Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	MULL DRILLING COMPANY, INC.
WELL	BLEUMER # 1-13
FIELD	WILDCAT
PROVINCE/COUNTY	GRAY COUNTY
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	2112' FNL & 778' FWL
	SW/4 NW/4

SEC	TWP	RGE
13	26S	30W

API Number 15-069-20371
Permit Number

Other Services
MPD/MDN SGS
MSS
MML

Permanent Datum G.L., Elevation 2772 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations:	feet
KB	2785.00
DF	2783.00
GL	2772.00

Date	07-MAY-2012		
Run Number	ONE		
Depth Driller	6200.00	feet	
Depth Logger	6193.00	feet	
First Reading	6190.00	feet	
Last Reading	462.00	feet	
Casing Driller	464.00	feet	
Casing Logger	462.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.40 lb/USg	57.00 CP	
PH / Fluid Loss	8.50	8.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.87 @ 70.0	ohm-m	
Rmf @ Measured Temp	0.70 @ 70.0	ohm-m	
Rmc @ Measured Temp	1.04 @ 70.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.49 @129.0	ohm-m	
Time Since Circulation	5 HOURS		
Max Recorded Temp	130.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13096	LIB	
Recorded By	A. GIAMBALVO		
Witnessed By	PAUL GERLACH		
S.O. / JOB #	3534535		LB12-115

BOREHOLE RECORD

Last Edited: 07-MAY-2012 07:55

Bit Size inches	Depth From feet	Depth To feet
7.875	462.00	6193.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	13.00	462.00	24.00

REMARKS

Tools Ran: MCG, SGS, MML, MDN, MPD, SKJ, MFE, MSS, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE, MSS and MAI 0.5 inch standoffs used.
2.71 g/cc Limestone Density Matrix used to calculate porosity.
Sonic porosity calculated using a Limestone scale (47.5 usec/ft).
All intervals logged and scaled per customer's request.
Annular volume with 5 inch production casing from TD to Surface Casing = 1468 cu. ft.
Total hole volume from TD to Surface Casing = 2248 cu. ft.
Service order: #3534535
Rig: Duke # 9
Engineer: A. Giambalvo
Operator(s): J. LaPoint, N. Adame

2 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\M...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta
Recorded on 07-MAY-2012 03:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:600

Array Ind. One Cond Ct
mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

Shallow FE
ohm metres
0 25 50
0 250 500

Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500

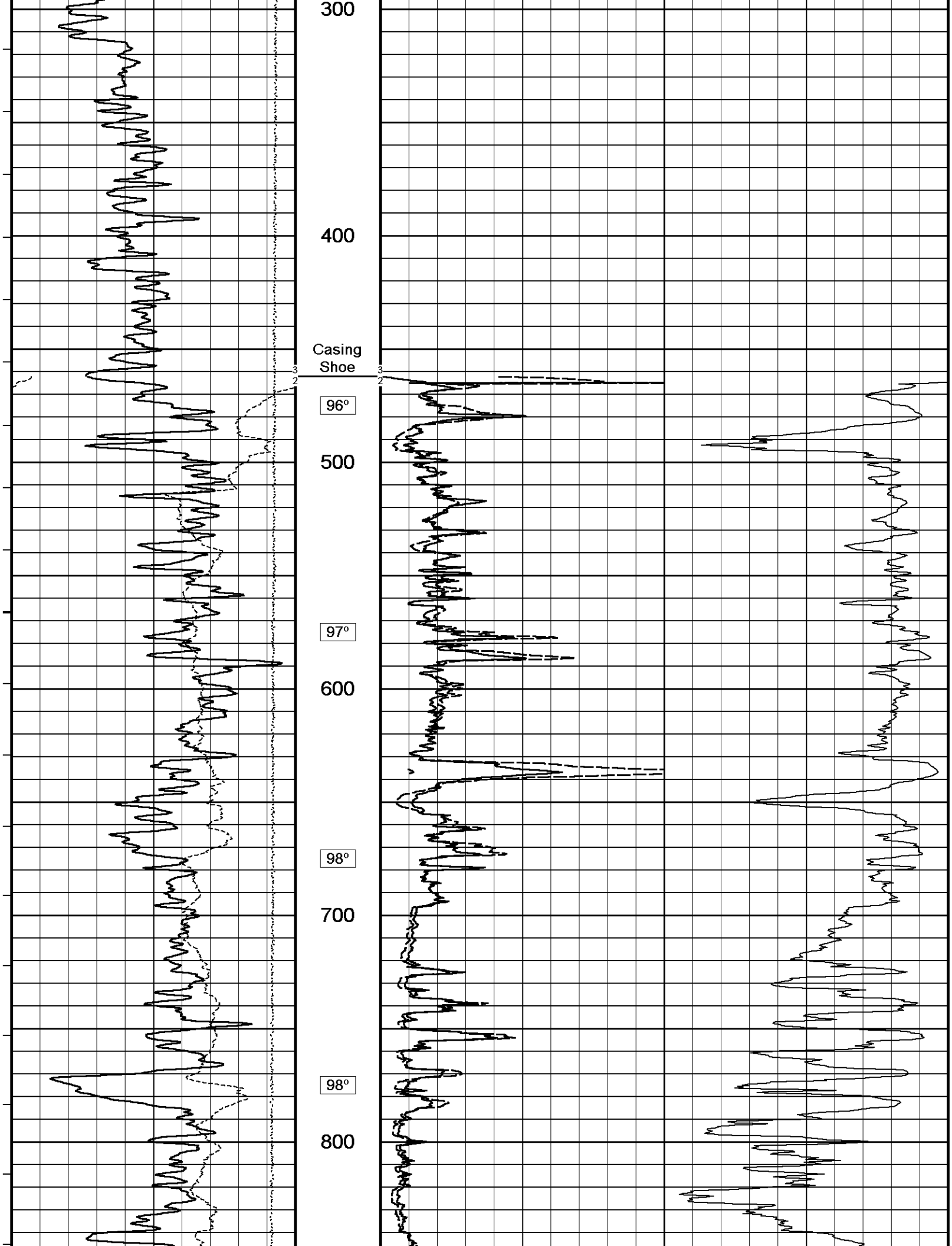
10

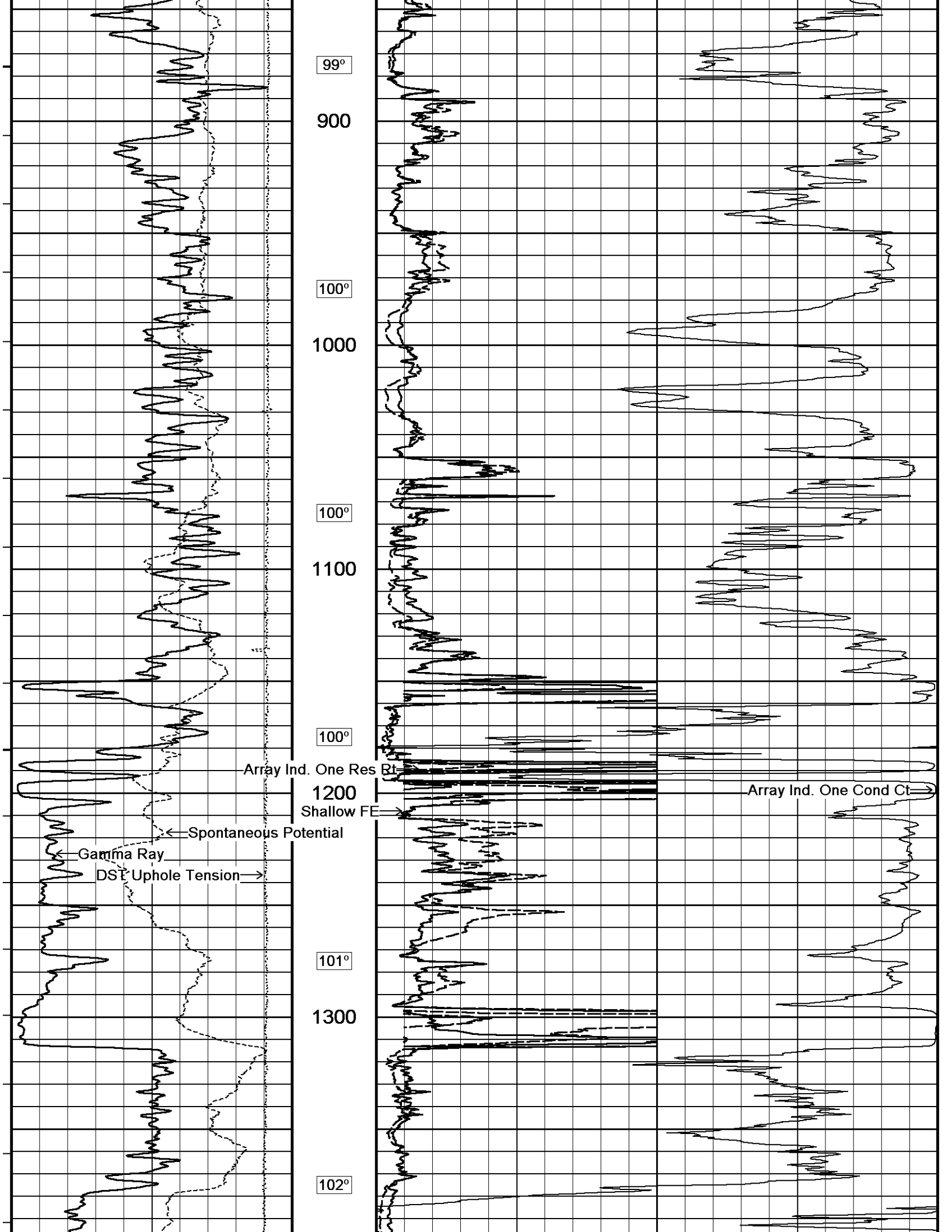
100

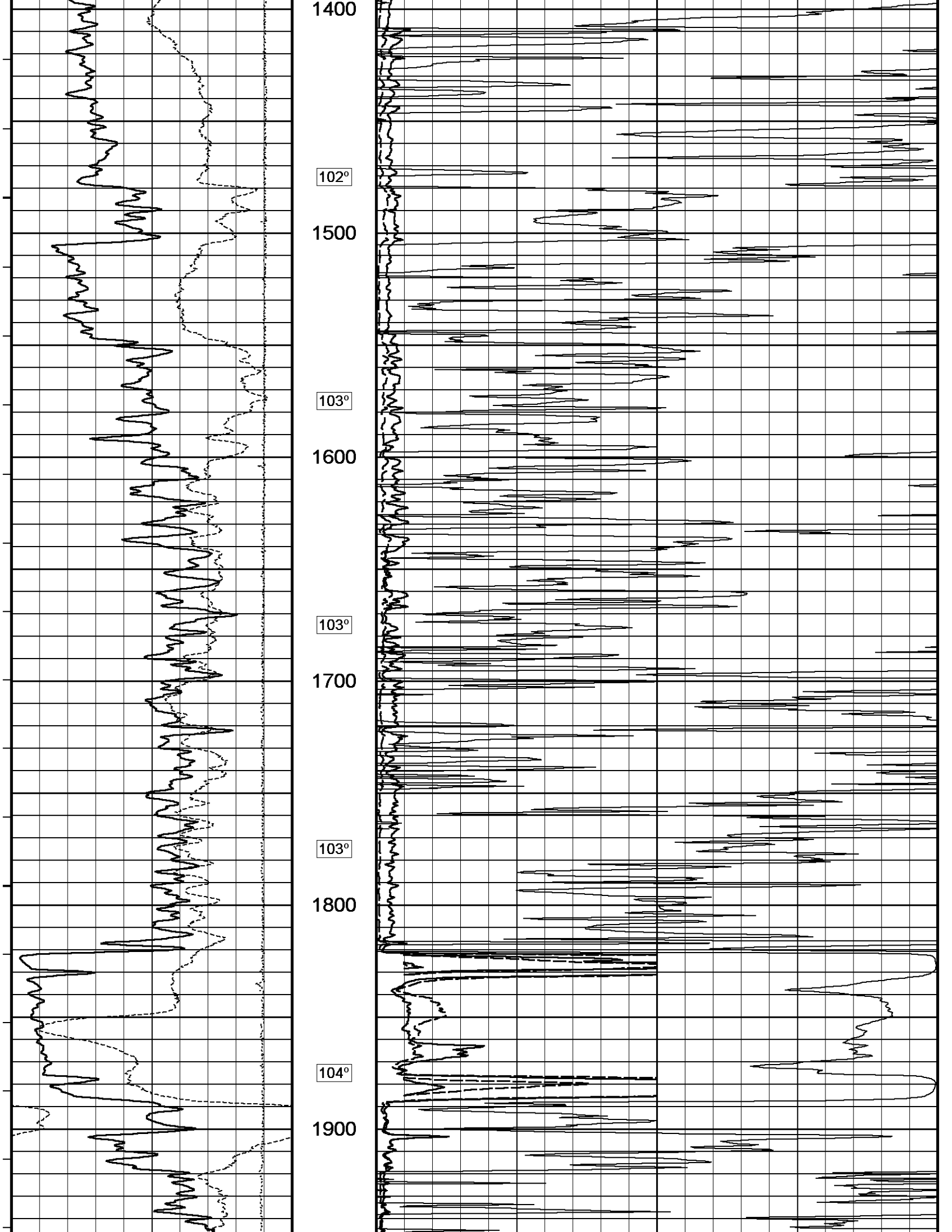
200

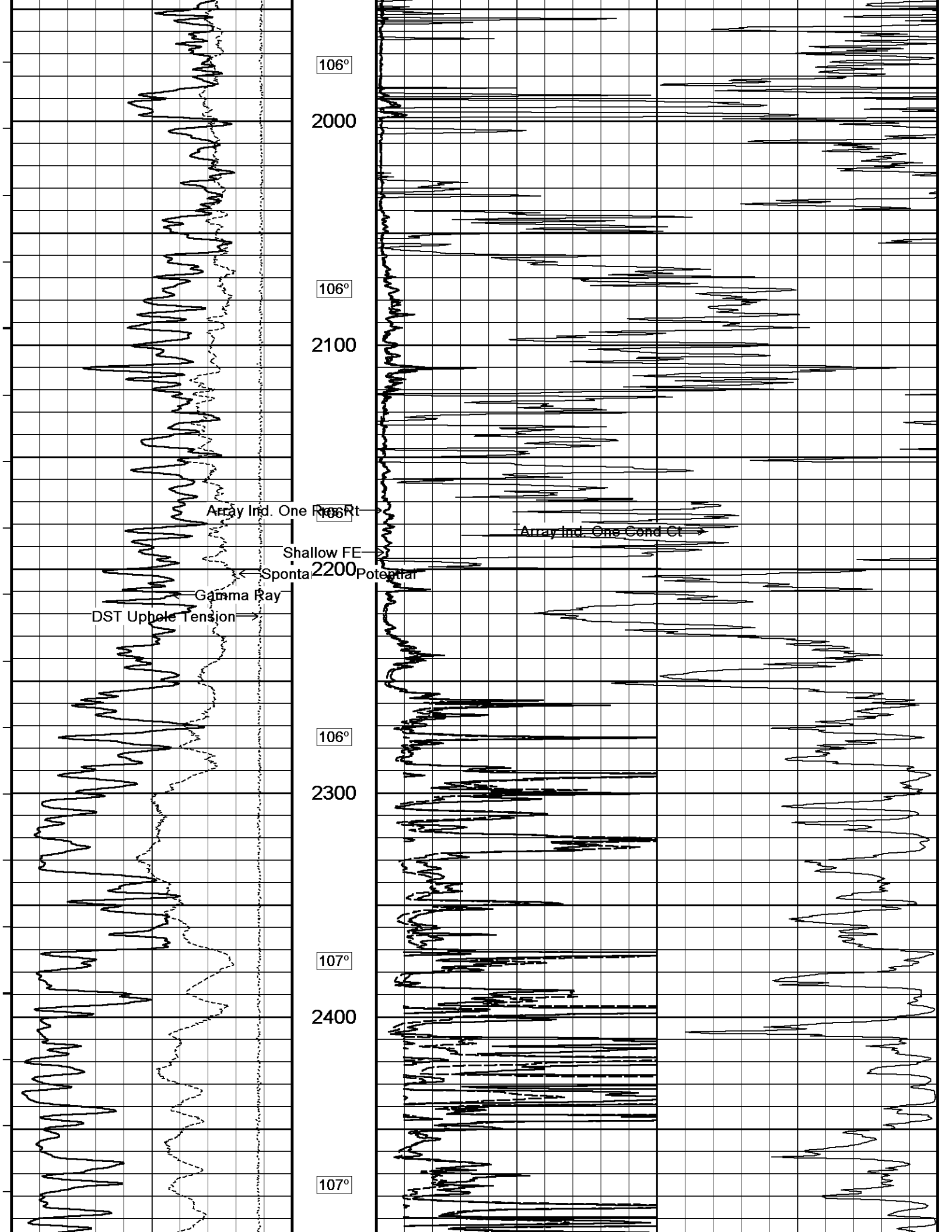
Gamma Ray

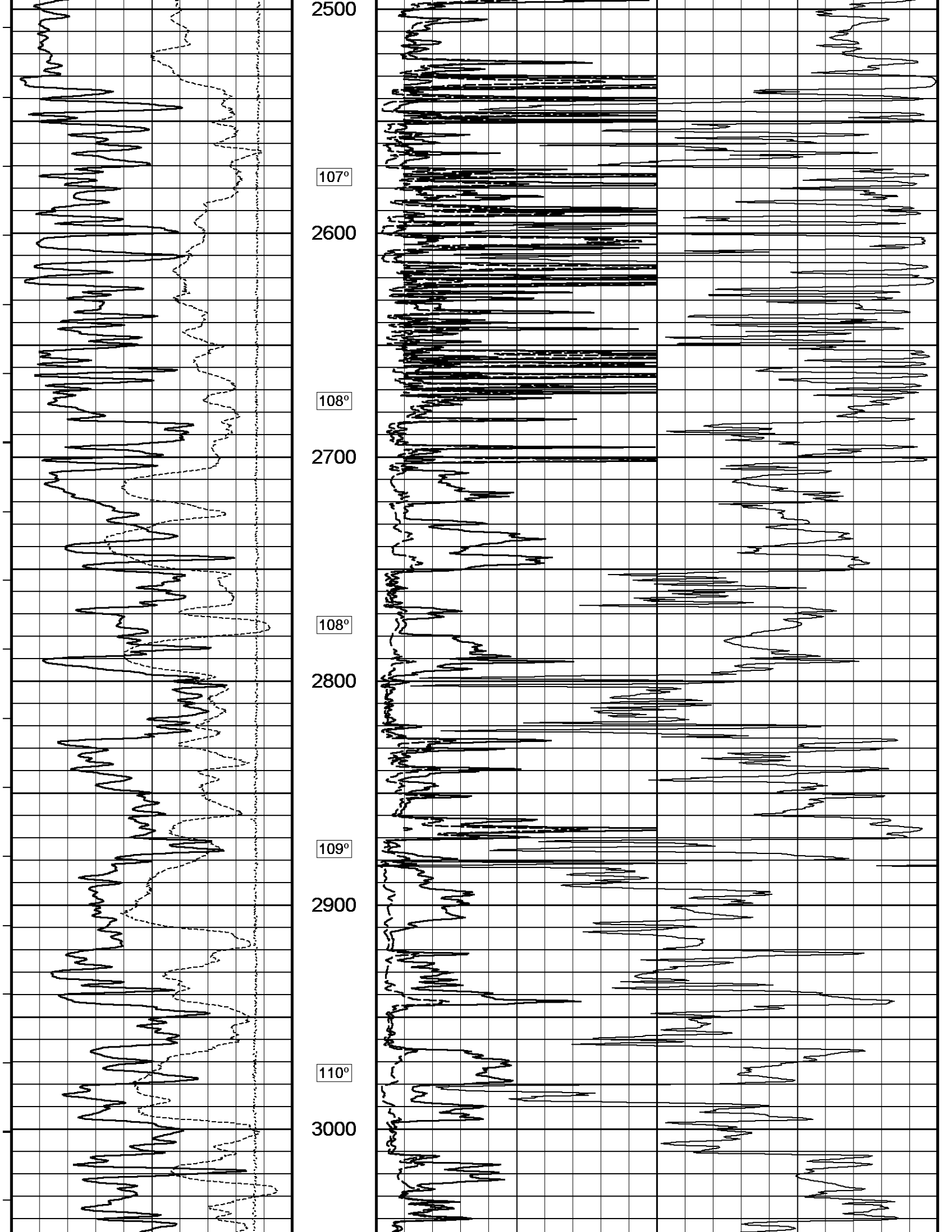
DST Uphole Tension

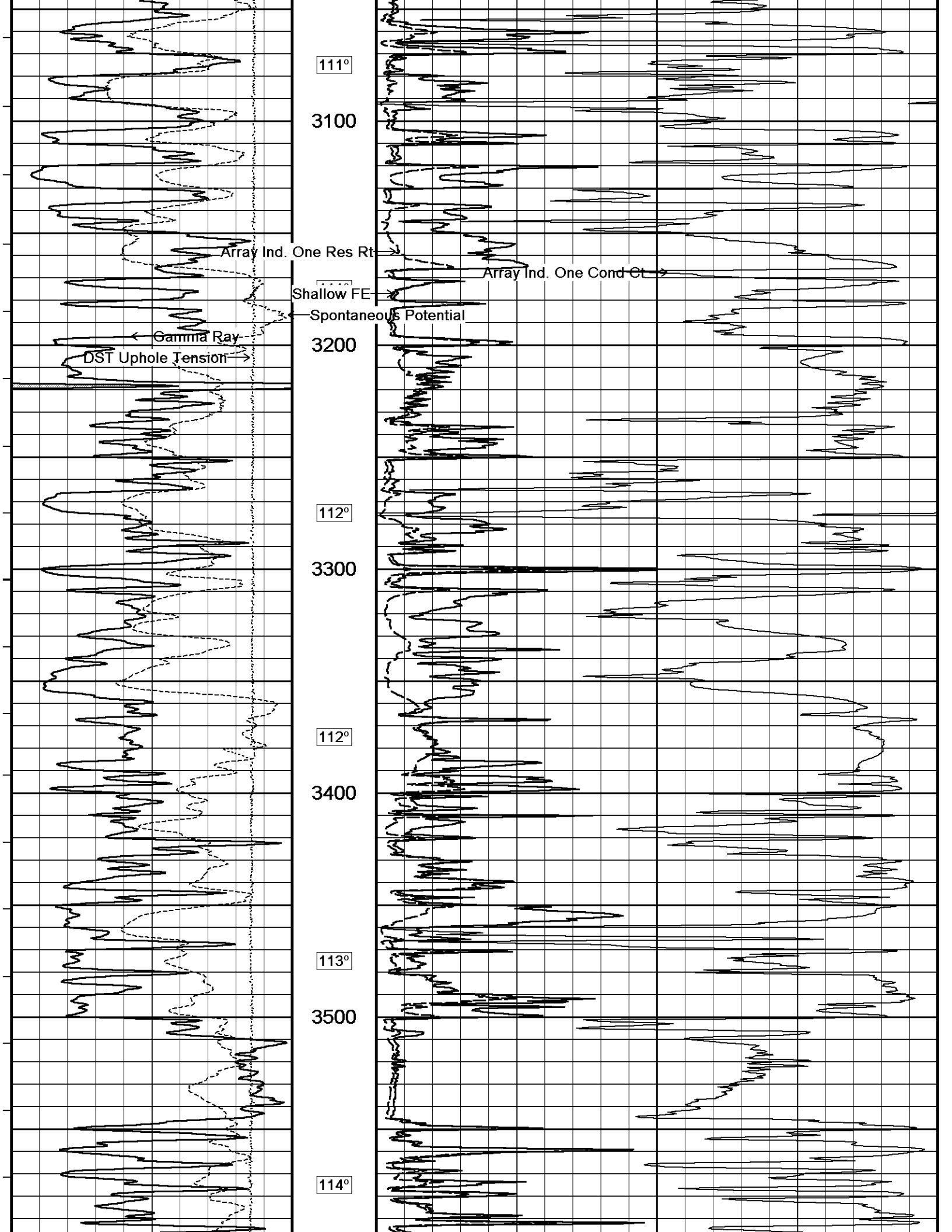

300
400
Casing
Shoe
3
2
3
2
96°
500
97°
600
98°
700
98°
800

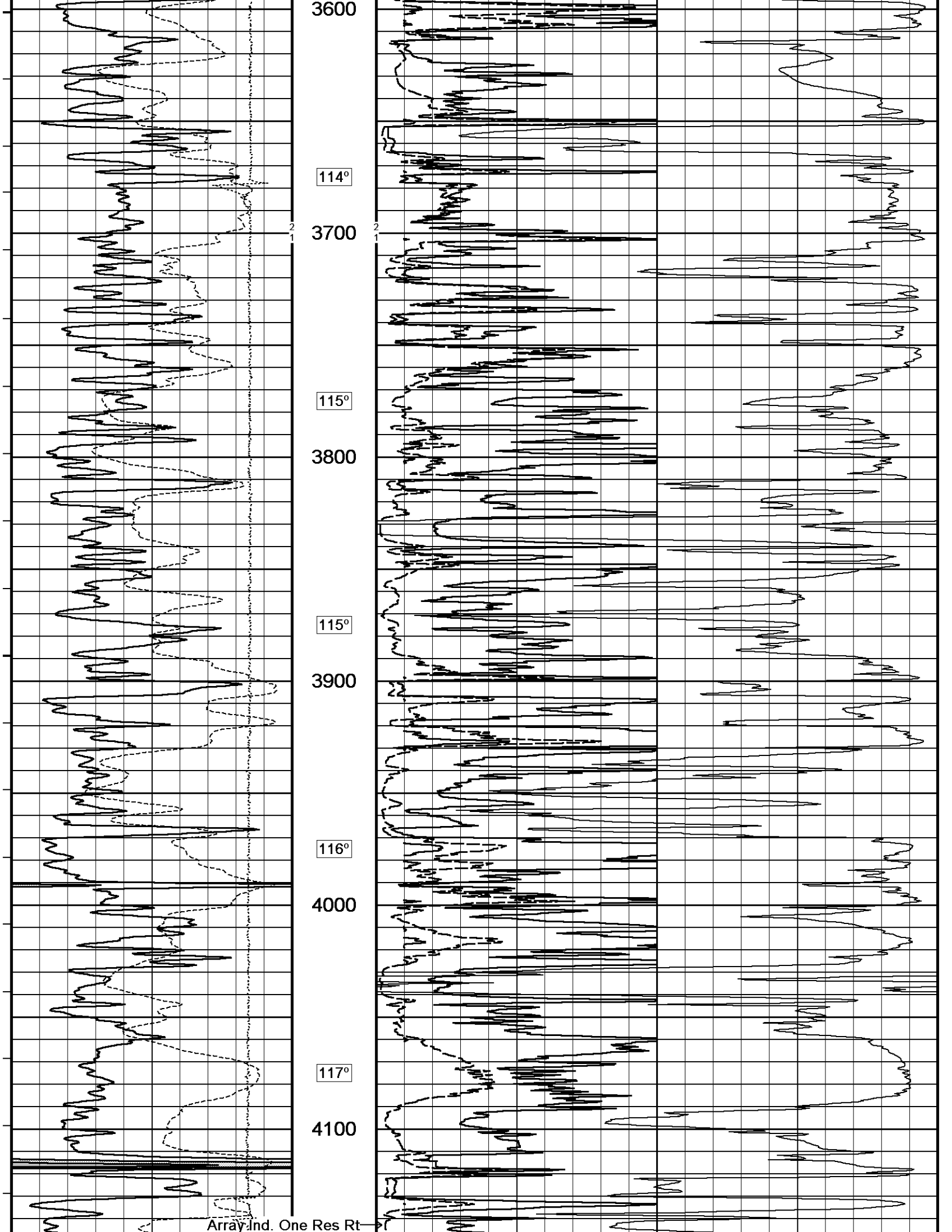

99°
900
100°
1000
100°
1100
100°
Array Ind. One Res Rt
1200
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
101°
1300
102°

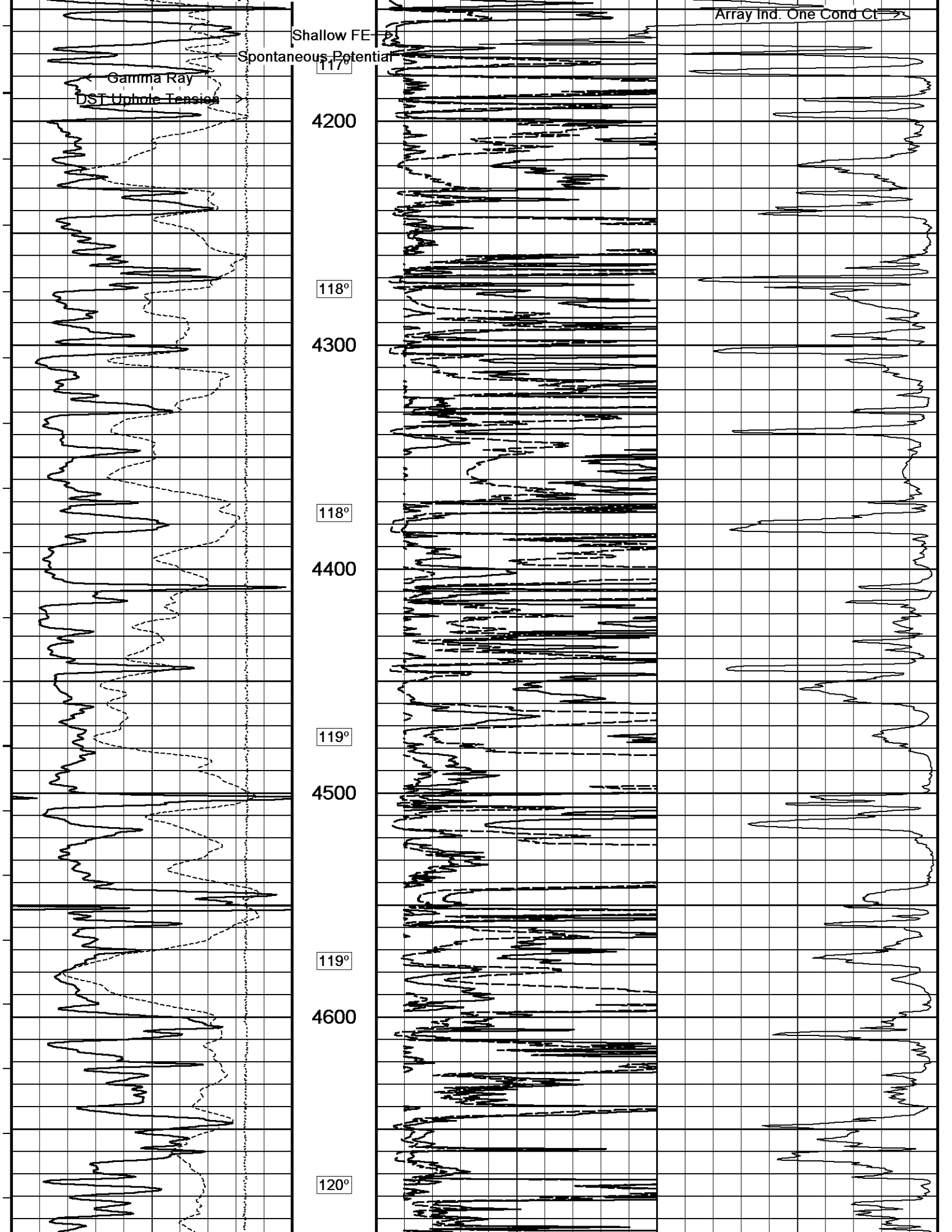

1400
102°
1500
103°
1600
103°
1700
103°
1800
104°
1900

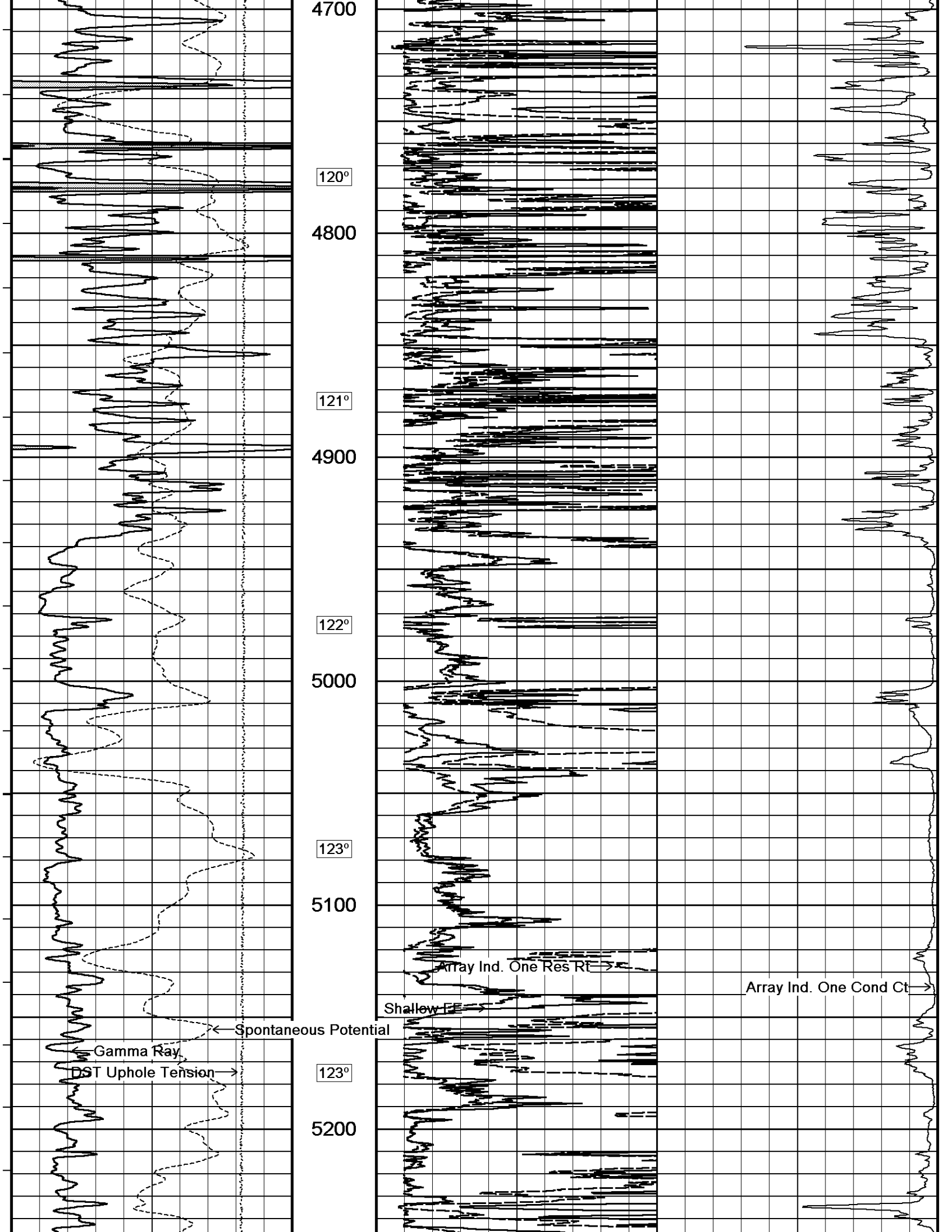

106°
2000
106°
2100
Array Ind. One Res Rt
106°
Array Ind. One Cond Ct
Shallow FE
2200
Potential
Sponta
Gamma Ray
DST Uphole Tension
106°
2300
107°
2400
107°

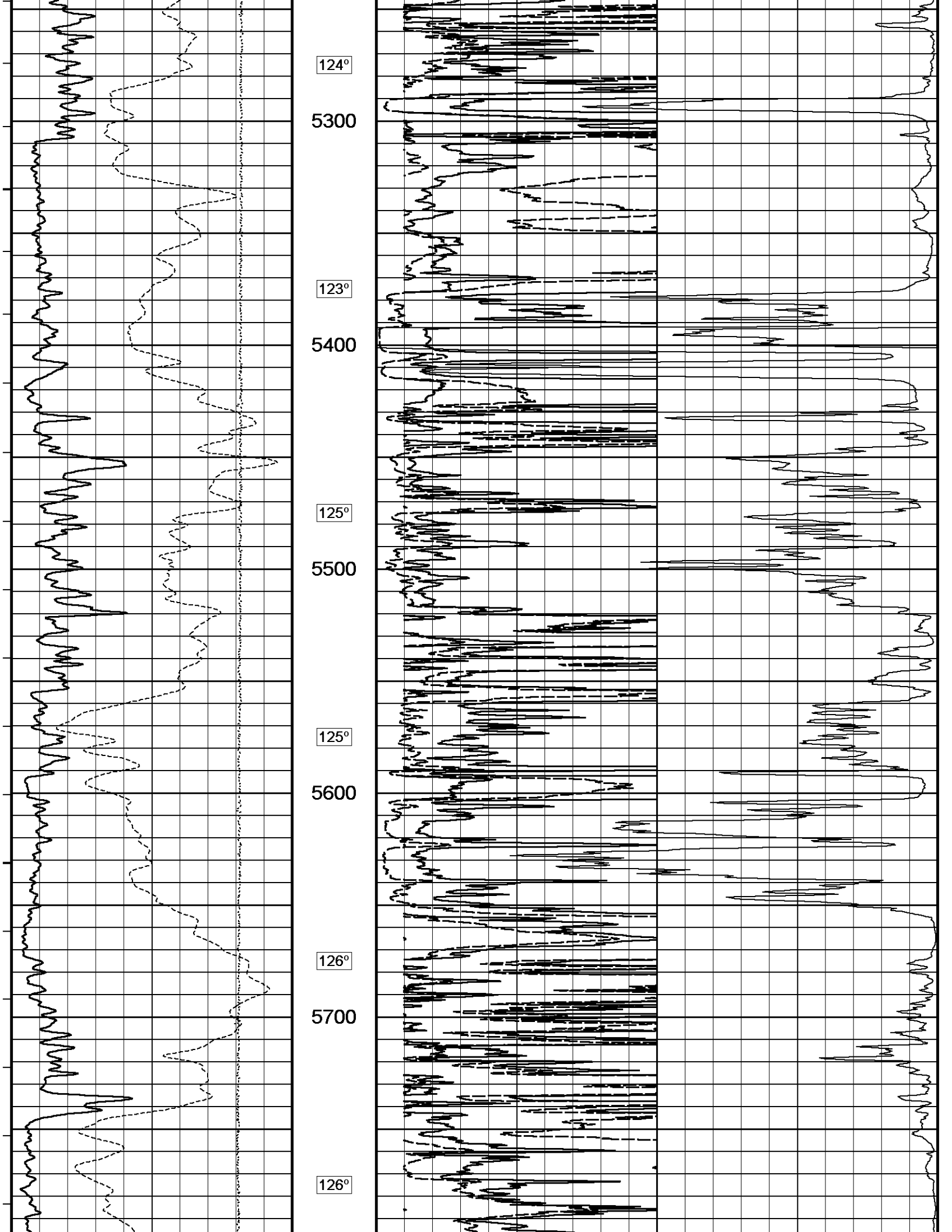

2500
107°
2600
108°
2700
108°
2800
109°
2900
110°
3000

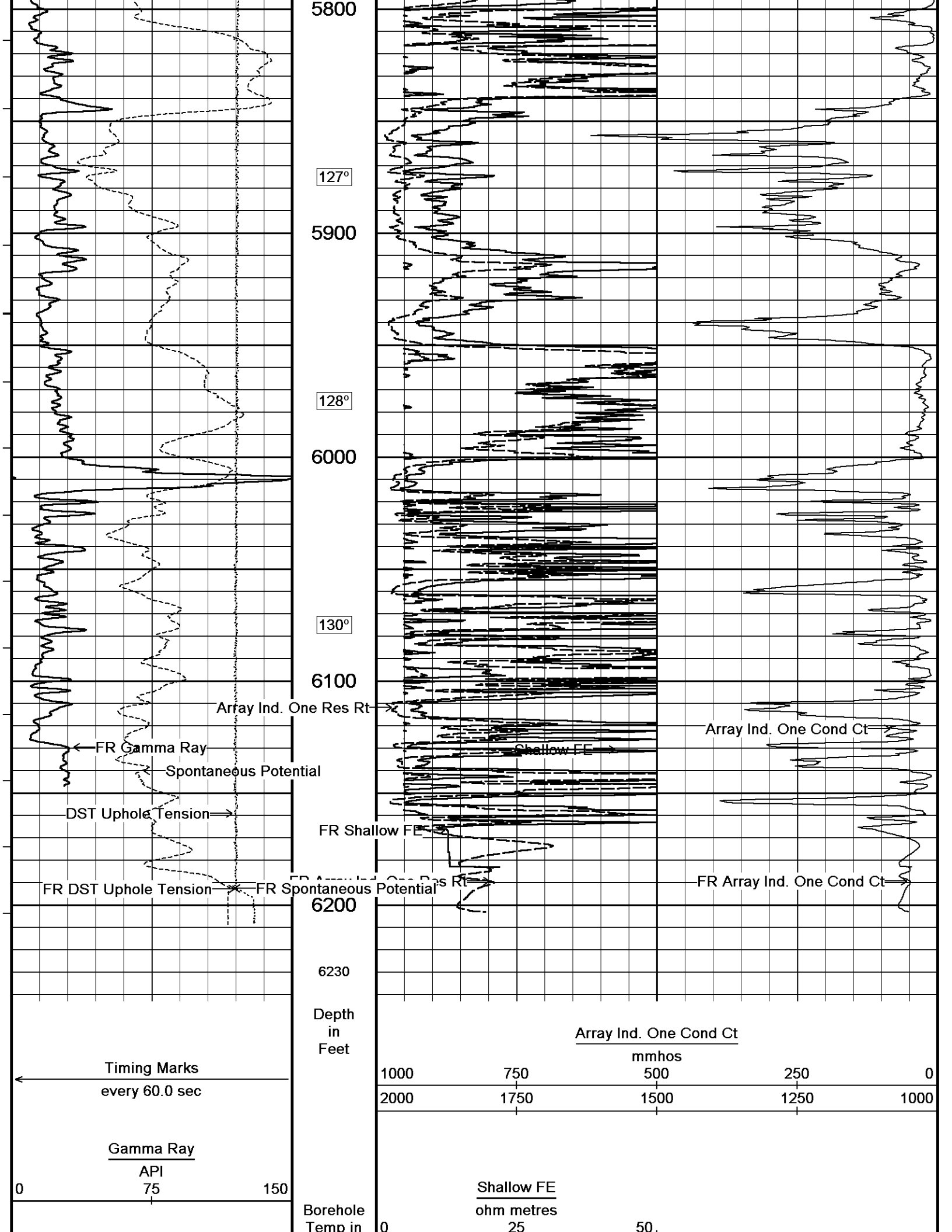

111°
3100
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
3200
DST Uphole Tension
112°
3300
112°
3400
113°
3500
114°


3600
114°
3700
115°
3800
115°
3900
116°
4000
117°
4100
Array Ind. One Res Rt


Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct
117°
4200
118°
4300
118°
4400
119°
4500
119°
4600
120°


4700
120°
4800
121°
4900
122°
5000
123°
5100
123°
5200
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


124°
5300
123°
5400
125°
5500
125°
5600
126°
5700
126°


5800
127°
5900
128°
6000
130°
6100
6200
6230
Array Ind. One Res Rt
FR Gamma Ray
Spontaneous Potential
DST Uphole Tension
FR Shallow FE
FR DST Uphole Tension
FR Spontaneous Potential
Shallow FE
Array Ind. One Cond Ct
FR Array Ind. One Cond Ct
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
Borehole Temp in
Array Ind. One Cond Ct
mmhos
1000
750
500
250
0
2000
1750
1500
1250
1000
Shallow FE
ohm metres
0
25
50

deg F

0 250 500

Spontaneous Potential
millivolts
− → | 20 | ← +

Array Ind. One Res Rt
ohm metres
0 25 50

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:600

0 250 500

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\M...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta — Recorded on 07-MAY-2012 03:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

↑ 2 INCH MAIN ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\M...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta — Recorded on 07-MAY-2012 03:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Depth
in
Feet

Timing Marks
every 60.0 sec

Shallow FE
ohm metres
0.20 1 10 100 2000

Gamma Ray
API
0 75 150

Array Ind. One Res 40
ohm metres
0.20 1 10 100 2000

Borehole
Temp in
deg F

Spontaneous Potential
millivolts
− → | 20 | ← +

Array Ind. One Res 60
ohm metres
0.20 1 10 100 2000

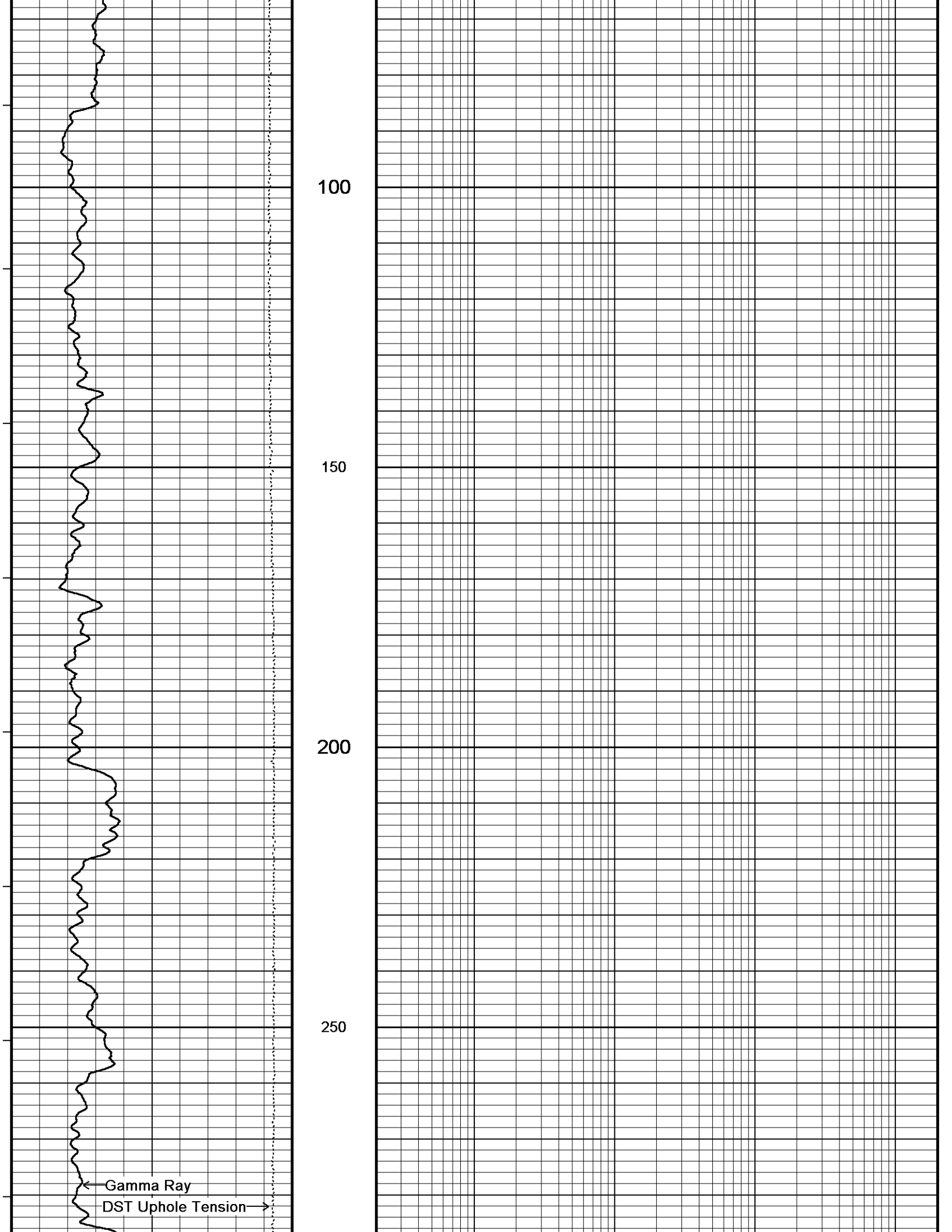
DST Uphole Tension
pounds
5000 0

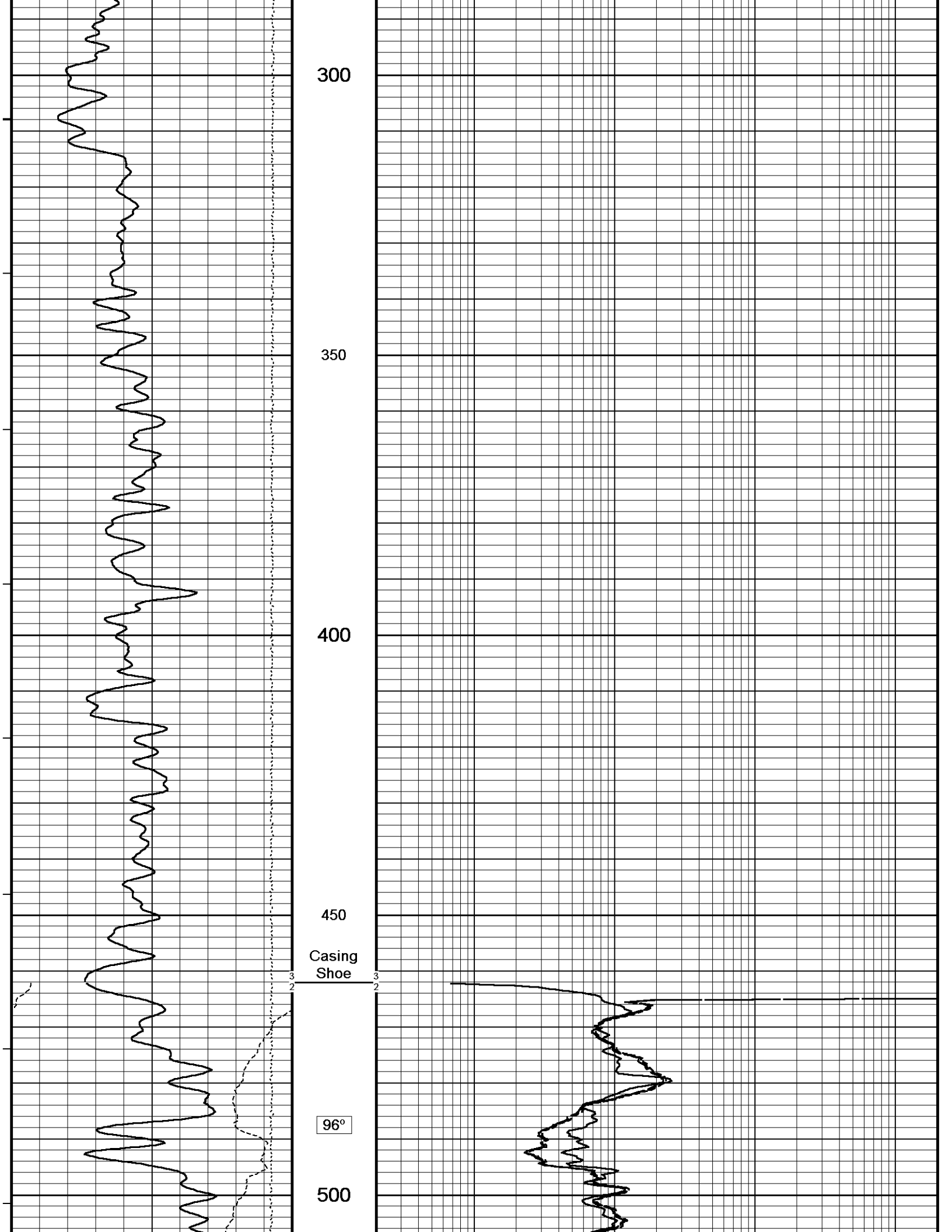
Array Ind. One Res Rt
ohm metres
0.20 1 10 100 2000

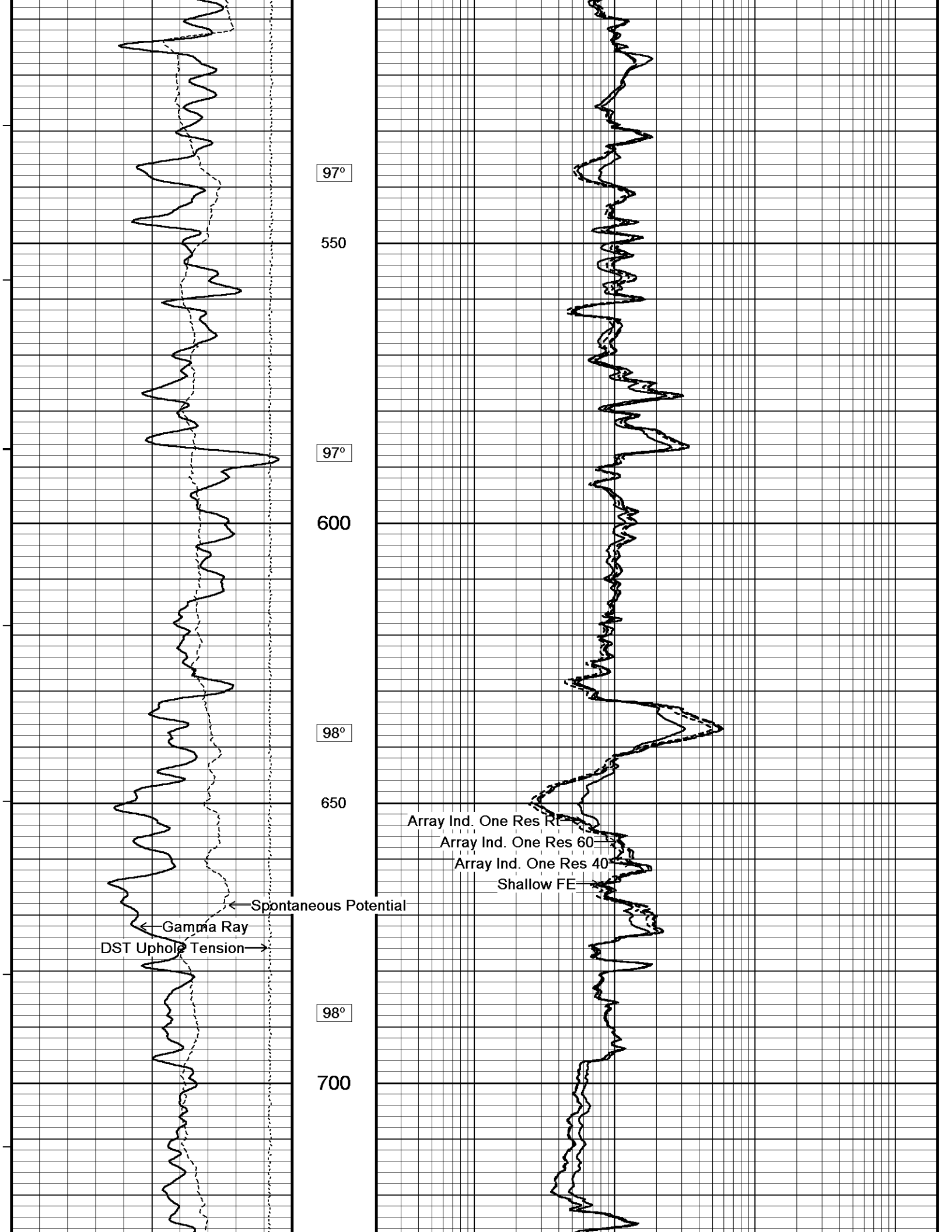
Replay
Scale
1:240

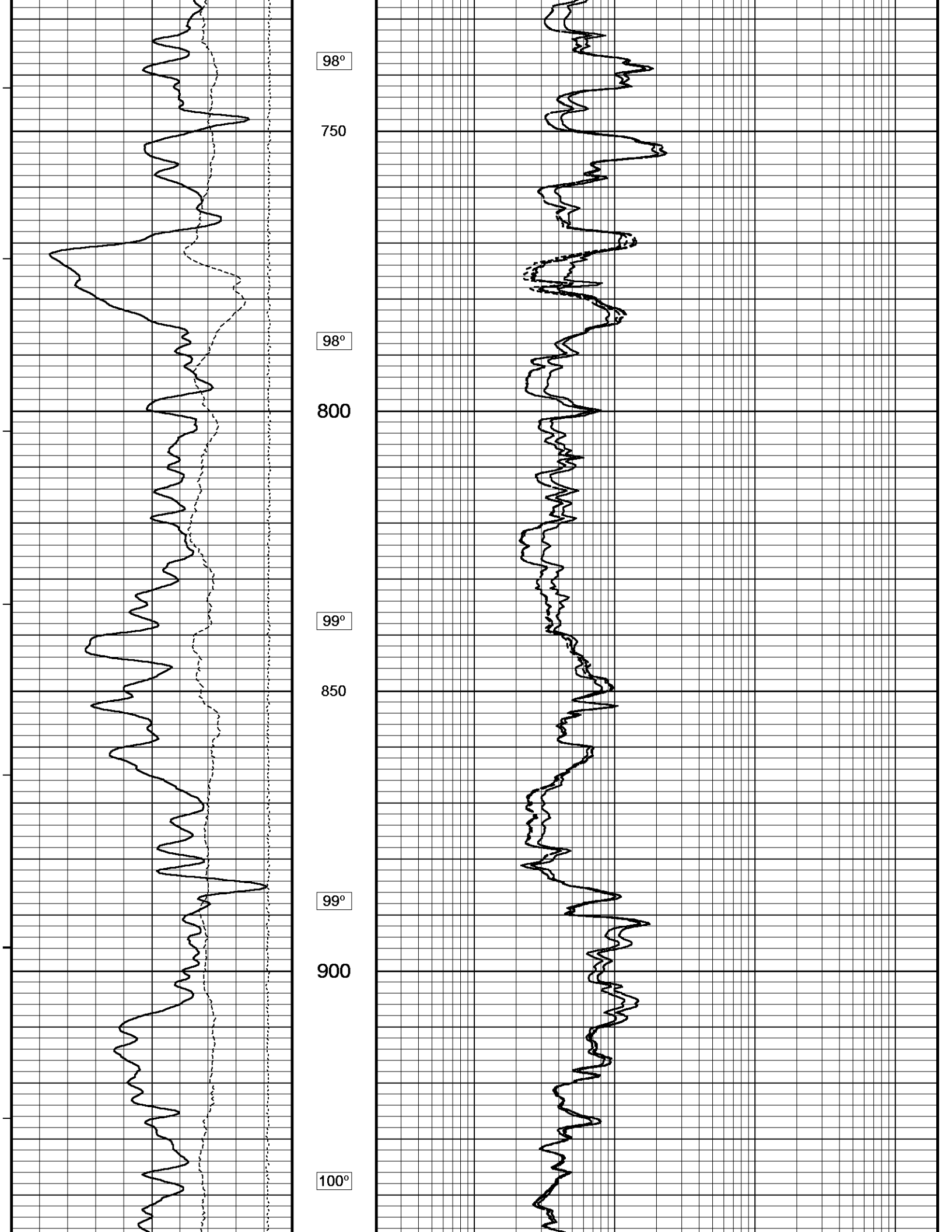
12

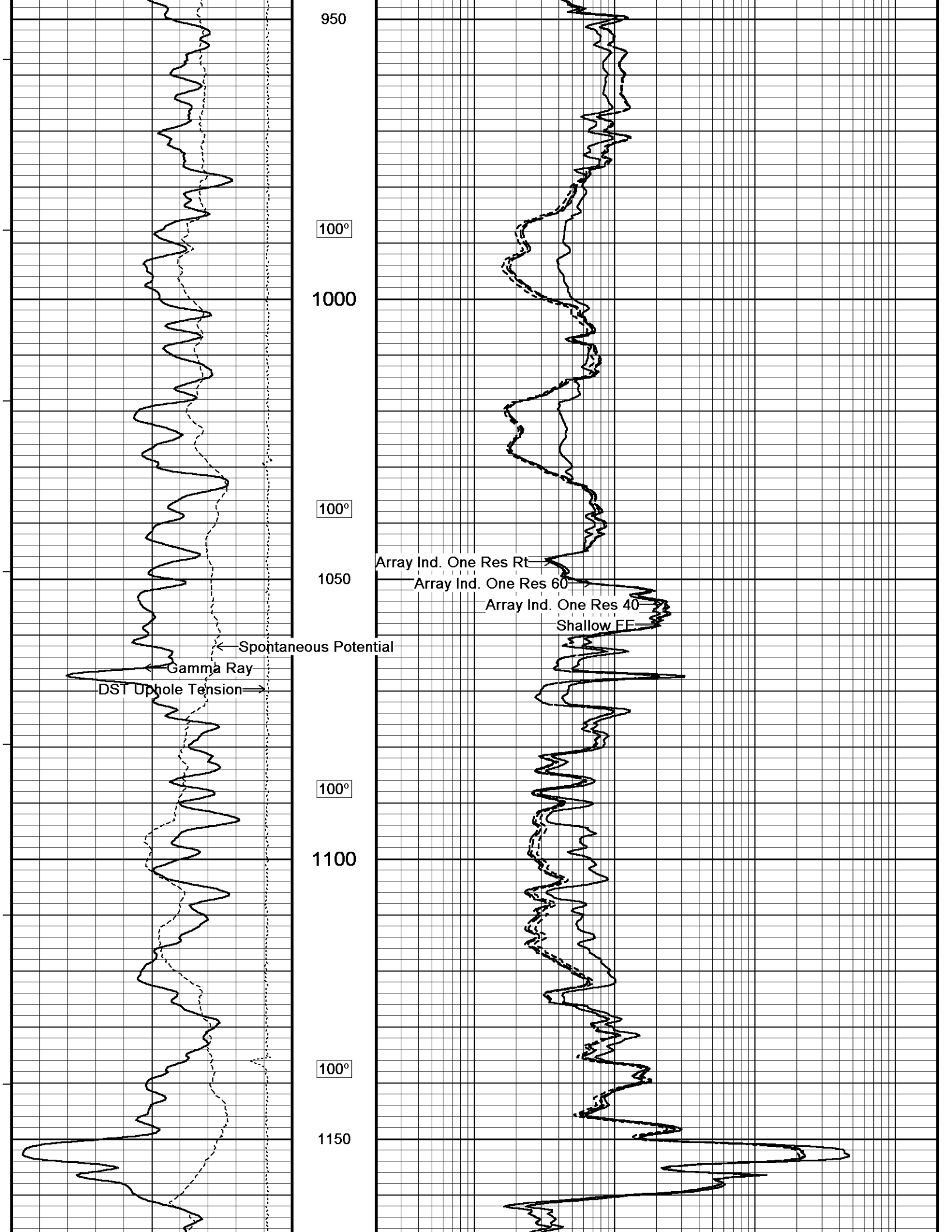
50

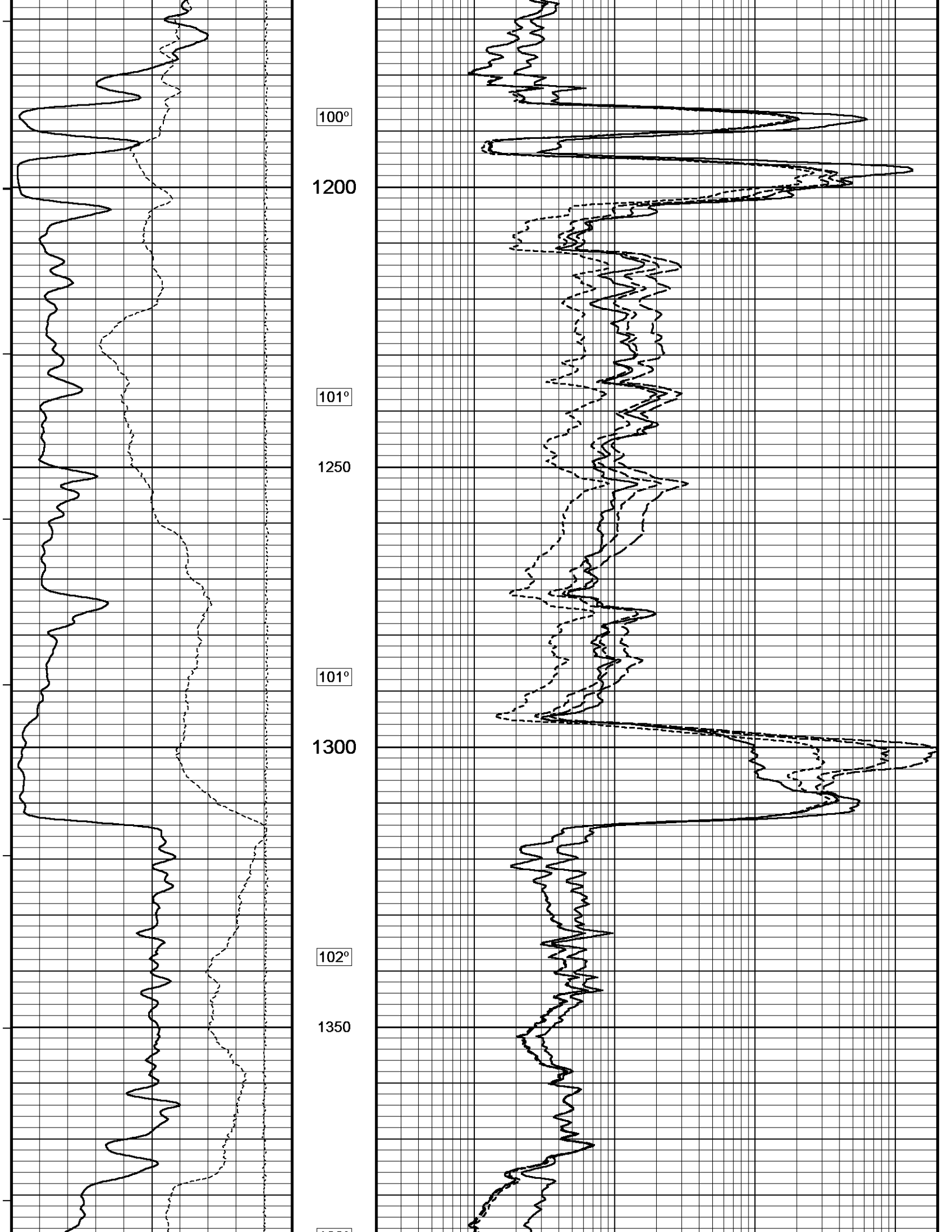

100
150
200
250
Gamma Ray
DST Uphole Tension

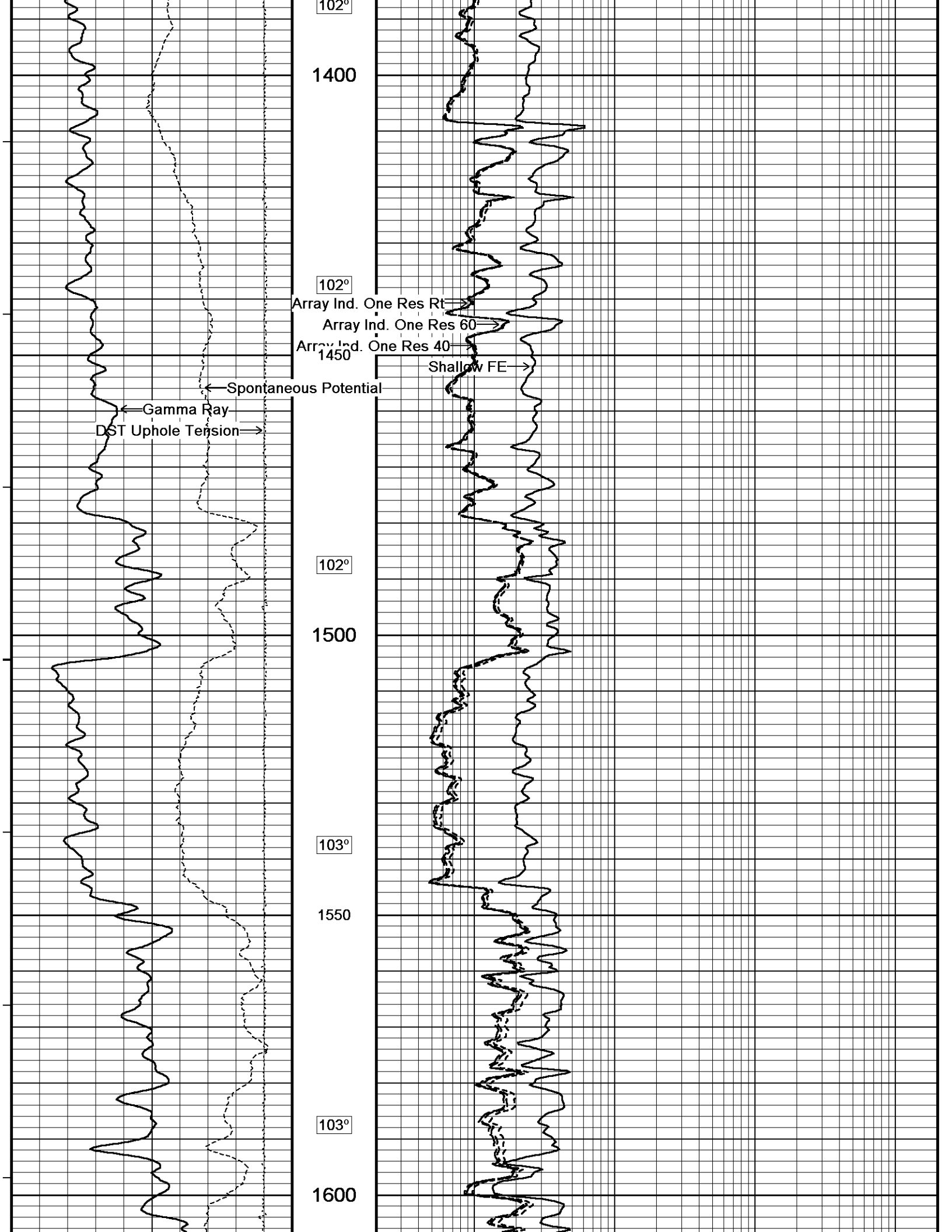

300
350
400
450
Casing
Shoe
3/2
3/2
96°
500

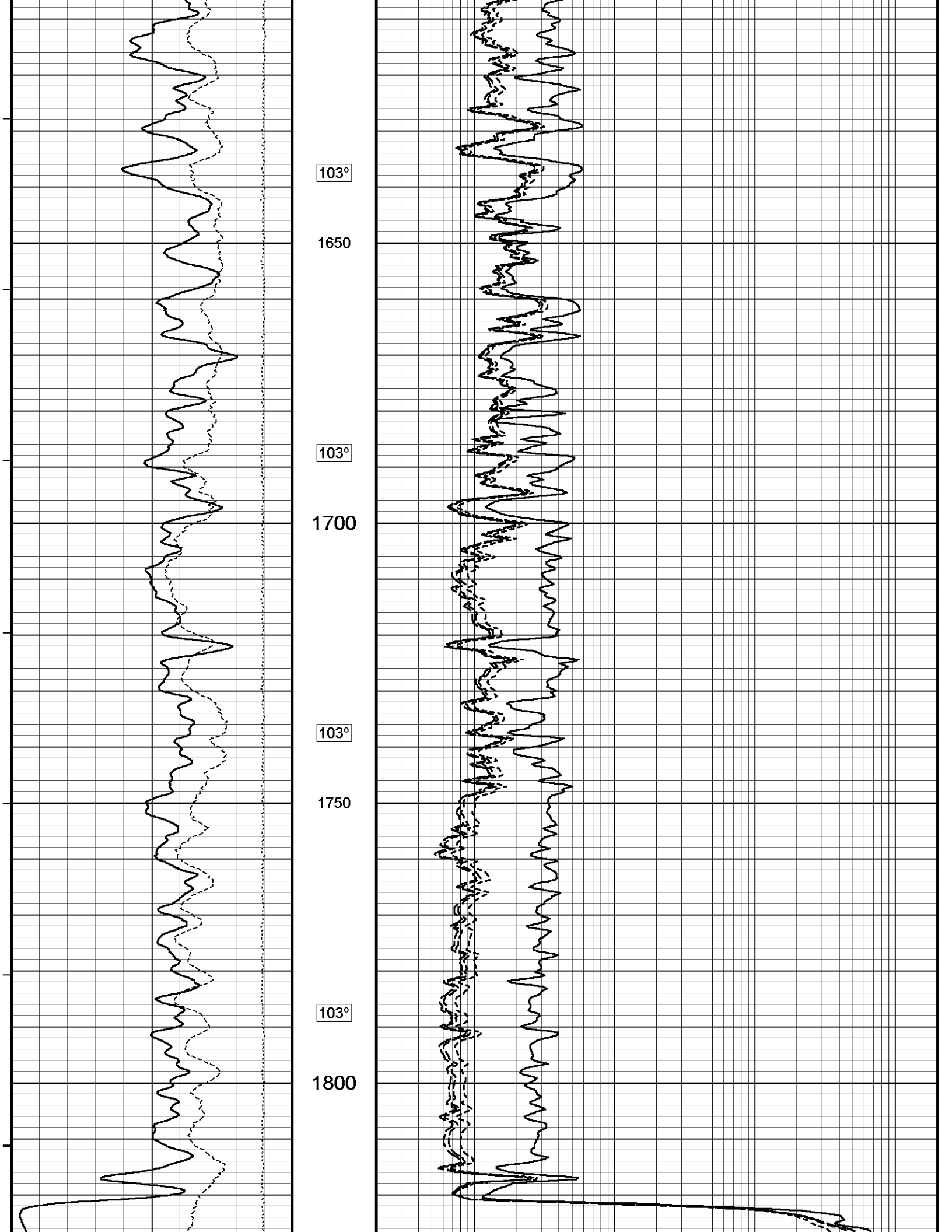

97°
550
97°
600
98°
650
98°
700
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

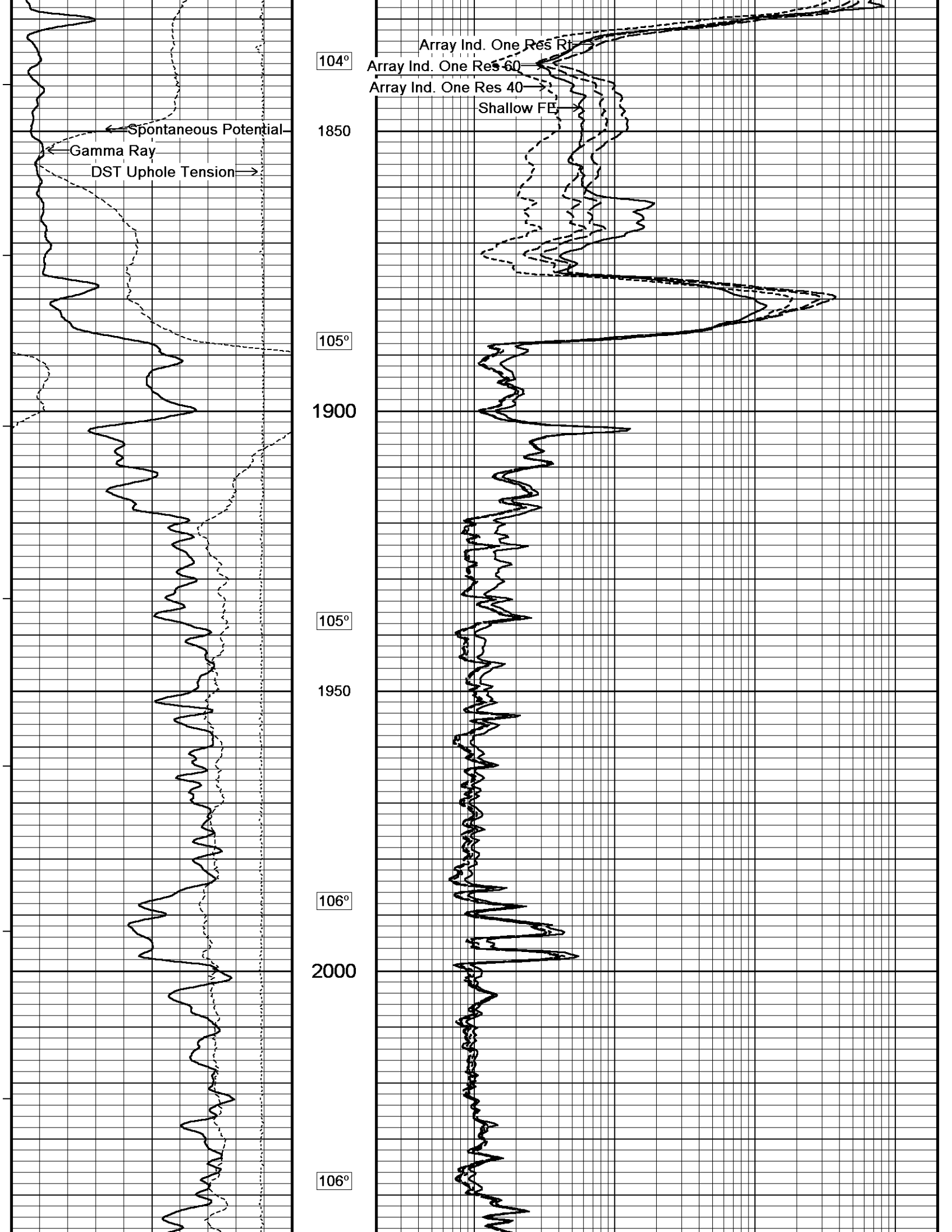

98°
750
98°
800
99°
850
99°
900
100°

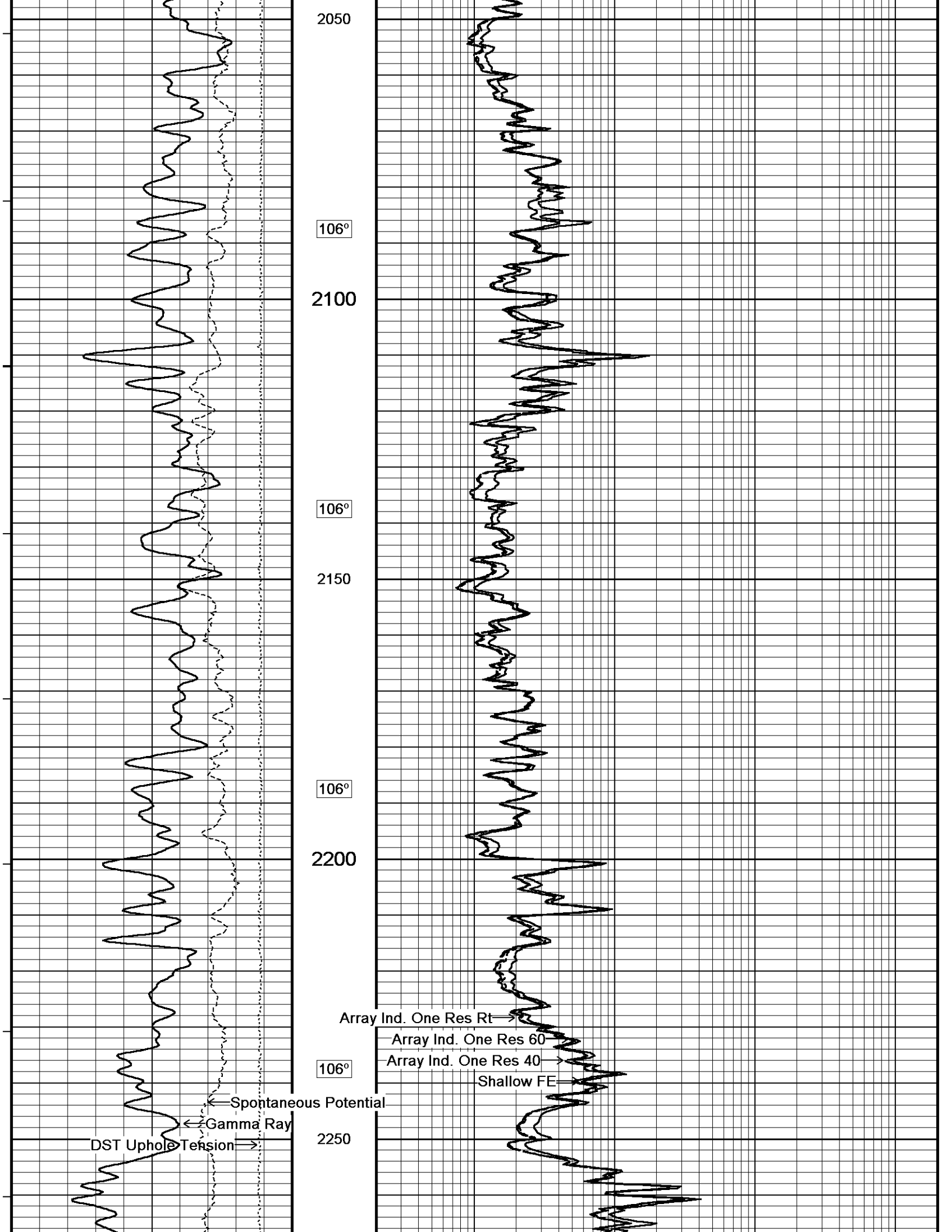

950
100°
1000
100°
Array Ind. One Res Rt
1050
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
100°
1100
100°
1150

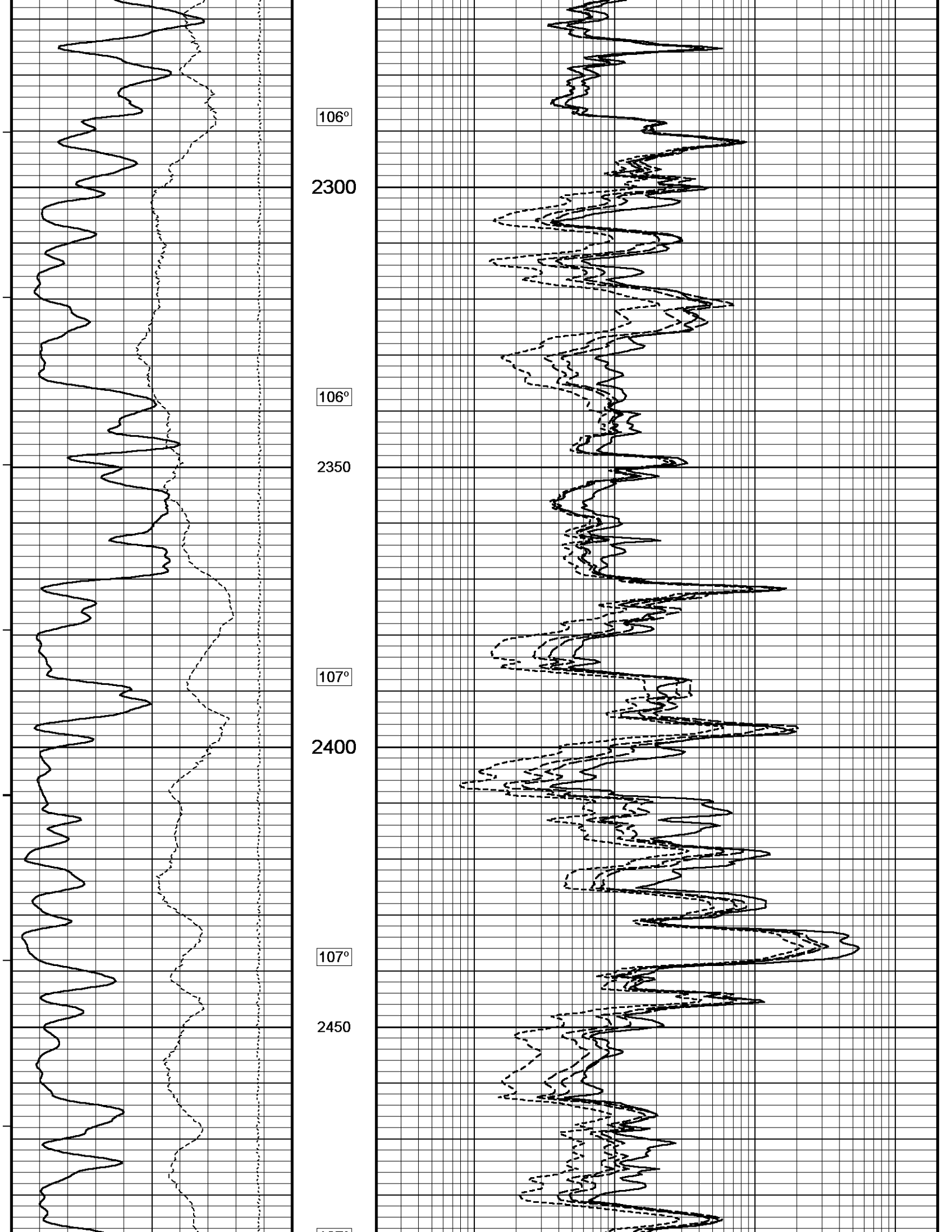

100°
1200
101°
1250
101°
1300
102°
1350

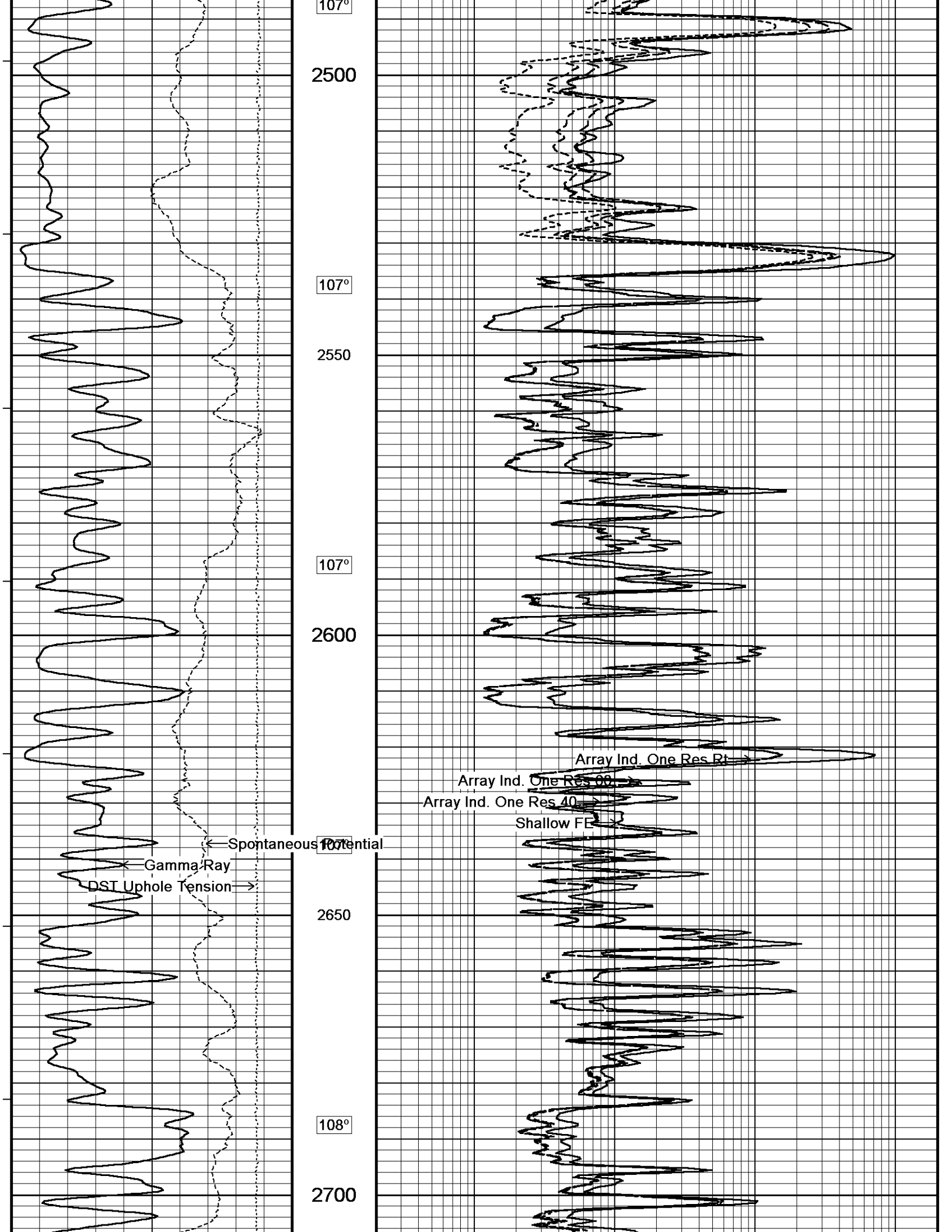

102°
1400
102°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
1450
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
102°
1500
103°
1550
103°
1600

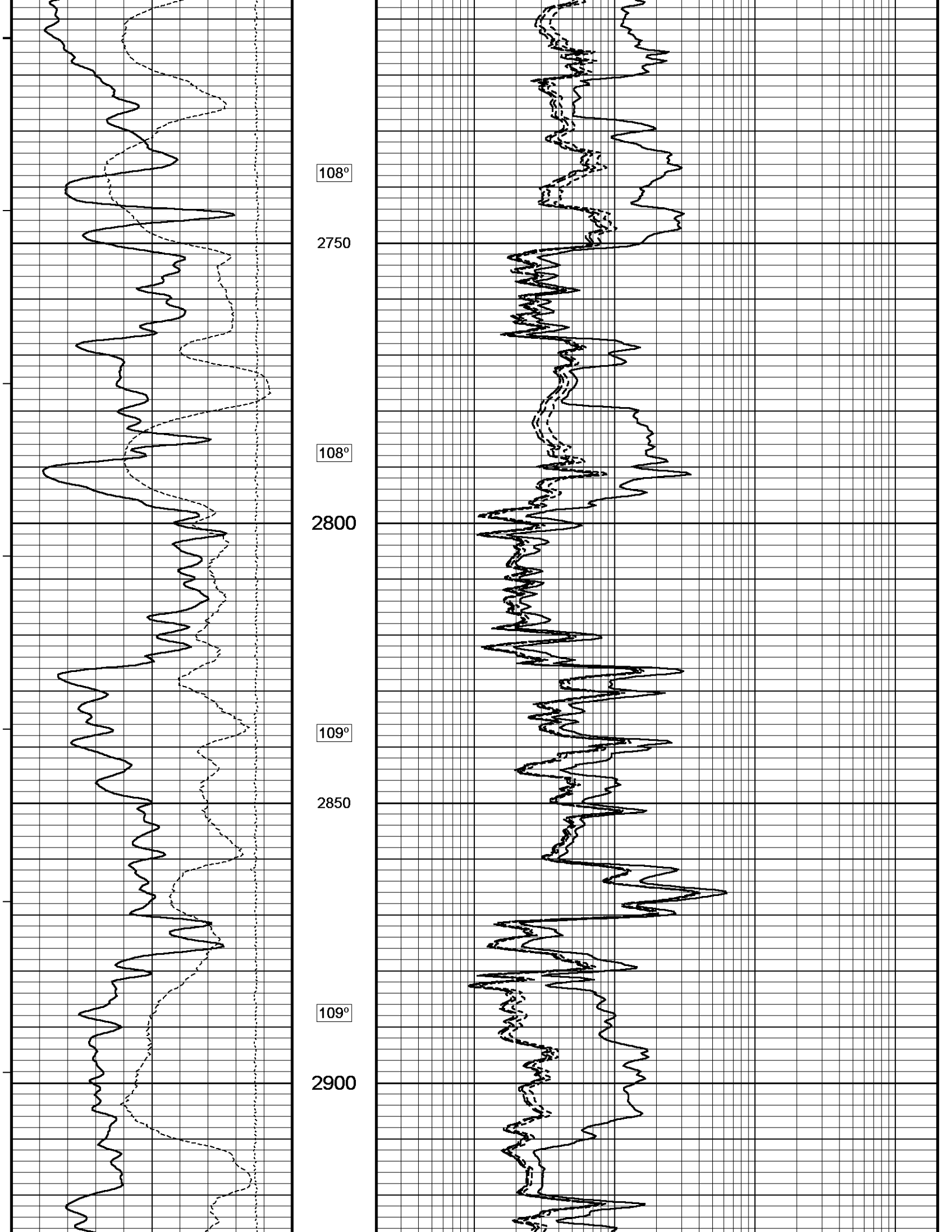

103°
1650
103°
1700
103°
1750
103°
1800

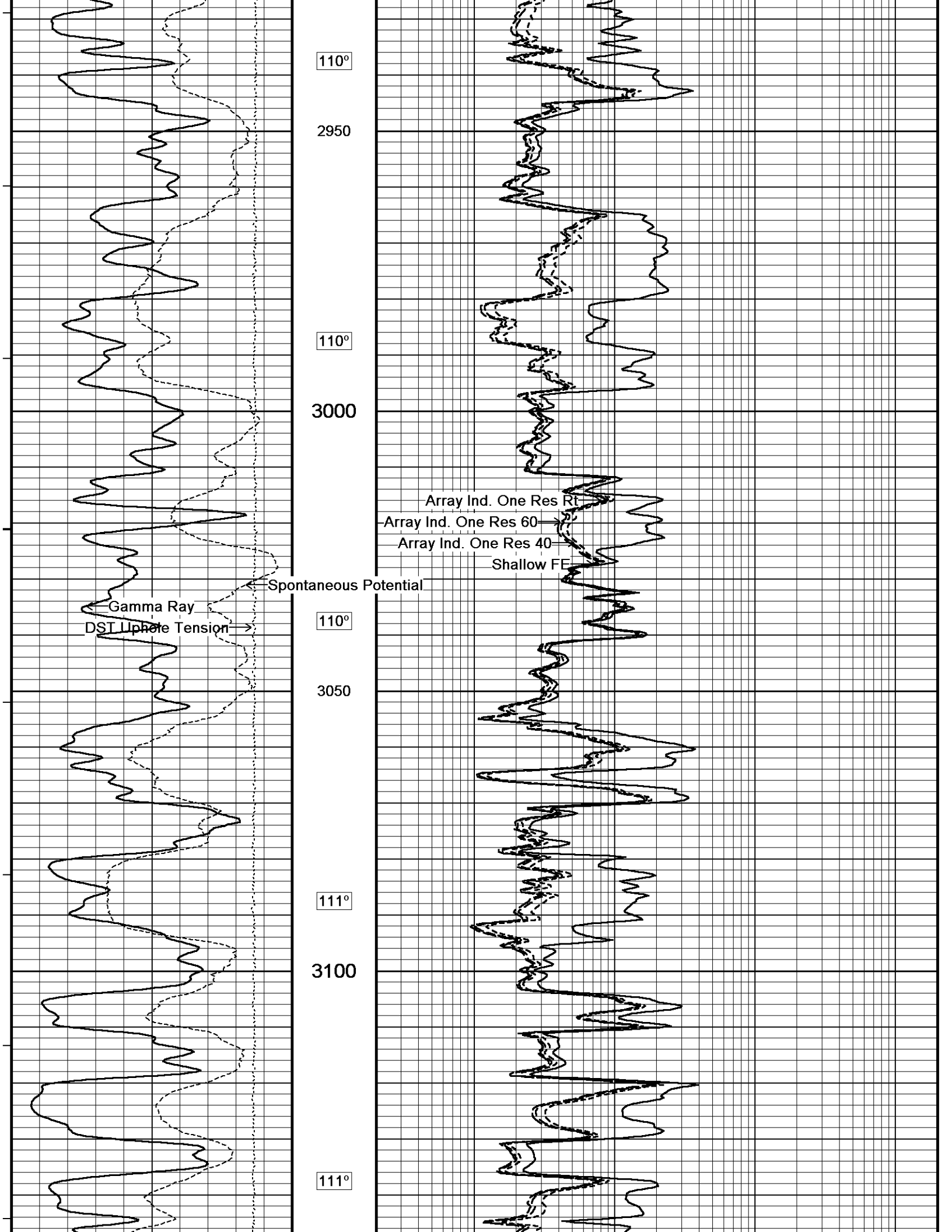

Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
104°
1850
105°
1900
105°
1950
106°
2000
106°

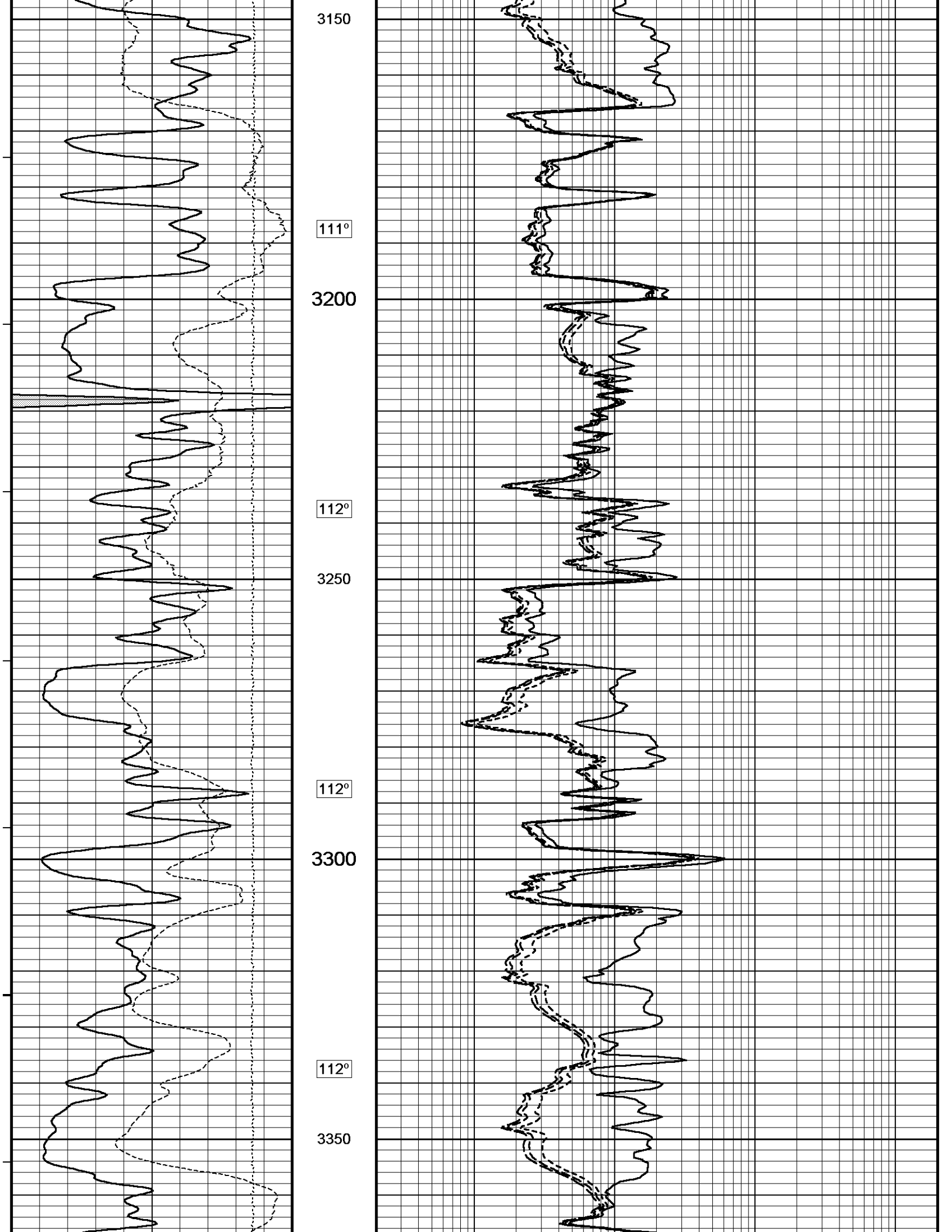

2050
106°
2100
106°
2150
106°
2200
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
106°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
2250

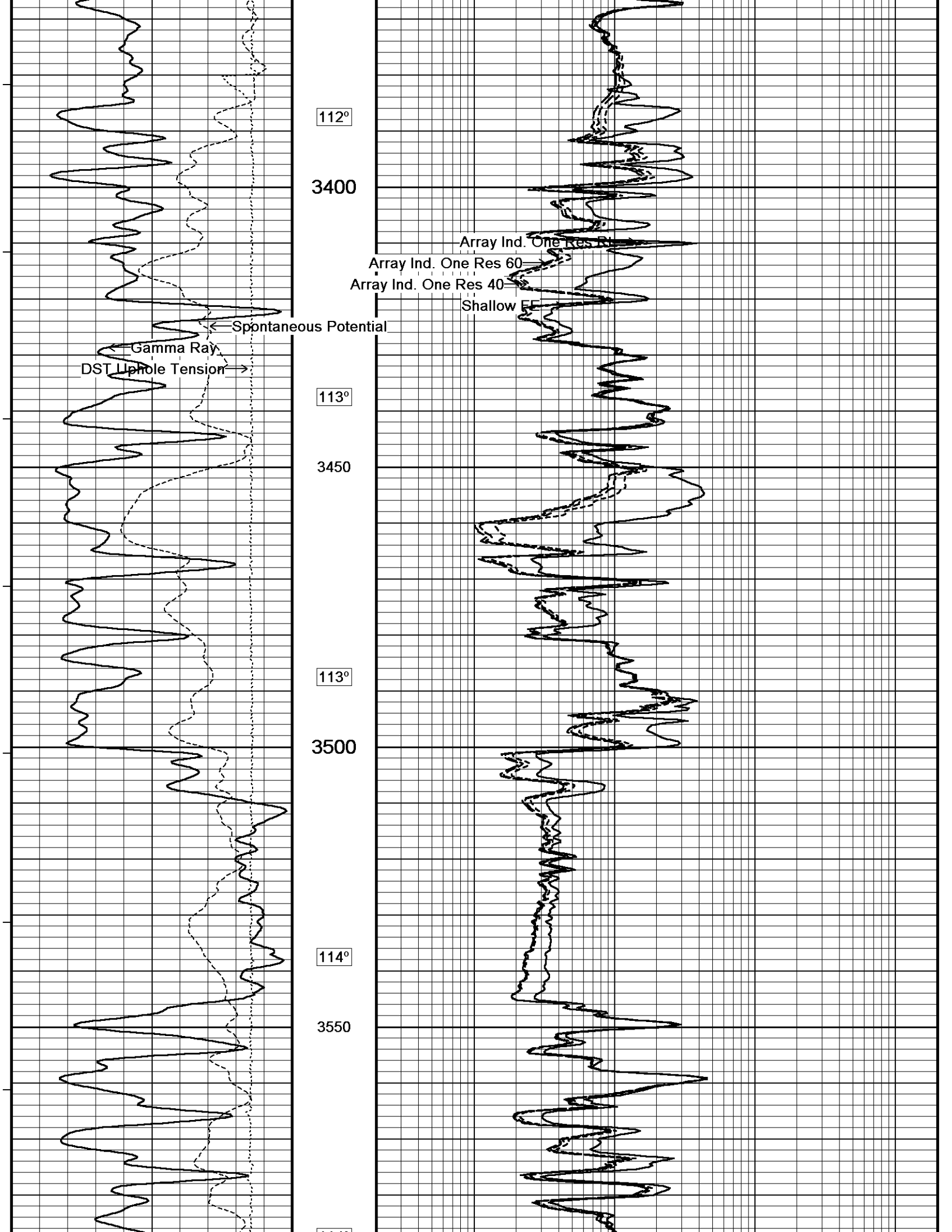

106°
2300
106°
2350
107°
2400
107°
2450

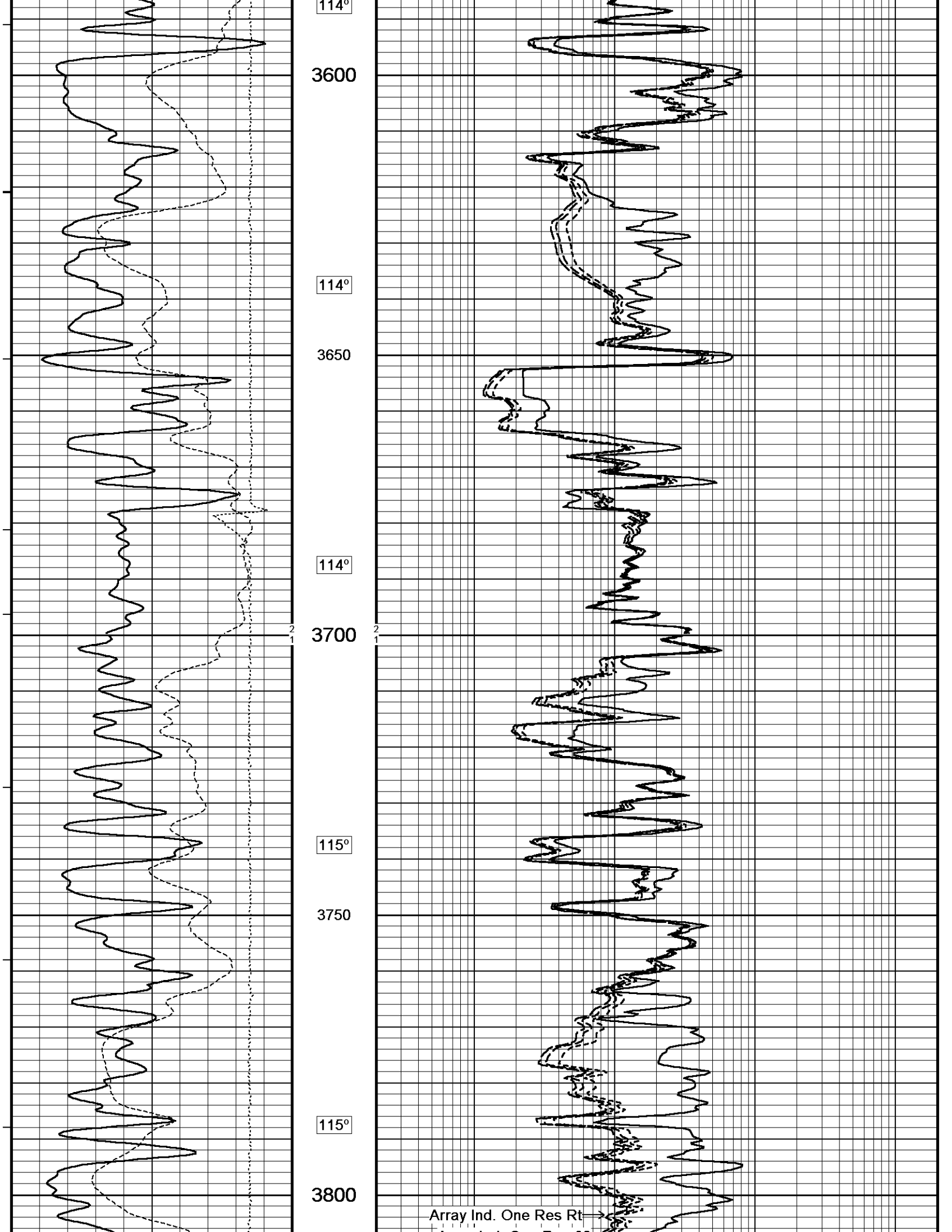

107°
2500
107°
2550
107°
2600
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
107°
2650
108°
2700

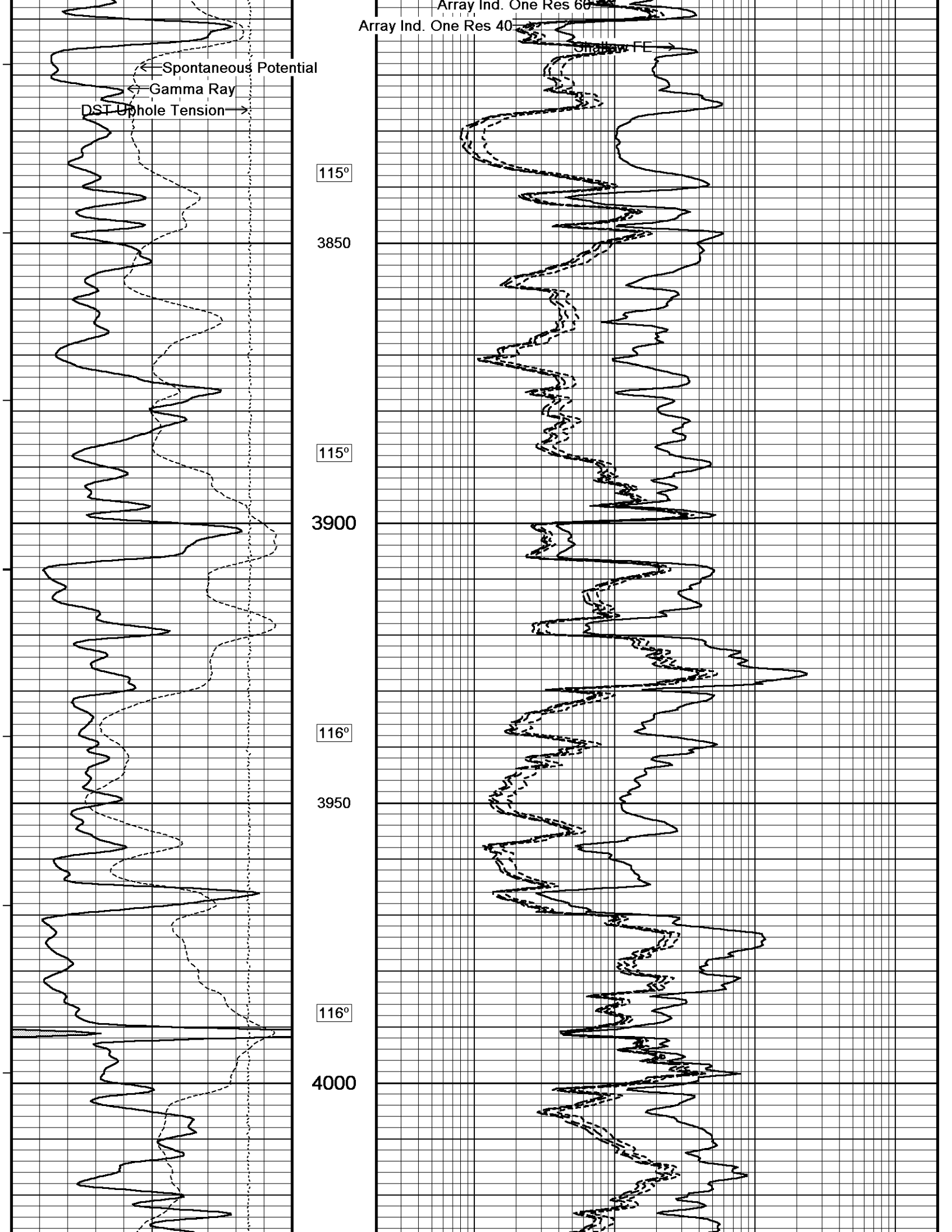

108°
2750
108°
2800
109°
2850
109°
2900

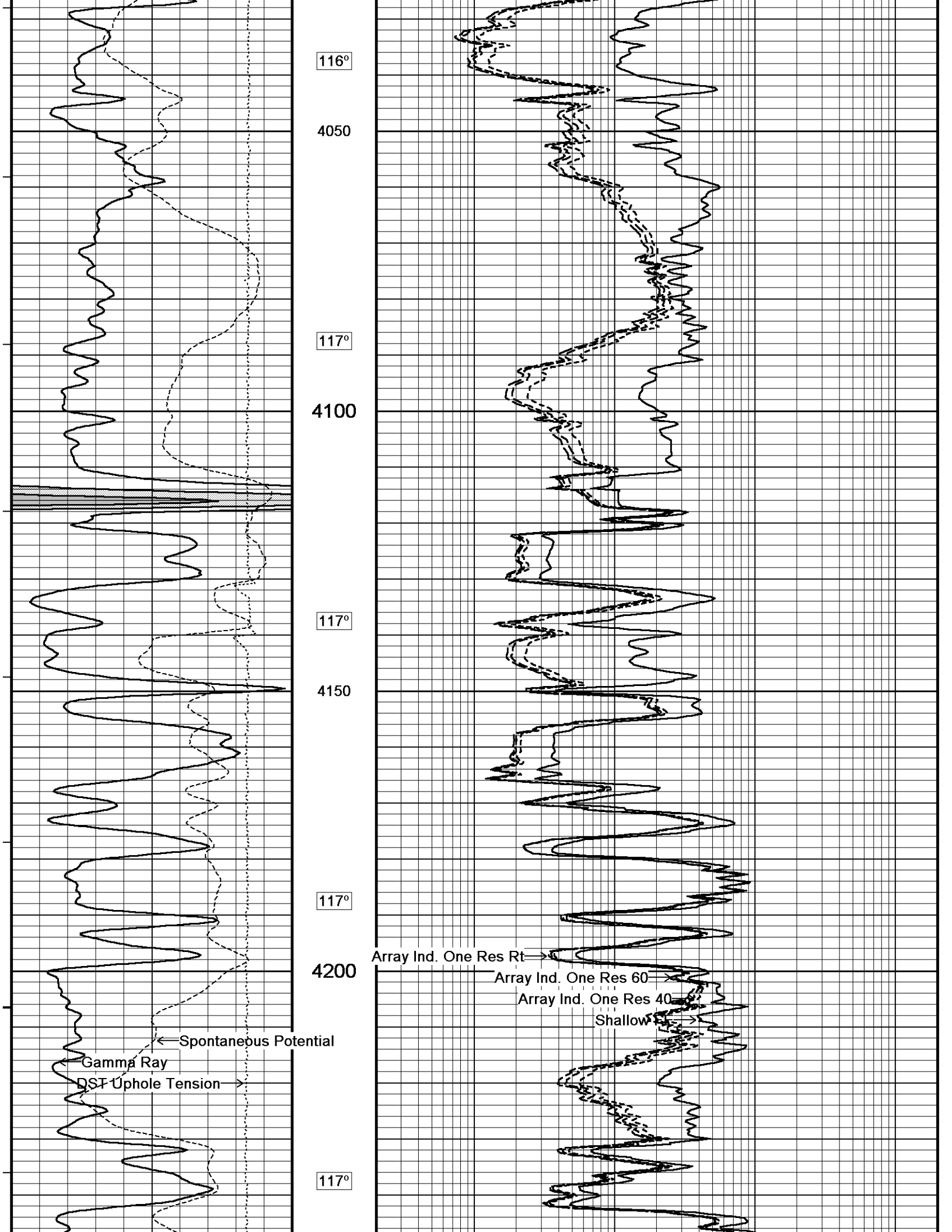

110°
2950
110°
3000
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
110°
3050
111°
3100
111°

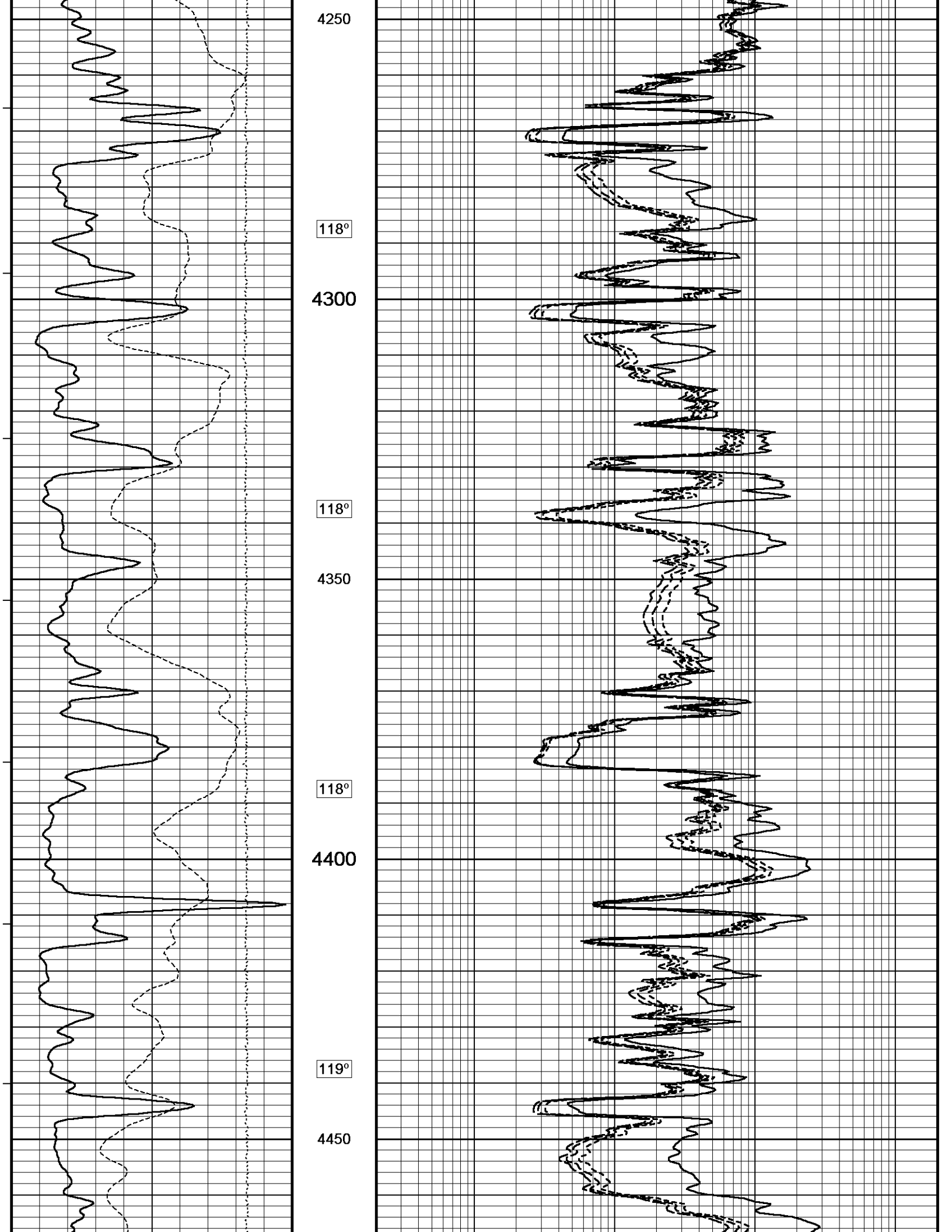

3150
111°
3200
112°
3250
112°
3300
112°
3350

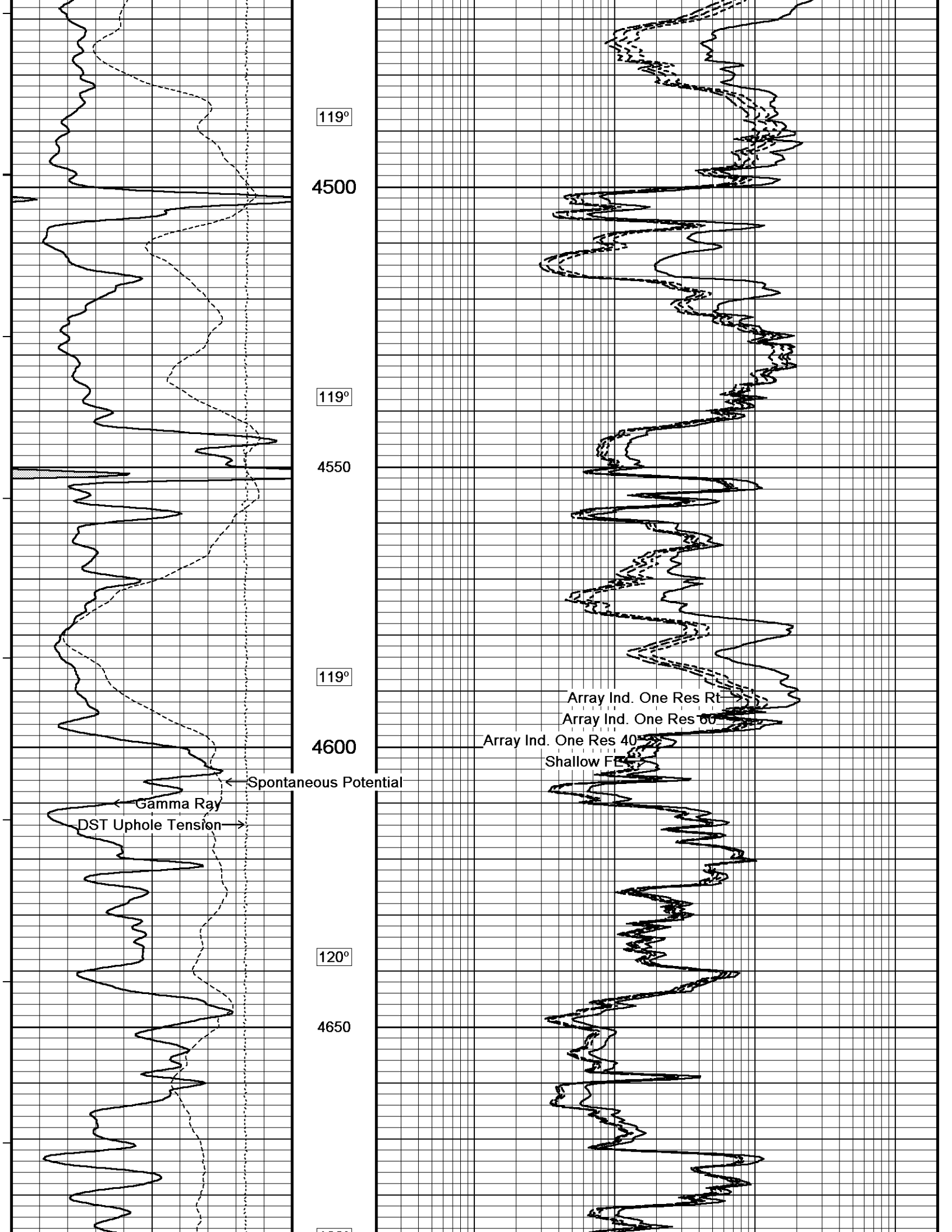

112°
3400
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF
Spontaneous Potential
Gamma Ray
DST Uphole Tension
113°
3450
113°
3500
114°
3550

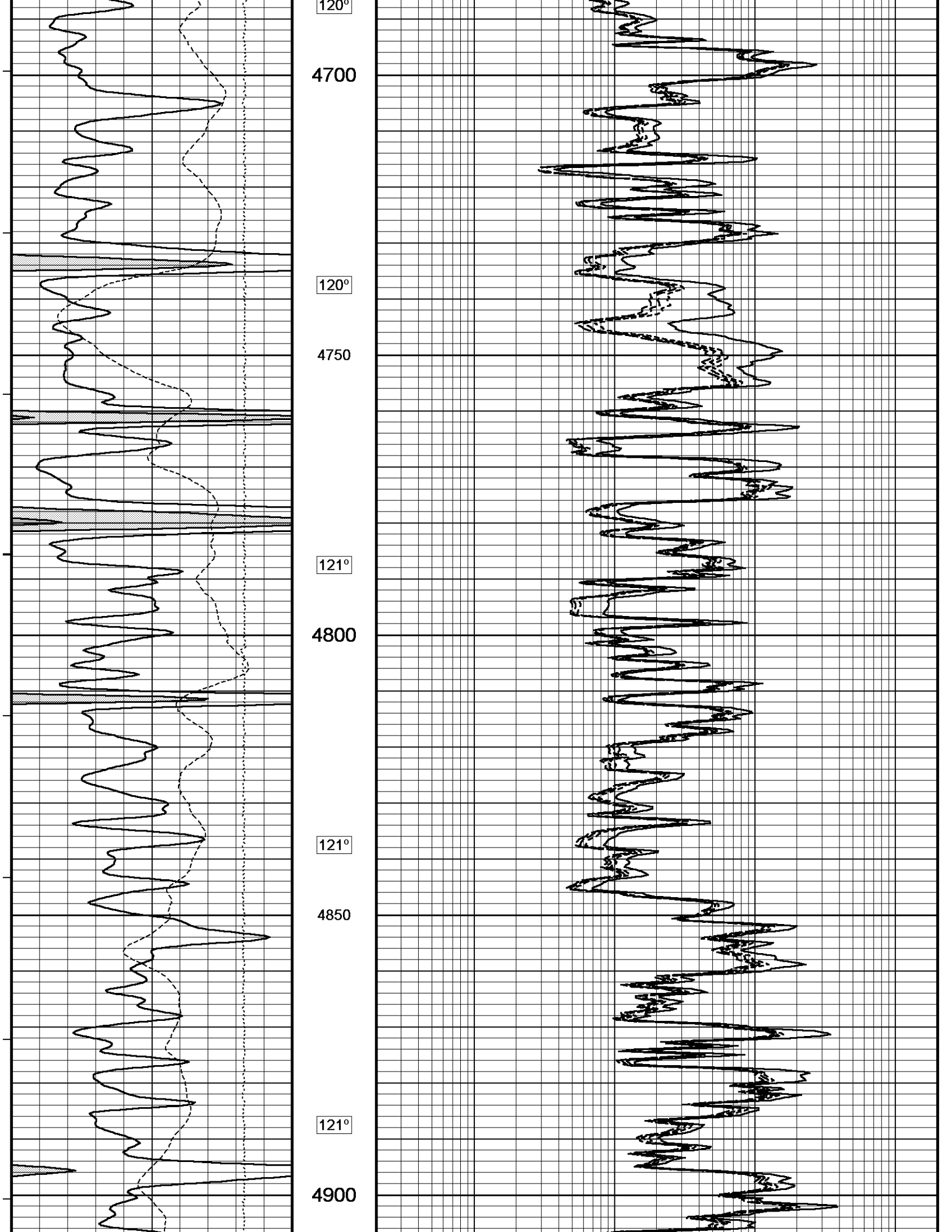

114°
3600
114°
3650
114°
3700
115°
3750
115°
3800
Array Ind. One Res Rt

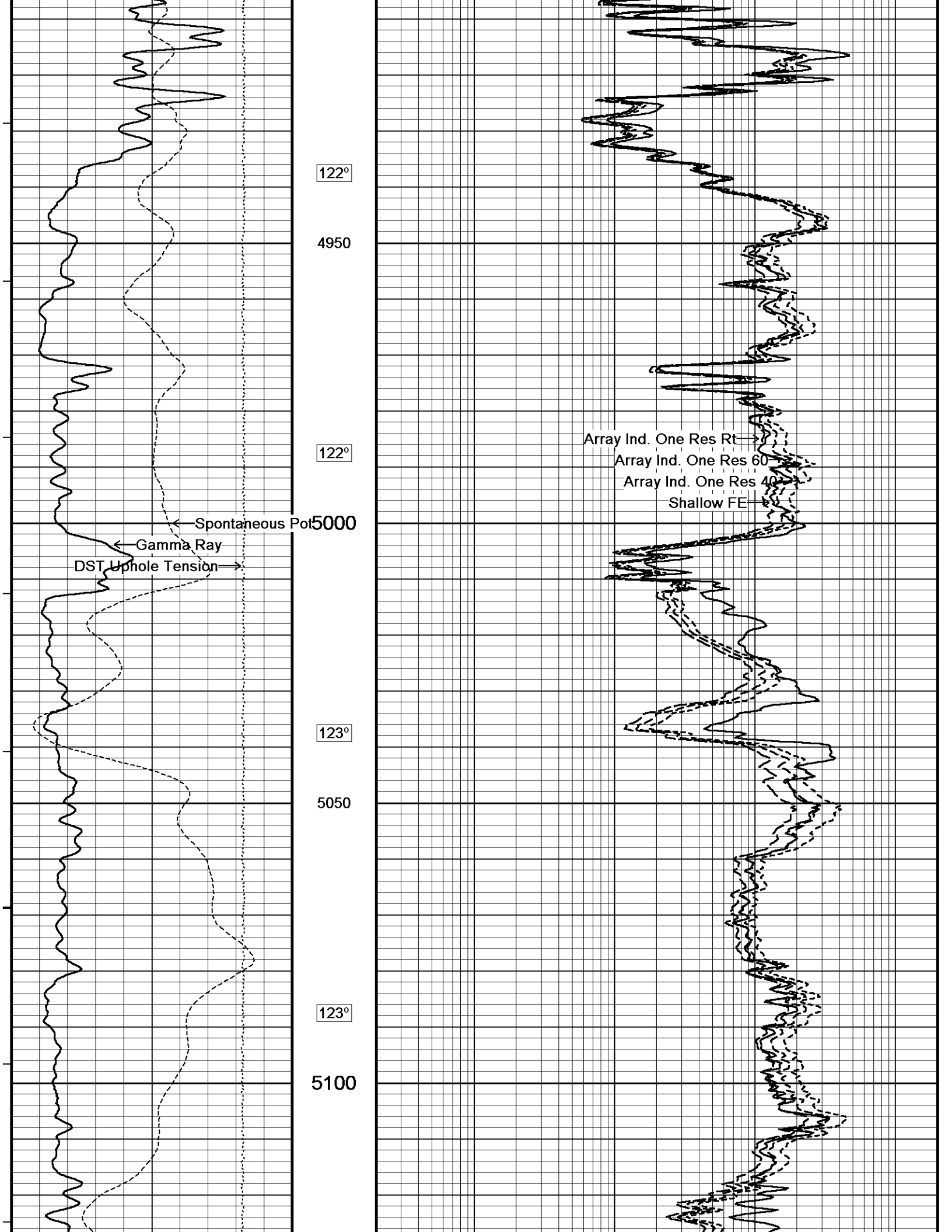

Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
115°
3850
115°
3900
116°
3950
116°
4000

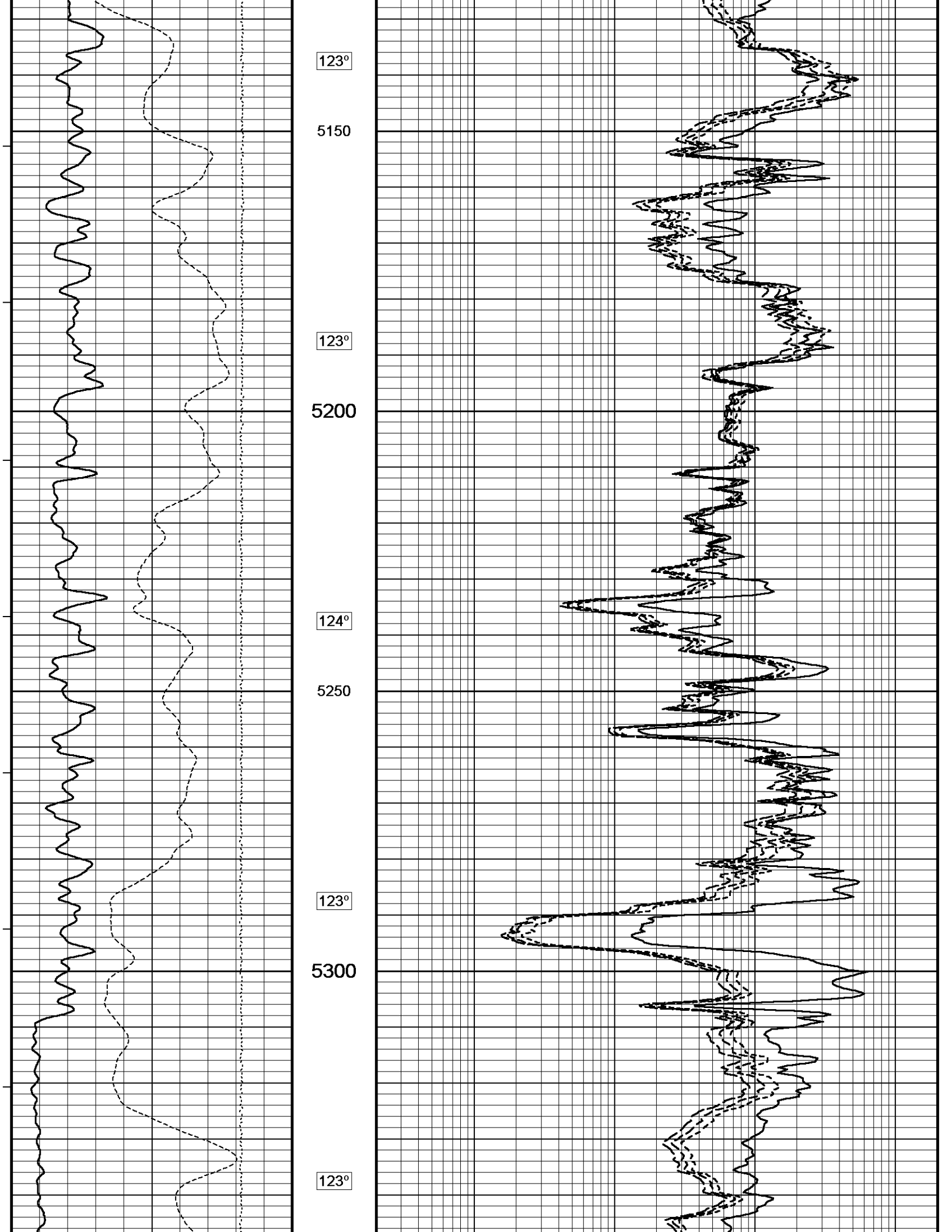

116°
4050
117°
4100
117°
4150
117°
4200
117°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow
Spontaneous Potential
Gamma Ray
DST Uphole Tension

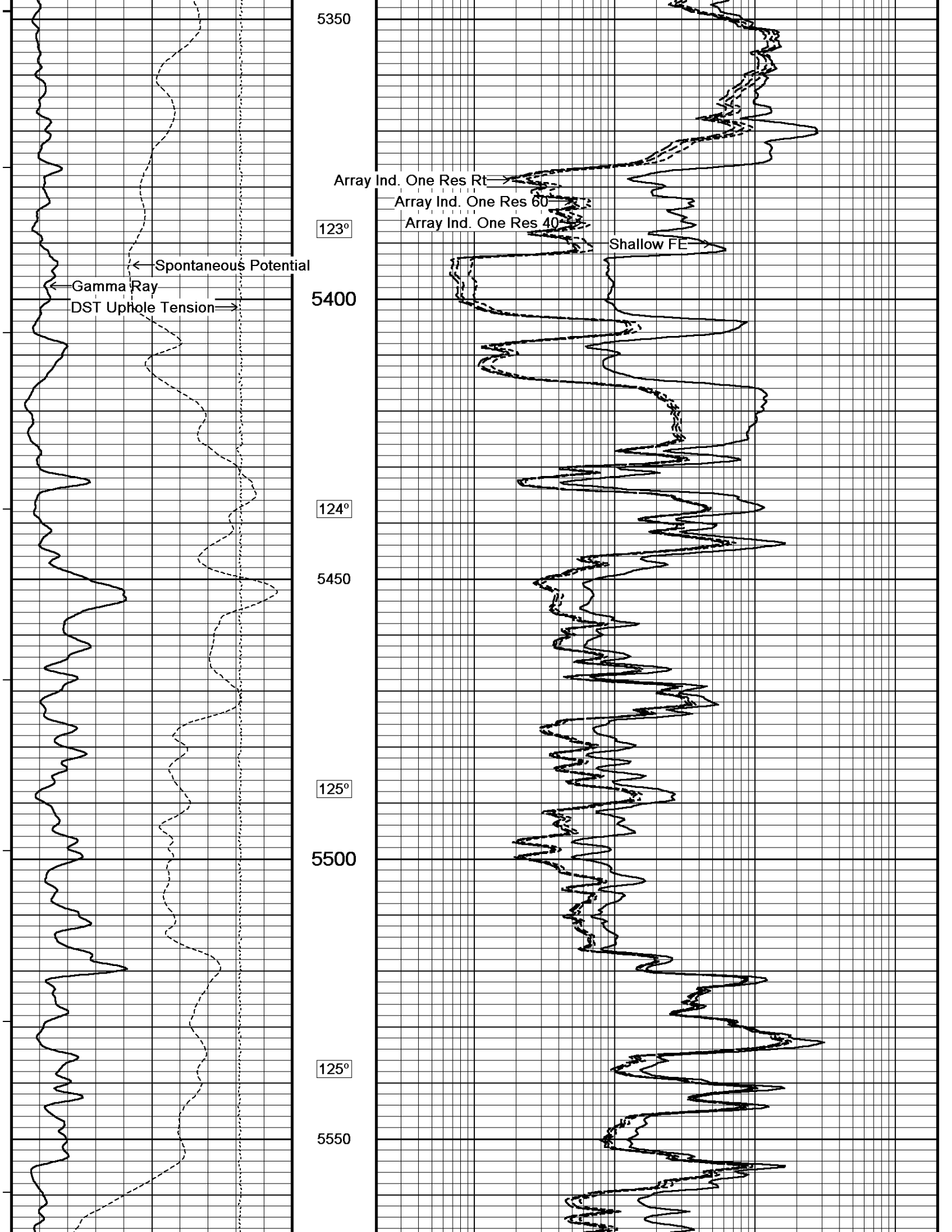

4250
118°
4300
118°
4350
118°
4400
119°
4450

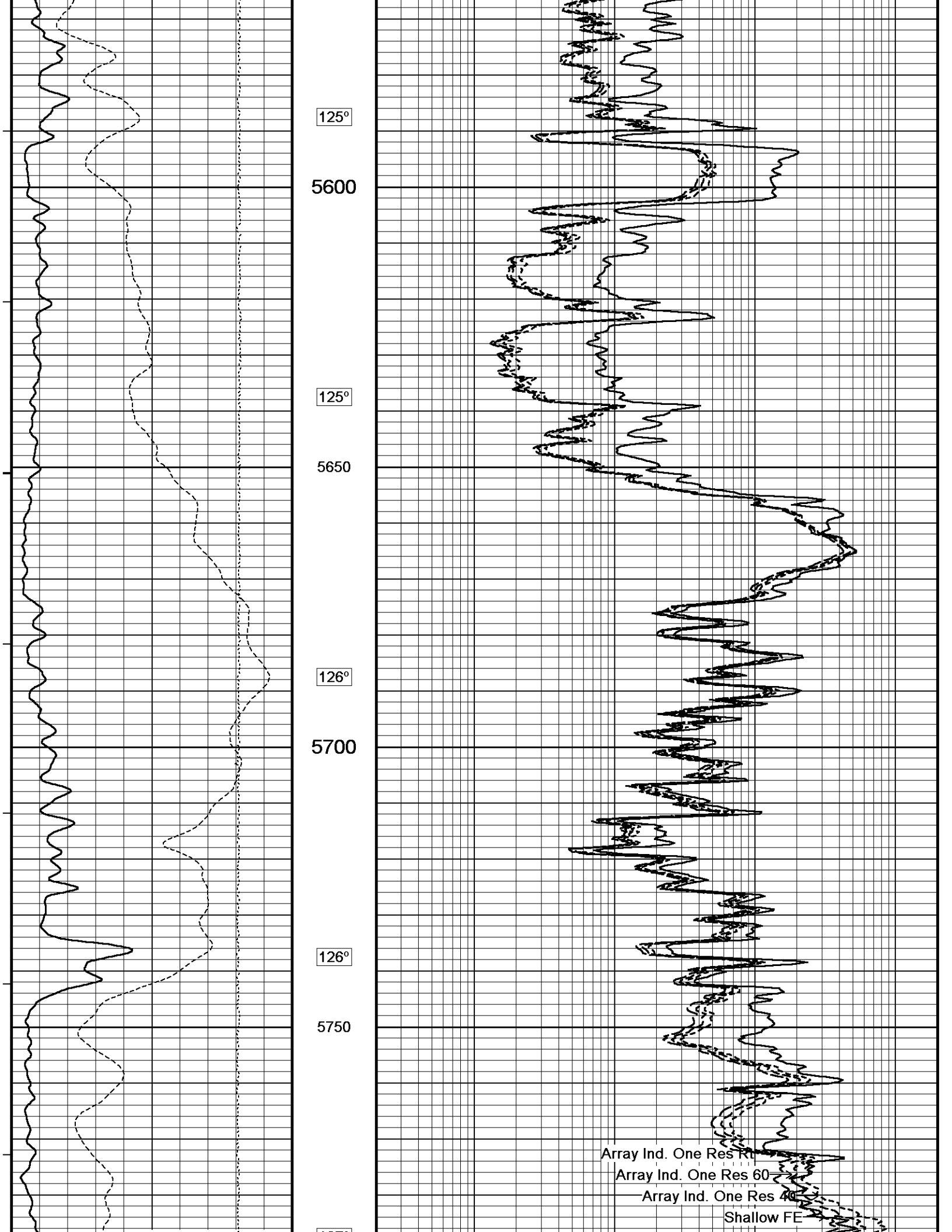

119°
4500
119°
4550
119°
4600
120°
4650
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

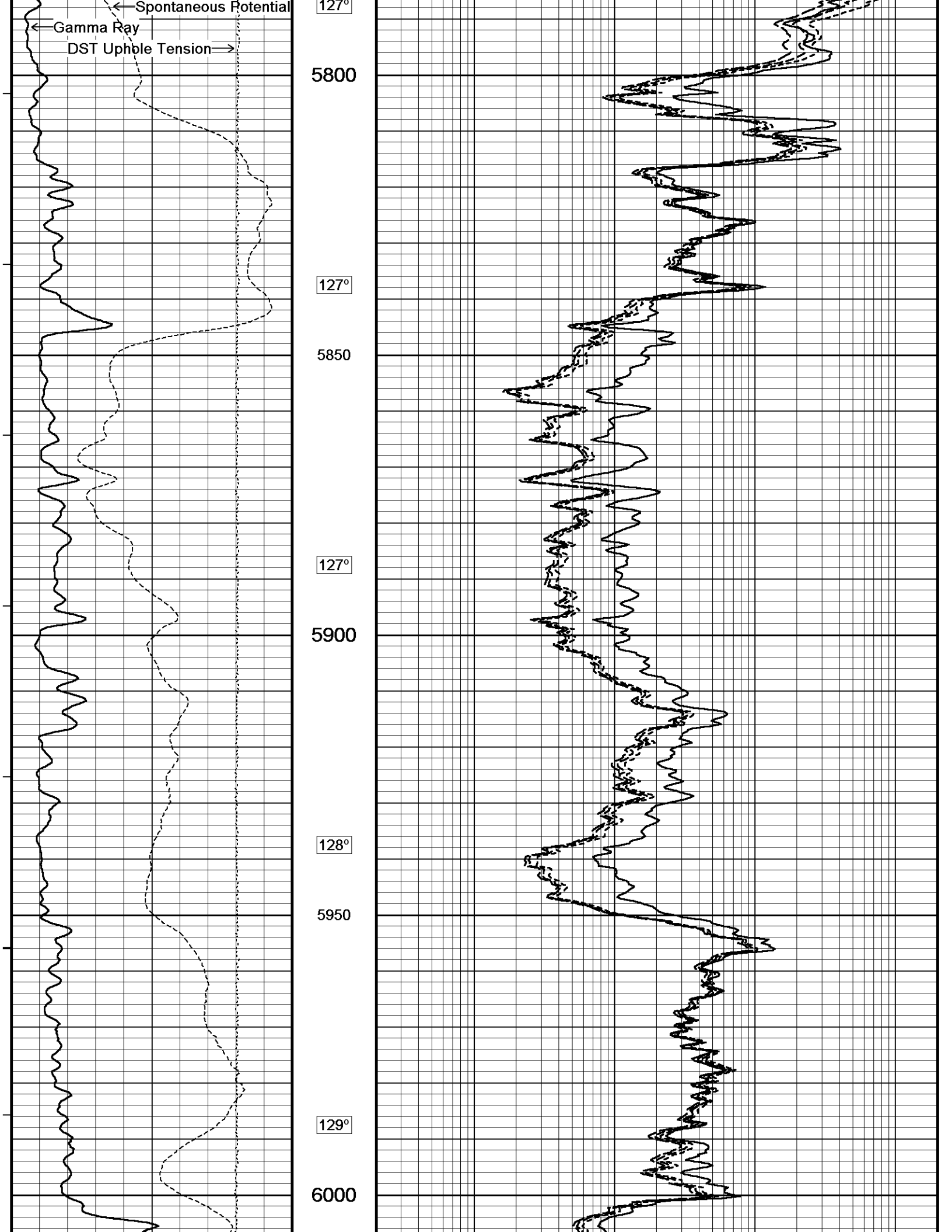

120°
4700
120°
4750
121°
4800
121°
4850
121°
4900

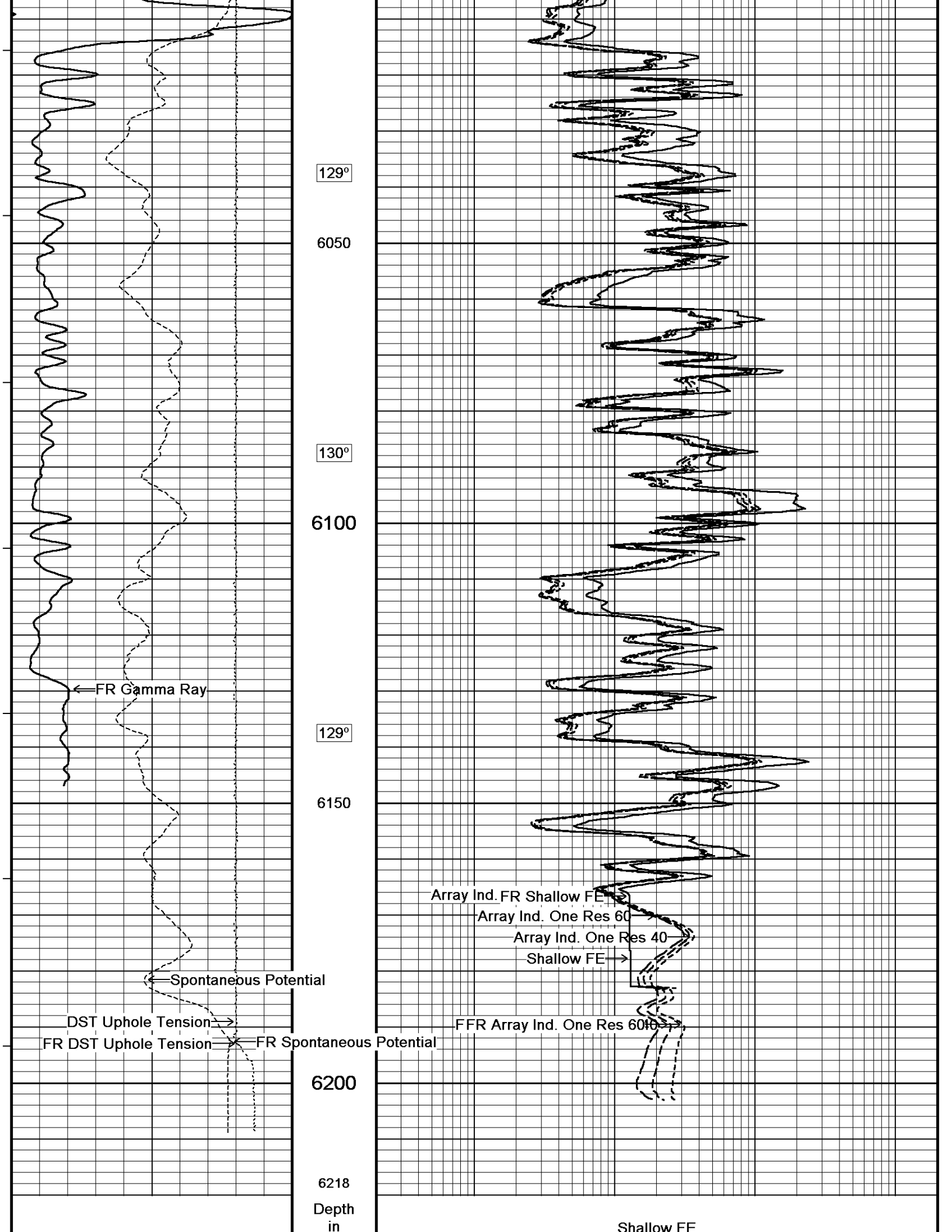

122°
4950
122°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Pot
5000
Gamma Ray
DST Uphole Tension
123°
5050
123°
5100


123°
5150
123°
5200
124°
5250
123°
5300
123°


5350
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
123°
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
5400
124°
5450
125°
5500
125°
5550


125°
5600
125°
5650
126°
5700
126°
5750
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 4
Shallow FE


Spontaneous Potential
Gamma Ray
DST Uphole Tension
127°
5800
127°
5850
127°
5900
128°
5950
129°
6000


129°
6050
130°
6100
129°
6150
6200
6218
Depth
in
FR Gamma Ray
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
FR Spontaneous Potential
Array Ind. FR Shallow FE
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FFR Array Ind. One Res 60
Shallow FE

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

Shallow FE
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res 40
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res 60
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res Rt
ohm metres
0.20 1 10 100 1000 2000

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\M...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta — Recorded on 07-MAY-2012 03:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\Mull Dr...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1.dta — Recorded on 07-MAY-2012 03:22
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

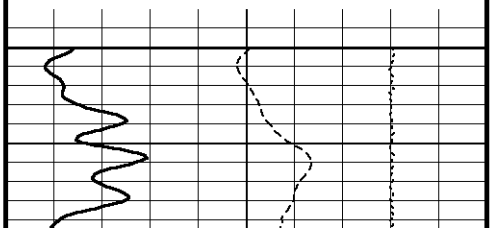
Shallow FE
ohm metres
0.20 1 10 100 1000 2000

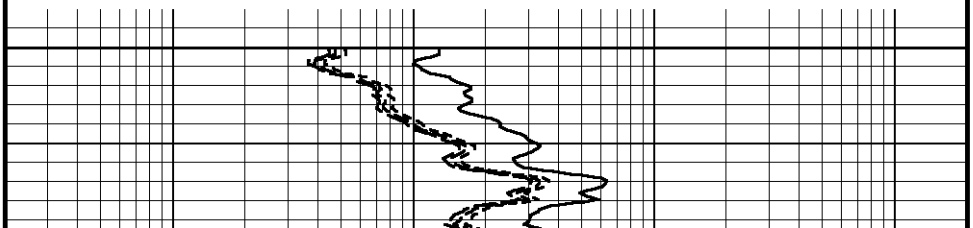
Array Ind. One Res 40
ohm metres
0.20 1 10 100 1000 2000

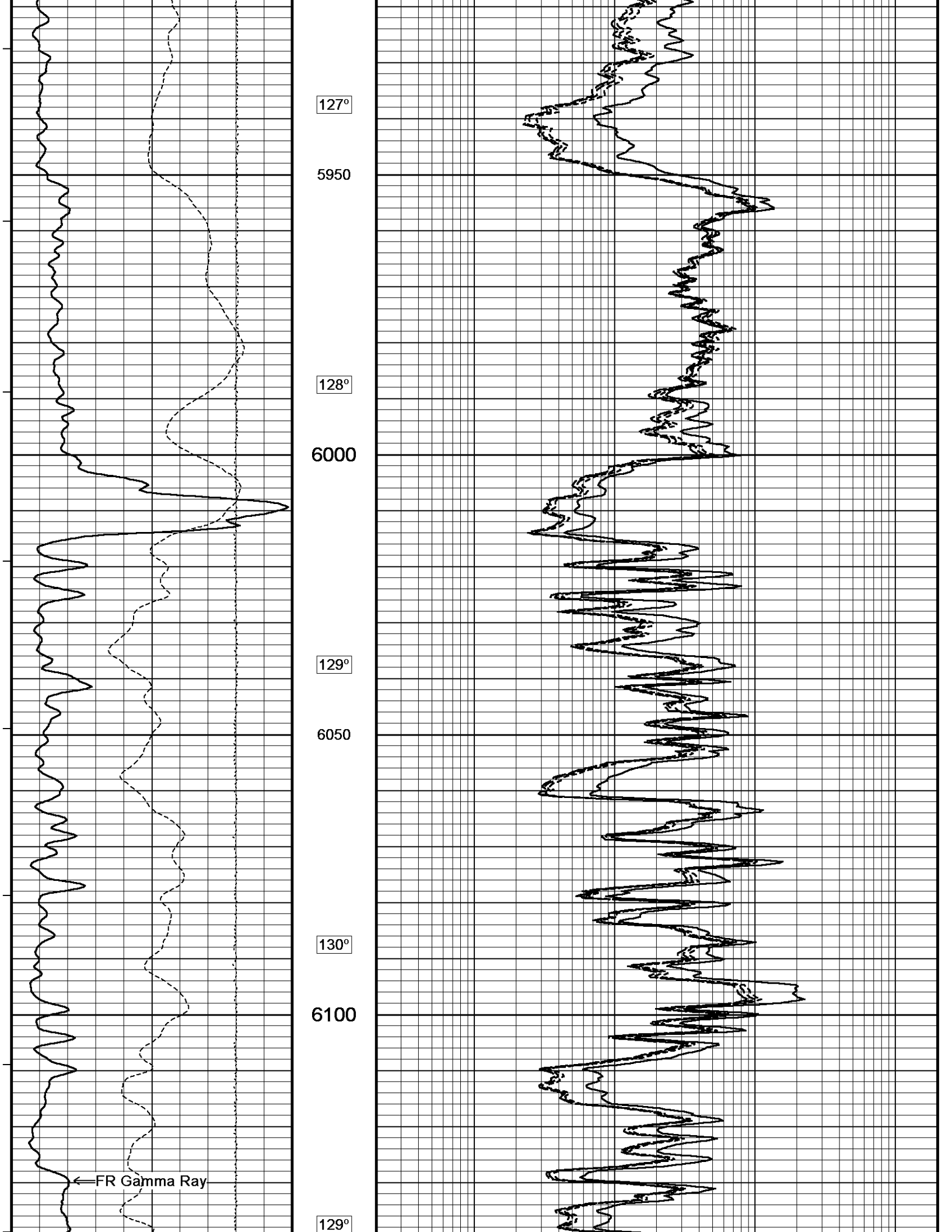
Array Ind. One Res 60
ohm metres
0.20 1 10 100 1000 2000

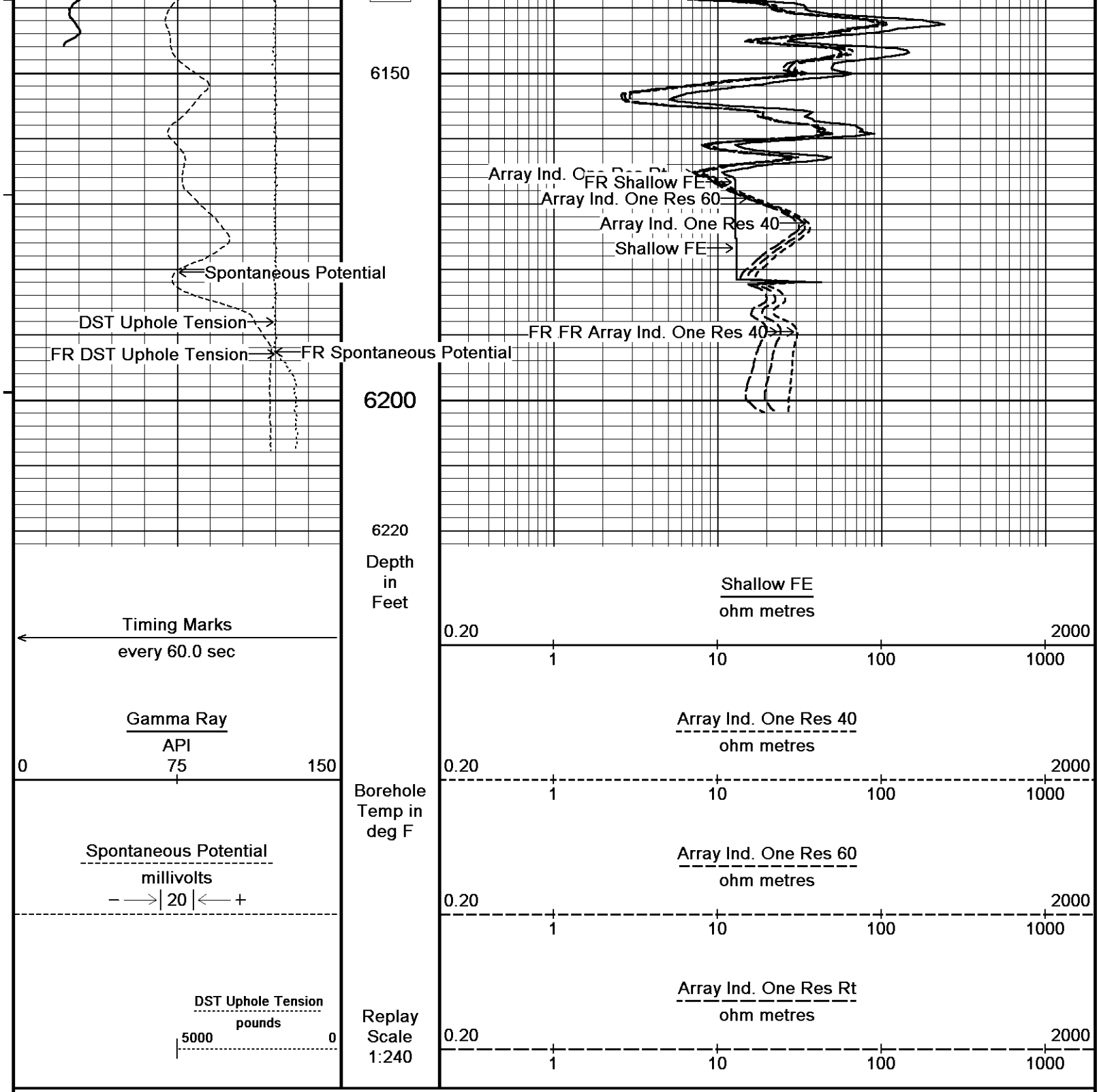
Array Ind. One Res Rt
ohm metres
0.20 1 10 100 1000 2000

5900






127°
5950
128°
6000
129°
6050
130°
6100
129°
⟸FR Gamma Ray



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18

Filename: C:\Minimus 11_03_4044\Data\Mull Dr...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1.dta — Recorded on 07-MAY-2012 03:22

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 11_03_4044\Data\Mull Drilling Company, Inc. Bleumer # 1-13\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta

General Constants All 000 — Last Edited on 07-MAY-2012,02:08

General Parameters		
Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	70.000	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	5.000	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters	
Porosity used	Limestone Density Por.
Resistivity used	Array Ind. One Res Rt
RWA Constant A	1.000
RWA Constant M	2.000

Down-hole Tension Calibration SMS 0

Field Calibration on 23-FEB-2012 23:25

Reading No	Measured	Calibrated (lbs)
1	13693.36	0.00
2	14387.39	407.90

Gamma Calibration MCG-B 39

Field Calibration on 02-APR-2012 14:02

	Measured	Calibrated (API)
Background	74	49
Calibrator (Gross)	752	505
Calibrator (Net)	678	456

Gamma Constants MCG-B 39

Last Edited on 07-MAY-2012,00:51

Gamma Calibrator Number	GRC141	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-B 39

Field Calibration on 02-APR-2012,14:02

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

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 02-APR-2012,14:03

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-B 39

Last Edited on

Pre-filter Length	11

Caliper Calibration MML-A 4

Base Calibration on 0C3170021008,
Field Calibration on 0C4060524000

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15017	5.98
2	18447	7.97
3	21786	9.86
4	25801	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.08	5.98

Micro Normal and Micro Inverse Calibration MML-A 4

Base Calibration on 0C3170023008,
Field Check on 0C4060525000

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.7	78.3	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.9	62.9
Micro Inverse	48.3	48.3

Micro Normal and Micro Inverse Constants MML-A 4

Last Edited on 0C4060A13004,

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches

Neutron Calibration MDN-B.J 387

Base Calibration on 0C31C0938008
Field Check on 0C4060537000

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2956	91	3714	110
Ratio	32.635		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2214	3169
Ratio	0.699	

Field Check

	Calibrated (cps)	
	2202	3182
Ratio	0.692	

Neutron Constants MDN-B.J 387

Last Edited on 07-MAY-2012,00:51

Neutron Source Id	P0204NN	
Neutron Jig Number	NEDC117	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	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
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 0C31B0831004
Field Check on 0C4060523000

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.7	126.8
Base Check		281.5
Field Check		281.5

FE Constants MFE-B.J 352

Last Edited on 07-MAY-2012,00:52

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.	MCG External Temperature	
Stand-off	0.5	inches

Sonic Constants MSS-A.A 126

Last Edited on 07-MAY-2012,00:53

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft

Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A

Peak Amplitude Source N/A

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing N/A

Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	N/A
N/A	N/A	N/A	
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A	
Use 4' Waveform to derive TR	N/A	
Use 5' Waveform to derive TR	N/A	
Use 6' Waveform to derive TR	N/A	
3' Waveform Discriminator Level	N/A	mV
4' Waveform Discriminator Level	N/A	mV
5' Waveform Discriminator Level	N/A	mV
6' Waveform Discriminator Level	N/A	mV
3' Waveform Filter	N/A	
4' Waveform Filter	N/A	
5' Waveform Filter	N/A	
6' Waveform Filter	N/A	
Semblance Level	N/A	
Semblance Window Width	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

Induction Calibration MAI-A.A 178

Base Calibration on 0C31B0B06000,
Field Check on 0C4060521000

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	17.6	484.7	9.3	966.2
2	6.2	391.4	7.6	821.4
3	4.0	264.5	5.2	566.0
4	2.3	135.1	2.6	279.2

Array Temperature 77.0 Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	12.3	3762.6
2	0.0	0.0	29.6	3466.9
3	0.0	0.0	27.3	3014.1

4	0.0	0.0	18.8	2064.7	
Deep	0.0	0.0	15.9	1995.3	
Medium	0.0	0.0	40.3	3955.3	
Shallow	0.0	0.0	45.3	5081.7	
Array Temperature		0.0		72.7	Deg F

Induction Constants MAI-A.A 178

Last Edited on 07-MAY-2012,03:16

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	8.0000	
Stand-off Fin Angle	45.00	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	

High Resolution Temperature Calibration MAI-A.A 178

Field Calibration on 0C4030110004,

	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	68.00	68.00

High Resolution Temperature Constants MAI-A.A 178

Last Edited on 0C4060522000,

Pre-filter Length	11

Caliper Calibration MPD-B 35

Base Calibration on 0C31C0A2C008
Field Calibration on 0C4060527000

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	20688	3.99
2	30944	5.98
3	41312	7.97
4	50976	9.86
5	61184	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.99	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 0C31C0B00008
Field Check on 0C406052B000

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	62298	31871	59556	30836
Reference 2	26887	2863	24941	2541

Field Check at Base

1142.9	1359.1

Field Check

1145.7	1361.2

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	204	1008		
Reference 1	23049	62096	0.374	0.371
Reference 2	7079	26739	0.267	0.272

Field Check at Base

204.4	1008.1

Field Check

206.4	1011.8

Density Constants MPD-B 35

Last Edited on 07-MAY-2012,00:52

Density Source Id	18235B	
Nylon Calibrator Number	DNCE695	
Aluminium Calibrator Number	DACD698	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.13	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

Spectral Gamma Calibration SGS-E.J 150

Base Calibration on 14-NOV-2011,14:14
Field Calibration on 14-NOV-2011,14:09

Base Calibration

Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	204.7	109.8	22.0	0.9	1.3
Calibrator (Net)	124.8	86.7	19.7	0.2	-0.1

	K %	U ppm	Th ppm
Concentrations	5.8	0.0	0.0

Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	480.7	164.8	14.5	7.2	4.1
Calibrator (Net)	400.8	141.7	12.3	6.5	2.7

	K %	U ppm	Th ppm
Concentrations	0.0	9.8	0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	397.7	137.8	11.3	6.3	15.0
Calibrator (Net)	317.8	114.7	9.0	5.6	13.6

	K %	U ppm	Th ppm
Concentrations	0.0	0.0	44.3

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	914.0	361.7	43.2	12.9	17.8
Calibrator (Net)	834.0	338.5	41.0	12.1	16.4

Field Calibration

Gamma Ray

	Measured	Calibrated (API)
Background	112	23
Calibrator (Gross)	1354	273
Calibrator (Net)	1242	250

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	914.0	361.7	43.2	12.9	17.8
Calibrator (Net)	834.0	338.5	41.0	12.1	16.4

Spectral Gamma Constants SGS-E.J 150

Last Edited on 30-APR-2012,12:03

Mixture Calibrator Number	147-1	
Potassium Calibrator Number	148-1	
Uranium Calibrator Number	150-1	
Thorium Calibrator Number	149-1	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

DOWNHOLE EQUIPMENT

C:\Minimus 11_03_4044\Data\Mull Drilling Company, Inc. Bleumer # 1-13\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta

MCB-A.A 11B Tension Cablehead
MCB-A.A 161 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

SHA-F Compact Swivel Head Adaptor
SHA-F 59 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

Compact Comms Gamma
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

- 63.17 ft GRGC - Gamma Ray
- 60.26 ft CGXT - MCG External Temperature

Spectral Gamma Ray Sub
SGS-E.J 150 LG: 7.78 ft WT: 105.8 lb OD: 3.54 in

- 53.70 ft GCGR - Uranium Stripped Gamma
- 53.70 ft GRSG - SGS Gamma Ray

Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

- 45.76 ft MINV - Micro-inverse
- 45.76 ft MNRL - Micro-normal
- 46.76 ft MLTC - MML Caliper

Compact Neutron

- 40.97 ft NPRL - Limestone Neutron Por.

MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

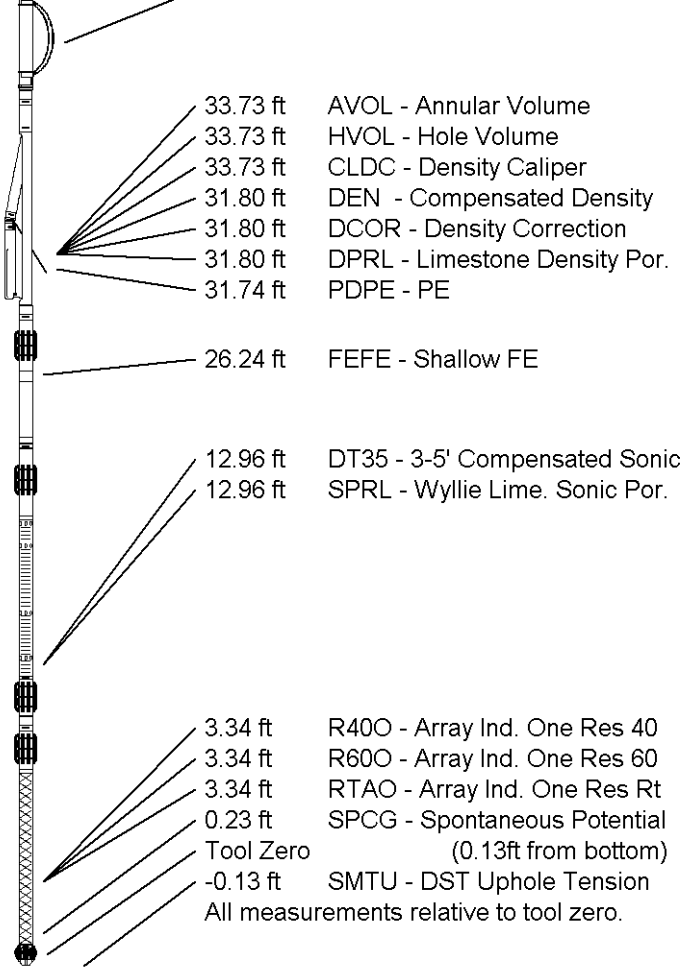
Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 178 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 73.59 ft Weight: 608.5 lb



33.73 ft	AVOL - Annular Volume
33.73 ft	HVOL - Hole Volume
33.73 ft	CLDC - Density Caliper
31.80 ft	DEN - Compensated Density
31.80 ft	DCOR - Density Correction
31.80 ft	DPRL - Limestone Density Por.
31.74 ft	PDPE - PE
26.24 ft	FEFE - Shallow FE
12.96 ft	DT35 - 3-5' Compensated Sonic
12.96 ft	SPRL - Wyllie Lime. Sonic Por.
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	RTAO - Array Ind. One Res Rt
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	MULL DRILLING COMPANY, INC.
WELL	BLEUMER # 1-13
FIELD	WILDCAT
PROVINCE/COUNTY	GRAY COUNTY
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2785.00	feet	First Reading	6190.00	feet
Elevation Drill Floor	2783.00	feet	Depth Driller	6200.00	feet
Elevation Ground Level	2772.00	feet	Depth Logger	6193.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

40 Years of Wireline 1970 2010

COMPANY	MULL DRILLING COMPANY, INC.								
WELL	BLEUMER # 1-13								
FIELD	WILDCAT								
PROVINCE/COUNTY	GRAY COUNTY								
COUNTRY/STATE	U.S.A. / KANSAS								
LOCATION	2112' FNL & 778' FWL								
	SW/4 NW/4								
SEC	TWP	RGE	Other Services						
13	26S	30W	MPD/MDN						
API Number	15-069-20371		MSS						
Permanent Datum G.L. Elevation 2772 feet			MML						
Log Measured From KB									
Drilling Measured From K.B.									
Date	07-MAY-2012								
Run Number	ONE								
Depth Driller	6200.00	feet							
Depth Logger	6193.00	feet							
First Reading	6190.00	feet							
Last Reading	462.00	feet							
Casing Driller	464.00	feet							
Casing Logger	462.00	feet							
Bit Size	7.875	inches							
Hole Fluid Type	CHEMICAL								
Density/Viscosity	9.40	lbm/Usg	57.00	CP					
PH/Fluid Loss	8.50		8.00	ml/30Min					
Sample Source	FLOWLINE								
Rm @ Measured Temp	0.87 @ 70.0	ohm-m							
Rmf @ Measured Temp	0.70 @ 70.0	ohm-m							
Rmc @ Measured Temp	1.04 @ 70.0	ohm-m							
Source Rmf/Rmc	CALC		CALC						
Rm @ BHT	0.49 @ 129.0	ohm-m							
Time Since Circulation	5 HOURS								
Max Recorded Temp	130.00	deg F							
Equipment Name	COMPACT								
Equipment/ Base	13096	LIB							
Recorded By	A. GAMBALVO								
Witnessed By	PAUL GERLACH								
S.O. / JOB #	3534535								
	LB12-115								

Weatherford

ARRAY INDUCTION
SHALLOW FOCUS
ELECTRIC LOG

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18

Filename: C:\Minimus 11_03_4044\Data\Mull ...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta — Recorded on 07-MAY-2012 03:49

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
−→ 20 ←+

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:600

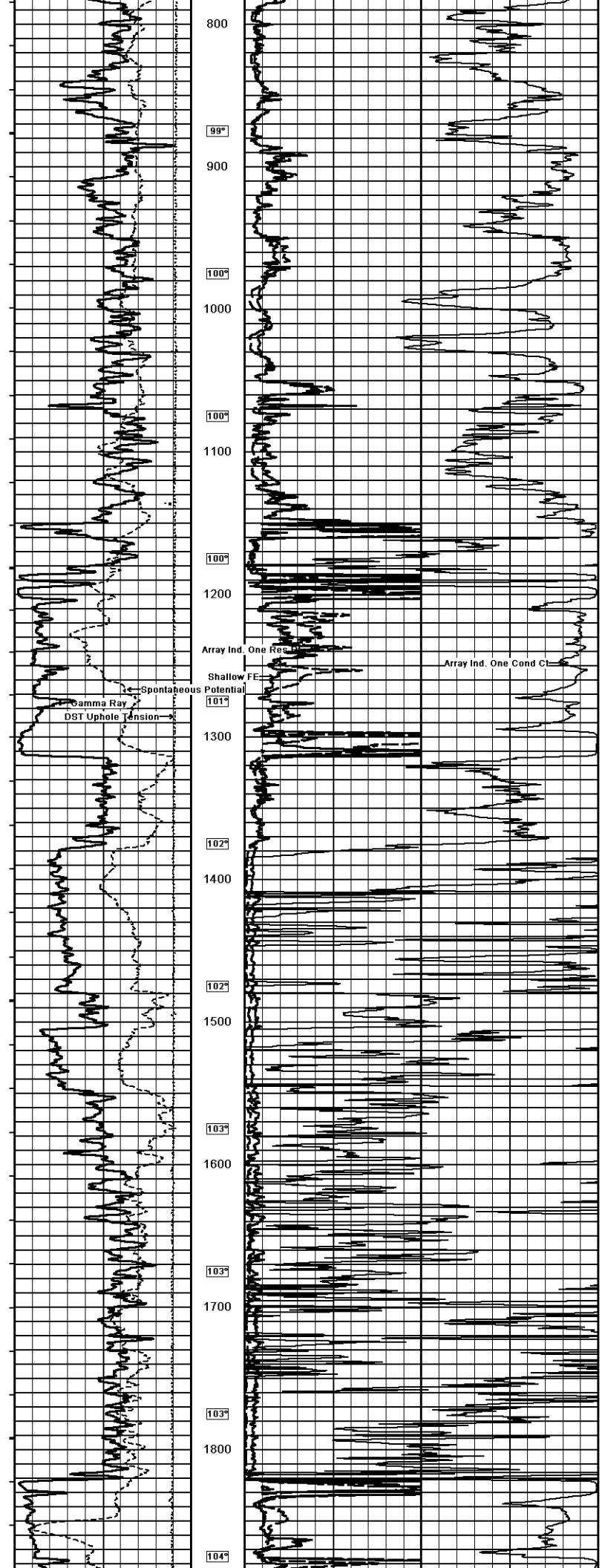
Array Ind. One Cond Ct
mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

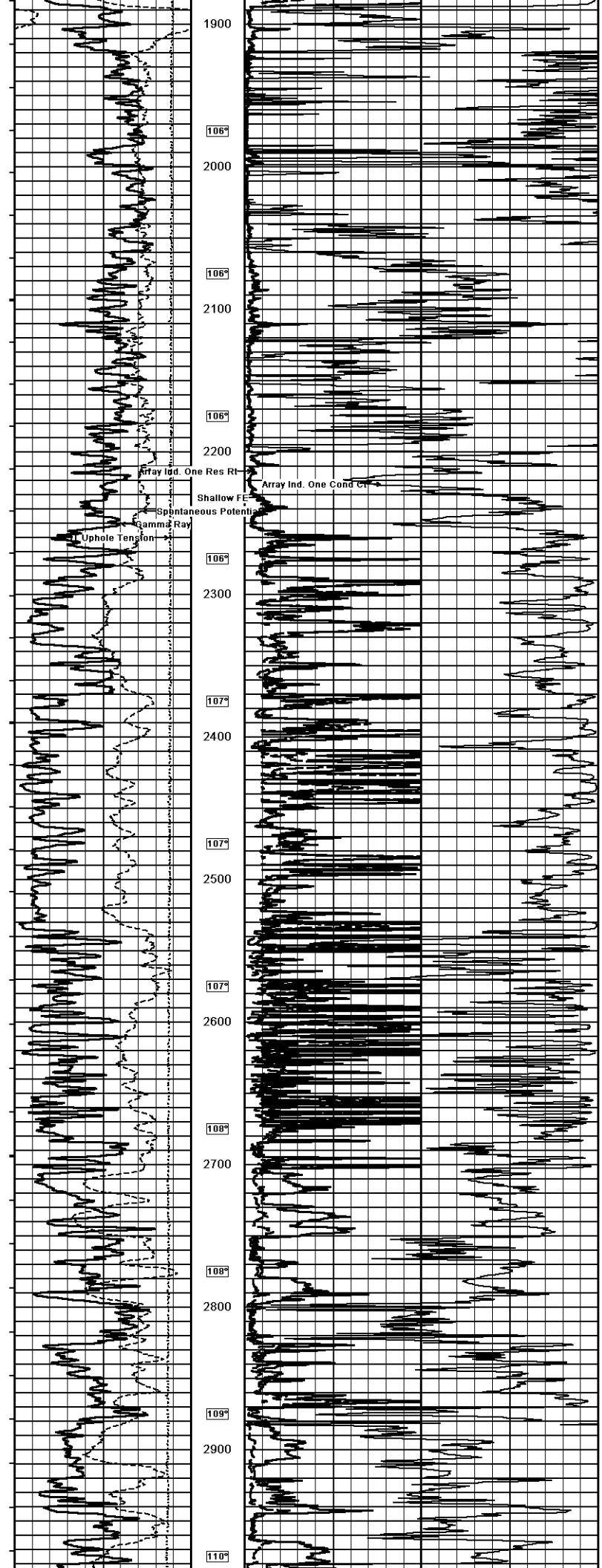
Shallow FE
ohm metres
0 25 50
0 250 500

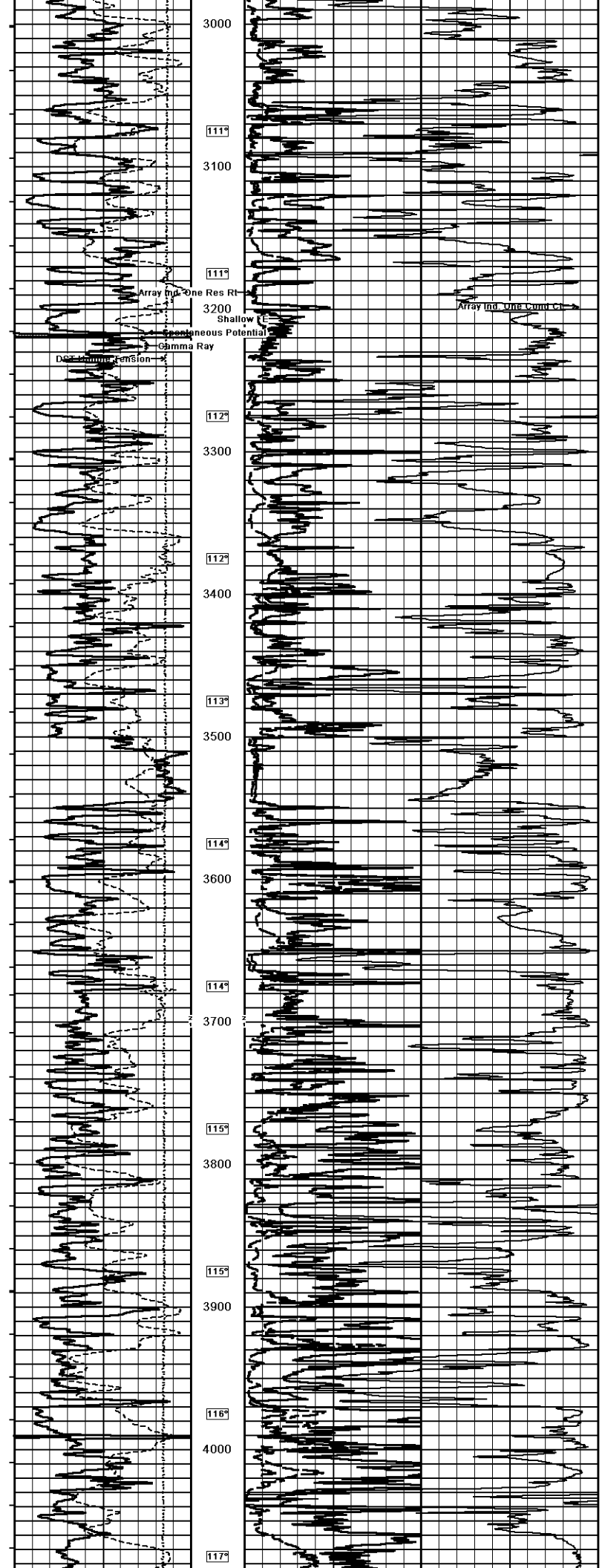
Array Ind. One Res Rt
ohm metres
0 25 50
0 250 500

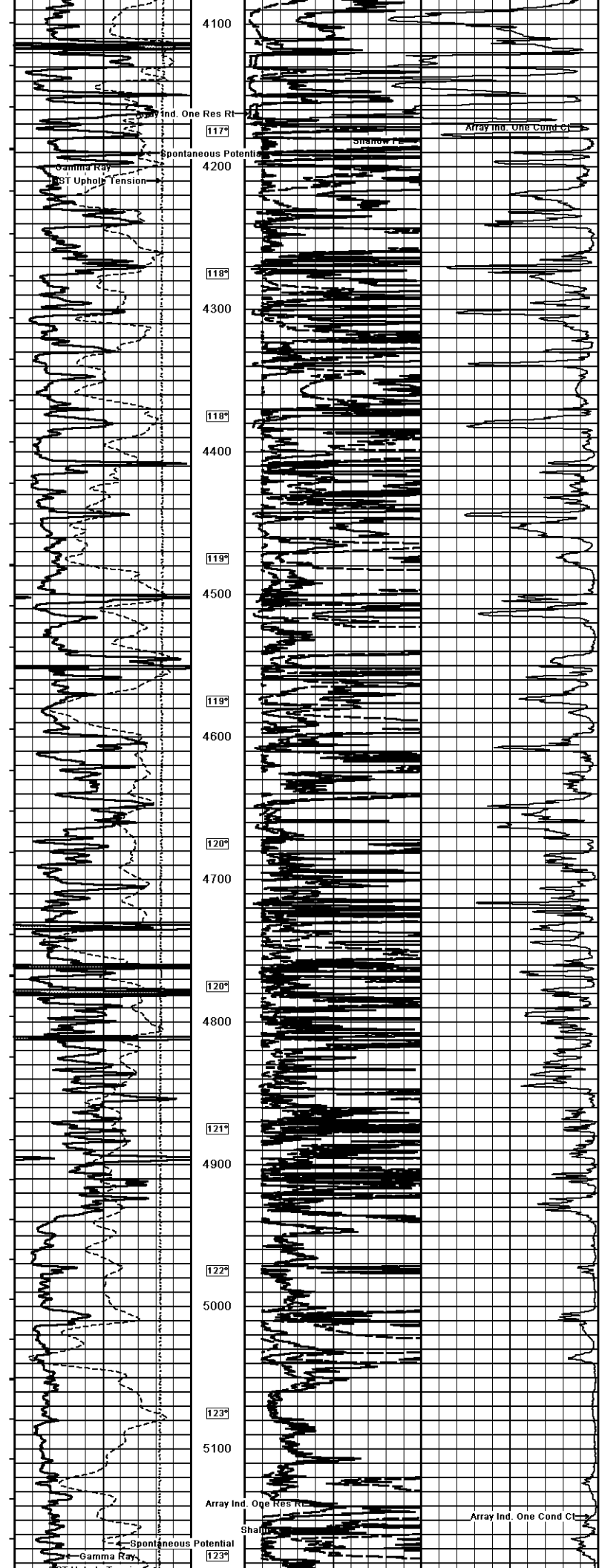
10
100
200
300
400
Casing Shoe
96°
500
97°
600
98°
700
98°

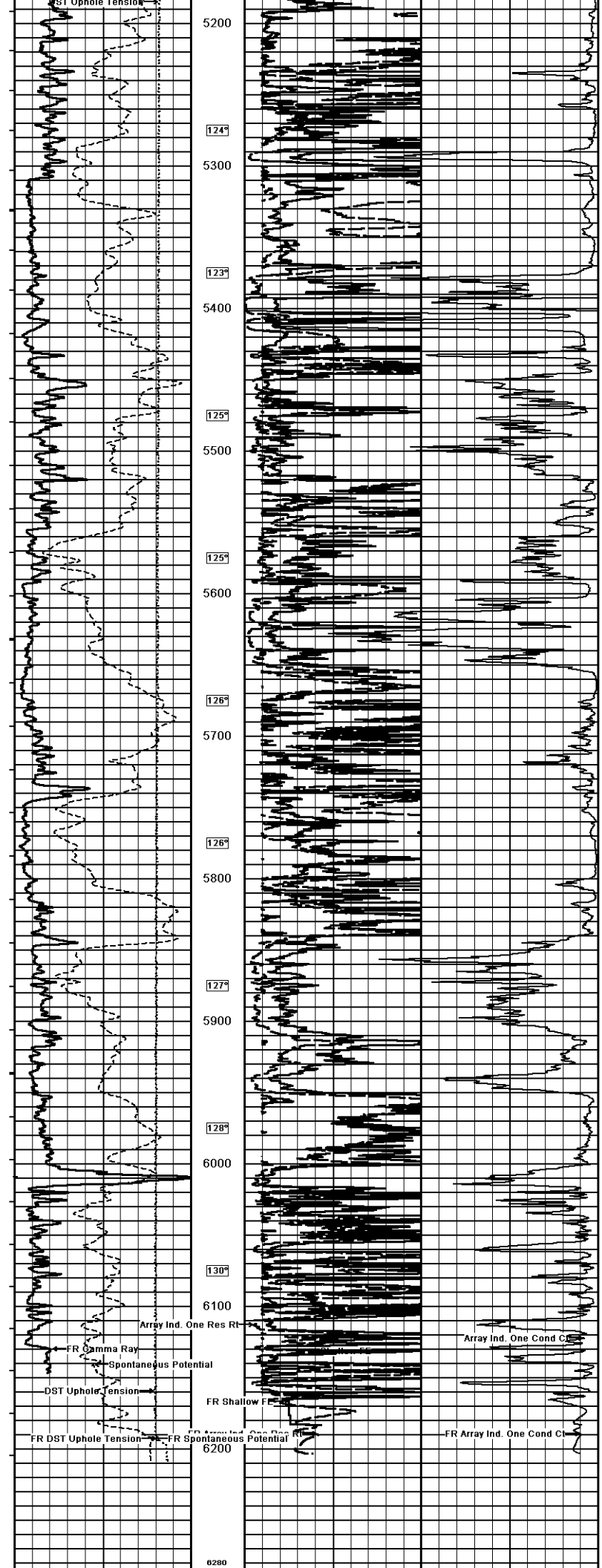
Gamma Ray
DST Uphole Tension

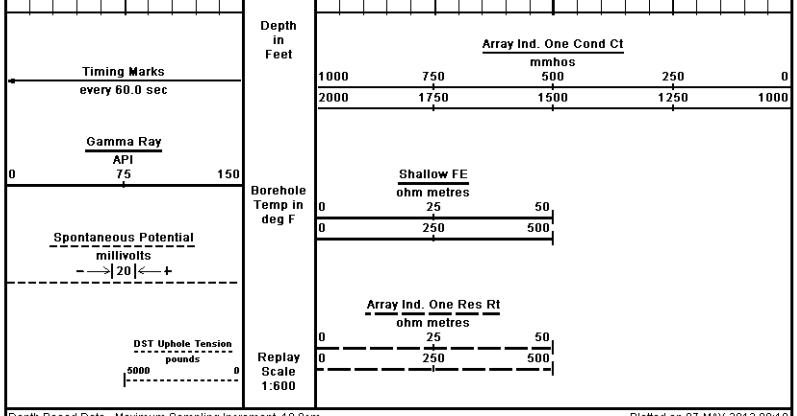

800
99°
900
100°
1000
100°
1100
100°
1200
Array Ind. One Res
Array Ind. One Cond
Shallow FE
Spontaneous Potential
101°
Gamma Ray
DST Uphole Tension
1300
102°
1400
102°
1500
103°
1600
103°
1700
103°
1800
104°


1900
106°
2000
106°
2100
106°
2200
Array Ind. One Res Rt
Array Ind. One Cond Cl
Shallow FE
Spontaneous Potentia
Gamma Ray
Uphole Tension
106°
2300
107°
2400
107°
2500
107°
2600
108°
2700
108°
2800
109°
2900
110°


3000
111°
3100
111°
Array Ind. One Res Rt
3200
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
Dep Hdmne Tension
112°
3300
112°
3400
113°
3500
114°
3600
114°
3700
115°
3800
115°
3900
116°
4000
117°


4100
Array Ind. One Res Rt
117"
Array Ind. One Cond Ct
Shallow Ft
Spontaneous Potential
4200
Gamma Ray
MST Uphole Tension
118"
4300
118"
4400
119"
4500
119"
4600
120"
4700
120"
4800
121"
4900
122"
5000
123"
5100
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow
Spontaneous Potential
Gamma Ray
123"


DST Uphole Tension
5200
124°
5300
123°
5400
125°
5500
125°
5600
126°
5700
126°
5800
127°
5900
128°
6000
130°
6100
Array Ind. One Res Rt
FR Gamma Ray
Spontaneous Potential
DST Uphole Tension
FR Shallow Fl
FR DST Uphole Tension
FR Spontaneous Potential
Array Ind. One Cond Ct
FR Array Ind. One Cond Ct
6200
6280



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 07-MAY-2012 08:18
Filename: C:\Minimus 11_03_4044\Data\Mull ...\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1_001.dta — Recorded on 07-MAY-2012 03:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

1 INCH MAIN

COMPANY	MULL DRILLING COMPANY, INC.
WELL	BLEUMER # 1-13
FIELD	WILDCAT
PROVINCE/COUNTY	GRAY COUNTY
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2785.00	feet	First Reading	6190.00	feet
Elevation Drill Floor	2783.00	feet	Depth Driller	6200.00	feet
Elevation Ground Level	2772.00	feet	Depth Logger	6193.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

40 Wireline