



Weatherford[®]

MICRORESISTIVITY LOG

COMPANY	GRAND MESA OPERATING				
WELL	BEAZLEY-CHAMBERS #2-13				
FIELD	WILDCAT				
PROVINCE/COUNTY	GOVE				
COUNTRY/STATE	U.S.A. / KANSAS				
LOCATION	330' FSL & 2389' FEL				
SEC	TWP	RGE	Other Services		
13	13S	31W	MAI/MFE		
API Number	15-063-22020		MPD/MDN		
Permit Number					
Permanent Datum G.L., Elevation 2861 feet			Elevations:		
Log Measured From KB			KB 2866.00		
Drilling Measured From K.B. @ 5 FEET			DF 2864.00		
			GL 2861.00		
Date	19-JUL-2012				
Run Number	ONE				
Depth Driller	4650.00		feet		
Depth Logger	4649.00		feet		
First Reading	4616.00		feet		
Last Reading	3600.00		feet		
Casing Driller	210.00		feet		
Casing Logger	208.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEMICAL				
Density / Viscosity	1.12	g/cc	64.00	CP	
PH / Fluid Loss	10.00		8.00	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.24 @106.0		ohm-m		
Rmf @ Measured Temp	0.99 @106.0		ohm-m		
Rmc @ Measured Temp	1.49 @106.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	1.05 @125.0		ohm-m		
Time Since Circulation	3 HOURS				
Max Recorded Temp	125.00		deg F		
Equipment Name	COMPACT				
Equipment / Base	13096		LIB		
Recorded By	R.HOFFMAN				
Witnessed By	JOHN GOLDSMITH				
S.O. # / JOB #	3534501		LB12-187		

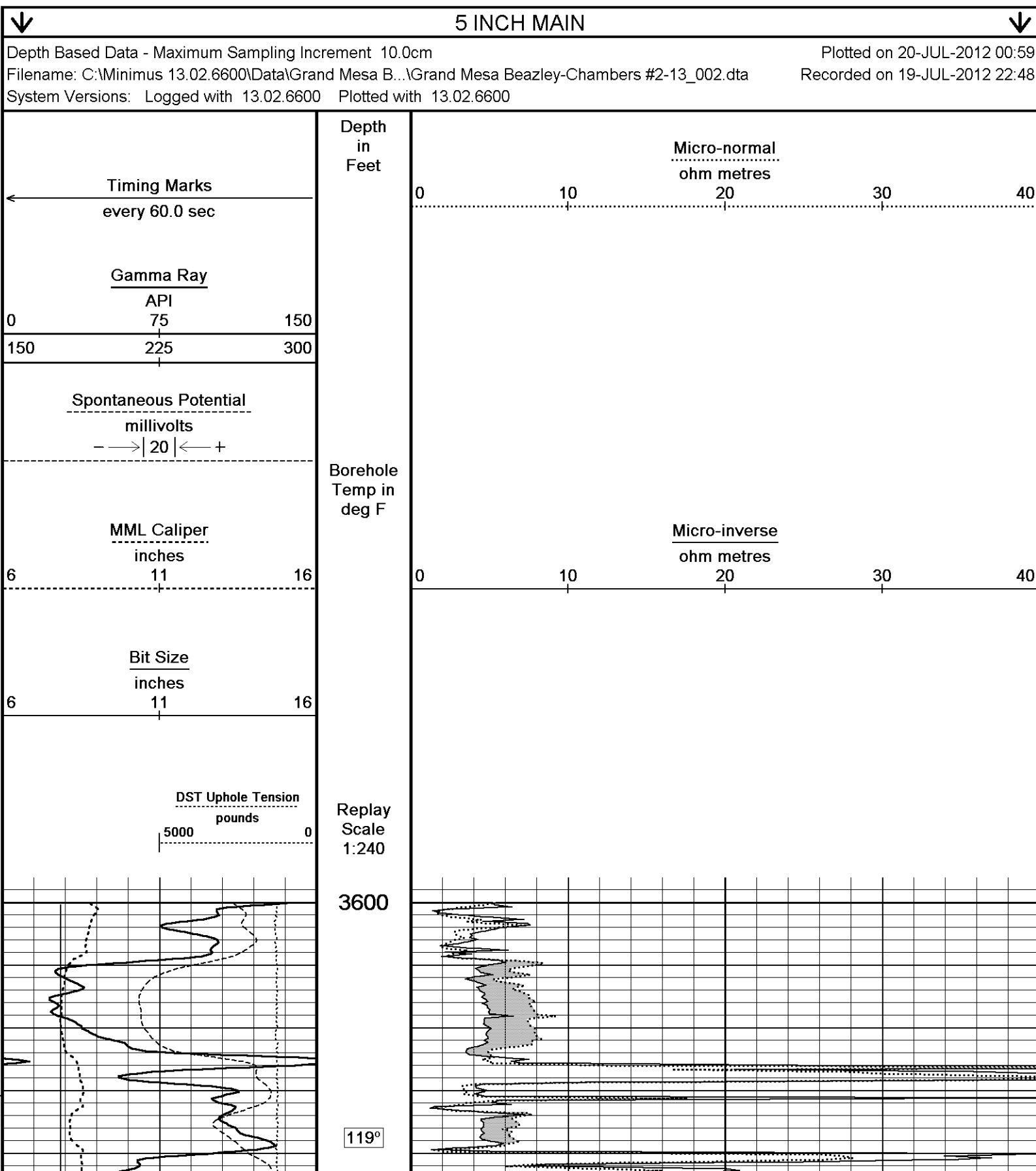
BOREHOLE RECORD					Last Edited: 20-JUL-2012 00:33
Bit Size inches		Depth From feet		Depth To feet	
7.875		208.00		4649.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	208.00	24.00	

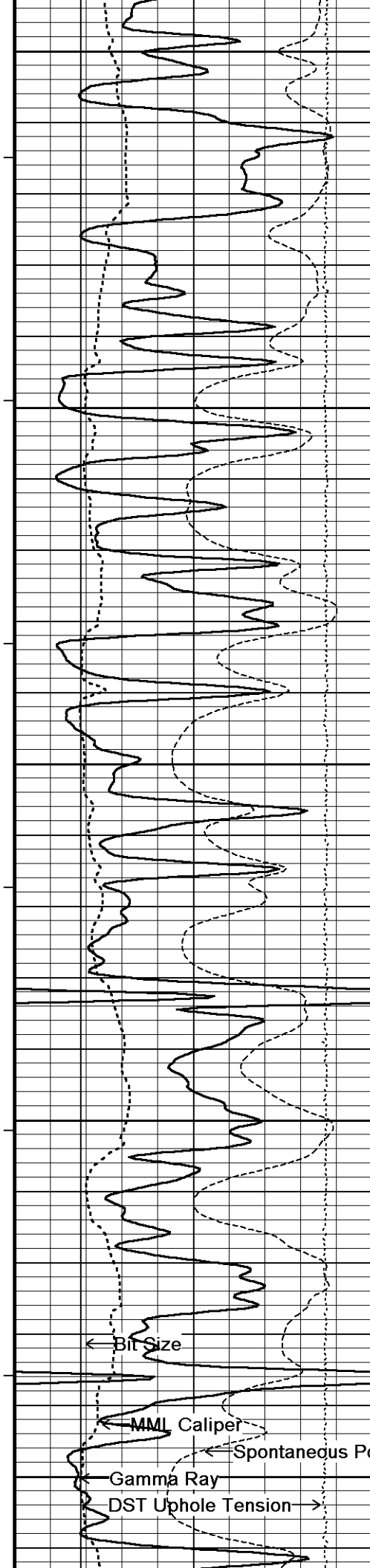
REMARKS
- SOFTWARE ISSUE: WLS 13.02.6600.
- MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO BOTTOM OF DRILL PIPE: 1979 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING: 228 CU. FT.
- SERVICE ORDER # 3534501
- RIG: MURPHIN #24

- ENGINEER: R. HOFFMAN

- 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.





3650

119°

3700

119°

3750

120°

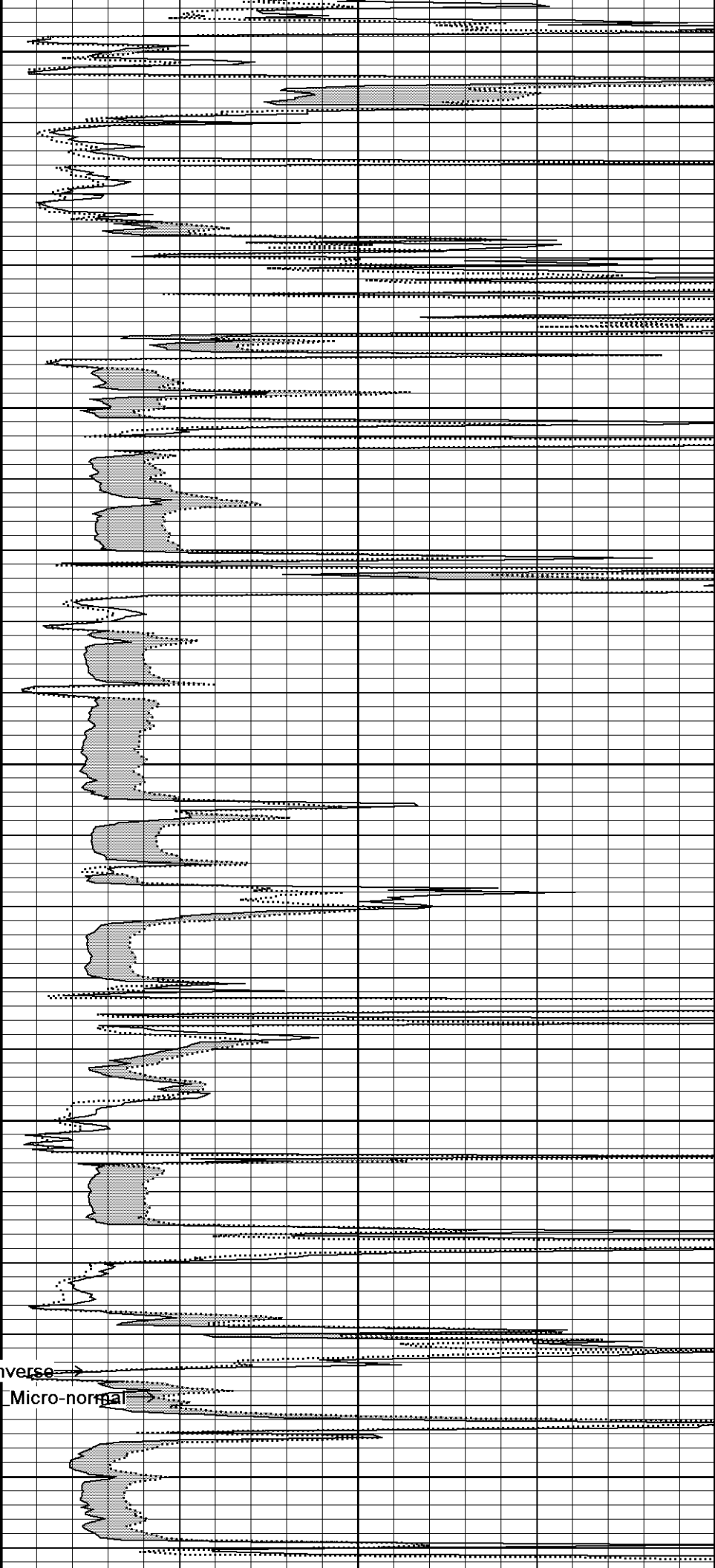
3800

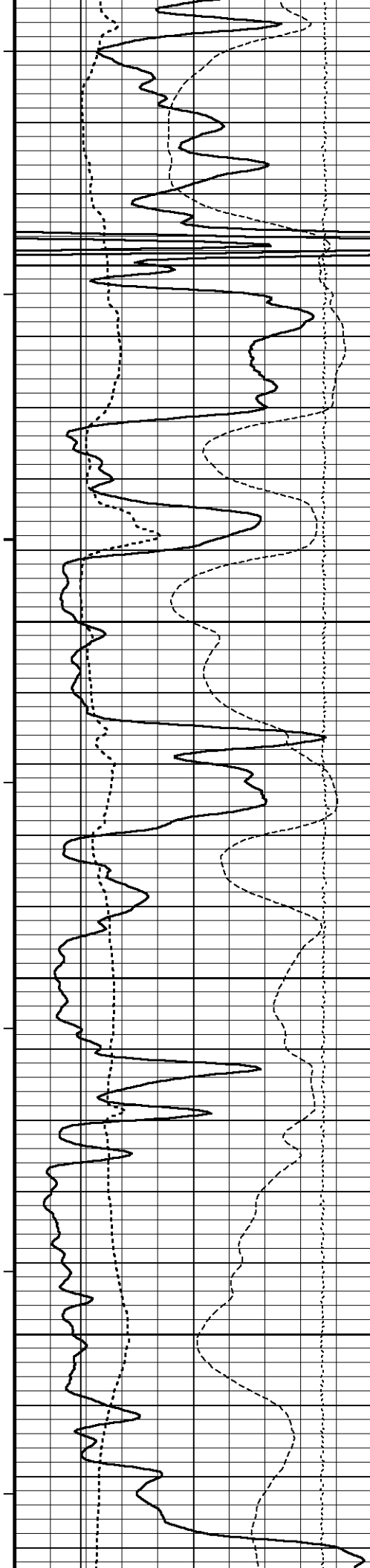
Micro-inverse

120°

Micro-normal

3850





120°

3900

120°

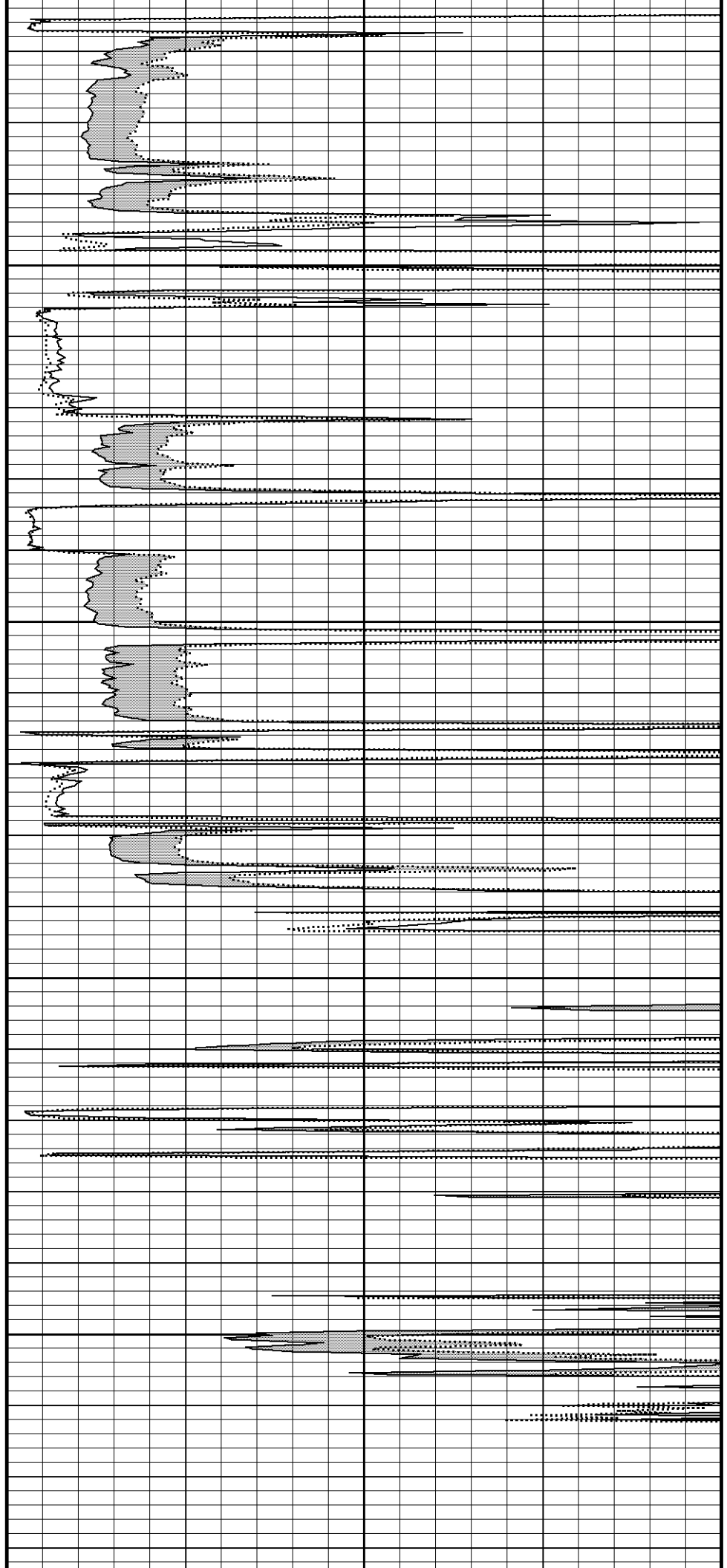
3950

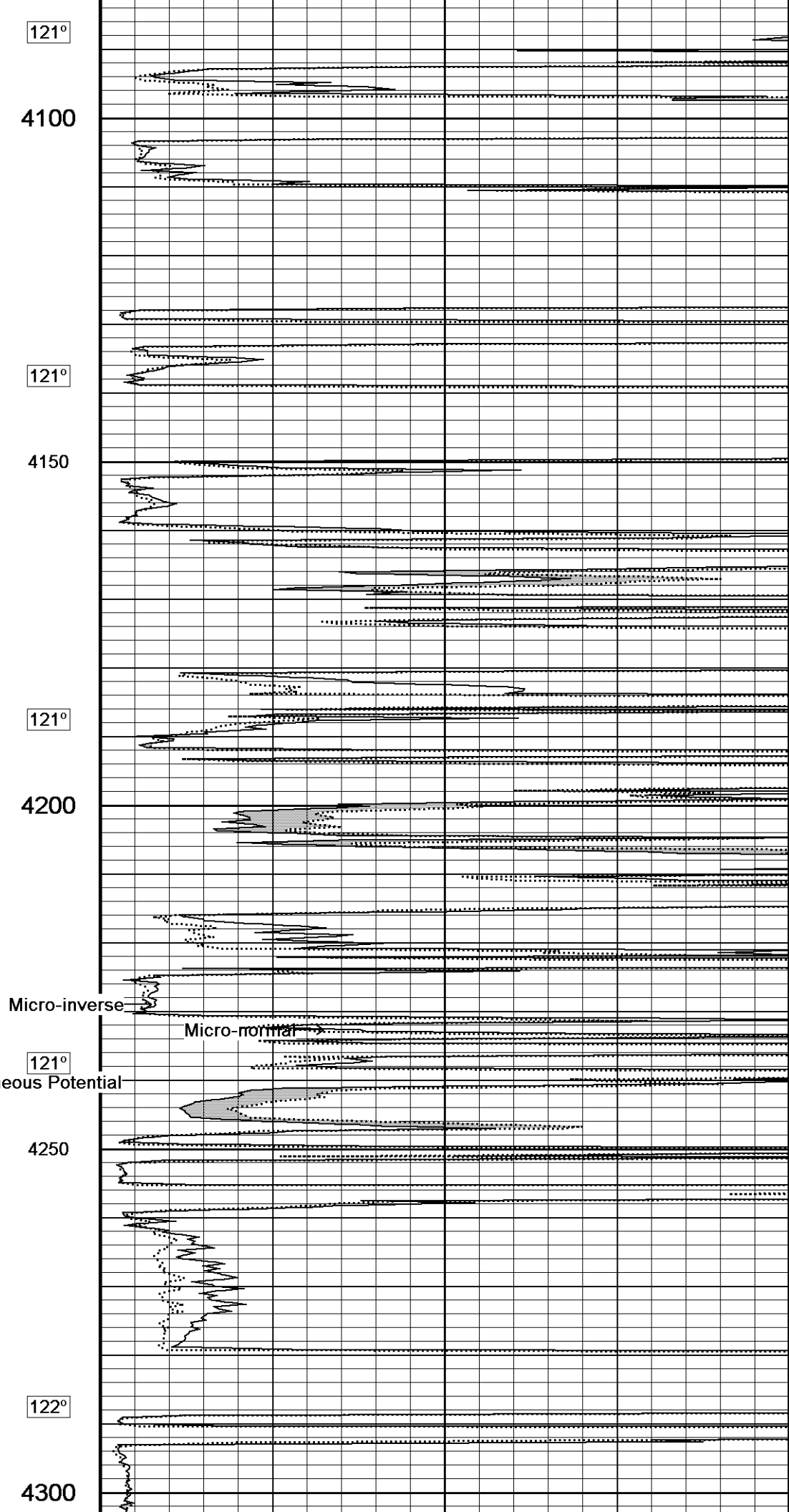
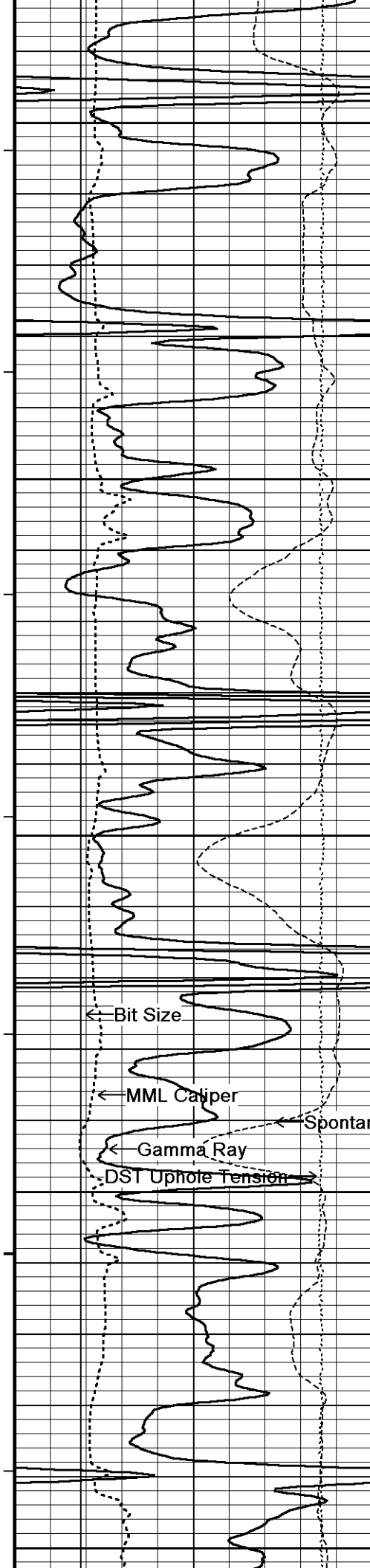
121°

4000

121°

4050





121°

4100

121°

4150

121°

4200

Micro-inverse

Micro-normal

121°

4250

122°

4300

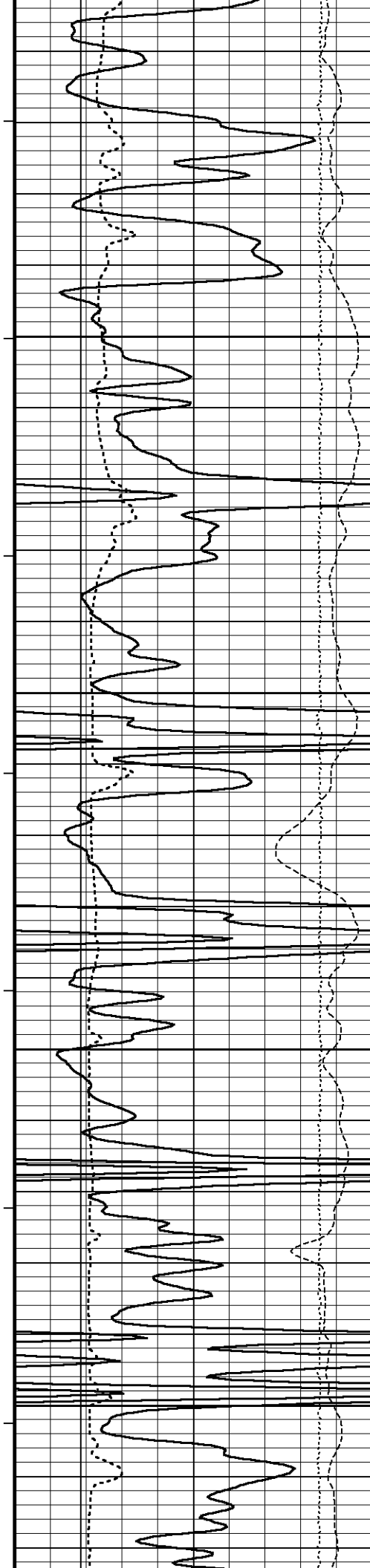
Bit Size

MML Caliper

Gamma Ray

DST Uphole Tension

Spontaneous Potential



122°

4350

123°

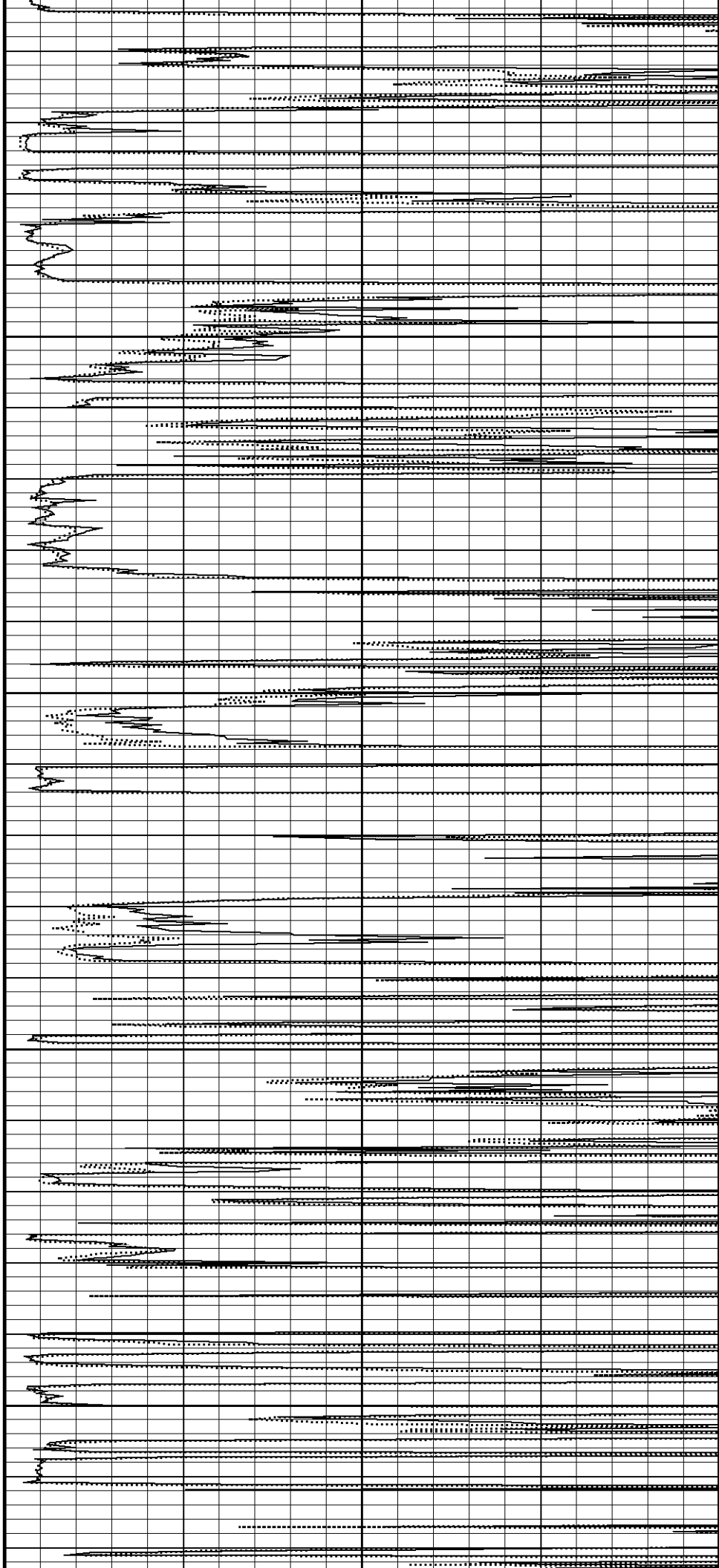
4400

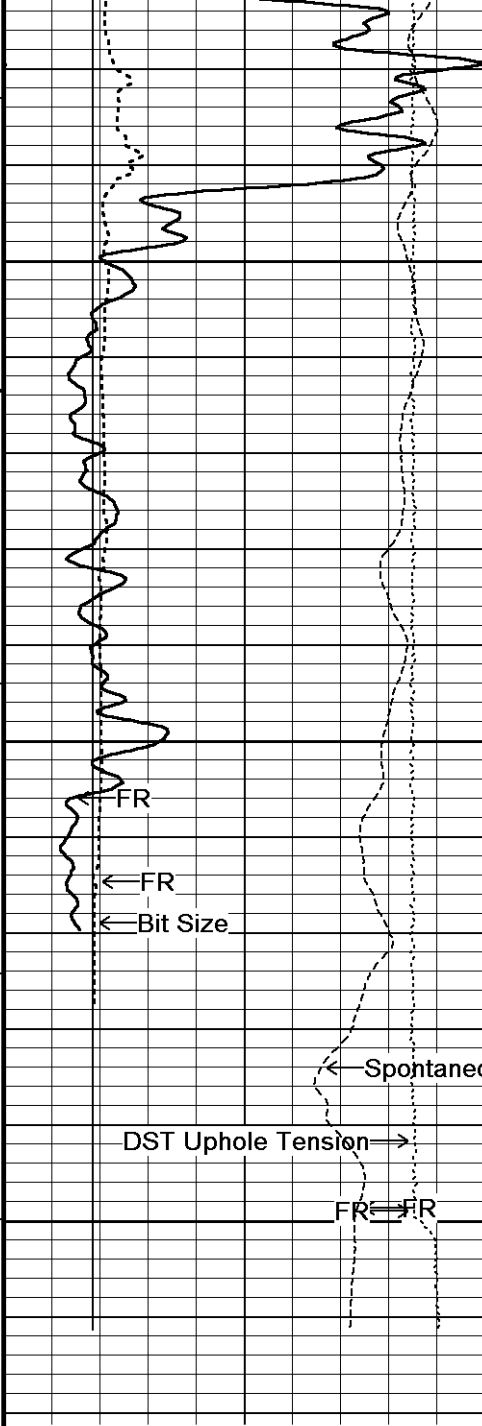
123°

4450

124°

4500





125°

4550

124°

4600

TD
4650

Depth
in
Feet

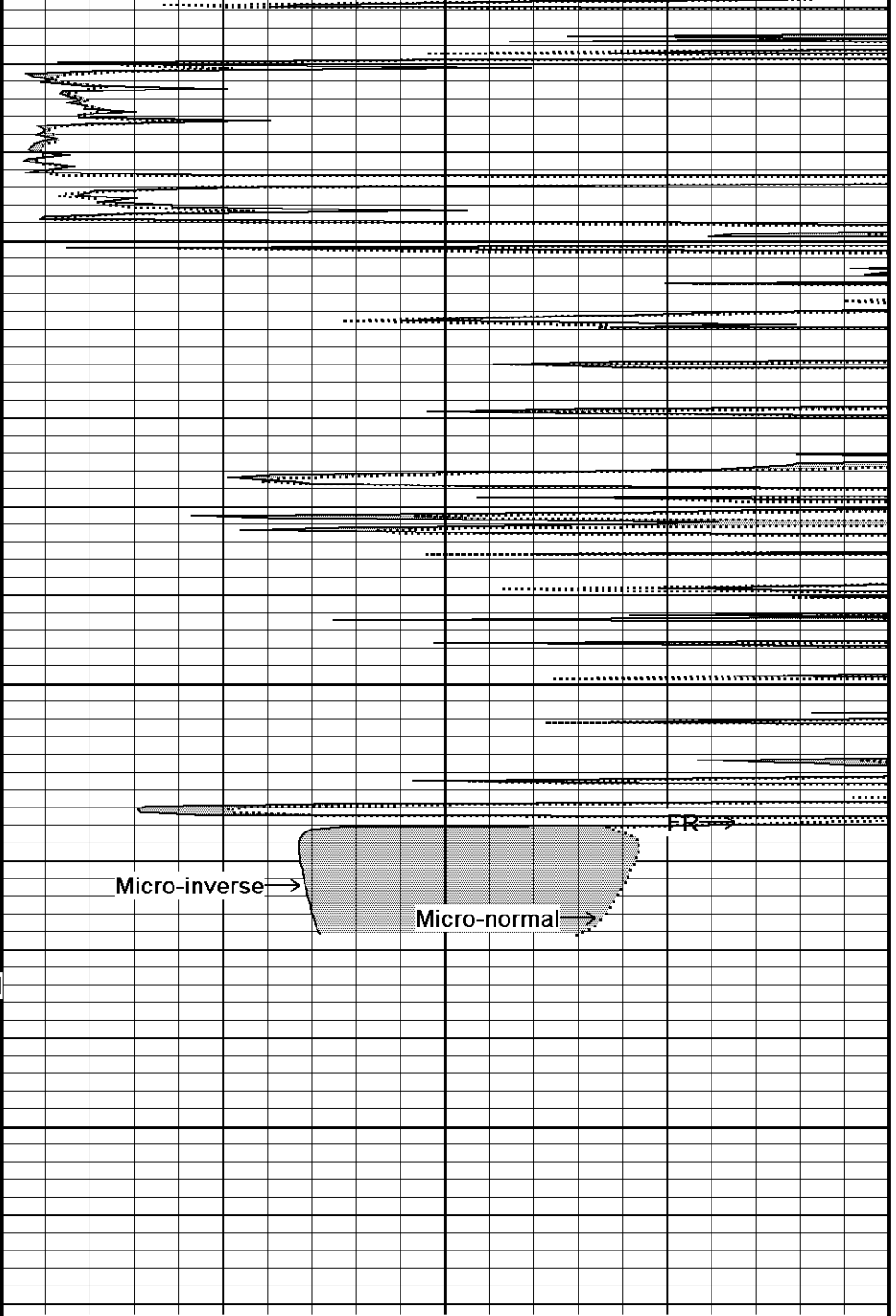
Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
- - -> | 20 | < - +

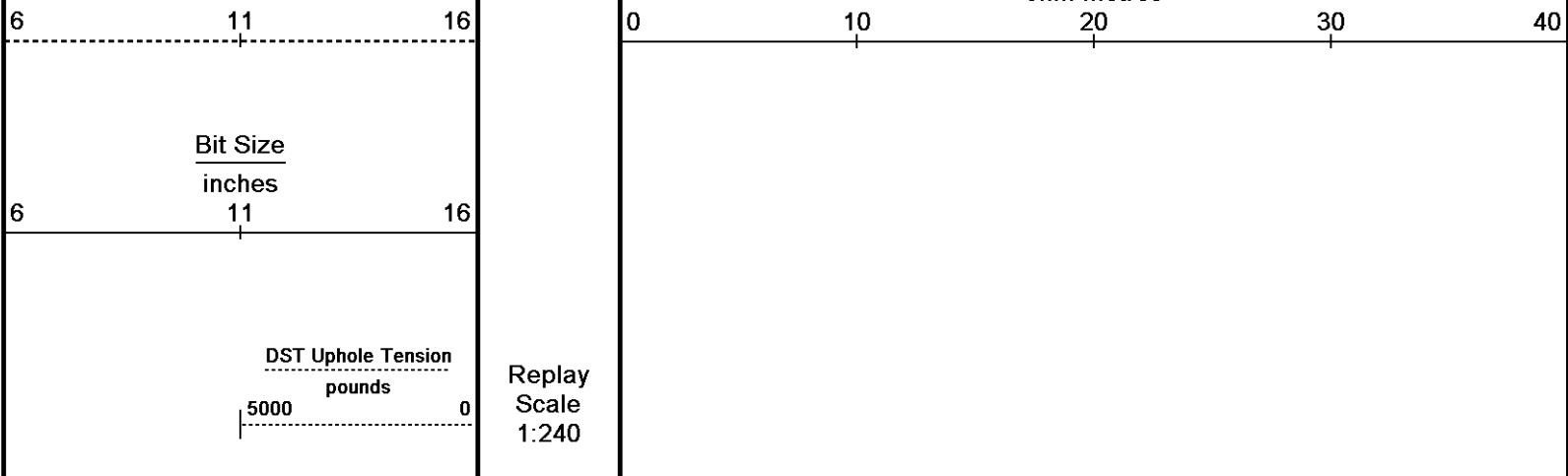
MML Caliper
inches

Borehole
Temp in
deg F



Micro-normal
ohm metres
0 10 20 30 40

Micro-inverse
ohm metres



Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 20-JUL-2012 00:59

Filename: C:\Minimus 13.02.6600\Data\Grand Mesa B...\Grand Mesa Beazley-Chambers #2-13_002.dtaRecorded on 19-JUL-2012 22:48

System Versions: Logged with 13.02.6600Plotted with 13.02.6600

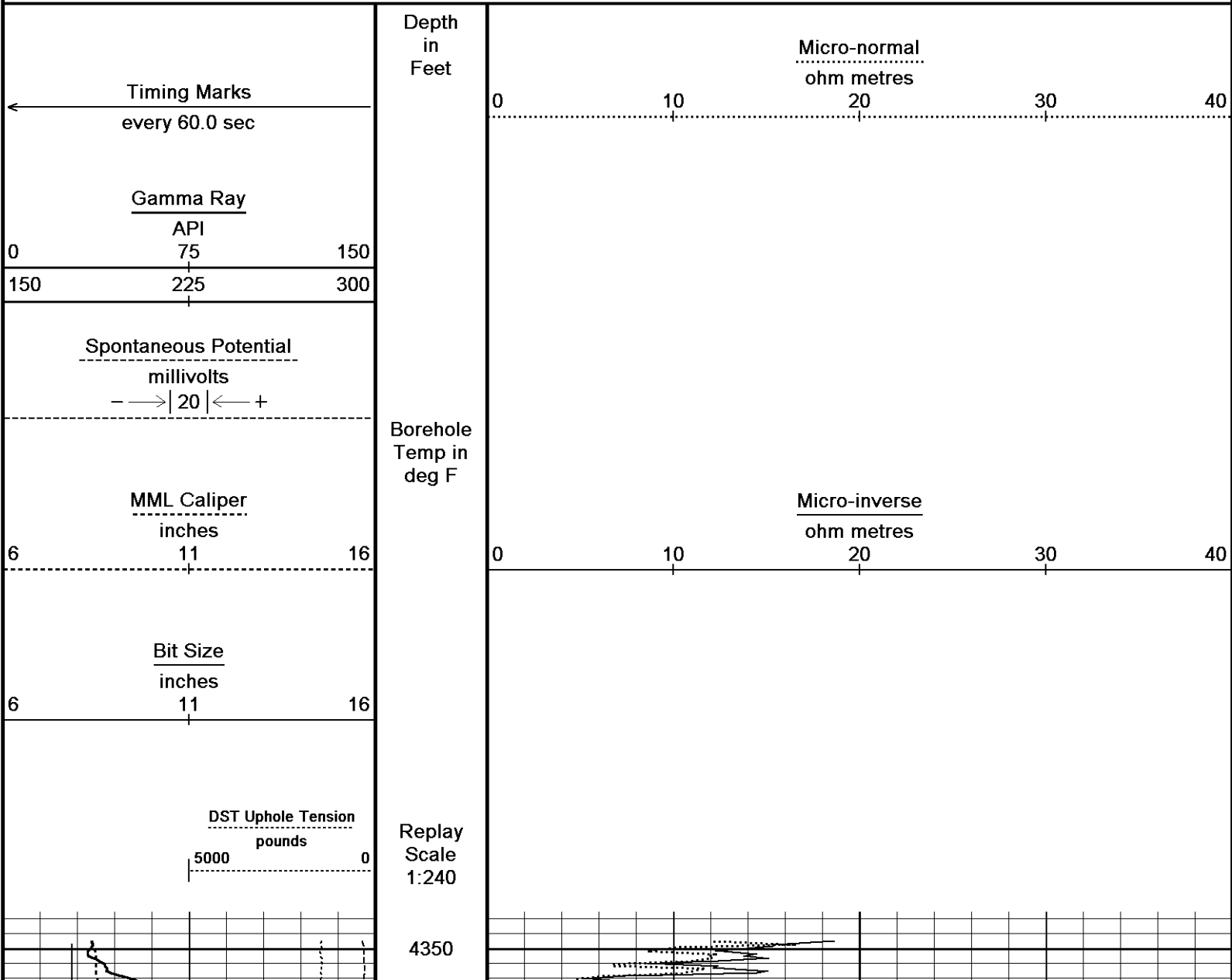
↑5 INCH MAIN↑

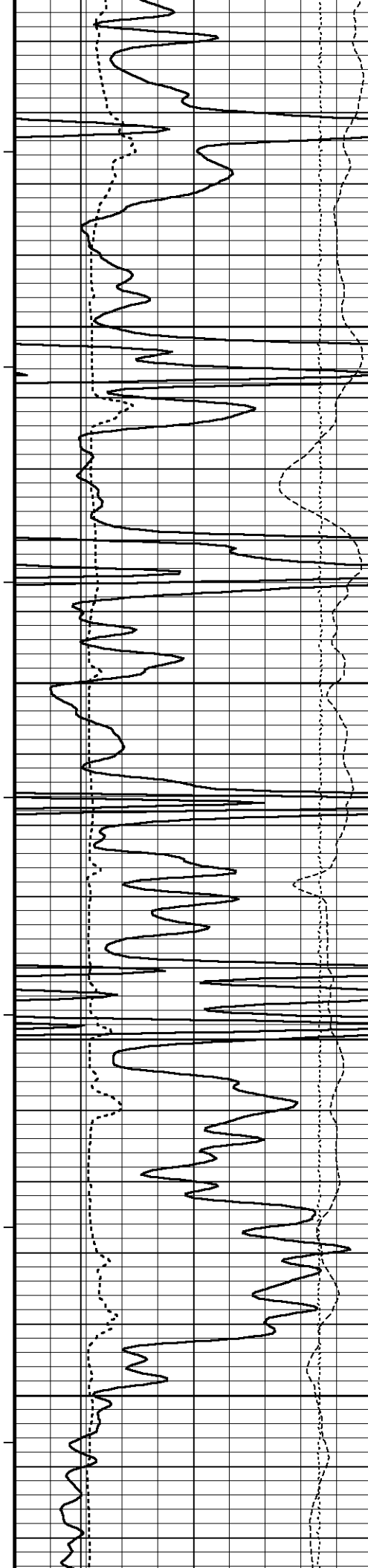
↓5 INCH REPEAT↓

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 20-JUL-2012 00:59

Filename: C:\Minimus 13.02.6600\Data\Grand Mesa B...\Grand Mesa Beazley-Chambers #2-13_001.dtaRecorded on 19-JUL-2012 22:28

System Versions: Logged with 13.02.6600Plotted with 13.02.6600





122°

4400

123°

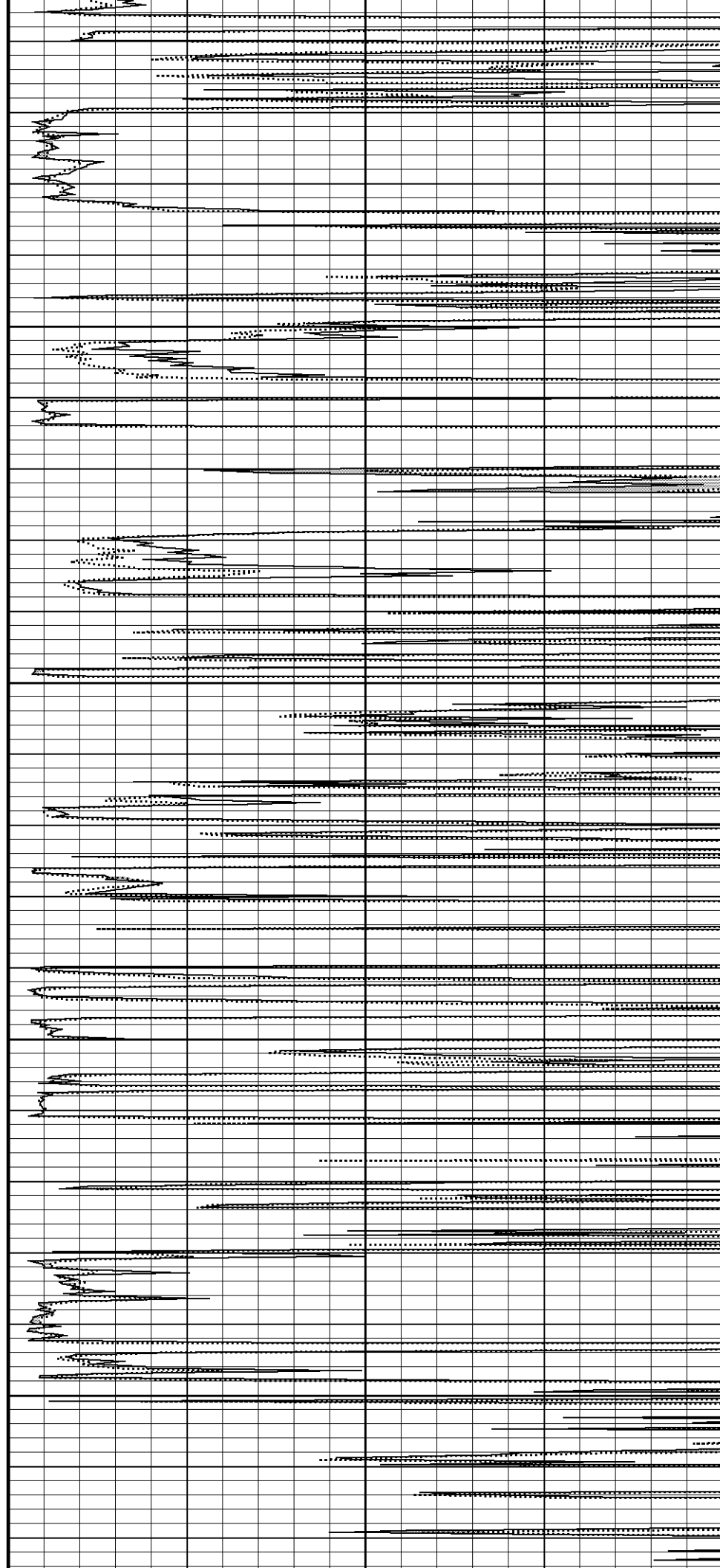
4450

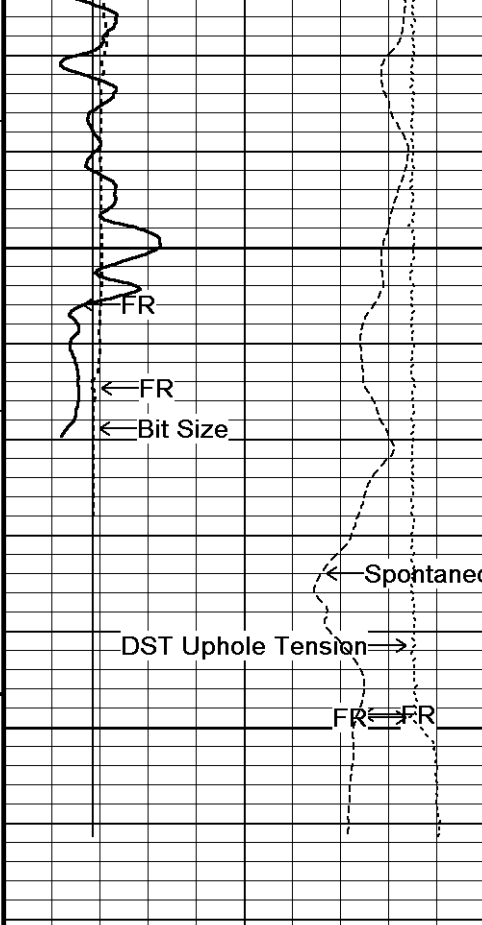
123°

4500

124°

4550





123°

4600

TD 4650

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
- —> | 20 | <- +

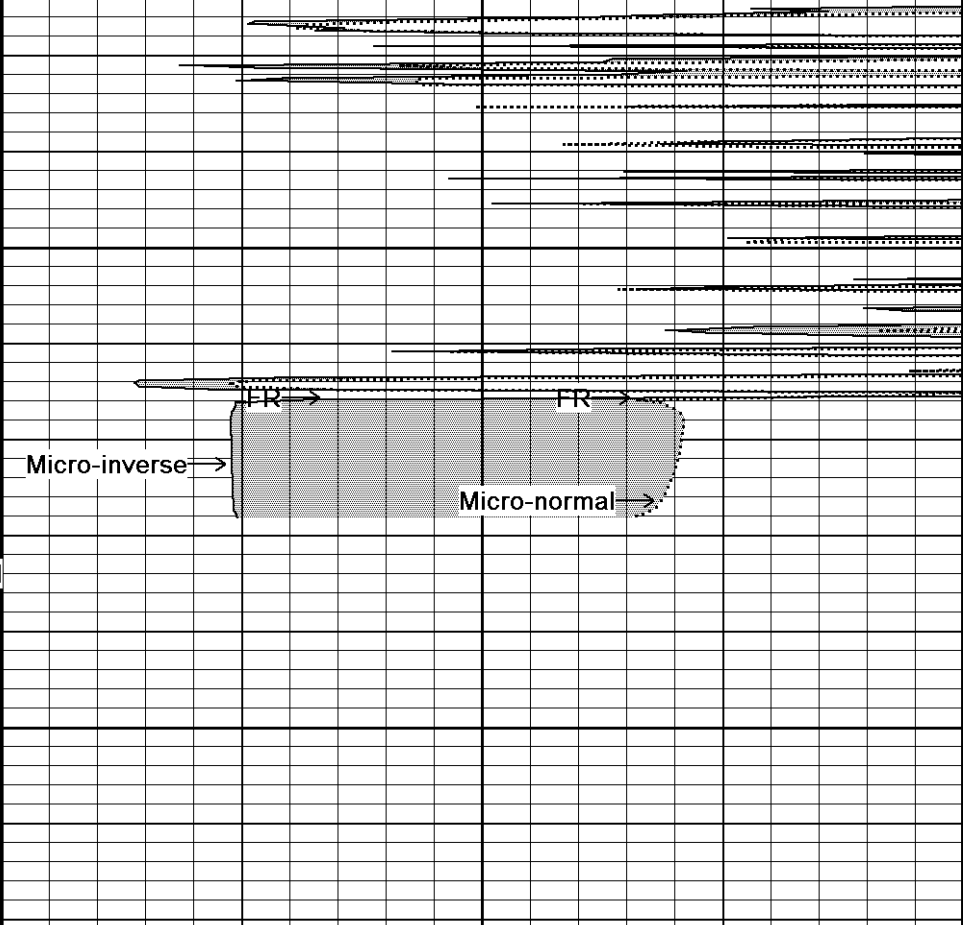
MML Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Borehole
Temp in
deg F

Replay
Scale
1:240



Micro-normal
ohm metres
0 10 20 30 40

Micro-inverse
ohm metres
0 10 20 30 40



5 INCH REPEAT



BEFORE SURVEY CALIBRATION

C:\Minimus 13.02.6600\Data\Grand Mesa Beazley-Chambers #2-13\Grand Mesa Beazley-Chambers #2-13_002.dta

General Constants All 000

Last Edited on 19-JUL-2012,19:24

General Parameters

Mud Resistivity	1.240	ohm-metres
Mud Resistivity Temperature	106.000	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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Four Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Gamma Calibration MCG-D.K 442

Field Calibration on 19-JUL-2012 15:01

	Measured	Calibrated (API)
Background	67	44
Calibrator (Gross)	1156	769
Calibrator (Net)	1089	725

Gamma Constants MCG-D.K 442

Last Edited on 19-JUL-2012,19:23

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

SP Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012 16:34

	Measured	Calibrated (mV)
Reference 1	100.2	100.0
Reference 2	-99.9	-100.0

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012,16:35

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

High Resolution Temperature Constants MCG-D.K 442

Last Edited on

Pre-filter Length	11
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Caliper Calibration MML-A 16

Base Calibration on 17-JUL-2012 16:12

Field Calibration on 17-JUL-2012 16:13

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14596	5.98
2	17798	7.97
3	21110	9.86
4	25111	11.92
5	0	0.00
6	N/A	N/A

Field Calibration		Measured Caliper (in)	Actual Caliper (in)
		5.95	5.98
Micro Normal and Micro Inverse Calibration MML-A 16			Base Calibration on 17-JUL-2012 16:16 Field Check on 17-JUL-2012 16:18
Base Calibration			
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1 Resistor 2
Micro Normal	12.2	60.2	5.0 25.0
Micro Inverse	15.6	78.3	5.0 25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)
Micro Normal	62.9		62.9
Micro Inverse	48.2		48.2
Micro Normal and Micro Inverse Constants MML-A 16			Last Edited on 19-JUL-2012,19:23
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		
Neutron Calibration MDN-A.B 66			Base Calibration on 17-JUL-2012 10:54 Field Check on 19-JUL-2012 15:06
Base Calibration			
	Near	Measured Far	Calibrated (cps) Near Far
	3220	101	3714 110
Ratio	31.859		33.764
Field Calibrator at Base	Calibrated (cps)		
	1595 2289		
Ratio	0.696		
Field Check	Calibrated (cps)		
	1604 2293		
Ratio	0.699		
Neutron Constants MDN-A.B 66			Last Edited on 19-JUL-2012,19:22
Neutron Source Id	P0204NN		
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	Constant Value		
Formation Pressure	0.00	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	Constant Value		
Formation Fluid Salinity	0.00	kppm	
Barite Mud Correction	Not Applied		
FE Calibration MFE-B.J 353			Base Calibration on 17-JUL-2012 15:58 Field Check on 19-JUL-2012 14:48
Base Calibration			
		Measured	Calibrated (ohm-m)
Reference 1		0.0	0.0
Reference 2		964.8	126.8
Base Check			280.6
Field Check			280.8
FE Constants MFE-B.J 353			Last Edited on 19-JUL-2012,19:23

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 17-JUL-2012,13:53
	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 17-JUL-2012,13:49
Pre-filter Length	11	

Induction Calibration MAI-A.A 167					Base Calibration on 17-JUL-2012,13:55
					Field Check on 19-JUL-2012 14:47
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)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	13.9	3837.4	
2	0.0	0.0	29.8	3474.3	
3	0.0	0.0	29.2	3050.4	
4	0.0	0.0	19.8	2079.9	
Deep	0.0	0.0	18.7	2047.1	
Medium	0.0	0.0	42.2	3987.7	
Shallow	0.0	0.0	43.2	5050.6	
Array Temperature		0.0	89.8	Deg F	

Induction Constants MAI-A.A 167				Last Edited on 19-JUL-2012,19:22
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 64

Base Calibration on 17-JUL-2012 14:43
Field Calibration on 19-JUL-2012 14:54

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13949	3.99
2	22435	5.98
3	31057	7.97
4	39360	9.86
5	48766	11.92
6	N/A	N/A

Field Calibration

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

Photo Density Calibration MPD-B 64

Base Calibration on 17-JUL-2012 15:04
Field Check on 19-JUL-2012 14:53

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	59921	33969	59556	30836
Reference 2	25388	2962	24941	2541

Field Check at Base

1193.4 1388.8

Field Check

1193.0 1385.0

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	214	1064		
Reference 1	22602	59722	0.382	0.371
Reference 2	6872	25249	0.275	0.272

Field Check at Base

214.1 1063.8

Field Check

216.1 1066.2

Density Constants MPD-B 64

Last Edited on 19-JUL-2012,19:19

Density Source Id	18235B	
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	1.12	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	0.00

Down-hole Tension Calibration SMS 0

Field Calibration on 19-JUL-2012 21:42

Reading No	Measured	Calibrated (lbs)
1	16149.30	0.00
2	16750.19	410.00

DOWNHOLE EQUIPMENT

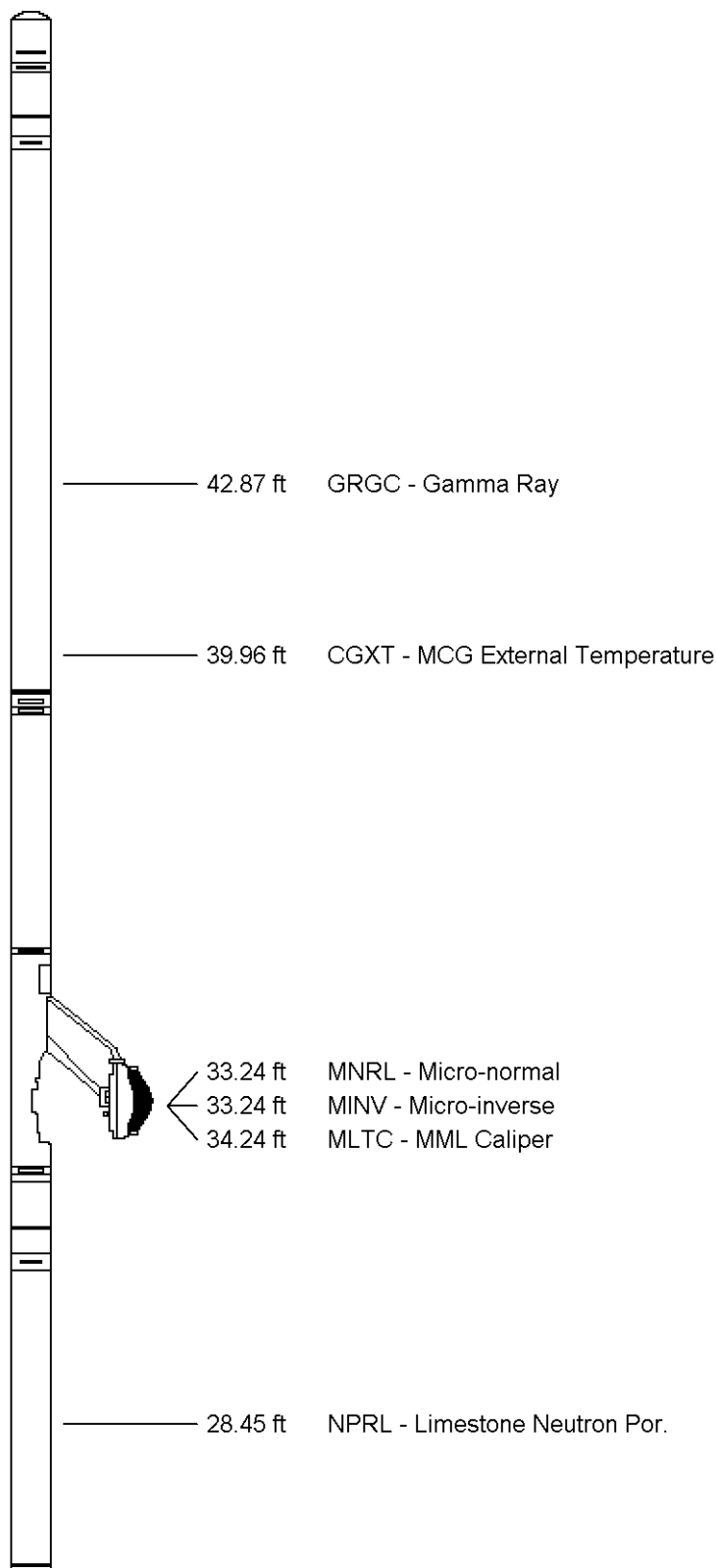
C:\Minimus 13.02.6600\Data\Grand Mesa Beazley-Chambers #2-13\Grand Mesa Beazley-Chambers #2-13_002.dta

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 442 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

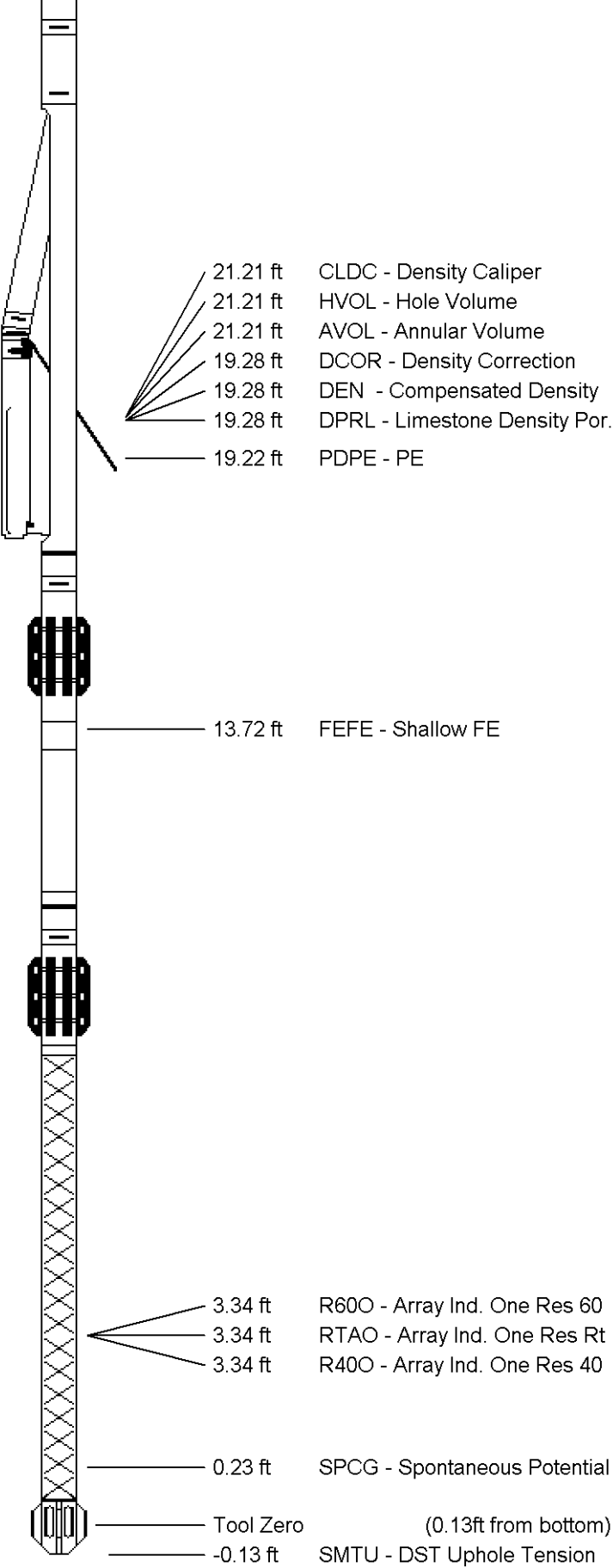
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in



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 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

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING
WELL	BEAZLEY-CHAMBERS #2-13
FIELD	WILDCAT
PROVINCE/COUNTY	COVE

PROVINCE/COUNTY GOVE
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2866.00	feet	First Reading	4616.00	feet
Elevation Drill Floor	2864.00	feet	Depth Driller	4650.00	feet
Elevation Ground Level	2861.00	feet	Depth Logger	4649.00	feet



Weatherford®

MICRORESISTIVITY LOG