



Weatherford[®]

**ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG**

COMPANY			O'BRIEN ENERGY RESOURCES CORP.		
WELL			CLAYTON #2-28		
FIELD			SINGLEY		
PROVINCE/COUNTY			MEADE		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			335' FSL & 2281' FWL		
SEC	TWP	RGE	Other Services		
28	33S	29W	MPD/MDN		
API Number		15-119-21346		MML	
Permit Number					
Permanent Datum GL, Elevation 2591 feet				Elevations:	
Log Measured From KB				KB	
Drilling Measured From KB				DF	
Date	25-JUL-2013			GL	
Run Number	ONE				
Service Order	3539951				
Depth Driller	6400.00			feet	
Depth Logger	6395.00			feet	
First Reading	6392.00			feet	
Last Reading	1448.00			feet	
Casing Driller	1451.00			feet	
Casing Logger	1448.00			feet	
Bit Size	7.875			inches	
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30 lb/USg		60.00 CP		
PH / Fluid Loss	9.50		8.40 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.81 @ 99.0		ohm-m		
Rmf @ Measured Temp	0.65 @ 99.0		ohm-m		
Rmc @ Measured Temp	0.97 @ 99.0		ohm-m		
Source Rmf / Rmc	CALC	CALC			
Rm @ BHT	0.59 @136.0		ohm-m		
Time Since Circulation	6 HOURS				
Max Recorded Temp	136.00		deg F		
Equipment / Base	13096	LIB			
Recorded By	ADAM SILL				
Witnessed By	ROGER PEARSON		PETER DEBENHAM		
JOB #	LB13-211				

BOREHOLE RECORD				Last Edited: 25-JUL-2013 02:08	
Bit Size inches		Depth From feet		Depth To feet	
7.875		1451.00		6400.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	1451.00	24.00	

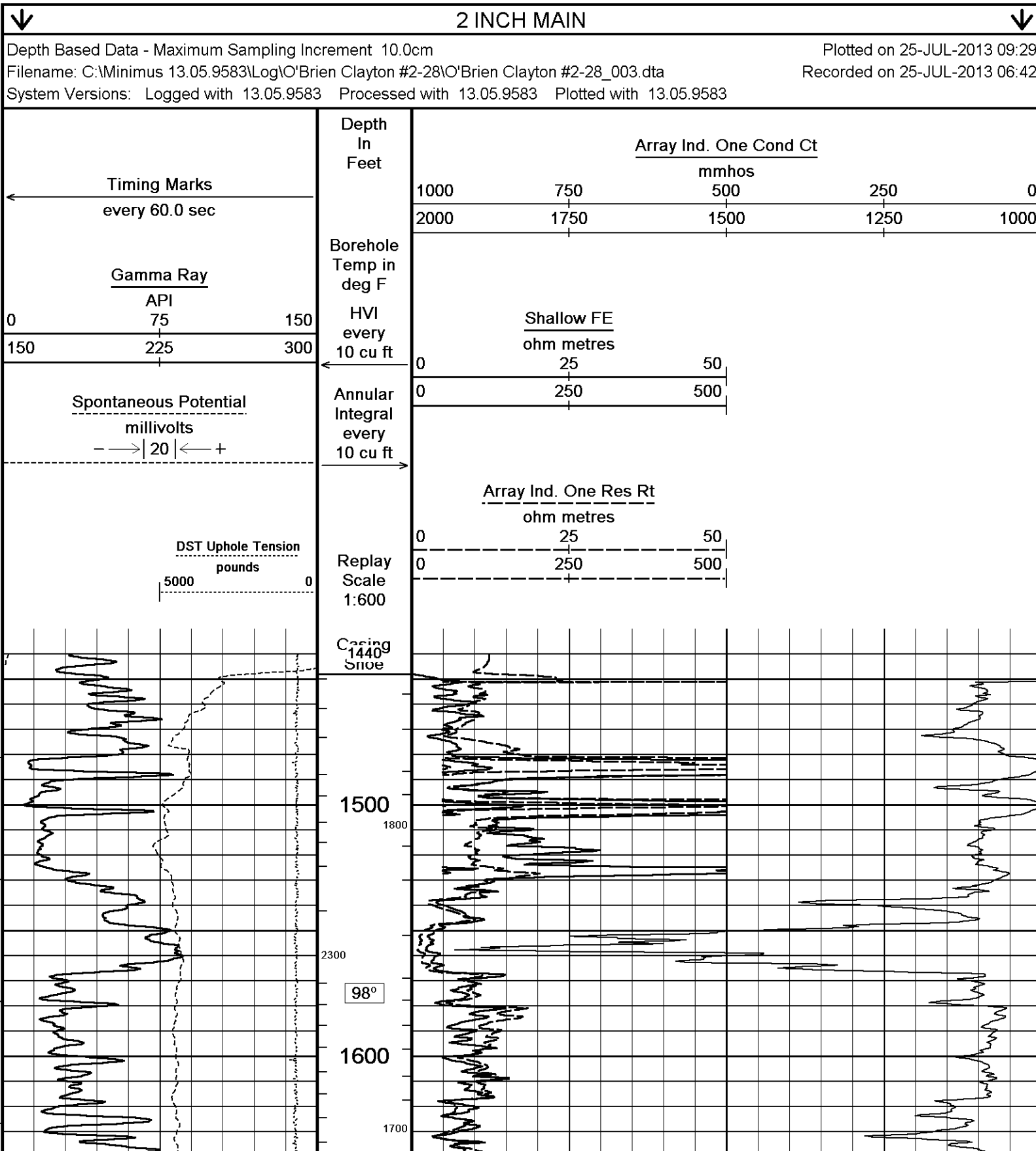
REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2390 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 4000 FEET: 755 CU. FT.
- RIG: DUKE #6

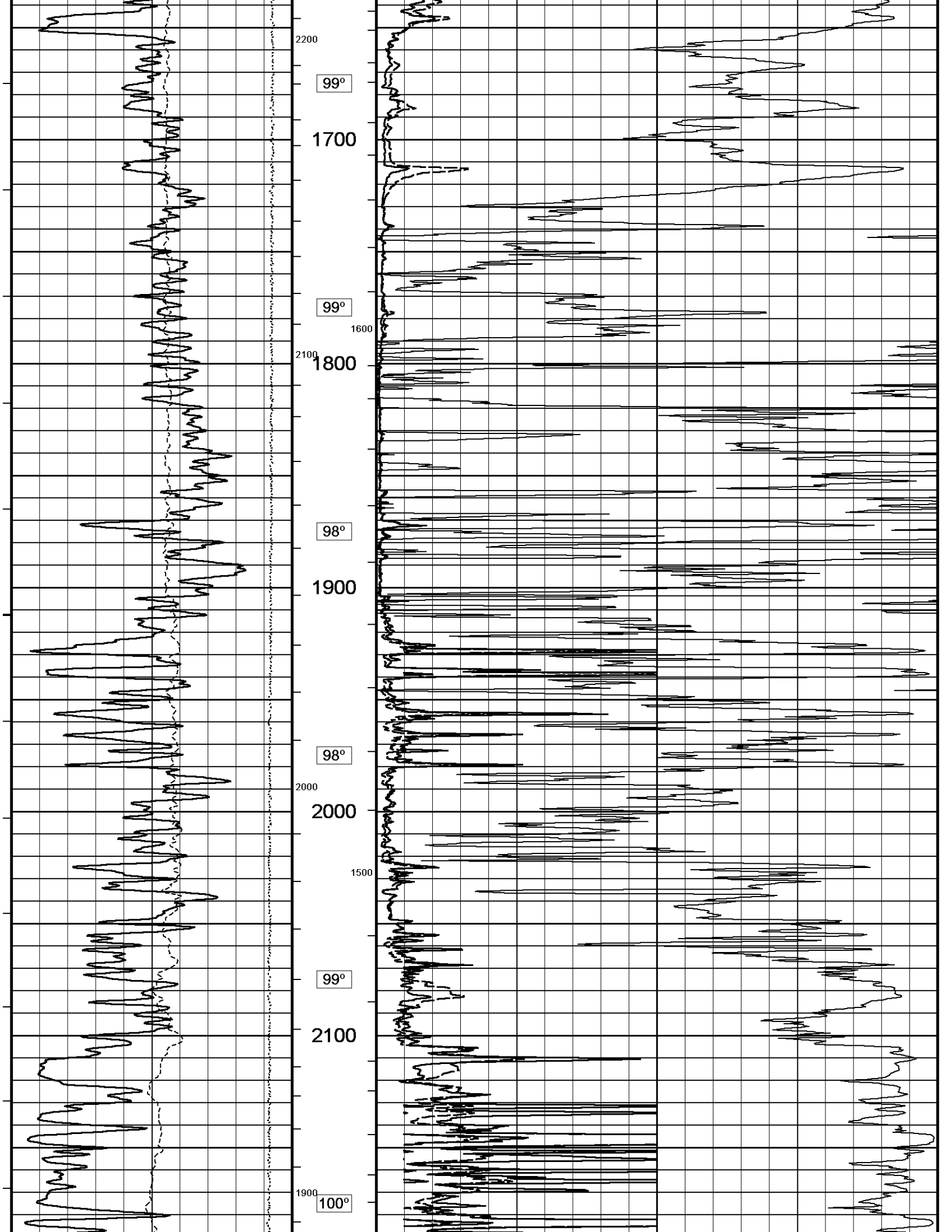
FILE: DORE.WC

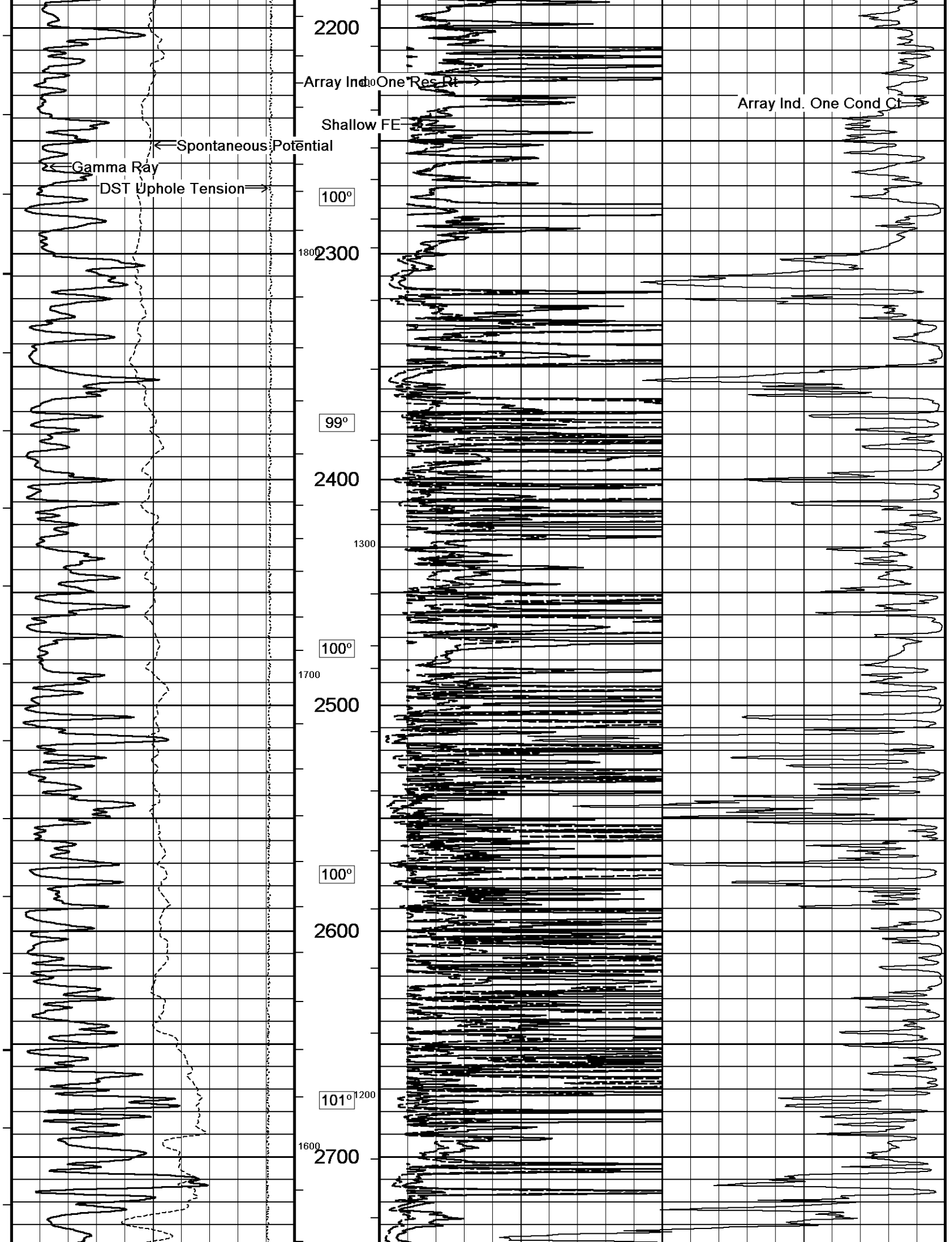
- ENGINEER: A. SILL.

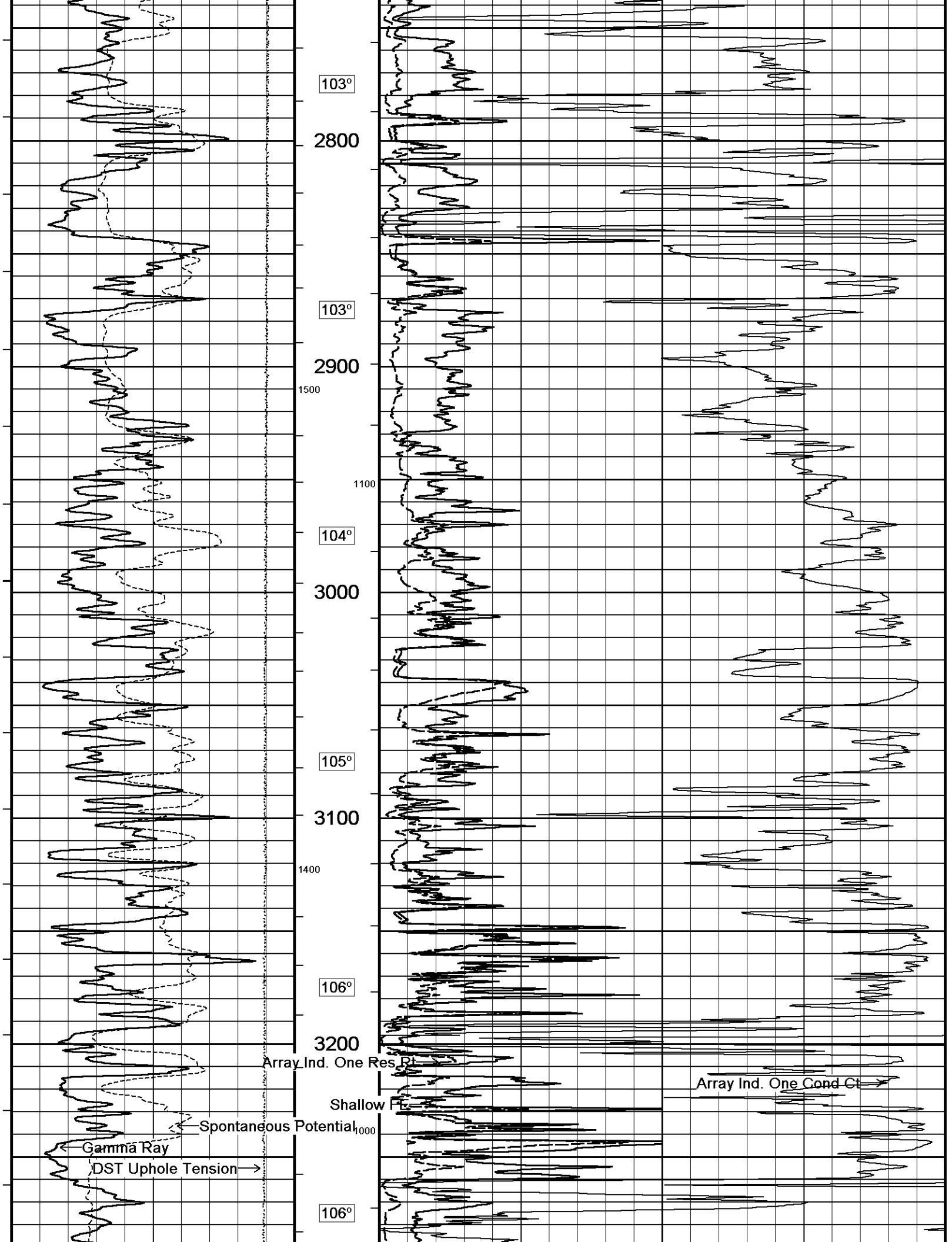
- OPERATOR(S): N. ADAME.

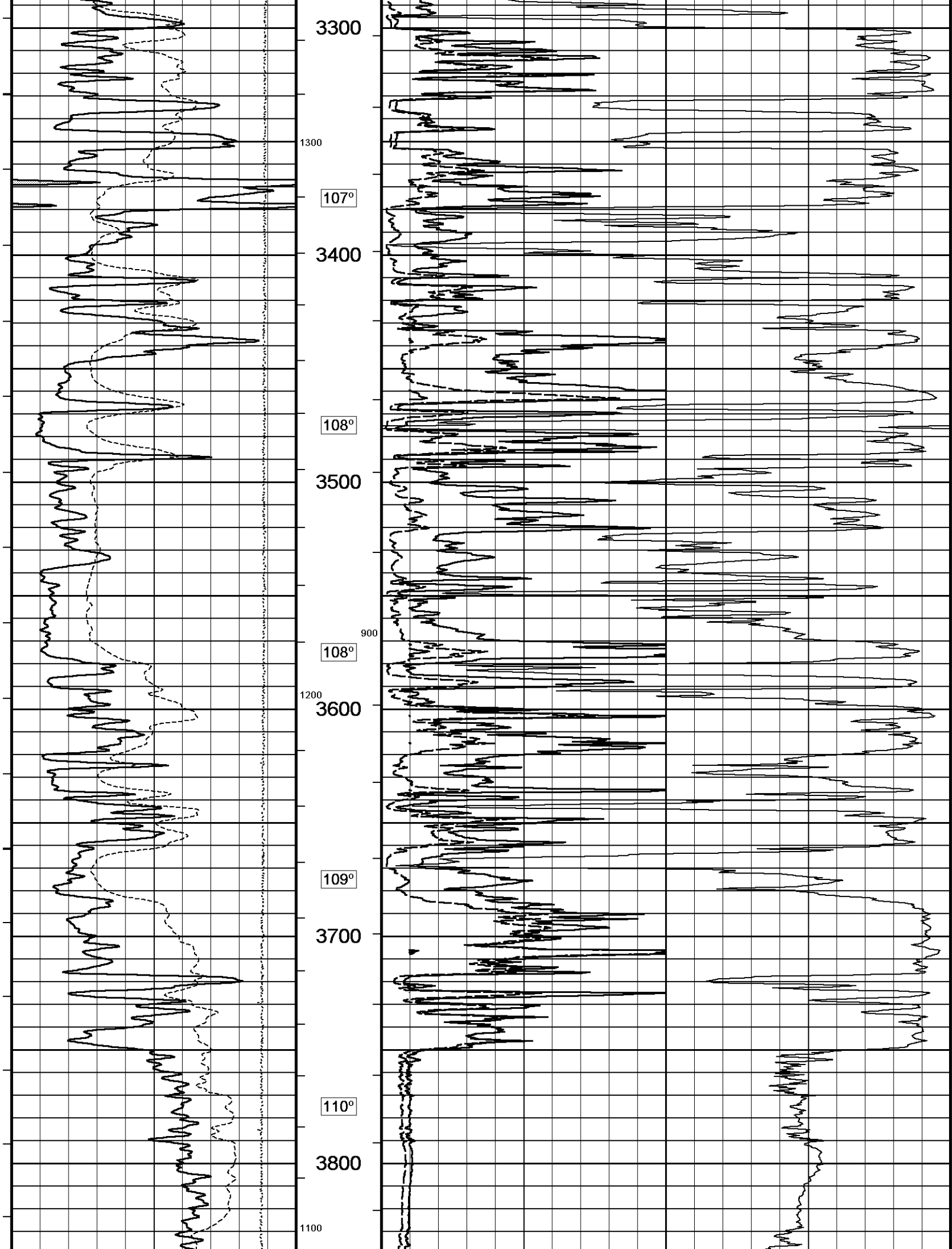
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

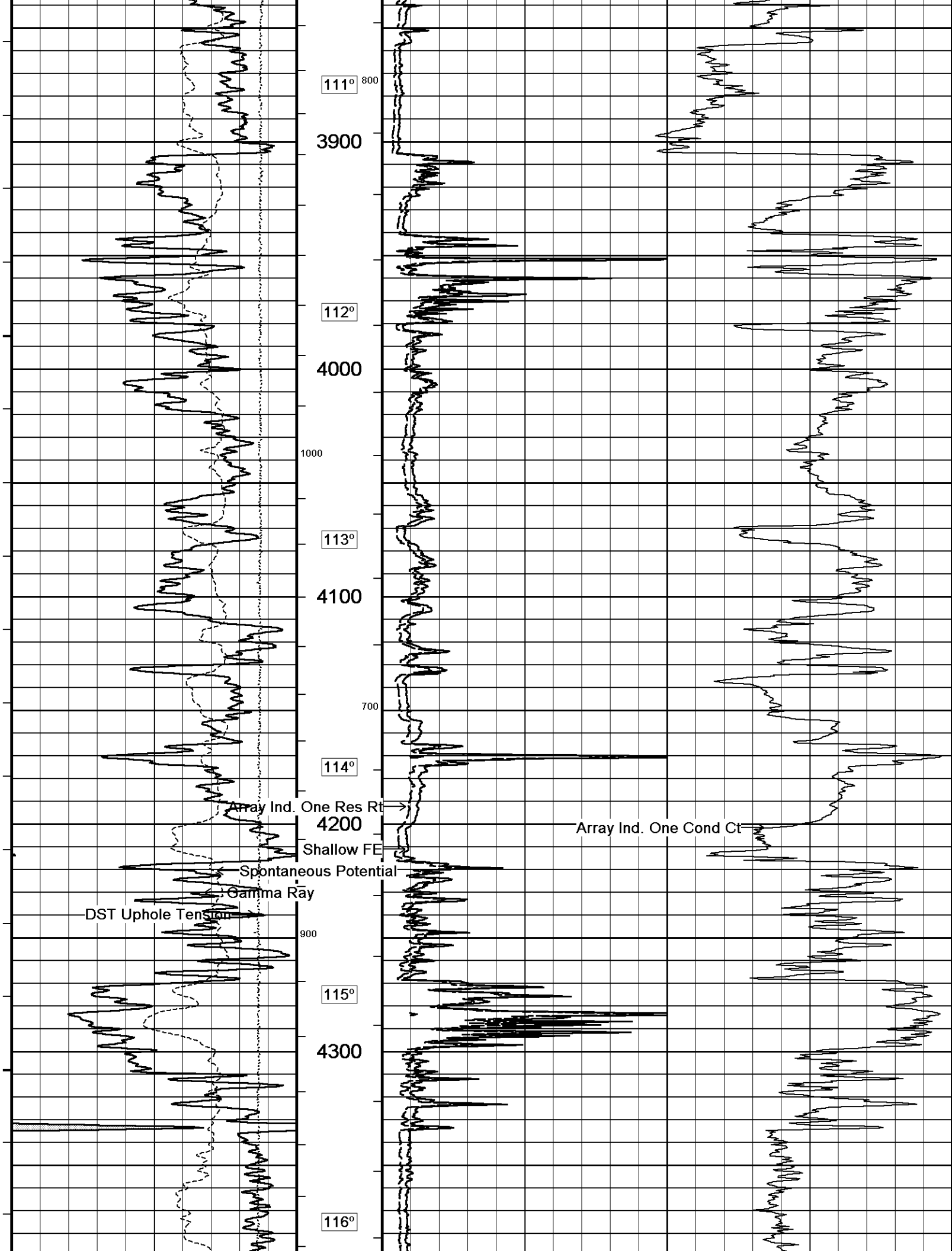


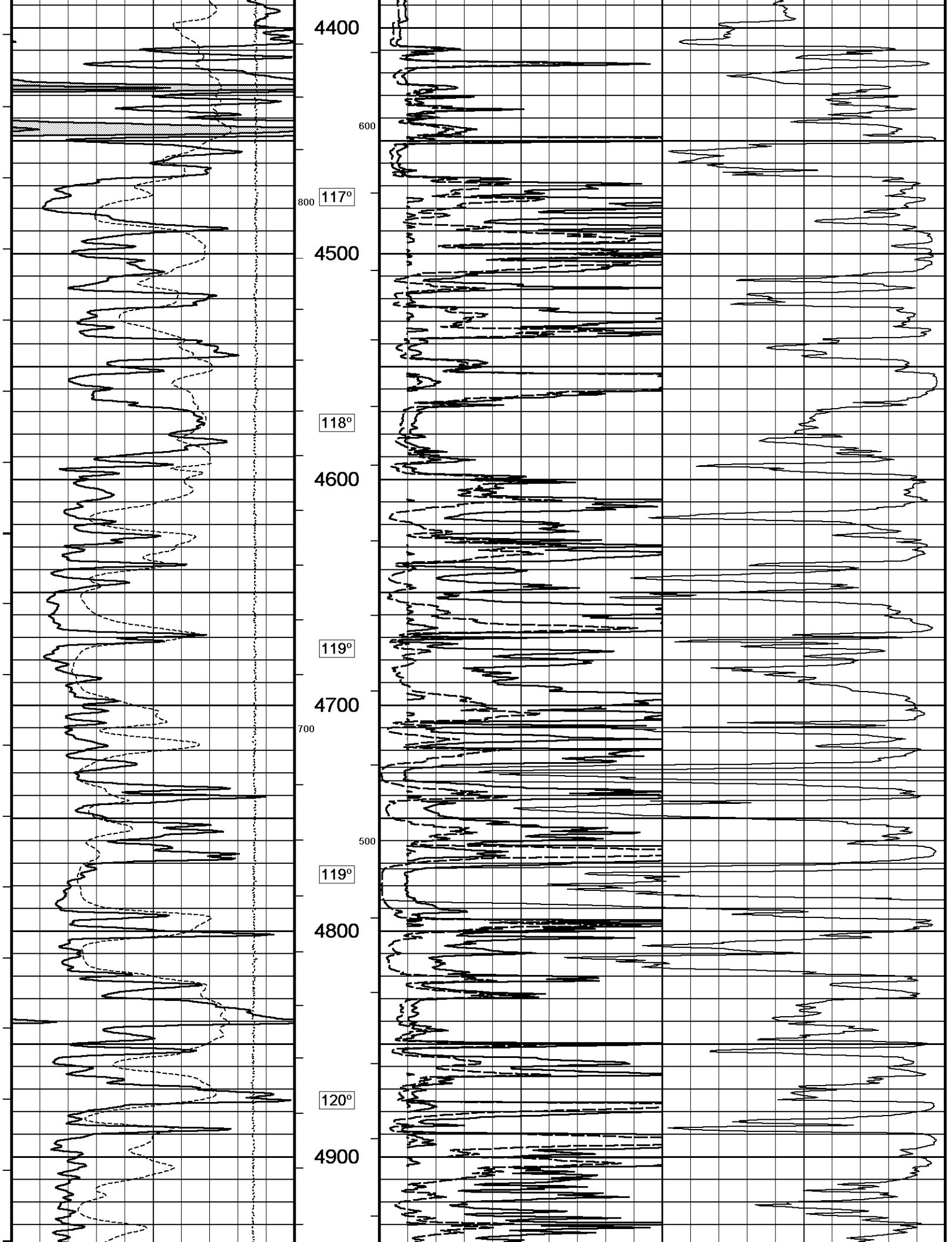


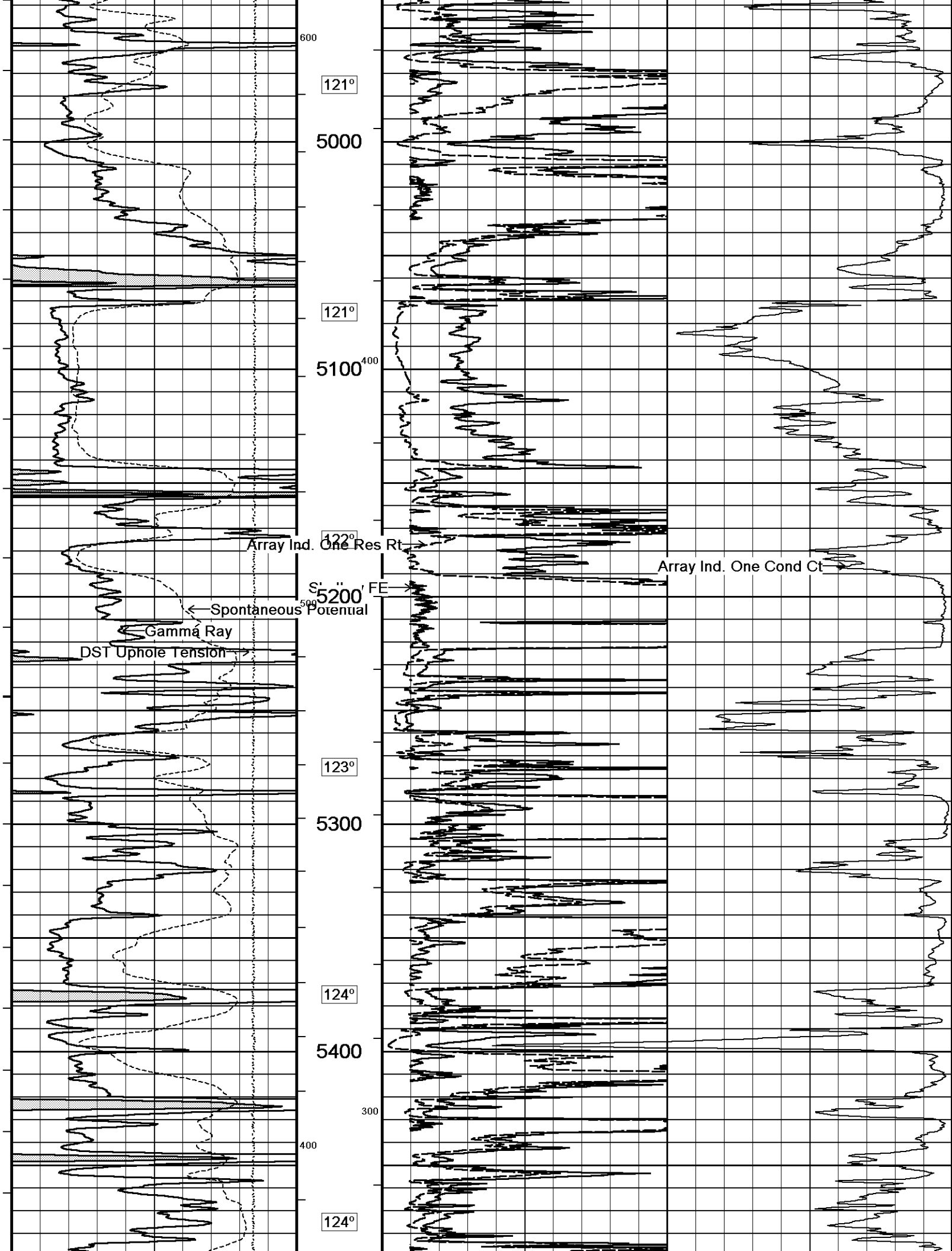


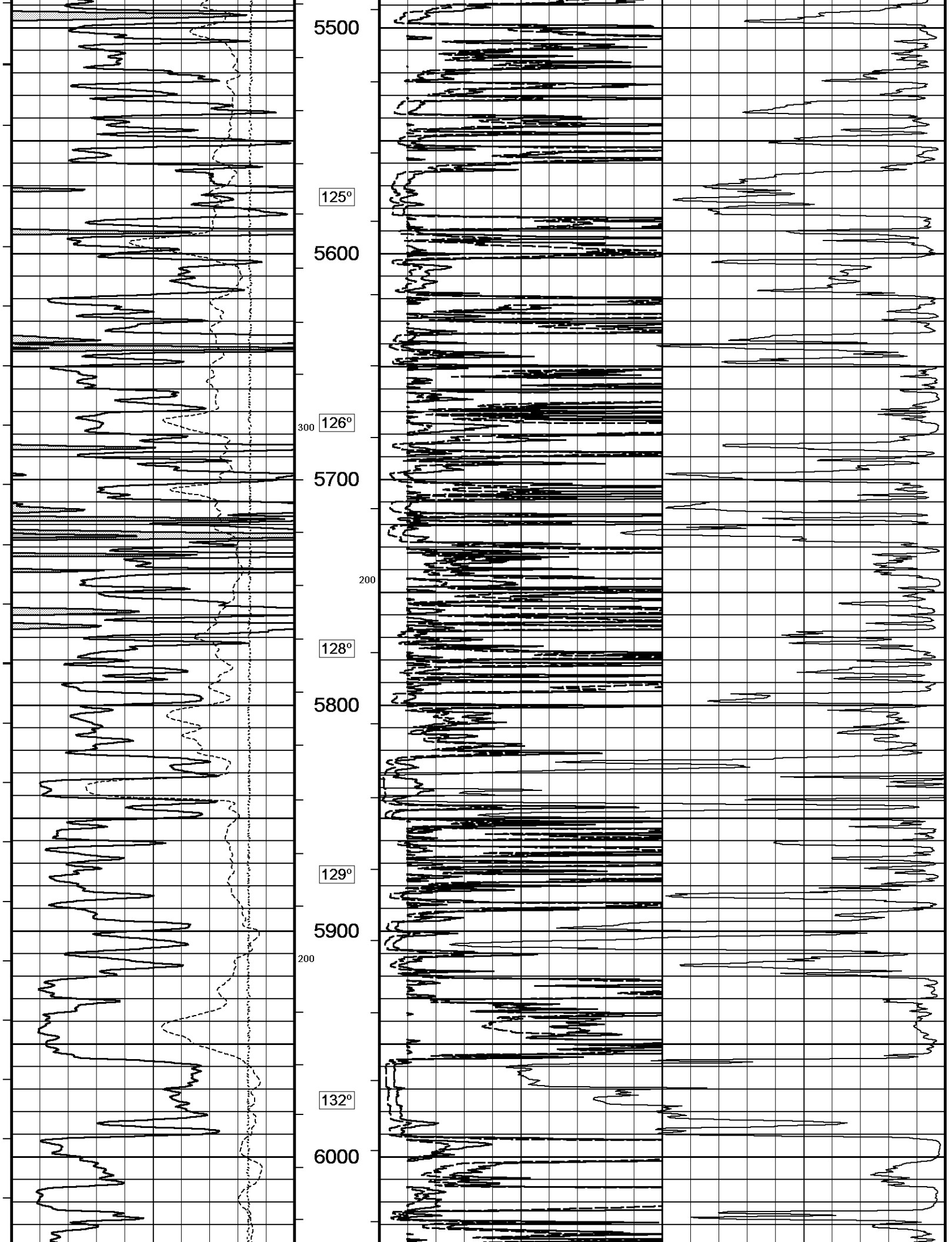


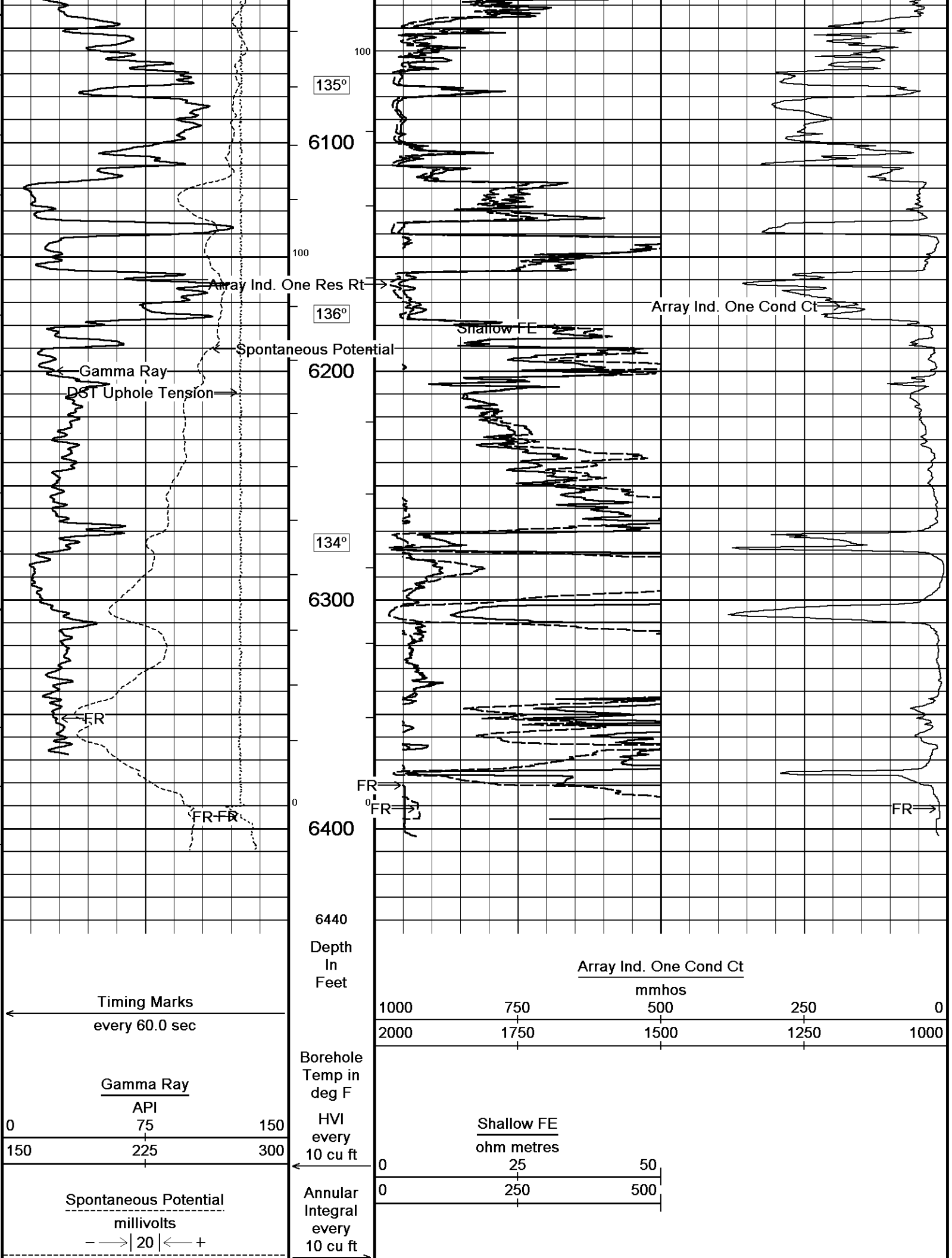


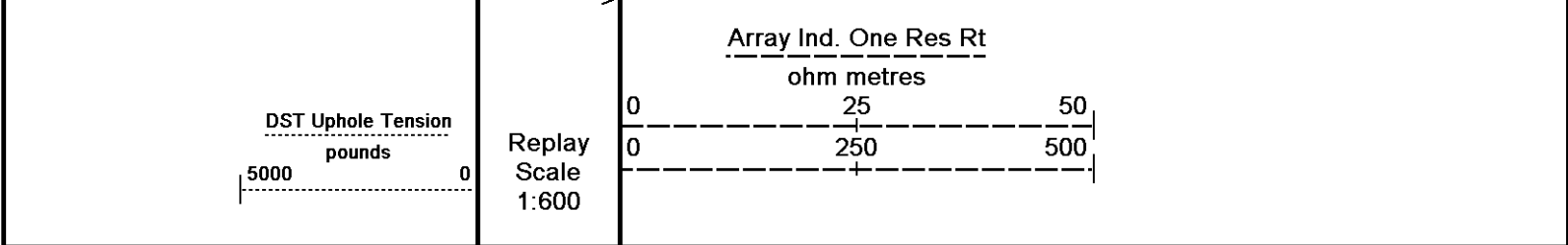








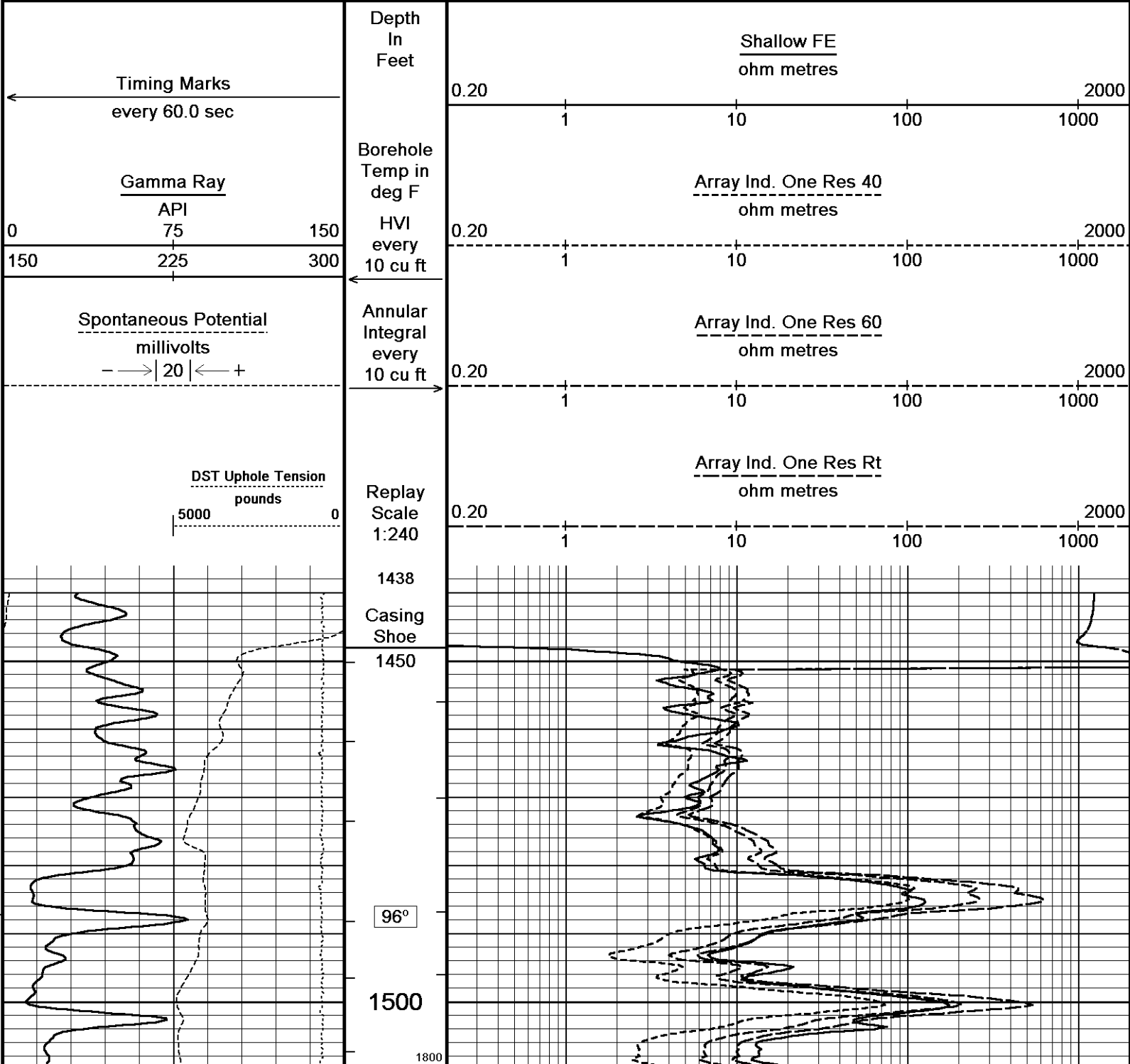


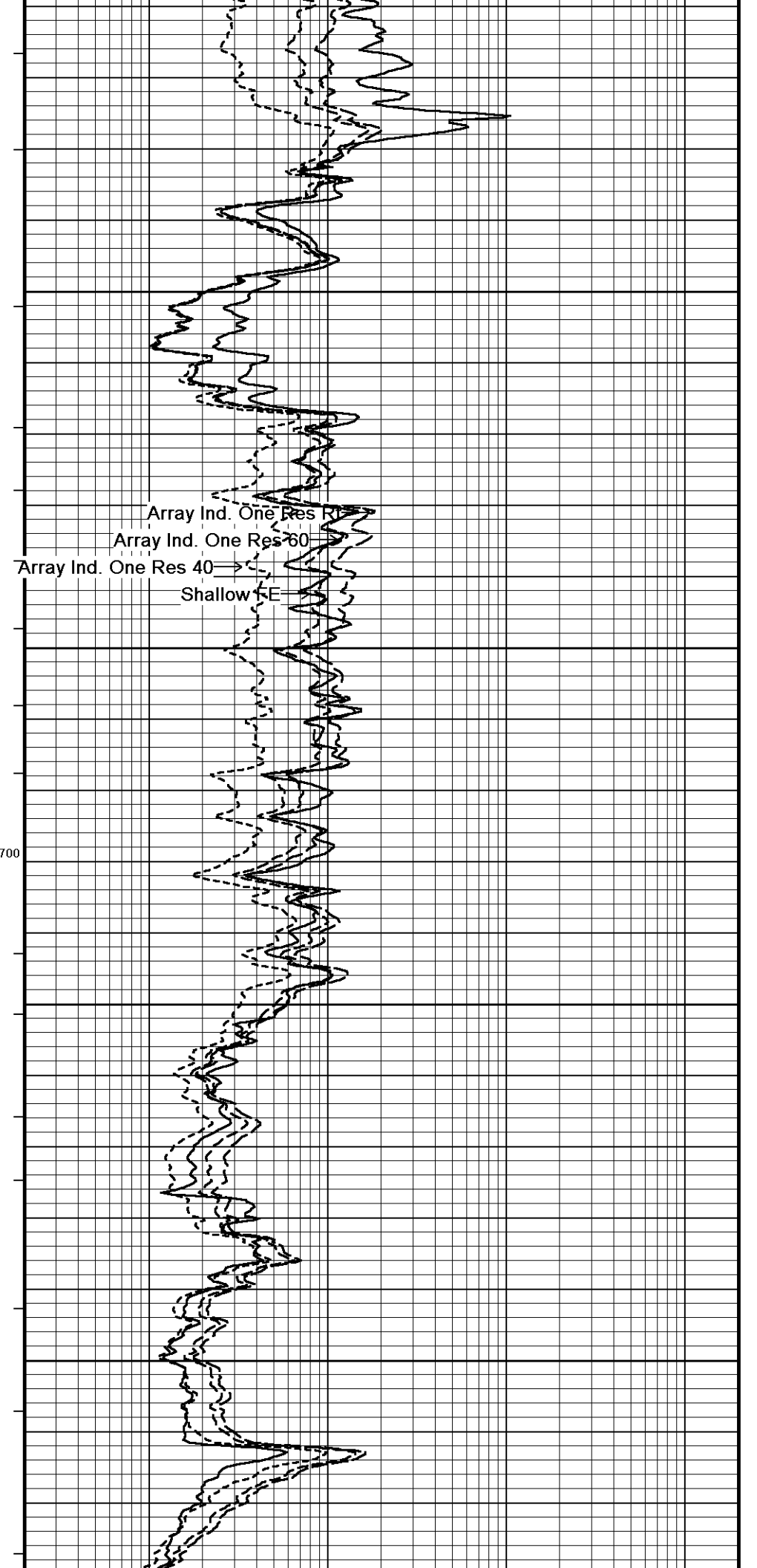
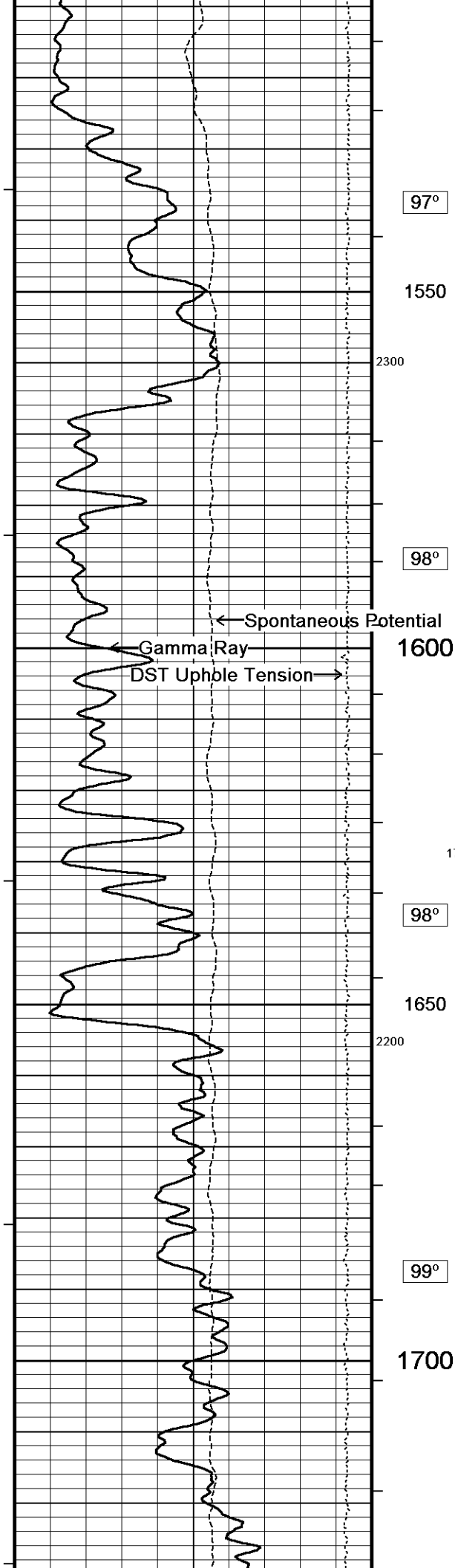


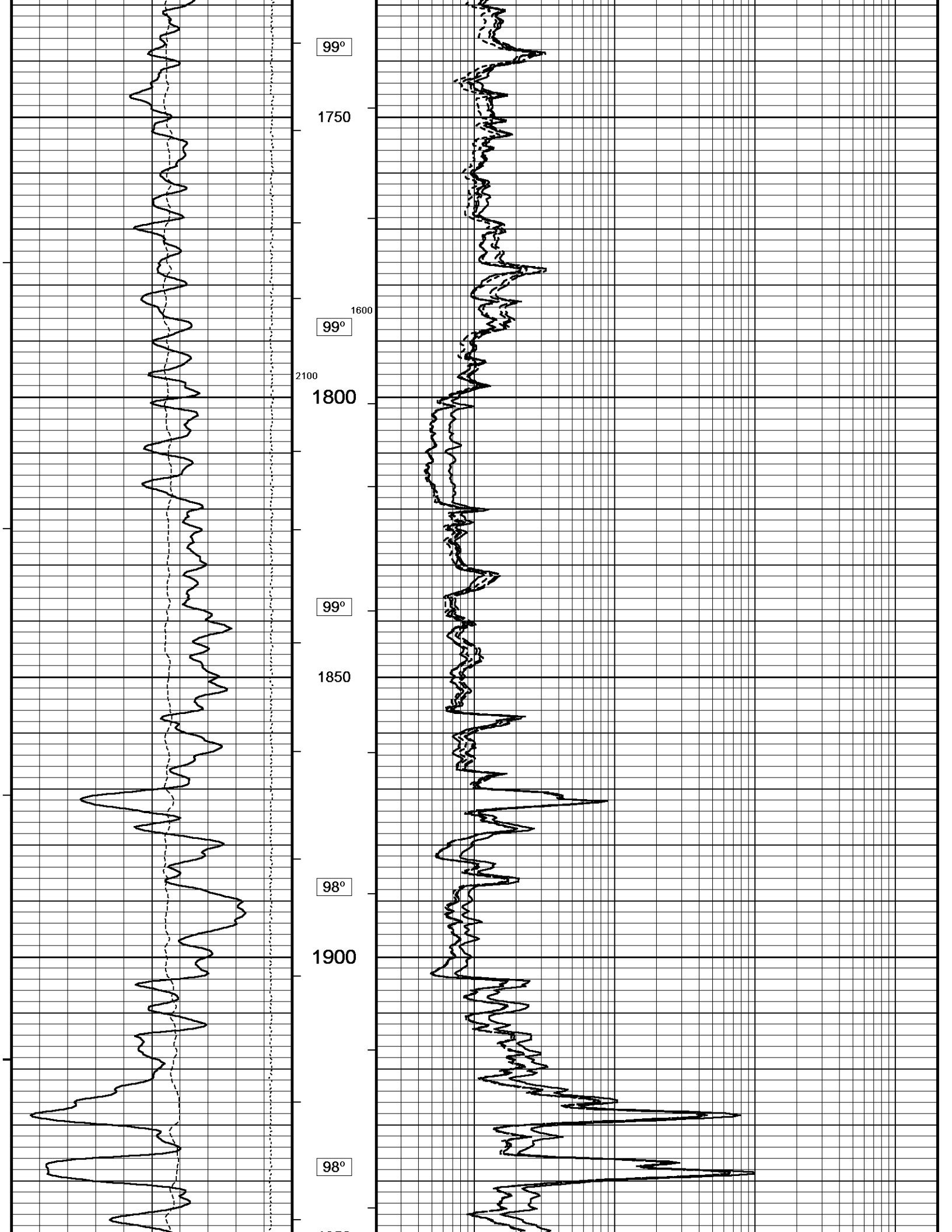
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-JUL-2013 09:29
Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_003.dta
Recorded on 25-JUL-2013 06:42
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

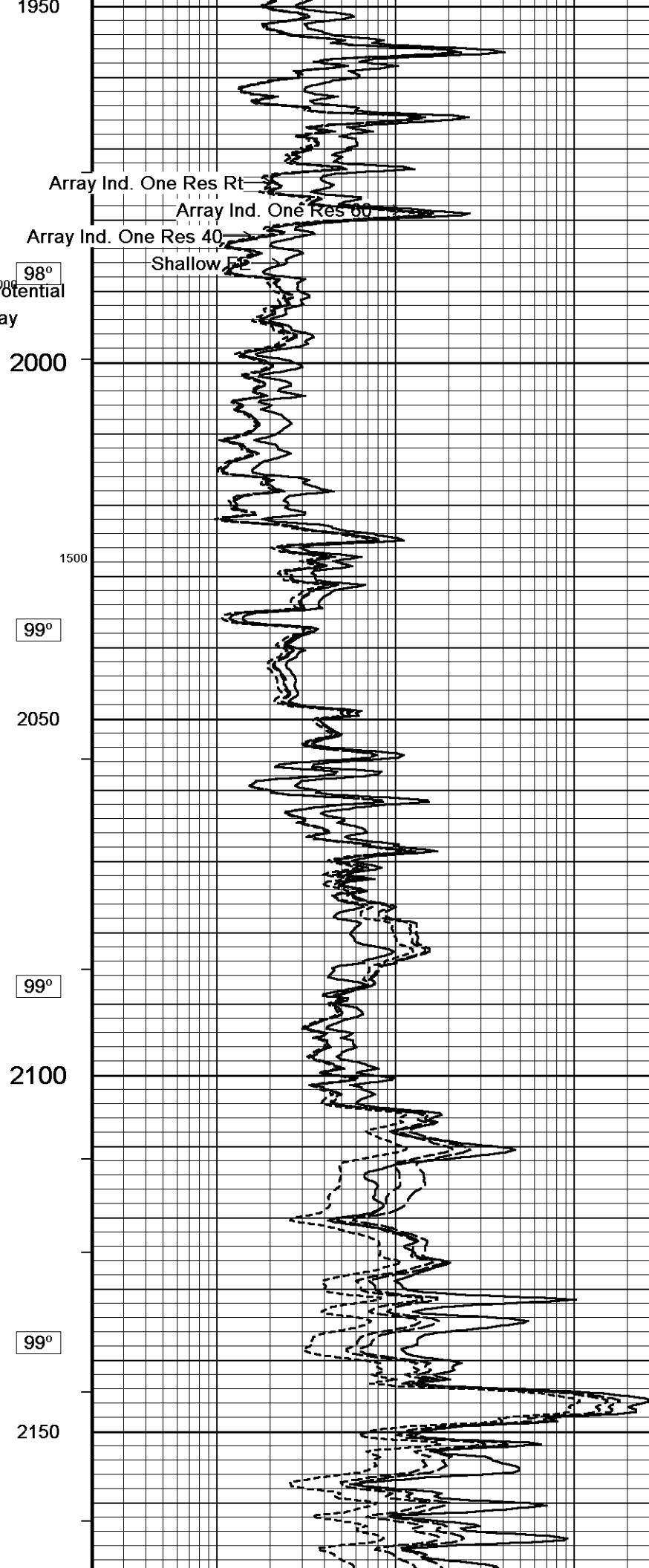
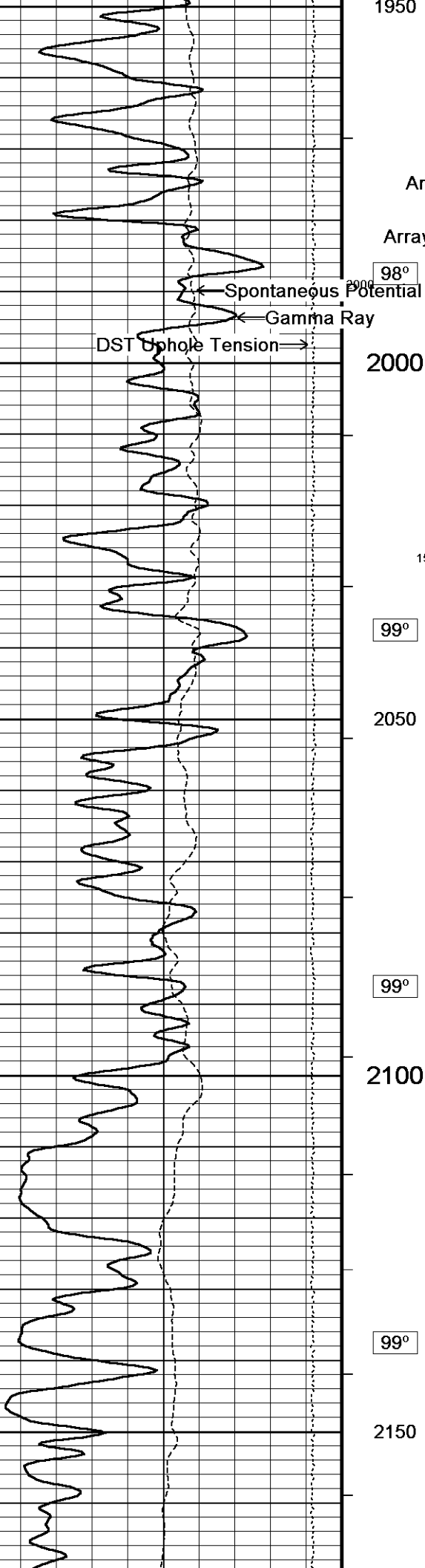
2 INCH MAIN

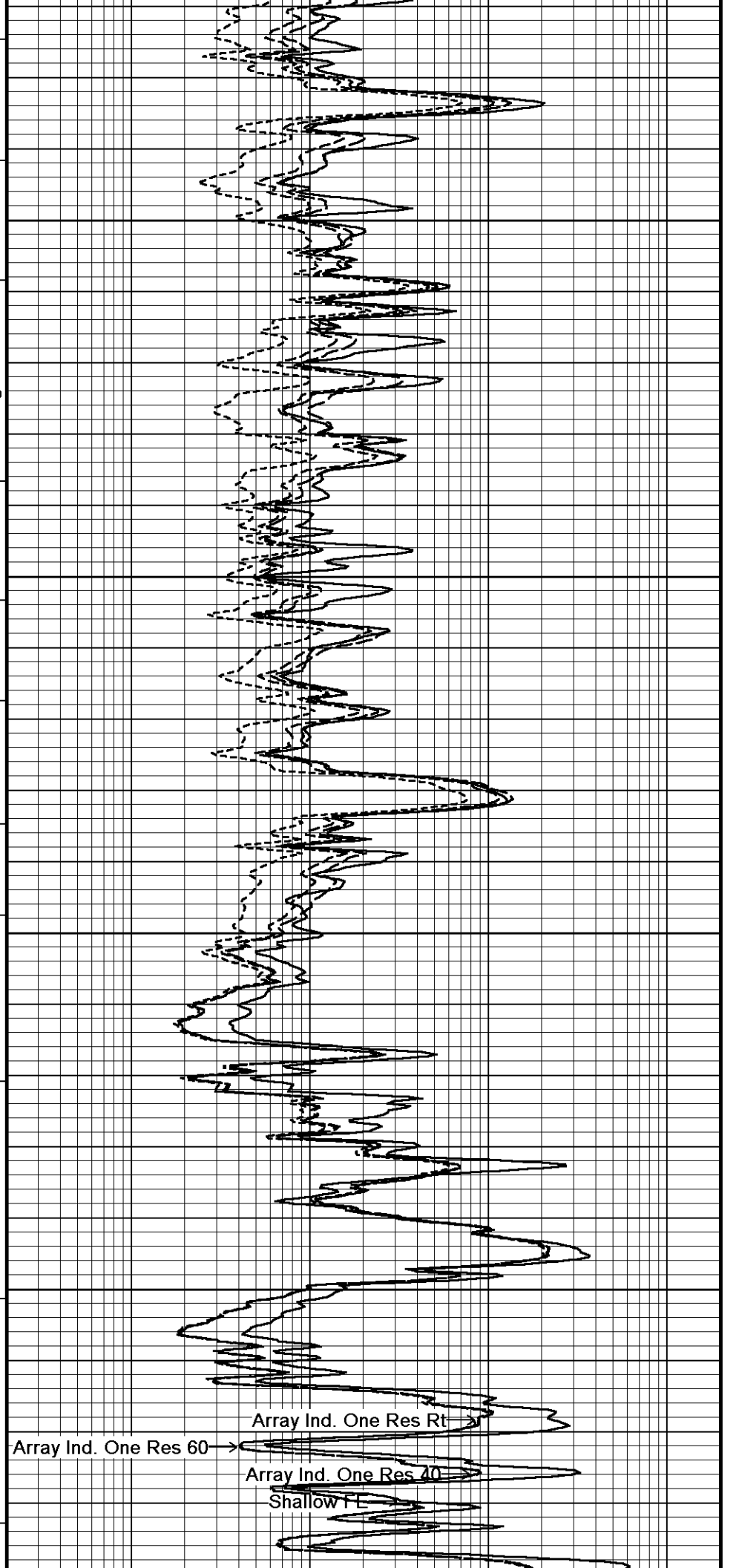
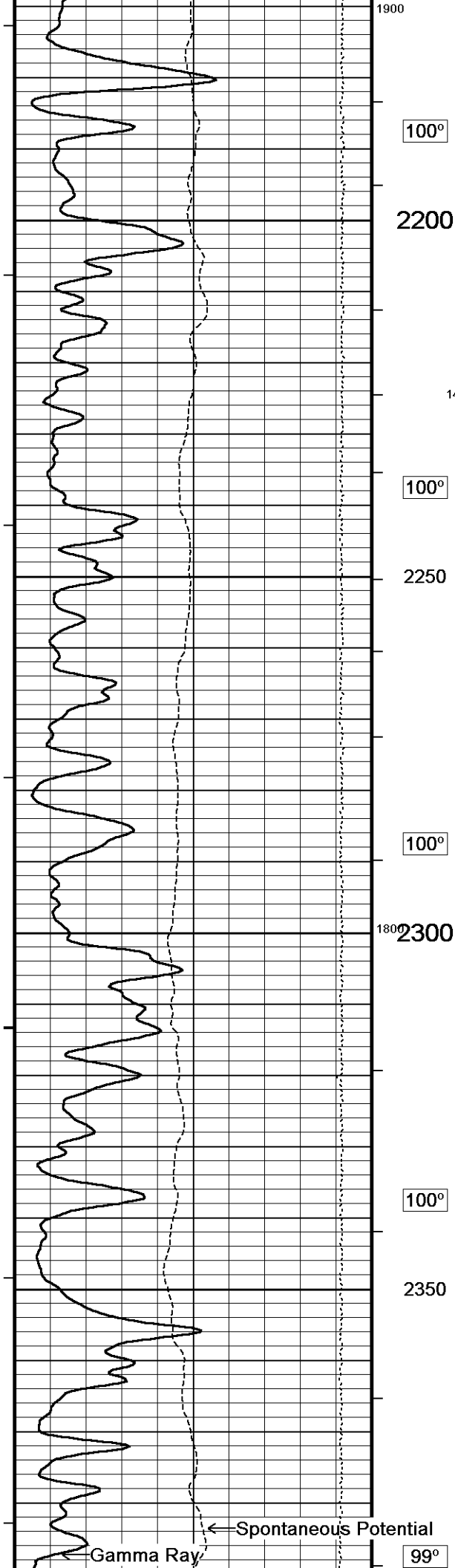
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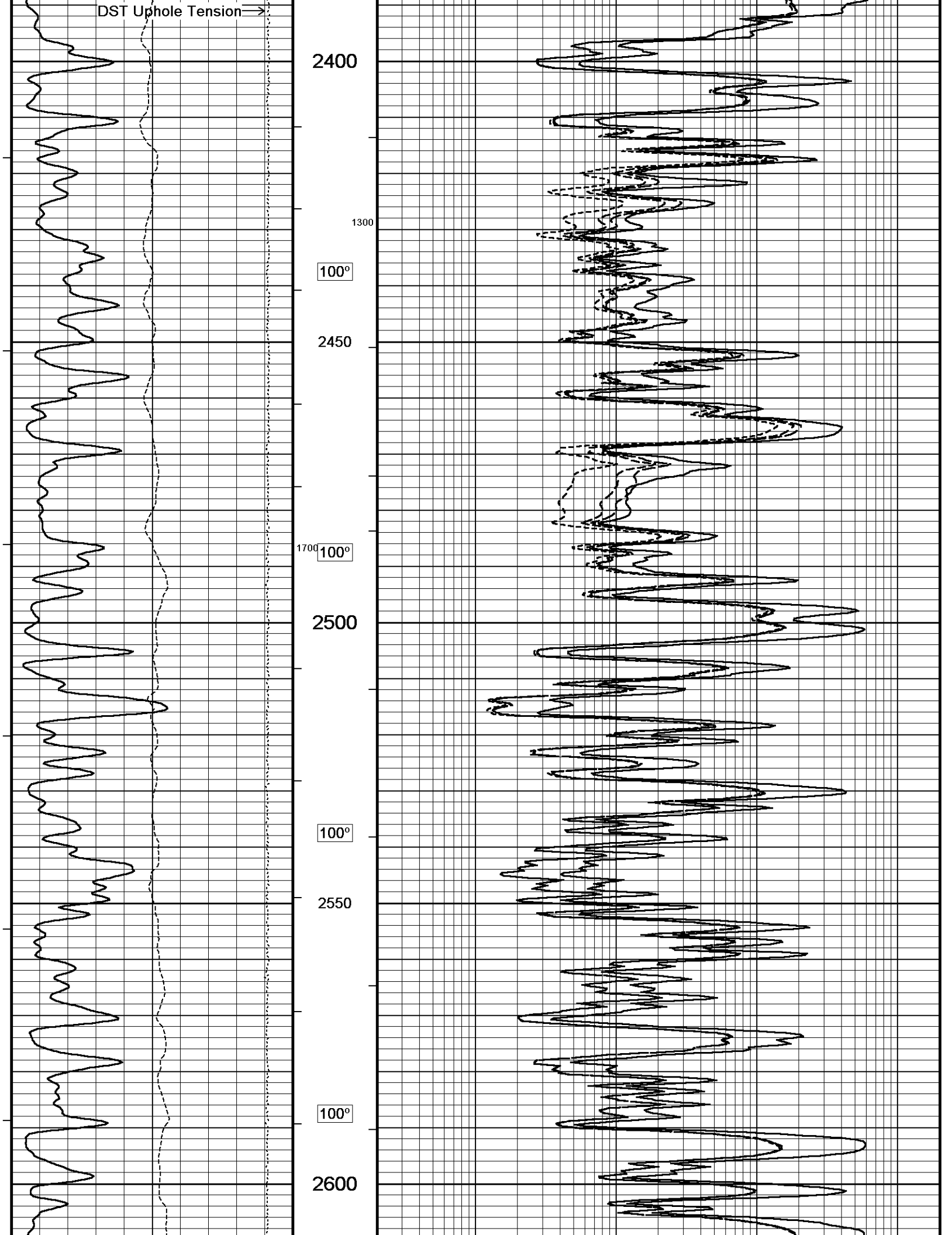


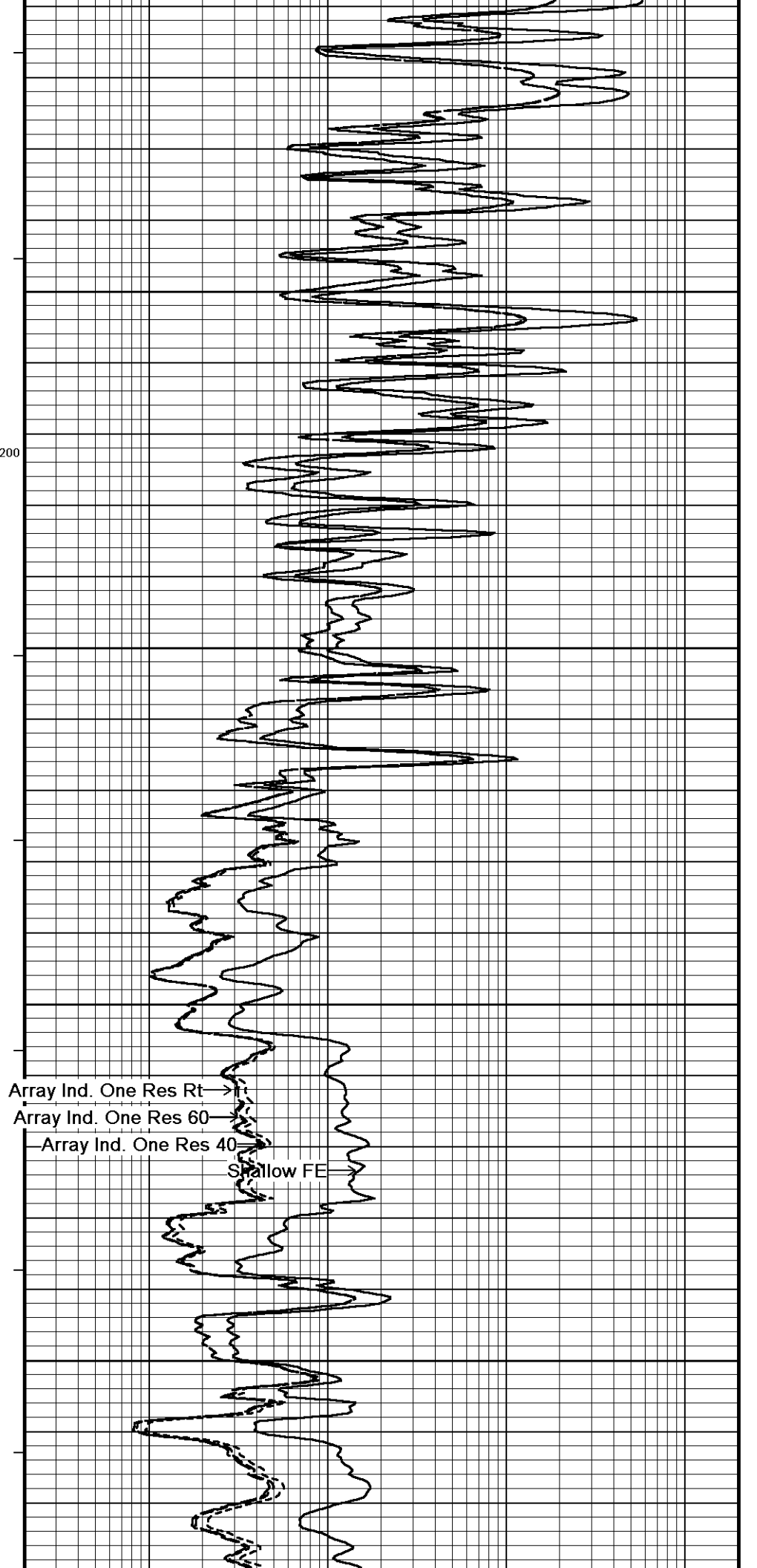
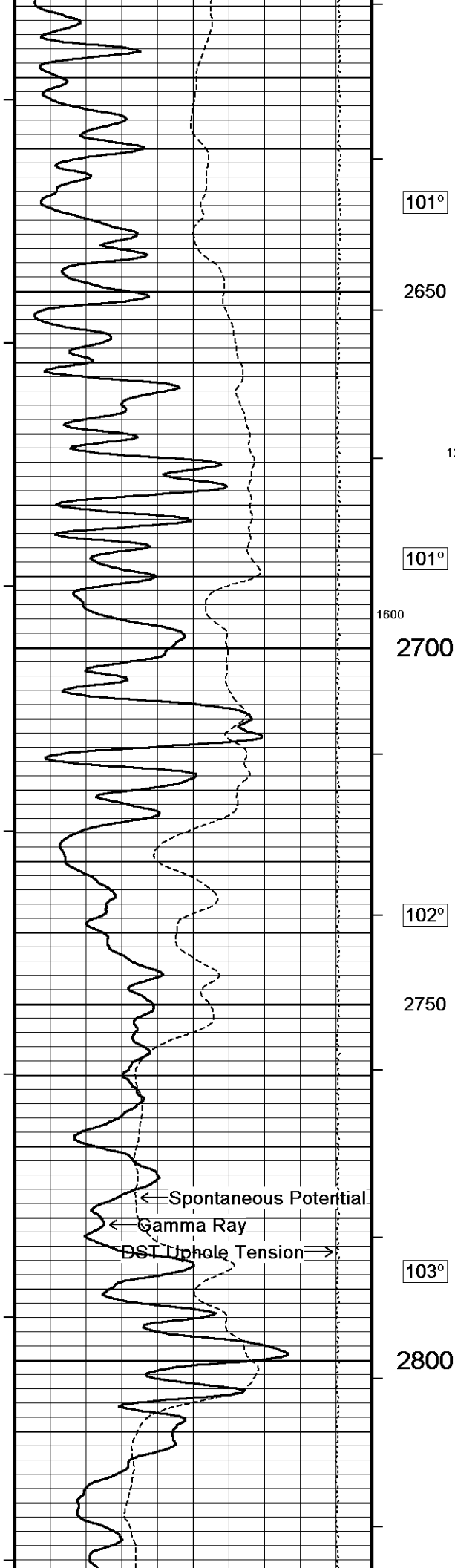


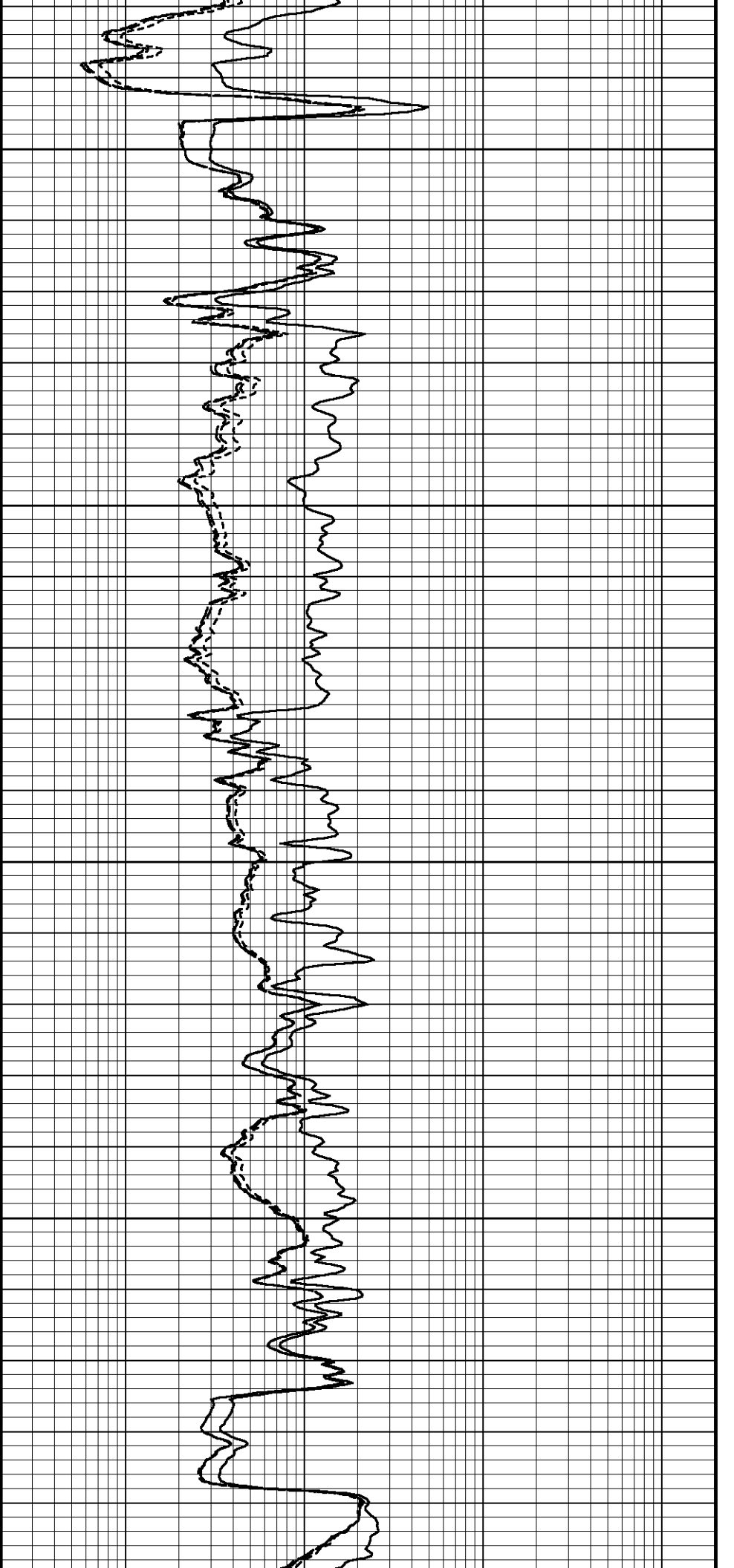
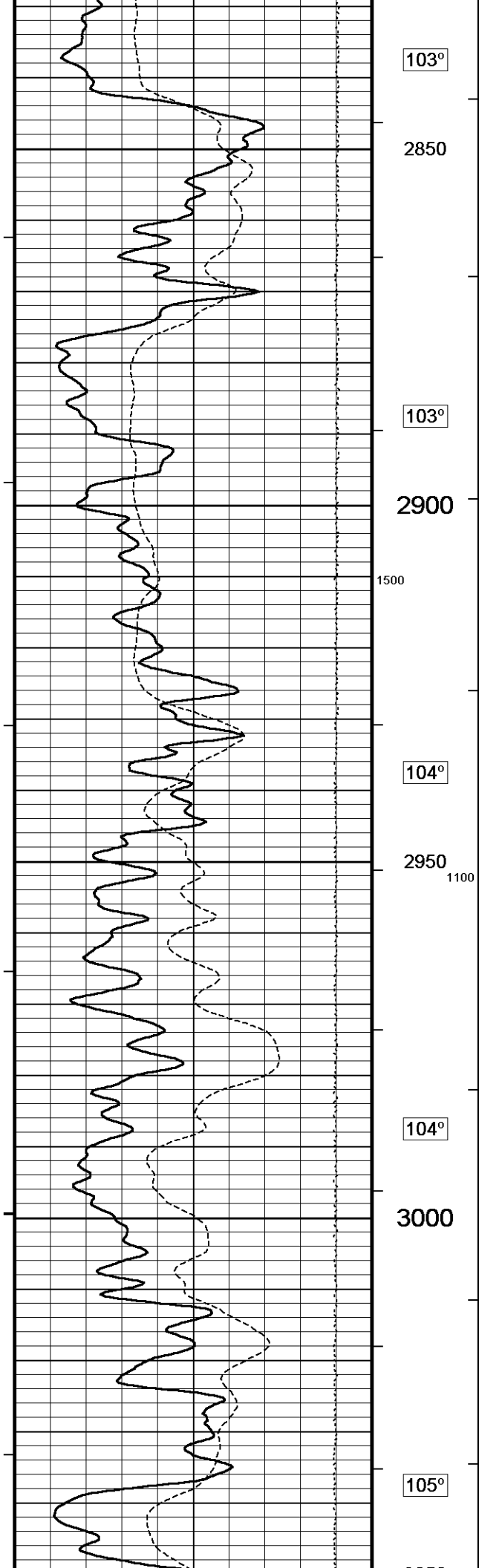


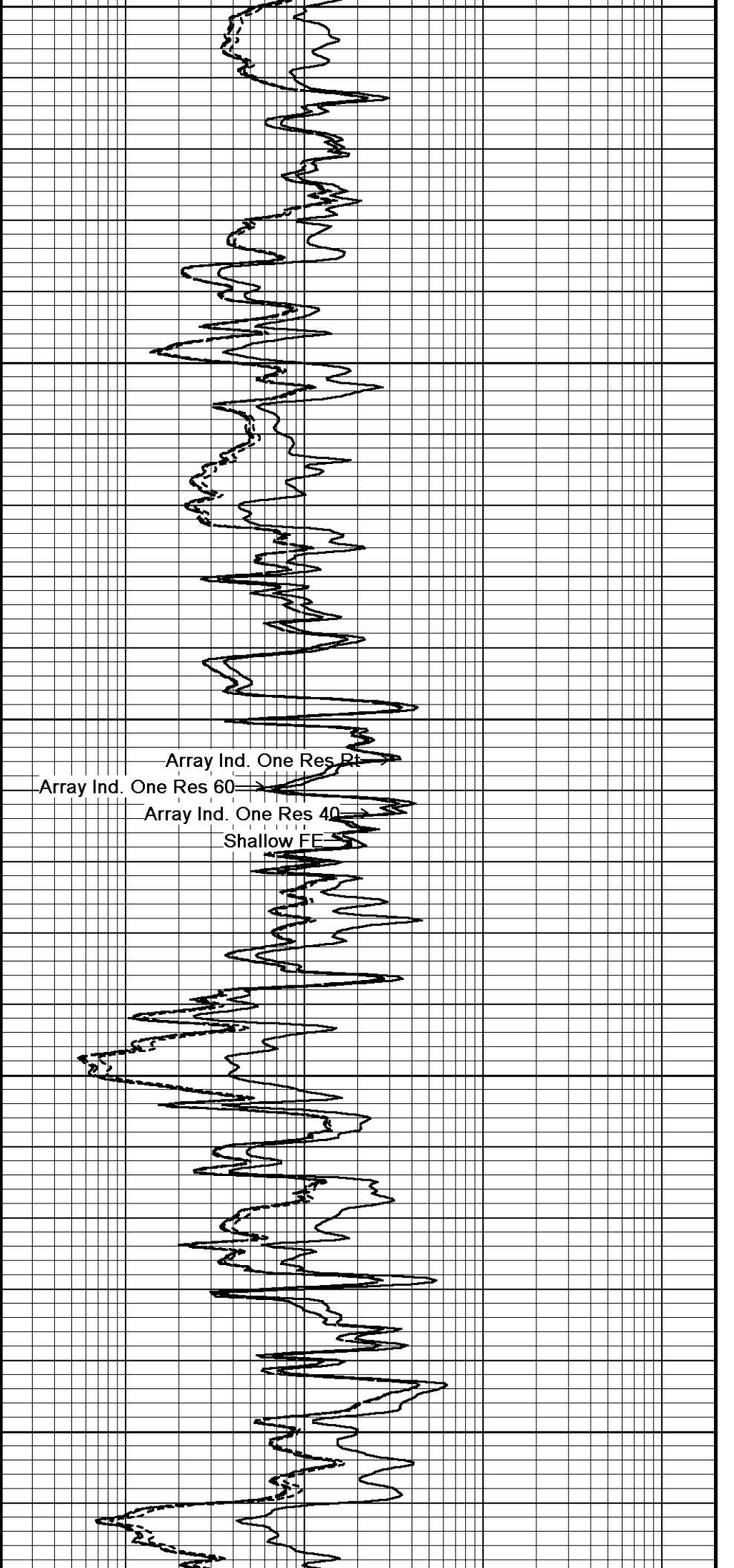
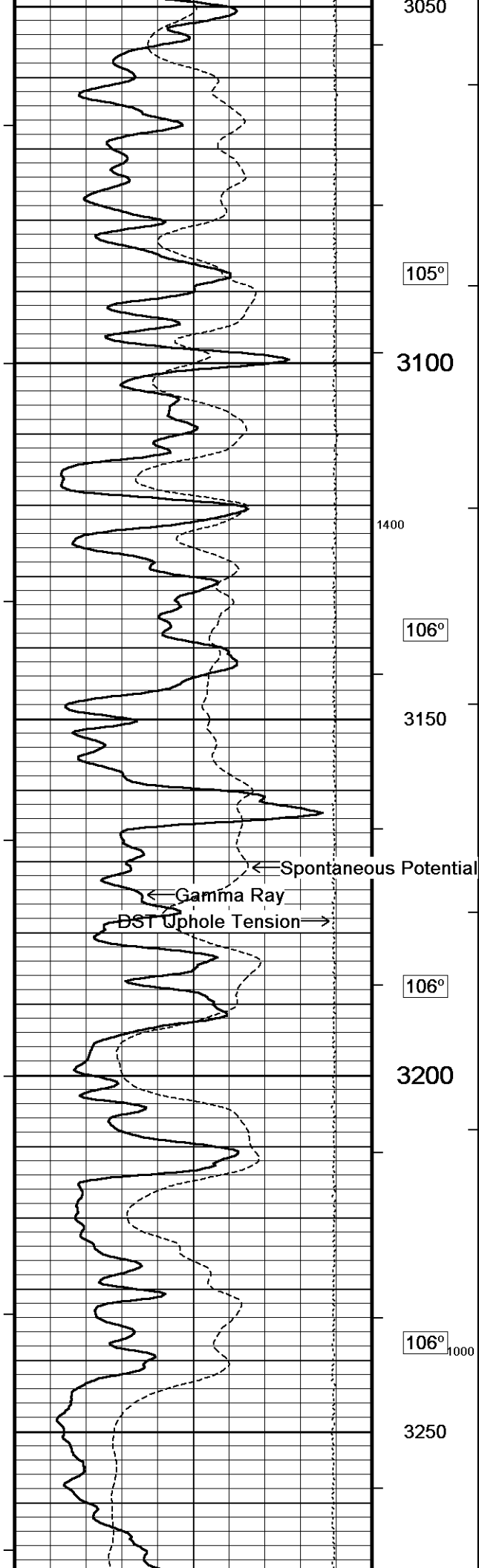


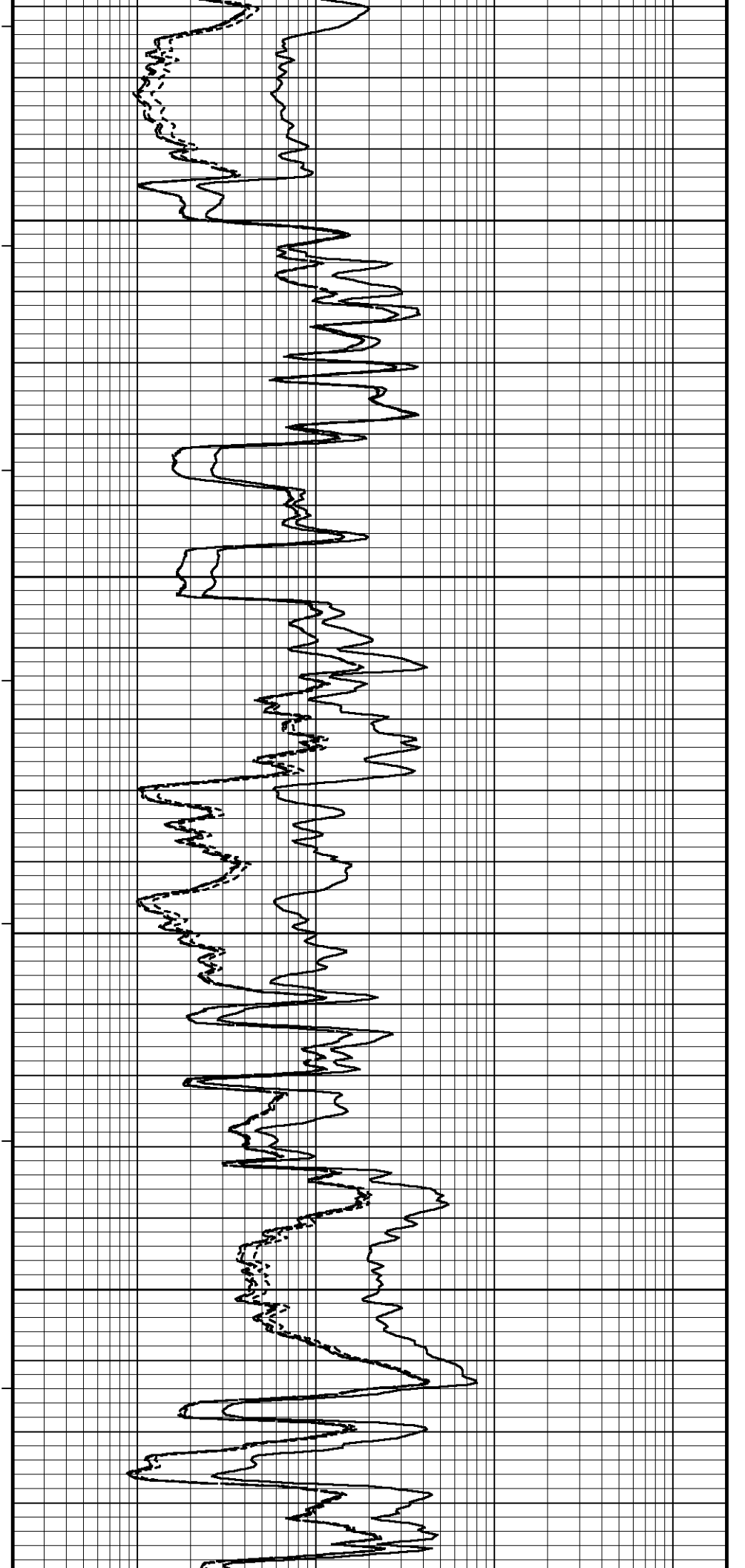
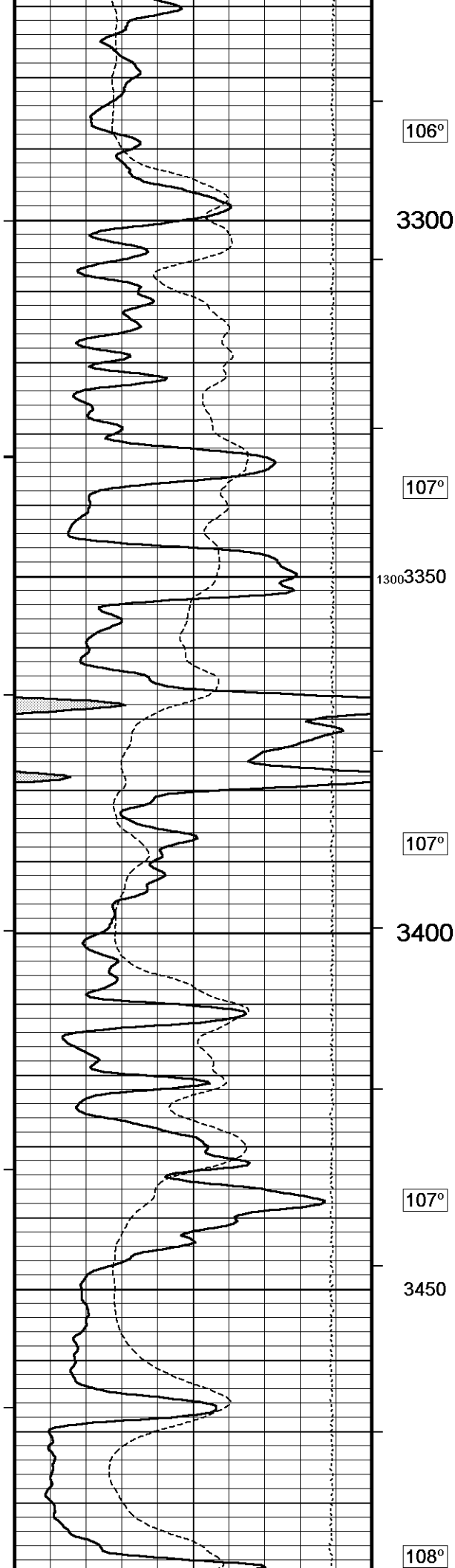


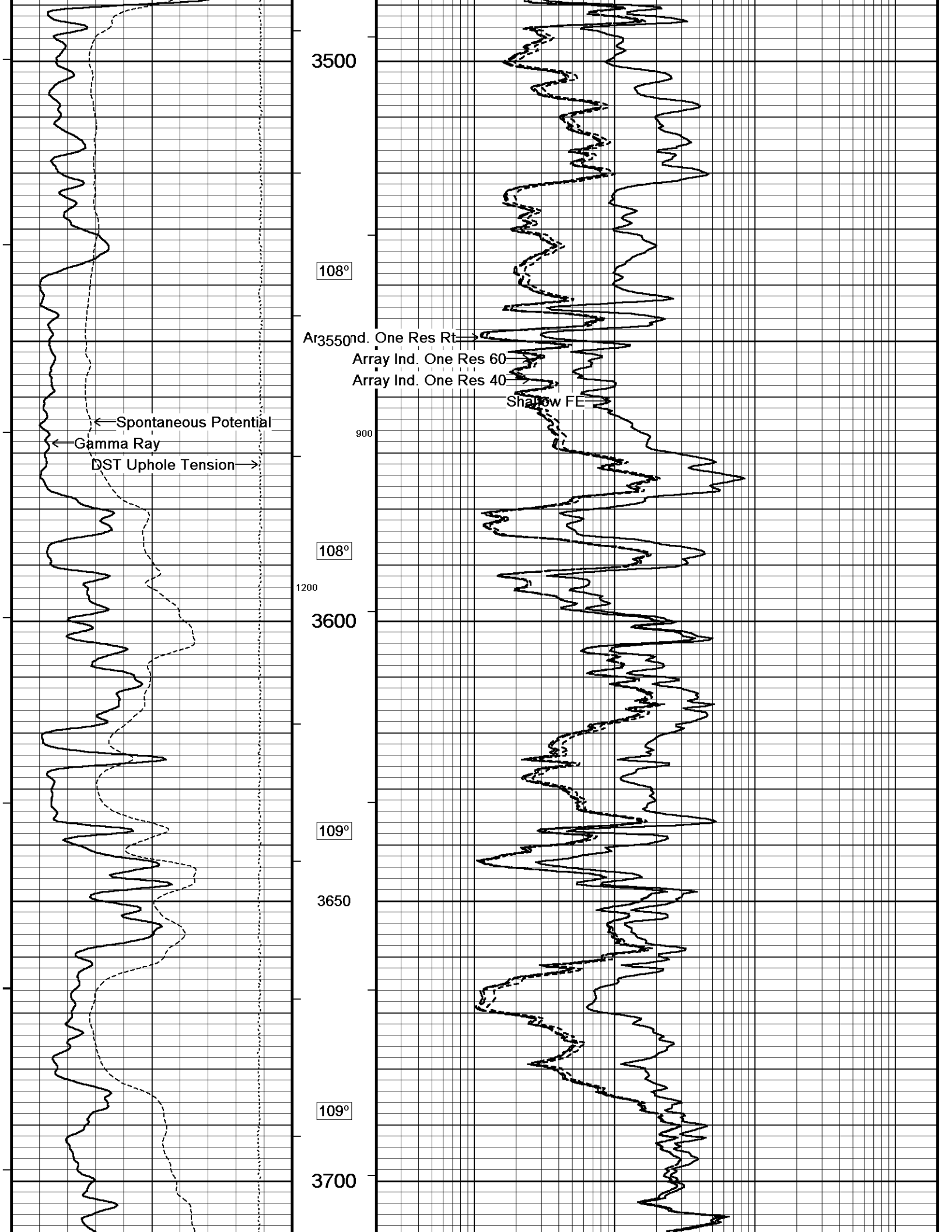


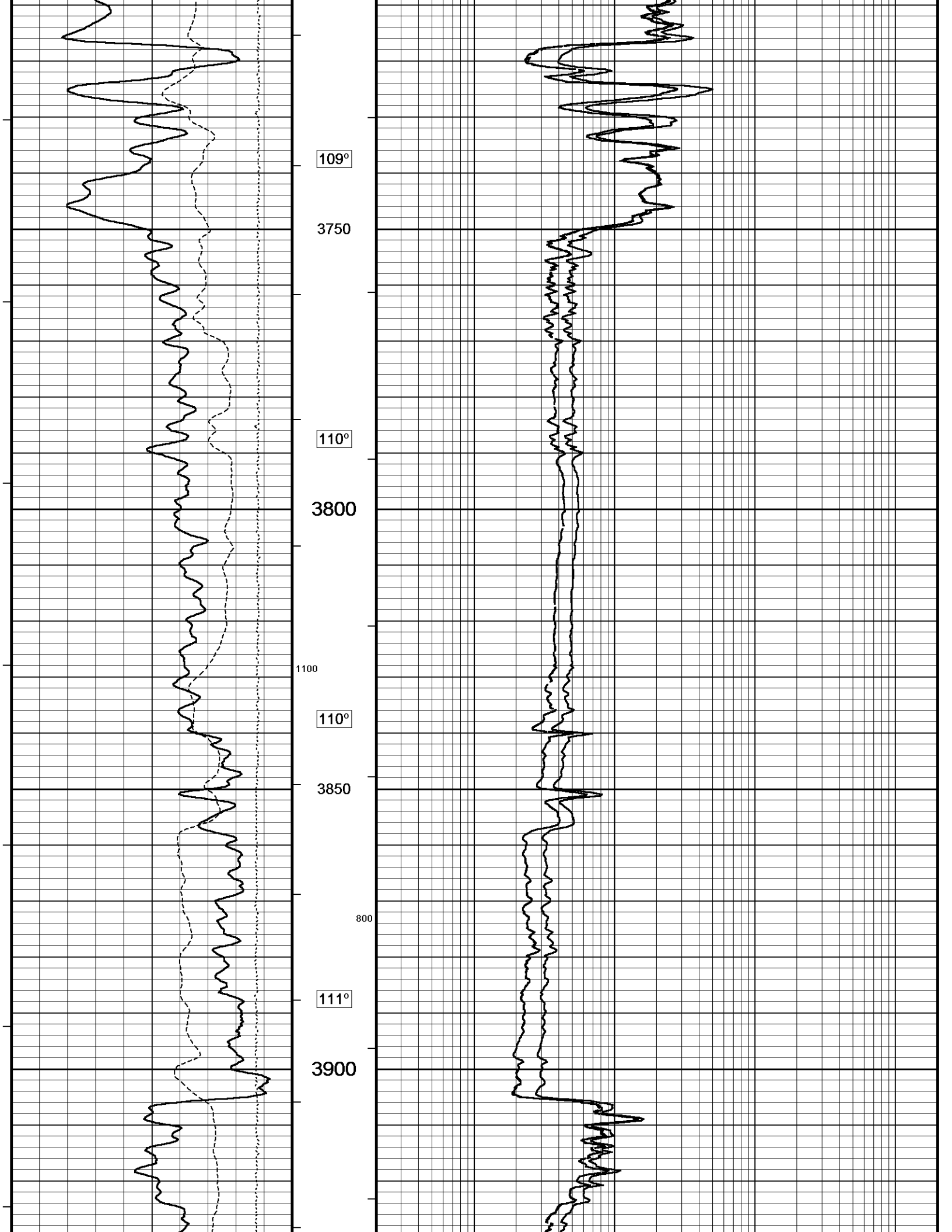


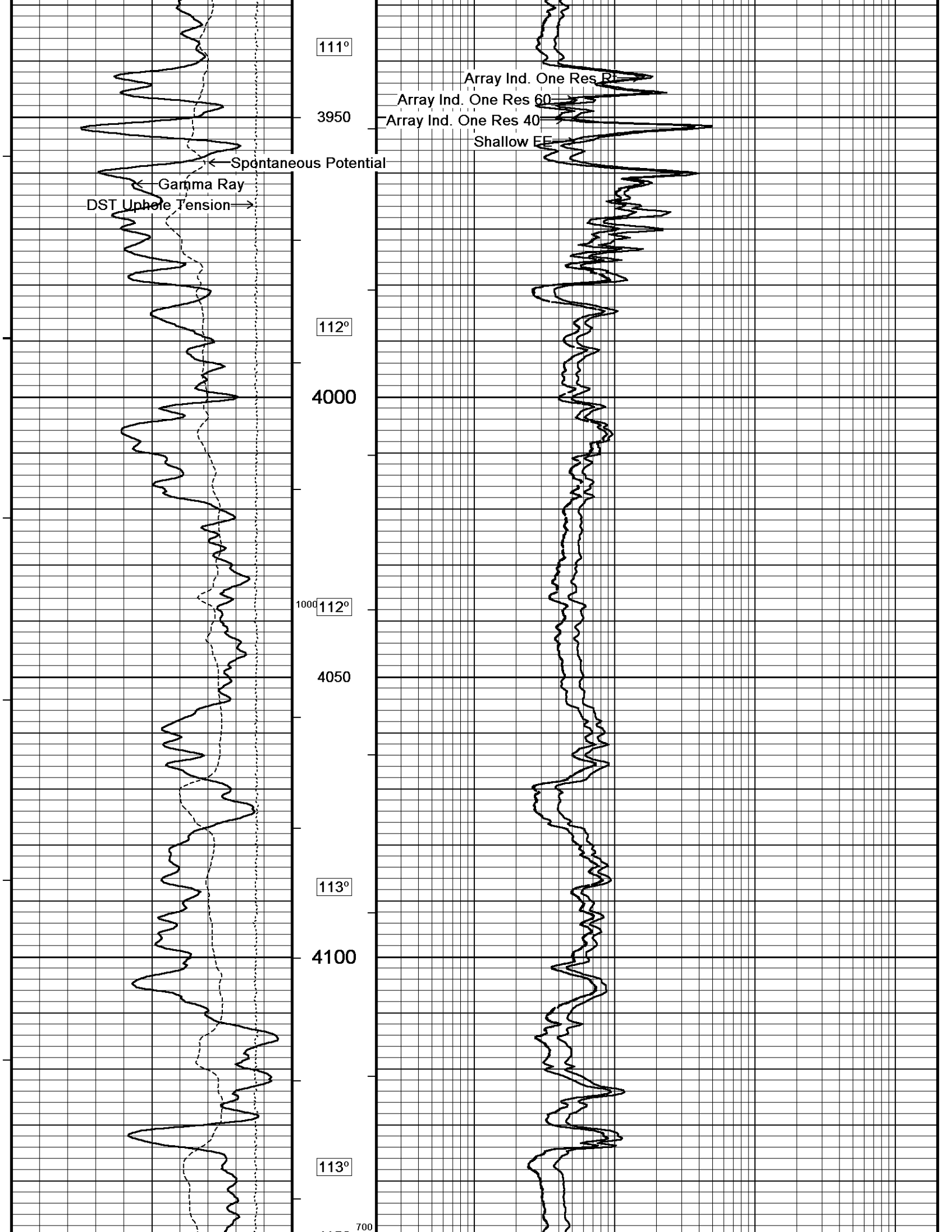


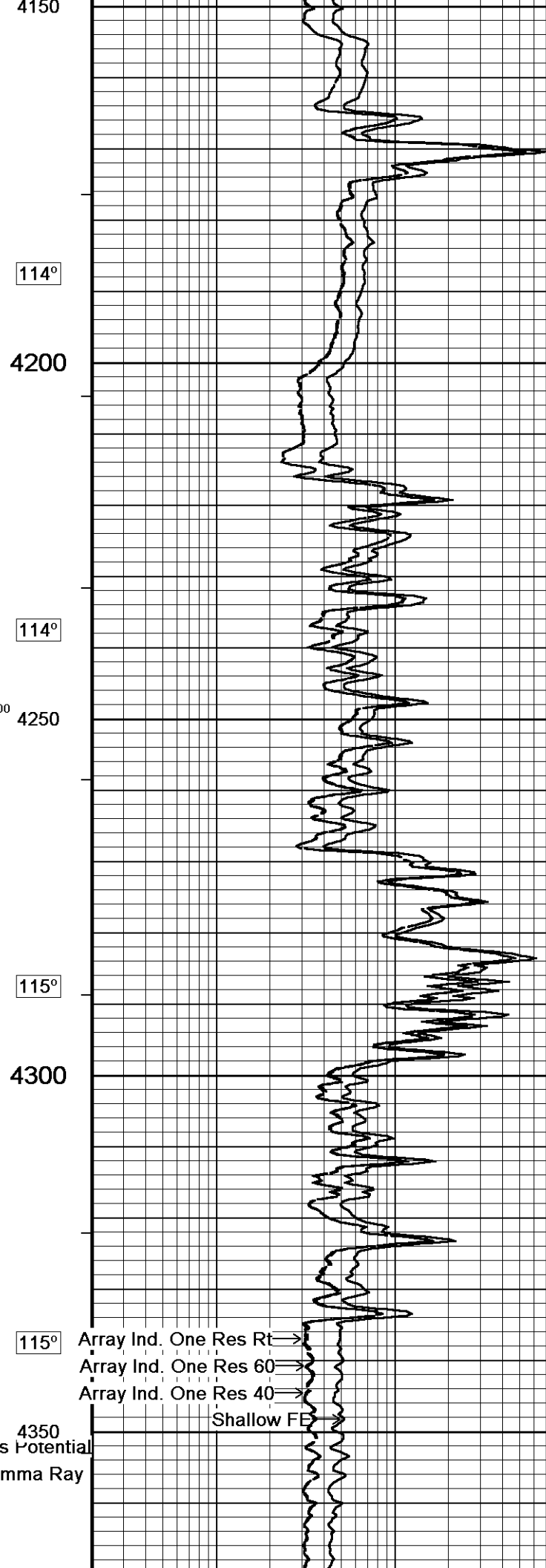
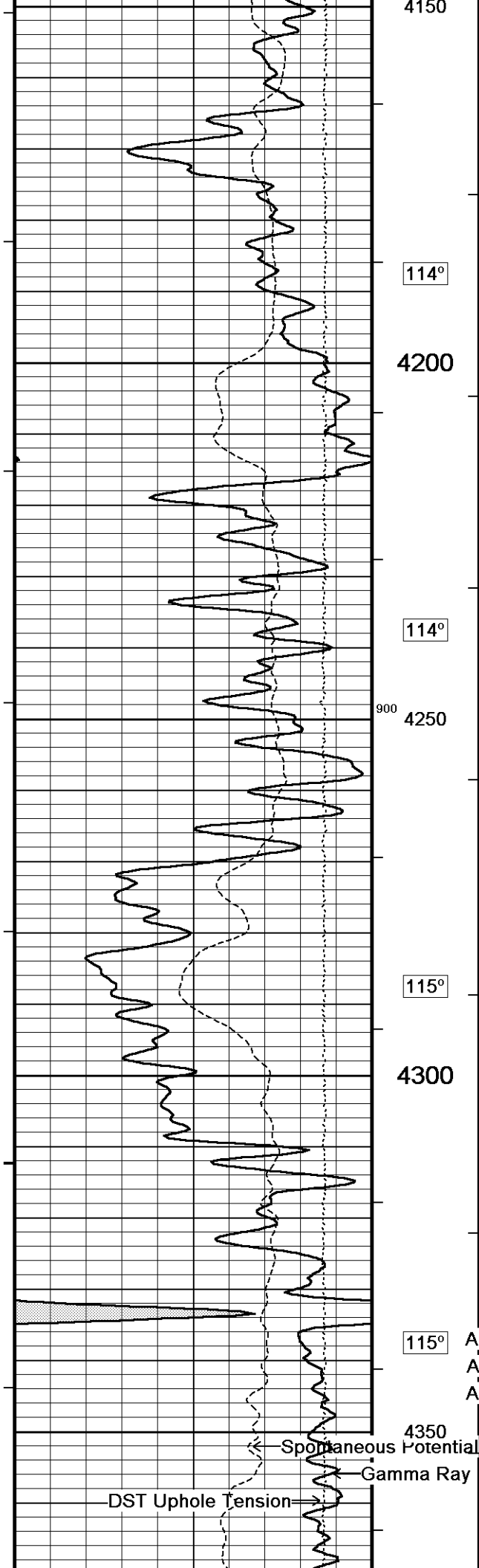






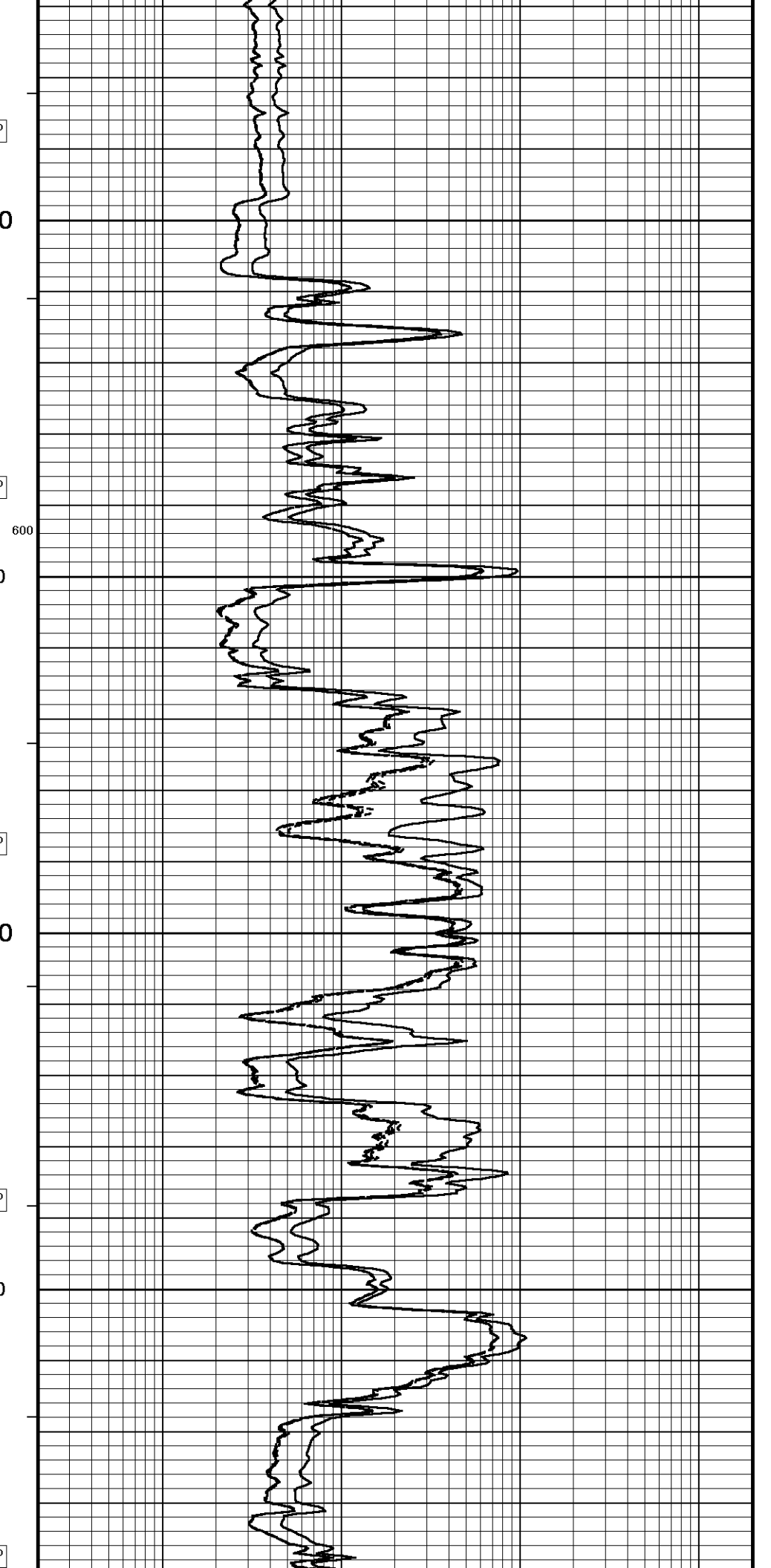
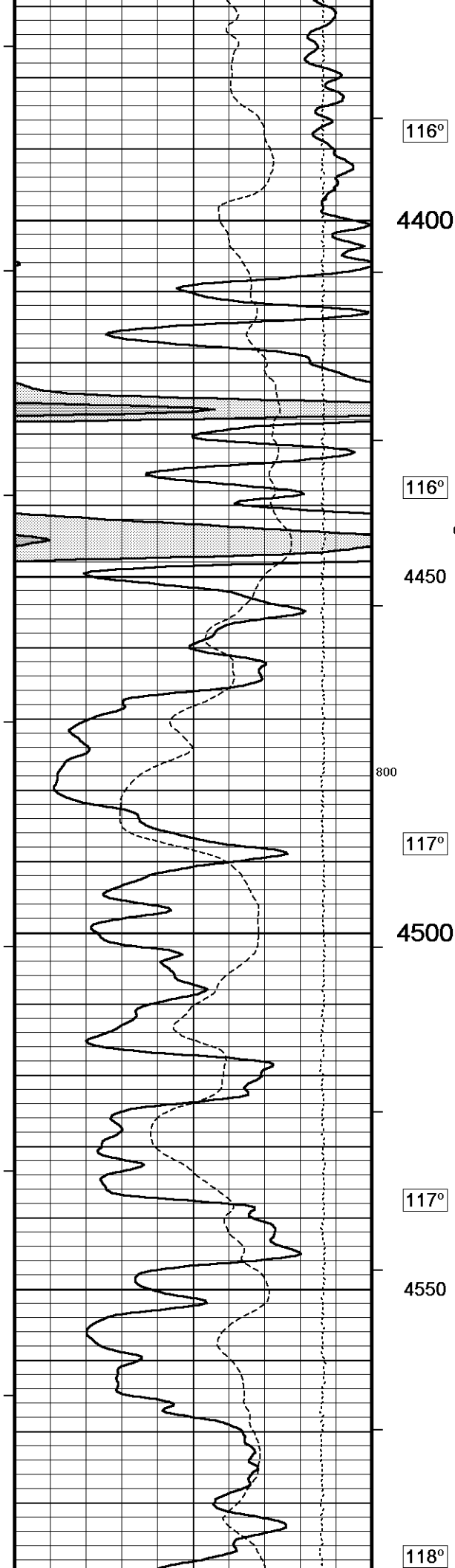


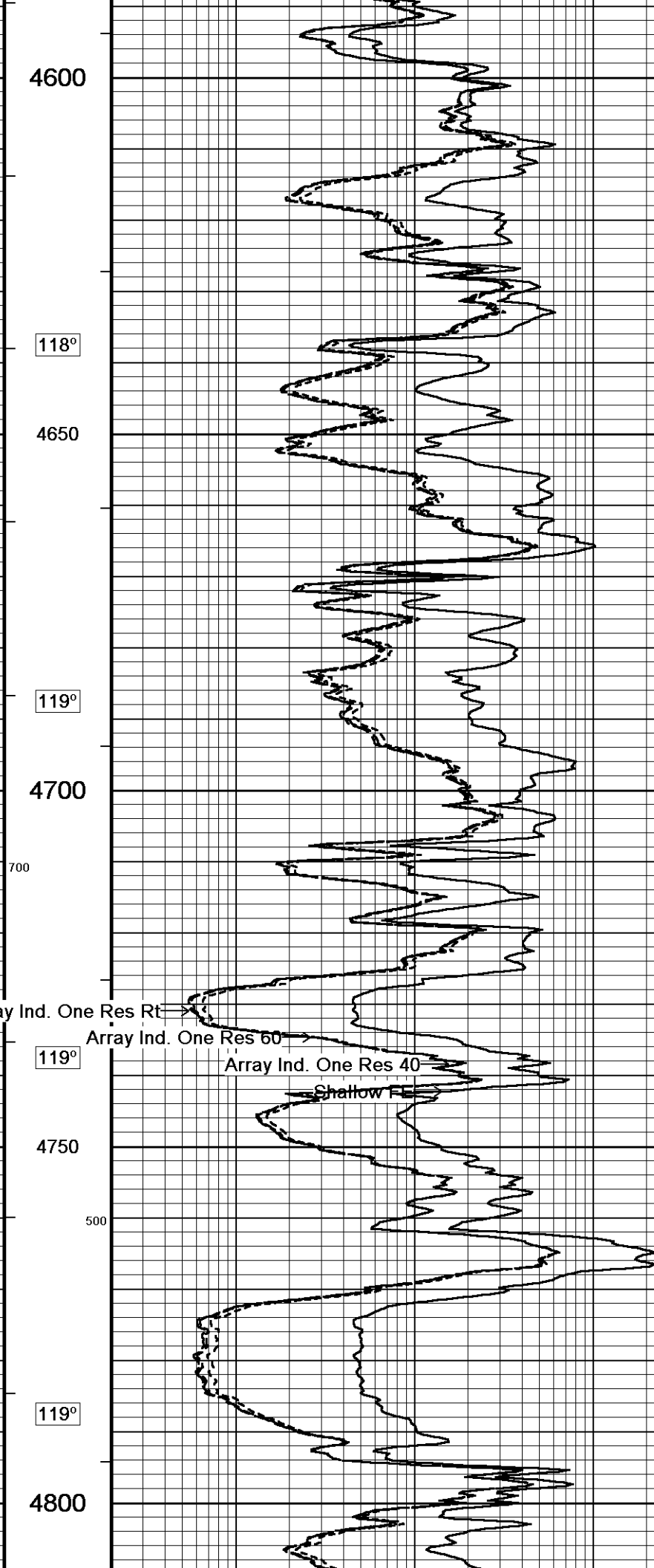
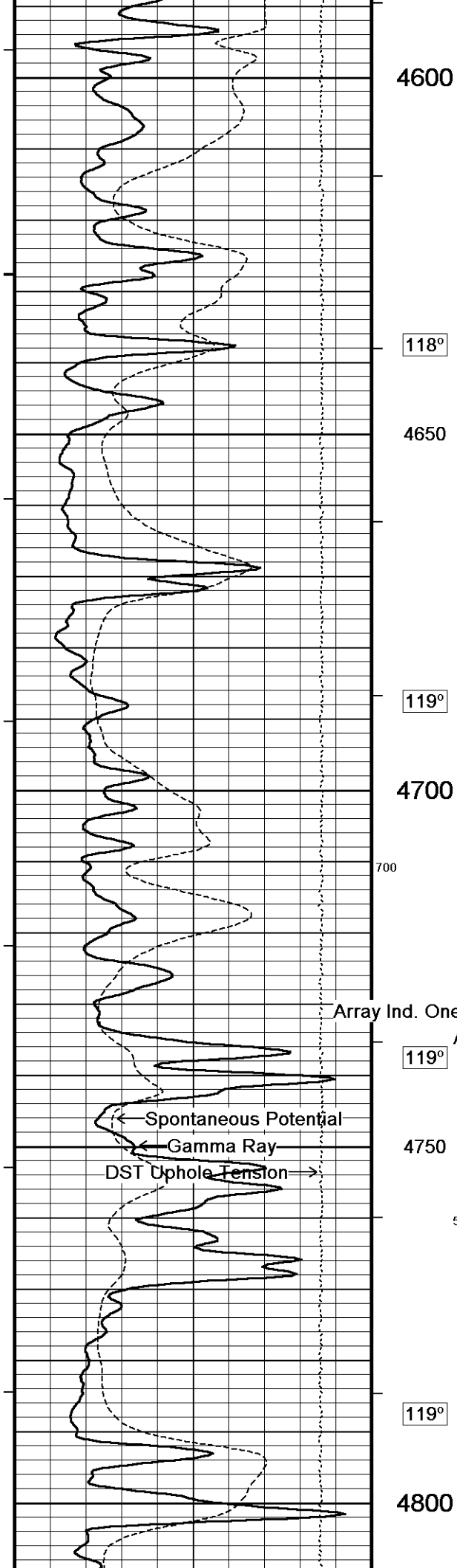


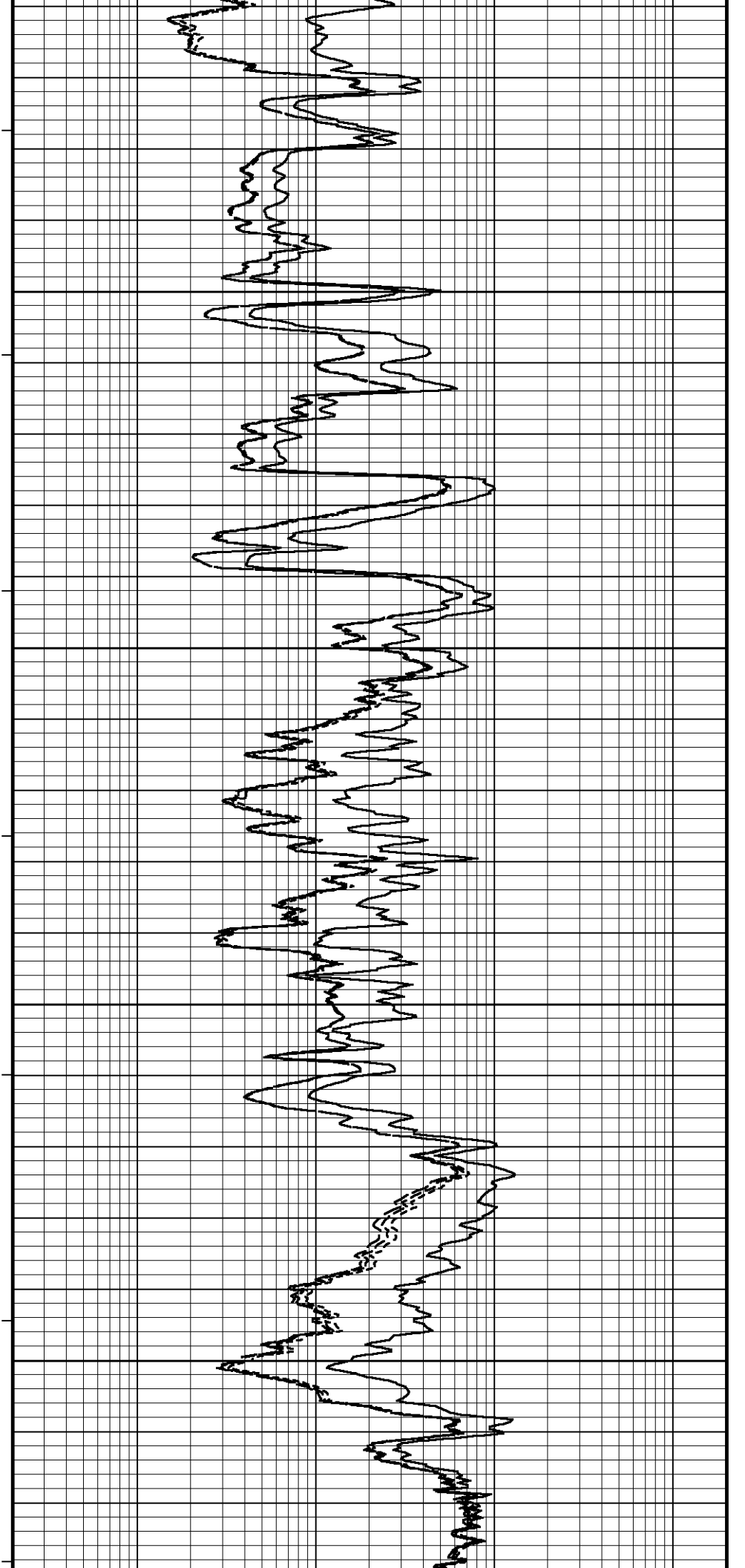
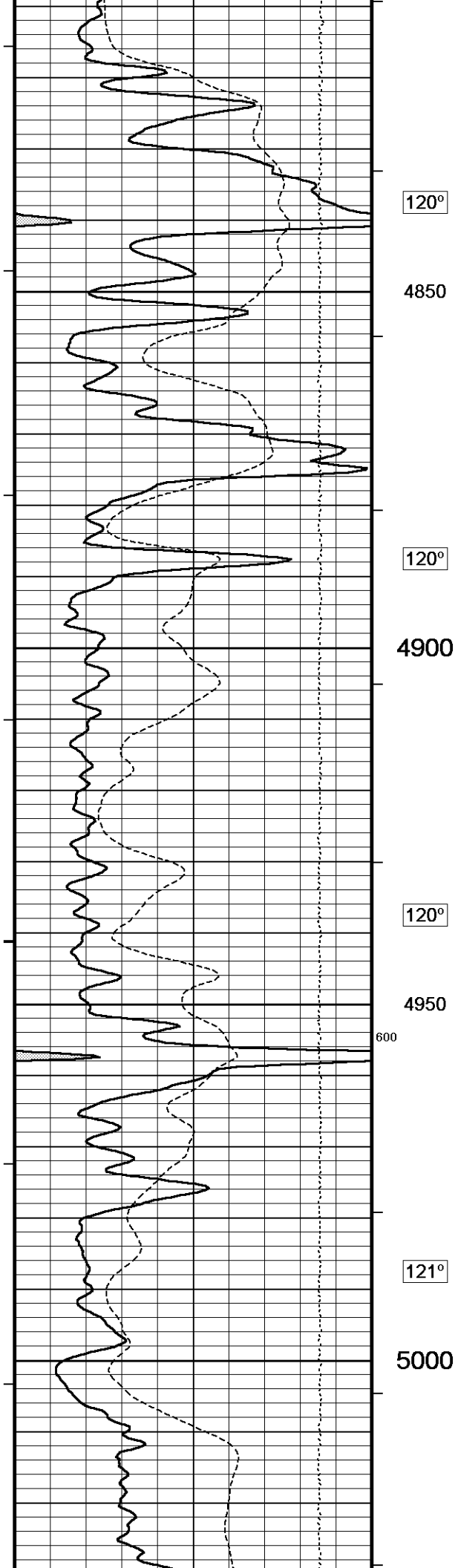


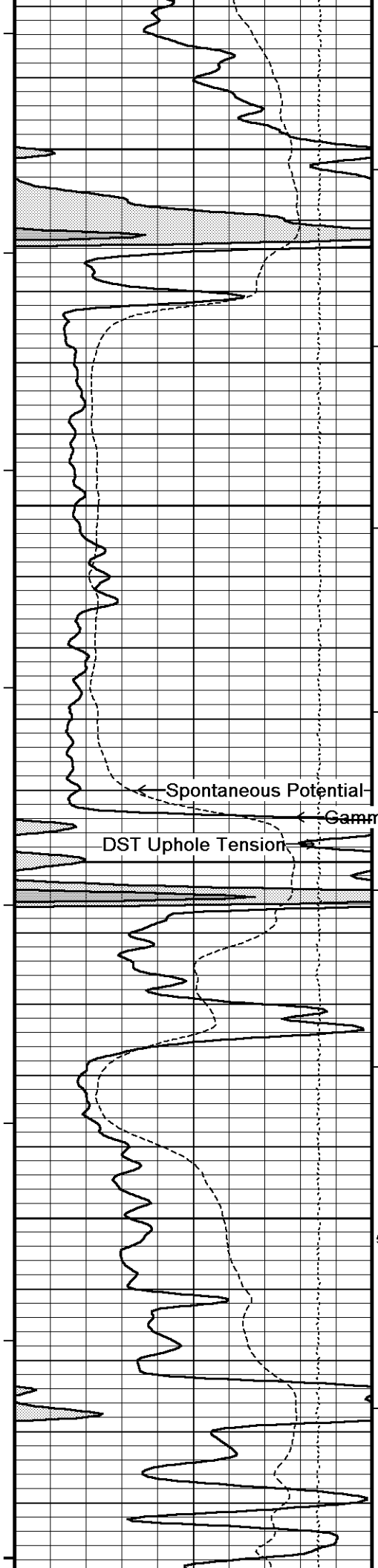
115° Array Ind. One Res Rt
115° Array Ind. One Res 60
115° Array Ind. One Res 40
Shallow FE

4350 Spontaneous Potential
Gamma Ray
DST Uphole Tension









121°

5050

122°

5100

122°

5150

122°

5200

123°

500

Spontaneous Potential

Gamma Ray

DST Uphole Tension

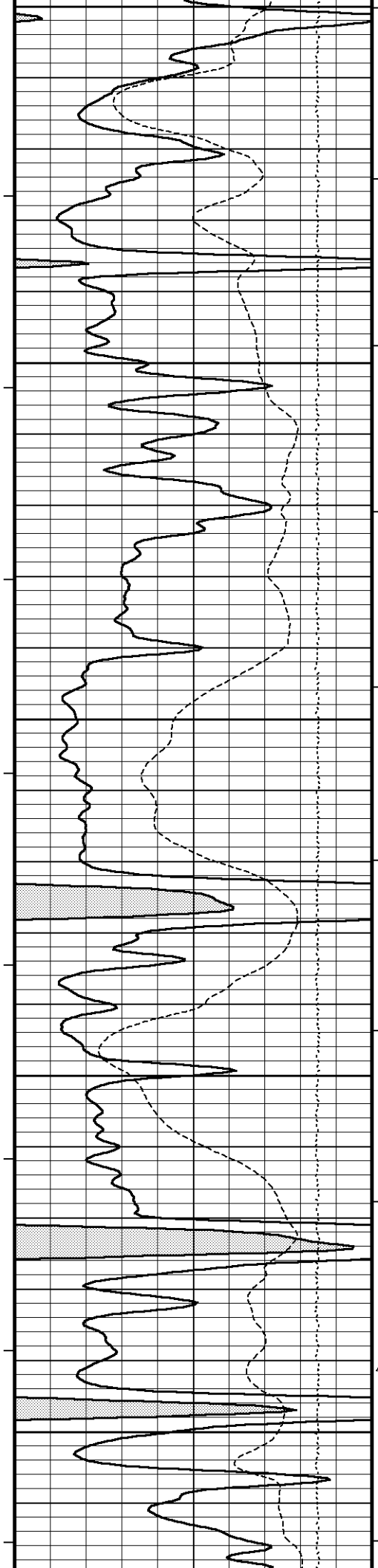
Array Ind. One Res Rt

Array Ind. One Res 60

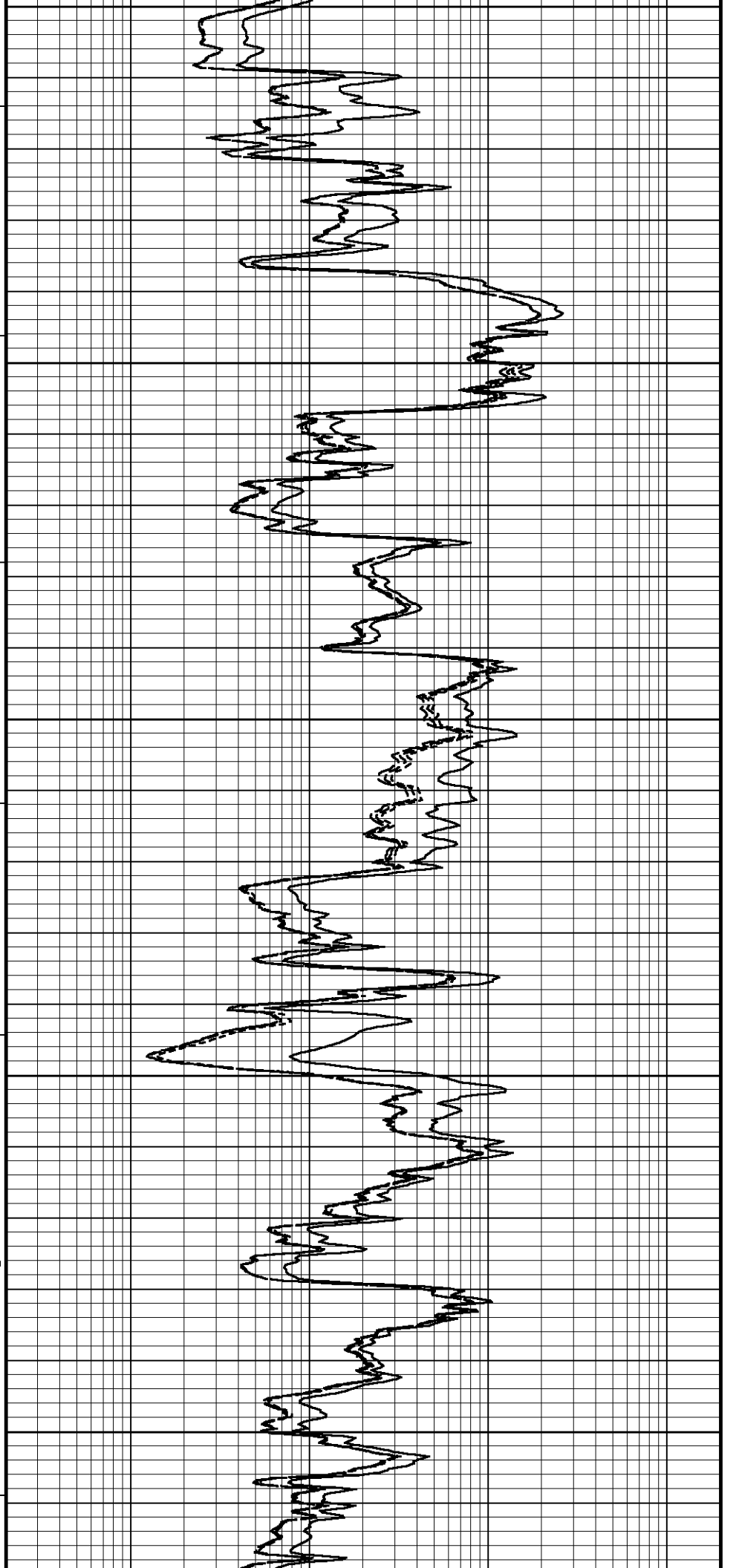
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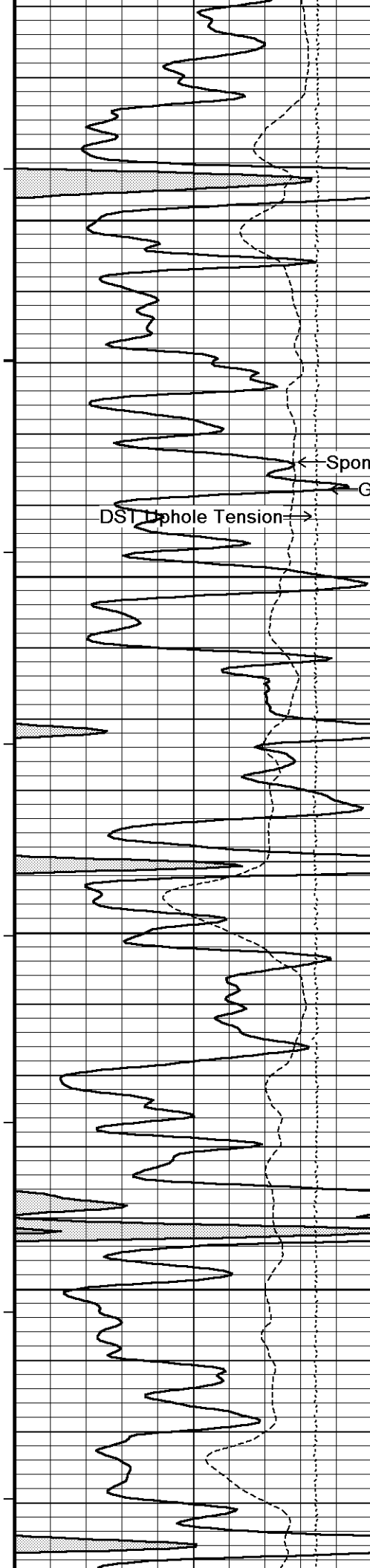
Shallow FE

400



5250
123°
5300
123°
5350
124°
5400
300
124°
400
5450





125°

5500

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FL

Spontaneous Potential

Gamma Ray

DST Up-hole Tension

5550

125°

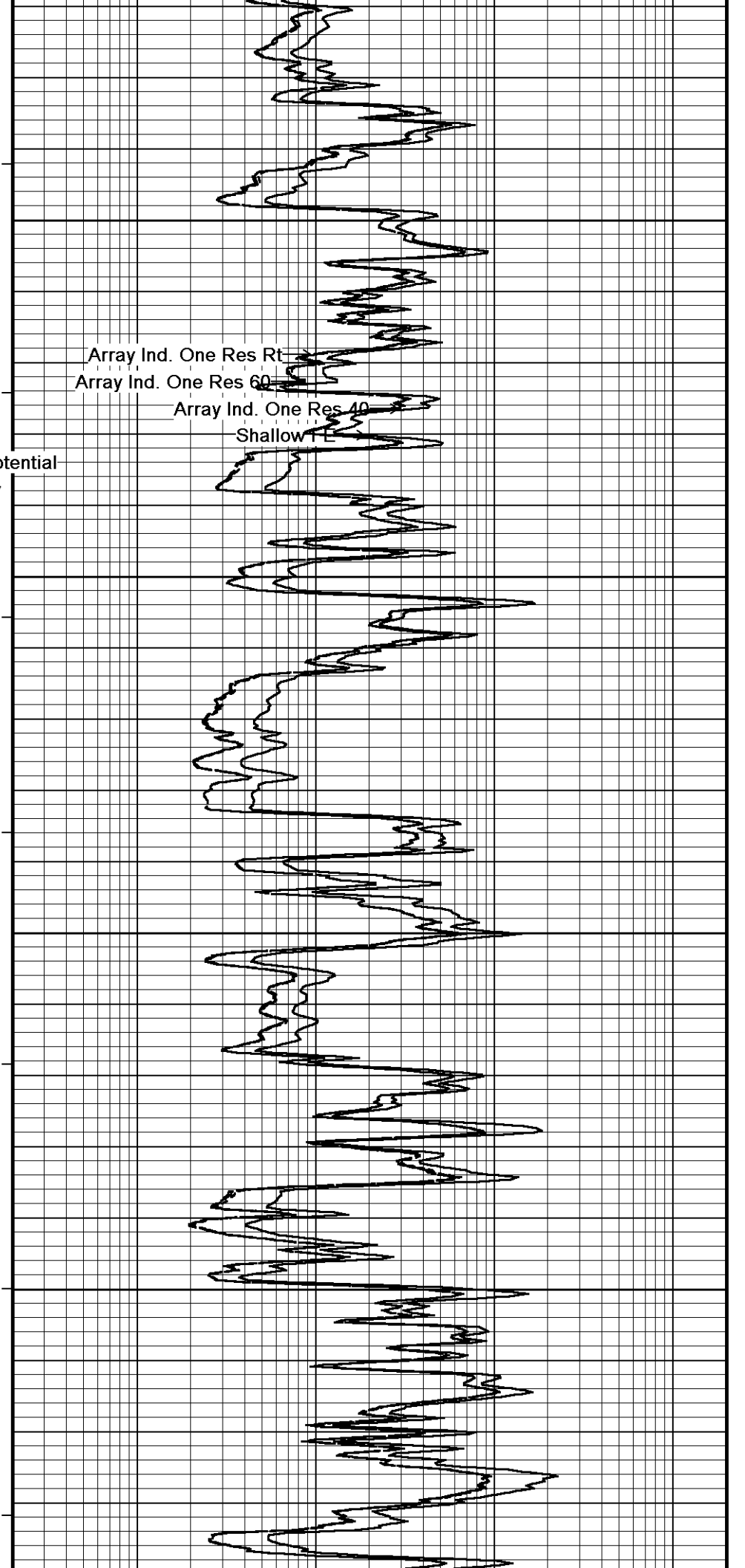
5600

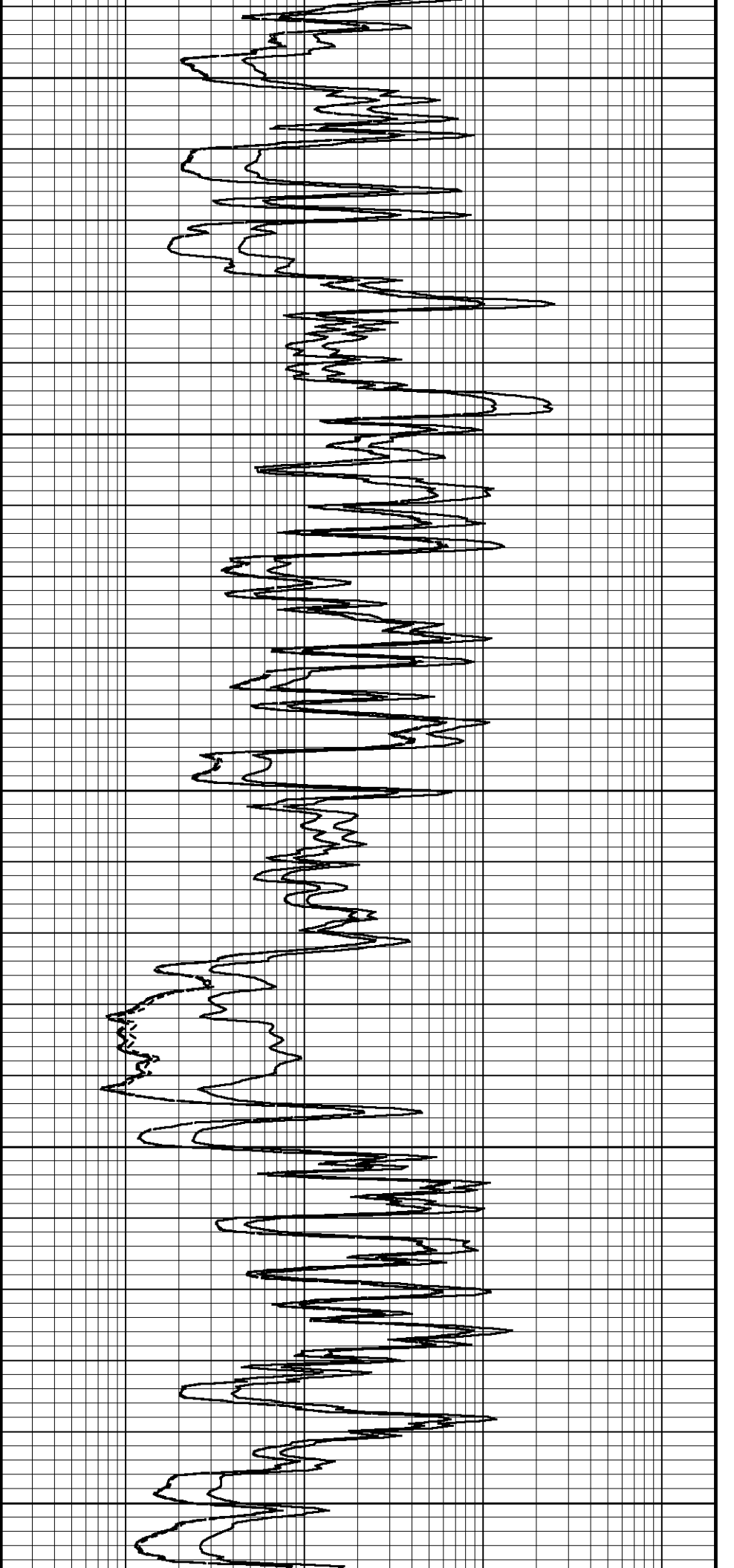
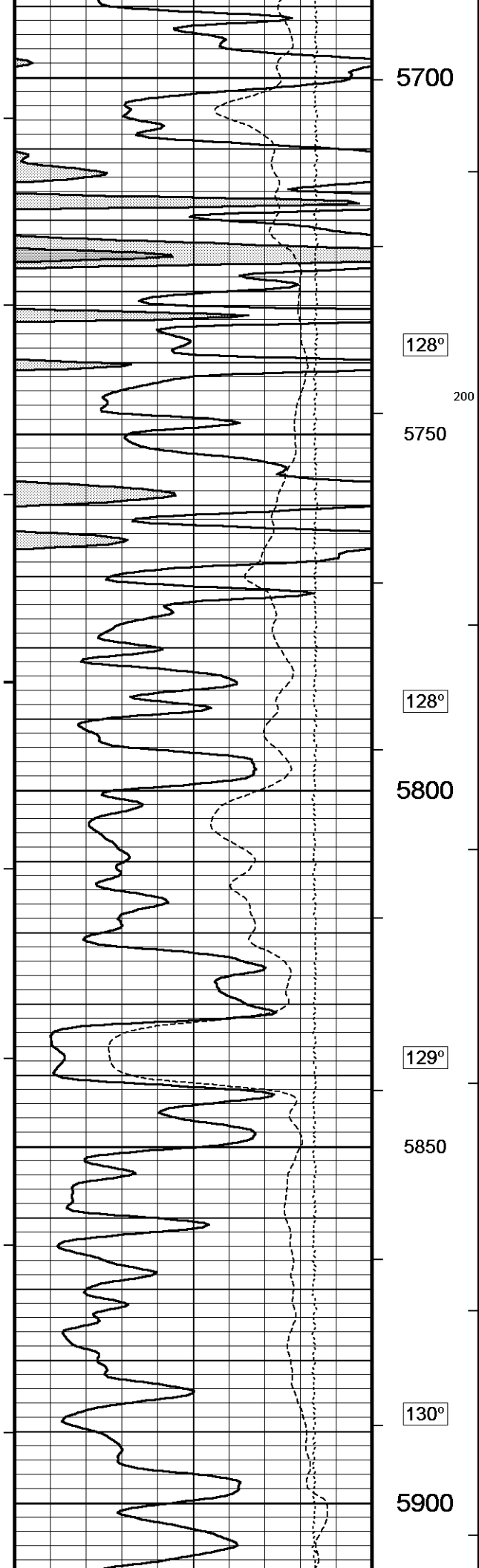
126°

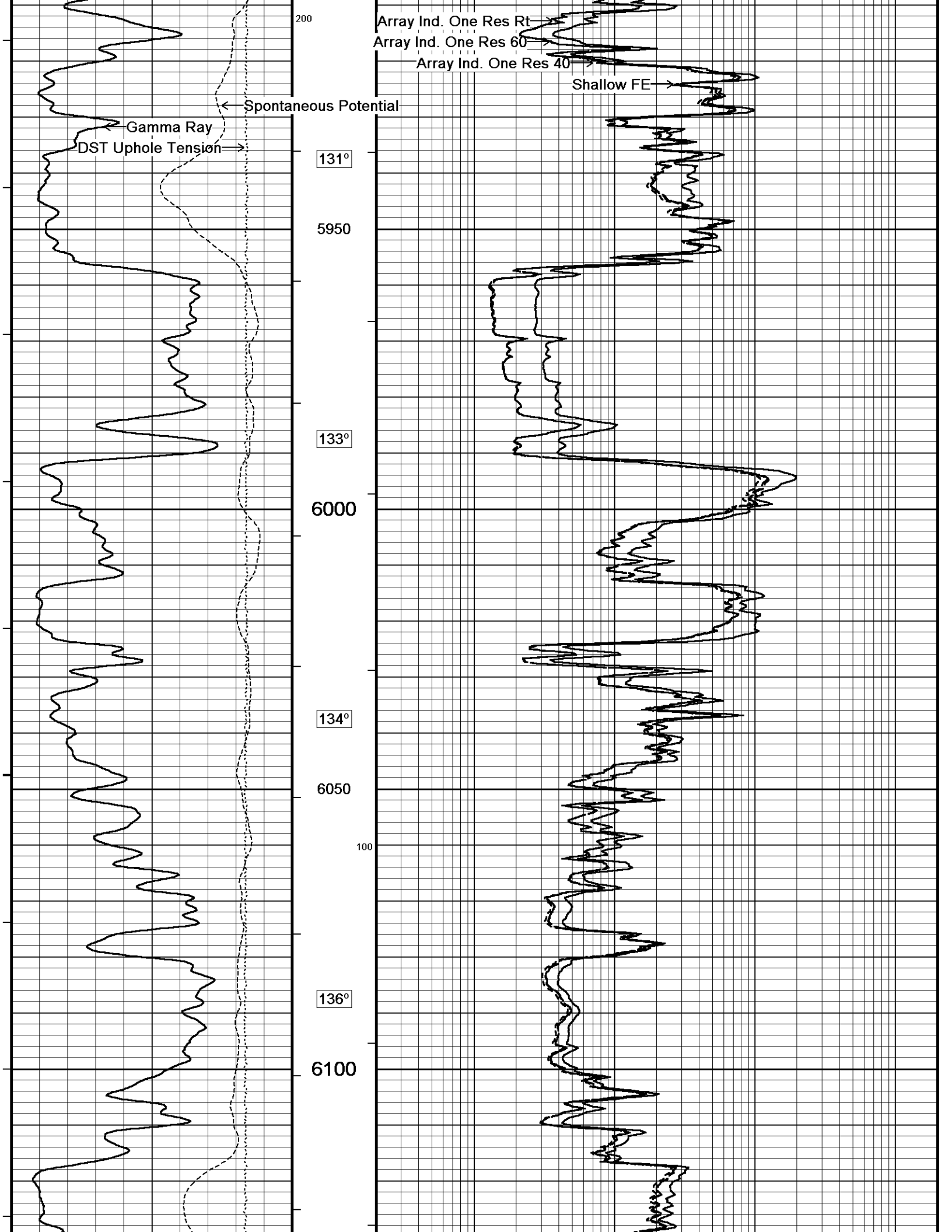
5650

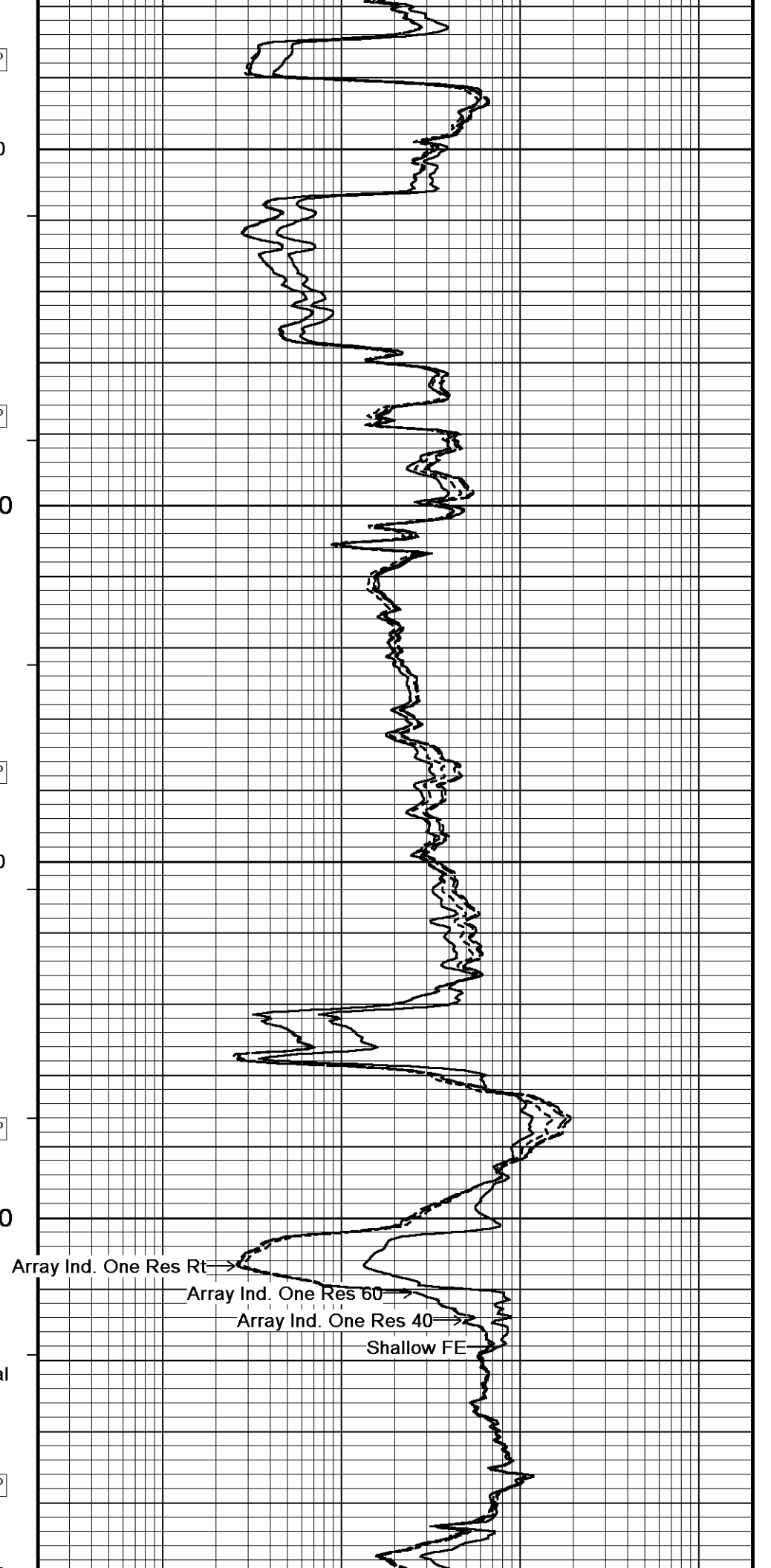
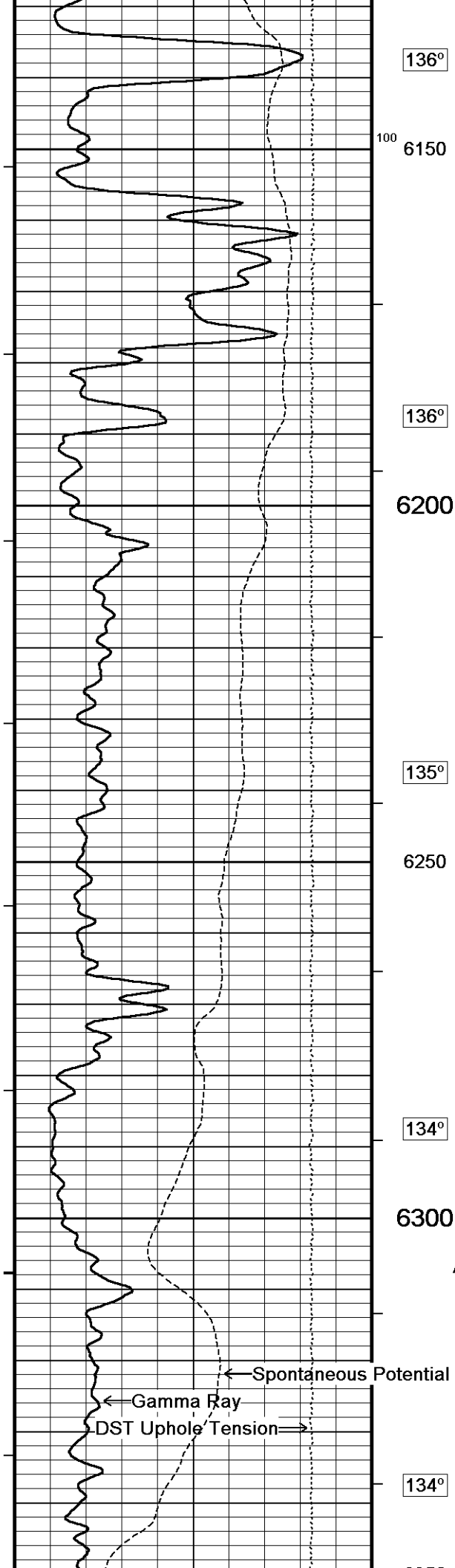
300

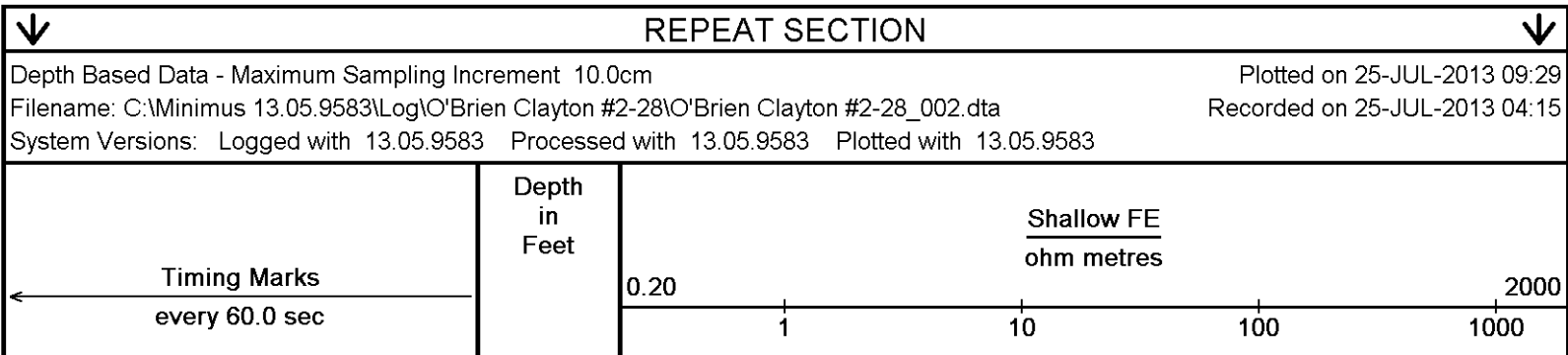
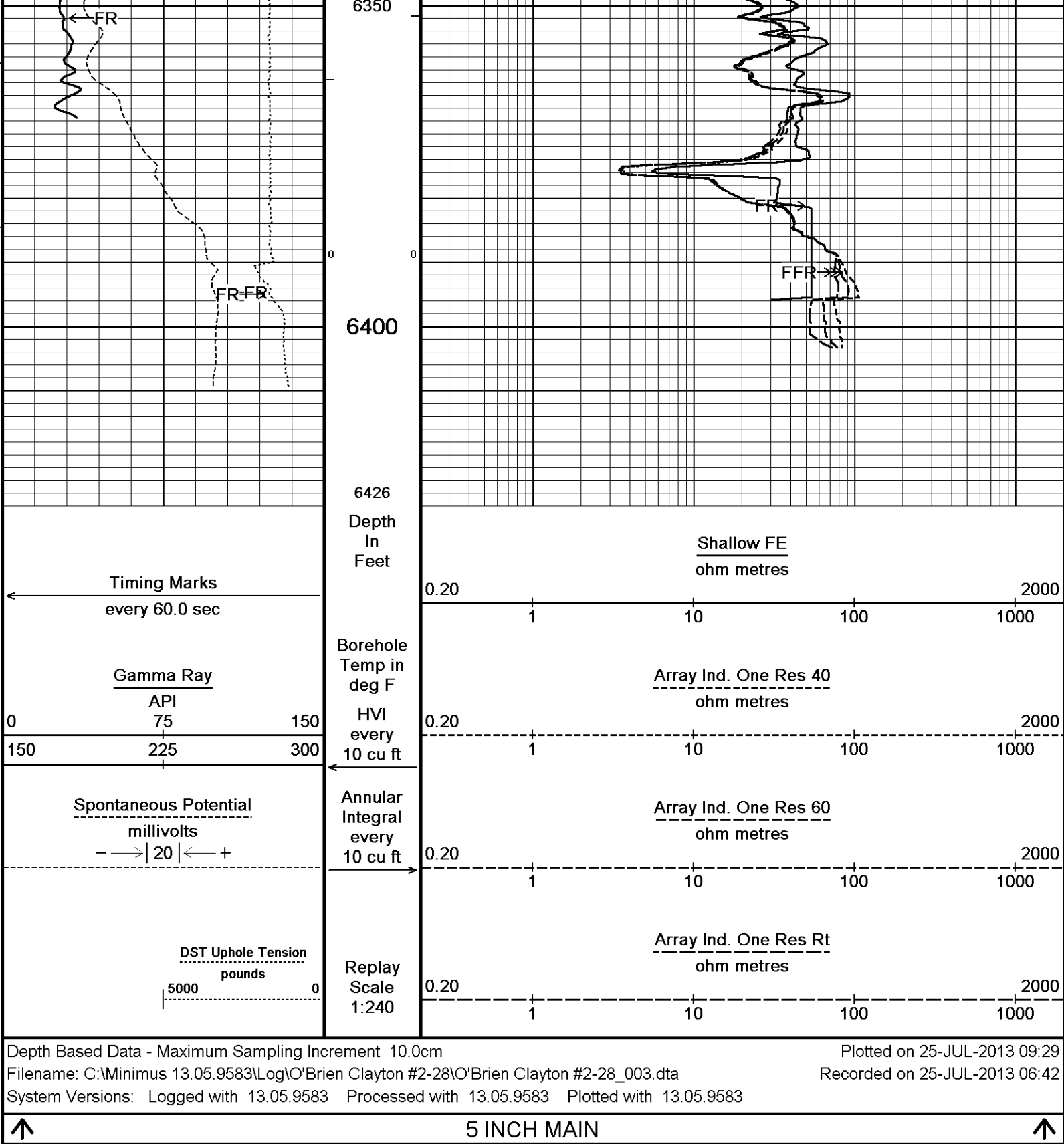
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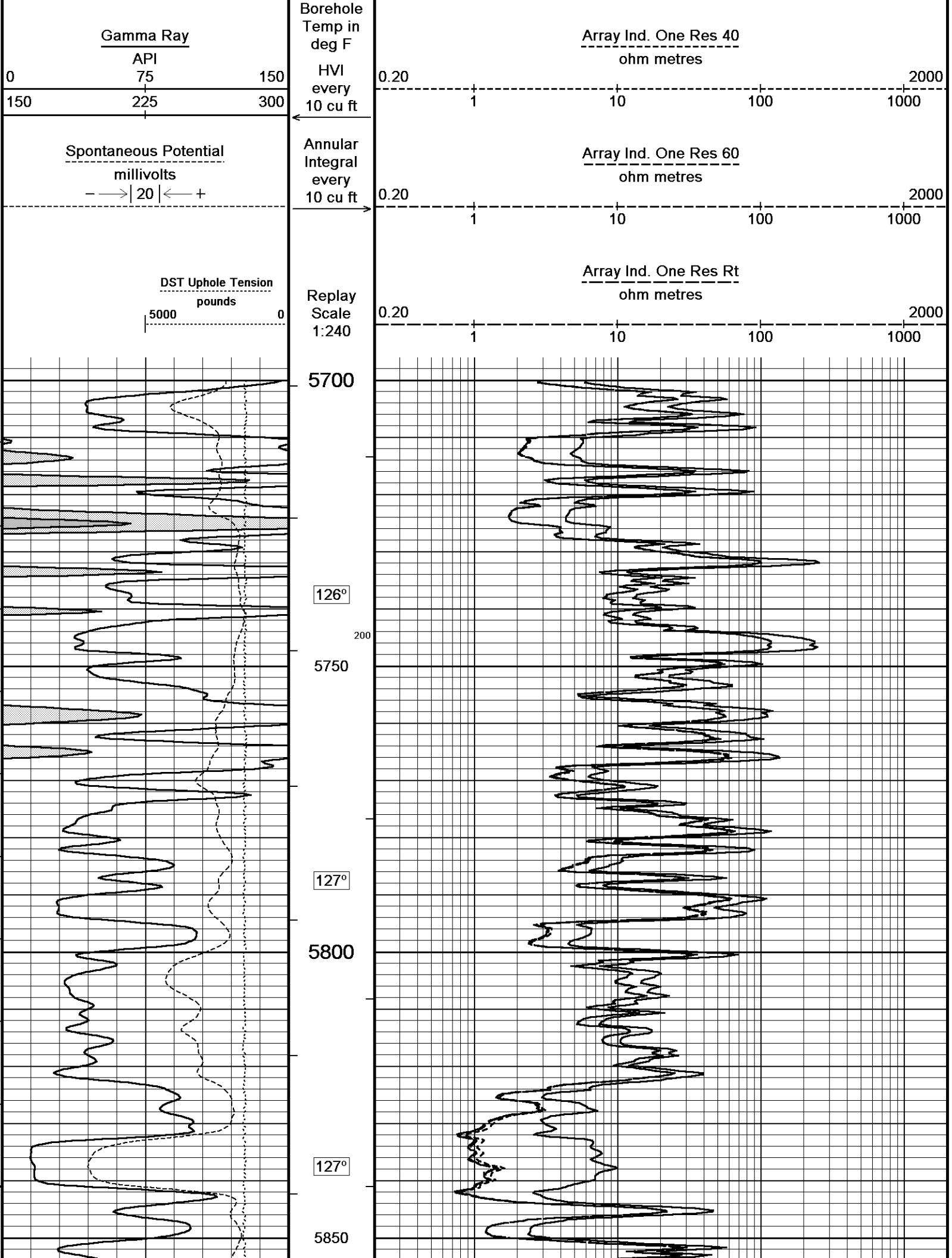


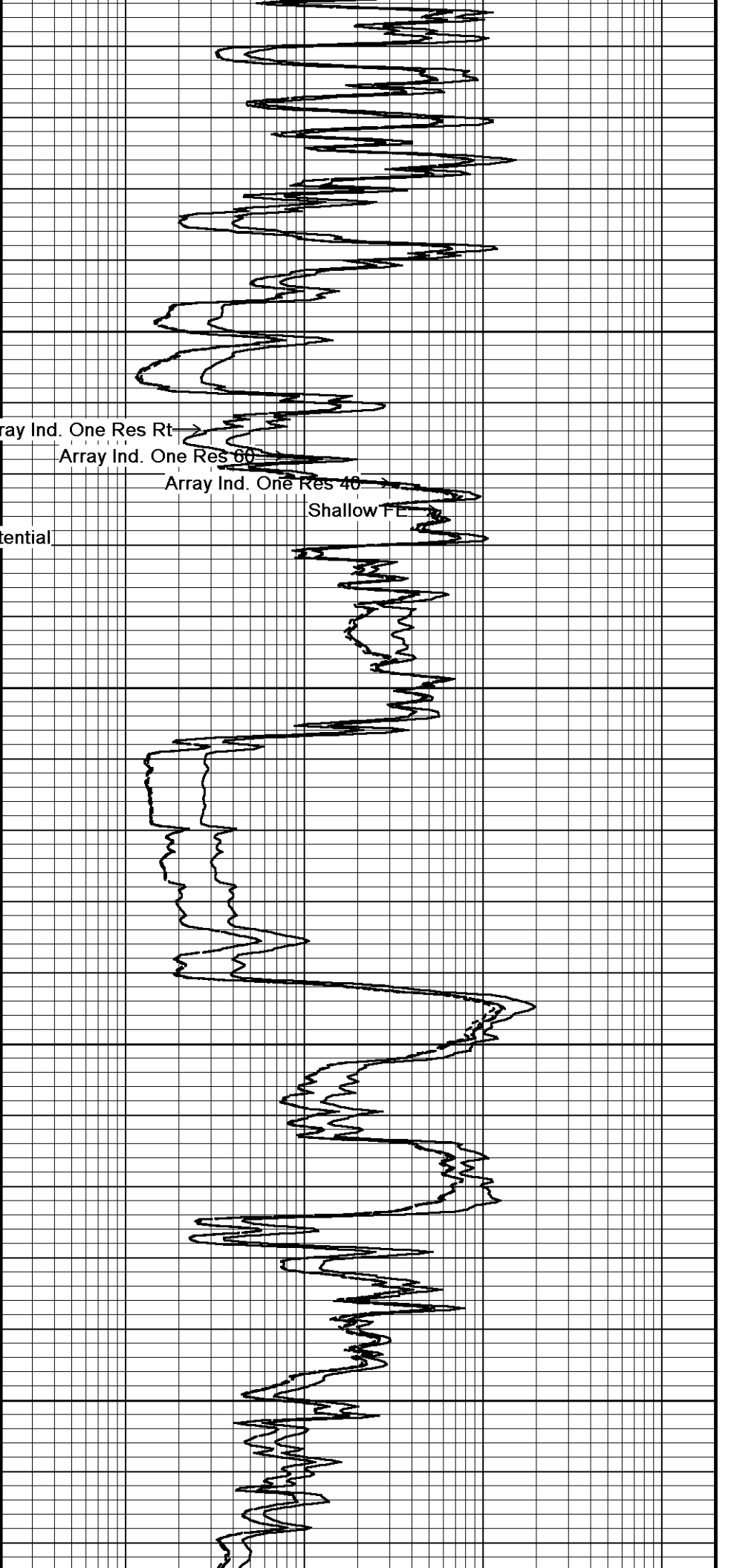
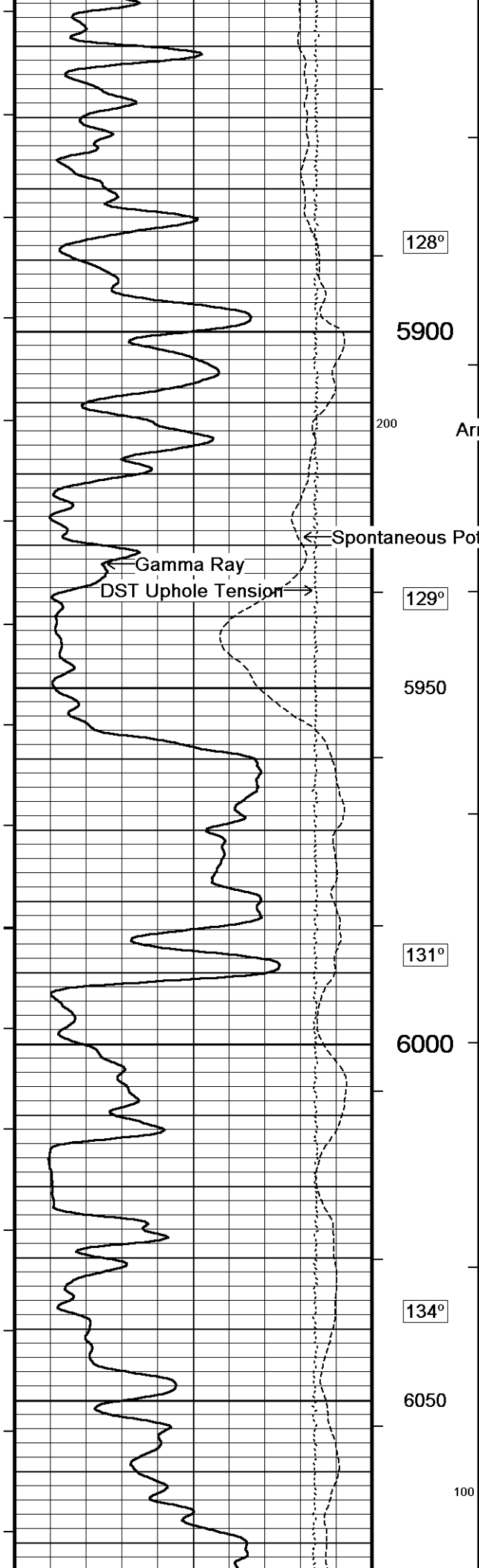


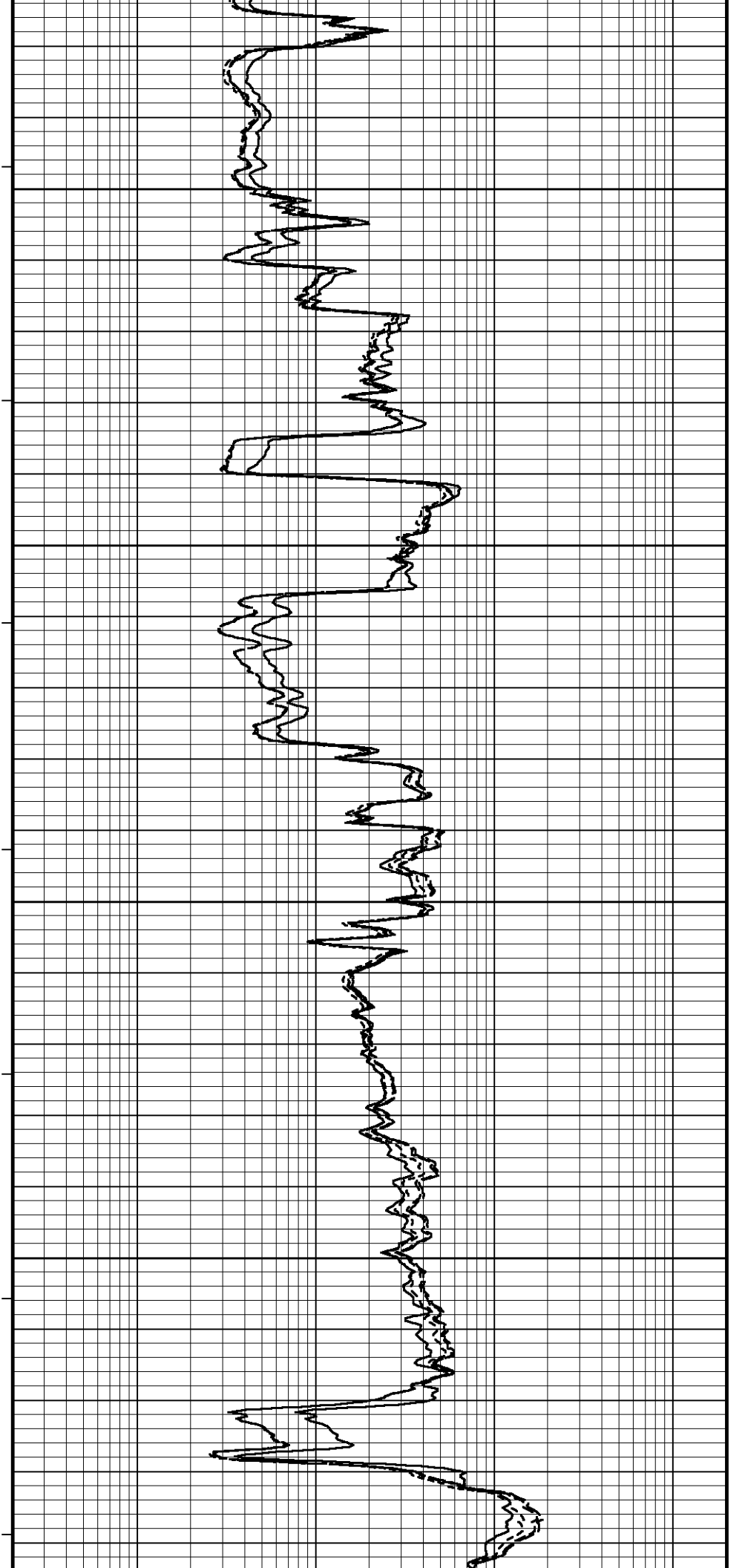
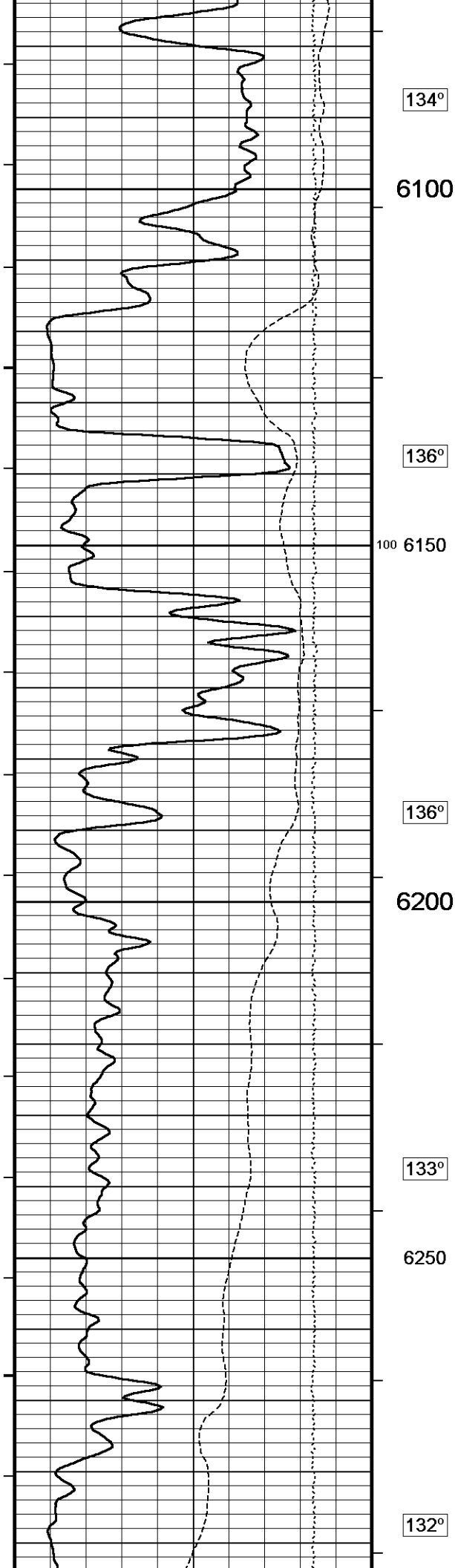


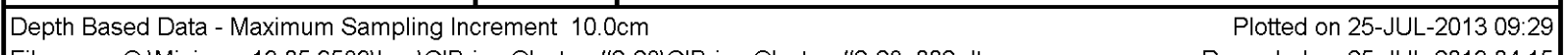












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REPEAT SECTION

↑

↓

10 INCH HI-RES

↓

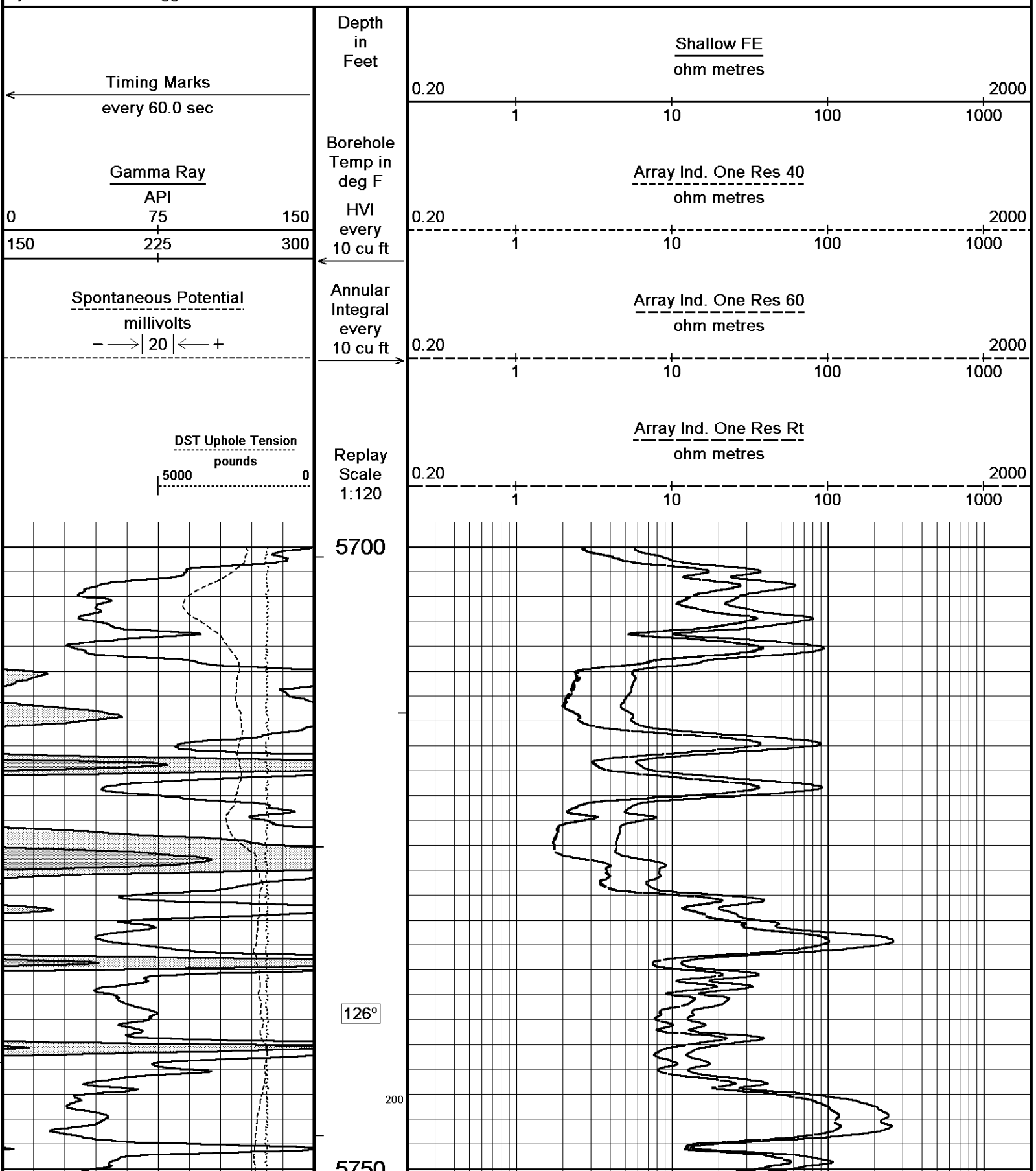
Depth Based Data - Maximum Sampling Increment 2.5cm

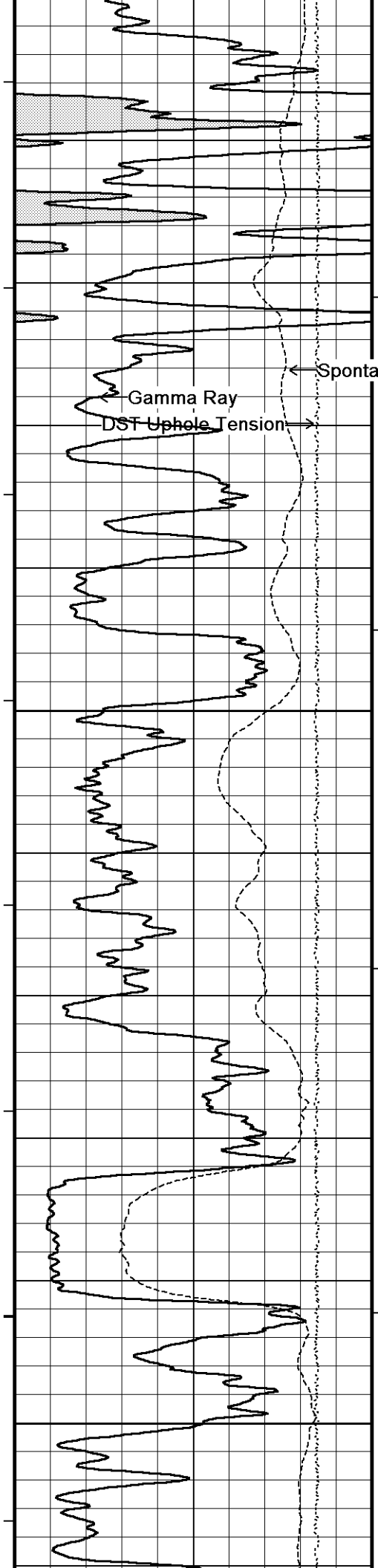
Plotted on 25-JUL-2013 09:29

Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_001.dta

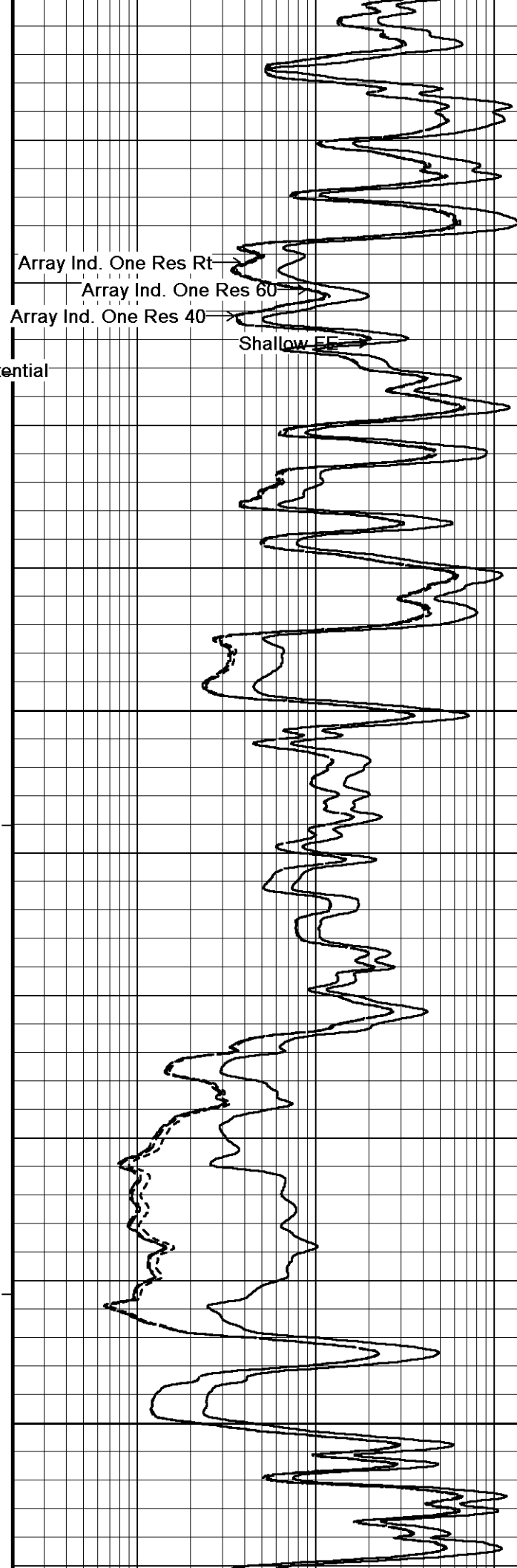
Recorded on 25-JUL-2013 04:15

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

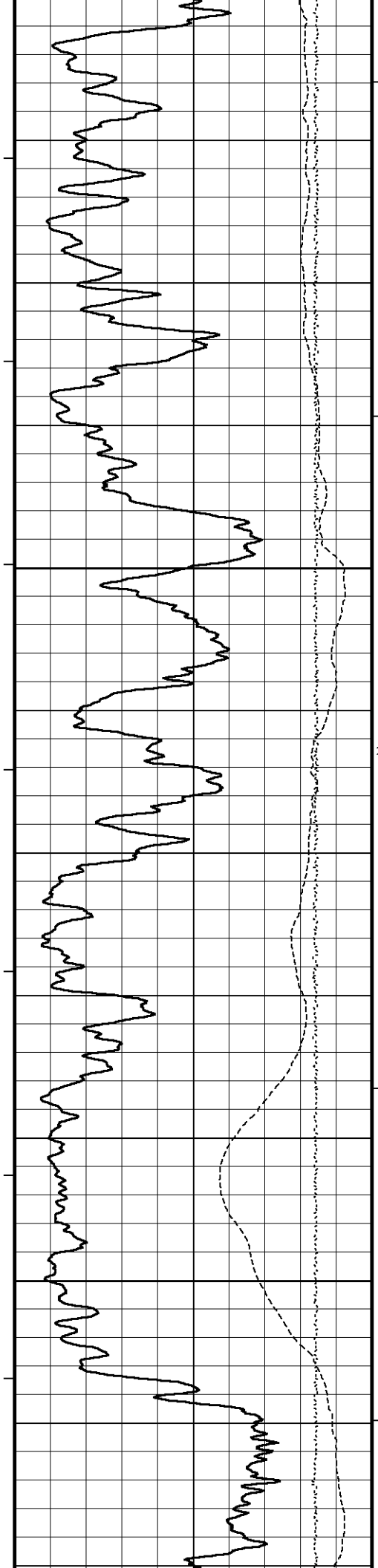




5750
127°
5800
127°
5850



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



128°

5900

200

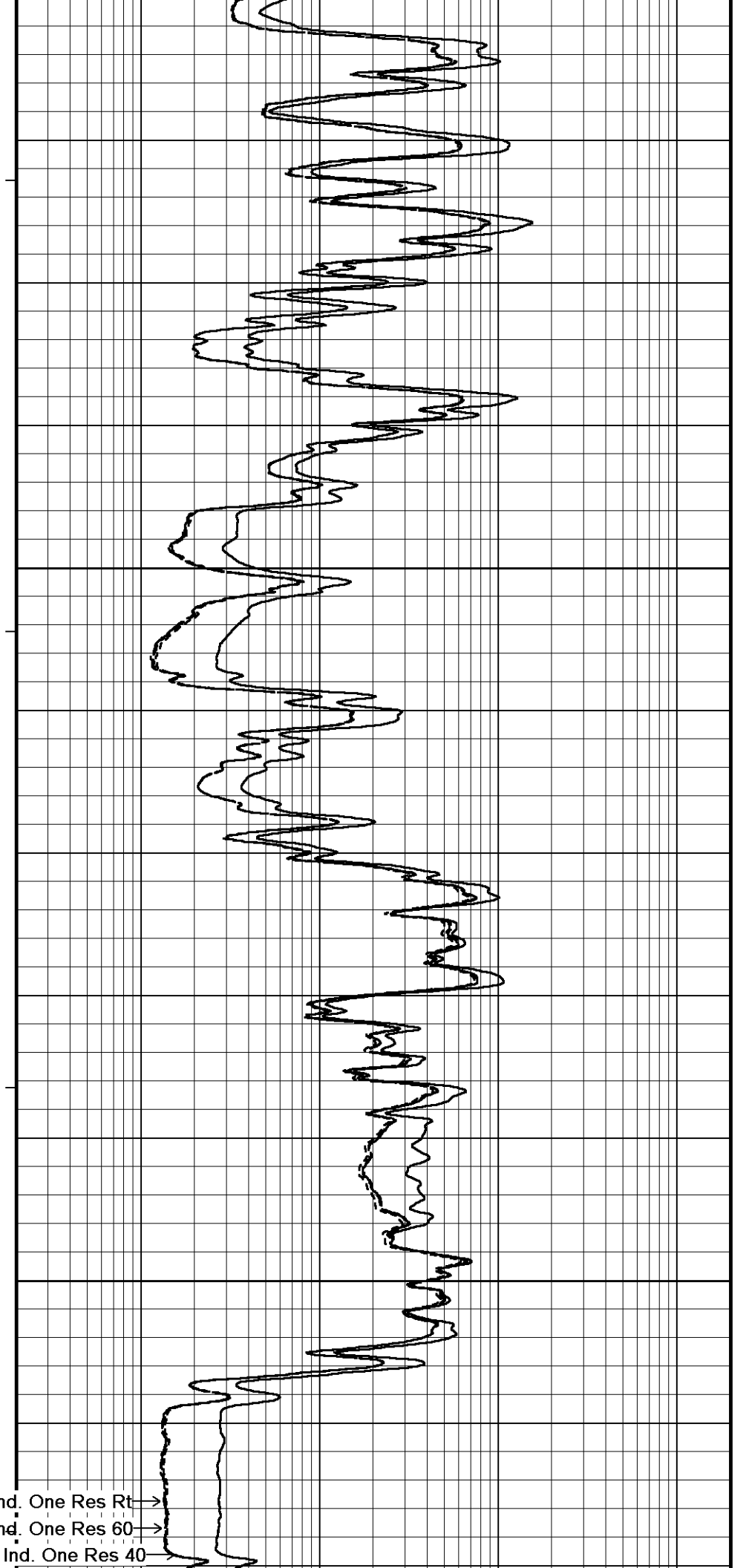
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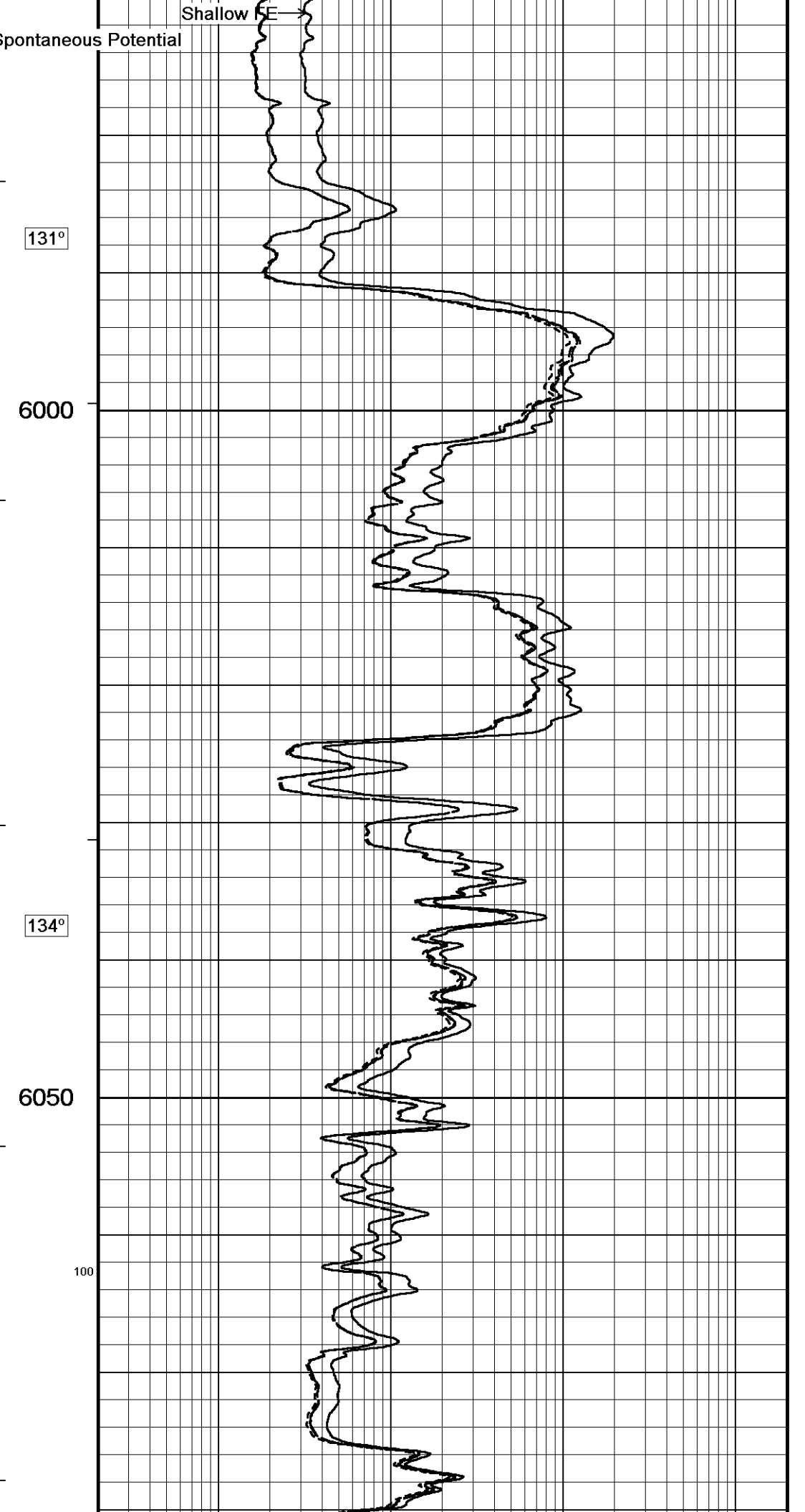
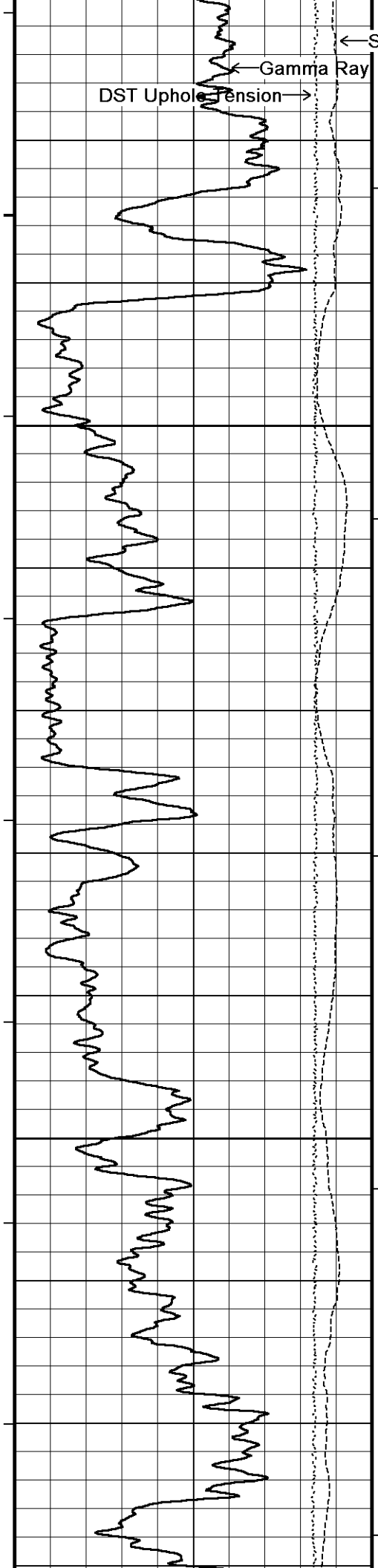
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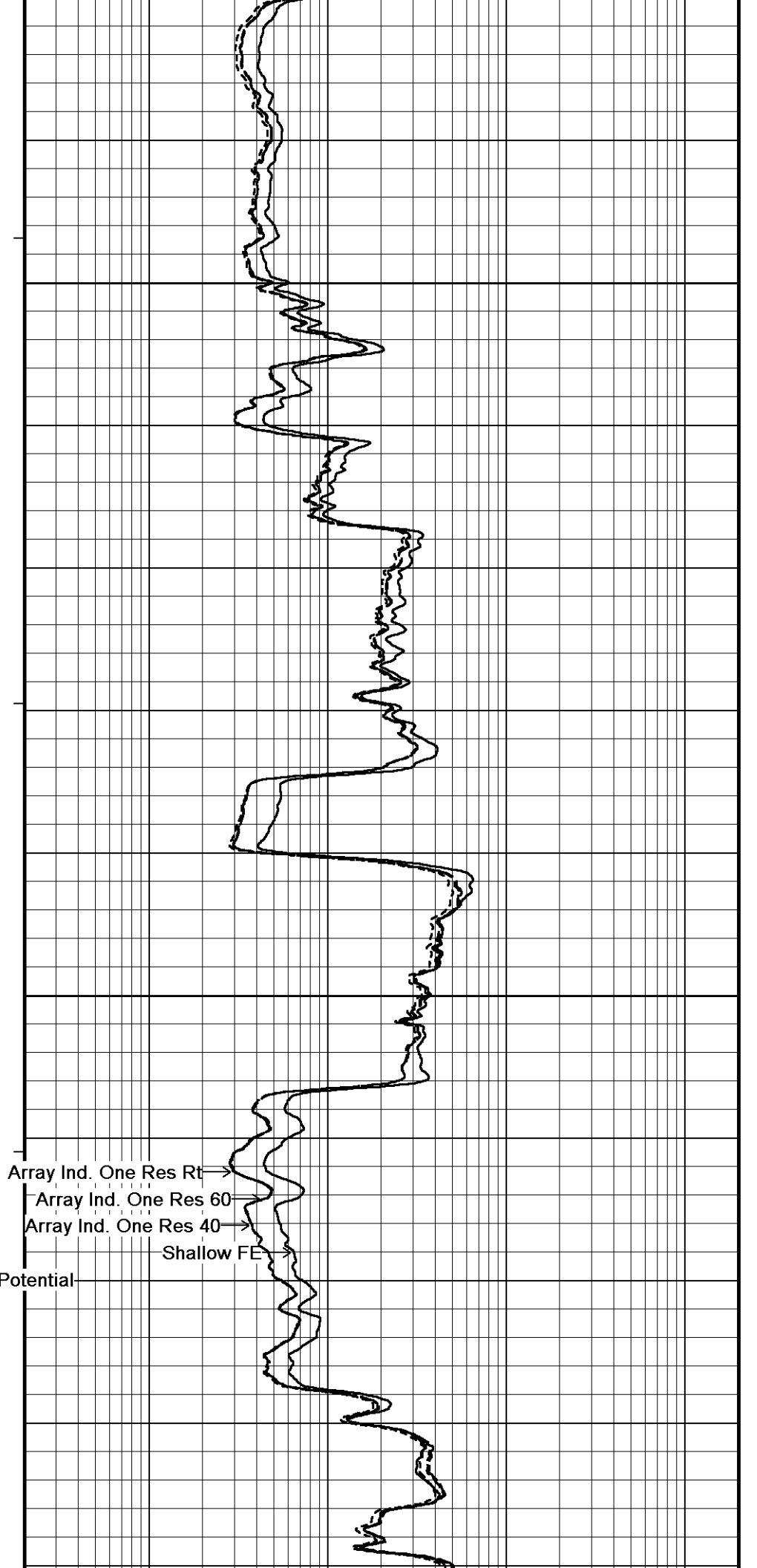
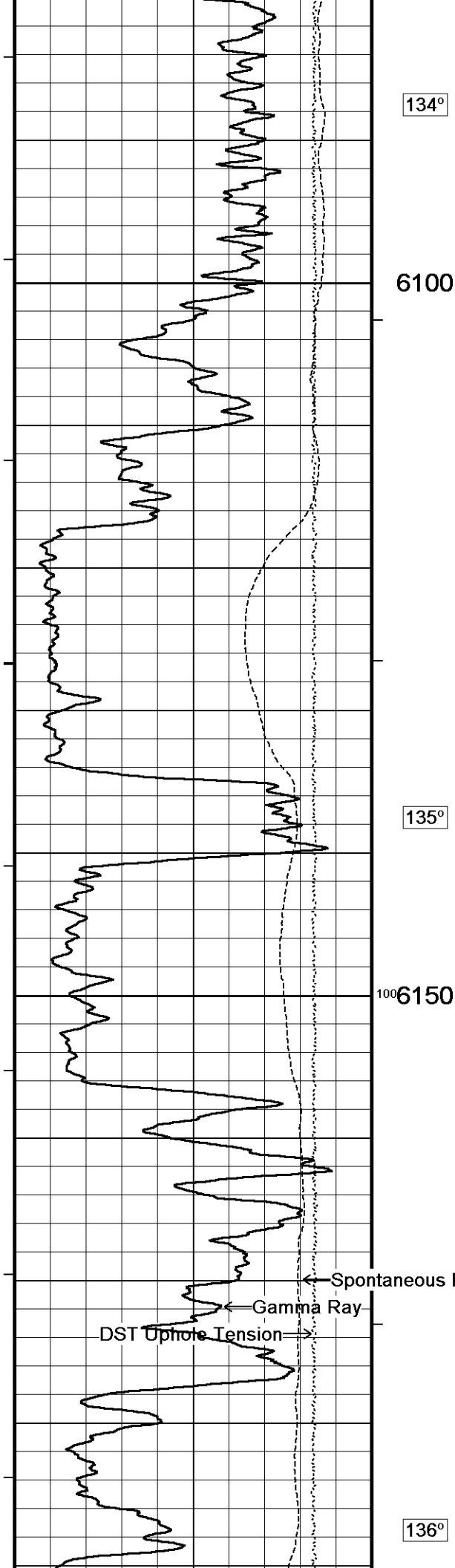
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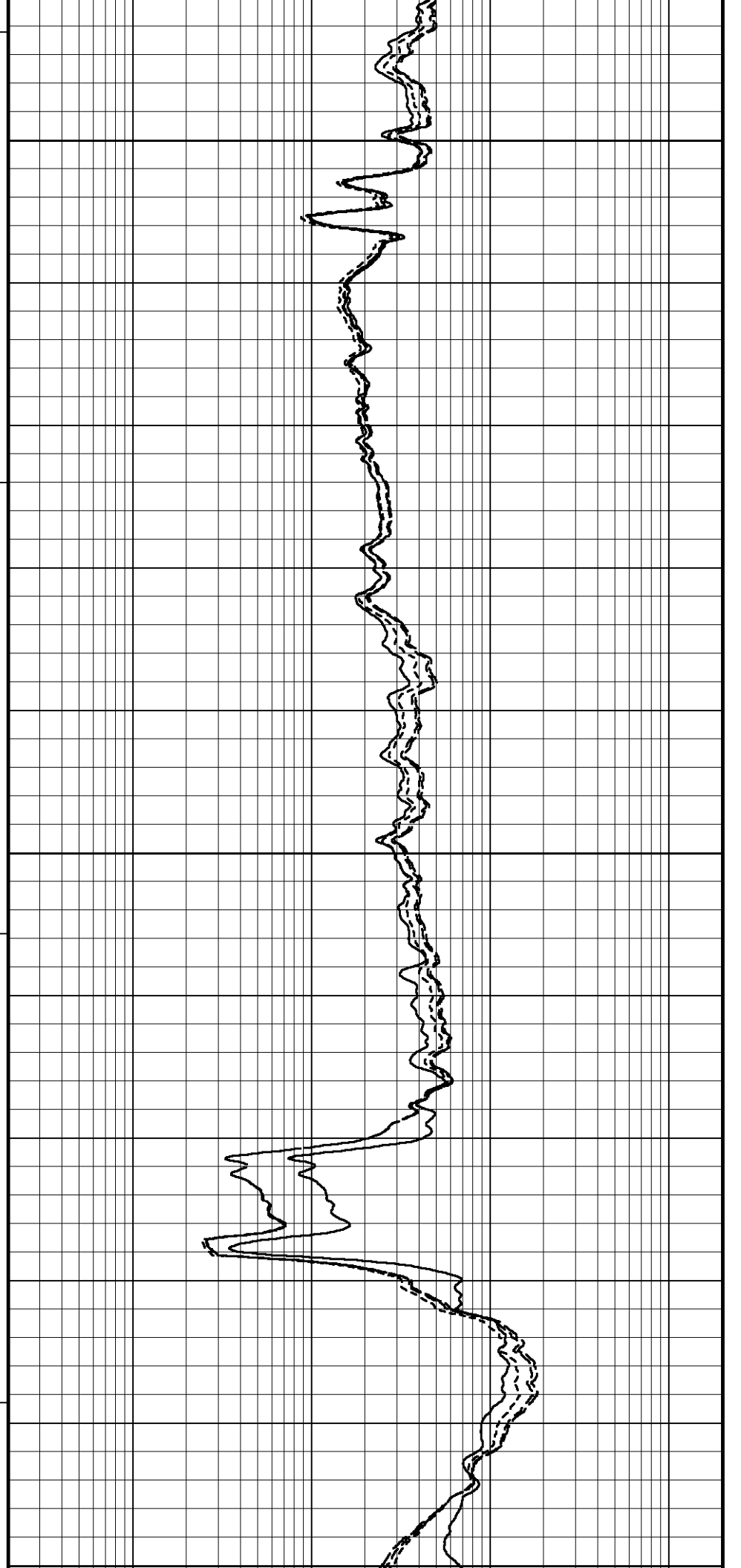
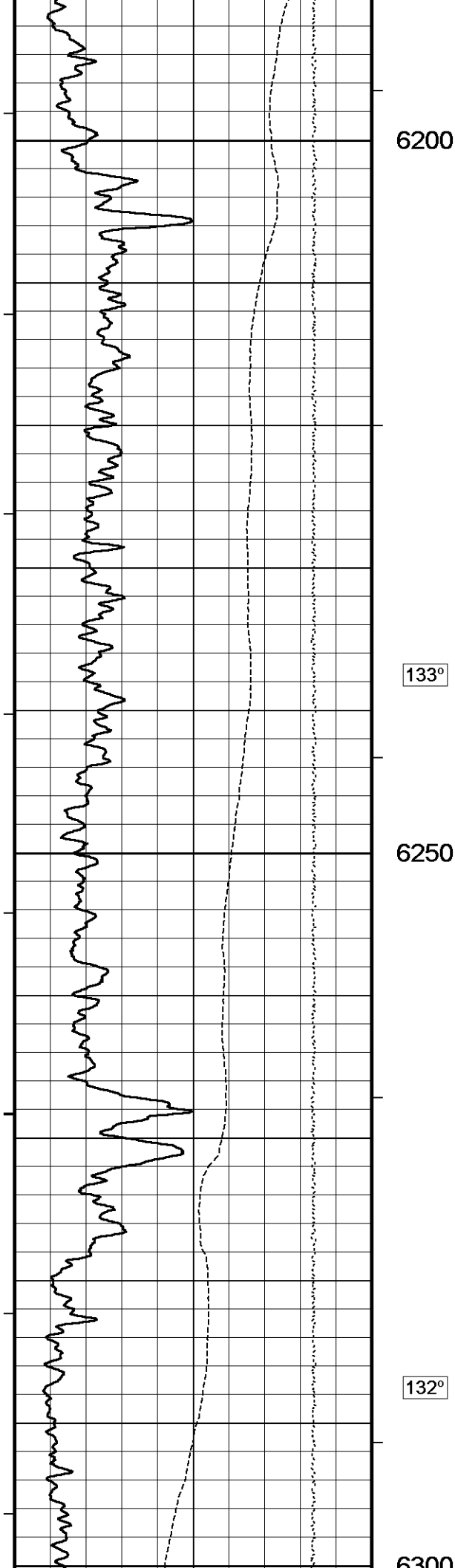
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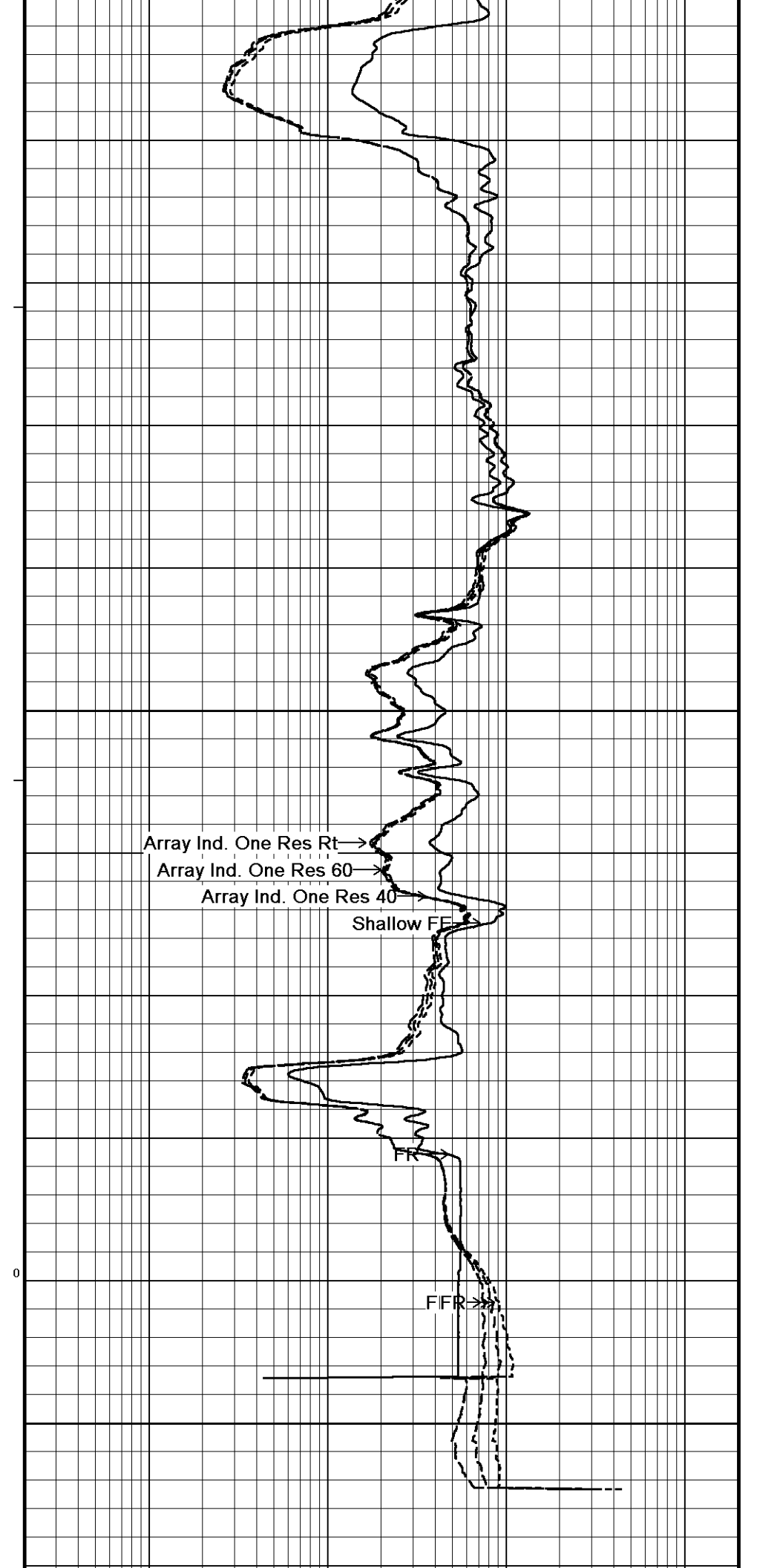
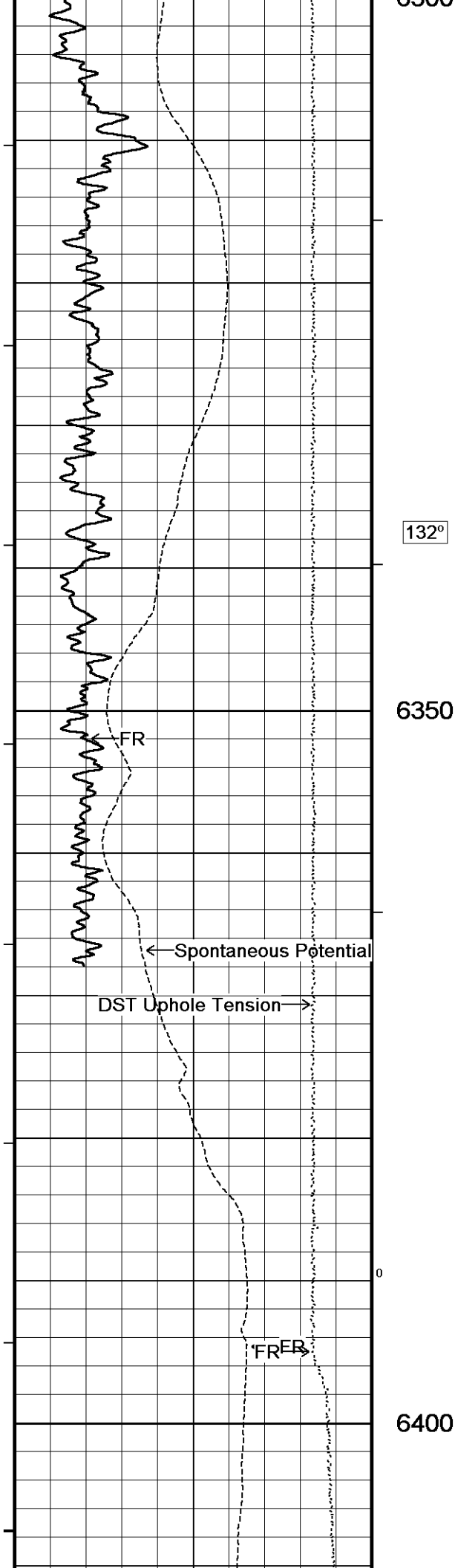
Array Ind. One Res 40 →

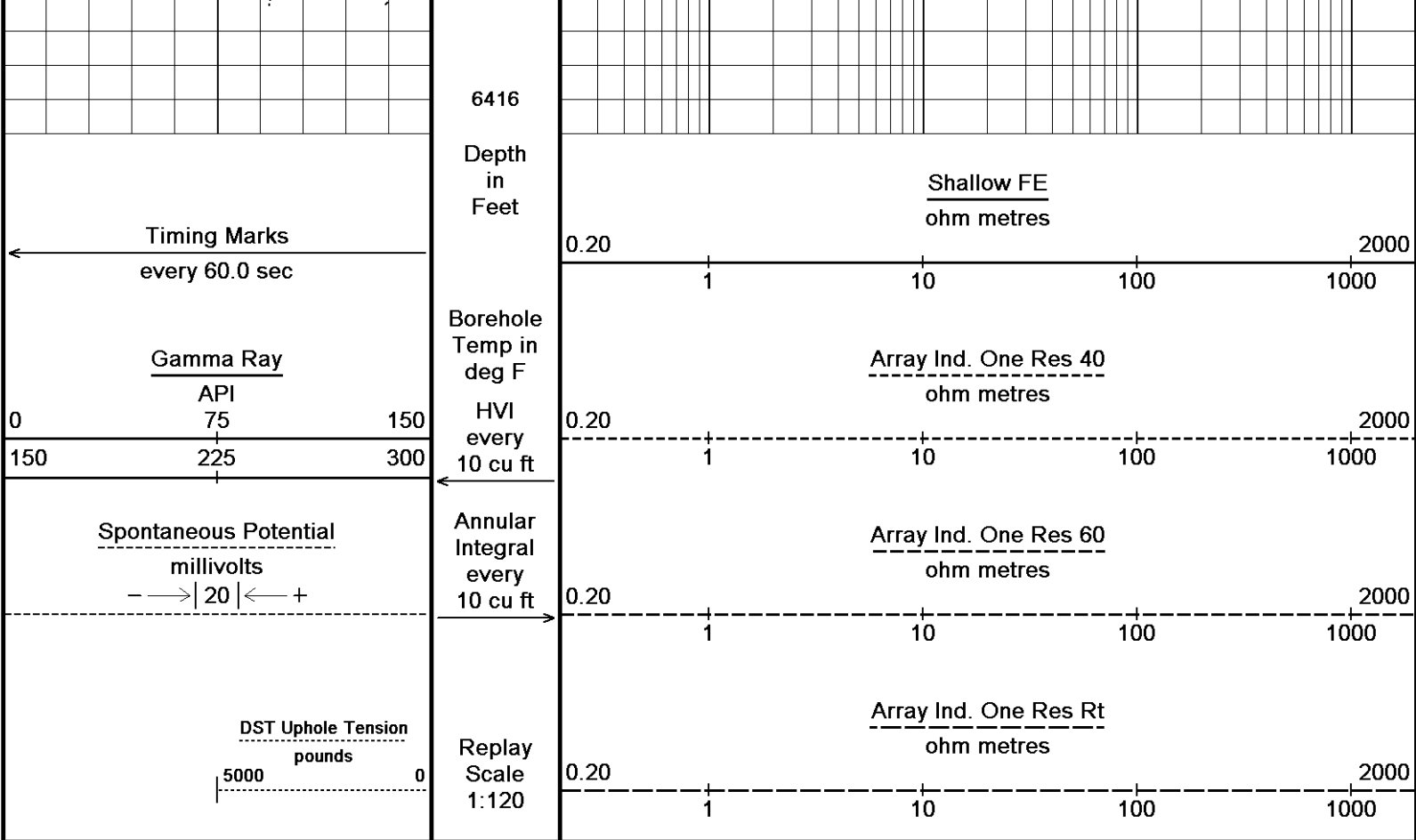












Depth Based Data - Maximum Sampling Increment 2.5cm
 Filename: C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_001.dta
 System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

Plotted on 25-JUL-2013 09:29
 Recorded on 25-JUL-2013 04:15

↑

10 INCH HI-RES

↑

BEFORE SURVEY CALIBRATION		
C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_002.dta		
General Constants All 000		Last Edited on 25-JUL-2013,03:30
General Parameters		
Mud Resistivity	0.810	ohm-metres
Mud Resistivity Temperature	99.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	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. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	
Down-hole Tension Calibration SMS 0		Field Calibration on 21-JUL-2013 20:00
Reading No	Measured	Calibrated (lbs)
1	13811.52	0.00
2	14365.27	471.80
Gamma Calibration MCG-B 39		

	Measured	Calibrated (API)
Background	68	46
Calibrator (Gross)	1137	771
Calibrator (Net)	1070	725

Gamma Constants MCG-B 39

Last Edited on 25-JUL-2013,02:10

Gamma Calibrator Number	GRC38	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MCG-B 39

Field Calibration on 11-JUN-2013,10:13

	Measured	Calibrated (mV)
Reference 1	105.8	100.0
Reference 2	-94.3	-100.0

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 11-JUN-2013,10:13

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-B 39

Last Edited on 11-JUN-2013,10:13

Pre-filter Length	11
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Caliper Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:43

Field Calibration on 04-JUL-2013 09:18

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14624	5.98
2	17958	7.97
3	21263	9.86
4	25213	11.92
5	0	0.00
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	6.11	5.98

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:36

Field Check on 04-JUL-2013 09:20

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	63.0		63.0	
Micro Inverse	48.2		48.2	

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 25-JUL-2013,02:10

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-A.B 66

Base Calibration on 22-MAY-2013 15:00

Field Check on 04-JUL-2013 09:34

Base Calibration				
		Measured	Calibrated (cps)	
	Near	Far	Near	Far
	3145	98	3714	110
Ratio	32.215		33.764	

Field Calibrator at Base		Calibrated (cps)	
		1654	2365
Ratio		0.699	
Field Check		Calibrated (cps)	
		1643	2364
Ratio		0.698	

Neutron Constants MDN-A.B 66			Last Edited on 25-JUL-2013,02:10		
Neutron Source Id		P0204NN			
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		None			
Formation Pressure		N/A	kpsi		
Temperature Source		Constant Value			
Temperature		68.00	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 353			Base Calibration on 22-MAY-2013 08:22		
			Field Check on 04-JUL-2013 09:10		
Base Calibration					
	Measured	Calibrated (ohm-m)			
Reference 1	0.0	0.0			
Reference 2	964.9	126.8			
Base Check		280.9			
Field Check		280.8			

FE Constants MFE-B.J 353			Last Edited on 25-JUL-2013,02:09		
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 167			Base Calibration on 19-APR-2013,13:41		
			Field Check on 04-JUL-2013 09:04		
Base Calibration					
Test Loop Calibration					
Channel	Low	Measured High	Low	Calibrated (mmho/m) High	
1	17.3	474.2	9.3	966.2	
2	6.3	388.4	7.6	821.4	
3	3.3	259.4	5.2	566.0	
4	1.9	133.0	2.6	279.2	
Array Temperature		76.8	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1			13.1	3839.2	
2			29.6	3477.2	
3			29.1	3053.5	
4			19.8	2082.0	
Deep			18.6	2049.4	
Medium			42.2	3991.9	
Shallow			43.0	5054.3	

Induction Constants MAI-A.A 167

Last Edited on 25-JUL-2013,02:09

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	60.00	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 167

Field Calibration on 02-JUL-2013,03:28

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 02-JUL-2013,03:28

Pre-filter Length	11
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Caliper Calibration MPD-B 64

Base Calibration on 10-JUL-2013 09:51

Field Calibration on 10-JUL-2013 09:52

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	15217	3.99
2	24188	5.98
3	32870	7.97
4	41232	9.86
5	50592	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.93	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 10-JUL-2013 10:09

Field Check on 10-JUL-2013 10:16

Density Calibration				
Base Calibration		Measured		Calibrated (sdu)
		Near	Far	
Reference 1	60252	23858	59556	20826

Reference 1	60252	33858	39358	30838
Reference 2	25108	2914	24941	2541

Field Check at Base

1163.0 1342.8

Field Check

1165.4 1350.2

PE Calibration

Base Calibration

Measured

Calibrated

WS

WH

Ratio

Ratio

Background

211

1034

Reference 1

22924

60048

0.385

0.371

Reference 2

6861

24971

0.278

0.272

Field Check at Base

210.7

1033.8

Field Check

209.9

1034.2

Density Constants MPD-B 64

Last Edited on 25-JUL-2013,02:10

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

1.12

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

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\O'Brien Clayton #2-28\O'Brien Clayton #2-28_002.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma

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

Compact Micro-log

MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron

MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper



42.87 ft

GRGC - Gamma Ray

39.96 ft

CGXT - MCG External Temperature

33.24 ft

MINV - Micro-inverse

33.24 ft

MNRL - Micro-normal

34.24 ft

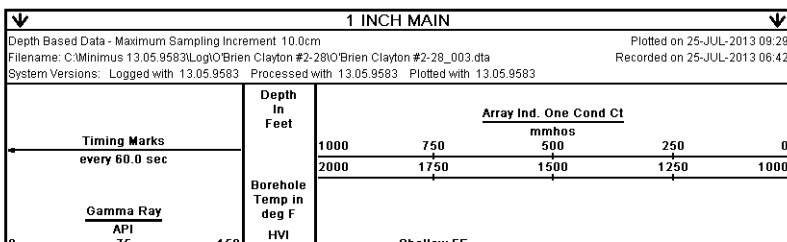
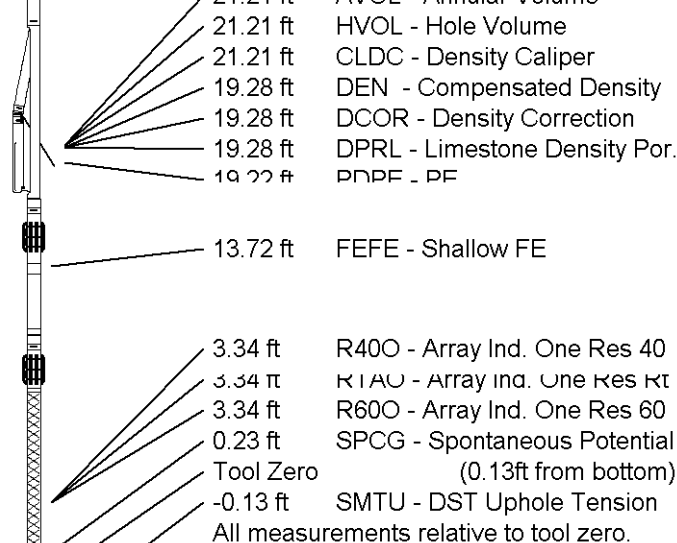
MLTC - MML Caliper

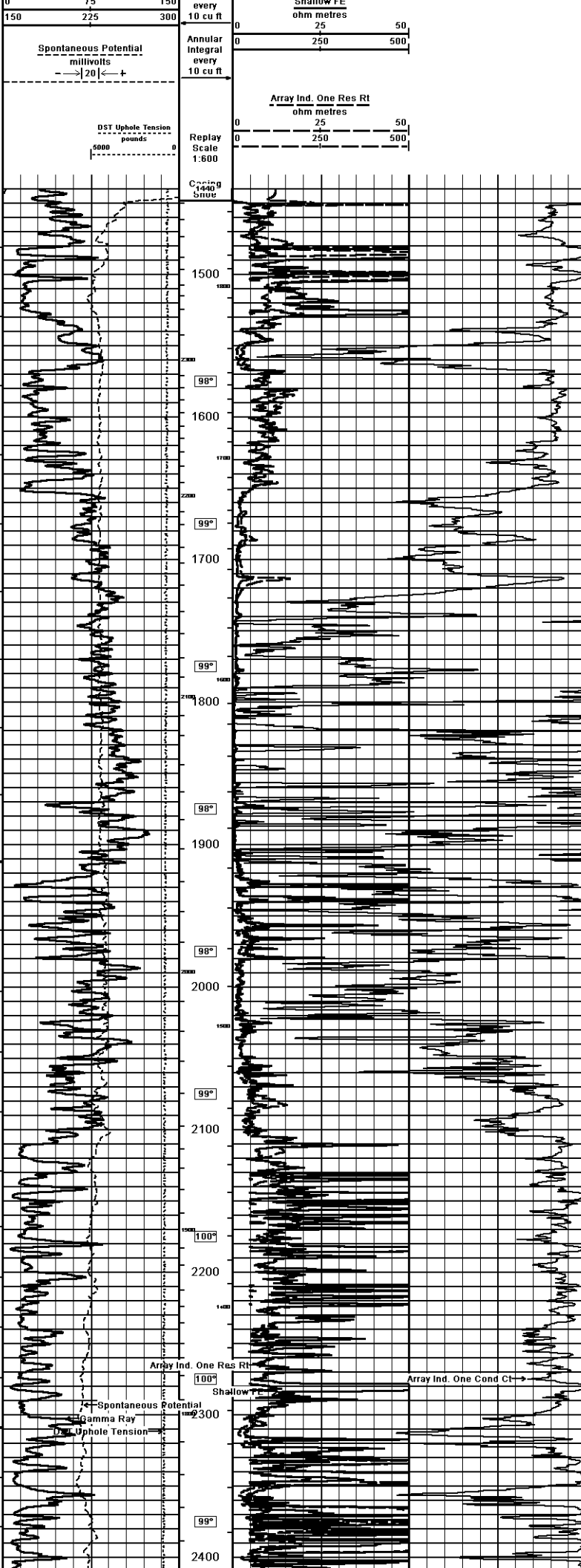
28.45 ft

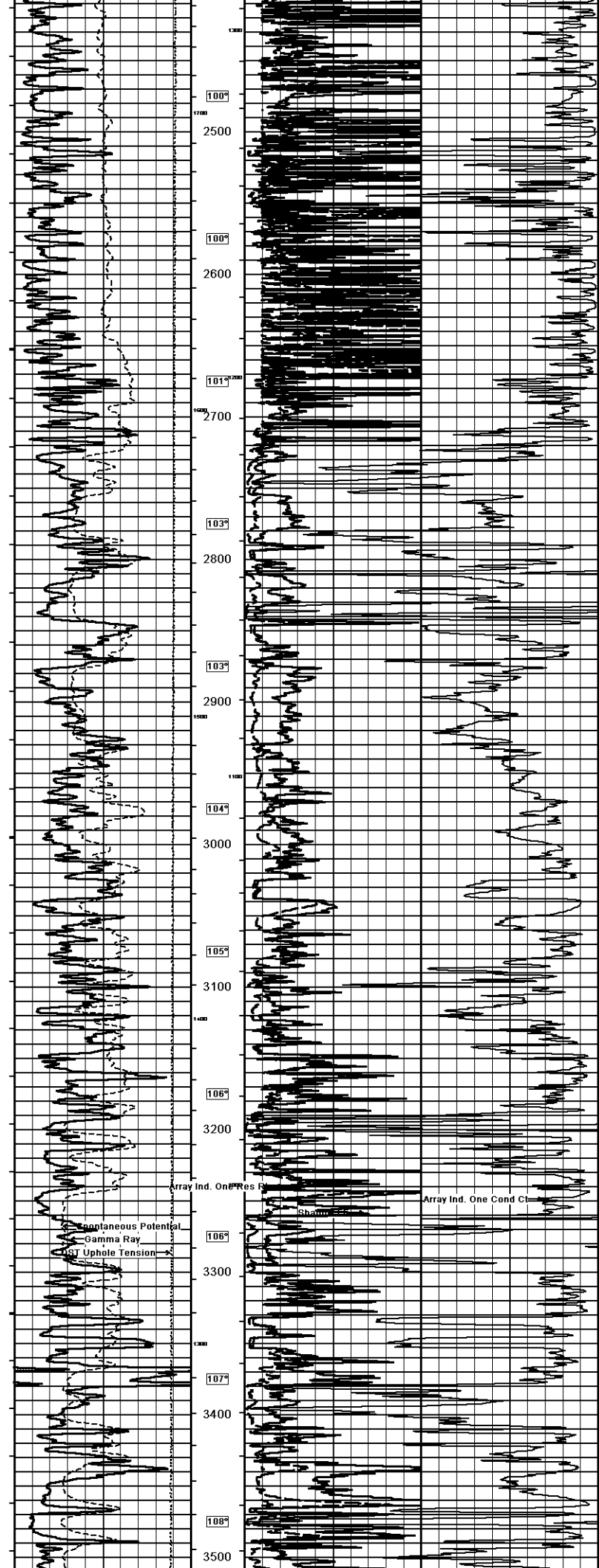
NPRL - Limestone Neutron Por.

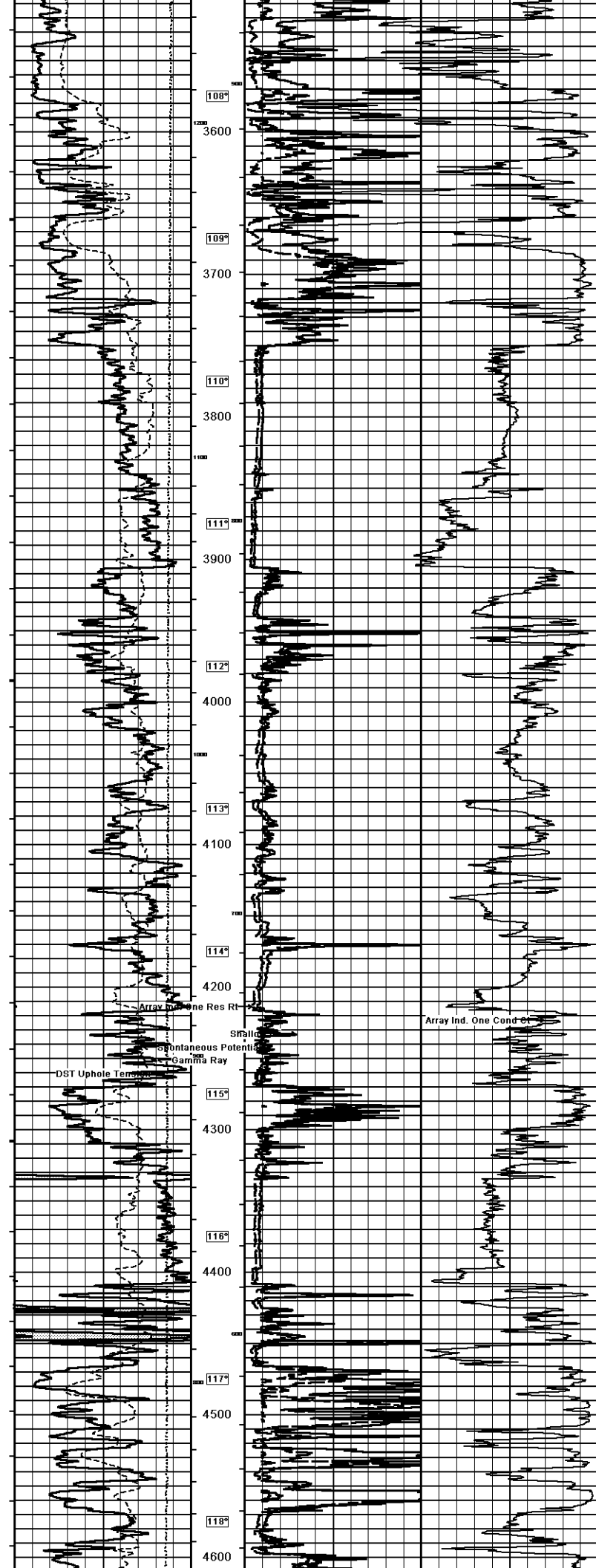
21.21 ft

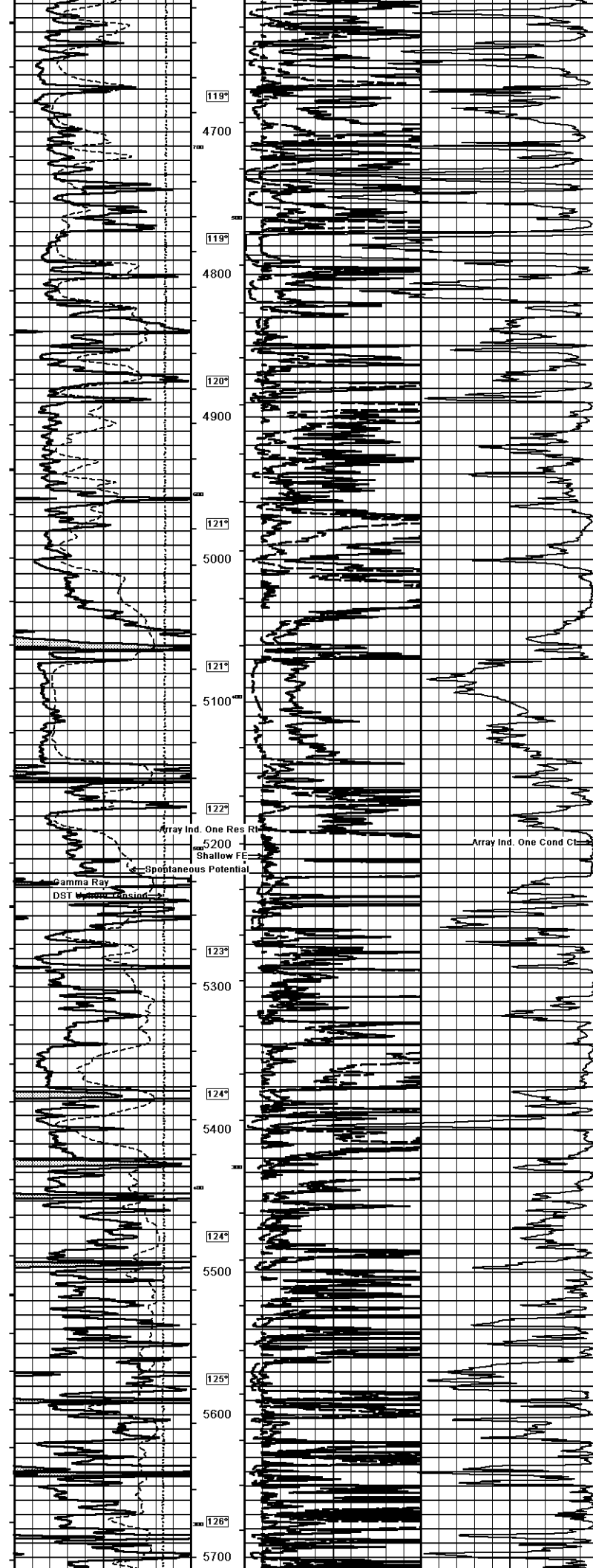
AVOL - Annular Volume

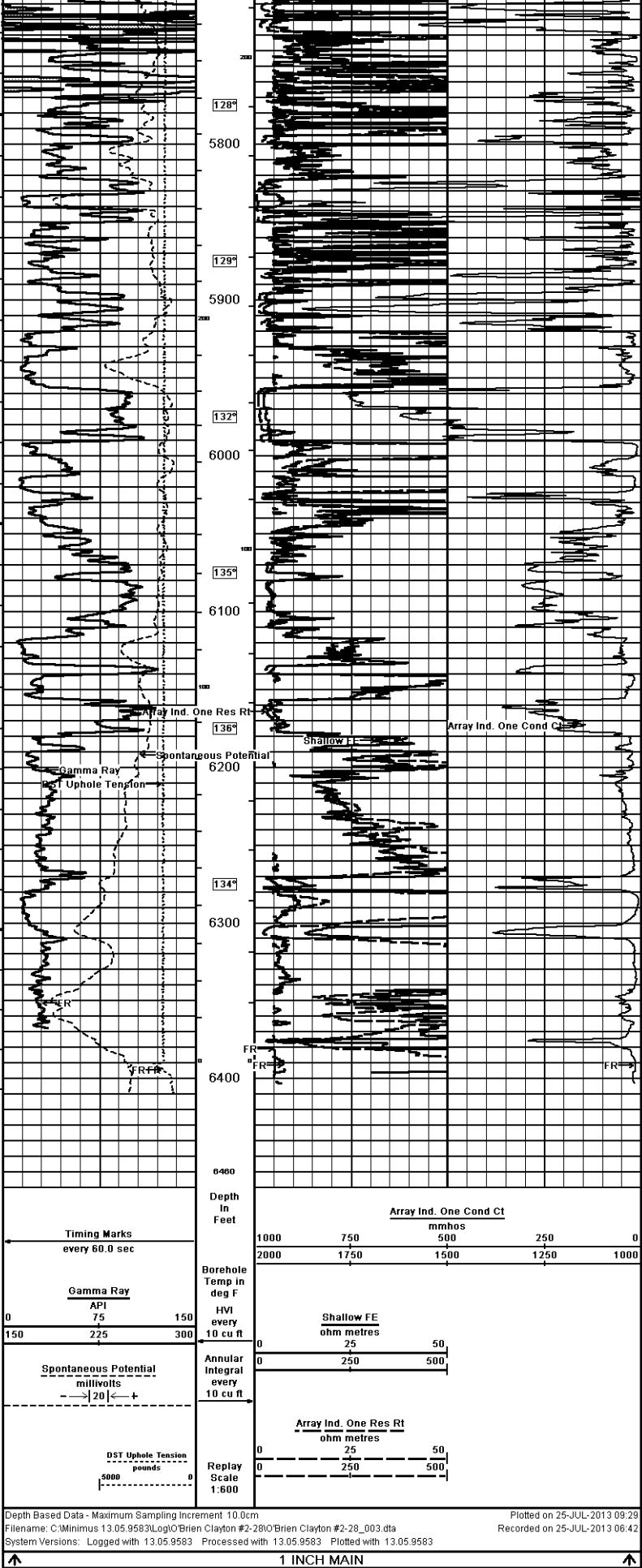












COMPANY	O'BRIEN ENERGY RESOURCES CORP.		
WELL	CLAYTON #2-28		
FIELD	SINGLEY		
PROVINCE/COUNTY	MEADE		
COUNTRY/STATE	U.S.A. / KANSAS		

Elevation Kelly Bushing	2602.00	feet	First Reading	6392.00	feet
Elevation Drill Floor	2601.00	feet	Depth Driller	6400.00	feet

Elevation Ground Level	2591.00	feet	Depth Logger	6395.00	feet
			ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG		