



Weatherford

MICRORESISTIVITY LOG

COMPANY				GRAND MESA OPERATING COMPANY			
WELL				SHOOK #1-29			
FIELD				WILDCAT			
PROVINCE/COUNTY				WASHINGTON			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				2187' FNL & 1188' FEL			
SEC 29	TWP 2S	RGE 52W	Other Services		MPD/MDN		
Latitude	39.85123		MAI/MFE				
Longitude	-103.22386		MSS				
API Number	05-121-11048						
Permanent Datum GL, Elevation 4827 feet					Elevations:		
Log Measured From KB					KB 4833.00		
Drilling Measured From KB @ 6 FEET					DF 4831.00		
					GL 4827.00		
Date	06-JUN-2015						
Run Number	ONE						
Service Order	7606-120707644						
Depth Driller	4730.00				feet		
Depth Logger	4724.00				feet		
First Reading	4678.24				feet		
Last Reading	3300.00				feet		
Casing Driller	519.00				feet		
Casing Logger	521.00				feet		
Bit Size	7.875				inches		
Hole Fluid Type	CHEMICAL						
Density / Viscosity	8.70 lb/USg		40.00 CP				
PH / Fluid Loss	8.00		8.00 ml/30Min				
Sample Source	MUD PIT						
Rm @ Measured Temp	2.90 @ 75.0		ohm-m				
Rmf @ Measured Temp	2.32 @ 75.0		ohm-m				
Rmc @ Measured Temp	3.40 @ 75.0		ohm-m				
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	1.66 @133.0		ohm-m				
Time Since Circulation	3 HOURS						
Max Recorded Temp	133.00		deg F				
Equipment / Base	13244		LIB				
Recorded By	BEN WELDIN						
Witnessed By	BOB SCHREIBER						
JOB #	LB15-088						

BOREHOLE RECORD					Last Edited: 06-JUN-2015 02:29
Bit Size inches		Depth From feet		Depth To feet	
7.875		519.00		4730.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	519.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 14.05.5335.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 2 X 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: 1400 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING FT: 710 CU.FT.

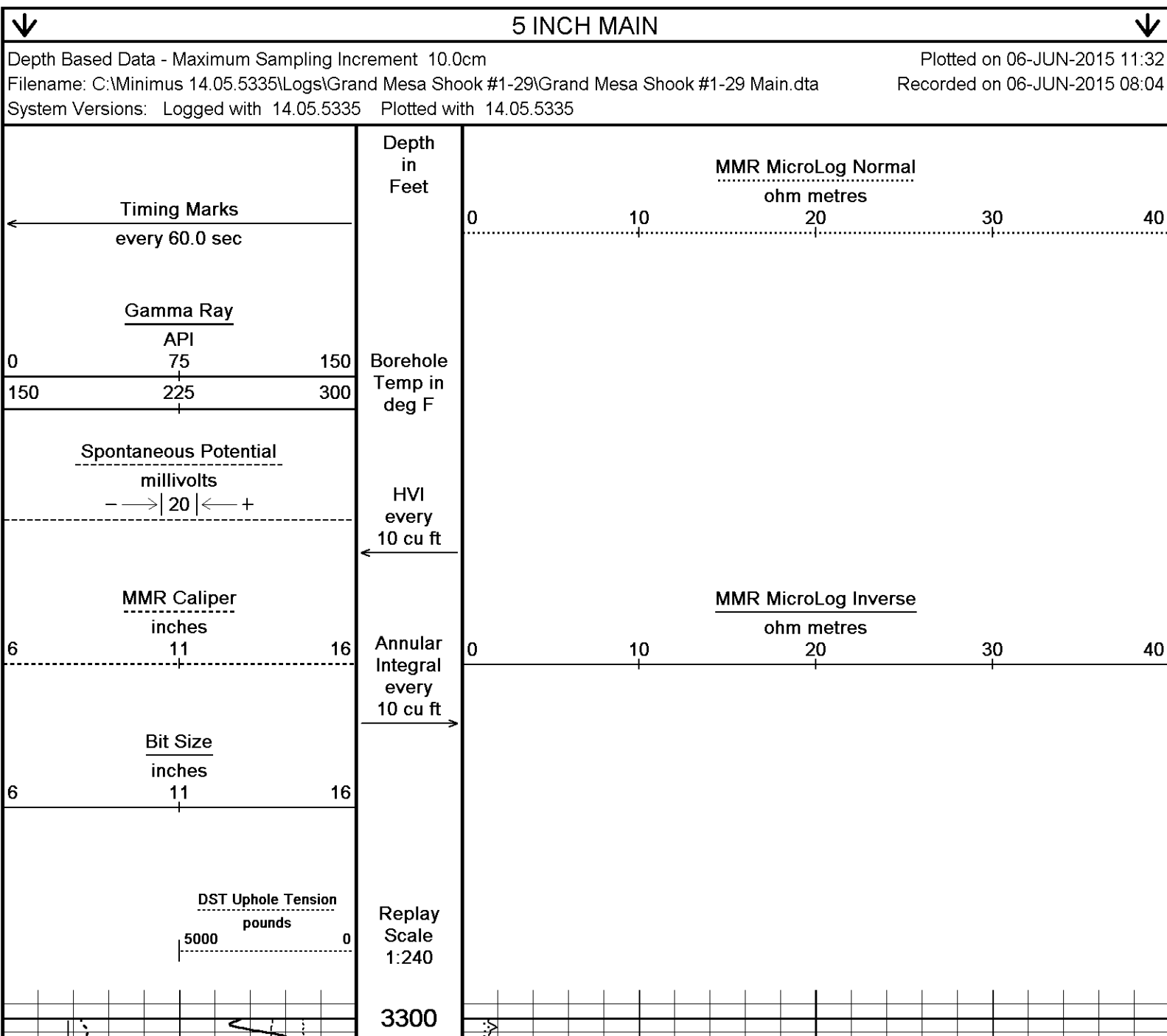
- RIG: EXCELL DRILLING RIG #10

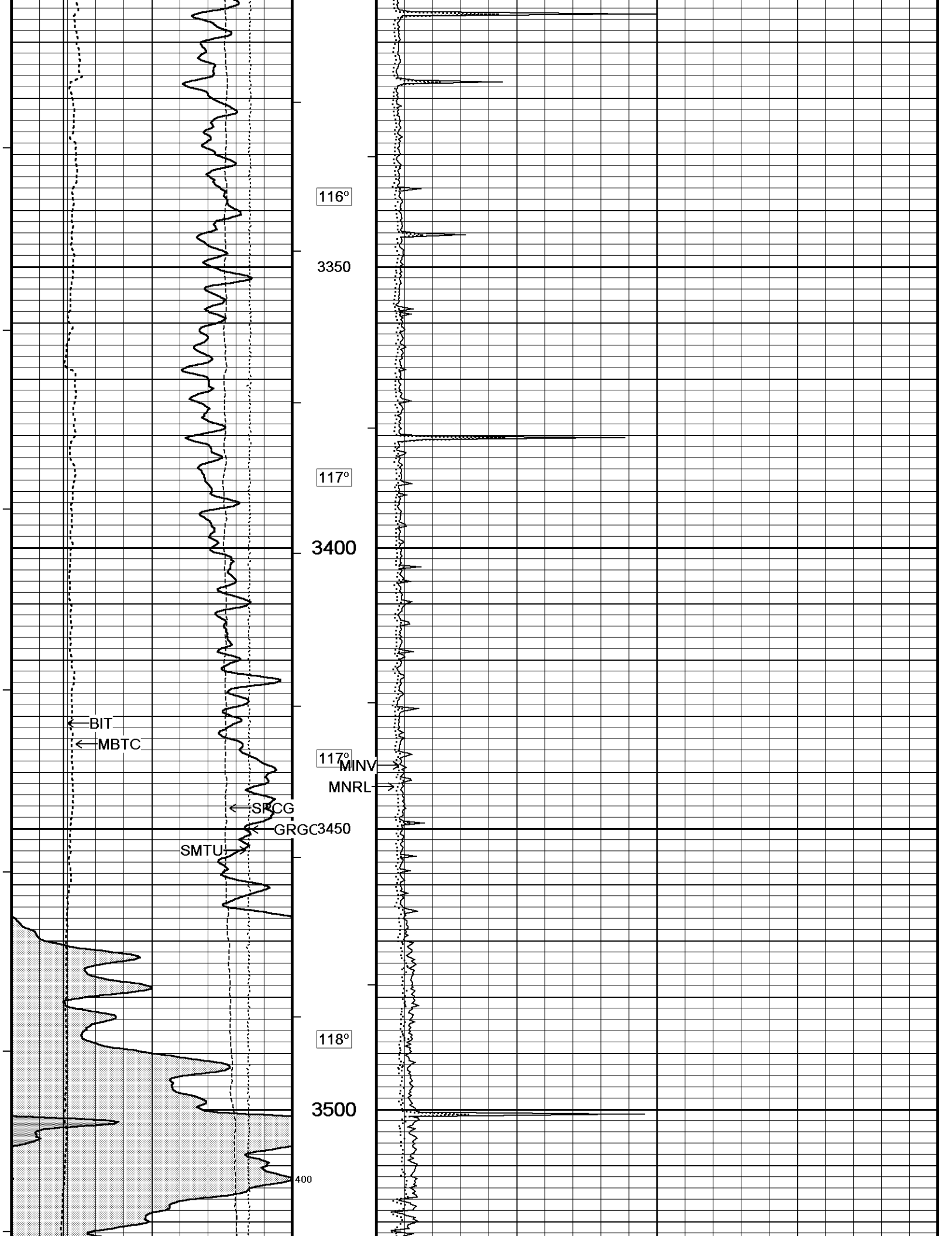
- ENGINEER: BEN WELDIN

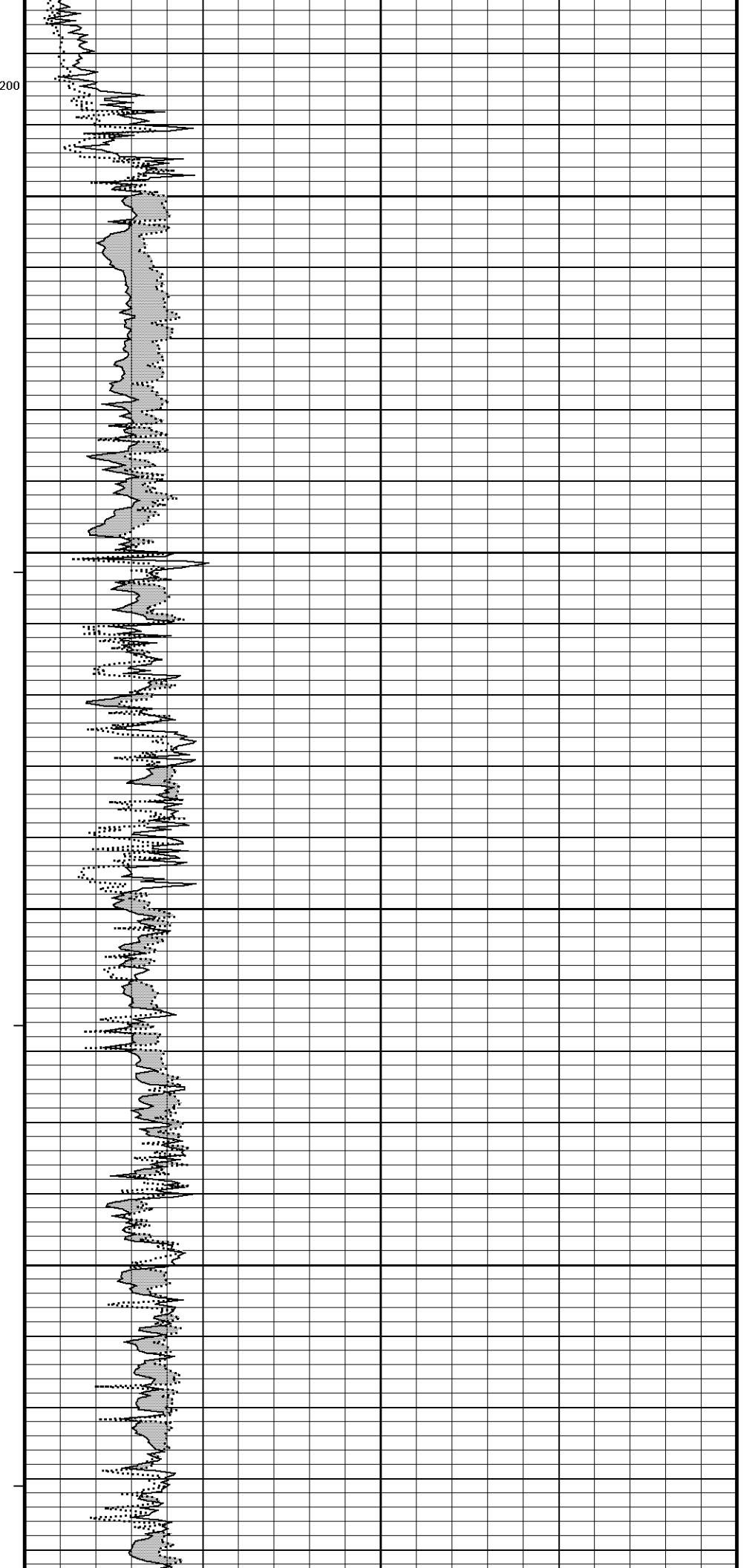
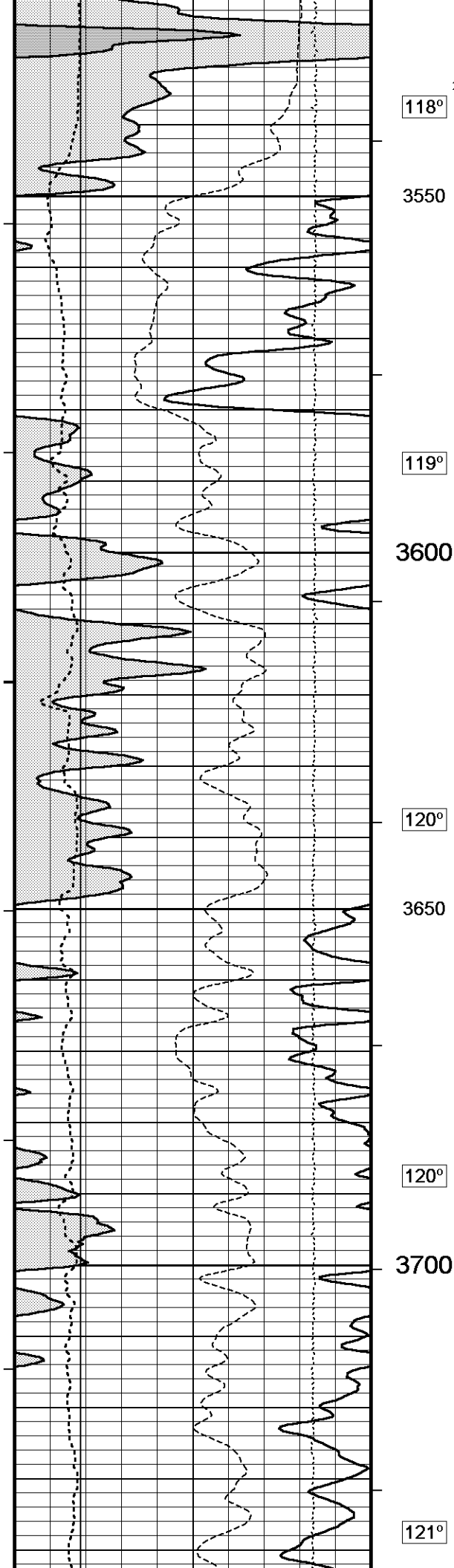
- OPERATOR: JOHN LAPOINT

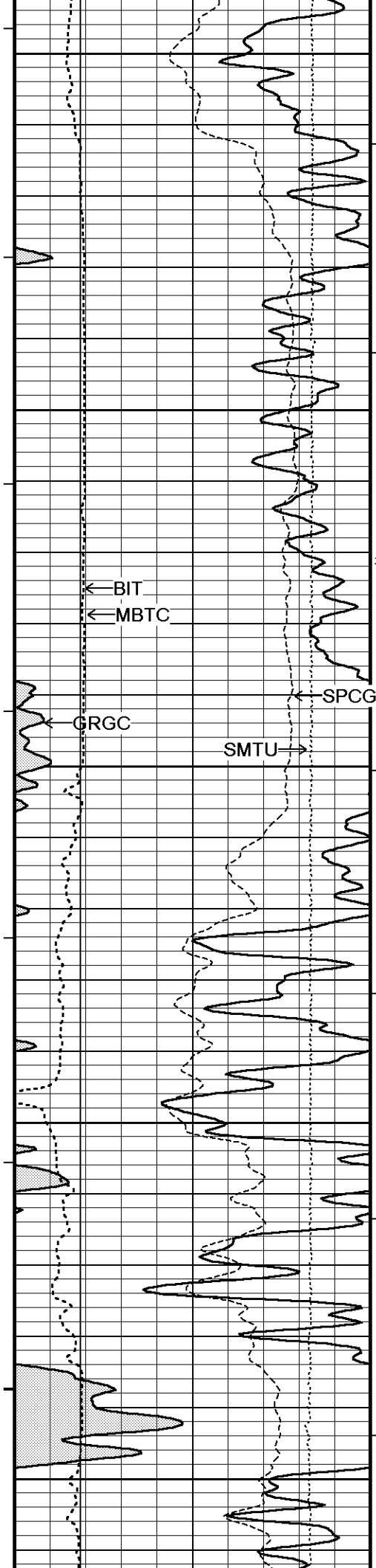
*** DIFFERENCE BETWEEN DRILLER TD AND LOGGER TD ASSUMED TO BE FROM FILL AS DISCUSSED WITH CLIENT.***

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.









3750

121°

3800

300

← BIT

← MBTC

← SPCG

SMTU →

← GRGC

122°

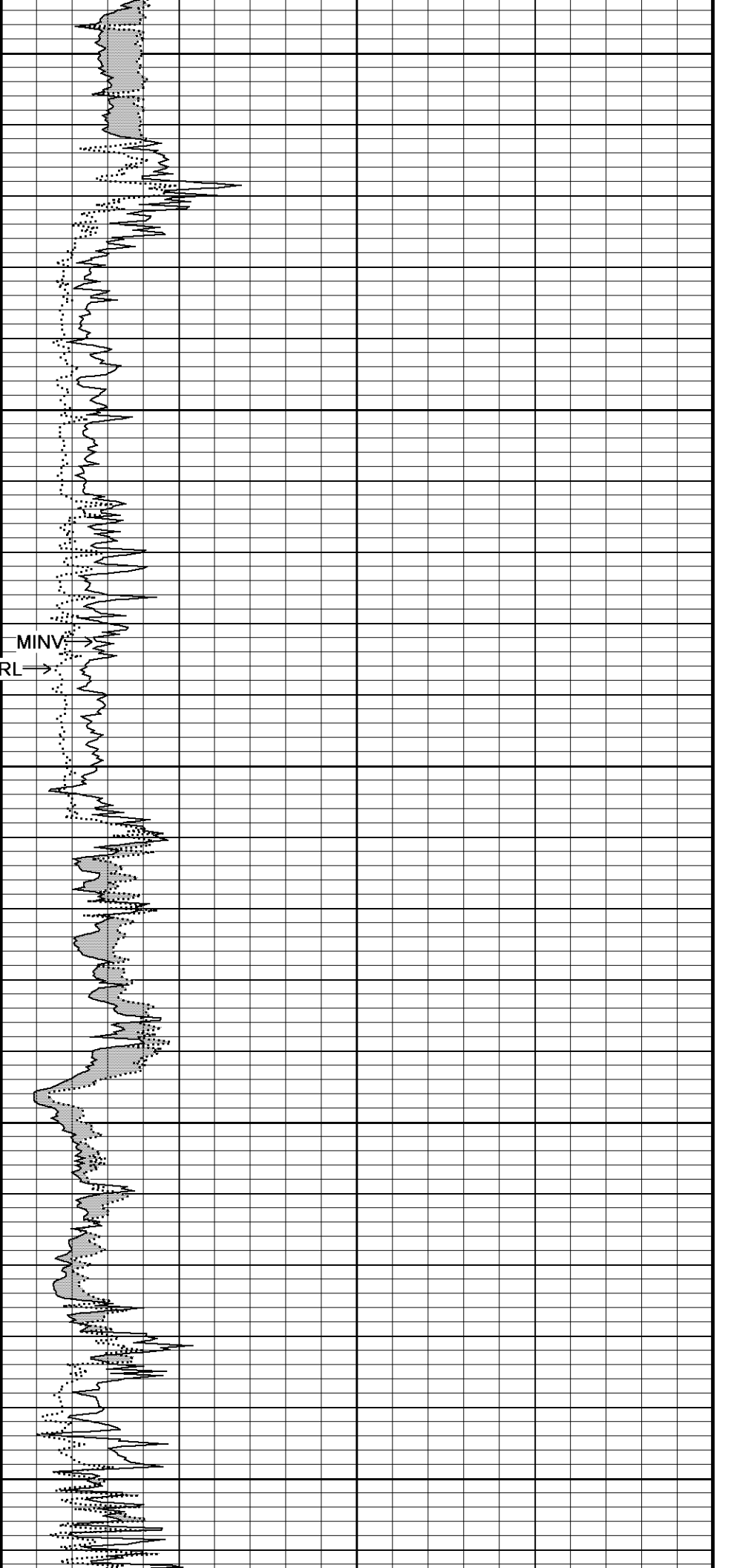
3850

122°

3900

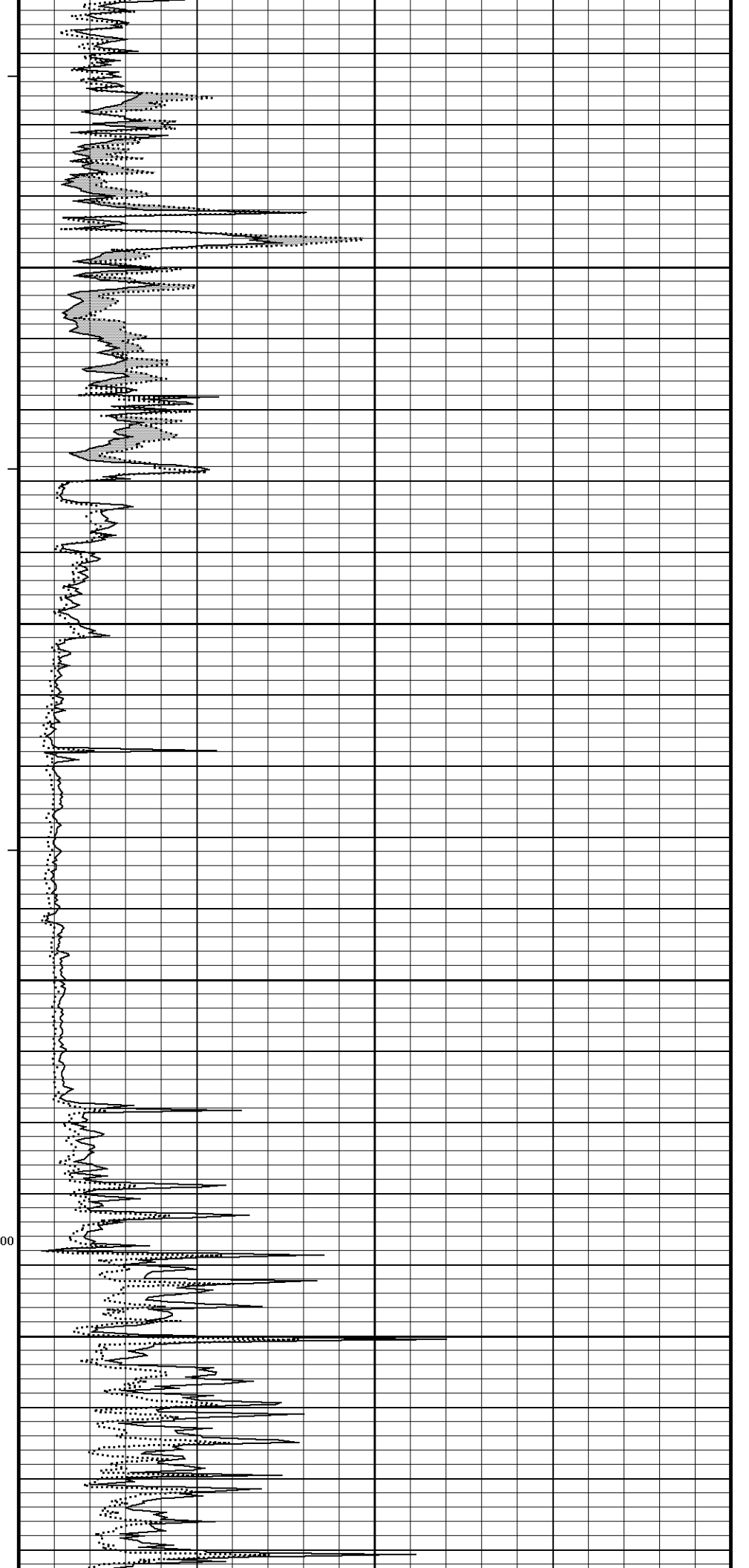
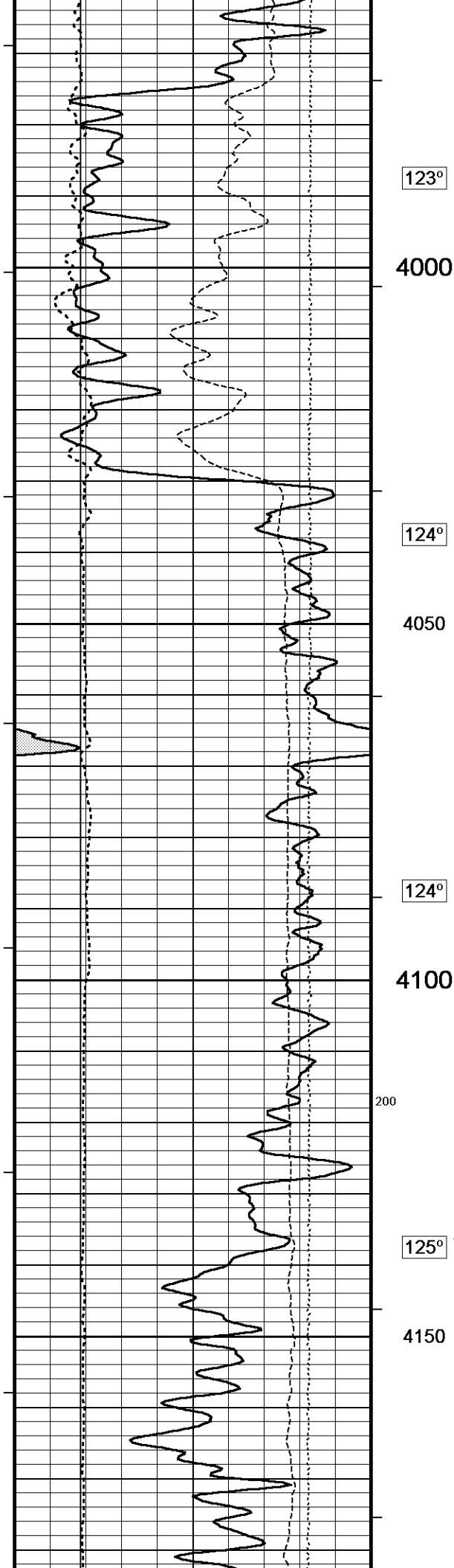
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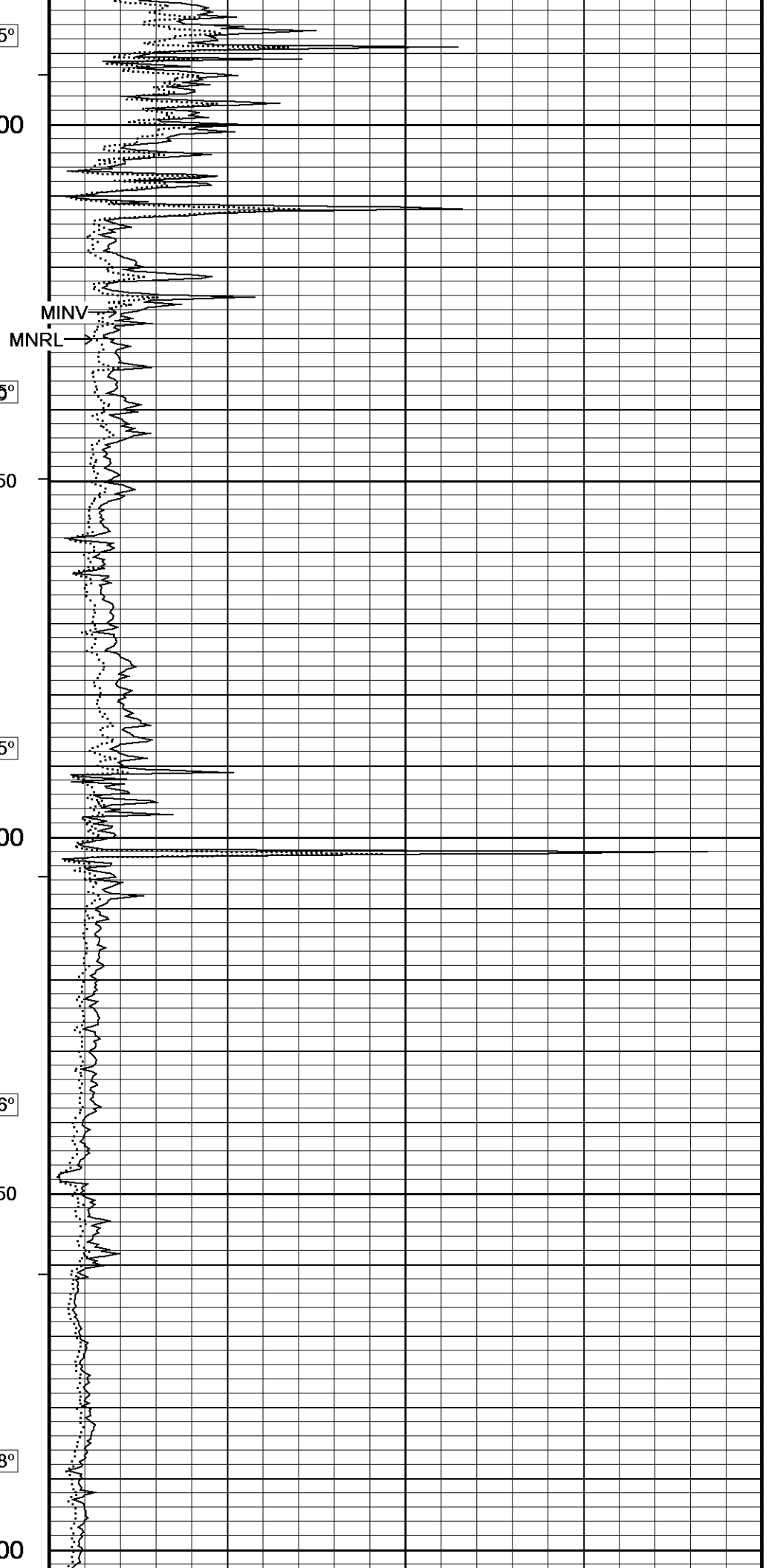
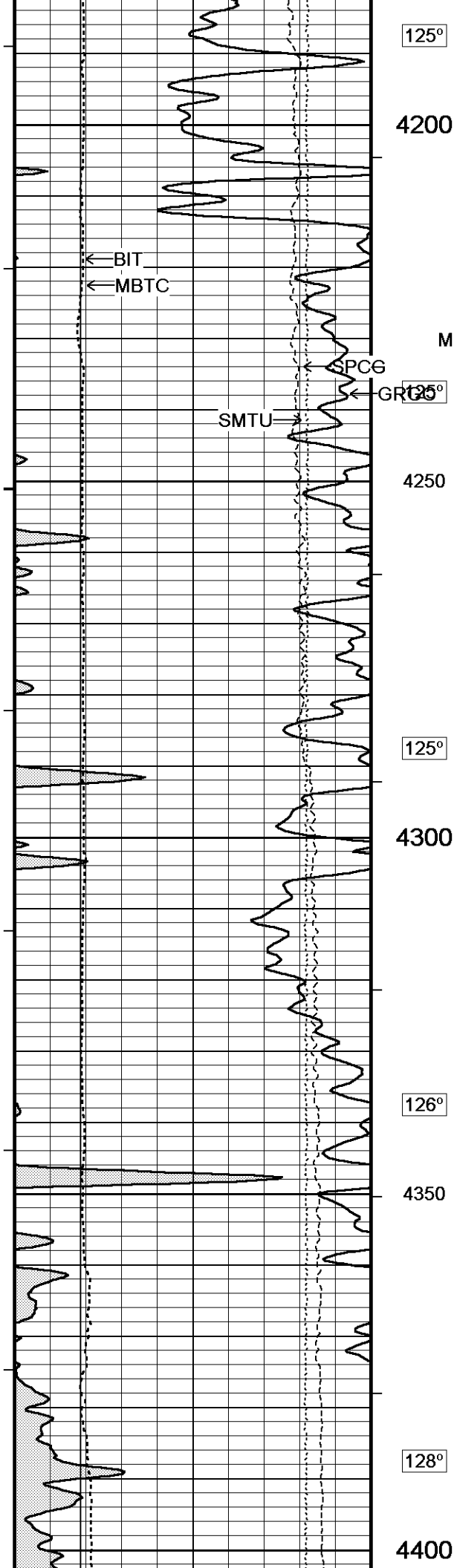
3950

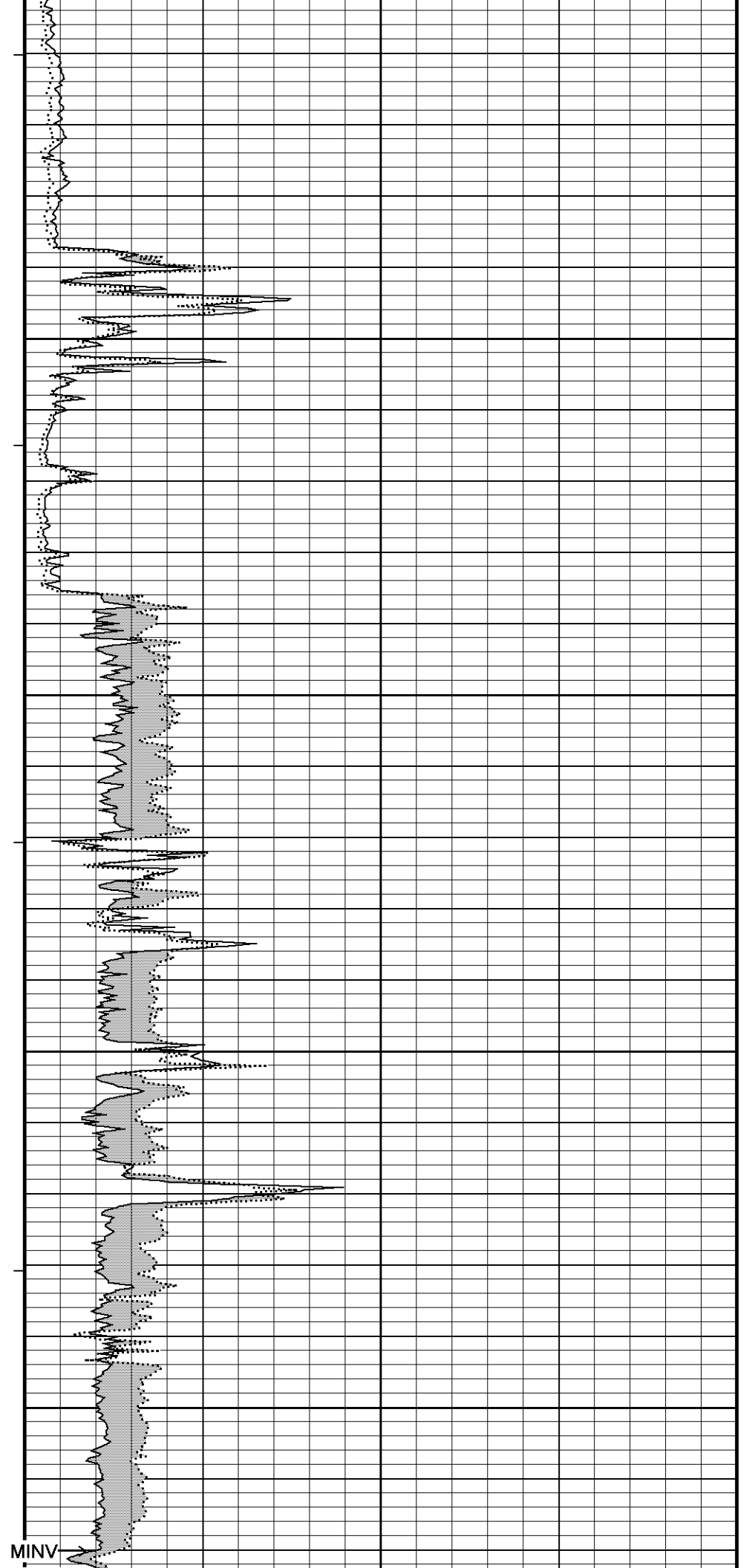
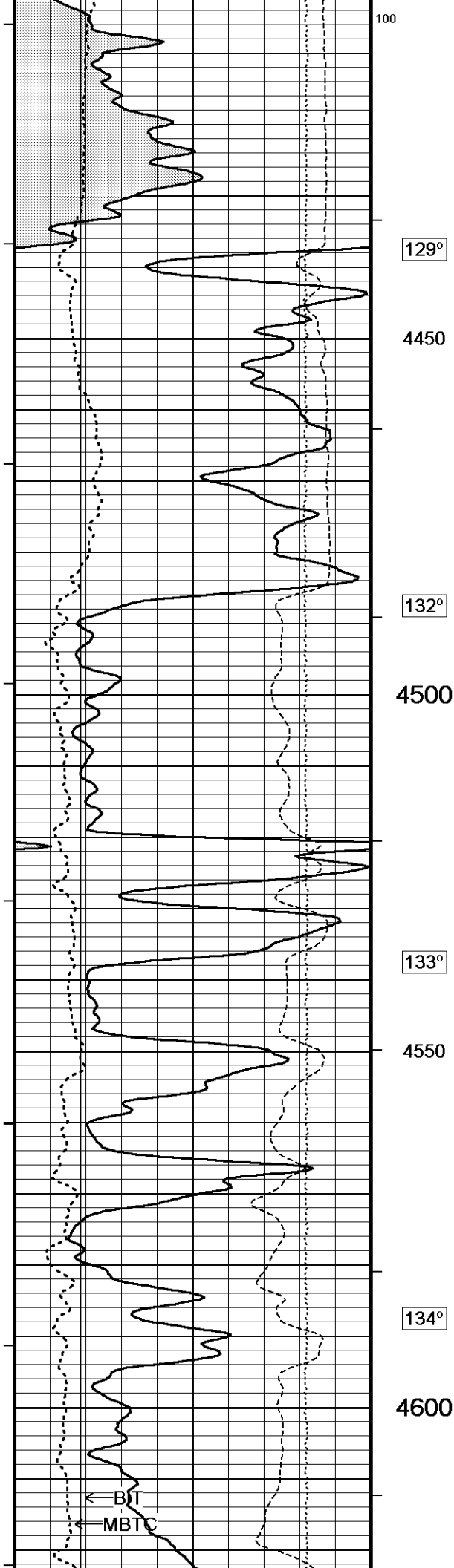


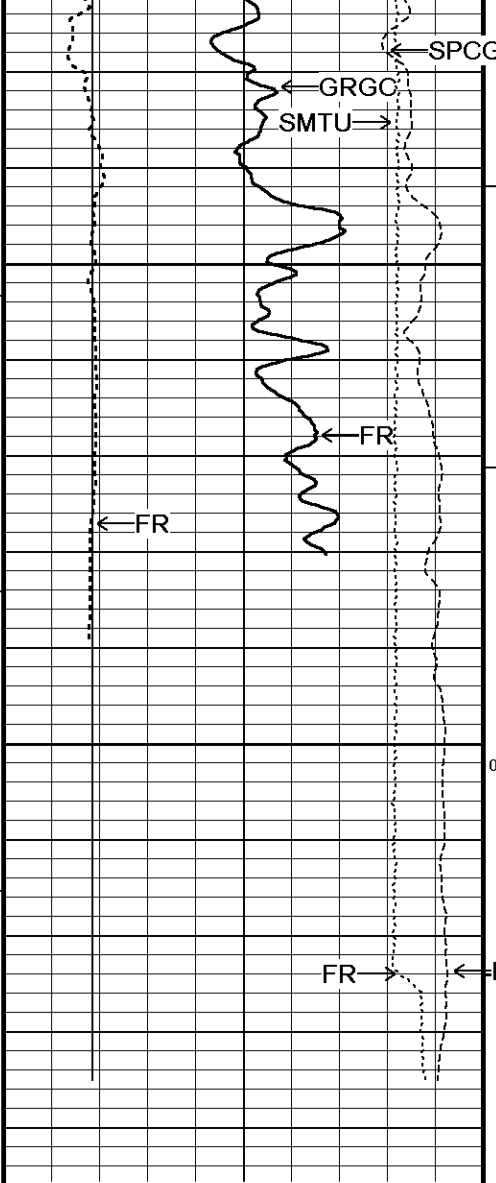
MINV

MNRL →

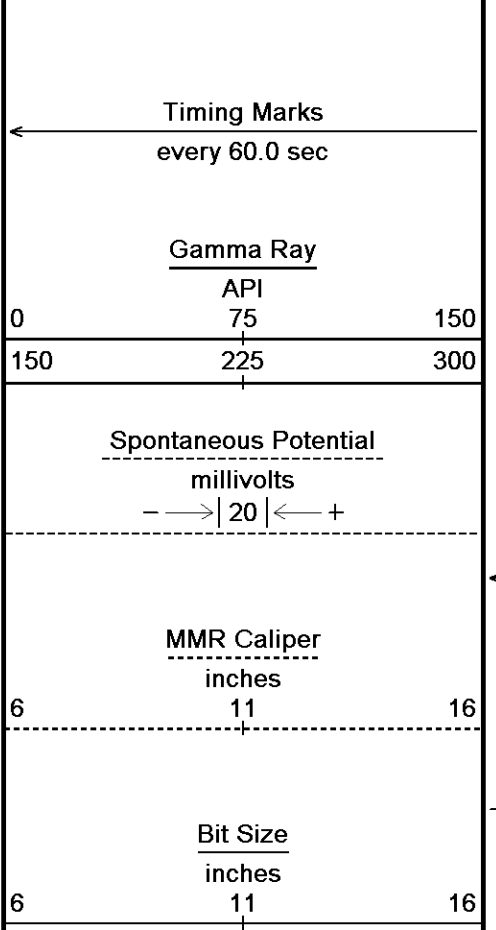
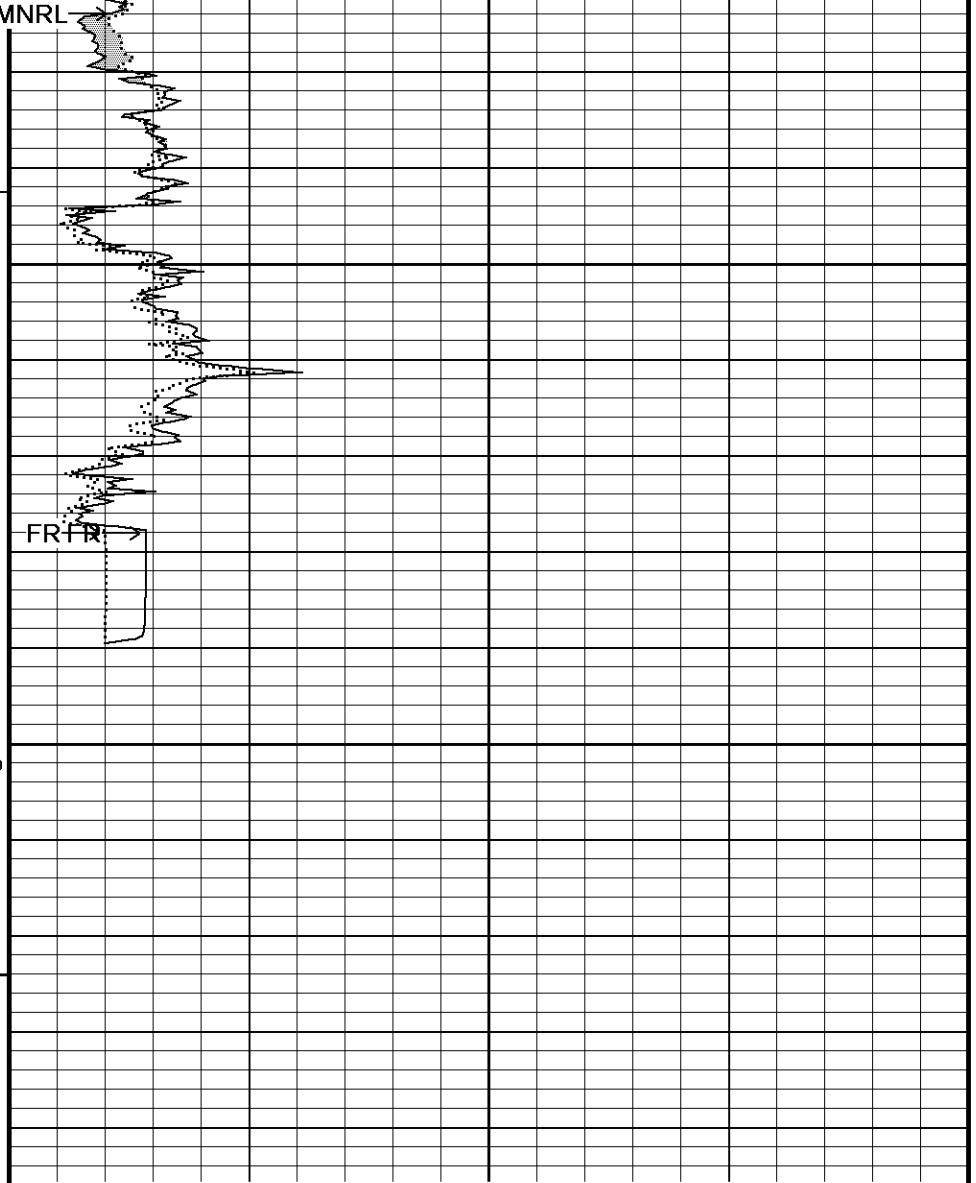




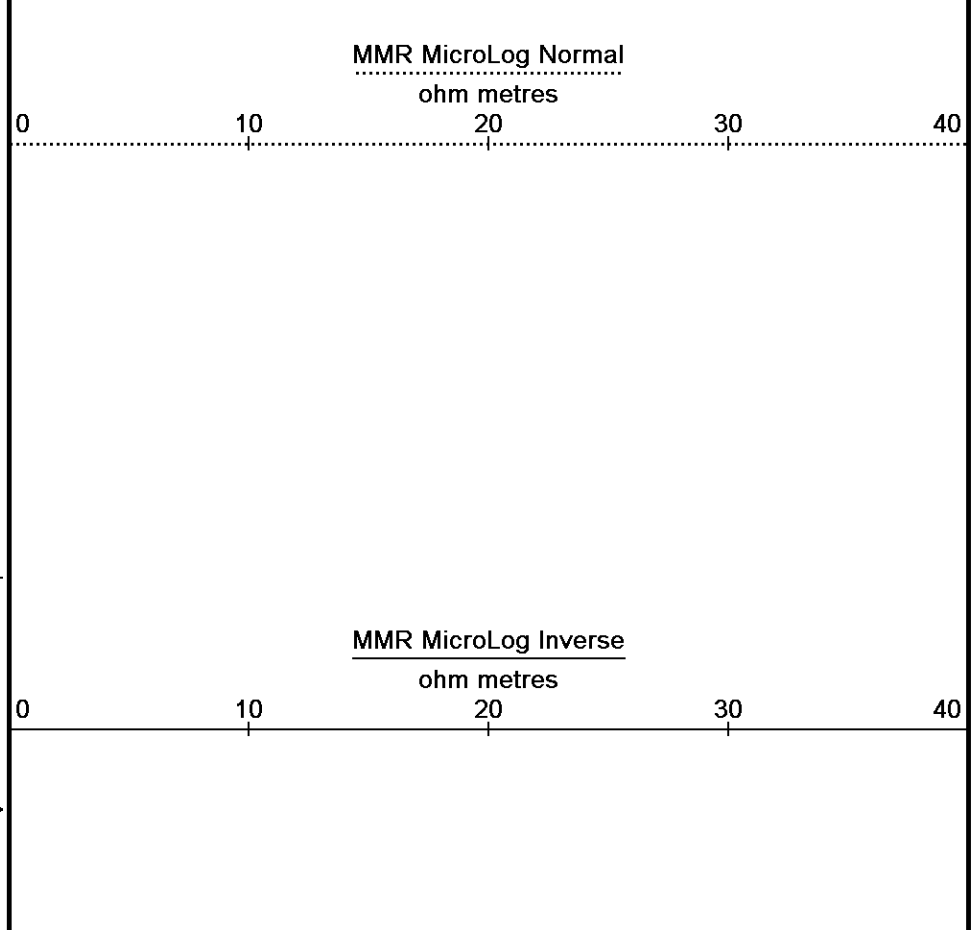




133°
4650
4700
0
FR TD



Depth
in
Feet
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft



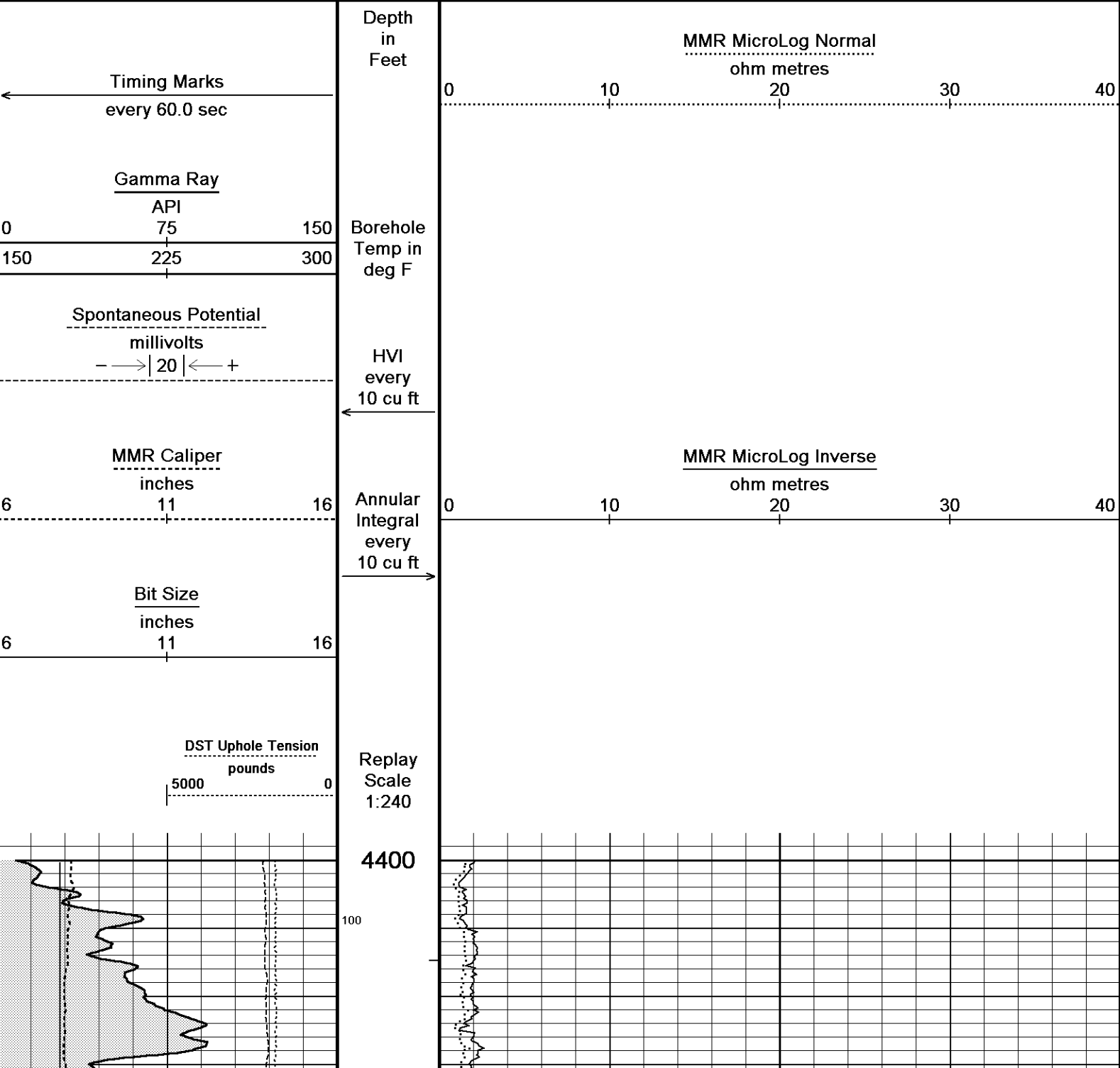
<u>DST Uphole Tension</u> pounds 5000 0	Replay Scale 1:240	
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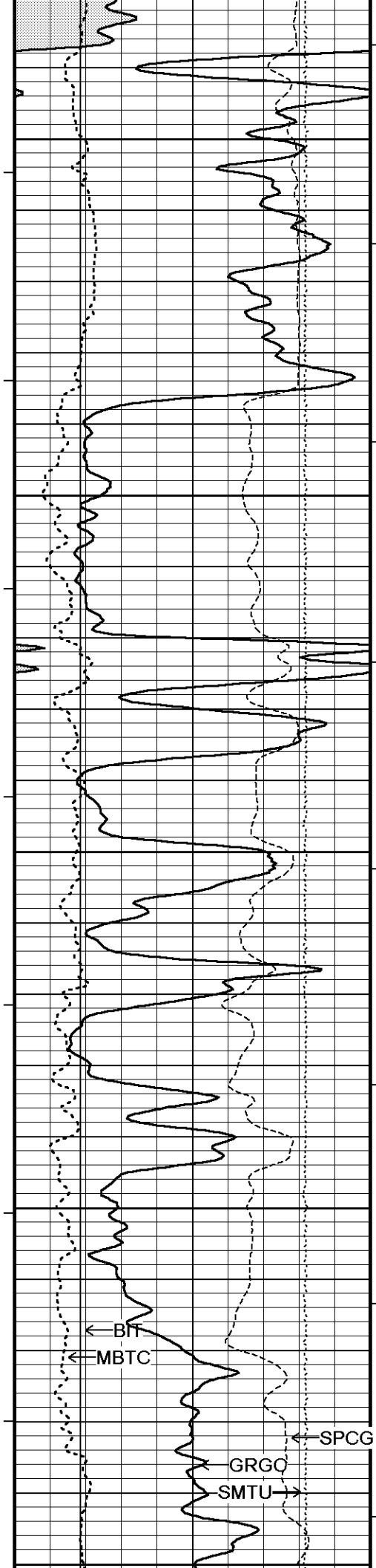
Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 14.05.5335\Logs\Grand Mesa Shook #1-29\Grand Mesa Shook #1-29 Main.dta
 System Versions: Logged with 14.05.5335 Plotted with 14.05.5335

Plotted on 06-JUN-2015 11:32
 Recorded on 06-JUN-2015 08:04

↑
5 INCH MAIN
↑

<div style="display: flex; justify-content: space-between;"> ↓ REPEAT SECTION ↓ </div>		
<u>Depth in Feet</u> Timing Marks every 60.0 sec <u>Gamma Ray</u> API 0 75 150 150 225 300	Borehole Temp in deg F	





128°

4450

130°

4500

132°

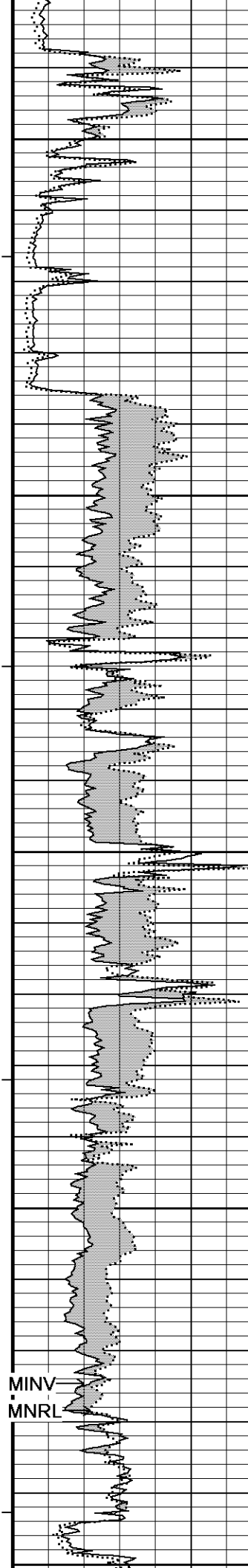
4550

132°

4600

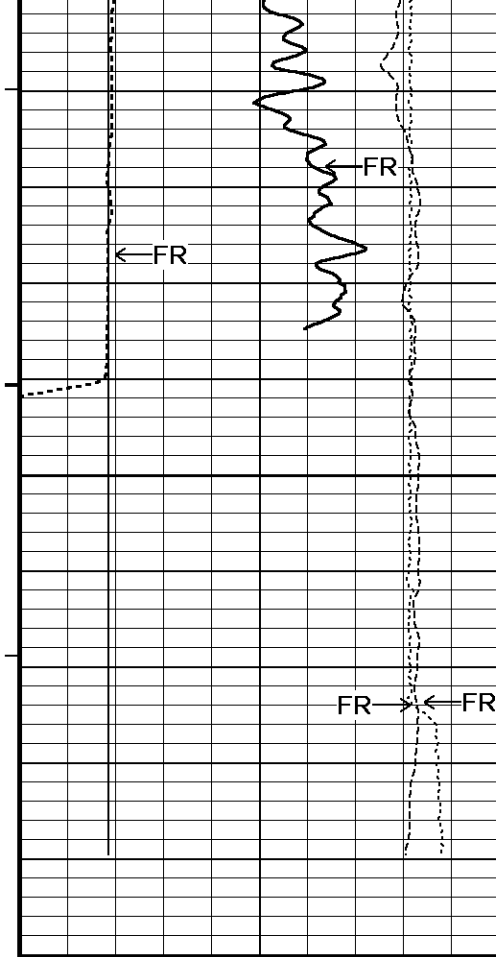
132°

4650

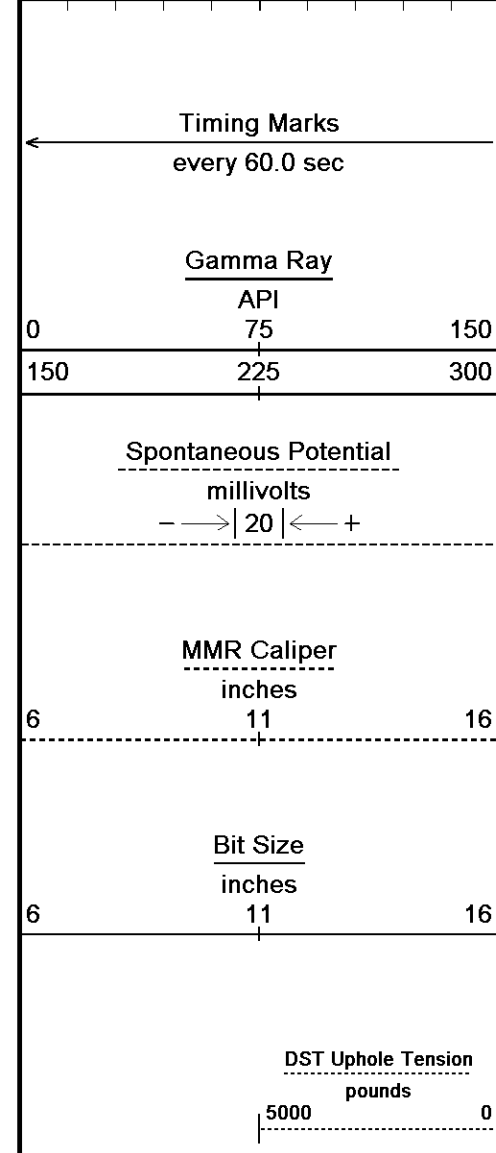
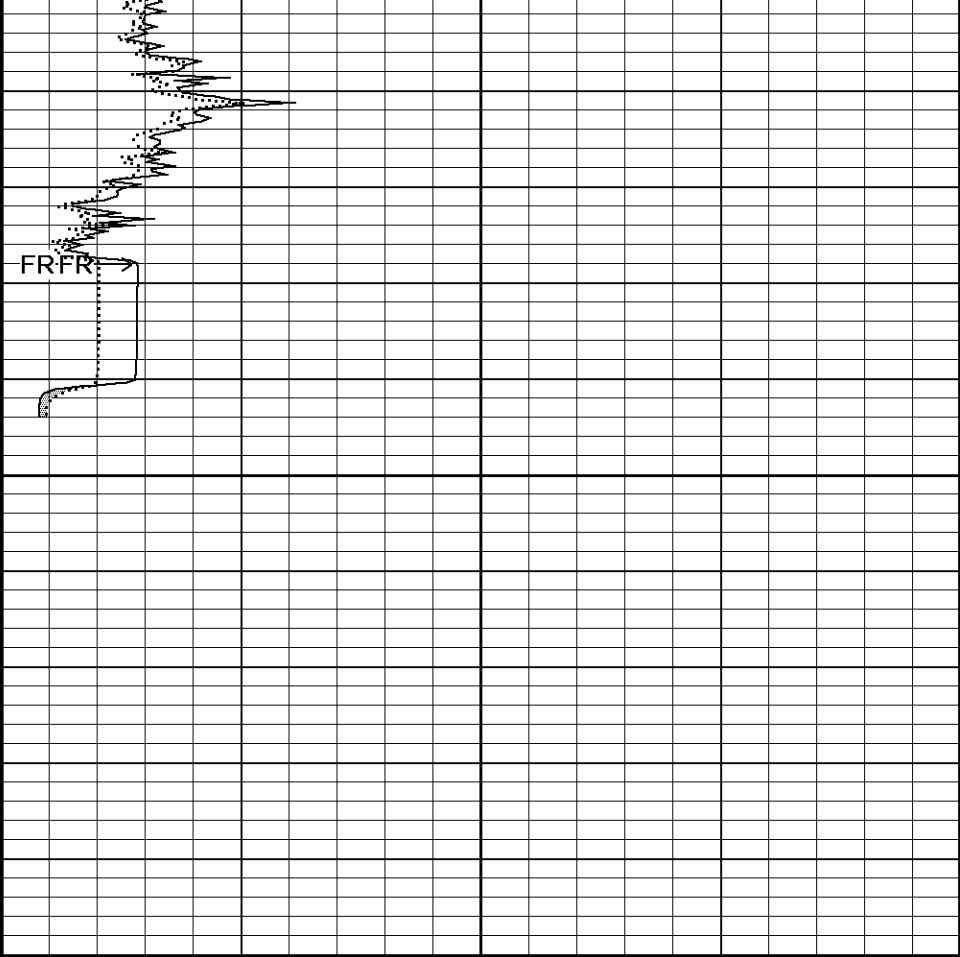


MINV

MNRL



4700
0
TD



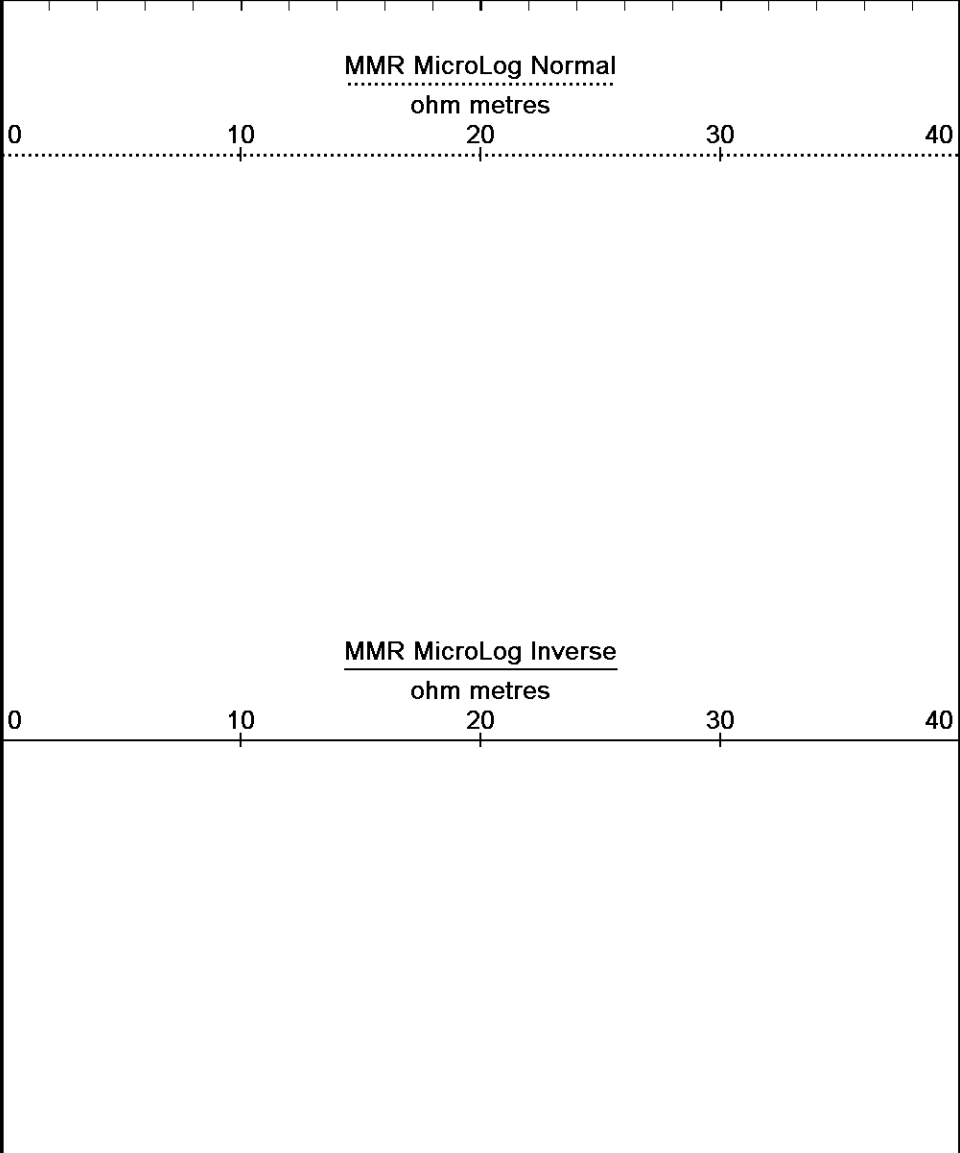
4750
Depth
in
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240



↑

REPEAT SECTION

↑

BEFORE SURVEY CALIBRATION

C:\Minimus 14.05.5335\Logs\Grand Mesa Shook #1-29\Grand Mesa Shook #1-29 Main.dta

General Constants All 000

Last Edited on 06-JUN-2015,07:03

General Parameters

Mud Resistivity2.900ohm-metres

Mud Resistivity Temperature75.000degrees F

Water Level0.000feet

Borehole Fluid ProcessingWet Hole

Hole/Annular Volume and Differential Caliper Parameters

HVOL MethodSingle Caliper

HVOL Caliper 1Density Caliper

HVOL Caliper 2N/A

Annular Volume Diameter5.500inches

Caliper for Differential CaliperNone

Rwa Parameters

Porosity usedCrossplot Porosity

Resistivity usedArray Ind. One Res Rt

RWA Constant A0.610

RWA Constant M2.150

SW/APOR Tool Source0.000

Gamma Calibration MCG-C 208

Field Calibration on 05-JUN-2015 09:53

MeasuredCalibrated (API)

Background6747

Calibrator (Gross)1100772

Calibrator (Net)1033725

Gamma Calibration Tolerances MCG-C 208

Ratio1.424

1.40

1.475

1.55

Counts/API

Gamma Constants MCG-C 208

Last Edited on 06-JUN-2015,02:43

Gamma Calibrator NumberGRC038

GRC-M Calibrator Jig in Use?NO

Inactive Background Jig in Use?NO

Mud Density1.04gm/cc

Caliper Source for ProcessingDensity Caliper

Tool PositionEccentred

Concentration of KClkppm

K Mud TypeChloride

K Mud Concentration0.00%

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 13-FEB-2015,10:34

MeasuredCalibrated(Deg F)

Lower10.0010.00

Upper100.00100.00

High Resolution Temperature Constants MCG-C 208

Last Edited on 23-SEP-2014,19:44

Pre-filter Length11

Caliper Calibration MMR-C.A 248

Base Calibration on 26-MAY-2015 10:42

Field Calibration on 05-JUN-2015 09:27

Base Calibration

Reading NoMeasuredCalibrator Size (in)

1139835.98

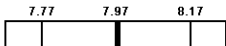
2173057.97

3	20605	9.86
4	24536	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.98	7.97

Caliper Calibration Tolerances MMR-C.A 248

Short Arm Field Cal.	7.98		in
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Micro Normal and Micro Inverse Calibration MMR-C.A 248

Base Calibration on 26-MAY-2015 10:34

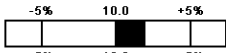
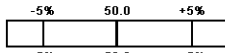
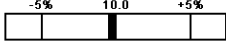
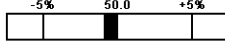
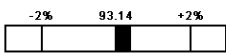
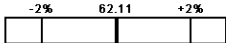
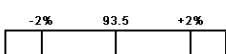
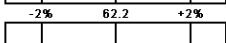
Field Check on 05-JUN-2015 09:25

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.2	49.9	5.1	25.6
Micro Inverse	9.9	49.5	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.5	93.5
Micro Inverse	62.2	62.2

Micro Normal & Micro Inverse Calibration Tolerance MMR-C.A 248

Micro Normal Res. 1	10.2		ohm	Micro Normal Res. 2	49.9		ohm
Micro Inverse Res. 1	9.9		ohm	Micro Inverse Res. 2	49.5		ohm
Micro Normal Base Check	93.5		ohm-m				
Micro Inverse Base Check	62.2		ohm-m				
Micro Normal Field Check	93.5		ohm-m				
Micro Inverse Field Check	62.2		ohm-m				

Micro Normal and Micro Inverse Constants MMR-C.A 248

Last Edited on 14-MAY-2015,22:08

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	0.0000	inches	

Caliper Calibration MPD-B 103

Base Calibration on 26-MAY-2015 14:48

Field Calibration on 05-JUN-2015 09:33


Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14988	3.99
2	24912	5.98
3	34944	7.97
4	44880	9.86
5	56016	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.91	7.97

Caliper Calibration Tolerances MPD-B 103

Short Arm Field Cal.	7.91		in
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DOWNHOLE EQUIPMENT

C:\Minimus 14.05.5335\Logs\Grand Mesa Shook #1-29\Grand Mesa Shook #1-29 Main.dta

CBH-C, Cablehead, 11 pin
CBH-C 265, LG: 2.40 ft, WT: 24.3 lb, OD: 2.240 in



Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

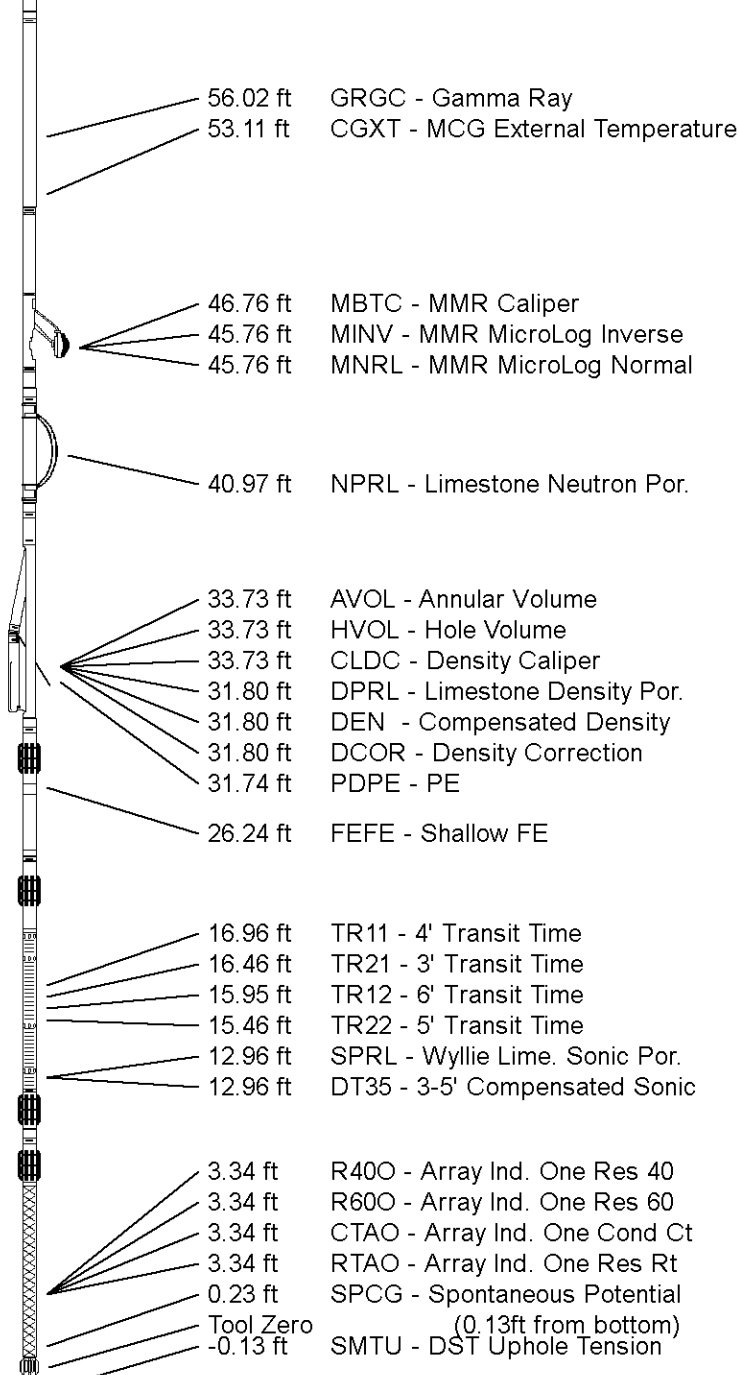
Compact Density/Caliper
MPD-B 103 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 157 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	SHOOK #1-29
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4833.00	feet	First Reading	4678.24	feet
Elevation Drill Floor	4831.00	feet	Depth Driller	4730.00	feet
Elevation Ground Level	4827.00	feet	Depth Logger	4724.00	feet



Weatherford®

MICRORESISTIVITY LOG

