



Weatherford¹⁸⁰

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY

GRAND MESA OPERATING COMPANY

WELL

Q-B #1-17

FIELD

WILDCAT

PROVINCE/COUNTY

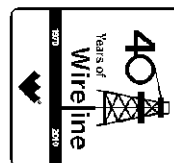
GOVE

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

1477' FNL & 2519' FWL
NE NE SE NW



SEC

TWP

RGE

17

11S

26W

Other Services

MPD/MDN

MSS

MML

Permit Number

15-063-21990

Permanent Datum G.L., Elevation 2644 feet

Log Measured From KB

Drilling Measured From K.B.

Date

20-MAY-2012

Run Number

ONE

Depth Driller

4632.00 feet

Depth Logger

4633.00 feet

First Reading

4630.00 feet

Last Reading

260.00 feet

Casing Driller

260.00 feet

Casing Logger

260.00 feet

Bit Size

7.875 inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.20 lb/USg

50.00 CP

PH / Fluid Loss

9.50

8.80 ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

0.88 @ 93.0 ohm-m

Rmf @ Measured Temp

0.70 @ 93.0 ohm-m

Rmc @ Measured Temp

1.06 @ 93.0 ohm-m

Source Rmf / Rmc

CALC

Rm @ BHT

0.68 @120.0 ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

120.00 deg F

Equipment Name

COMPACT

Equipment / Base

13057 LIB

Recorded By

L. SCOTT

Witnessed By

JOHN GOLDSMITH

STEVE STRIBLING

S.O.# / JOB#

3534580

LB12-130

BOREHOLE RECORD

Last Edited: 20-MAY-2012 14:40

Bit Size
inches

7.875

Depth From
feet

260.00

Depth To
feet

4633.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

260.00

Weight
pounds/ft

24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, MFE, MSS, MAI.

Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used.

MFE: 0.5 inch Standoff = 1

MAI: 0.5 inch Standoff = 1

MSS: 0.5 inch Standoffs = 2

2.71 g/cc Limestone Density Matrix used to calculate porosity.

Sonic porosity calculated using (47.5usec/ft) Limestone scale.

All intervals logged and scaled per customer's request.

Annular volume with 5.5 inch production casing= 185 cu. ft.

Total hole volume from TD to surface casing= 1844 cu. ft.

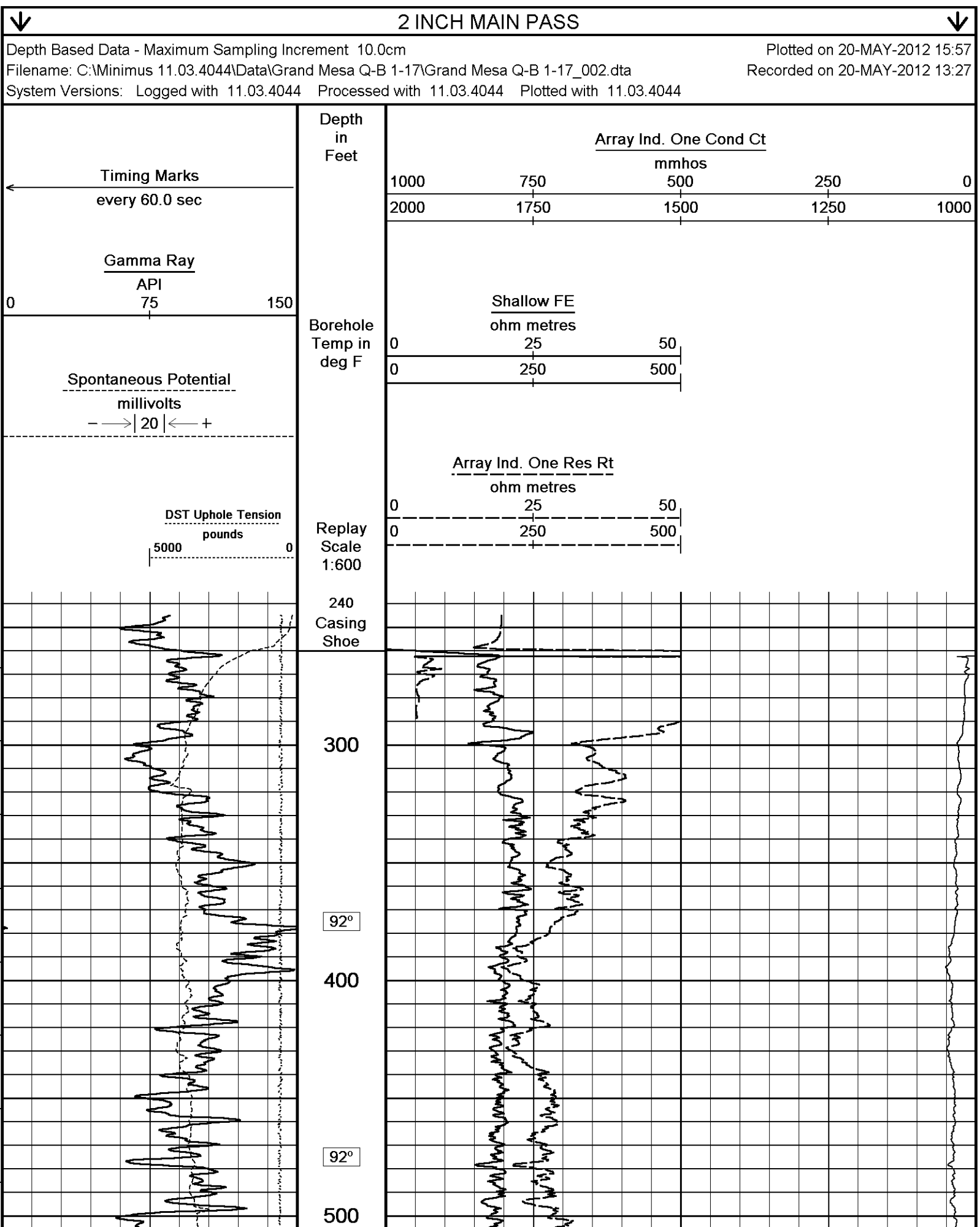
Service order: #3534580

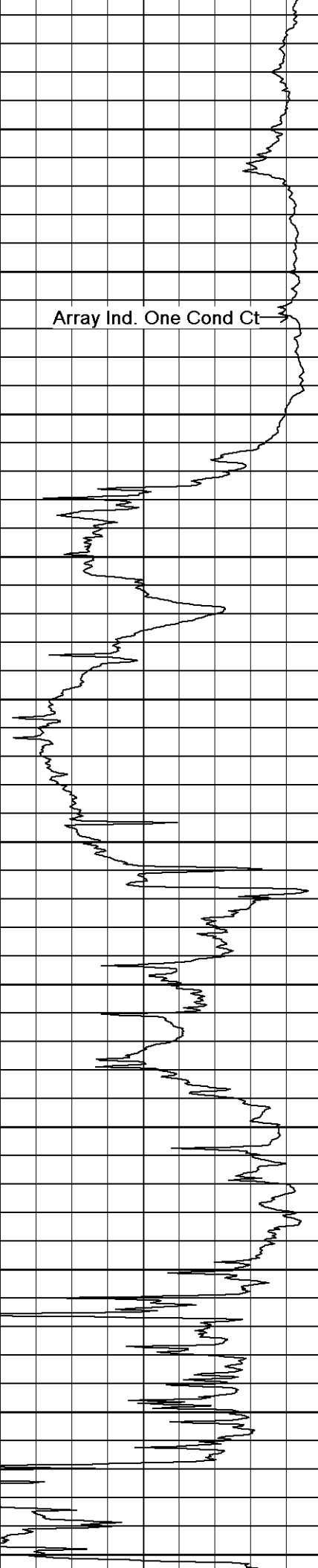
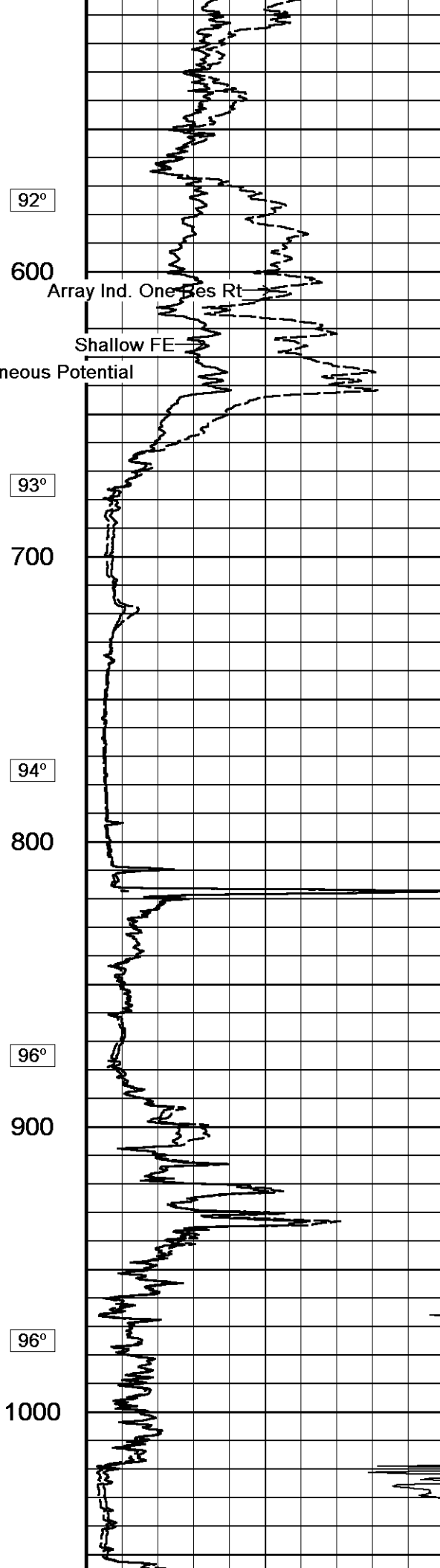
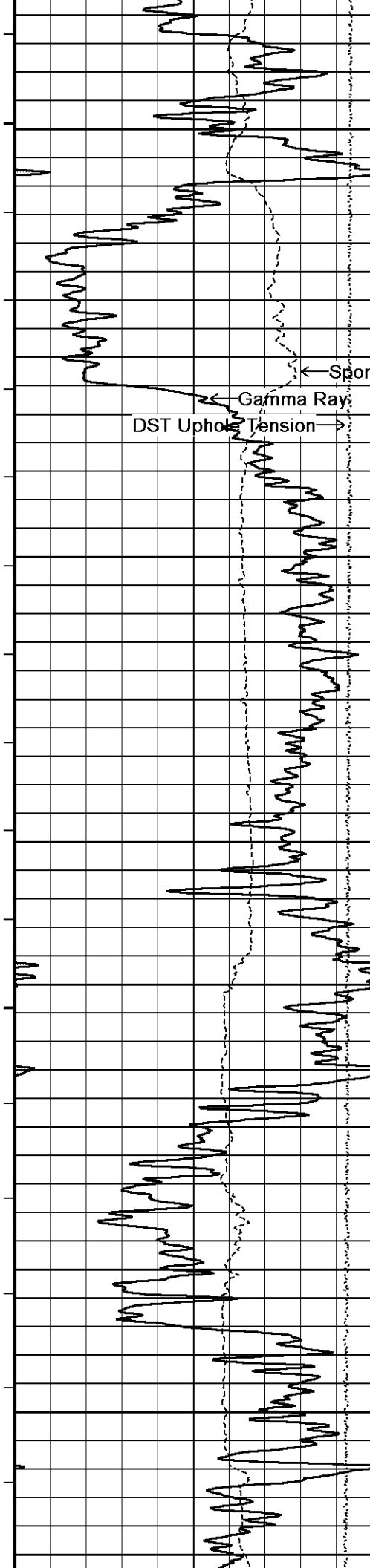
Rig: Murfin #24

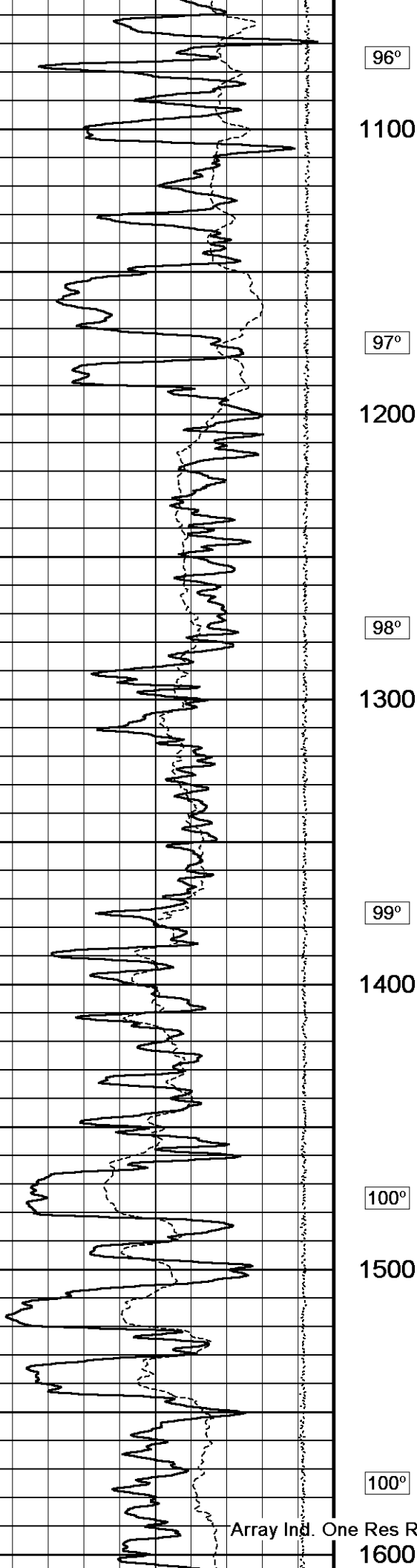
Engineer: L. Scott

Operator(s): B. Johnson

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



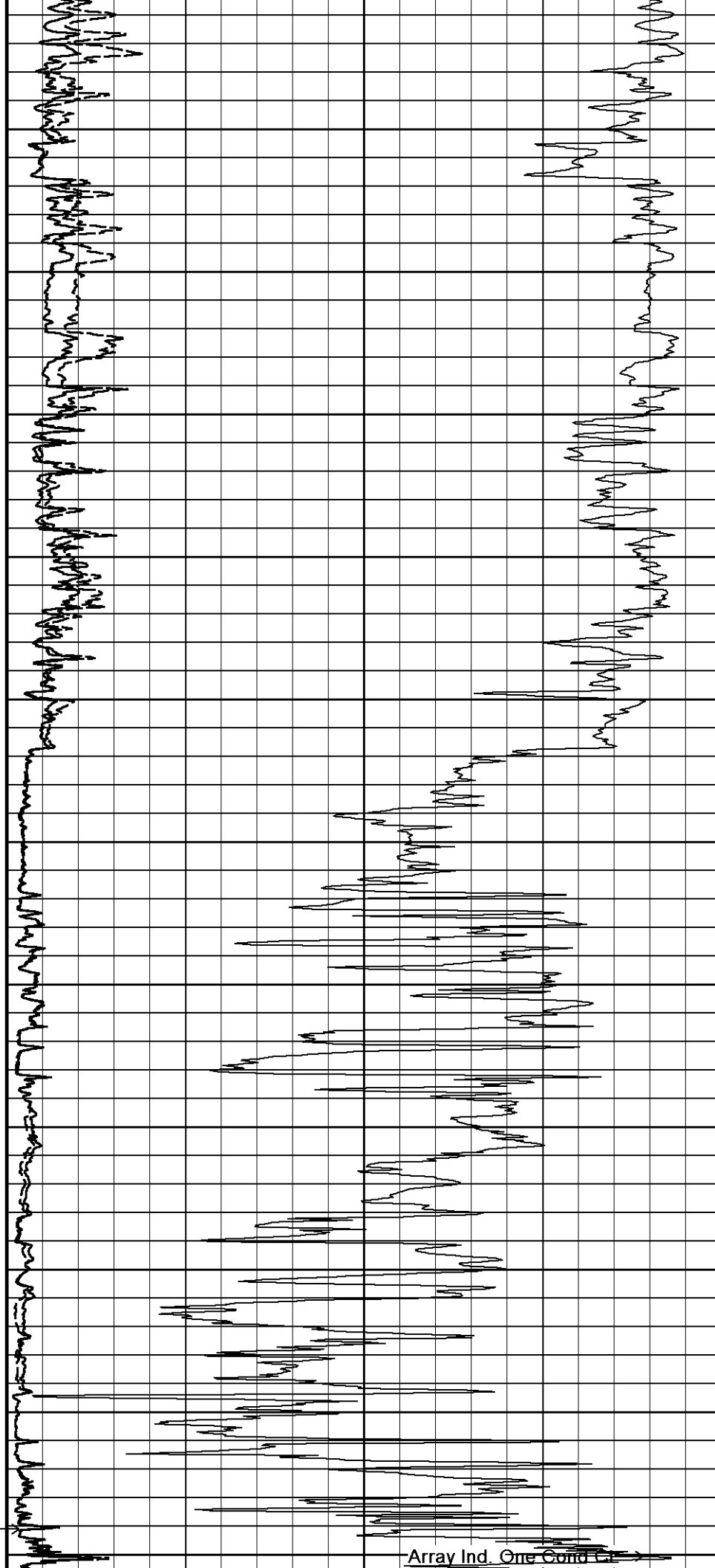




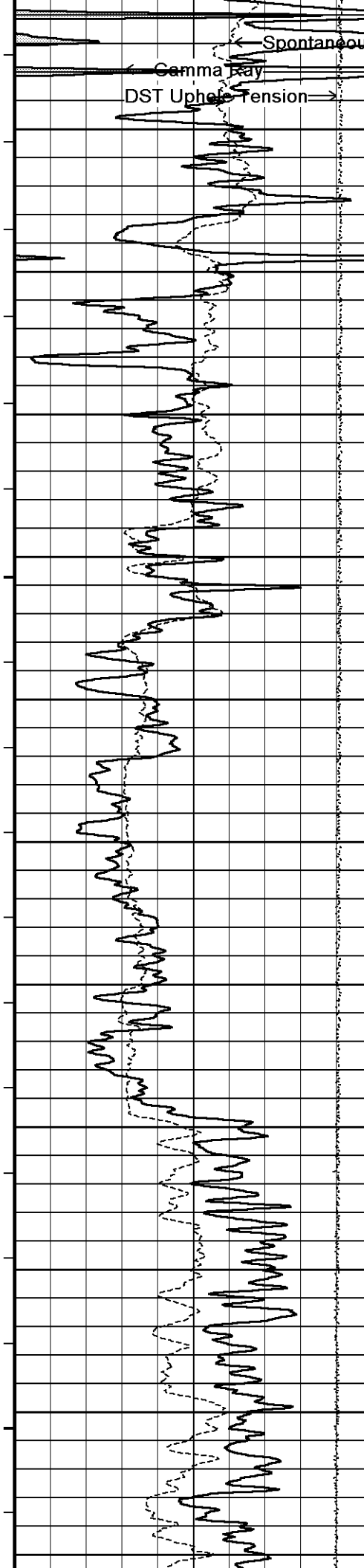
96°
1100
97°
1200
98°
1300
99°
1400
100°
1500
100°
1600

Array Ind. One Res Rt

1600



Array Ind. One Cond Ct



Shallow

101°

1700

101°

1800

101°

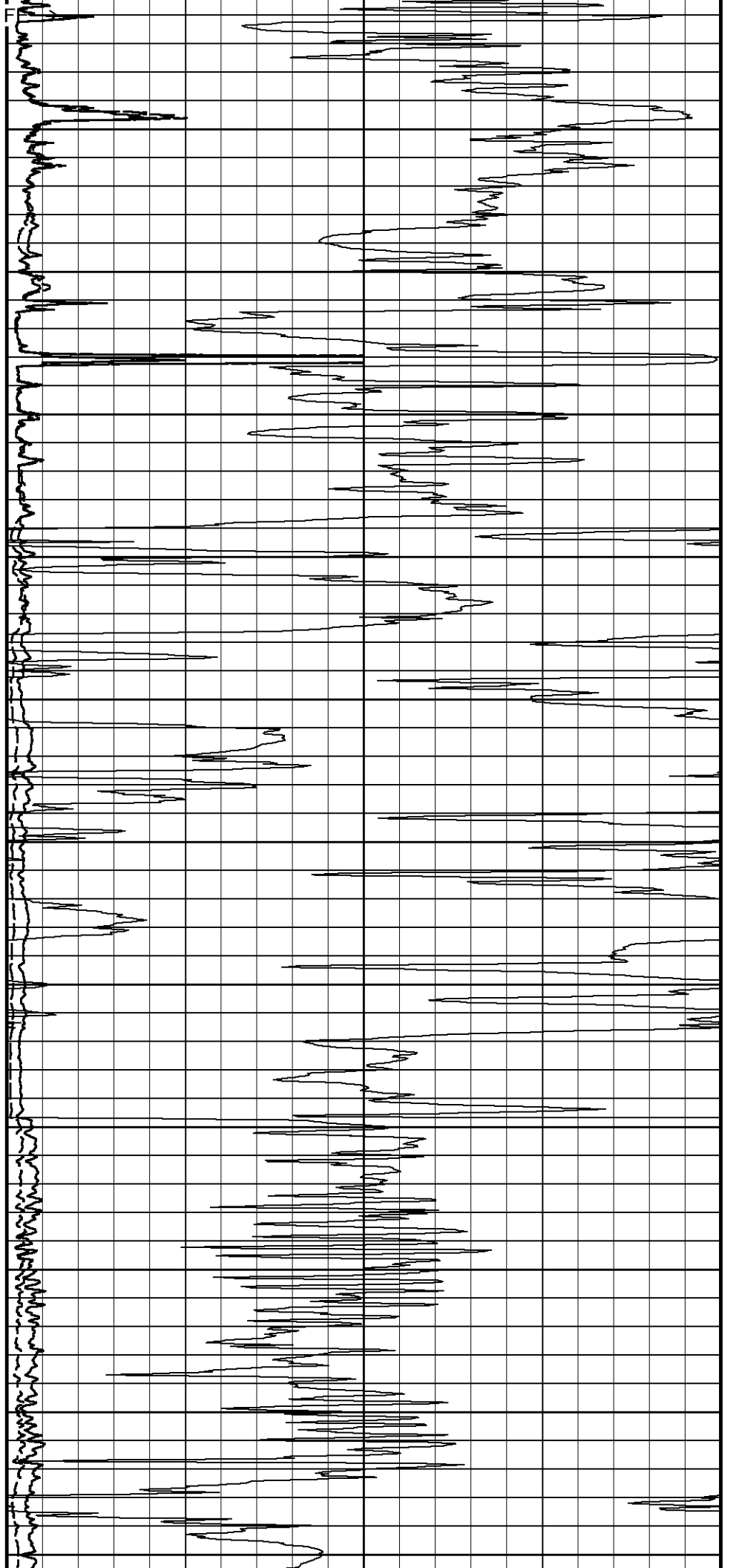
1900

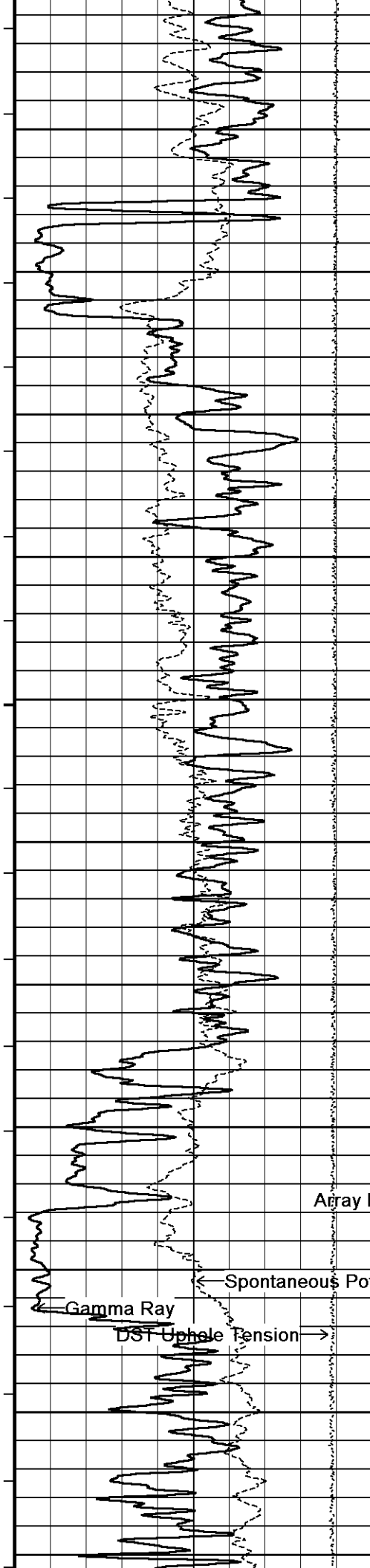
102°

2000

102°

2100





103°

2200

103°

2300

104°

2400

104°

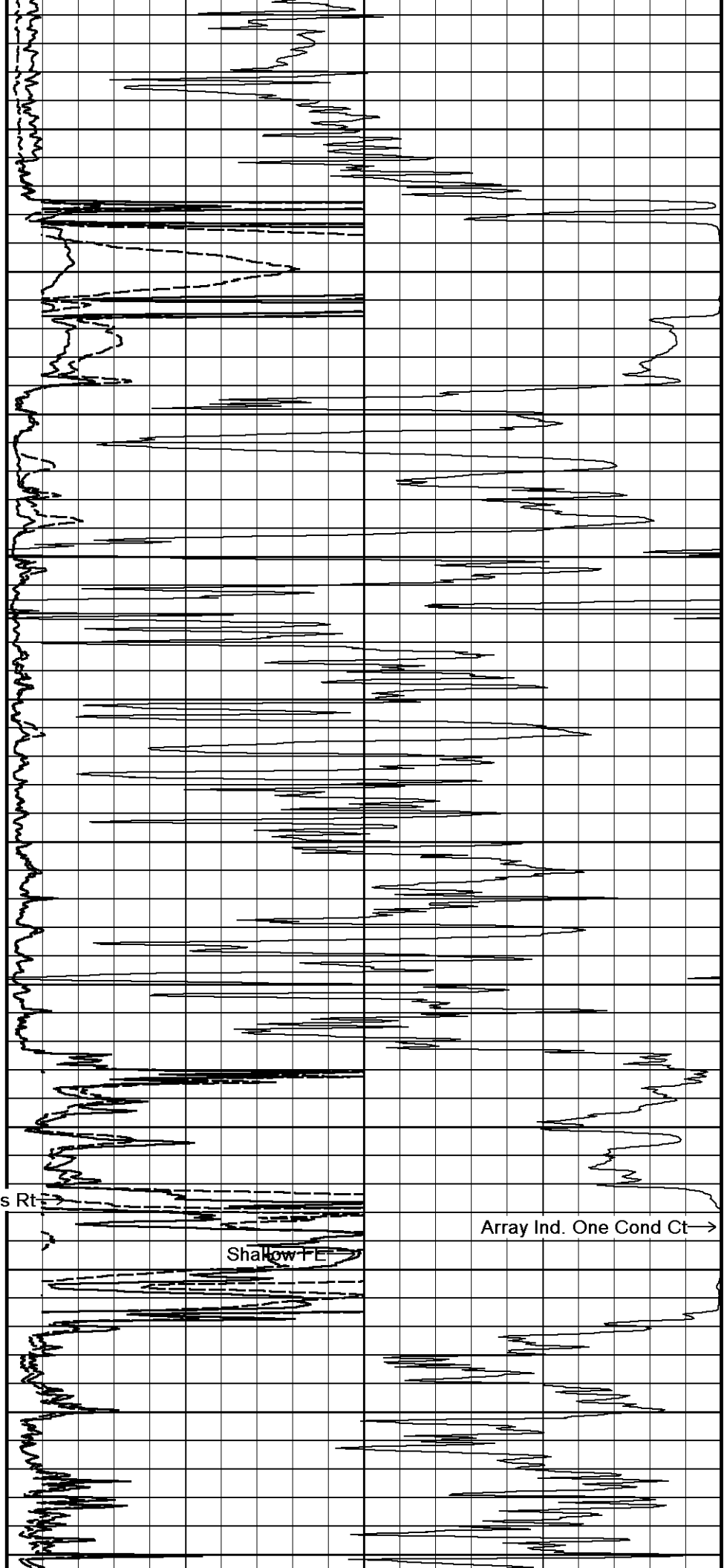
2500

Array Ind. One Res Rt →

2600

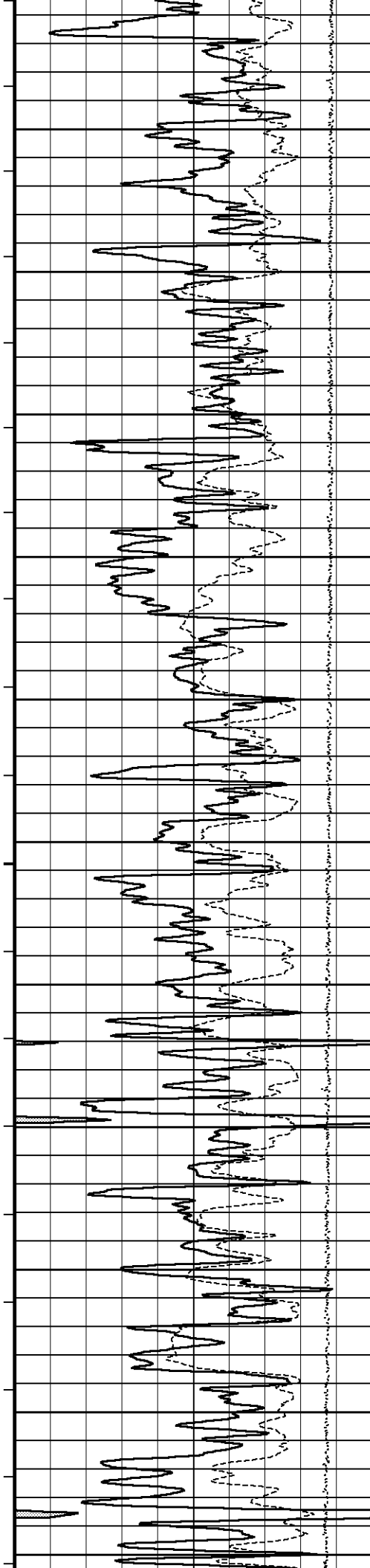
105°

2700



Array Ind. One Cond Ct →

Shallow FE



106°

2800

107°

2900

107°

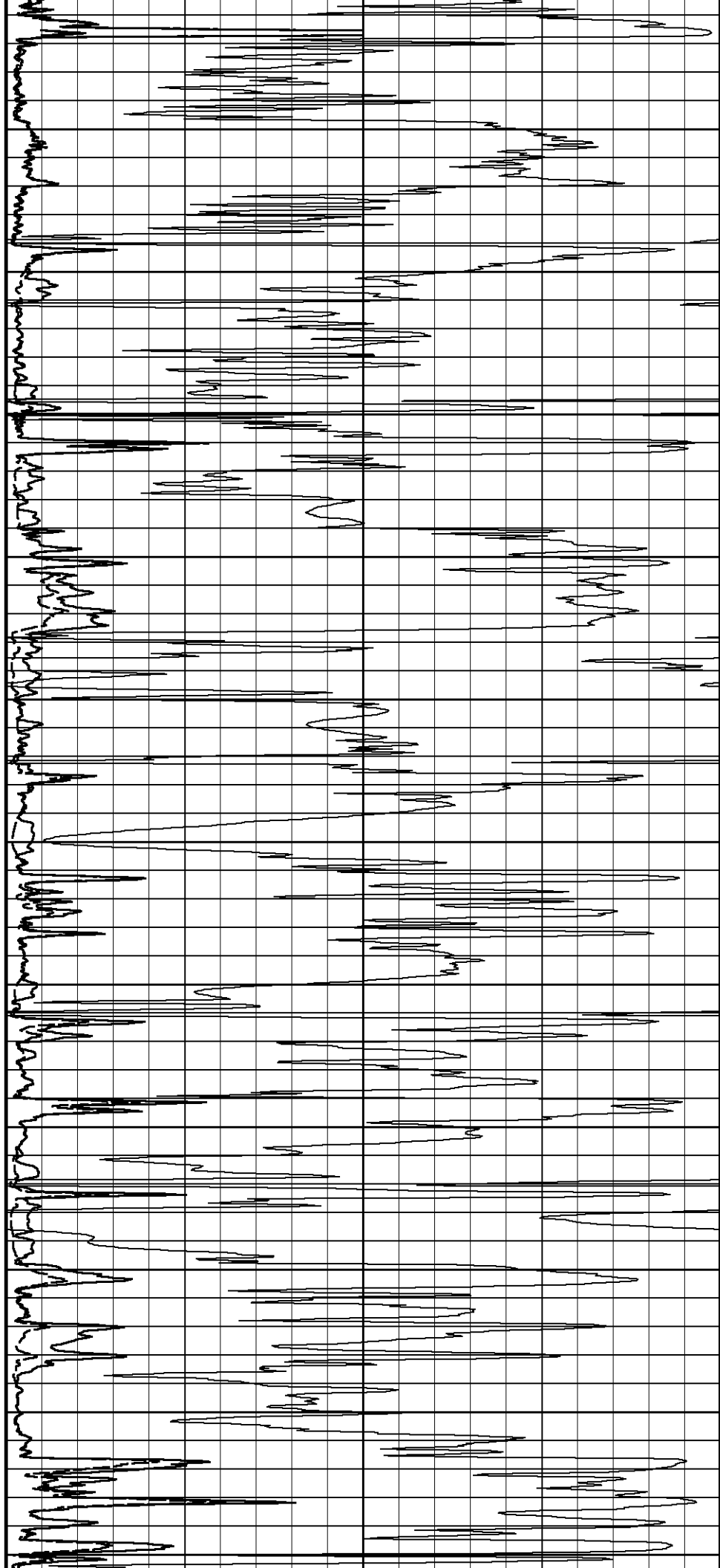
3000

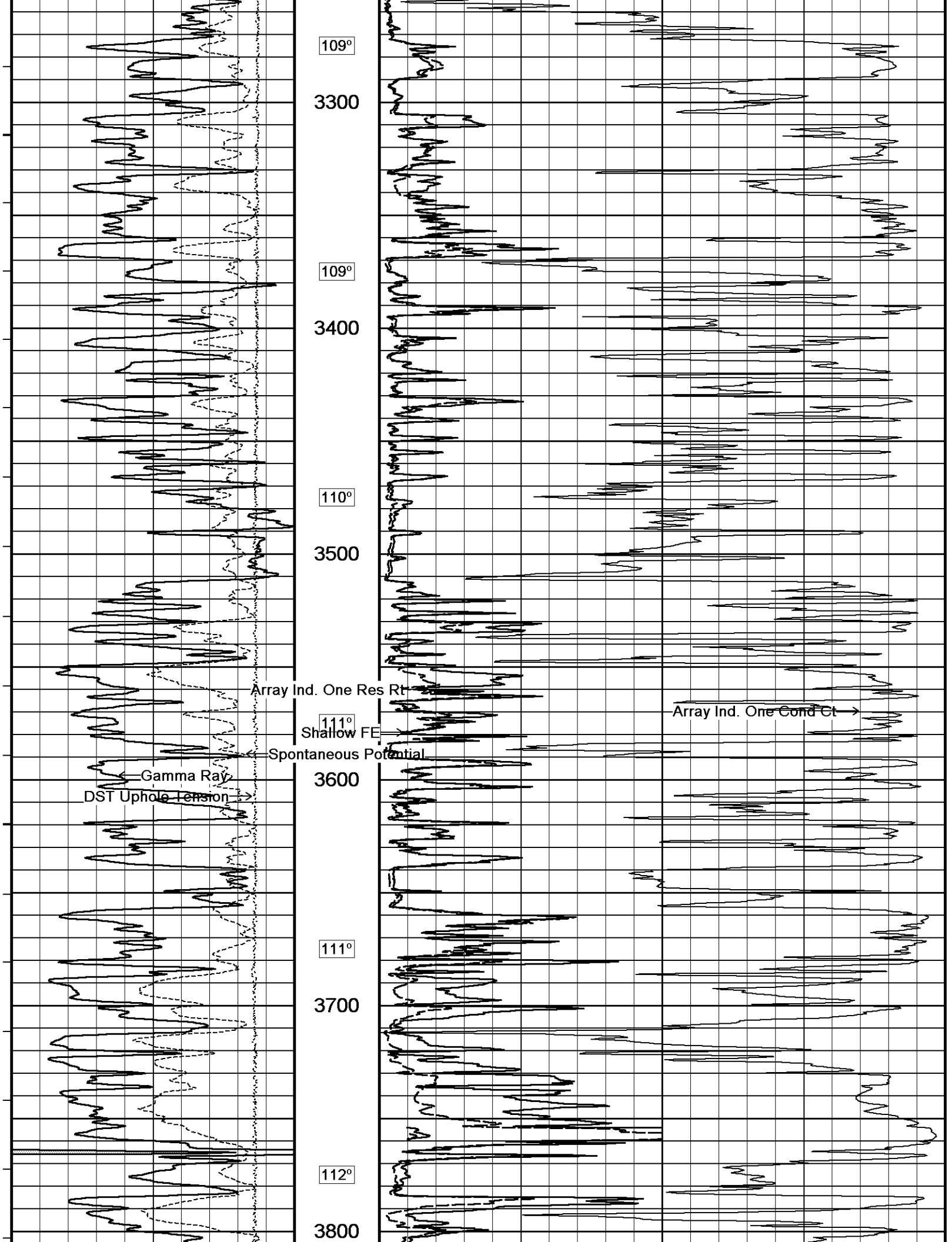
108°

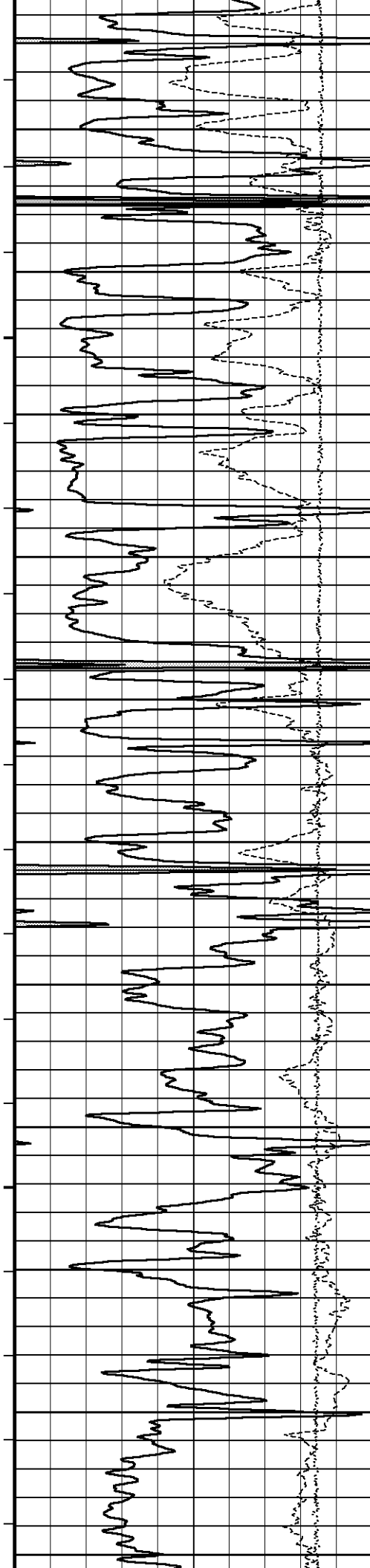
3100

108°

3200







112°

3900

113°

4000

114°

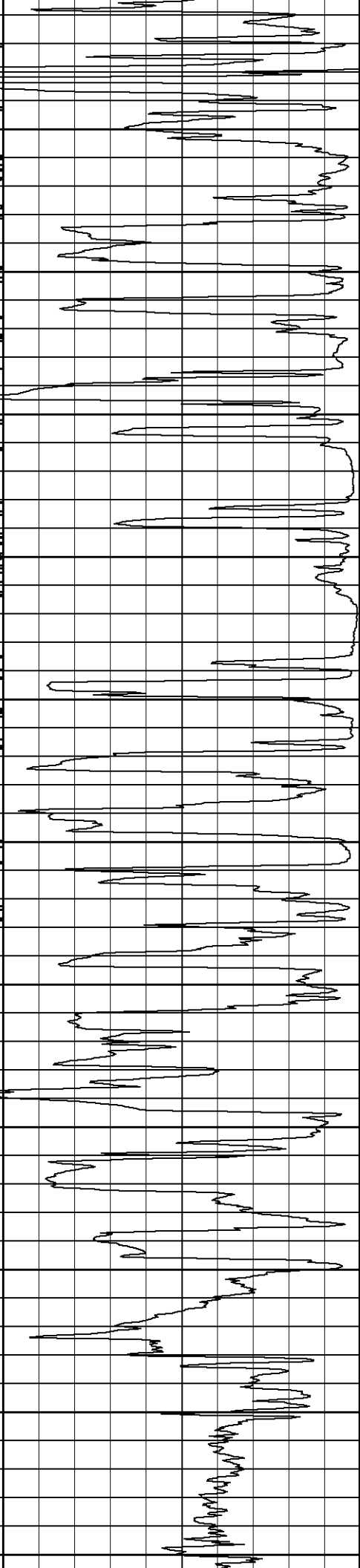
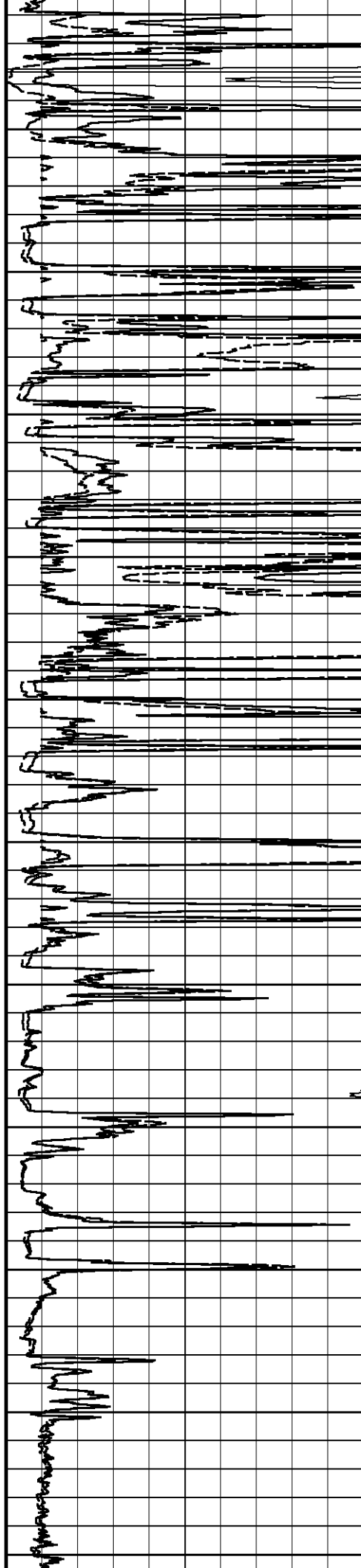
4100

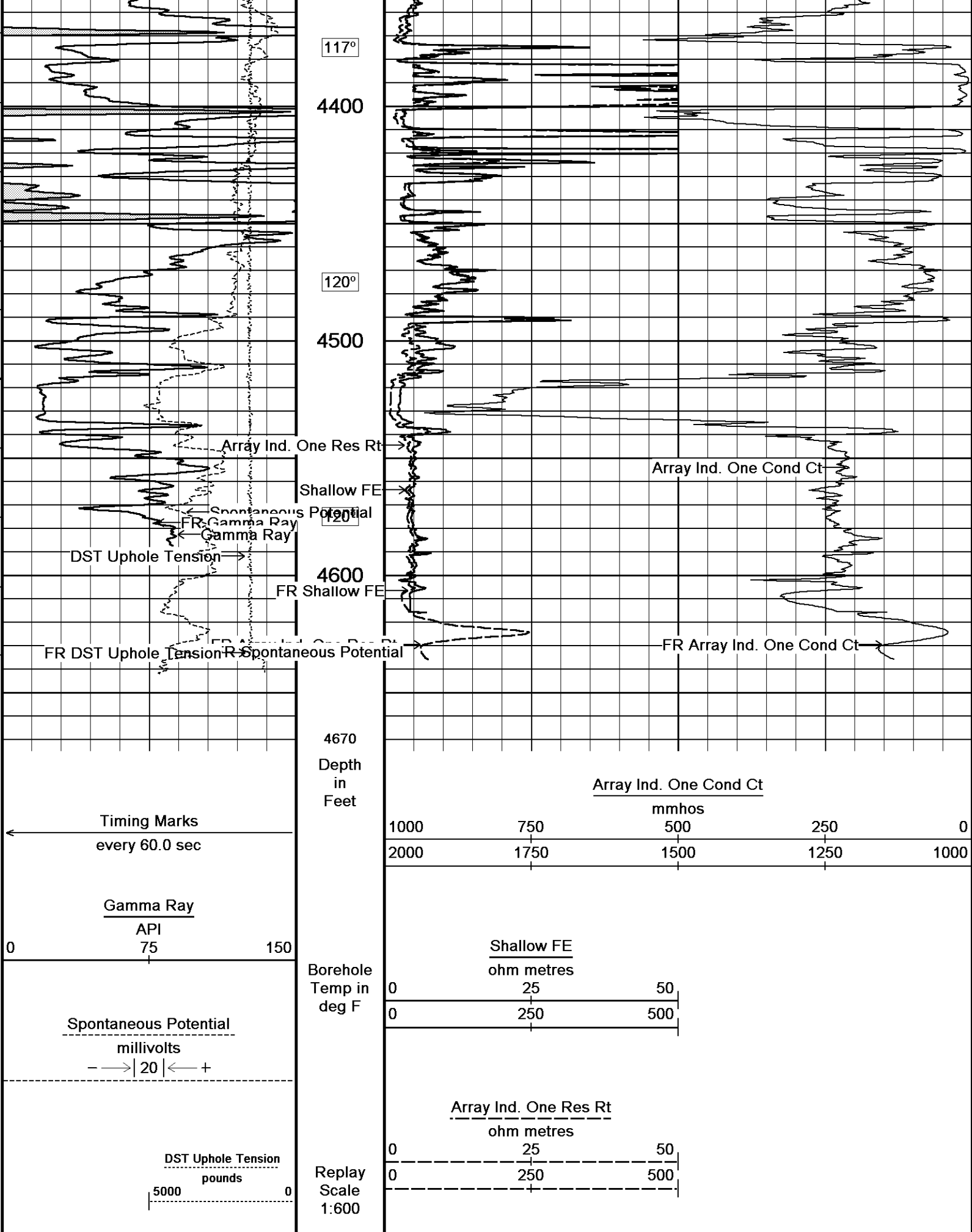
115°

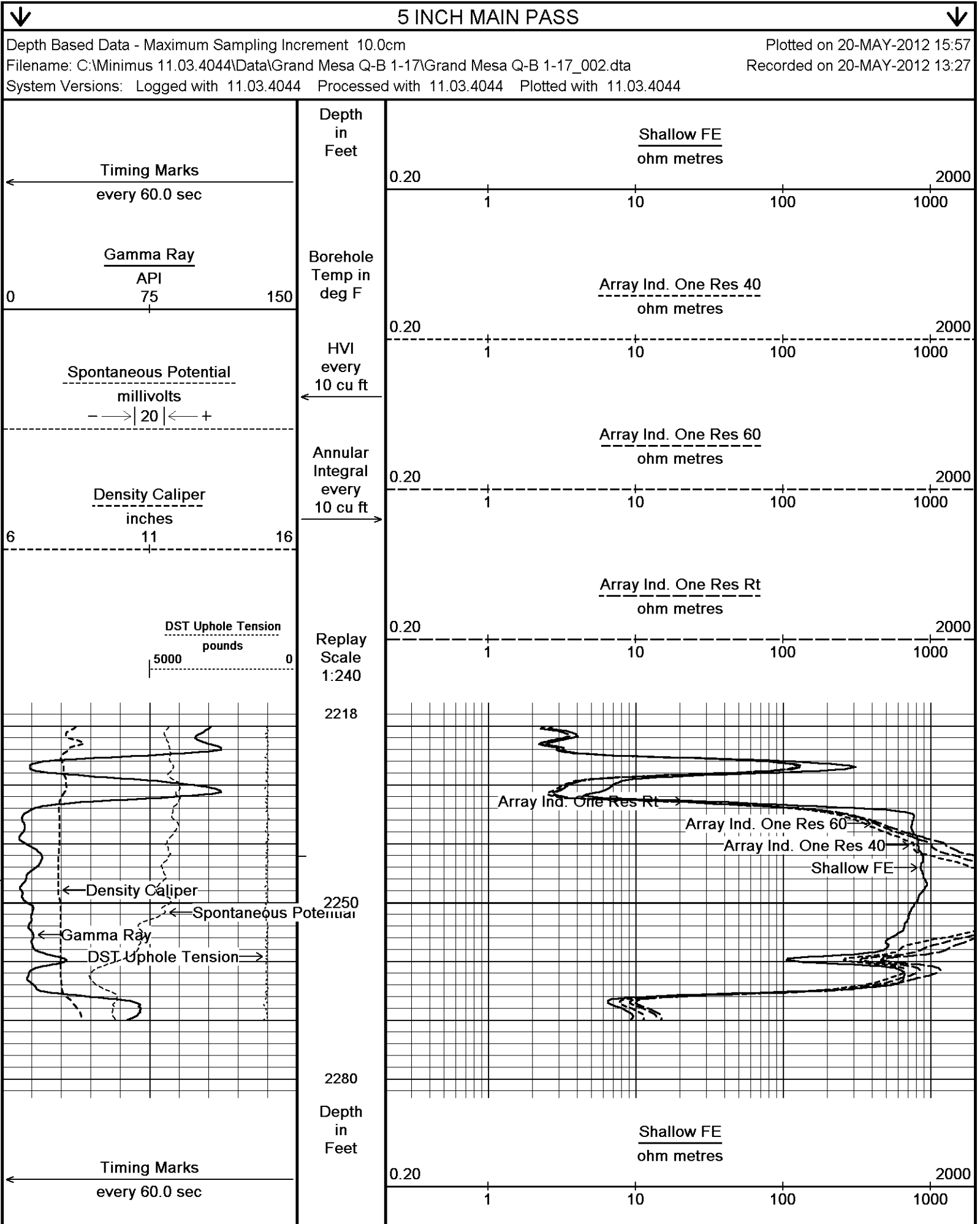
4200

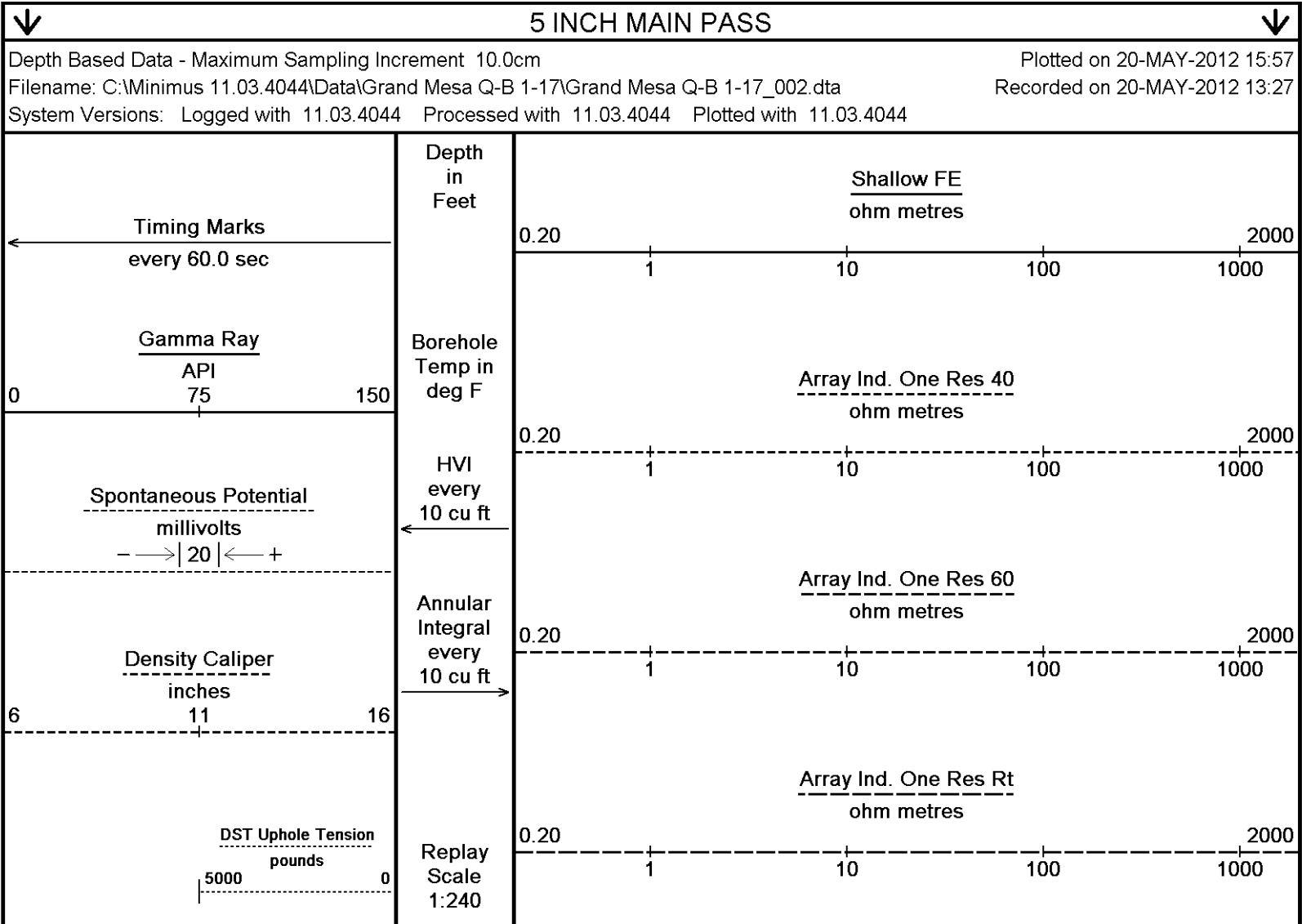
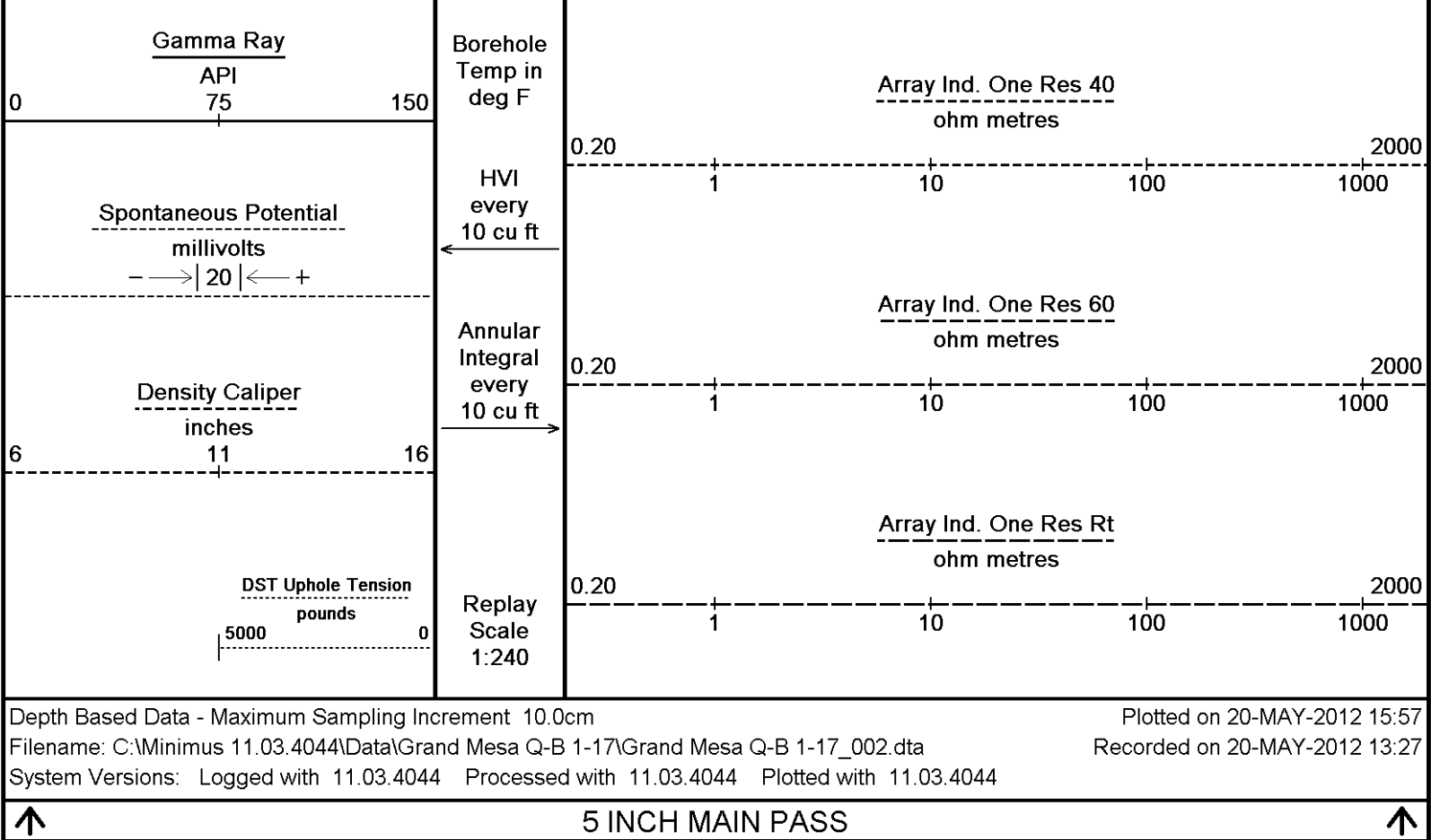
116°

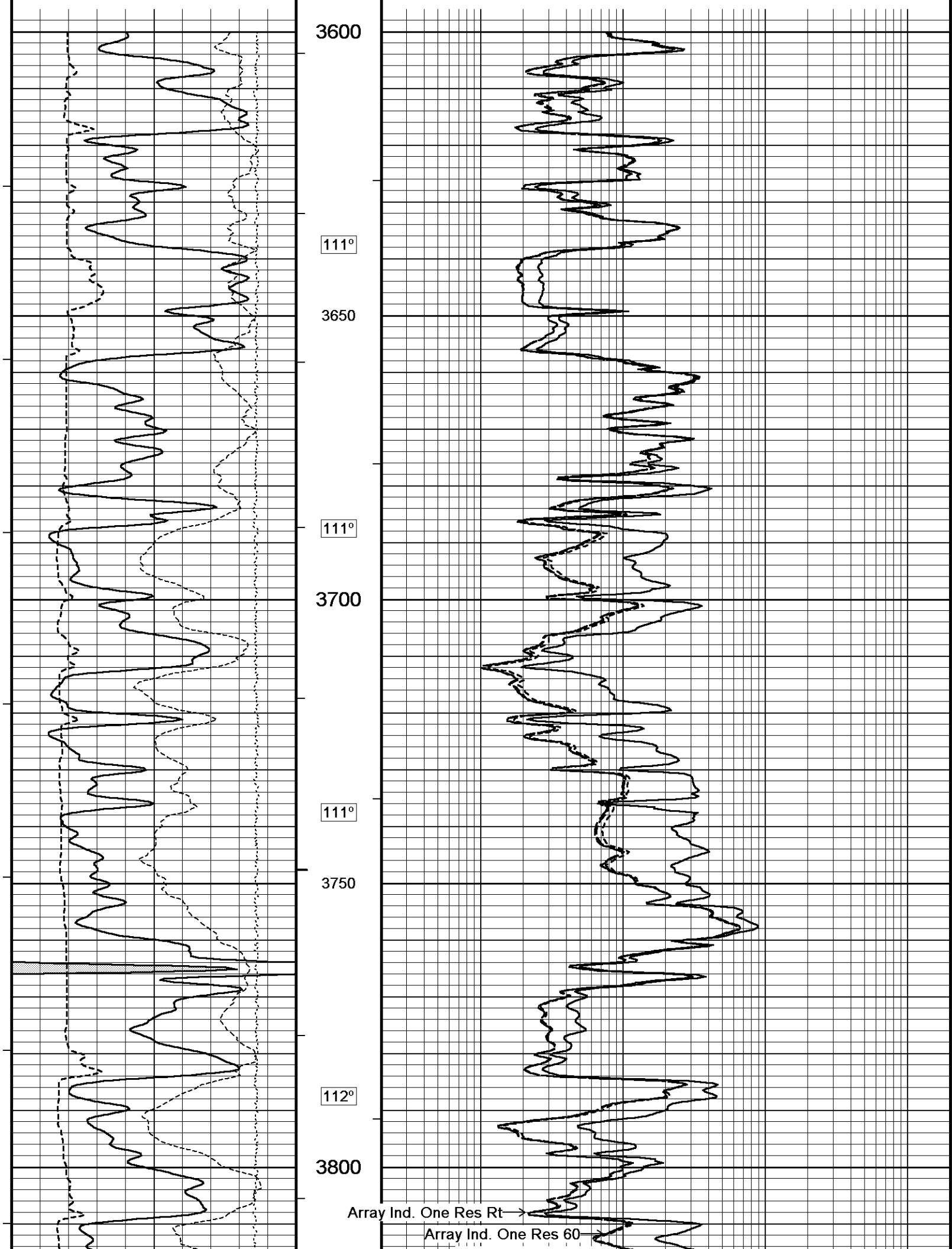
4300

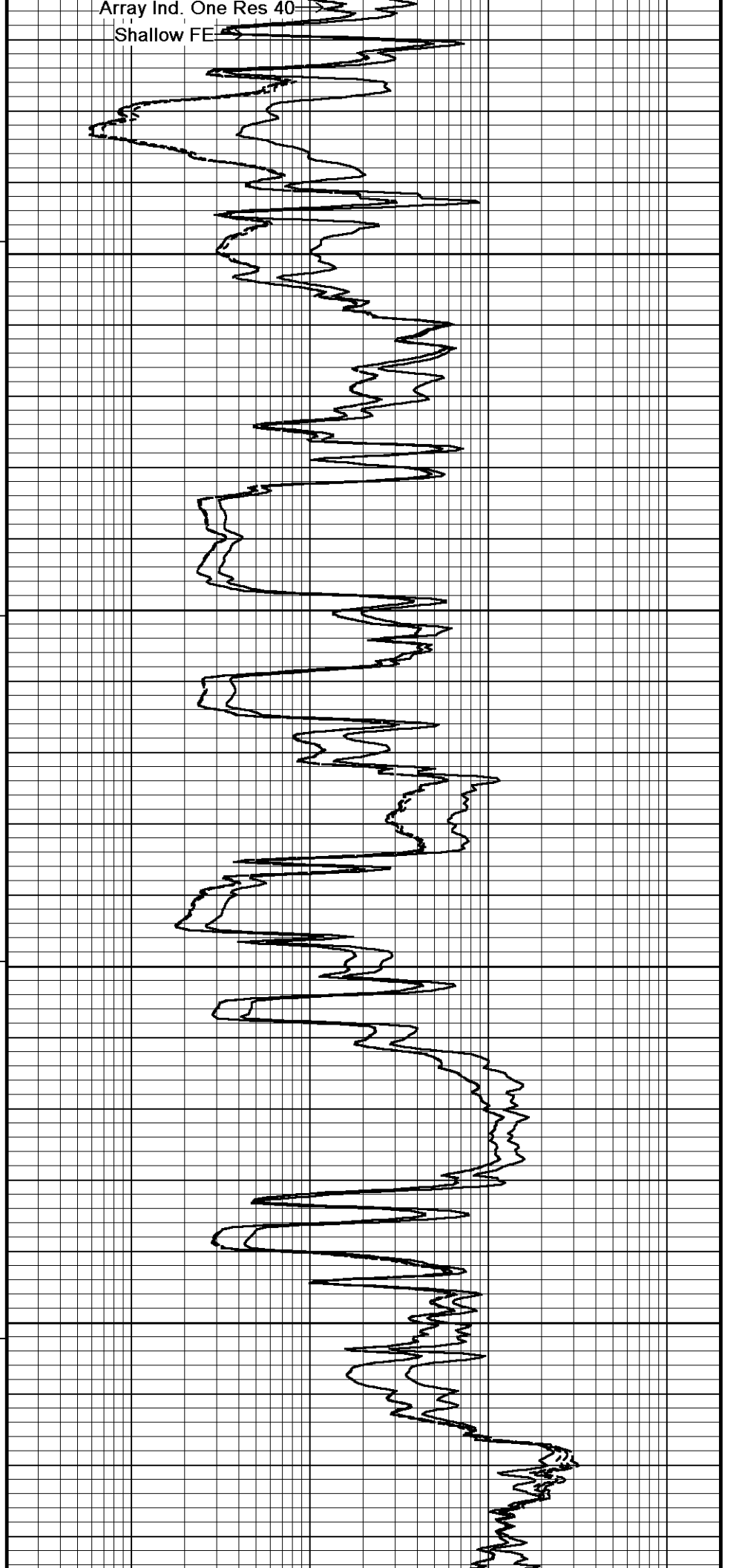
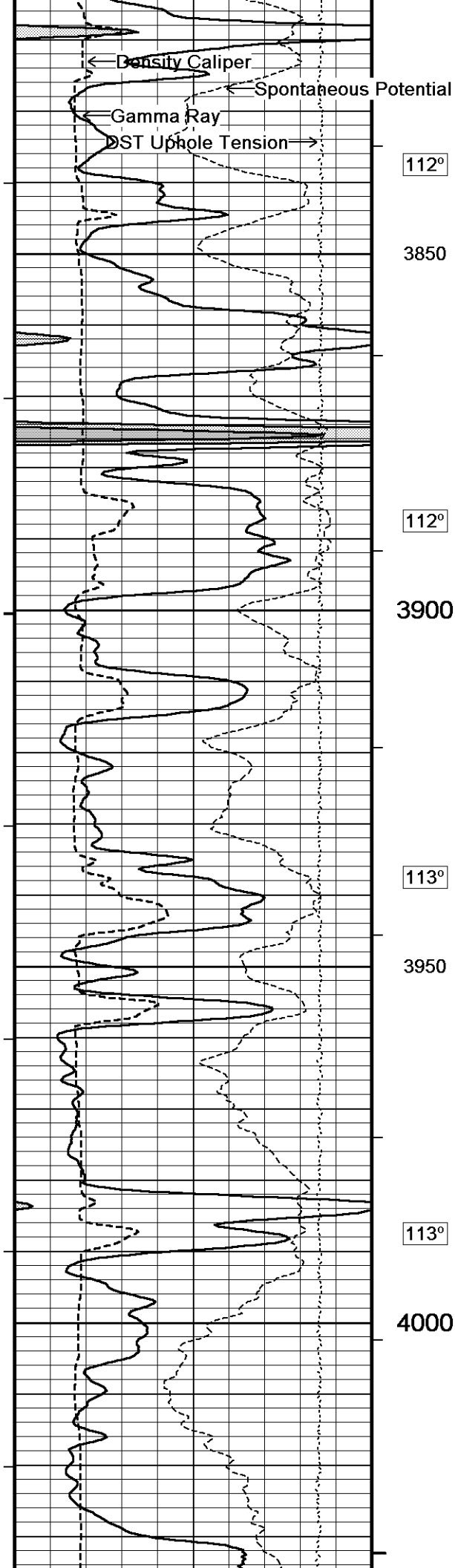


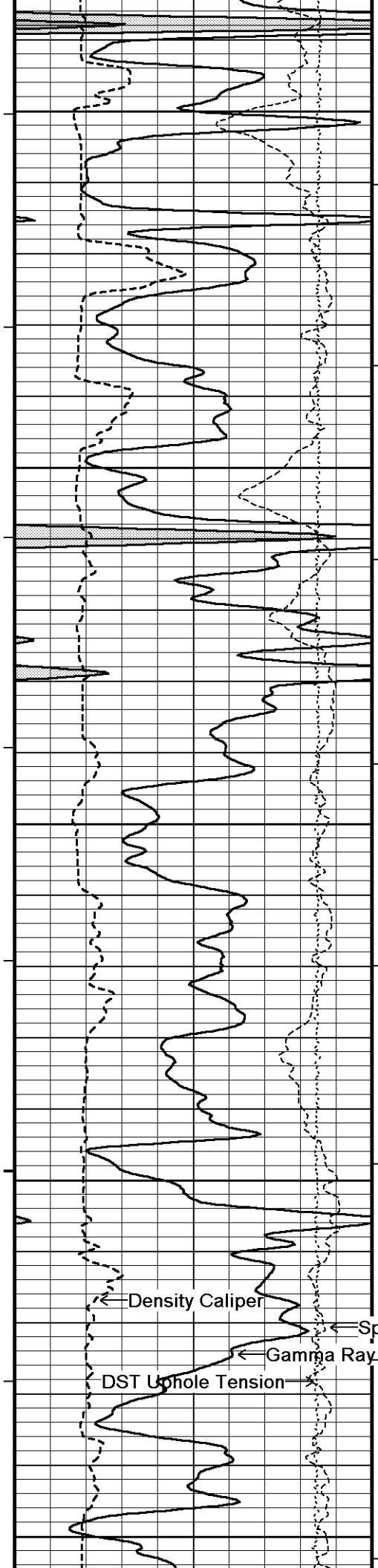












113°

4050

114°

4100

114°

4150

115°

4200

115°

4250

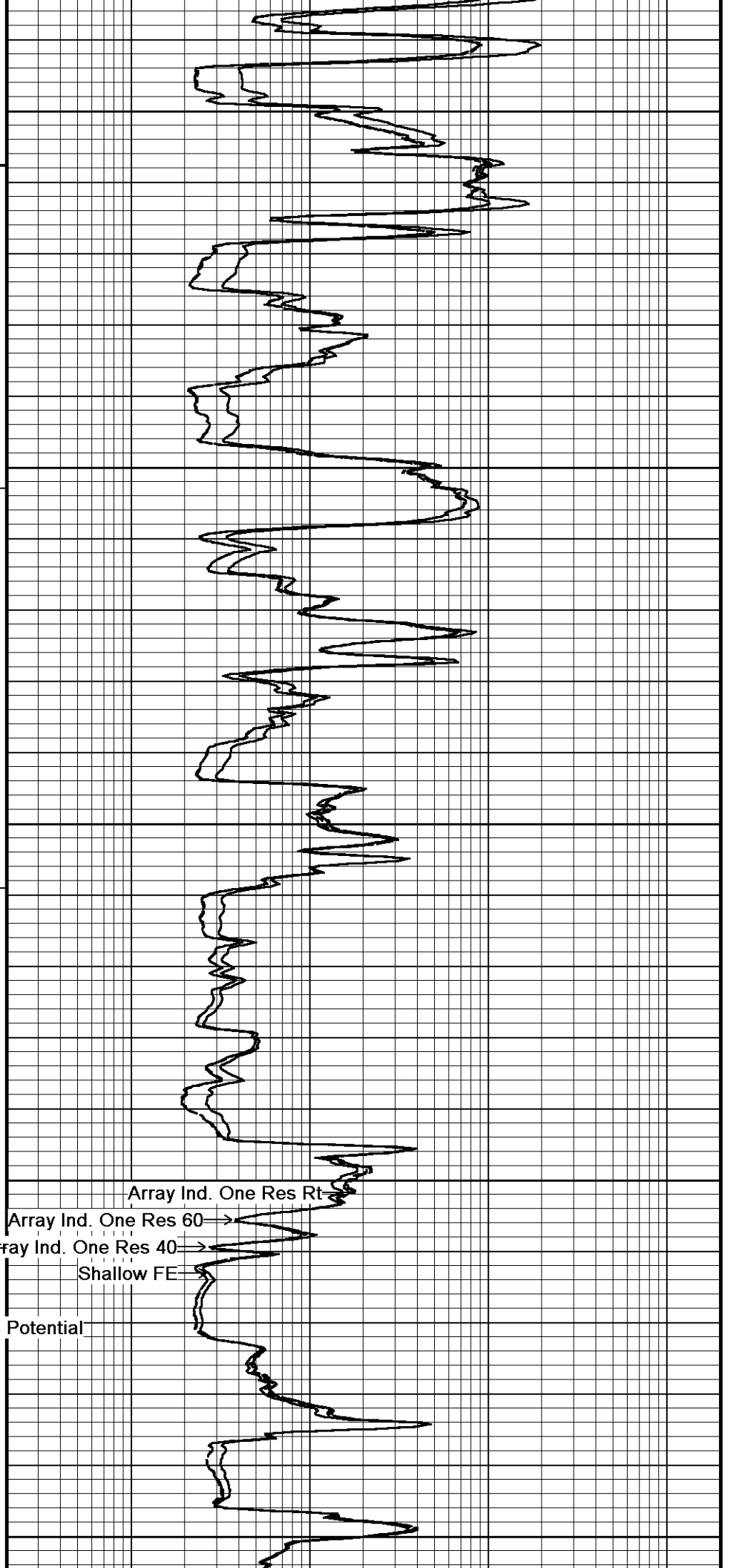
Density Caliper

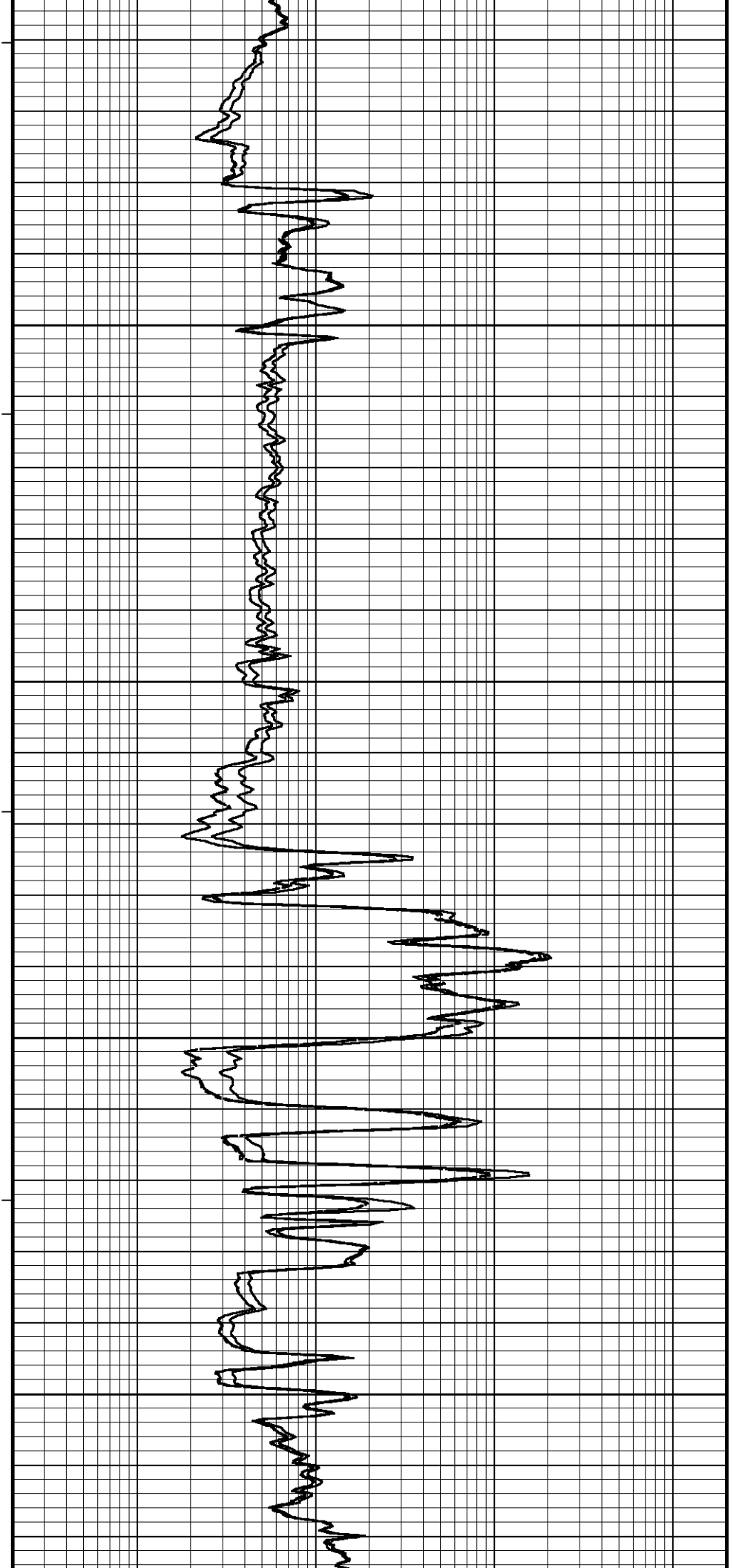
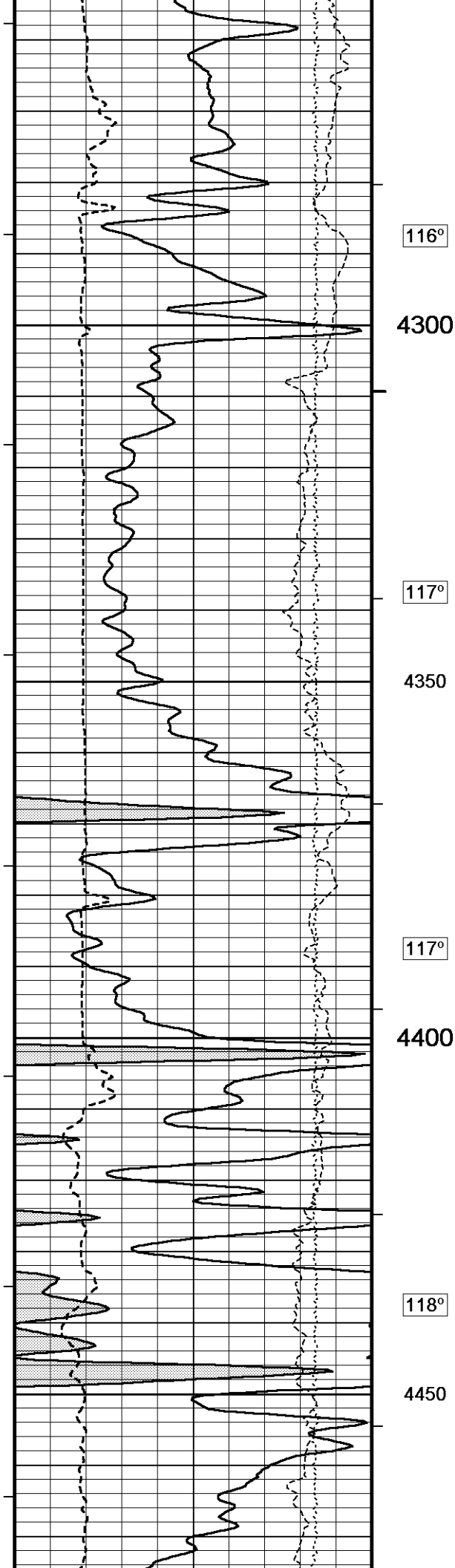
Spontaneous Potential

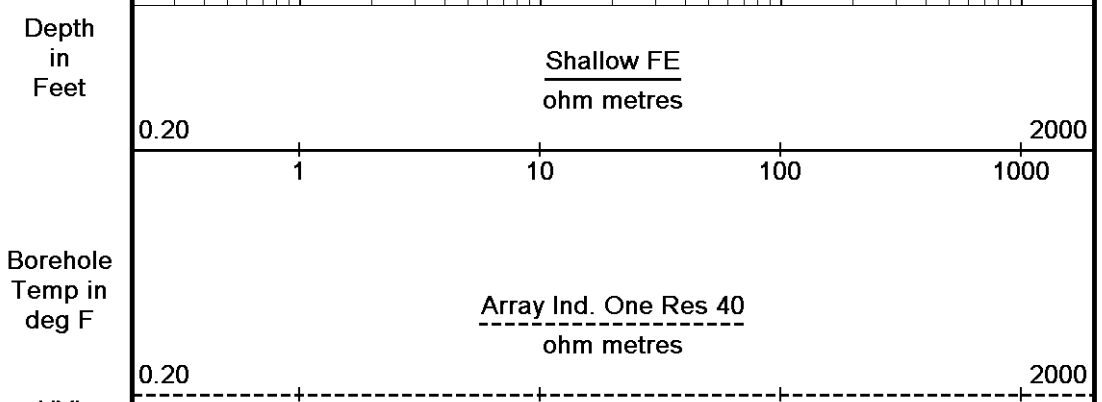
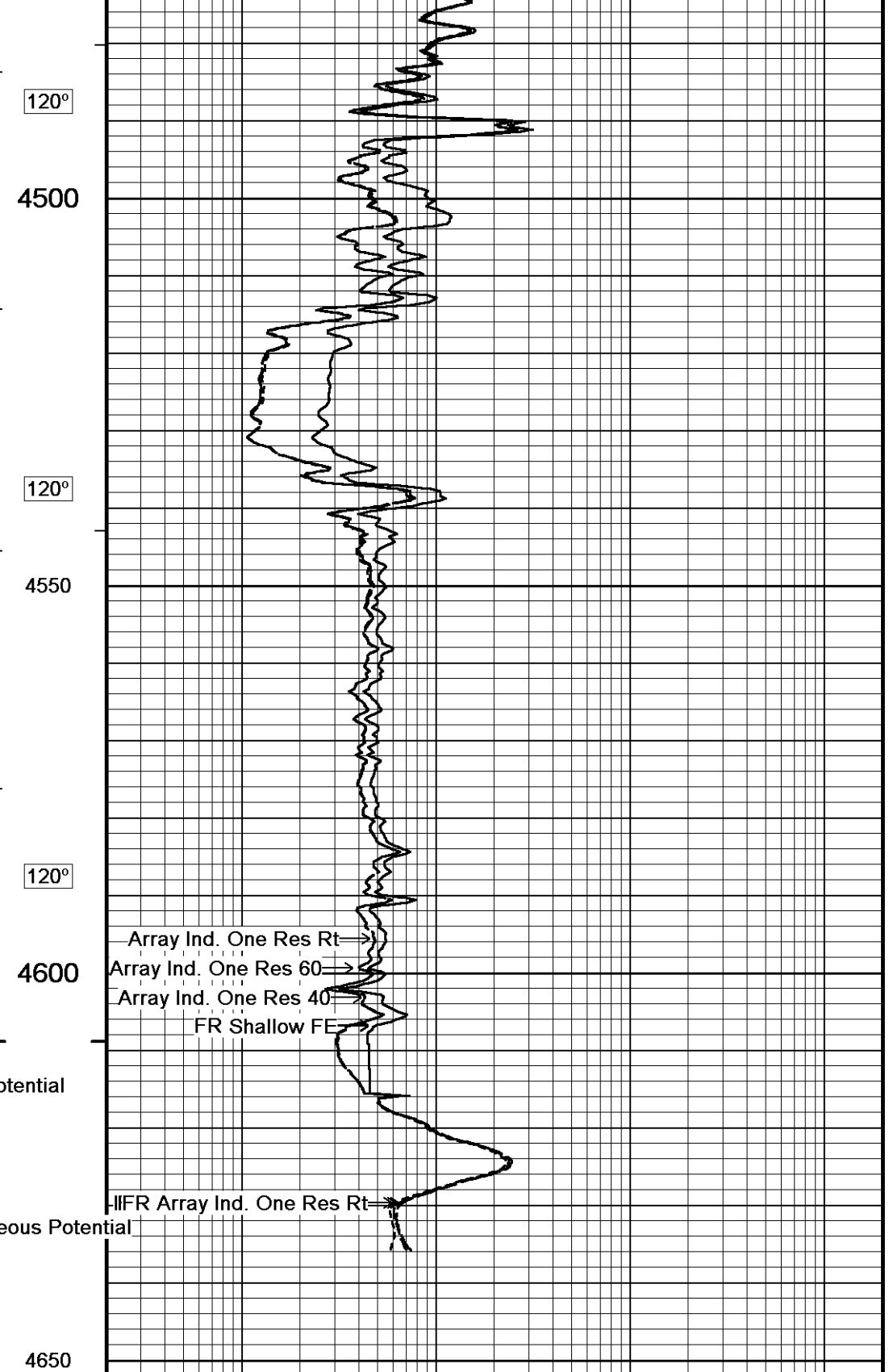
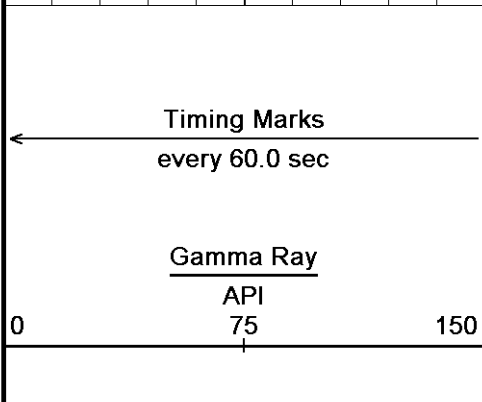
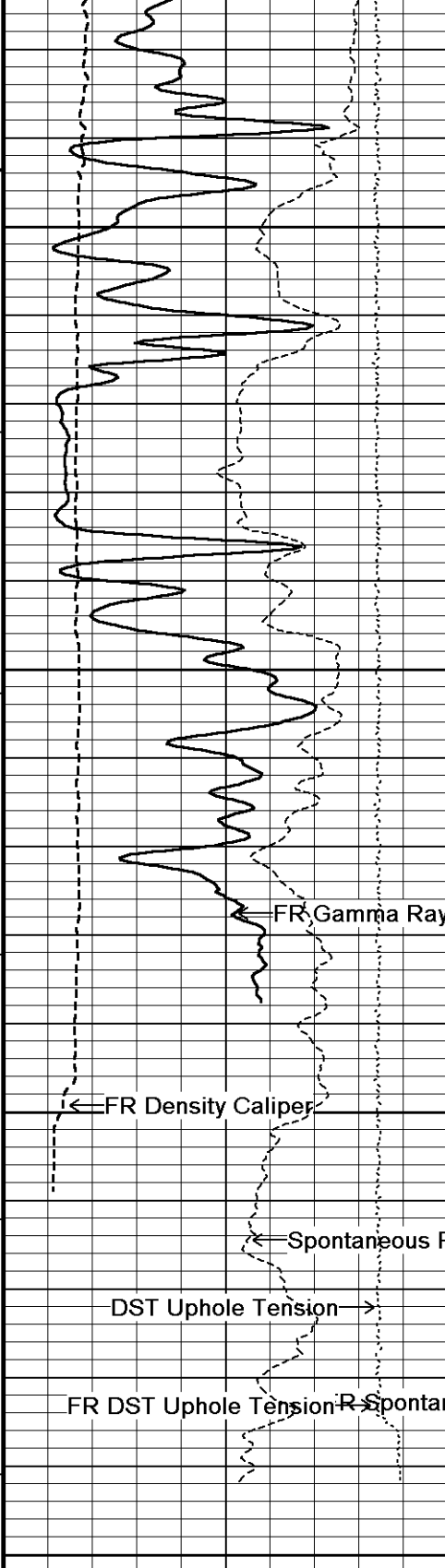
Gamma Ray

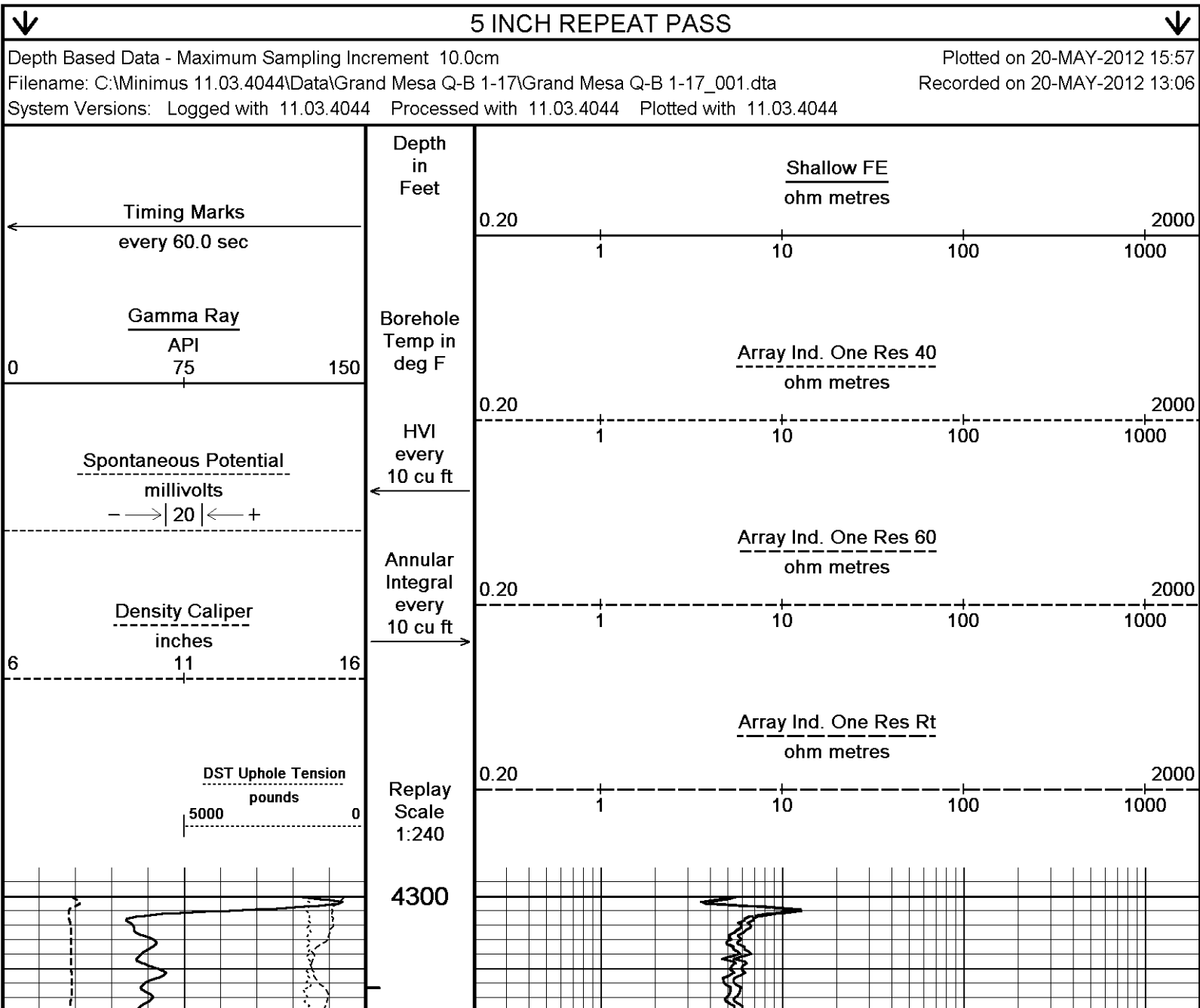
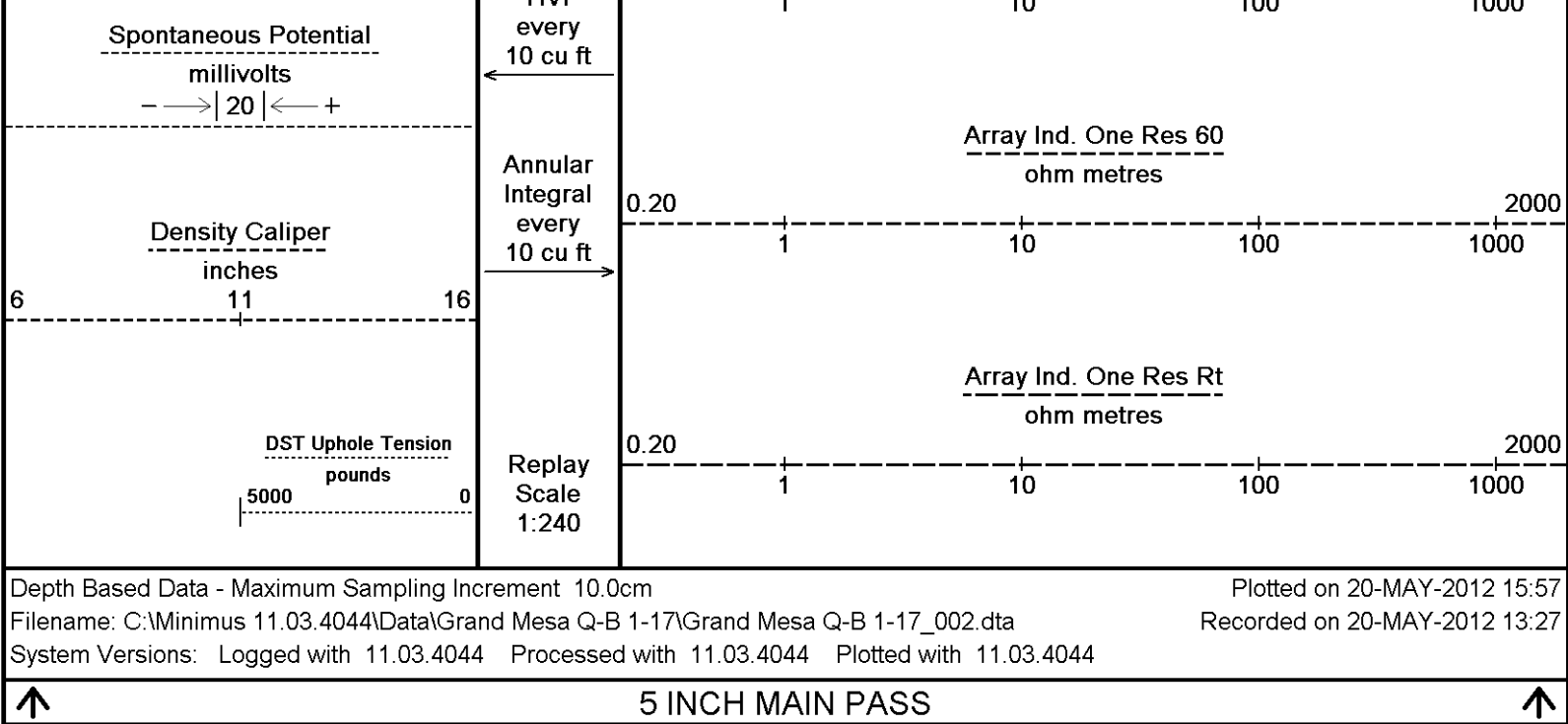
DST Uphole Tension

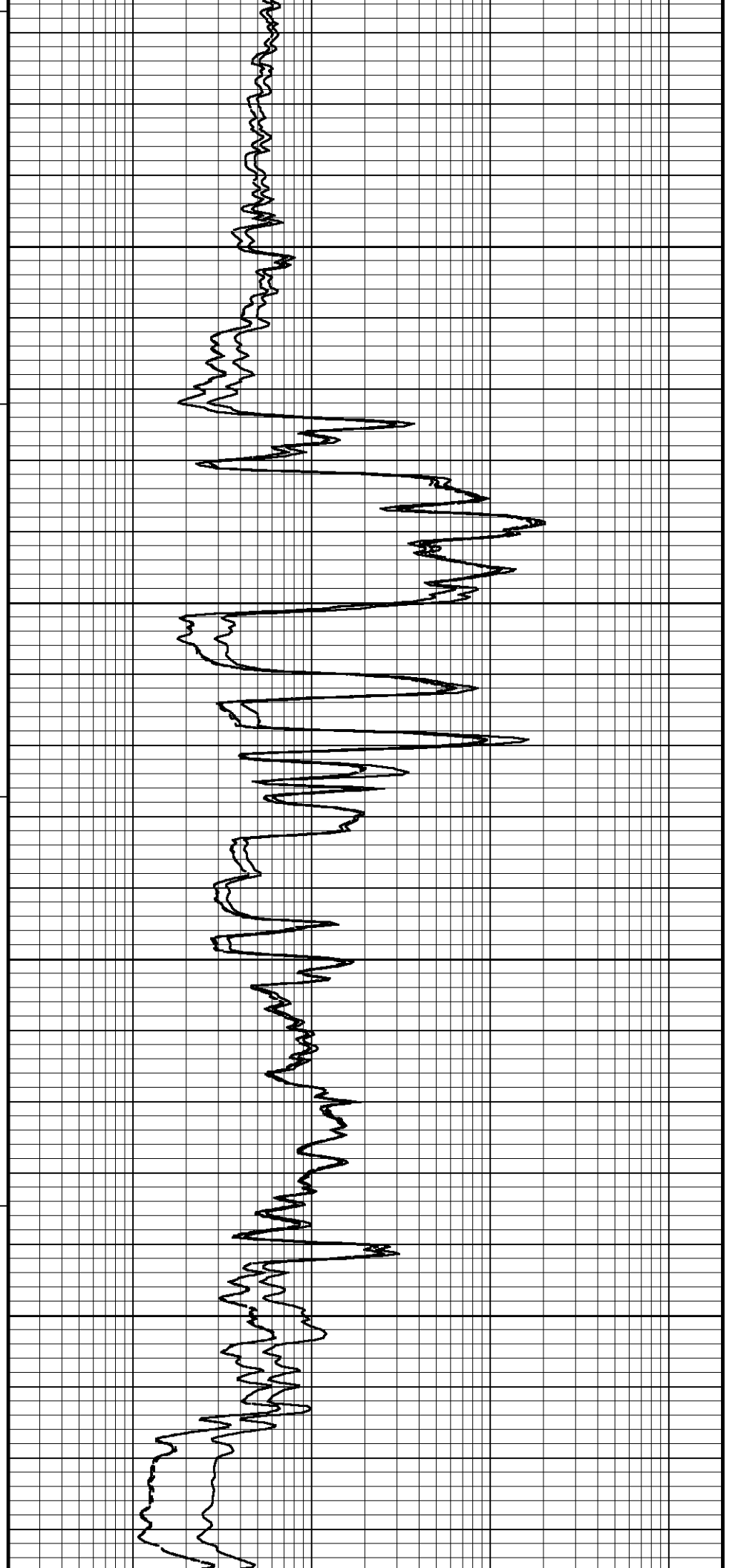
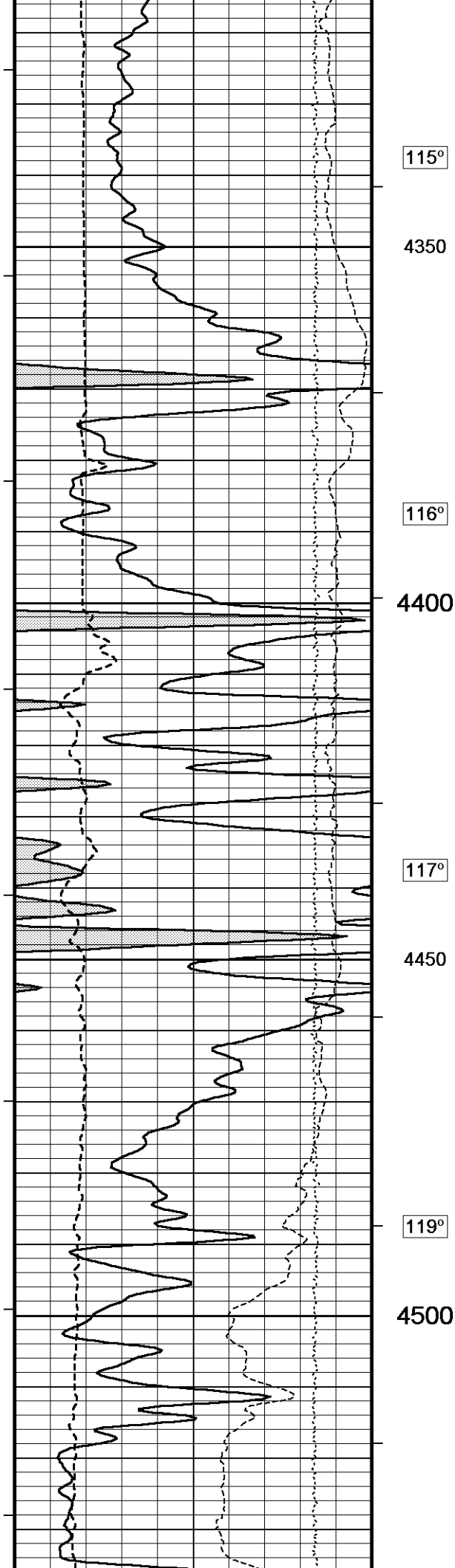
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

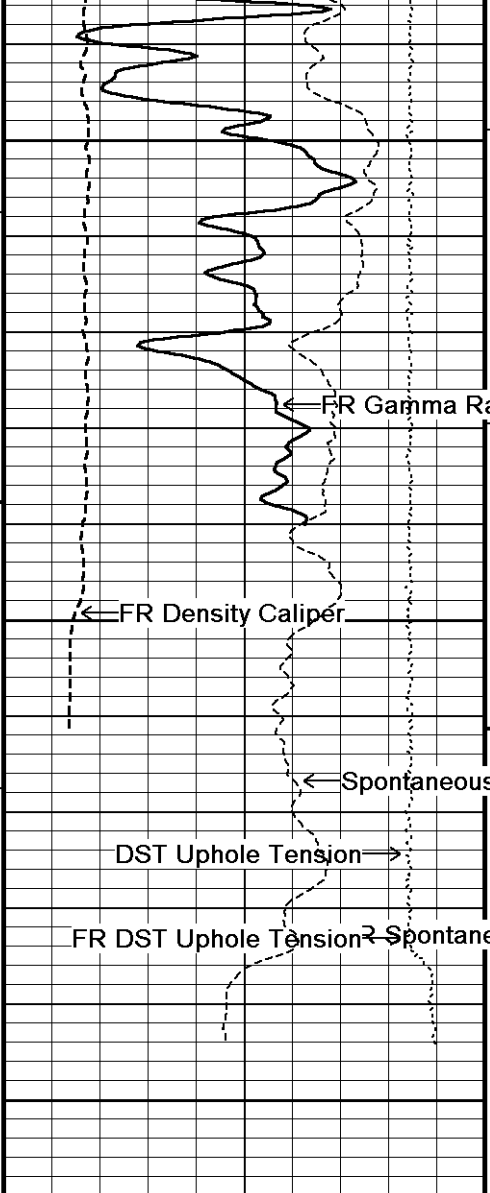












119°

4550

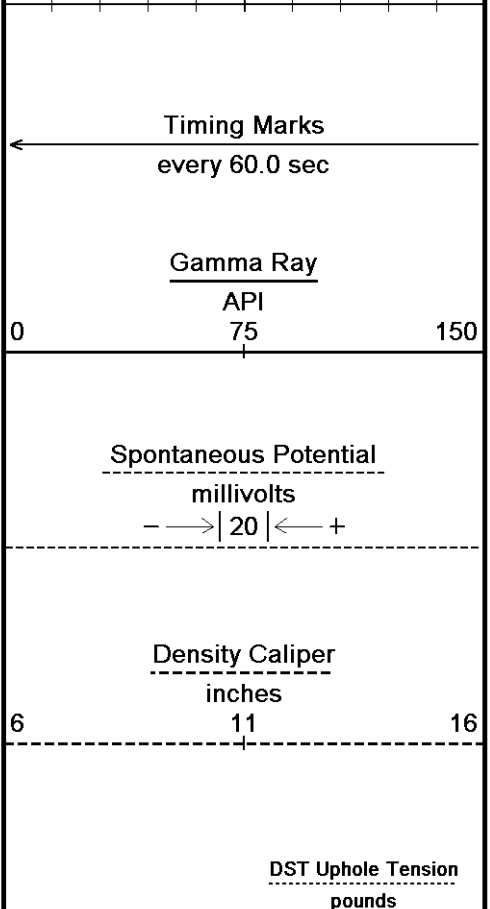
118°

4600

4650

4658

Depth in Feet



Timing Marks every 60.0 sec

Gamma Ray API 0 75 150

Spontaneous Potential millivolts - 20 +

Density Caliper inches 6 11 16

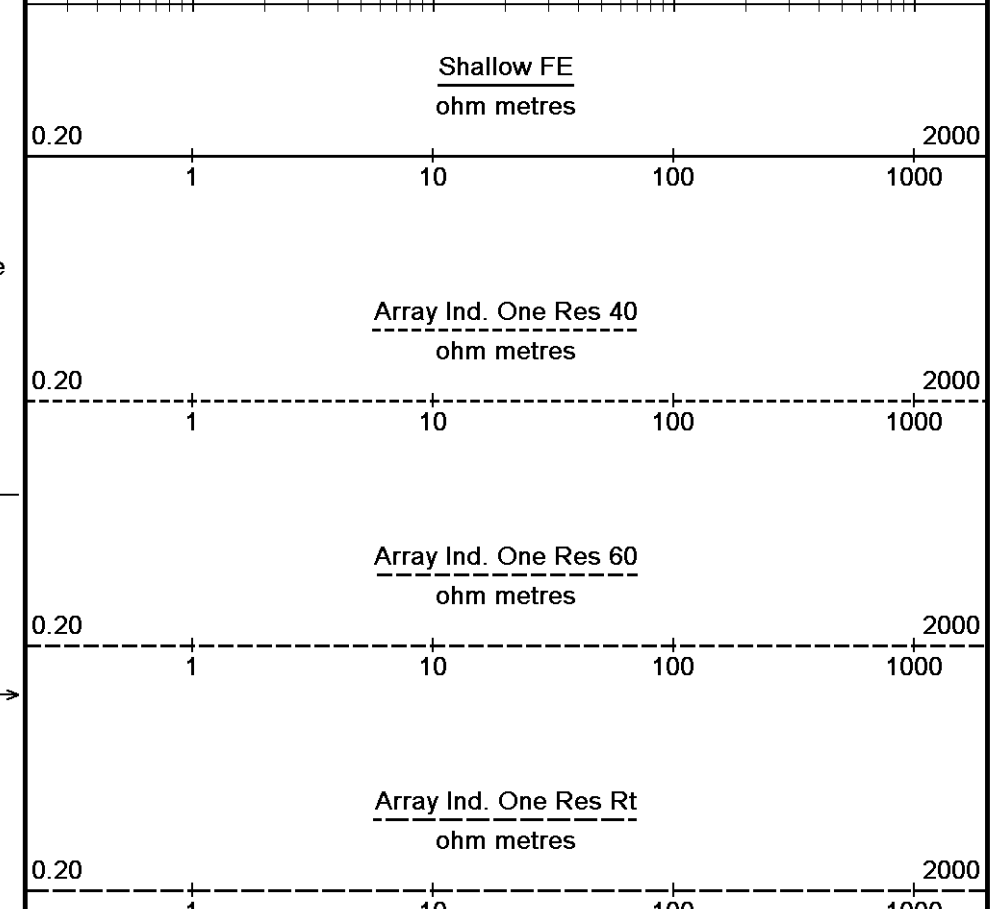
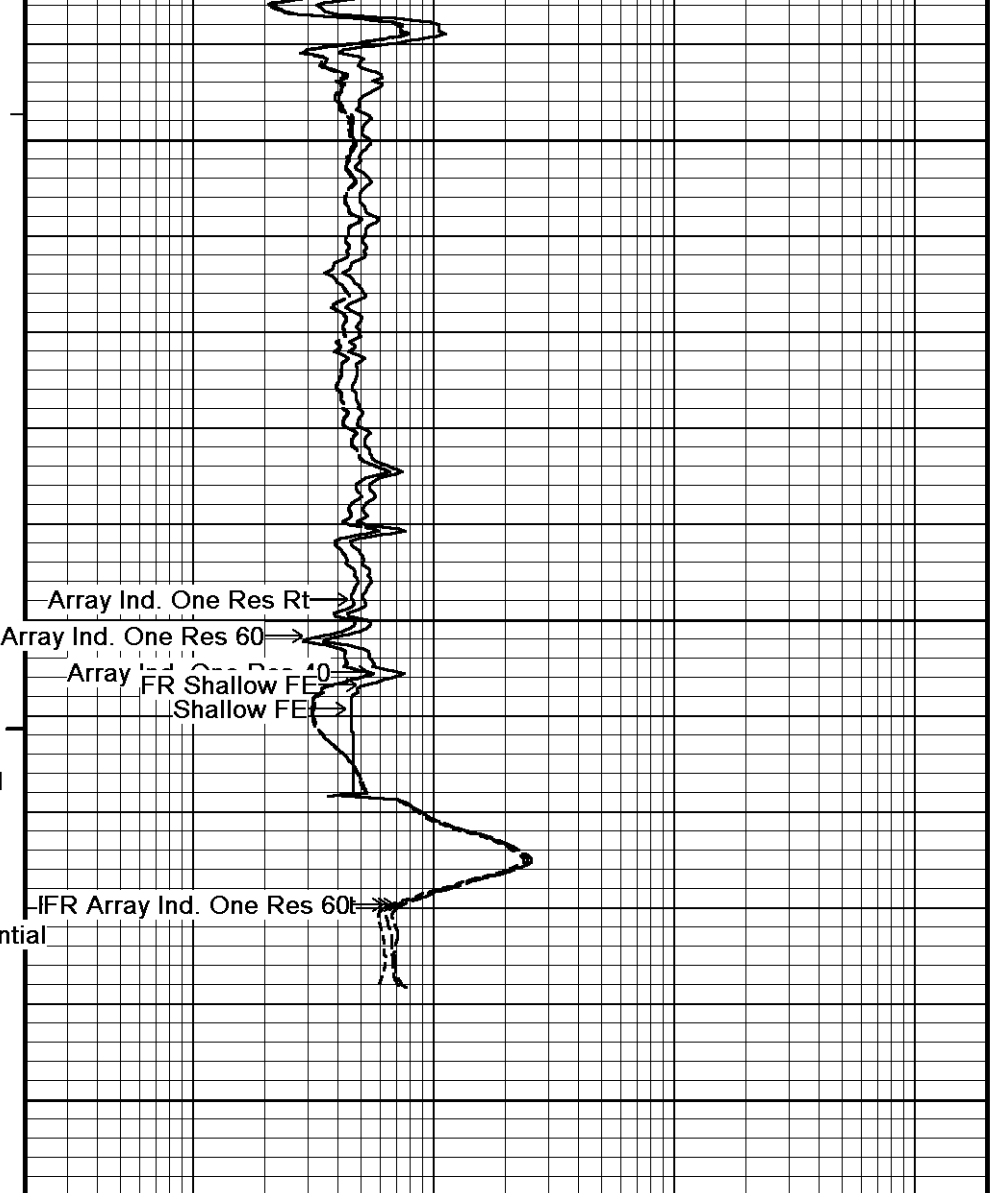
DST Uphole Tension pounds 5000

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale



5000
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 20-MAY-2012 15:57
 Filename: C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17_001.dta
 Recorded on 20-MAY-2012 13:06
 System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044

↑ 5 INCH REPEAT PASS ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17.dta

General Constants All 000

Last Edited on 20-MAY-2012,12:39

General Parameters

Mud Resistivity	0.880	ohm-metres
Mud Resistivity Temperature	93.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Limestone Density Por.
Resistivity used	Array Ind. One Res Rt
RWA Constant A	1.000
RWA Constant M	2.000

Down-hole Tension Calibration SMS 0

Field Calibration on 11-MAY-2012 11:47

Reading No	Measured	Calibrated (lbs)
1	13322.68	0.00
2	13679.25	383.60

Gamma Calibration MCG-C 84

Field Calibration on 20-MAY-2012 07:19

	Measured	Calibrated (API)
Background	71	48
Calibrator (Gross)	1143	773
Calibrator (Net)	1073	725

Gamma Constants MCG-C 84

Last Edited on 20-MAY-2012,12:40

Gamma Calibrator Number	grc38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-C 84

Field Calibration on 01-MAY-2012,03:09

	Measured	Calibrated (mV)
Reference 1	103.5	100.0
Reference 2	-96.9	-100.0

High Resolution Temperature Calibration MCG-C 84

Field Calibration on 01-MAY-2012,03:10

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

High Resolution Temperature Constants MCG-C 84

Last Edited on

Pre-filter Length	11
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Caliper Calibration MML-A 16

Base Calibration on 09-MAY-2012 08:19

Field Calibration on 20-MAY-2012 07:11

Base Calibration

Base Calibration		Measured	Calibrator Size (in)
Reading No			
1		14458	5.98
2		17779	7.97
3		21092	9.86
4		25087	11.92
5		0	0.00
6		N/A	N/A
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.02	5.98	

Micro Normal and Micro Inverse Calibration MML-A 16					Base Calibration on 09-MAY-2012 08:25	
					Field Check on 20-MAY-2012 07:13	
Base Calibration						
		Measured		Calibrated (ohm-m)		
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2		
Micro Normal	12.2	60.2	5.0	25.0		
Micro Inverse	15.6	78.3	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 16				Last Edited on 18-MAY-2012,04:40	
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 65				Base Calibration on 27-APR-2012 16:25	
				Field Check on 20-MAY-2012 07:37	
Base Calibration					
		Measured		Calibrated (cps)	
	Near	Far	Near	Far	
	3227	100	3714	110	
Ratio	32.312		33.764		
Field Calibrator at Base					
			Calibrated (cps)		
			1605	2333	
Ratio	0.688				
Field Check					
			Calibrated (cps)		
			1579	2286	
Ratio	0.691				

Neutron Constants MDN-A.B 65			Last Edited on 20-MAY-2012,07:19		
Neutron Source Id	PN-521				
Neutron Jig Number	5824NE				
Epithermal Neutron	No				
Caliper Source for Processing	Density Caliper				
Stand-off	0.00	inches			
Mud Density	1.00	gm/cc			
Limestone Sigma	7.10	cu			
Sandstone Sigma	4.26	cu			
Dolomite Sigma	4.70	cu			
Formation Pressure Source	Constant Value				
Formation Pressure	0.00	kpsi			
Temperature Source	Constant Value				
Temperature	68.00	degrees F			
Mud Salinity	0.00	kppm			
Formation Fluid Salinity Source	Constant Value				
Formation Fluid Salinity	0.00	kppm			
Barite Mud Correction	Not Applied				

FE Calibration MFE-A.A 55			Base Calibration on 25-APR-2012 15:47 Field Check on 20-MAY-2012 07:01		
Base Calibration					
	Measured		Calibrated (ohm-m)		
Reference 1	0.0		0.0		

Reference 2	950.5	126.8
Base Check		281.7
Field Check		281.9

FE Constants MFE-A.A 55		Last Edited on 20-MAY-2012,06:59	
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	

Sonic Constants MSS-C.K 330		Last Edited on 20-MAY-2012,12:40			
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	
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			
3' Waveform Filter	N/A				
4' Waveform Filter	N/A				
5' Waveform Filter	N/A				
6' Waveform Filter	N/A				
Semblance Level	N/A				

Semblance Window Width		N/A	micro-sec
Sonic 1 Despiker		N/A	N/A
Sonic 2 Despiker		N/A	N/A
High Resolution Temperature Calibration MAI-A.A 45			
	Measured	Calibrated(Deg F)	Field Calibration on 12-JAN-2012,13:36
Lower	50.00	50.00	
Upper	100.00	100.00	
High Resolution Temperature Constants MAI-A.A 45			
Pre-filter Length	11		Last Edited on 12-JAN-2012,11:13
Induction Calibration MAI-A.A 45			
Base Calibration			Base Calibration on 12-JAN-2012,13:34
			Field Check on 20-MAY-2012 06:59
Test Loop Calibration	Measured		Calibrated (mmho/m)
Channel	Low	High	Low High
1	14.4	472.6	9.3 966.2
2	5.7	374.0	7.6 821.4
3	3.4	261.2	5.2 566.0
4	2.5	133.9	2.6 279.2
Array Temperature	79.4		Deg F
Channel	Base Check (mmho/m)		Field Check (mmho/m)
	Low	High	Low High
1	0.0	0.0	18.5 3851.8
2	0.0	0.0	31.7 3630.1
3	0.0	0.0	28.7 3050.0
4	0.0	0.0	18.3 2079.5
Deep	0.0	0.0	16.1 1911.5
Medium	0.0	0.0	42.6 4061.6
Shallow	0.0	0.0	49.6 5484.3
Array Temperature	0.0		67.3 Deg F
Induction Constants MAI-A.A 45			
			Last Edited on 20-MAY-2012,06:57
Induction Model	RtAP-WBM		
Caliper for Borehole Corr.	Density Caliper		
Hole Size for Borehole Correction	N/A	inches	
Tool Centred	No		
Stand-off Type	Fins		
Stand-off	0.50	inches	
Number of Fins on Stand-off	8.0000		
Stand-off Fin Angle	45.00	degrees	
Stand-off Fin Width	0.5000	inches	
Borehole Corr. Rm Source	Temperature Corr		
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start	0.0020	mhos/metre	
Squasher Offset	N/A	mhos/metre	
Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000
Calibration Site Corrections			
Channel 1	0.00	mmhos/metre	
Channel 2	0.00	mmhos/metre	
Channel 3	0.00	mmhos/metre	
Channel 4	0.00	mmhos/metre	
Apparent Porosity and Water Saturation Constants			
Archie Constant (A)	1.00		
Cementation Exponent (M)	2.00		
Saturation Exponent (N)	2.00		
Saturation of Water (Sw)	100.00		

Caliper Calibration MPD-B 59		Base Calibration on 16-MAY-2012 14:32
		Field Calibration on 20-MAY-2012 07:02
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	19200	3.99
2	29152	5.98
3	39216	7.97
4	48949	9.86
5	60064	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.94	5.98

Photo Density Calibration MPD-B 59				Base Calibration on 16-MAY-2012 14:49 Field Check on 20-MAY-2012 07:09	
Density Calibration					
Base Calibration			Measured	Calibrated (sdu)	
		Near	Far	Near	Far
	Reference 1	49293	24802	59556	30836
	Reference 2	20819	2436	24941	2541
Field Check at Base					
		1213.5	1290.5		
Field Check					
		1207.8	1289.0		
PE Calibration					
Base Calibration			Measured	Calibrated	
	WS	WH	Ratio	Ratio	
	Background	220	1092		
	Reference 1	18022	49118	0.371	0.371
	Reference 2	5449	20689	0.267	0.272
Field Check at Base					
		220.3	1091.9		
Field Check					
		218.1	1085.7		

[illegible]

DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\Grand Mesa Q-B 1-17\Grand Mesa Q-B 1-17.dta

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

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

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

Compact Density/Caliper
MPD-B 59 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Density/Caliper
MPD-B 59 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

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

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

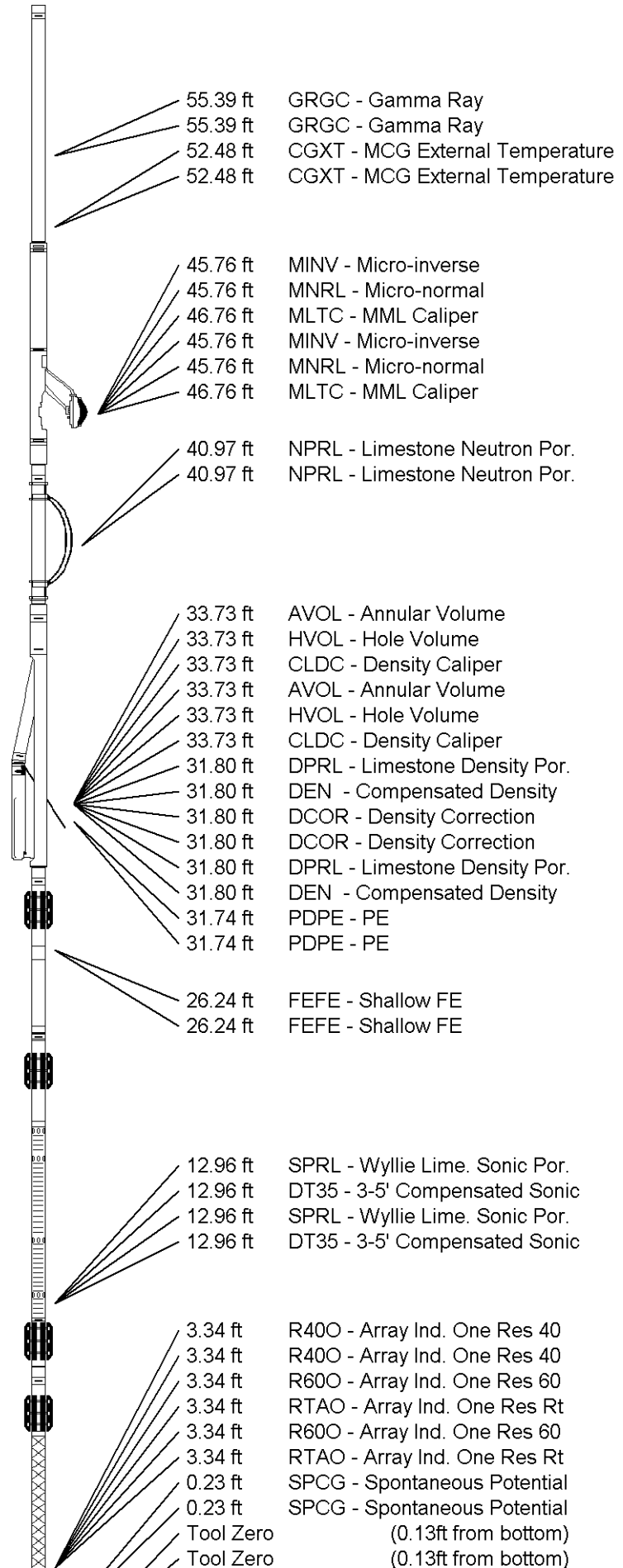
Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

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

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

Total Length: 60.68 ft Weight: 456.4 lb

Total Length: 60.68 ft Weight: 456.4 lb





-0.13 ft SMTU - DST Uphole Tension
-0.13 ft SMTU - DST Uphole Tension
All measurements relative to tool zero.
All measurements relative to tool zero.

COMPANY GRAND MESA OPERATING COMPANY
WELL Q-B #1-17
FIELD WILDCAT
PROVINCE/COUNTY GOVE
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2649.00	feet	First Reading	4630.00	feet
Elevation Drill Floor	2648.00	feet	Depth Driller	4632.00	feet
Elevation Ground Level	2644.00	feet	Depth Logger	4633.00	feet

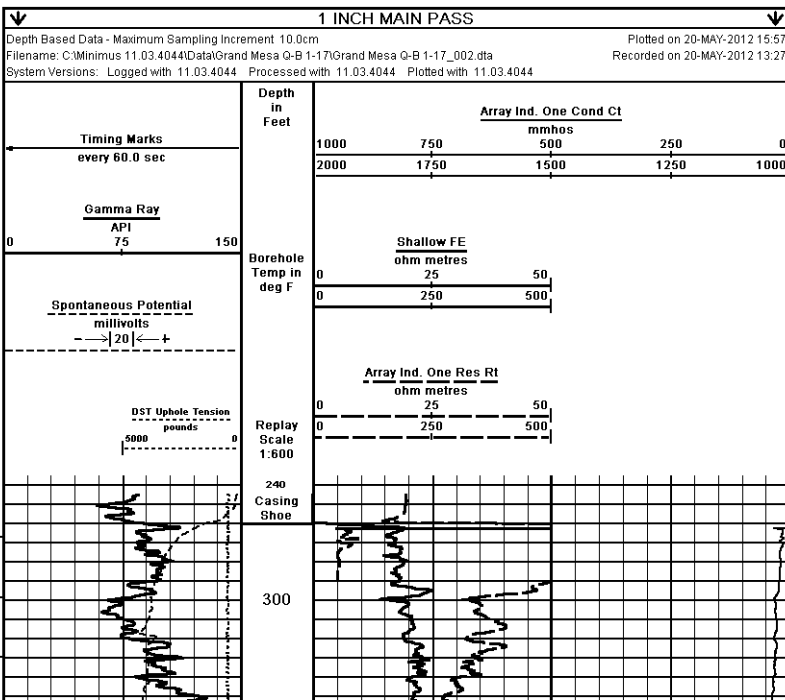


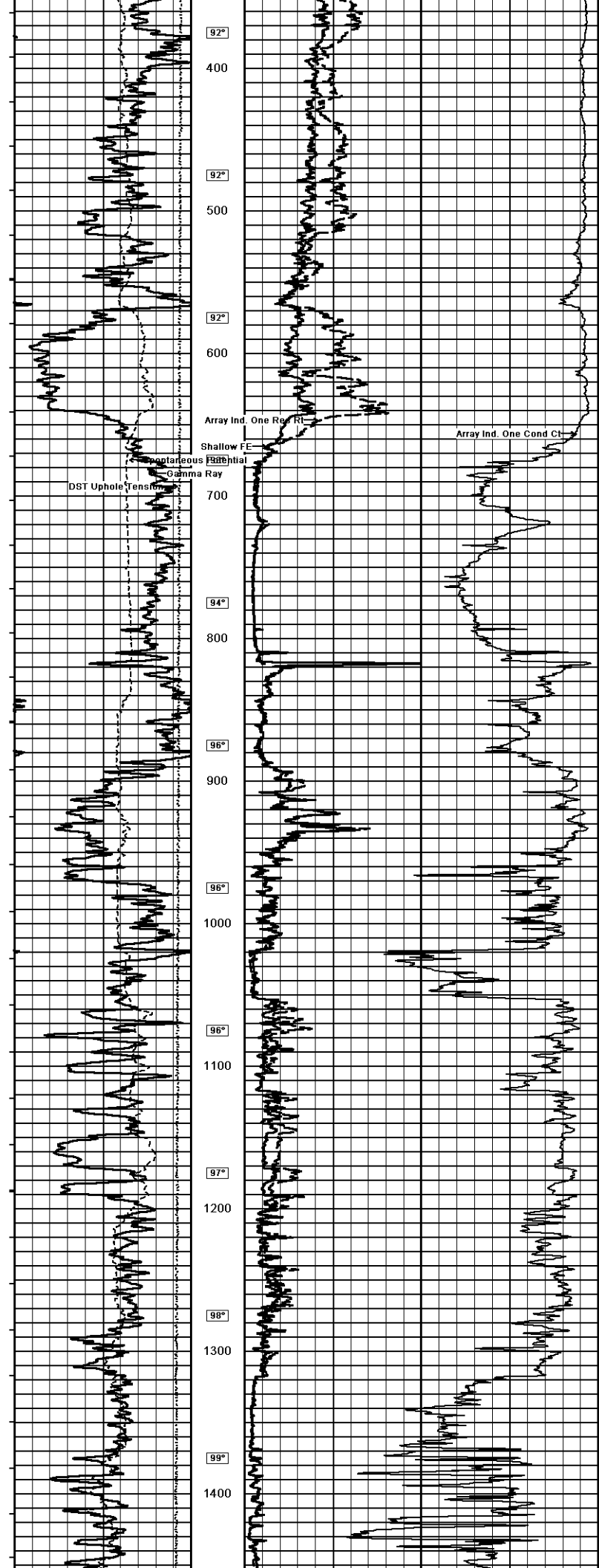
Weatherford[®]

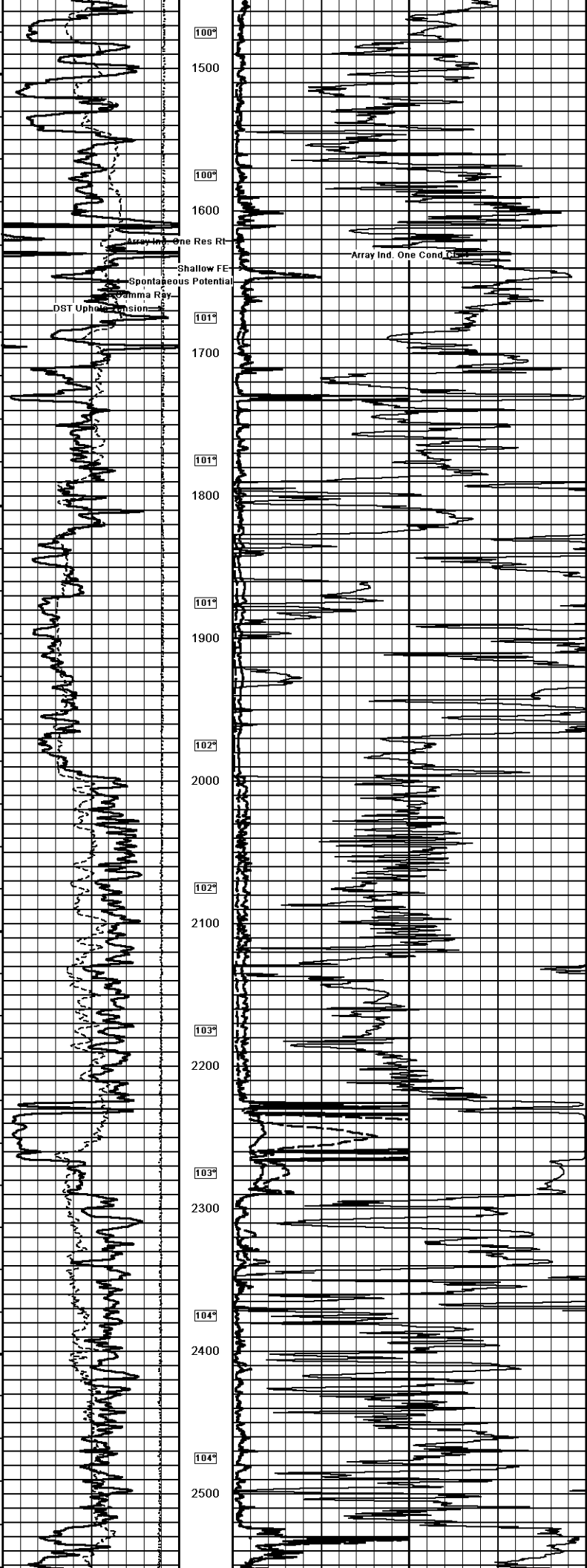
ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

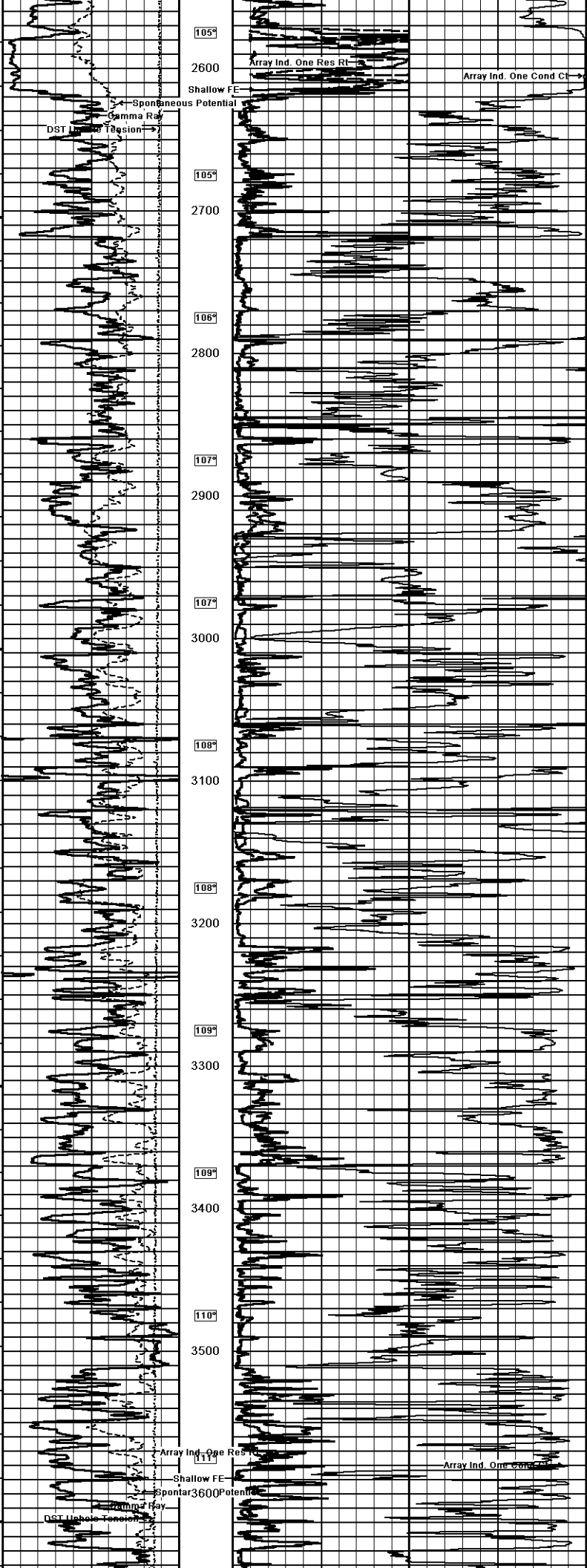


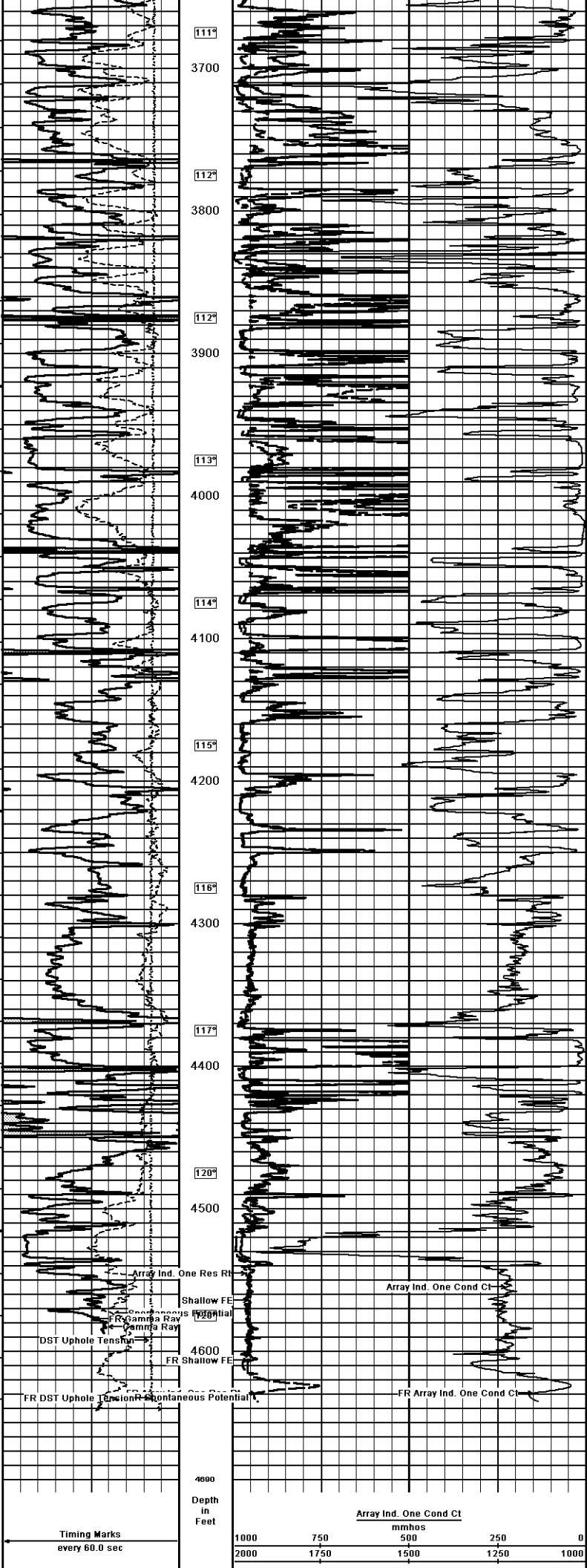
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY GRAND MESA OPERATING COMPANY			
WELL Q-B #1-17			
FIELD WILDCAT			
PROVINCE/COUNTY GOVE			
COUNTRY/STATE U.S.A. / KANSAS			
LOCATION 1477' FNL & 2519' FWL NE NE SE NW			
SEC 17	TIME 11:5	RSE 26W	Other Services MML
API Number 15-063-21990	MSS		
Permanent Datum O.L. Elevation 2644 feet			
Log Measured From IGB			
Drilling Measured From K.B.			
Date 20-MAY-2012			
Run Number ONE			
Depth Driller	4632.00	feet	
Depth Logger	4633.00	feet	
First Reading	4630.00	feet	
Last Reading	260.00	feet	
Casing Driller	260.00	feet	
Casing Logger	260.00	feet	
BIT Size 7.875		inches	
Flow Fluid Type CHEMICAL			
Density/Viscosity 9.20 lb/USg	50.00	CP	
PH/Fluid Loss 9.50		ml/30min	
Sample Source FLOWLINE			
Rm @ Measured Temp 0.88 @ 93.0		ohm-m	
Rmt @ Measured Temp 0.70 @ 93.0		ohm-m	
Rmc @ Measured Temp 1.06 @ 93.0		ohm-m	
Source Rmt/Rmc CALC			
Rm @ BHT 0.68 @ 120.0		ohm-m	
Time Since Circulation 4 HOURS			
Max Record Temp 120.00		deg F	
Equipment Name COMPACT			
Equipment Base 13087		LB	
Recorded By L. SCOTT			
Witnessed By JOHN GOLOSINITH			
EO# / JOE# 3534580			
			STEVE STRIBLING LBT-7130

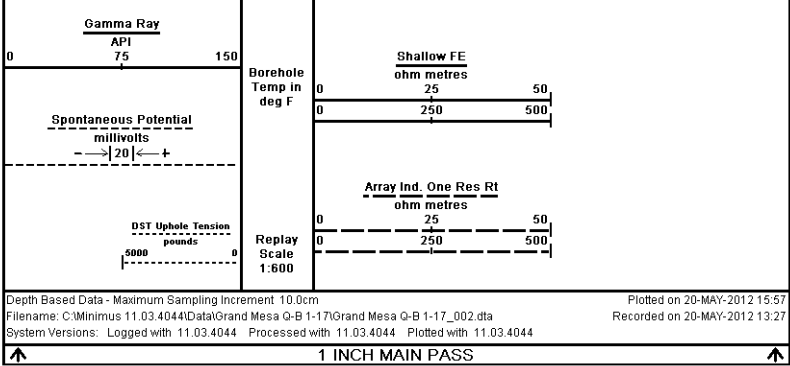












COMPANY		GRAND MESA OPERATING COMPANY			
WELL		Q-B #1-17			
FIELD		WILDCAT			
PROVINCE/COUNTY		GOVE			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2649.00	feet	First Reading	4630.00	feet
Elevation Drill Floor	2648.00	feet	Depth Driller	4632.00	feet
Elevation Ground Level	2644.00	feet	Depth Logger	4633.00	feet

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

40

Wireline