



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY

COMANCHE RESOURCES COMPANY

WELL

EDER # 6-4

FIELD

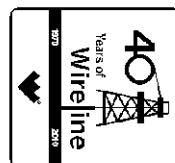
WILDCAT

PROVINCE/COUNTY

SCOTT

LOCATION

U.S.A. / KANSAS
780' FSL & 920' FEL



SEC

TWP
20S

RGE
34W

Other Services
MPD/MDN
MML

API Number

15-171-20857

Permit Number

Permanent Datum G.L., Elevation 3070 feet

Log Measured From KB

Drilling Measured From K.B. @ 11 FEET

Date

03-JAN-2012

Run Number

ONE

Depth Driller

5000.00

Depth Logger

5004.00

First Reading

5001.00

Last Reading

394.00

Casing Driller

393.00

Casing Logger

394.00

Bit Size

7.875

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.10 lb/USg

PH / Fluid Loss

10.00

Sample Source

FLOWLINE

Rm @ Measured Temp

0.80 @ 50.0

Rmf @ Measured Temp

0.64 @ 50.0

Rmc @ Measured Temp

0.96 @ 50.0

Source Rmf / Rmc

CALC

Rm @ BHT

0.38 @ 111.0

Time Since Circulation

5 HOURS

Max Recorded Temp

111.00

Equipment Name

COMPACT

Equipment / Base

13057

LIB

A. GIAMBALVO

SEAN DEENIHAN

LB12-02

BOREHOLE RECORD

Last Edited: 04-JAN-2012 03:19

Bit Size
inches

7.875

Depth From
feet

394.00

Depth To
feet

5004.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

11.00

Shoe Depth
feet

394.00

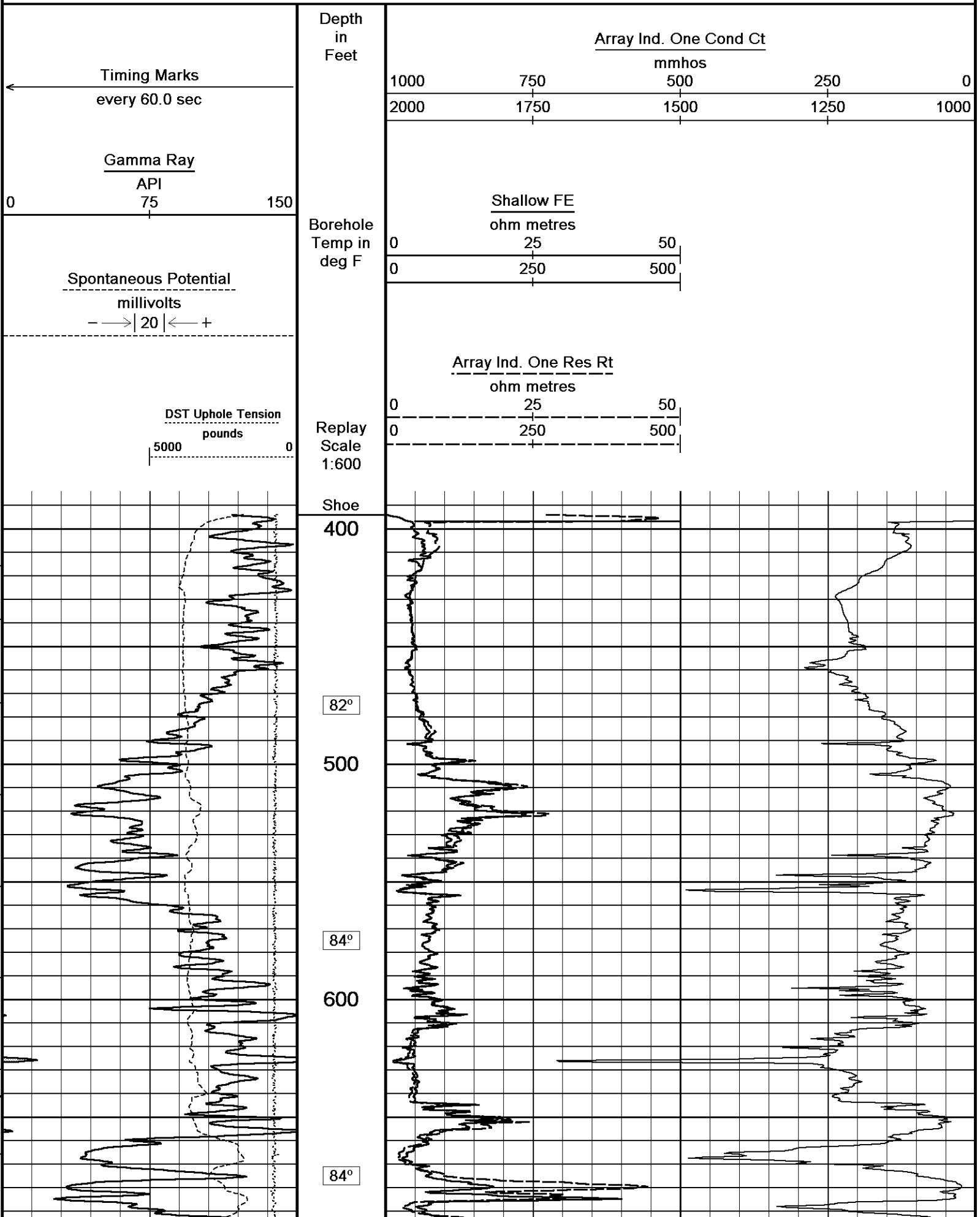
Weight
pounds/ft

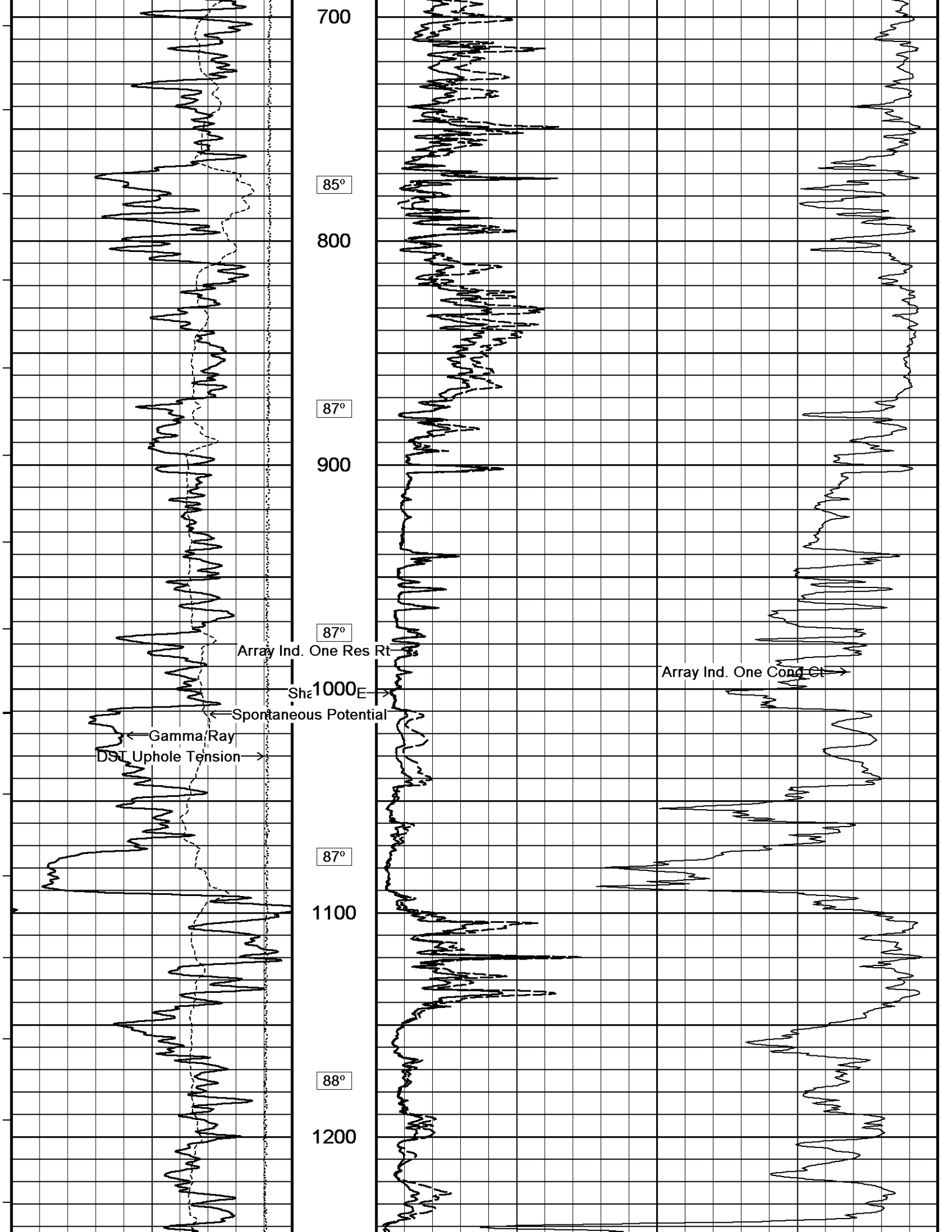
24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, SKJ, MFE, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE and MAI 0.5 inch standoffs used.
2.71 g/cc Limestone Density Matrix used to calculate porosity.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = 275 cu. ft.
Service order #3531243
Rig: Murfin Rig # 22
Engineer: A. Giambalvo
Operator(s): B. Johnson

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.







89°

1300

89°

1400

91°

1500

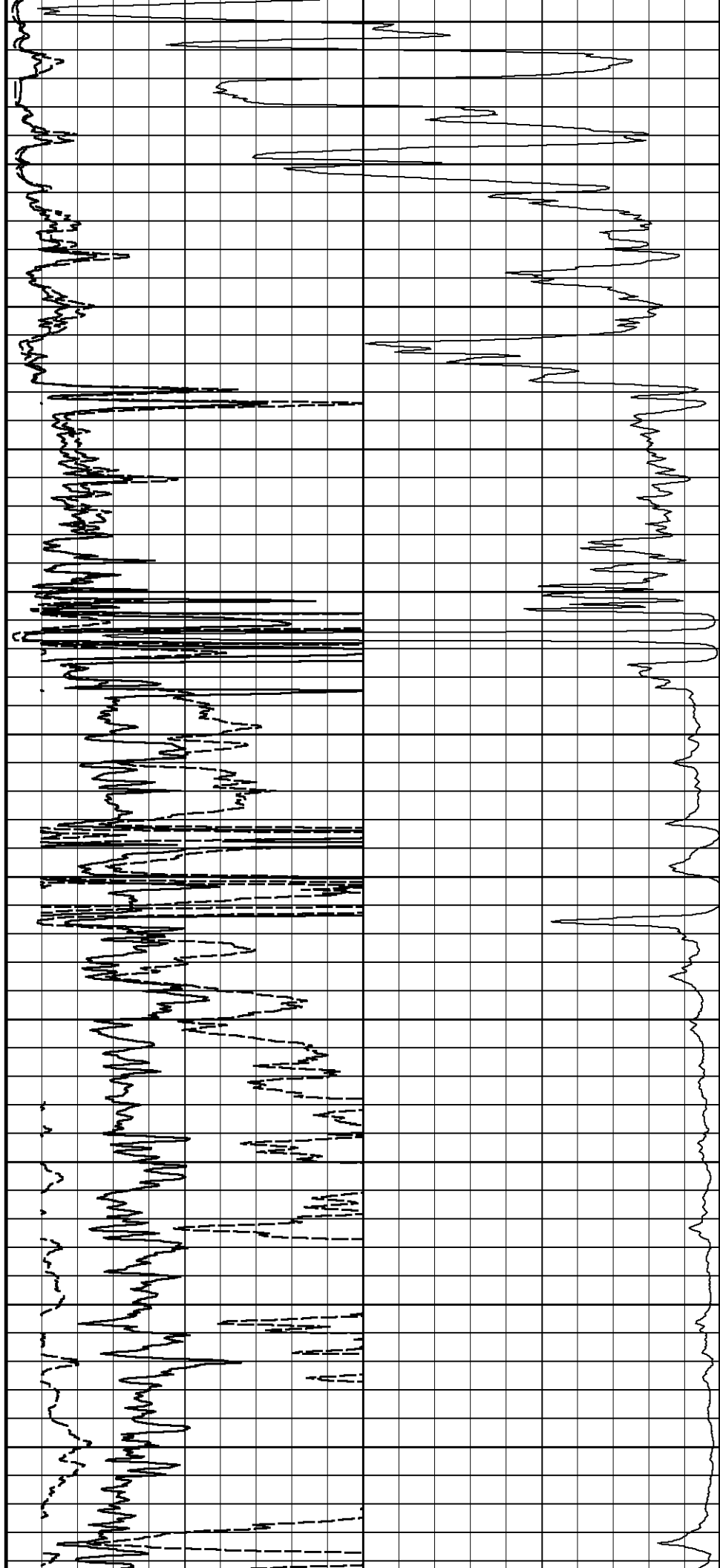
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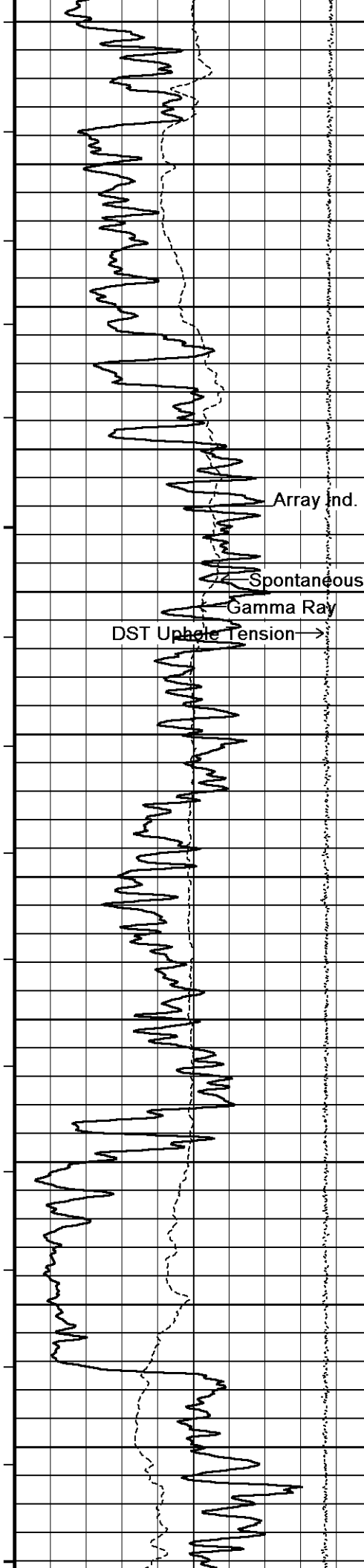
1600

92°

1700

92°





1800

91°

1900

Array Ind. One Res Rt

92°

Shallow FE

Spontaneous Pot

Gamma Ray

DST Uphole Tension

2000

92°

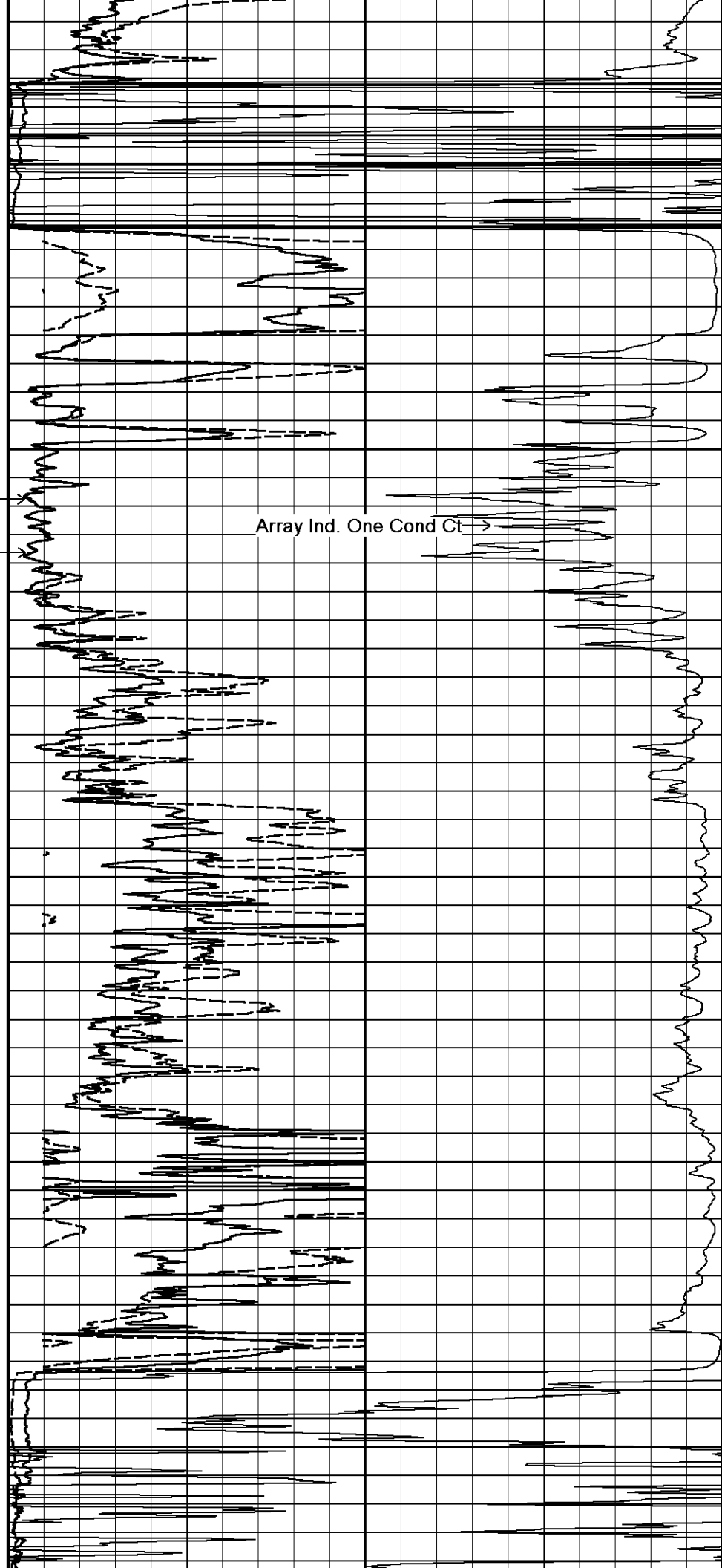
2100

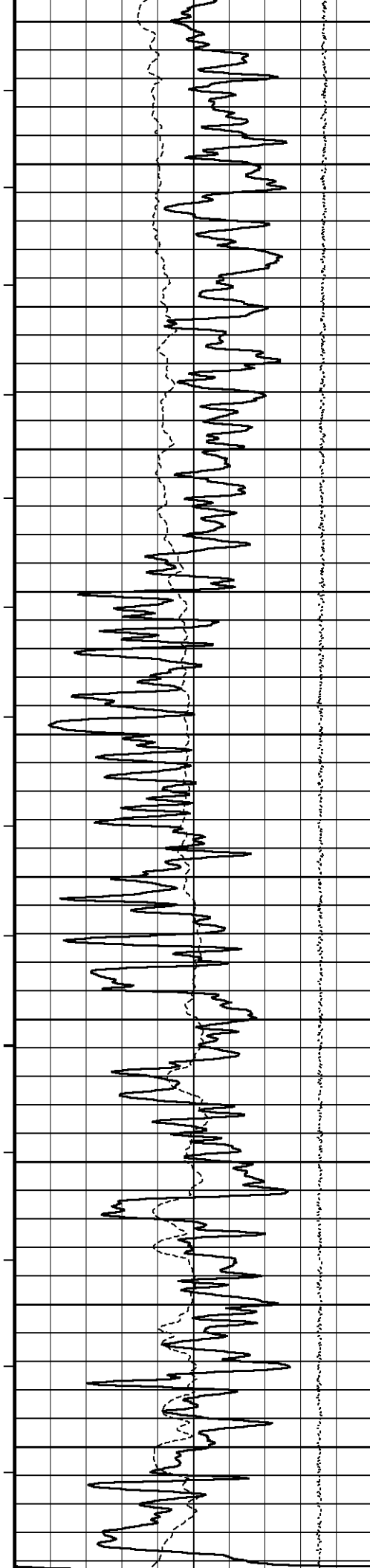
93°

2200

94°

2300





94°

2400

94°

2500

95°

2600

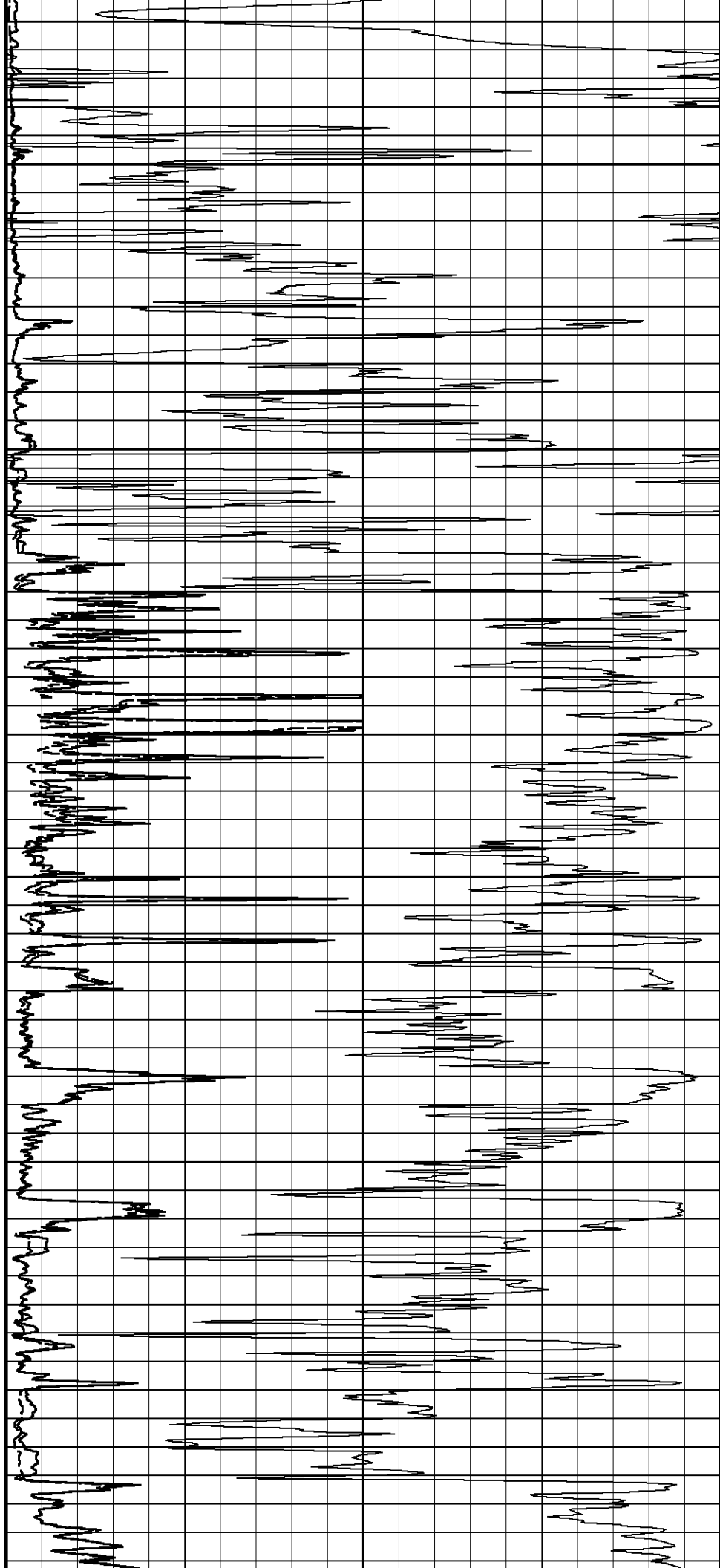
95°

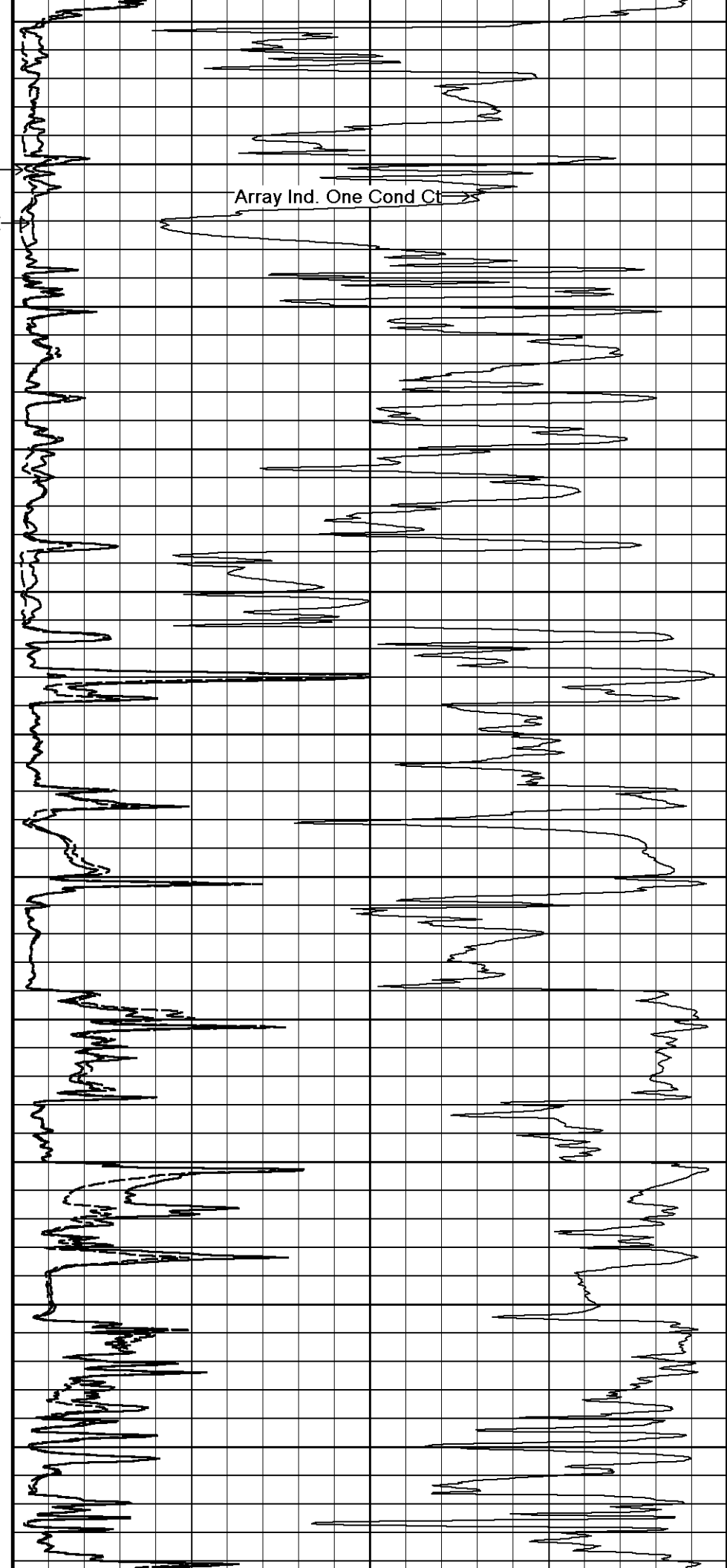
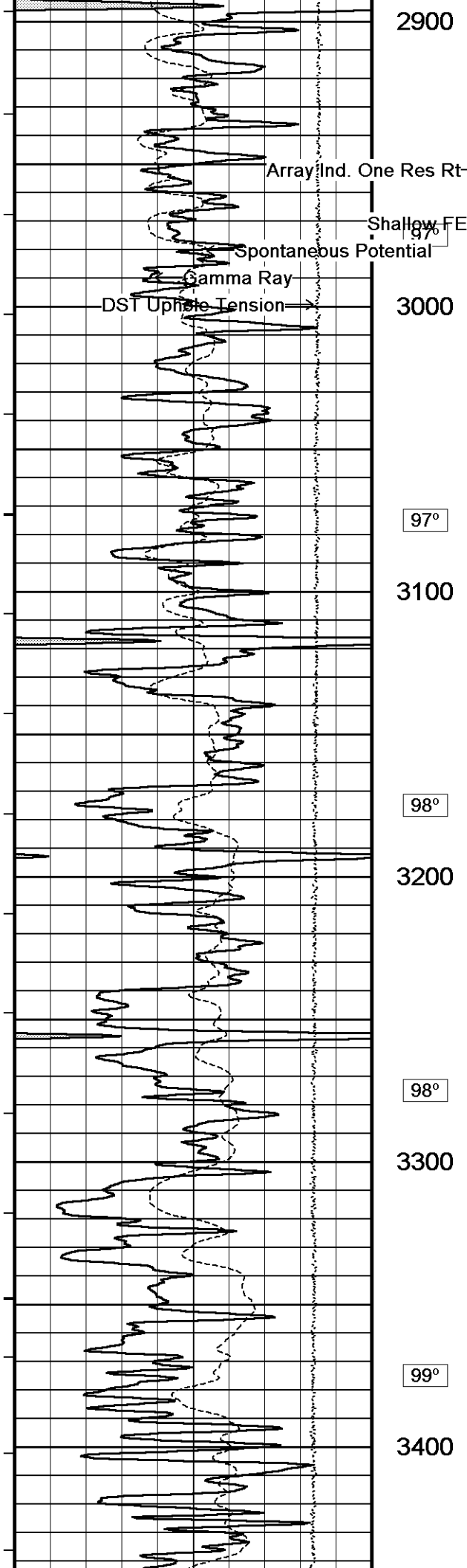
2700

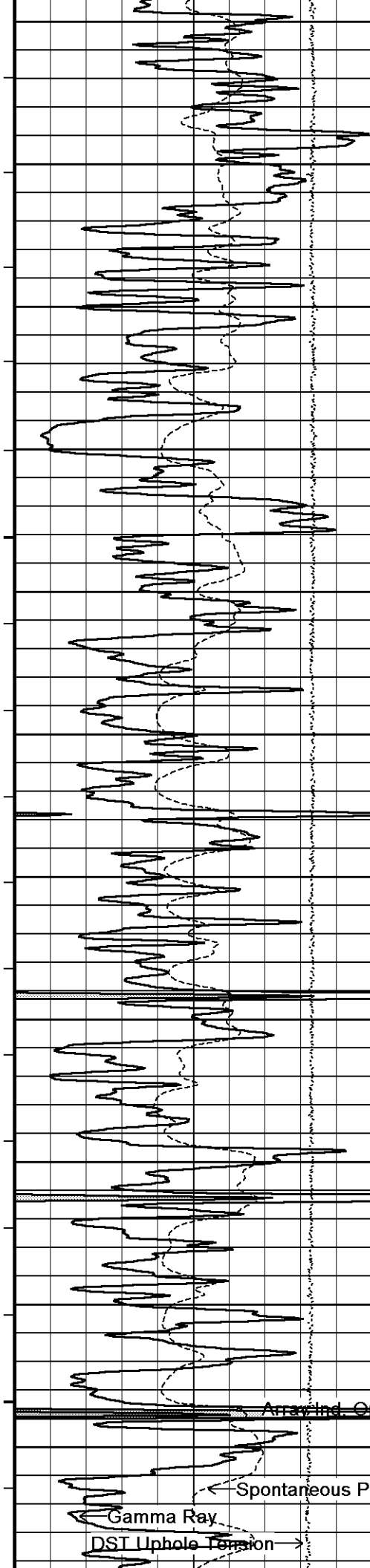
96°

2800

96°







100°

3500

100°

3600

101°

3700

101°

3800

102°

3900

Array Ind. One Res Rt

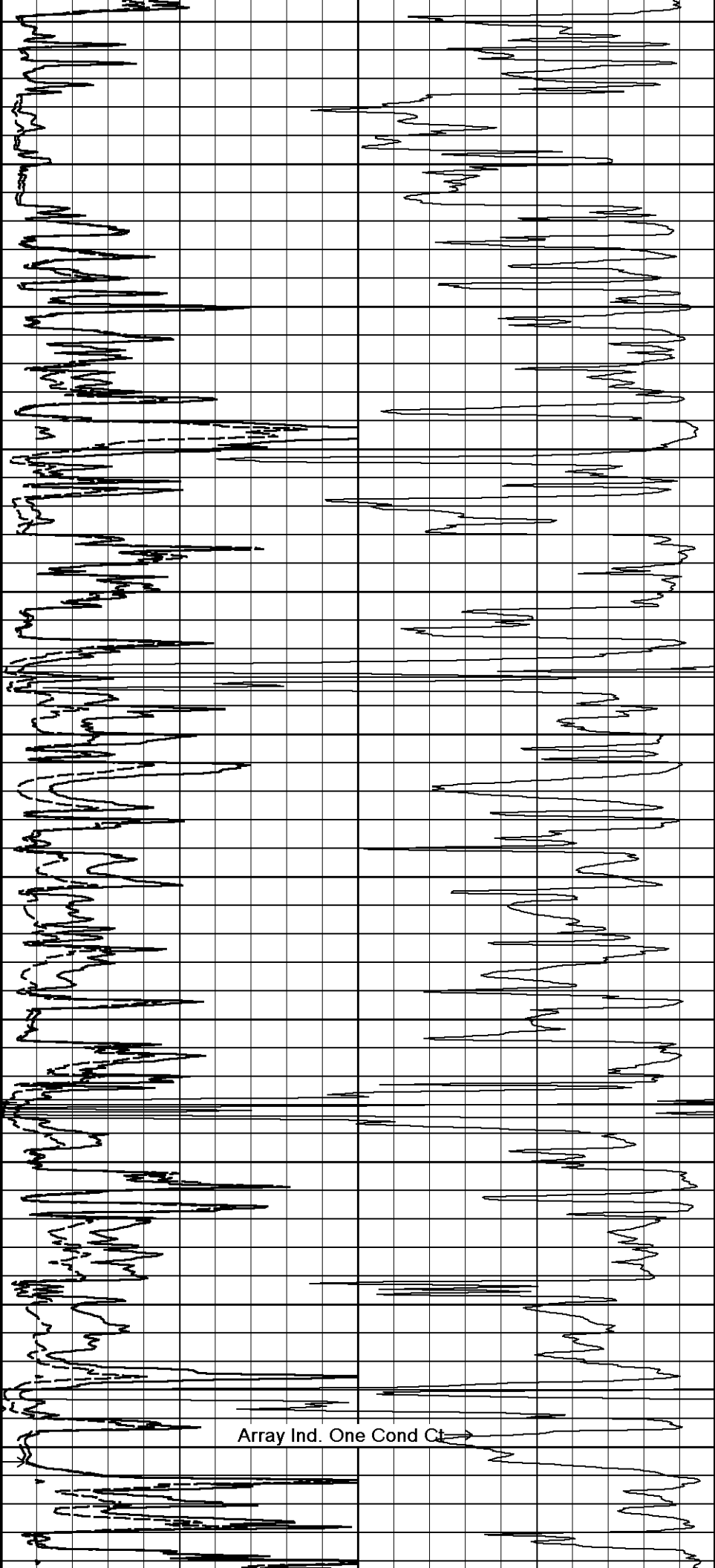
Shallow FE

Spontaneous Potential

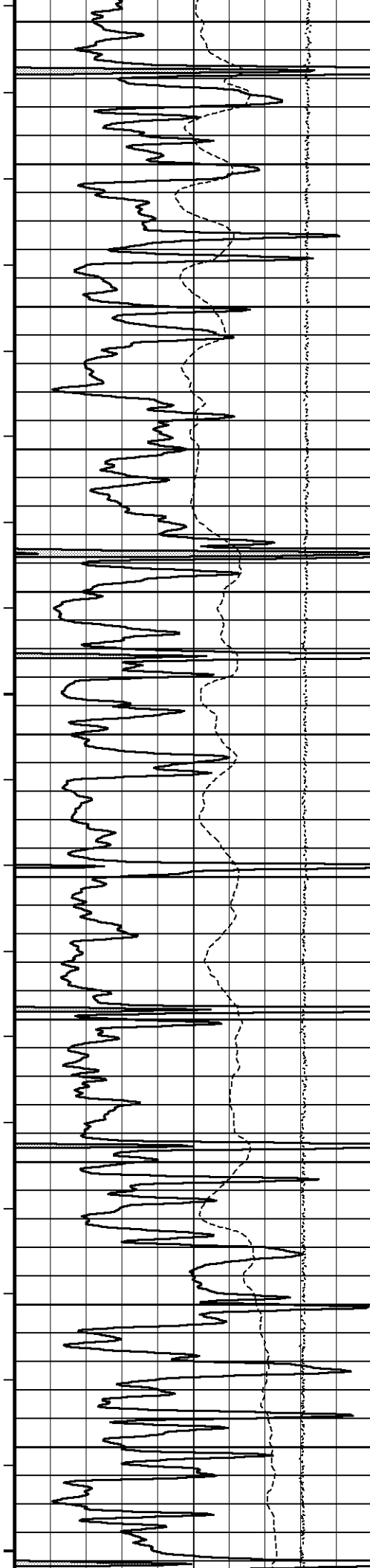
Gamma Ray

DST Uphole Tension

102°



Array Ind. One Cond Ct



4000

103°

4100

103°

4200

104°

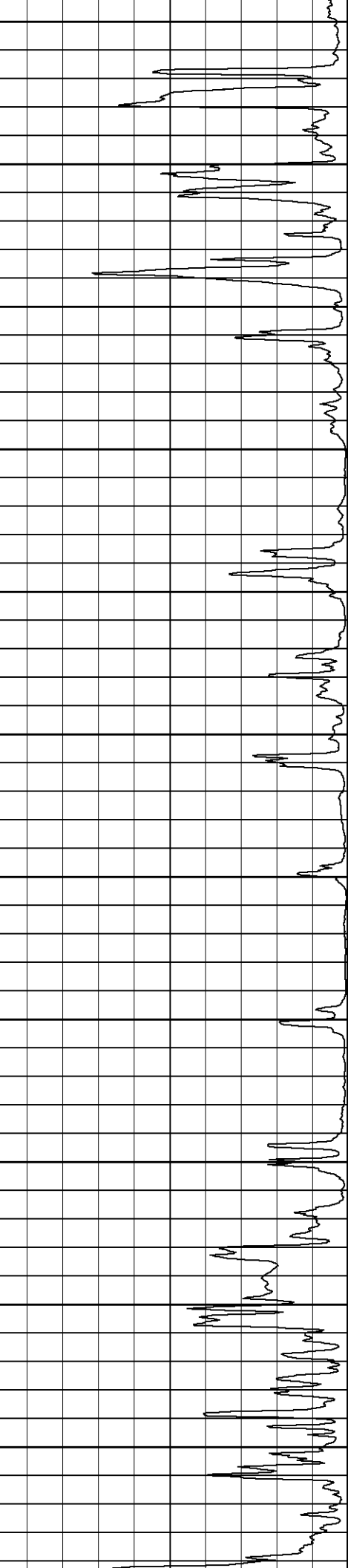
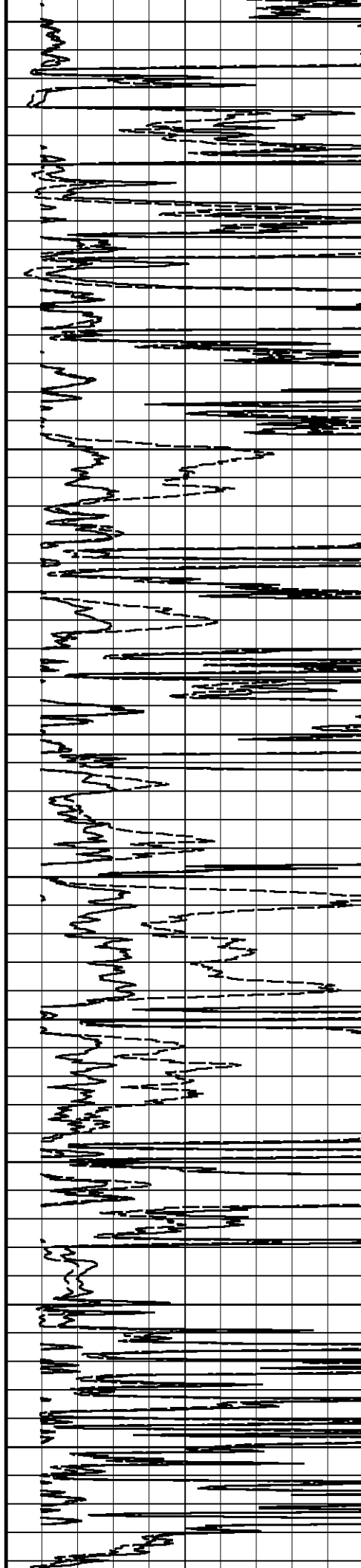
4300

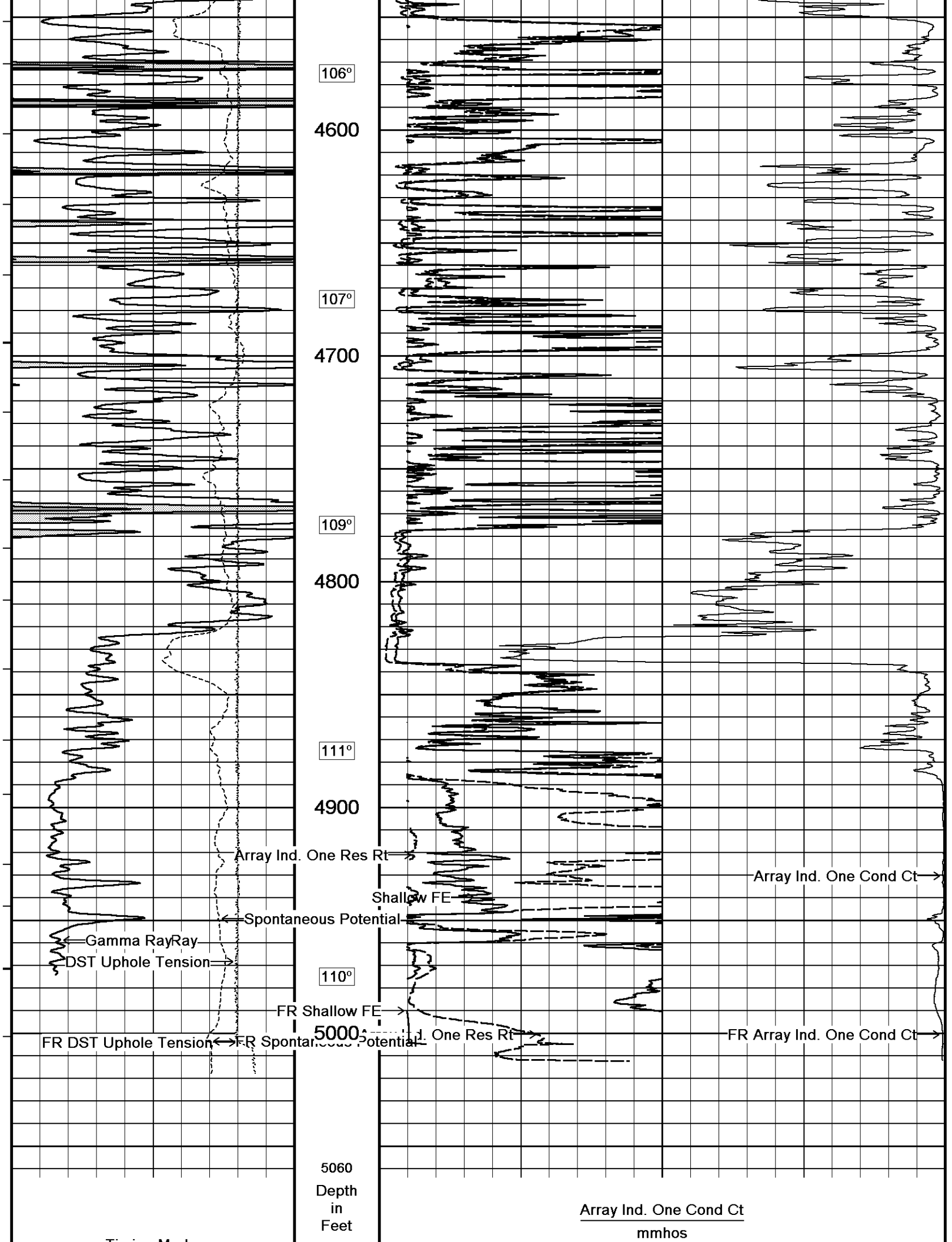
104°

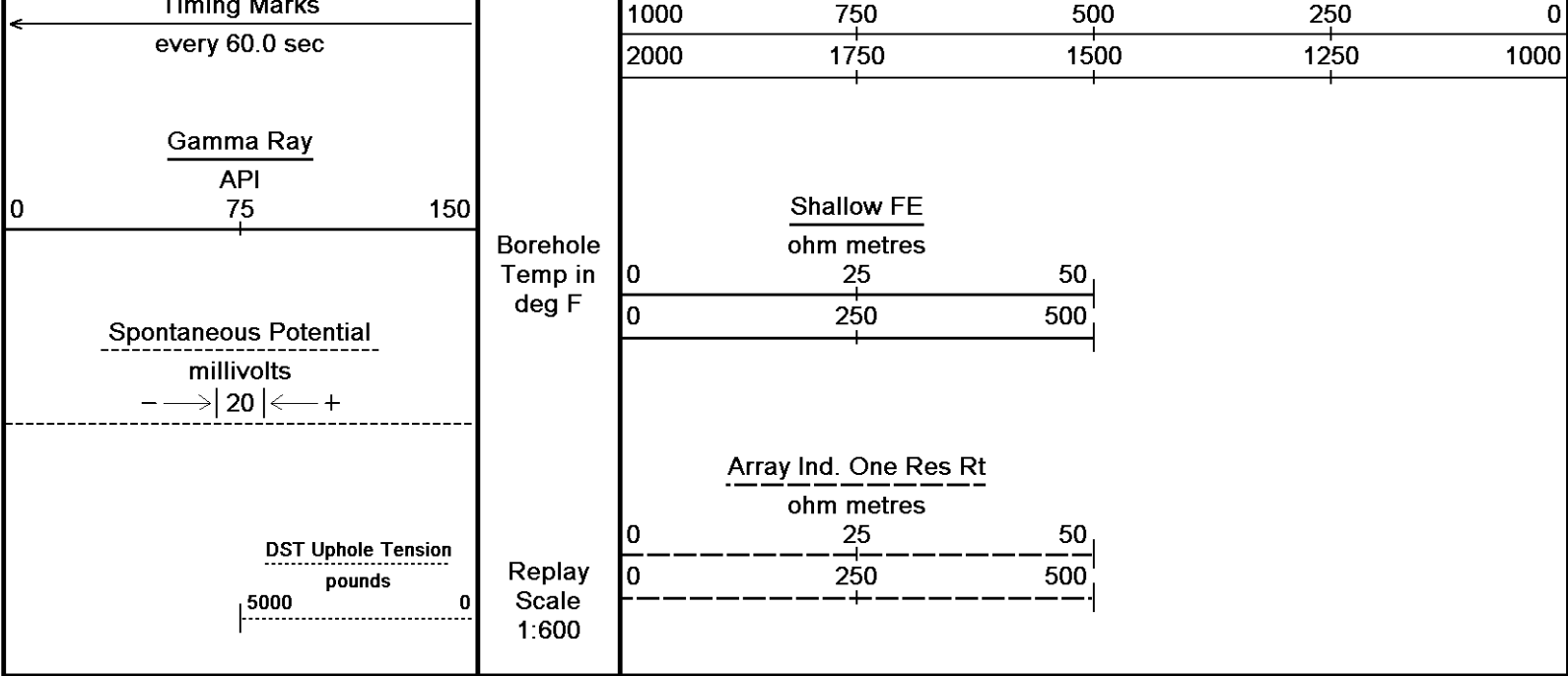
4400

105°

4500





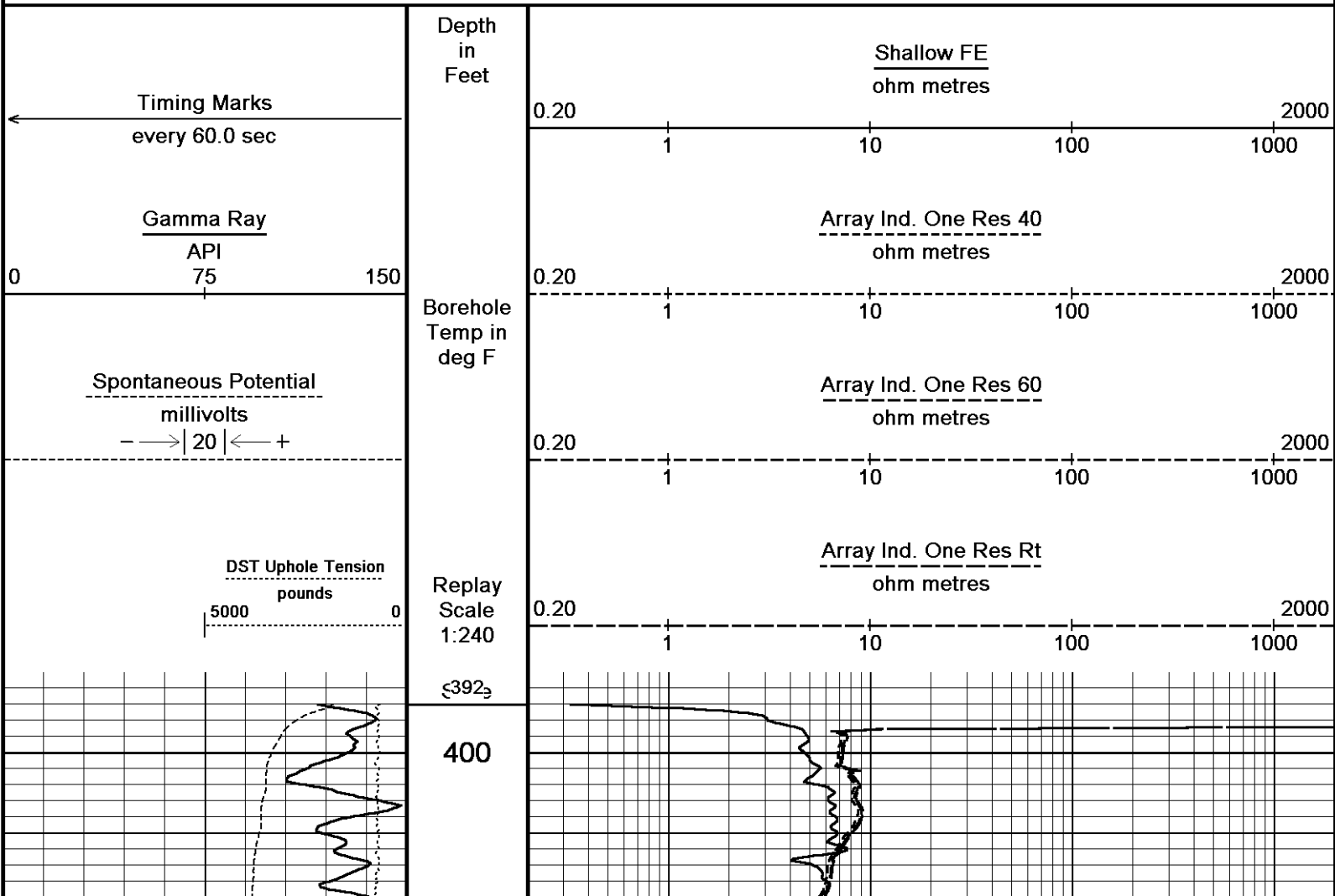


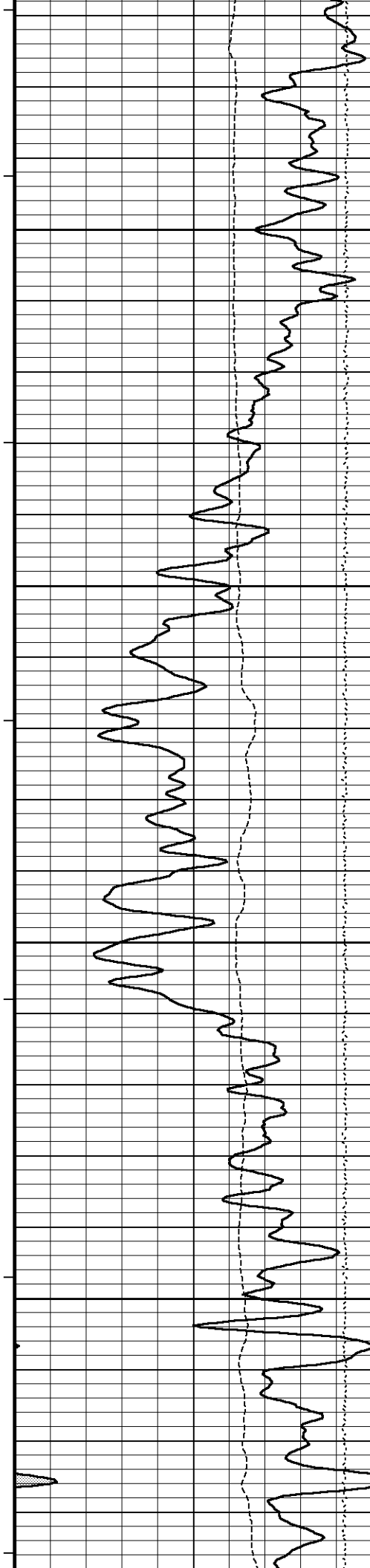
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 04-JAN-2012 03:37
Filename: C:\Minimus 11.03.4044\Data\Comanche Eder # 6-4\Comanche Eder 6-4_002.dta	Recorded on 04-JAN-2012 00:37
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044	

↑	2 INCH MAIN PASS	↑
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↓	5 INCH MAIN PASS	↓
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Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 04-JAN-2012 03:37
Filename: C:\Minimus 11.03.4044\Data\Comanche Eder # 6-4\Comanche Eder 6-4_002.dta	Recorded on 04-JAN-2012 00:37
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044	





81°

450

82°

500

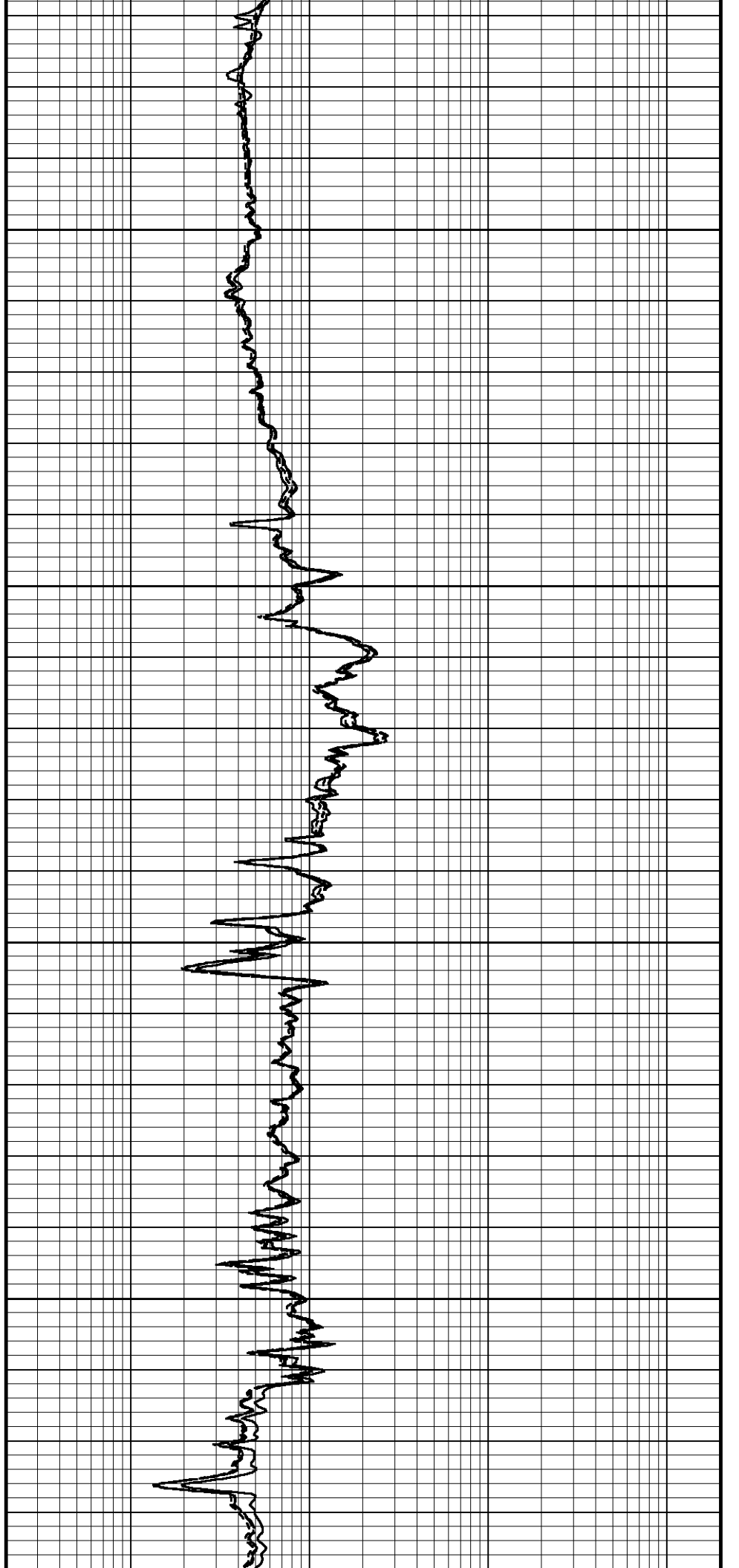
84°

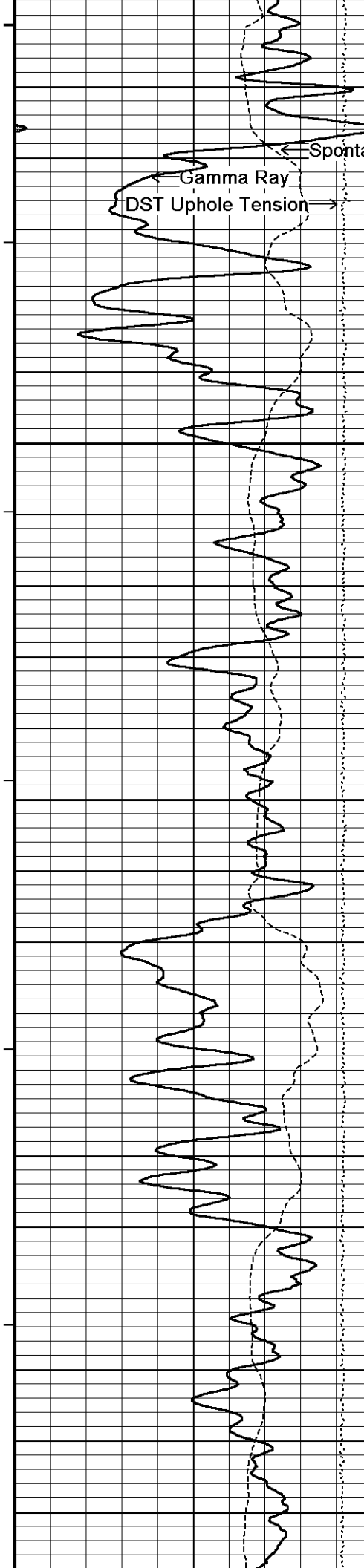
550

84°

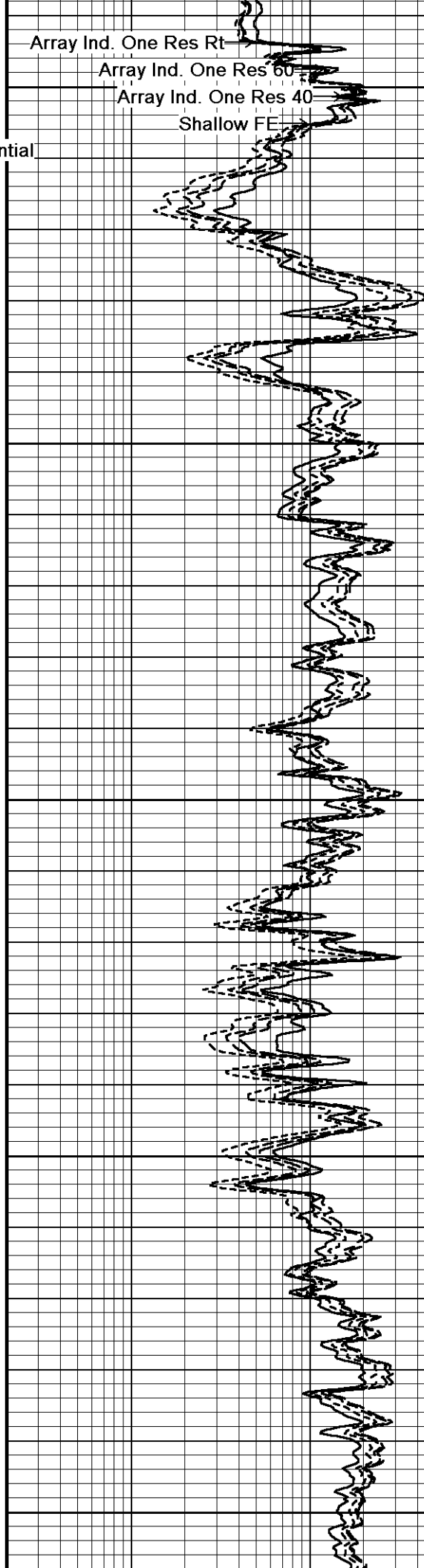
600

84°

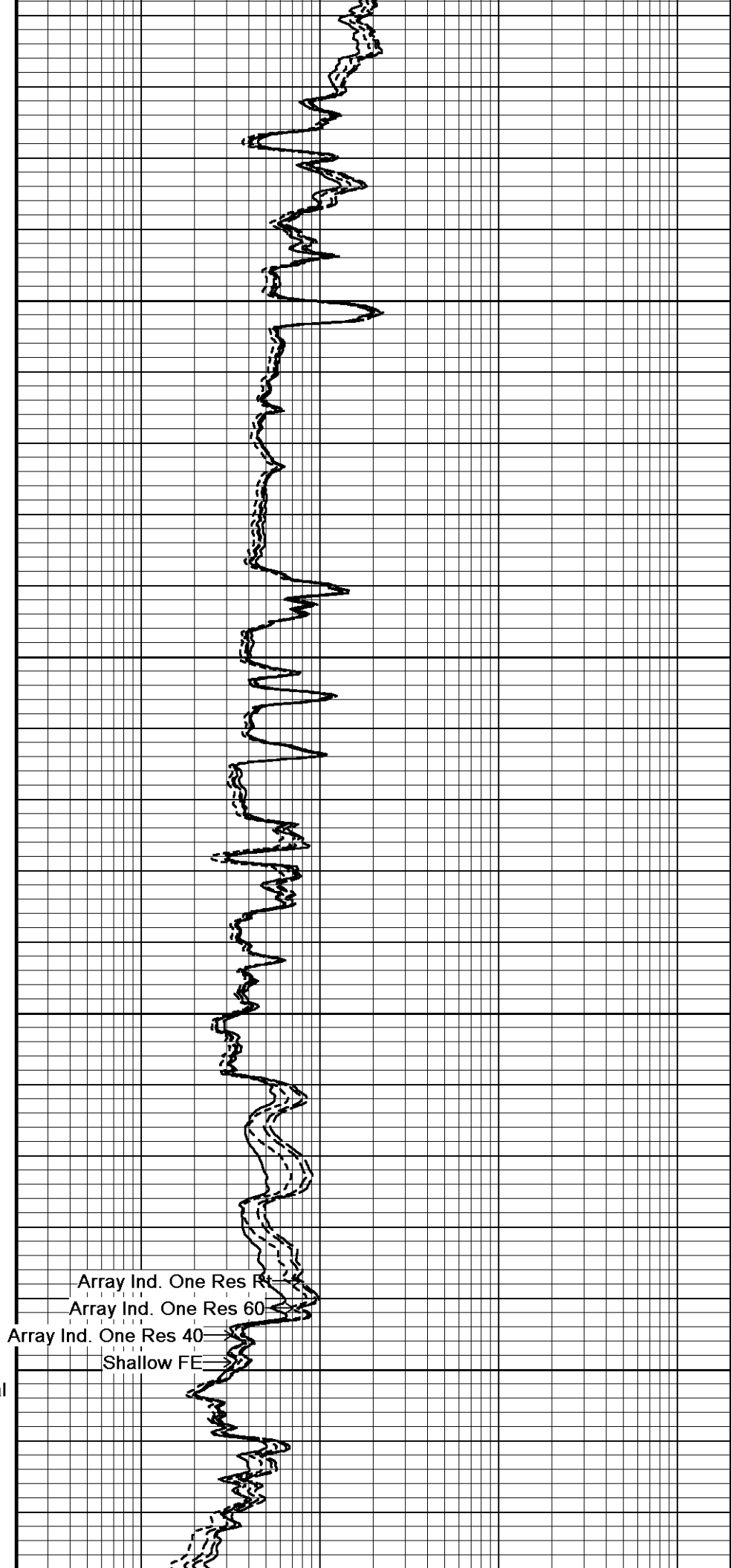
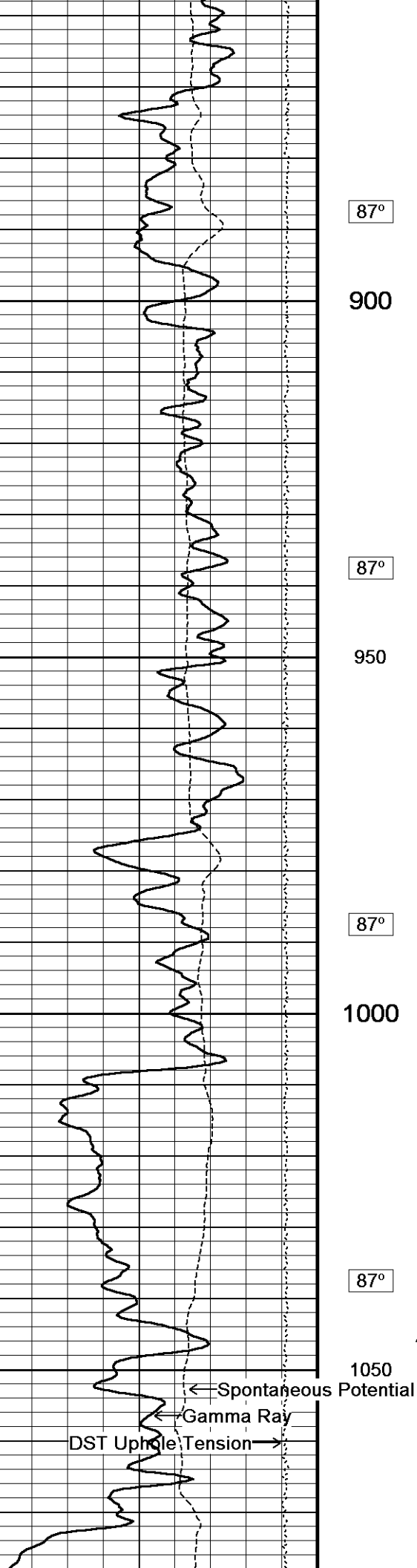


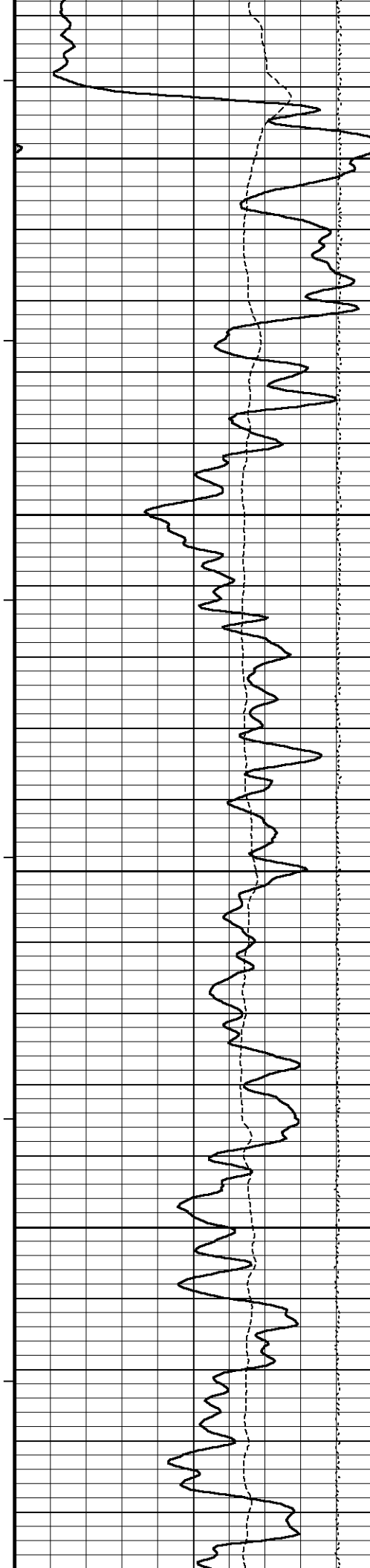


650
84°
700
84°
750
85°
800
86°
850



Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE





88°

1100

88°

1150

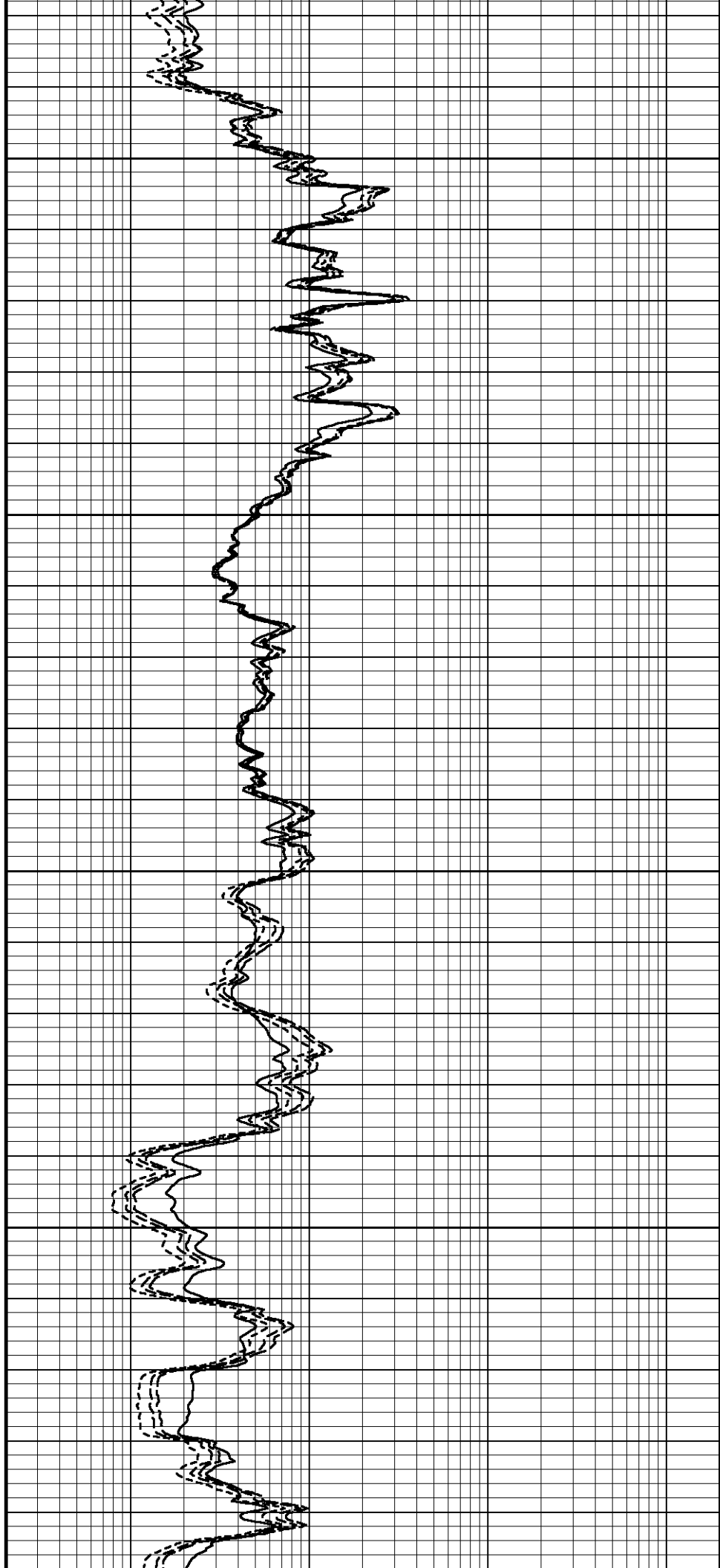
88°

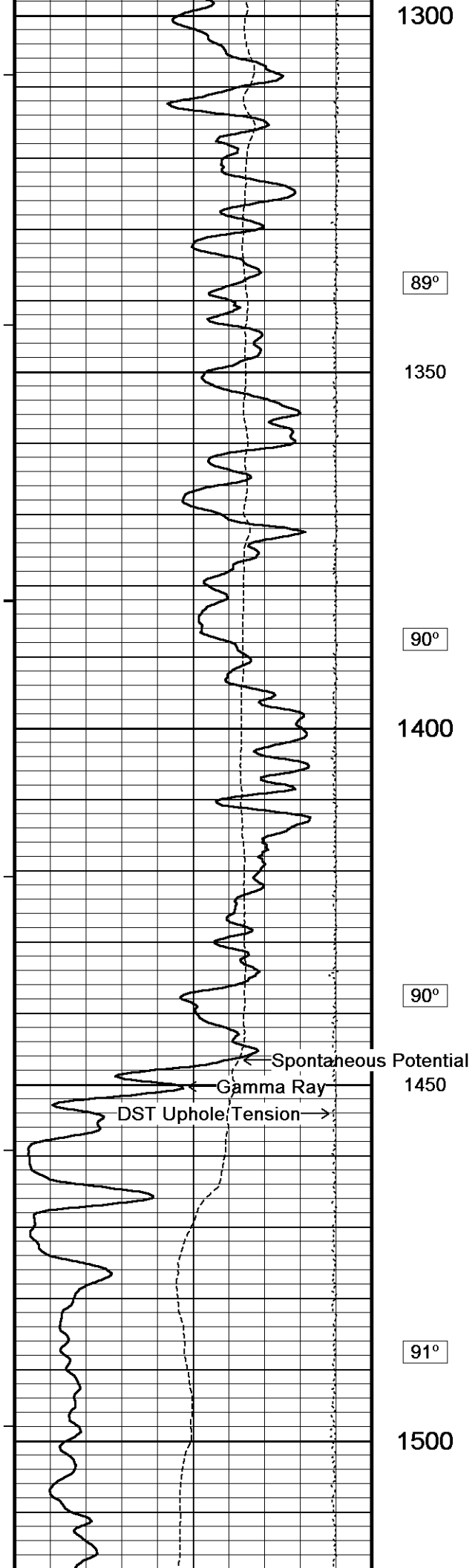
1200

89°

1250

89°





1300

89°

1350

90°

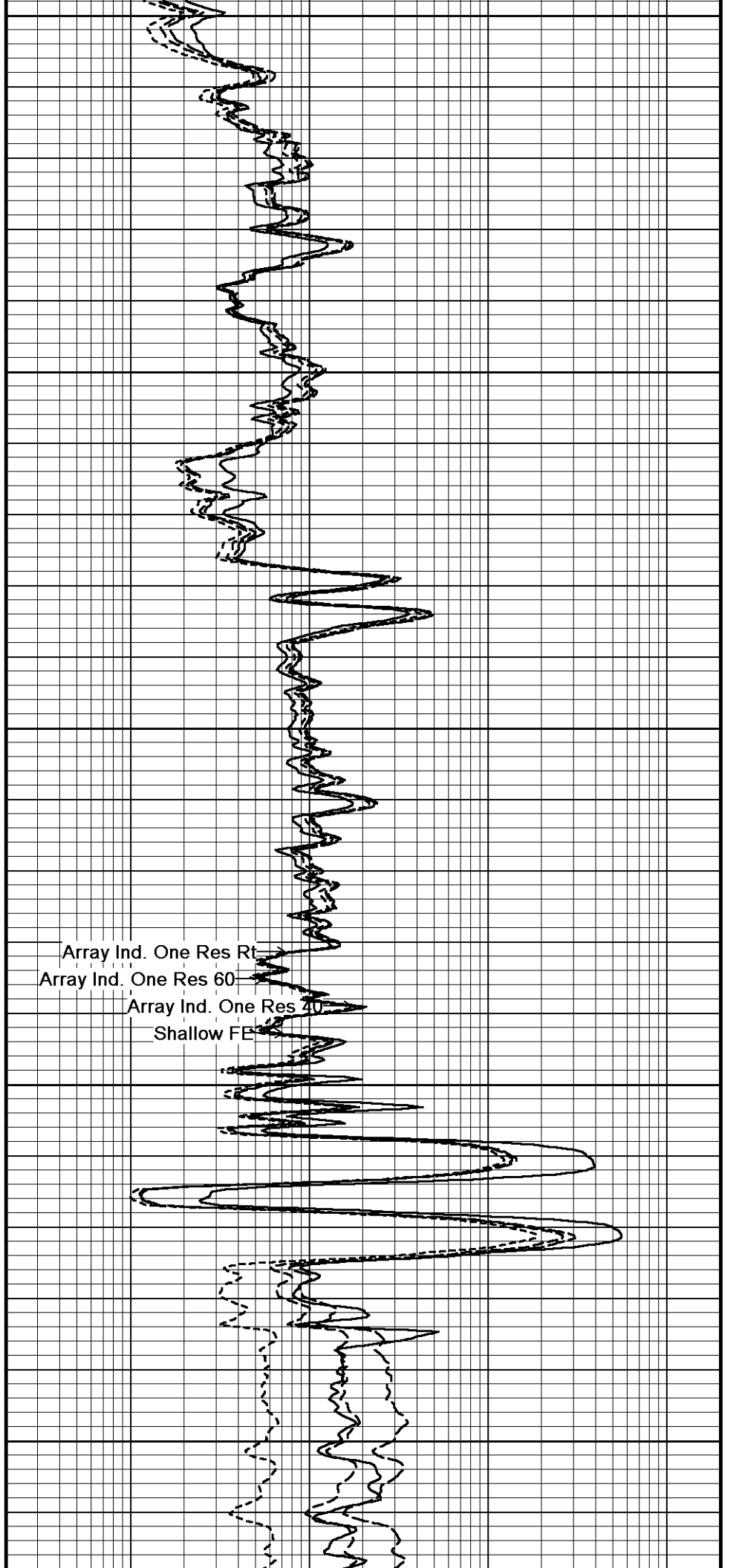
1400

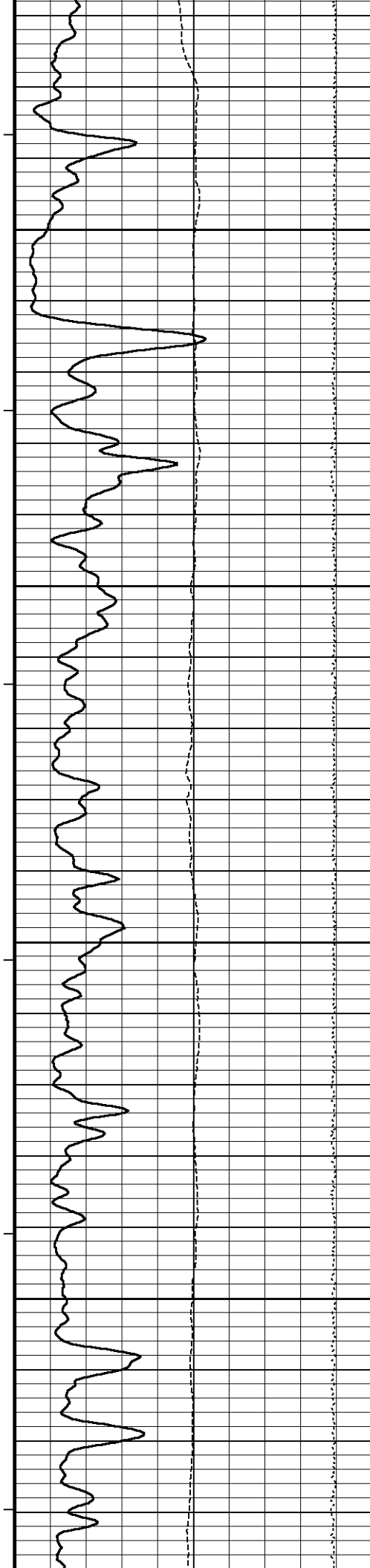
90°

1450

91°

1500





91°

1550

91°

1600

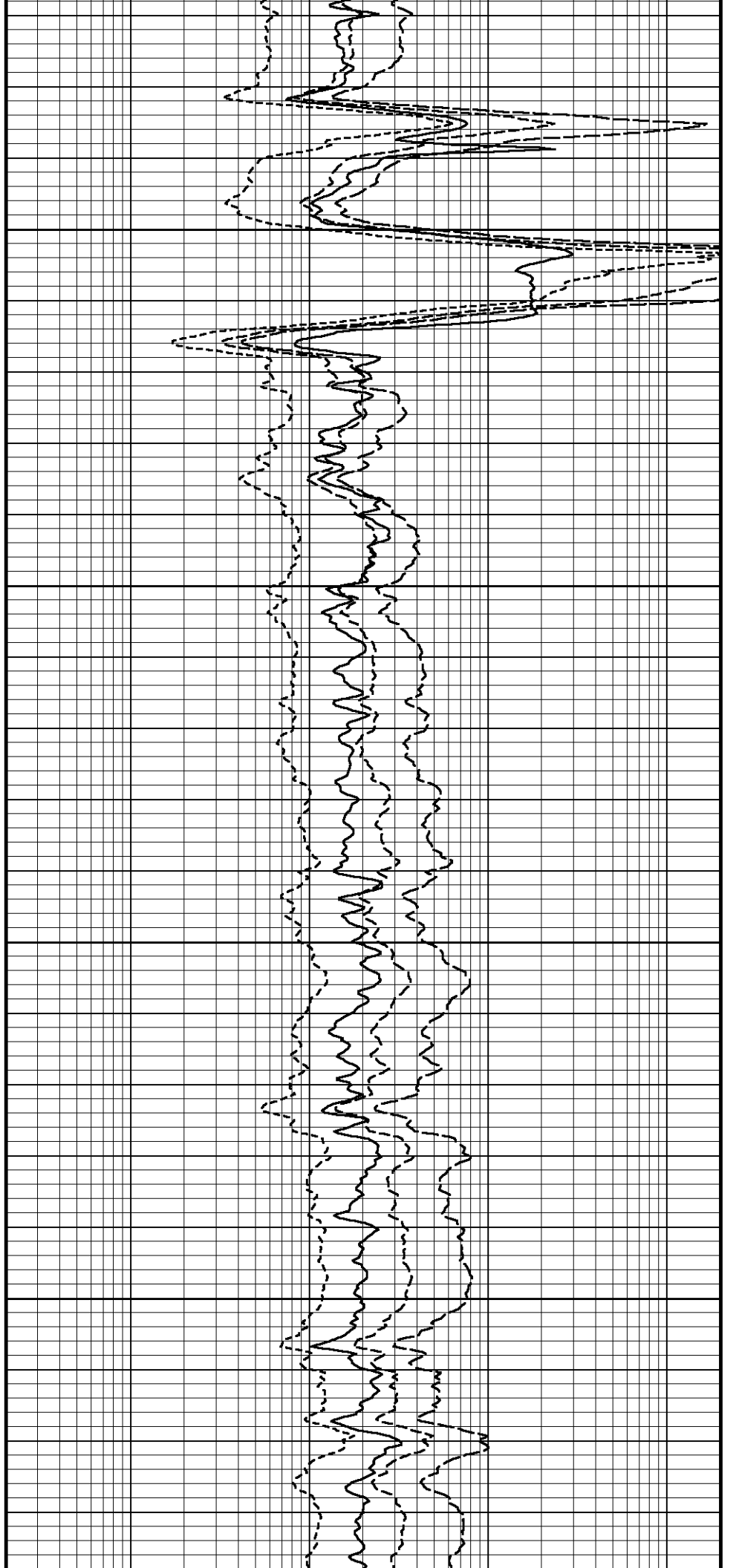
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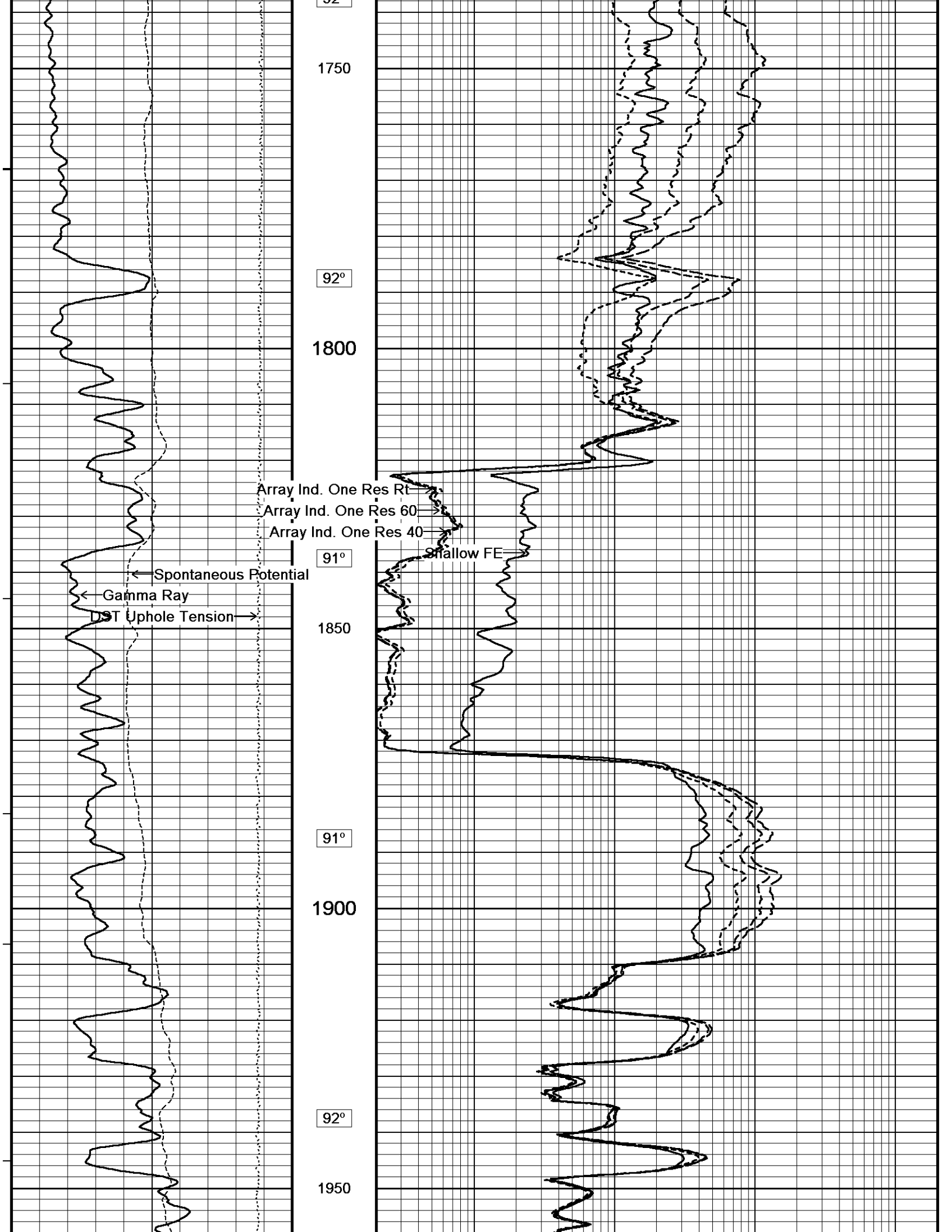
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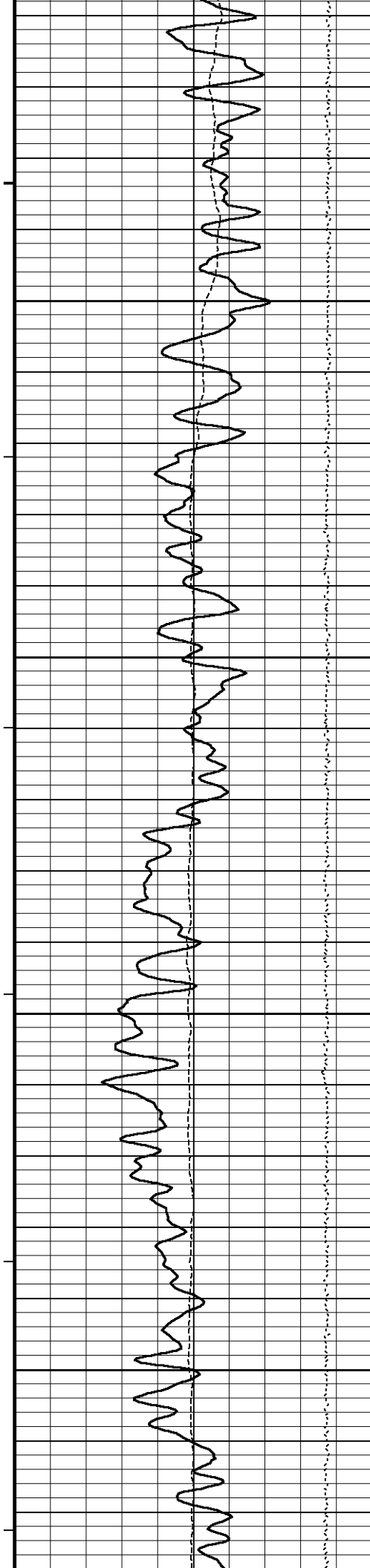
92°

1700

92°







92°

2000

92°

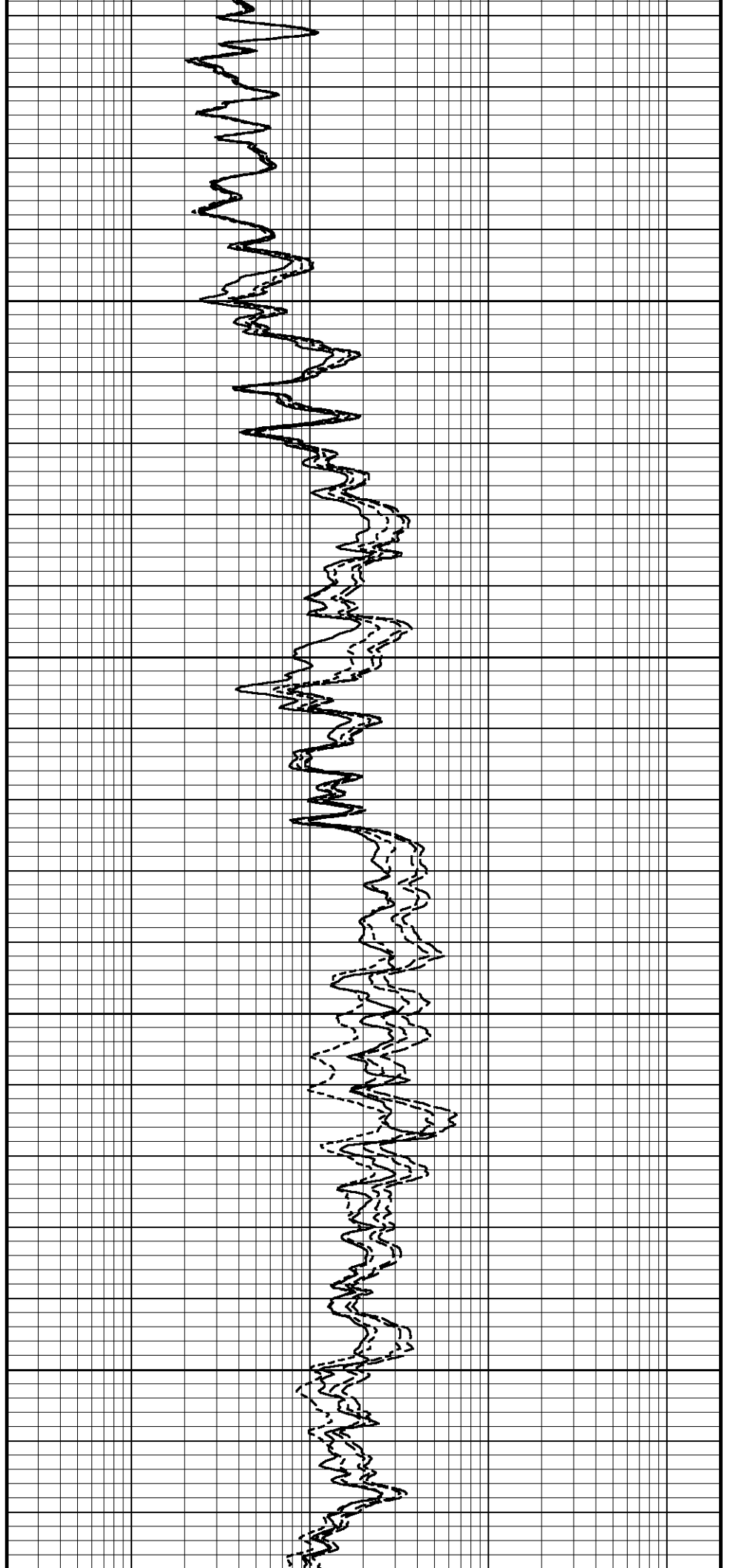
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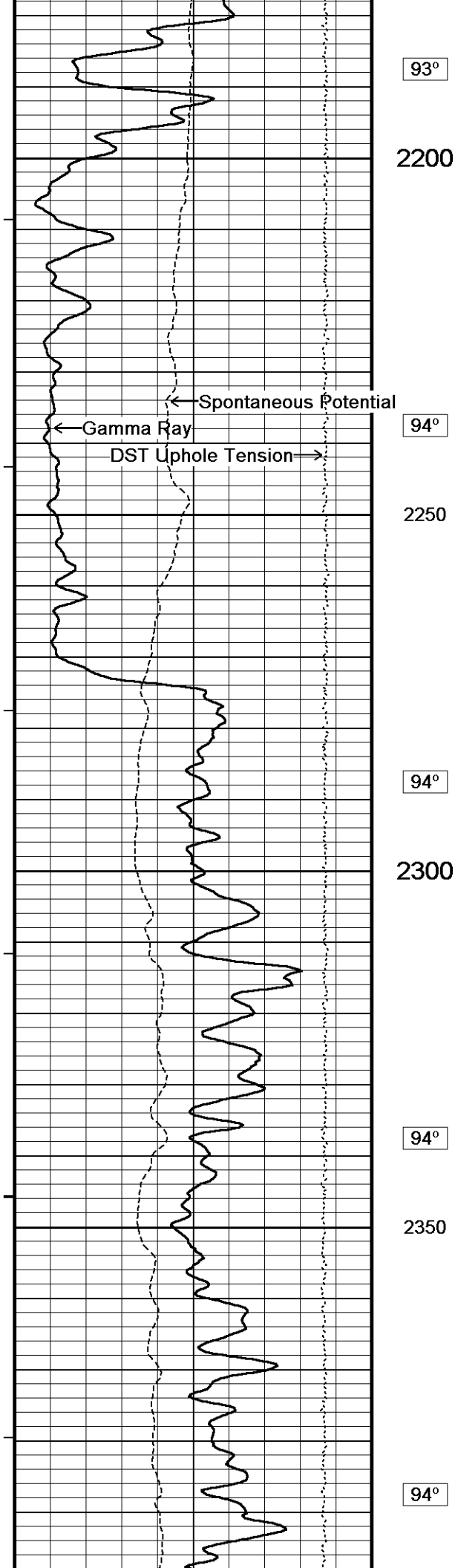
92°

2100

93°

2150





93°

2200

94°

2250

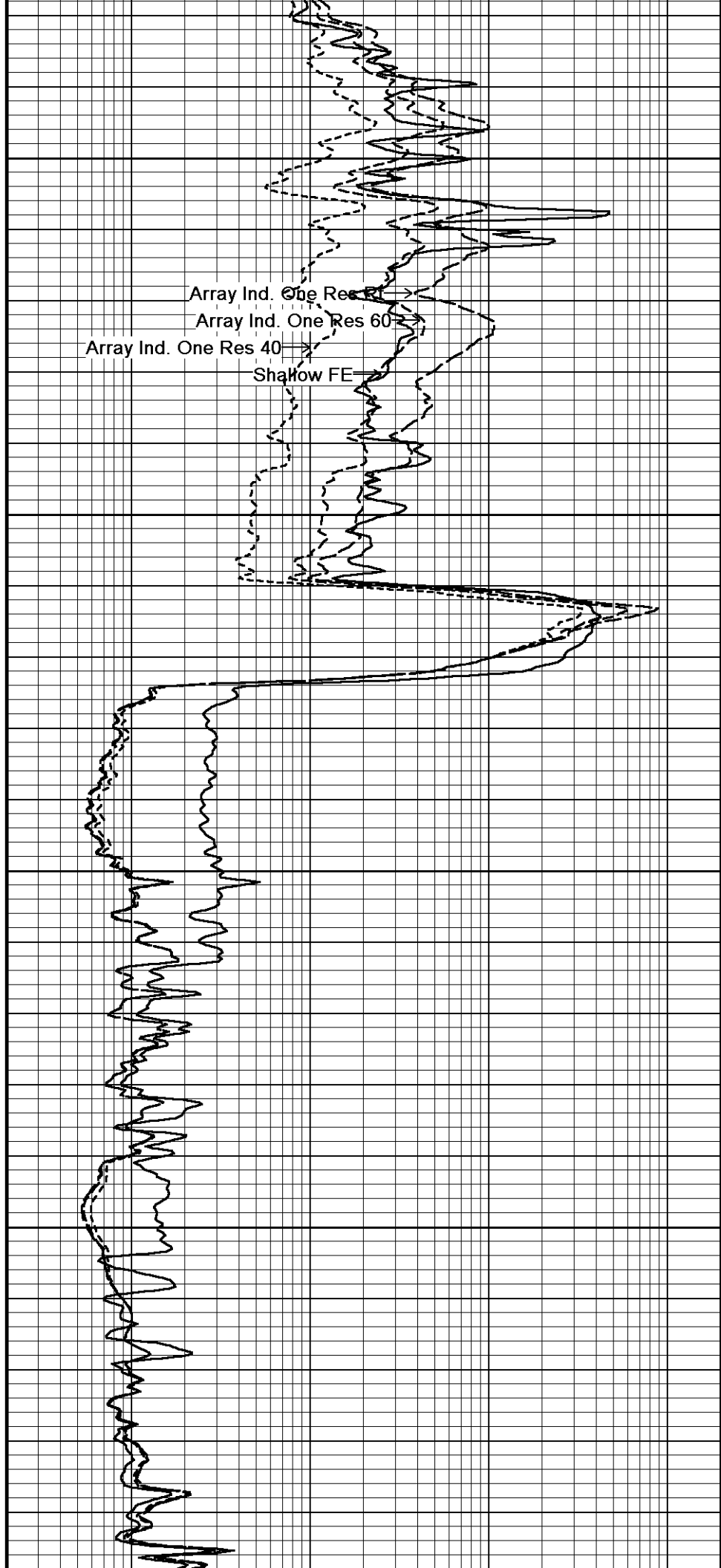
94°

2300

94°

2350

94°



Array Ind. One Res RT

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE

2400

94°

2450

95°

2500

95°

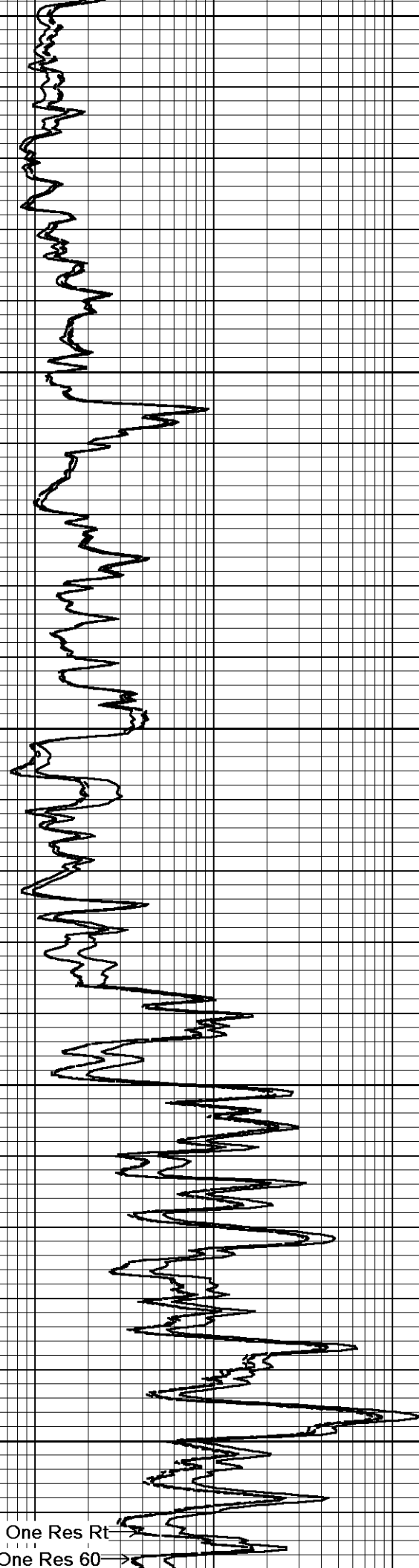
2550

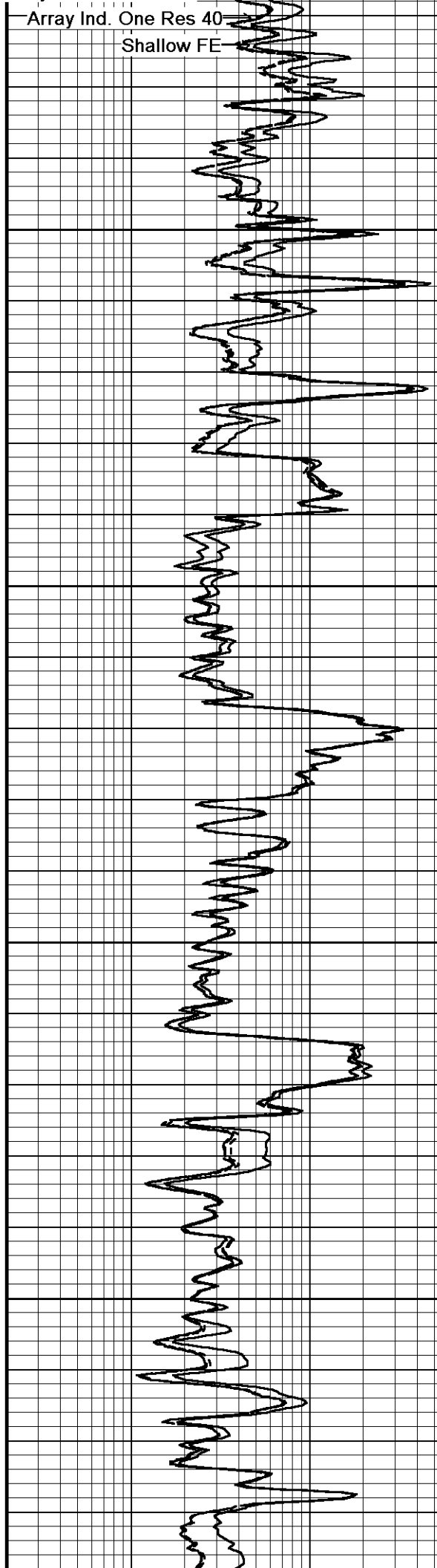
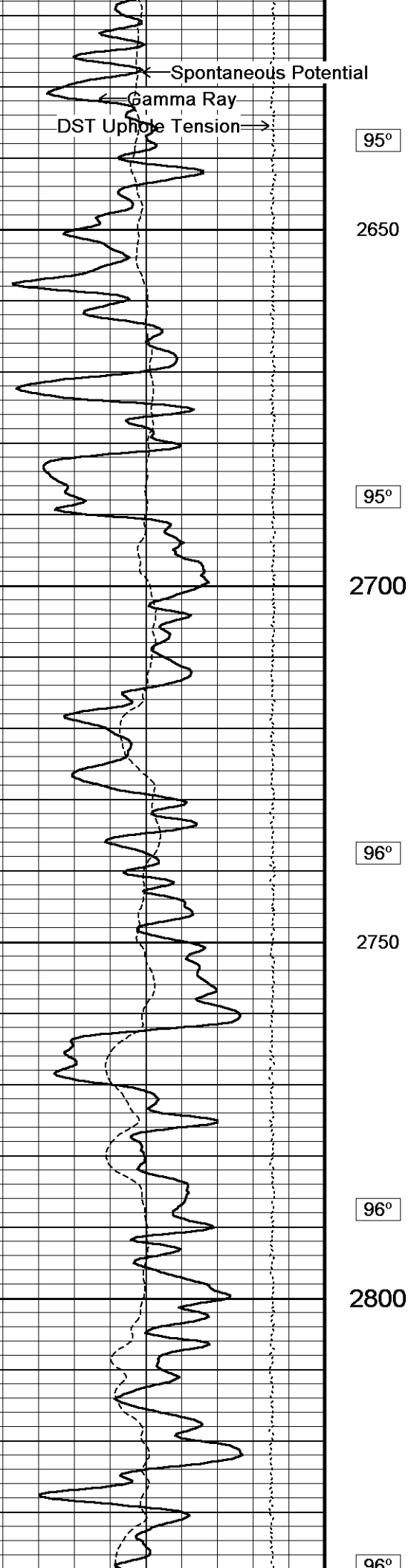
95°

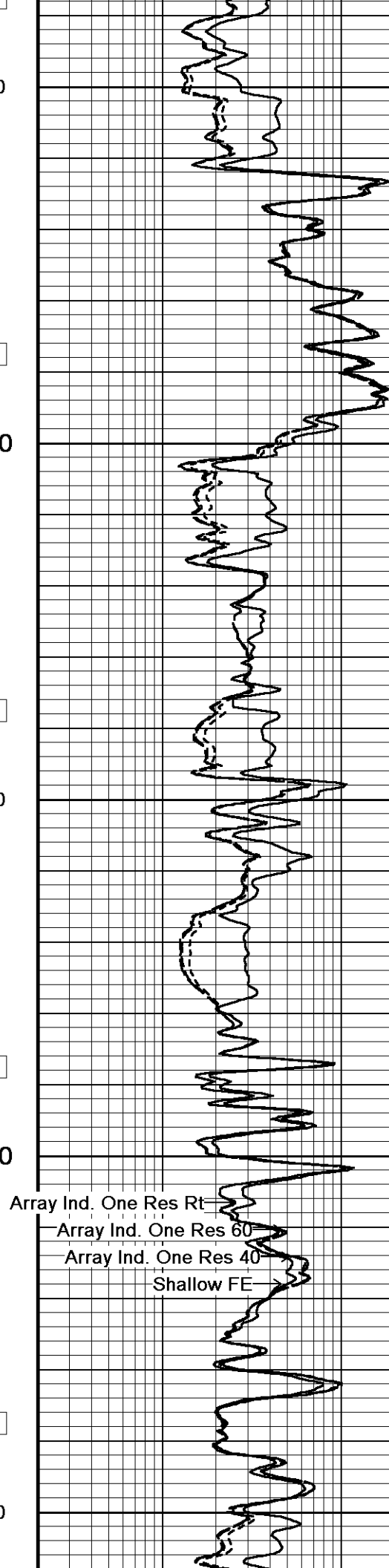
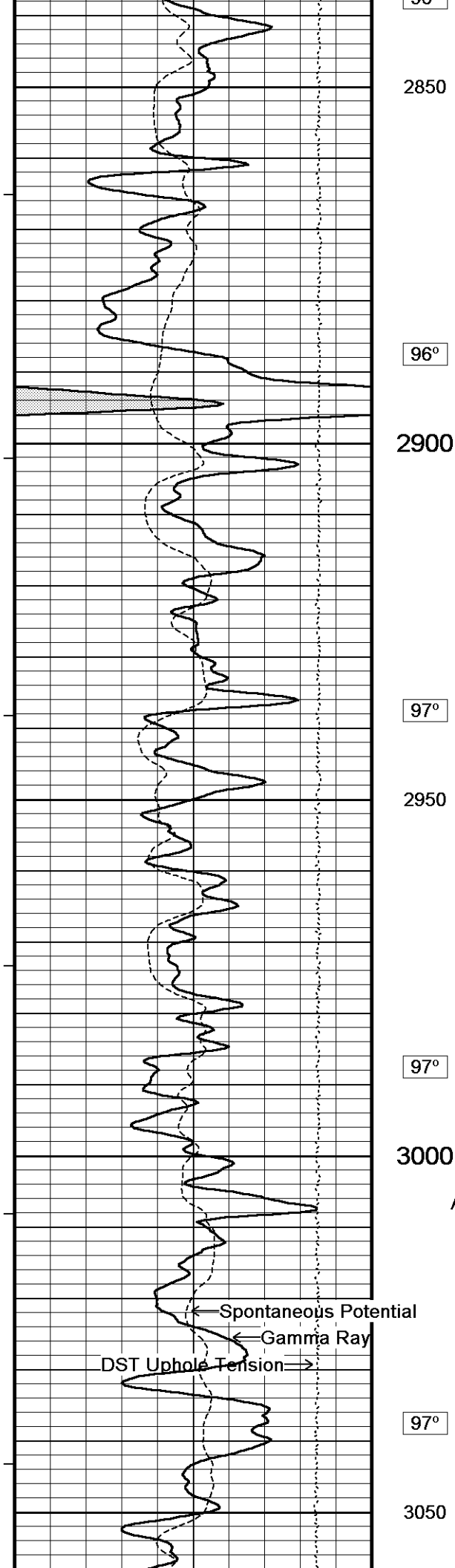
2600

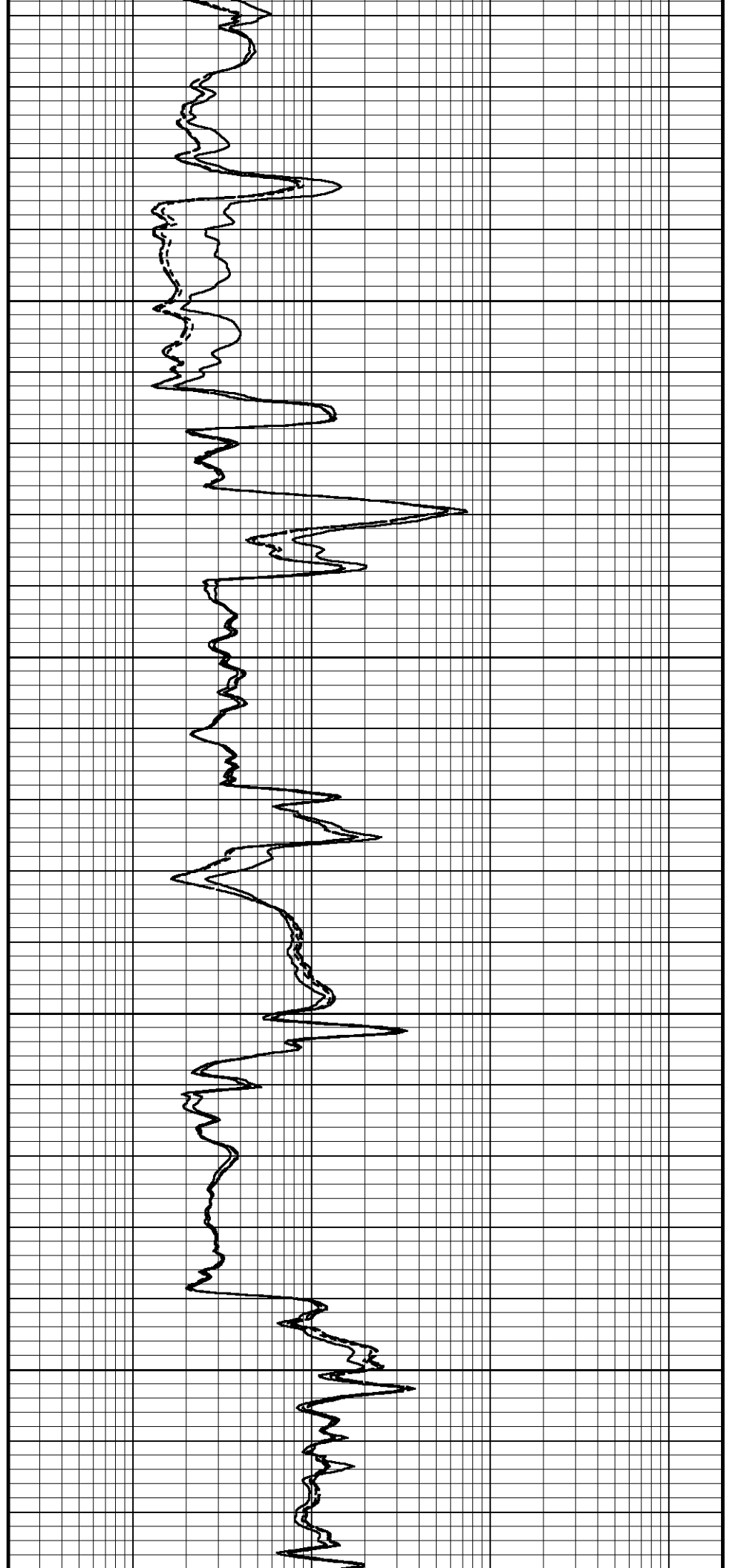
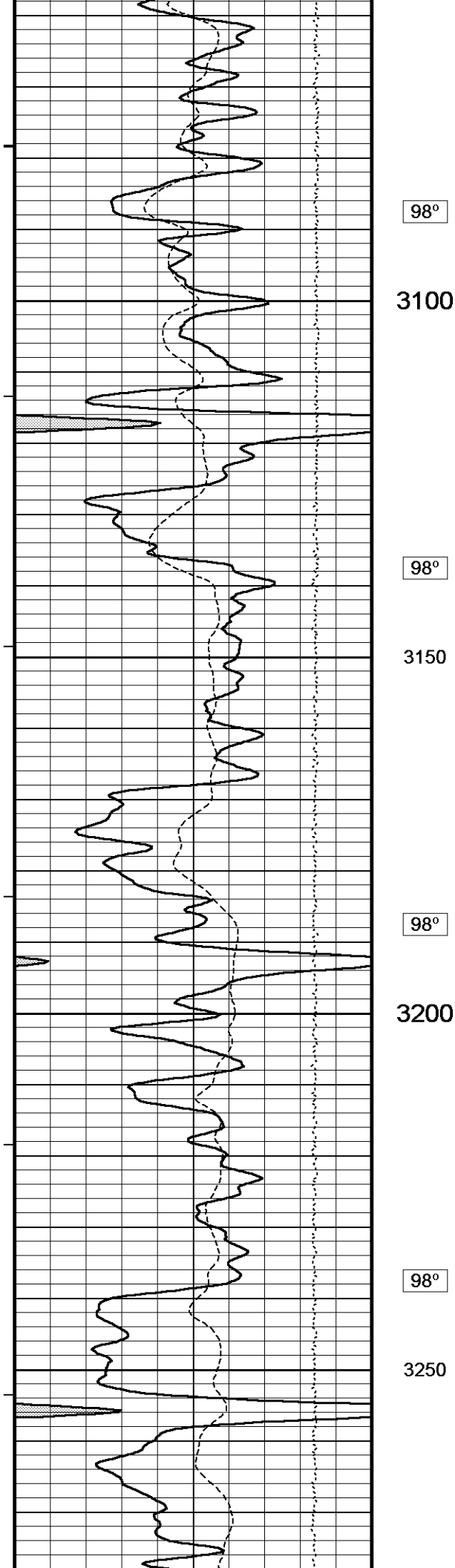
Array Ind. One Res Rt →

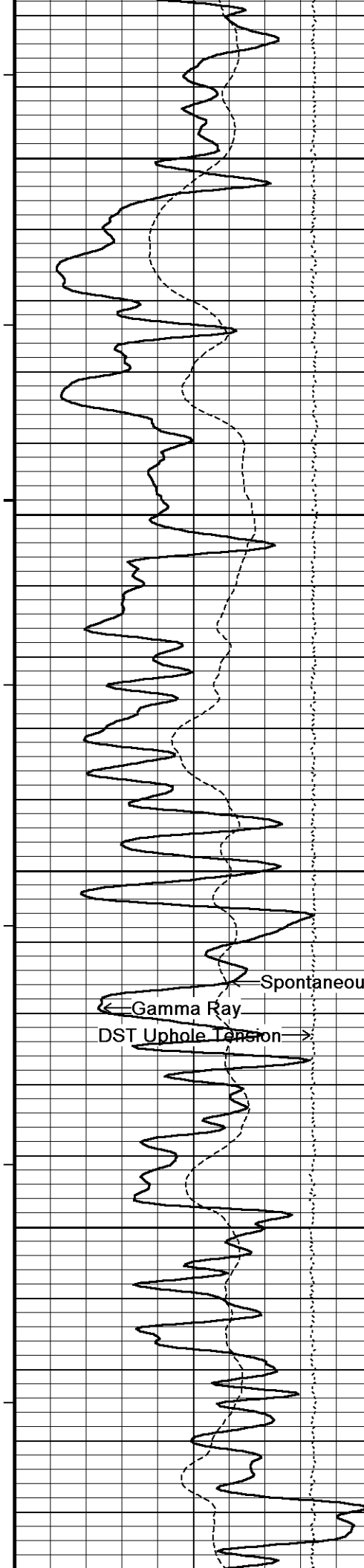
Array Ind. One Res 60 →











99°

3300

99°

3350

99°

3400 Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE

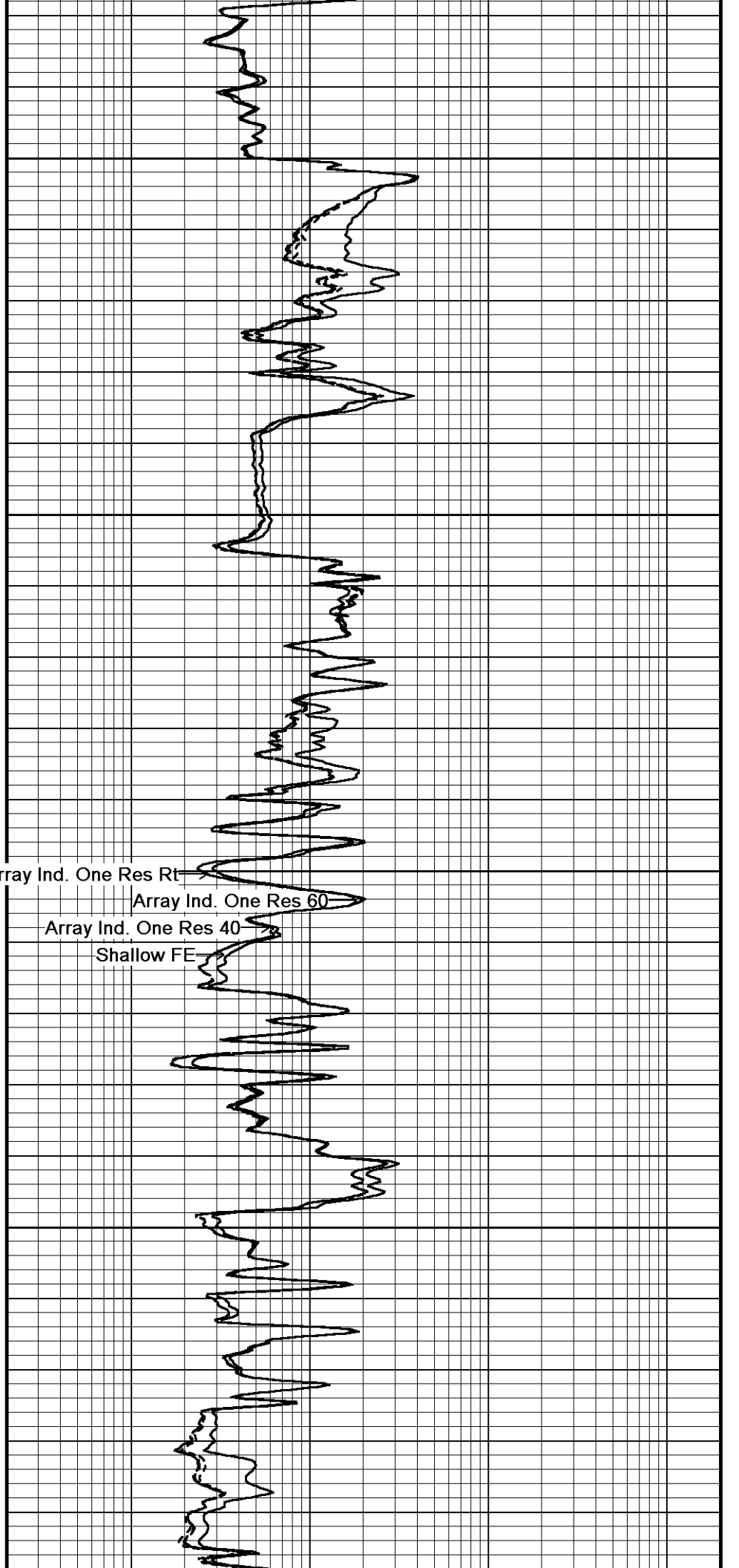
Spontaneous Potential

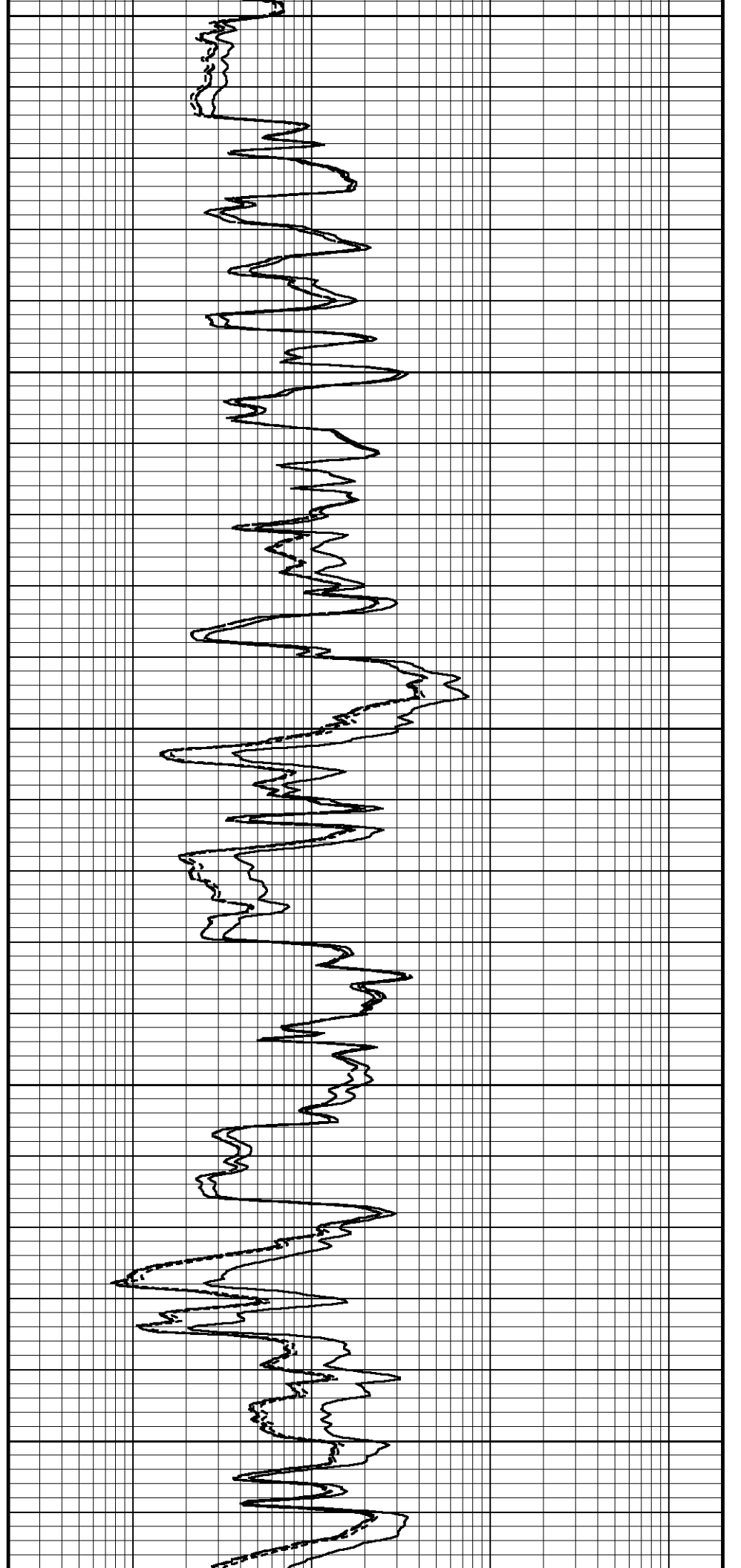
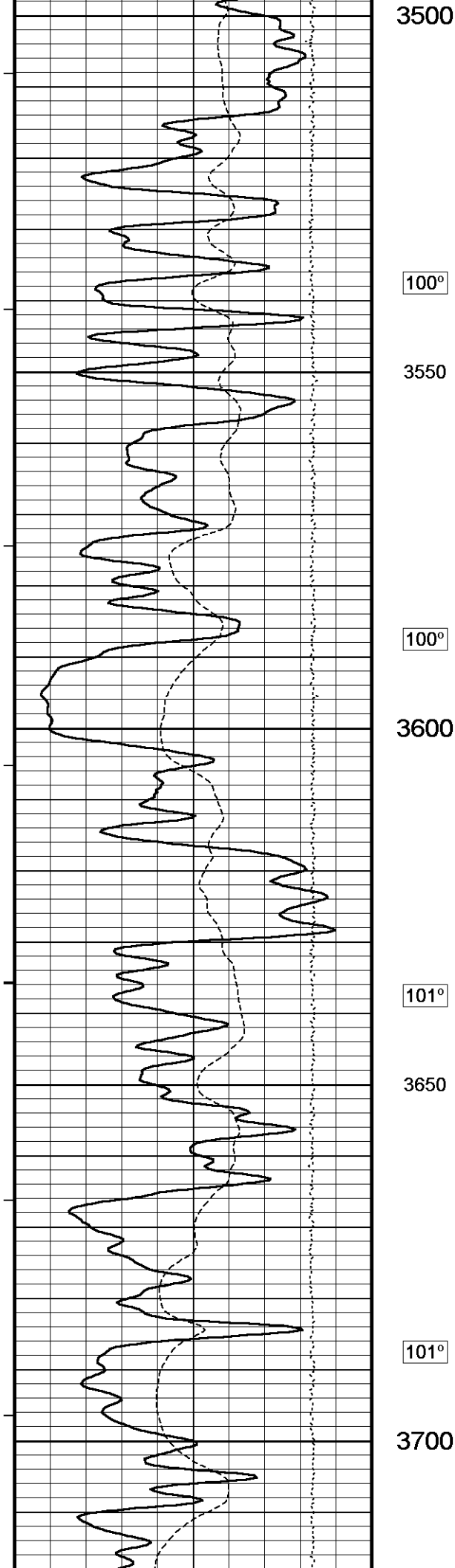
← Gamma Ray
DST Uphole Tension →

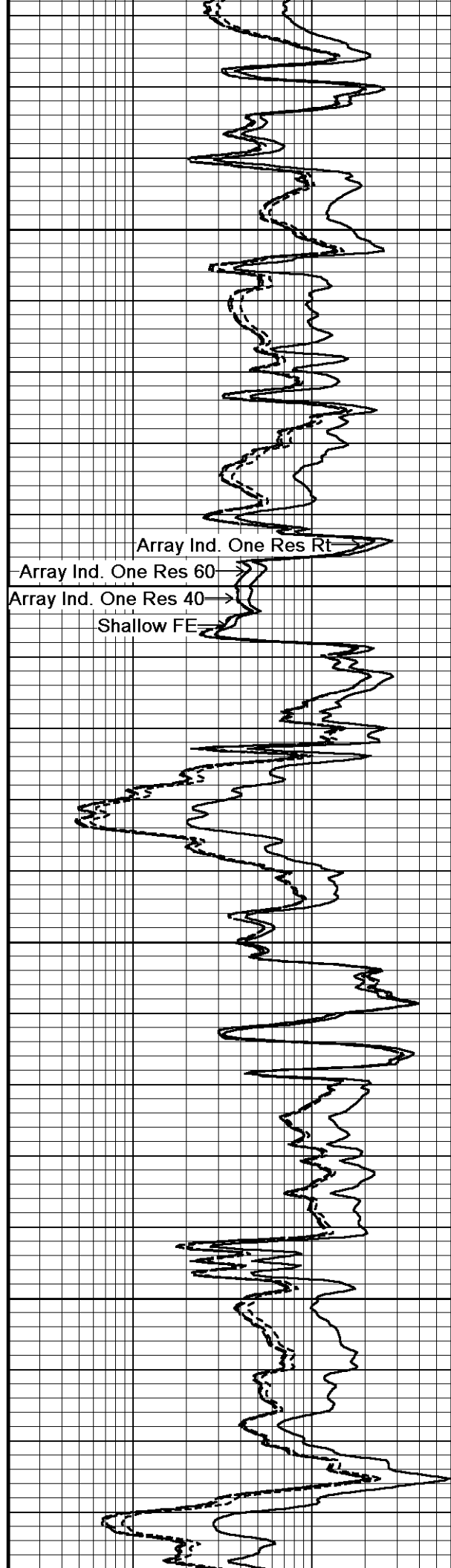
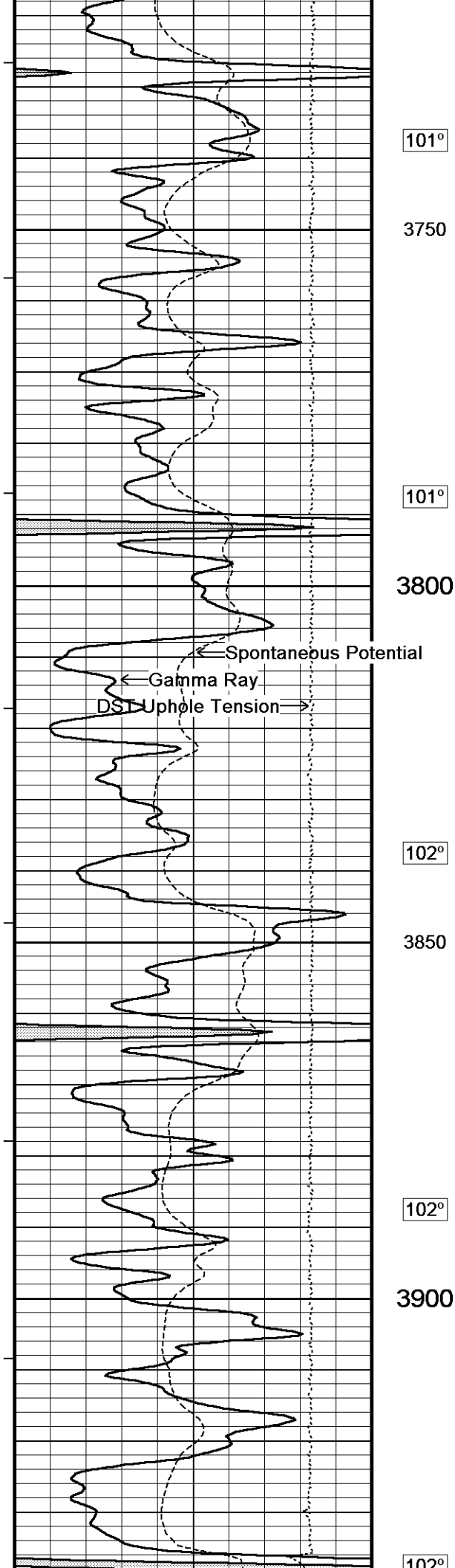
100°

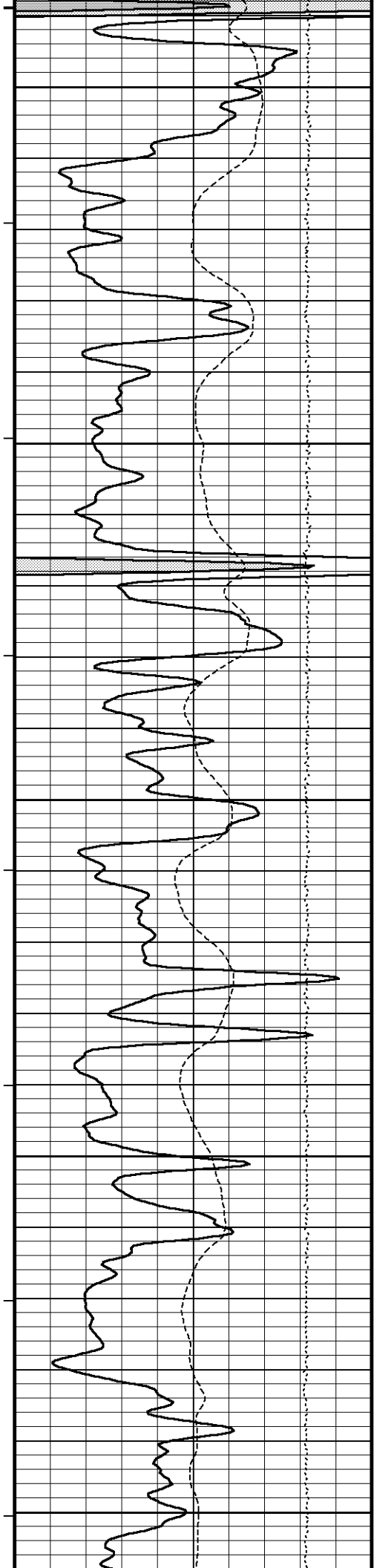
3450

100°









102°

3950

102°

4000

103°

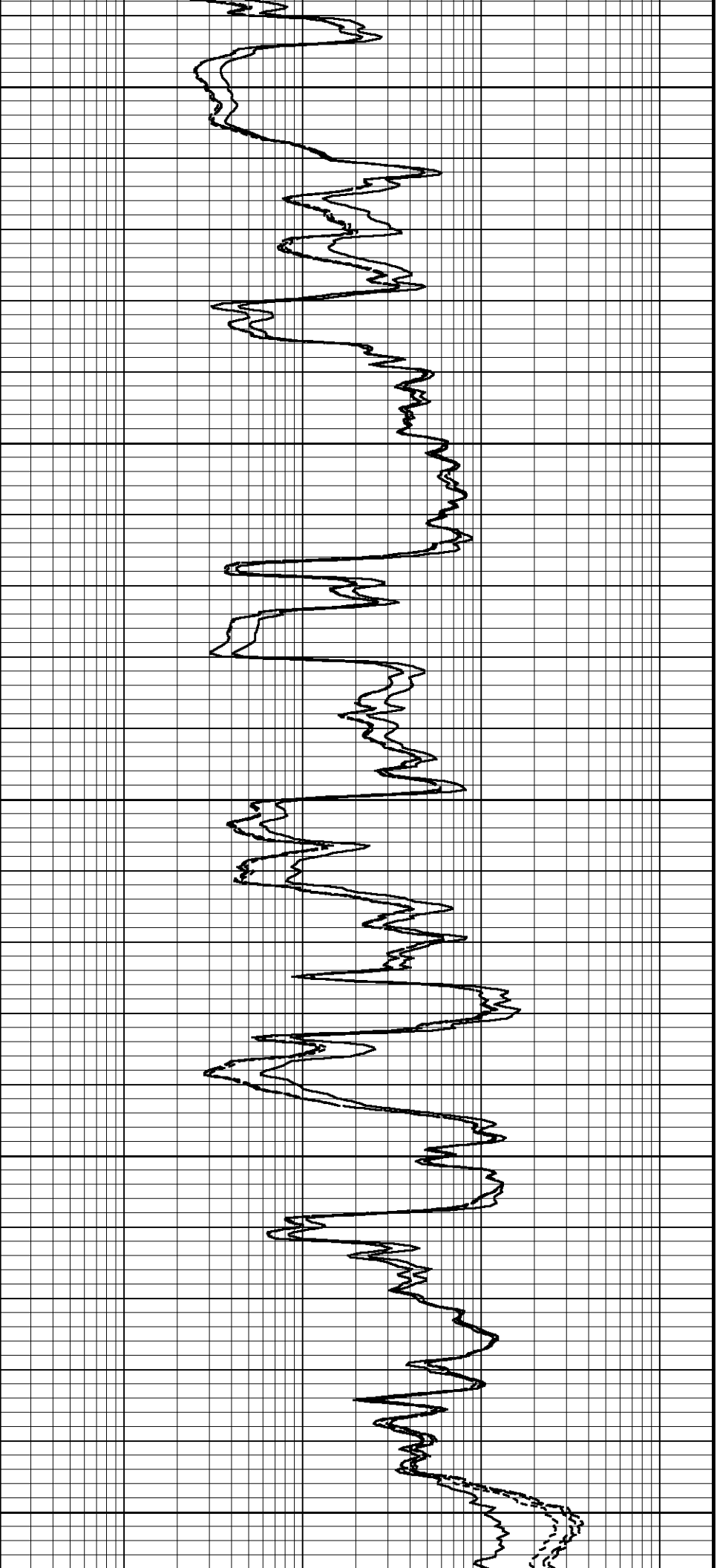
4050

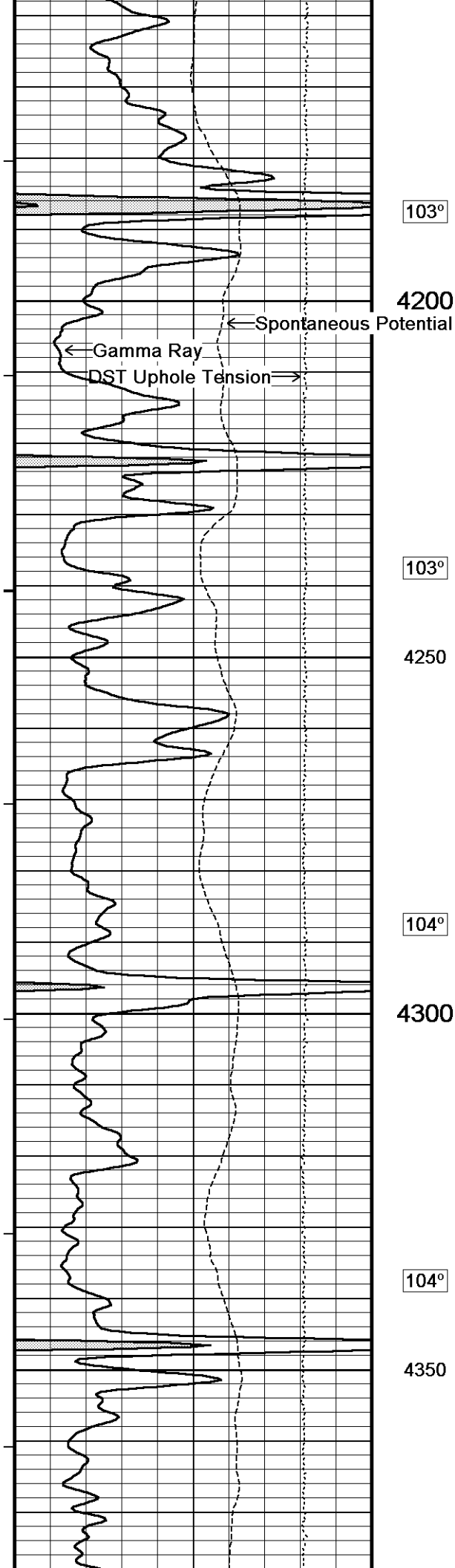
103°

4100

103°

4150





103°

4200

103°

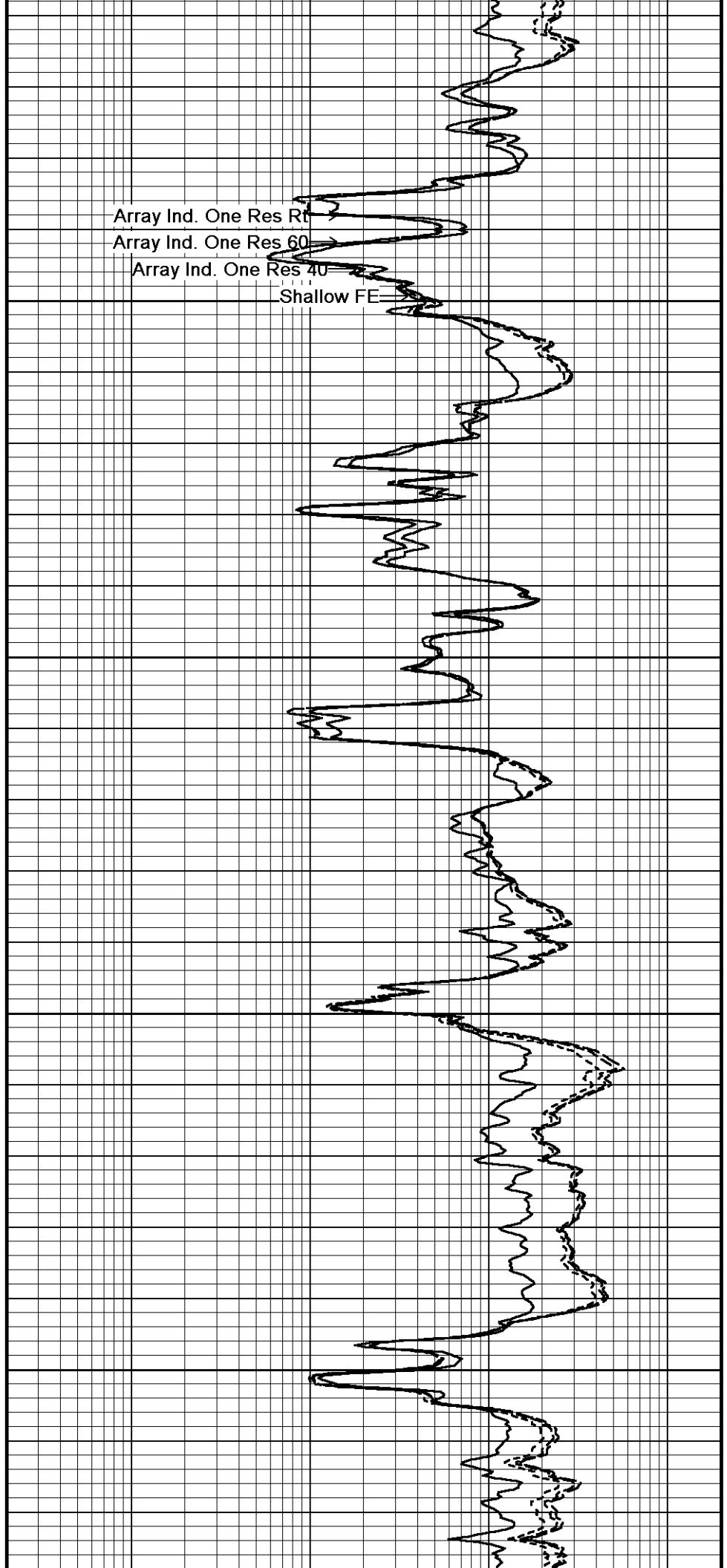
4250

104°

4300

104°

4350

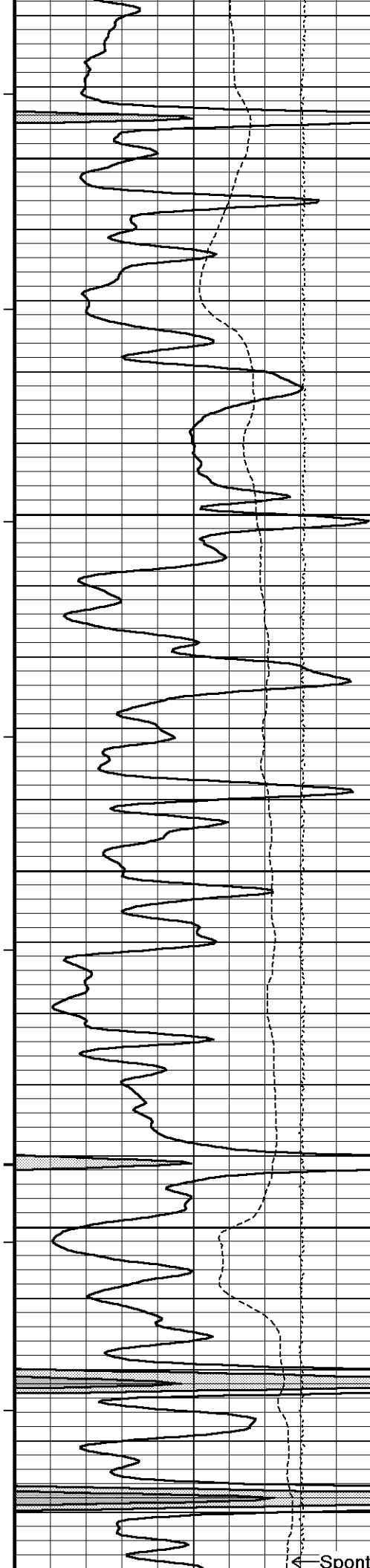


Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



104°

4400

104°

4450

105°

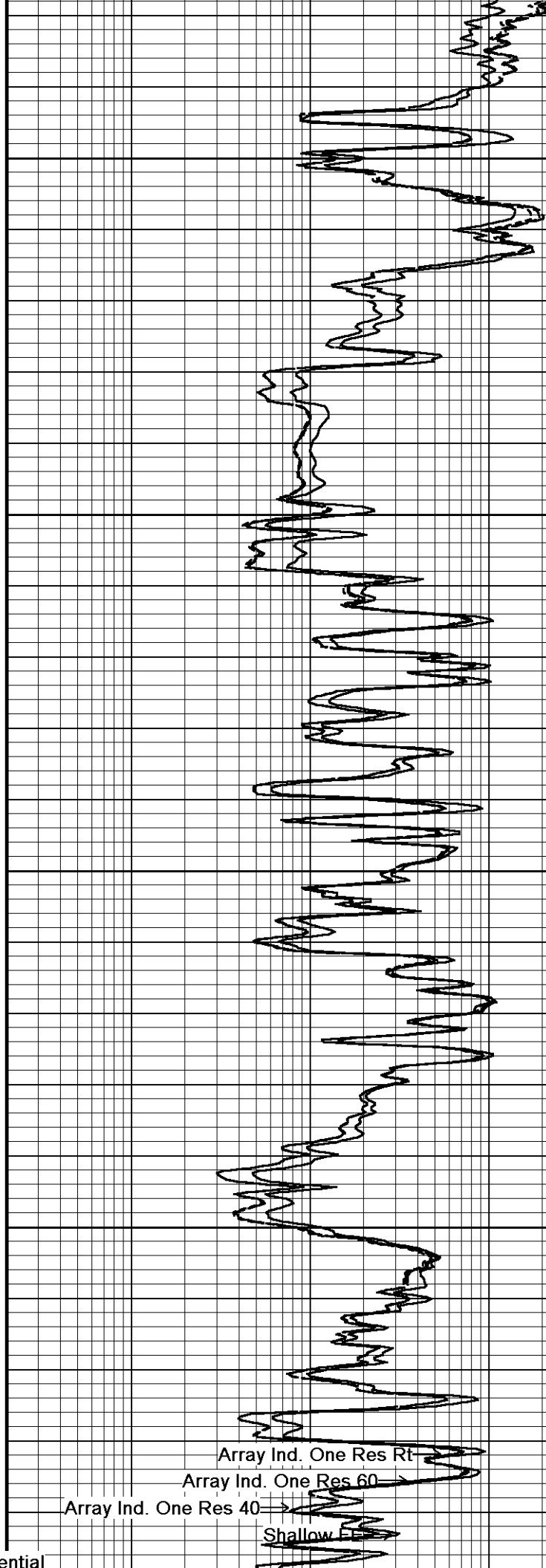
4500

106°

4550

106°

← Spontaneous Potential



Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow Fm



4600

107°

4650

108°

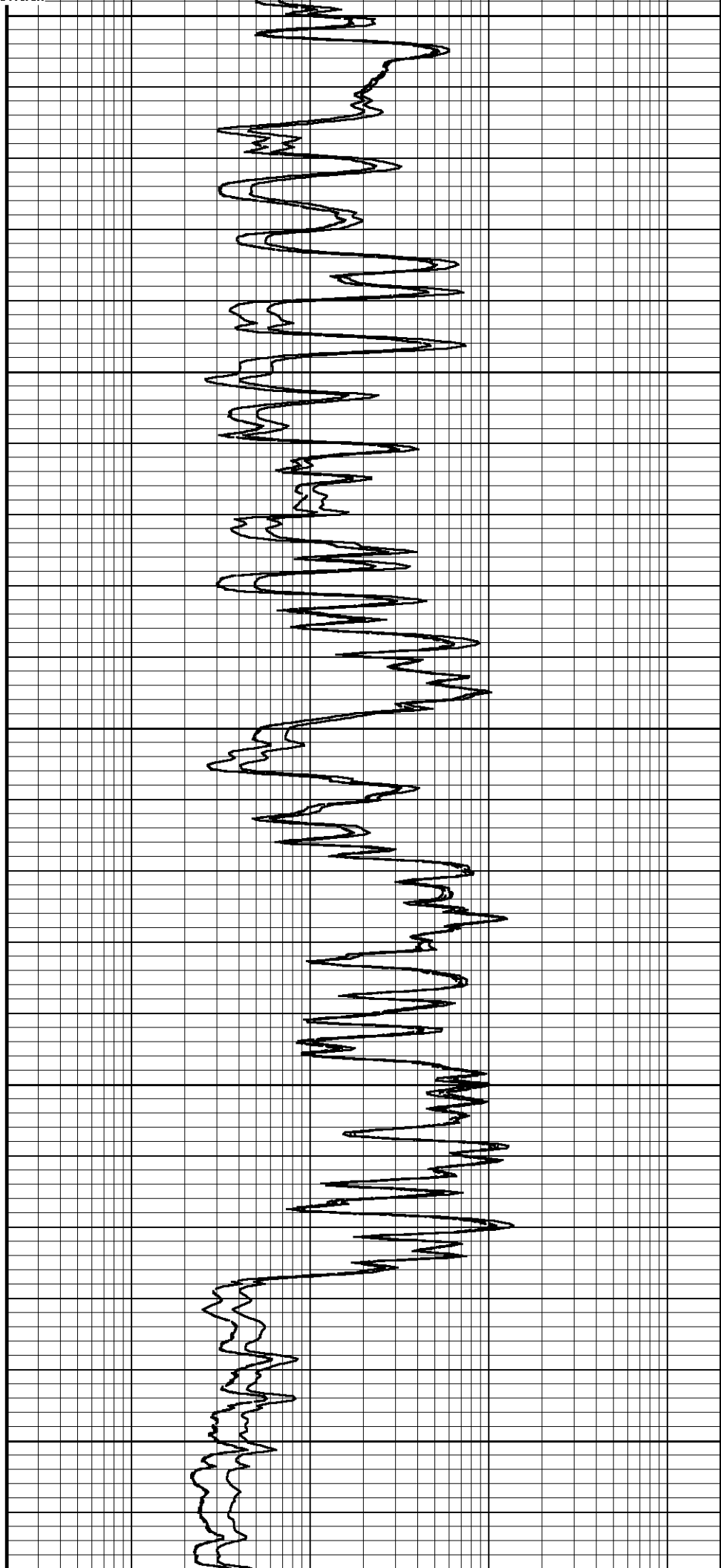
4700

109°

4750

110°

4800



111°

4850

111°

4900

111°

4950

5000

5034

FR Gamma Ray

Spontaneous Potential

DST Uphole Tension

FR DST Uphole Tension

FR Spontaneous Potential

Array Ind. One Res Rt

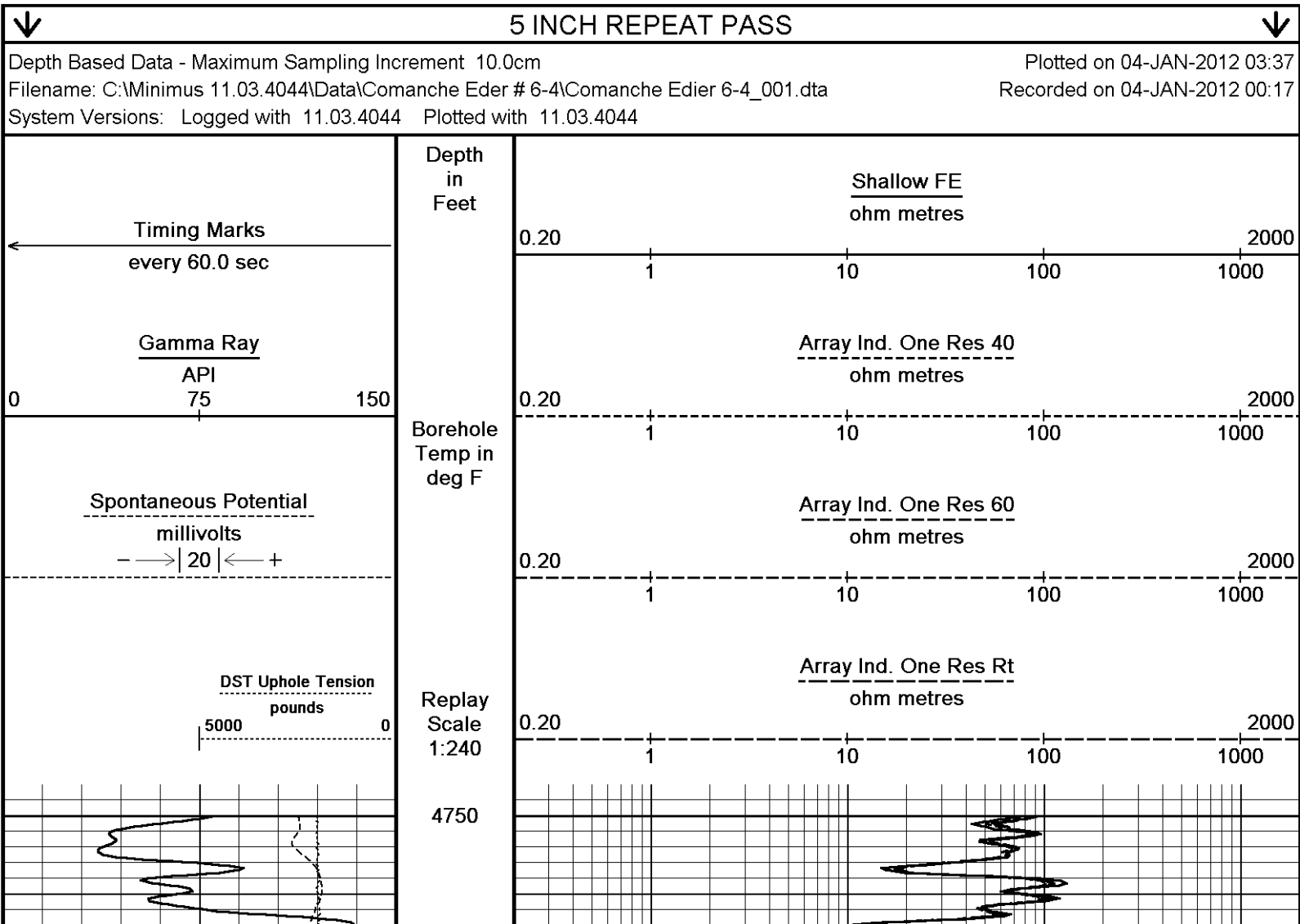
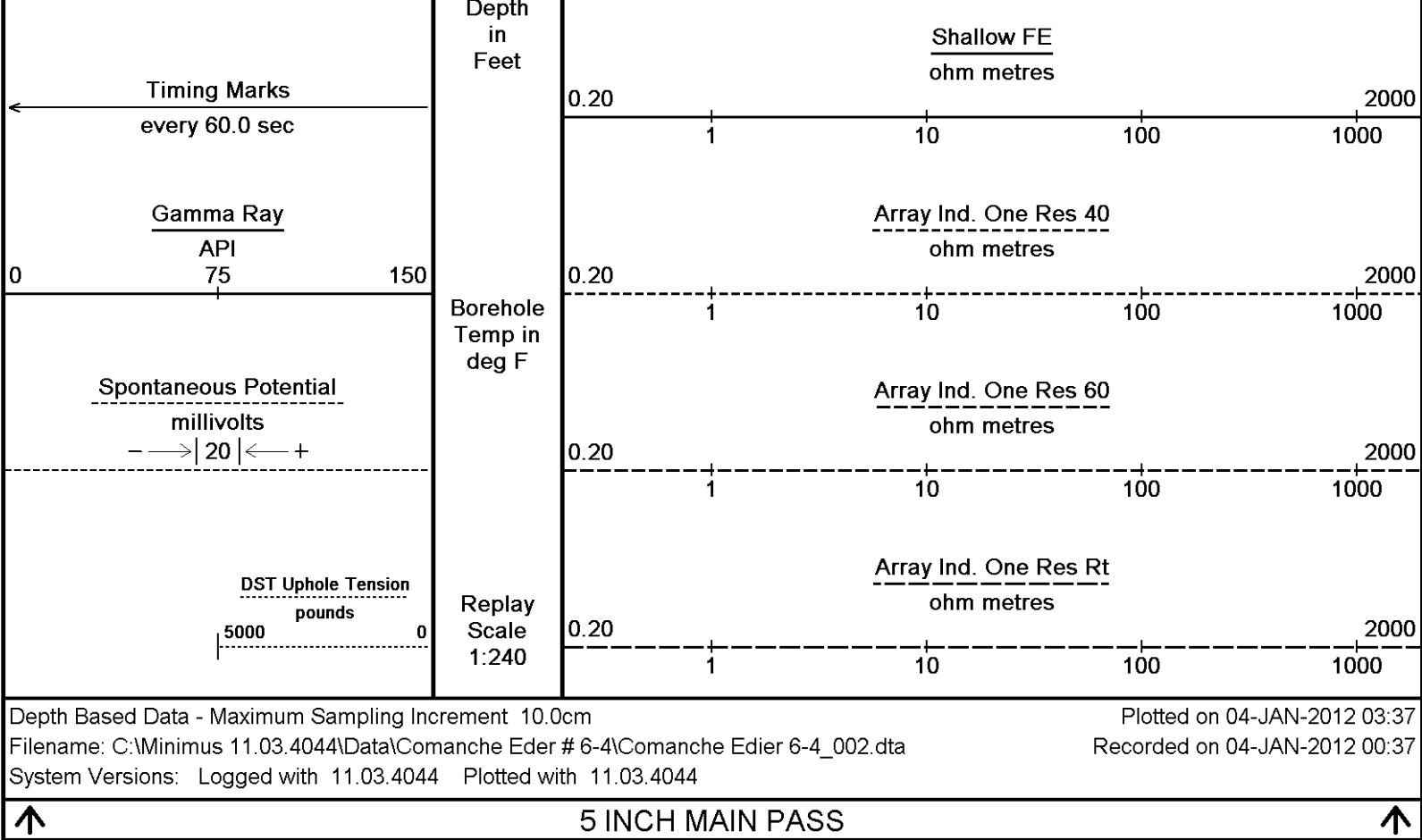
Array Ind. One Res 60

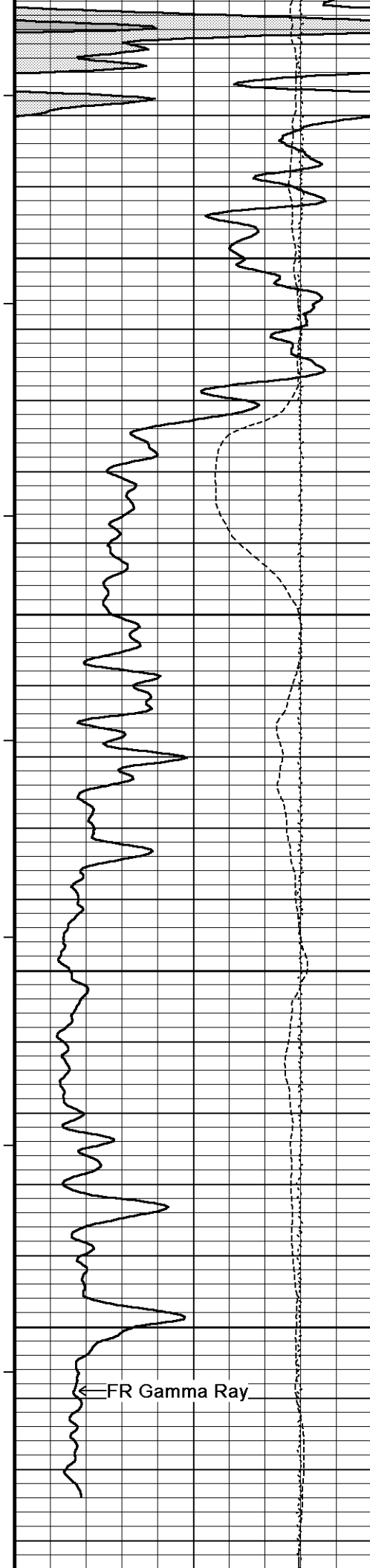
Array Ind. One Res 40

Shallow FE

FR Shallow FE

FIFR Array Ind. One Res Rt





108°

4800

110°

4850

110°

4900

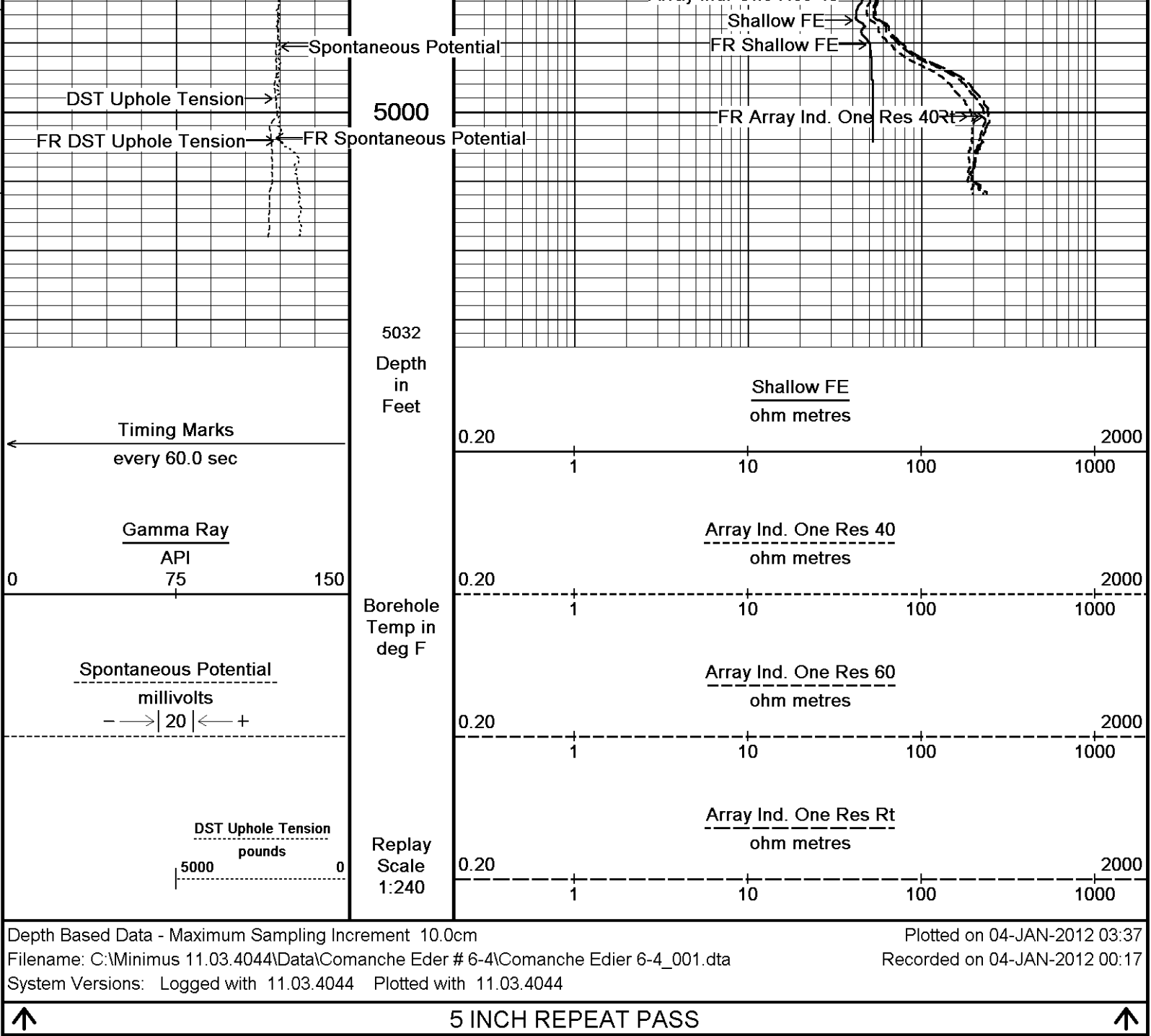
110°

4950

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40



BEFORE SURVEY CALIBRATION		
C:\Minimus 11.03.4044\Data\Comanche Eder # 6-4\Comanche Edier 6-4_002.dta		
General Constants All 000		Last Edited on 03-JAN-2012,23:46
General Parameters		
Mud Resistivity	0.800	ohm-metres
Mud Resistivity Temperature	50.000	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. One Res Rt	

Resistivity used	Array Ind. One Res Rt	1.000	
RWA Constant A		2.000	
RWA Constant M			
Down-hole Tension Calibration SMS 0			Field Calibration on 24-DEC-2011 19:14
Reading No	Measured	Calibrated (lbs)	
1	13180.10	0.00	
2	14049.87	408.00	
Gamma Calibration MCG-D.K 442			Field Calibration on 30-NOV-2011 11:34
	Measured	Calibrated (API)	
Background	73	51	
Calibrator (Gross)	731	507	
Calibrator (Net)	658	456	
Gamma Constants MCG-D.K 442			Last Edited on 03-JAN-2012,23:46
Gamma Calibrator Number	grc141		
Mud Density	1.09	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
SP Calibration MCG-D.K 442			Field Calibration on 23-SEP-2011 14:10
	Measured	Calibrated (mV)	
Reference 1	100.3	100.0	
Reference 2	-98.9	-100.0	
High Resolution Temperature Calibration MCG-D.K 442			Field Calibration on 02-DEC-2011,12:34
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-D.K 442			Last Edited on 25-SEP-2011,21:25
Pre-filter Length	11		
Caliper Calibration MML-A 4			Base Calibration on 26-DEC-2011 14:04 Field Calibration on 03-JAN-2012 11:18
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15032	5.98	
2	18428	7.97	
3	21790	9.86	
4	25773	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.98	5.98	
Micro Normal and Micro Inverse Calibration MML-A 4			Base Calibration on 26-DEC-2011 13:57 Field Check on 03-JAN-2012 11:22
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2	
Micro Normal	12.2 60.2	2.6 12.8	
Micro Inverse	15.7 78.4	1.7 8.4	
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	32.1	32.1	
Micro Inverse	16.3	16.3	
Micro Normal and Micro Inverse Constants MML-A 4			Last Edited on 26-DEC-2011,13:43
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	

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3067	96	3714	110
Ratio	31.868		33.764	

Field Calibrator at Base

	Calibrated (cps)
	1645
Ratio	0.692

Field Check

	Calibrated (cps)
	1658
Ratio	0.703

Neutron Constants MDN-A.B 65

Last Edited on 03-JAN-2012,23:46

Neutron Source Id	757	
Neutron Jig Number	5824NE	
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-A.A 55

Base Calibration on 16-DEC-2011 15:40

Field Check on 03-JAN-2012 11:26

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	951.4	126.8

Base Check 281.6

Field Check 281.6

FE Constants MFE-A.A 55

Last Edited on 03-JAN-2012,23:47

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

Induction Calibration MAI-A.A 45

Base Calibration on 13-OCT-2011 14:35

Field Check on 03-JAN-2012 11:30

Base Calibration

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		14.4	472.6	9.3	966.2
2		5.7	374.0	7.6	821.4
3		3.4	261.2	5.2	566.0
4		2.5	133.9	2.6	279.2

Array Temperature 79.4 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	18.8	3852.2
2	0.0	0.0	01.0	0000.0

2	0.0	0.0	31.8	3630.0
3	0.0	0.0	28.7	3050.0
4	0.0	0.0	18.4	2079.5
Deep	0.0	0.0	16.1	1911.6
Medium	0.0	0.0	42.6	4061.5
Shallow	0.0	0.0	49.7	5484.1
Array Temperature		0.0	65.1	Deg F

Induction Constants MAI-A.A 45				Last Edited on 03-JAN-2012,23:47	
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.		MCG 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-A.A 45			Field Calibration on 03-NOV-2011,09:08
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	100.00	100.00	

High Resolution Temperature Constants MAI-A.A 45		Last Edited on
Pre-filter Length	11	

Photo Density Calibration MPD-B 64			Base Calibration on 08-DEC-2011 15:10	
			Field Check on 03-JAN-2012 11:06	
Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	47904	25079	59556	30836
Reference 2	19725	2537	24941	2541
Field Check at Base				
	1205.0	1399.0		
Field Check				
	1205.2	1397.8		

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	220	1077		
Reference 1	18004	47717	0.381	0.371
Reference 2	5349	19592	0.277	0.272

Field Check at Base

219.9 1077.0

Field Check

219.0 1077.4

Density Constants MPD-B 64

Last Edited on 03-JAN-2012,23:47

Density Source Id	254
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	1.09 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

Caliper Calibration MPD-B 64

Base Calibration on 08-DEC-2011 14:37

Field Calibration on 03-JAN-2012 11:08

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12765	3.99
2	21501	5.98
3	30128	7.97
4	38369	9.86
5	47411	11.92
6	N/A	N/A

Field Calibration

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

DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\Comanche Eder # 6-4\Comanche Edier 6-4_002.dta

MCB-A.A 11B Tension Cablehead
MCB-A.A 175 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

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

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



45.04 ft GRGC - Gamma Ray
42.13 ft CGXT - MCG External Temperature

35.41 ft MINV - Micro-inverse
35.41 ft MNRL - Micro-normal
36.40 ft MLTC - MML Caliper

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

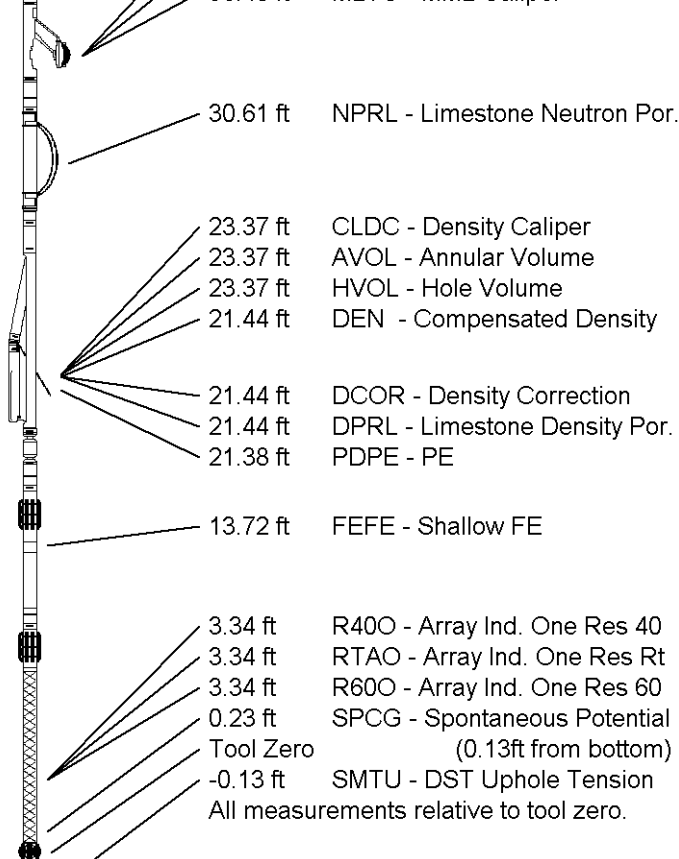
Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 37 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 52.72 ft Weight: 427.7 lb



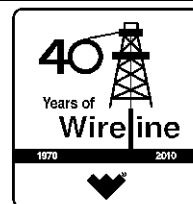
COMPANY COMANCHE RESOURCES COMPANY
WELL EDER # 6-4
FIELD WILDCAT
PROVINCE/COUNTY SCOTT
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	3081.00	feet	First Reading	5001.00	feet
Elevation Drill Floor	3079.00	feet	Depth Driller	5000.00	feet
Elevation Ground Level	3070.00	feet	Depth Logger	5004.00	feet



Weatherford®

**ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG**

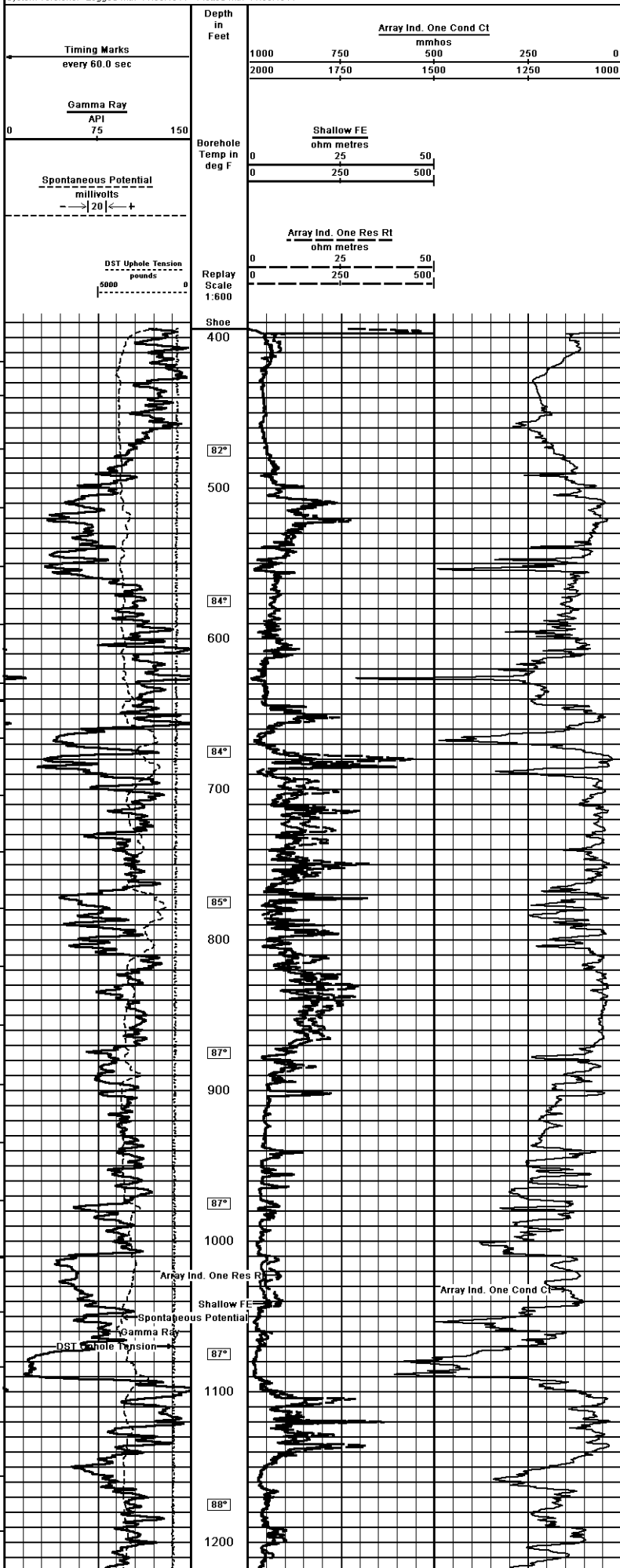


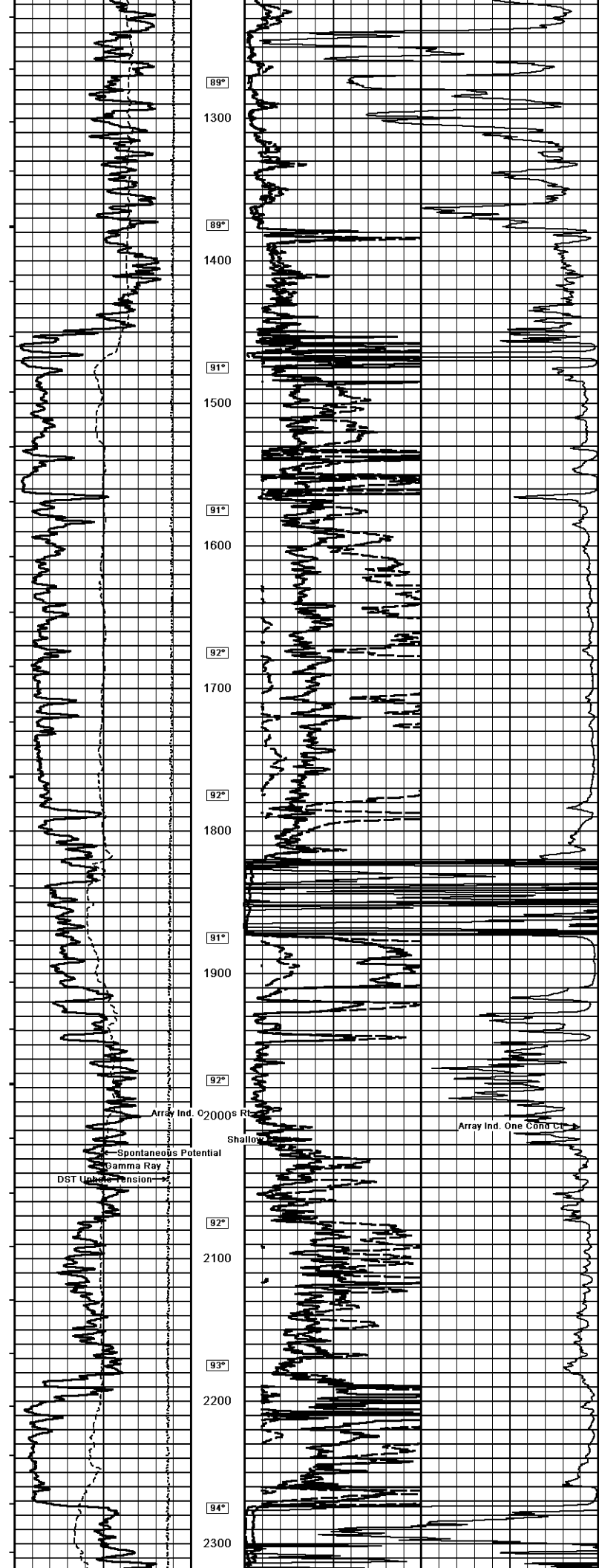
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY COMANCHE RESOURCES COMPANY WELL EDER # 6-4 FIELD WILDCAT PROVINCE/COUNTY SCOTT COUNTRY/STATE U.S.A. / KANSAS LOCATION 780' FSL & 920' FEL SEC 20S RGE 34W Other Services MFL SPR Number 15-171-20057 Permit Number 15-171-20057 Log Measured From KB @ 11 FEET Drilling Measured From KB @ 11 FEET		Revisions: KB 3081 DF 3079 GL 3070	
Date 03-JAN-2012 Run Number ONE Depth Driller 5000.00 feet Depth Logger 5004.00 feet First Reading 5001.00 feet Last Reading 394.00 feet Casing Driller 394.00 feet Casing Logger 394.00 feet Bit Size 7.875 inches Hole Fluid Type CHEMICAL Density/Viscosity 9.10 lb/USg 14500 CP PH/Fluid Loss 10.00 6.80 ml/30min Sample Source FLOWLINE Em @ Measured Temp 0.80 @ 50.0 ohm-m Em @ Measured Temp 0.64 @ 50.0 ohm-m Em @ Measured Temp 0.90 @ 50.0 ohm-m Source Rmt/ Rmc CALC Rm @ BHT 0.38 @ 111.0 ohm-m Time Since Circulation 5 HOURS Max Recorded Temp 111.00 deg F Equipment Name COMPACT Equipment Base 13057 Recorded By A. GIMBALVO Witnessed By SEANTERHAN SPC 13057			

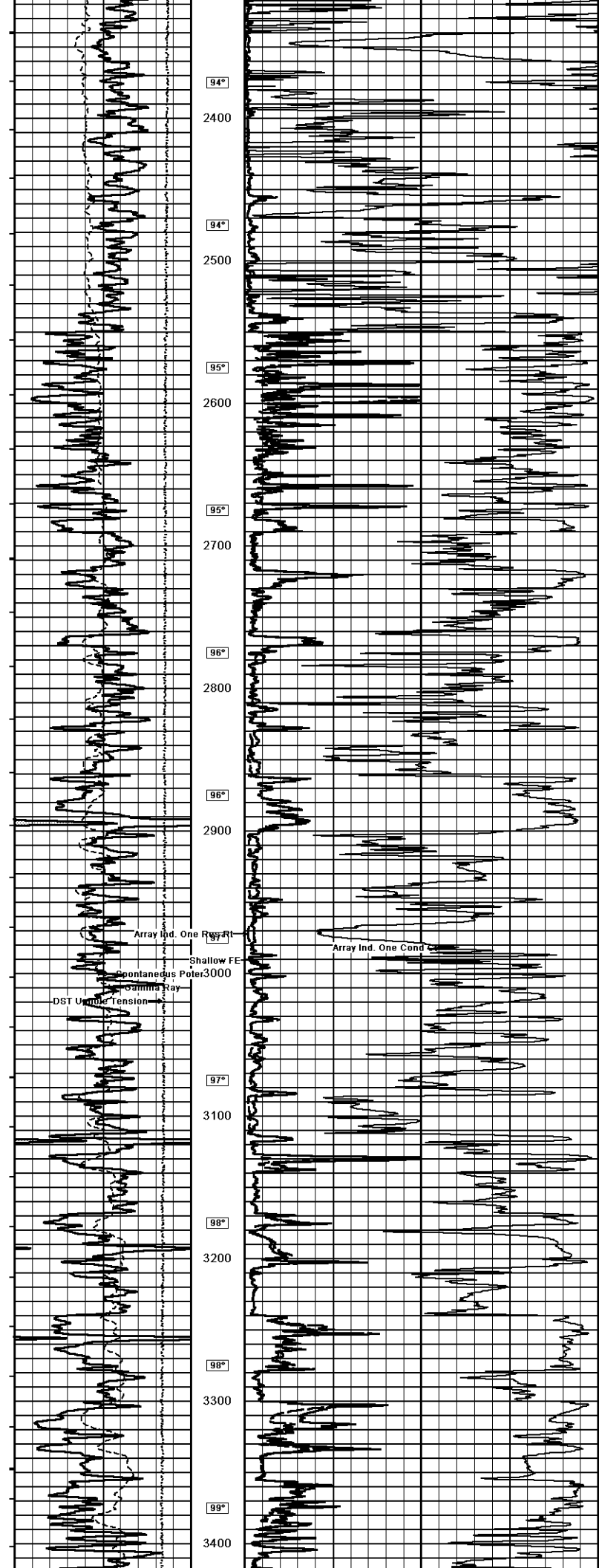
Plotted on 04-JAN-2012 03:37

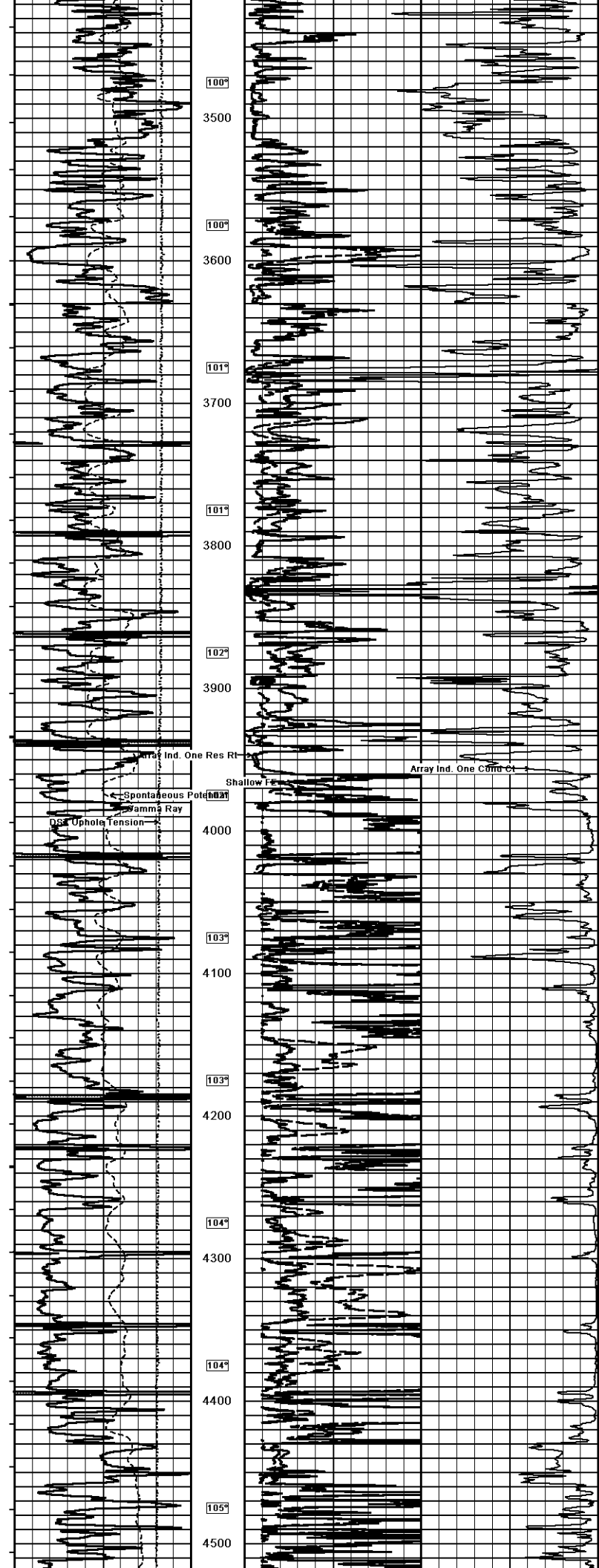
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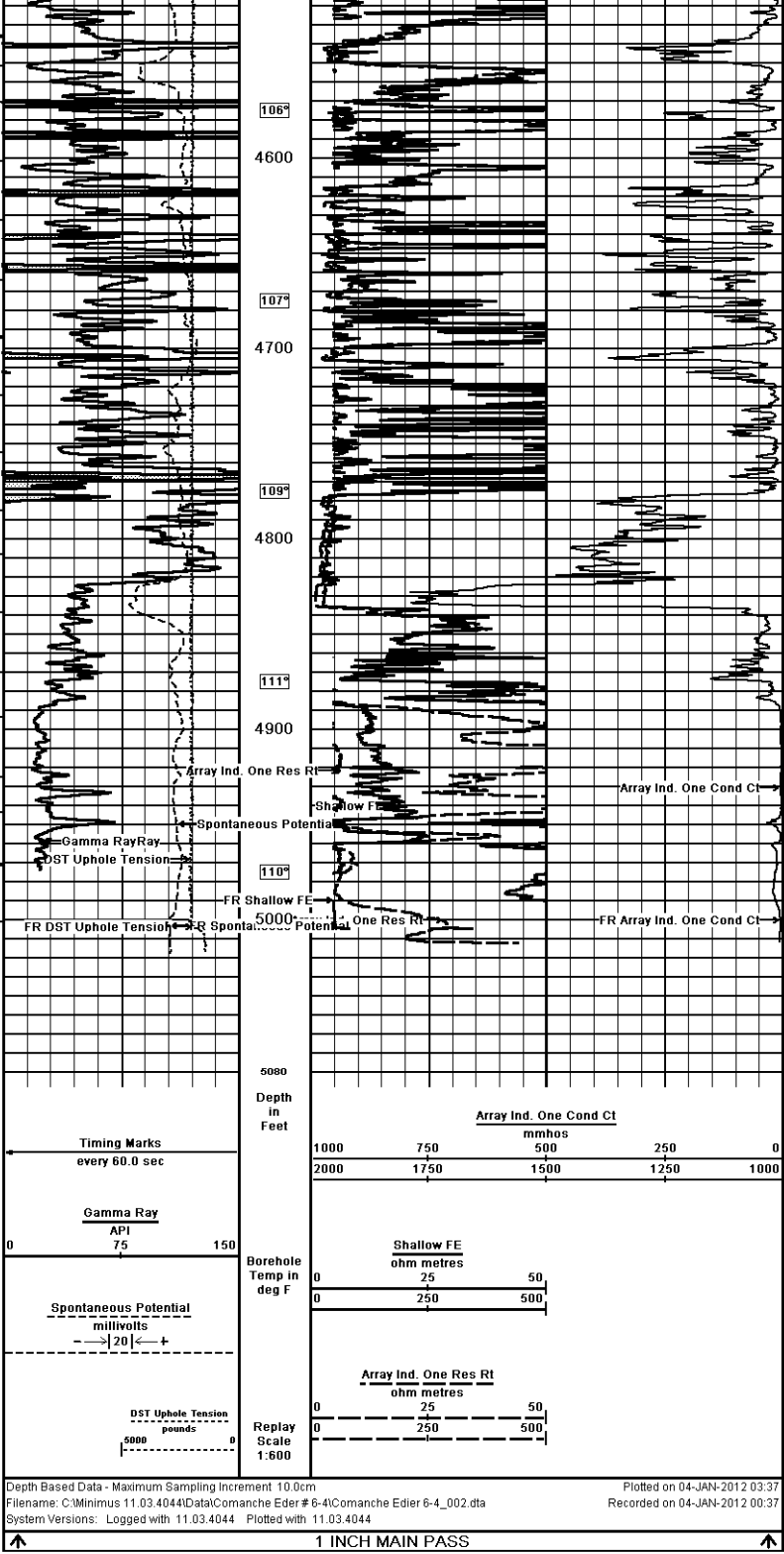
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044











COMPANY		COMANCHE RESOURCES COMPANY			
WELL		EDER # 6-4			
FIELD		WILDCAT			
PROVINCE/COUNTY		SCOTT			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	3081.00	feet	First Reading	5001.00	feet
Elevation Drill Floor	3079.00	feet	Depth Driller	5000.00	feet
Elevation Ground Level	3070.00	feet	Depth Logger	5004.00	feet



ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG



