



**Weatherford**<sup>®</sup>

**CML MESSENGER SHUTTLE**

**ARRAY INDUCTION**

**LOG**

COMPANY	SANDRIDGE ENERGY		
WELL	ANITA 3420 2-12H		
FIELD	COMANCHE PROSPECT		
PROVINCE/COUNTY	COMANCHE		
COUNTRY/STATE	USA / KANSAS		
LOCATION	250' FNL & 700' FEL NE NW NE NE		
SEC	TWP	RGE	Other Services
12	34S	20W	MPD/MDN
API Number	15-033-21703		
Permit Number			
Permanent Datum G.L., Elevation	1795 feet		
Log Measured From	DF		
Drilling Measured From	DF @ 21 FEET		
Date	22-APR-2013		
Run Number	ONE		
Service Order	3539486		
Depth Driller	9535.00	feet	
Depth Logger	9535.00	feet	
First Reading	9488.00	feet	
Last Reading	5690.00	feet	
Casing Driller	5690.00	feet	
Casing Logger	5690.00	feet	
Bit Size	6.125	inches	
Hole Fluid Type	WATER		
Density / Viscosity	8.50 lb/USg	28.00 CP	
PH / Fluid Loss	10.70	100.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	1.90 @ 67.0	ohm-m	
Rmf @ Measured Temp	1.52 @ 67.0	ohm-m	
Rmc @ Measured Temp	2.28 @ 67.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.91 @140.0	ohm-m	
Time Since Circulation	1 HOUR		
Max Recorded Temp	140.00	deg F	
Equipment / Base	18109	OKC	
Recorded By	B.ALLEN		
Witnessed By	M.RODEN		
AFE# / S.O.	DC12852		3539486

Elevations:	feet
KB	1816.00
DF	1816.00
GL	1795.00

**BOREHOLE RECORD**

Last Edited: 22-APR-2013 14:47

Bit Size inches	Depth From feet	Depth To feet
12.250	0.00	732.00
8.750	732.00	5690.00
6.125	5690.00	9535.00

**REMARKS**

LOGGED WITH WLS VER 13.05.9583 SOFTWARE

WELL LOGGED USING MESSENGER METHOD OF DEPLOYMENT, AND MEMORY LOGGING SYSTEM

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

2.71 G/CC DENSITY MATRIX USED TOCALCULATE POROSITY  
 ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT - 9411  
 LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9494

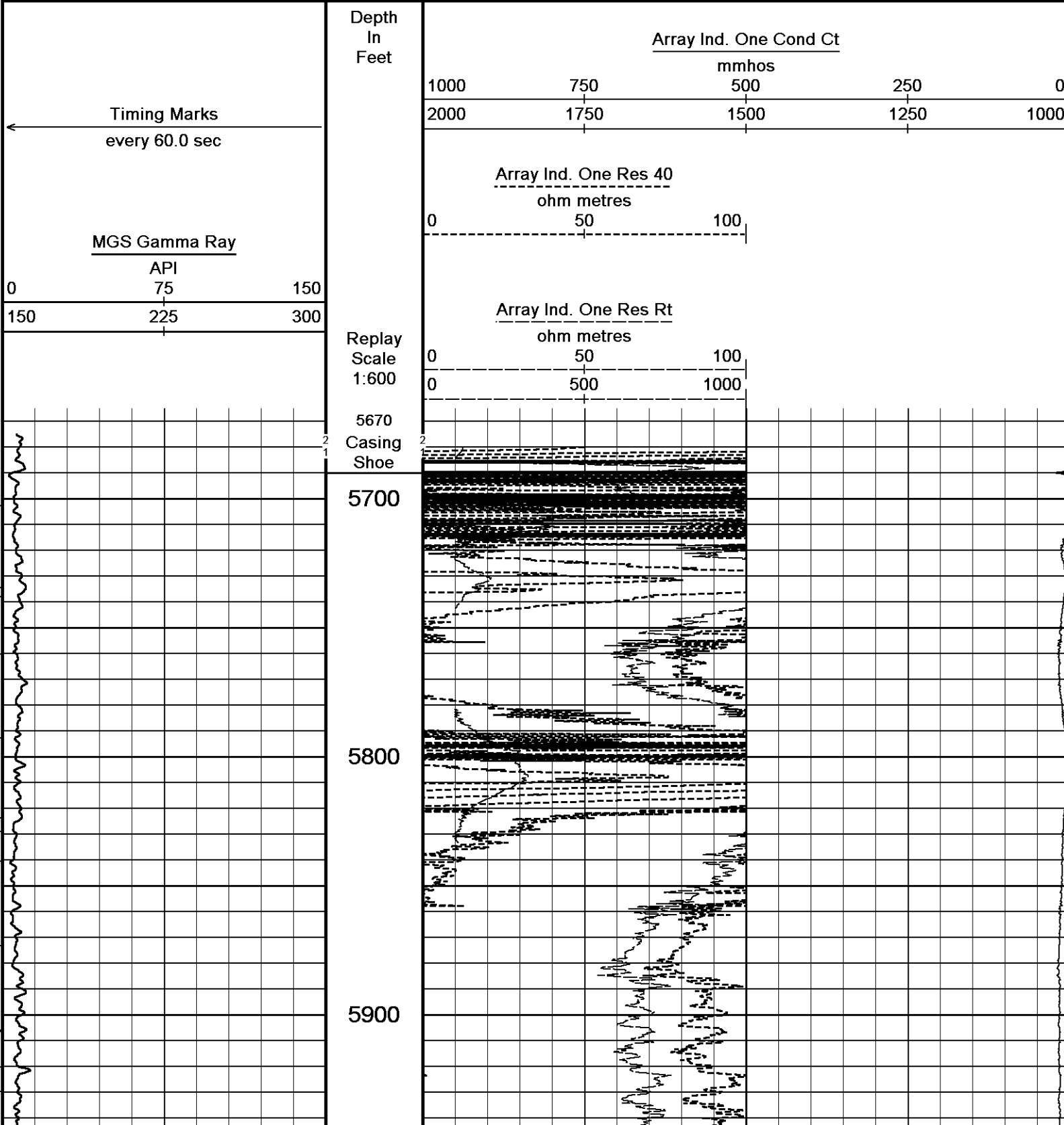
4.5" CASING USED TO CALCULATE AHV

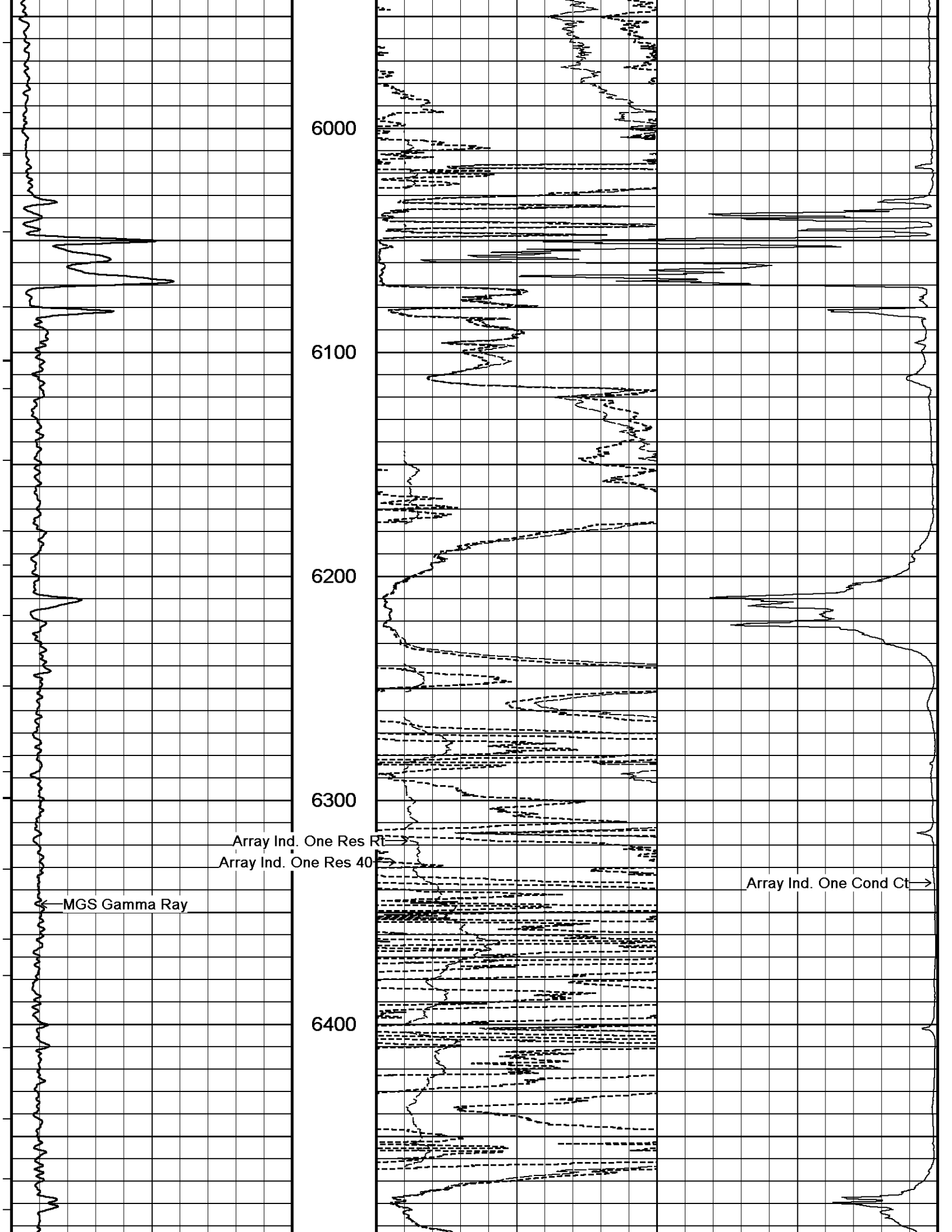
SERVICE ORDER # 3539486  
 RIG: LARIAT 4

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

**DSC**

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 22-APR-2013 17:11  
 Filename: C:\13\_05\_9583\DATA\SANDRIDGE(ANITA 3420 2-12H)\27342 RTAP.dta Recorded on 22-APR-2013 16:13  
 System Versions: Processed with 13.05.9583 Plotted with 13.05.9583





6000

6100

6200

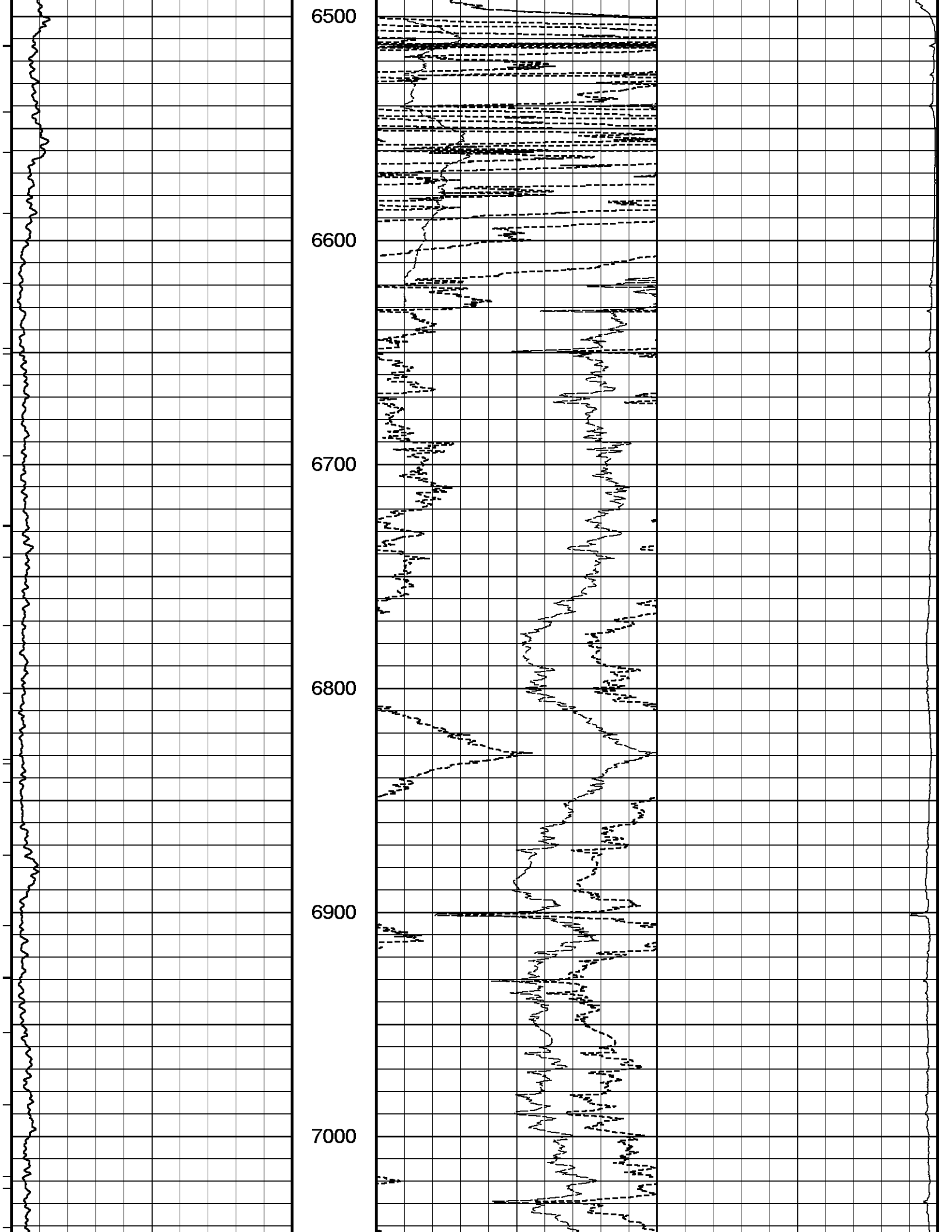
6300

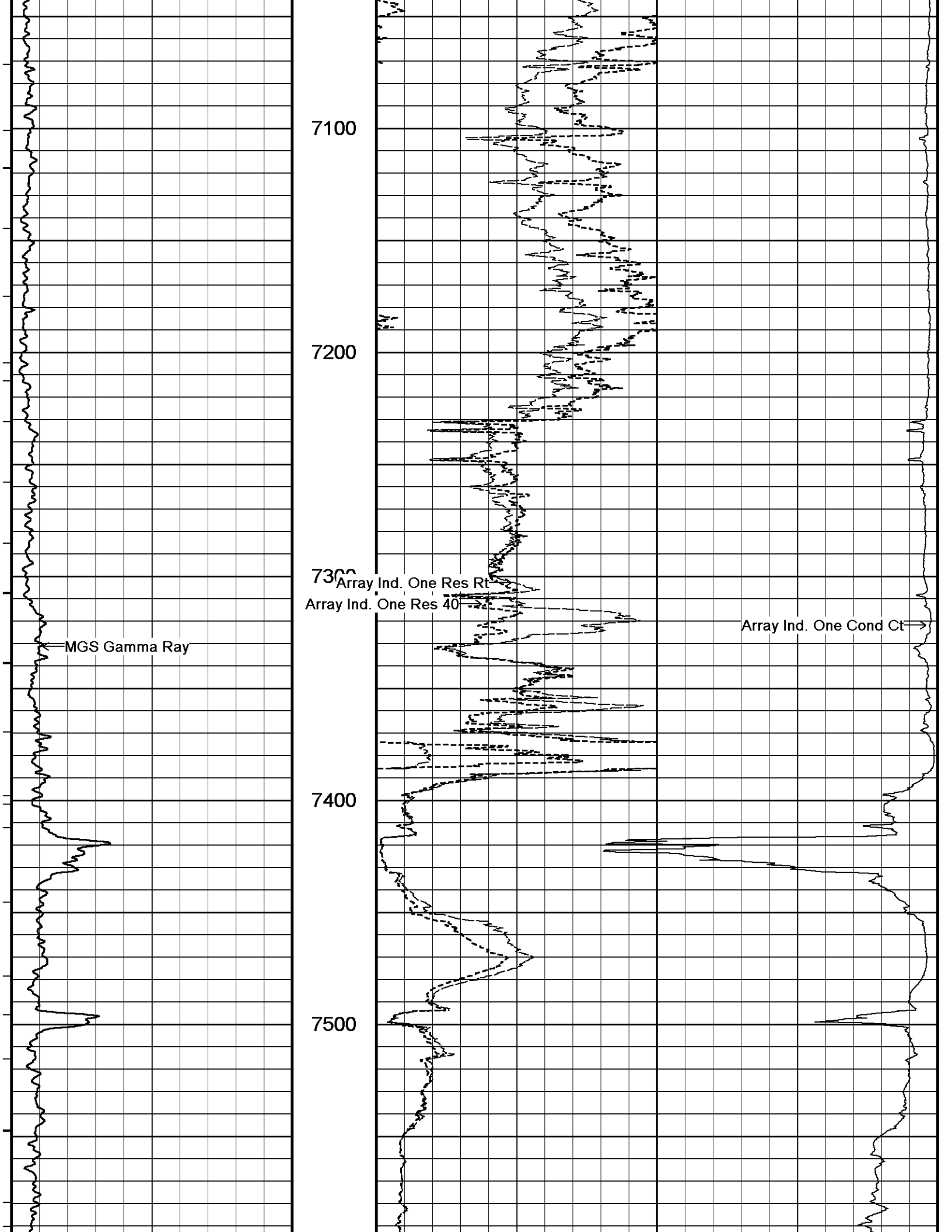
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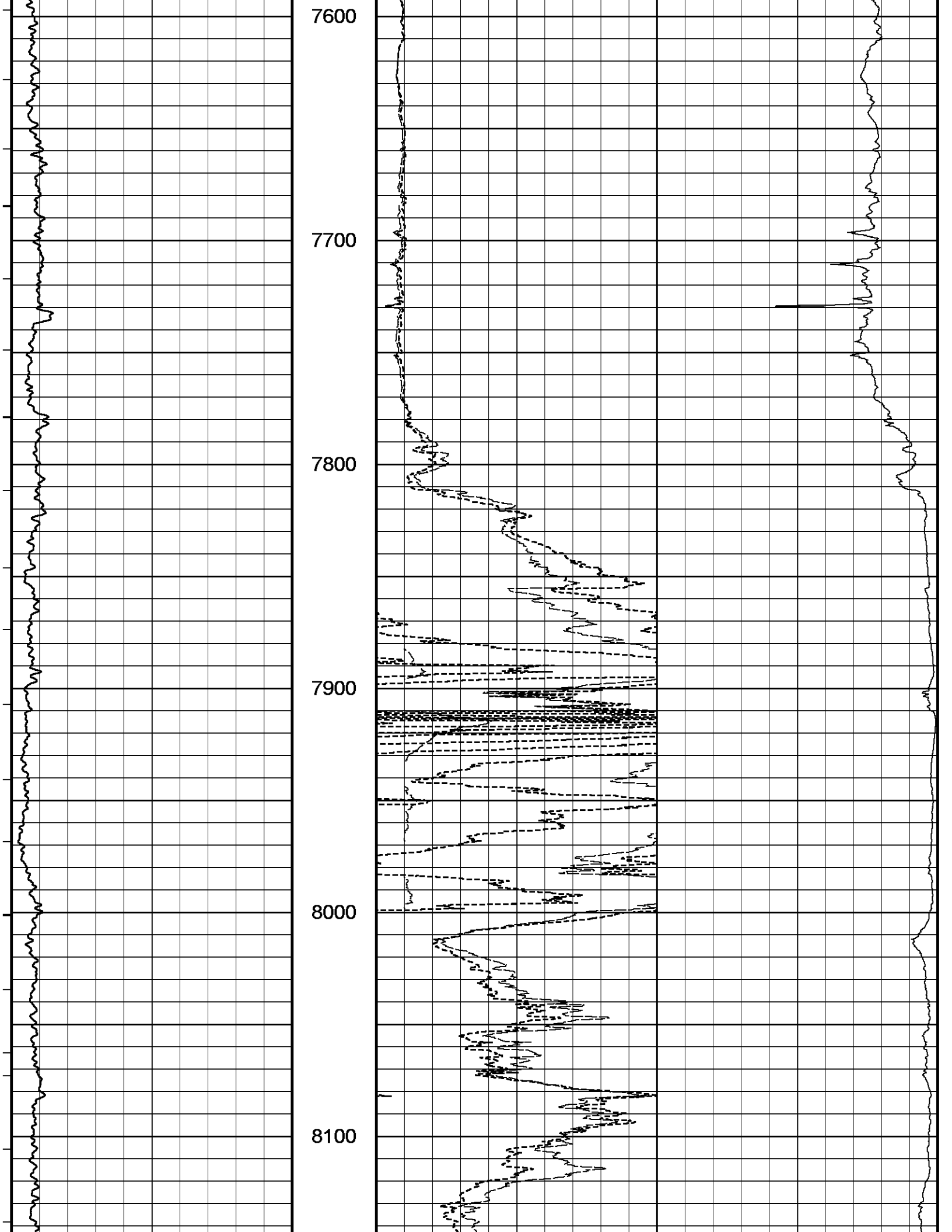
Array Ind. One Res Rt  
Array Ind. One Res 40

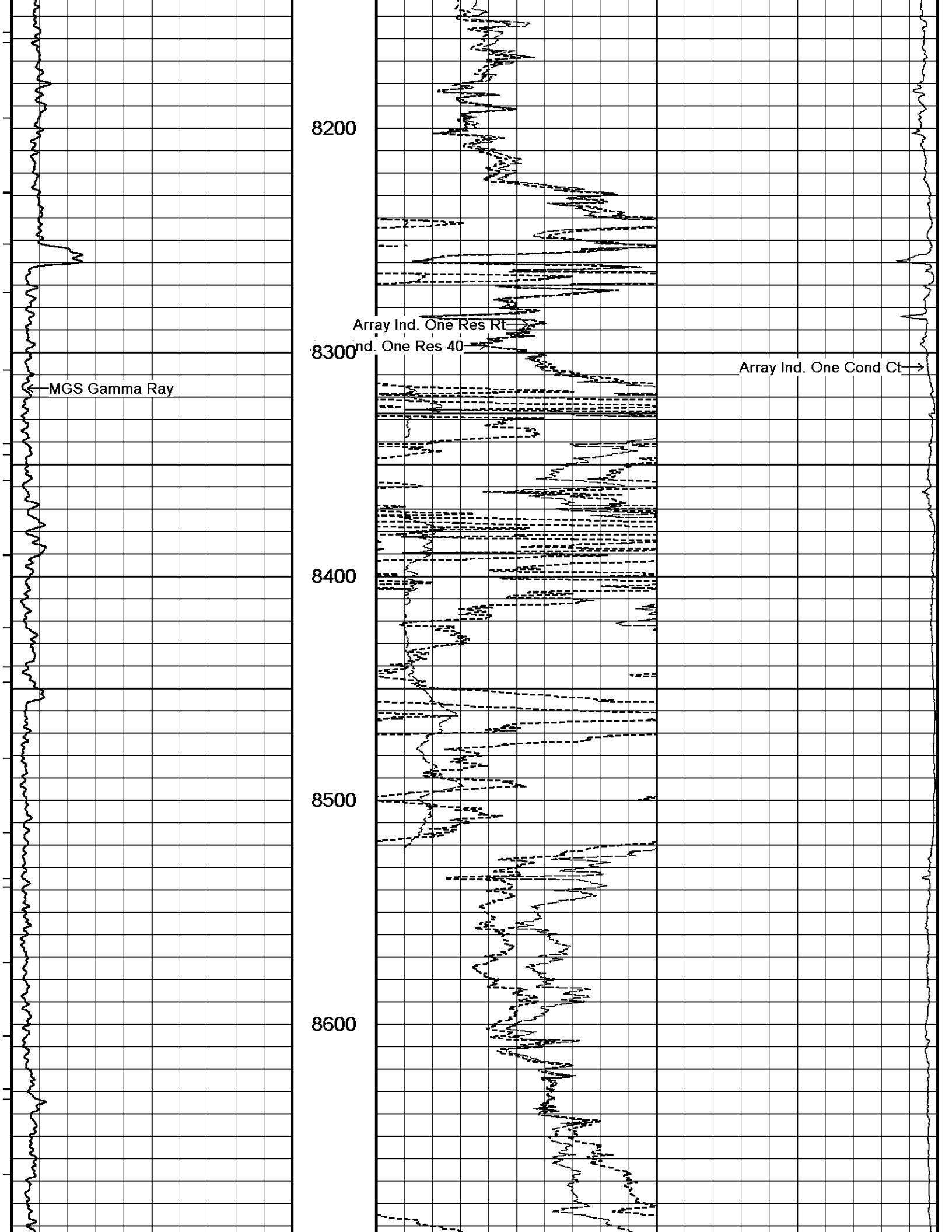
MGS Gamma Ray

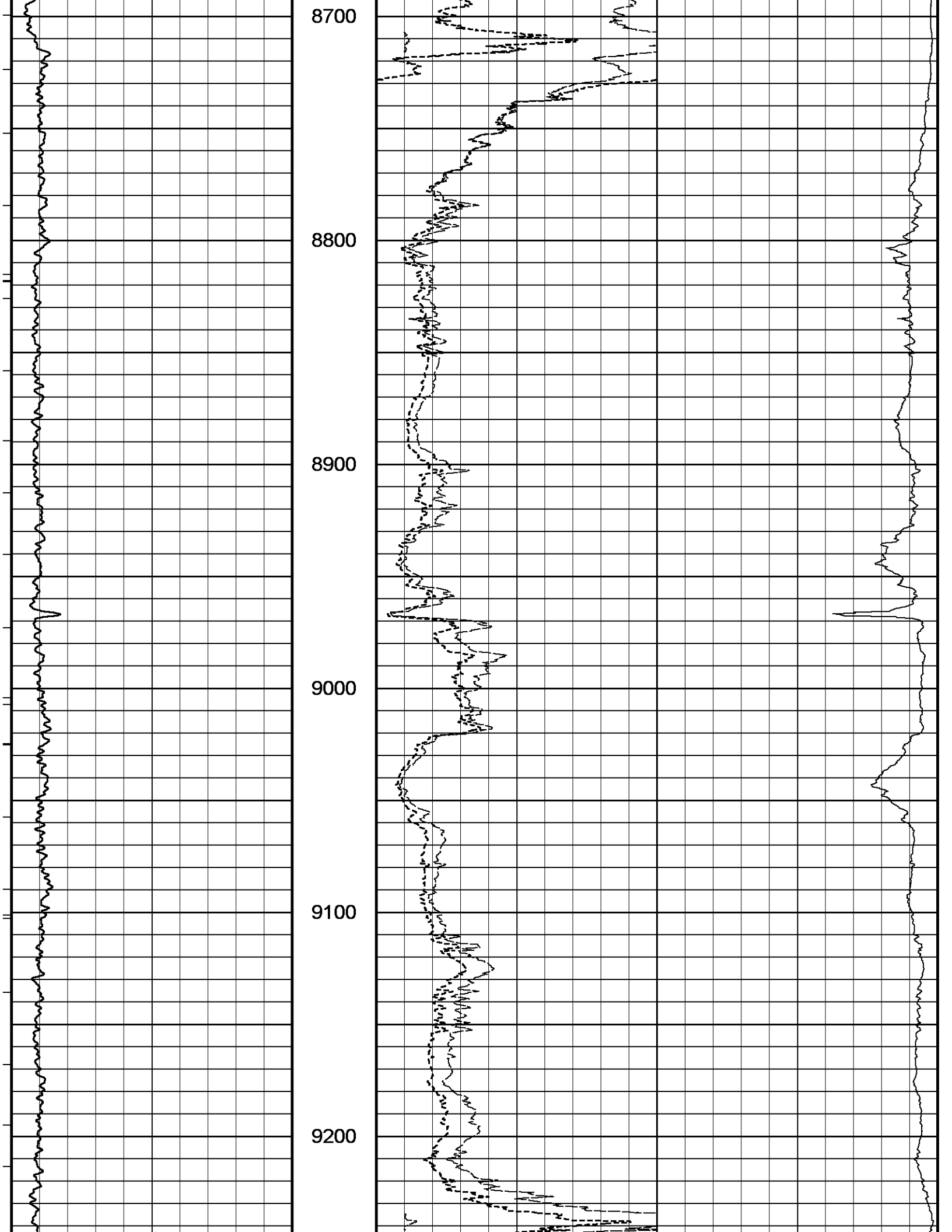
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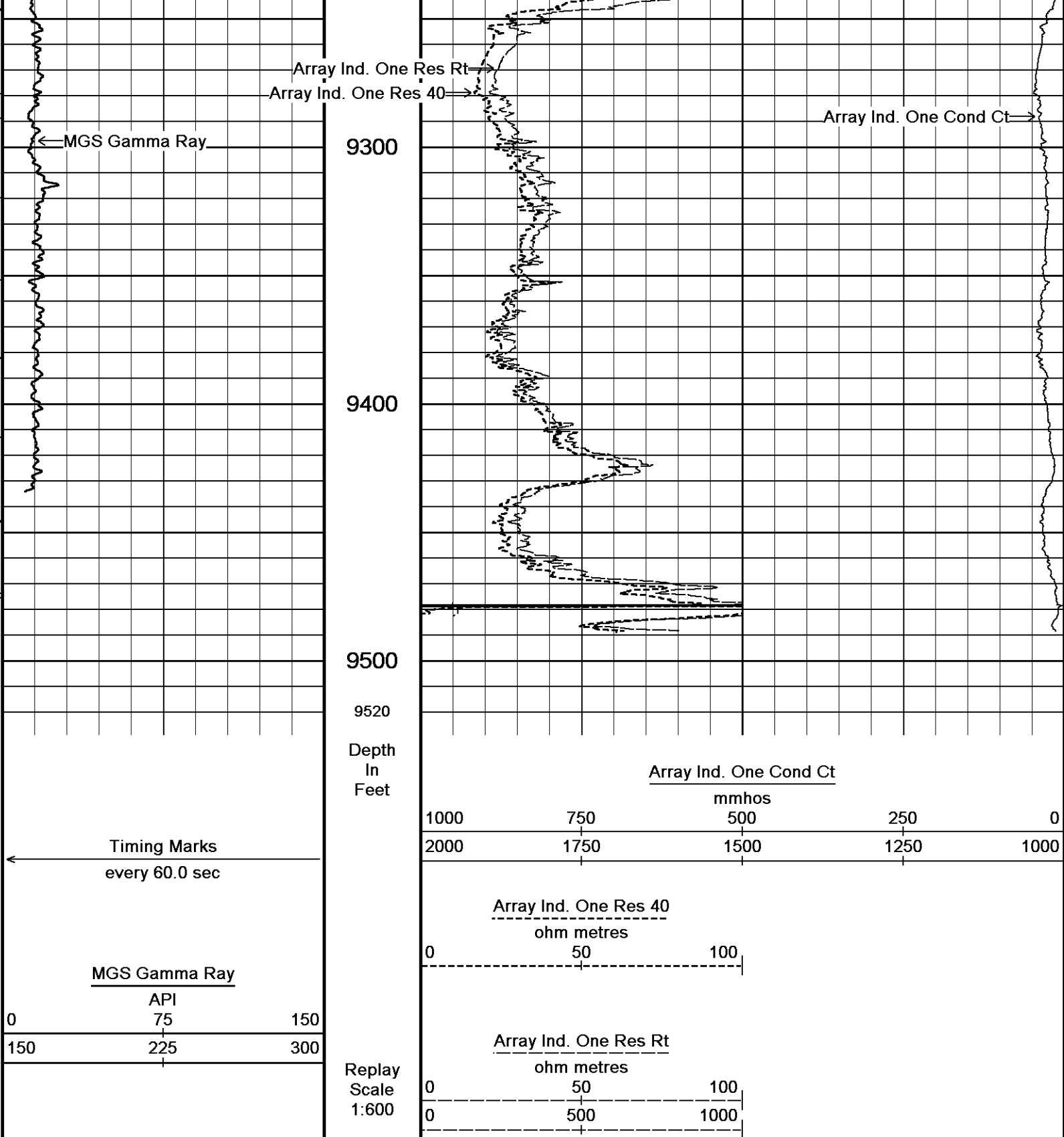












Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 22-APR-2013 17:11  
 Filename: C:\13\_05\_9583\DATA\SANDRIDGE(ANITA 3420 2-12H)\27342 RTAP.dta  
 Recorded on 22-APR-2013 16:13  
 System Versions: Processed with 13.05.9583 Plotted with 13.05.9583

↑ DSC ↑

↓ DSC ↓

Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 22-APR-2013 17:11  
 Filename: C:\13\_05\_9583\DATA\SANDRIDGE(ANITA 3420 2-12H)\27342 RTAP.dta  
 Recorded on 22-APR-2013 16:13  
 System Versions: Processed with 13.05.9583 Plotted with 13.05.9583

Depth

In Feet

Timing Marks  
every 60.0 sec

←

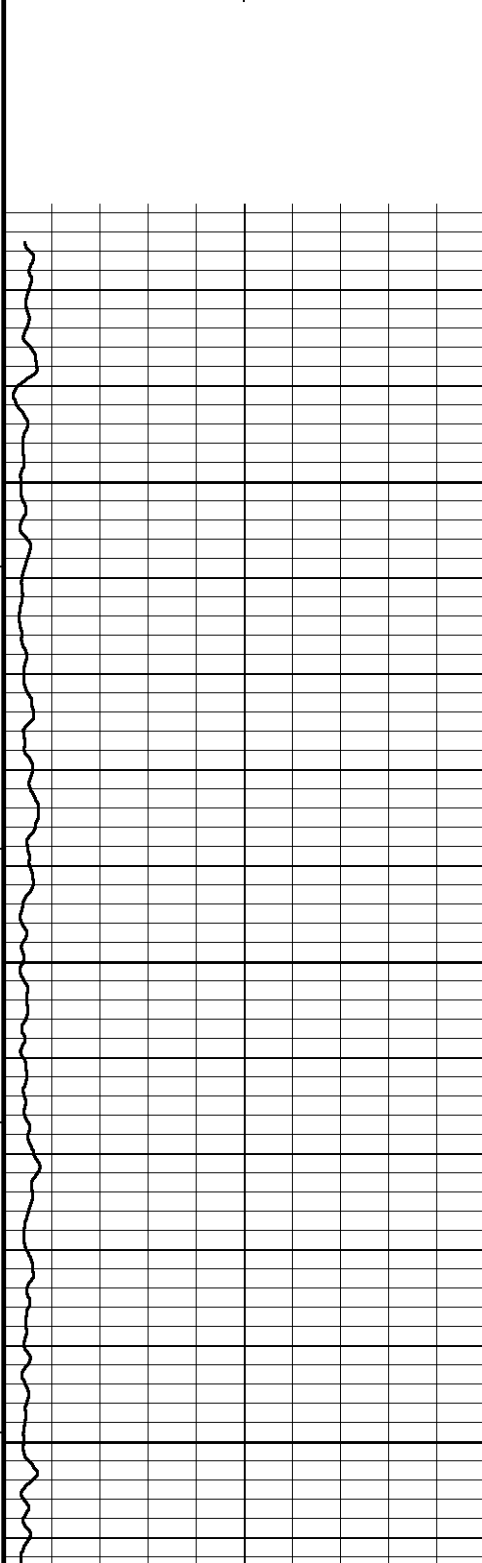
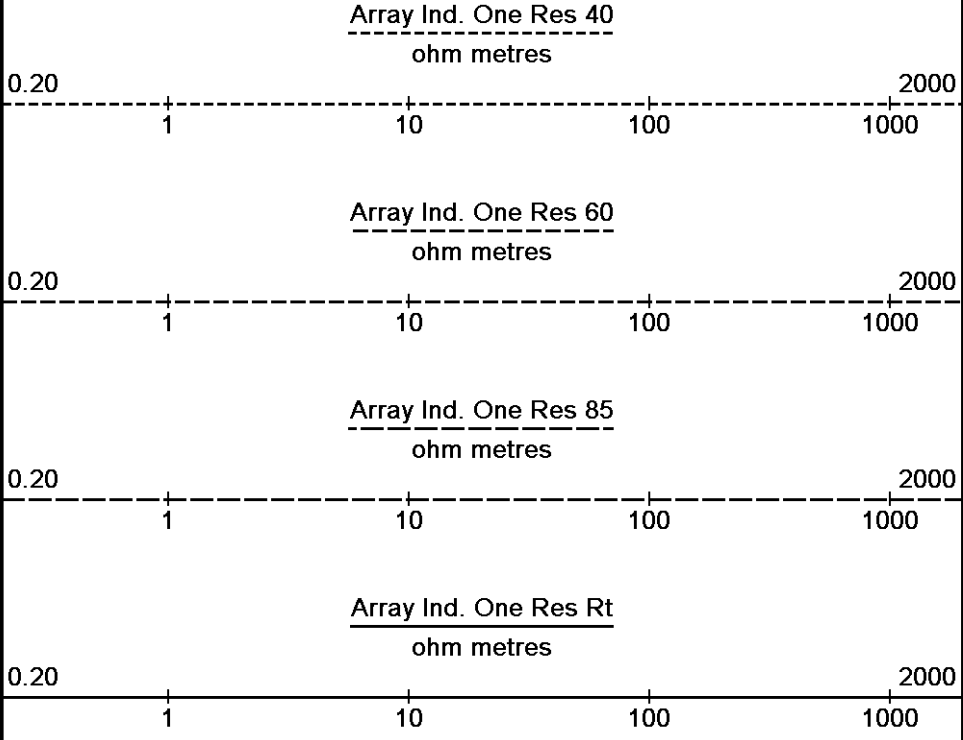
MGs Gamma Ray  
API

