



**Weatherford**<sup>®</sup>

**CML WELL SHUTTLE  
COMPACT ARRAY INDUCTION  
LOG**

COMPANY SANDRIDGE EXPLORATION & PRODUCTION  
WELL TURNER 3406 5-7H  
FIELD WILD CREEK NORTH  
PROVINCE/COUNTY HARPER  
COUNTRY/STATE USA / KANSAS  
LOCATION 250' FSL & 1980' FEL

SEC 7 TWP 34S RGE 6W Other Services MDN/MPD  
API Number 15-077-21918-01  
Permit Number

Permanent Datum G.L., Elevation 1309 feet  
Log Measured From KB  
Drilling Measured From K.B.

Elevations: feet  
KB 1327.00  
DF 1327.00  
GL 1309.00

Date	12-MAY-2013
Run Number	ONE
Depth Driller	8973.00 feet
Depth Logger	8949.00 feet
First Reading	8944.00 feet
Last Reading	5317.00 feet
Casing Driller	5317.00 feet
Casing Logger	5317.00 feet
Bit Size	6.125 inches
Hole Fluid Type	WATER
Density / Viscosity	8.35 lb/USg 27.00 CP
PH / Fluid Loss	9.00 60.00 ml/30Min
Sample Source	FLOWLINE
Rm @ Measured Temp	3.50 @ 73.8 ohm-m
Rmf @ Measured Temp	2.80 @ 73.8 ohm-m
Rmc @ Measured Temp	4.20 @ 73.8 ohm-m
Source Rmf / Rmc	CALC CALC
Rm @ BHT	1.76 @ 146.0 ohm-m
Time Since Circulation	1 HOUR
Max Recorded Temp	146.00 deg F
Equipment Name	COMPACT
Equipment / Base	18064 OKC
Recorded By	C. GRIFFIN
Witnessed By	M. HALE
S.O.#/AFE	3540433 / DC12711

**BOREHOLE RECORD** Last Edited: 12-MAY-2013 14:43

Bit Size inches	Depth From feet	Depth To feet
6.125	5317.00	8973.00

**CASING RECORD**

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5317.00	26.00

**REMARKS**

WLS SOFTWARE VERSION 13.03. USED.  
TOOLS RUN ON DRILLPIPE USING COMPACT WELL SHUTTLE DEPLOYMENT TECHNIQUE.  
DEPTH MEASURED USING ADVANTAGE RIG DEPTH CORRECTED TO PIPE TALLY.  
TOOLS DEPLOYED WITH MULE SHOE SITTING AT 8868 FT.  
AFTER DEPLOYMENT LOGGING TOOL WAS AT 8949 FT.  
4.5 " PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUMES.  
OPERATORS: P. BURGER, G. GARCIA  
RIG: LARIAT 39

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

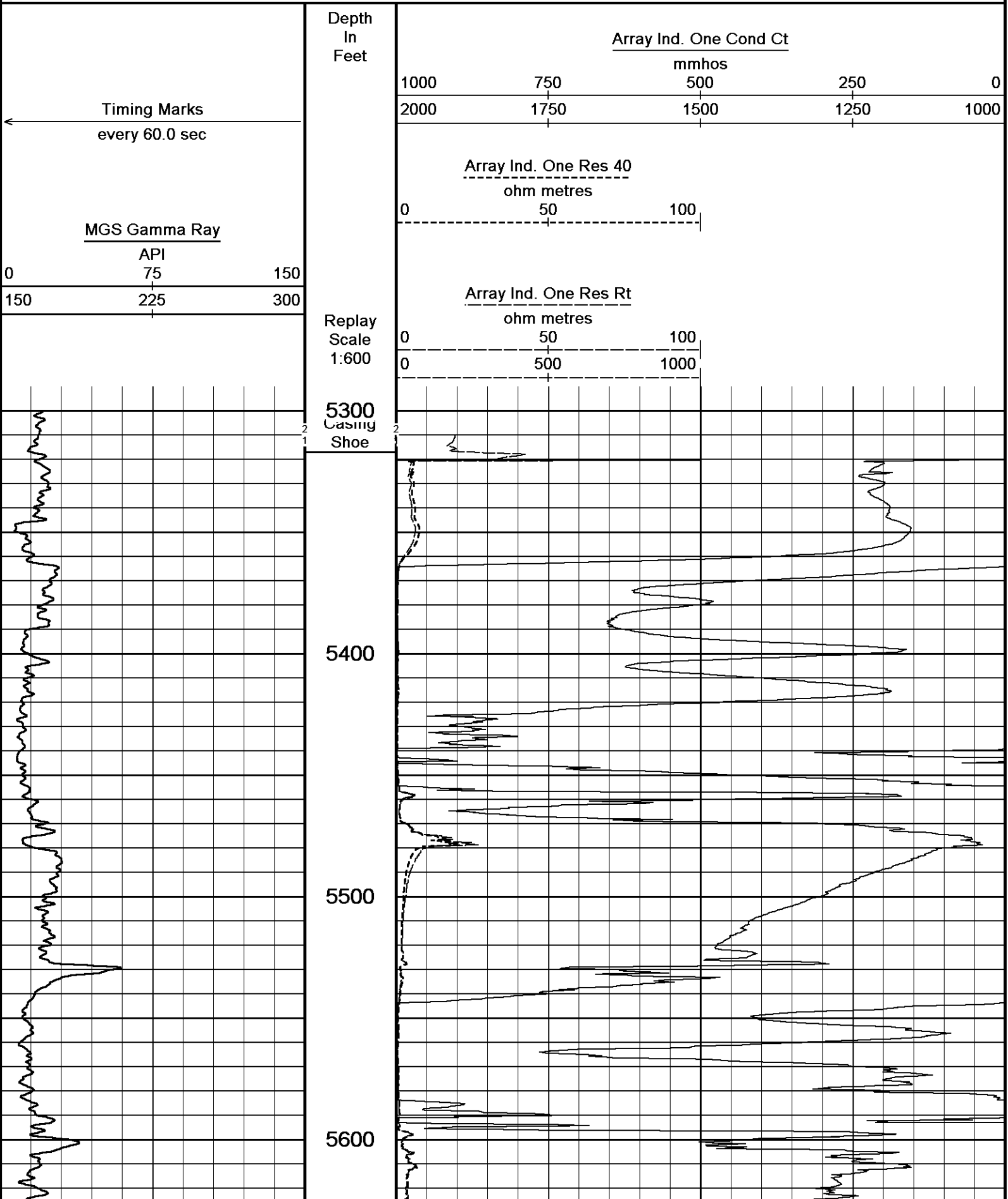
Depth Based Data - Maximum Sampling Increment 10.0cm

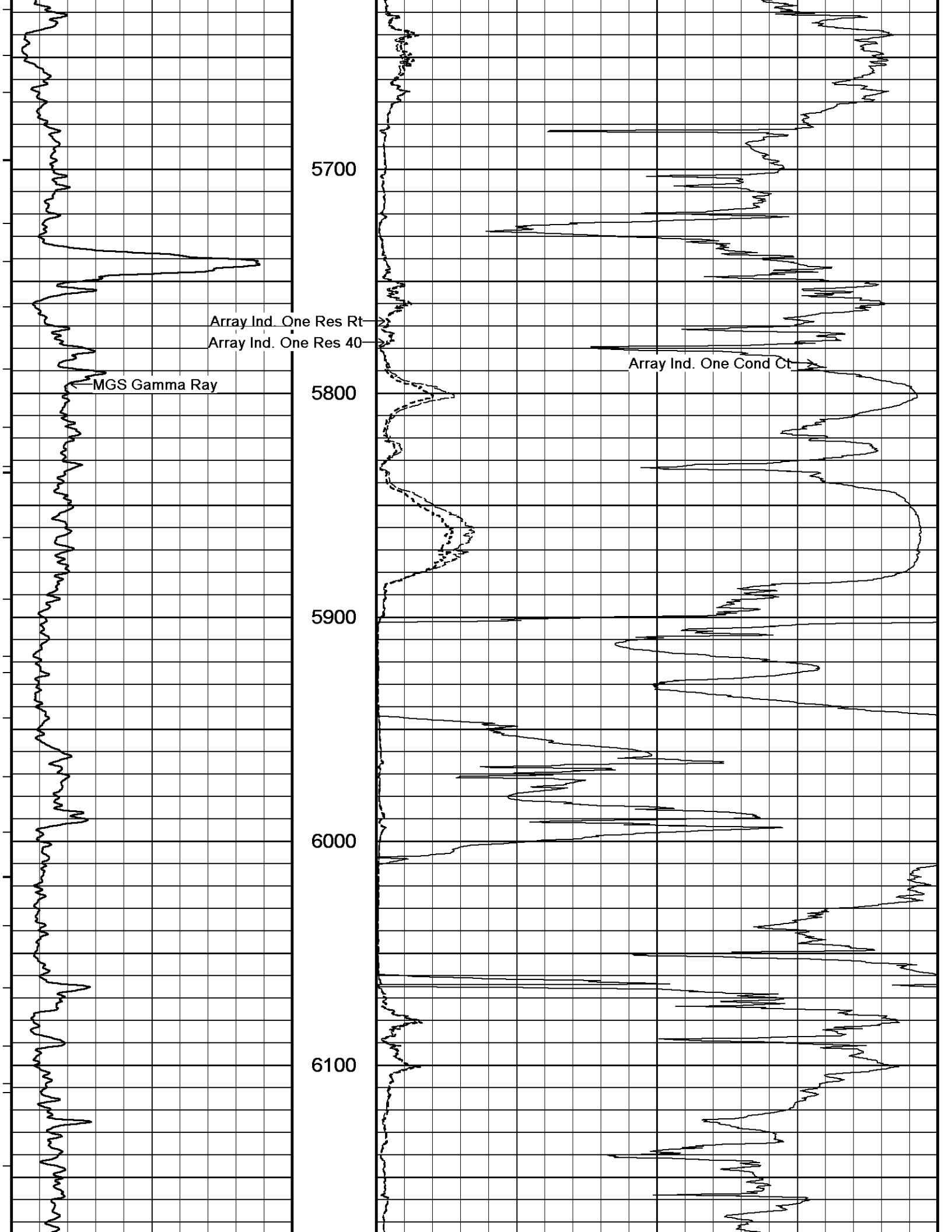
Plotted on 12-MAY-2013 14:57

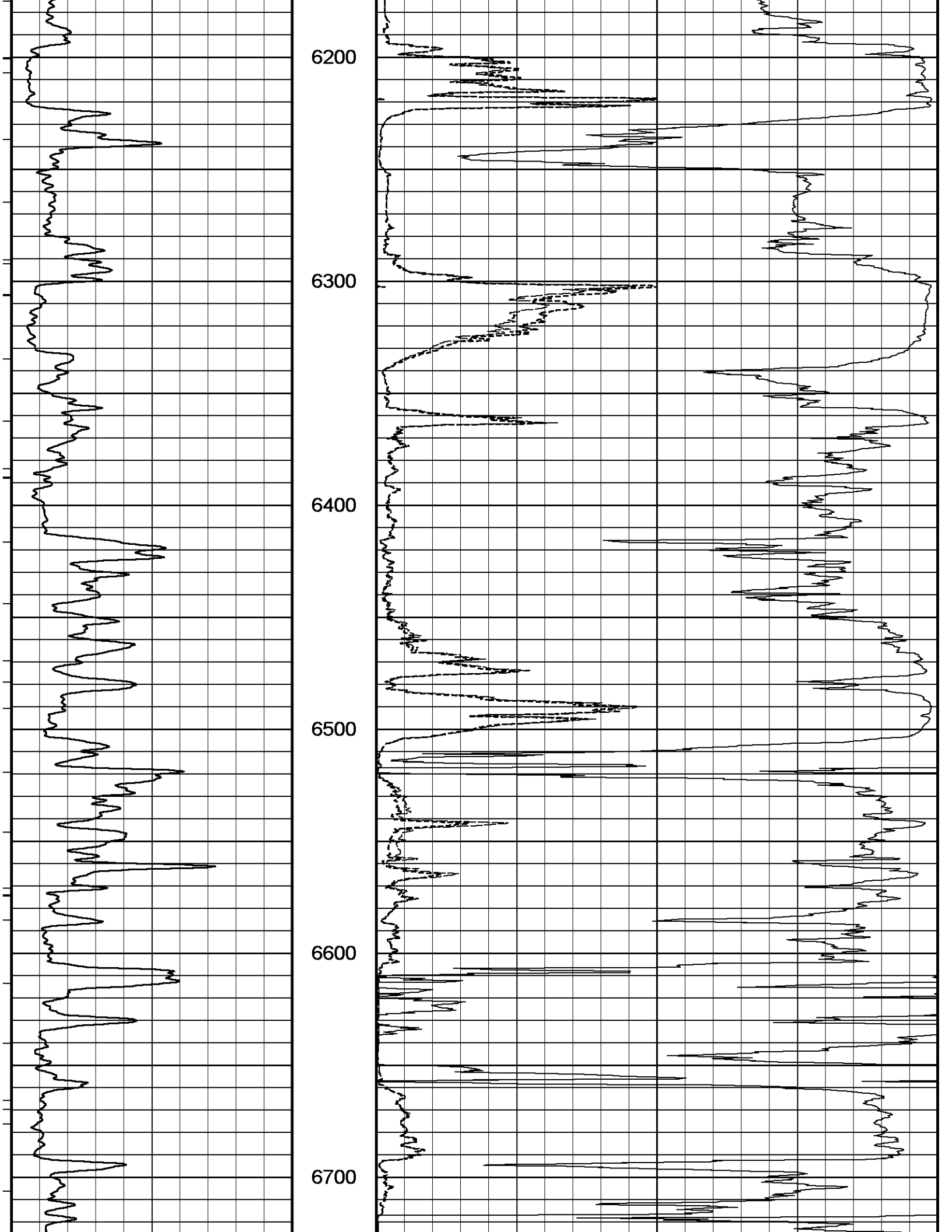
Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta

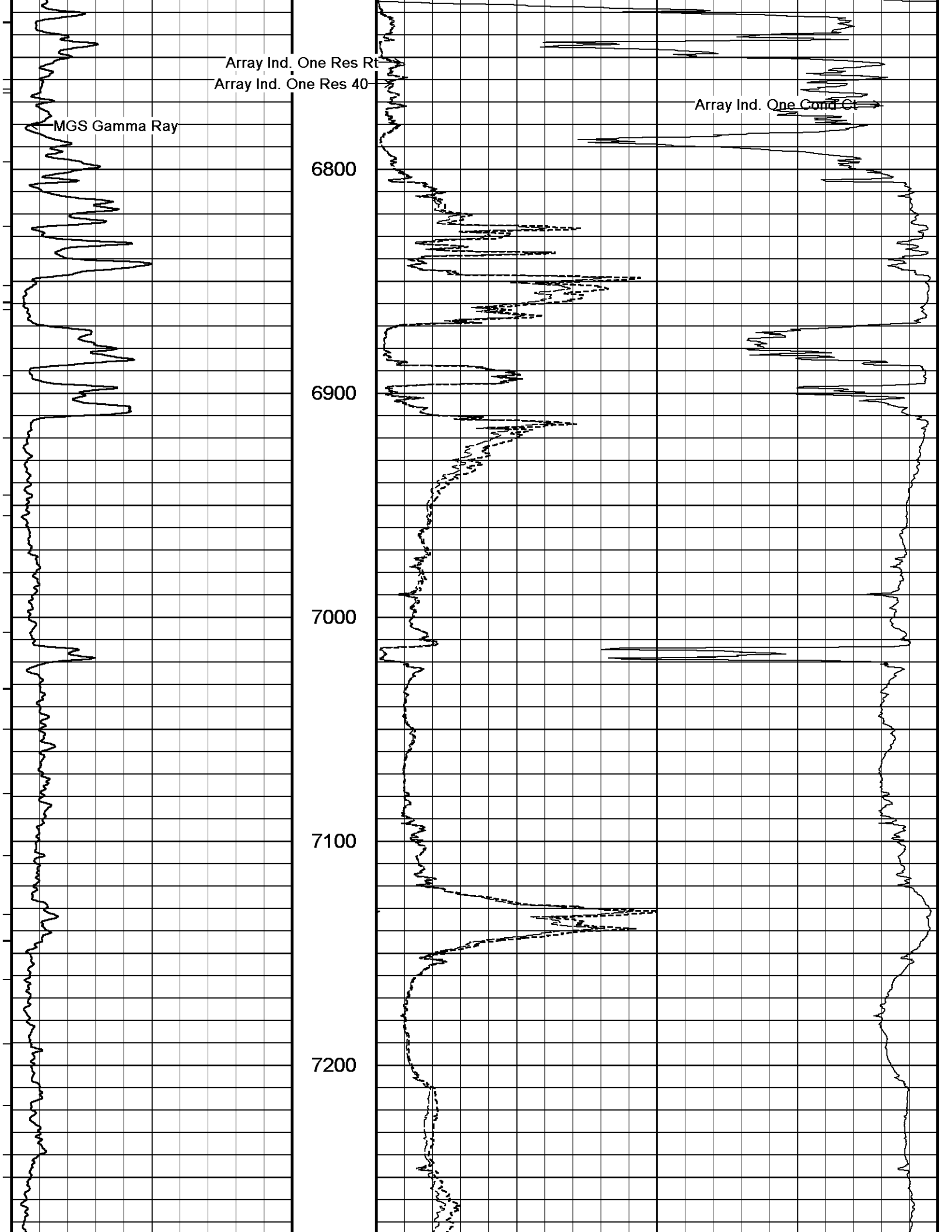
Recorded on 12-MAY-2013 14:25

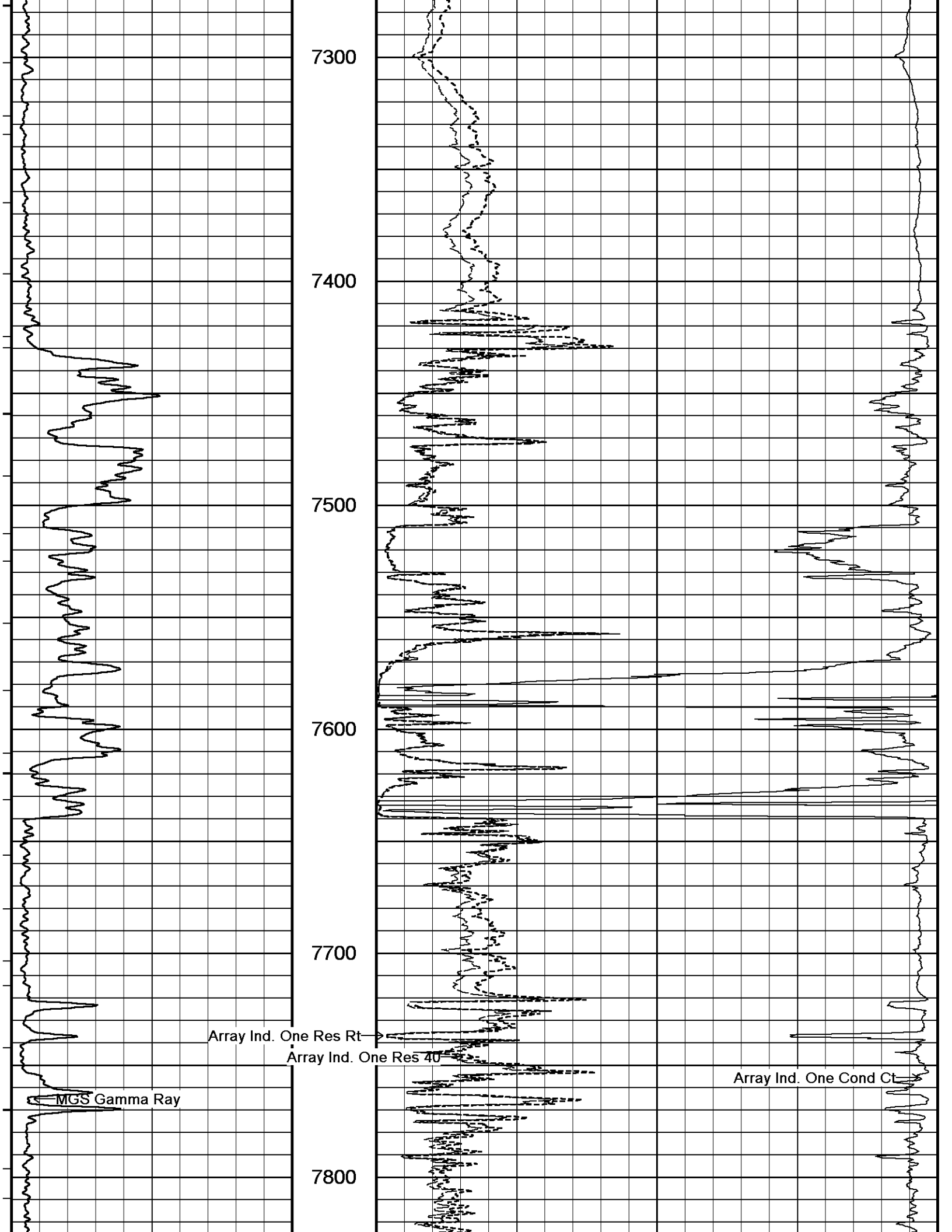
System Versions: Processed with 13.03.7779 Plotted with 13.03.7779

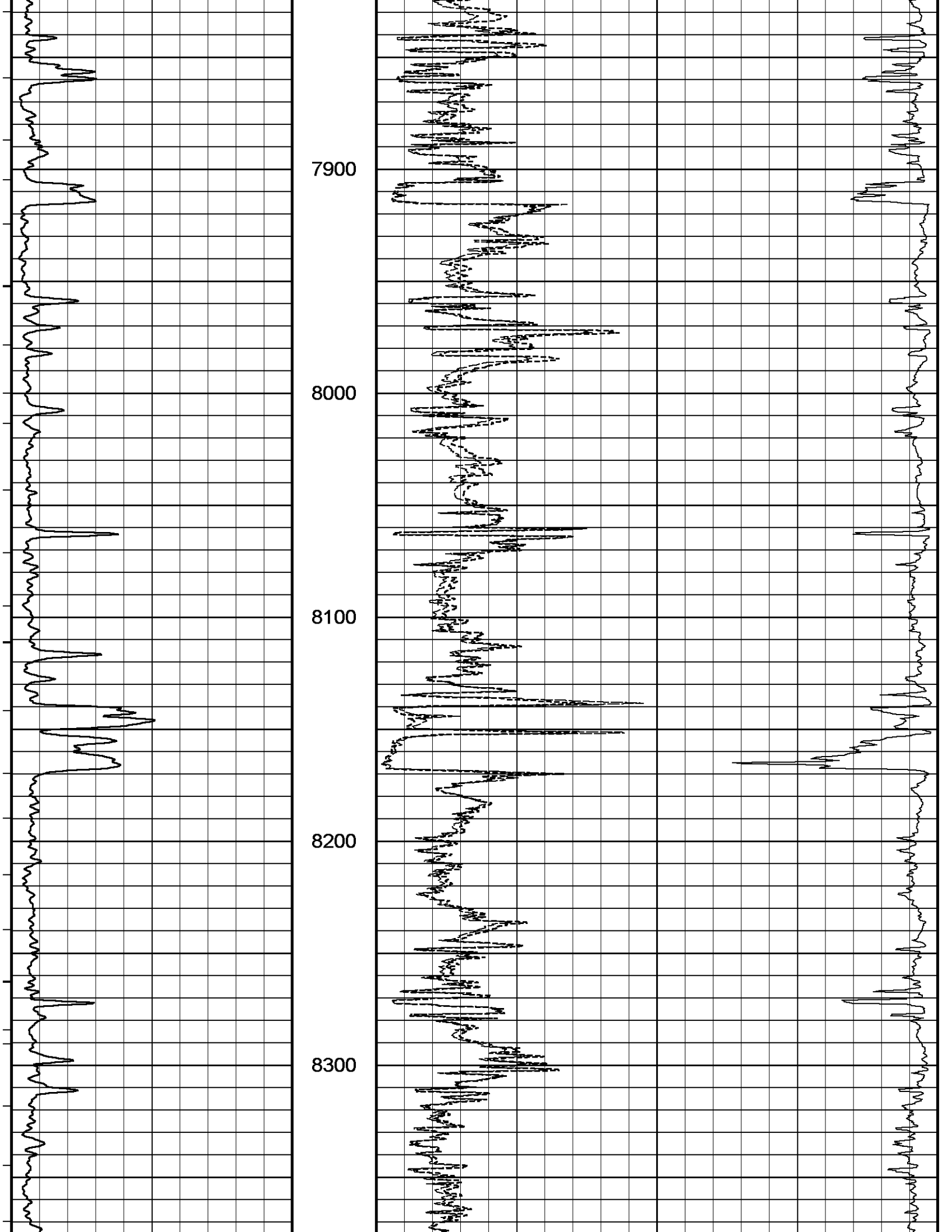


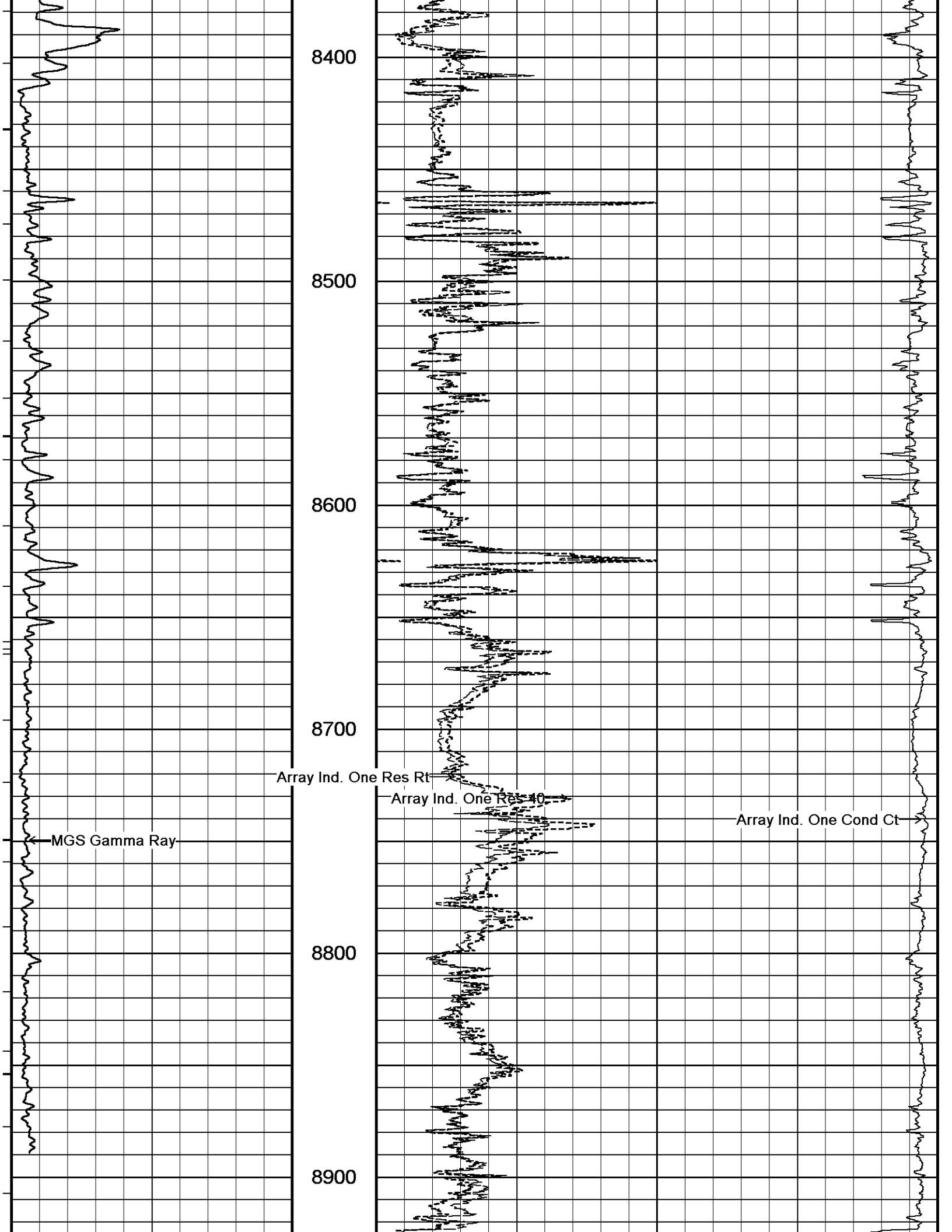




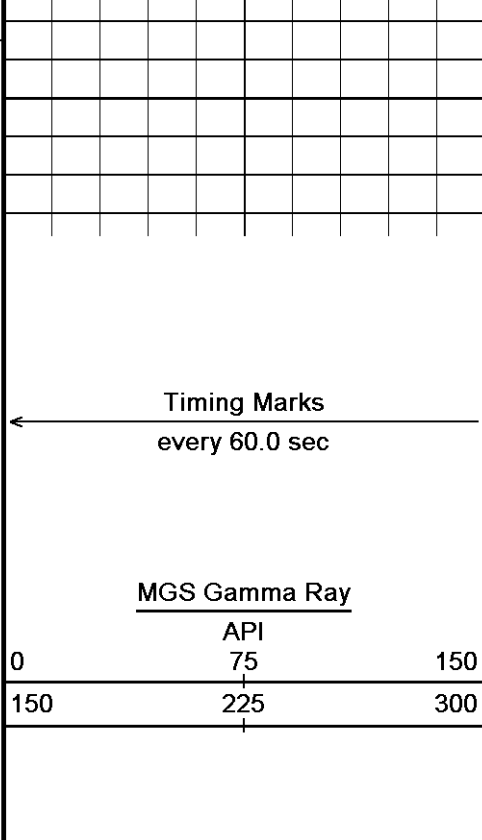




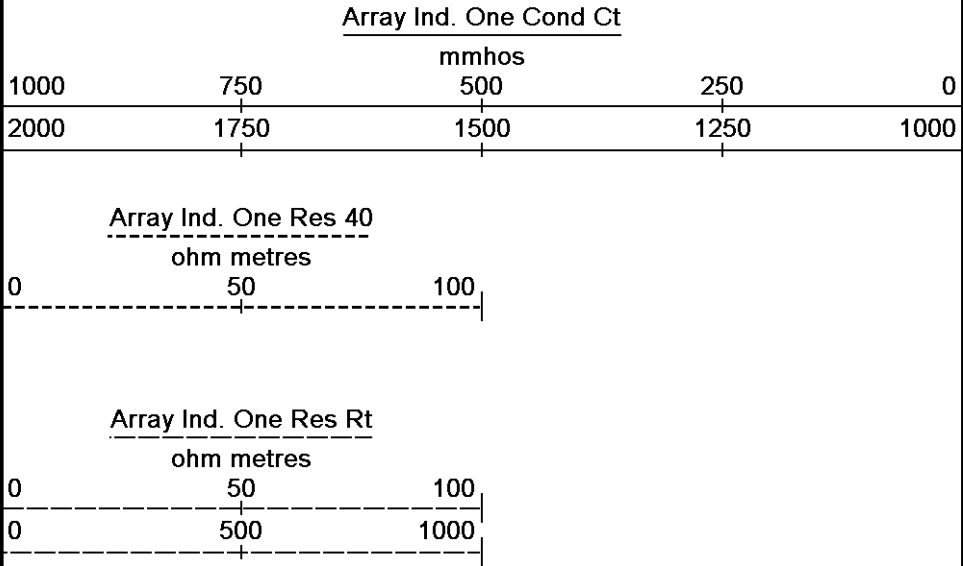








8980  
Depth  
In  
Feet



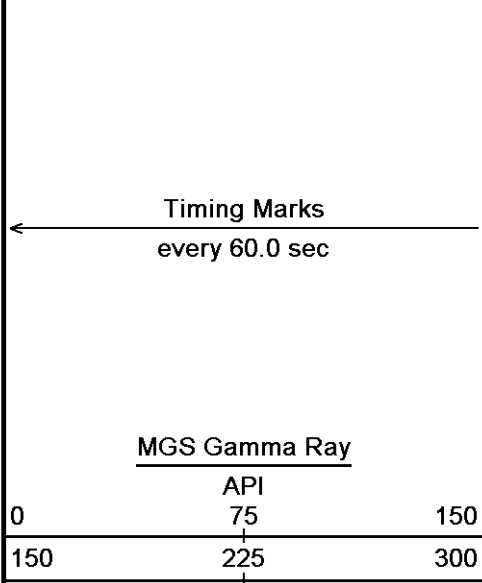
Replay  
Scale  
1:600

Depth Based Data - Maximum Sampling Increment 10.0cm  
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta  
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779  
 Plotted on 12-MAY-2013 14:57  
 Recorded on 12-MAY-2013 14:25

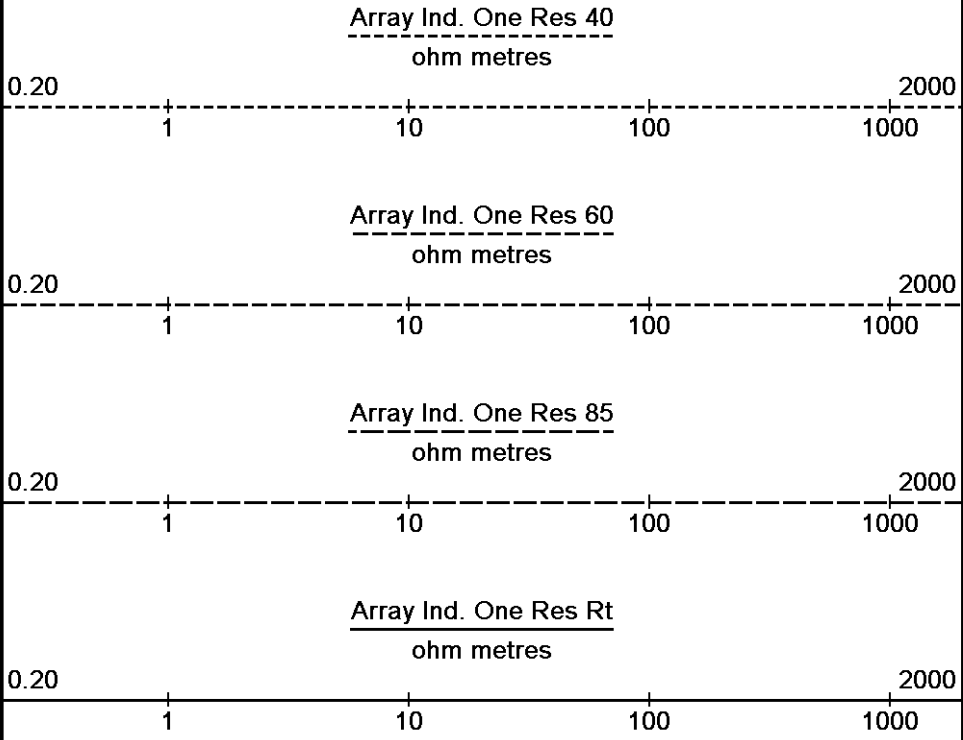
↑ DSC ↑

↓ DSC ↓

Depth Based Data - Maximum Sampling Increment 10.0cm  
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta  
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779  
 Plotted on 12-MAY-2013 14:57  
 Recorded on 12-MAY-2013 14:25

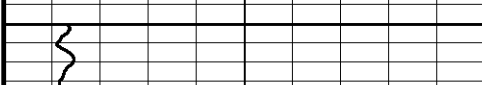


Depth  
In  
Feet

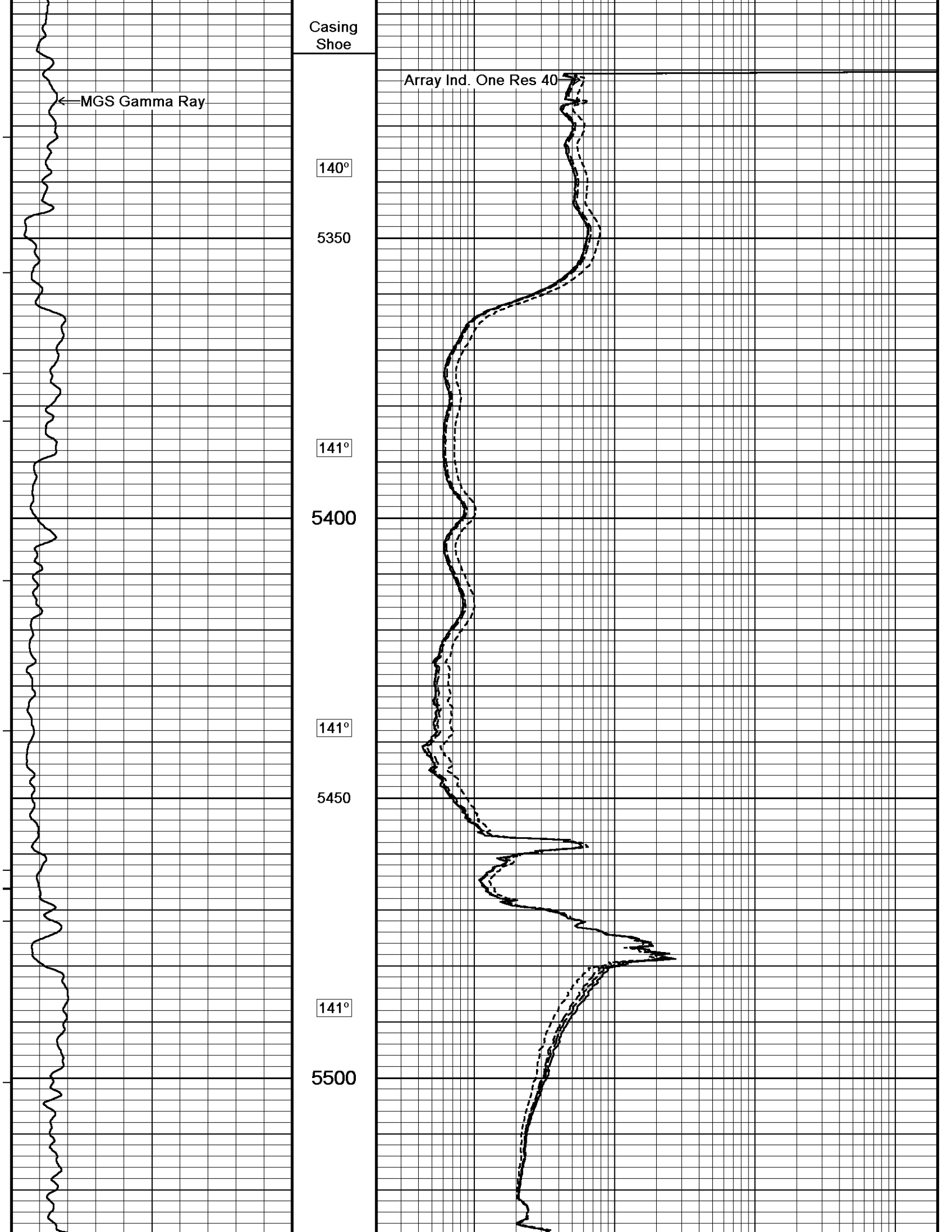


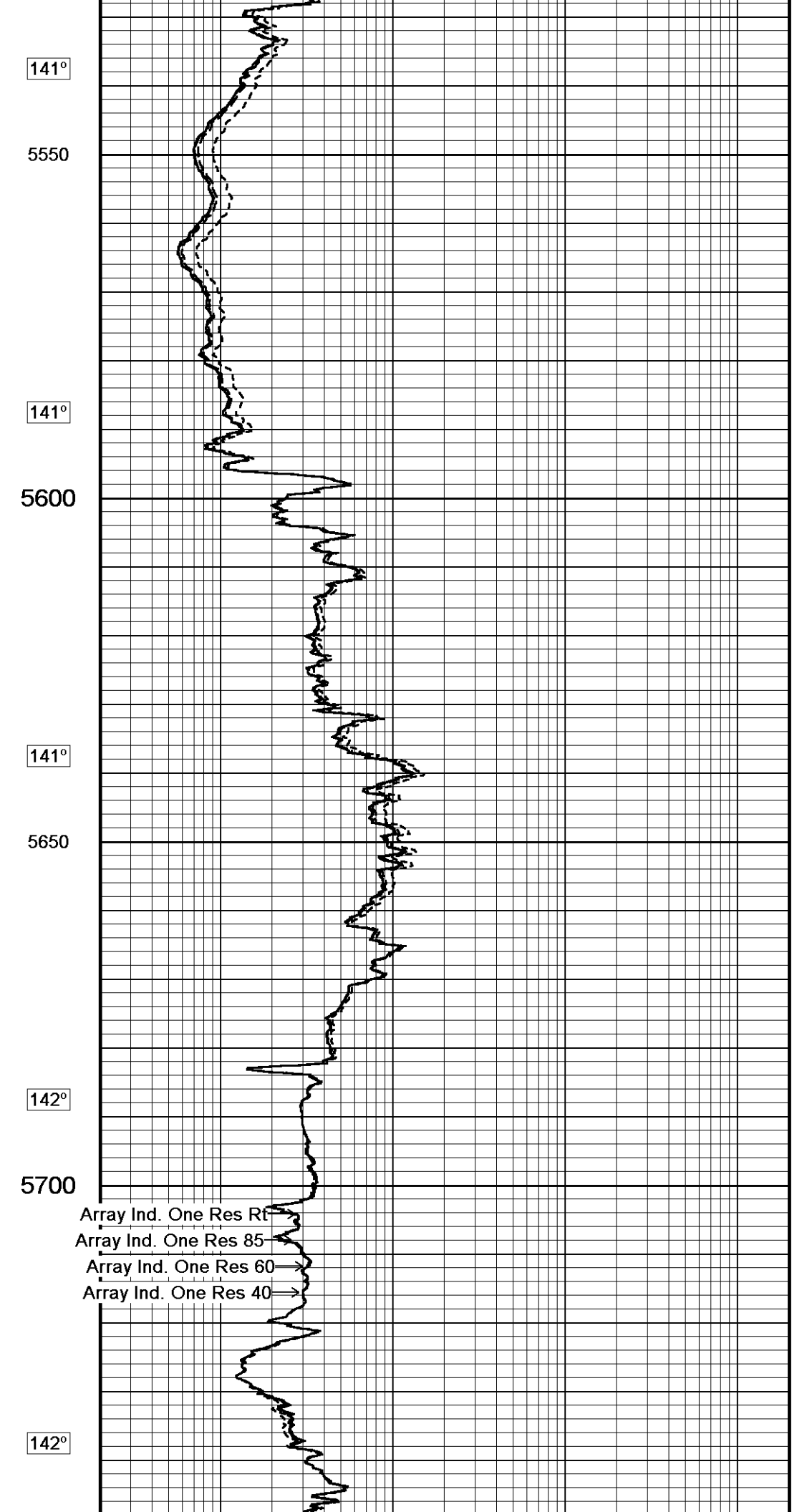
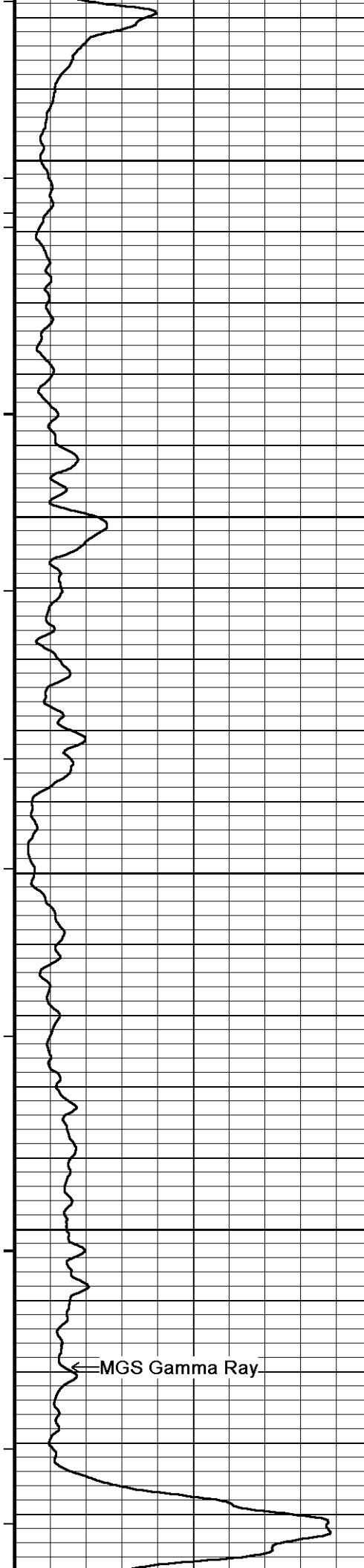
Borehole  
Temp in  
deg F

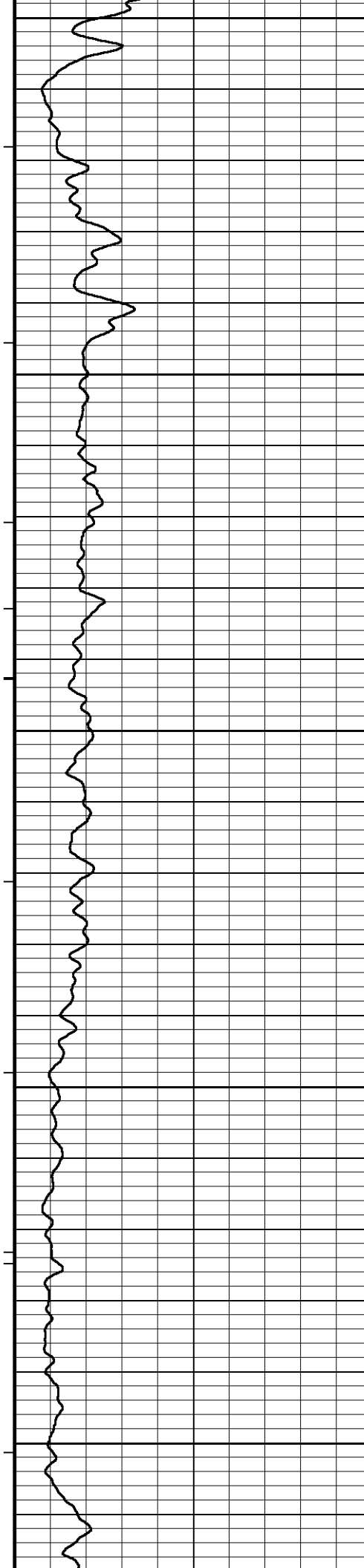
Replay  
Scale  
1:240



5300







5750

143°

5800

143°

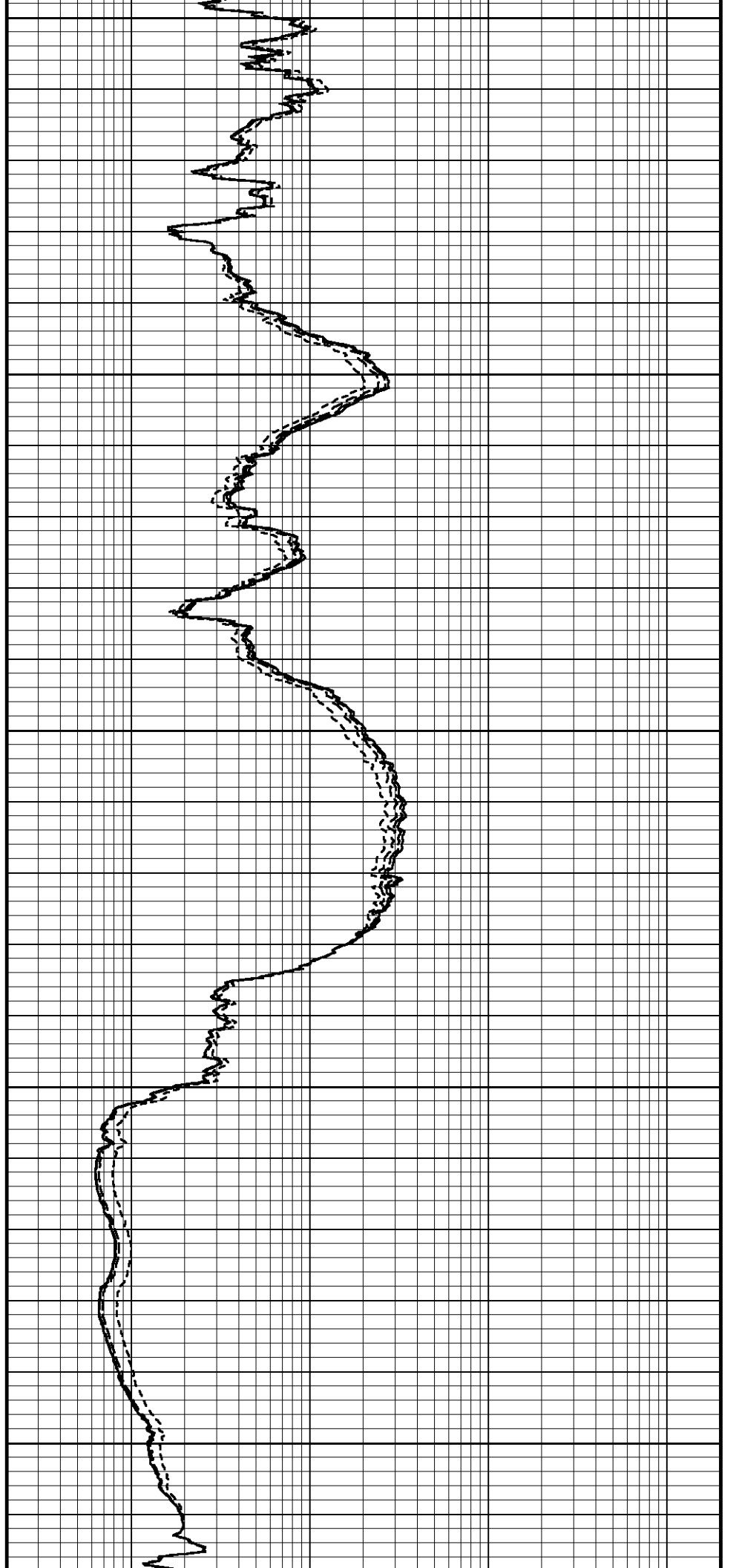
5850

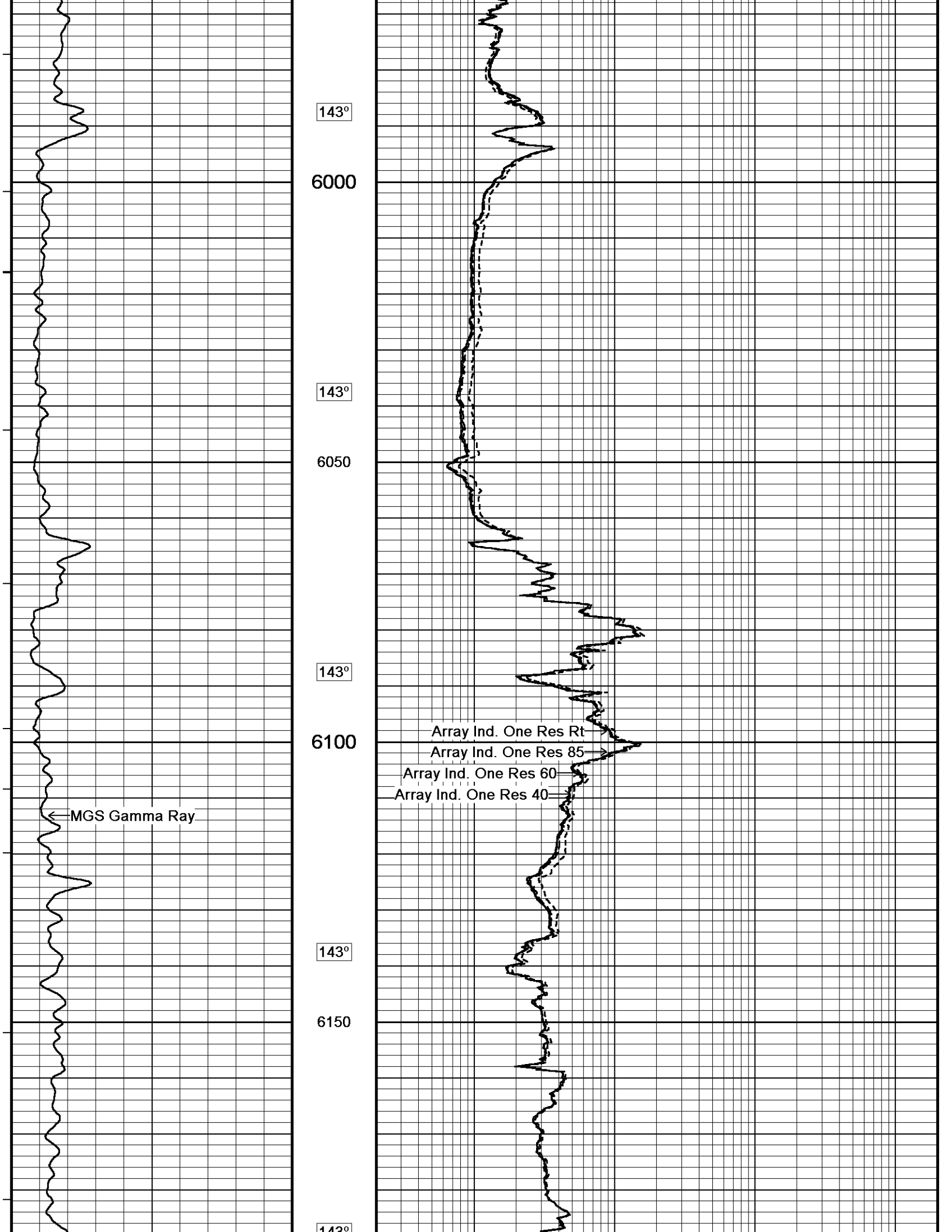
143°

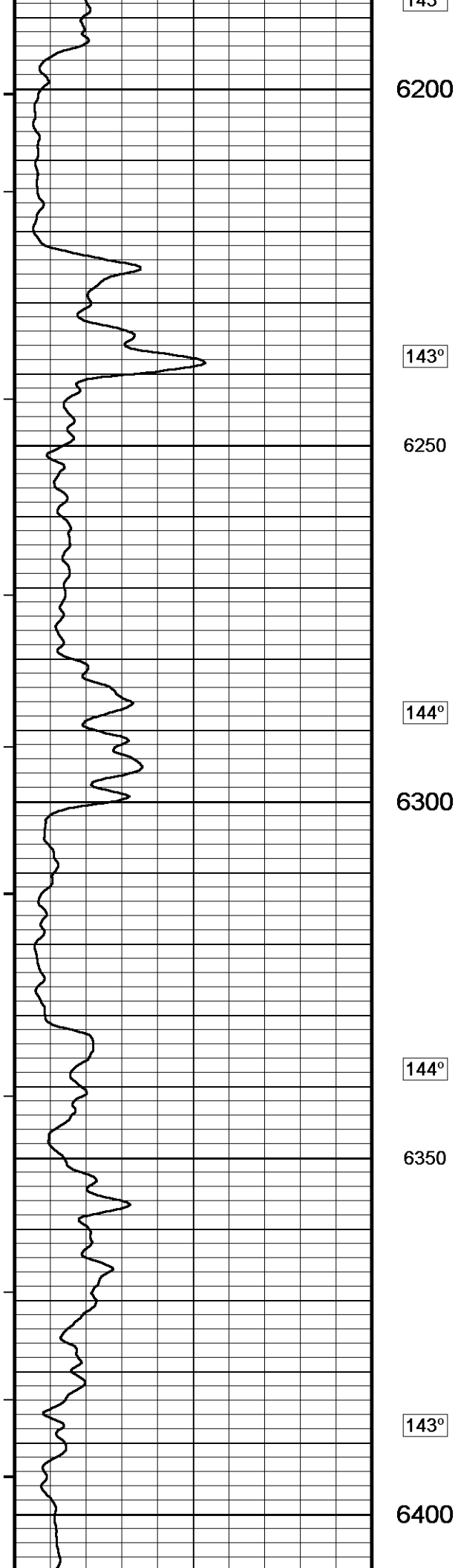
5900

143°

5950







145

6200

143°

6250

144°

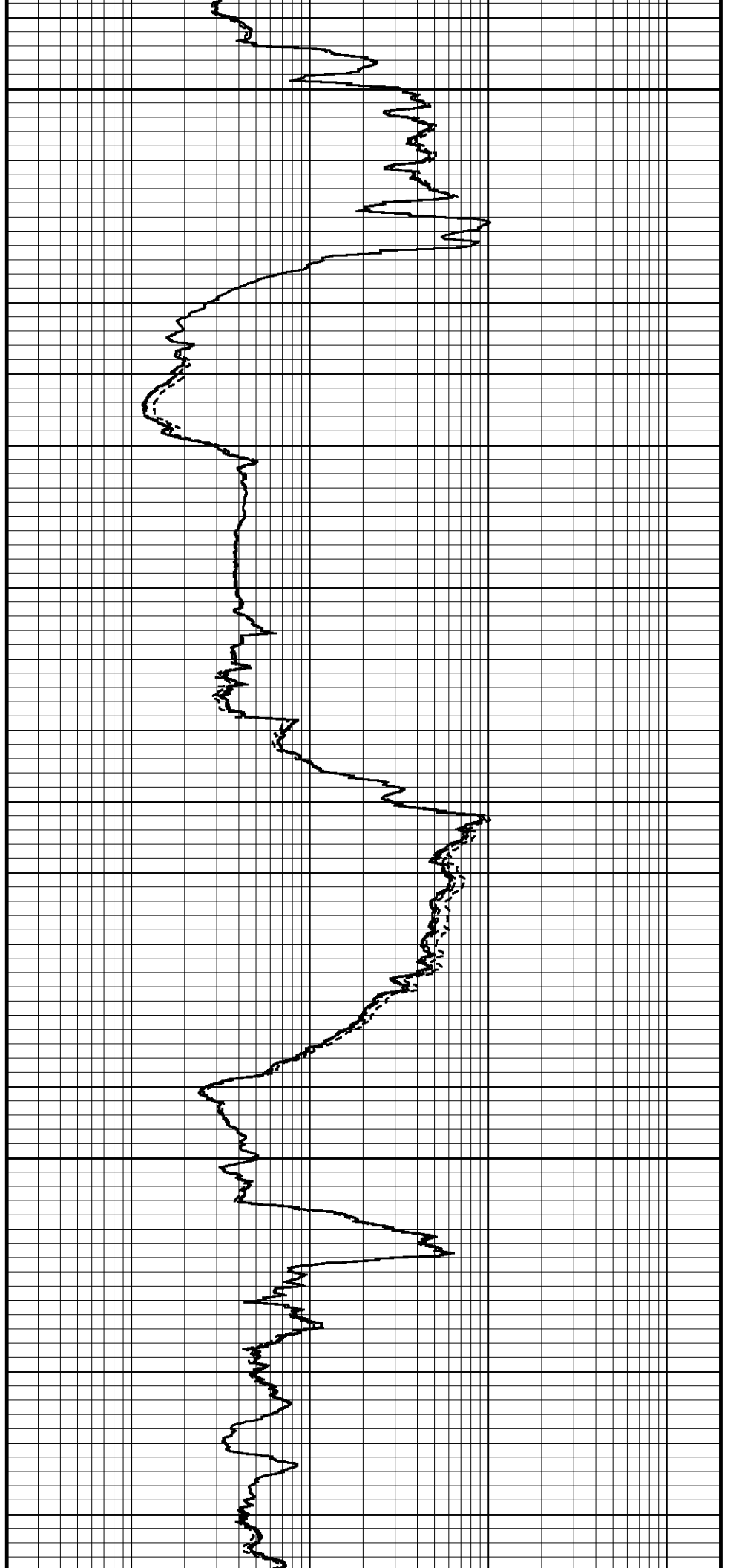
6300

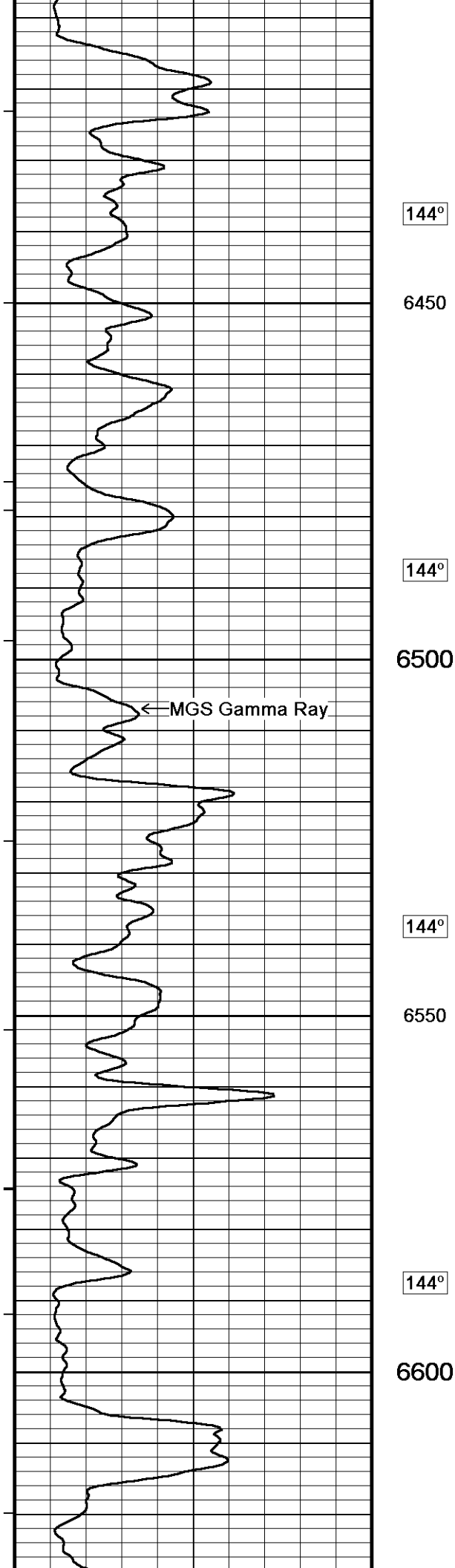
144°

6350

143°

6400





144°

6450

144°

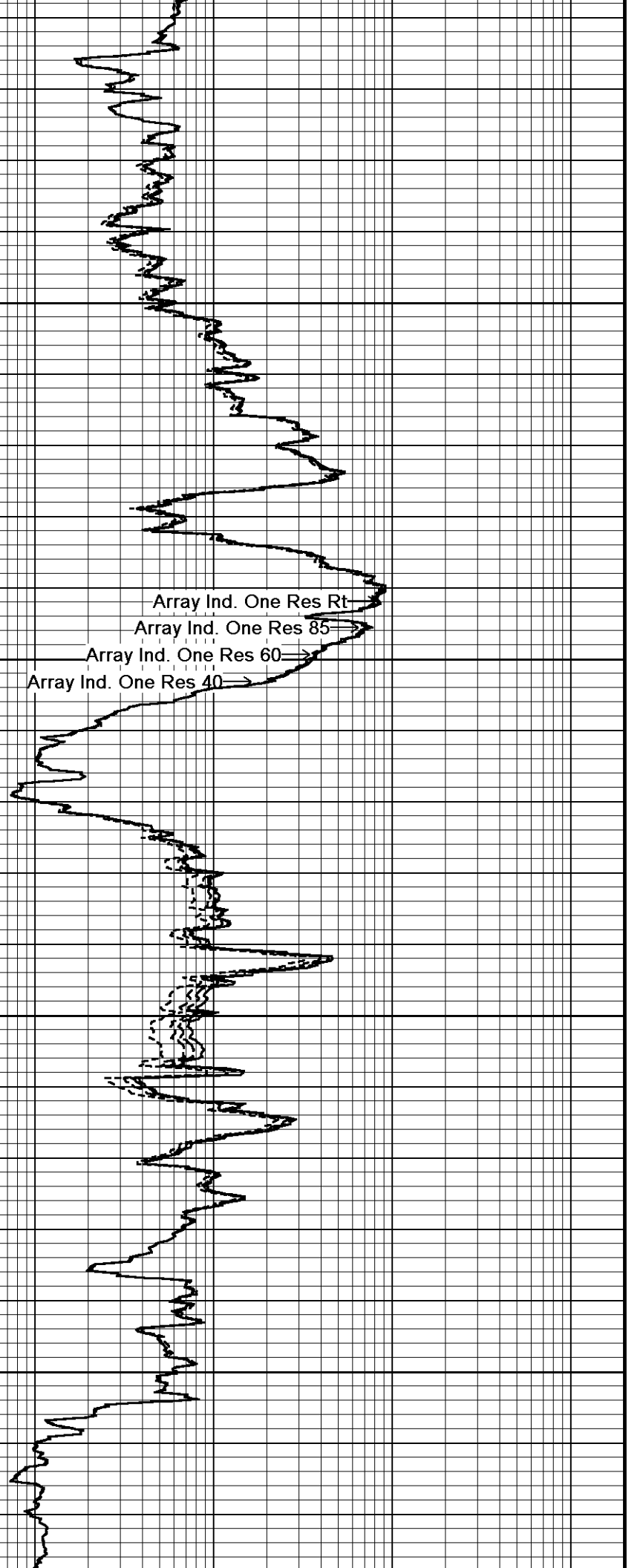
6500

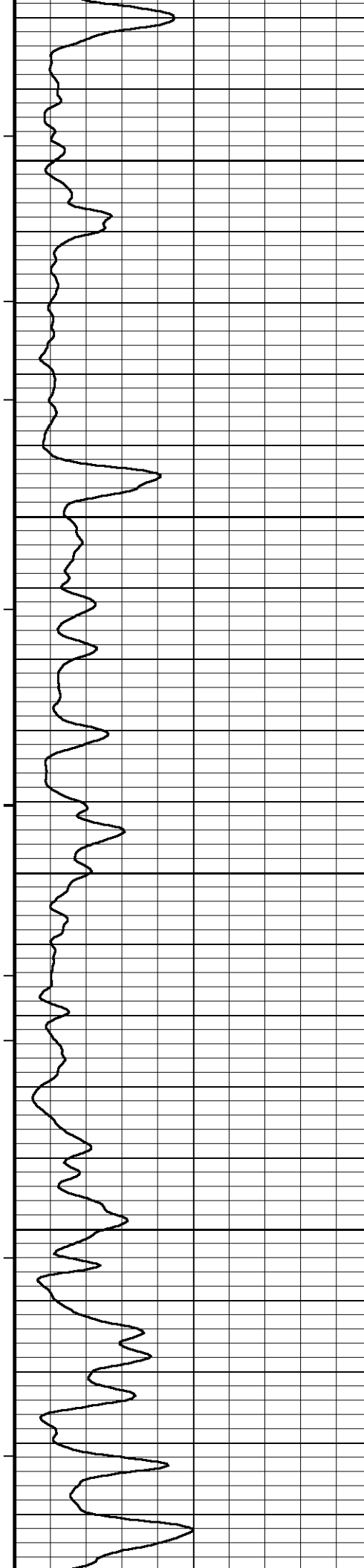
144°

6550

144°

6600





144°

6650

144°

6700

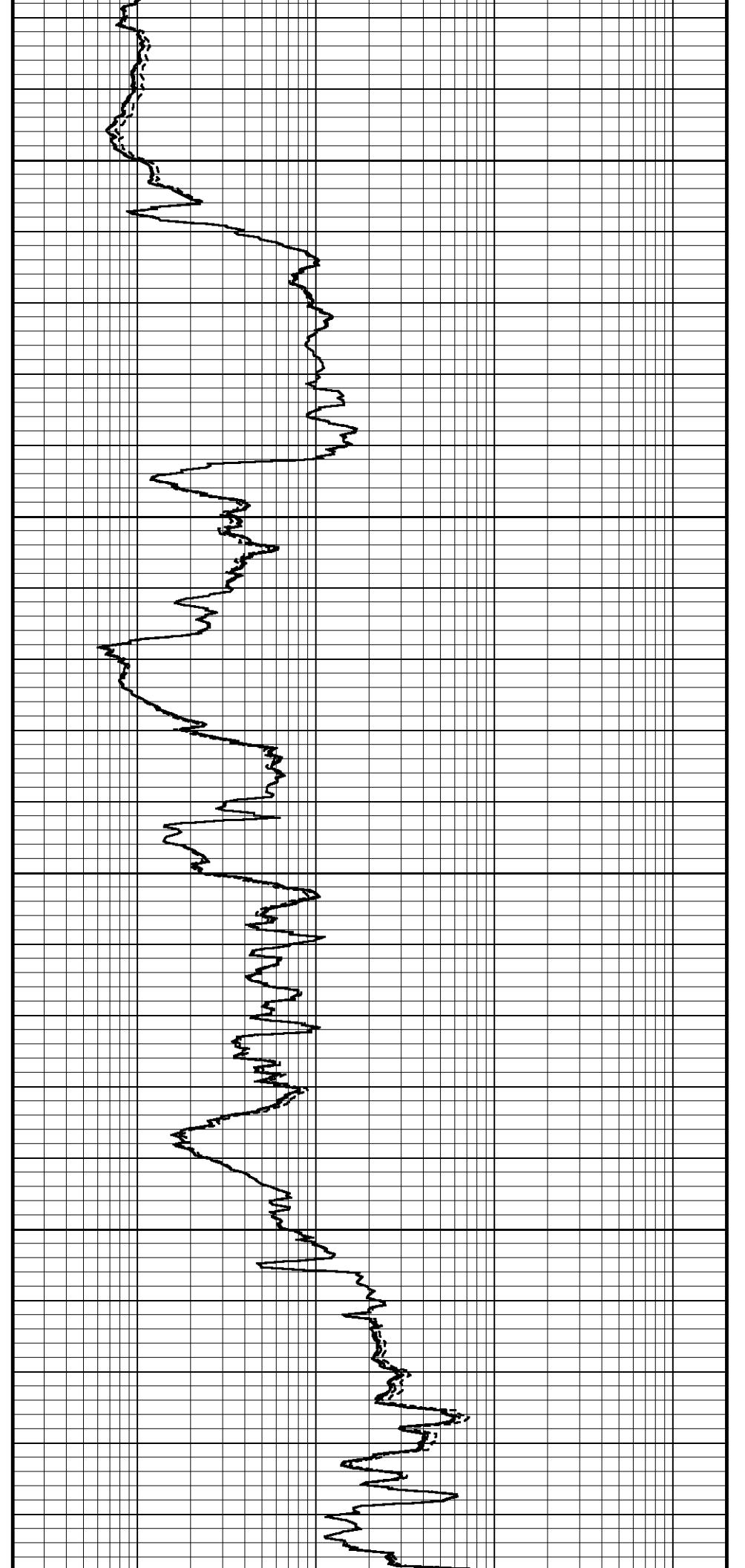
144°

6750

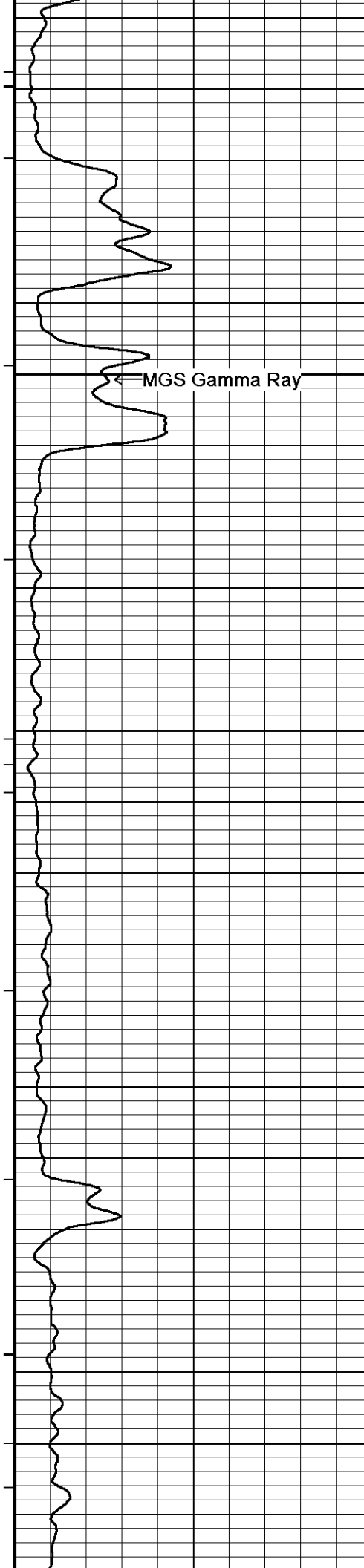
144°

6800

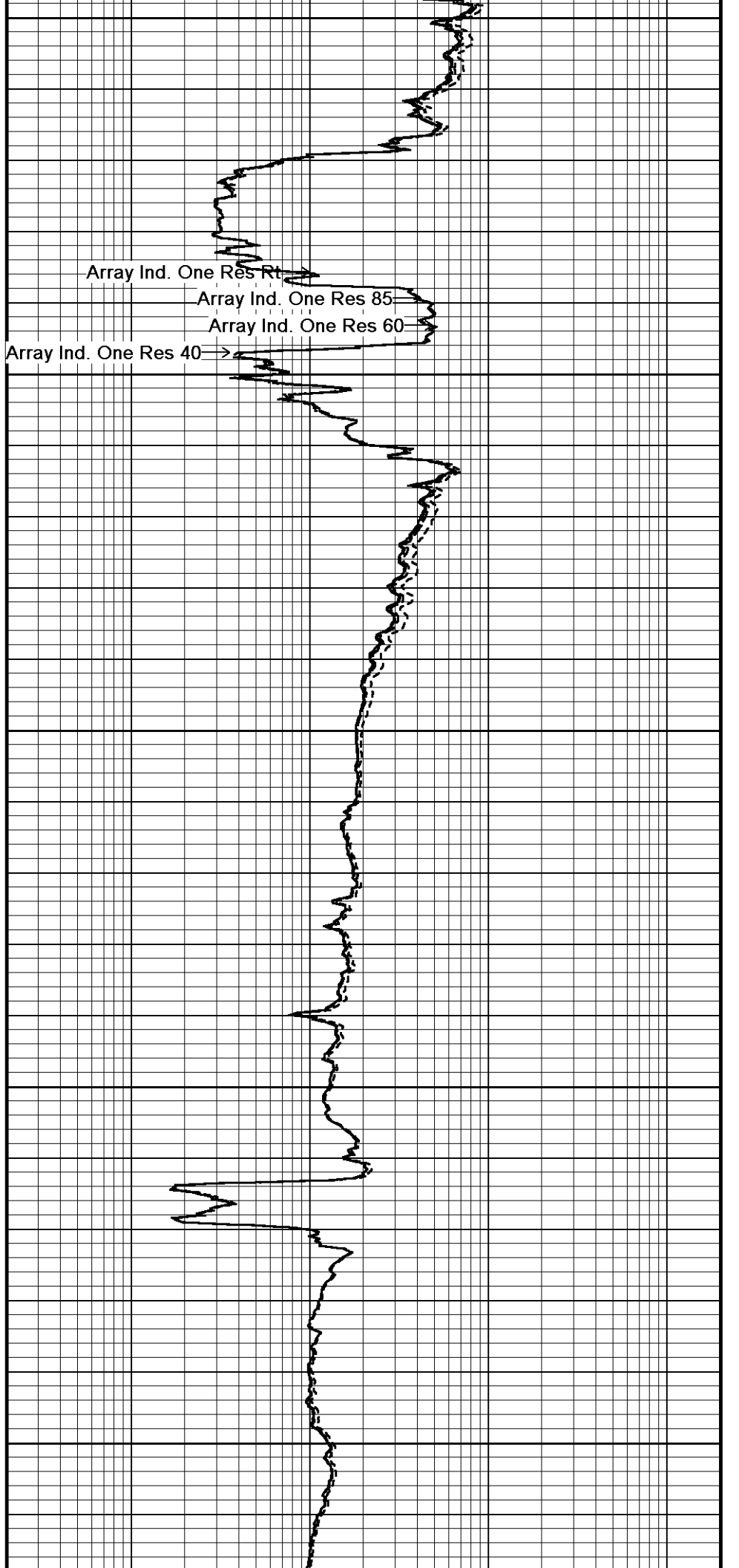
144°

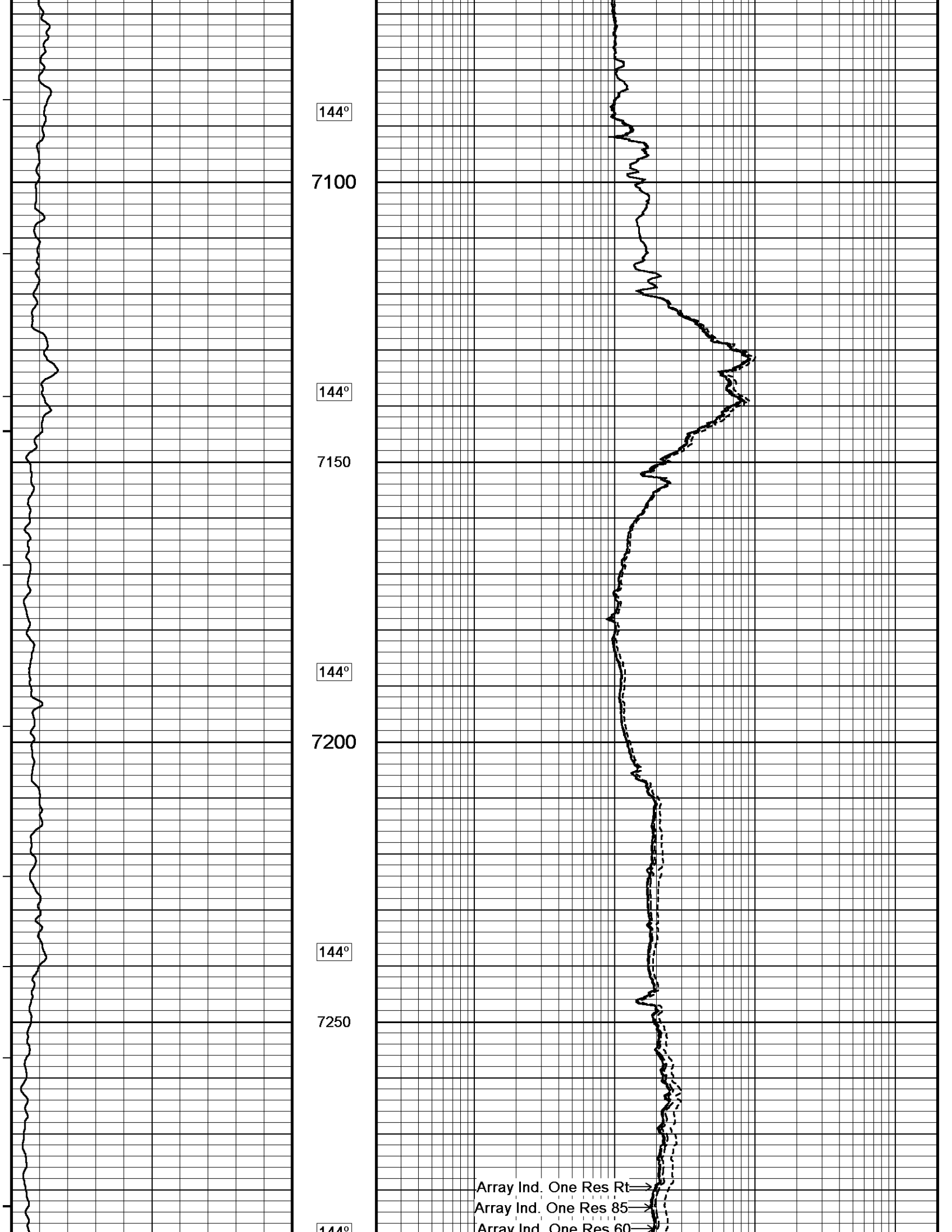


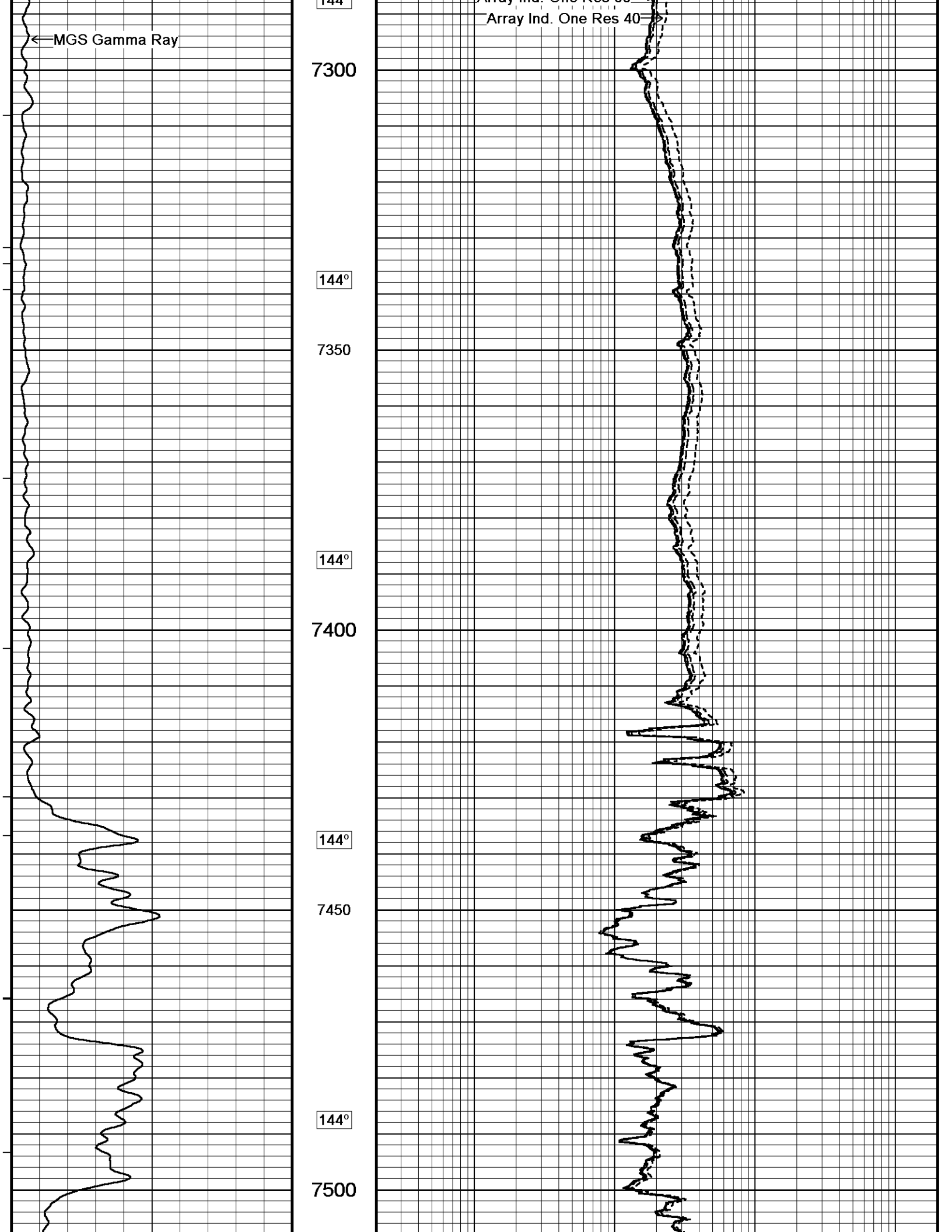




6850  
144°  
6900  
144°  
6950  
144°  
7000  
144°  
7050







← MGS Gamma Ray

Array Ind. One Res 40

7300

144°

7350

144°

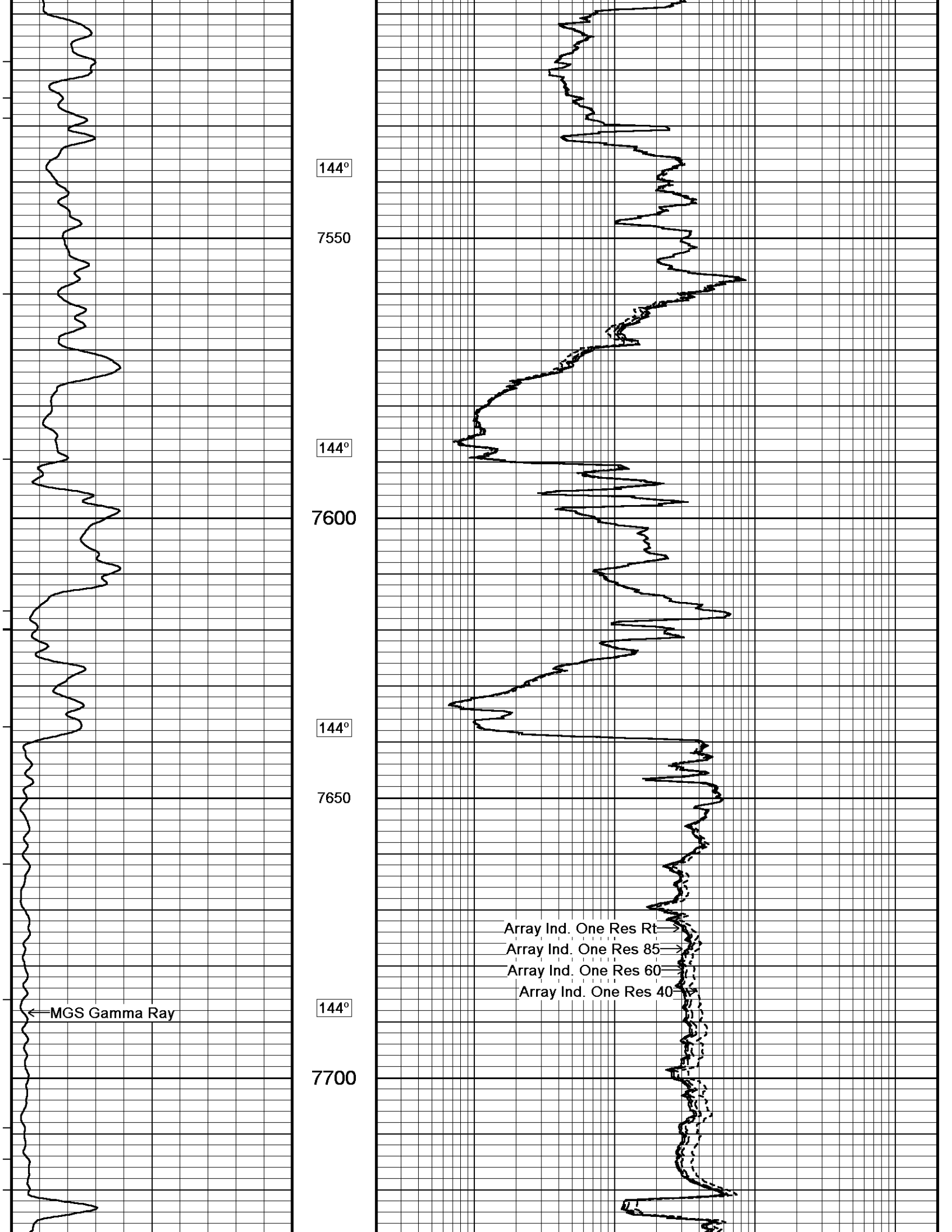
7400

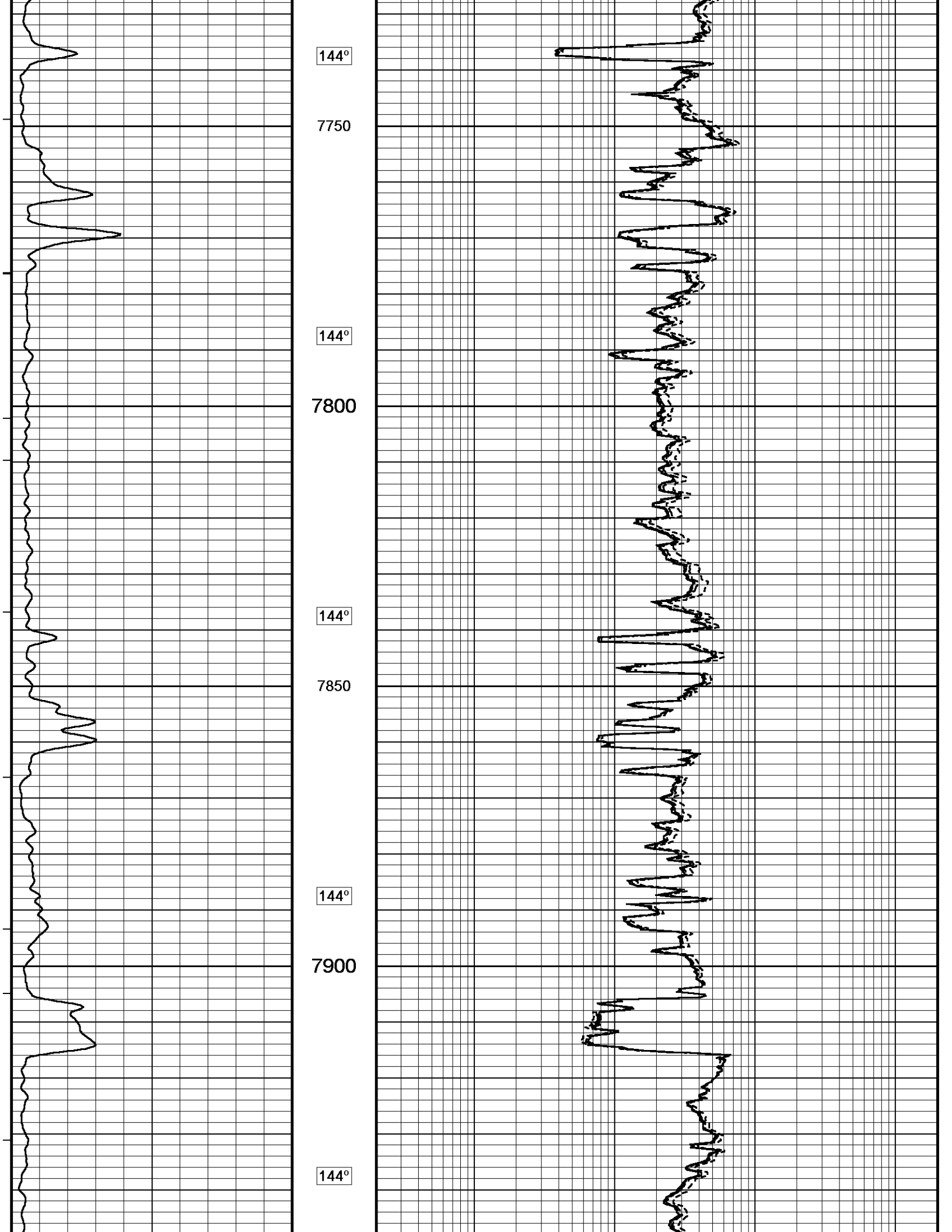
144°

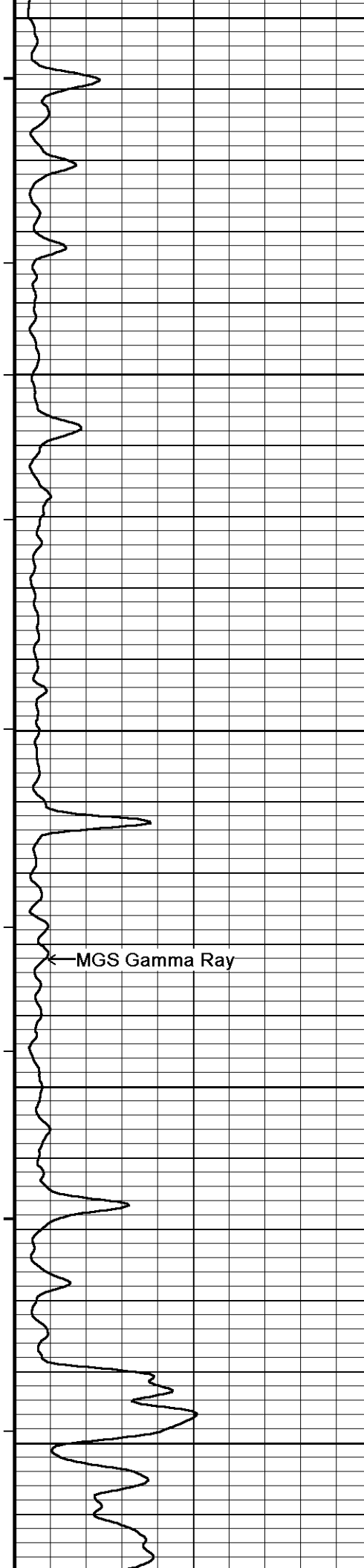
7450

144°

7500







7950

144°

8000

144°

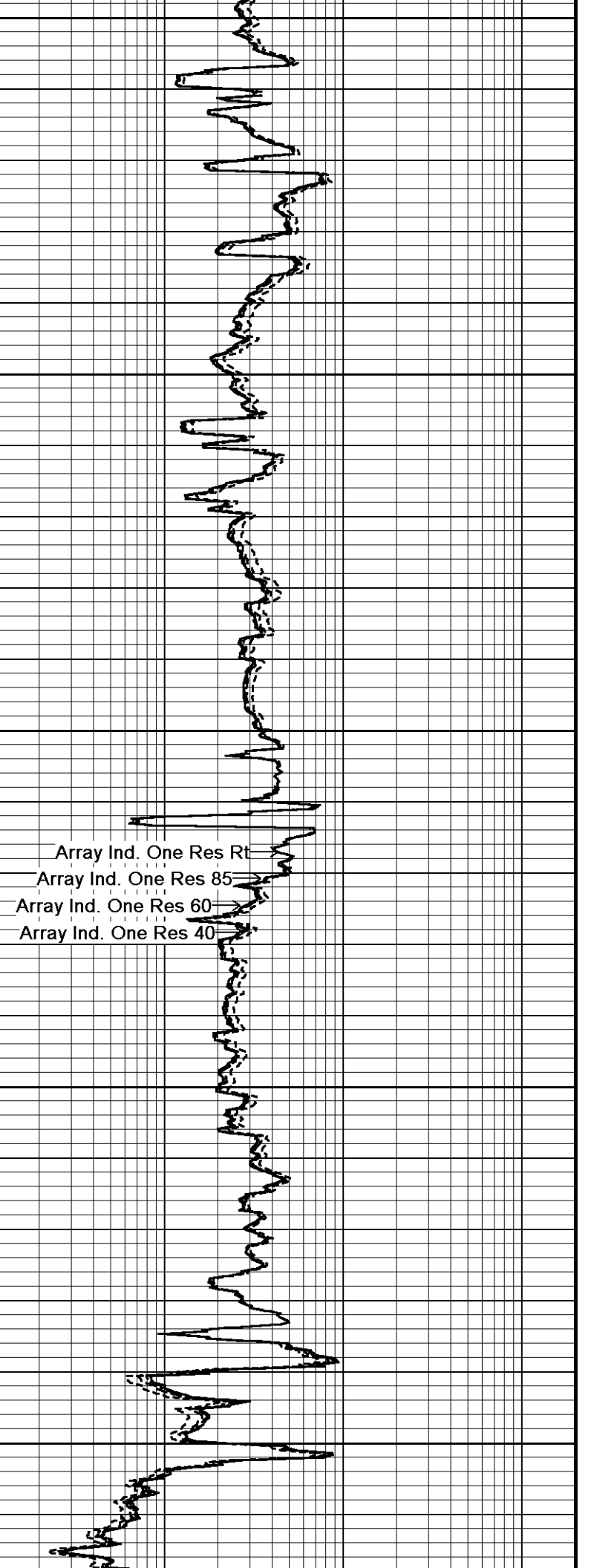
8050

144°

8100

144°

8150

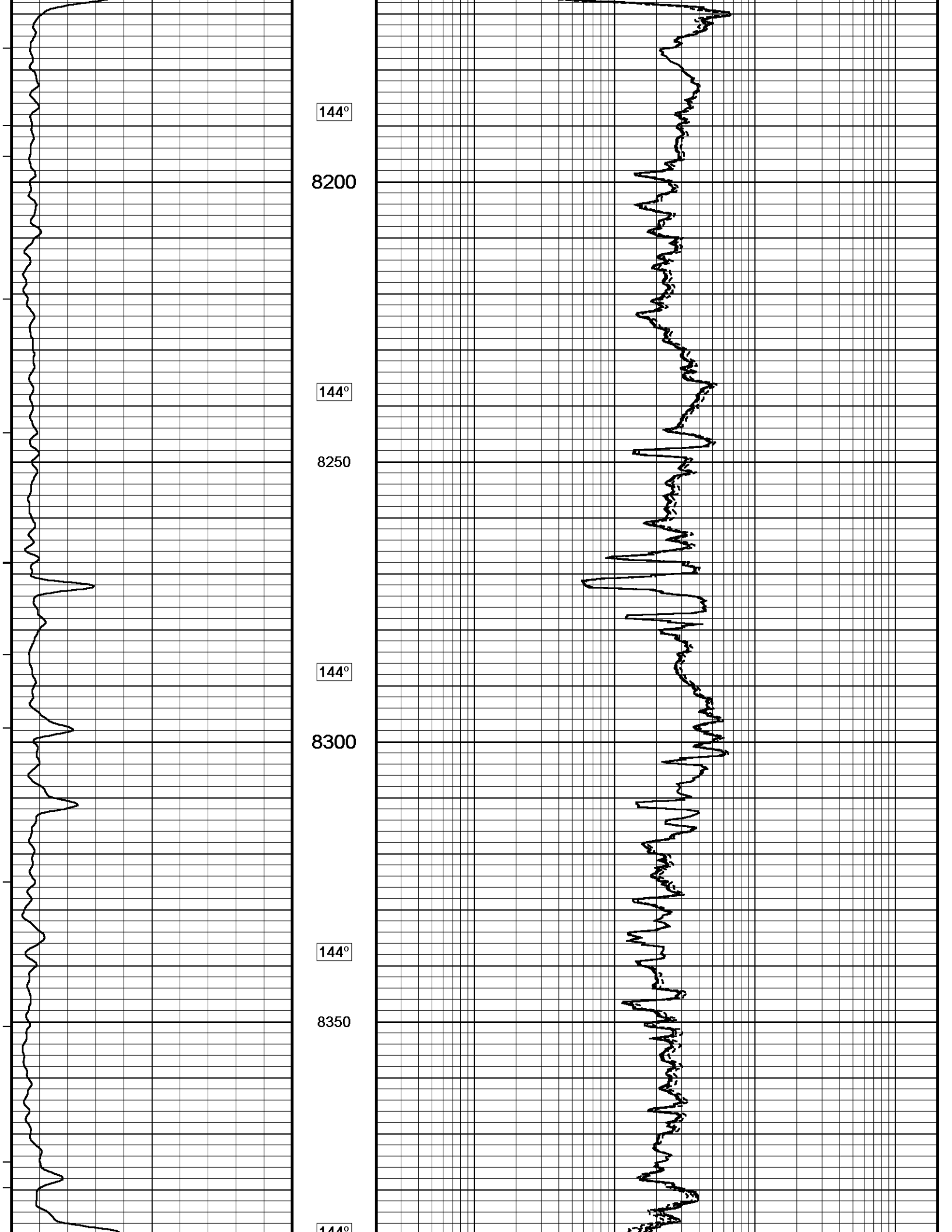


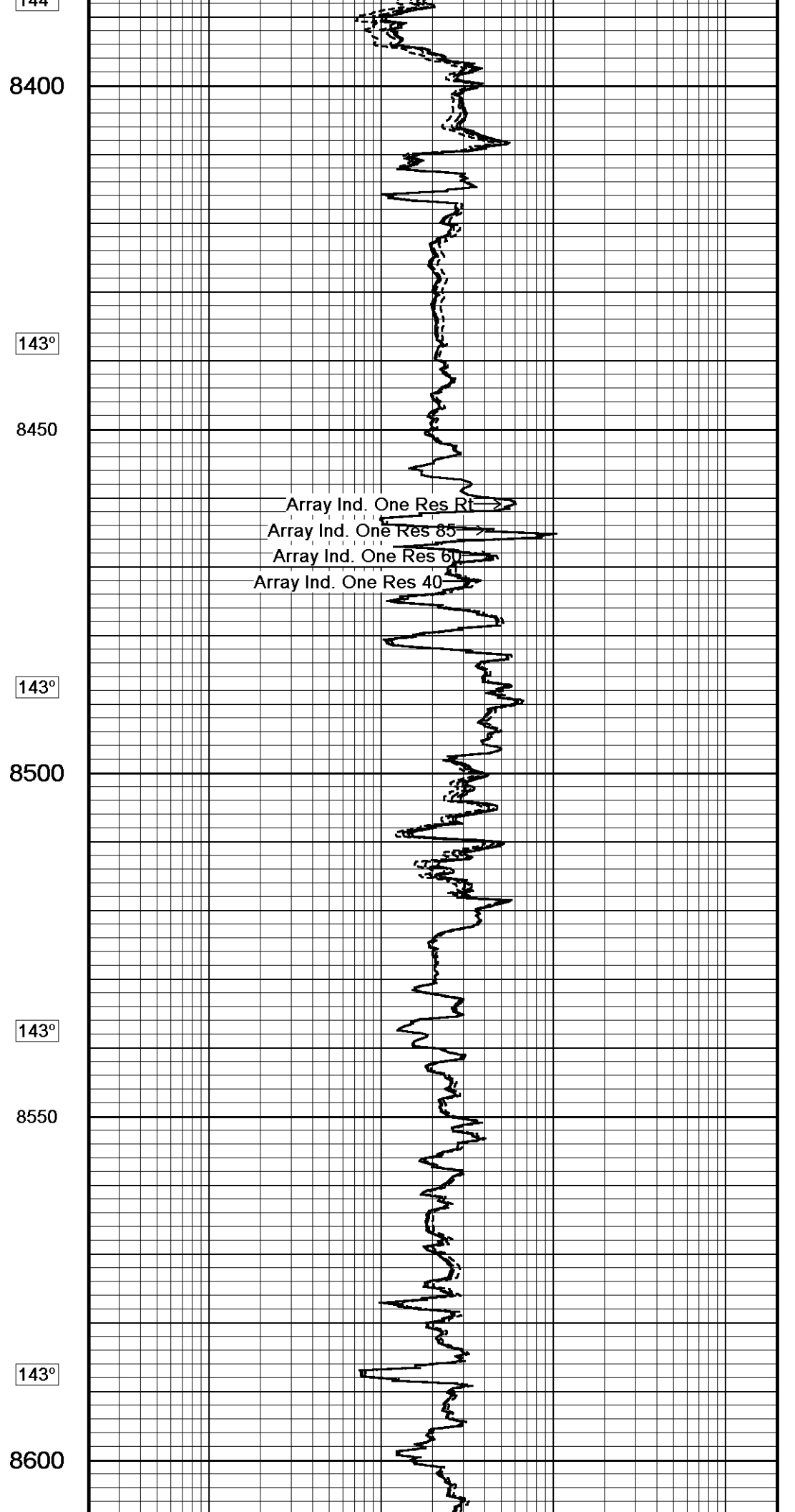
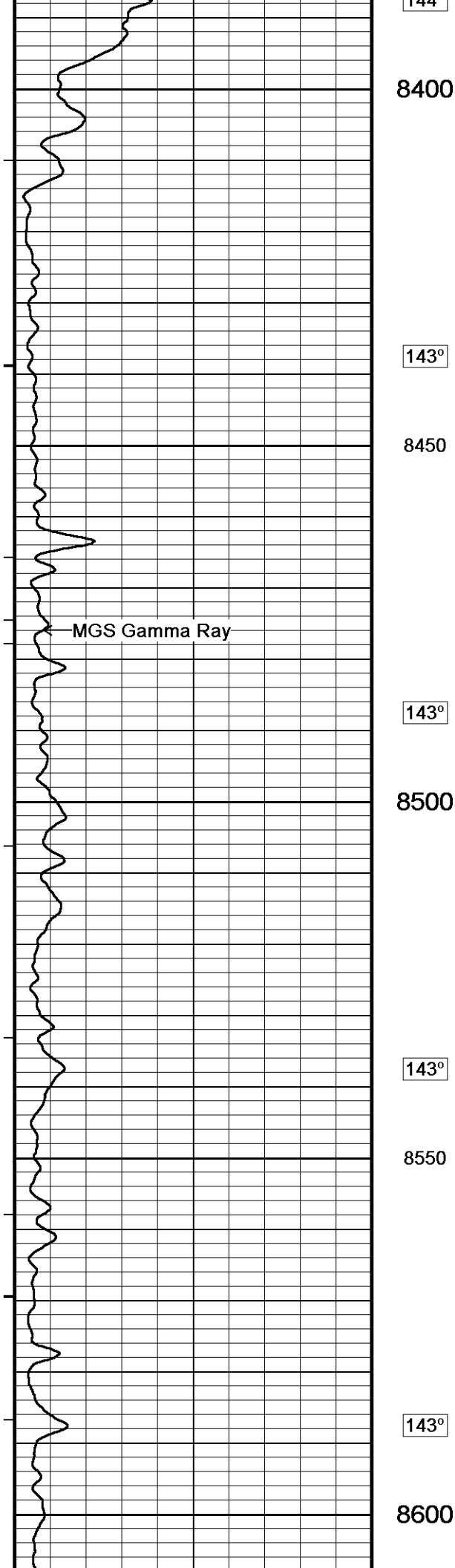
Array Ind. One Res Rt

Array Ind. One Res 85

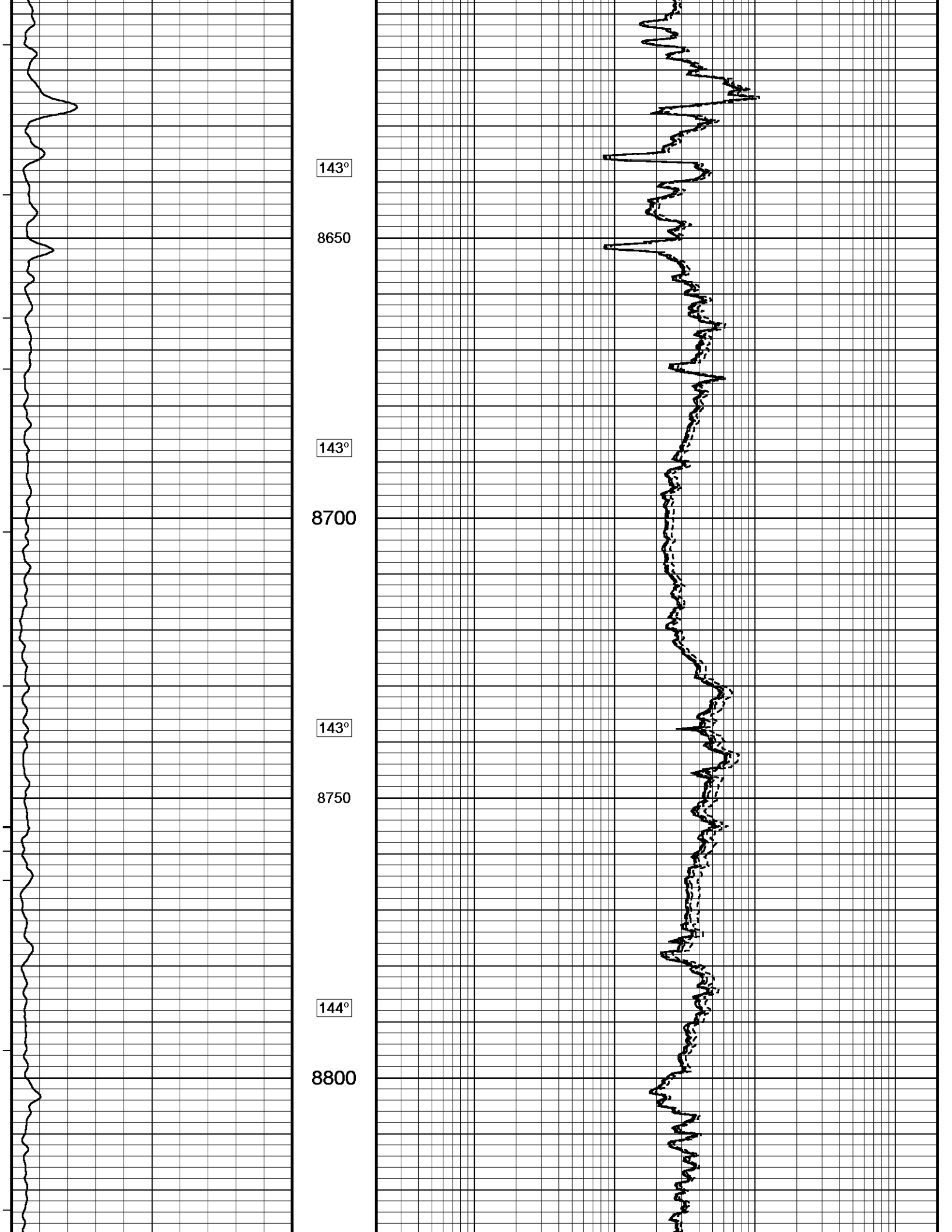
Array Ind. One Res 60

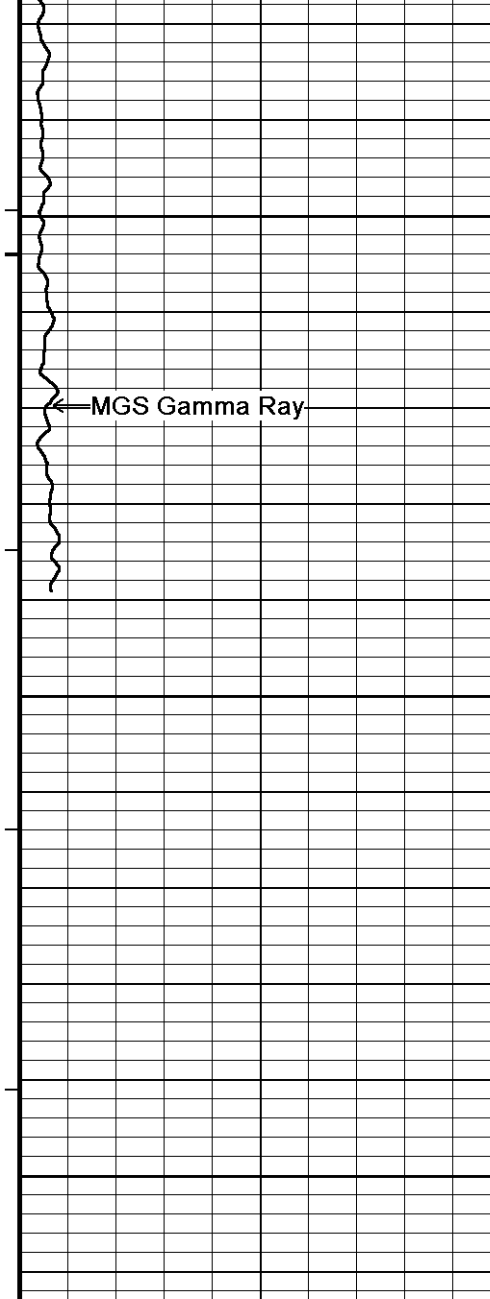
Array Ind. One Res 40











146°

8850

147°

8900

8950

8960

Depth  
In  
Feet

Borehole  
Temp in  
deg F

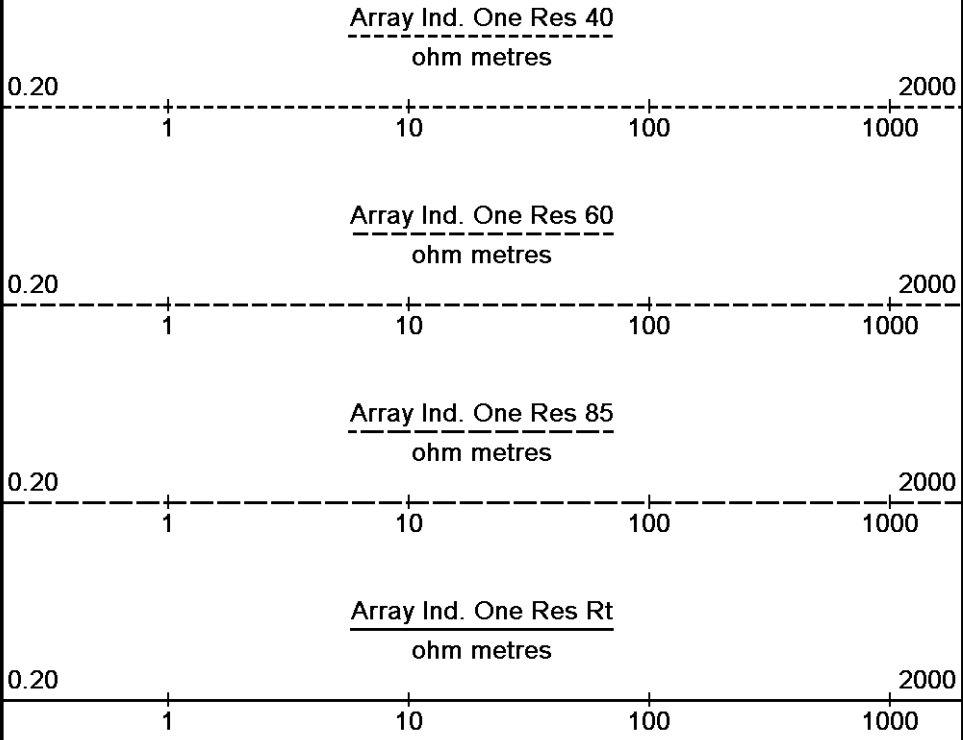
Replay  
Scale  
1:240

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

Timing Marks  
every 60.0 sec

MGS Gamma Ray

0	API	150
	75	
150	225	300





DSC



## BEFORE SURVEY CALIBRATION

C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta

## General Constants All 000

Last Edited on 12-MAY-2013,08:16

## General Parameters

Mud Resistivity	3.500	ohm-metres
Mud Resistivity Temperature	73.800	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

## Hole/Annular Volume and Differential Caliper Parameters

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

## Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

## Down-hole Tension Calibration SMS 0

Field Calibration on 05-SEP-2012,13:01

Reading No	Measured	Calibrated (lbs)
1	15152.07	0.00
2	18386.74	2000.00

## Strain Gauge Constants MMS-E.B 166

Last Edited on 30-JAN-2013,09:56

Atmospheric Pressure	14.70	psi
Serial Number	262005	
Calibration Date	04-Jan-2011	
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	0.096	0.097	0.113	0.113	0.129	0.129	0.138	0.139
3000.0	5.275	5.280	5.290	5.294	5.303	5.306	5.307	5.310
6000.0	10.464	10.472	10.478	10.485	10.488	10.494	10.487	10.494
9000.0	15.664	15.672	15.676	15.684	15.683	15.691	15.679	15.687
12000.0	20.876	20.882	20.888	20.893	20.892	20.898	20.885	20.890
15000.0	26.101		26.111		26.114		26.103	

## Gamma Calibration MGS-C.J 133

Field Calibration on 07-MAY-2013 09:32

	Measured	Calibrated (API)
Background	39	27
Calibrator (Gross)	1866	1288
Calibrator (Net)	1827	1261

## Gamma Constants MGS-C.J 133

Last Edited on 12-MAY-2013,14:33

Gamma Calibrator Number	46	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

## SP Calibration MGS-C.J 133

Field Calibration on 07-FEB-2013,10:52

Measured	Calibrated (mV)
----------	-----------------

Reference 1	-100.0	-100.0
Reference 2	100.0	100.0

High Resolution Temperature Calibration MGS-C.J 133		Field Calibration on 09-FEB-2013,12:46
	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	0.00	0.00

High Resolution Temperature Constants MGS-C.J 133		Last Edited on 20-MAR-2013,13:25
Pre-filter Length	11	

Neutron Calibration MDN-B.J 423		Base Calibration on 04-APR-2013 11:20	Field Check on 10-MAY-2013 08:26
Base Calibration			
	Measured		Calibrated (cps)
	Near	Far	Near Far
	2823	85	3714 110
Ratio	33.061		33.764
Field Calibrator at Base			
			Calibrated (cps)
			2263 3348
Ratio			0.676
Field Check			
			Calibrated (cps)
			1325 1977
Ratio			

Neutron Constants MDN-B.J 423		Last Edited on 10-MAY-2013,08:22	
Neutron Source Id	000		
Neutron Jig Number	000		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	0.99	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	None		
Temperature	N/A	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		

FE Calibration MFE-B.J 328		Base Calibration on 30-APR-2013 09:19	Field Check on
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.0	126.8	
Base Check		279.3	
Field Check			

FE Constants MFE-B.J 328		Last Edited on 07-MAY-2013,09:10	
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	

High Resolution Temperature Calibration MAI-B.J 392		Field Calibration on 23-APR-2013,20:26
---	--	--

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

High Resolution Temperature Constants MAI-B.J 392

Last Edited on 23-APR-2013,20:26

Pre-filter Length 11

Induction Calibration MAI-B.J 392

Base Calibration on 23-APR-2013,20:27  
Field Check on 10-MAY-2013 08:36

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	15.4	450.7	9.3	966.2
2	5.4	363.0	7.6	821.4
3	3.4	248.8	5.2	566.0
4	2.1	125.2	2.6	279.2

Array Temperature 24.2 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			14.7	4025.1
2			31.4	3711.3
3			28.3	3181.0
4			19.4	2210.6
Deep			16.2	2093.8
Medium			41.7	4157.1
Shallow			48.6	5467.4

Array Temperature 60.6 Deg F

Induction Constants MAI-B.J 392

Last Edited on 12-MAY-2013,14:32

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	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	Constant Value	
Temp. for Rm Corr.	N/A	
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	

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	56599	28433	59494	30754
Reference 2	23789	2739	26390	2598

Field Check at Base

1276.2 1466.6

Field Check

1268.9 1467.7

PE Calibration

Base Calibration

	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	245	1147		
Reference 1	25303	56390	0.454	0.367
Reference 2	7527	23646	0.324	0.270

Field Check at Base

244.7 1146.5

Field Check

243.6 1137.8

Density Constants MPD-D.A 471

Last Edited on 12-MAY-2013,14:33

Density Source Id	243	
Nylon Calibrator Number	633	
Aluminium Calibrator Number	633	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	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	

Caliper Calibration MPD-D.A 471

Base Calibration on 04-FEB-2013 23:20  
Field Calibration on 10-MAY-2013 08:32

Base Calibration

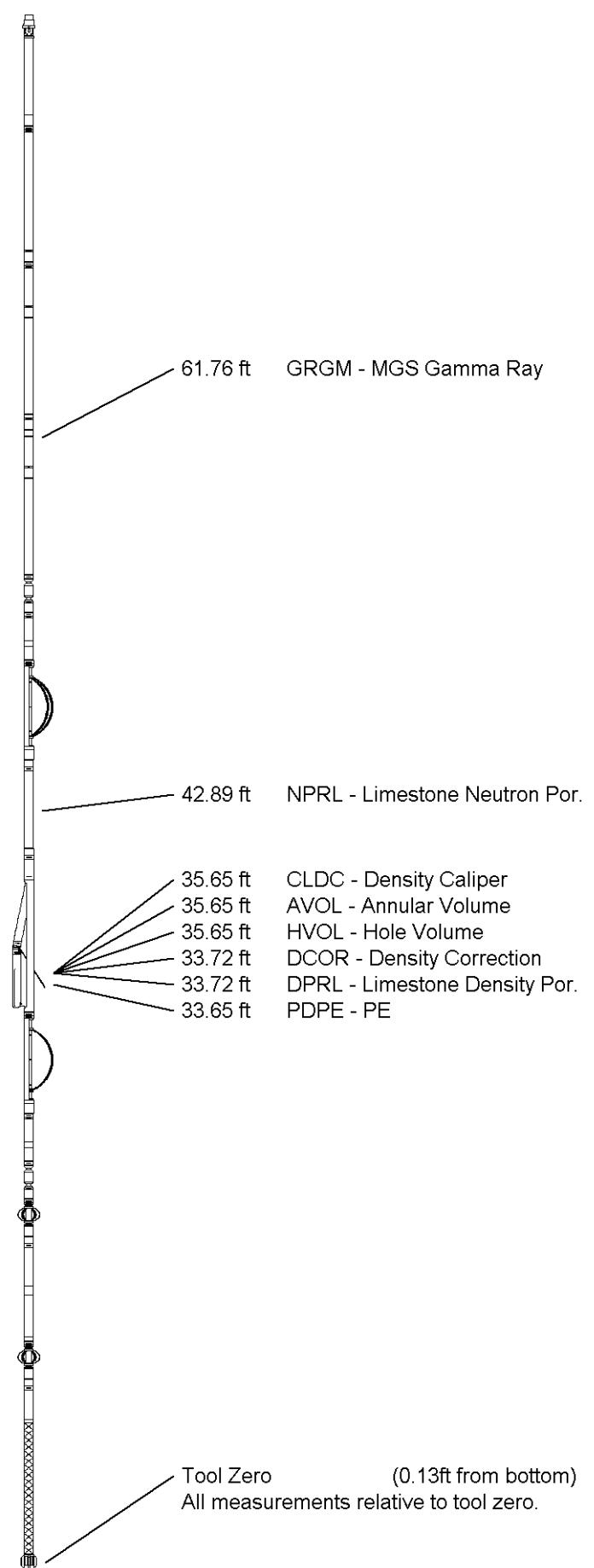
Reading No	Measured	Calibrator Size (in)
1	19168	3.99
2	28887	5.97
3	38925	7.99
4	48364	9.86
5	59511	11.93
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.71	5.97

DOWNHOLE EQUIPMENT

- Shuttle Running Tool 3.5" )  
SRT-A.A 40 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in
  
- MBS-F.A 200v Compact Battery Sub  
MBS-F.A 112 LG: 10.61 ft WT: 70.5 lb OD: 2.24 in
  
- Compact Memory Sub E.B  
MMS-E.B 166 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in
  
- Compact Tool Isolator sub.  
MTI-B.A 63 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in
  
- Compact Short Gamma  
MGS-C.J 133 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in
  
- Compact Collar Locator  
MCL-B.J 72 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in
  
- SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 458 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in
  
- SHA-J.A Compact Swivel Head Adaptor  
SHA-J.A 432 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in
  
- MIS-A.A Compact Inline Bowspring sub  
MIS-A.A 247 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in
  
- Compact Neutron  
MDN-B.J 423 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in
  
- Compact Density/Caliper  
MPD-D.A 471 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in
  
- MIS-D.A Compact Inline Bowspring sub  
MIS-D.A 315 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in
  
- SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 595 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in
  
- SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 477 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in
  
- MIS-B Compact Inline Standoff sub  
MIS-B 102 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in
  
- Compact Focussed Electric  
MFE-B.J 328 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in
  
- MIS-E.B Compact Inline Standoff sub  
MIS-E.B 565 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in
  
- Compact Induction  
MAI-B.J 392 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in
  
- Total** Length: 86.65 ft Weight: 637.1 lb



FIELD WILD CREEK NORTH  
 PROVINCE/COUNTY HARPER  
 COUNTRY/STATE USA / KANSAS

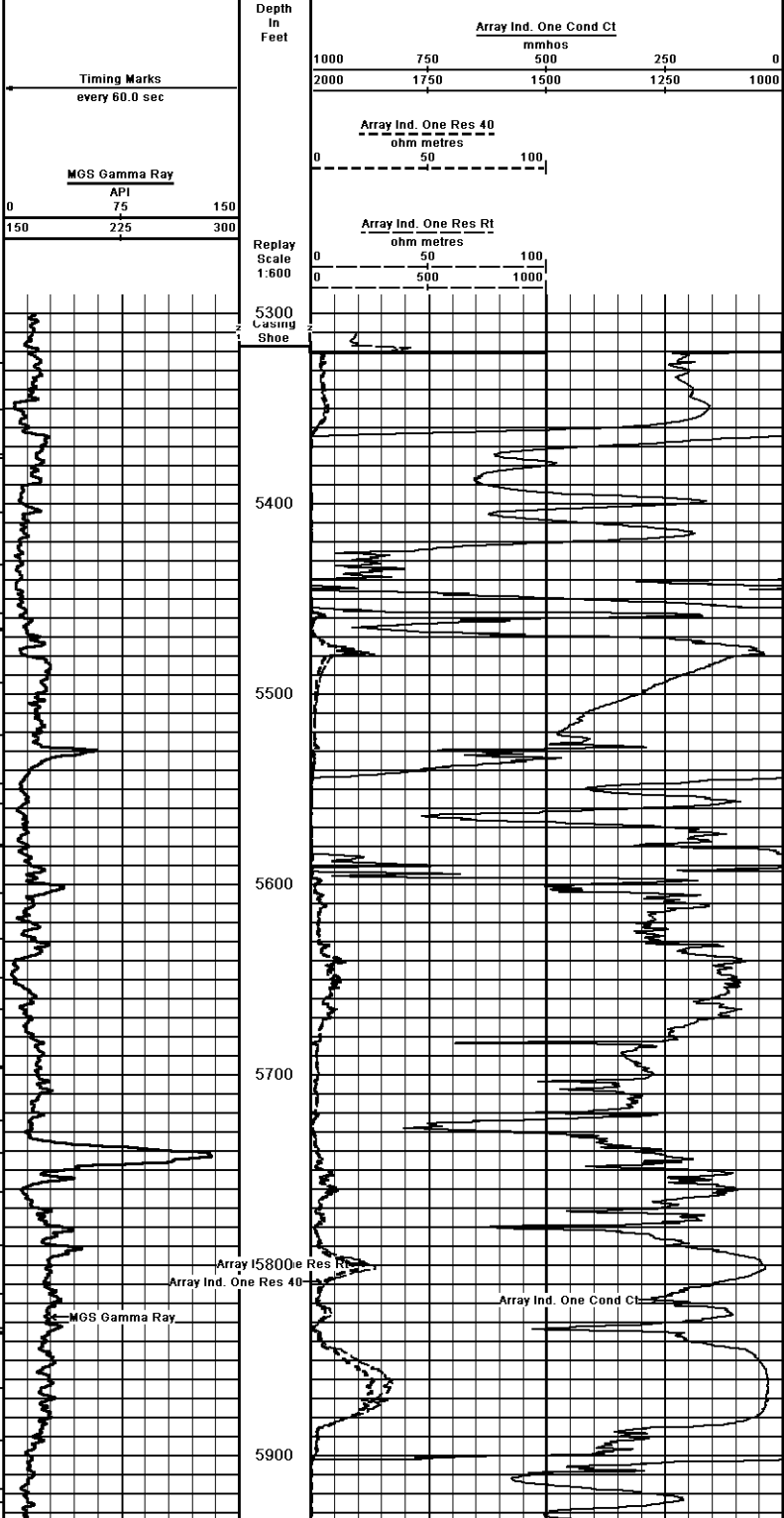
Elevation Kelly Bushing	1327.00	feet	First Reading	8944.00	feet
Elevation Drill Floor	1327.00	feet	Depth Driller	8973.00	feet
Elevation Ground Level	1309.00	feet	Depth Logger	8949.00	feet



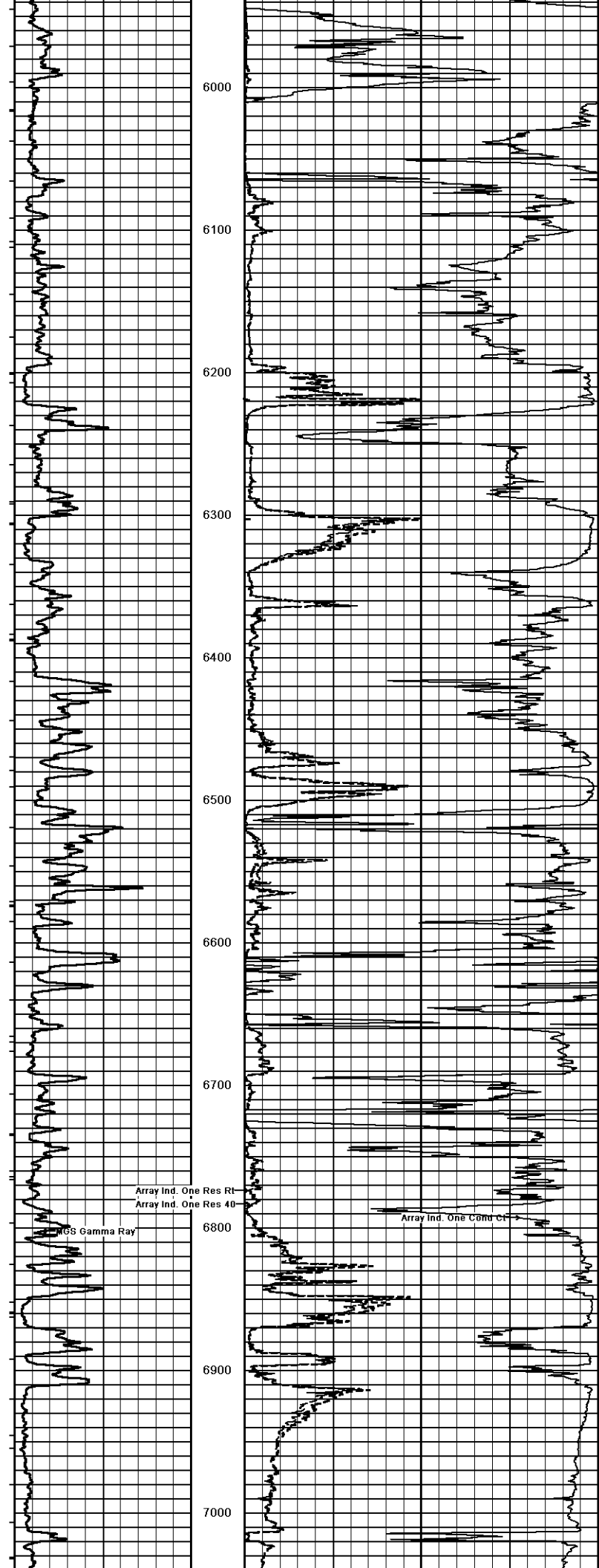
**Weatherford**<sup>®</sup>

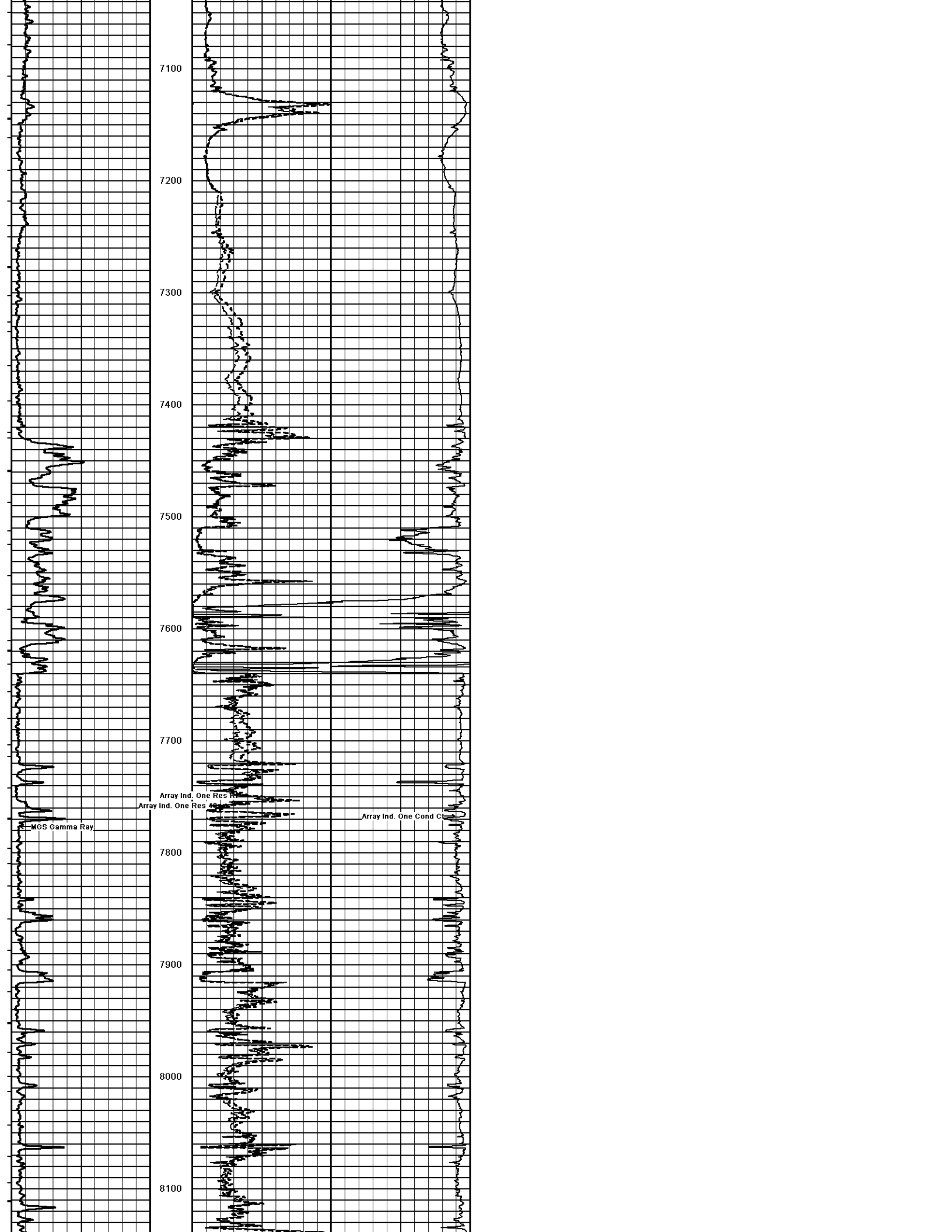
CML WELL SHUTTLE  
 COMPACT ARRAY INDUCTION  
 LOG

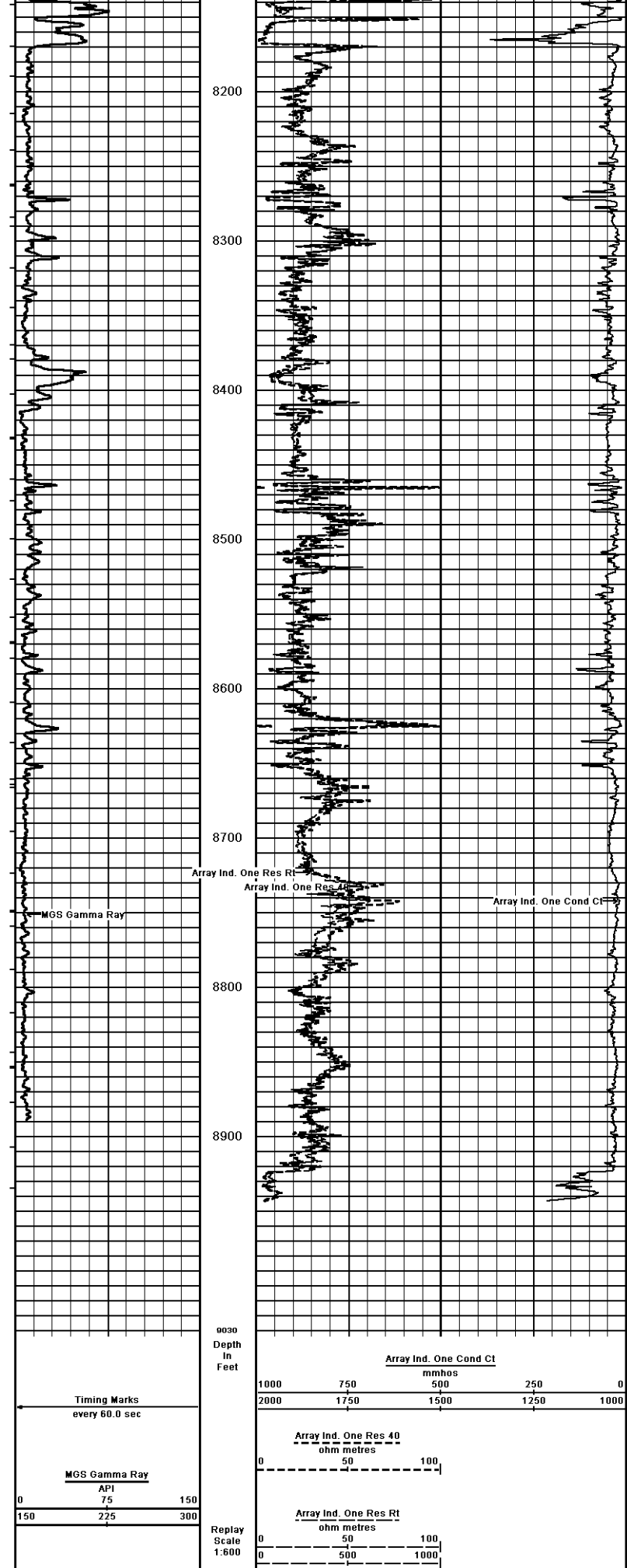
DSC  
 Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 12-MAY-2013 14:57  
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7-Hrms166 Depthlog.dta  
 Recorded on 12-MAY-2013 14:25  
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779












COMPANY	SANDRIDGE EXPLORATION & PRODUCTION		
WELL	TURNER 3406 5-7H		
FIELD	WILD CREEK NORTH		
PROVINCE/COUNTY	HARPER		
COUNTRY/STATE	USA / KANSAS		

Elevation Kelly Bushing	1327.00	feet	First Reading	8944.00	feet
Elevation Drill Floor	1327.00	feet	Depth Driller	8973.00	feet
Elevation Ground Level	1309.00	feet	Depth Logger	8949.00	feet

	CML WELL SHUTTLE COMPACT ARRAY INDUCTION LOG
--	--