



Weatherford[®]

**ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG**

COMPANY

SHAKESPEARE OIL COMPANY, INC.

WELL

JANZEN #1-26

FIELD

WILDCAT

PROVINCE/COUNTY

SCOTT

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

2000' FSL & 900' FEL

SE/4

SEC

TWP

RGE

Other Services
MPD/MDN

MML

26

16S

34W

API Number

15-171-20909

MSS

Permit Number

Permanent Datum G.L., Elevation 3109 feet

Log Measured From KB

Drilling Measured From K.B.

Date

15-OCT-2012

Elevations:
KB 3119.00
DF 3118.00
GL 3109.00

Run Number

ONE

Depth Driller

4870.00

feet

Depth Logger

4867.00

feet

First Reading

4864.00

feet

Last Reading

264.00

feet

Casing Driller

264.00

feet

Casing Logger

264.00

feet

Bit Size

7.875

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.30

lb/USg

58.00 CP

PH / Fluid Loss

10.00

9.60 ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

0.51 @ 87.0

ohm-m

Rmf @ Measured Temp

0.41 @ 87.0

ohm-m

Rmc @ Measured Temp

0.61 @ 87.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.40 @ 111.0

ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

111.00

deg F

Equipment Name

COMPACT

Equipment / Base

13096

LIB

Recorded By

LYNN SCOTT

BOREHOLE RECORD

Last Edited: 15-OCT-2012 08:51

Bit Size
inches
7.875

Depth From
feet
264.00

Depth To
feet
4867.00

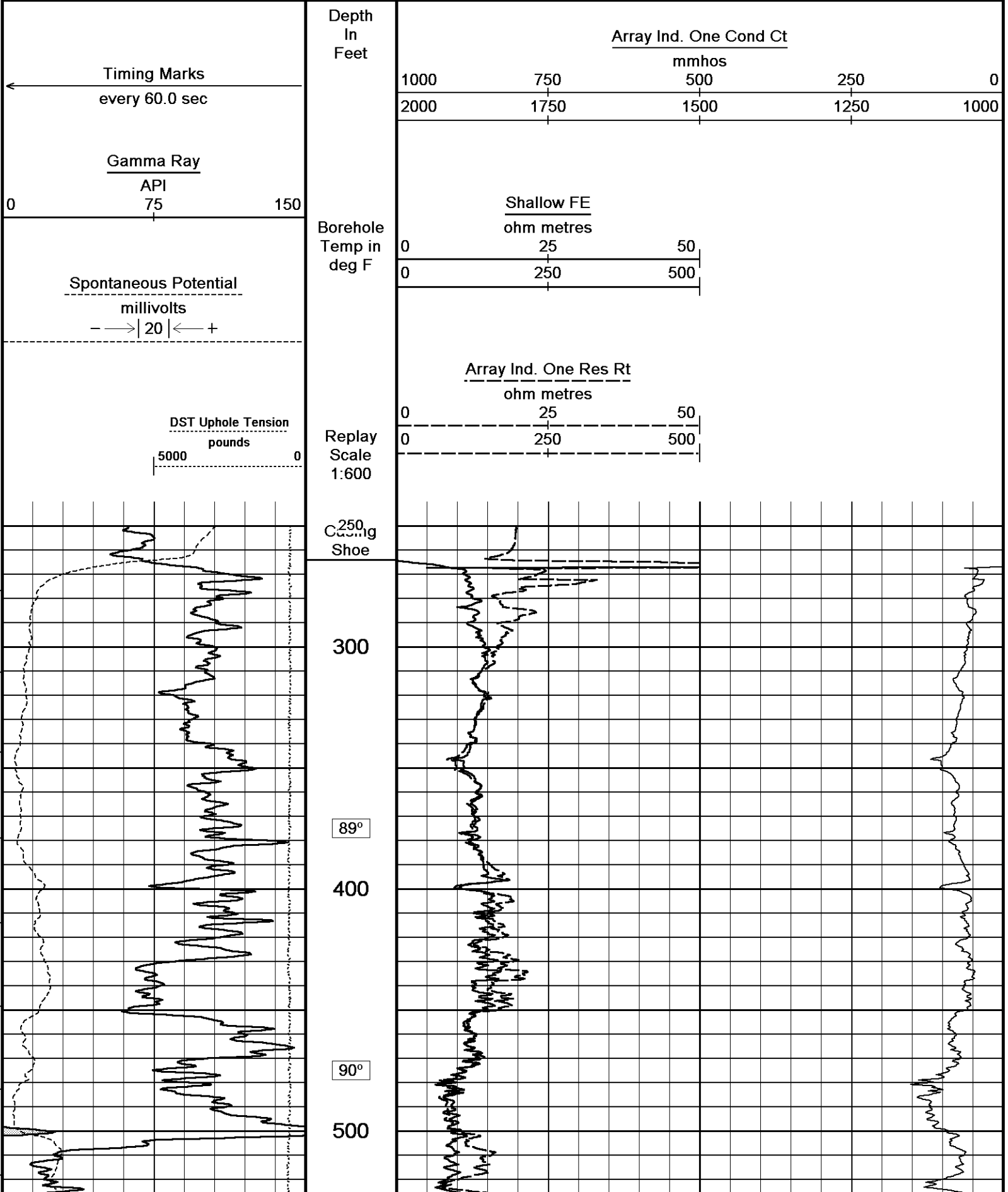
CASING RECORD

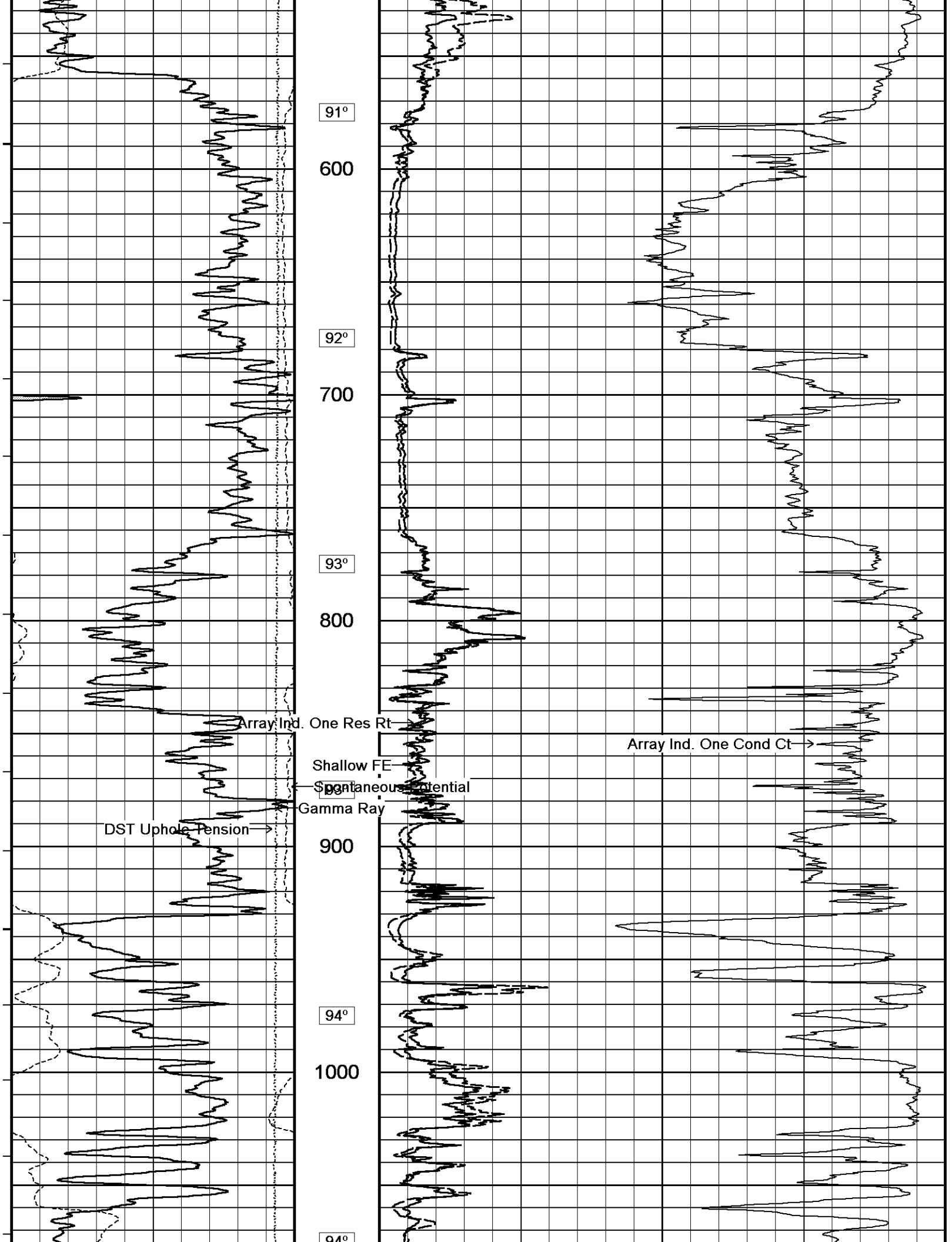
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	264.00	24.00

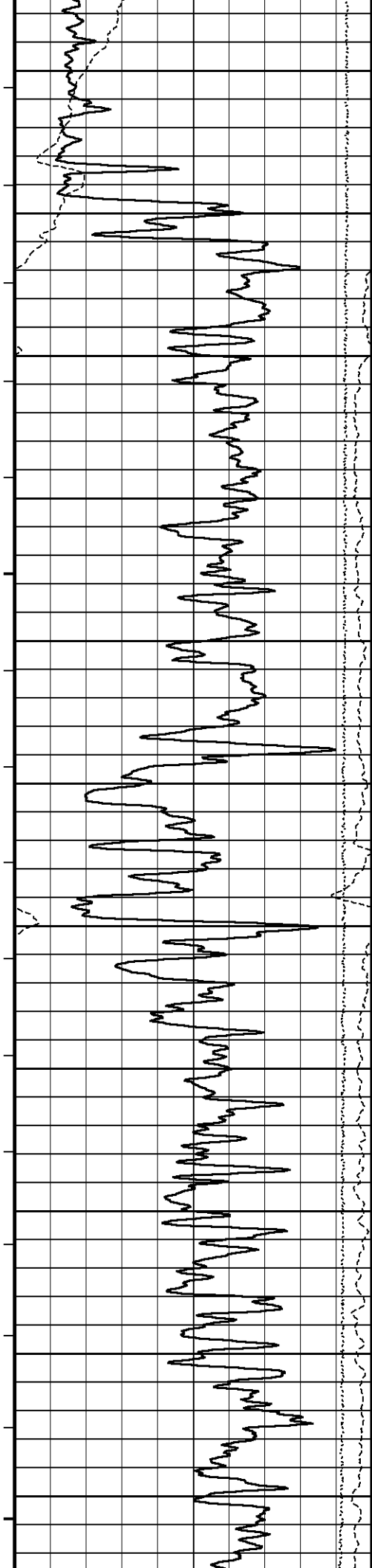
REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MSS, MML
Hardware: MPD: 8 inch profile plate used. MAI, MFE, and MSS: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Sonic porosity calculated using 47.5 usec/ft Limestone scale.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing from TD to the top of detail = 227 cubic feet
Total hole volume from TD to Surface casing= 2294 cubic feet
Service order #3537891
Rig: HD #2
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 any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.







94

1100

95°

1200

96°

1300

96°

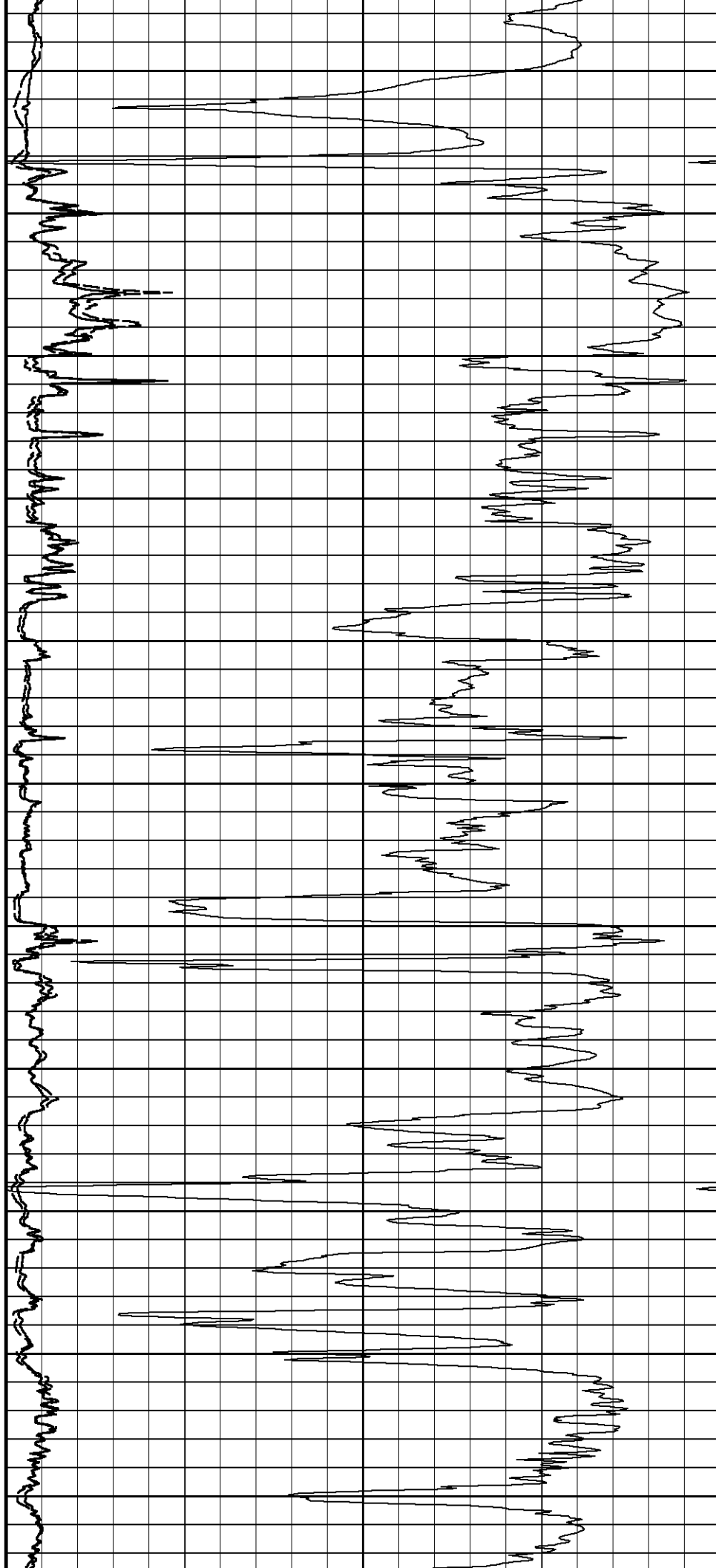
1400

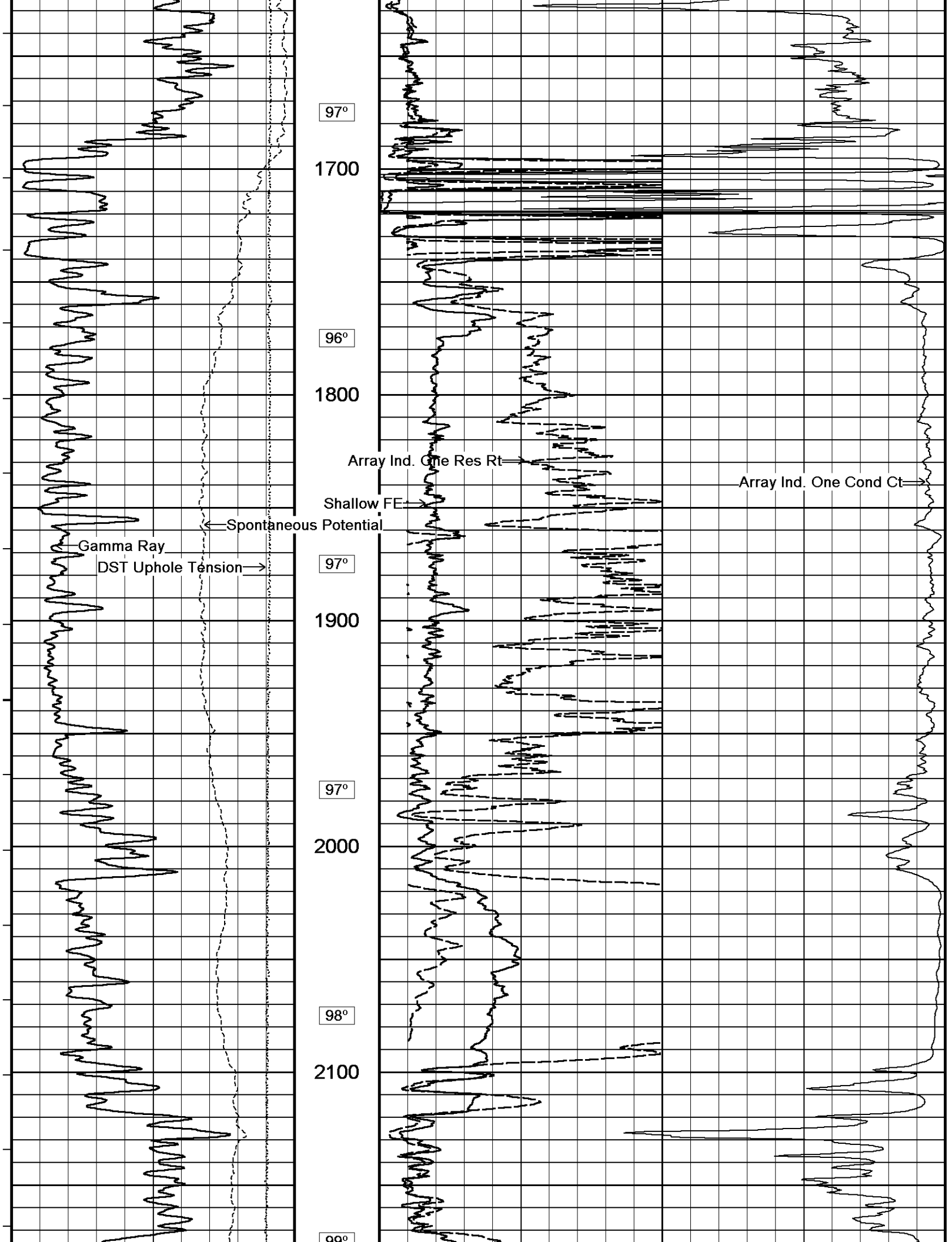
96°

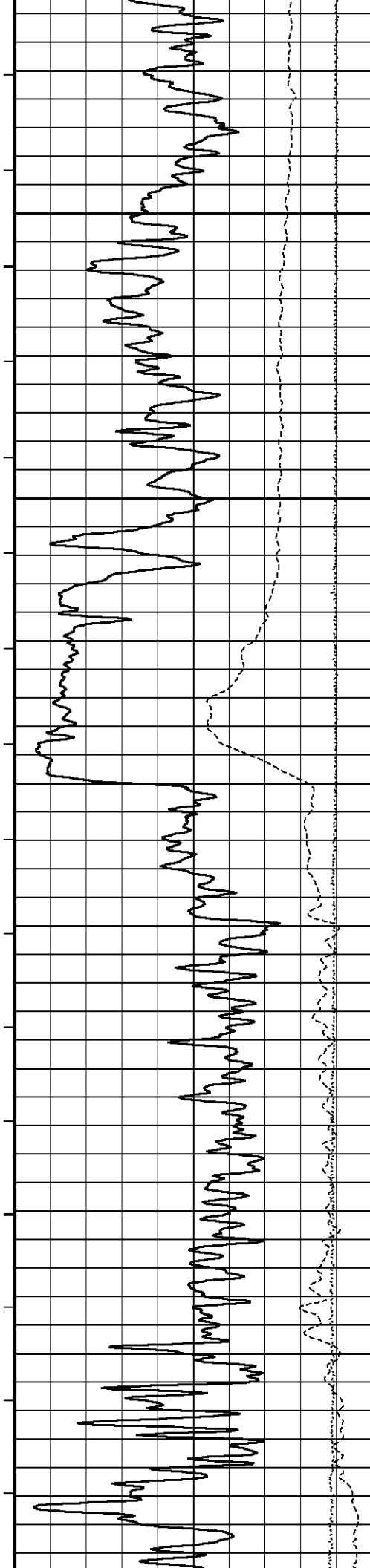
1500

97°

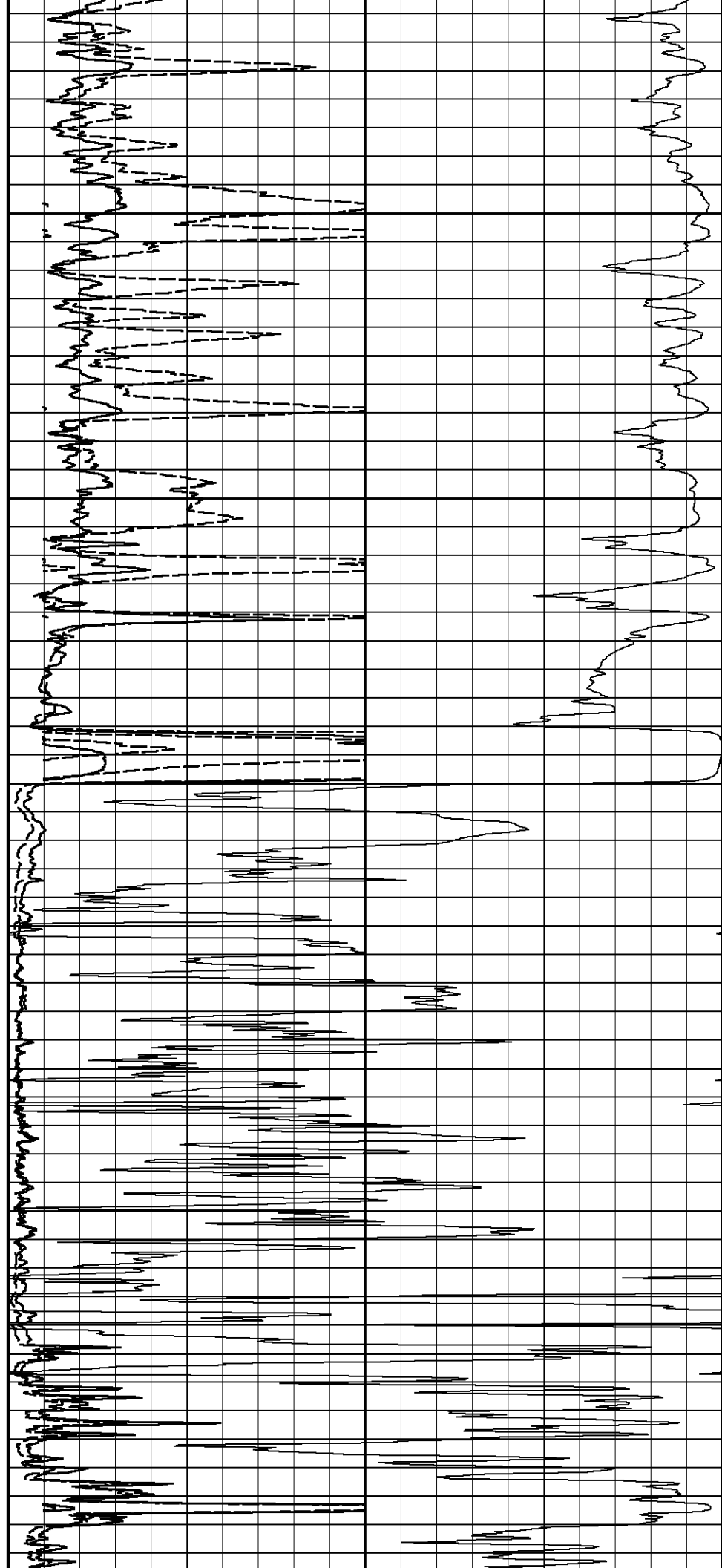
1600

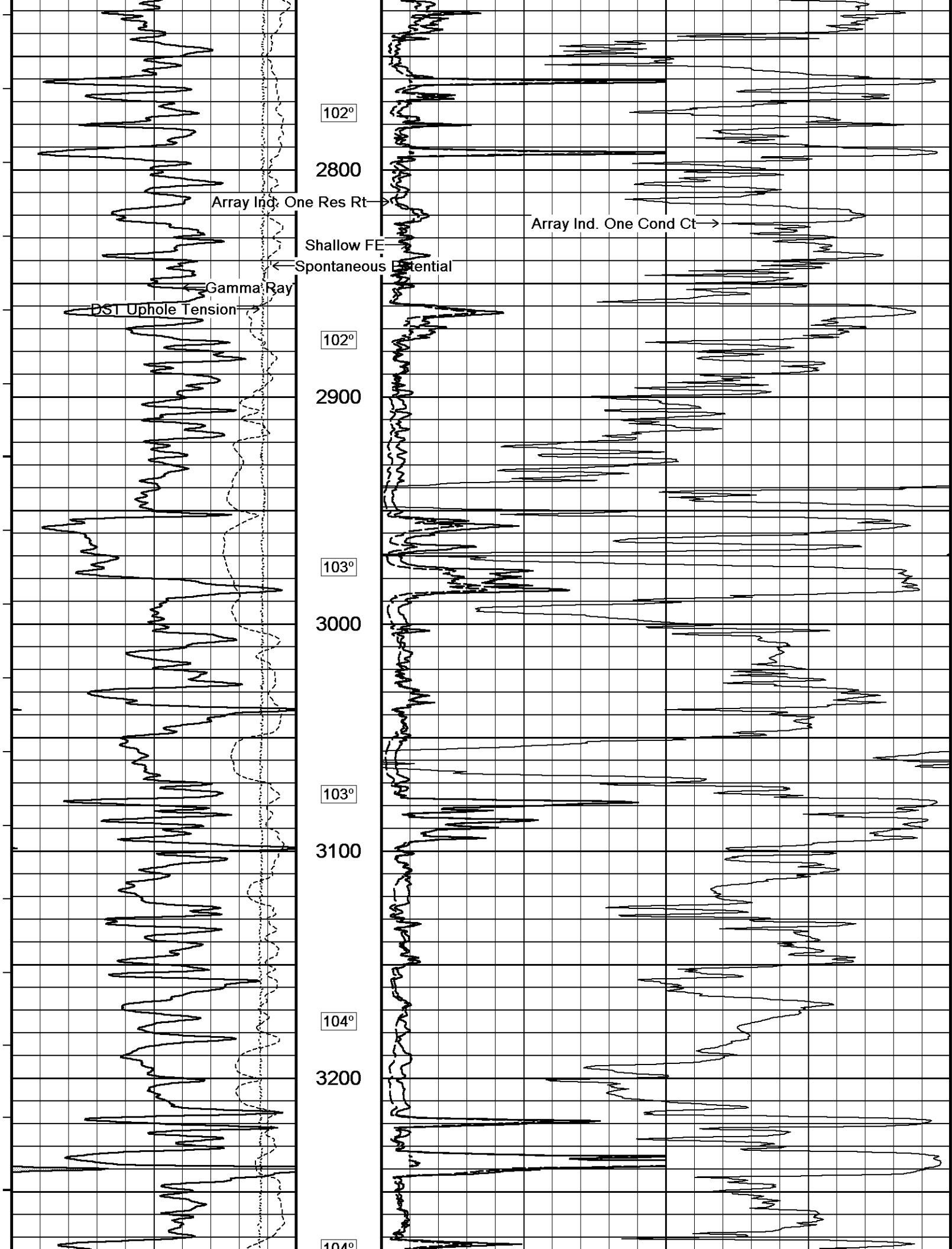


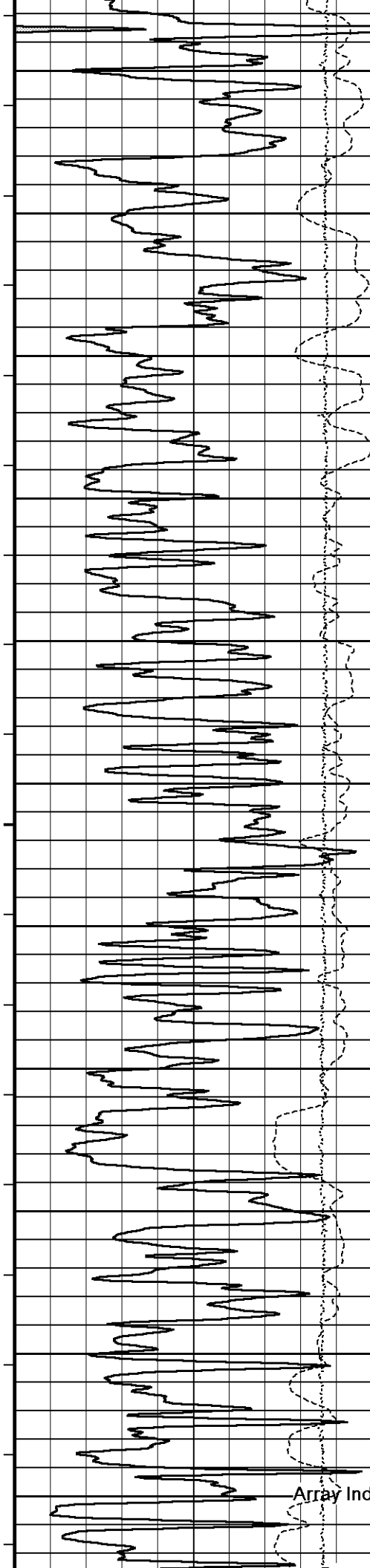




2200 100° 2300 101° 2400 101° 2500 101° 2600 101° 2700



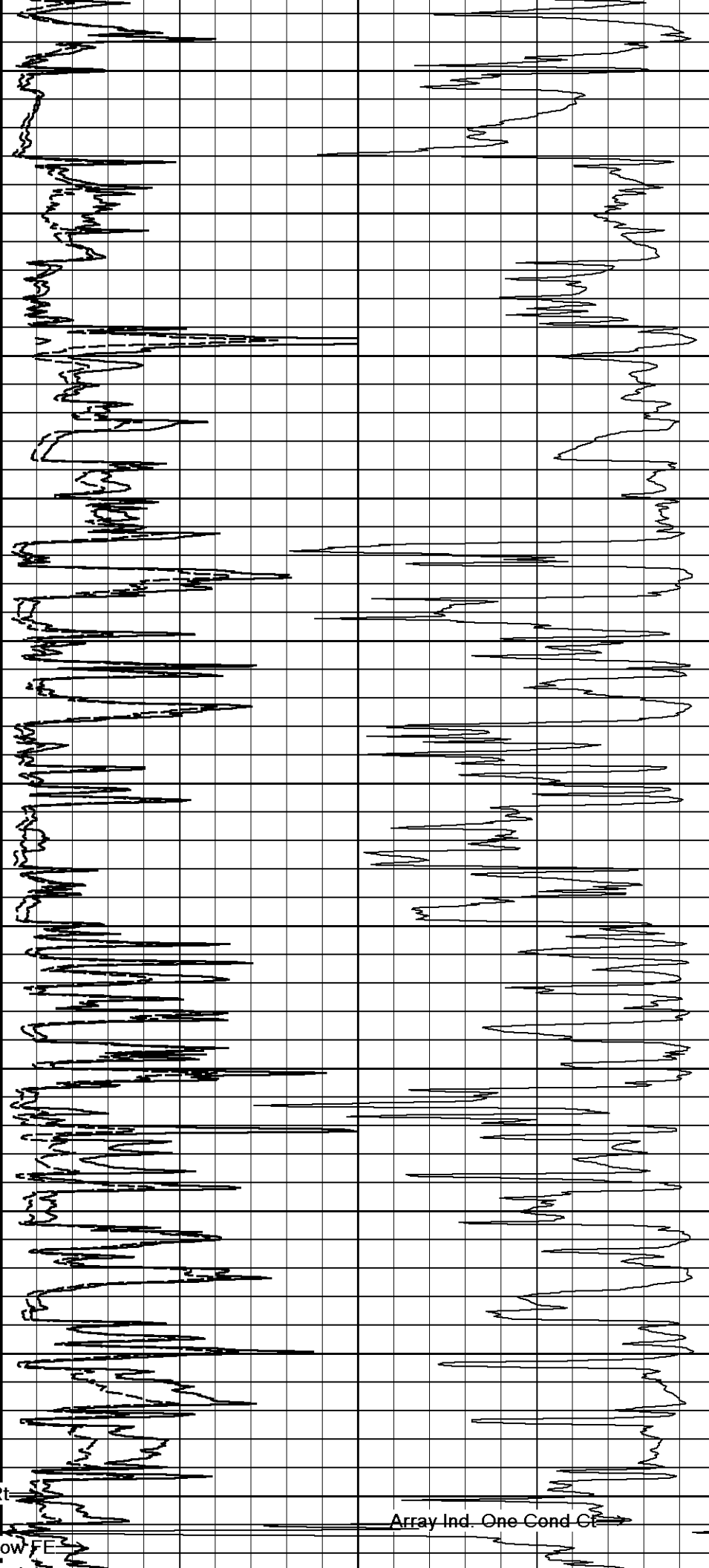




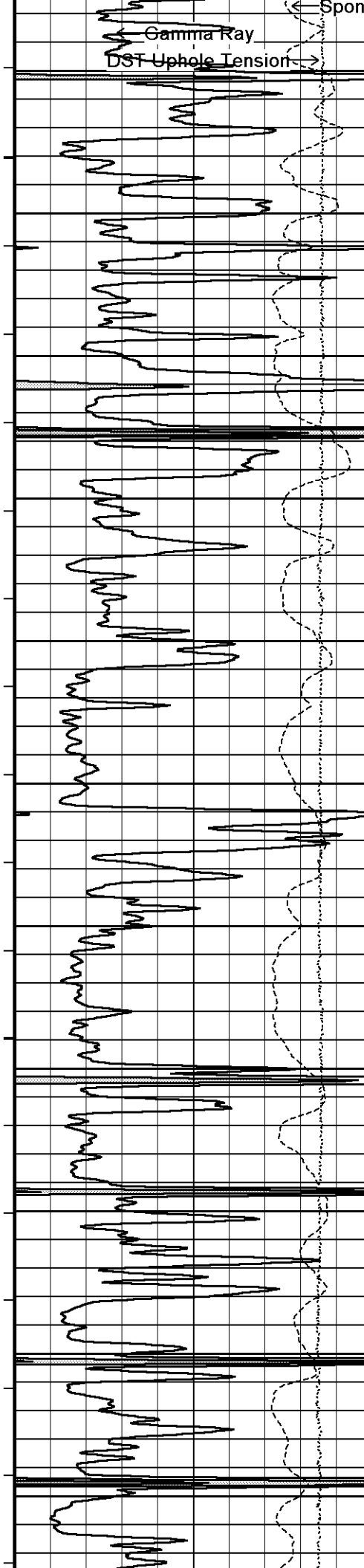
104
3300
105°
3400
105°
3500
105°
3600
106°
3700
106°

Array Ind. C3800s Rt

Shallow FE



Array Ind. One Cond Ct



Spontaneous Potential

107°

3900

107°

4000

108°

4100

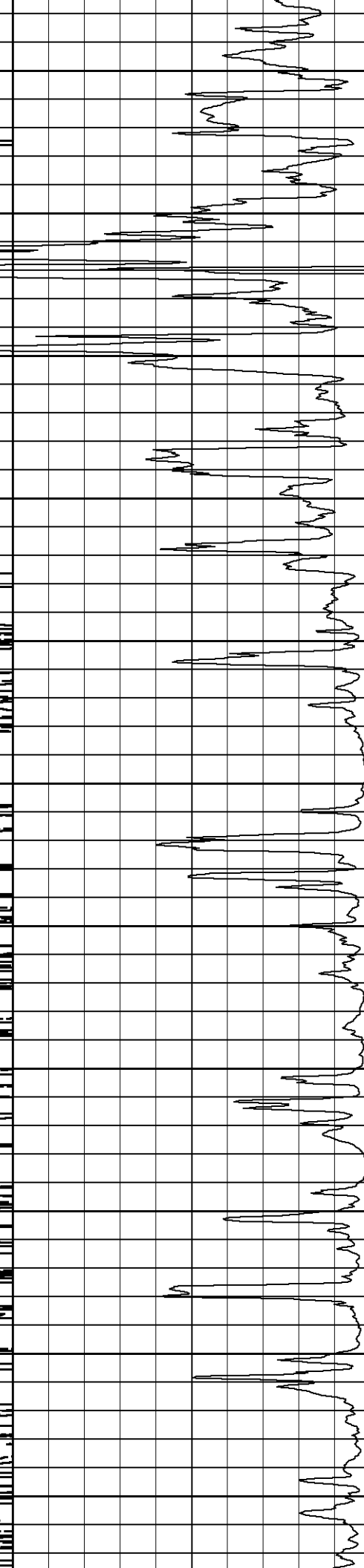
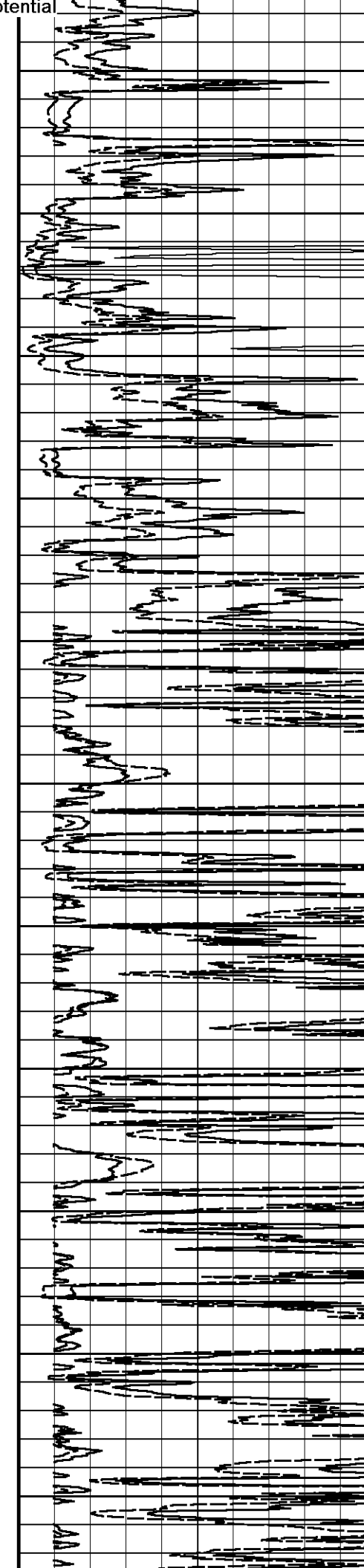
108°

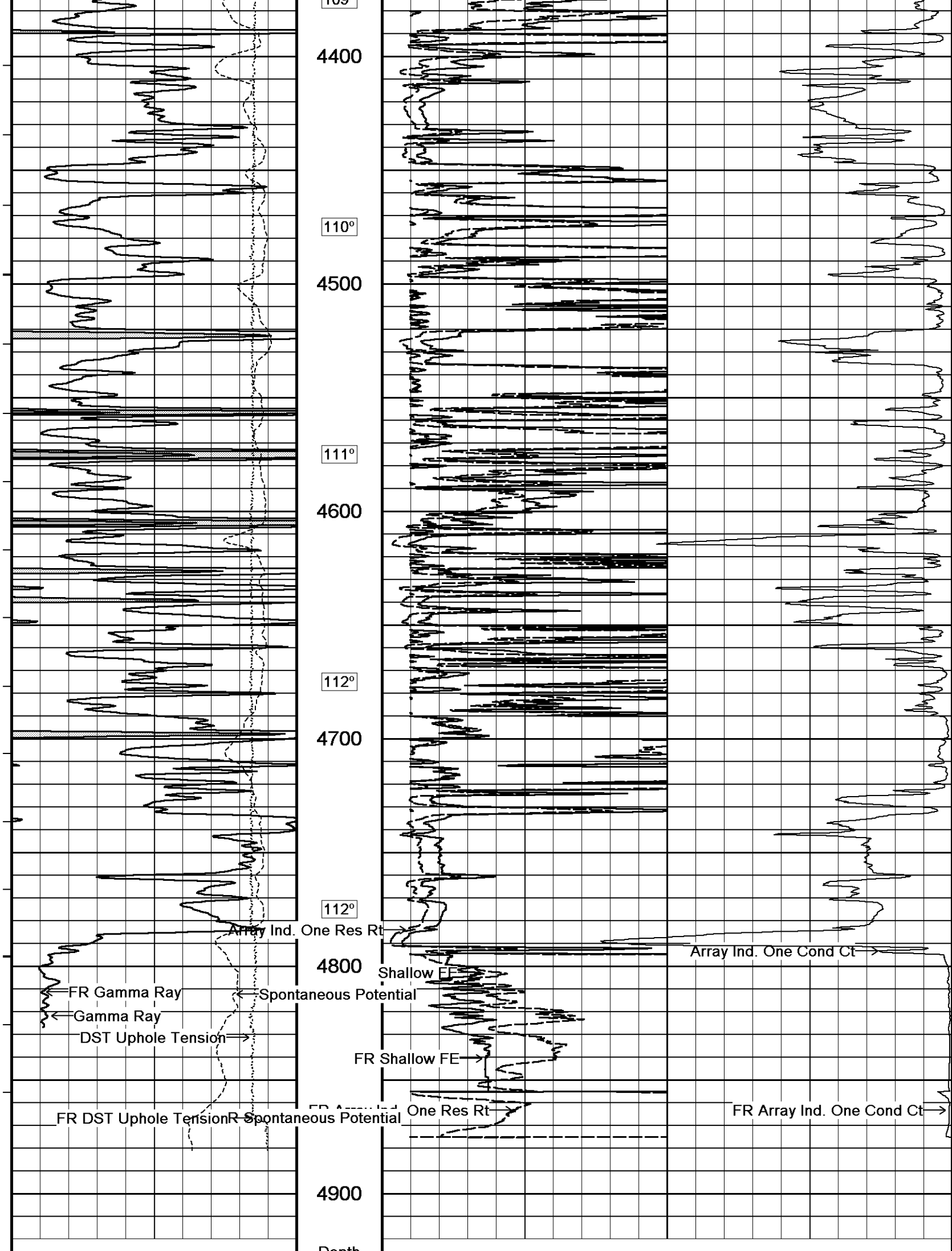
4200

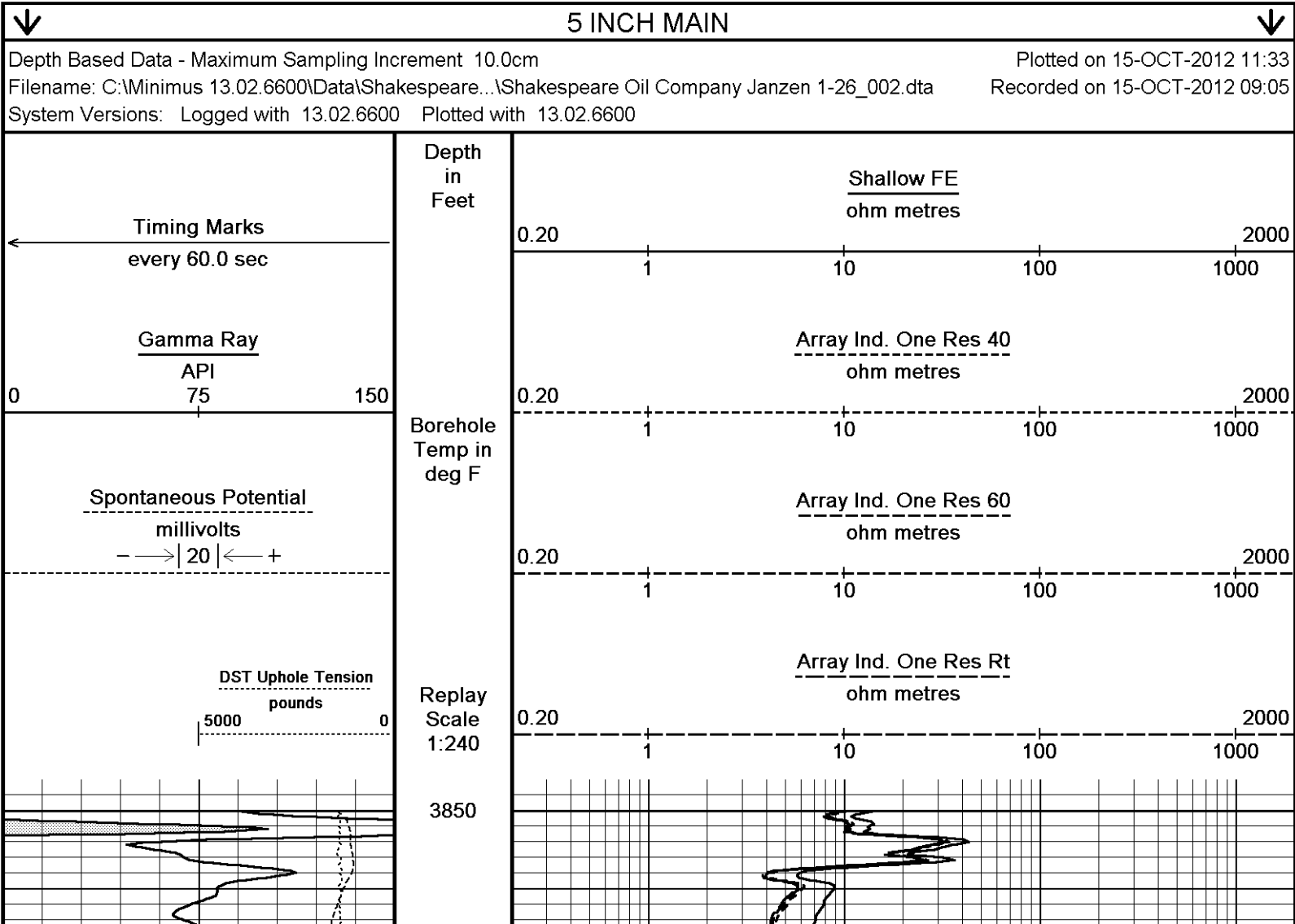
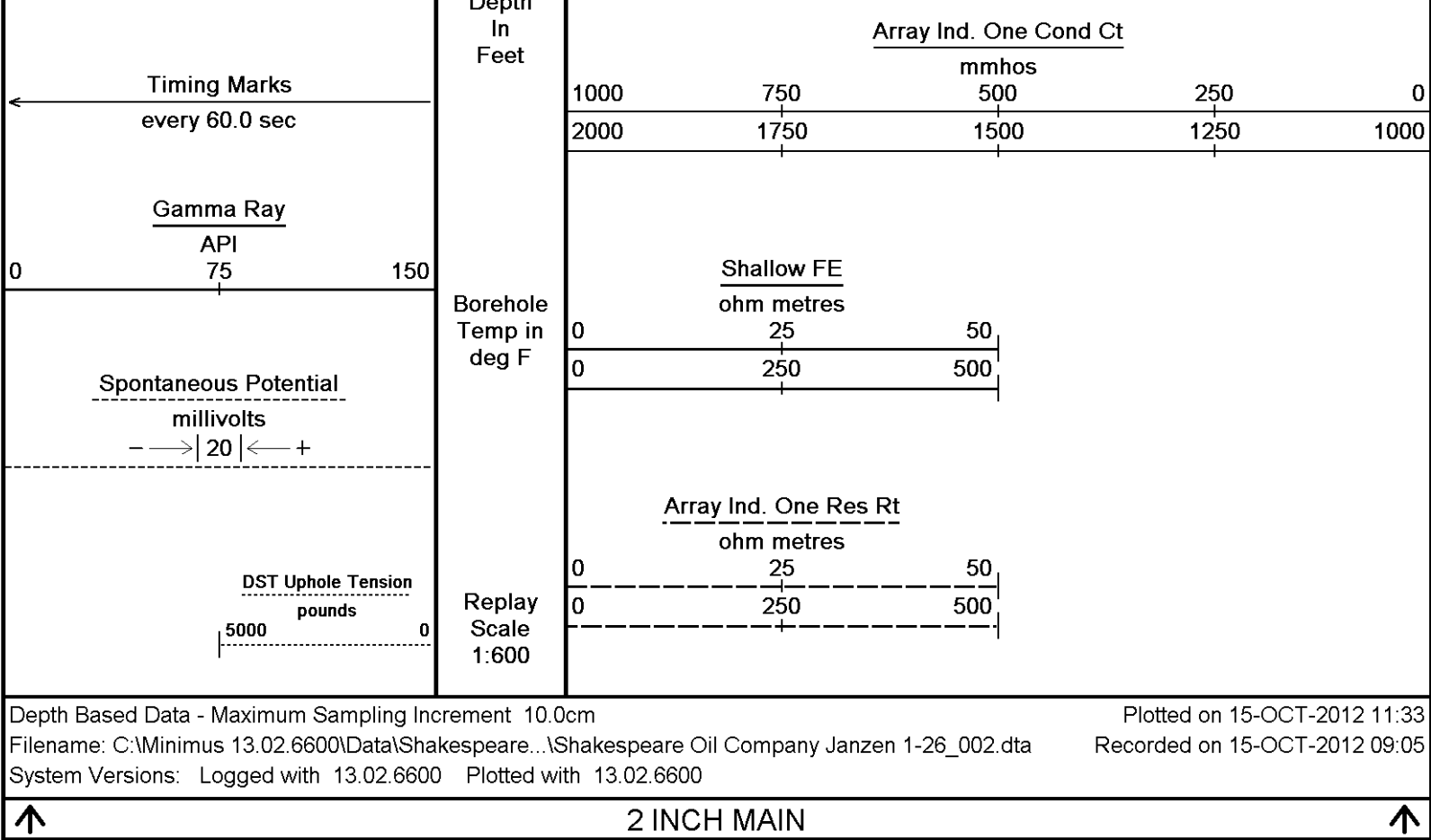
109°

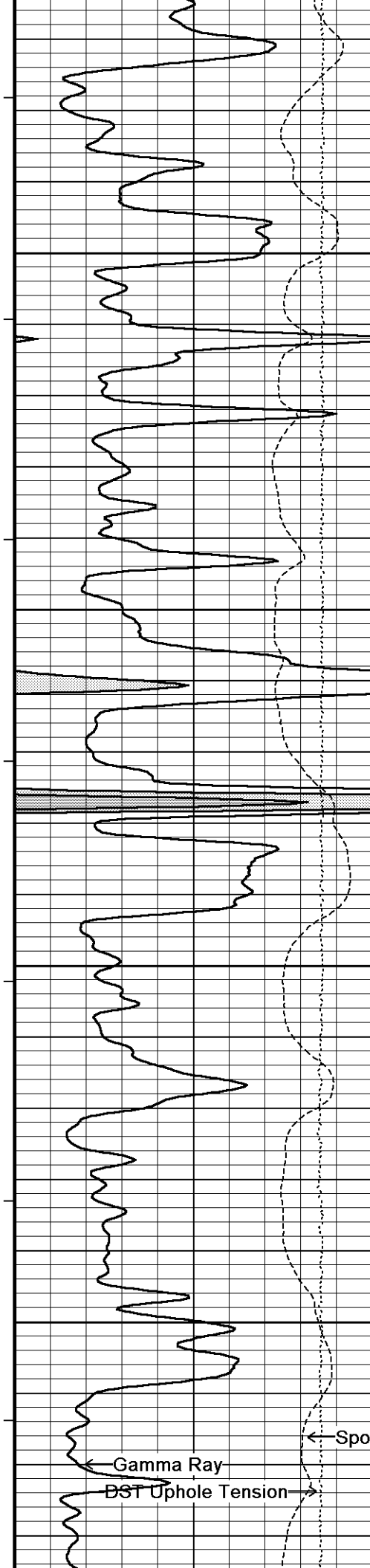
4300

100°









107°

3900

107°

3950

108°

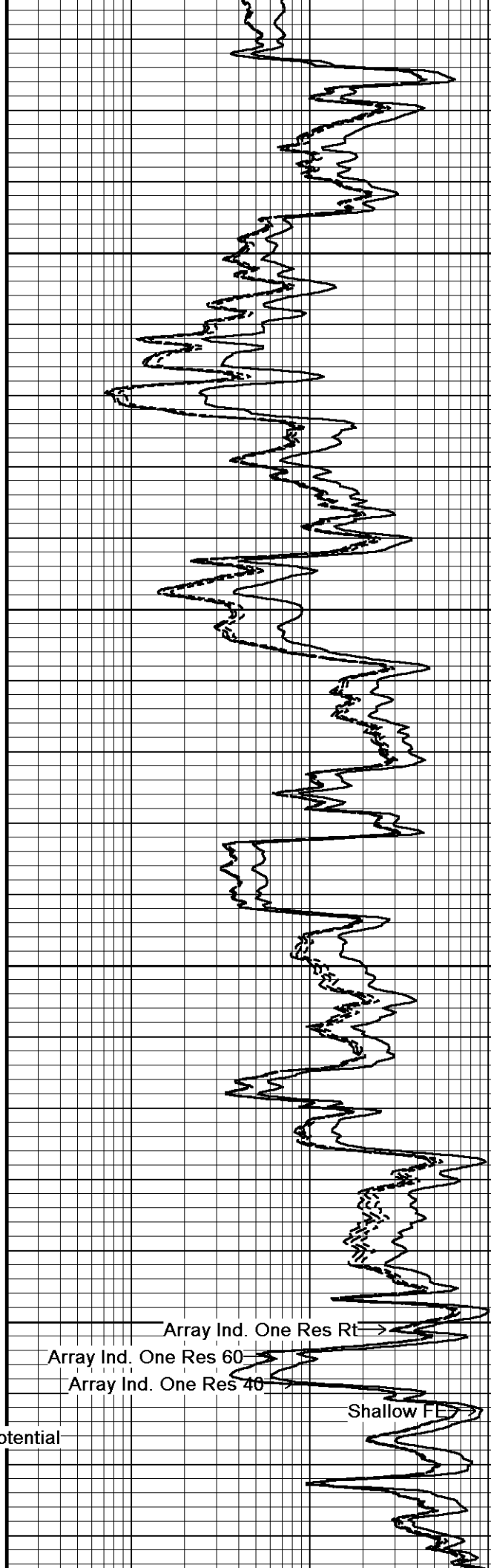
4000

108°

4050

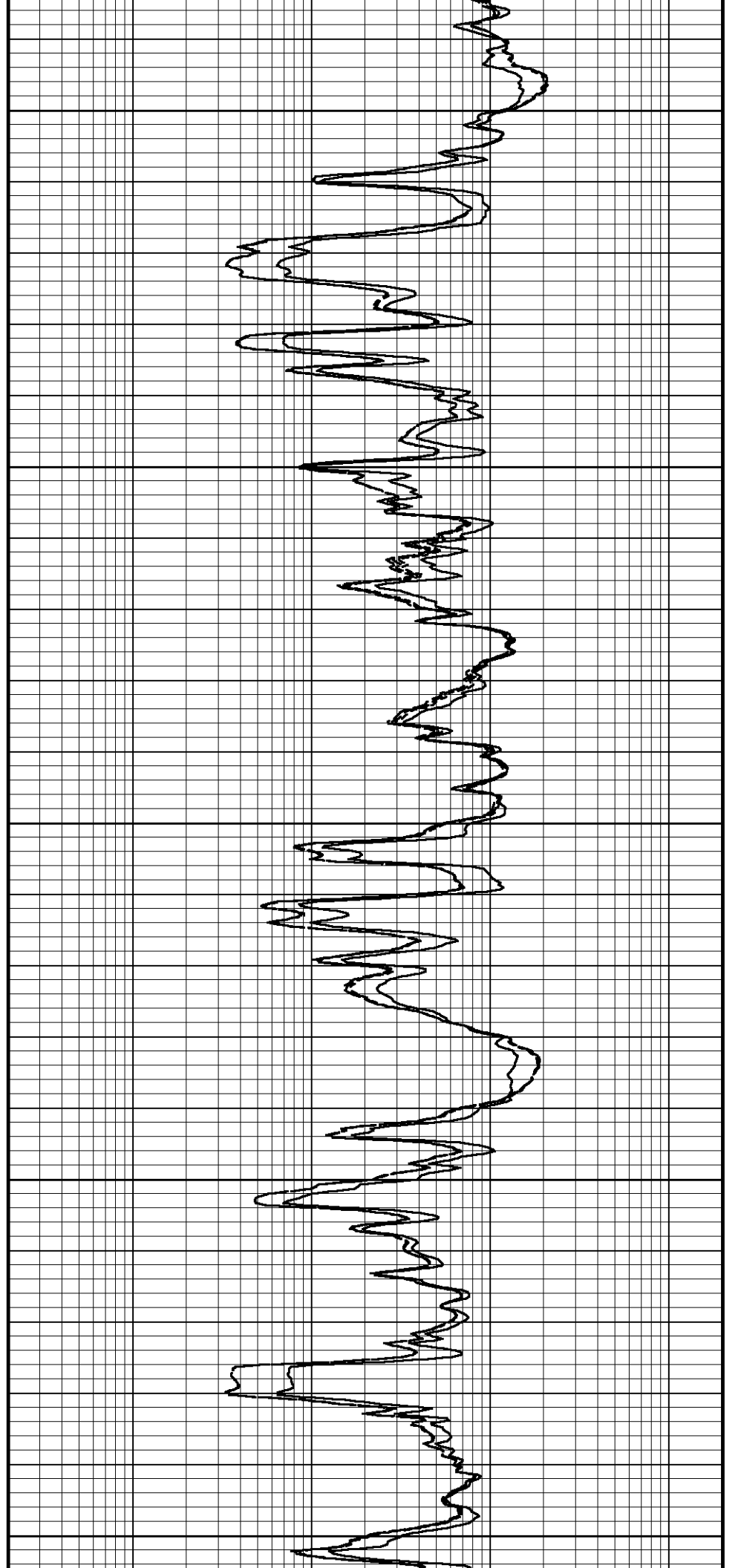
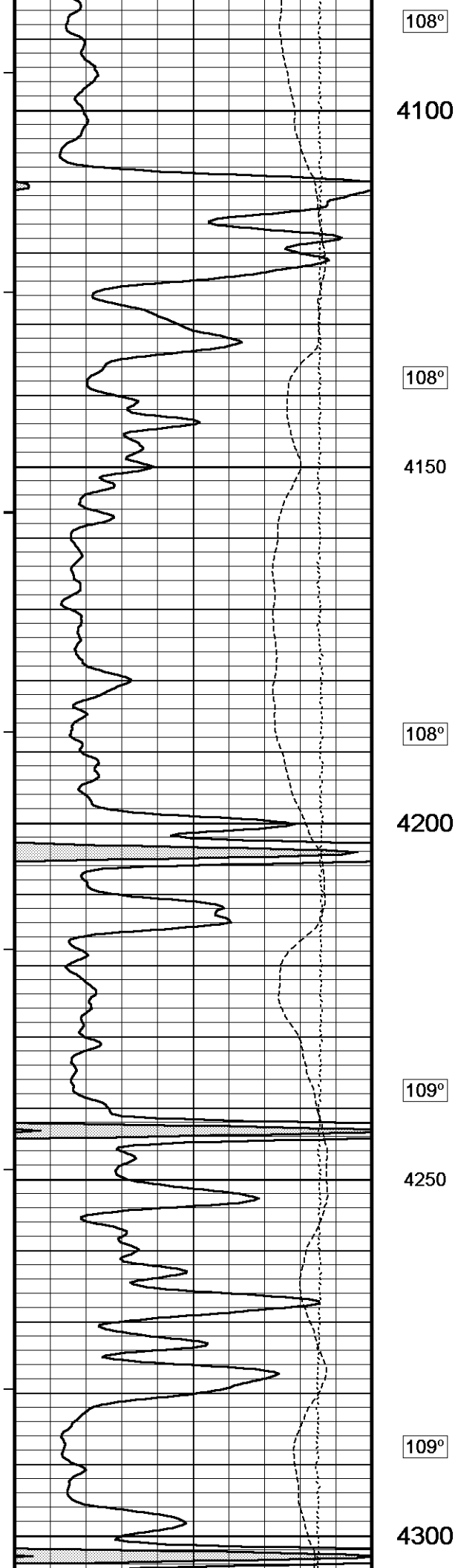
← Gamma Ray
DST Uphole Tension →

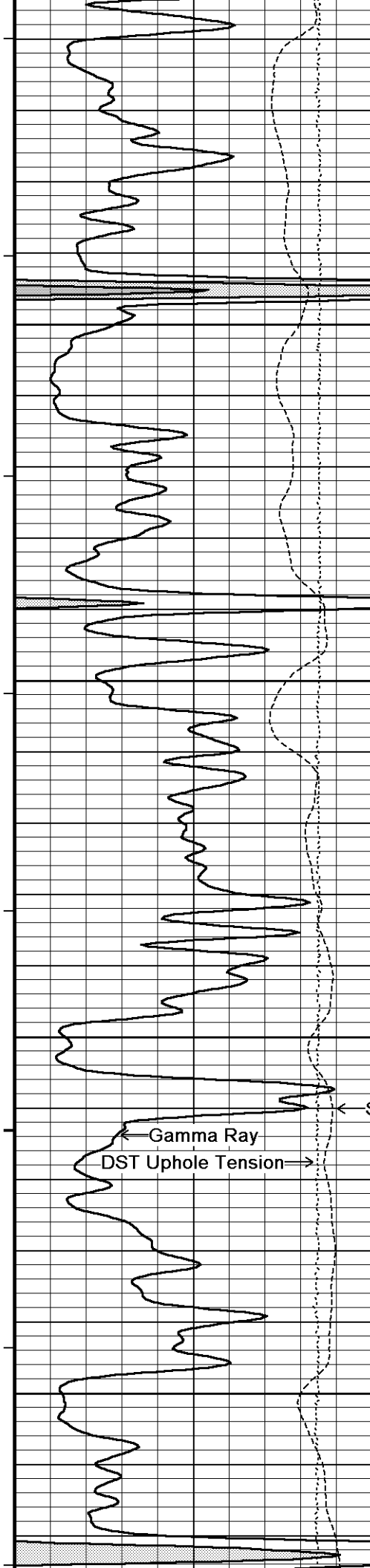
← Spontaneous Potential



Array Ind. One Res Rt →
Array Ind. One Res 60 →
Array Ind. One Res 40 →

Shallow FLS →





109°

4350

110°

4400

110°

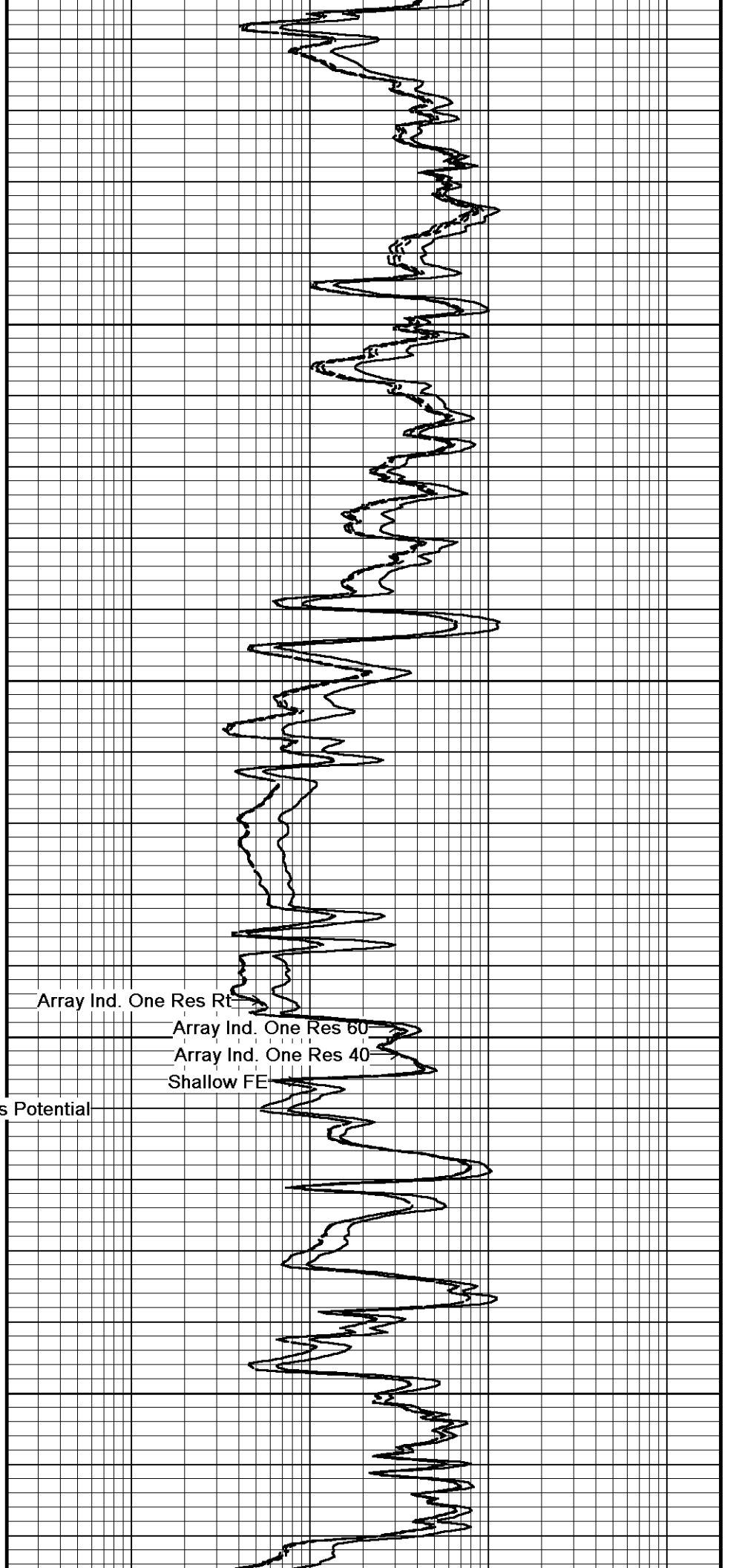
4450

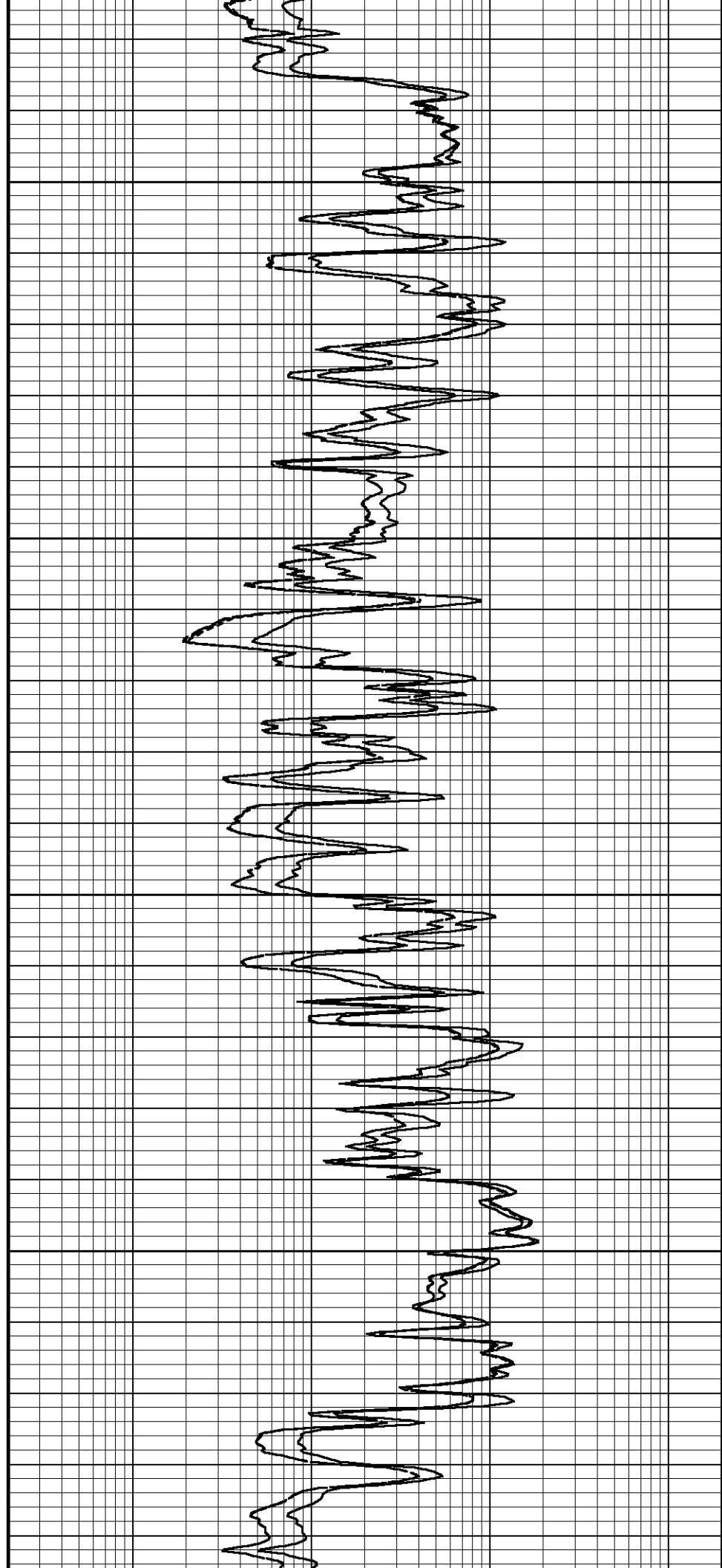
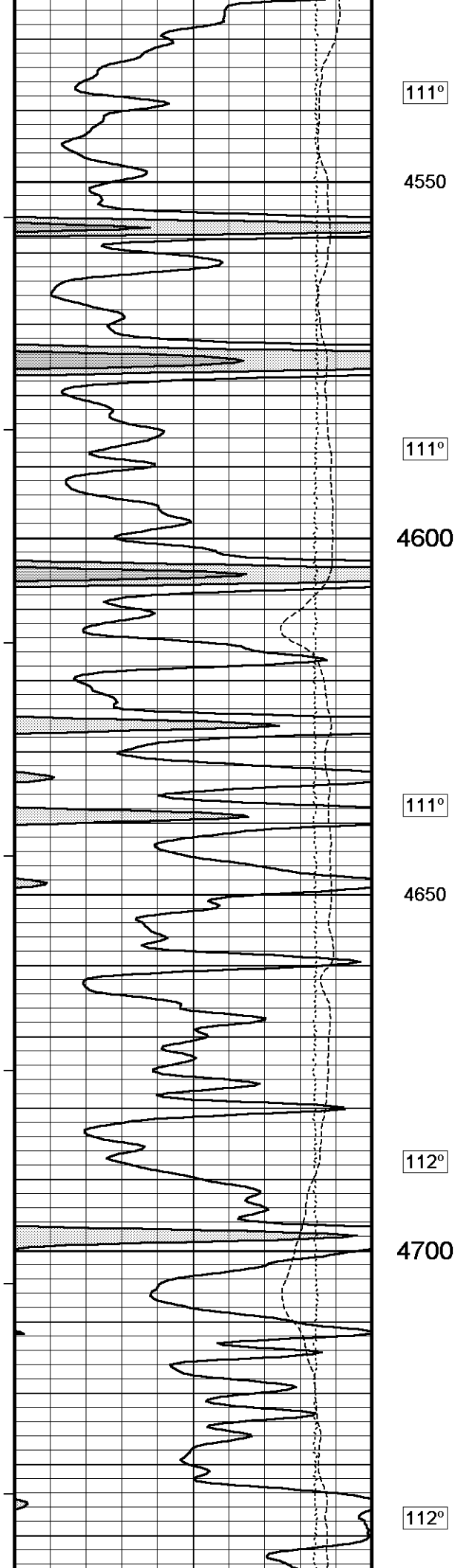
← Spontaneous Potential

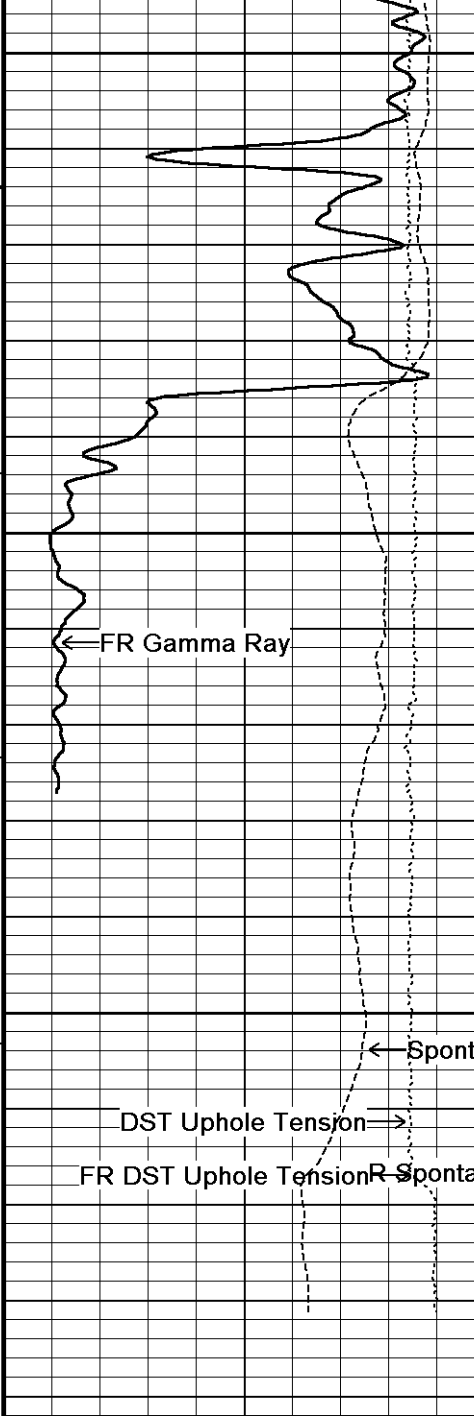
← Gamma Ray
DST Uphole Tension →

110°

4500







4750

111°

4800

4850

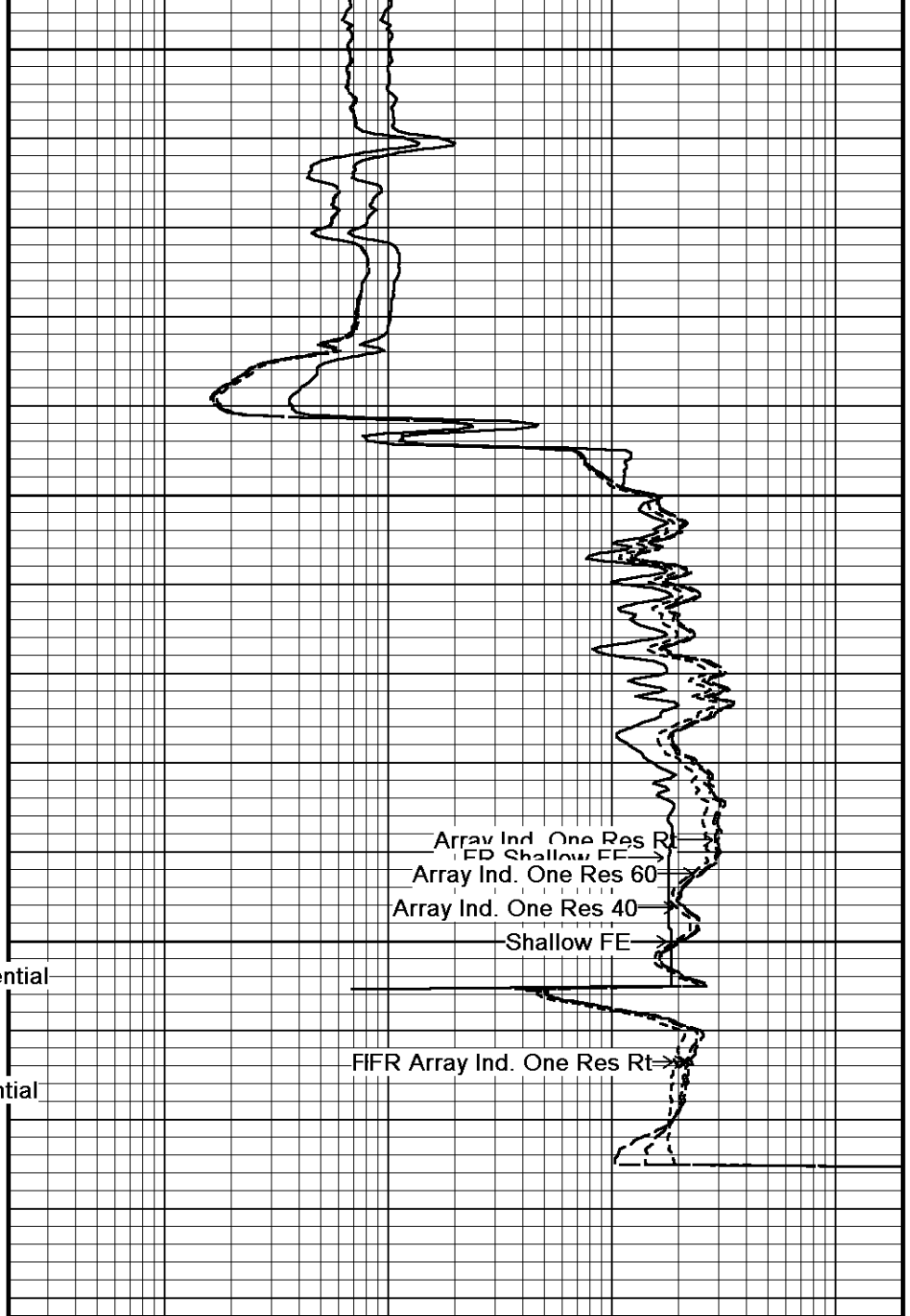
4890

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
- - - - - 20 - - - - - +

DST Uphole Tension



Shallow FE
ohm metres

0.20 1 10 100 1000 2000

Array Ind. One Res 40
ohm metres

0.20 1 10 100 1000 2000

Array Ind. One Res 60
ohm metres

0.20 1 10 100 1000 2000

Array Ind. One Res Rt
ohm metres

Borehole
Temp in
deg F

Replay

50000pounds

0

Replay
Scale
1:240

0.20

1101000

2000

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 15-OCT-2012 11:33

Filename: C:\Minimus 13.02.6600\Data\Shakespeare...\Shakespeare Oil Company Janzen 1-26_002.dta

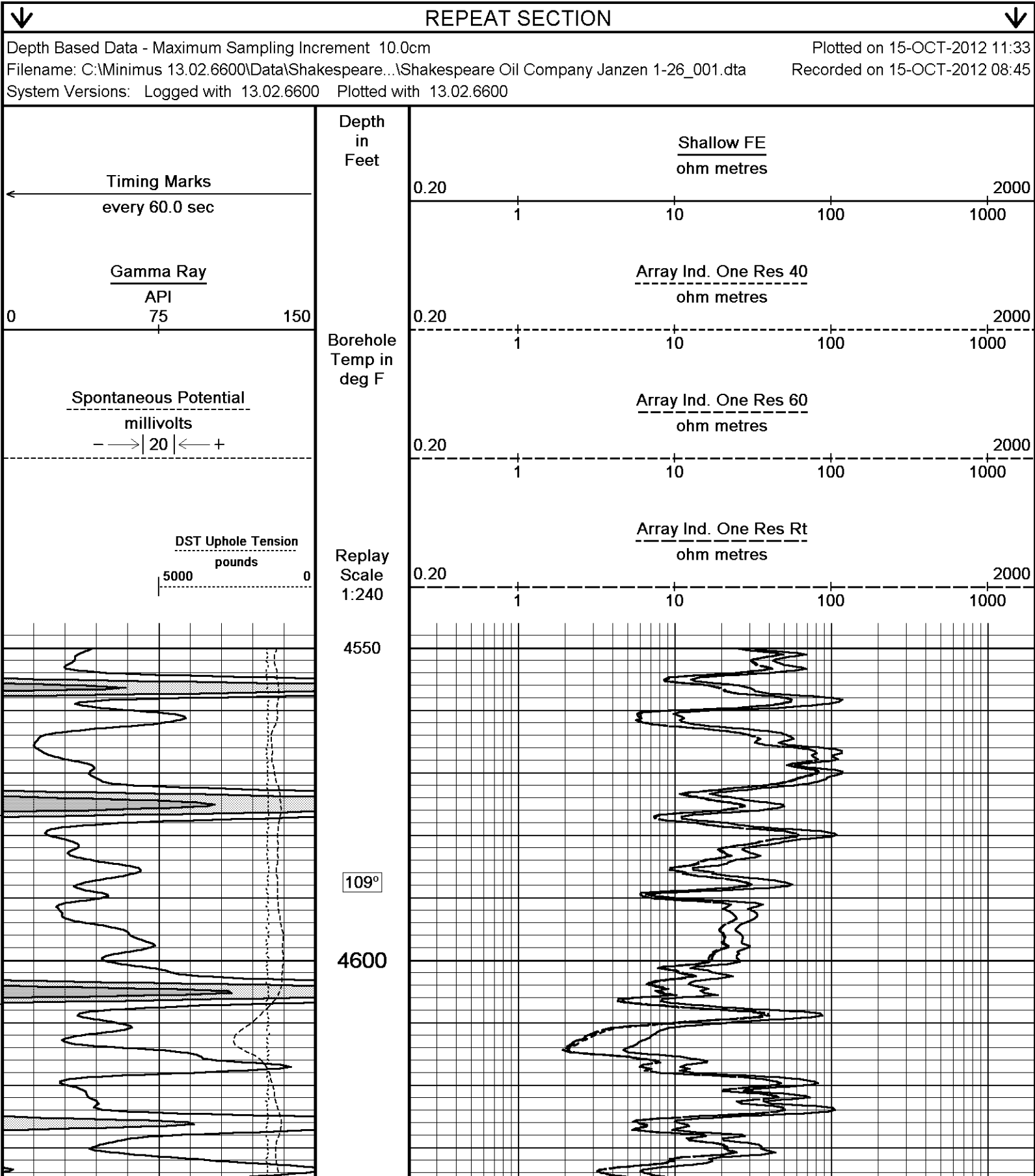
Recorded on 15-OCT-2012 09:05

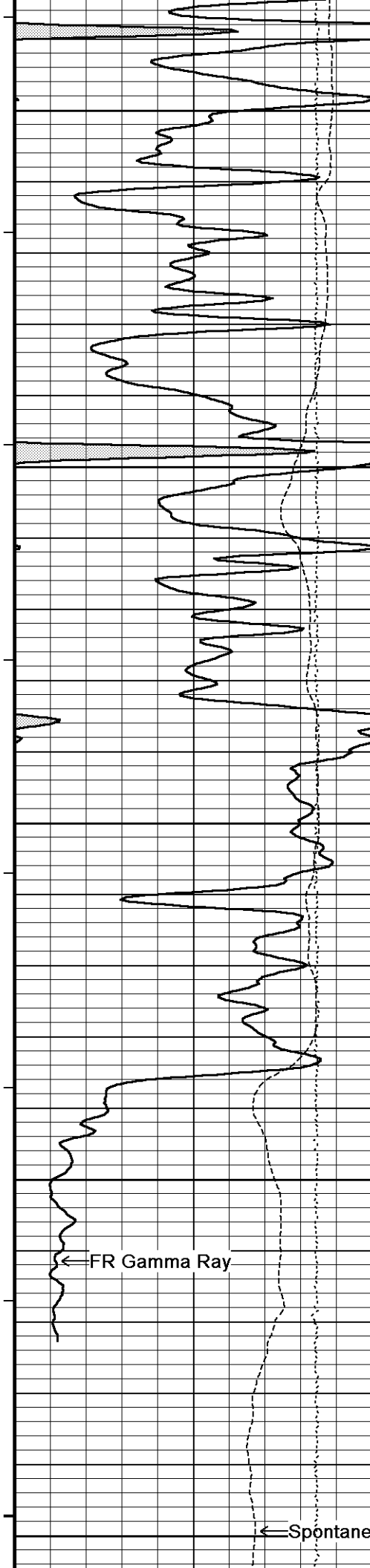
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

↑

5 INCH MAIN

↑





110°

4650

110°

4700

110°

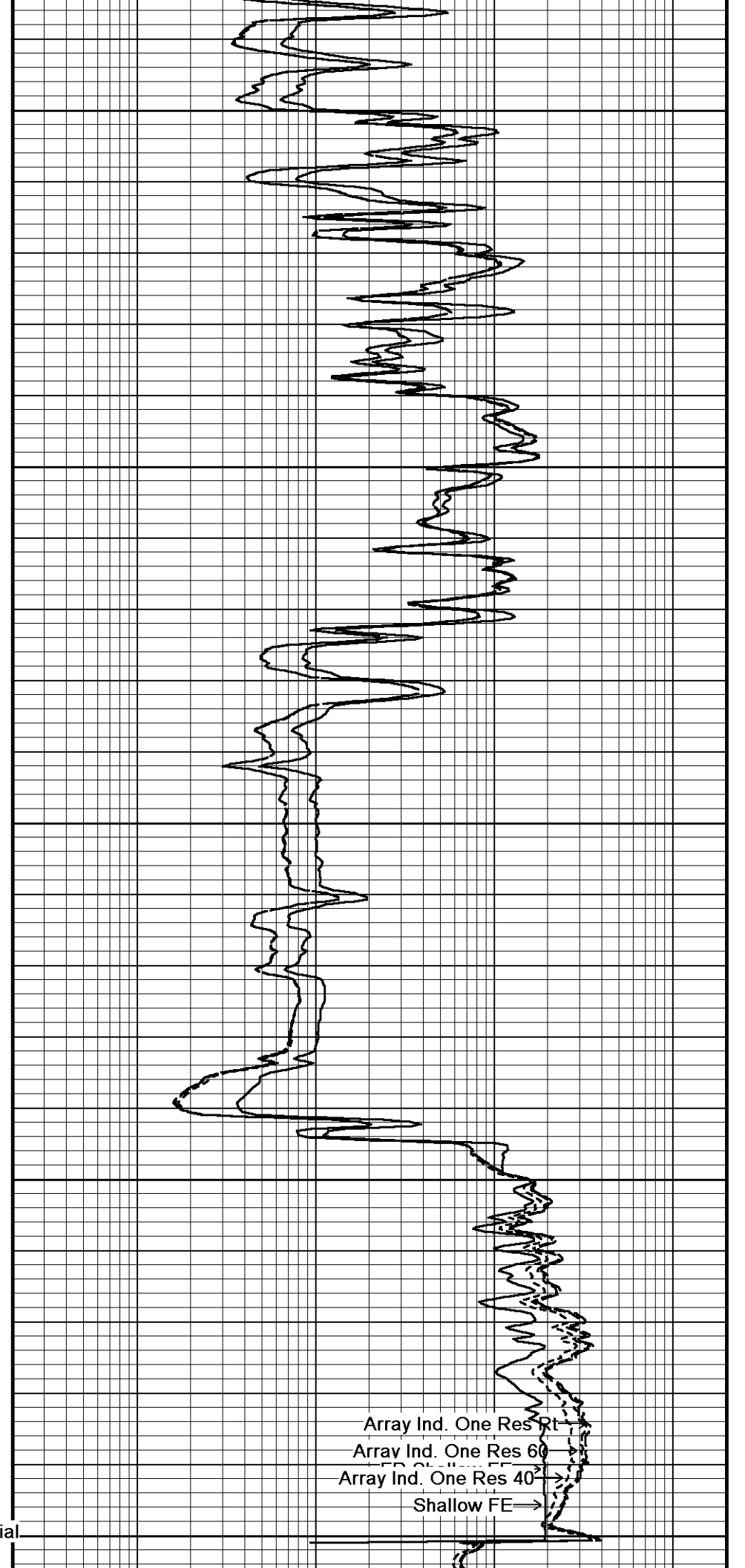
4750

109°

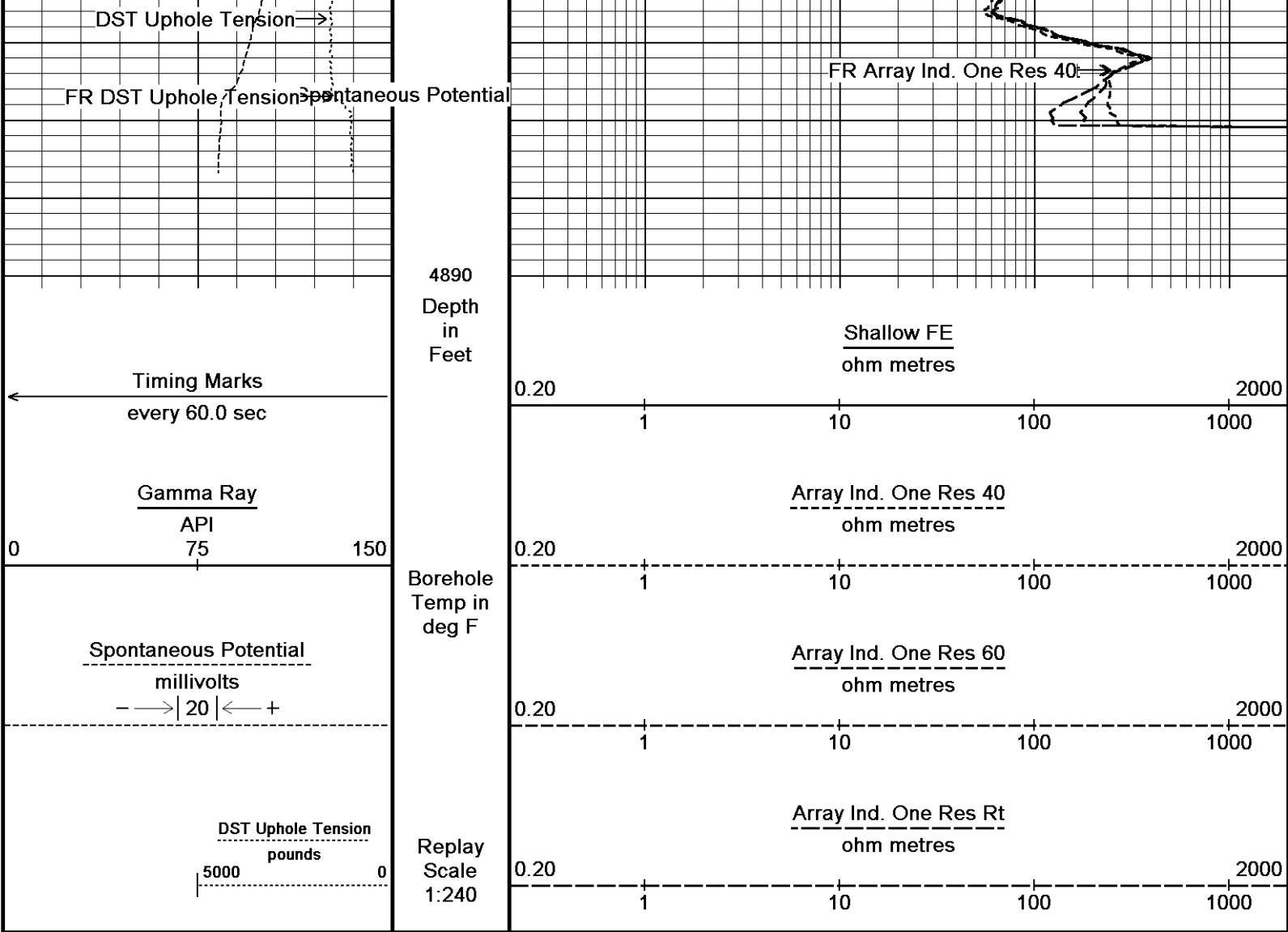
4800

← FR Gamma Ray

← Spontaneous Potential



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



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\Shakespeare Oil Company Janzen 1-26_001.dta
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600
Plotted on 15-OCT-2012 11:33
Recorded on 15-OCT-2012 08:45

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION			
C:\Minimus 13.02.6600\Data\Shakespeare Oil Company Janzen 1-26\Shakespeare Oil Company Janzen 1-26_001.dta			
General Constants All 000		Last Edited on 15-OCT-2012,06:35	
General Parameters			
Mud Resistivity	0.510	ohm-metres	
Mud Resistivity Temperature	87.000	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	Base Density Porosity		
Resistivity used	Array Ind. Four Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		

Reading No		Measured	Calibrated (lbs)	Field Calibration on 10-SEP-2012 04:28
1		15456.86	0.00	
2		16071.78	384.00	
Gamma Calibration MCG-D.K 442				Field Calibration on 14-OCT-2012 02:07
		Measured	Calibrated (API)	
Background		69	46	
Calibrator (Gross)		1152	771	
Calibrator (Net)		1083	725	
Gamma Constants MCG-D.K 442				Last Edited on 14-OCT-2012,08:31
Gamma Calibrator Number		GRC38		
Mud Density		1.12	gm/cc	
Caliper Source for Processing		Density Caliper		
Tool Position		Eccentred		
Concentration of KCl		0.00	kppm	
SP Calibration MCG-D.K 442				Field Calibration on 17-JUL-2012 16:34
		Measured	Calibrated (mV)	
Reference 1		100.2	100.0	
Reference 2		-99.9	-100.0	
High Resolution Temperature Calibration MCG-D.K 442				Field Calibration on 17-JUL-2012,16:35
		Measured	Calibrated(Deg F)	
Lower		50.00	50.00	
Upper		100.00	100.00	
High Resolution Temperature Constants MCG-D.K 442				Last Edited on
Pre-filter Length		11		
Caliper Calibration MML-A 16				Base Calibration on 30-SEP-2012 19:38 Field Calibration on 14-OCT-2012 02:01
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		13888	5.98	
2		16946	7.97	
3		20169	9.86	
4		23996	11.92	
5		0	0.00	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		6.03	5.98	
Micro Normal and Micro Inverse Calibration MML-A 16				Base Calibration on 30-SEP-2012 19:42 Field Check on 14-OCT-2012 02:02
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	78.4	5.0	25.0
		Base Check (ohm-m)	Field Check (ohm-m)	
Channel				
Micro Normal		62.9	62.9	
Micro Inverse		48.2	48.2	
Micro Normal and Micro Inverse Constants MML-A 16				Last Edited on 14-OCT-2012,02:01
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 10-OCT-2012 14:12 Field Check on 14-OCT-2012 02:13
Base Calibration				
		Measured	Calibrated (cps)	

	Near	Far	Near	Far
	3058	95	3714	110
Ratio	32.033		33.764	
Field Calibrator at Base			Calibrated (cps)	
			1673	2395
Ratio			0.698	
Field Check			Calibrated (cps)	
			1678	2400
Ratio			0.699	

Neutron Constants MDN-A.B 66			Last Edited on 14-OCT-2012,08:31	
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	Constant Value			
Formation Pressure	0.00	kpsi		
Temperature Source	Constant Value			
Temperature	68.00	degrees F		
Mud Salinity	0.00	kppm		
Salinity Correction	Not Applied			
Formation Fluid Salinity Source	Constant Value			
Formation Fluid Salinity	0.00	kppm		
Barite Mud Correction	Not Applied			

FE Calibration MFE-B.J 353			Base Calibration on 01-OCT-2012 09:16 Field Check on 14-OCT-2012 01:52	
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	965.2	126.8		
Base Check		280.7		
Field Check		280.9		

FE Constants MFE-B.J 353			Last Edited on 14-OCT-2012,08:30	
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-A.A 55	Last Edited on 15-OCT-2012,06:36	
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					

Offset	Measured	Calibrated
	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	

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 167	Field Calibration on 17-JUL-2012,13:53
	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants	MAI-A.A 167	Last Edited on 17-JUL-2012,13:49
Pre-filter Length	11	

Induction Calibration	MAI-A.A 167	Base Calibration on 17-JUL-2012,13:55
		Field Check on 14-OCT-2012 01:51

Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.3	474.2	9.3	966.2	
2	6.3	388.4	7.6	821.4	
3	3.3	259.4	5.2	566.0	
4	1.9	133.0	2.6	279.2	
Array Temperature	76.8		Deg F		

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	12.3	3841.0
2	0.0	0.0	29.3	3478.5
3	0.0	0.0	28.9	3054.3
4	0.0	0.0	19.7	2082.6
Deep	0.0	0.0	18.5	2049.7
Medium	0.0	0.0	42.1	3992.9
Shallow	0.0	0.0	42.5	5056.6

Array Temperature

0.0

64.3

Deg F

Induction Constants MAI-A.A 167

Last Edited on 14-OCT-2012,08:30

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 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 MPD-B 64

Base Calibration on 10-OCT-2012 12:35

Field Calibration on 14-OCT-2012 01:53

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12128	3.99
2	20753	5.98
3	29254	7.97
4	37705	9.86
5	46896	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.95	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 10-OCT-2012 12:54

Field Check on 14-OCT-2012 02:00

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	58951	32645	59556	30836
Reference 2	24760	2893	24941	2541

Field Check at Base

1181.6	1375.1
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Field Check

1187.9	1371.9
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PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	215	1053		
Reference 1	22216	58751	0.381	0.371
Reference 2	6718	24623	0.276	0.272

Field Check at Base

215.0 1052.6

Field Check

215.0 1059.8

Density Constants MPD-B 64

Last Edited on 14-OCT-2012,08:30

Density Source Id	18235B
Nylon Calibrator Number	DNCE695
Aluminium Calibrator Number	DACD698
Density Shoe Profile	8 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.12 gm/cc
Mud Density Z/A Multiplier	1.11
Mud Filtrate Density	1.00 gm/cc
Dry Hole Mud Filtrate Density	1.00 gm/cc
DNCT	0.00 gm/cc
CRCT	0.00 gm/cc
Density Z/A Correction	Hybrid

Matrix Density (gm/cc)	Depth (ft)
2.87	
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

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.6600\Data\Shakespeare Oil Company Janzen 1-26\Shakespeare Oil Company Janzen 1-26_001.dta

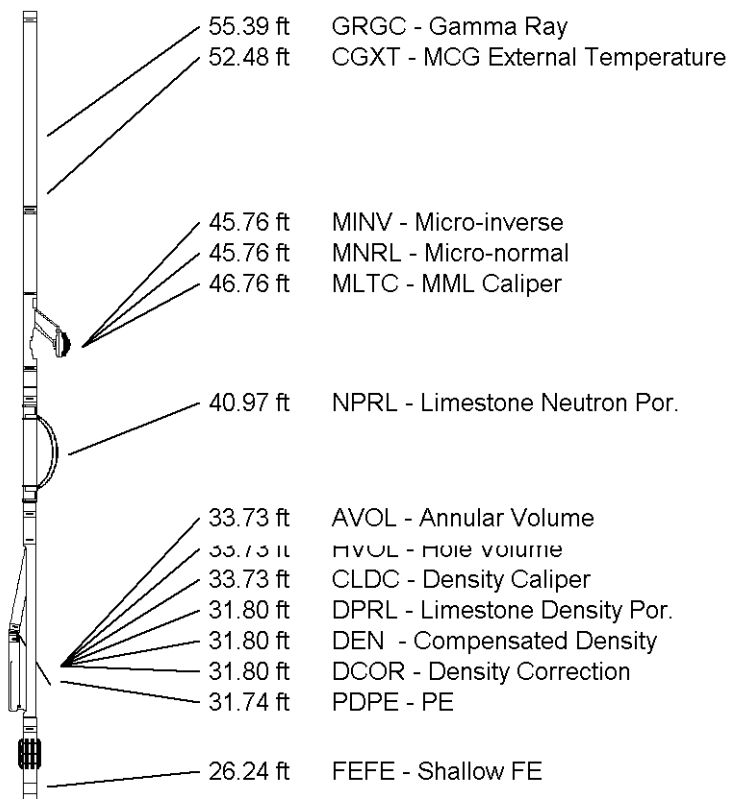
Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

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

Compact 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

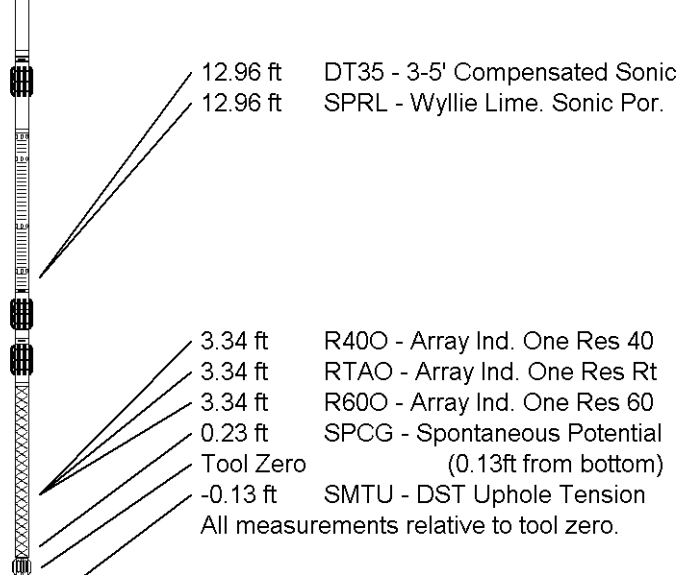
Compact Focused Electric
MFE-B 1352 LG: 6.95 ft WT: 48.5 lb OD: 2.24 in



Compact Sonic
MSS-A-A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAL-AA 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 60.68 ft Weight: 456.4 lb



COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	JANZEN #1-26
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3119.00	feet	First Reading	4864.00	feet
Elevation Drill Floor	3118.00	feet	Depth Driller	4870.00	feet
Elevation Ground Level	3109.00	feet	Depth Logger	4867.00	feet



ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

Weatherford®



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY
SHAKESPEARE OIL COMPANY, INC.

WELL
JANZEN #1-2B

FIELD
WILDCAT

COUNTRY/STATE
U.S.A. / KANSAS

LOCATION
2000' FSL & 900' FEL

SE/4

SEC
2B

TRIP
15-171-20999

API Number
Permit Number

RECE
34W

Other Services
MP/MD/N

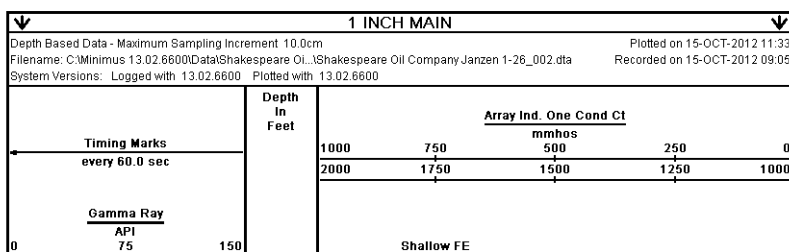
MSS

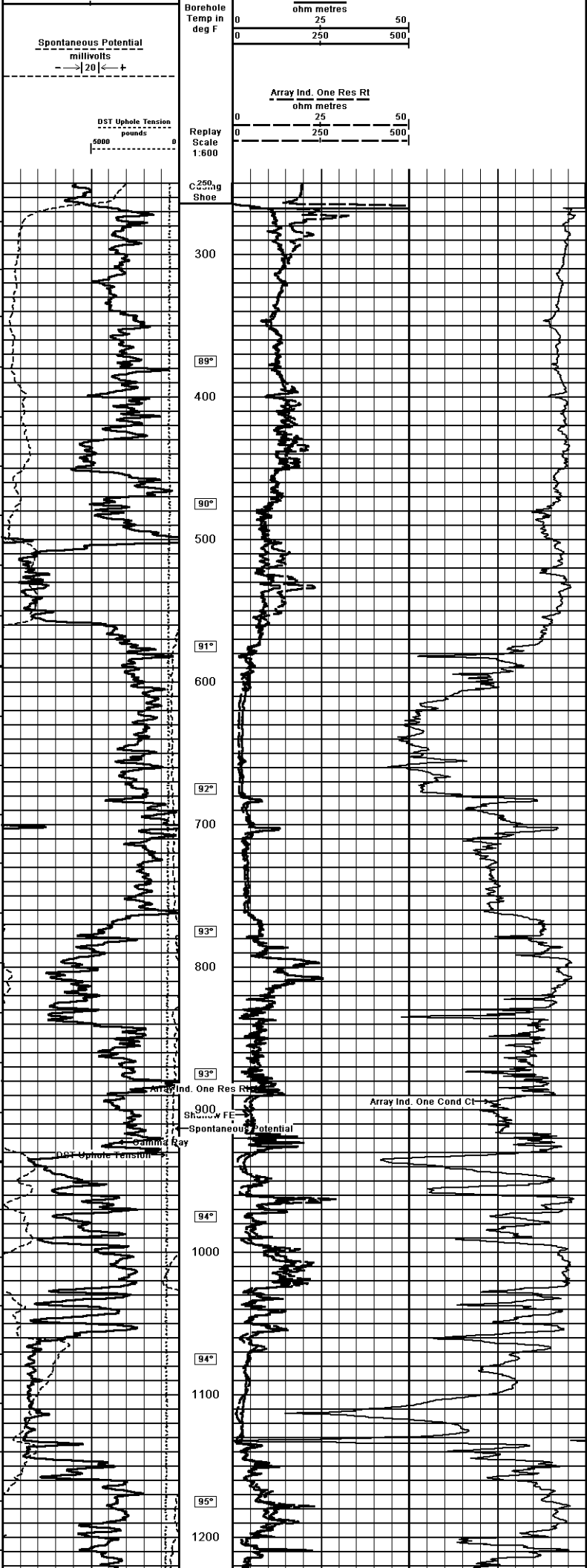
MLL

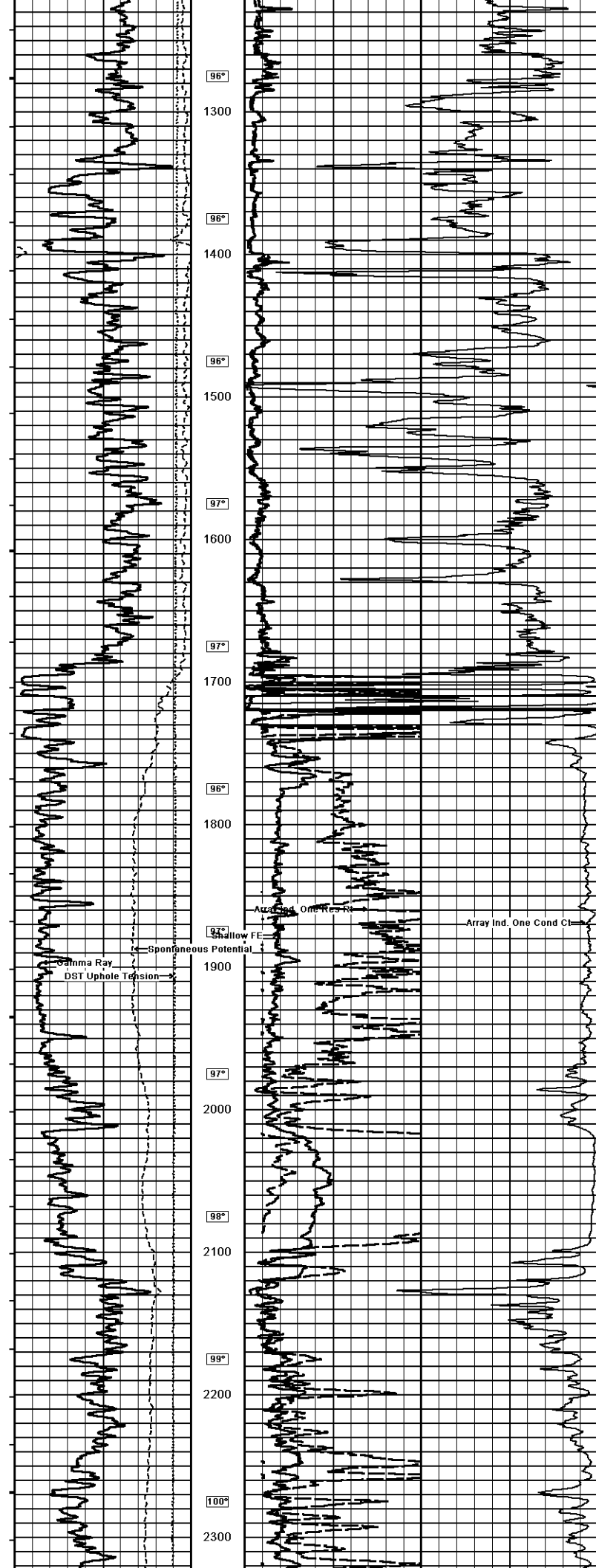
Elevations:
 HGB
 D/F
 GL

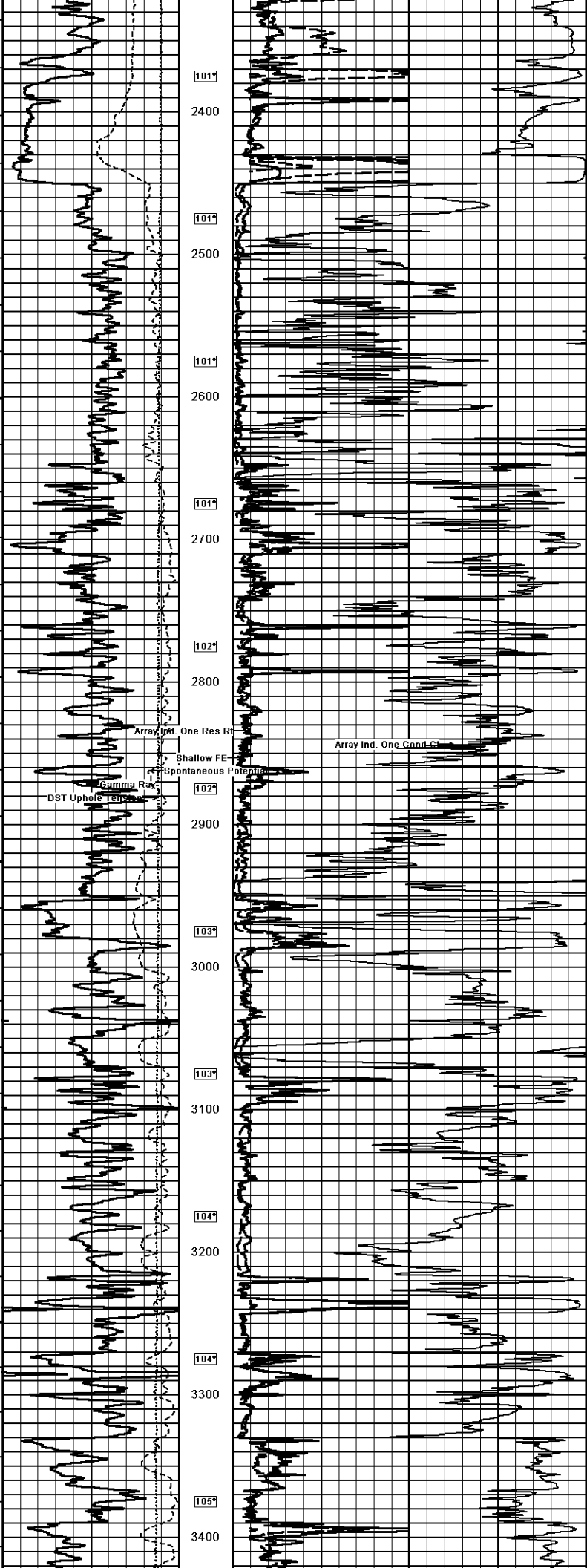
Permanent Datum (G.L. Elevation 310.9 feet)
 Log Measured From (KB)
 Drilling Measured From (KB)

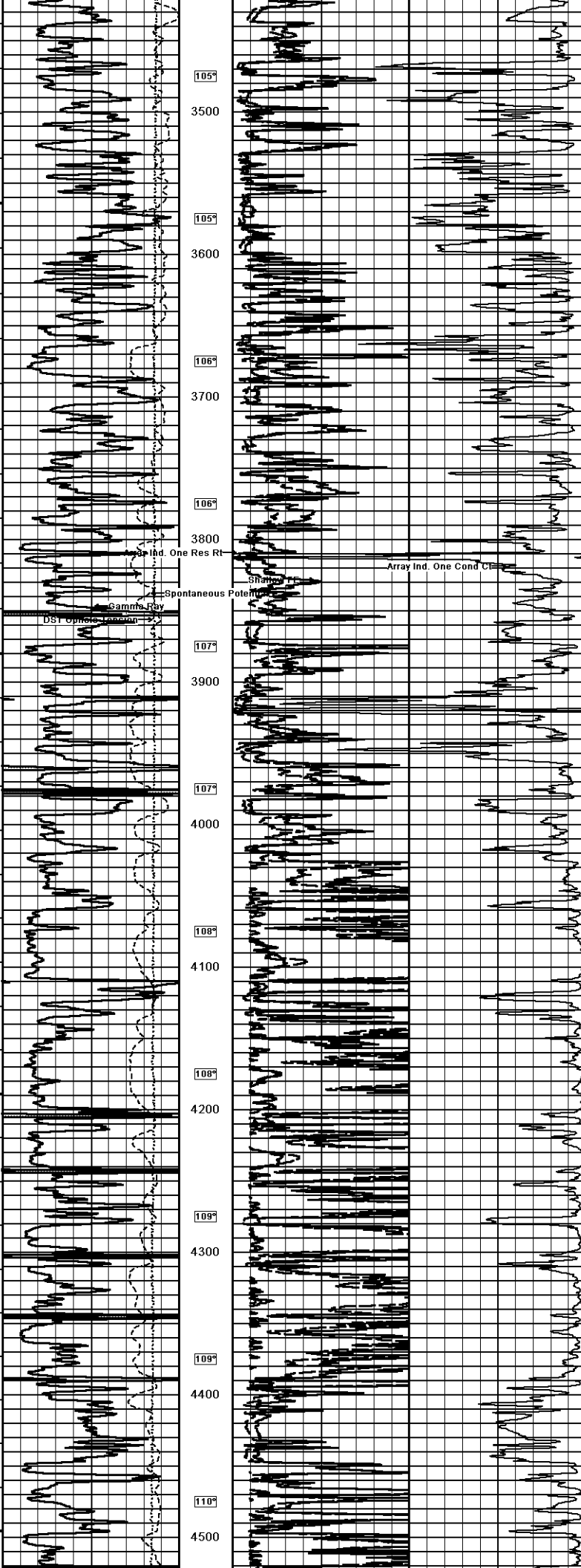
Date	15-AUG-2012
Run Number	ONE
Depth Driller	4870.00 feet
Depth Logger	4869.700 feet
First Reading	4869.400 feet
Last Reading	264.00 feet
Casing Driller	264.00 feet
Casing Logger	264.00 feet
Bit Size	7.875 inches
High Fluid Type	CHEMICAL
Chemical Density/Viscosity	9.30 lb/Lb/g
Oil/Fat/Loss	56.00 CP
Flow Line	10.00 ml/50Min
Sample Source	
Rim @ Measured Temp	0.51 @ 87.0 ohm-in
Rim @ Measured Temp	0.41 @ 87.0 ohm-in
Rim @ Measured Temp	0.61 @ 87.0 ohm-in
Sample Rmt/ Rms	CALC
Rim @ BHT	0.40 @ 111.0 ohm-in
Time Since Circulation	4 HOURS
Max Recorded Temp	111.00 deg F
Equipment Name	COMPACT
Equipment Base	13096
Accessed By	LYNN SCOTT
Witnessed By	ILB
	TIM PRIEST
S.O.# 1005#	3537891
	LB12-275

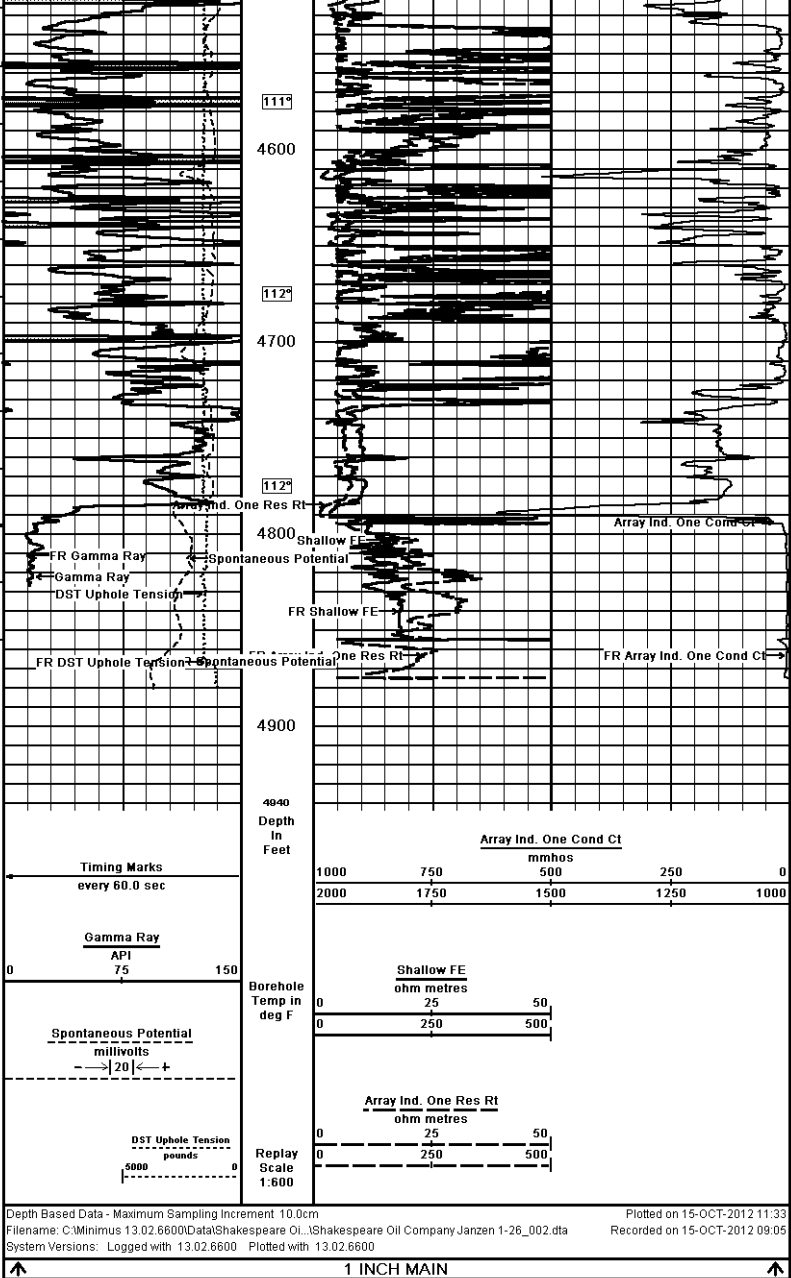












Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 15-OCT-2012 11:33
Filename: C:\Minimus 13.02.6600\Data\Shakespeare Oil\Shakespeare Oil Company\Janzen 1-26_002.dta
Recorded on 15-OCT-2012 09:05
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

COMPANY		SHAKESPEARE OIL COMPANY, INC.			
WELL		JANZEN #1-26			
FIELD		WILDCAT			
PROVINCE/COUNTY		SCOTT			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	3119.00	feet	First Reading	4864.00	feet
Elevation Drill Floor	3118.00	feet	Depth Driller	4870.00	feet
Elevation Ground Level	3109.00	feet	Depth Logger	4867.00	feet
		ARRAY INDUCTION			
		SHALLOW FOCUSED			
		ELECTRIC LOG			