



Weatherford[®]

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY	GRAND MESA OPERATING COMPANY		
WELL	DBY #4-16		
FIELD	WILDCAT		
PROVINCE/COUNTY	SCOTT		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	1370' FSL & 1840' FWL		
SEC	TWP	RGE	Other Services
16	16S	33W	MPD/MDN
API Number	15-171-20922		MML
Permit Number			
Permanent Datum G.L., Elevation	3071 feet		
Log Measured From	KB		
Drilling Measured From	K.B.		
Date	08-JAN-2013		Elevations: KB 3076.00 DF 3075.00 GL 3071.00
Run Number	ONE		
Service Order	3538968		
Depth Driller	4756.00 feet		
Depth Logger	4756.00 feet		
First Reading	4753.00 feet		
Last Reading	261.00 feet		
Casing Driller	262.00 feet		
Casing Logger	261.00 inches		
Bit Size	7.875		
Hole Fluid Type	CHEMICAL		lb/USg
Density / Viscosity	9.20 lb/USg	68.00 CP	
PH / Fluid Loss	11.00	11.00	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.74 @ 77.0	ohm-m	
Rmf @ Measured Temp	0.59 @ 77.0	ohm-m	
Rmc @ Measured Temp	0.89 @ 77.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.53 @108.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	108.00	deg F	
Equipment / Base	13057	LIB	
Recorded By	LYNN SCOTT		
Witnessed By	JOHN GOLDSMITH		
JOB#	LB13-006		

BOREHOLE RECORD			Last Edited: 08-JAN-2013 08:55
Bit Size inches	Depth From feet	Depth To feet	
7.875	261.00	4756.00	

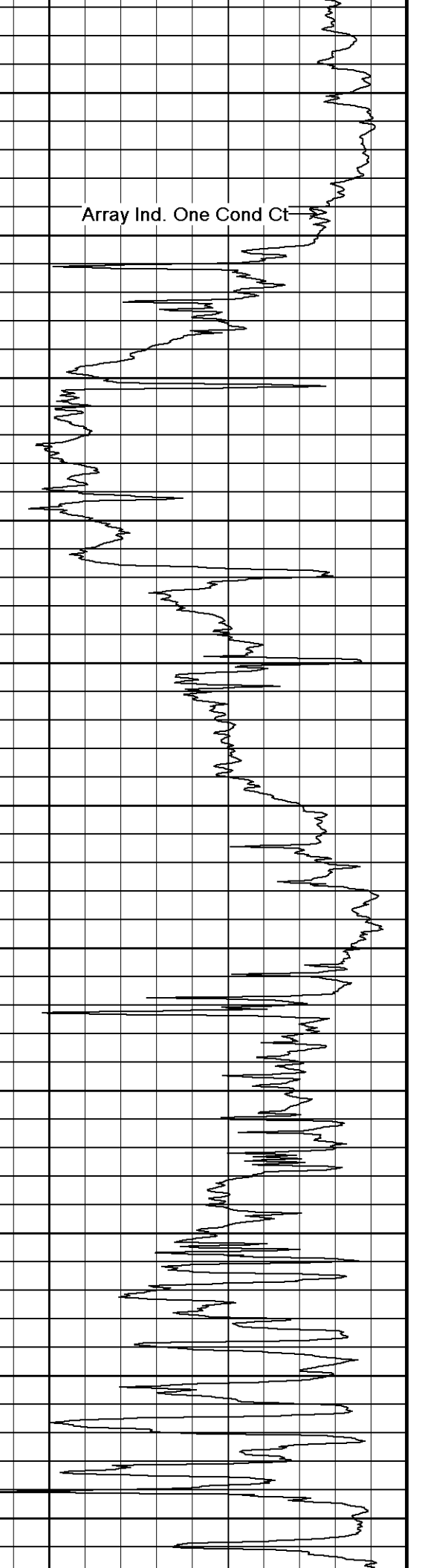
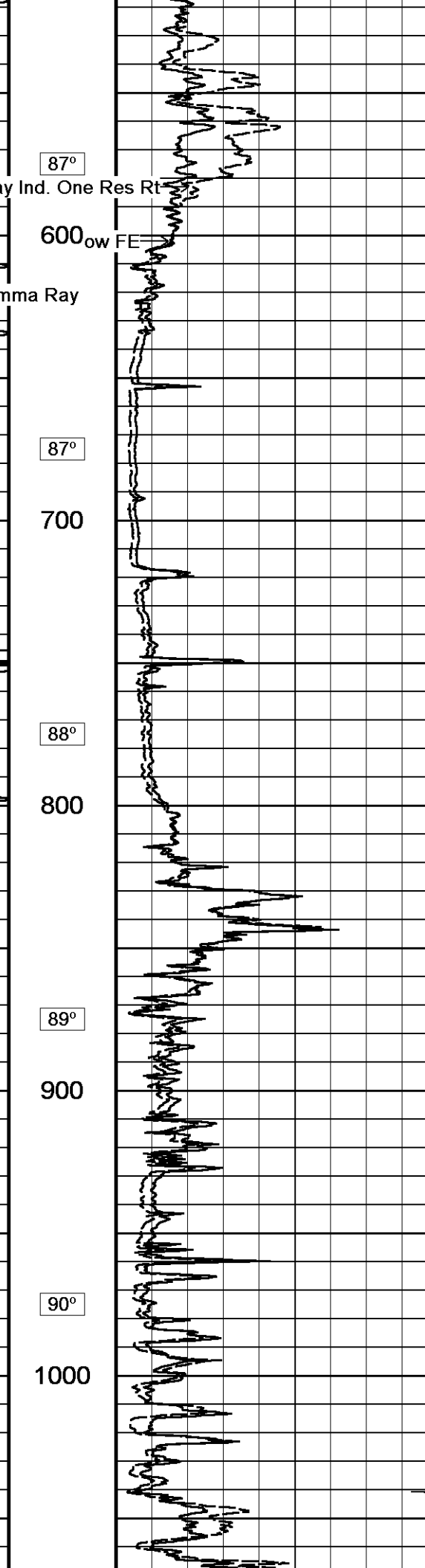
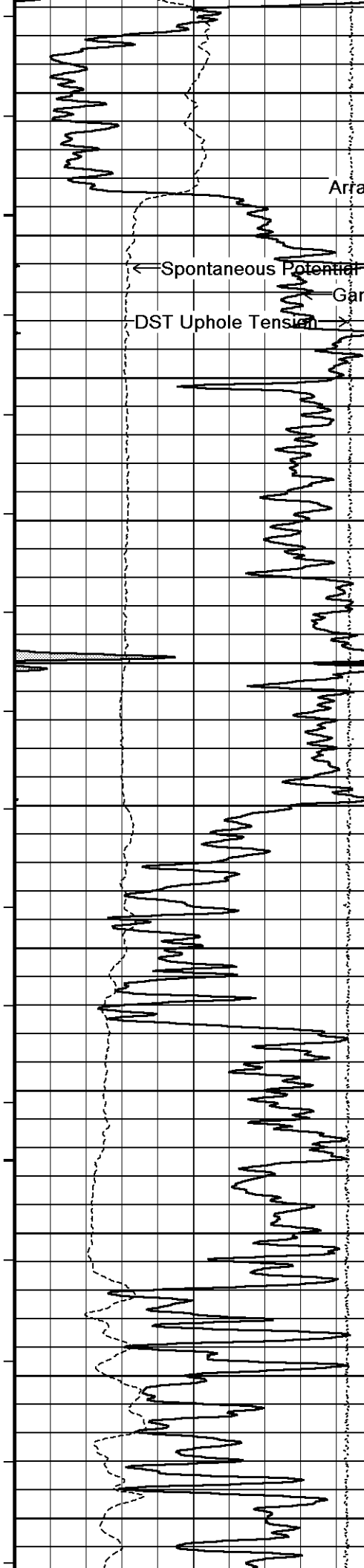
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	261.00
			Weight pounds/ft
			24.00

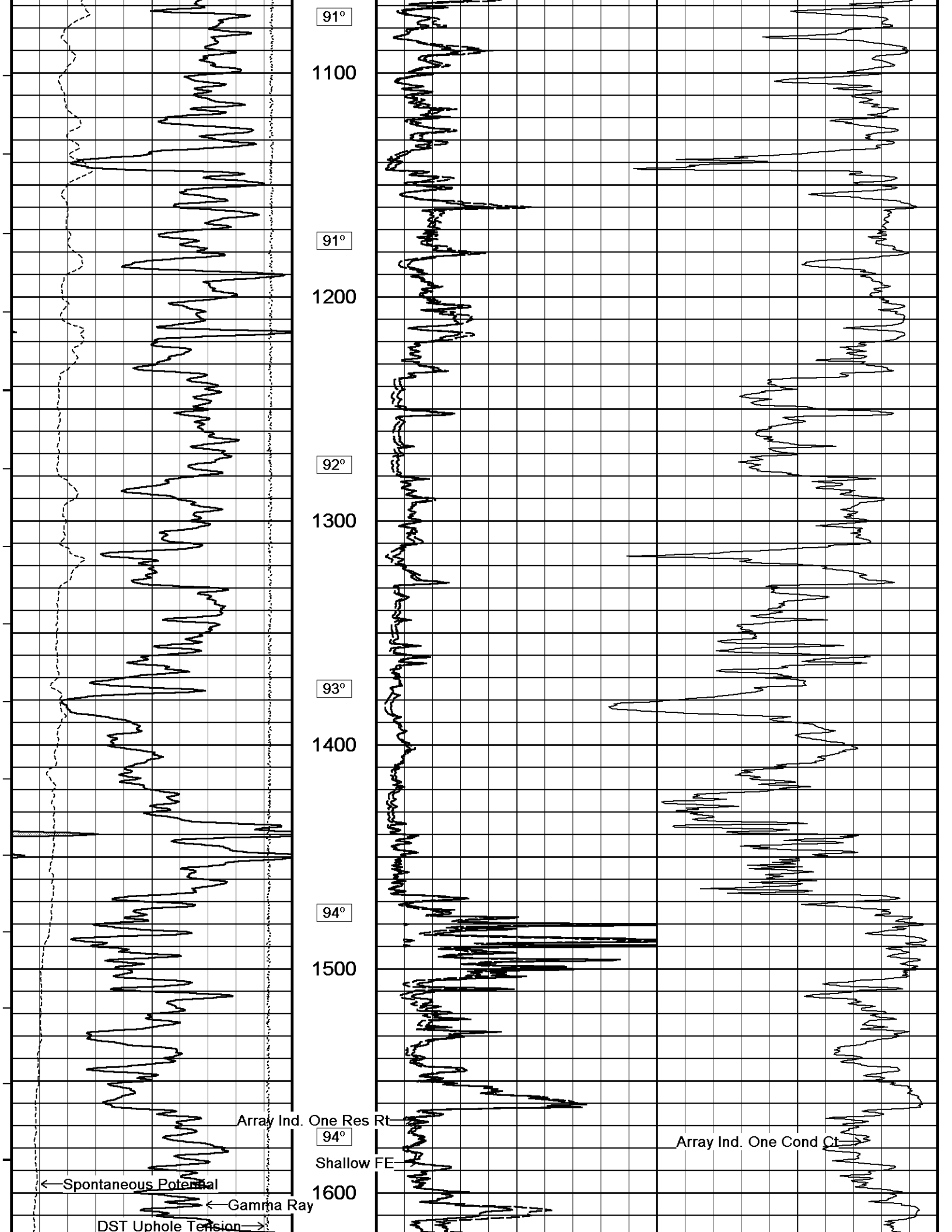
REMARKS

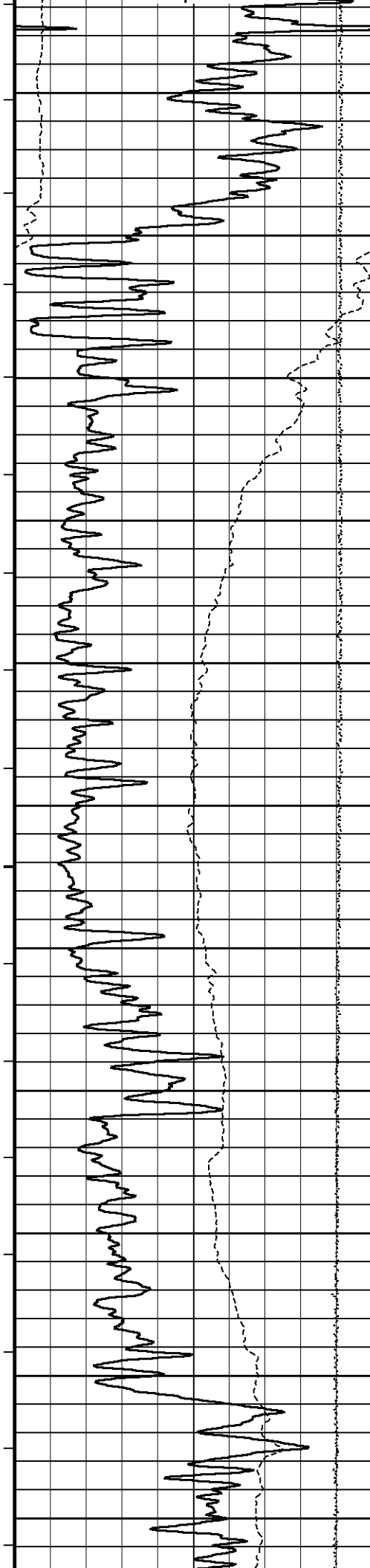
Tools Ran: MCG, MML, MDN, MPD, MFE, MAI ran in combination.
Hardware Used: MPD: 8 inch profile plate used. MAI and MFE: 0.5 inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone Density porosity used to calculate porosity.
Borehole Rugosity, Tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Total hole volume from TD to Surface casing= 2173 cubic feet
Annular hole volume with 5.5 Inch casing from TD to 3700 ft.=225 cubic feet
Service order: 3538968
Rig: Murfin #24
Engineer: L. Scott
Operator(s): R. Venegas

Software duplicates the pH value and the fluid loss value. The fluid loss is 7.6.

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







95°

1700

95°

1800

95°

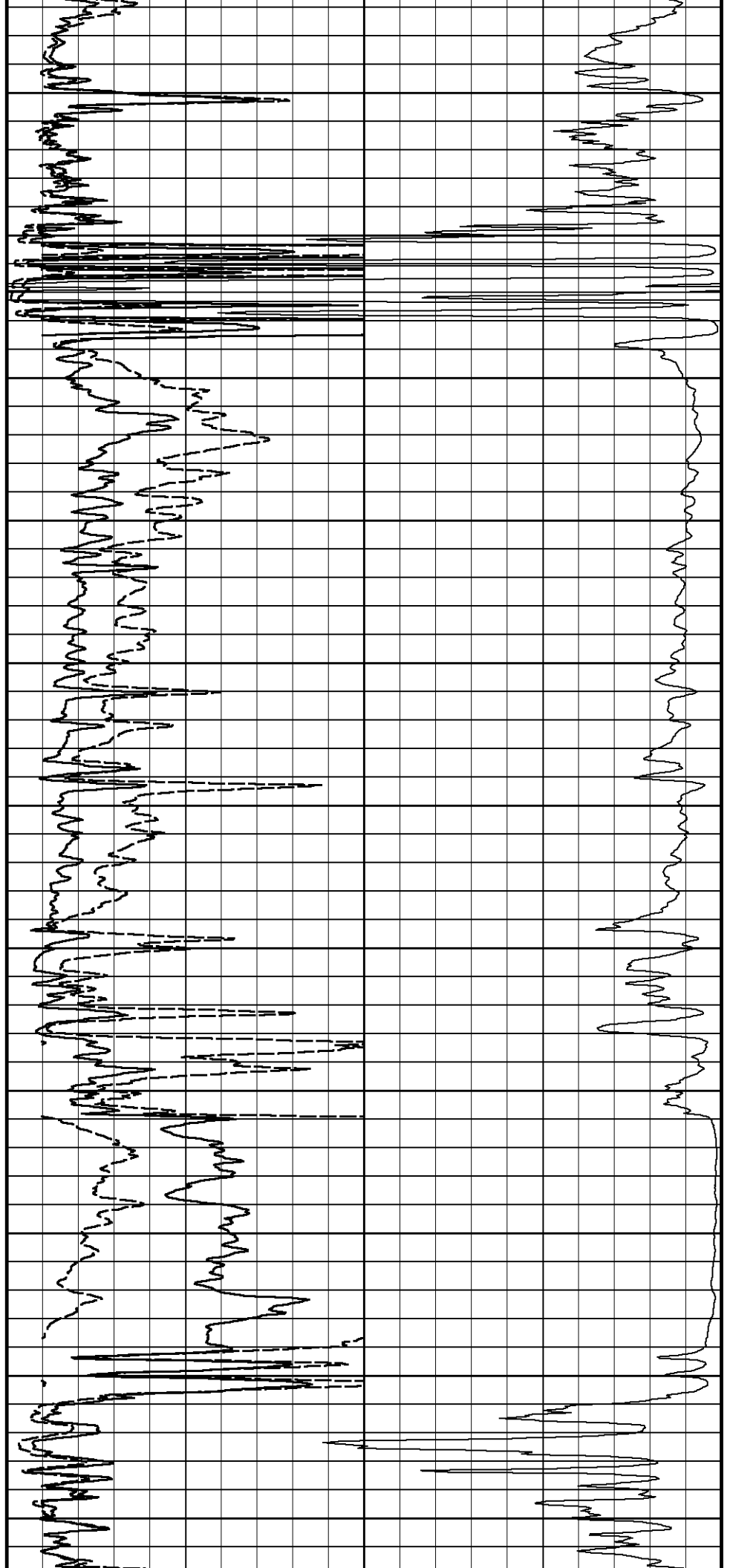
1900

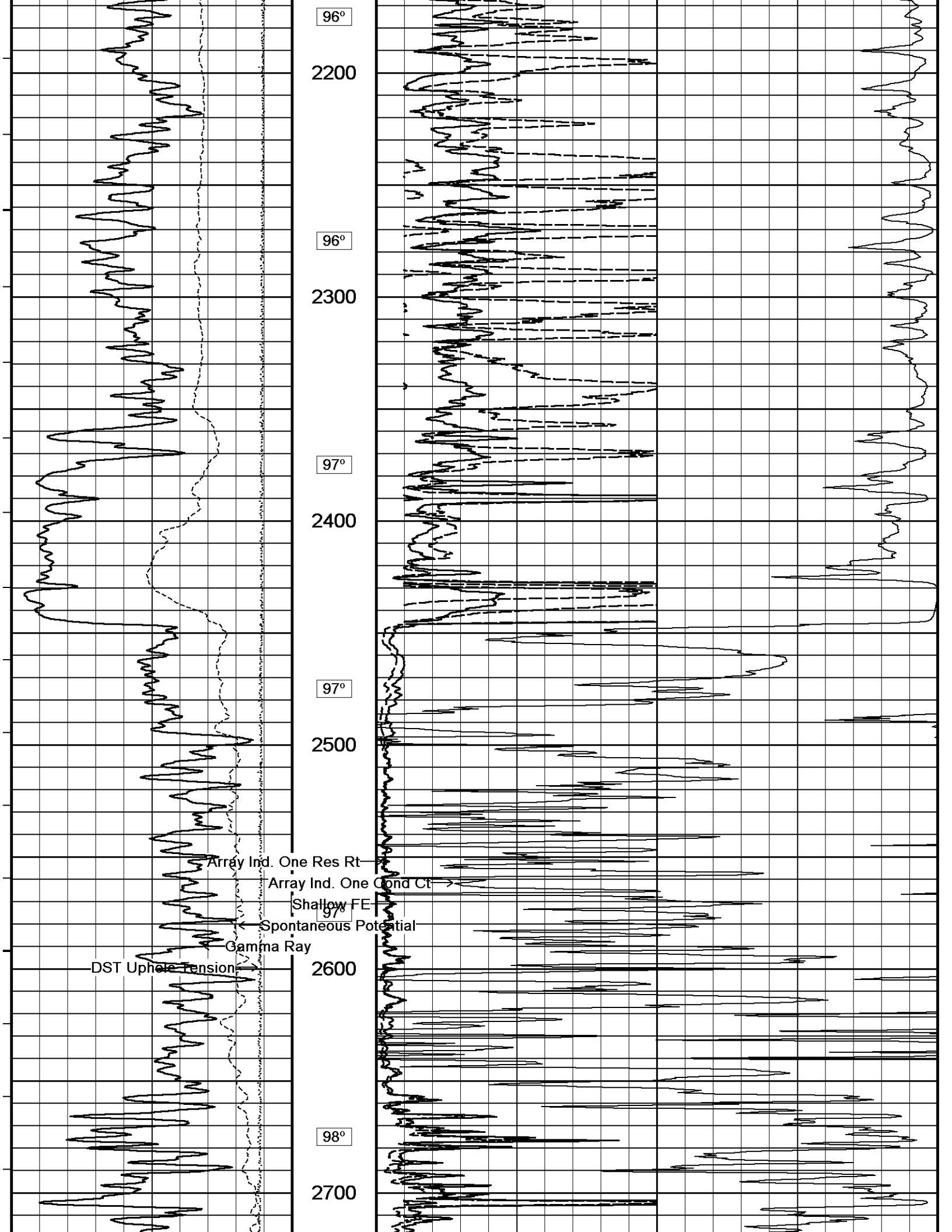
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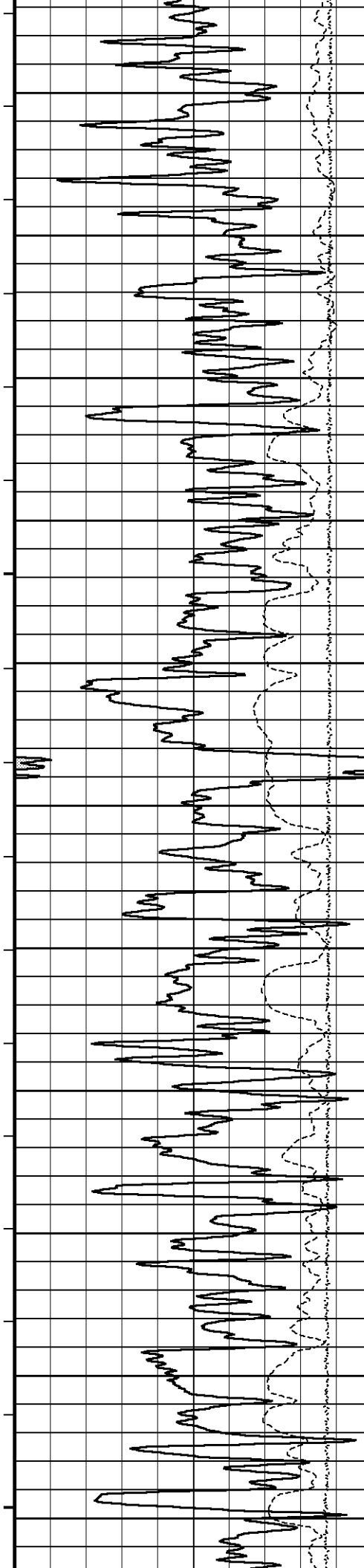
2000

95°

2100







98°

2800

99°

2900

99°

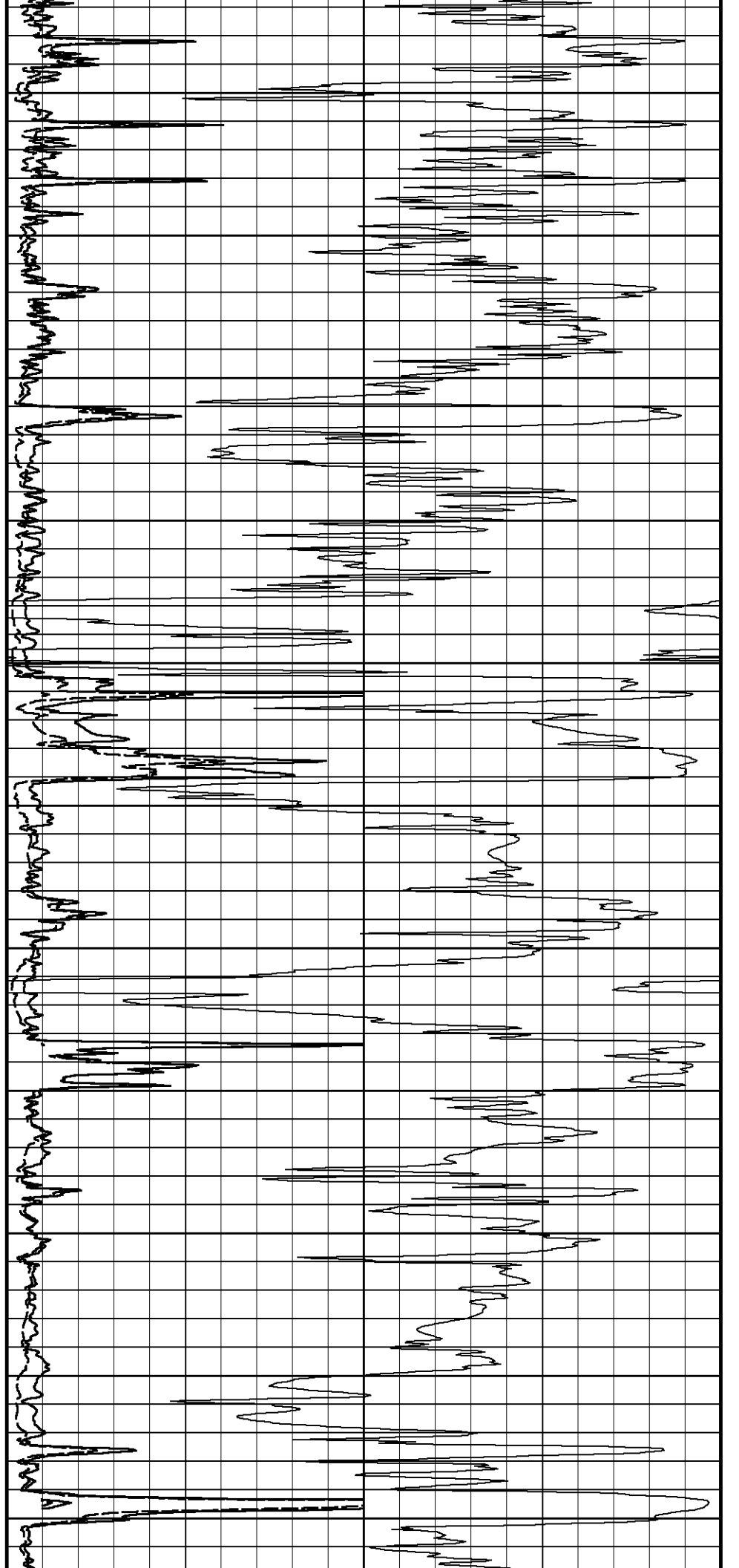
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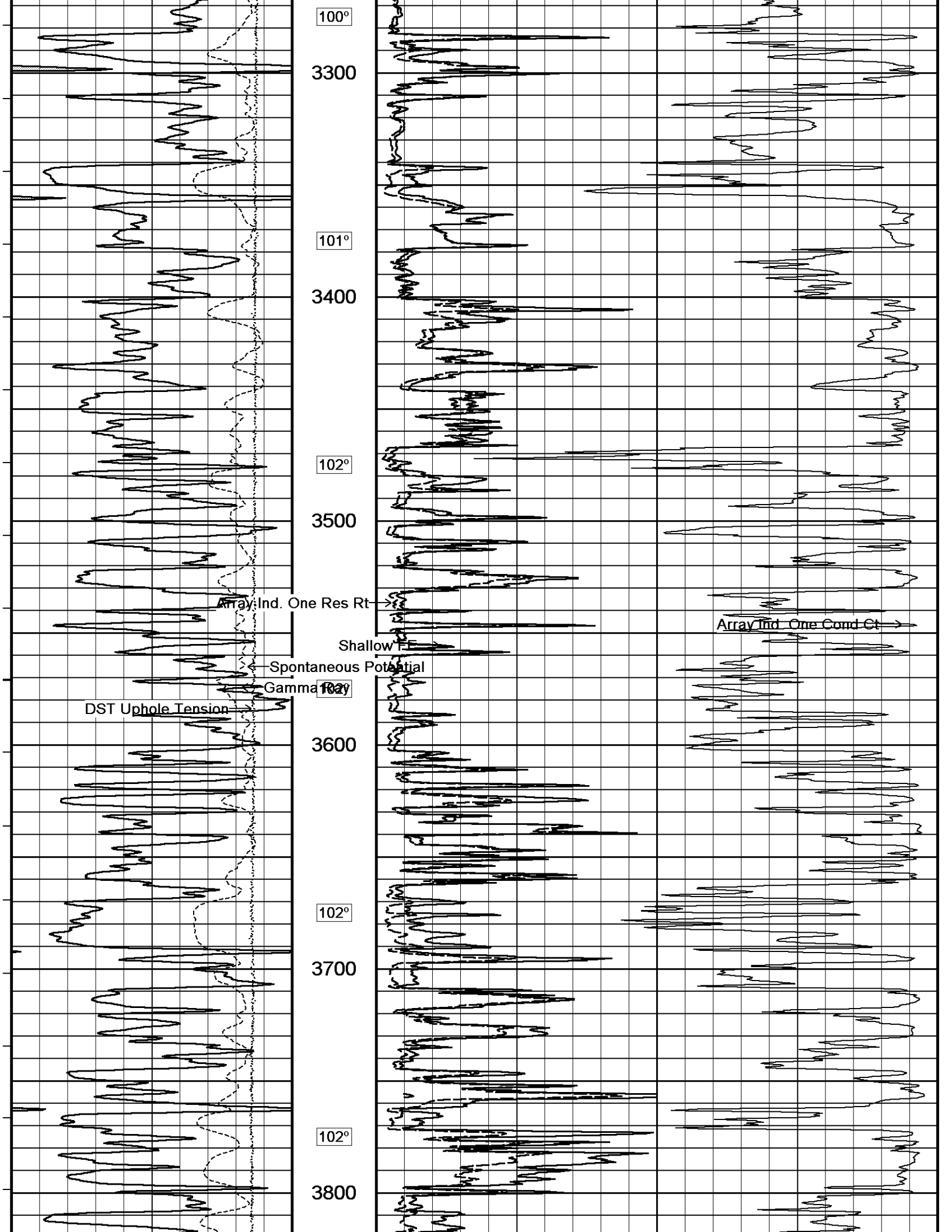
100°

