MICRO-RESISTIVITY LOG

COMPANY	SHAKESPEARE
WELL	OTTLEY #6-15
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A./KANSAS
LOCATION	1335' FNL & 1585' FEL

COMPACT

SEC	TWP	RGE
15	4S	32W

API Number 15-109-20933
Permit Number

Other Services
MPD/MDN
MAI/MFE

Permanent Datum G.L., Elevation 2729 feet
Log Measured From K.B. @ 10 FEET above Permanent Datum
Drilling Measured From K.B.

Elevations:	feet
KB	2739.00
DF	2738.00
GL	2729.00

Date	10-AUG-2010			
Run Number	ONE			
Depth Driller	4490.00	feet		
Depth Logger	4488.00	feet		
First Reading	4453.00	feet		
Last Reading	3500.00	feet		
Casing Driller	222.00	feet		
Casing Logger	222.00	feet		
Bit Size	7.880	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.30 lb/USg	49.00 CP		
PH / Fluid Loss	11.00	7.20 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.71 @ 88.0	ohm-m		
Rmf @ Measured Temp	0.57 @ 88.0	ohm-m		
Rmc @ Measured Temp	0.85 @ 88.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.53 @117.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	117.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13057	LIB		
Recorded By	SHAWN NUTT			
Witnessed By	STEVE DAVIS			
S.O.#/JOB#	3524515		LB10-199	

BOREHOLE RECORD

Last Edited: 10-AUG-2010 03:08

Bit Size inches	Depth From feet	Depth To feet
7.880	200.00	4488.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	200.00	24.00

REMARKS

Tools Used: MAI, MPD, MCG, MDN, MML, MFE, SKJ,
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
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.
Annular volume with 5.5 inch production casing= 296 cu. ft.
Service order #3518969
Rig: HD #2
Engineer: L. Scott
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.

5 Inch Main

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 10-AUG-2010 08:13

Filename: C:\DOCUME~1\Alex\LOCALS~1\Temp\Weatherfo...\OTTLEY #6-15_002 spooled section.dta — Recorded on 10-AUG-2010 03:54

System Versions: Logged with 10.08.1568 Plotted with 8.01.0091

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− 20 +

MML Caliper
inches
4 9 14

Bit Size
inches
4 9 14

DST Uphole Tension
pounds
5000 0
0 -5000

Depth in Feet

Borehole Temp in deg F

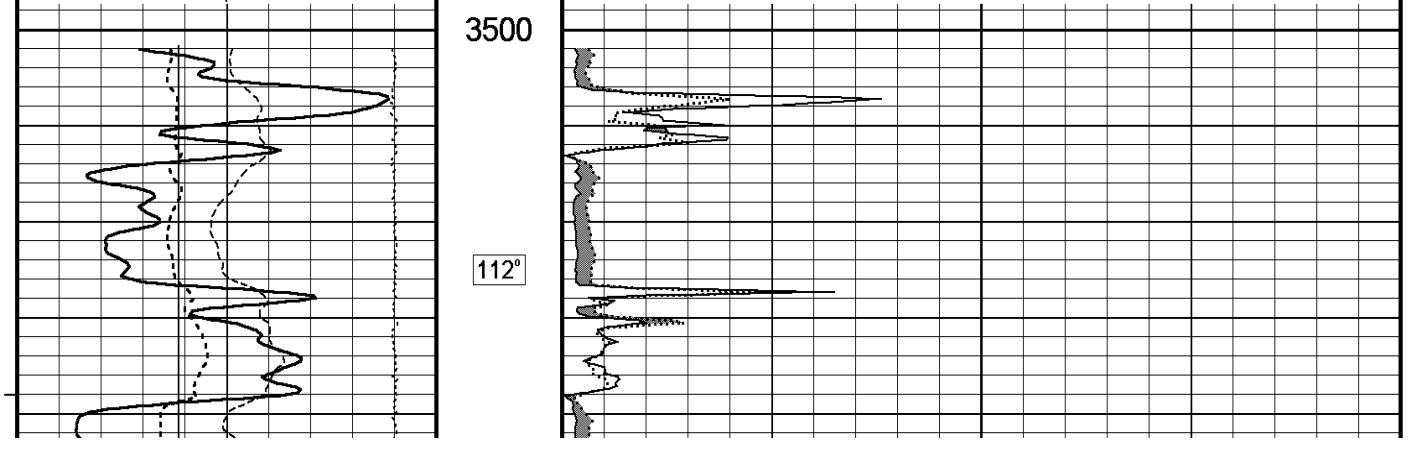
Replay Scale 1:240

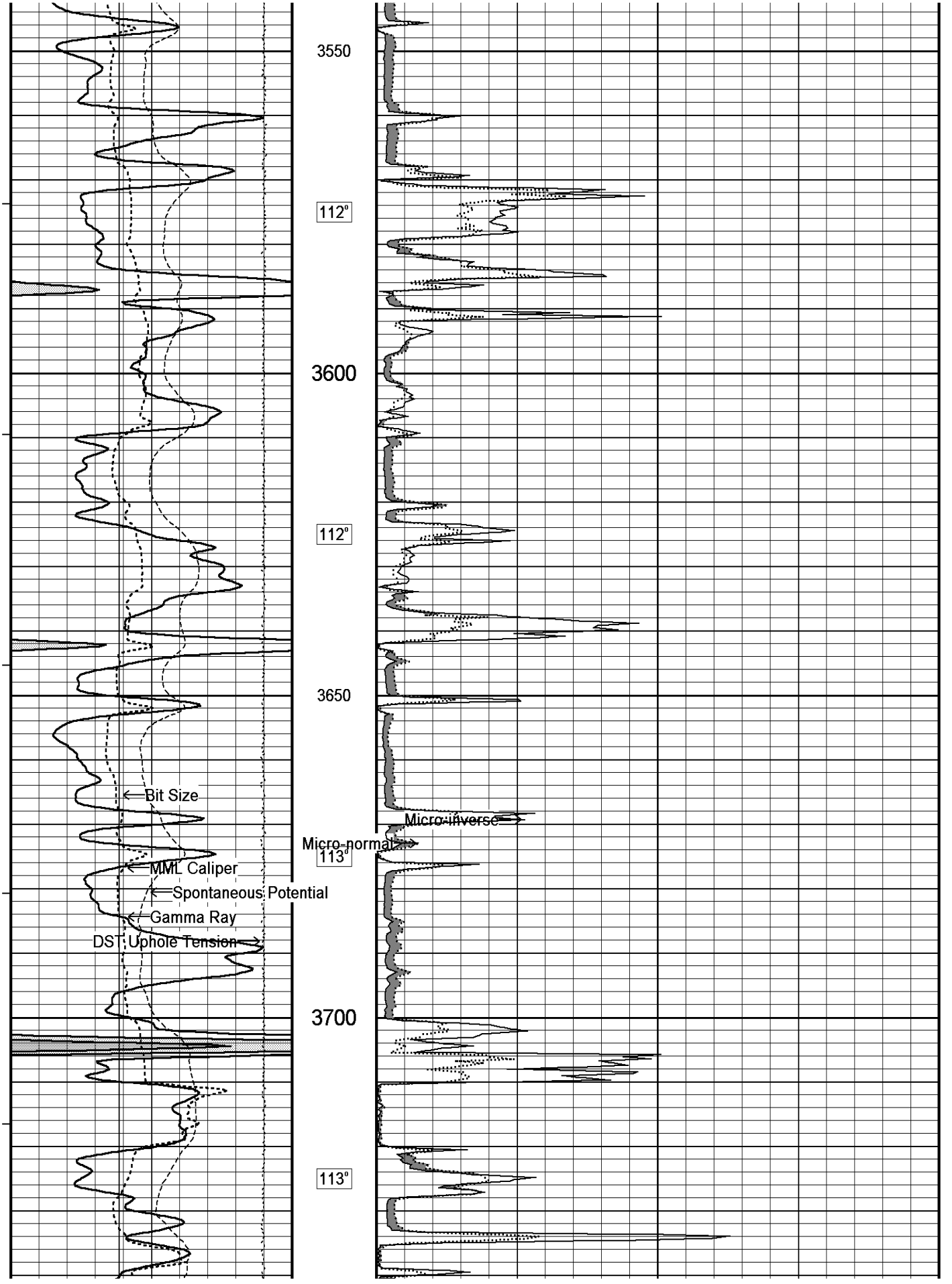
3500

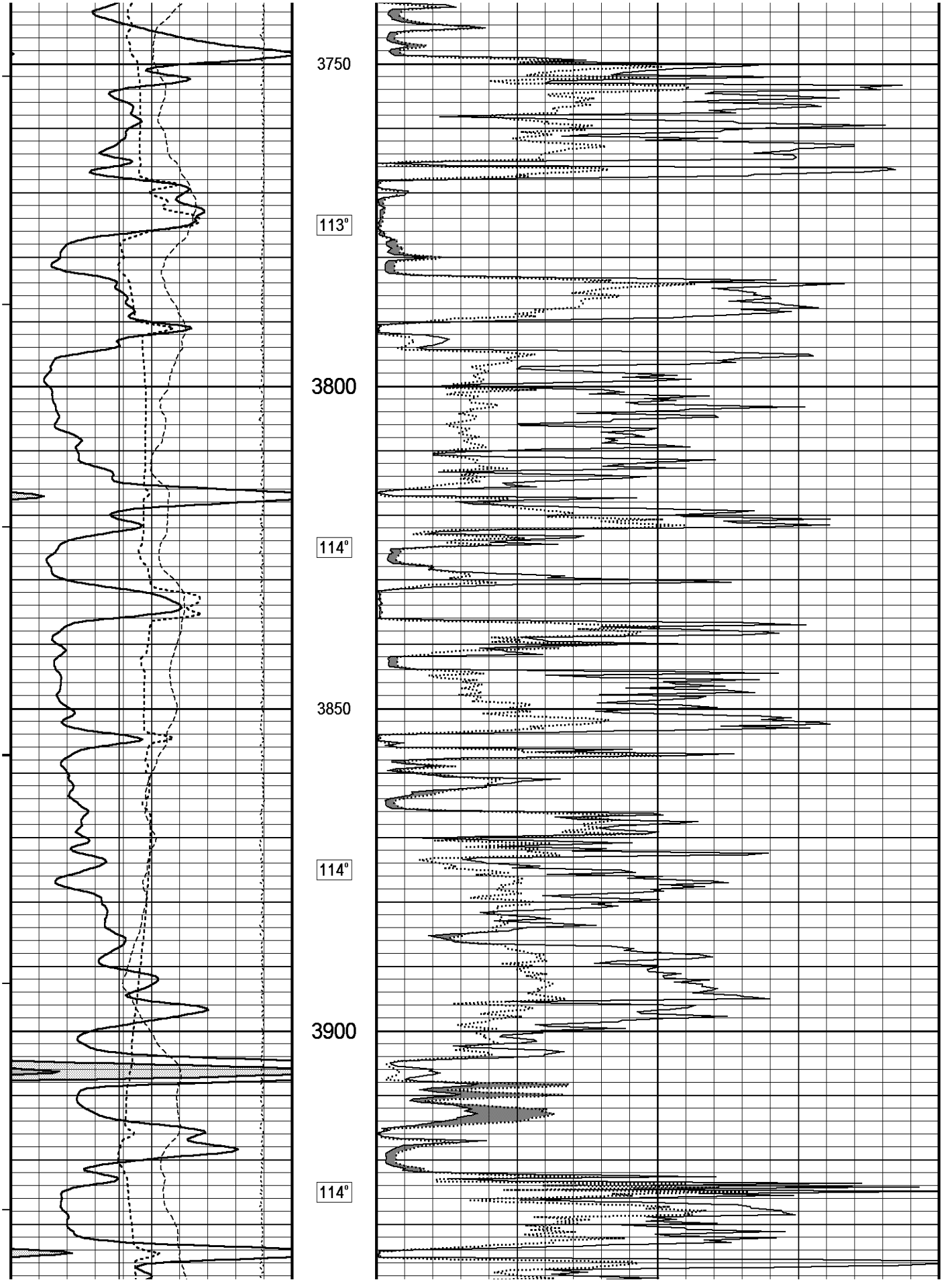
112°

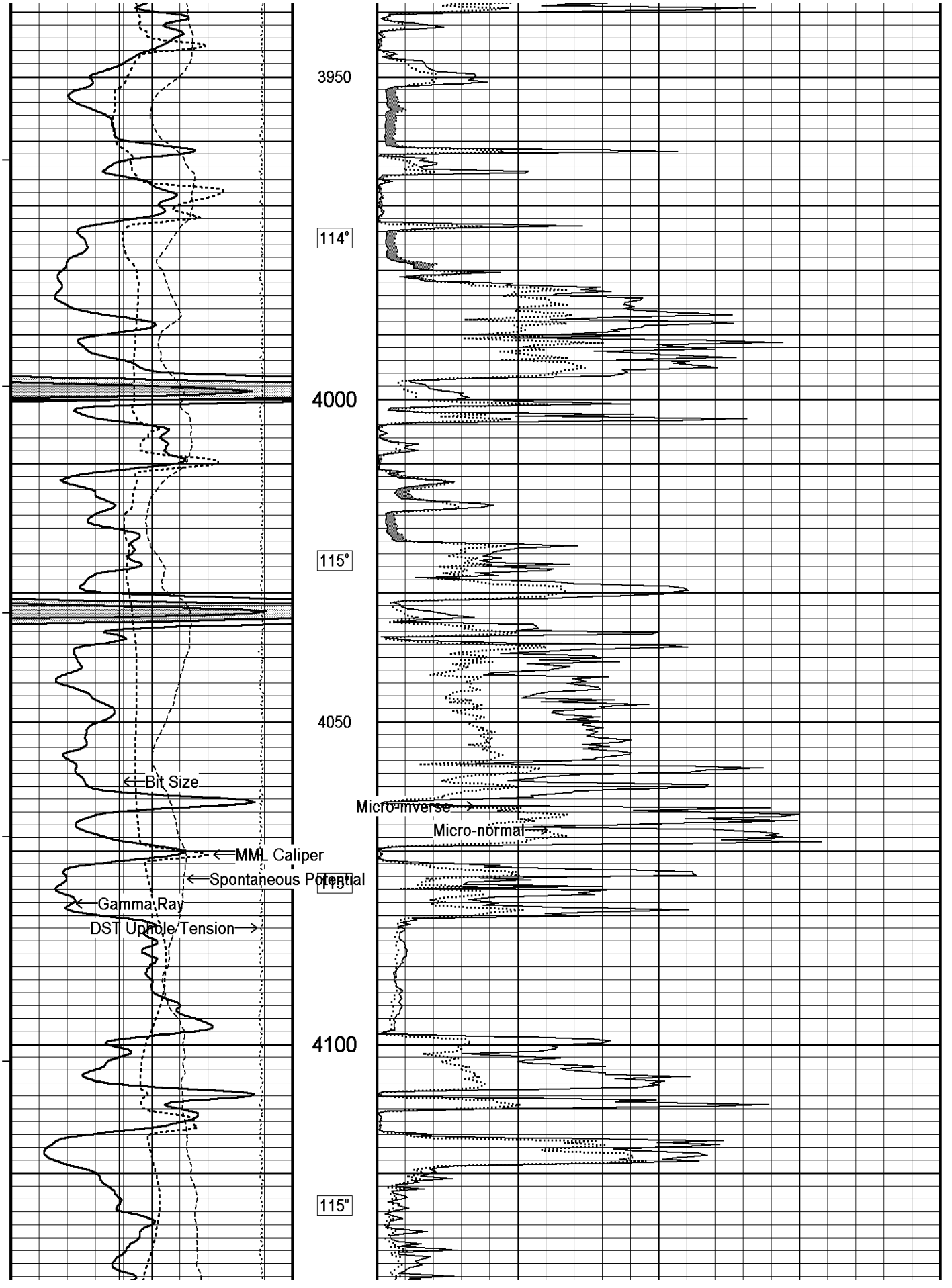
Micro-normal
ohm metres
0 10 20 30 40

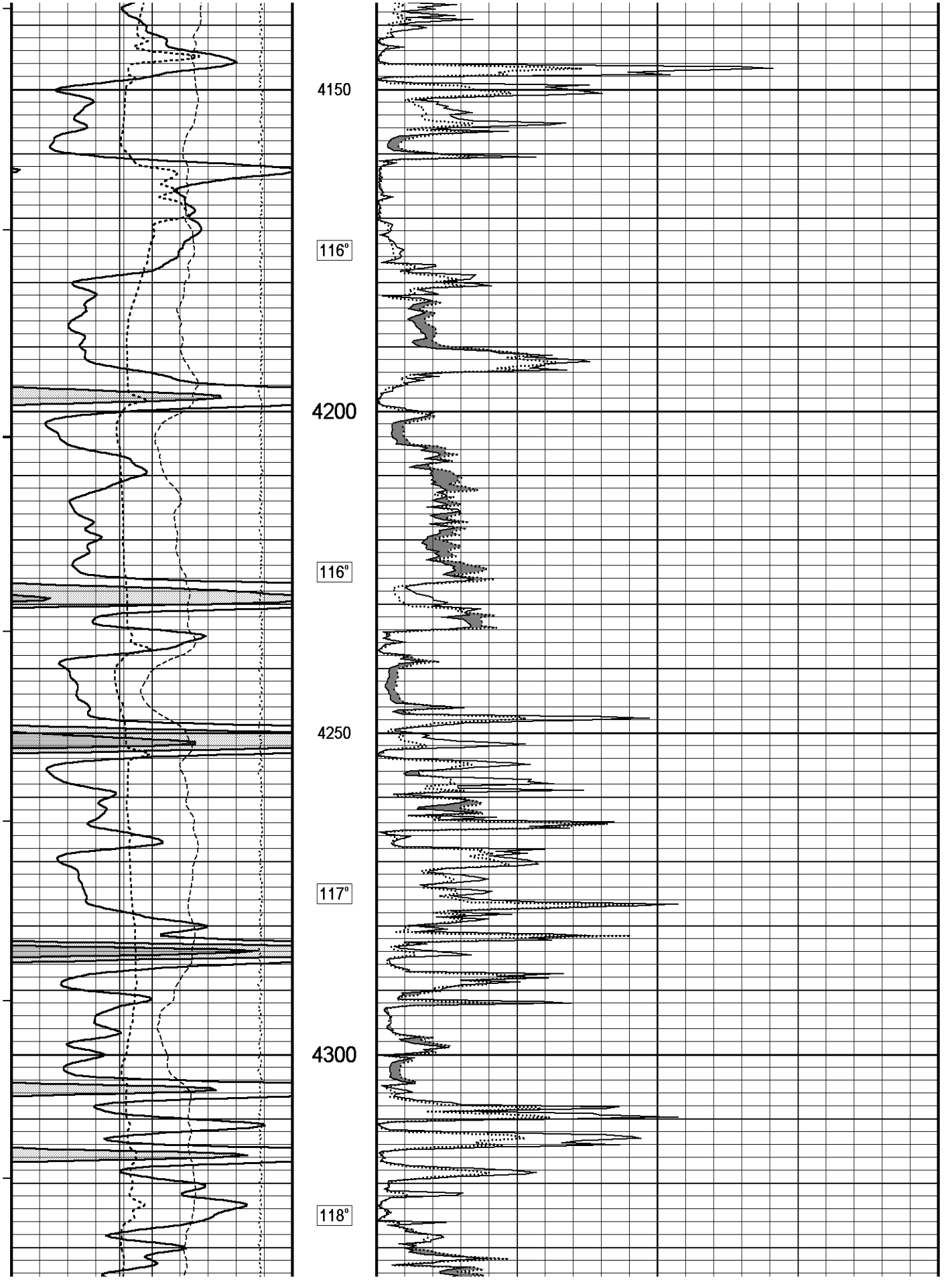
Micro-inverse
ohm metres
0 10 20 30 40

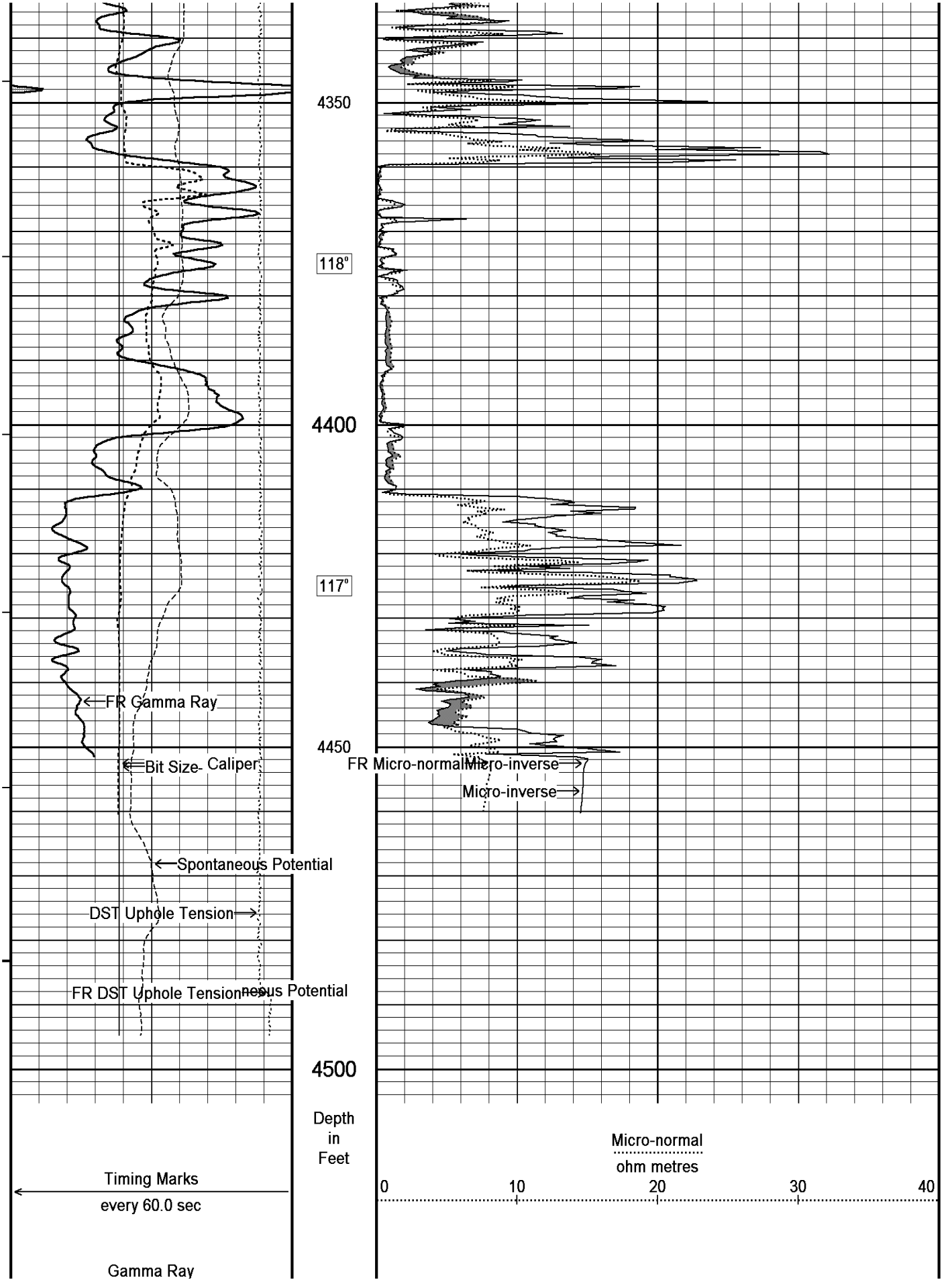



3550
112°
3600
112°
3650
Bit Size
Micro-inverse
Micro-normal
113°
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3700
113°


3750
113°
3800
114°
3850
114°
3900
114°


3950
114°
4000
115°
4050
Bit Size
Micro-inverse
Micro-normal
MML Caliper
Spontaneous Potential
Gamma Ray
DST Uphole Tension
4100
115°


4150
116°
4200
116°
4250
117°
4300
118°


4350
118°
4400
117°
4450
4500
FR Gamma Ray
Bit Size
Caliper
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
FR Micro-normal
Micro-inverse
Micro-inverse
Depth
in
Feet
Timing Marks
every 60.0 sec
Gamma Ray
Micro-normal
ohm metres
0
10
20
30
40

API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− → | 20 | ← +

MML Caliper
inches
4 9 14

Bit Size
inches
4 9 14

DST Uphole Tension
pounds
5000 0
0 -5000

Borehole Temp in deg F

Replay Scale 1:240

Micro-inverse
ohm metres
0 10 20 30 40

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 10-AUG-2010 08:13
Filename: C:\DOCUME~1\Alex\LOCALS~1\Temp\Weatherfo...\OTTLEY #6-15_002 spooled section.dta — Recorded on 10-AUG-2010 03:54
System Versions: Logged with 10.08.1568 Plotted with 8.01.0091

5 Inch Main

Repeat Section

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 10-AUG-2010 08:13
Filename: C:\DOCUME~1\Alex\LOCALS~1\Temp\Weatherford PreVi...\Copy of OTTLEY #6-15_001.dta — Recorded on 10-AUG-2010 02:56
System Versions: Logged with 10.08.1568 Plotted with 8.01.0091

Timing Marks
every 60.0 sec

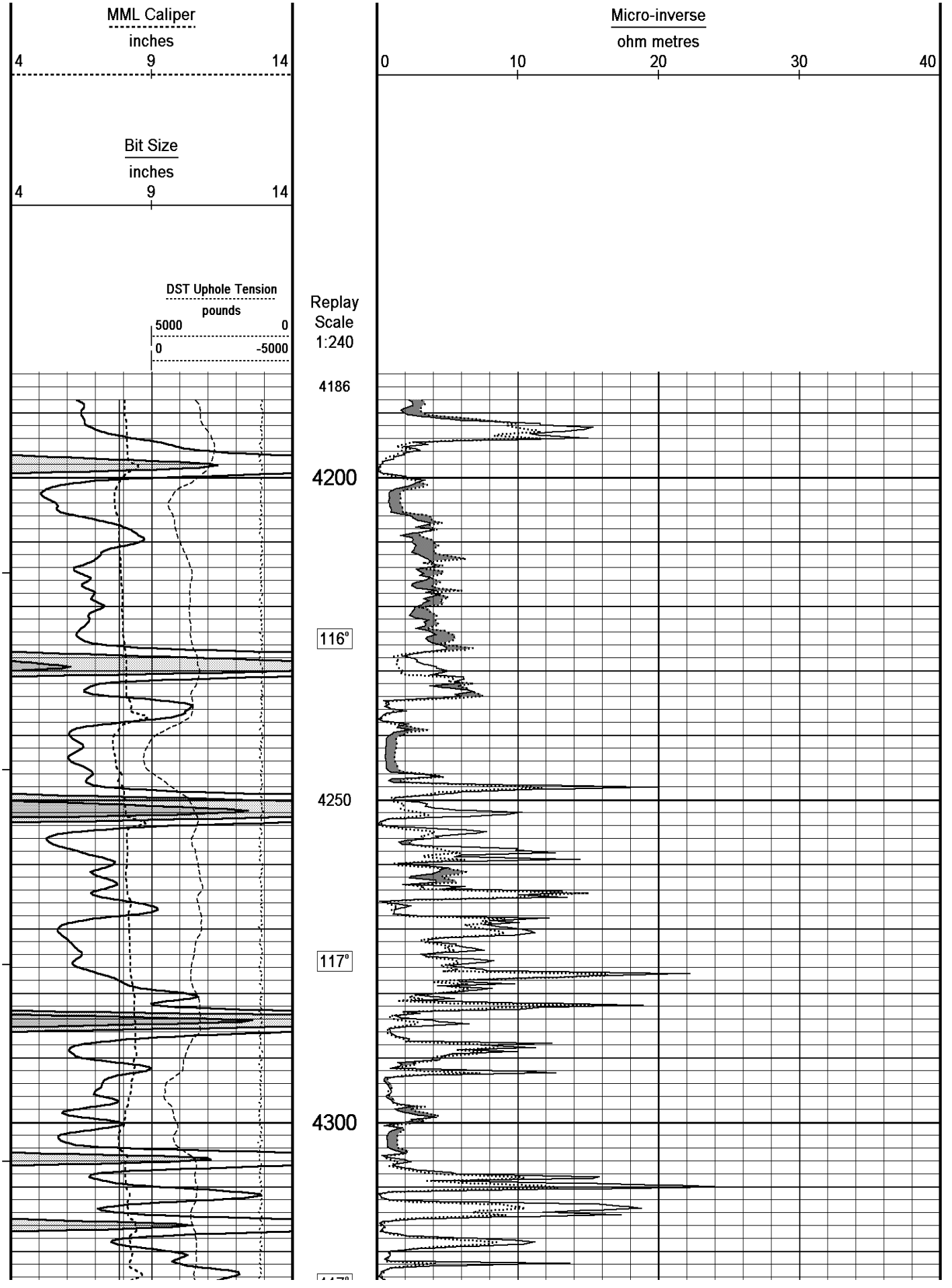
Gamma Ray
API
0 75 150
150 225 300

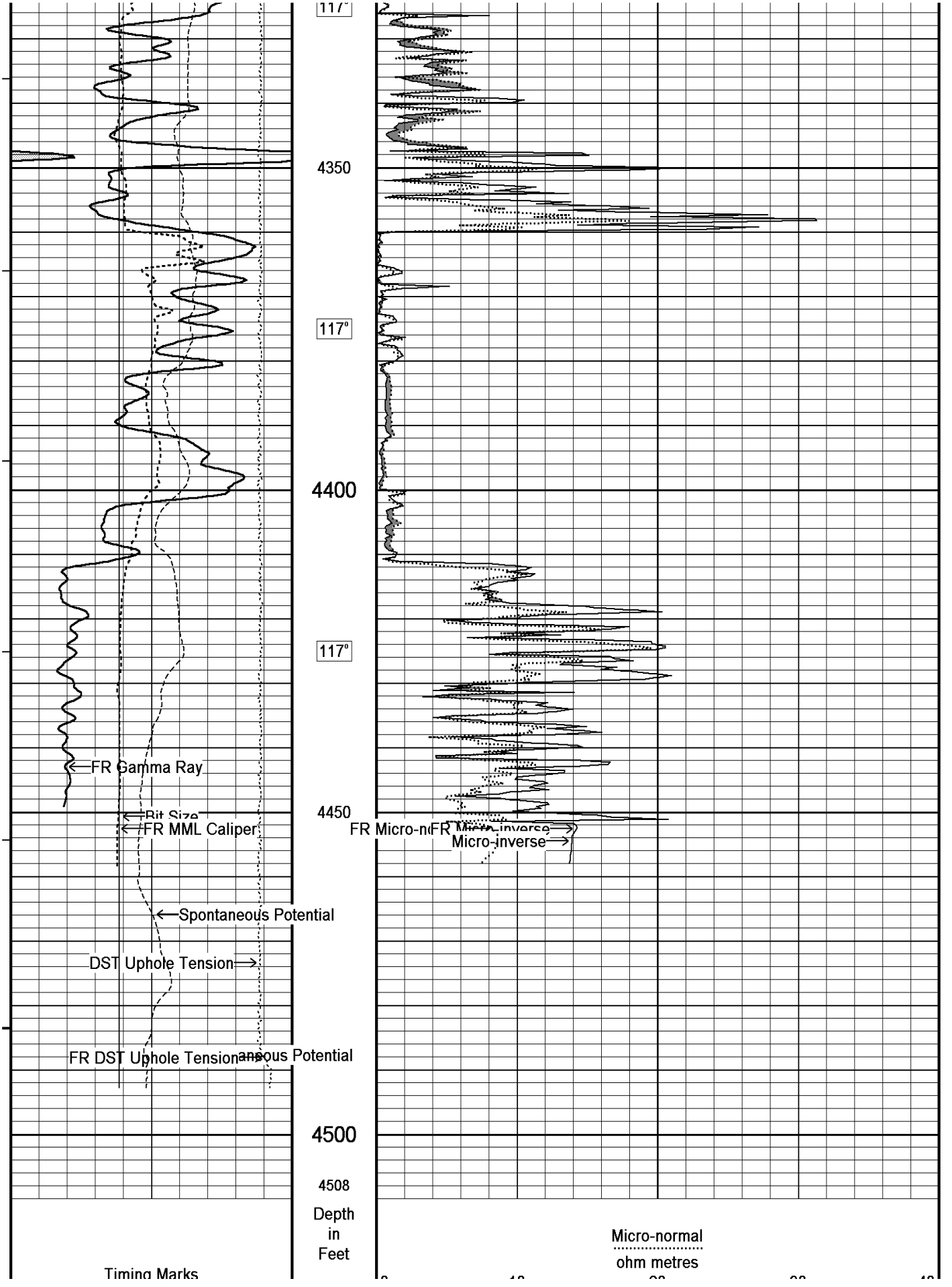
Spontaneous Potential
millivolts
− → | 20 | ← +

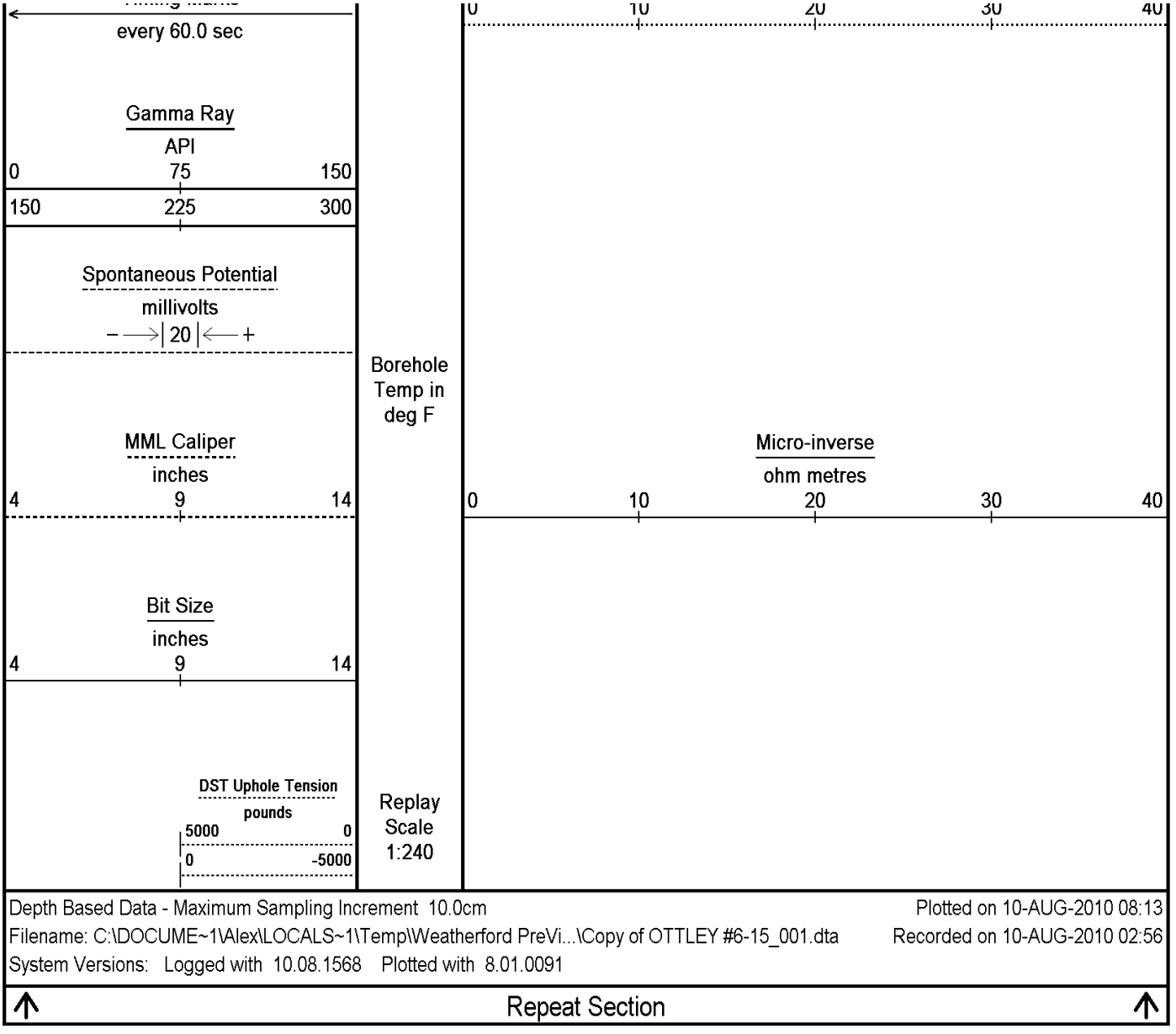
Depth in Feet

Micro-normal
ohm metres
0 10 20 30 40

Borehole Temp in deg F


MML Caliper
inches
4
9
14
Bit Size
inches
4
9
14
DST Uphole Tension
pounds
5000
0
0
-5000
Replay
Scale
1:240
4186
4200
116°
4250
117°
4300
Micro-inverse
ohm metres
0
10
20
30
40


117°
4350
117°
4400
117°
4450
FR Gamma Ray
Bit Size
FR MML Caliper
FR Micro-normal
FR Micro-inverse
Micro-inverse
Spontaneous Potential
DST Uphole Tension
FR DST Uphole Tension
Spontaneous Potential
4500
4508
Depth
in
Feet
Timing Marks
Micro-normal
ohm metres



BEFORE SURVEY CALIBRATION

C:\DOCUME~1\Alex\LOCALS~1\Temp\Weatherford PreView\0\Copy of OTTLEY #6-15_001.dta

General Constants All 000 — Last Edited on 10-AUG-2010,02:17

General Parameters		
Mud Resistivity	0.710	ohm-metres
Mud Resistivity Temperature	88.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Caliper 1	Density Caliper	
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	1.000
RWA Constant M	2.000

High Resolution Temperature Calibration MCG 034

Field Calibration on 19-OCT-2009,11:45

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

High Resolution Temperature Constants MCG 034

Pre-filter Length	11

SP Calibration MCG 034

Field Calibration on 9-NOV-2009,18:07

	Measured	Calibrated (mV)
Reference 1	107.7	100.0
Reference 2	-93.8	-100.0

Gamma Calibration MCG 034

Field Calibration on 09-AUG-2010 11:47

	Measured	Calibrated (API)
Background	54	38
Calibrator (Gross)	1101	763
Calibrator (Net)	1047	725

Gamma Constants MCG 034

Last Edited on 09-AUG-2010,15:15

Gamma Calibrator Number	grc38	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Caliper Calibration MML 009

Base Calibration on 08-JUL-2010 09:53
Field Calibration on 09-AUG-2010 11:26

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14507	5.96
2	18047	7.98
3	21463	9.95
4	25252	11.91
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.10	5.96

Micro Normal and Micro Inverse Calibration MML 009

Base Calibration on 08-JUL-2010 09:42
Field Check on 09-AUG-2010 11:24

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	59.8	2.6	12.8
Micro Inverse	15.6	78.1	1.7	8.4

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	32.4	32.4
Micro Inverse	16.4	16.4

Micro Normal and Micro Inverse Constants MML 009

Last Edited on 06-AUG-2010,17:30

Micro Normal K Factor	0.5110	
Micro Inverse K Factor	0.3380	
Standoff Offset	N/A	inches

DOWNHOLE EQUIPMENT

C:\DOCUME~1\Alex\LOCALS~1\Temp\Weatherford PreView\0\Copy of OTTLEY #6-15_001.dta

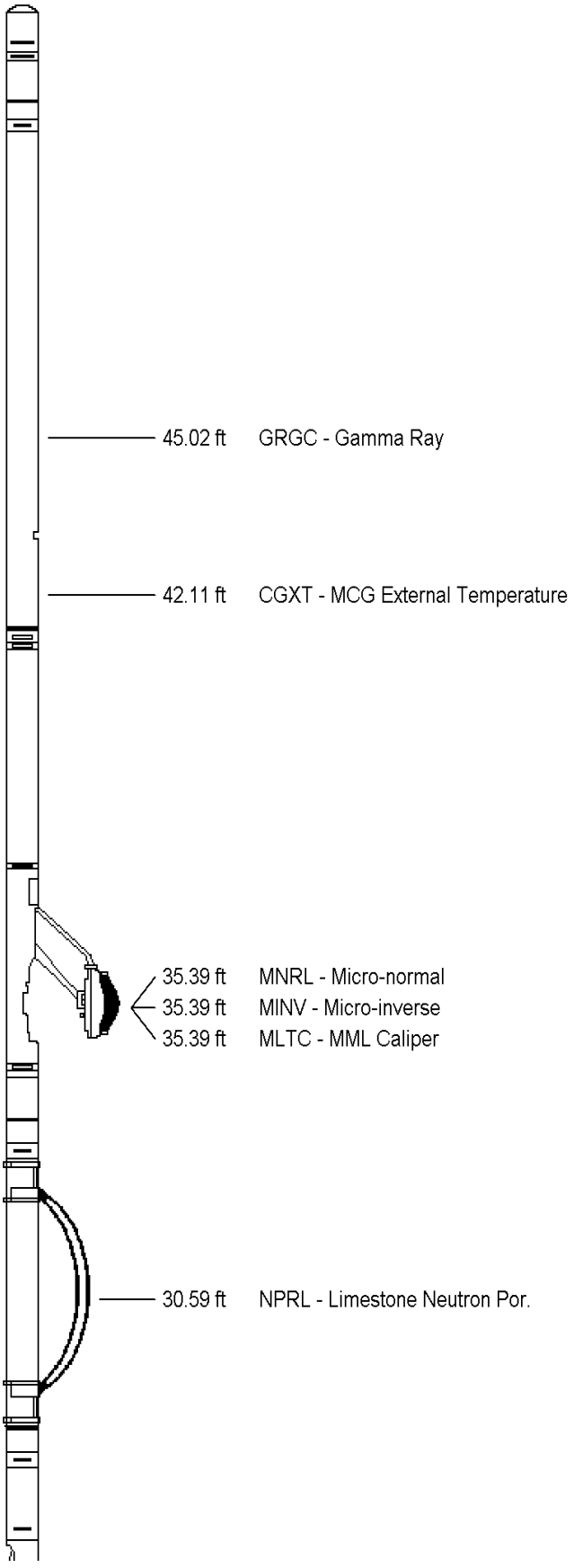
3/8" Triple Cone Cable Head (MCB C A)
MCB 5 Length: 1.58 ft Weight: 15.4 lb

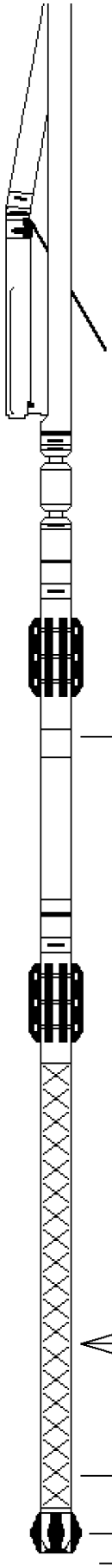
Compact Gamma
MCG 34 Length: 8.70 ft Weight: 63.9 lb

Compact Micro-log
MML 9 Length: 7.97 ft Weight: 81.6 lb

Compact Neutron
MDN 65 Length: 5.04 ft Weight: 50.7 lb

Compact Density/Caliper
MPD 35 Length: 9.59 ft Weight: 90.4 lb





22.12 ft CLDC - Density Caliper
21.42 ft DCOR - Density Correction
21.42 ft DEN - Compensated Density
21.42 ft DPRL - Limestone Density Por.
21.36 ft PDPE - PE

SKJ-D.A Compact Knuckle Joint
SKJ 37 Length: 2.17 ft Weight: 24.3 lb

Compact Focussed Electric
MFE 55 Length: 6.03 ft Weight: 48.5 lb

13.70 ft FEFE - Shallow FE

Compact Induction
MAI 178 Length: 10.81 ft Weight: 48.5 lb

3.34 ft R60O - Array Ind. One Res 60
3.34 ft RTAO - Array Ind. One Res Rt
3.34 ft R40O - Array Ind. One Res 40

0.23 ft SPCG - Spontaneous Potential

Tool Zero (0.13ft from bottom)
-0.13 ft SMTU - DST Uphole Tension

Total Length: 51.88 ft Weight: 423.3 lb

All measurements relative to tool zero.

COMPANY	SHAKESPEARE
WELL	OTTLEY #6-15
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A./KANSAS

Elevation Kelly Bushing	2739.00	feet	First Reading	4466.00	feet
Elevation Drill Floor	2738.00	feet	Depth Driller	4490.00	feet
Elevation Ground Level	2729.00	feet	Depth Logger	4488.00	feet

Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRO-RESISTIVITY LOG