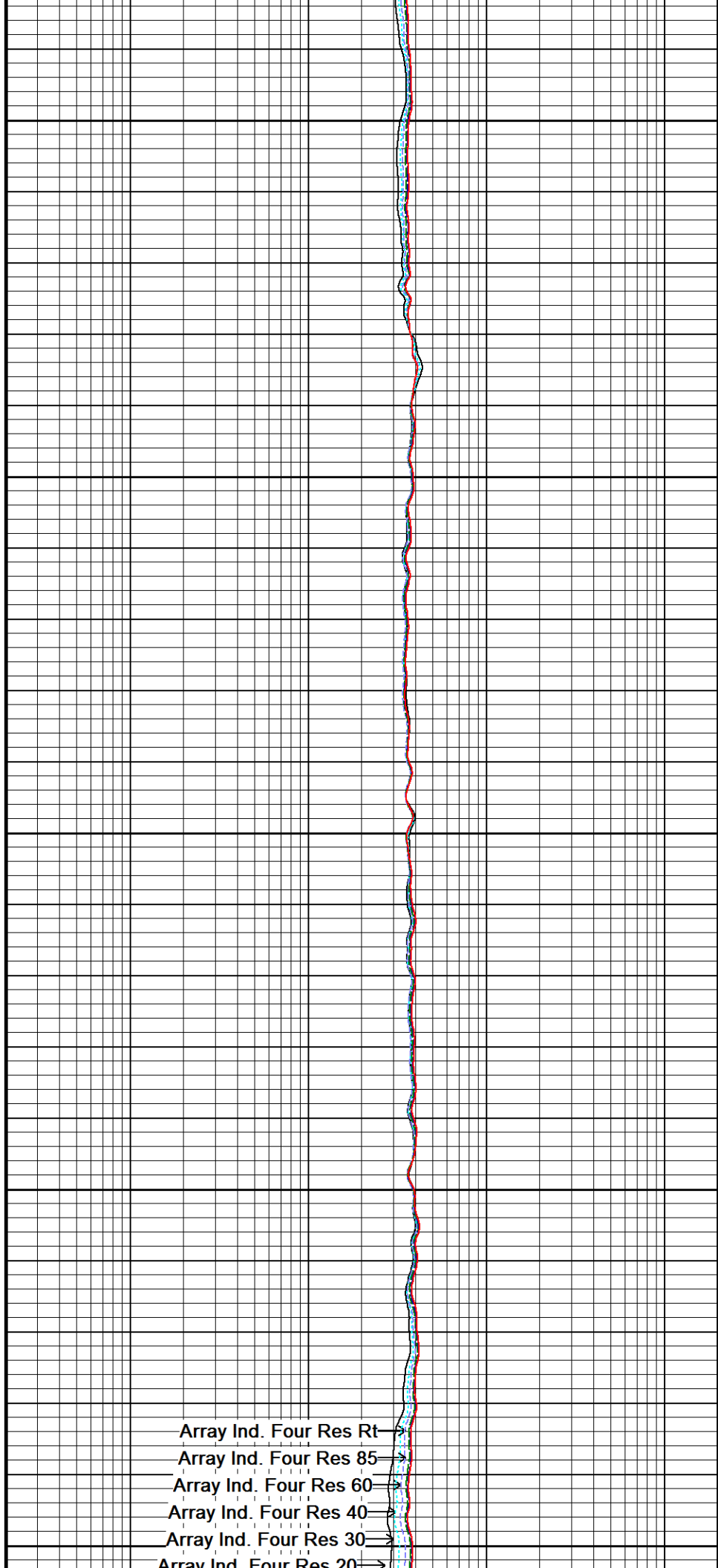
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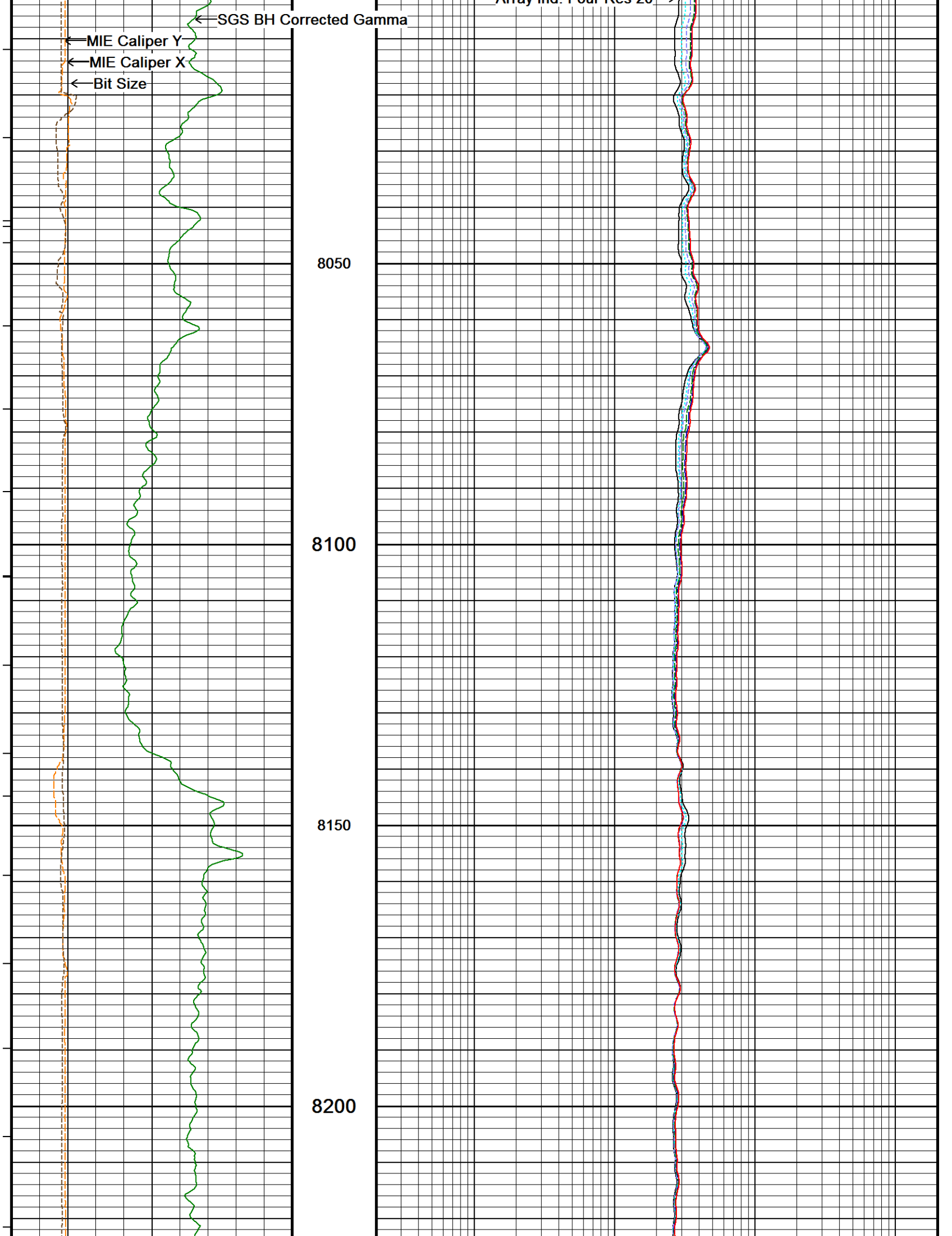
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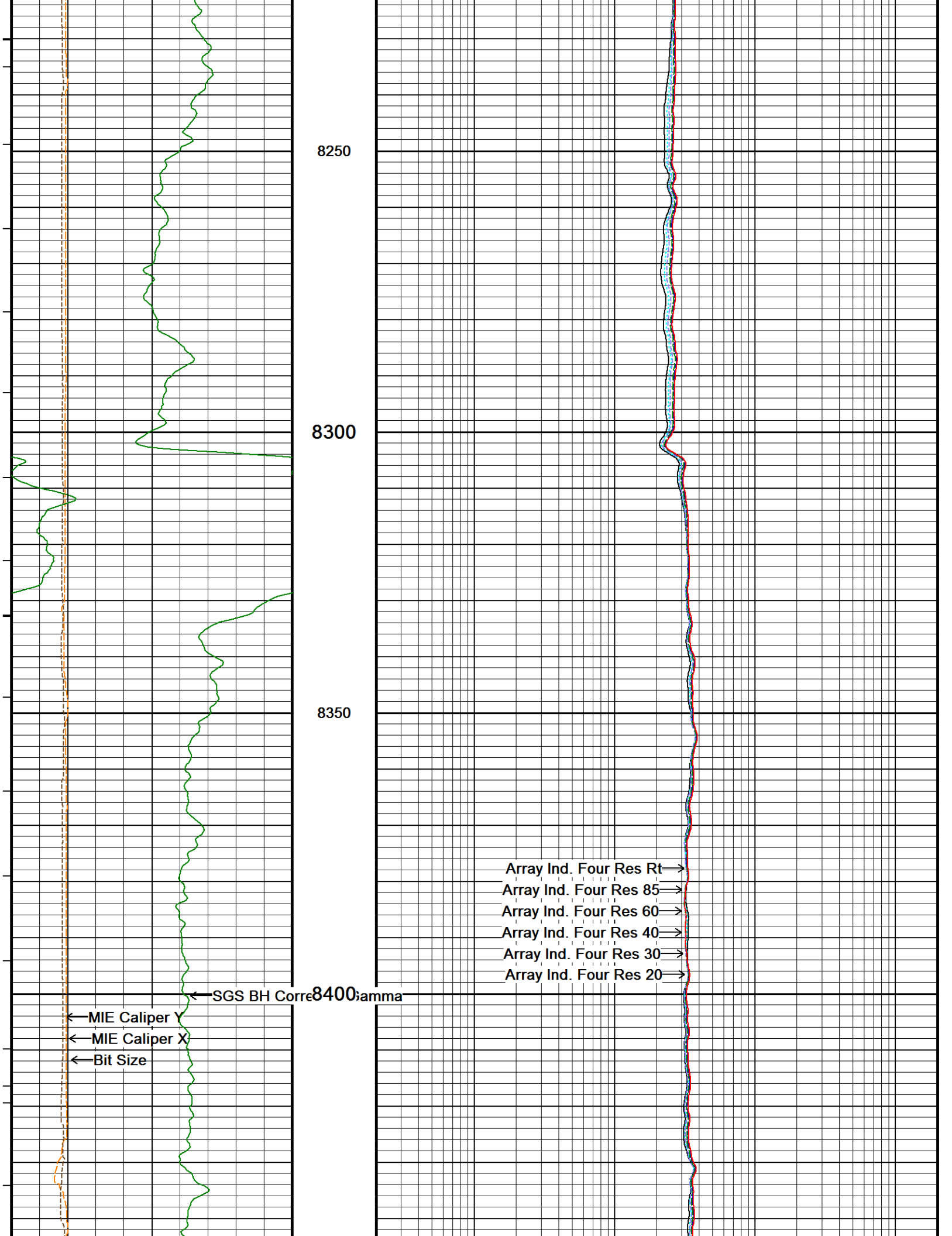
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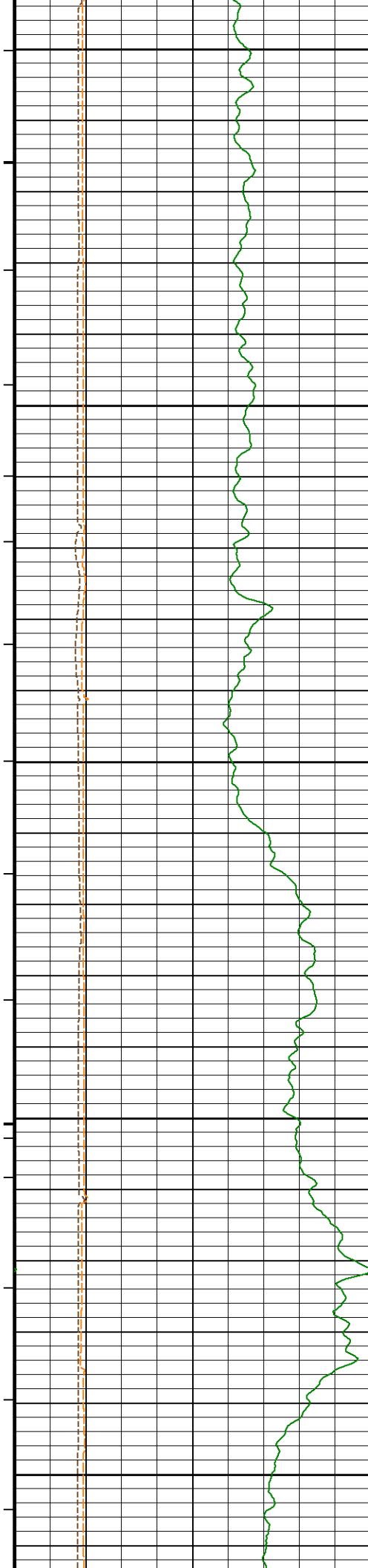
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Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
Array Ind. Four Res 40 →
Array Ind. Four Res 30 →
Array Ind. Four Res 20 →









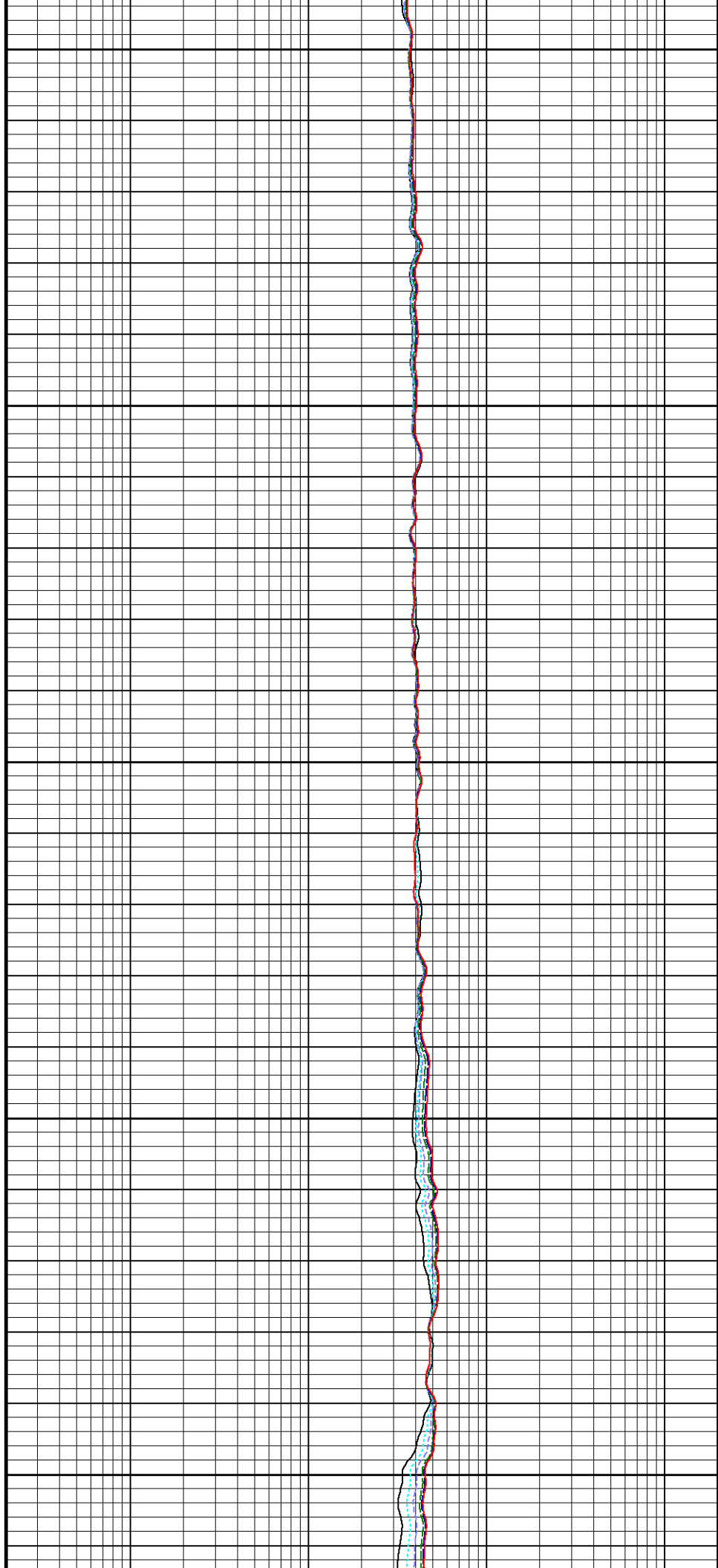
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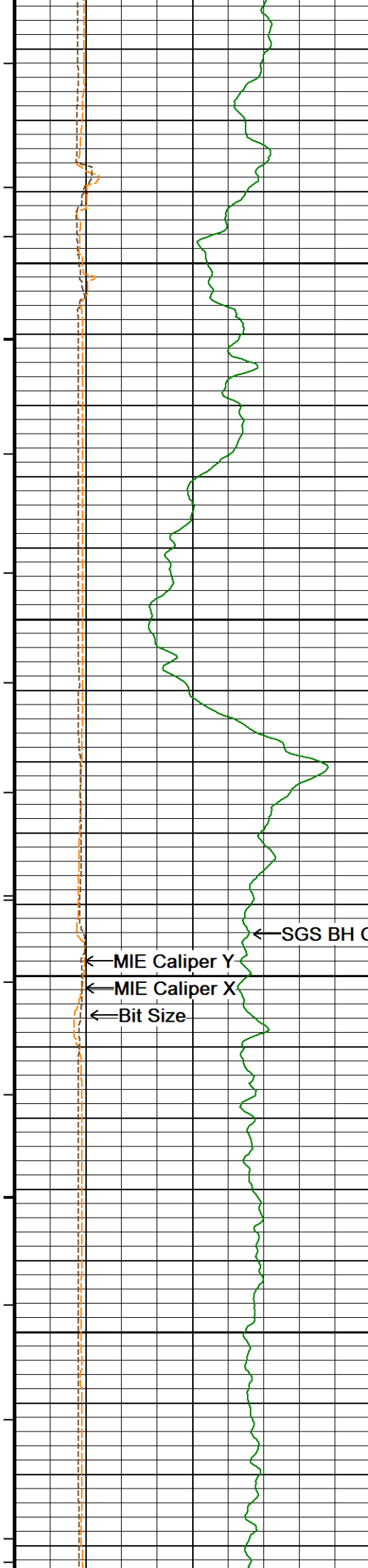
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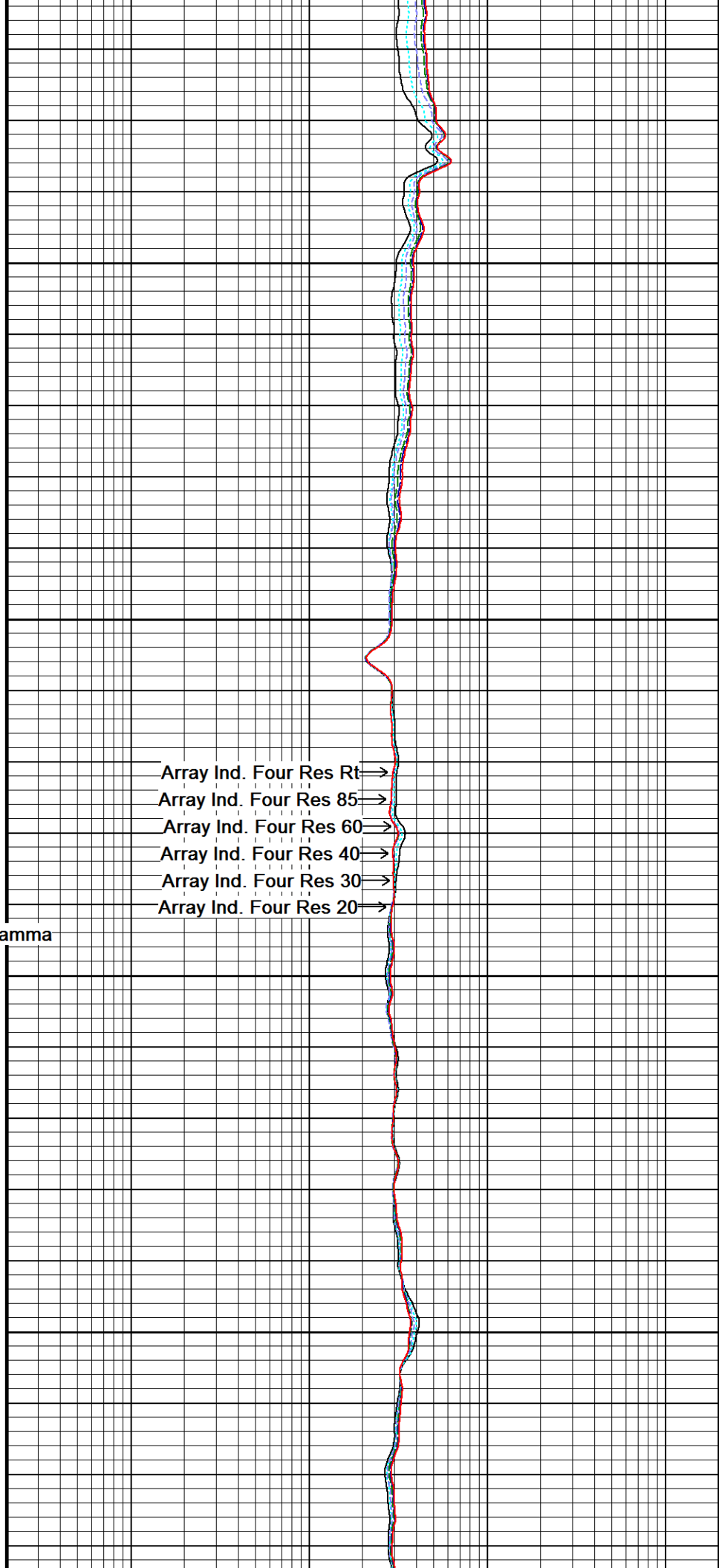
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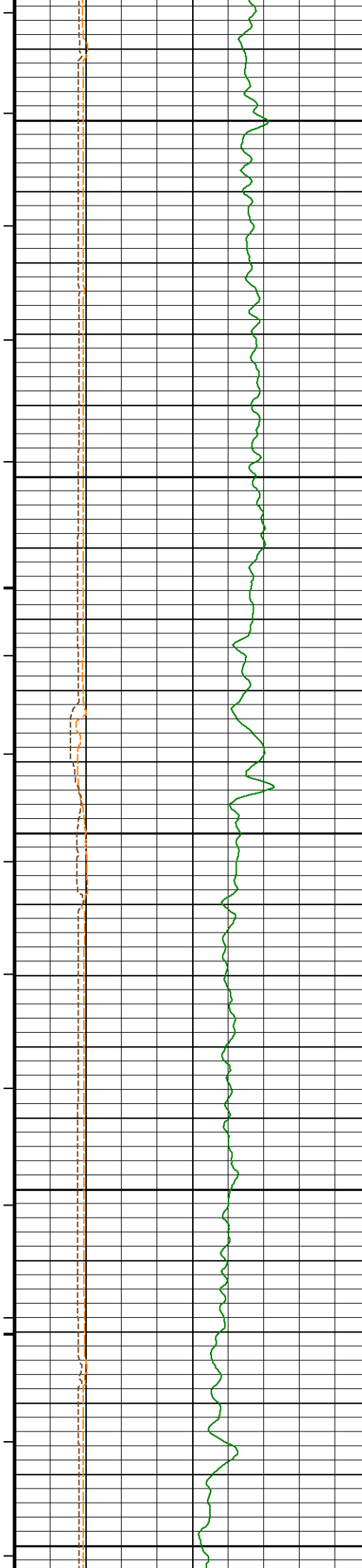
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← MIE Caliper Y
← MIE Caliper X
← Bit Size
← SGS BH Corrected Gamma



Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
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Array Ind. Four Res 30 →
Array Ind. Four Res 20 →



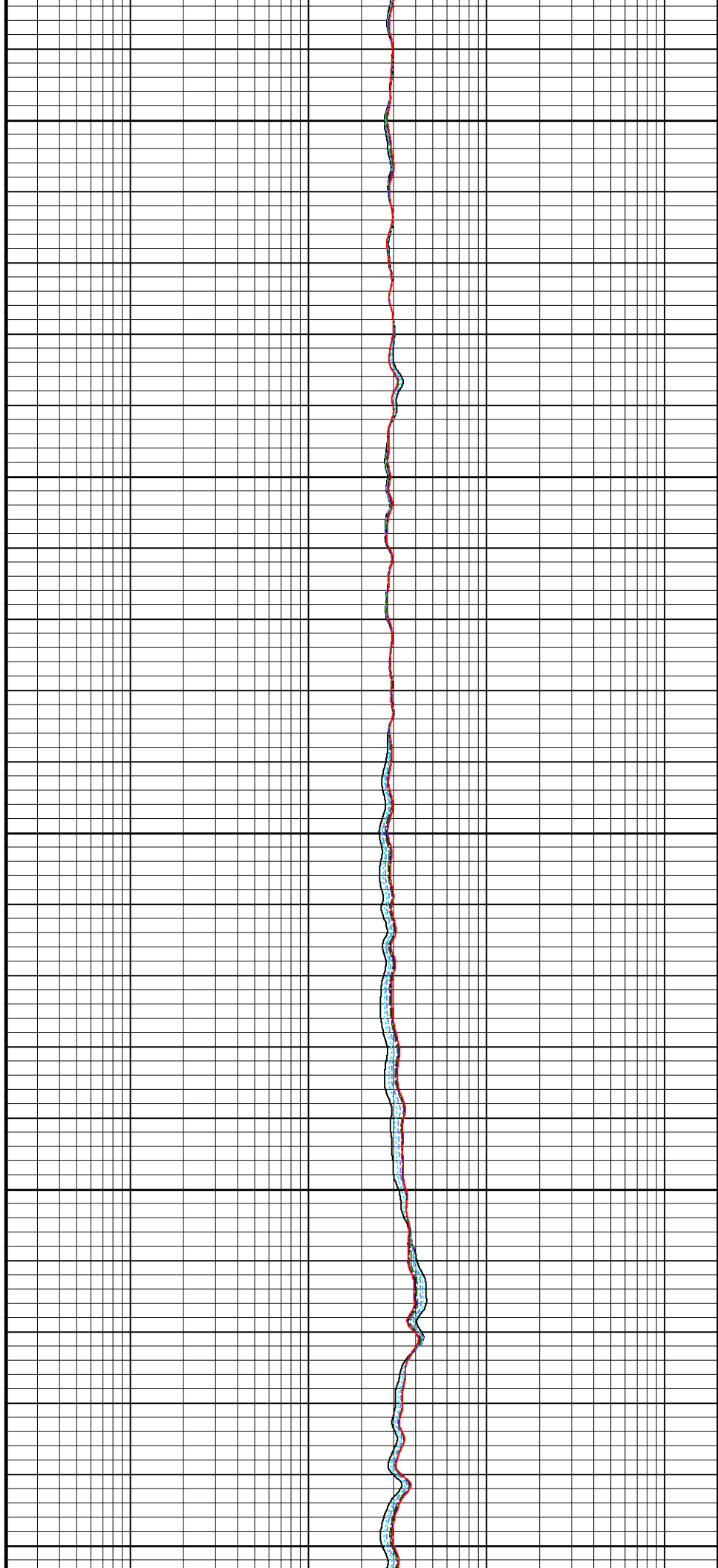
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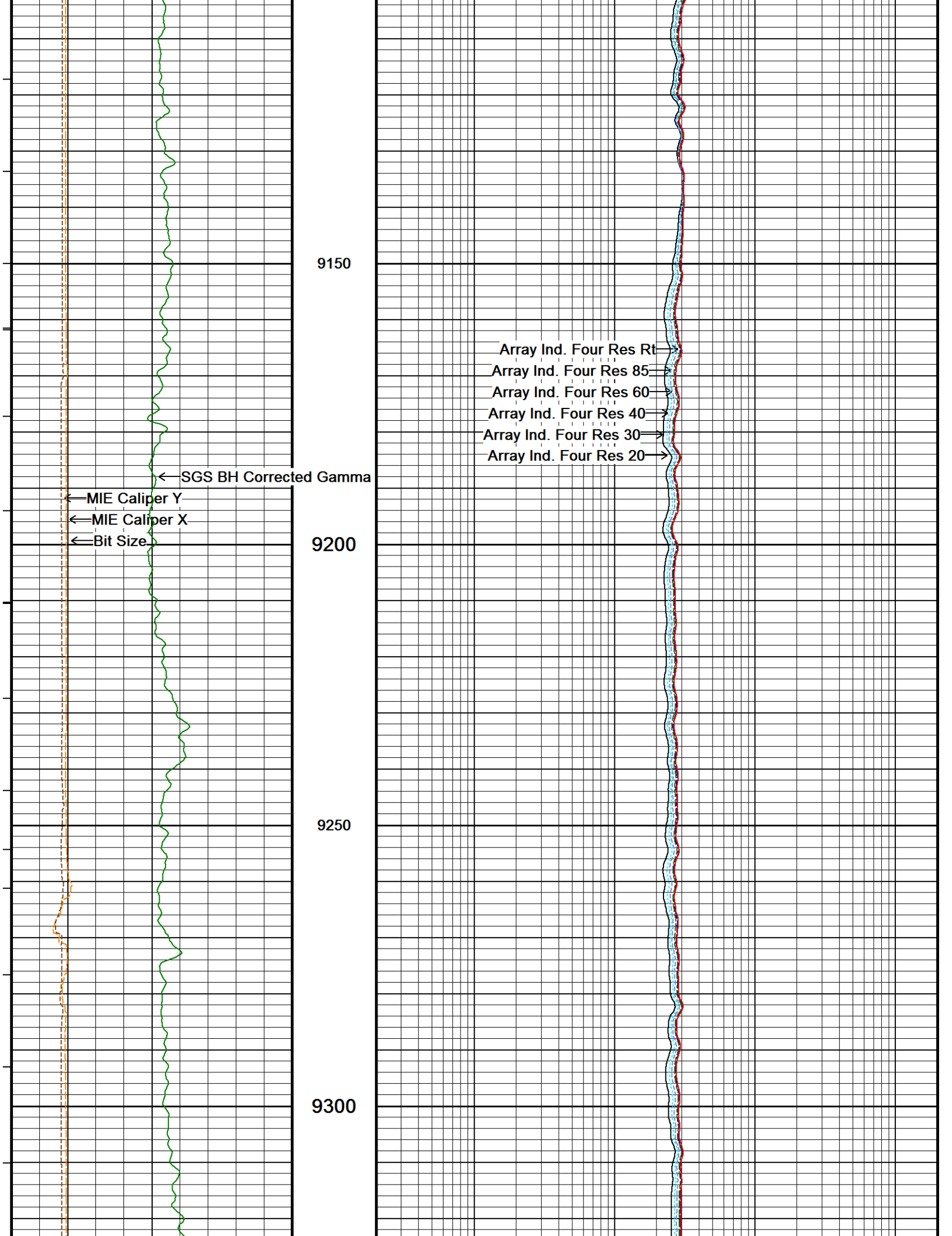
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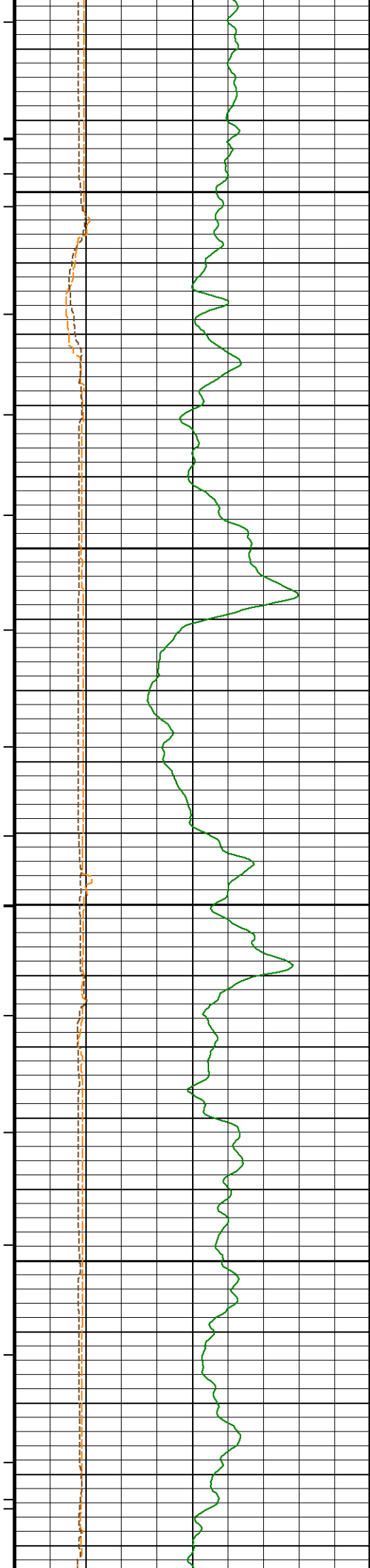
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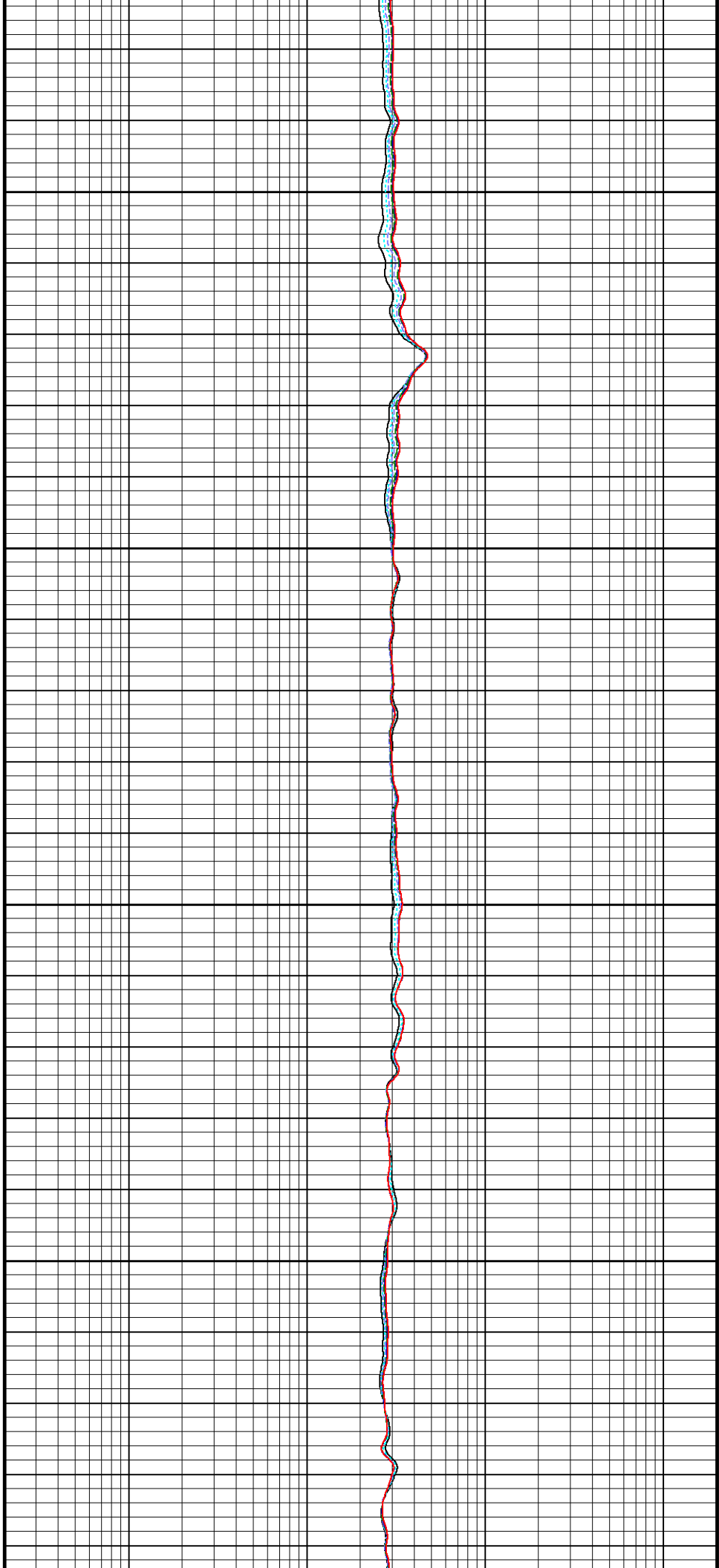


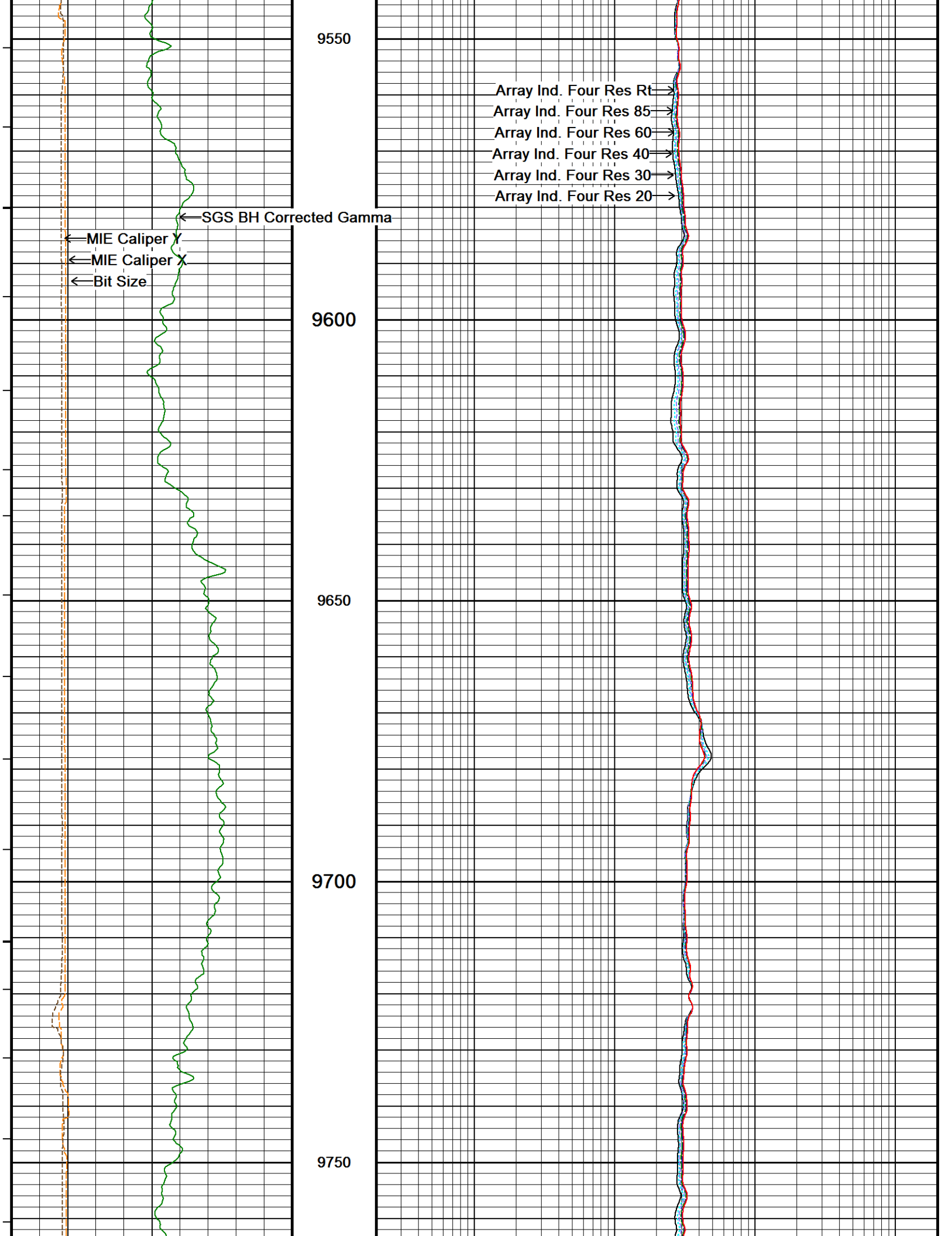
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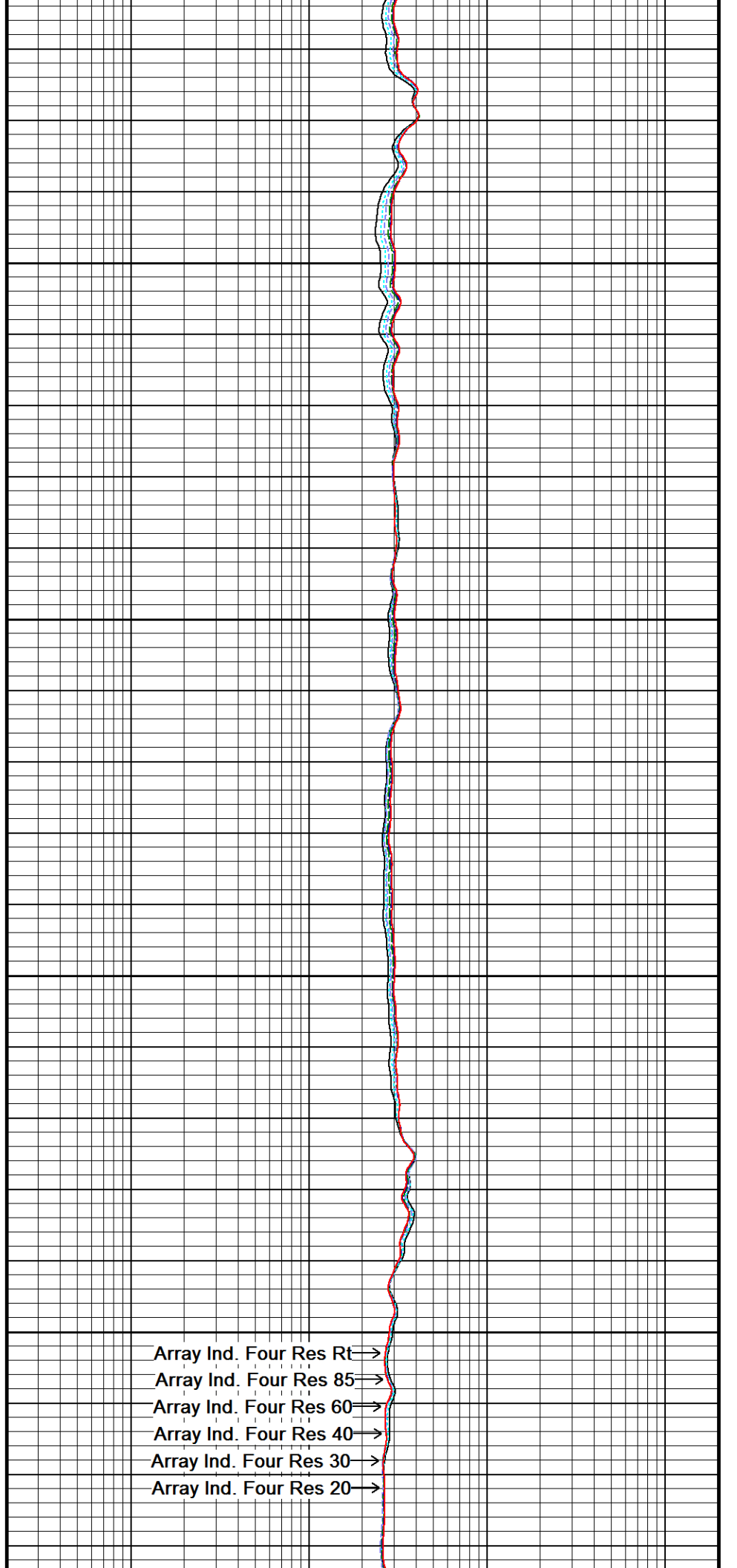
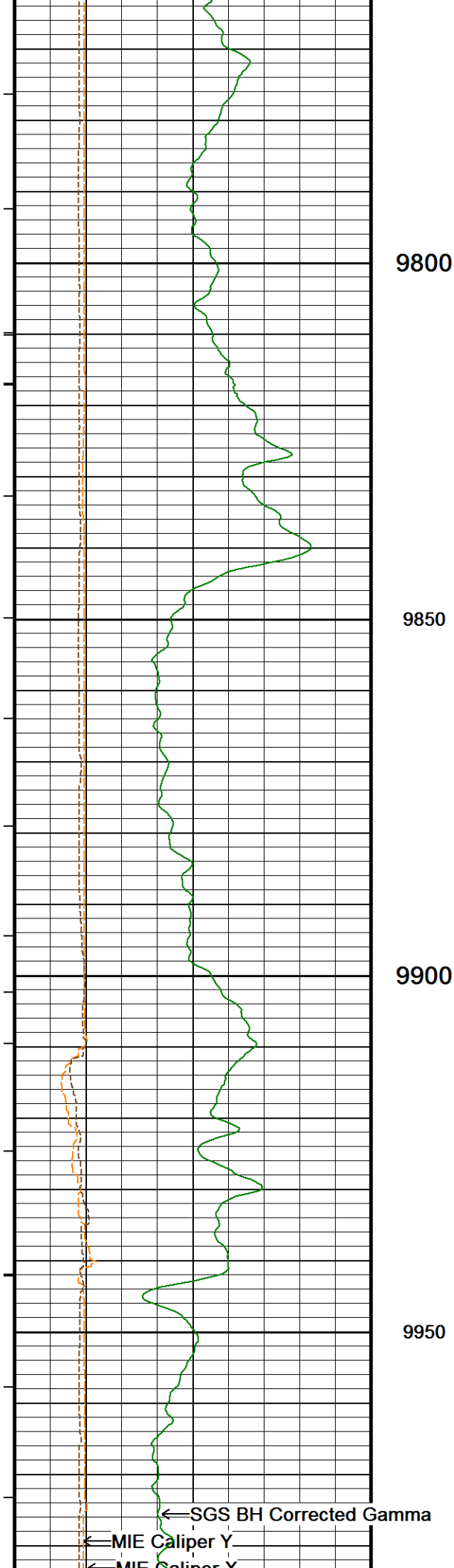
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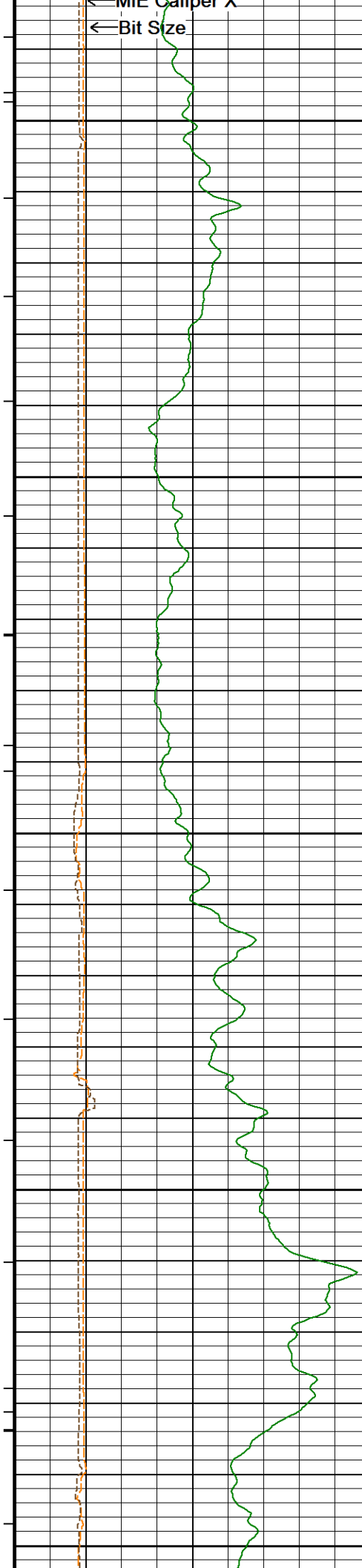
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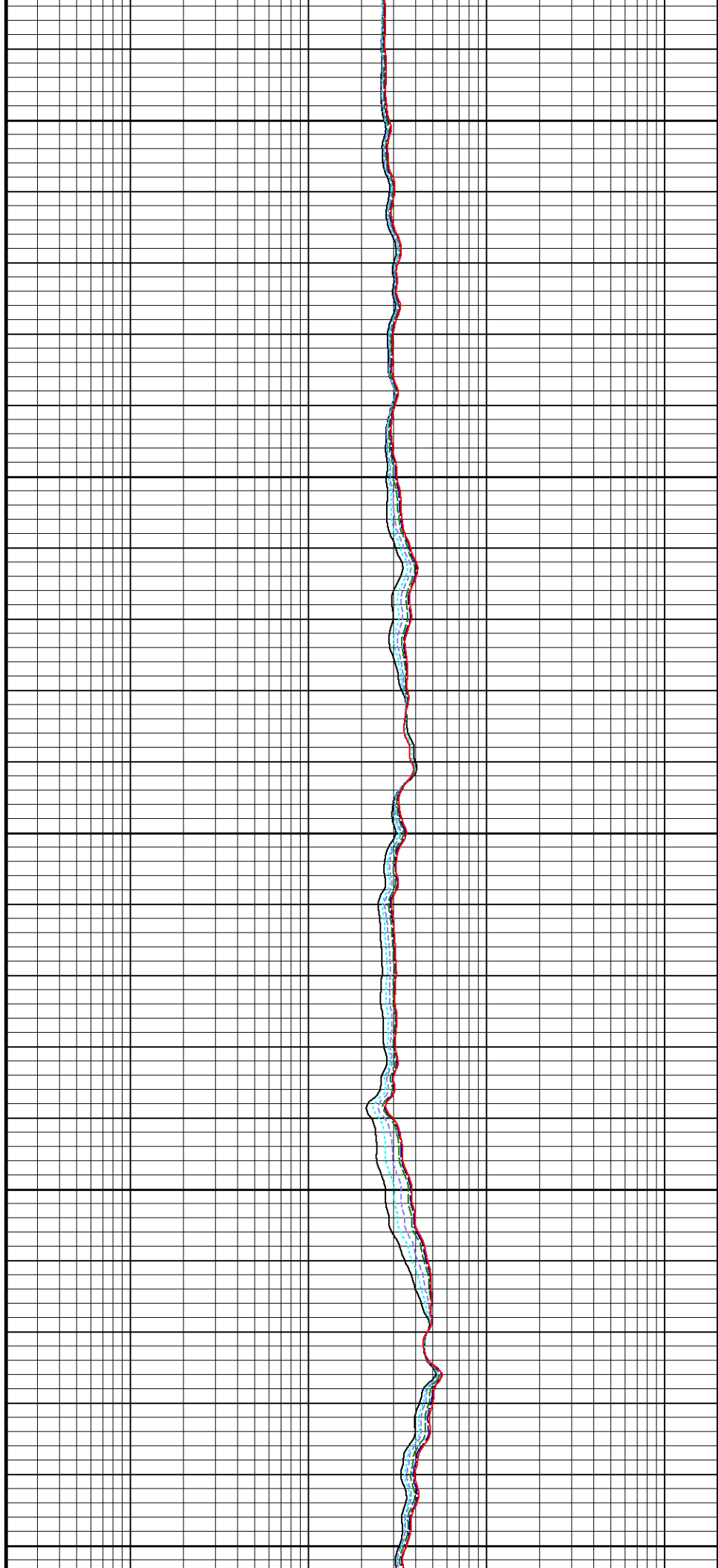
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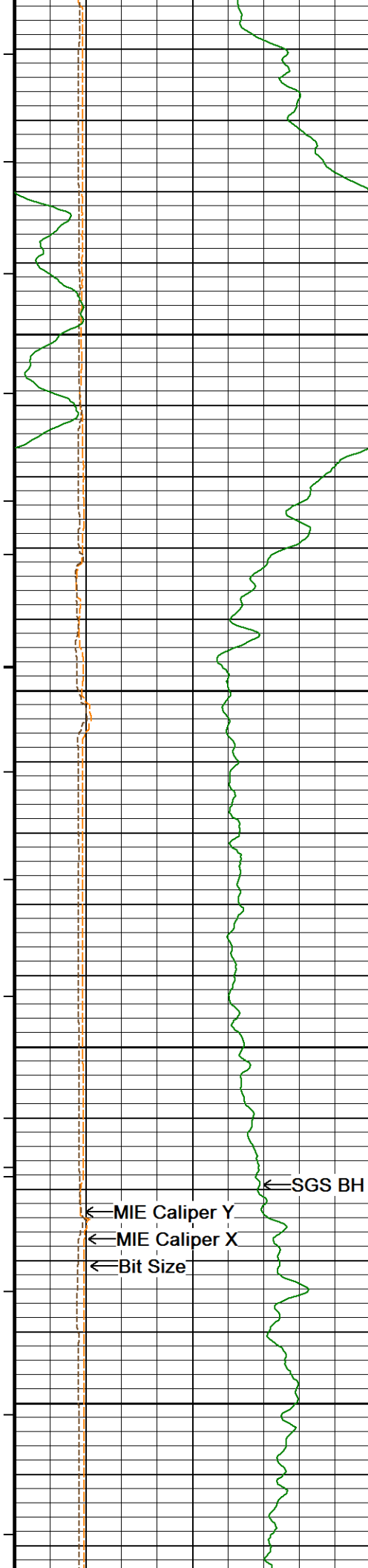
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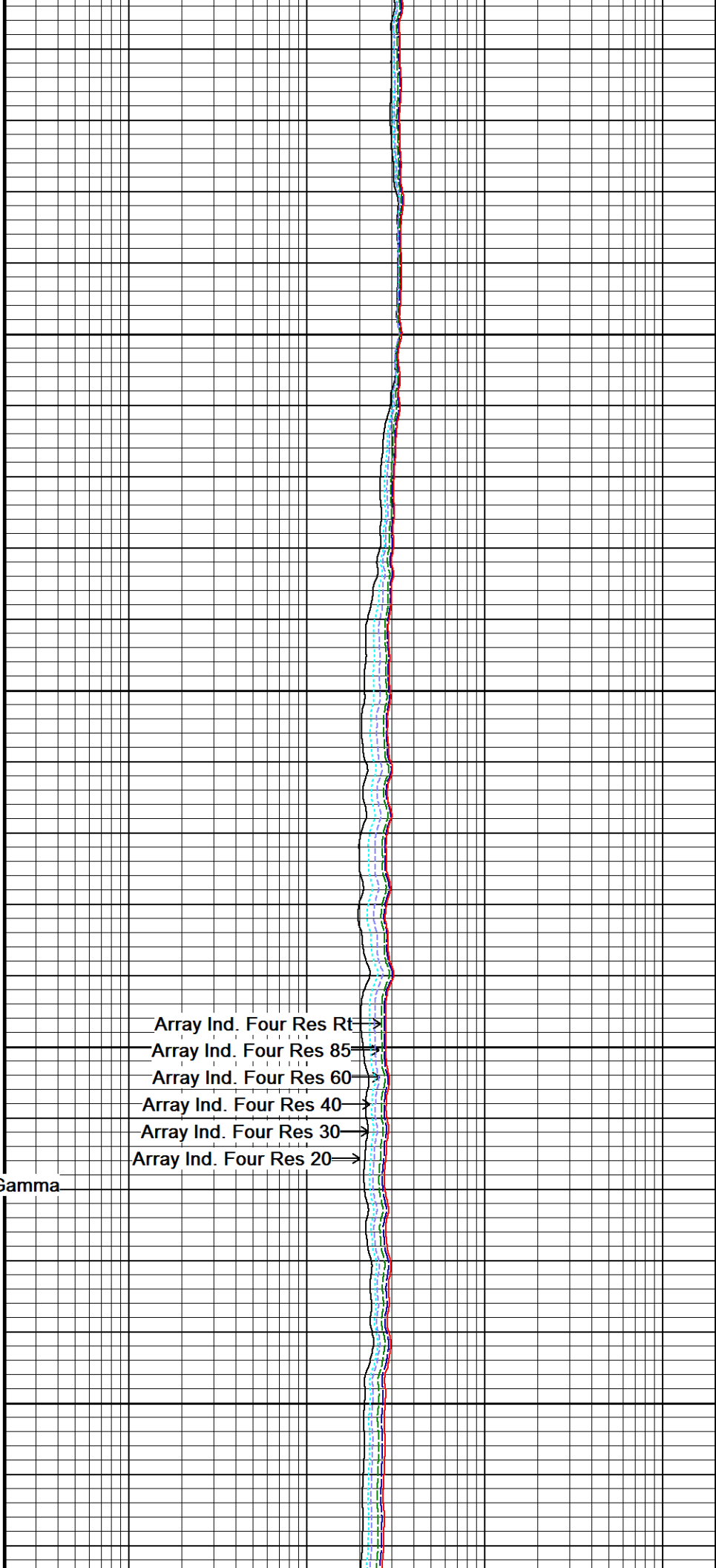
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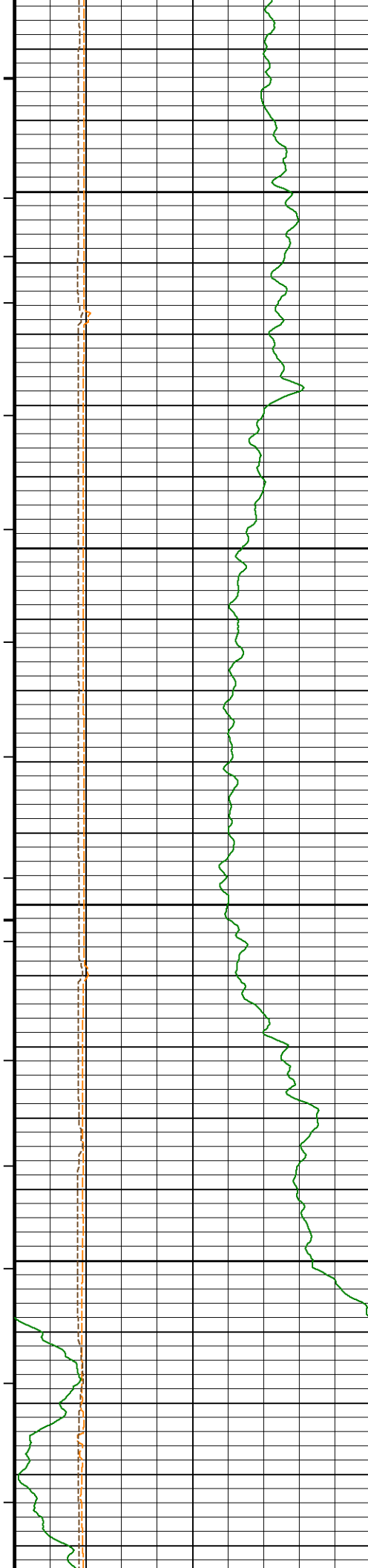
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← MIE Caliper Y
← MIE Caliper X
← Bit Size

← SGS BH Corrected Gamma

Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
Array Ind. Four Res 40 →
Array Ind. Four Res 30 →
Array Ind. Four Res 20 →



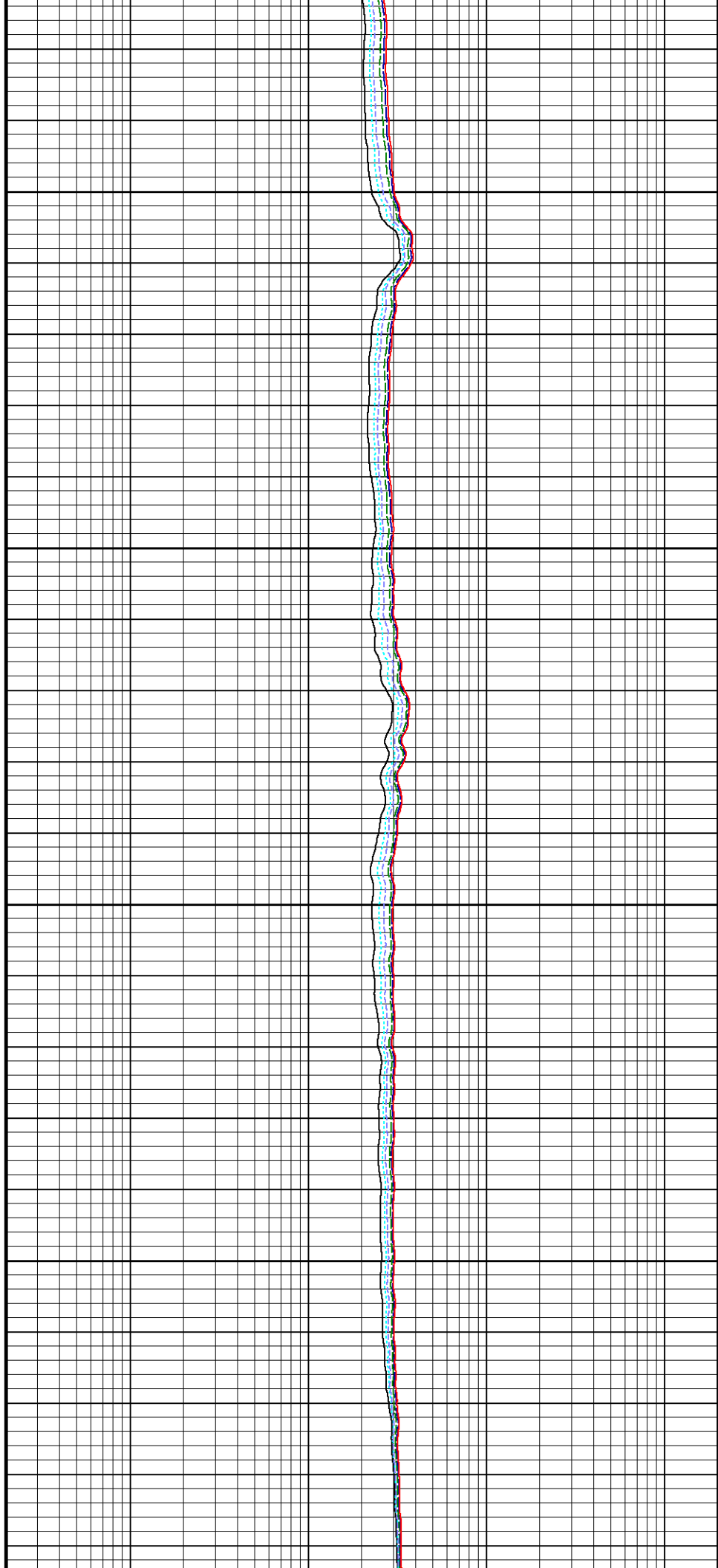


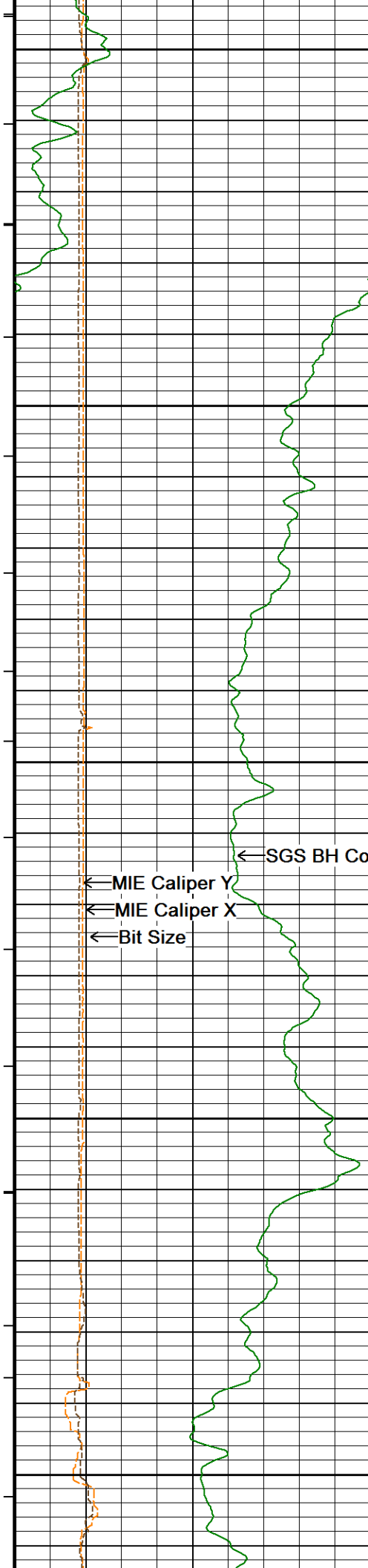
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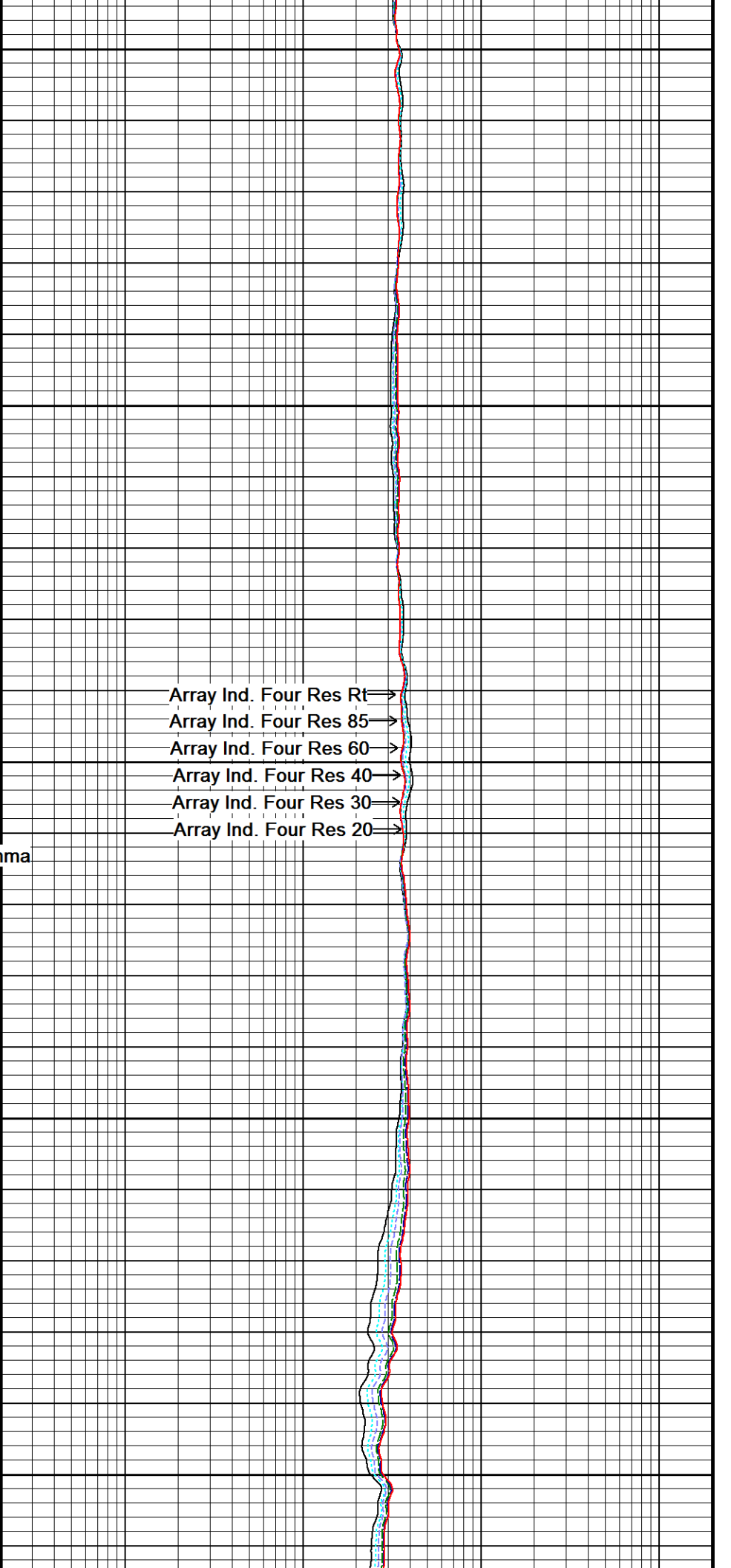
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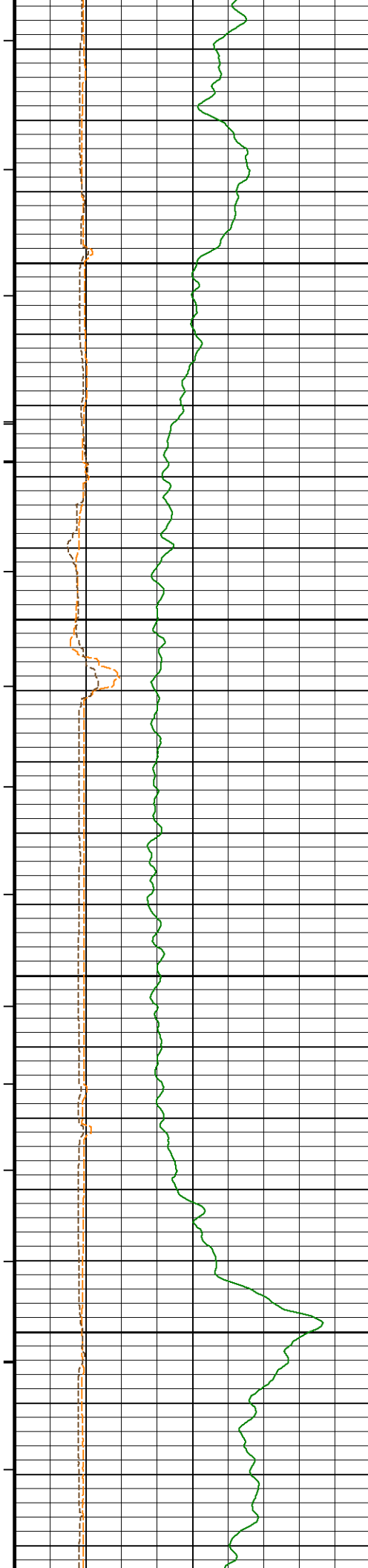
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Array Ind. Four Res Rt
Array Ind. Four Res 85
Array Ind. Four Res 60
Array Ind. Four Res 40
Array Ind. Four Res 30
Array Ind. Four Res 20

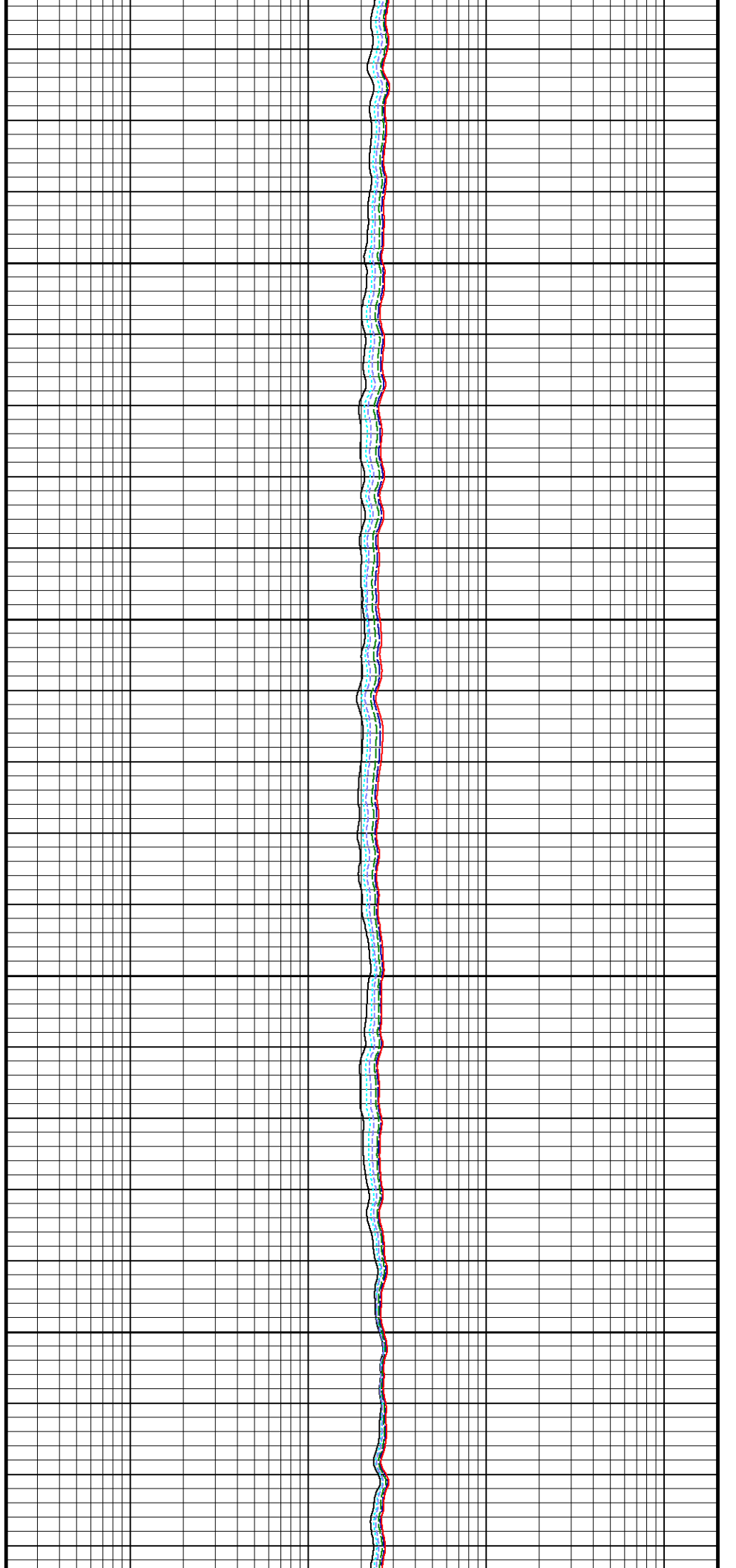


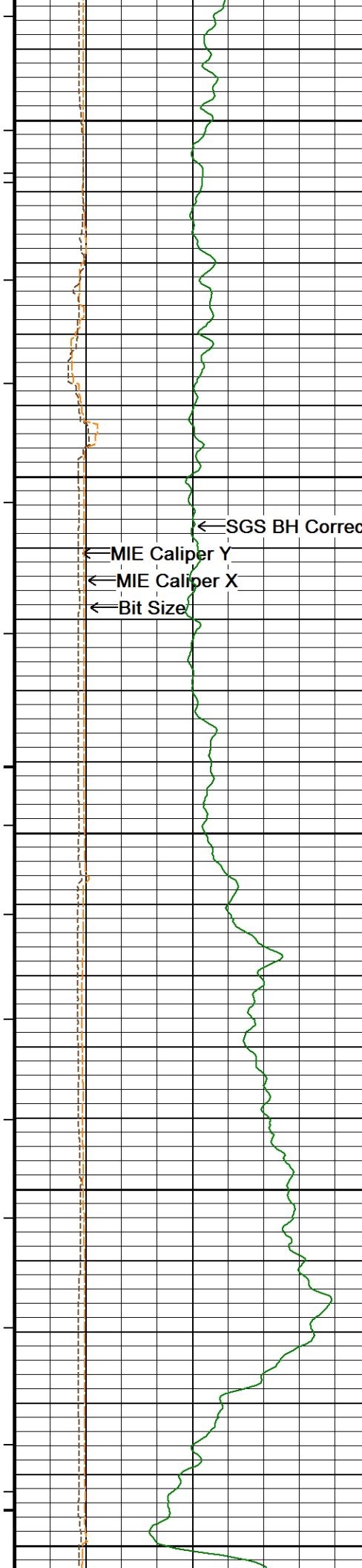
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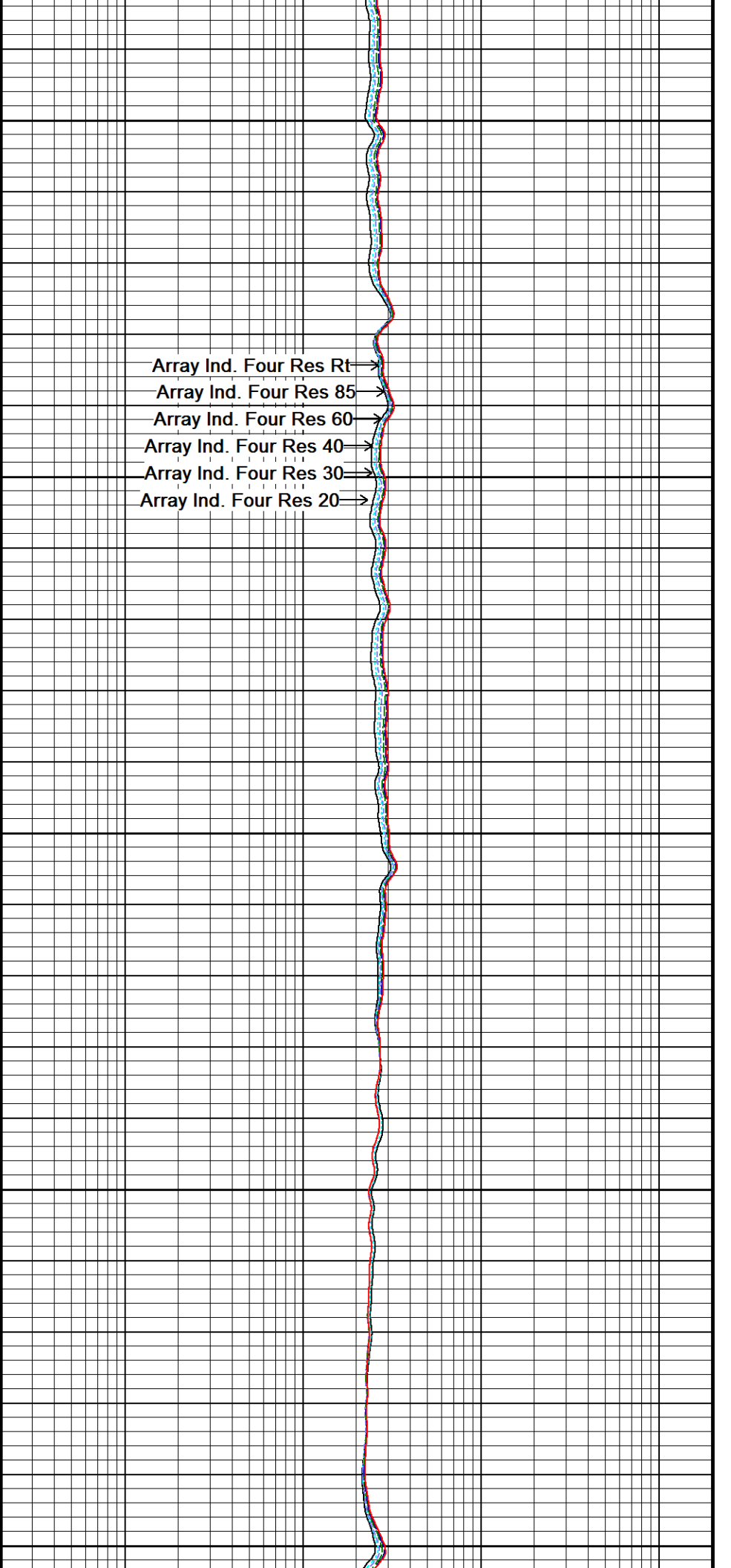
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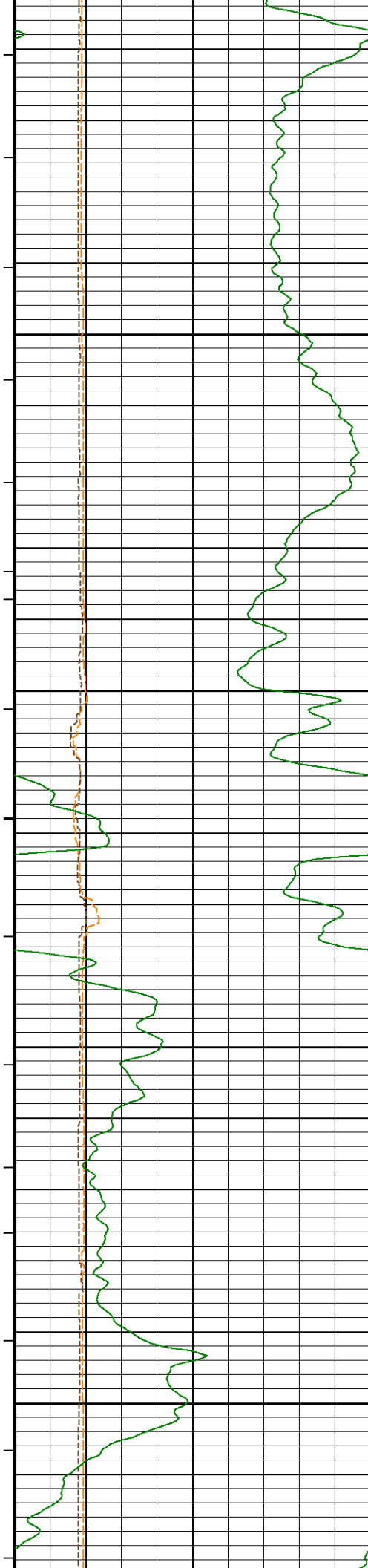
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11300

