Weatherford®

# COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG

| | |
|---|---|
| COMPANY | GRAND MESA OPERATING |
| WELL | CSC #1-21 |
| FIELD | WILDCAT |
| PROVINCE/COUNTY | GOVE |
| COUNTRY/STATE | U.S.A. / KANSAS |
| LOCATION | 1200' FNL & 1040' FWL |

40 Years of Wireline 1970 2010

| SEC | TWP | RGE | Other Services |
|---|---|---|---|
| 21 | 13S | 31W | MAI/MFE |

API Number 15-063-21983
Permit Number

Permanent Datum G.L., Elevation 2888 feet
Log Measured From KB
Drilling Measured From K.B.

| Elevations: | feet |
|---|---|
| KB | 2893.00 |
| DF | 2891.00 |
| GL | 2888.00 |

| | | | | |
|---|---|---|---|---|
| Date | 24-APR-2012 | | | |
| Run Number | ONE | | | |
| Depth Driller | 4640.00 | feet | | |
| Depth Logger | 4644.00 | feet | | |
| First Reading | 4623.00 | feet | | |
| Last Reading | 3644.00 | feet | | |
| Casing Driller | 213.00 | feet | | |
| Casing Logger | 213.00 | feet | | |
| Bit Size | 7.875 | inches | | |
| Hole Fluid Type | CHEMICAL | | | |
| Density / Viscosity | 9.30 lb/USg | 56.00 CP | | |
| PH / Fluid Loss | 8.00 | 8.00 ml/30Min | | |
| Sample Source | FLOWLINE | | | |
| Rm @ Measured Temp | 0.78 @ 84.0 | ohm-m | | |
| Rmf @ Measured Temp | 0.62 @ 84.0 | ohm-m | | |
| Rmc @ Measured Temp | 0.94 @ 84.0 | ohm-m | | |
| Source Rmf / Rmc | CALC | CALC | | |
| Rm @ BHT | 0.56 @117.0 | ohm-m | | |
| Time Since Circulation | 4 HOURS | | | |
| Max Recorded Temp | 117.00 | deg F | | |
| Equipment Name | COMPACT | | | |
| Equipment / Base | 13025 | LIB | | |
| Recorded By | R. HOFFMAN | | | |
| Witnessed By | KENT MATSON | | | |
| S.O. # / JOB # | 3534649 | | LB12-104 | |

## BOREHOLE RECORD

Last Edited: 25-APR-2012 02:10

| Bit Size inches | Depth From feet | Depth To feet |
|---|---|---|
| 7.875 | 213.00 | 4644.00 |

## CASING RECORD

| Type | Size inches | Depth From feet | Shoe Depth feet | Weight pounds/ft |
|---|---|---|---|---|
| SURFACE | 8.625 | 0.00 | 213.00 | 24.00 |

## REMARKS

Tools Ran: MCG, MML, MDN, MPD, SKJ, MFE, MAI.
Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE and MAI 0.5 inch standoffs used.
2.71 g/cc Limestone Density Matrix used to calculate porosity.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = 219 cu. ft.
Service order #3534649
Rig: Murfin Drilling Rig #24
Engineer: R. Hoffman
Operator(s): K. Rinehart



5 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Plotted on 25-APR-2012 02:19
Recorded on 24-APR-2012 23:50

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Limestone Neutron Por.
percent
30 20 10 0 -10

Limestone Density Por.
percent
30 20 10 0 -10

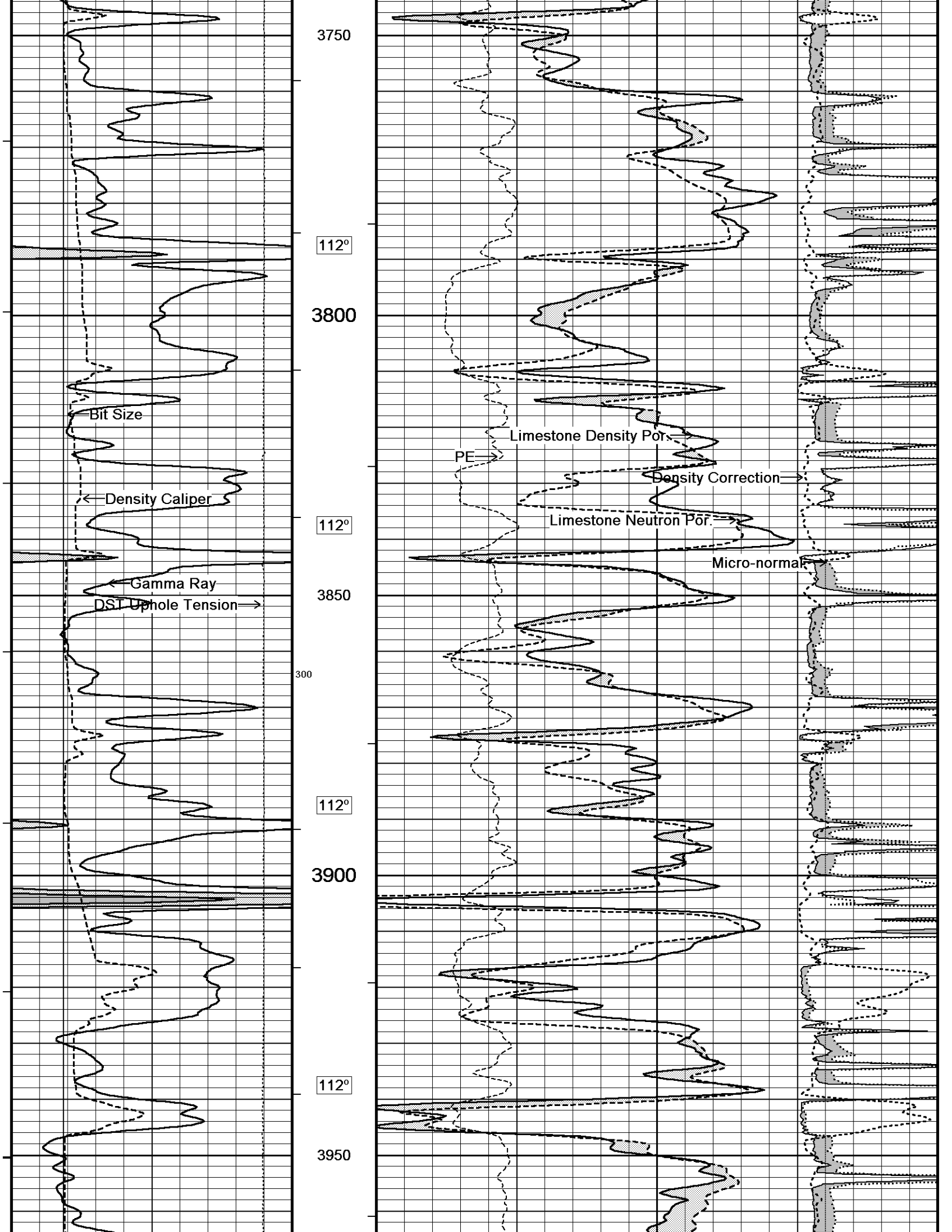
PE
barns/electron
0 5 10

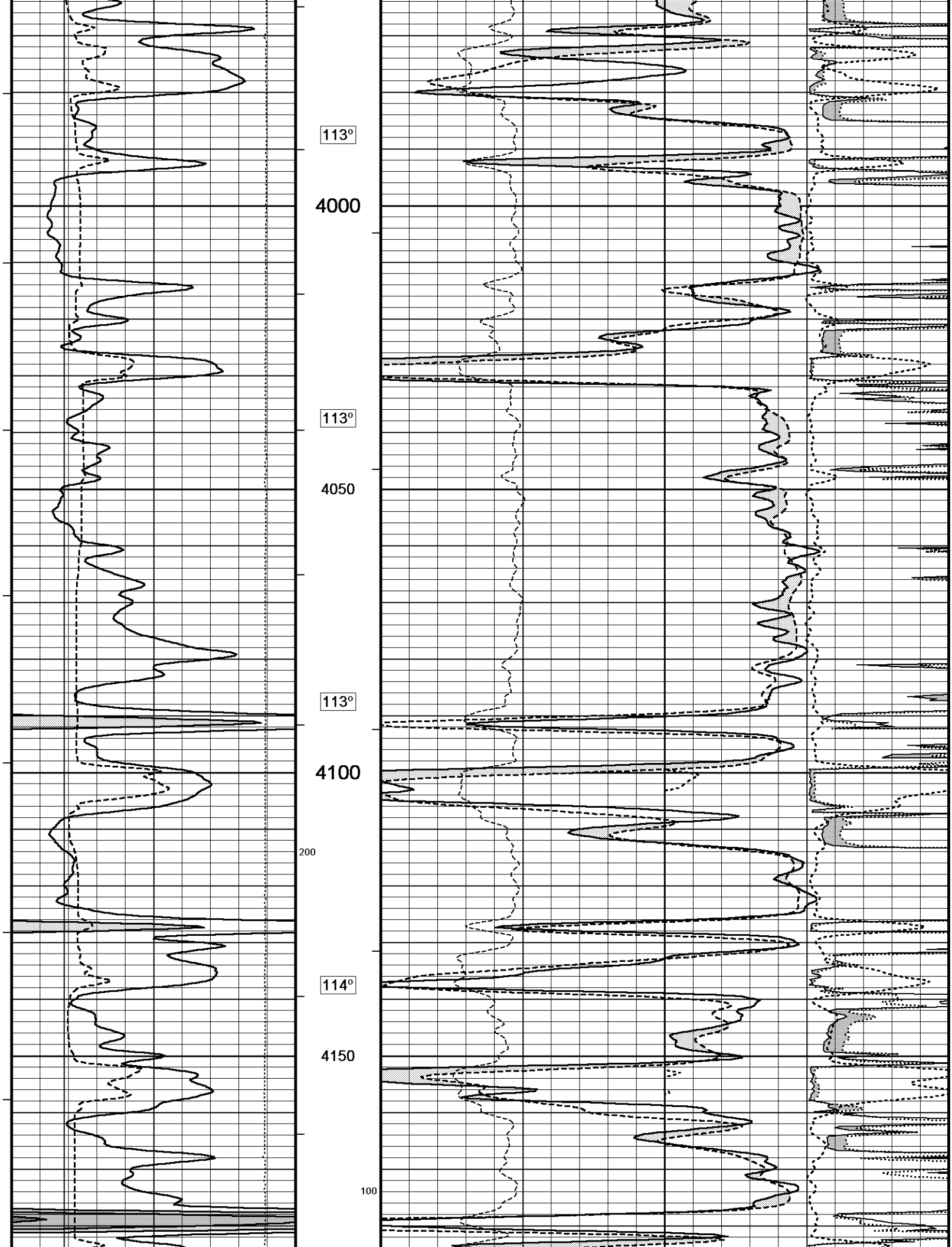
Density Correction
grams/cc
-0.25 0 0.25

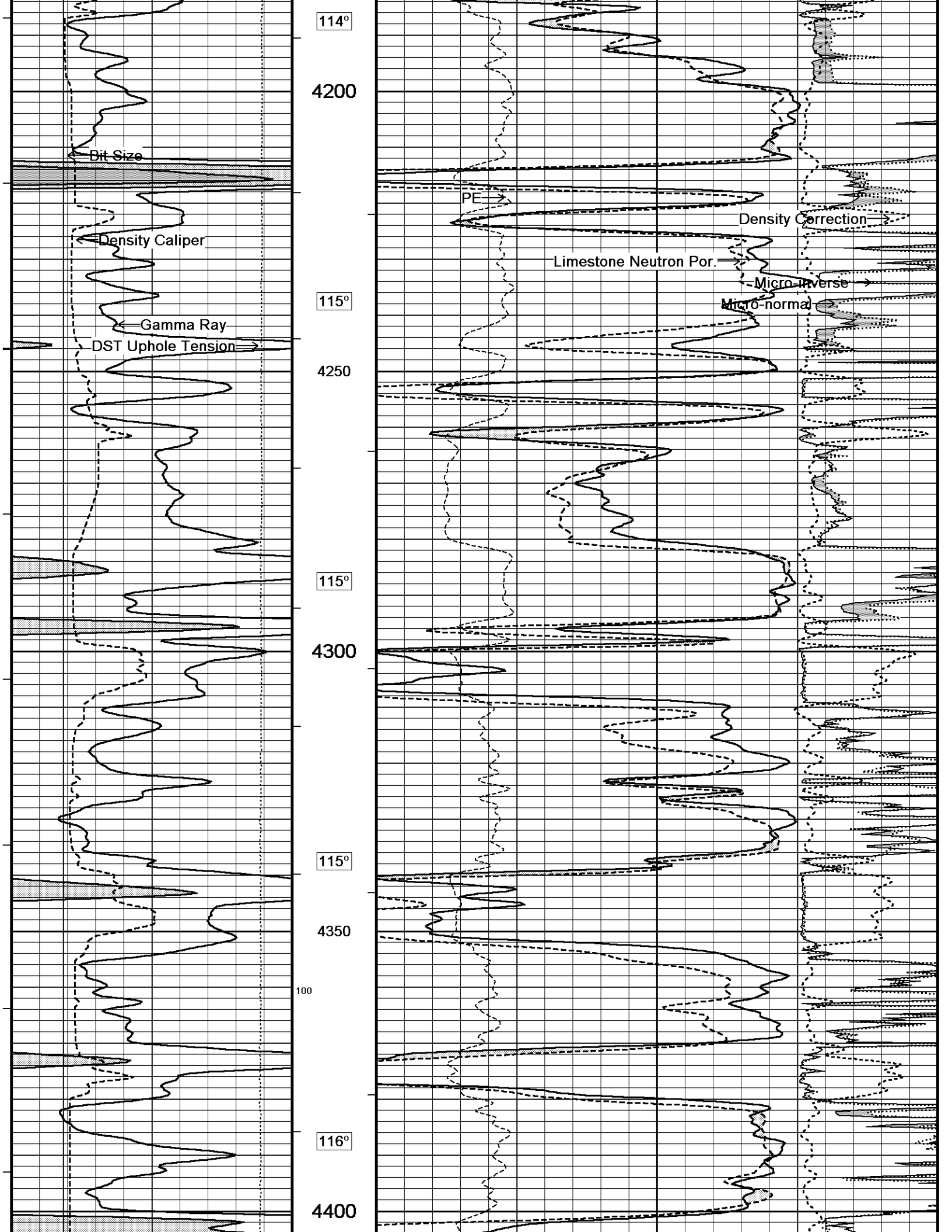
Micro-normal
ohm metres
0 10

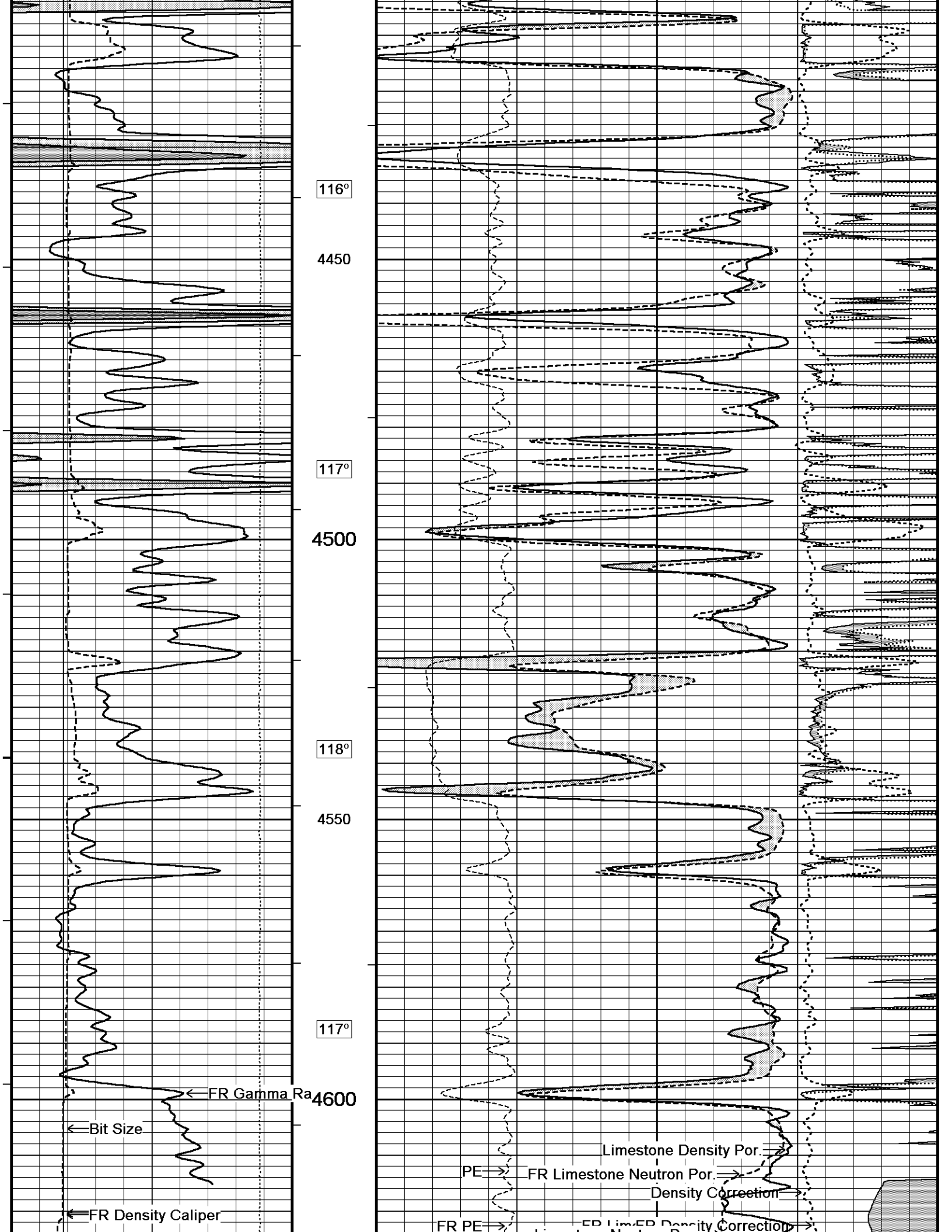
Micro-inverse
ohm metres
0 10

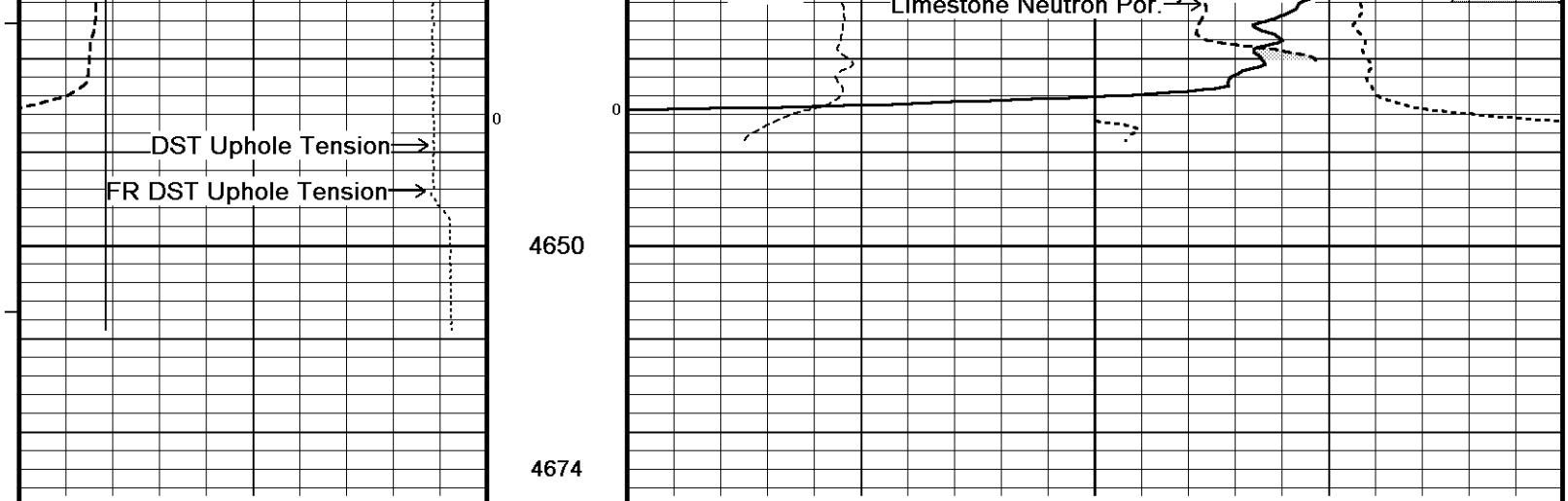
3642
3650
112°
3700
200
112°


3750
112°
3800
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
300
112°
3850
112°
3900
112°
3950
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.
Micro-normal


113°
4000
113°
4050
113°
4100
200
114°
4150
100


114°
4200
Bit Size
PE
Density Correction
Density Caliper
Limestone Neutron Por.
Micro-Inverse
115°
Micro-normal
Gamma Ray
DST Uphole Tension
4250
115°
4300
115°
4350
100
116°
4400


116°
4450
117°
4500
118°
4550
117°
4600
FR Gamma Ra
Bit Size
FR Density Caliper
PE
Limestone Density Por.
FR Limestone Neutron Por.
Density Correction
FR PE
FR Lim/FR Density Correction




Depth in Feet

Timing Marks
every 60.0 sec

Limestone Neutron Por.
percent
30 20 10 0 -10

Gamma Ray
API
0 75 150

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI every 10 cu ft

Density Caliper
inches
6 11 16

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.25 0 0.25

Annular Integral every 10 cu ft

Bit Size
inches
6 11 16

Micro-normal
ohm metres
0 10

DST Uphole Tension
pounds
5000 0

Micro-inverse
ohm metres
0 10

Replay Scale 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:19
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
Recorded on 24-APR-2012 23:50
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 25-APR-2012 02:19
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_001.dta
Recorded on 24-APR-2012 23:16
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Depth in Feet

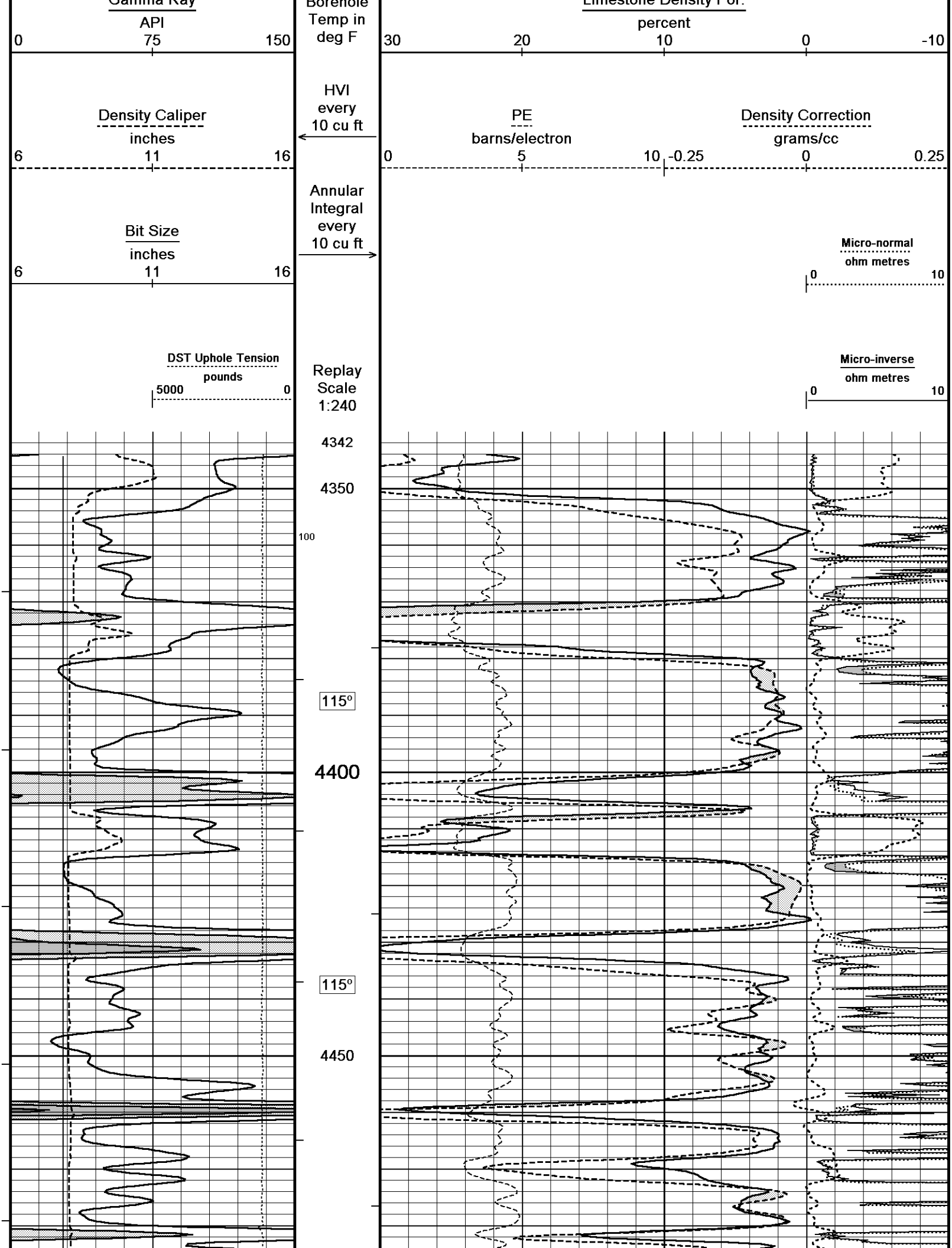
Timing Marks
every 60.0 sec

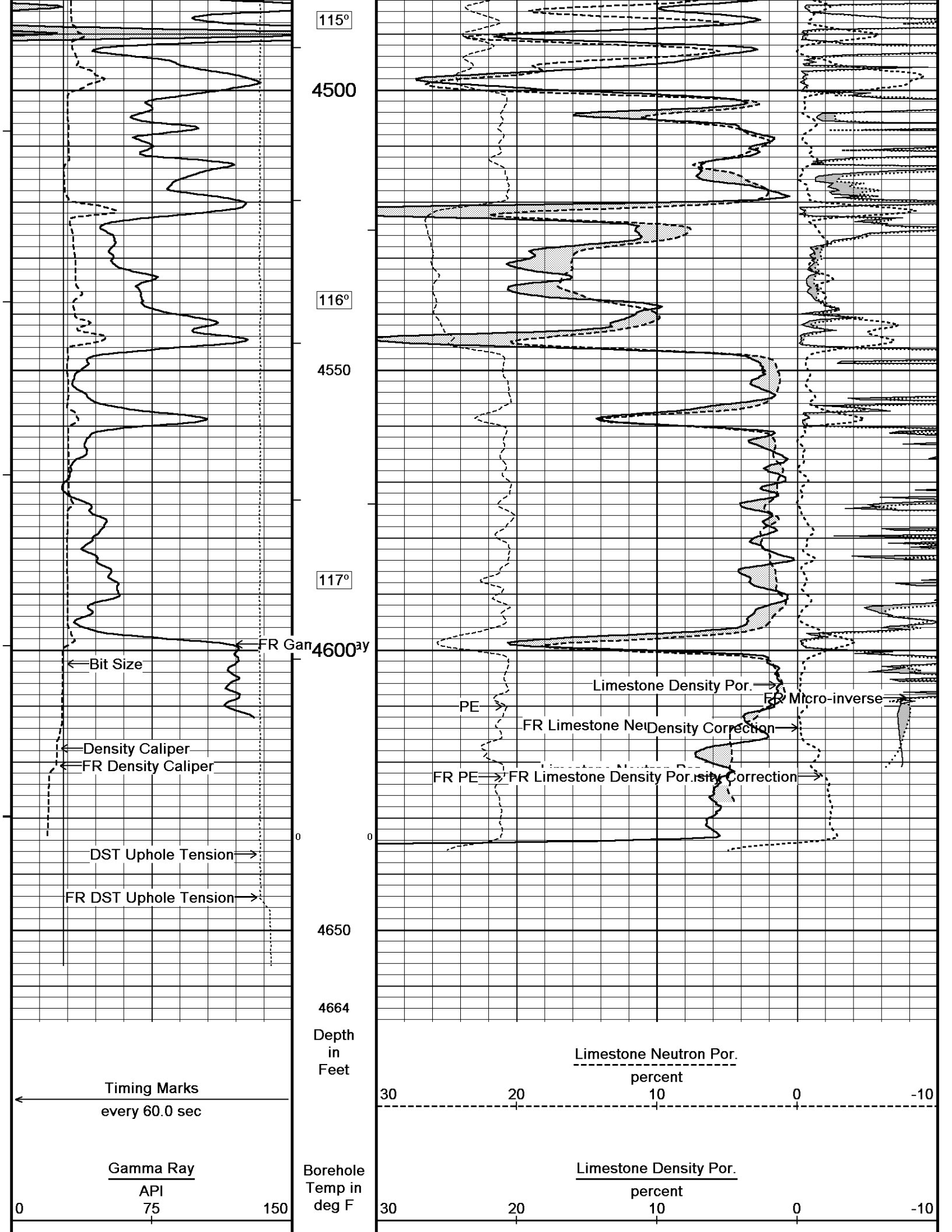
Limestone Neutron Por.
percent
30 20 10 0 -10

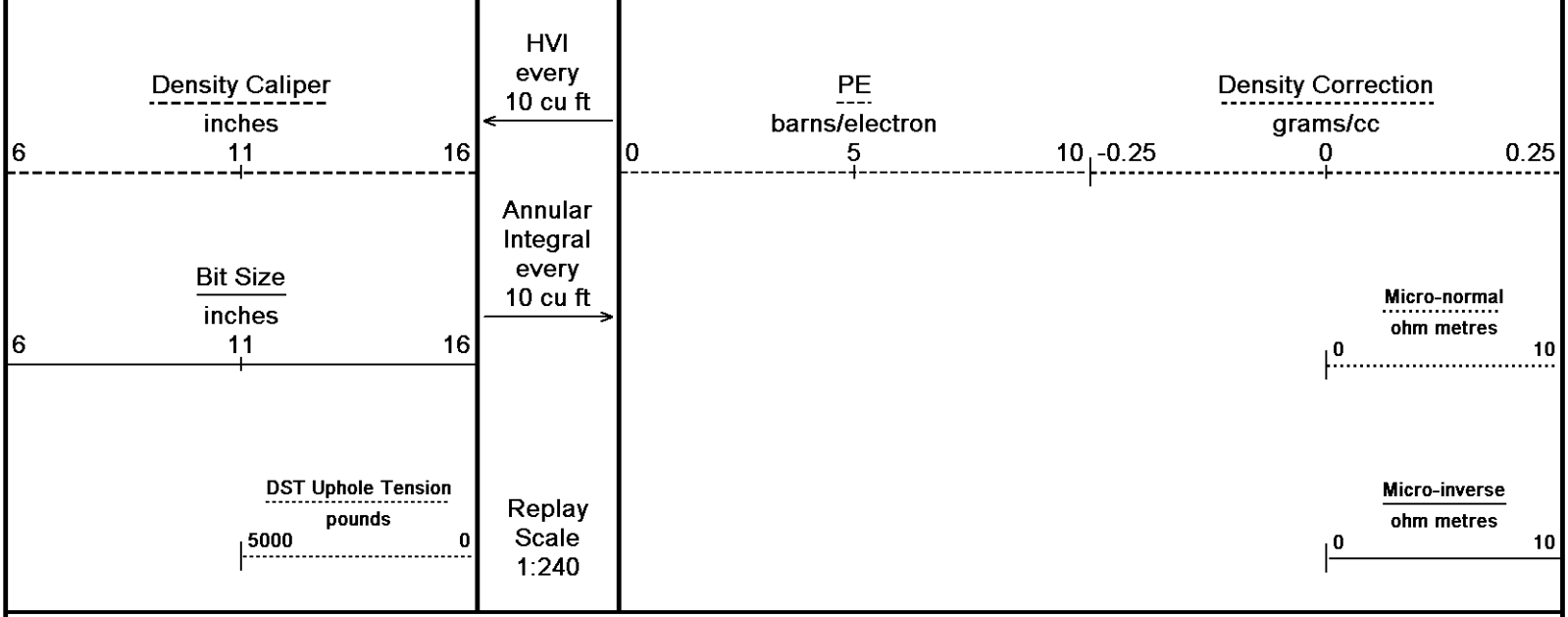
Gamma Ray
API
0 75 150

Borehole Temp in deg F

Limestone Density Por.
percent
30 20 10 0 -10


Gamma Ray
API
0
75
150
Borehole Temp in deg F
Limestone Density Por.
percent
30
20
10
0
-10
HVI every 10 cu ft
Density Caliper
inches
6
11
16
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.25
0
0.25
Annular Integral every 10 cu ft
Bit Size
inches
6
11
16
Micro-normal
ohm metres
0
10
DST Uphole Tension
pounds
5000
0
Micro-inverse
ohm metres
0
10
Replay Scale 1:240
4342
4350
100
115°
4400
115°
4450


115°
4500
116°
4550
117°
4600
4650
4664
FR Gamma Ray
Bit Size
Density Caliper
FR Density Caliper
DST Uphole Tension
FR DST Uphole Tension
PE
FR PE
Limestone Density Por.
FR Micro-inverse
FR Limestone Neu
Density Correction
FR Limestone Density Por.
sity Correction
0
0
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
Borehole Temp in deg F
Limestone Neutron Por.
percent
30
20
10
0
-10
Limestone Density Por.
percent
30
20
10
0
-10

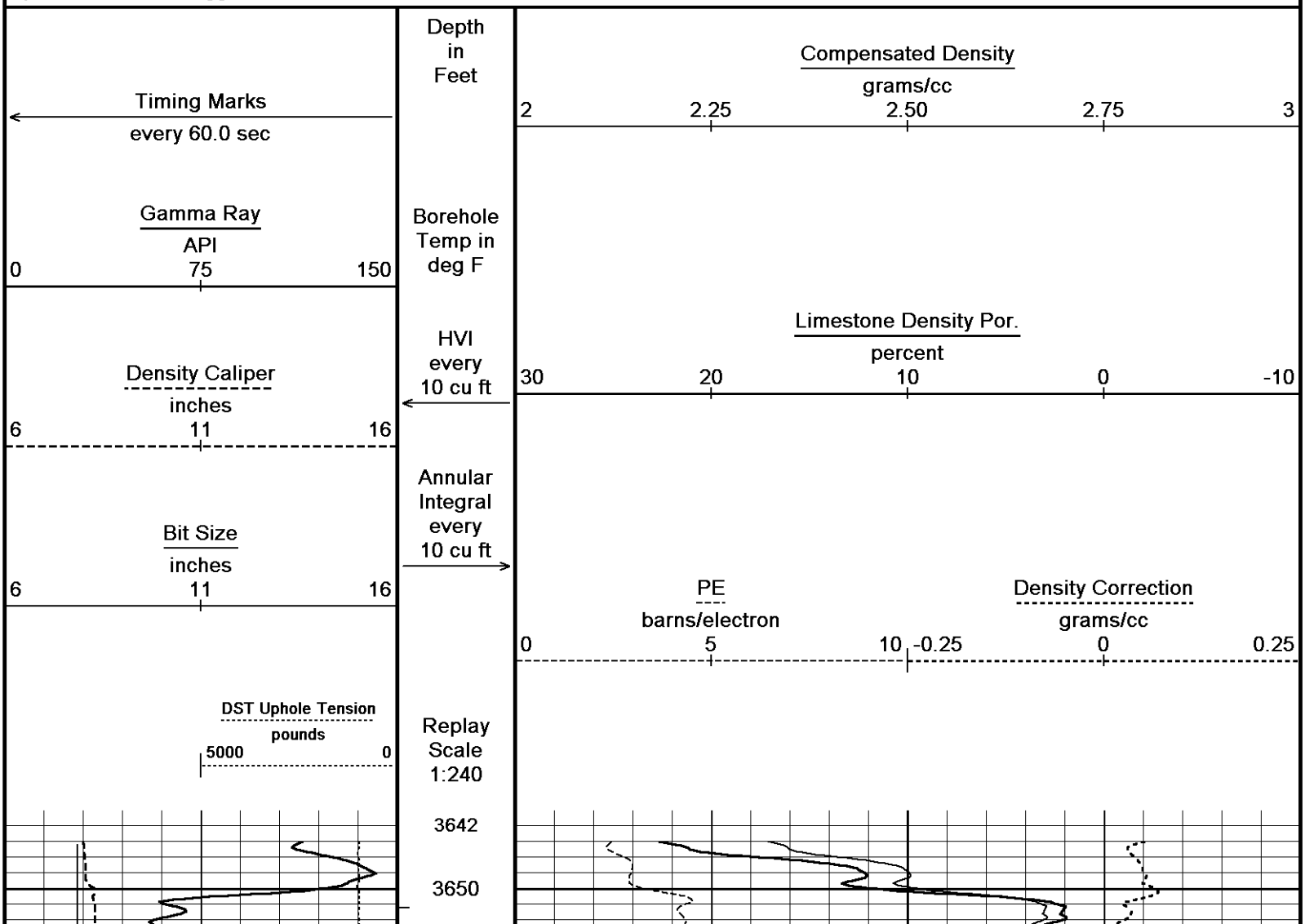


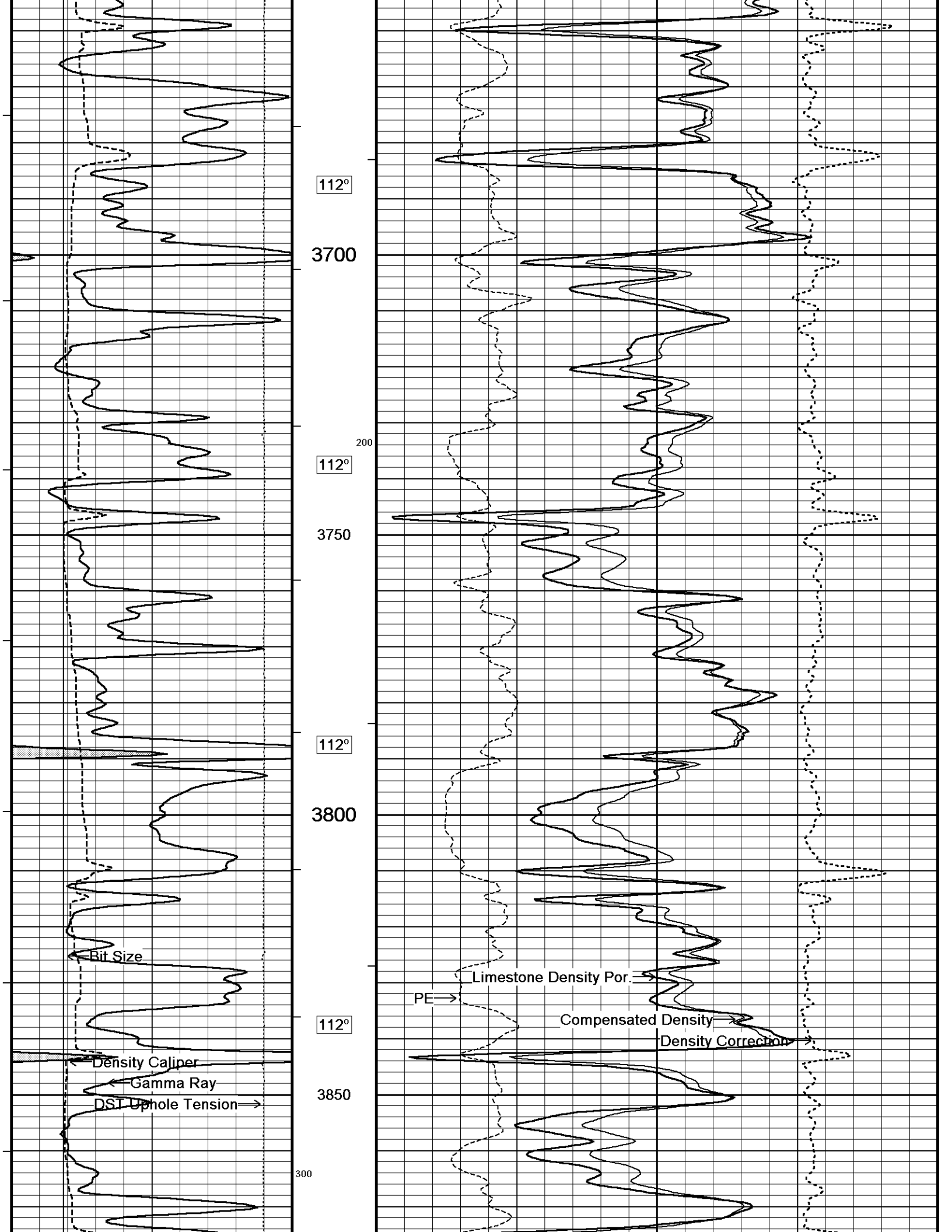

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:19
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_001.dta
Recorded on 24-APR-2012 23:16
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

