



Weatherford

**MEASURED DEPTH
ARRAY INDUCTION
LOG**

COMPANY			WHITTING OIL AND GAS CORPORATION		
WELL			HORSETAIL 02D-0204		
FIELD			REDTAIL		
PROVINCE/COUNTY			WELD		
COUNTRY/STATE			U.S.A. / COLORADO		
LOCATION			SHL: 300' FNL & 750' FWL		
PERMIT NUMBER			AFE: 14-1601		
SEC 2	TWP 10N	RGE 57W	Other Services		
			MICRO IMAGER		
			SPECTRAL GAMMA		
			DENSITY/NEUTRON		
API Number			05-123-39383		
Permanent Datum G.L., Elevation 4778 feet					
Log Measured From KB					
Drilling Measured From K.B. @ 17 FEET					
Date	14-OCT-2014				
Run Number	ONE				
Service Order	2577-100430125				
Depth Driller	9948.00		feet		
Depth Logger	9948.00		feet		
First Reading	9930.00		feet		
Last Reading	6031.00		feet		
Casing Driller	6028.00		feet		
Casing Logger	6031.00		feet		
Bit Size	6.000		inches		
Hole Fluid Type	WBM				
Density / Viscosity	9.30	lb/USg	41.00	type in	
PH / Fluid Loss	9.70		6.80	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.37 @ 78.2		ohm-m		
Rmf @ Measured Temp	1.09 @ 78.2		ohm-m		
Rmc @ Measured Temp	1.64 @ 78.2		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.53 @205.0		ohm-m		
Time Since Circulation	.5 HOURS				
Max Recorded Temp	205.00		deg F		
Equipment / Base	18063		Casper		
Recorded By	M.RICHINS				
Witnessed By	M.ODEGARD				
			GEOLOGIST		

BOREHOLE RECORD					Last Edited: 14-OCT-2014 17:22
Bit Size inches		Depth From feet		Depth To feet	
6.000		6028.00		9948.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	7.000	0.00	6028.00	29.00	

REMARKS
LOGGED WITH WLS 14.01.3220
LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT
HARDWARE:
MDN: MIS-A DOUBLE 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: -103.723214
LATITUDE: 40.862739
ANNULAR HOLE VOLUME FROM TD TO CASING AT 6031 FEET = 390 CUBIC FEET

ANNULAR HOLE VOLUME FROM TD TO CASING AT 6031 FEET = 810 CUBIC FEET.

DRILL PIPE DEPTH DURING DEPLOYMENT: 9833.21 FEET
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9935.39FEET

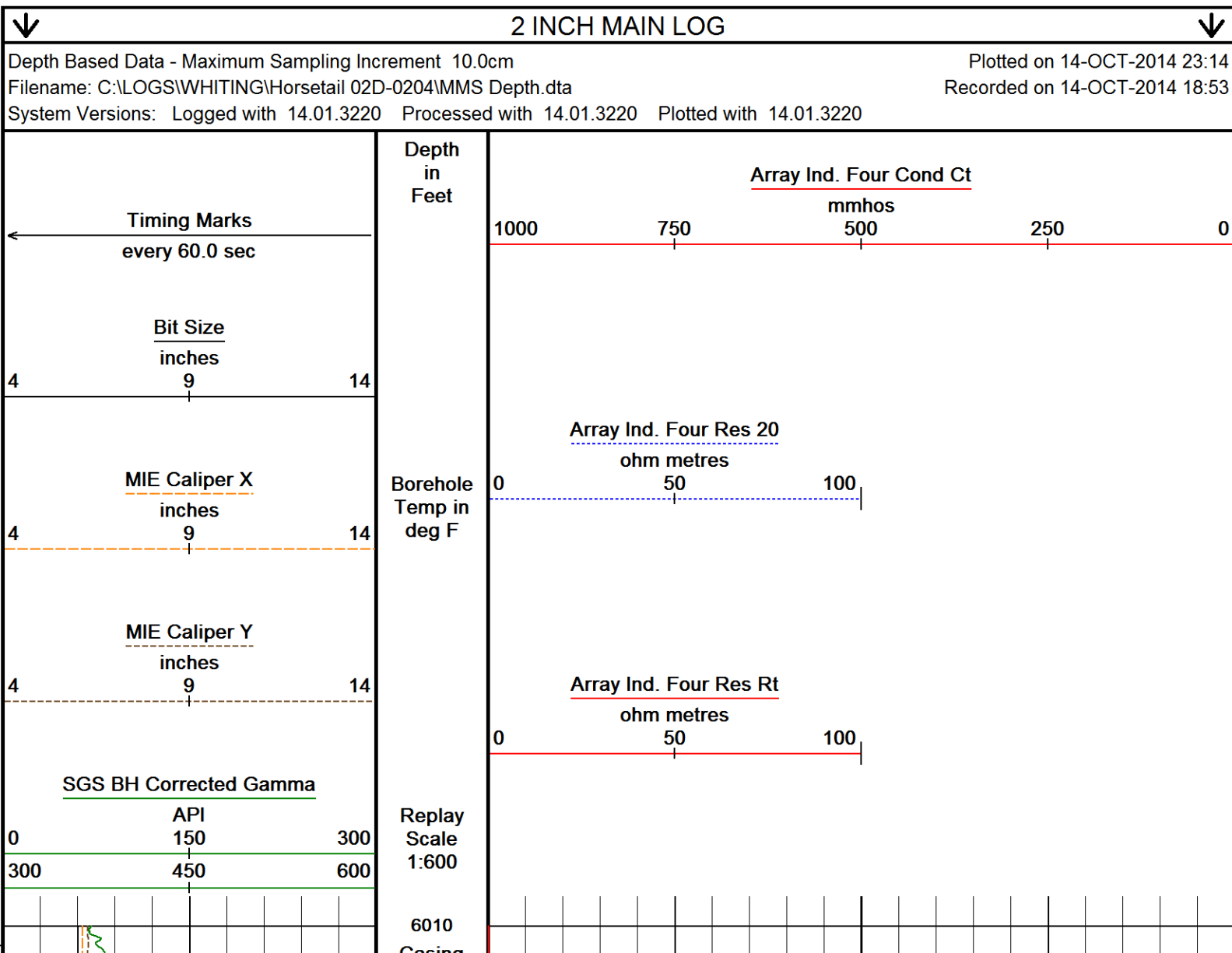
SLOWLY ROTATED LAST STAND DOWN AT 20-30 RPM TO REACH TD - EXCESSIVE STICK/SLIP LOW HOOKLOAD WHEN NOT ROTATING.

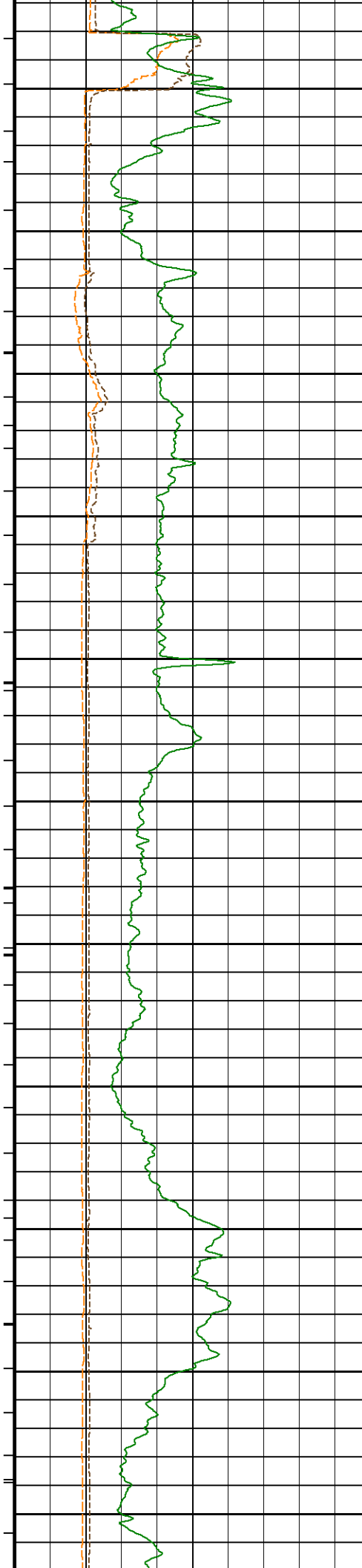
PIPE ROTATED AT 30 RPM FOR FIRST 10 STANDS DURING LOGGING RUN

OPERATORS: D.SMITH, B.GOODMAN

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.





Casing
Shoe

6100

201°

6200

201°

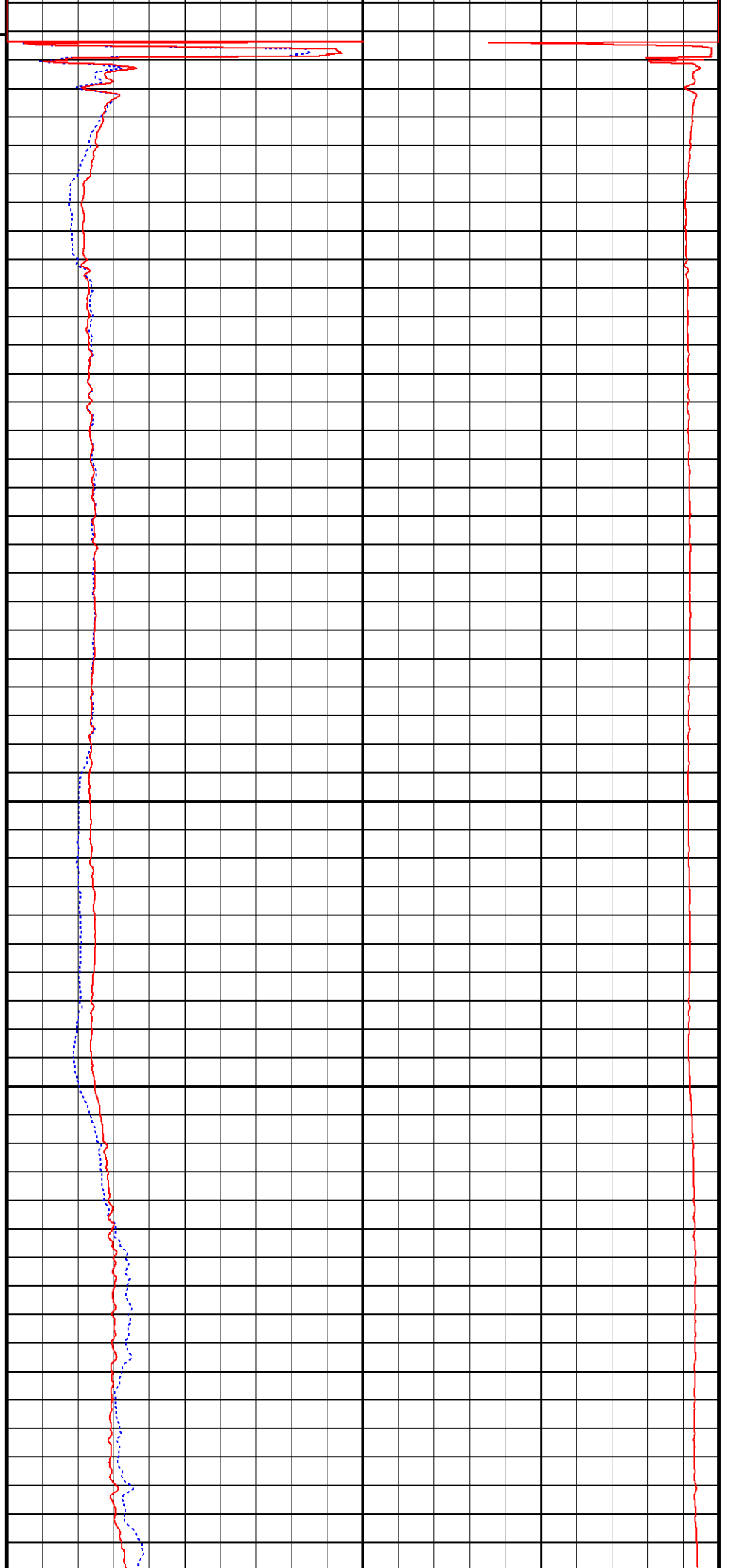
6300

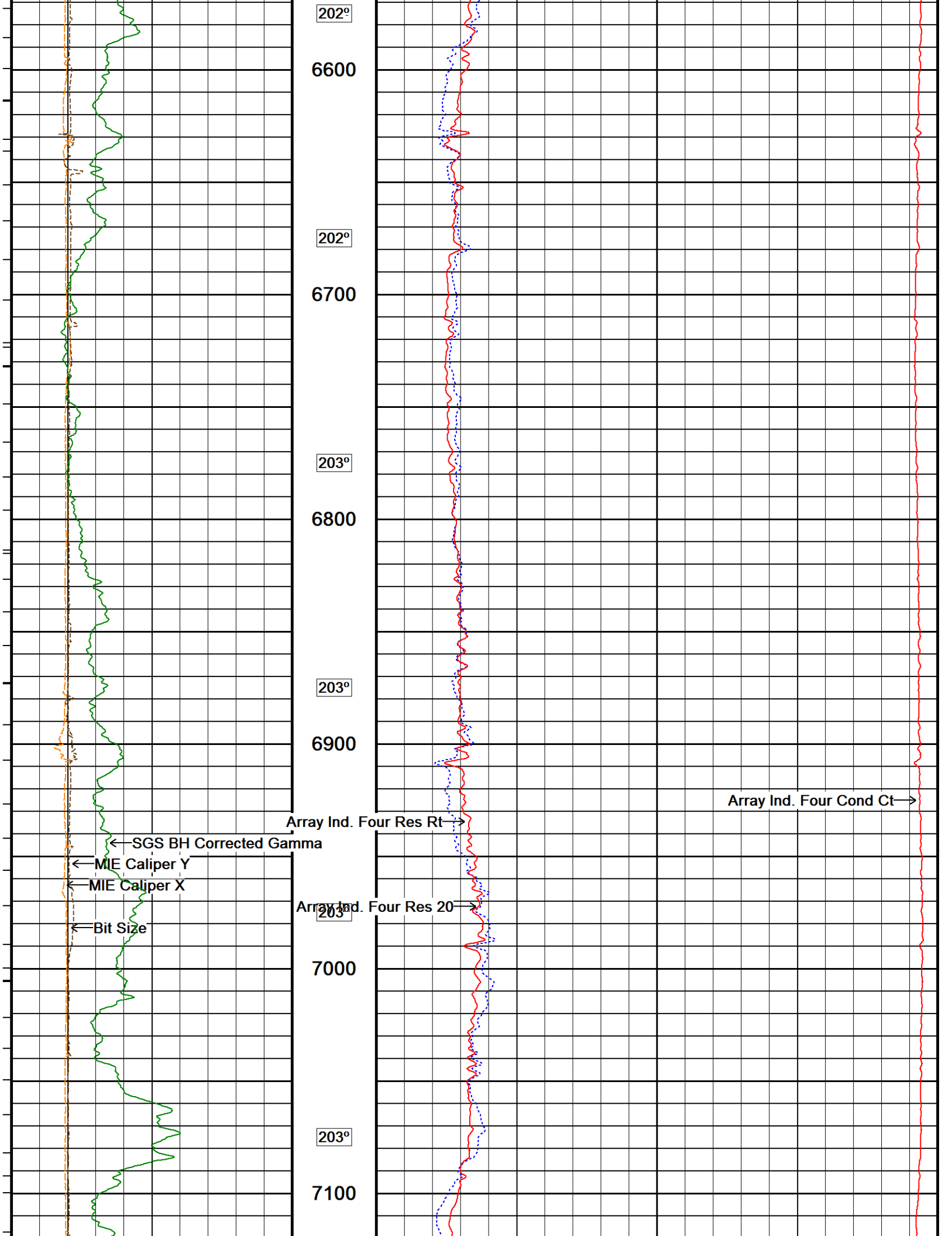
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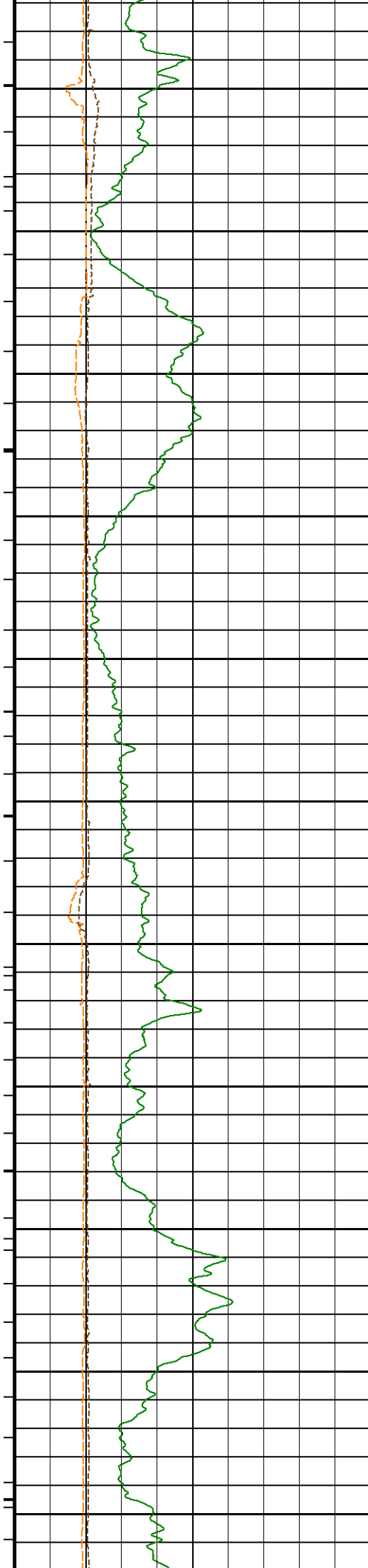
6400

202°

6500







203°

7200

203°

7300

203°

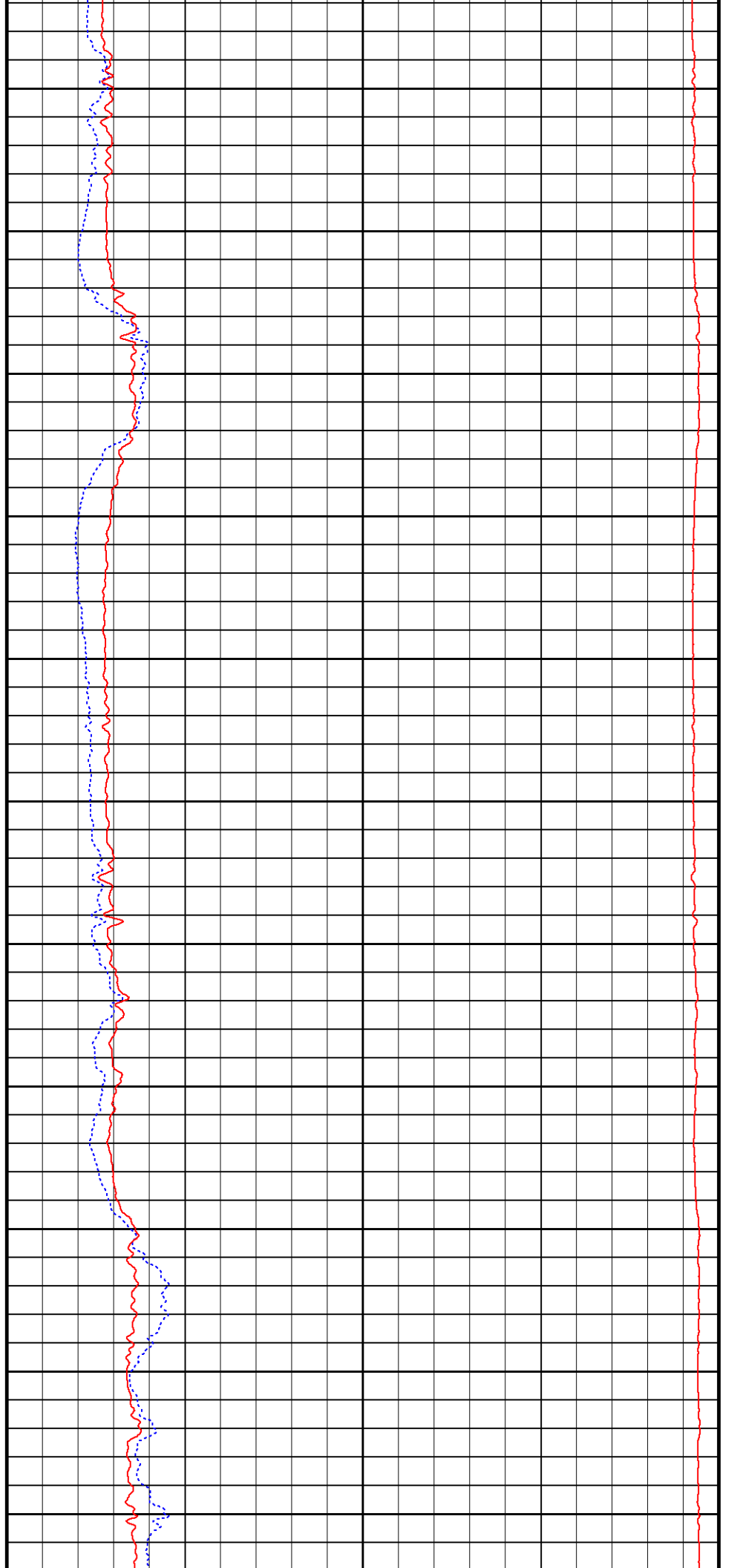
7400

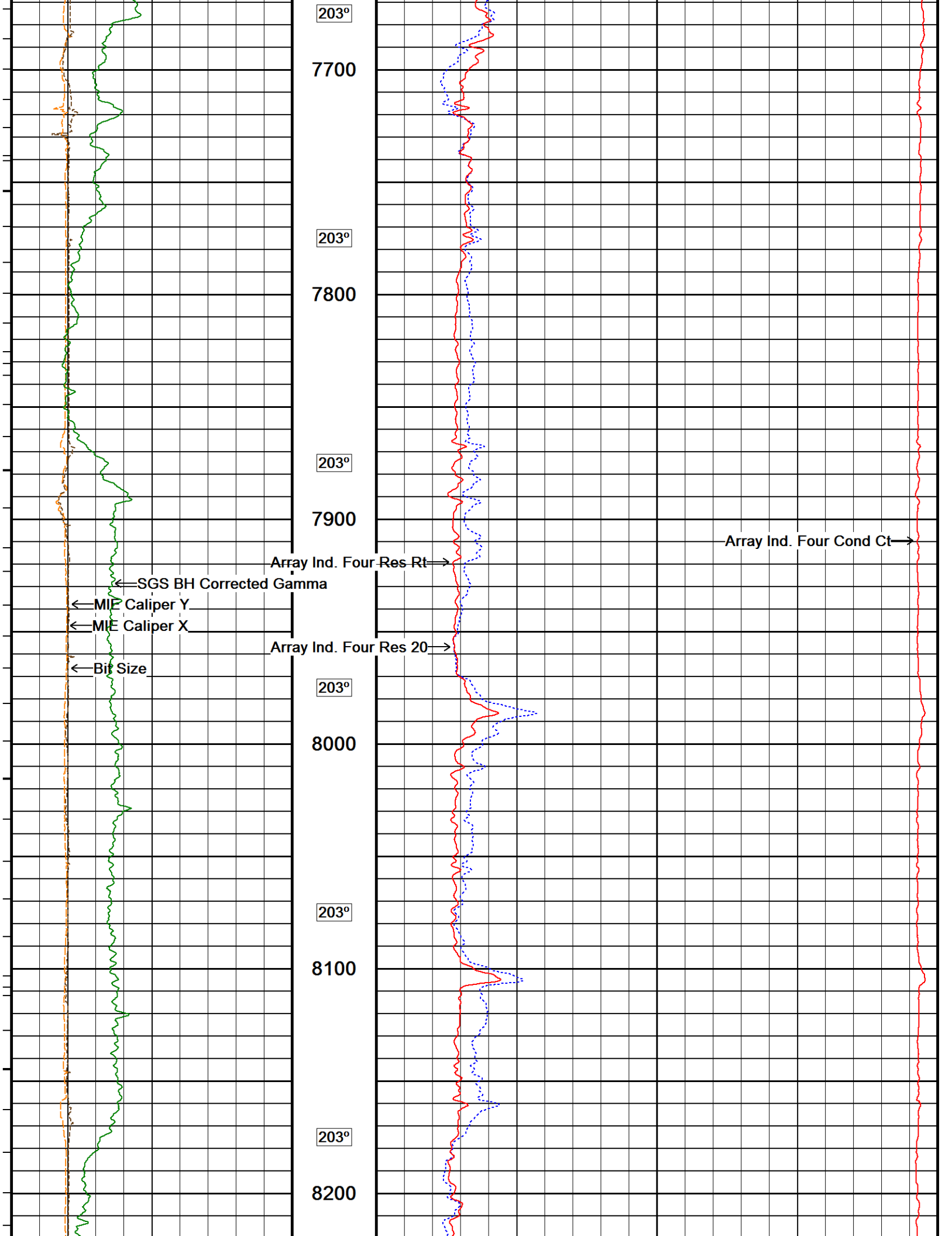
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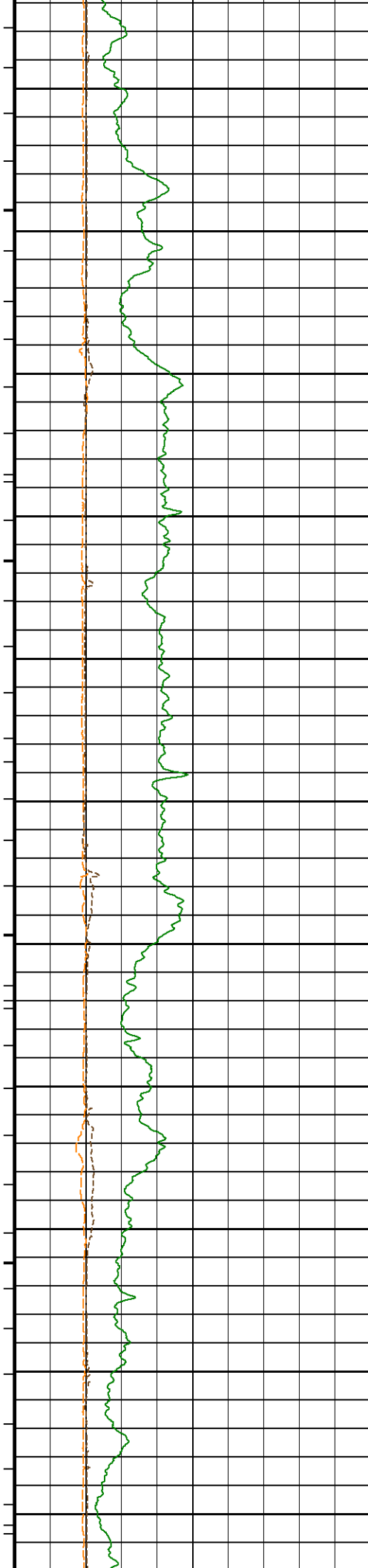
7500

203°

7600







203°

8300

203°

8400

202°

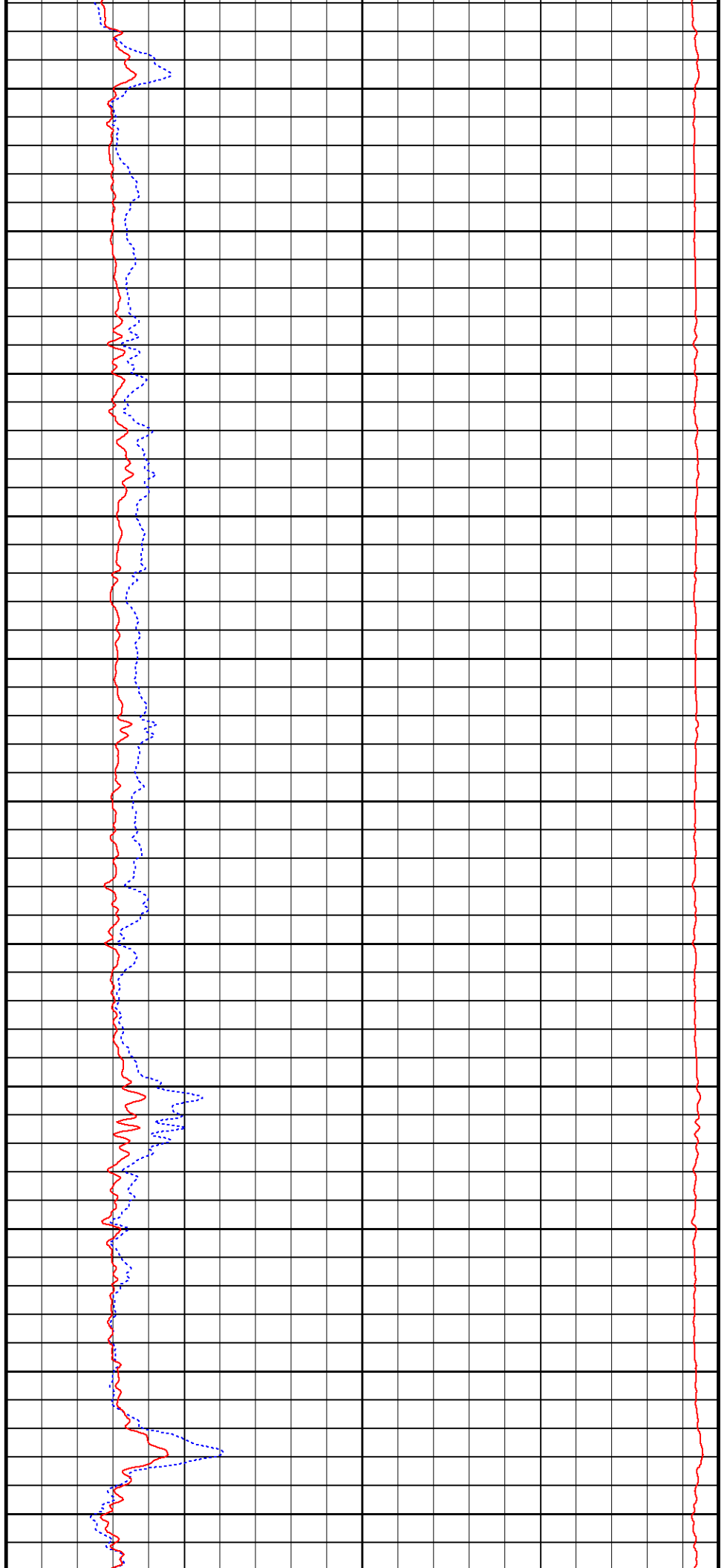
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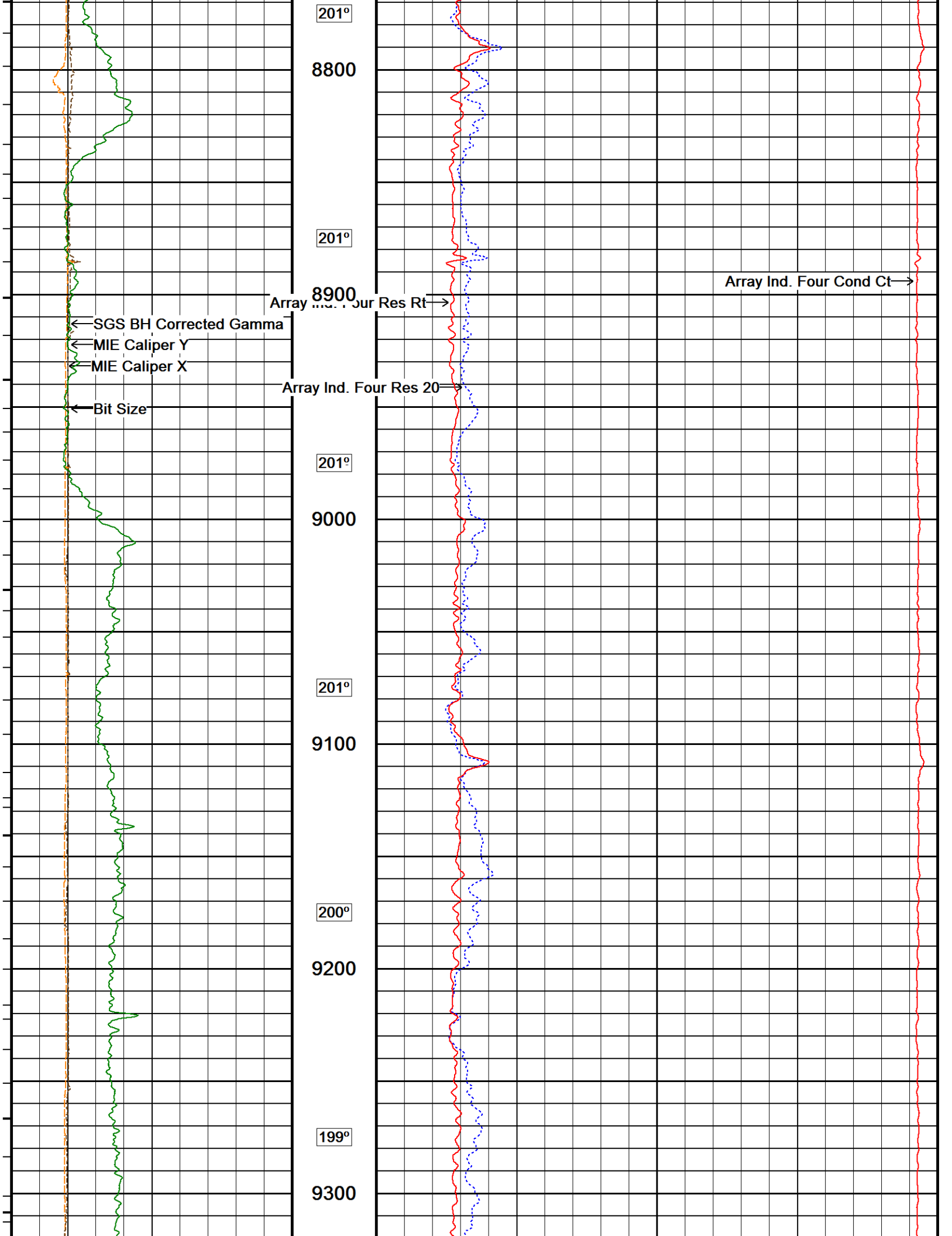
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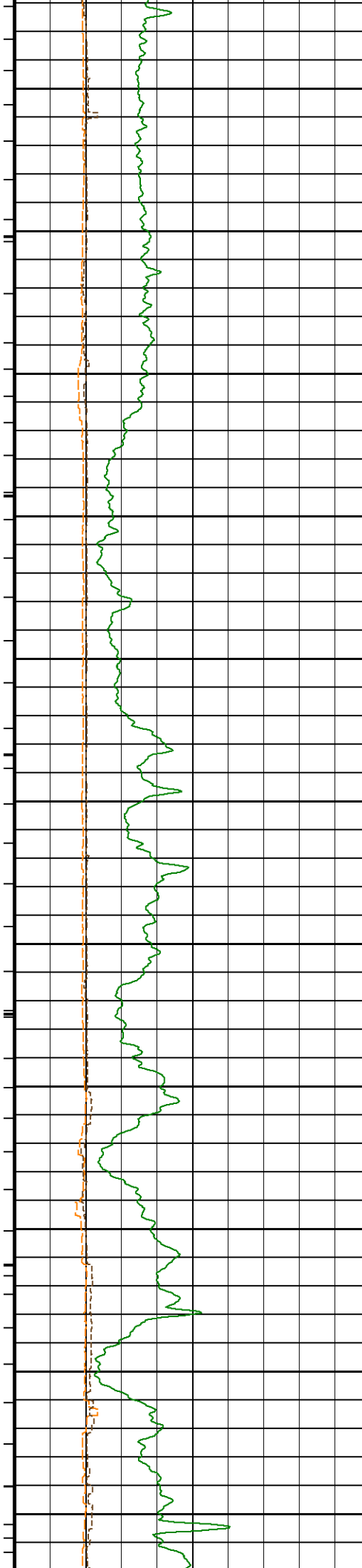
8600

202°

8700







198°

9400

197°

9500

195°

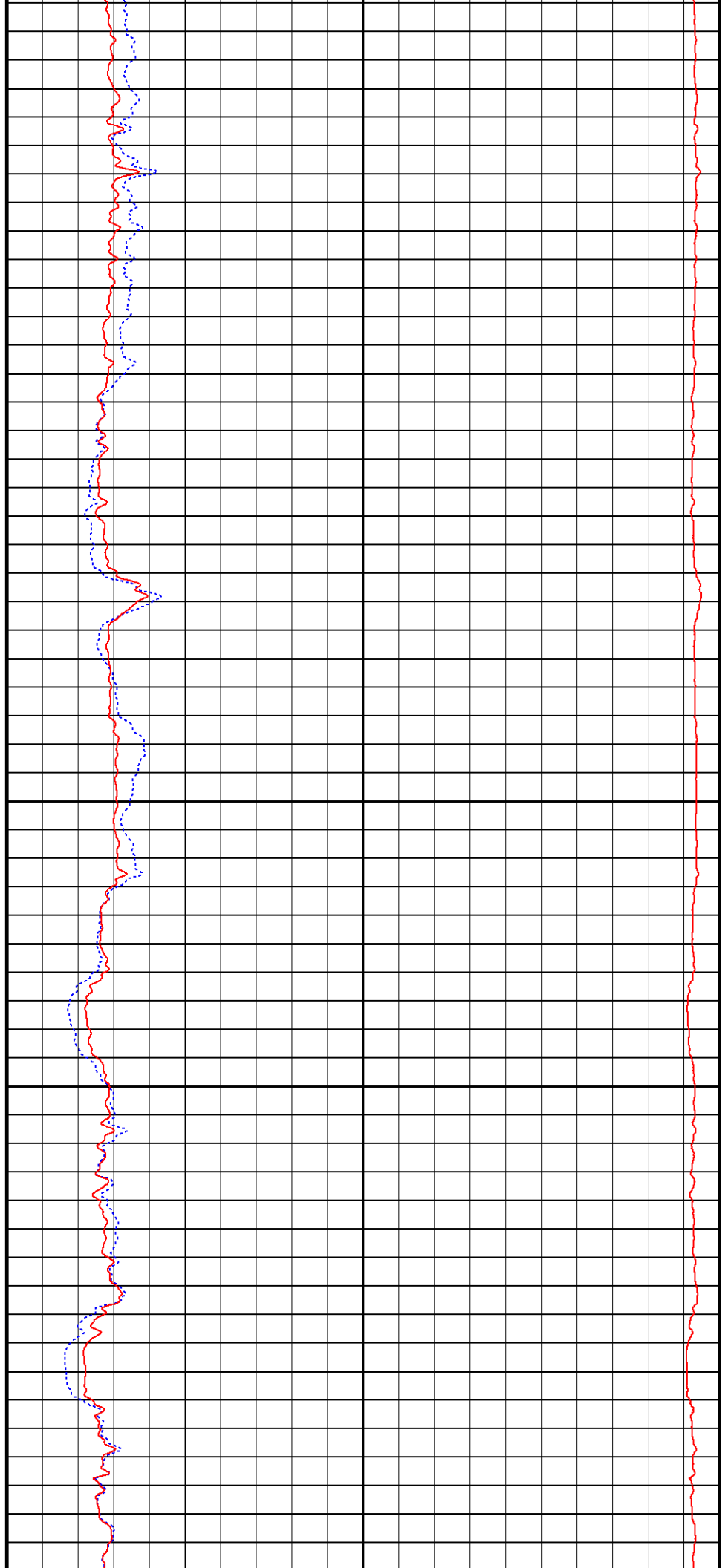
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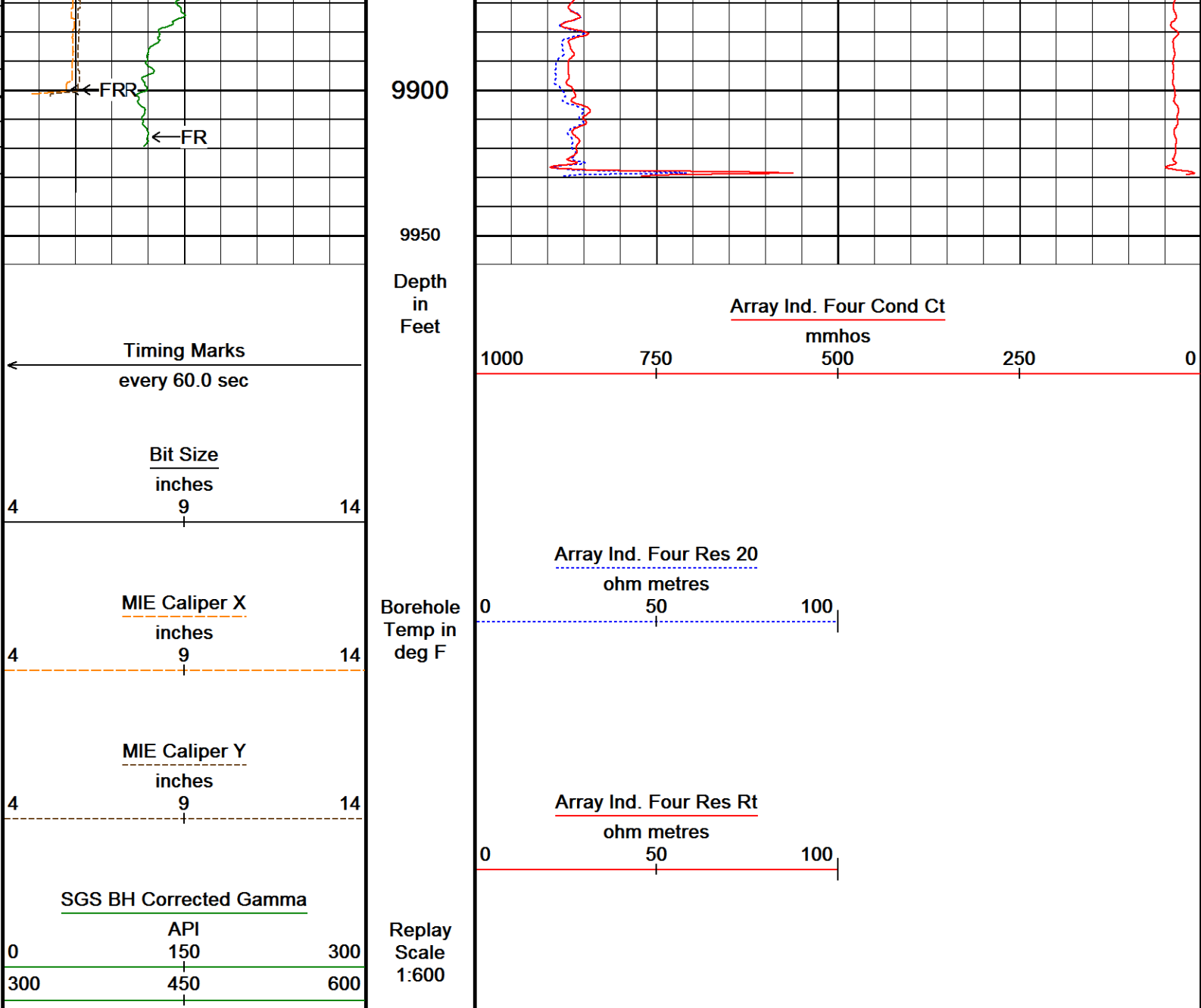
194°

9700

198°

9800



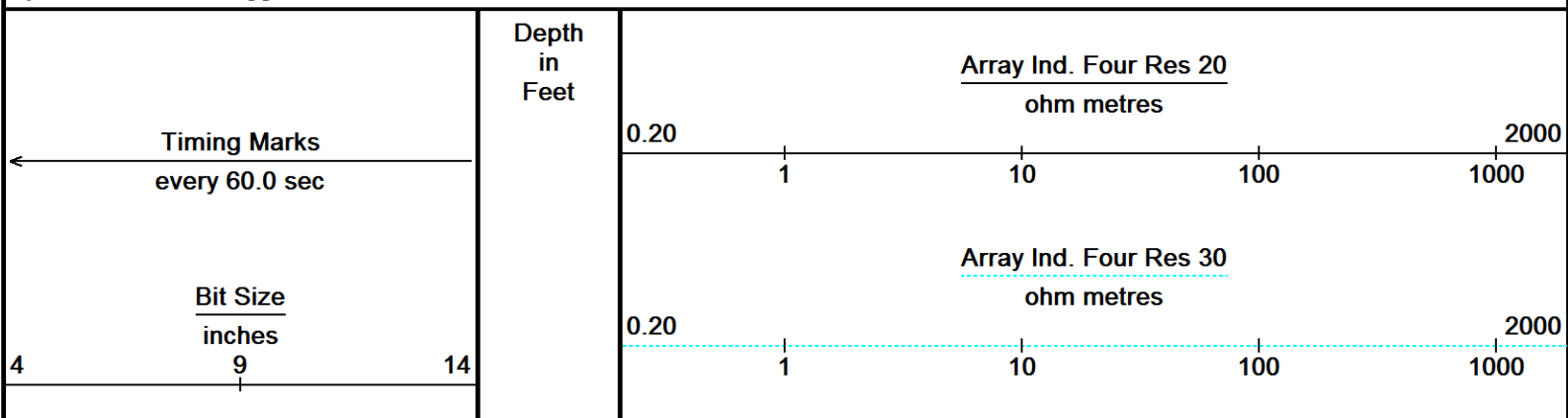


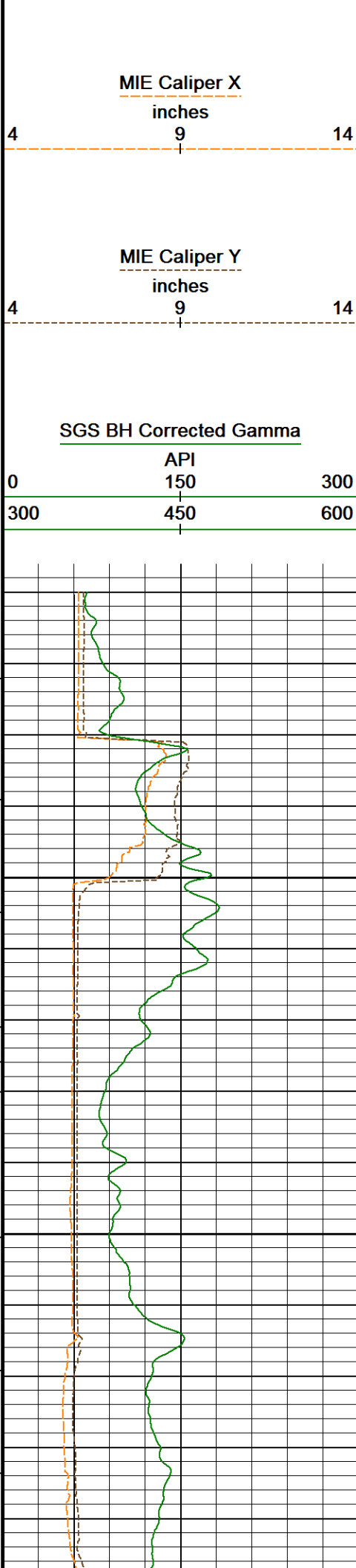
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-OCT-2014 23:14
Filename: C:\LOGS\WHITING\Horsetail 02D-0204\MMS Depth.dta Recorded on 14-OCT-2014 18:53
System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220

2 INCH MAIN LOG

5 INCH MAIN LOG

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-OCT-2014 23:14
Filename: C:\LOGS\WHITING\Horsetail 02D-0204\MMS Depth.dta Recorded on 14-OCT-2014 18:53
System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220





Borehole
Temp in
deg F

Replay
Scale
1:240

Casing
Shoe

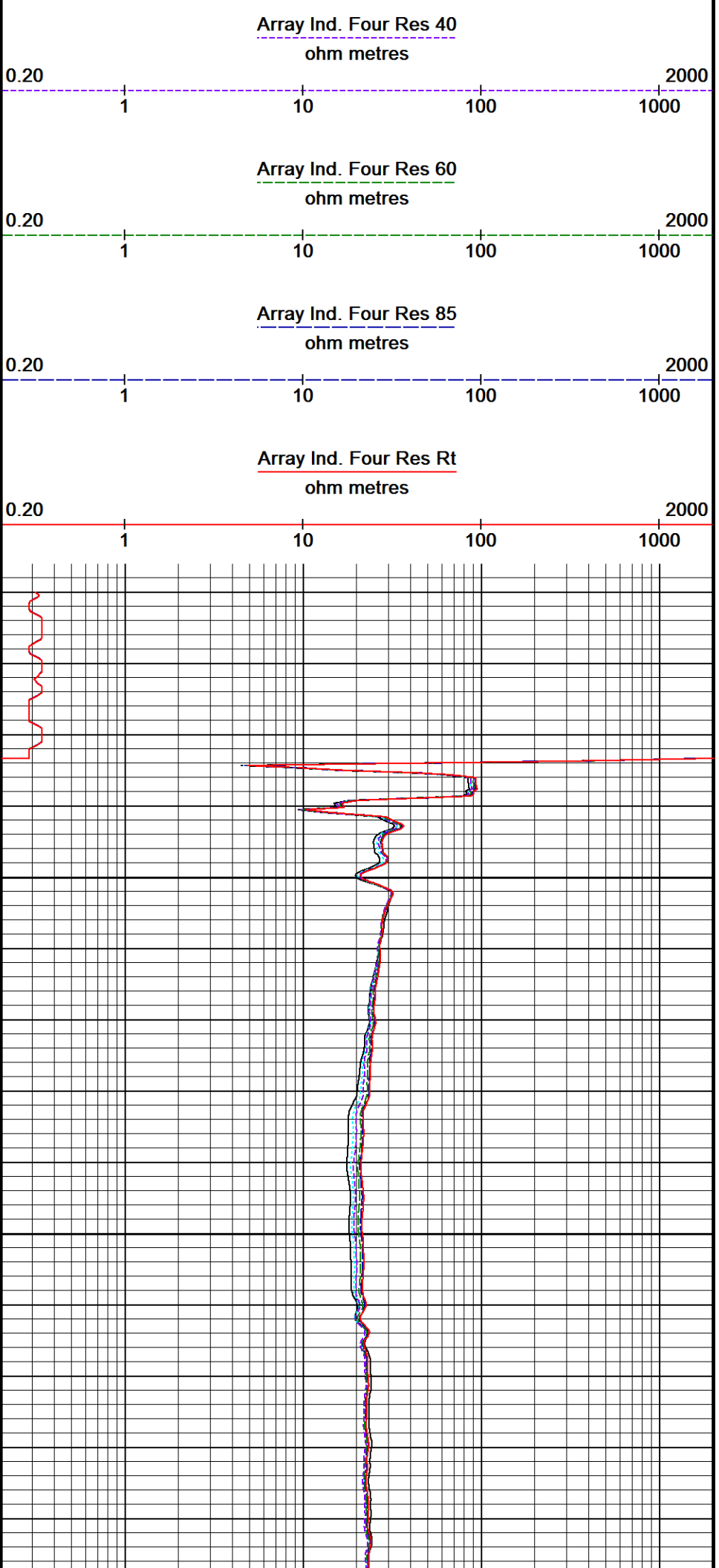
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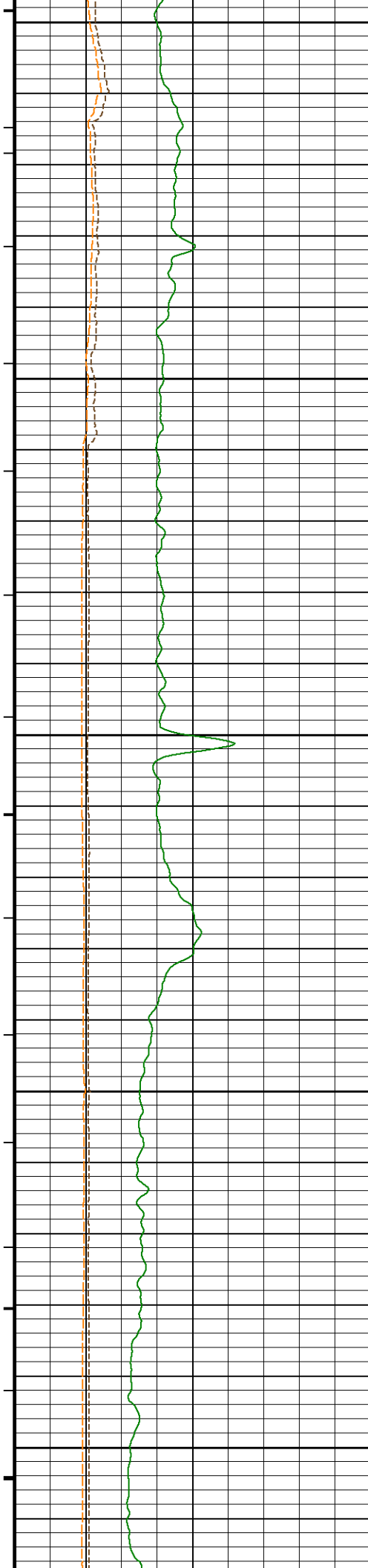
6050

