



**Weatherford®**

ARRAY INDUCTION  
LOG

COMPANY			WHITING OIL AND GAS CORP		
WELL			RAZOR 11E-0202B		
FIELD			REDTAIL		
PROVINCE/COUNTY			WELD		
COUNTRY/STATE			USA/COLORADO		
LOCATION			SHL: 2321' FNL & 822' FWL (SWNW)		
SEC 11	TWP 10N	RGE 58W	Other Services		
Latitude			MICRO-IMAGER		
Longitude			SPECTRAL GAMMA RAY		
API Number			PHOTO DENSITY		
Permanent Datum GL, Elevation 5002 feet			DUAL SPACED NEUTRON		
Log Measured From KB			Elevations:		
Drilling Measured From KB@17 feet			KB 5019.00		
Date			DF 5019.00		
Run Number			GL 5002.00		
Service Order			ONE		
Depth Driller			6551-80824109		
Depth Logger			12996.00		
First Reading			12996.00		
Last Reading			12993.00		
Casing Driller			6400.00		
Casing Logger			6425.00		
Bit Size			6420.00		
Hole Fluid Type			6.000		
Density / Viscosity			WBM		
PH / Fluid Loss			9.50 lb/USg		
Sample Source			43.00 SEC/QT		
Rm @ Measured Temp			9.00		
Rmf @ Measured Temp			FLOWLINE		
Rmc @ Measured Temp			1.55 @ 60.5		
Source Rmf / Rmc			1.24 @ 60.5		
Rm @ BHT			1.86 @ 60.5		
Time Since Circulation			1.86 @ 60.5		
Max Recorded Temp			CALC/CALC		
Equipment / Base			0.436 @225.0		
Recorded By			8 HOURS		
Witnessed By			225.00		
			deg F		
			18063		
			CASPER		
			C CULLEN		
			K SALLER		
			B MILLER		

BOREHOLE RECORD			Last Edited: 02-MAR-2014 06:01	
Bit Size inches	Depth From feet	Depth To feet		
6.000	6425.00	12996.00		
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	6425.00	29.00

REMARKS
SOFTWARE VERSION USED: 13.08.2113 TOOLS CONVEYED VIA CML WELL SHUTTLE.
TRIPLE COMBO - IMAGER - SPECTRAL GAMMA RAY WAS LOGGED IN A SINGLE RUN USING A 200V MEMORY CONVEYANCE SYSTEM.
HARDWARE USED: SEE TOOL DIAGRAM.
LAT: 40.854189 LONG: -103.839389

CUSTOMER'S SCALES USED AND INTERVALS LOGGED.

ALL DEPTHS RECORDED WITH WEATHERFORD DEPTHLOG DEPTH SYSTEM IN CONJUNCTION WITH PASON (RIGS) EDR SYSTEM.  
ALL DEPTHS CORRECTED TO DRILLER'S STRAP DEPTH.

4.5 INCH PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUME.

ANNULAR HOLE VOLUME FROM TD TO SURFACE CASING: 1330CUBIC FEET

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 610 CUBIC FEET

BOREHOLE SIZE AND RUGOSITY WILL AFFECT DATA QUALITY.

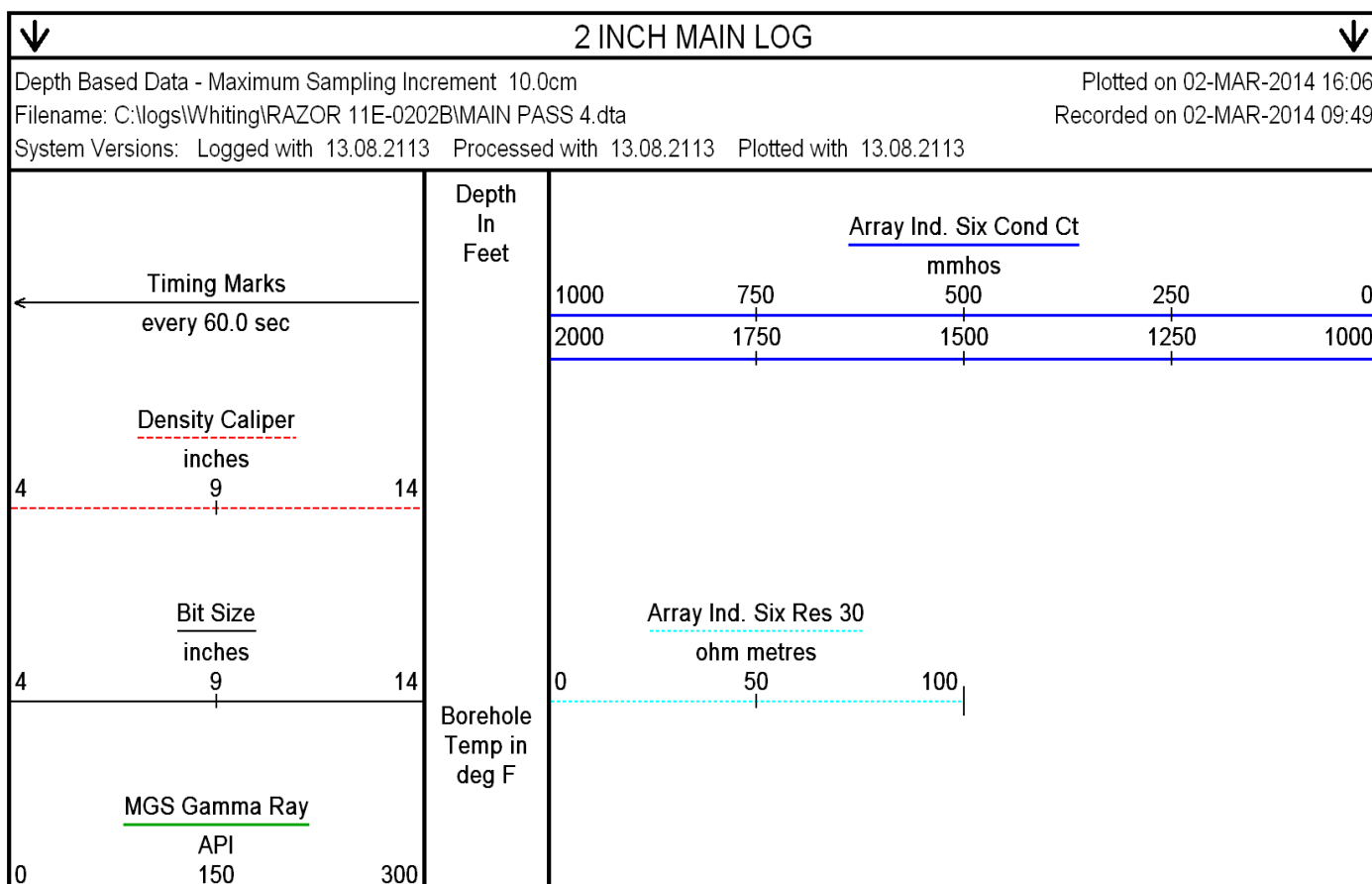
TIGHT PULLS WILL AFFECT DATA QUALITY.

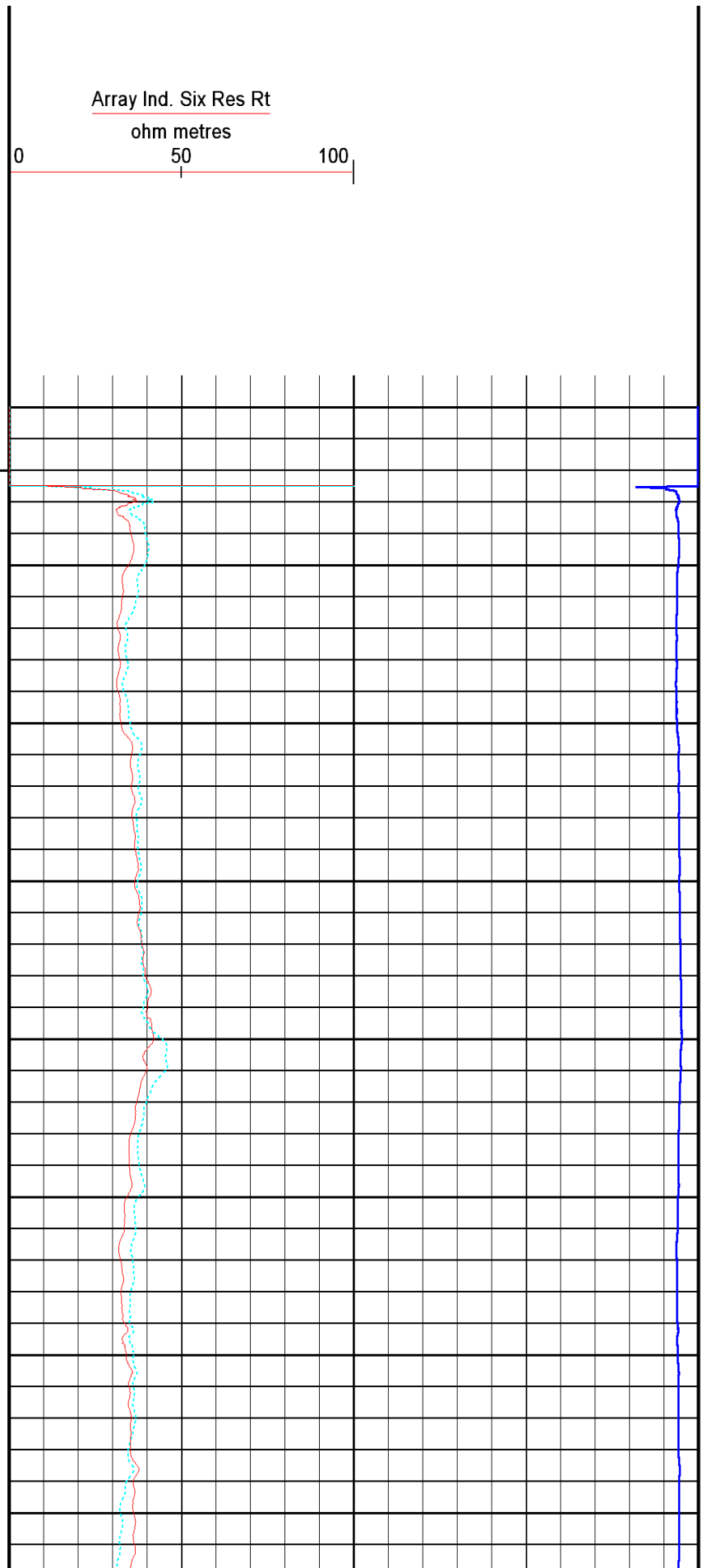
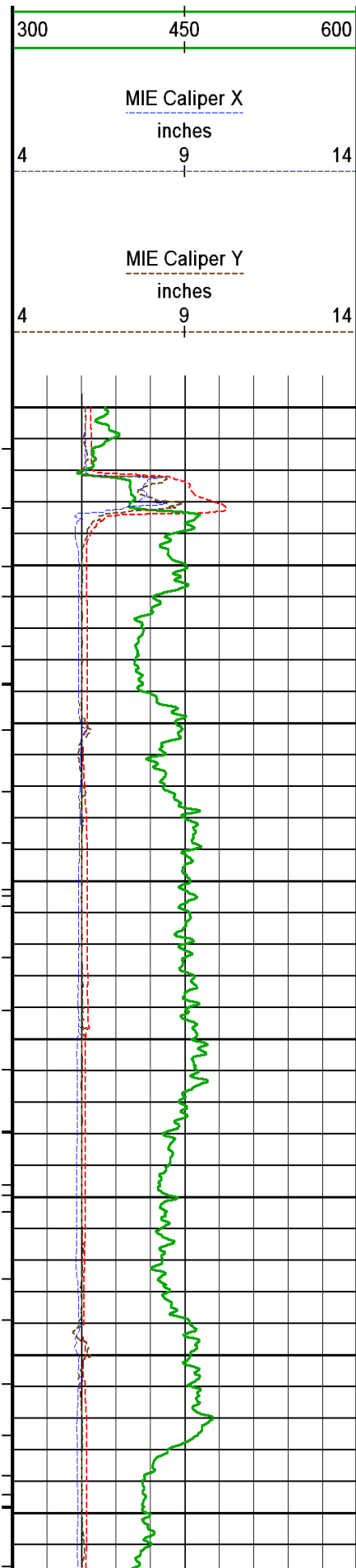
OPERATOR(S): J GERDES, D SMITH

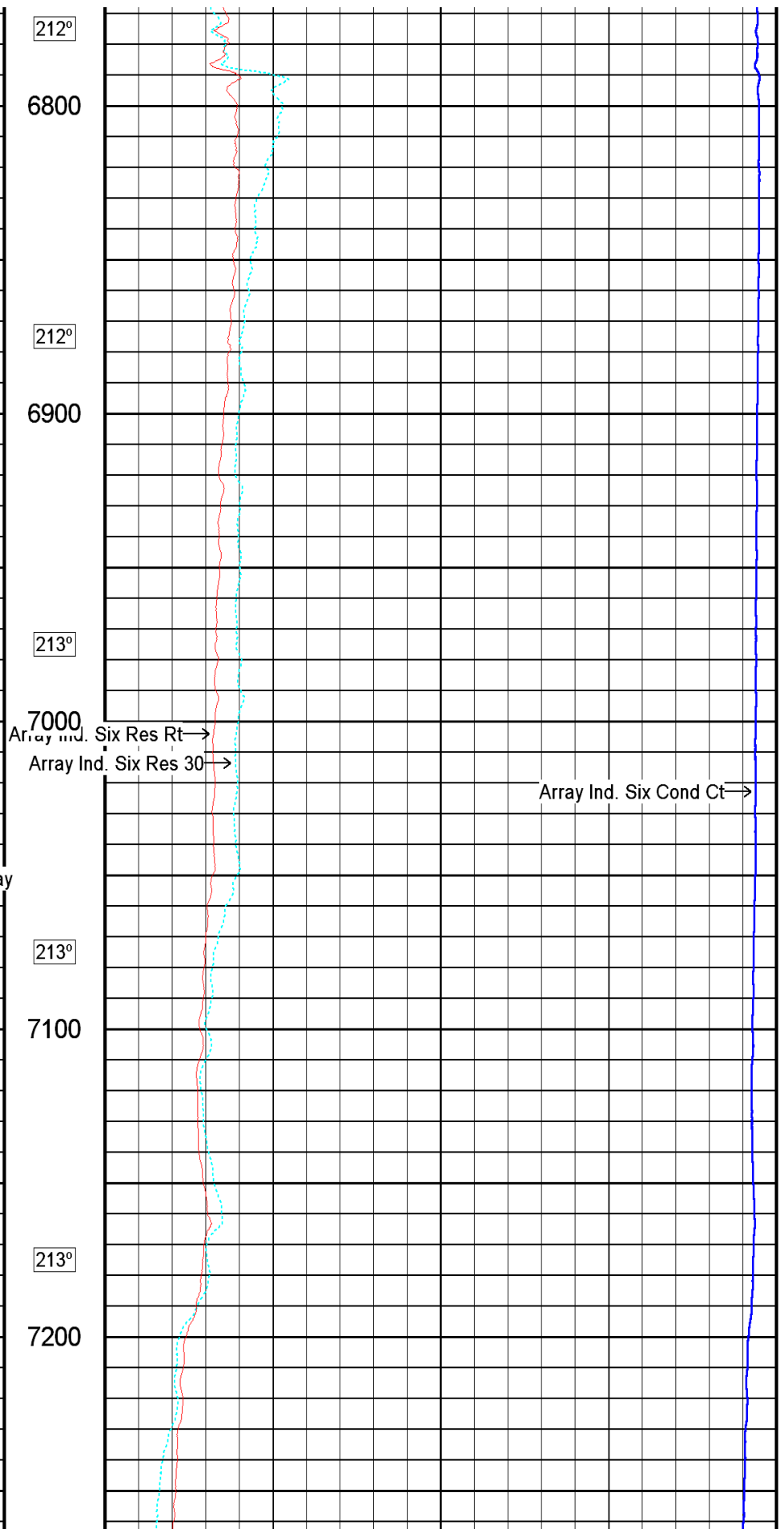
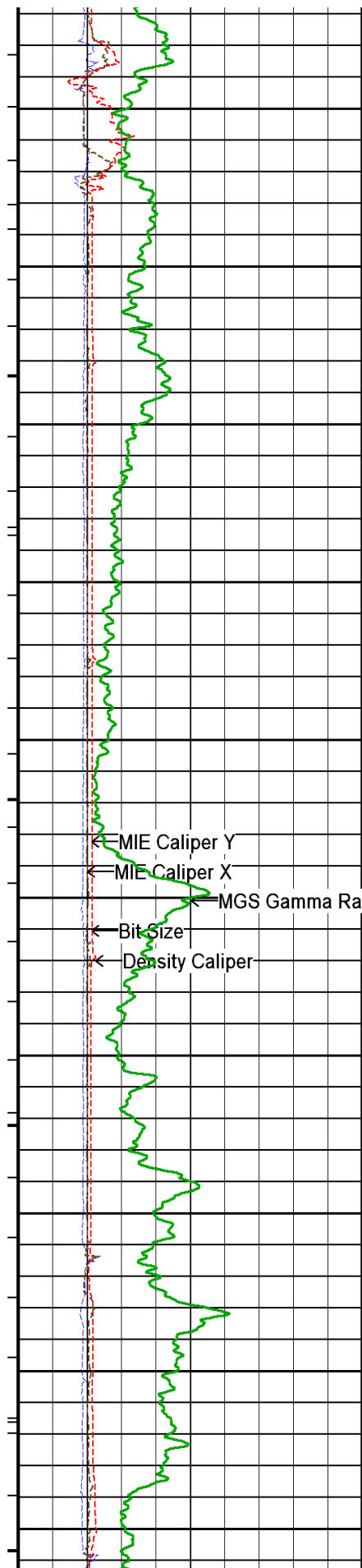
RIG: CADE 23

SERVICE ORDER #6551-80824109

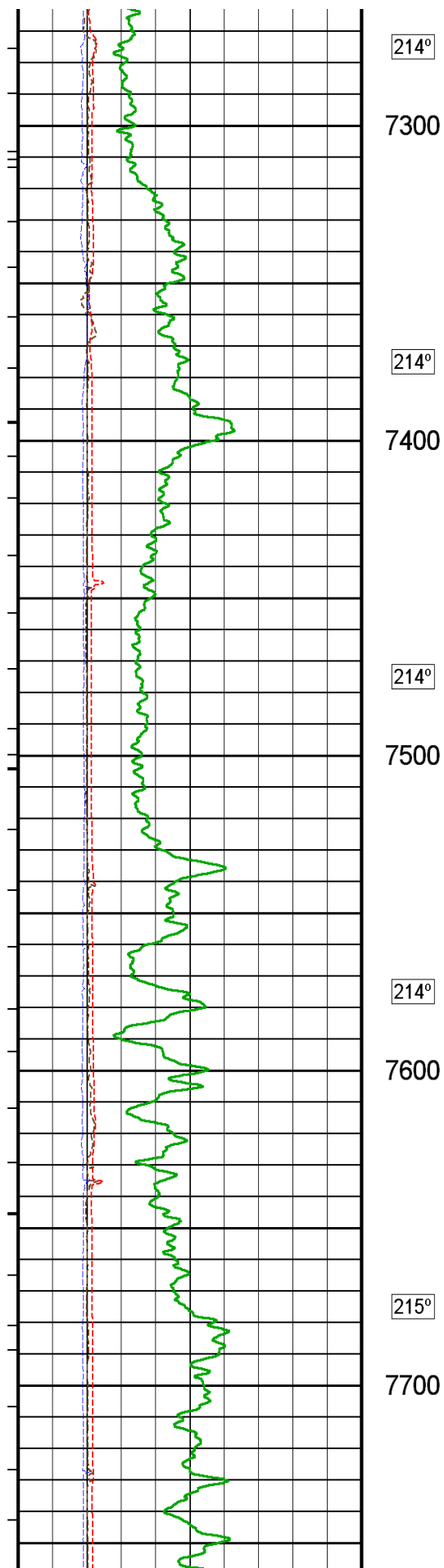
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.











214°

7300

214°

7400

214°

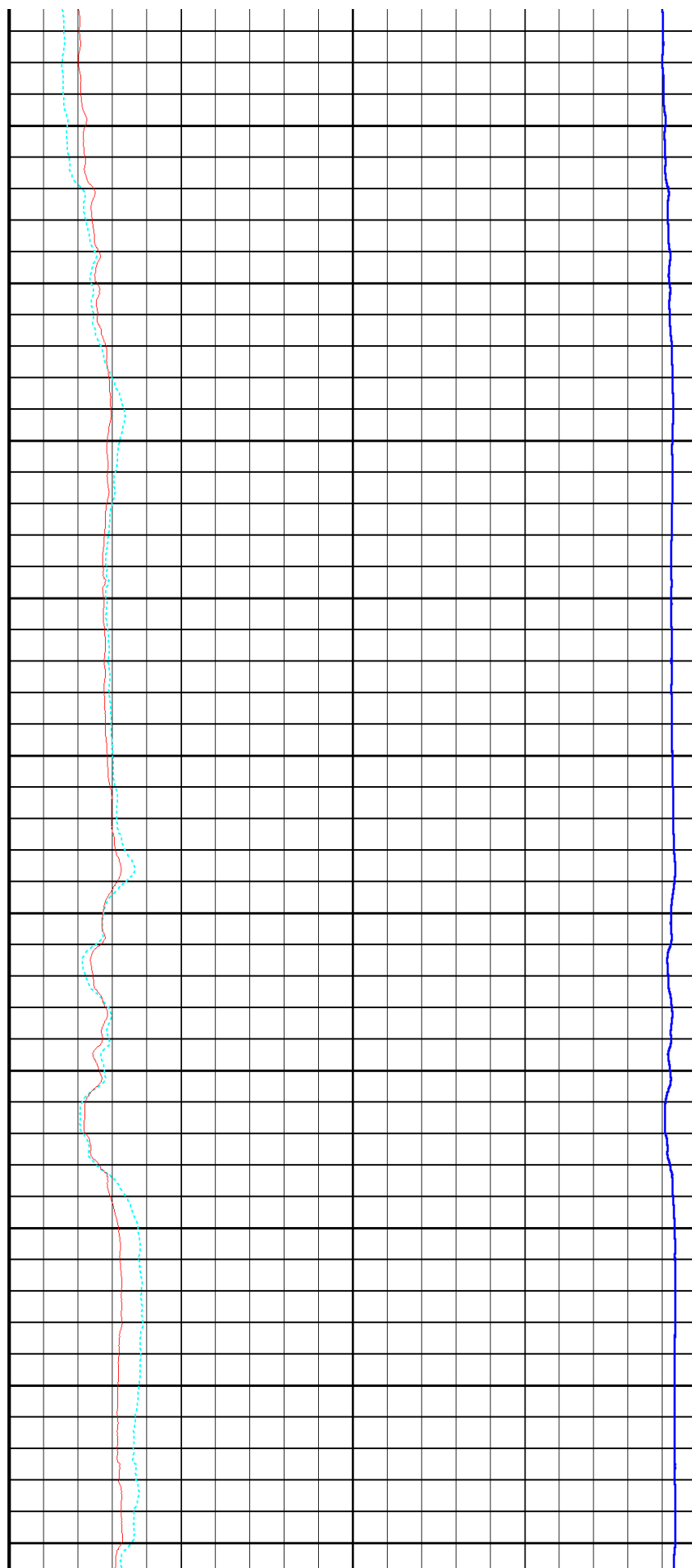
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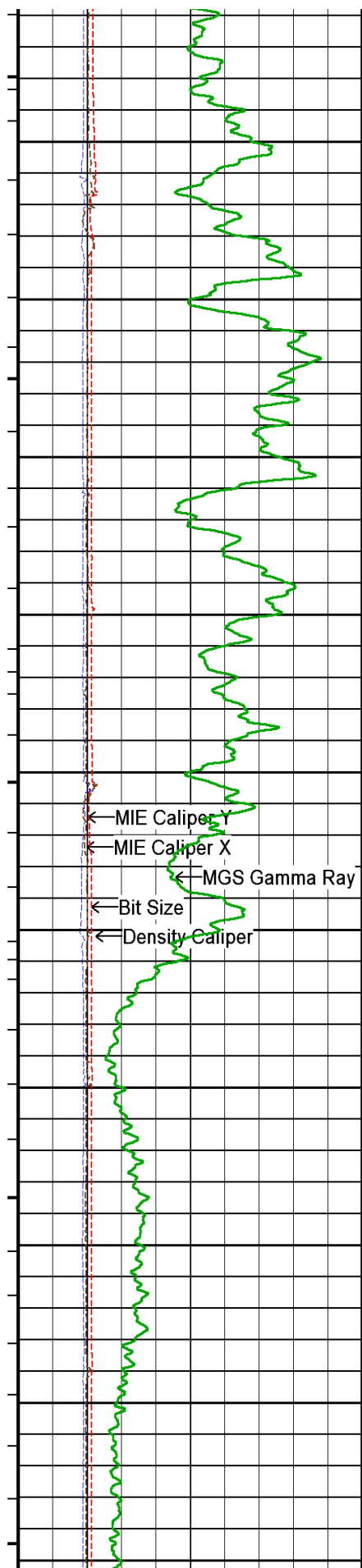
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7700





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7800

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7900

215°

Array Ind. Six Res Rt→

Ind. Six Res 30→

8000

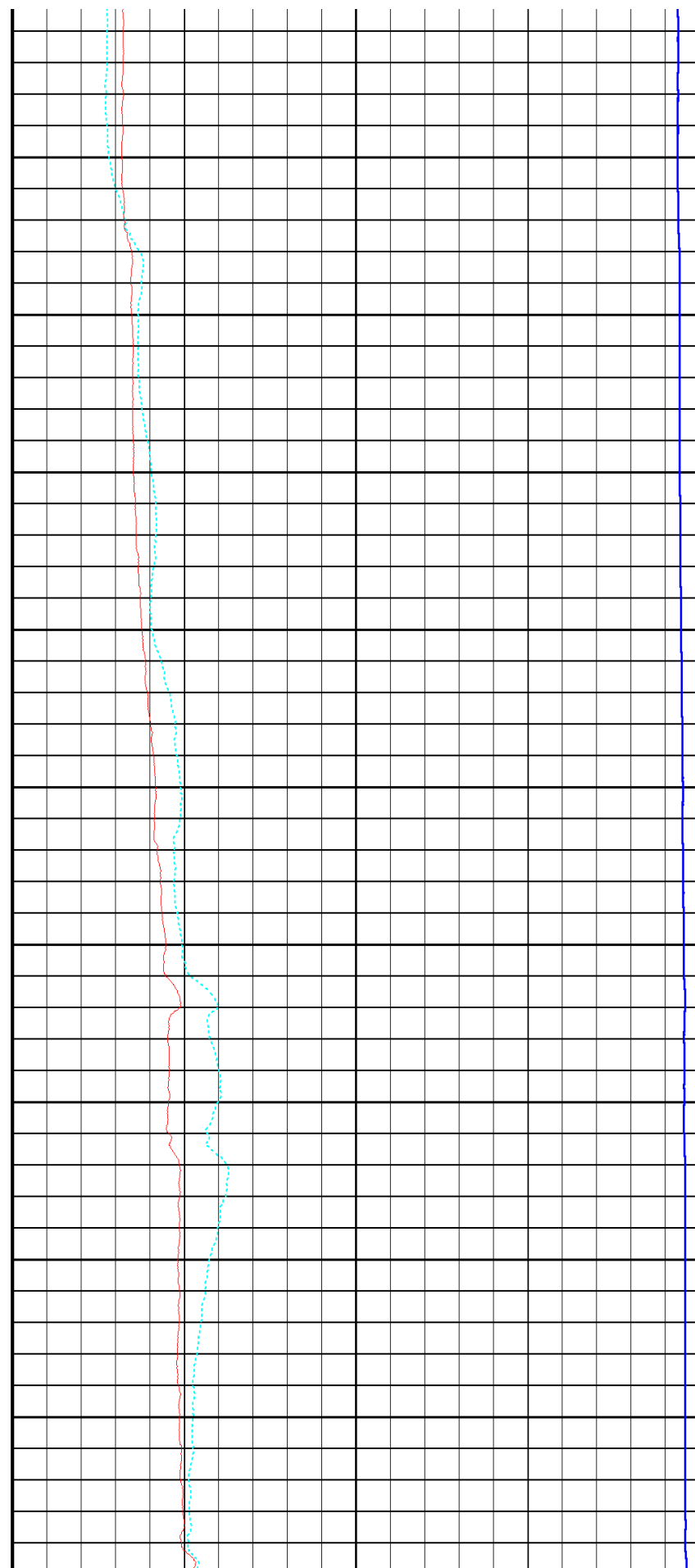
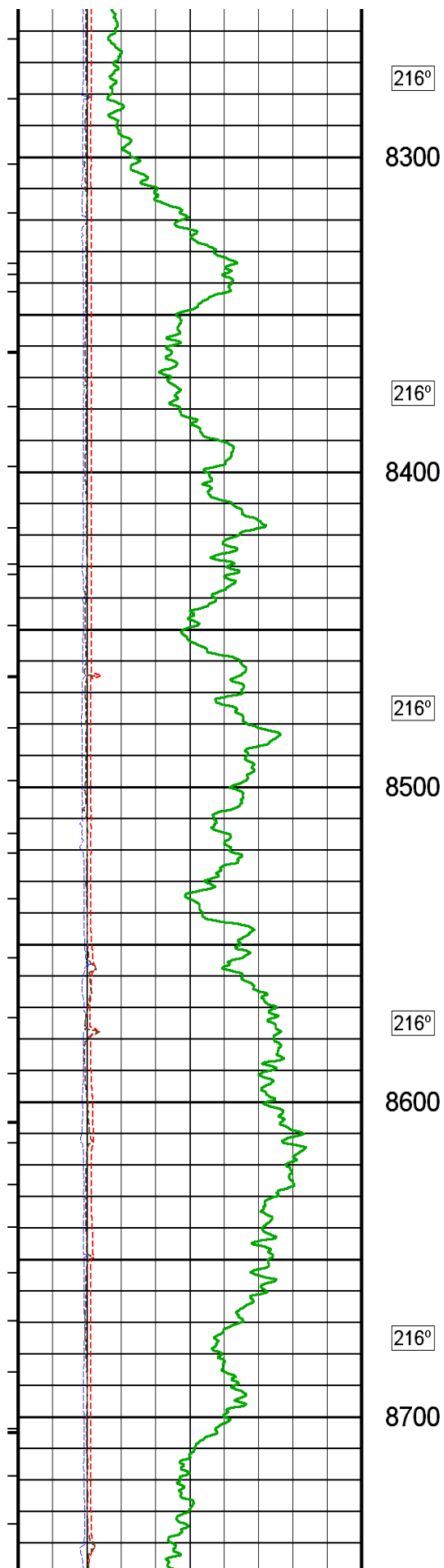
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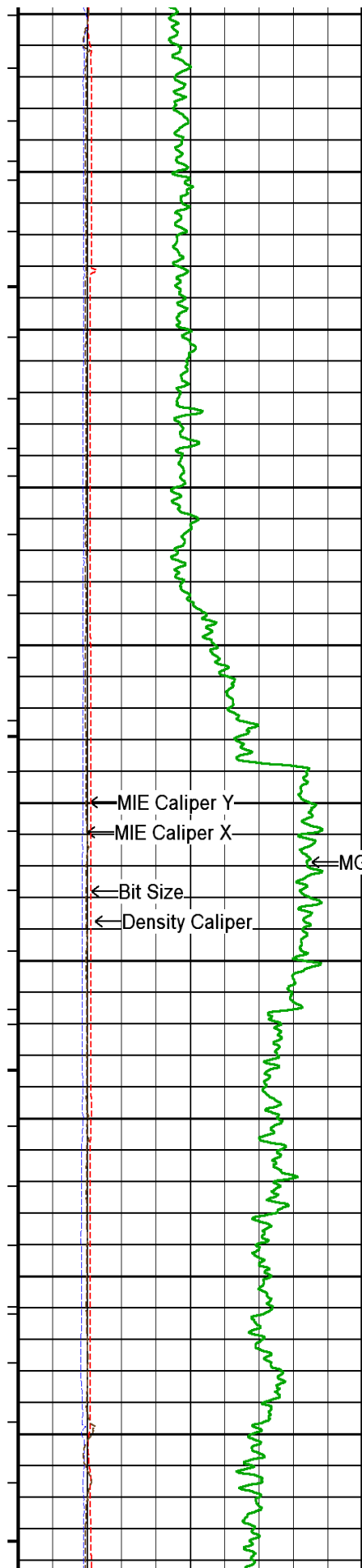
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8100

216°

8200





217°

8800

217°

8900

217°

9000

217°

9100

217°

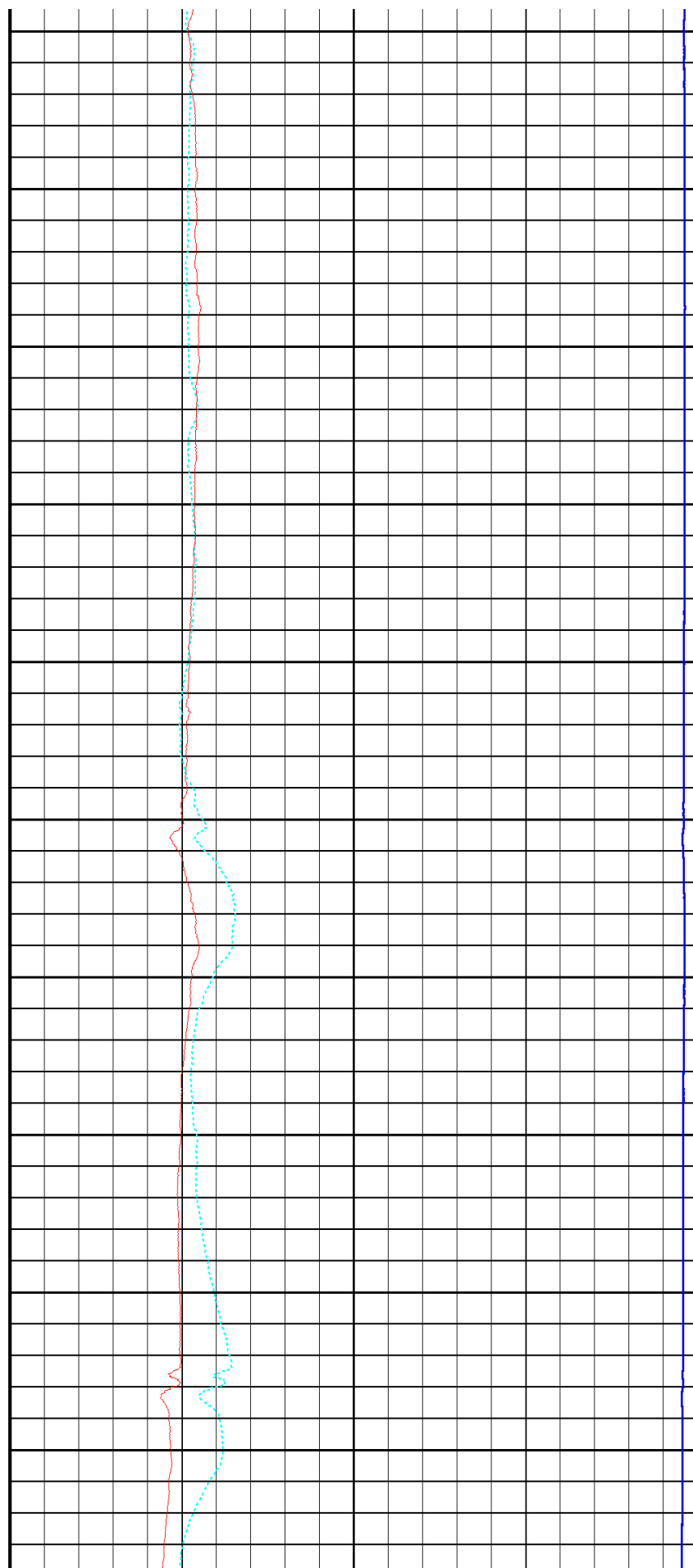
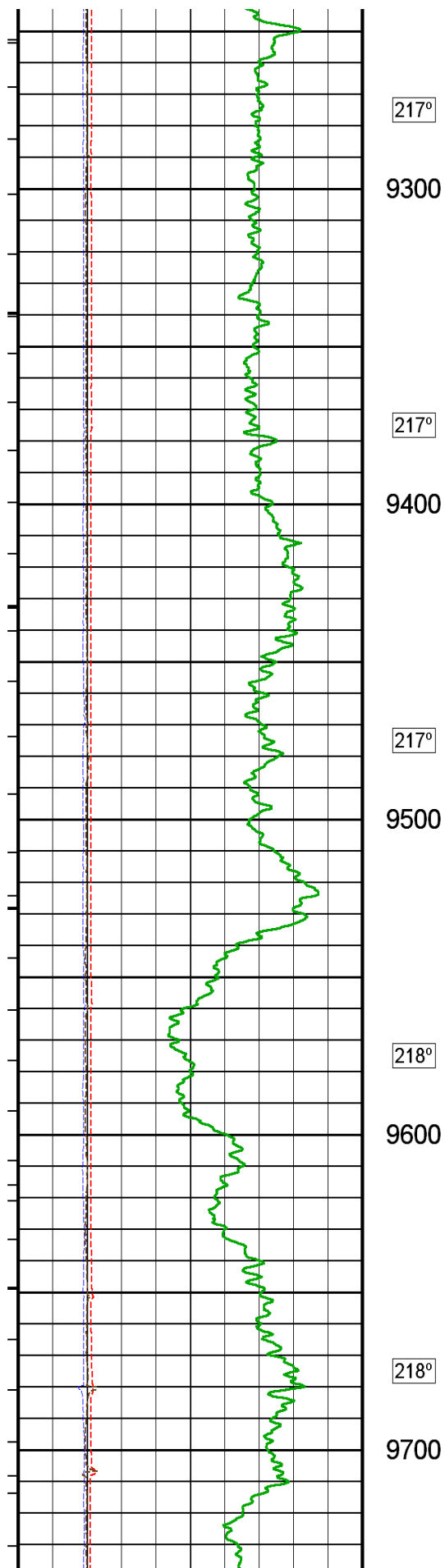
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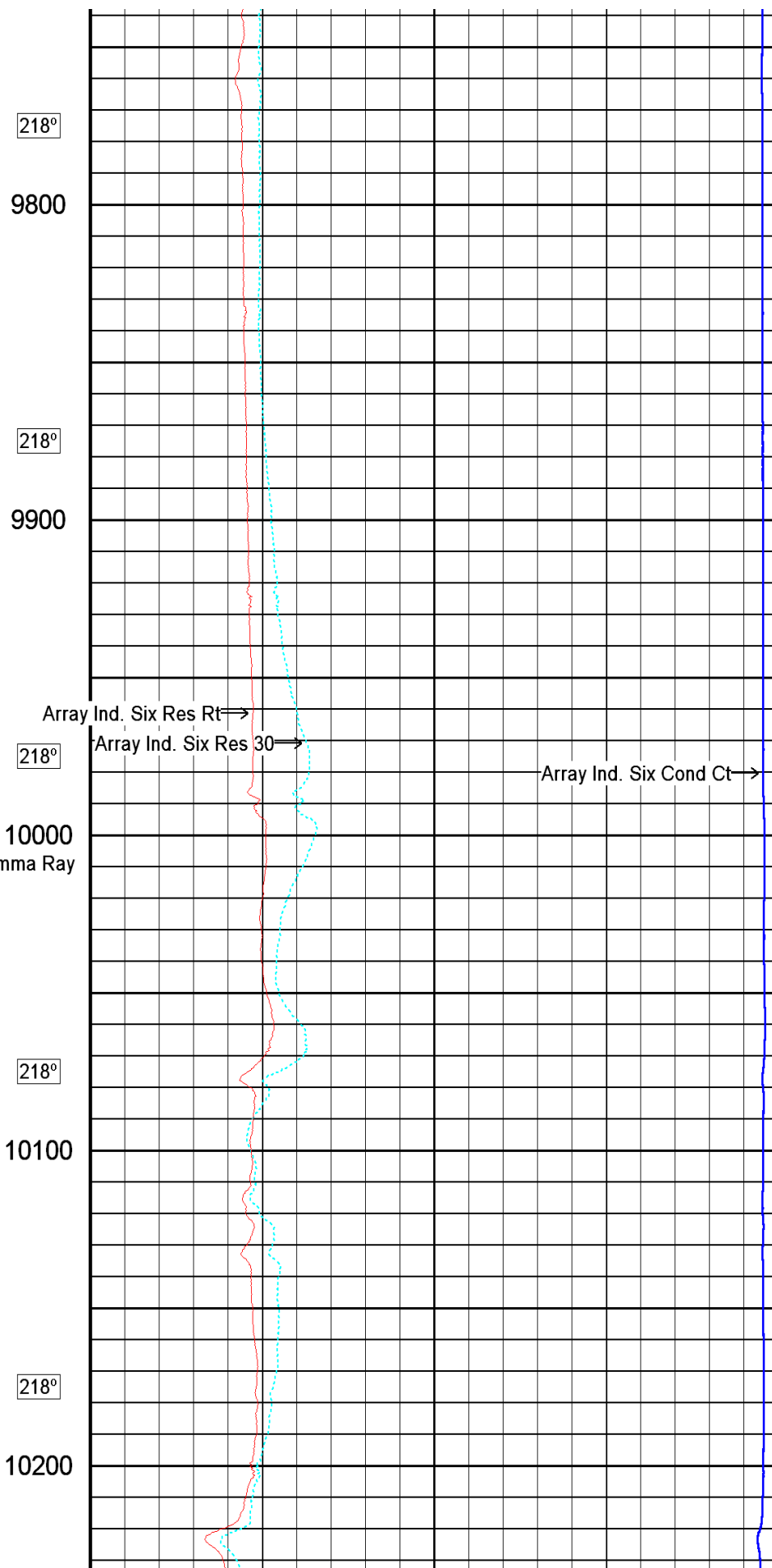
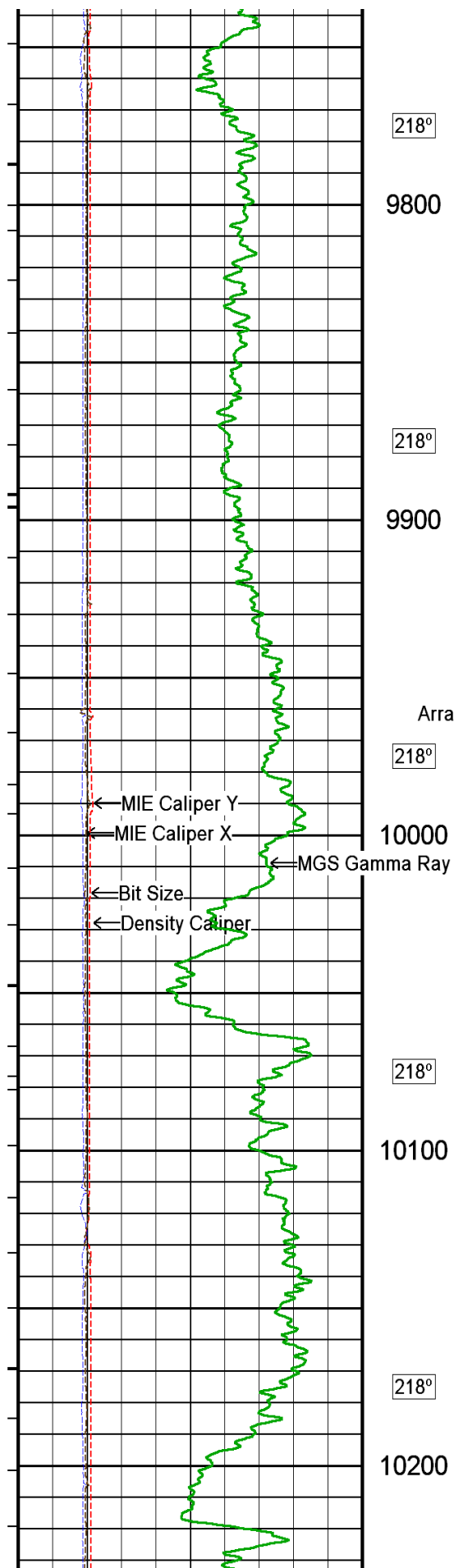
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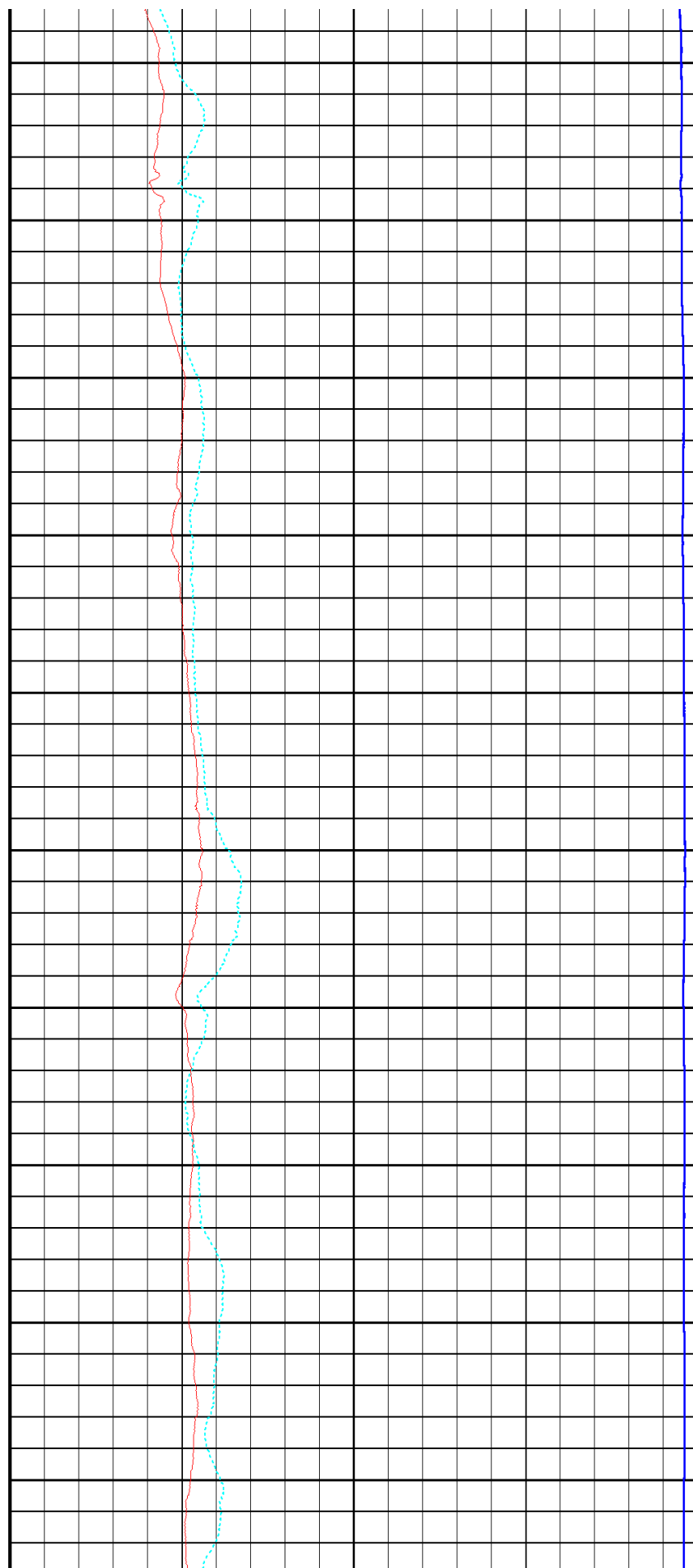
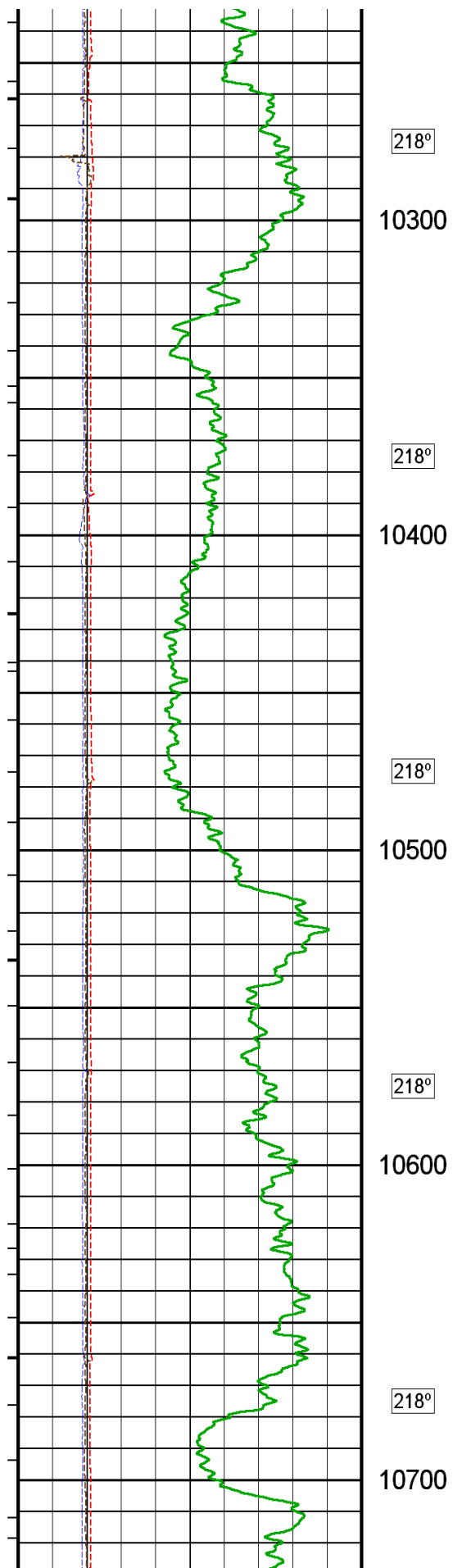
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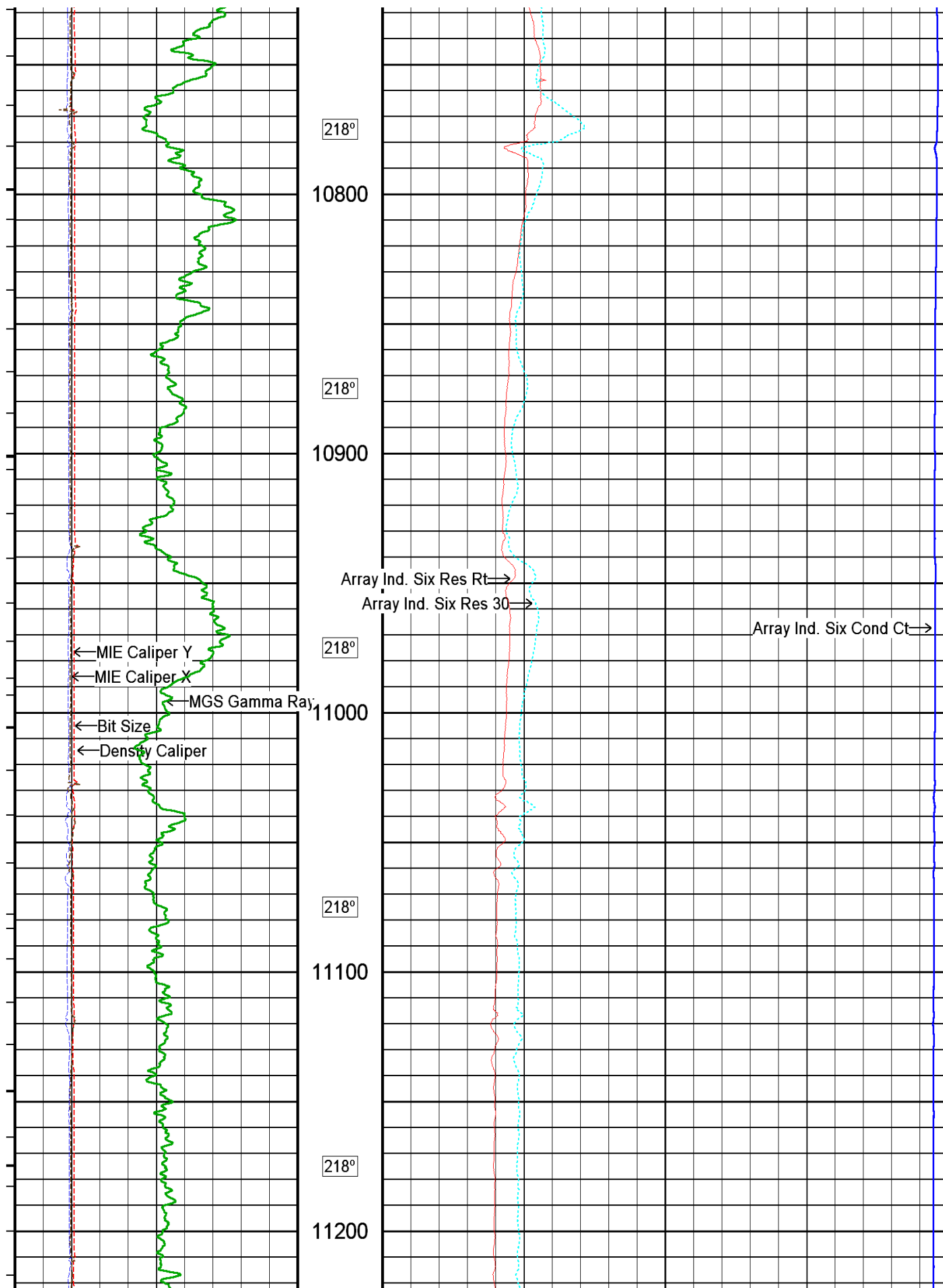
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MGS Gamma Ray

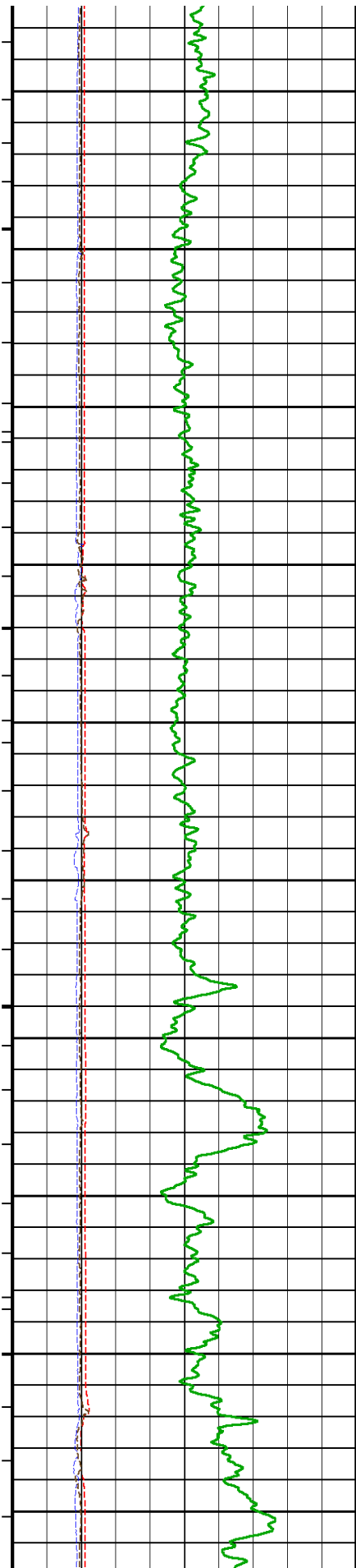




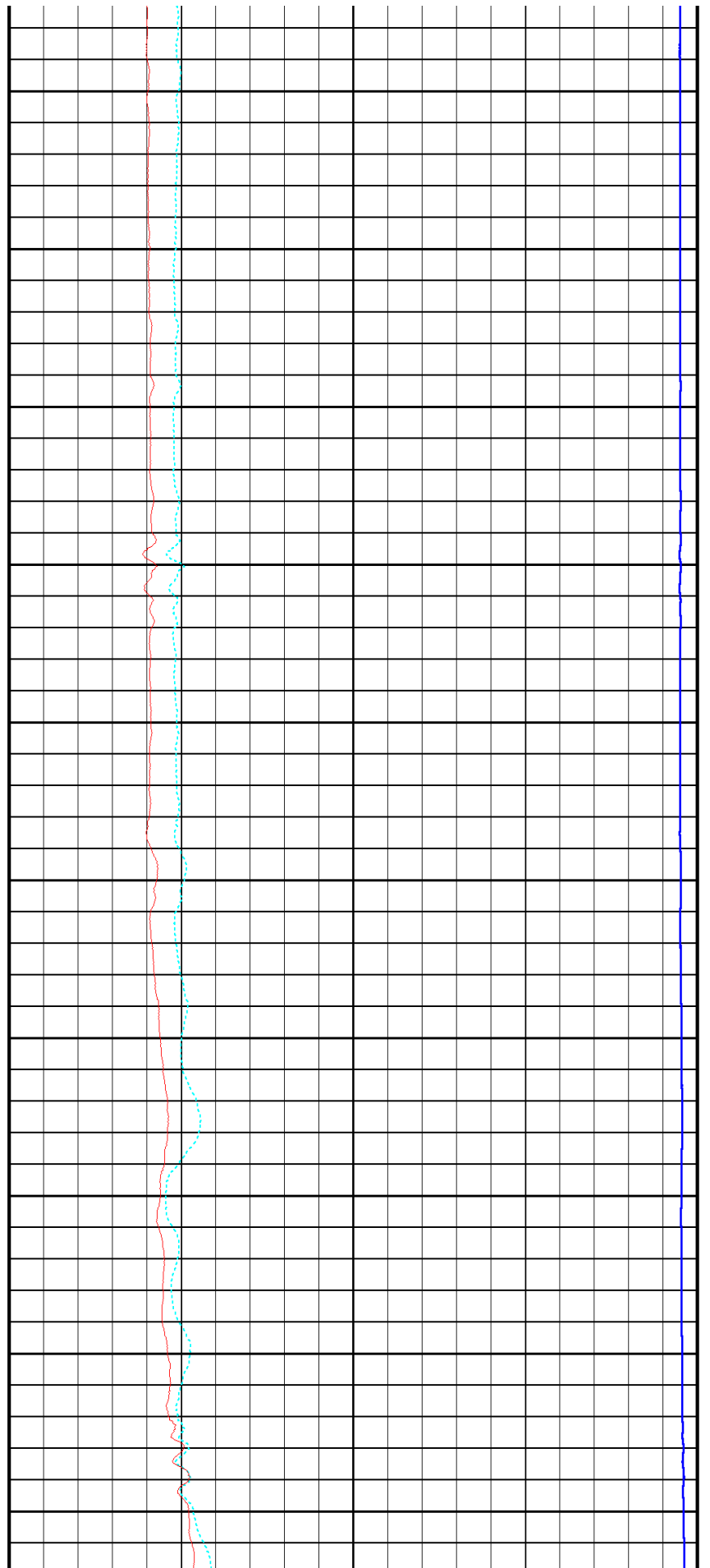


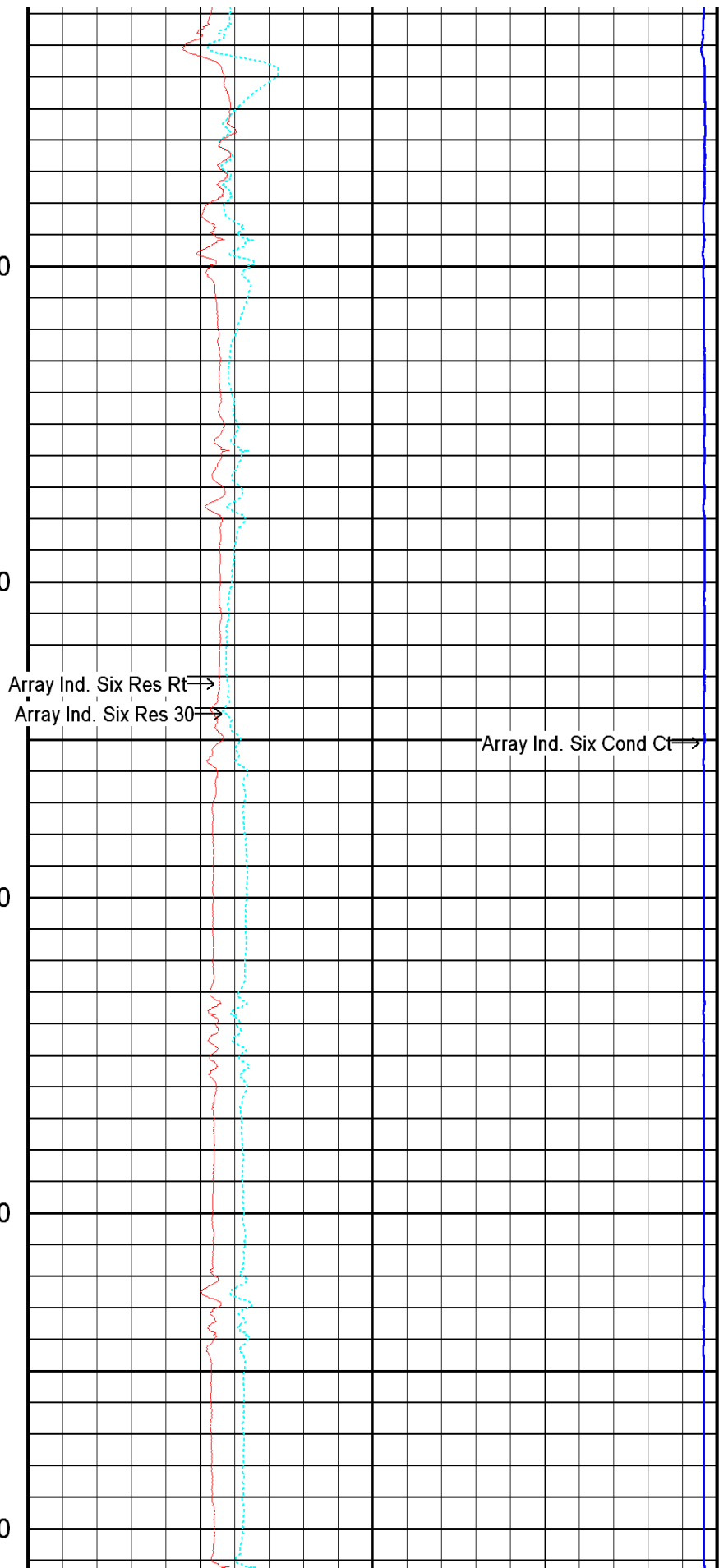
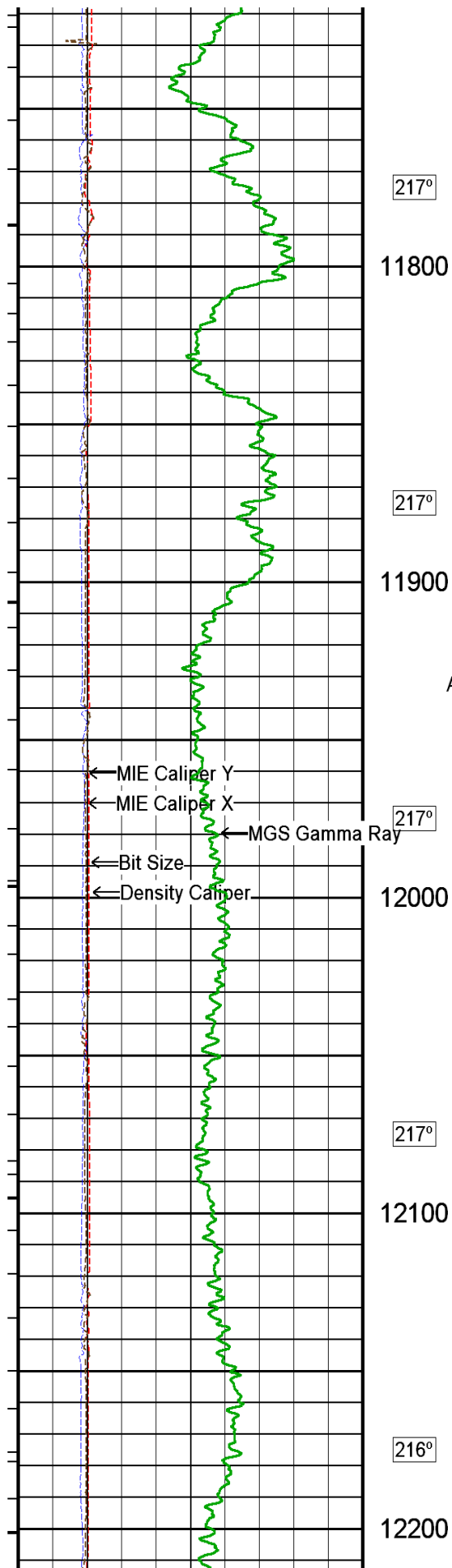


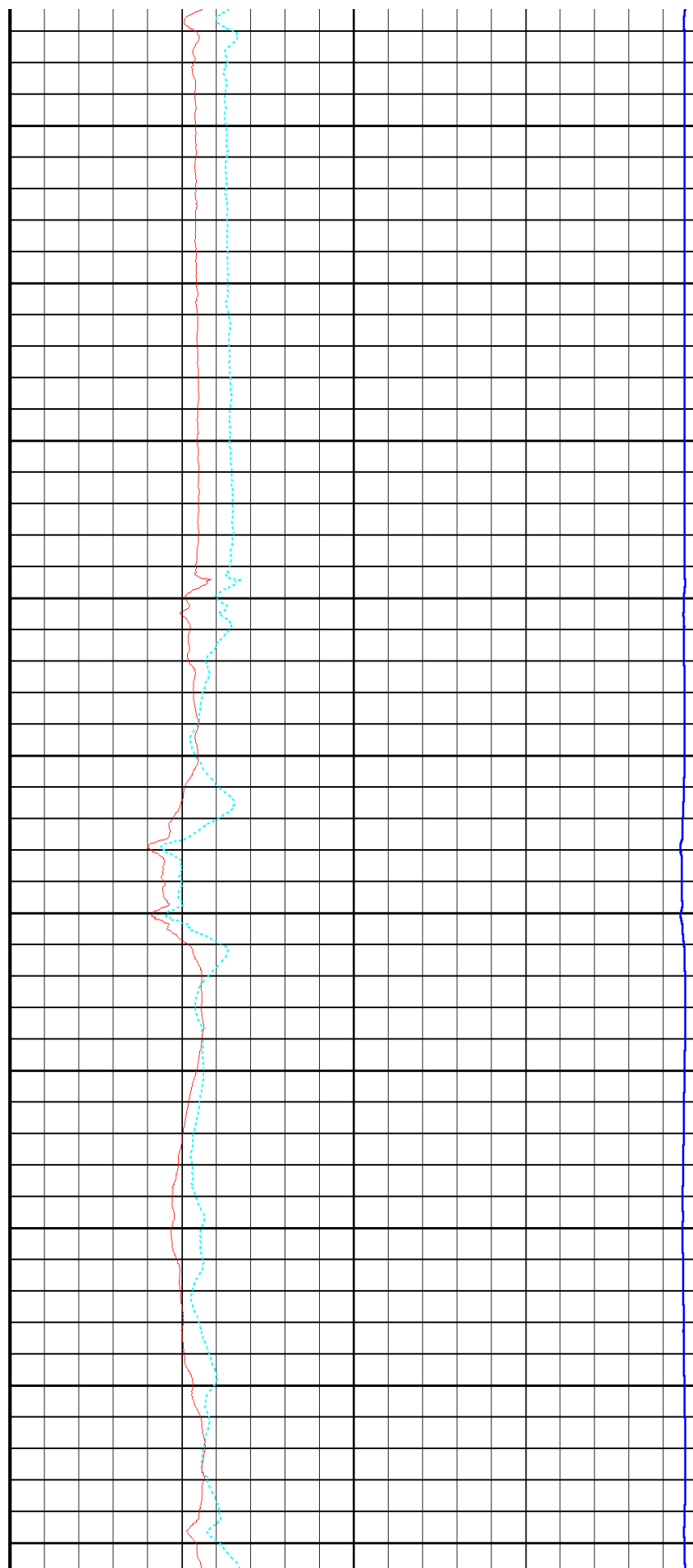
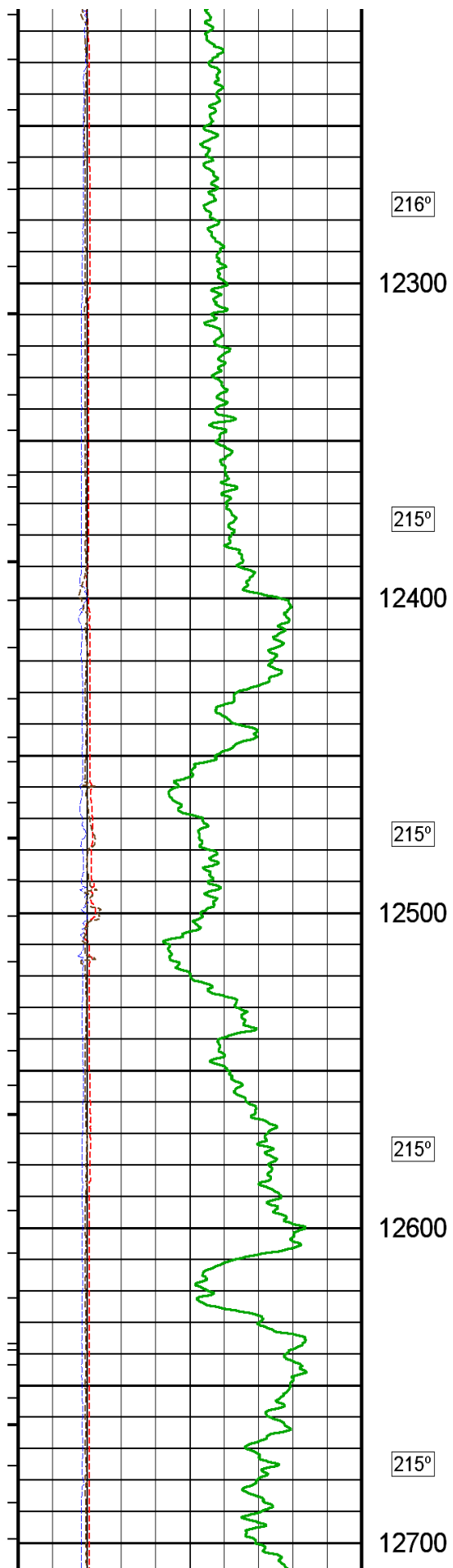


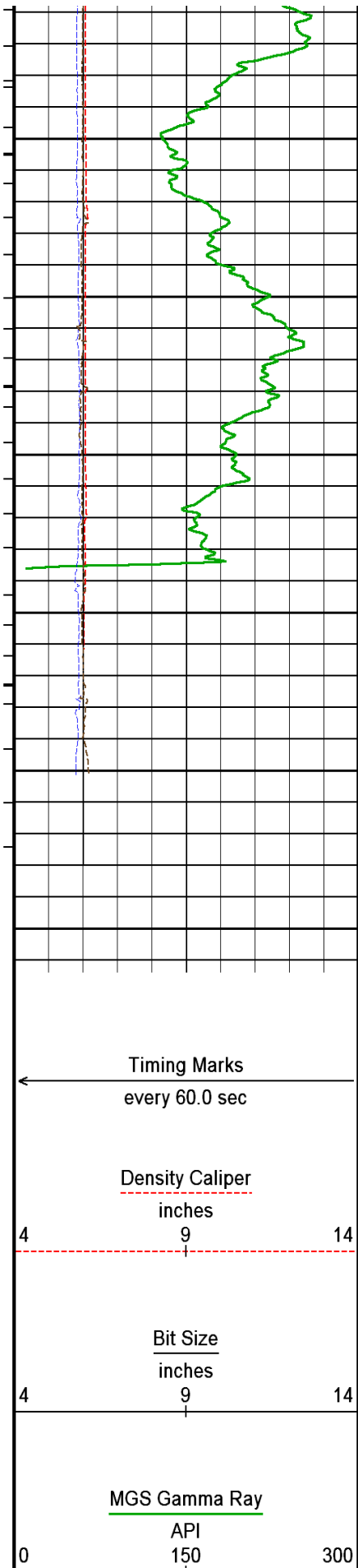


218°  
11300  
218°  
11400  
217°  
11500  
217°  
11600  
217°  
11700









217°

12800

226°

12900

13000

Depth  
In  
Feet

Timing Marks  
every 60.0 sec

Density Caliper

inches

4 9 14

Bit Size

inches

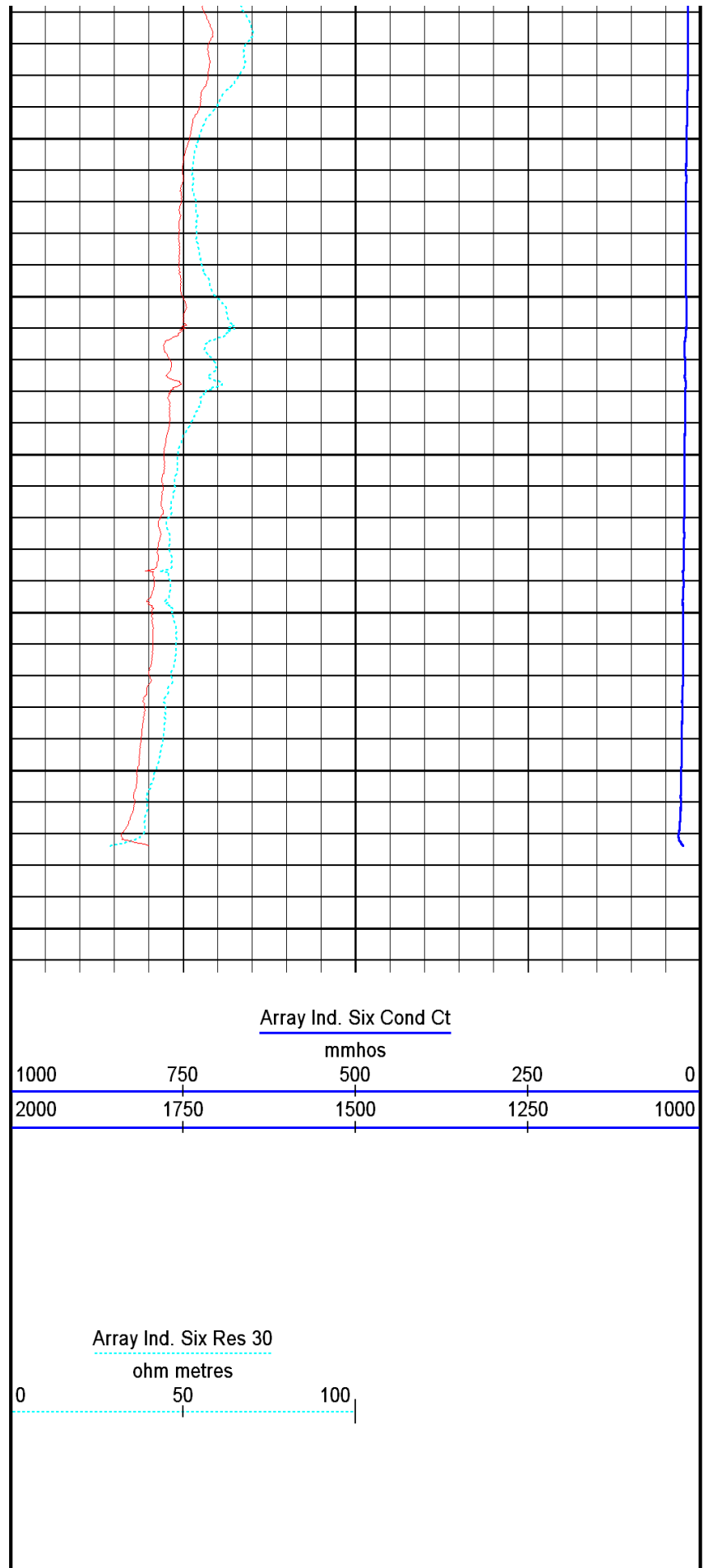
4 9 14

MGS Gamma Ray

API

0 150 300

Borehole  
Temp in  
deg F



Array Ind. Six Cond Ct

mmhos

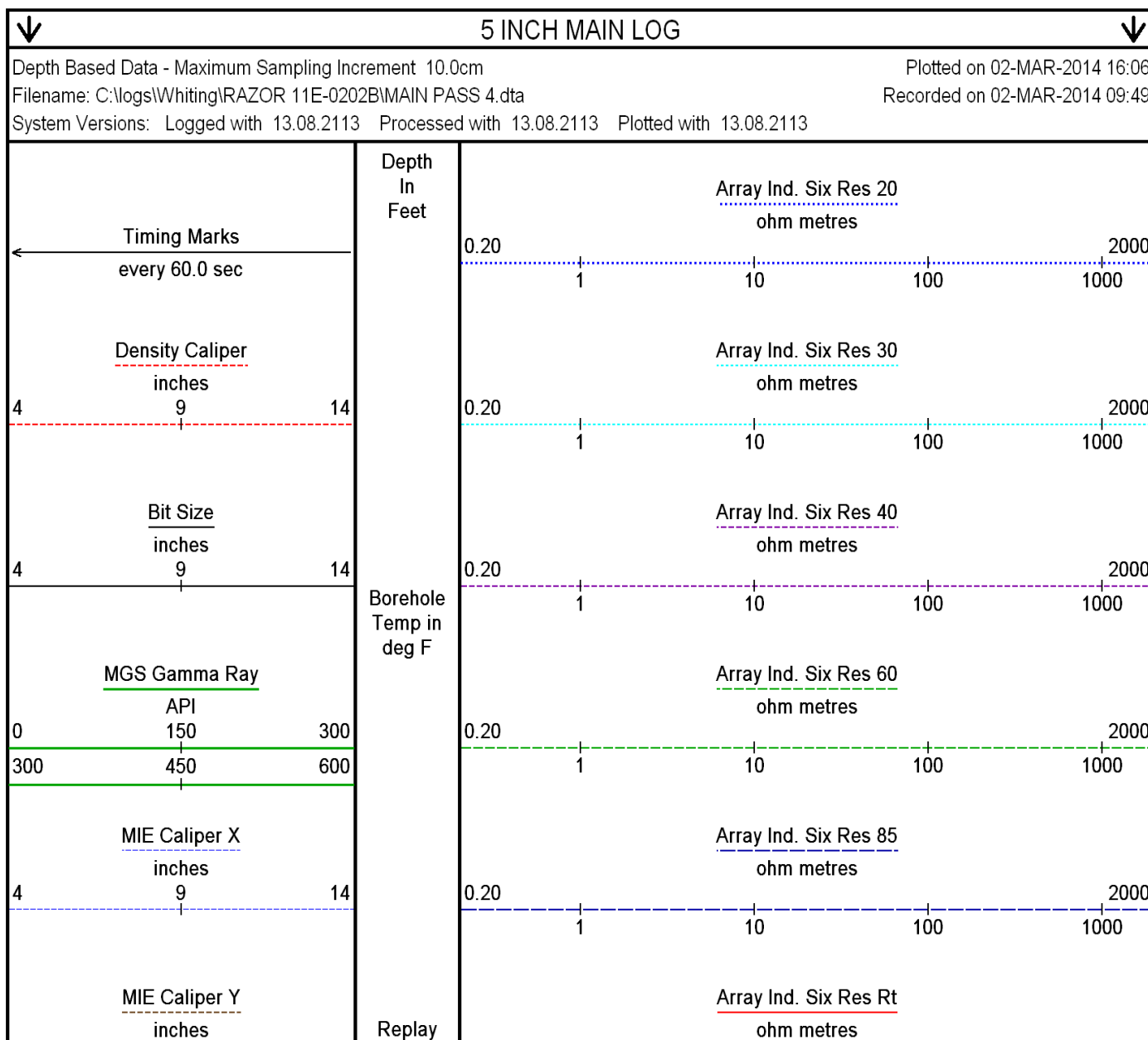
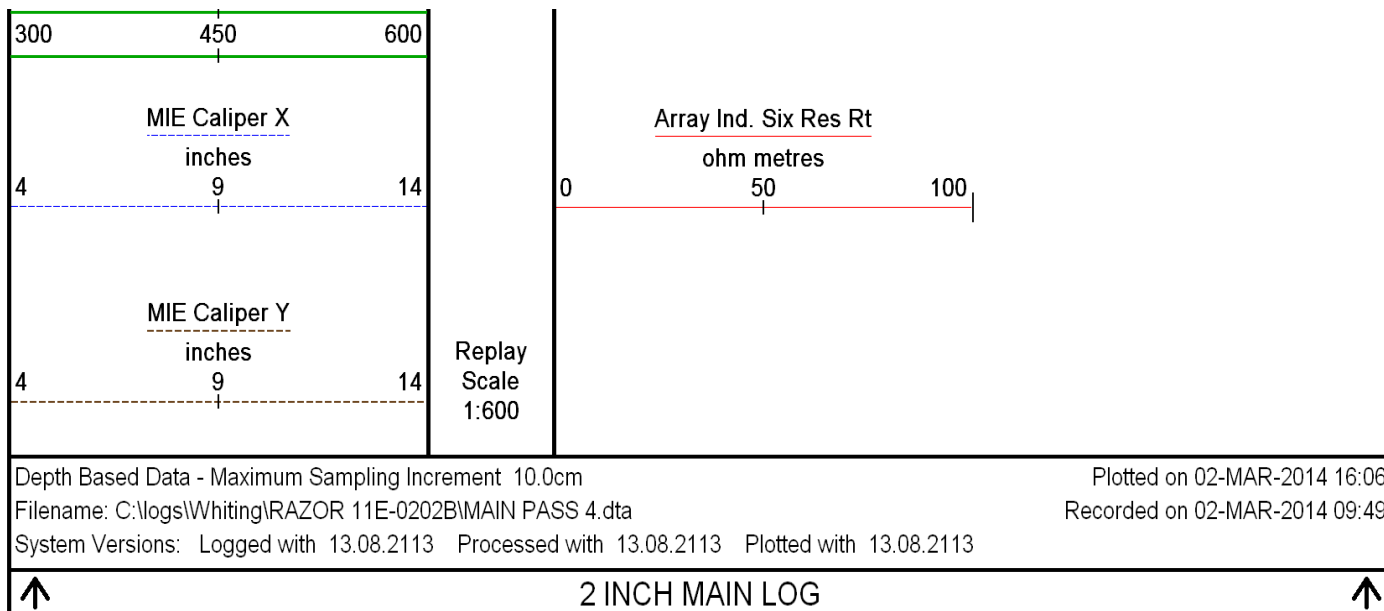
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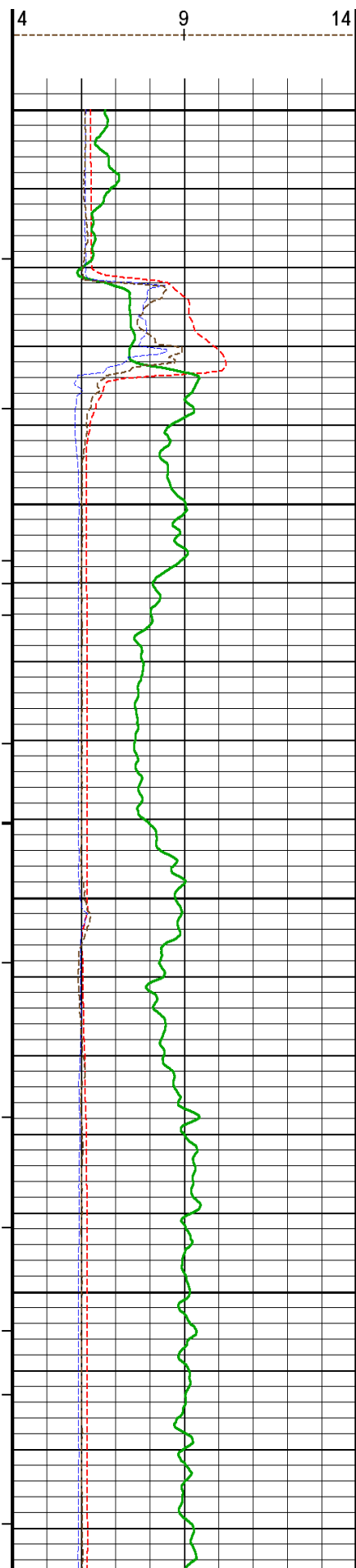
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Array Ind. Six Res 30

ohm metres

0 50 100





Scale  
1:240

6400

Casing  
Shoe

210°

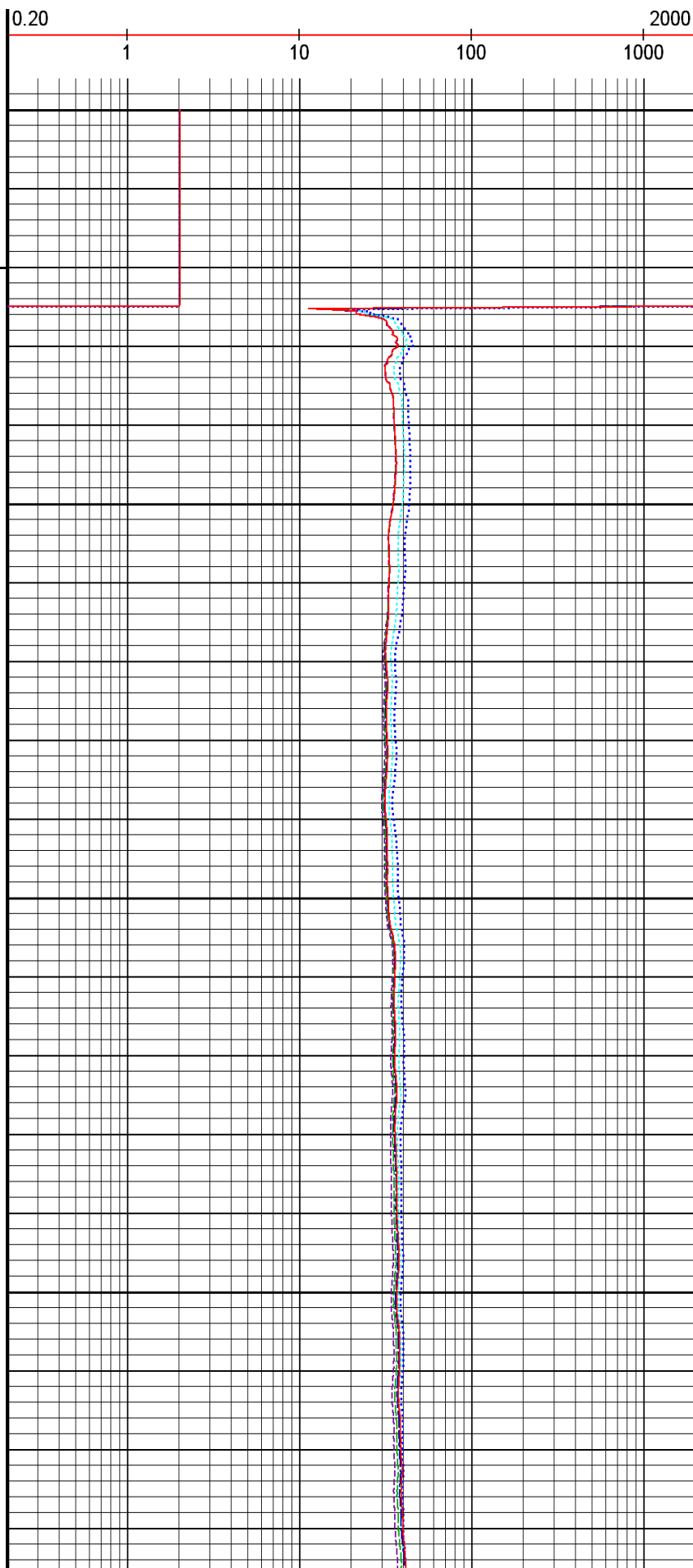
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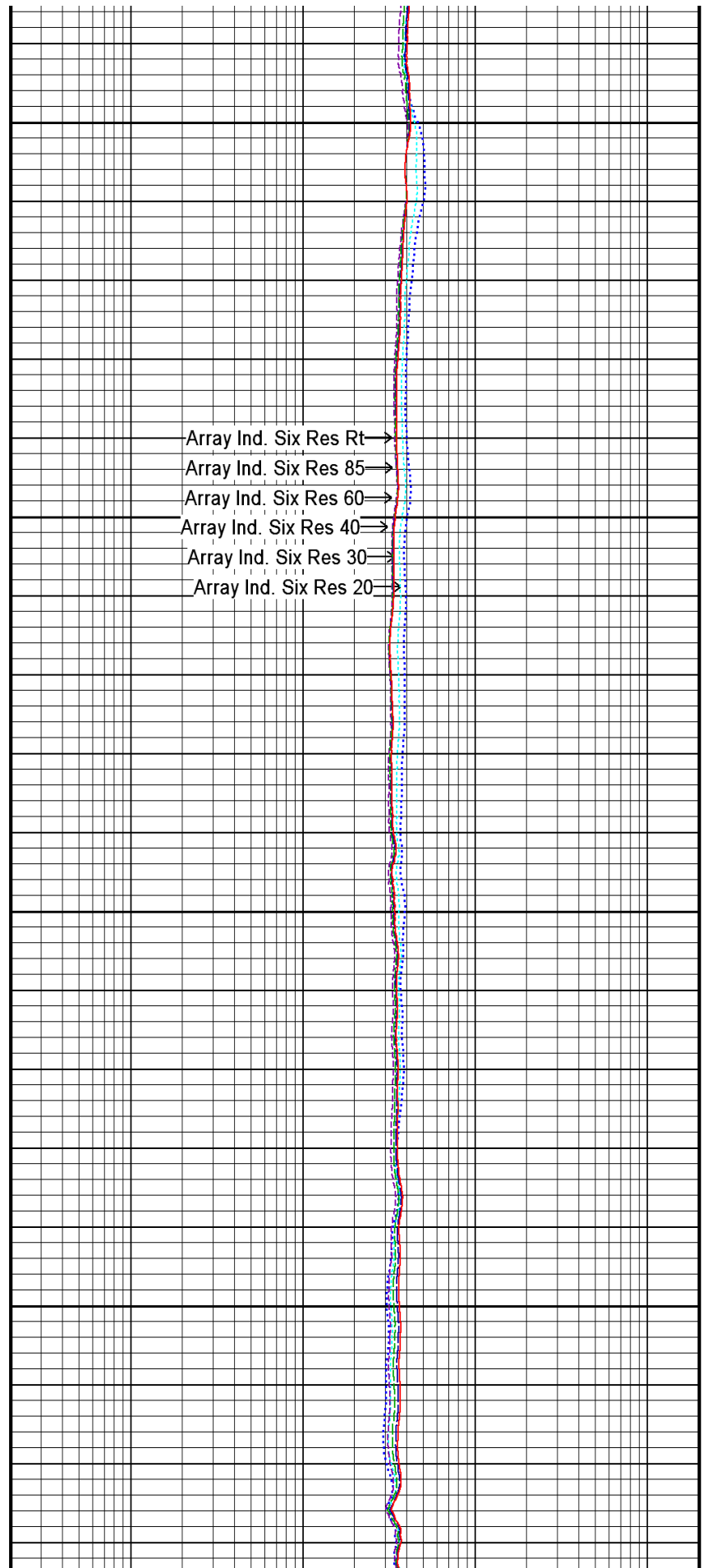
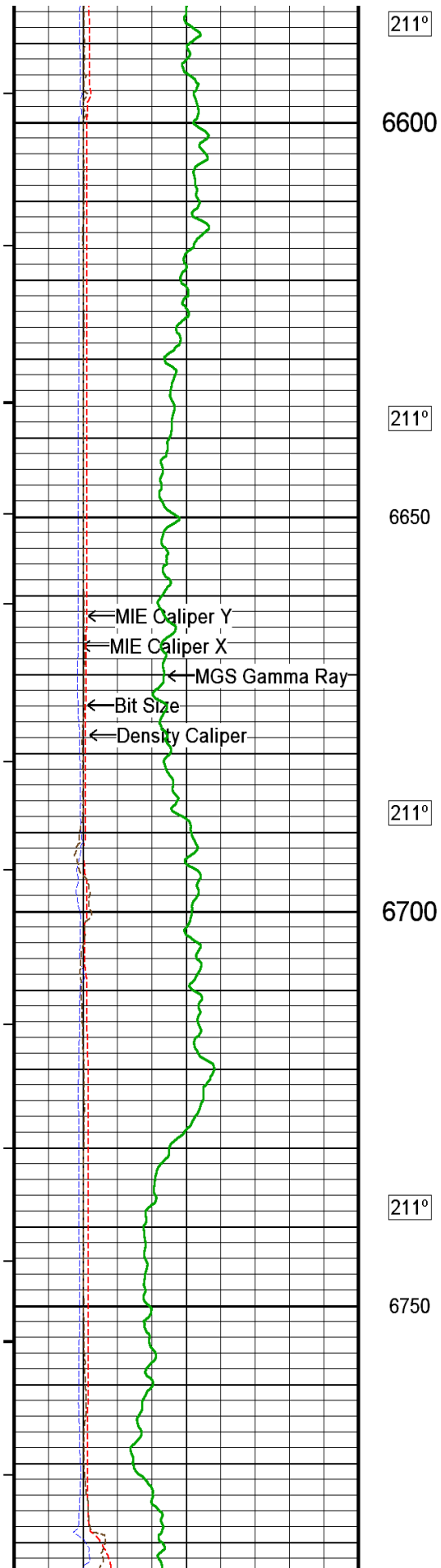
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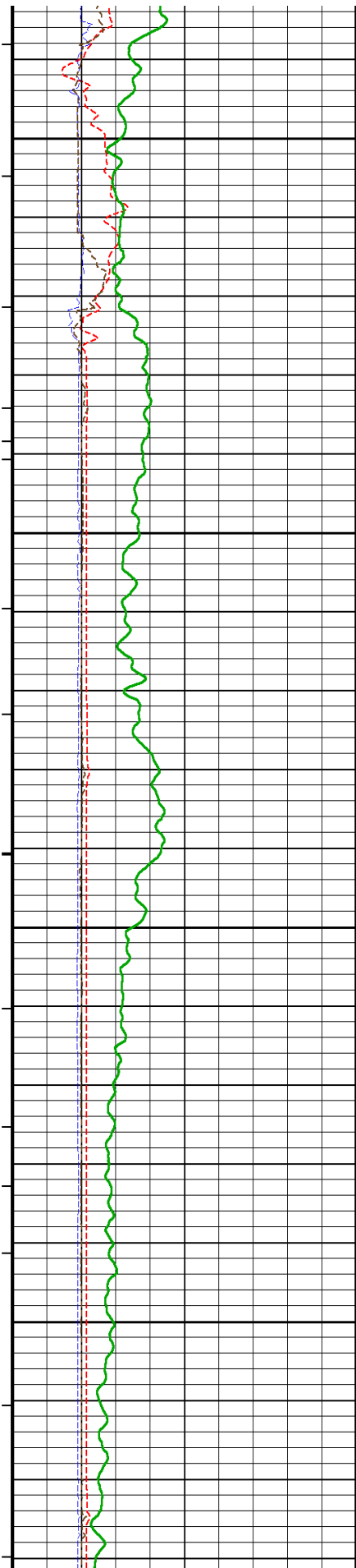
6500

210°

6550







212°

6800

212°

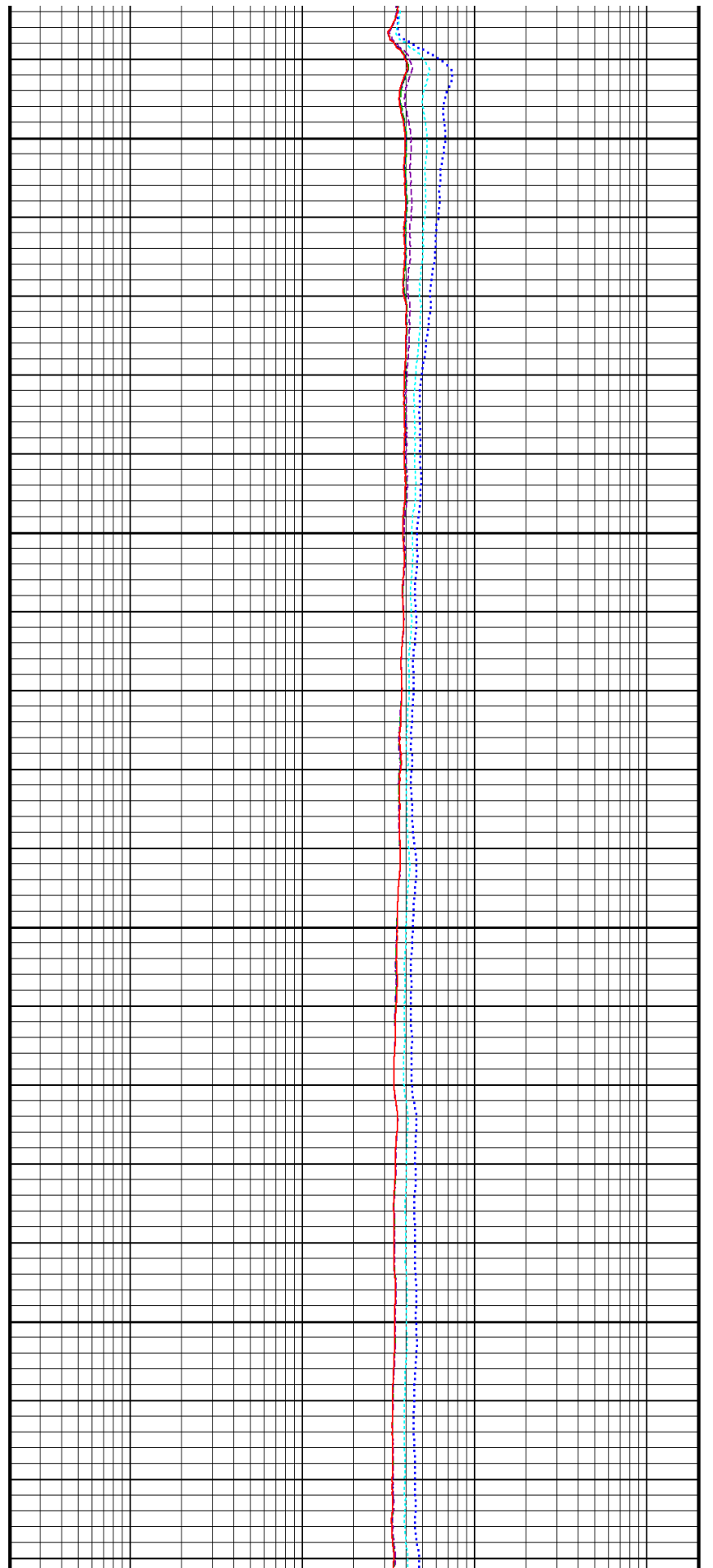
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212°

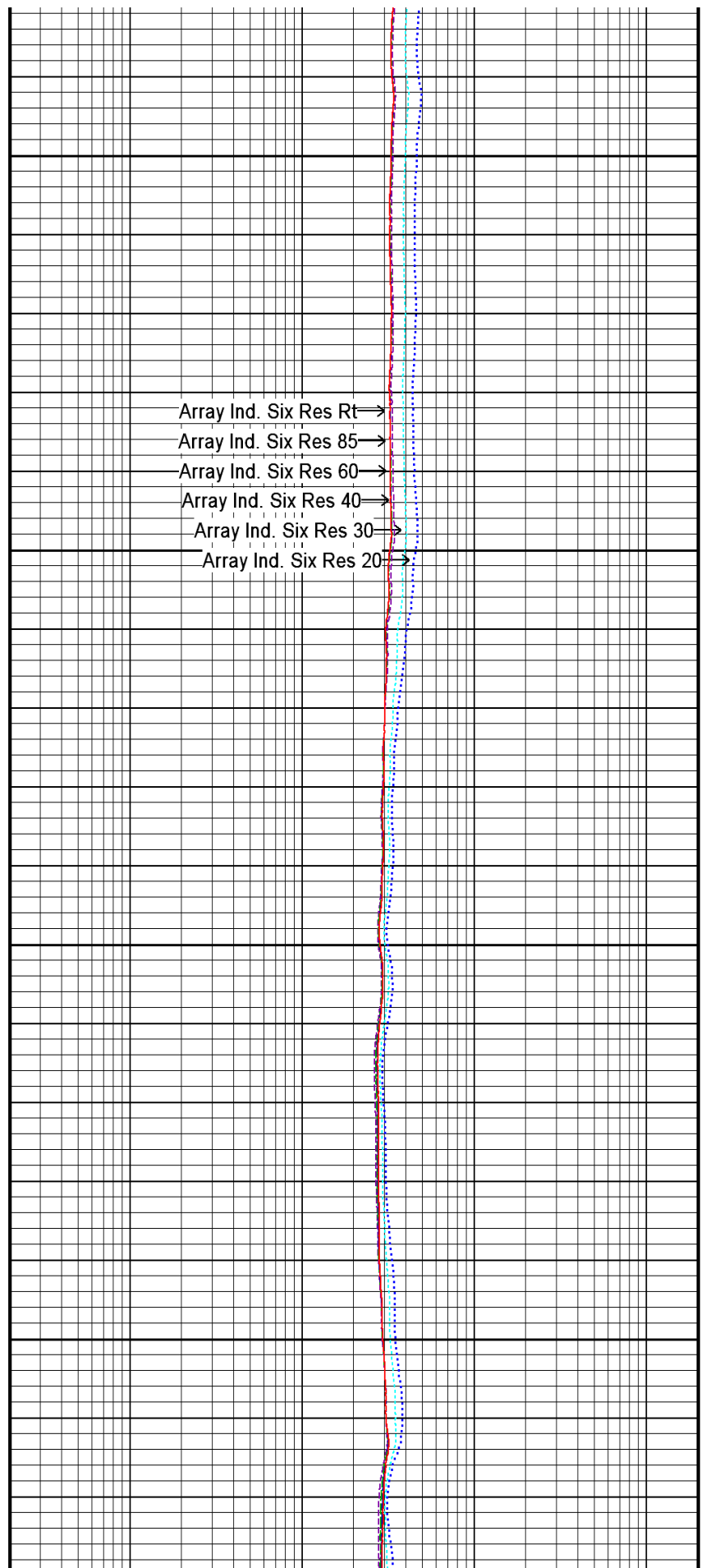
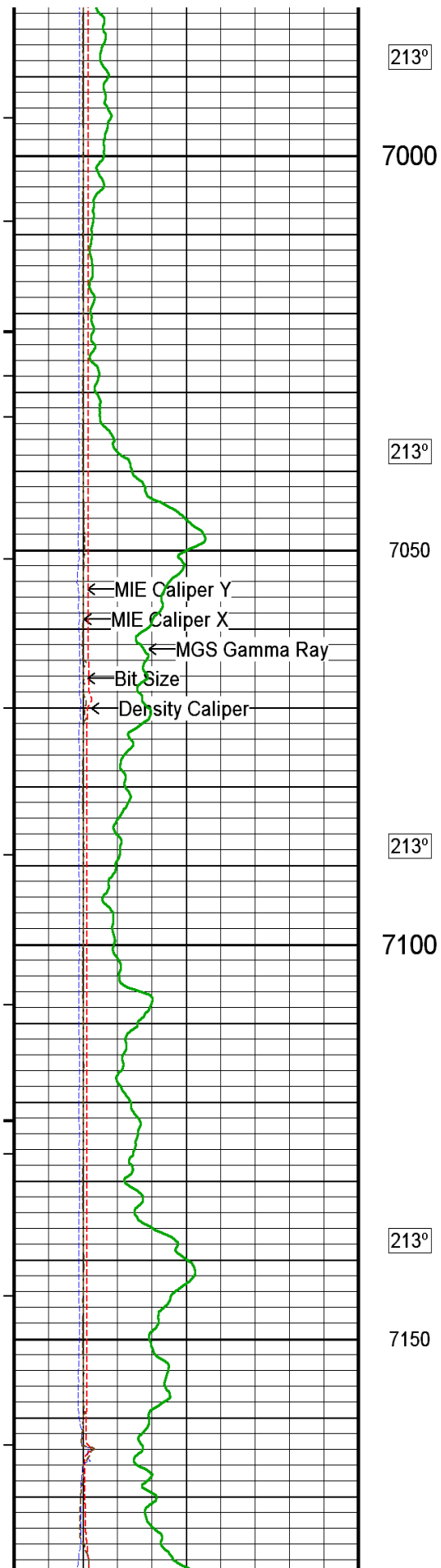
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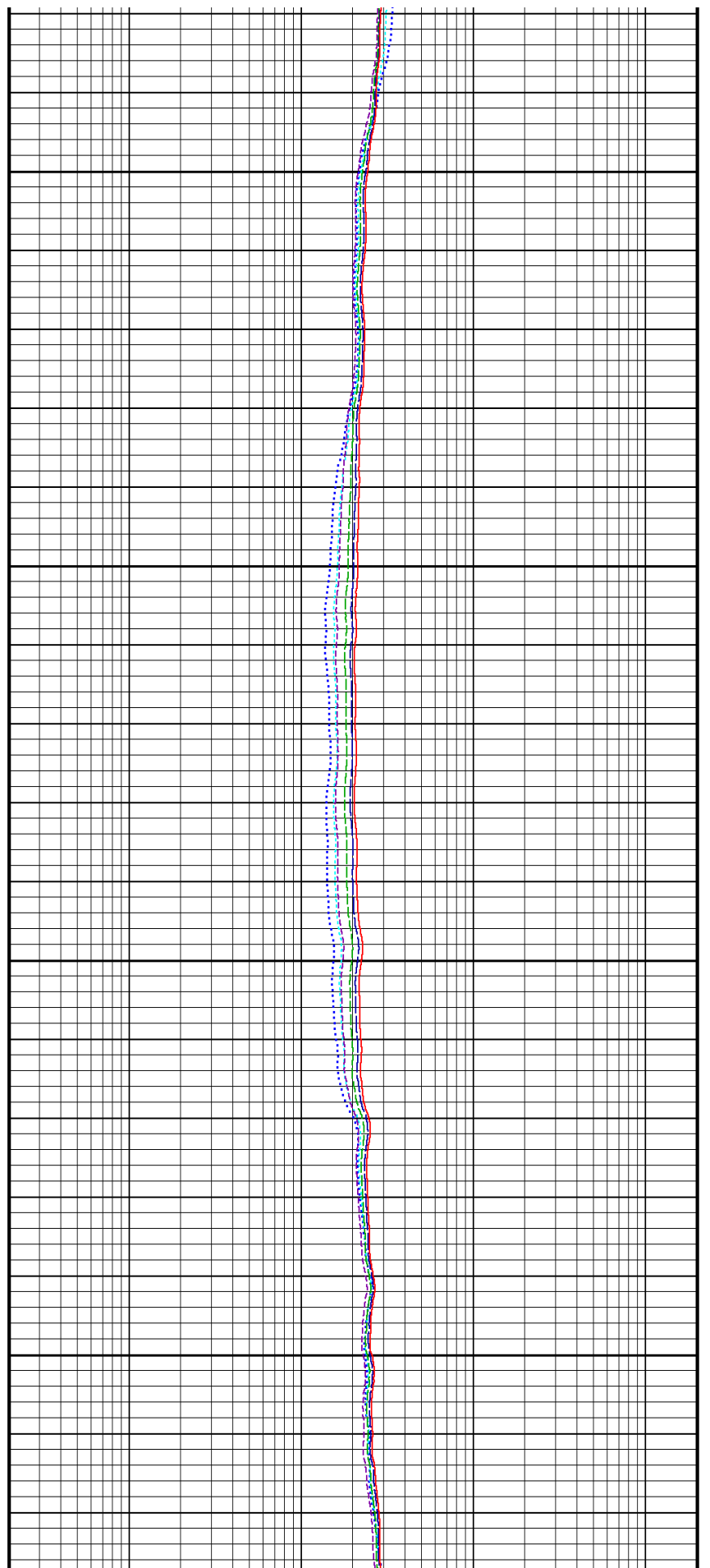
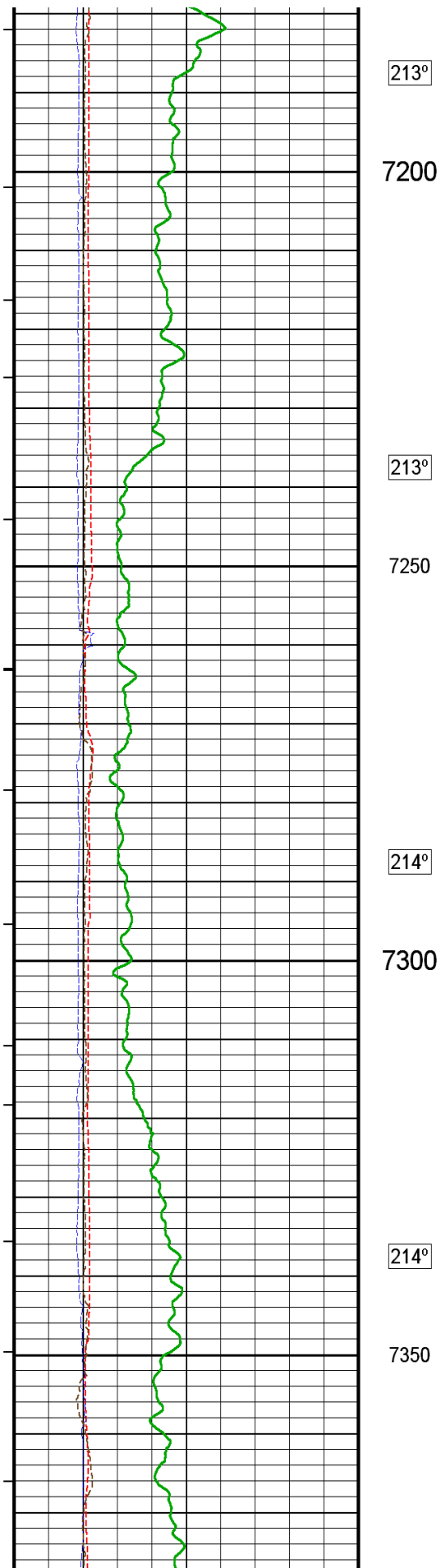
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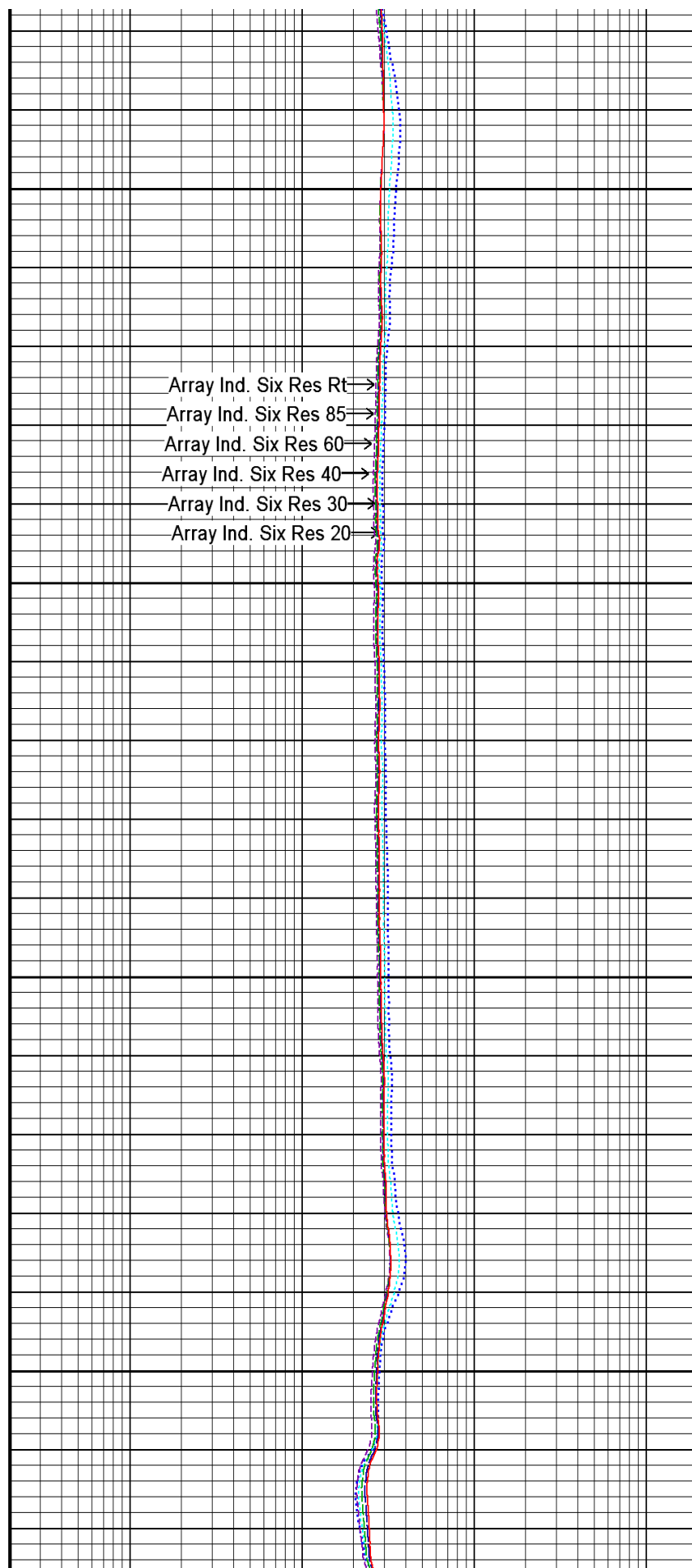
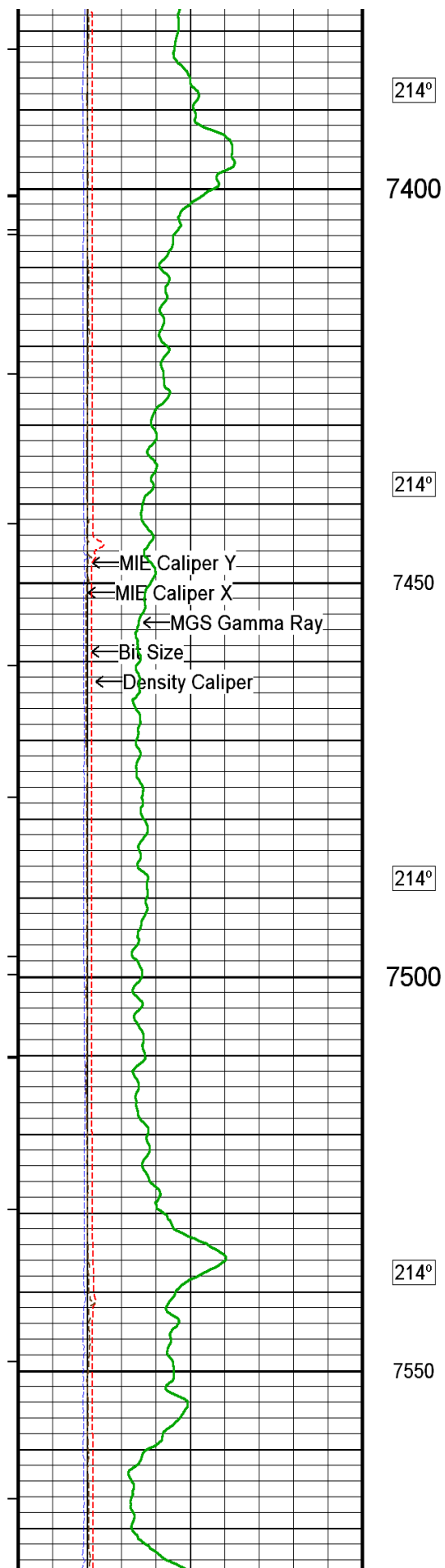
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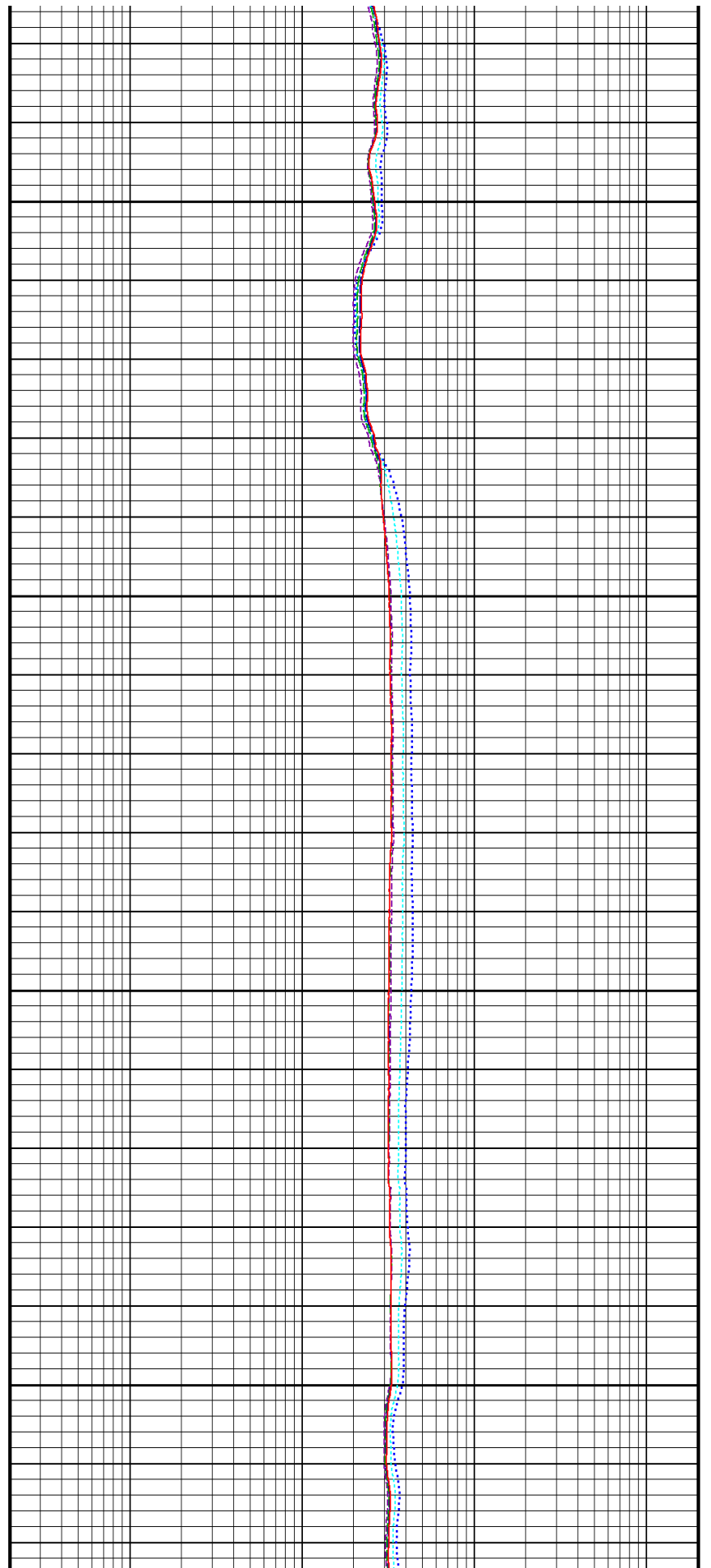
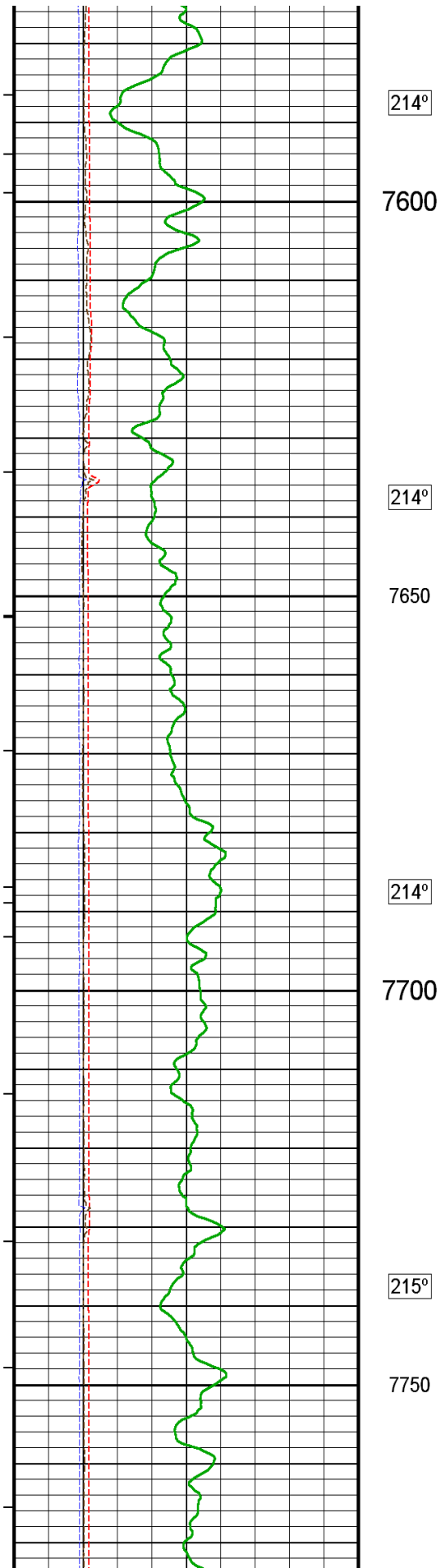


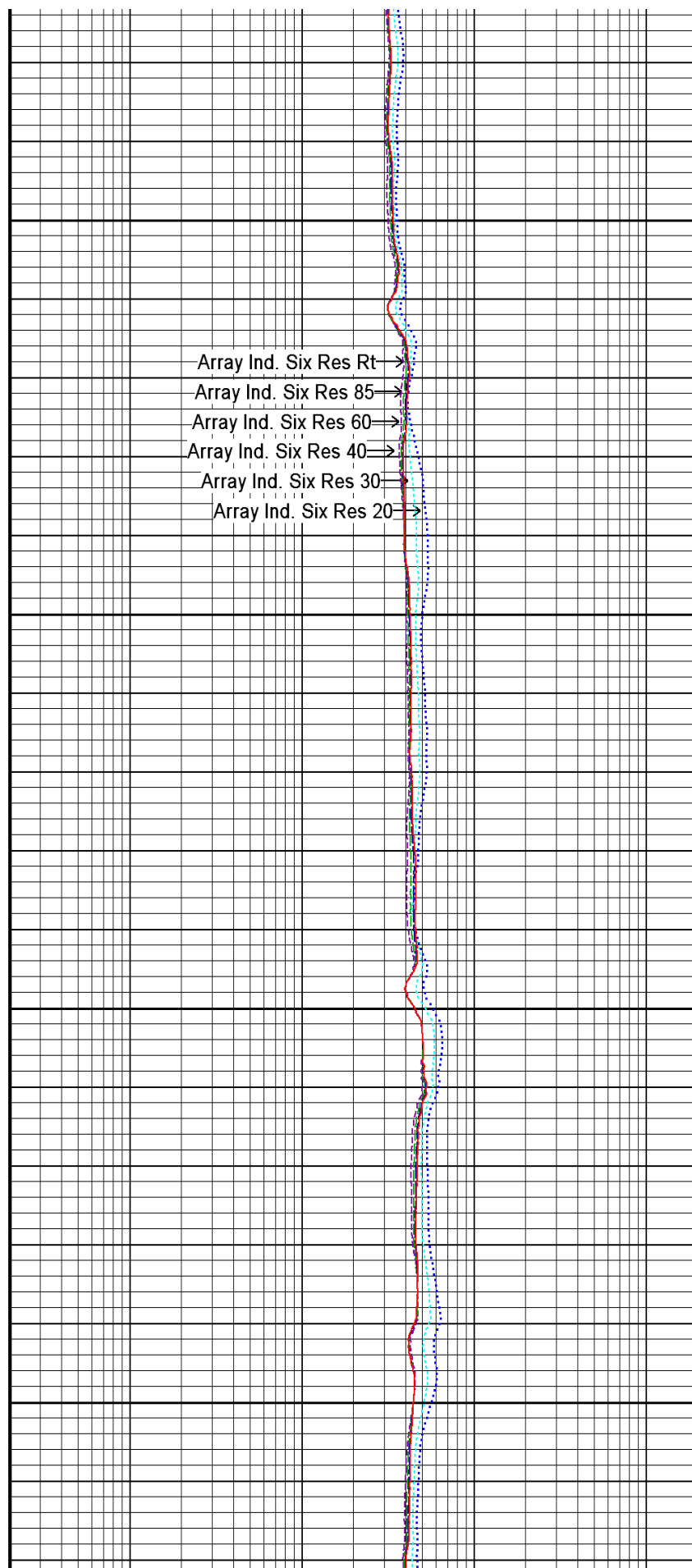
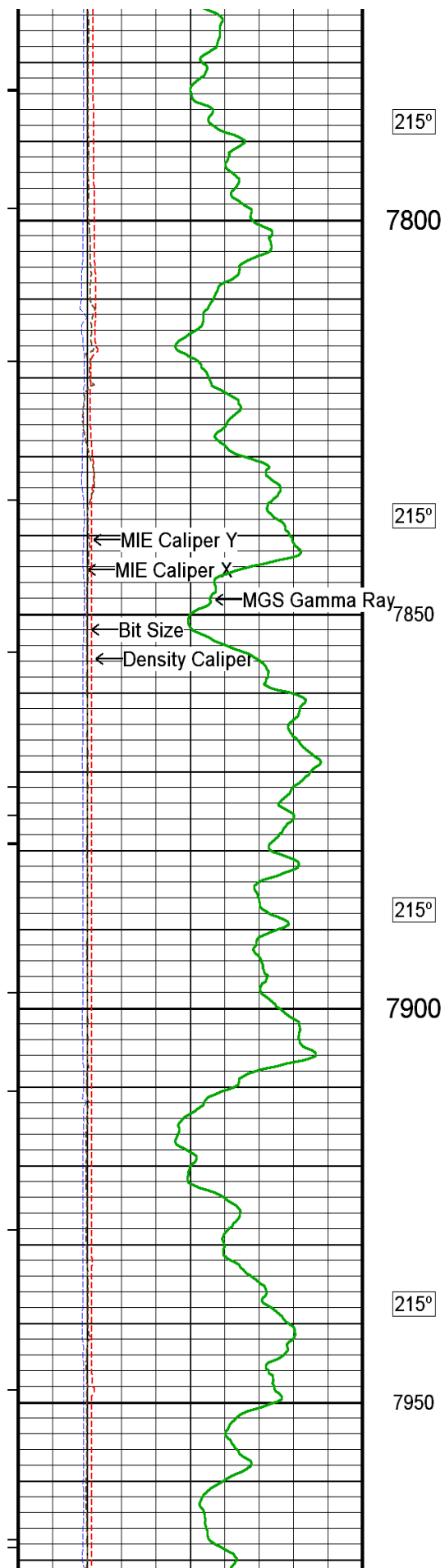


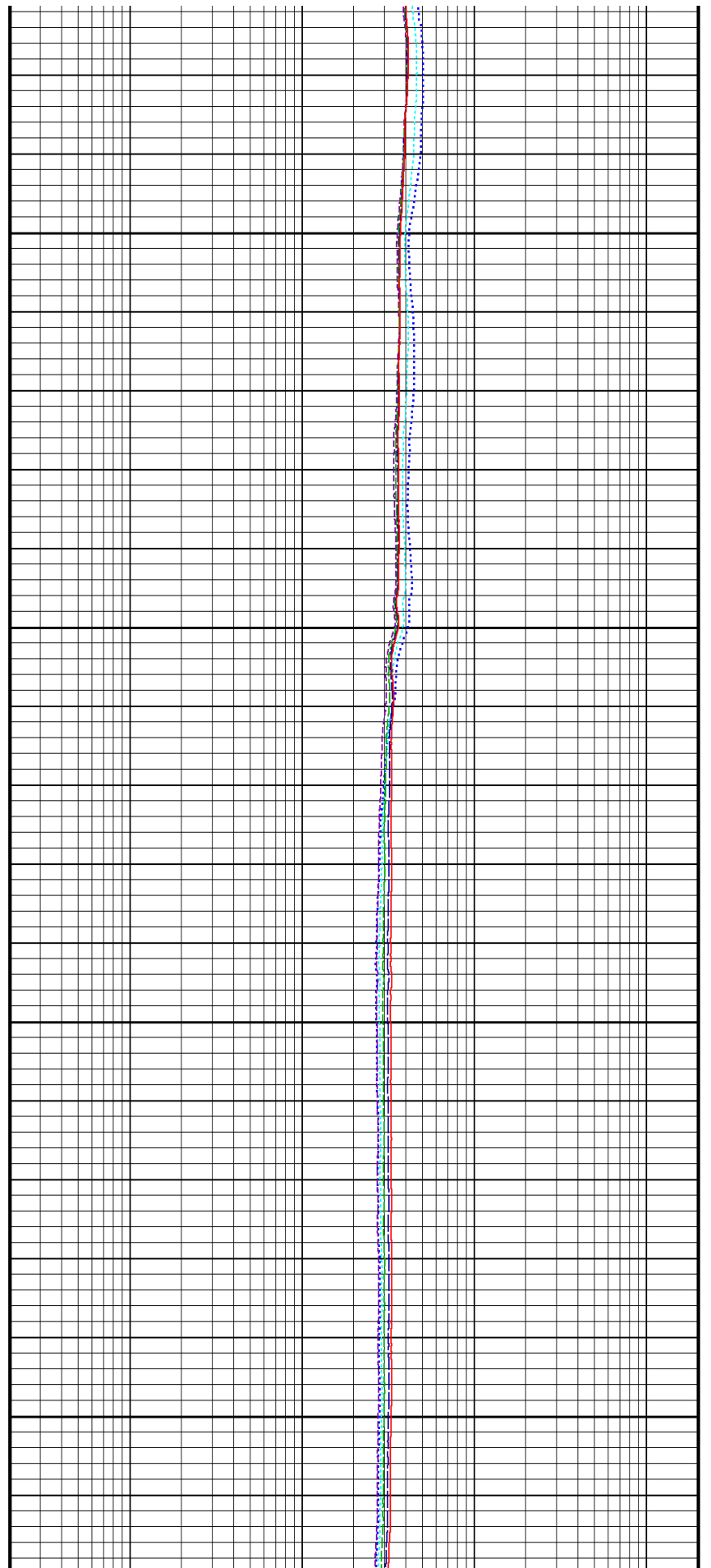
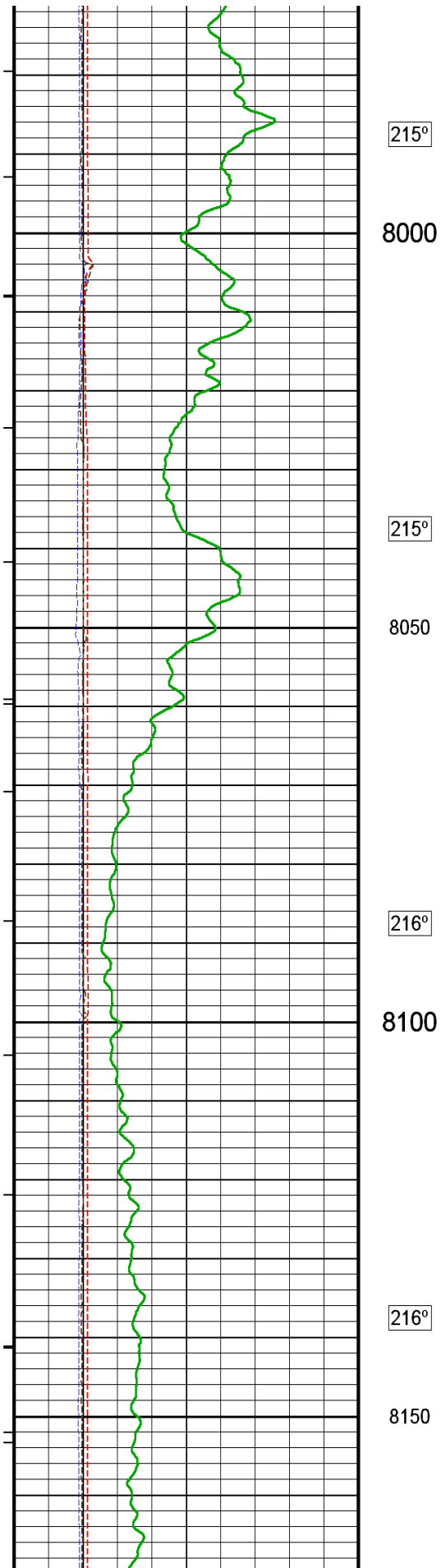


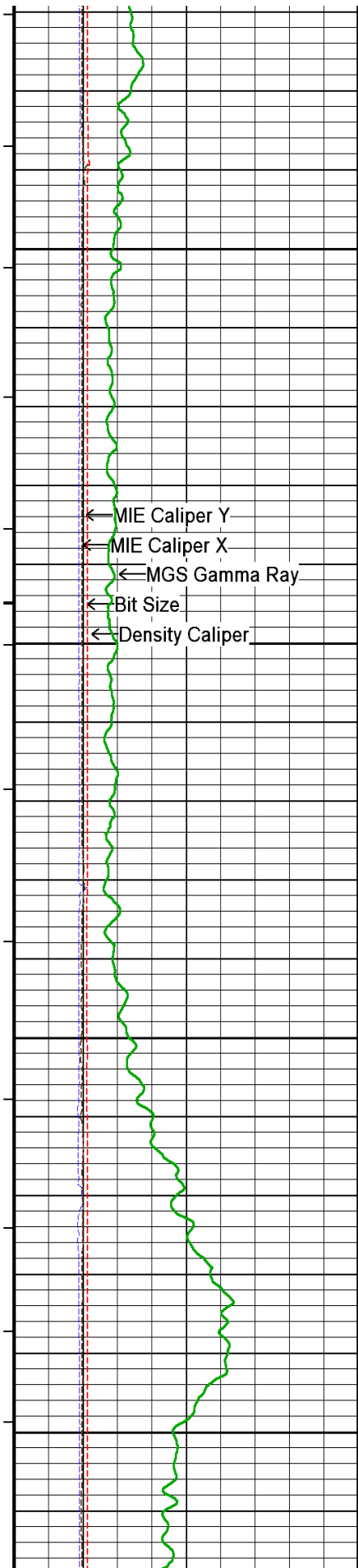












216°

8200

216°

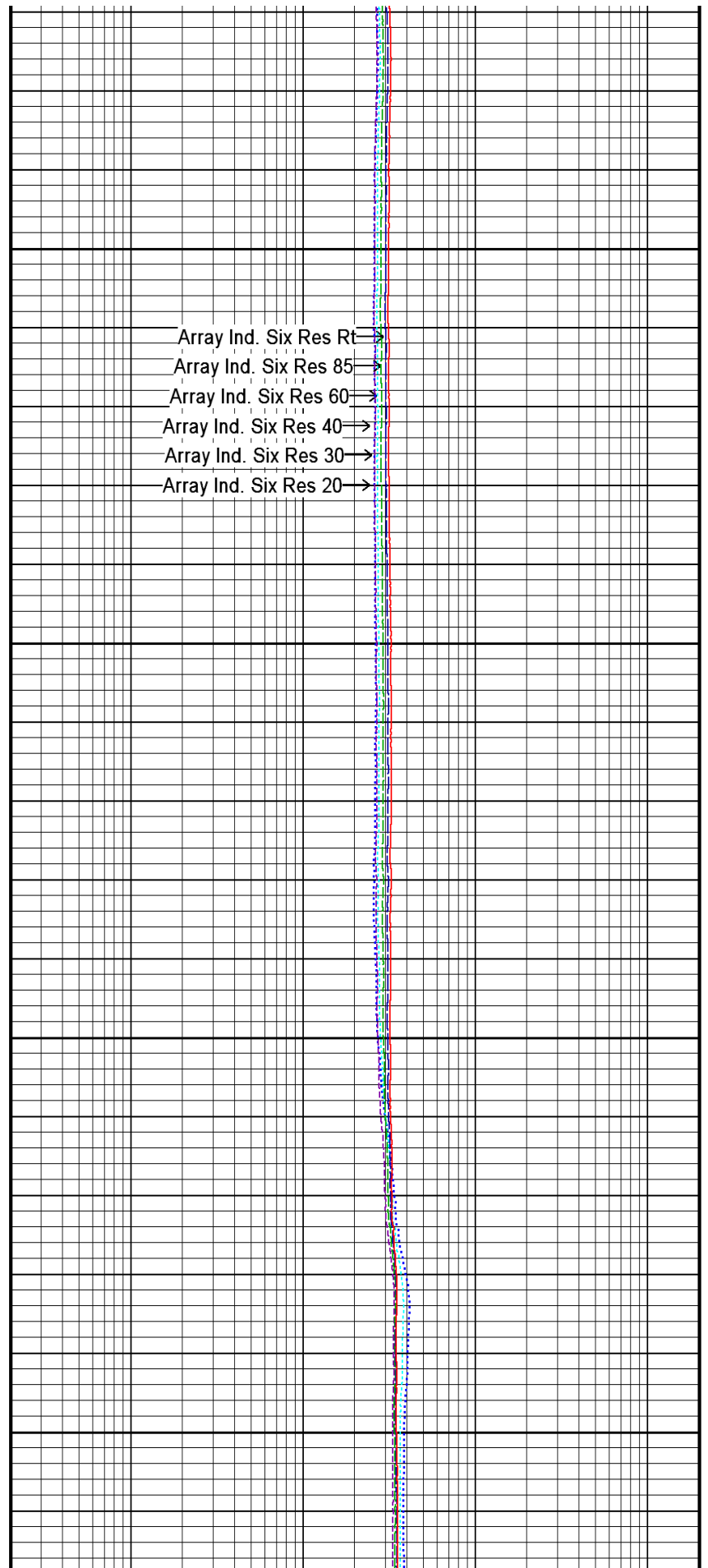
8250

216°

8300

216°

8350



Array Ind. Six Res Rt

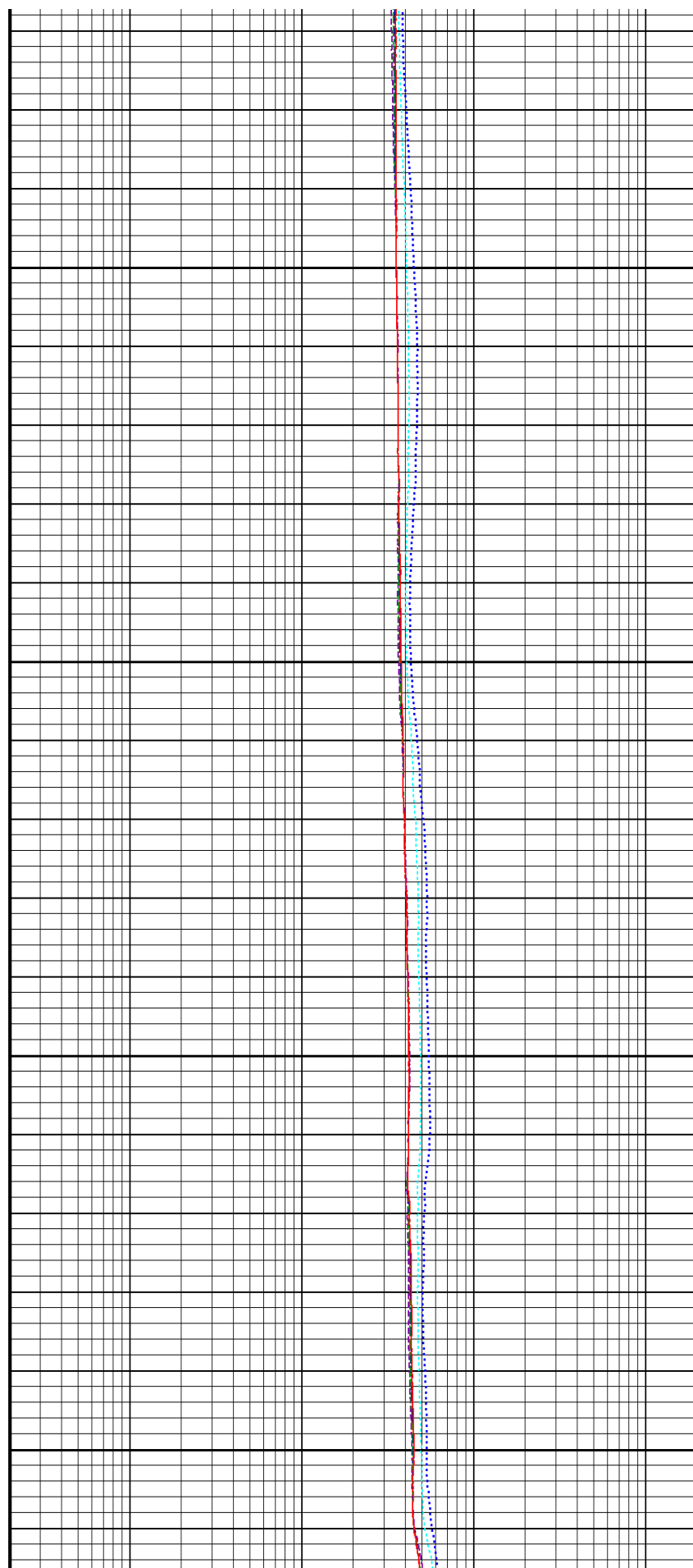
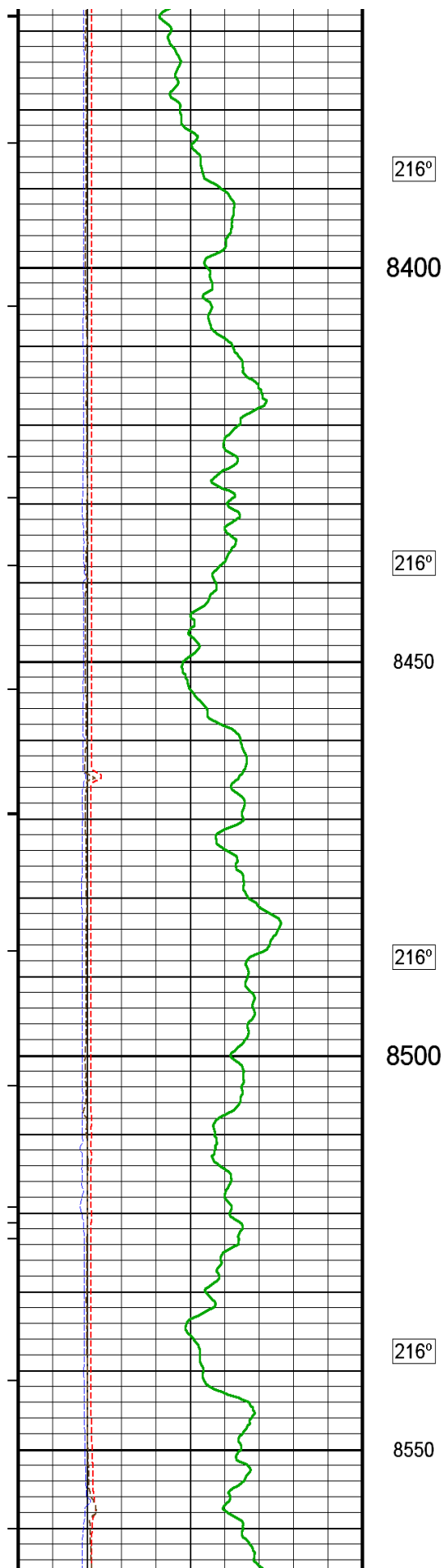
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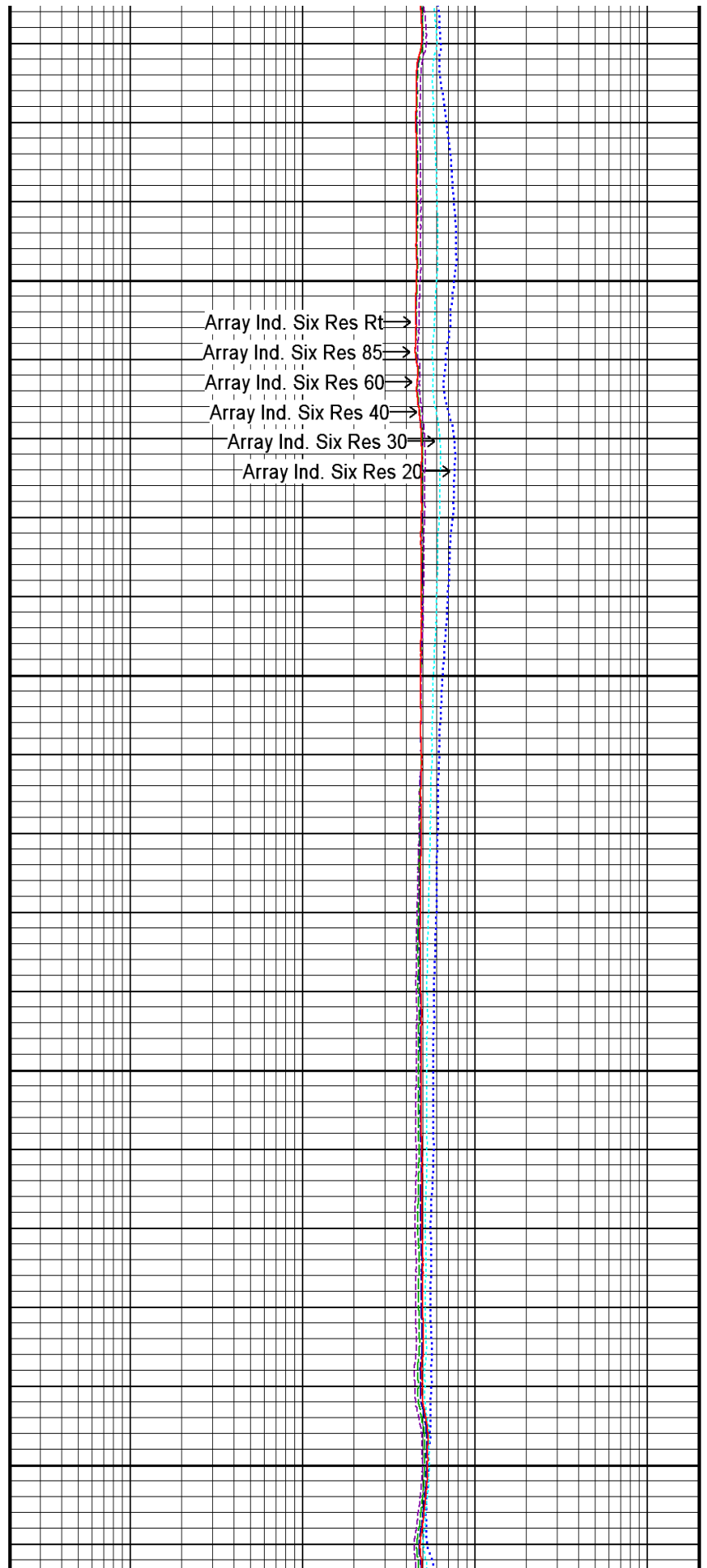
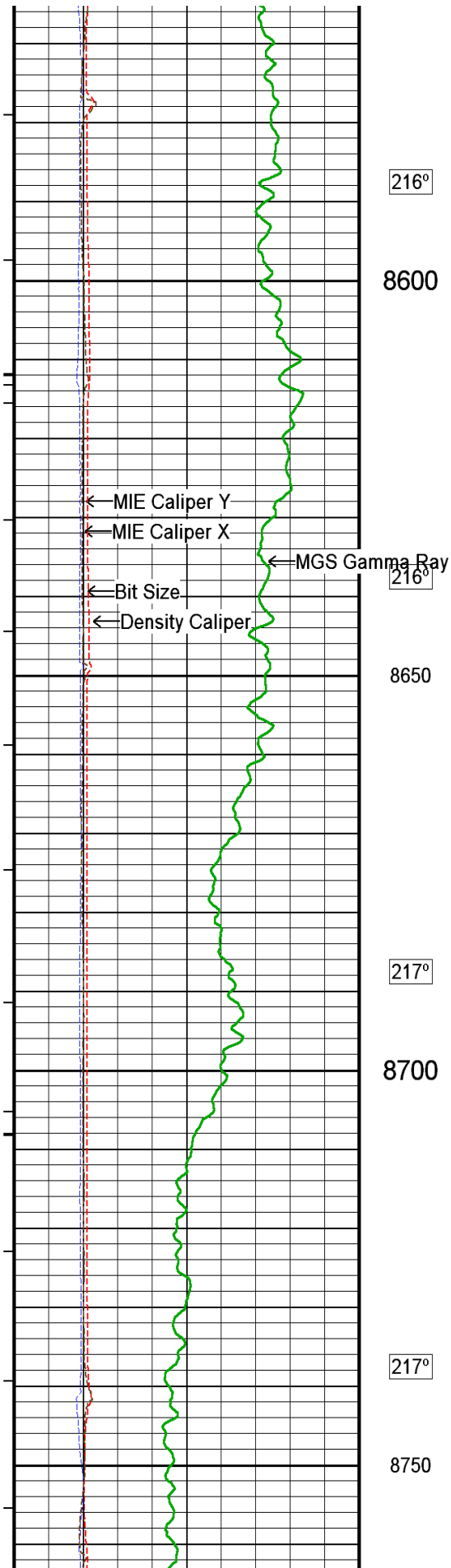
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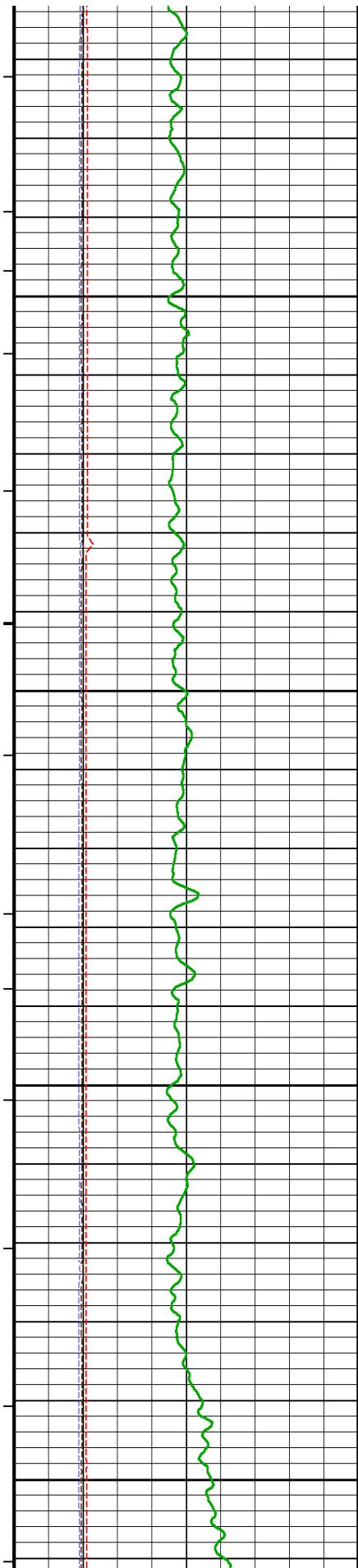
Array Ind. Six Res 30

Array Ind. Six Res 20









217°

8800

217°

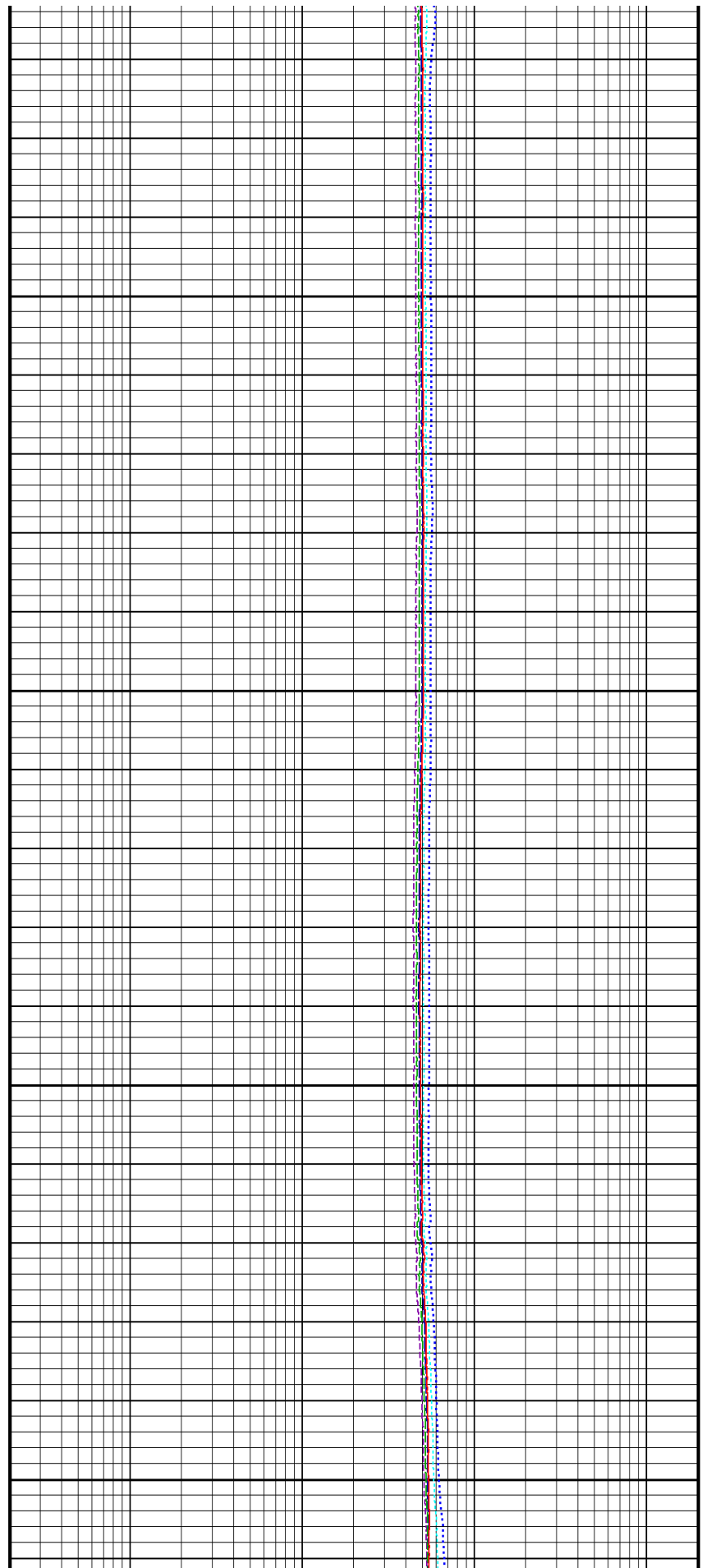
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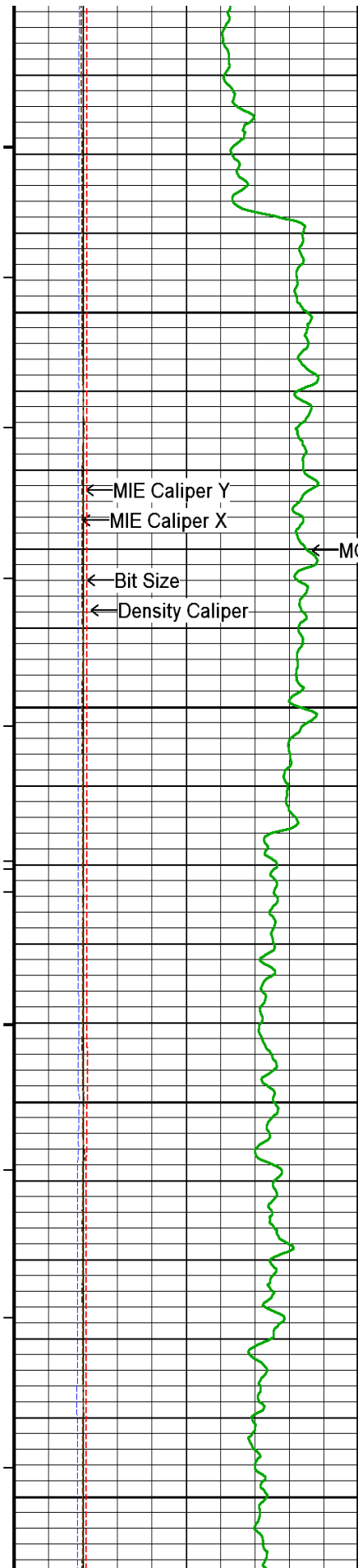
217°

8900

217°

8950





217°

9000

← MIE Caliper Y

← MIE Caliper X

← Bit Size

← Density Caliper

← MGS Gamma Ray

217°

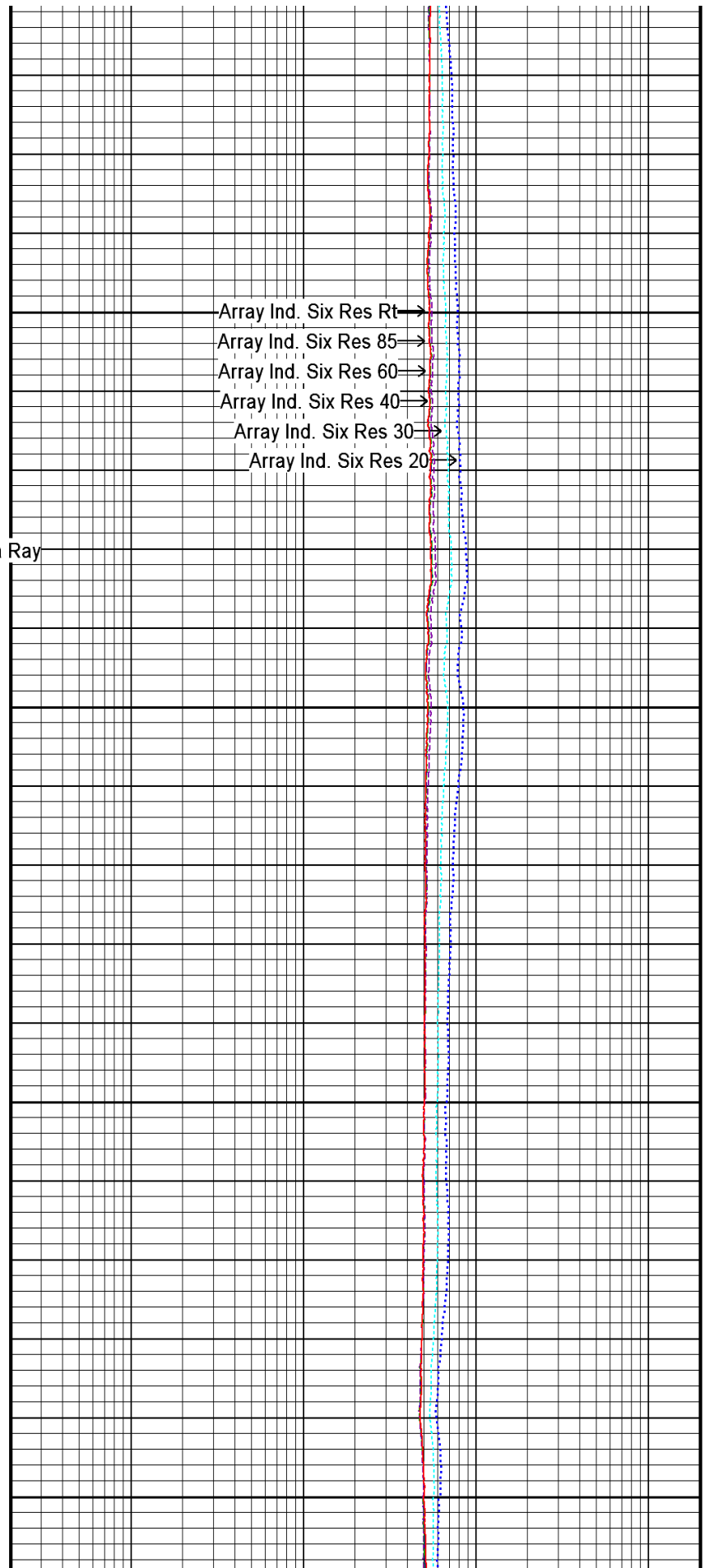
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217°

9100

217°

9150



Array Ind. Six Res Rt →

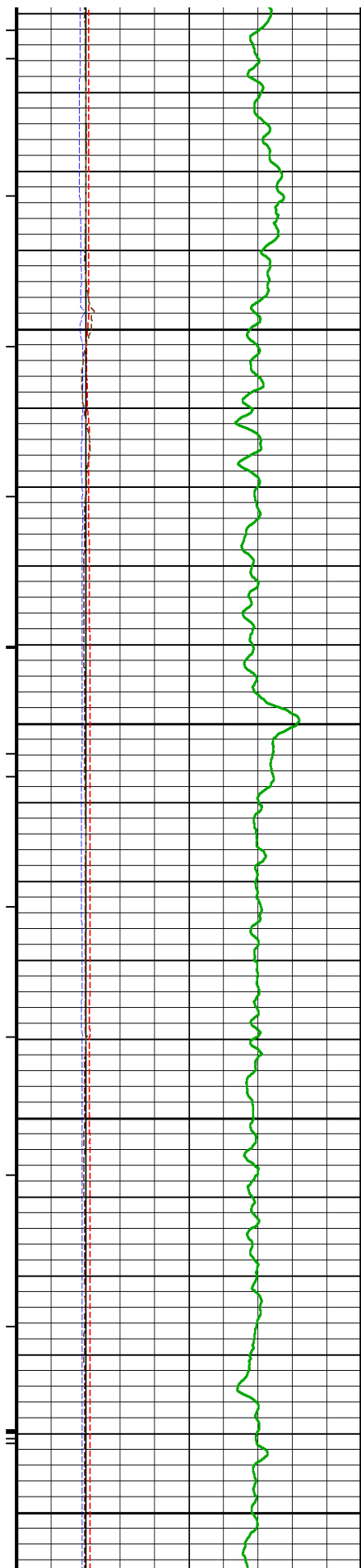
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Array Ind. Six Res 60 →

Array Ind. Six Res 40 →

Array Ind. Six Res 30 →

Array Ind. Six Res 20 →



217°

9200

217°

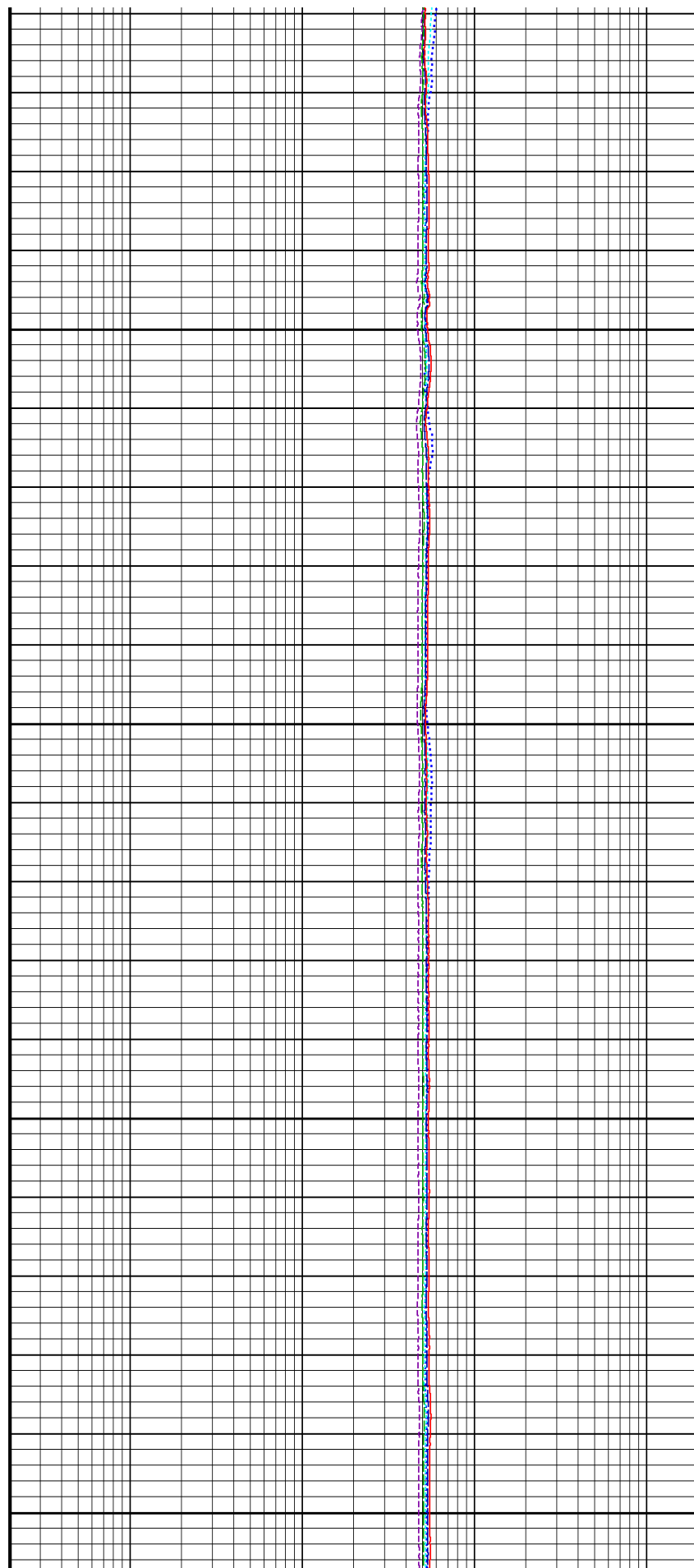
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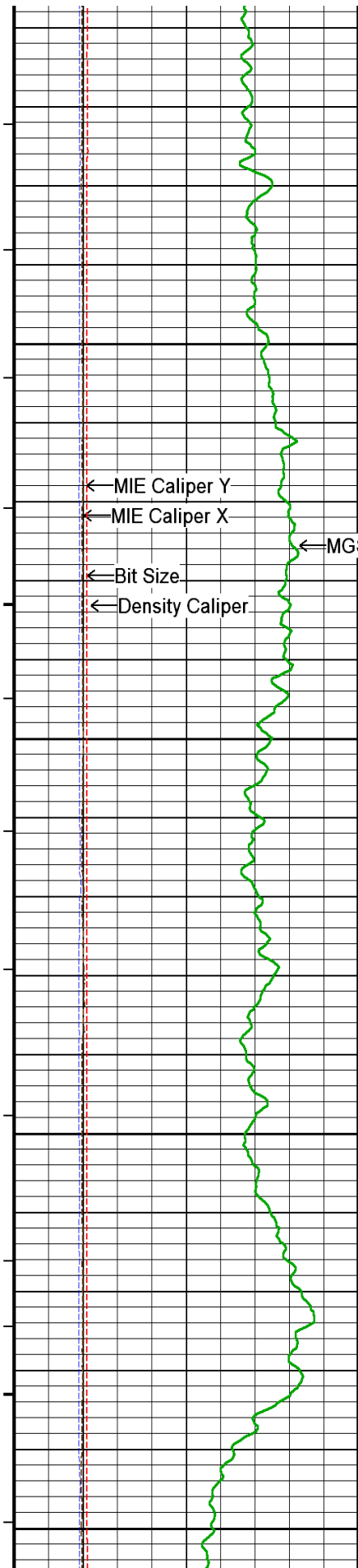
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9300

217°

9350





217°

9400

217°

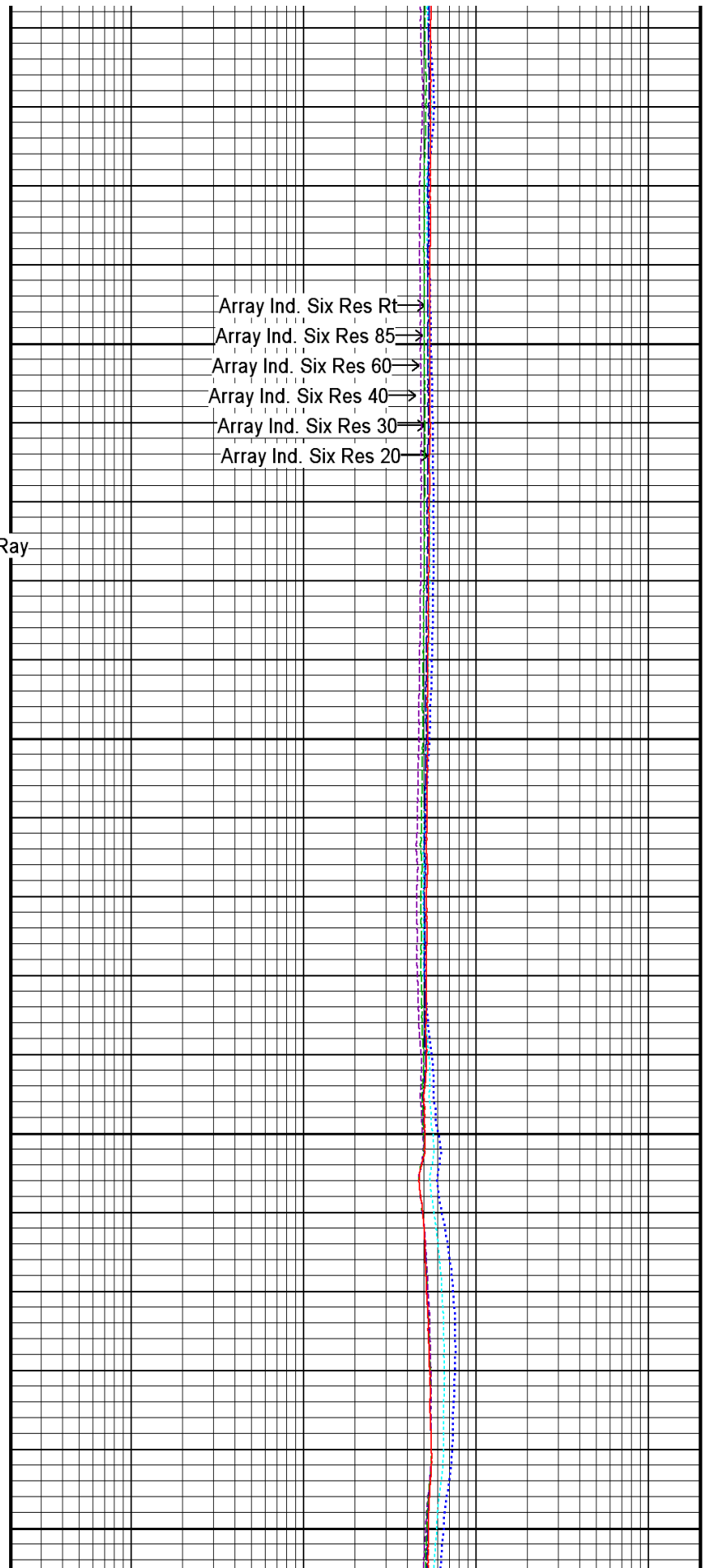
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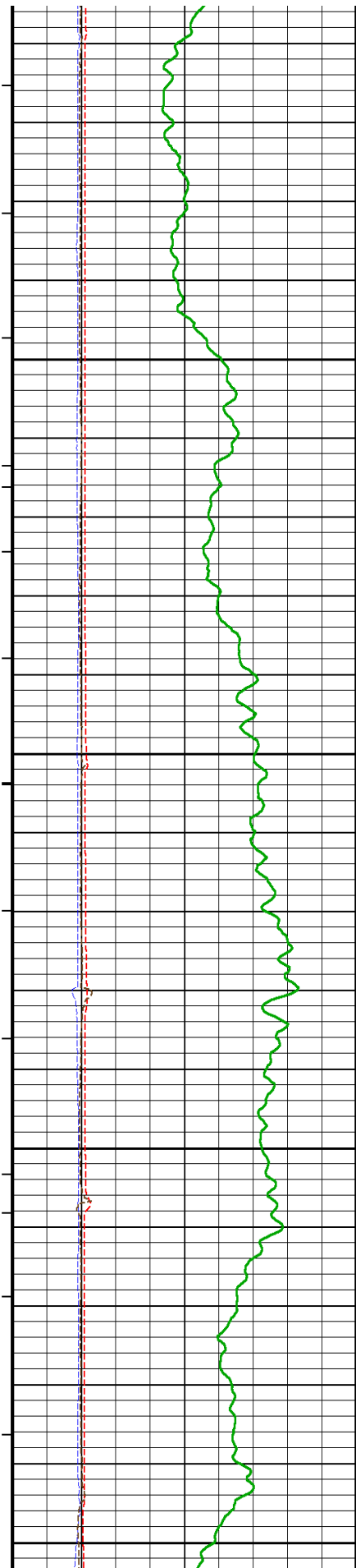
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9500

217°

9550





218°

9600

218°

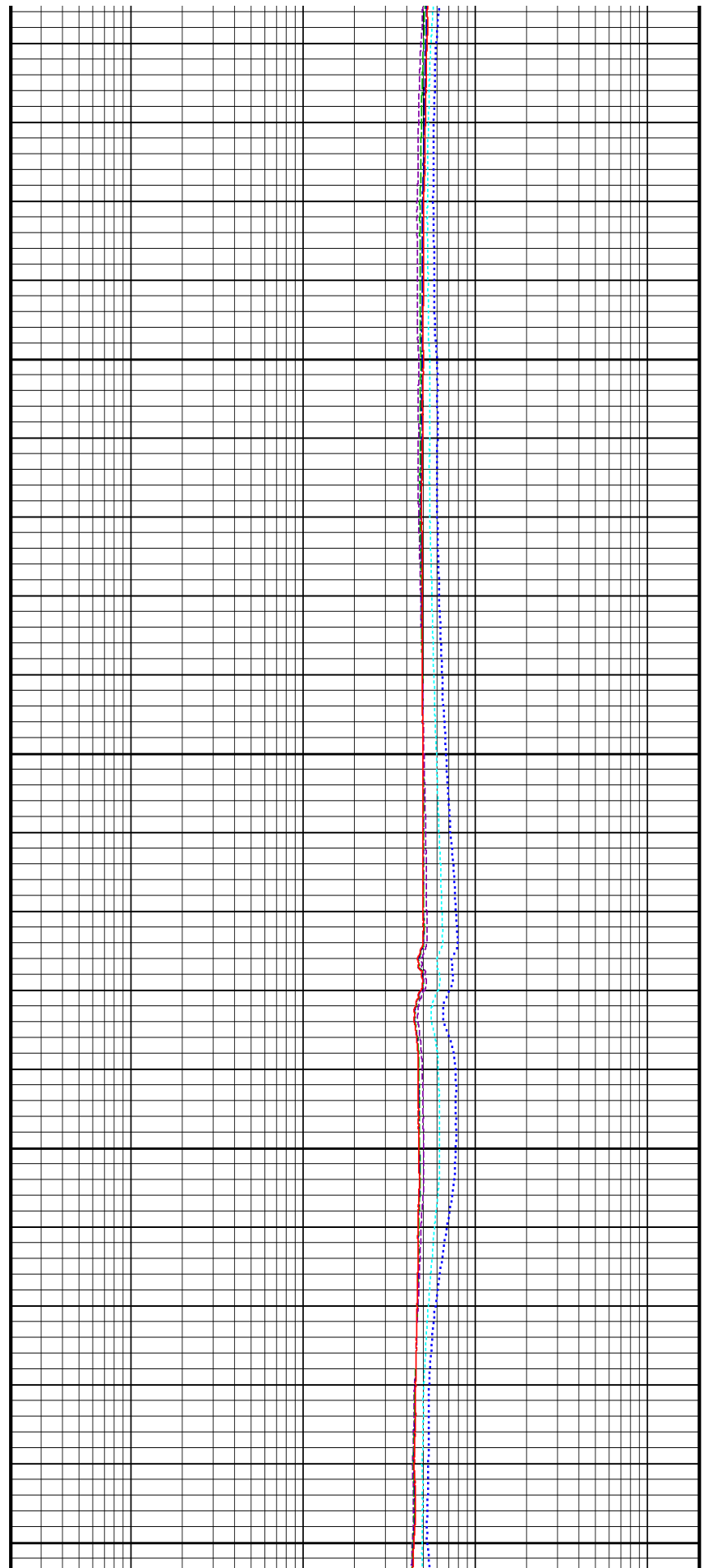
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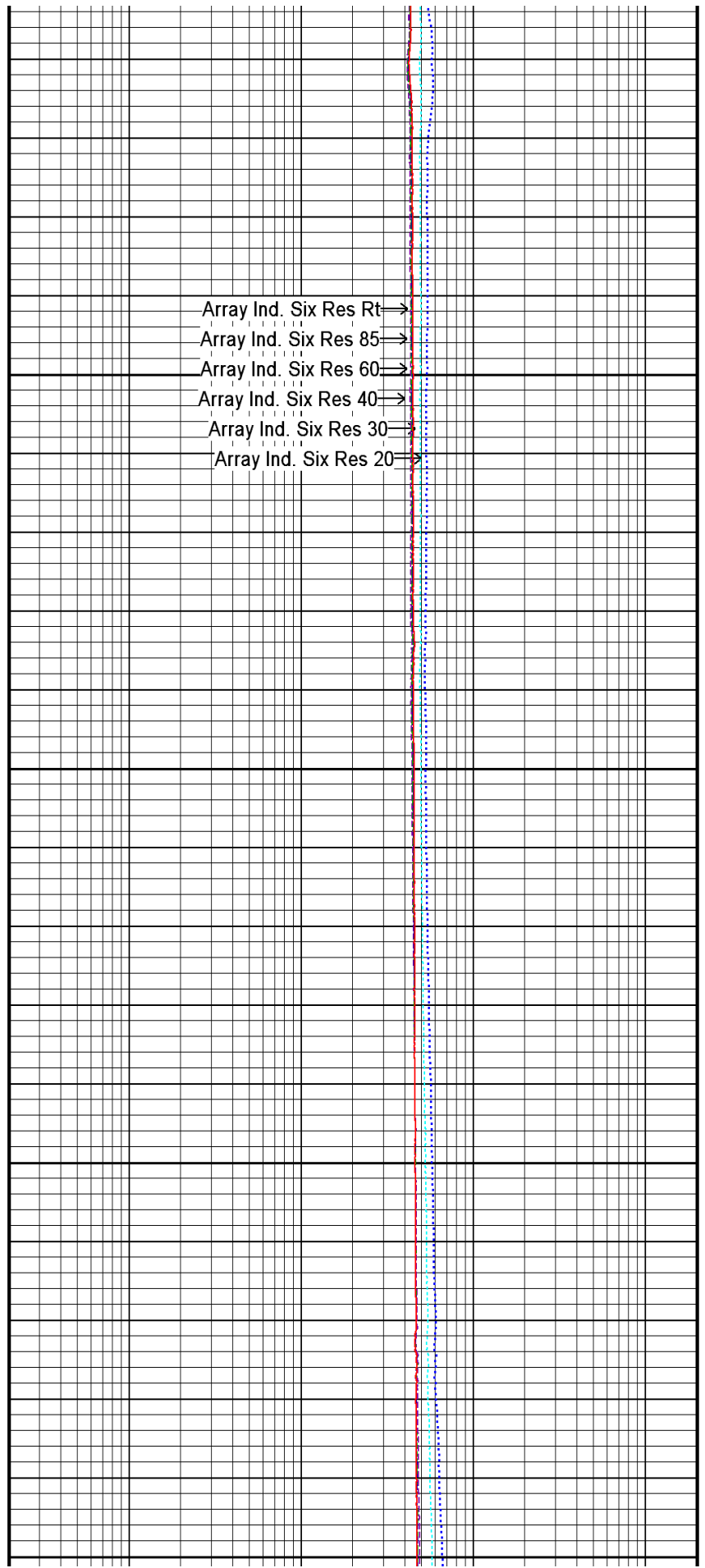
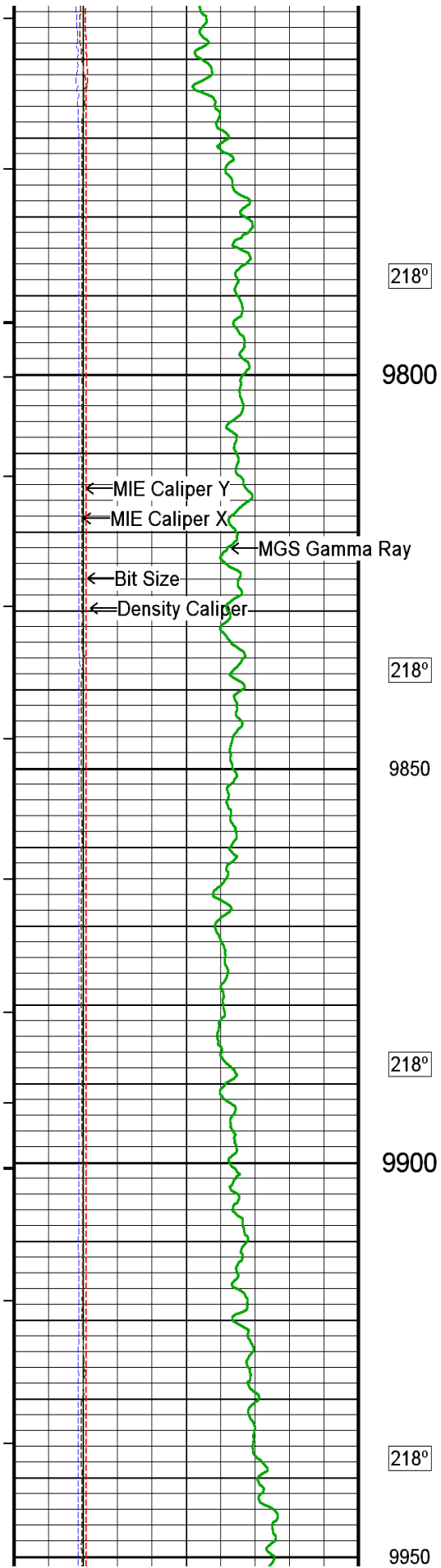
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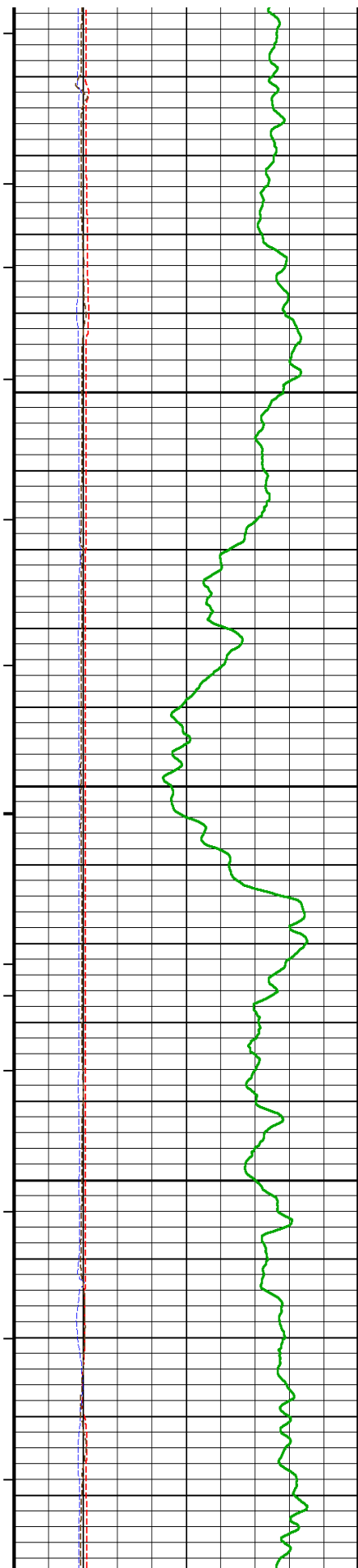
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218°

9750







218°

10000

218°

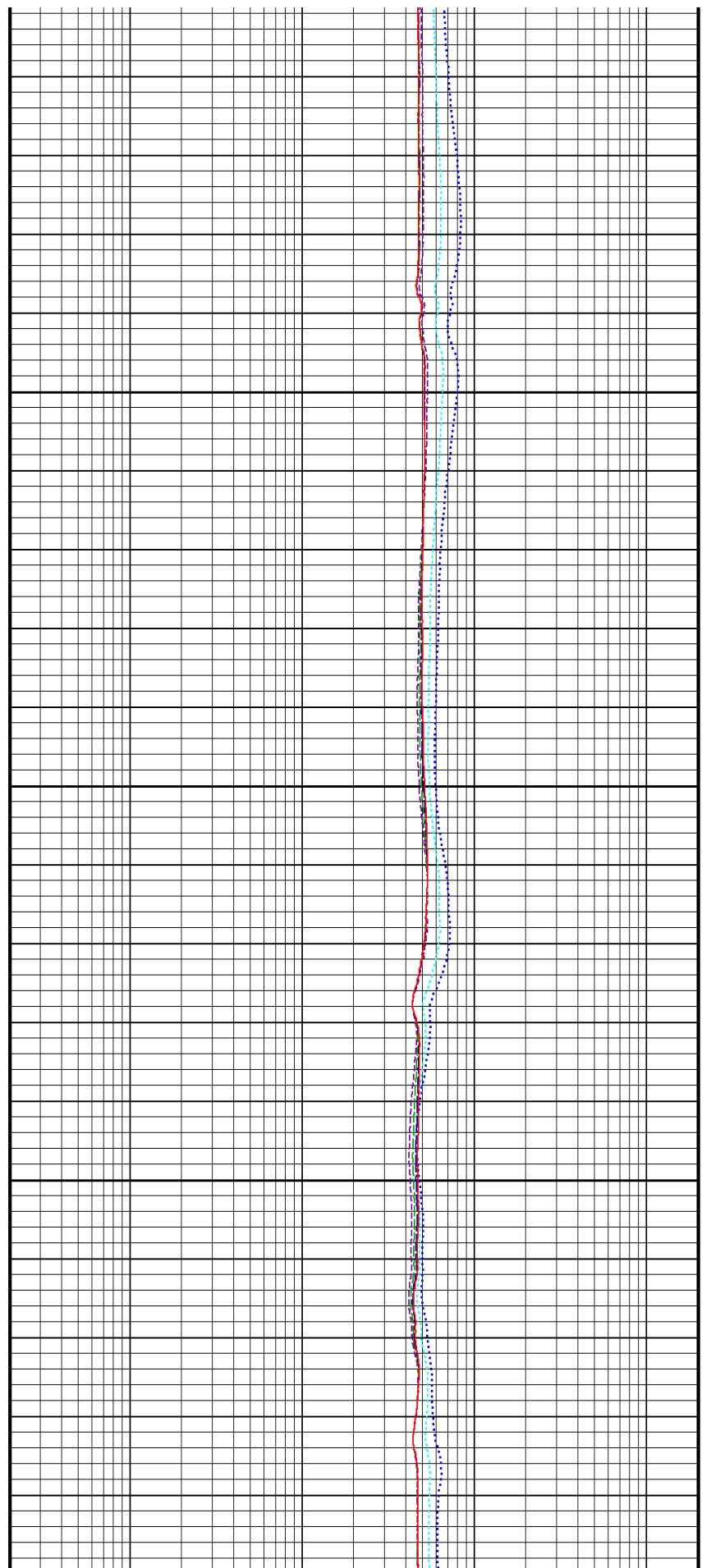
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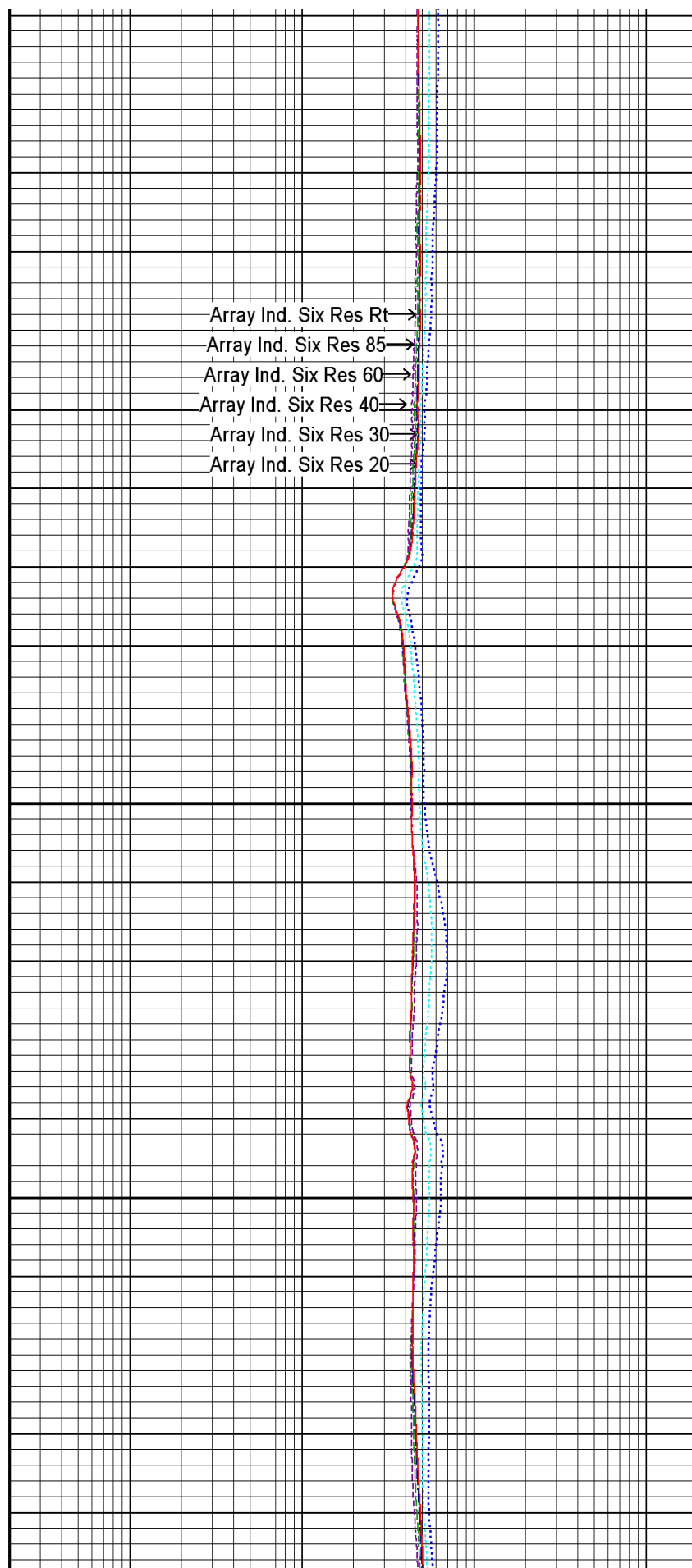
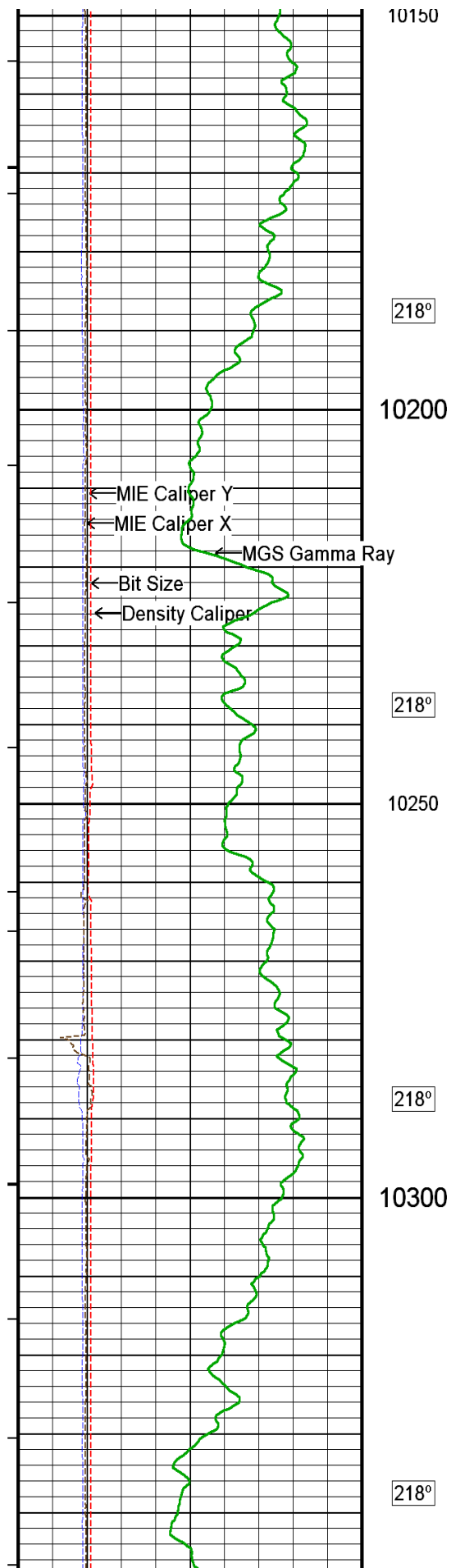
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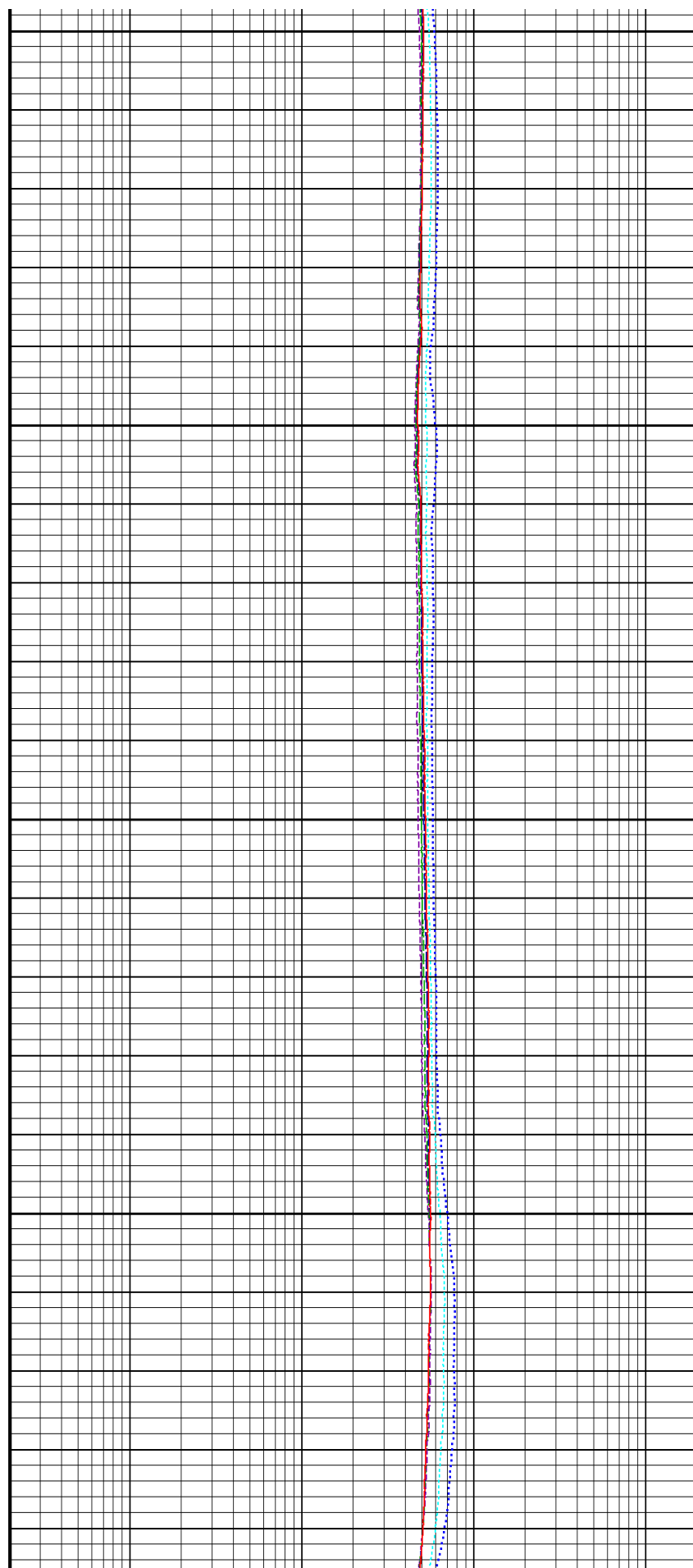
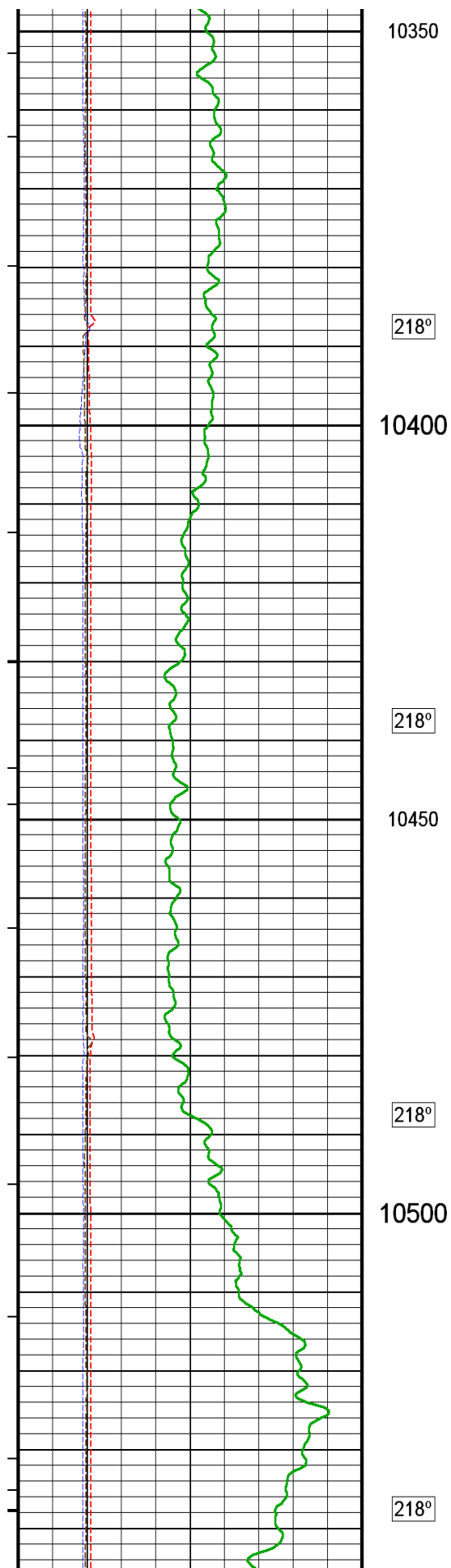
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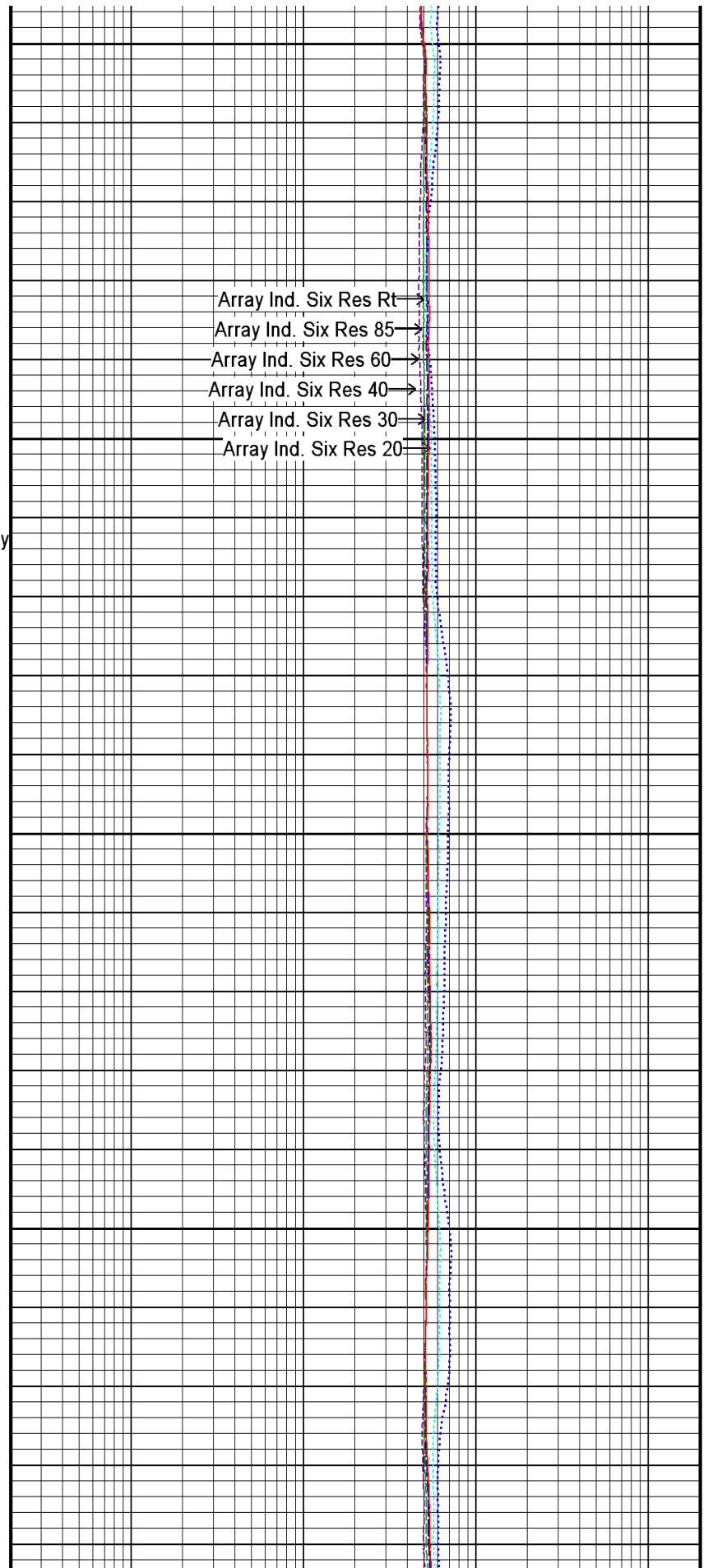
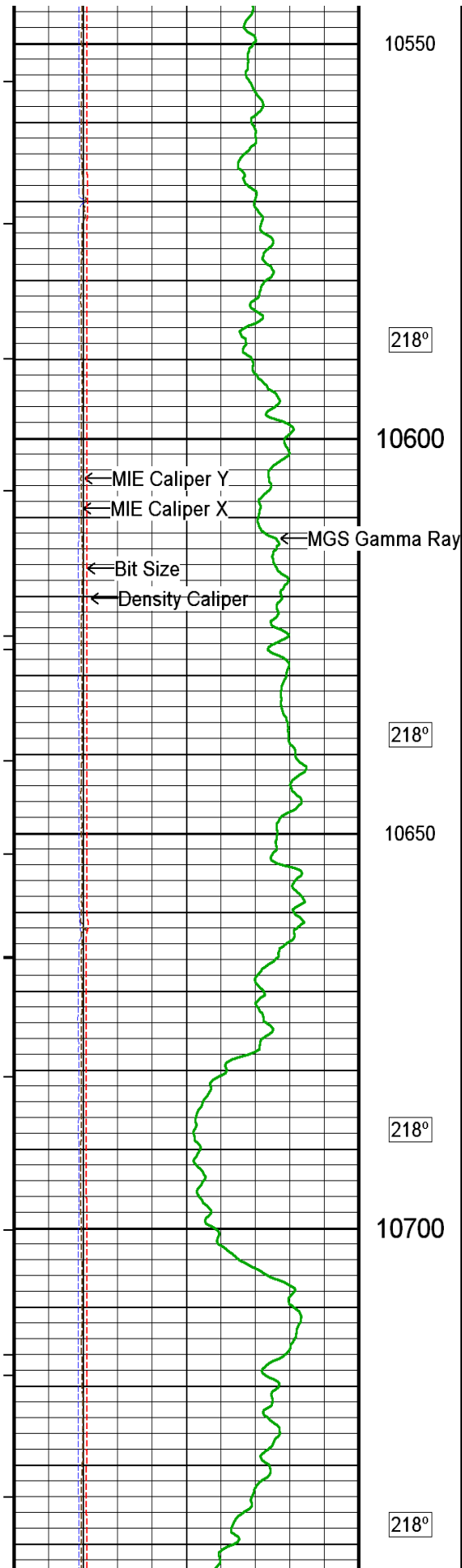
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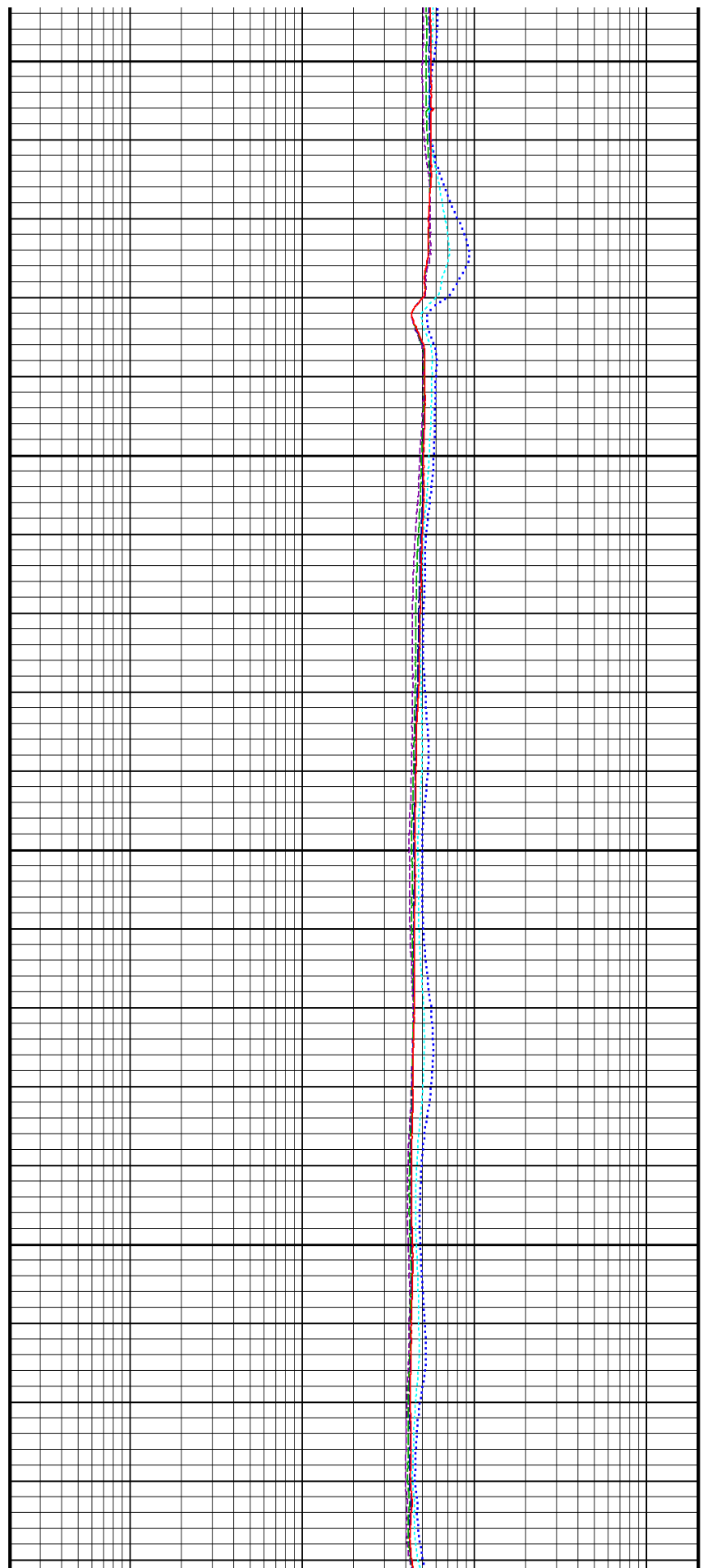
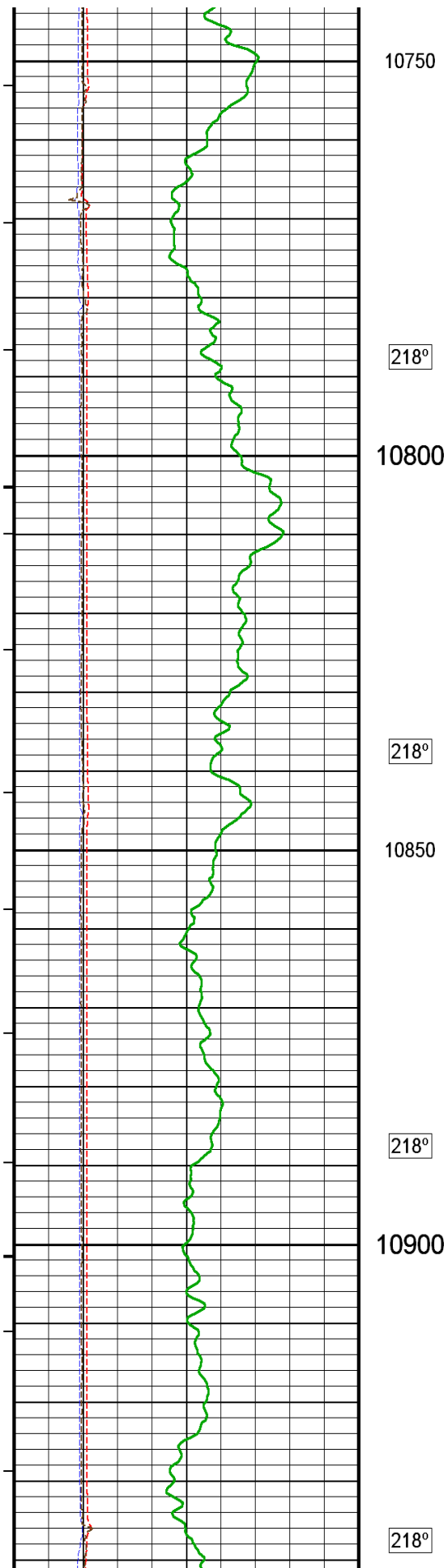


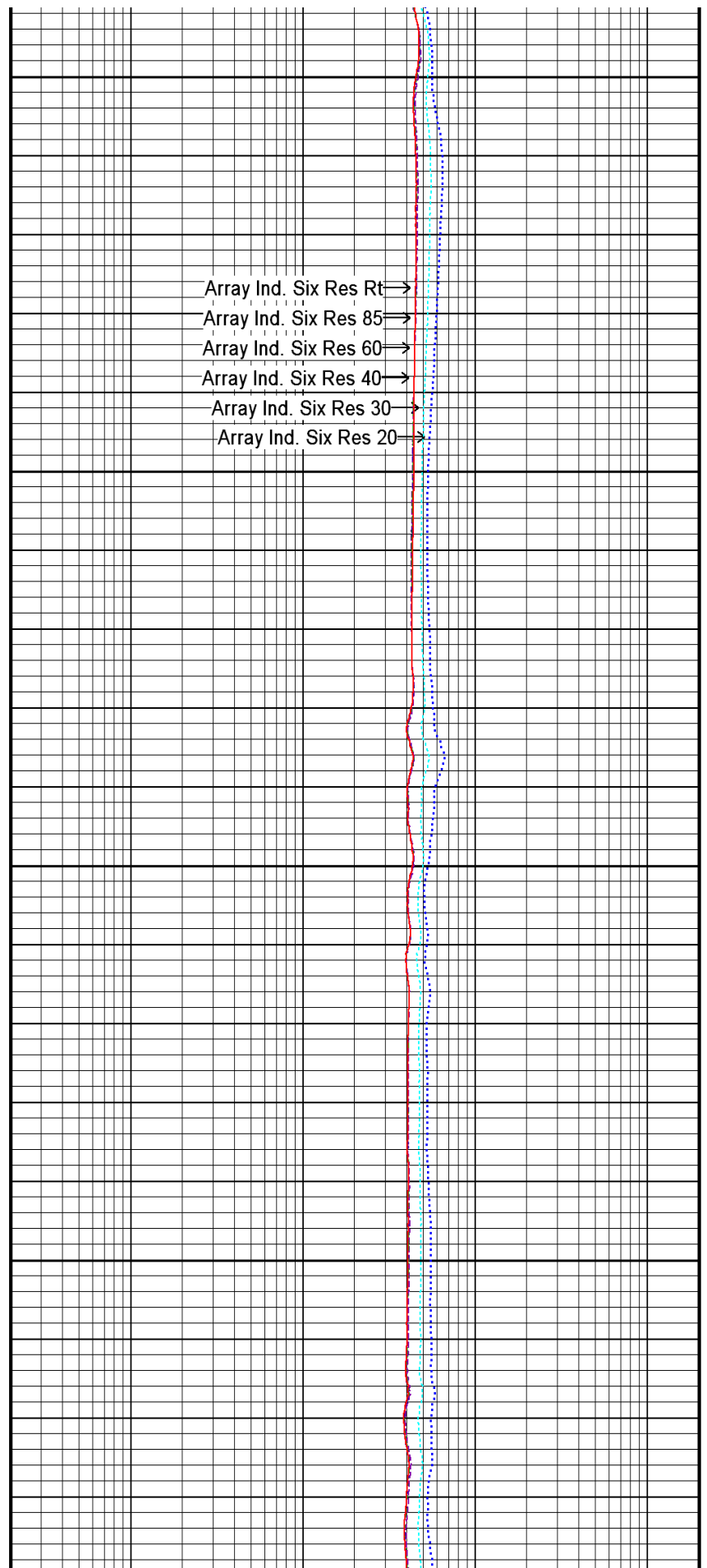
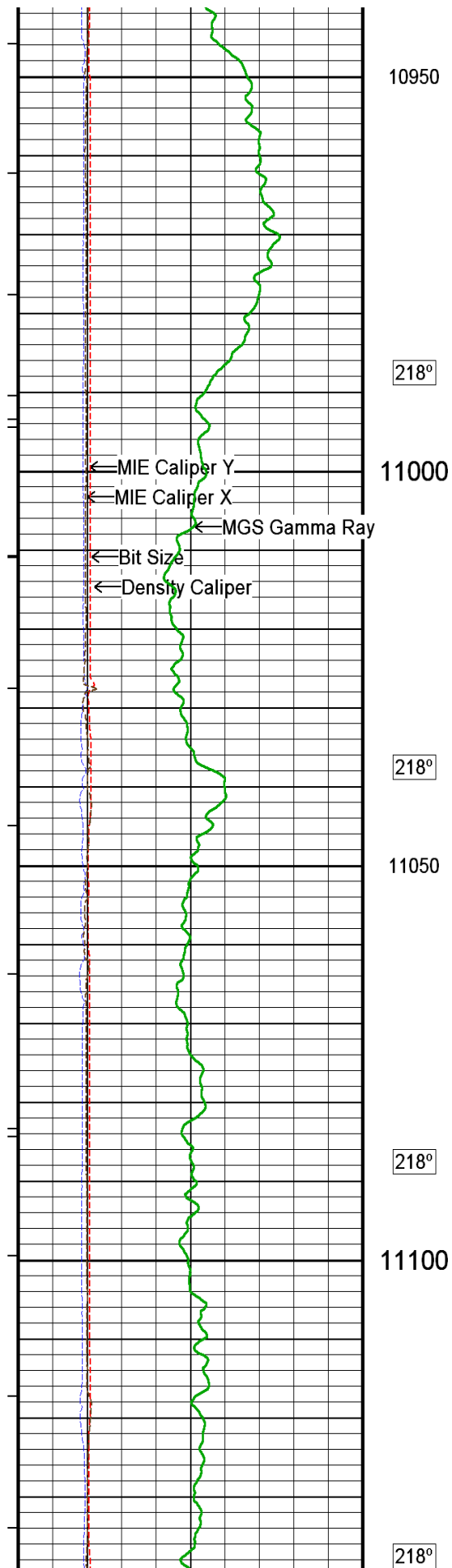


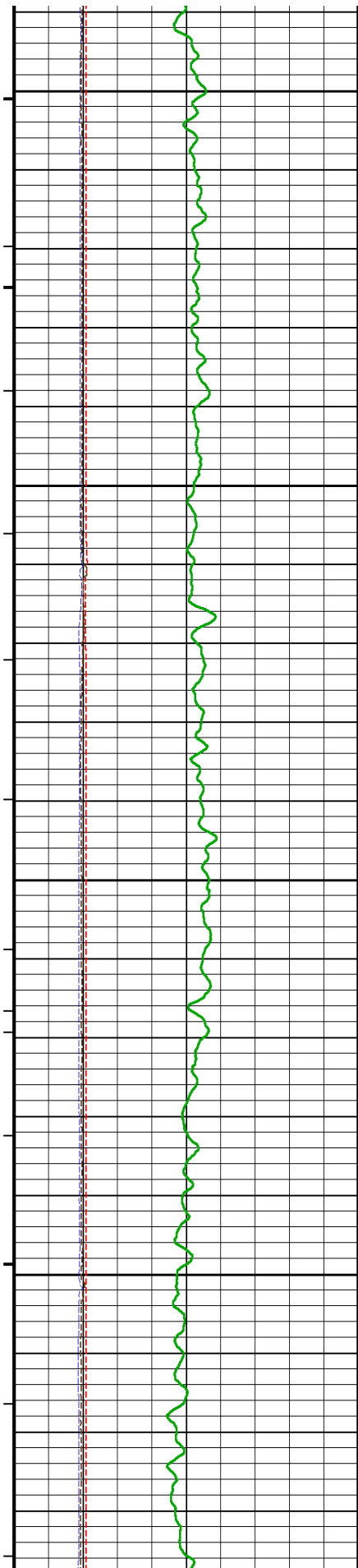












11150

218°

11200

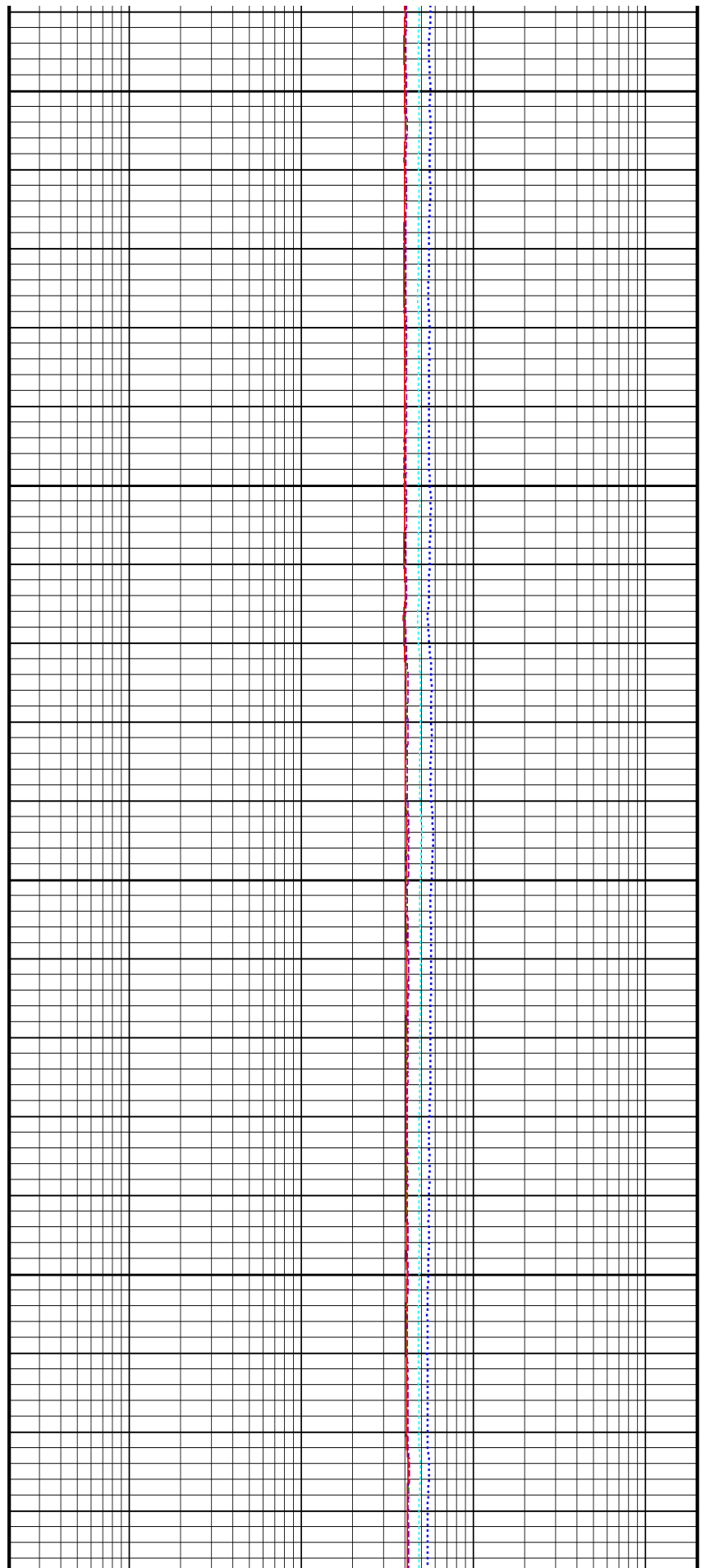
218°

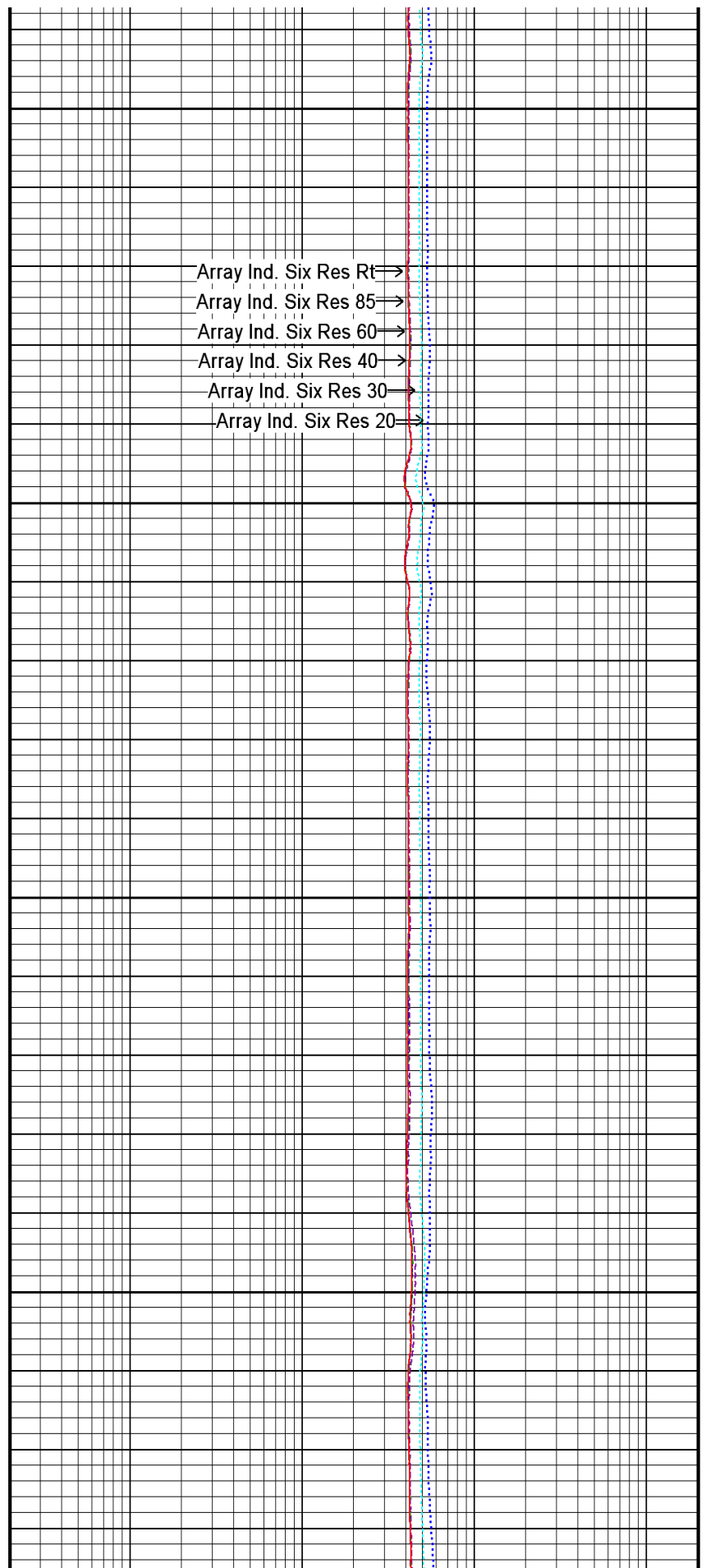
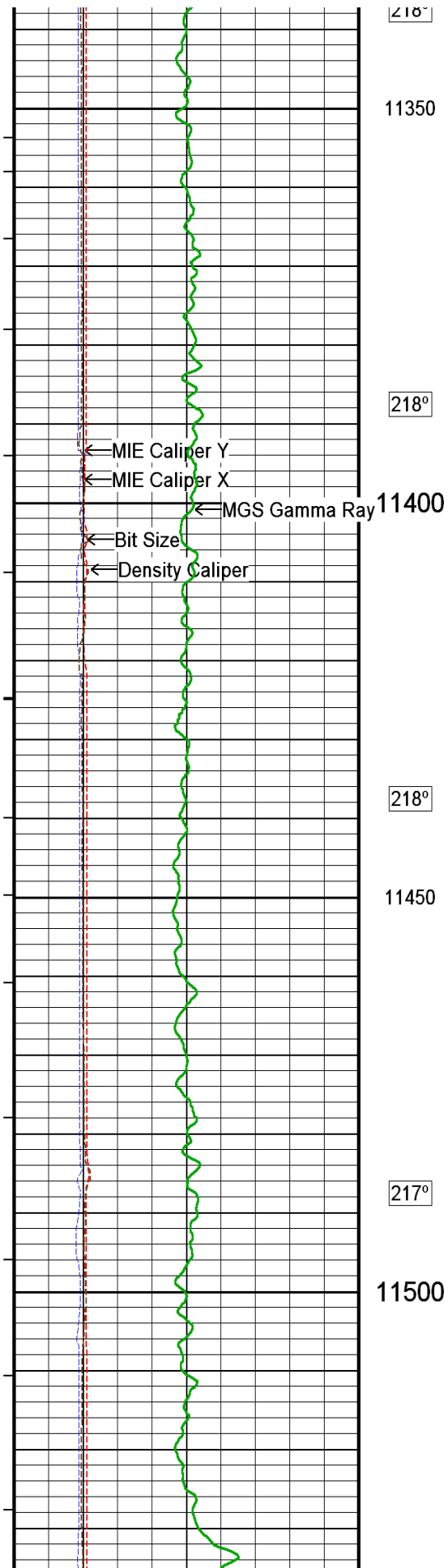
11250

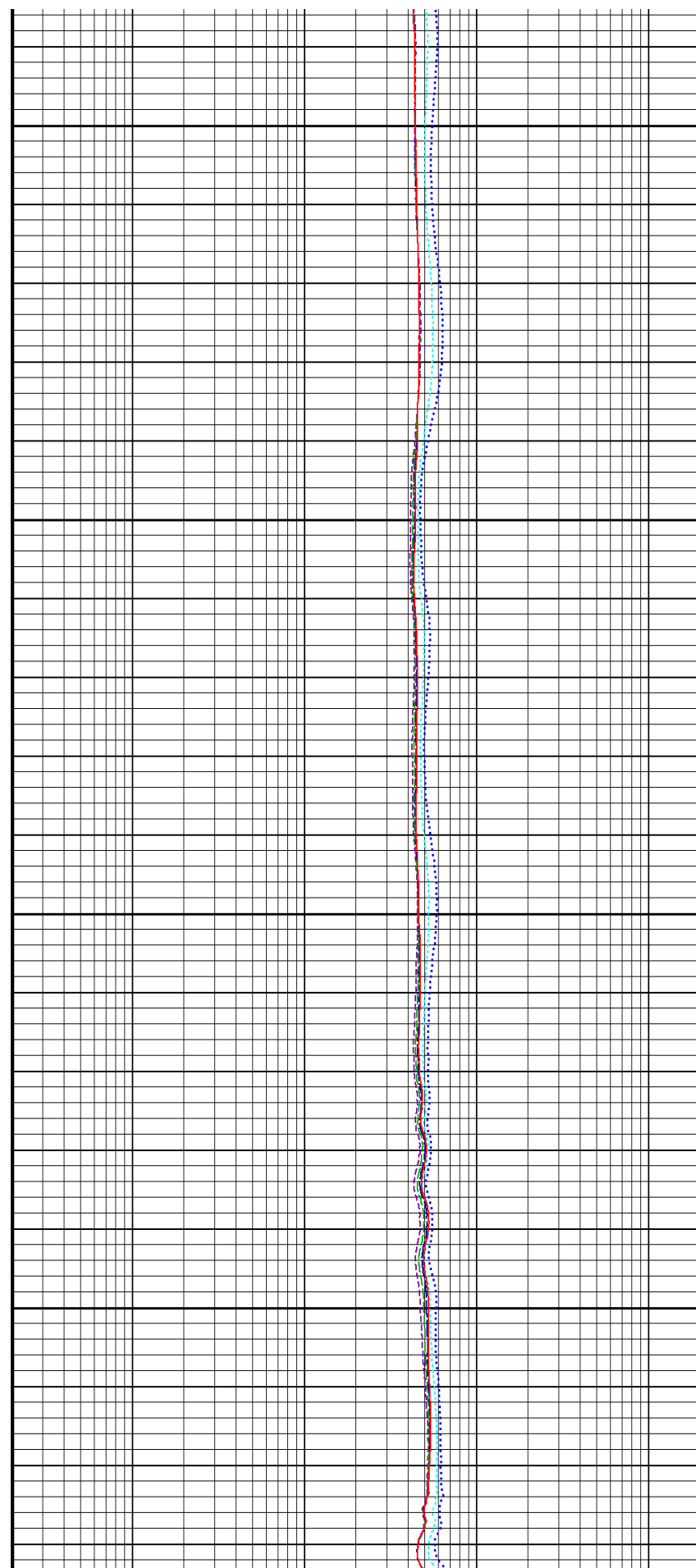
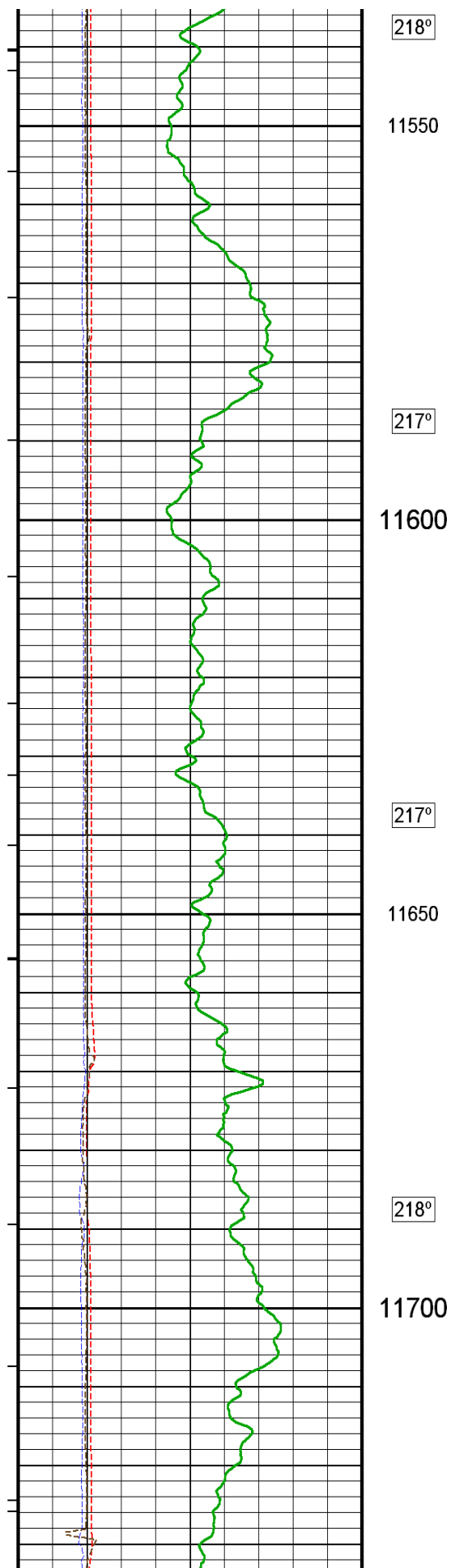
218°

11300

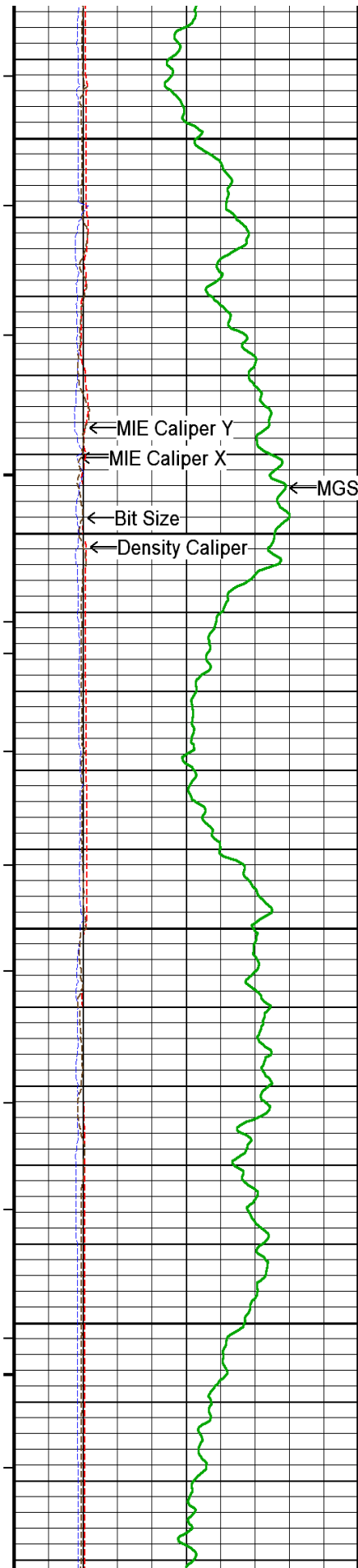
2400











217°

11750

217°

11800

217°

11850

217°

11900

← MIE Caliper Y

← MIE Caliper X

← Bit Size

← Density Caliper

← MGS Gamma Ray

Array Ind. Six Res Rt →

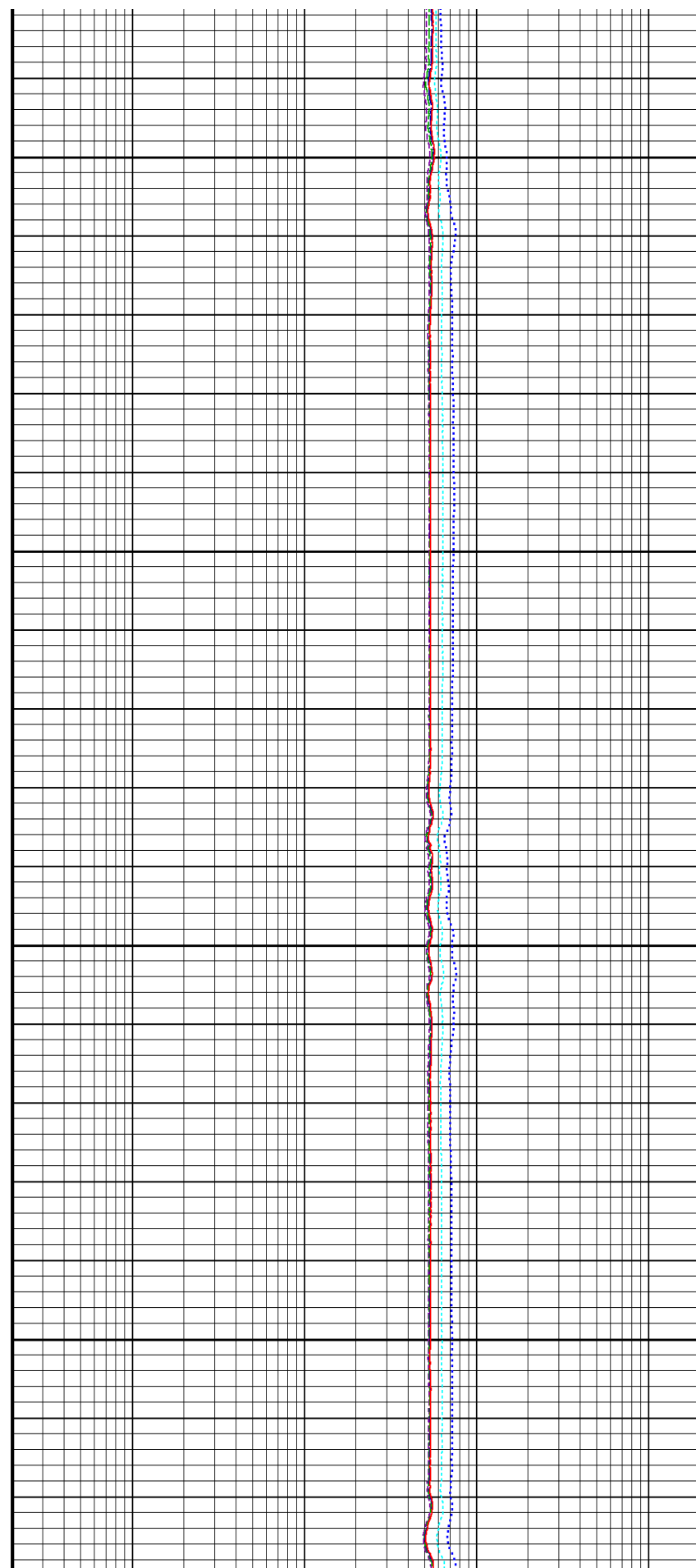
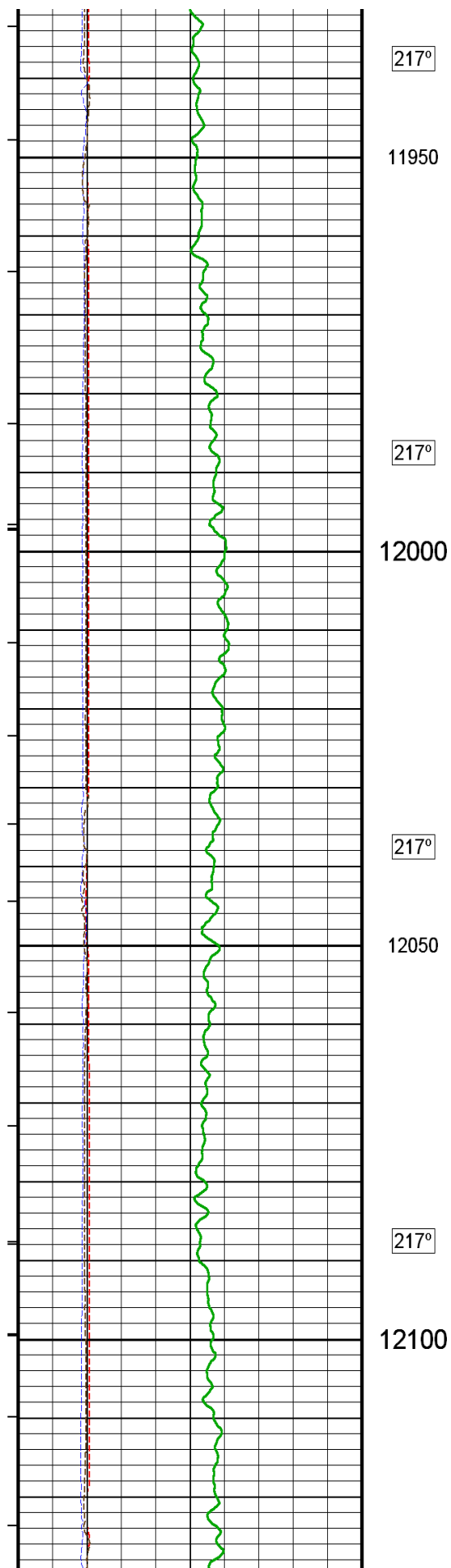
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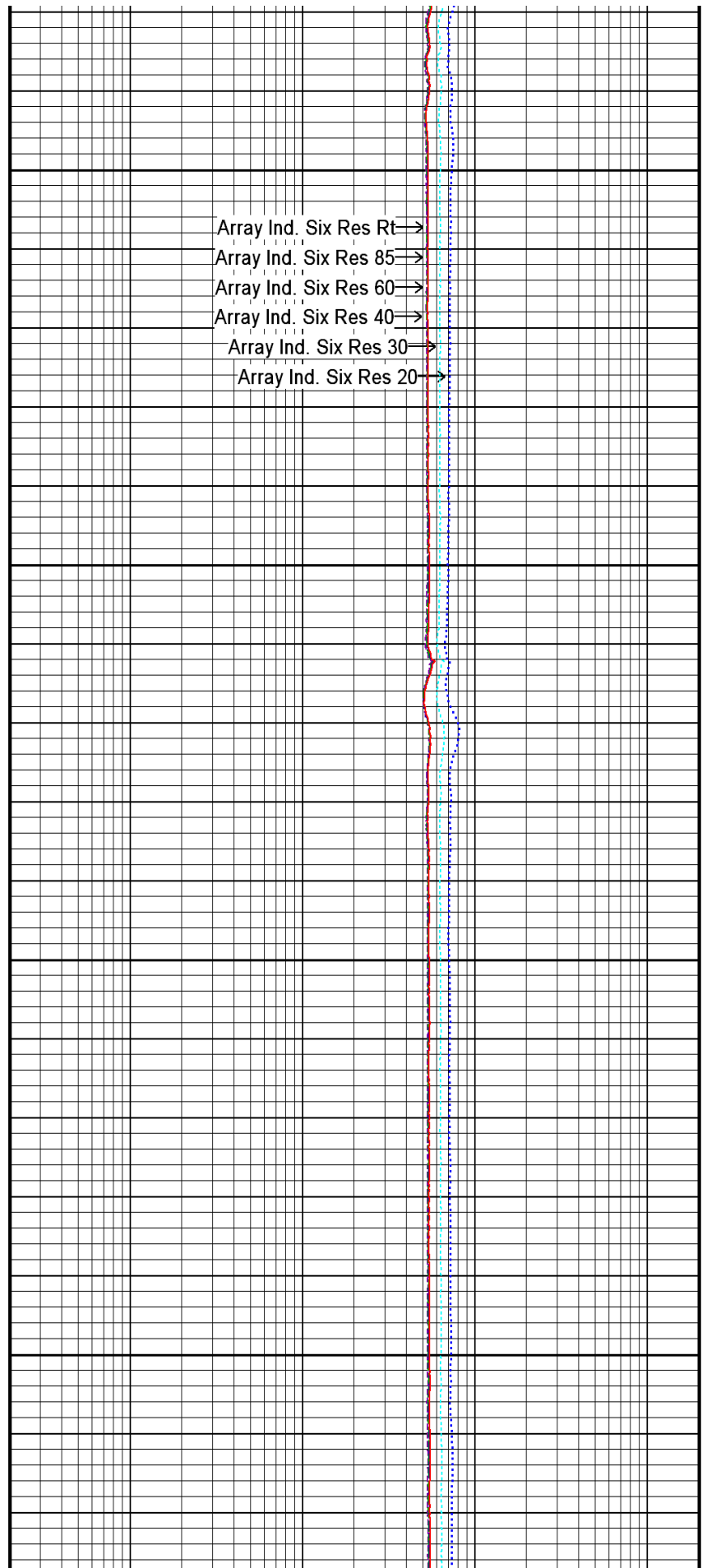
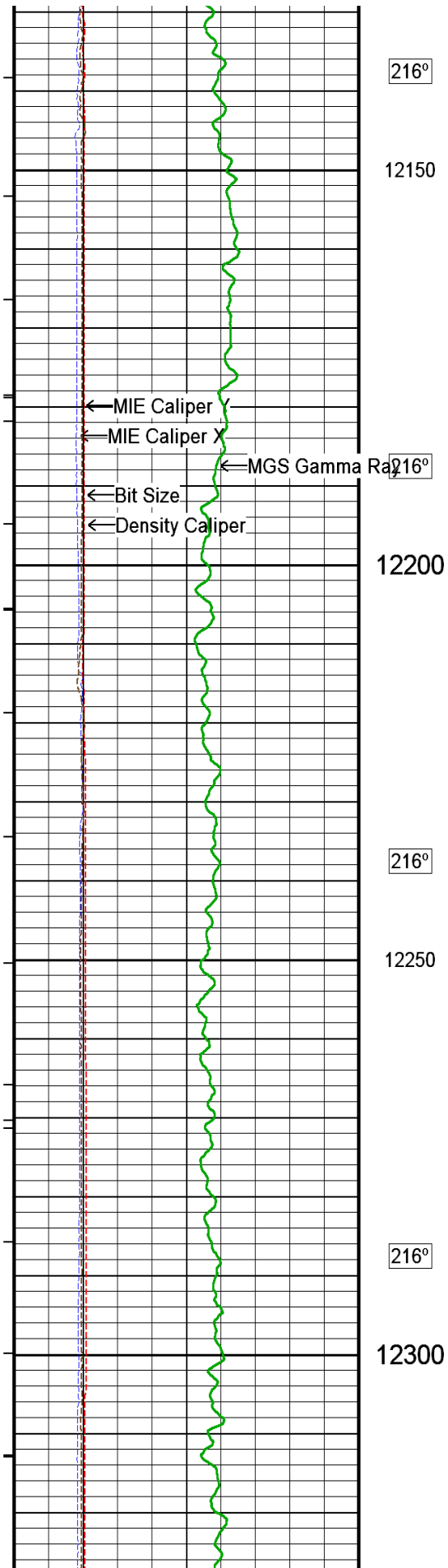
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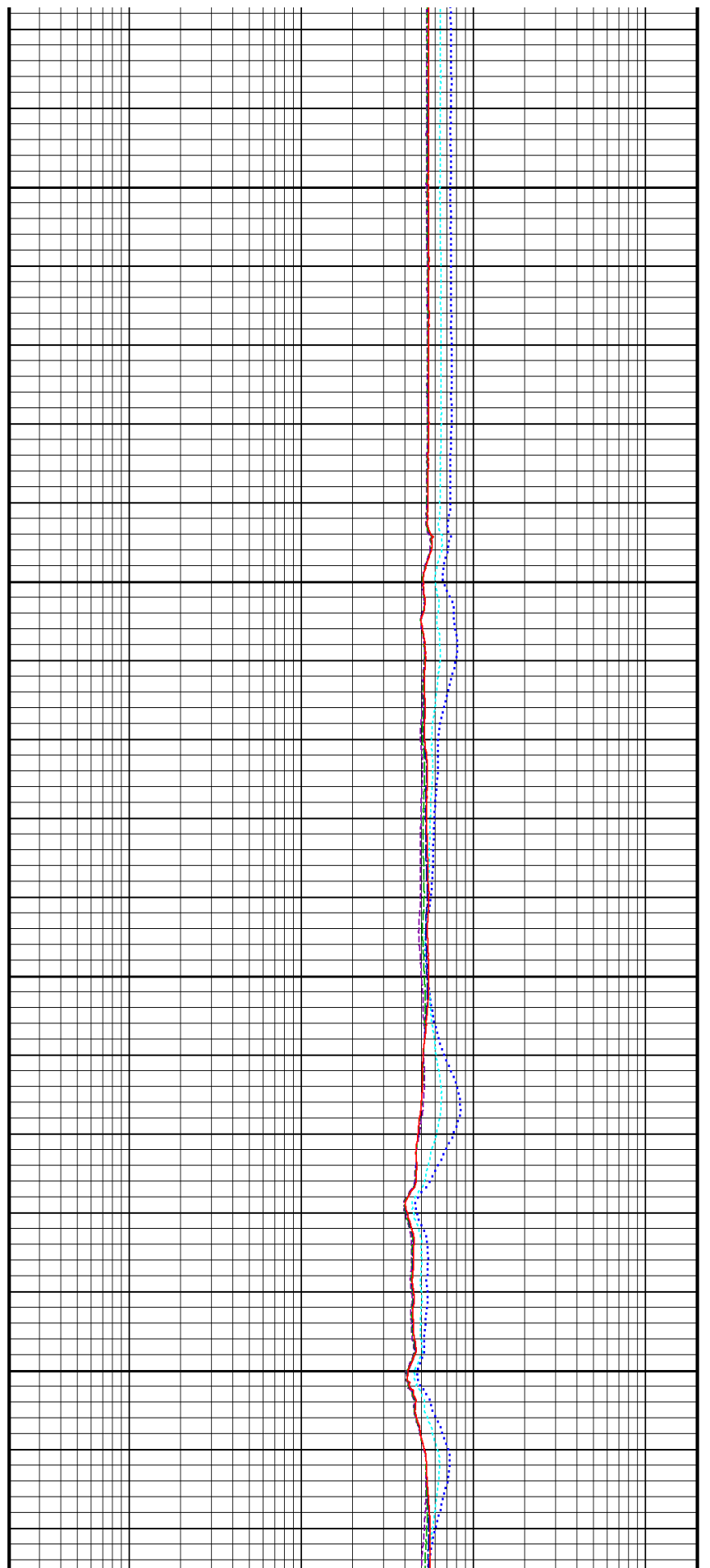
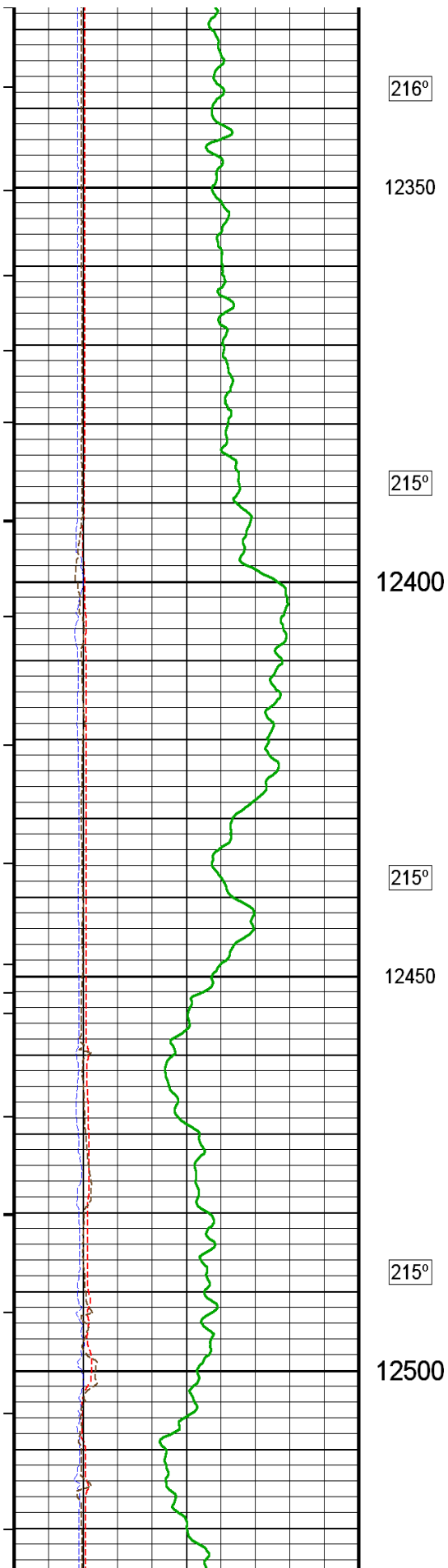
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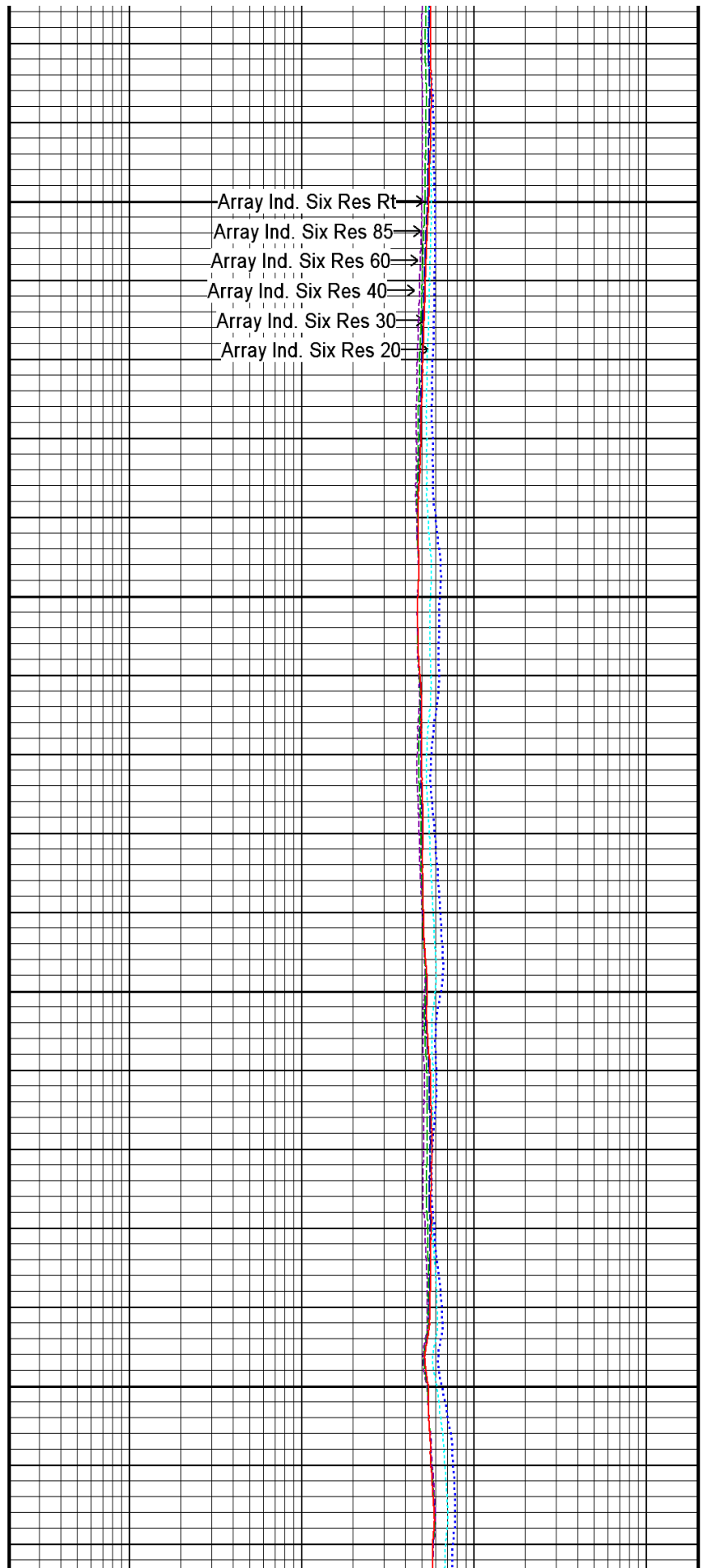
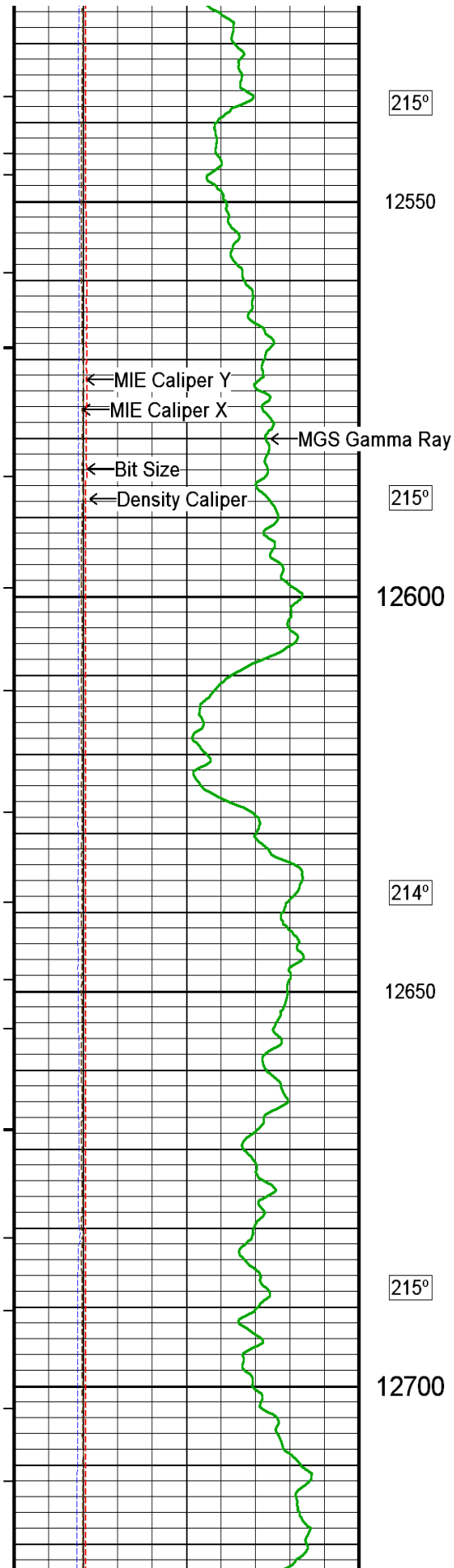
Array Ind. Six Res 30 →

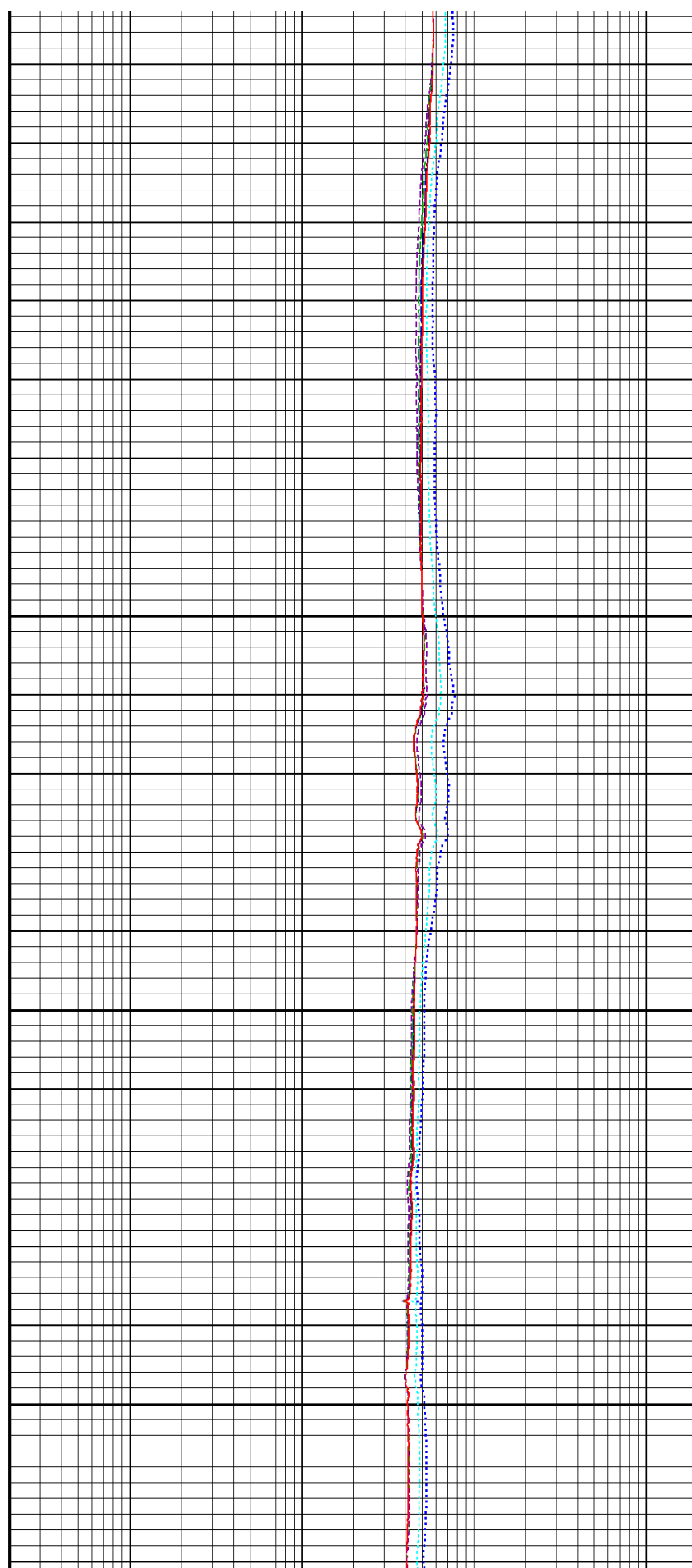
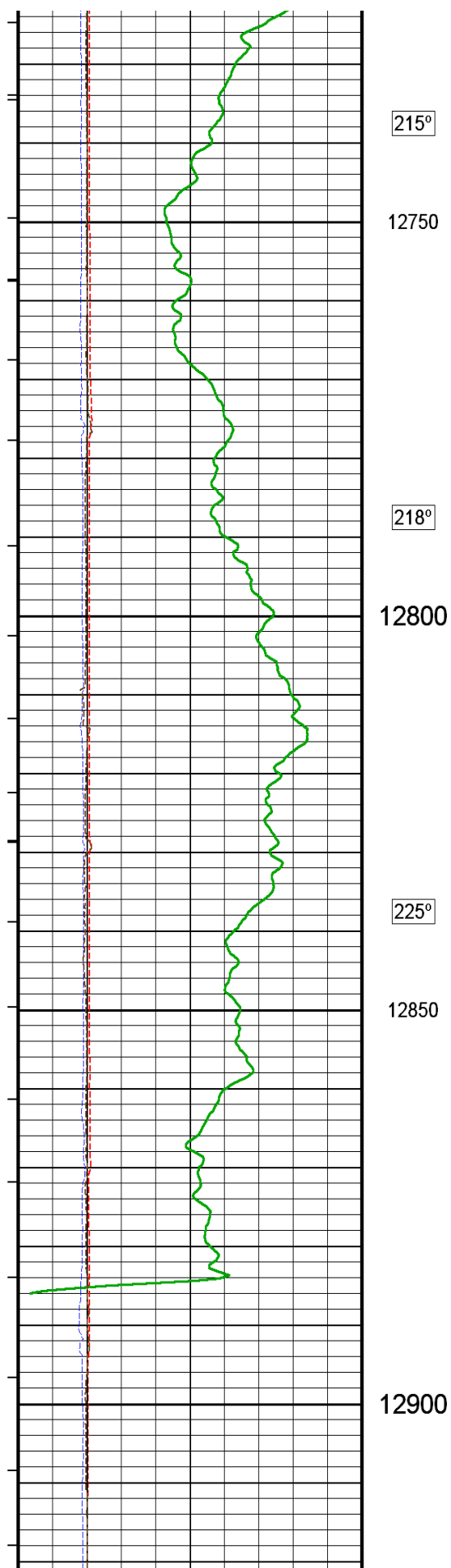
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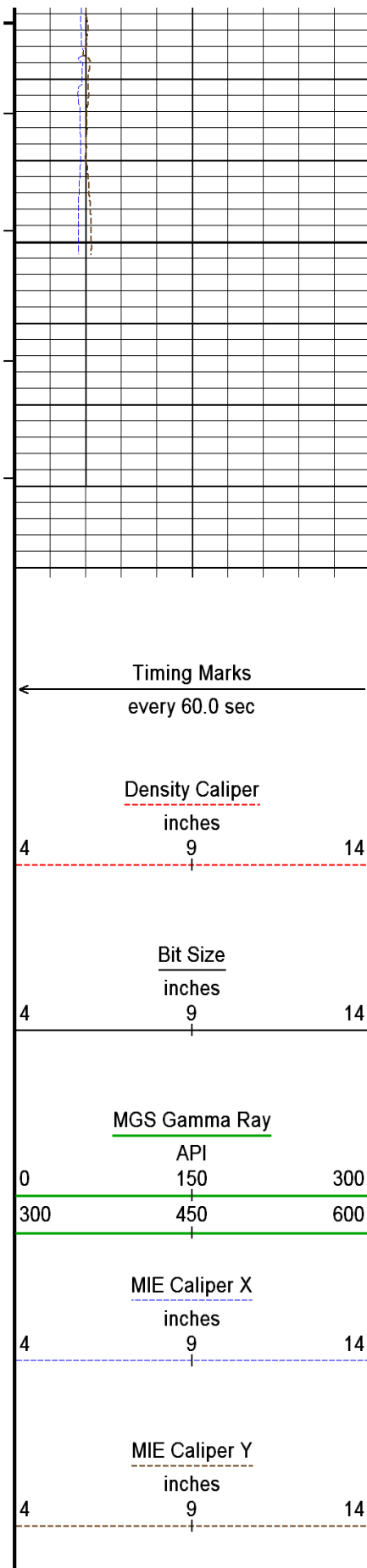










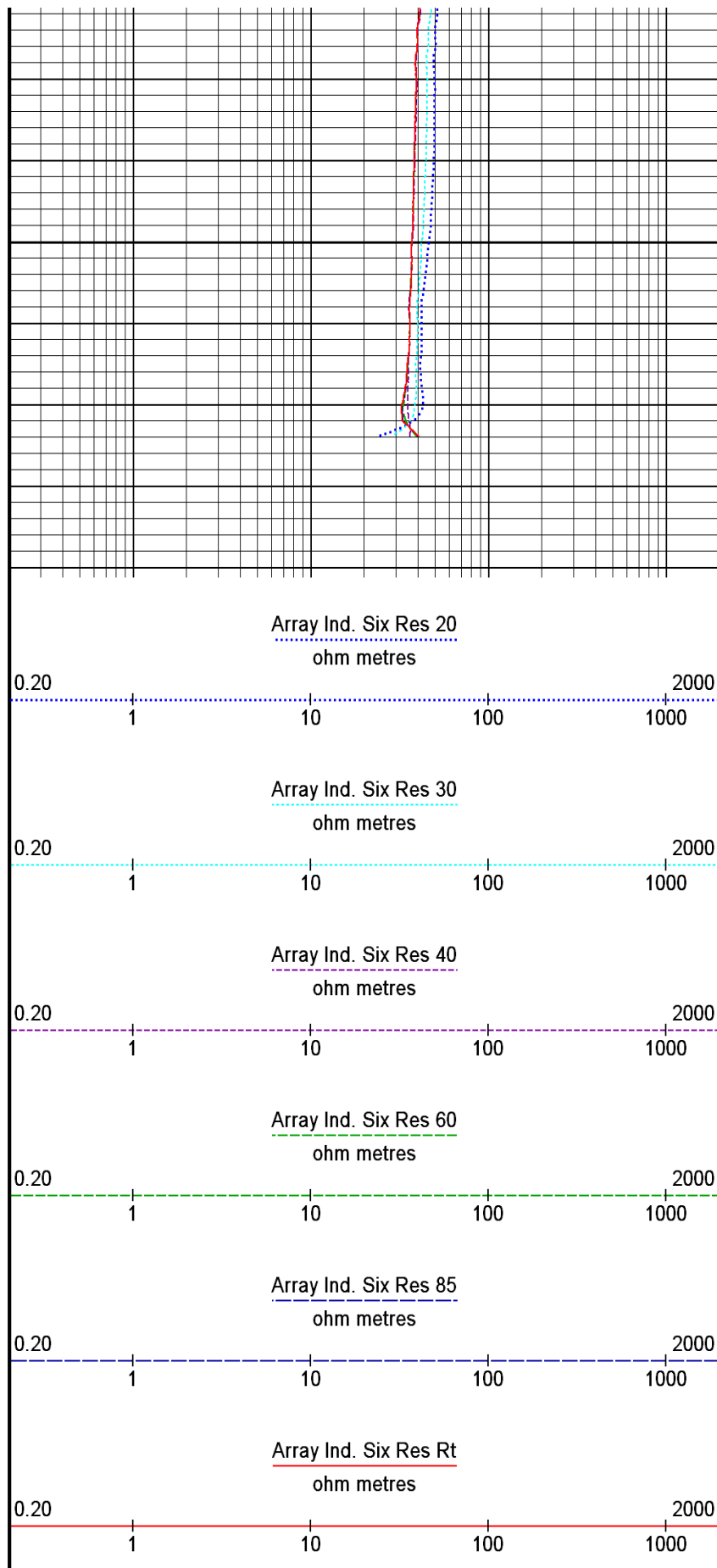


12950

Depth  
In  
Feet

Borehole  
Temp in  
deg F

Replay  
Scale  
1:240





## 5 INCH MAIN LOG



## BEFORE SURVEY CALIBRATION

C:\logs\Whiting\RAZOR 11E-0202B\MAIN PASS 4.dta

## General Constants All 000

Last Edited on 02-MAR-2014,14:20

## General Parameters

Mud Resistivity	1.550	ohm-metres
Mud Resistivity Temperature	60.500	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 248

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 28-FEB-2014 18:14

	Measured	Calibrated (API)
Background	122	86
Calibrator (Gross)	876	620
Calibrator (Net)	755	534

## Gamma Constants MGS-D.A 220

Last Edited on 02-MAR-2014,05:57

Gamma Calibrator Number	GRCC225	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%



Pre-filter Length 11

## Neutron Calibration MDN-B.J 430

Base Calibration on 23-FEB-2014 14:54

Field Check on 28-FEB-2014 17:24

## Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2895	87	3714	110
Ratio	33.086		33.764	

## Field Calibrator at Base

	Calibrated (cps)
	2347 3511
Ratio	0.668

## Field Check

	Calibrated (cps)
	2354 3525
Ratio	0.668

## Neutron Constants MDN-B.J 430

Last Edited on 02-MAR-2014,05:58

Neutron Source Id	P31131B		
Neutron Jig Number	NJ6630		
Epithermal Neutron			
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	Constant Value		
Formation Pressure	0.00	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	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		

## Magnetometer Parameters MIE-A.J 241

Date Of Last Magnetometer Calibration	10-FEB-2014,13:55		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-0.998919	-0.993681
Offset	-0.005406	-0.018443	-0.000425

## Magnetometer Constants MIE-A.J 241

Last Edited on

Magnetometer Calibrator Number 000

## Accelerometer Parameters MIE-A.J 241

Date Of Last Accelerometer Calibration	5-FEB-2014,12:22		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.111493	-1.110645	-1.094119
Offset	-0.003998	0.009385	-0.004954

## Accelerometer Constants MIE-A.J 241

Last Edited on 25-FEB-2014,10:14

Accelerometer Calibrator Number 000

Accelerometer Temperature Characterisation  
X Accelerometer

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	
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 25-FEB-2014,10:14
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				
Caliper Calibration MIE-A.J 241					Base Calibration on 25-FEB-2014 10:20 Field Calibration on 25-FEB-2014 10:22
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26070	29343	5.97		
2	36275	39676	7.96		
3	46245	49623	9.86		
4	58242	61303	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	25543	25154	24646	25780	5.97
2	34553	33729	33057	34113	7.96
3	42990	42045	41215	42349	9.86
4	53114	51787	51257	52364	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		

7.97		7.99		7.96	
Measured Pad 2 Caliper(in) 3.97	Measured Pad 4 Caliper(in) 3.97	Measured Pad 6 Caliper(in) 3.99	Measured Pad 8 Caliper(in) 4.00	Actual Caliper(in) 7.96	
Caliper Constants MIE-A.J 241				Last Edited on 25-FEB-2014,10:14	
Caliper Difference for BRKT		0.120	inches		
Navigation Constants MIE-A.J 241				Last Edited on	
Magnetic Declination		0.00	degrees	East	
Induction Calibration MAI-B.J 376				Base Calibration on 29-JAN-2014,13:18 Field Check on 28-FEB-2014 17:33	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	16.4	461.5	9.3	966.2	
2	5.9	377.0	7.6	821.4	
3	3.1	255.4	5.2	566.0	
4	1.7	130.3	2.6	279.2	
Array Temperature		73.8	Deg F		
Channel		Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High	
1	13.1	3940.5	12.0	3938.4	
2	30.6	3580.3	30.3	3579.0	
3	29.7	3099.9	29.5	3098.7	
4	20.4	2122.6	20.3	2121.6	
Deep	18.7	2050.6	18.6	2049.5	
Medium	43.1	4058.3	43.0	4057.2	
Shallow	44.8	5254.3	44.4	5252.7	
Array Temperature		44.1	29.5	Deg F	
Induction Constants MAI-B.J 376				Last Edited on 02-MAR-2014,06:01	
Induction Model		RtAP-WBM			
Caliper for Borehole Corr.		Density Caliper			
Hole Size for Borehole Correction		N/A	inches		
Tool Centred		No			
Stand-off Type		Fins			
Stand-off		0.50	inches		
Number of Fins on Stand-off		6.0000			
Stand-off Fin Angle		60.00	degrees		
Stand-off Fin Width		0.5000	inches		
Borehole Corr. Rm Source		Temperature Corr			
Temp. for Rm Corr.		MGS External Temperature			
Squasher Start		0.0020	mhos/metre		
Squasher Offset		N/A	mhos/metre		
Borehole Normalisation					
DRM1	0.0000	DRC1	0.0000		
DRM2	0.0000	DRC2	0.0000		
MRM1	0.0000	MRC1	0.0000		
MRM2	0.0000	MRC2	0.0000		
SRM1	0.0000	SRC1	0.0000		
SRM2	0.0000	SRC2	0.0000		
Calibration Site Corrections					
Channel 1		0.00	mmhos/metre		
Channel 2		0.00	mmhos/metre		
Channel 3		0.00	mmhos/metre		

Channel 4	0.00	mmhos/metre
Apparent Porosity and Water Saturation Constants		
Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	
High Resolution Temperature Calibration MAI-B.J 376		
	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	50.00	50.00
High Resolution Temperature Constants MAI-B.J 376		
Pre-filter Length	11	
Caliper Calibration MPD-C.A 280		
Base Calibration		Base Calibration on 23-FEB-2014 15:15
		Field Calibration on 28-FEB-2014 17:30
Reading No	Measured	Calibrator Size (in)
1	16617	4.01
2	24813	5.97
3	33200	7.96
4	41377	9.86
5	50608	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.89	5.97
Photo Density Calibration MPD-C.A 280		
Density Calibration		Base Calibration on 23-FEB-2014 16:44
		Field Check on 28-FEB-2014 17:28
Base Calibration	Measured	Calibrated (sdu)
	Near Far	Near Far
Background	1330 1358	
Reference 1	55743 27432	59443 30683
Reference 2	22692 2559	25113 2508
Field Check at Base		
	1330.5 1357.5	
Field Check		
	1337.9 1365.3	
PE Calibration		
Base Calibration	Measured	Calibrated
	WS WH Ratio	Ratio
Background	242 1189	
Reference 1	22204 55526 0.404	0.372
Reference 2	6159 22539 0.277	0.268
Field Check at Base		
	241.8 1189.3	
Field Check		
	241.3 1196.2	

Density Source Id	P21136B	
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	1.00	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	

## Spectral Gamma Calibration SGS-E.J 135

Base Calibration on 13-FEB-2014 13:52

Field Calibration on 13-FEB-2014 13:30

## Base Calibration

## Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	135.5	48.4	5.5	2.1	2.8
Calibrator (Gross)	269.1	137.7	32.3	3.4	3.2
Calibrator (Net)	133.6	89.3	26.8	1.4	0.4

	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	135.5	48.4	5.5	2.1	2.8
Calibrator (Gross)	583.7	209.5	19.2	12.7	6.3
Calibrator (Net)	448.2	161.1	13.7	10.6	3.5

	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	135.5	48.4	5.5	2.1	2.8
Calibrator (Gross)	448.6	167.7	13.9	7.6	18.0
Calibrator (Net)	313.1	119.3	8.4	5.5	15.2

	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	135.5	48.4	5.5	2.1	2.8
Calibrator (Gross)	923.7	381.5	50.0	16.4	20.7
Calibrator (Net)	788.2	333.1	44.4	14.3	18.0

## Field Calibration

## Gamma Ray

		Measured	Calibrated (API)			
Background		202	40			
Calibrator (Gross)		1400	280			
Calibrator (Net)		1198	240			
Mixture Calibrator						
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5	
Background	135.5	48.4	5.5	2.1	2.8	
Calibrator (Gross)	923.7	381.5	50.0	16.4	20.7	
Calibrator (Net)	788.2	333.1	44.4	14.3	18.0	
Spectral Gamma Constants SGS-E.J 135				Last Edited on 02-MAR-2014,06:00		
Background Calibrator Number	440					
Mixture Calibrator Number	450					
Potassium Calibrator Number	500					
Uranium Calibrator Number	506					
Thorium Calibrator Number	503					
Mud Density	1.13	gm/cc				
Caliper Source for Processing	Density Caliper					
Tool Position	Eccentred					
Concentration of KCl		kppm				
K Mud Type	Chloride					
K Mud Concentration	0.00	%				

## DOWNHOLE EQUIPMENT

C:\logs\Whiting\RAZOR 11E-0202B\MAIN PASS 4.dta

Shuttle Running Tool 3.5" (SRT A)

SRT-A 8 LG: 6.47 ft WT: 37.5 lb OD: 2.520 in

SKJ-D.A Compact Knuckle Joint

SKJ-D.A 106 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.B Compact Inline Standoff sub

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

Compact Linker

MLK-A 1 LG: 8.52 ft WT: 30.9 lb OD: 2.205 in

Compact Linker

MLK-A 2 LG: 14.23 ft WT: 30.9 lb OD: 2.205 in

SKJ-D.A Compact Knuckle Joint

SKJ-D.A 217 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MBS-F.A 200v Compact Battery Sub

MBS-F.A 120 LG: 17.06 ft WT: 123.5 lb OD: 2.205 in

Compact Memory Sub F.A

MMS-F.A 248 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.

MTI-B.A 64 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



95.68 ft GRGM - MGS Gamma Ray  
93.69 ft GSXT - MGS External Temperature

Compact Collar Locator  
MCL-C.A 128 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.B Compact Swivel Head Adaptor  
SHA-J.B 682 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 811 LG: 5.70 ft WT: 33.1 lb OD: 2.205 in

Compact Neutron  
MDN-B.J 430 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper  
MPD-C.A 280 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 654 LG: 5.70 ft WT: 33.1 lb OD: 2.205 in

SHA-J.A Compact Swivel Head Adaptor  
SHA-J.A 316 LG: 2.30 ft WT: 22.0 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-E.B Compact Inline Standoff sub  
MIS-E.B 662 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 603 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 709 LG: 5.70 ft WT: 33.1 lb OD: 2.205 in

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

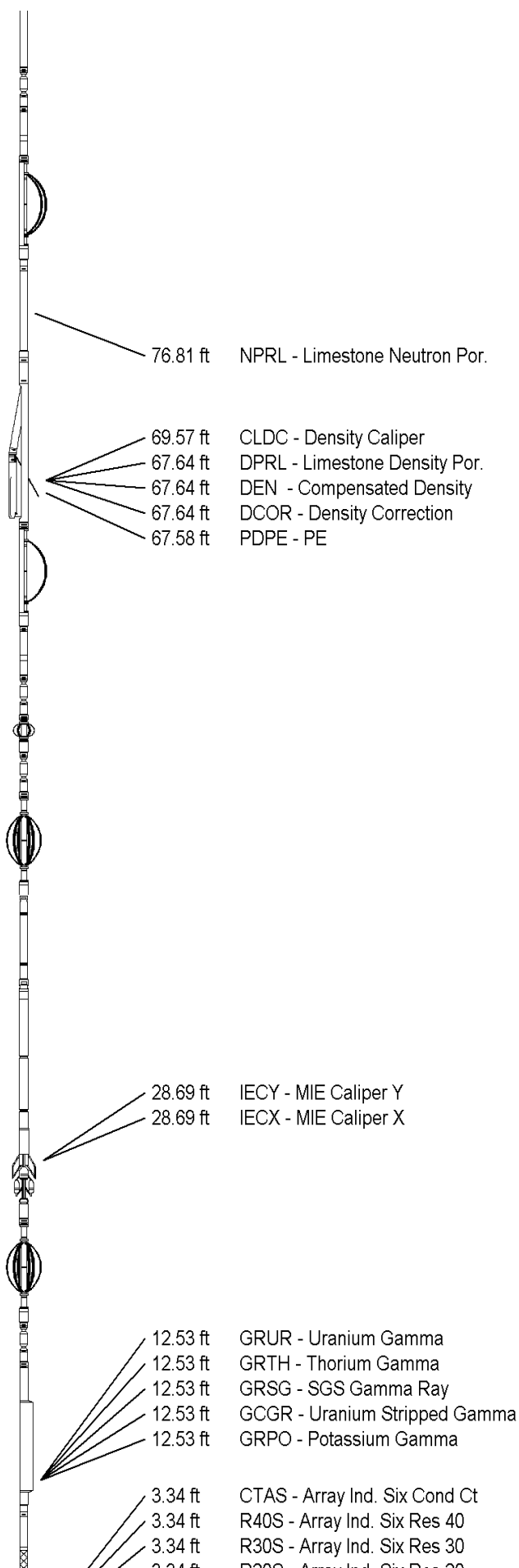
Compact MMI Electrode Section  
MIE-A.J 241 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 700 LG: 5.70 ft WT: 33.1 lb OD: 2.205 in

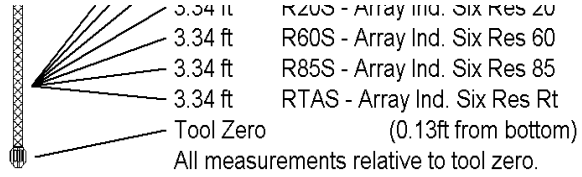
SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 537 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Spectral Gamma Ray Sub  
SGS-E.J 135 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

Compact Induction  
MAI-B.J 376 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in



Total Length: 156.08 ft Weight: 1097.9 lb



COMPANY WHITING OIL AND GAS CORP  
WELL RAZOR 11E-0202B  
FIELD REDTAIL  
PROVINCE/COUNTY WELD  
COUNTRY/STATE USA/COLORADO

Elevation Kelly Bushing	5019.00	feet	First Reading	12993.00	feet
Elevation Drill Floor	5019.00	feet	Depth Driller	12996.00	feet
Elevation Ground Level	5002.00	feet	Depth Logger	12996.00	feet



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ARRAY INDUCTION  
LOG