Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR 26-15
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	560' FSL & 2100' FEL SE/4

SEC	TWP	RGE	Other Services
26	33S	15W	MPD/MDN
			MML

API Number 15-007-24069
Permit Number

Permanent Datum G.L., Elevation 1809 feet
Log Measured From KB
Drilling Measured From K.B. @ 10 FEET

Elevations:	feet
KB	1819.00
DF	1817.00
GL	1809.00

Date	13-SEP-2013			
Run Number	ONE			
Service Order	3541081			
Depth Driller	5150.00	feet		
Depth Logger	5149.00	feet		
First Reading	5146.00	feet		
Last Reading	323.00	feet		
Casing Driller	324.00	feet		
Casing Logger	323.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.20 lb/USg		57.00 CP	
PH / Fluid Loss	10.00		8.00 ml/30Min	
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.13 @ 95.0	ohm-m		
Rmf @ Measured Temp	0.90 @ 95.0	ohm-m		
Rmc @ Measured Temp	1.36 @ 95.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.93 @116.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	116.00	deg F		
Equipment / Base	13096		LIB	
Recorded By	ROB HOFFMAN			
Witnessed By	BILL BUSCH		MIKE AUSTIN	
JOB#	LB13-256			

BOREHOLE RECORD

Last Edited: 13-SEP-2013 07:27

Bit Size inches	Depth From feet	Depth To feet
7.875	324.00	5150.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	13.375	0.00	324.00	48.00

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: 1998 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 3900: 298 CU. FT.
- SERVICE ORDER # 3541081

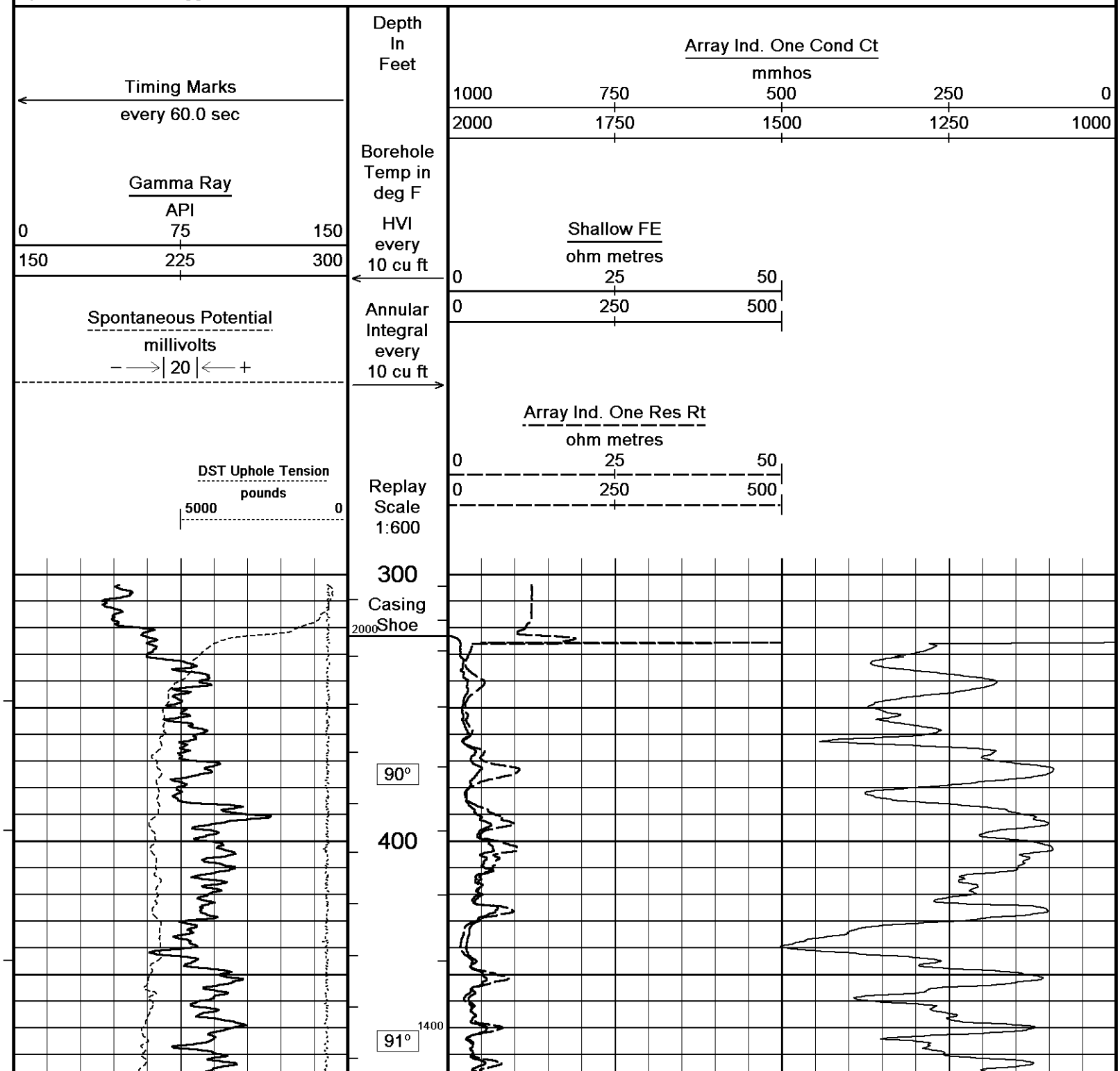
- RIG: HARDT RIG #1

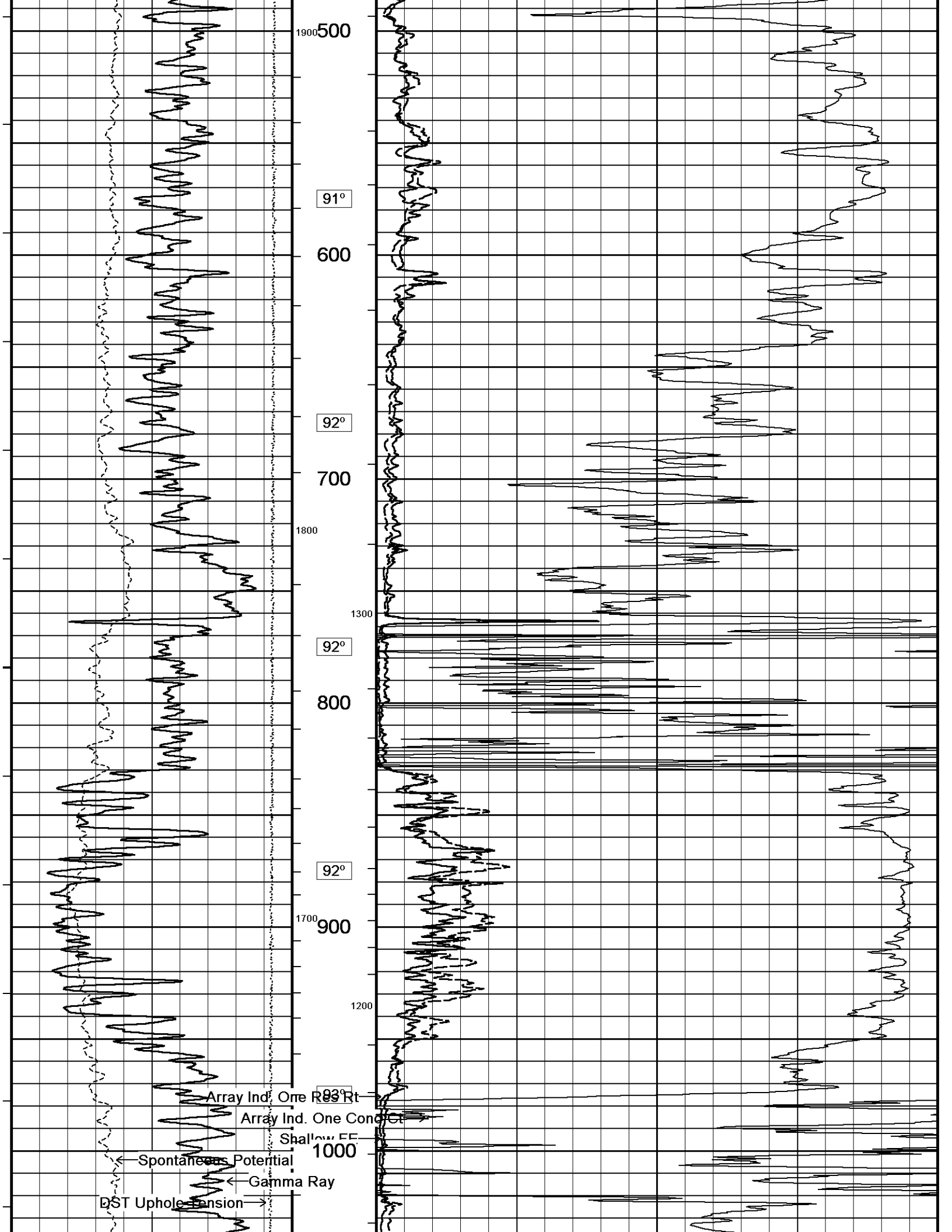
- ENGINEER: ROB HOFFMAN

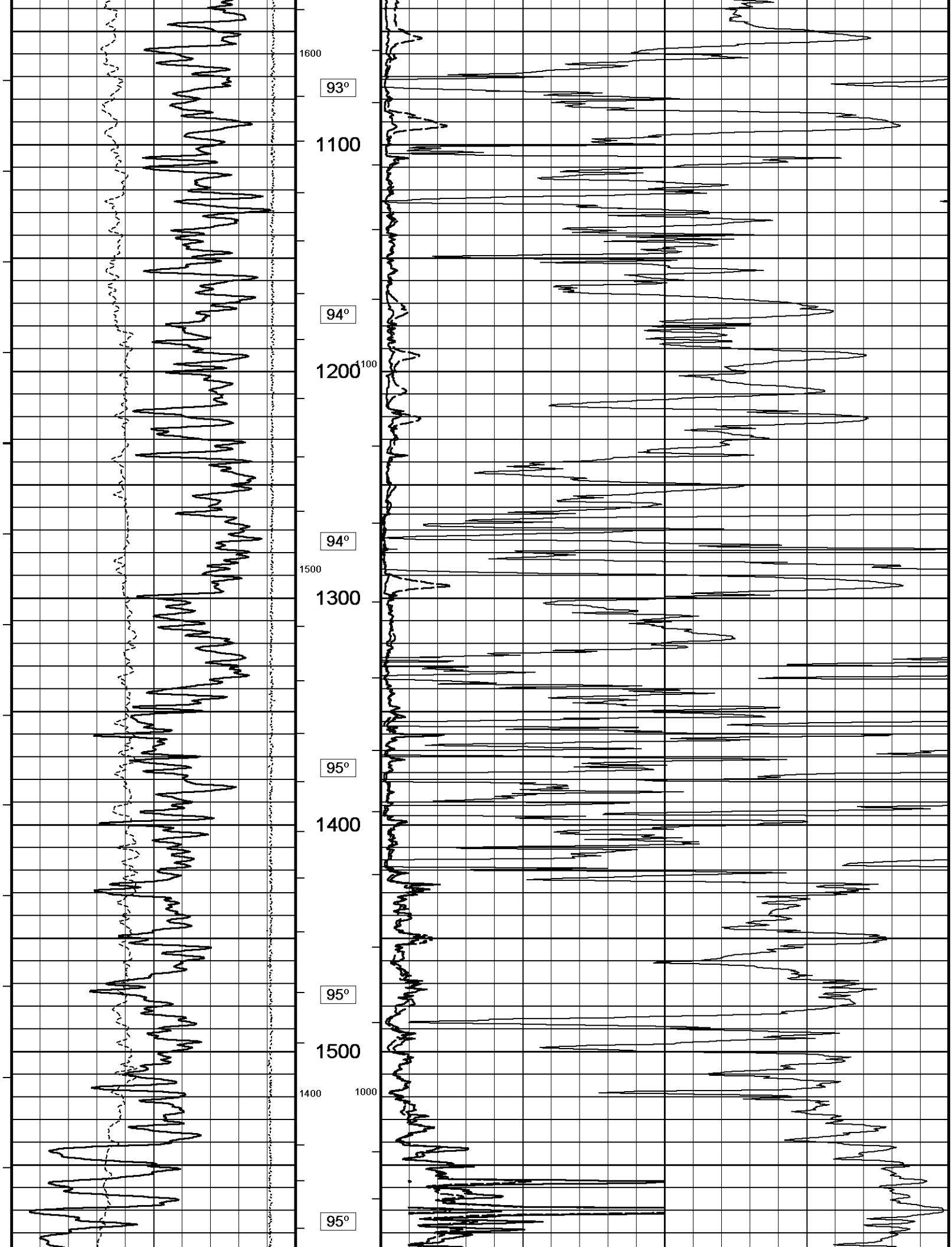
- OPERATOR(S): K. RINEHART, J. DUNLAP

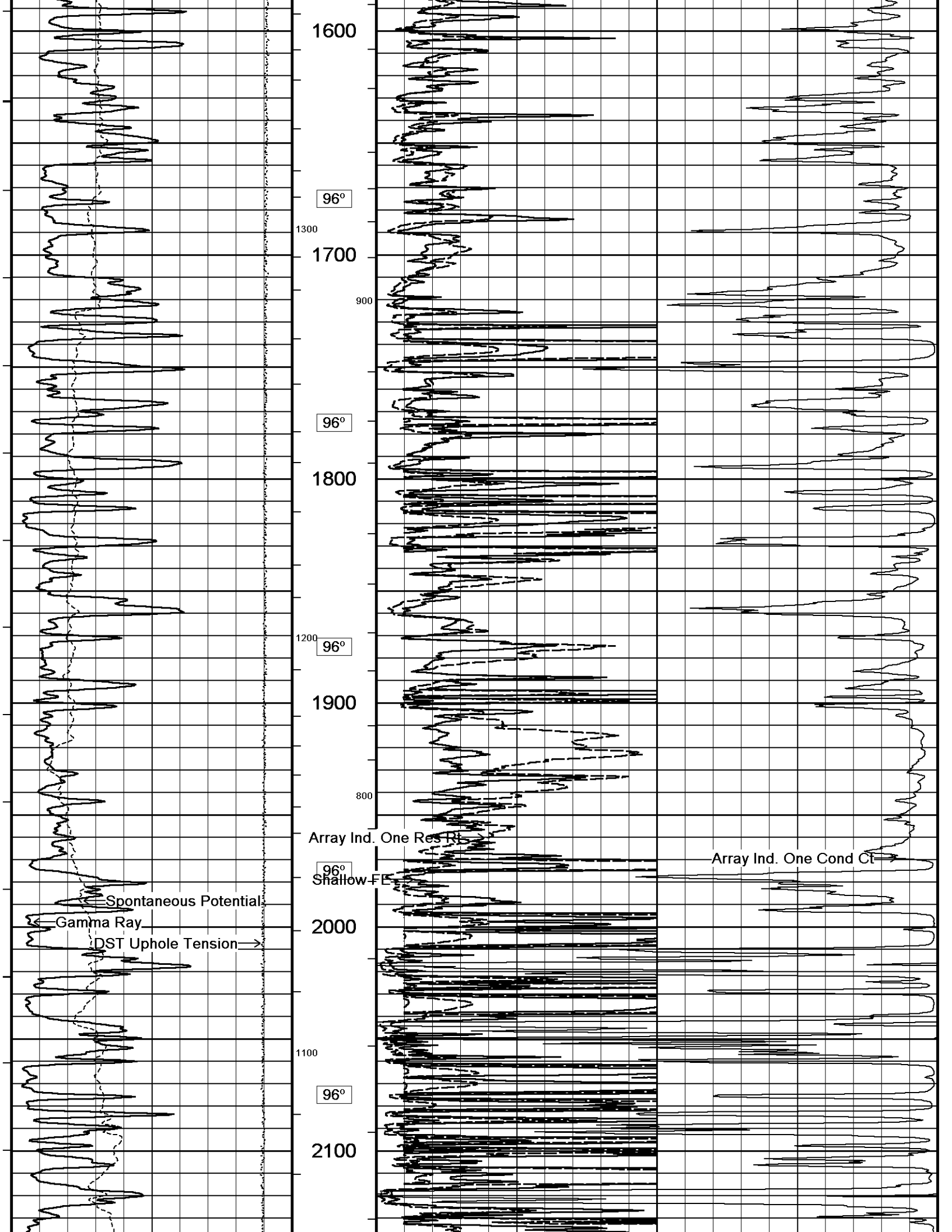
2 INCH MAIN

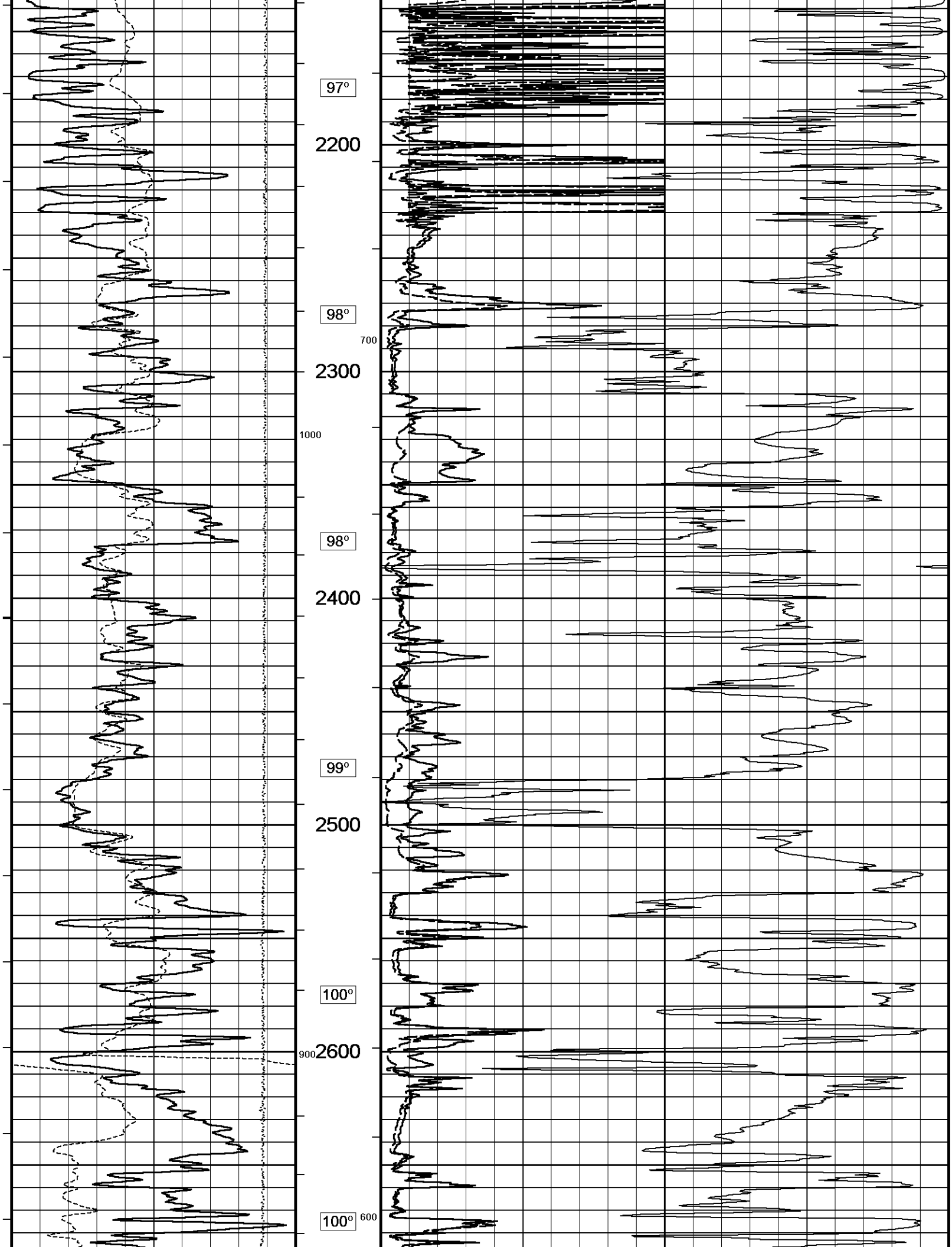
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00
Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_002.dta — Recorded on 13-SEP-2013 12:34
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

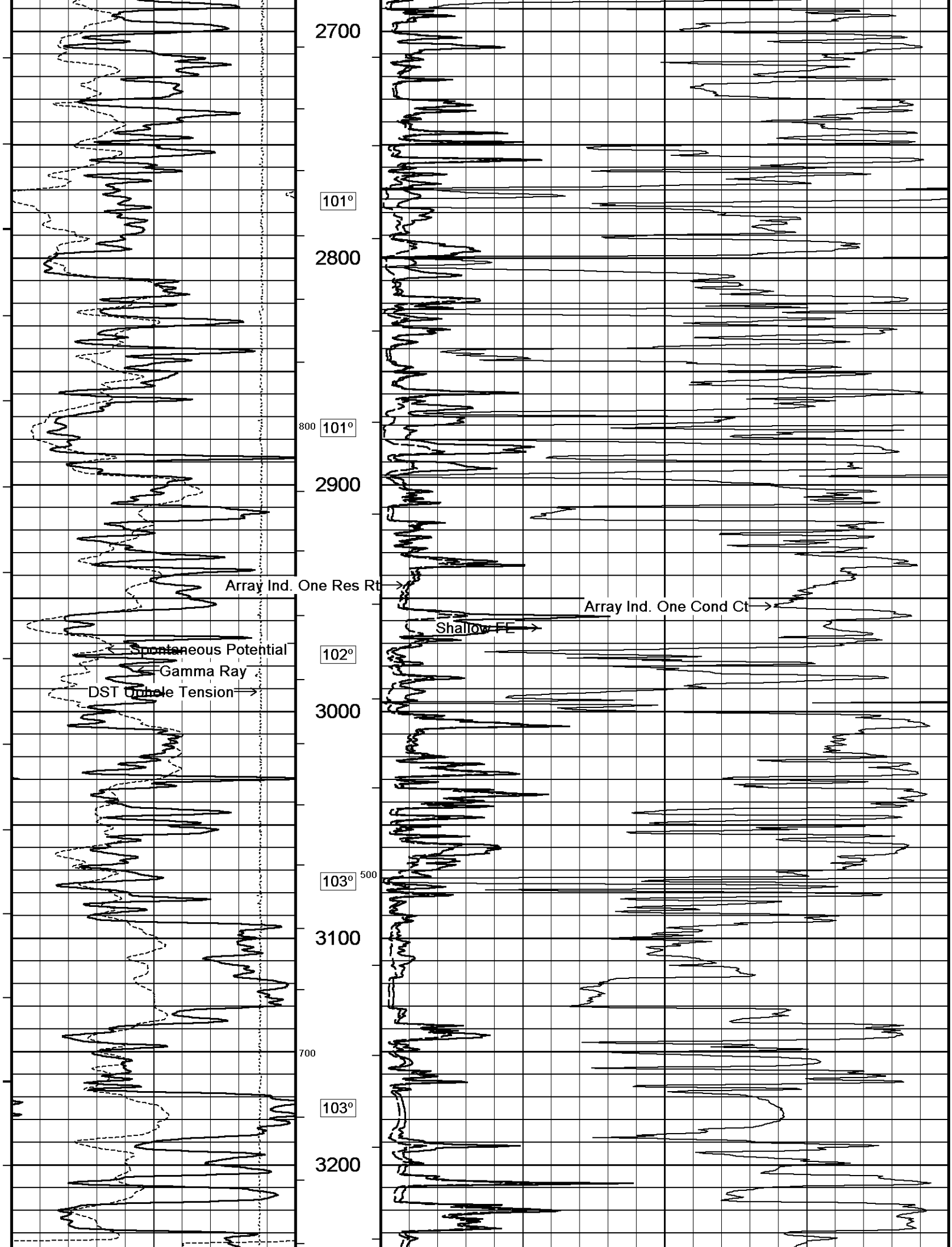


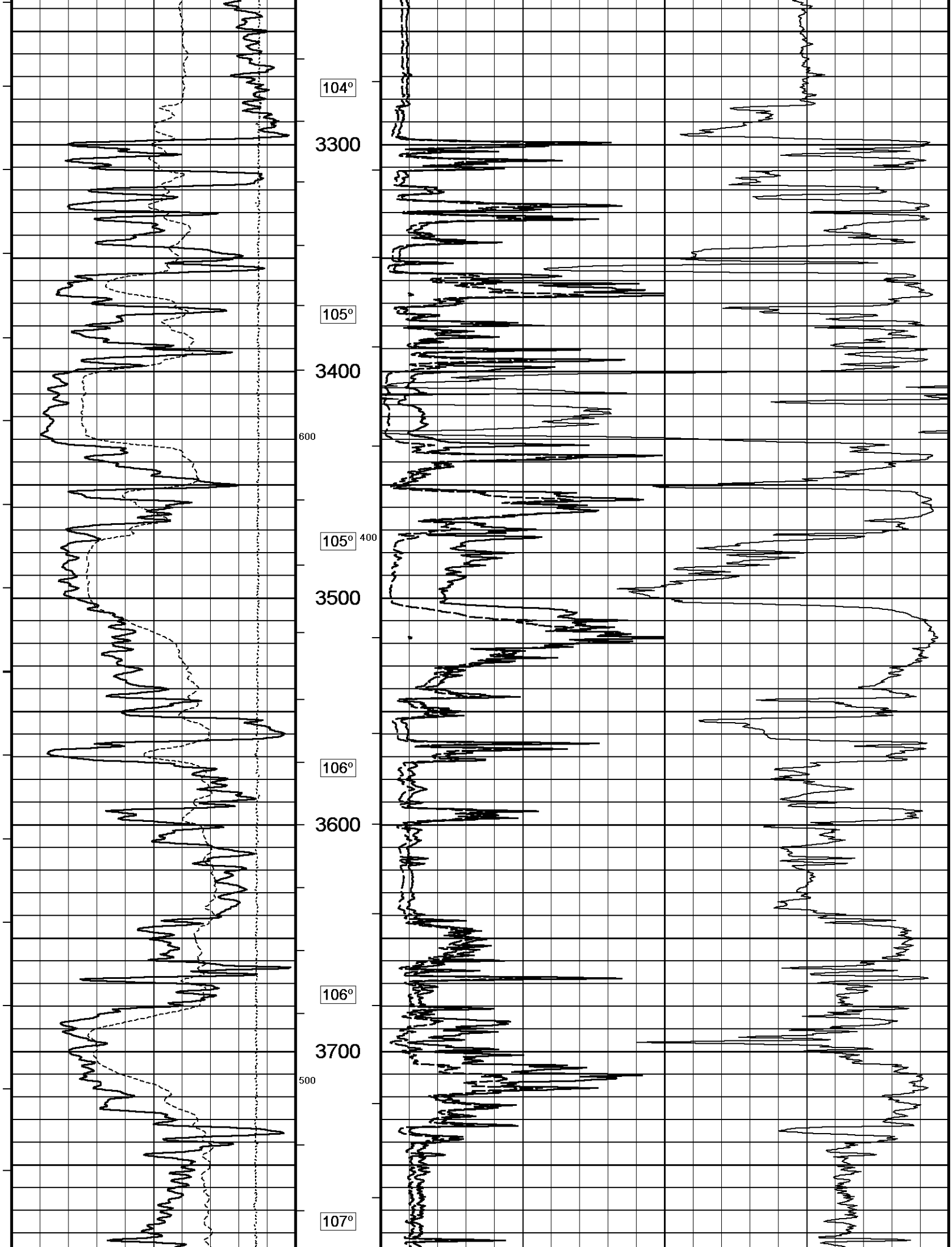

1900
500
91°
600
92°
700
1800
1300
92°
800
92°
1700
900
1200
93°
1000
Array Ind. One Res Rt
Array Ind. One Conduct
Shallow FF
Spontaneous Potential
Gamma Ray
DST Uphole Tension


1600
93°
1100
94°
1200
1100
94°
1500
1300
95°
1400
95°
1500
1400
1000
95°


1600
96°
1300
1700
900
96°
1800
1200
96°
1900
800
Array Ind. One Res RI
96°
Shallow FE
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
2000
1100
96°
2100


97°
2200
98°
700
2300
1000
98°
2400
99°
2500
100°
900
2600
100°
600


2700
101°
2800
800
101°
2900
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
102°
Gamma Ray
DST Cable Tension
3000
103°
500
3100
700
103°
3200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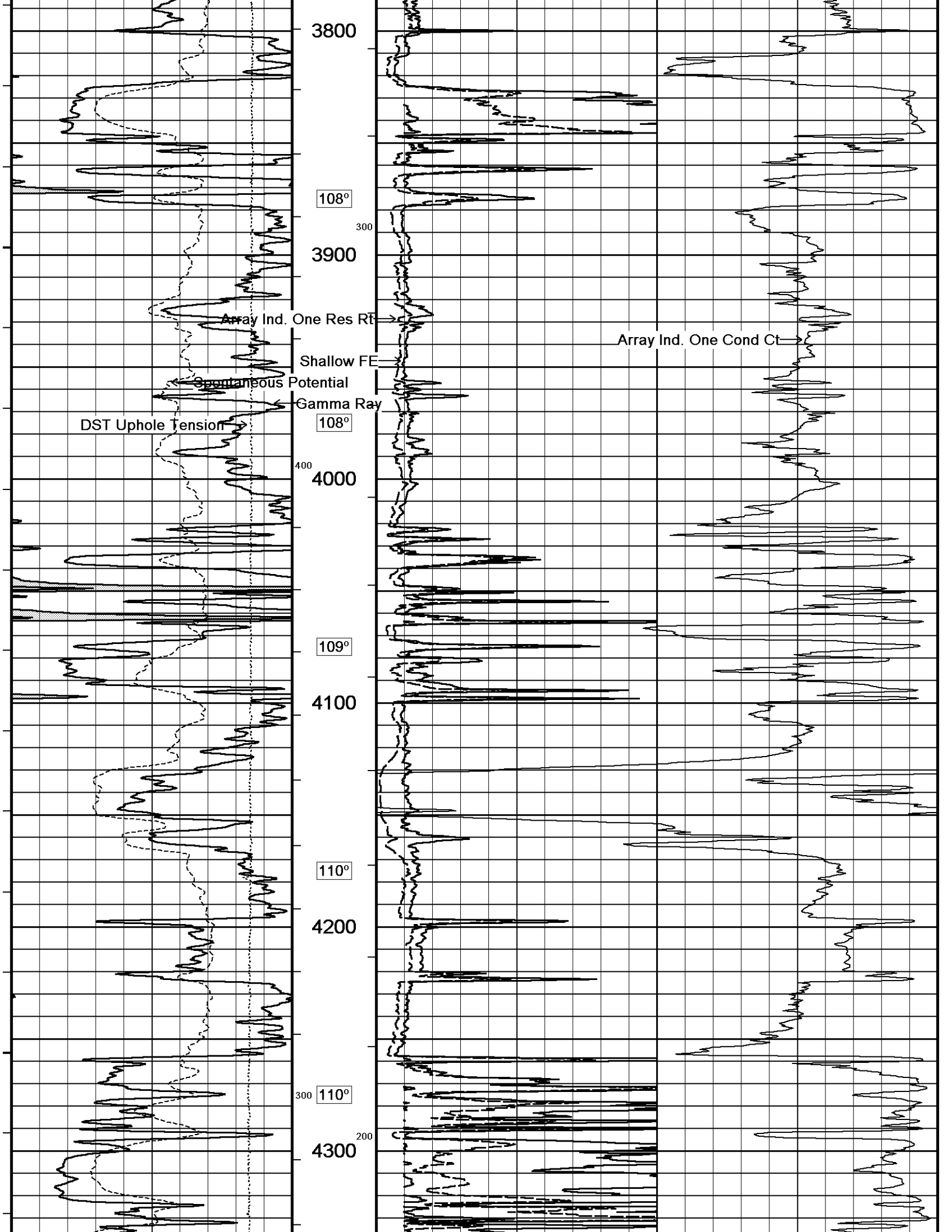
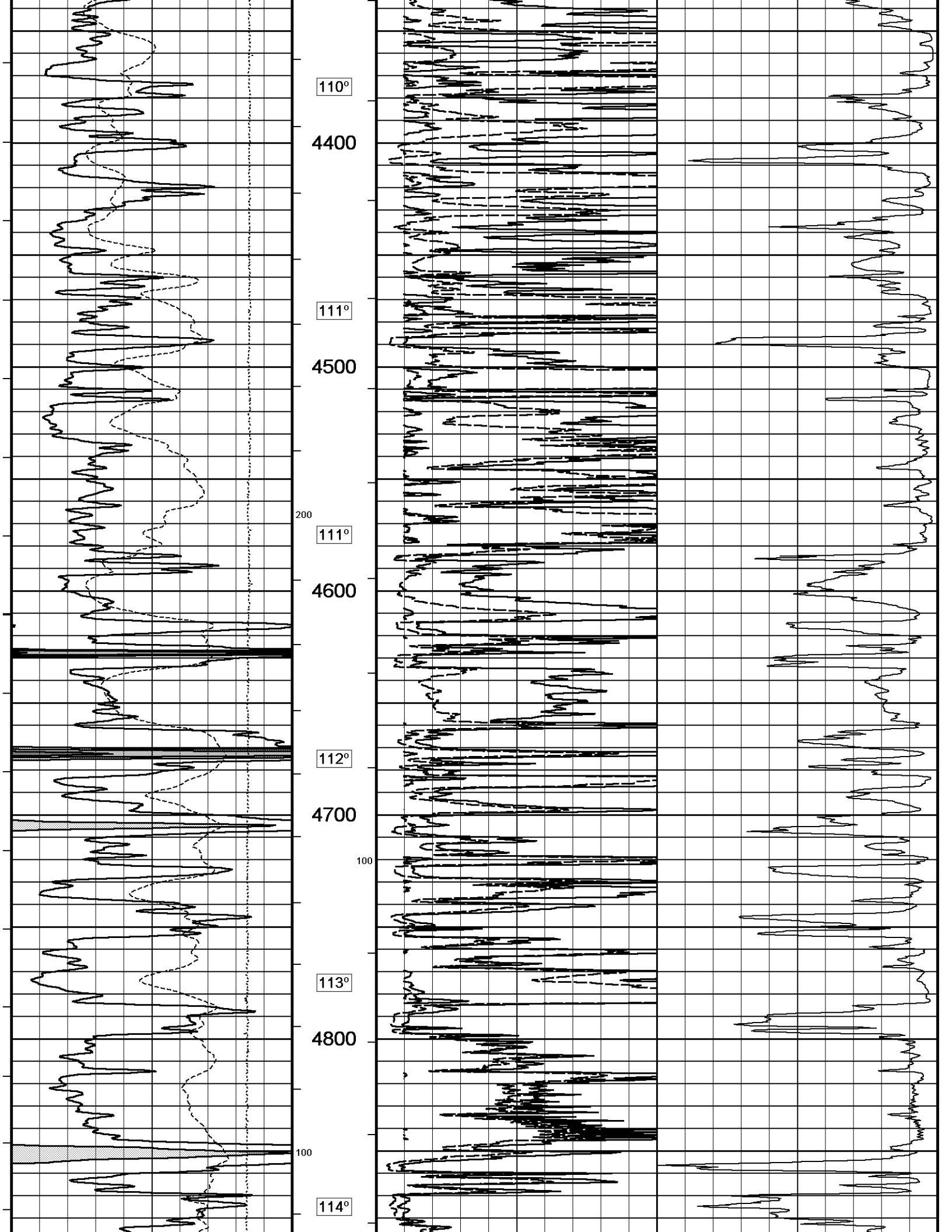
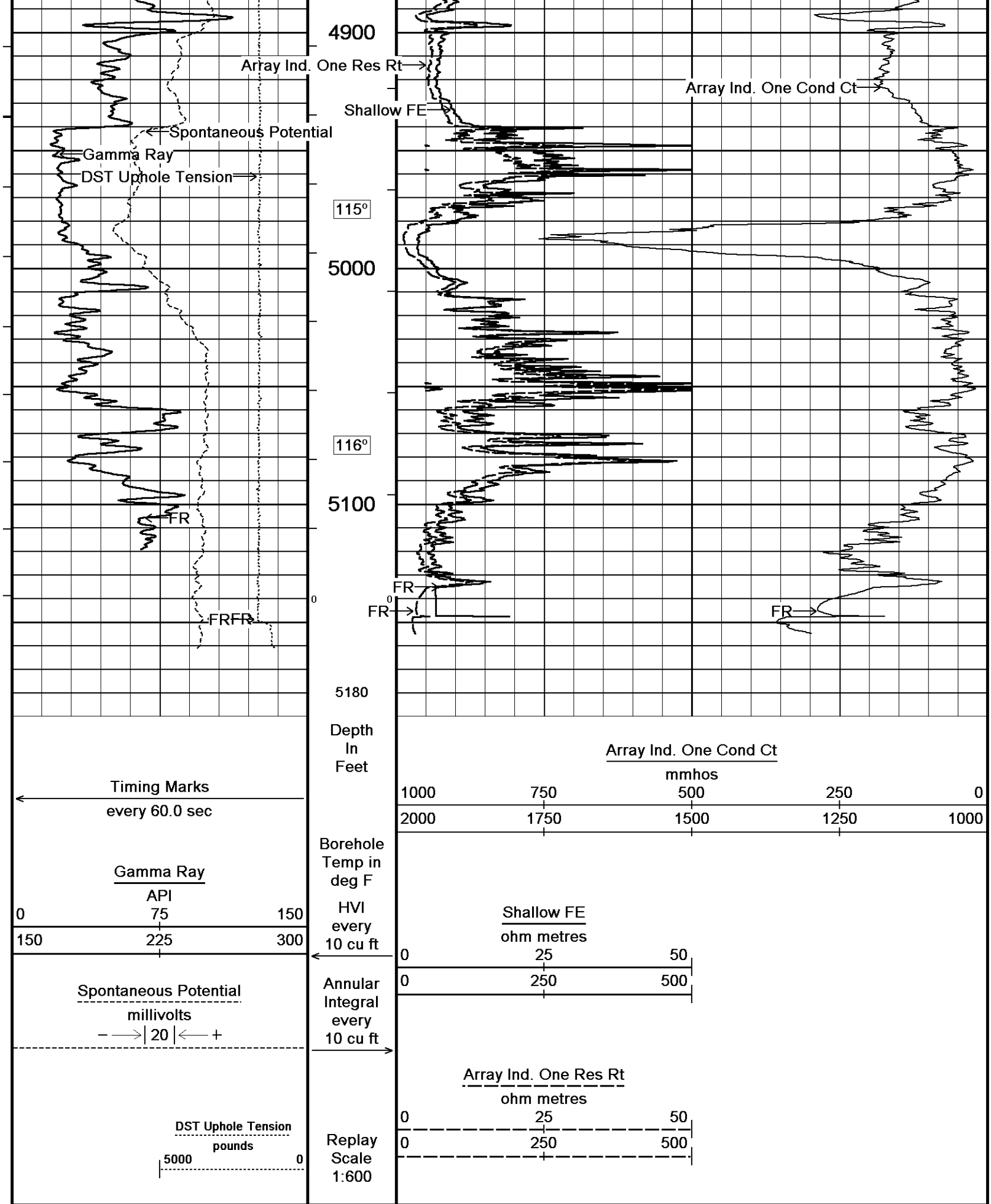
3300
105°
3400
600
105°
400
3500
106°
3600
106°
3700
500
107°


3800
108°
300
3900
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
108°
DST Uphole Tension
400
4000
109°
4100
110°
4200
300
110°
200
4300


110°
4400
111°
4500
200
111°
4600
112°
4700
100
113°
4800
100
114°



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 14-SEP-2013 10:00

Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_002.dta
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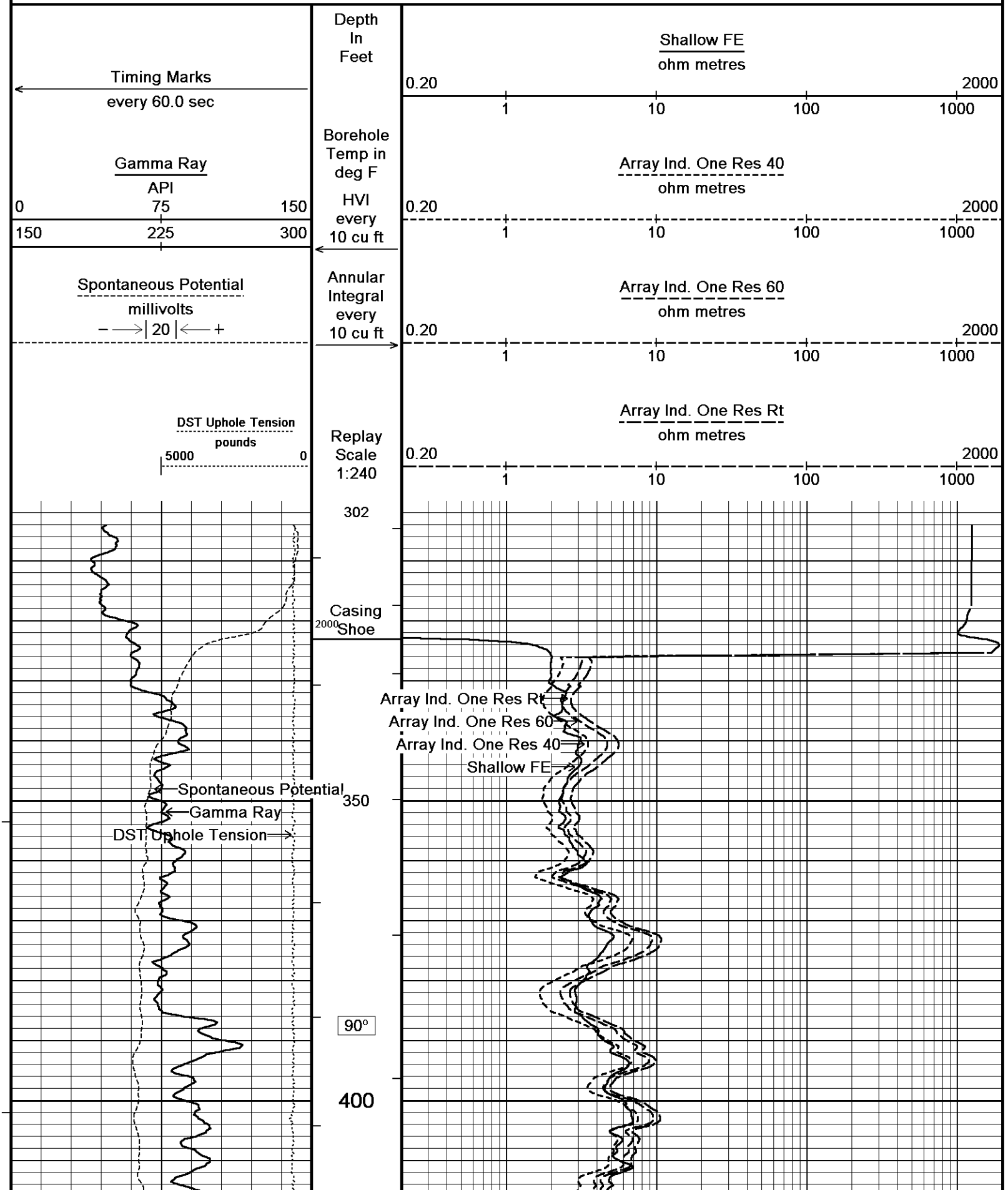
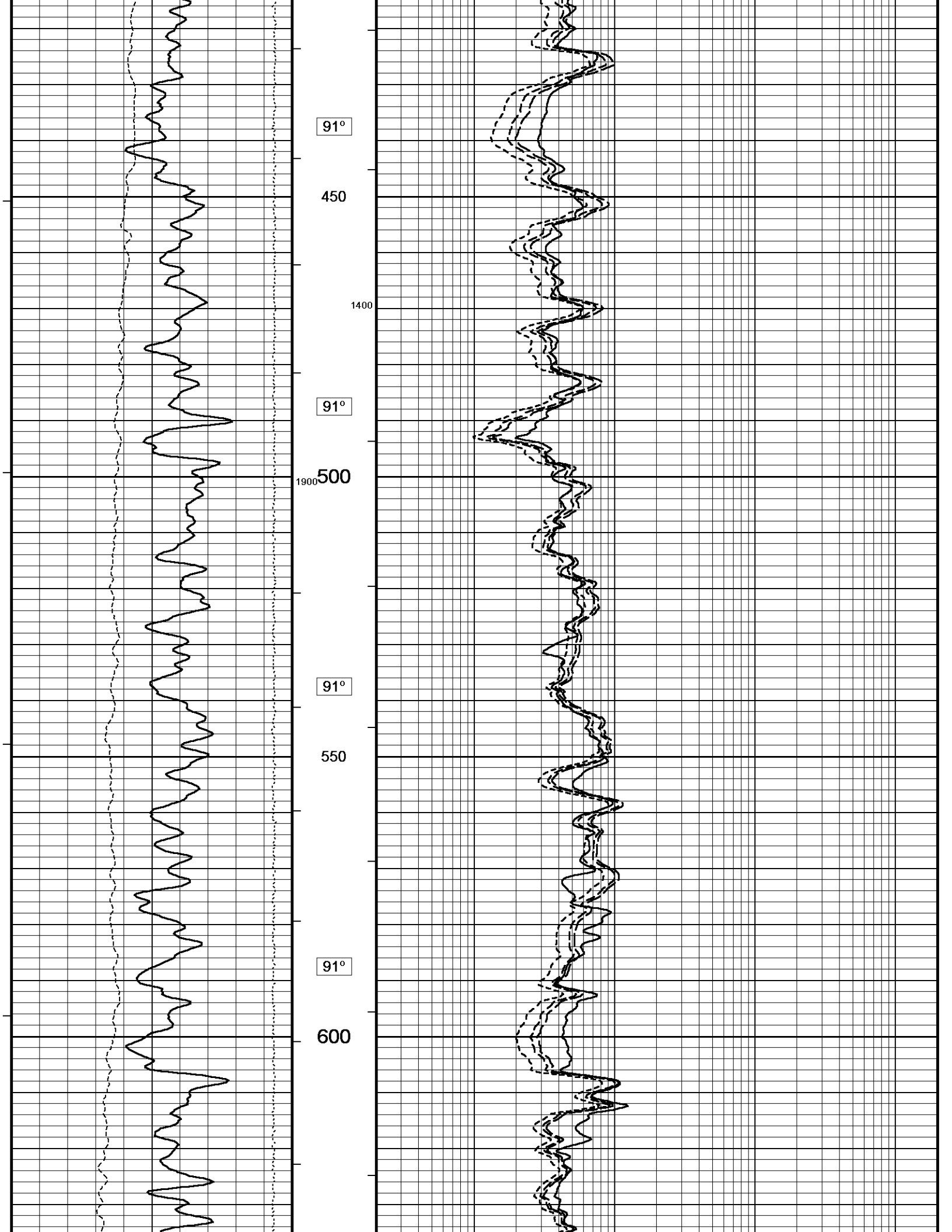
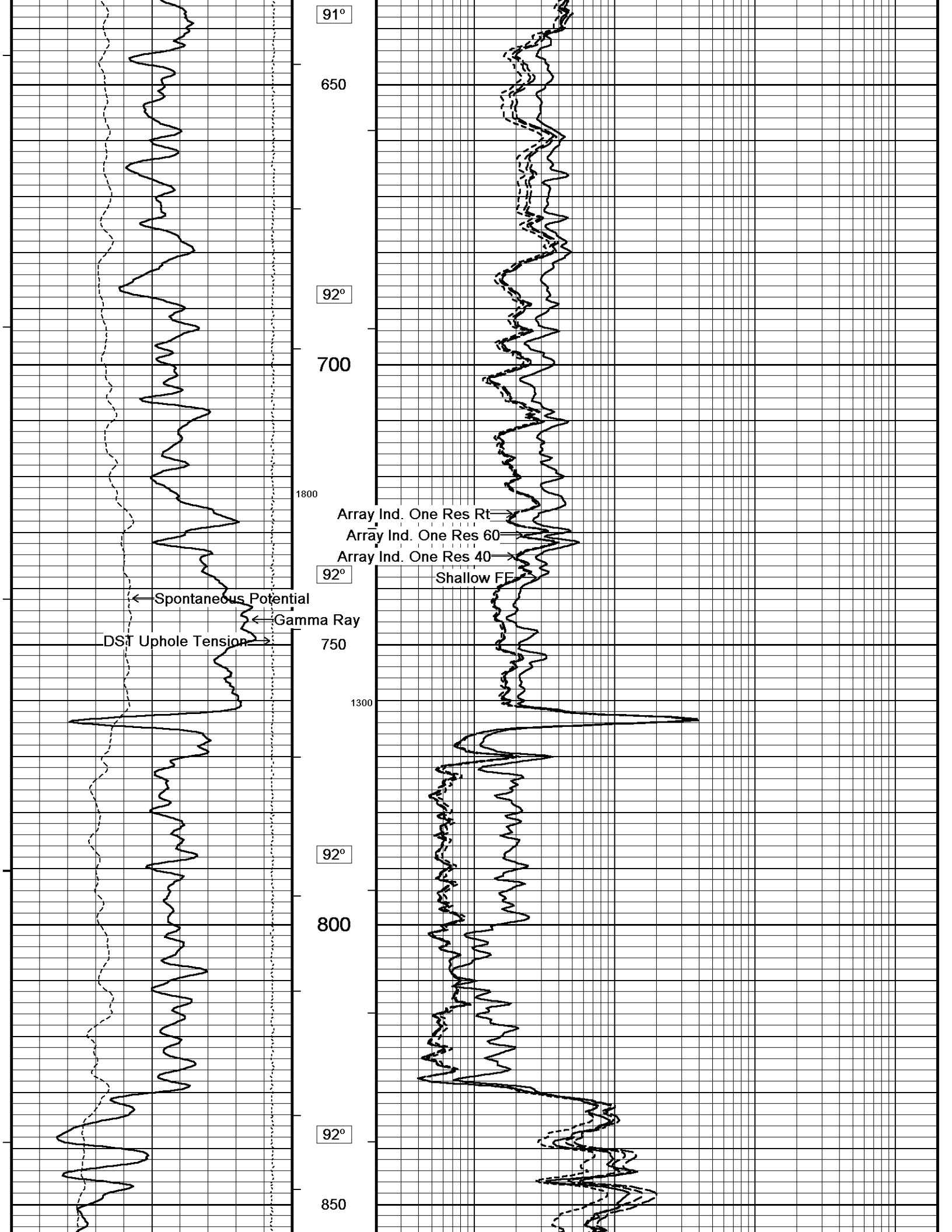
2 INCH MAIN

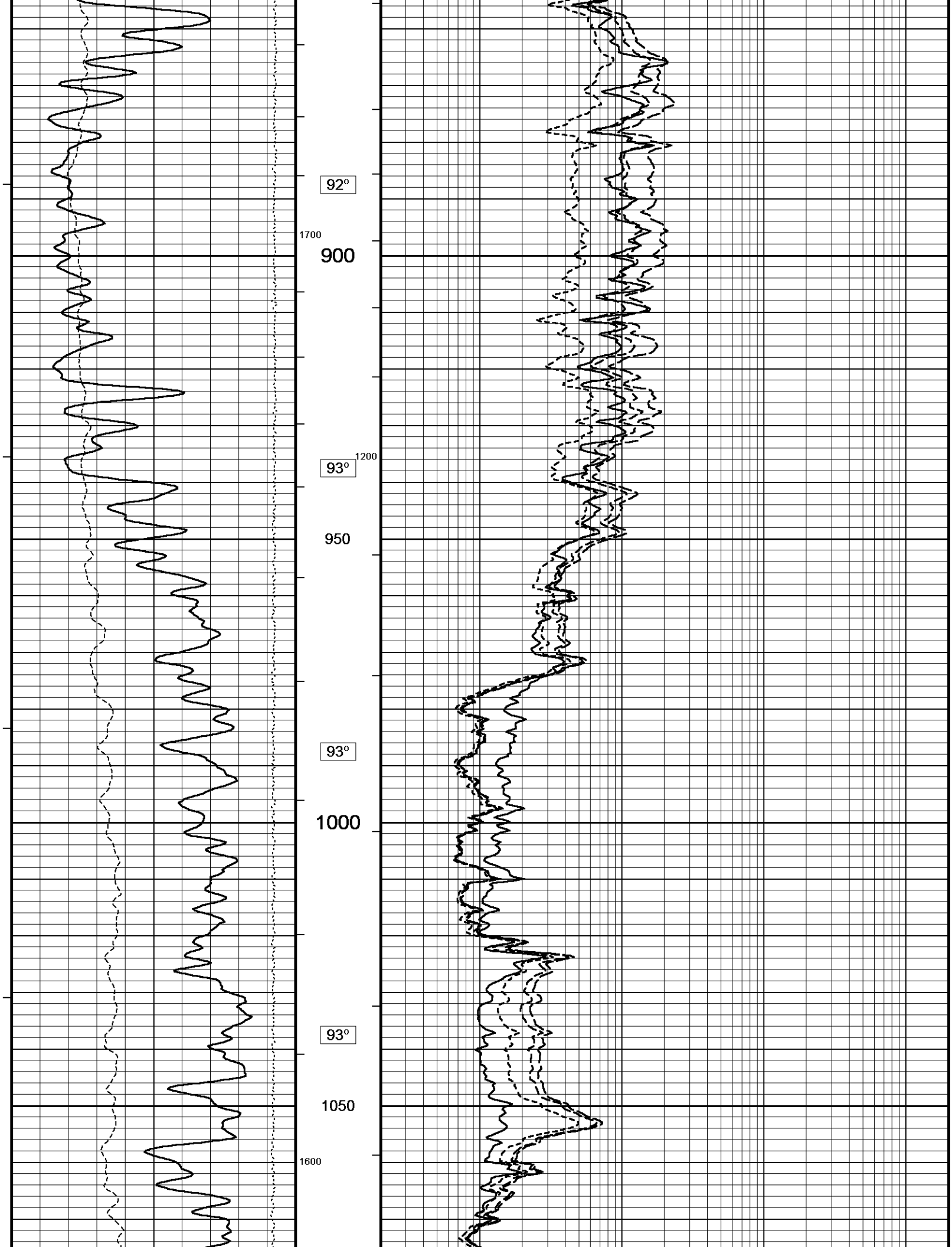
5 INCH MAIN

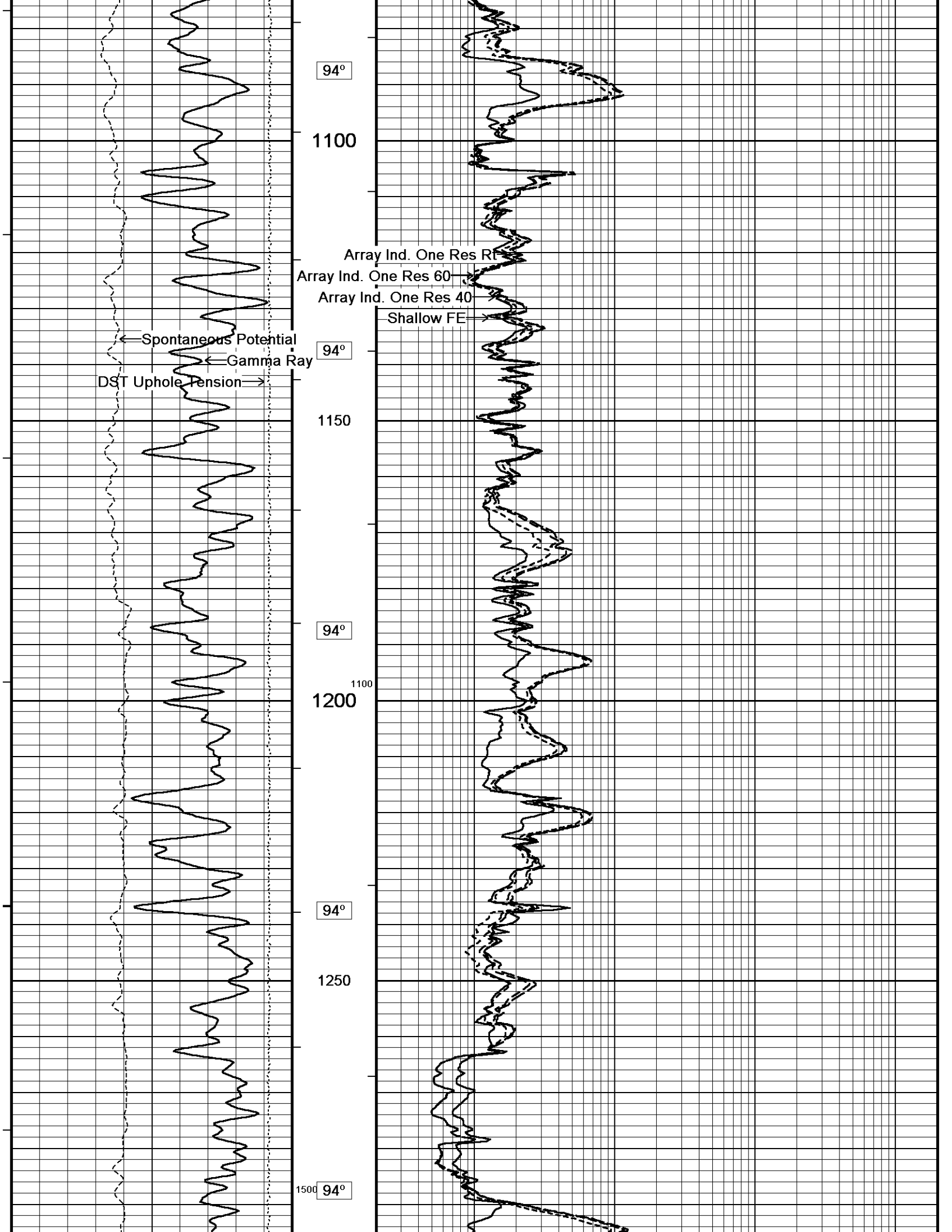
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 14-SEP-2013 10:00
Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_002.dta
Recorded on 13-SEP-2013 12:34
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

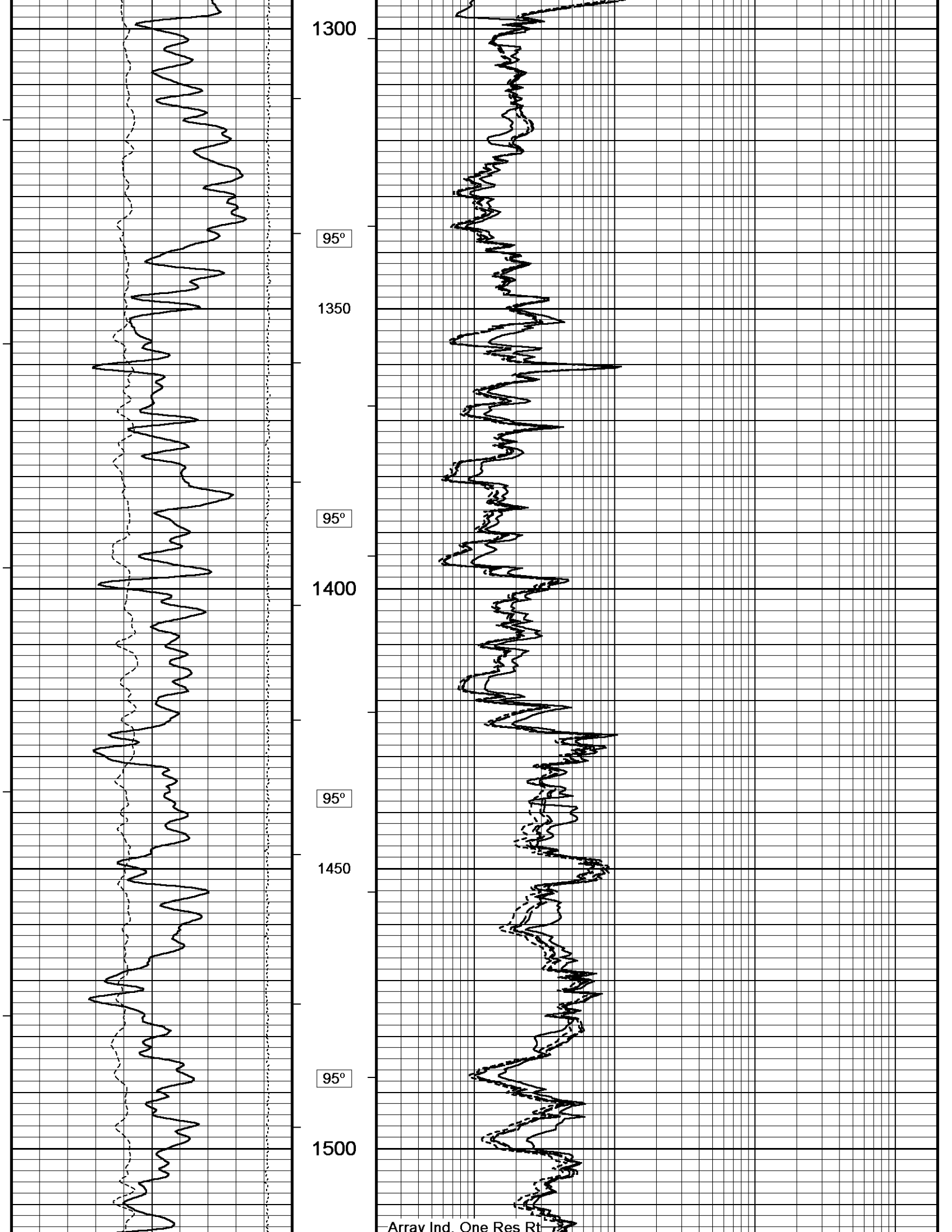


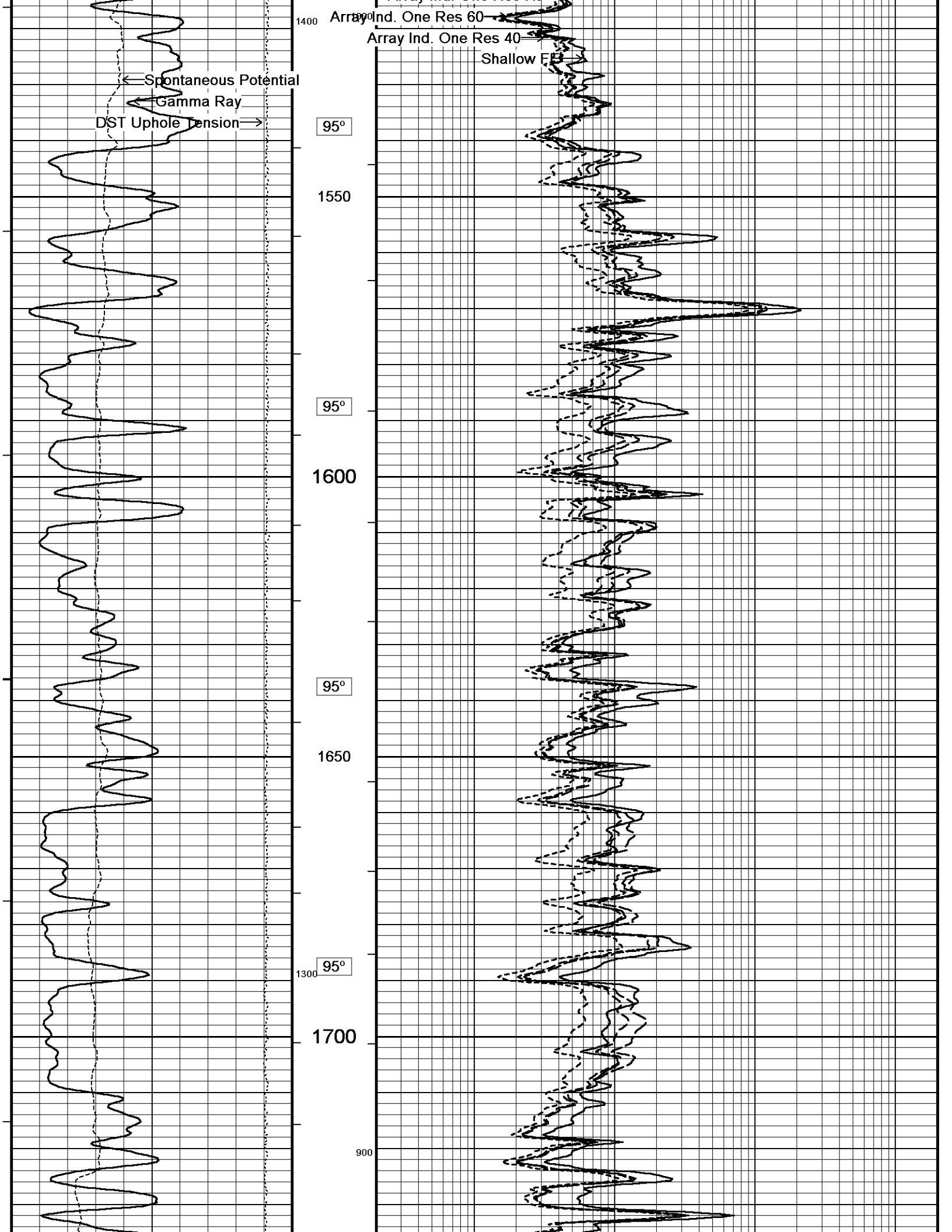

91°
450
1400
91°
1900
500
91°
550
91°
600

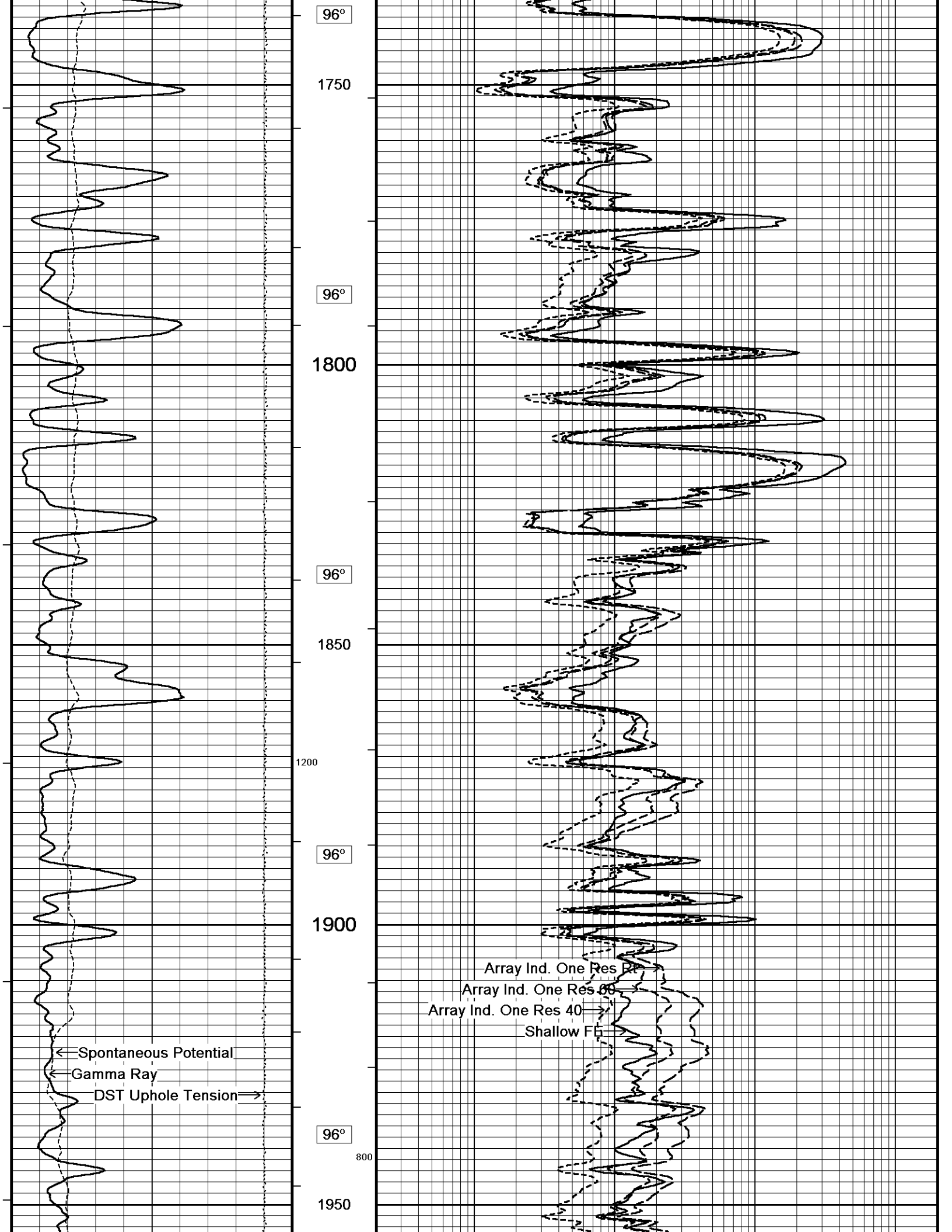

91°
650
92°
700
1800
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
92°
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
750
1300
92°
800
92°
850

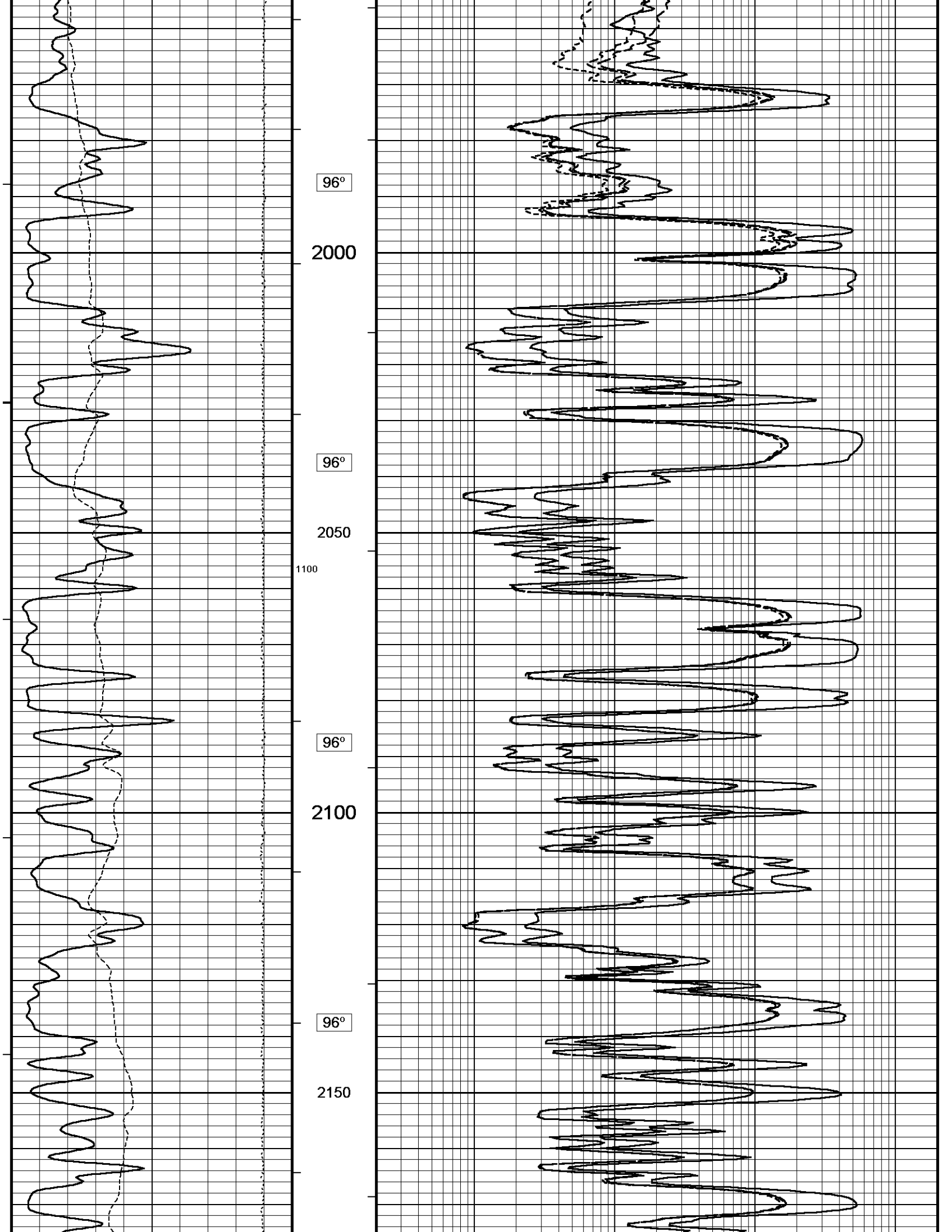

92°
1700
900
93°
1200
950
93°
1000
93°
1050
1600

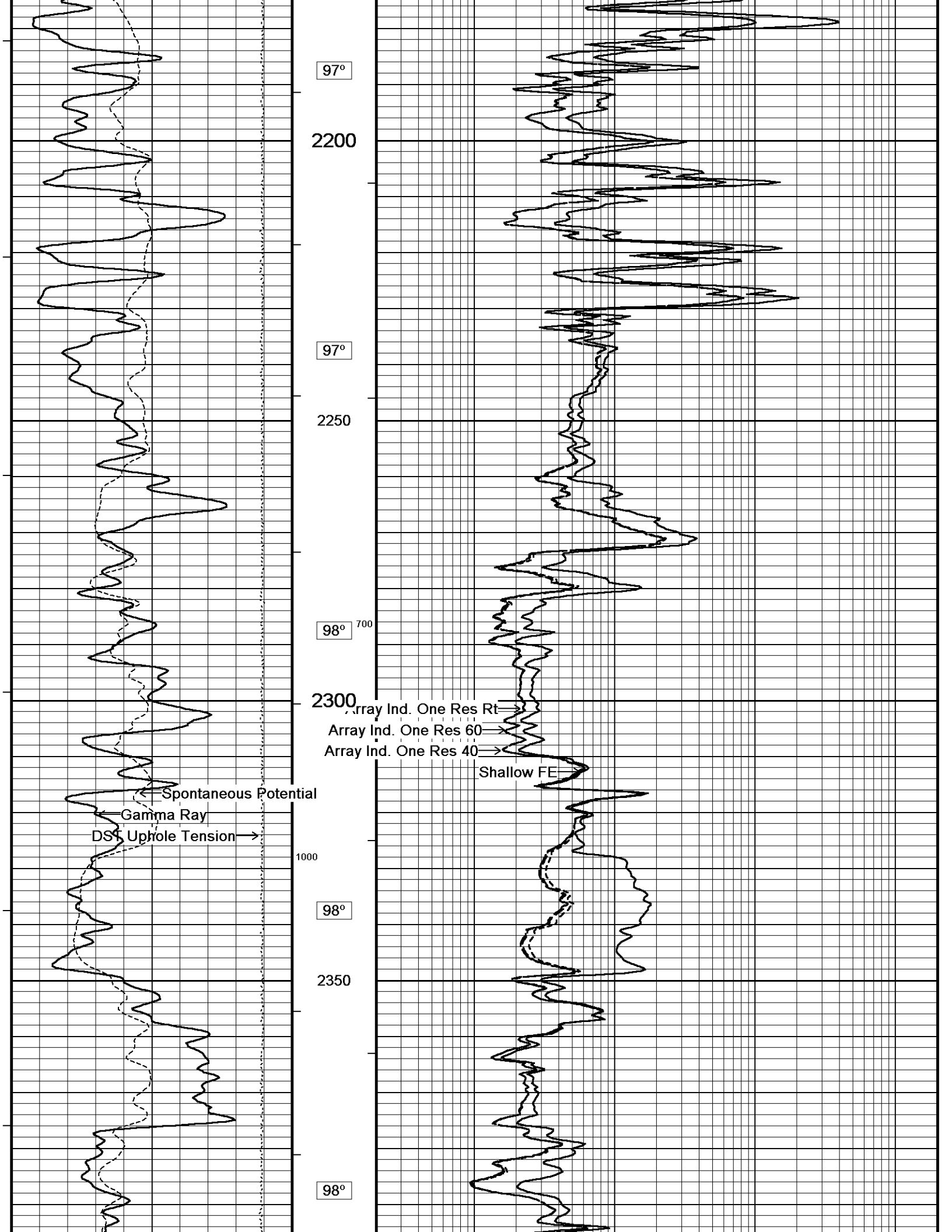

94°
1100
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
94°
1150
94°
1100
1200
94°
1250
1500
94°

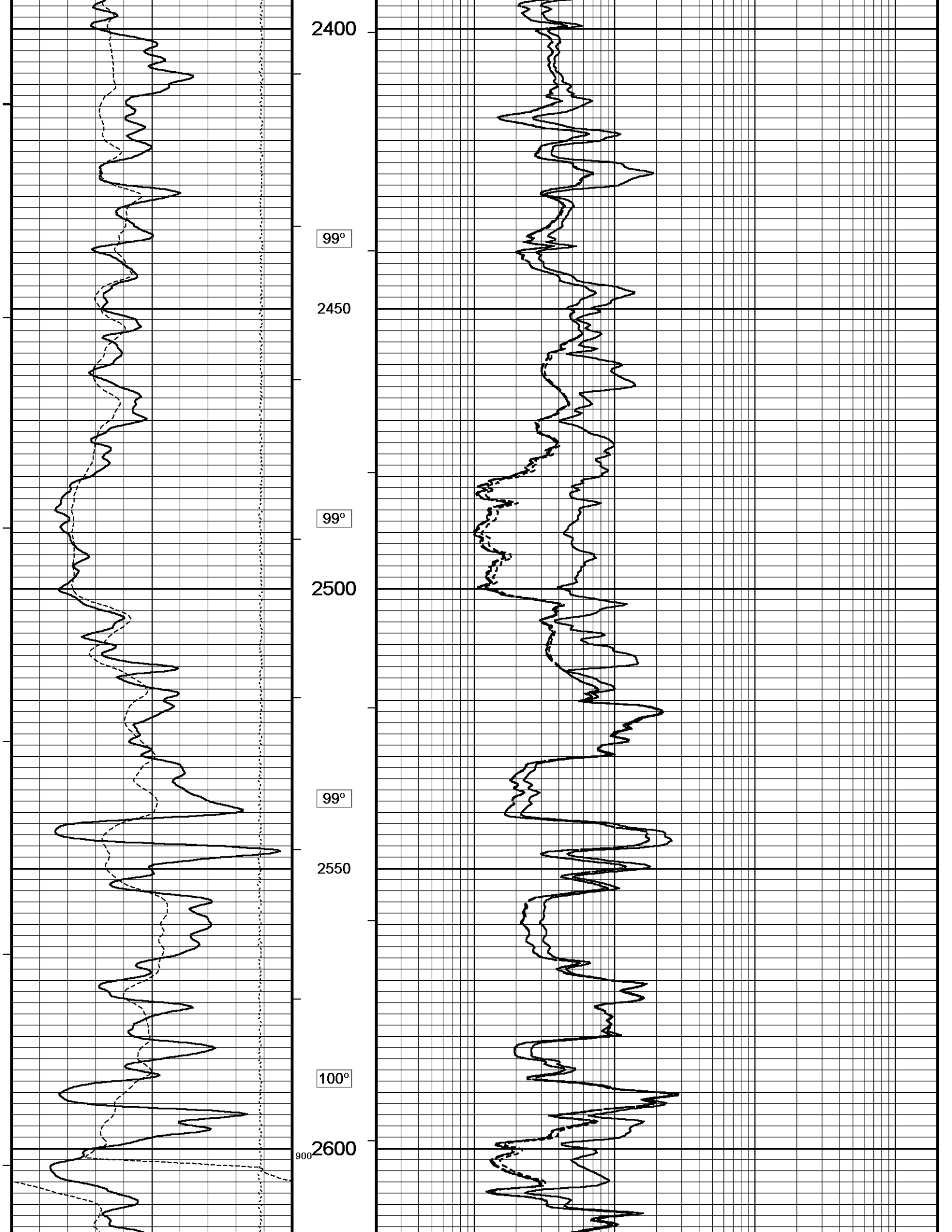

1300
95°
1350
95°
1400
95°
1450
95°
1500
Array Ind. One Res Rt

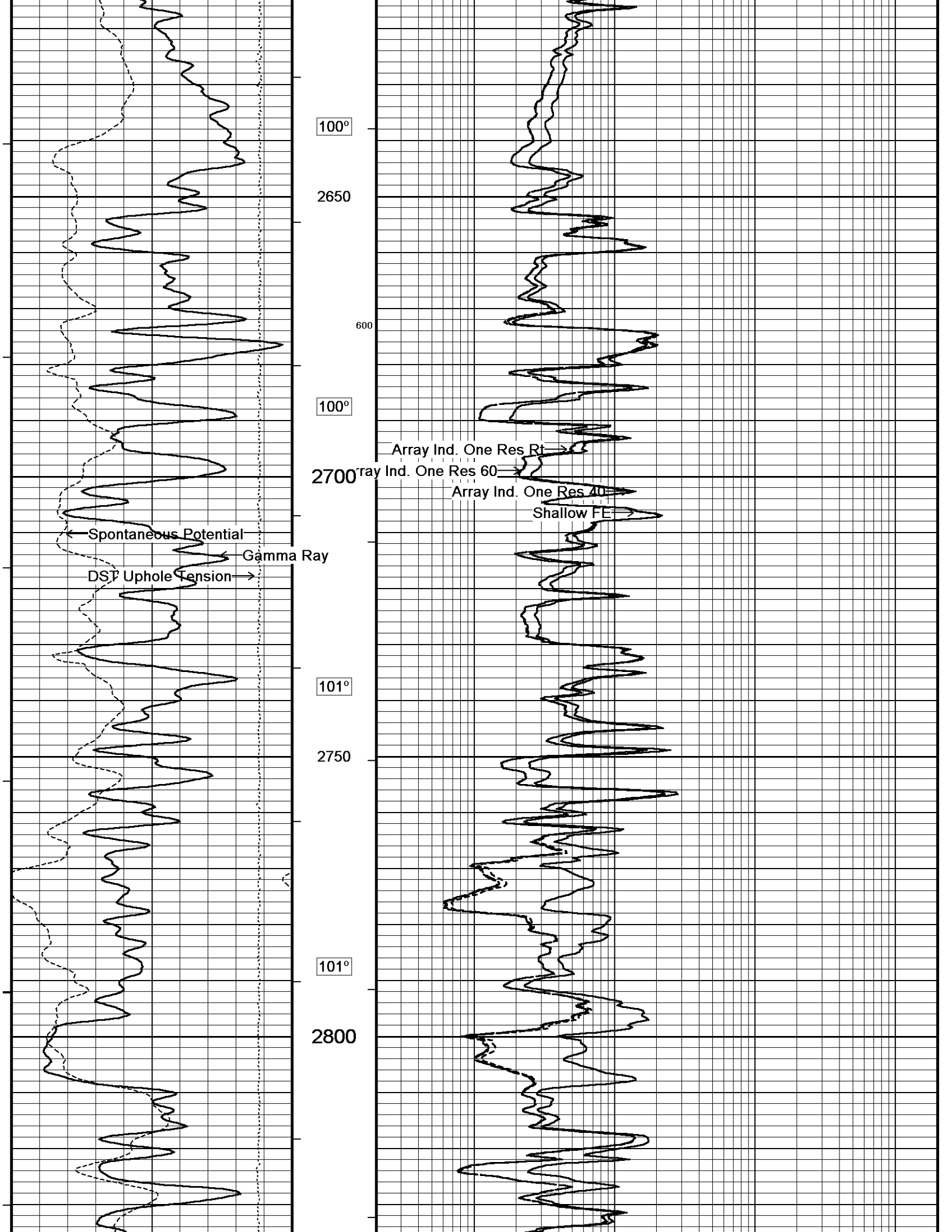

Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1400
95°
1550
95°
1600
95°
1650
1300
95°
1700
900

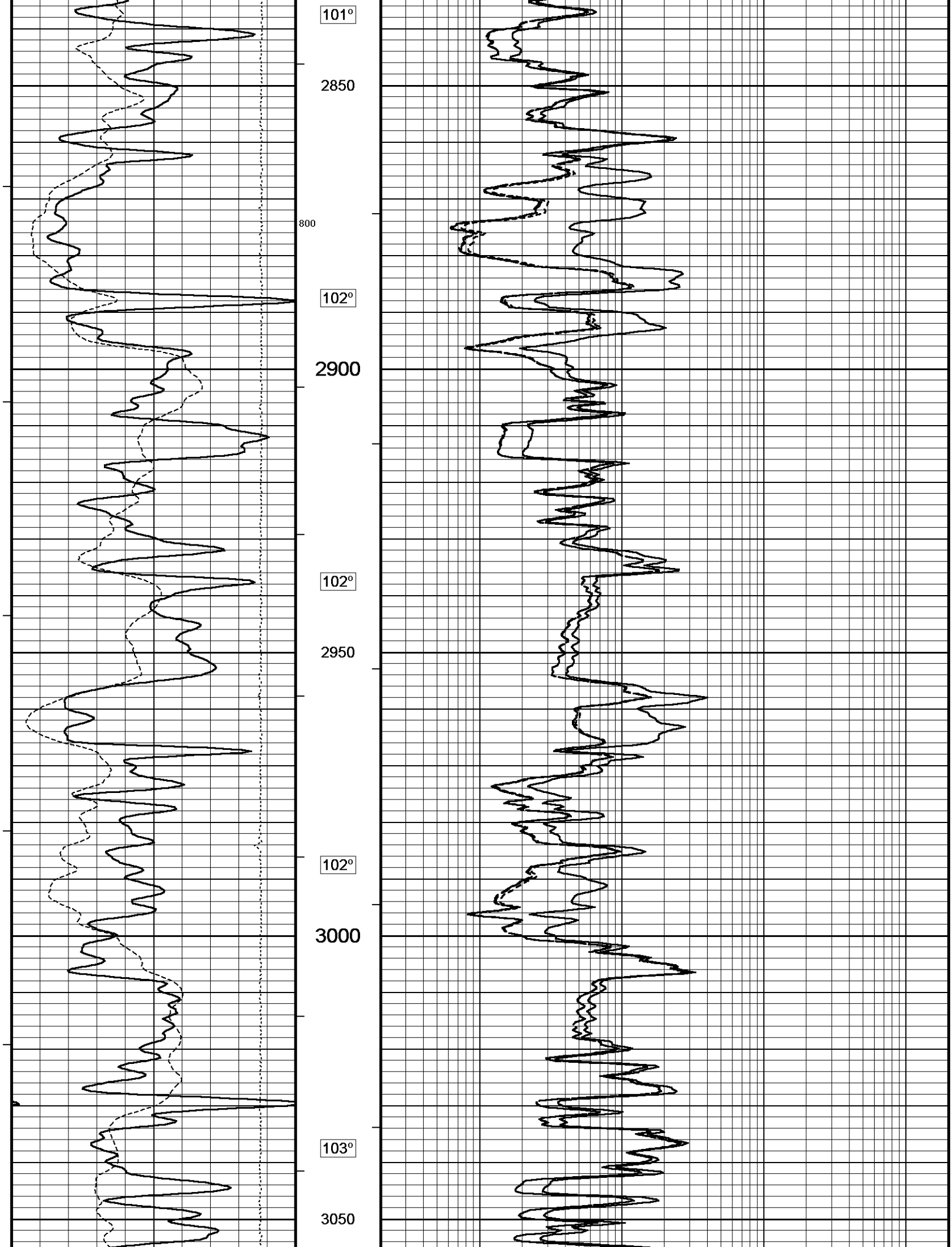

96°
1750
96°
1800
96°
1850
1200
96°
1900
800
96°
1950
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow Ft
Spontaneous Potential
Gamma Ray
DST Uphole Tension

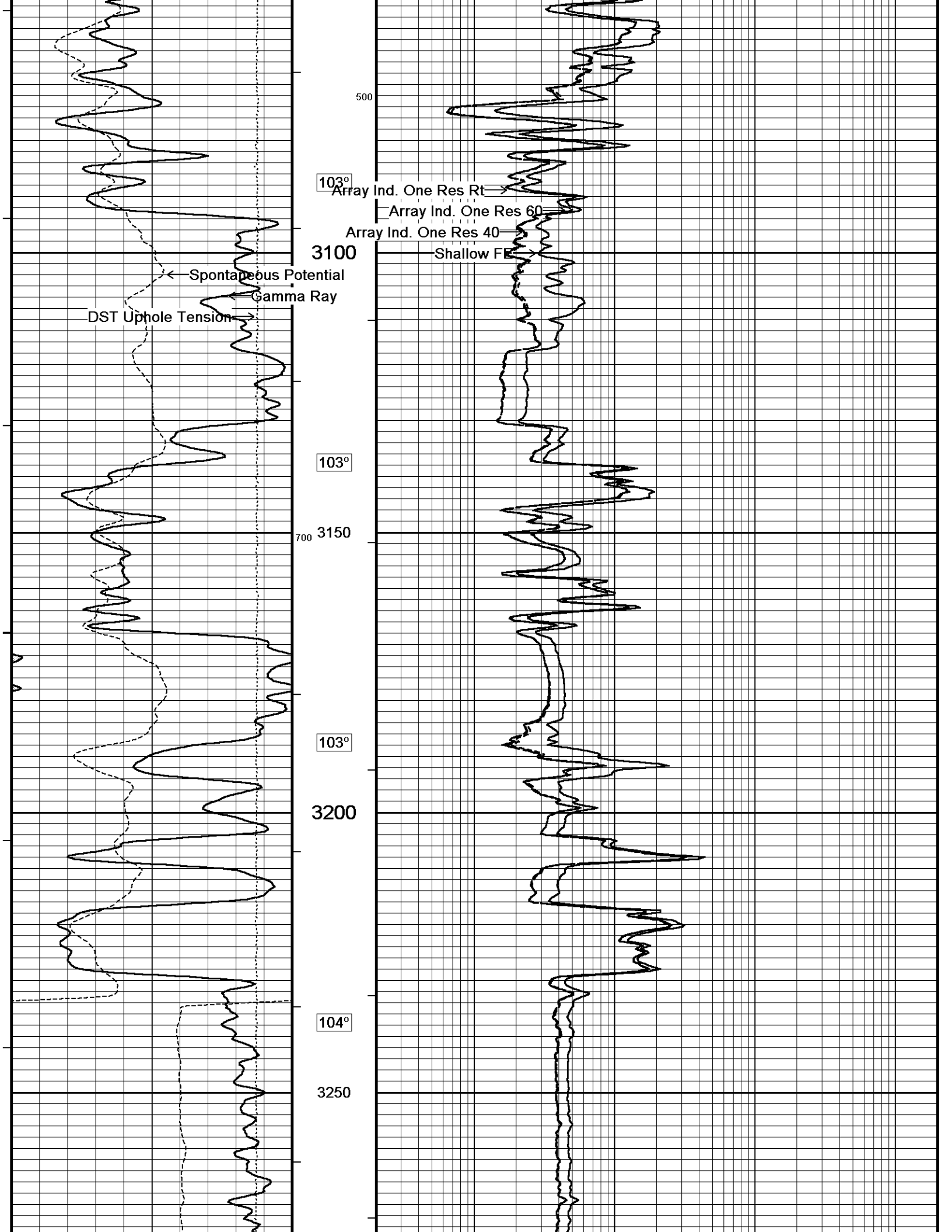

96°
2000
96°
2050
1100
96°
2100
96°
2150

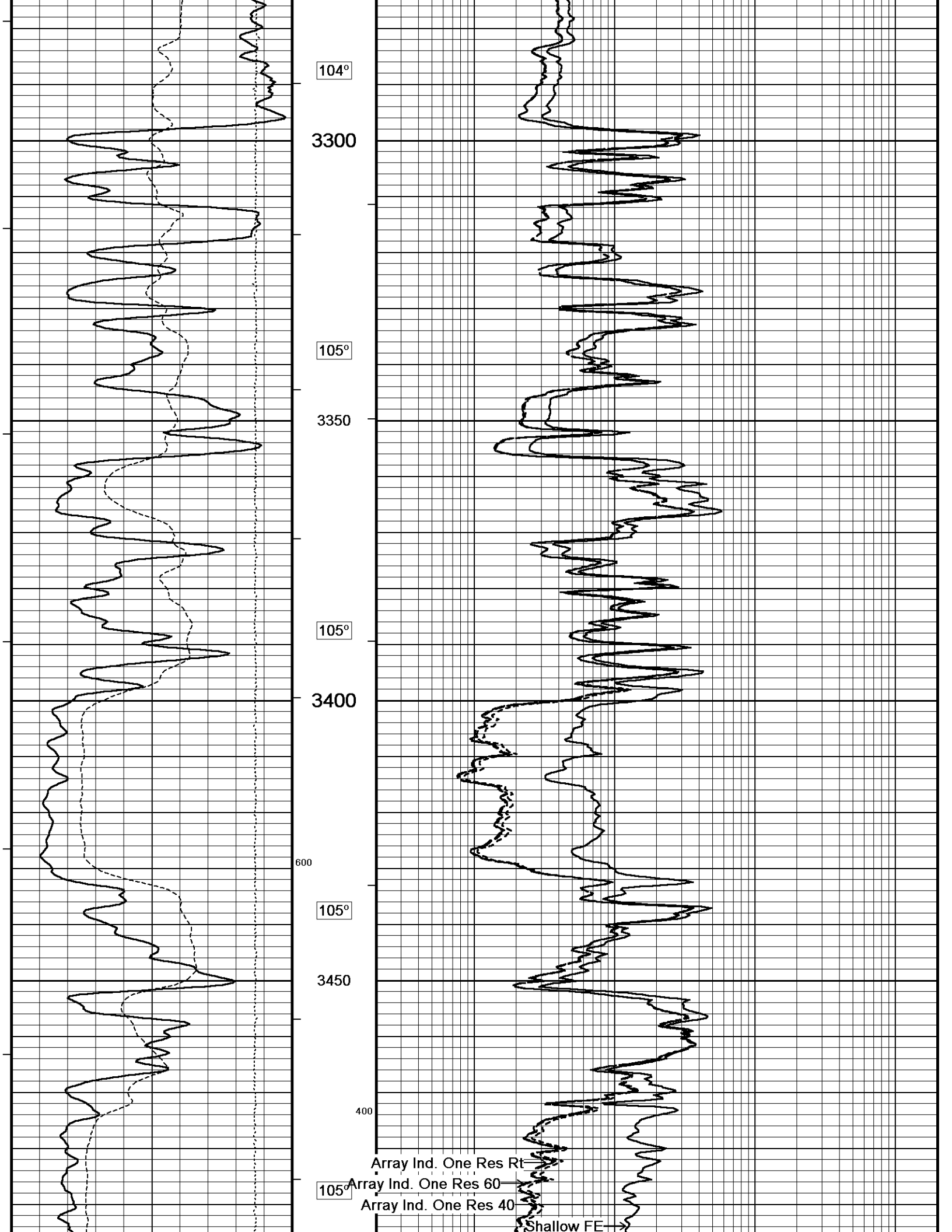

97°
2200
97°
2250
98°
700
2300
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
1000
98°
2350
98°

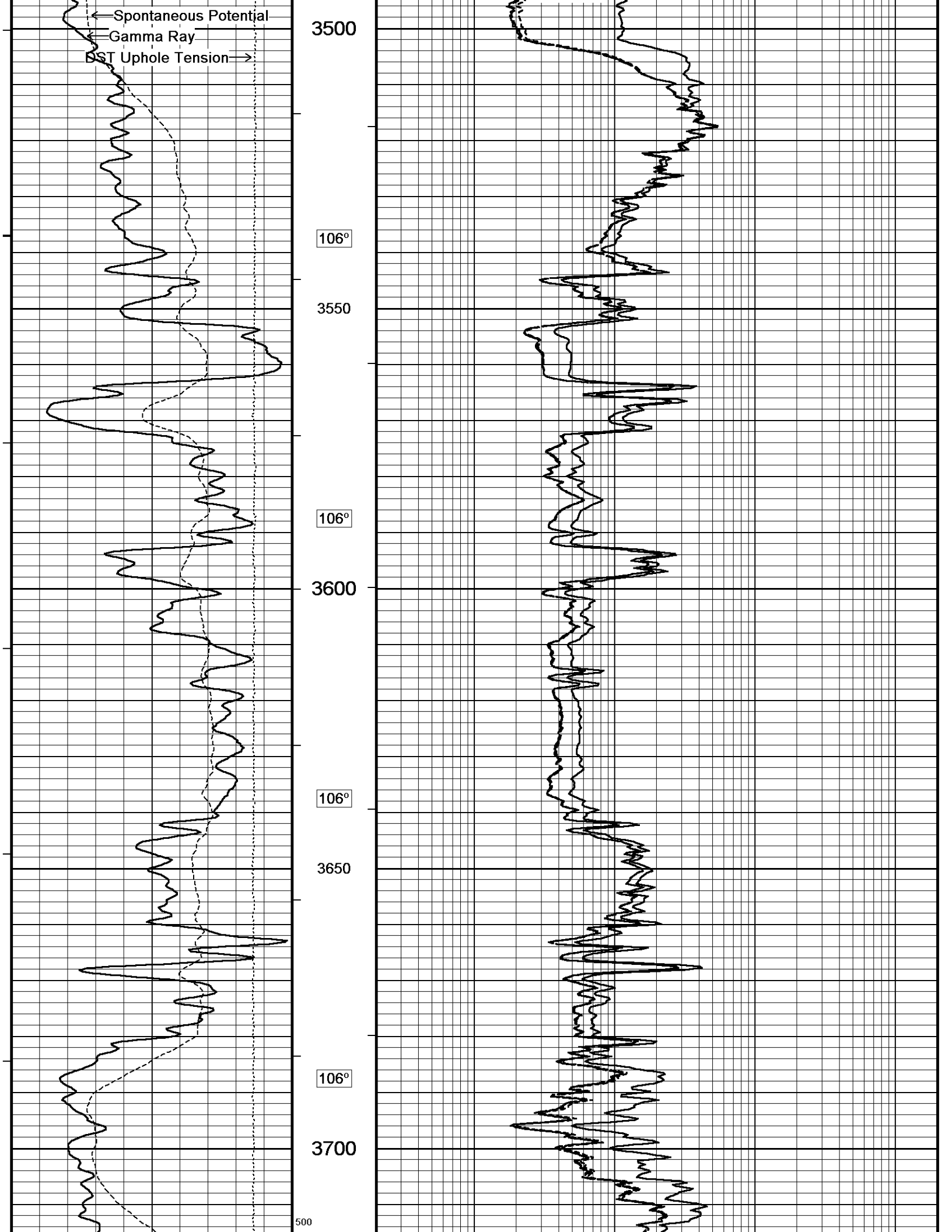

2400
99°
2450
99°
2500
99°
2550
100°
900
2600

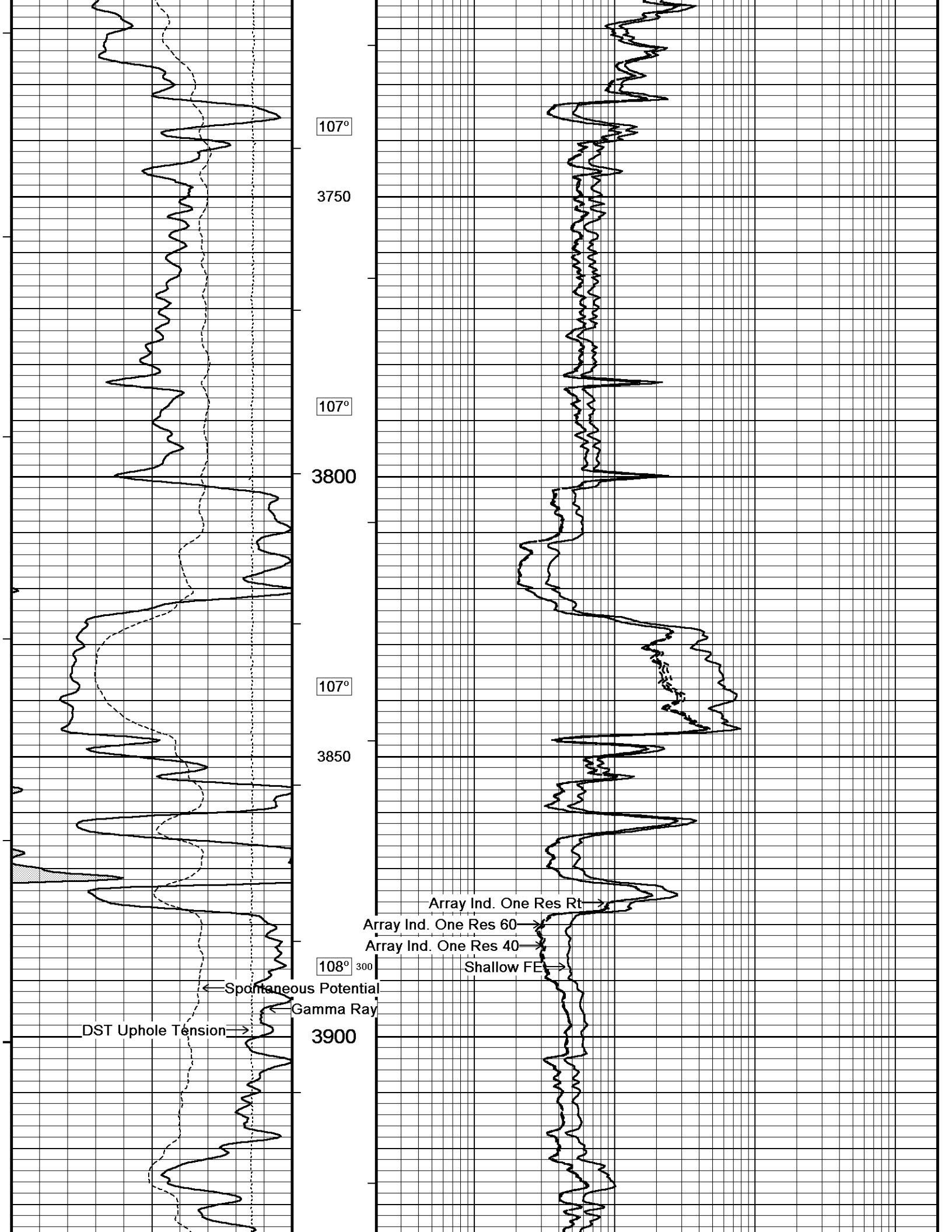

100°
2650
600
100°
Array Ind. One Res Rt
Array Ind. One Res 60
2700
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
101°
2750
101°
2800

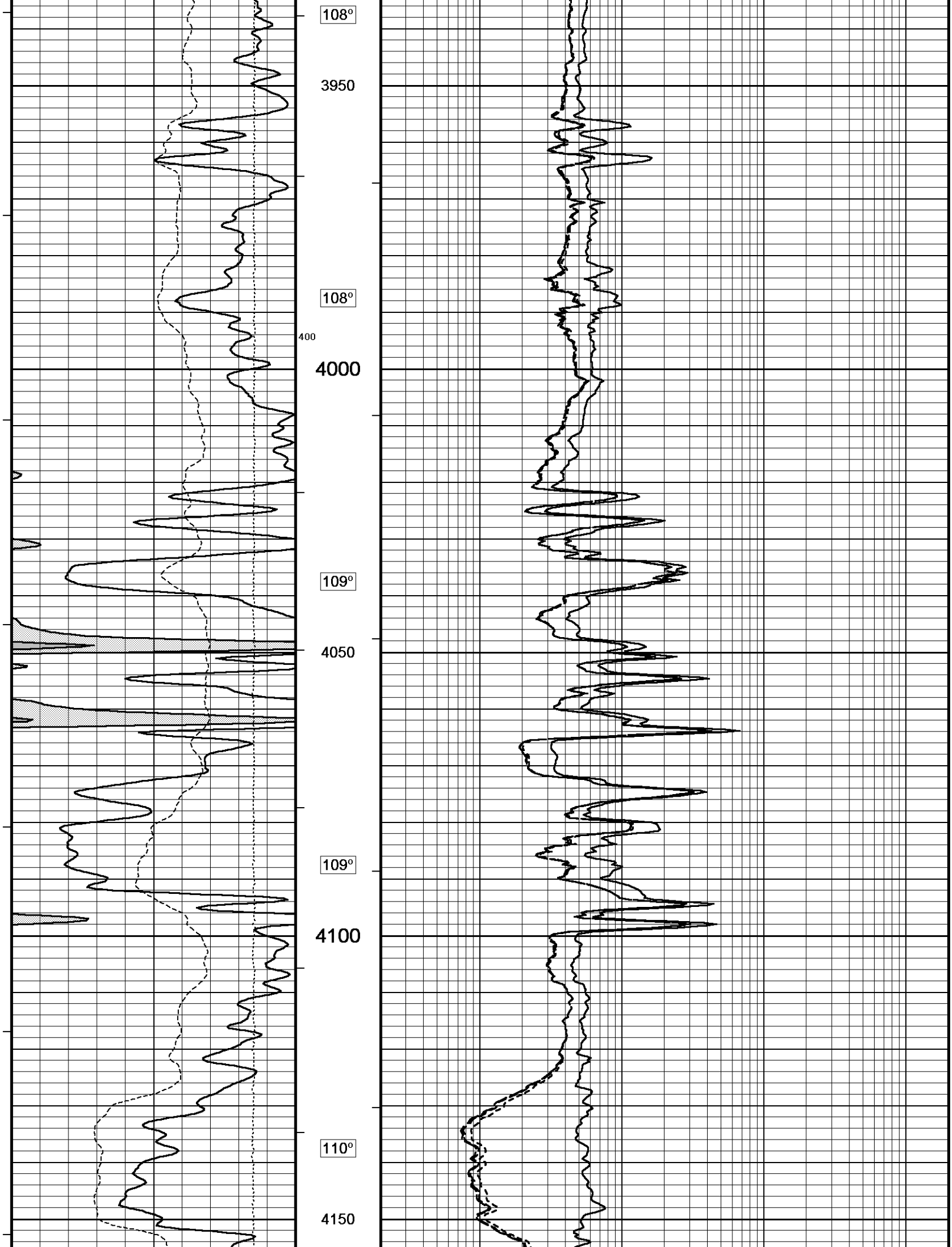

101°
2850
800
102°
2900
102°
2950
102°
3000
103°
3050

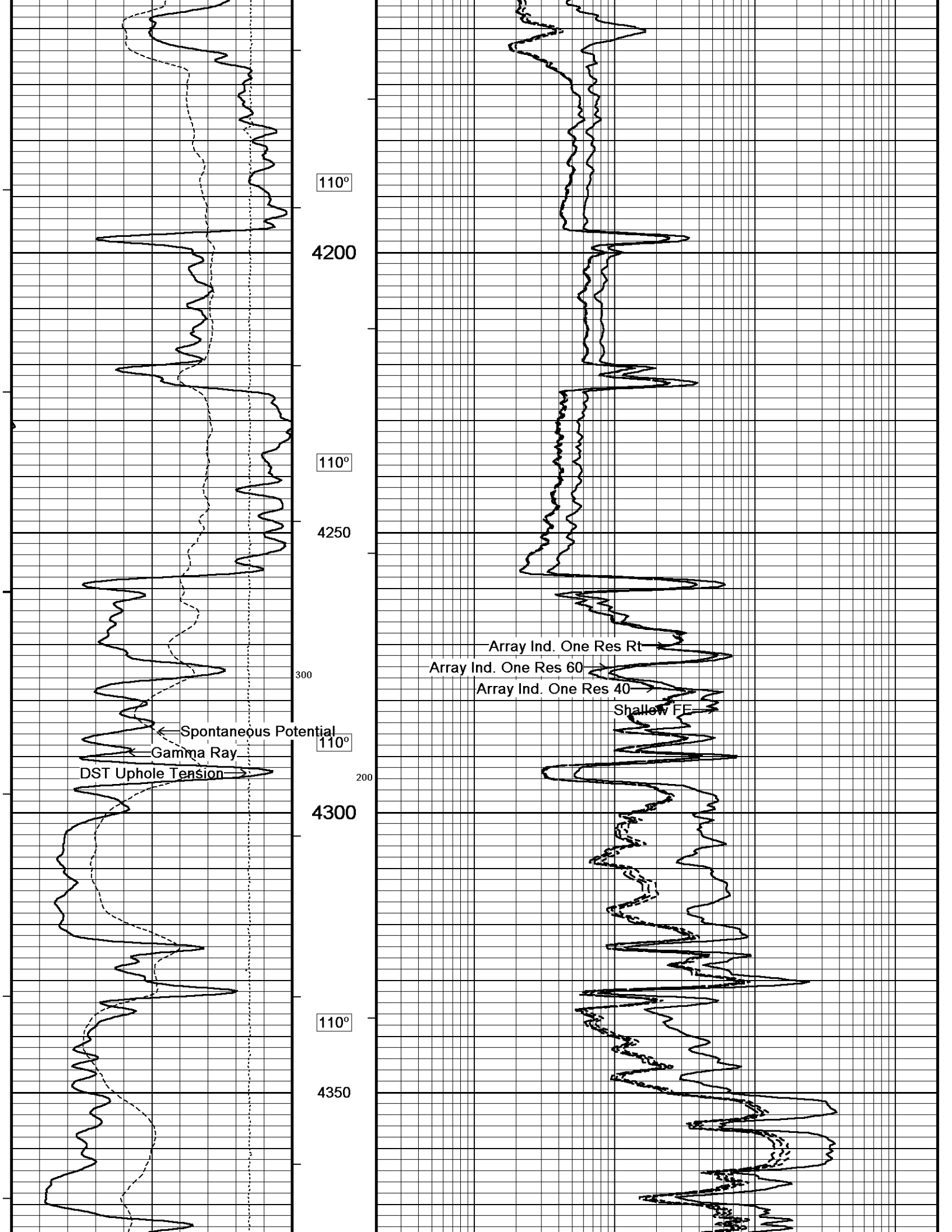

500
103°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
3100
Spontaneous Potential
Gamma Ray
DST Uphole Tension
103°
700
3150
103°
3200
104°
3250

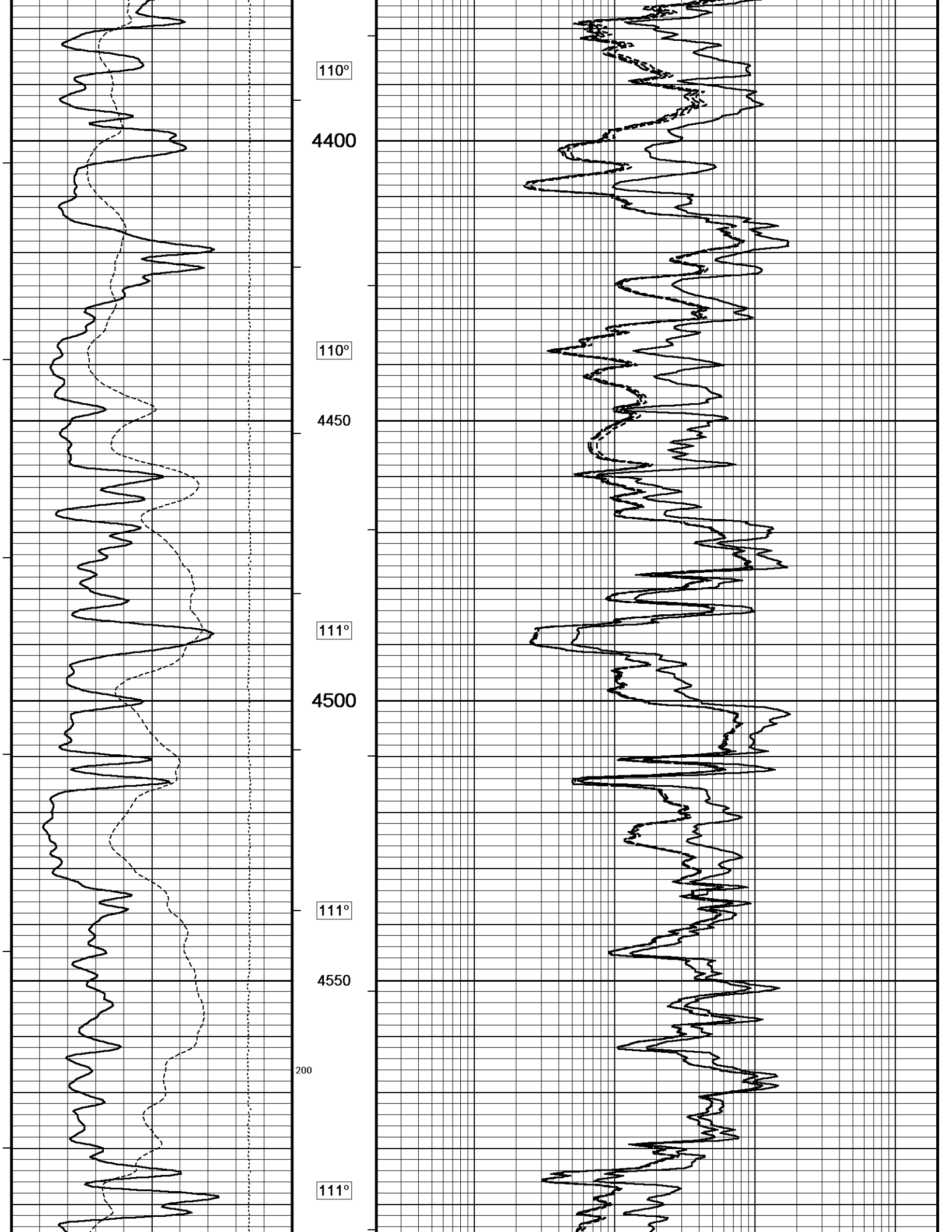

104°
3300
105°
3350
105°
3400
600
105°
3450
400
105°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

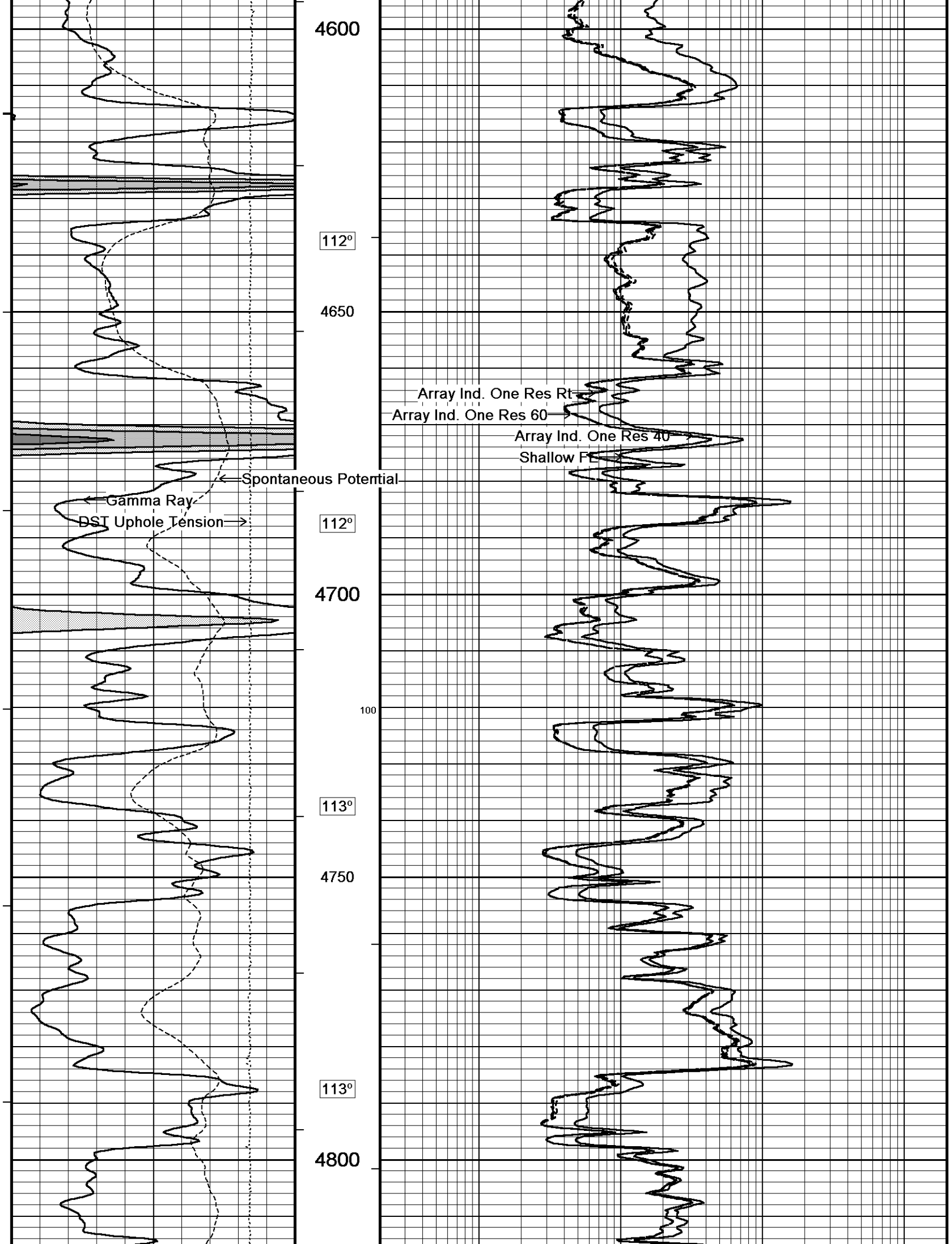

Spontaneous Potential
Gamma Ray
DST Uphole Tension
3500
106°
3550
106°
3600
106°
3650
106°
3700
500

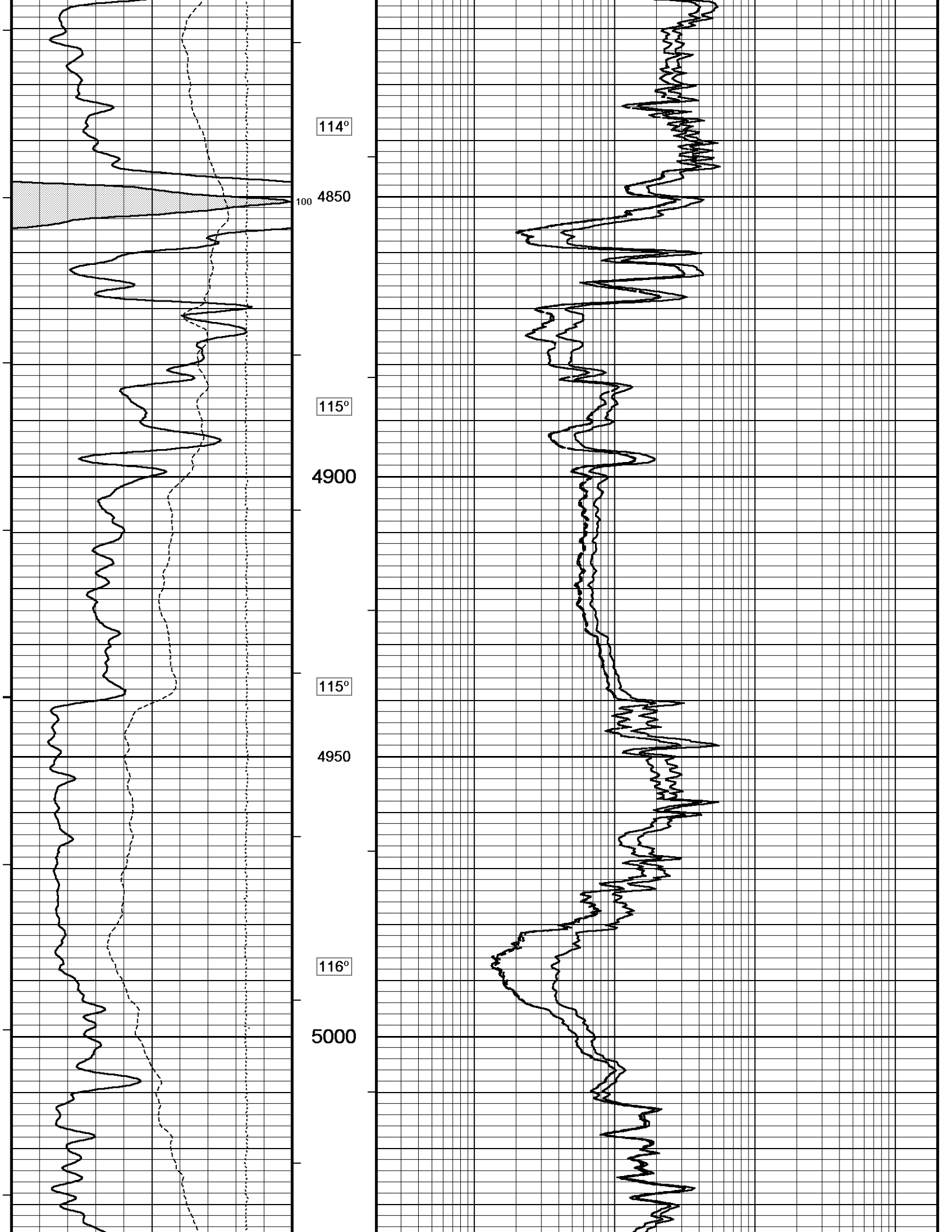

107°
3750
107°
3800
107°
3850
108°
300
3900
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

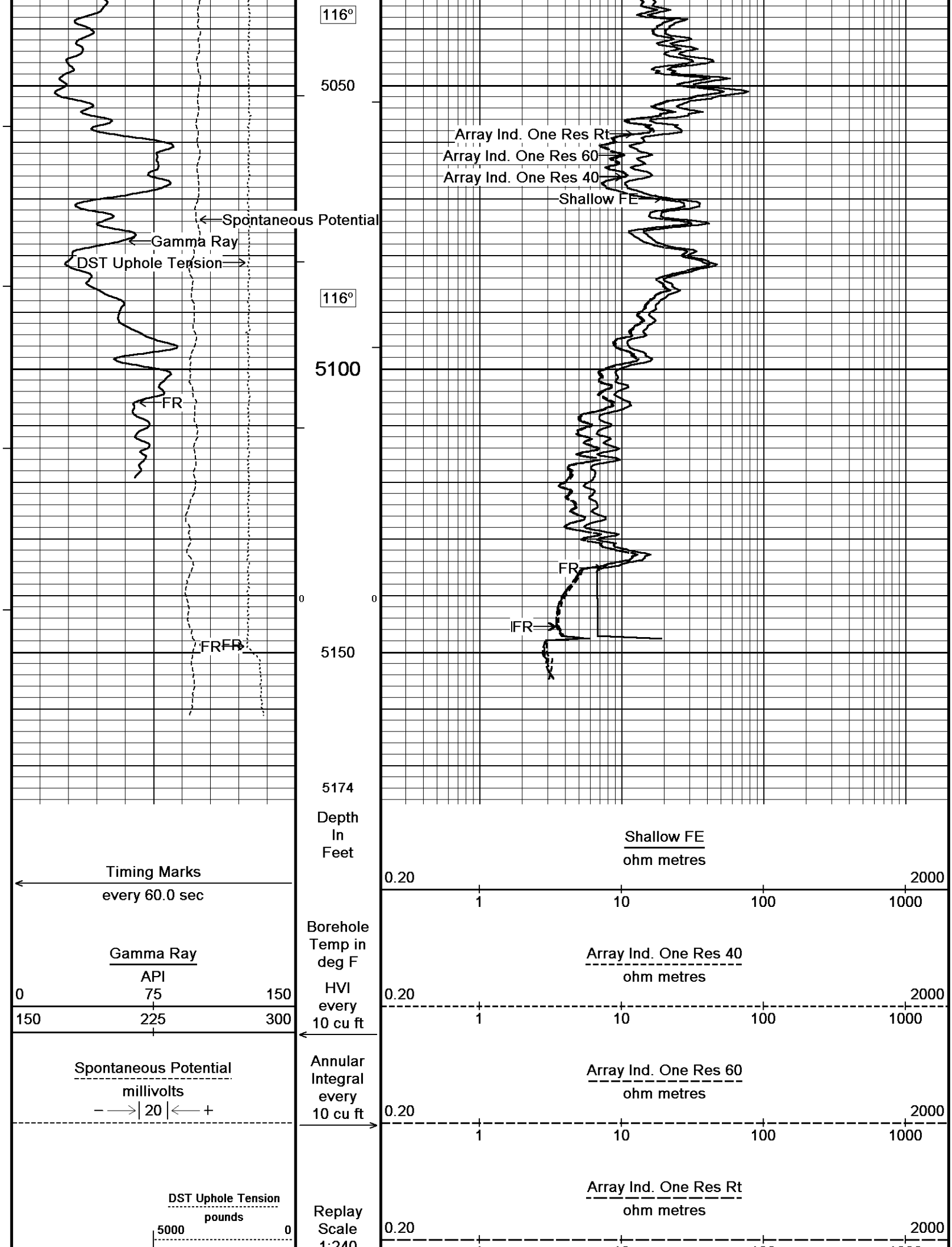

108°
3950
108°
400
4000
109°
4050
109°
4100
110°
4150


110°
4200
110°
4250
300
Spontaneous Potential
110°
Gamma Ray
DST Uphole Tension
200
4300
110°
4350
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE


110°
4400
110°
4450
111°
4500
111°
4550
200
111°


4600
112°
4650
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow Ft
Spontaneous Potential
Gamma Ray
DST Uphole Tension
112°
4700
100
113°
4750
113°
4800


114°
100
4850
115°
4900
115°
4950
116°
5000


116°
5050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
116°
5100
FR
FR
FR
IFR
0
0
5150
5174
Depth
In
Feet
Timing Marks
every 60.0 sec
Shallow FE
ohm metres
0.20
2000
1
10
100
1000
Borehole
Temp in
deg F
Gamma Ray
API
0
75
150
150
225
300
HVI
every
10 cu ft
Array Ind. One Res 40
ohm metres
0.20
2000
1
10
100
1000
Spontaneous Potential
millivolts
– 20 +
Annular
Integral
every
10 cu ft
Array Ind. One Res 60
ohm metres
0.20
2000
1
10
100
1000
DST Uphole Tension
pounds
5000
0
Replay
Scale
1:240
Array Ind. One Res Rt
ohm metres
0.20
2000

1 10 100 1000

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00
Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_002.dta — Recorded on 13-SEP-2013 12:34
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5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00
Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_001.dta — Recorded on 13-SEP-2013 12:13
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

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

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

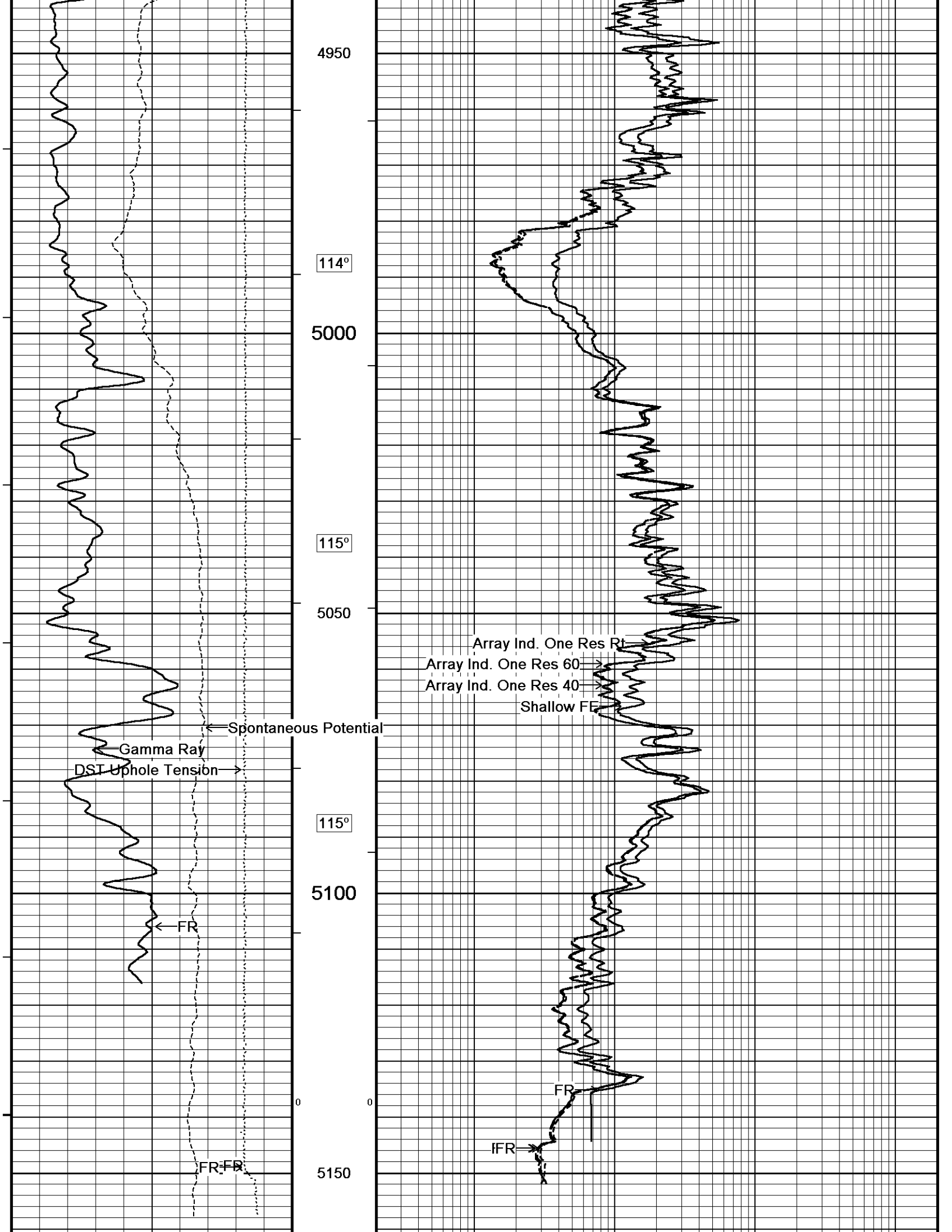
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

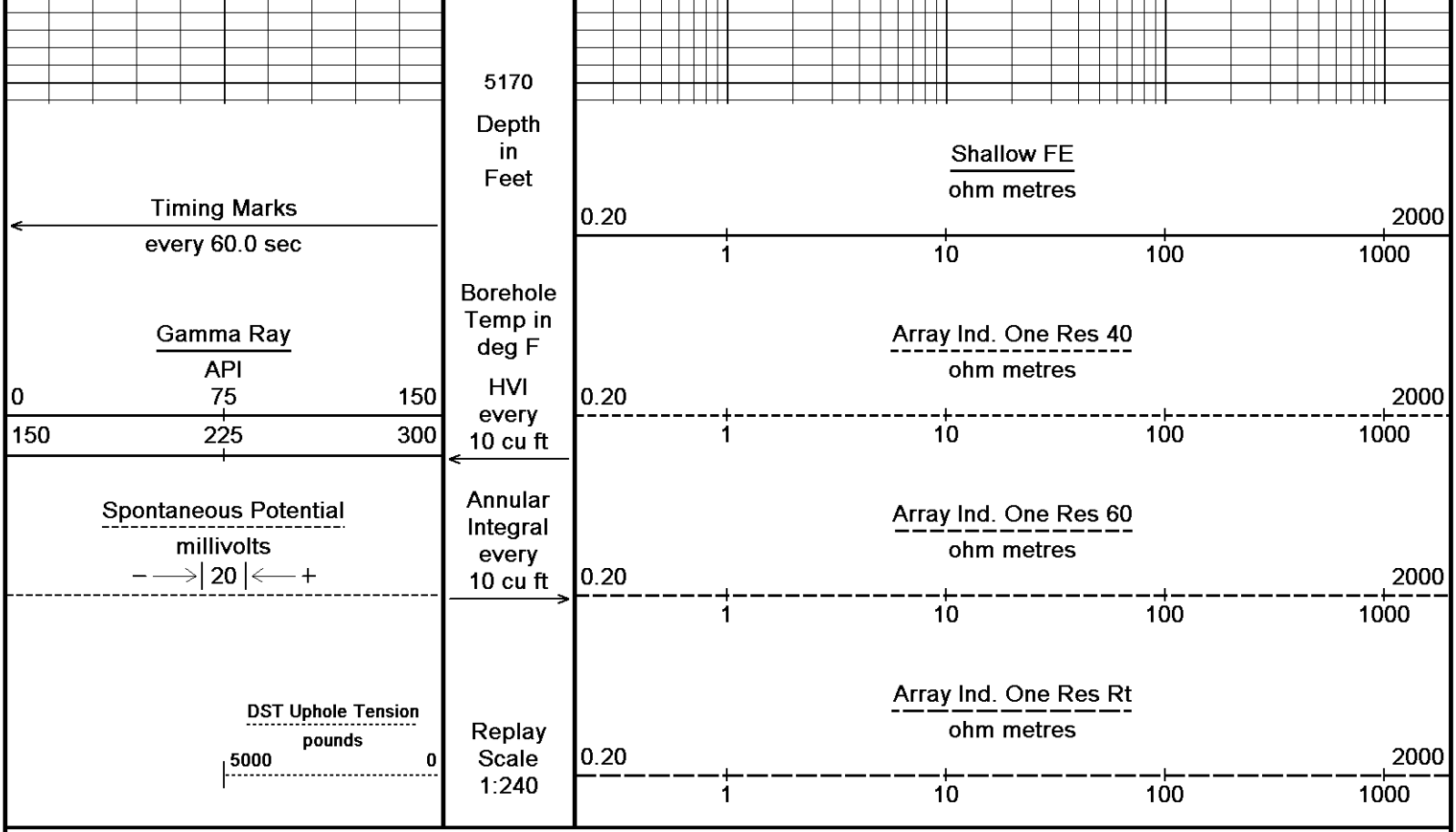
4850

114°

4900

114°


4950
114°
5000
115°
5050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
115°
5100
FR
0
0
FR
IFR
FR FR
5150



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00

Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Ba...\M&M Exploration Z-Bar 26-15_001.dta — Recorded on 13-SEP-2013 12:13

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Bar 26-15\M&M Exploration Z-Bar 26-15_001.dta

General Constants All 000

Last Edited on 13-SEP-2013,07:33

General Parameters		
Mud Resistivity	1.130	ohm-metres
Mud Resistivity Temperature	95.000	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	1.000	
RWA Constant M	2.000	
SW/APOR Tool Source	0.000	

Down-hole Tension Calibration SMS 0

Field Calibration on 13-SEP-2013 11:30

Reading No	Measured	Calibrated (lbs)
1	13577.56	0.00
2	14008.29	395.00

Gamma Calibration MCG-D.K 469

Field Calibration on 11-SEP-2013 14:30

	Measured	Calibrated (API)

	Measured	Calibrated (API)
Background	68	47
Calibrator (Gross)	1124	772
Calibrator (Net)	1055	725

Gamma Constants MCG-D.K 469

Last Edited on 13-SEP-2013,07:33

Gamma Calibrator Number	GRC38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-D.K 469

Field Calibration on 18-AUG-2013,02:35

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

High Resolution Temperature Constants MCG-D.K 469

Last Edited on 18-AUG-2013,02:35

Pre-filter Length	11

SP Calibration MCG-D.K 469

Field Calibration on 12-SEP-2013 15:11

	Measured	Calibrated (mV)
Reference 1	100.2	100.0
Reference 2	-99.2	-100.1

Caliper Calibration MML-A 3

Base Calibration on 15-AUG-2013 08:50
Field Calibration on 11-SEP-2013 14:21

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14887	5.98
2	18120	7.97
3	21042	9.86
4	25322	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.99	5.98

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 15-AUG-2013 09:16
Field Check on 11-SEP-2013 14:19

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.3	60.3	5.0	25.0
Micro Inverse	15.7	78.4	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.9	62.9
Micro Inverse	48.2	48.2

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 11-SEP-2013,14:18

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 31-JUL-2013 10:25
Field Check on 11-SEP-2013 14:35

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3180	99	3714	110
Ratio	32.180		33.764	

Field Calibrator at Base

Calibrated (cps)

	1617	2323
Ratio	0.696	

Field Check	Calibrated (cps)	
	1626	2326
Ratio	0.693	

Neutron Constants MDN-A.B 66

Last Edited on 11-SEP-2013,14:31

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 15-AUG-2013 09:33
Field Check on 11-SEP-2013 11:33

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.1	126.8
Base Check		280.9
Field Check		281.0

FE Constants MFE-B.J 353

Last Edited on 11-SEP-2013,11:32

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 11-SEP-2013 11:22

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) 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) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	13.4	3837.8
2	0.0	0.0	29.7	3475.3
3	0.0	0.0	29.1	3051.7
4	0.0	0.0	19.8	2080.7
Deep			18.6	2048.1
Medium			42.2	3989.4
Shallow			43.1	5051.7
Array Temperature	0.0		80.9	Deg F

Induction Constants MAI-A.A 167

Last Edited on 11-SEP-2013,11:20

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 18-AUG-2013,02:21

	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 18-AUG-2013,02:21

Pre-filter Length	11

Caliper Calibration MPD-B 64

Base Calibration on 15-AUG-2013 14:54
Field Calibration on 11-SEP-2013 11:34

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16560	3.99
2	24992	5.98
3	32880	7.97
4	41184	9.86
5	50688	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.89	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 15-AUG-2013 14:37
Field Check on 11-SEP-2013 14:18

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60206	33560	59556	30836
Reference 2	25378	2915	24941	2541

Field Check at Base

	1155.1	1345.7

Field Check

	1161.0	1348.7

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	211	1029		
Reference 1	22957	60005	0.386	0.371
Reference 2	6904	25238	0.276	0.272

Field Check at Base

	211.2	1028.9

Field Check

	208.9	1032.5

Density Constants MPD-B 64

Last Edited on 13-SEP-2013,07:33

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	1.10	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	

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Bar 26-15\M&M Exploration Z-Bar 26-15_001.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

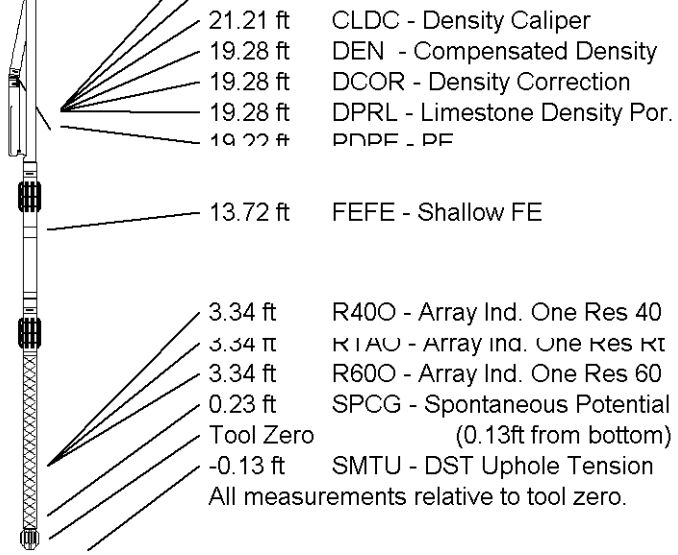
Compact Comms Gamma
MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

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
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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
21.21 ft	HVOL - Hole Volume



All measurements relative to tool zero.

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 49.73 ft Weight: 399.0 lb

COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR 26-15
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1819.00	feet	First Reading	5146.00	feet
Elevation Drill Floor	1817.00	feet	Depth Driller	5150.00	feet
Elevation Ground Level	1809.00	feet	Depth Logger	5149.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR 26-15
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	560' FSL & 2100' FEL SE/4
SEC	26
TWP	33S
RGE	15W
API Number	15-007-24069
Permit Number	
Permanent Datum G.L. Elevation 1809 feet	
Log Measured From KB	
Drilling Measured From K.B. @ 10 FEET	
Other Services	MFD/MDN MML
Elevations: KB	1819.00 feet
DF	1817.00
GL	1809.00

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

Date	13-SEP-2013	
Run Number	ONE	
Service Order	3541081	
Depth Driller	5150.00	feet
Depth Logger	5149.00	feet
First Reading	5146.00	feet
Last Reading	323.00	feet
Casing Logger	323.00	feet
Casing Driller	324.00	feet
Bit Size	7.875	inches
Hole Fluid Type	CHEMICAL	
Density / Viscosity	9.20 lb/USg	57.00 CP
PH / Fluid Loss	10.00	8.00 ml/30Min
Sample Source	FLOWLINE	
Rm @ Measured Temp	1.13 @ 95.0	ohm-m
Rmf @ Measured Temp	0.90 @ 95.0	ohm-m
Rmc @ Measured Temp	1.36 @ 95.0	ohm-m
Source Rmf / Rmc	CALC	CALC
Rm @ BHT	0.93 @ 116.0	ohm-m
Time Since Circulation	5 HOURS	
Max Recorded Temp	116.00	deg F
Equipment / Base	13096	LIB
Recorded By	ROB HOFFMAN	
Witnessed By	BILL BUSCH	MIKE AUSTIN
JOB#	LB13-256	

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00
Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Bar 26...\M&M Exploration Z-Bar 26-15_002.dta — Recorded on 13-SEP-2013 12:34
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

Timing Marks every 60.0 sec

Gamma Ray API
0 75 150
150 225 300

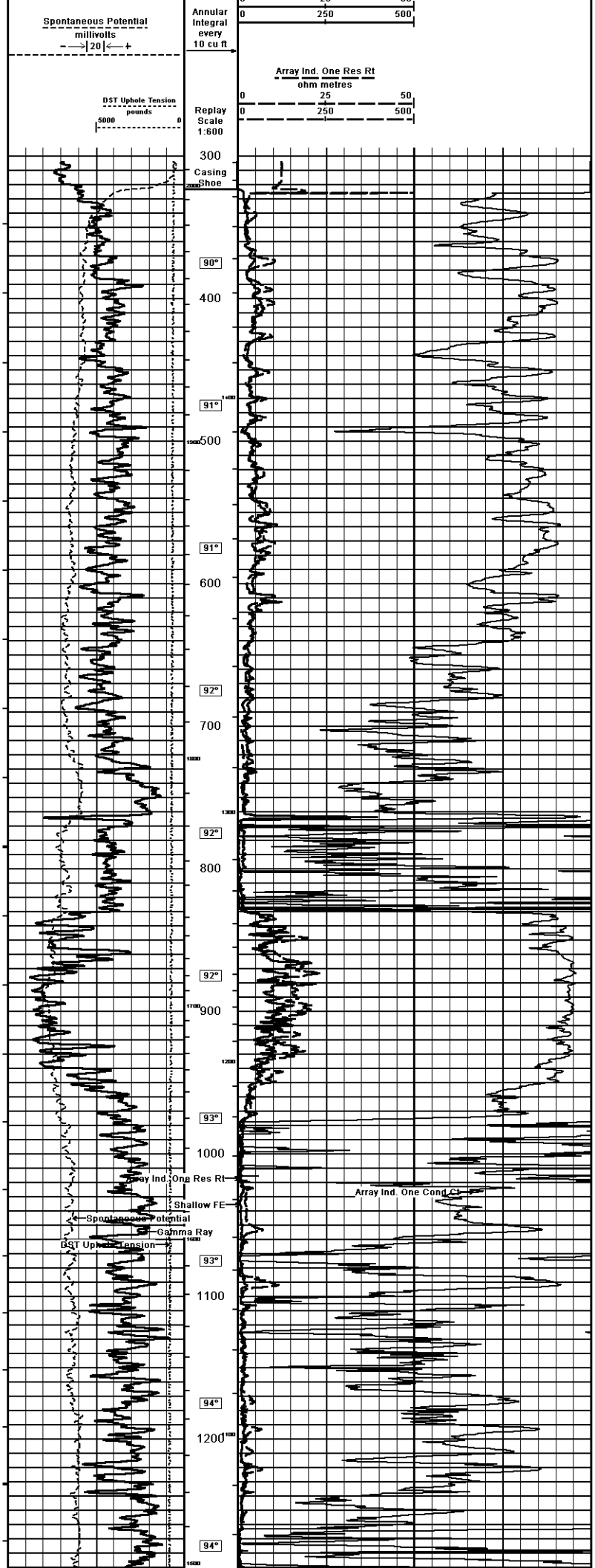
Depth In Feet

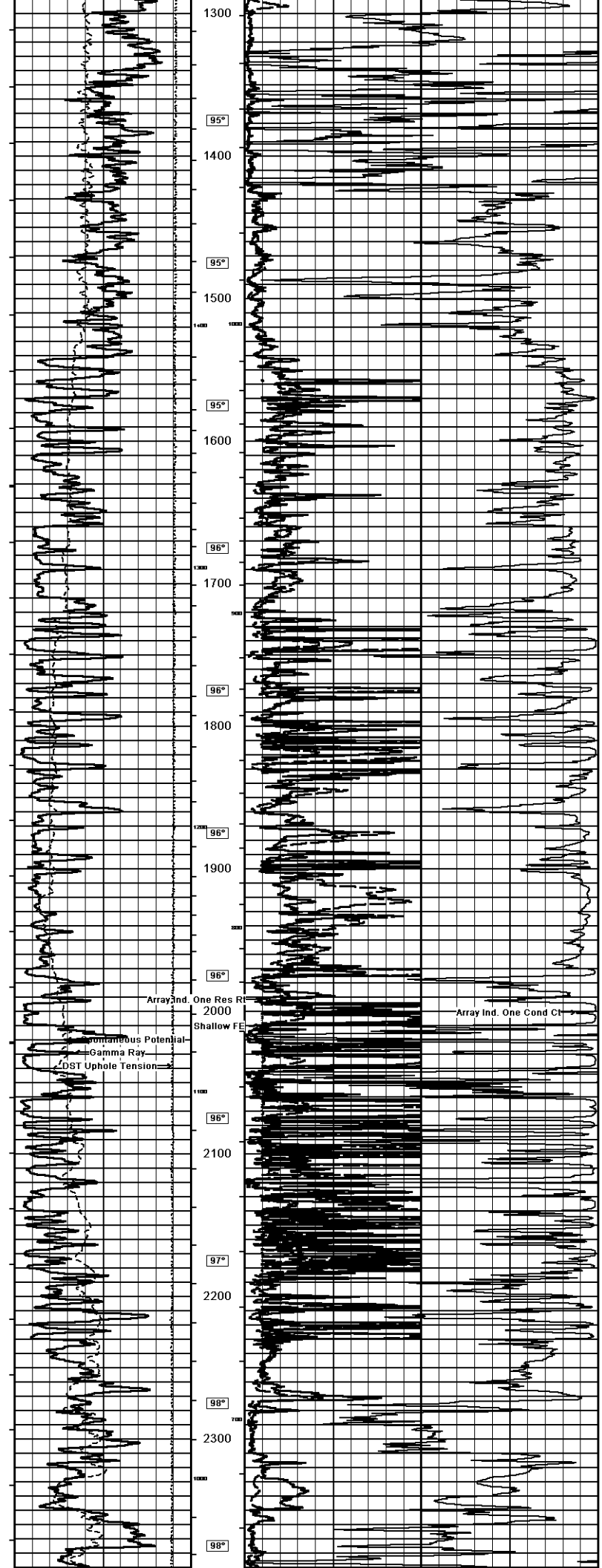
Borehole Temp in deg F

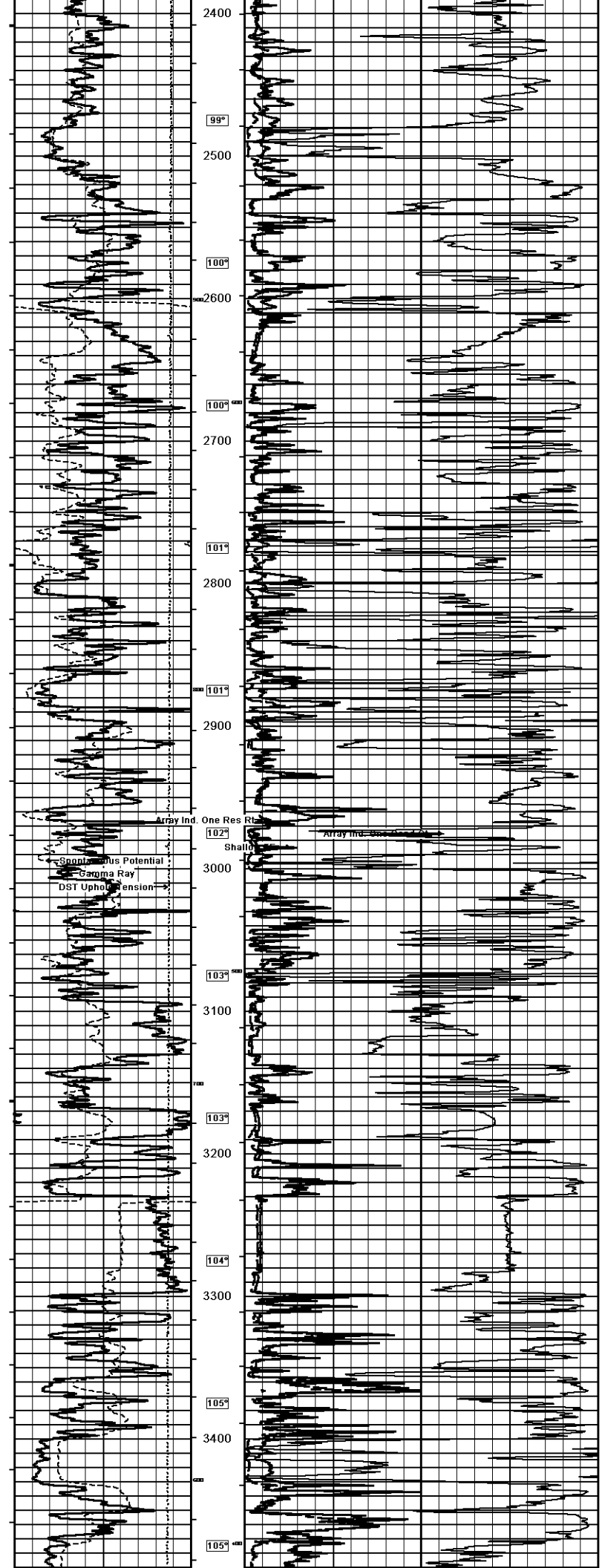
HVI every 10 cu ft

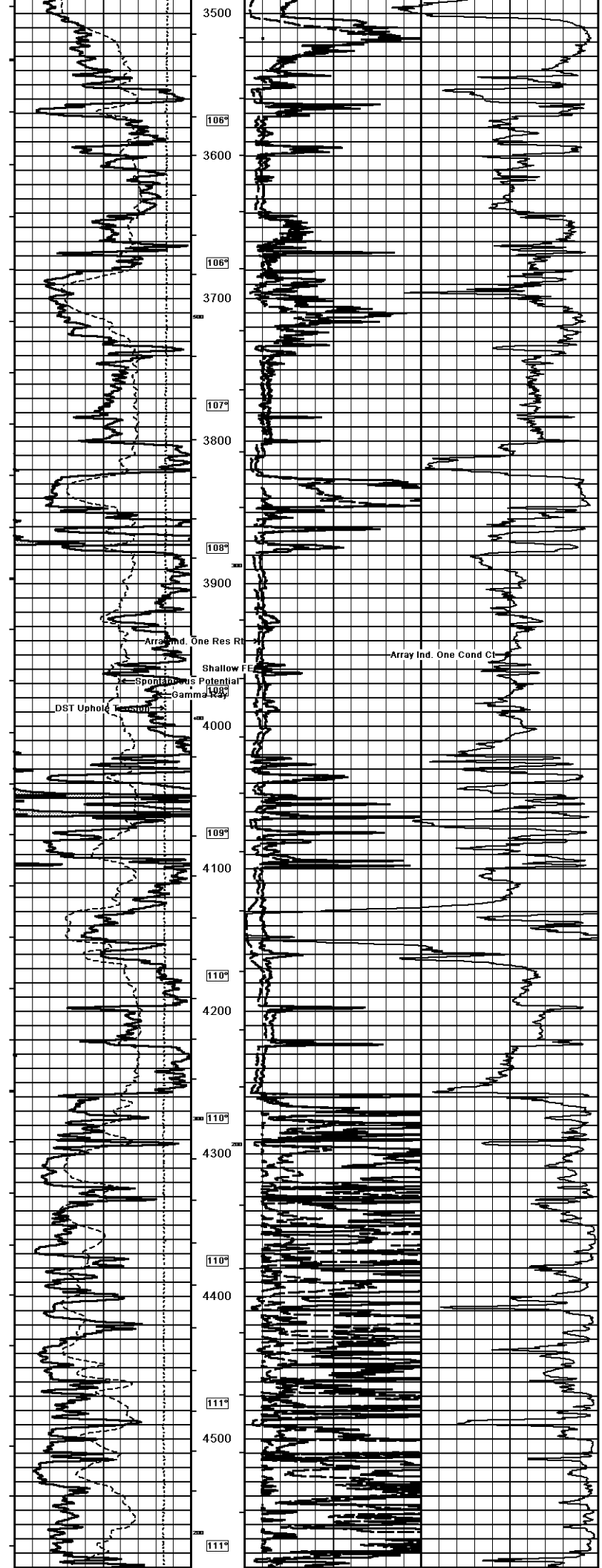
Array Ind. One Cond Ct mmhos
1000 750 500 250 0
2000 1750 1500 1250 1000

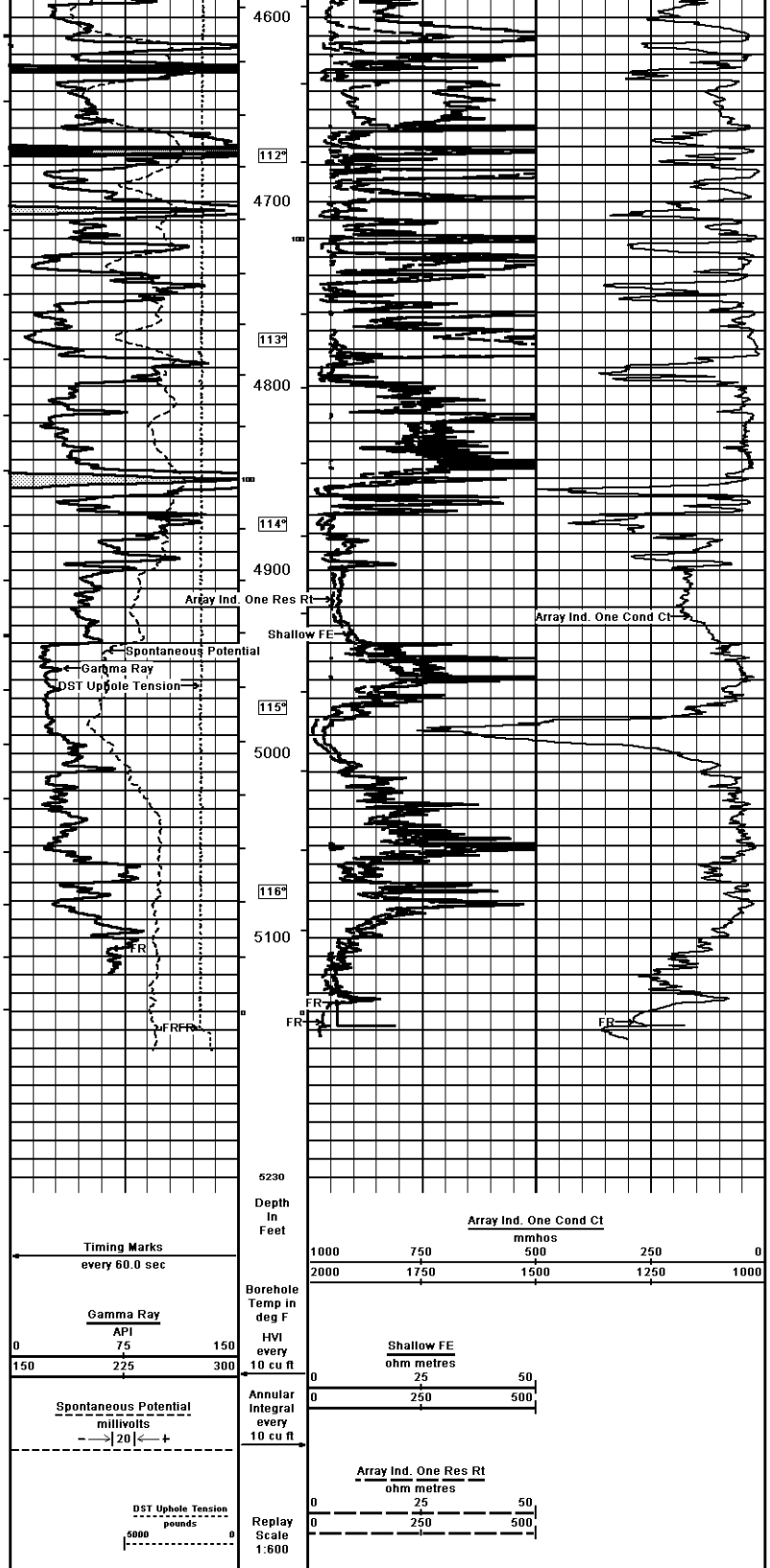
Shallow FE ohm metres
0 25 50


Spontaneous Potential
millivolts
−20+
DST Uphole Tension
pounds
5000
0
Annular
Integral
every
10 cu ft
0
250
500
Array Ind. One Res Rt
ohm metres
0
25
50
0
250
500
Replay
Scale
1:600
300
Casing
Shoe
90°
400
91°
500
91°
600
92°
700
92°
800
92°
900
93°
1000
93°
1100
94°
1200
94°
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct


1300
95°
1400
95°
1500
95°
1600
96°
1700
96°
1800
96°
1900
96°
Array Ind. One Res RI
2000
Shallow FE
Array Ind. One Cond CI
Spontaneous Potential
Gamma Ray
DST Uphole Tension
96°
2100
97°
2200
98°
2300
98°


2400
99°
2500
100°
2600
100°
2700
101°
2800
101°
2900
Array Ind. One Res Rt
102°
Shallow
Spontaneous Potential
Gamma Ray
DST Upholl Tension
3000
103°
3100
103°
3200
104°
3300
105°
3400
105°


3500
106°
3600
106°
3700
107°
3800
108°
3900
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
108°
Gamma Ray
DST Uphole Tension
4000
109°
4100
110°
4200
110°
4300
110°
4400
111°
4500
111°
Array Ind. One Cond Ct



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 14-SEP-2013 10:00

Filename: C:\Minimus 13.05.9583\Logs\M&M Exploration Z-Bar 26...\M&M Exploration Z-Bar 26-15_002.dta — Recorded on 13-SEP-2013 12:34

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

1 INCH MAIN

COMPANY	M&M EXPLORATION, INC.
WELL	Z-BAR 26-15
FIELD	AETNA GAS AREA
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1819.00	feet	First Reading	5146.00	feet
Elevation Drill Floor	1817.00	feet	Depth Driller	5150.00	feet
Elevation Ground Level	1809.00	feet	Depth Logger	5149.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG