



Weatherford

MICRORESISTIVITY LOG

COMPANY				SHAKESPEARE OIL CO., INC.			
WELL				OTTELEY #4-16			
FIELD				WILDCAT			
PROVINCE/COUNTY				LOGAN			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				1599' FNL & 1852' FWL			
SEC	TWP	RGE	Other Services				
16	14S	32W	MPD/MDN				
API Number	15-109-21198		MAI/MFE				
Permit Number			MSS				
Permanent Datum G.L., Elevation 2808 feet					Elevations:		
Log Measured From KB					KB 2818.00		
Drilling Measured From K.B. @10 FEET					DF 2816.00		
					GL 2808.00		
Date	04-AUG-2013						
Run Number	ONE						
Service Order	3539955						
Depth Driller	4530.00		feet				
Depth Logger	4528.00		feet				
First Reading	4482.00		feet				
Last Reading	3600.00		feet				
Casing Driller	222.00		feet				
Casing Logger	221.00		feet				
Bit Size	7.875		inches				
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.10 lb/USg		55.00 CP				
PH / Fluid Loss	10.00		10.00 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.51 @ 98.0		ohm-m				
Rmf @ Measured Temp	0.41 @ 98.0		ohm-m				
Rmc @ Measured Temp	0.61 @ 98.0		ohm-m				
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.44 @115.0		ohm-m				
Time Since Circulation	3 HOURS						
Max Recorded Temp	115.00		deg F				
Equipment / Base	13096		LIB				
Recorded By	ROB HOFFMAN						
Witnessed By	TIM PRIEST						
JOB #	LB13-218						

BOREHOLE RECORD

Last Edited: 04-AUG-2013 15:52

Bit Size inches	Depth From feet	Depth To feet
7.875	222.00	4530.00

CASING RECORD

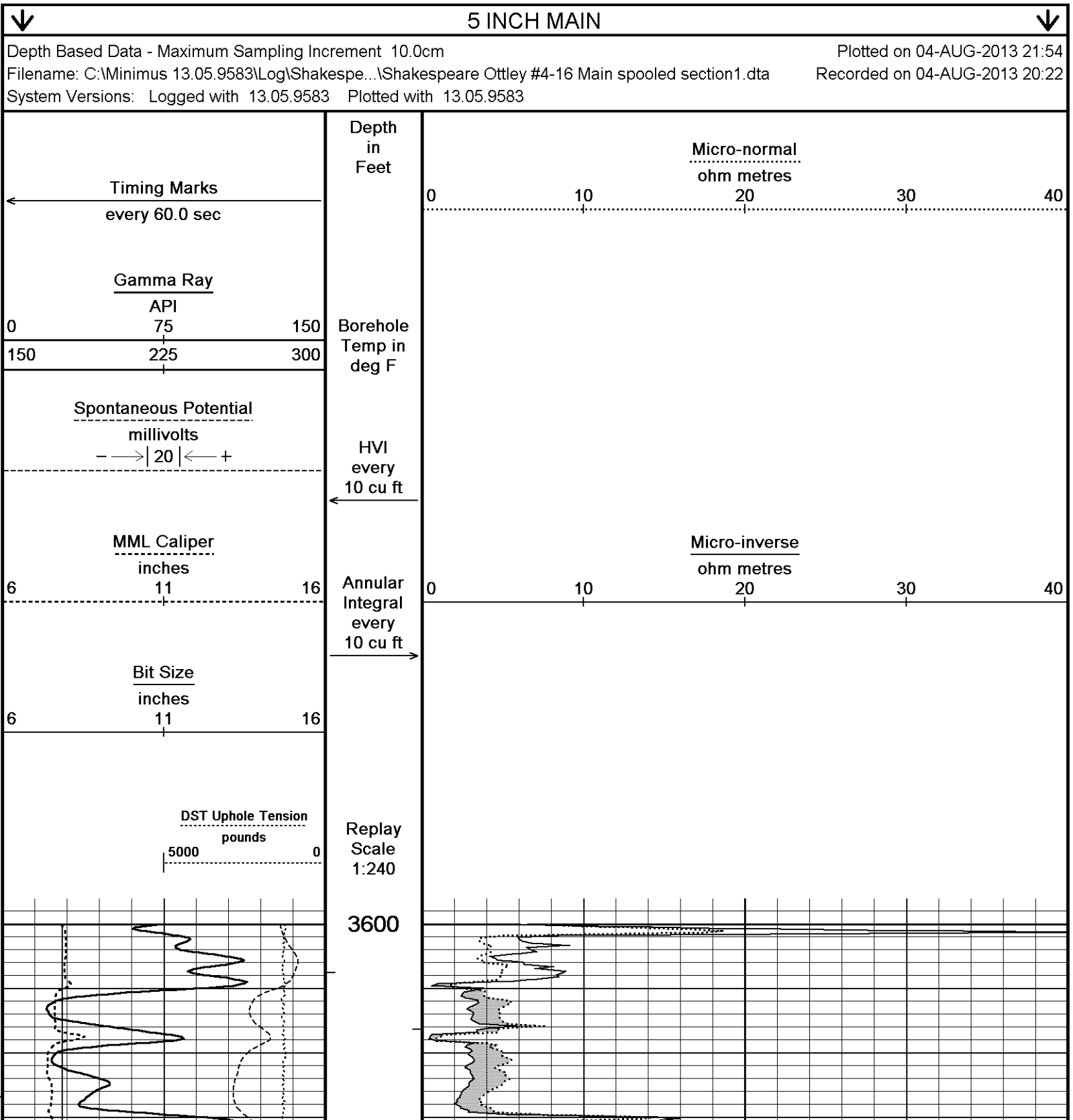
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	222.00	24.00

