



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY				GRAND MESA OPERATING COMPANY			
WELL				WEBER #1-14			
FIELD				WILDCAT			
PROVINCE/COUNTY				GOVE			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				1306' FSL & 1170' FWL			
SEC	TWP	RGE	Other Services				
14	13S	31W	MPD/MDN				
API Number		15-063-22141		MML			
Permit Number							
Permanent Datum G.L., Elevation 2881 feet						Elevations:	
Log Measured From KB						KB	2892.00
Drilling Measured From K.B. @ 11 FEET						DF	2890.00
						GL	2881.00
Date	08-OCT-2013						
Run Number	ONE						
Service Order	3539908						
Depth Driller	4680.00						feet
Depth Logger	4669.00						feet
First Reading	4666.00						feet
Last Reading	223.00						feet
Casing Driller	227.00						feet
Casing Logger	223.00						feet
Bit Size	7.875						inches
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.30 lb/USg						52.00 CP
PH / Fluid Loss	10.50						6.40 ml/30Min
Sample Source	FLOWLINE						
Rm @ Measured Temp	1.30 @ 72.0						ohm-m
Rmf @ Measured Temp	1.04 @ 72.0						ohm-m
Rmc @ Measured Temp	1.56 @ 72.0						ohm-m
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.79 @119.0						ohm-m
Time Since Circulation	3 HOURS						
Max Recorded Temp	119.00						deg F
Equipment / Base	13057		LIB				
Recorded By	ROB HOFFMAN						
Witnessed By	KENT MATSON						
JOB #	LB13-285						

BOREHOLE RECORD					Last Edited: 08-OCT-2013 13:08
Bit Size inches		Depth From feet		Depth To feet	
7.875		227.00		4680.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	227.00	24.00	

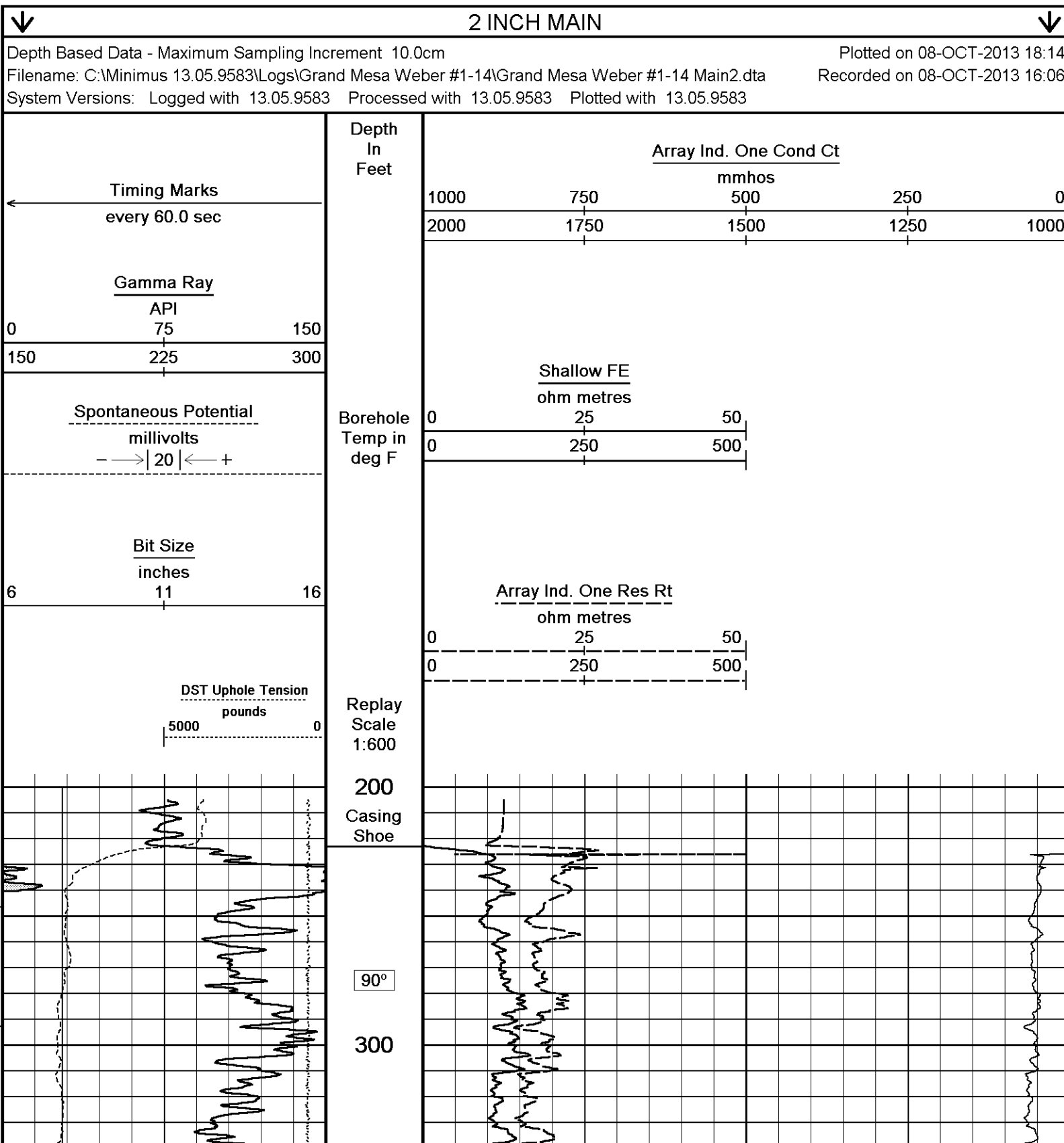
REMARKS
- SOFTWARE ISSUE: 13.05.9583
- MCG, MML, MDN, MPD, MFE AND MAI RAN IN COMBINATION
- HARDWARE: DUAL BOWSPRING USED ON MDN 0.5 INCH STANDOFF USED ON MFE AND MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL EFFECT DATA QUALITY
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMRES REQUEST
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 992 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3669FT: 496 CU.FT.
-RIG: DUKE DRILLING RIG #10

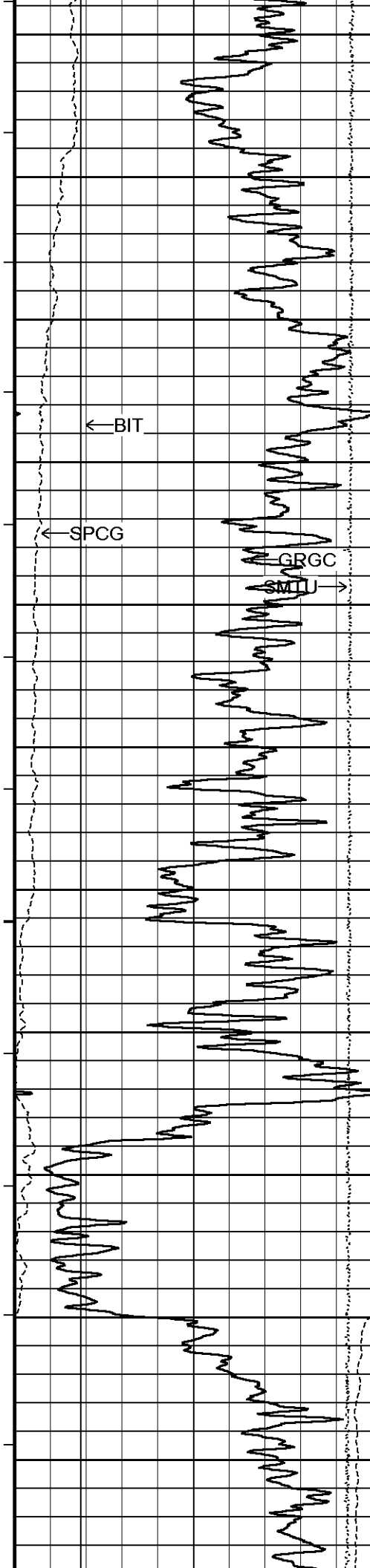
- ENGINEER: R. HOFFMAN

- OPERATOR: K. RINEHART

****CUSTOMER SAID THE RIG HAD SOME DEPTH ISSUES AND THOUGHT OUR DEPTH WAS GOOD****

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.





92°

400

94°

500

96°

600

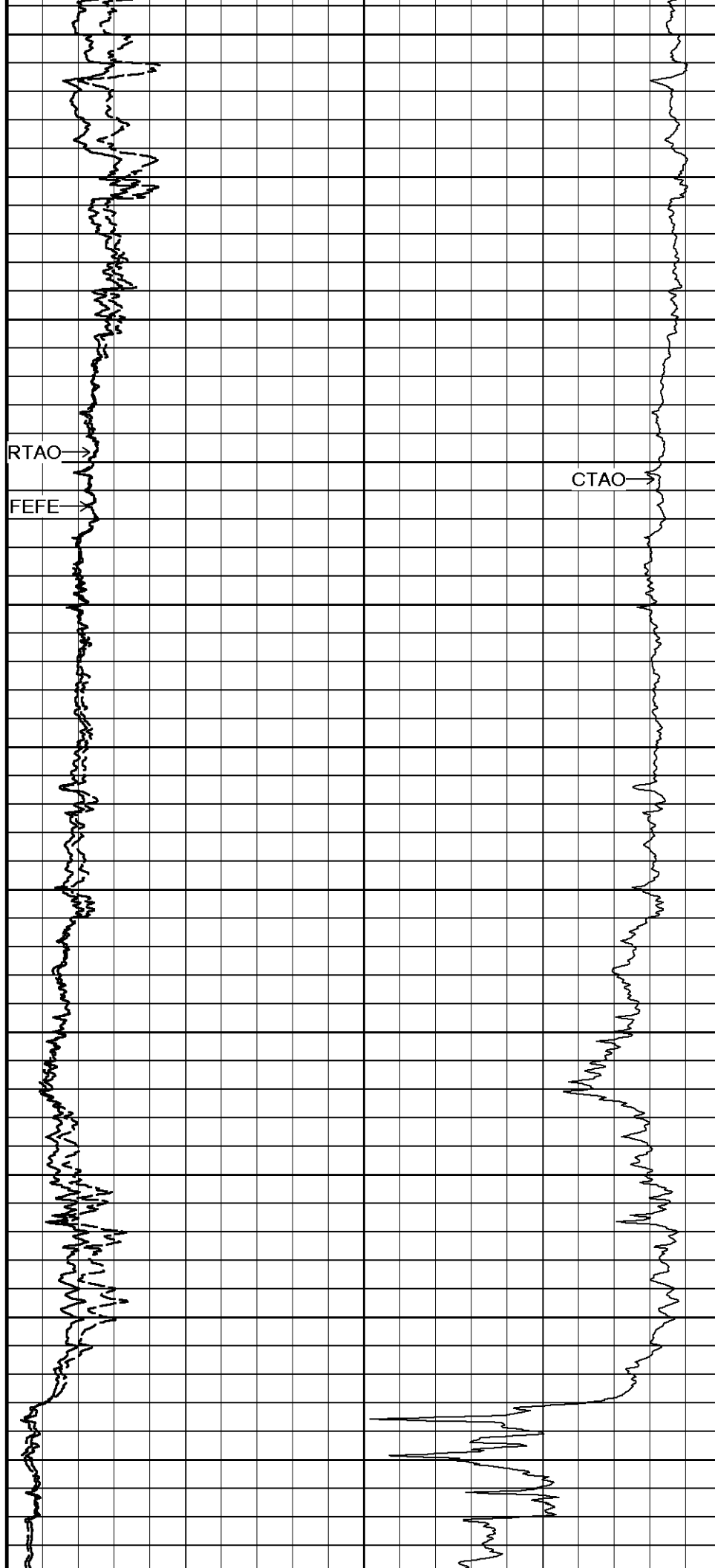
97°

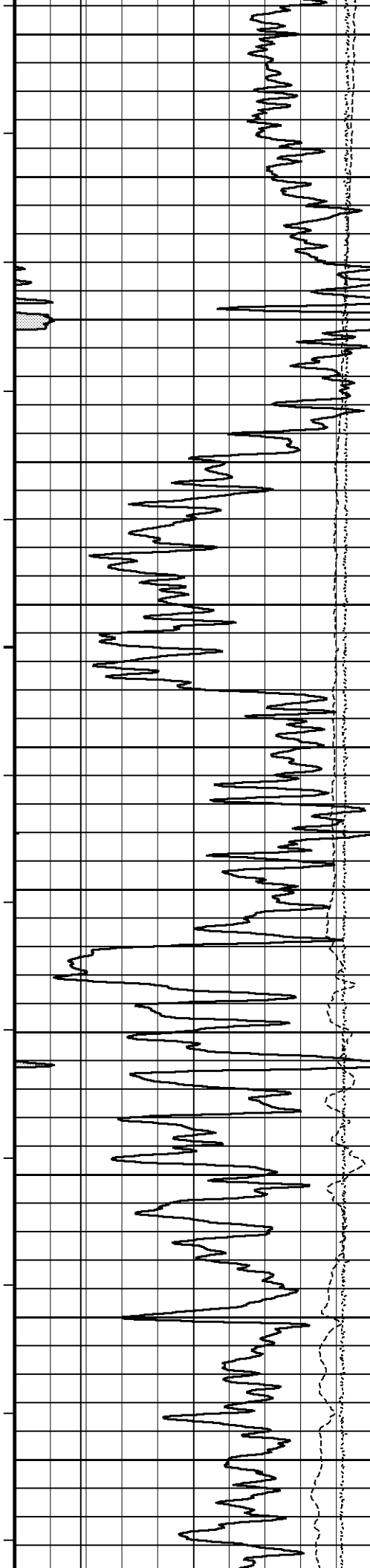
700

99°

800

100°





900

100°

1000

101°

1100

102°

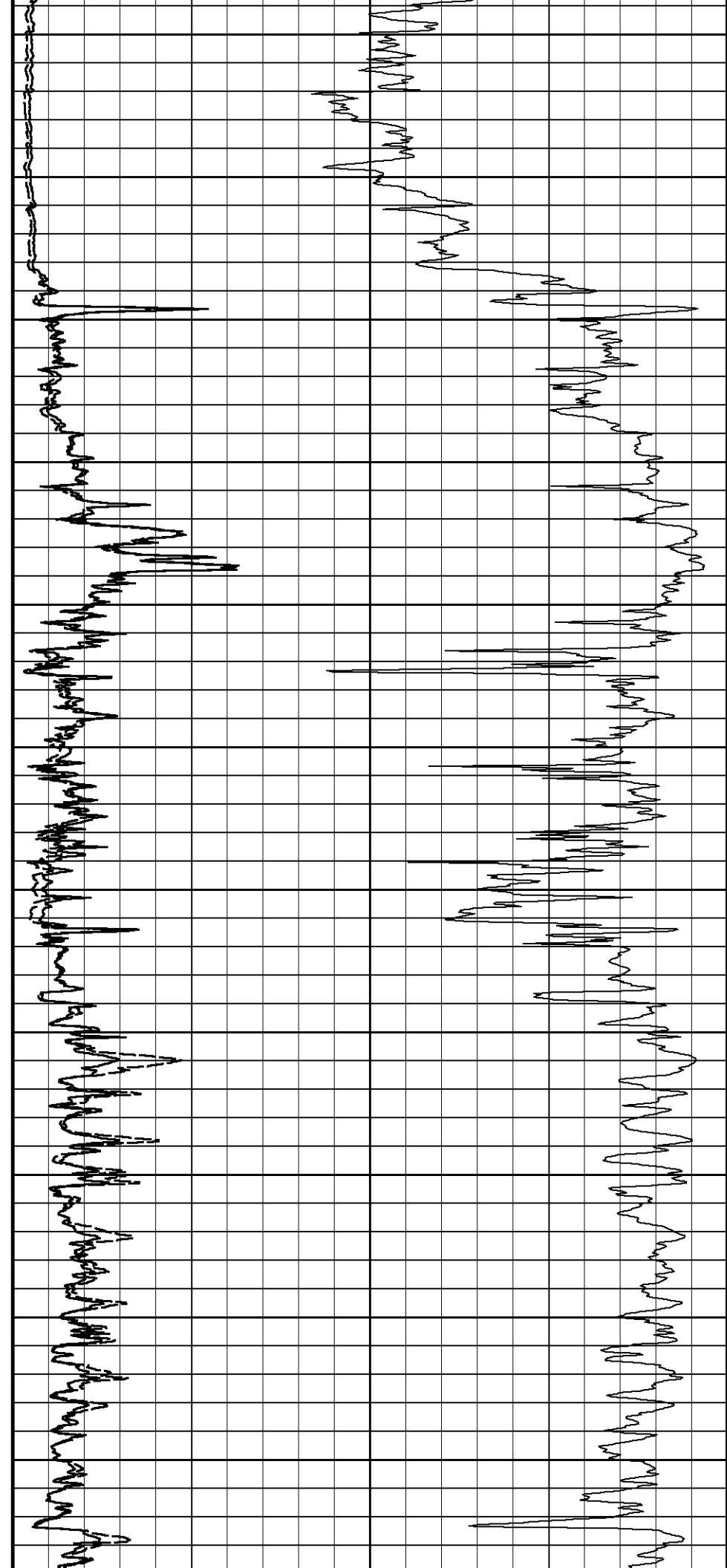
1200

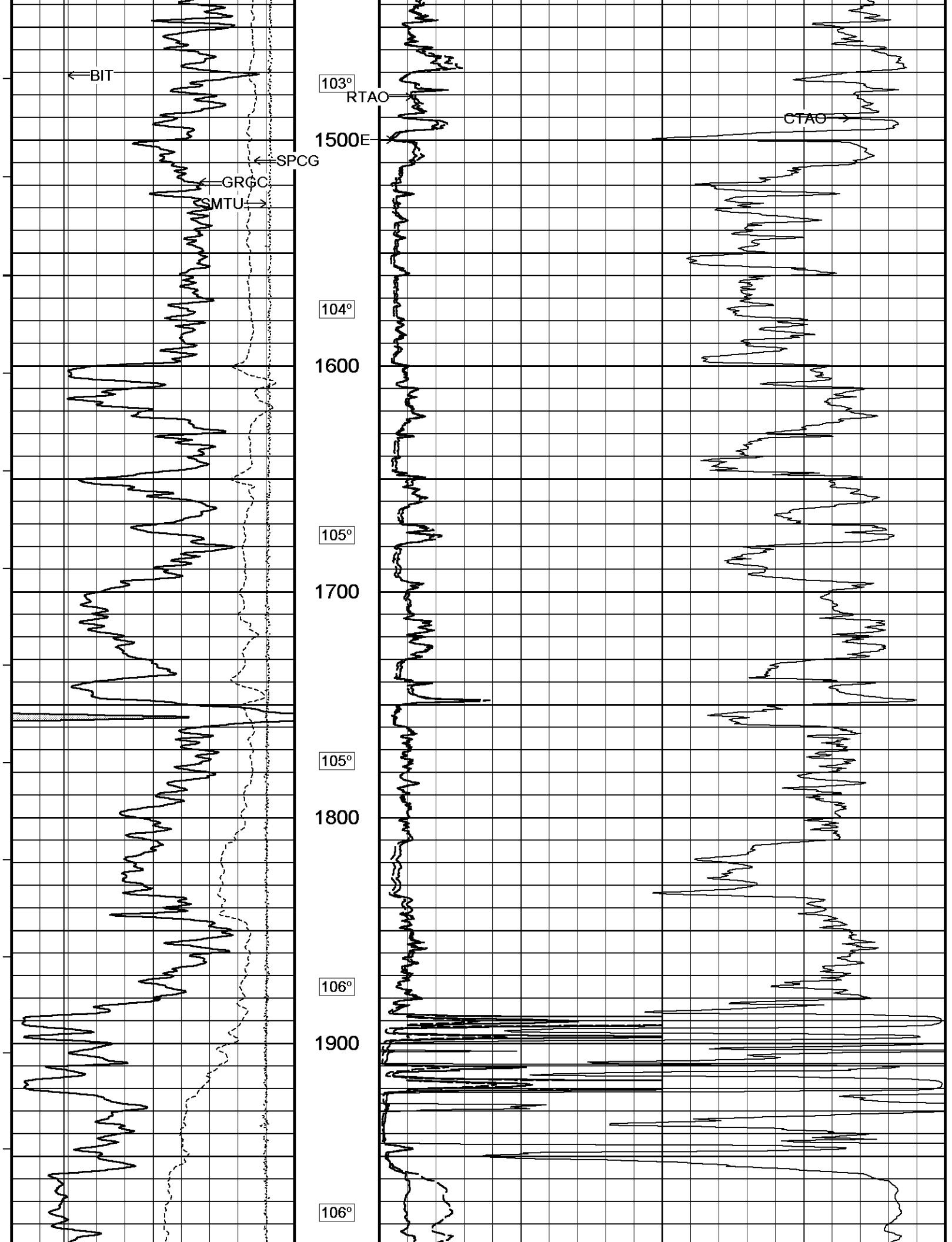
102°

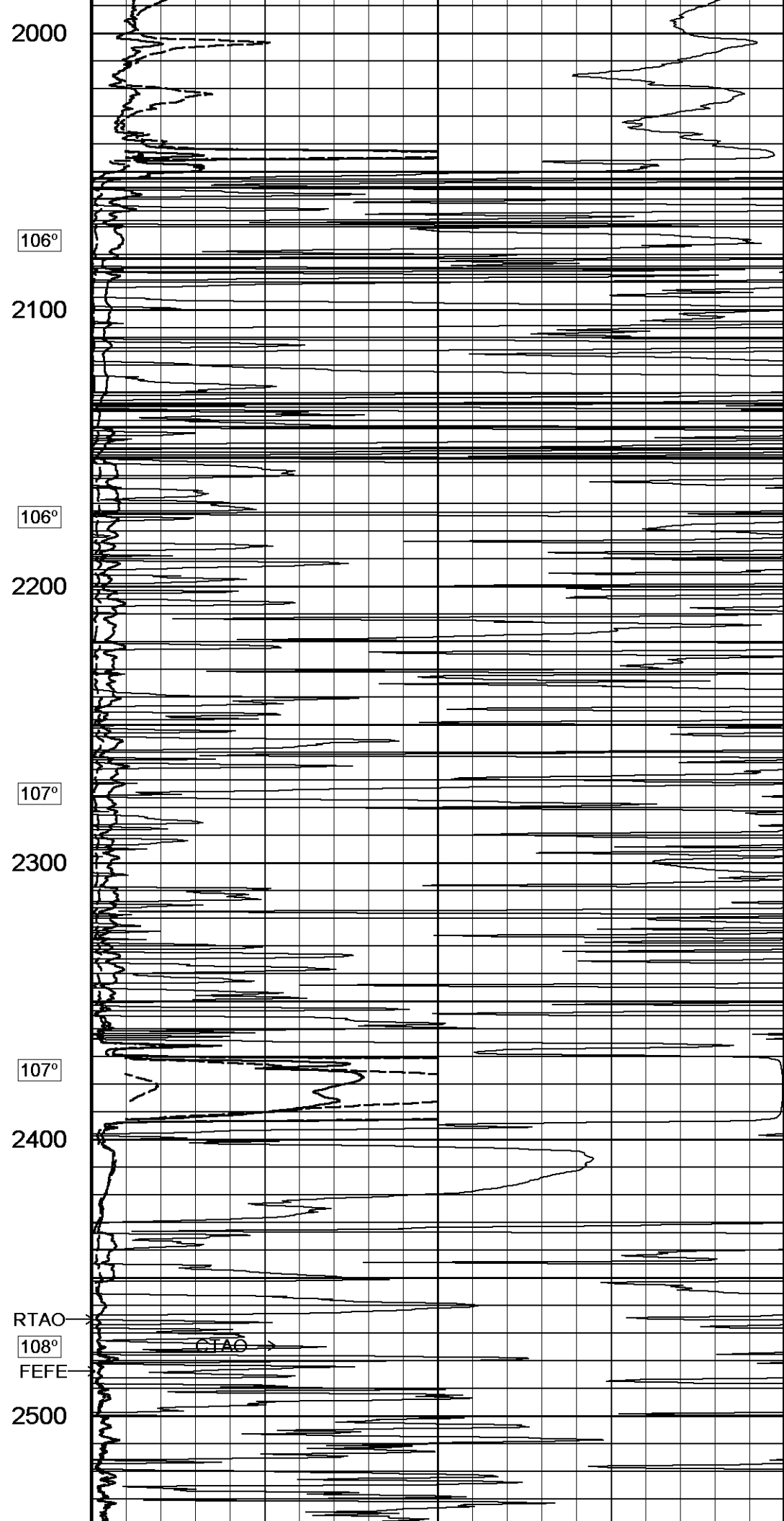
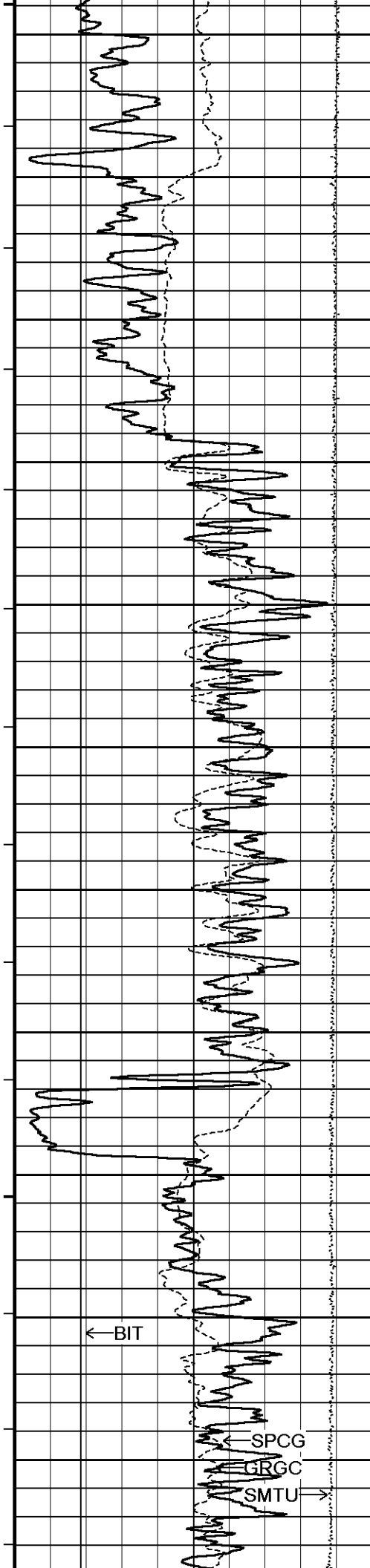
1300

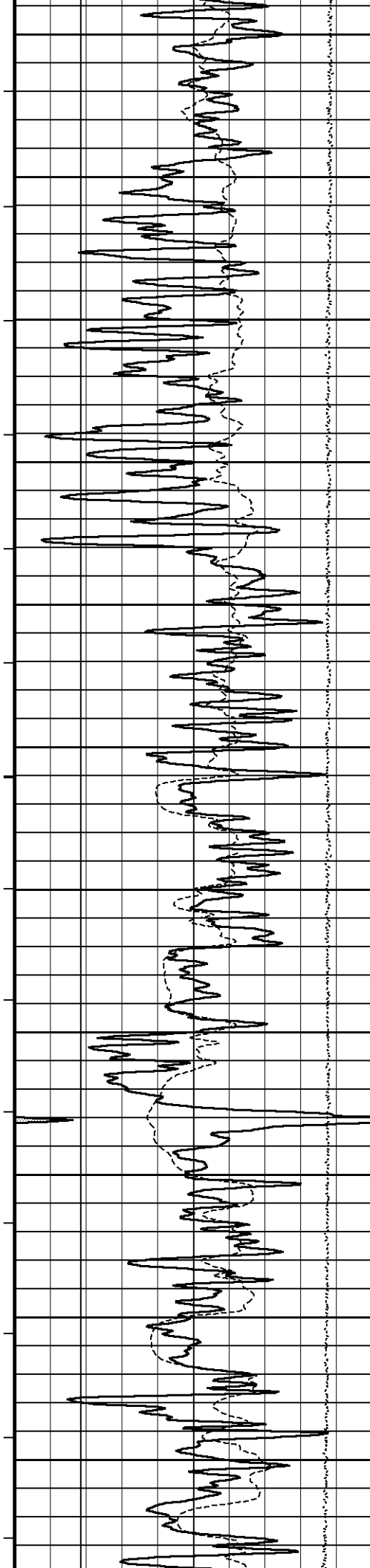
103°

1400









108°

2600

109°

2700

109°

2800

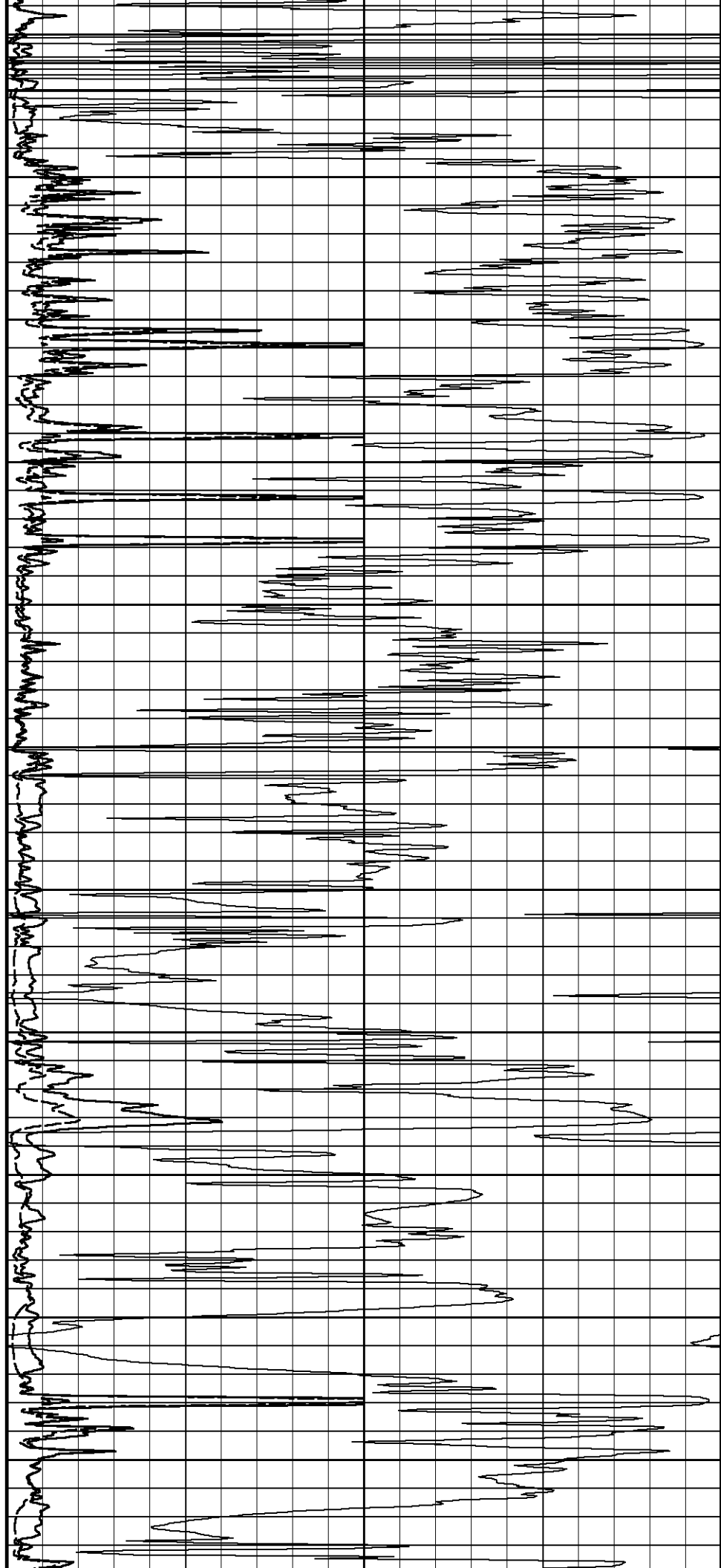
110°

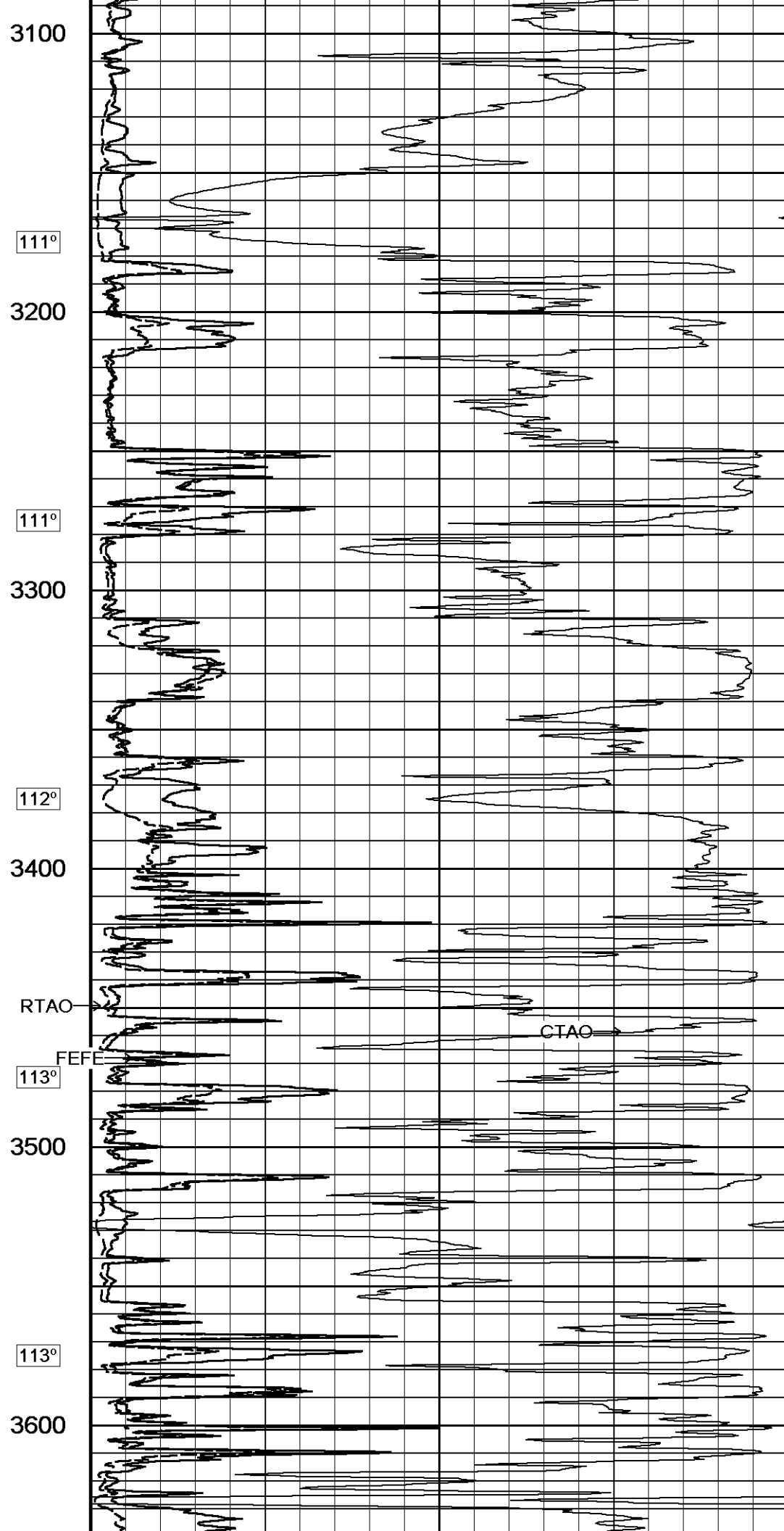
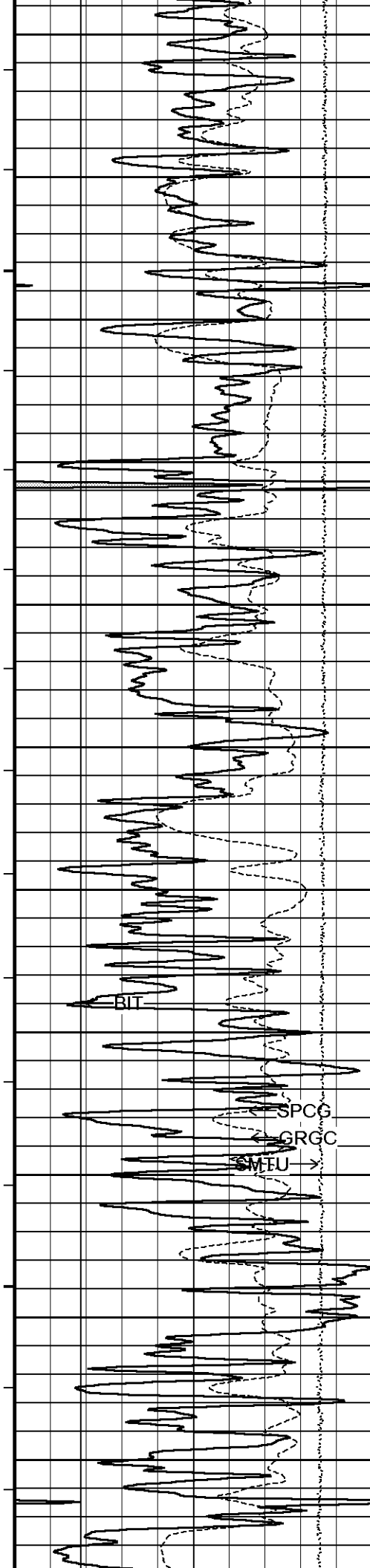
2900

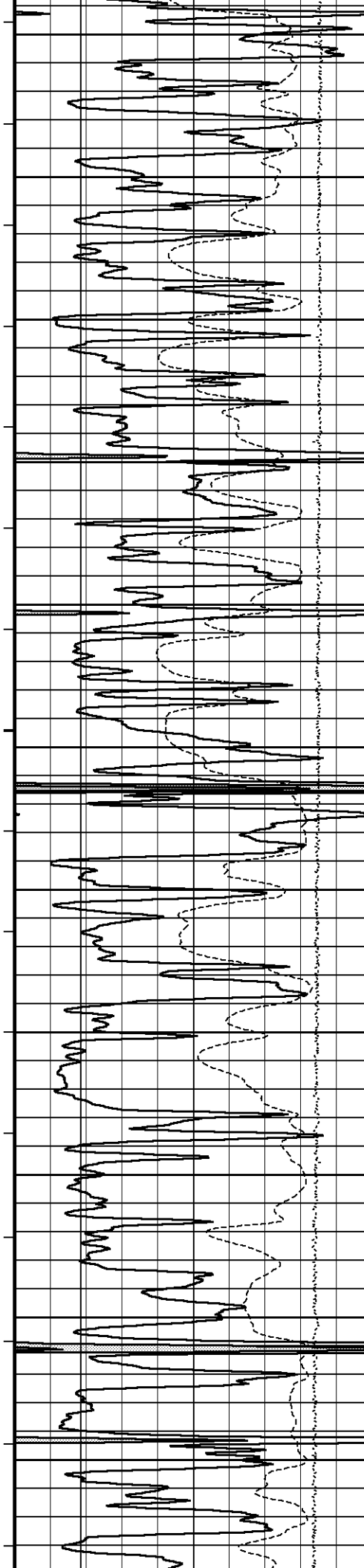
110°

3000

110°







114°

3700

114°

3800

115°

3900

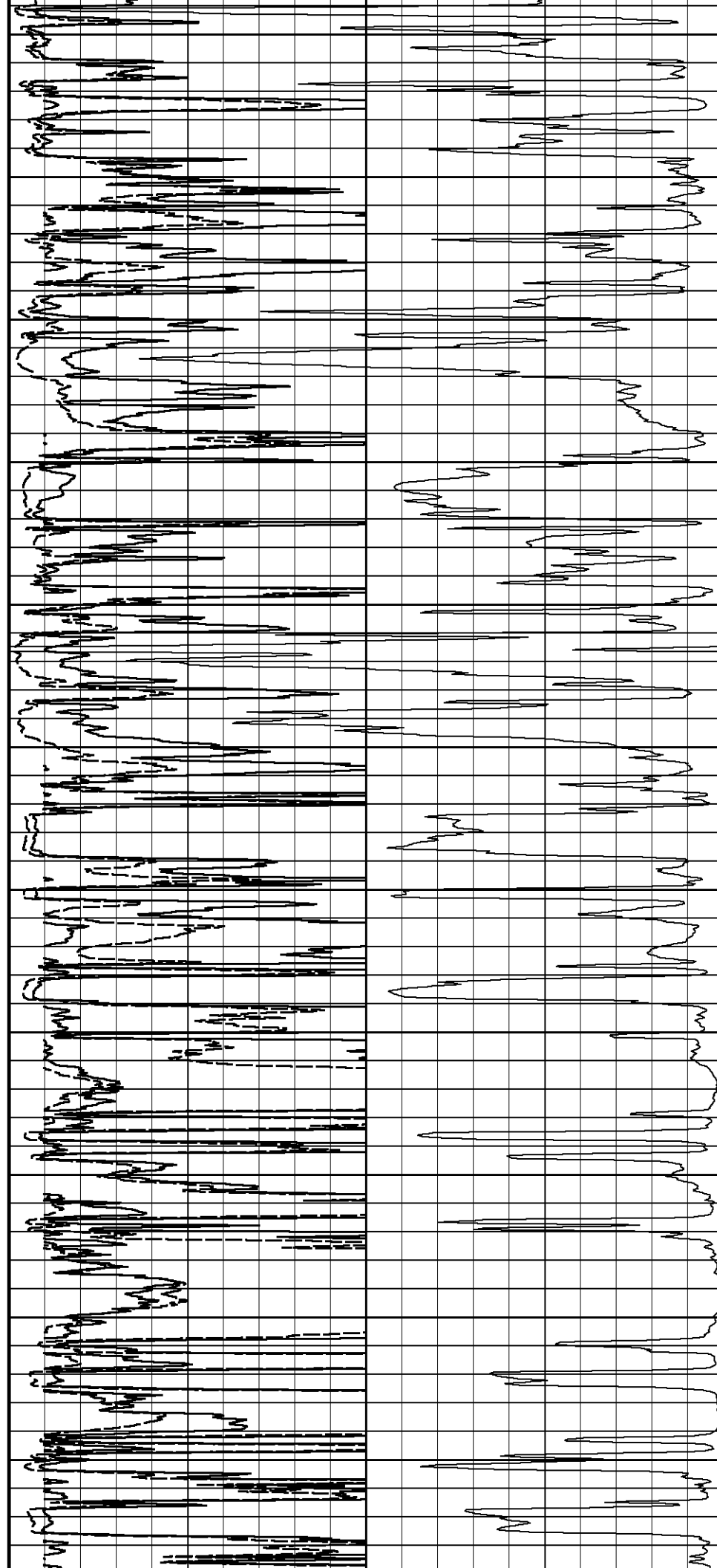
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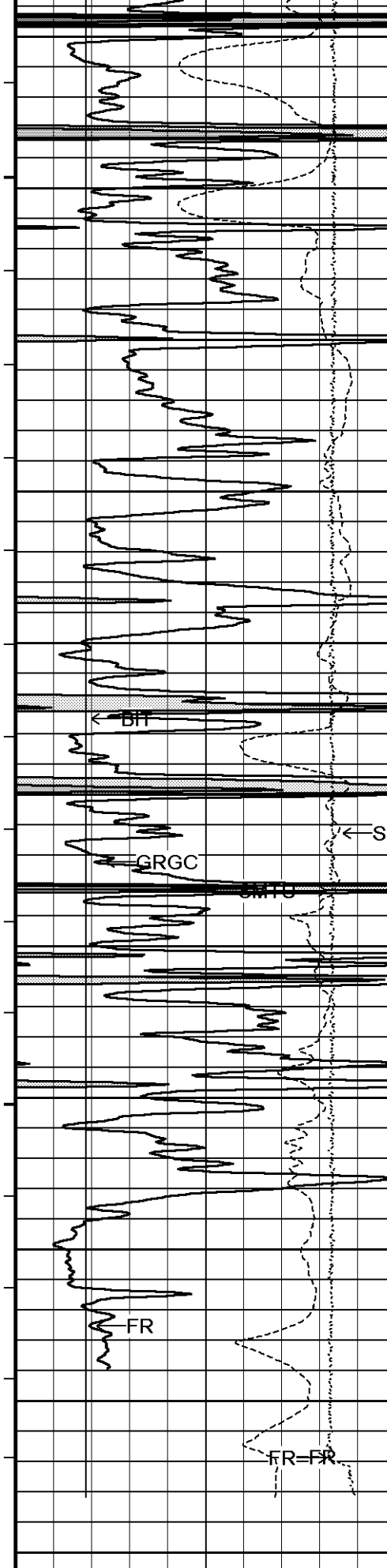
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116°

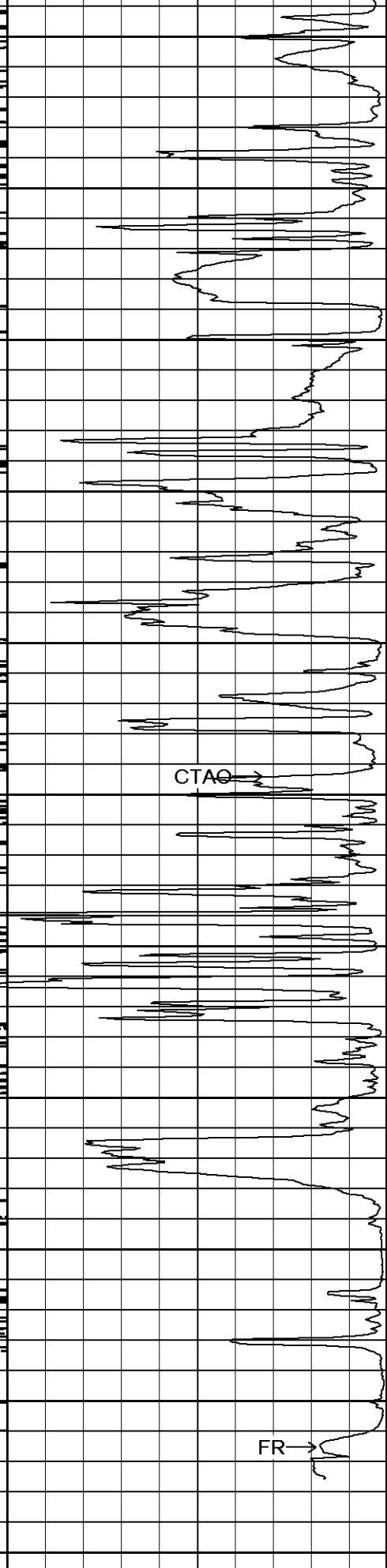
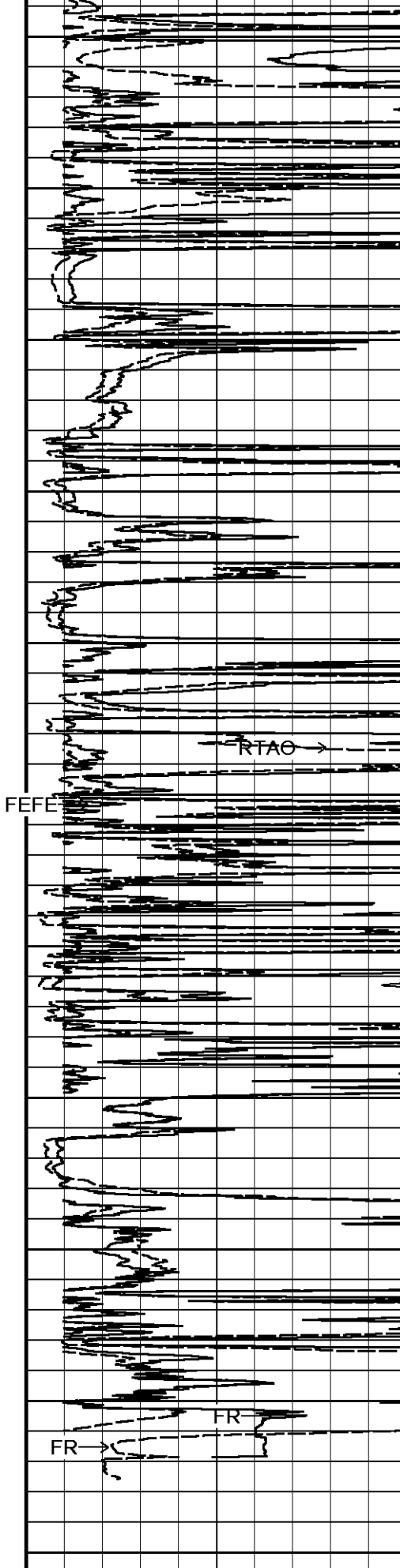
4100

117°





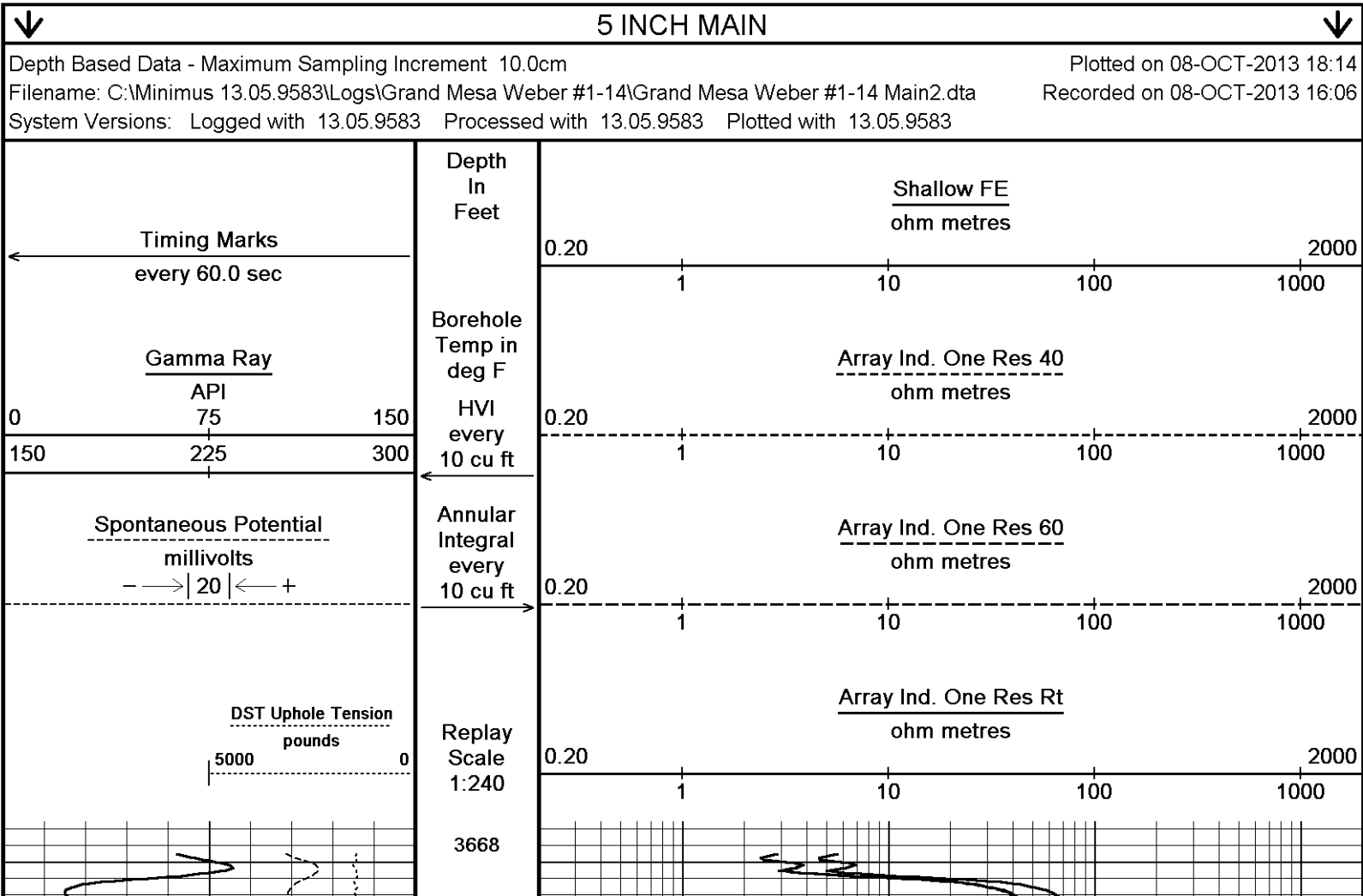
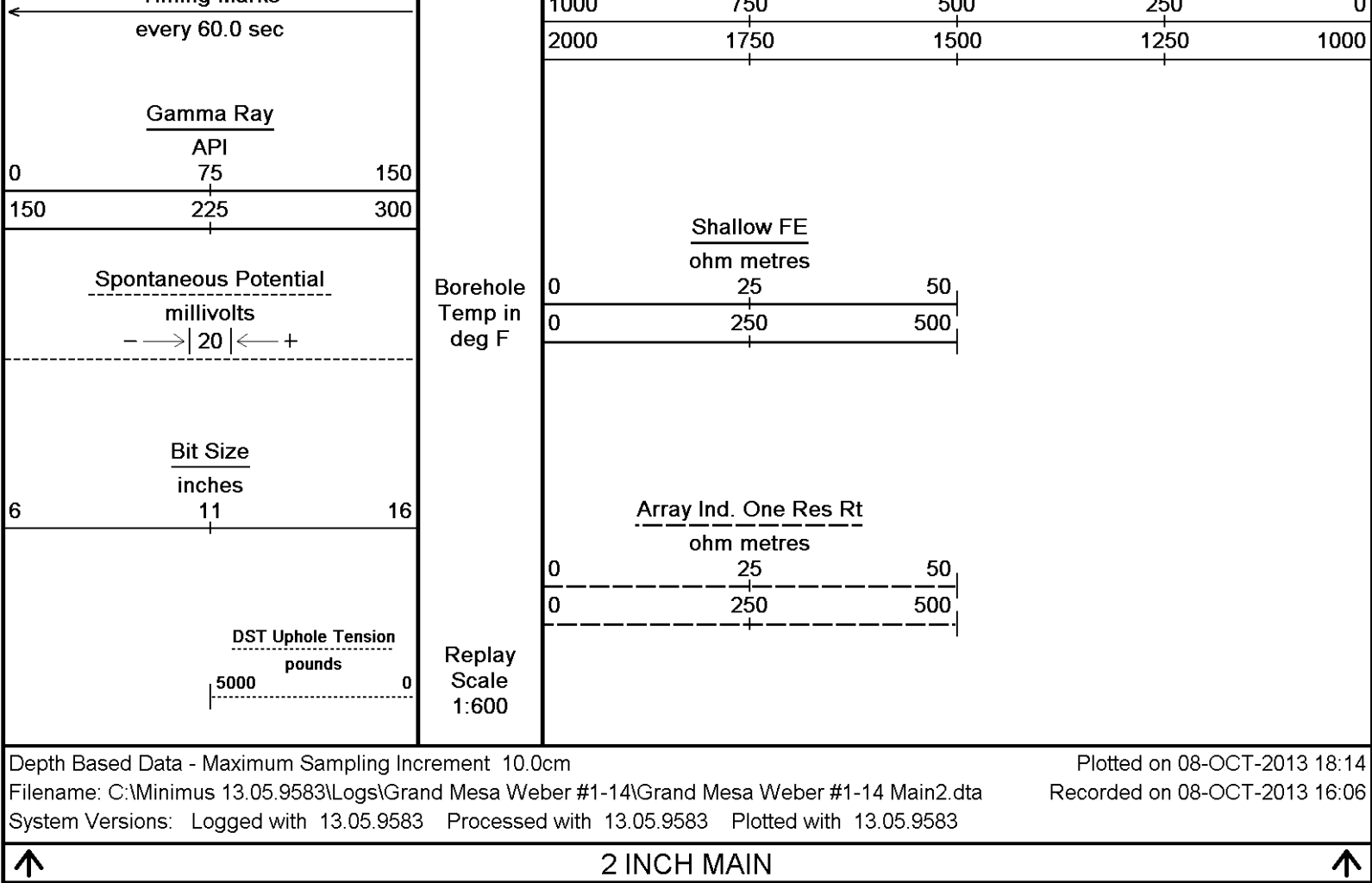
4200
117°
4300
118°
4400
119°
4500
120°
4600
4700
Depth
In
Feet

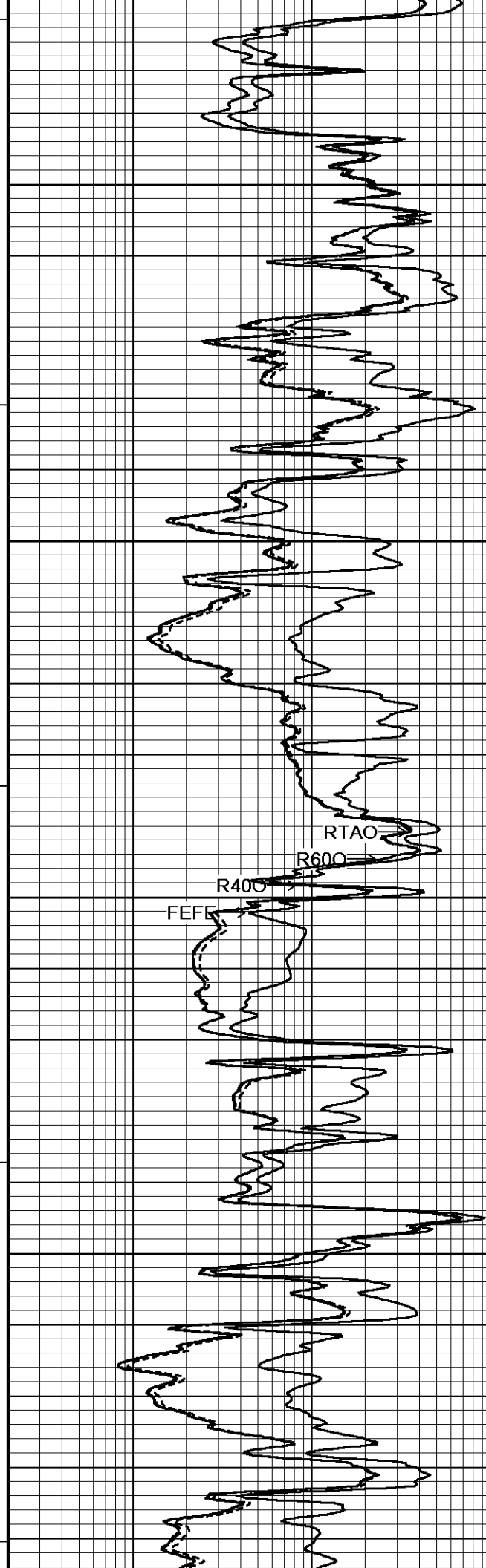
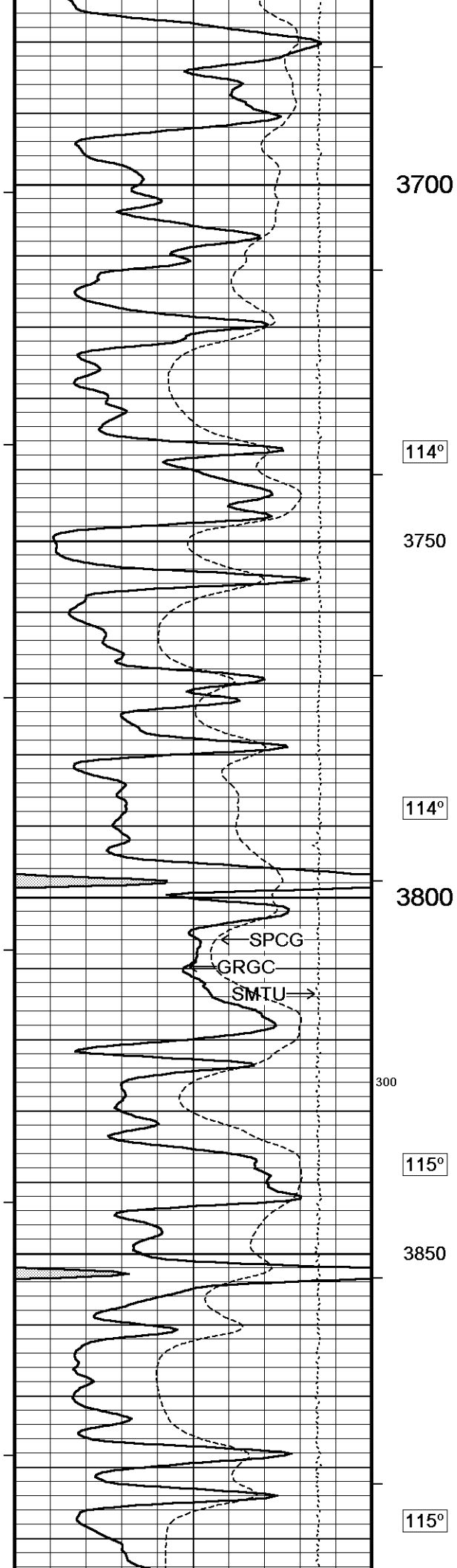


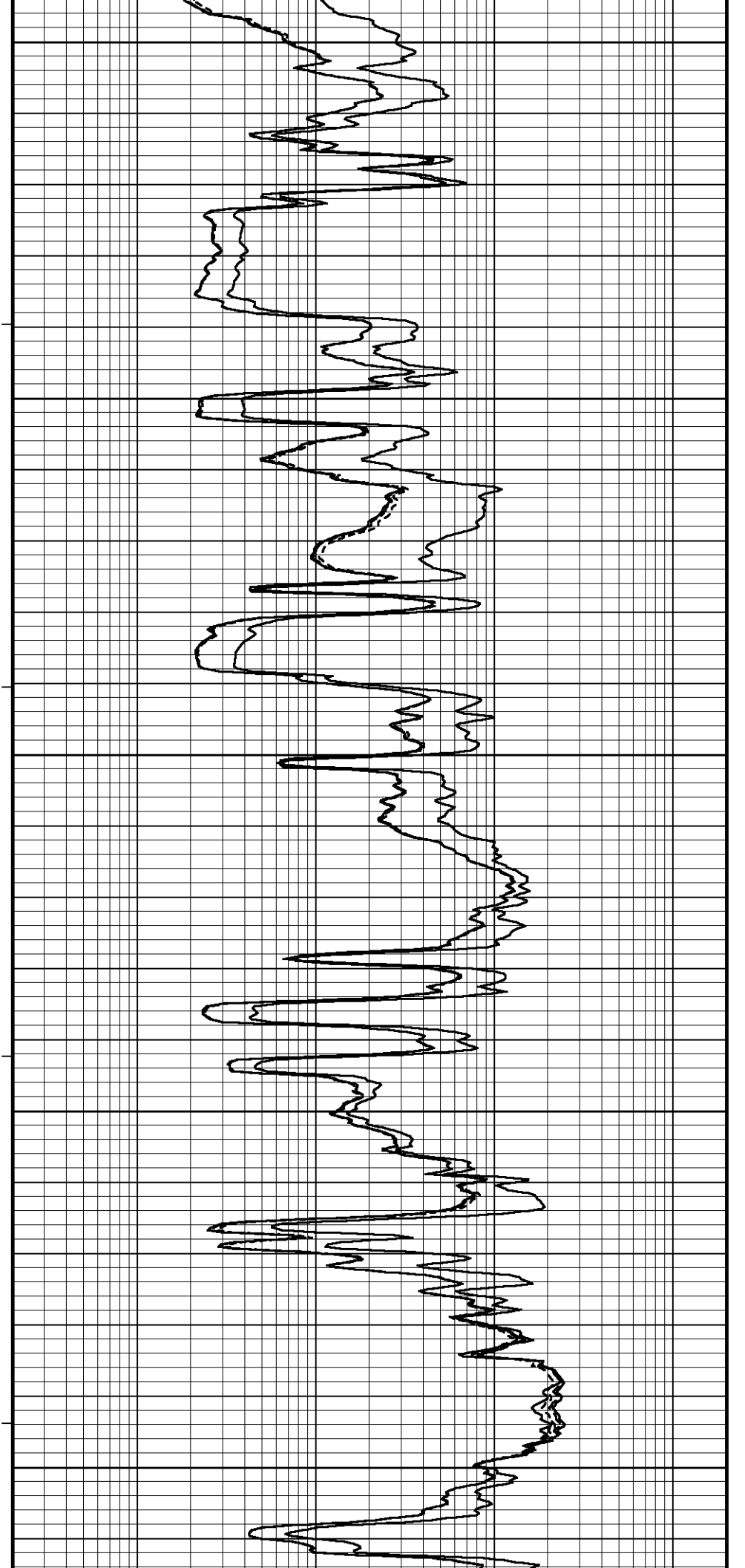
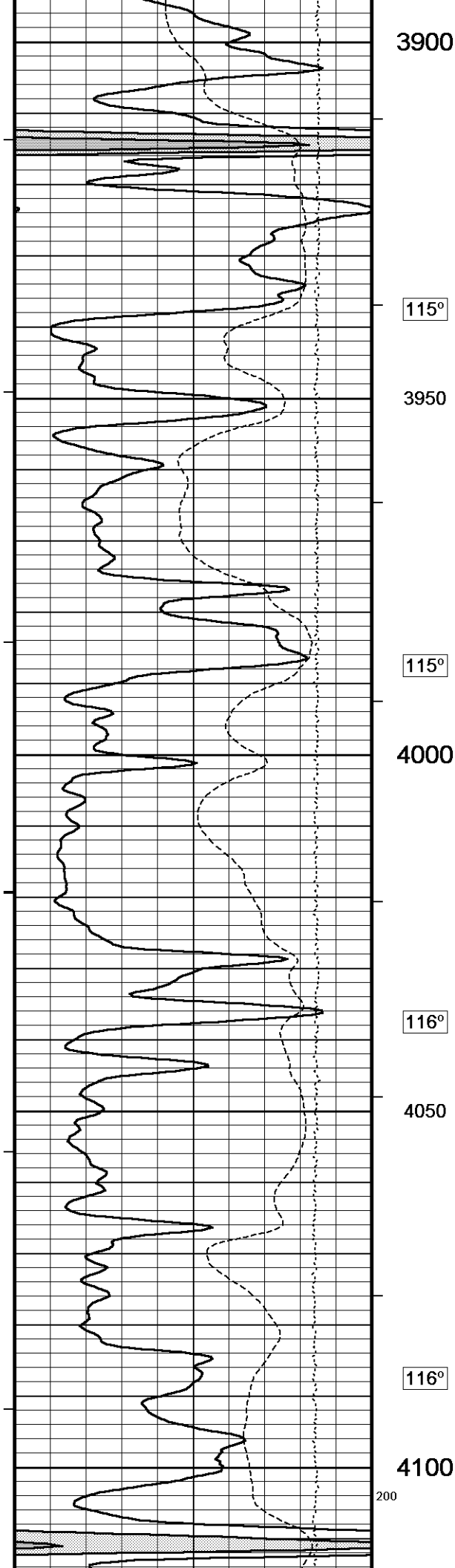
Array Ind. One Cond Ct

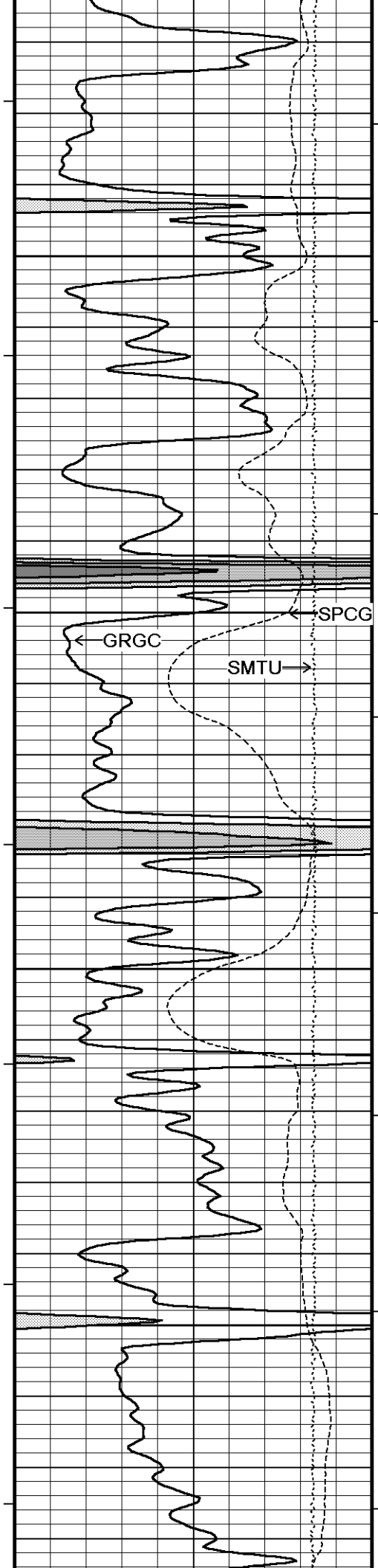
mmhos

Timing Marks









116°

100

4150

117°

4200

← GRGC

SMTU →

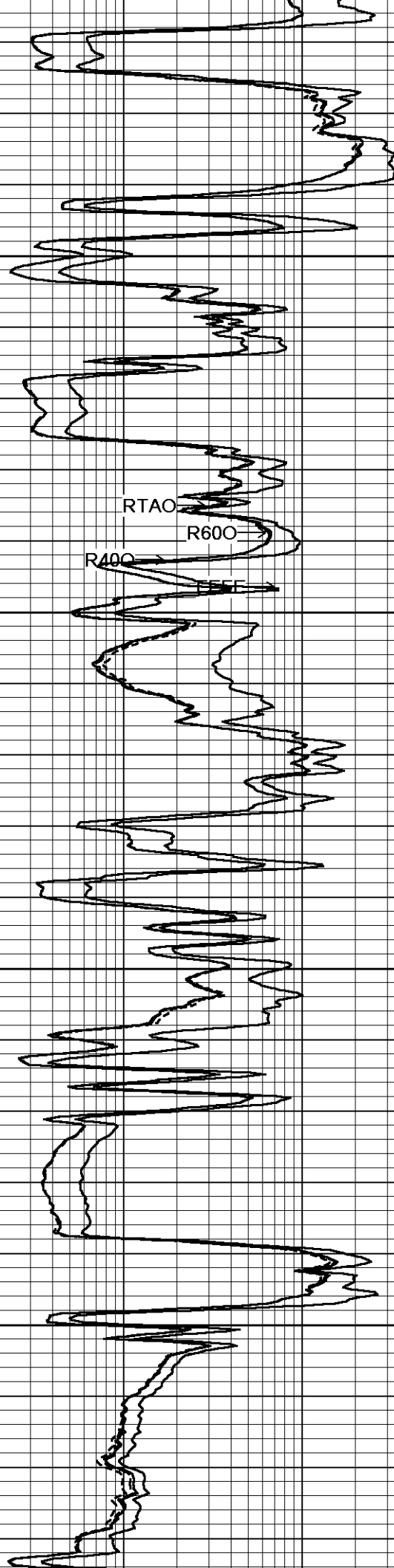
← SPCG

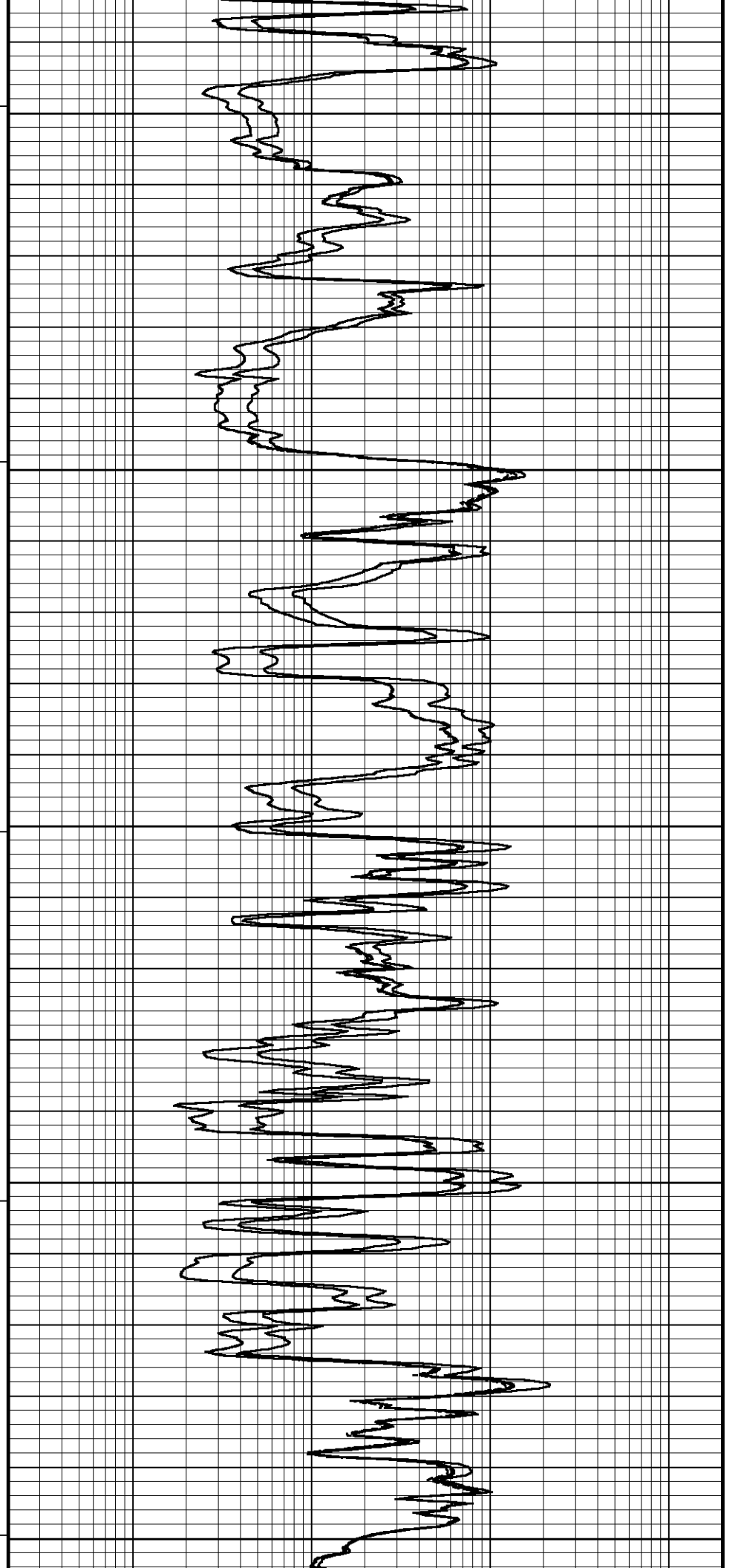
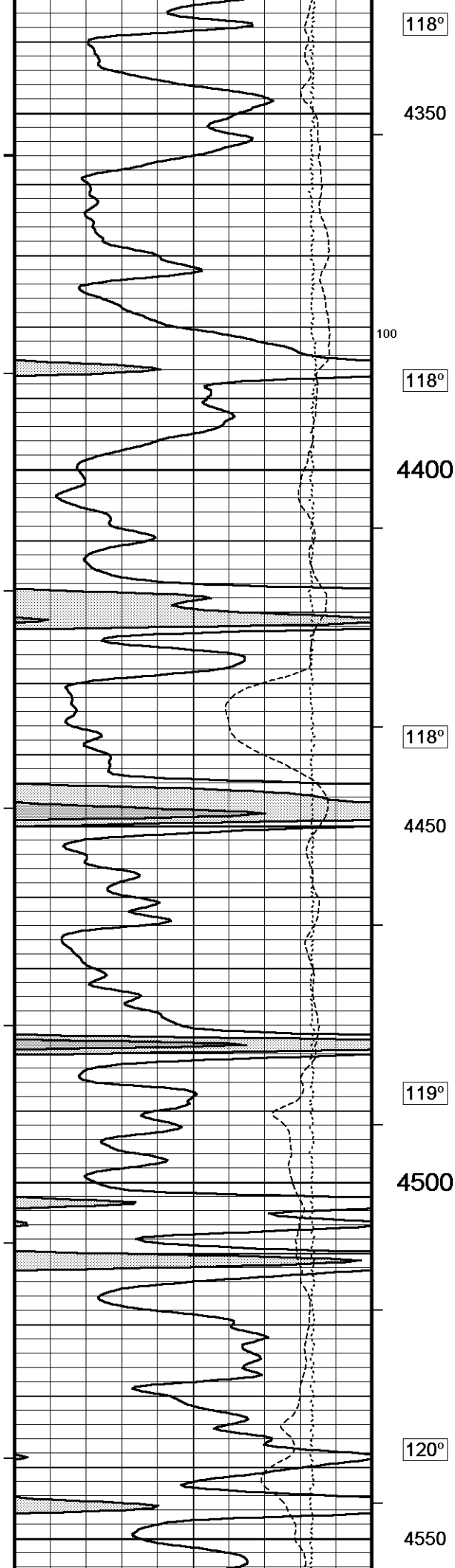
117°

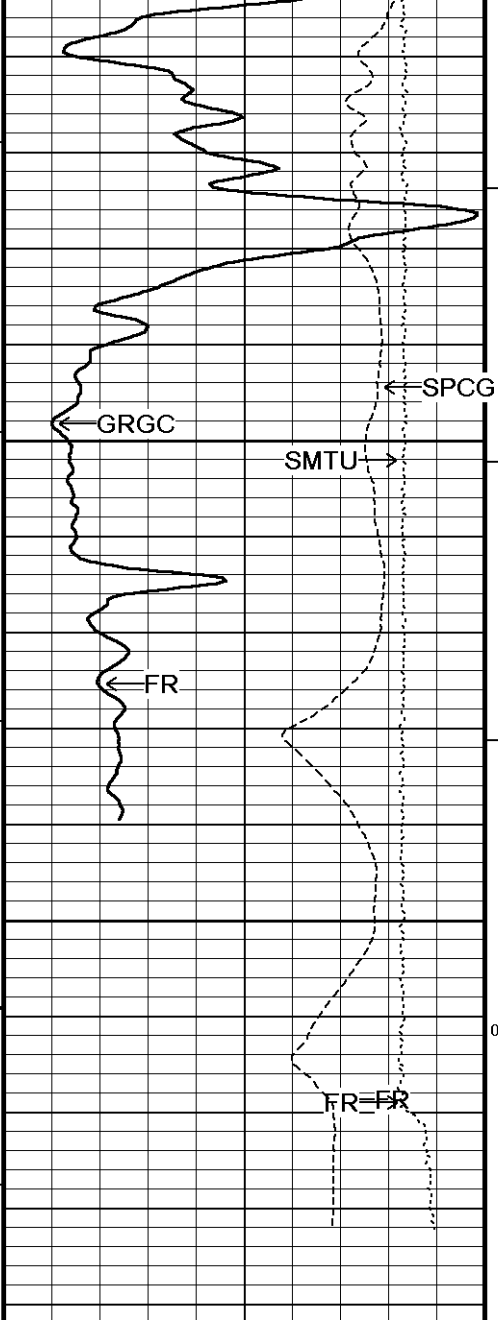
4250

117°

4300







120°

4600

120°

4650

4690

Depth
In
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

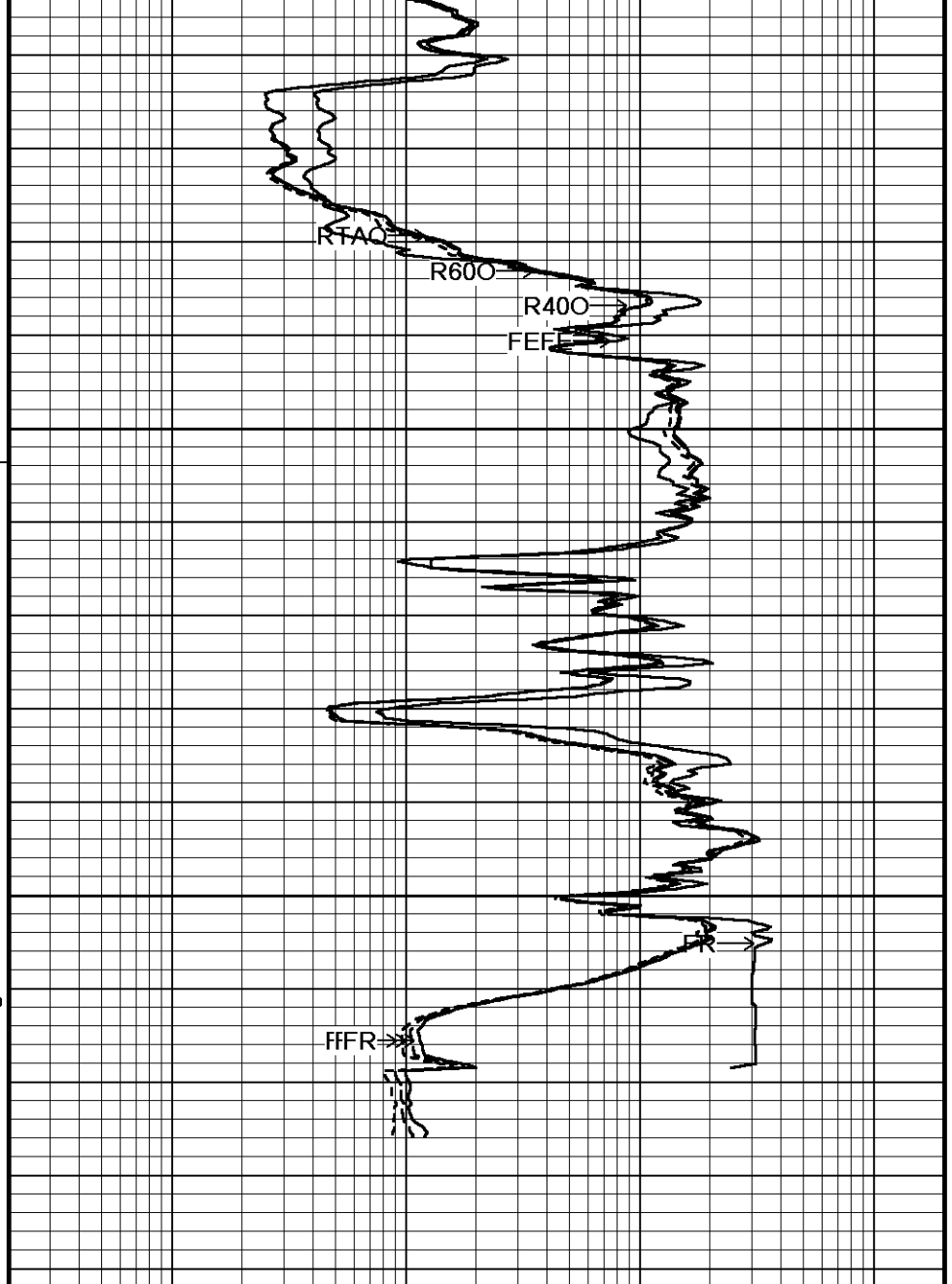
Spontaneous Potential
millivolts
- - -> | 20 | < - +

DST Uphole Tension
pounds
5000 0

Borehole
Temp in
deg F
HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240



RTAO

R600

R400

FEFF

FFR

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

↑

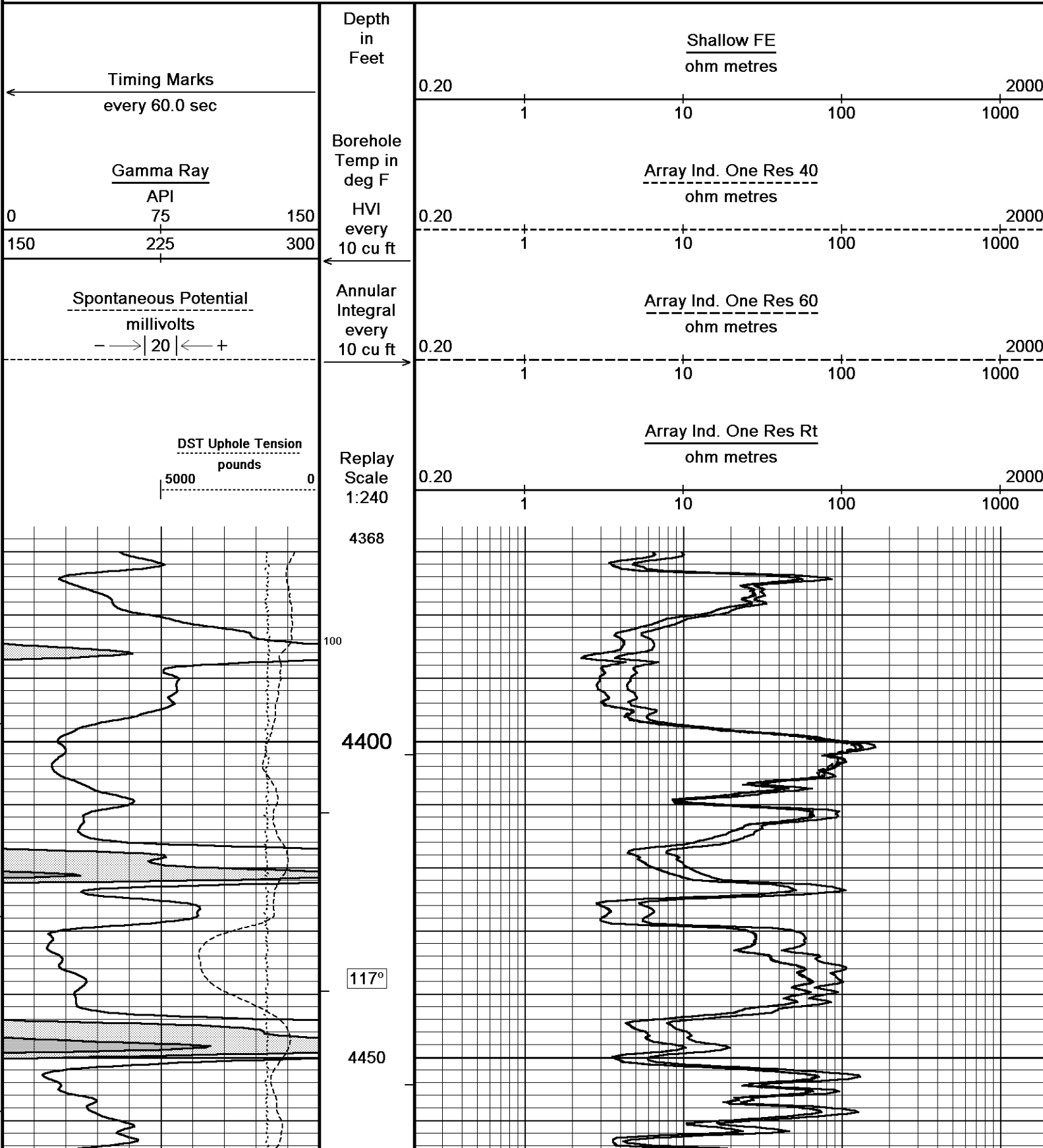
5 INCH MAIN

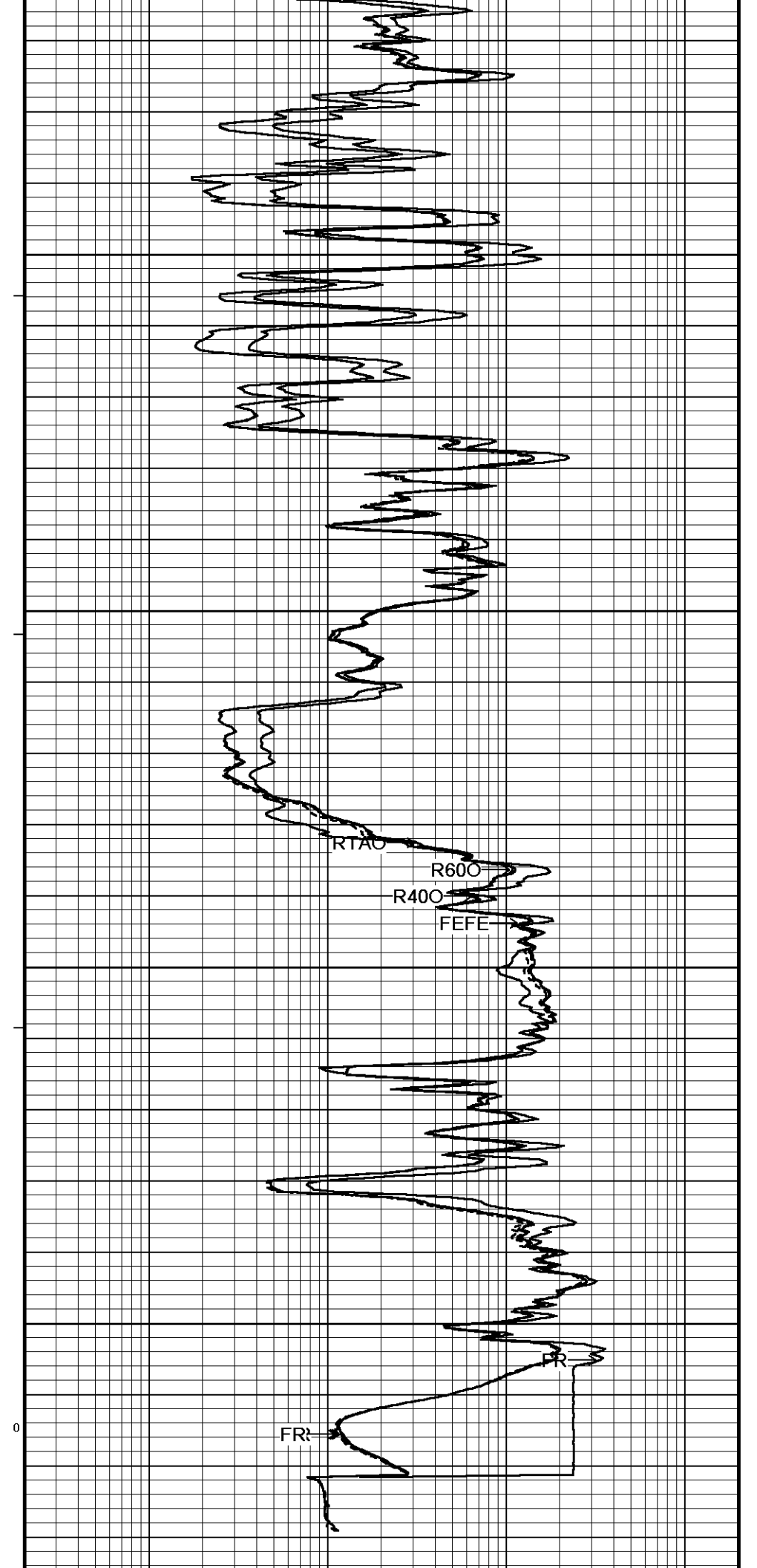
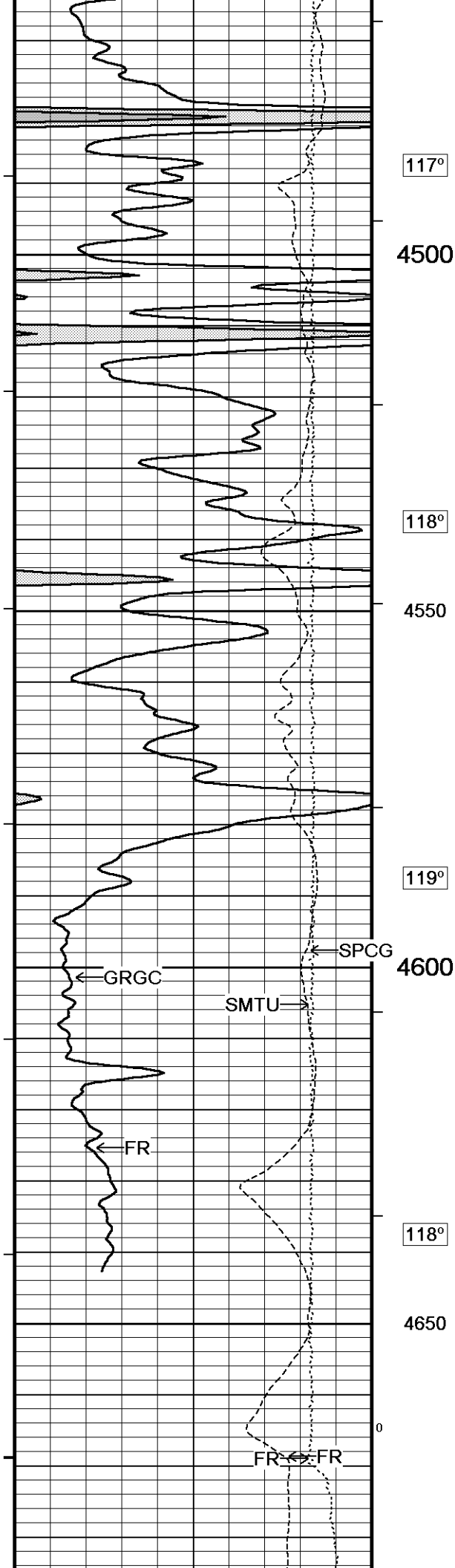
↑

↓

REPEAT SECTION

↓





SP Calibration MCG-D.K 442		Measured	Calibrated (mV)	Field Calibration on 09-AUG-2013,09:34
Reference 1		100.9	100.0	
Reference 2		-100.5	-100.0	
High Resolution Temperature Calibration MCG-D.K 442		Measured	Calibrated(Deg F)	Field Calibration on 09-AUG-2013,09:35
Lower		50.00	50.00	
Upper		75.00	75.00	
High Resolution Temperature Constants MCG-D.K 442				Last Edited on 09-AUG-2013,09:35
Pre-filter Length		11		
Gamma Calibration MCG-D.K 442		Measured	Calibrated (API)	Field Calibration on 08-OCT-2013 08:43
Background		68	46	
Calibrator (Gross)		1139	771	
Calibrator (Net)		1071	725	
Gamma Constants MCG-D.K 442				Last Edited on 08-OCT-2013,13:18
Gamma Calibrator Number		GRC38		
Mud Density		1.12	gm/cc	
Caliper Source for Processing		Density Caliper		
Tool Position		Eccentred		
Concentration of KCl			kppm	
K Mud Type		Chloride		
K Mud Concentration		0.00	%	
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
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				
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.		MCG External Temperature		
Caliper Calibration MMR-A 11				Base Calibration on 01-OCT-2013 09:07 Field Calibration on 08-OCT-2013 08:27
Base Calibration		Measured	Calibrator Size (in)	
Reading No				
1		14311	5.98	
2		17410	7.97	
3		20706	9.86	
4		24667	11.92	
5		0	0.00	
6		N/A	N/A	
Field Calibration		Measured Caliper (in)	Actual Caliper (in)	
		5.90	5.98	
Micro Normal and Micro Inverse Calibration MMR-A 11				Base Calibration on 01-OCT-2013 08:58 Field Calibration on 01-OCT-2013 08:58

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	58.8	5.0	25.0
Micro Inverse	15.4	76.4	5.0	25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	77.8		77.8	
Micro Inverse	59.6		59.6	

Micro Normal and Micro Inverse Constants MMR-A 11

Last Edited on 18-APR-2013,13:52

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 12-SEP-2013 15:12

Field Check on 08-OCT-2013 08:49

Base Calibration				
Ratio	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3130	94	3714	110
	33.369		33.764	
Field Calibrator at Base				
Ratio	Calibrated (cps)			
	1648		2461	
	0.670			
Field Check				
Ratio	Calibrated (cps)			
	1640		2460	
	0.673			

Neutron Constants MDN-A.B 65

Last Edited on 08-OCT-2013,08:43

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	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352

Base Calibration on 12-SEP-2013 11:04

Field Check on 08-OCT-2013 08:26

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.1	126.8
Base Check		281.6
Field Check		281.7

FE Constants MFE-B.J 352

Last Edited on 08-OCT-2013,08:25

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		

Rm Source for F.E. correction	Temperature Corr	MCG External Temperature	0.5	inches
Temp. for Rm Corr.				
Stand-off				
High Resolution Temperature Calibration MAI-A.A 45				
	Measured	Calibrated(Deg F)		Field Calibration on 21-AUG-2013,11:21
Lower	50.00	50.00		
Upper	75.00	75.00		
High Resolution Temperature Constants MAI-A.A 45				
Pre-filter Length	11			Last Edited on 21-AUG-2013,11:21
Induction Calibration MAI-A.A 45				
Base Calibration				Base Calibration on 21-MAY-2013,16:47
Test Loop Calibration				Field Check on 08-OCT-2013 08:25
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	0.0	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			18.8	3850.3
2			31.9	3628.2
3			28.7	3048.4
4			18.4	2078.5
Deep			16.1	1910.6
Medium			42.6	4059.1
Shallow			49.8	5481.2
Array Temperature			63.7	Deg F
Induction Constants MAI-A.A 45				
Last Edited on 08-OCT-2013,08:24				
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	

Photo Density Calibration MPD-B 31

Base Calibration on 12-SEP-2013 14:34
Field Check on 08-OCT-2013 08:35

Density Calibration

Base Calibration

	Measured	Calibrated (sdu)
	Near	Far
Reference 1	44533	22959
Reference 2	18249	1888

Field Check at Base

671.8 823.4

Field Check

670.1 827.8

PE Calibration

Base Calibration

	Measured	Calibrated
	WH	Ratio
Background	125	598
Reference 1	18732	44423
Reference 2	5465	18167

Field Check at Base

125.0 597.9

Field Check

125.0 595.0

Density Constants MPD-B 31

Last Edited on 08-OCT-2013,13:18

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	1.12 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)
2.71	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

Caliper Calibration MPD-B 31

Base Calibration on 12-SEP-2013 14:44
Field Calibration on 08-OCT-2013 08:37

Base Calibration

Reading No

Measured

Calibrator Size (in)

1	17985	3.99
2	27104	5.98
3	35456	7.97
4	43696	9.86
5	52880	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)

Actual Caliper (in)

5.87 5.98

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Grand Mesa Weber #1-14\Grand Mesa Weber #1-14 Main2.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 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-Resistivity

MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

Compact Neutron

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

Compact Density/Caliper

MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

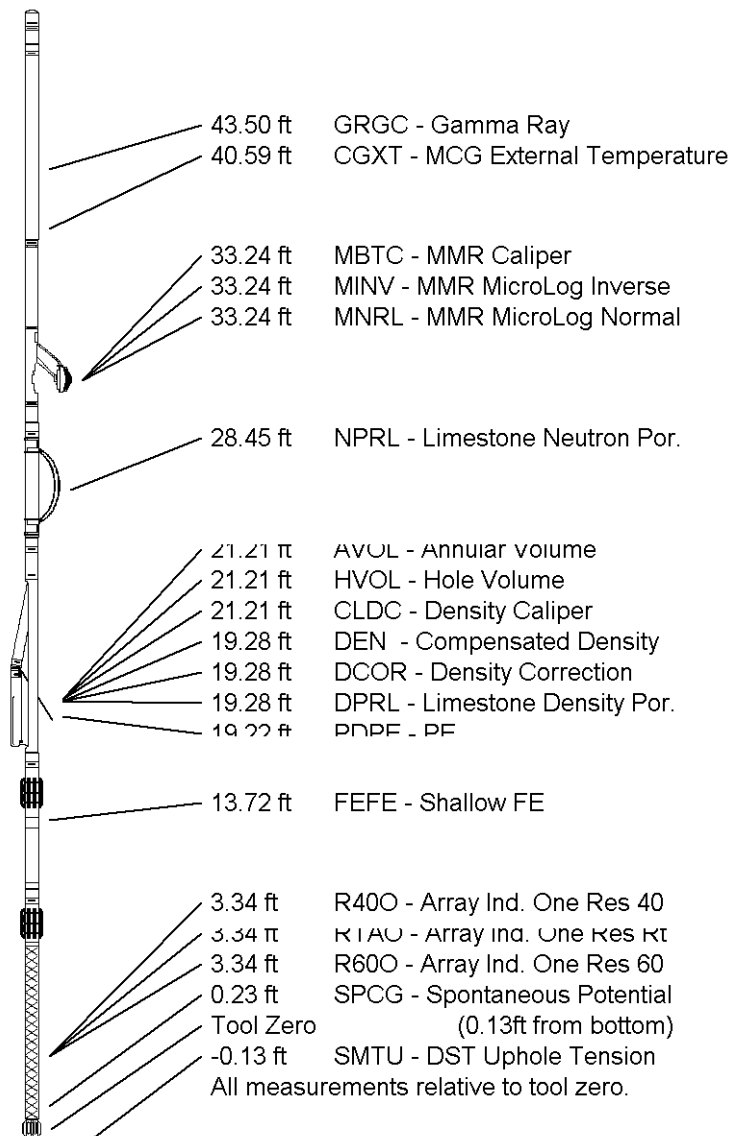
Compact Focussed Electric

MFE-B.J 352 LG: 6.05 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: 50.36 ft Weight: 399.0 lb



COMPANY

GRAND MESA OPERATING COMPANY

WELL

WEBER #1-14

FIELD

WILDCAT

PROVINCE/COUNTY

GOVE

COUNTRY/STATE

U.S.A. / KANSAS

Elevation Kelly Bushing	2892.00	feet
Elevation Drill Floor	2890.00	feet
Elevation Ground Level	2881.00	feet

First Reading	4666.00	feet
Depth Driller	4680.00	feet
Depth Logger	4669.00	feet



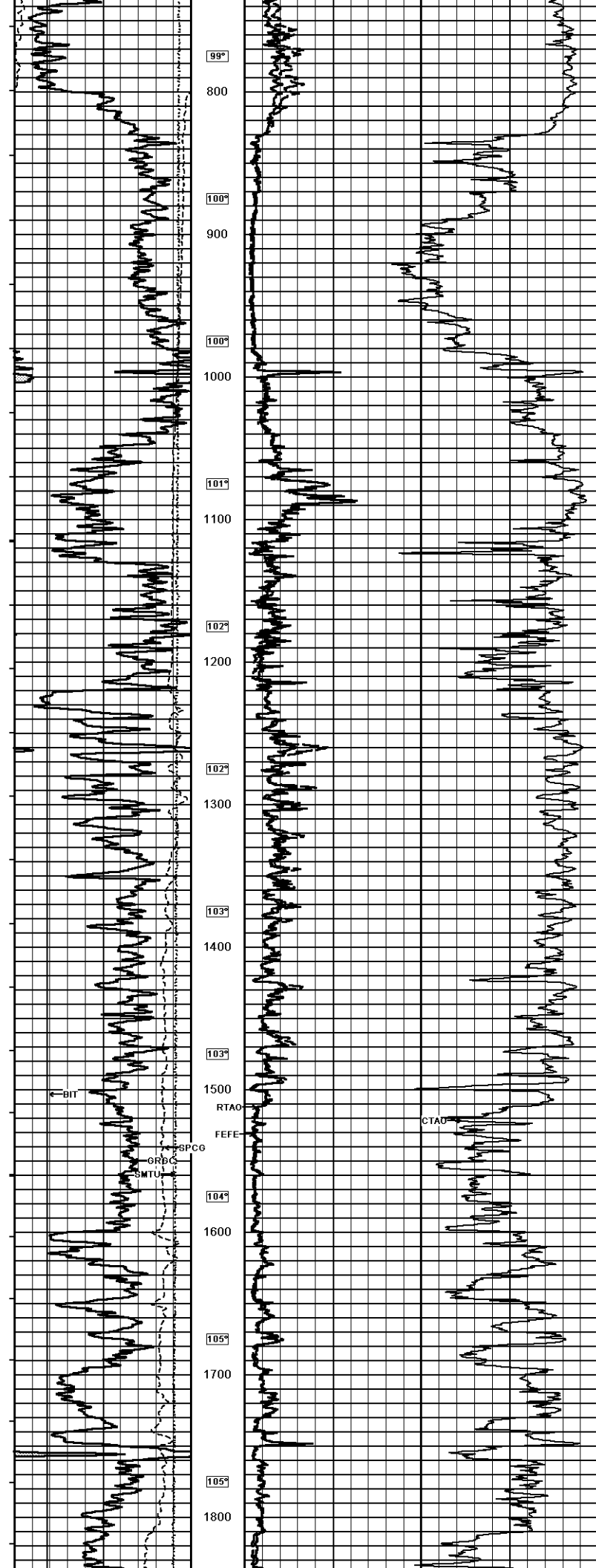
ARRAY INDUCTION

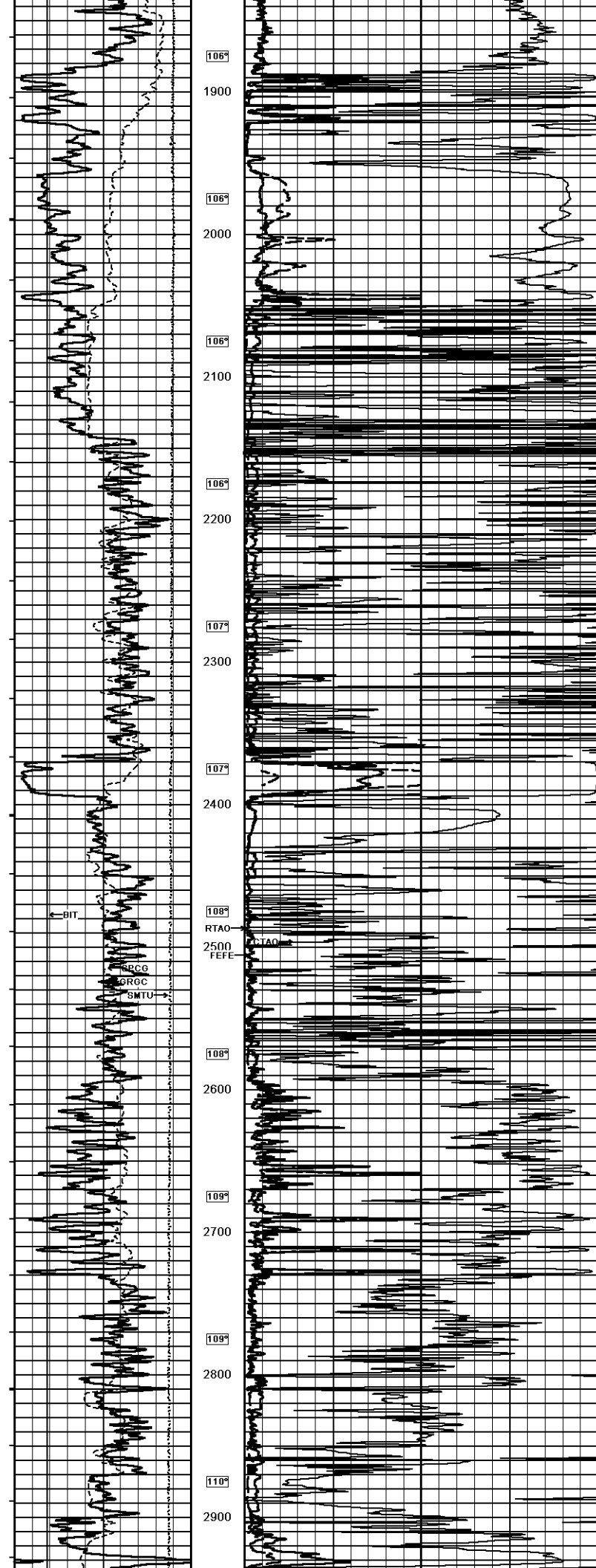
SHALLOW FOCUSED

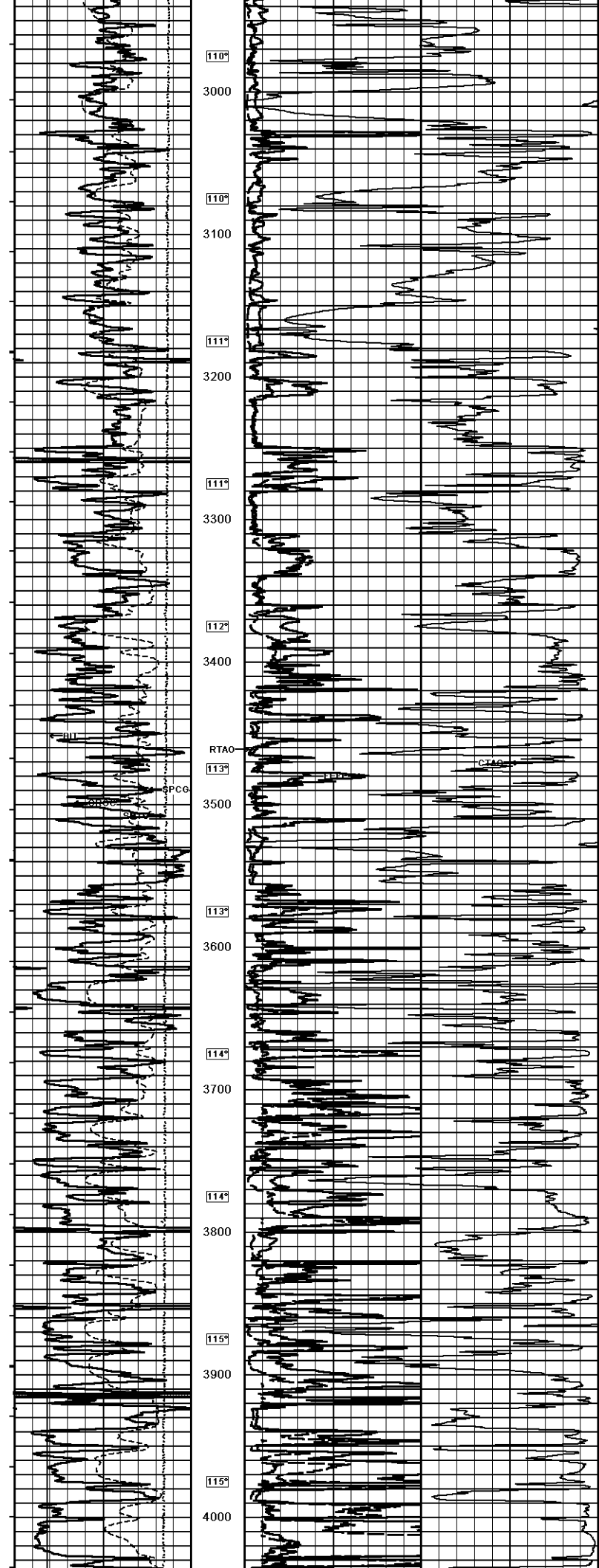
ELECTRIC LOG

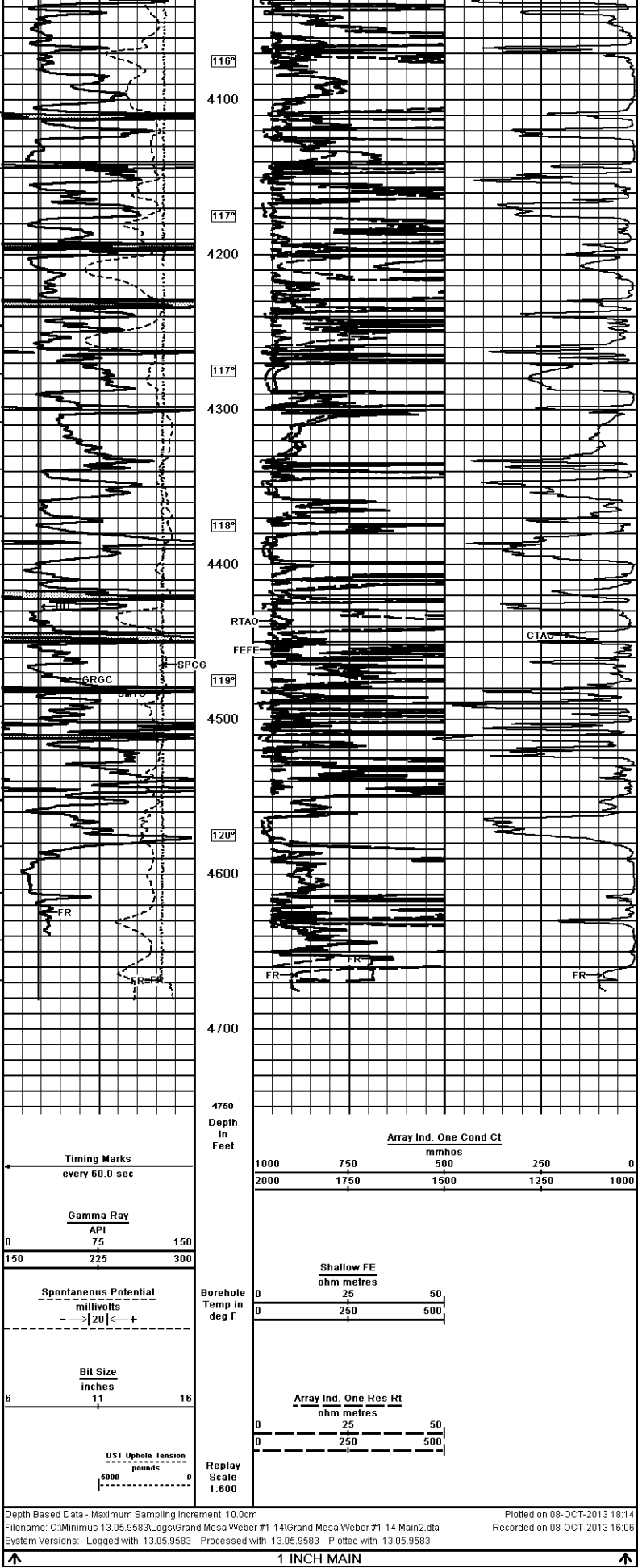
Weatherford®











COMPANY	GRAND MESA OPERATING COMPANY
WELL	WEBER #1-14
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS
Elevation Kelly Bushing	2892.00 feet
First Reading	4666.00 feet

Elevation Drill Floor	2890.00	feet	Depth Driller	4680.00	feet
Elevation Ground Level	2881.00	feet	Depth Logger	4669.00	feet



ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG