



Weatherford

MICRORESISTIVITY LOG

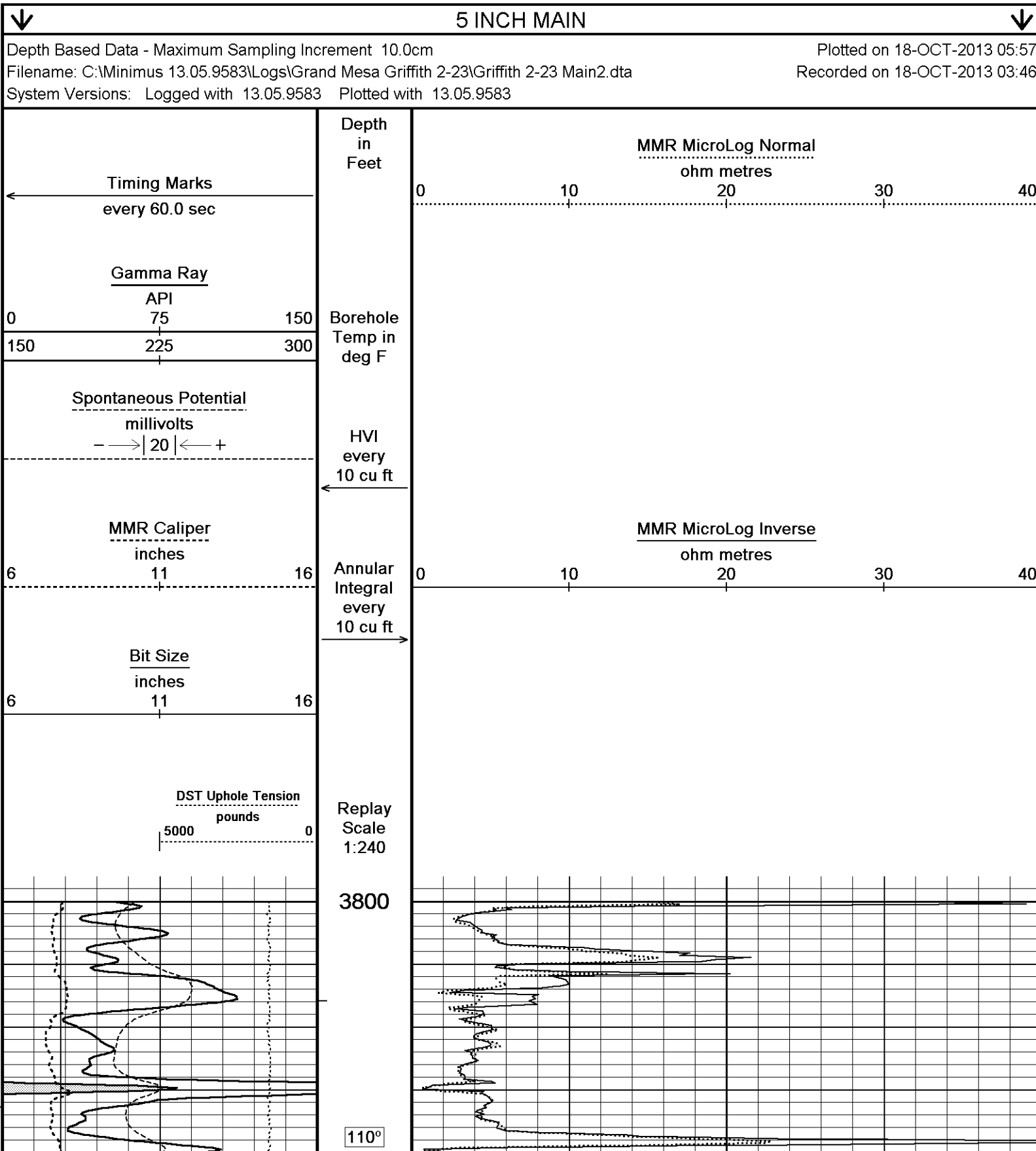
COMPANY				GRAND MESA OPERATING COMPANY			
WELL				GRIFFITH 2-23			
FIELD				WILDCAT			
PROVINCE/COUNTY				SCOTT			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				1429' FSL & 775' FEL SE SW NE SE			
SEC	TWP	RGE	Other Services		Elevations:		
23	16S	33W	MPD/MDN		KB 2978.00		
API Number		15-171-20988		MAI/MFE		DF 2977.00	
Permit Number						GL 2968.00	
Permanent Datum GL, Elevation 2968 feet							
Log Measured From KB							
Drilling Measured From KB @ 9 FEET							
Date	18-OCT-2013						
Run Number	ONE						
Service Order	3541125						
Depth Driller	4810.00			feet			
Depth Logger	4814.00			feet			
First Reading	4781.00			feet			
Last Reading	3800.00			feet			
Casing Driller	221.00			feet			
Casing Logger	220.00			feet			
Bit Size	7.875			inches			
Hole Fluid Type	CHEM						
Density / Viscosity	9.20 lb/USg		67.00 CP				
PH / Fluid Loss	10.00		7.20 ml/30Min				
Sample Source	PIT						
Rm @ Measured Temp	1.0 @ 58.0			ohm-m			
Rmf @ Measured Temp	0.80 @ 58.0			ohm-m			
Rmc @ Measured Temp	1.20 @ 58.0			ohm-m			
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.49 @ 117.0			ohm-m			
Time Since Circulation	4 HRS						
Max Recorded Temp	117.00			deg F			
Equipment / Base	13057			KANSAS			
Recorded By	D. COLE						
Witnessed By	K. MATSON						
IOB#	LB 13-294						

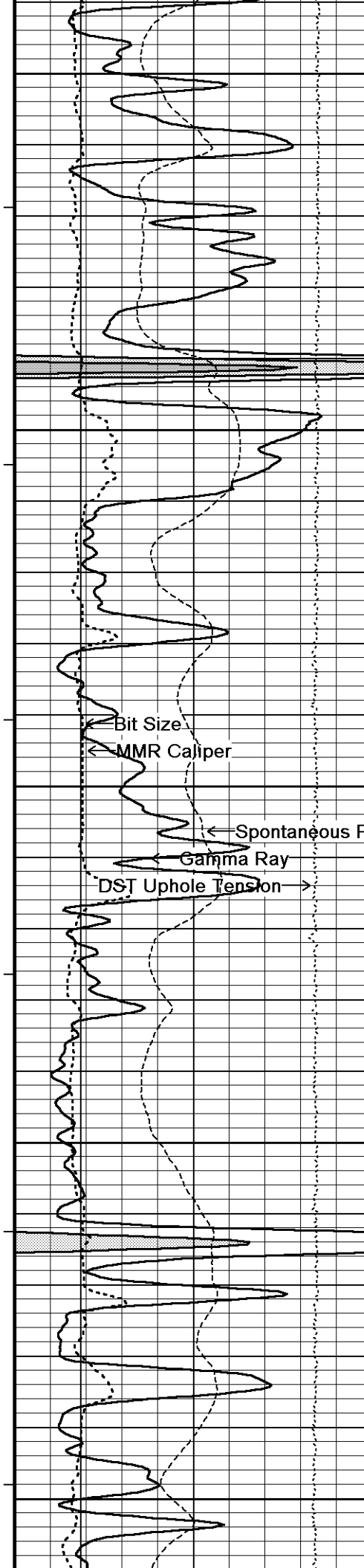
BOREHOLE RECORD					Last Edited: 18-OCT-2013 03:03
Bit Size inches		Depth From feet		Depth To feet	
7.875		220.00		4814.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	220.00	24.00	

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 3800: 375 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING TD TO 3800: 210 CU.FT.
-RIG: DUKE DRILLING RIG #10

- ENGINEER: D. COLE
- OPERATOR: J. LAPOINT AND C. RAMIREZ

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.





3850 200

110°

3900

110°

3950

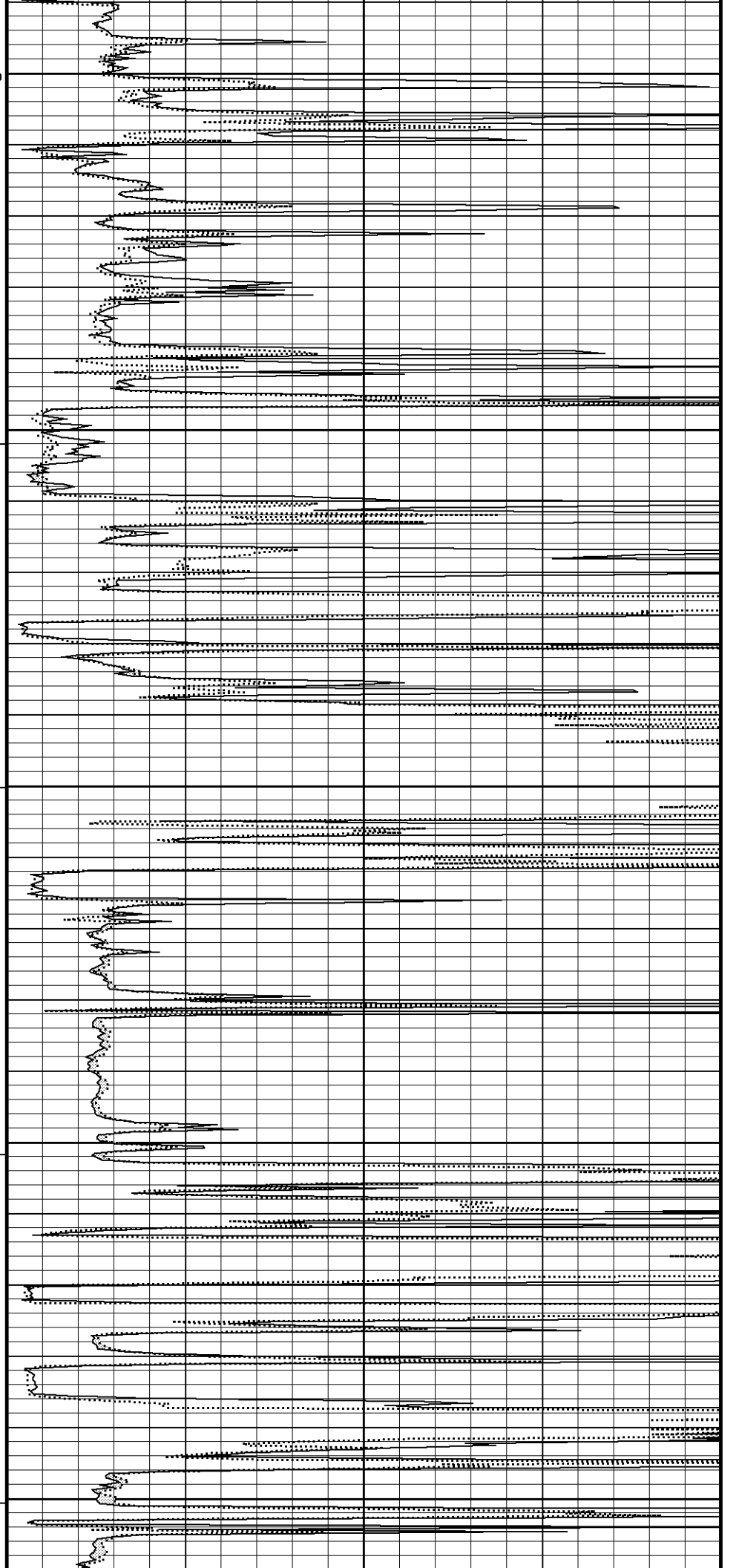
111°

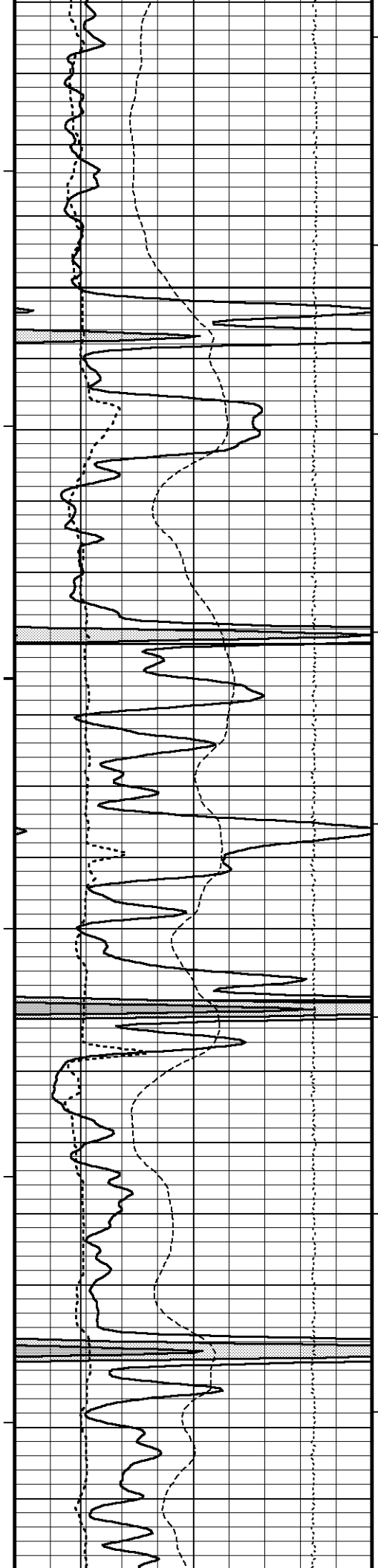
4000

300

111°

4050





111°

4100

112°

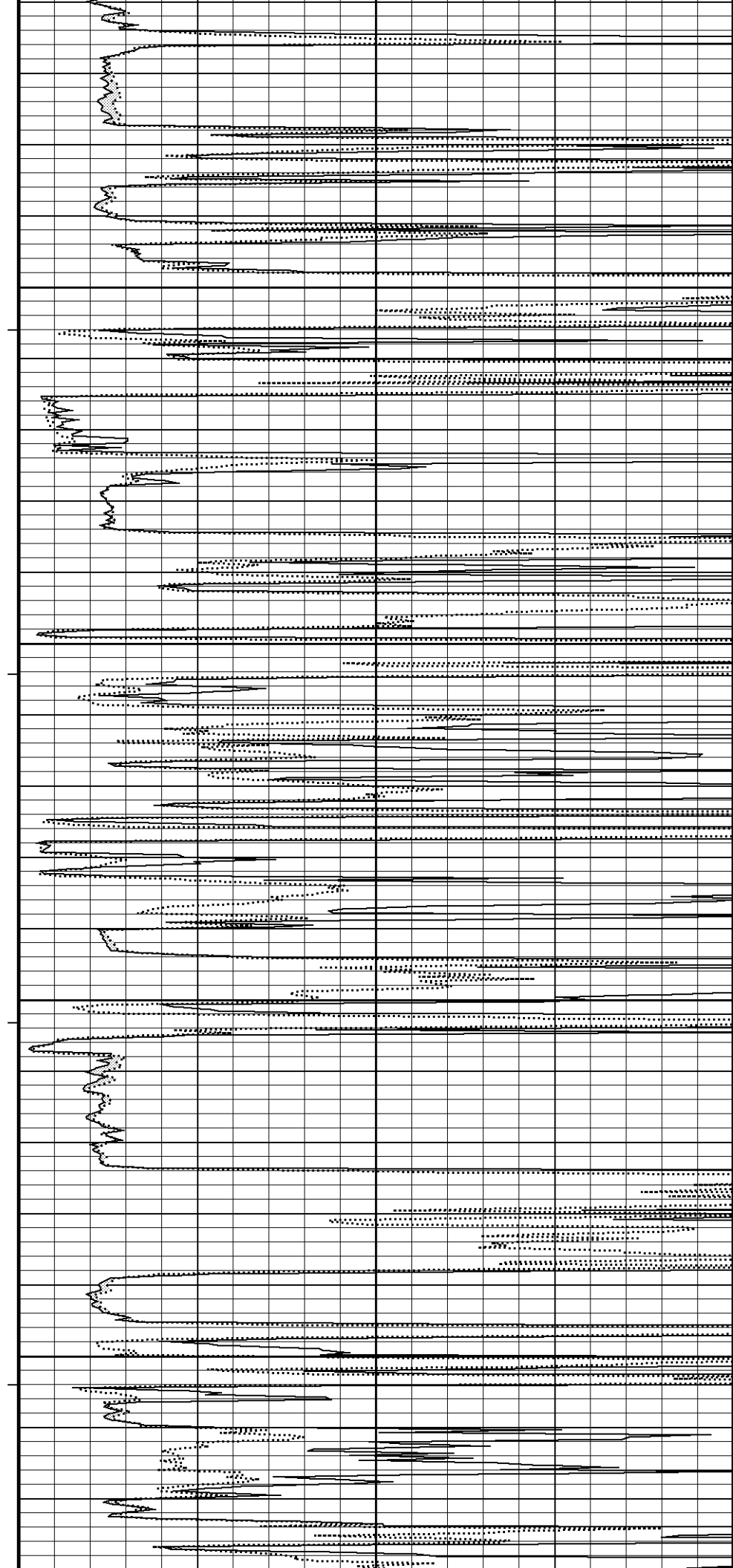
4150

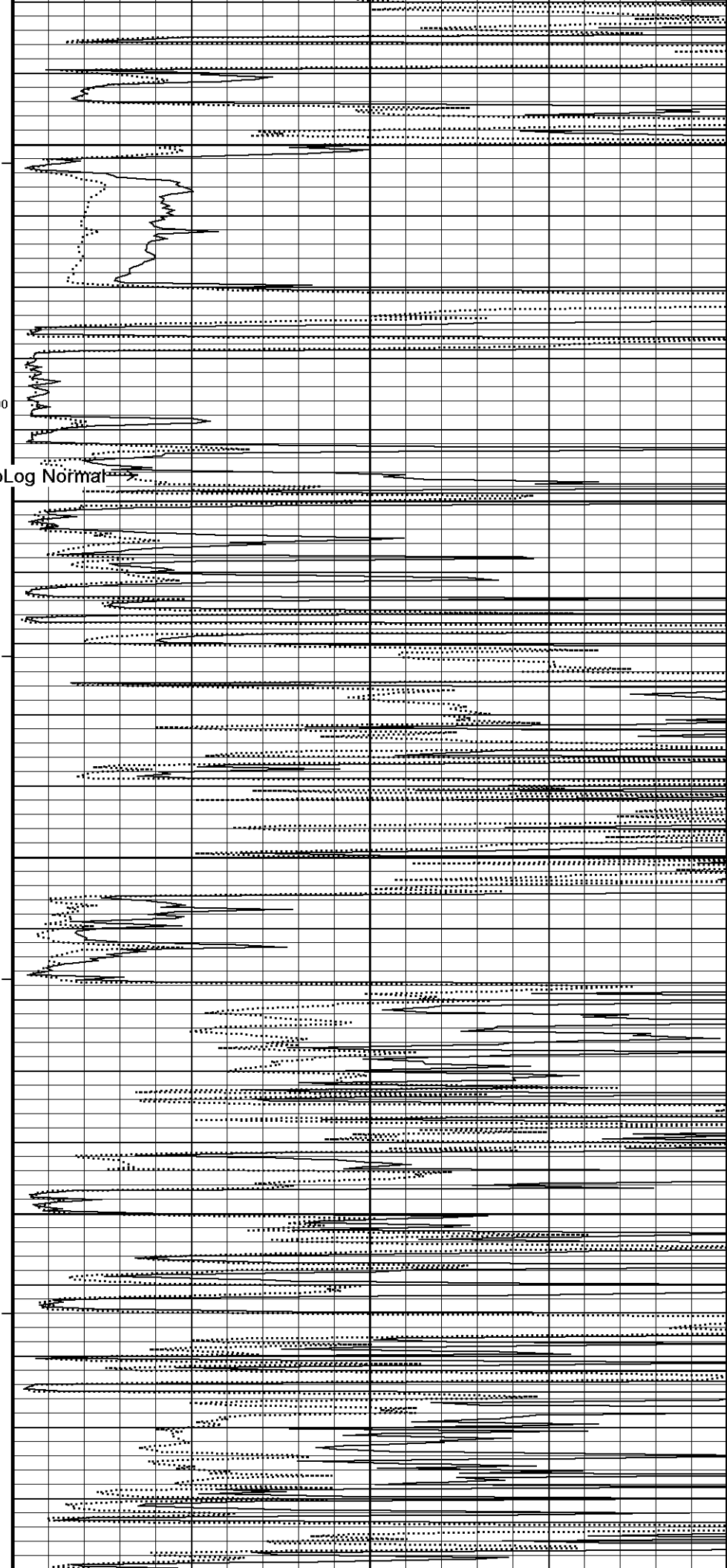
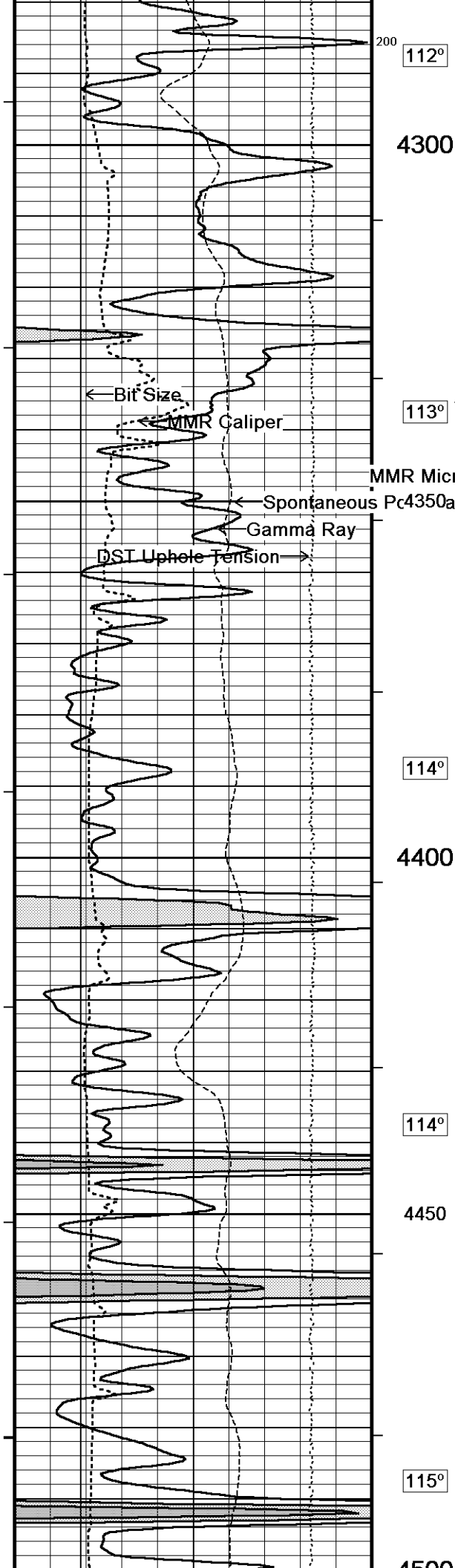
112°

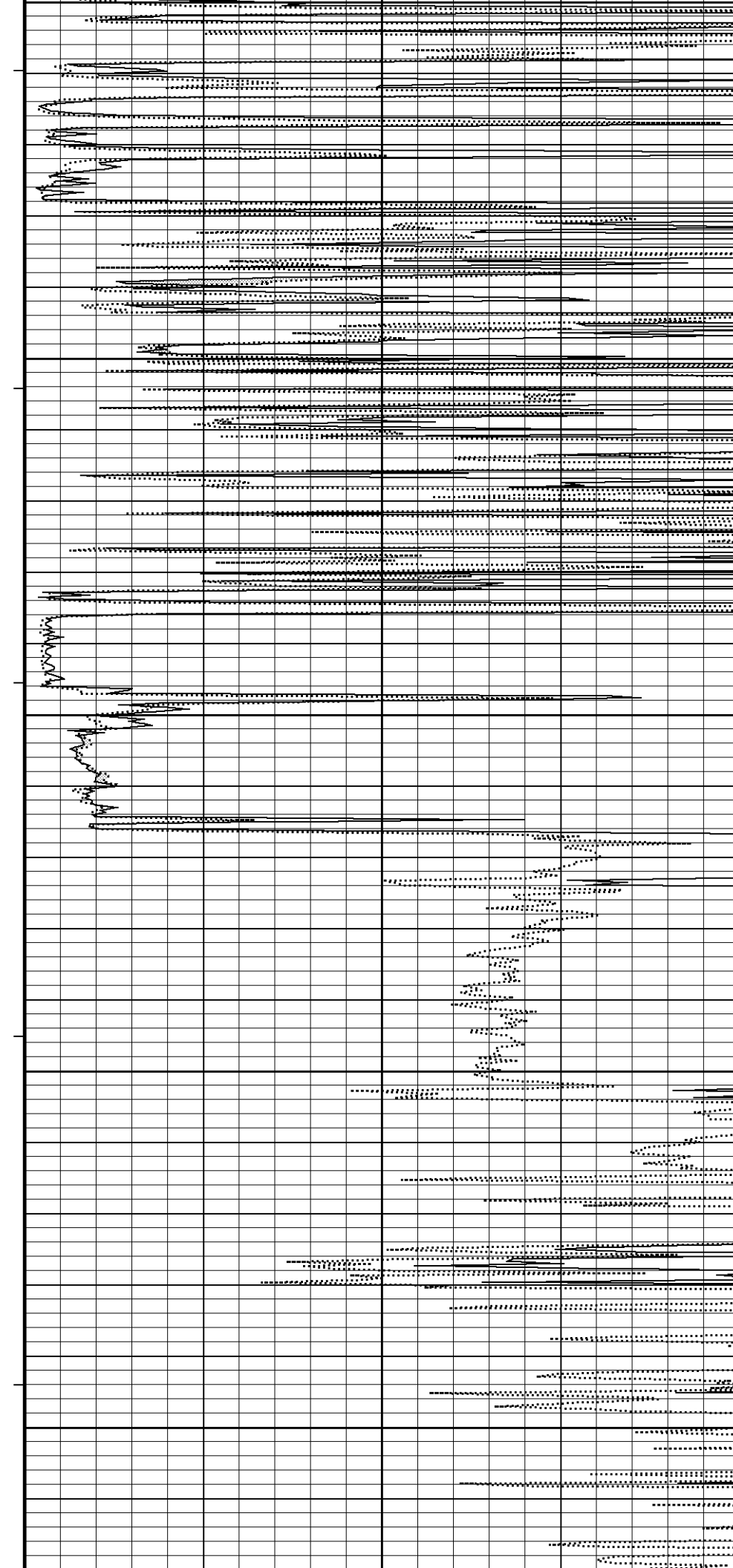
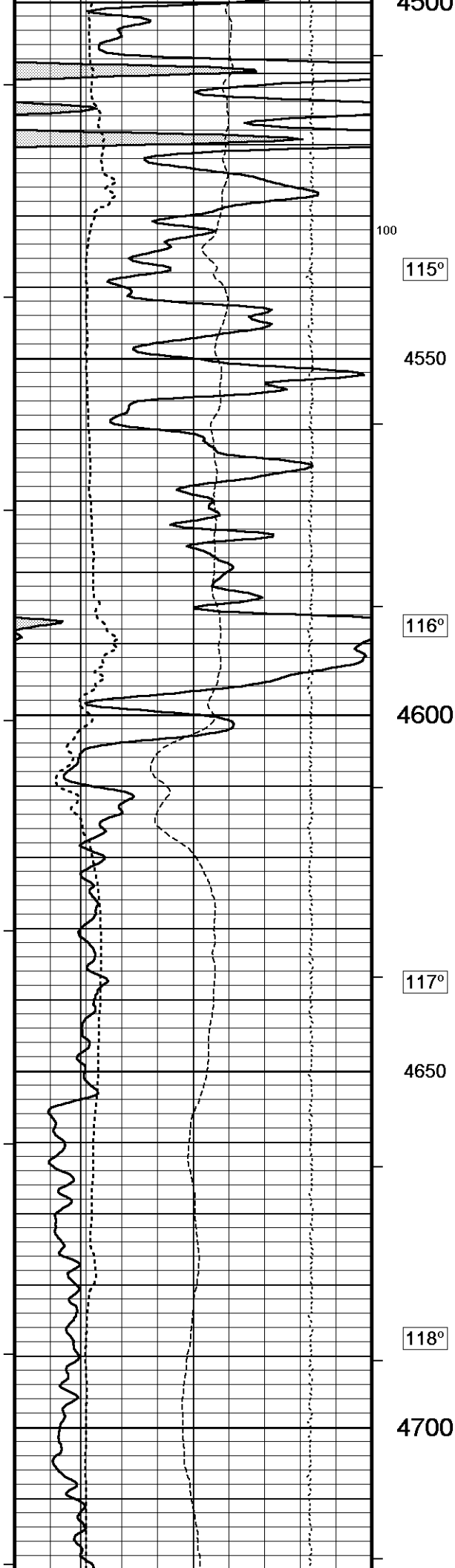
4200

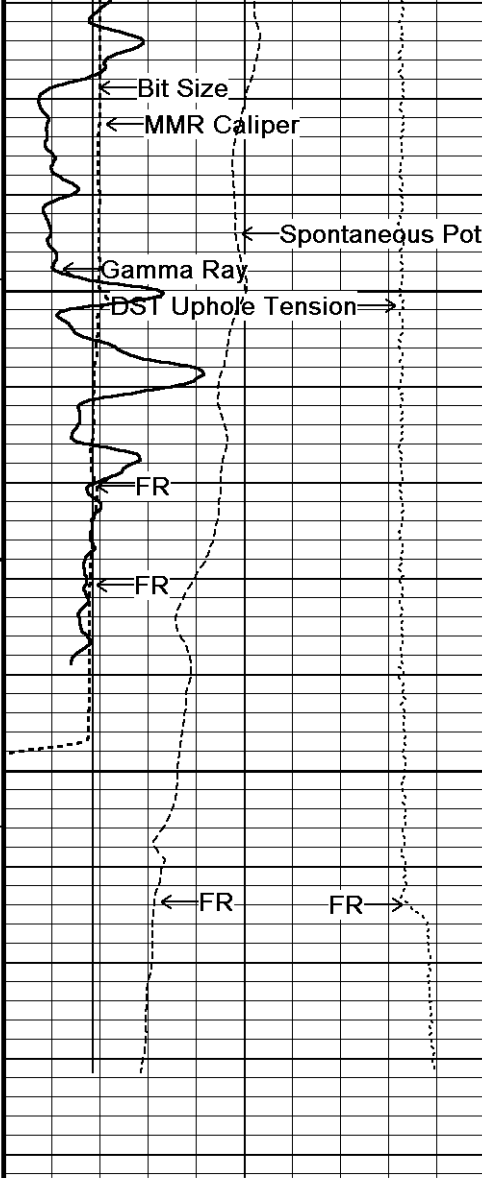
112°

4250









118°

4750

117°

4800

0 TD

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray

API

0 75 150
150 225 300

Borehole
Temp in
deg F

Spontaneous Potential

millivolts

- -> | 20 | <- +

HVI
every
10 cu ft

MMR Caliper

inches

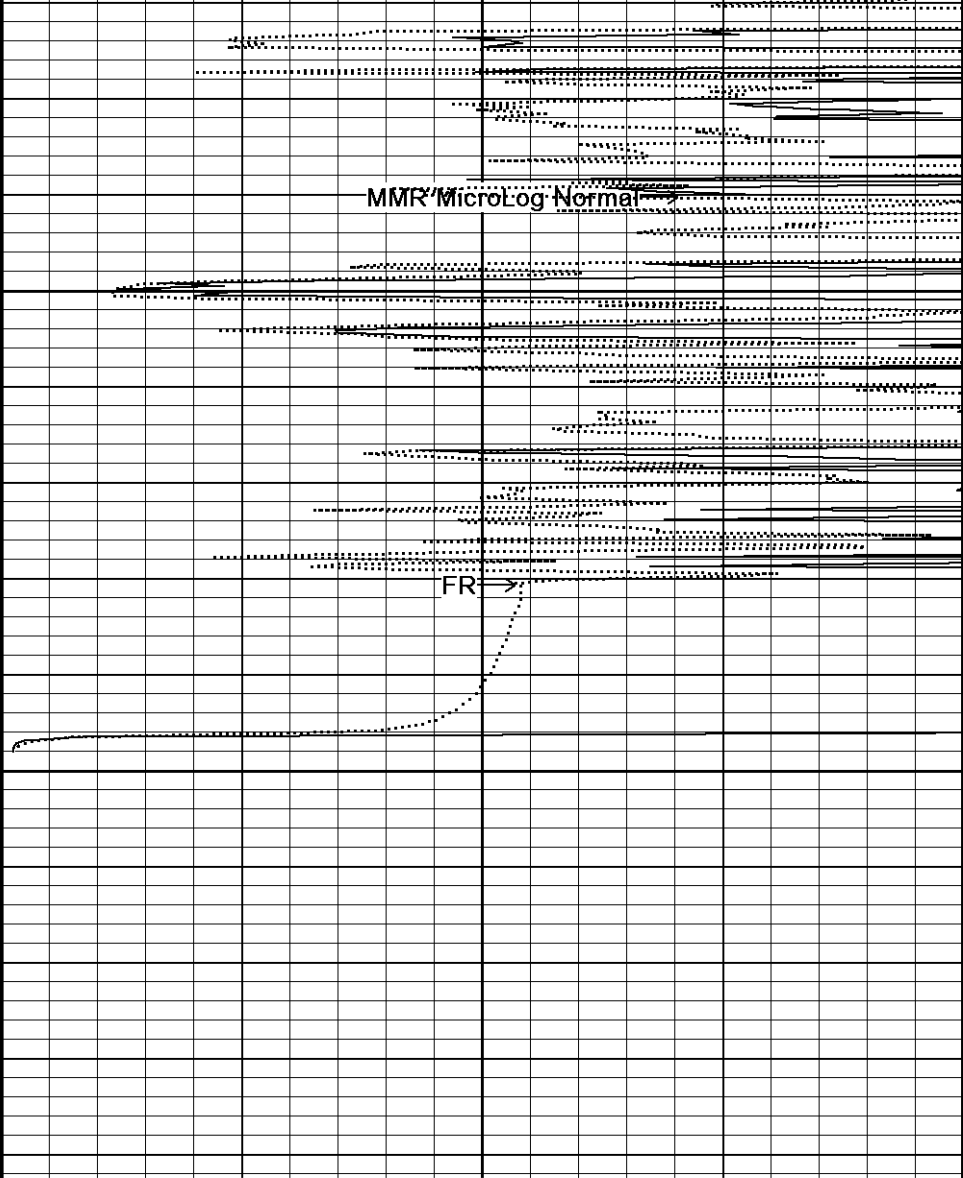
6 11 16

Annular
Integral
every
10 cu ft

Bit Size

inches

6 11 16



MMR MicroLog Normal
ohm metres

0 10 20 30 40

MMR MicroLog Inverse
ohm metres

0 10 20 30 40

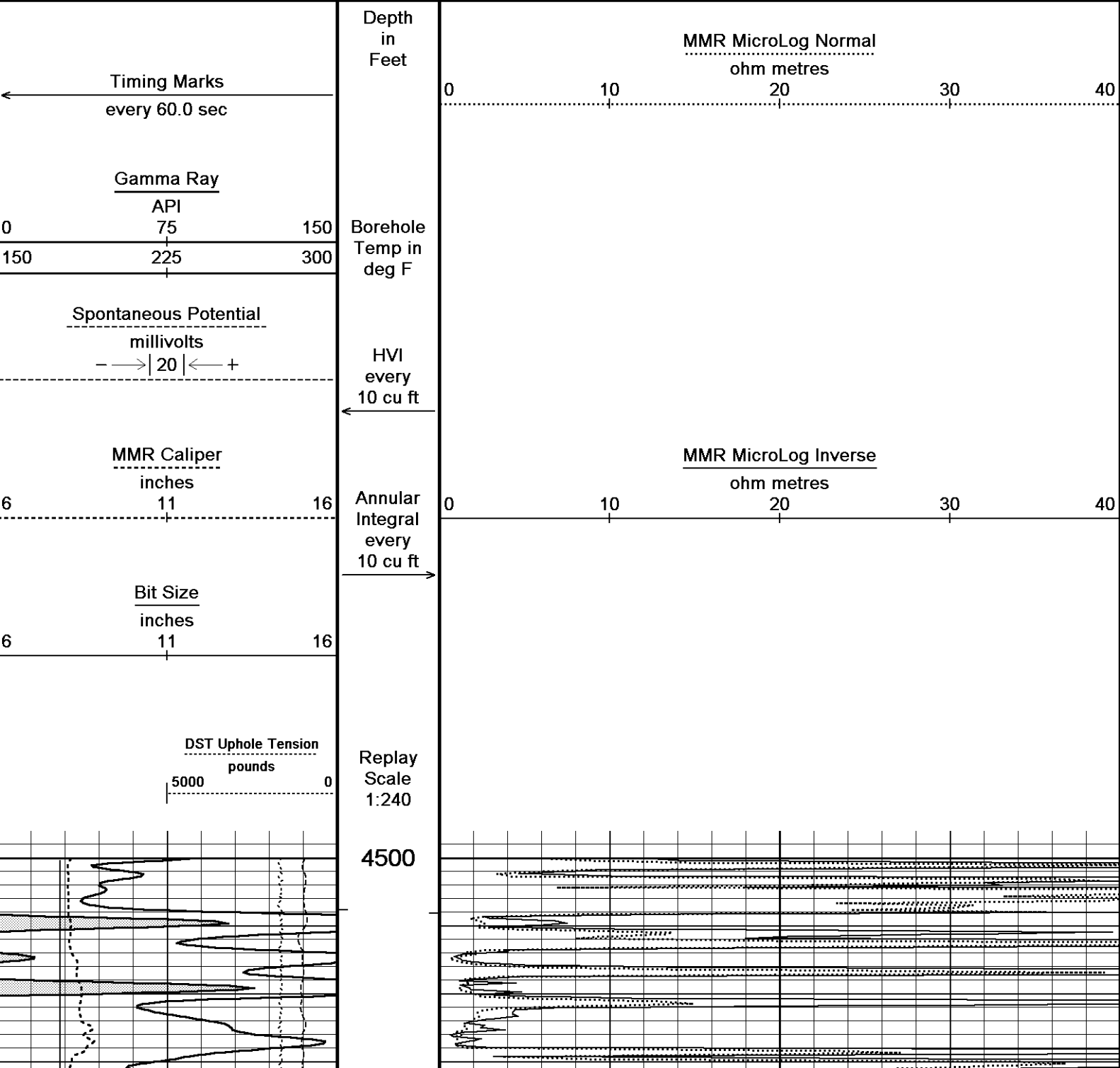
<u>DST Uphole Tension</u> pounds 5000 0	Replay Scale 1:240	
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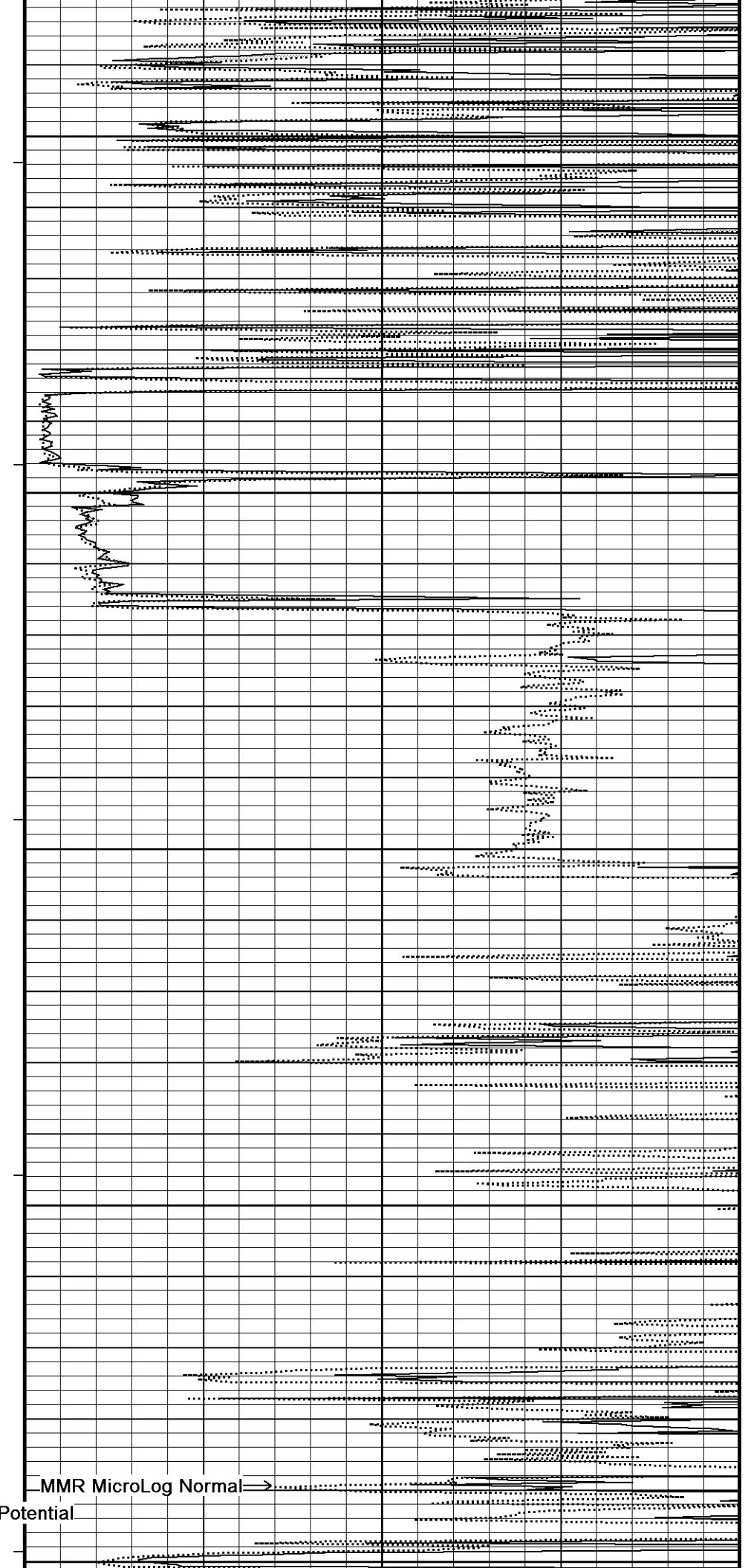
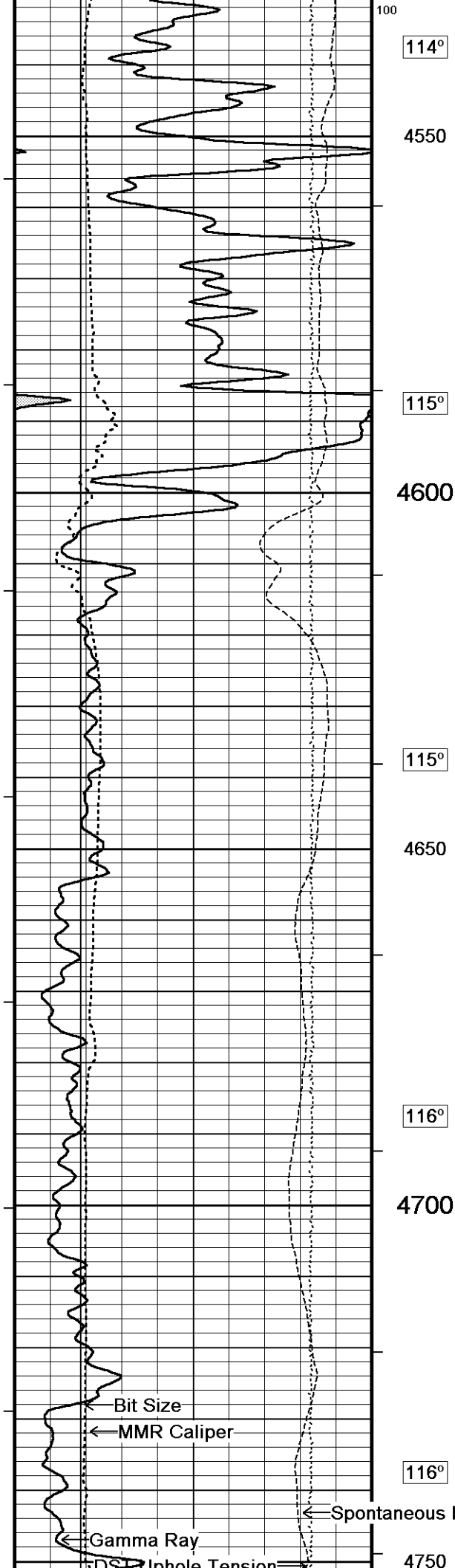
Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa Griffith 2-23\Griffith 2-23 Main2.dta System Versions: Logged with 13.05.9583 Plotted with 13.05.9583	Plotted on 18-OCT-2013 05:57 Recorded on 18-OCT-2013 03:46
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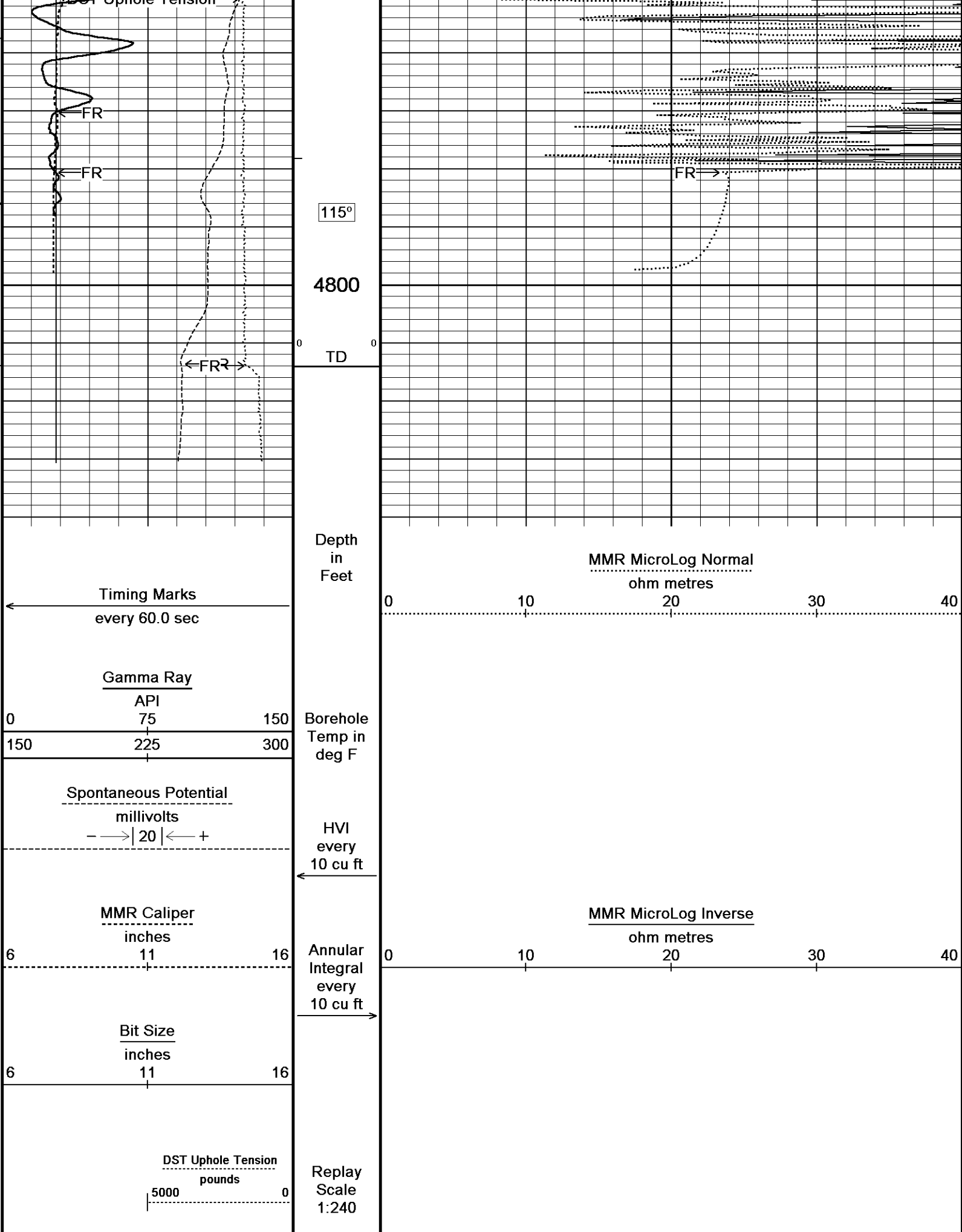
↑	5 INCH MAIN	↑
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↓	REPEAT SECTION	↓
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Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Minimus 13.05.9583\Logs\Grand Mesa Griffith 2-23\Copy of Griffith 2-23 Repeat2.dta System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583	Plotted on 18-OCT-2013 05:57 Recorded on 18-OCT-2013 02:26
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REPEAT SECTION



BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Grand Mesa Griffith 2-23\Copy of Griffith 2-23 Repeat2.dta

General Constants All 000

Last Edited on 18-OCT-2013,01:48

General Parameters

Mud Resistivity	1.000	ohm-metres
Mud Resistivity Temperature	58.000	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	MMR Caliper	

Rwa Parameters

Porosity used	Crossplot Porosity
Resistivity used	Deep Induction
RWA Constant A	0.610
RWA Constant M	2.150
SW/APOR Tool Source	0.000

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 09-AUG-2013,09:35

	Measured	Calibrated(Deg F)
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
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Gamma Calibration MCG-D.K 442

Field Calibration on 16-OCT-2013 07:50

	Measured	Calibrated (API)
Background	72	49
Calibrator (Gross)	1147	774
Calibrator (Net)	1075	725

Gamma Constants MCG-D.K 442

Last Edited on 18-OCT-2013,00:46

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

Caliper Calibration MMR-A 11

Base Calibration on 01-OCT-2013 09:07

Field Calibration on 16-OCT-2013 07:44

Base Calibration

Reading No	Measured	Calibrator Size (in)
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)
8.03	7.97

Micro Normal and Micro Inverse Calibration MMR-A 11

Base Calibration on 11-OCT-2013 11:00

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	59.0	5.0	25.0
Micro Inverse	15.5	76.7	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	77.5	77.5
Micro Inverse	59.4	59.4

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	

Caliper Calibration MPD-B 31

Base Calibration on 11-OCT-2013 13:50
Field Calibration on 16-OCT-2013 07:40

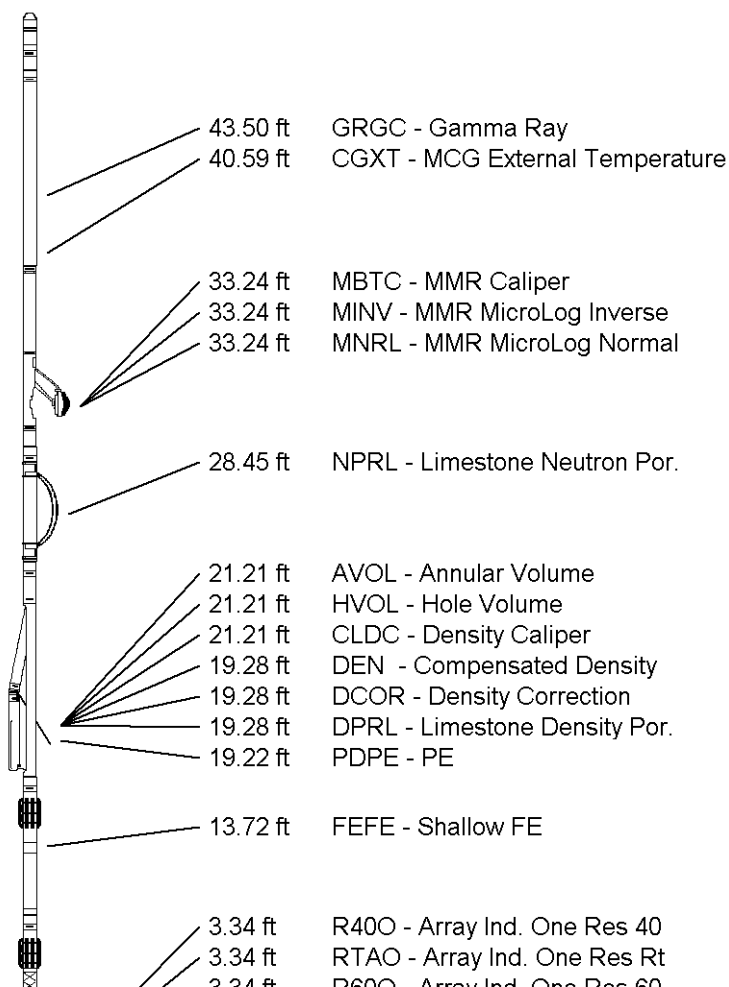
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	18160	3.99
2	27038	5.98
3	35584	7.97
4	43976	9.86
5	53328	11.92
6	N/A	N/A

Field Calibration

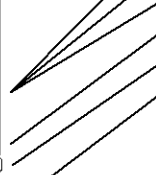
Measured Caliper (in)	Actual Caliper (in)
7.96	7.97

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Grand Mesa Griffith 2-23\Copy of Griffith 2-23 Repeat2.dta

CBH-C, Cablehead, 11 pin
CBH-CA 170 LG: 2.40 ft WT: 24.3 lb OD: 2.24 inCompact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 inCompact Micro-Resistivity
MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 inCompact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 inCompact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 inCompact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 inCompact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 51.18 ft Weight: 407.9 lb



5.34 ft R600 - Array Ind. One Res 60
0.23 ft SPCG - Spontaneous Potential
Tool Zero (0.13ft from bottom)
-0.13 ft SMTU - DST Uphole Tension
All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	GRIFFITH 2-23
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2978.00	feet	First Reading	4781.00	feet
Elevation Drill Floor	2977.00	feet	Depth Driller	4810.00	feet
Elevation Ground Level	2968.00	feet	Depth Logger	4814.00	feet



Weatherford®

MICRORESISTIVITY LOG