200°

6100

201°





6150

201°

6200

201°

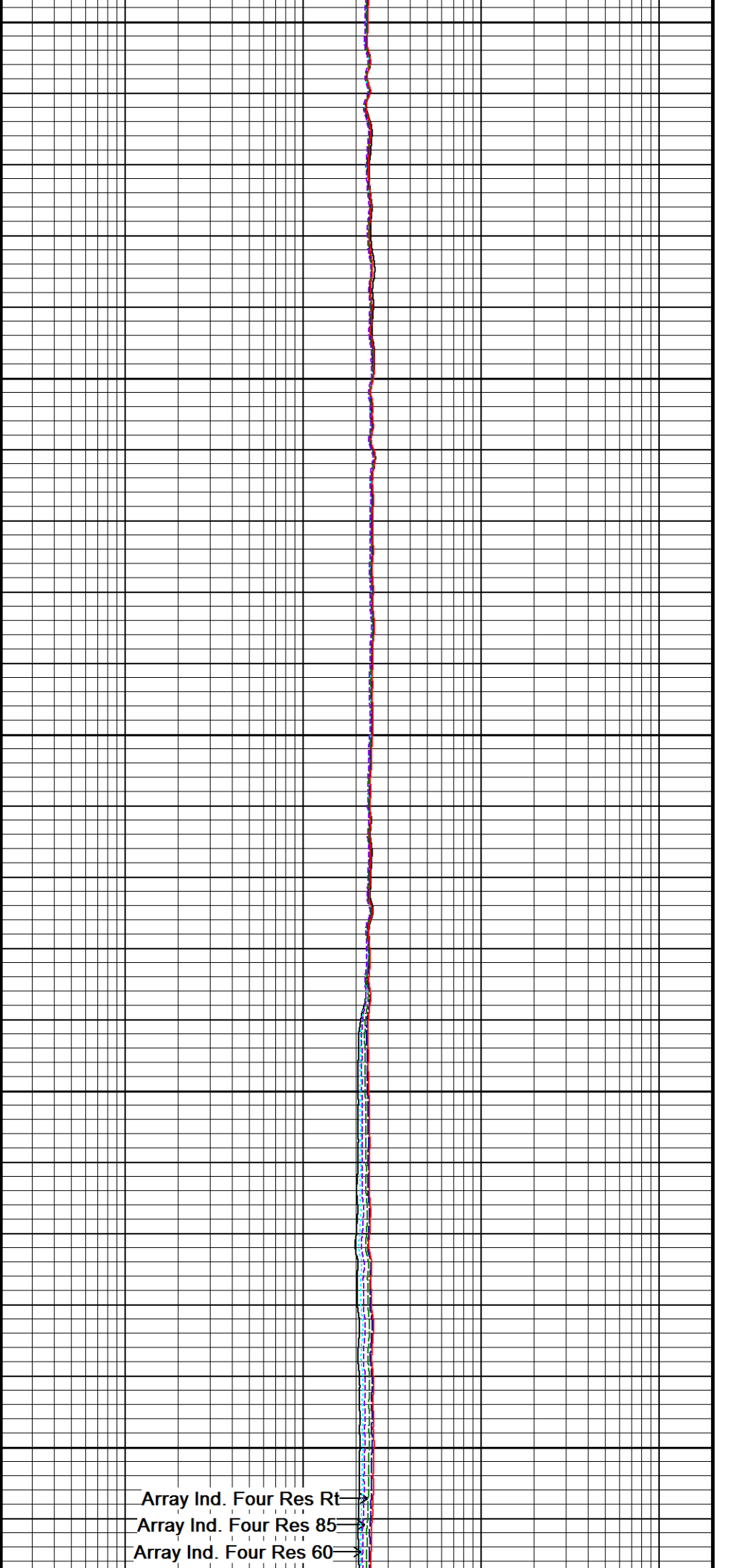
6250

201°

6300

201°

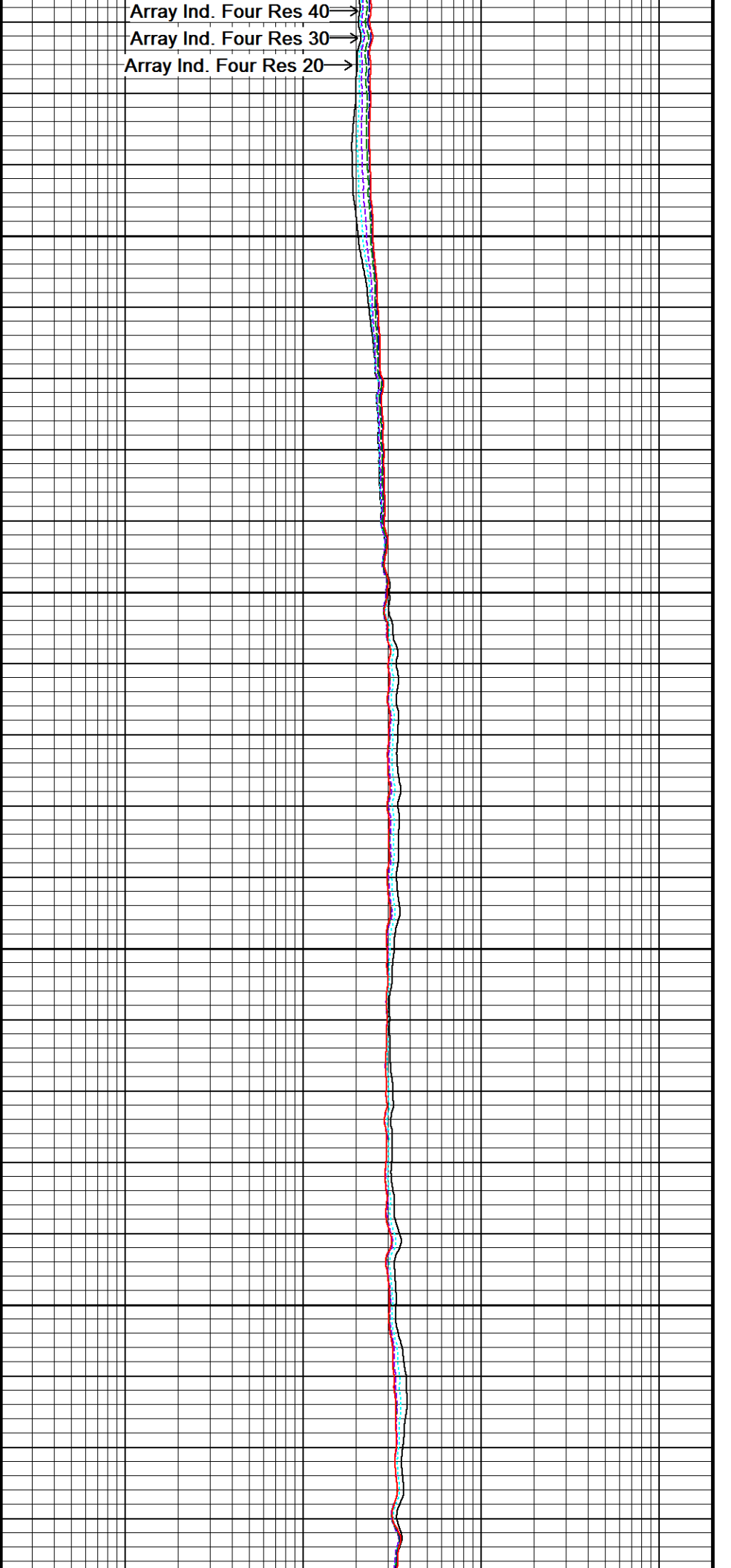
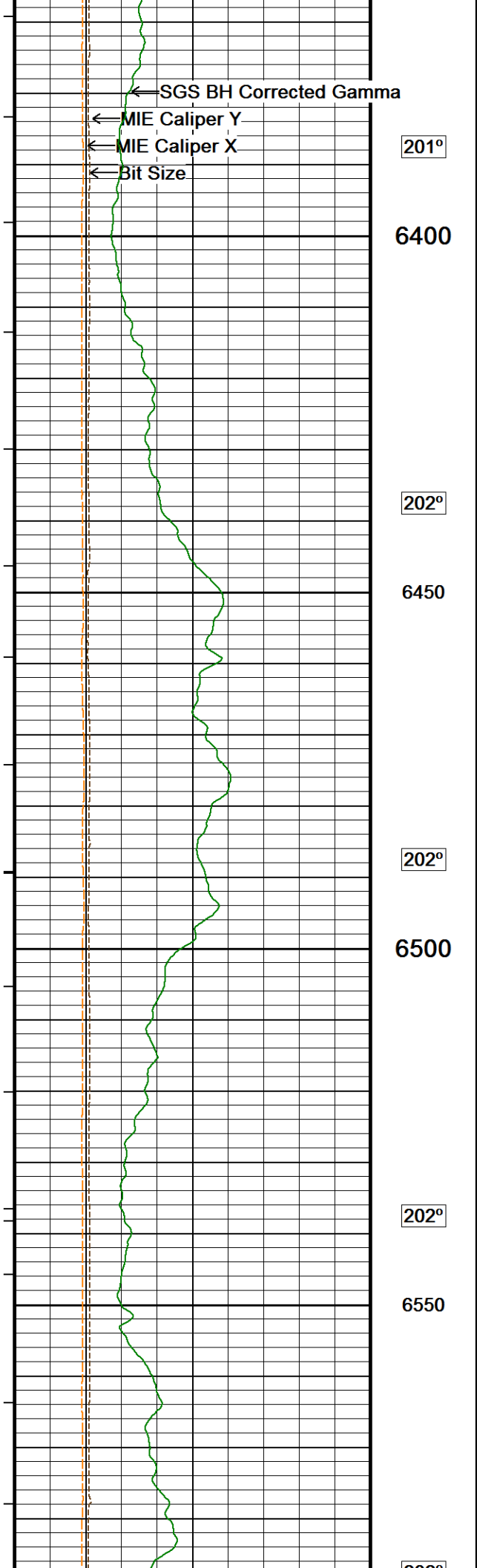
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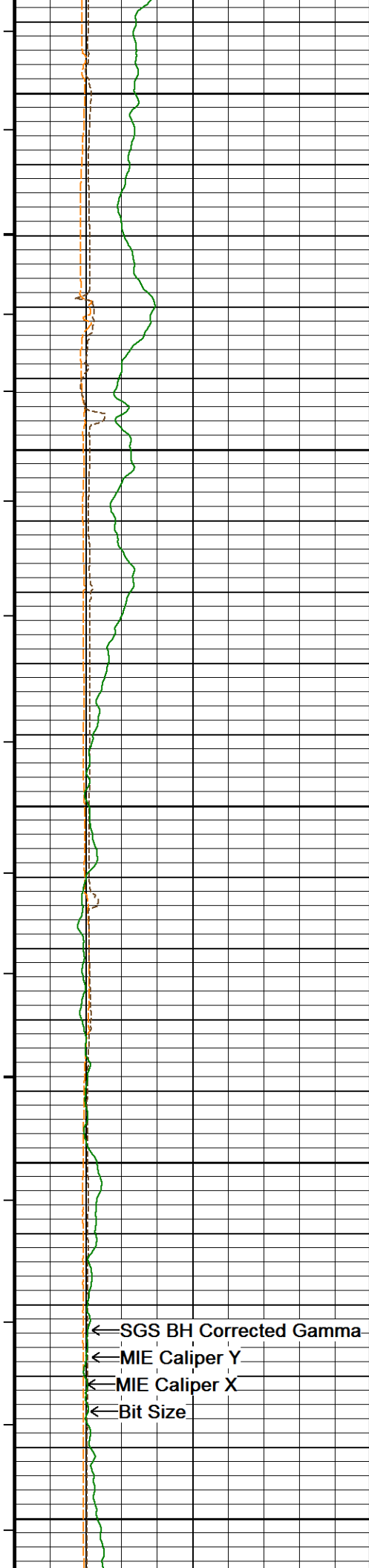


Array Ind. Four Res Rt

Array Ind. Four Res 85

Array Ind. Four Res 60





202°

6600

202°

6650

202°

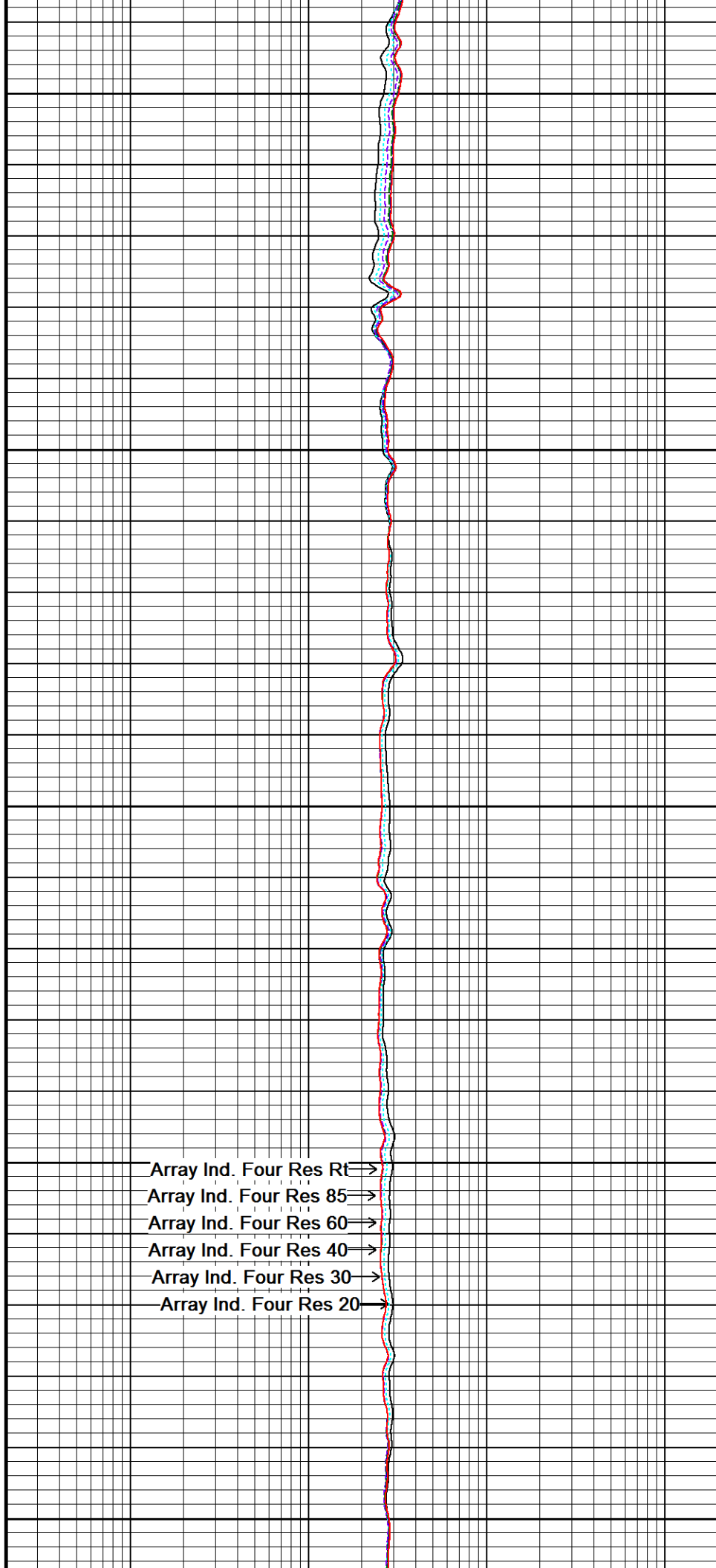
6700

202°

6750

203°

6800



Array Ind. Four Res Rt

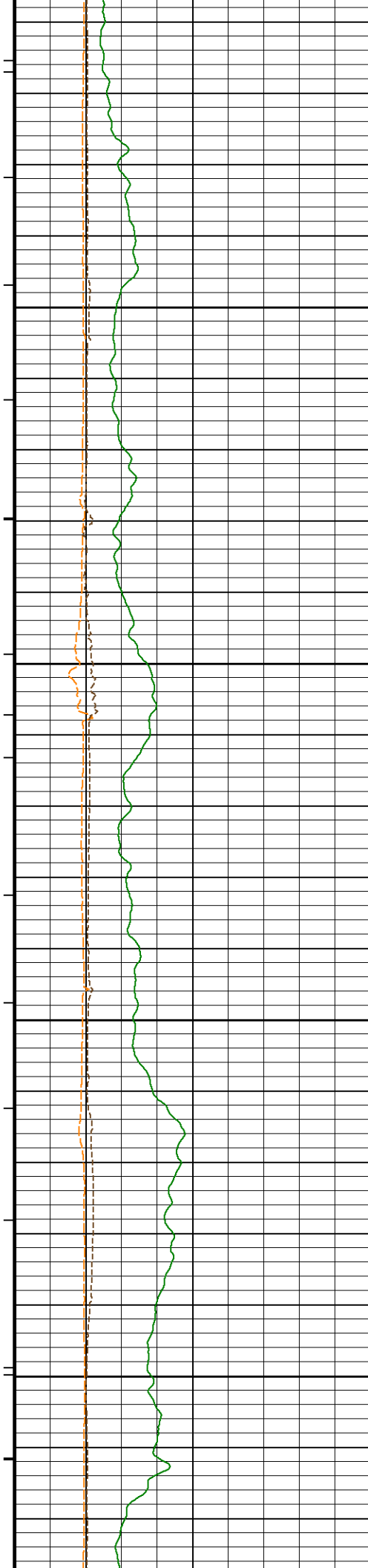
Array Ind. Four Res 85

Array Ind. Four Res 60

Array Ind. Four Res 40

Array Ind. Four Res 30

Array Ind. Four Res 20



203°

6850

203°

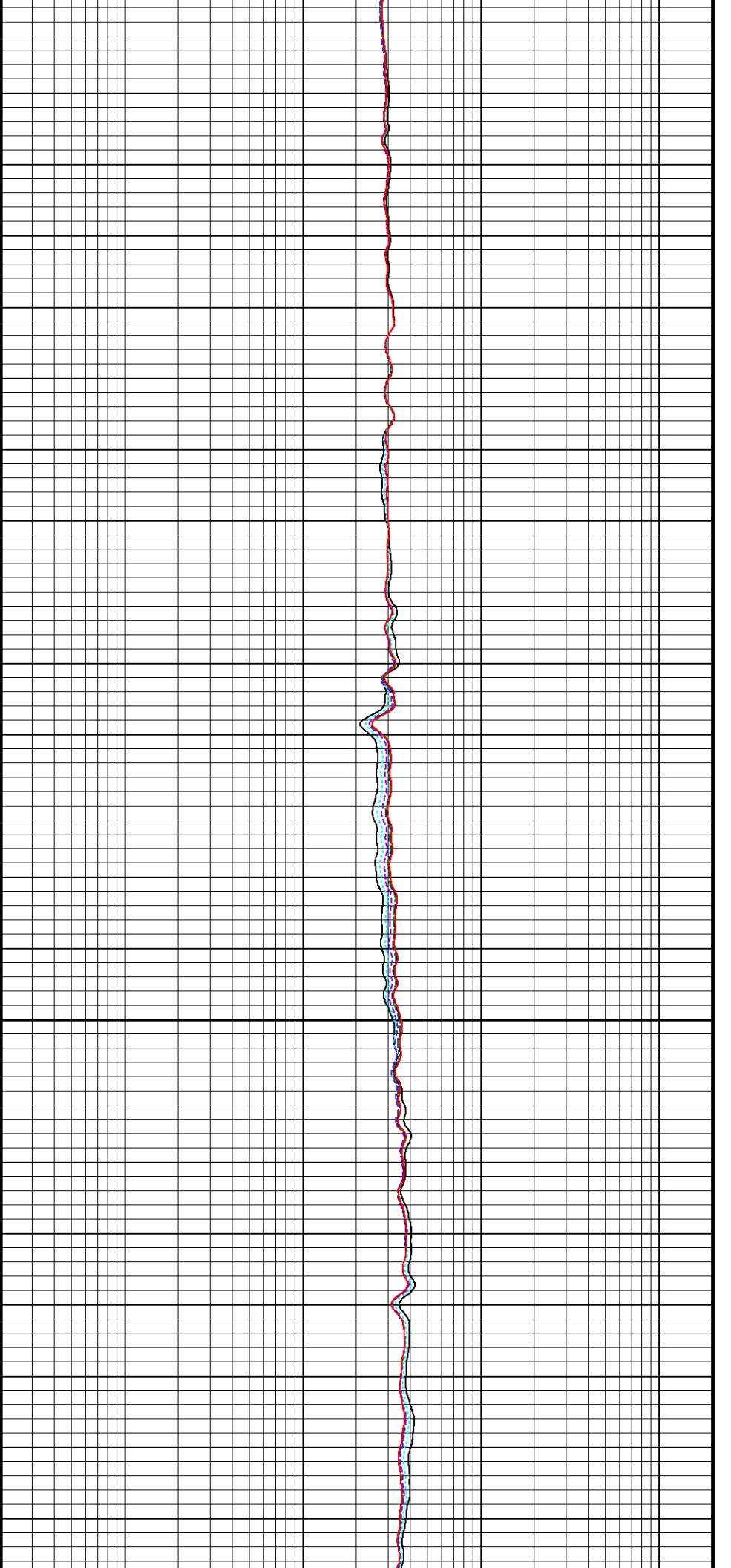
6900

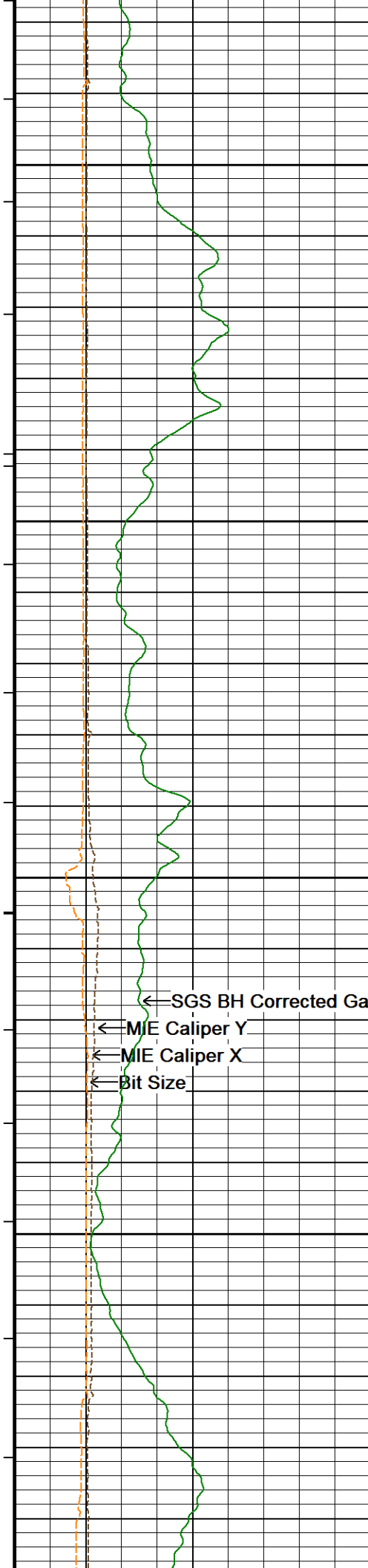
203°

6950

203°

7000





203°

7050

203°

7100

203°

7150

← SGS BH Corrected Gamma

← MIE Caliper Y

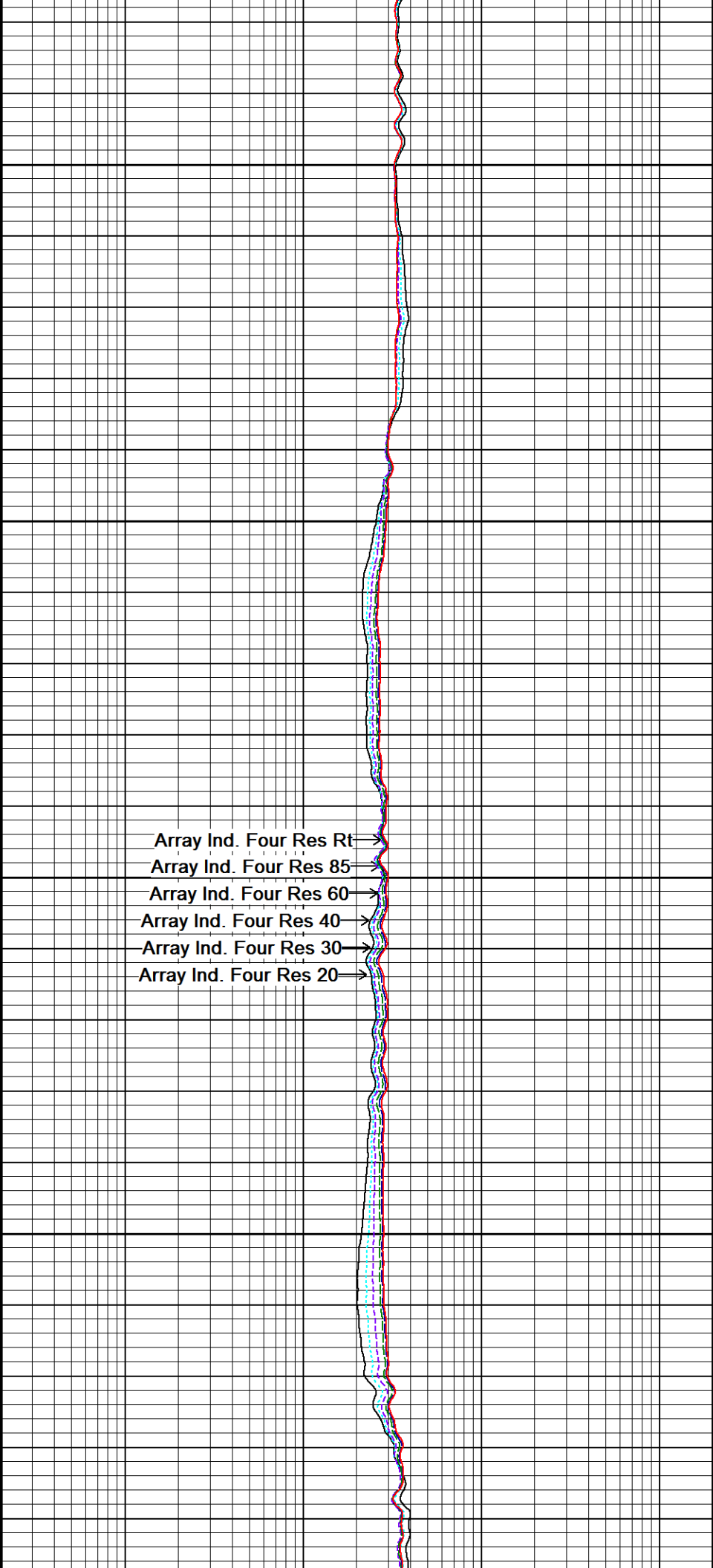
← MIE Caliper X

← Bit Size

203°

7200

203°



Array Ind. Four Res Rt →

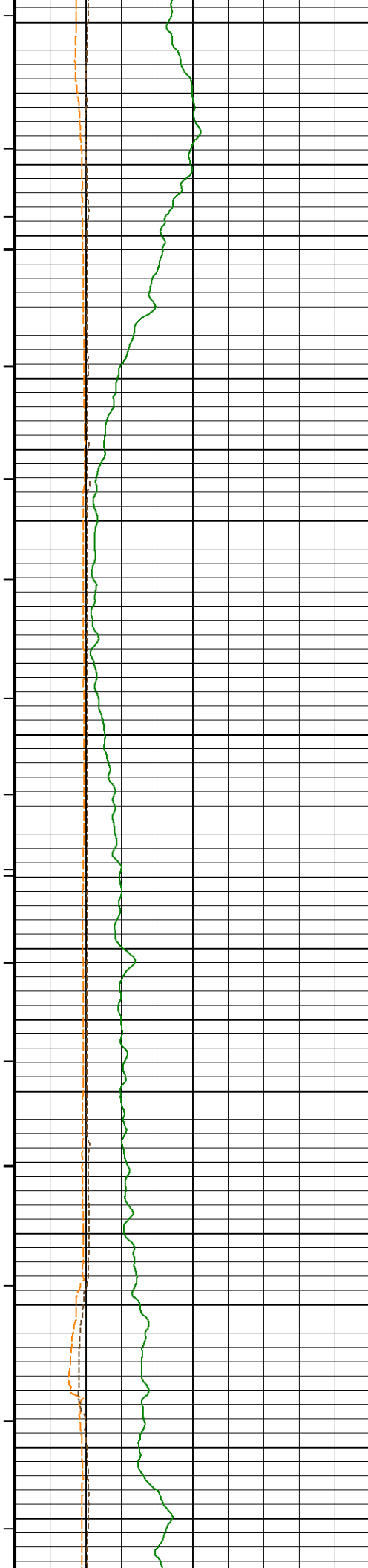
Array Ind. Four Res 85 →

Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →



7250

203°

7300

203°

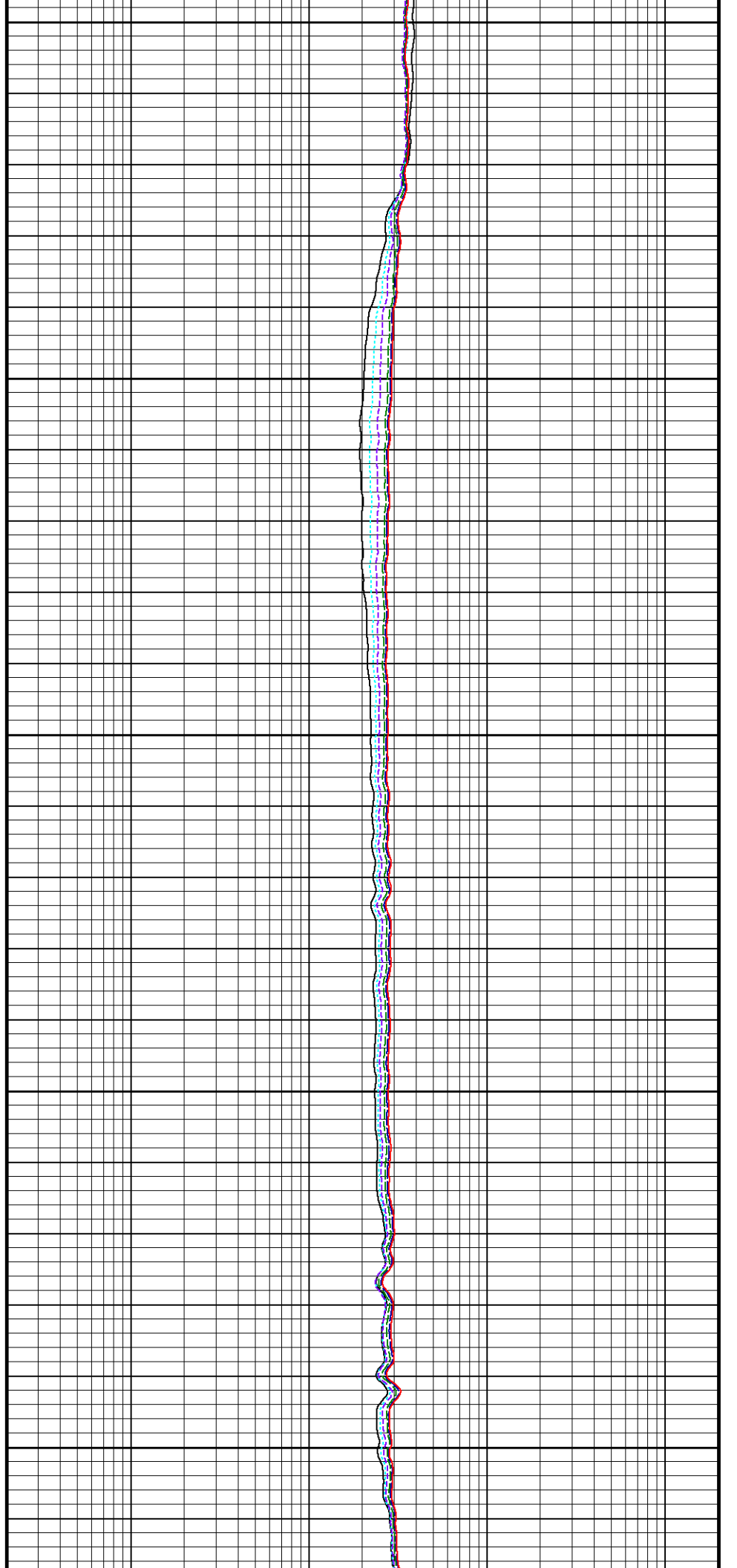
7350

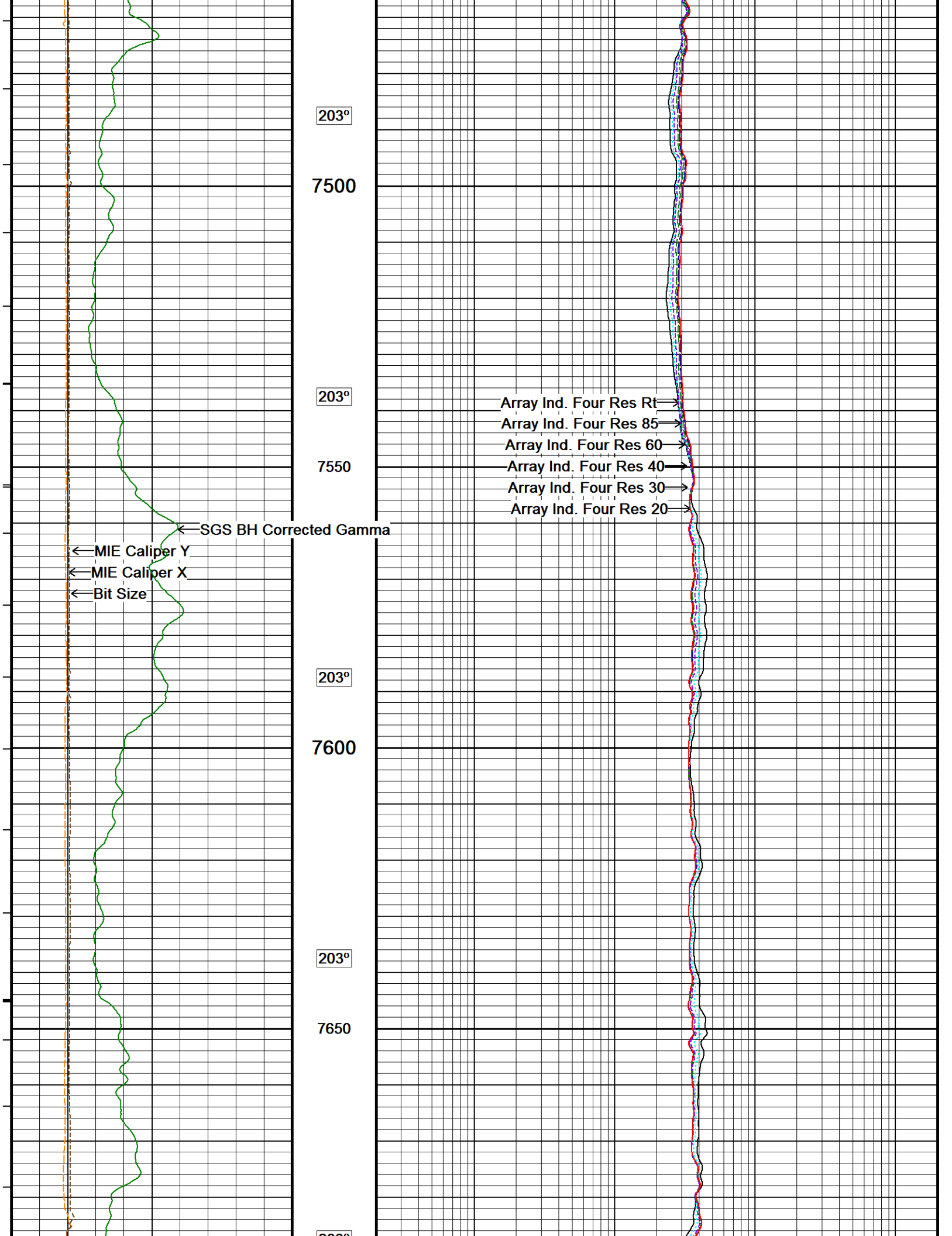
203°

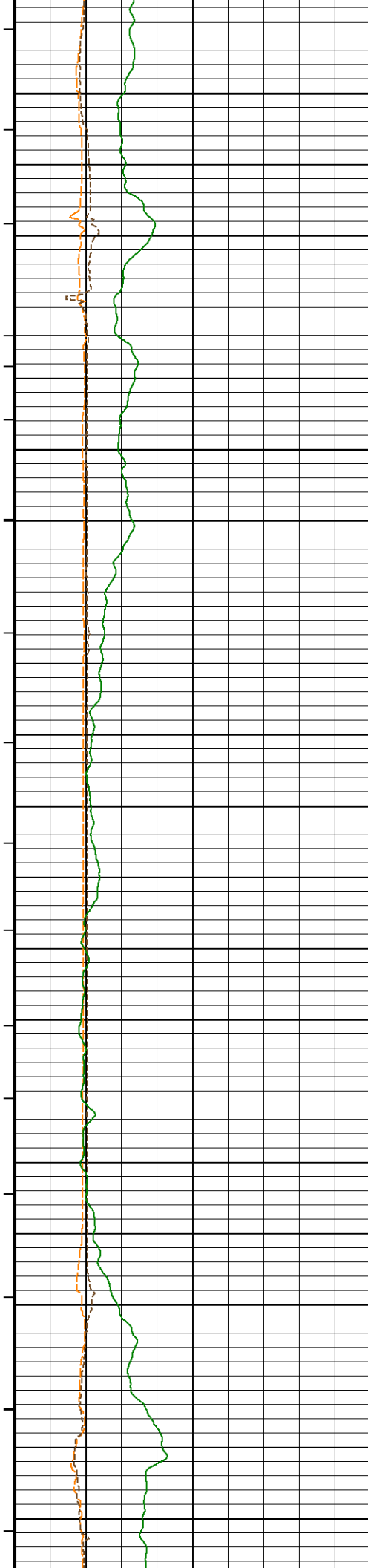
7400

203°

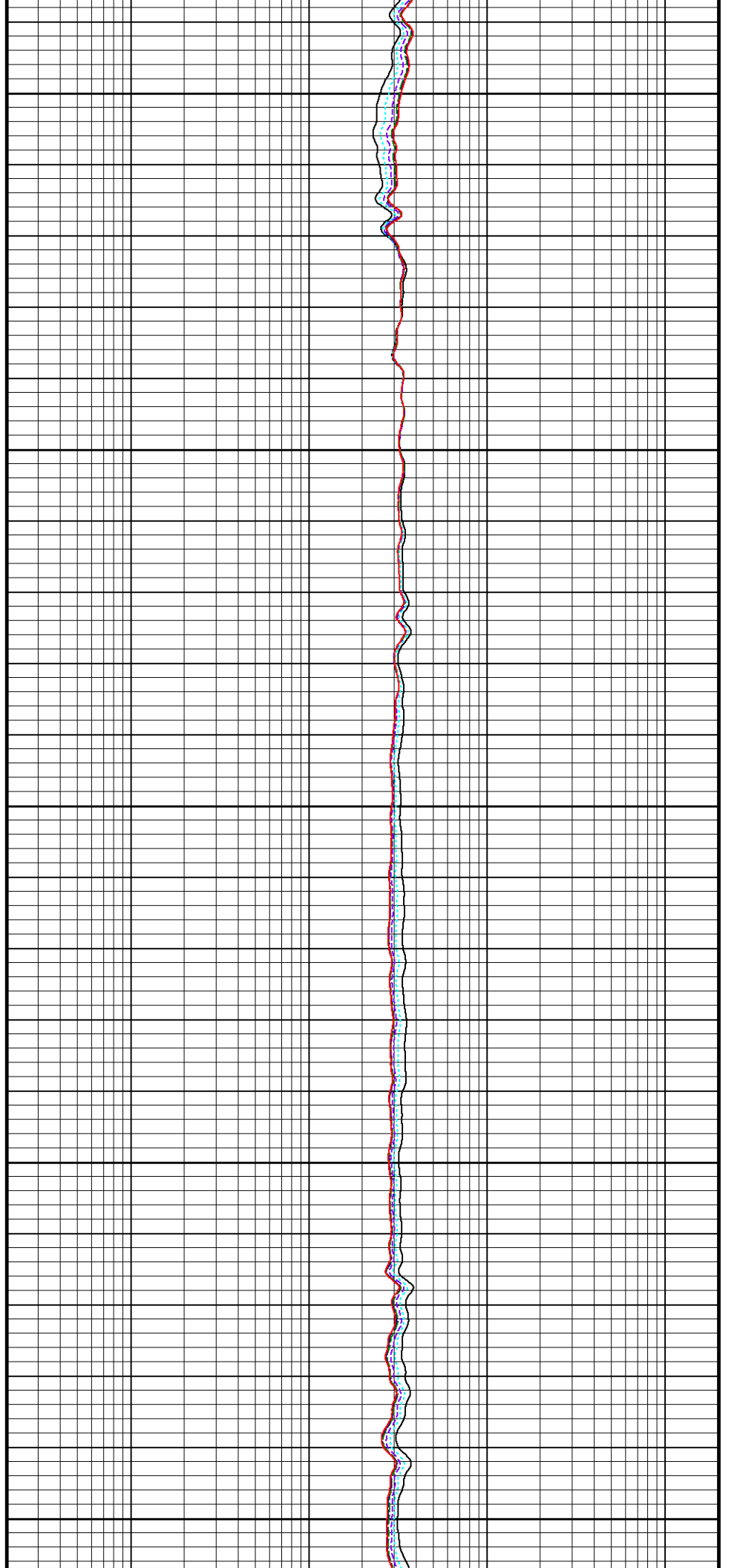
7450

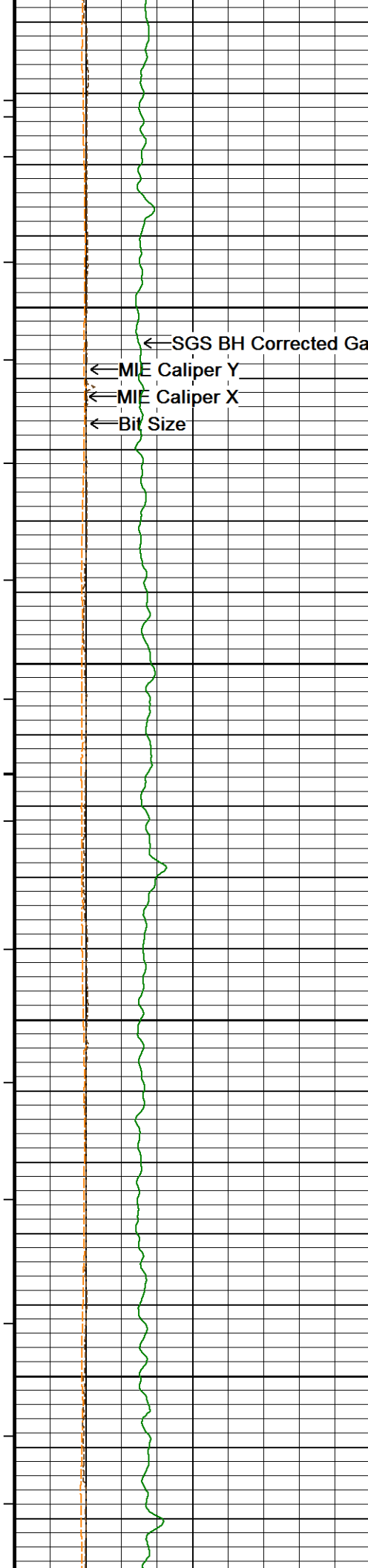






203°
7700
203°
7750
203°
7800
203°
7850
203°
7900





203°

7950

203°

8000

203°

8050

203°

8100

Array Ind. Four Res Rt →

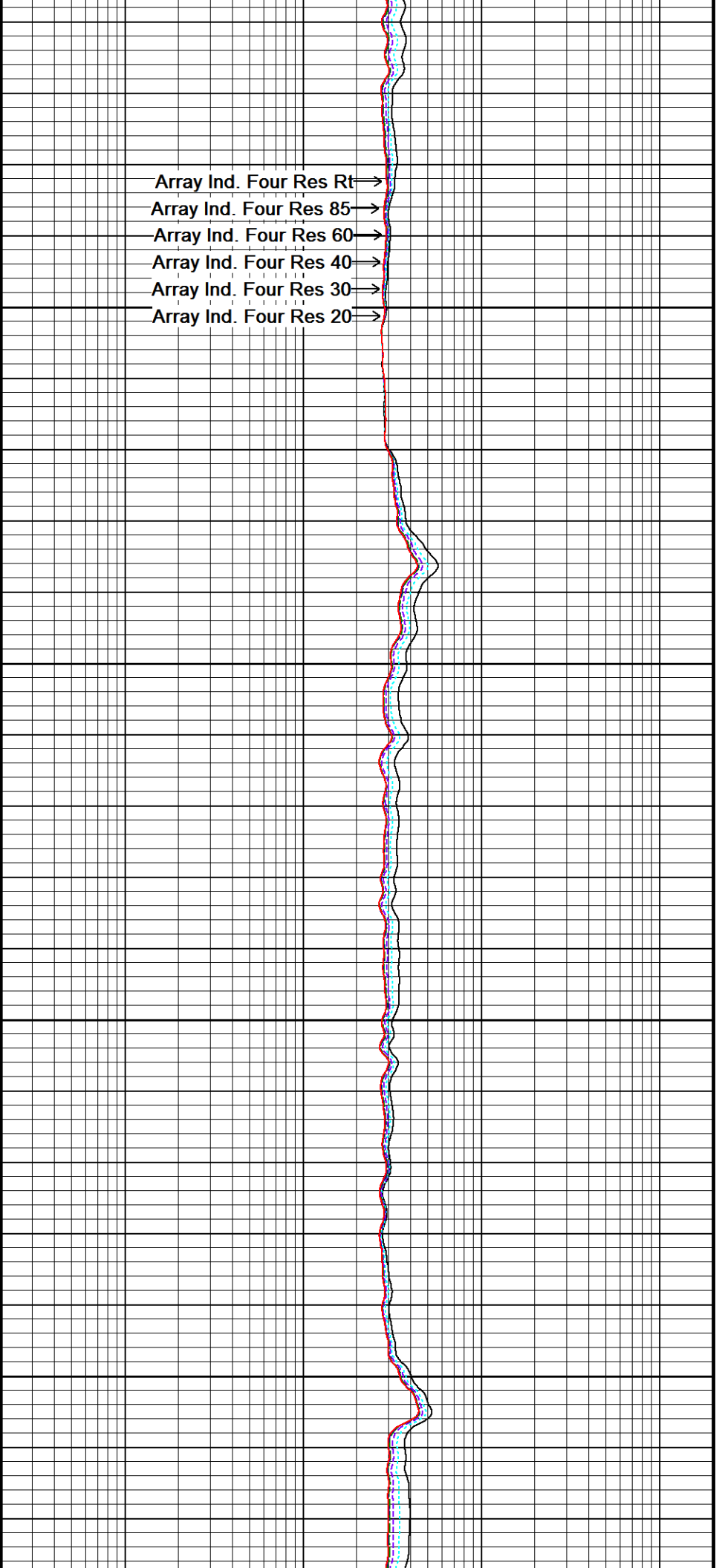
Array Ind. Four Res 85 →

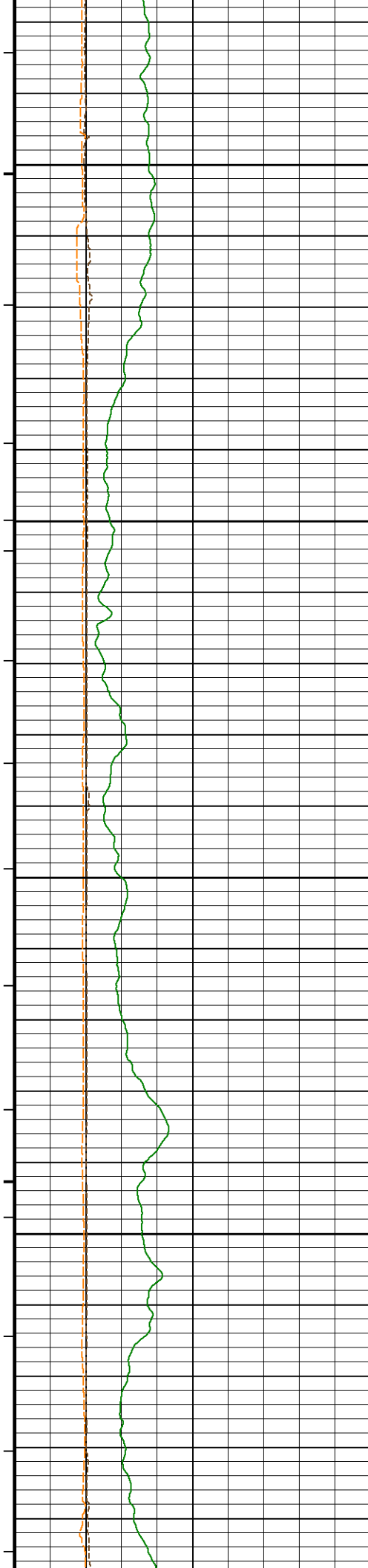
Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →





203°

8150

203°

8200

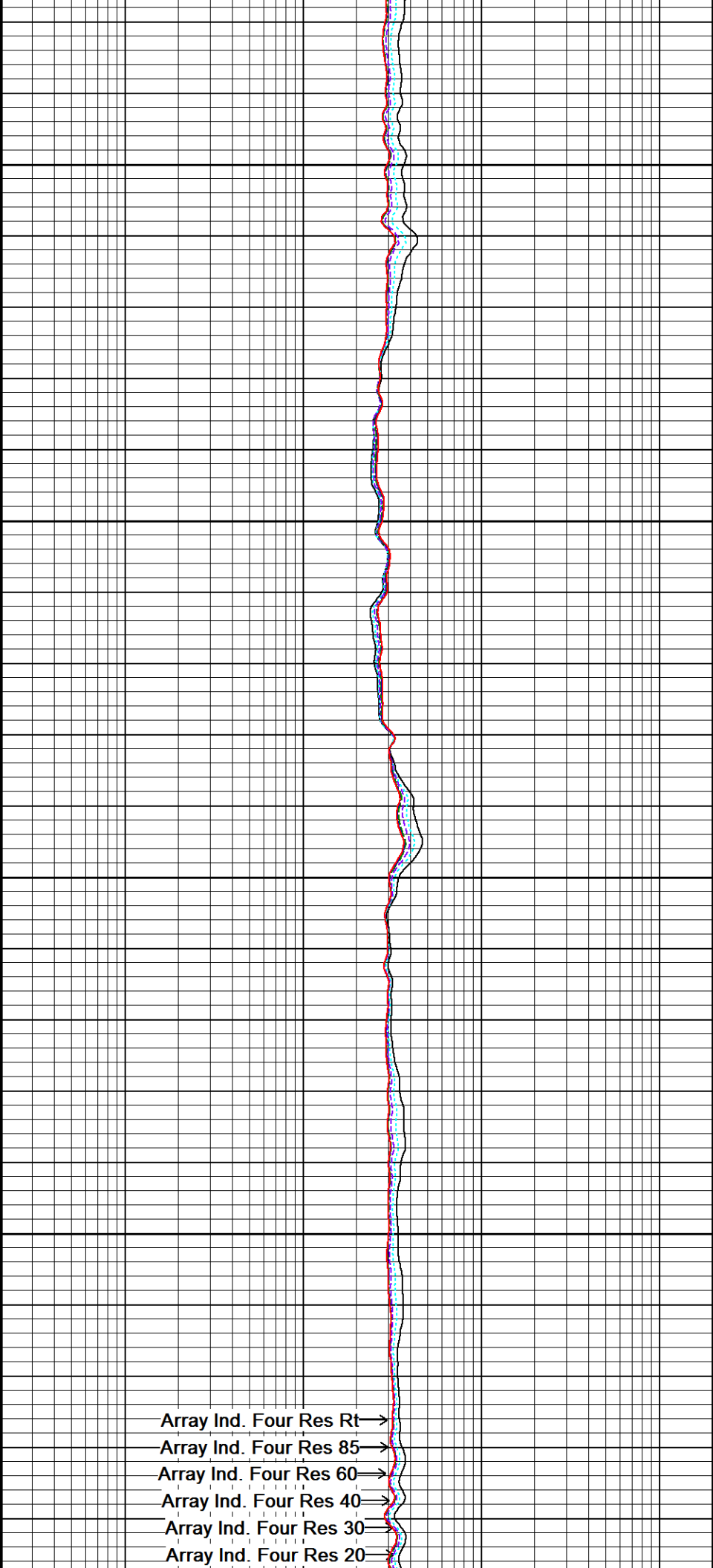
203°

8250

203°

8300

203°



Array Ind. Four Res Rt →

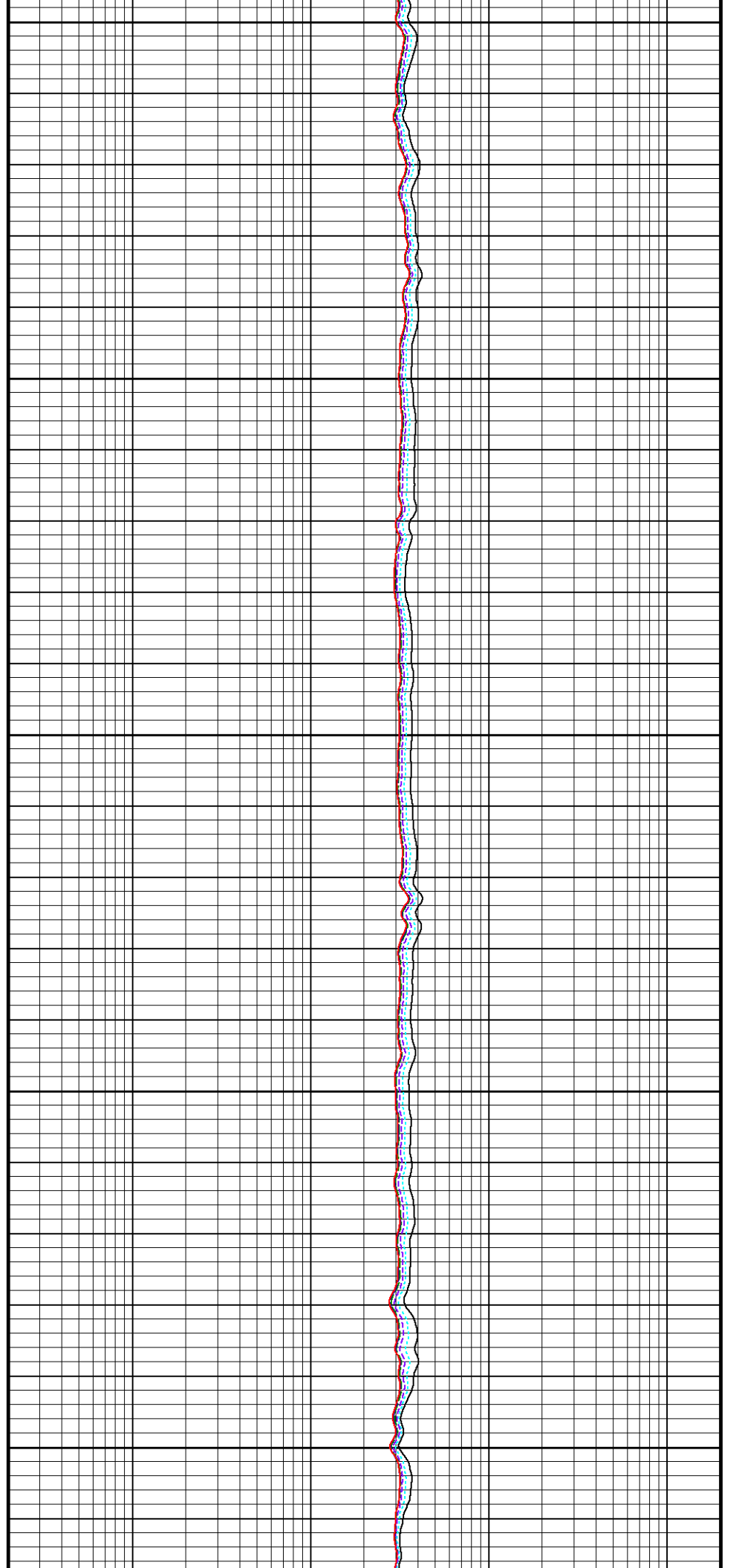
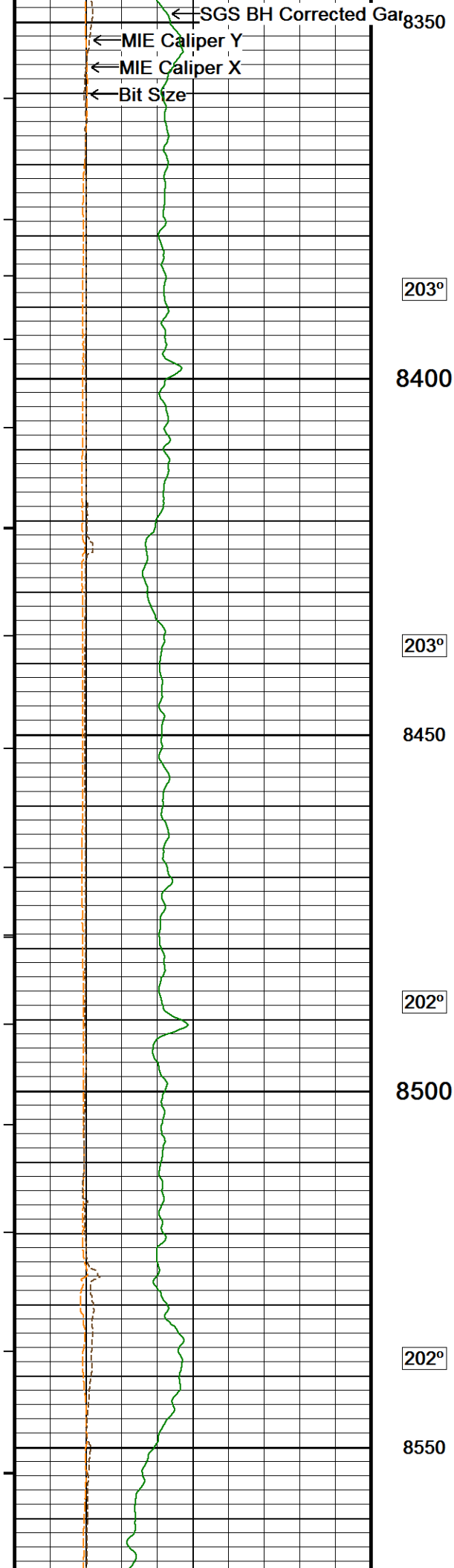
Array Ind. Four Res 85 →

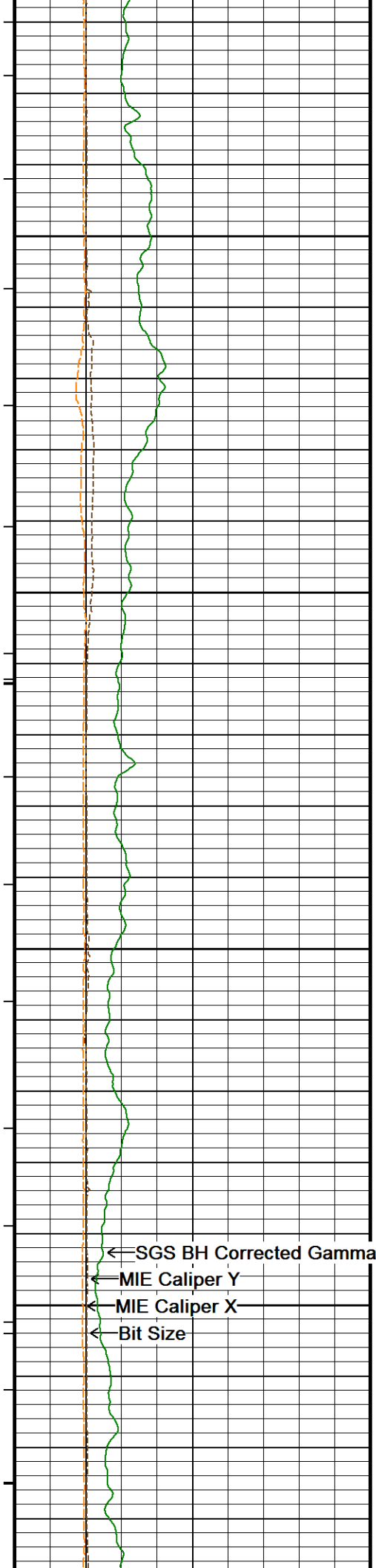
Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →





202°

8600

202°

8650

202°

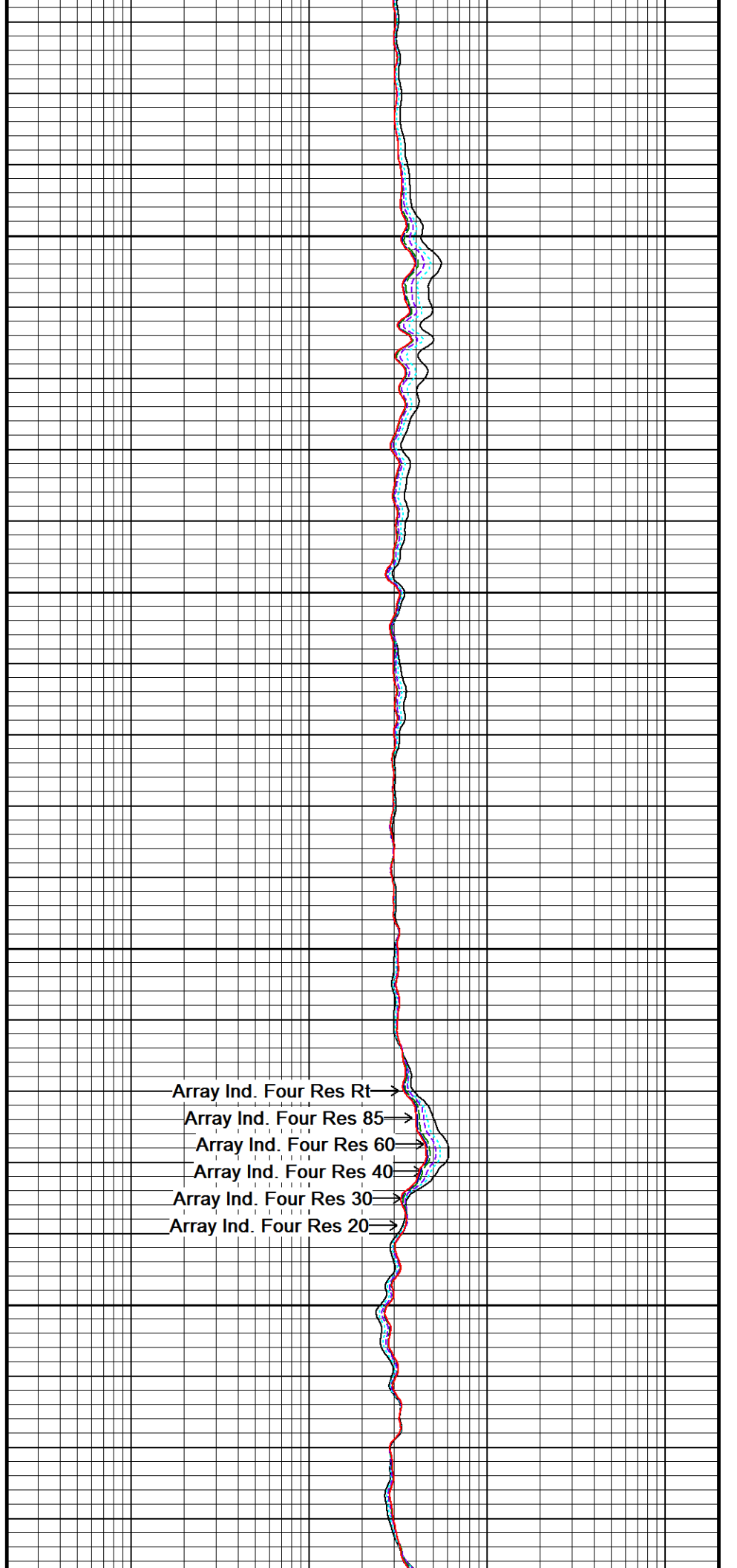
8700

202°

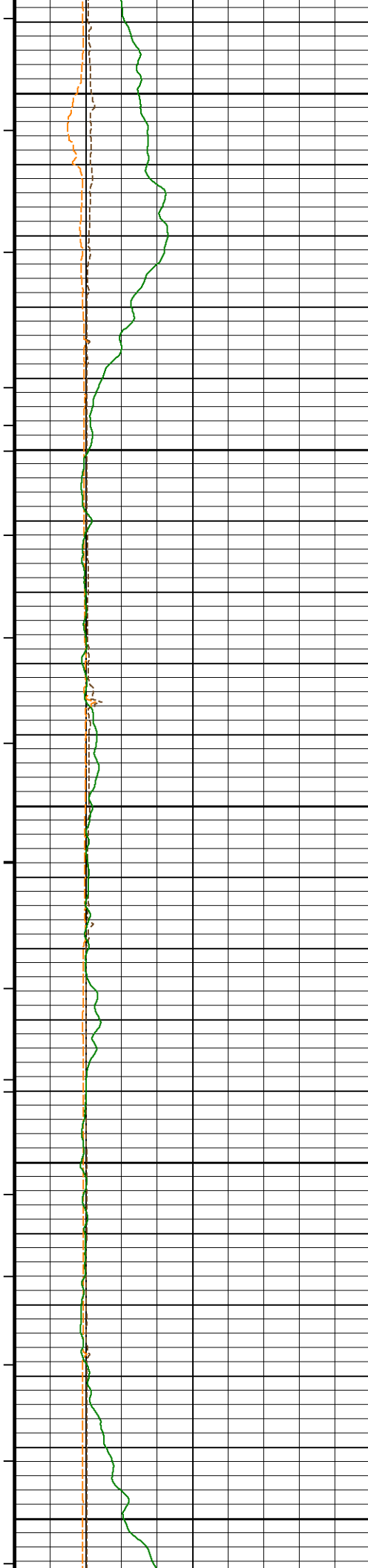
8750

8800

← 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



201°

8800

201°

8850

201°

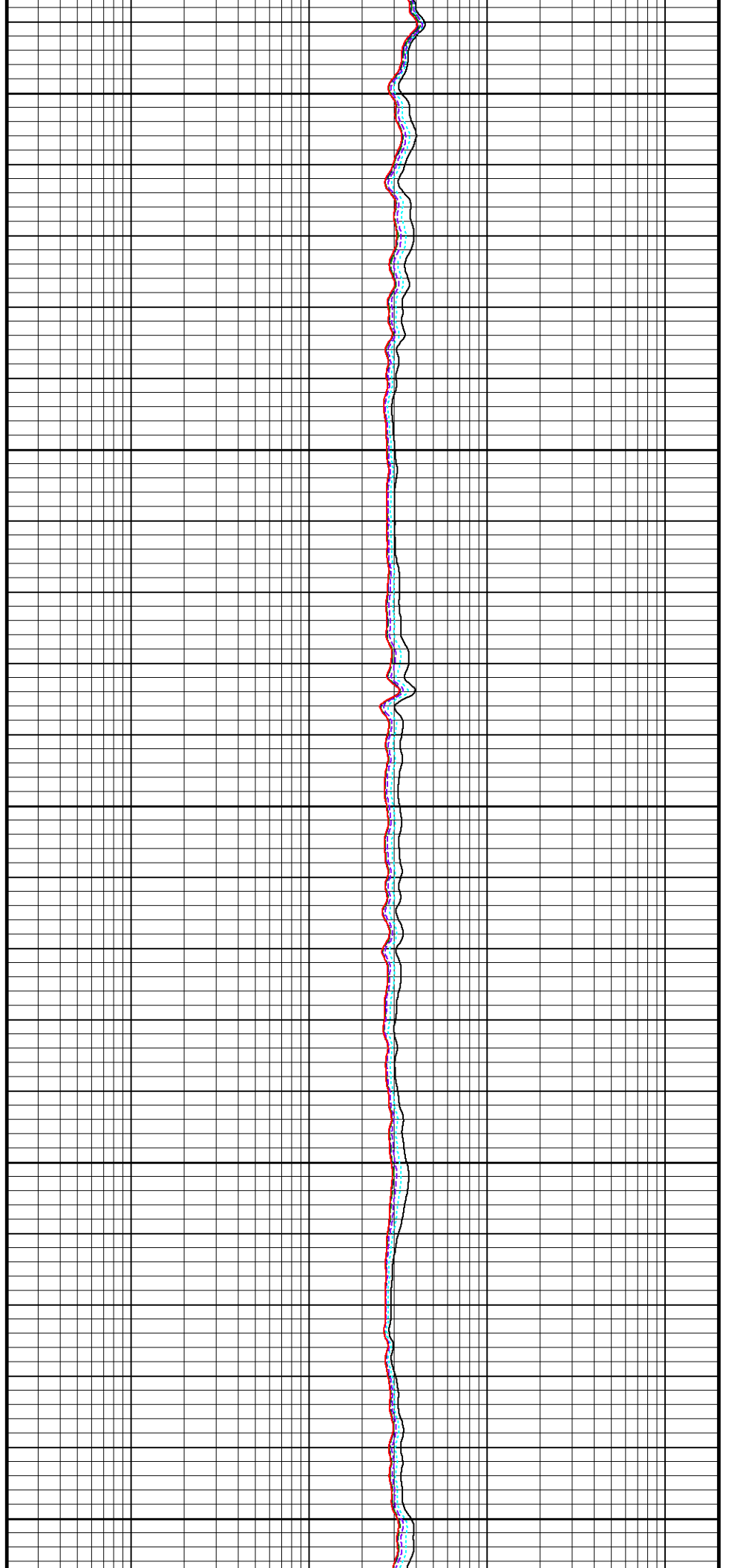
8900

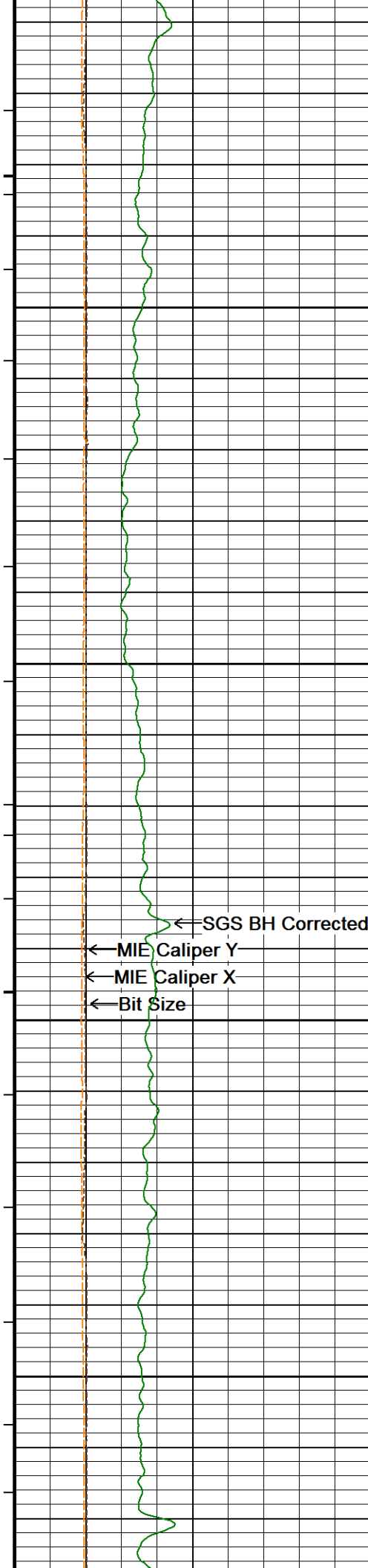
201°

8950

201°

9000





201°

9050

200°

9100

← SGS BH Corrected Gamma

← MIE Caliper Y

← MIE Caliper X

← Bit Size

200°

9150

200°

9200

Array Ind. Four Res Rt →

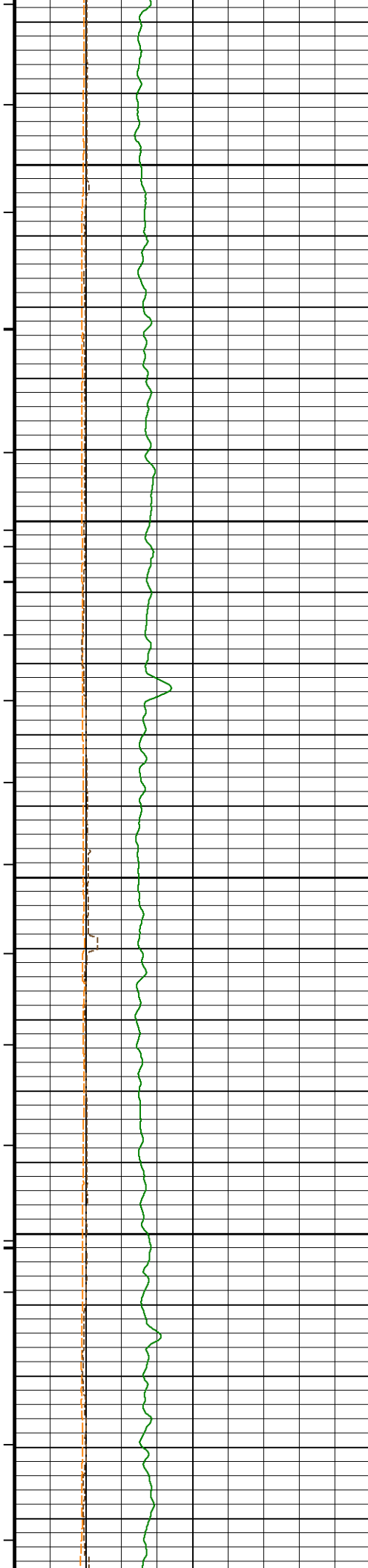
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Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →



199°

9250

199°

9300

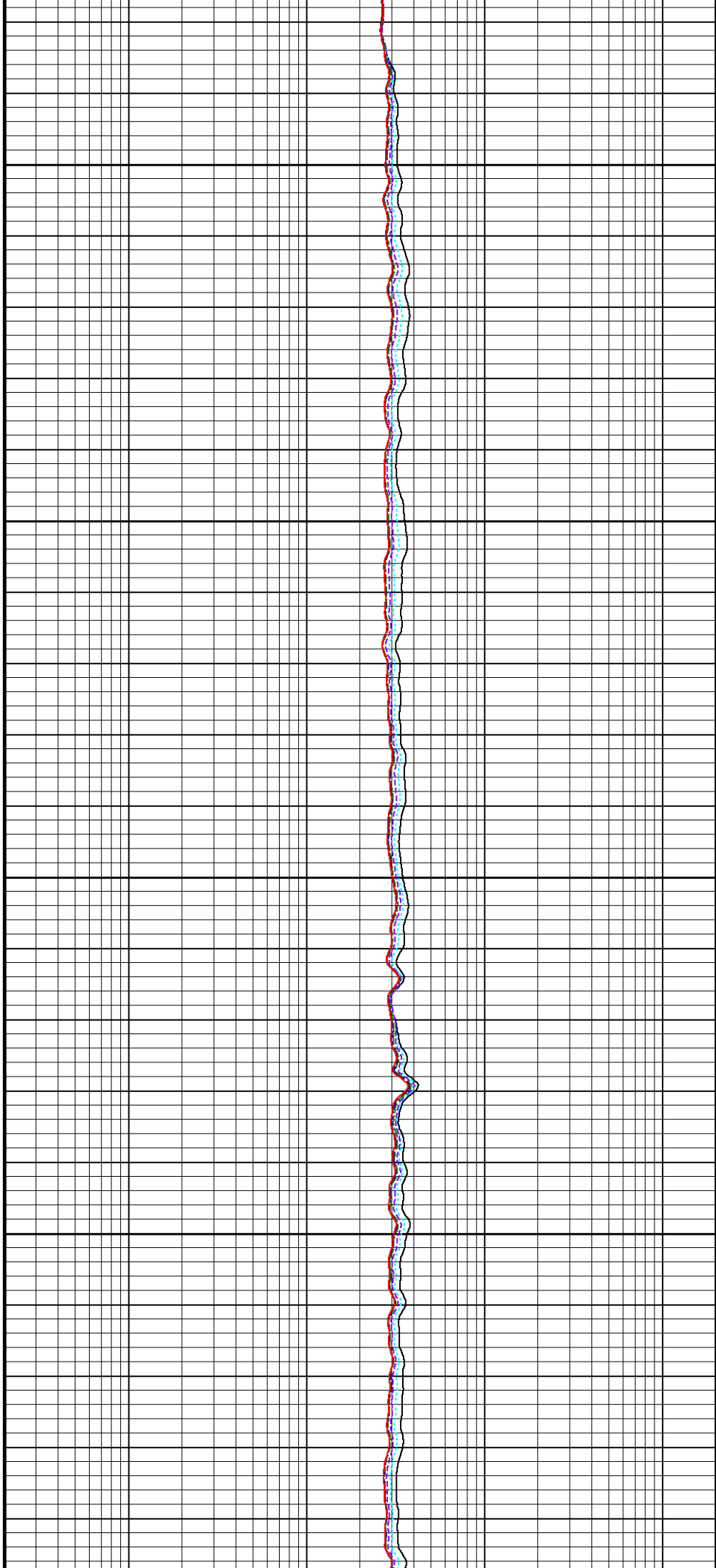
198°

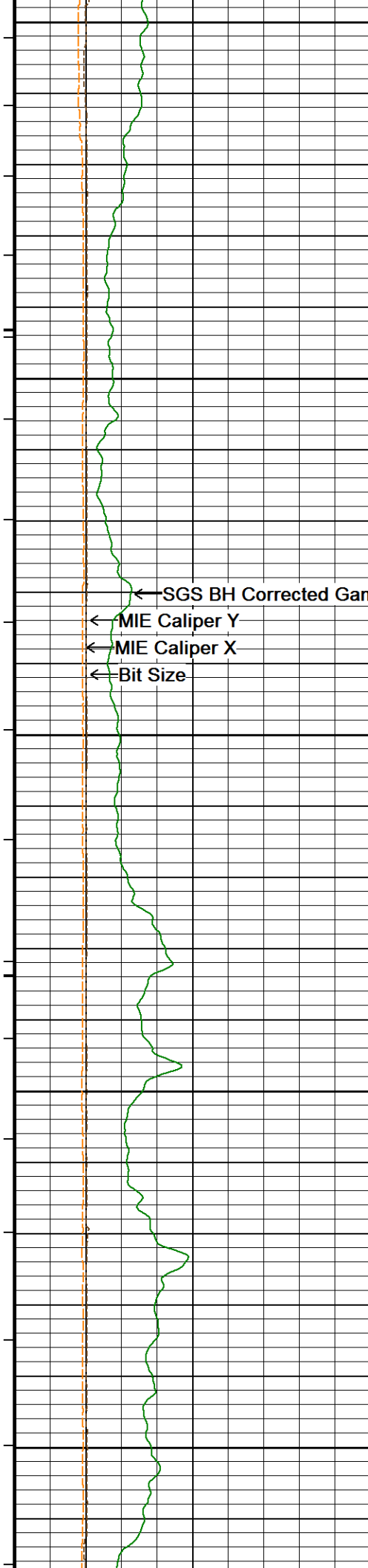
9350

197°

9400

197°





9450

196°

9500

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

196°

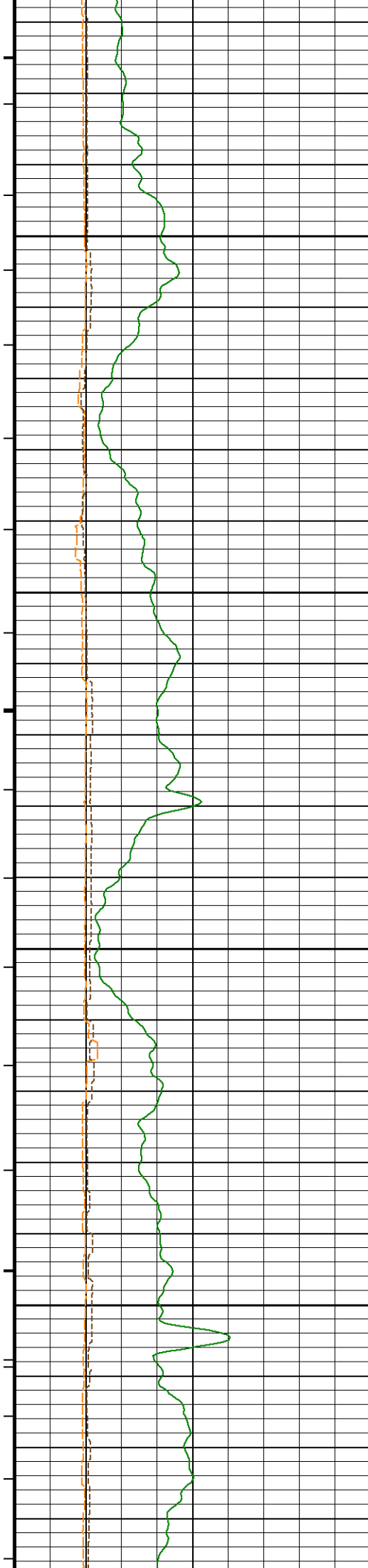
9550

195°

9600

194°

9650



194°

9700

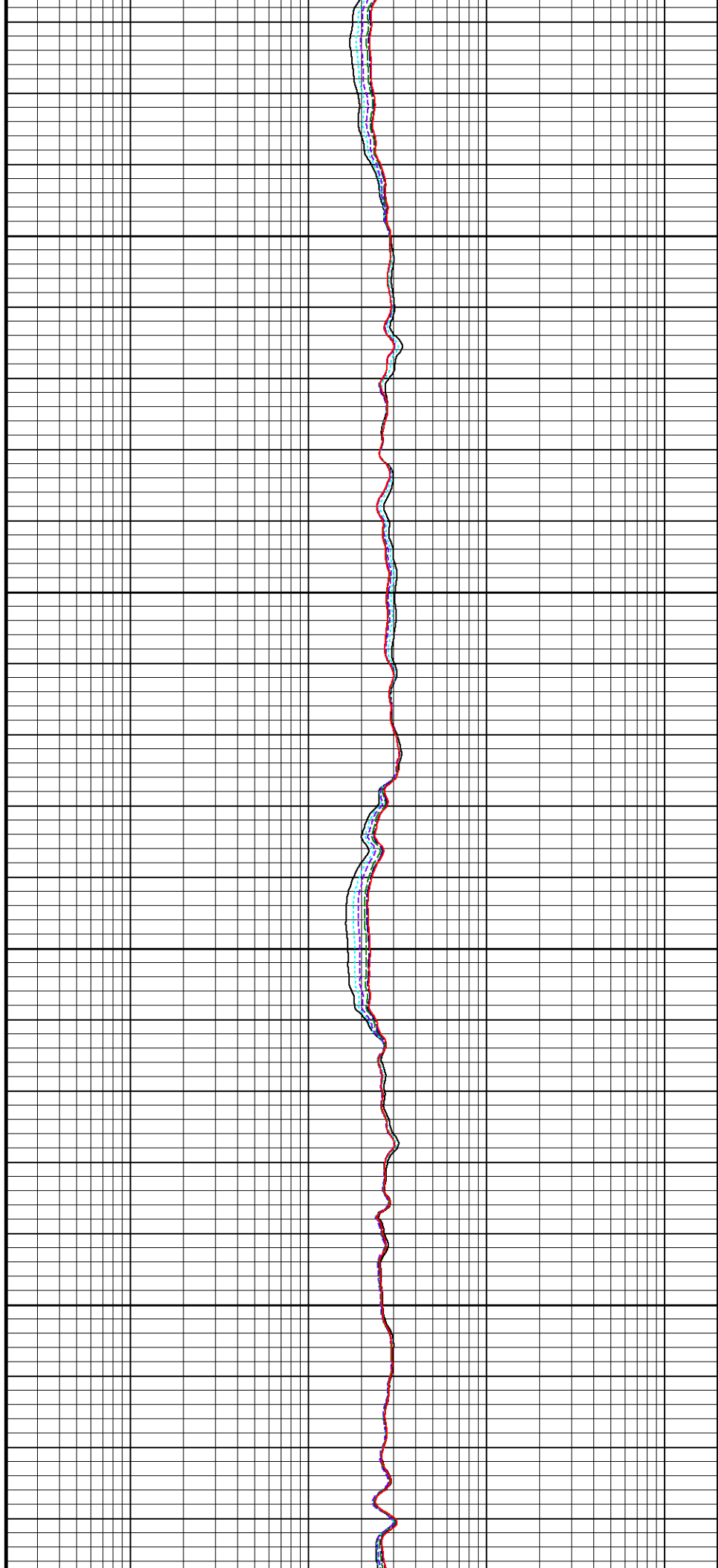
195°

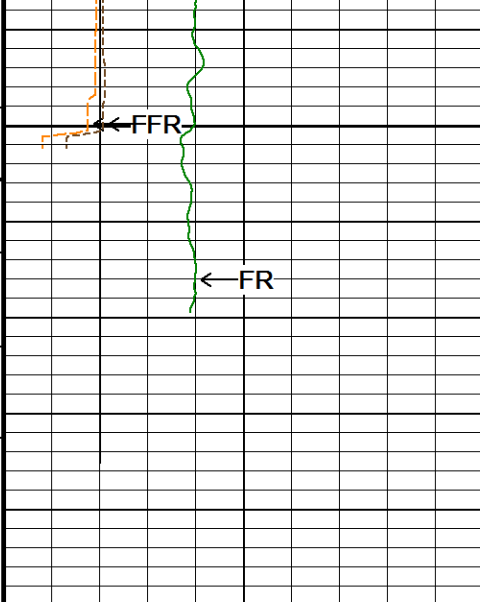
9750

201°

9800

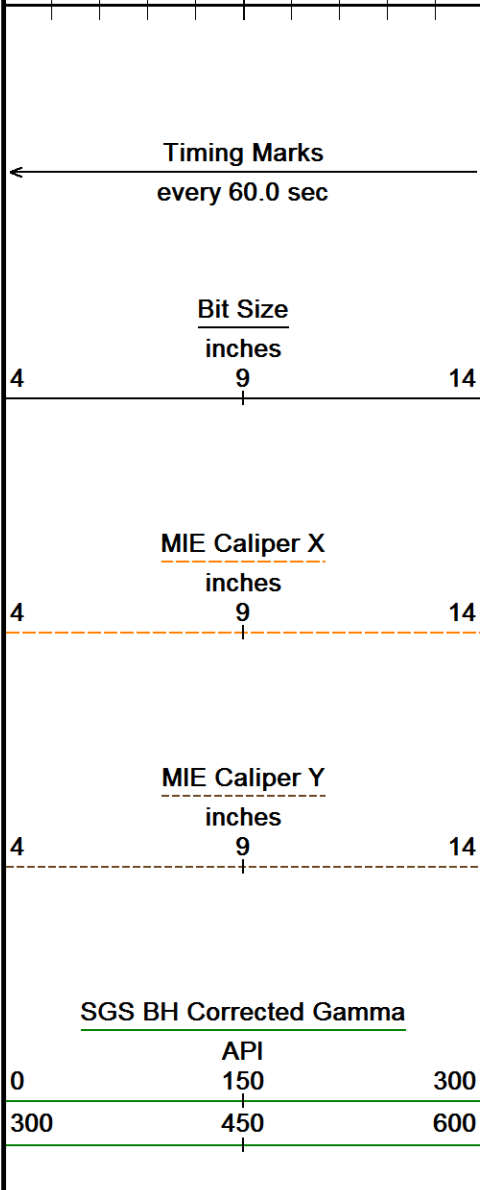
9850





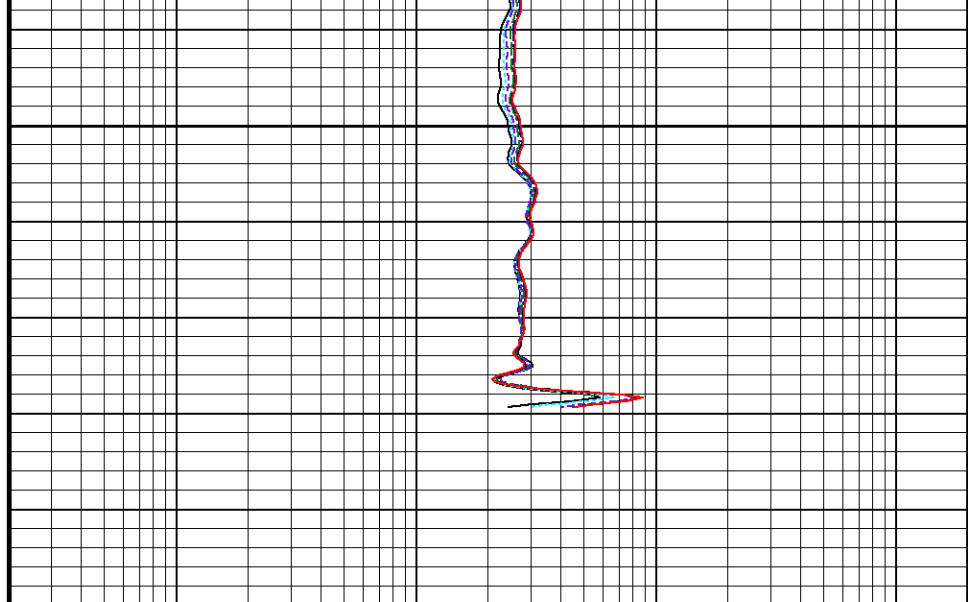
9900

9950
Depth
in
Feet



Borehole
Temp in
deg F

Replay
Scale
1:240



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\LOGS\WHITING\Horsetail 02D-0204\MMS Depth.dta
System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220
Plotted on 14-OCT-2014 23:14
Recorded on 14-OCT-2014 18:53

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION
C:\LOGS\WHITING\Horsetail 02D-0204\MMS Depth.dta

General Parameters

Mud Resistivity	1.370	ohm-metres
Mud Resistivity Temperature	78.200	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Four Res Rt
RWA Constant A	0.610
RWA Constant M	2.150
SW/APOR Tool Source	0.000

Strain Gauge Constants MMS-F.A 246

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		

Gamma Calibration MGS-D.A 220

Field Calibration on 13-OCT-2014 18:03

	Measured	Calibrated (API)
Background	142	101
Calibrator (Gross)	991	703
Calibrator (Net)	848	602

Gamma Constants MGS-D.A 220

Last Edited on 13-OCT-2014,17:45

Gamma Calibrator Number	GRC-224	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.09	%

SP Calibration MGS-D.A 220

Field Calibration on 13-OCT-2014,17:44

	Measured	Calibrated (mV)
Reference 1	100.0	101.0
Reference 2	-100.0	-101.0

High Resolution Temperature Calibration MGS-D.A 220

Field Calibration on 13-OCT-2014,17:44

	Measured	Calibrated(Deg F)
Lower	20.00	21.00
Upper	200.00	201.00

High Resolution Temperature Constants MGS-D.A 220

Last Edited on 13-OCT-2014,17:44

Pre-filter Length	11
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Neutron Calibration MDN-B.J 372

Base Calibration on 01-OCT-2014 13:06

Base Calibration

Base Calibration		Measured	Calibrated (cps)	
	Near	Far	Near	Far
	2881	87	3714	110
Ratio	33.018		33.764	
Field Calibrator at Base				
			Calibrated (cps)	
			2377	3500
Ratio			0.679	
Field Check				
			Calibrated (cps)	
			2392	3557
Ratio			0.672	

Neutron Constants MDN-B.J 372

Last Edited on 13-OCT-2014,17:40

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	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

Accelerometer Parameters MIE-A.J 241

Date Of Last Accelerometer Calibration	8-APR-2012,12:35		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.108980	-1.107773	-1.091611
Offset	-0.003545	0.008582	-0.004936

Accelerometer Constants MIE-A.J 241

Last Edited on 24-SEP-2014,15:24

Accelerometer Calibrator Number		000			
Accelerometer Temperature Characterisation					
X Accelerometer					
Serial Number		922			
Calibration Date		14-Nov-2010			
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	1.98626e-005	-2.34772e-009	1.61466e-010	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.59314e-004	4.64734e-007	5.67183e-010	
Y Accelerometer					
Serial Number		970			
Calibration Date		19-Jan-2011			
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	-4.23329e-006	-2.08894e-008	1.84400e-010	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.61643e-004	3.45088e-007	8.15526e-010	
Z Accelerometer					
Serial Number		1076			
Calibration Date		05-May-2011			
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	-5.18602e-006	1.72429e-008	7.30746e-011	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.93462e-004	2.41183e-007	1.26400e-009	

Magnetometer Parameters MIE-A.J 241

Date Of Last Magnetometer Calibration	9-AUG-2014,14:48		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.010059	-0.993063
Offset	0.000064	-0.018611	0.005101

Magnetometer Constants MIE-A.J 241	Last Edited on
Magnetometer Calibrator Number	000

Caliper Calibration MIE-A.J 241	Base Calibration on 24-SEP-2014 15:35 Field Calibration on 24-SEP-2014 15:36				
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	25791	29402	5.97		
2	35739	39625	7.96		
3	45187	49544	9.86		
4	56655	60899	11.92		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25282	25027	24801	25969	5.97
2	34223	33459	33093	34195	7.96
3	42933	41405	40947	42789	9.86
4	53039	50642	50663	53201	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured Pads 1-5 Caliper(in)	Measured Pads 3-7 Caliper(in)	Actual Caliper(in)		
	5.94	6.00	5.97		
	Measured Pad 2 Caliper(in)	Measured Pad 4 Caliper(in)	Measured Pad 6 Caliper(in)	Measured Pad 8 Caliper(in)	Actual Caliper(in)
	2.99	2.98	2.96	2.97	5.97

Caliper Constants MIE-A.J 241	Last Edited on 24-SEP-2014,15:26		
Caliper Difference for BRKT	0.120	inches	

Navigation Constants MIE-A.J 241	Last Edited on 14-OCT-2014,17:29		
Magnetic Declination	7.88	degrees	East

Imager Pad Check MIE-A.J 241	Field Check on		
Pad 1	Pad Not Tested	Pad 5	Pad Not Tested
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested

Compact Micro Imager Constants MIE-A.J 241	Last Edited on 29-SEP-2014,05:04		
Sonde Configuration	Imager Mode		
Arm-Pad Kit	Normal Pads (12.25 in)		
Arm-Pad Kit Serial Number	N/A		
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		

Induction Calibration MAI-B.A 289	Base Calibration on 09-OCT-2014,22:26 Field Check on 13-OCT-2014 17:31		
Base Calibration			
Test Loop Calibration			
Channel	Low	High	Calibrated (mmho/m)
1	16.7	472.3	9.3 966.2
2	5.8	281.0	7.6 821.4

2	5.8	581.9	7.6	621.4
3	3.2	261.2	5.2	566.0
4	1.9	138.0	2.6	279.2
Array Temperature		76.1	Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			13.3	3834.5
2			30.6	3519.7
3			28.7	3019.5
4			18.9	1996.6
Deep			16.6	1912.5
Medium			42.9	4037.7
Shallow			47.0	5279.8
Array Temperature			61.2	Deg F

Induction Constants MAI-B.A 289			Last Edited on 13-OCT-2014,20:17	
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		

High Resolution Temperature Calibration MAI-B.A 289			Field Calibration on 13-OCT-2014,17:32
	Measured	Calibrated(Deg F)	
Lower	10.00	10.00	
Upper	100.00	101.00	

High Resolution Temperature Constants MAI-B.A 289		Last Edited on 13-OCT-2014,17:32
Pre-filter Length	11	

Photo Density Calibration MPD-C.J 378				Base Calibration on 01-OCT-2014 11:53	
				Field Check on 13-OCT-2014 17:38	
Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
	Near	Far		Near	Far

Background	1145	1223		
Reference 1	56123	24901	59443	30683
Reference 2	22147	2322	25113	2508
Field Check at Base				
	1145.2	1222.9		
Field Check				
	1146.1	1229.0		
PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	209	1030		
Reference 1	24056	55936	0.434	0.372
Reference 2	6396	22017	0.295	0.268
Field Check at Base				
	209.3	1029.7		
Field Check				
	210.5	1029.5		

Density Constants MPD-C.J 378

Last Edited on 13-OCT-2014,17:34

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	1.09 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 378

Base Calibration on 14-OCT-2014 22:05
Field Calibration on 14-OCT-2014 22:06

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13922	4.01
2	22072	5.97
3	30204	7.96
4	38079	9.86
5	47409	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.97

Spectral Gamma Calibration SGS-E.J 128

Base Calibration on 25-SEP-2014 17:21
Field Calibration on 13-OCT-2014,17:33

Base Calibration					
Potassium Calibrator					
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	106.5	36.9	3.8	1.4	2.3
Calibrator (Gross)	234.7	121.4	29.0	1.5	2.4
Calibrator (Net)	128.2	84.5	25.2	0.1	0.1

Calibrator (Net)	126.2	84.3	23.2	0.1	0.1
Concentrations	K % 5.9		U ppm 0.0	Th ppm 0.0	
Uranium Calibrator					
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	106.5	36.9	3.8	1.4	2.3
Calibrator (Gross)	561.8	196.8	17.3	11.1	5.9
Calibrator (Net)	455.4	159.9	13.5	9.7	3.6
Concentrations	K % 0.0		U ppm 16.6	Th ppm 0.0	
Thorium Calibrator					
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	106.5	36.9	3.8	1.4	2.3
Calibrator (Gross)	424.1	156.4	12.6	6.6	17.3
Calibrator (Net)	317.6	119.5	8.8	5.2	14.9
Concentrations	K % 0.0		U ppm 0.0	Th ppm 44.7	
Mixture Calibrator					
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	106.5	36.9	3.8	1.4	2.3
Calibrator (Gross)	906.0	369.5	48.4	14.6	19.8
Calibrator (Net)	799.6	332.5	44.6	13.2	17.5
Field Calibration					
Gamma Ray		Measured	Calibrated (API)		
Background		157	31		
Calibrator (Gross)		1356	271		
Calibrator (Net)		1199	240		
Mixture Calibrator					
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	105.4	35.9	3.8	1.4	2.2
Calibrator (Gross)	900.9	365.2	48.3	14.3	19.5
Calibrator (Net)	795.4	329.3	44.5	12.9	17.3
Spectral Gamma Constants SGS-E.J 128					Last Edited on 13-OCT-2014,17:33
Background Calibrator Number	440				
Mixture Calibrator Number	450				
Potassium Calibrator Number	500				
Uranium Calibrator Number	506				
Thorium Calibrator Number	503				
Mud Density	1.09	gm/cc			
Caliper Source for Processing	Density Caliper				
Tool Position	Eccentred				
Concentration of KCl		kppm			
K Mud Type	Chloride				
K Mud Concentration	0.09	%			

DOWNHOLE EQUIPMENT

C:\LOGS\WHITING\Horsetail 02D-0204\MMS Depth.dta

Shuttle Running Tool 3.5"
SRT-A.A 59 LG: 6.62 ft WT: 37.5 lb OD: 2.520 in

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

Compact Linker 200 STD
MLK-A 1 LG: 8.52 ft WT: 30.9 lb OD: 2.240 in



SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 397 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 694 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 695 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

MBS-F.A 200v Compact Battery Sub
MBS-F.A 123 LG: 17.06 ft WT: 123.5 lb OD: 2.240 in

Compact Memory Sub F.A
MMS-F.A 246 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.
MTI-C.A 146 LG: 1.54 ft WT: 13.2 lb OD: 2.244 in

Compact Short Gamma
MGS-D.A 220 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 610 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 314 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 695 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Neutron
MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.J 378 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 734 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 682 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 537 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

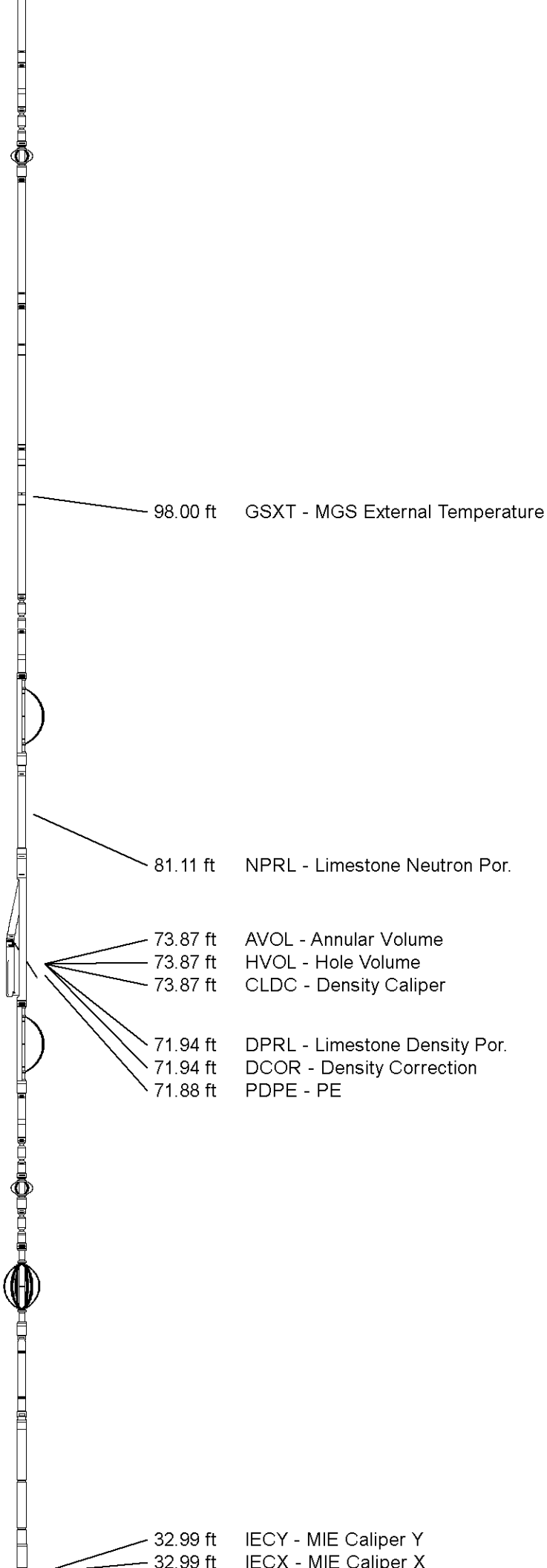
MIS-E.A Compact Inline Standoff sub
MIS-E.A 363 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 410 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 698 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section
MIM-A.J 244 LG: 4.65 ft WT: 26.5 lb OD: 2.244 in

Compact MMI Electrode Section
MIE-A.J 241 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in



MIS-D.B Compact Inline Bowspring sub
MIS-D.B 810 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 203 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

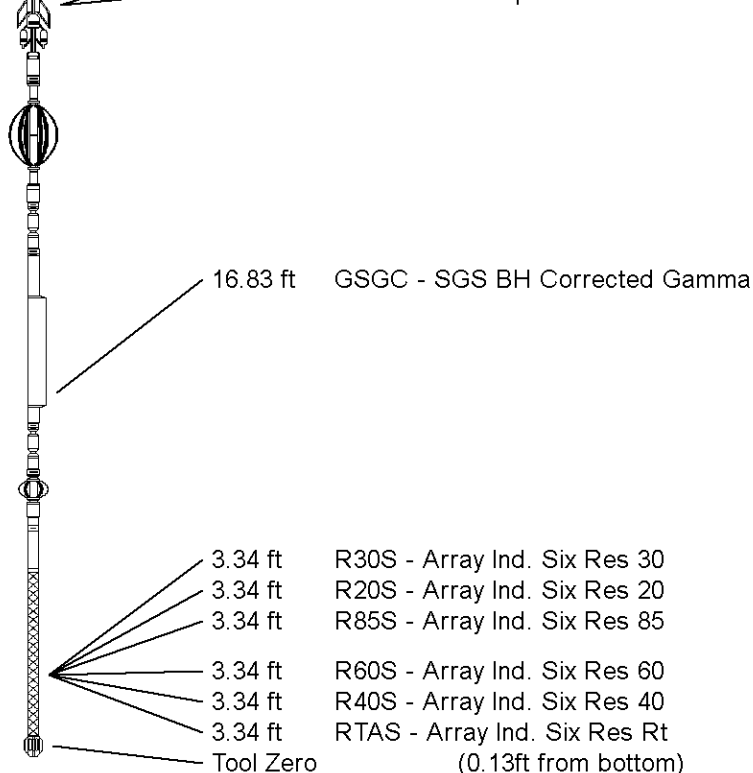
Spectral Gamma Ray Sub
SGS-E.J 128 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

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

MIS-E.B Compact Inline Standoff sub
MIS-E.B 662 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

Compact Induction
MAI-B.A 289 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 160.68 ft Weight: 1135.4 lb



COMPANY	WHITING OIL AND GAS CORPORATION
WELL	HORSETAIL 02D-0204
FIELD	REDTAIL
PROVINCE/COUNTY	WELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4795.00	feet	First Reading	9930.00	feet
Elevation Drill Floor	4795.00	feet	Depth Driller	9948.00	feet
Elevation Ground Level	4778.00	feet	Depth Logger	9948.00	feet



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