← SGS BH Corrected Gamma
← MIE Caliper Y
← MIE Caliper X
← Bit Size



Array Ind. Four Res Rt
Array Ind. Four Res 85
Array Ind. Four Res 60
Array Ind. Four Res 40
Array Ind. Four Res 30
Array Ind. Four Res 20



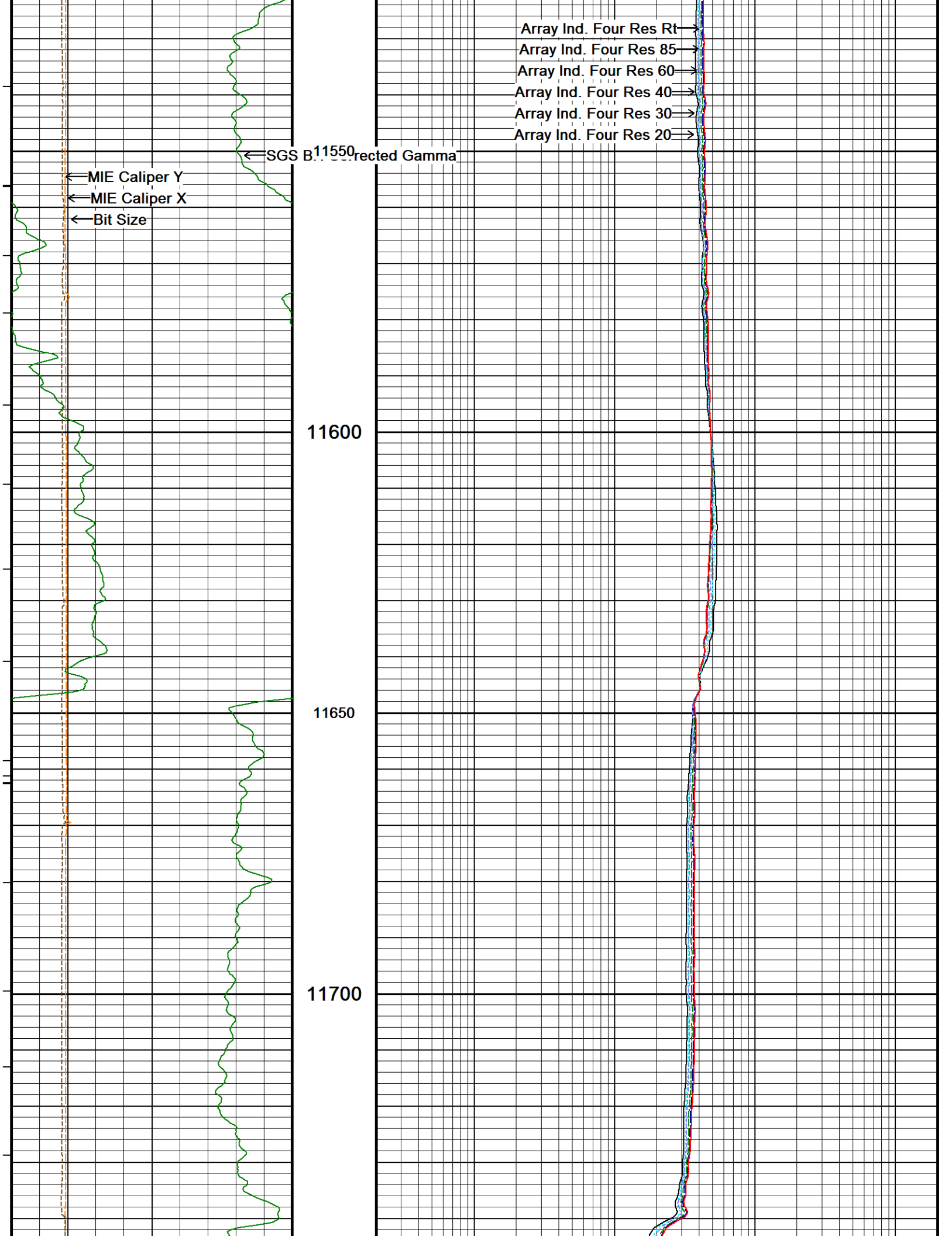
11350

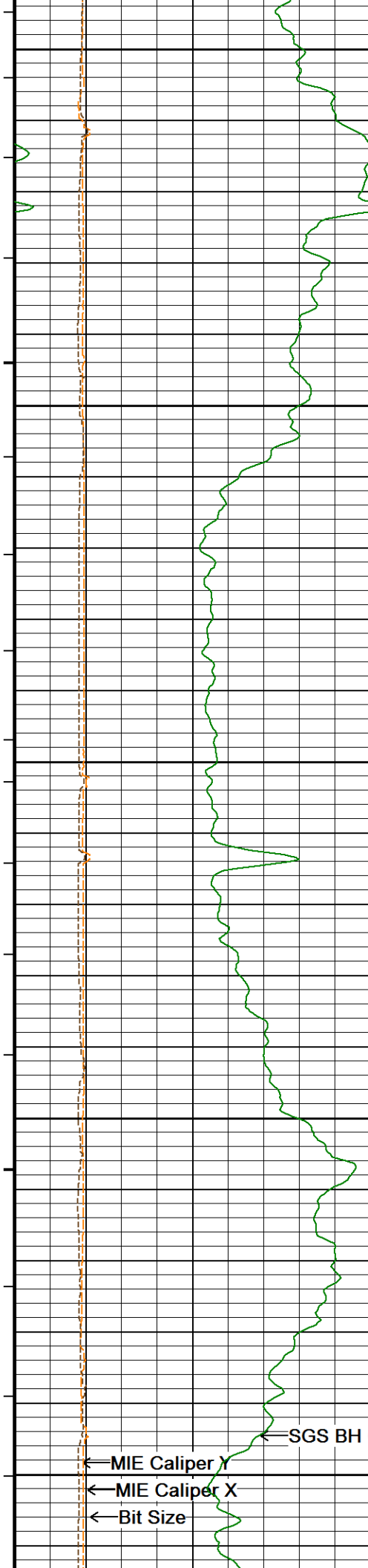
11400

11450

11500







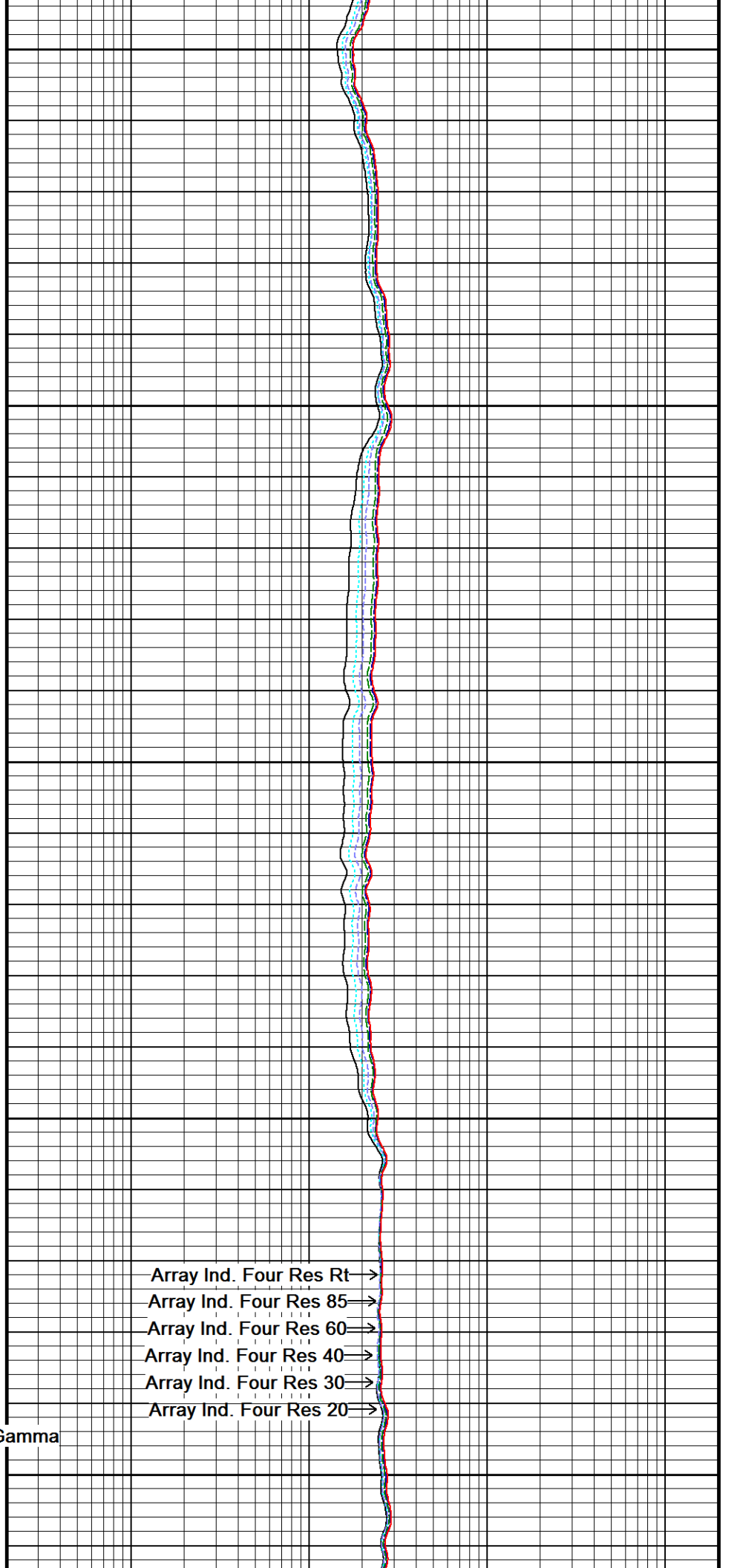
11750

11800

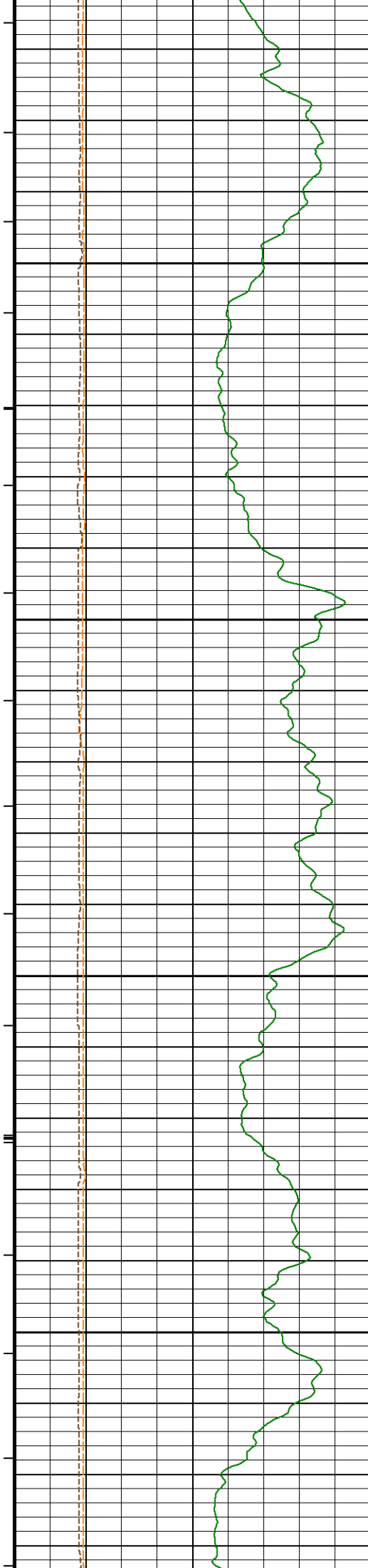
11850

11900

11950



Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
Array Ind. Four Res 40 →
Array Ind. Four Res 30 →
Array Ind. Four Res 20 →

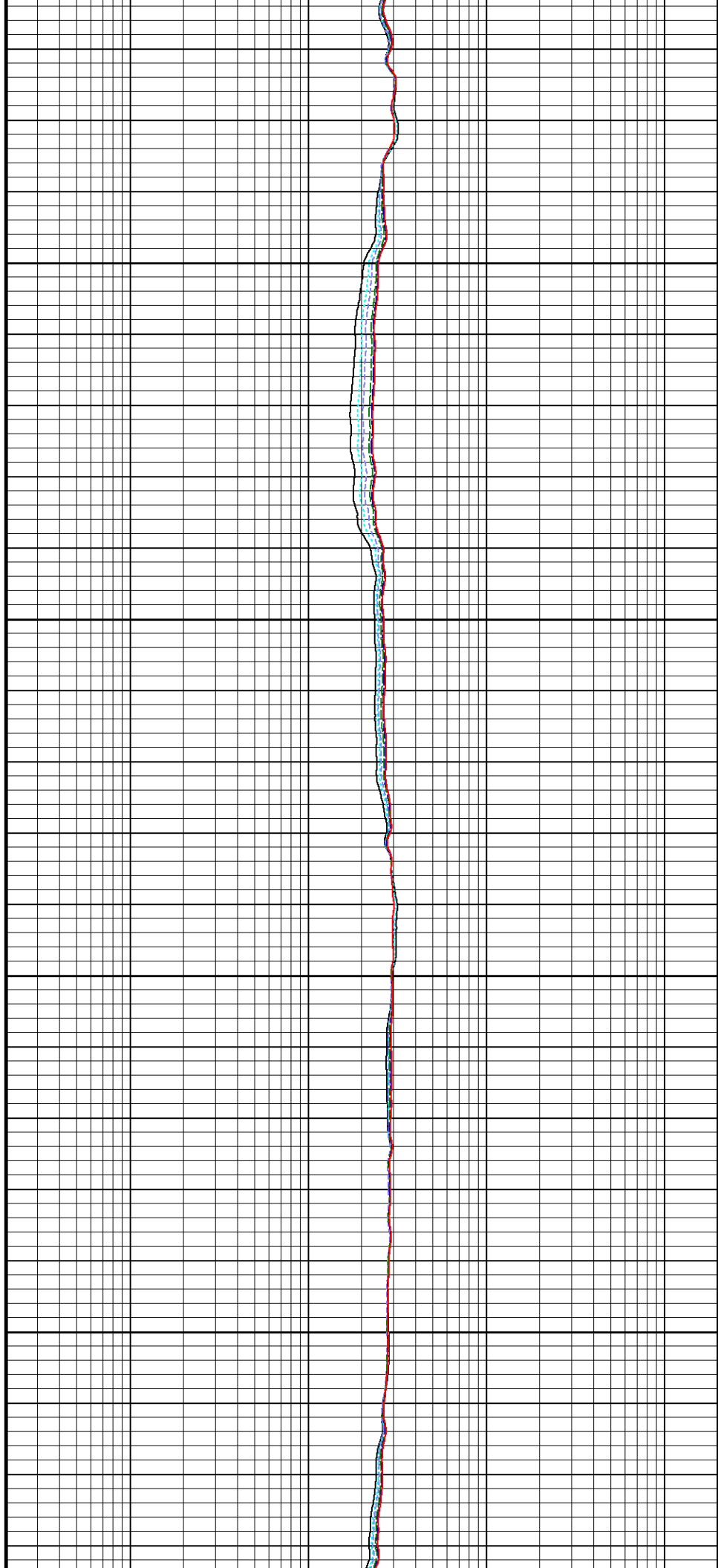


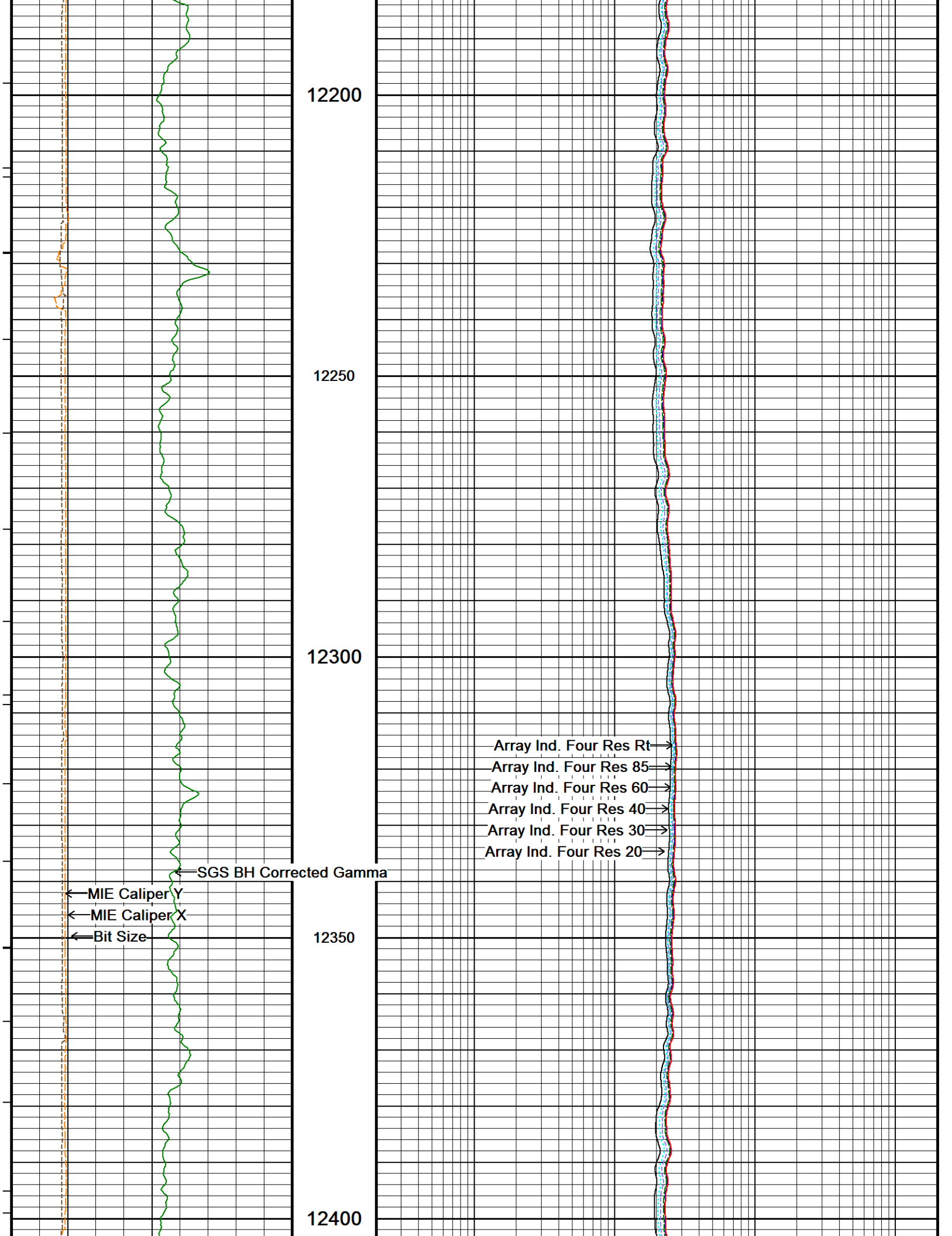
12000

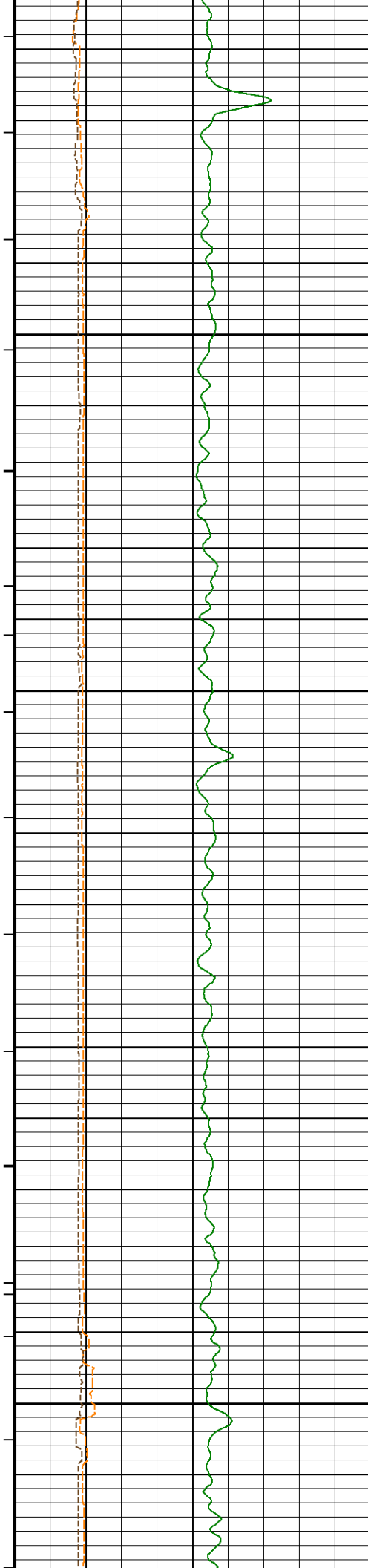
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12100

12150





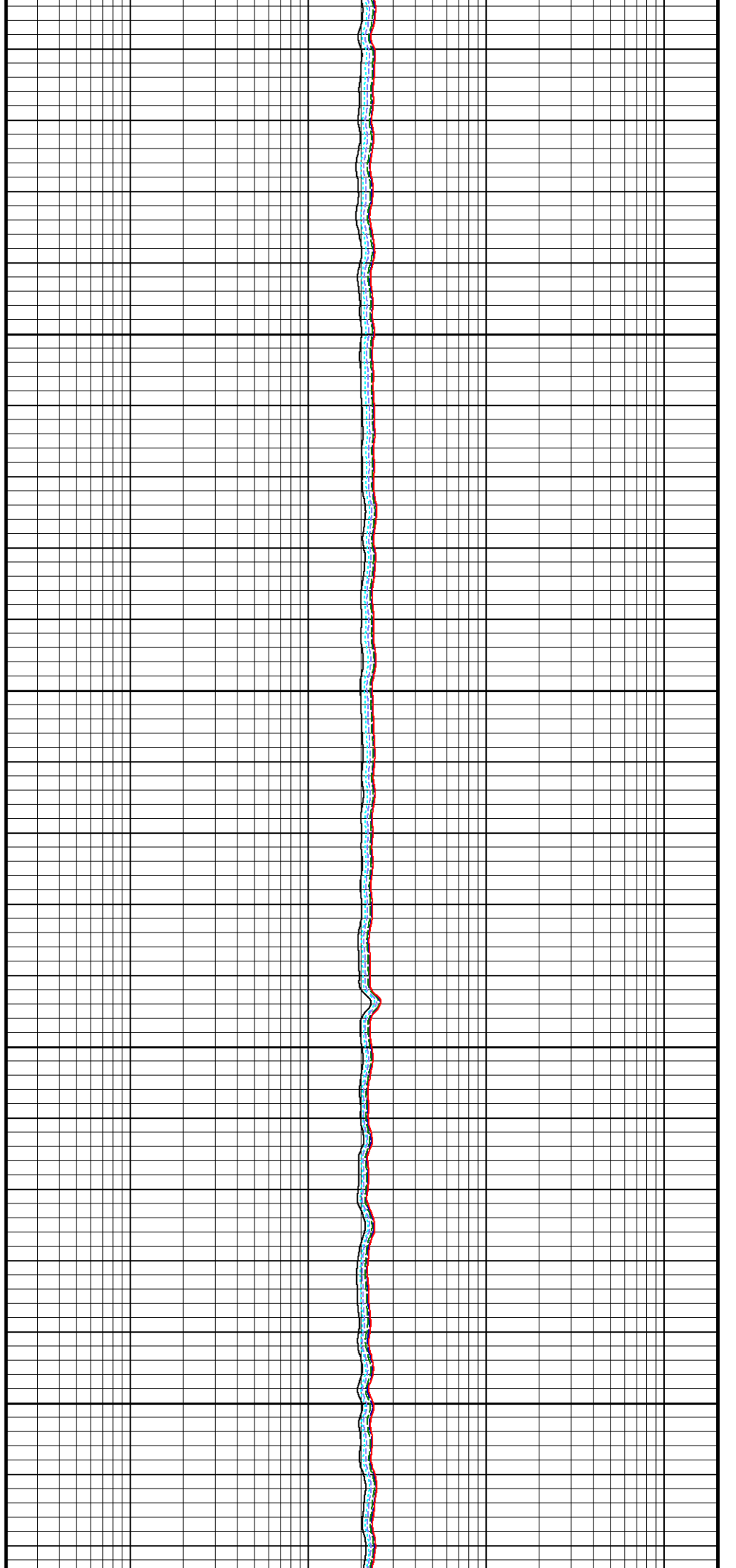


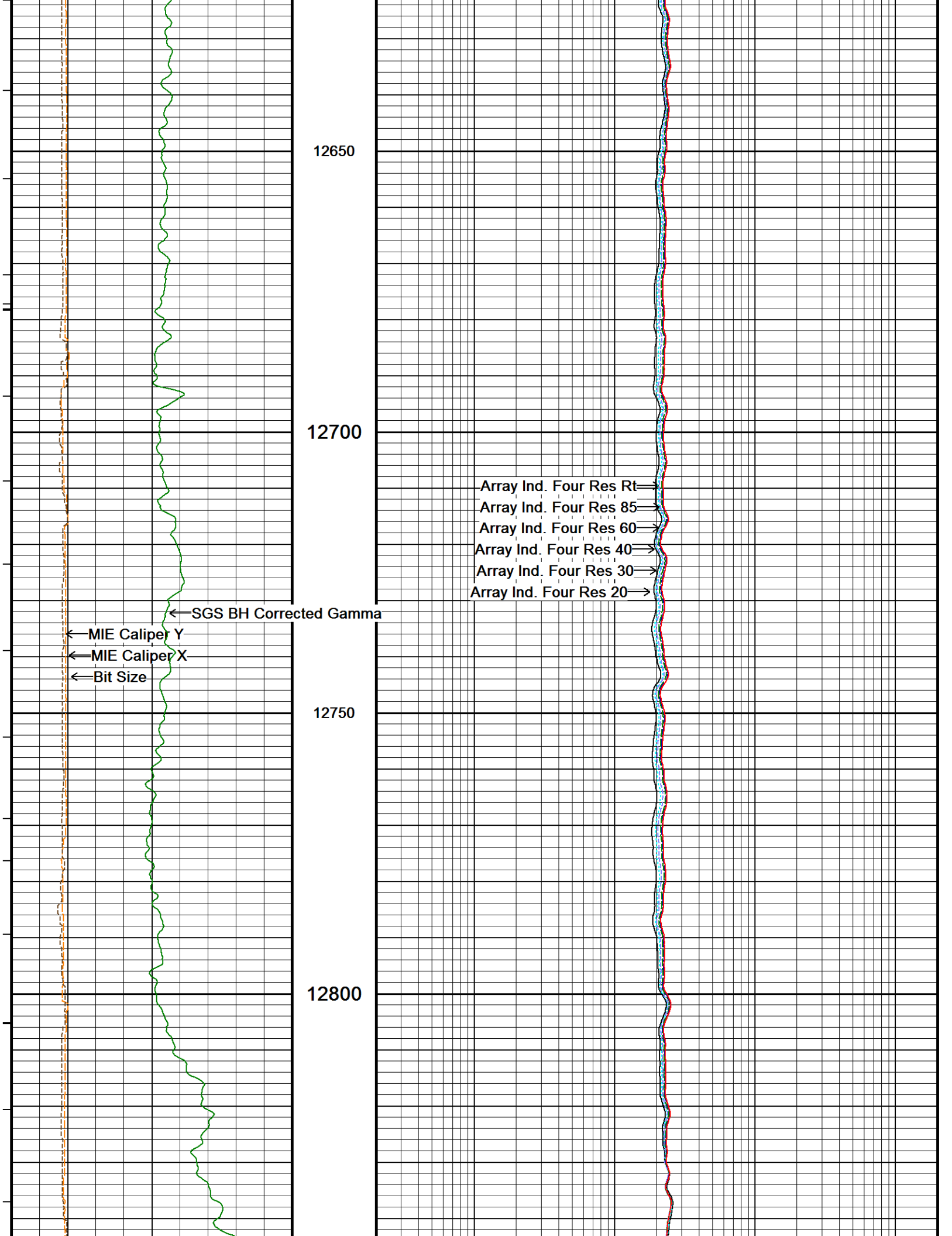
12450

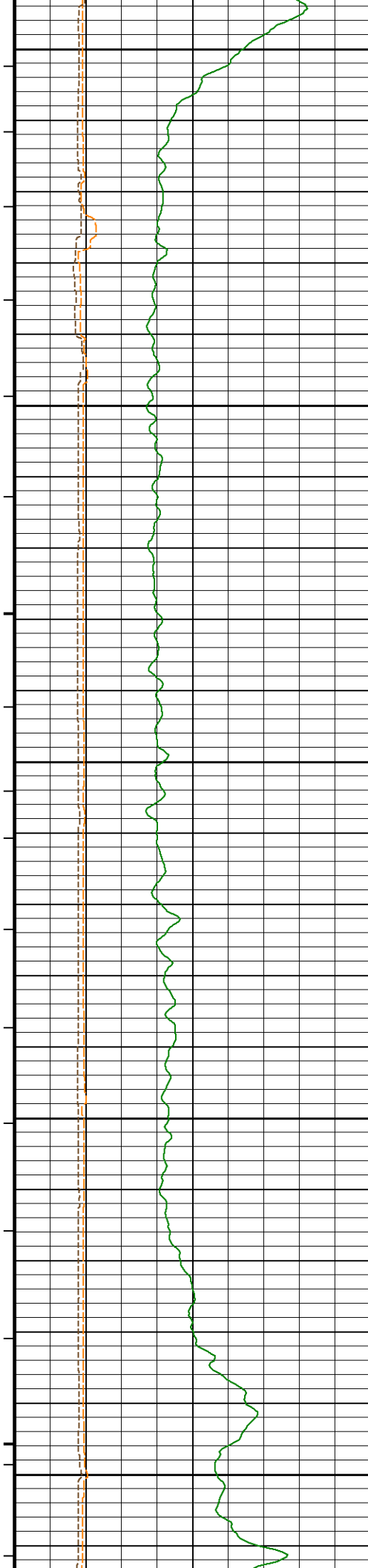
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12550

12600







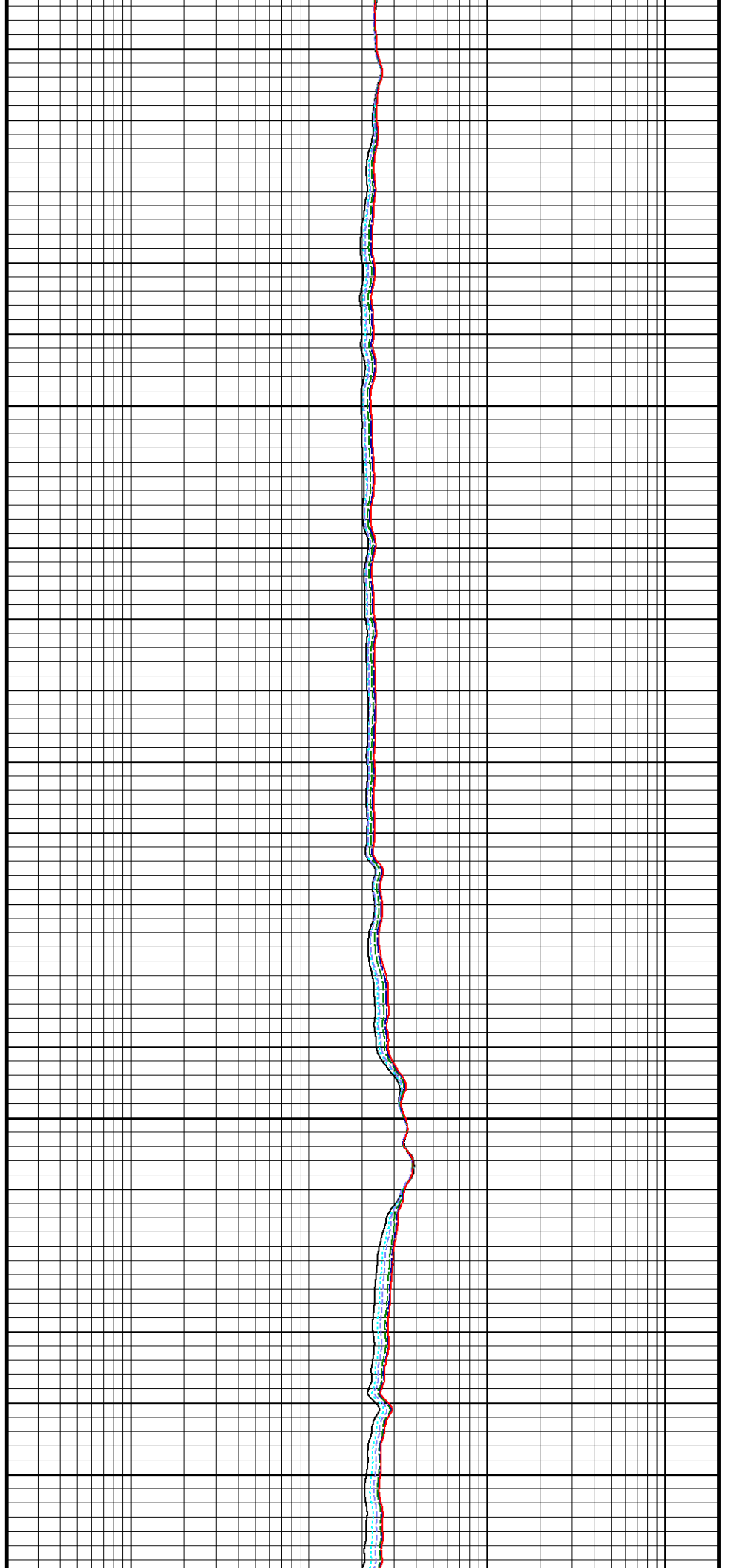
12850

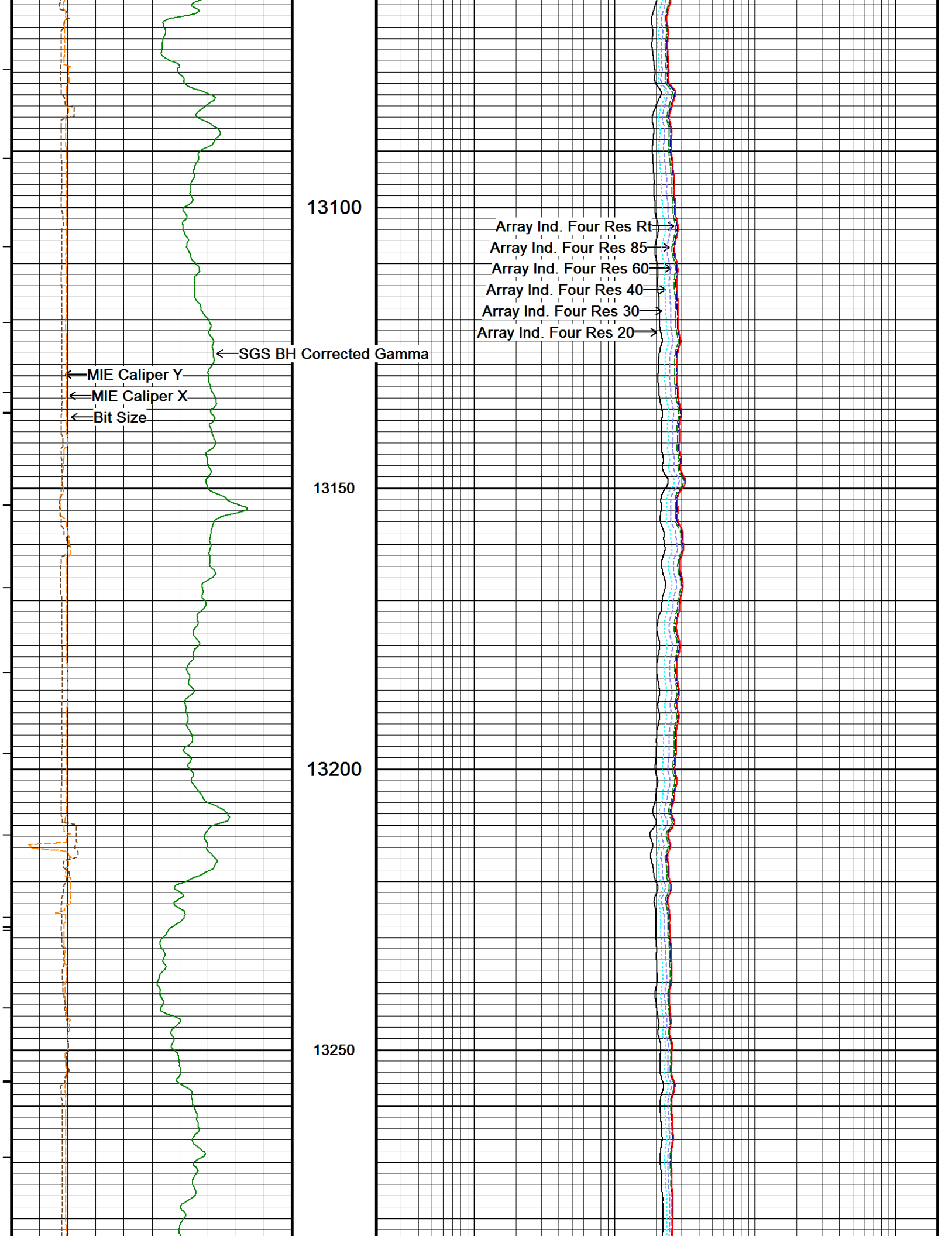
12900

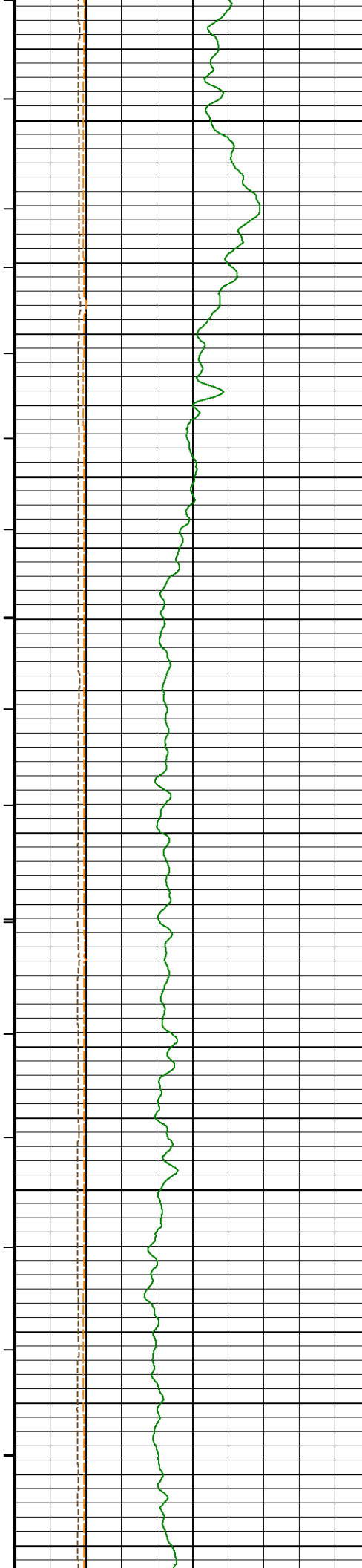
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13000

13050







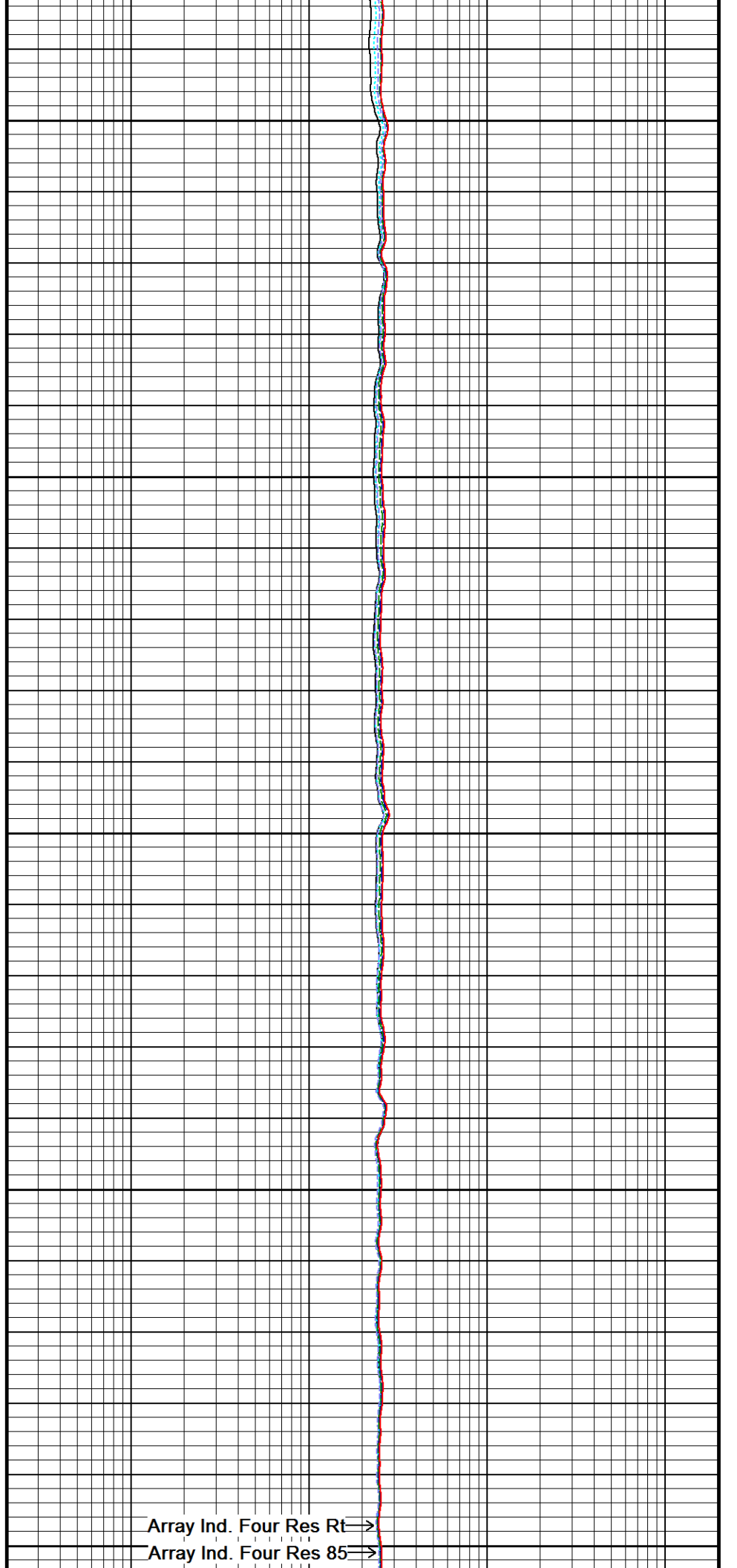
13300

13350

13400

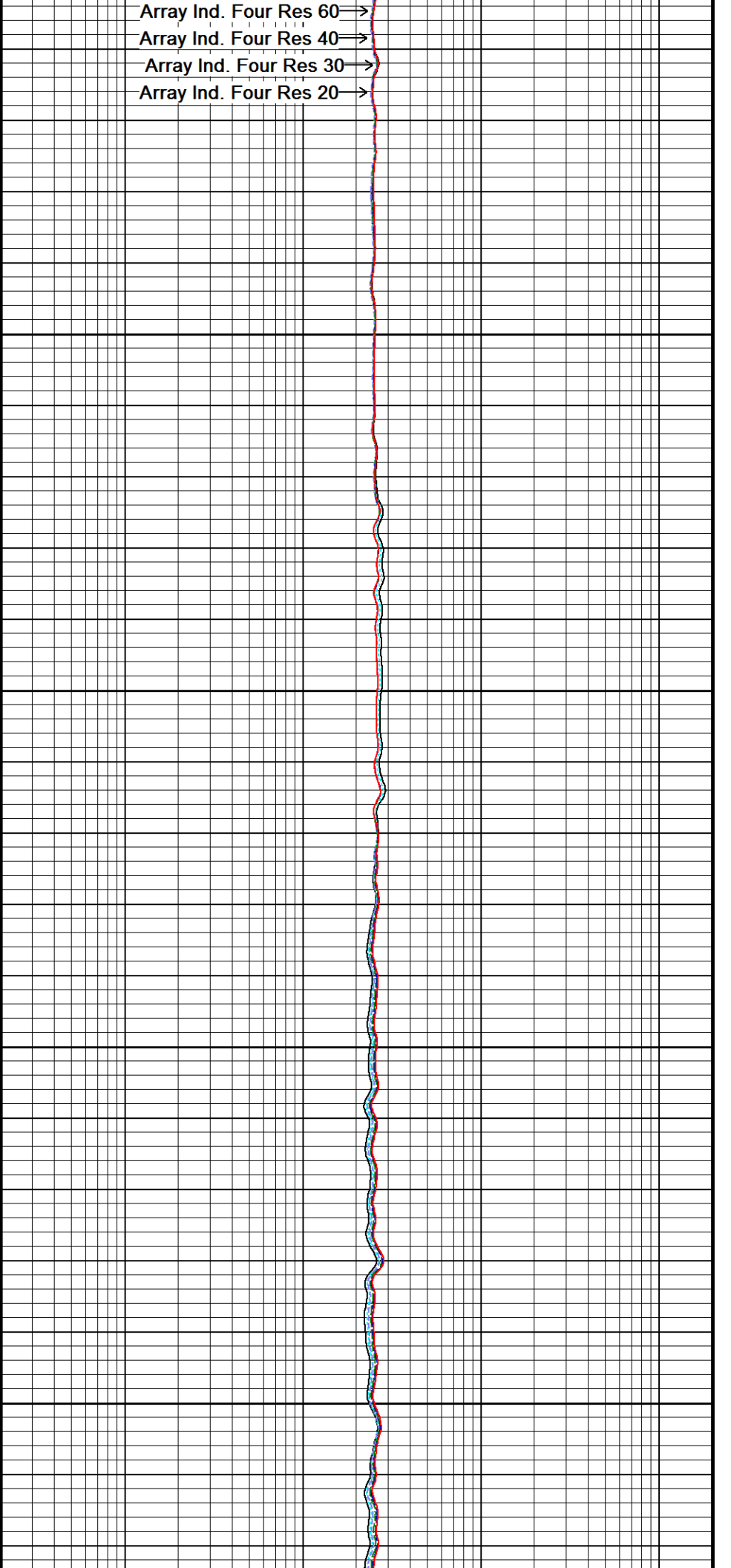
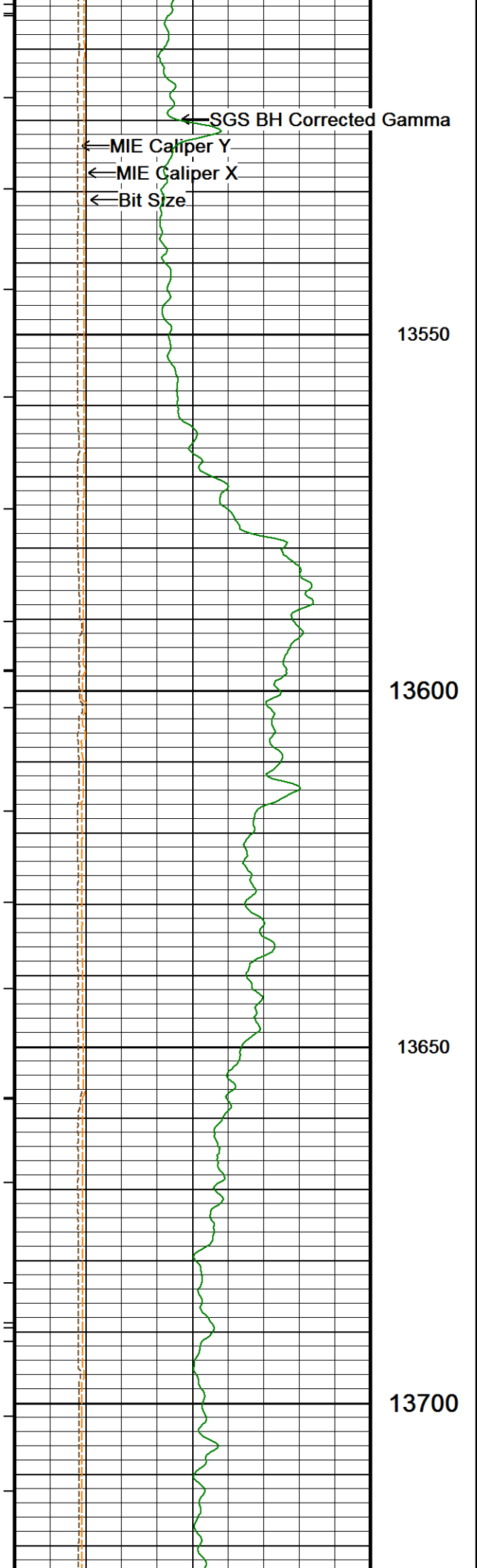
13450

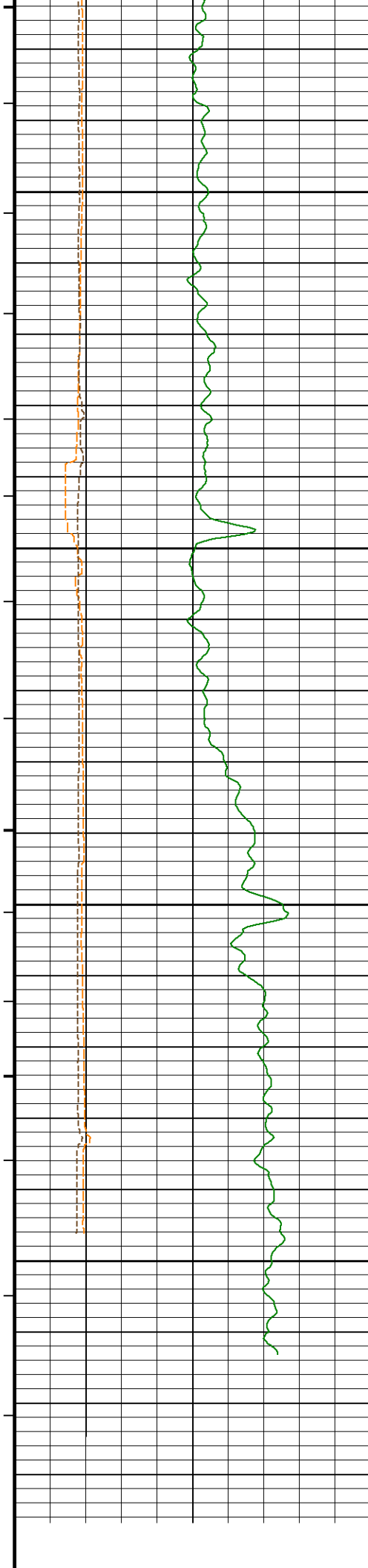
13500



Array Ind. Four Res Rt→

Array Ind. Four Res 85→





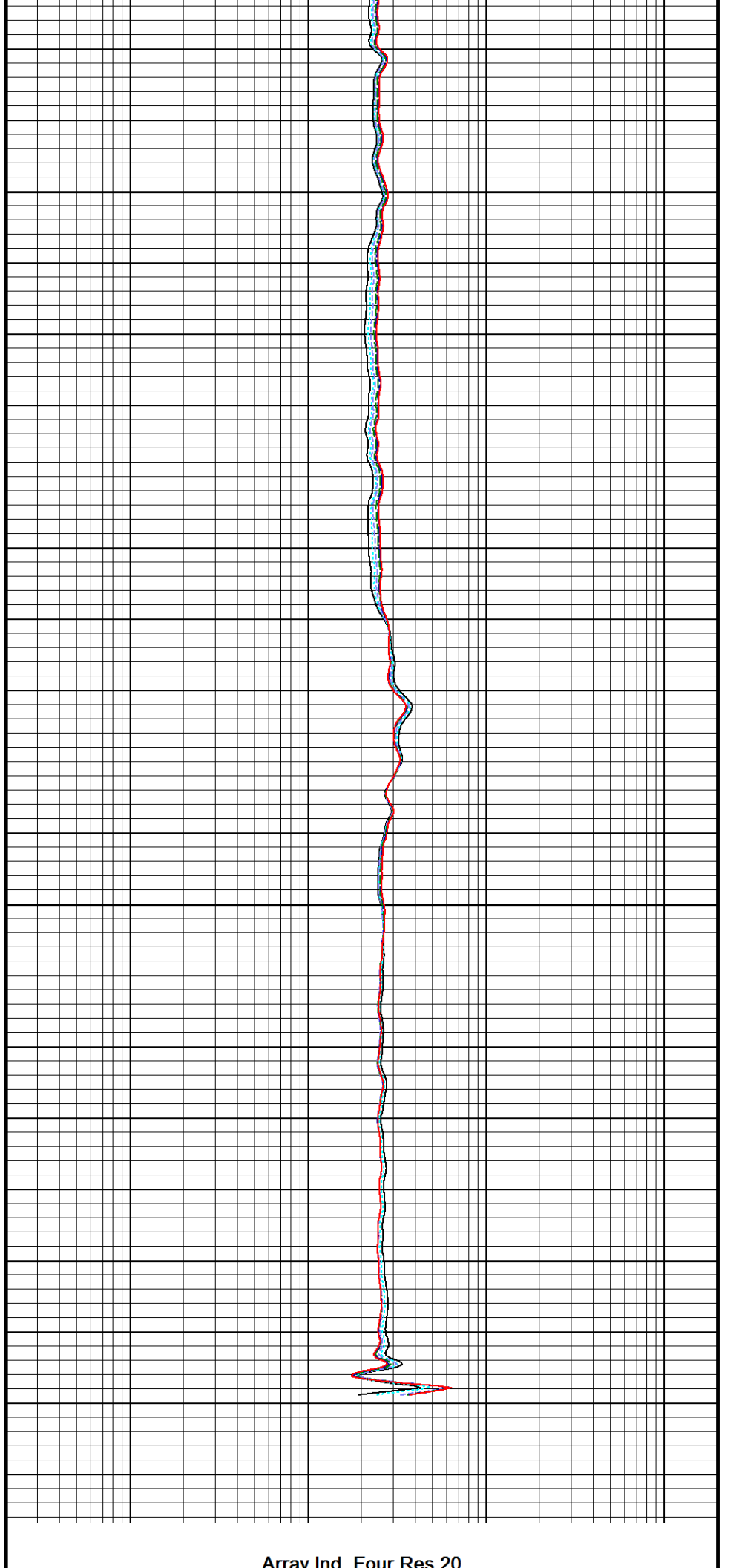
13750

13800

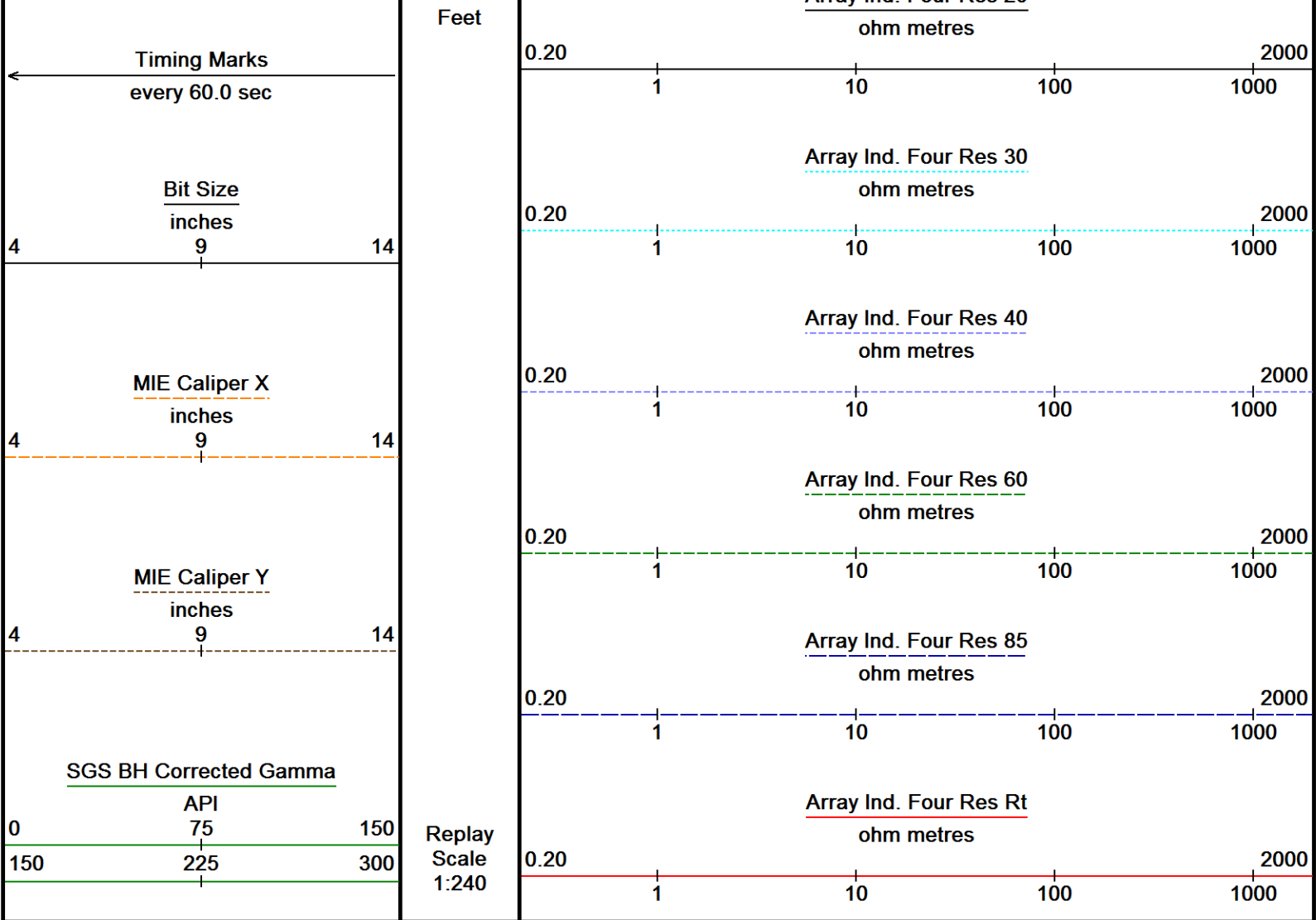
13850

13900

Depth in



Array Ind Four Res 20



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: D:\Logs\Whiting\Horsetail 33M-2804\MMS Depth.dta
System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220

Plotted on 26-JUL-2014 23:26
Recorded on 26-JUL-2014 21:53

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION

D:\Logs\Whiting\Horsetail 33M-2804\MMS Depth.dta

Down-hole Tension Calibration All 000			Field Calibration on 24-OCT-2010 03:34
Reading No	Measured		
1	15659.85	0.00	
2	15734.68	370.00	

General Constants All 000

Last Edited on 26-JUL-2014,22:31

General Parameters		
Mud Resistivity	1.860	ohm-metres
Mud Resistivity Temperature	123.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	XY Caliper	
HVOL Caliper 1	MIE Diam. X Armswing	
HVOL Caliper 2	MIE Diam. Y Armswing	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	MIE Diam. X Armswing	
Rwa Parameters		
Porosity used	Base Density Porosity	

Resistivity used		Array Ind. Four Res Rt		0.610					
RWA Constant A				2.150					
RWA Constant M				0.000					
SW/APOR Tool Source				0.000					
Down-hole Tension Calibration SMS 0									
Reading No		Measured		Calibrated (lbs)		Field Calibration on 03-MAR-2014 17:38			
1		15344.12		0.00					
2		16163.79		590.00					
Strain Gauge Constants MMS-F.A 249									
Last Edited on									
Atmospheric Pressure		14.70		psi					
Serial Number		0							
Calibration Date		000000000000							
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		0.000 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		0.000 0.000		0.000 0.000	
Gamma Calibration MGS-D.A 219									
		Measured		Calibrated (API)		Field Calibration on 24-JUL-2014 18:59			
Background		156		95					
Calibrator (Gross)		1027		623					
Calibrator (Net)		871		528					
Gamma Constants MGS-D.A 219									
Last Edited on 24-JUL-2014,18:42									
Gamma Calibrator Number		GRCC 224							
Mud Density		1.21		gm/cc					
Caliper Source for Processing		Density Caliper							
Tool Position		Centred							
Concentration of KCl				kppm					
K Mud Type		Chloride							
K Mud Concentration		0.06		%					
SP Calibration MGS-D.A 219									
		Measured		Calibrated (mV)		Field Calibration on 24-JUL-2014,18:59			
Reference 1		-100.0		-100.0					
Reference 2		100.0		100.0					
High Resolution Temperature Calibration MGS-D.A 219									
		Measured		Calibrated(Deg F)		Field Calibration on 24-JUL-2014,18:59			
Lower		20.00		20.00					
Upper		200.00		200.00					
High Resolution Temperature Constants MGS-D.A 219									
Last Edited on 24-JUL-2014,18:59									
Pre-filter Length		11							
Neutron Calibration MDN-B.J 374									
Base Calibration									
		Measured		Calibrated (cps)					
		Near Far		Near Far					
		2934 90		3714 110					
Ratio		32.619		33.764					
Field Calibrator at Base				Calibrated (cps)					
				2203 3253					
Ratio				0.677					
Field Check				Calibrated (cps)					

Field Check	Calibrated (cps)
Ratio	2234 3315 0.674

Neutron Constants MDN-B.J 374			Last Edited on 26-JUL-2014,22:31
Neutron Source Id	P44385B		
Neutron Jig Number	NJ5236		
Air Hole Processing	Modified Ratio		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	7.00	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		

Imager Pad Check MIE-A.A 173			Field Check on 24-JUL-2014 08:37
Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified

Compact Micro Imager Constants MIE-A.A 173			Last Edited on 24-JUL-2014,07:09
Sonde Configuration	Imager Mode		
Arm-Pad Kit	Normal Pads (12.25 in)		
Arm-Pad Kit Serial Number			
Centre Pad 1 Rotational Offset	0.00	degrees	
Image/Borehole Ovality Reference	Azimuth of Pad 1		
Non Active Buttons	Omit		
Search Angle	0.00	degrees	
Correlation Interval	3.28	feet	
Correlation Step	1.64	feet	
Current Offset	0.0000	mAmp	
Squasher Start	0.0500	mAmp	
Image Processing	Enabled		

Navigation Constants MIE-A.A 173			Last Edited on 26-JUL-2014,22:30
Magnetic Declination	7.93	degrees	East

Magnetometer Parameters MIE-A.A 173				
Date Of Last Magnetometer Calibration	17-JUL-2014,16:28			
	X Magnetometer	Y Magnetometer	Z Magnetometer	
Slope	-1.000000	-1.011067	-0.996373	
Offset	0.009674	-0.014518	0.002543	

Magnetometer Constants MIE-A.A 173			Last Edited on
Magnetometer Calibrator Number	000		

Accelerometer Parameters MIE-A.A 173				
Date Of Last Accelerometer Calibration	15-JUL-2014,13:24			
	X Accelerometer	Y Accelerometer	Z Accelerometer	
Slope	-1.113967	-1.108777	-1.100961	
Offset	0.007433	0.003599	0.006425	

Accelerometer Constants MIE-A.A 173			Last Edited on 24-JUL-2014,07:08
Accelerometer Calibrator Number	000		

Accelerometer Temperature Characterisation				
X Accelerometer				
Serial Number	648			
Calibration Date	19-Aug-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	-9.57706e-006	9.83611e-009	1.13245e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.83616e-004	1.98700e-007	1.44742e-009
Y Accelerometer				
Serial Number	652			
Calibration Date	19-Aug-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.42793e-006	-1.11656e-008	-4.36730e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.75161e-004	2.12516e-007	8.53262e-010
Z Accelerometer				
Serial Number	588			
Calibration Date	06-May-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	2.55228e-005	-4.28668e-009	8.28710e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.82774e-004	2.50728e-007	1.25354e-009

Caliper Calibration MIE-A.A 173					Base Calibration on 24-JUL-2014 19:50
					Field Calibration on 24-JUL-2014 19:51
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26591	27647	5.96		
2	36922	38180	7.98		
3	46659	47925	9.86		
4	57833	59348	11.88		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	24934	26271	25832	25748	5.96
2	33896	35324	34509	34350	7.98
3	42313	43589	42662	42671	9.86
4	52095	53353	52427	52005	11.88
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		
	6.00	6.00	5.96		
	Measured	Measured	Measured	Measured	Actual
	Pad 2 Caliper(in)	Pad 4 Caliper(in)	Pad 6 Caliper(in)	Pad 8 Caliper(in)	Caliper(in)
	3.03	3.01	2.98	2.98	5.96

Caliper Constants MIE-A.A 173					Last Edited on
Caliper Difference for BRKT	0.120	inches			

High Resolution Temperature Calibration MAI-B.A 289					Field Calibration on 18-JAN-2012 09:35
	Measured	Calibrated(Deg F)			
Lower	50.00	50.00			
Upper	75.00	75.00			

High Resolution Temperature Constants MAI-B.A 289					Last Edited on
Pre-filter Length	11				

Induction Calibration MAI-B.A 289					Base Calibration on 26-MAY-2014 14:29
					Field Check on 24-JUL-2014 19:19
Base Calibration					
Test Loop Calibration	Measured		Calibrated (mmho/m)		
Channel	Low	High	Low	High	
1	16.4	480.5	9.3	966.2	
2	5.8	383.6	7.6	821.4	
3	3.4	259.9	5.2	566.0	
4	2.4	137.8	2.6	279.2	

Array Temperature	92.7	Deg F
Channel	Base Check (mmho/m)	Field Check (mmho/m)
	Low	High
1		15.2 3759.0
2		30.7 3498.1
3		28.6 3030.7
4		17.9 2002.0
Deep		16.1 1933.2
Medium		43.2 4059.6
Shallow		47.8 5222.4
Array Temperature	83.7	Deg F

Induction Constants MAI-B.A 289 Last Edited on 26-JUL-2014,22:32

Induction Model	RtAP-WBM
Caliper for Borehole Corr.	Density Caliper
Hole Size for Borehole Correction	N/A inches
Tool Centred	No
Stand-off Type	Pineapple
Stand-off	0.49 inches
Number of Fins on Stand-off	5.0000
Stand-off Fin Angle	72.00 degrees
Stand-off Fin Width	1.3878 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

Photo Density Calibration MPD-C.J 377 Base Calibration on 23-JUL-2014 18:54
Field Check on 24-JUL-2014 19:04

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Background	1315	1528		
Reference 1	52972	28114	59443	30683
Reference 2	21695	2761	25113	2508
Field Check at Base				
	1314.8	1528.4		
Field Check				
	1318.6	1538.9		

PE Calibration

Base Calibration	WS	WH	Measured	Calibrated
Background	245	1175		
Reference 1	20955	52770	0.401	0.372
Reference 2	5969	21550	0.281	0.268
Field Check at Base				
	244.9	1175.4		
Field Check				
	242.0	1181.7		

Density Constants MPD-C.J 377		Last Edited on 24-JUL-2014,18:41	
Density Source Id	P44264B		
Nylon Calibrator Number	652		
Aluminium Calibrator Number	659		
Density Shoe Profile	4 inch		
Caliper Source for Processing	Density Caliper		
PE Correction to Density	Not Applied		
Mud Density	1.21	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		

Caliper Calibration		MPD-C.J 377	Base Calibration on 24-JUL-2014 19:38	
			Field Calibration on 24-JUL-2014 19:40	
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		15841	4.00	
2		23887	5.96	
3		32305	7.98	
4		40384	9.86	
5		49264	11.88	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		7.98	7.98	

Spectral Gamma Calibration			SGS-E.J 167			Base Calibration on 07-MAY-2014 16:09			Field Calibration on 24-JUL-2014,18:39				
Base Calibration													
Potassium Calibrator													
		Gate 1	Gate 2	Gate 3	Gate 4	Gate 5							
	Background	112.3	38.2	4.1	1.5	2.5							
	Calibrator (Gross)	238.1	123.0	27.2	1.6	2.4							
	Calibrator (Net)	125.8	84.9	23.1	0.1	-0.0							
		K %	U ppm	Th ppm									
Concentrations		5.9	0.0	0.0									
Uranium Calibrator													
		Gate 1	Gate 2	Gate 3	Gate 4	Gate 5							
	Background	112.3	38.2	4.1	1.5	2.5							
	Calibrator (Gross)	561.7	197.9	17.8	11.0	5.7							
	Calibrator (Net)	449.4	159.7	13.7	9.5	3.2							
		K %	U ppm	Th ppm									

Concentrations

0.0

16.6

0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.3	38.2	4.1	1.5	2.5
Calibrator (Gross)	436.7	161.1	13.5	7.5	17.2
Calibrator (Net)	324.4	122.9	9.4	6.0	14.7

	K %	U ppm	Th ppm
Concentrations	0.0	0.0	44.7

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.3	38.2	4.1	1.5	2.5
Calibrator (Gross)	895.3	361.0	45.9	14.1	19.1
Calibrator (Net)	783.0	322.8	41.9	12.6	16.6

Field Calibration

Gamma Ray

	Measured	Calibrated (API)
Background	167	34
Calibrator (Gross)	1343	274
Calibrator (Net)	1177	240

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.3	38.2	4.1	1.5	2.5
Calibrator (Gross)	895.3	361.0	45.9	14.1	19.1
Calibrator (Net)	783.0	322.8	41.9	12.6	16.6

Spectral Gamma Constants SGS-E.J 167

Last Edited on 24-JUL-2014,18:40

Background Calibrator Number	440	
Mixture Calibrator Number	450	
Potassium Calibrator Number	500	
Uranium Calibrator Number	506	
Thorium Calibrator Number	503	
Mud Density	1.21	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.06	%

DOWNHOLE EQUIPMENT

D:\Logs\Whiting\Horsetail 33M-2804\MMS Depth.dta

Shuttle Running Tool 3.5" (SRT A)
SRT-A 5 LG: 6.47 ft WT: 37.5 lb OD: 2.520 in

Compact Linker 400V EXT
MLK-A 2 LG: 14.23 ft WT: 30.9 lb OD: 2.240 in

Compact Linker 200V STD
MLK-A 1 LG: 14.23 ft WT: 30.9 lb OD: 2.240 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 693 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 589 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 612 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MRS-E.A 200V Compact Battery Sub

MBS-F.A 200V Compact Battery Sub
MBS-F.A 63 LG: 17.06 ft WT: 123.5 lb OD: 2.240 in

Compact Memory Sub F.A
MMS-F.A 249 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.
MTI-C.A 145 LG: 1.54 ft WT: 13.2 lb OD: 2.244 in

Compact Short Gamma
MGS-D.A 219 LG: 3.41 ft WT: 24.3 lb OD: 2.244 in

Compact Collar Locator
MCL-C.A 129 LG: 3.17 ft WT: 26.5 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 533 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 678 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 723 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Neutron
MDN-B.J 374 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.J 377 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 731 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 677 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 245 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 183 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 246 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 437 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section
MIM-A.A 173 LG: 4.65 ft WT: 26.5 lb OD: 2.240 in

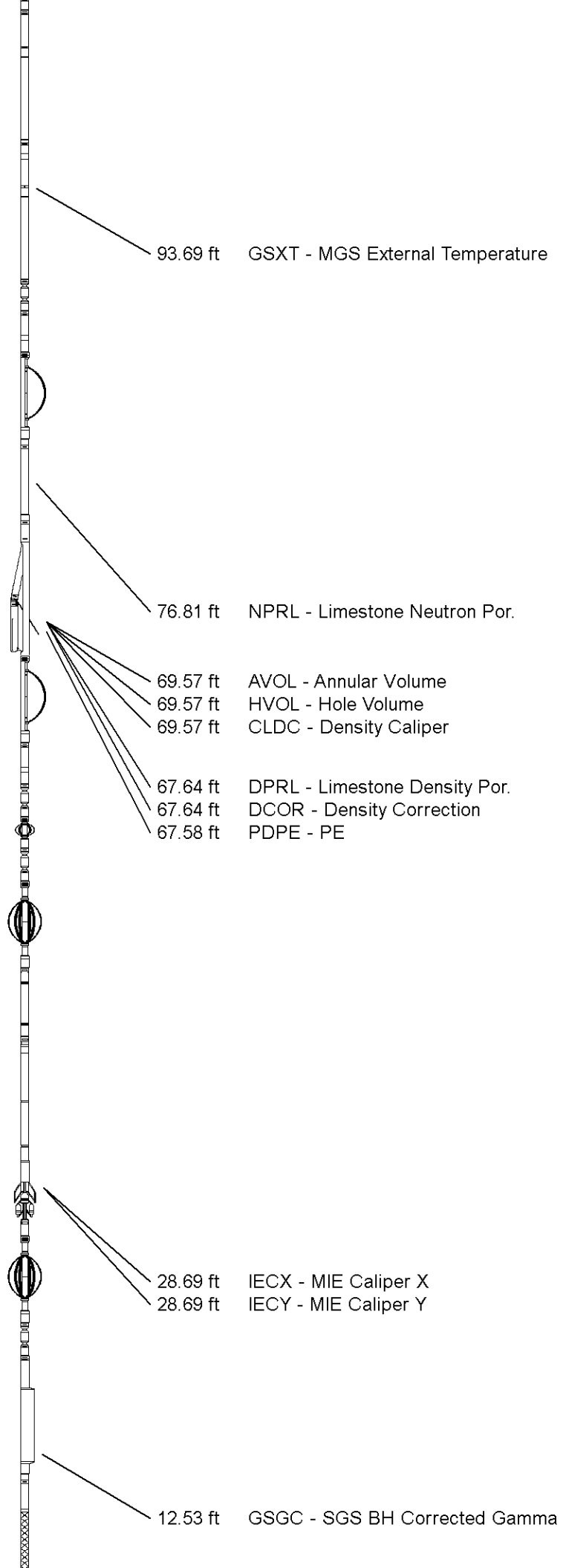
Compact MMI Electrode Section
MIE-A.A 173 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 654 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 597 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Spectral Gamma Ray Sub
SGS-E.J 167 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

Compact Induction



MAI-B.A 289 LG: 10.81 ft WT: 48.5 lb OD: 2.240 in

Total Length: 161.93 ft Weight: 1095.7 lb



Tool Zero

(0.13ft from bottom)

COMPANY	WHITING OIL AND GAS CORPORATION
WELL	HORSETAIL 33M-2804
FIELD	REDTAIL
PROVINCE/COUNTY	WELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4651.00	feet	First Reading	13916.00	feet
Elevation Drill Floor	4651.00	feet	Depth Driller	14806.00	feet
Elevation Ground Level	4634.00	feet	Depth Logger	13952.00	feet



MEASURED DEPTH
ARRAY INDUCTION
LOG

Weatherford[®]