0 75 150  
150 225 300

In Feet

Borehole Temp in deg F

Replay Scale 1:240



5674

Casing Shoe

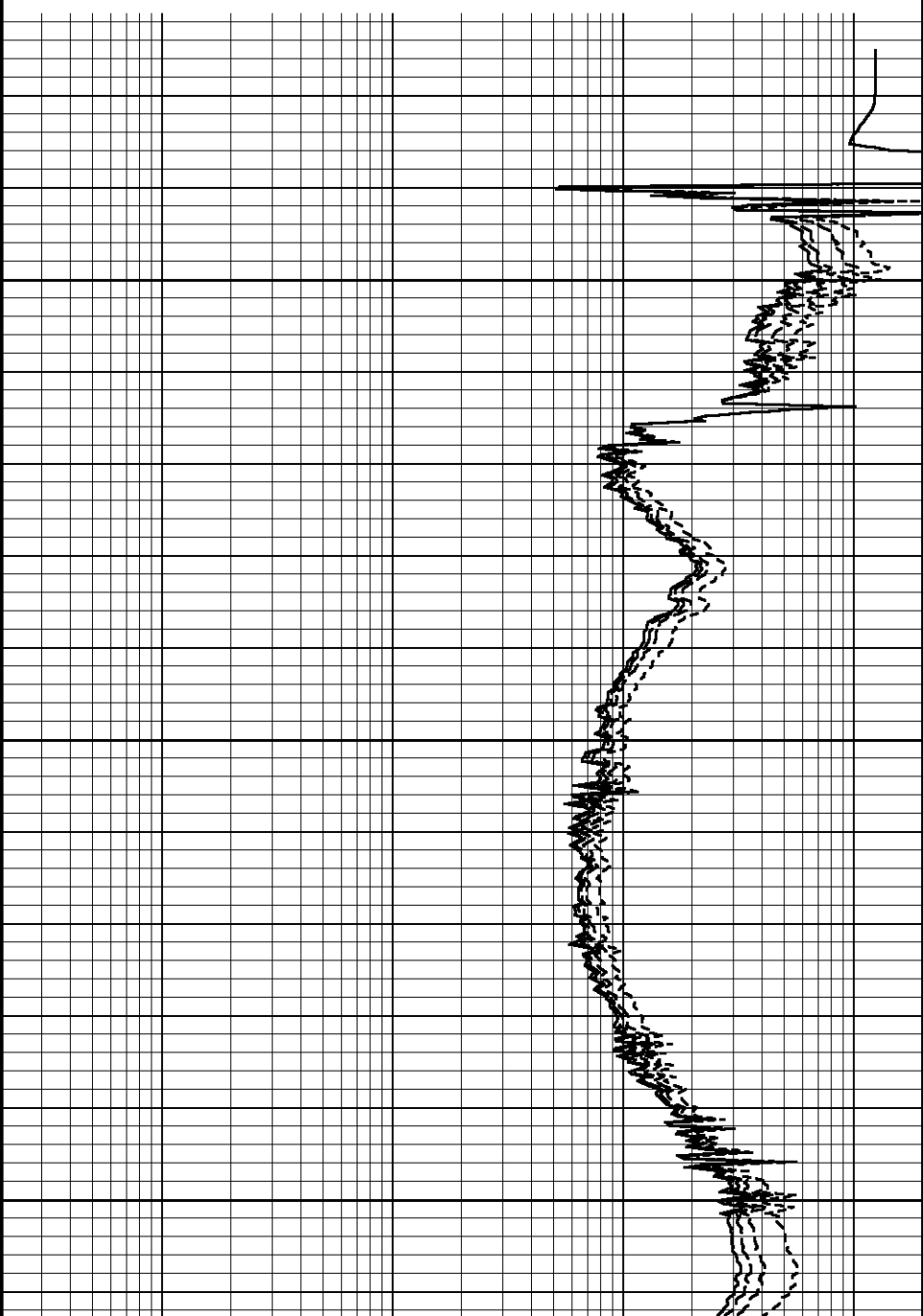
5700

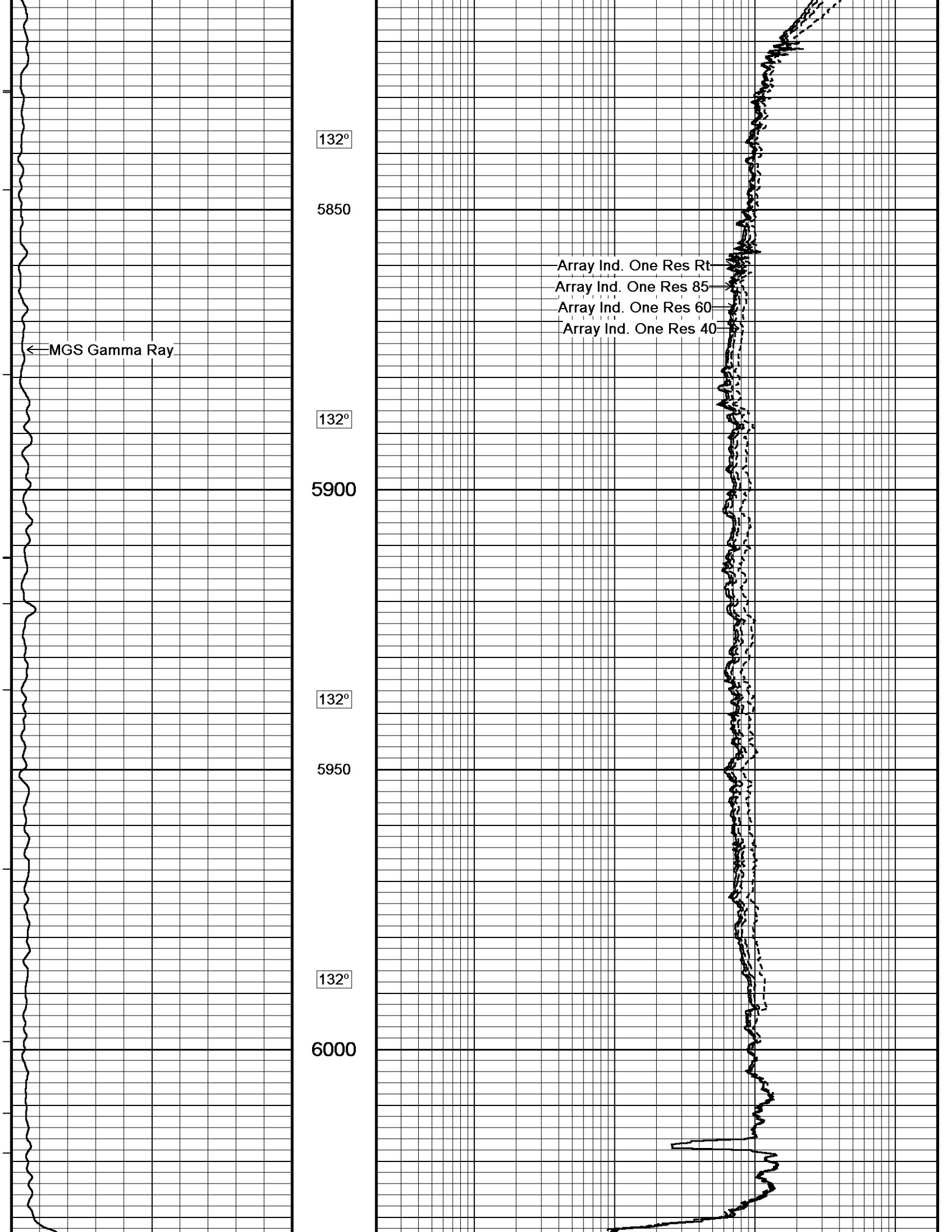
132°

5750

132°

5800





132°

5850

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

← MGS Gamma Ray

132°

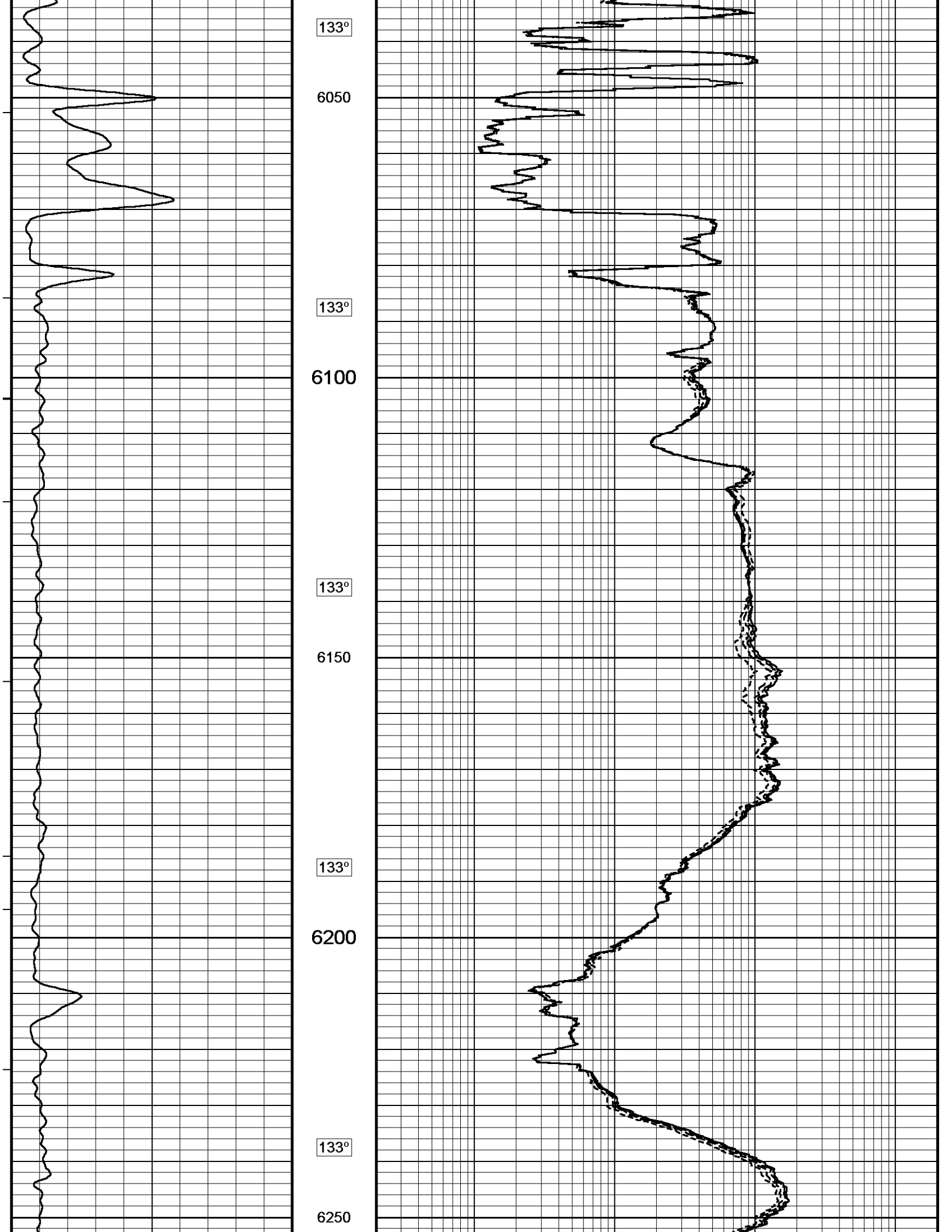
5900

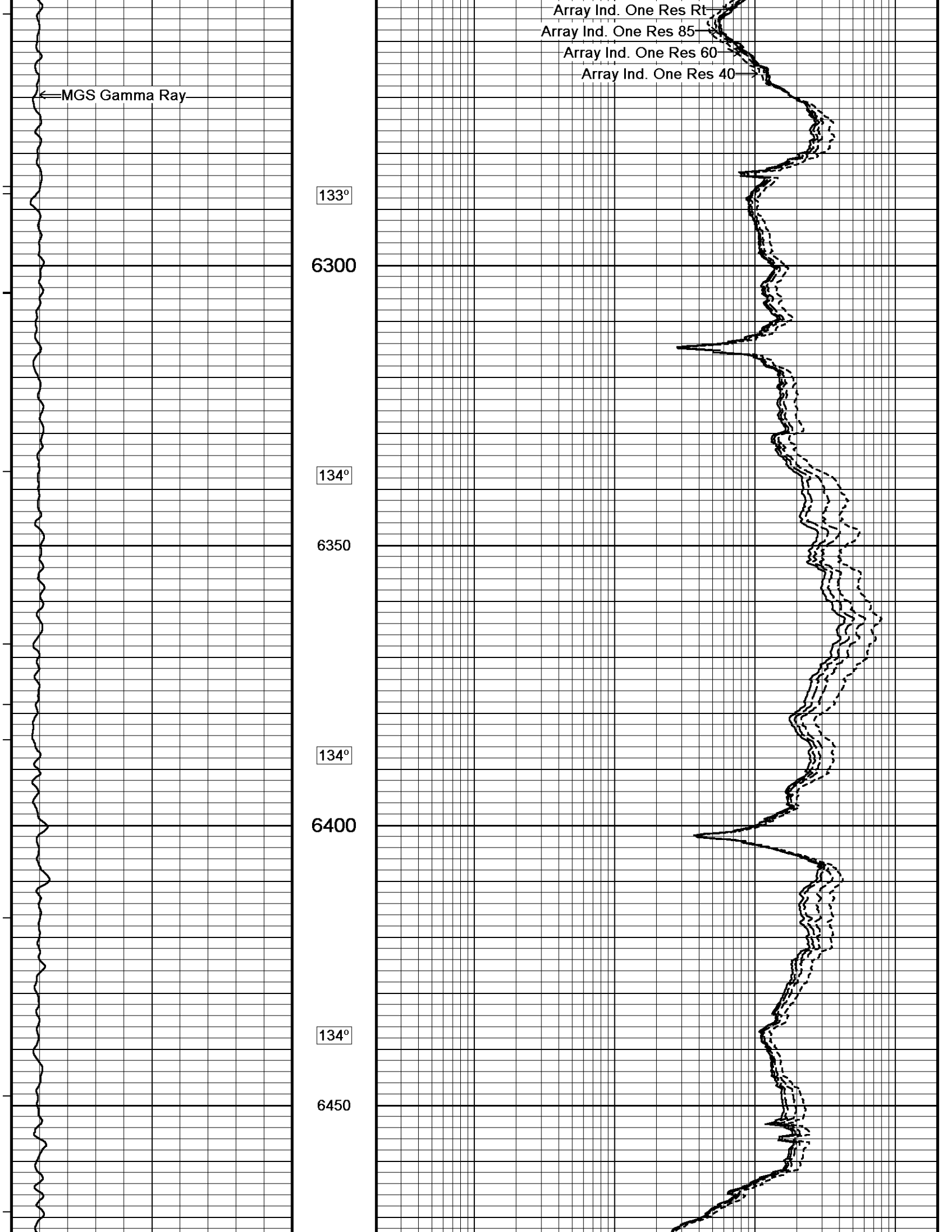
132°

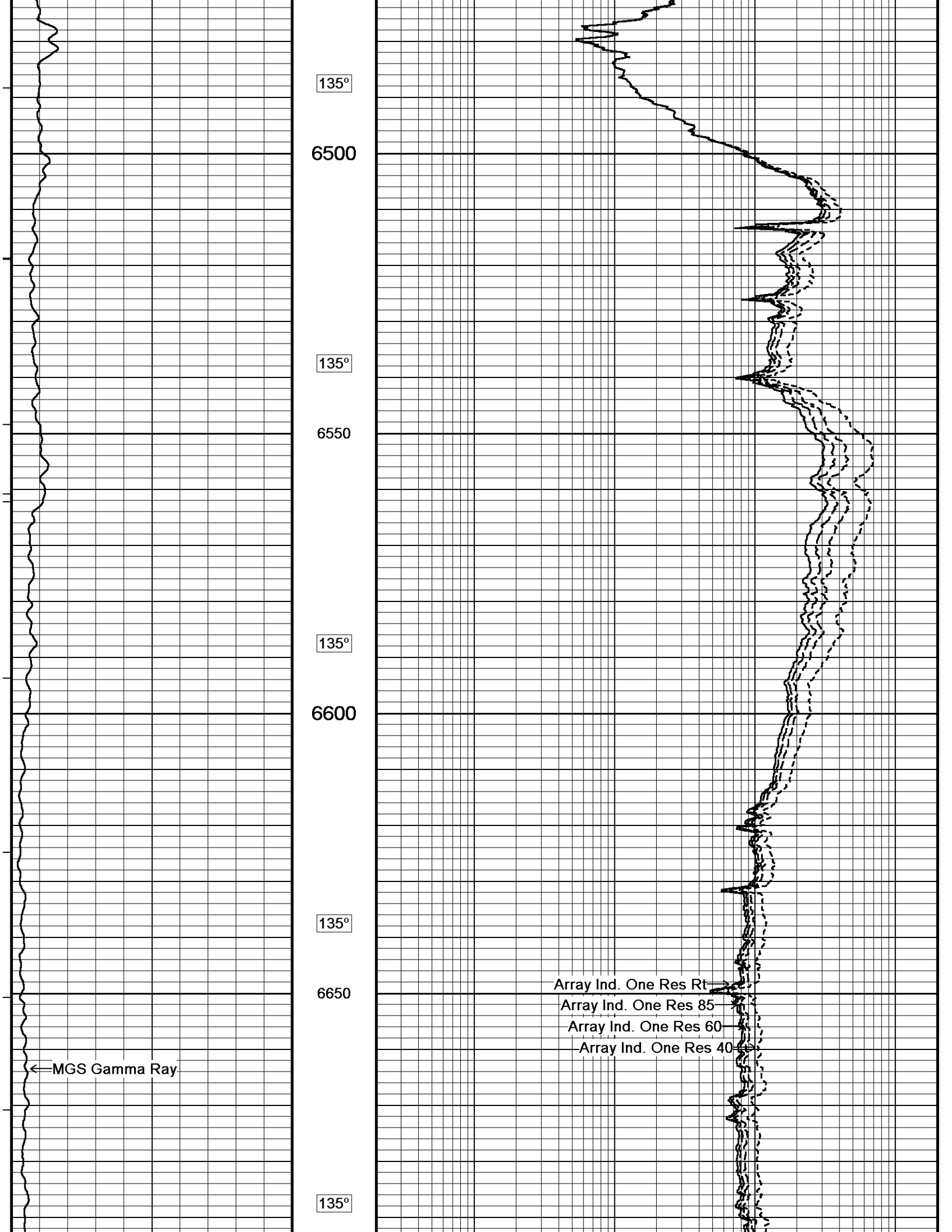
5950

132°

6000







135°

6500

135°

6550

135°

6600

135°

6650

135°

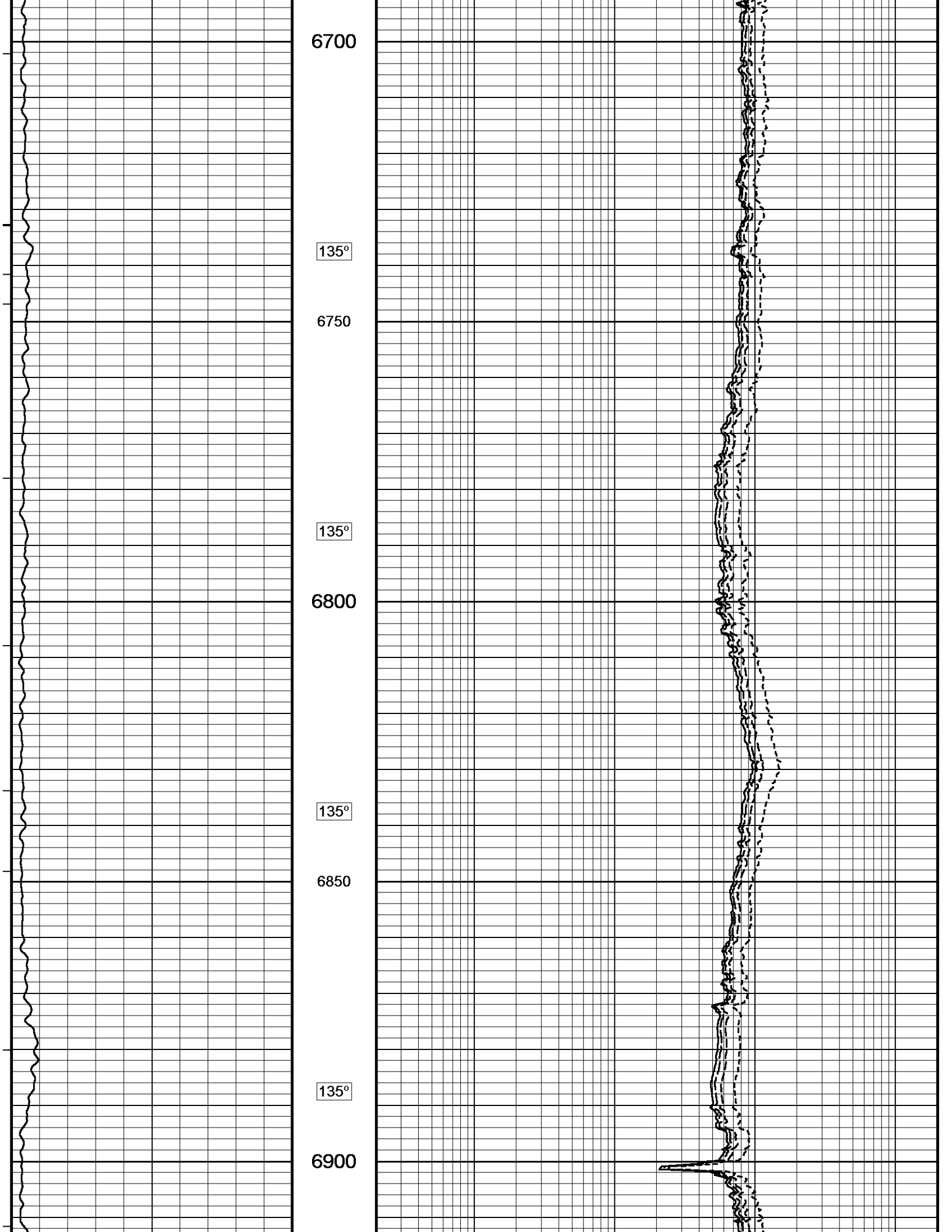
← MGS Gamma Ray

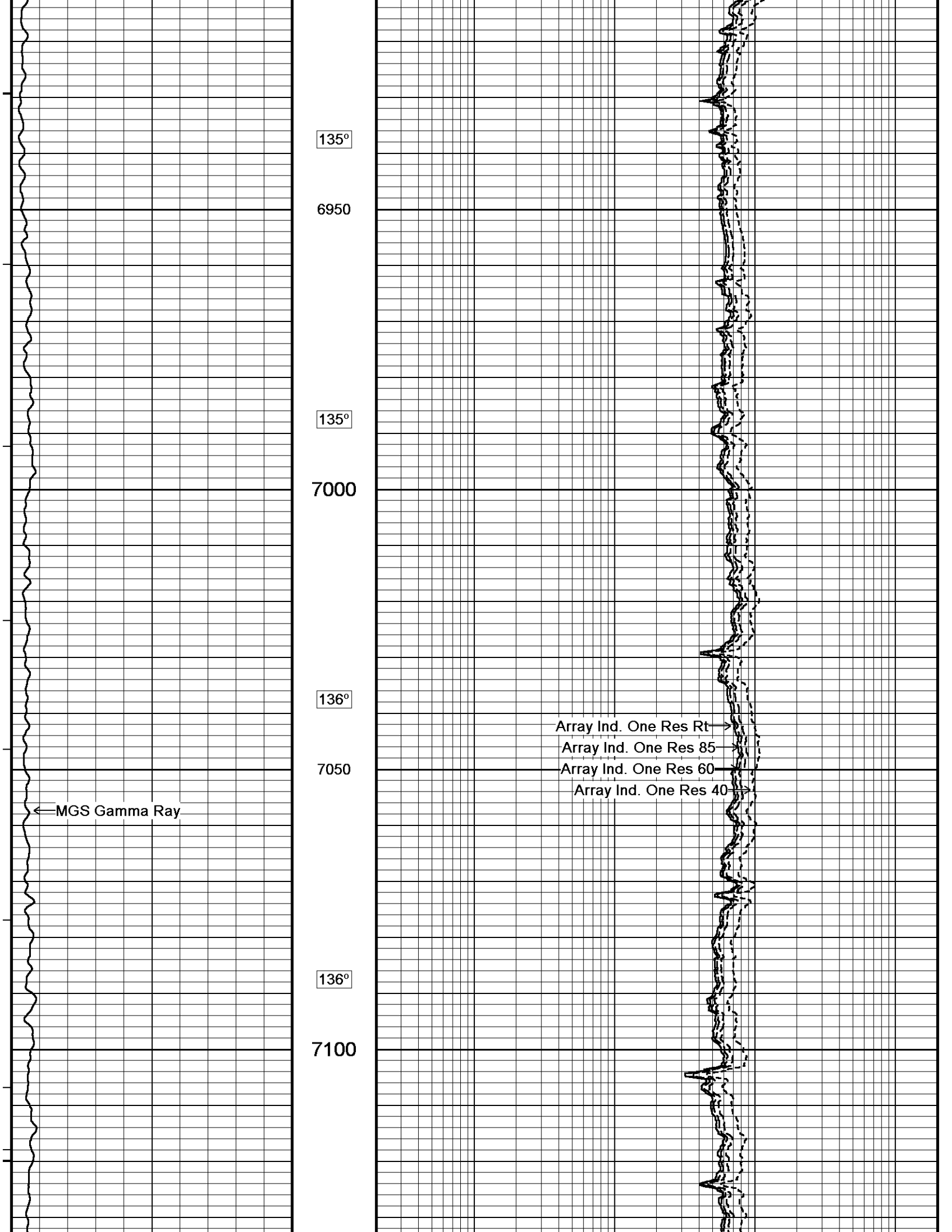
Array Ind. One Res Rt →

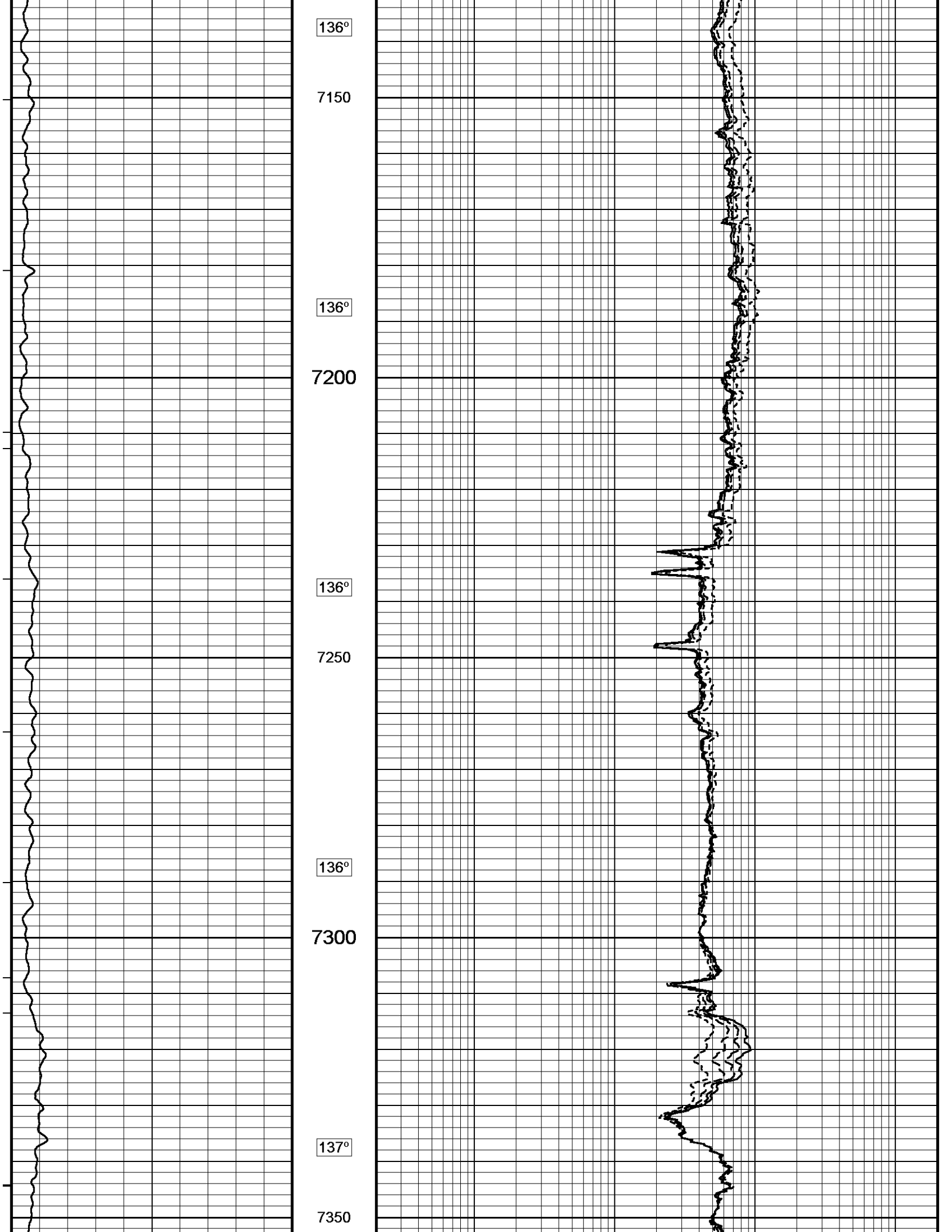
Array Ind. One Res 85 →

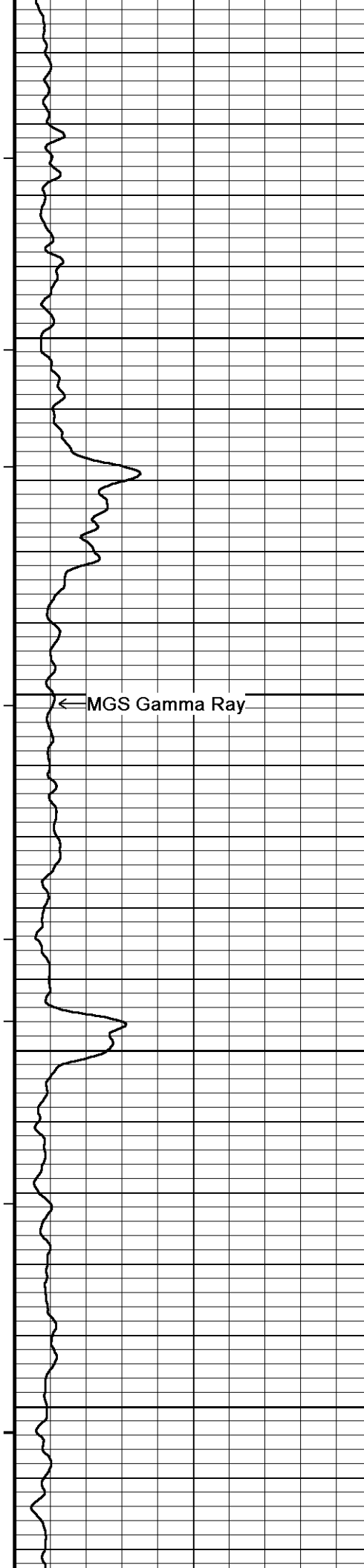
Array Ind. One Res 60 →

Array Ind. One Res 40 →









137°

7400

137°

7450

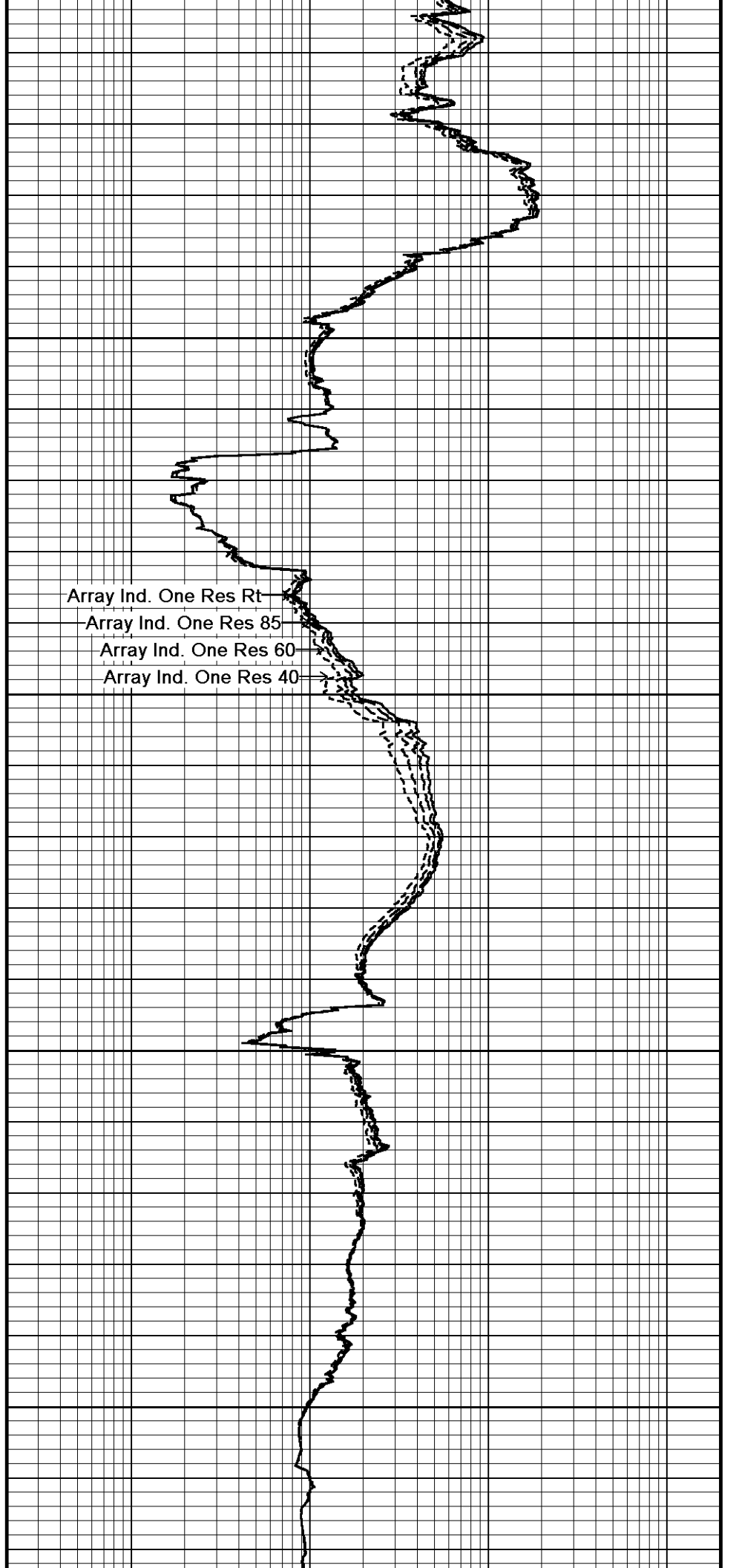
← MGS Gamma Ray

137°

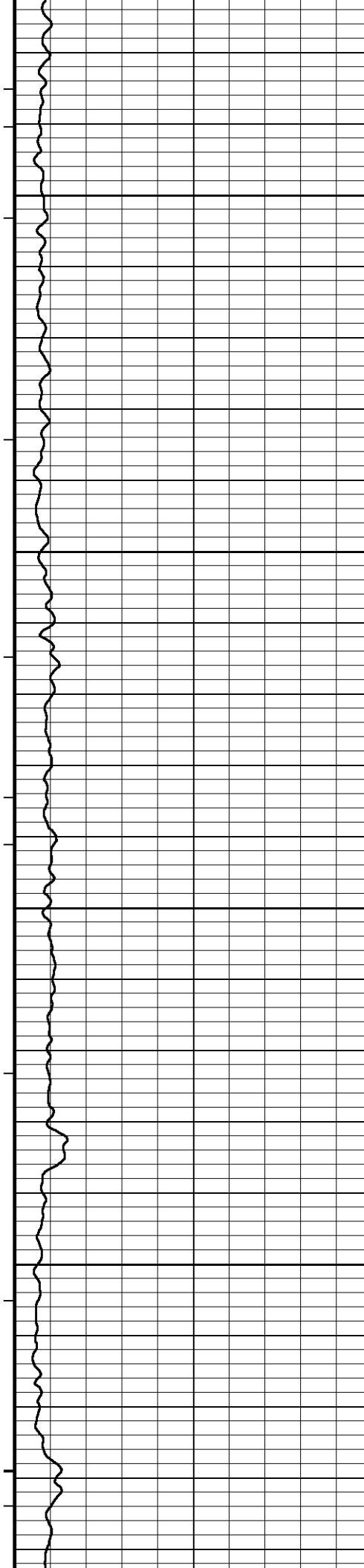
7500

137°

7550



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



137°

7600

138°

7650

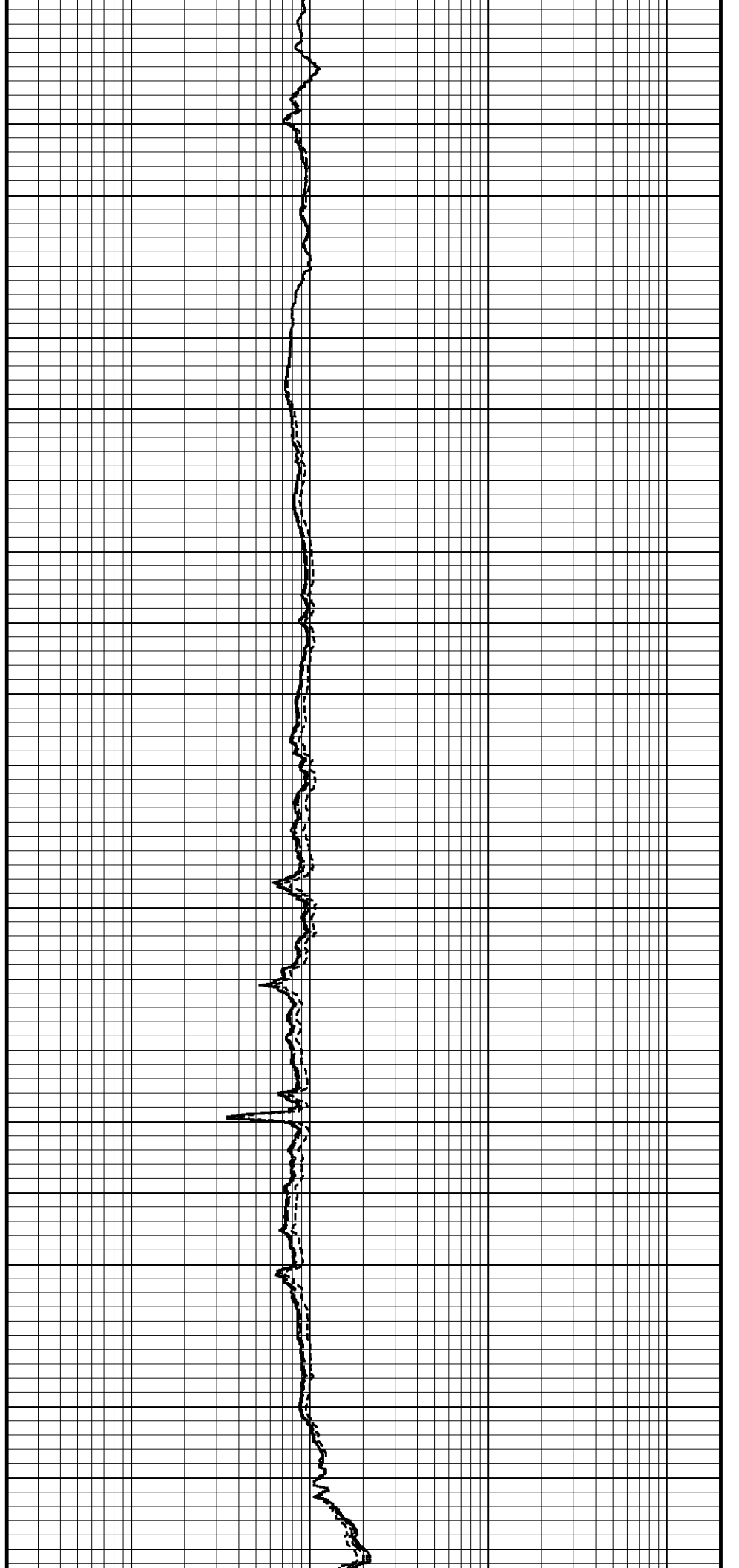
138°

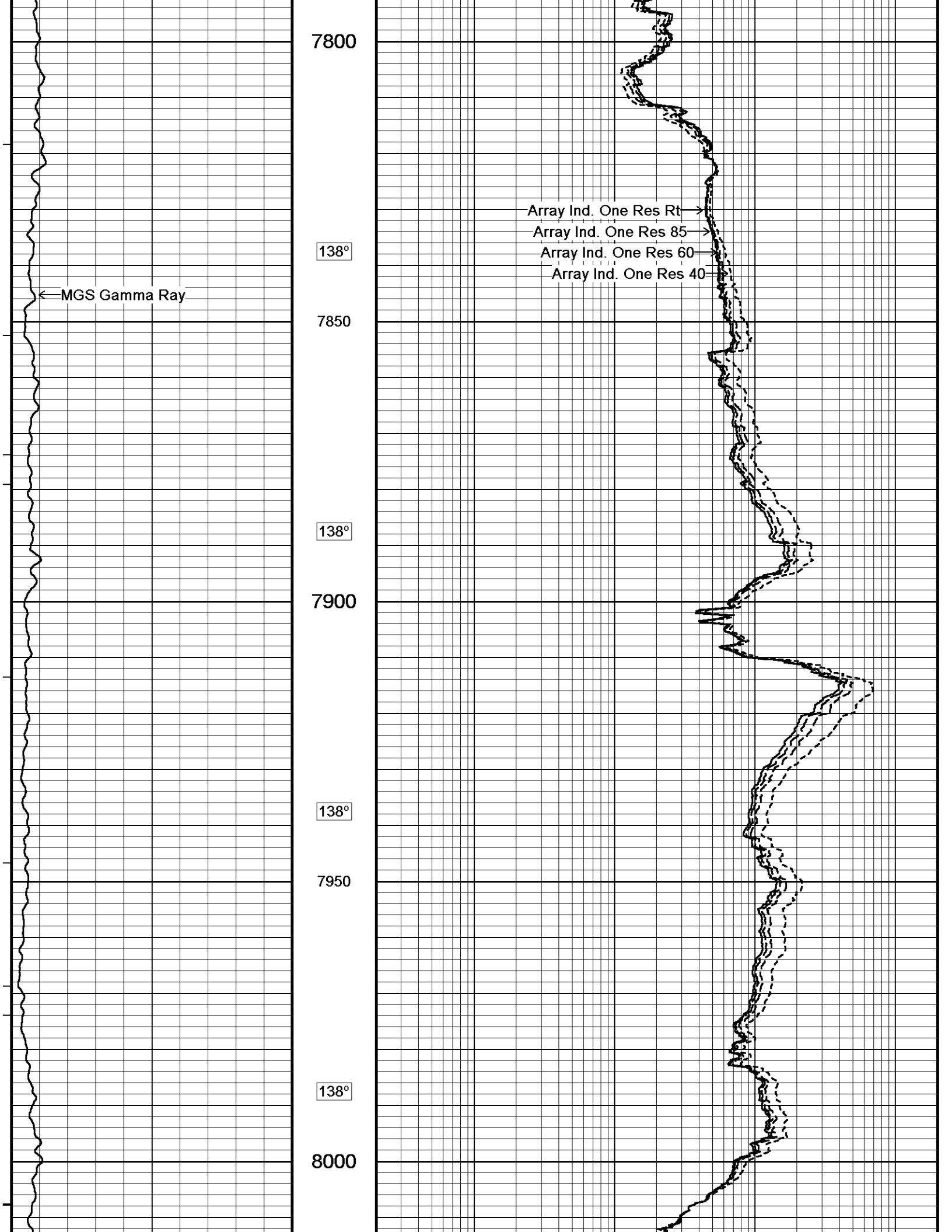
7700

138°

7750

138°





7800

Array Ind. One Res Rt

Array Ind. One Res 85

138°

Array Ind. One Res 60

Array Ind. One Res 40

← MGS Gamma Ray

7850

138°

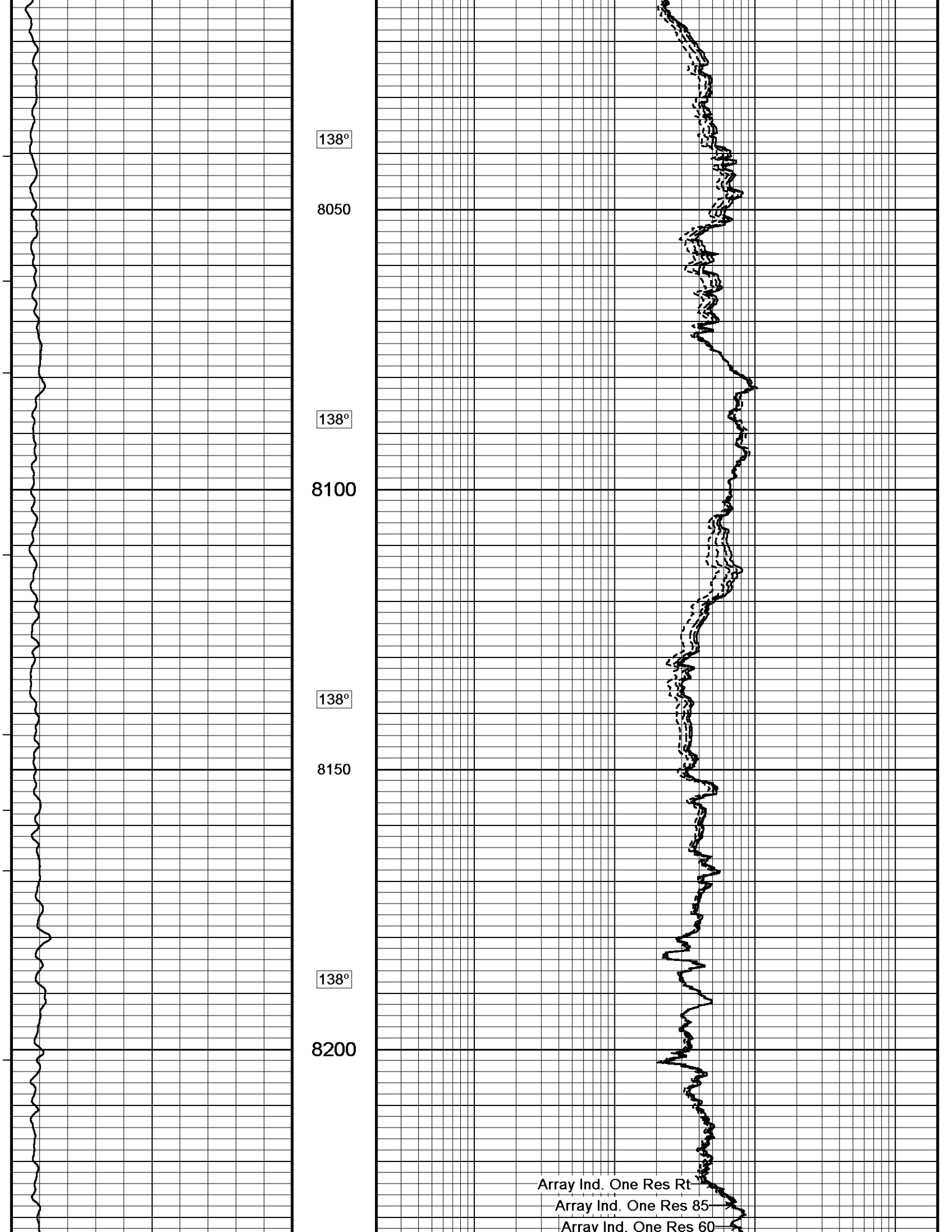
7900

138°

7950

138°

8000



138°

8050

138°

8100

138°

8150

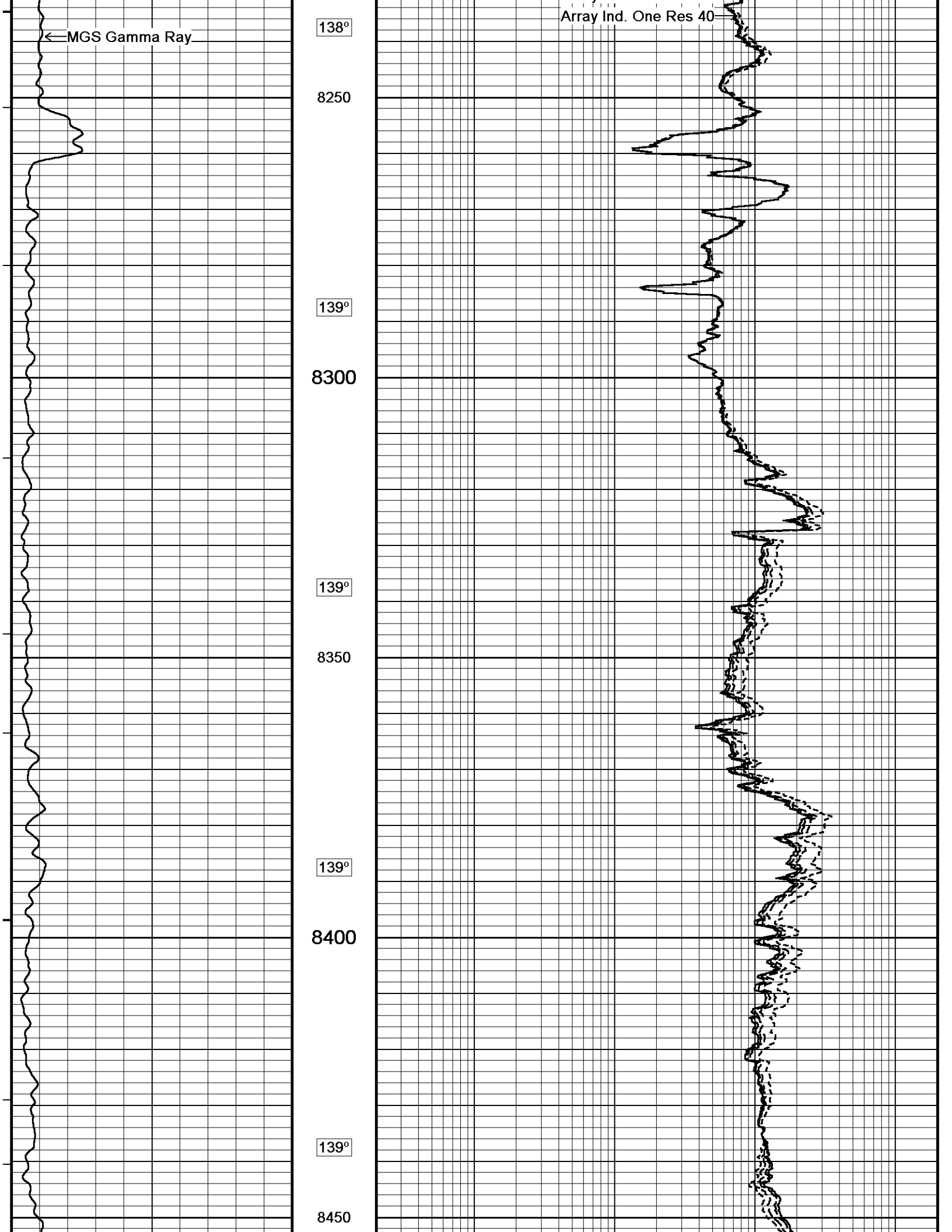
138°

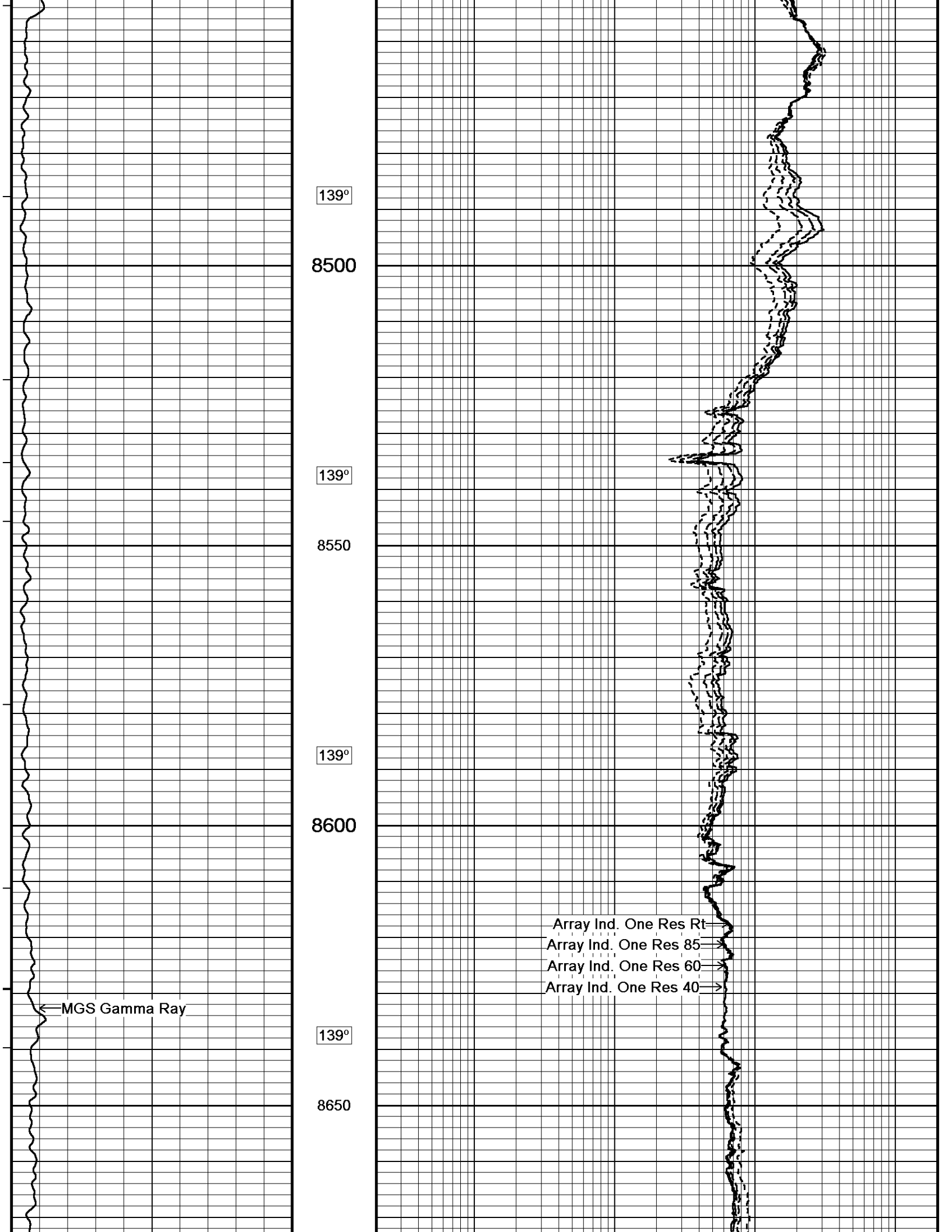
8200

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60





139°

8500

139°

8550

139°

8600

Array Ind. One Res Rt

Array Ind. One Res 85

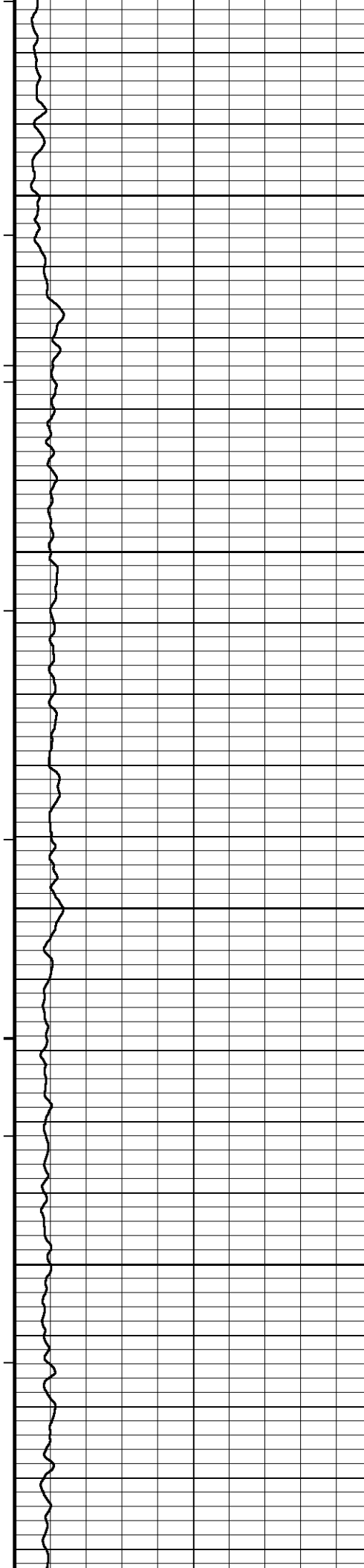
Array Ind. One Res 60

Array Ind. One Res 40

← MGS Gamma Ray

139°

8650



139°

8700

139°

8750

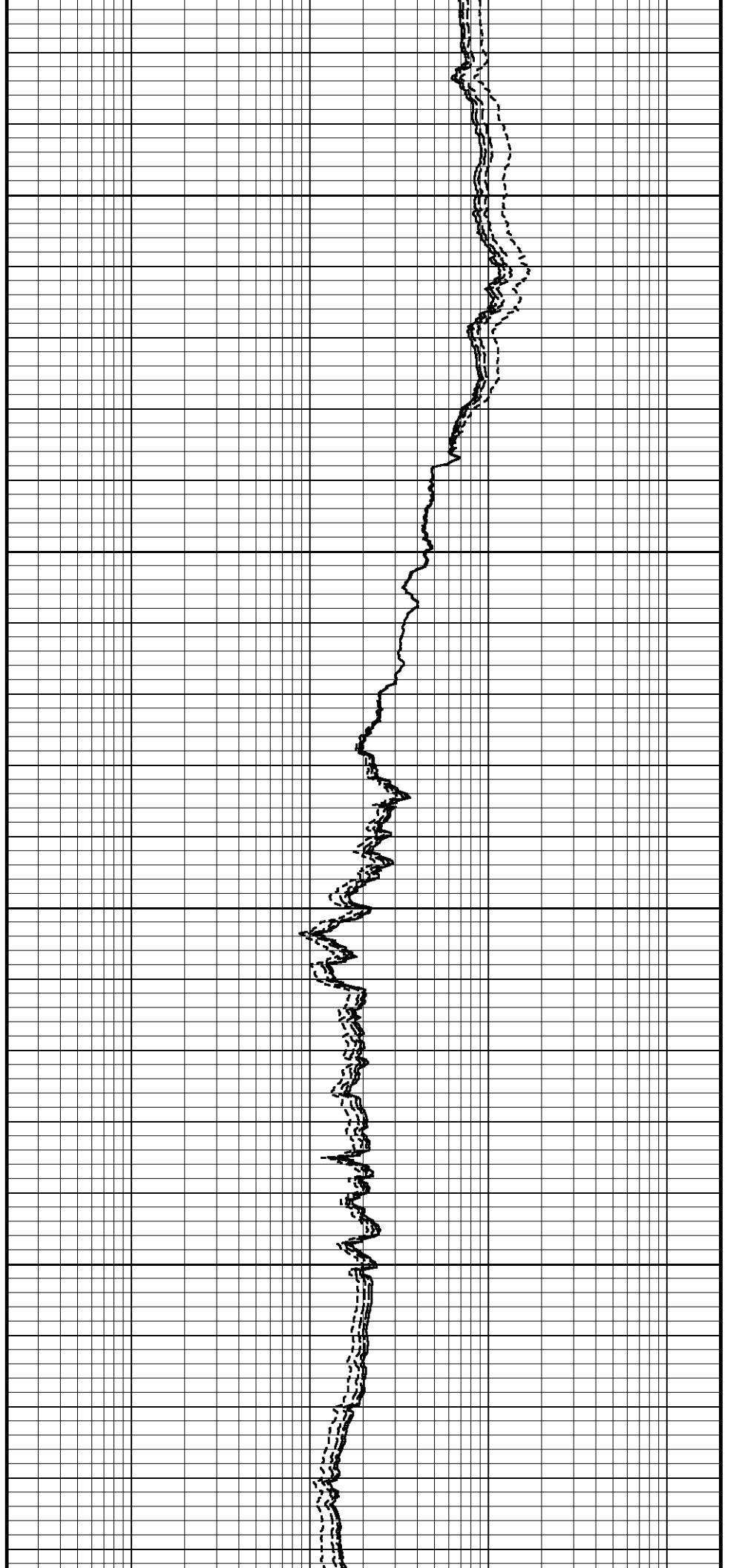
139°

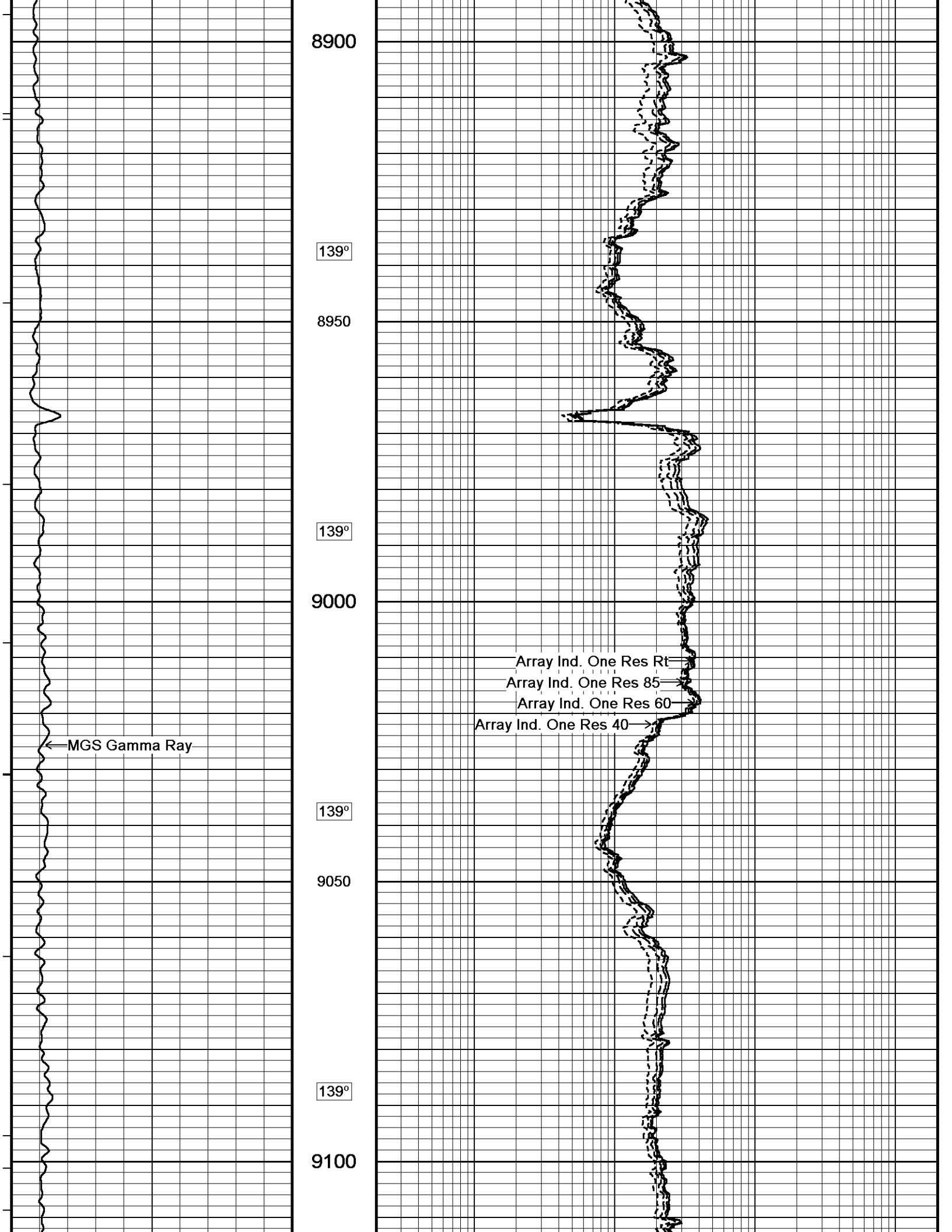
8800

139°

8850

139°





8900

139°

8950

139°

9000

Array Ind. One Res Rt

Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

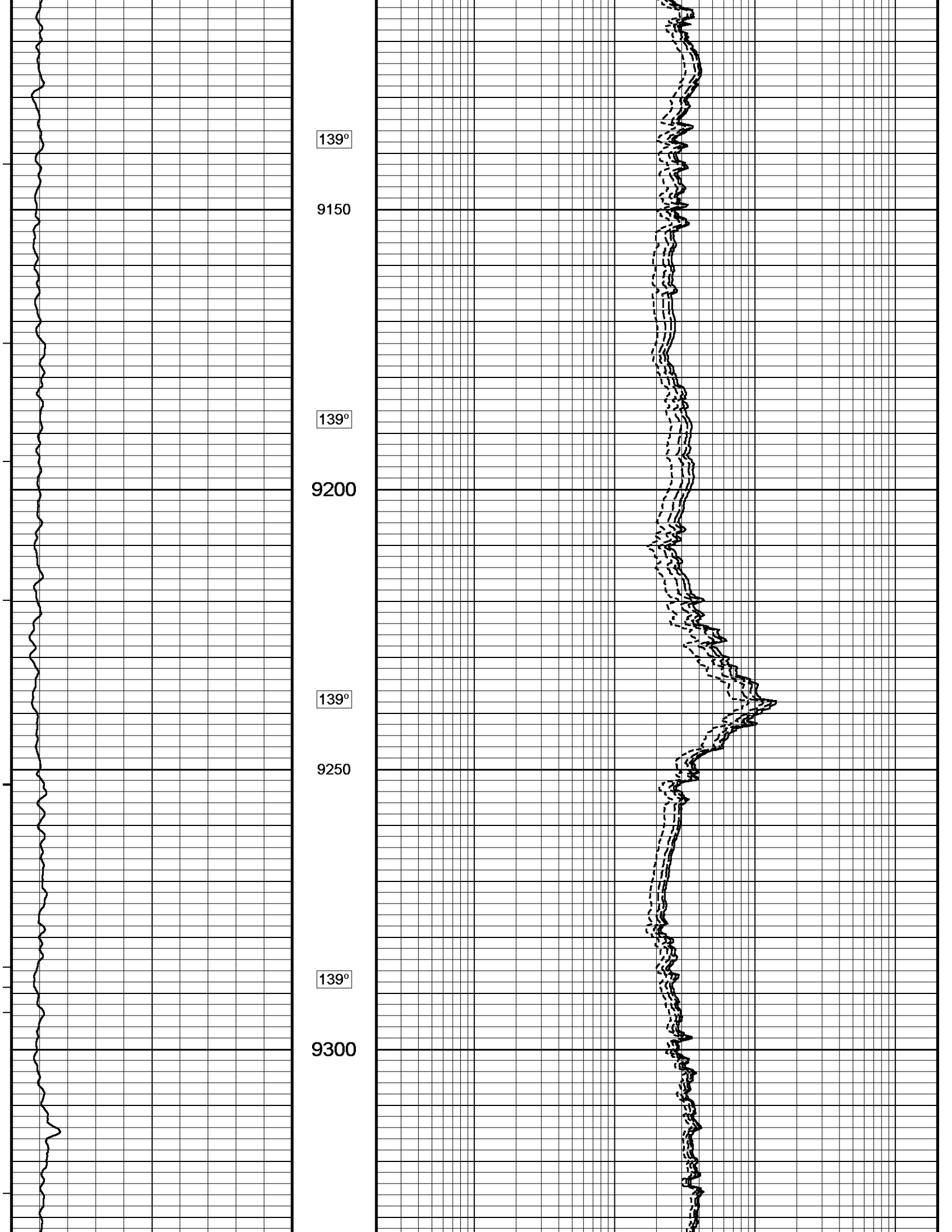
← MGS Gamma Ray

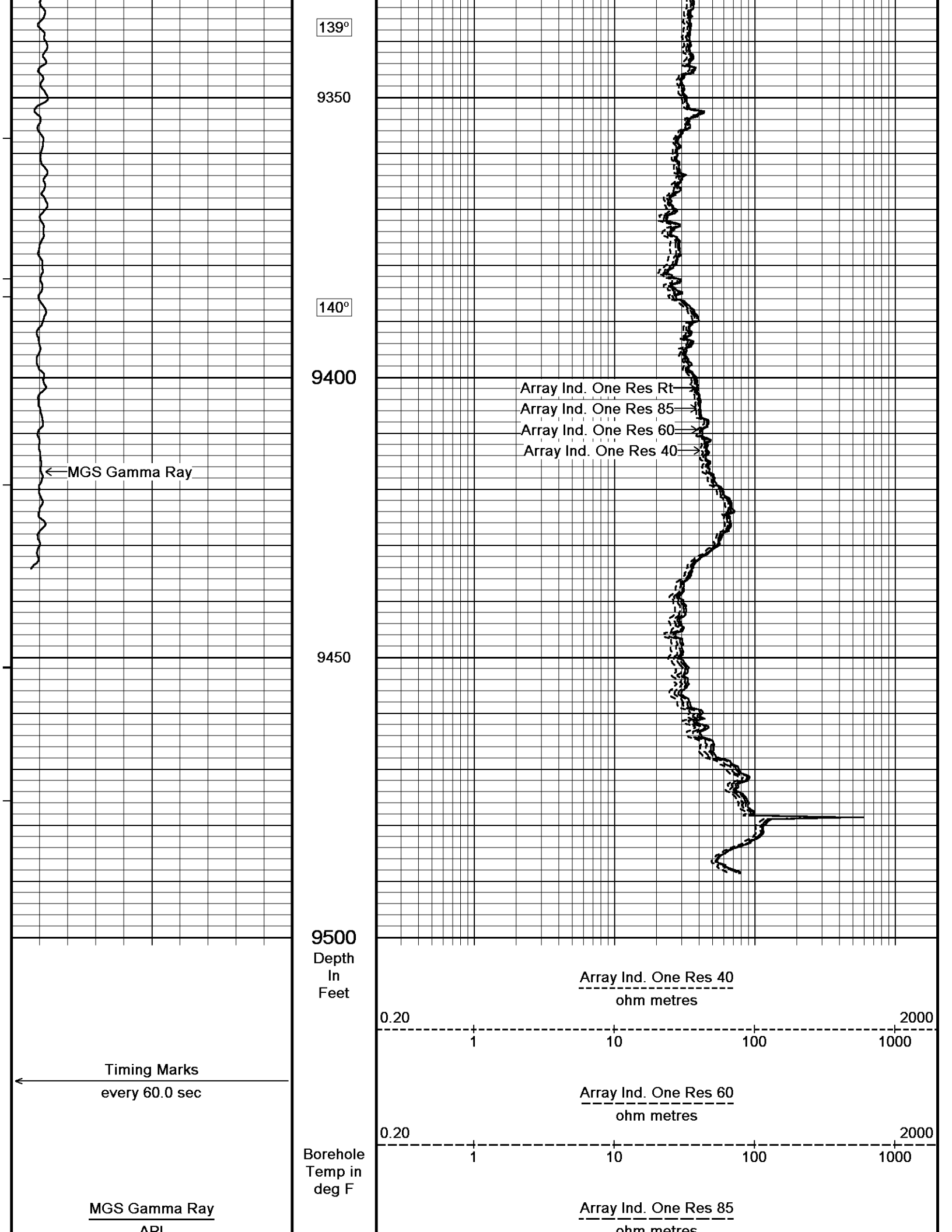
139°

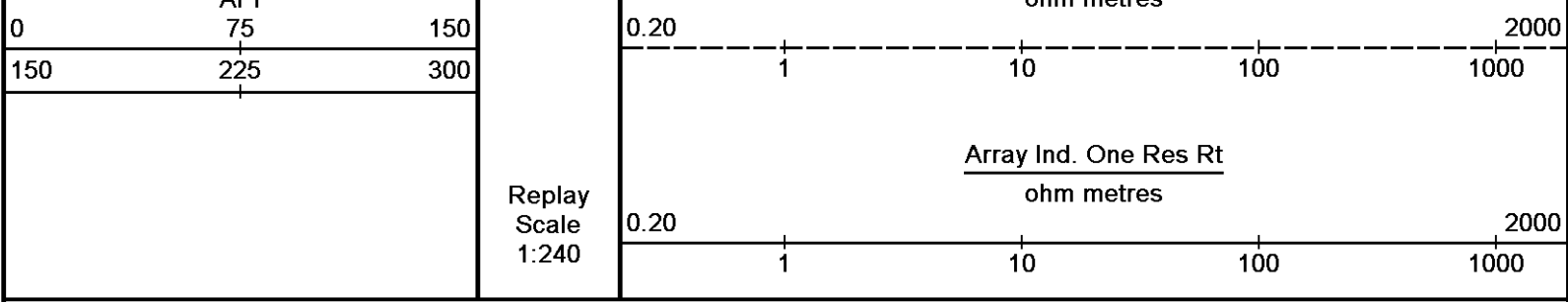
9050

139°

9100







Depth Based Data - Maximum Sampling Increment 10.0cm  
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↑ DSC ↑

## BEFORE SURVEY CALIBRATION

C:\13\_05\_9583\DATA\SANDRIDGE(ANITA 3420 2-12H)\27342 RTAP.dta

General Constants All 000 Last Edited on 22-APR-2013,16:26

**General Parameters**

Mud Resistivity	1.900	ohm-metres
Mud Resistivity Temperature	67.000	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	None	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	

**Rwa Parameters**

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

Down-hole Tension Calibration SMS 0 Field Calibration on 07-FEB-2006 14:19

Reading No	Measured	
1	16292.42	0.00
2	17072.79	420.00

Strain Gauge Constants MMS-E.B 165 Last Edited on 05-MAR-2013,02:14

Atmospheric Pressure 14.70 psi

Serial Number 262778

Calibration Date 28-Dec-2010

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	-0.111	-0.111	-0.108	-0.107	-0.109	-0.109	-0.117	-0.117
3000.0	5.068	5.069	5.072	5.072	5.070	5.071	5.061	5.063
6000.0	10.256	10.260	10.261	10.264	10.260	10.263	10.250	10.254
9000.0	15.454	15.459	15.460	15.464	15.459	15.463	15.449	15.455
12000.0	20.663	20.666	20.669	20.672	20.669	20.673	20.661	20.665
15000.0	25.884		25.891		25.893		25.885	

MMS Parameters MMS-E.B 165 Last Edited on 21-APR-2013 13:17

**Logging Parameters**

Firmware Version	2v40
Caliper Open On	MAI

Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	60.0	seconds
Pulse Duration Status Pulse From	20.0	seconds
Pulse Duration Caliper Close From	145.0	seconds
Pulse Duration Caliper Open From	150.0	seconds
Pulse Duration Release Pulse From	215.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	1613.0	seconds
Pulse Pressure Discriminator	3690.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	0.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	80.0	seconds
Caliper Close To		seconds
Caliper Open To	210.0	seconds

Configuration

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

Gamma Calibration MGS-C.J 108

Field Calibration on 21-APR-2013 13:13

	Measured	Calibrated (API)
Background	72	33
Calibrator (Gross)	1948	890
Calibrator (Net)	1876	857

Gamma Constants MGS-C.J 108

Last Edited on 22-APR-2013,10:21

Gamma Calibrator Number	GRCG073	
Mud Density	1.02	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MGS-C.J 108

Field Calibration on 15-APR-2013,10:33

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

High Resolution Temperature Calibration MGS-C.J 108

Field Calibration on 15-APR-2013,10:33

	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	0.00	0.00

High Resolution Temperature Constants MGS-C.J 108

Last Edited on 15-APR-2013,10:33

Pre-filter Length	11
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Neutron Calibration MDN-B.J 422

Base Calibration on 02-APR-2013 09:27  
Field Check on 21-APR-2013 13:05

Base Calibration	Measured	Calibrated (cps)
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	Near	Far	Near	Far
	3035	92	3714	110
Ratio	32.903		33.764	
Field Calibrator at Base			Calibrated (cps)	
			2275	3356
Ratio			0.678	
Field Check			Calibrated (cps)	
			1246	1866
Ratio			0.668	

Neutron Constants MDN-B.J 422			Last Edited on 21-APR-2013,12:58	
Neutron Source Id	HN553			
Neutron Jig Number	N639			
Epithermal Neutron	No			
Caliper Source for Processing	Density Caliper			
Stand-off	0.00	inches		
Mud Density	1.02	gm/cc		
Limestone Sigma	7.10	cu		
Sandstone Sigma	4.26	cu		
Dolomite Sigma	4.70	cu		
Formation Pressure Source	None			
Formation Pressure	N/A		kpsi	
Temperature Source	MGS External Temperature			
Temperature	N/A		degrees F	
Mud Salinity	0.00		kppm	
Salinity Correction	Not Applied			
Formation Fluid Salinity Source	None			
Formation Fluid Salinity	N/A		kppm	
Barite Mud Correction	Not Applied			

FE Calibration MFE-C.A 396			Base Calibration on 01-APR-2013 12:14	
			Field Check on 21-APR-2013 12:53	
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	961.7	126.8		
Base Check			281.8	
Field Check			281.8	

FE Constants MFE-C.A 396			Last Edited on 21-APR-2013,12:52	
Running Mode	No Sleeve			
MFE K Factor	0.1268			
Caliper Source for FE correction	Density Caliper			
Caliper Value for FE correction	N/A		inches	
Rm Source for FE correction	Temperature Corr			
Temp. for Rm Corr.	MGS External Temperature			
Stand-off	0.5	inches		

Induction Calibration MAI-B.J 394			Base Calibration on 09-FEB-2013,18:02		
			Field Check on 21-APR-2013 12:52		
Base Calibration					
Test Loop Calibration	Measured		Calibrated (mmho/m)		
Channel	Low	High	Low	High	
1	16.7	473.5	9.3	966.2	
2	5.6	368.9	7.6	821.4	
3	3.3	256.4	5.2	566.0	
4	1.8	133.4	2.6	279.2	
Array Temperature	71.8		Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	14.5	3833.3	
2	0.0	0.0	32.5	3651.7	
3	0.0	0.0	29.4	3084.1	
4	0.0	0.0	19.8	2068.9	

Deep	16.6	1912.3
Medium	43.7	4145.1
Shallow	50.6	5538.7

Array Temperature 0.0 78.0 Deg F

Induction Constants MAI-B.J 394

Last Edited on 22-APR-2013,16:26

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 394

Field Calibration on 03-APR-2013,14:52

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

High Resolution Temperature Constants MAI-B.J 394

Last Edited on 03-APR-2013,14:52

Pre-filter Length 11

Caliper Calibration MPD-D.A 472

Base Calibration on 01-APR-2013 11:55

Field Calibration on 15-APR-2013 10:26

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	18294	4.00
2	27757	5.98
3	37451	7.96
4	47445	9.86
5	58536	11.88
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.98	5.98

Photo Density Calibration MPD-D.A 472

Base Calibration on 01-APR-2013 11:33

## Density Calibration

## Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	59828	30798	59494	30754
Reference 2	25544	2871	26398	2598

## Field Check at Base

1197.3	1459.7
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## Field Check

1198.1	1465.0
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## PE Calibration

## Base Calibration

	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	232	1068		
Reference 1	26692	59617	0.452	0.367
Reference 2	8016	25400	0.320	0.270

## Field Check at Base

232.5	1067.8
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## Field Check

232.8	1069.6
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## Density Constants MPD-D.A 472

Last Edited on 22-APR-2013,10:22

Density Source Id	P74840B	
Nylon Calibrator Number	DNCE766	
Aluminium Calibrator Number	DHCG856	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.02	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	

## DOWNHOLE EQUIPMENT

C:\113\_05\_9583\DATA\SANDRIDGE(ANITA 3420 2-12H)\27342 RTAP.dta

Shuttle Running Tool 3.5"

SRT-A.A 71 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-F.A 200v Compact Battery Sub

MBS-F.A 131 LG: 10.61 ft WT: 70.5 lb OD: 2.24 in

Compact Memory Sub E.B

MMS-E.B 165 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.

MTI-B.A 68 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in



Compact Short Gamma  
MGS-C.J 108 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator  
MCL-B.J 69 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 455 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor  
SHA-H 185 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 603 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron  
MDN-B.J 422 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper  
MPD-D.A 472 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 733 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 594 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint  
SKJ-D.A 140 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

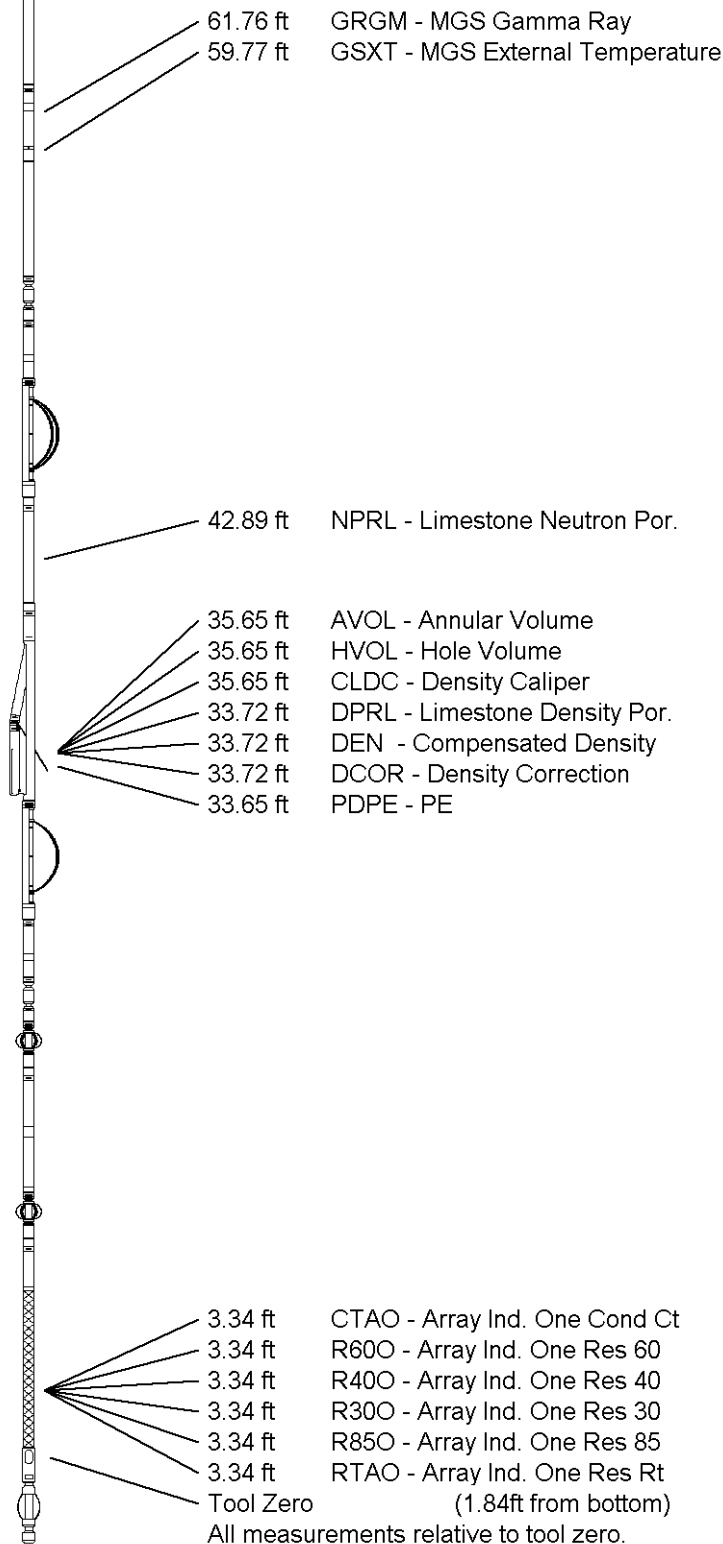
MIS-B Compact Inline Standoff sub  
MIS-B 202 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric  
MFE-C.A 396 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub  
MIS-E.B 595 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction  
MAI-B.J 394 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 88.36 ft Weight: 637.1 lb



**COMPANY** SANDRIDGE ENERGY  
**WELL** ANITA 3420 2-12H  
**FIELD** COMANCHE PROSPECT  
**PROVINCE/COUNTY** COMANCHE  
**COUNTRY/STATE** USA / KANSAS

Elevation Kelly Bushing	1816.00	feet	First Reading	9488.00	feet
Elevation Drill Floor	1816.00	feet	Depth Driller	9535.00	feet
Elevation Ground Level	1795.00	feet	Depth Logger	9535.00	feet

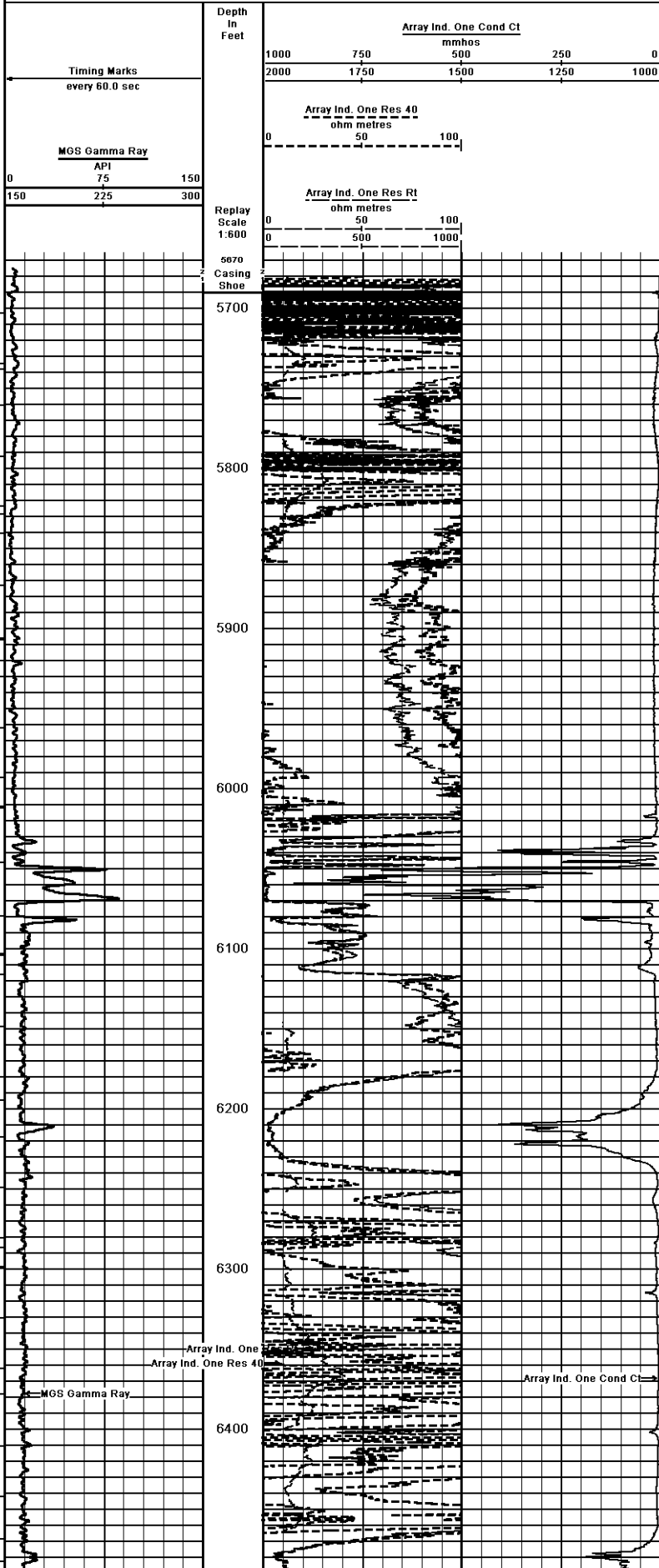


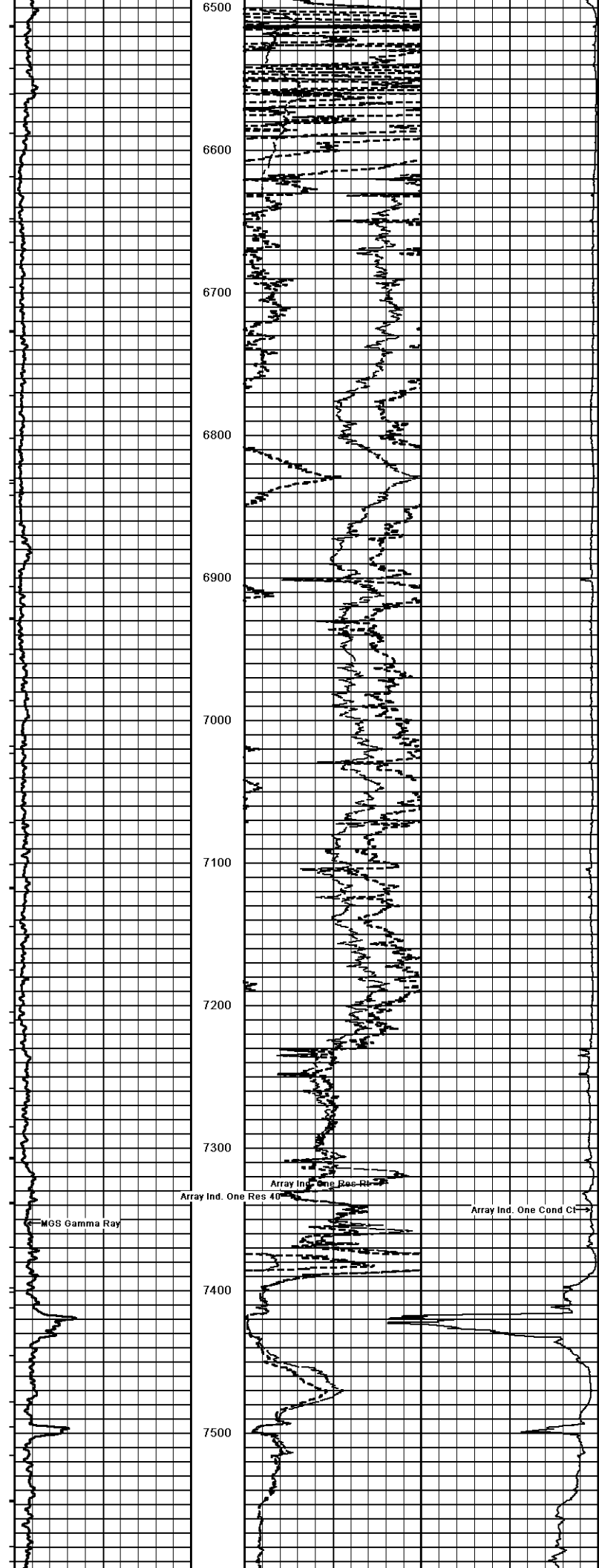
**CML MESSENGER SHUTTLE**  
**ARRAY INDUCTION**

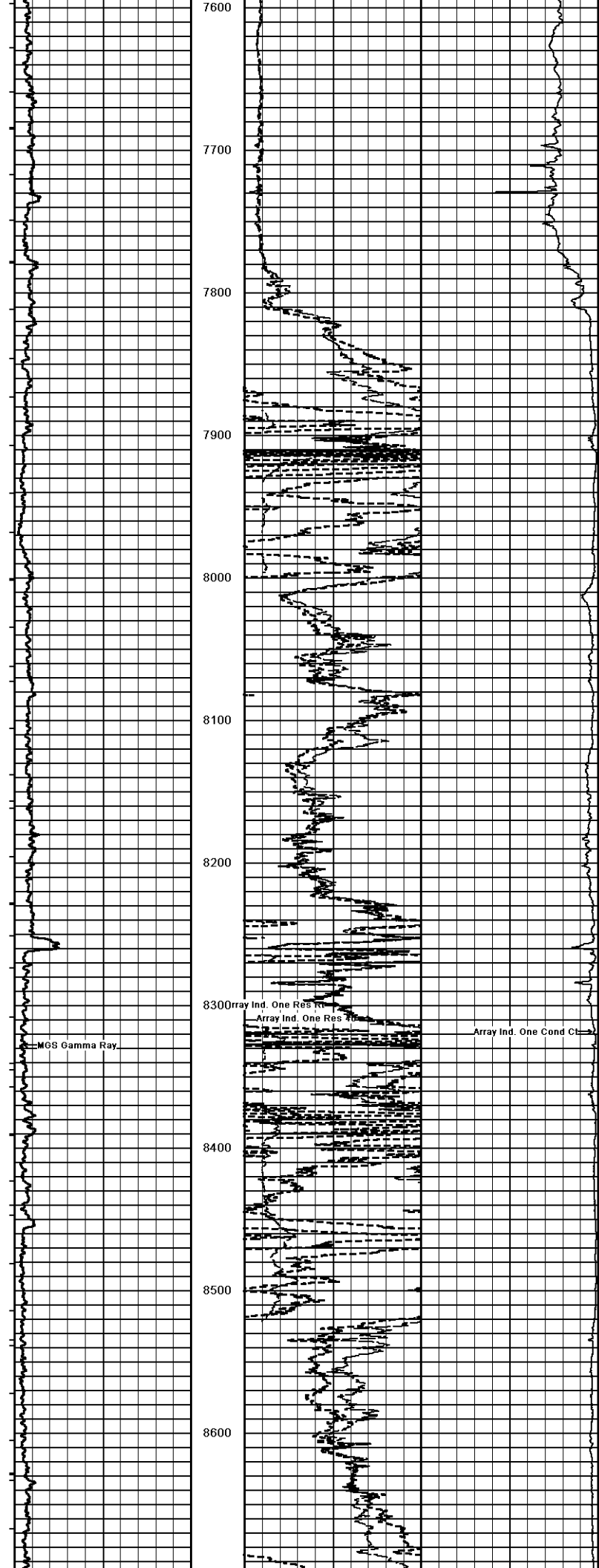
DSC

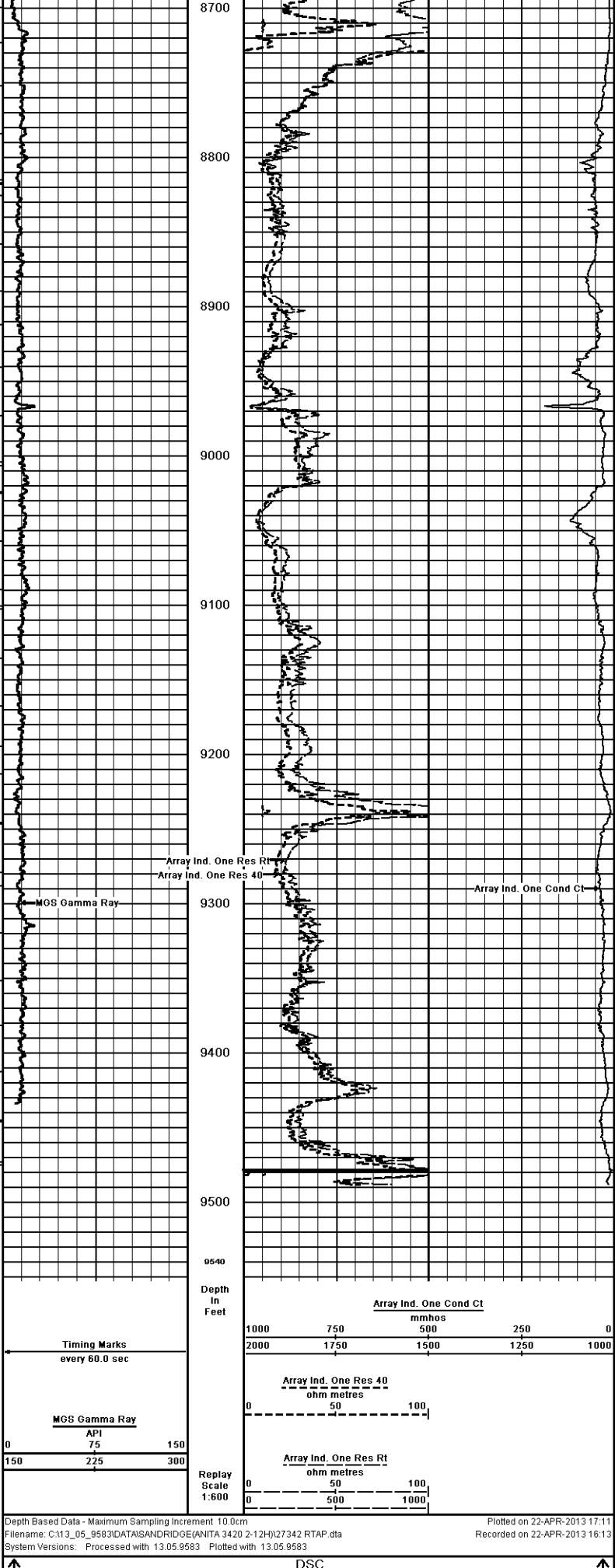
Depth Based Data - Maximum Sampling Increment 10.0cm  
Filename: C:\13\_05\_9583\DATA\SANDRIDGE\ANITA 3420 2-12H\127342 RTAP.dta  
System Versions: Processed with 13.05.9583 Plotted with 13.05.9583

Plotted on 22-APR-2013 17:11  
Recorded on 22-APR-2013 16:13









COMPANY SANDRIDGE ENERGY  
 WELL ANITA 3420 2-12H  
 FIELD COMANCHE PROSPECT

PROVINCE/COUNTY COMANCHE  
COUNTRY/STATE USA / KANSAS

Elevation Kelly Bushing	1816.00	feet	First Reading	9488.00	feet
Elevation Drill Floor	1816.00	feet	Depth Driller	9535.00	feet
Elevation Ground Level	1795.00	feet	Depth Logger	9535.00	feet



CML MESSENGER SHUTTLE  
ARRAY INDUCTION  
LOG