



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY **GRAND MESA OPERATING**
 WELL **BFF #1-35**
 FIELD **WILDCAT**
 PROVINCE/COUNTY **SCOTT**
 COUNTRY/STATE **U.S.A. / KANSAS**
 LOCATION **2479' FNL & 2772' FEL**
SE SE SE NW

SEC 35 TWP 16S RGE 33W Other Services: MPD/MDN MAI/MFE
 API Number 15-171-21013
 Permit Number
 Permanent Datum GL, Elevation 2970 feet
 Log Measured From KB
 Drilling Measured From KB AT 9 FEET

Date	15-JAN-2014	Elevations:	KB 2979.00
Run Number	ONE	DF 2977.00	GL 2970.00
Service Order	736-76969324		
Depth Driller	4800.00	feet	
Depth Logger	4800.00	feet	
First Reading	4765.76	feet	
Last Reading	3800.00	feet	
Casing Driller	220.00	feet	
Casing Logger	219.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	63.00 CP	
PH / Fluid Loss	11.00	7.20 ml/30Min	
Sample Source	MUDPIT		
Rm @ Measured Temp	0.61 @ 75.0	ohm-m	
Rmf @ Measured Temp	0.49 @ 75.0	ohm-m	
Rmc @ Measured Temp	0.73 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.40 @ 117.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	117.00	deg F	
Equipment / Base	13096	LIB	
Recorded By	DEREK CARTER		
Witnessed By	JOHN GOLDSMITH		
JOB #	LB14-016		

BOREHOLE RECORD

Last Edited: 15-JAN-2014 04:14

Bit Size inches	Depth From feet	Depth To feet
7.875	220.00	4800.00

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: WLS 13.05.9583
- TOOLS: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION
 HARDWARE:
 MDN: DUAL BOWSPRING ECCENTRALIZER
 MFE: 1 X 0.5 INCH STANDOFF
 MAI: 2 X 0.5 INCH STANDOFF
- 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: 2010 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1250 CU. FT.

- RIG: DUKE DRILLING COMPANY #4

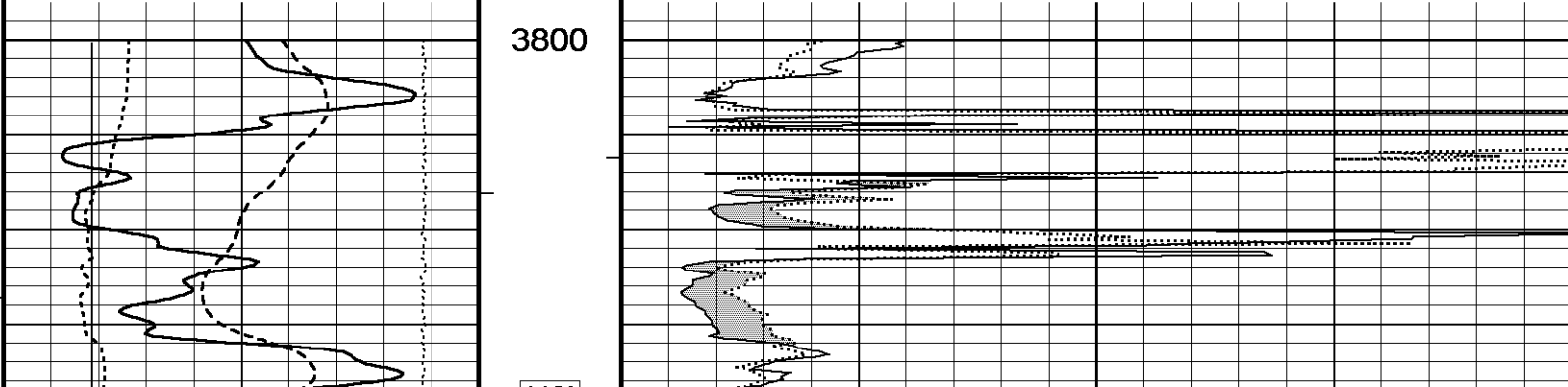
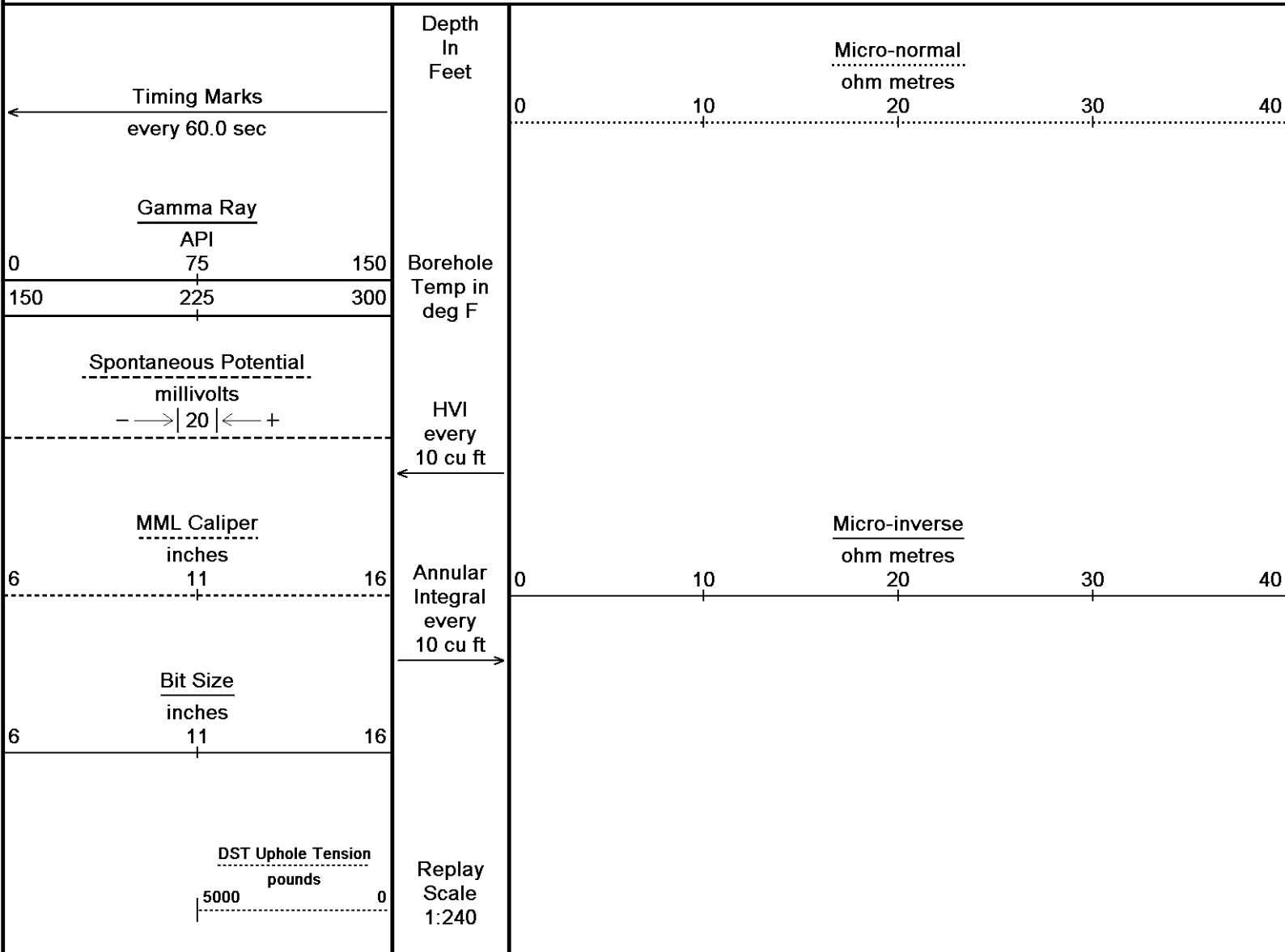
- ENGINEER: DEREK CARTER

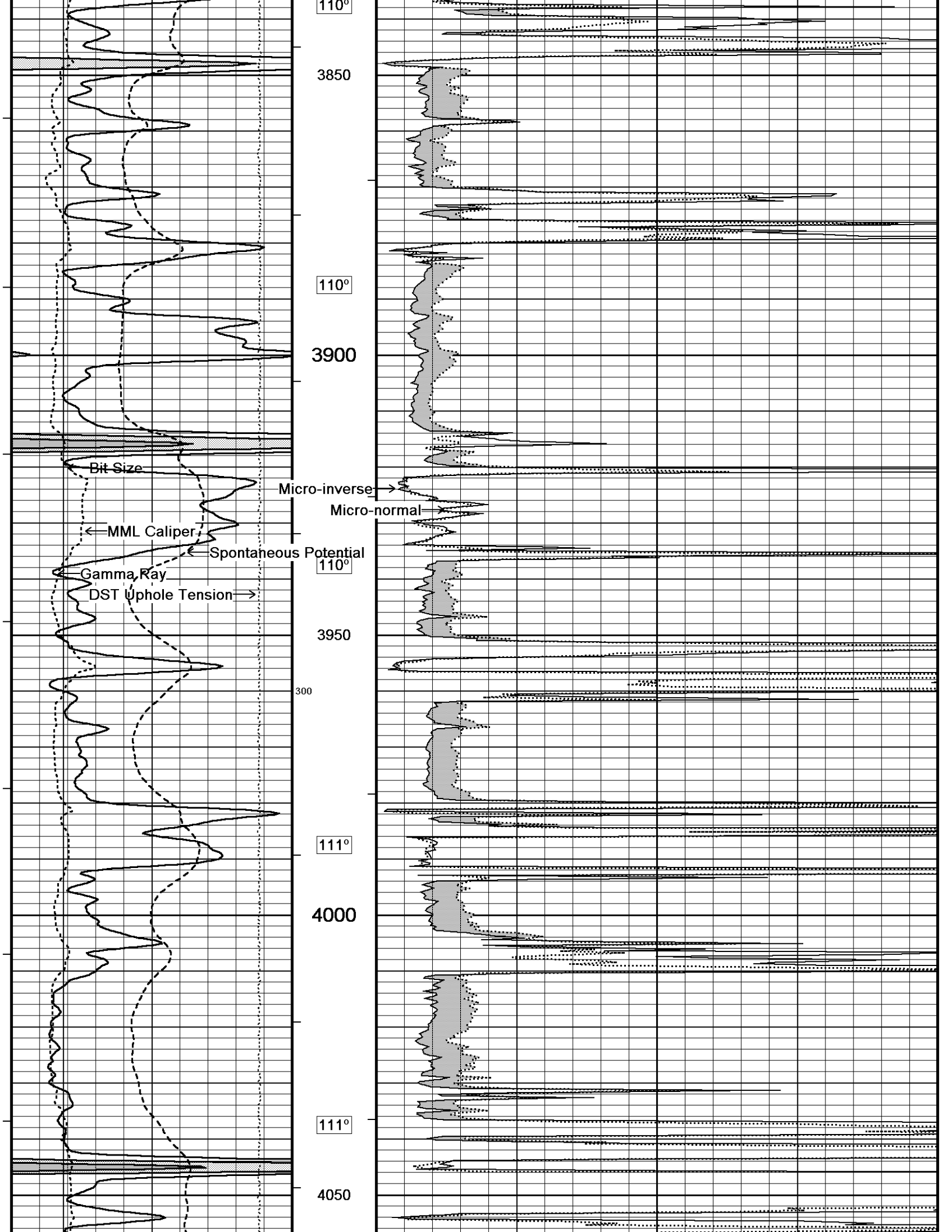
- OPERATORS: KEN RINEHART, TROWDY DICKENS

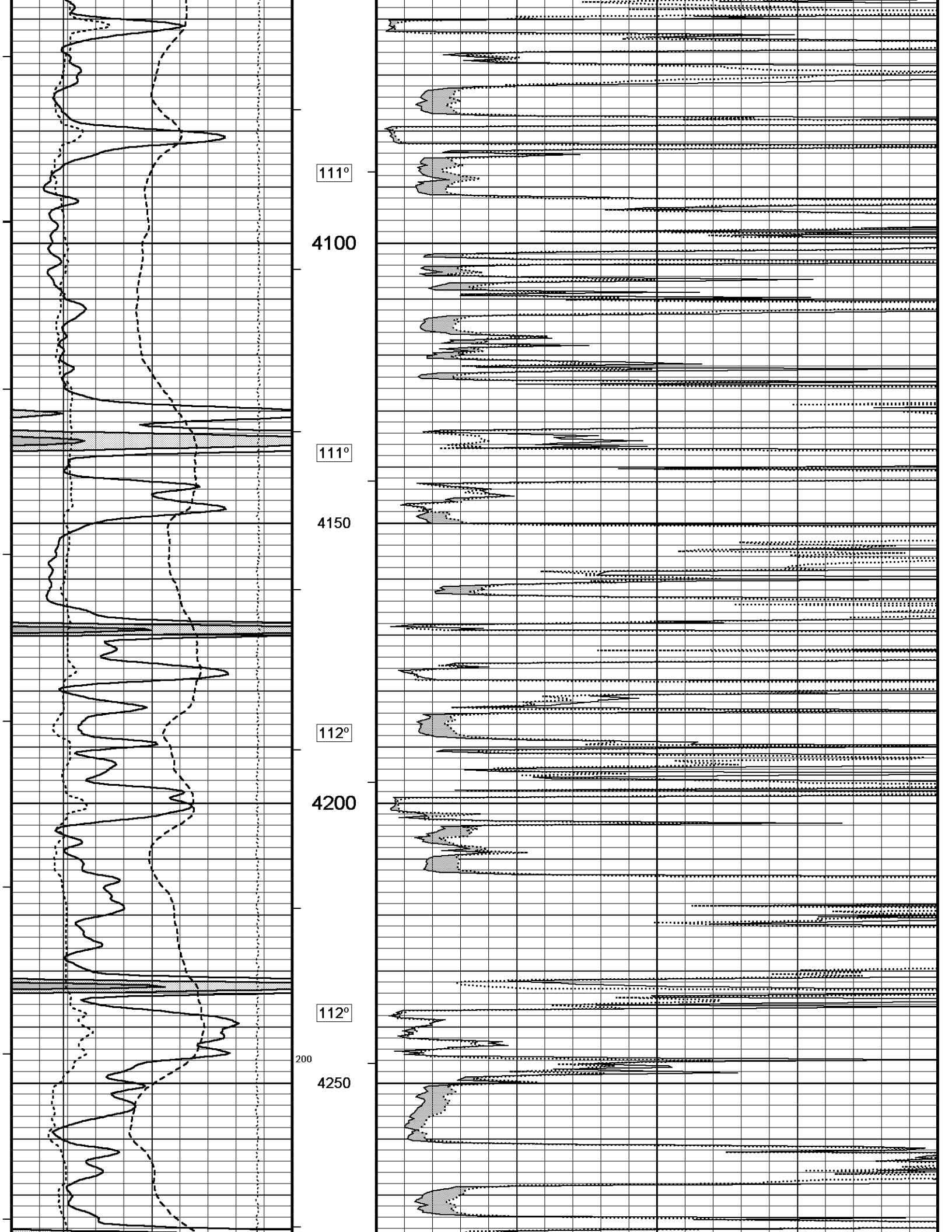
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

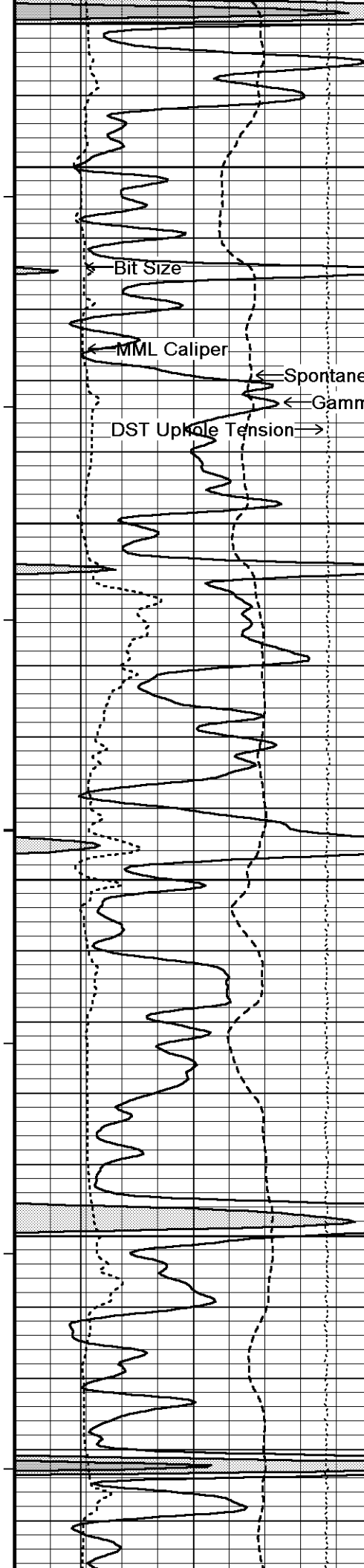
5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 15-JAN-2014 09:02
Filename: C:\Minimus 13.05.9583\Log\Grand Mesa BFF #1-35\Grand Mesa BFF #1-35 Main.dta
Recorded on 15-JAN-2014 05:07
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

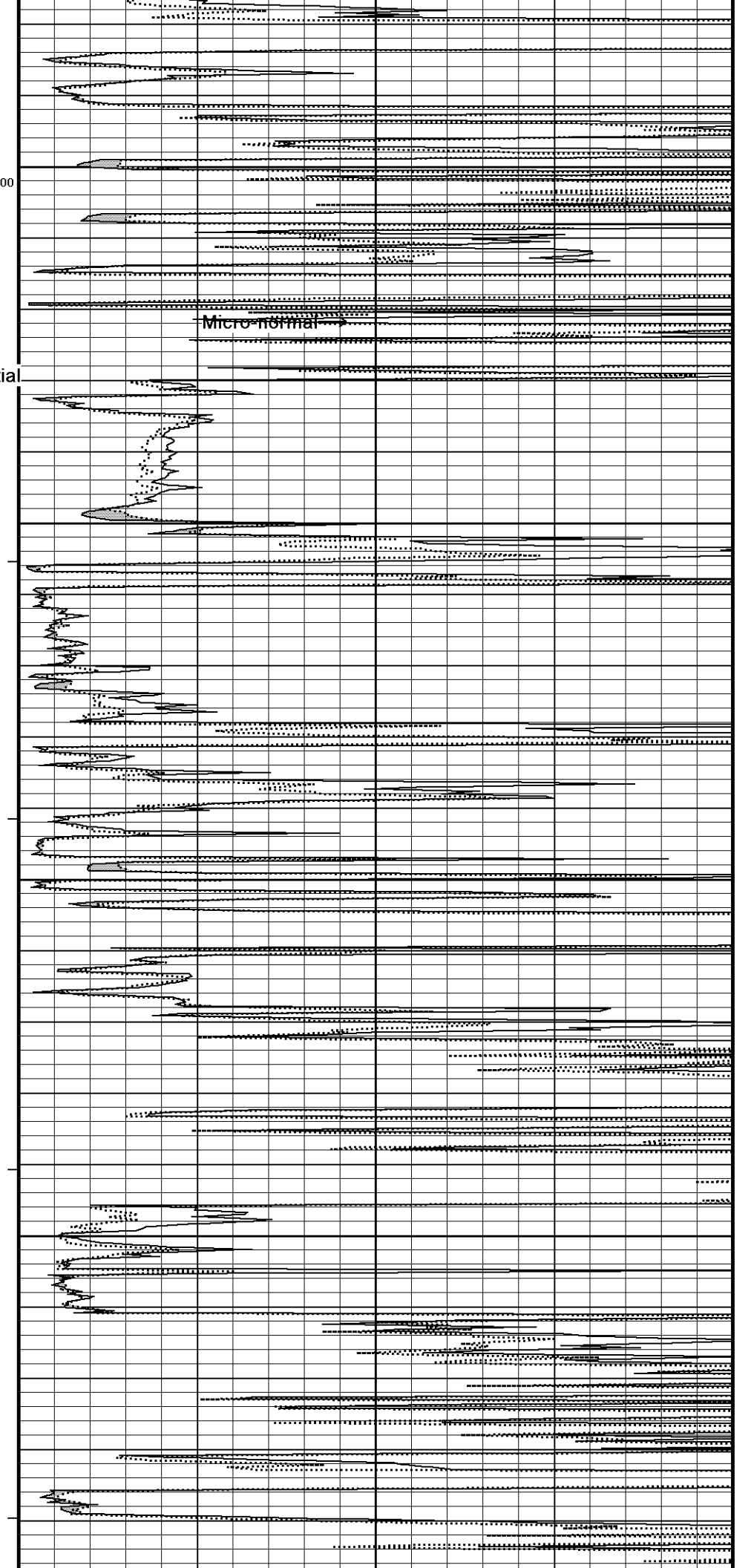




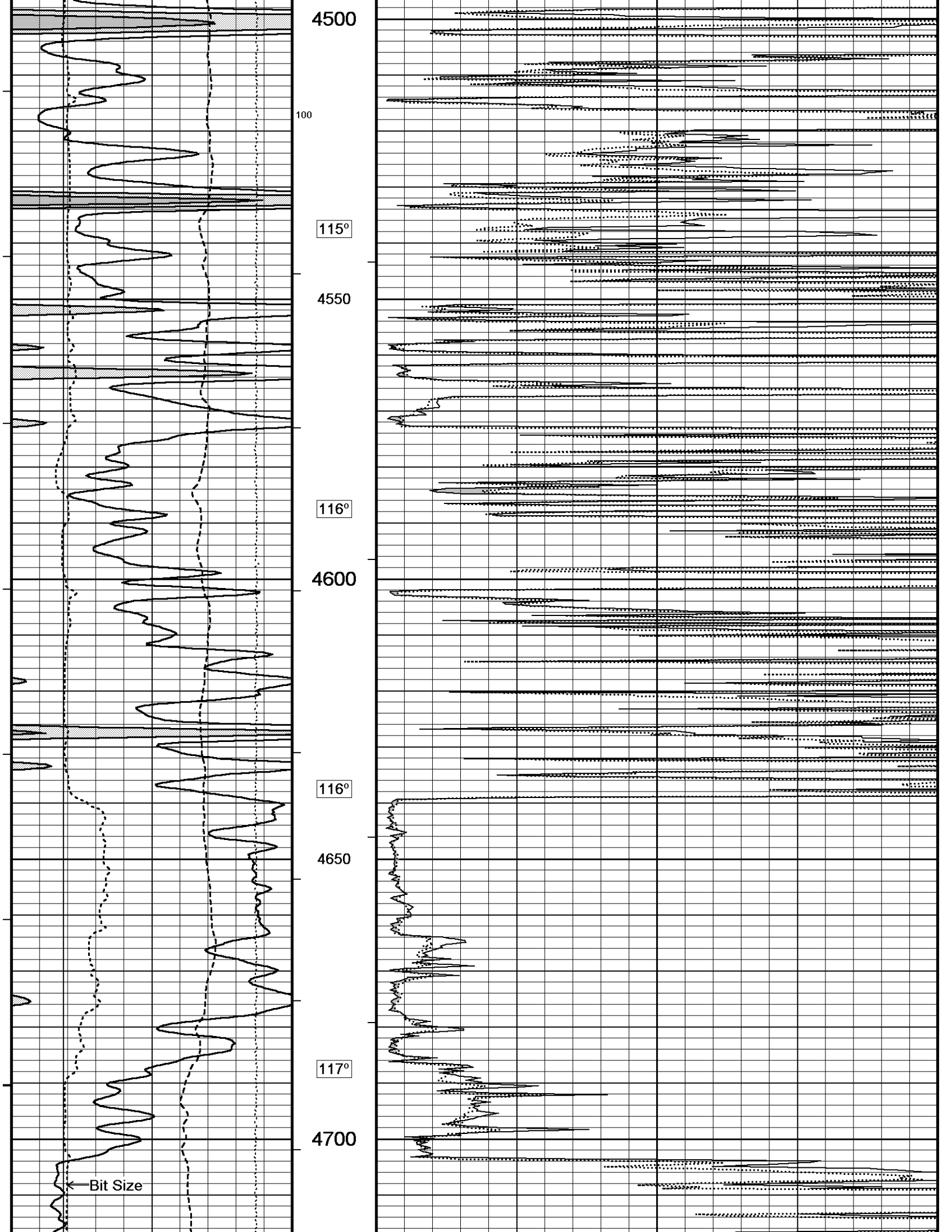


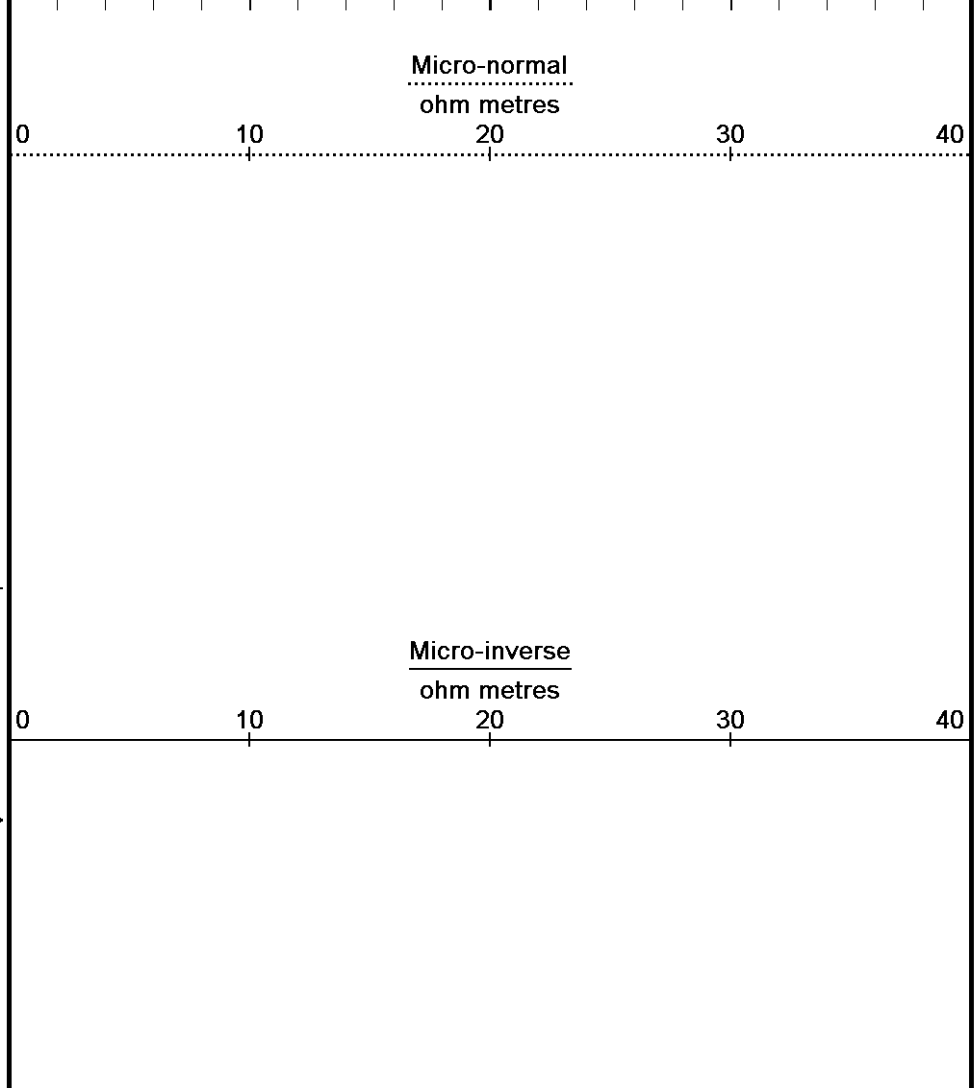
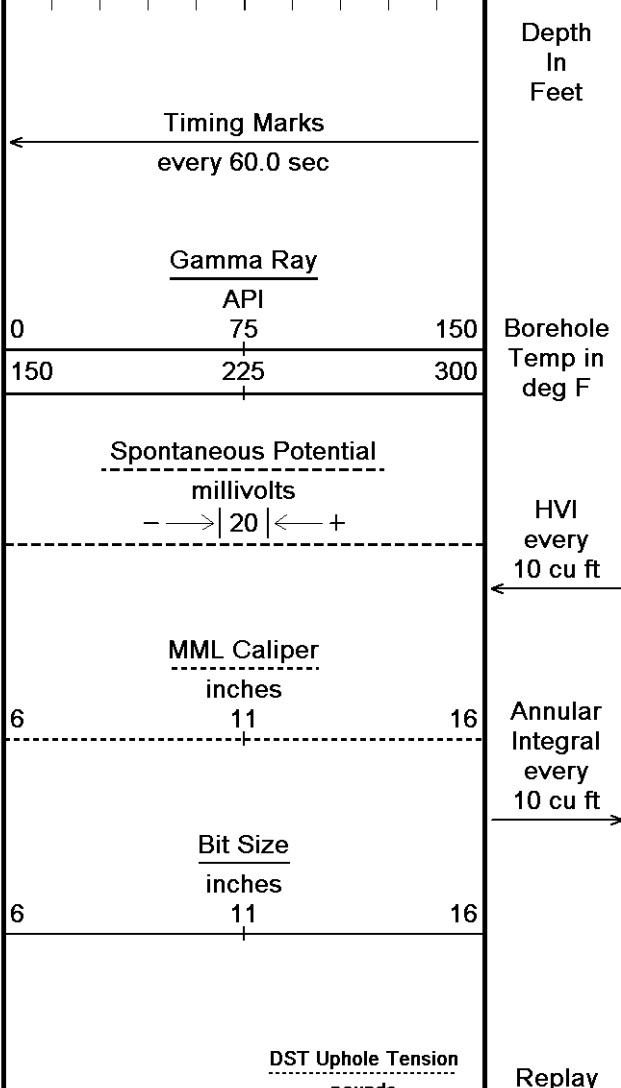
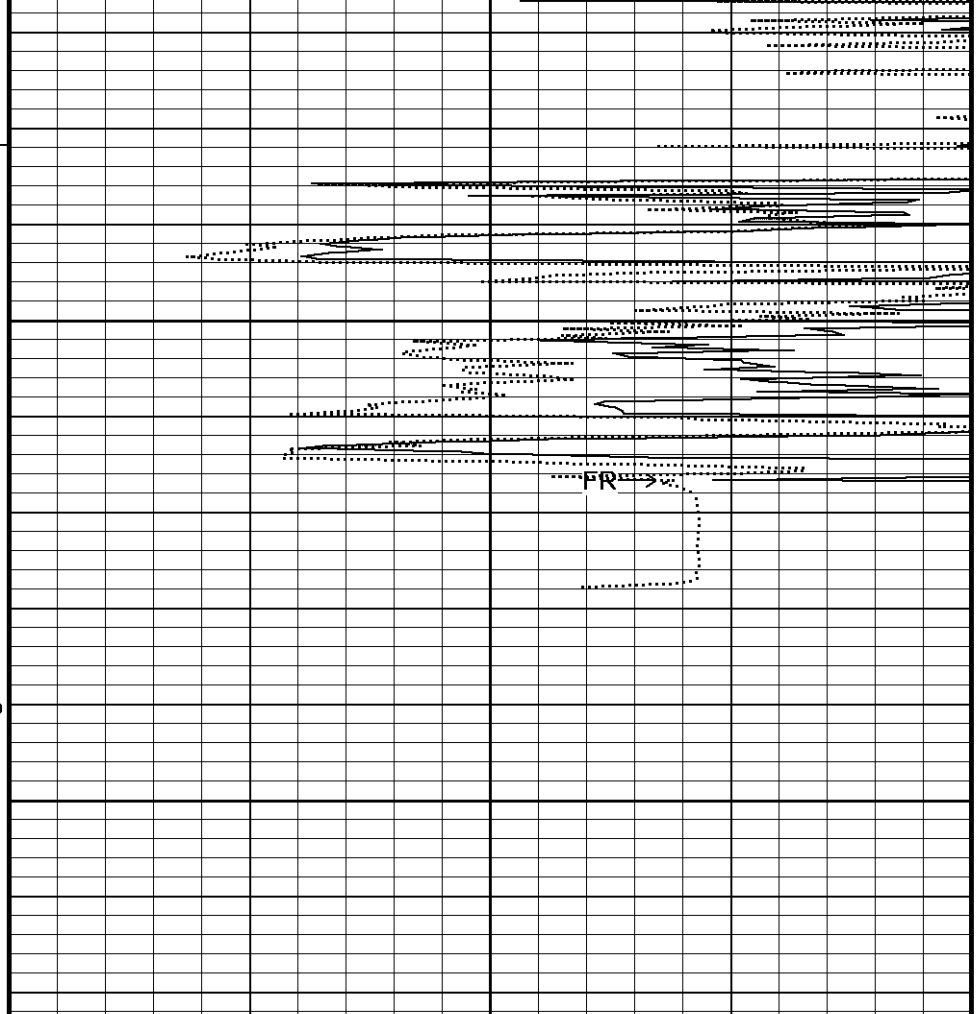
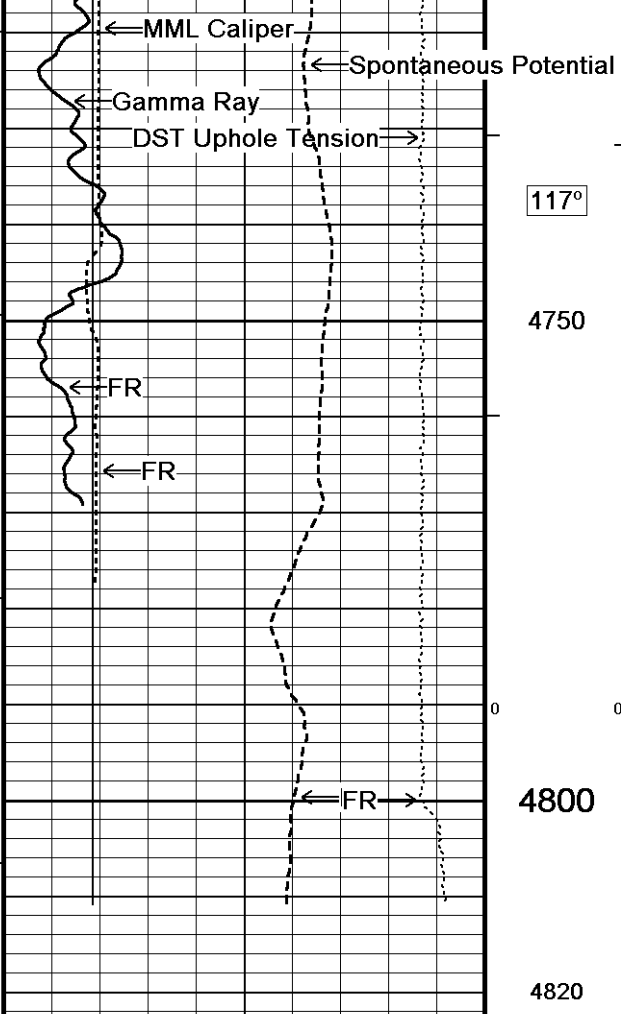


113°
4300
100
113°
4350
113°
4400
114°
4450
114°



Micro-normal





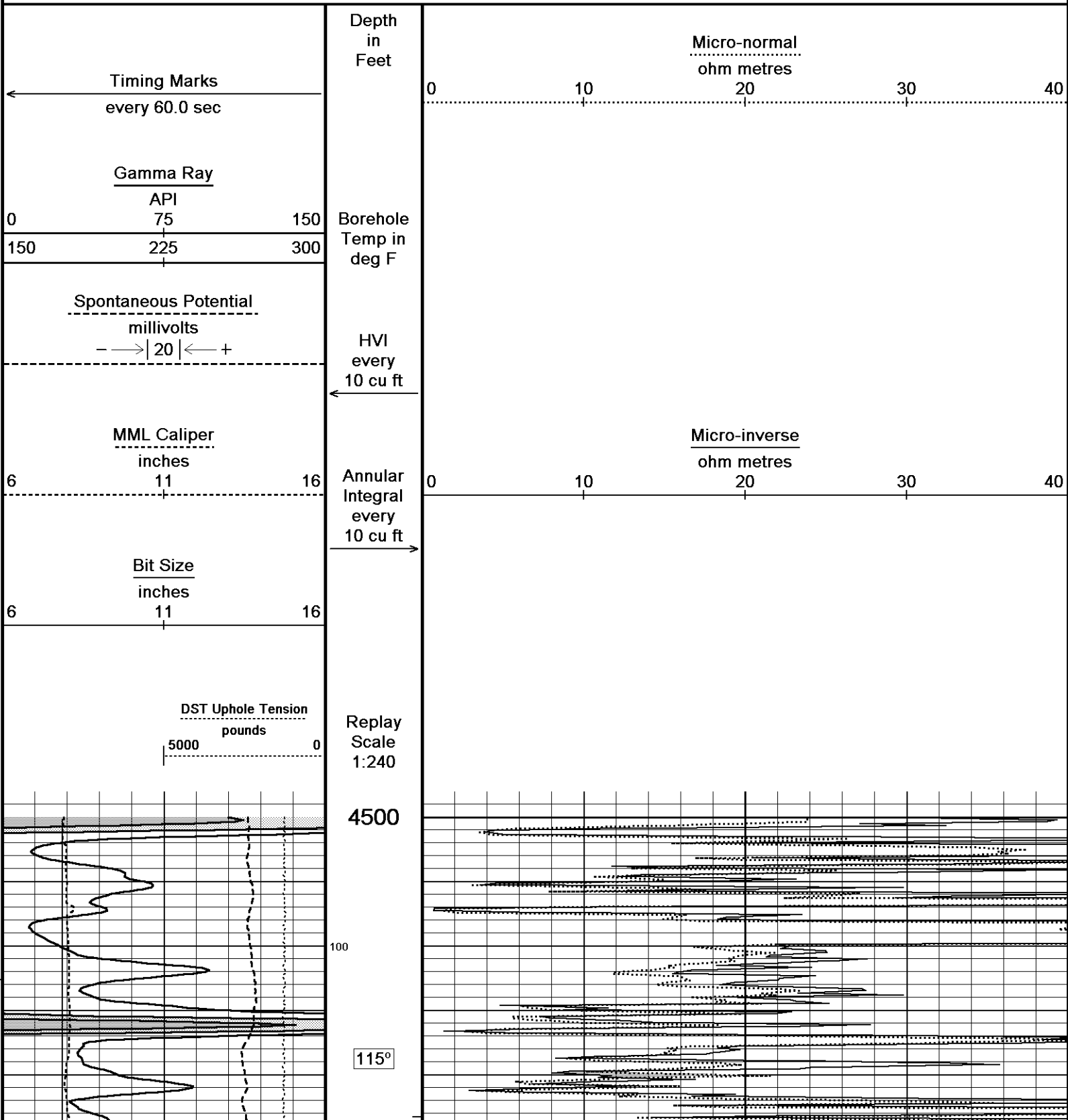
5000 0
Scale
1:240

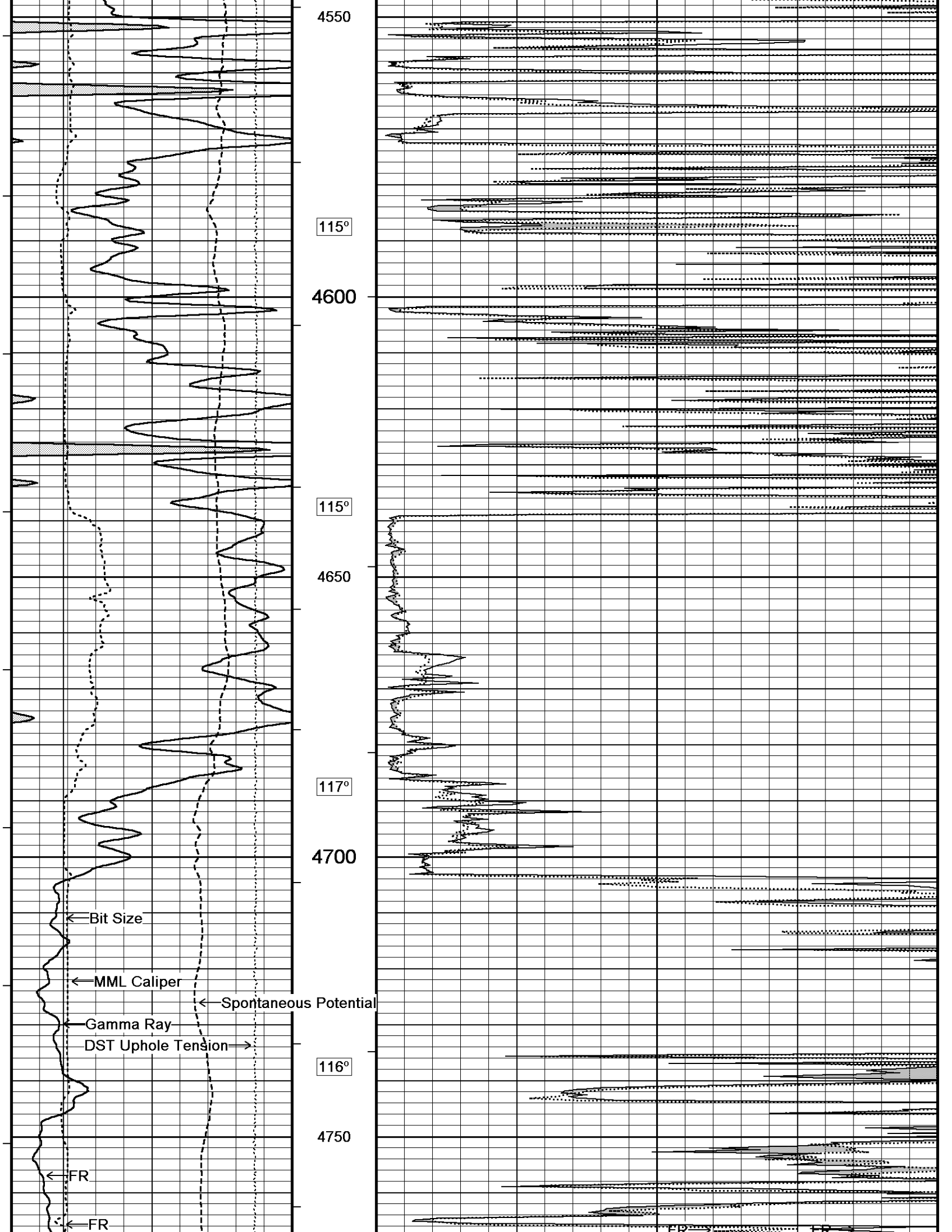
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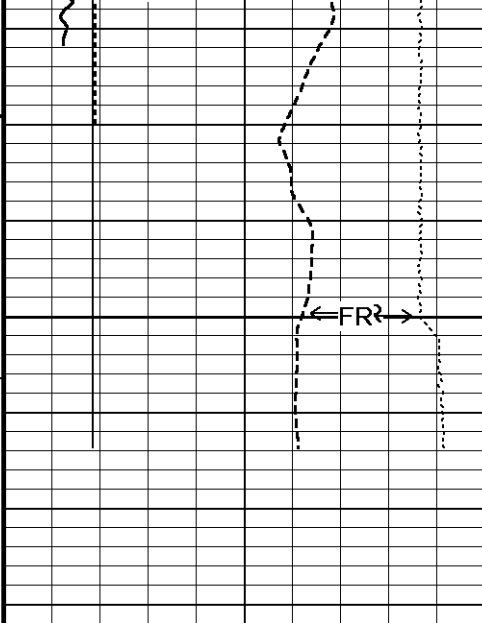
↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 15-JAN-2014 09:02
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 Recorded on 15-JAN-2014 04:44
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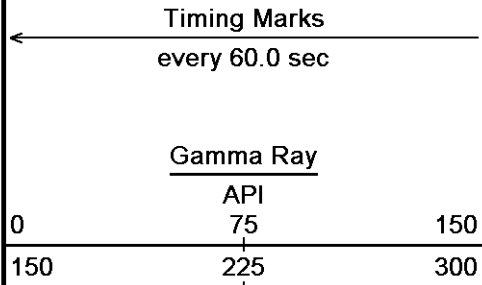




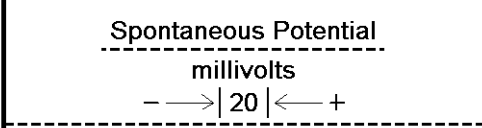


4800

4830
Depth
in
Feet

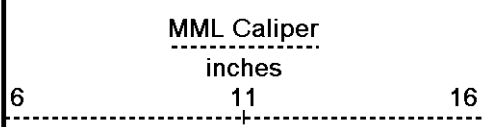


Borehole
Temp in
deg F



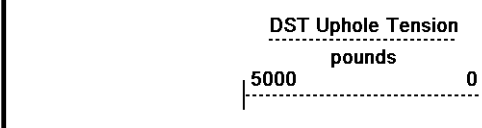
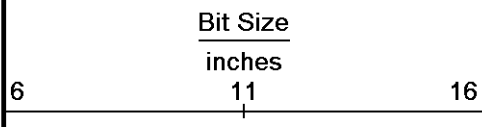
HVI
every
10 cu ft

←

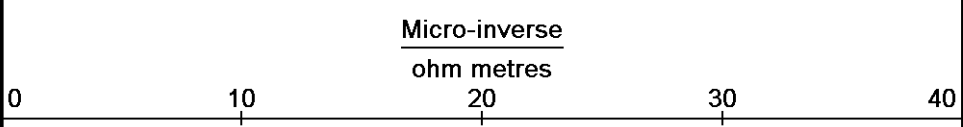
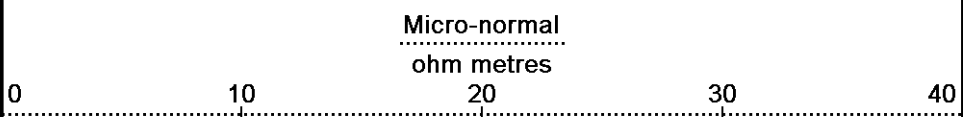
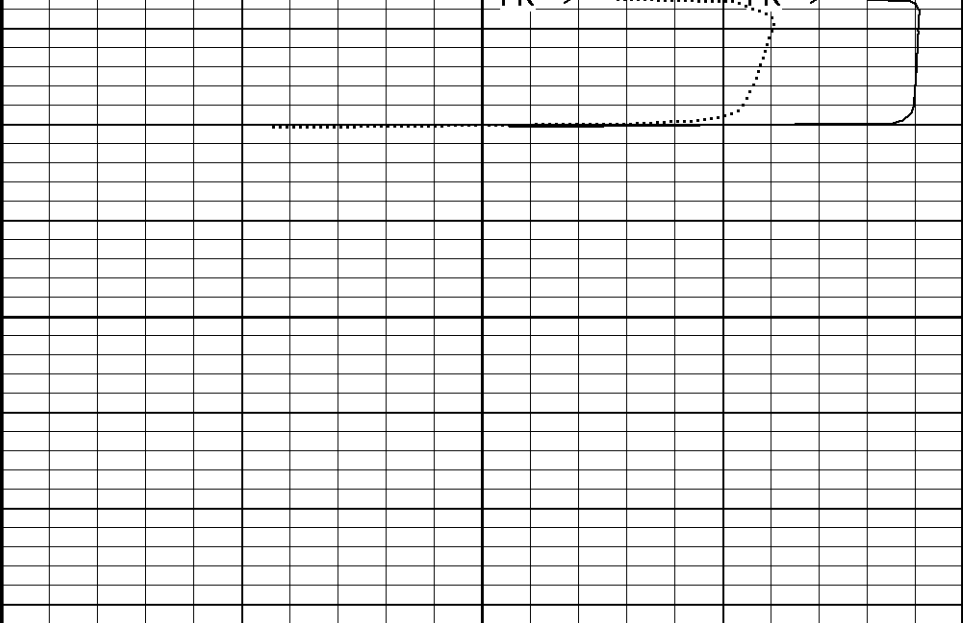


Annular
Integral
every
10 cu ft

→



Replay
Scale
1:240



Depth Based Data - Maximum Sampling Increment 10.0cm
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↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 13.05.9583\Log\Grand Mesa BFF #1-35\Grand Mesa BFF #1-35 Main.dta

General Parameters

Mud Resistivity	0.880	ohm-metres
Mud Resistivity Temperature	77.800	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	None	

Rwa Parameters

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

Gamma Calibration MCG-D.K 469

Field Calibration on 13-JAN-2014 14:21

	Measured	Calibrated (API)
Background	65	43
Calibrator (Gross)	1158	768
Calibrator (Net)	1093	725

Gamma Constants MCG-D.K 469

Last Edited on 15-JAN-2014,03:13

Gamma Calibrator Number	GRC38	
Mud Density	1.12	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-D.K 469

Field Calibration on 11-JAN-2014,16:37

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-D.K 469

Last Edited on 11-JAN-2014,16:37

Pre-filter Length	11
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Caliper Calibration MML-A 3

Base Calibration on 30-DEC-2013 11:54
Field Calibration on 13-JAN-2014 14:15

Base Calibration	Measured	Calibrator Size (in)
Reading No		
1	14864	5.98
2	18053	7.97
3	21223	9.86
4	25163	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.93	7.97

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 30-DEC-2013 12:09
Field Check on 13-JAN-2014 14:13

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	60.2	5.0	25.0
Micro Inverse	15.7	78.4	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
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Micro Normal	62.9	62.9
Micro Inverse	48.2	48.2

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 14-JAN-2014,19:12

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-C.A 216

Base Calibration on 30-DEC-2013 16:06
 Field Calibration on 13-JAN-2014 14:07

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	16063	3.99
2	26074	5.98
3	36080	7.97
4	45856	9.86
5	57120	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\Log\Grand Mesa BFF #1-35\Grand Mesa BFF #1-35 Main.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-D.K 469 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

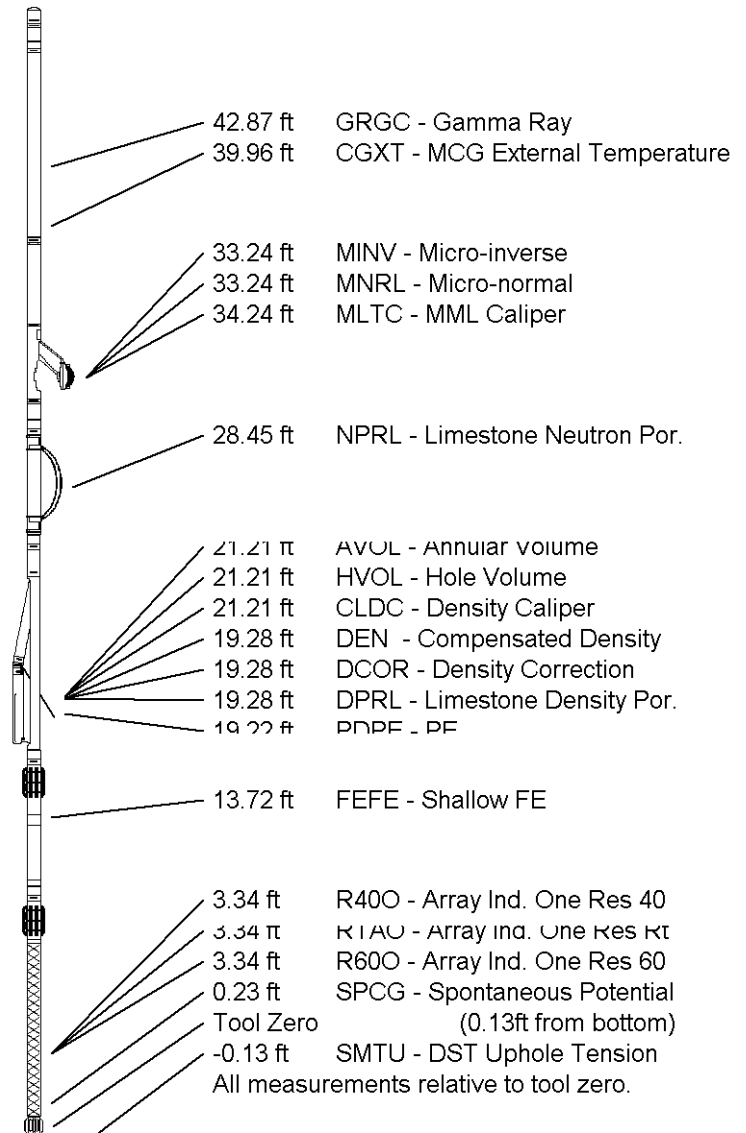
Compact Neutron
 MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
 MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focused Electric
 MFE-B.J 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

Total Length: 49.73 ft Weight: 399.0 lb



COMPANY	GRAND MESA OPERATING
WELL	BFF #1-35
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2979.00	feet	First Reading	4765.76	feet
Elevation Drill Floor	2977.00	feet	Depth Driller	4800.00	feet
Elevation Ground Level	2970.00	feet	Depth Logger	4800.00	feet



MICRORESISTIVITY LOG

Weatherford[®]