MICRORESISTIVITY LOG

Weatherford®

COMPANY	O'BRIEN ENERGY RESOURCES CORP.
WELL	MEADE LAKE OFFSET #2-13
FIELD	WILDCAT
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	430' FNL & 350' FWL
	SE NW NW NW

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
13	33S	29W	MPD/MDN MAI/MFE

API Number 15-119-21299
Permit Number

Permanent Datum G.L., Elevation 2505 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations:	feet
KB	2516.00
DF	2514.00
GL	2505.00

Date	04-OCT-2011			
Run Number	ONE			
Depth Driller	6250.00	feet		
Depth Logger	6254.00	feet		
First Reading	6218.00	feet		
Last Reading	4000.00	feet		
Casing Driller	1462.00	feet		
Casing Logger	1462.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.10 lb/USg	47.00 CP		
PH / Fluid Loss	10.00	8.00 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.99 @ 90.0	ohm-m		
Rmf @ Measured Temp	0.79 @ 90.0	ohm-m		
Rmc @ Measured Temp	1.19 @ 90.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.70 @127.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	127.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13025	LIB		
Recorded By	L. SCOTT			
Witnessed By	PETER DEBENHAM		ROGER PEARSON	
S.O.# / JOB#	3531195		LB11-254	

BOREHOLE RECORD

Last Edited: 04-OCT-2011 04:52

Bit Size inches	Depth From feet	Depth To feet
7.875	1462.00	6254.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1462.00	24.00

REMARKS

Tools Run: MAI, MPD, MCG, MDN, MFE, MML,
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 inch standoffs used. MDN: Dual Eccentralizer used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borhole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 4.5 inch production casing= 549 cu. ft.
Service order #3531195
Rig: Duke #6
Engineer: L. Scott
Operator(s): K. Rinehart, B. Johnson

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 02-DEC-2011 13:29
Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_003.dta
Recorded on 04-OCT-2011 03:19
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 12.01.3513

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Spontaneous Potential
millivolts
– → | 20 | ← +

MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

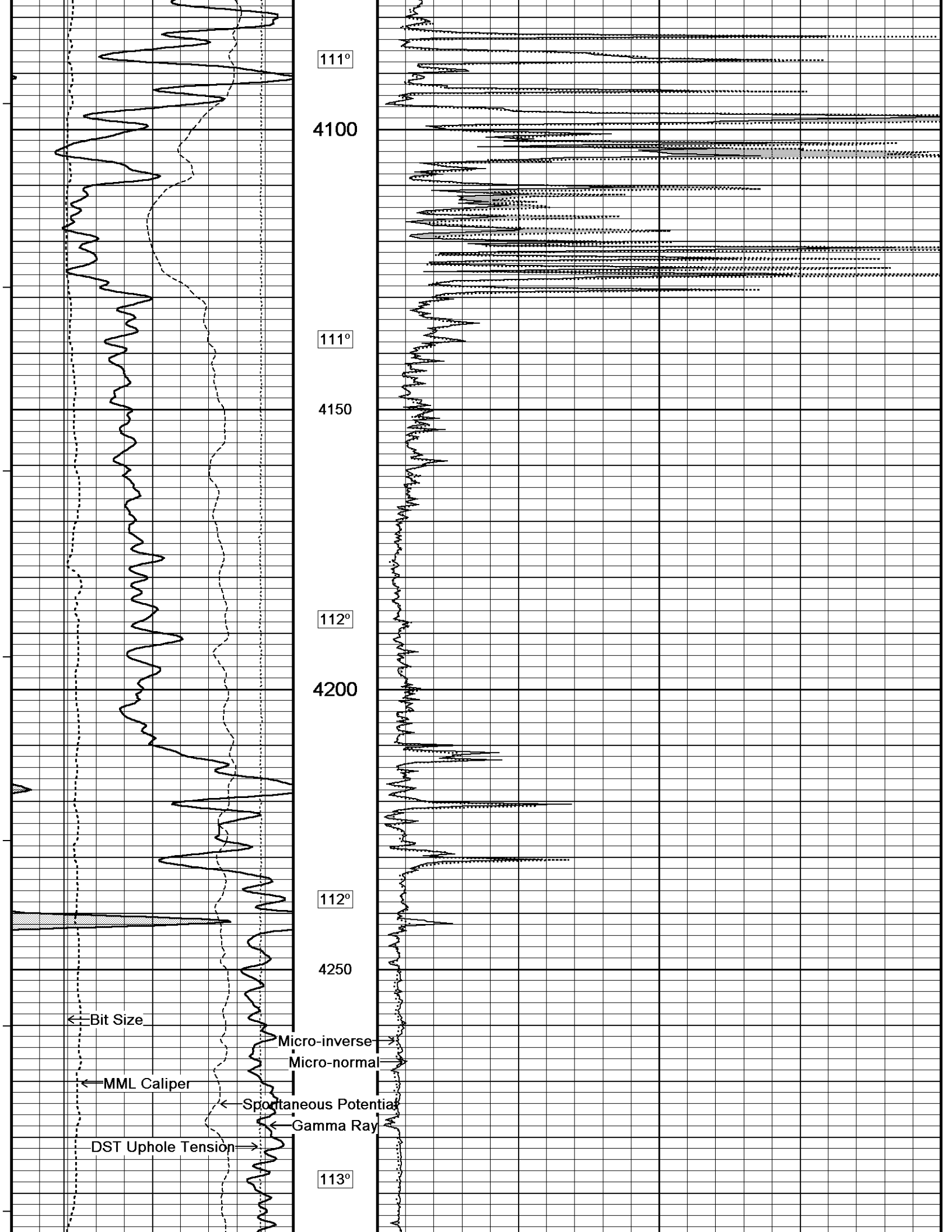
4000

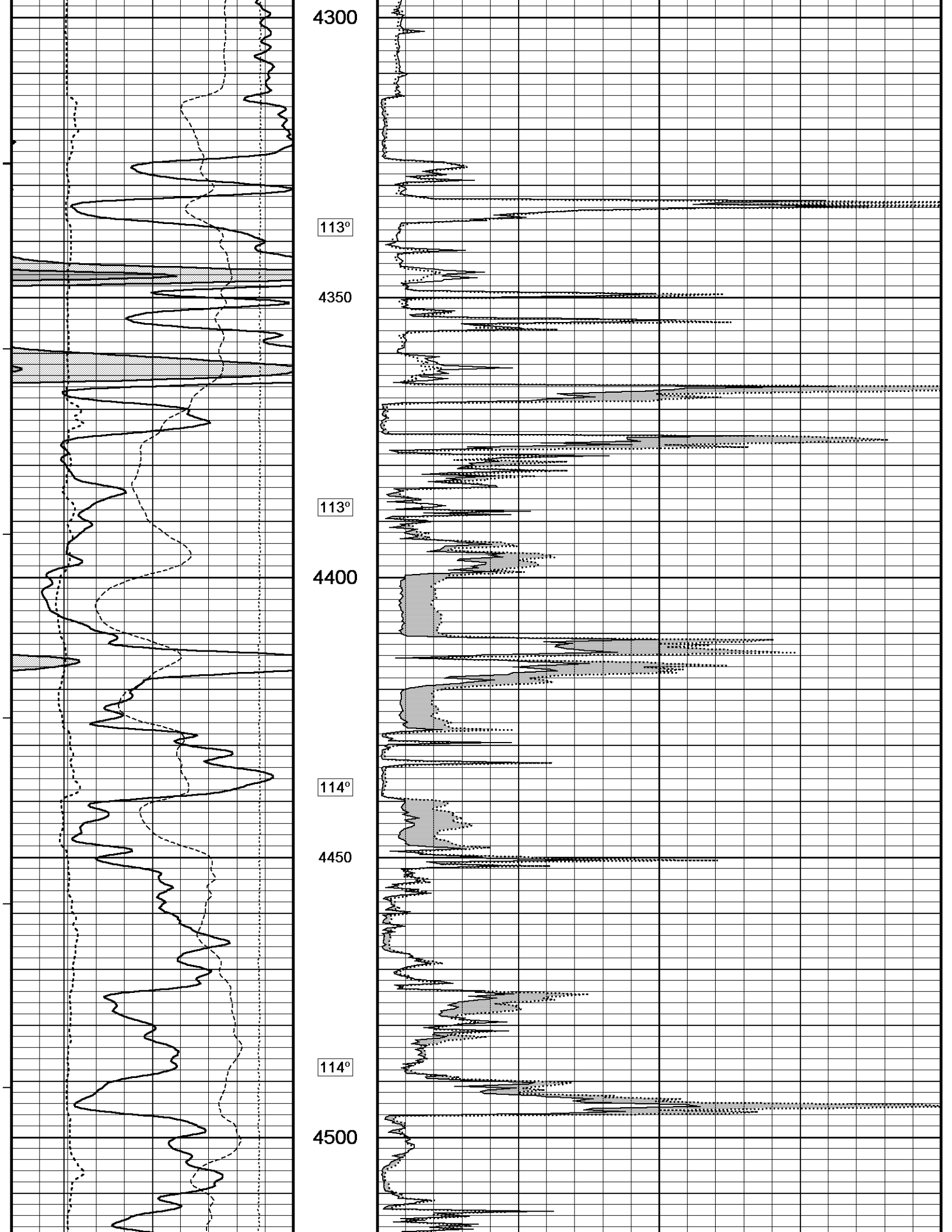
110°

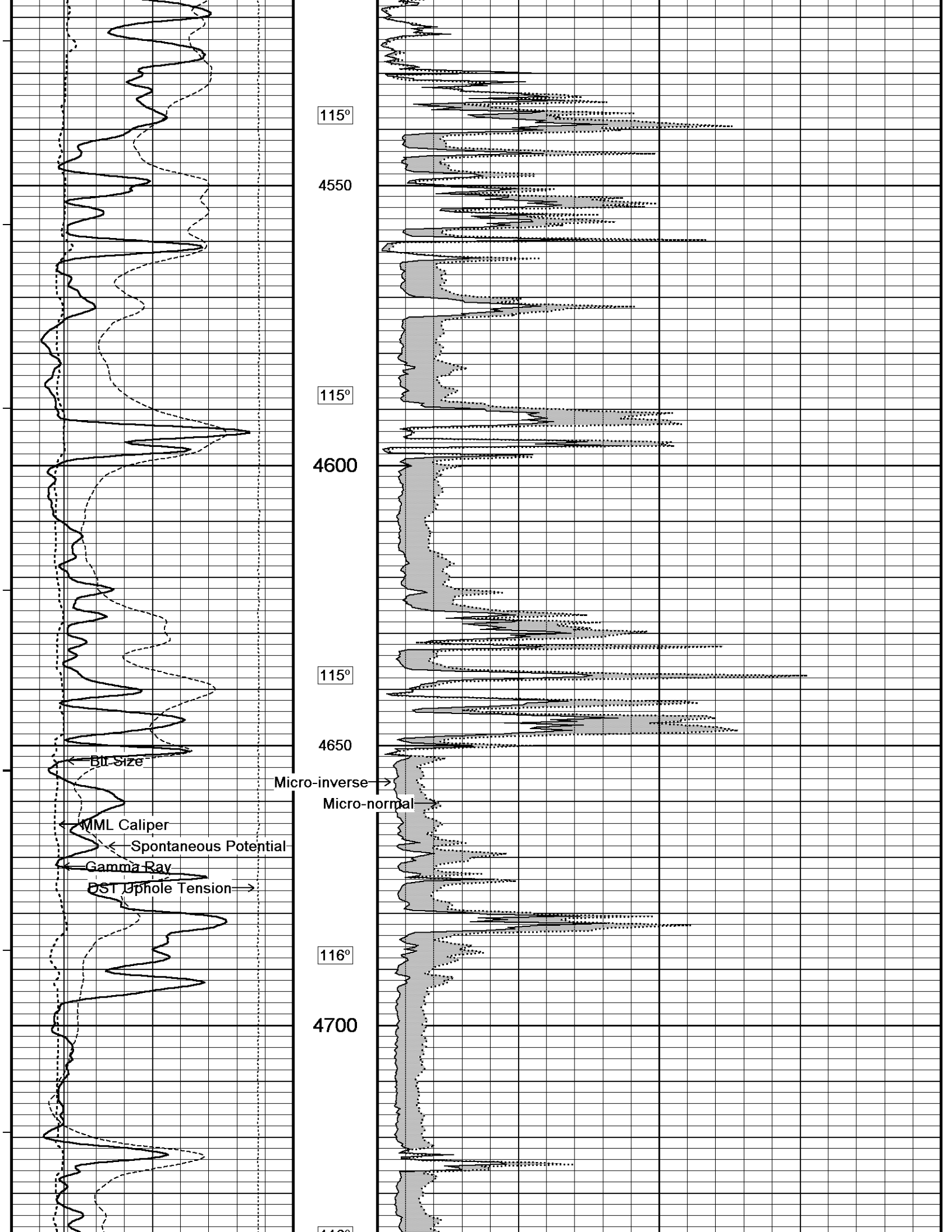
4050

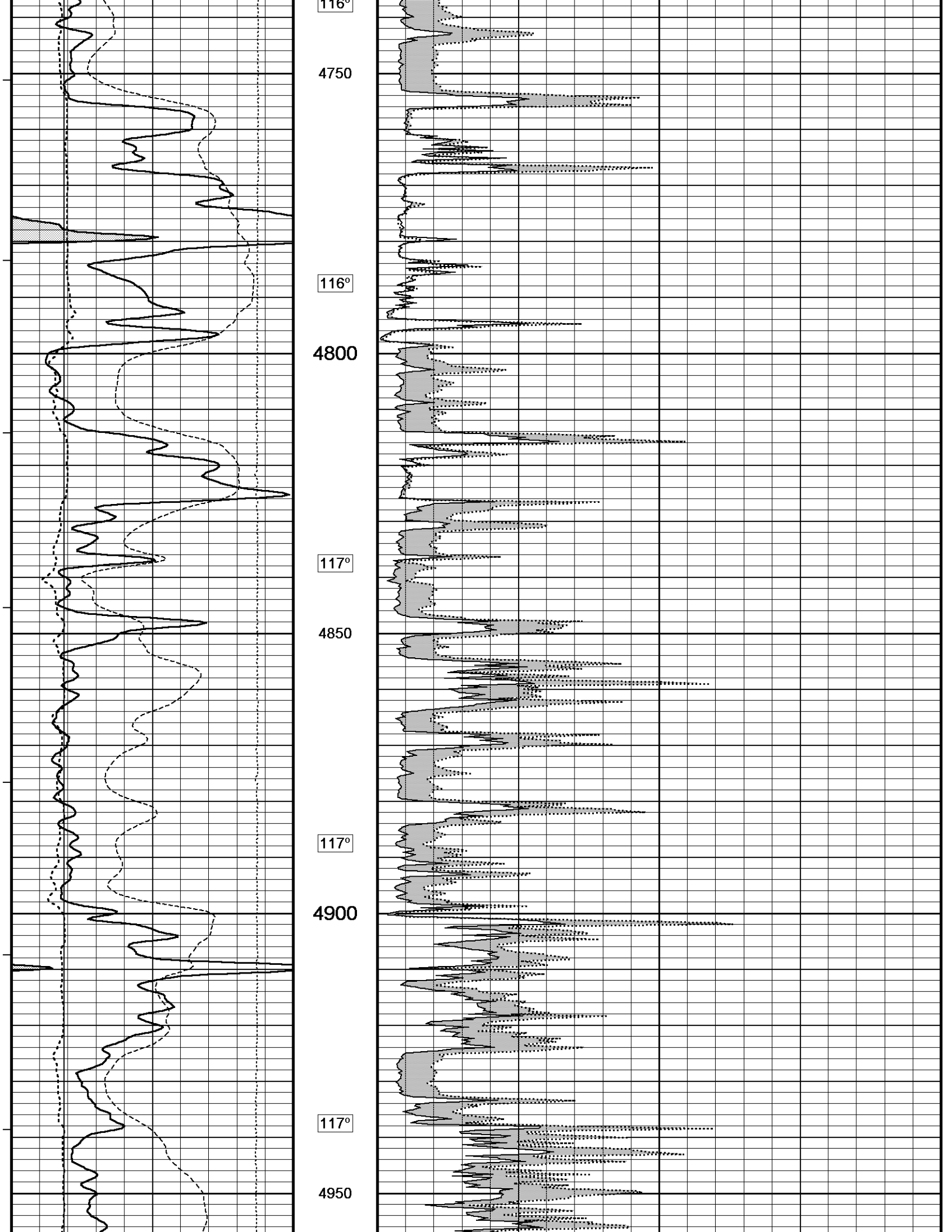
Micro-normal
ohm metres
0 10 20 30 40

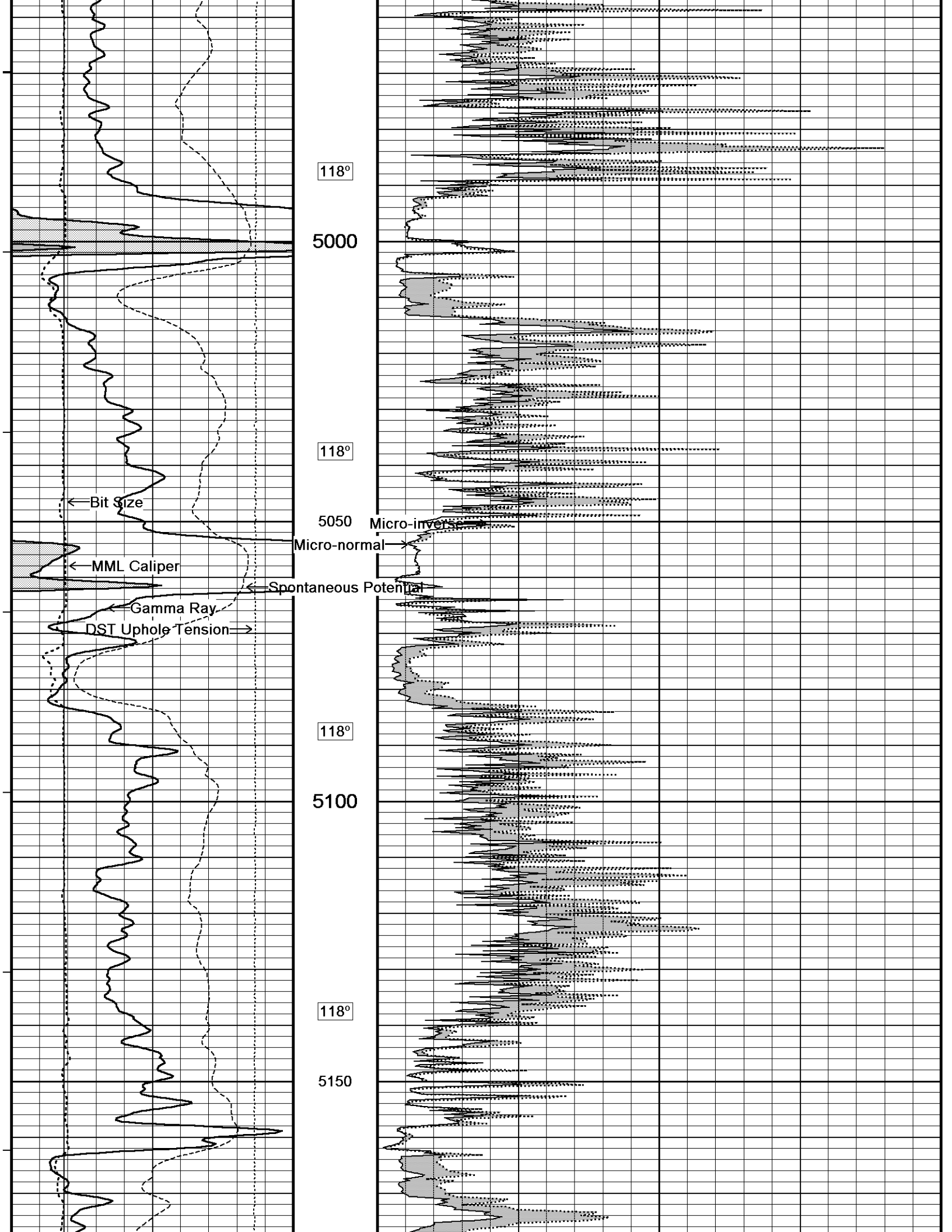
Micro-inverse
ohm metres
0 10 20 30 40

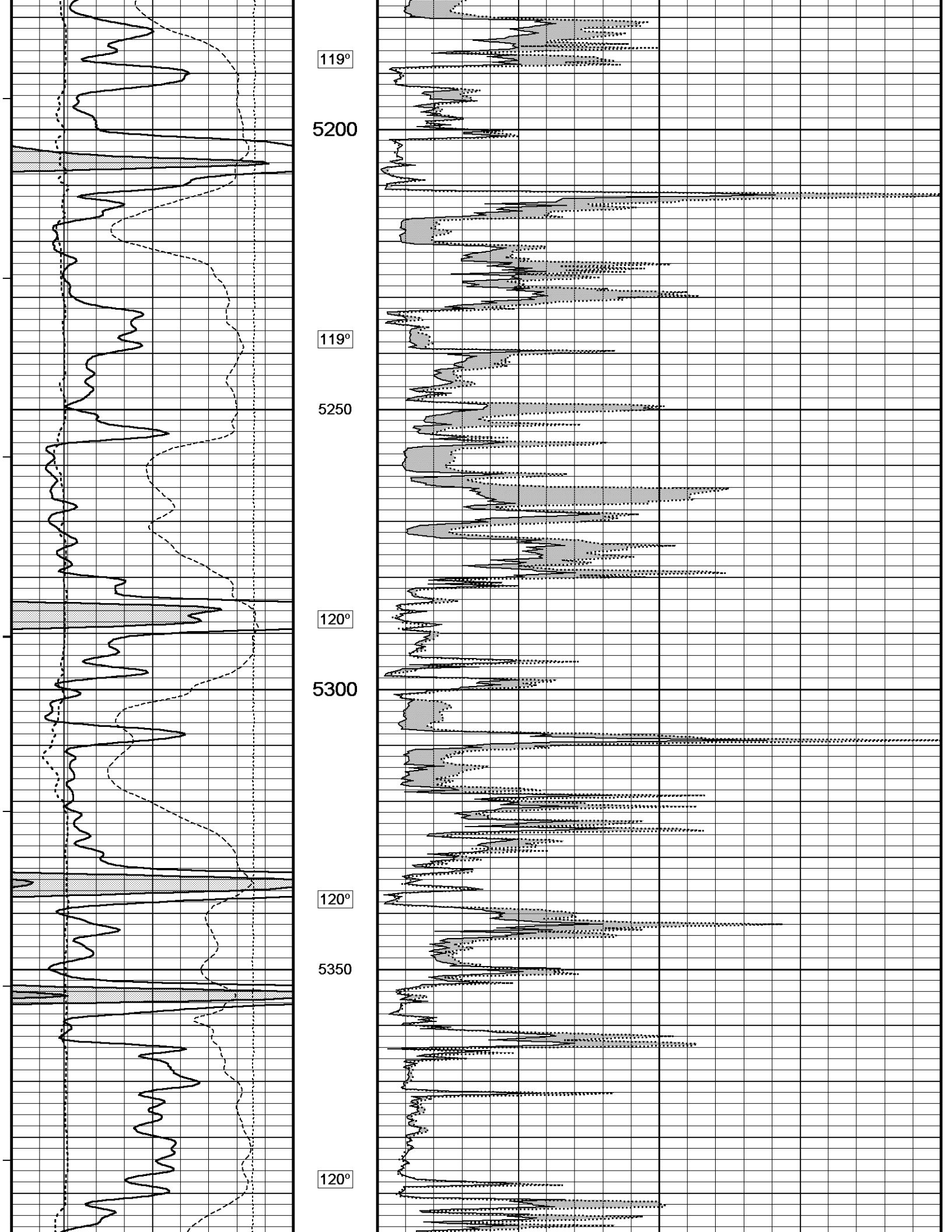

111°
4100
111°
4150
112°
4200
112°
4250
113°
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension

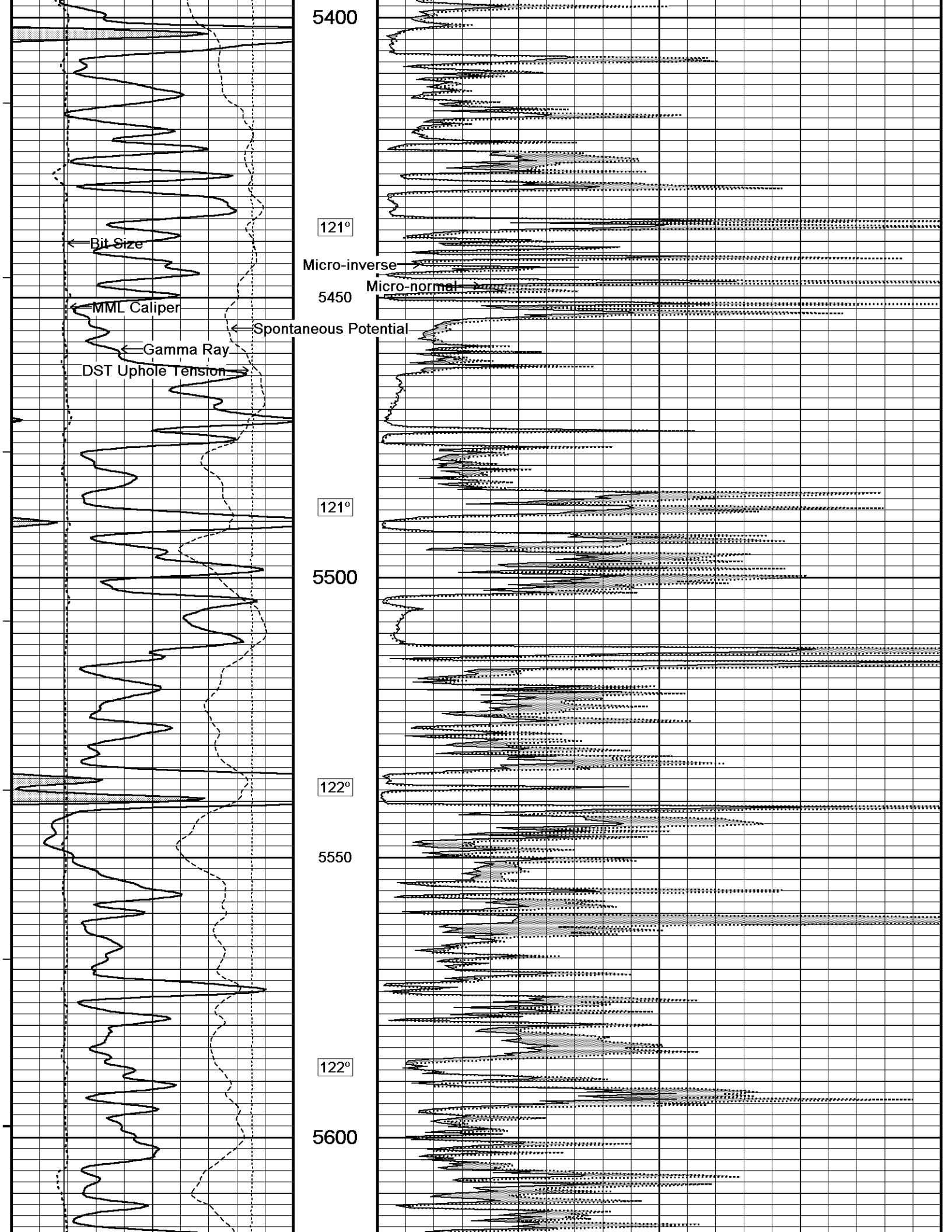

4300
113°
4350
113°
4400
114°
4450
114°
4500

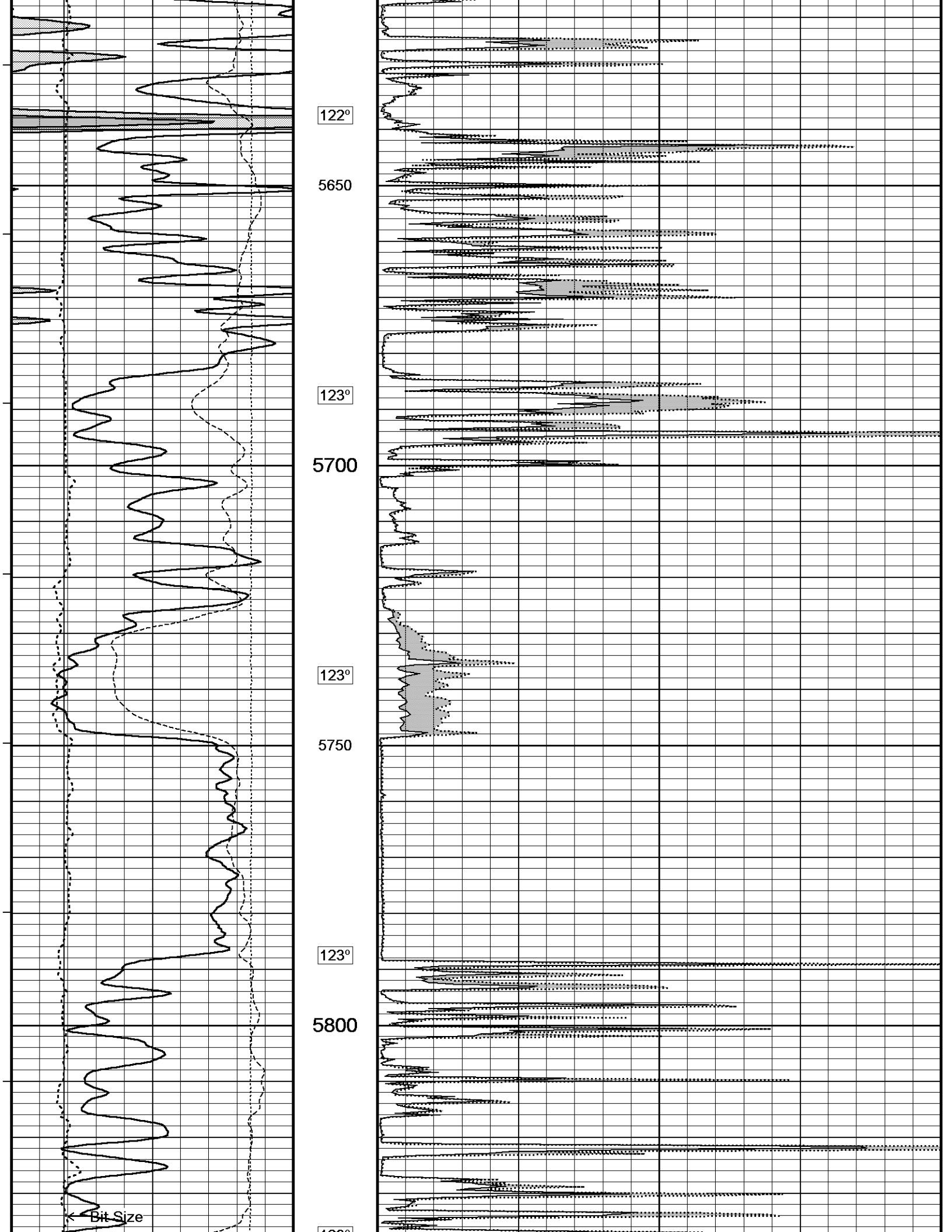

115°
4550
115°
4600
115°
4650
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
116°
4700

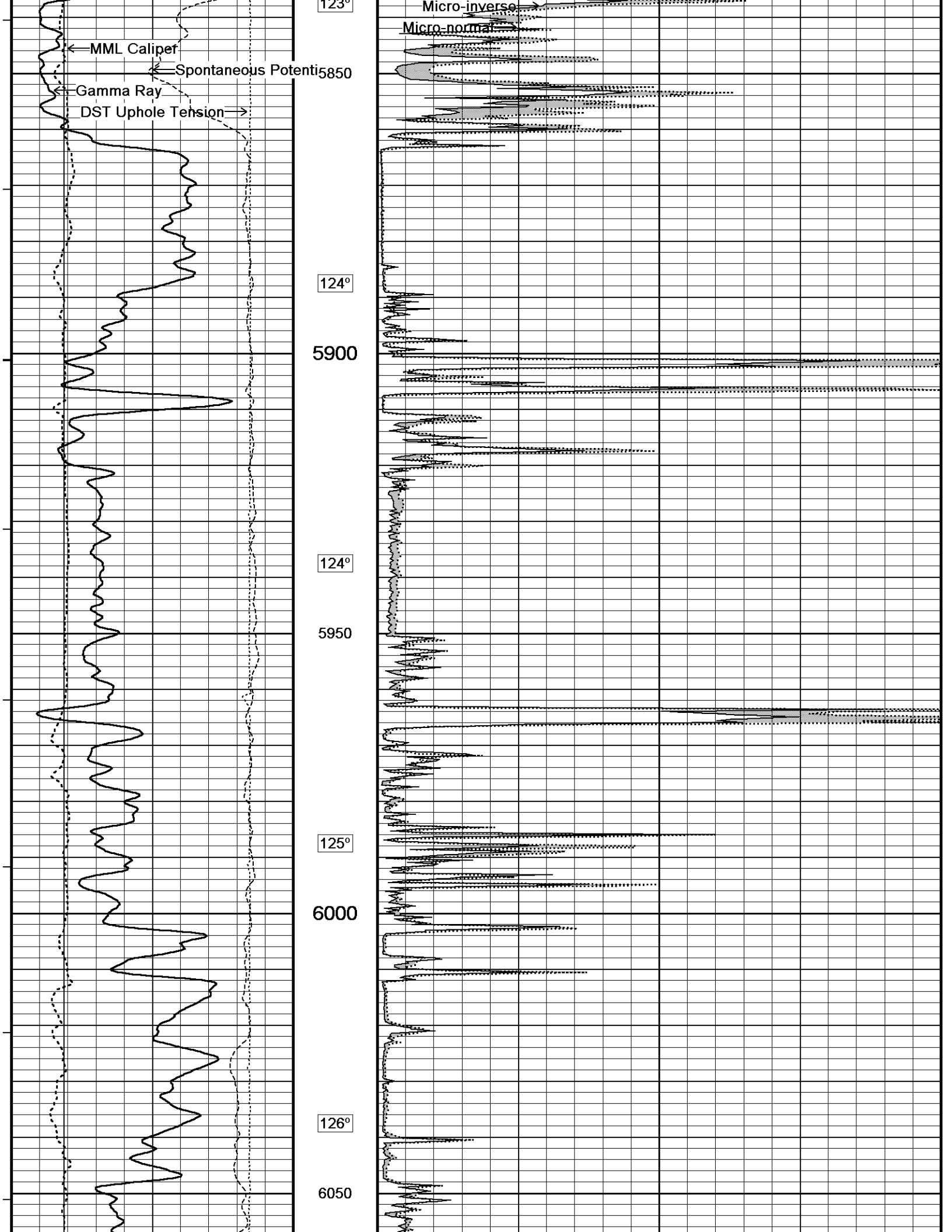

116°
4750
116°
4800
117°
4850
117°
4900
117°
4950

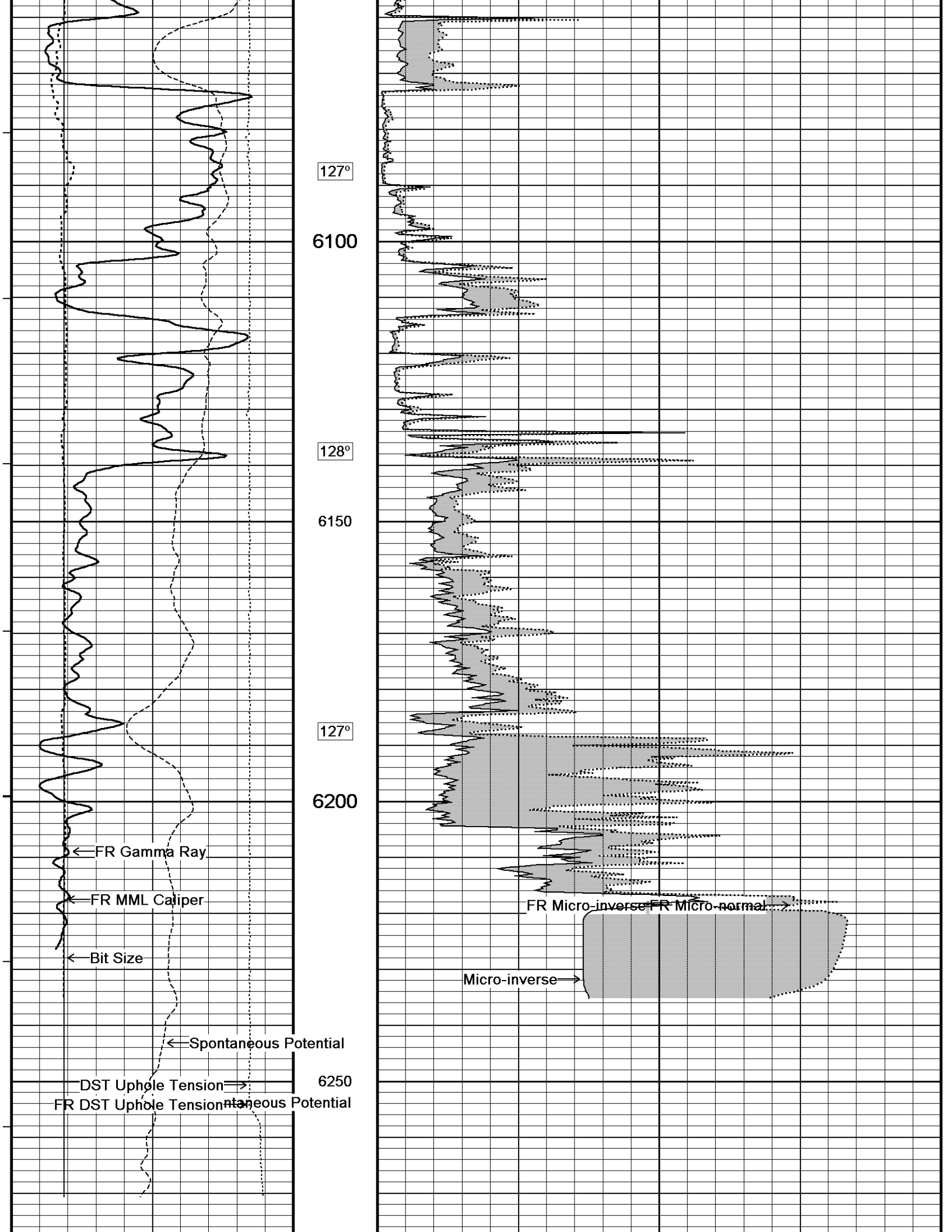

118°
5000
118°
Bit Size
5050
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
118°
5100
118°
5150

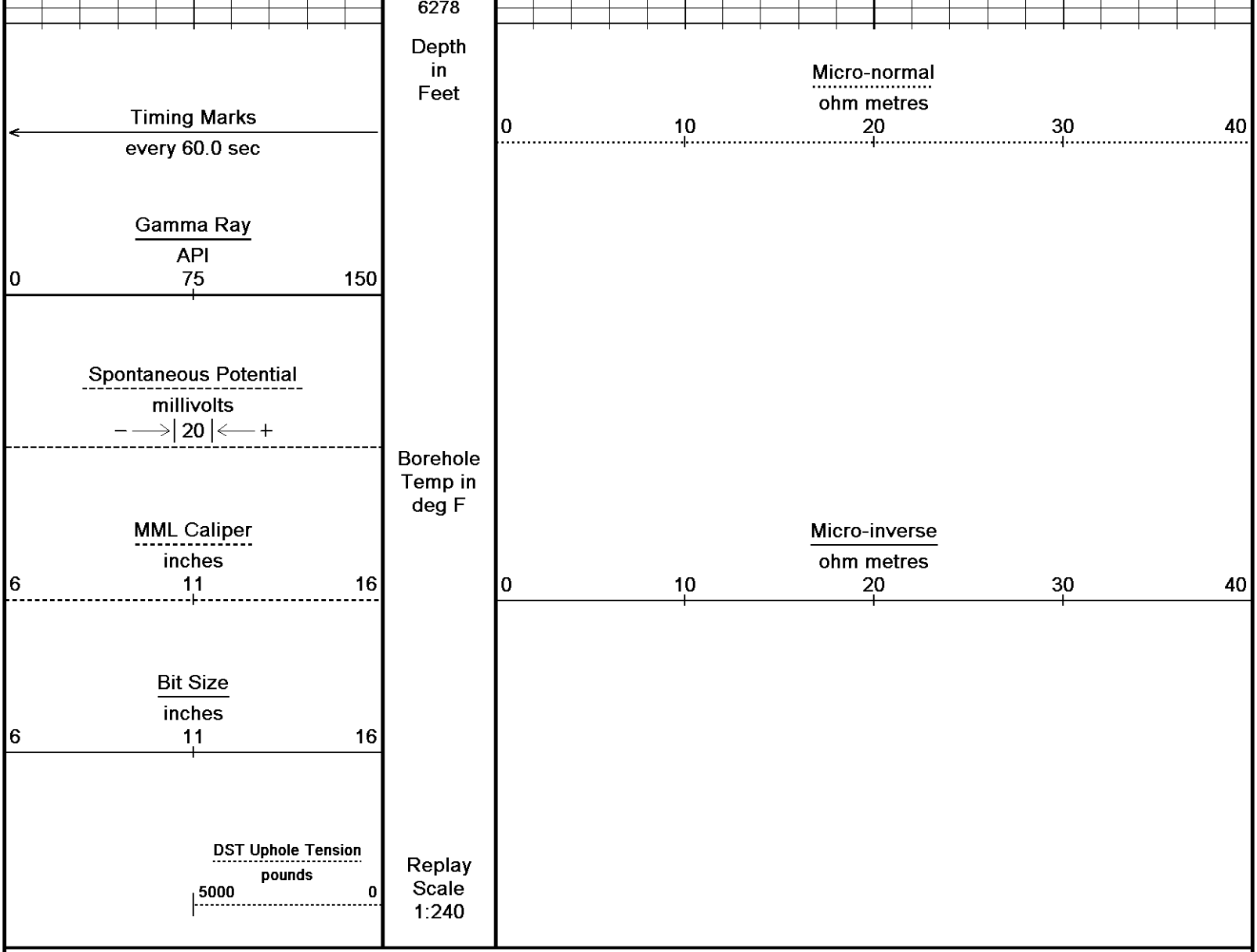

119°
5200
119°
5250
120°
5300
120°
5350
120°


5400
121°
Bit Size
Micro-inverse
Micro-normal
5450
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
121°
5500
122°
5550
122°
5600


122°
5650
123°
5700
123°
5750
123°
5800
← Bit Size


123°
MML Caliper
Spontaneous Potenti
5850
Gamma Ray
DST Uphole Tension
Micro-inverse
Micro-normal
124°
5900
124°
5950
125°
6000
126°
6050


127°
6100
128°
6150
127°
6200
←FR Gamma Ray
←FR MML Caliper
←Bit Size
←Spontaneous Potential
DST Uphole Tension→
FR DST Uphole Tension
ntaneous Potential
6250
FR Micro-inverse
FR Micro-normal→
Micro-inverse→

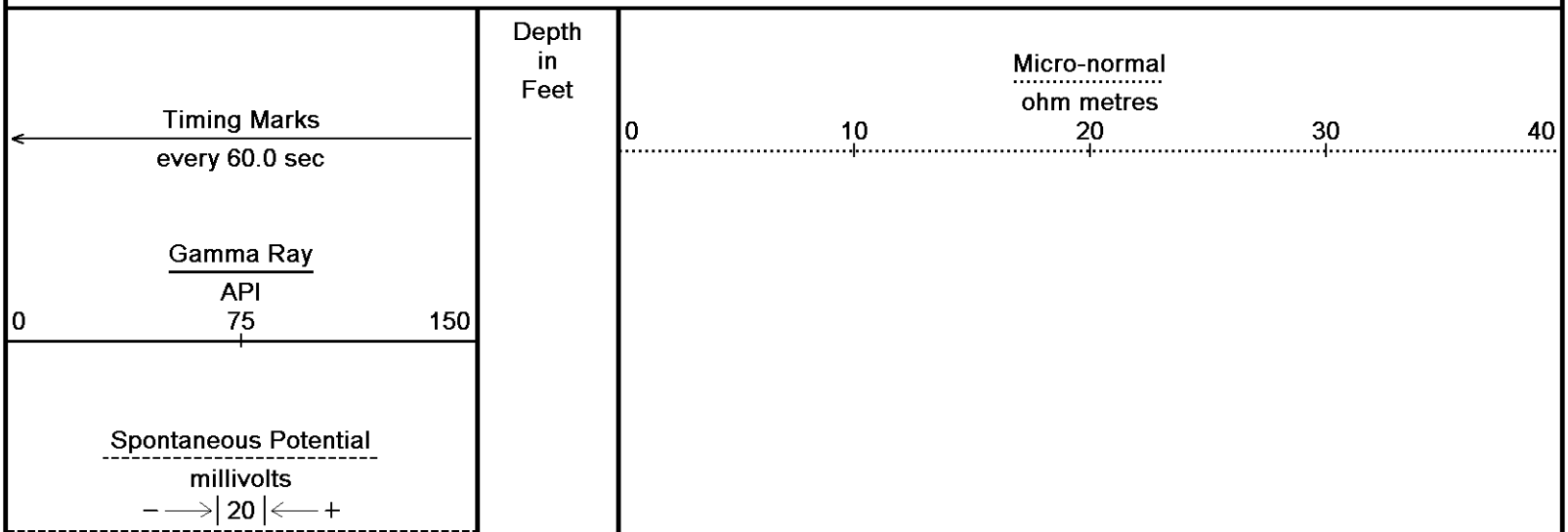


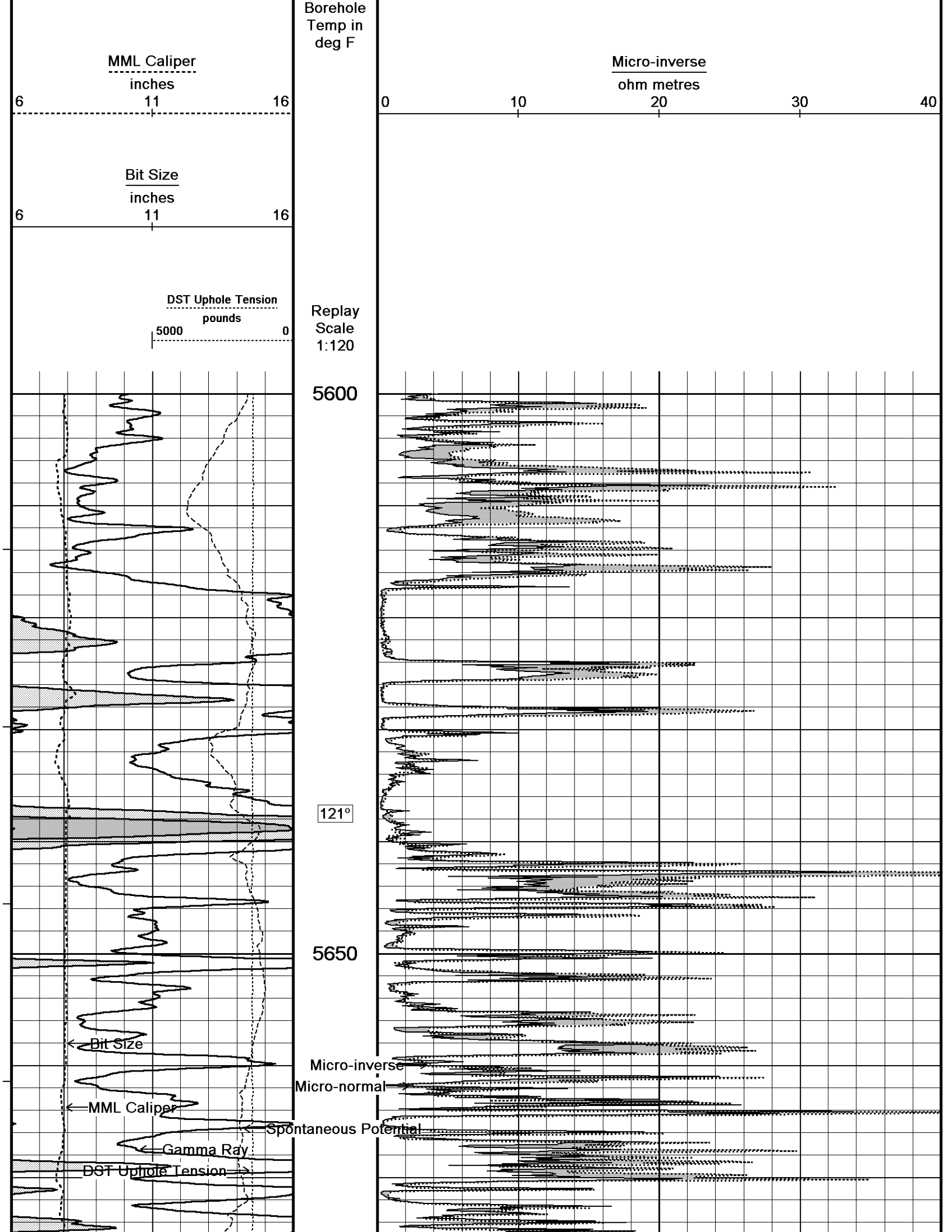
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 02-DEC-2011 13:29
Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_003.dta — Recorded on 04-OCT-2011 03:19
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 12.01.3513

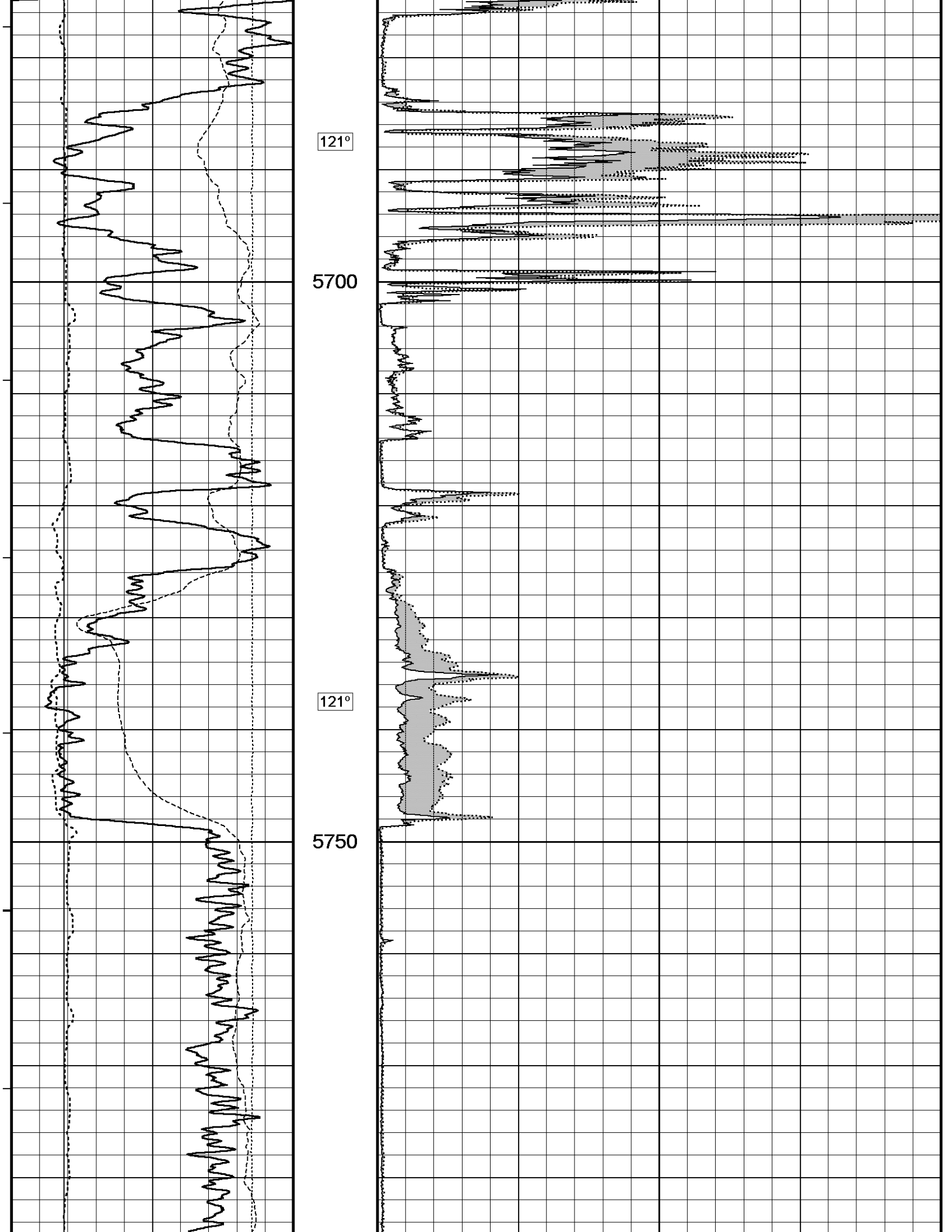
5 INCH MAIN

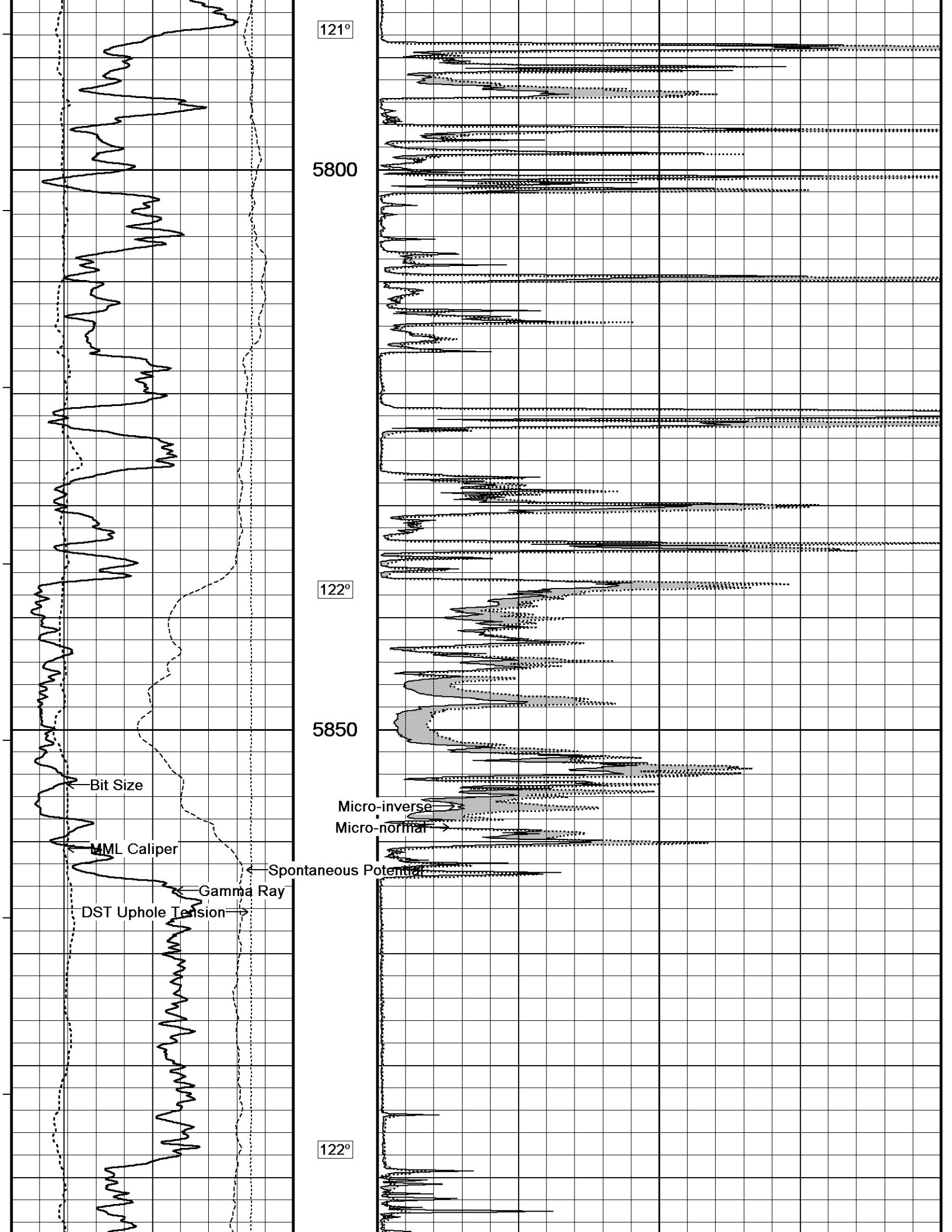
10 INCH HIGH RESOLUTION

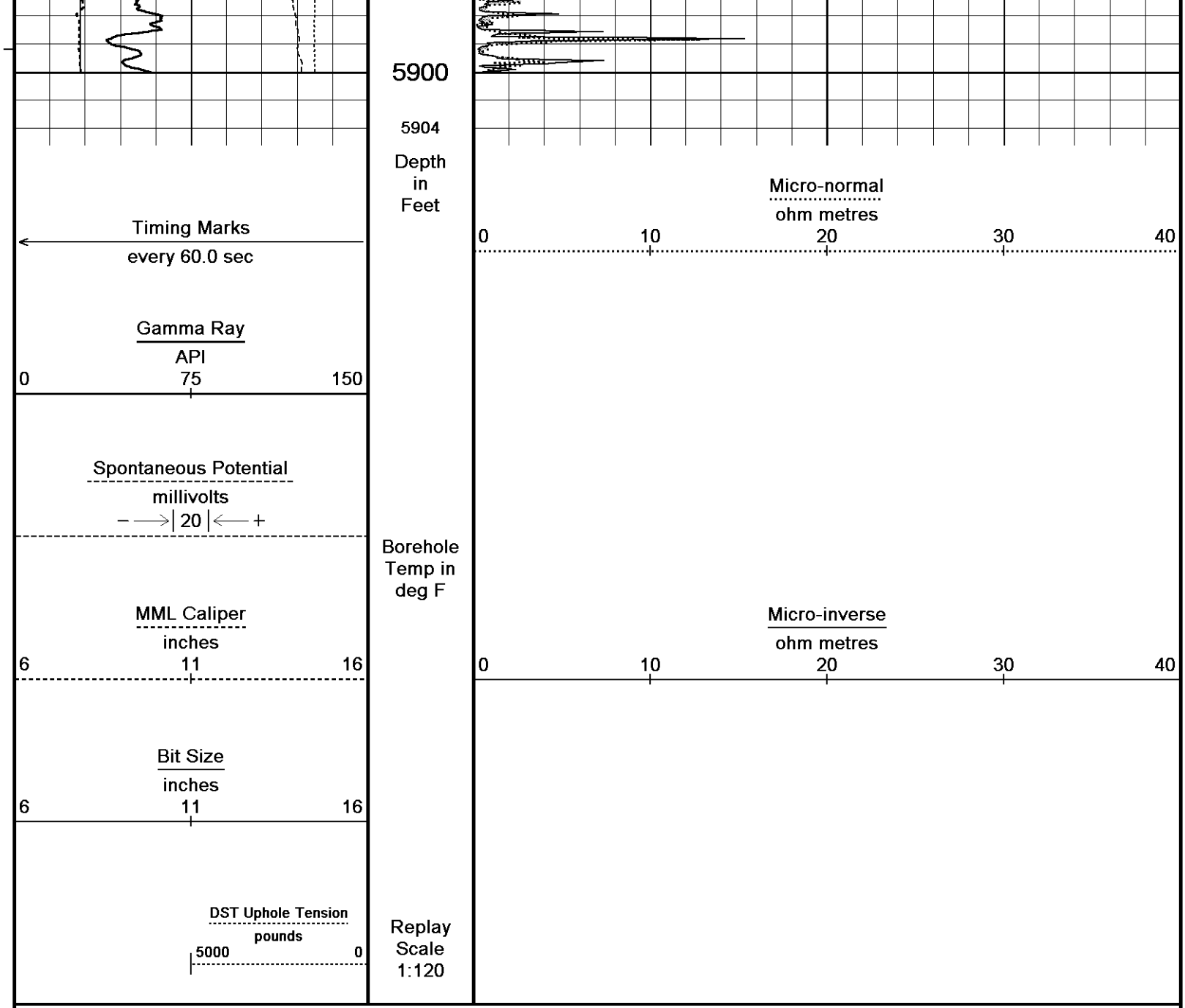
Depth Based Data - Maximum Sampling Increment 2.5cm — Plotted on 02-DEC-2011 13:29
Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_001.dta — Recorded on 04-OCT-2011 02:18
System Versions: Logged with 11.03.4044 Plotted with 12.01.3513




MML Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
Replay Scale 1:120
Micro-inverse
ohm metres
0
10
20
30
40
5600
121°
5650
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension


121°
5700
121°
5750


121°
5800
122°
5850
Bit Size
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Micro-inverse
Micro-normal
122°

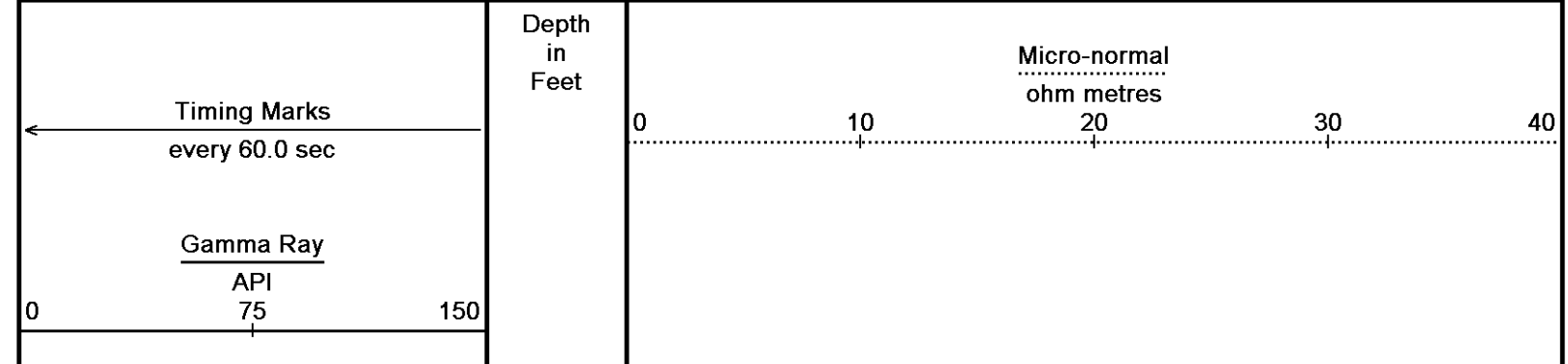


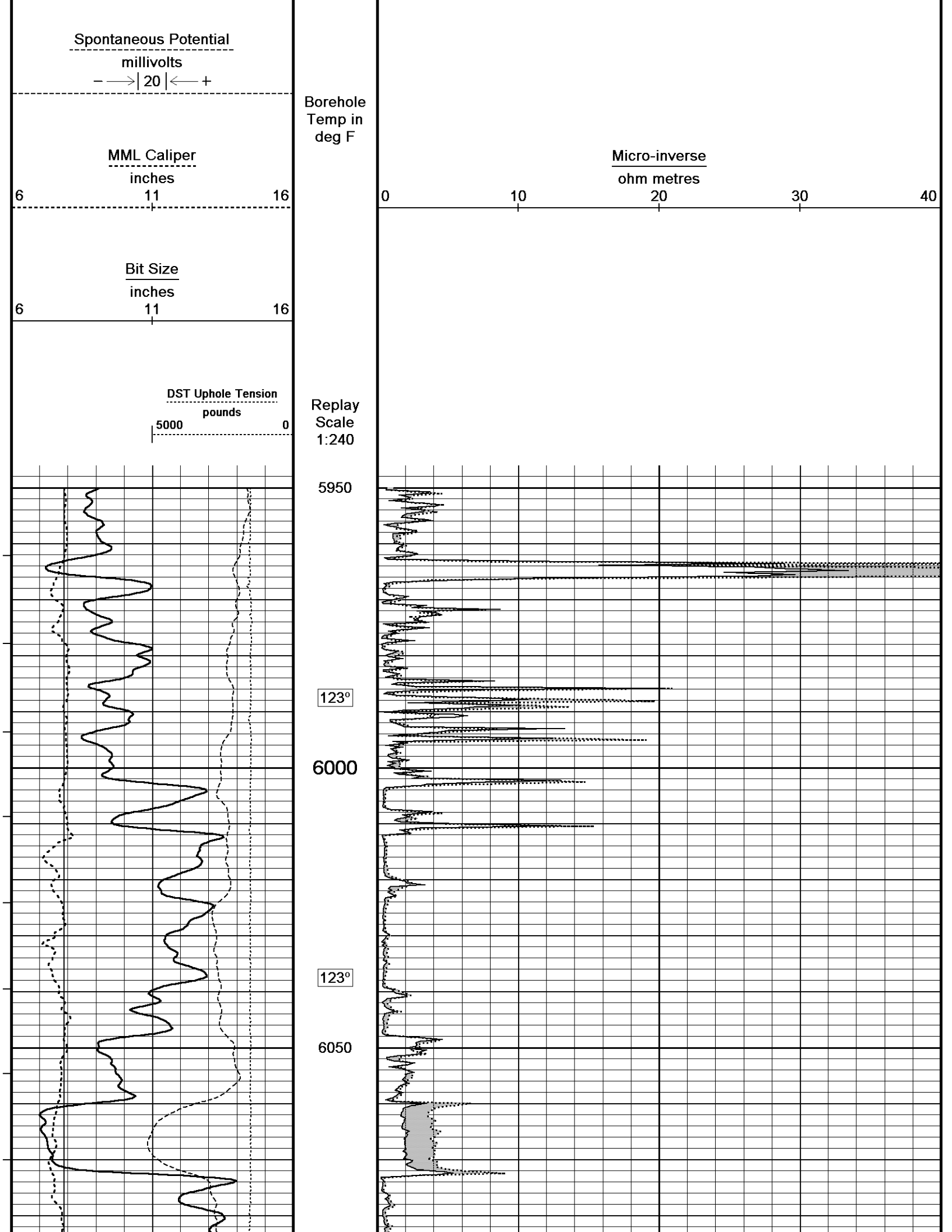
Depth Based Data - Maximum Sampling Increment 2.5cm — Plotted on 02-DEC-2011 13:29
Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_001.dta — Recorded on 04-OCT-2011 02:18
System Versions: Logged with 11.03.4044 Plotted with 12.01.3513

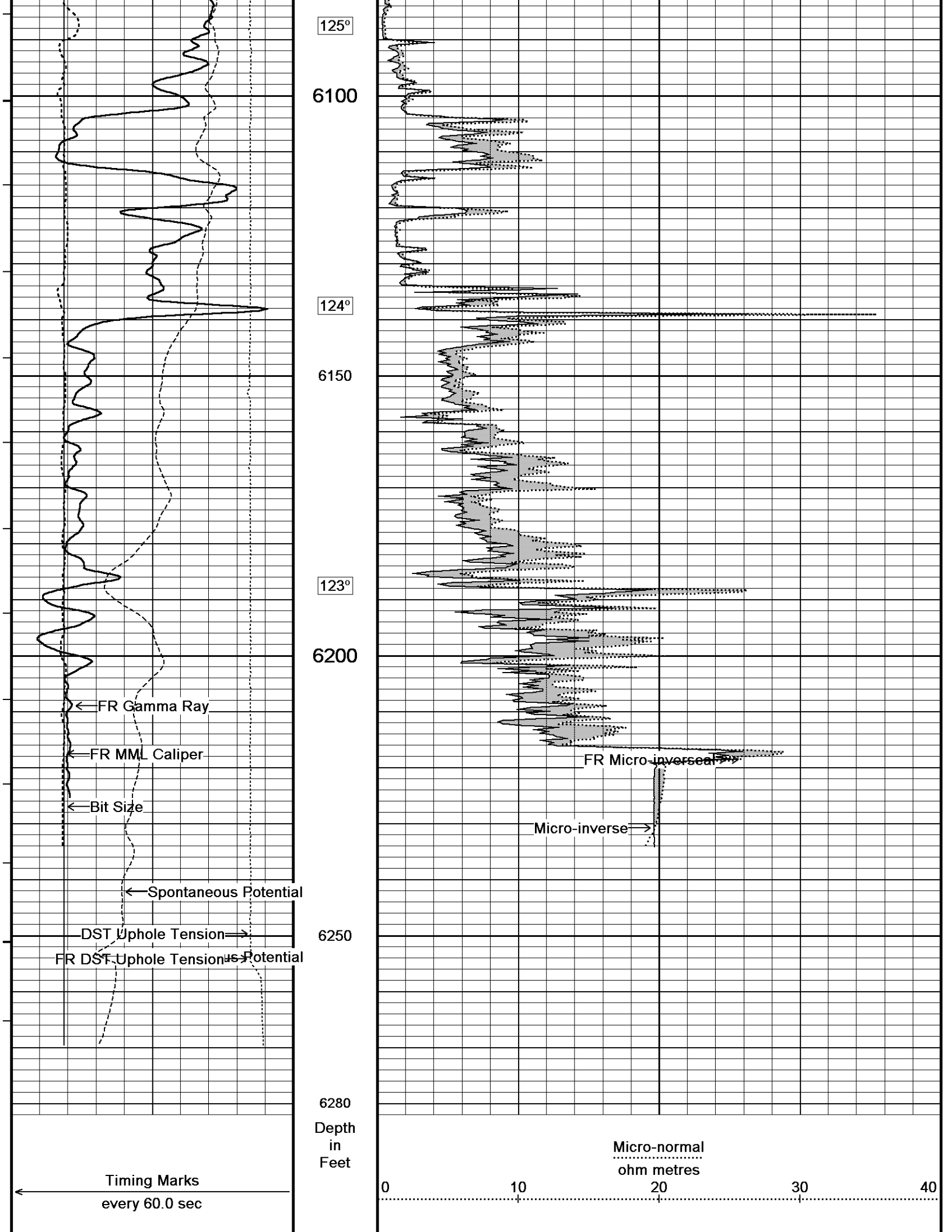
10 INCH HIGH RESOLUTION

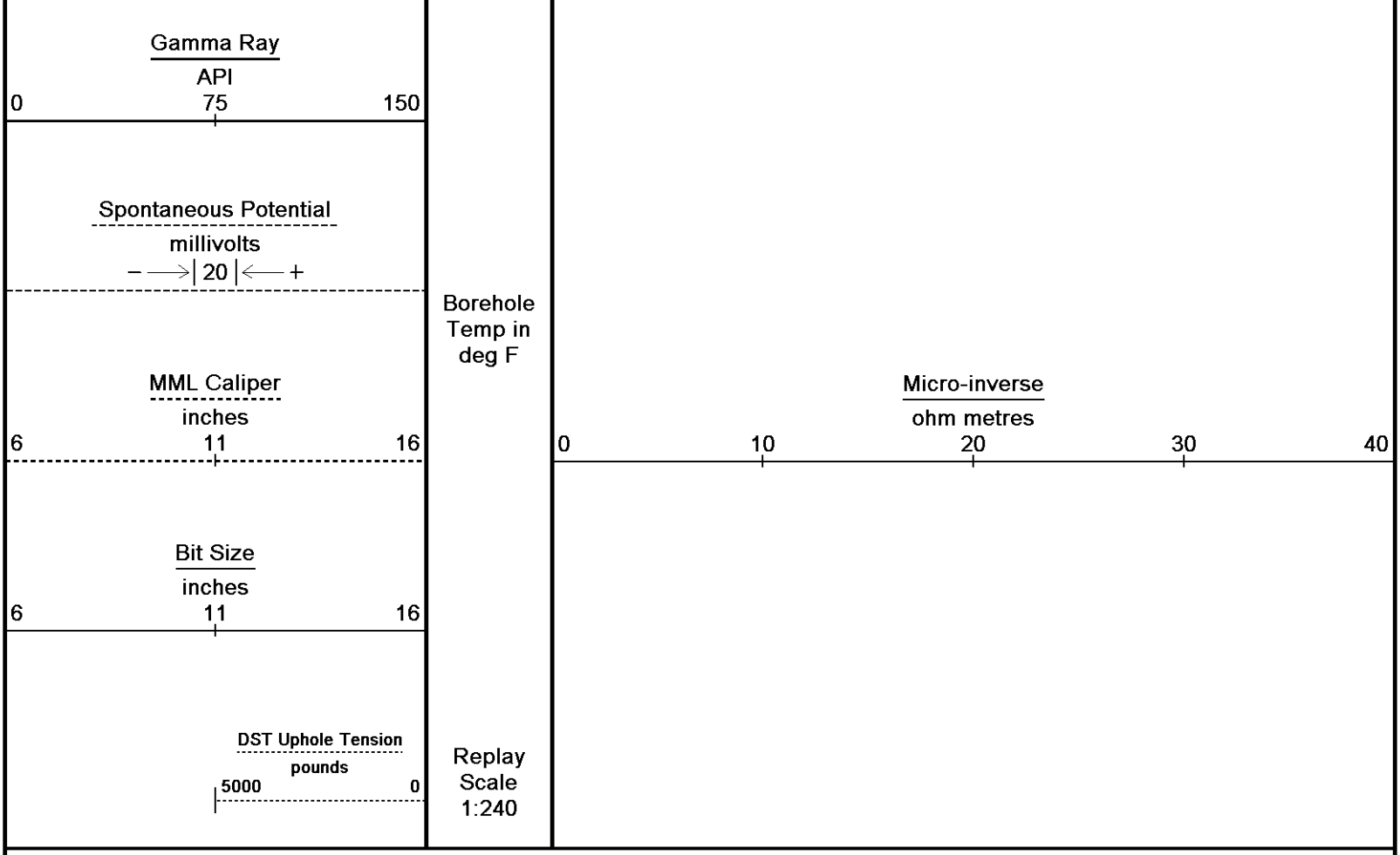
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 02-DEC-2011 13:29
Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_002.dta — Recorded on 04-OCT-2011 02:18
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 12.01.3513




Spontaneous Potential
millivolts
– 20 +
Borehole Temp in deg F
MML Caliper
inches
6
11
16
Micro-inverse
ohm metres
0
10
20
30
40
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Replay Scale 1:240
5950
123°
6000
123°
6050


125°
6100
124°
6150
123°
6200
6250
6280
FR Gamma Ray
FR MML Caliper
Bit Size
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
us Potential
FR Micro-inverseal
Micro-inverse
Depth
in
Feet
Timing Marks
every 60.0 sec
Micro-normal
ohm metres
0
10
20
30
40



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 02-DEC-2011 13:29

Filename: C:\Users\Joe\AppData\Local\Temp\Weatherford ...\O'Brien Meade Lake Offset 2-13_002.dta — Recorded on 04-OCT-2011 02:18

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

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Users\Joe\AppData\Local\Temp\Weatherford PreView\0\O'Brien Meade Lake Offset 2-13.dta

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

General Constants All 000

Last Edited on 04-OCT-2011 01:11

General Parameters		
Mud Resistivity	0.990	ohm-metres
Mud Resistivity Temperature	90.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

Down-hole Tension Calibration SMS 0

Field Calibration on 13-CFR-2011 05:00

Field Calibration on 10-SEP-2011 05:32

Reading No	Measured	Calibrated (lbs)
1	-2243.52	0.00
2	-2203.03	480.60

High Resolution Temperature Calibration MCG-C 139

Field Calibration on 02-AUG-2011 18:13

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

High Resolution Temperature Constants MCG-C 139

Last Edited on

Pre-filter Length	11

SP Calibration MCG-C 139

Field Calibration on 29-AUG-2011 10:25

	Measured	Calibrated (mV)
Reference 1	103.7	100.0
Reference 2	-96.7	-100.0

Gamma Calibration MCG-C 139

Field Calibration on 03-OCT-2011 14:43

	Measured	Calibrated (API)
Background	71	49
Calibrator (Gross)	1136	774
Calibrator (Net)	1065	725

Gamma Constants MCG-C 139

Last Edited on 04-OCT-2011 01:11

Gamma Calibrator Number	grc38	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 06-SEP-2011 15:54
Field Check on 03-OCT-2011 14:23

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	2.6	12.8
Micro Inverse	15.6	78.3	1.7	8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.1	32.1
Micro Inverse	16.3	16.3

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 03-OCT-2011 14:22

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches

Caliper Calibration MML-A 16

Base Calibration on 06-SEP-2011 15:42
Field Calibration on 03-OCT-2011 14:31

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14123	5.98
2	17493	7.97
3	20788	9.86
4	24810	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.99	5.98

Neutron Calibration MDN-A.B 66

Base Calibration on 13-SEP-2011 12:51
Field Check on 03-OCT-2011 14:49

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far

	Near	Far	Near	Far
	3143	99	3714	110
Ratio	31.704		33.764	

Field Calibrator at Base	Calibrated (cps)	
	1637	2327
Ratio	0.703	

Field Check	Calibrated (cps)	
	1624	2323
Ratio	0.699	

Neutron Constants MDN-A.B 66

Last Edited on 04-OCT-2011 01:12

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	Constant Value	
Temperature	68.00	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-A.A 52

Base Calibration on 06-SEP-2011 15:24
Field Check on 03-OCT-2011 14:22

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.4	126.8
Base Check		279.9
Field Check		279.8

FE Constants MFE-A.A 52

Last Edited on 04-OCT-2011 01:12

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

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 02-AUG-2011 18:25

	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

Pre-filter Length	11

Induction Calibration MAI-A.A 167

Base Calibration on 11-MAR-2011 09:58
Field Check on 03-OCT-2011 14:21

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) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High	
1	0.0	0.0	13.5	3837.9	
2	0.0	0.0	29.6	3475.0	
3	0.0	0.0	29.1	3051.1	
4	0.0	0.0	19.7	2080.2	
Deep	0.0	0.0	18.5	2047.5	
Medium	0.0	0.0	42.2	3988.7	
Shallow	0.0	0.0	43.1	5051.7	
Array Temperature		0.0		81.6	Deg F

Induction Constants MAI-A.A 167

Last Edited on 04-OCT-2011 01:13

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 35

Base Calibration on 06-SEP-2011 17:16
Field Calibration on 03-OCT-2011 14:25

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	19648	3.99
2	29970	5.98
3	40402	7.97
4	49920	9.86
5	60645	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.86	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 06-SEP-2011 17:37
Field Check on 03-OCT-2011 14:30

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	56515	26877	59556	30836
Reference 2	23047	2560	24941	2541
Field Check at Base	1159.0	1382.3		
Field Check	1159.9	1377.1		

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	208	1024		
Reference 1	21161	56315	0.379	0.371
Reference 2	6144	22898	0.271	0.272
Field Check at Base	208.4	1023.8		
Field Check	208.5	1024.0		

Density Constants MPD-B 35

Last Edited on 04-OCT-2011 01:12

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	1.09	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

DOWNHOLE EQUIPMENT

C:\Users\Joe\AppData\Local\Temp\Weatherford PreView\0\O'Brien Meade Lake Offset 2-13.dta

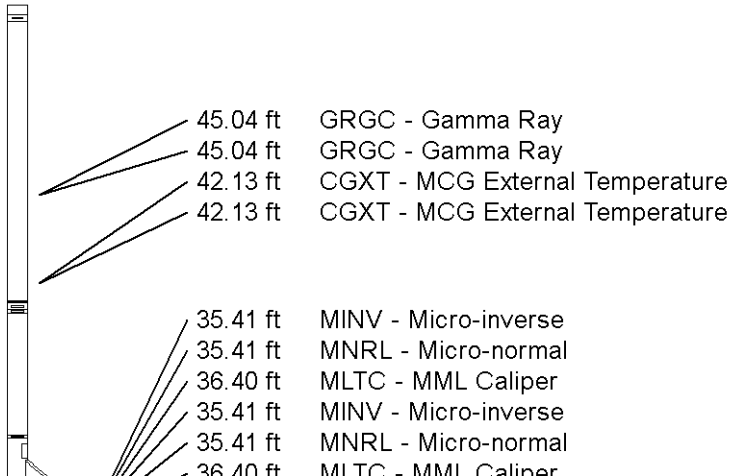
Compact Comms Gamma
MCG-C 139 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 139 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 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 52 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

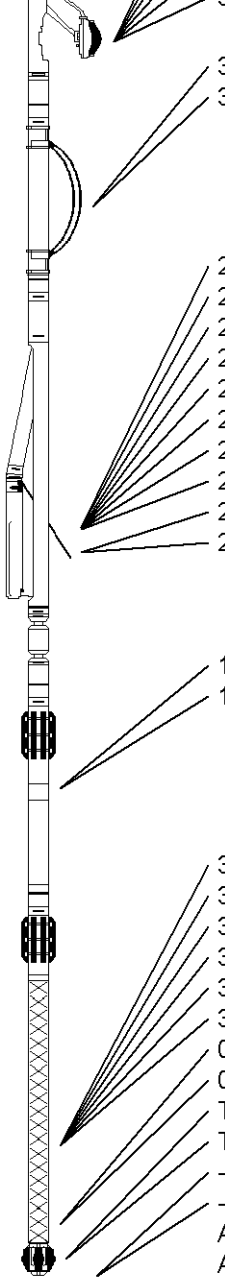
Compact Focussed Electric
MFE-A.A 52 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

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: 50.32 ft Weight: 407.9 lb

Total Length: 50.32 ft Weight: 407.9 lb



30.61 ft	NPRL - Limestone Neutron Por.
30.61 ft	NPRL - Limestone Neutron Por.
23.37 ft	CLDC - Density Caliper
23.37 ft	CLDC - Density Caliper
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.44 ft	DCOR - Density Correction
21.44 ft	DCOR - Density Correction
21.44 ft	DPRL - Limestone Density Por.
21.44 ft	DEN - Compensated Density
21.38 ft	PDPE - PE
21.38 ft	PDPE - PE
13.72 ft	FEFE - Shallow FE
13.72 ft	FEFE - Shallow FE
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	RTAO - Array Ind. One Res Rt
0.23 ft	SPCG - Spontaneous Potential
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

All measurements relative to tool zero.

COMPANY	O'BRIEN ENERGY RESOURCES CORP.
WELL	MEADE LAKE OFFSET #2-13
FIELD	WILDCAT
PROVINCE/COUNTY	MEADE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2516.00	feet	First Reading	6218.00	feet
Elevation Drill Floor	2514.00	feet	Depth Driller	6250.00	feet
Elevation Ground Level	2505.00	feet	Depth Logger	6254.00	feet

Weatherford®

MICRORESISTIVITY LOG

40 Years of Wireline 1970 2010