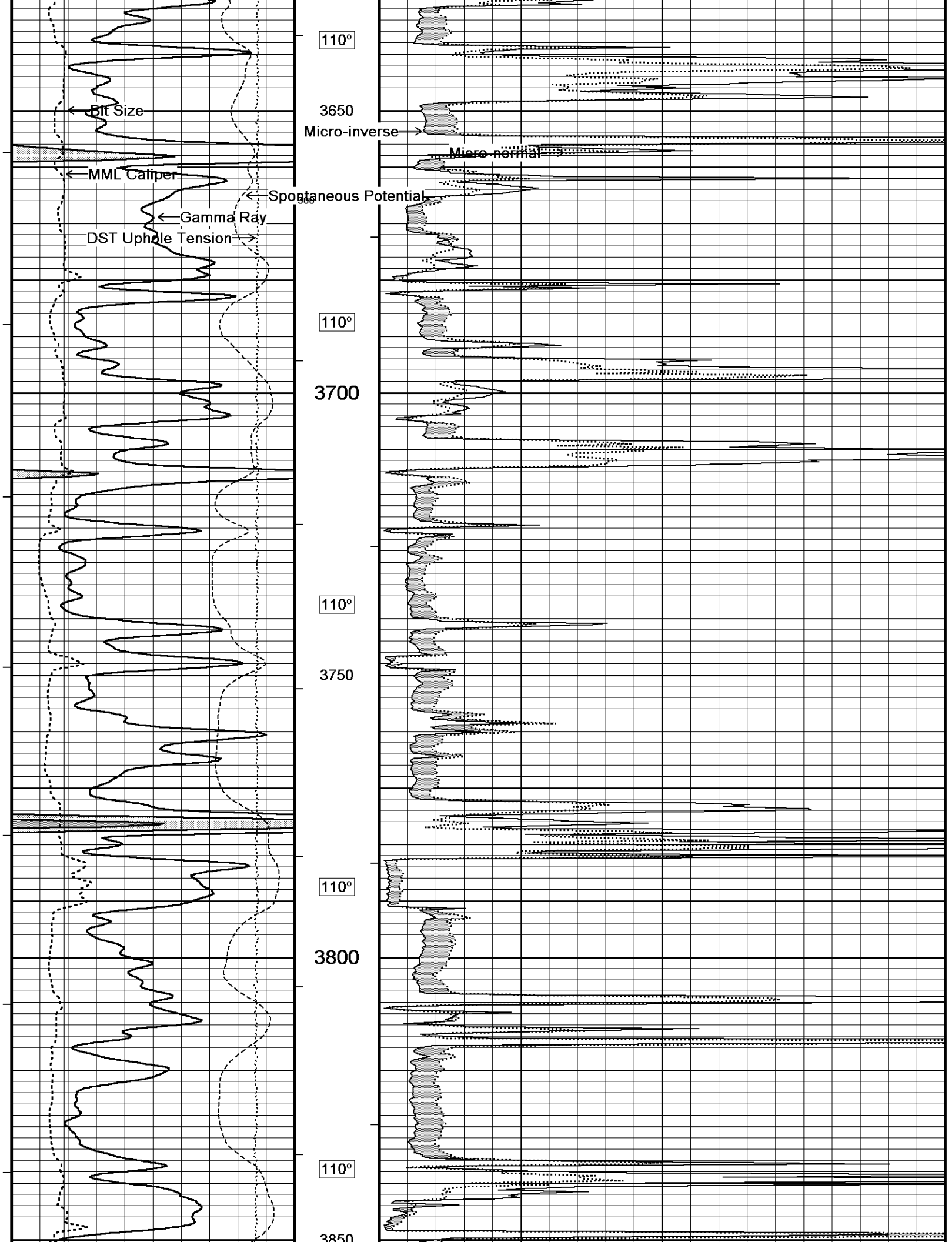
REMARKS

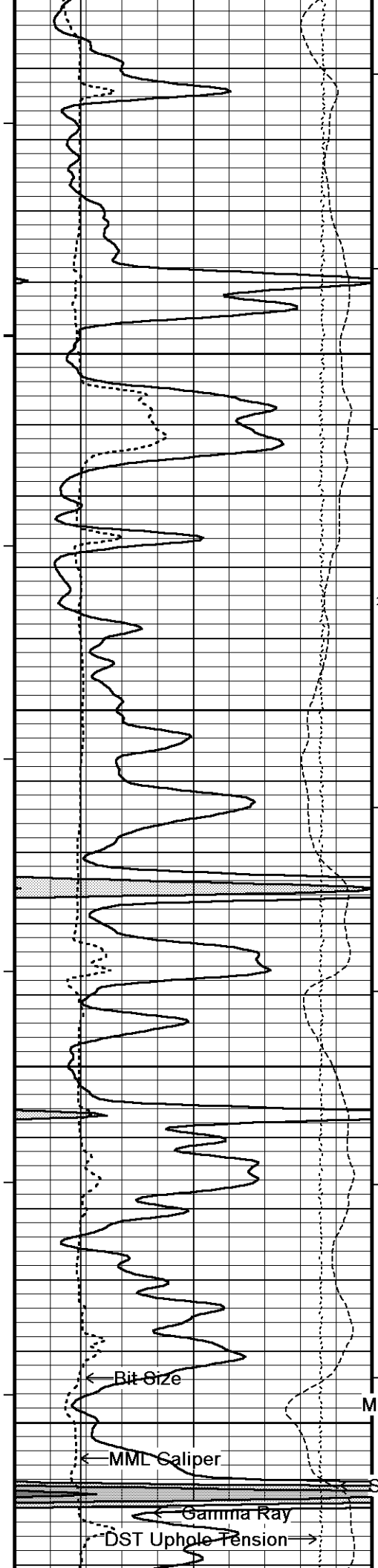
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - TWO 0.5 INCH STANDOFFS USED ON MSS.
 - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1952 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 175 CU. FT.

- SERVICE ORDER # 3539955
- RIG: HD DRILLING #2.
- ENGINEER: ROB HOFFMAN
- OPERATOR(S): NICK ADAME

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.







3900
200
3950
100
4000
4050

111°

111°

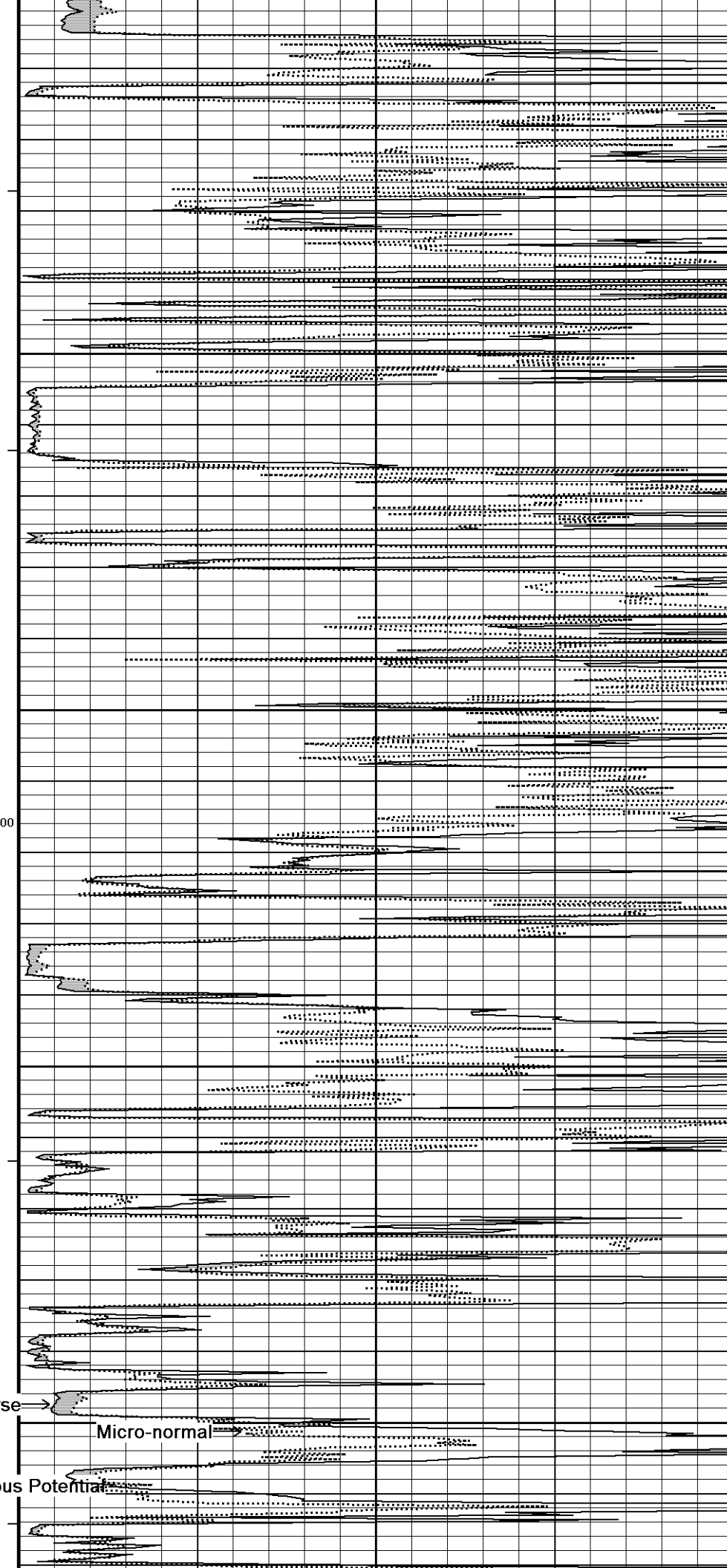
111°

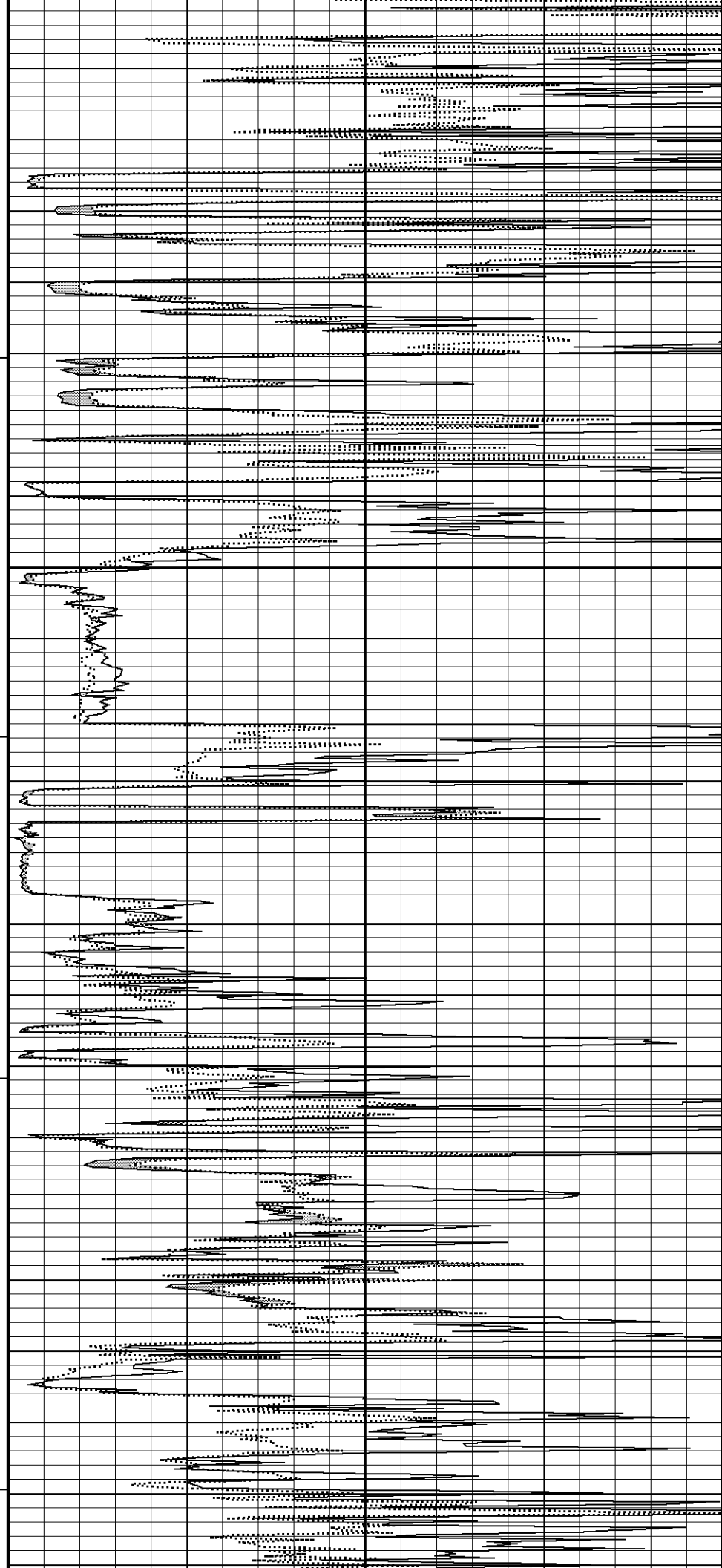
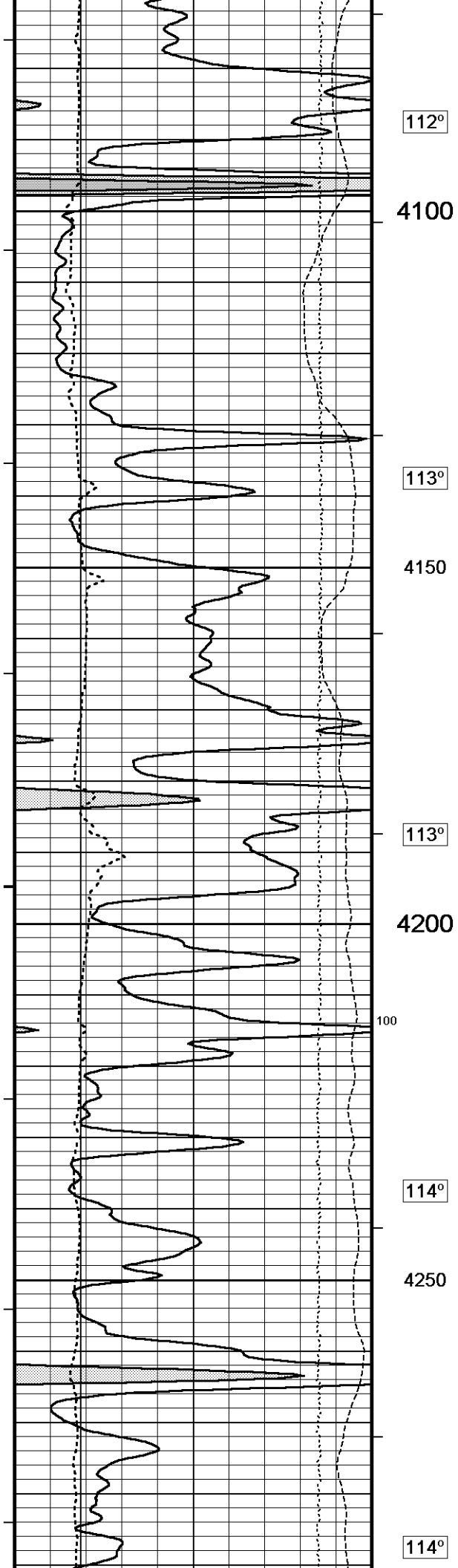
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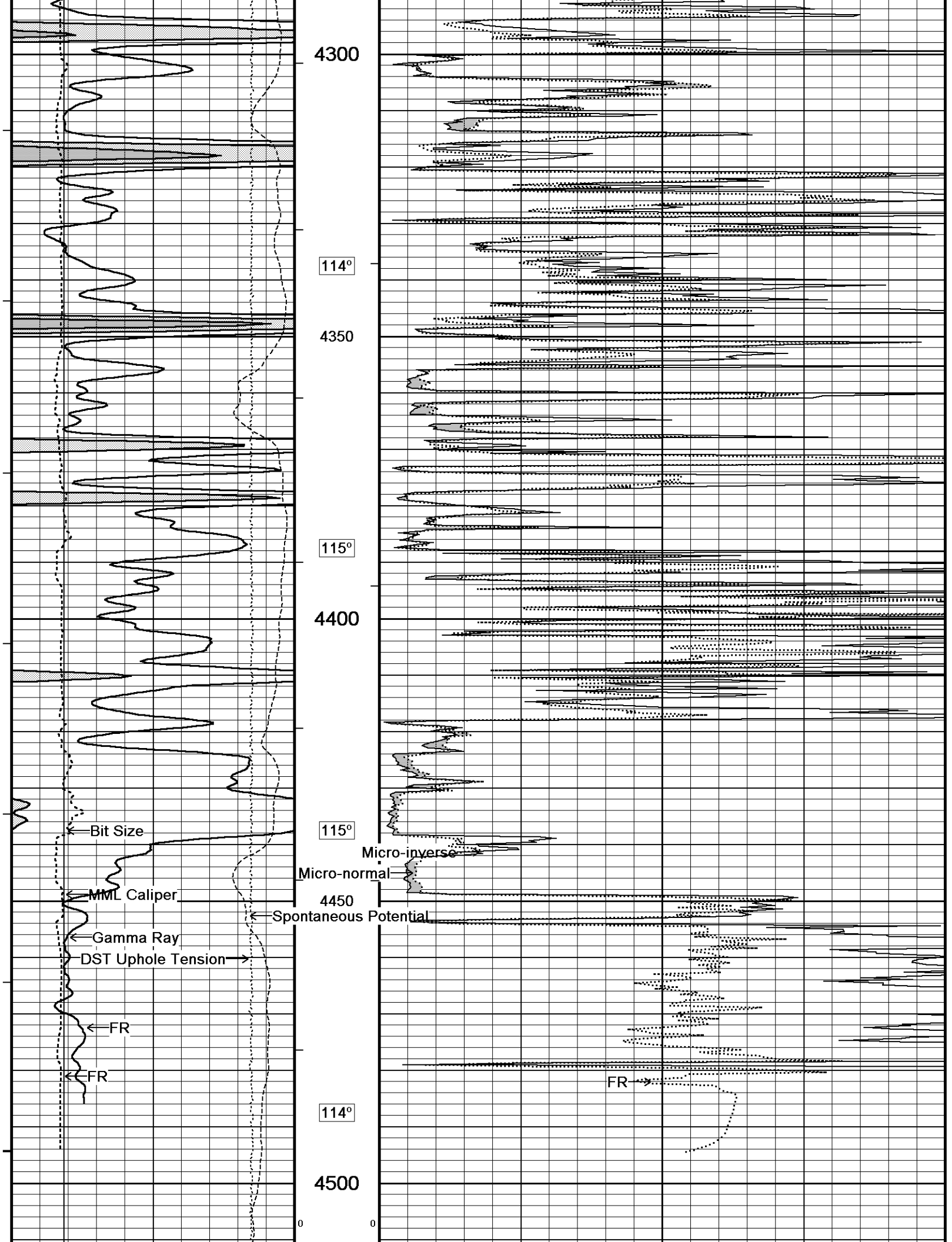
Micro-inverse

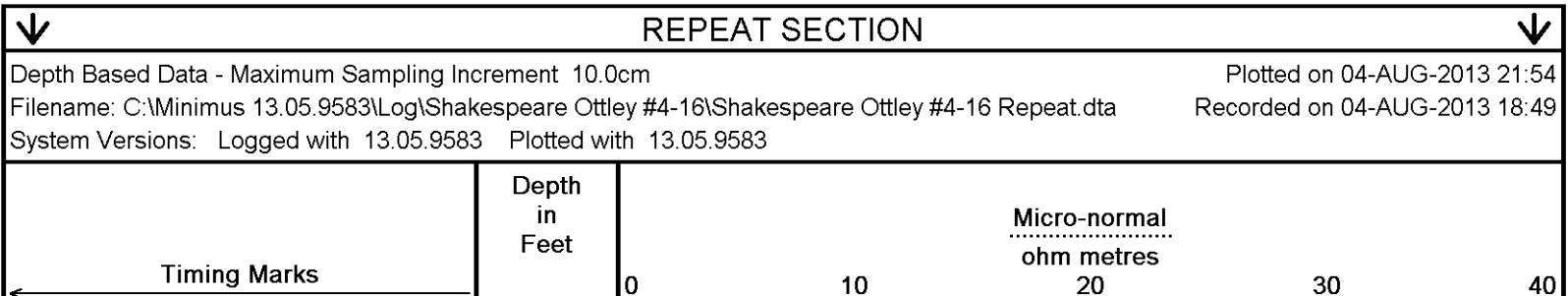
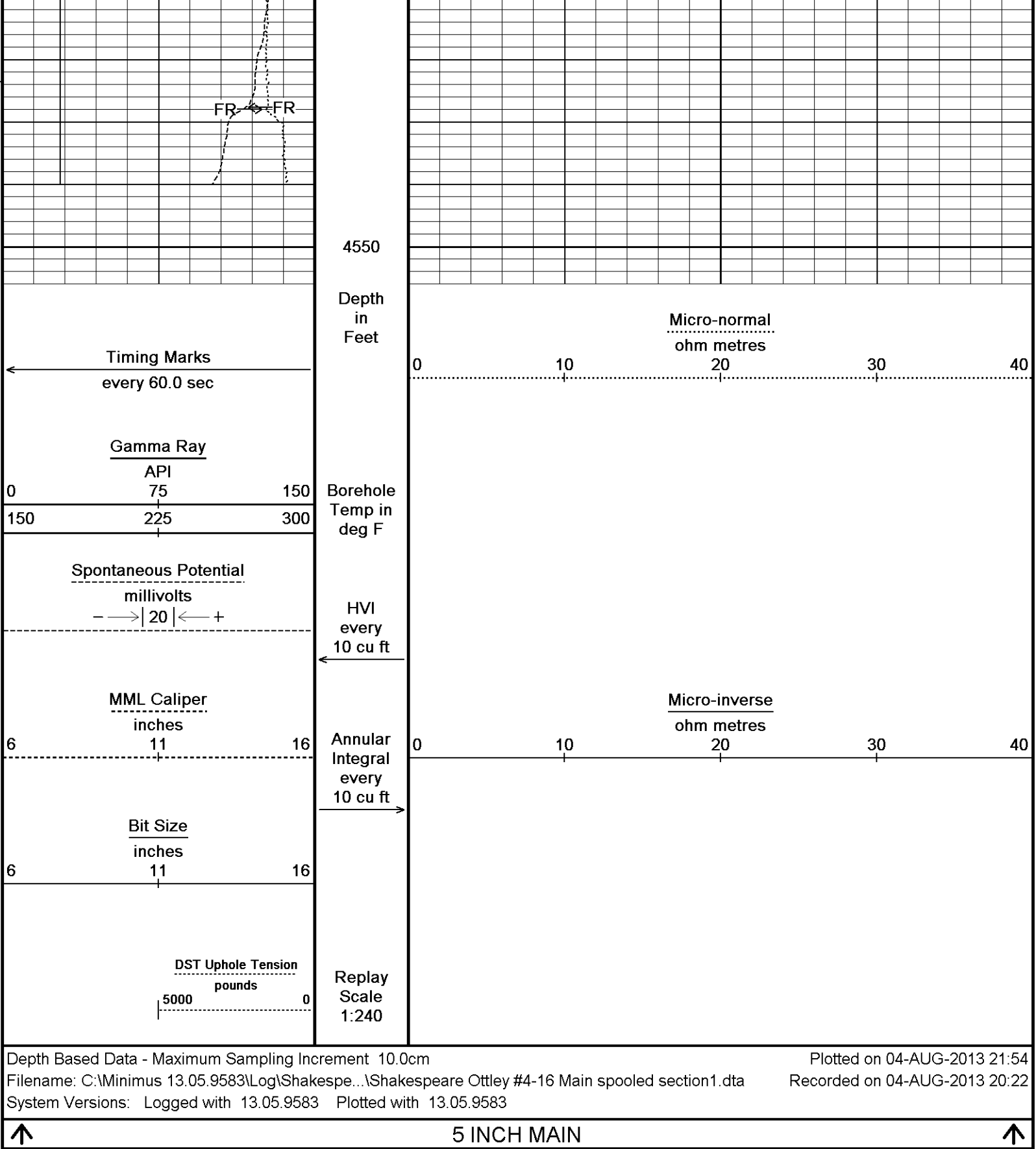
Micro-normal

Spontaneous Potential





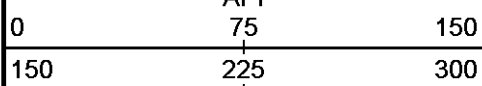




every 60.0 sec

Gamma Ray

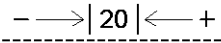
API



Borehole
Temp in
deg F

Spontaneous Potential

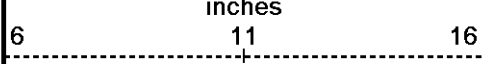
millivolts



HVI
every
10 cu ft

MML Caliper

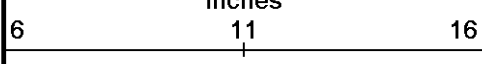
inches



Annular
Integral
every
10 cu ft

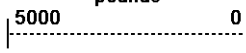
Bit Size

inches



DST Uphole Tension

pounds



Replay
Scale
1:240

4326

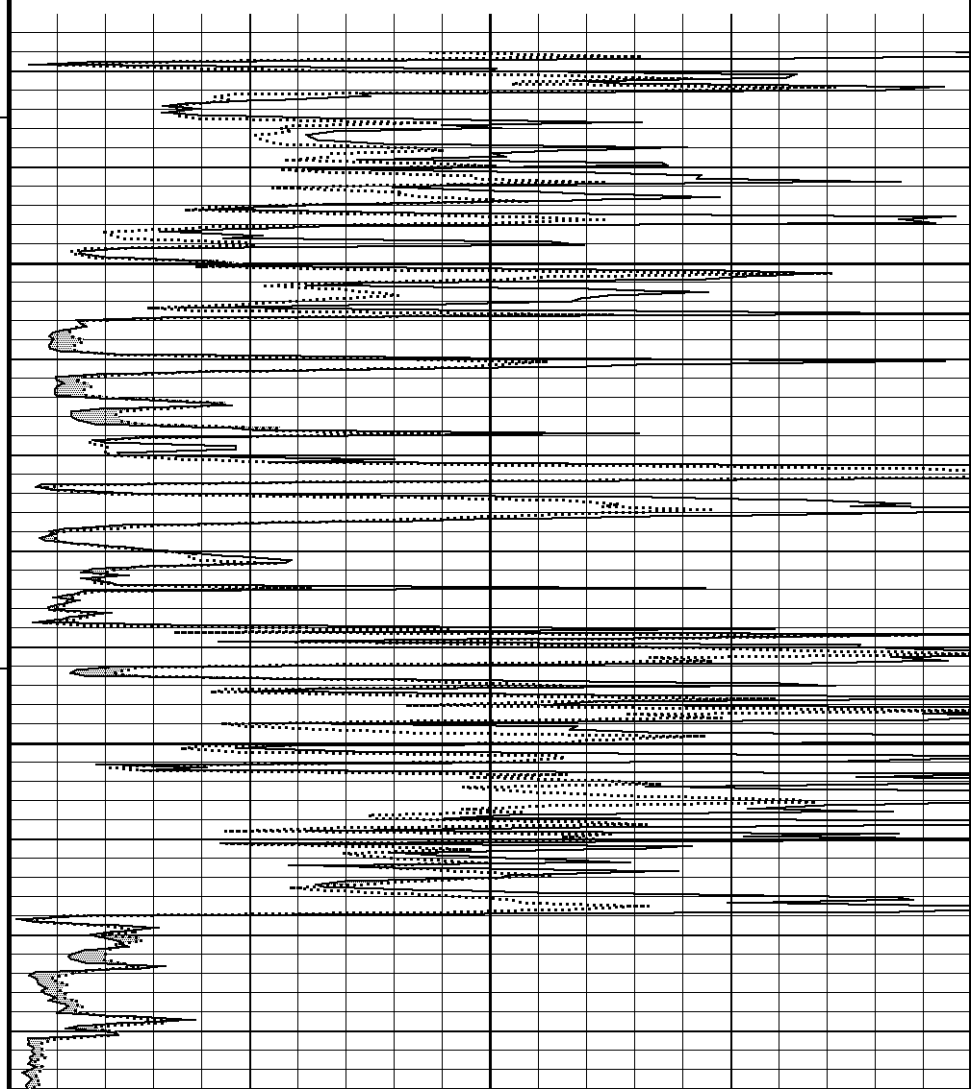
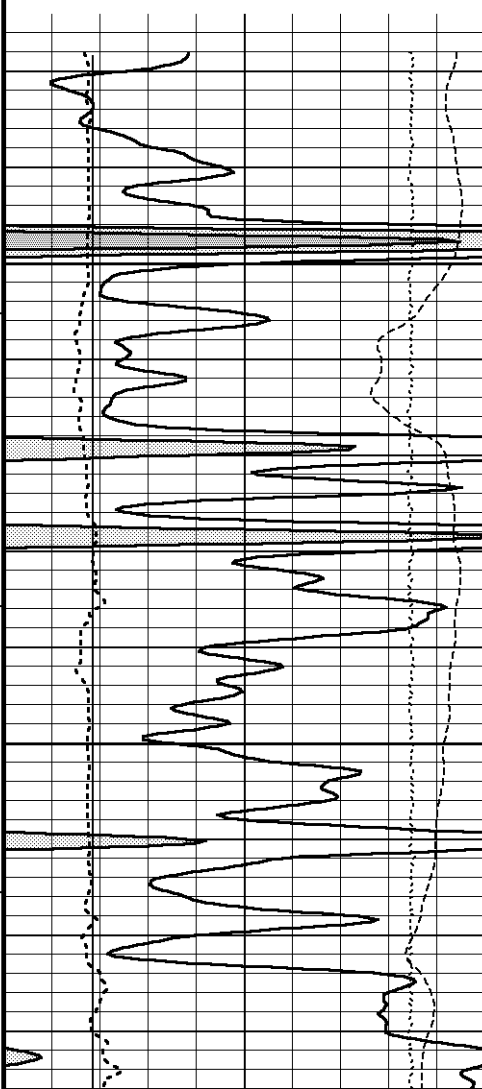
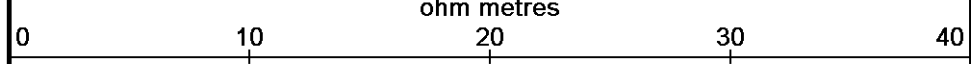
4350

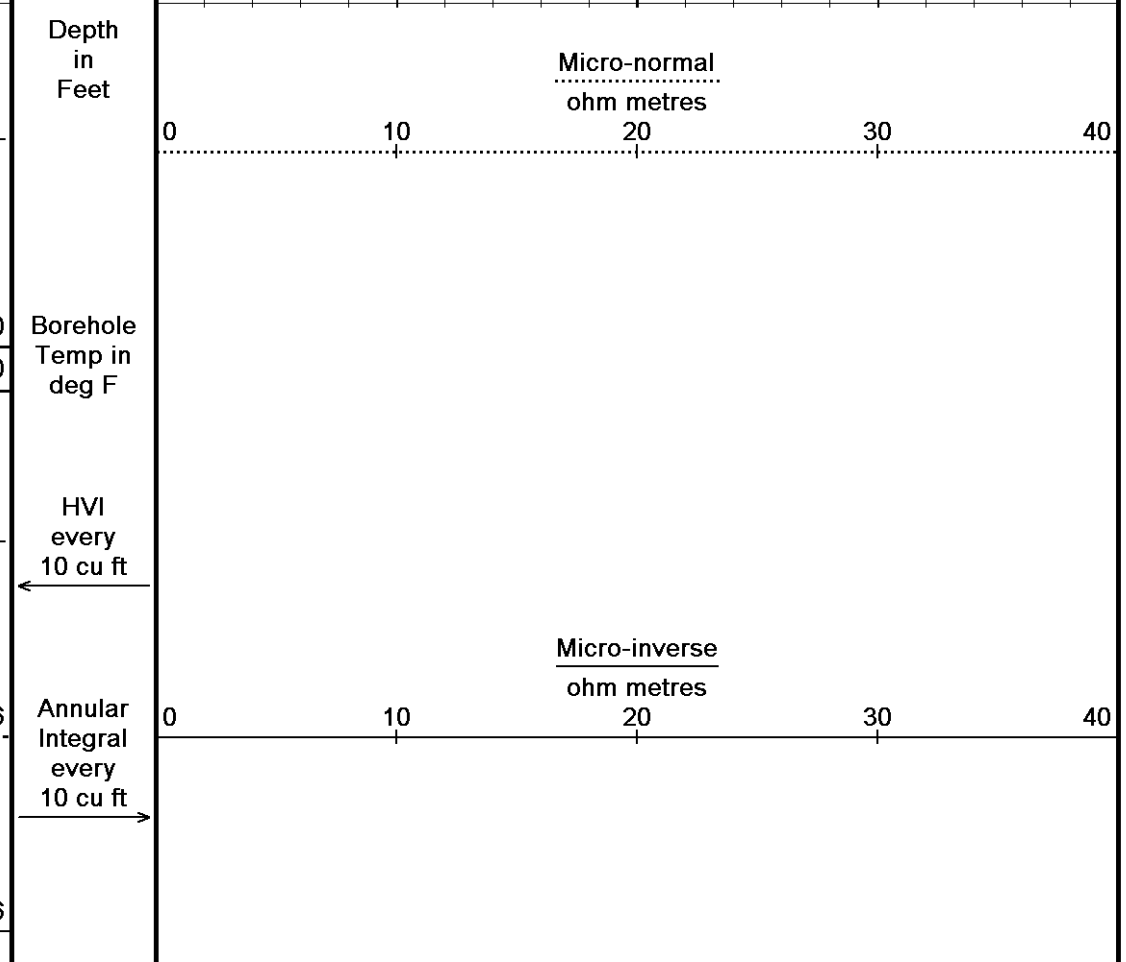
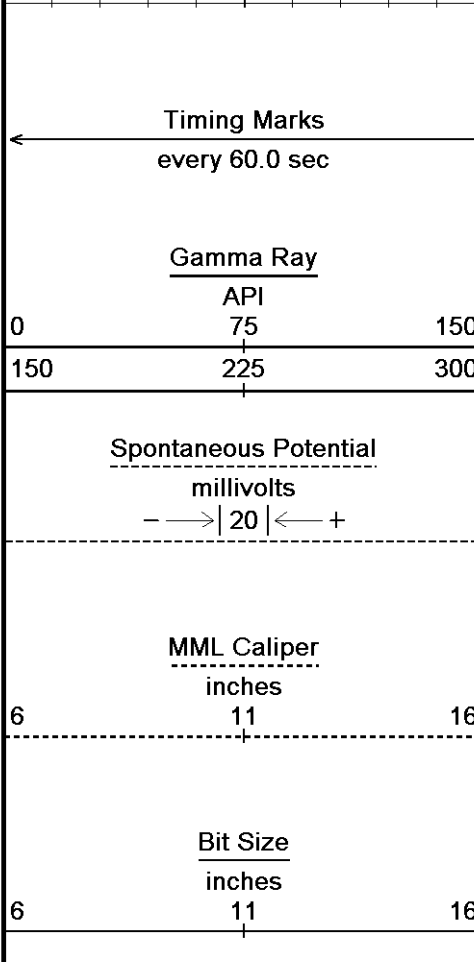
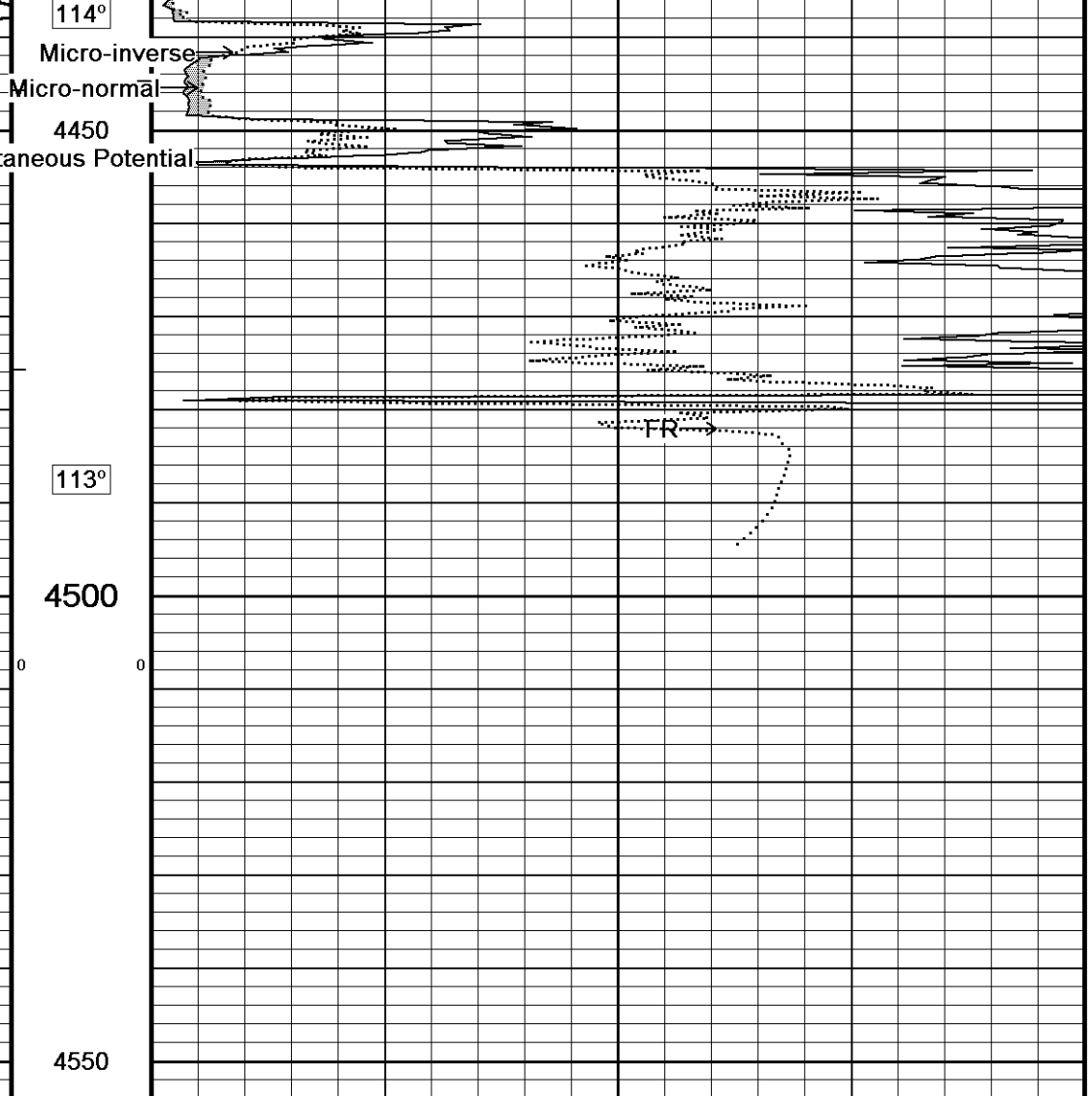
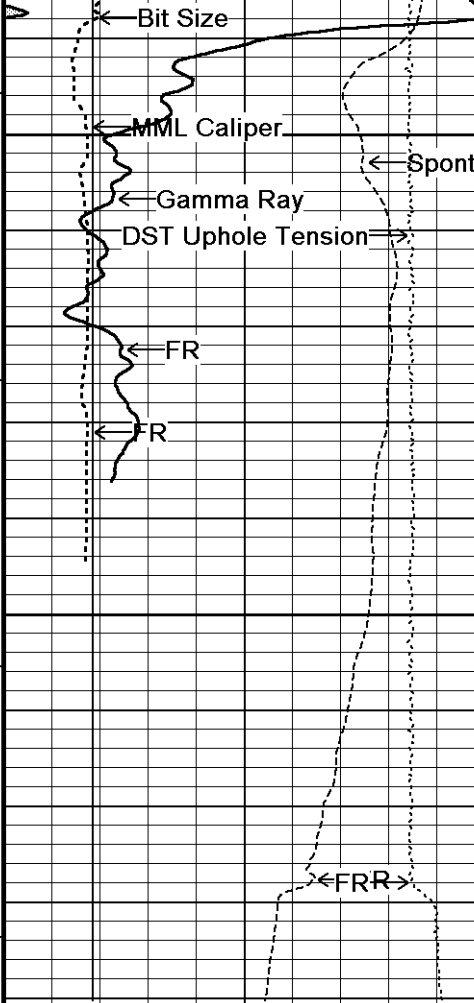
114°

4400

Micro-inverse

ohm metres





DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 04-AUG-2013 21:54

Filename: C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Repeat.dta

Recorded on 04-AUG-2013 18:49

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583



REPEAT SECTION



BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Main spooled section.dta

General Constants All 000

Last Edited on 04-AUG-2013,16:01

General Parameters

Mud Resistivity	0.510	ohm-metres
Mud Resistivity Temperature	98.000	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	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Six Res Rt
RWA Constant A	1.000
RWA Constant M	2.000
SW/APOR Tool Source	0.000

Gamma Calibration MCG-B 39

Field Calibration on 04-AUG-2013 10:53

	Measured	Calibrated (API)
Background	64	43
Calibrator (Gross)	1141	768
Calibrator (Net)	1077	725

Gamma Constants MCG-B 39

Last Edited on 04-AUG-2013,16:01

Gamma Calibrator Number	GRC38	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 30-JUL-2013,09:41

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

High Resolution Temperature Constants MCG-B 39

Last Edited on 30-JUL-2013,09:41

Pre-filter Length 11

Caliper Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:43

Field Calibration on 04-AUG-2013 10:46

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14624	5.98
2	17958	7.97
3	21262	9.86

3	21205	9.86
4	25213	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.15	5.98

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:36

Field Check on 04-AUG-2013 10:47

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.7	78.3	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	63.0	63.0
Micro Inverse	48.2	48.2

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 04-AUG-2013,10:46

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	

Caliper Calibration MPD-B 64

Base Calibration on 04-AUG-2013 10:37

Field Calibration on 04-AUG-2013 10:38

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15388	3.99
2	24325	5.98
3	32740	7.97
4	41178	9.86
5	50491	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.00	5.98

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Ottley #4-16\Shakespeare Ottley #4-16 Main spooled section.dta

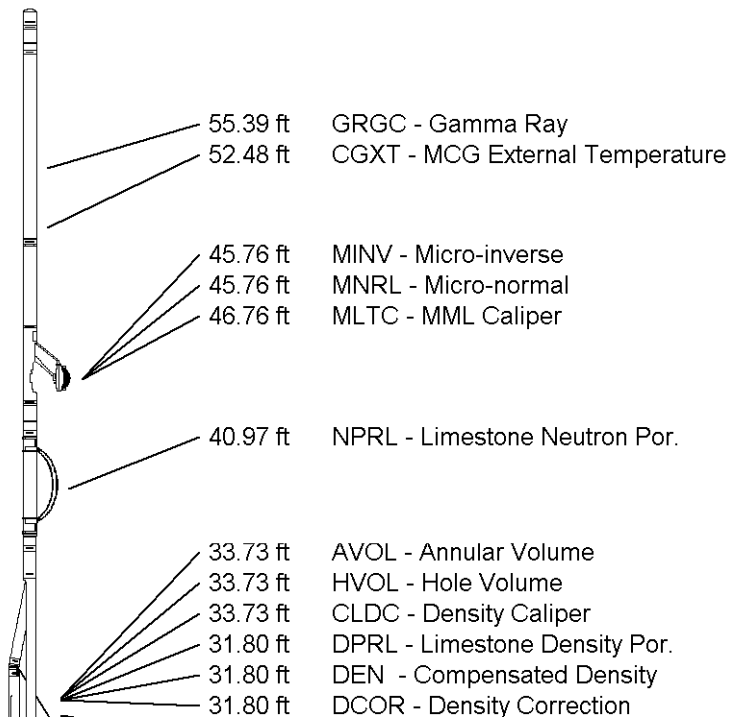
3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 3 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 Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

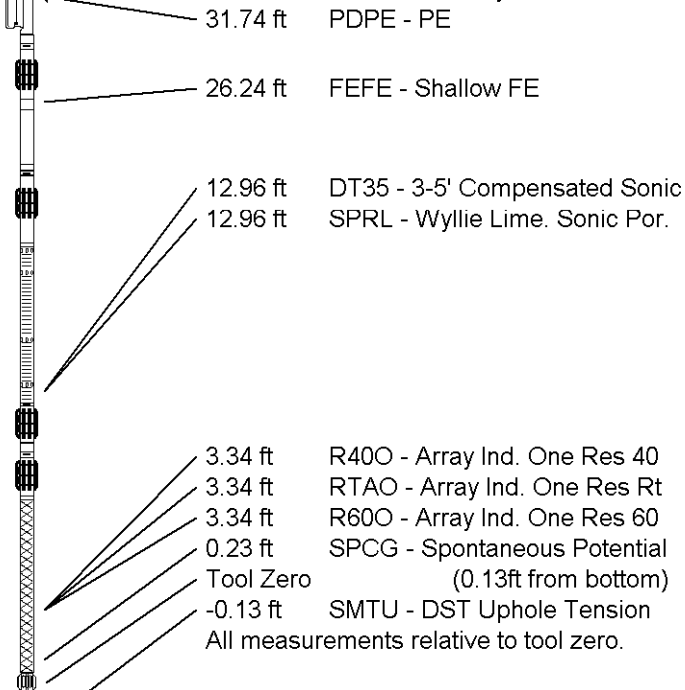


Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 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: 62.25 ft Weight: 471.8 lb



COMPANY SHAKESPEARE OIL CO., INC.
WELL OTTLEY #4-16
FIELD WILDCAT
PROVINCE/COUNTY LOGAN
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2818.00	feet	First Reading	4482.00	feet
Elevation Drill Floor	2816.00	feet	Depth Driller	4530.00	feet
Elevation Ground Level	2808.00	feet	Depth Logger	4528.00	feet



Weatherford®

MICRORESISTIVITY LOG