

**Weatherford**¹⁸⁰**MICRORESISTIVITY LOG**

COMPANY

REDLAND RESOURCES, INC.

WELL

CHERYL #31-15

FIELD

MCVICKER SE

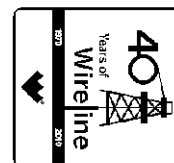
PROVINCE/COUNTY

NESS

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

610' FSL & 2080' FEL**SE/4**

SEC

TWP

RGE

Other Services

MAI/MFE

31

20S

25W

MPD/MDN

API Number

15-135-25364

Permit Number

Permanent Datum G.L., Elevation 2399 feet

Log Measured From KB

Drilling Measured From K.B.

Date

22-MAR-2012

Elevations:

feet

KB

2407.00

DF

2405.00

GL

2399.00

Run Number

ONE

Depth Driller

4500.00

feet

Depth Logger

4497.00

feet

First Reading

4461.00

feet

Last Reading

3500.00

feet

Casing Driller

213.00

feet

Casing Logger

214.00

feet

Bit Size

7.875

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.50

lb/USg

48.00

CP

PH / Fluid Loss

9.50

8.00

ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

0.87 @ 77.0

ohm-m

Rmf @ Measured Temp

0.70 @ 77.0

ohm-m

Rmc @ Measured Temp

1.04 @ 77.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.61 @ 110.0

ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

110.00

deg F

Equipment Name

COMPACT

Equipment / Base

13096

LIB

BOREHOLE RECORD

Last Edited: 22-MAR-2012 11:54

Bit Size
inches

7.875

Depth From
feet

214.00

Depth To
feet

4497.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

214.00

Weight
pounds/ft

24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML

Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs 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 4.5 inch production casing = 263 cu. ft

Total hole volume from TD to Surface Casing= 2037 cu. ft.

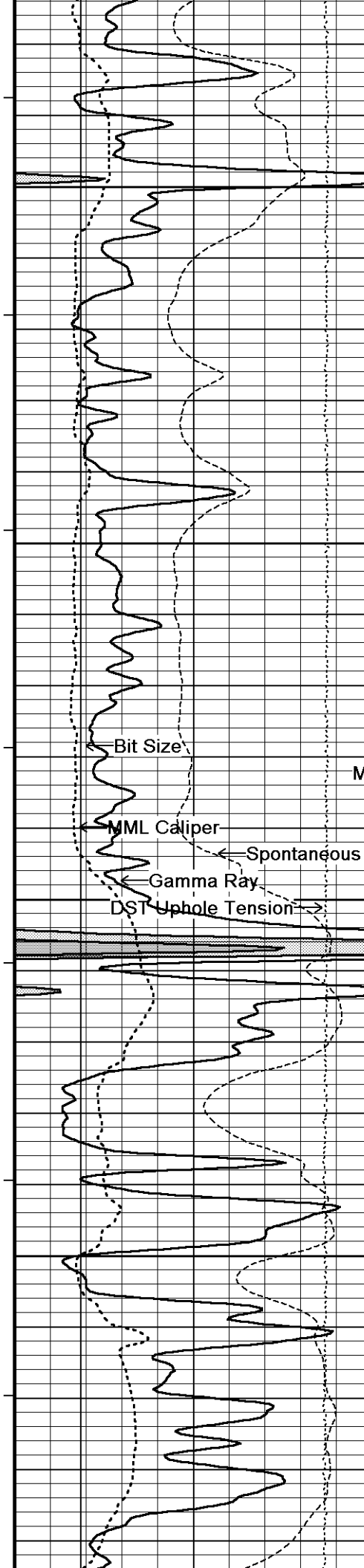
Service order #3534694

Rig: Duke # 2

Engineer: L. Scott

Operator(s): K. Rinehart

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.



103°

3600

103°

3650

Micro-inverse →

Micro-normal →

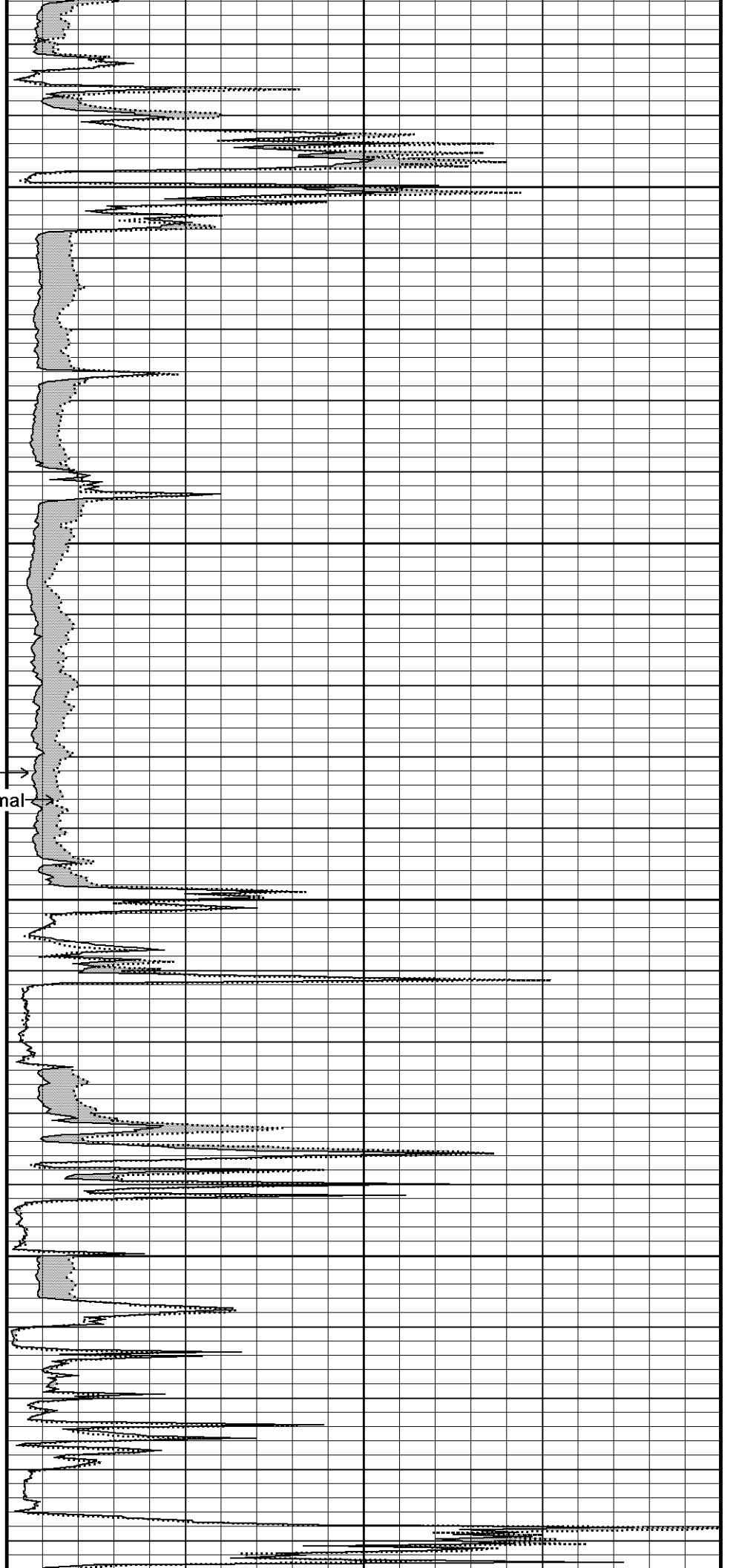
103°

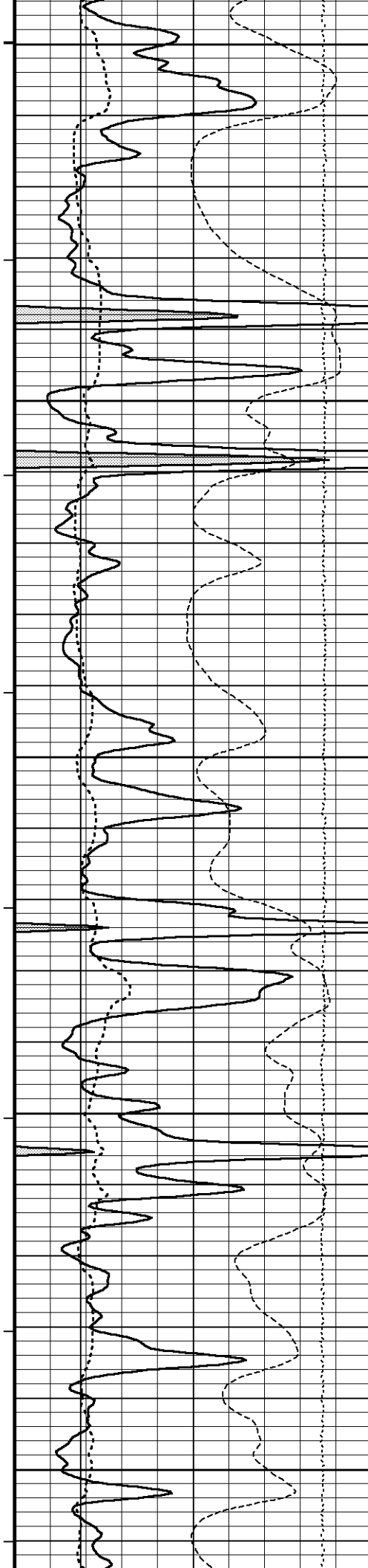
3700

104°

3750

104°





3800

104°

3850

104°

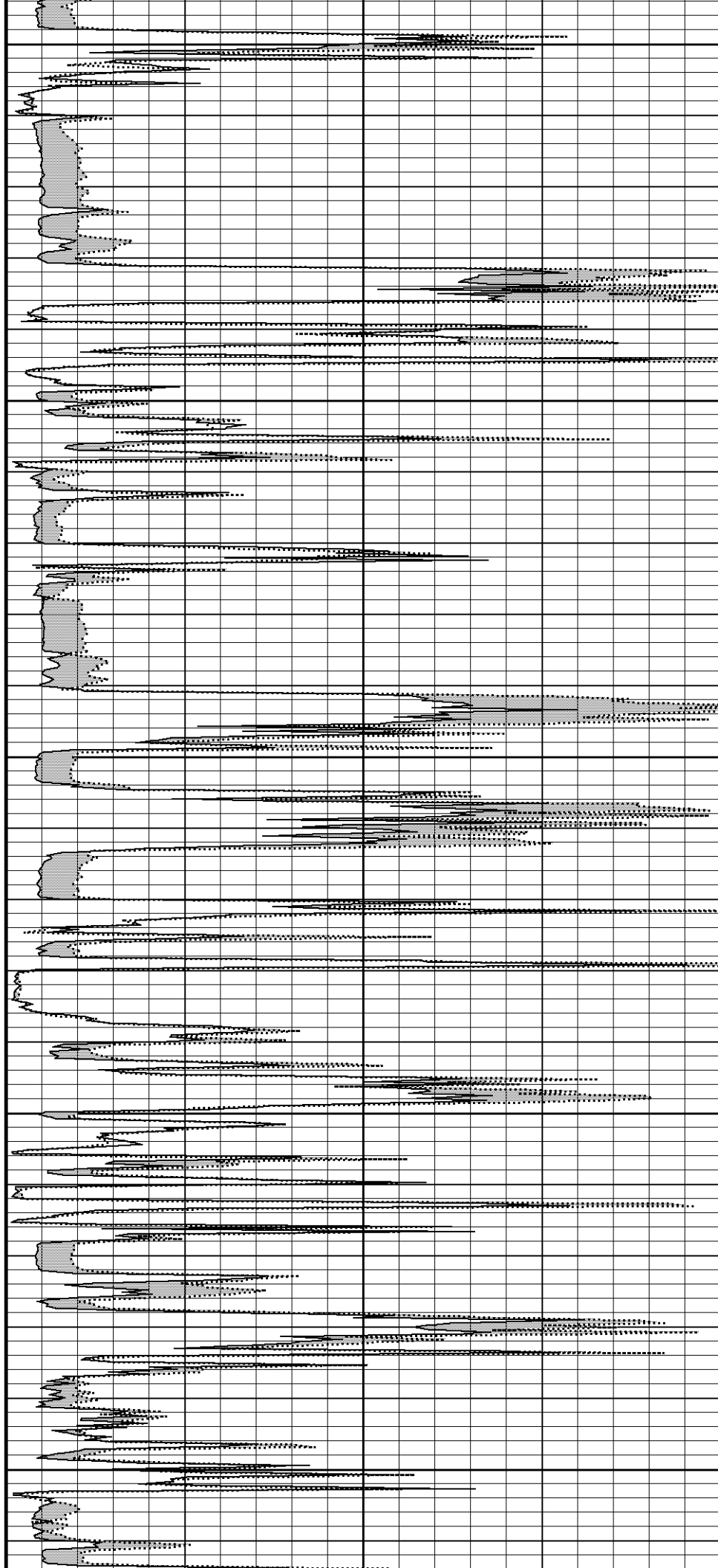
3900

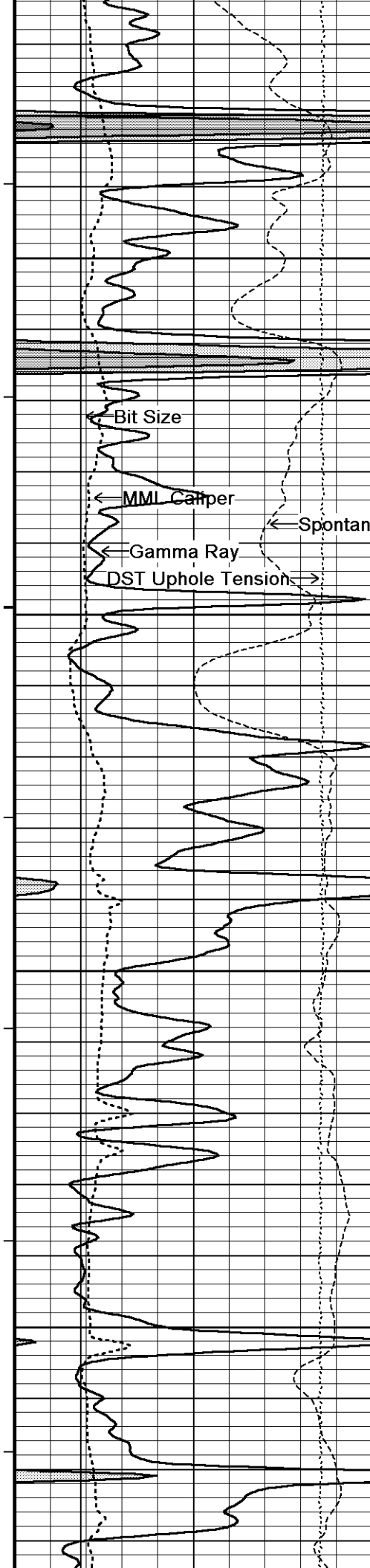
105°

3950

105°

4000





105°

4050

4100

4150

106°

4200

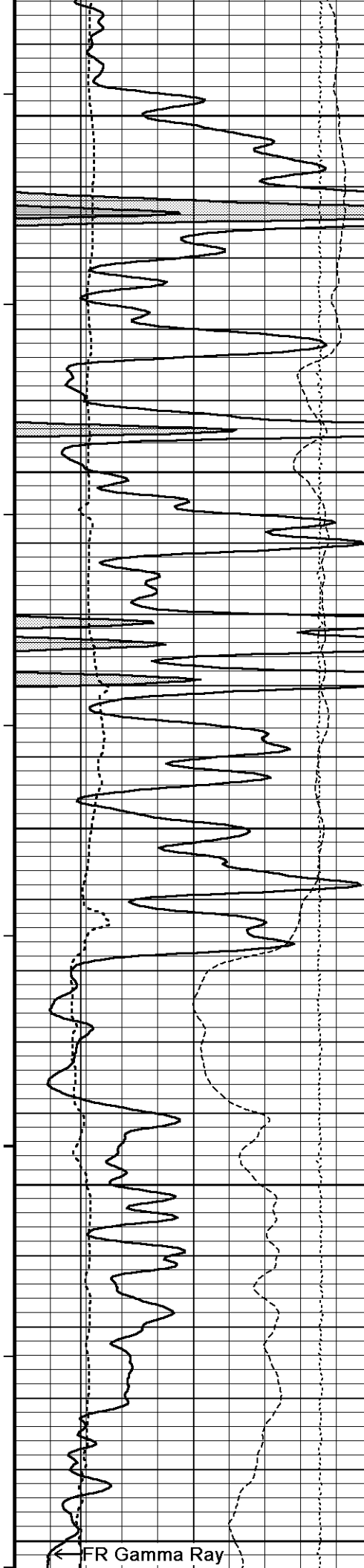
107°

4250

Micro-inverse

Micro-normal

Spontaneous Potential



108°

4250

109°

4300

109°

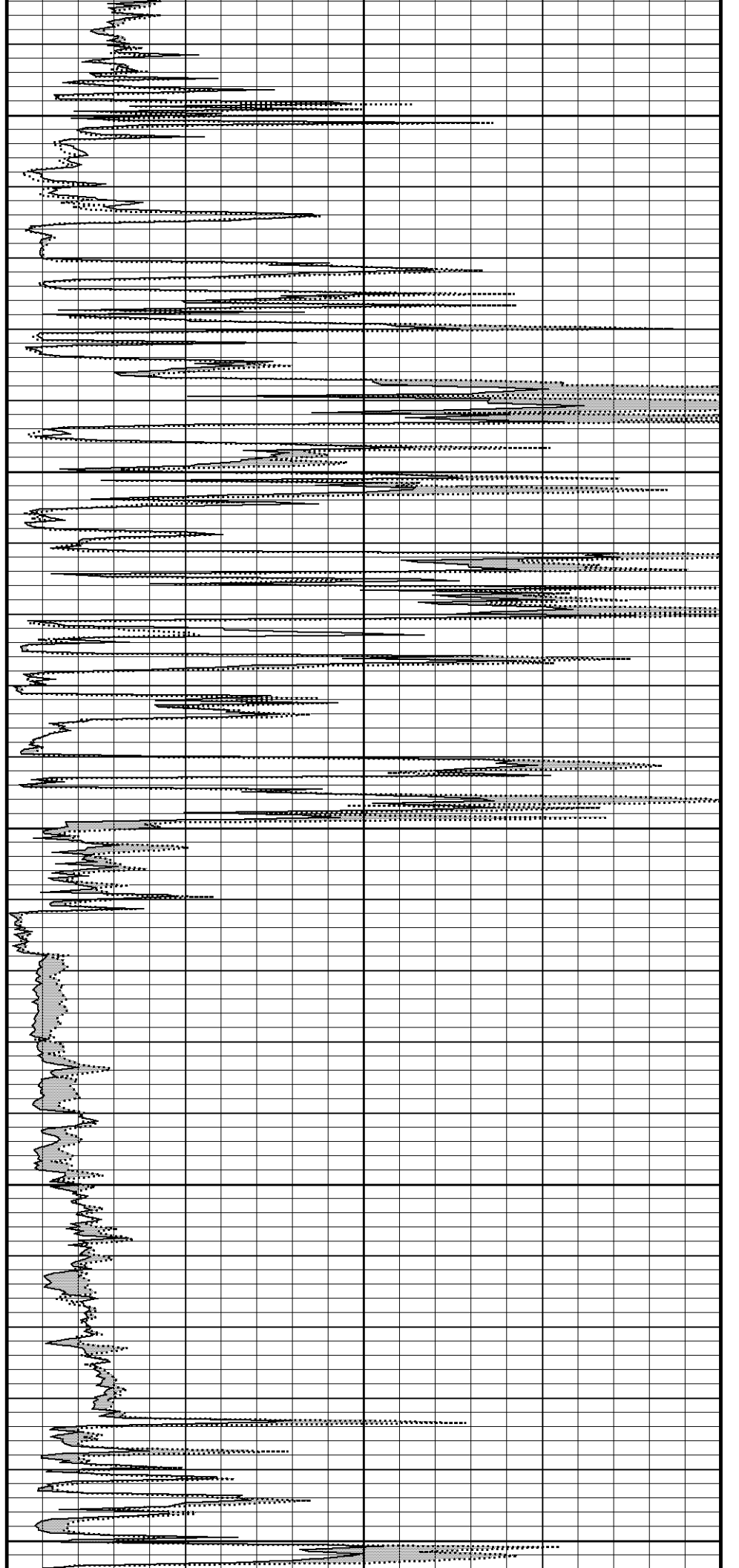
4350

110°

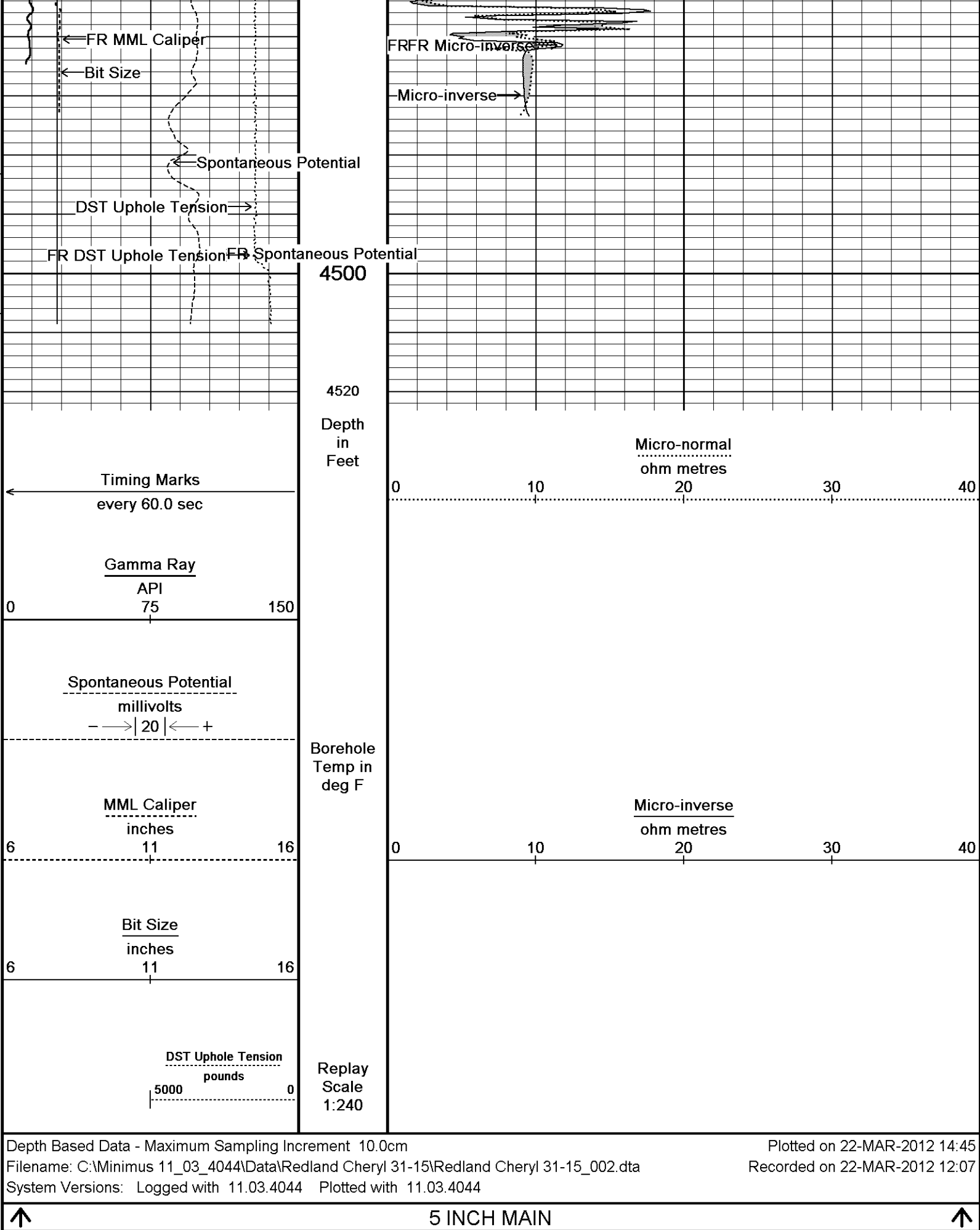
4400

110°

4450



← FR Gamma Ray



Depth Based Data - Maximum Sampling Increment 10.0cm

Filename: C:\Minimus 11_03_4044\Data\Redland Cheryl 31-15\Redland Cheryl 31-15_002.dta

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 22-MAR-2012 14:45

Recorded on 22-MAR-2012 12:07

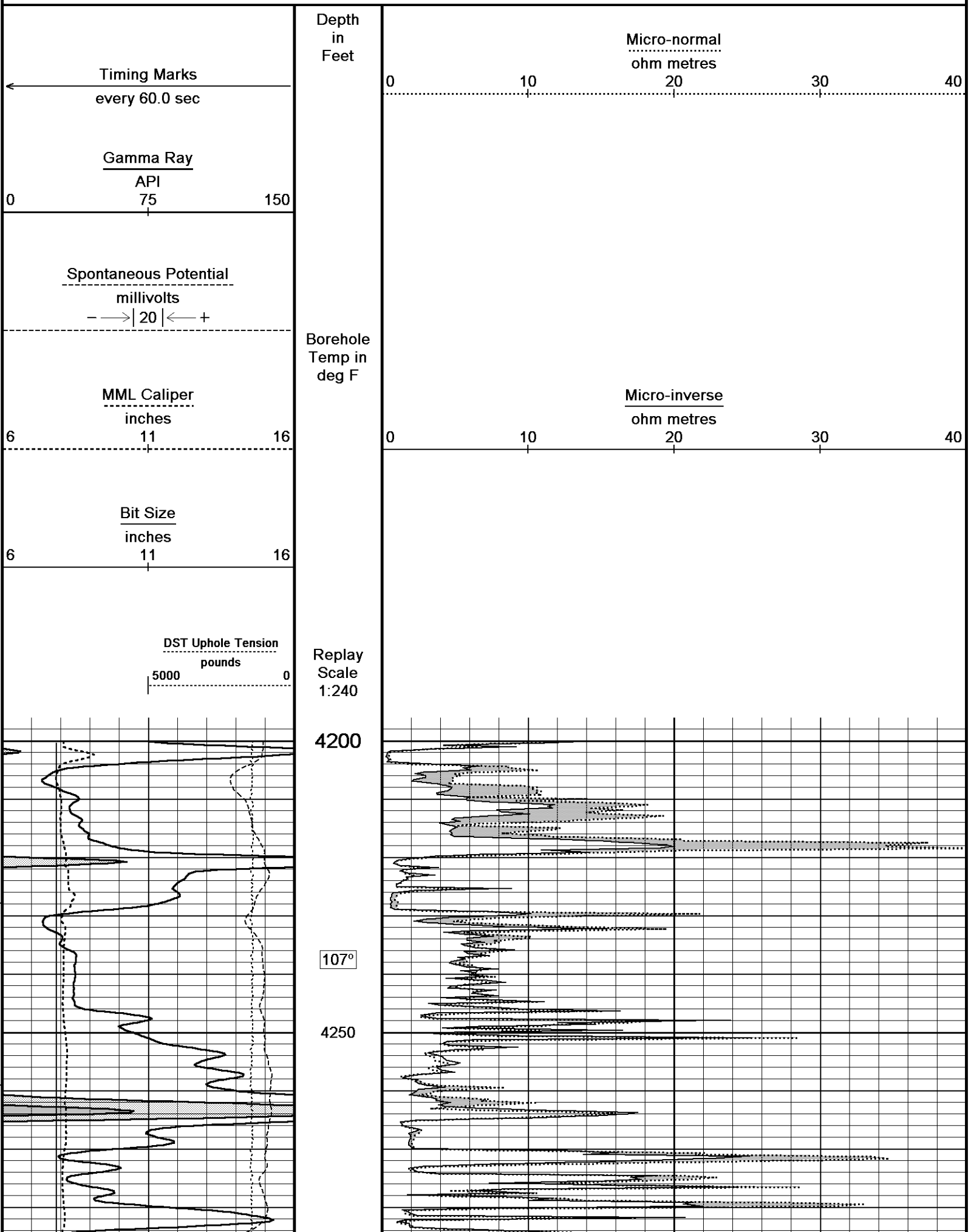
↓

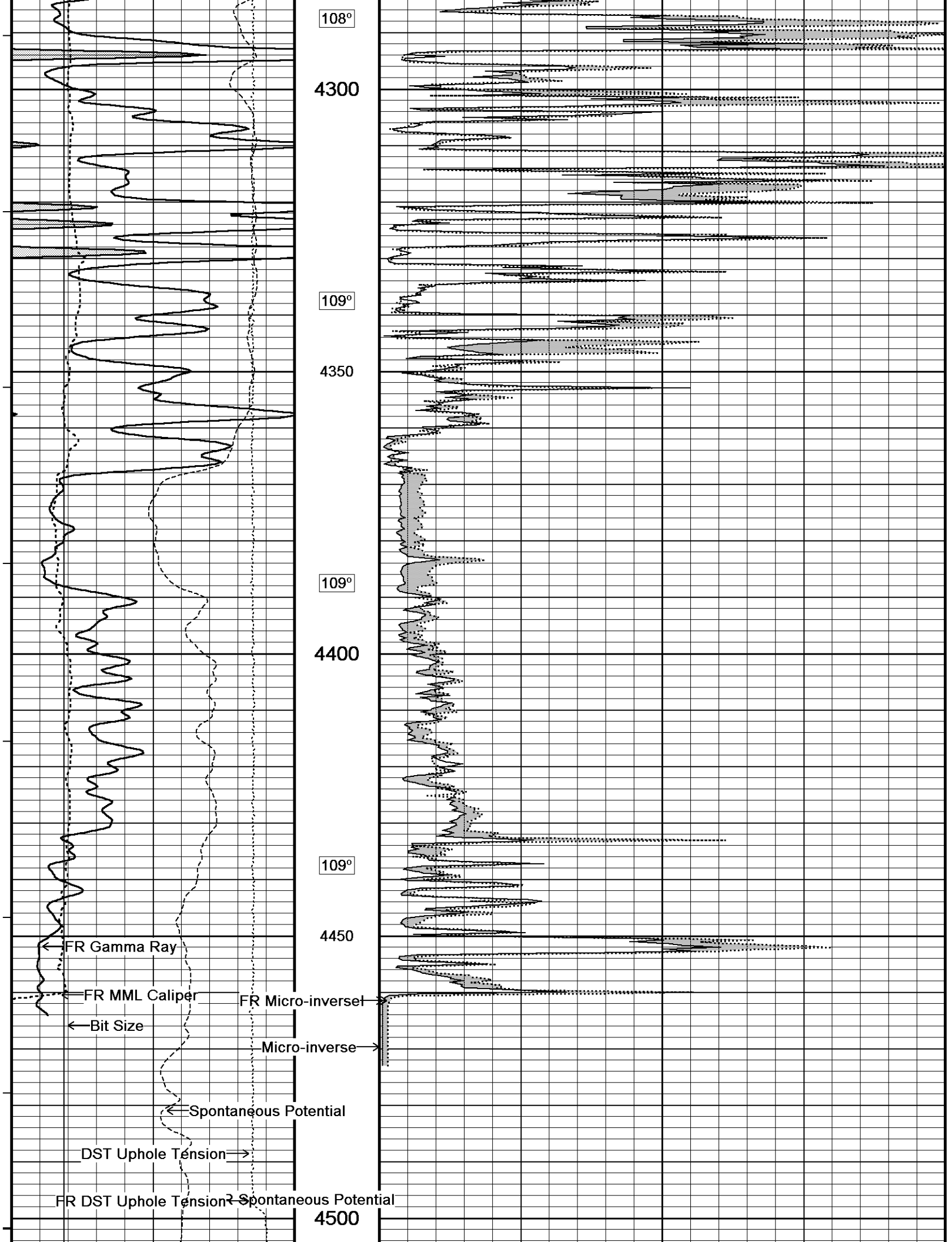
REPEAT SECTION

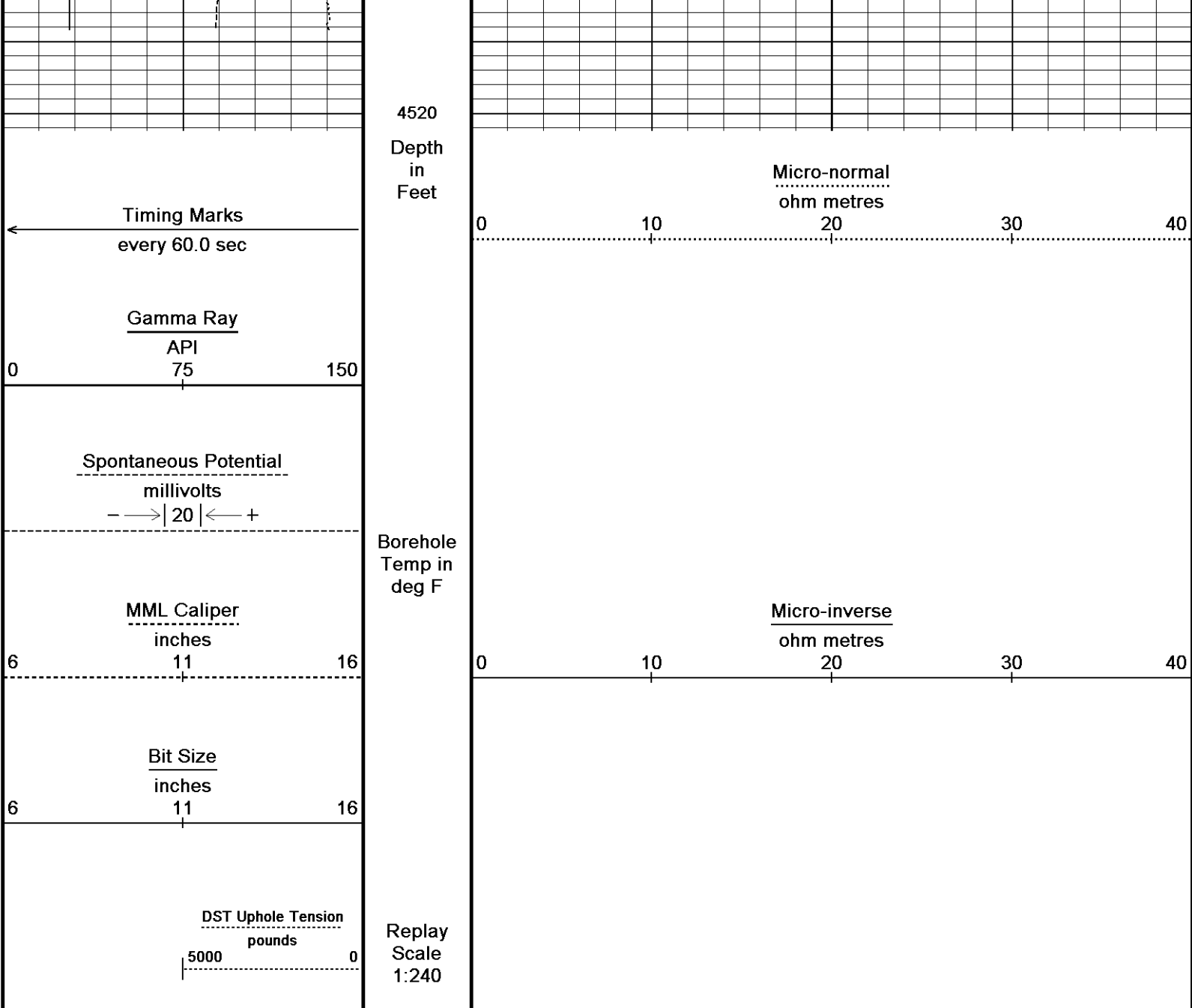
↓

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 22-MAR-2012 14:45







Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 22-MAR-2012 14:45
Filename: C:\Minimus 11_03_4044\Data\Redland Cheryl 31-15\Redland Cheryl 31-15_001.dta	Recorded on 22-MAR-2012 11:49
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044	

↑	REPEAT SECTION	↑
---	----------------	---

BEFORE SURVEY CALIBRATION	
C:\Minimus 11_03_4044\Data\Redland Cheryl 31-15\Redland Cheryl 31-15.dta	

General Constants All 000	Last Edited on 22-MAR-2012,11:05
---------------------------	----------------------------------

General Parameters		
Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	77.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters		Limestone Density Por.	
Porosity used		Array Ind. One Res Rt	
Resistivity used		1.000	
RWA Constant A		2.000	
RWA Constant M			
Down-hole Tension Calibration SMS 0			
		Field Calibration on 23-FEB-2012 23:25	
Reading No	Measured	Calibrated (lbs)	
1	13693.36	0.00	
2	14387.39	407.90	
Gamma Calibration MCG-C 84			
		Field Calibration on 22-MAR-2012 00:55	
	Measured	Calibrated (API)	
Background	79	54	
Calibrator (Gross)	744	510	
Calibrator (Net)	665	456	
Gamma Constants MCG-C 84			
		Last Edited on 22-MAR-2012,11:06	
Gamma Calibrator Number	grc141		
Mud Density	1.14	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
SP Calibration MCG-C 84			
		Field Calibration on 22-MAR-2012,00:48	
	Measured	Calibrated (mV)	
Reference 1	100.3	100.0	
Reference 2	-99.7	-100.0	
High Resolution Temperature Calibration MCG-C 84			
		Field Calibration on 22-MAR-2012,00:47	
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 84			
		Last Edited on	
Pre-filter Length	11		
Caliper Calibration MML-A 9			
		Base Calibration on 15-MAR-2012 11:46	
		Field Calibration on 22-MAR-2012 00:37	
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15186	5.98	
2	18659	7.97	
3	21935	9.86	
4	25881	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.98	5.98	
Micro Normal and Micro Inverse Calibration MML-A 9			
		Base Calibration on 15-MAR-2012 14:42	
		Field Check on 22-MAR-2012 00:35	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2	
Micro Normal	12.0 59.5	2.6 12.8	
Micro Inverse	15.5 77.7	1.7 8.4	
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	32.5	32.5	
Micro Inverse	16.4	16.5	
Micro Normal and Micro Inverse Constants MML-A 9			
		Last Edited on 20-MAR-2012,03:51	
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	N/A		inches	
Neutron Calibration MDN-A.B 39			Base Calibration on 12-MAR-2012 14:56 Field Check on 22-MAR-2012 01:02	
Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2762	87	3714	110
Ratio	31.770		33.764	
Field Calibrator at Base				
			Calibrated (cps)	
			2387	3366
Ratio			0.709	
Field Check				
			Calibrated (cps)	
			2368	3400
Ratio			0.696	

Neutron Constants MDN-A.B 39			Last Edited on 22-MAR-2012,01:02		
Neutron Source Id	N1095				
Neutron Jig Number	NECD117				
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	None				
Formation Pressure	N/A	kpsi			
Temperature Source	Constant Value				
Temperature	68.00	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-A.A 67			Base Calibration on 15-MAR-2012 15:00	
			Field Check on 22-MAR-2012 00:32	
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	958.8	126.8		
Base Check		281.1		
Field Check		281.0		

FE Constants MFE-A.A 67			Last Edited on 21-MAR-2012,06:58	
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 188			Field Calibration on 12-AUG-2011,21:41	
	Measured		Calibrated(Deg F)	
Lower	32.00		32.00	
Upper	68.00		68.00	

High Resolution Temperature Constants MAI-A.A 188		Last Edited on 21-JUN-2011,19:05
Pre-filter Length	11	

Induction Calibration MAI-A.A 188			Base Calibration on 04-JAN-2012,13:31	
			Field Check on 22-MAR-2012 00:31	
Base Calibration				
Test Log Calibration	Measured	Calibrated (mmps/m)		

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		16.9	470.2	9.3	966.2
2		6.4	377.1	7.6	821.4
3		3.9	257.8	5.2	566.0
4		1.7	135.1	2.6	279.2
Array Temperature		66.3		Deg F	
		Base Check (mmho/m)		Field Check (mmho/m)	
Channel		Low	High	Low	High
1		0.0	0.0	13.3	3867.7
2		0.0	0.0	30.0	3585.1
3		0.0	0.0	28.0	3079.1
4		0.0	0.0	19.9	2047.1
Deep		0.0	0.0	17.3	1955.2
Medium		0.0	0.0	40.5	4115.4
Shallow		0.0	0.0	44.8	5370.2
Array Temperature		0.0		60.7	Deg F

Induction Constants MAI-A.A 188				Last Edited on 22-MAR-2012,00:28	
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 65			Base Calibration on 06-FEB-2012 15:42
			Field Calibration on 22-MAR-2012 00:33
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14246	3.99	
2	22911	5.98	
3	31473	7.97	
4	39776	9.86	
5	48992	11.92	
6	N/A	N/A	

Field Calibration

Measured Caliper (in)
6.01Actual Caliper (in)
5.98

Photo Density Calibration MPD-B 65

Base Calibration on 06-FEB-2012 16:03

Field Check on 22-MAR-2012 00:47

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	58421	27705	59556	30836
Reference 2	23654	2410	24941	2541

Field Check at Base

1233.9 1179.6

Field Check

1230.9 1175.8

PE Calibration

Base Calibration

	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	226	1097		
Reference 1	21385	58213	0.370	0.371
Reference 2	6241	23505	0.268	0.272

Field Check at Base

225.7 1097.3

Field Check

223.6 1093.0

Density Constants MPD-B 65

Last Edited on 22-MAR-2012,11:07

Density Source Id	P57072B
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	1.14 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

DOWNHOLE EQUIPMENT

C:\Minimus 11_03_4044\Data\Redland Cheryl 31-15\Redland Cheryl 31-15.dta

Compact Comms Gamma
MCG-C 84 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in



45.04 ft GRGC - Gamma Ray
42.13 ft CGXT - MCG External Temperature

Compact Micro-log
MML-A 9 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

35.41 ft MINV - Micro-inverse
35.41 ft MNRL - Micro-normal

Compact Neutron
MDN-A.B 39 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

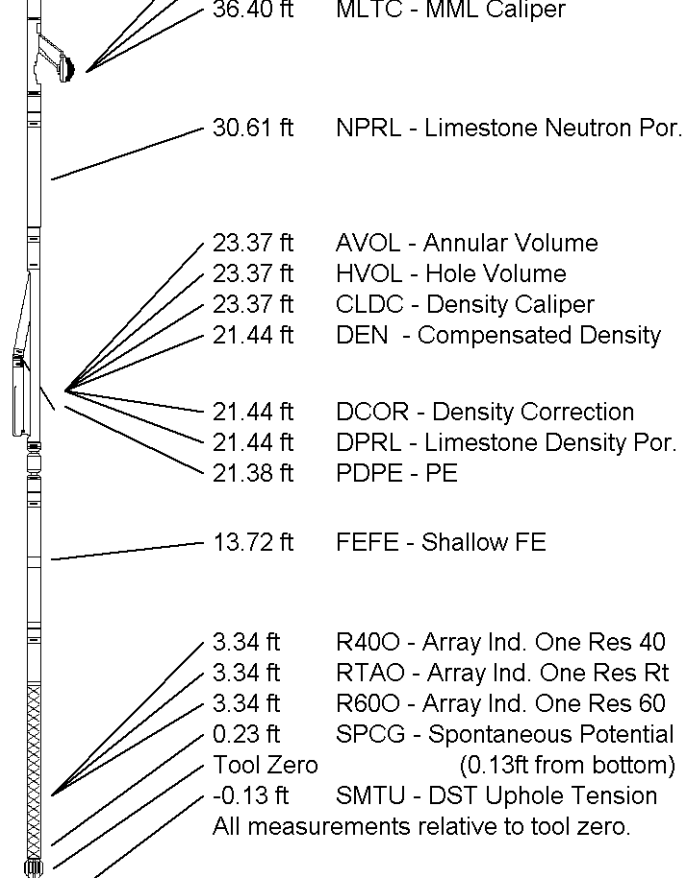
Compact Density/Caliper
MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 91 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 188 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.32 ft Weight: 407.9 lb



COMPANY REDLAND RESOURCES, INC.
WELL CHERYL #31-15
FIELD MCVICKER SE
PROVINCE/COUNTY NESS
COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2407.00	feet	First Reading	4461.00	feet
Elevation Drill Floor	2405.00	feet	Depth Driller	4500.00	feet
Elevation Ground Level	2399.00	feet	Depth Logger	4497.00	feet



Weatherford®

MICRORESISTIVITY LOG

