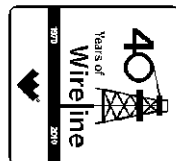




Weatherford[®]

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY CISCO OPERATING LLC.
WELL MFWF UNIT # 14
FIELD MISSOURI FLATS NORTHEAST
PROVINCE/COUNTY GOVE
COUNTRY/STATE U.S.A. / KANSAS
LOCATION 2300' FNL & 335' FWL



SEC	TWP	RGE	Other Services	Elevations:
22	14S	28W	MPD/MDN	KB 2586.00
API Number	15-063-21916	MML		DF 2584.00
Permit Number				GL 2575.00
Permanent Datum G.L., Elevation 2575 feet				
Log Measured From KB				
Drilling Measured From KB				
Date	05-DEC-2011			
Run Number	ONE			
Depth Driller	4200.00	feet		
Depth Logger	4203.00	feet		
First Reading	4200.00	feet		
Last Reading	382.00	feet		
Casing Driller	384.00	feet		
Casing Logger	382.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	8.90 lb/USg	60.00 CP		
PH / Fluid Loss	11.00	6.80 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.74 @ 35.0	ohm-m		
Rmf @ Measured Temp	1.39 @ 35.0	ohm-m		
Rmc @ Measured Temp	2.09 @ 35.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.59 @ 116.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	116.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13096	LIB		
Recorded By	A. SILL			
Witnessed By	JOHN JORDAN			
S.O. # / JOB #	3534678		LB11-308	

BOREHOLE RECORD

Last Edited: 05-DEC-2011 02:57

Bit Size inches	Depth From feet	Depth To feet
12.250	0.00	400.00
7.875	400.00	4200.00

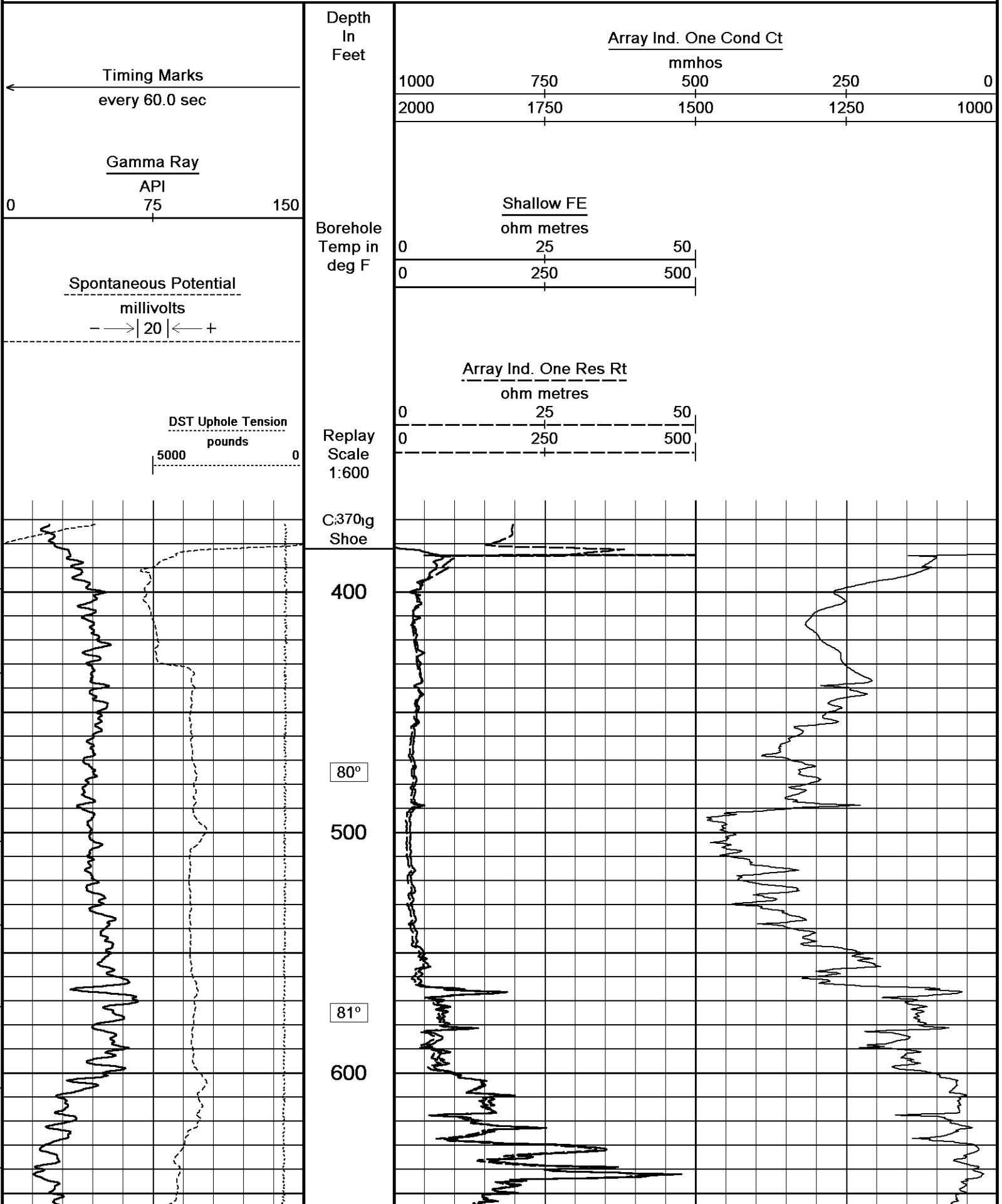
CASING RECORD

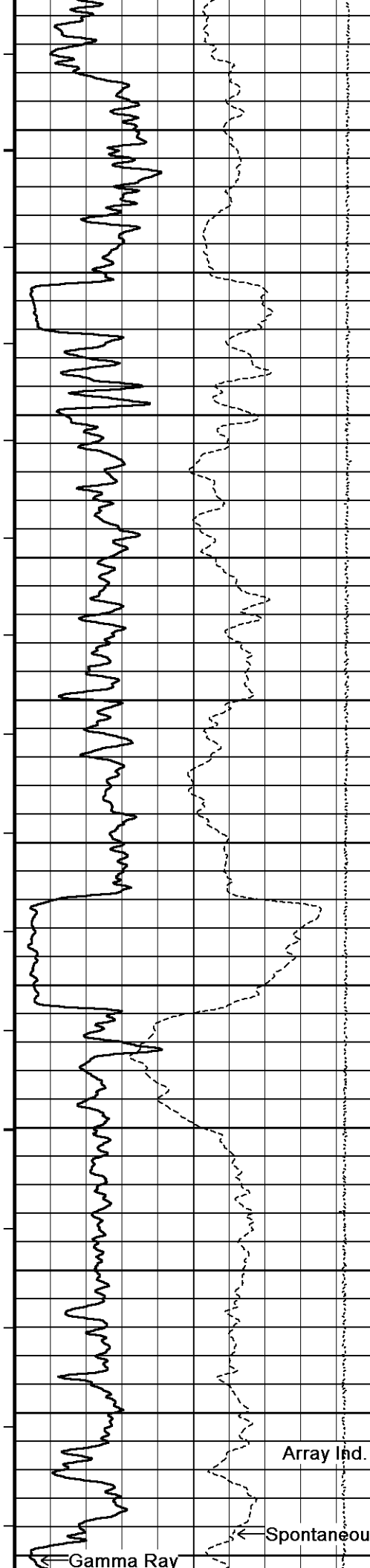
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	384.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML
Hardware: MPD: 8 inch profile plate used. MAI AND MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = 171 cu. ft
Service order #3534678
Rig: Murfin # 22
Engineer: A. Sill
Operator(s): M. Stegman

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.





82°

700

84°

800

85°

900

86°

1000

87°

1100

Array Ind. One Res Rt

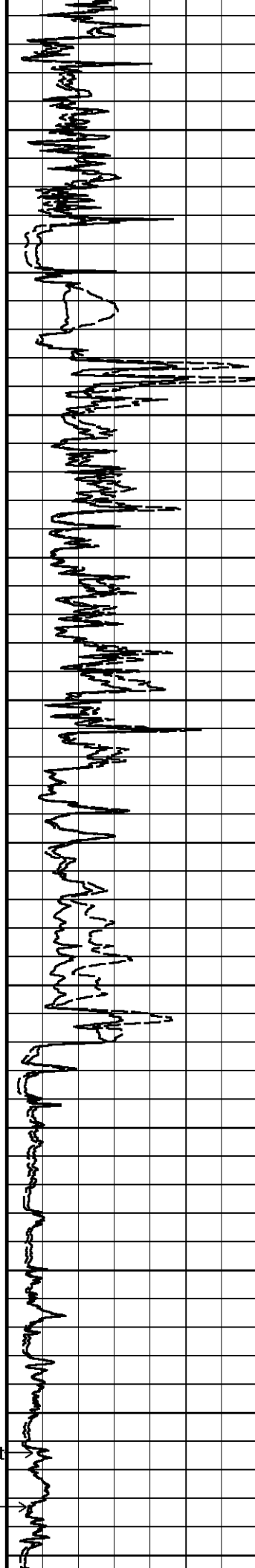
88°

Shallow FE

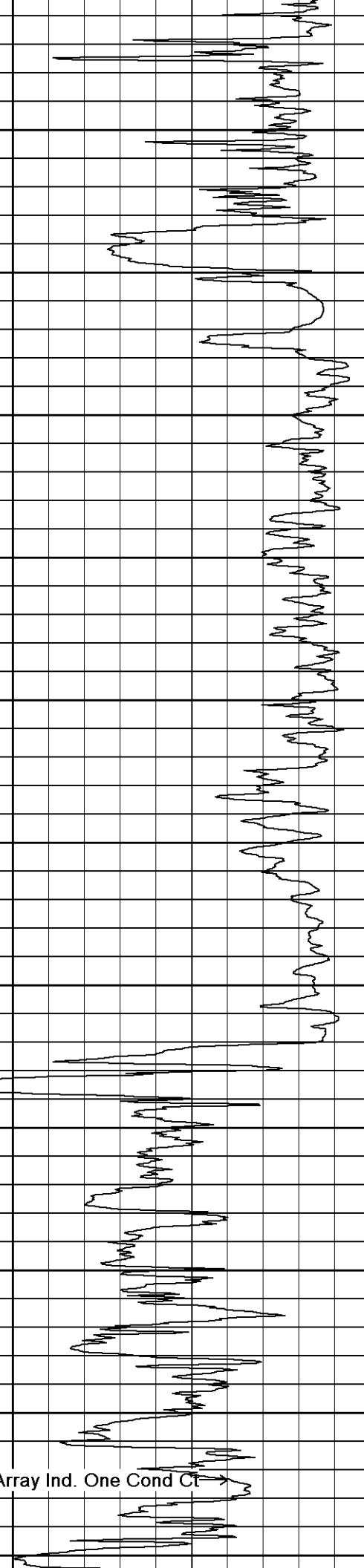
Spontaneous Potential

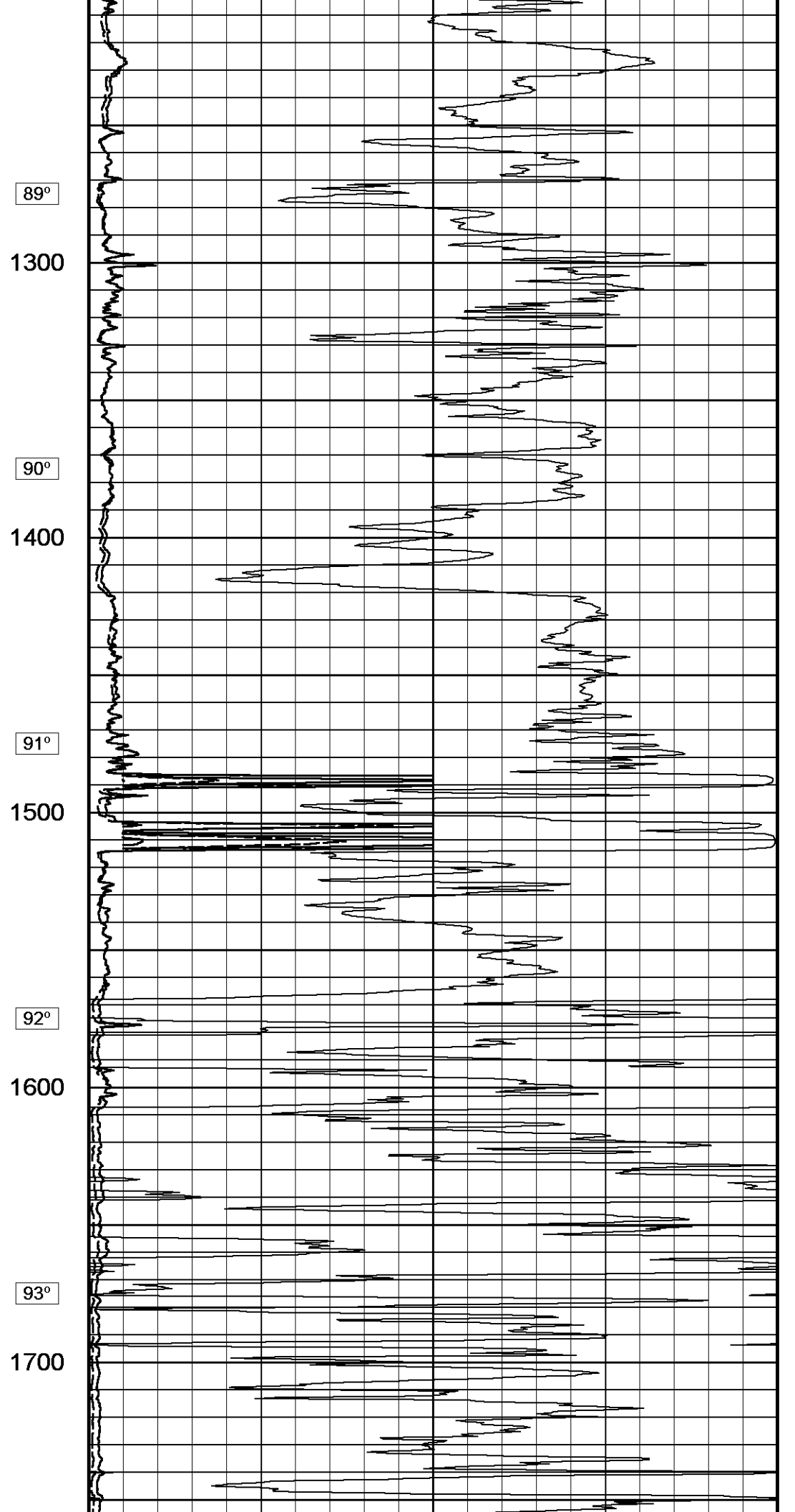
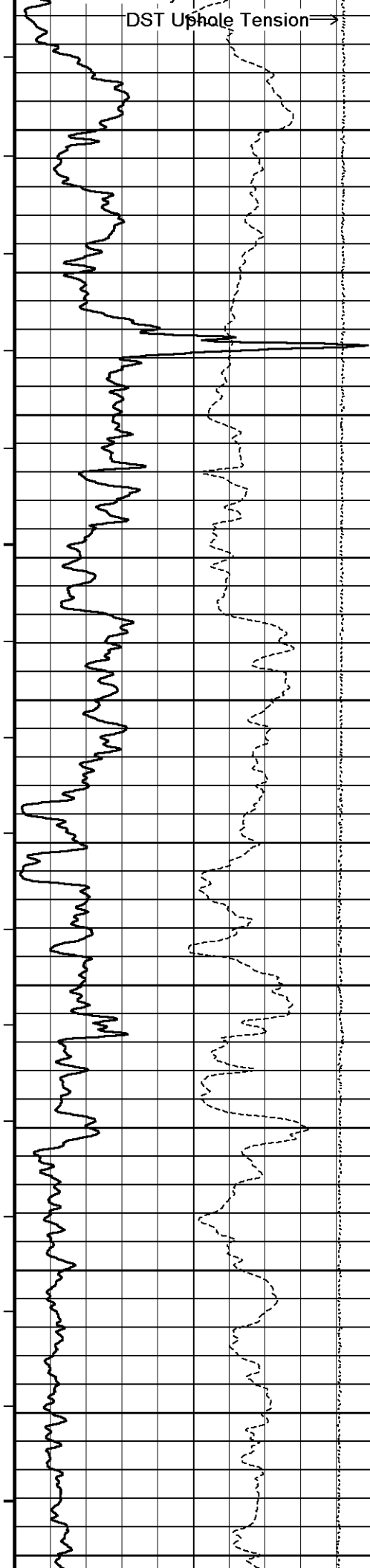
1200

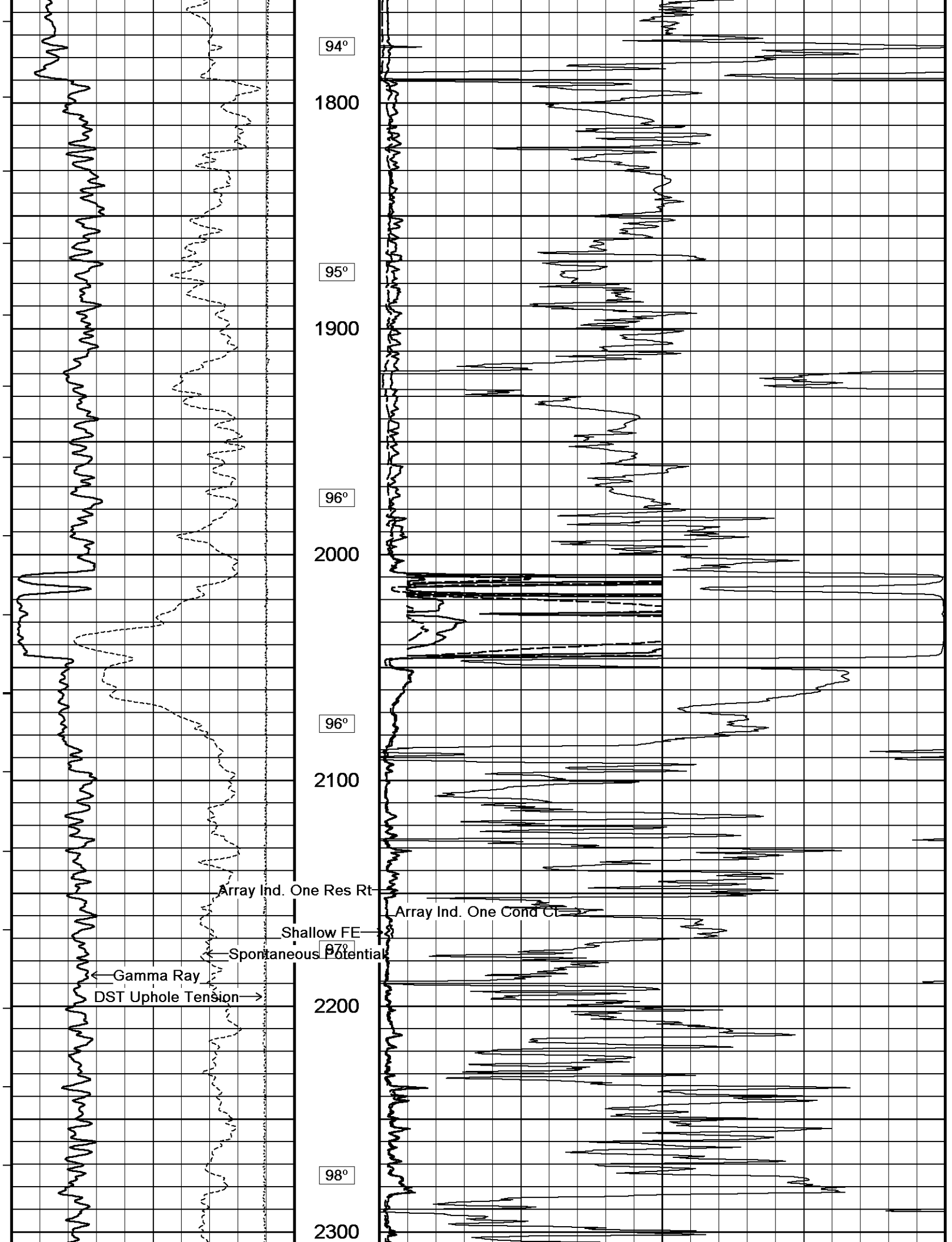
Gamma Ray

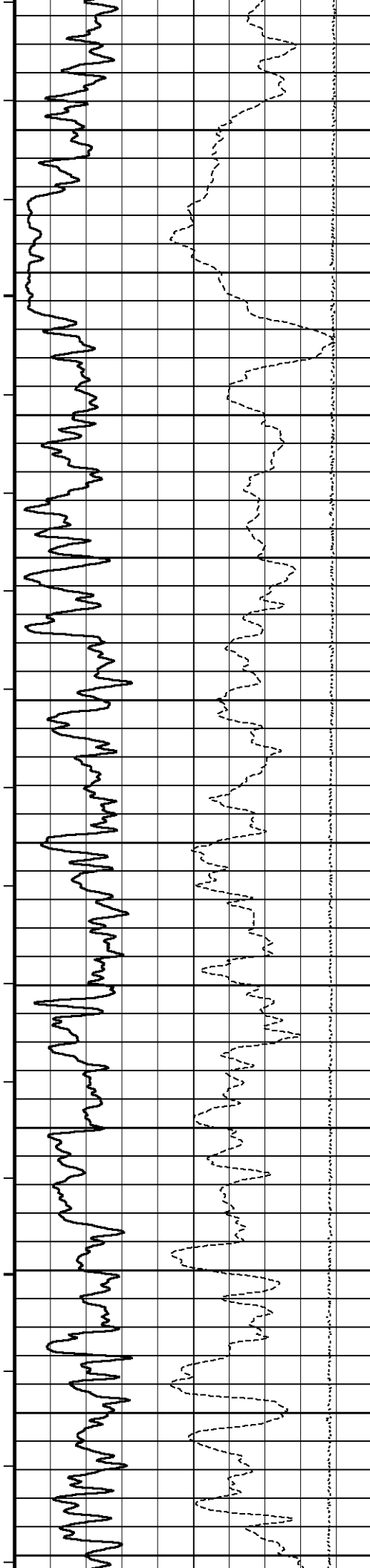


Array Ind. One Cond Ct









98°

2400

100°

2500

101°

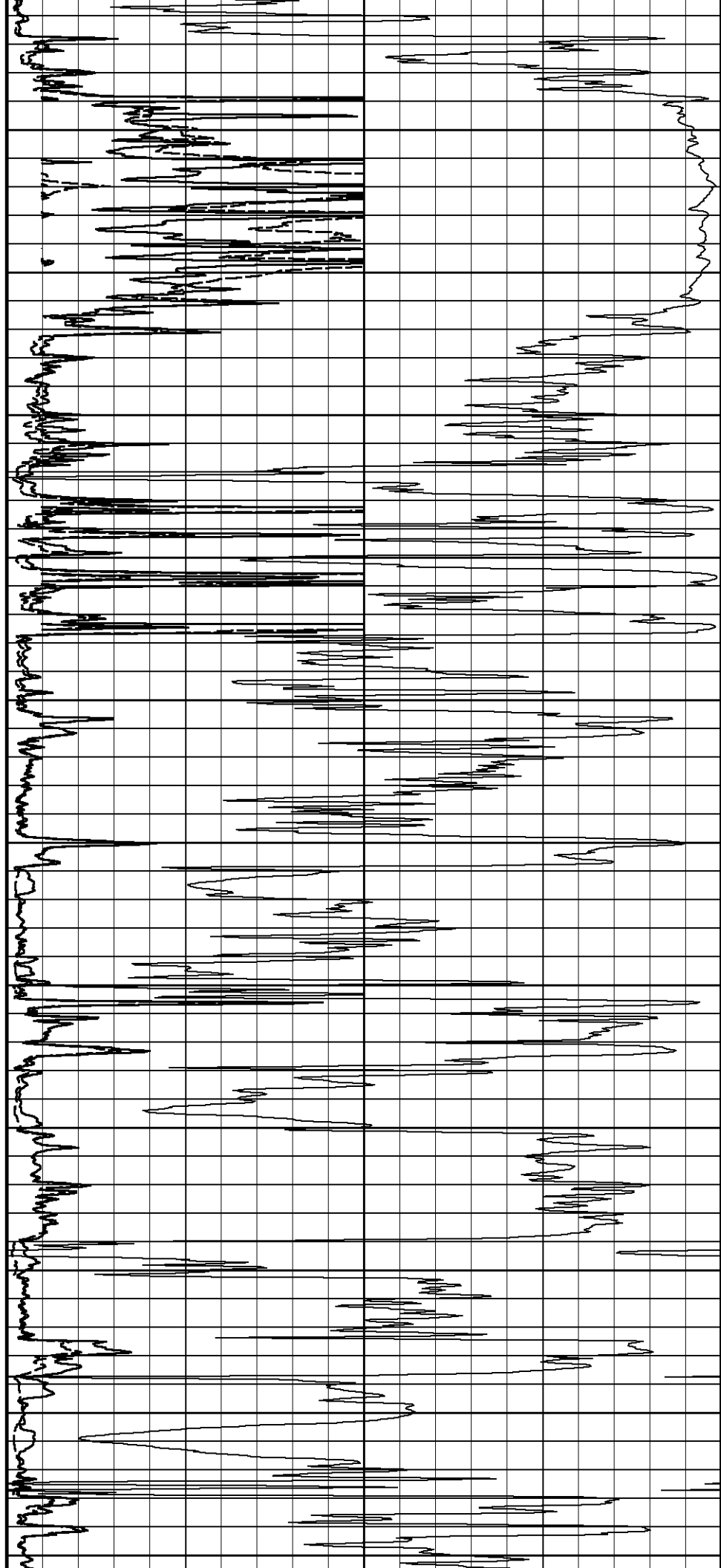
2600

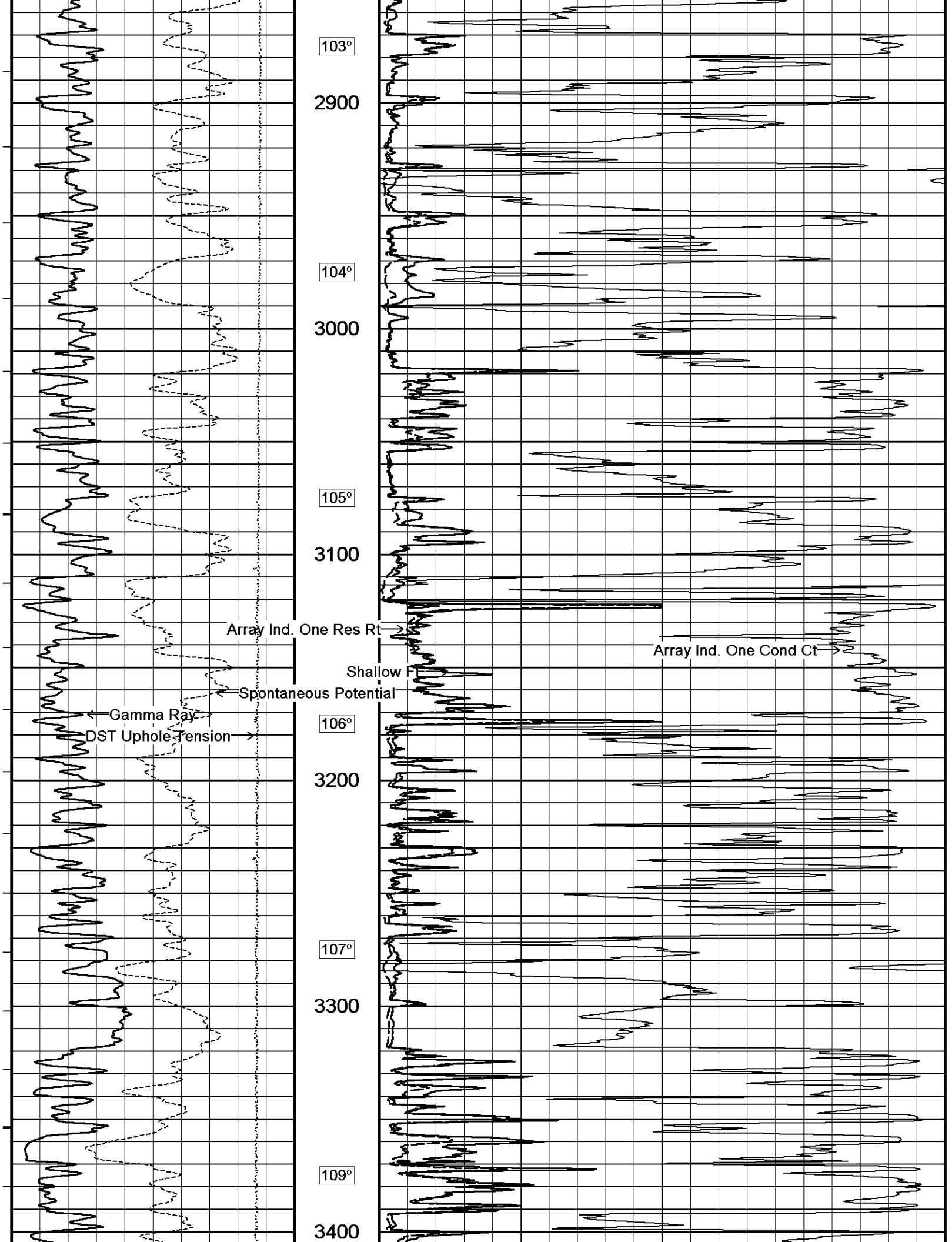
102°

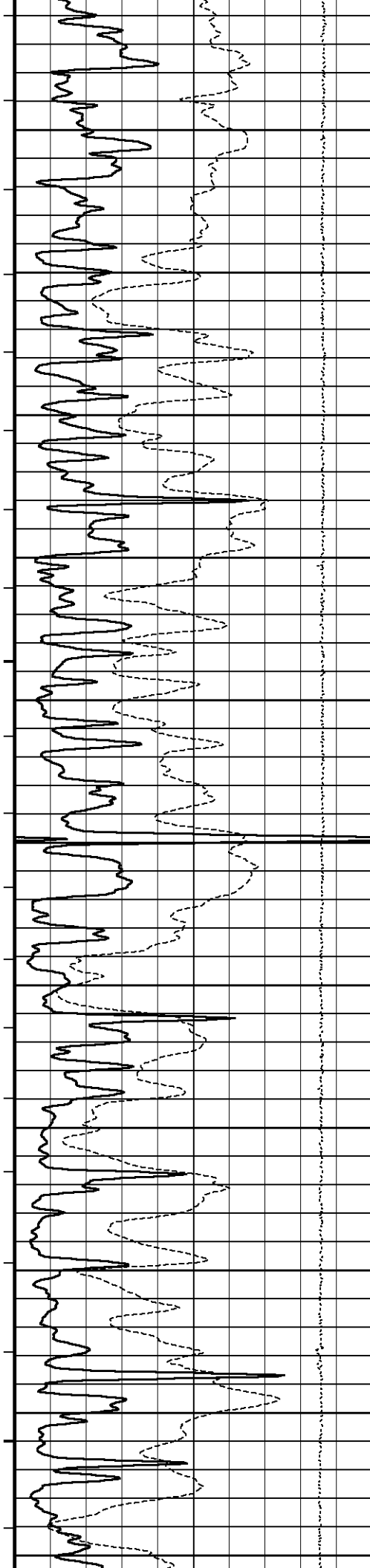
2700

102°

2800







110°

3500

111°

3600

112°

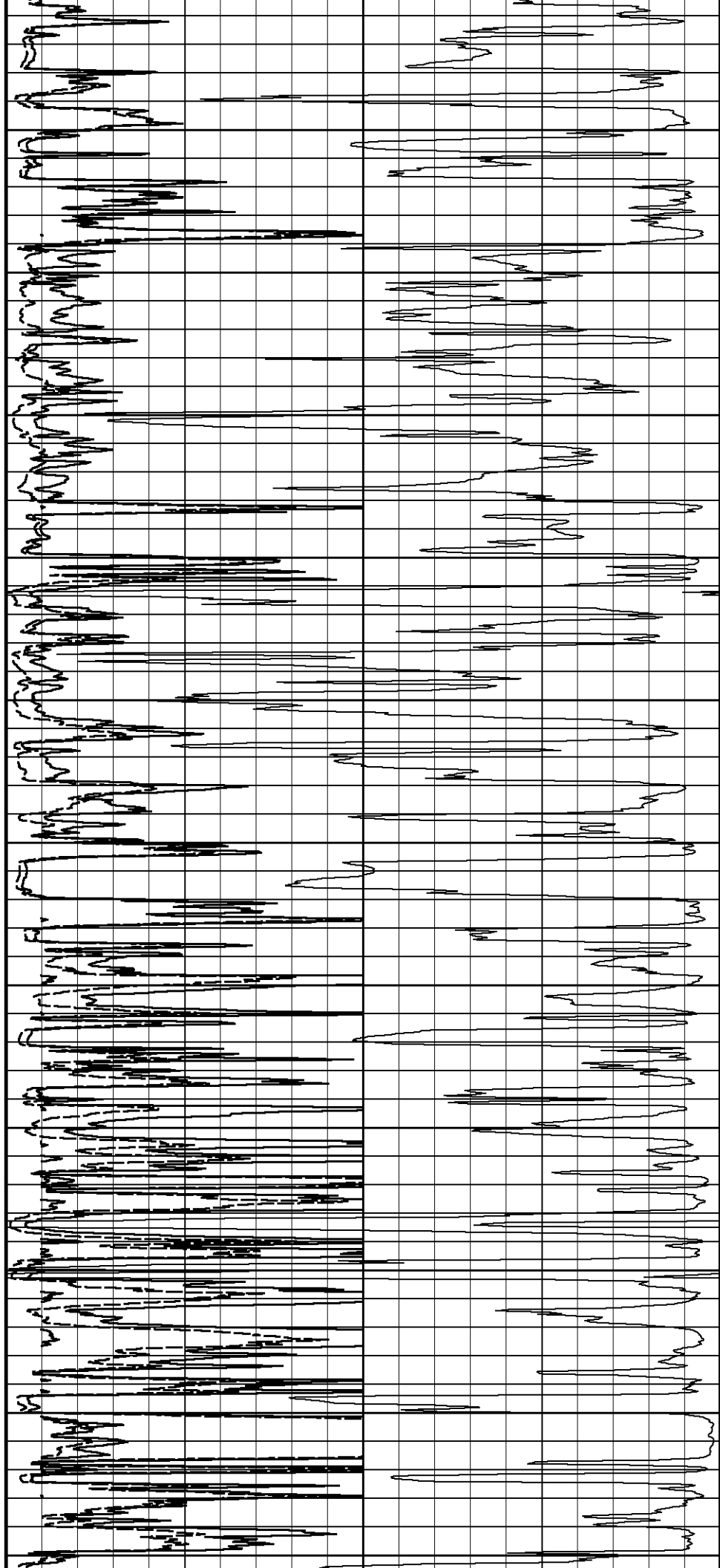
3700

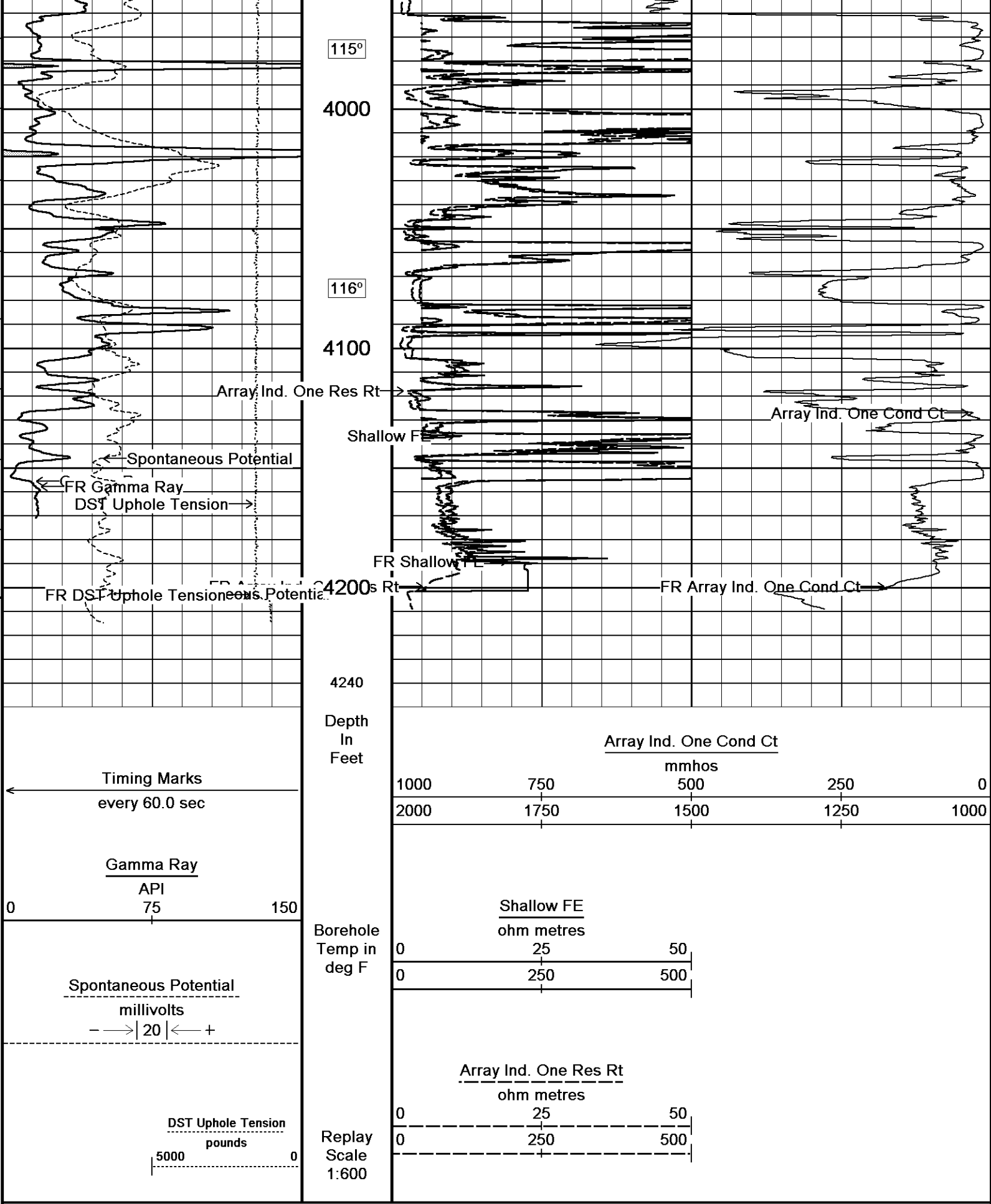
114°

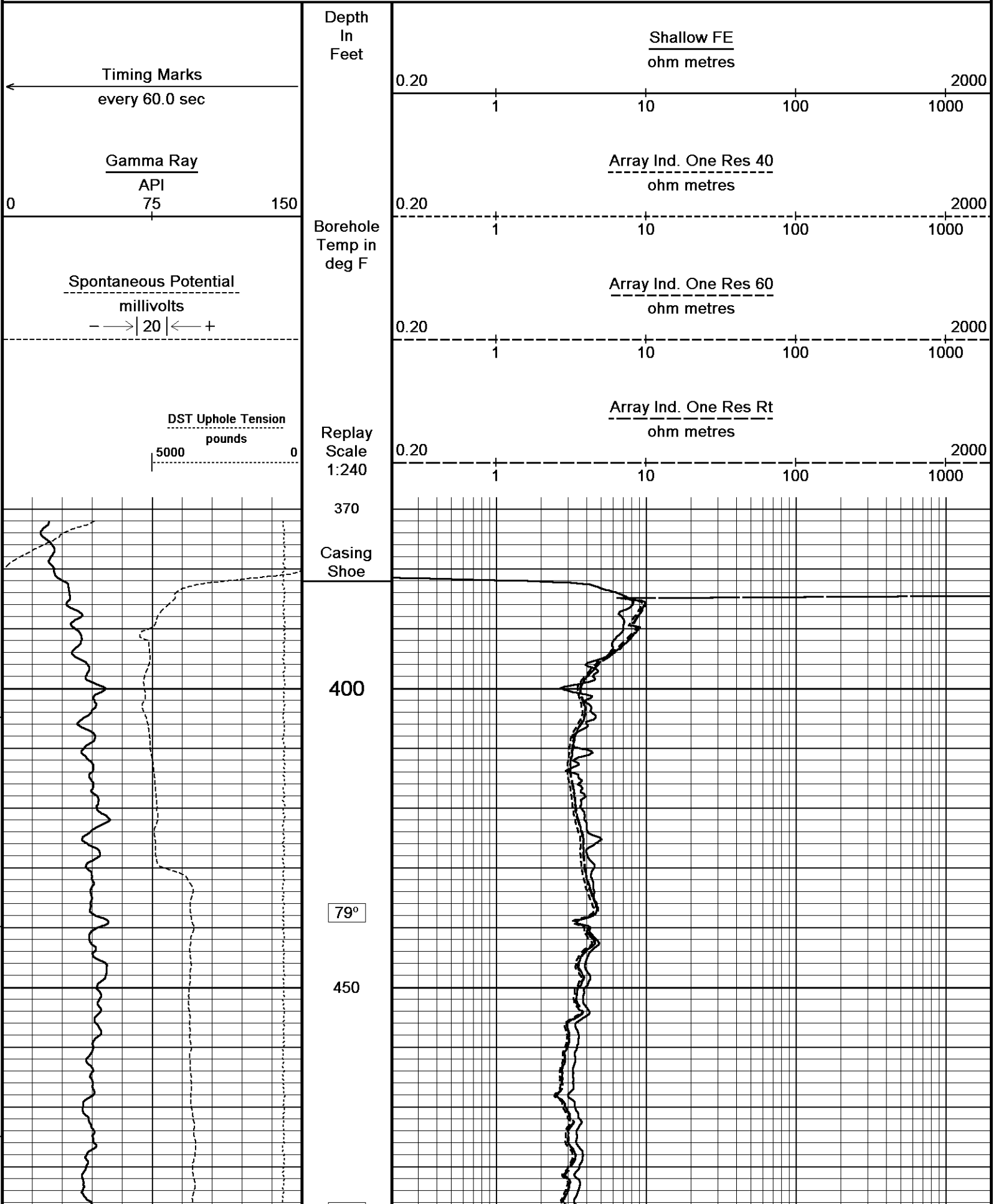
3800

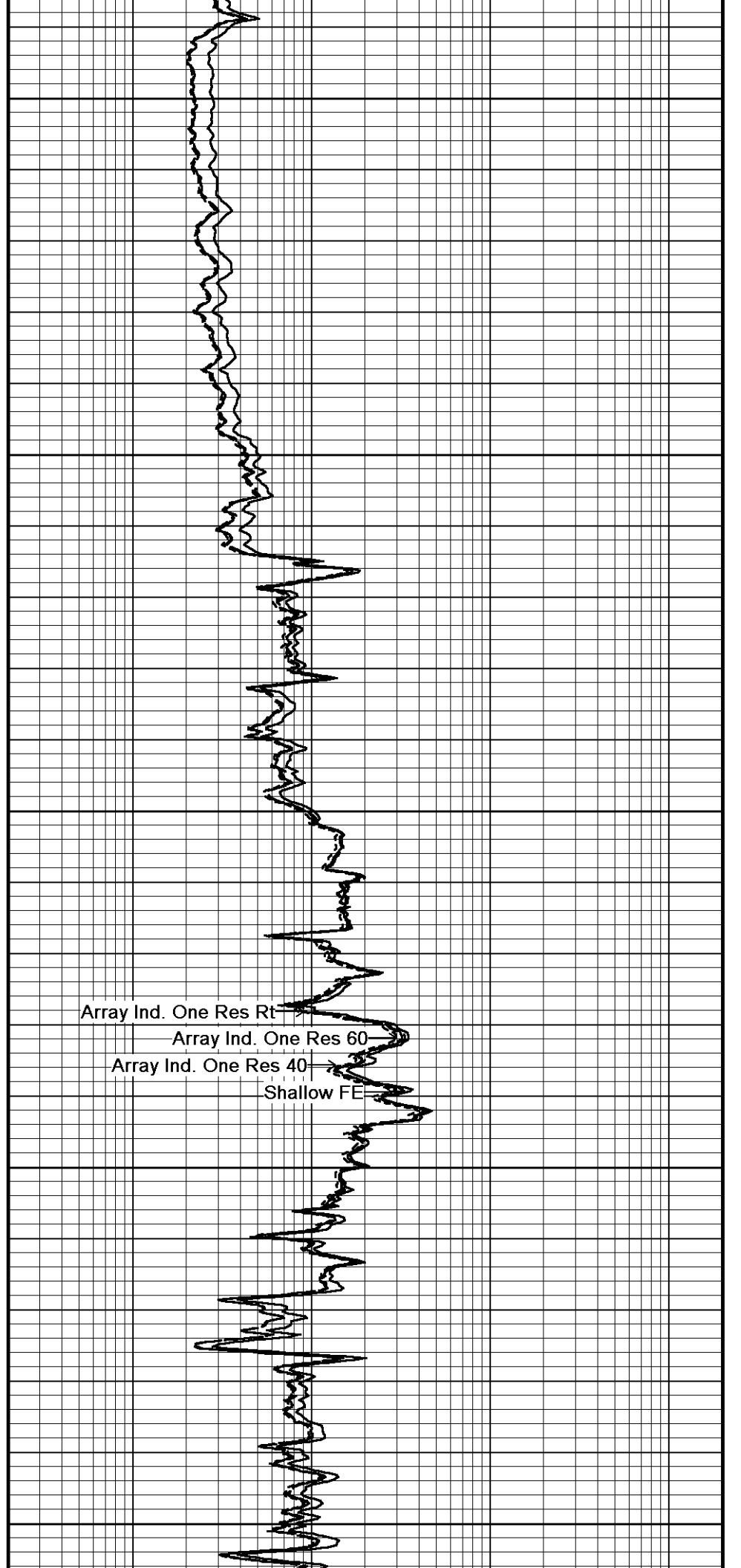
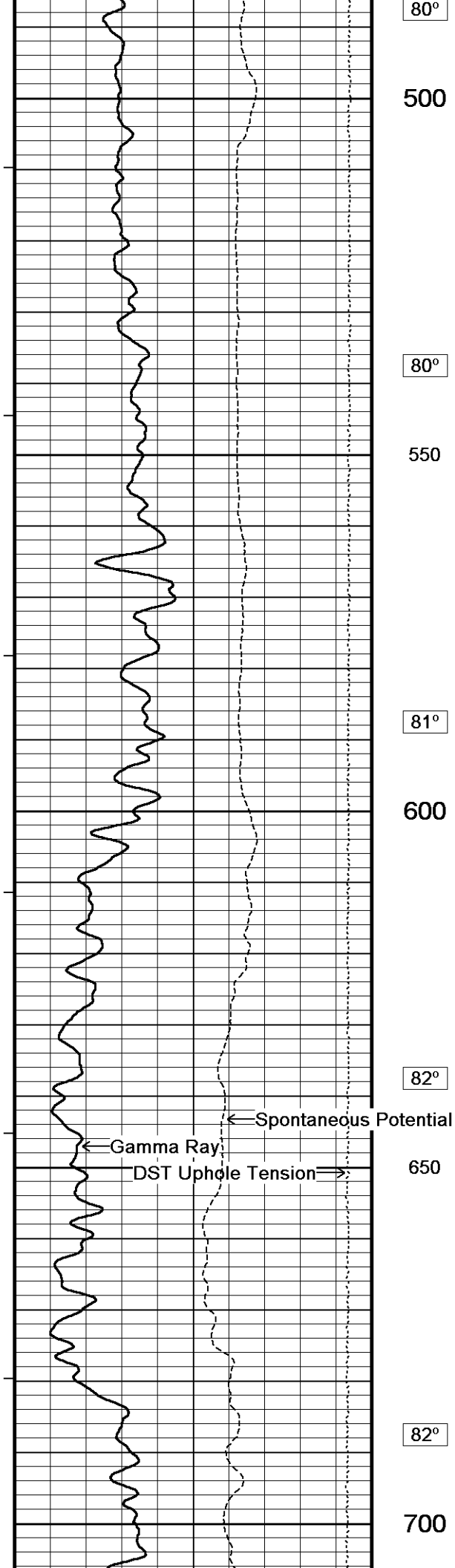
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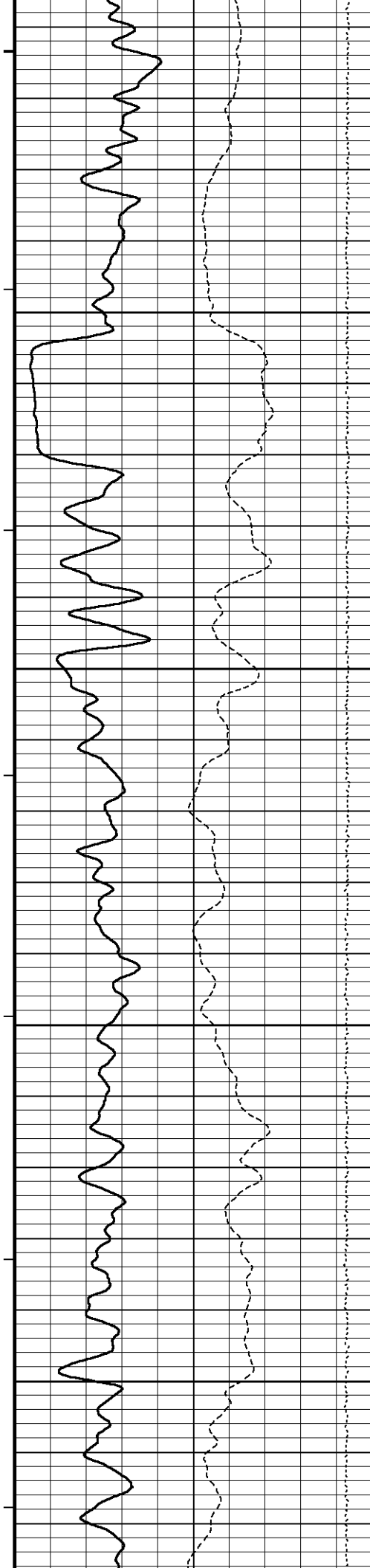
3900











83°

750

84°

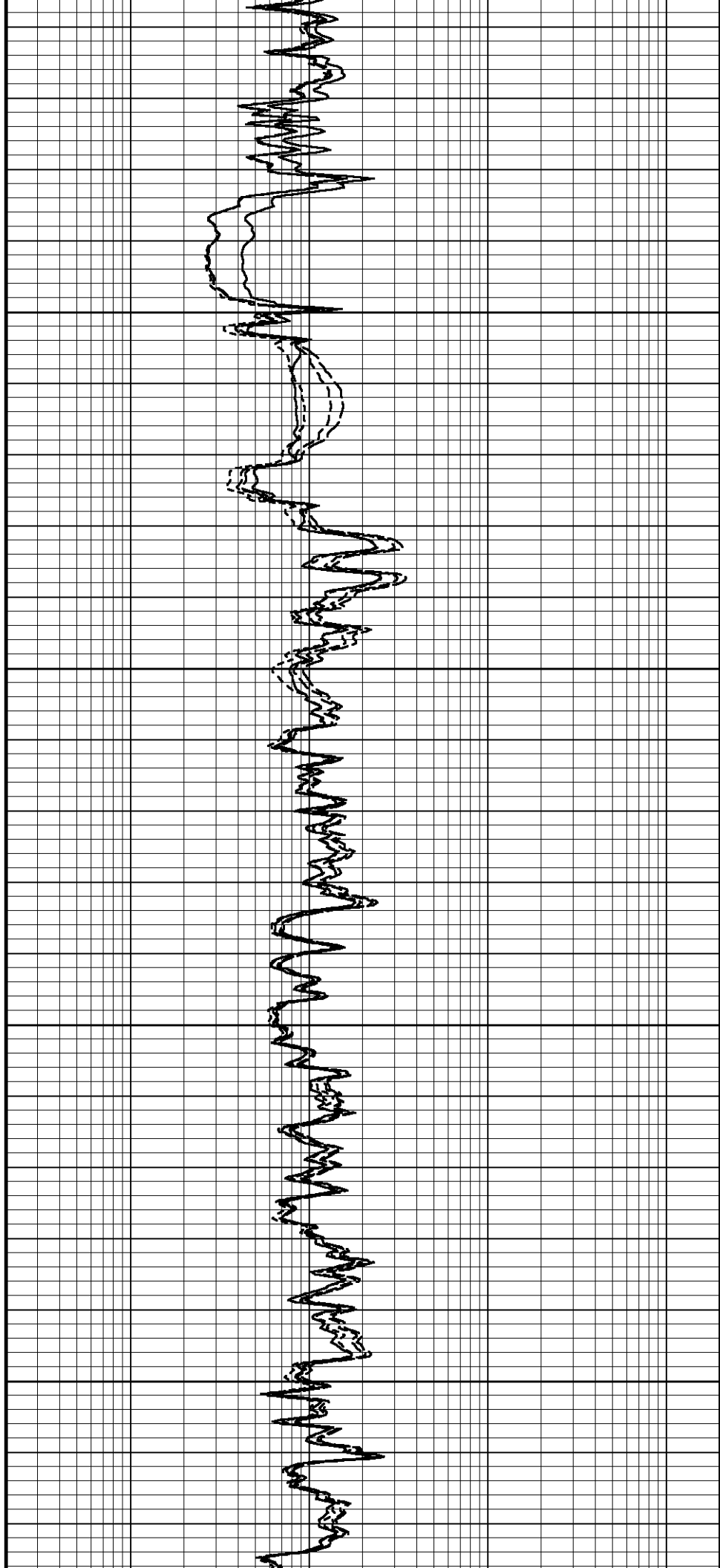
800

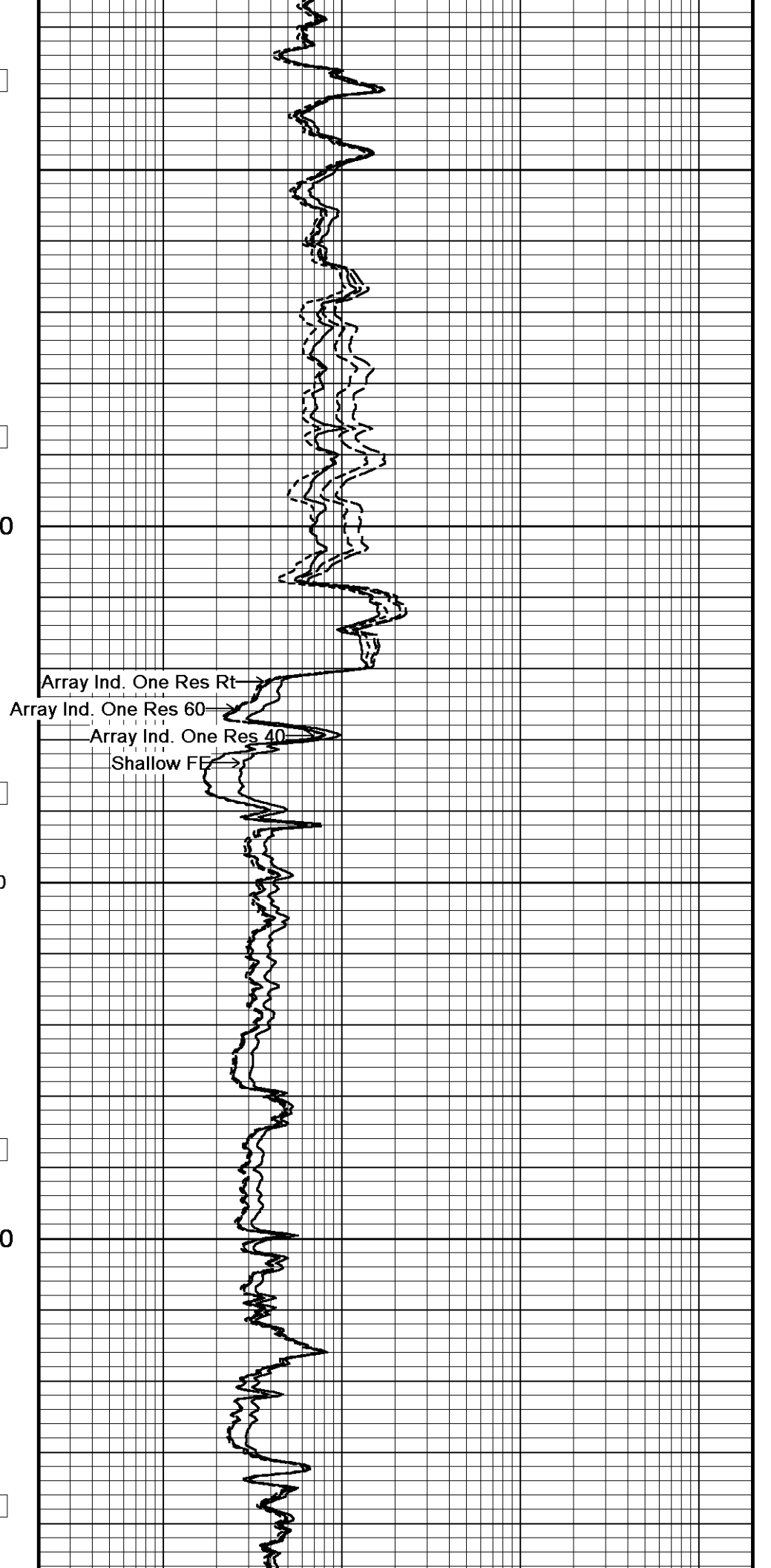
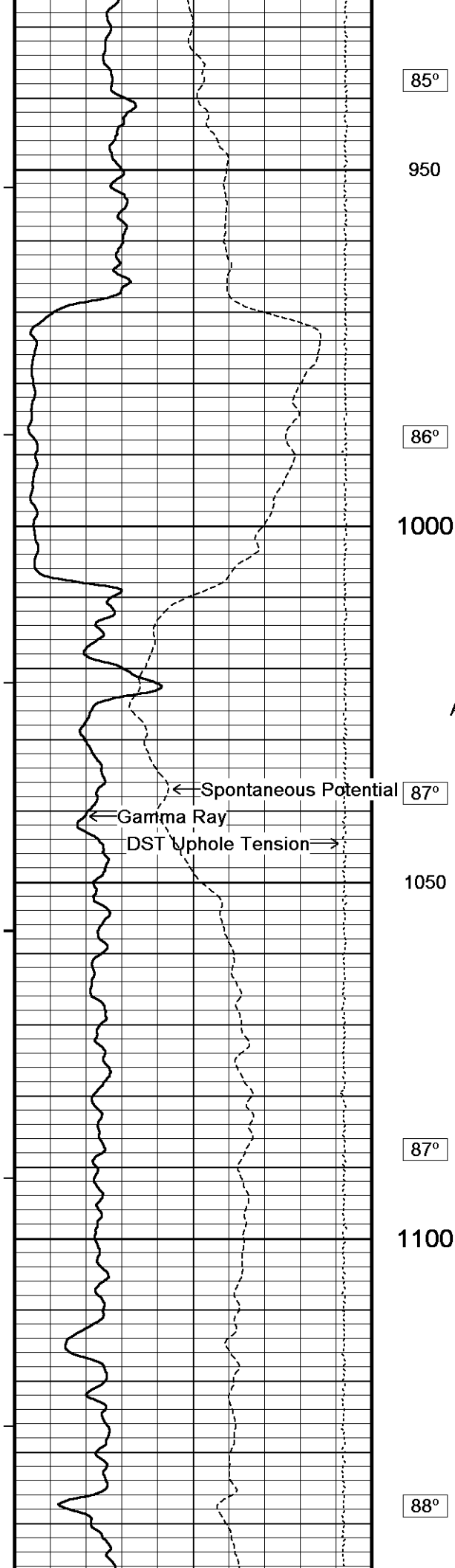
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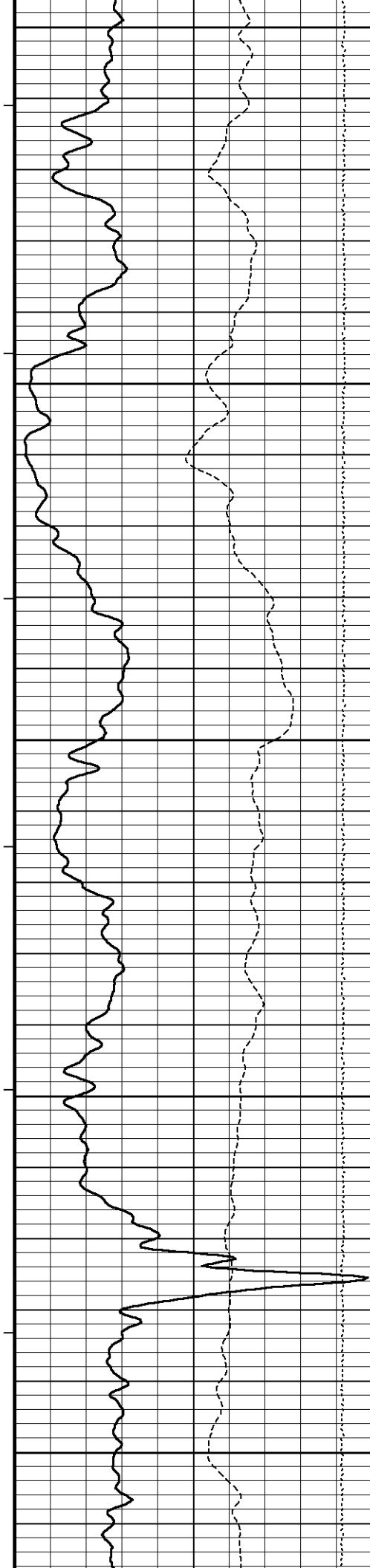
850

85°

900







1150

88°

1200

89°

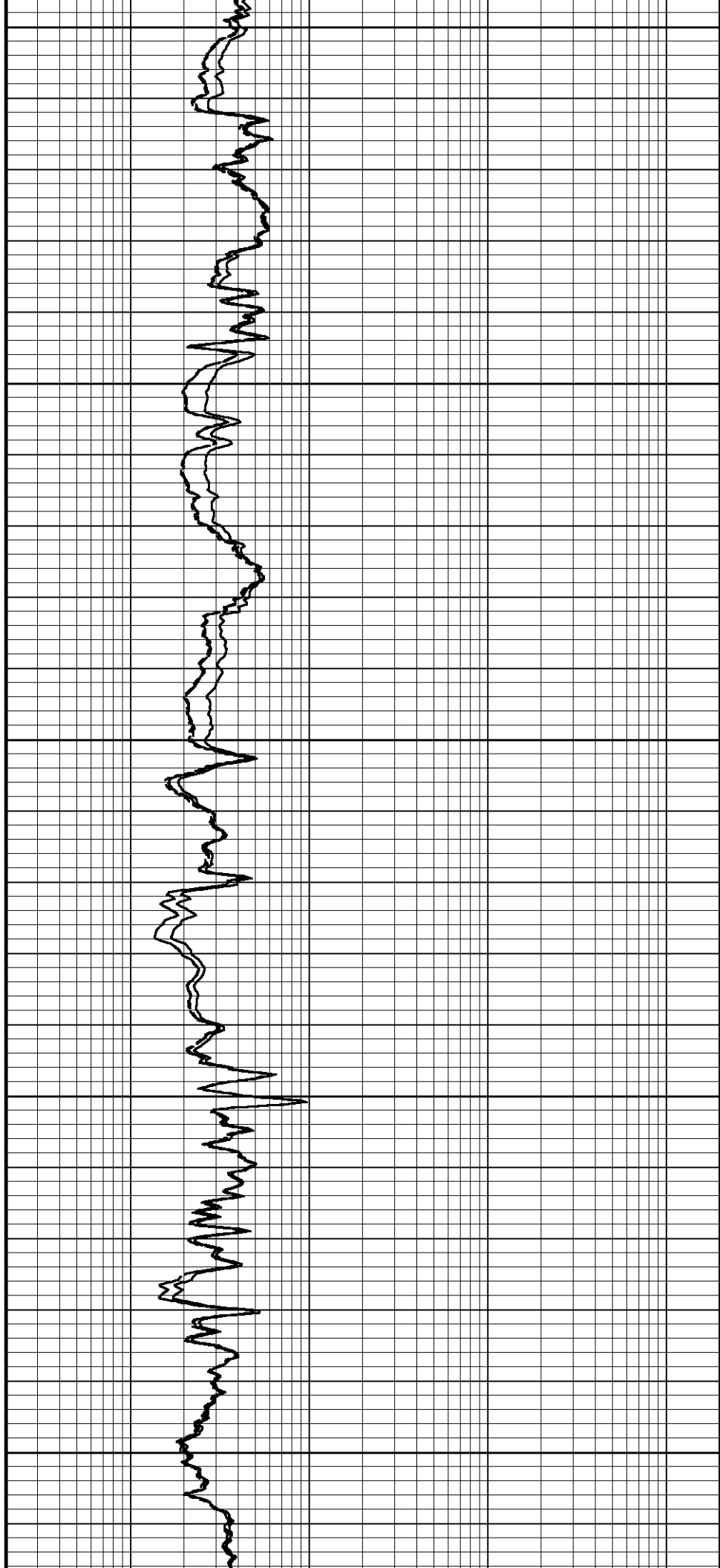
1250

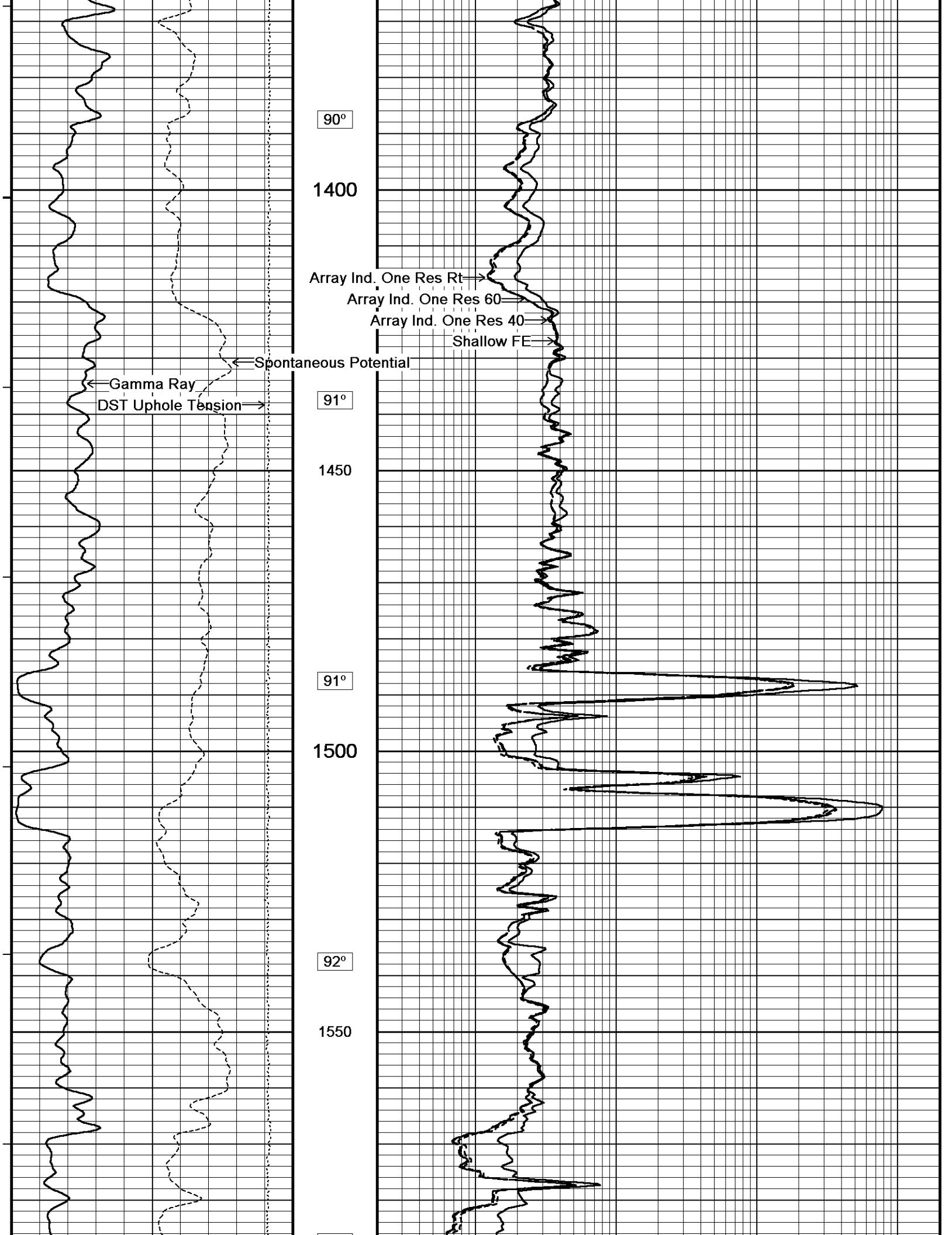
90°

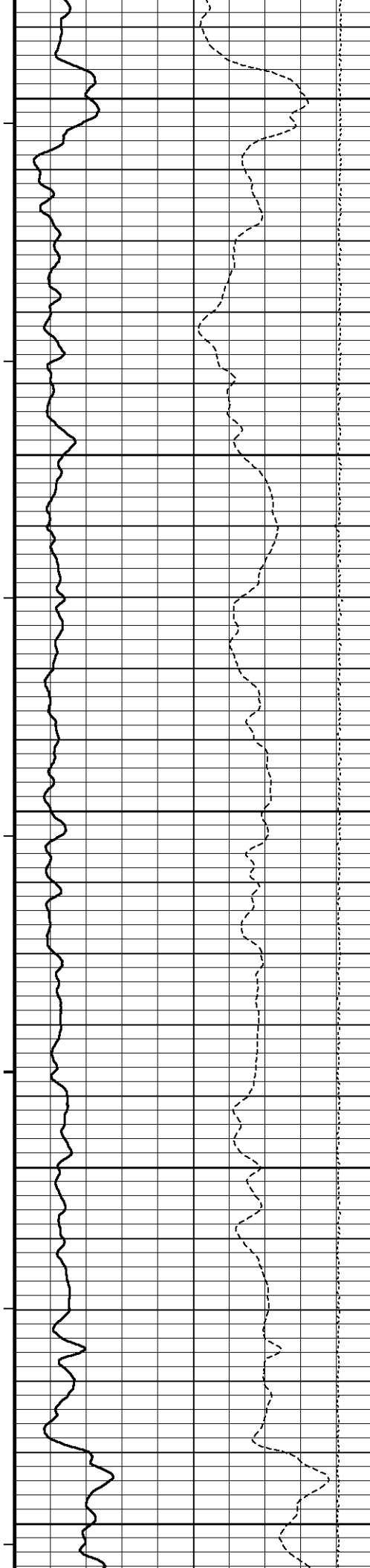
1300

90°

1350







92°

1600

92°

1650

93°

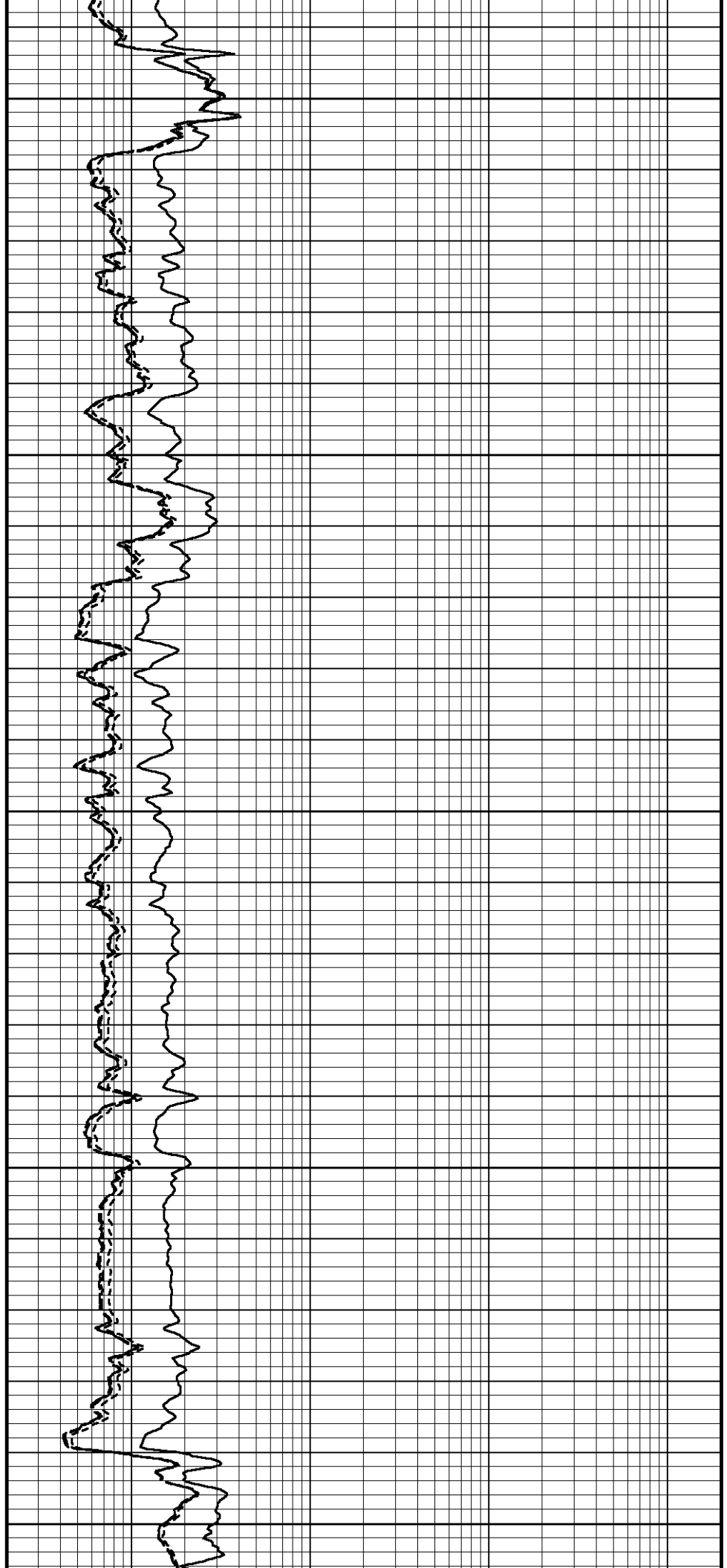
1700

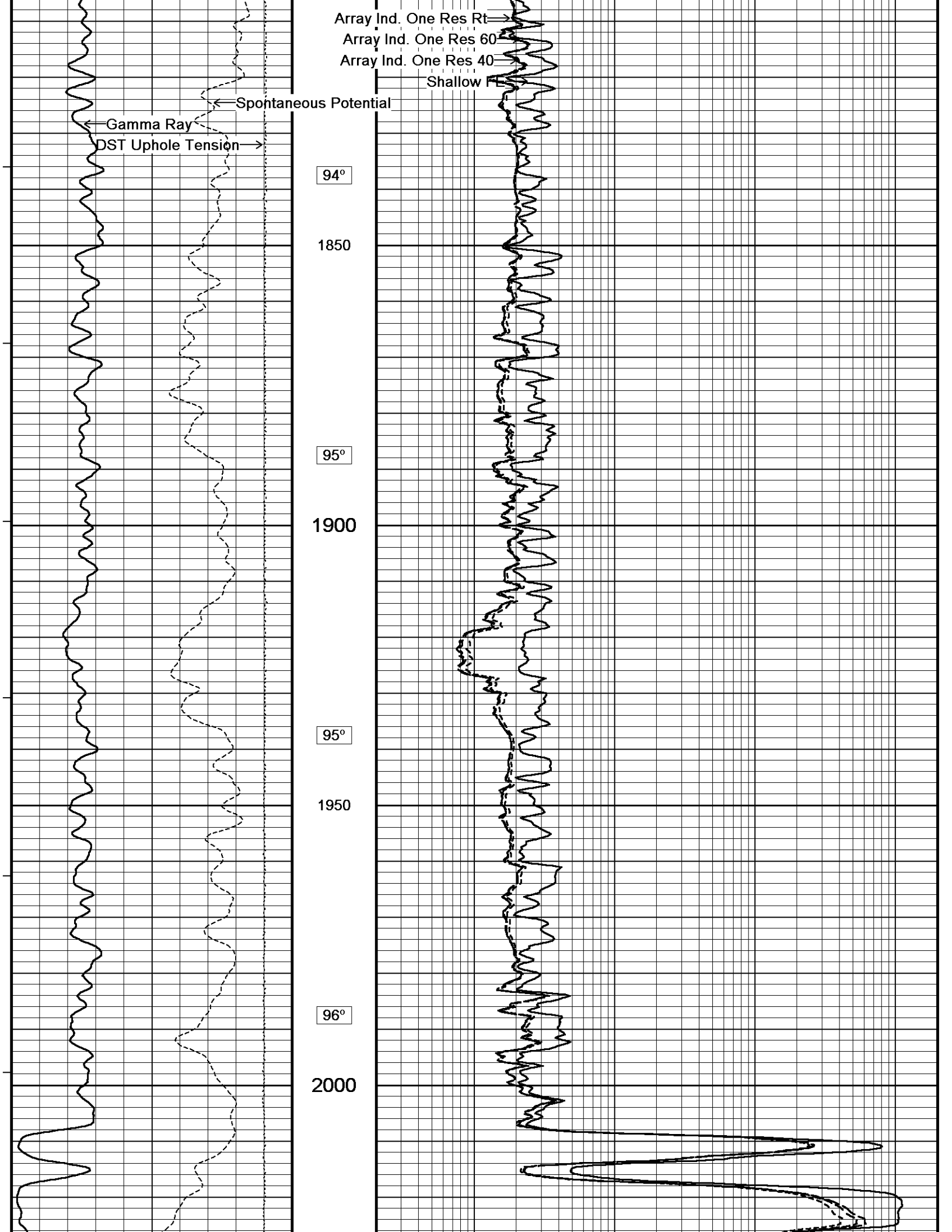
93°

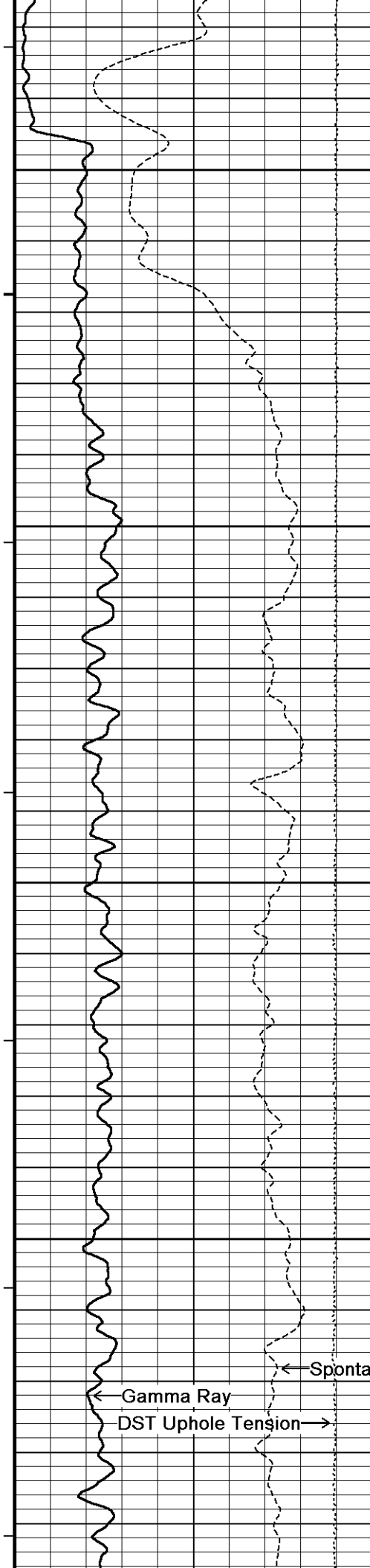
1750

94°

1800







96°

2050

96°

2100

97°

2150

97°

2200

98°

Array Ind. One Res Rt

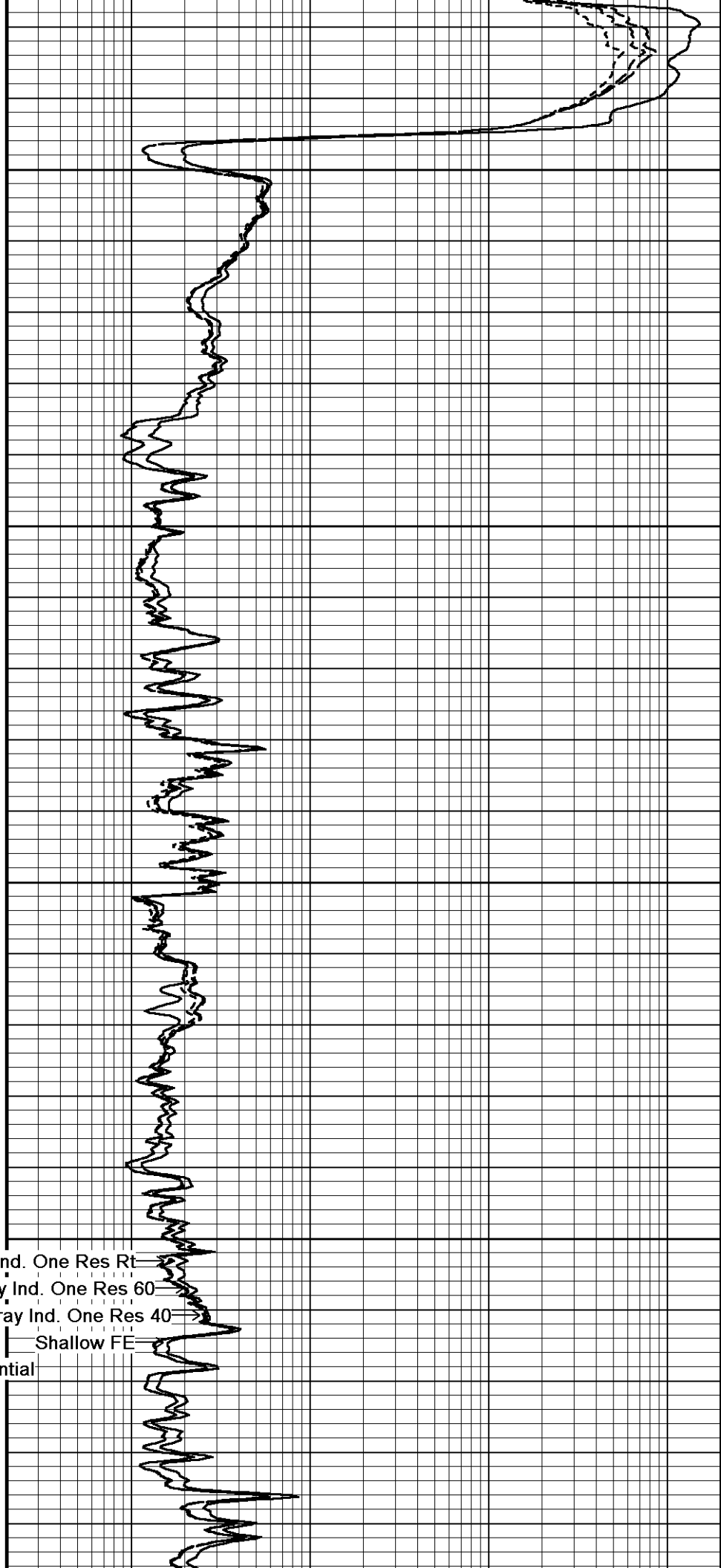
Array Ind. One Res 60

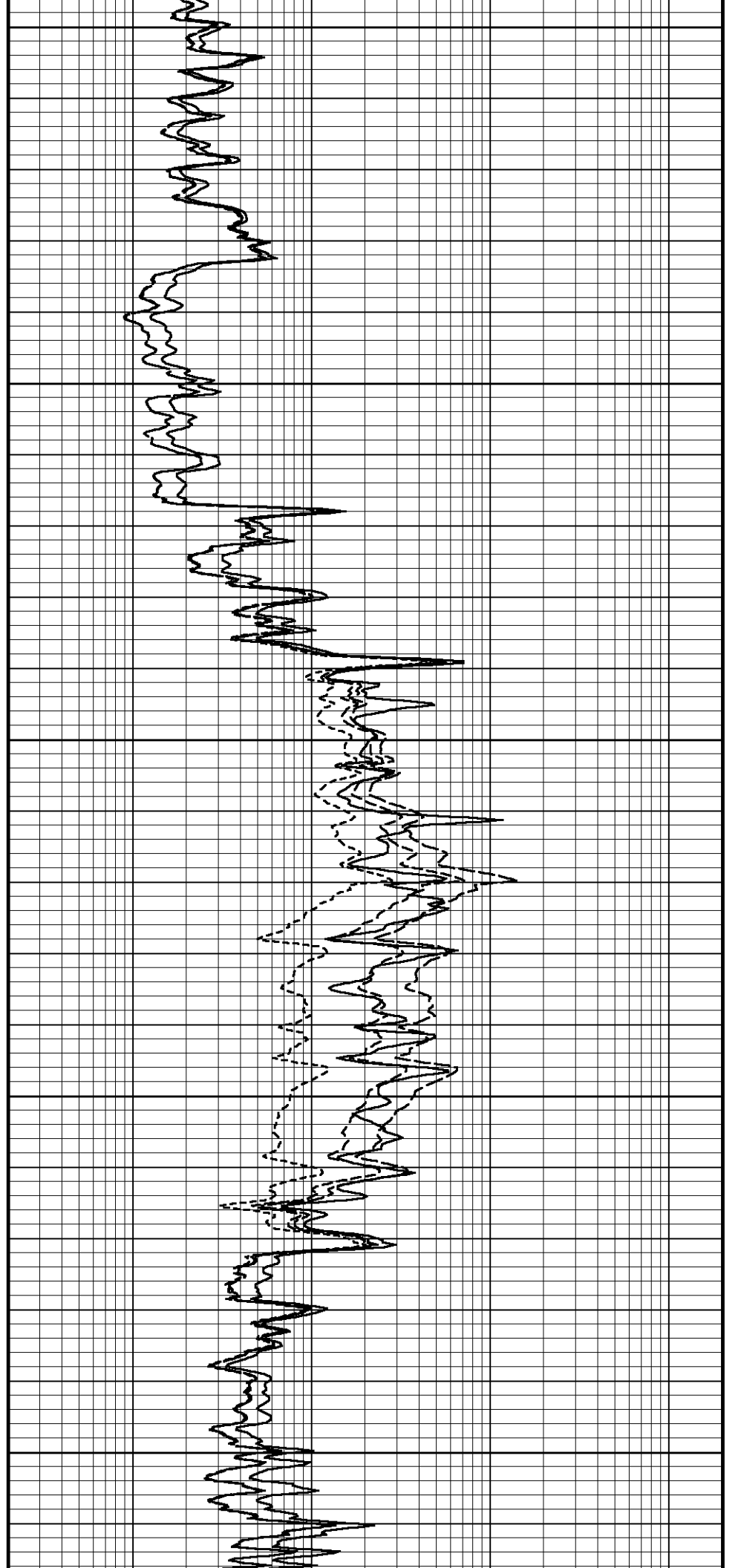
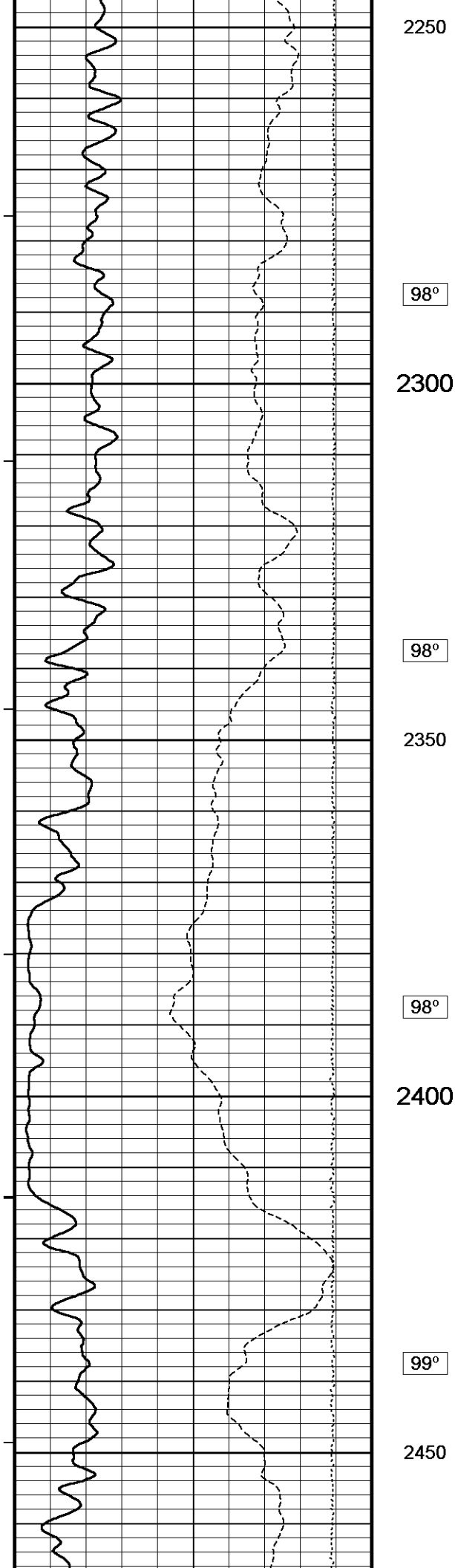
Array Ind. One Res 40

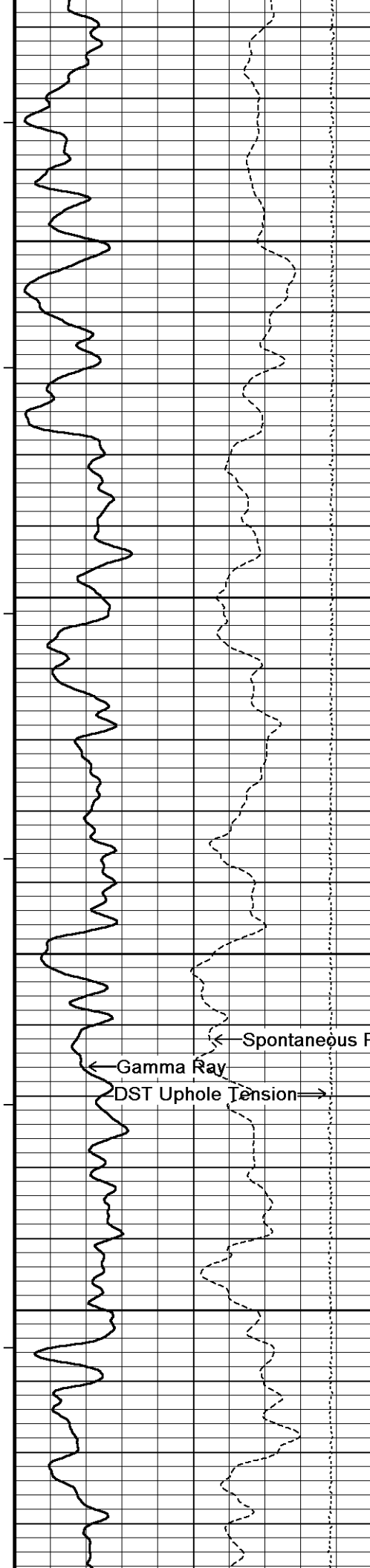
Shallow FE

← Spontaneous Potential

← Gamma Ray
DST Uphole Tension →







100°

2500

100°

2550

101°

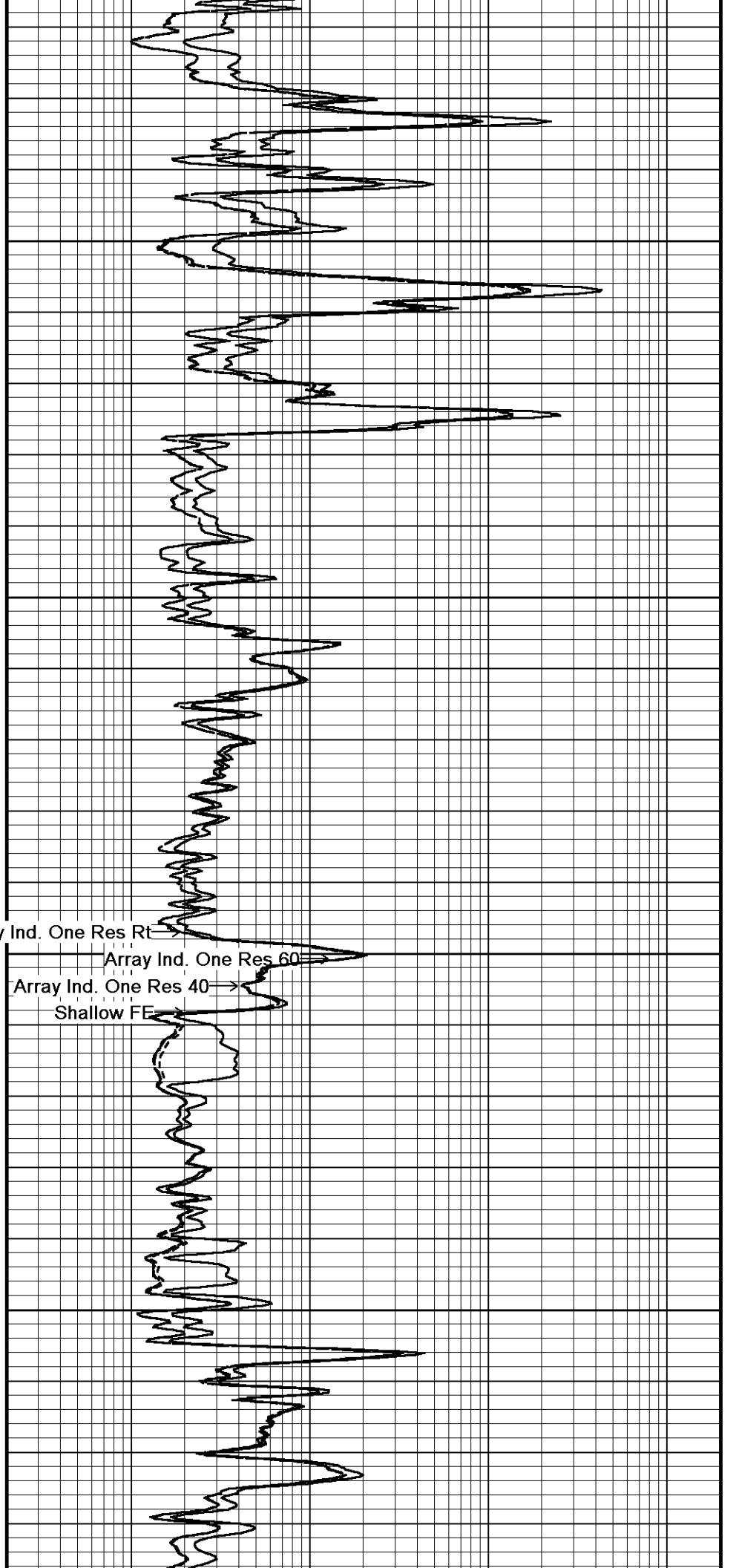
2600

101°

2650

← Gamma Ray
DST Uphole Tension →

← Spontaneous Potential

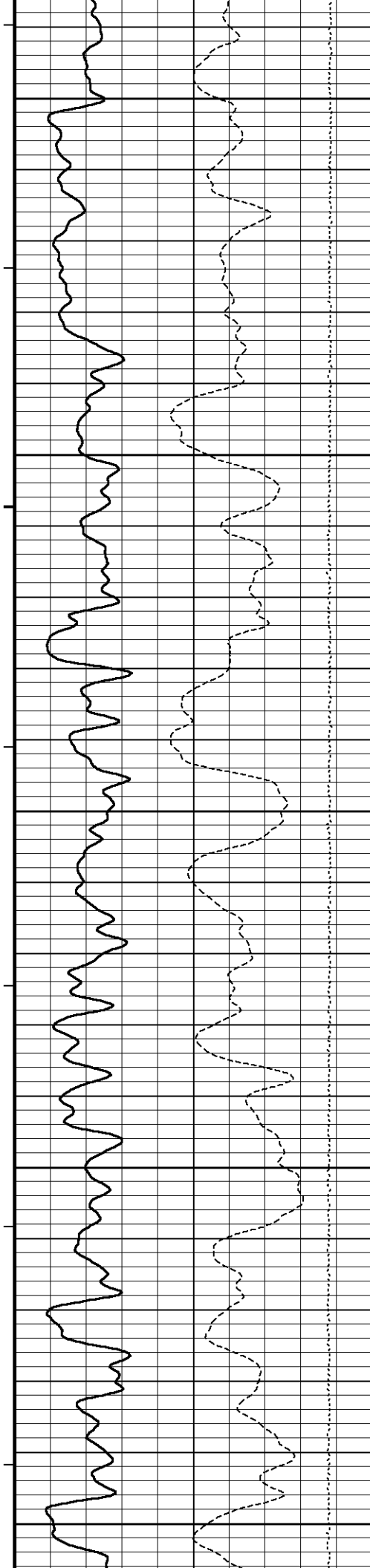


Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



102°

2700

102°

2750

102°

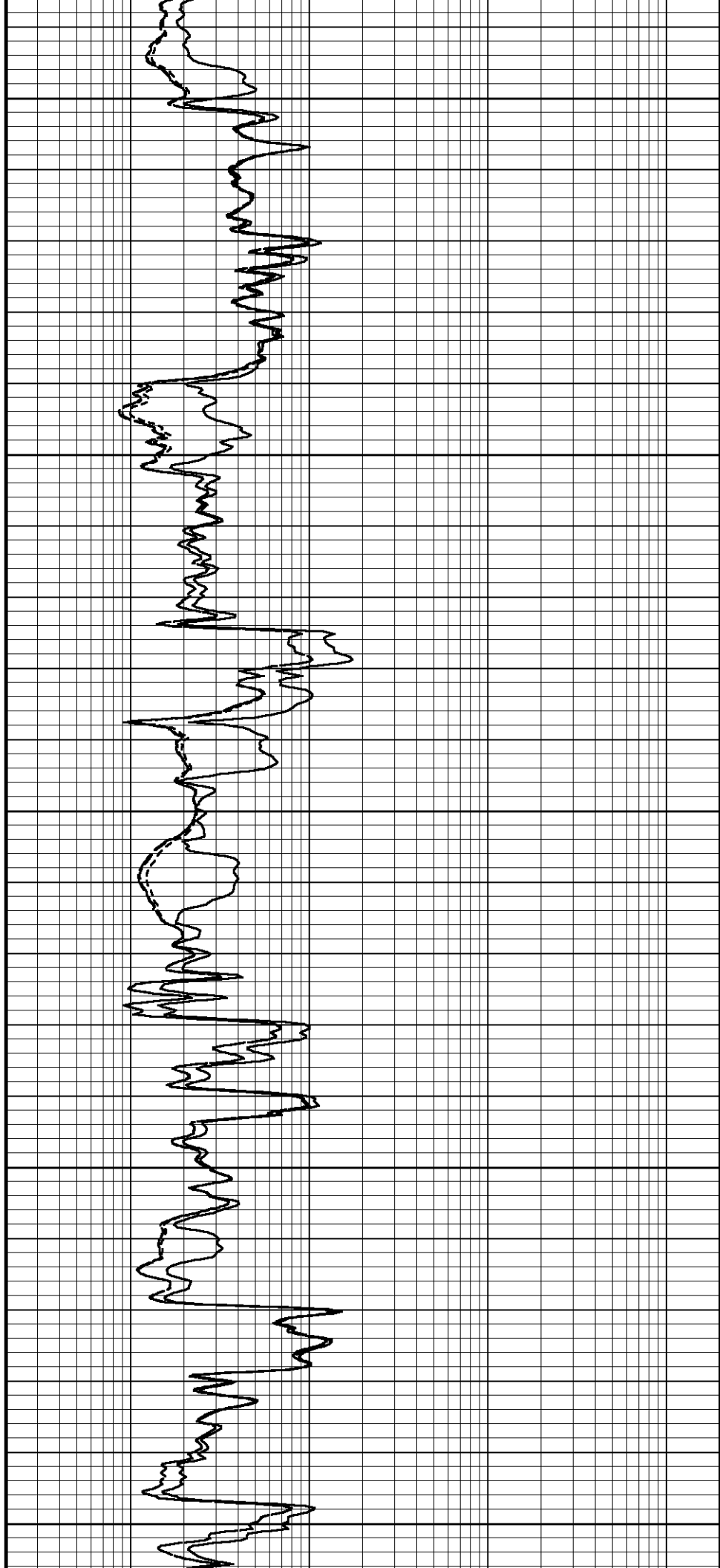
2800

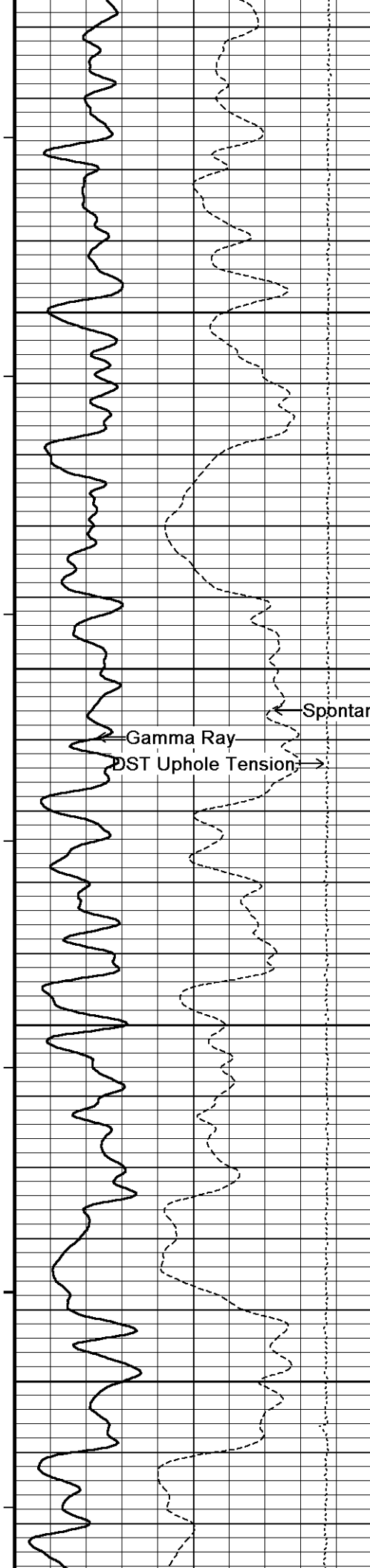
103°

2850

103°

2900





103°

2950

104°

Array Ind. One Res Rt

Array Ind. One Res 60

3000 Array Ind. One Res 40

Shallow FE

Spontaneous Potential

Gamma Ray

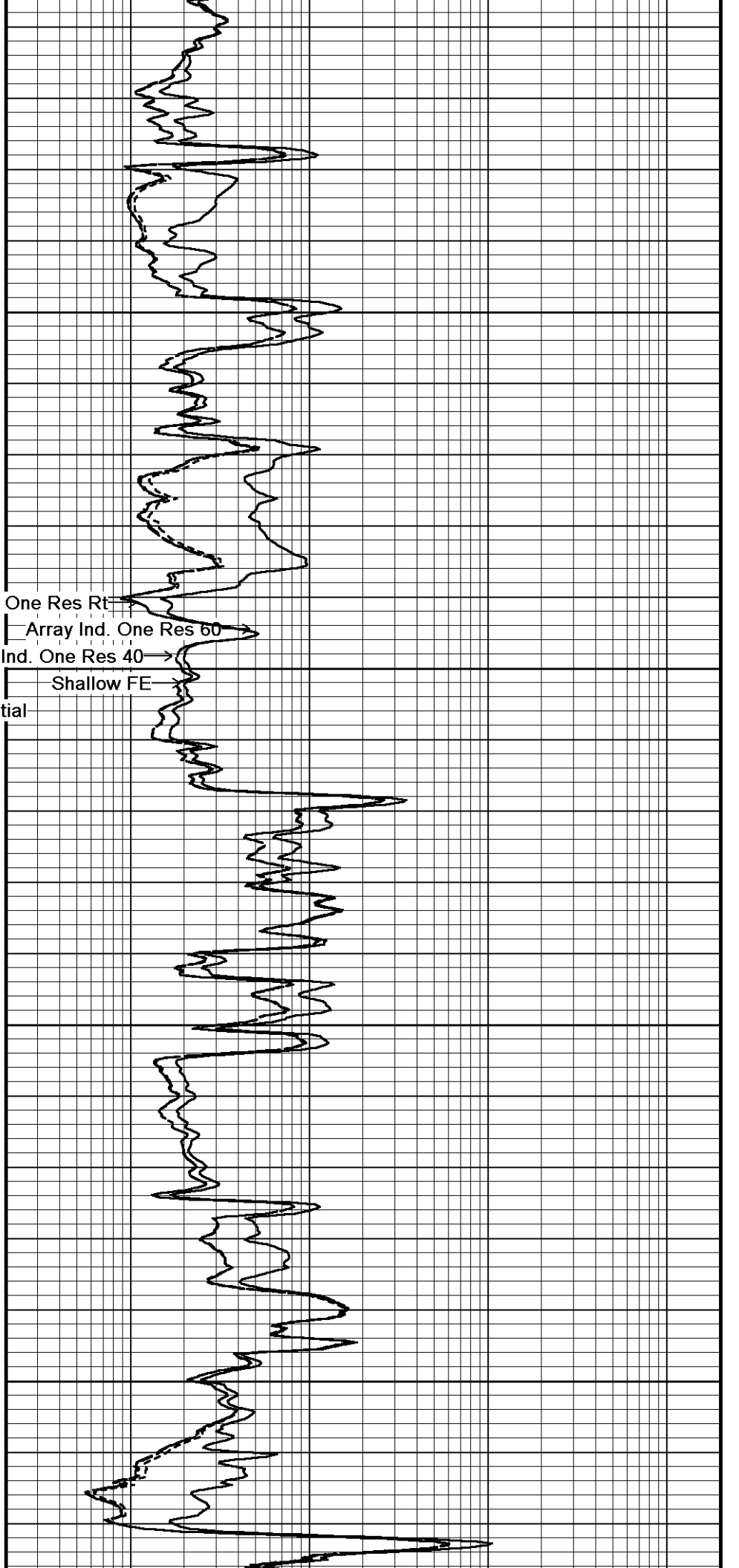
DST Uphole Tension

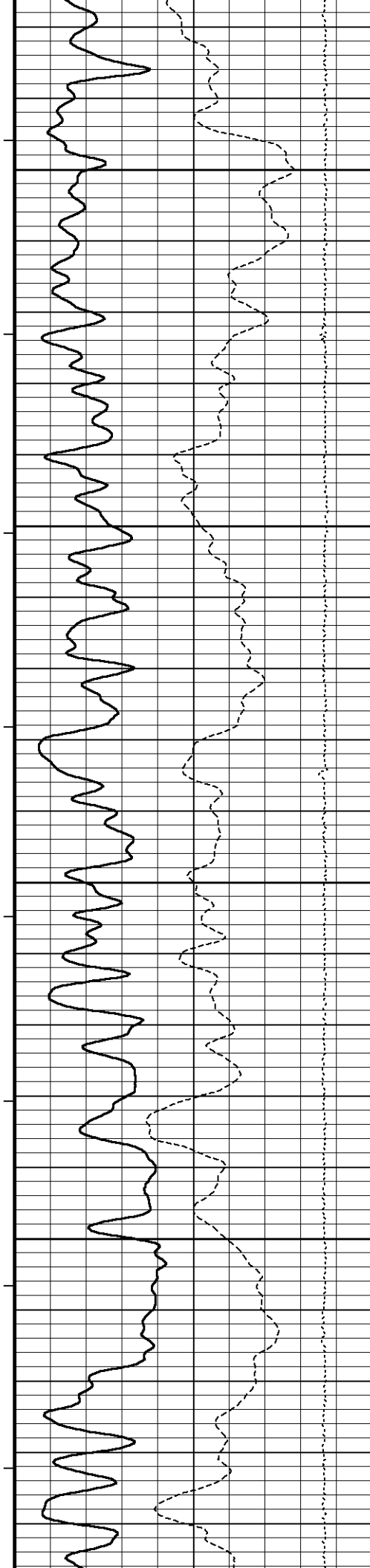
105°

3050

105°

3100





106°

3150

106°

3200

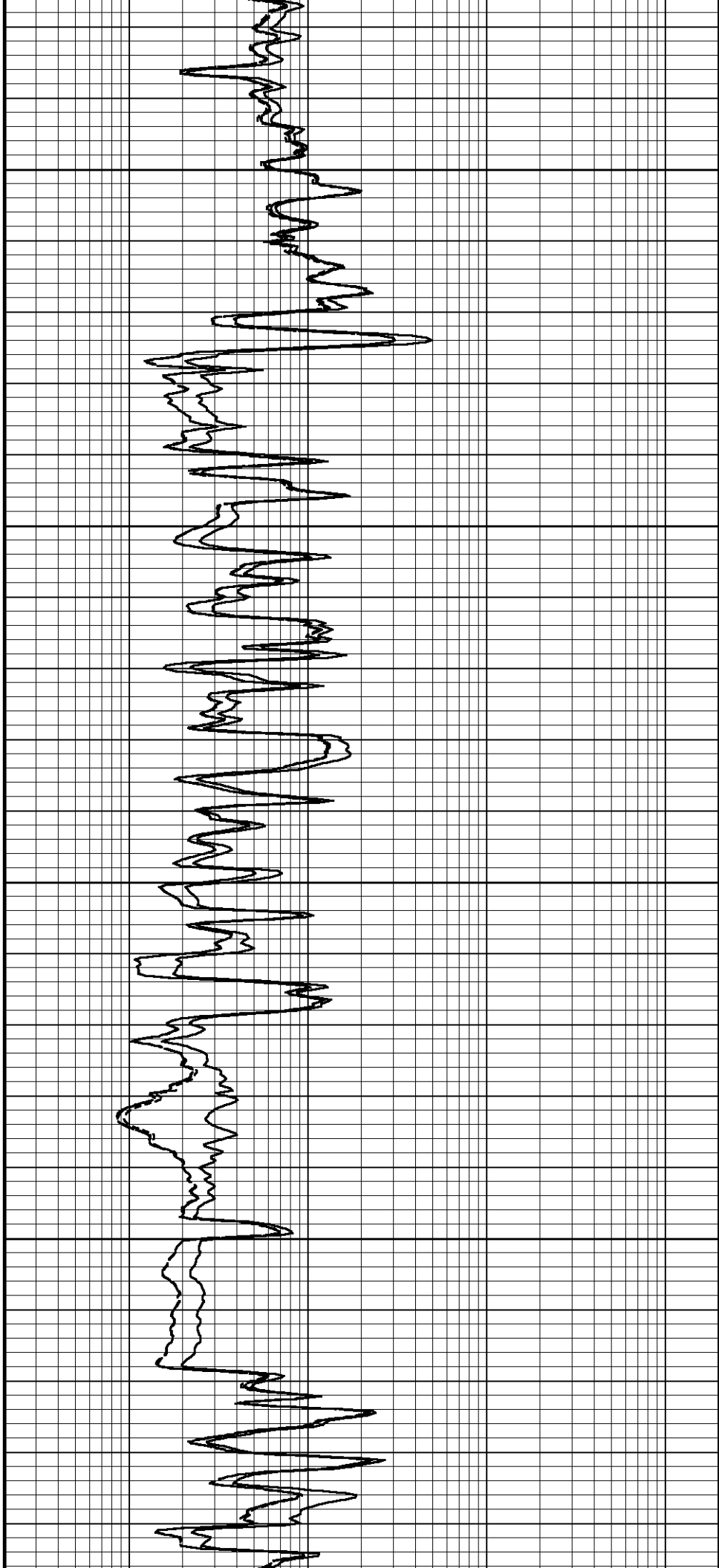
107°

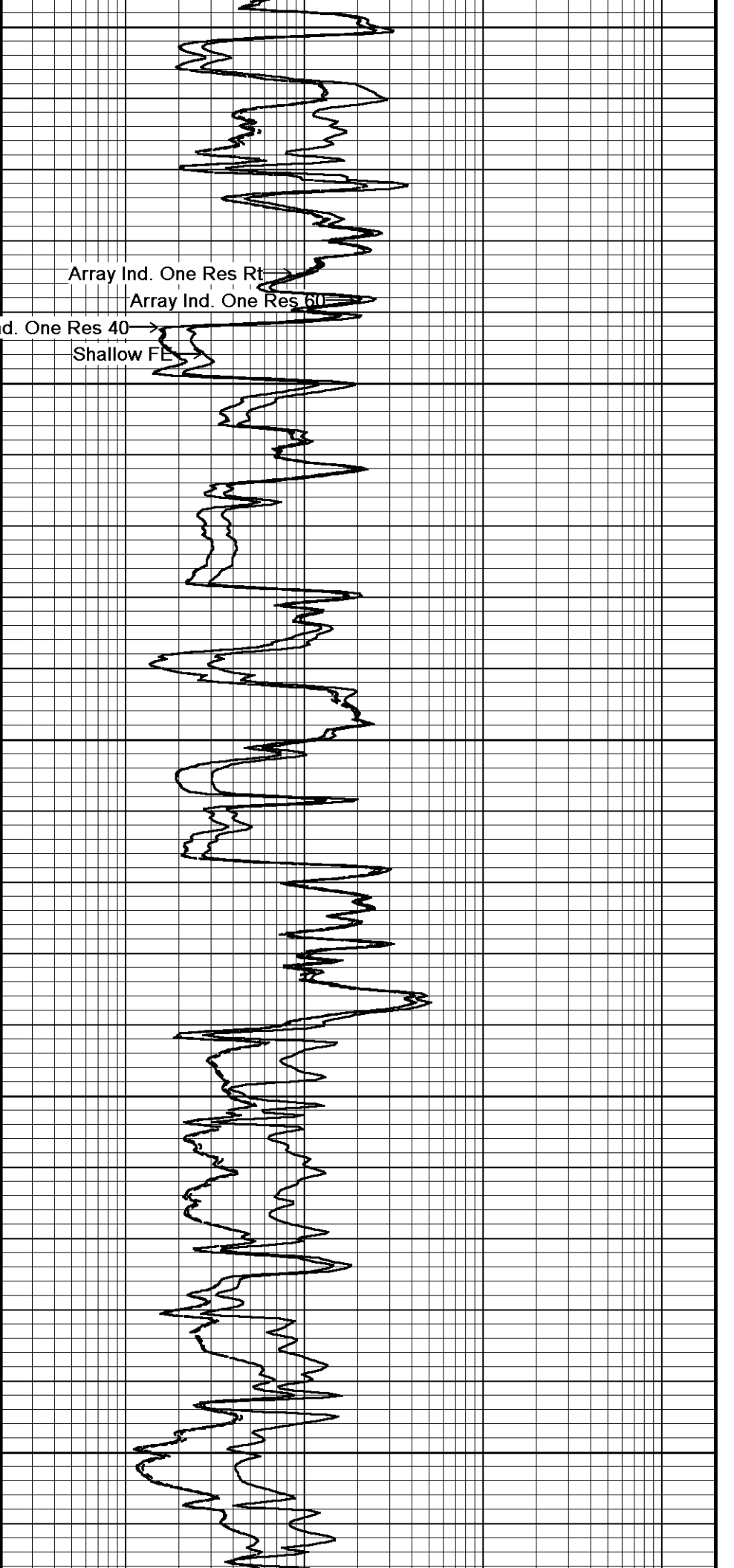
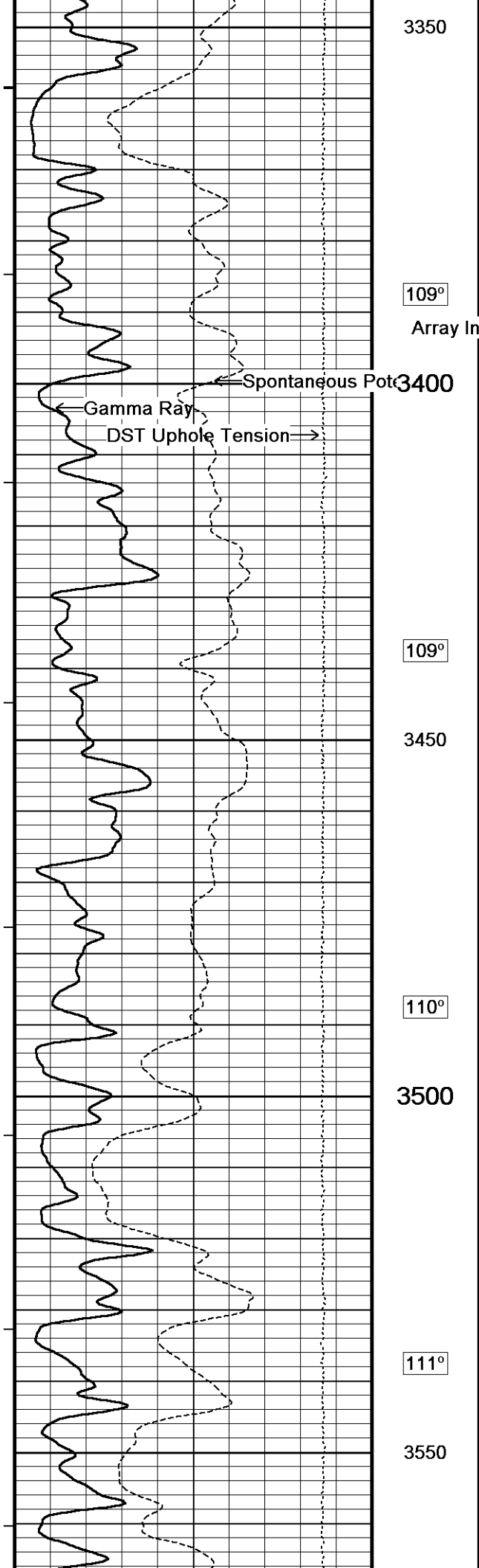
3250

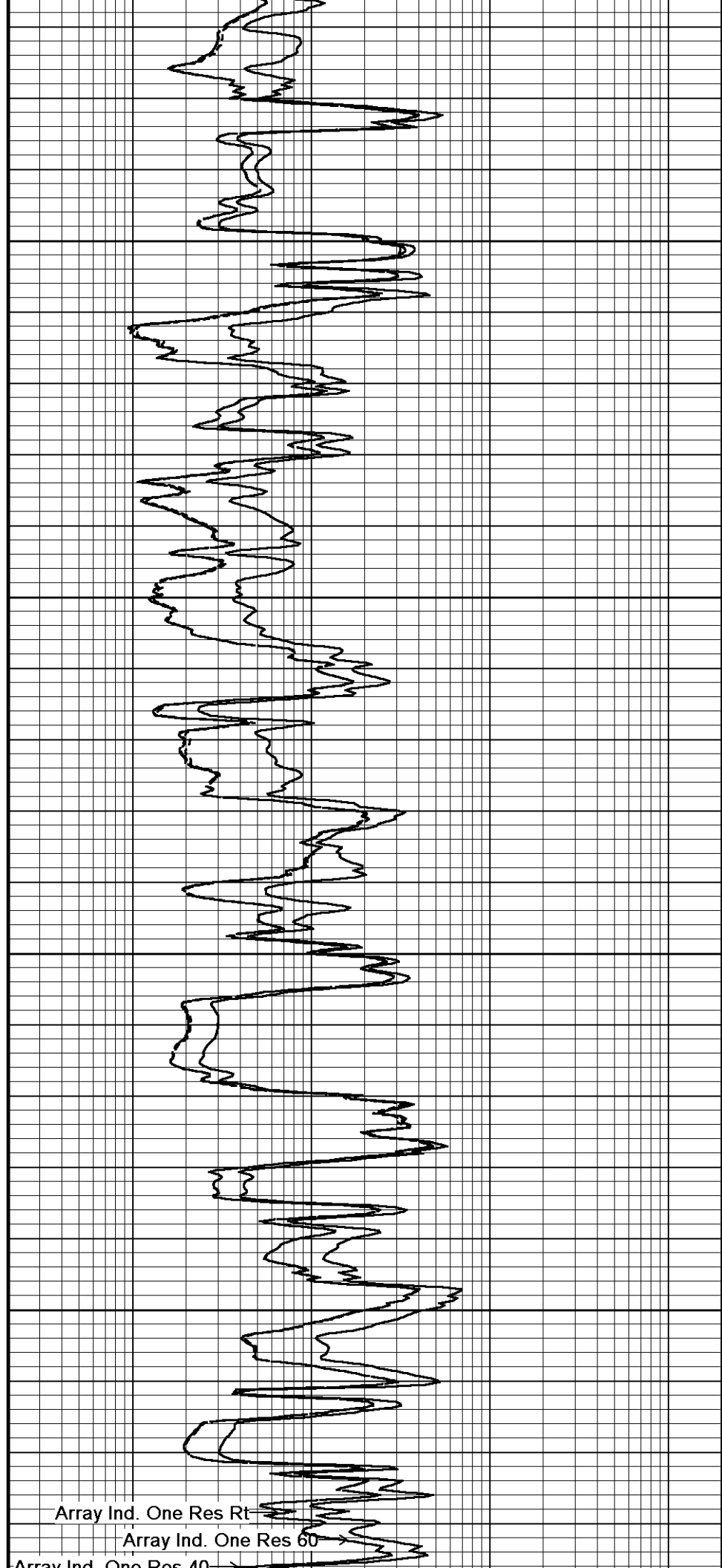
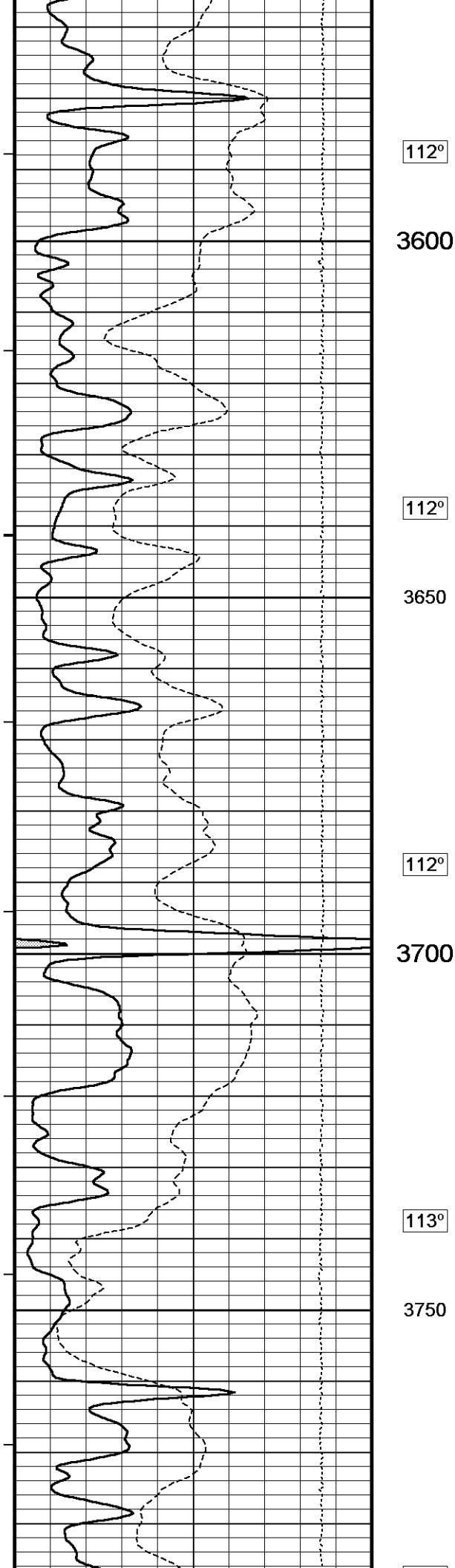
107°

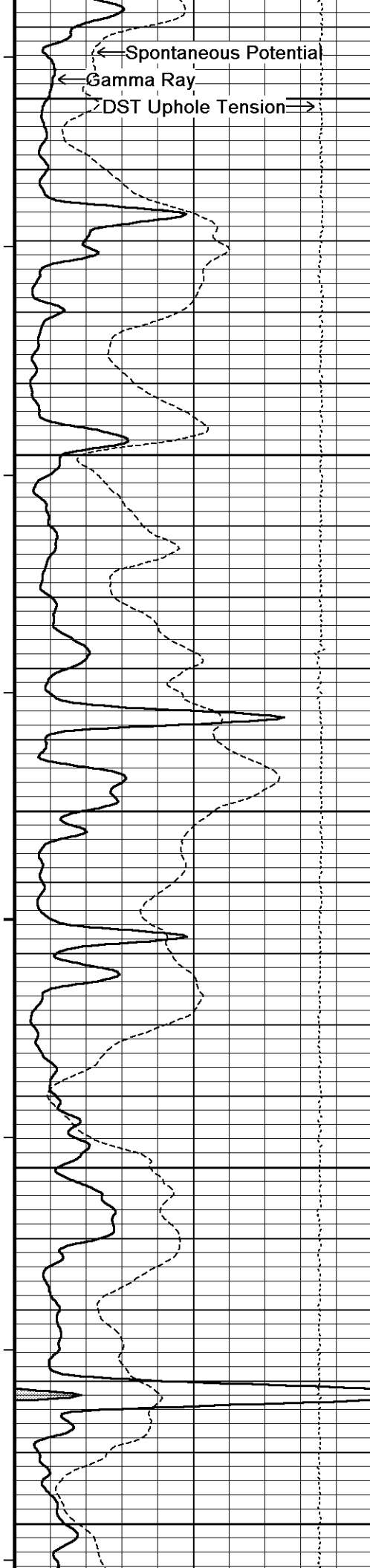
3300

108°









114°

3800

114°

3850

114°

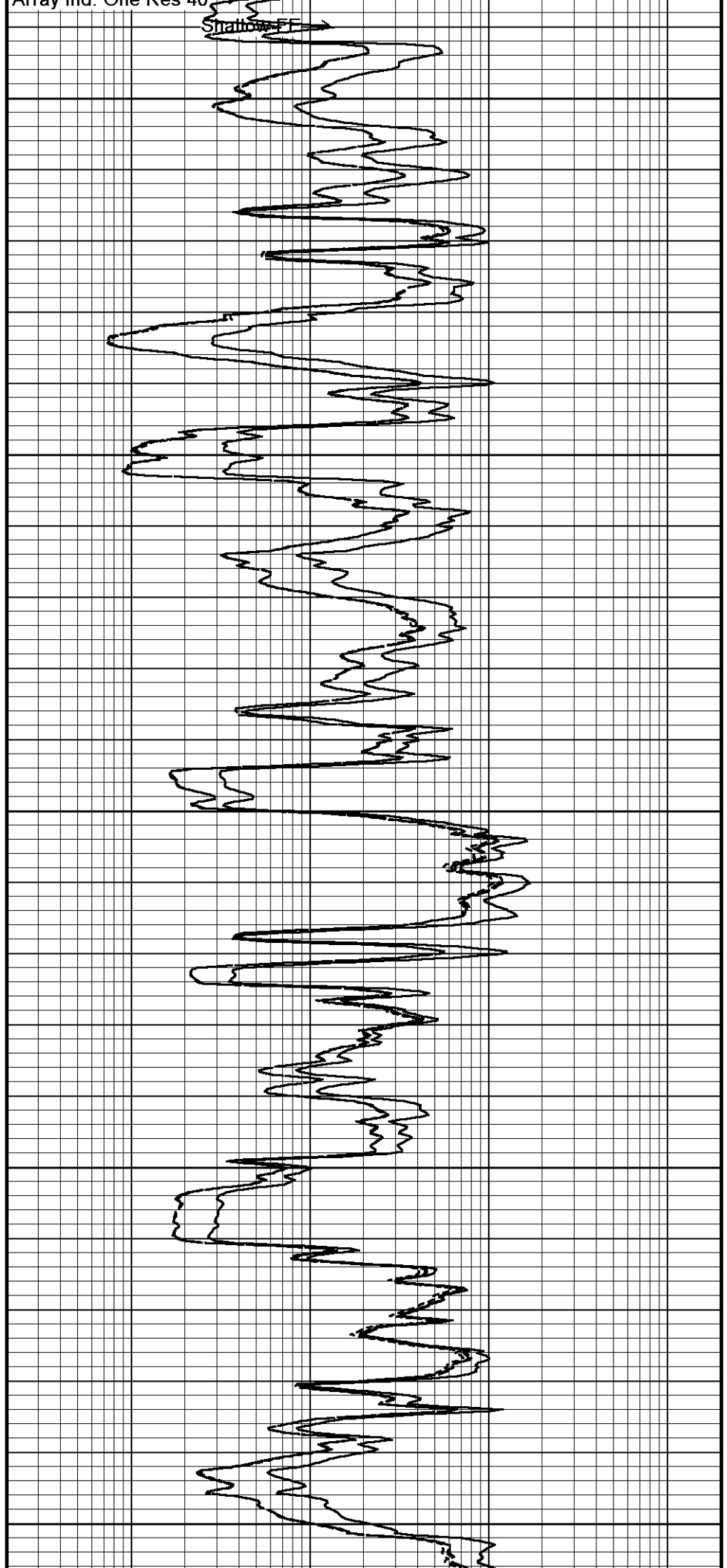
3900

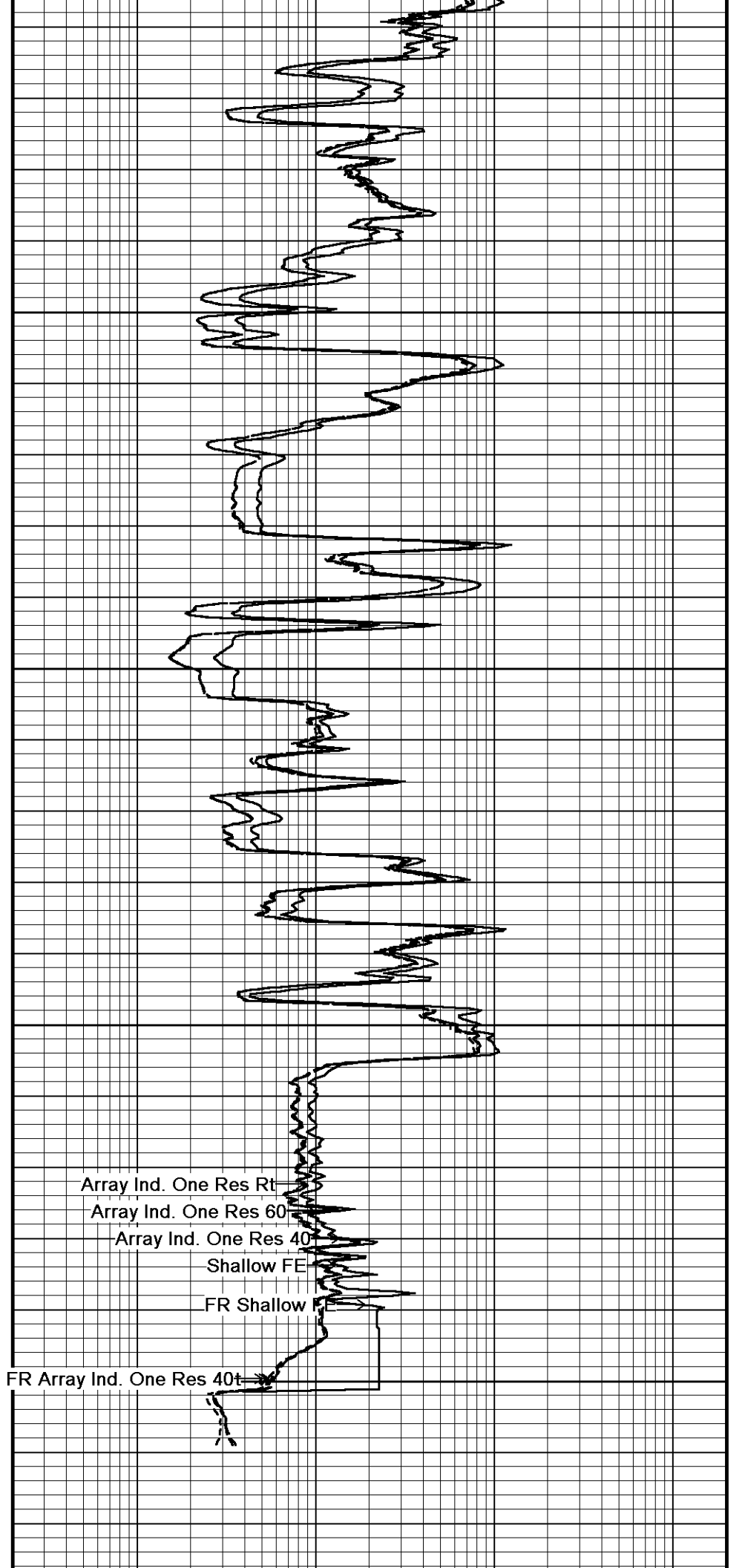
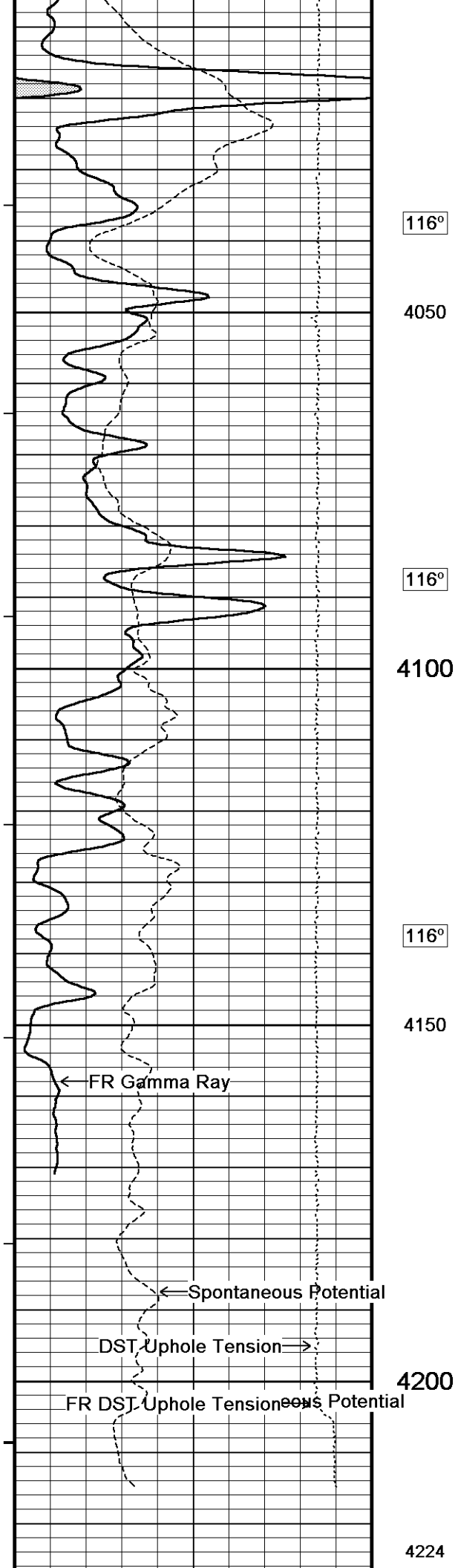
115°

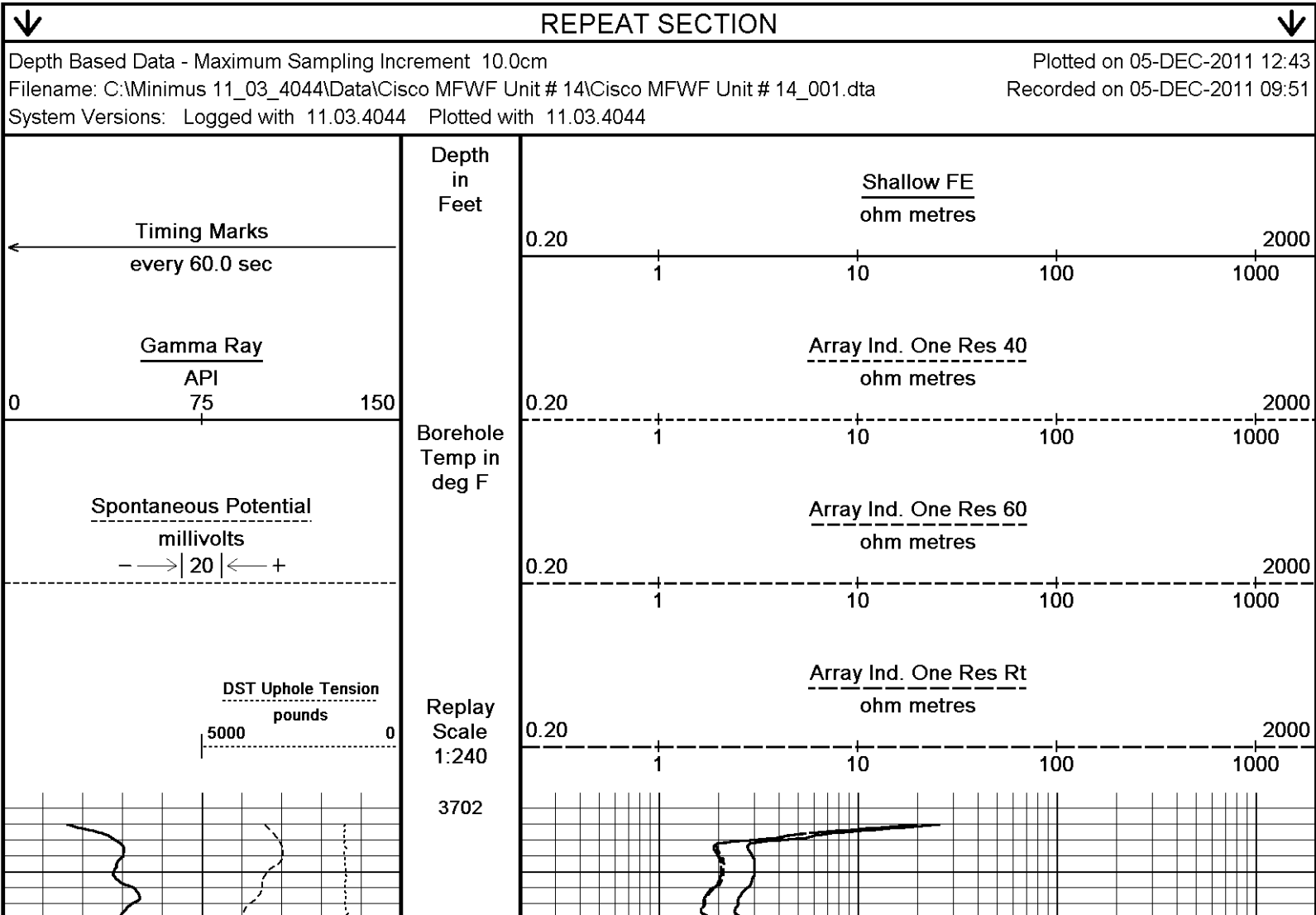
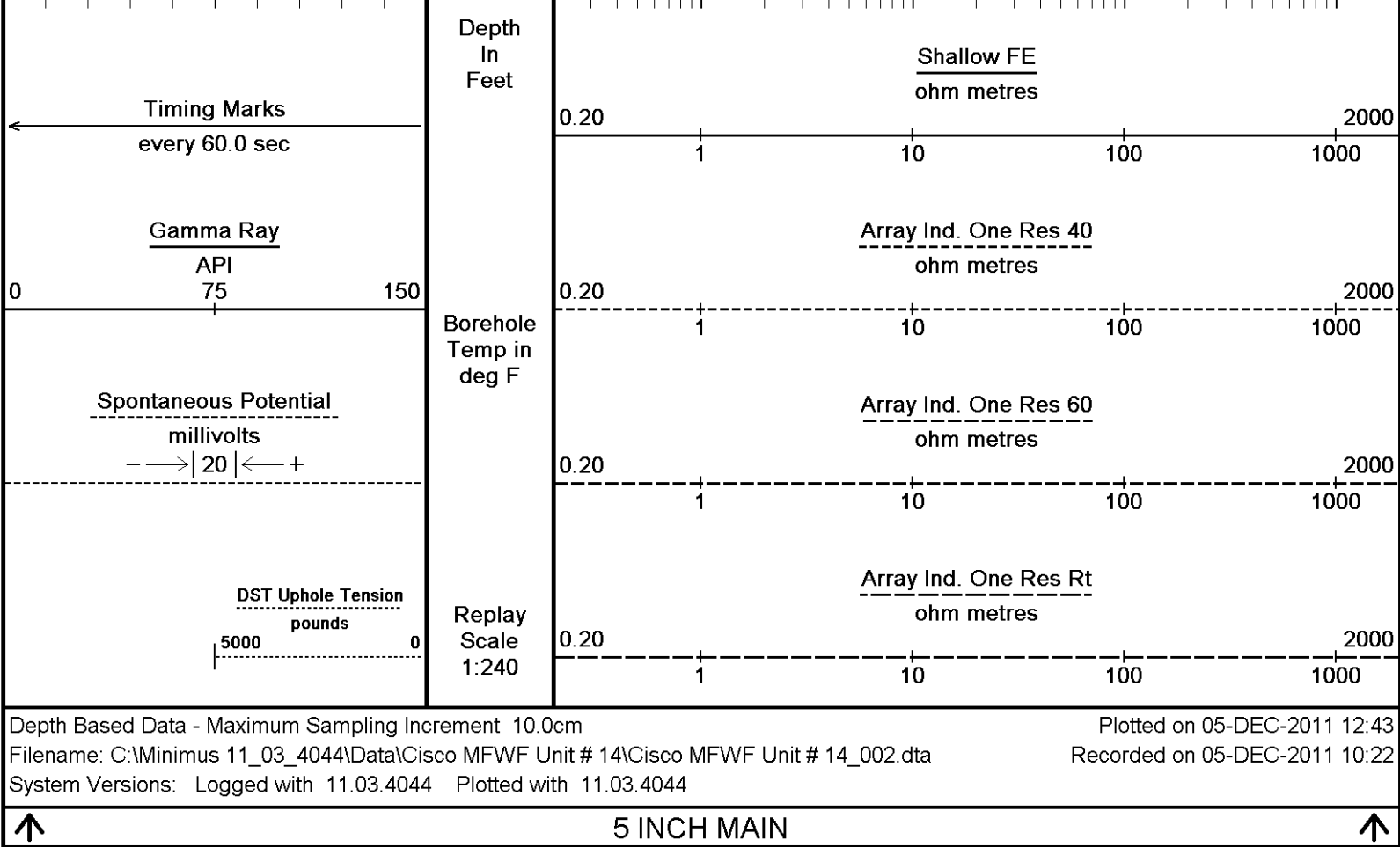
3950

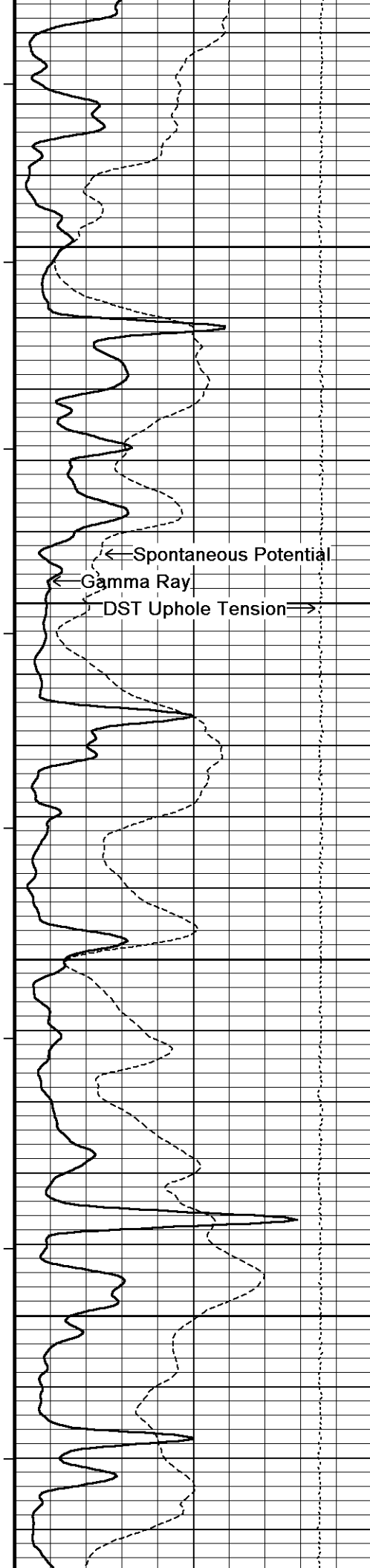
116°

4000









3750

112°

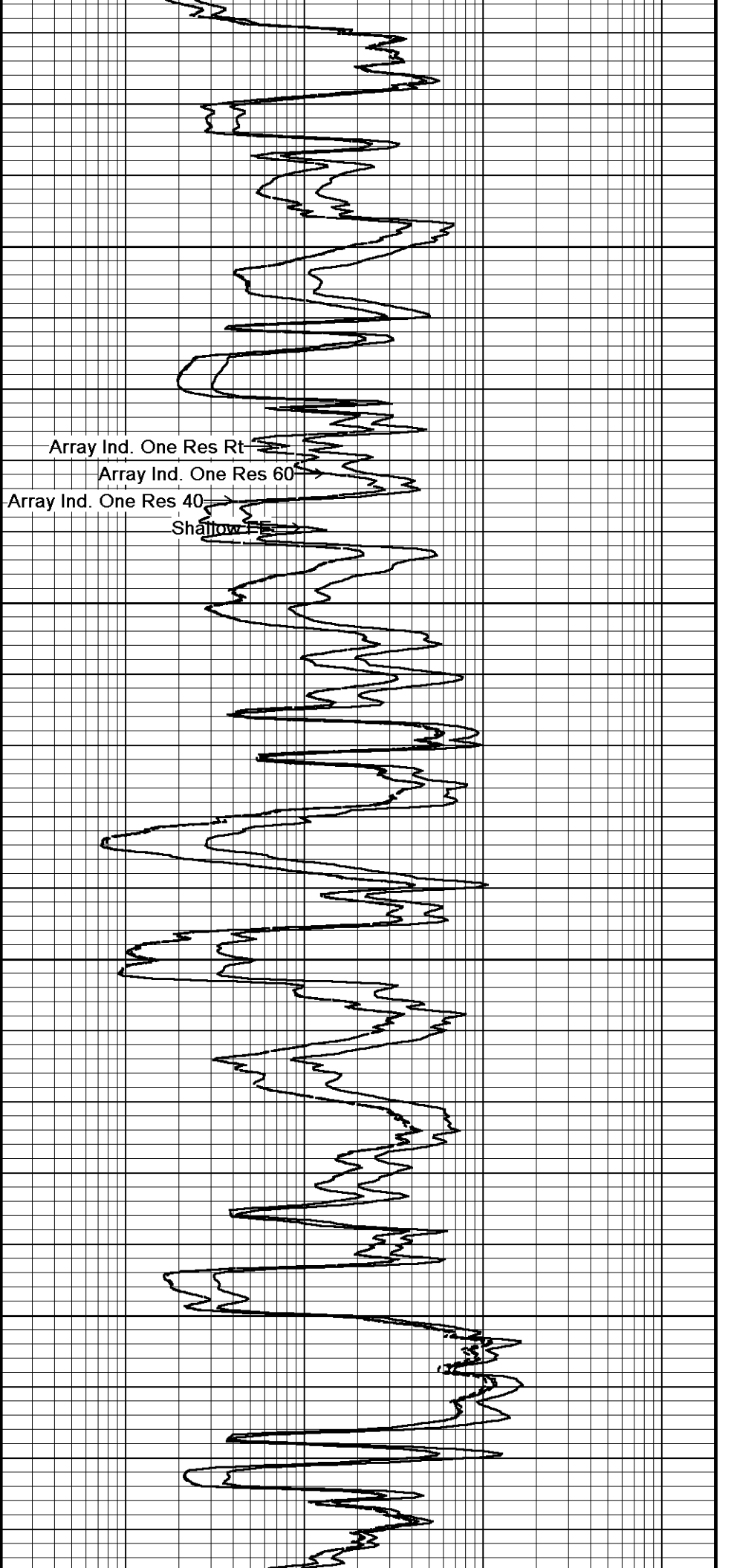
3800

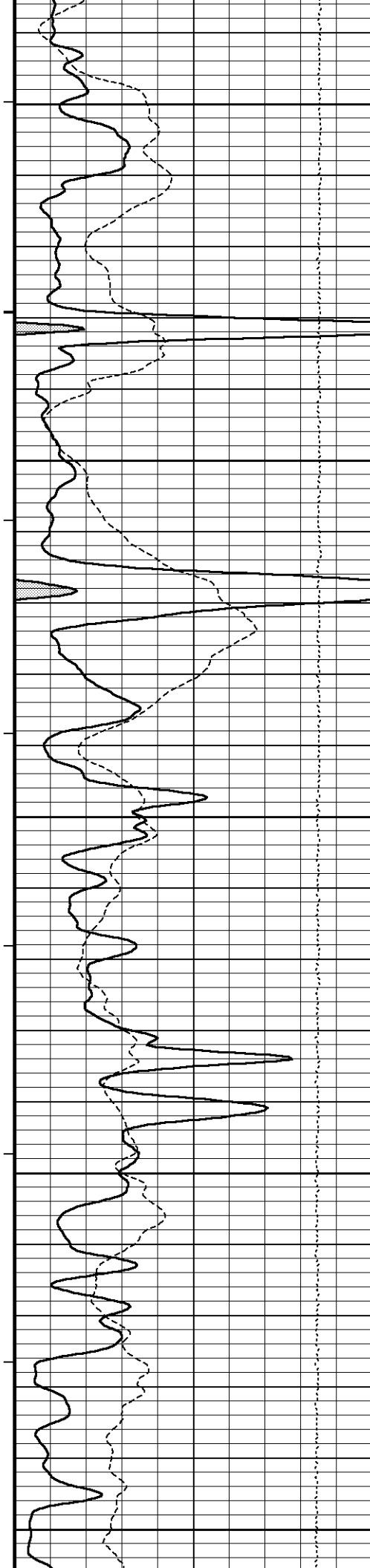
112°

3850

112°

3900





112°

3950

113°

4000

114°

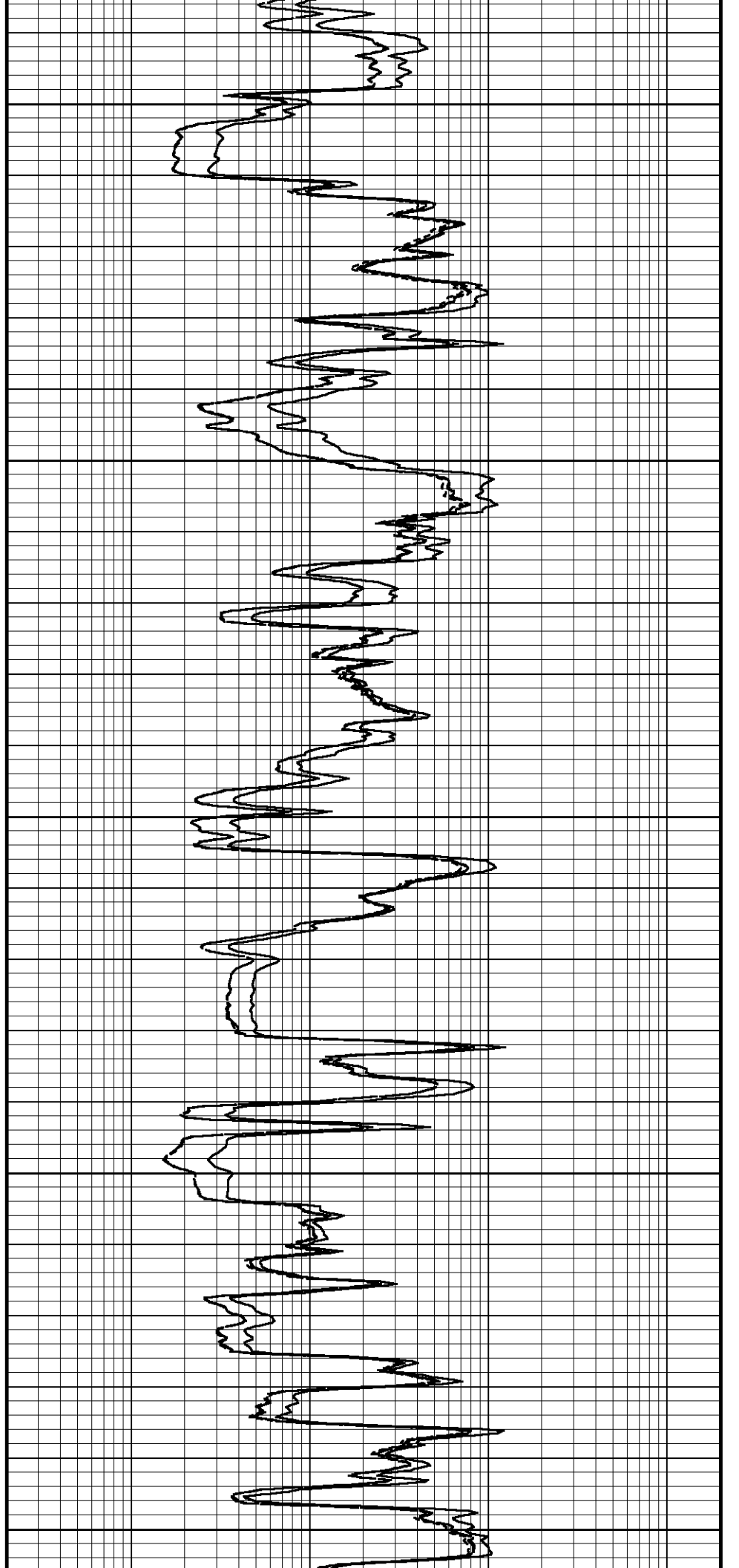
4050

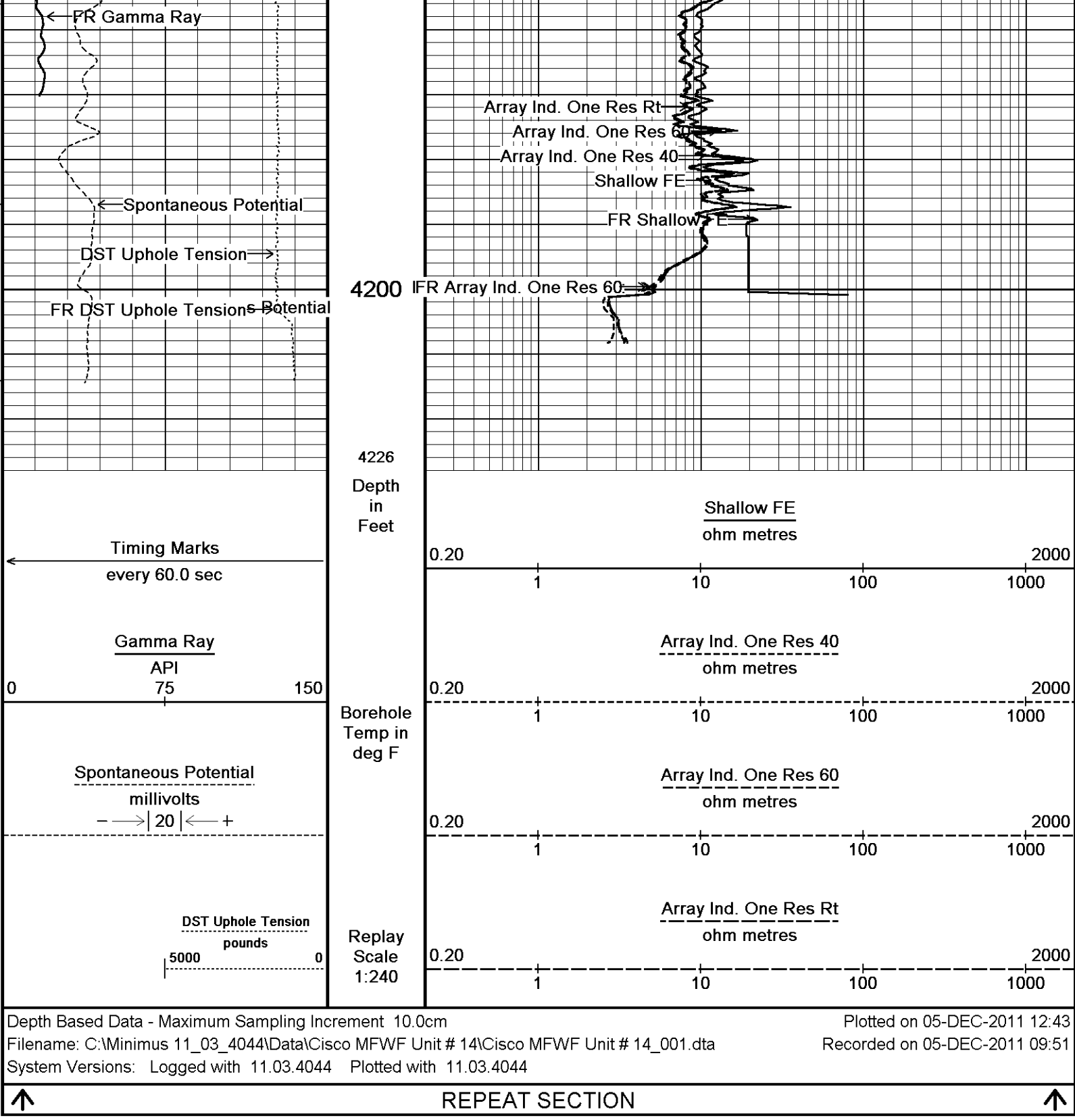
114°

4100

115°

4150





BEFORE SURVEY CALIBRATION		
C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta		
General Constants All 000		Last Edited on 05-DEC-2011,03:00
General Parameters		
Mud Resistivity	0.640	ohm-metres
Mud Resistivity Temperature	86.000	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	5.500	inches	
Caliper for Differential Caliper	Density Caliper		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Array Ind. Six Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
Down-hole Tension Calibration SMS 0			
Reading No	Measured	Calibrated (lbs)	Field Calibration on 23-OCT-2011 03:19
1	12734.06	0.00	
2	13523.27	454.00	
Gamma Calibration MCG-D.K 442			
	Measured	Calibrated (API)	Field Calibration on 04-DEC-2011 22:30
Background	72	20	
Calibrator (Gross)	1747	476	
Calibrator (Net)	1675	456	
Gamma Constants MCG-D.K 442			
			Last Edited on 05-DEC-2011,03:01
Gamma Calibrator Number	GRC141		
Mud Density	1.07	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
SP Calibration MCG-D.K 442			
	Measured	Calibrated (mV)	Field Calibration on 07-NOV-2011,09:01
Reference 1	100.0	100.0	
Reference 2	-100.0	-100.0	
High Resolution Temperature Calibration MCG-D.K 442			
	Measured	Calibrated(Deg F)	Field Calibration on 07-NOV-2011,09:01
Lower	50.00	50.00	
Upper	100.00	100.00	
High Resolution Temperature Constants MCG-D.K 442			
			Last Edited on
Pre-filter Length	11		
Caliper Calibration MML-A 9			
			Base Calibration on 17-OCT-2011 11:45
			Field Calibration on 04-DEC-2011 22:18
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15145	5.98	
2	18563	7.97	
3	21887	9.86	
4	25872	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.95	5.98	
Micro Normal and Micro Inverse Calibration MML-A 9			
			Base Calibration on 17-OCT-2011 11:28
			Field Check on 04-DEC-2011 22:21
Base Calibration			
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1 Resistor 2
Micro Normal	12.1	59.5	2.6 12.8
Micro Inverse	15.6	77.7	1.7 8.4
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	32.5	32.5	
Micro Inverse	16.4	16.4	

Micro Normal and Micro Inverse Constants MML-A 9

Last Edited on 05-DEC-2011,03:03

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	0.5110		
Micro Inverse K Factor	0.3380		
Standoff Offset	N/A	inches	

Neutron Calibration MDN-A.B 39

Base Calibration on 19-OCT-2011 15:30

Field Check on 04-DEC-2011 22:37

Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2769	86	3714	110
Ratio	32.016		33.764	
Field Calibrator at Base			Calibrated (cps)	
			2150	3003
Ratio			0.716	
Field Check			Calibrated (cps)	
			2381	1226
Ratio			1.941	

Neutron Constants MDN-A.B 39

Last Edited on 05-DEC-2011,03:03

Neutron Source Id	N1095		
Neutron Jig Number	NECD117		
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	None		
Formation Pressure	N/A	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-A.A 67

Base Calibration on 21-NOV-2011 10:01

Field Check on 04-DEC-2011 22:11

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	959.2	126.8
Base Check		281.1
Field Check		281.1

FE Constants MFE-A.A 67

Last Edited on 05-DEC-2011,03:02

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	

High Resolution Temperature Calibration MAI-A.A 188

Field Calibration on 12-AUG-2011,21:41

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

High Resolution Temperature Constants MAI-A.A 188

Last Edited on 21-JUN-2011,19:05

Induction Calibration MAI-A.A 188

Base Calibration on 19-OCT-2011 14:25

Field Check on 04-DEC-2011 22:09

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.9	470.2	9.3	966.2
2	6.4	377.1	7.6	821.4
3	3.9	257.8	5.2	566.0
4	1.7	135.1	2.6	279.2

Array Temperature 66.3 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	13.7	3867.1
2	0.0	0.0	30.0	3584.1
3	0.0	0.0	27.9	3078.3
4	0.0	0.0	19.8	2046.5
Deep	0.0	0.0	17.2	1954.7
Medium	0.0	0.0	40.3	4114.2
Shallow	0.0	0.0	44.9	5368.6

Array Temperature 0.0 68.3 Deg F

Induction Constants MAI-A.A 188

Last Edited on 05-DEC-2011,03:02

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

Temperature Corr

Temp. for Rm Corr.

Borehole Temp. Unfilt.

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	

Caliper Calibration MPD-B 65

Base Calibration on 28-NOV-2011 10:07

Field Calibration on 04-DEC-2011 22:12

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13805	3.99
2	22448	5.98

3	31025	7.97
4	39247	9.86
5	48400	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.98

Photo Density Calibration MPD-B 65

Base Calibration on 28-NOV-2011 10:33
Field Check on 04-DEC-2011 22:17

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60872	28838	59556	30836
Reference 2	24326	2449	24941	2541

Field Check at Base

1237.1 1179.7

Field Check

1234.4 1182.7

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	225	1100		
Reference 1	22729	60656	0.378	0.371
Reference 2	6549	24175	0.274	0.272

Field Check at Base

224.7 1100.1

Field Check

222.4 1095.8

Density Constants MPD-B 65

Last Edited on 05-DEC-2011,03:02

Density Source Id	P57072B
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	1.07 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 (m)
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:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta

Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in



Compact Comms Gamma 45.04 ft GRGC - Gamma Ray

Compact Gamma Ray
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log

MML-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Micro-log

MML-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron

MDN-A.B 39 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Neutron

MDN-A.B 39 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Density/Caliper

MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint

SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint

SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric

MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Focussed Electric

MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction

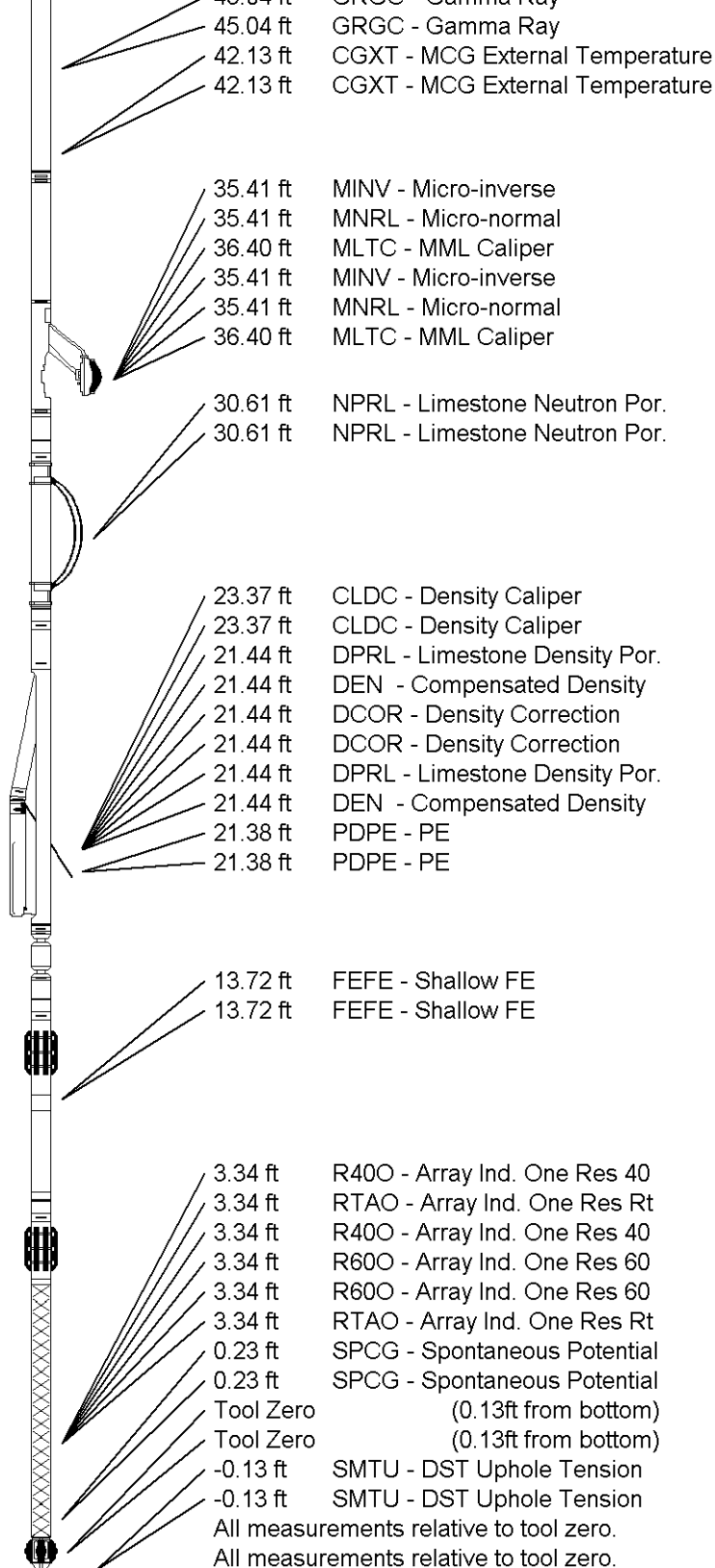
MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction

MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.32 ft Weight: 407.9 lb

Total Length: 50.32 ft Weight: 407.9 lb



COMPANY

CISCO OPERATING LLC.

WELL

MFWF UNIT # 14

FIELD

MISSOURI FLATS NORTHEAST

PROVINCE/COUNTY

GOVE

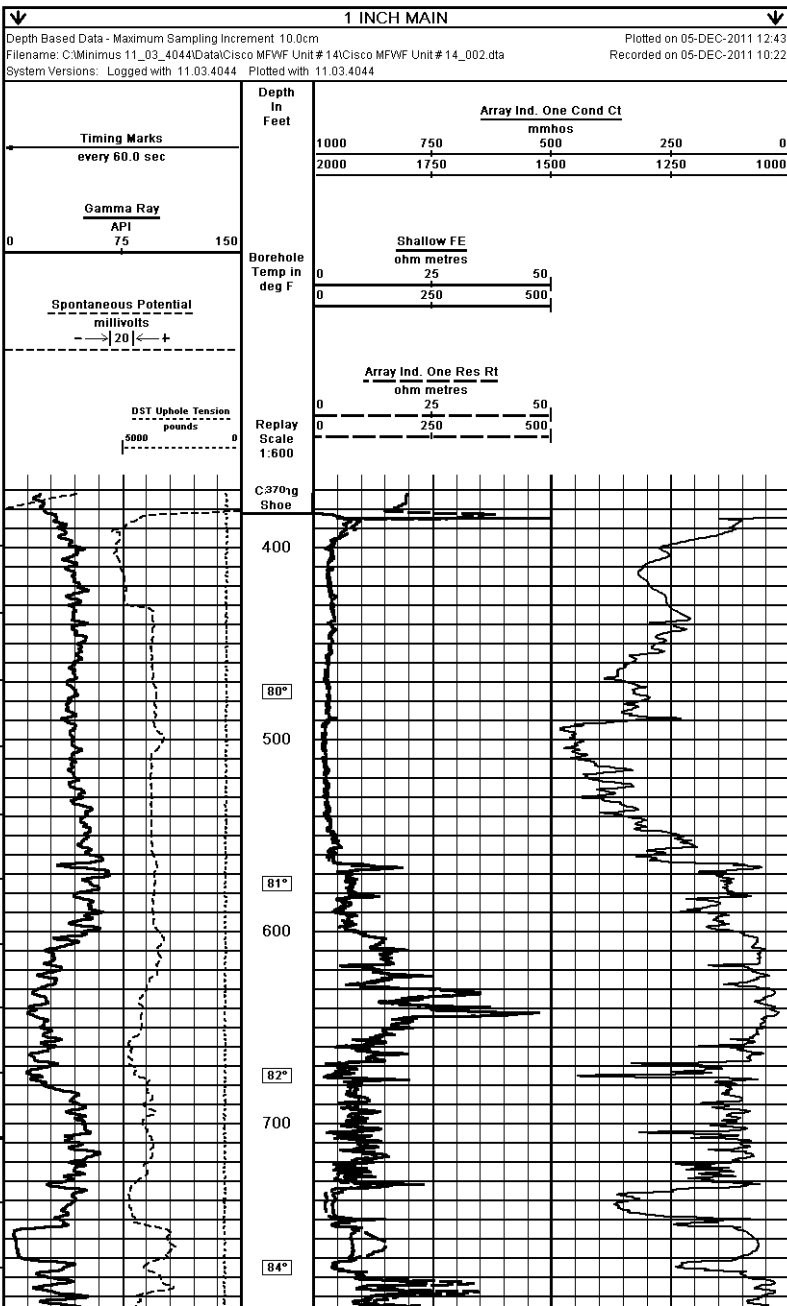
COUNTRY/STATE

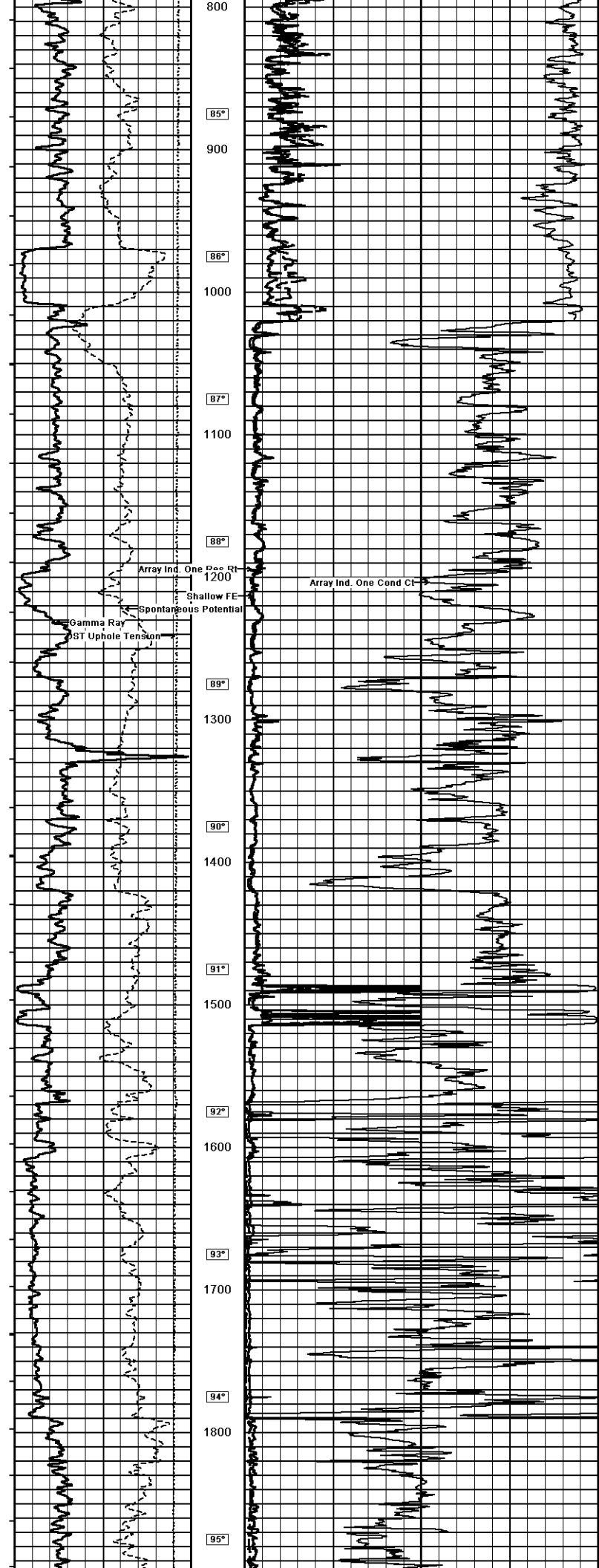
U.S.A. / KANSAS

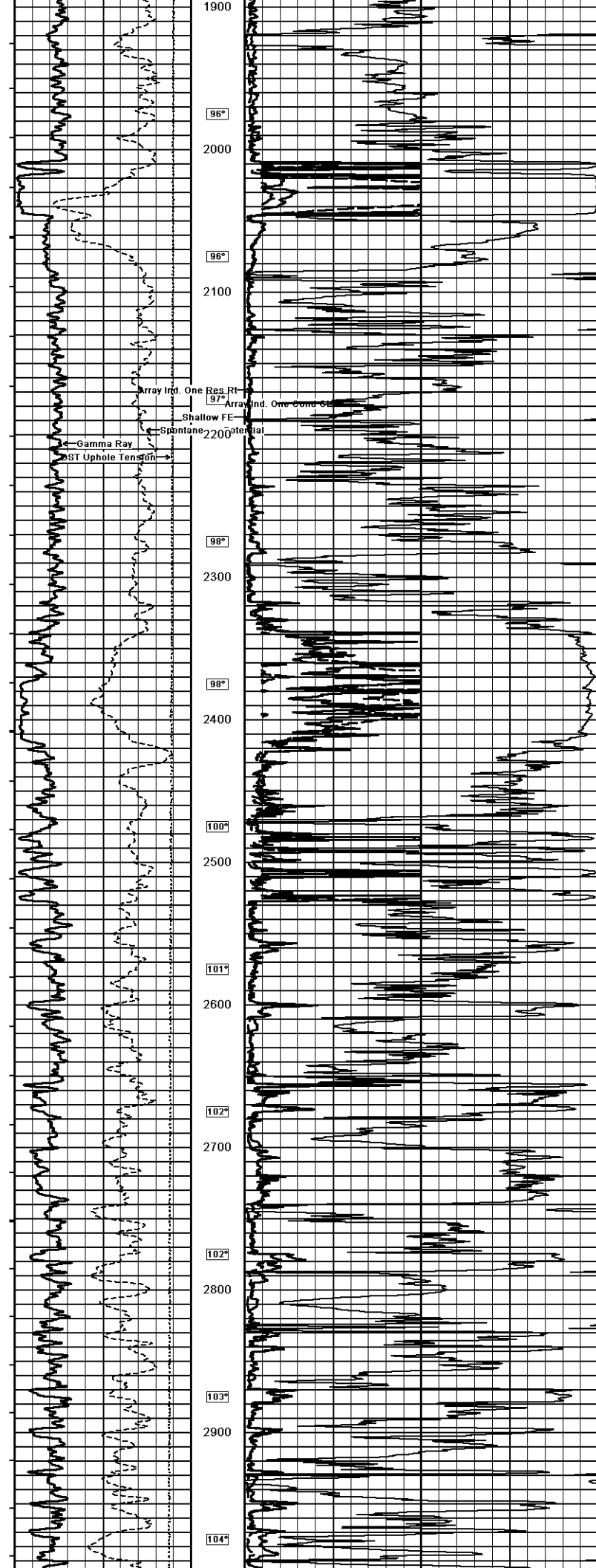
Elevation Kelly Bushing	2586.00	feet
Elevation Drill Floor	2584.00	feet
Elevation Ground Level	2575.00	feet

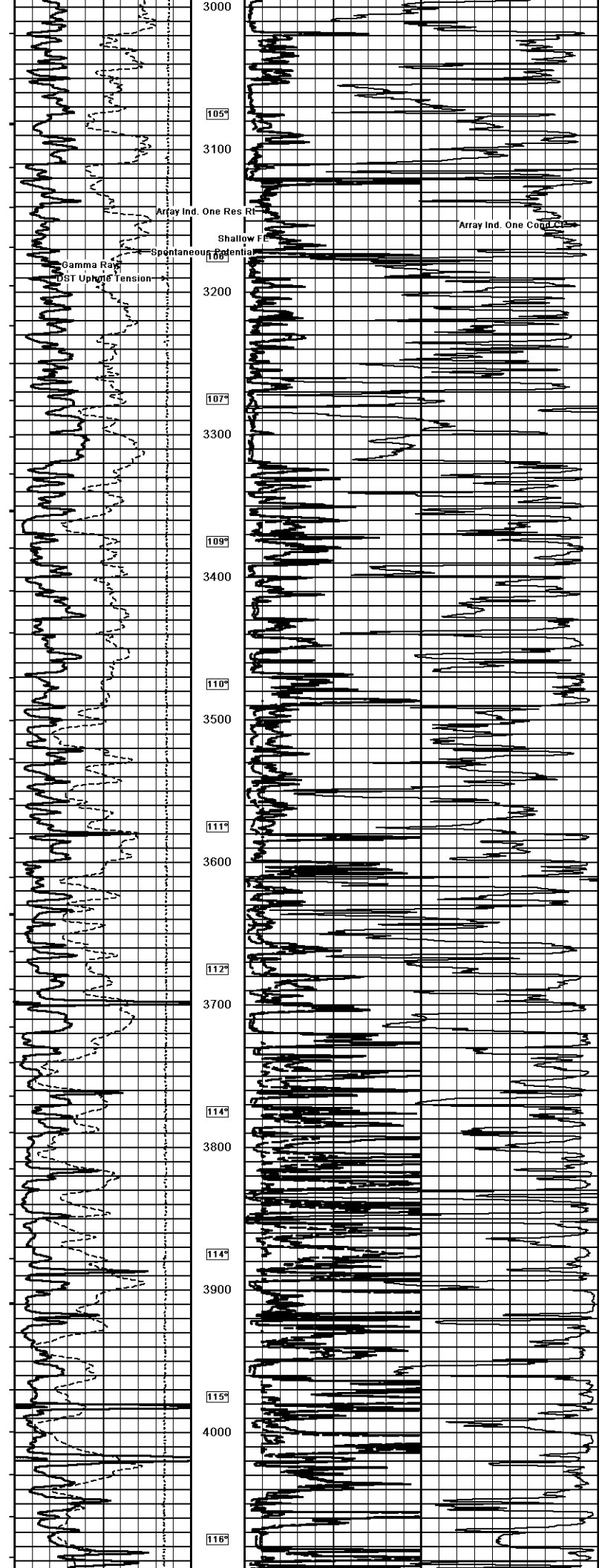
First Reading	4200.00	feet
Depth Driller	4200.00	feet
Depth Logger	4203.00	feet

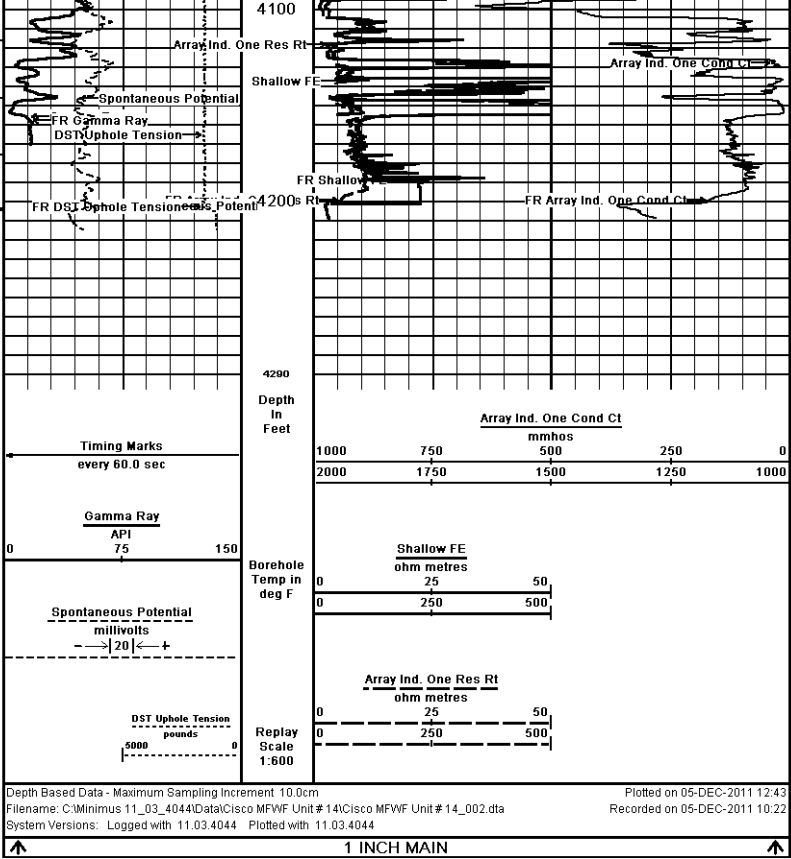
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY: CISCO OPERATING, LLC. WELL: MFWF UNIT # 14 FIELD: MISSOURI FLATS NORTHEAST PROVINCE/COUNTY: GOVE COUNTRY/STATE: U.S.A. / KANSAS LOCATION: 2300' FNL & 335' FWL		SEC: 22 TWP: 14S RGE: 28W ZONE: 14S Other Services: MFL, MFLN, MFLN	
Date: 05-DEC-2011 Log Measured From KB: 4200.00 Drilling Measured From KB: 4200.00		Log Measured From KB: 4200.00 Drilling Measured From KB: 4200.00	
Run Number: ONE Depth Driller: 4200.00 Depth Logger: 4200.00 First Reading: 392.00 Last Reading: 392.00 Casing Driller: 392.00 Casing Logger: 392.00		Bit Size: 7.875 Hole Fluid Type: CHEMICAL Density/Viscosity: 8.90 lbm/gal pH/Fluid Loss: 11.00 Sample Source: FLOWLINE Sample @ Measured Temp: 1.74 @ 35.0 Sample @ Measured Temp: 1.30 @ 35.0 Sample @ Measured Temp: 2.09 @ 35.0 Source Rmt/Rmc: CALC Rmt @ BHT: 0.59 @ 116.0 Time Since Circulation: 5 HOURS Max Recorded Temp: 116.00 Equipment Name: COMPACT Equipment Phase: LIB Recorded By: A. SILL Witnessed By: JOHN JORDAN C.O.# 1065# 3534078	











COMPANY		CISCO OPERATING LLC.			
WELL		MFWF UNIT # 14			
FIELD		MISSOURI FLATS NORTHEAST			
PROVINCE/COUNTY		GOVE			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2586.00	feet	First Reading	4200.00	feet
Elevation Drill Floor	2584.00	feet	Depth Driller	4200.00	feet
Elevation Ground Level	2575.00	feet	Depth Logger	4203.00	feet
 Weatherford		ARRAY INDUCTION			
		SHALLOW FOCUSSED			
		ELECTRIC LOG			
					