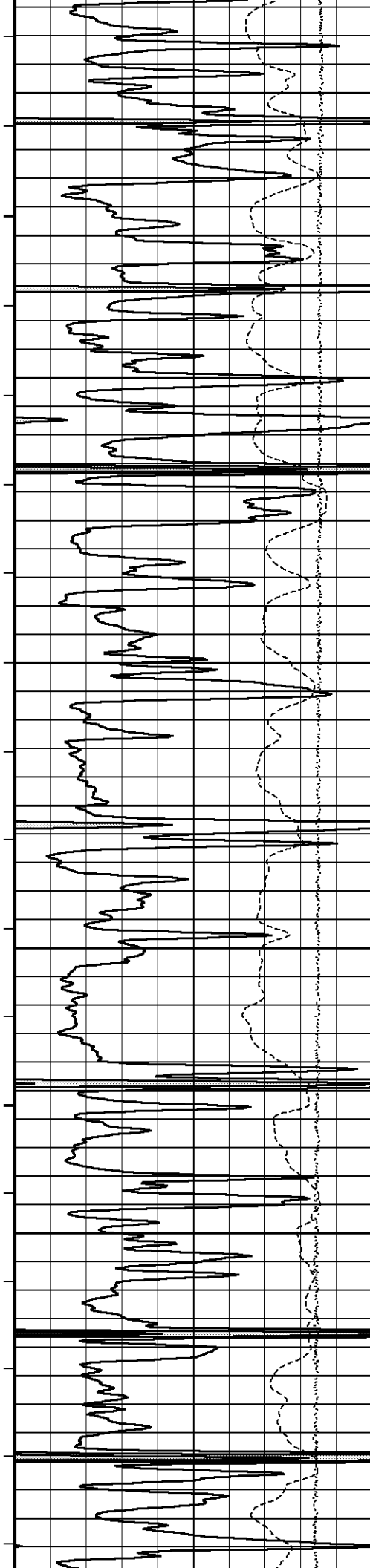
3100

100°

3200







103°

3900

103°

4000

103°

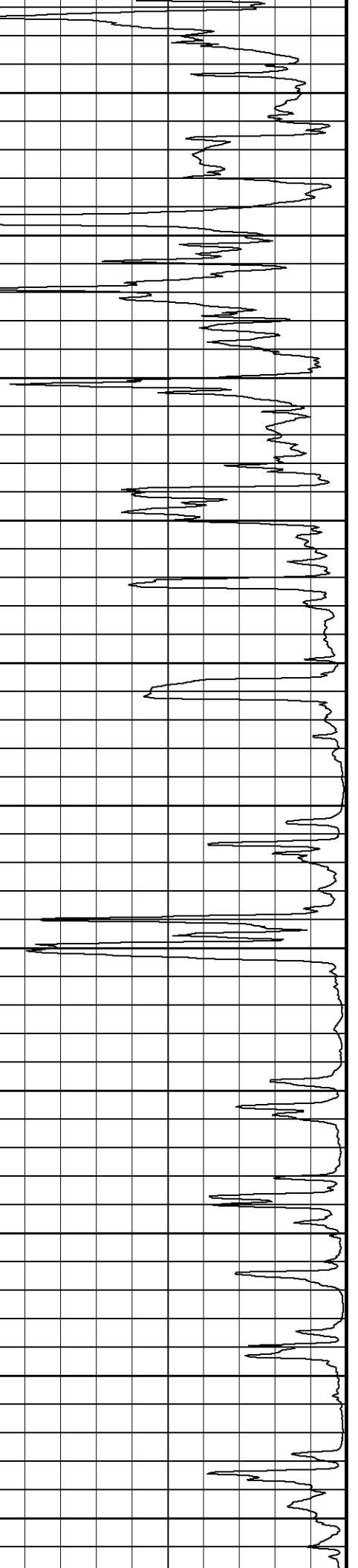
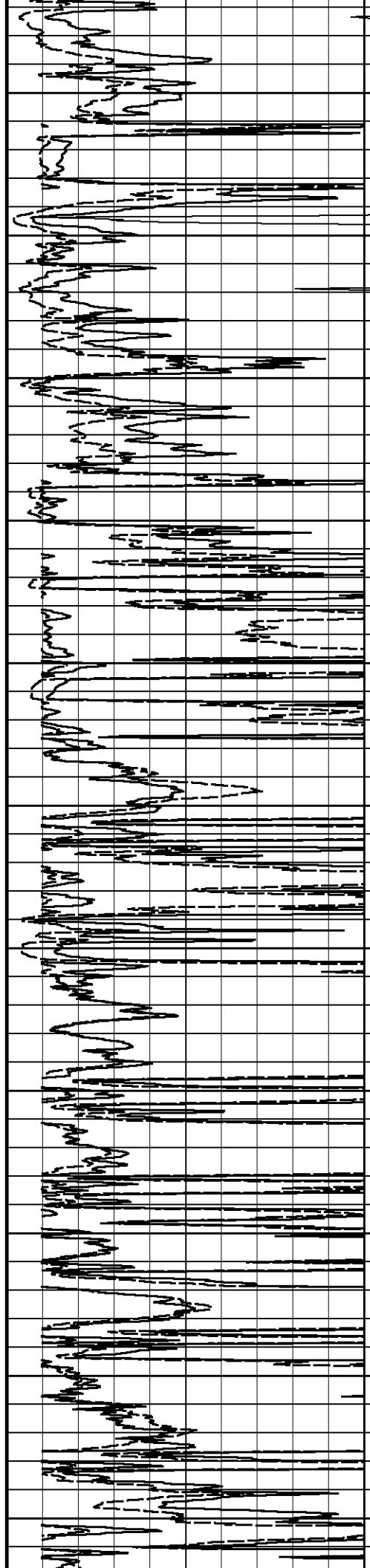
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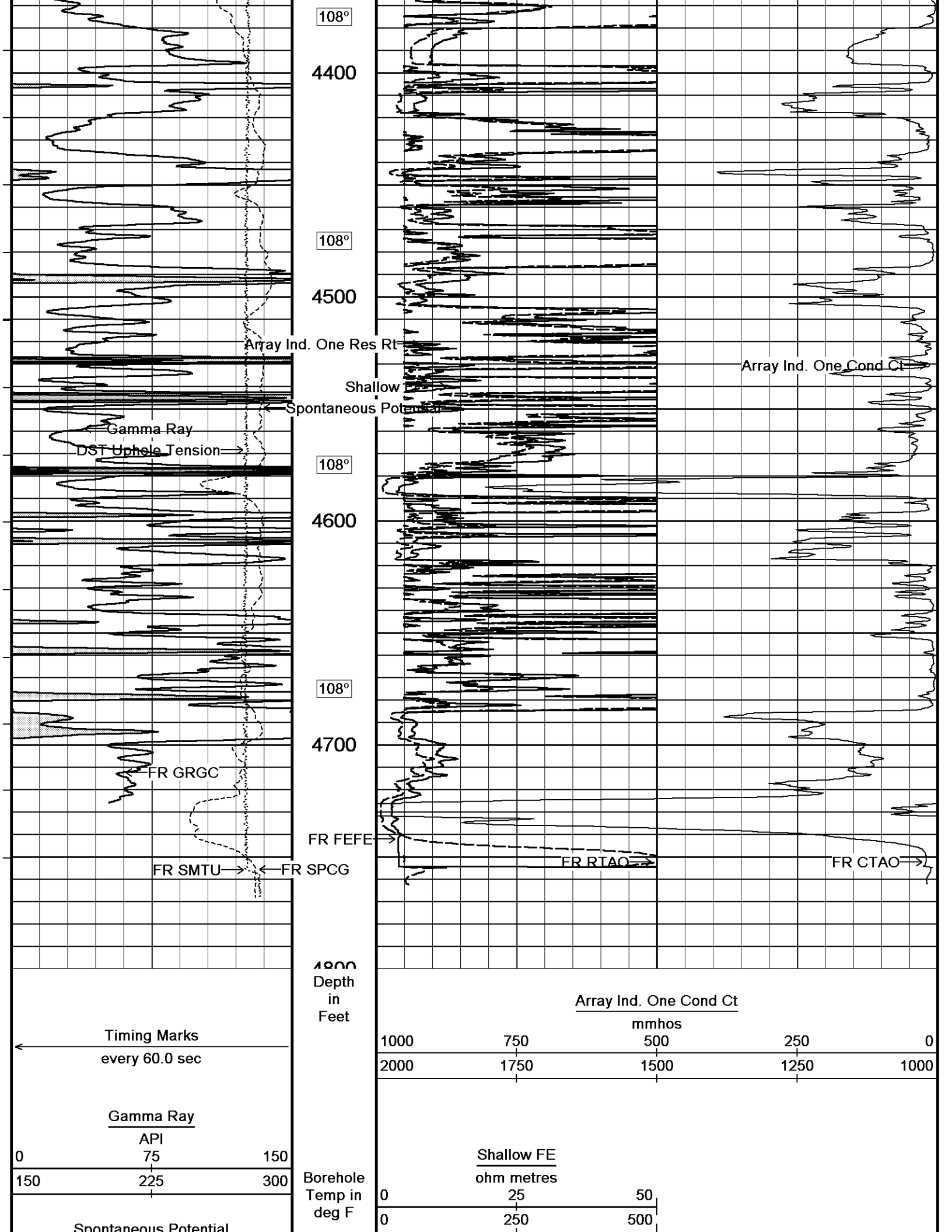
104°

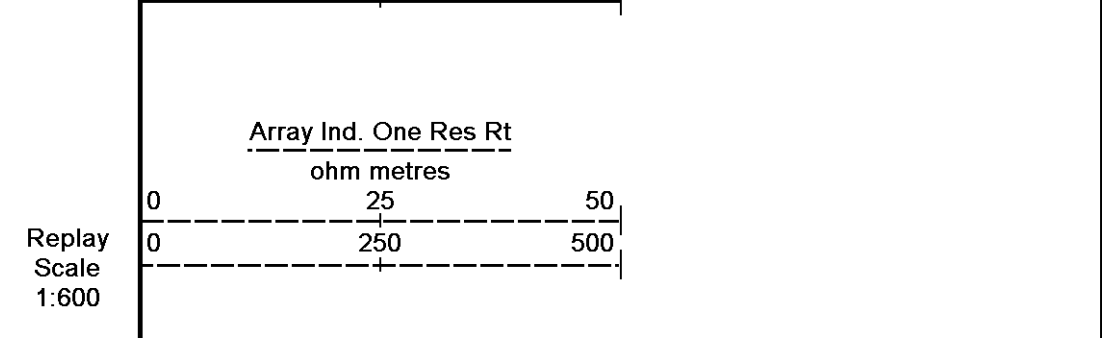
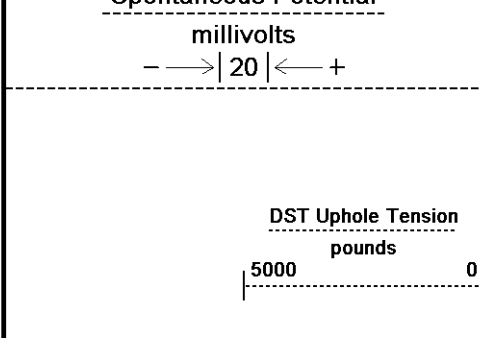
4200

106°

4300





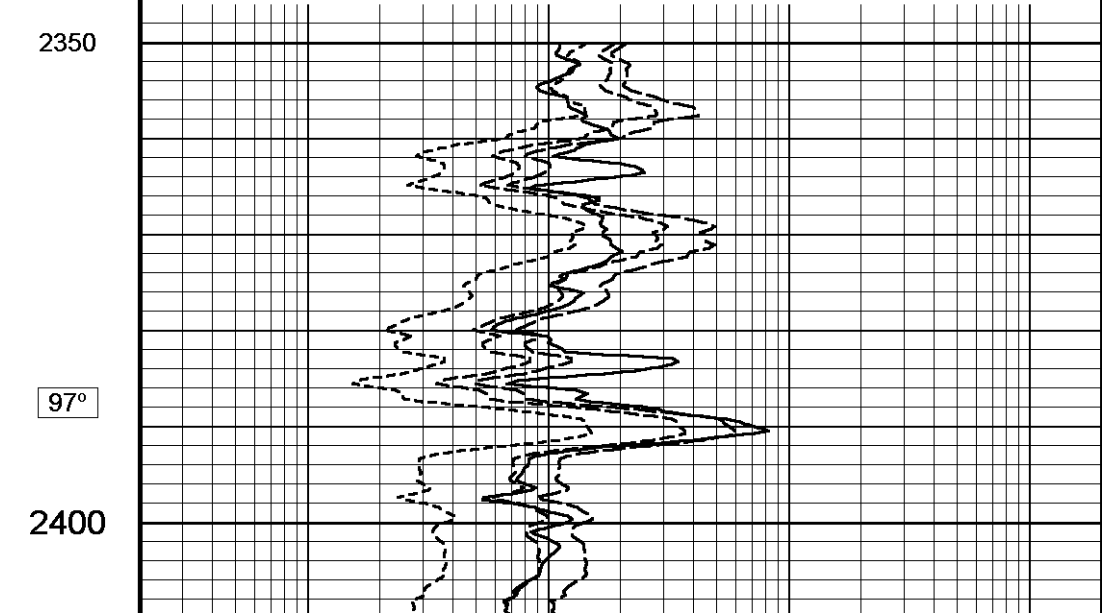
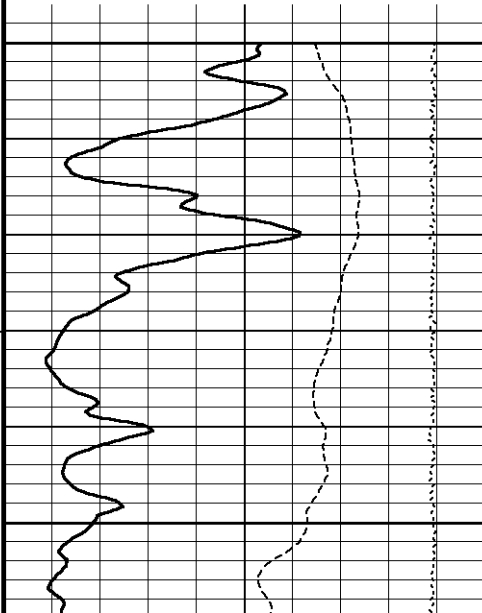
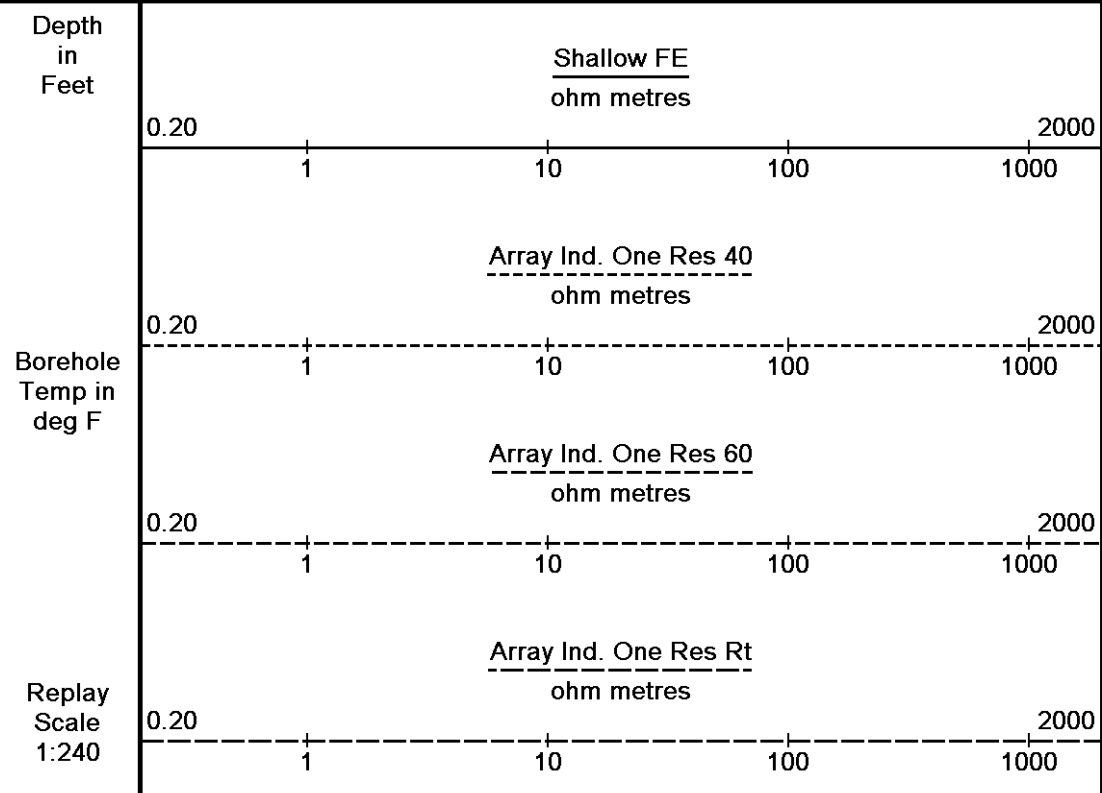
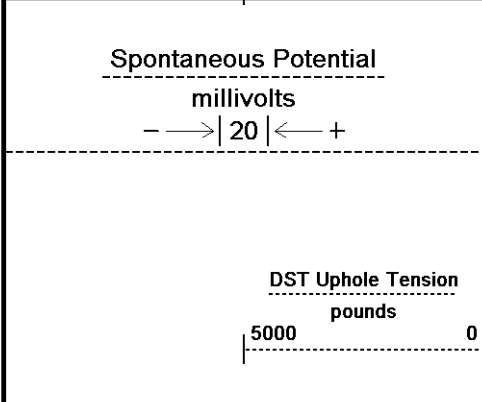
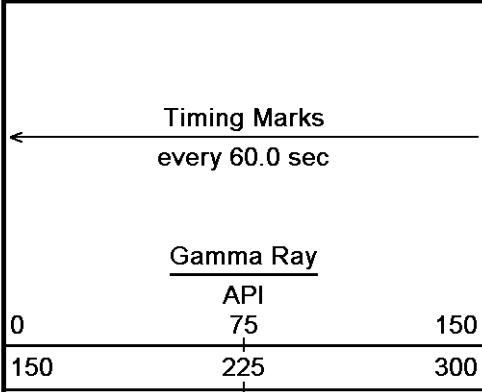


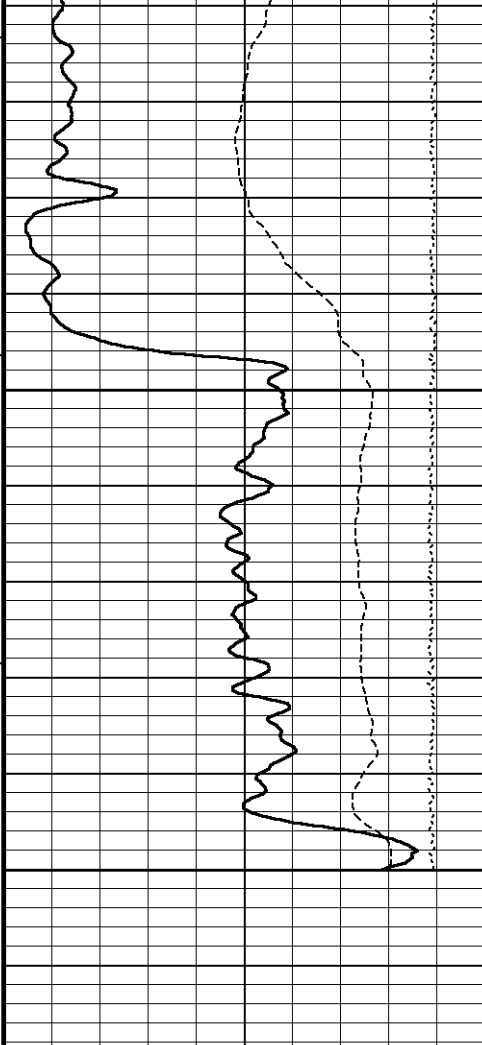
Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...\Grand Mesa Operating Company DBY 4-16_002.dta
 Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

↑ 2 INCH MAIN ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...\Grand Mesa Operating Company DBY 4-16_002.dta
 Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492





97°

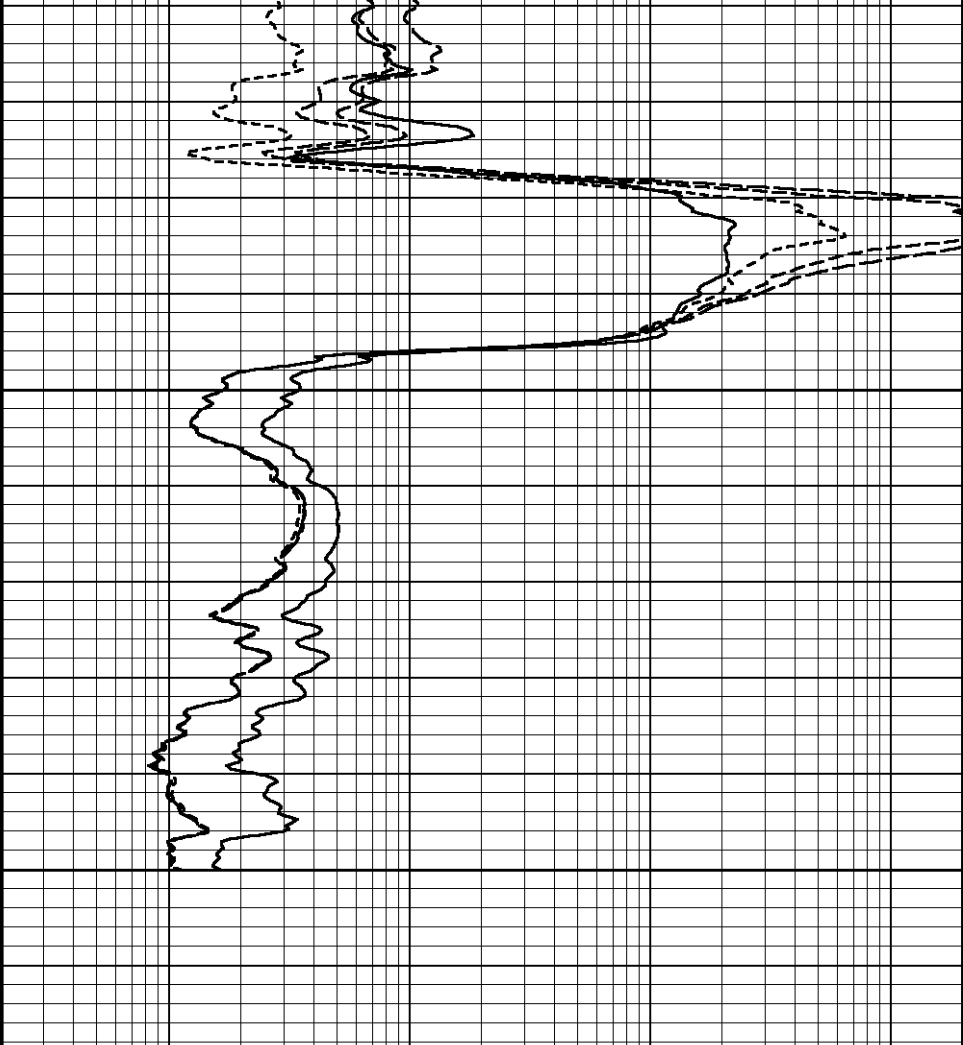
2450

97°

2500

2516

Depth in Feet



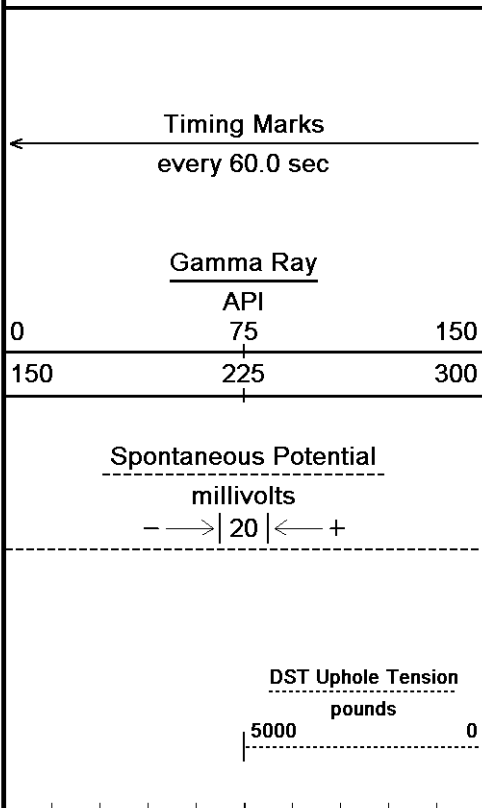
Borehole Temp in deg F

Replay Scale 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...Grand Mesa Operating Company DBY 4-16_002.dta Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

↑ 5 INCH MAIN ↑

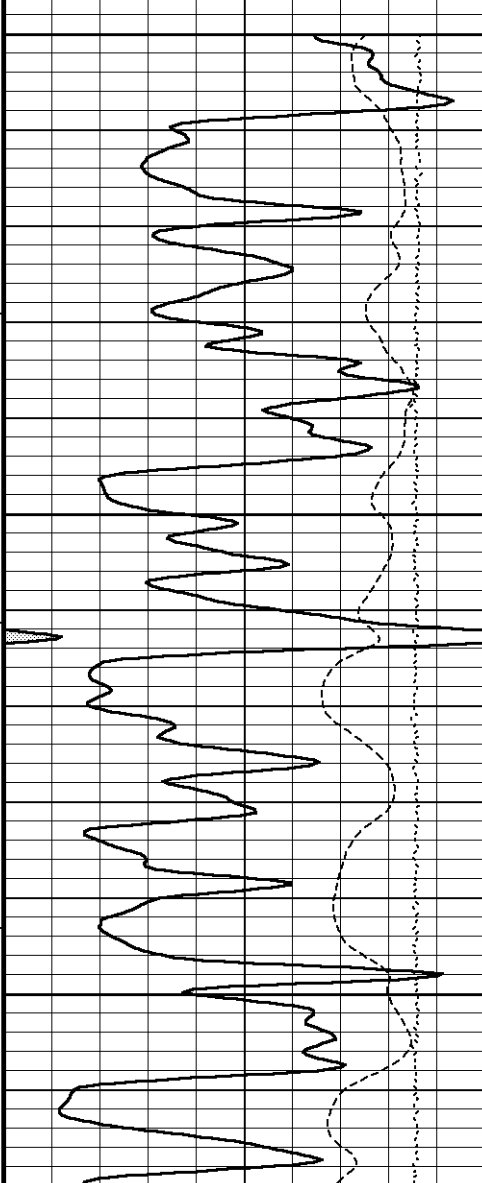
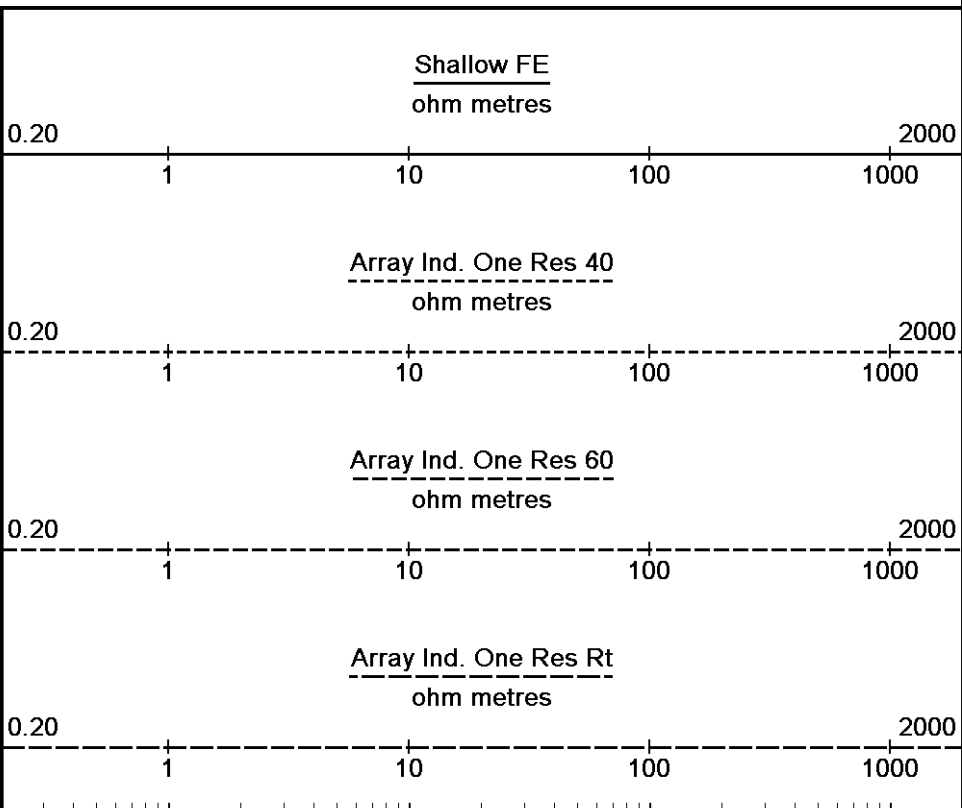
↓ 5 INCH MAIN ↓



Depth
in
Feet

Borehole
Temp in
deg F

Replay
Scale
1:240



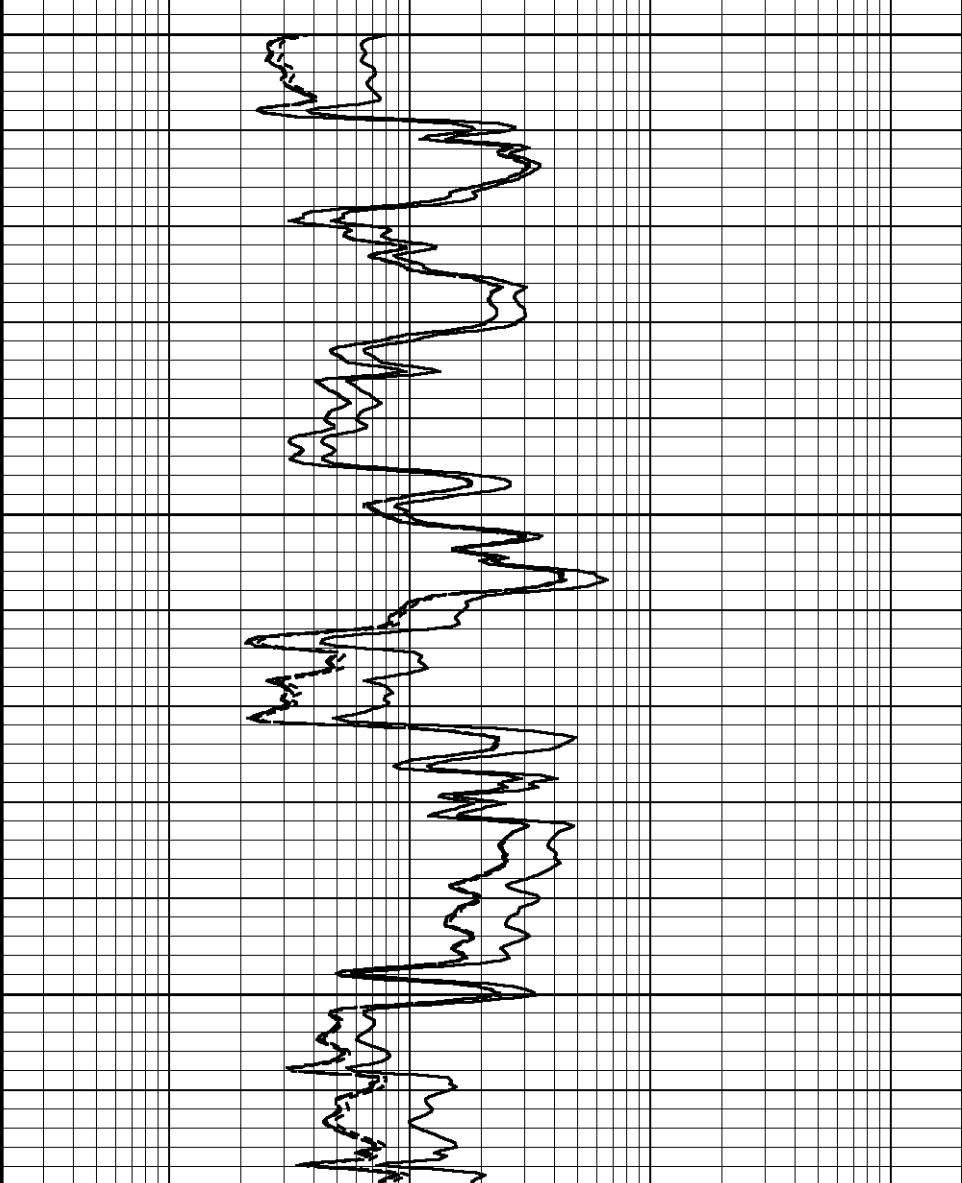
3700

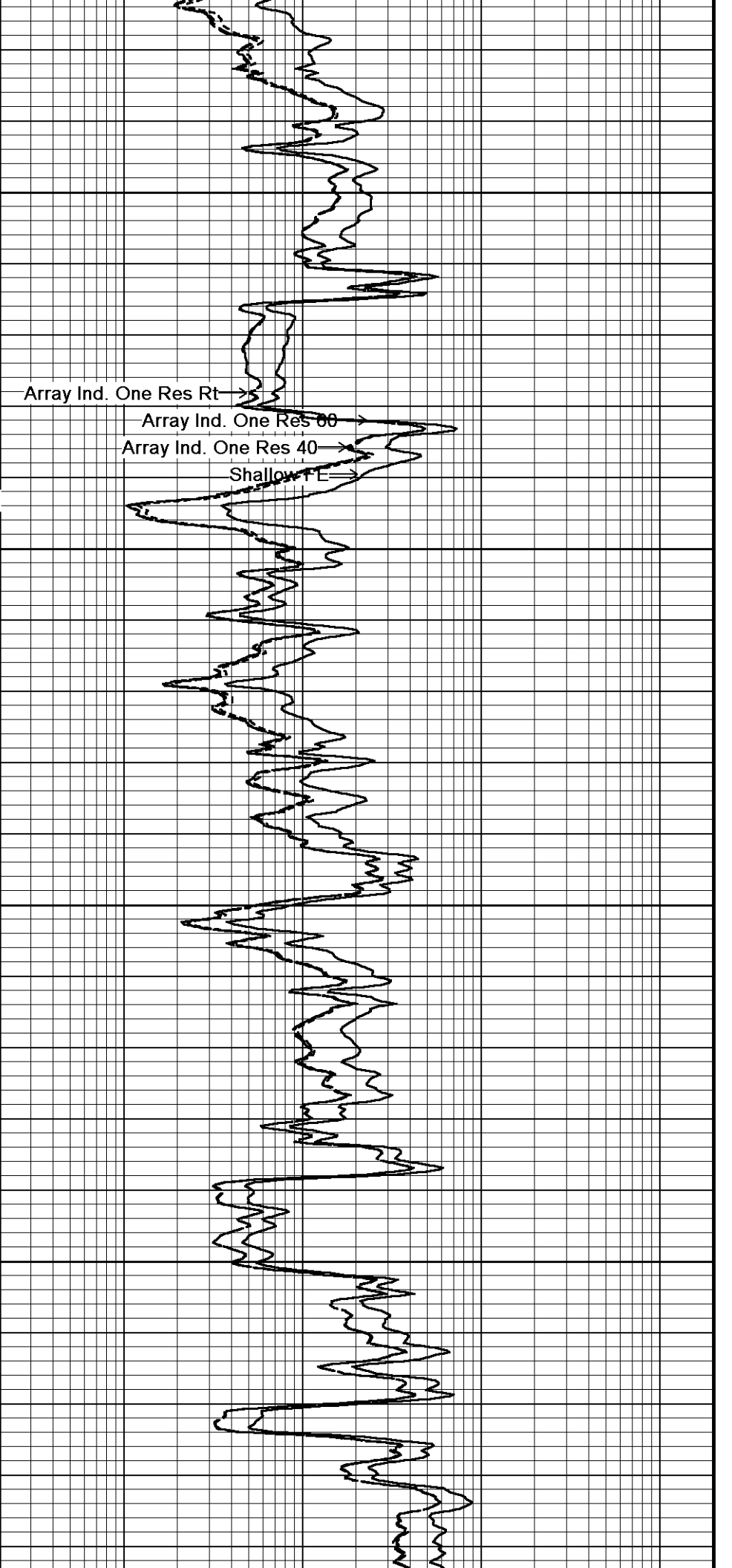
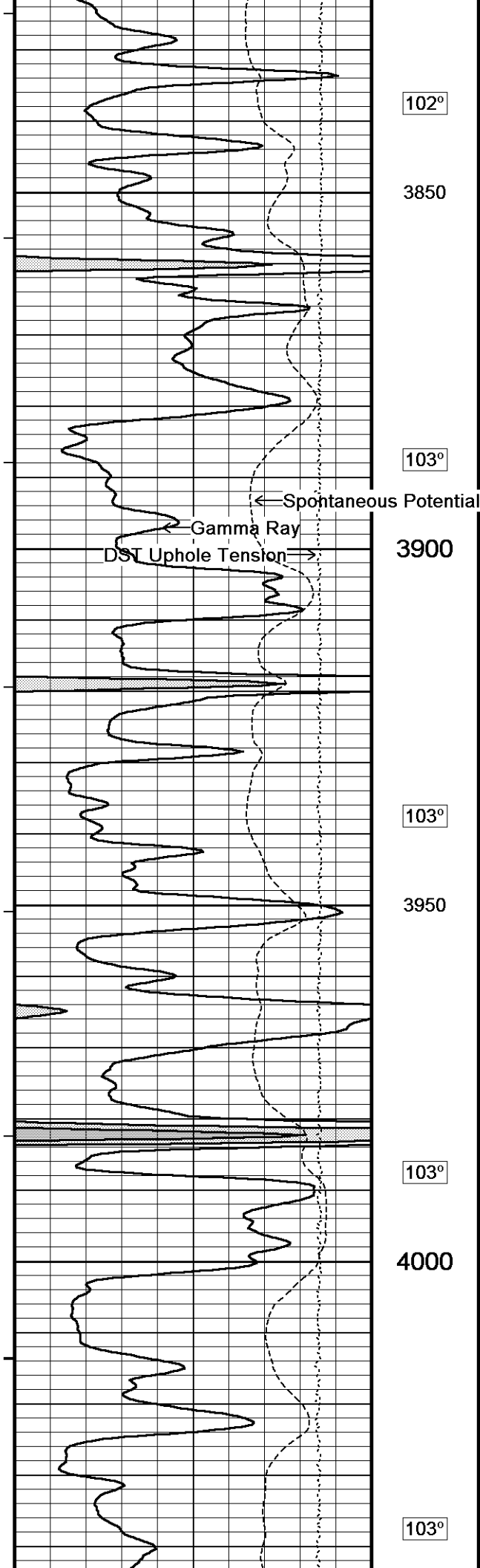
102°

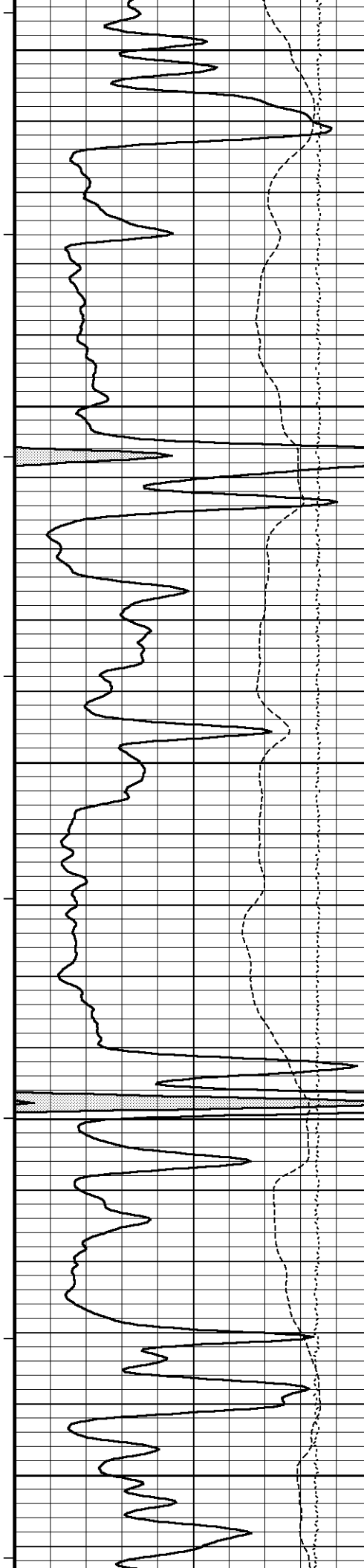
3750

102°

3800







4050

103°

4100

104°

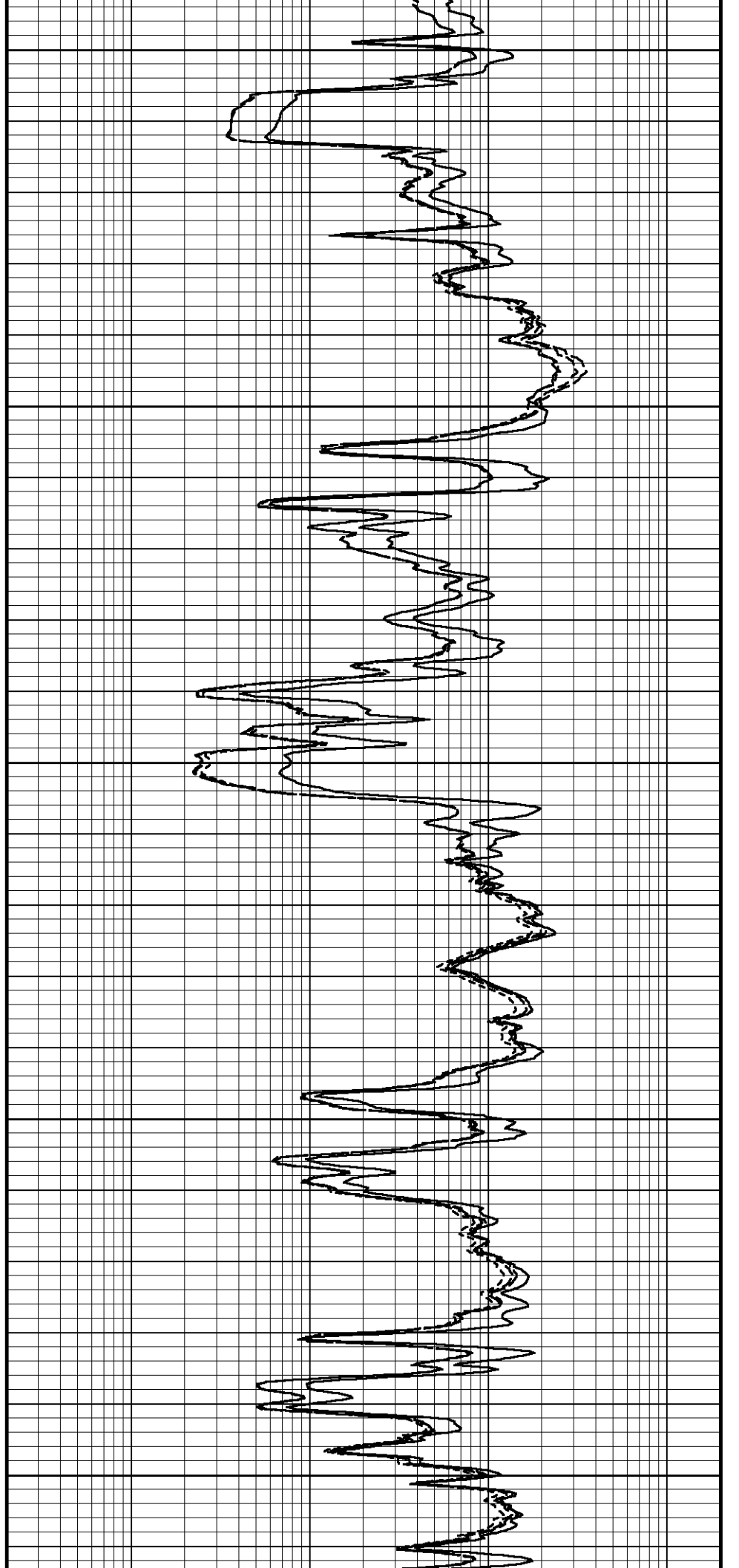
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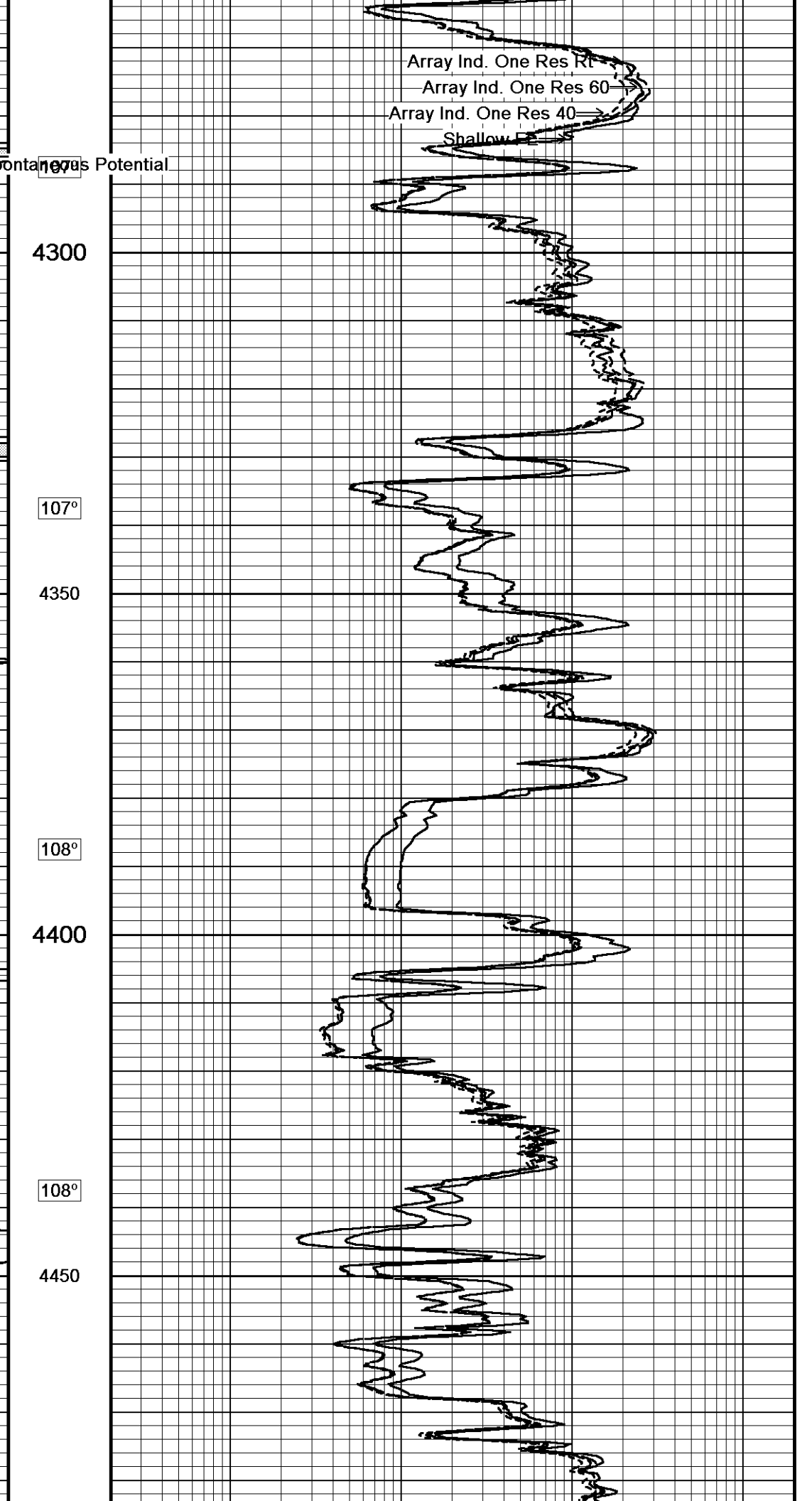
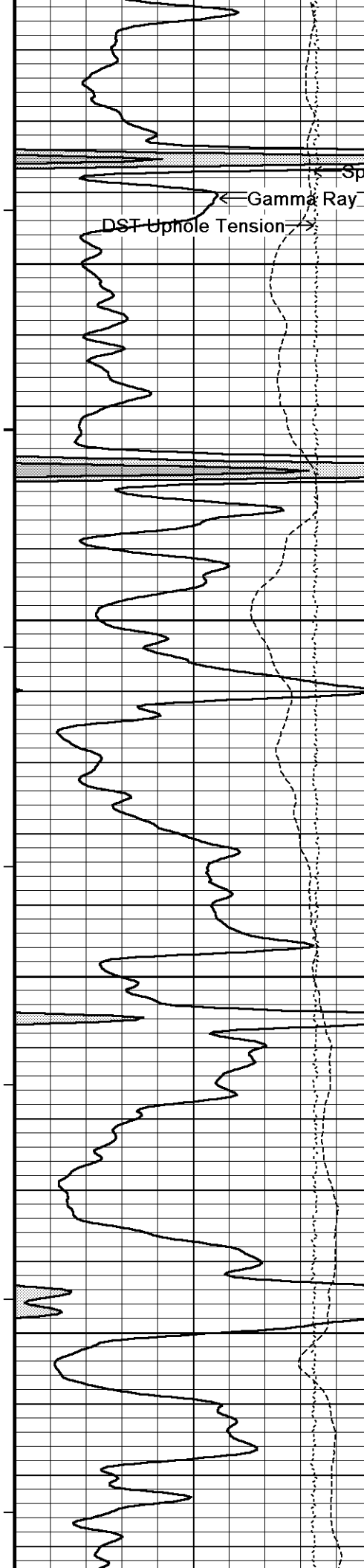
105°

4200

106°

4250





Spontaneous Potential

Gamma Ray

DST Uphole Tension

4300

107°

4350

108°

4400

108°

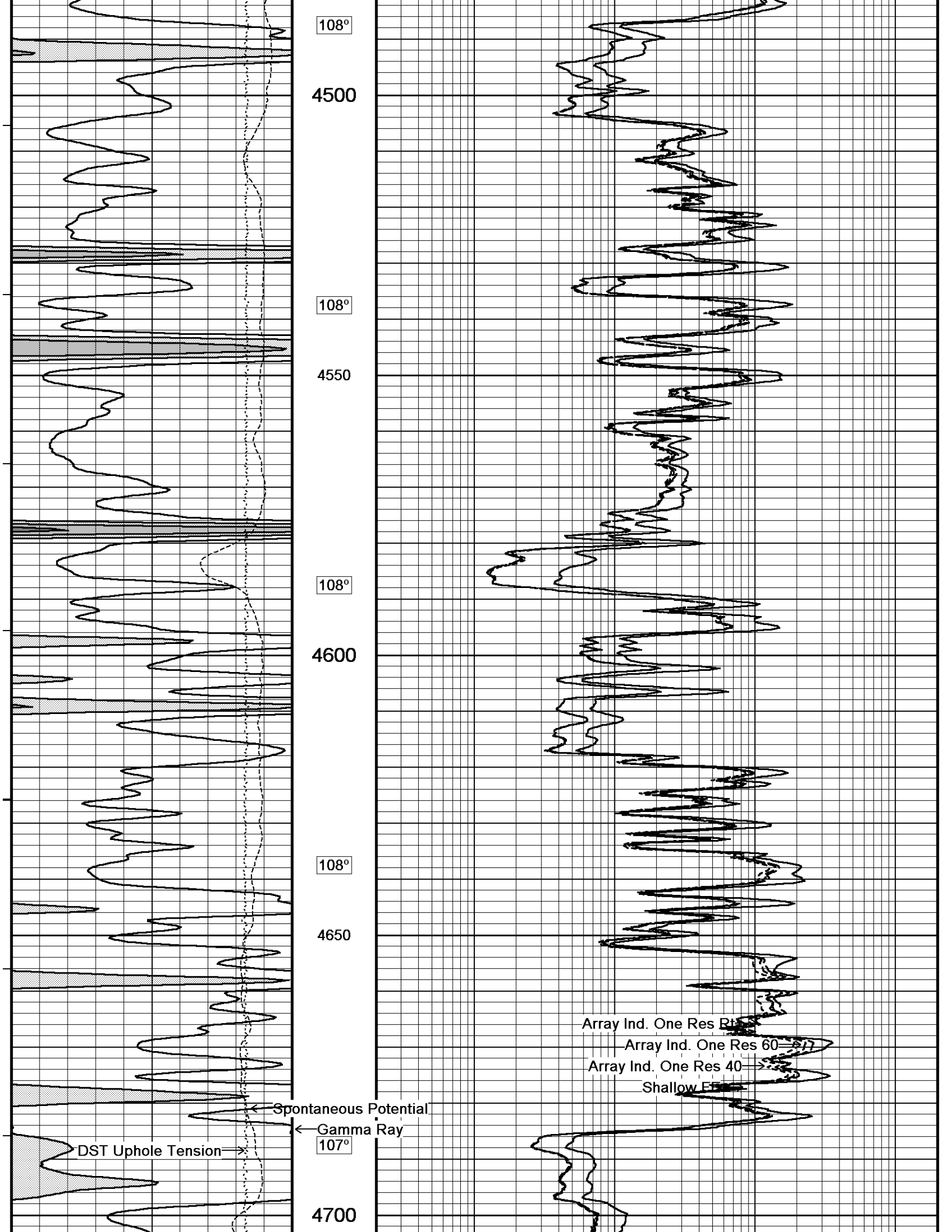
4450

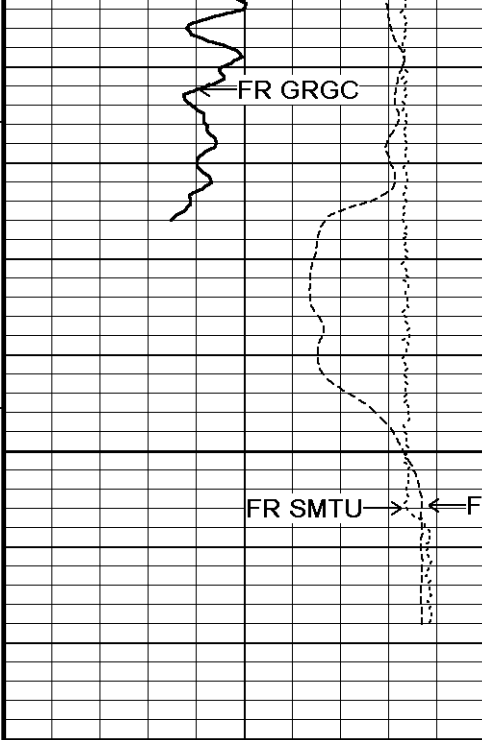
Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow Fz



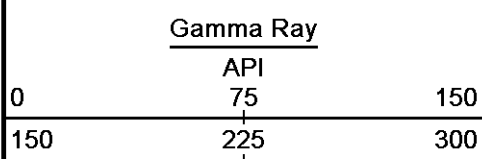


4750

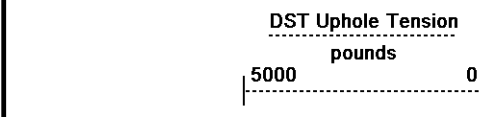
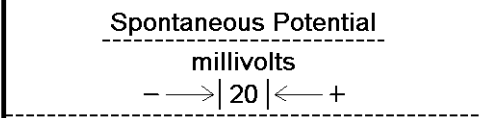
4778

Depth
in
Feet

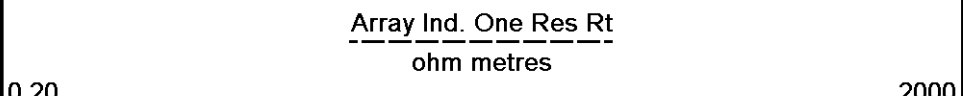
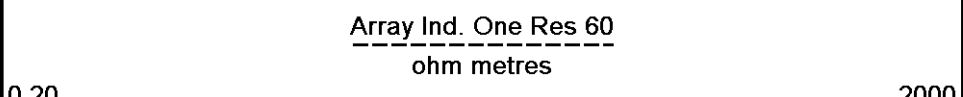
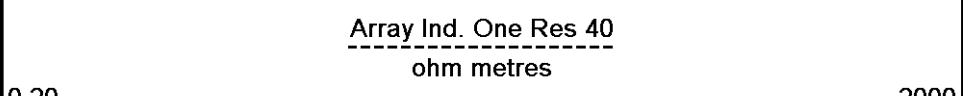
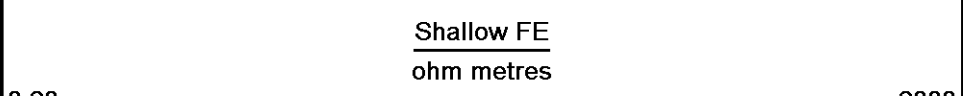
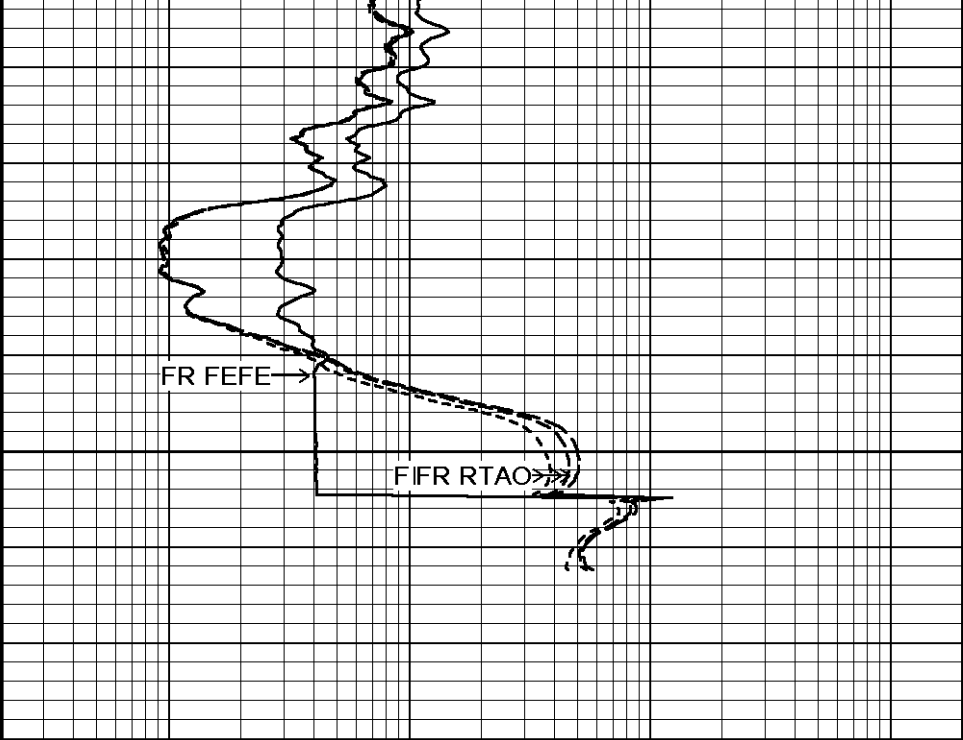
← Timing Marks
every 60.0 sec



Borehole
Temp in
deg F



Replay
Scale
1:240



Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...\Grand Mesa Operating Company DBY 4-16_002.dta Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

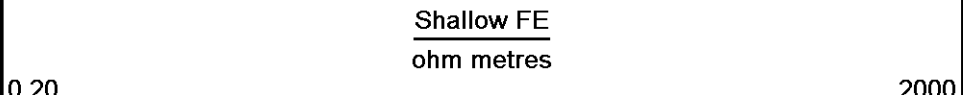
↑ 5 INCH MAIN ↑

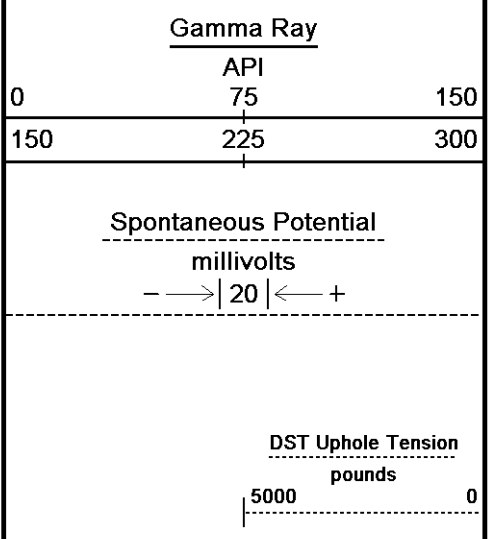
↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...\Grand Mesa Operating Company DBY 4-16_001.dta Recorded on 08-JAN-2013 09:18
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

← Timing Marks
every 60.0 sec

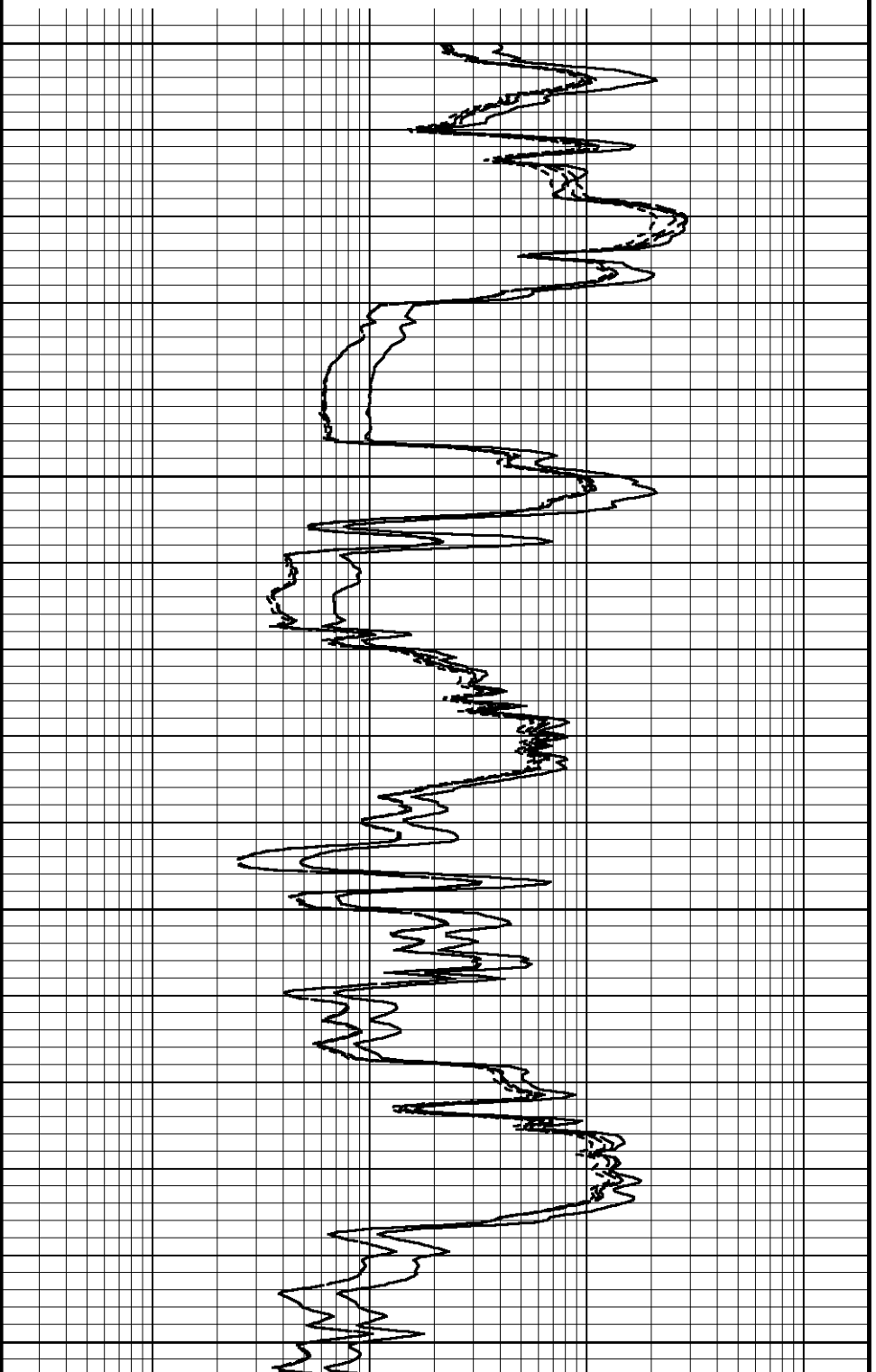
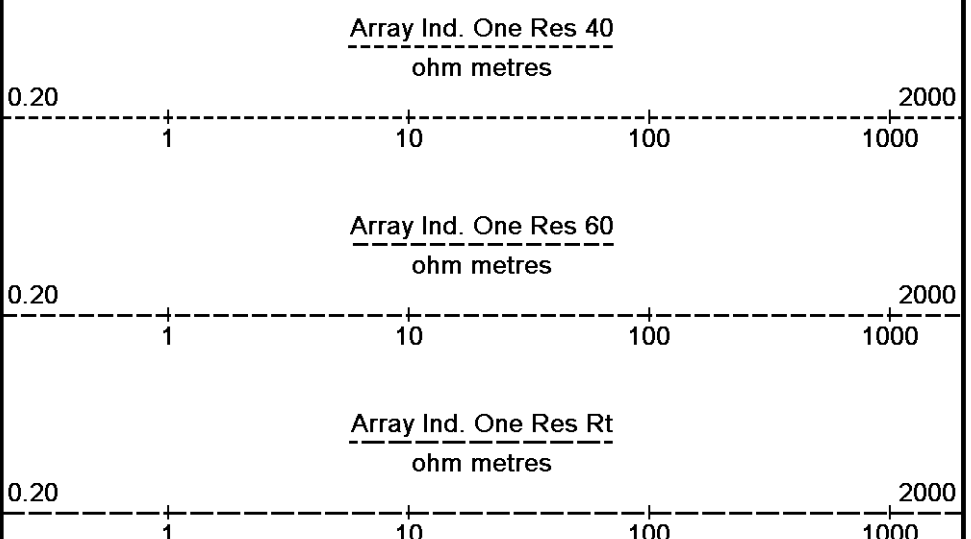
Depth
in
Feet

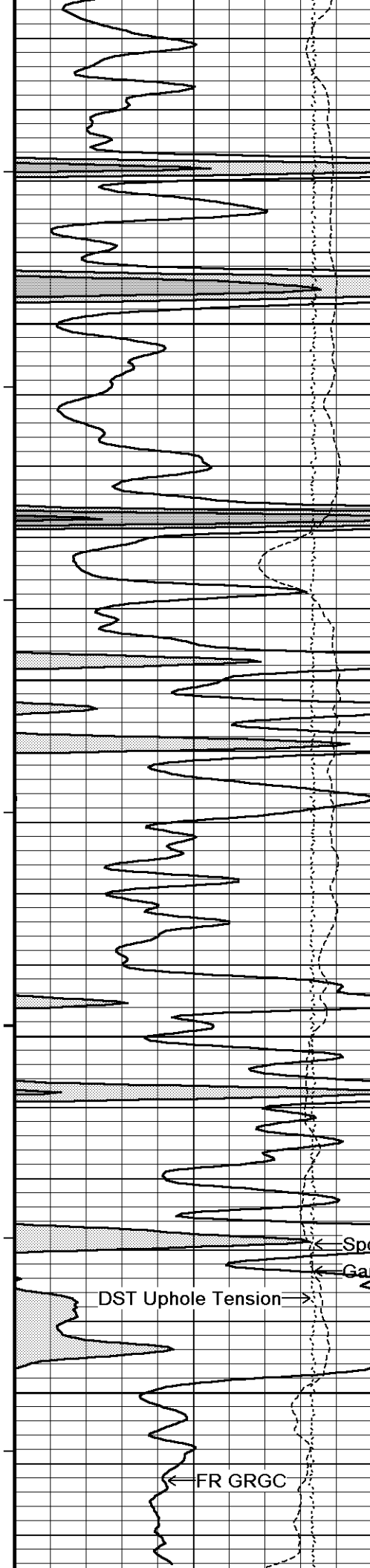




Borehole
Temp in
deg F

Replay
Scale
1:240





107°

4550

106°

4600

106°

4650

104°

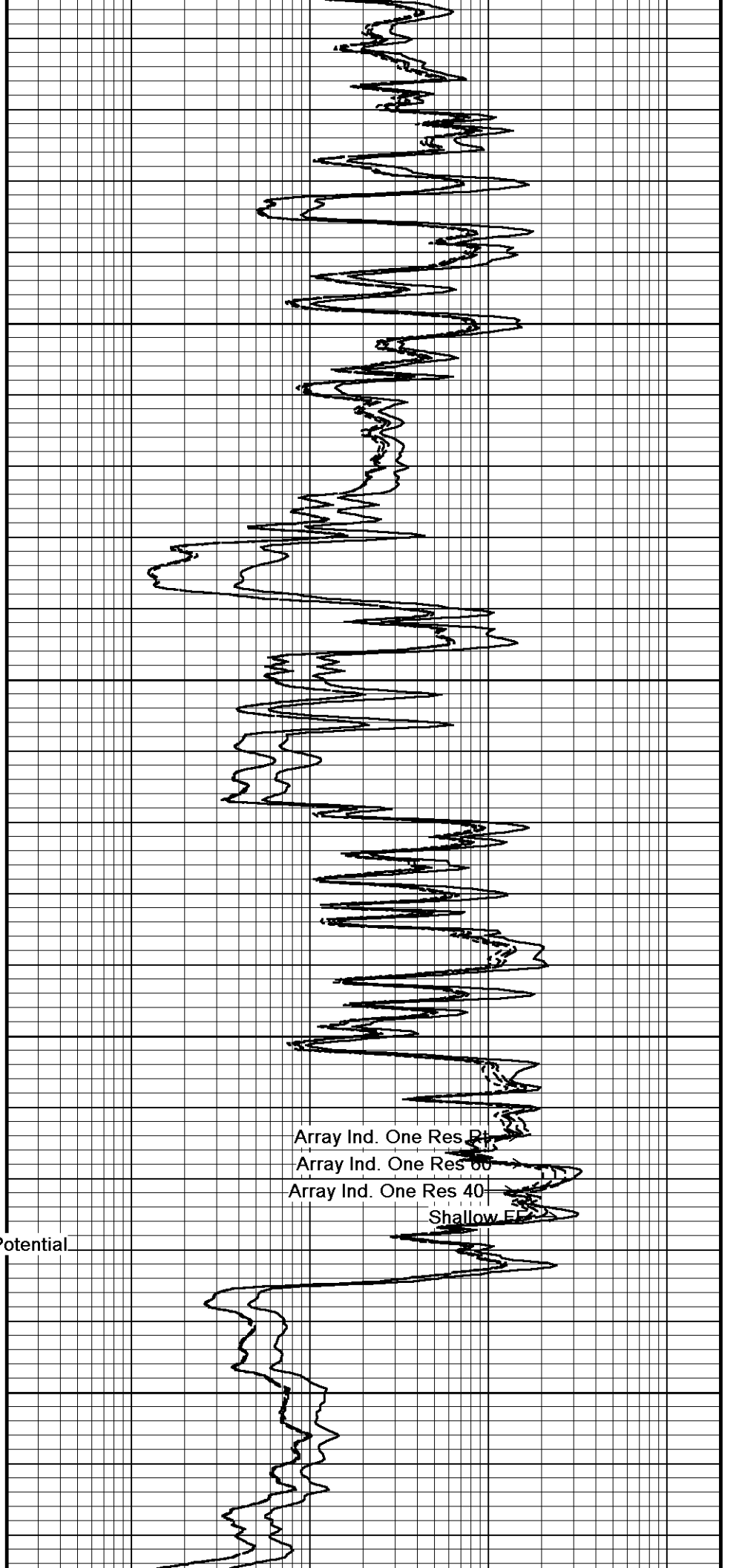
4700

← Spontaneous Potential

← Gamma Ray

DST Uphole Tension →

← FR GRGC

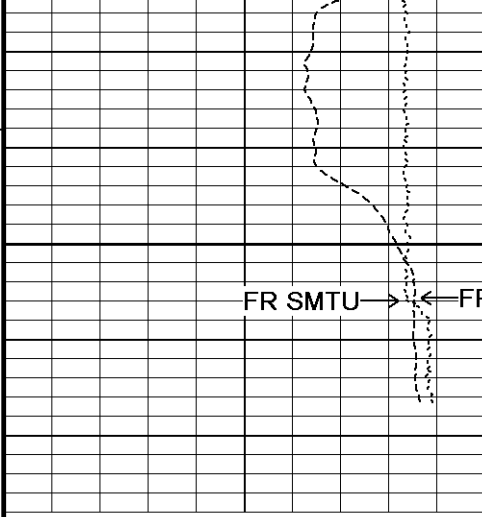


Array Ind. One Res 80

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FF

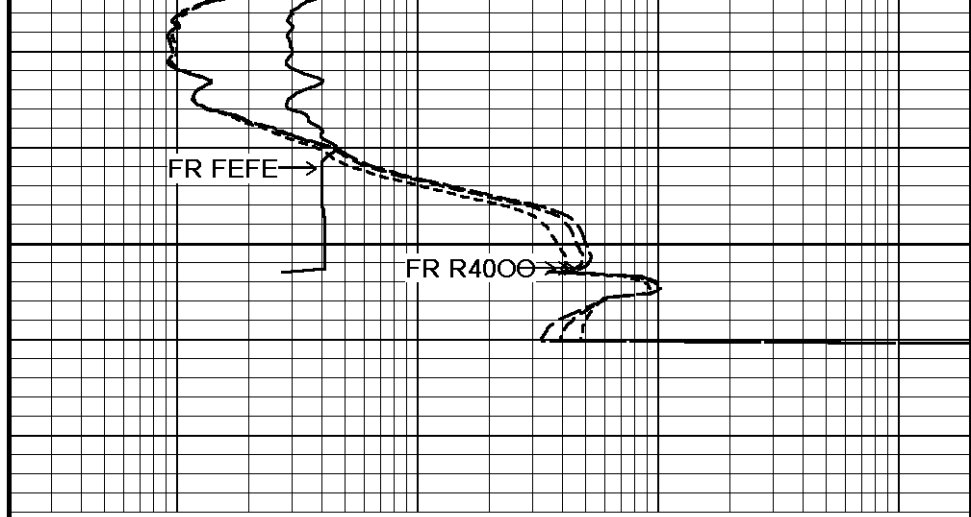


4750

FR SMTU → ← FR SPCG

4776

Depth
in
Feet



FR FEFE →

FR R400 →

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

Borehole
Temp in
deg F

Replay
Scale
1:240

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
0.20 1 10 100 1000 2000

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand M...Grand Mesa Operating Company DBY 4-16_001.dta Recorded on 08-JAN-2013 09:18
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.04.8492\Data\Grand Mesa DBY 4-16\Grand Mesa Operating Company DBY 4-16_001.dta

General Constants All 000

Last Edited on 08-JAN-2013,08:01

General Parameters
 Mud Resistivity 0.740 ohm-metres
 Mud Resistivity Temperature 77.000 degrees F
 Water Level 0.000 feet
 Borehole Fluid Processing Wet Hole

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

Rwa Parameters
 Density used Base Density Density

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Four Res Rt
RWA Constant A	1.000
RWA Constant M	2.000

Down-hole Tension Calibration SMS 0

Field Calibration on 29-DEC-2012 22:07

Reading No	Measured	Calibrated (lbs)
1	15337.85	0.00
2	15893.74	383.60

SP Calibration MCG-C 208

Field Calibration on 27-DEC-2012 10:06

	Measured	Calibrated (mV)
Reference 1	100.9	100.0
Reference 2	-100.6	-100.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 05-NOV-2012,14:26

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

High Resolution Temperature Constants MCG-C 208

Last Edited on 05-NOV-2012,14:25

Pre-filter Length 11

Gamma Calibration MCG-C 208

Field Calibration on 07-JAN-2013 15:22

	Measured	Calibrated (API)
Background	66	47
Calibrator (Gross)	1080	772
Calibrator (Net)	1015	725

Gamma Constants MCG-C 208

Last Edited on 08-JAN-2013,08:01

Gamma Calibrator Number	GR38	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Laterolog Calibration MMR-A 11

Base Calibration on 31-DEC-1999 00:00

Field Check on 31-DEC-1999 00:00

Base Calibration

	Measured		Calibrated (ohm-m)	
	Ref 1	Ref 2	Ref 1	Ref 2
	0.0	0.0	0.0	0.0
	Base Check (ohm-m)		Field Check (ohm-m)	
	0.0		0.0	

Micro Laterolog Constants MMR-A 11

Last Edited on 12-NOV-2012,01:59

Pad Type	6 in Solid Nylon B23059	
Micro Laterolog K Factor	0.0128	
Standoff Offset	0.0000	inches
Mudcake Thickness Correction Constants		
Mud Cake Source	Constant Value	
Mud Cake Thickness	0.4000	inches
Mud Cake Thickness Caliper	N/A	
Mud Cake Resistivity	0.1500	ohm-m
Mud Cake Resistivity Temp.	68.00	Deg F
Mud Cake Resistivity Source	Constant Value	
Temp. Source Rmc Correc.	N/A	

Caliper Calibration MMR-A 11

Base Calibration on 12-DEC-2012 09:20

Field Calibration on 07-JAN-2013 15:36

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13821	5.98
2	17082	7.97
3	20336	9.86
4	24304	11.92

4	24504	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

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

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 12-DEC-2012 09:26
Field Check on 07-JAN-2013 15:26

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.3	59.8	5.0	25.0
Micro Inverse	15.5	77.5	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.5	76.5
Micro Inverse	58.7	58.7

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 05-NOV-2012,13:54

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	0.0000 inches

Neutron Calibration MDN-A.B 65

Base Calibration on 13-DEC-2012 16:03
Field Check on 07-JAN-2013 15:25

Base Calibration

Ratio	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2945	91	3714	110
	32.377		33.764	

Field Calibrator at Base	Calibrated (cps)
	1743 2519
Ratio	0.692

Field Check	Calibrated (cps)
	1729 2508
Ratio	0.662

Neutron Constants MDN-A.B 65

Last Edited on 07-JAN-2013,15:22

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
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 352

Base Calibration on 12-DEC-2012 09:38
Field Check on 07-JAN-2013 15:29

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.4	126.8
Base Check		281.6

FE Constants MFE-B.J 352

Last Edited on 08-JAN-2013,08:01

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 45

Base Calibration on 26-JUL-2012,09:22

Field Check on 07-JAN-2013 15:28

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	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	78.4	Deg F
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Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			18.9	3851.3
2			31.9	3629.2
3			28.8	3049.3
4			18.4	2079.2
Deep			16.2	1911.2
Medium			42.8	4060.4
Shallow			50.0	5482.8

Array Temperature	64.5	Deg F
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Induction Constants MAI-A.A 45

Last Edited on 08-JAN-2013,08:02

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 Water for Apor and Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 13-DEC-2012,10:54

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on 13-DEC-2012,10:53

Pre-filter Length 11

Caliper Calibration MPD-B 31

Base Calibration on 13-DEC-2012 14:11
Field Calibration on 07-JAN-2013 15:30

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	15472	3.99
2	24160	5.98
3	32703	7.97
4	41008	9.86
5	50231	11.92
6	N/A	N/A

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

Photo Density Calibration MPD-B 31

Base Calibration on 13-DEC-2012 14:32
Field Check on 07-JAN-2013 15:35

Density Calibration				
Base Calibration				
	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	46489	23675	59556	30836
Reference 2	18873	1941	24941	2541
Field Check at Base				
	683.9	844.6		
Field Check				
	682.6	841.2		

PE Calibration				
Base Calibration				
	WS	Measured	Ratio	Calibrated
		WH		Ratio
Background	126	608		
Reference 1	18821	46368	0.409	0.371
Reference 2	5566	18789	0.299	0.272
Field Check at Base				
	125.8	608.0		
Field Check				
	125.7	605.8		

Density Constants MPD-B 31

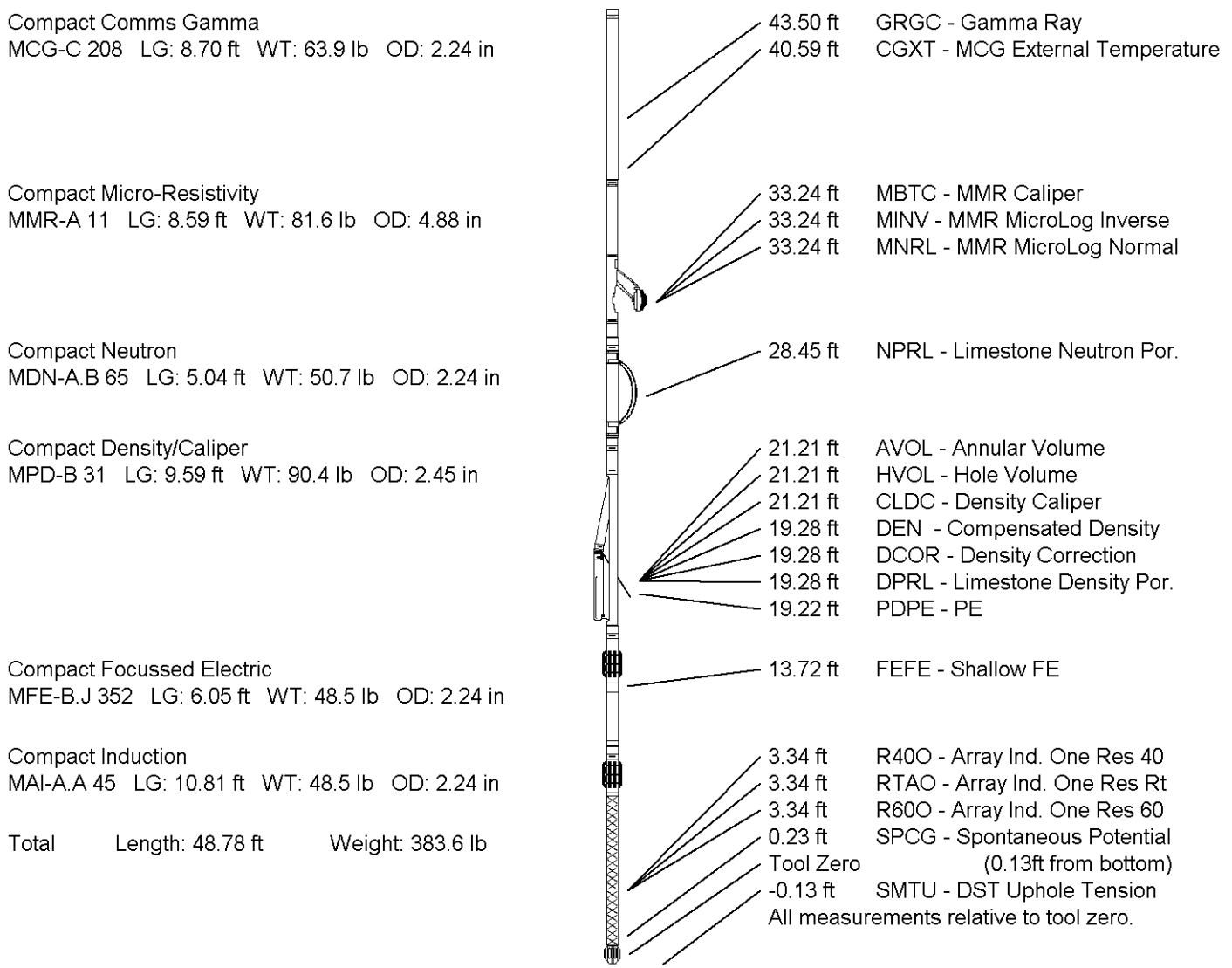
Last Edited on 08-JAN-2013,08:01

Density Source Id	254	
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 (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
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.04.8492\Data\Grand Mesa DBY 4-16\Grand Mesa Operating Company DBY 4-16_001.dta



COMPANY	GRAND MESA OPERATING COMPANY		
WELL	DBY #4-16		
FIELD	WILDCAT		
PROVINCE/COUNTY	SCOTT		
COUNTRY/STATE	U.S.A. / KANSAS		

Elevation Kelly Bushing	3076.00	feet	First Reading	4753.00	feet
Elevation Drill Floor	3075.00	feet	Depth Driller	4756.00	feet
Elevation Ground Level	3071.00	feet	Depth Logger	4756.00	feet

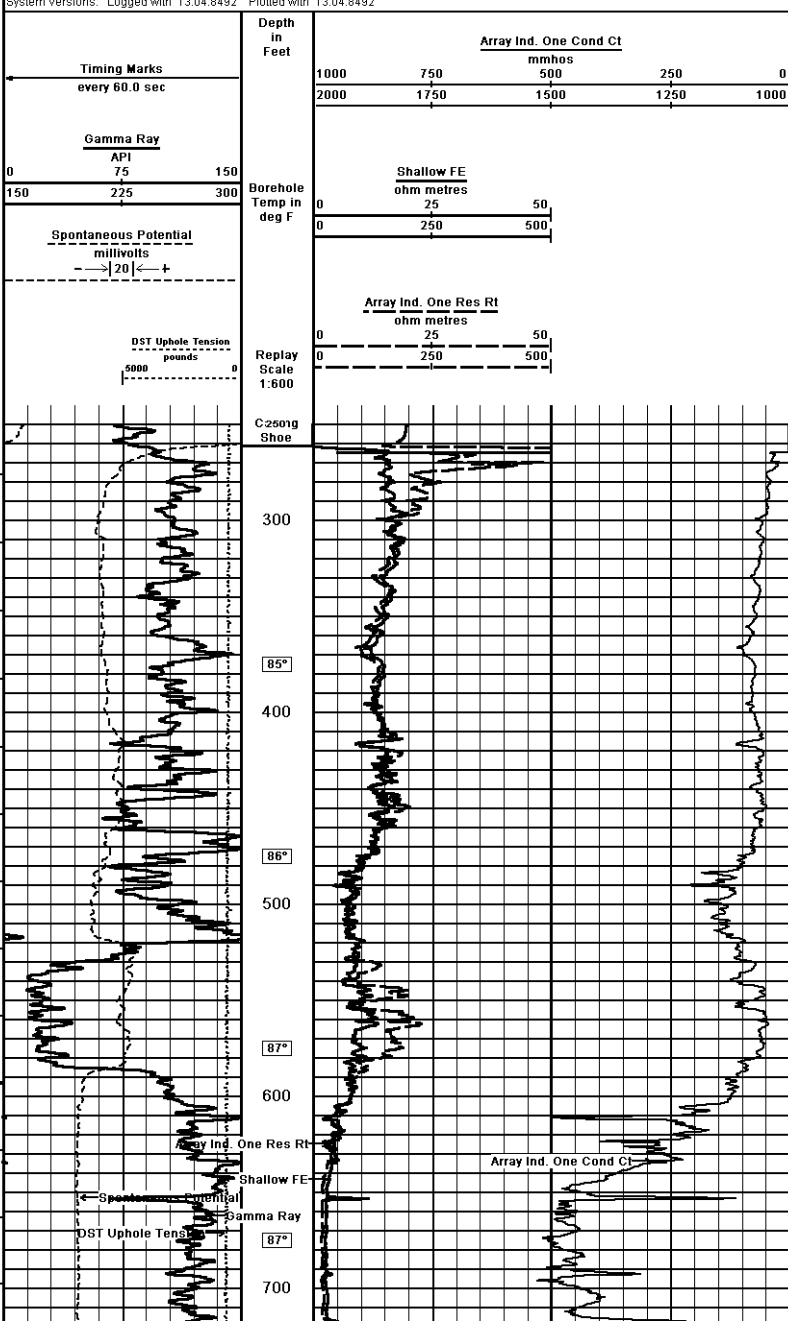


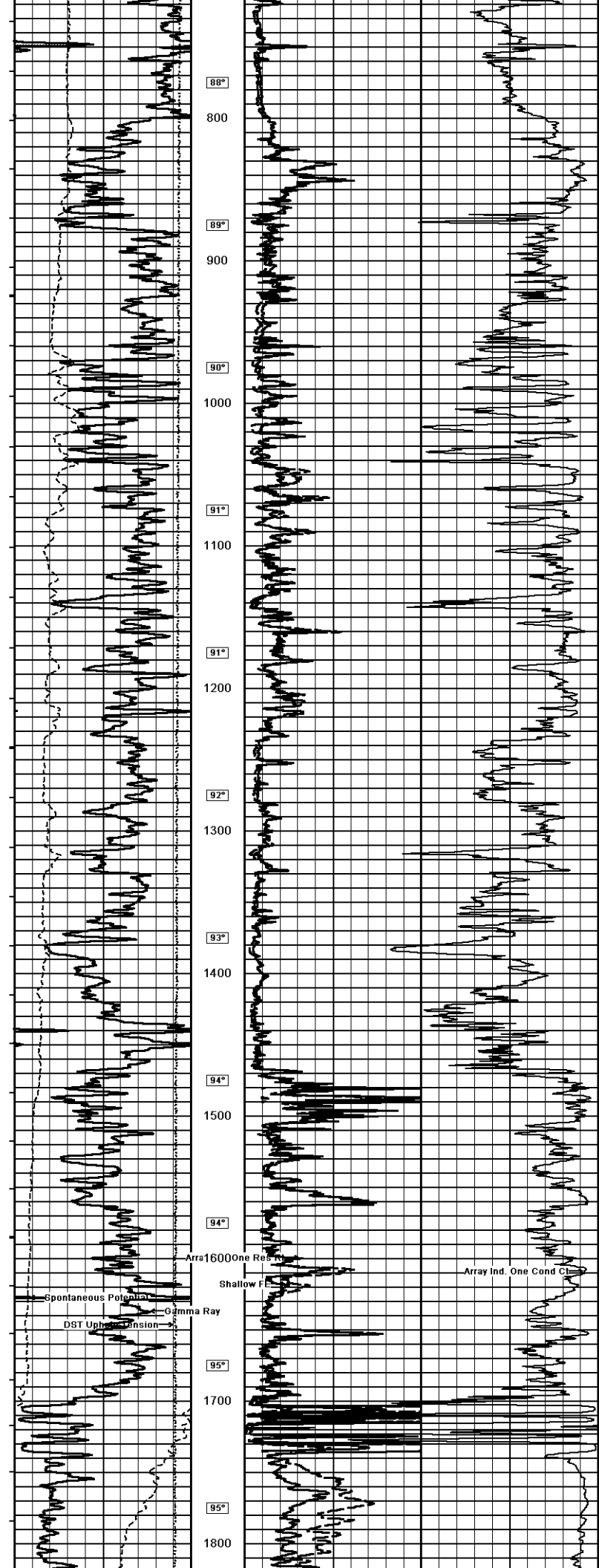
ARRAY INDUCTION
SHALLOW FOCUSED

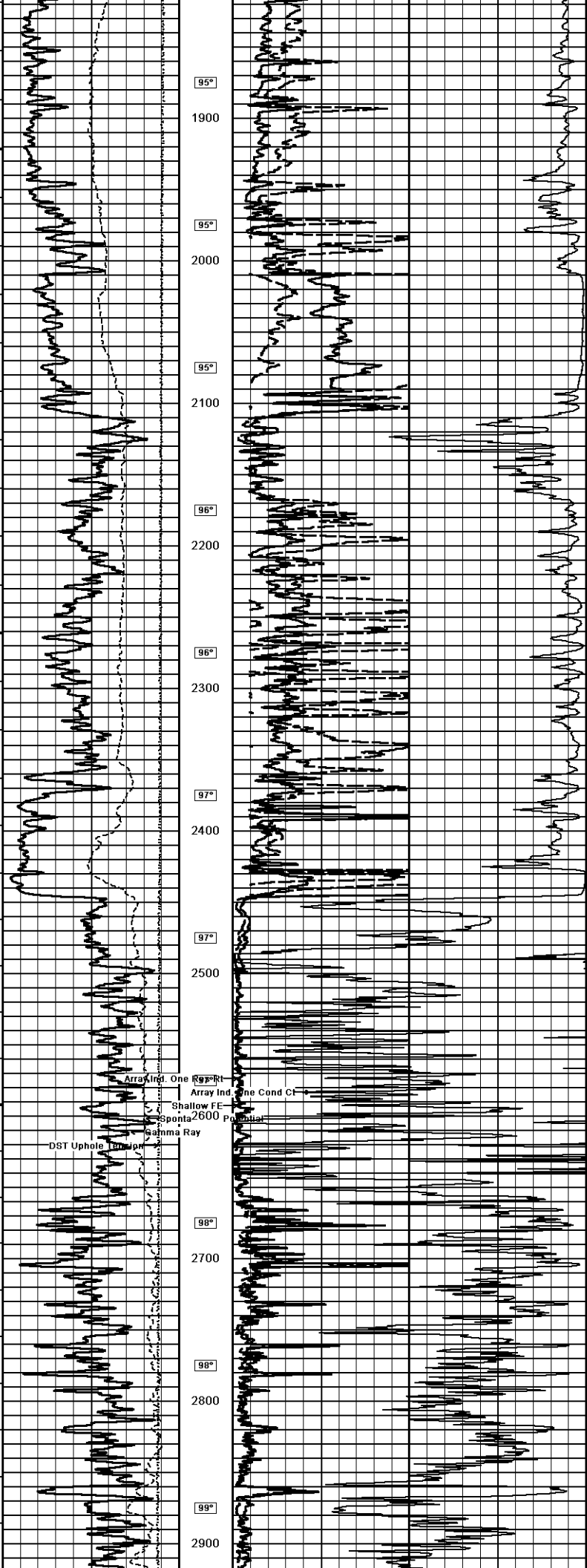
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY	GRAND MESA OPERATING COMPANY	WELL	DBY #4-16
FIELD	WILDCAT	PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS	LOG MEASURED FROM	K:B
LOCATION	1370' FSL & 1840' F.W.L.	LOG MEASURED FROM	K:B
SEC	TIME	DATE	08-JAN-2013
16	188	154771-26922	
Run Number	ONE	Log Measured From	K:B
Service Order	3428968	Drilling Measured From	K:B
Depth Diller	4756.00	Run Number	154771-26922
Depth Logger	4753.00	Log Measured From	K:B
First Reading	261.00	Drilling Measured From	K:B
Last Reading	262.00	Run Number	154771-26922
Casing Logger	261.00	Log Measured From	K:B
Bit Size	7.875	Drilling Measured From	K:B
Hole Fluid Type	CHEMICAL	Run Number	154771-26922
Density/Viscosity	9.20 lbm/sg	Log Measured From	K:B
pH/Filtration	11.00	Drilling Measured From	K:B
Sample Source	FLOWLINE	Run Number	154771-26922
Rm @ Measured Temp	0.74 @ 77.0	Log Measured From	K:B
Rm @ Measured Temp	0.59 @ 77.0	Drilling Measured From	K:B
Rm @ Measured Temp	0.98 @ 77.0	Run Number	154771-26922
Source Rm / Rm	CALC	Log Measured From	K:B
Rm @ BHT	0.53 @ 108.0	Drilling Measured From	K:B
Time Since Circulation	4 HOURS	Run Number	154771-26922
Max Recorded Temp	108.00	Log Measured From	K:B
Equipment / Base	13057	Drilling Measured From	K:B
Recorded By	LYNN SCOTT	Run Number	154771-26922
Witnessed By	JOHN SOUTSMITH	Log Measured From	K:B
LOG#	LE153006	Drilling Measured From	K:B

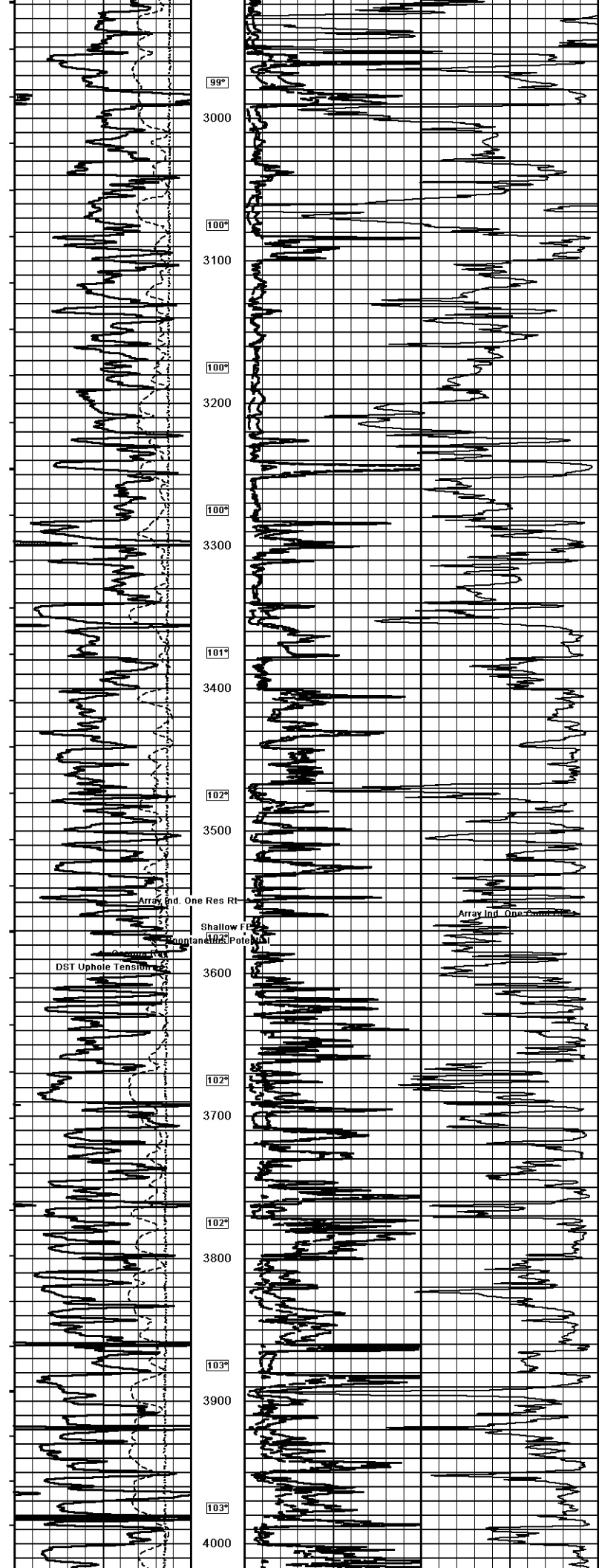
1 INCH MAIN

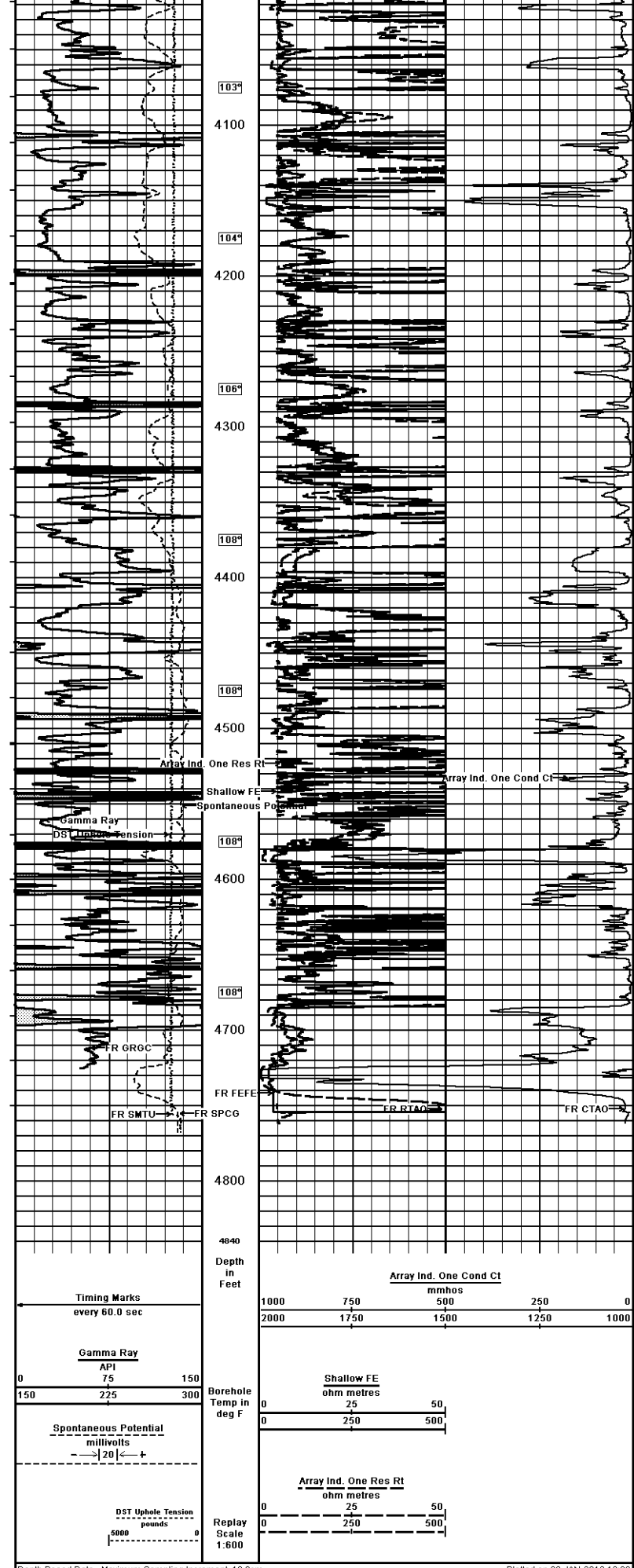
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 Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand Mesa...\Grand Mesa Operating Company DBY 4-16_002.dta
 Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492












Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 08-JAN-2013 12:09
 Filename: C:\Minimus 13.04.8492\Data\Grand Mesa - Grand Mesa Operating Company DBY 4-16_002.dta
 Recorded on 08-JAN-2013 09:38
 System Versions: Logged with 13.04.8492 Plotted with 13.04.8492

1 INCH MAIN

COMPANY GRAND MESA OPERATING COMPANY

WELL DBY #4-16
FIELD WILDCAT
PROVINCE/COUNTY SCOTT
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	3076.00	feet	First Reading	4753.00	feet
Elevation Drill Floor	3075.00	feet	Depth Driller	4756.00	feet
Elevation Ground Level	3071.00	feet	Depth Logger	4756.00	feet

 ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG