



Weatherford

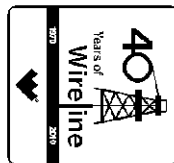
MICRORESISTIVITY LOG

COMPANY	BEREN CORPORATION				
WELL	LOIS #10				
FIELD	HARDTNER				
PROVINCE/COUNTY	BARBER				
COUNTRY/STATE	U.S.A. / KANSAS				
LOCATION	2302' FNL & 990' FWL				
SEC	TWP	RGE	Other Services		
9	35S	12W	MPD/MDN		
API Number	15-007-23889		MAI/MFE		
Permit Number					
Permanent Datum GL, Elevation 1419 feet			Elevations:		
Log Measured From KB			KB		
Drilling Measured From KB			DF		
Date	11-JUN-2012		GL		
Run Number	ONE				
Depth Driller	5100.00	feet			
Depth Logger	5113.00	feet			
First Reading	5080.00	feet			
Last Reading	3600.00	feet			
Casing Driller	300.00	feet			
Casing Logger	293.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.20 lb/USg	58.00 CP			
PH / Fluid Loss	9.50	8.80 ml/30Min			
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.32 @ 91.0	ohm-m			
Rmf @ Measured Temp	0.26 @ 91.0	ohm-m			
Rmc @ Measured Temp	0.38 @ 91.0	ohm-m			
Source Rmf / Rmc	CALC	CALC			
Rm @ BHT	0.25 @117.0	ohm-m			
Time Since Circulation	5 HOURS				
Max Recorded Temp	117.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13025	LIB			
Recorded By	ADAM SILL				
Witnessed By	EDWIN GRIEVES				
S.O. # / JOB #	3534657		LB12-145		

40

Years of Wireline

19732019



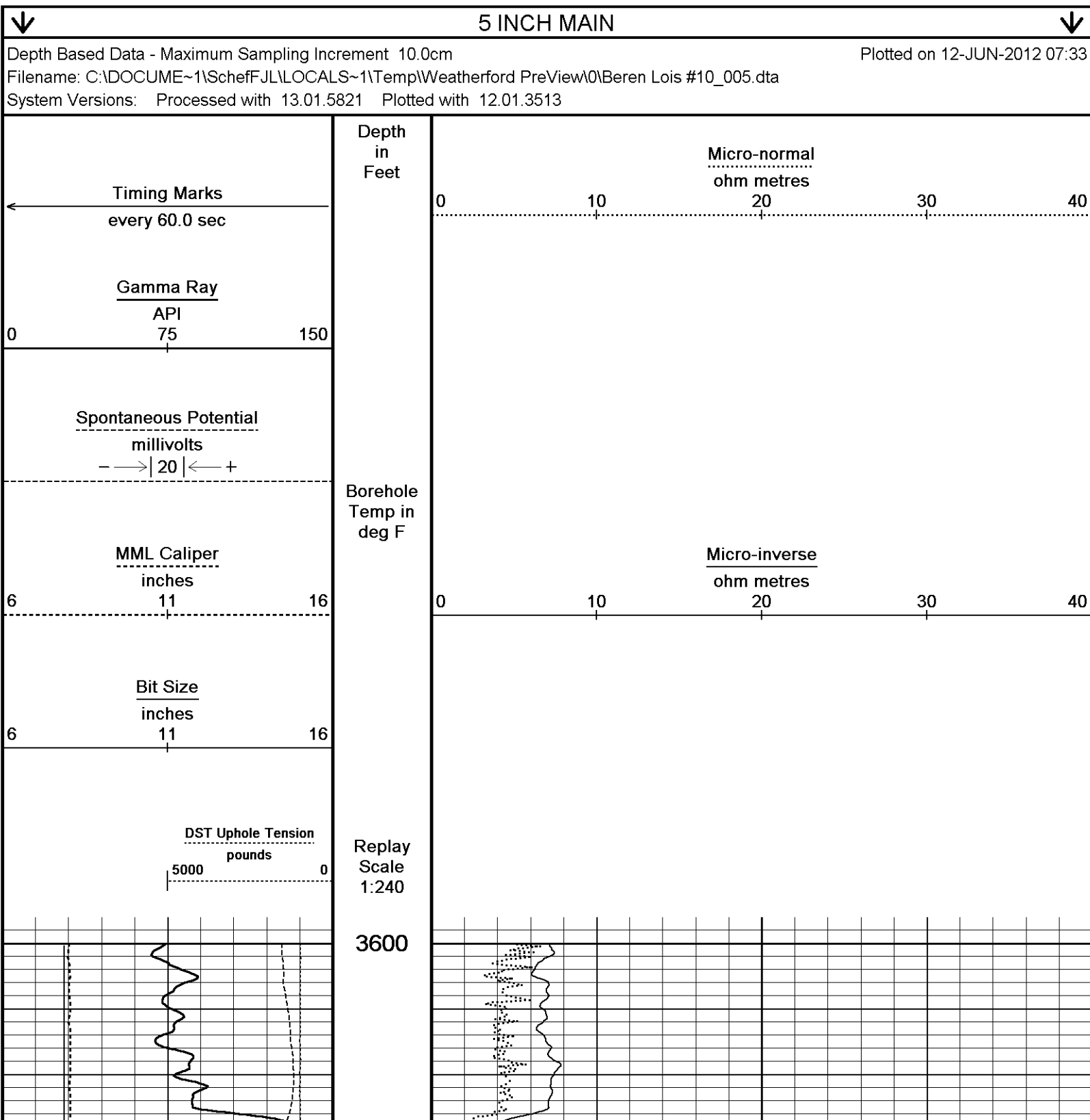
BOREHOLE RECORD			Last Edited: 11-JUN-2012 21:37
Bit Size inches	Depth From feet	Depth To feet	
14.500	0.00	300.00	
12.250	300.00	900.00	
7.875	900.00	5100.00	

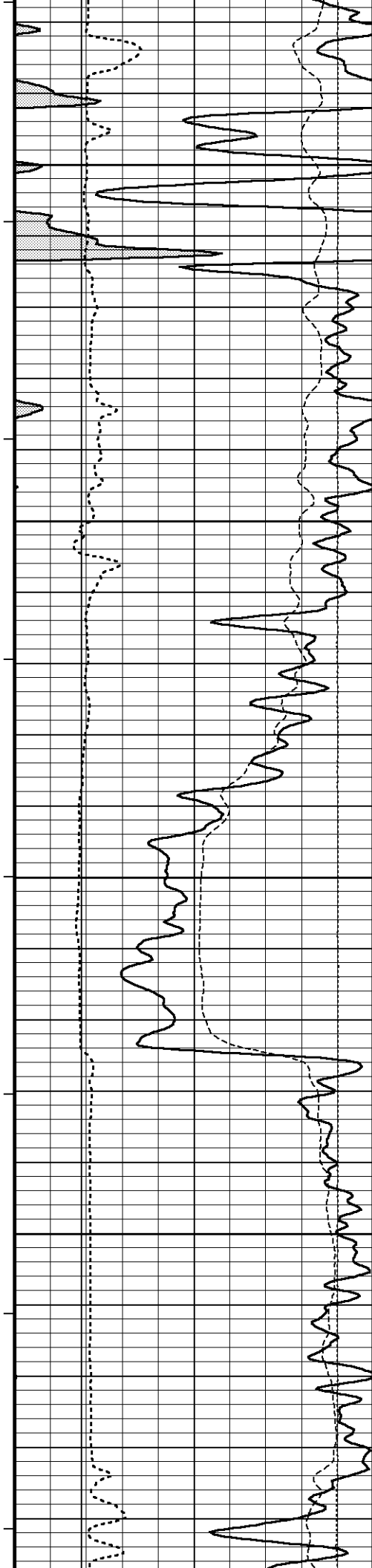
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	13.375	0.00	300.00	48.00

REMARKS
- SOFTWARE ISSUE: WLS 11.03.4044.
- MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MAI. 0.5 INCH STANDOFF USED ON MFE.
- 2.71 G/CC LIMESTONE DENSITY MATRIX 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: 572 CU.FT.
- ANNUAL HOLE VOLUME WITH 5.5 INCH CASING: 325 CU.FT.

- OPERATOR(S): B. REEVES.

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.





107°

3650

107°

3700

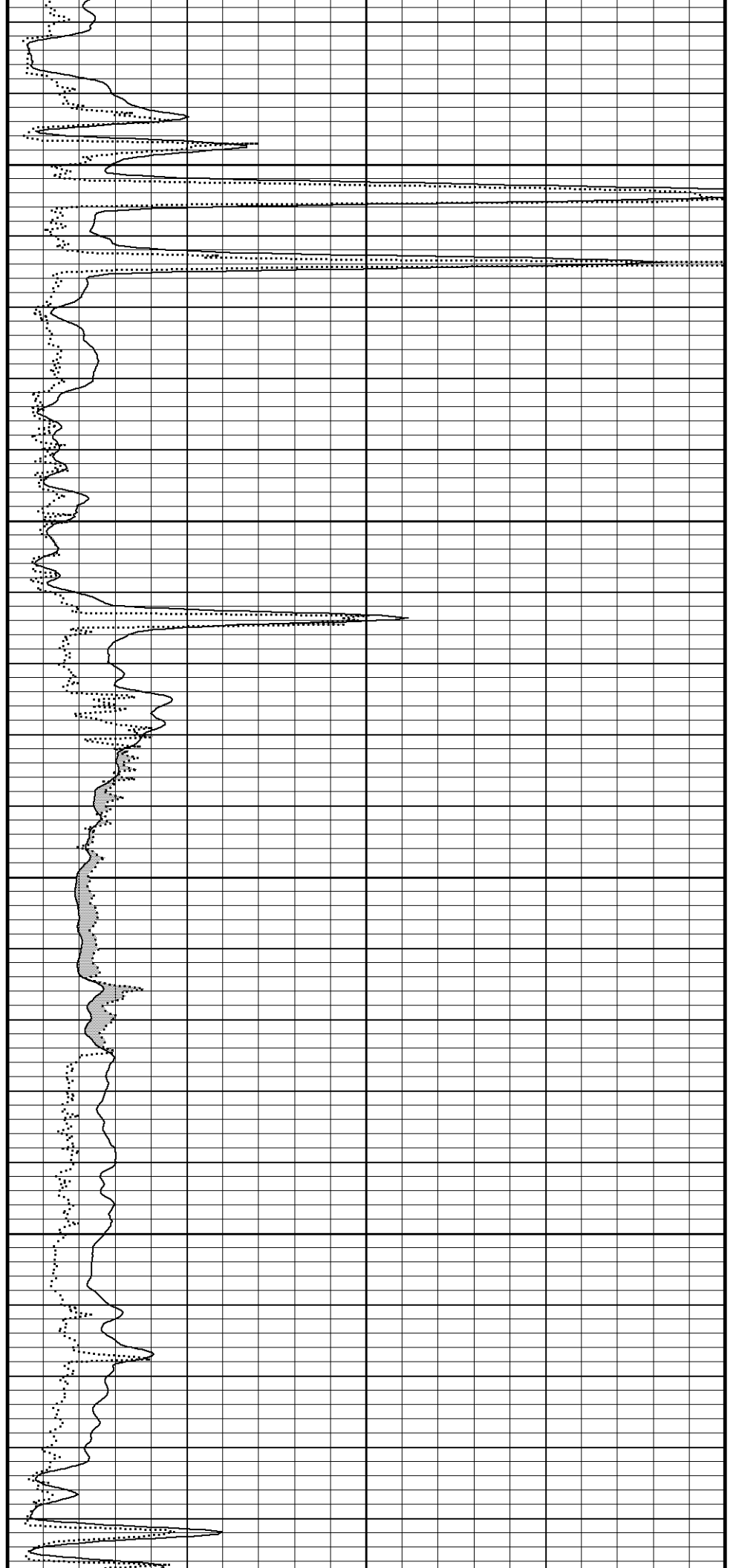
107°

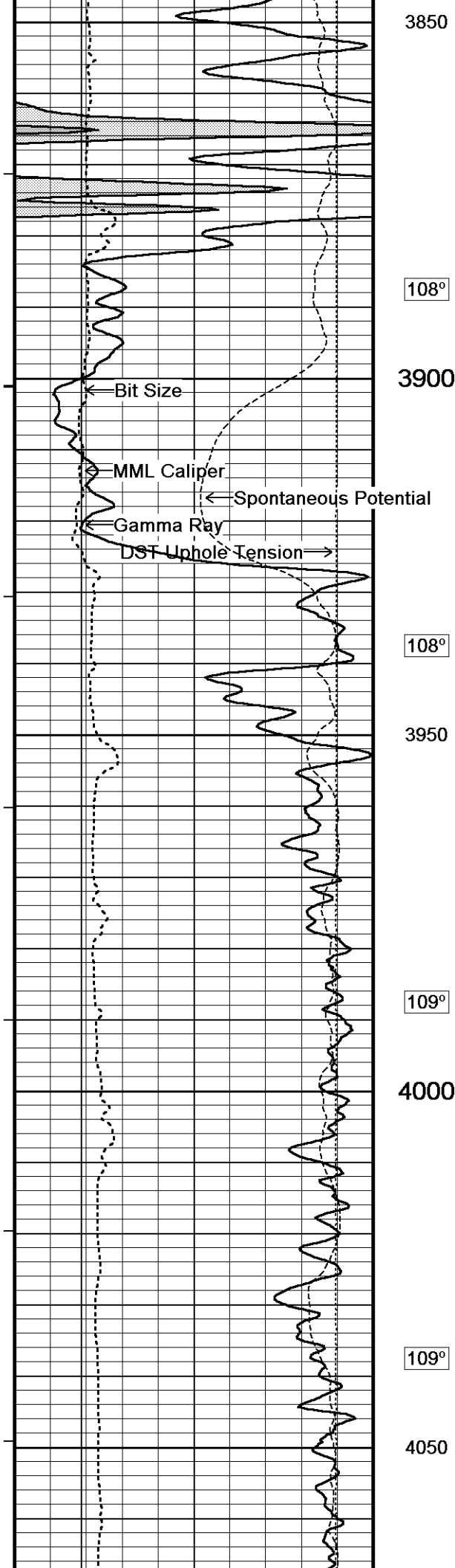
3750

108°

3800

108°





3850

108°

3900

108°

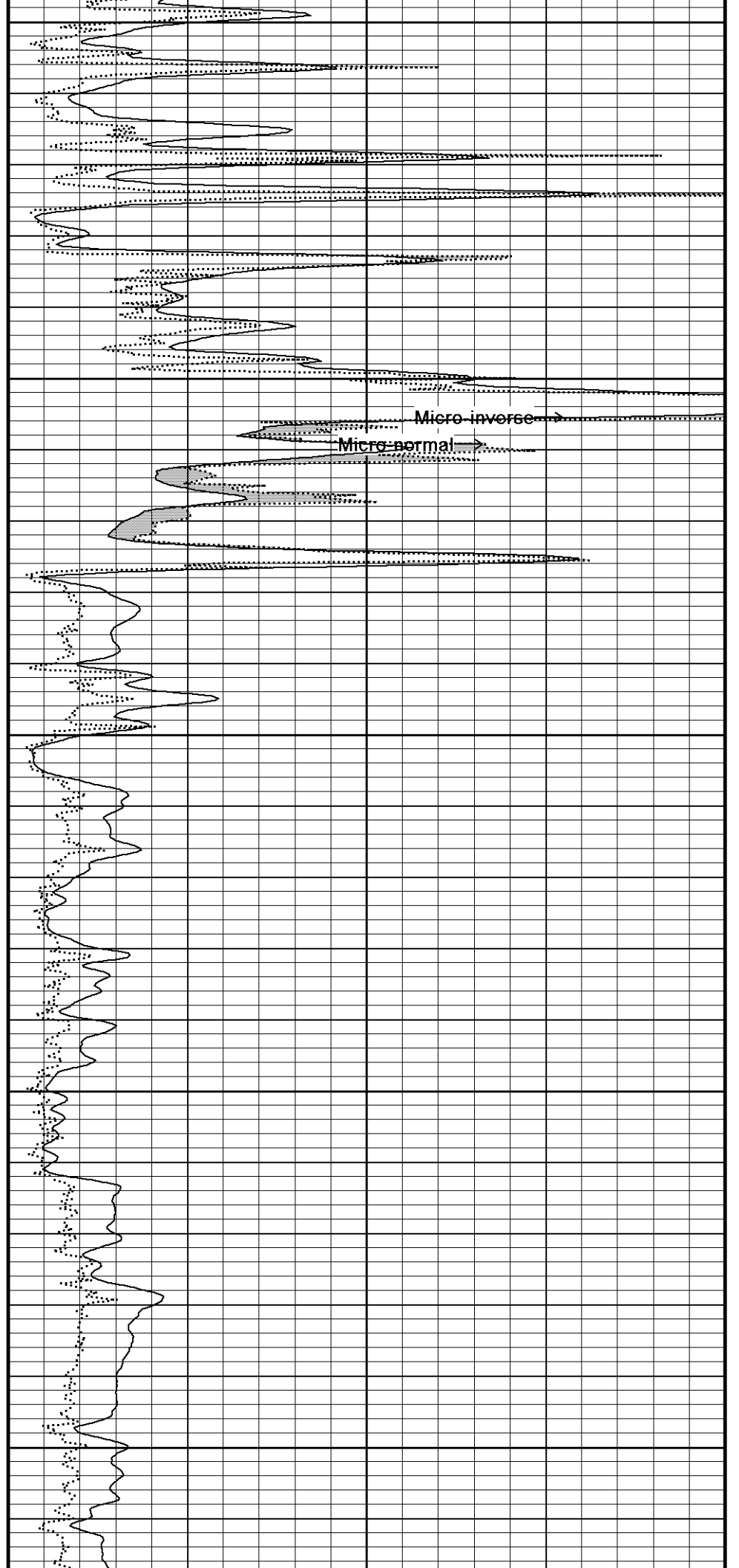
3950

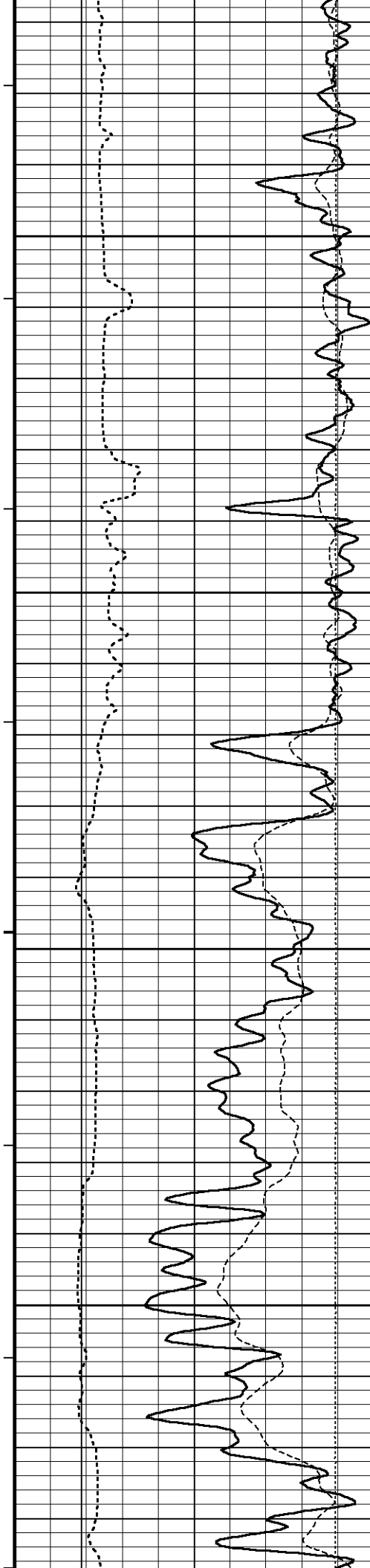
109°

4000

109°

4050





110°

4100

110°

4150

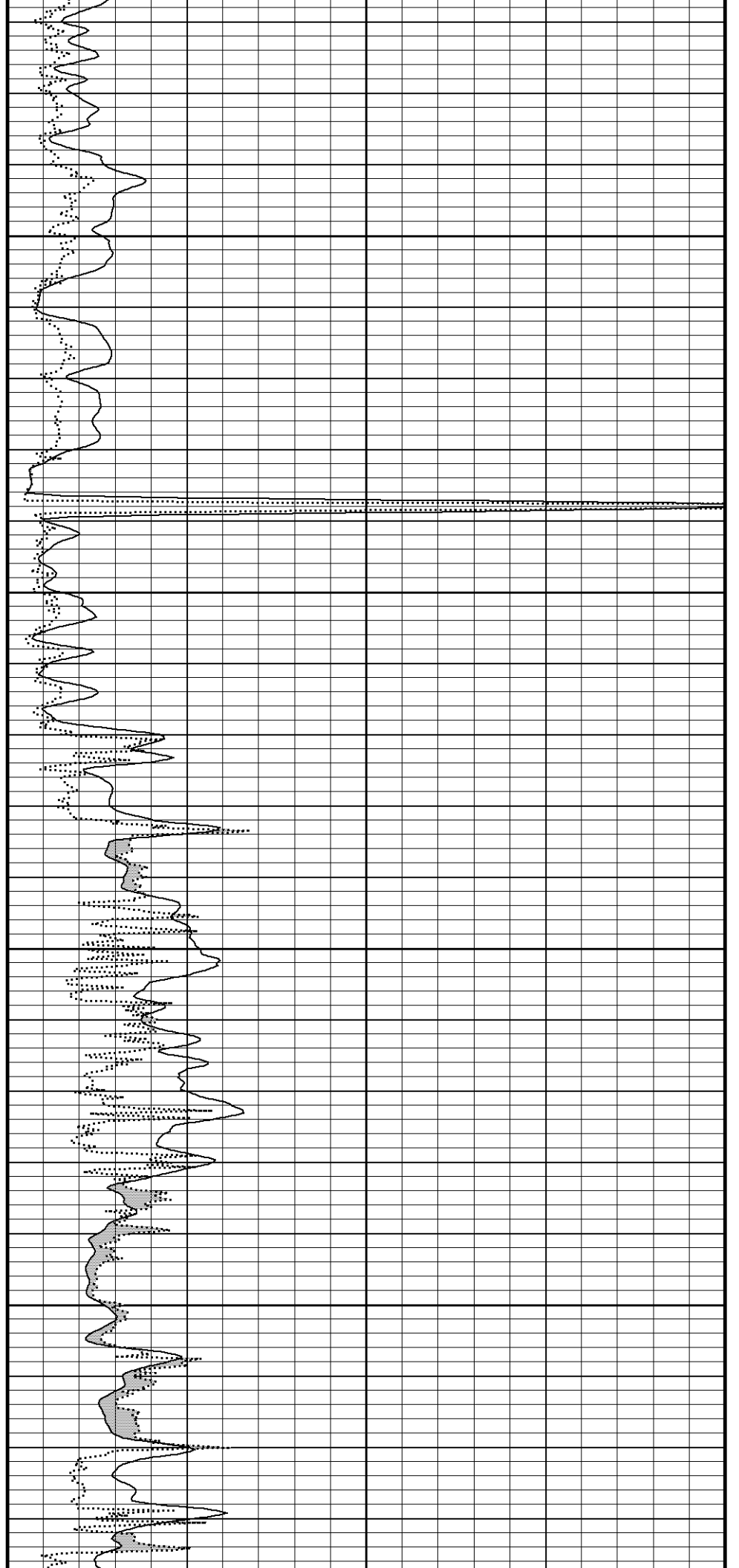
111°

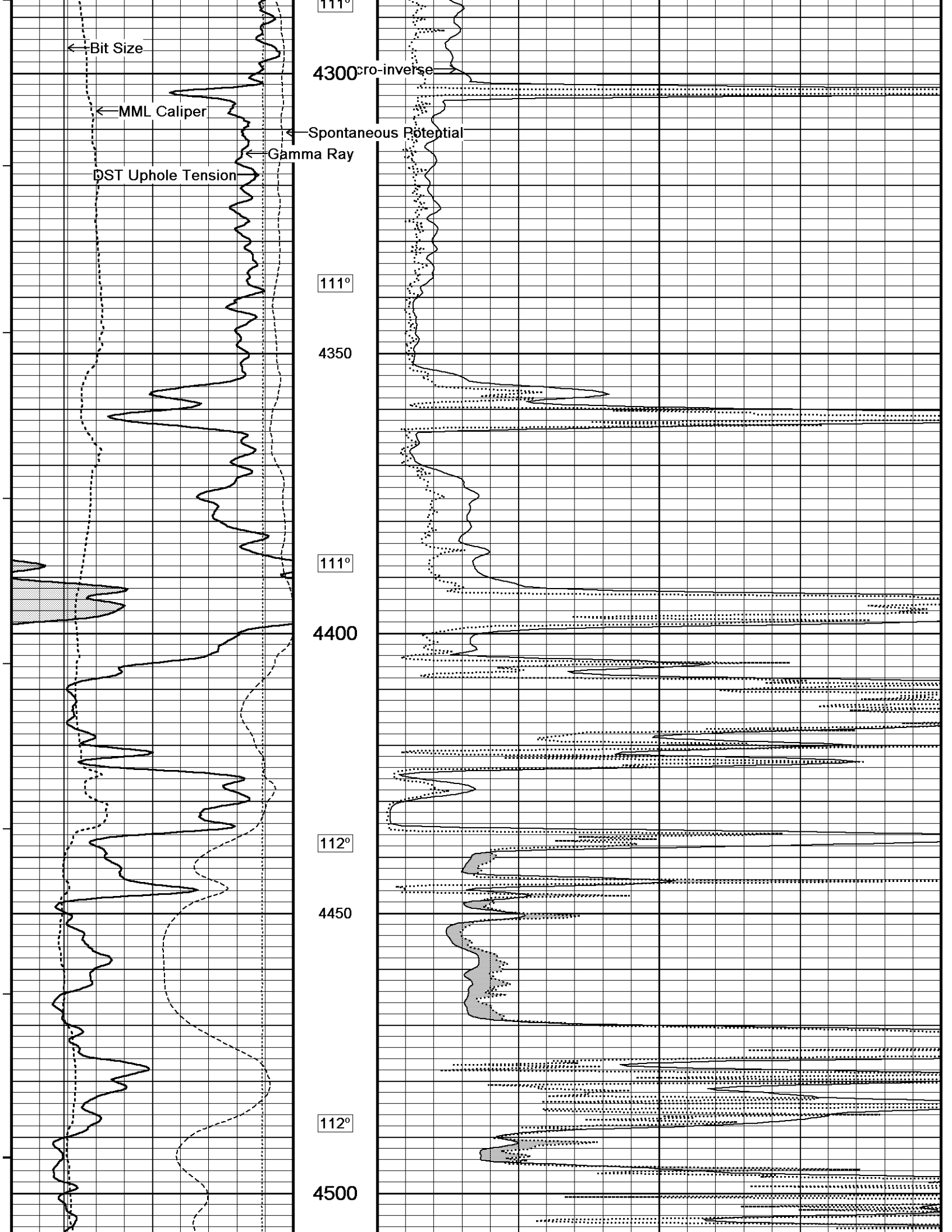
4200

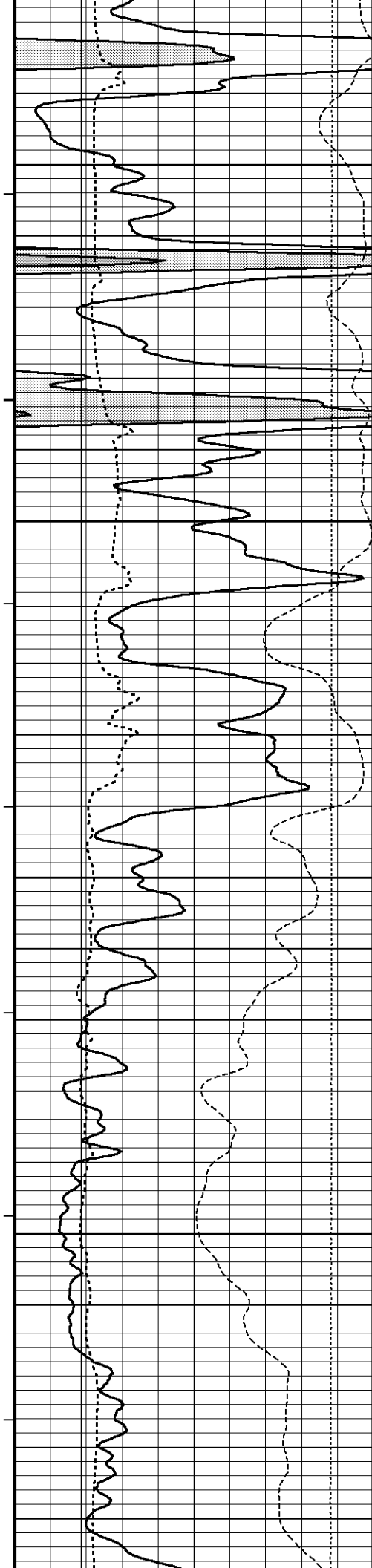
111°

4250

4440







113°

4750

113°

4800

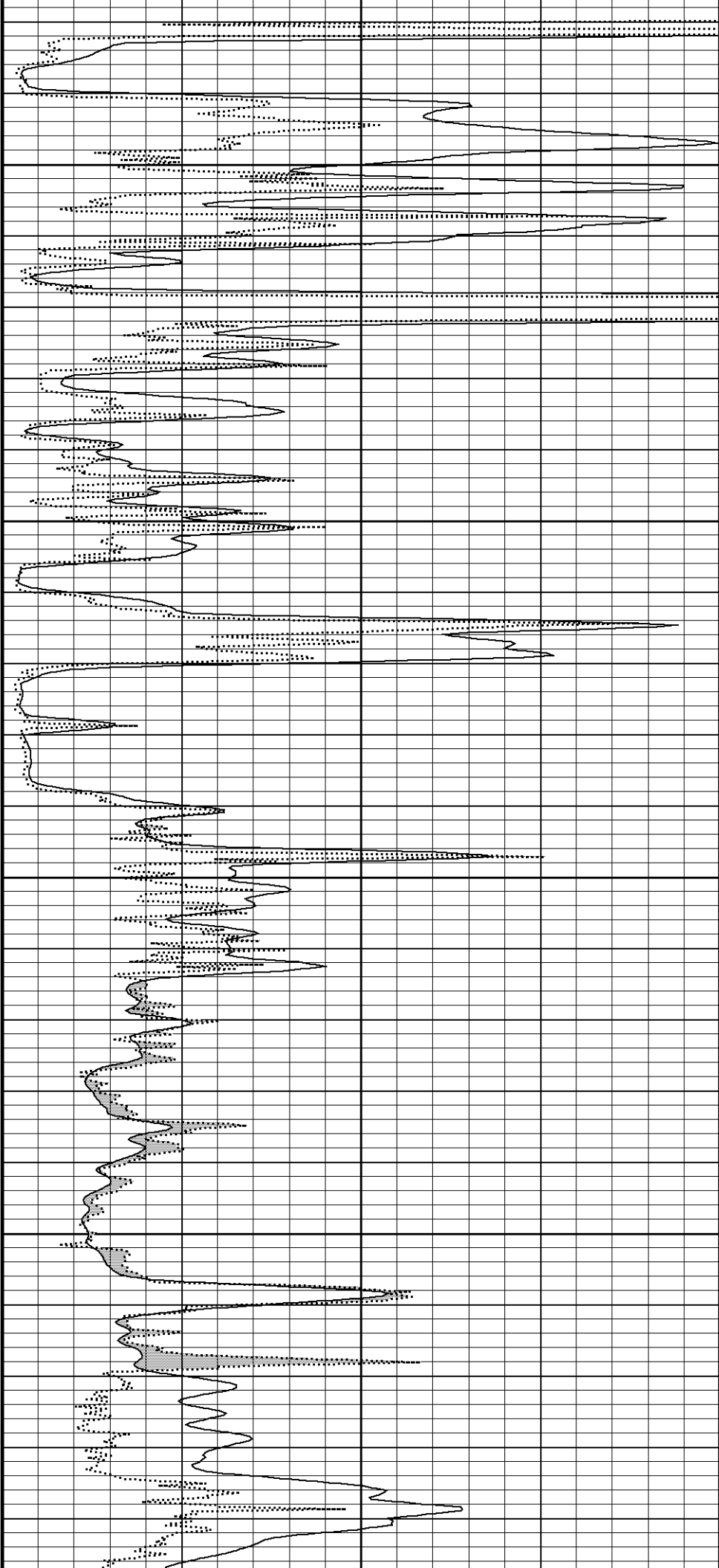
114°

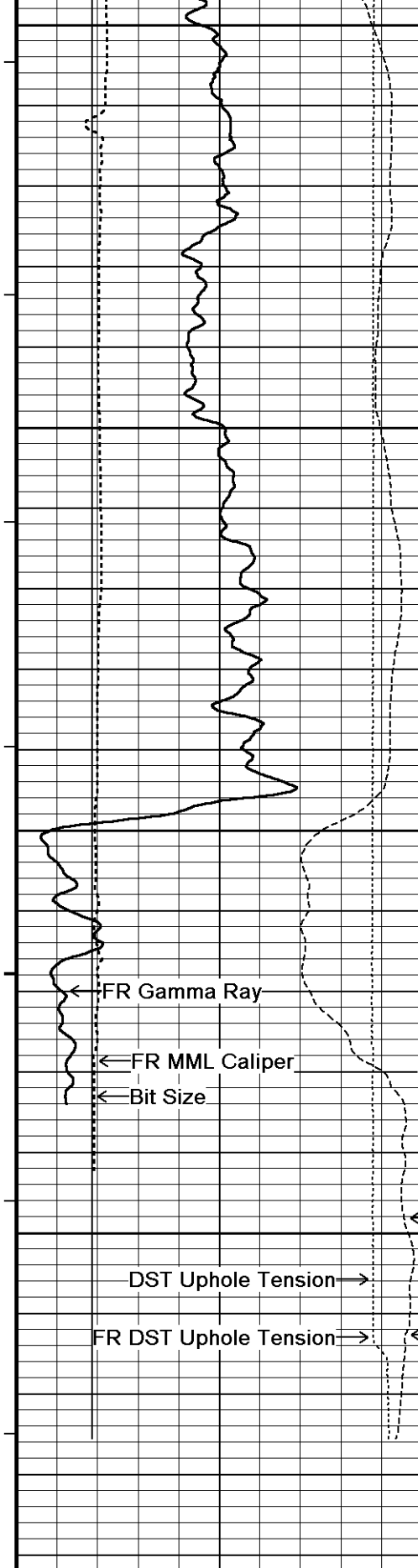
4850

114°

4900

116°





4950

117°

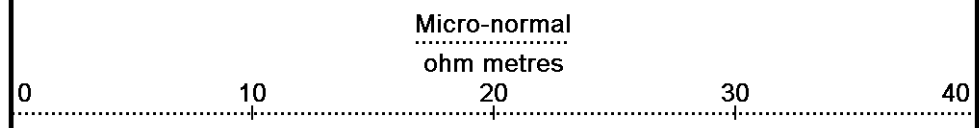
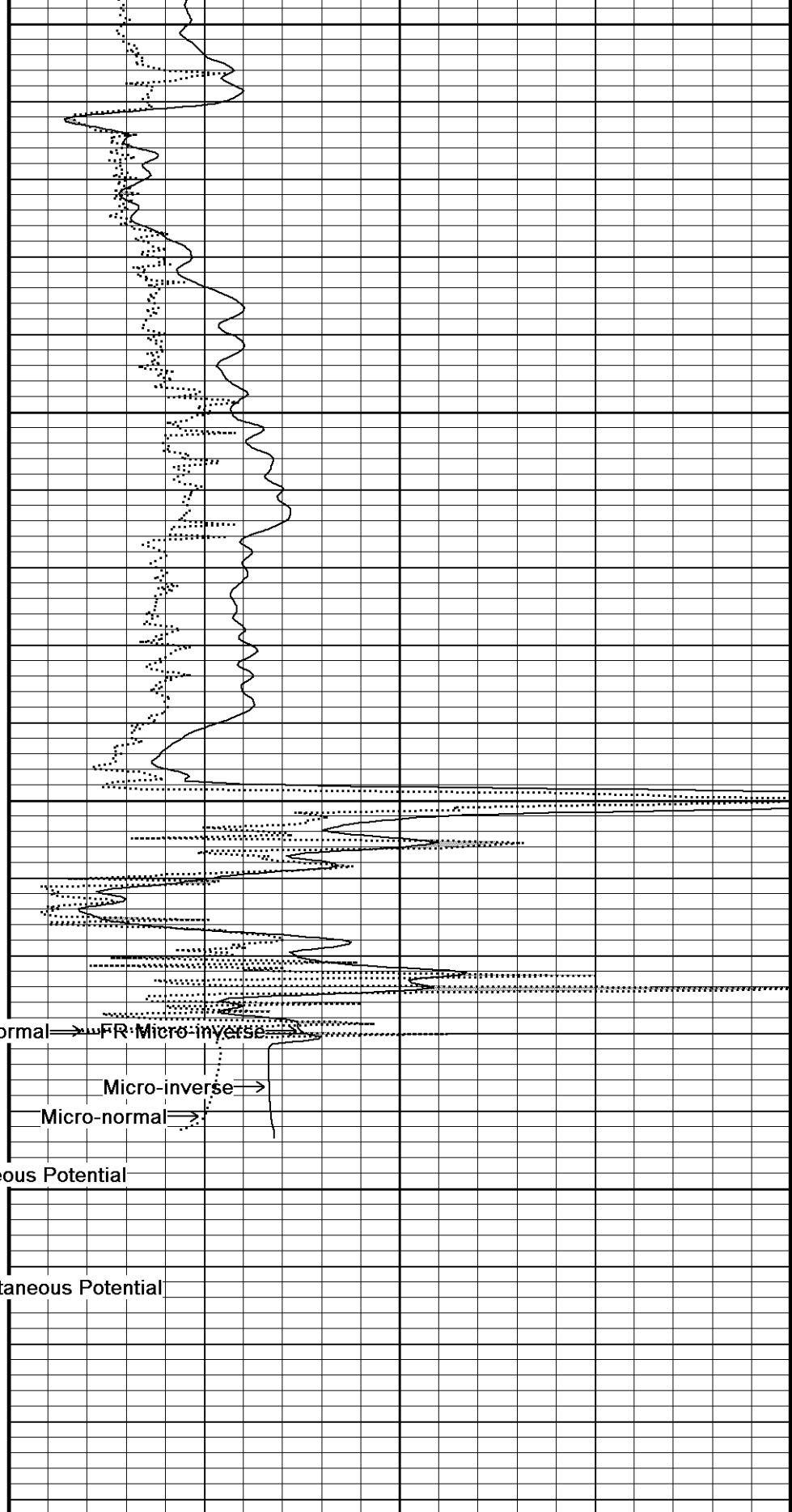
5000

116°

5050

5100

5140
Depth
in
Feet



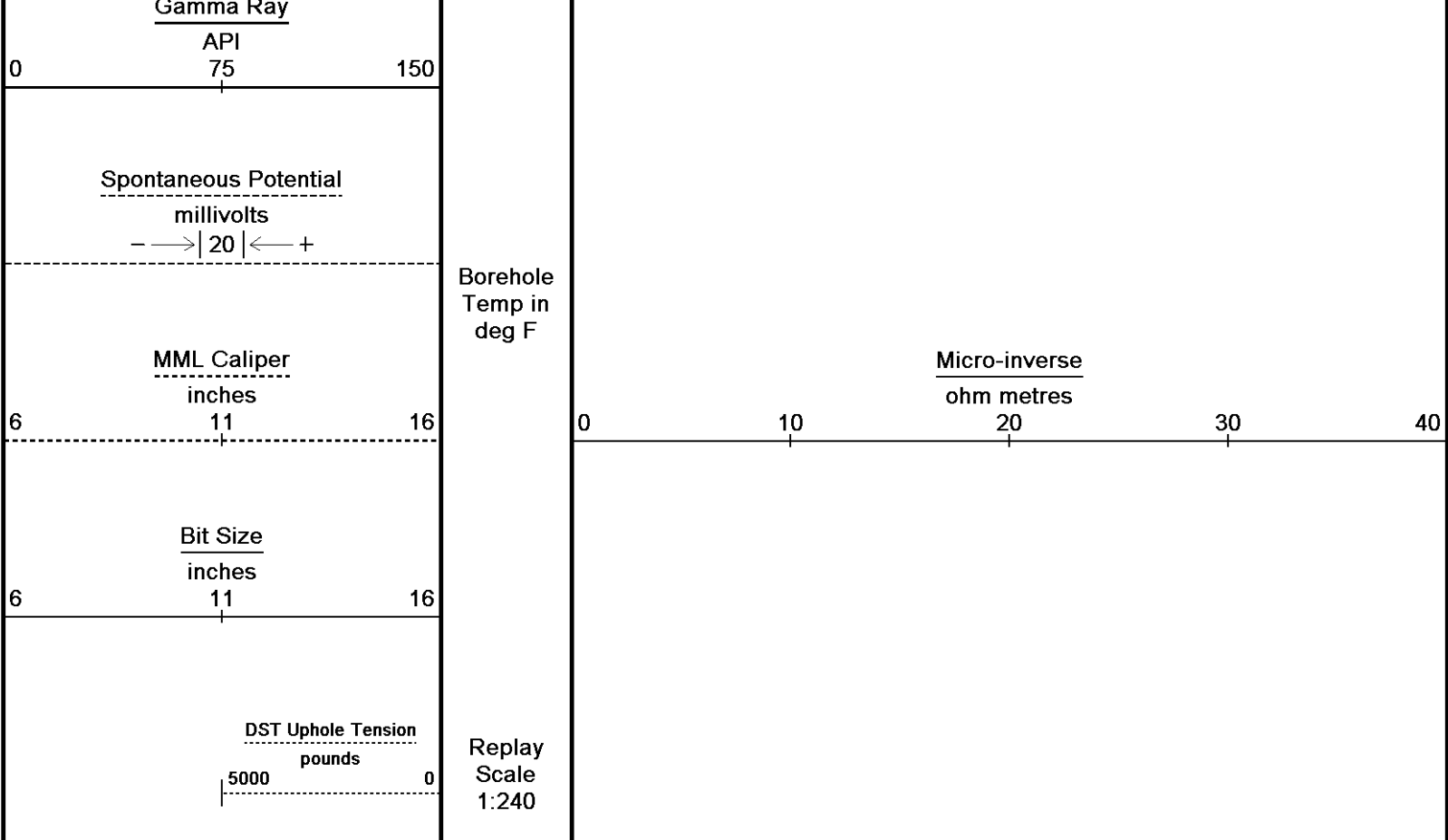
Timing Marks
every 60.0 sec

← FR Gamma Ray
← FR MML Caliper
← Bit Size

DST Uphole Tension →
FR DST Uphole Tension →

FR Micro-normal → FR Micro-inverse →
Micro-inverse →
Micro-normal →

← Spontaneous Potential
← FR Spontaneous Potential



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-JUN-2012 07:33

Filename: C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford PreView\0\Beren Lois #10_005.dta

System Versions: Processed with 13.01.5821 Plotted with 12.01.3513

↑

5 INCH MAIN

↑

↓

REPEAT SECTION

↓

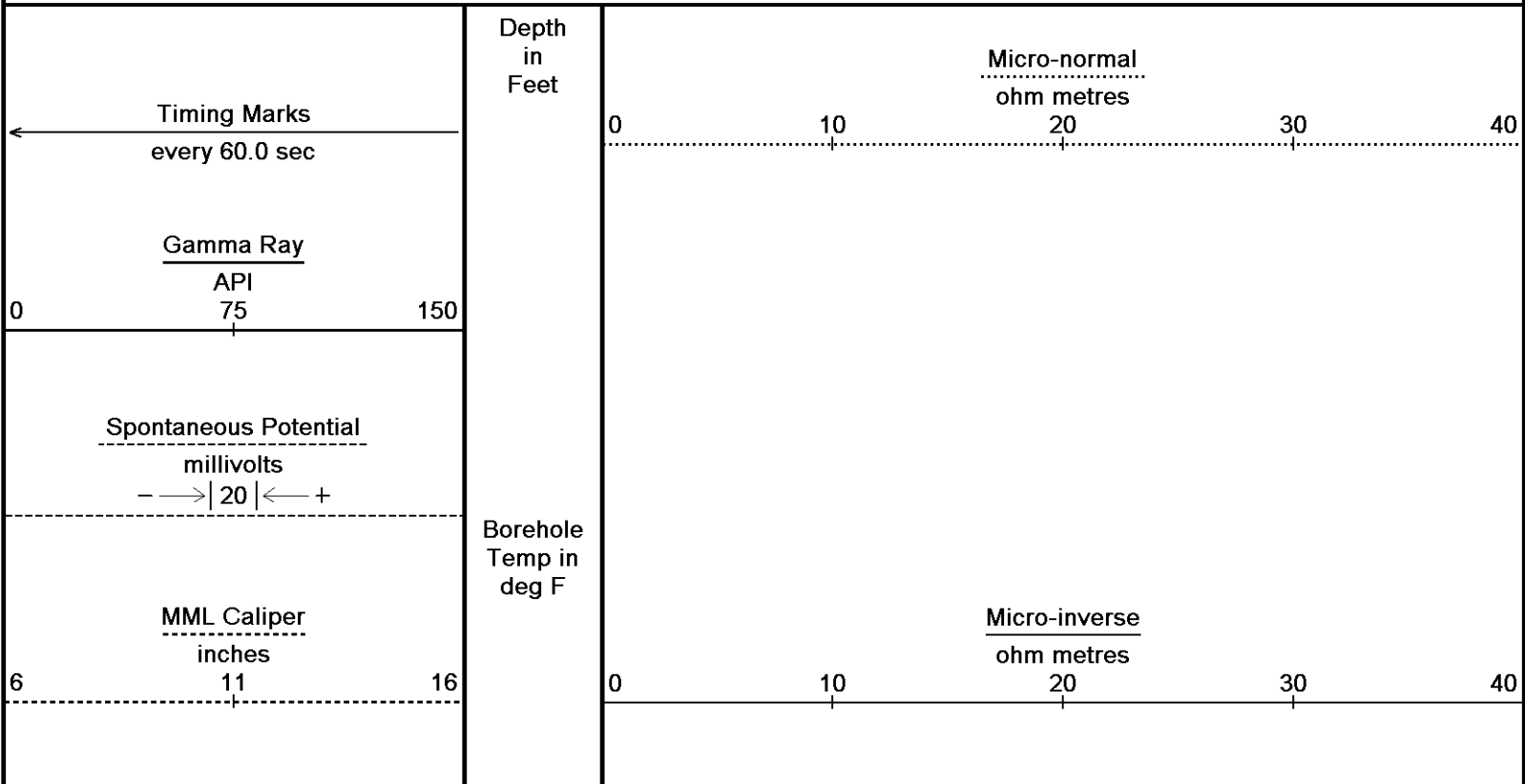
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-JUN-2012 07:33

Filename: C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford PreView\0\Beren Lois #10_001.dta

Recorded on 11-JUN-2012 23:16

System Versions: Logged with 11.03.4044 Processed with 13.01.5821 Plotted with 12.01.3513



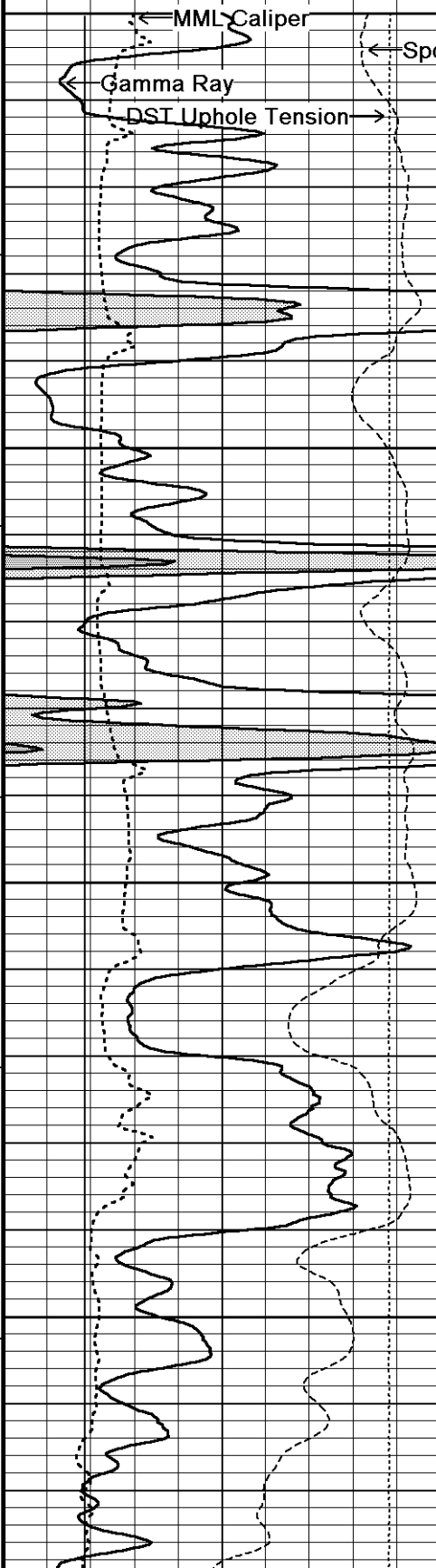
Bit Size
inches

6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4700



Spontaneous Potential

111°

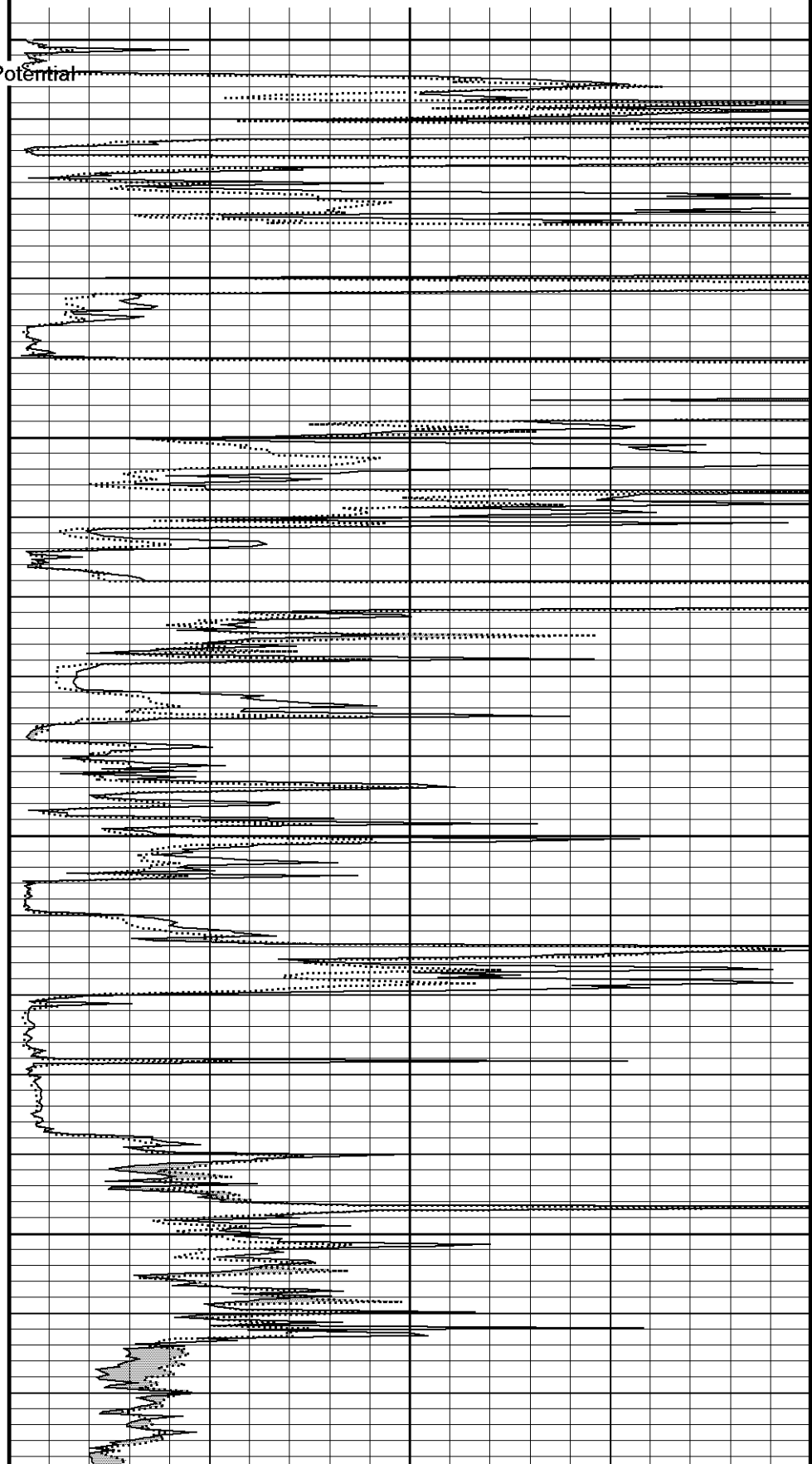
4750

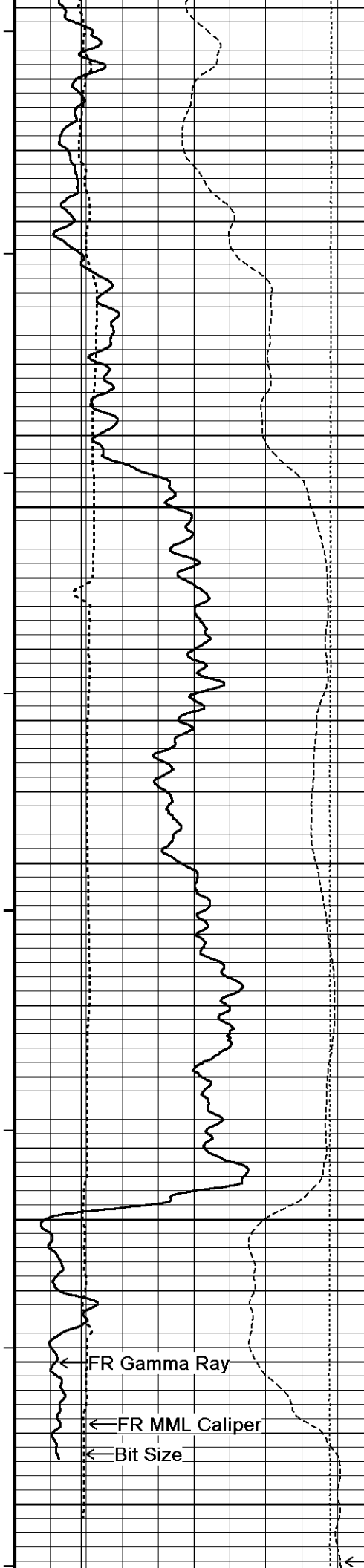
111°

4800

112°

4850





113°

4900

114°

4950

115°

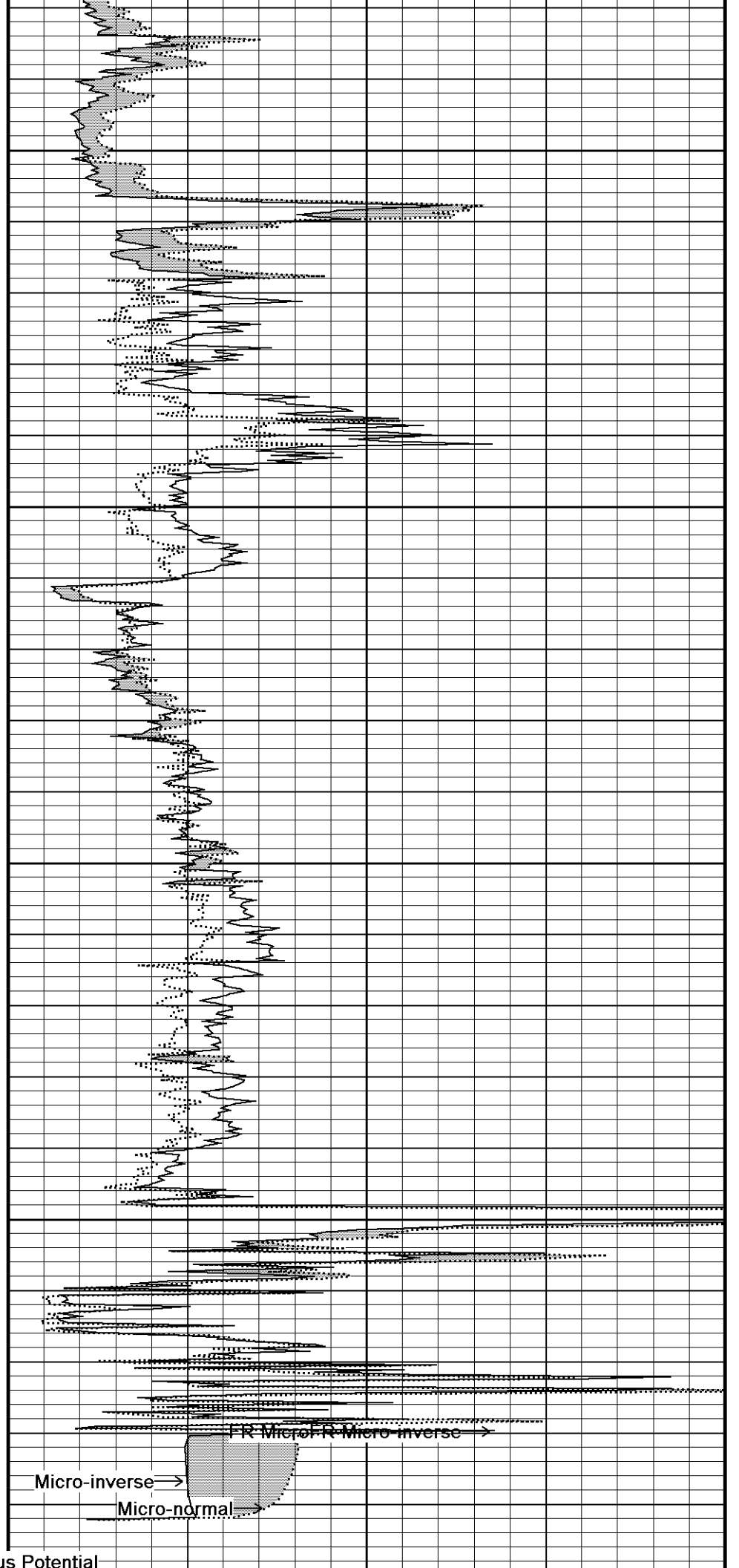
5000

116°

5050

← FR Gamma Ray
← FR MML Caliper
← Bit Size

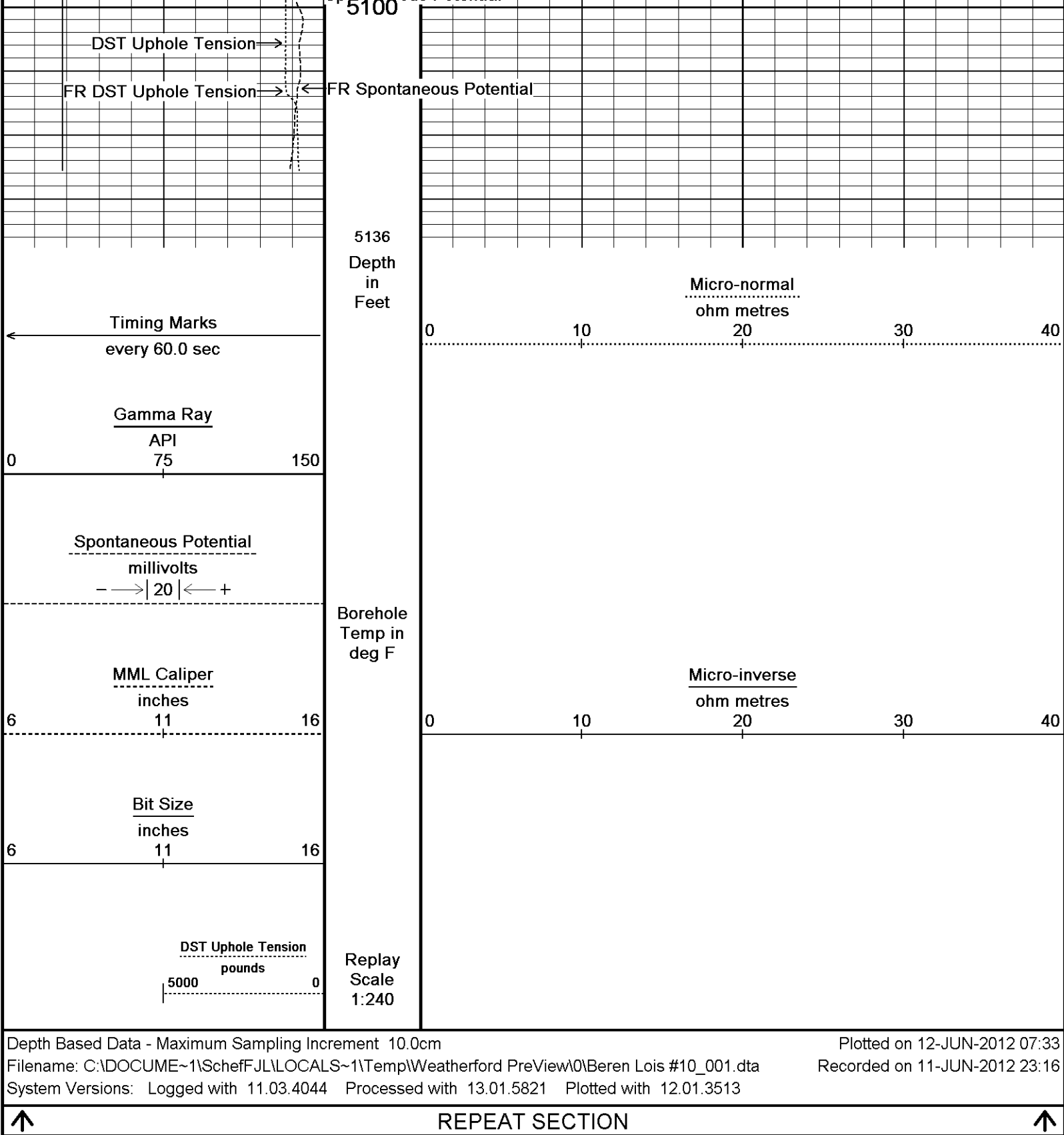
← Spontaneous Potential



Micro-inverse →

Micro-normal →

FR Micro-inverse →



BEFORE SURVEY CALIBRATION		
C:\DOCUME~1\ScheffJL\LOCALS~1\Temp\Weatherford PreView\0\Beren Lois #10_004.dta		
General Constants All 000		Last Edited on 11-JUN-2012 23:43
General Parameters		
Mud Resistivity	0.320	ohm-metres
Mud Resistivity Temperature	91.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		

Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	None		
HVOL Caliper 2	N/A		
Annular Volume Diameter	5.500	inches	
Caliper for Differential Caliper	None		
Rwa Parameters			
Porosity used	Limestone Density Por.		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
Down-hole Tension Calibration All 000		Field Calibration on 30-JUN-2010 01:00	
Reading No	Measured	Calibrated (lbs)	
1	14112.01	10.00	
2	15164.79	427.00	
Down-hole Tension Calibration SMS 0		Field Calibration on 29-MAR-2012 12:07	
Reading No	Measured	Calibrated (lbs)	
1	-2133.10	0.00	
2	-2135.89	100.00	
Gamma Calibration MCG-C 208		Field Calibration on 11-JUN-2012 10:21	
	Measured	Calibrated (API)	
Background	74	53	
Calibrator (Gross)	1091	778	
Calibrator (Net)	1016	725	
Gamma Constants MCG-C 208		Last Edited on 11-JUN-2012 17:07	
Gamma Calibrator Number	gcr38		
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 208		Field Calibration on 24-FEB-2012 11:08	
	Measured	Calibrated (mV)	
Reference 1	98.6	100.0	
Reference 2	-101.8	-100.0	
High Resolution Temperature Calibration MCG-C 208		Field Calibration on 17-MAY-2012 11:07	
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 208		Last Edited on	
Pre-filter Length	11		
Caliper Calibration MML-A 16		Base Calibration on 23-MAY-2012 09:49 Field Calibration on 11-JUN-2012 10:13	
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14648	5.98	
2	17884	7.97	
3	21168	9.86	
4	25204	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.99	5.98	
Micro Normal and Micro Inverse Calibration MML-A 16		Base Calibration on 23-MAY-2012 09:57 Field Check on 11-JUN-2012 10:15	
Base Calibration			
	Measured	Calibrated (ohm-m)	

Channel	Resistor 1	Measured	Resistor 2	Calibrated (ohm-m)	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		
Micro Inverse			48.2		
Micro Normal and Micro Inverse Constants MML-A 16					Last Edited on 11-JUN-2012 10:14
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 17-MAY-2012 13:54 Field Check on 11-JUN-2012 10:26
Base Calibration					
		Measured		Calibrated (cps)	
	Near		Far	Near	Far
	3162		99	3714	110
Ratio	31.795		33.764		
Field Calibrator at Base				Calibrated (cps)	
				1615	2304
Ratio	0.701				
Field Check				Calibrated (cps)	
				1621	2311
Ratio	0.701				
Neutron Constants MDN-A.B 66					Last Edited on 11-JUN-2012 17:08
Neutron Source Id	P58125B				
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	MCG External Temperature				
Temperature			N/A	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-C.A 353					Base Calibration on 17-MAY-2012 09:40 Field Check on 11-JUN-2012 10:04
Base Calibration					
		Measured		Calibrated (ohm-m)	
Reference 1			0.0	0.0	
Reference 2			964.5	126.8	
Base Check				281.0	
Field Check				281.0	
FE Constants MFE-C.A 353					Last Edited on 11-JUN-2012 17:08
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			0.0	inches	
Location Calibration MML-A 167					Base Calibration on 11-MAY-2011 09:59

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	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	13.1	3839.5
2	0.0	0.0	29.6	3477.3
3	0.0	0.0	29.1	3053.2
4	0.0	0.0	19.7	2081.7
Deep	0.0	0.0	18.5	2048.9
Medium	0.0	0.0	42.2	3991.6
Shallow	0.0	0.0	43.1	5054.9

Array Temperature 0.0 73.4 Deg F

Induction Constants MAI-A.A 167

Last Edited on 11-JUN-2012 17:08

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	0.00	inches	
Number of Fins on Stand-off	6.0000		
Stand-off Fin Angle	60.00	degrees	
Stand-off Fin Width	0.0000	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	

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 17-MAY-2012 11:07

	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

Caliper Calibration MPD-B 31

Base Calibration on 17-MAY-2012 11:46

Field Calibration on 11-JUN-2012 10:06

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17422	3.99
2	26064	5.98
3	34746	7.97
4	42992	9.86
5	52432	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 17-MAY-2012 12:08

Field Check on 11-JUN-2012 10:11

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57479	28439	59556	30836
Reference 2	22883	2144	24941	2541

Field Check at Base

693.0 857.8

Field Check

694.1 856.7

PE Calibration

Base Calibration	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	127	608		
Reference 1	22685	57323	0.398	0.371
Reference 2	6674	22783	0.295	0.272

Field Check at Base

127.1 608.2

Field Check

125.9 608.6

Density Constants MPD-B 31

Last Edited on 11-JUN-2012 17:07

Density Source Id	P50557B
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

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 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 66 LG: 5.04 ft WT: 50.7 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 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

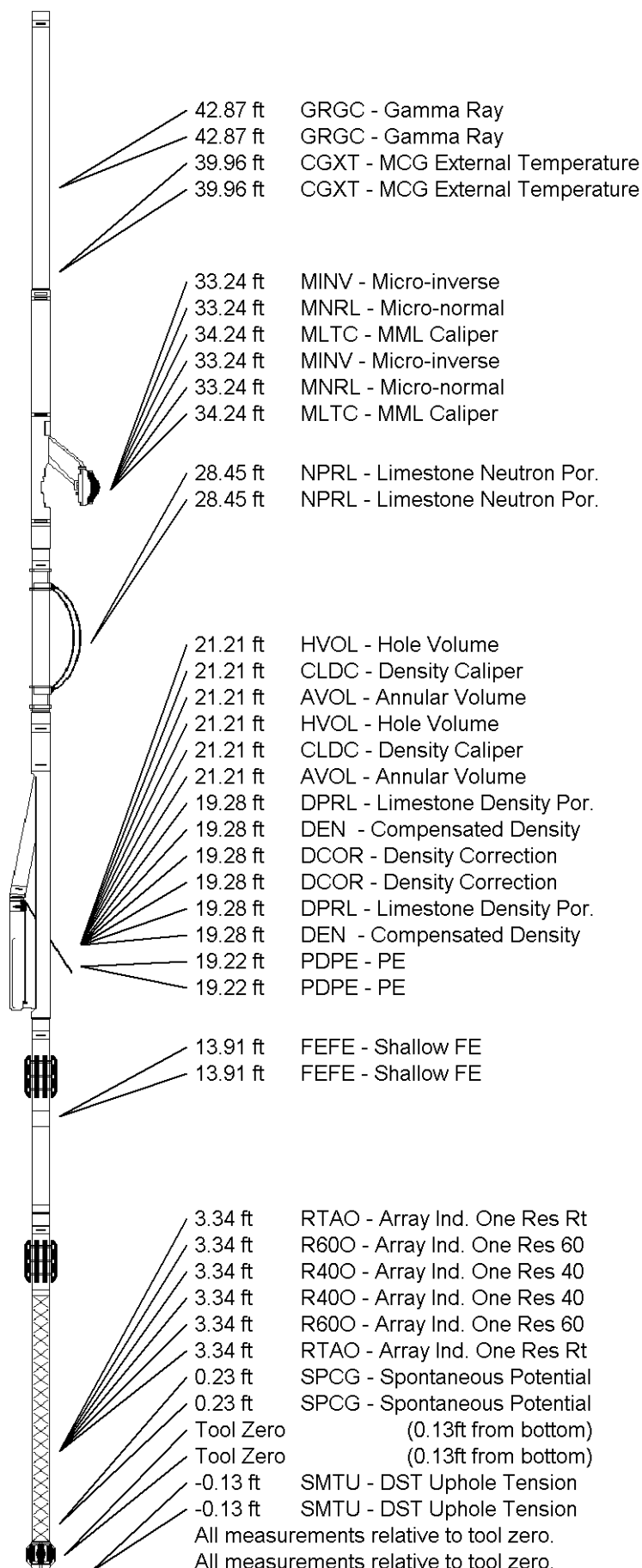
Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.16 ft Weight: 383.6 lb

Total Length: 48.16 ft Weight: 383.6 lb



FIELD	HARDTNER
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1432.00	feet	First Reading	5080.00	feet
Elevation Drill Floor	1429.00	feet	Depth Driller	5100.00	feet
Elevation Ground Level	1419.00	feet	Depth Logger	5113.00	feet



Weatherford®

MICRORESISTIVITY LOG