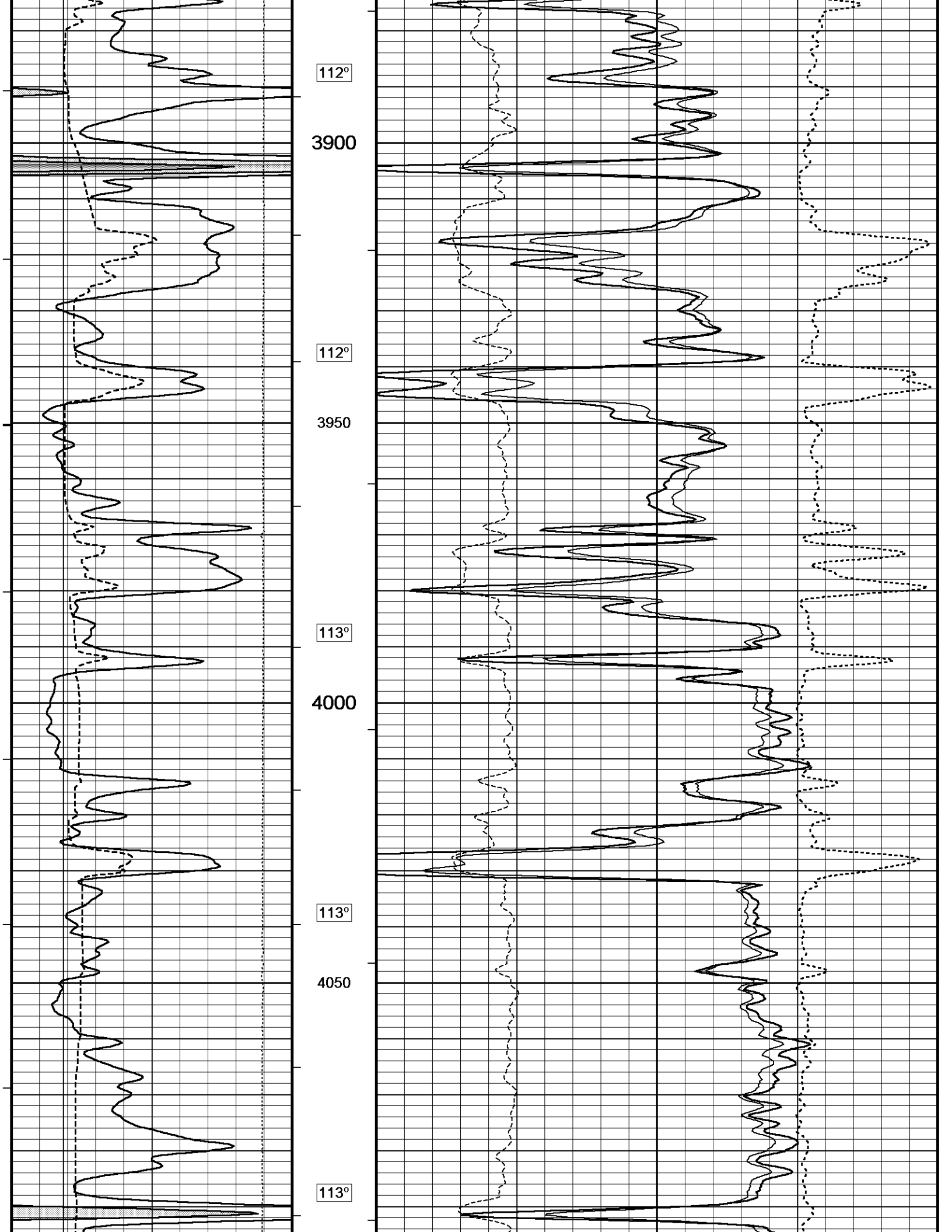
REPEAT SECTION

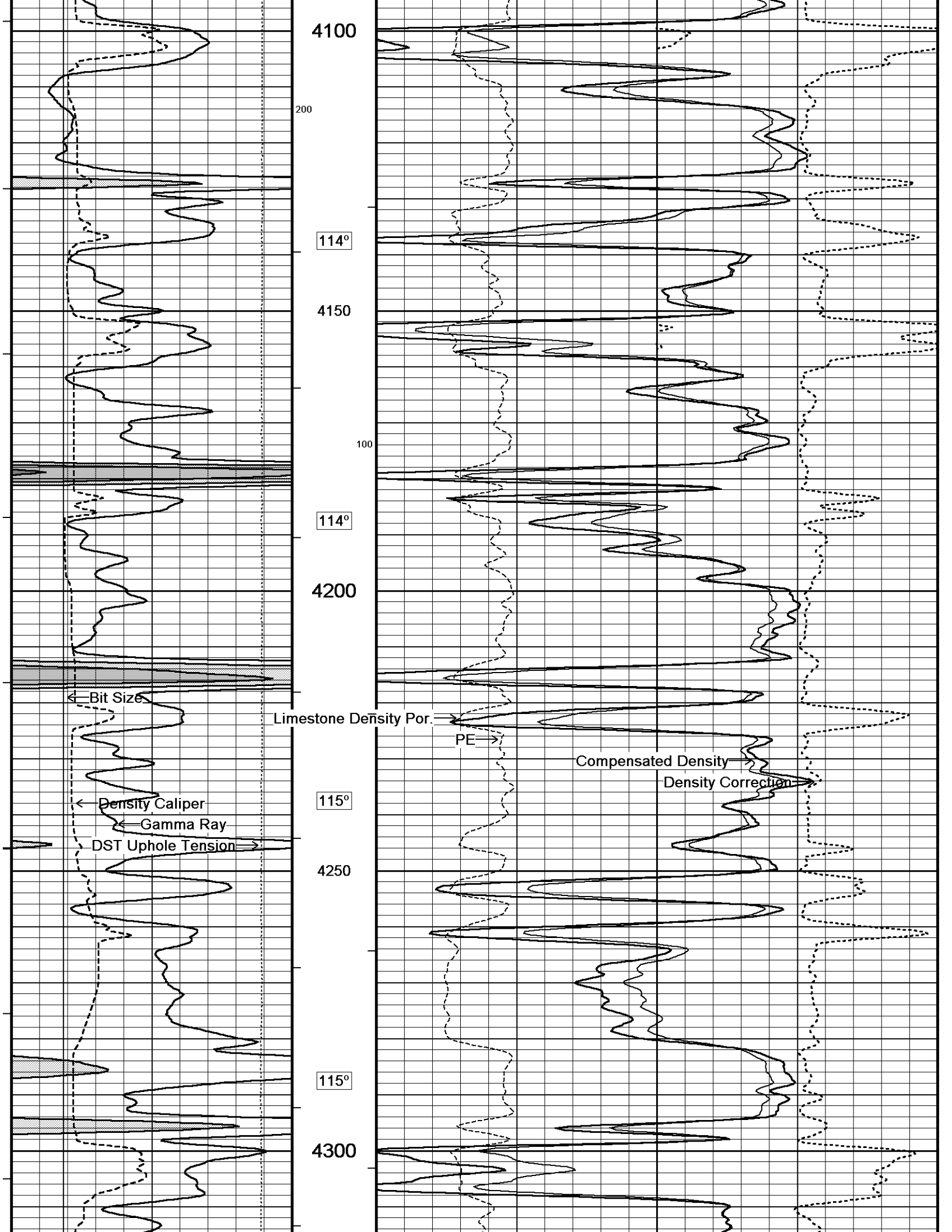
## 5 INCH MAIN

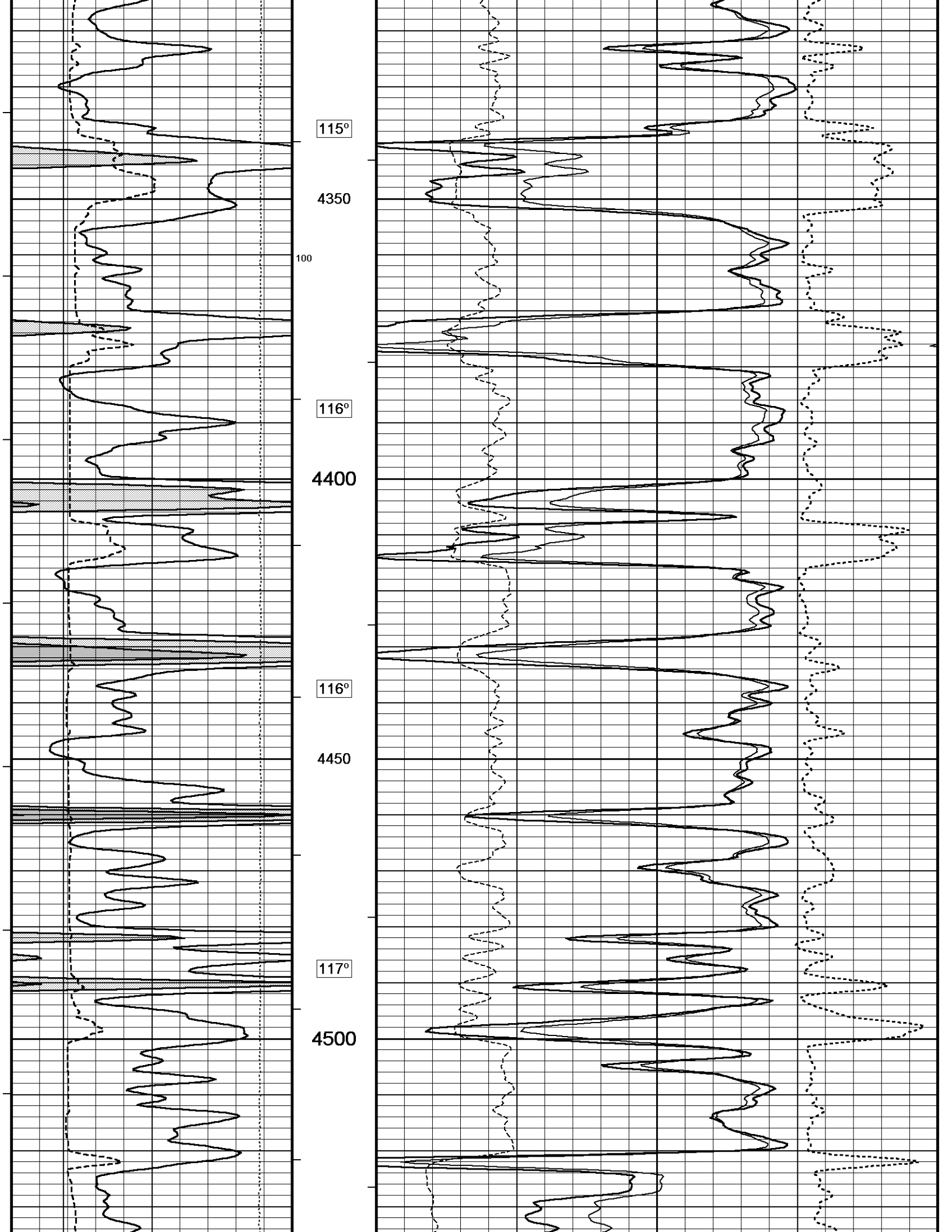
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:19
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta
Recorded on 24-APR-2012 23:50
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

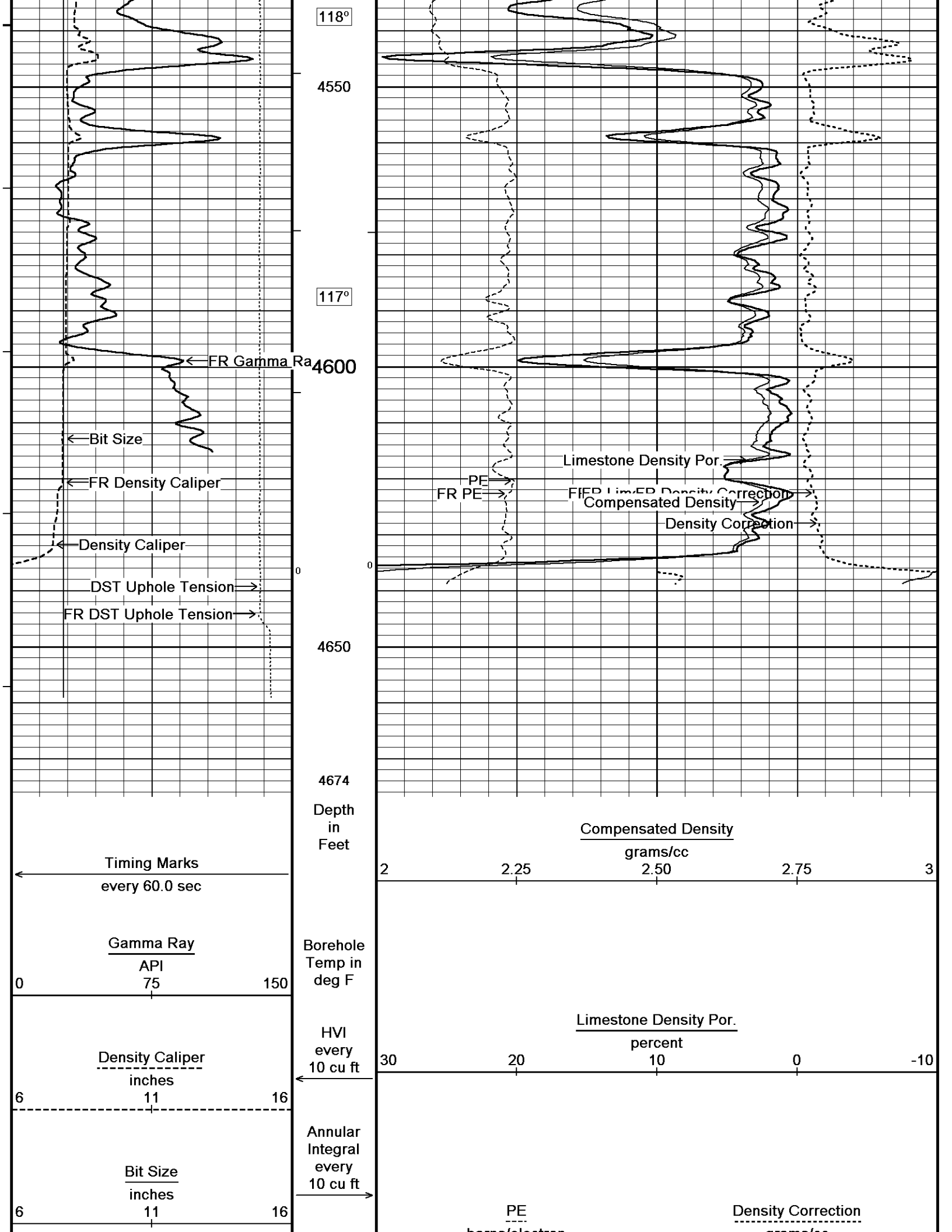



112°
3700
200
112°
3750
112°
3800
Bit Size
Limestone Density Por.
PE
Compensated Density
Density Correction
112°
Density Caliper
Gamma Ray
DST Uphole Tension
3850
300


112°
3900
112°
3950
113°
4000
113°
4050
113°


4100
200
114°
4150
100
114°
4200
Bit Size
Limestone Density Por.
PE
Compensated Density
Density Correction
115°
Density Caliper
Gamma Ray
DST Uphole Tension
4250
115°
4300


115°
4350
100
116°
4400
116°
4450
117°
4500


118°
4550
117°
4600
4650
4674
FR Gamma Ra
Bit Size
FR Density Caliper
Density Caliper
DST Uphole Tension
FR DST Uphole Tension
0
Limestone Density Por.
PE
FR PE
Compensated Density
Density Correction
0
Depth in Feet
Compensated Density
grams/cc
2
2.25
2.50
2.75
3
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
Borehole Temp in deg F
HVI every 10 cu ft
Limestone Density Por.
percent
30
20
10
0
-10
Density Caliper
inches
6
11
16
Annular Integral every 10 cu ft
Bit Size
inches
6
11
16
PE
Density Correction

barns/electron
0 5 10 -0.25 grams/cc 0 0.25

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 25-APR-2012 02:19
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5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 25-APR-2012 02:19
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System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks
every 60.0 sec

Depth
in
Feet

Compensated Density
grams/cc
2 2.25 2.50 2.75 3

Gamma Ray
API
0 75 150

Borehole
Temp in
deg F

Limestone Density Por.
percent
30 20 10 0 -10

HVI
every
10 cu ft

Density Caliper
inches
6 11 16

Annular
Integral
every
10 cu ft

Bit Size
inches
6 11 16

PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.25 0 0.25

DST Uphole Tension
pounds
5000 0

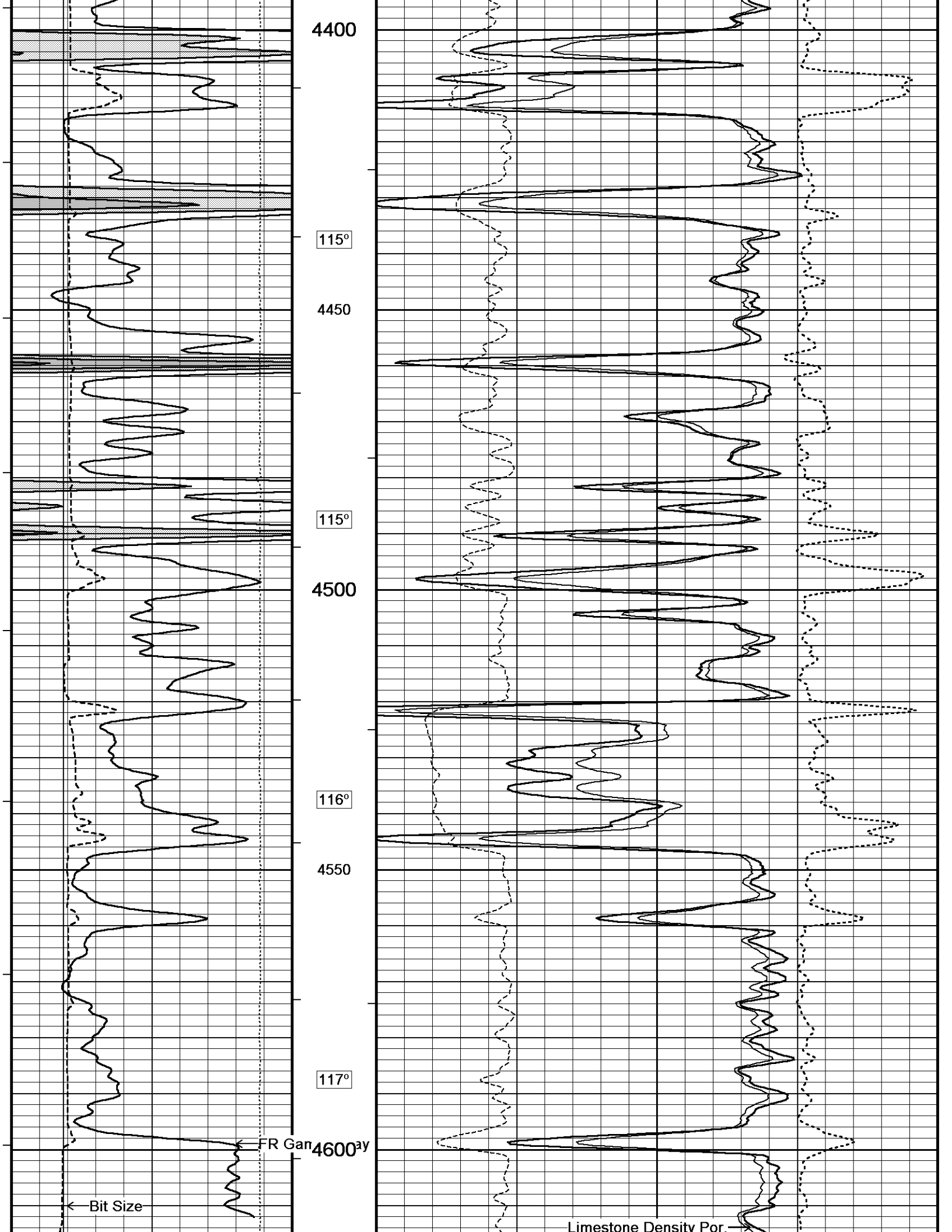
Replay
Scale
1:240

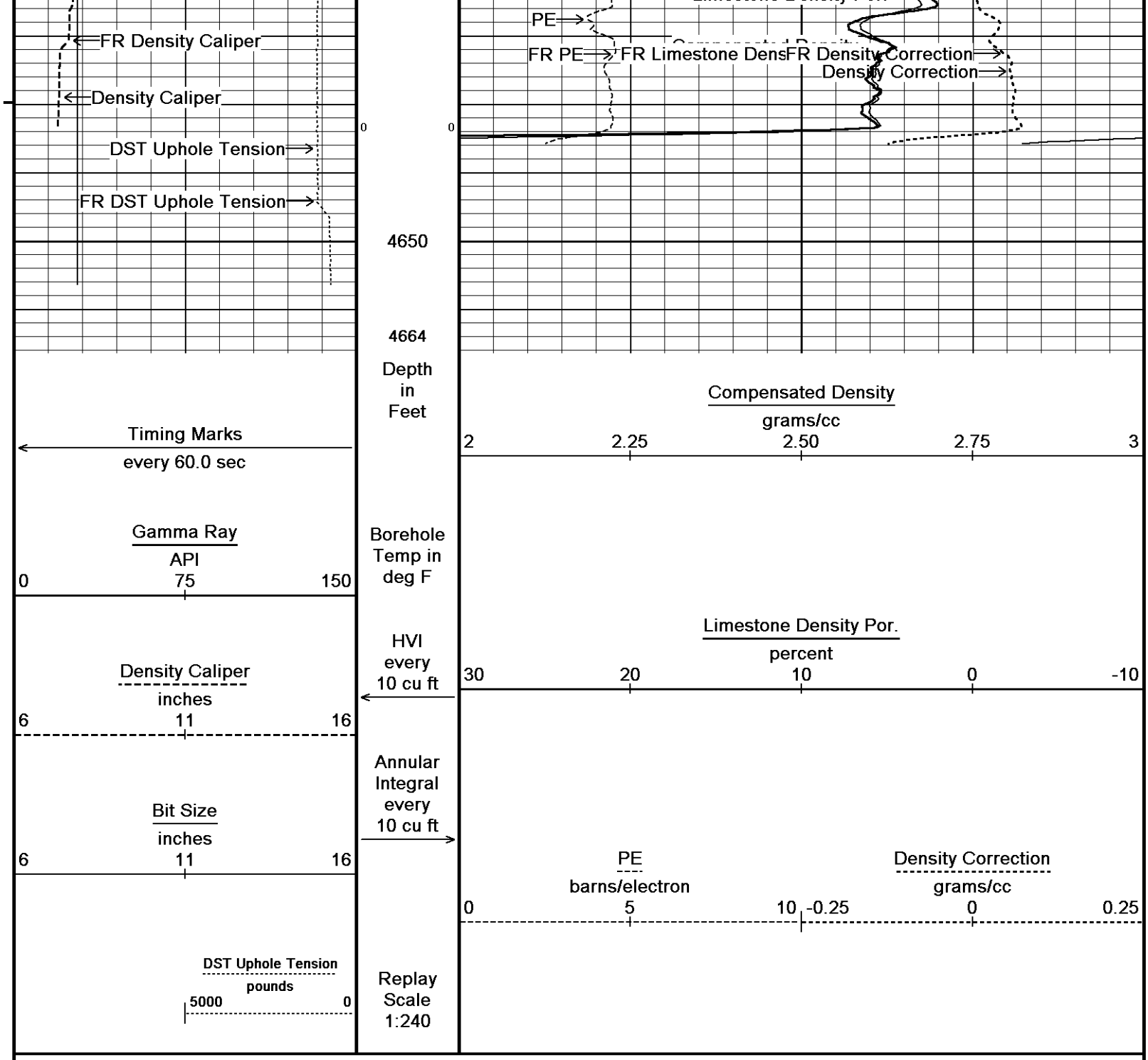
4342

4350

100

115°


4400
115°
4450
115°
4500
116°
4550
117°
4600
FR Gamma Ray
Bit Size
Limestone Density Por




Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2012 02:19
Filename: C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_001.dta
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REPEAT SECTION

## BEFORE SURVEY CALIBRATION

C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta

General Constants All 000

Last Edited on 24-APR-2012,22:12

General Parameters

| | | |
|---|---|---|
| Mud Resistivity | 0.780 | ohm-metres |
| Mud Resistivity Temperature | 84.000 | 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 | 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-C 208

Field Calibration on 24-APR-2012 07:33

| | Measured | Calibrated (API) |
|---|---|---|
| Background | 81 | 60 |
| Calibrator (Gross) | 1057 | 785 |
| Calibrator (Net) | 976 | 725 |

## Gamma Constants MCG-C 208

Last Edited on 24-APR-2012,12:07

| | | |
|---|---|---|
| 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-C 208

Field Calibration on 24-FEB-2012 11:08

| | Measured | Calibrated (mV) |
|---|---|---|
| Reference 1 | 98.6 | 100.0 |
| Reference 2 | -101.8 | -100.0 |

## High Resolution Temperature Calibration MCG-C 208

Field Calibration on 18-OCT-2011,14:32

| | Measured | Calibrated(Deg F) |
|---|---|---|
| Lower | 50.00 | 50.00 |
| Upper | 75.00 | 75.00 |

## High Resolution Temperature Constants MCG-C 208

Last Edited on

| | |
|---|---|
| Pre-filter Length | 11 |

## Caliper Calibration MML-A 16

Base Calibration on 12-MAR-2012 08:42
Field Calibration on 24-APR-2012 07:43

Base Calibration

| Reading No | Measured | Calibrator Size (in) |
|---|---|---|
| 1 | 14446 | 5.98 |
| 2 | 17749 | 7.97 |
| 3 | 20974 | 9.86 |
| 4 | 24969 | 11.92 |
| 5 | 0 | 0.00 |
| 6 | N/A | N/A |

Field Calibration

| Measured Caliper (in) | Actual Caliper (in) |
|---|---|
| 6.03 | 5.98 |

## Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 12-MAR-2012 08:50
Field Check on 24-APR-2012 07:42

Base Calibration

| | Measured | | Calibrated (ohm-m) | |
|---|---|---|---|---|
| Channel | Resistor 1 | Resistor 2 | Resistor 1 | Resistor 2 |
| Micro Normal | 12.2 | 60.2 | 2.6 | 12.8 |

| | | | | |
|---|---|---|---|---|
| Micro Inverse | 15.6 | 78.3 | 1.7 | 8.4 |

| Channel | Base Check (ohm-m) | Field Check (ohm-m) |
|---|---|---|
| Micro Normal | 32.1 | 32.1 |
| Micro Inverse | 16.3 | 16.3 |

## Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 24-APR-2012,12:15

| | | |
|---|---|---|
| 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 66

Base Calibration on 12-MAR-2012 14:21
Field Check on 24-APR-2012 07:49

Base Calibration

| | Measured | | Calibrated (cps) | |
|---|---|---|---|---|
| | Near | Far | Near | Far |
| | 3048 | 95 | 3714 | 110 |
| Ratio | 32.068 | | 33.764 | |

Field Calibrator at Base

| | Calibrated (cps) | |
|---|---|---|
| | 1659 | 2400 |
| Ratio | 0.691 | |

Field Check

| | Calibrated (cps) | |
|---|---|---|
| | 1709 | 2435 |
| Ratio | 0.702 | |

## Neutron Constants MDN-A.B 66

Last Edited on 24-APR-2012,12:15

| | | |
|---|---|---|
| Neutron Source Id | P58125B | |
| Neutron Jig Number | 5824NE | |
| Epithermal Neutron | No | |
| Caliper Source for Processing | Density Caliper | |
| Stand-off | 0.00 | inches |
| Mud Density | 1.00 | 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-C.A 353

Base Calibration on 12-MAR-2012 09:09
Field Check on 24-APR-2012 07:40

Base Calibration

| | Measured | Calibrated (ohm-m) |
|---|---|---|
| Reference 1 | 0.0 | 0.0 |
| Reference 2 | 964.2 | 126.8 |
| Base Check | | 281.2 |
| Field Check | | 281.1 |

## FE Constants MFE-C.A 353

Last Edited on 24-APR-2012,12:15

| | | |
|---|---|---|
| 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 |

## Induction Calibration MAI-A.A 167

Base Calibration on 11-MAR-2011,09:58
Field Check on 24-APR-2012 07:39

Base Calibration

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 | 12.4 | 3840.9 |
| 2 | 0.0 | 0.0 | 29.4 | 3479.3 |
| 3 | 0.0 | 0.0 | 29.0 | 3055.3 |
| 4 | 0.0 | 0.0 | 19.7 | 2083.2 |
| Deep | 0.0 | 0.0 | 18.5 | 2050.5 |
| Medium | 0.0 | 0.0 | 42.2 | 3994.5 |
| Shallow | 0.0 | 0.0 | 42.8 | 5057.5 |
| Array Temperature | 0.0 | | 62.7 | Deg F |

## Induction Constants MAI-A.A 167

Last Edited on 24-APR-2012,12:15

| | | |
|---|---|---|
| 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 | |

## High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 12-MAR-2012,10:57

| | 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 13-FEB-2012 10:56

Caliper Calibration MPD-B 64

Field Calibration on 13-FEB-2012 10:57

Base Calibration

| Reading No | Measured | Calibrator Size (in) |
|---|---|---|
| 1 | 13425 | 3.99 |
| 2 | 22192 | 5.98 |
| 3 | 30768 | 7.97 |
| 4 | 39024 | 9.86 |
| 5 | 48432 | 11.92 |
| 6 | N/A | N/A |

Field Calibration

| Measured Caliper (in) | Actual Caliper (in) |
|---|---|
| 5.96 | 5.98 |

## Photo Density Calibration MPD-B 64

Base Calibration on 13-FEB-2012 11:14
Field Check on 13-FEB-2012 11:21

Density Calibration

| Base Calibration | Measured | | Calibrated (sdu) | |
|---|---|---|---|---|
| | Near | Far | Near | Far |
| Reference 1 | 47670 | 25060 | 59556 | 30836 |
| Reference 2 | 19597 | 2525 | 24941 | 2541 |
| Field Check at Base | 1199.0 | 1386.9 | | |
| Field Check | 1196.3 | 1389.6 | | |

PE Calibration

| Base Calibration | WS | Measured WH | Ratio | Calibrated Ratio |
|---|---|---|---|---|
| Background | 218 | 1072 | | |
| Reference 1 | 18017 | 47489 | 0.383 | 0.371 |
| Reference 2 | 5304 | 19465 | 0.276 | 0.272 |
| Field Check at Base | 218.3 | 1071.8 | | |
| Field Check | 218.5 | 1068.3 | | |

## Density Constants MPD-B 64

Last Edited on 24-APR-2012,12:15

| | | |
|---|---|---|
| Density Source Id | 254 | |
| 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 | |

## DOWNHOLE EQUIPMENT

C:\Minimus 11.03.4044\Data\Grand Mesa CSC 1-21\Grand Mesa CSC 1-21_003.dta

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 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 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 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 Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

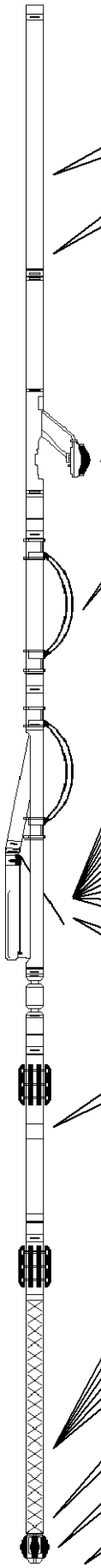
Compact Focussed Electric
MFE-C.A 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 50.32 ft Weight: 407.9 lb

Total Length: 50.32 ft Weight: 407.9 lb



| | |
|---|---|
| 45.04 ft | GRGC - Gamma Ray |
| 45.04 ft | GRGC - Gamma Ray |
| 42.13 ft | CGXT - MCG External Temperature |
| 42.13 ft | CGXT - MCG External Temperature |
| 35.41 ft | MINV - Micro-inverse |
| 35.41 ft | MNRL - Micro-normal |
| 36.40 ft | MLTC - MML Caliper |
| 35.41 ft | MINV - Micro-inverse |
| 35.41 ft | MNRL - Micro-normal |
| 36.40 ft | MLTC - MML Caliper |
| 30.61 ft | NPRL - Limestone Neutron Por. |
| 30.61 ft | NPRL - Limestone Neutron Por. |
| 23.37 ft | HVOL - Hole Volume |
| 23.37 ft | CLDC - Density Caliper |
| 23.37 ft | AVOL - Annular Volume |
| 23.37 ft | HVOL - Hole Volume |
| 23.37 ft | CLDC - Density Caliper |
| 23.37 ft | AVOL - Annular Volume |
| 21.44 ft | DPRL - Limestone Density Por. |
| 21.44 ft | DEN - Compensated Density |
| 21.44 ft | DCOR - Density Correction |
| 21.44 ft | DCOR - Density Correction |
| 21.44 ft | DPRL - Limestone Density Por. |
| 21.44 ft | DEN - Compensated Density |
| 21.38 ft | PDPE - PE |
| 21.38 ft | PDPE - PE |
| 13.91 ft | FEFE - Shallow FE |
| 13.91 ft | FEFE - Shallow FE |
| 3.34 ft | RTAO - Array Ind. One Res Rt |
| 3.34 ft | R60O - Array Ind. One Res 60 |
| 3.34 ft | R40O - Array Ind. One Res 40 |
| 3.34 ft | R40O - Array Ind. One Res 40 |
| 3.34 ft | R60O - Array Ind. One Res 60 |
| 3.34 ft | RTAO - Array Ind. One Res Rt |
| 0.23 ft | SPCG - Spontaneous Potential |
| 0.23 ft | SPCG - Spontaneous Potential |
| Tool Zero | (0.13ft from bottom) |
| Tool Zero | (0.13ft from bottom) |
| -0.13 ft | SMTU - DST Uphole Tension |
| -0.13 ft | SMTU - DST Uphole Tension |

All measurements relative to tool zero.
All measurements relative to tool zero.

| | |
|---|---|
| COMPANY | GRAND MESA OPERATING |
| WELL | CSC #1-21 |
| FIELD | WILDCAT |

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

| | | | | | |
|---|---|---|---|---|---|
| Elevation Kelly Bushing | 2893.00 | feet | First Reading | 4623.00 | feet |
| Elevation Drill Floor | 2891.00 | feet | Depth Driller | 4640.00 | feet |
| Elevation Ground Level | 2888.00 | feet | Depth Logger | 4644.00 | feet |

Weatherford®

# COMPACT PHOTO DENSITY
# COMPENSATED NEUTRON
# MICRORESISTIVITY LOG