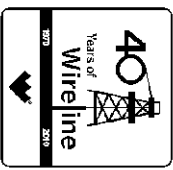




Weatherford[®]

MICRORESISTIVITY LOG

COMPANY **Grand Mesa Operating Co.**
 WELL **S & L #1-14**
 FIELD **Maurice Prospect**
 PROVINCE/COUNTY **Gove**
 COUNTRY/STATE **U.S.A. / Kansas**
 LOCATION **0330' FSL X 0553' FEL**



FINAL PRINT

SEC **14** TWP **13S** RGE **31W** Other Services
 API Number **15-063-22003** MPD/MDN
 Permit Number **MA/MFE**

Permanent Datum G.L., Elevation 2904 feet
 Log Measured From **KB**
 Drilling Measured From **KB @ 5 FEET**

Elevations: feet
 KB 2909.00
 DF 2911.00
 GL 2904.00

Date	29-JUN-2012	
Run Number	One	
Depth Driller	4700.00	feet
Depth Logger	4700.00	feet
First Reading	4664.00	feet
Last Reading	3600.00	feet
Casing Driller	212.00	feet
Casing Logger	212.00	feet
Bit Size	7.875	inches
Hole Fluid Type	Chem	
Density / Viscosity	9.30 lb/USg	54.00 CP
PH / Fluid Loss	11.50	6.40 ml/30Min
Sample Source	FLOWLINE	
Rm @ Measured Temp	0.57 @ 99.0	ohm-m
Rmf @ Measured Temp	0.46 @ 99.0	ohm-m
Rmc @ Measured Temp	0.68 @ 99.0	ohm-m
Source Rmf / Rmc	CALC	
Rm @ BHT	0.45 @ 125.0	ohm-m
Time Since Circulation	5 HOURS	
Max Recorded Temp	125.00	deg F
Equipment Name	COMPACT	
Equipment / Base	13025	LIB
Recorded By	R. BURNS	
Witnessed By	BOB SCHRIEVER	J. LAPPOINT
S.O./JOB#	3529328	LB12-169

BOREHOLE RECORD			Last Edited: 29-JUN-2012 20:07	
Bit Size inches	Depth From feet	Depth To feet		
7.875	212.00	4700.00		
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	212.00	24.00

REMARKS

Tools Used: MPD, MCG, MDN, MML, MFE, MAI.
 Hardware: MPD: 8 inch profile plate 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 = 225 cu. ft.
 Service order #3529328
 Rig: Murfin # 24
 Engineer: R. Burns, J. LaPoint
 Operator(s):

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

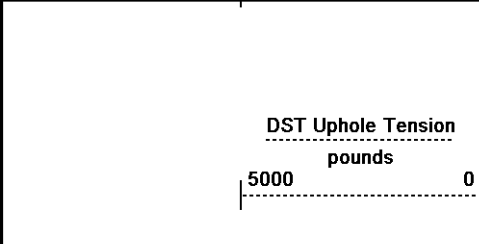
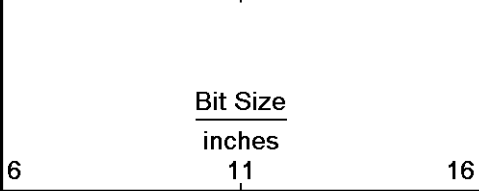
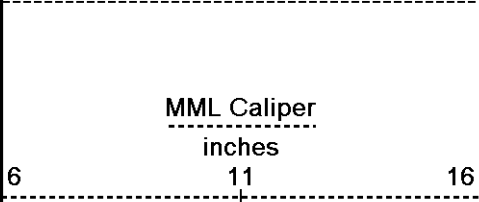
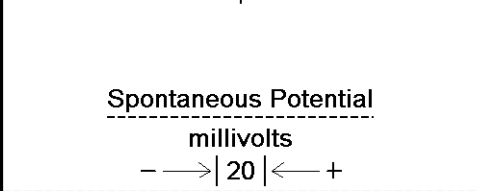
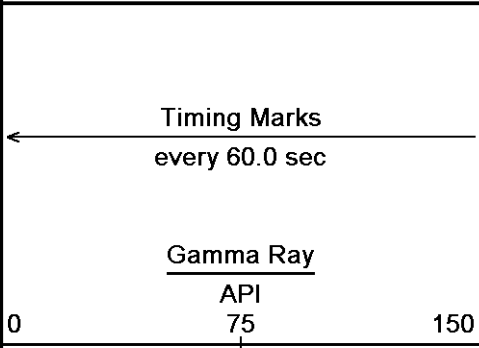
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 29-JUN-2012 21:02

Filename: C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_003.dta

Recorded on 29-JUN-2012 18:53

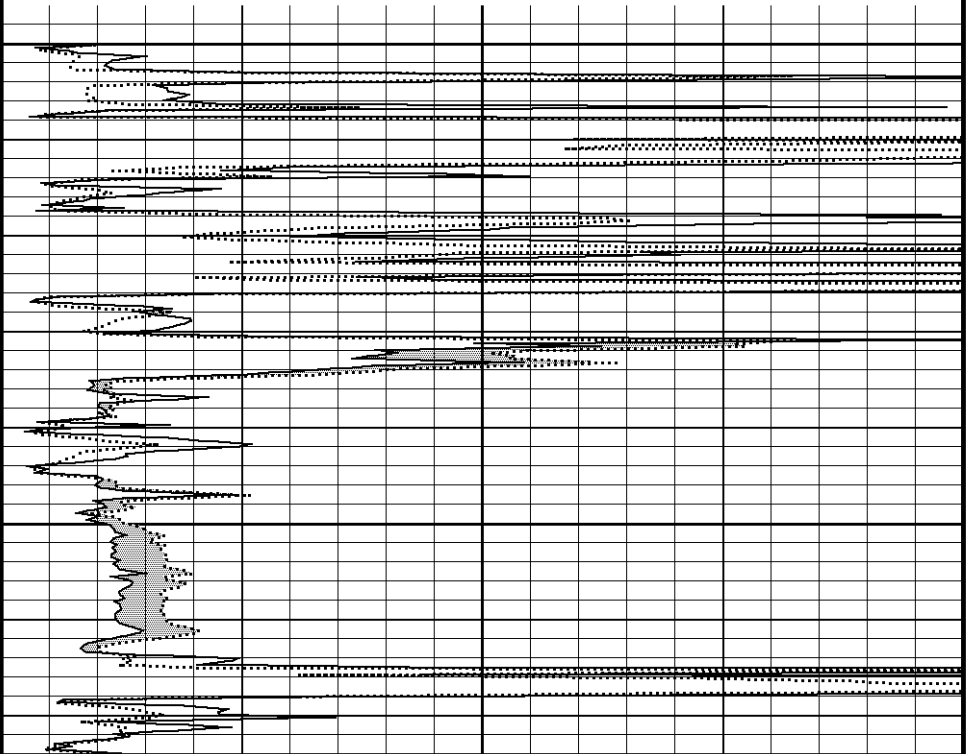
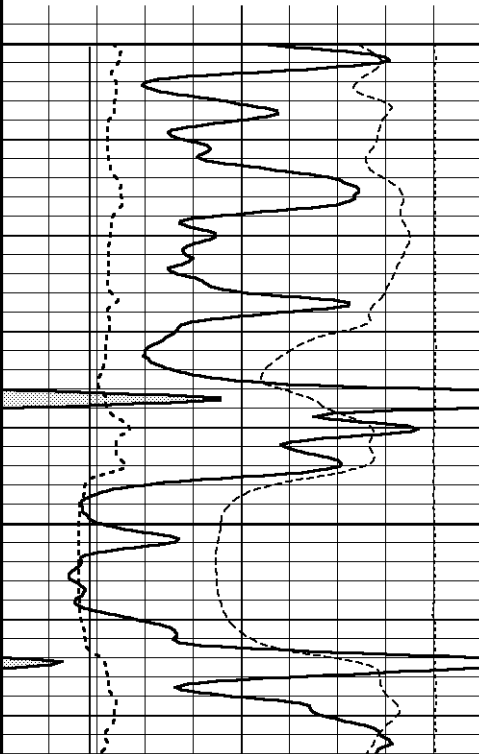
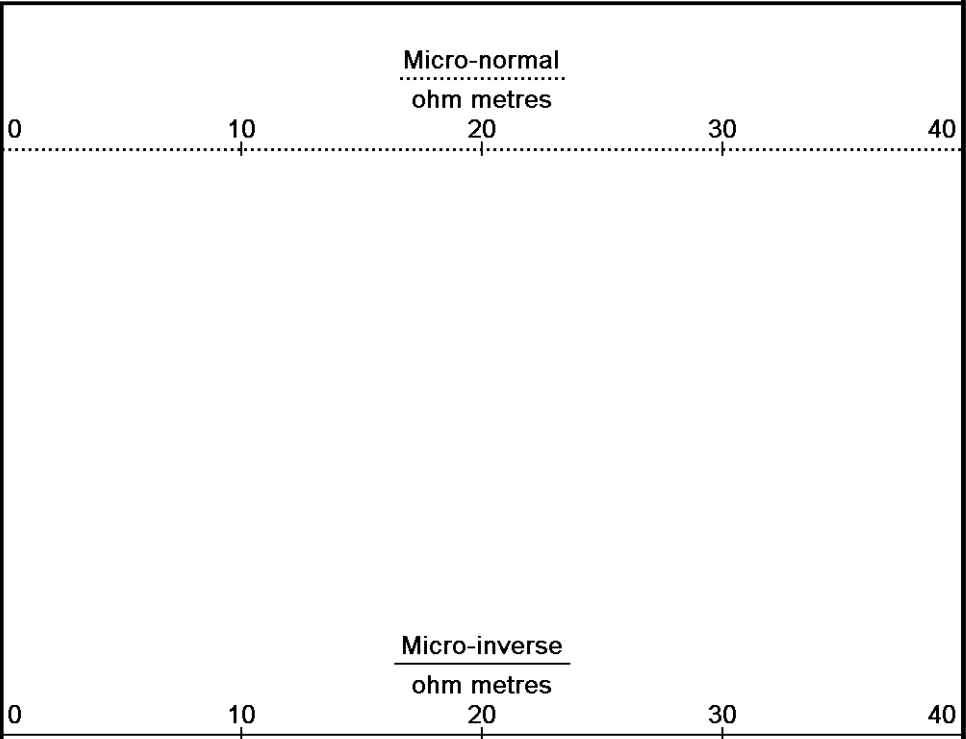
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

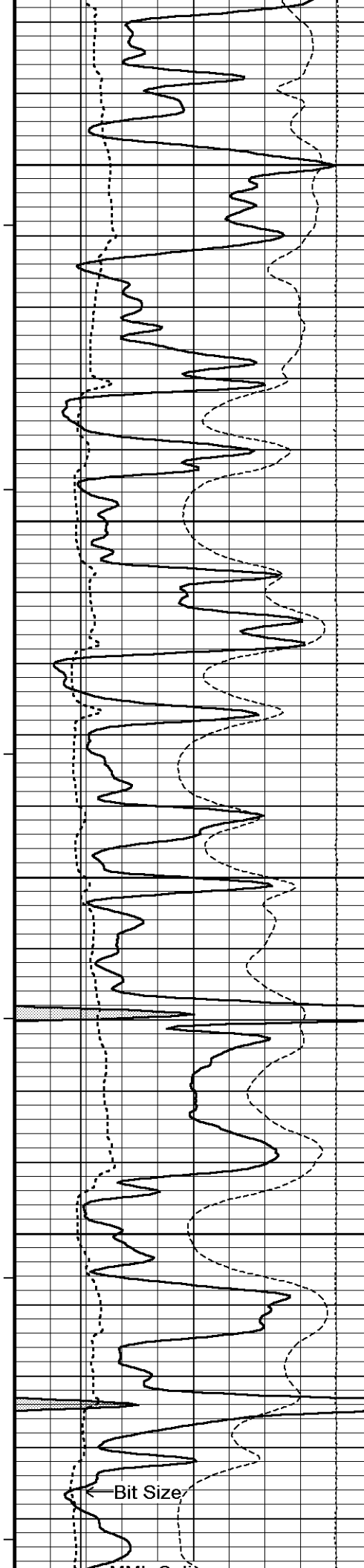


Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240





118°

3700

118°

3750

118°

3800

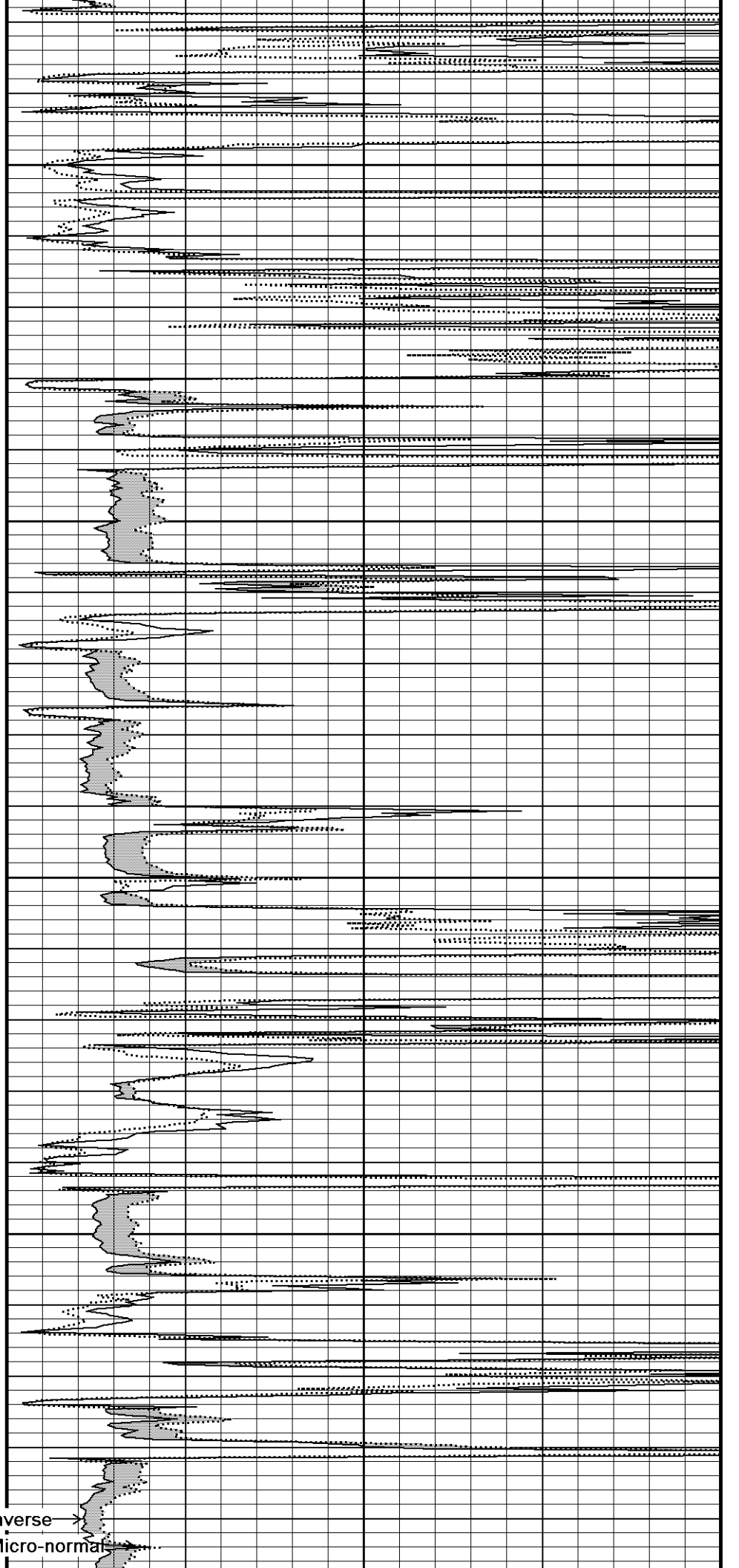
119°

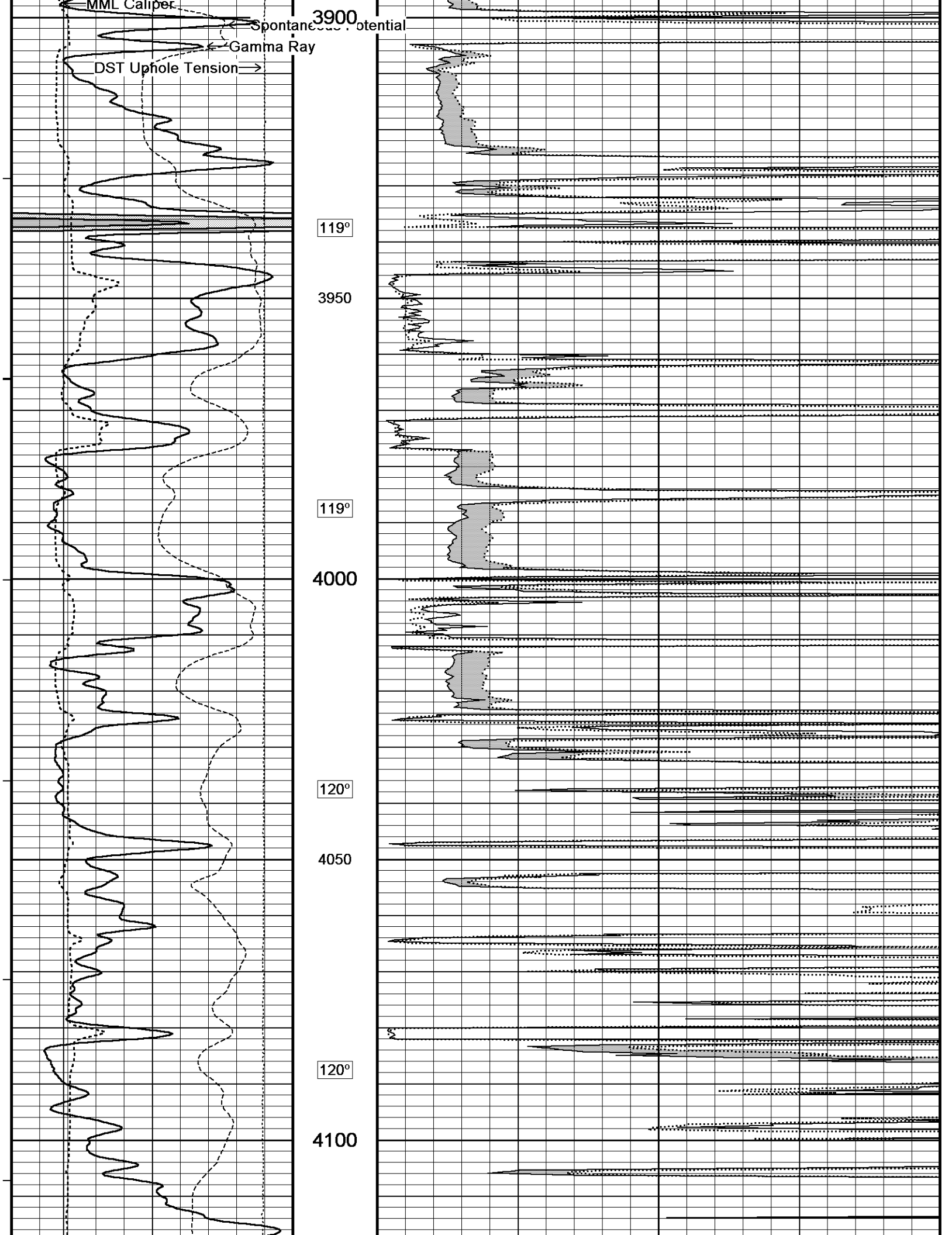
3850

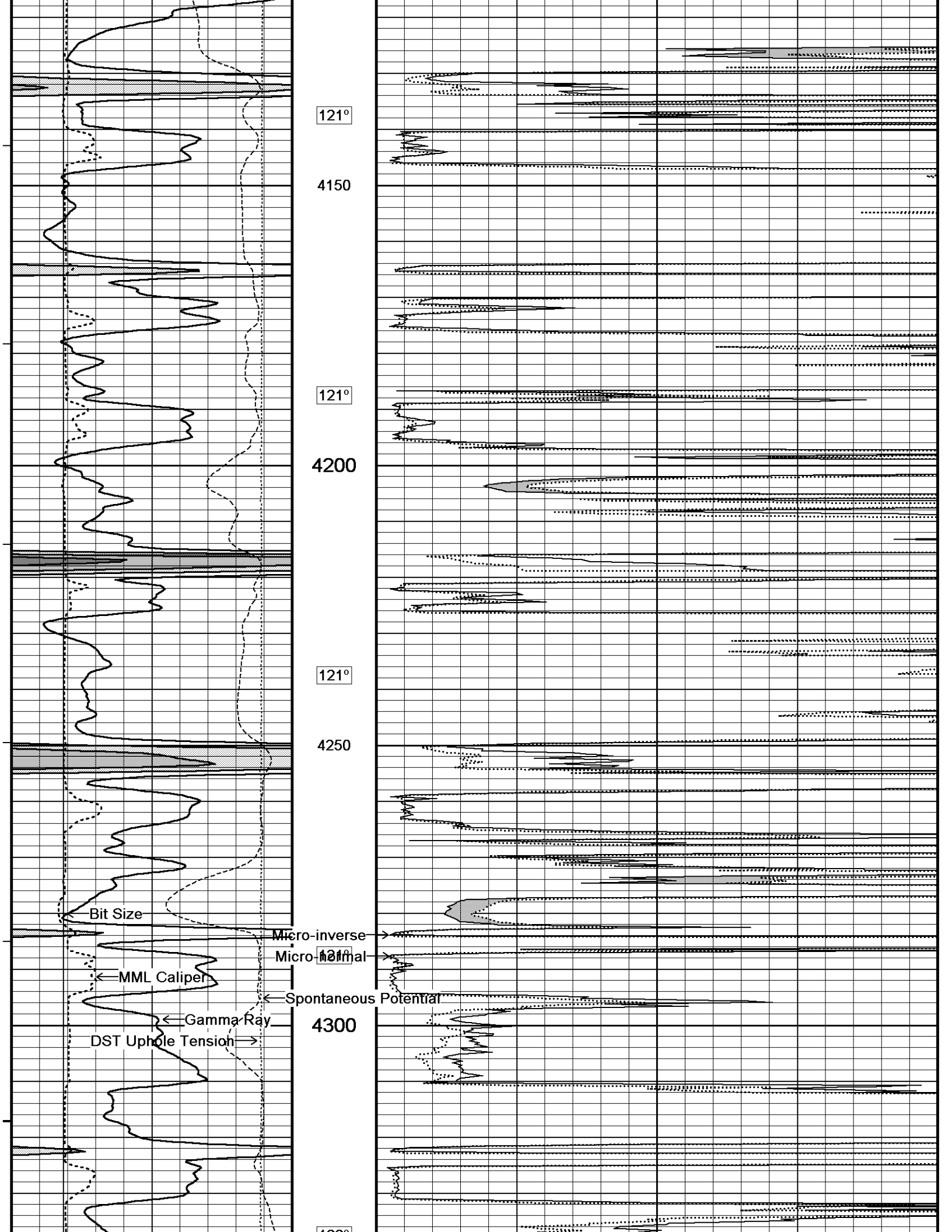
119°

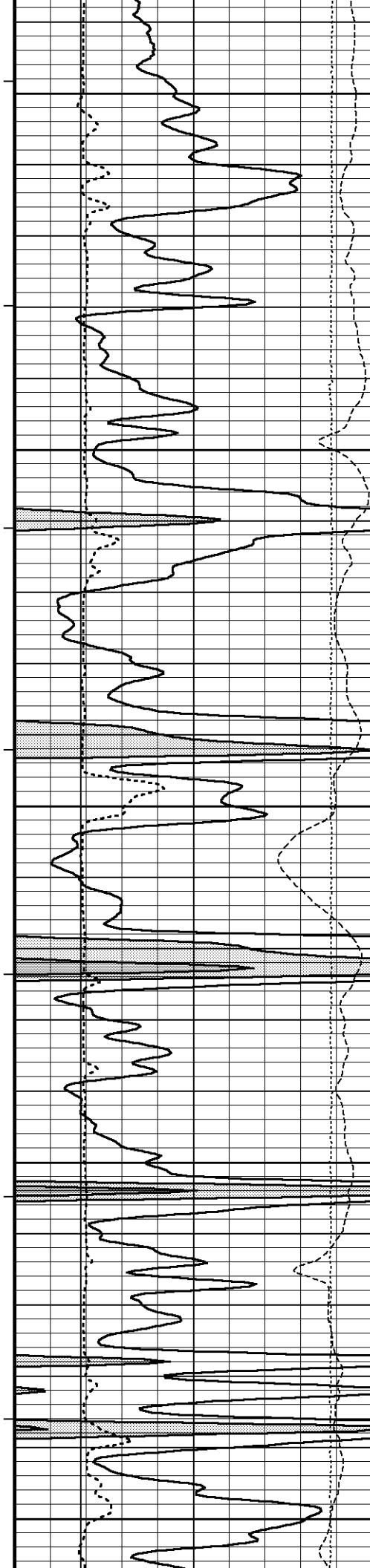
Micro-inverse

Micro-normal









122°

4350

122°

4400

123°

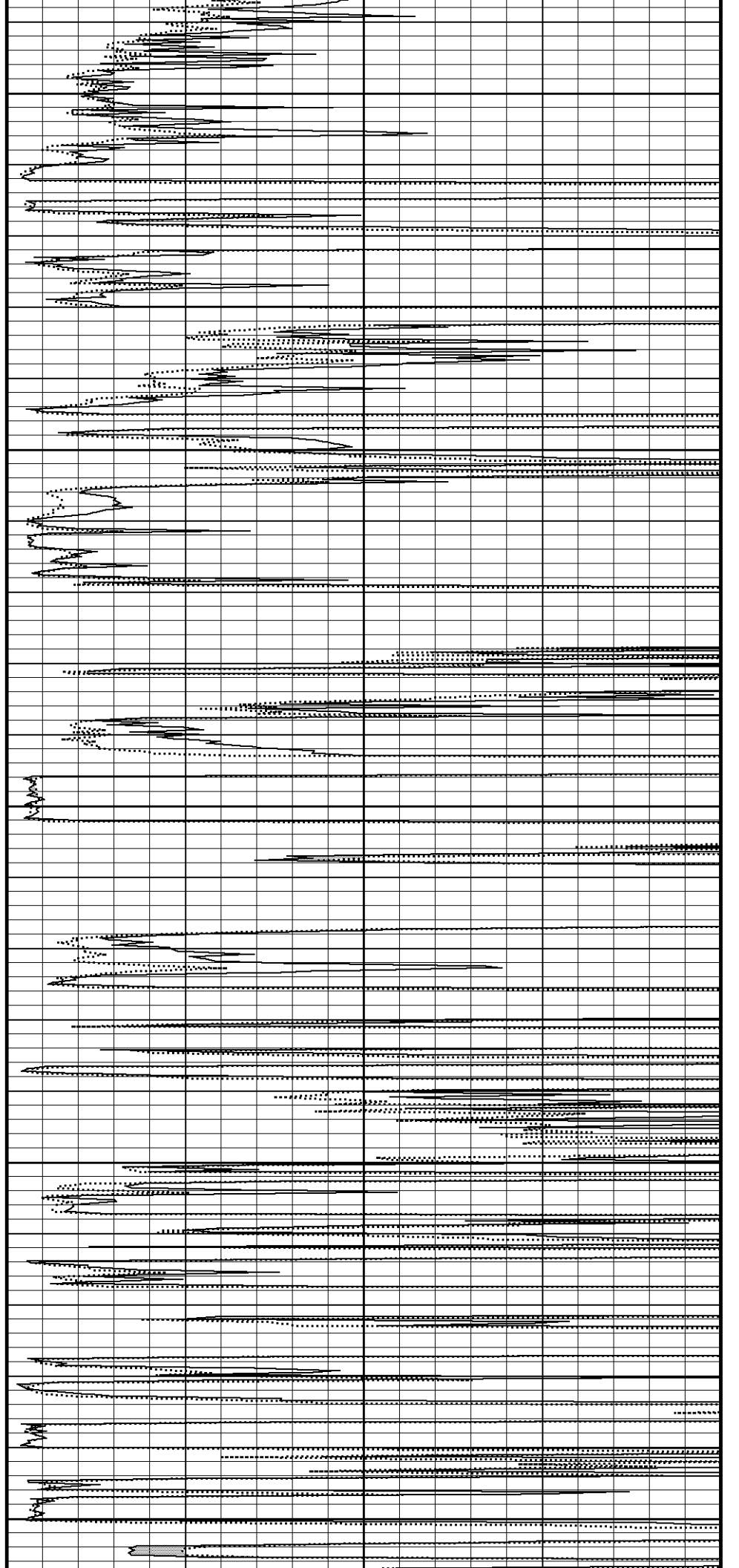
4450

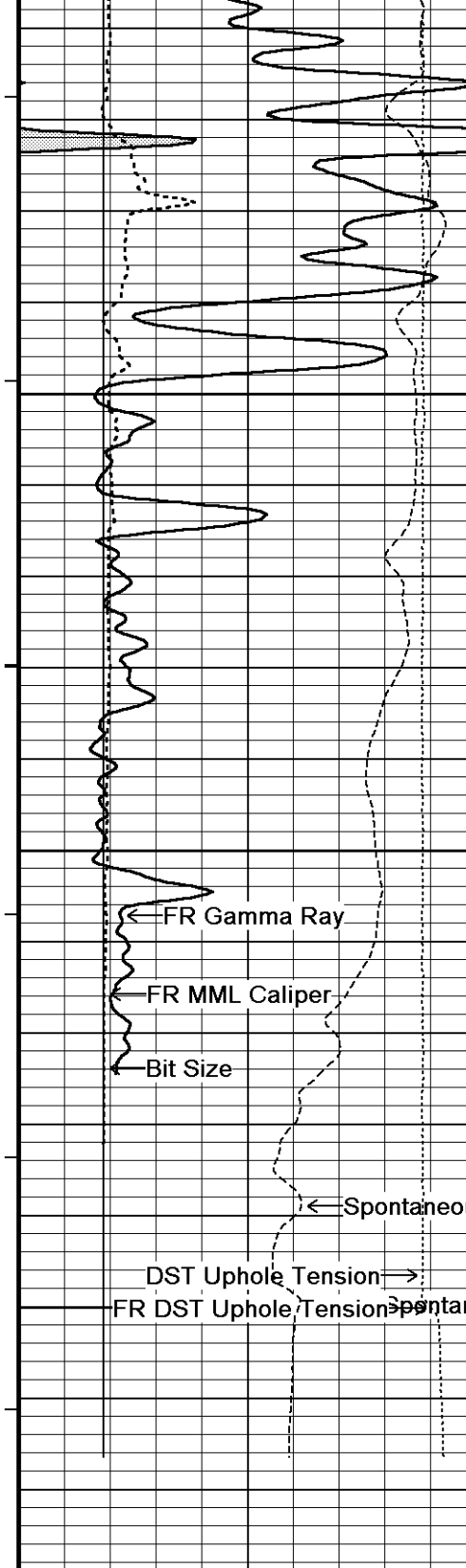
124°

4500

124°

4550





125°

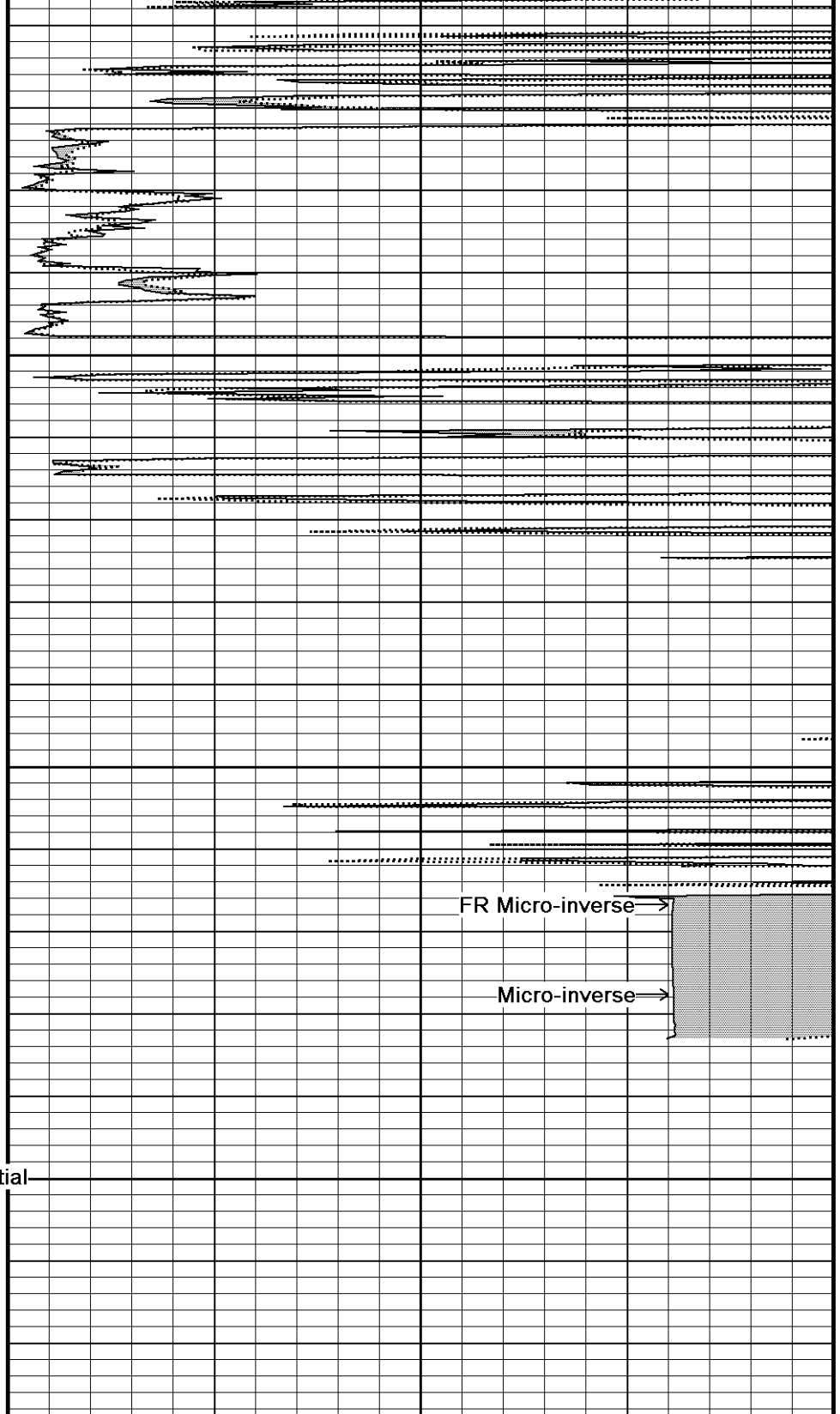
4600

125°

4650

4700

4726
Depth
in
Feet



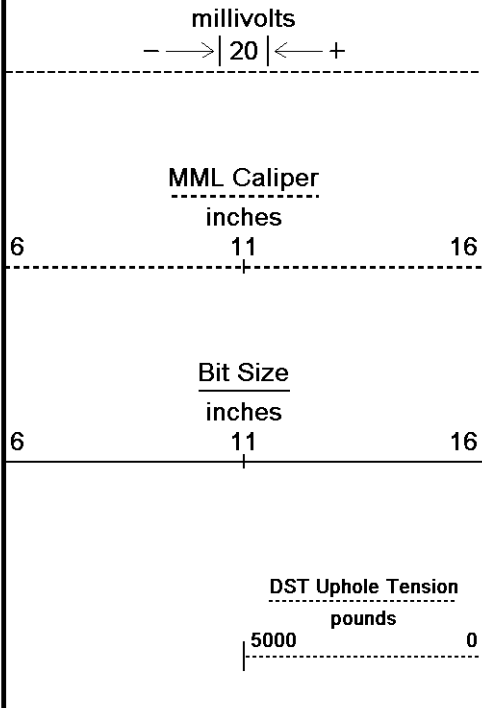
Micro-normal
ohm metres

0 10 20 30 40

Timing Marks
every 60.0 sec

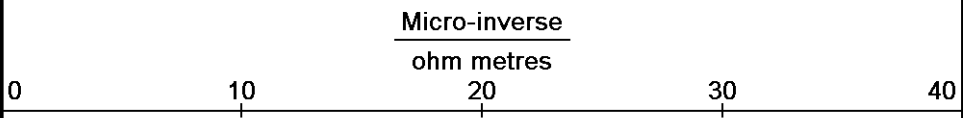
Gamma Ray
API
0 75 150

Spontaneous Potential



Borehole Temp in deg F

Replay Scale 1:240

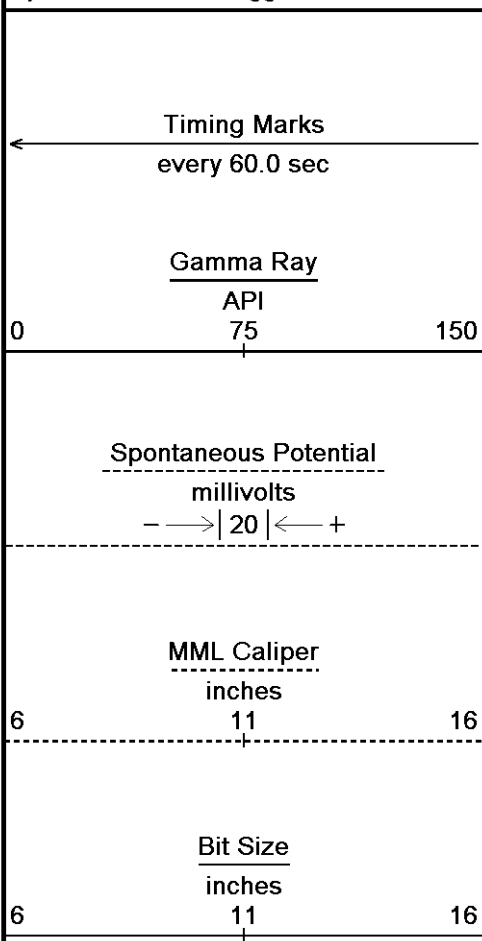


Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 29-JUN-2012 21:02
 Filename: C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_003.dta
 Recorded on 29-JUN-2012 18:53
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

↑ 5 INCH MAIN ↑

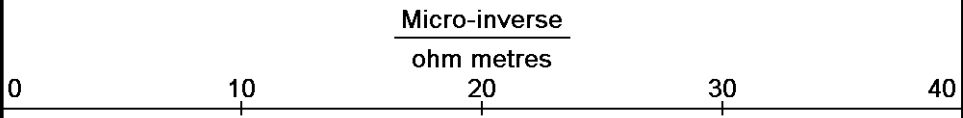
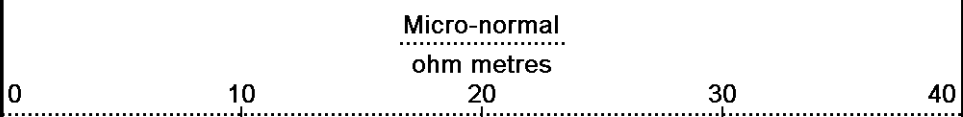
↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 29-JUN-2012 21:02
 Filename: C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_002.dta
 Recorded on 29-JUN-2012 18:29
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044



Depth in Feet

Borehole Temp in deg F



DST Uphole Tension
pounds

5000 0

Replay
Scale
1:240

4500

123°

4550

124°

4600

124°

4650

4700

FR Gamma Ray

FR MML Caliper

Bit Size

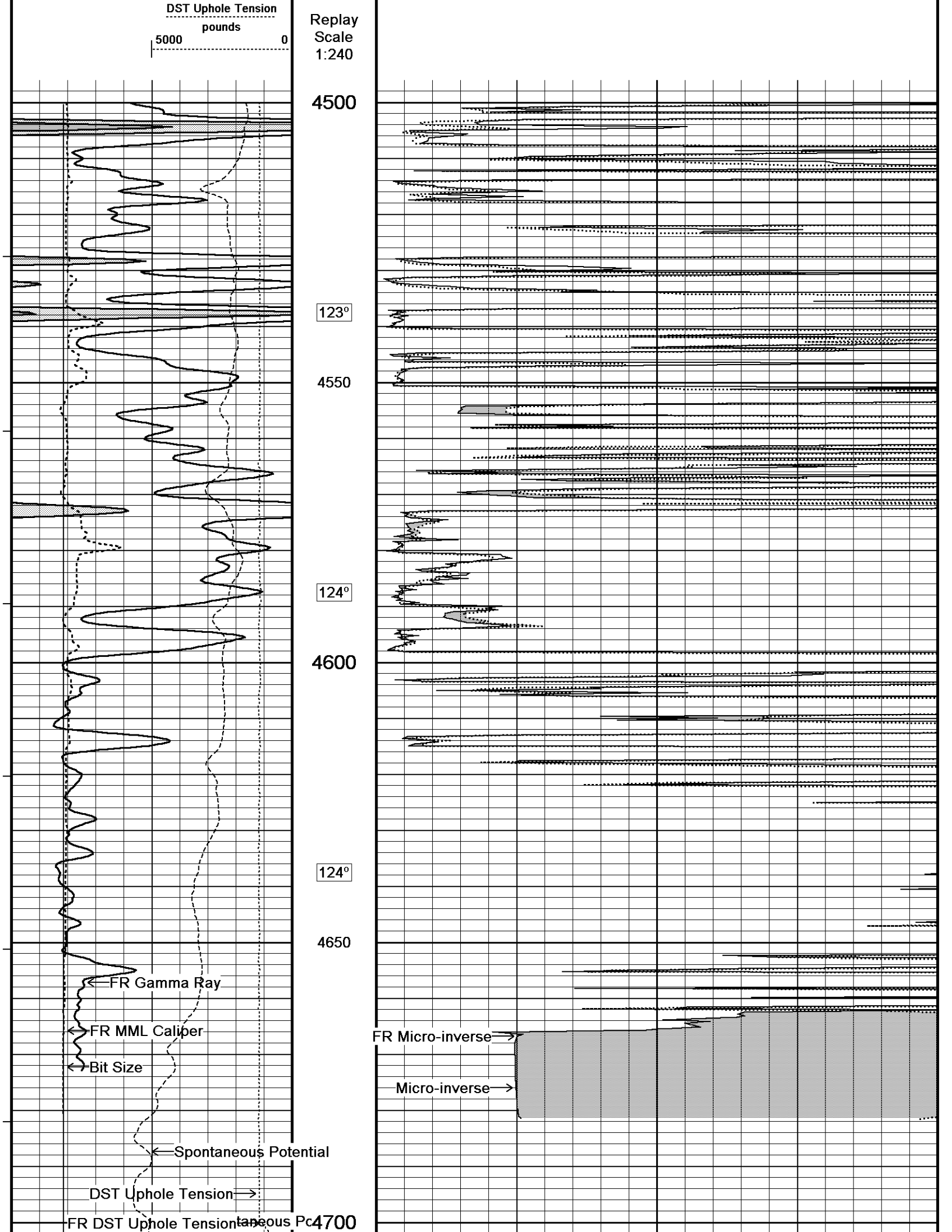
Spontaneous Potential

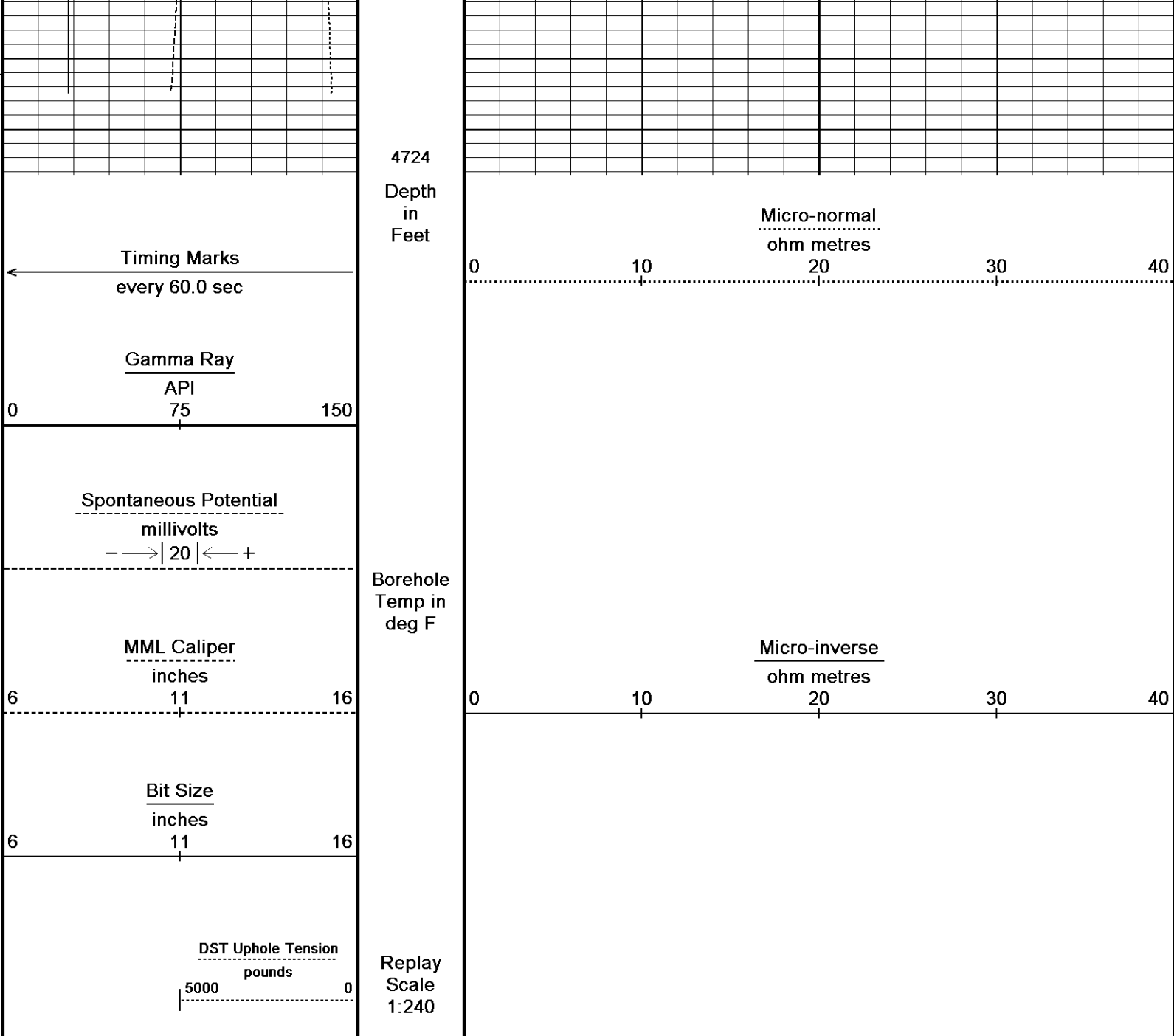
DST Uphole Tension

FR DST Uphole Tension

FR Micro-inverse

Micro-inverse





Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 29-JUN-2012 21:02
 Filename: C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_002.dta
 Recorded on 29-JUN-2012 18:29
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_003.dta

General Constants All 000 Last Edited on 29-JUN-2012,17:06

General Parameters

Mud Resistivity	0.570	ohm-metres
Mud Resistivity Temperature	99.800	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	Limestone Density Por.
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration All 000			Field Calibration on 30-JUN-2010
Reading No	Measured	Calibrated (lbs)	
1	14112.01	10.00	
2	15164.79	427.00	

Down-hole Tension Calibration SMS 0			Field Calibration on 29-MAR-2012 11:07
Reading No	Measured	Calibrated (lbs)	
1	-2133.10	0.00	
2	-2135.89	100.00	

Gamma Calibration MCG-E.A 443			Field Calibration on 29-JUN-2012 00:51
	Measured	Calibrated (API)	
Background	74	50	
Calibrator (Gross)	1153	775	
Calibrator (Net)	1079	725	

Gamma Constants MCG-E.A 443			Last Edited on 29-JUN-2012,17:07
Gamma Calibrator Number	grc38		
Mud Density	1.11	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	

SP Calibration MCG-E.A 443			Field Calibration on 27-JUN-2012,16:46
	Measured	Calibrated (mV)	
Reference 1	98.6	100.0	
Reference 2	-101.8	-100.0	

High Resolution Temperature Calibration MCG-E.A 443			Field Calibration on 27-JUN-2012,16:47
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-E.A 443			Last Edited on 27-JUN-2012,16:45
Pre-filter Length	11		

Caliper Calibration MML-A 16			Base Calibration on 23-MAY-2012 08:49	Field Calibration on 29-JUN-2012 00:44
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	14648	5.98		
2	17884	7.97		
3	21168	9.86		
4	25204	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration	Measured Caliper (in)	Actual Caliper (in)		
	5.99	5.98		

Micro Normal and Micro Inverse Calibration MML-A 16					Base Calibration on 23-MAY-2012 08:57	Field Check on 29-JUN-2012 00:35
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 27-JUN-2012,15:28

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-MAY-2012 12:54
 Field Check on 29-JUN-2012 00:56

Base Calibration

		Measured		Calibrated (cps)
	Near	Far	Near	Far
	3162	99	3714	110
Ratio	31.795		33.764	

Field Calibrator at Base

		Calibrated (cps)
		1615 2304
Ratio		0.701

Field Check

		Calibrated (cps)
		1620 2323
Ratio		0.697

Neutron Constants MDN-A.B 66

Last Edited on 29-JUN-2012,17:07

Neutron Source Id P58125B
 Neutron Jig Number 5824NE
 Epithermal Neutron No
 Caliper Source for Processing Density Caliper
 Stand-off 0.00 inches
 Mud Density 1.11 gm/cc
 Limestone Sigma 7.10 cu
 Sandstone Sigma 4.26 cu
 Dolomite Sigma 4.70 cu
 Formation Pressure Source None
 Formation Pressure N/A kpsi
 Temperature Source MCG External Temperature
 Temperature N/A degrees F
 Mud Salinity 0.00 kppm
 Formation Fluid Salinity Source Constant Value
 Formation Fluid Salinity 0.00 kppm
 Barite Mud Correction Not Applied

FE Calibration MFE-C.A 353

Base Calibration on 19-JUN-2012 09:41
 Field Check on 28-JUN-2012 13:02

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	966.3	126.8
Base Check		280.4
Field Check		280.3

FE Constants MFE-C.A 353

Last Edited on 28-JUN-2012,13:01

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 0.0 inches

Induction Calibration MAI-A.A 167

Base Calibration on 11-MAR-2011,09:58
 Field Check on 28-JUN-2012 13:00

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	14.5	3837.1
2	0.0	0.0	29.9	3473.2
3	0.0	0.0	29.2	3049.2
4	0.0	0.0	19.8	2079.1
Deep	0.0	0.0	18.6	2046.4
Medium	0.0	0.0	42.3	3985.8
Shallow	0.0	0.0	43.6	5048.9
Array Temperature	0.0		96.9	Deg F

Induction Constants MAI-A.A 167

Last Edited on 29-JUN-2012,05:02

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	0.00 inches
Number of Fins on Stand-off	8.0000
Stand-off Fin Angle	45.00 degrees
Stand-off Fin Width	0.0000 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

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 17-MAY-2012,10:07

	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

Pre-filter Length 11

Caliper Calibration MPD-B 64

Base Calibration on 24-JUN-2012 14:30
Field Calibration on 29-JUN-2012 00:32

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13920	3.99
2	22688	5.98
3	31088	7.97
4	39486	9.86
5	48676	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.94	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 24-JUN-2012 14:54
Field Check on 29-JUN-2012 00:29

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	56338	29291	59556	30836
Reference 2	22715	2675	24941	2541

Field Check at Base

1198.8	1389.9
--------	--------

Field Check

1192.9	1382.1
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PE Calibration

Base Calibration	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	217	1071		
Reference 1	21443	56144	0.385	0.371
Reference 2	6237	22577	0.280	0.272

Field Check at Base

216.7	1070.6
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Field Check

217.8	1066.0
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Density Constants MPD-B 64

Last Edited on 29-JUN-2012,17:07

Density Source Id	P50557B	
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	1.11	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

DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\Grand Mesa S & L # 1-14\SL 1 14_003.dta

Compact Comms Gamma



42.87 ft GRGC - Gamma Ray

MCG-E.A 443 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

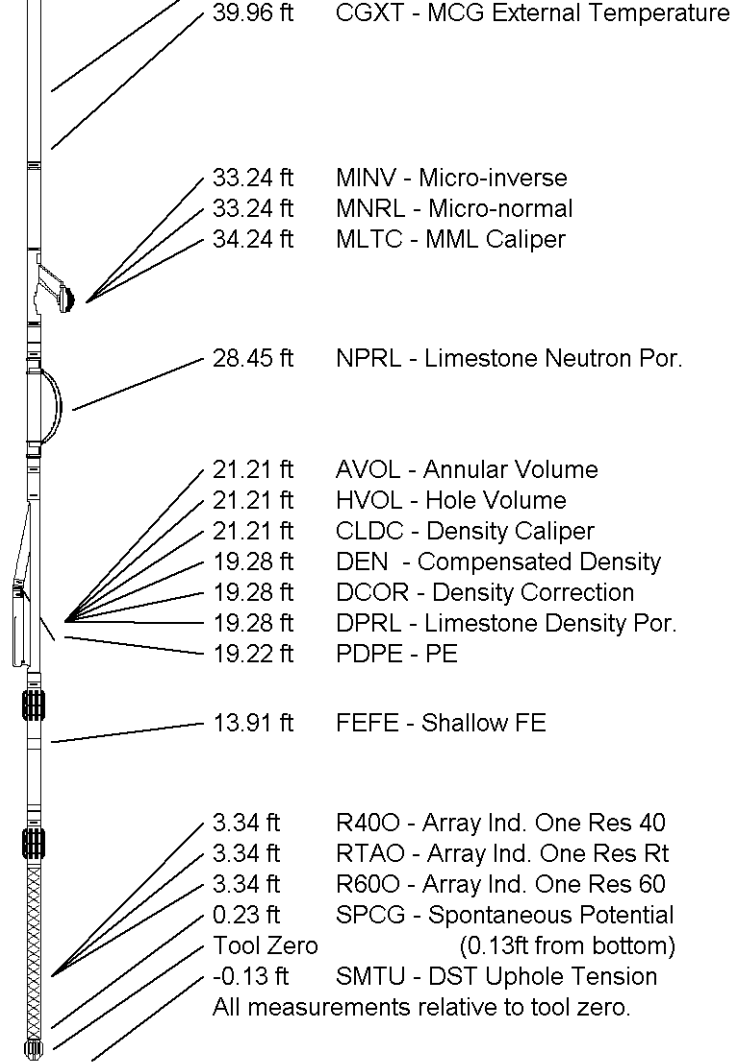
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focused Electric
MFE-C.A 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: 48.16 ft Weight: 383.6 lb



COMPANY Grand Mesa Operating Co.
WELL S & L #1-14
FIELD Maurice Prospect
PROVINCE/COUNTY Gove
COUNTRY/STATE U.S.A. / Kansas

Elevation Kelly Bushing	2909.00	feet	First Reading	4664.00	feet
Elevation Drill Floor	2911.00	feet	Depth Driller	4700.00	feet
Elevation Ground Level	2904.00	feet	Depth Logger	4700.00	feet



MICRORESISTIVITY LOG

