Weatherford

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	O'BRIEN RESOURCES, LLC.
WELL	BESPERAT #33-1
FIELD	WILDCAT
PROVINCE/COUNTY	RUSH
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1250' FNL & 1391' FEL

SEC 33	TWP 18S	RGE 17W	Other Services
Latitude			MPD/MDN MML
Longitude			MSS
API Number	15-165-22139		

Permanent Datum GL, Elevation 2057 feet
Log Measured From KB, 8 feet above Permanent Datum
Drilling Measured From KB @ 8 FEET

Elevations:	feet
KB	2065.00
DF	2063.00
GL	2057.00

Date	22-DEC-2016			
Run Number	ONE			
Service Order	4558-169594456			
Depth Driller	3836.00	feet		
Depth Logger	3834.00	feet		
First Reading	3831.00	feet		
Last Reading	265.00	feet		
Casing Driller	264.00	feet		
Casing Logger	265.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.30 lb/USg		56.00 CP	
PH / Fluid Loss	10.50		12.00 ml/30Min	
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.29 @ 75.0	ohm-m		
Rmf @ Measured Temp	0.23 @ 75.0	ohm-m		
Rmc @ Measured Temp	0.35 @ 75.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.23 @ 96.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	96.00	deg F		
Equipment / Base	13096		OKC	
Recorded By	ADAM SILL			
Witnessed By	JIM MUSGROVE			

BOREHOLE RECORD

Last Edited: 22-DEC-2016 12:25

Bit Size inches	Depth From feet	Depth To feet
7.875	264.00	3836.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	264.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 15.03.5939.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  0.5 INCH STANDOFF USED ON MFE.
  TWO 0.5 INCH STANDOFFS USED ON MSS.
  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: 1792 CU.FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 2300: 392 CU.FT.

- RIG: DUKE #2.

- ENGINEER: A. SILL.

- OPERATOR: B. TOVAR.

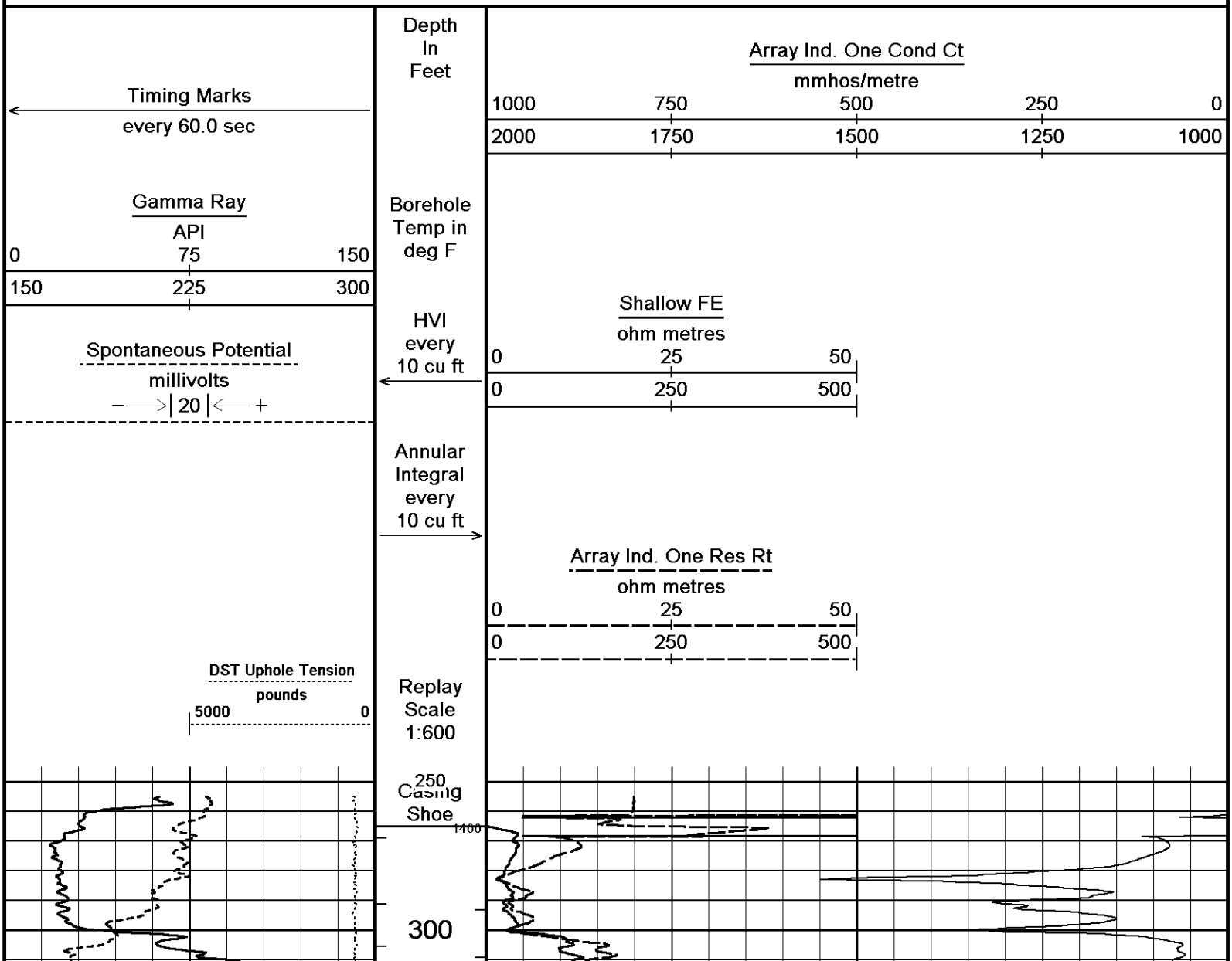
**** GAMMA RAY FROM RUN TWO WAS SPLICE INTO RUN ONE TO ALLOW FOR A DEEPER GAMMA RAY FIRST READ. ****

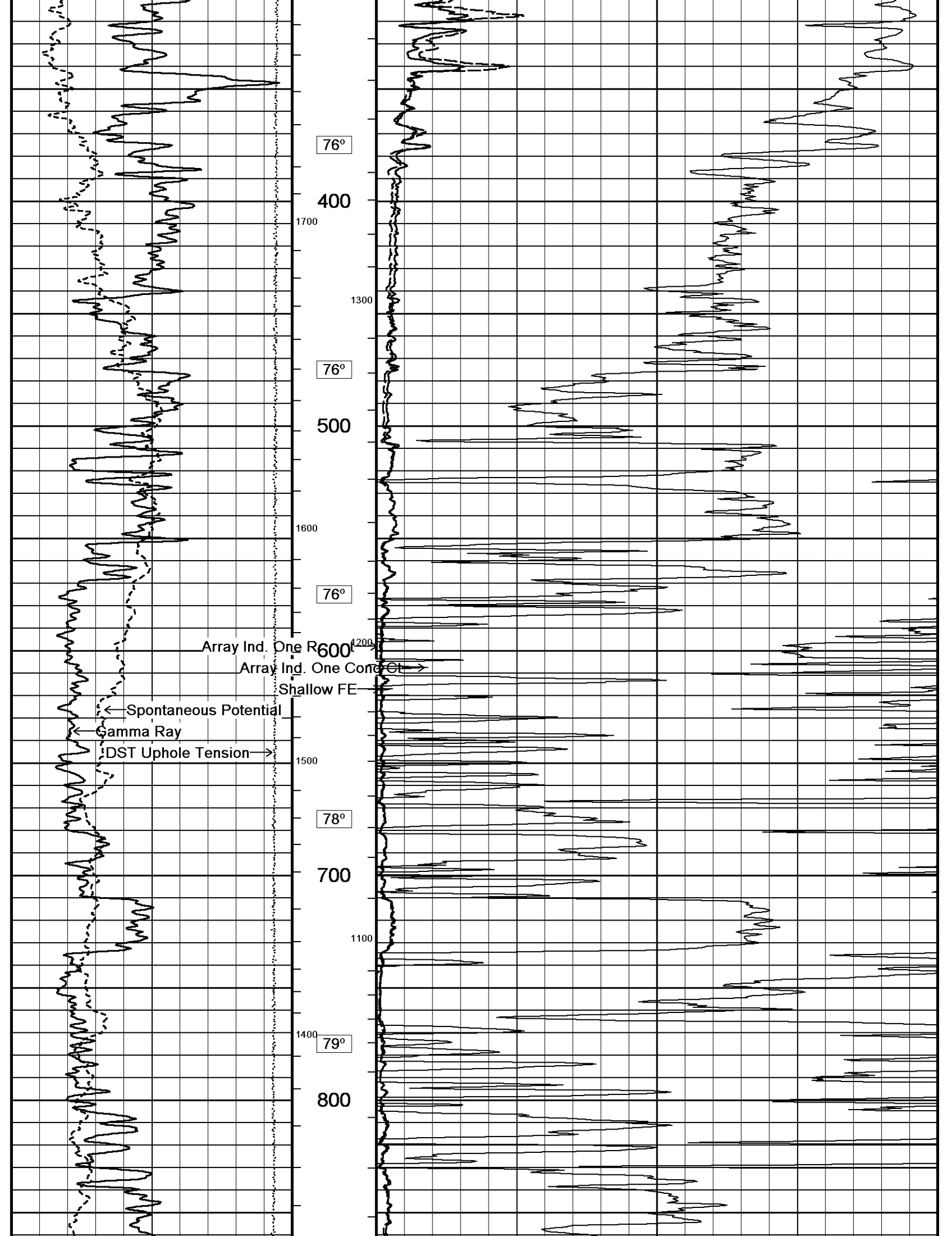
2 INCH MAIN

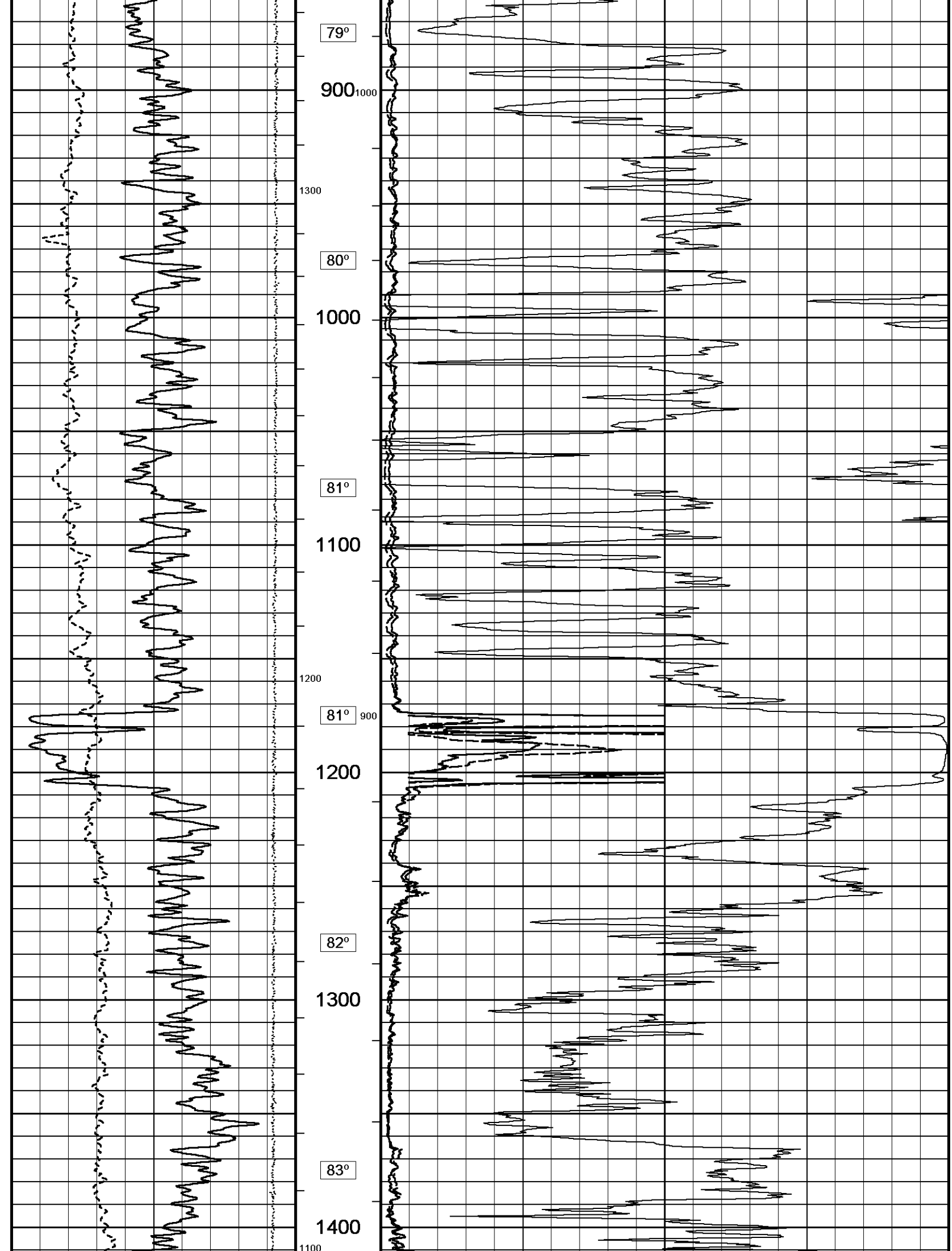
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-DEC-2016 17:14

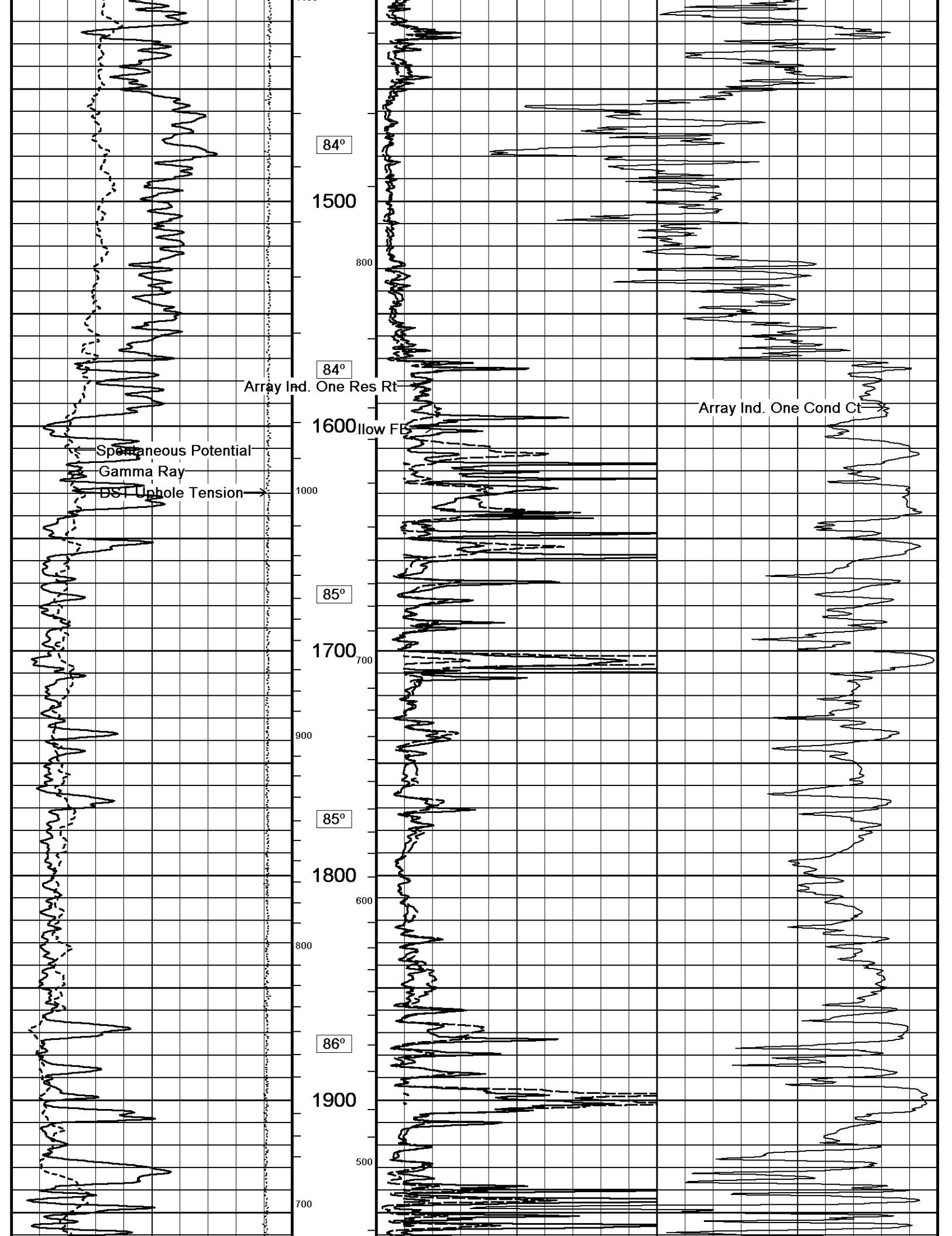
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bes...\O'Brien (LA) Besperat #33-1 Main Merge.dta — Recorded on 22-DEC-2016 12:45

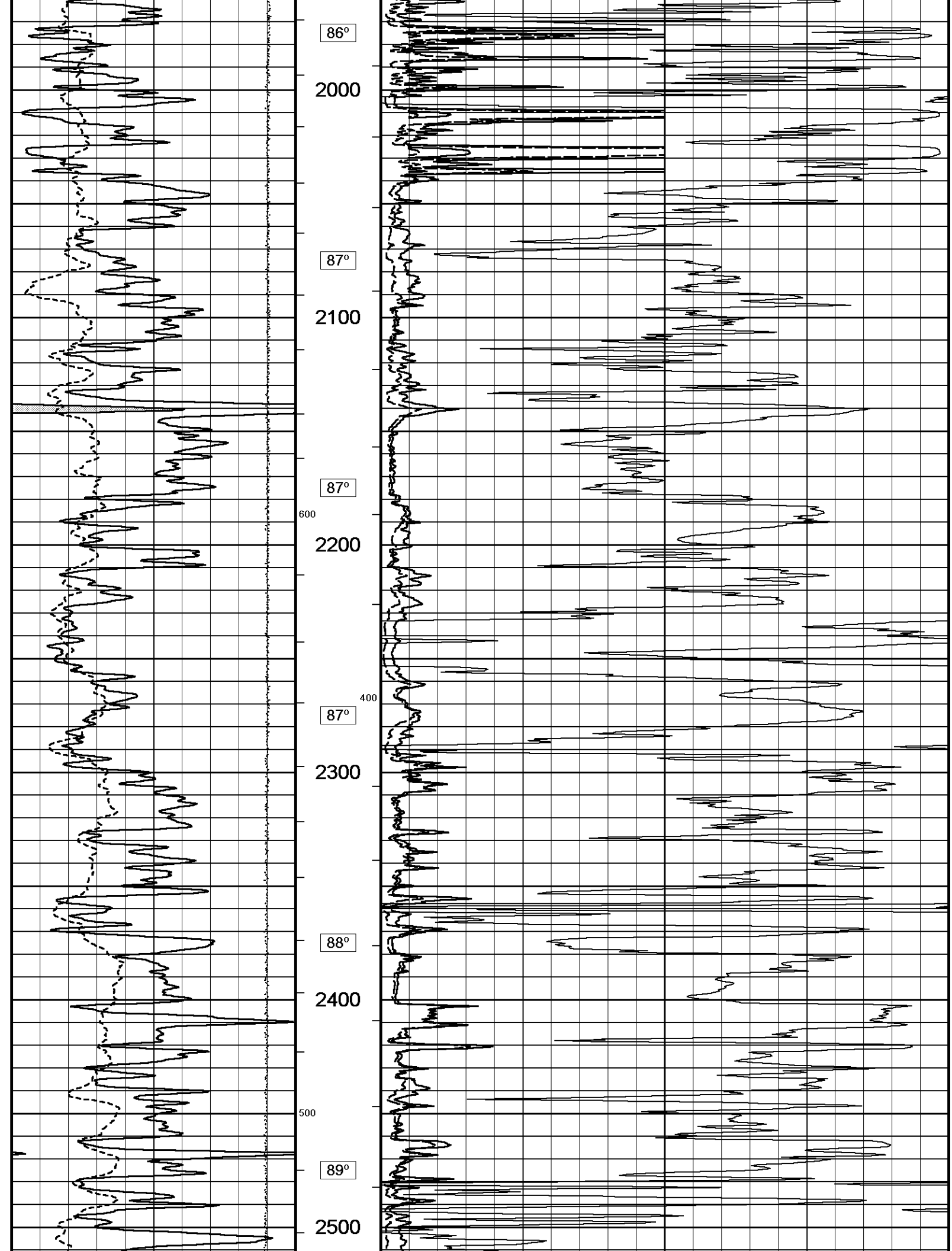
System Versions: Plotted with 16.05.3841

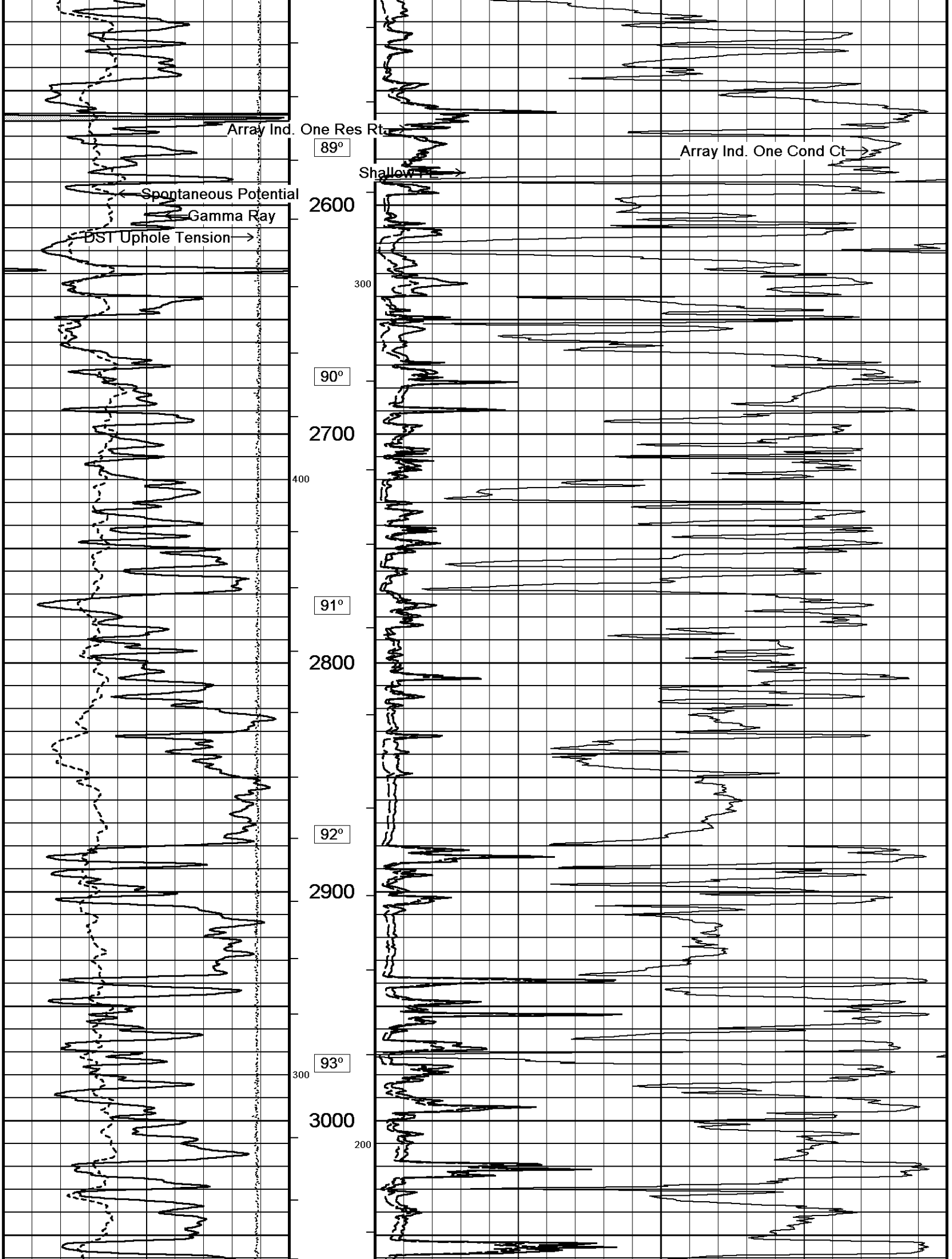


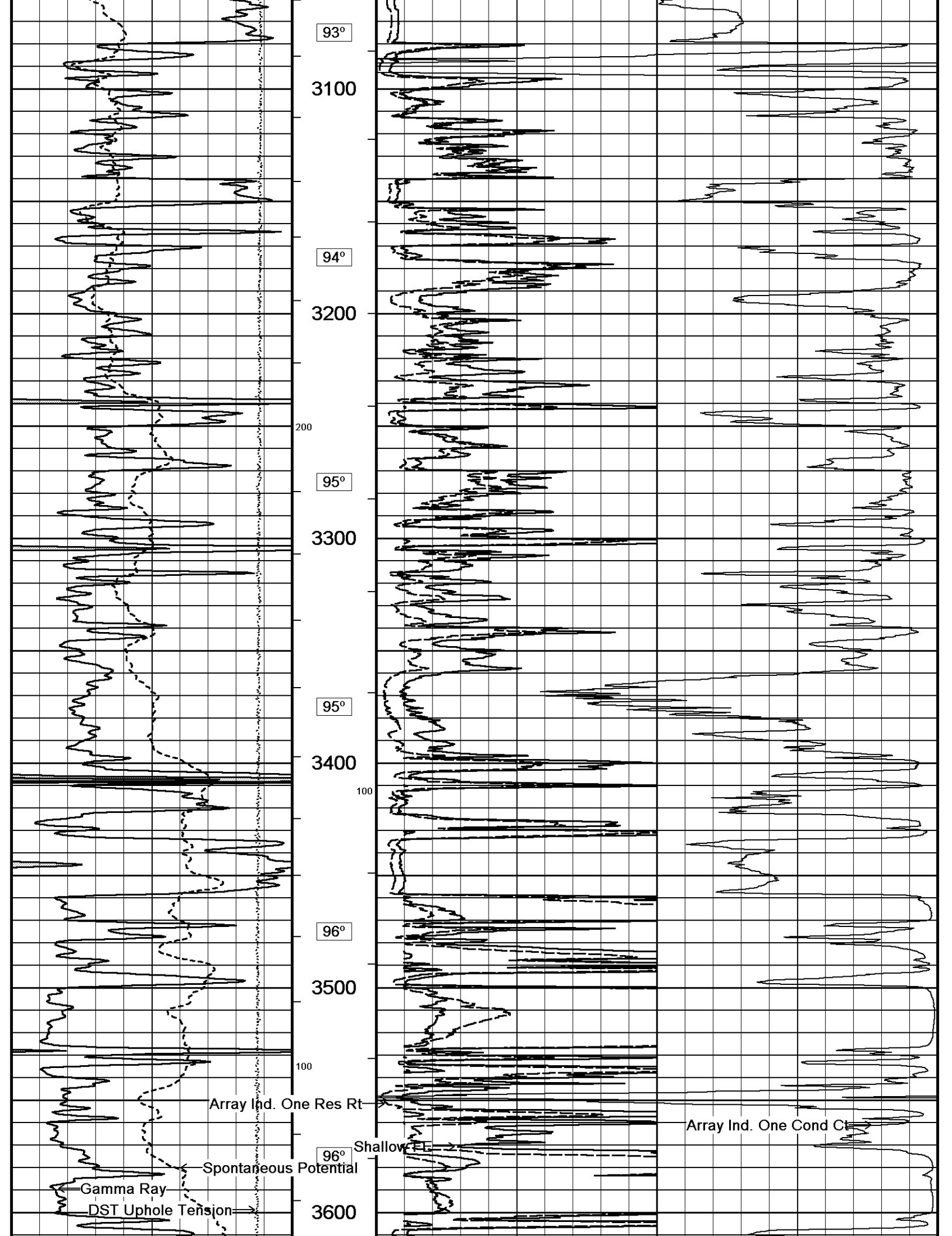

76°
400
1700
1300
76°
500
1600
76°
Array Ind. One R
600
1200
Array Ind. One Conc Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1500
78°
700
1100
1400
79°
800

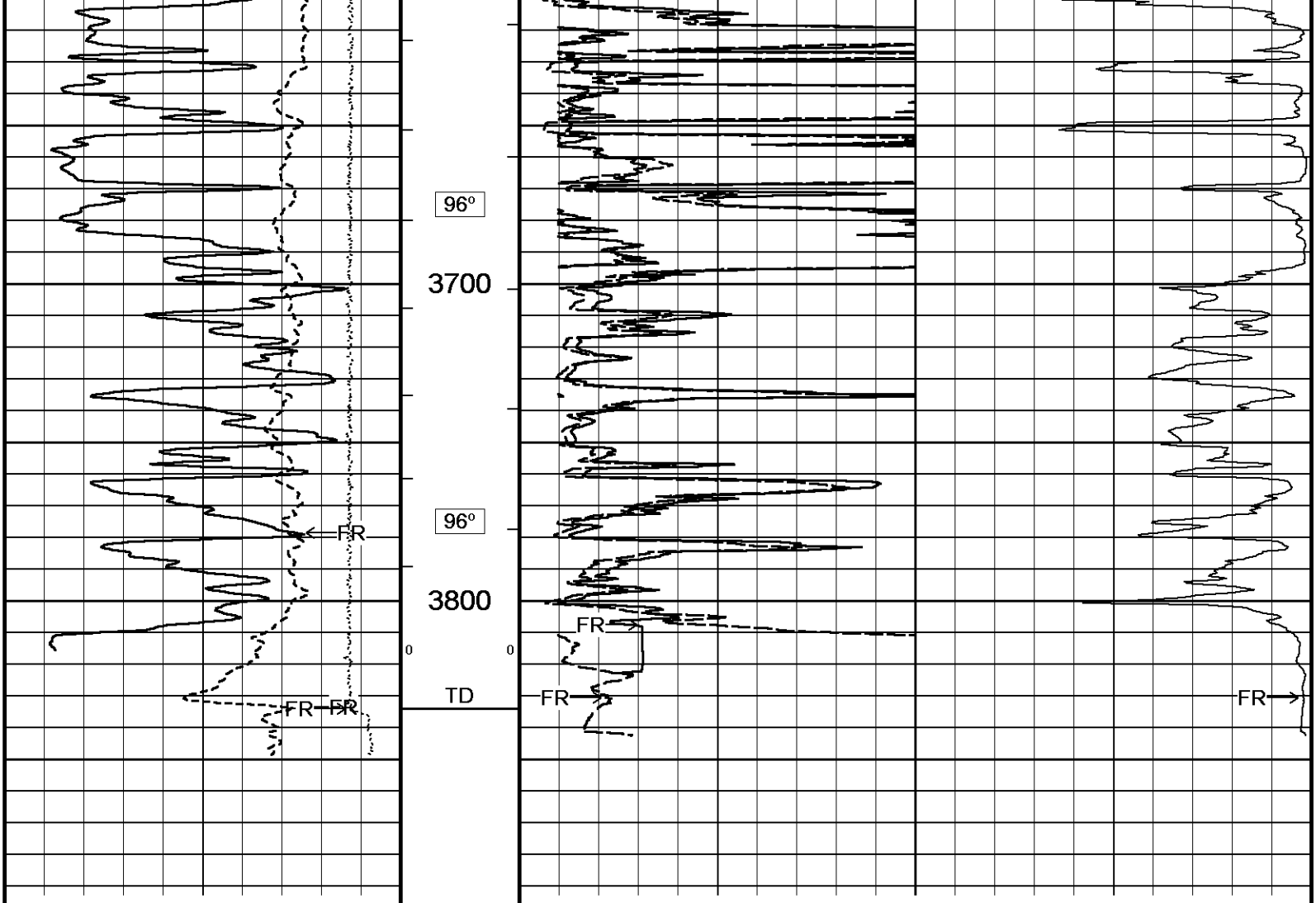

79°
900
1000
1300
80°
1000
81°
1100
1200
81°
900
1200
82°
1300
83°
1400
1100


84°
1500
800
84°
Array Ind. One Res Rt
1600
Illow FB
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1000
85°
1700
700
900
85°
1800
600
800
86°
1900
500
700


86°
2000
87°
2100
87°
600
2200
400
87°
2300
88°
2400
500
89°
2500


Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow Res
Spontaneous Potential
Gamma Ray
DST Uphole Tension
89°
90°
91°
92°
93°
2600
2700
2800
2900
3000
400
300
300
200


93°
3100
94°
3200
200
95°
3300
95°
3400
100
96°
3500
100
96°
3600
Array Ind. One Res Rt
Shallow FT
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct



Depth
In
Feet

Timing Marks
every 60.0 sec

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

Gamma Ray
API
0 75 150
150 225 300

Borehole
Temp in
deg F

Shallow FE
ohm metres
0 25 50
0 250 500

HVI
every
10 cu ft

Spontaneous Potential
millivolts
− 20 +

Annular
Integral
every
10 cu ft

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

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:600

Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bes...\O'Brien (LA) Besperat #33-1 Main Merge.dta Recorded on 22-DEC-2016 12:45
System Versions: Plotted with 16.05.3841

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 22-DEC-2016 17:14
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bes...\O'Brien (LA) Besperat #33-1 Main Merge.dta Recorded on 22-DEC-2016 12:45
System Versions: Plotted with 16.05.3841

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

DST Uphole Tension
pounds
5000 0

Depth In Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

254
Casing Shoe
1400

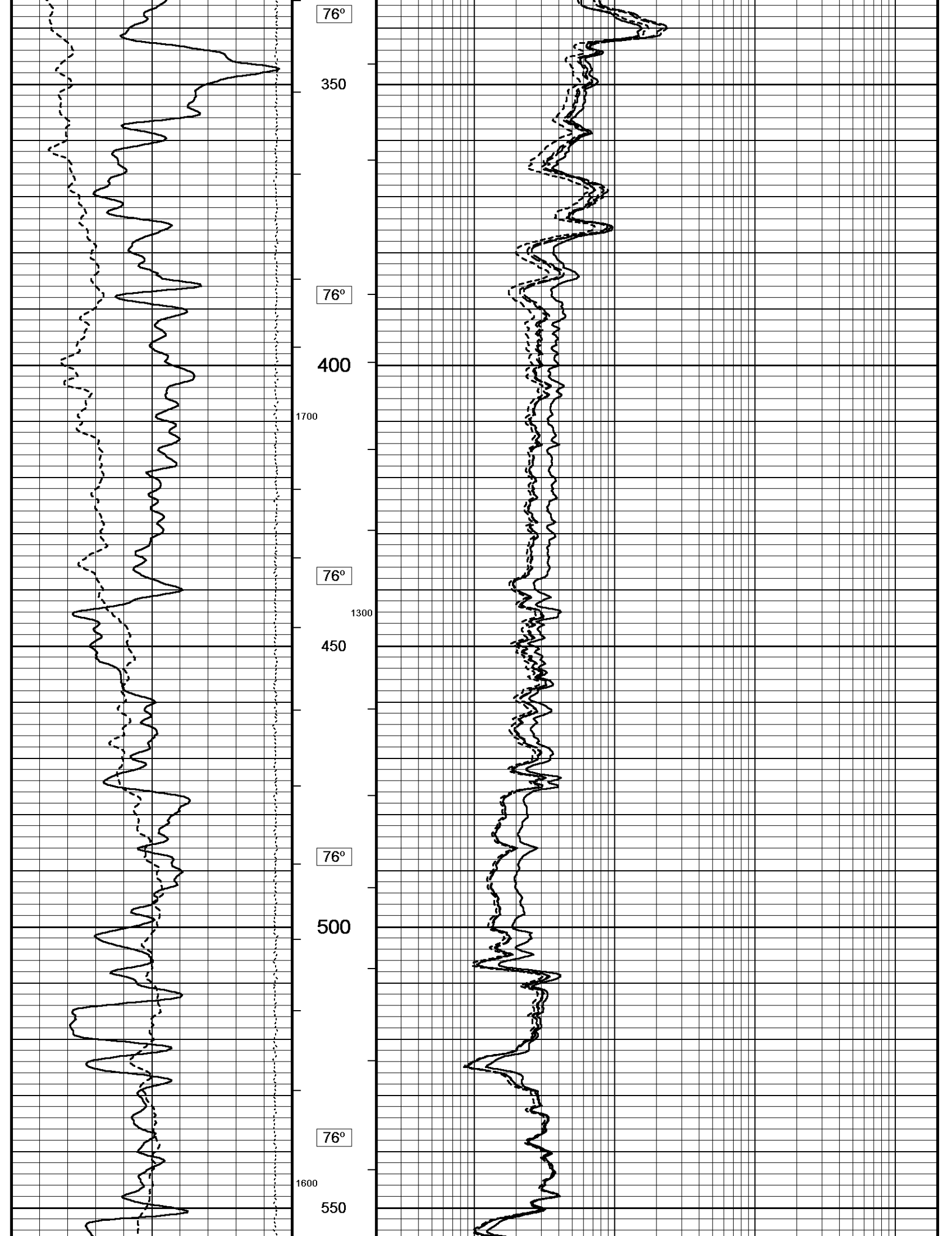
300

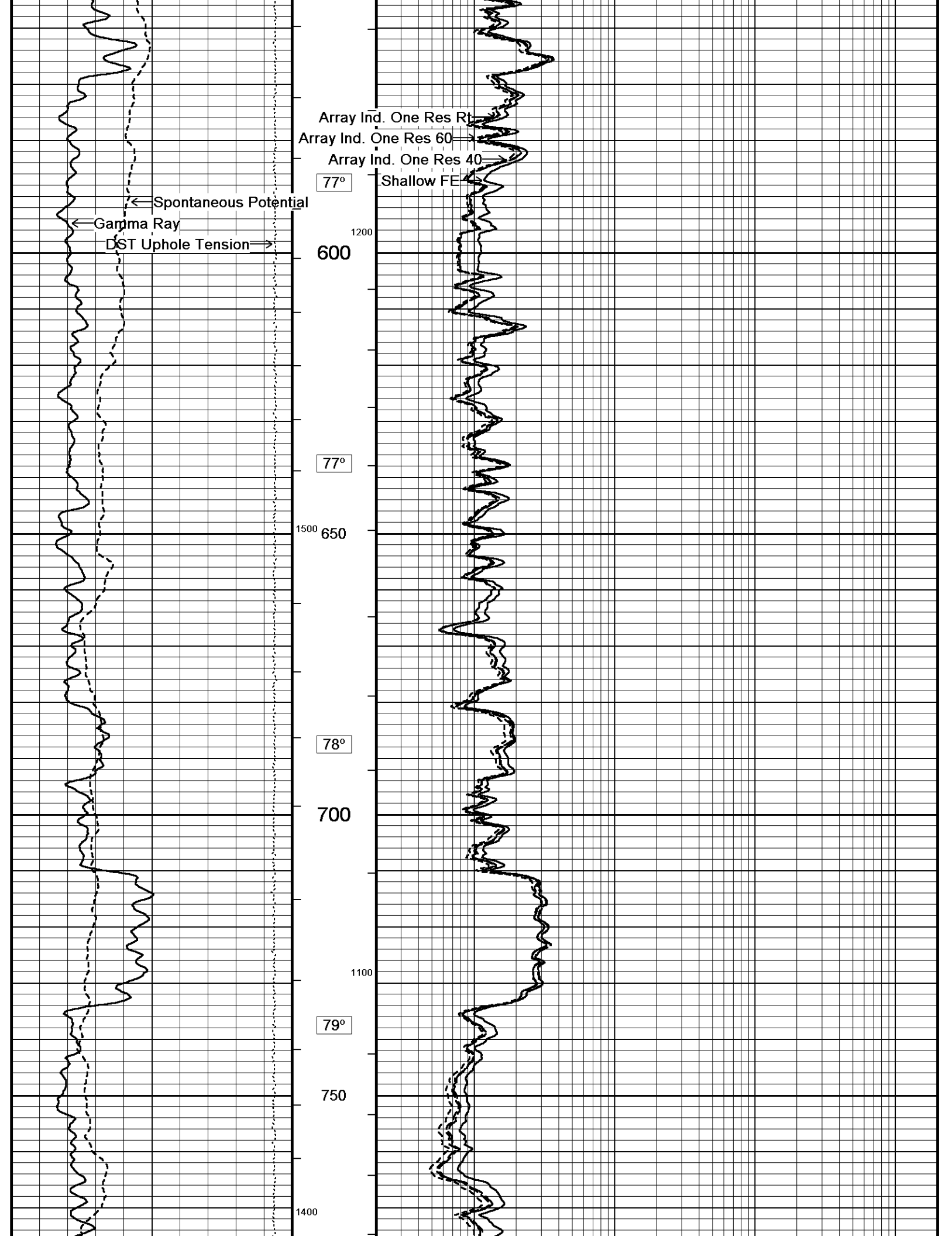
Shallow FE
ohm metres
0.20 2000
1 10 100 1000

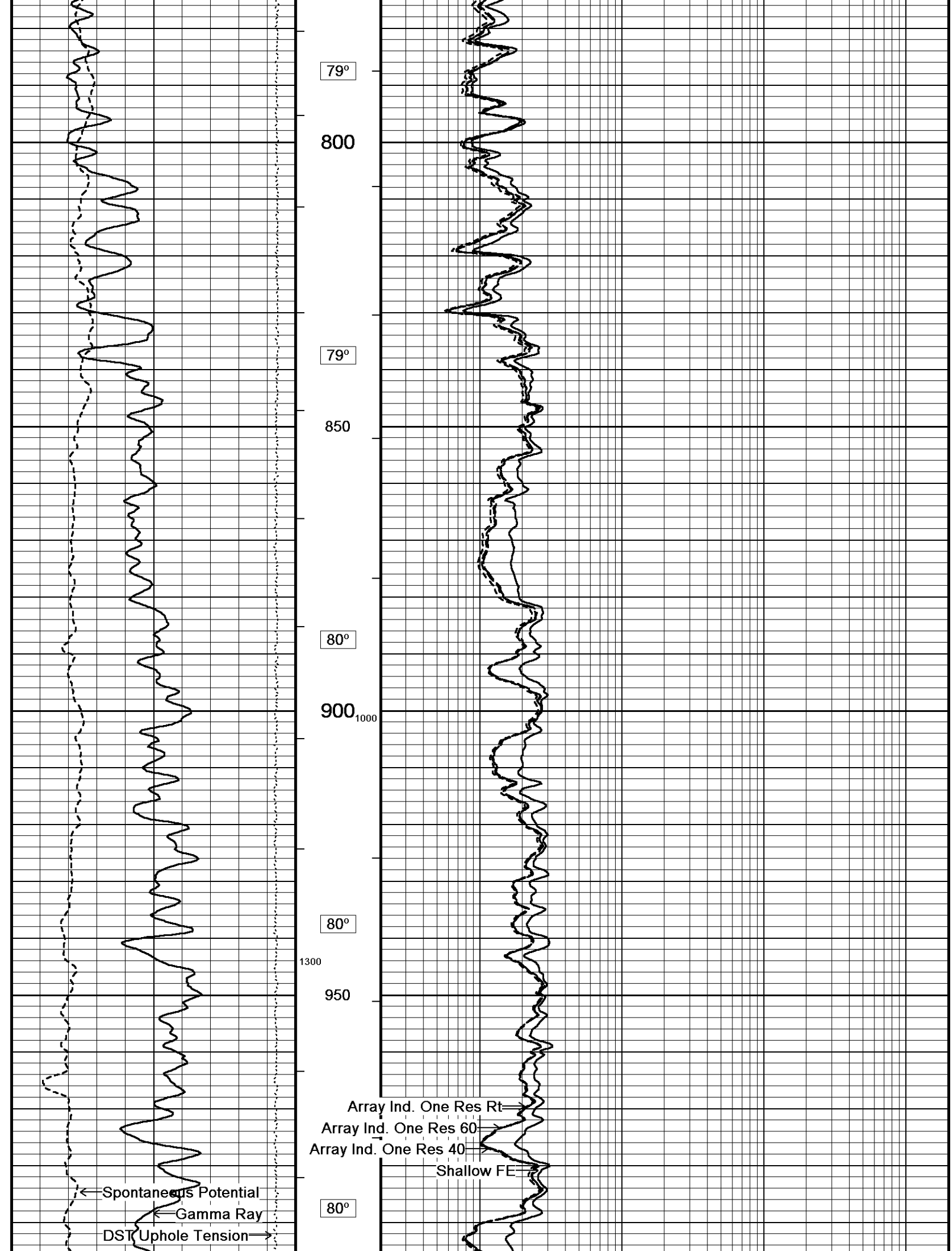
Array Ind. One Res 40
ohm metres
0.20 2000
1 10 100 1000

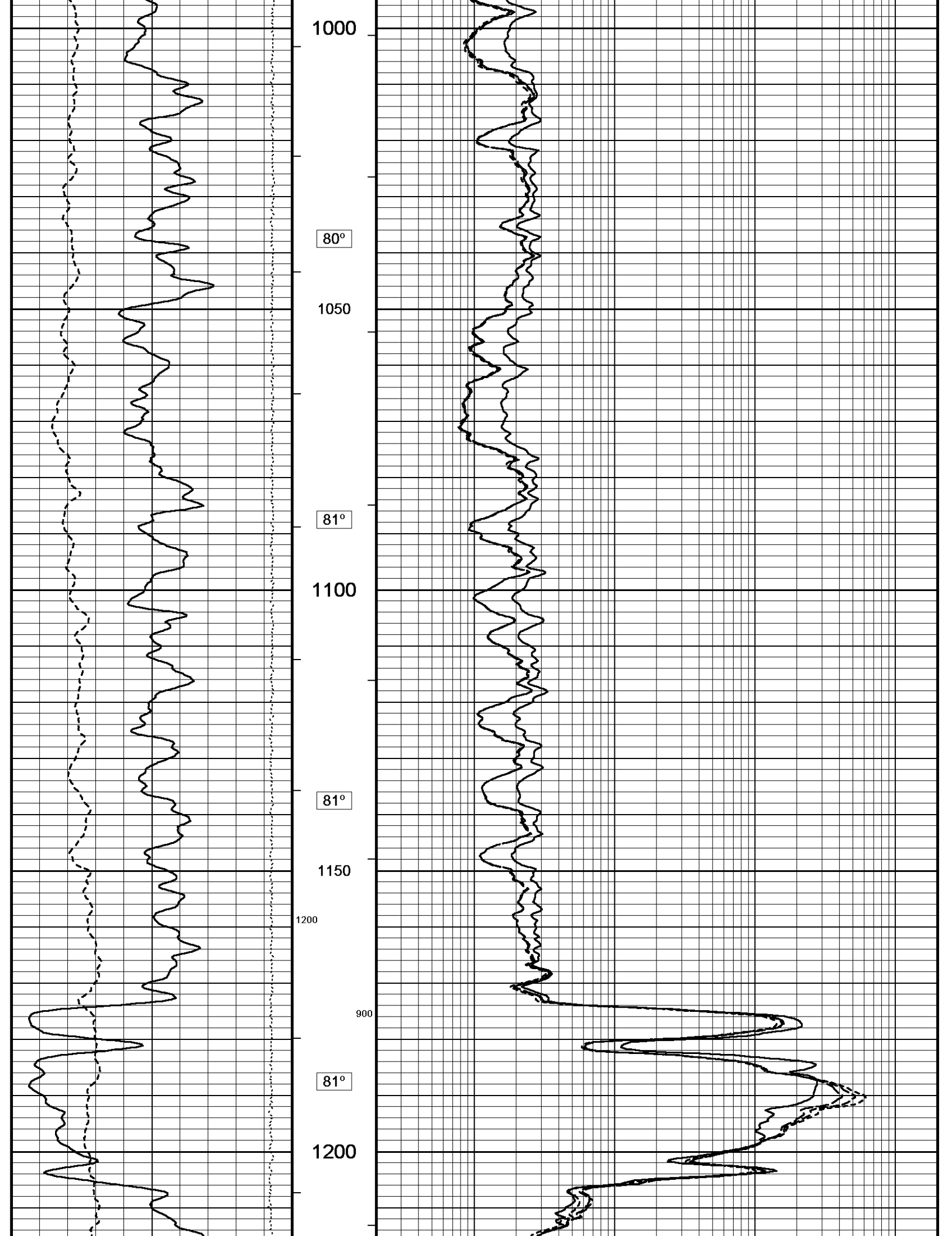
Array Ind. One Res 60
ohm metres
0.20 2000
1 10 100 1000

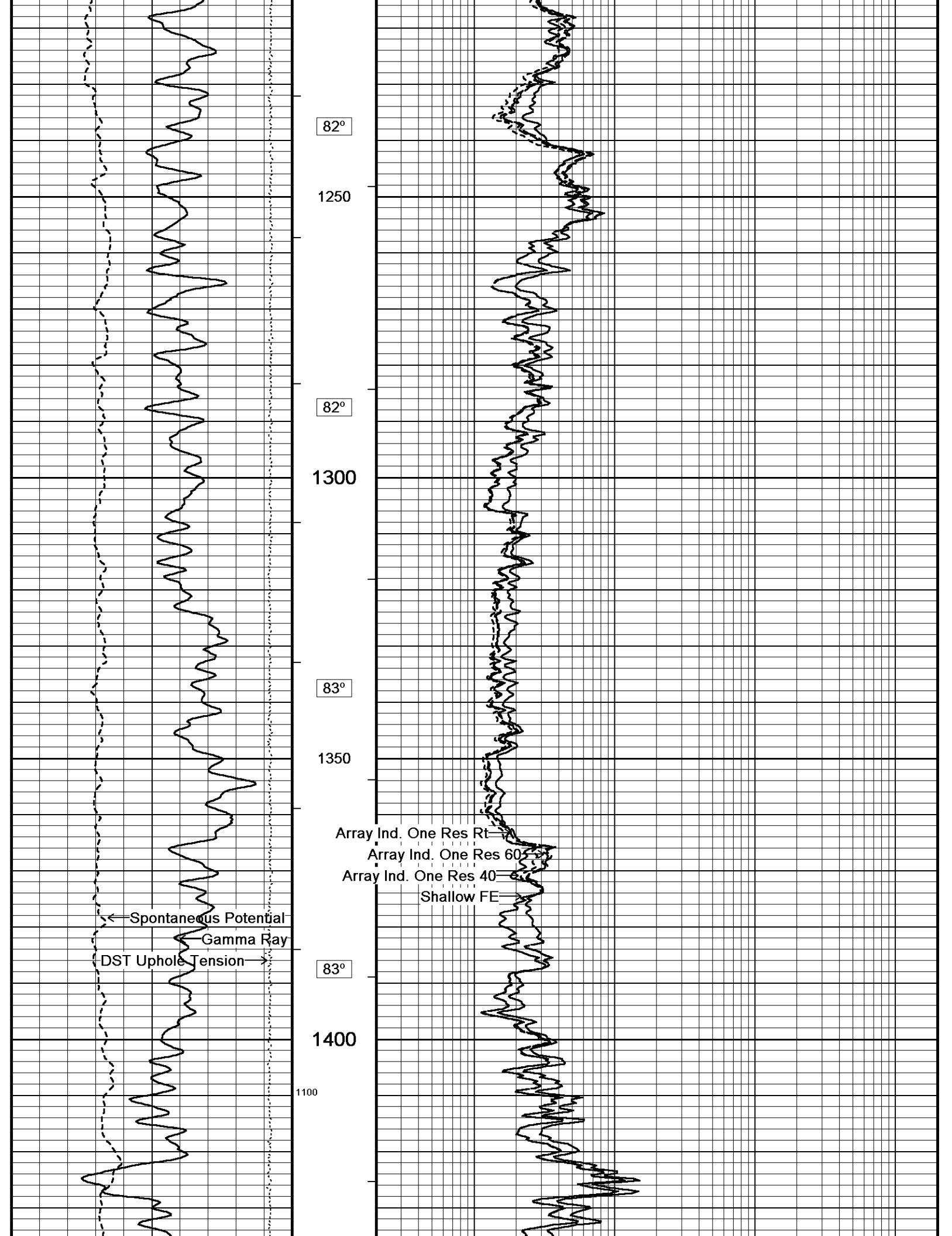
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

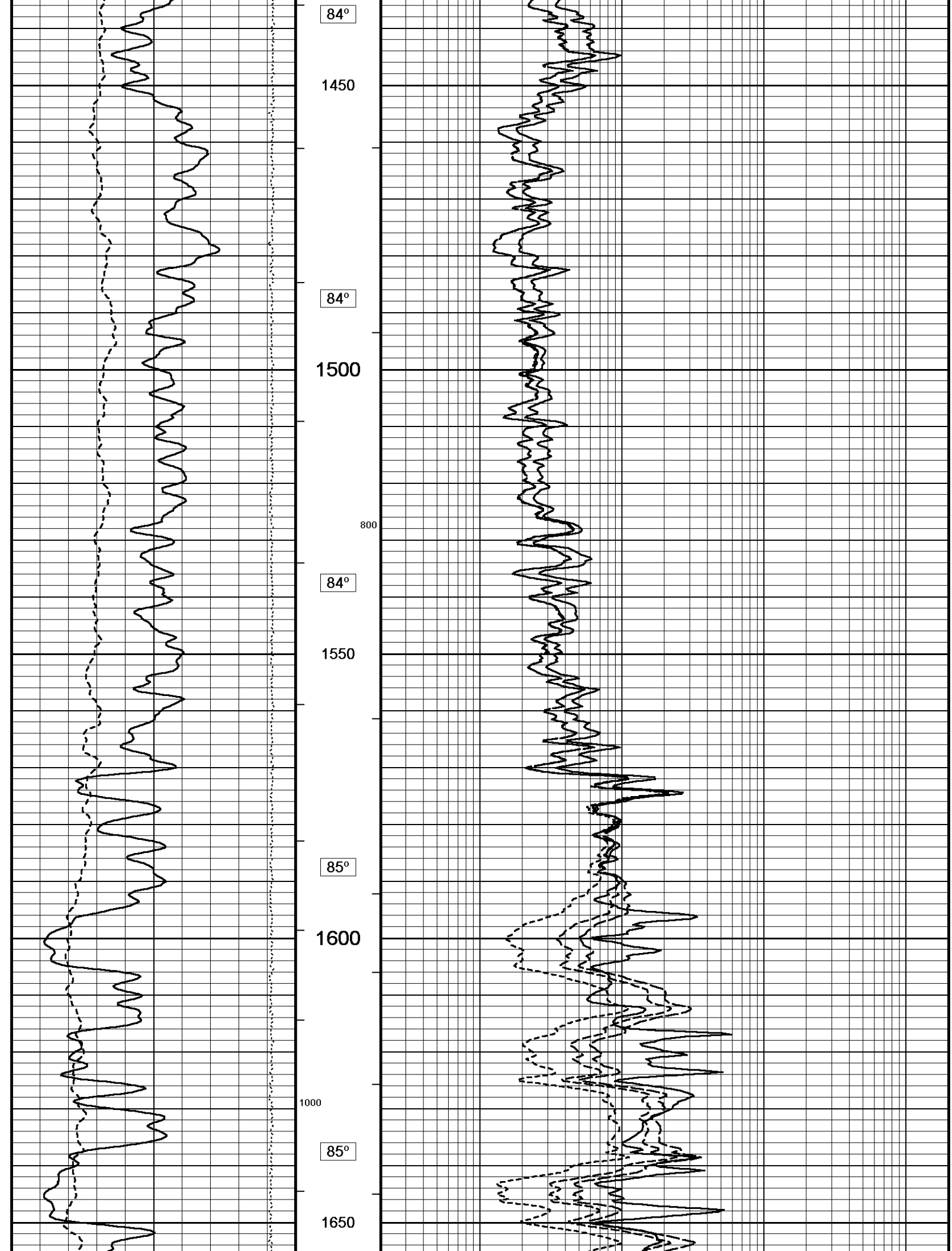

76°
350
76°
400
1700
76°
1300
450
76°
500
76°
1600
550

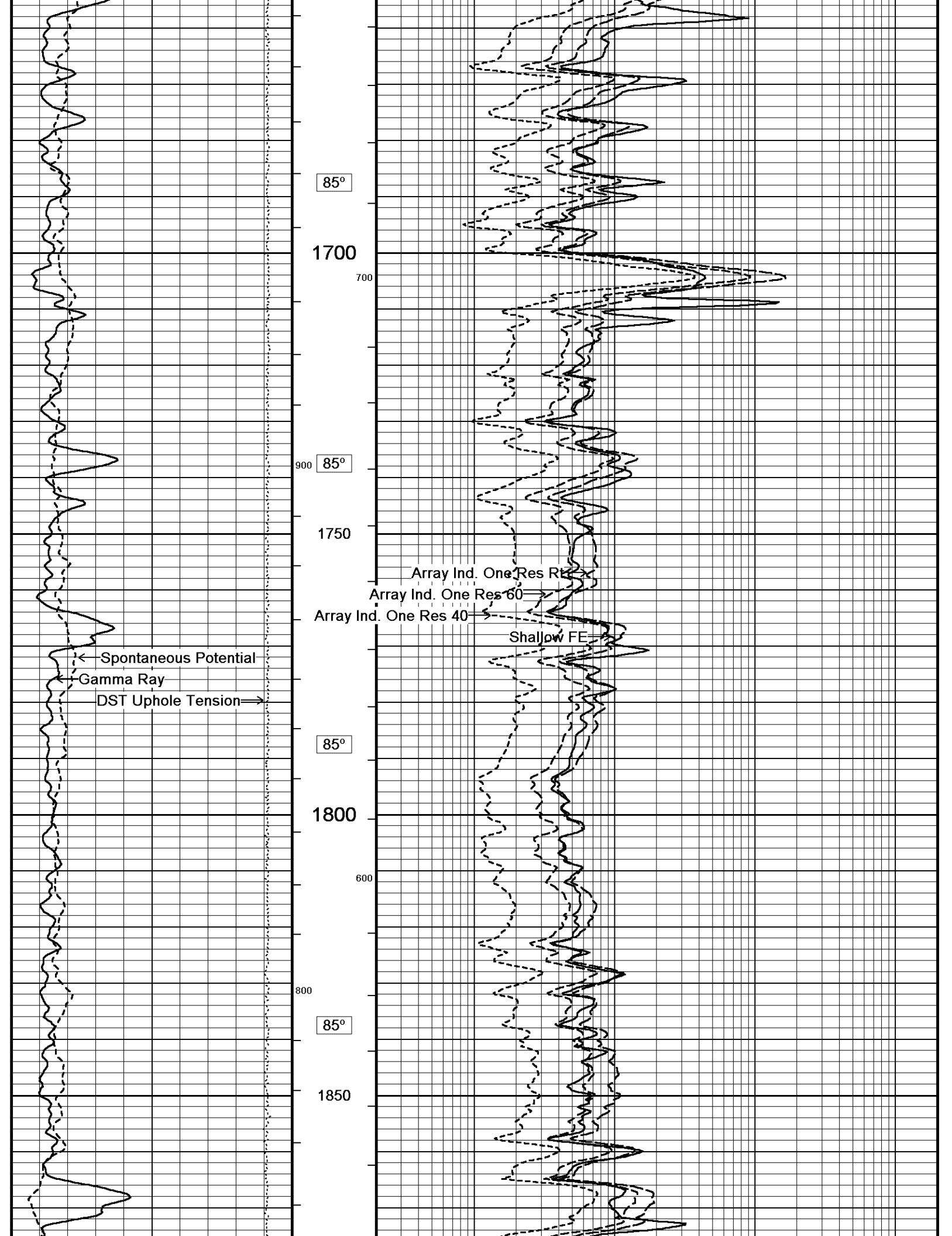

Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
77°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1200
600
77°
1500
650
78°
700
1100
79°
750
1400

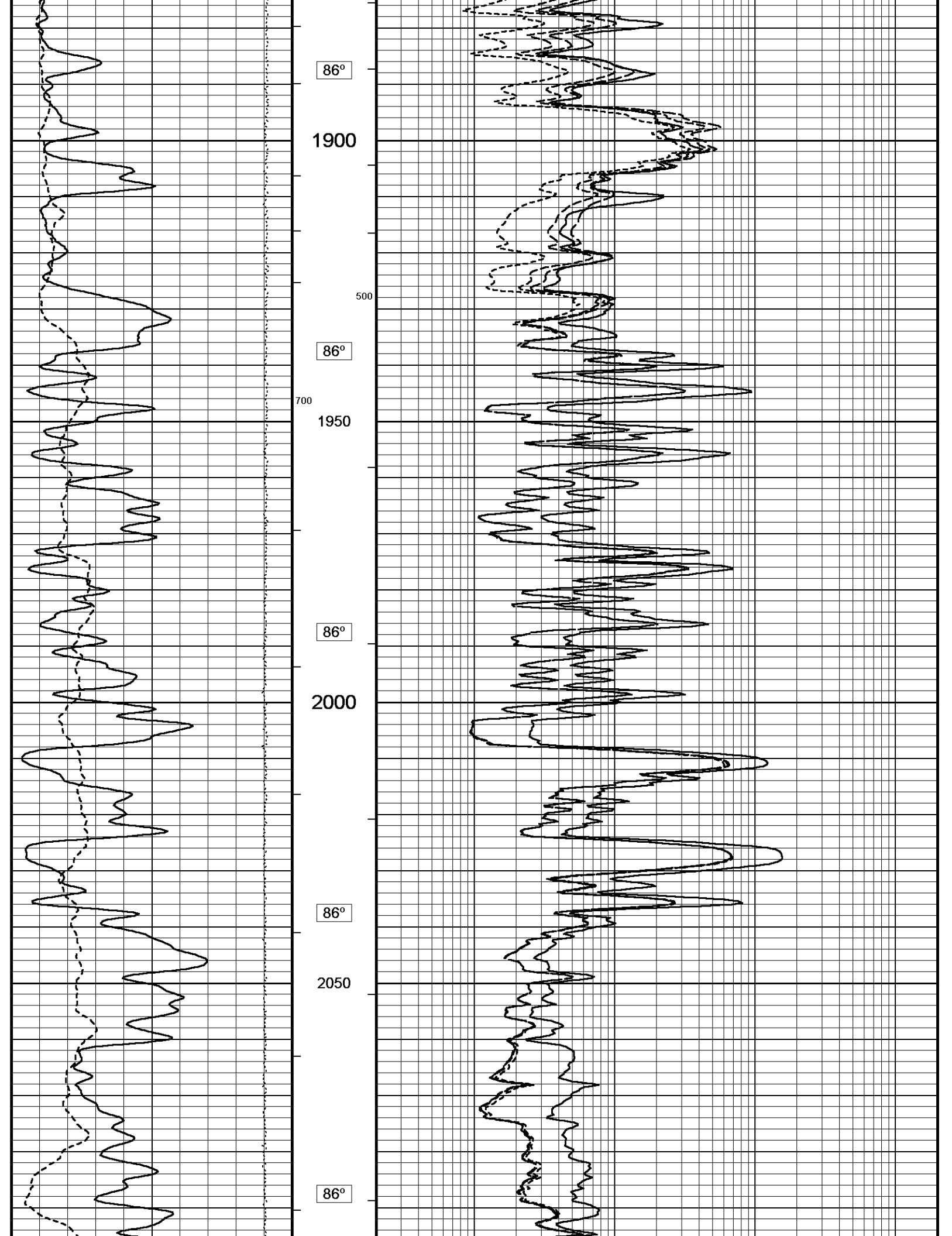

79°
800
79°
850
80°
900
1000
80°
1300
950
80°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

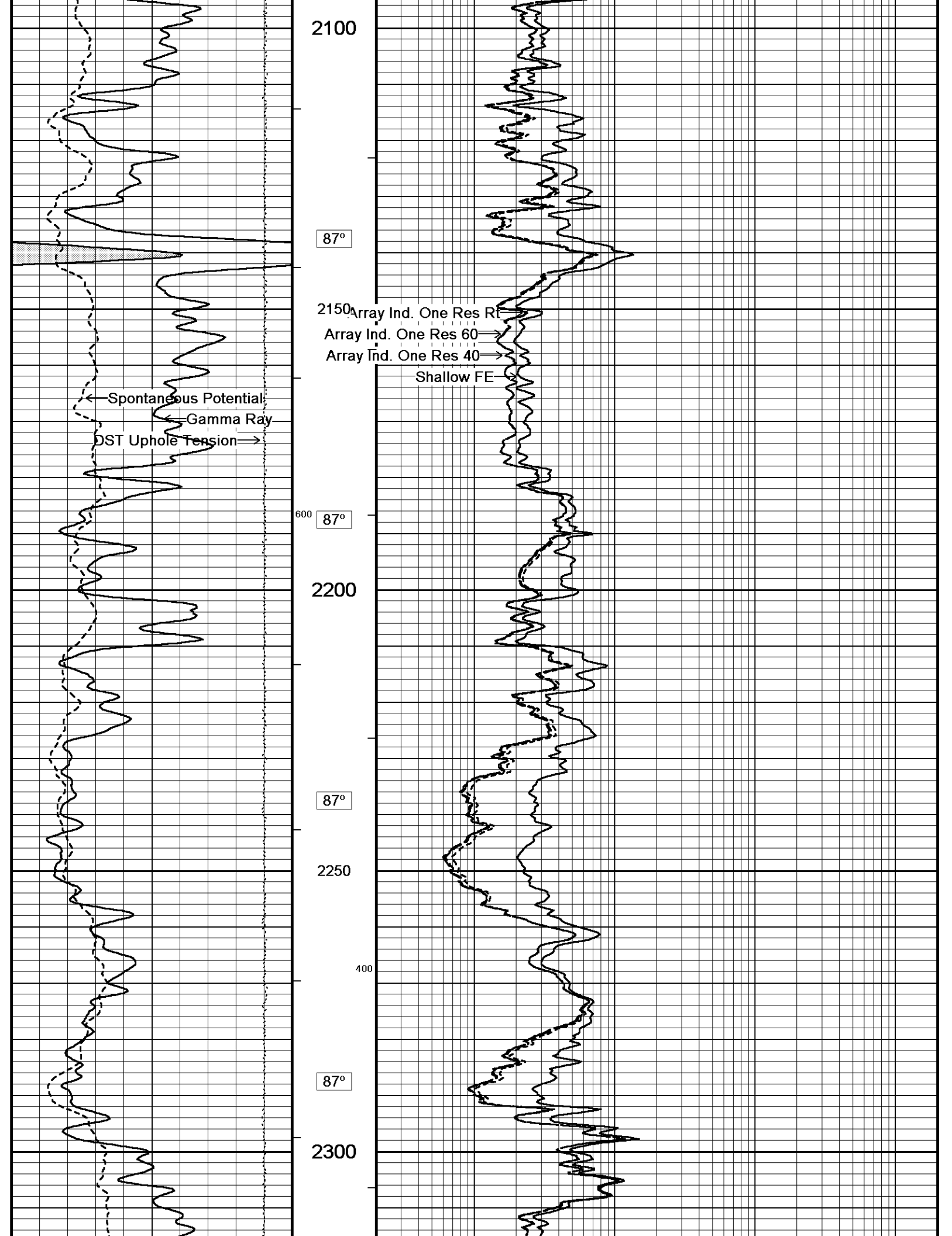

1000
80°
1050
81°
1100
81°
1150
1200
900
81°
1200

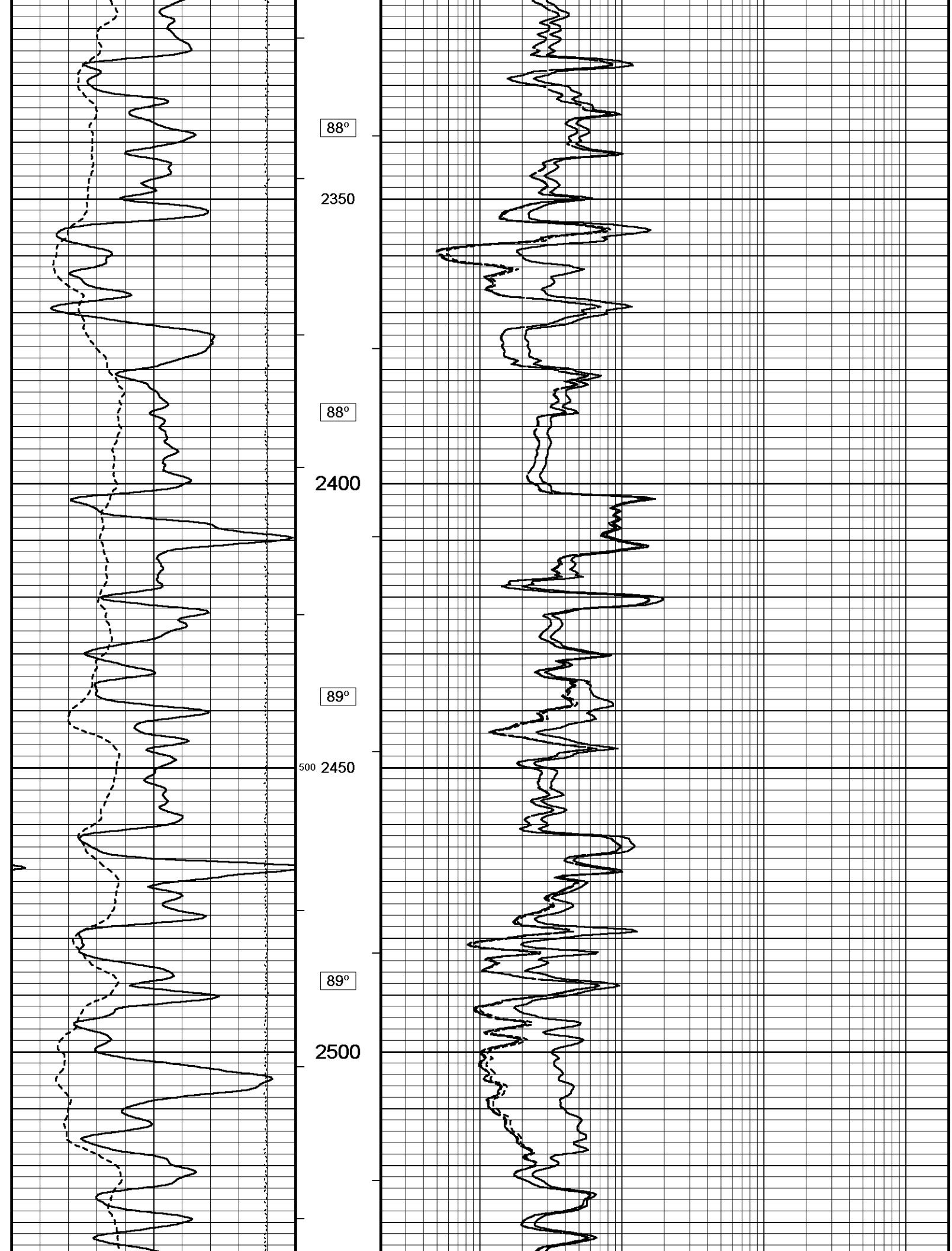

82°
1250
82°
1300
83°
1350
83°
1400
1100
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

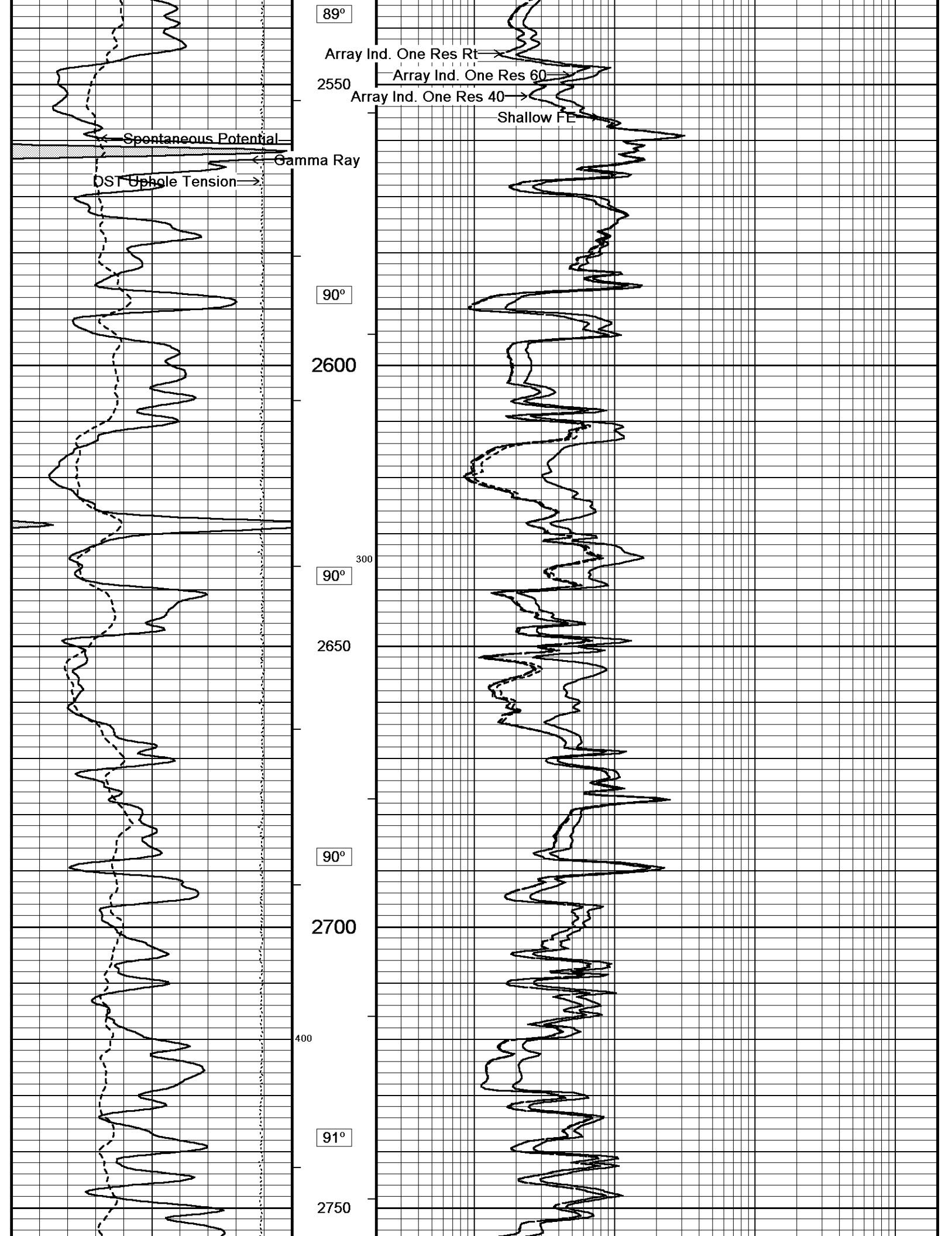

84°
1450
84°
1500
800
84°
1550
85°
1600
1000
85°
1650

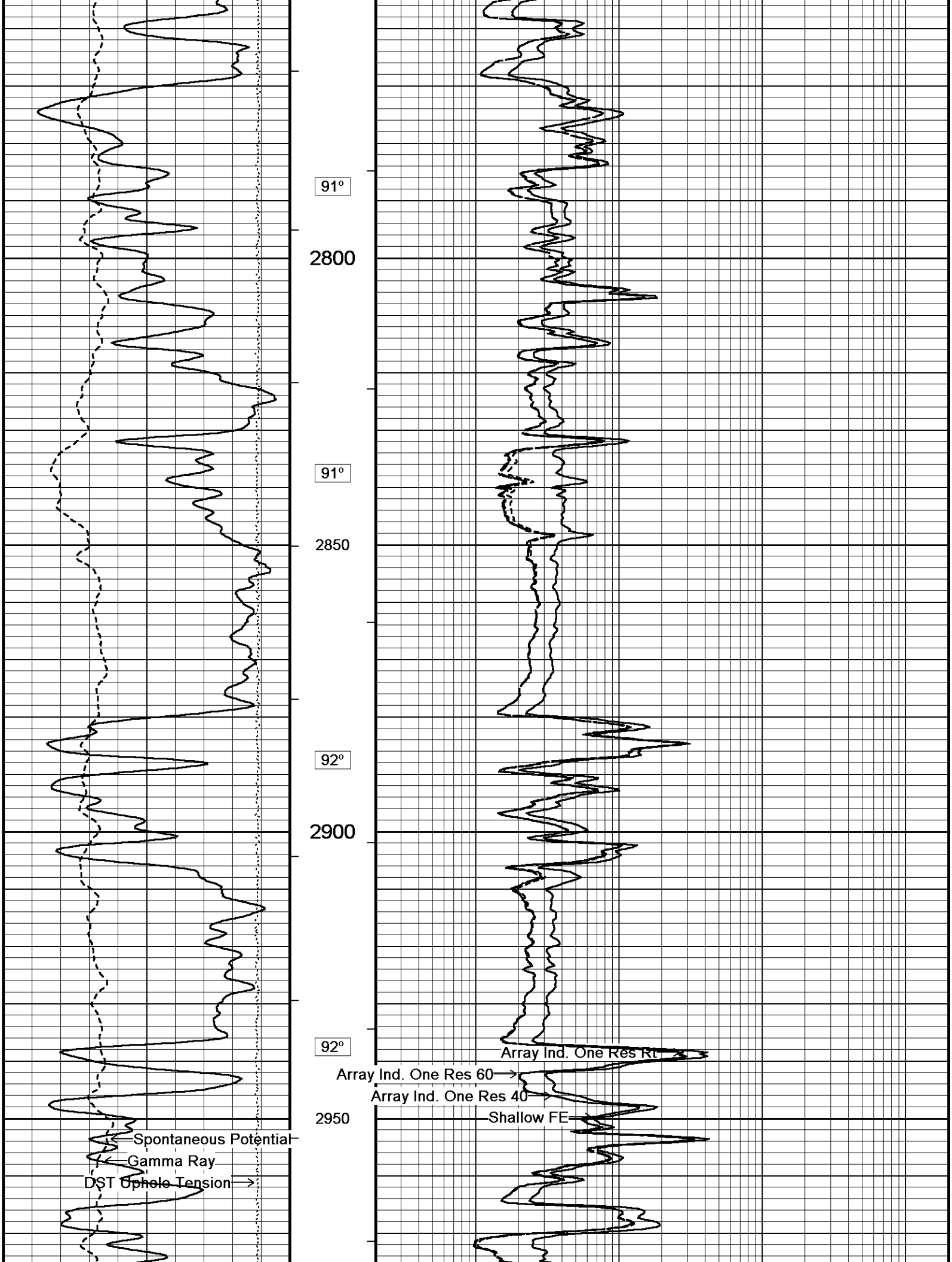

85°
1700
700
900
85°
1750
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
85°
1800
600
800
85°
1850

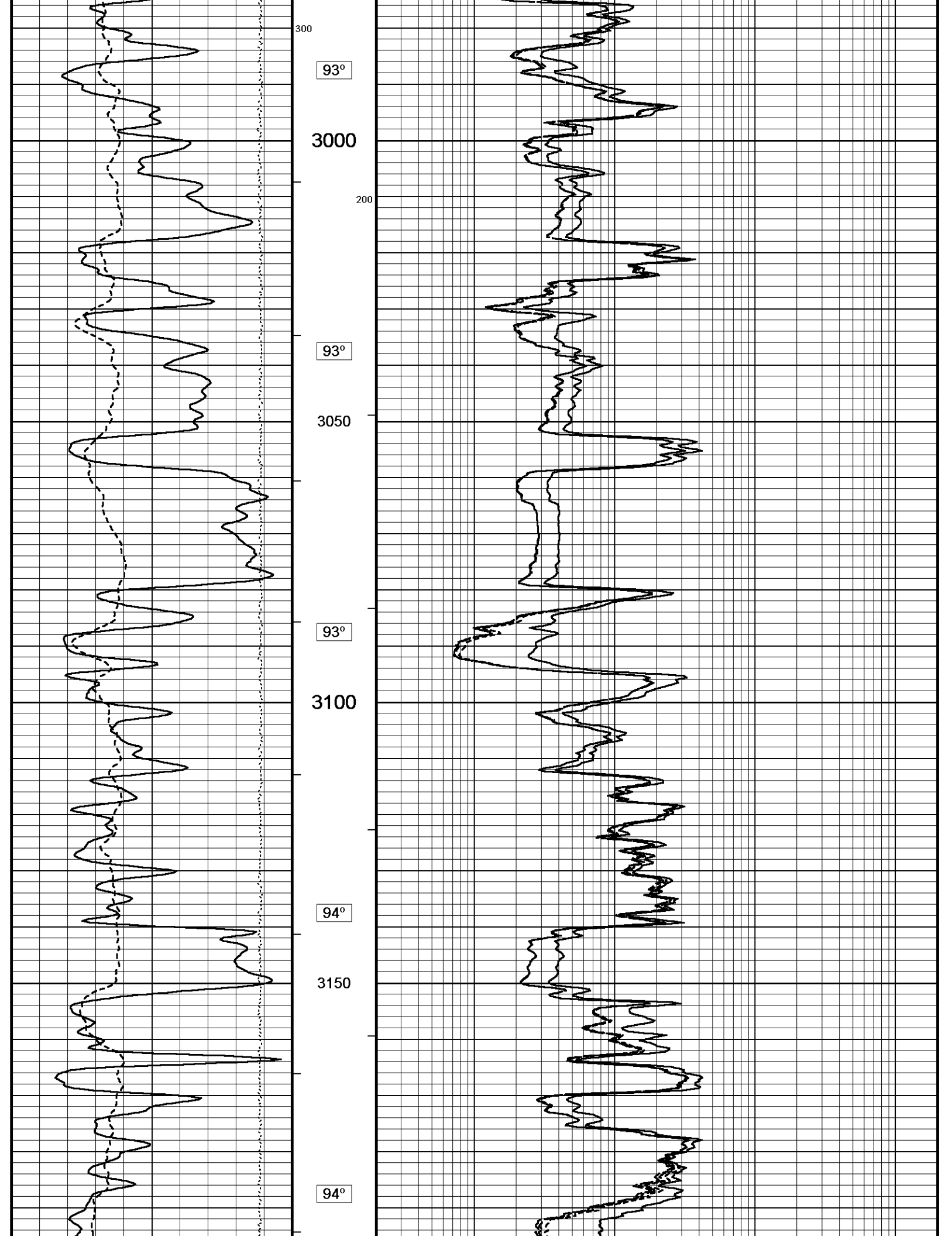

86°
1900
500
86°
700
1950
86°
2000
86°
2050
86°

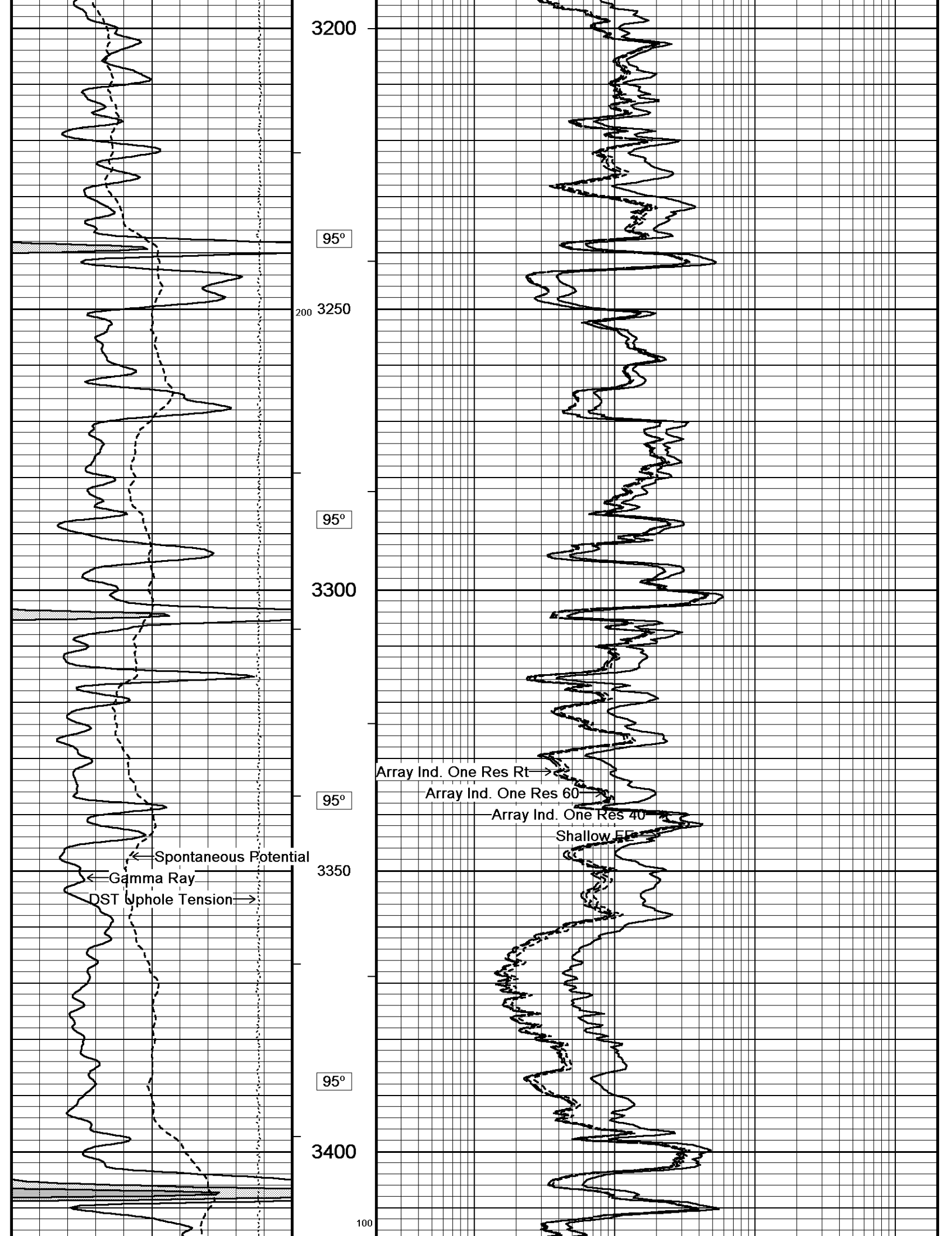

2100
87°
2150
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
600
87°
2200
87°
2250
400
87°
2300

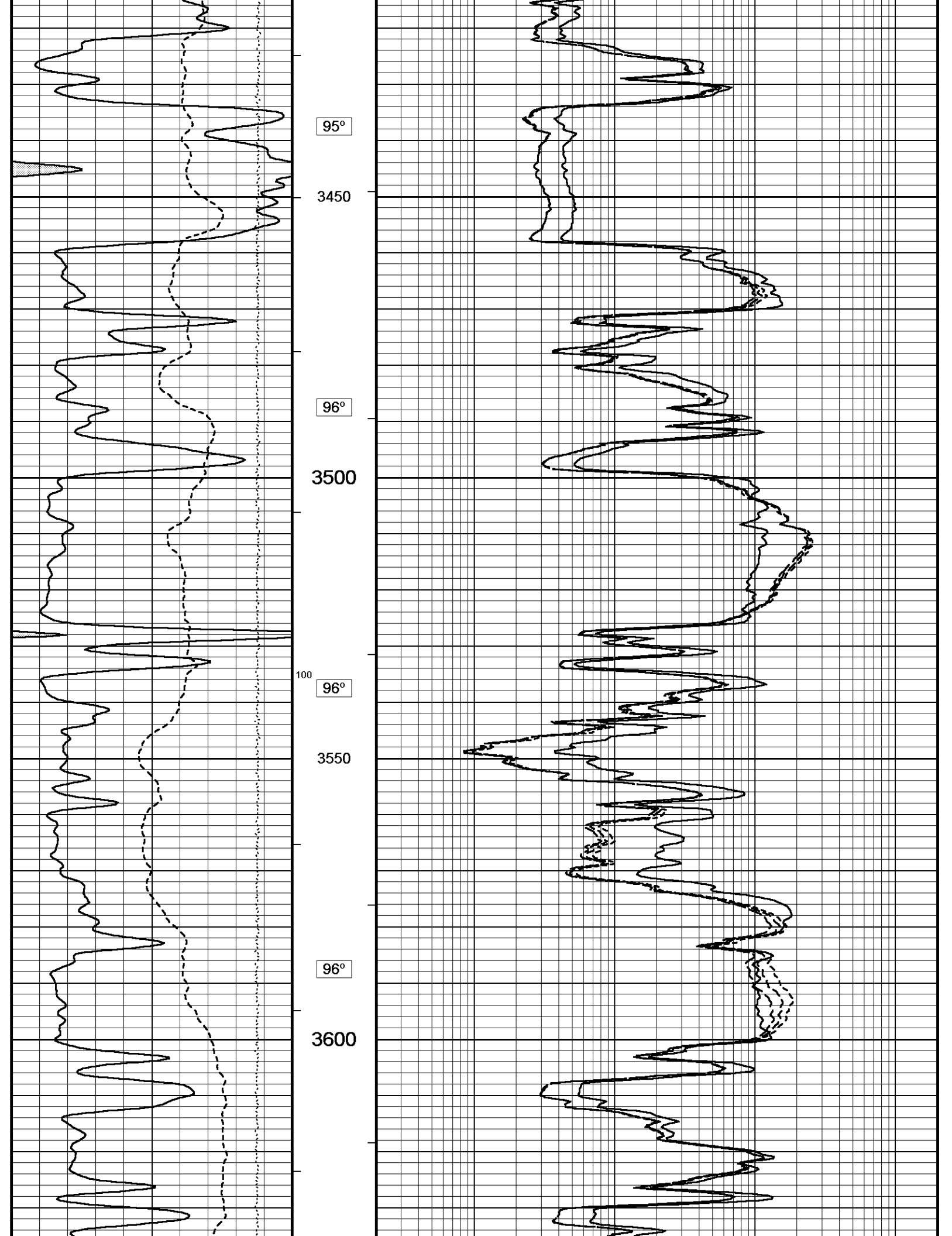

88°
2350
88°
2400
89°
500 2450
89°
2500

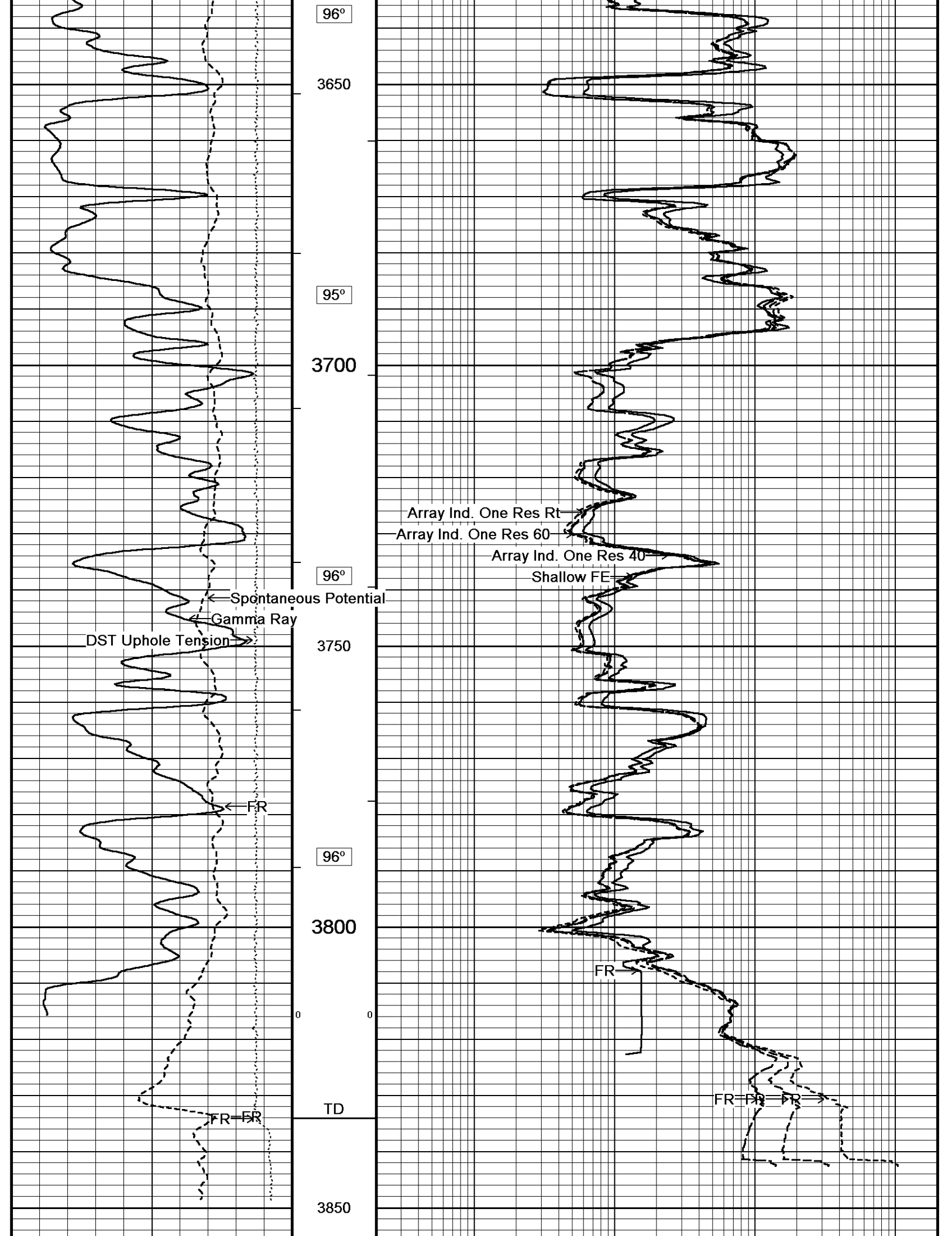

89°
Array Ind. One Res Rt
Array Ind. One Res 60
2550
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
90°
2600
300
90°
2650
90°
2700
400
91°
2750

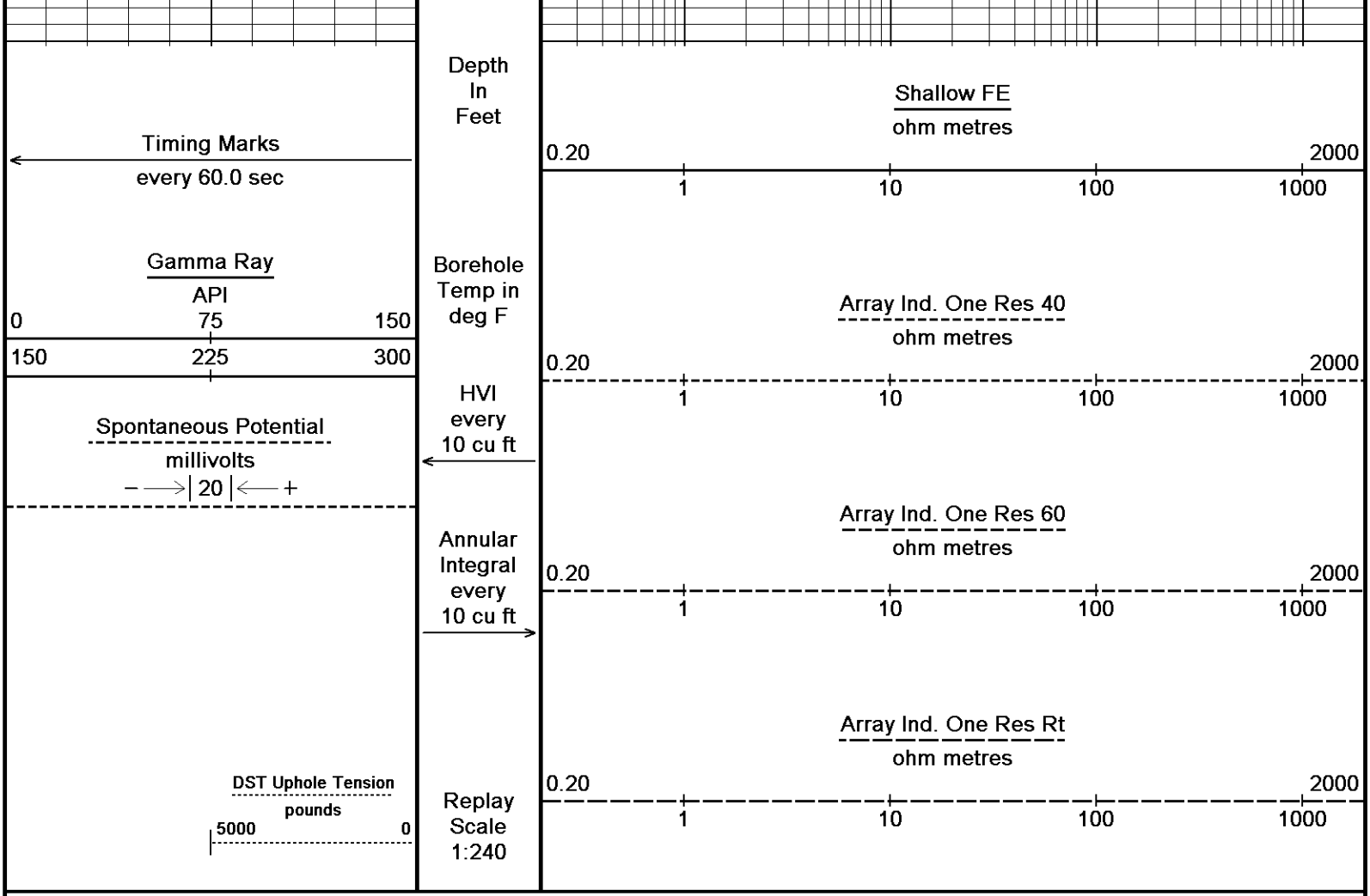

91°
2800
91°
2850
92°
2900
92°
2950
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


300
93°
3000
200
93°
3050
93°
3100
94°
3150
94°


3200
95°
200
3250
95°
3300
95°
3350
95°
3400
100
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


95°
3450
96°
3500
100
96°
3550
96°
3600


96°
3650
95°
3700
96°
3750
96°
3800
TD
3850
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR
FR
FR
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FR
FR
FR
FR

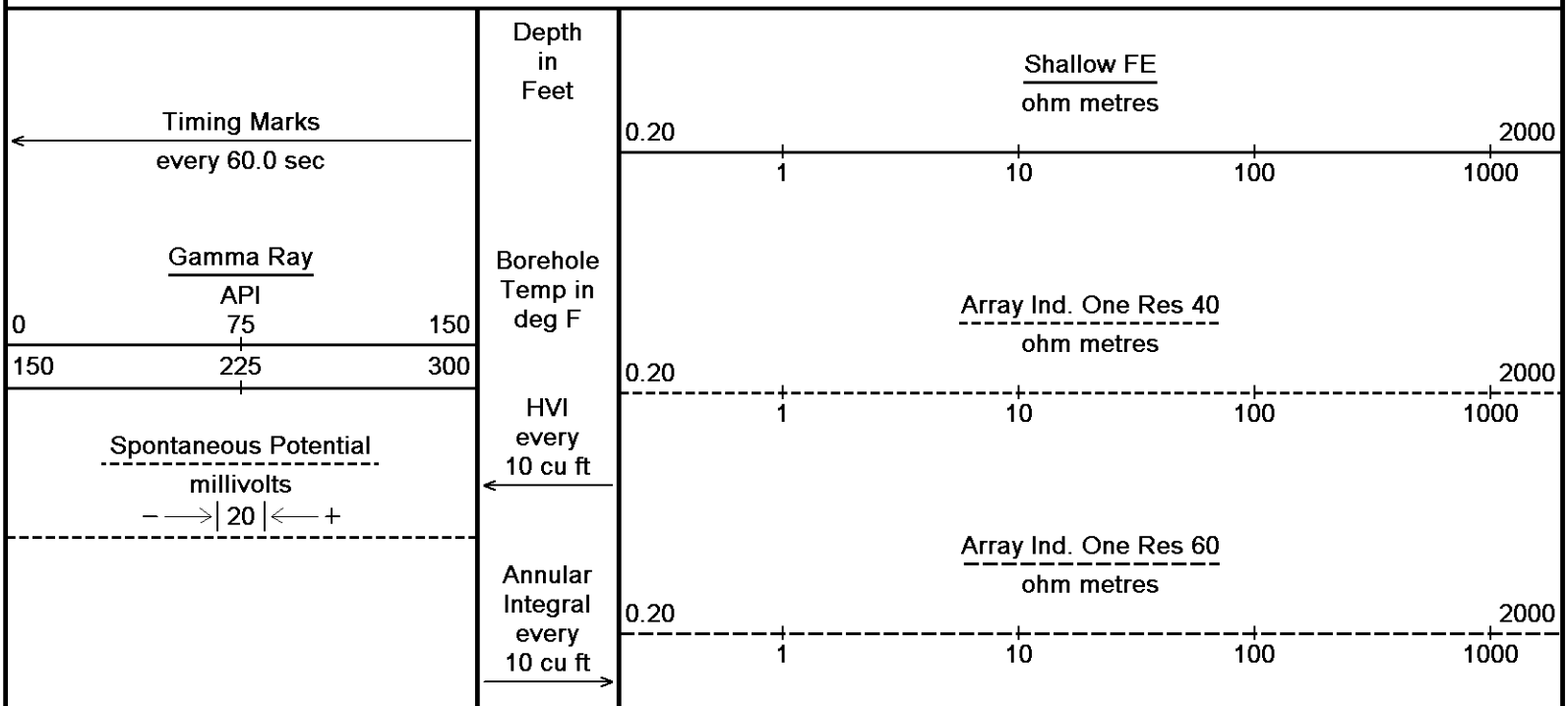


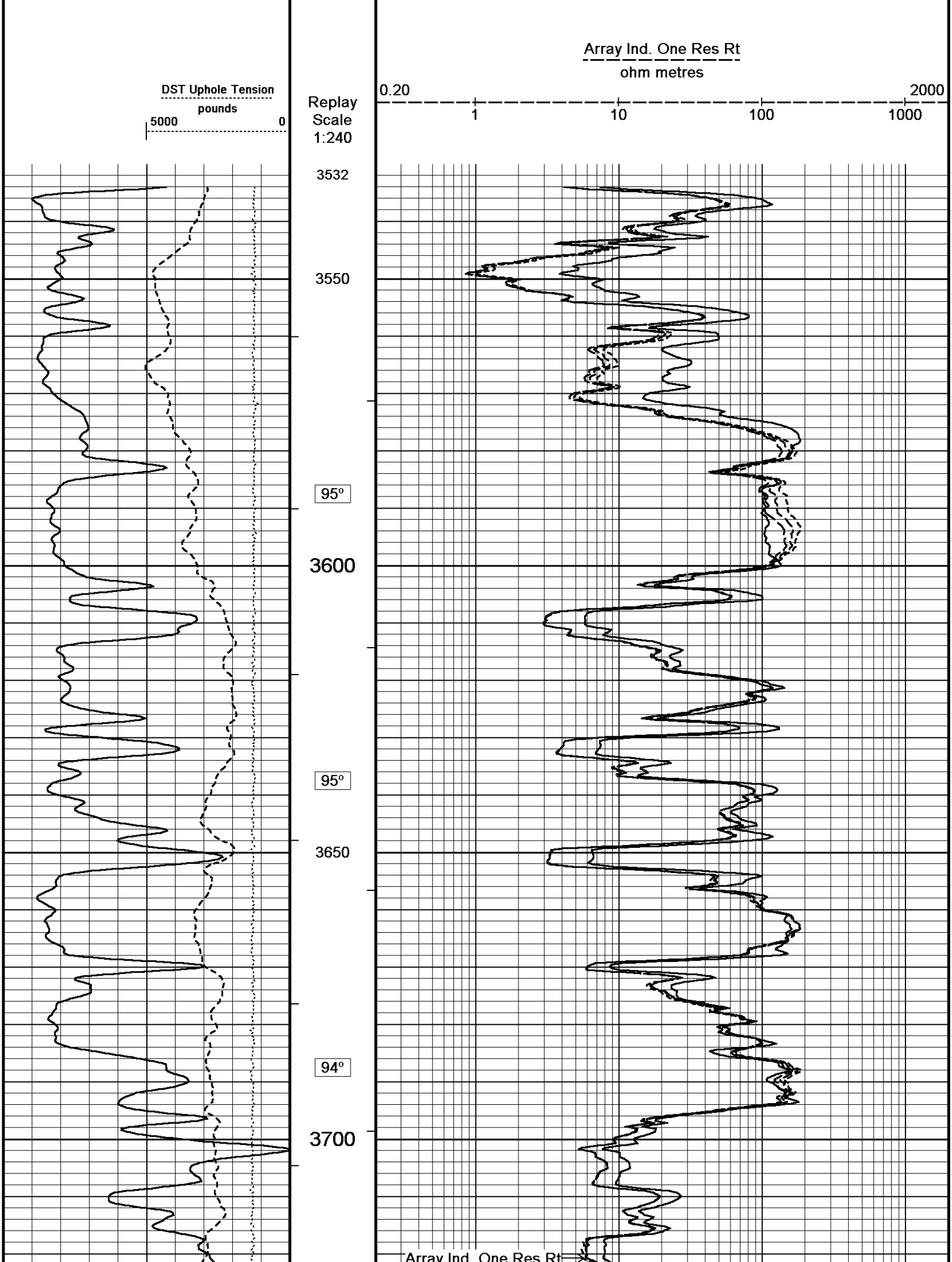
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-DEC-2016 17:14
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bes...\O'Brien (LA) Besperat #33-1 Main Merge.dta — Recorded on 22-DEC-2016 12:45
System Versions: Plotted with 16.05.3841

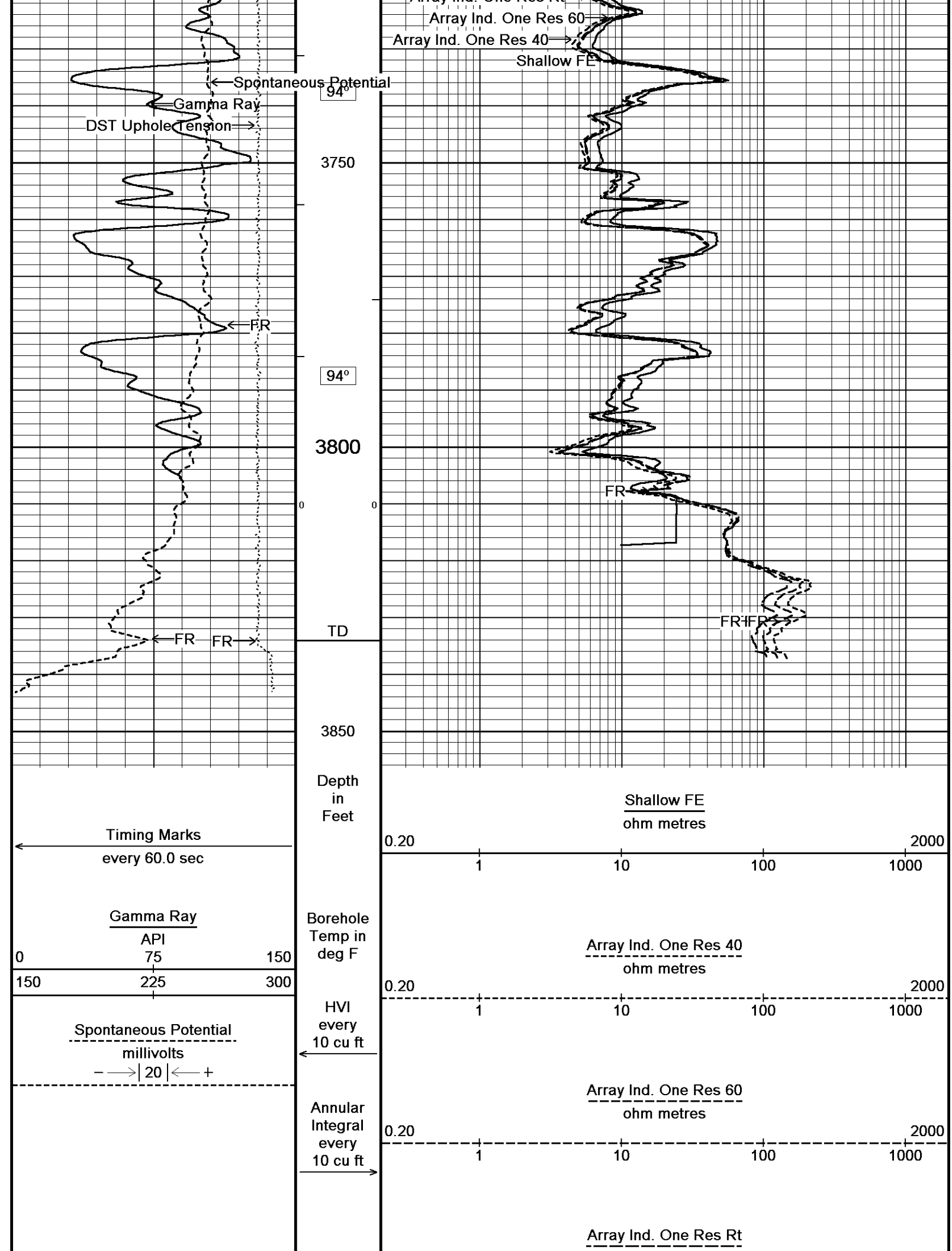
5 INCH MAIN

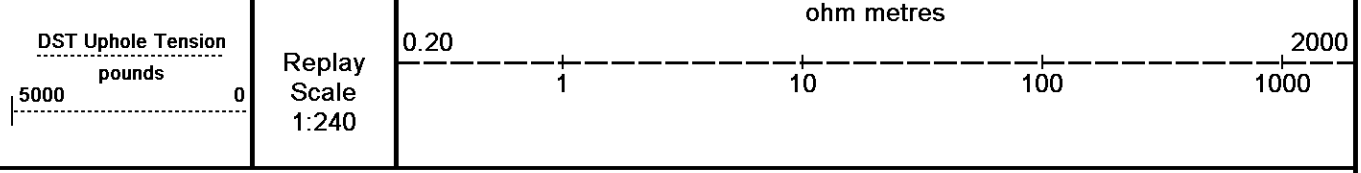
REPEAT SECTION

Depth based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-DEC-2016 17:14
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) B...\O'Brien (LA) Besperat #33-1 Repeat Merge.dta — Recorded on 22-DEC-2016 12:17
System Versions: Plotted with 16.05.3841




DST Uphole Tension
pounds
5000
0
Replay
Scale
1:240
Array Ind. One Res Rt
ohm metres
0.20
2000
1
10
100
1000
3532
3550
95°
3600
95°
3650
94°
3700
Array Ind. One Res Rt


Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Upholetension
94°
3750
FR
94°
3800
FR
FR
FR
FR
TD
3850
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
− 20 +
Borehole Temp in deg F
HVI every 10 cu ft
Annular Integral every 10 cu ft
Shallow FE
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res 40
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res 60
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res Rt



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-DEC-2016 17:14
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) B...\O'Brien (LA) Besperat #33-1 Repeat Merge.dta — Recorded on 22-DEC-2016 12:17
System Versions: Plotted with 16.05.3841

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 16.05.3841\Data\O'Brien (LA) Besperat #33-1\O'Brien (LA) Besperat #33-1_001.dta

General Constants All 000

Last Edited on 22-DEC-2016,11:53

General Parameters		
Mud Resistivity	0.290	ohm-metres
Mud Resistivity Temperature	75.000	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. Two Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	
SW/APOR Tool Source	0.000	

Down-hole Tension Calibration SMS 0

Field Calibration on 17-DEC-2016 05:43

Reading No	Measured	Calibrated (lbs)
1	16023.38	0.00
2	17442.64	490.00

Gamma Calibration MCG-C 123

Field Calibration on 20-DEC-2016 17:24

	Measured	Calibrated (API)
Background	73	50
Calibrator (Gross)	733	506
Calibrator (Net)	661	456

Gamma Calibration Tolerances MCG-C 123

Ratio 1.449 (1.40 | 1.475 | 1.55) Counts/API

Gamma Constants MCG-C 123

Last Edited on 22-DEC-2016,10:24

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-C 123

Field Calibration on 03-DEC-2016,14:52

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

High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length	11

SP Calibration MCG-C 123

Field Calibration on 03-DEC-2016 14:58

	Measured	Calibrated (mV)
Reference 1	100.9	100.0
Reference 2	-99.4	-99.9

Caliper Calibration MML-A 7

Base Calibration on 16-DEC-2016 17:16
Field Calibration on 21-DEC-2016 16:47

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14052	5.97
2	17400	7.98
3	20637	9.86
4	24492	11.88
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.95	7.97

Caliper Calibration Tolerances MML-A 7

		7.77	7.97	8.17	
Short Arm Field Cal.	7.95				in

Micro Normal and Micro Inverse Calibration MML-A 7

Base Calibration on 16-DEC-2016 17:25
Field Check on 21-DEC-2016 16:46

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.0	49.9	5.1	25.6
Micro Inverse	10.0	49.8	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	77.4	77.4
Micro Inverse	51.3	51.3

Micro Normal & Micro Inverse Calibration Tolerance MML-A 7

		-5%	10.0	+5%			-5%	50.0	+5%	
Micro Normal Res. 1	10.0				ohm	Micro Normal Res. 2	49.9			ohm
Micro Inverse Res. 1	10.0				ohm	Micro Inverse Res. 2	49.8			ohm

		-2%	77.27	+2%	
Micro Normal Base Check	77.4				ohm-m
Micro Inverse Base Check	51.3		51.22		ohm-m

		-2%	77.4	+2%	
Micro Normal Field Check	77.4				ohm-m
Micro Inverse Field Check	51.3		51.3		ohm-m

Micro Normal and Micro Inverse Constants MML-A 7

Last Edited on 22-DEC-2016,10:24

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 66

Base Calibration on 03-DEC-2016,15:38
Field Check on 20-DEC-2016 17:31

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3116	97	3714	110
Ratio	32.277		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2061	3028
Ratio	0.681	

Field Check	Calibrated (cps)	
	2149	3082
Ratio	0.697	

Neutron Calibration Tolerances MDN-A.B 66

		-5%	33	+5%
Ratio	32.277			

		0.65	0.7	0.75
Base Check	0.681			

		0.661	0.681	0.701
Field Check	0.697			

Neutron Constants MDN-A.B 66

Last Edited on 22-DEC-2016,10:24

Neutron Source Id	P0204NN	
Neutron Jig Number	NJ5736	
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 01-DEC-2016 15:21
Field Check on 20-DEC-2016 16:56

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.5	126.8
Base Check		281.3
Field Check		281.5

FE Calibration Tolerances MFE-B.J 352

		-3%	980.0	+3%	
Reference 2	963.5				ohm

		-2%	277.0	+2%	
Base Check	281.3				ohm-m

		-2%	281.3	+2%	
Field Check	281.5				ohm-m

FE Constants MFE-B.J 352

Last Edited on 22-DEC-2016,10:23

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	

Sonic Constants MSS-A.A 55

Last Edited on 22-DEC-2016,10:23

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft

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

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

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

Peak Amplitude Source N/A

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

Processed Fixed Gate Parameters

Waveform Used For Processing N/A

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

Full Waveform Parameters

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

Induction Calibration MAI-A.A 111

Base Calibration on 05-AUG-2014,09:34
Field Check on 20-DEC-2016 16:48

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	17.6	473.6	9.3	966.2
2	6.4	385.9	7.6	821.4
3	3.2	264.0	5.2	566.0
4	2.1	135.5	2.6	279.2

Array Temperature 23.0 Deg F

Test Loop Calibration Verified 03-DEC-2016,14:48

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	12.1	3873.0	9.5	3868.2
2	29.8	3528.1	27.7	3523.7
3	29.1	3021.3	27.3	3017.3
4	19.1	2058.5	18.0	2055.4
Deep	17.7	1962.1	16.5	1959.0
Medium	43.1	3976.4	40.8	3971.5

Shallow	44.4	5232.7	41.4	5226.9	
Array Temperature		65.8		58.5	Deg F

Induction Calibration Tolerances MAI-A.A 111

Low Conductivity 1	17.6	13.0 / 17.0 / 21.0	mmho/m	High Conductivity 1	473.6	430.0 / 475.0 / 520.0	mmho/m
Low Conductivity 2	6.4	4.5 / 6.0 / 7.5	mmho/m	High Conductivity 2	385.9	345.0 / 385.0 / 425.0	mmho/m
Low Conductivity 3	3.2	1.0 / 3.5 / 6.0	mmho/m	High Conductivity 3	264.0	240.0 / 260.0 / 280.0	mmho/m
Low Conductivity 4	2.1	0.0 / 2.0 / 4.0	mmho/m	High Conductivity 4	135.5	120.0 / 135.0 / 150.0	mmho/m
Background Vx 1	0.0	-110.0 / -32.5 / 45.0	mmho/m	Phase Check Loop 1	0.0	-2.0 / 0.0 / 2.0	%
Background Vx 2	0.0	-35.0 / 20.0 / 75.0	mmho/m	Phase Check Loop 2	0.0	-2.0 / 0.0 / 2.0	%
Background Vx 3	0.0	-60.0 / 2.5 / 65.0	mmho/m	Phase Check Loop 3	0.0	-2.0 / 0.0 / 2.0	%
Background Vx 4	0.0	-50.0 / -17.5 / 15.0	mmho/m	Phase Check Loop 4	0.0	-2.0 / 0.0 / 2.0	%

Induction Constants MAI-A.A 111

Last Edited on 22-DEC-2016,10:23

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	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
Rm Source	Global Value: Temperature Corrected	
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
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	

High Resolution Temperature Calibration MAI-A.A 111

Field Calibration on 03-DEC-2016,14:51

	Measured	Calibrated(Deg F)
Lower	10.00	10.00

Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 111

Last Edited on 26-JUN-2014,15:06

Pre-filter Length	11

Photo Density Calibration MPD-B 104

Base Calibration on 03-DEC-2016 14:06
Field Check on 20-DEC-2016 17:04

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1135	1315		
Reference 1	50307	24205	59556	30836
Reference 2	20296	2434	24941	2541
Field Check at Base	1134.8	1314.6		
Field Check	1134.7	1319.5		

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	208	1012		
Reference 1	21183	50127	0.427	0.371
Reference 2	5908	20162	0.298	0.272
Field Check at Base	207.5	1012.2		
Field Check	206.7	1011.6		

Photo Density Calibration Tolerances MPD-B 104

Near Density Ratio	2.57	-5% 2.52 +5%	Far Density Ratio	20.45	-5% 21.00 +5%
PE Calibration	0.121	0.089 0.110 0.131			
Near Den. Field Check	1134.7	-3% 1134.8 +3%	Far Den. Field Check	1319.5	-3% 1314.6 +3%
PE WS Field Check	206.7	-6% 207.5 +6%	PE WH Field Check	1011.6	-6% 1012.2 +6%

Density Constants MPD-B 104

Last Edited on 22-DEC-2016,10:24

Density Source Id	P50557B	
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	
Precision Enhanced Density Processing	Not Applied	

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 104

Base Calibration on 01-DEC-2016 17:42

Field Calibration on 20-DEC-2016 16:58

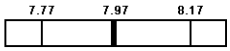
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14257	3.99
2	23231	5.98
3	32062	7.97
4	40288	9.86
5	49313	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.95	7.97

Caliper Calibration Tolerances MPD-B 104

Short Arm Field Cal. 7.95 

in

DOWNHOLE EQUIPMENT

C:\Minimus 16.05.3841\Data\O'Brien (LA) Besperat #33-1\O'Brien (LA) Besperat #33-1_002.dta

Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-log
MML-A 7 LG: 7.97 ft WT: 81.6 lb OD: 2.244 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

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

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.07 ft Weight: 480.6 lb

55.39 ft	GRGC - MCG Gamma Ray
52.48 ft	CGXT - MCG External Temperature
46.76 ft	MLTC - MML Caliper
45.76 ft	MINV - Micro-inverse
45.76 ft	MNRL - Micro-normal
40.97 ft	NPRL - Limestone Neutron Por.
33.73 ft	AVOL - Annular Volume
33.73 ft	HVOL - Hole Volume
33.73 ft	CLDC - Density Caliper
31.80 ft	DPRL - Limestone Density Por.
31.80 ft	DCOR - Density Correction
31.74 ft	PDPE - PE
26.24 ft	FEFE - Shallow FE
16.96 ft	TR11 - 4' Transit Time
16.46 ft	TR21 - 3' Transit Time
15.95 ft	TR12 - 6' Transit Time
15.46 ft	TR22 - 5' Transit Time
12.96 ft	DT35 - 3-5' Compensated Sonic
12.96 ft	SPRL - Wyllie Lime. Sonic Por.
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
0.23 ft	SPCG - Spontaneous Potential

Tool Zero (0.13ft from bottom)

-0.13 ft SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	O'BRIEN RESOURCES, LLC.
WELL	BESPERAT #33-1
FIELD	WILDCAT
PROVINCE/COUNTY	RUSH
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2065	feet	First Reading	3831.00	feet
Elevation Drill Floor	2063	feet	Depth Driller	3836.00	feet
Elevation Ground Level	2057	feet	Depth Logger	3834.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

Weatherford

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	O'BRIEN RESOURCES, LLC.
WELL	BESPERAT #33-1
FIELD	WILDCAT
PROVINCE/COUNTY	RUSH
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1250' FNL & 1391' FEL
SEC 33 TWP 18S RGE 17W	Other Services: MPD/MDN, MSS, MML
API Number	15-165-22139
Latitude	
Longitude	
Permanent Datum GL, Elevation 2057 feet	Elevations: feet
Log Measured From KB, 8 feet above Permanent Datum	KB 2065.00
Drilling Measured From KB @ 8 FEET	DF 2063.00
	GL 2057.00

Date	22-DEC-2016			
Run Number	ONE			
Service Order	4568-16594456			
Depth Driller	3836.00	feet		
Depth Logger	3834.00	feet		
First Reading	3831.00	feet		
Last Reading	265.00	feet		
Casing Driller	264.00	feet		
Casing Logger	265.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.30 lb/USg	56.00 CP		
PH / Fluid Loss	10.50	12.00 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.29 @ 75.0	ohm-m		
Rmf @ Measured Temp	0.23 @ 75.0	ohm-m		
Rmc @ Measured Temp	0.35 @ 75.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.23 @ 96.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	96.00	deg F		
Equipment / Base	13096	OKC		
Recorded By	ADAM SILL			
Witnessed By	JIM MUSGROVE			

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bespera...\O'Brien (LA) Besperat #33-1 Main Merge.dta
System Versions: Plotted with 16.05.3841

Plotted on 22-DEC-2016 17:14
Recorded on 22-DEC-2016 12:45

Timing Marks every 60.0 sec

Gamma Ray API 0 75 150; 150 225 300

Spontaneous Potential millivolts —→|20|←— +

DST Uphole Tension pounds 5000 0

Depth In Feet

Borehole Temp in deg F

HVI every 10 cu ft

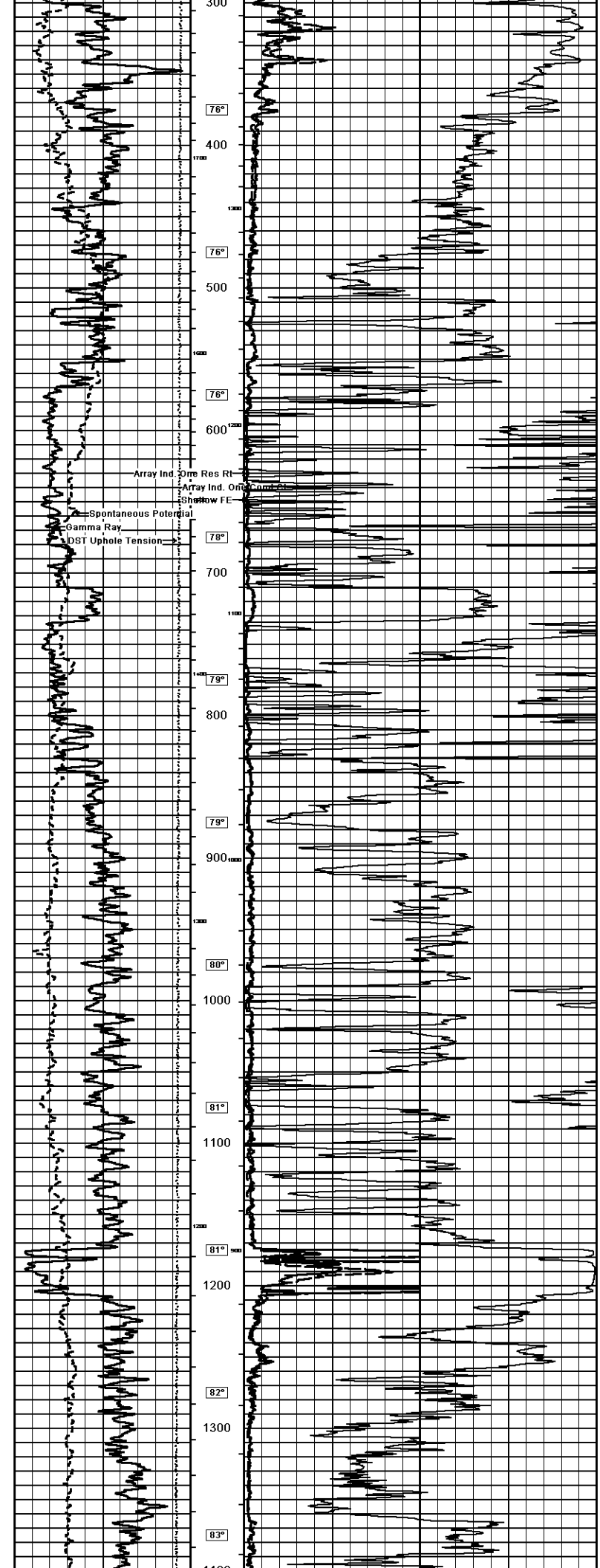
Annular Integral every 10 cu ft

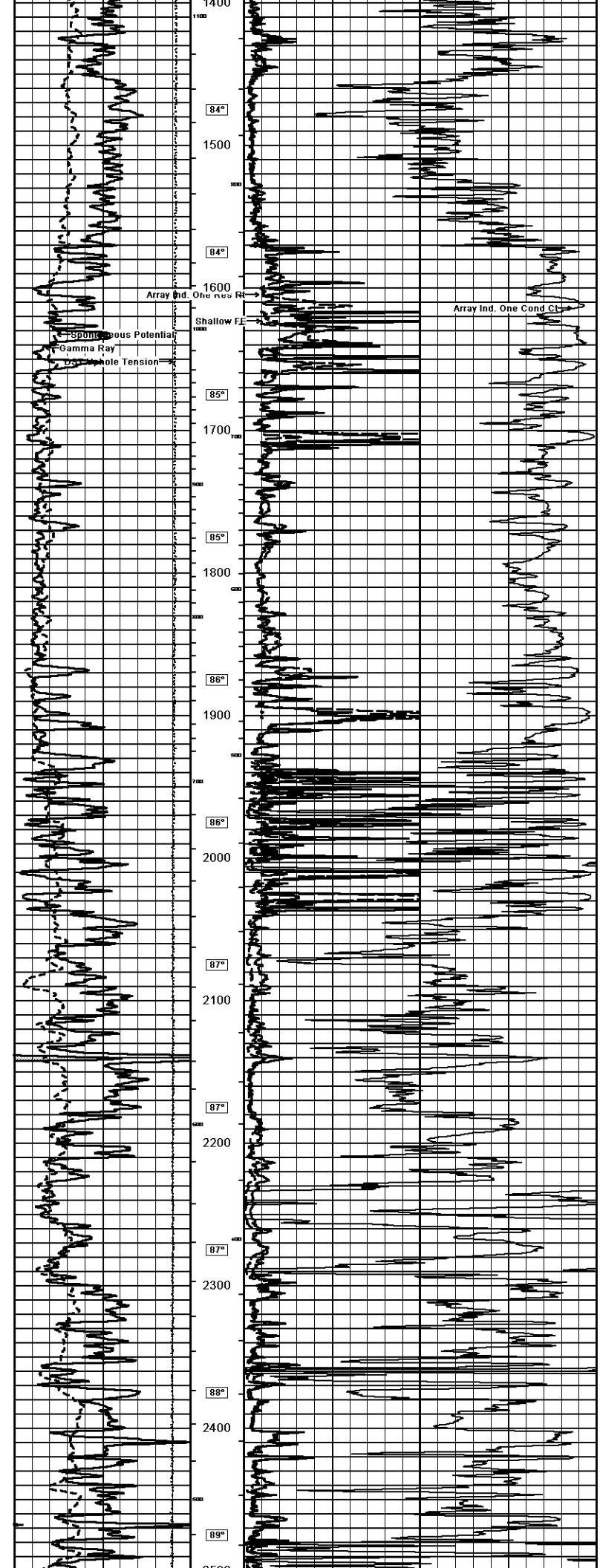
Replay Scale 1:600

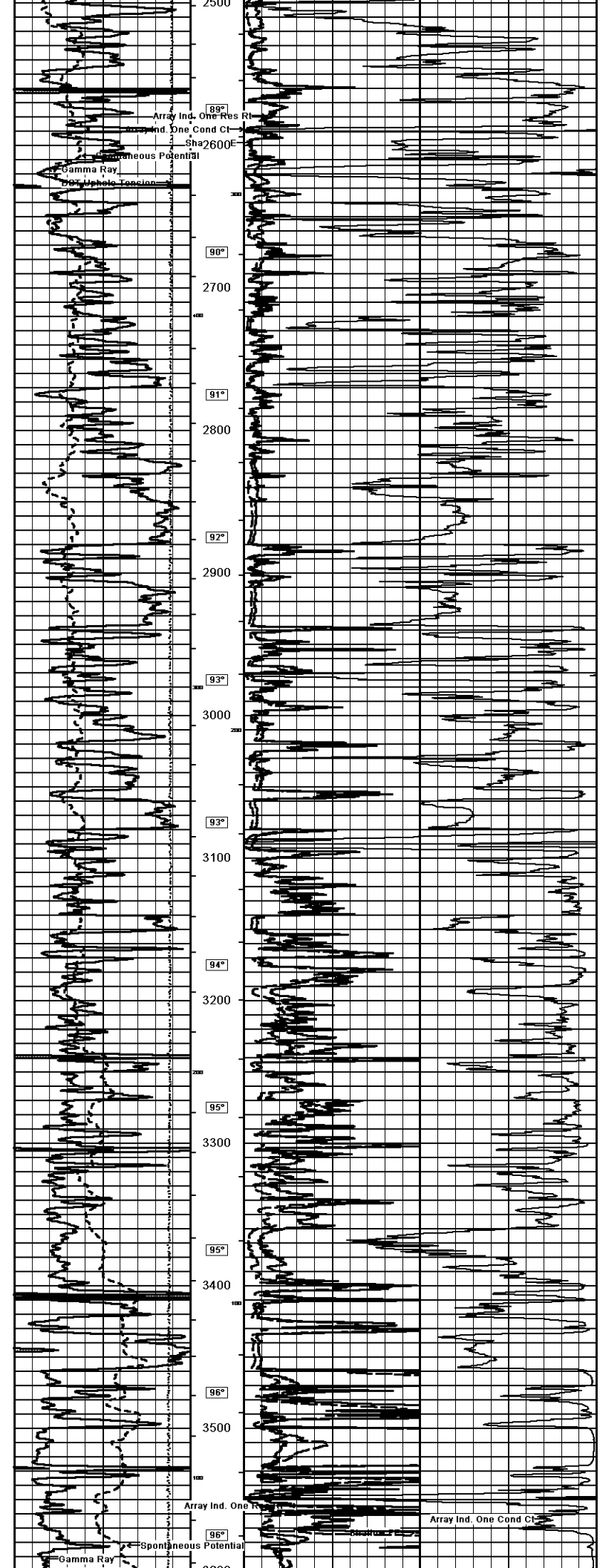
Array Ind. One Cond Ct mmhos/metre 1000 750 500 250 0; 2000 1750 1500 1250 1000

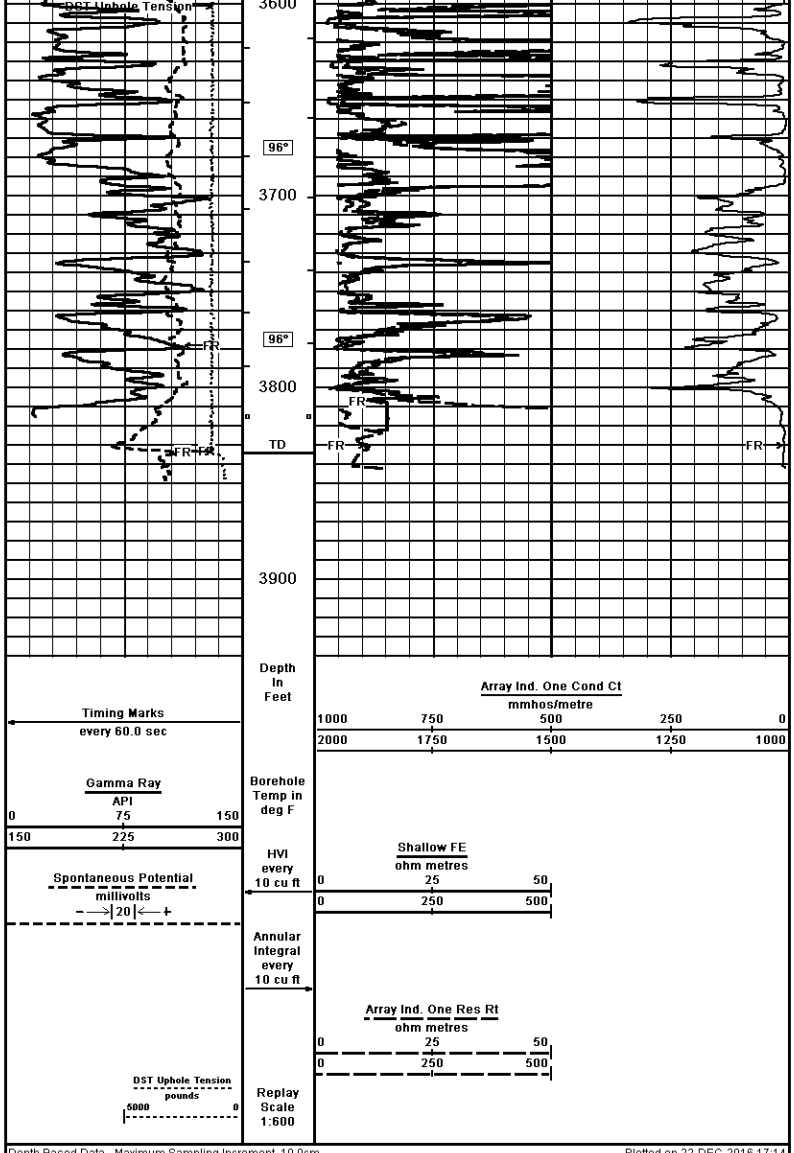
Shallow FE ohm metres 0 25 50; 0 250 500

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


300
76°
400
76°
500
76°
600
Array Ind. Orre Res Rt
Array Ind. Orre Cond Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
78°
700
79°
800
79°
900
80°
1000
81°
1100
81°
1200
82°
1300
83°


1400
84°
1500
84°
1600
Array Ind. One Res RI
Array Ind. One Cond CI
Shallow FE
Spontaneous Potential
Gamma Ray
Borehole Tension
85°
1700
85°
1800
86°
1900
86°
2000
87°
2100
87°
2200
87°
2300
88°
2400
89°


2500
89°
Array Ind. One Res Rt
Array Ind. One Cond Ct
Sha
2600
Spontaneous Potential
Gamma Ray
DOT Uphole Tension
90°
2700
91°
2800
92°
2900
93°
3000
93°
3100
94°
3200
95°
3300
95°
3400
96°
3500
Array Ind. One Res
Array Ind. One Cond Ct
96°
Spontaneous Potential
Gamma Ray



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-DEC-2016 17:14

Filename: C:\Minimus 16.05.3841\Data\O'Brien (LA) Bespera...\O'Brien (LA) Besperat #33-1 Main Merge.dta — Recorded on 22-DEC-2016 12:45

System Versions: Plotted with 16.05.3841

1 INCH MAIN

COMPANY	O'BRIEN RESOURCES, LLC.
WELL	BESPERAT #33-1
FIELD	WILDCAT
PROVINCE/COUNTY	RUSH
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2065	feet	First Reading	3831.00	feet
Elevation Drill Floor	2063	feet	Depth Driller	3836.00	feet
Elevation Ground Level	2057	feet	Depth Logger	3834.00	feet

Weatherford

ARRAY INDUCTION
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