

 Weatherford®				ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG			
COMPANY		O'BRIEN ENERGY RESOURCES CORP					
WELL		KEYSTONE #5-4					
FIELD		KEYSTONE					
PROVINCE/COUNTY		MEADE					
COUNTRY/STATE		U.S.A. / KANSAS					
LOCATION		S2 S2 N2 SW 1350' FSL & 1320' FWL					
SEC 4	TWP 33	RGE 29W	Other Services				
Latitude	37.202613		MDN/MPD				
Longitude	-100.484790		MML				
API Number	15-119-21435						
Permanent Datum GL, Elevation 2634 feet							Elevations:
Log Measured From KB, 12.00 feet above Permanent Datum							KB 2646.00
Drilling Measured From KB							DF 2644.00
						GL 2634.00	
Date	21-JUN-2019						
Run Number	ONE						
Service Order	17937-248222596						
Depth Driller	6250.00						feet
Depth Logger	6250.00						feet
First Reading	6247.00						feet
Last Reading	1567.00						feet
Casing Driller	1567.00						feet
Casing Logger	1567.00						feet
Bit Size	7.875						inches
Hole Fluid Type	WATER-BASED						
Density / Viscosity	8.90 lb/USg		50.00 sec/qt				
PH / Fluid Loss	10.00		8.00 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.88 @ 96.0						ohm-m
Rmf @ Measured Temp	0.70 @ 96.0						ohm-m
Rmc @ Measured Temp	1.06 @ 96.0						ohm-m
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.70 @122.0		ohm-m				
Time Since Circulation	3 HOURS						
Max Recorded Temp	122.00		deg F				
Equipment / Base	13057		ELRENO				
Recorded By	M. MCGLOTHLIN						
Witnessed By	P. DEBENHAM						D. GREATHOUSE

BOREHOLE RECORD					Last Edited: 21-JUN-2019 00:31
Bit Size inches		Depth From feet		Depth To feet	
7.875		1567.00		6250.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	1567.00	24.00	

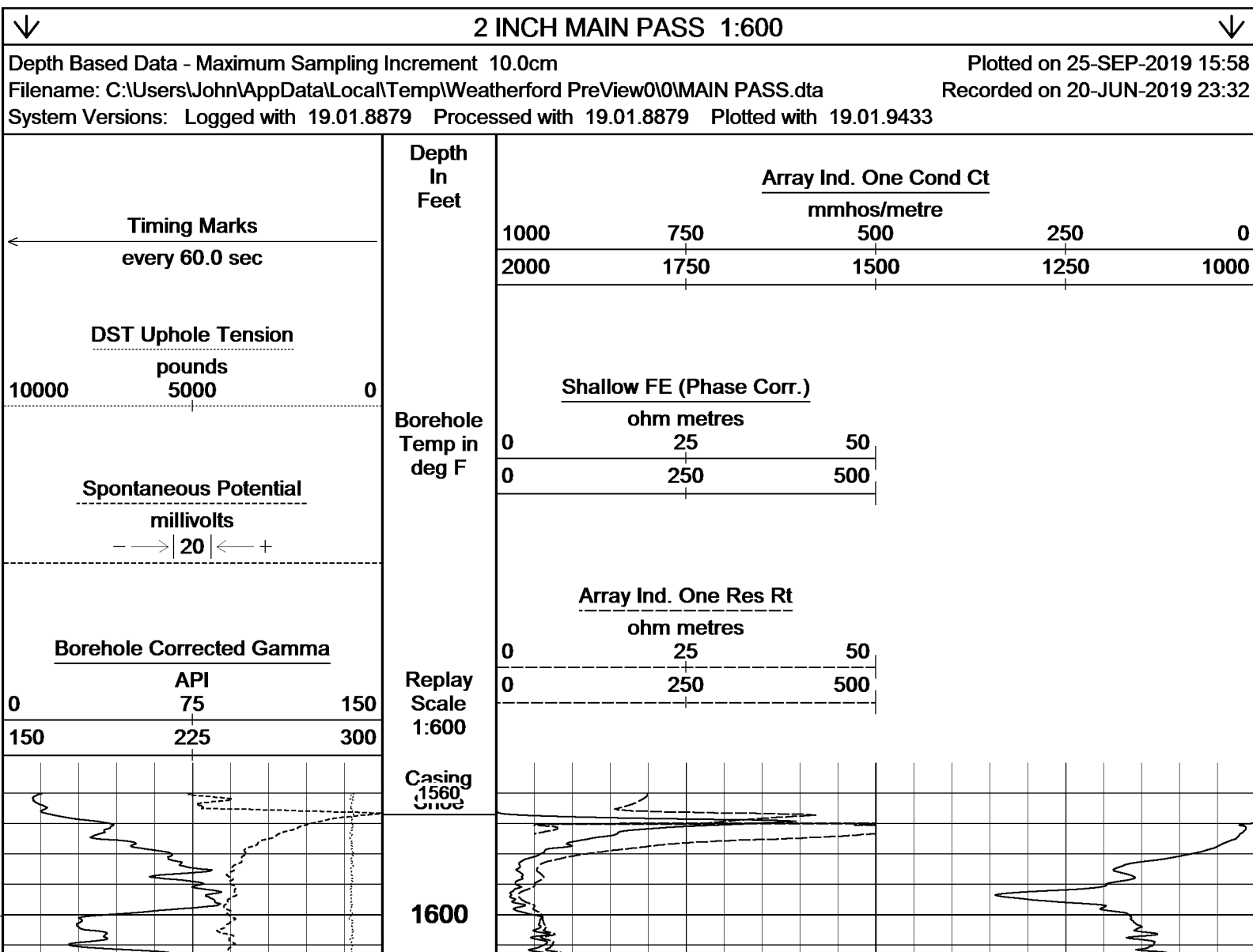
REMARKS
SOFTWARE: WLS 19.01.8879 - TOOLSTRING: RUN 1: CBH, SHA, MCG, MML, MDN, MPD, SKJ, MFE, MAI LOGGED IN COMBINATION. - HARDWARE USED: MAI: TWO 0.5 INCH STANDOFFS WITH HOLE FINDER. MFE: ONE 0.5 INCH STANDOFF. MDN: DUAL BOWSPRING. MPD: 8 INCH PROFILE PLATE. - DENSITY MATRICES: 2.71 G/CC DENSITY MATRIX USED TO CALCULATE LIMESTONE POROSITY. 2.65 G/CC DENSITY MATRIX USED TO CALCULATE SANDSTONE POROSITY. 2.87 G/CC DENSITY MATRIX USED TO CALCULATE DOLOMITE POROSITY. - LOGGING INTERVAL REQUESTED: INDUCTION LOGGING (20' - 1320') CASING SHOOT

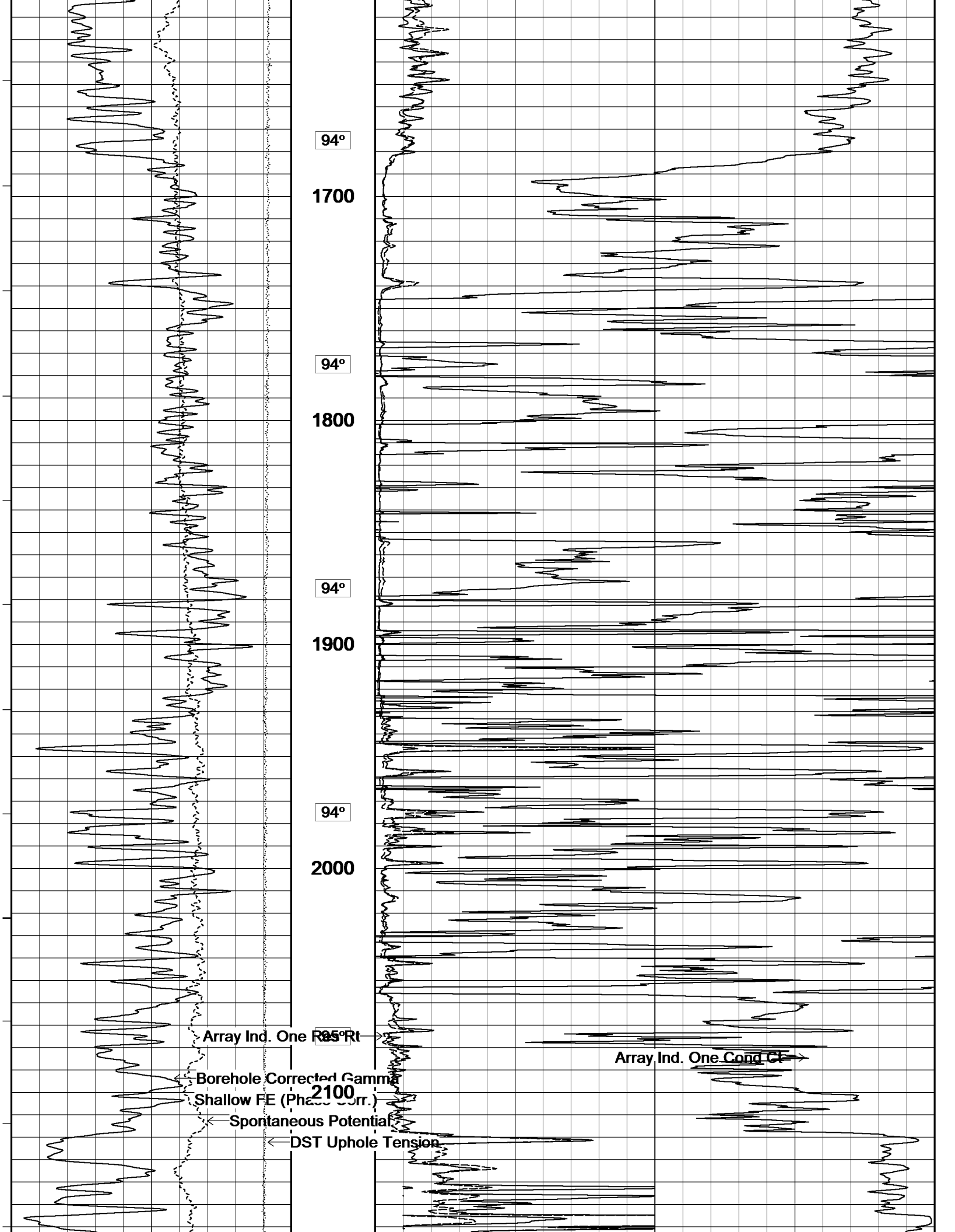
INDUCTION / GAMMA / SP = TD - CASING SHOE.
DENSITY / NEUTRON / MICRO-RESISTIVITY / CALIPER = TD - 4000 FT.

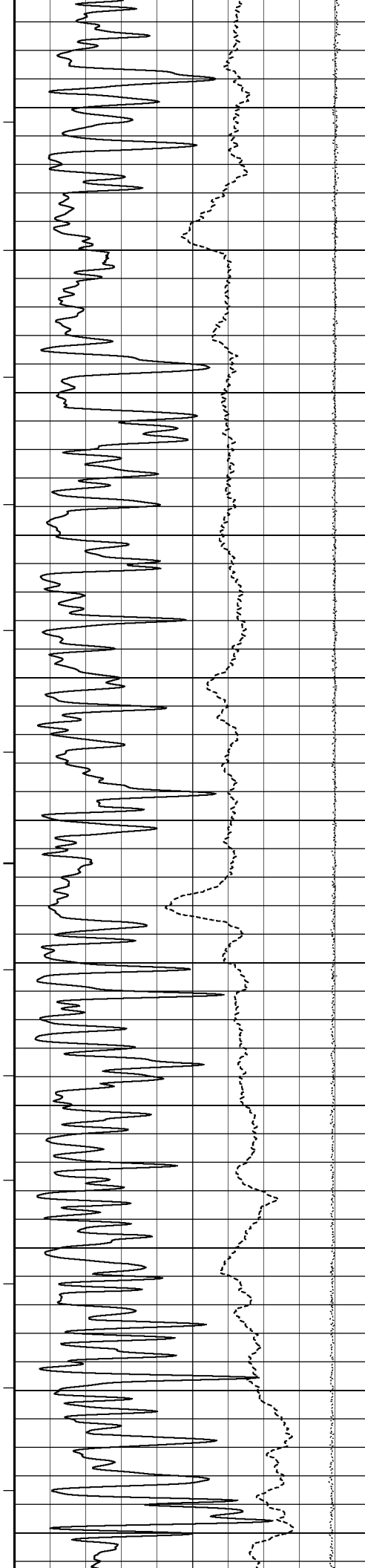
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 1400 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 630 CU.FT.
- CREW: B. TOVAR, B. COPELAND, C. BAKER.
- MUD PROPERTIES:
CHLORIDES: 4000 PPM.
LCM: 5 #/BBL.

TOOLS BRIDGED OFF AT 4742', MADE IT TO TD AFTER WIPER TRIP

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.







95°

2200

95°

2300

95°

2400

96°

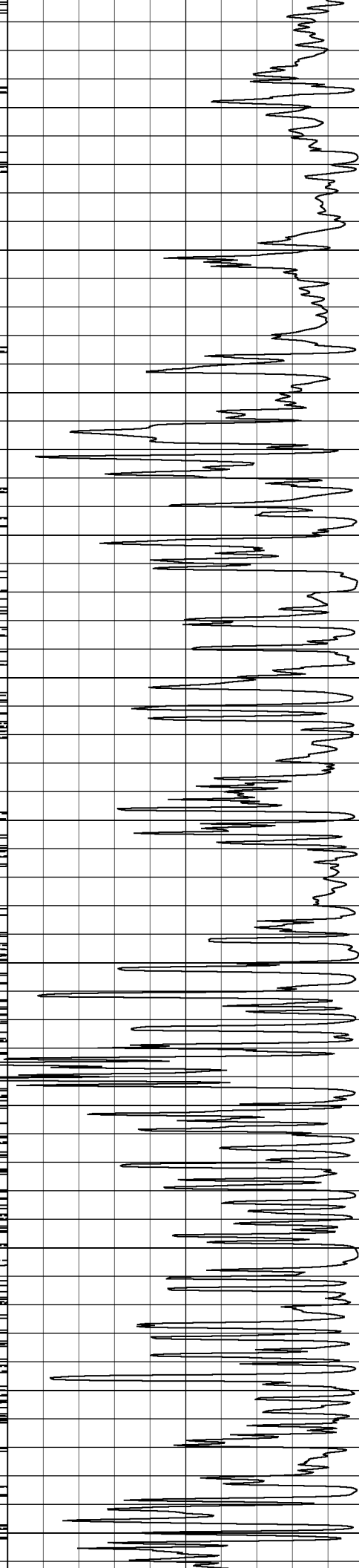
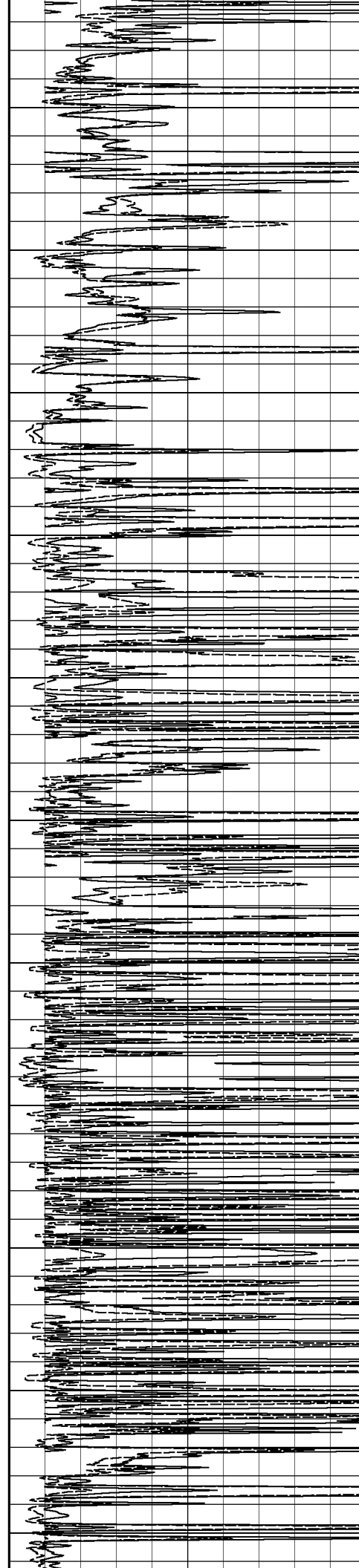
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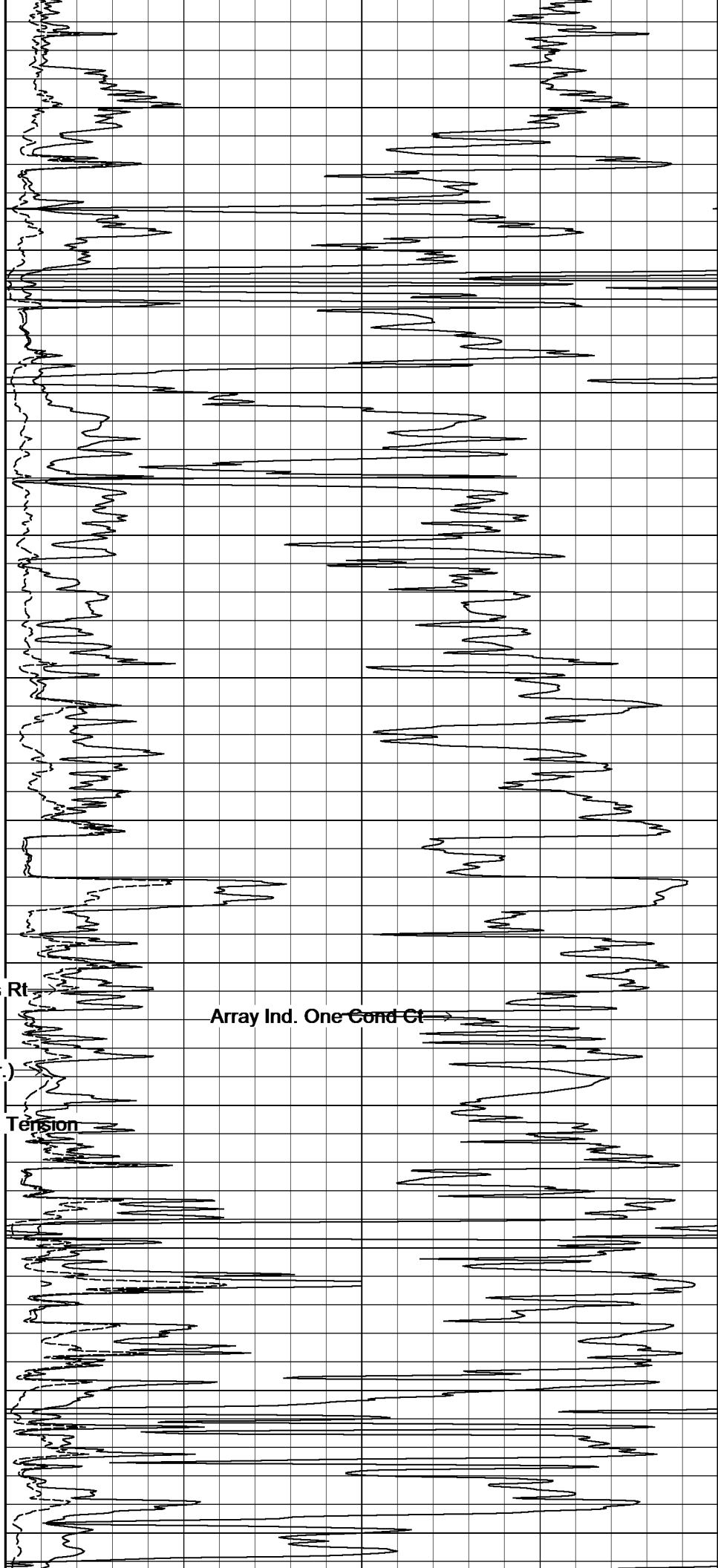
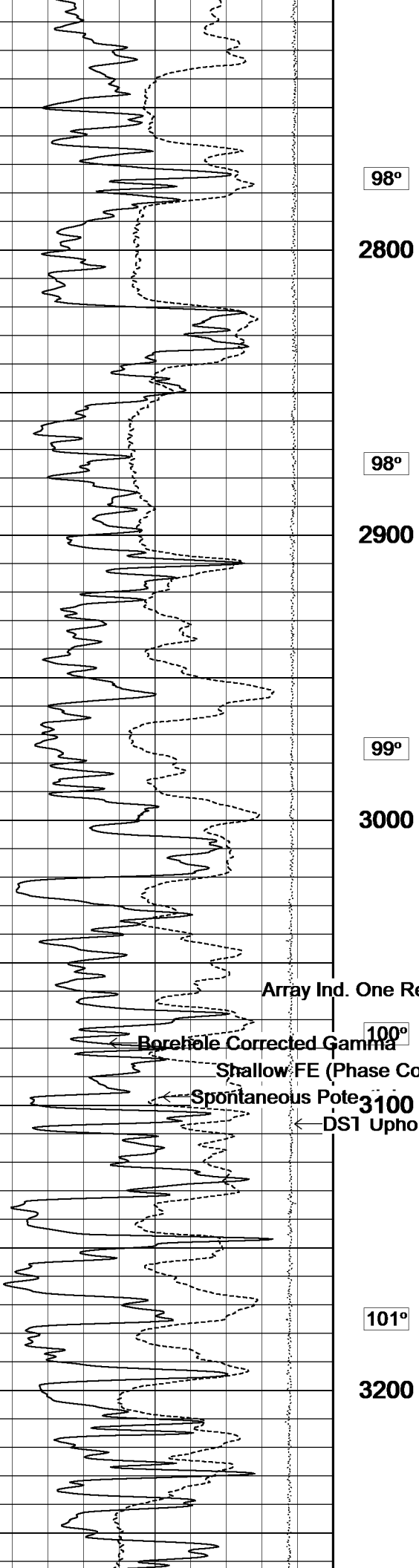
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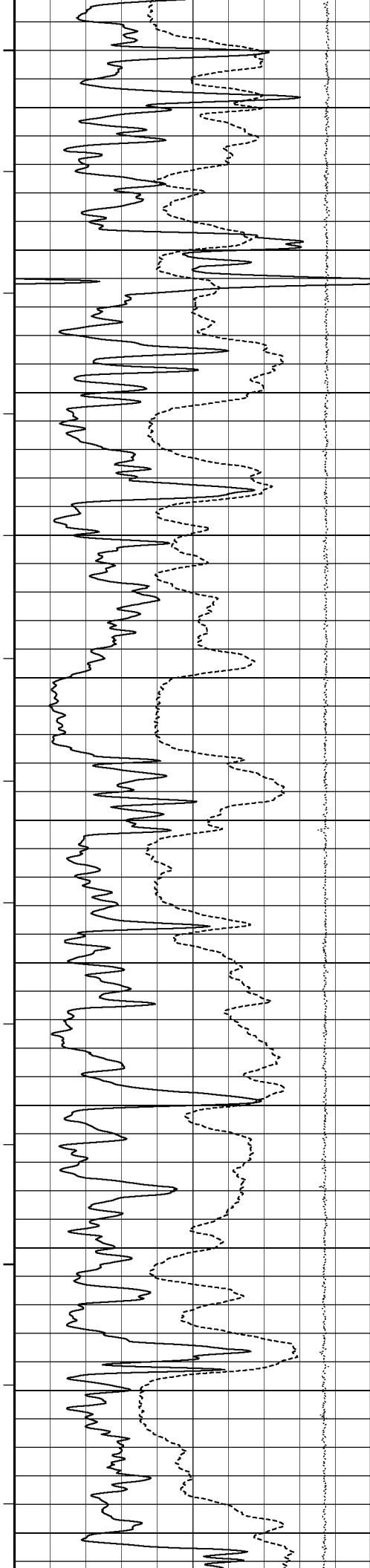
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2700







101°

3300

102°

3400

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3500

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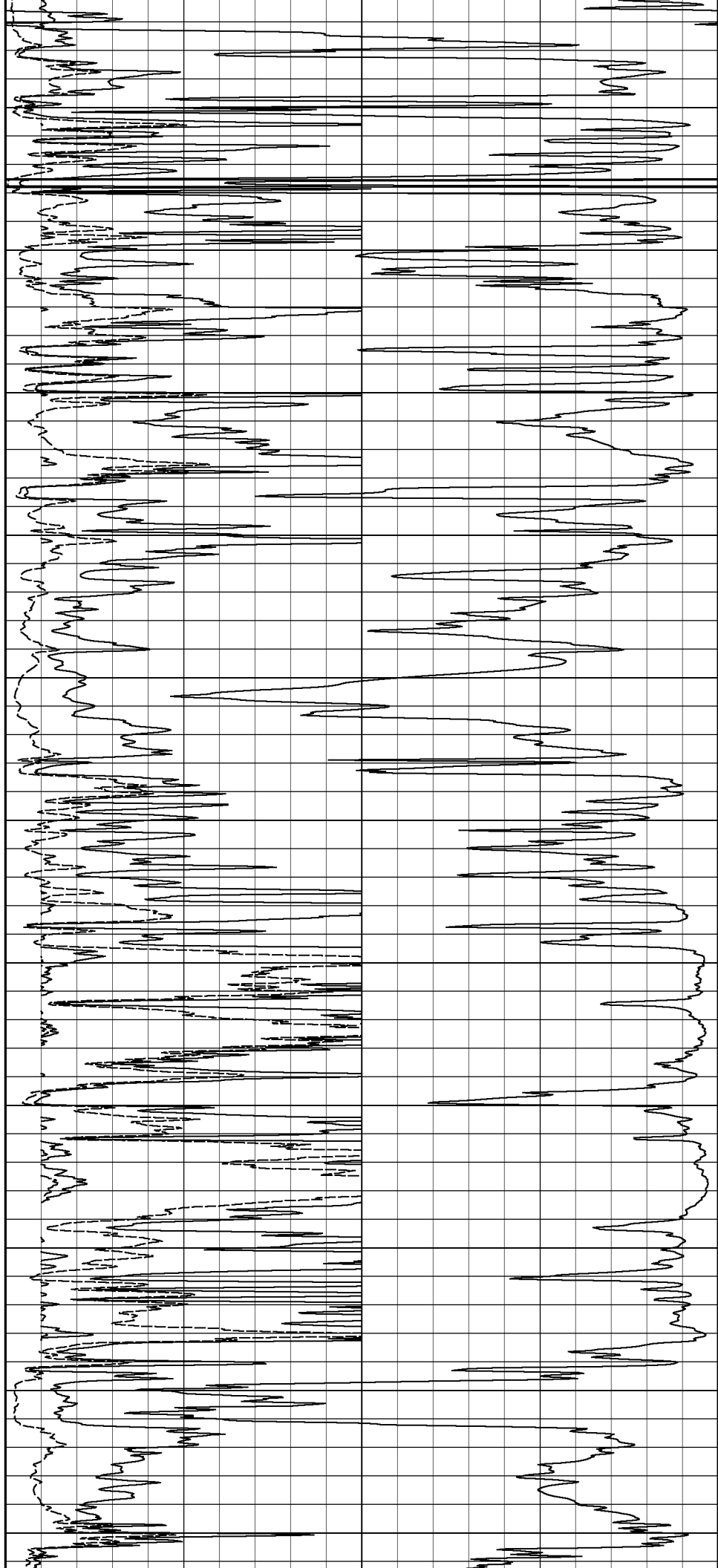
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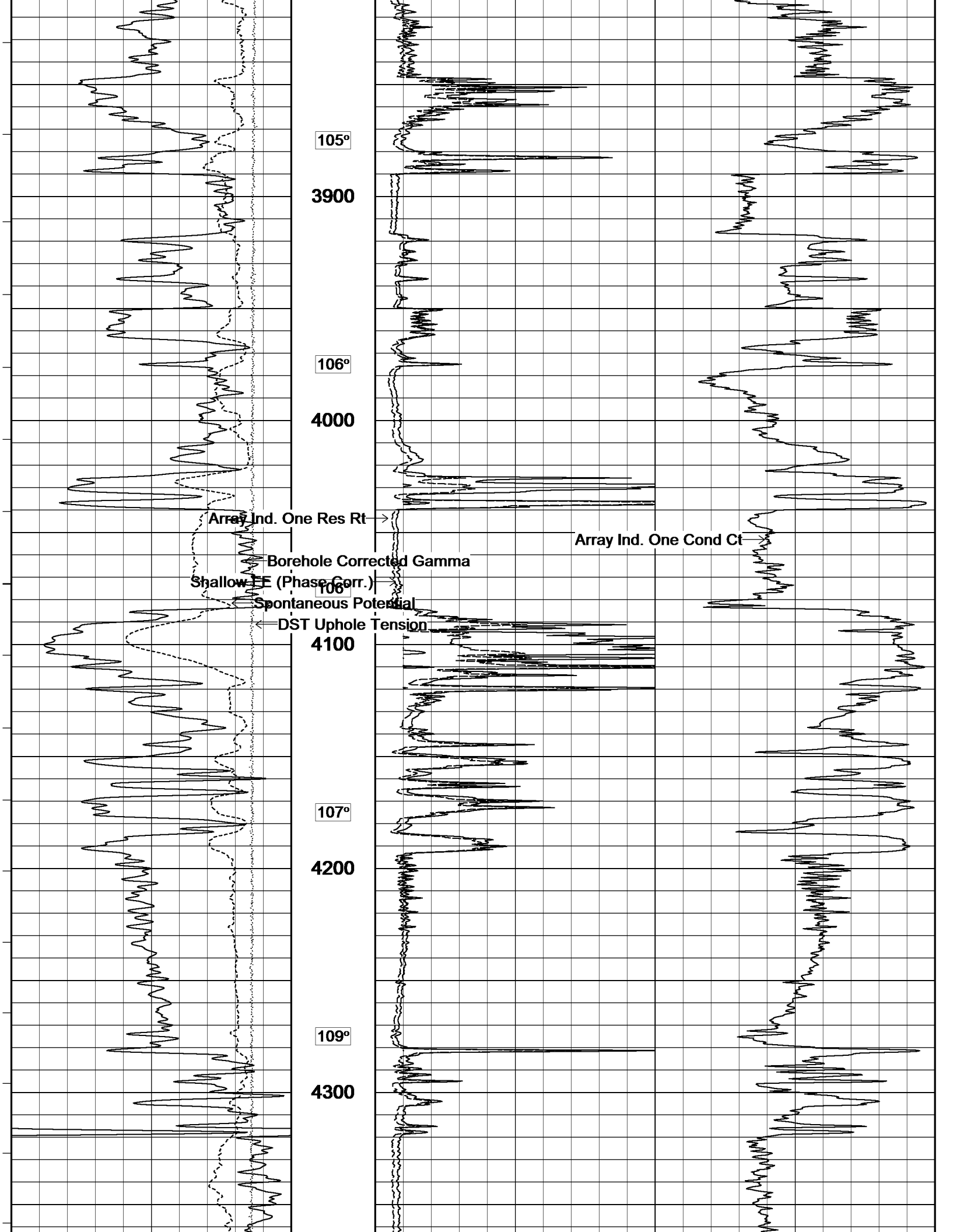
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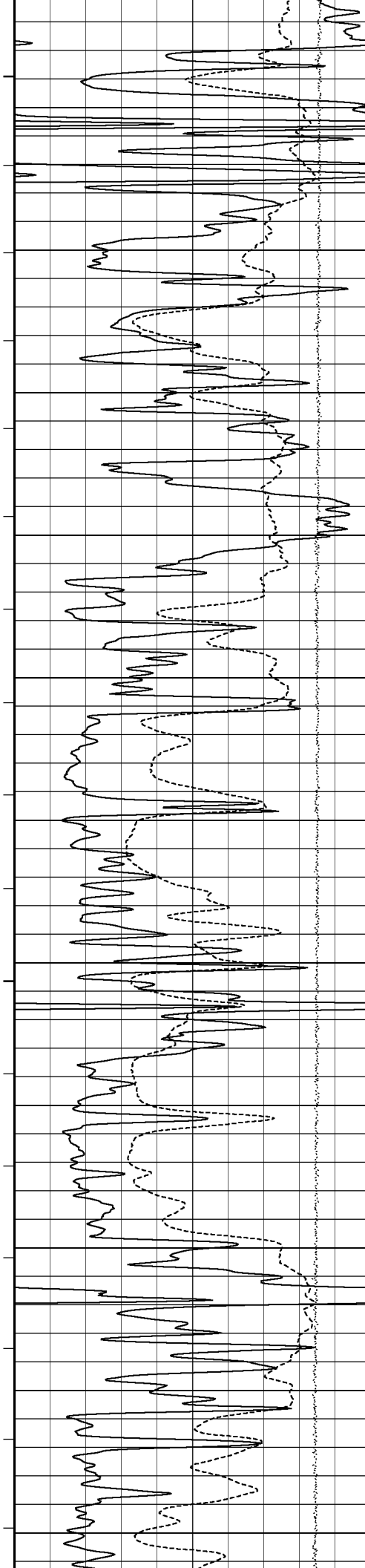
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109°

4400

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111°

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111°

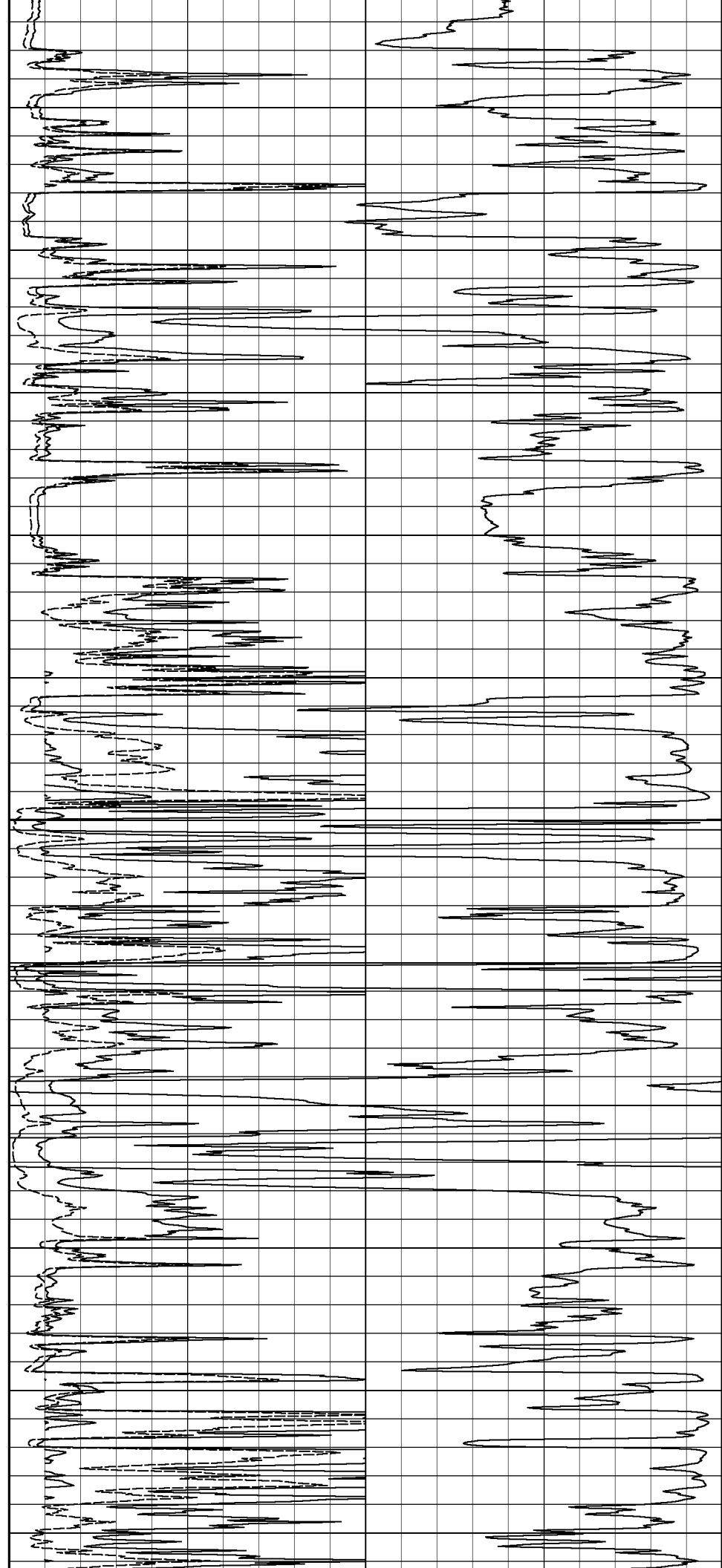
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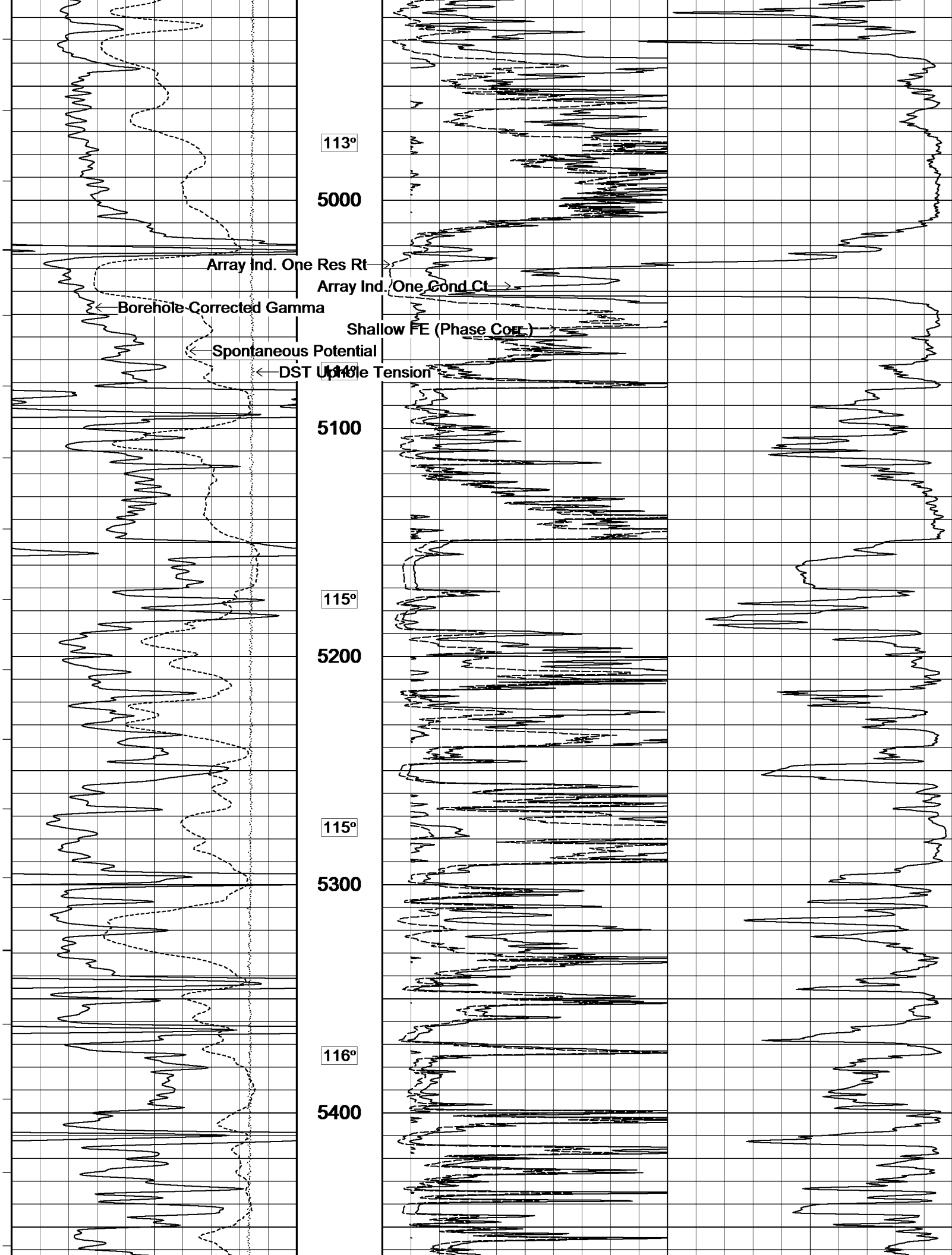
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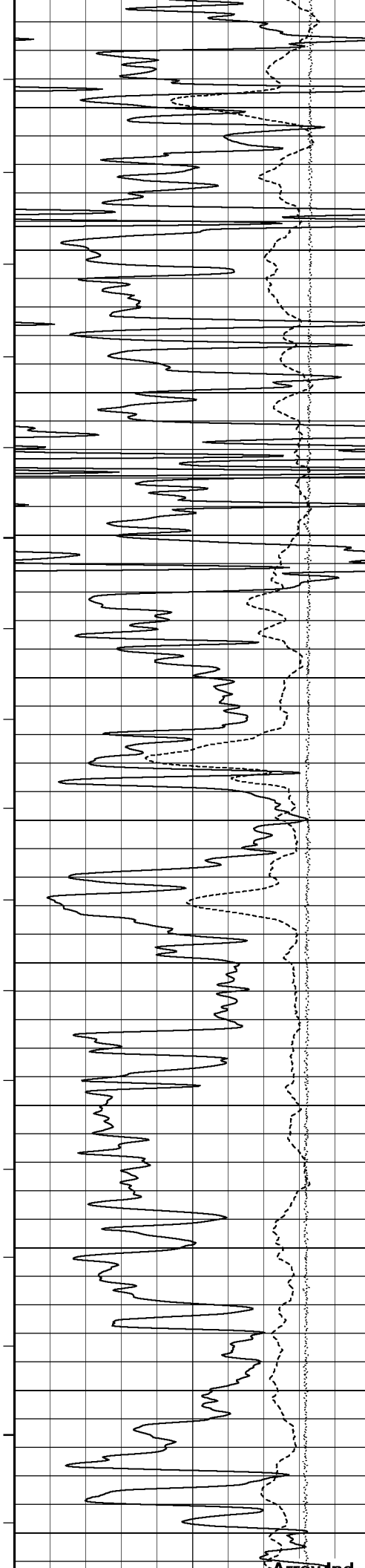
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113°

4900







117°

5500

117°

5600

119°

5700

119°

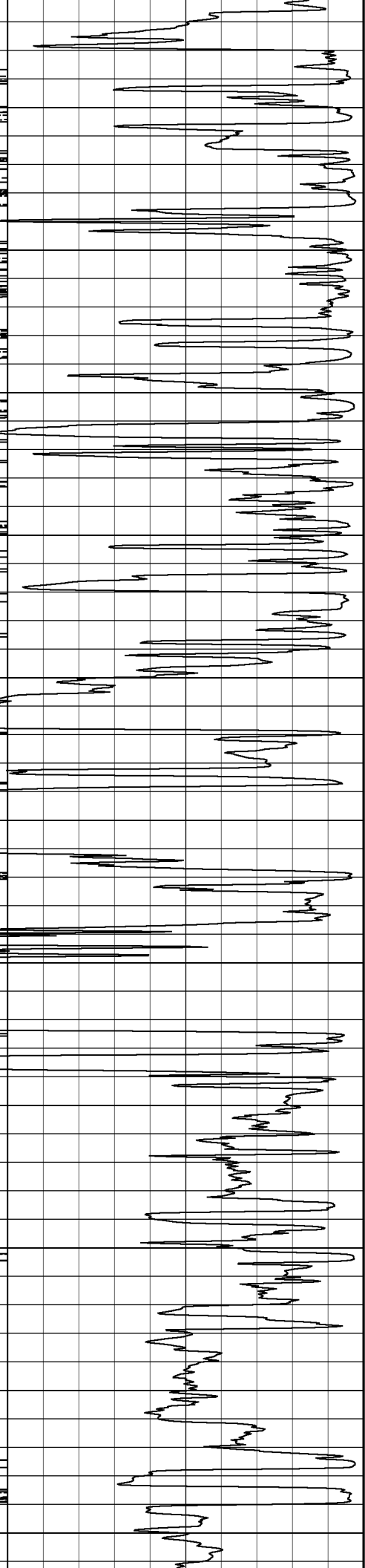
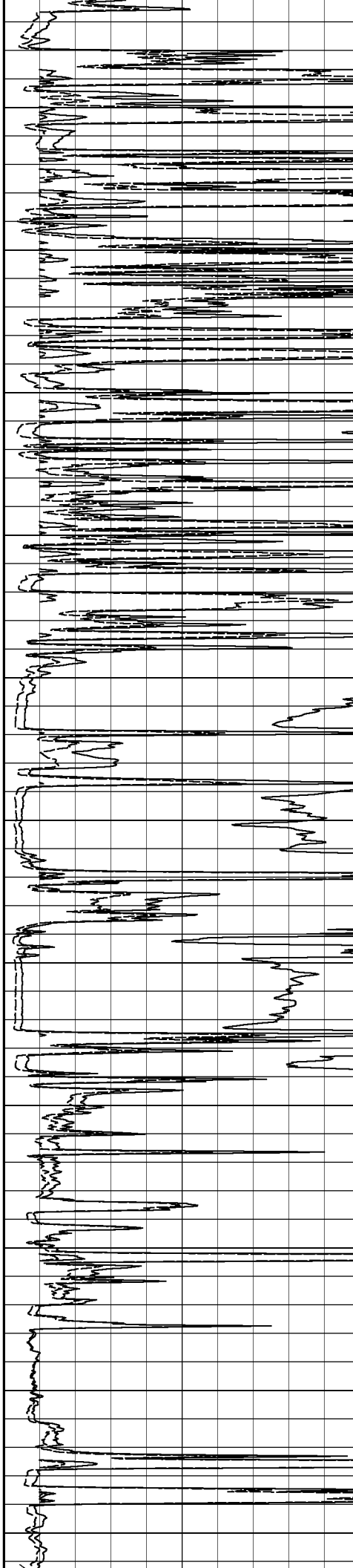
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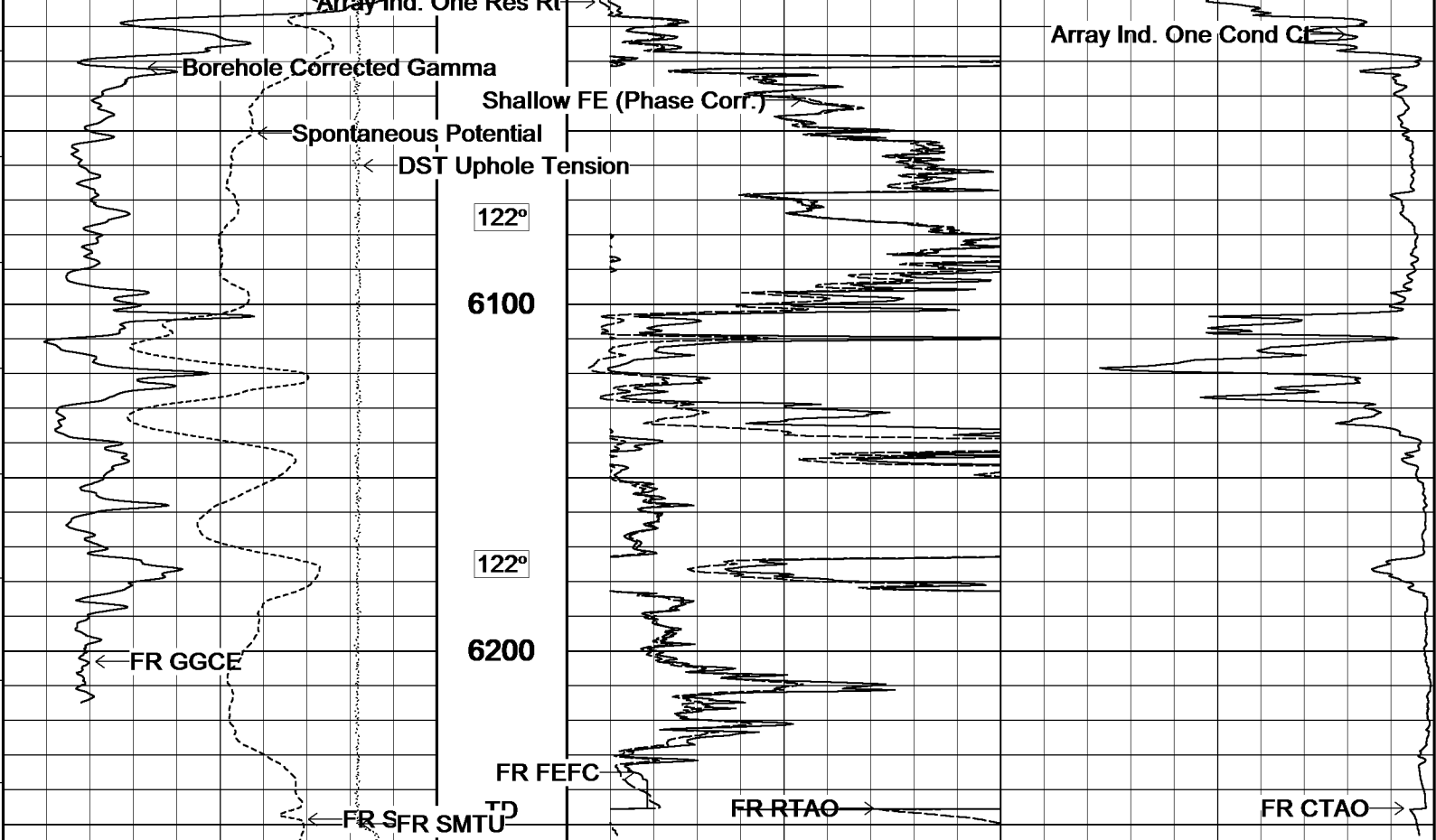
120°

5900

122°

6000





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Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Users\John\AppData\Local\Temp\Weatherford PreView0\0\MAIN PASS.dta
 System Versions: Logged with 19.01.8879 Processed with 19.01.8879 Plotted with 19.01.9433

↑ 2 INCH MAIN PASS 1:600 ↑

↓ 5 INCH MAIN PASS 1:240 ↓

Array Ind. One Cond Ct

Borehole Corrected Gamma

Shallow FE (Phase Corr.)

Spontaneous Potential

DST Uphole Tension

122°

6100

122°

6200

FR GGCE

FR FEFC

FR SFR SMTU

FR RTAO

FR CTAO

Timing Marks
every 60.0 sec

DST Uphole Tension
pounds

Spontaneous Potential
millivolts
----->|20|<-----+

Borehole Corrected Gamma
API

Depth
In
Feet

Borehole
Temp in
deg F

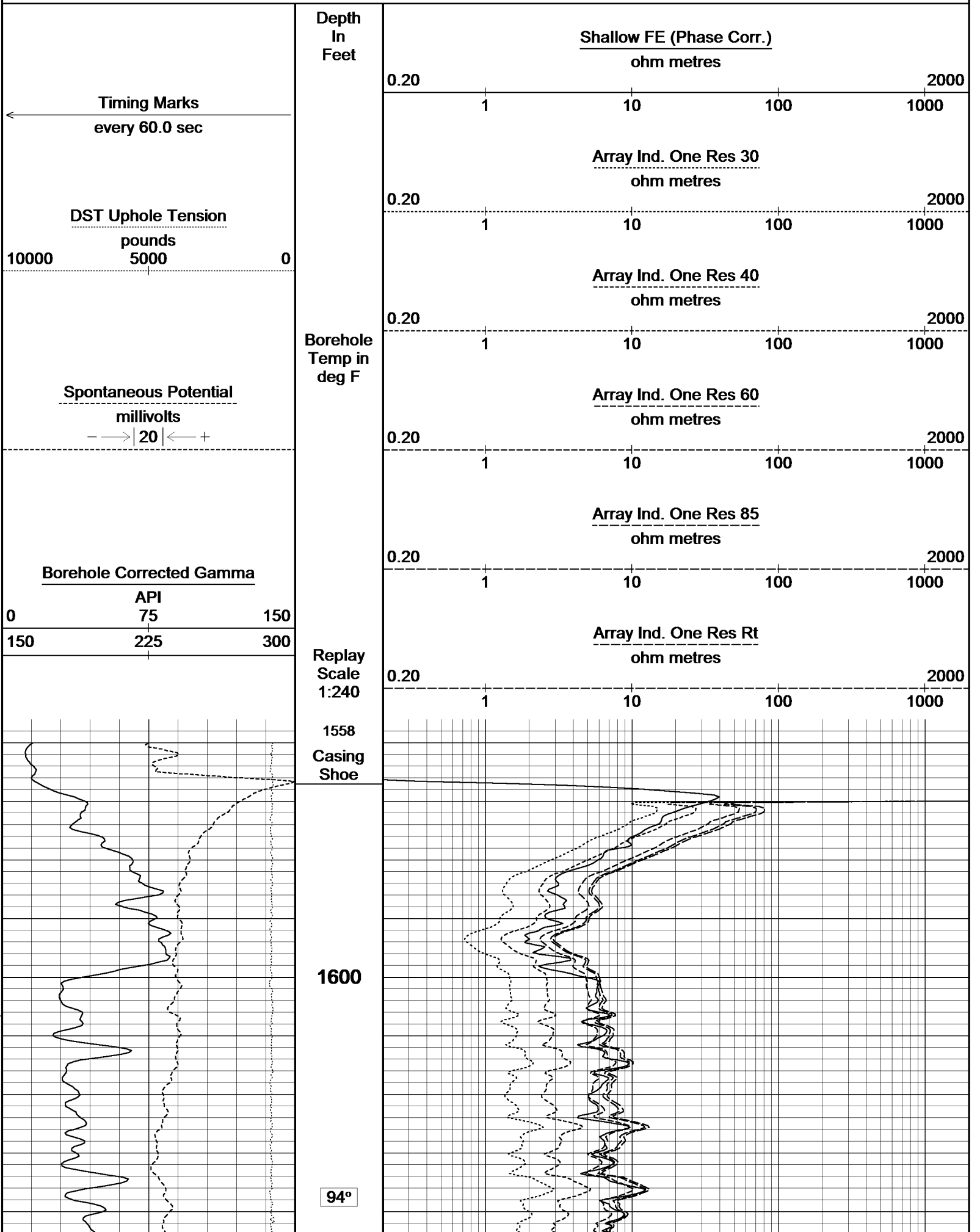
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Scale
1:600

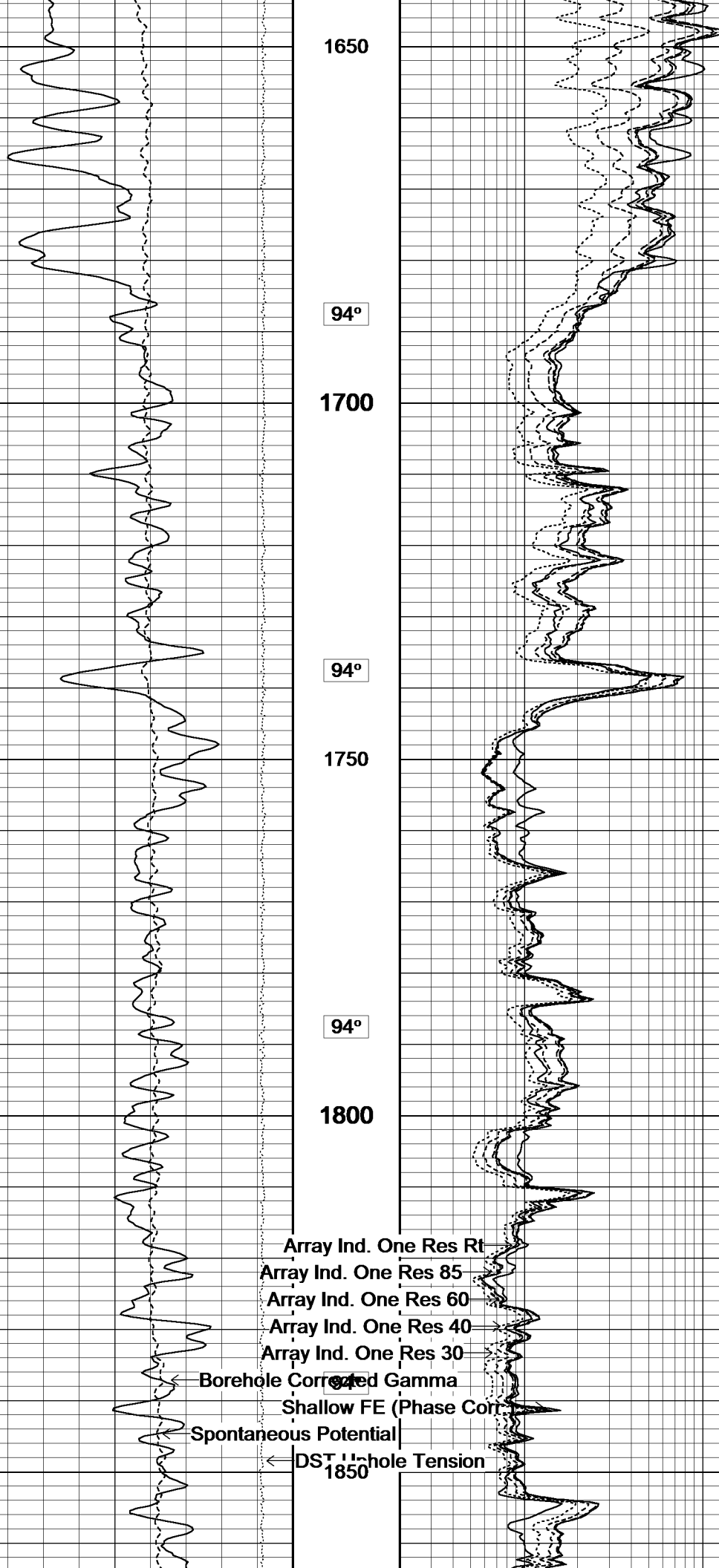
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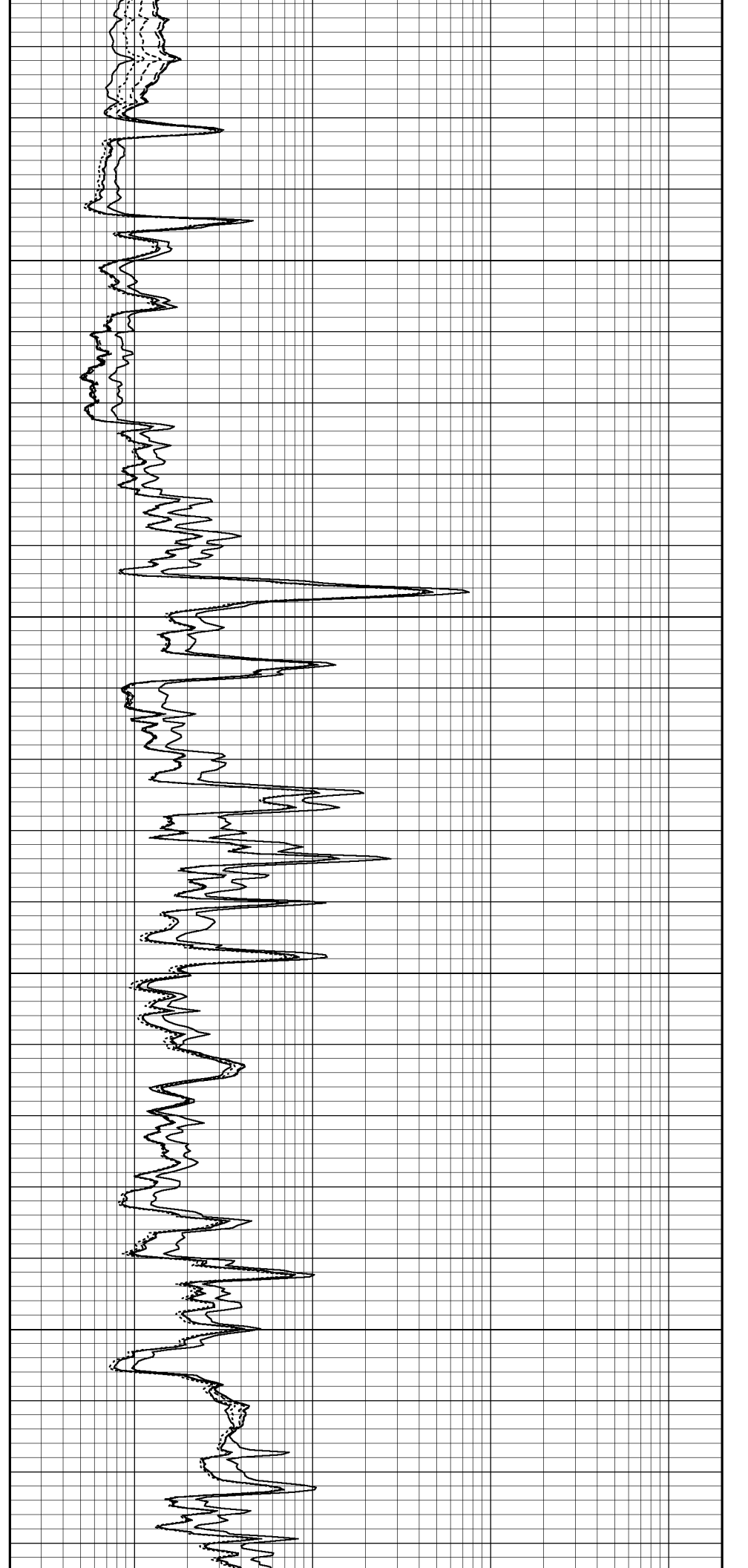
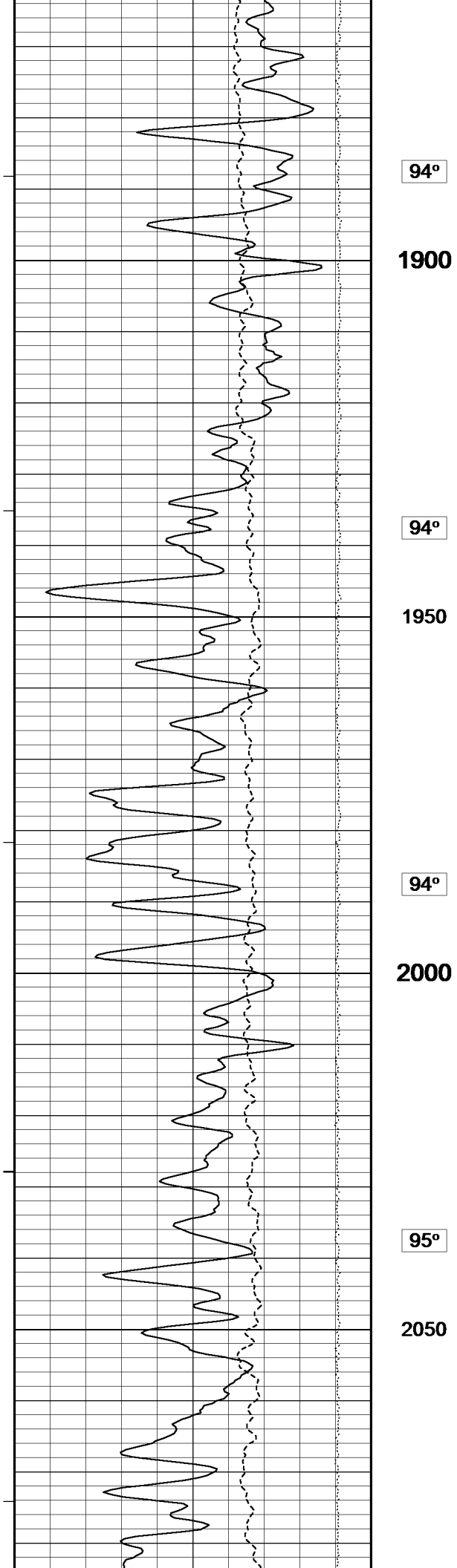
Shallow FE (Phase Corr.)

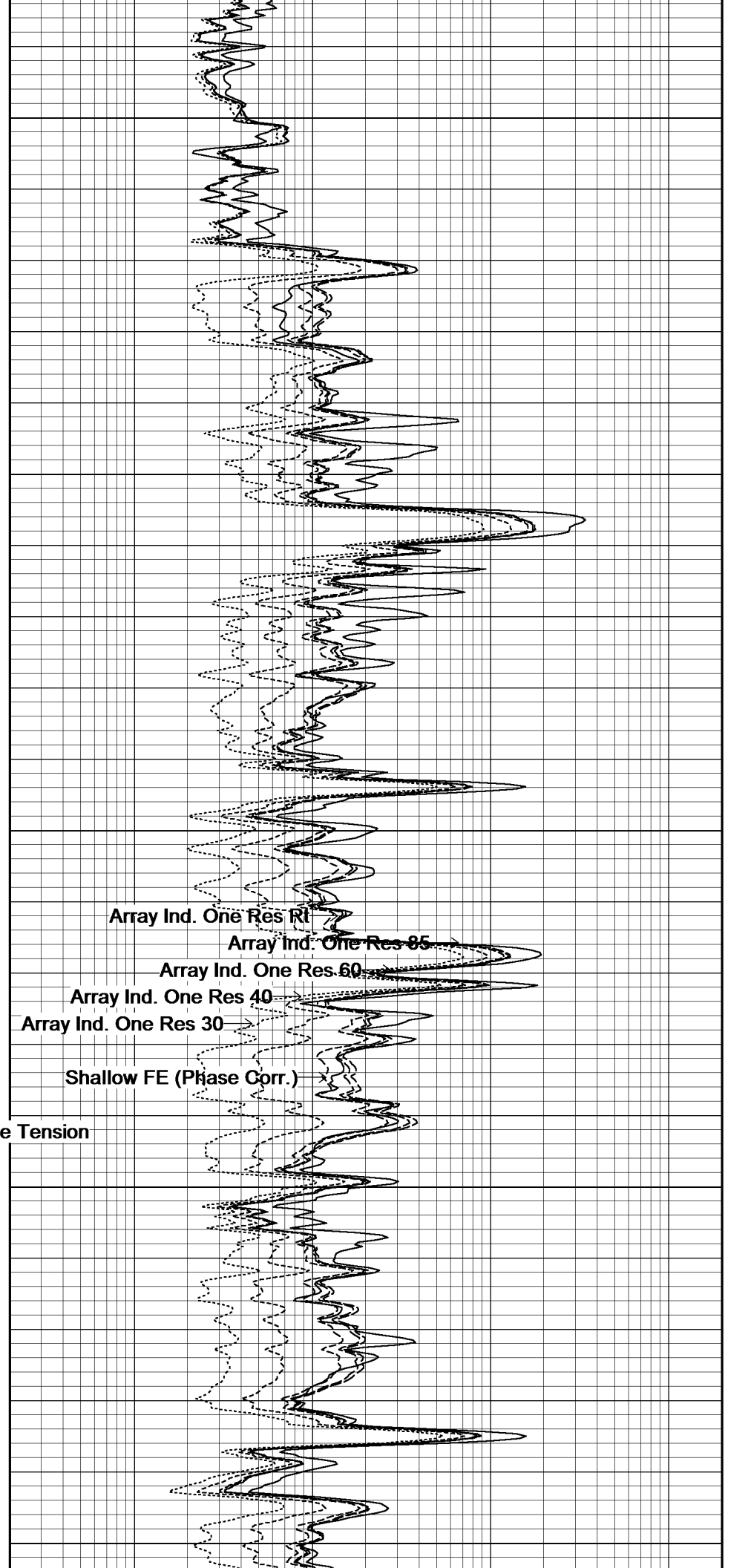
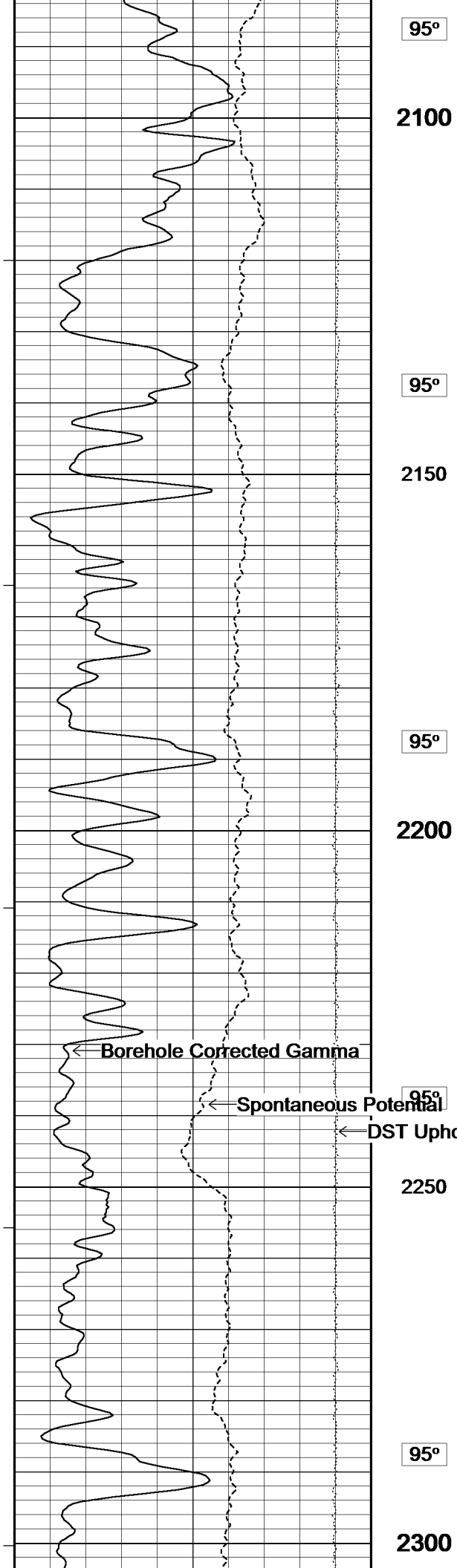
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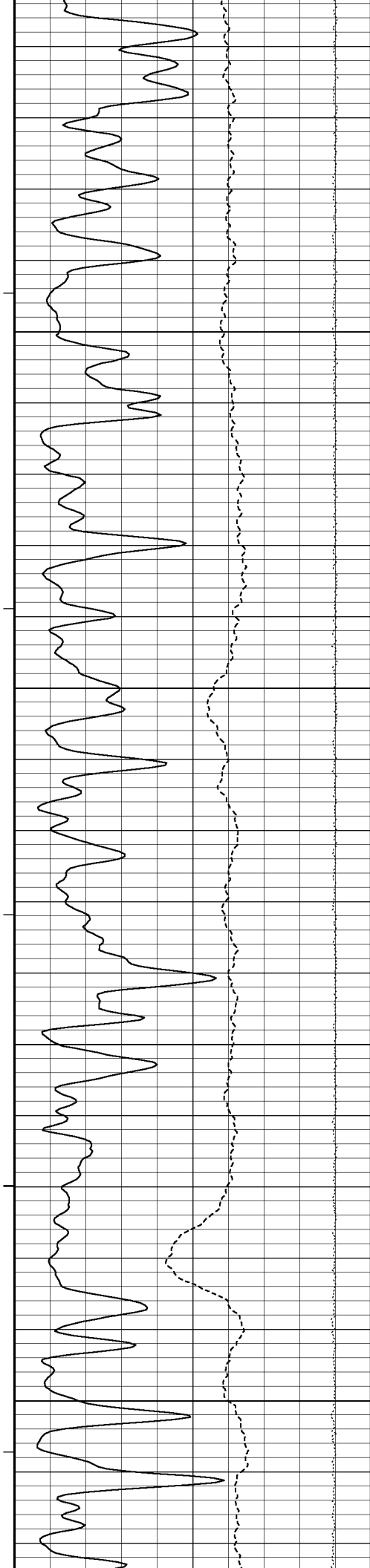
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Recorded on 20-JUN-2019 23:32











95°

2350

95°

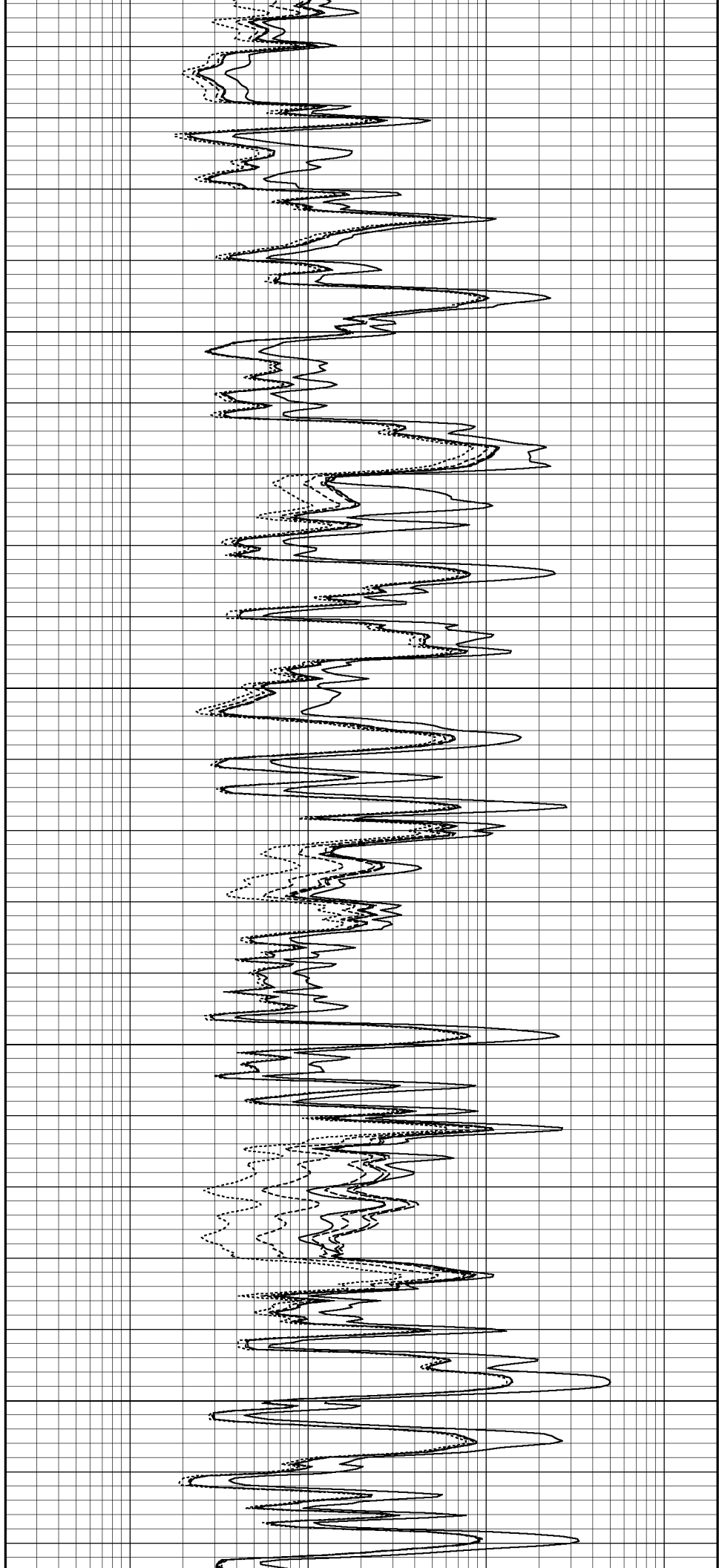
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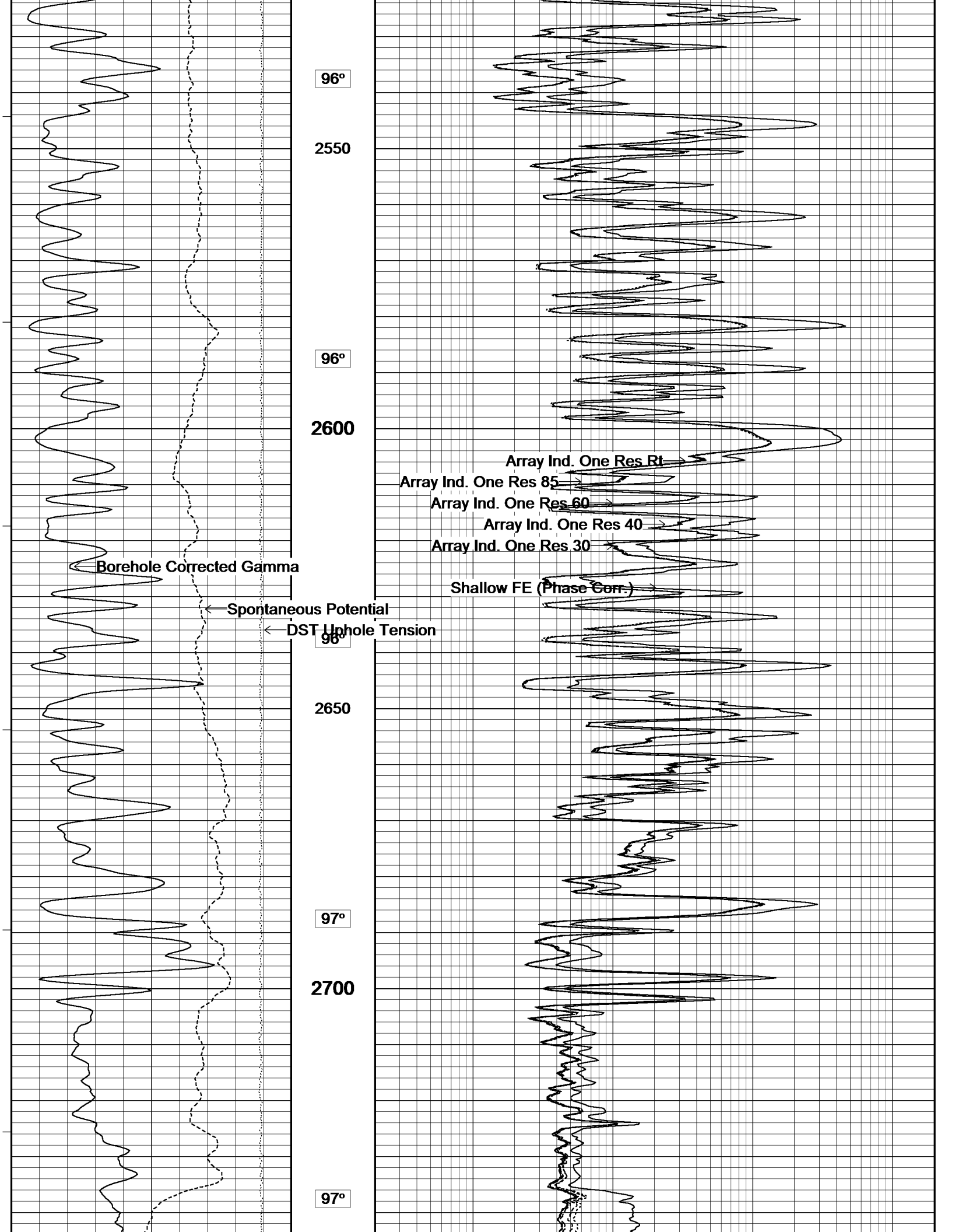
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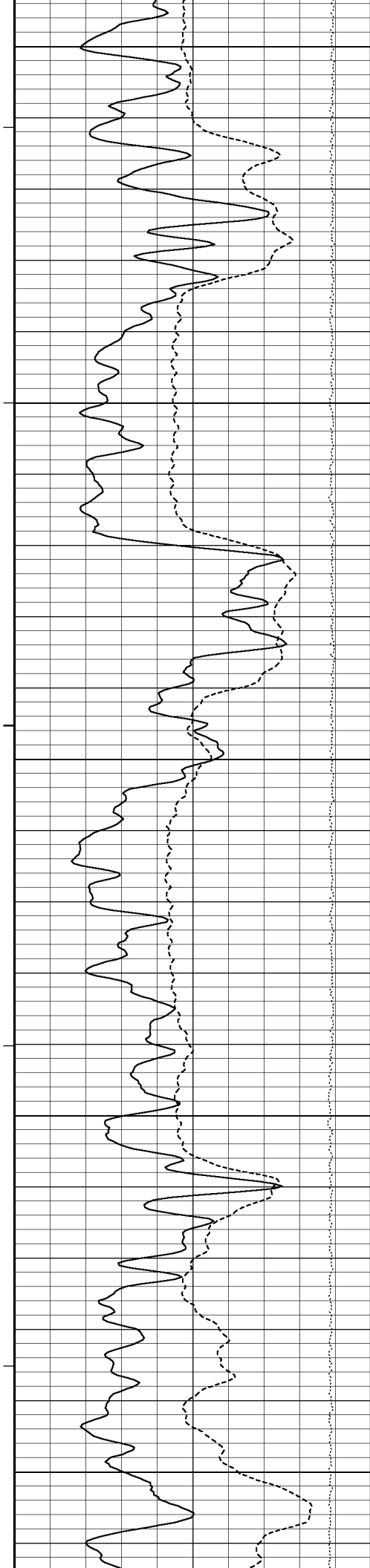
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96°

2500







2750

98°

2800

98°

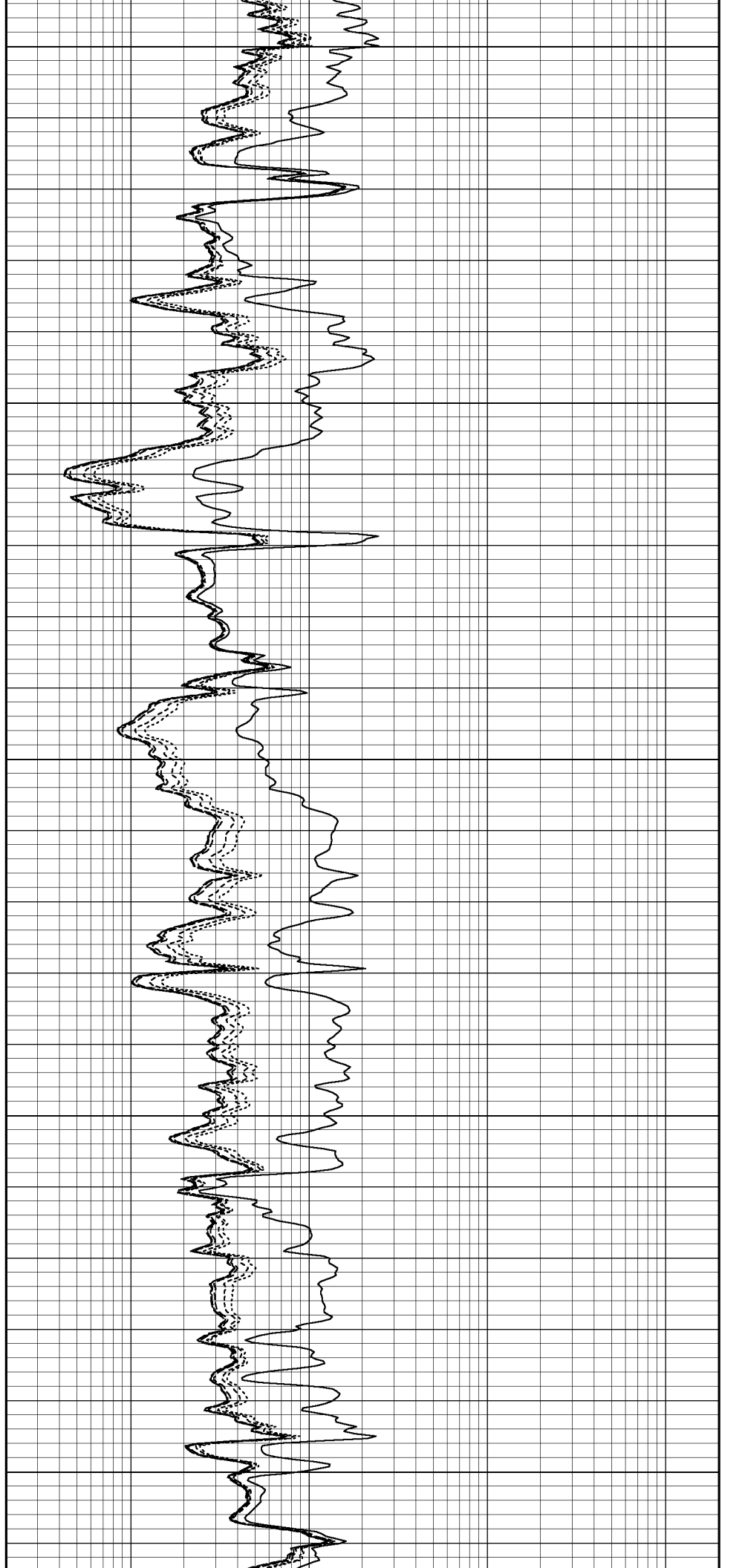
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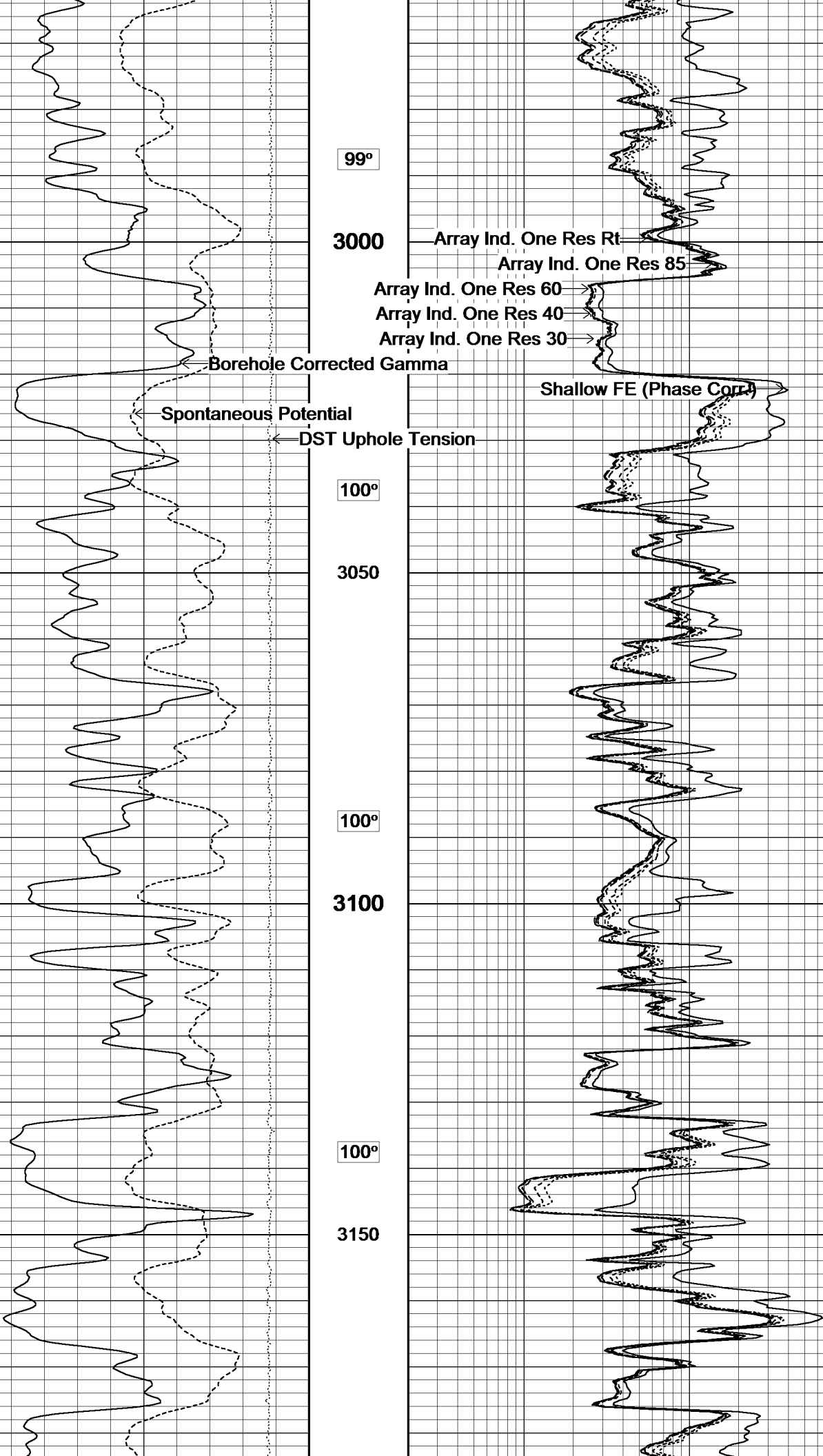
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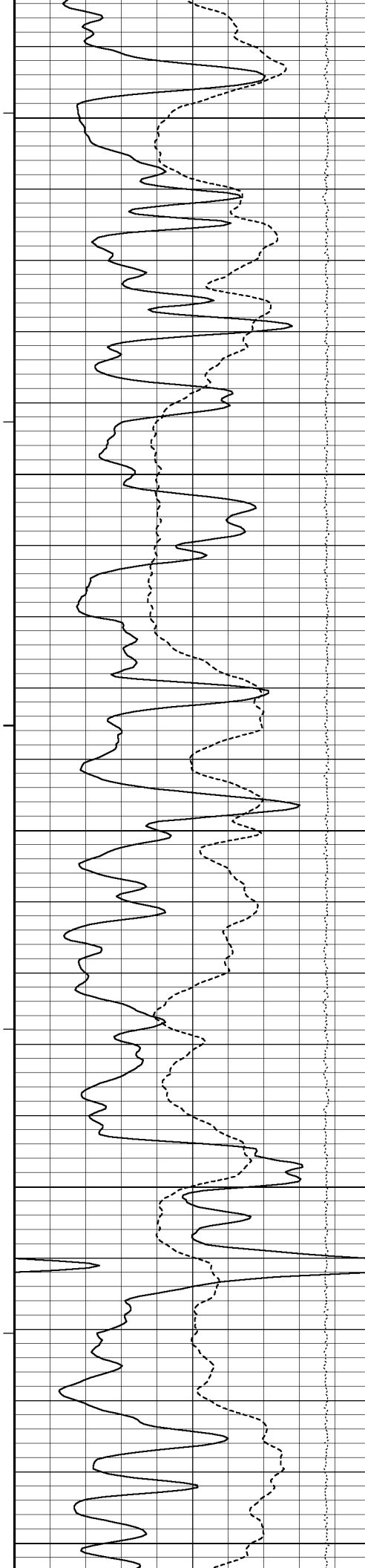
2900

99°

2950







100°

3200

101°

3250

101°

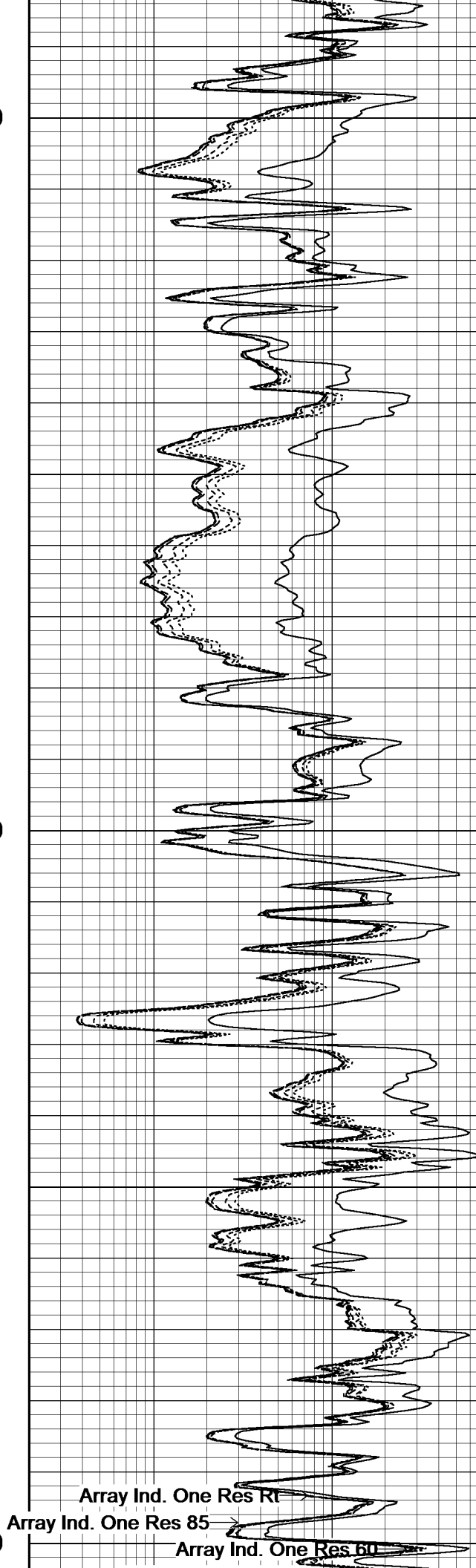
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102°

3350

102°

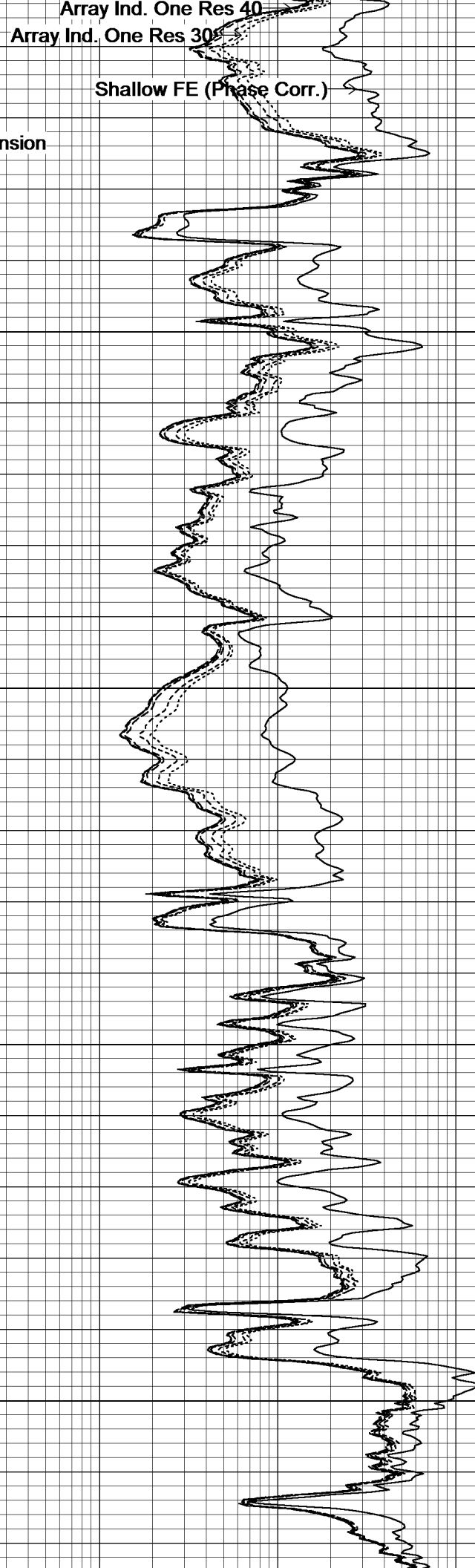
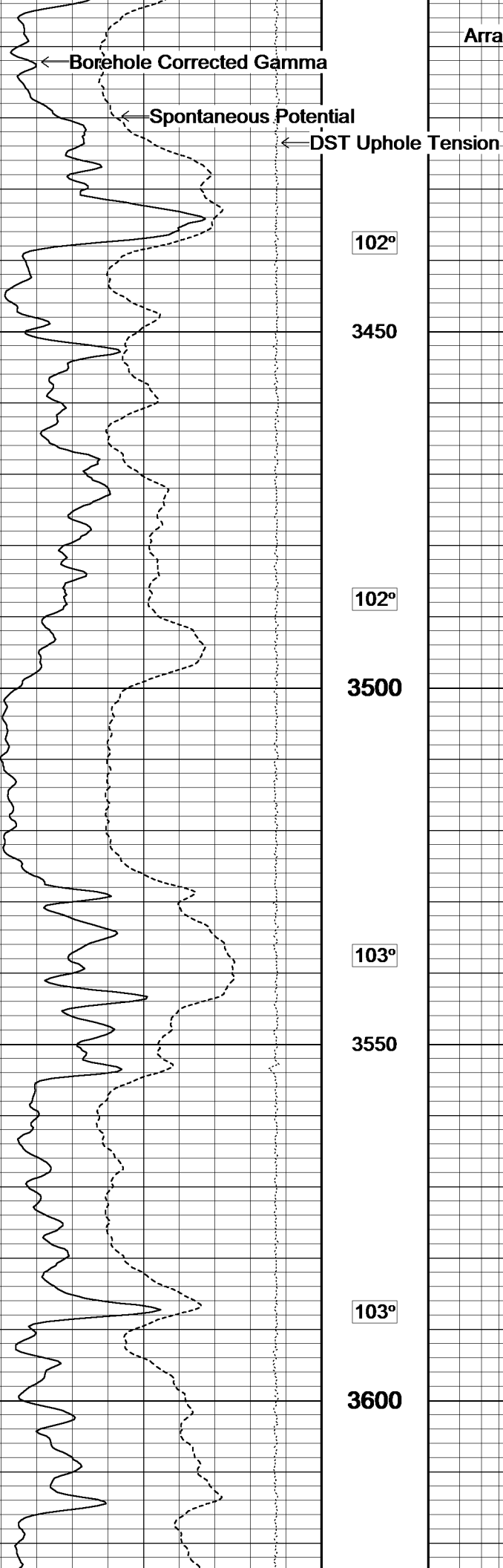
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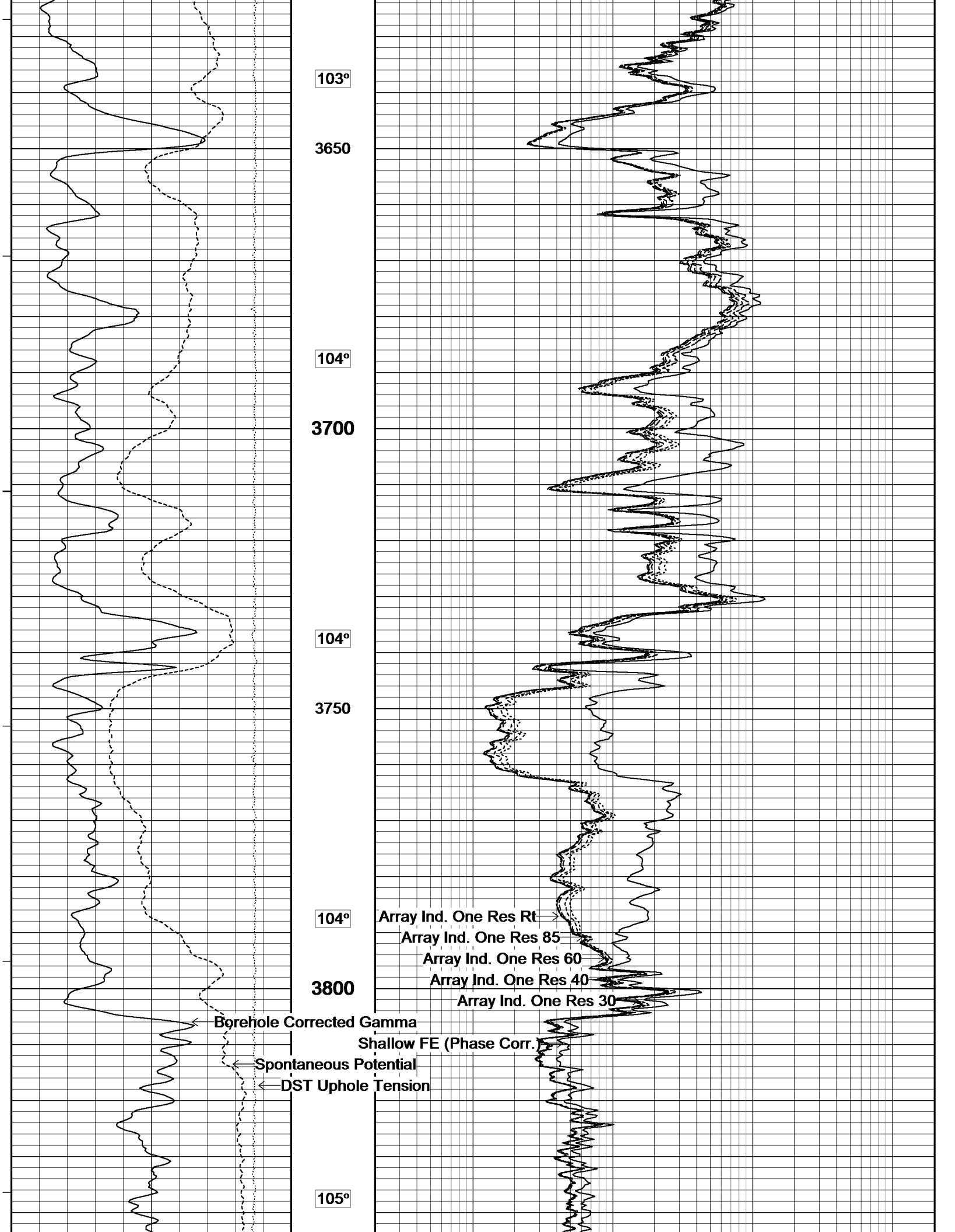


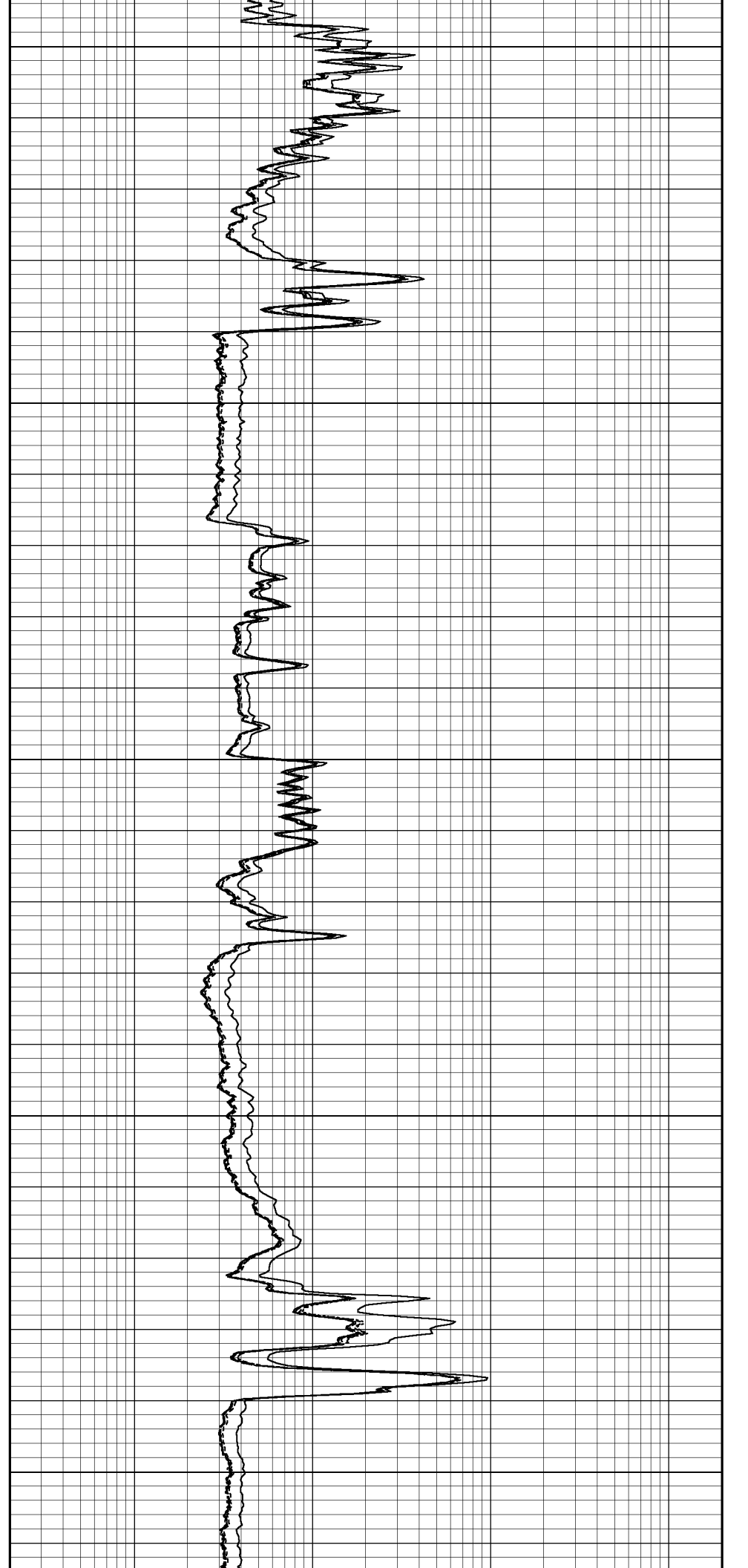
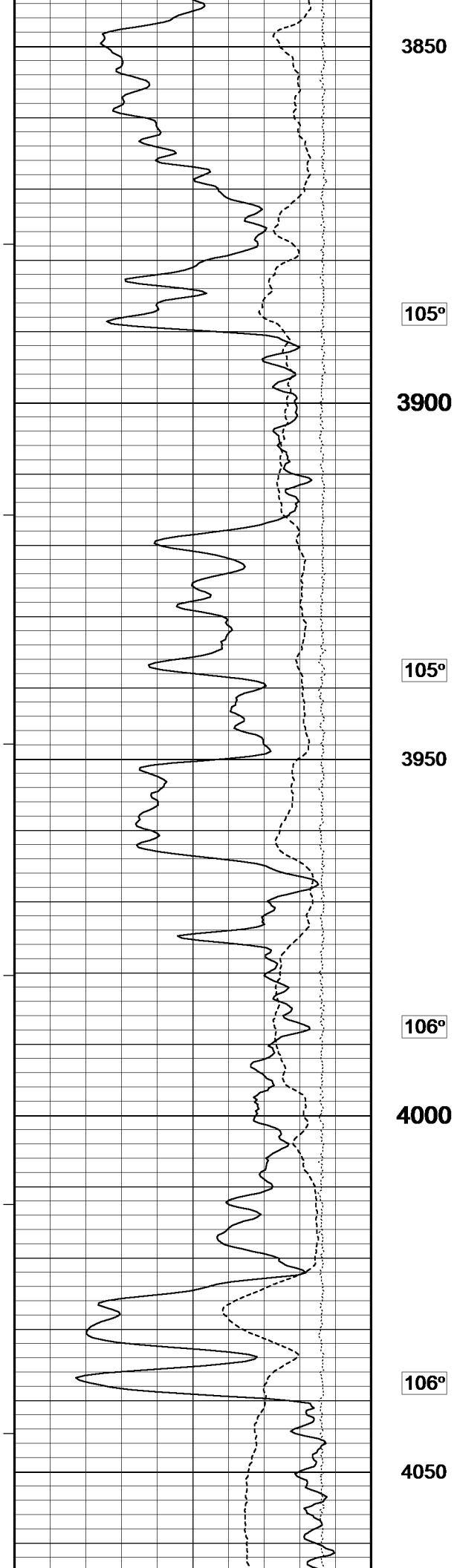
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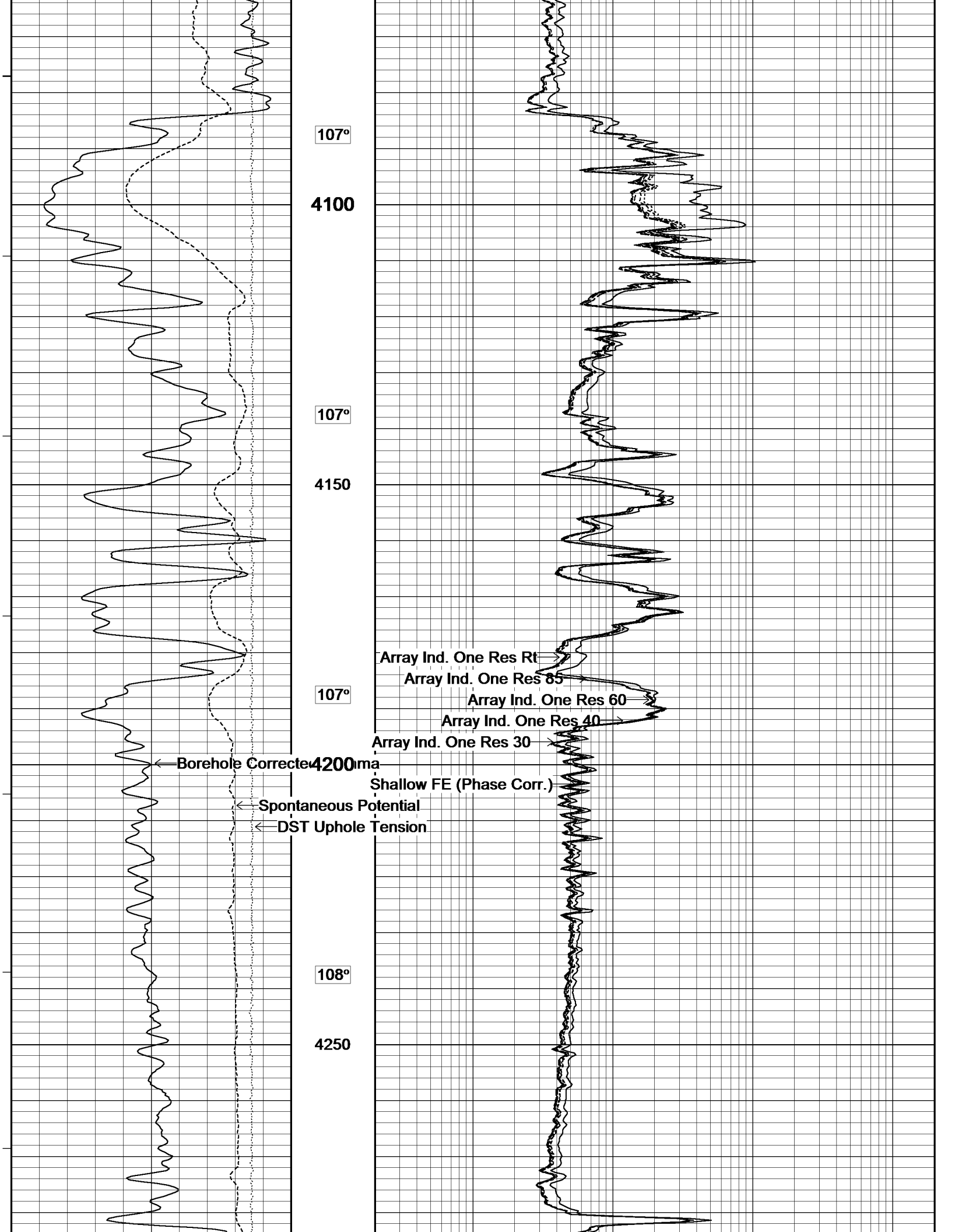
Array Ind. One Res 85

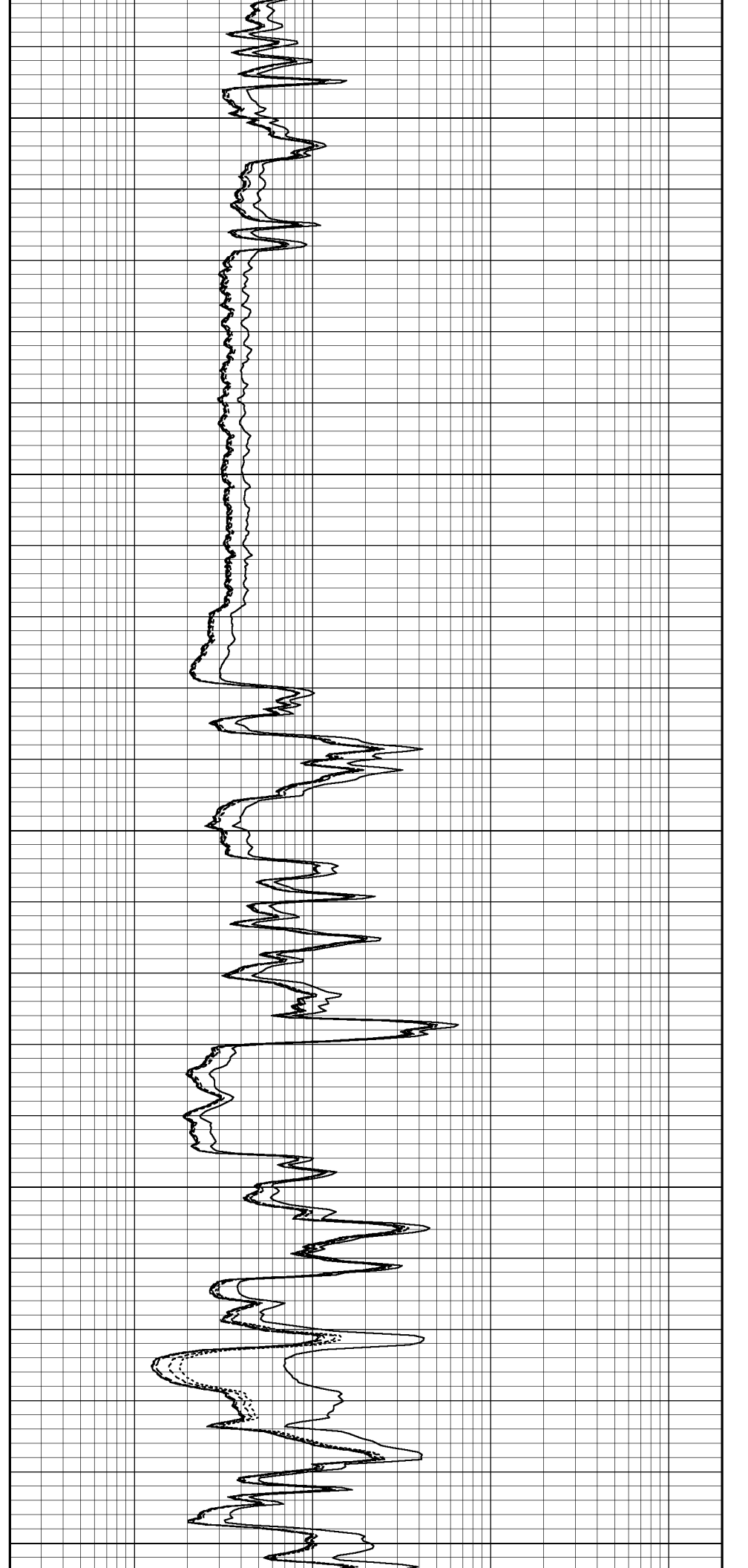
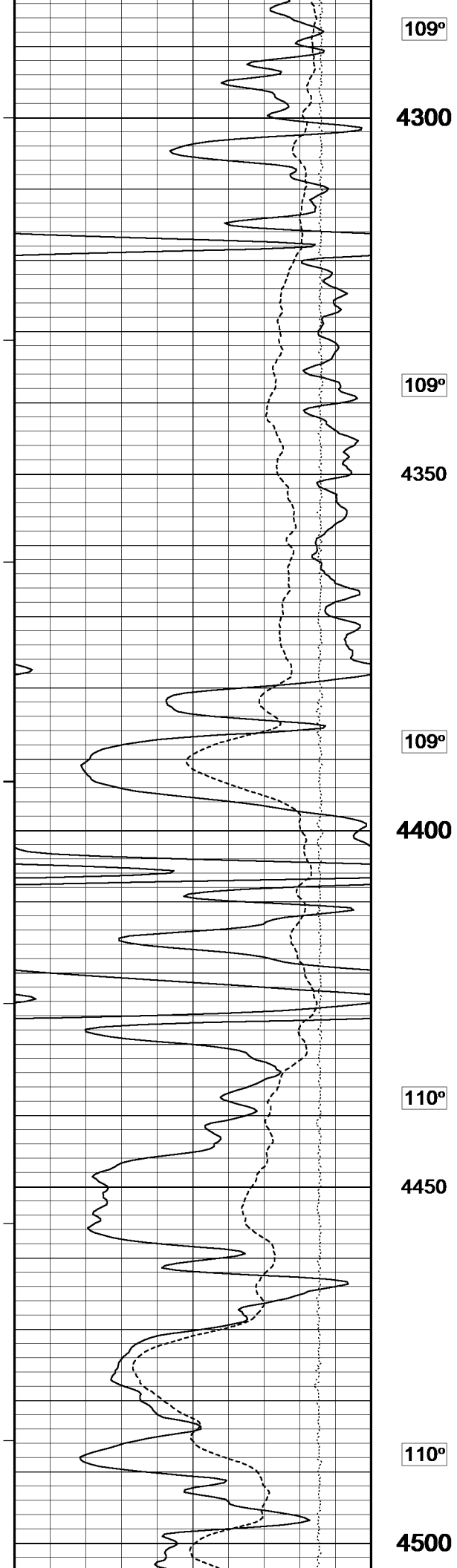
Array Ind. One Res 60

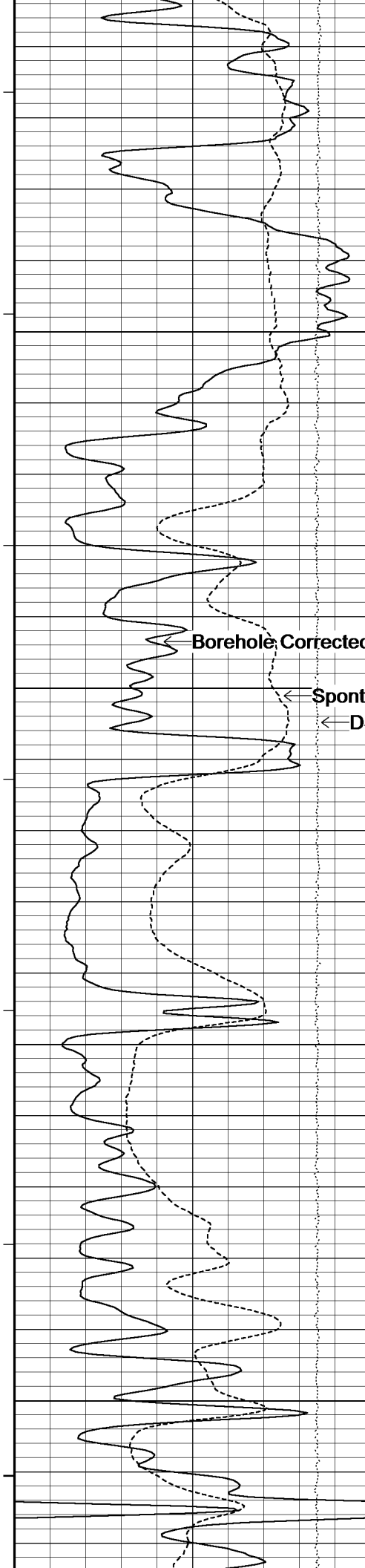












111°

4550

111°

4600

111°

4650

111°

4700

Borehole Corrected Gamma

Spontaneous Potential

DST Uphole Tension

Array Ind. One Res Rt

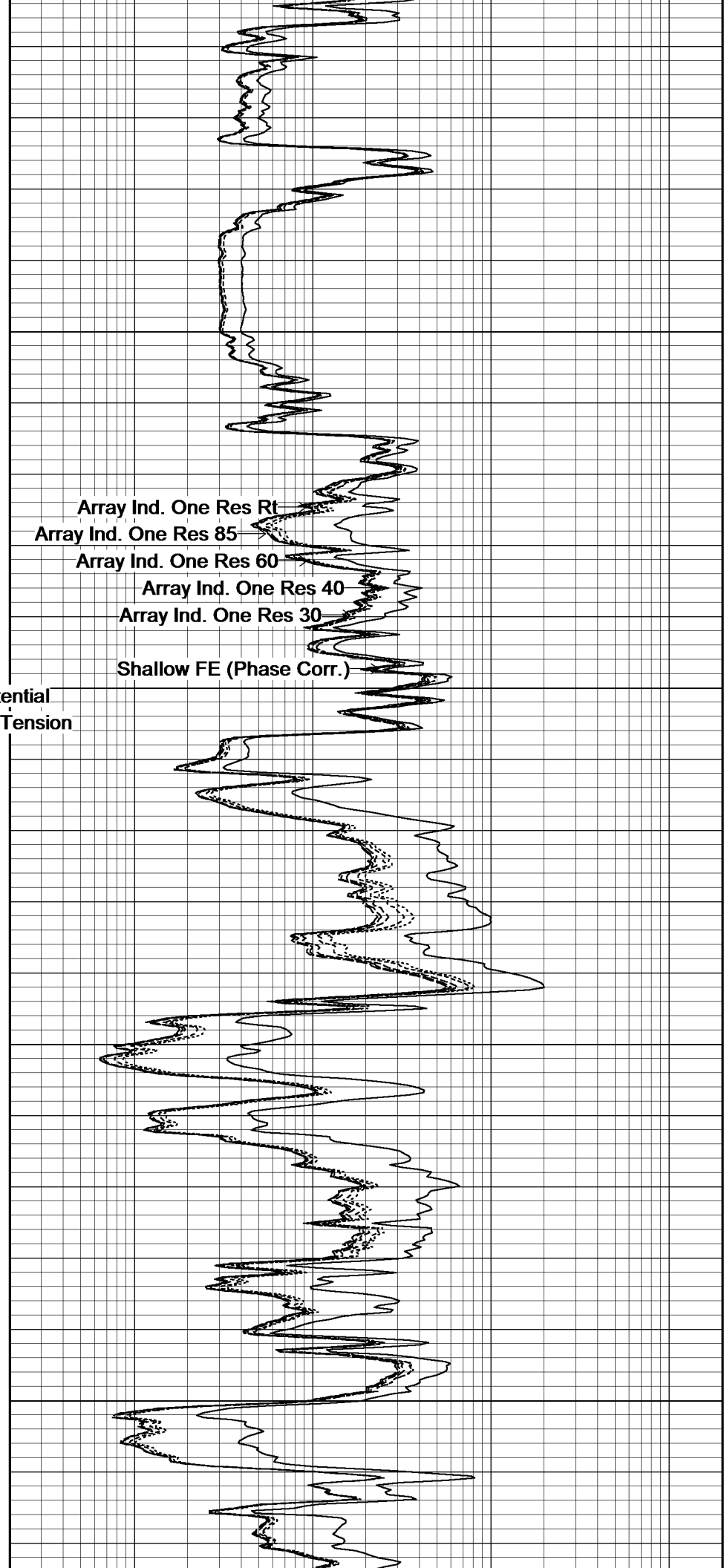
Array Ind. One Res 85

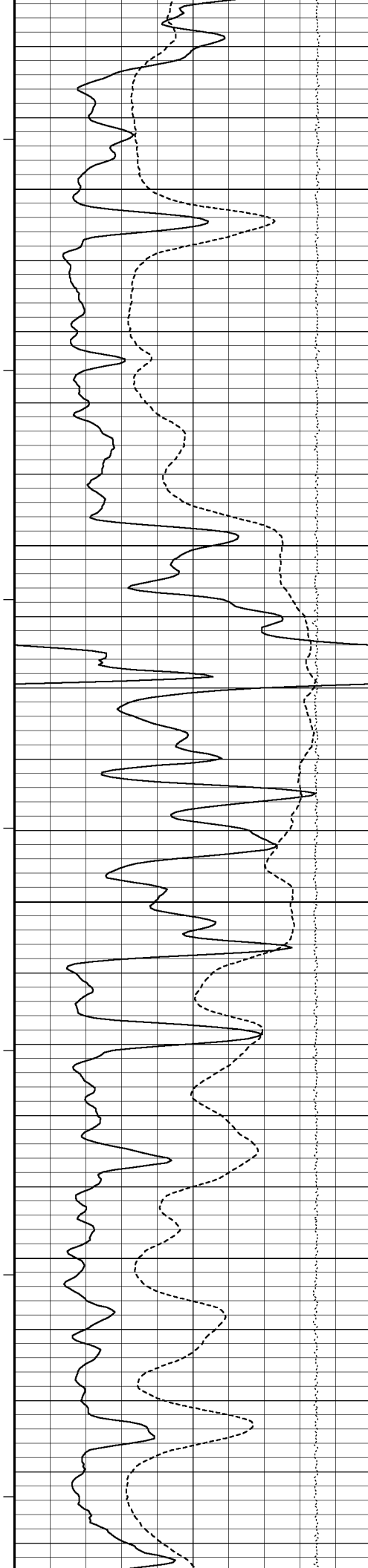
Array Ind. One Res 60

Array Ind. One Res 40

Array Ind. One Res 30

Shallow FE (Phase Corr.)





112°

4750

112°

4800

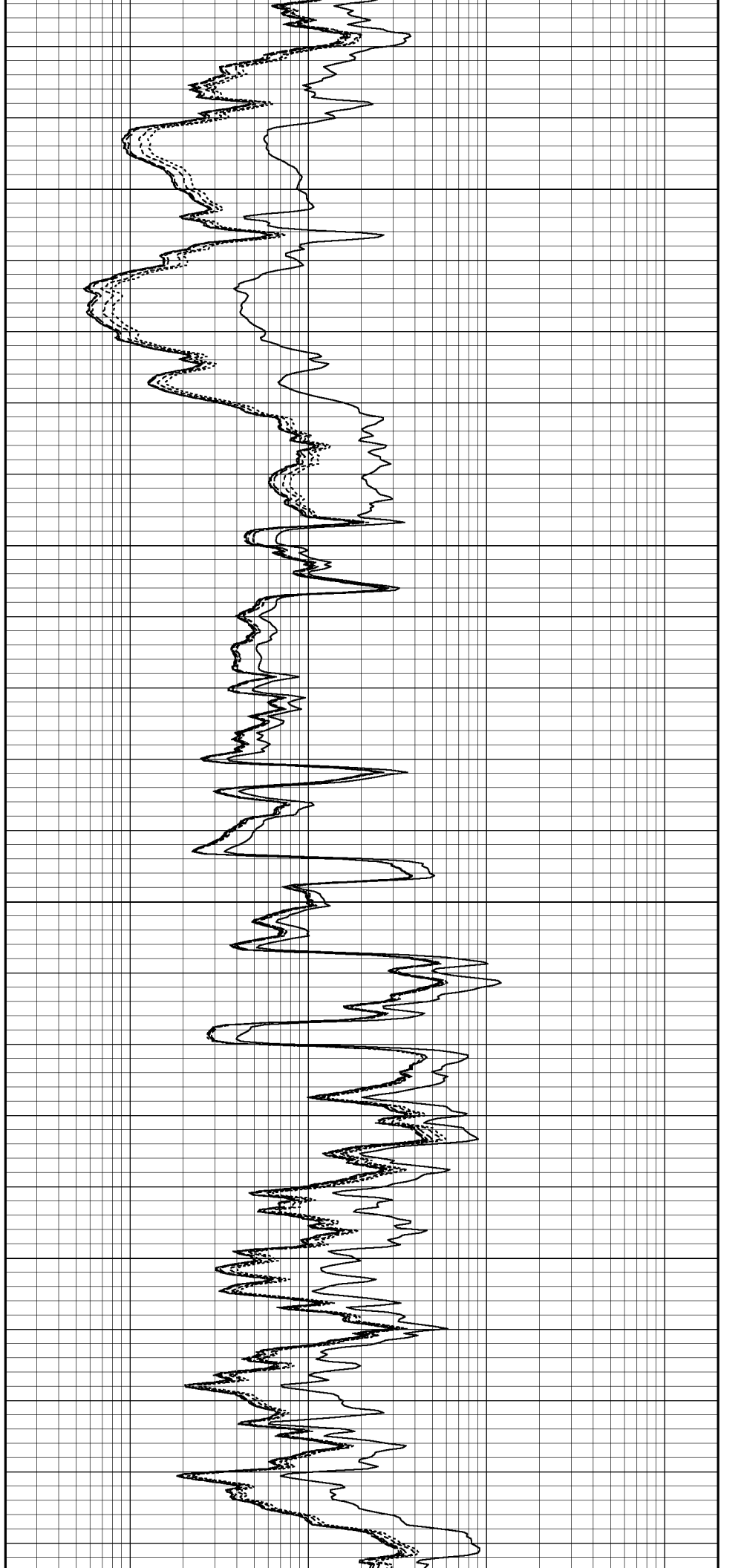
113°

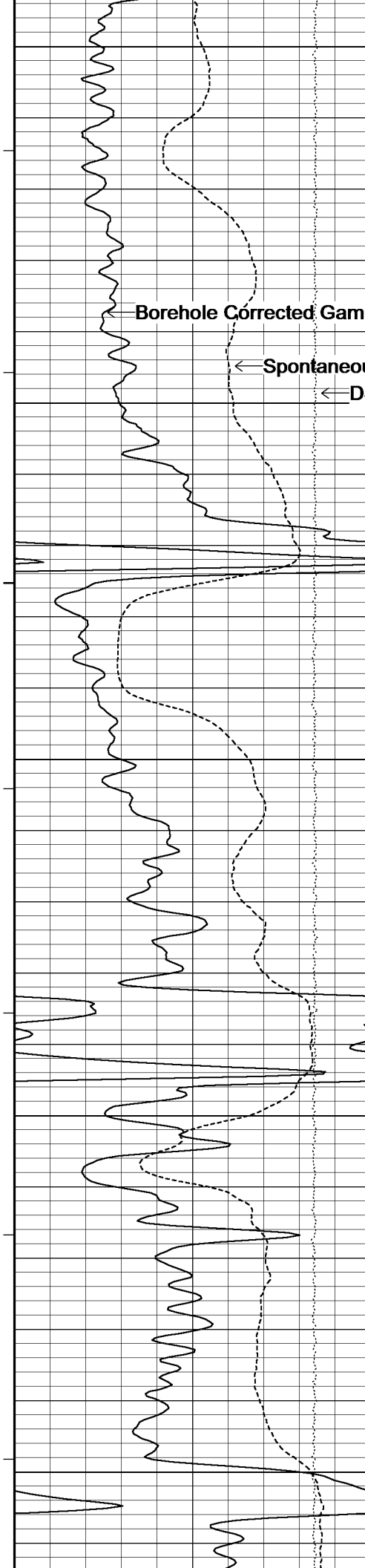
4850

113°

4900

113°





4950

Borehole Corrected Gamma 113°

← Spontaneous Potential

← DST Pressure Tension

5000

114°

5050

114°

5100

115°

5150

Array Ind. One Res Rt

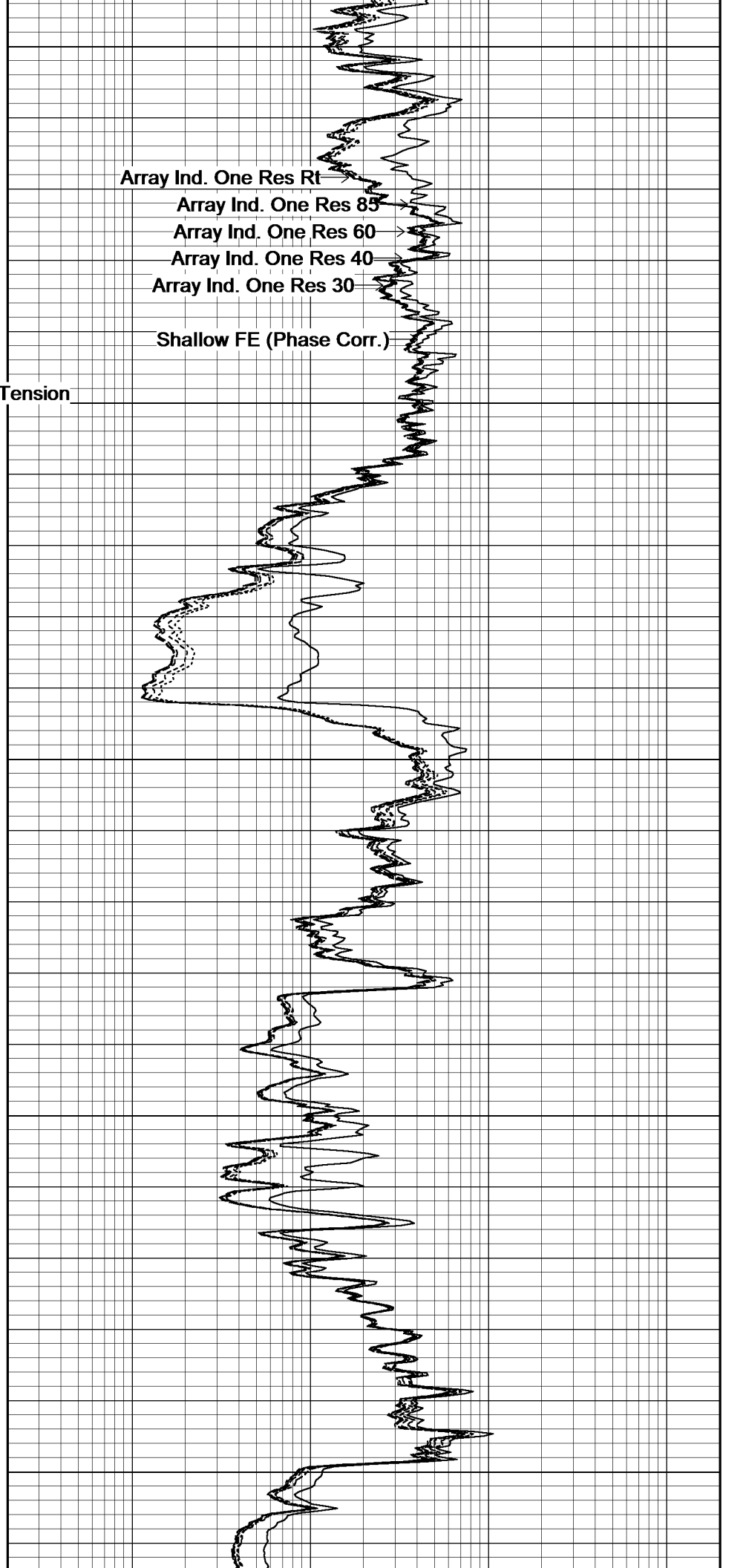
Array Ind. One Res 85

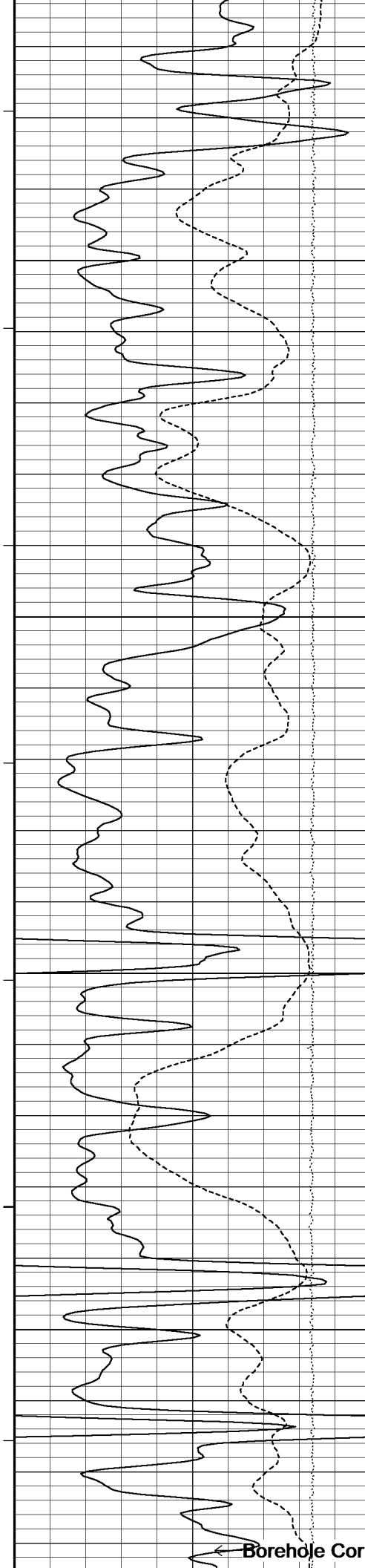
Array Ind. One Res 60

Array Ind. One Res 40

Array Ind. One Res 30

Shallow FE (Phase Corr.)





115°

5200

115°

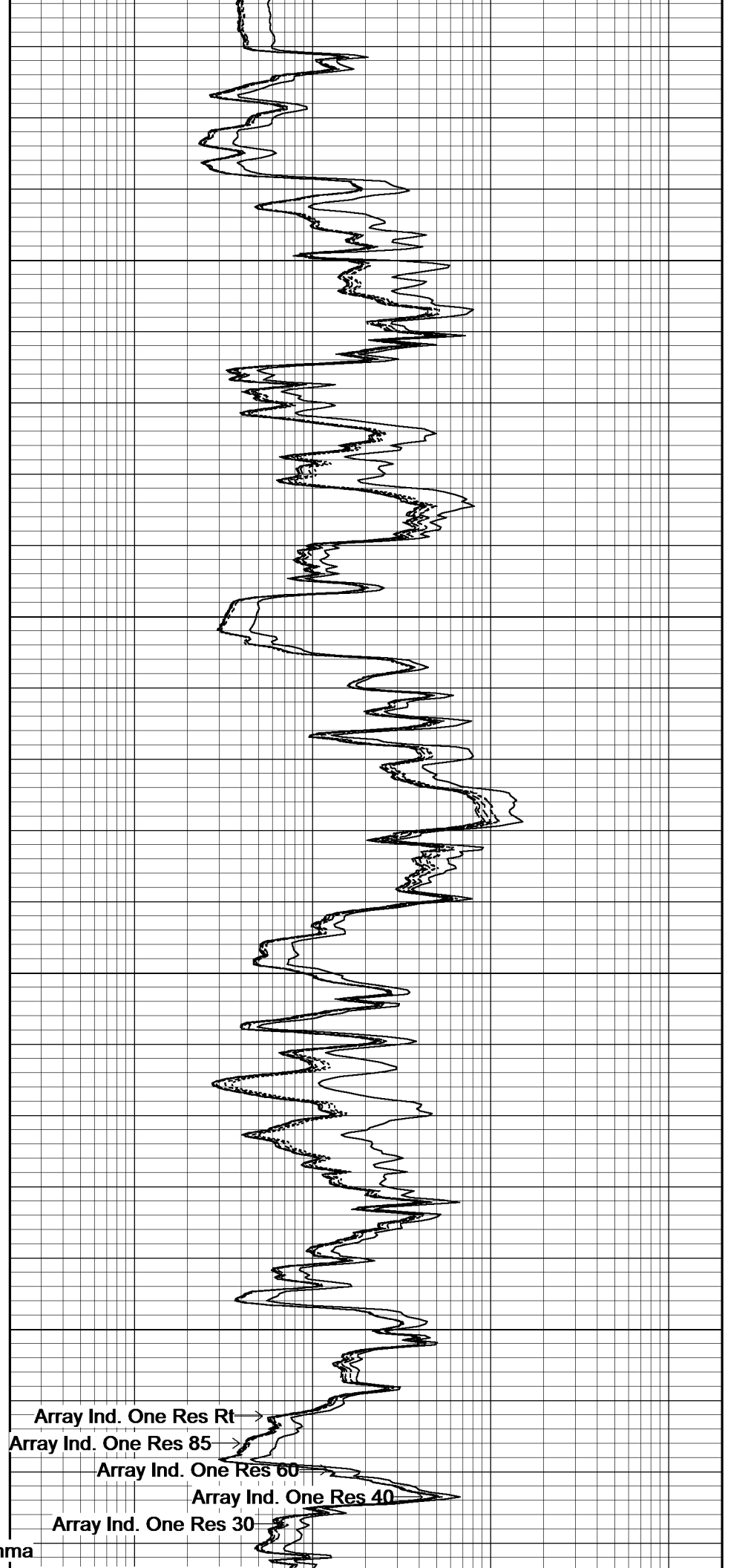
5250

116°

5300

116°

5350



Array Ind. One Res Rt >

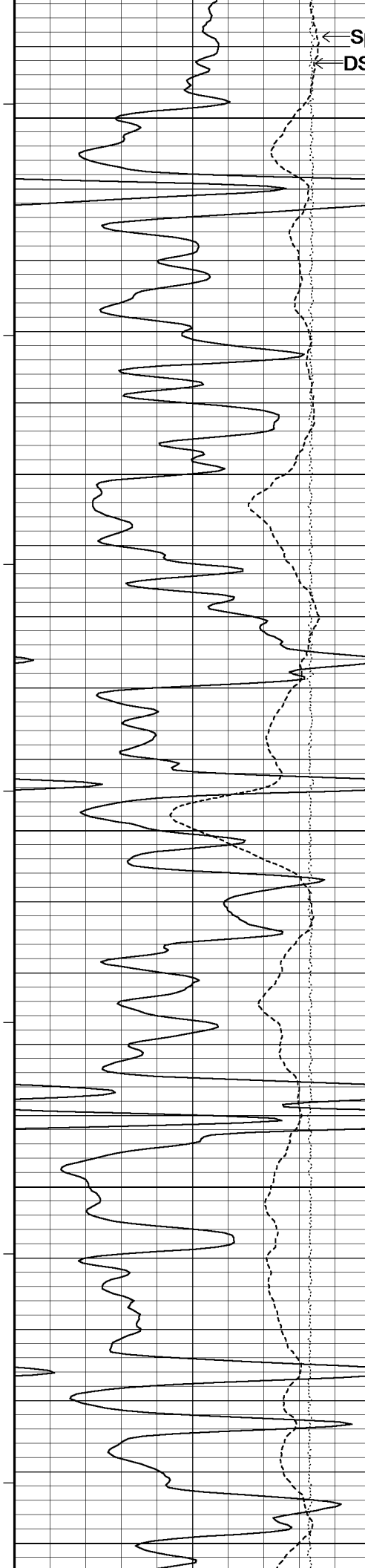
Array Ind. One Res 85 >

Array Ind. One Res 60 >

Array Ind. One Res 40 >

Array Ind. One Res 30 >

← Borehole Corrected Gamma



← Spontaneous Potential
← DST Uphole Tension

5400

116°

5450

117°

5500

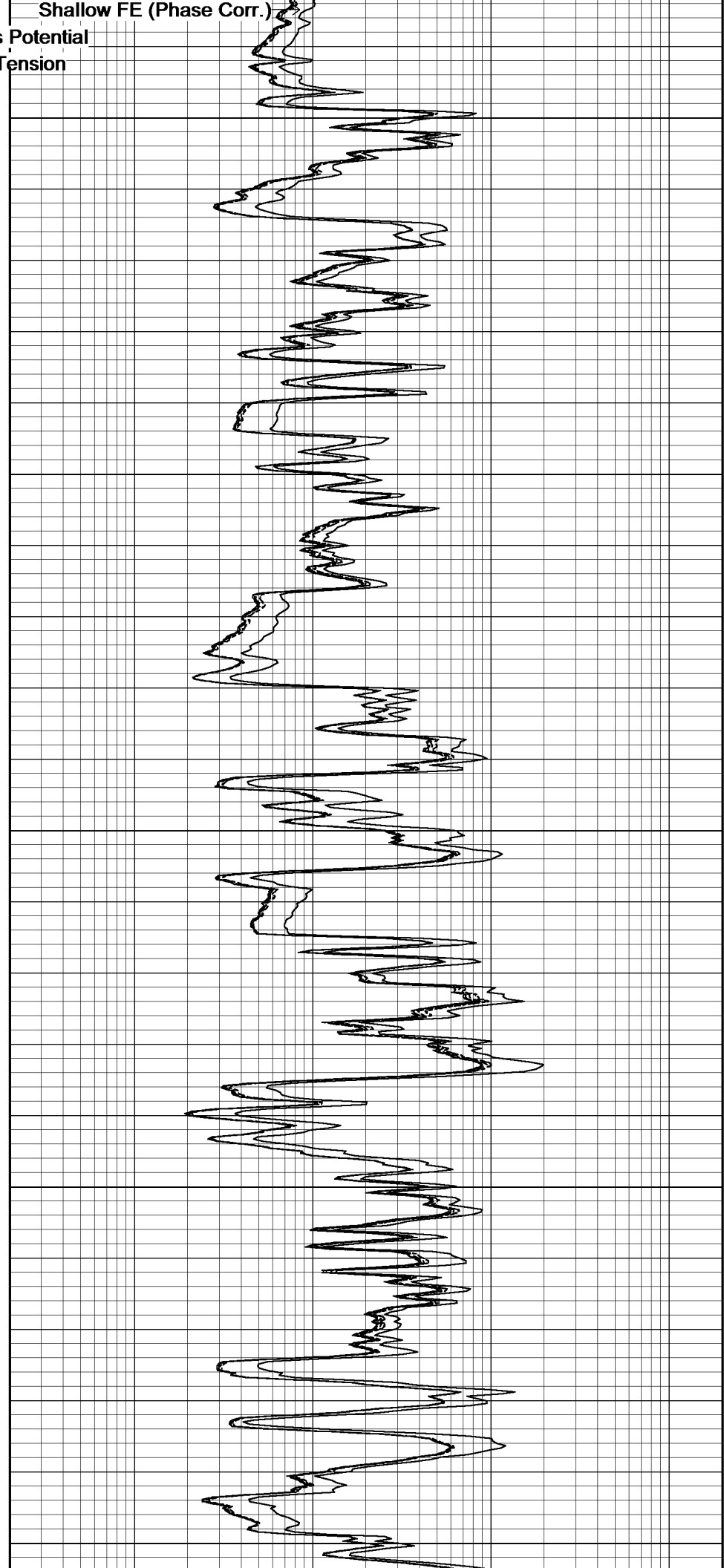
117°

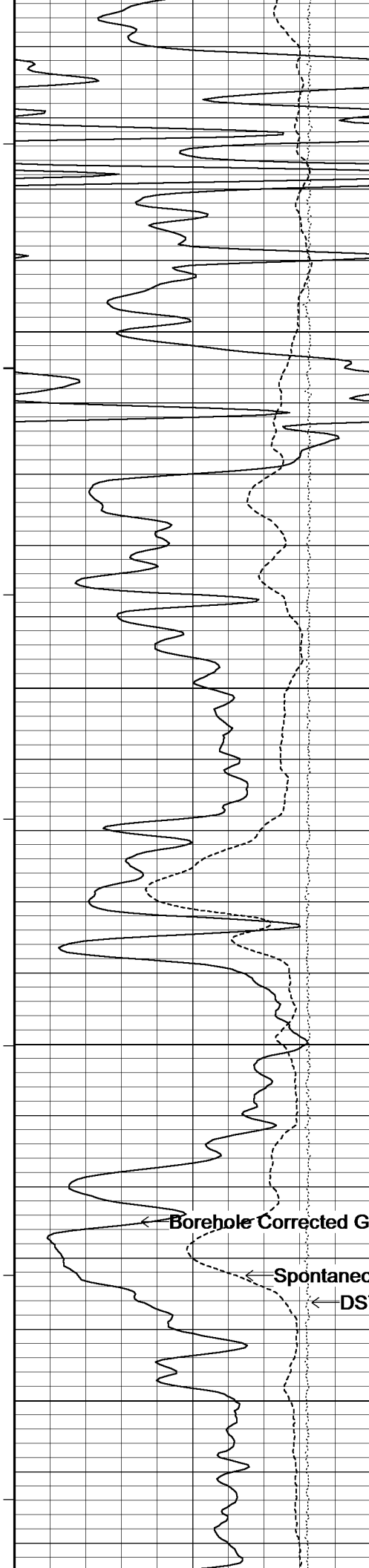
5550

118°

5600

Shallow FE (Phase Corr.)





118°

5650

119°

5700

119°

5750

Array Ind. One Res Rt →

Array Ind. One Res 85 →

Array Ind. One Res 60 →

Array Ind. One Res 40 →

Array Ind. One Res 30 →

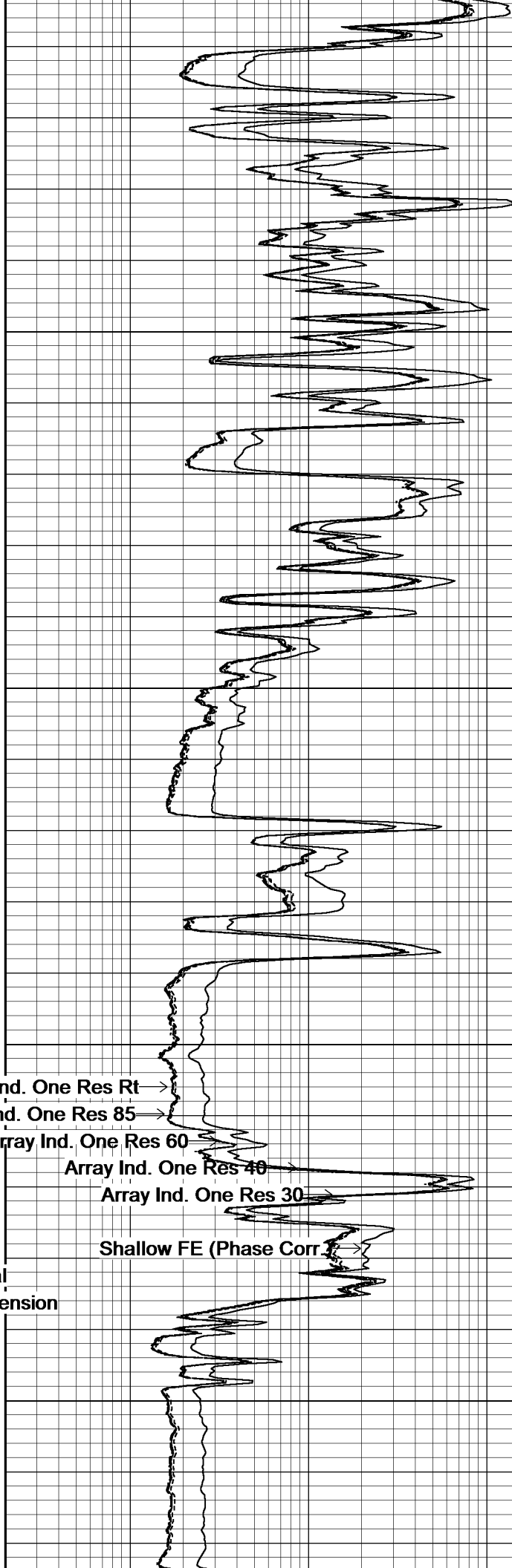
Shallow FE (Phase Corr) →

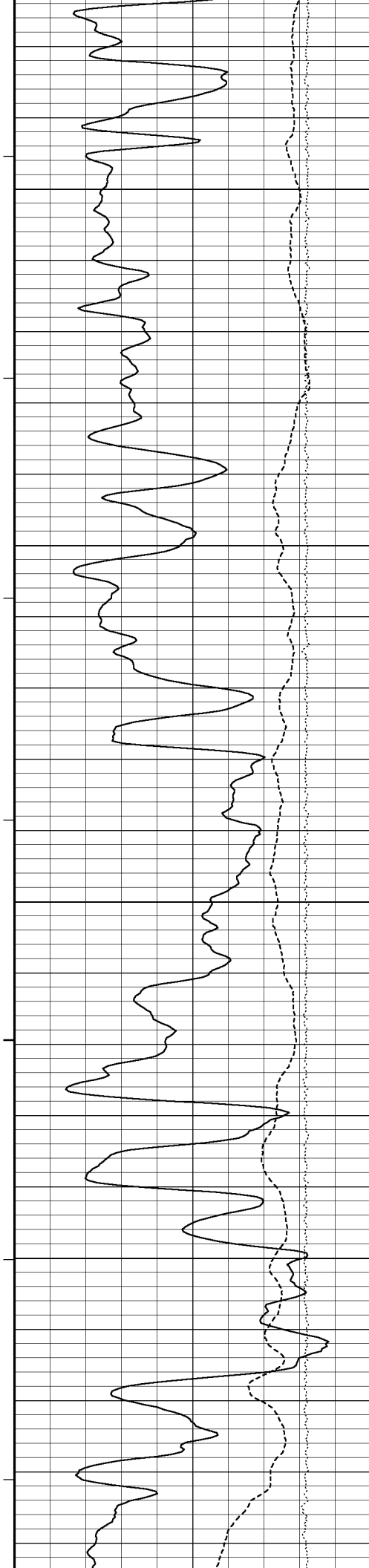
← Borehole Corrected Gamma

← Spontaneous Potential

← DST Uphole Tension

5800





120°

5850

120°

5900

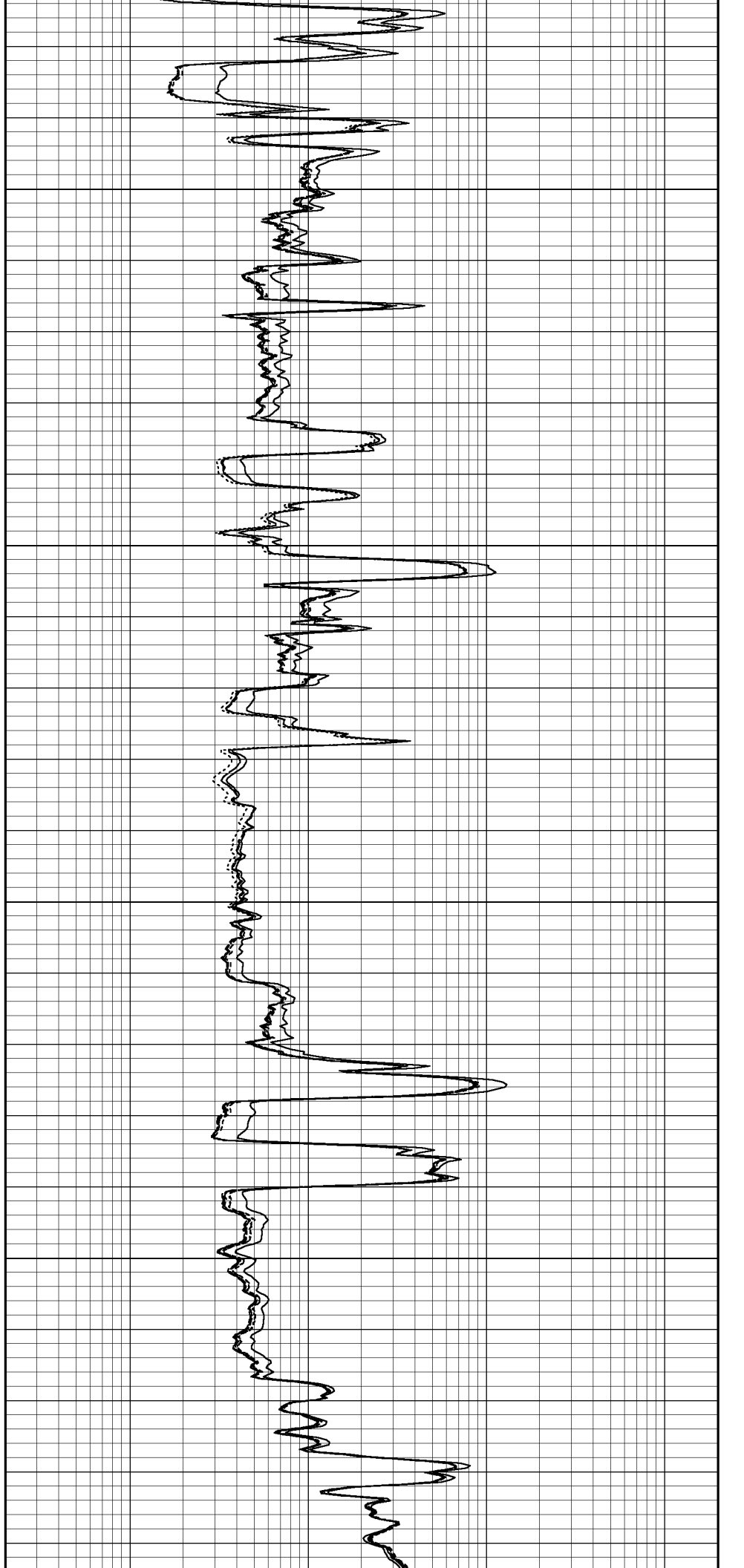
121°

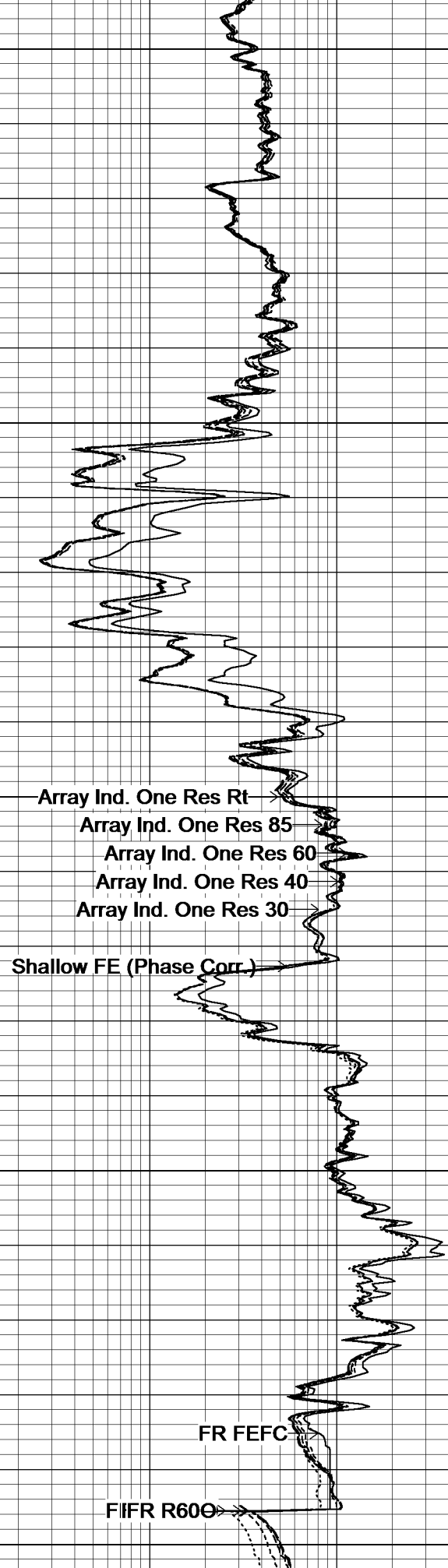
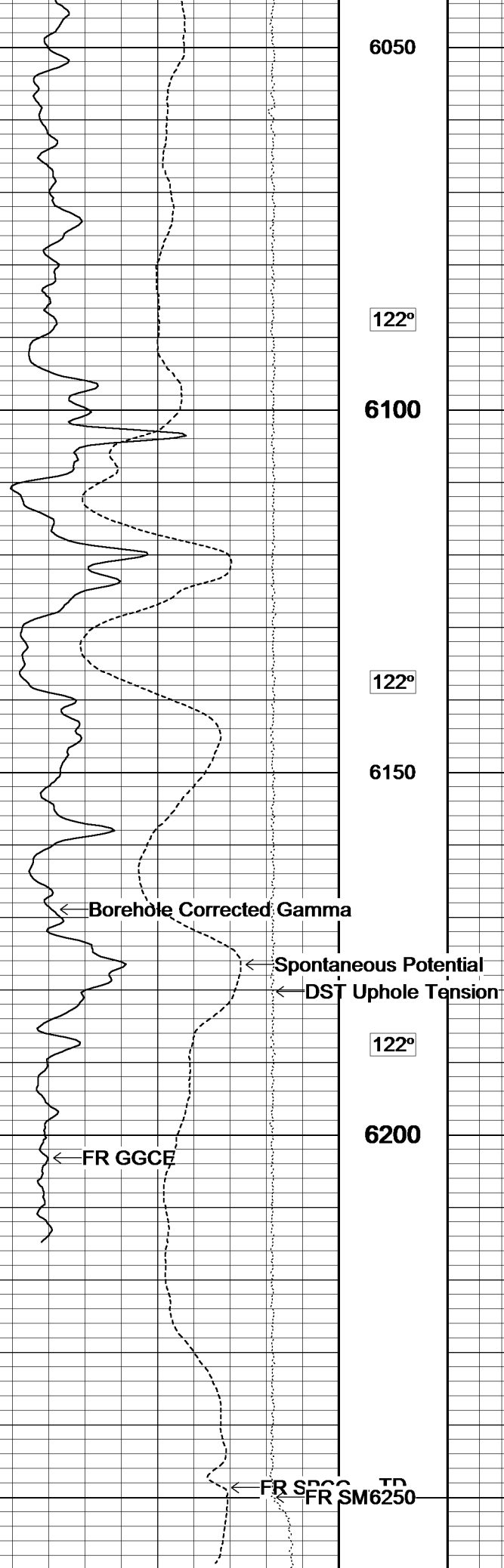
5950

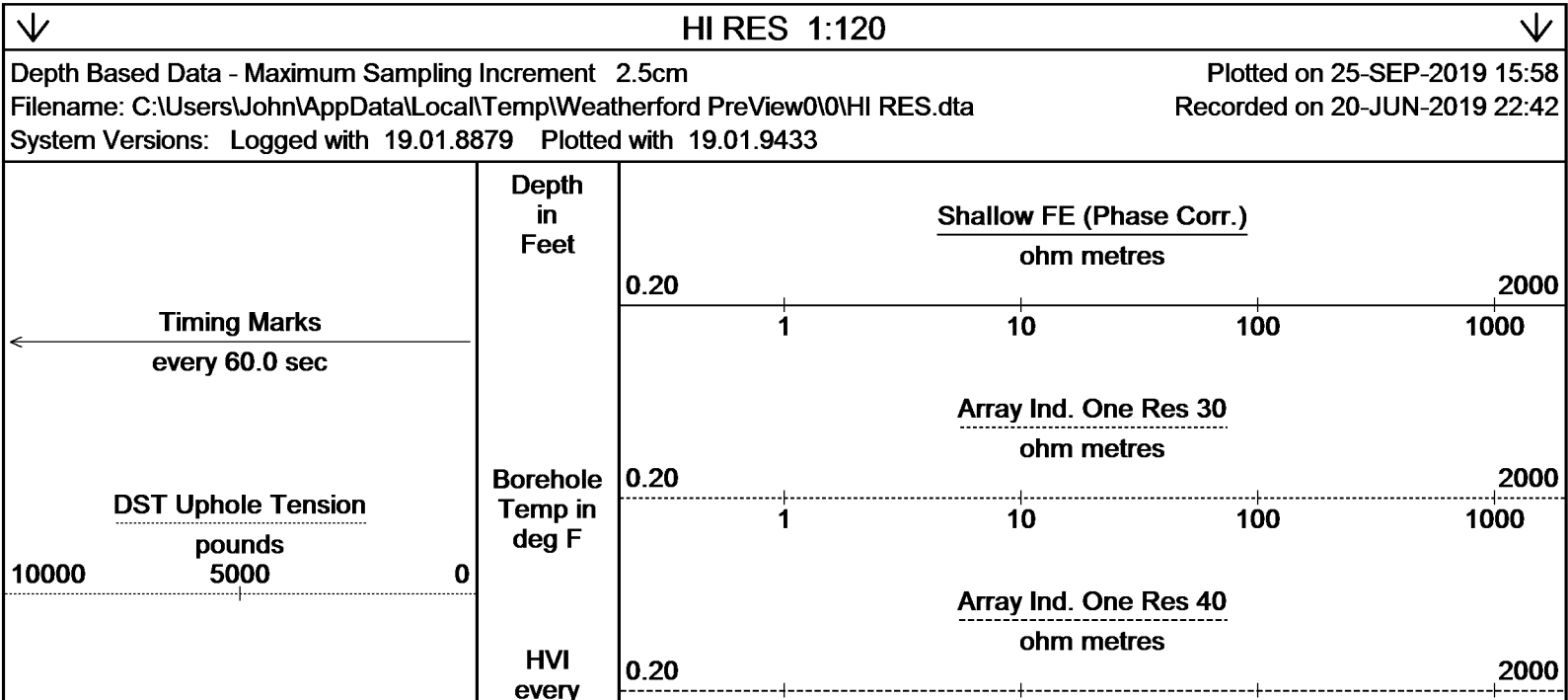
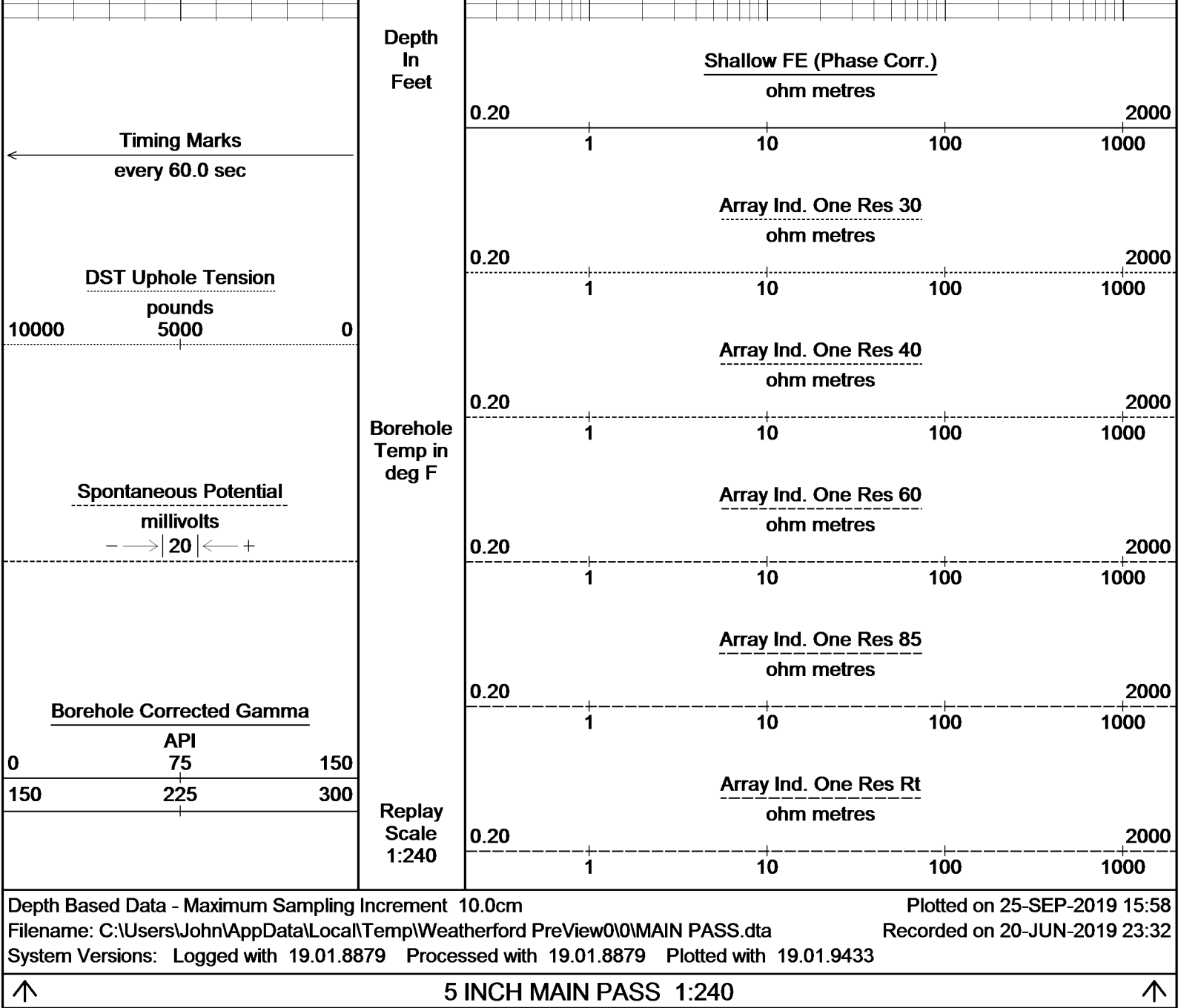
122°

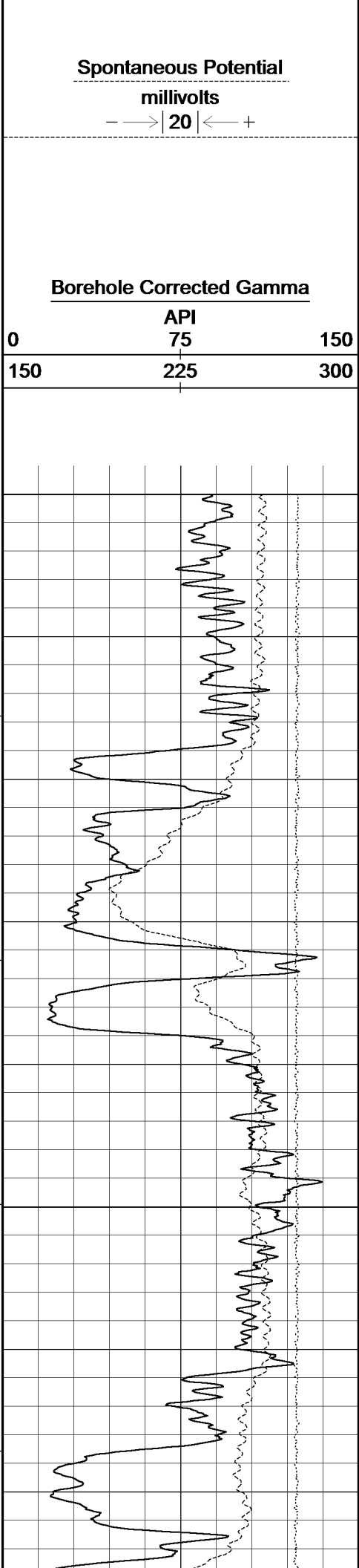
6000

122°









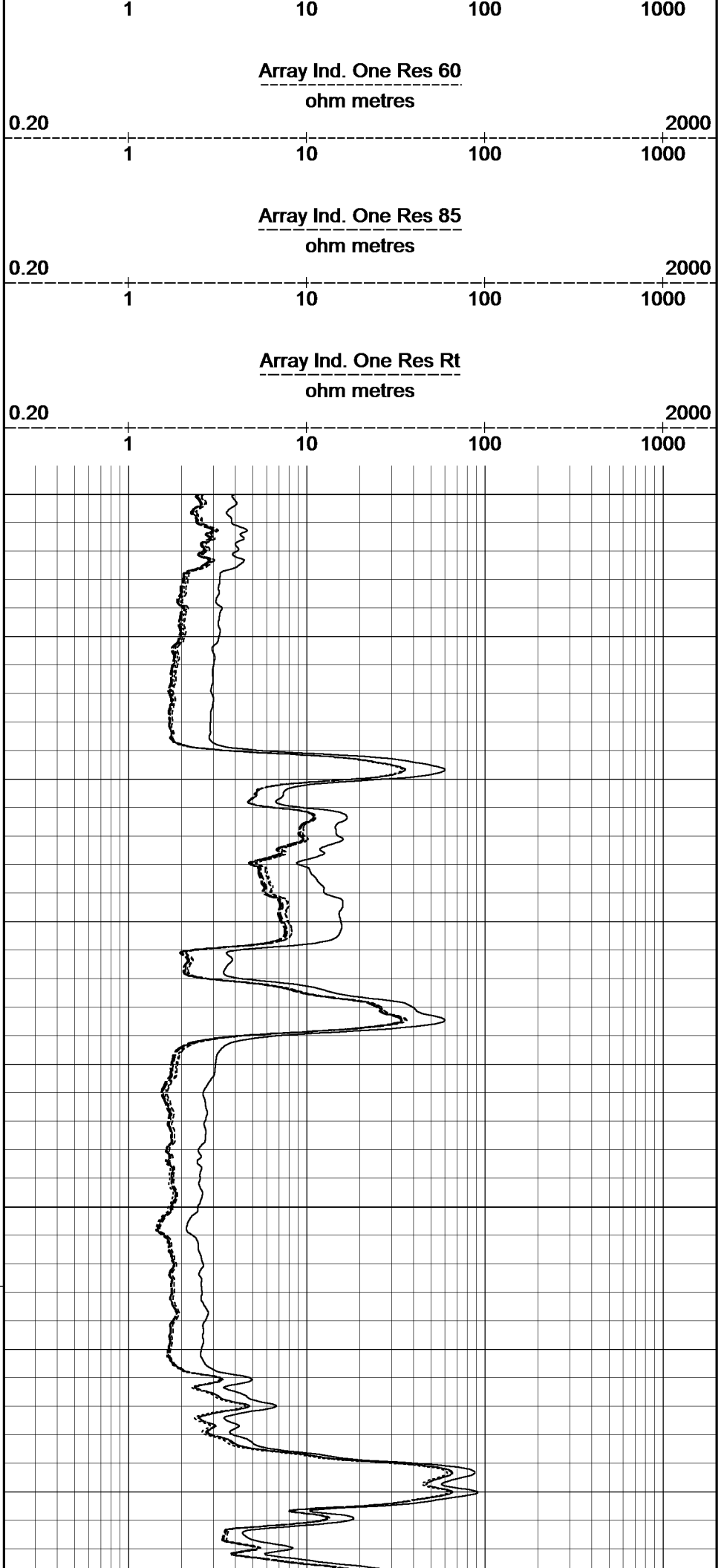
10 cu ft
←
Annular
Integral
every
10 cu ft
→

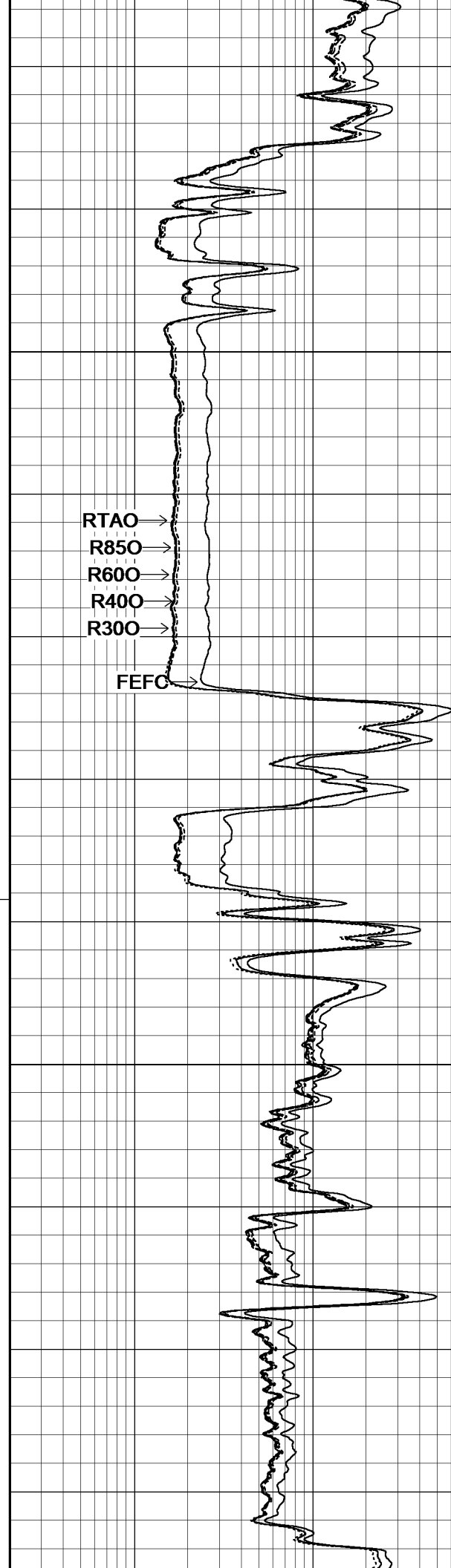
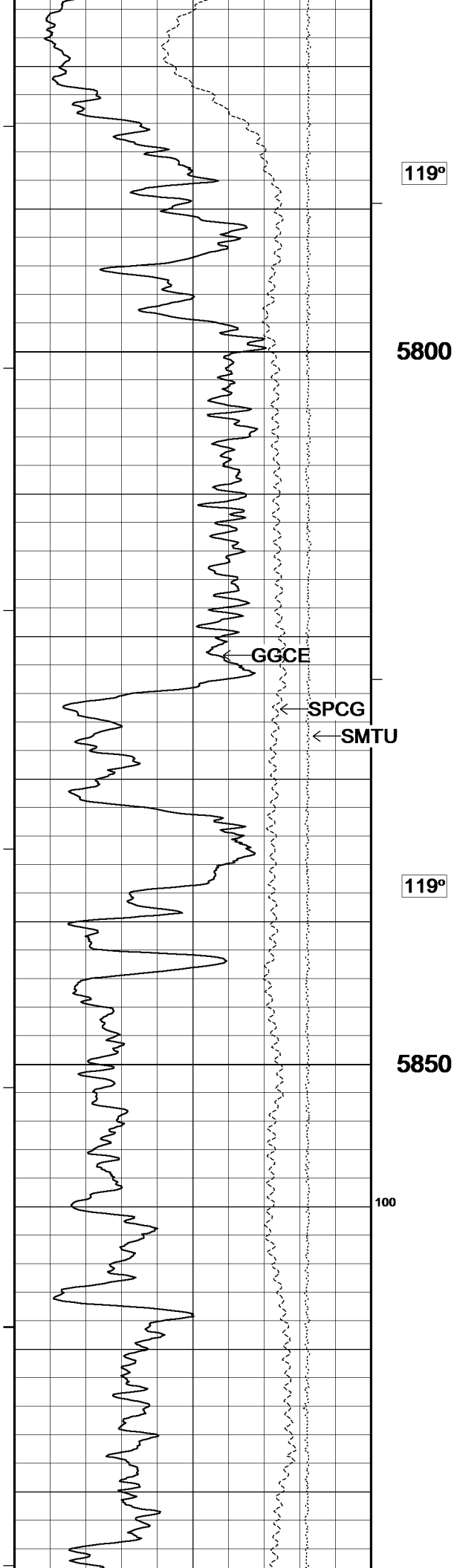
Replay
Scale
1:120

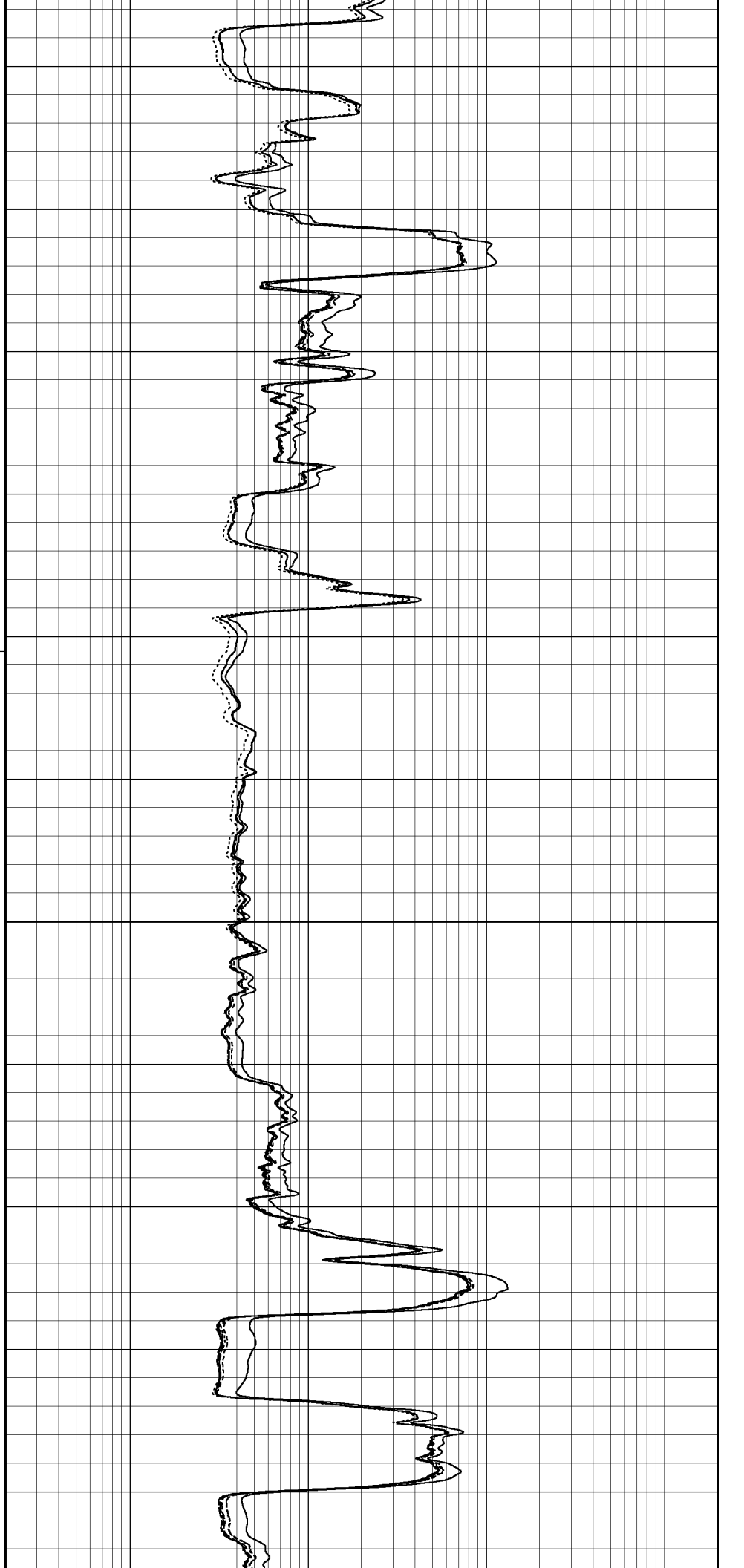
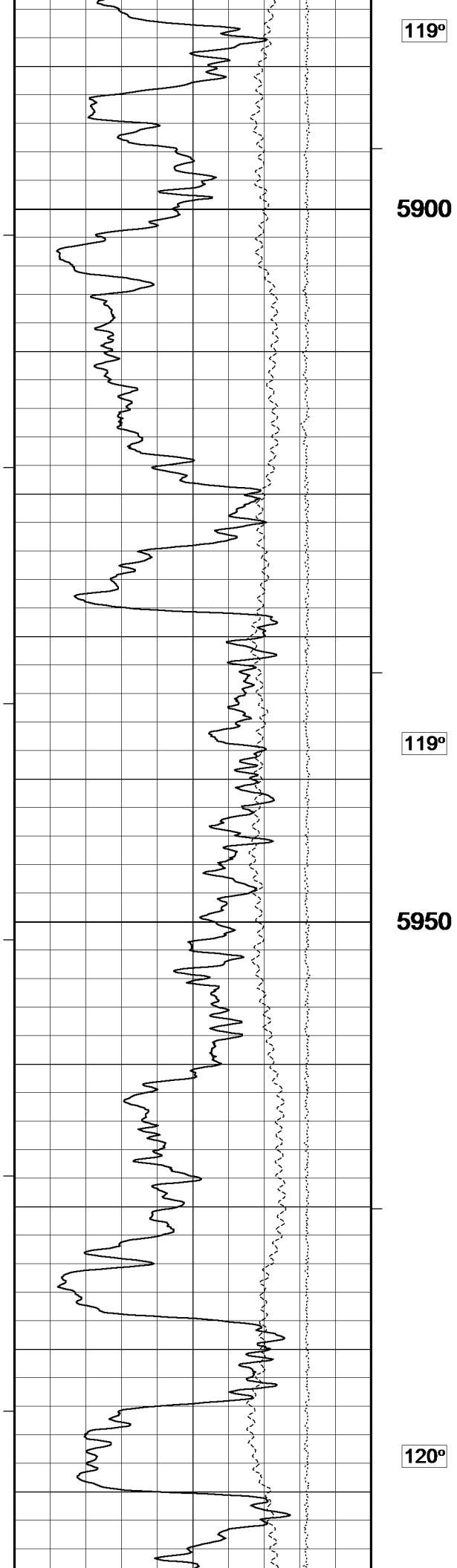
5700

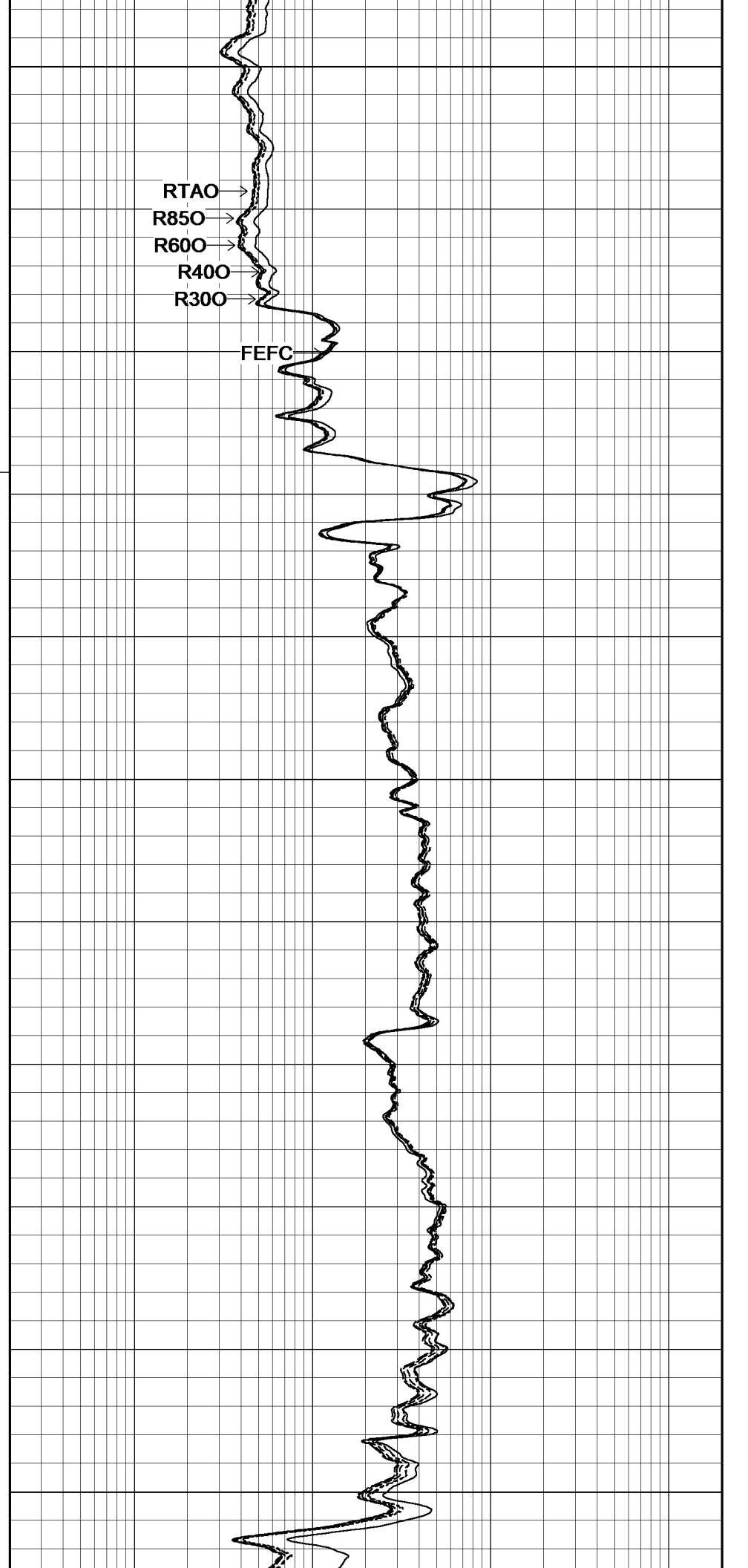
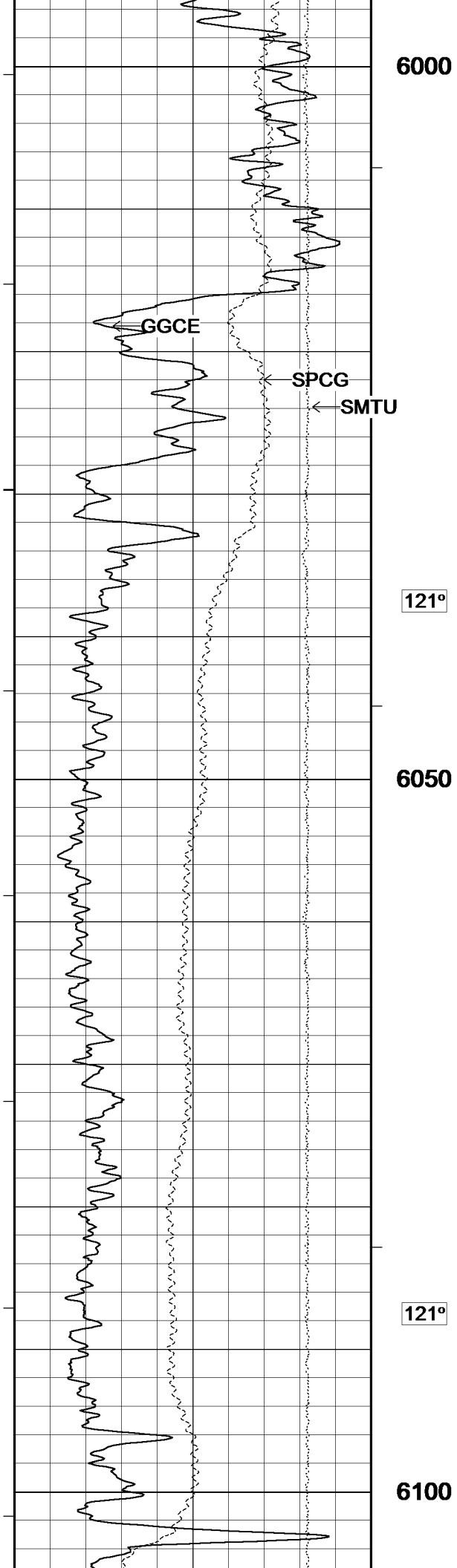
118°

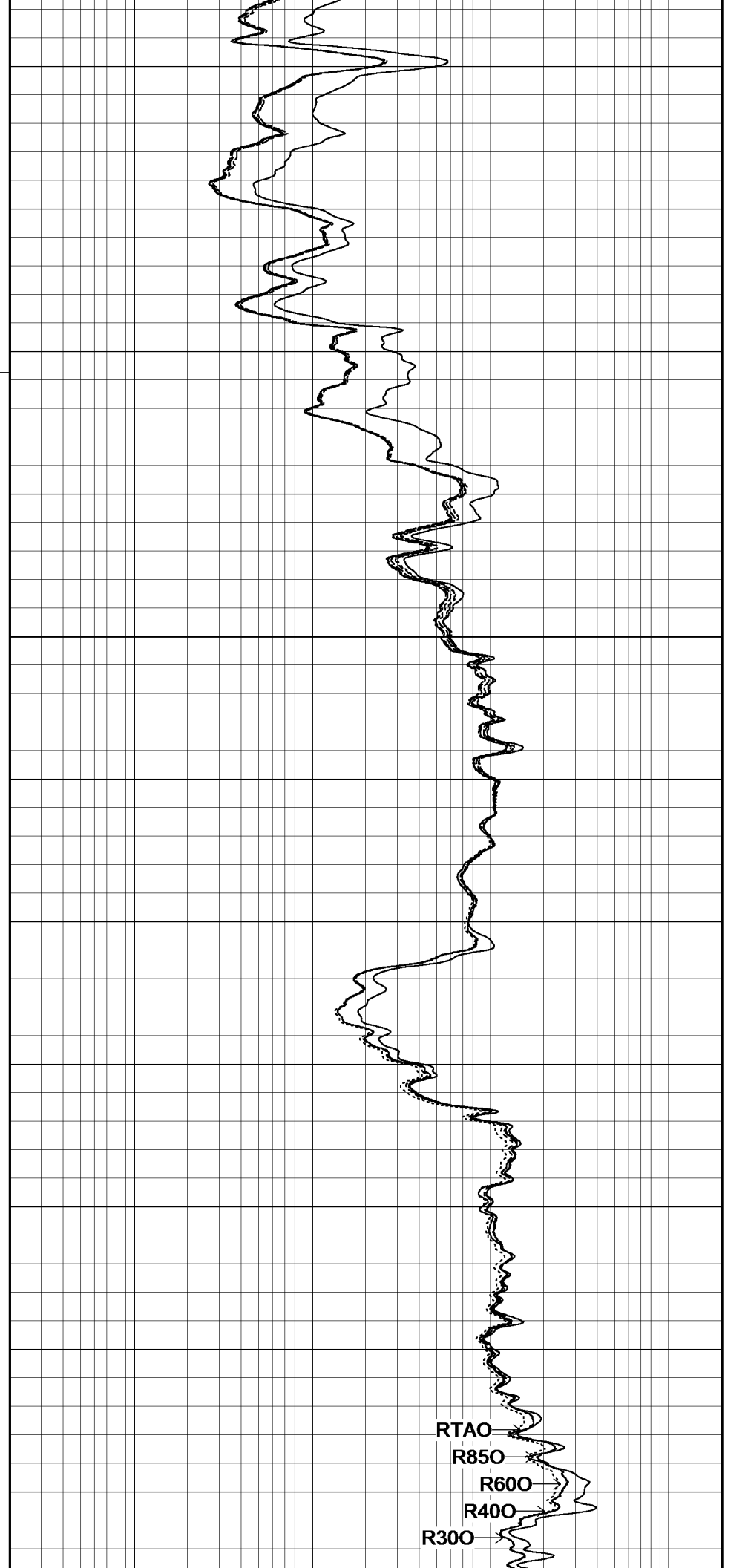
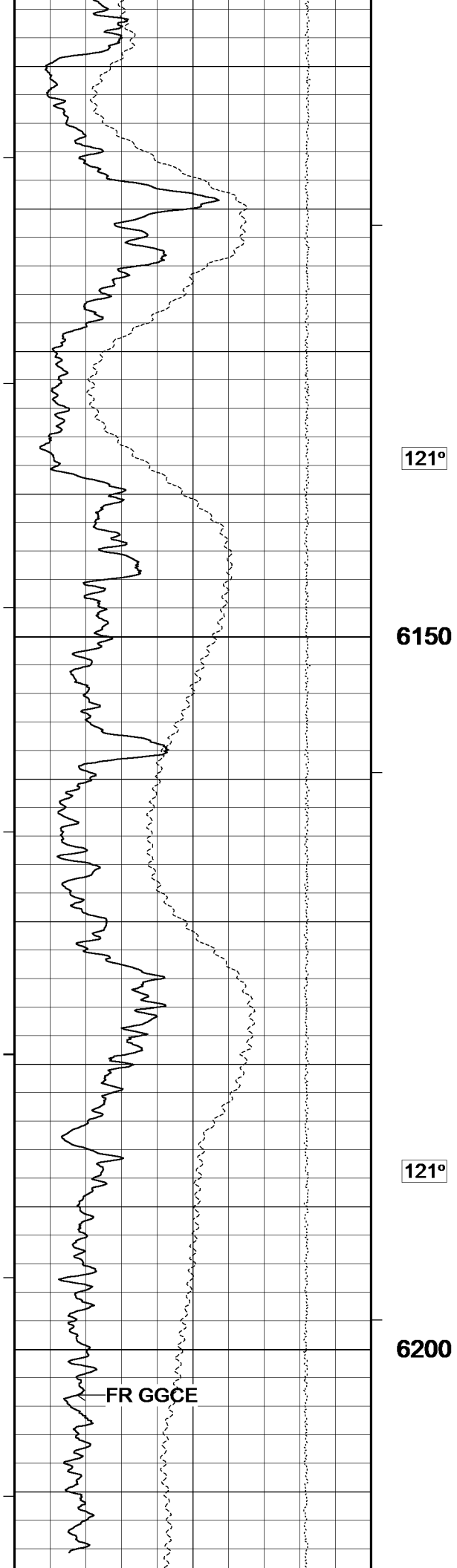
5750

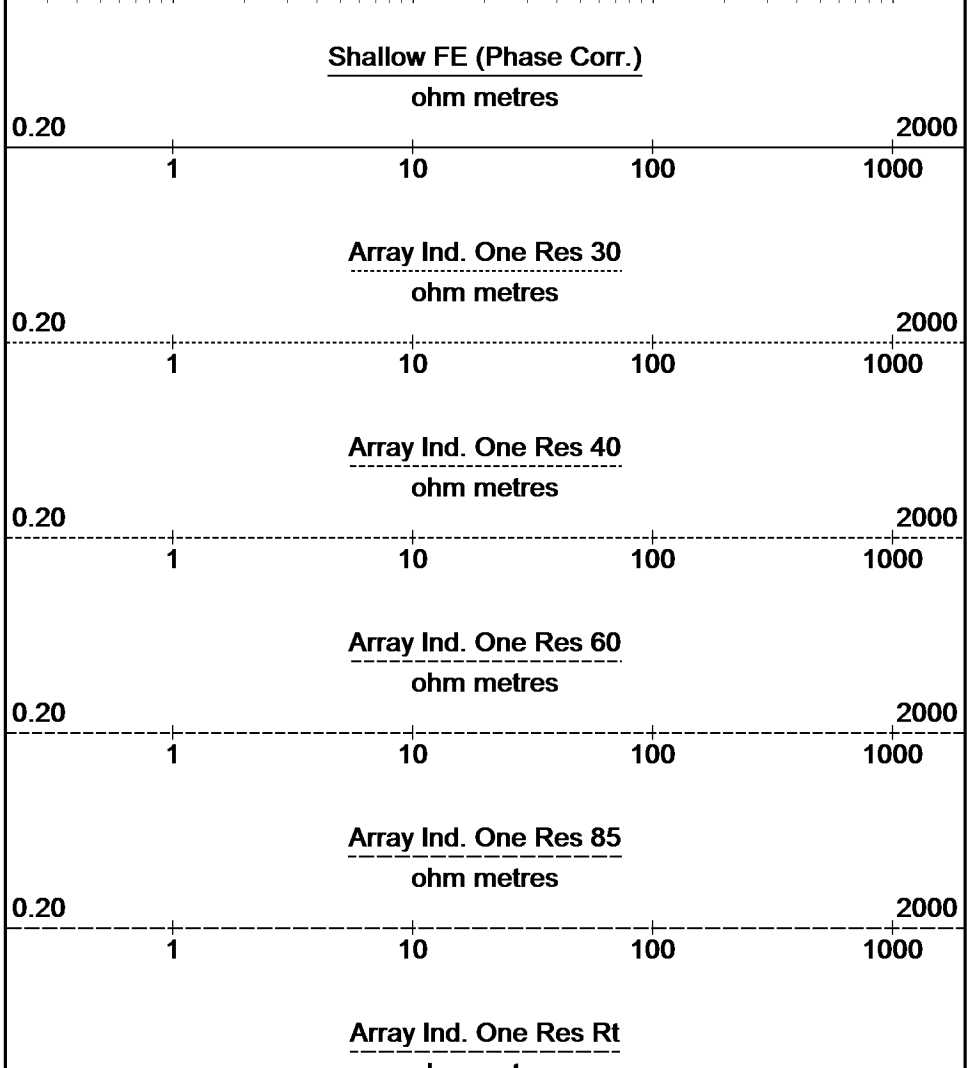
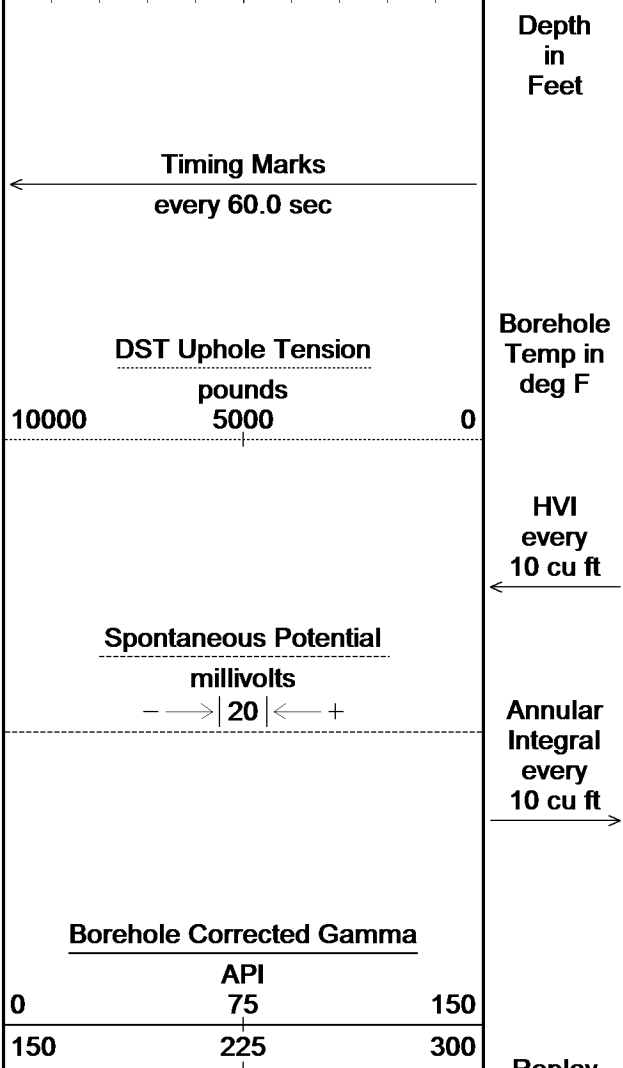
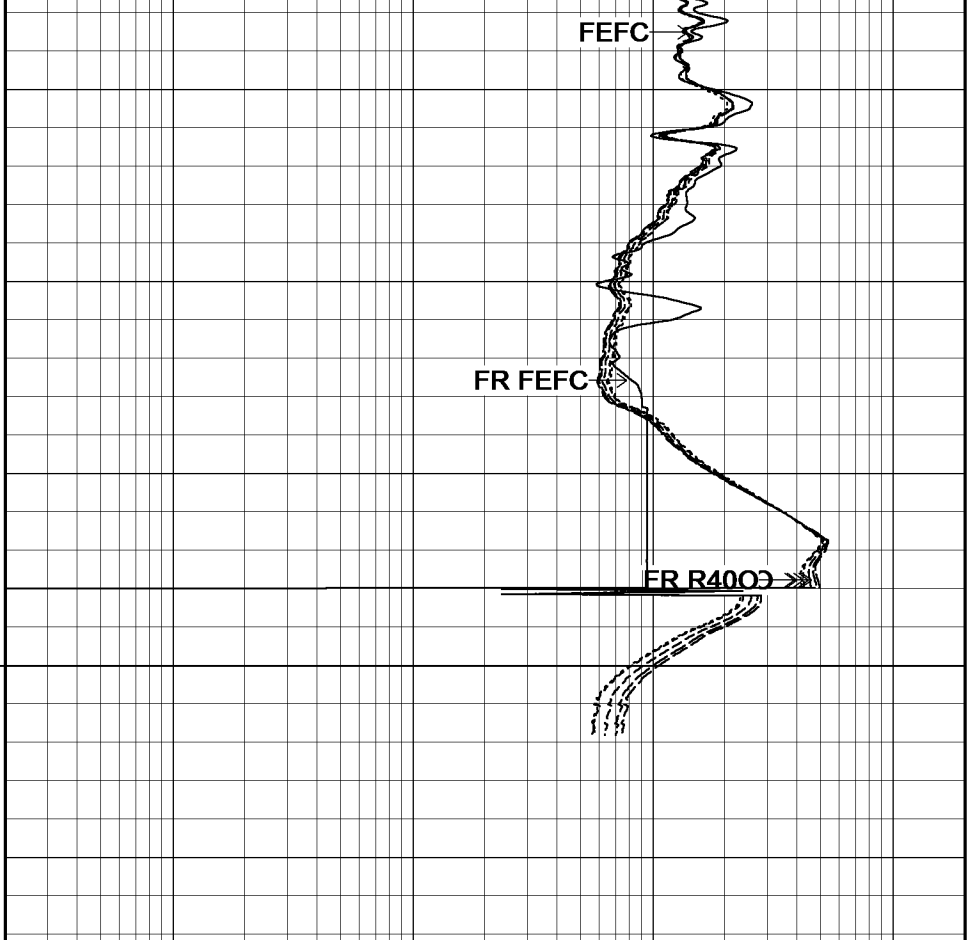
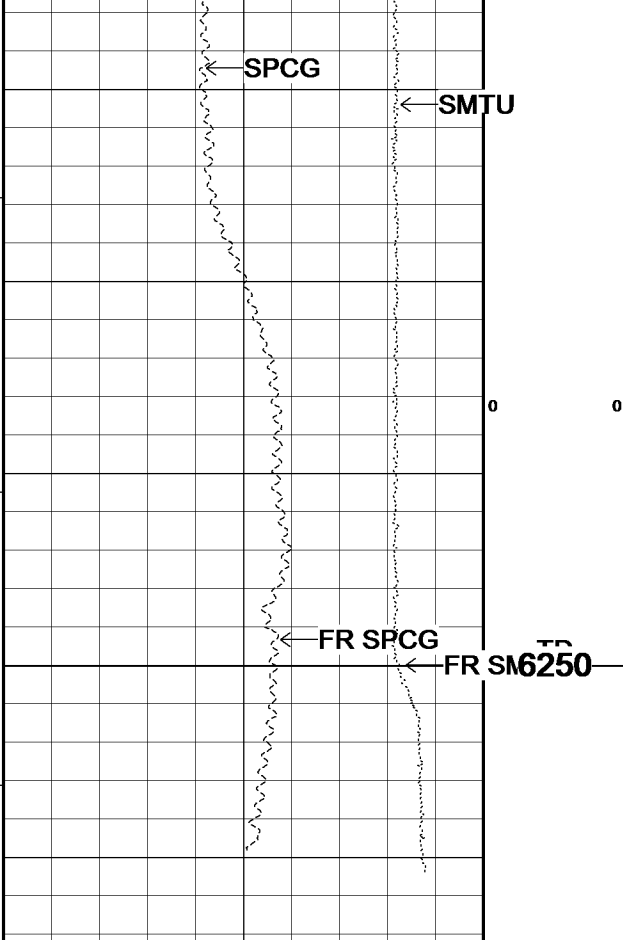


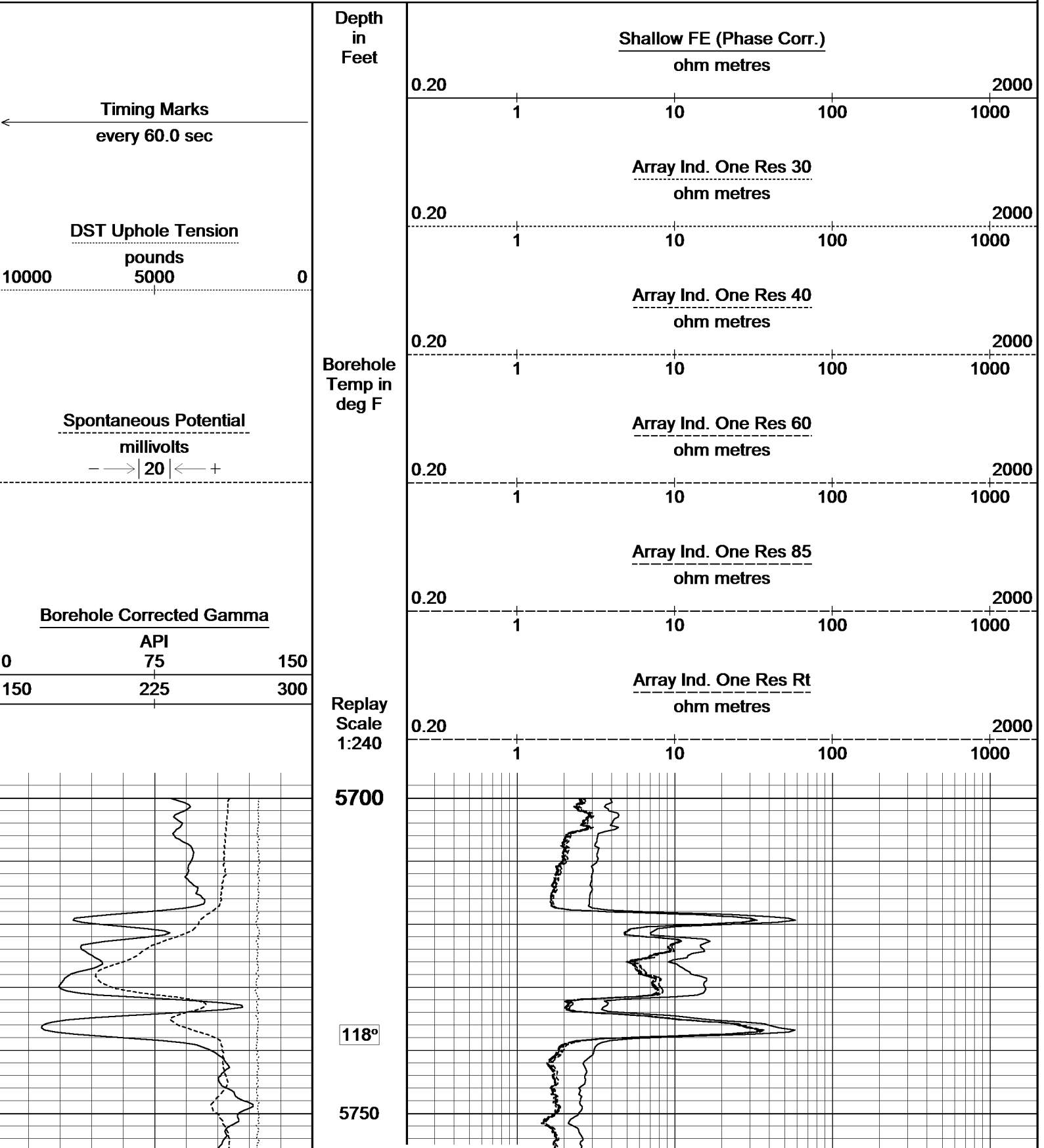


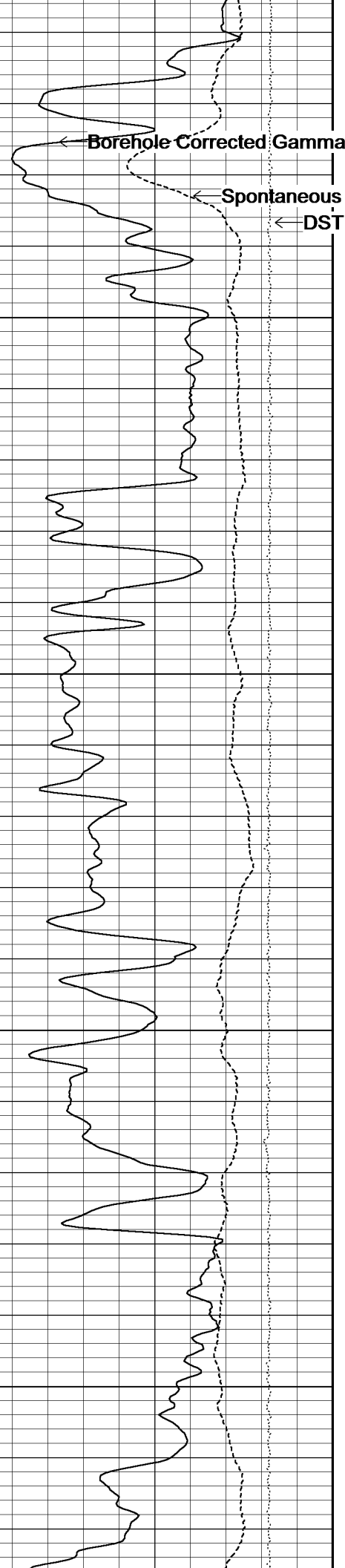












Array Ind. One Res Rt
Array Ind. One Res 85
Array Ind. One Res 60
Array Ind. One Res 40
Array Ind. One Res 30
Shallow FE (Phase Corr.)
DST Up
Angle Tension

5800

119°

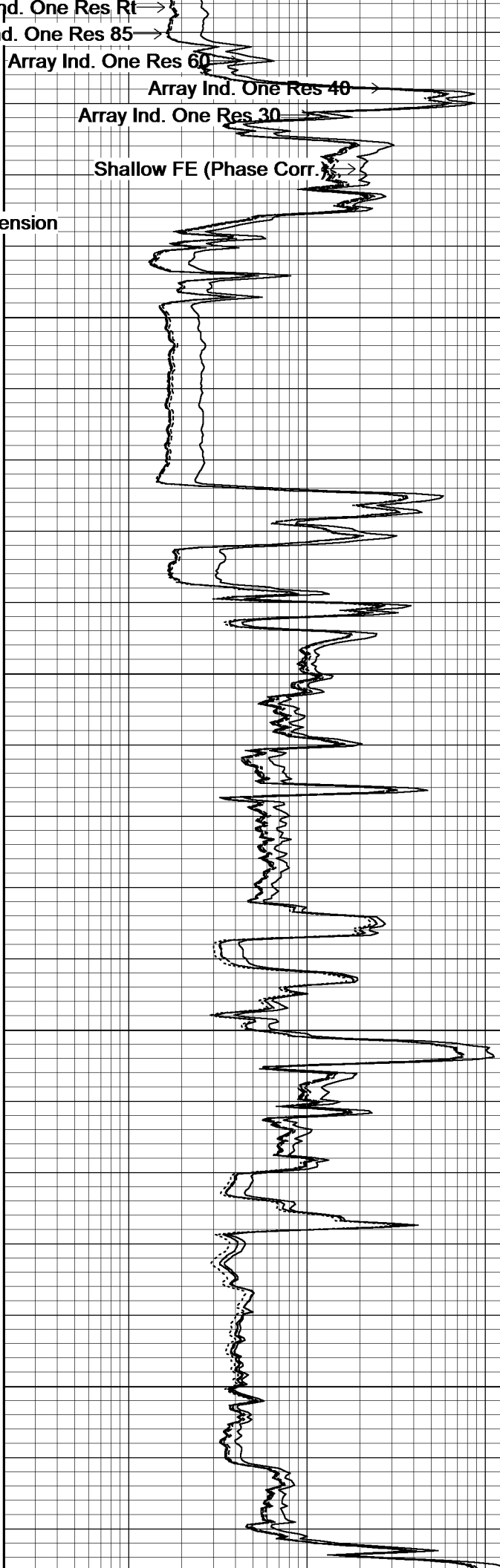
5850

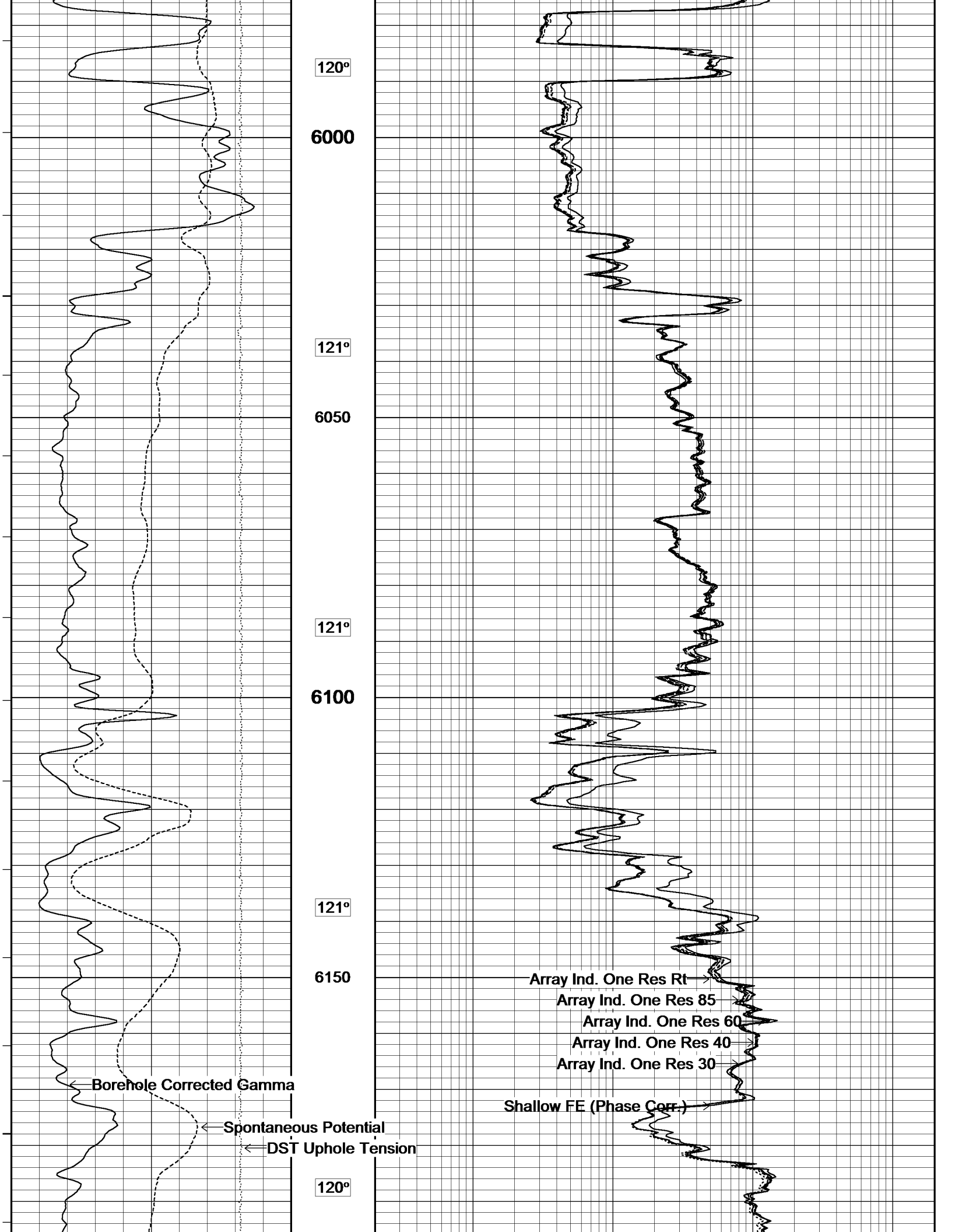
119°

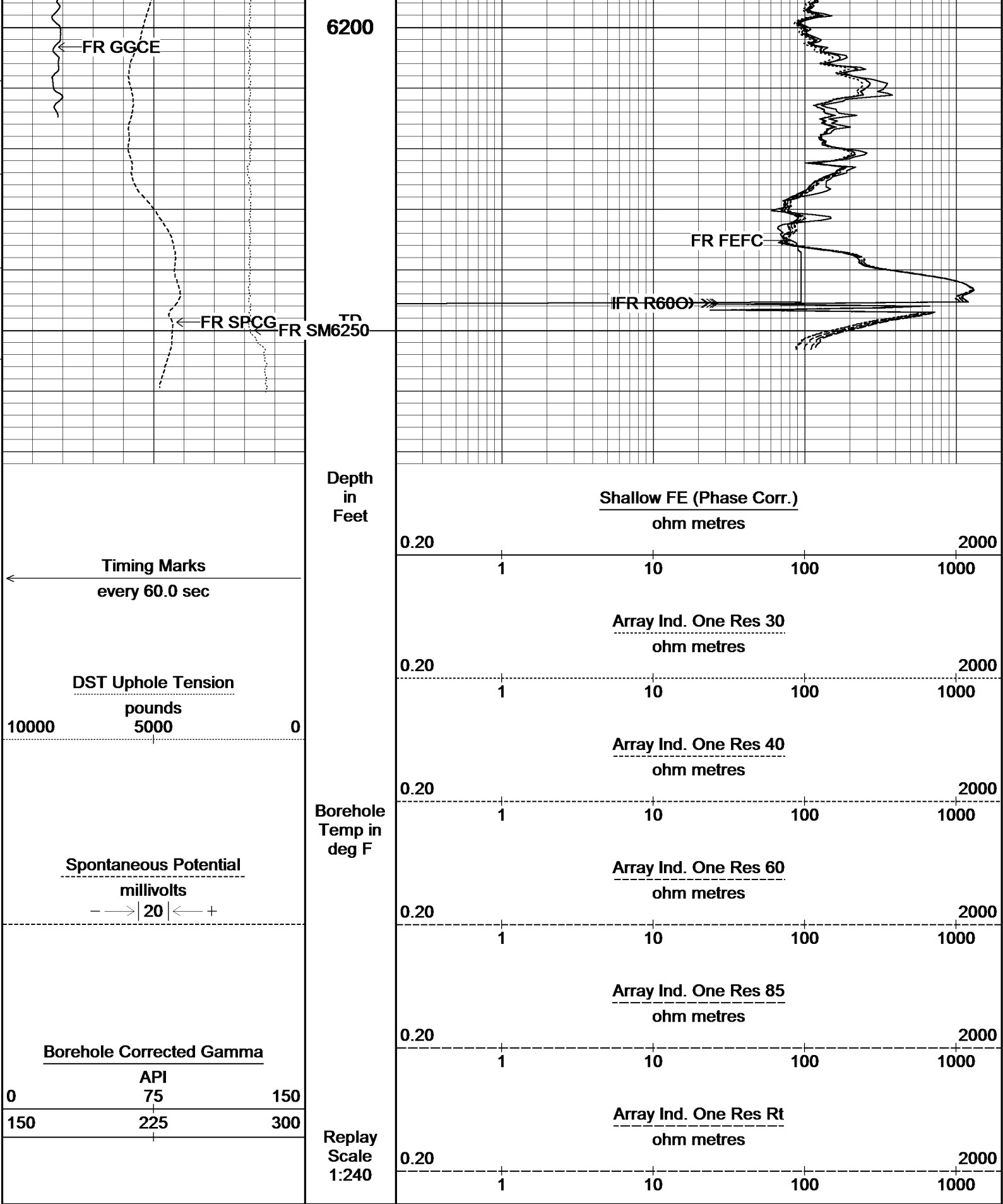
5900

119°

5950







BEFORE SURVEY CALIBRATION

C:\Users\John\AppData\Local\Temp\Weatherford PreView0\0\MAIN PASS.dta

General Constants All 000

Last Edited on 20-JUN-2019,20:27

General Parameters

Mud Resistivity	0.880	ohm-metres
Mud Resistivity Temperature	96.000	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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Limestone Density Por.
Resistivity used	Array Ind. Two Res Rt
RWA Constant A	0.620
RWA Constant M	2.150
SW/APOR Tool Source	0.000

Down-hole Tension Calibration SMS 0

Field Calibration on 20-JUN-2019 21:55

Reading No	Measured	Calibrated (lbs)
1	14707.37	0.00
2	16335.54	456.40

Gamma Calibration MCG-D.K 443

Field Calibration on 13-JUN-2019 10:16

	Measured	Calibrated (API)
Background	82	58
Calibrator (Gross)	791	555
Calibrator (Net)	709	497

Gamma Calibration Tolerances MCG-D.K 443

Ratio	1.426		Counts/API
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Gamma Constants MCG-D.K 443

Last Edited on 20-JUN-2019,10:19

Gamma Calibrator Number	GRCC175	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.07	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

SP Calibration MCG-D.K 443

Field Calibration on 13-JUN-2019,10:18

	Measured	Calibrated (mV)
Reference 1	100.8	99.9
Reference 2	-98.4	-99.9

High Resolution Temperature Calibration MCG-D.K 443

Field Calibration on 13-JUN-2019,10:18

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	212.00	212.00

High Resolution Temperature Constants MCG-D.K 443

Last Edited on 13-JUN-2019,10:18

Pre-filter Length	11
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Neutron Calibration MDN-B.A 295

Base Calibration on 13-JUN-2019 15:00

Field Check on 13-JUN-2019 15:15

Base Calibration		
	Measured	Calibrated (cps)

	Near	Far	Near	Far
	2974	91	3714	110
Ratio	32.502		33.764	
Field Calibrator at Base	Calibrated (cps)			
	1230		1826	
Ratio	0.674			
Field Check	Calibrated (cps)			
	1245		1822	
Ratio	0.684			

Neutron Calibration Tolerances MDN-B.A 295				
Ratio	32.502	-5% 33 +5%		
Base Check	0.674	0.65 0.7 0.75		
Field Check	0.684	0.654 0.674 0.694		

Neutron Constants MDN-B.A 295			Last Edited on 20-JUN-2019,20:27		
Neutron Source Id	P0204NN				
Neutron Jig Number	NEC 513				
Air Hole Processing	Legacy				
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 352		Base Calibration on 13-JUN-2019 11:01 Field Check on 13-JUN-2019 11:05	
	Resistor 1 (ohm)	Resistor 2 (ohm)	
	0.0	1000.0	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	963.0	126.8	
Base Check		281.0	
Field Check		281.0	

FE Calibration Tolerances MFE-B.J 352				
Reference 2	963.0	-3% 980.0 +3%		
		ohm		
Base Check	281.0	-2% 277.0 +2%		
		ohm-m		
Field Check	281.0	-2% 281.0 +2%		
		ohm-m		

FE Constants MFE-B.J 352			Last Edited on 20-JUN-2019,20:27		
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Borehole Correction Constants					
Sonde Position		0.5	inches		

Hole Size Source	Density Caliper				
Hole Size Constant Value	N/A	inches			
Rm Source	Global Value: Temperature Corrected				
Temp. for Rm Corr.	MCG External Temperature				
High Resolution Temperature Calibration MAI-B.A 299					
	Measured	Calibrated(Deg F)	Field Calibration on 13-JUN-2019,14:01		
Lower	50.00	50.00			
Upper	200.00	200.00			
High Resolution Temperature Constants MAI-B.A 299					
Pre-filter Length	11		Last Edited on 12-MAY-2019,20:47		
Induction Calibration MAI-B.A 299					
Factory Loop Calibration			Factory Loop Calibration 13-JUN-2019 13:59		
			Field Check on 13-JUN-2019 14:01		
High Conductivity Reference Resistor	3.3 ohm				
Low Conductivity Reference Resistor	333.3 ohm				
	Measured Signal (unitless)	Reference Conductivity (mmho/m)	Calibration		
Array	Low High	Low High	Gain Offset		
1 (near)	17.1 480.3	9.3 966.2	2.066 -26.1		
2	6.0 378.3	7.6 821.4	2.185 -5.5		
3	4.3 262.4	5.2 566.0	2.173 -4.2		
4 (far)	1.4 132.2	2.6 279.2	2.115 -0.4		
Array Temperature	74.7	Deg F			
Tool Checks					
	Factory Reference (mmho/m)	Before Survey (mmho/m)			
Array	Low High	Low High			
1 (near)	12.5 3783.6	12.5 3783.5			
2	30.7 3566.4	30.7 3566.5			
3	26.4 3024.5	26.4 3024.5			
4 (far)	20.7 2085.0	20.7 2085.0			
Array Temperature	90.7	90.5	Deg F		
Induction Check Tolerances MAI-B.A 299					
Low Array 1	12.5	11.0 12.5 14.0 mmho/m	High Array 1	3783.5	-0.5% 3783.6 +0.5% mmho/m
Low Array 2	30.7	29.2 30.7 32.2 mmho/m	High Array 2	3566.5	-0.5% 3566.4 +0.5% mmho/m
Low Array 3	26.4	24.9 26.4 27.9 mmho/m	High Array 3	3024.5	-0.5% 3024.5 +0.5% mmho/m
Low Array 4	20.7	19.2 20.7 22.2 mmho/m	High Array 4	2085.0	-0.5% 2085.0 +0.5% mmho/m
Induction Constants MAI-B.A 299				Last Edited on 20-JUN-2019,20:58	
Induction Model		RtAP-WBM			
Borehole Correction Constants					
Tool Centred		No			
Hole Size Source		Density Caliper			
Hole Size Constant Value		N/A inches			
Stand-off Type		Pineapple			
Stand-off		0.49 inches			
Number of Fins on Stand-off		5.0000			
Stand-off Fin Angle		72.00 degrees			
Stand-off Fin Width		1.3878 inches			
Rm Source		Global Value: Temperature Corrected			
Temp. for Rm Corr.		MCG External Temperature			
Borehole Correction Method		Default			
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

Symmetrised Receiver Gains

Receiver 1	1.00
Receiver 2	1.00
Receiver 3	1.00
Receiver 4	1.00

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 MMR-B.A 91

Base Calibration on 13-JUN-2019 11:47
Field Calibration on 13-JUN-2019 11:48

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13869	5.98
2	17522	7.96
3	20731	9.86
4	24837	11.93
5	0	0.00
6	N/A	N/A

Field Calibration		
Measured Caliper (in)	Actual Caliper (in)	
7.98	7.96	

Caliper Calibration Tolerances MMR-B.A 91

Short Arm Field Cal. 7.98 in

Micro-Resistivity Caliper Constants MMR-B.A 91

Sonde Configuration	Resistivity Mode
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Micro Normal and Micro Inverse Calibration MMR-B.A 91

Base Calibration on 13-JUN-2019 11:37
Field Check on 13-JUN-2019 11:39

	Resistor 1 (ohm)	Resistor 2 (ohm)
	10.0	50.0

Base Calibration				
	Measured	Calibrated (ohm-m)		
Micro Normal	9.9 49.3	5.1100	25.5500	
Micro Inverse	9.9 49.2	3.3800	16.9000	

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	94.5	94.5
Micro Inverse	62.6	62.6

Micro Normal & Micro Inverse Calibration Tolerance MMR-B.A 91

Micro Normal Res. 1	9.9		ohm	Micro Normal Res. 2	49.3		ohm
Micro Inverse Res. 1	9.9		ohm	Micro Inverse Res. 2	49.2		ohm

Micro Normal Base Check 94.5		ohm-m
Micro Inverse Base Check 62.6		ohm-m

-2%	94.5	+2%
-2%	62.6	+2%

Last Edited on 13-JUN-2019,11:29

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	0.0000

Base Calibration on 13-JUN-2019 17:11
Field Check on 13-JUN-2019 17:27

Density Calibration		Measured		Calibrated (sdu)	
Base Calibration		Near	Far	Near	Far
Background	1093	1316			
Reference 1	51191	25138	59494	30754	
Reference 2	21976	2478	26396	2598	

Field Check at Base	1093.0	1316.1
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Field Check	1096.4	1317.7
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PE Calibration		Measured		Ratio	Calibrated Ratio
Base Calibration	WS	WH			
Background	212	979			
Reference 1	23484	51002	0.465		0.367
Reference 2	7048	21833	0.328		0.270

Field Check at Base	212.4	979.3
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Field Check	213.2	982.1
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Photo Density Calibration Tolerances MPD-D.A 479

		-5%	2.52	+5%
Near Density Ratio	2.40			
PE Calibration	0.131			

Far Density Ratio 20.51

-5%	21.00	+5%

		0.009	0.110	0.131
PE Calibration	0.131			

		-3%	1093.0	+3%
Near Den. Field Check	1096.4			

			-3%	1316.1	+3%
Far Den. Field Check	1317.7				

		-6%	212.4	+6%
PE WS Field Check	213.2			

		-6%	979.3	+6%
PE WH Field Check	982.1			

Last Edited on 20-JUN-2019,10:18

Density Source Id	P50557B	
Nylon Calibrator Number	766	
Aluminium Calibrator Number	856	
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 Type		
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	
Precision Enhanced Density Processing	Applied	

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

Caliper Calibration MPD-D.A 479

Base Calibration on 13-JUN-2019 17:42
Field Calibration on 13-JUN-2019 17:44

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16436	4.01
2	25093	5.98
3	33645	7.87
4	41925	9.87
5	51125	11.88
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.87	7.87

Caliper Calibration Tolerances MPD-D.A 479

Long Arm Field Cal. 7.87

7.46	7.87	8.27

 in

DOWNHOLE EQUIPMENT

C:\Users\John\AppData\Local\Temp\Weatherford PreView0\0\MAIN PASS.dta

Cablehead, 11 pin
CBH-CA 177 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 719 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

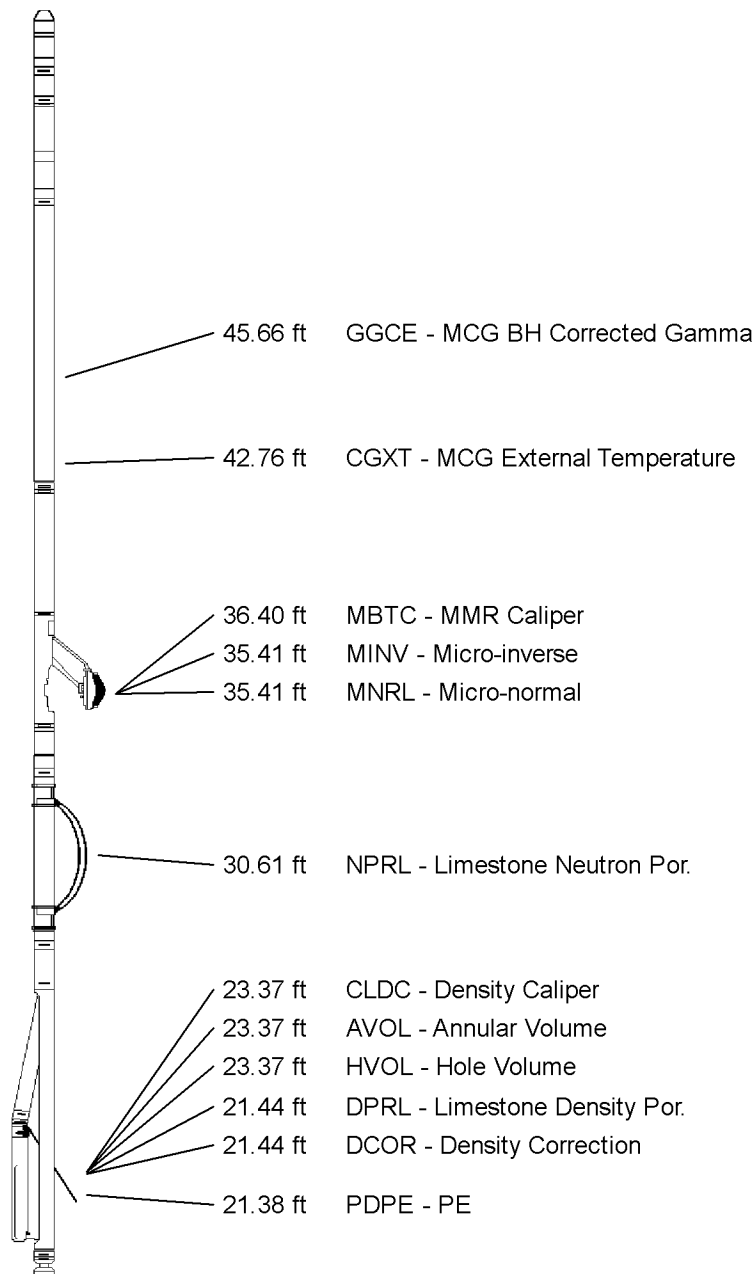
Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-B.A 91 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.A 295 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-D.A 479 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Knuckle Joint



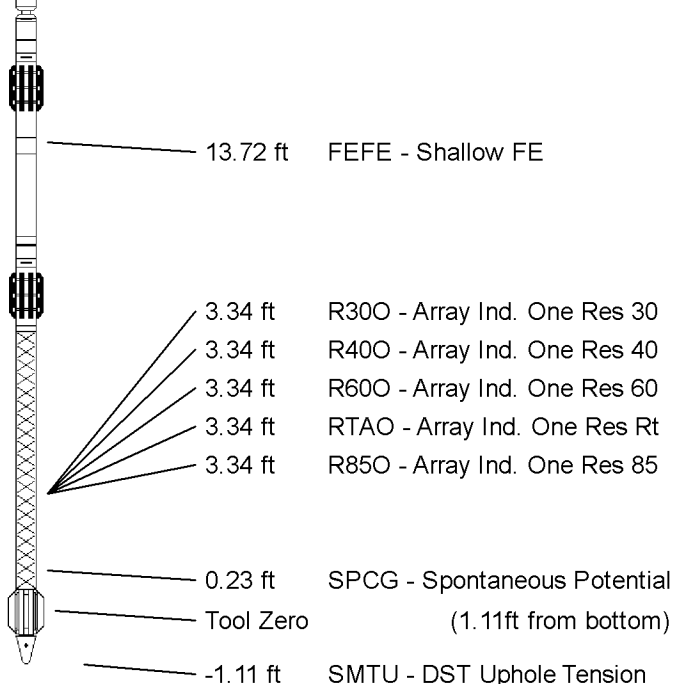
SKJ-E.A 167 LG: 17.7 ft WT: 24.3 lb OD: 2.244 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-B.A 299 LG: 11.00 ft WT: 48.5 lb OD: 2.244 in

Compact Hole Finder
HFS 1 LG: 0.78 ft WT: 2.2 lb OD: 2.244 in

Total Length: 56.62 ft Weight: 456.4 lb



All measurements relative to tool zero.

COMPANY O'BRIEN ENERGY RESOURCES CORP
WELL KEYSTONE #5-4
FIELD KEYSTONE
PROVINCE/COUNTY MEADE
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2646	feet	First Reading	6247.00	feet
Elevation Drill Floor	2644	feet	Depth Driller	6250.00	feet
Elevation Ground Level	2634	feet	Depth Logger	6250.00	feet



ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

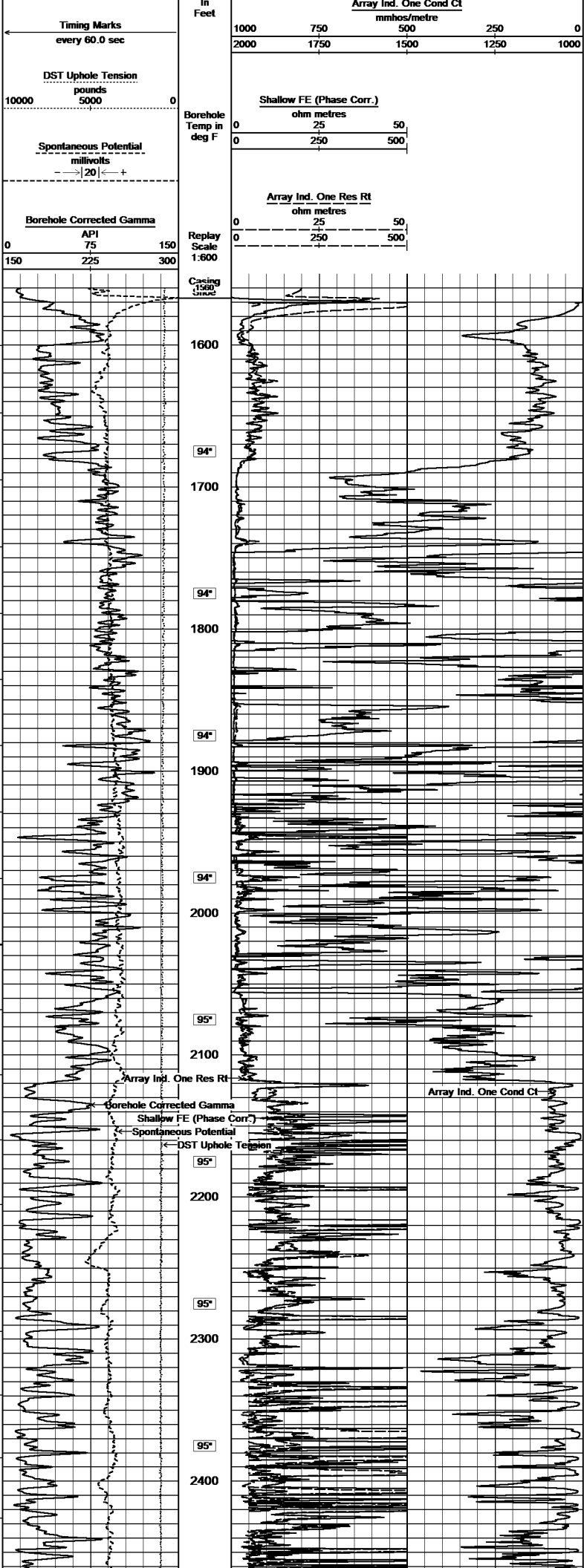
Weatherford®

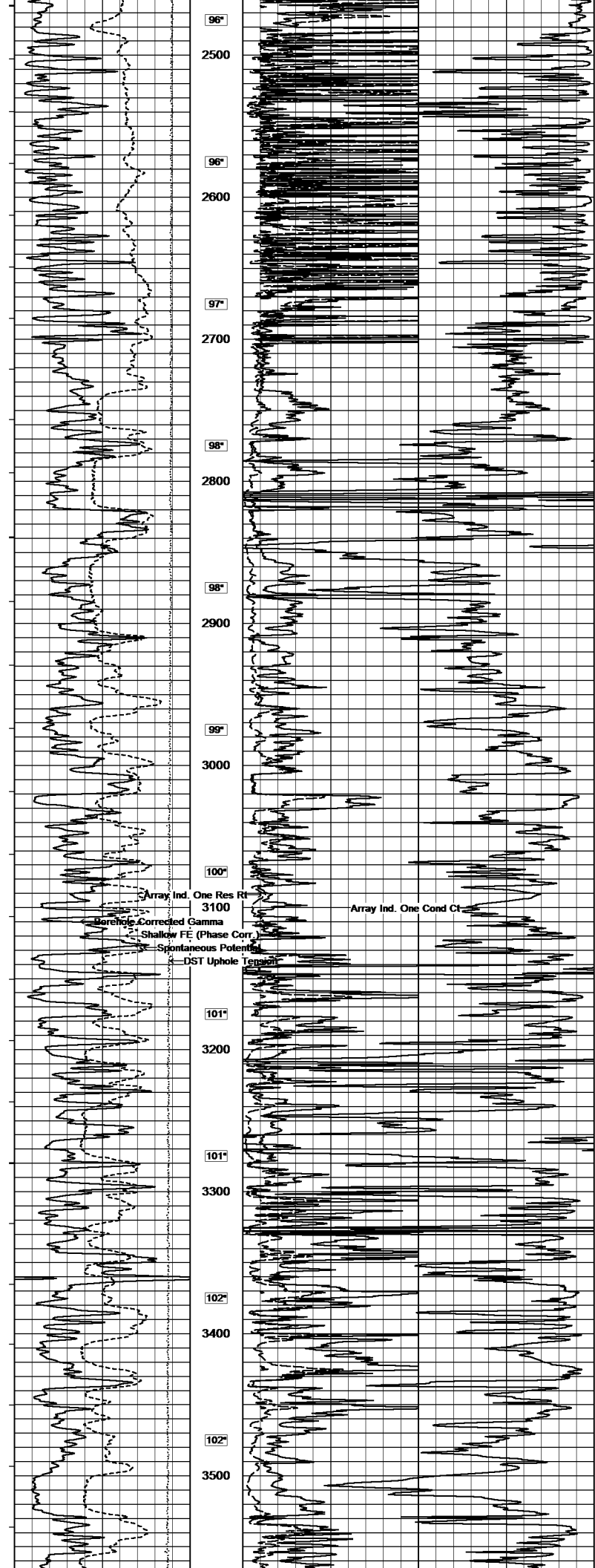
Weatherford®		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY O'BRIEN ENERGY RESOURCES CORP		WELL KEYSTONE #5-4	
FIELD KEYSTONE		PROVINCE/COUNTY MEADE	
COUNTRY/STATE U.S.A. / KANSAS		LOCATION S2 S2 N2 SW 1350' FSL & 1320' FWL	
SEC 4 TWP 33 RGE 29W		Other Services MIDNAPOLIS	
Latitude -100.444790		Longitude 37.202613	
API Number 15-119-21435		Permanent Datum GL, Elevation 2634 feet	
Log Measured From KB, 12.00 feet above Permanent Datum		Drilling Measured From KB	
Date 21-JUN-2019		Run Number ONE	
Service Order 17937-24822568		Depth Driller 6250.00	
Depth Logger 6250.00		First Reading 6247.00	
Last Reading 1967.00		Casing Driller 1967.00	
Casing Logger 1967.00		Bit Size 7.875	
Hole Fluid Type WATER-BASED		Hole Fluid Density 8.90 lb/USg	
Hole Fluid Viscosity 10.00		Hole Fluid Loss 8.00 ml/30min	
Sample Source 0.88 @ 96.0		Flow Line 0.88 @ 96.0	
Run @ Measured Temp 0.70 @ 96.0		Run @ Measured Temp 0.70 @ 96.0	
Source Fluid / Run CALC		Run @ BHT 0.70 @ 122.0	
Time Since Circulation 3 HOURS		Max Recorded Temp 122.00	
Equipment / Base 1967		Recorded By M. MCGLOTHLIN	
Witnessed By P. DEBENHAM		D. GREATHOUSE	

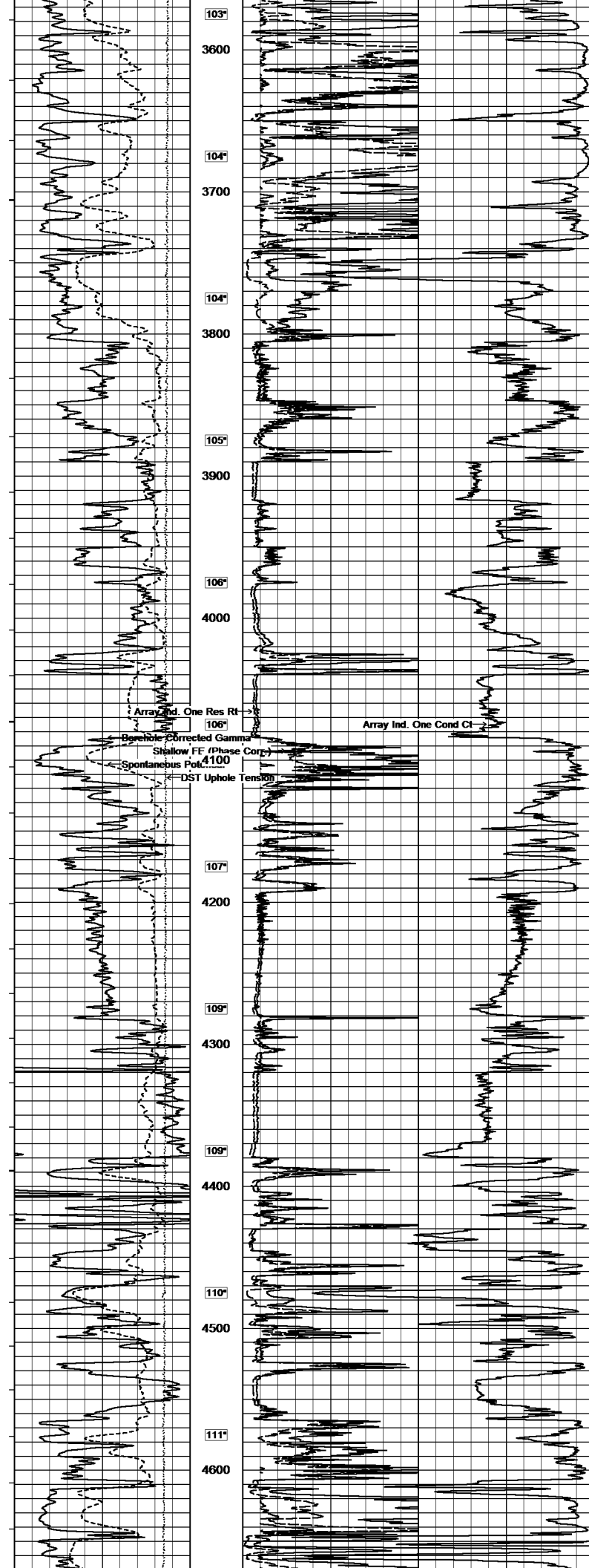
1 INCH MAIN PASS 1:600

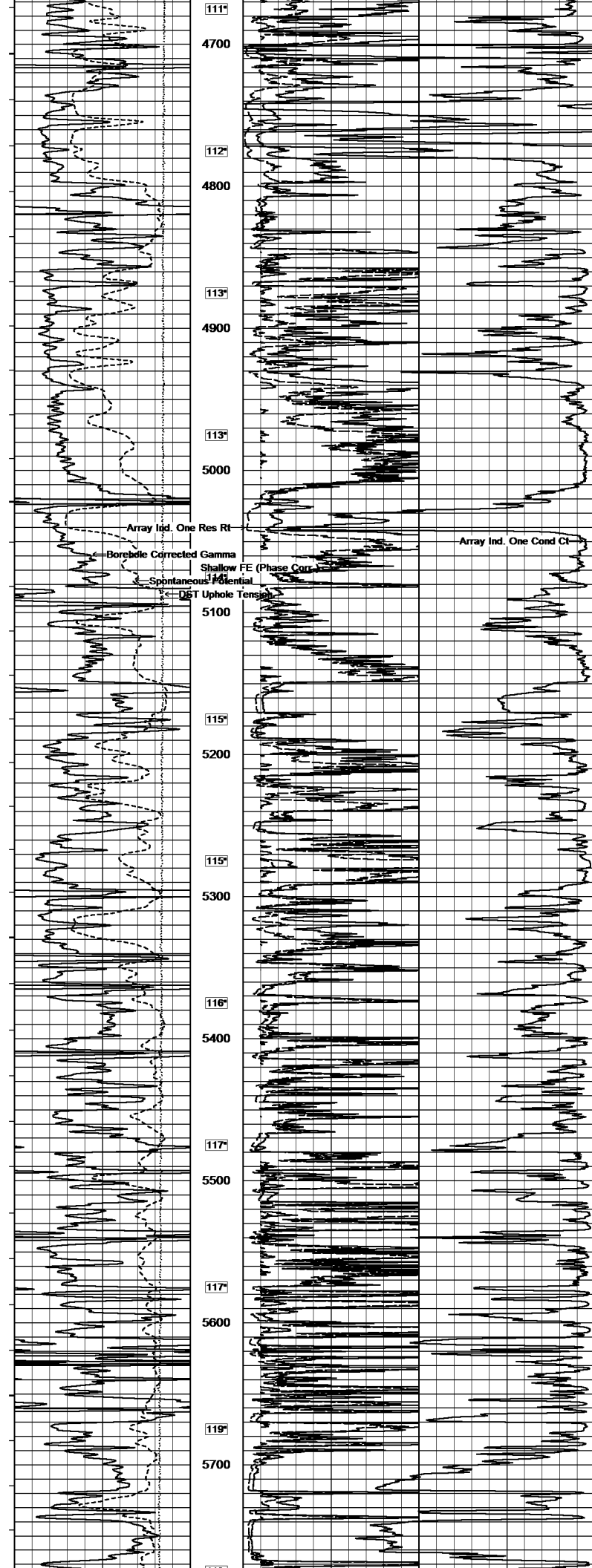
Depth Based Data - Maximum Sampling Increment: 10.0cm
Plotted on 25-SEP-2019 15:58
Filename: C:\Users\John\AppData\Local\Temp\Weatherford PreView\010MAIN PASS.dta
Recorded on 20-JUN-2019 23:32
System Versions: Logged with 19.01.8879 Processed with 19.01.8879 Plotted with 19.01.9433

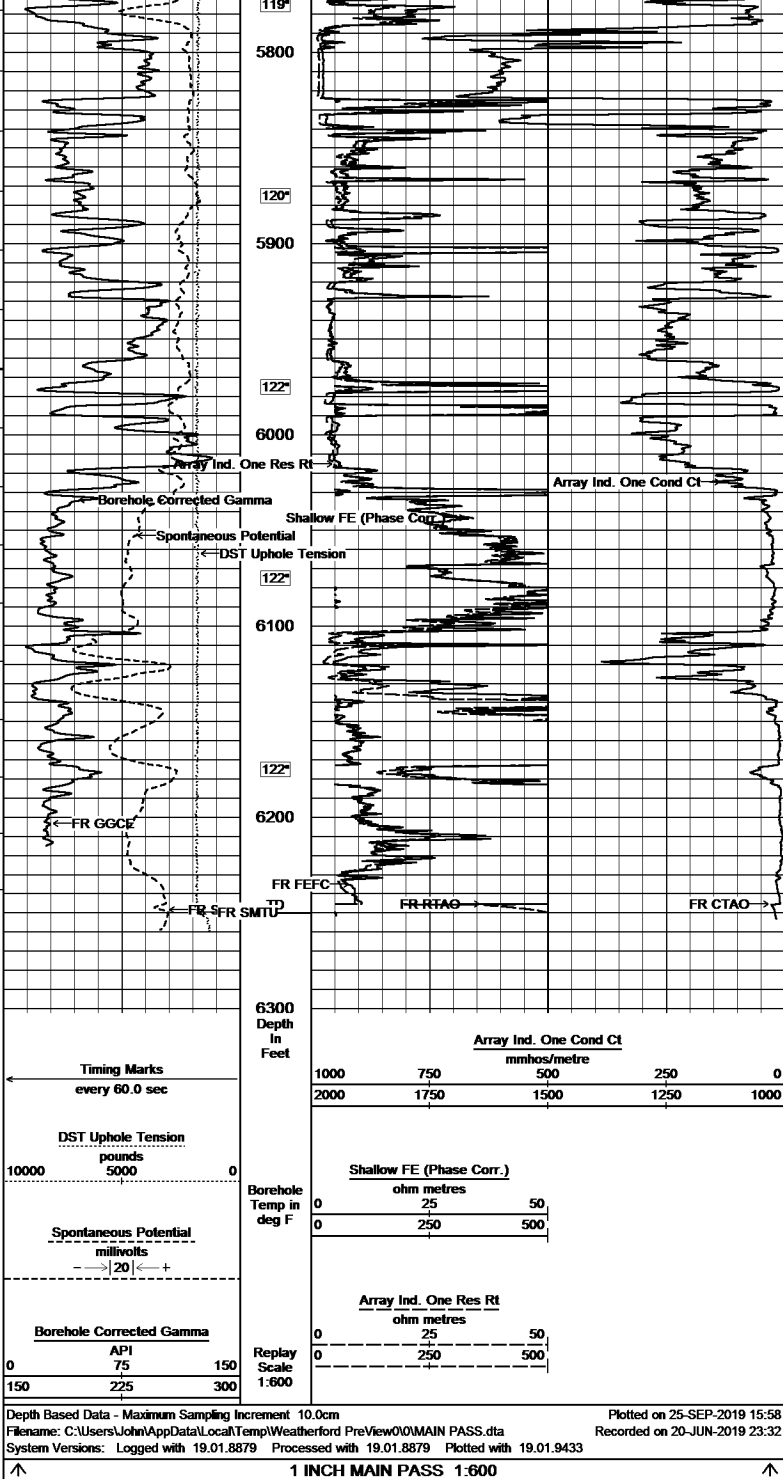
Depth











COMPANY		O'BRIEN ENERGY RESOURCES CORP			
WELL		KEYSTONE #5-4			
FIELD		KEYSTONE			
PROVINCE/COUNTY		MEADE			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2651	feet	First Reading	6247.00	feet
Elevation Drill Floor	2649	feet	Depth Driller	6250.00	feet
Elevation Ground Level	2639	feet	Depth Logger	6250.00	feet
 ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG					