Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON

COMPANY	CISCO OPERATING LLC.
WELL	MFWF UNIT # 14
FIELD	MISSOURI FLATS NORTHEAST
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	2300' FNL & 335' FWL

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
22	14S	28W	MAI/MFE
			MML

API Number 15-063-21916
Permit Number

Permanent Datum G.L., Elevation 2575 feet
Log Measured From KB
Drilling Measured From KB

Elevations:	feet
KB	2586.00
DF	2584.00
GL	2575.00

Date	05-DEC-2011			
Run Number	ONE			
Depth Driller	4200.00	feet		
Depth Logger	4203.00	feet		
First Reading	4182.00	feet		
Last Reading	3204.00	feet		
Casing Driller	384.00	feet		
Casing Logger	382.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	8.90 lb/USg	60.00 CP		
PH / Fluid Loss	11.00	6.80 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.74 @ 35.0	ohm-m		
Rmf @ Measured Temp	1.39 @ 35.0	ohm-m		
Rmc @ Measured Temp	2.09 @ 35.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.59 @116.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	116.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13096	LIB		
Recorded By	A. SILL			
Witnessed By	JOHN JORDAN			
S.O. # / JOB #	3534678		LB11-308	

BOREHOLE RECORD

Last Edited: 05-DEC-2011 02:57

Bit Size inches	Depth From feet	Depth To feet
12.250	0.00	400.00
7.875	400.00	4200.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	384.00	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 5.5 inch production casing = 171 cu. ft
Service order #3534678
Rig: Murfin # 22
Engineer: A. Sill
Operator(s): M. Stegman

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta
Recorded on 05-DEC-2011 10:22
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

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

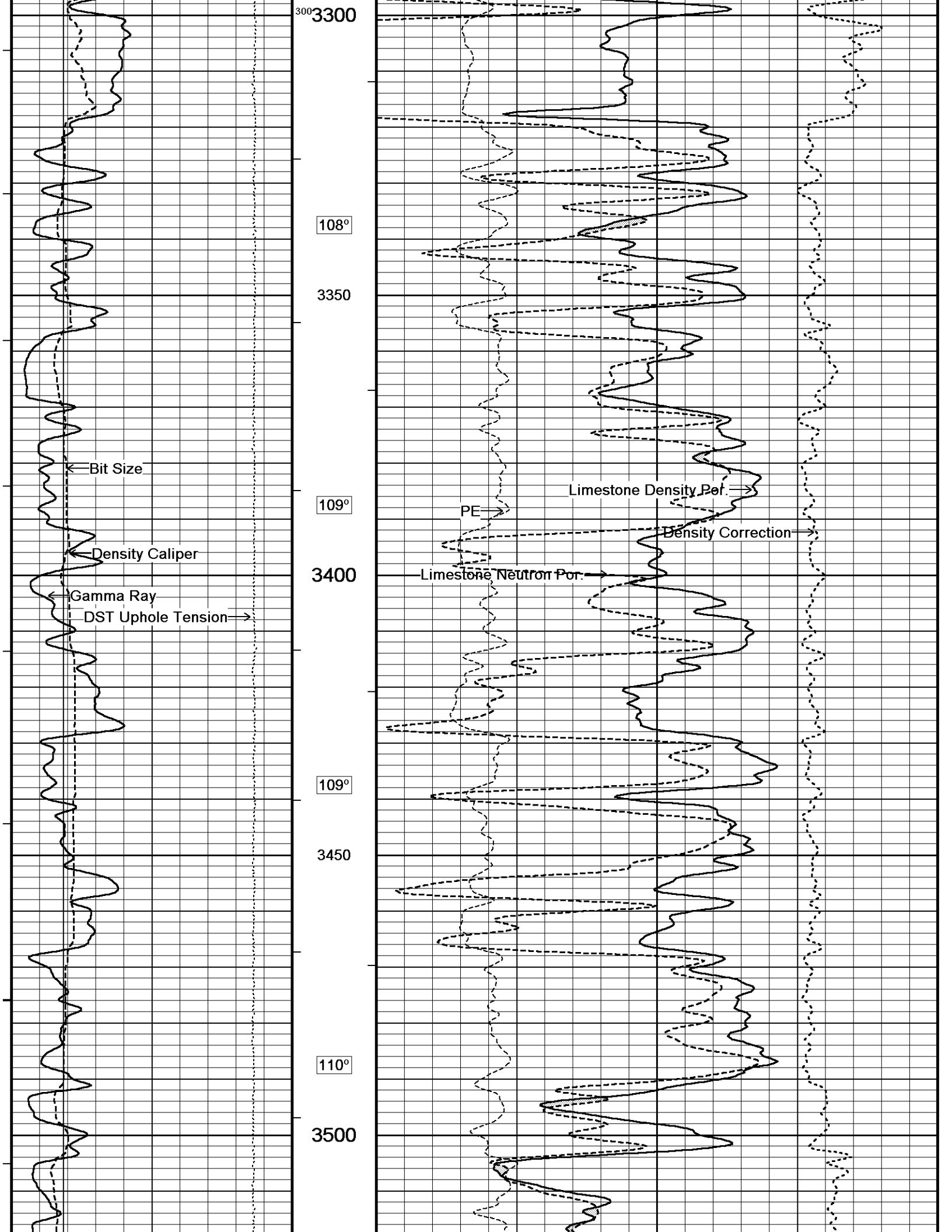
PE
barns/electron
0 5 10

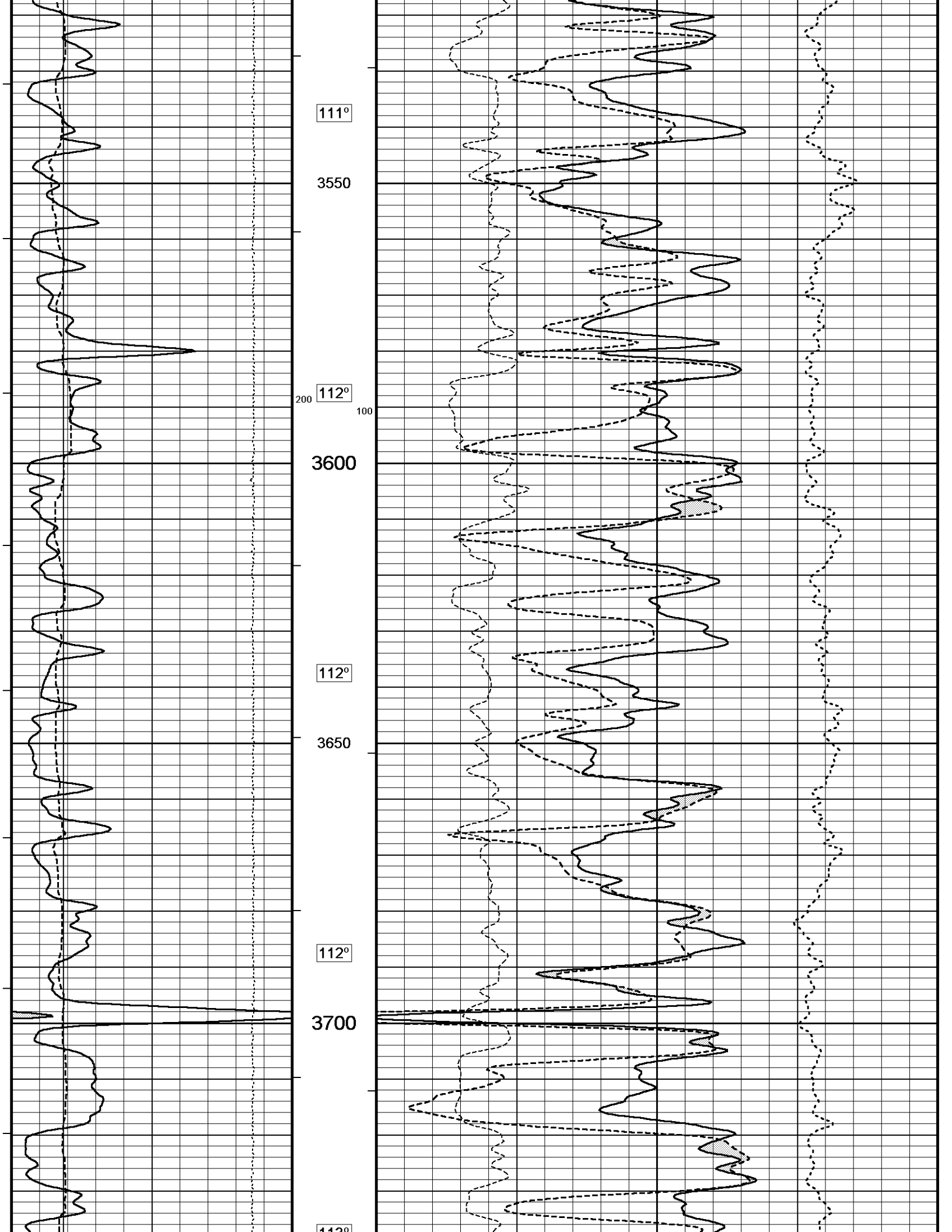
Density Correction
grams/cc
-0.25 0 0.25

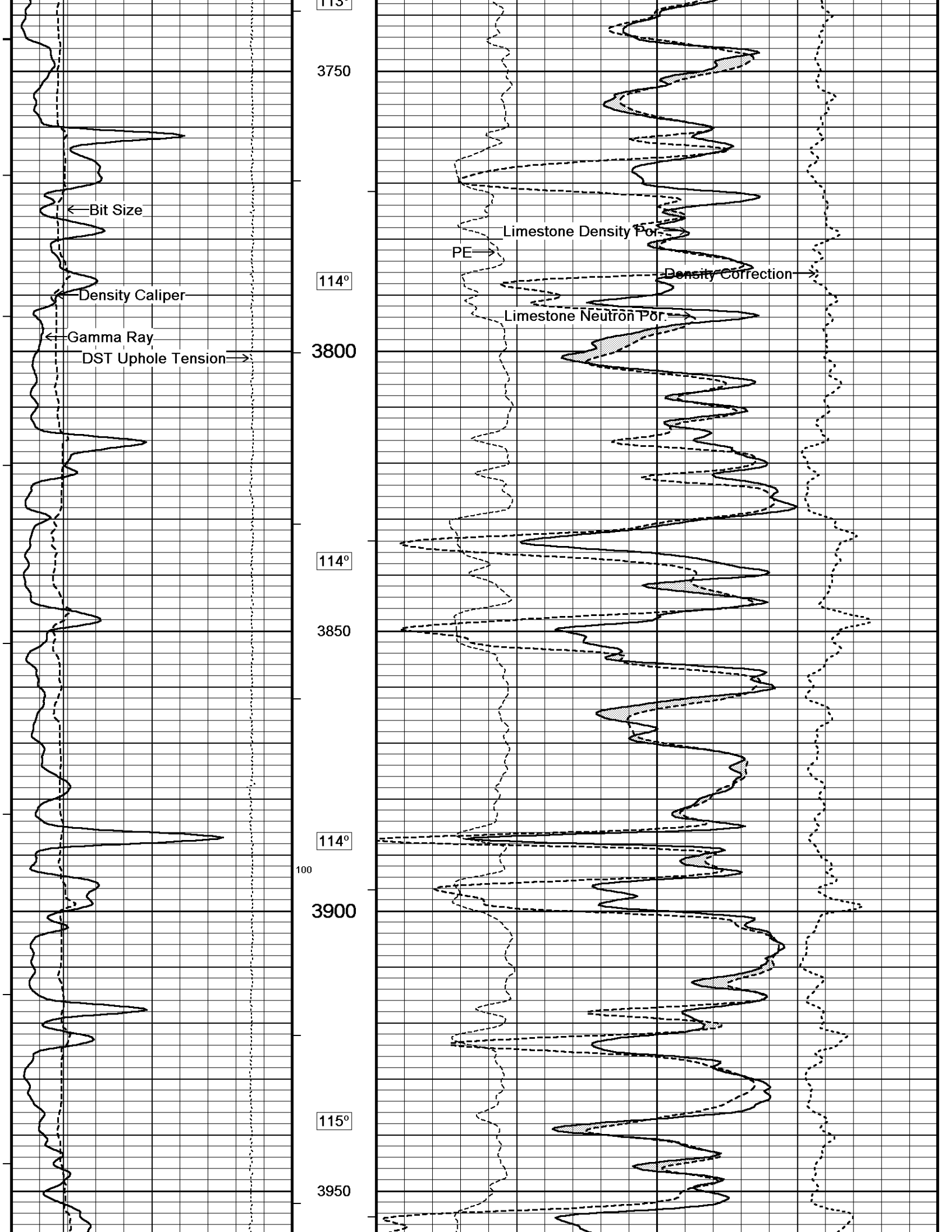
3202

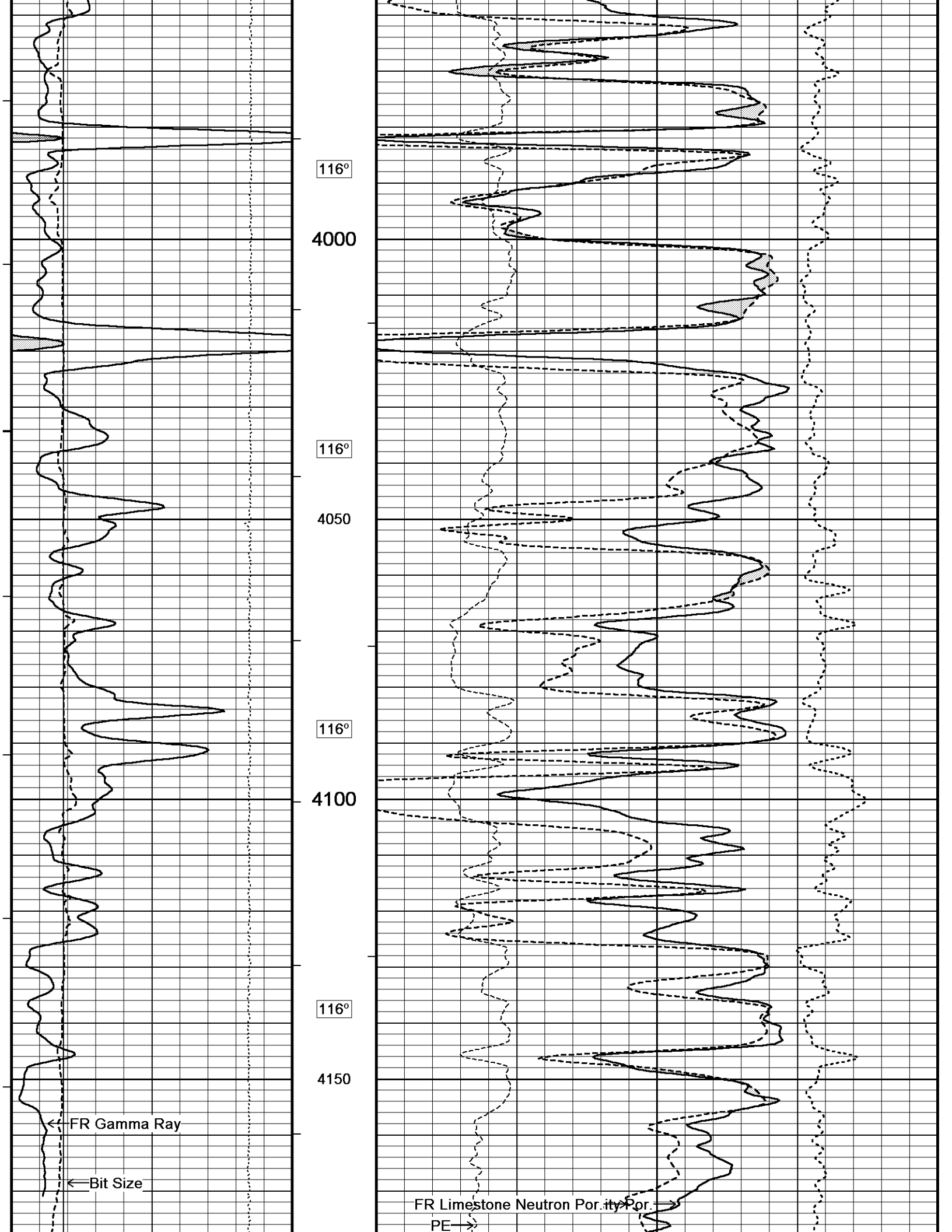
3250

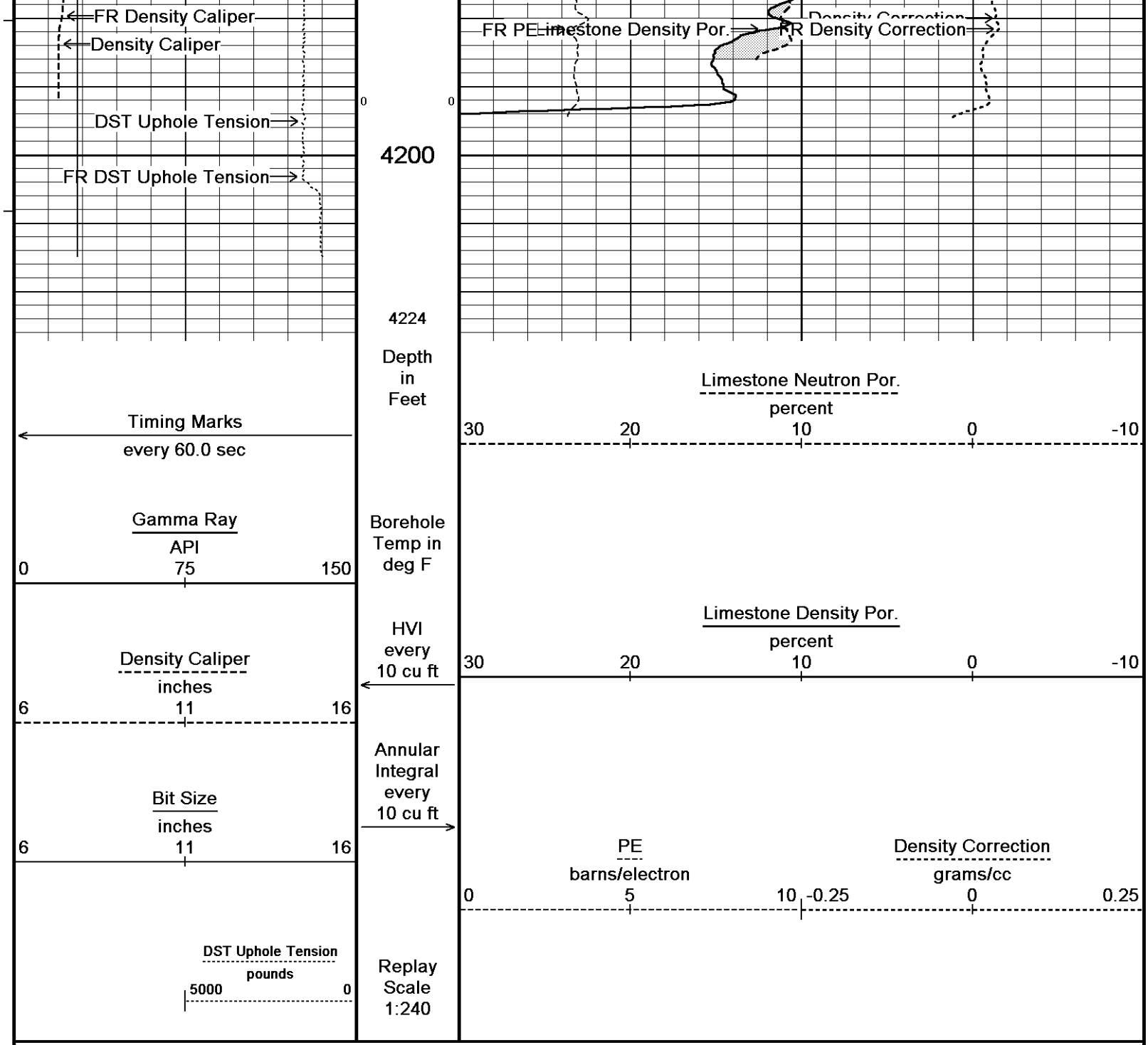
107°


300
3300
108°
3350
Bit Size
109°
PE
Limestone Density Por.
Density Correction
Density Caliper
3400
Limestone Neutron Por.
Gamma Ray
DST Uphole Tension
109°
3450
110°
3500


111°
3550
112°
200
100
3600
112°
3650
112°
3700


Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.
3750
3800
3850
3900
3950
114°
114°
114°
115°
100


116°
4000
116°
4050
116°
4100
116°
4150
FR Gamma Ray
Bit Size
FR Limestone Neutron Porosity Por.
PE

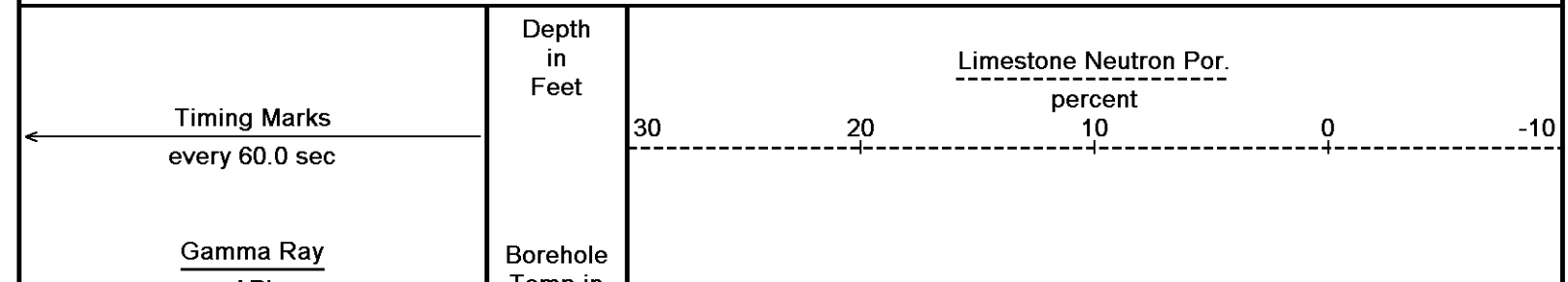


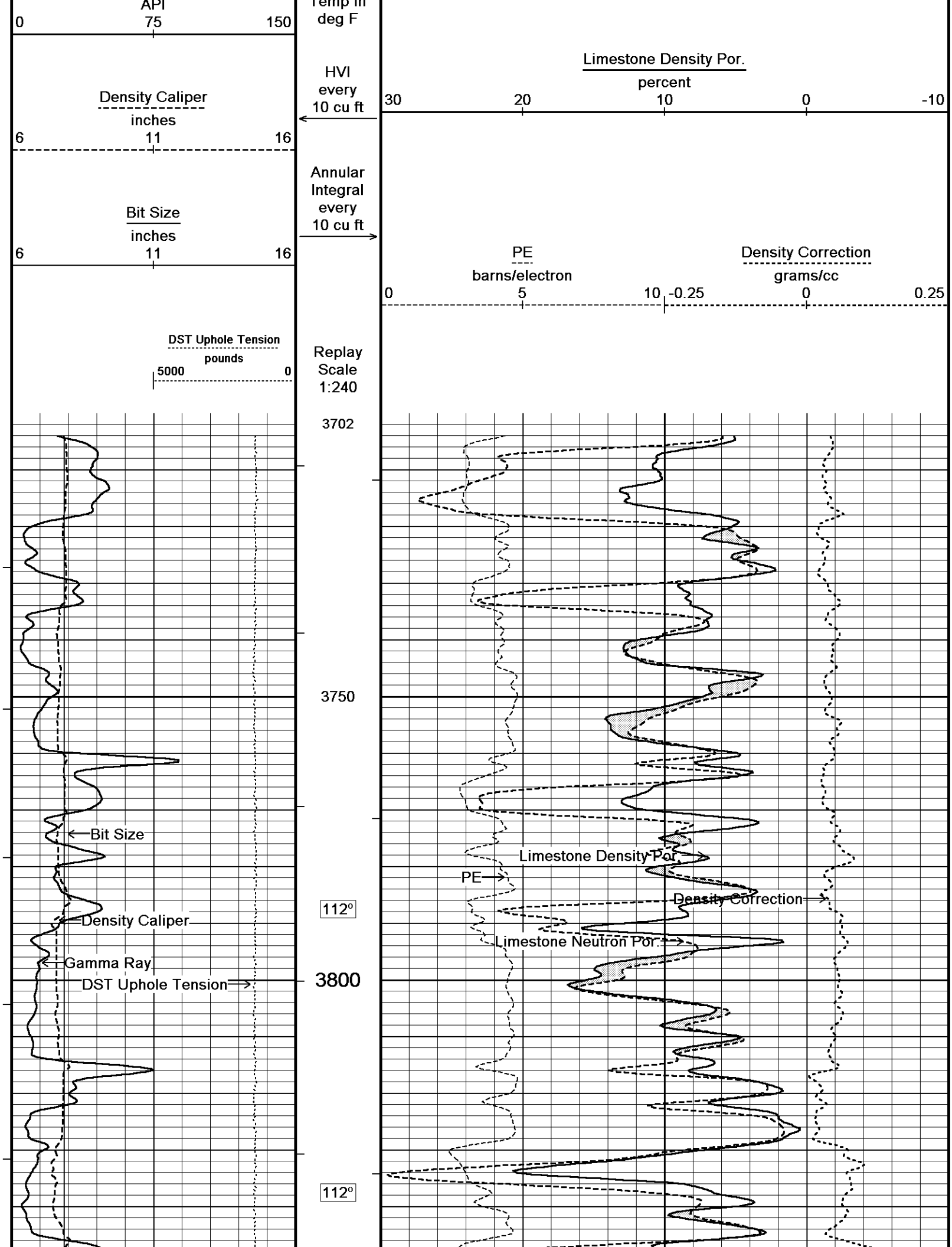
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta
Recorded on 05-DEC-2011 10:22
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

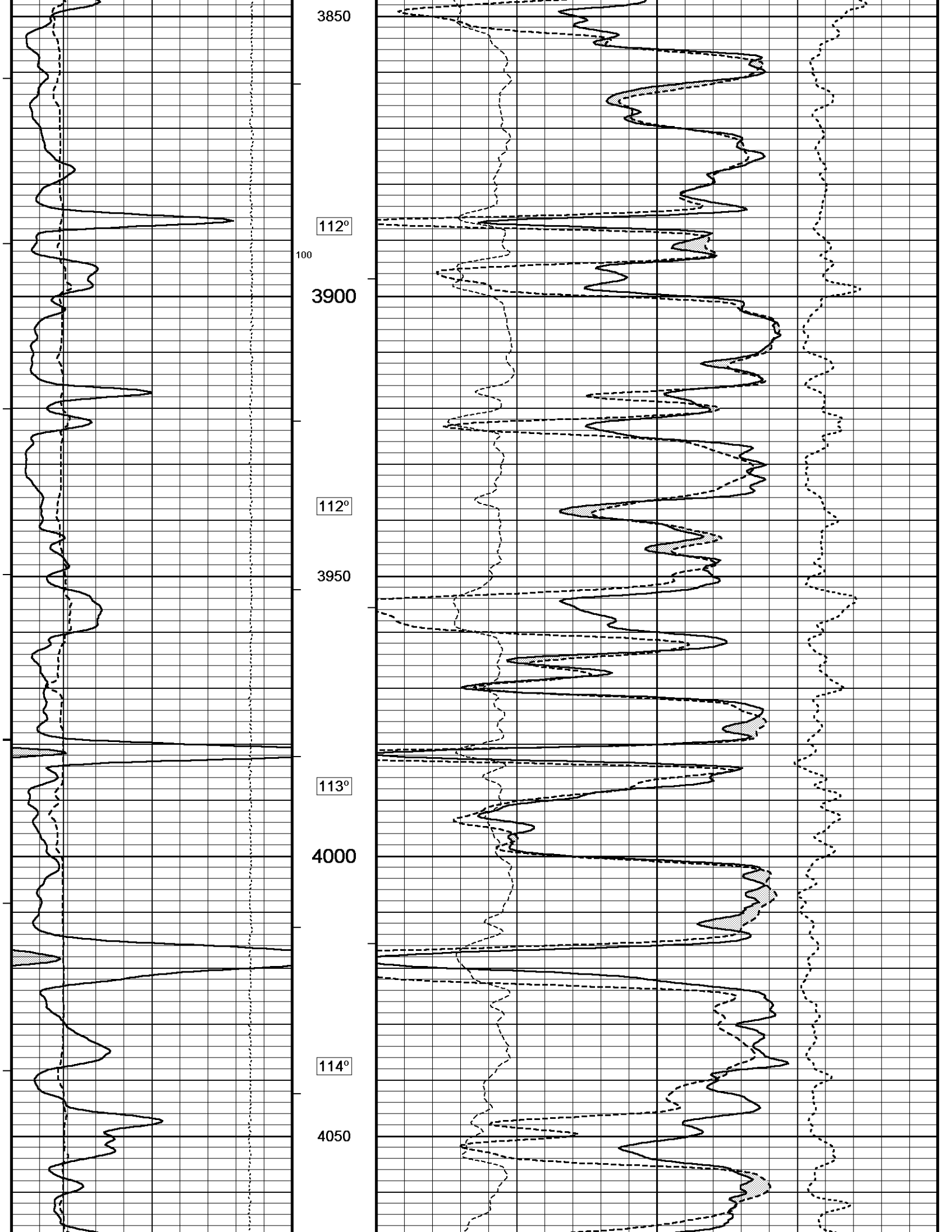
5 INCH MAIN

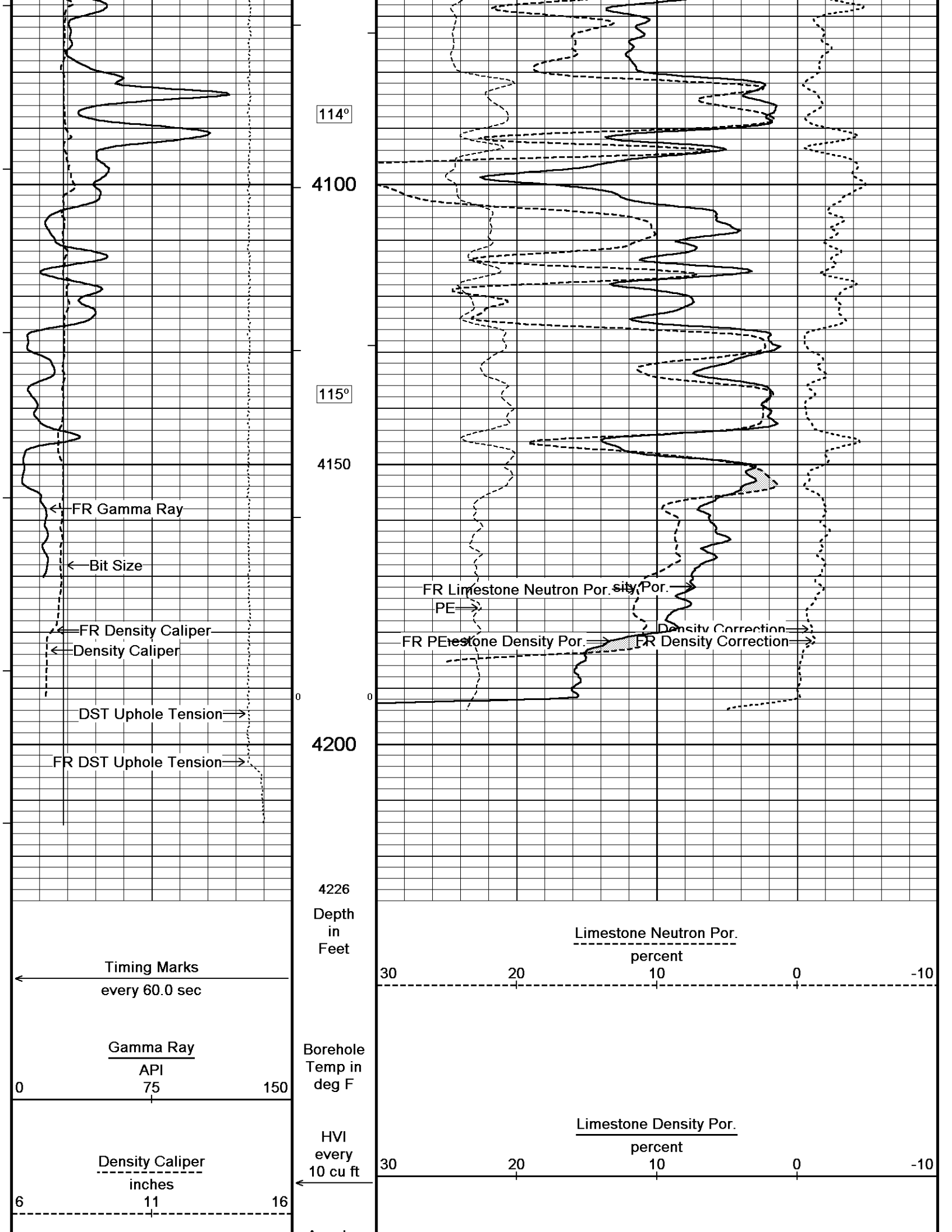
REPEAT SECTION

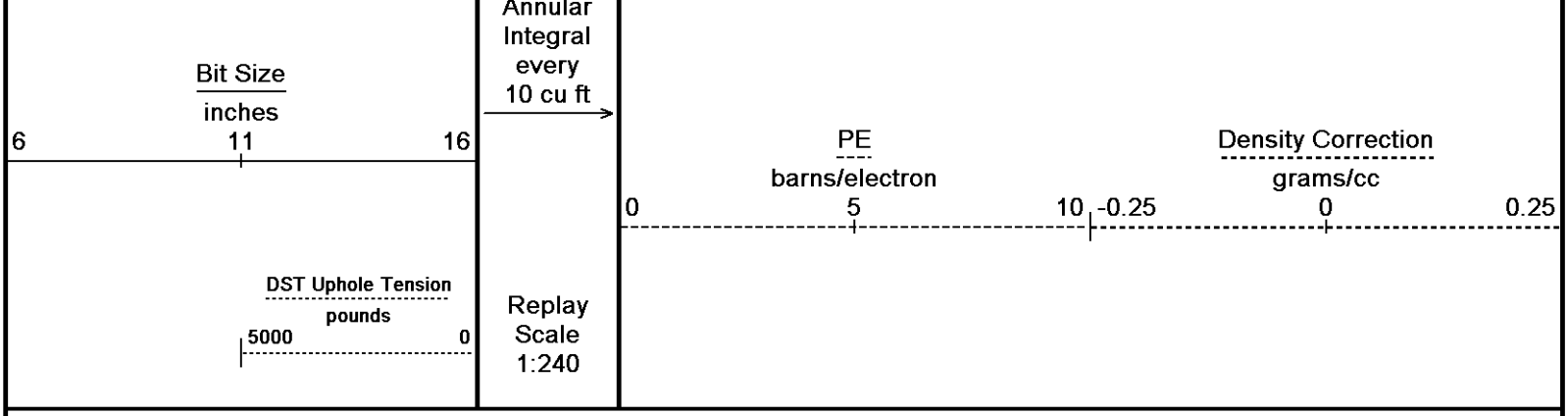
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_001.dta
Recorded on 05-DEC-2011 09:51
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044




API
0
75
150
Temp in deg F
Density Caliper
inches
6
11
16
HVI every 10 cu ft
Limestone Density Por.
percent
30
20
10
0
-10
Bit Size
inches
6
11
16
Annular Integral every 10 cu ft
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
3702
3750
3800
112°
112°
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.


3850
112°
100
3900
112°
3950
113°
4000
114°
4050


114°
4100
115°
4150
FR Gamma Ray
Bit Size
FR Density Caliper
Density Caliper
DST Uphole Tension
FR DST Uphole Tension
0
4200
4226
FR Limestone Neutron Por.
sity Por.
PE
Density Correction
FR PE
estone Density Por.
FR Density Correction
0
Depth
in
Feet
Limestone Neutron Por.
percent
30
20
10
0
-10
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
Borehole
Temp in
deg F
Limestone Density Por.
percent
HVI
every
10 cu ft
30
20
10
0
-10
Density Caliper
inches
6
11
16

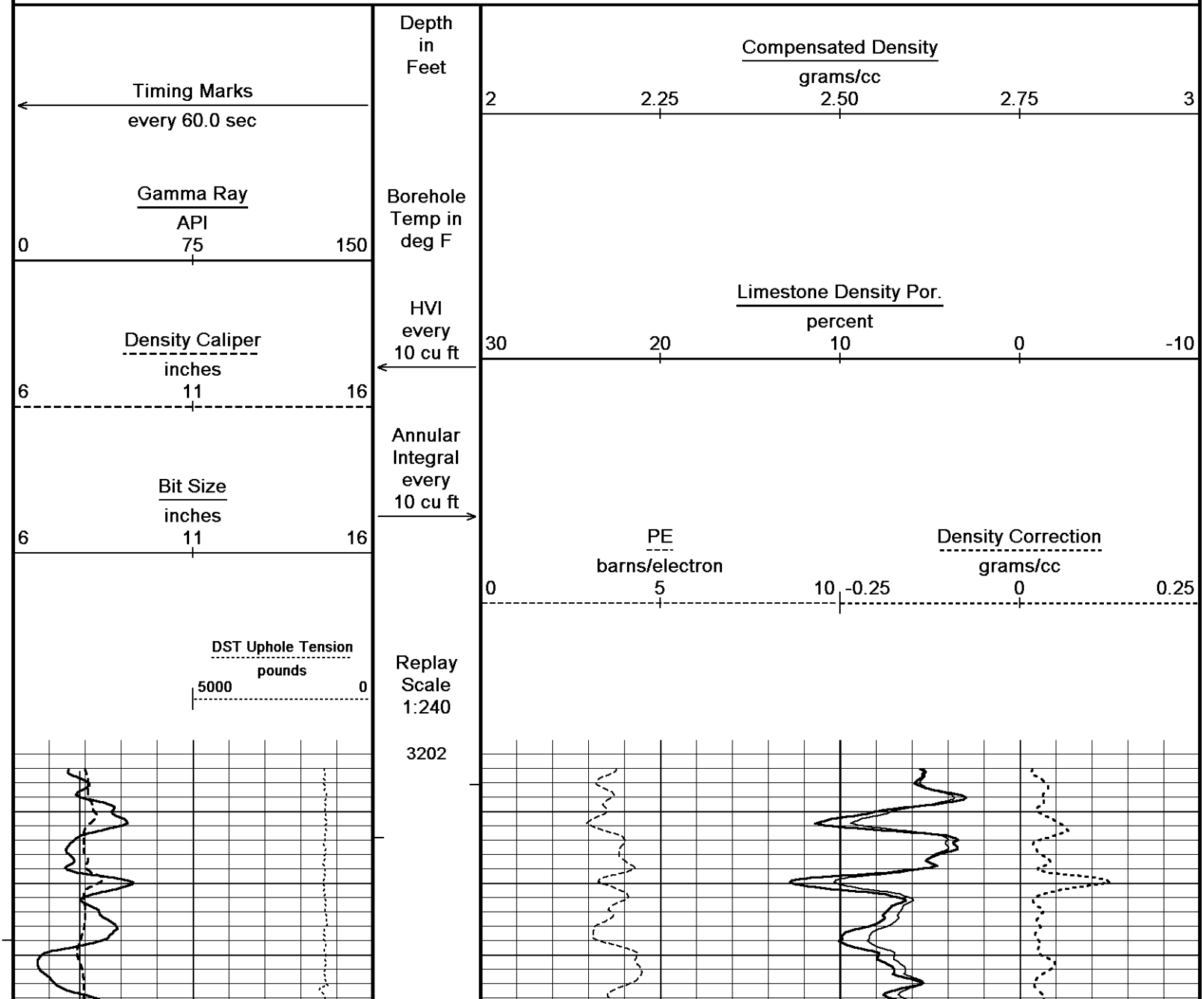


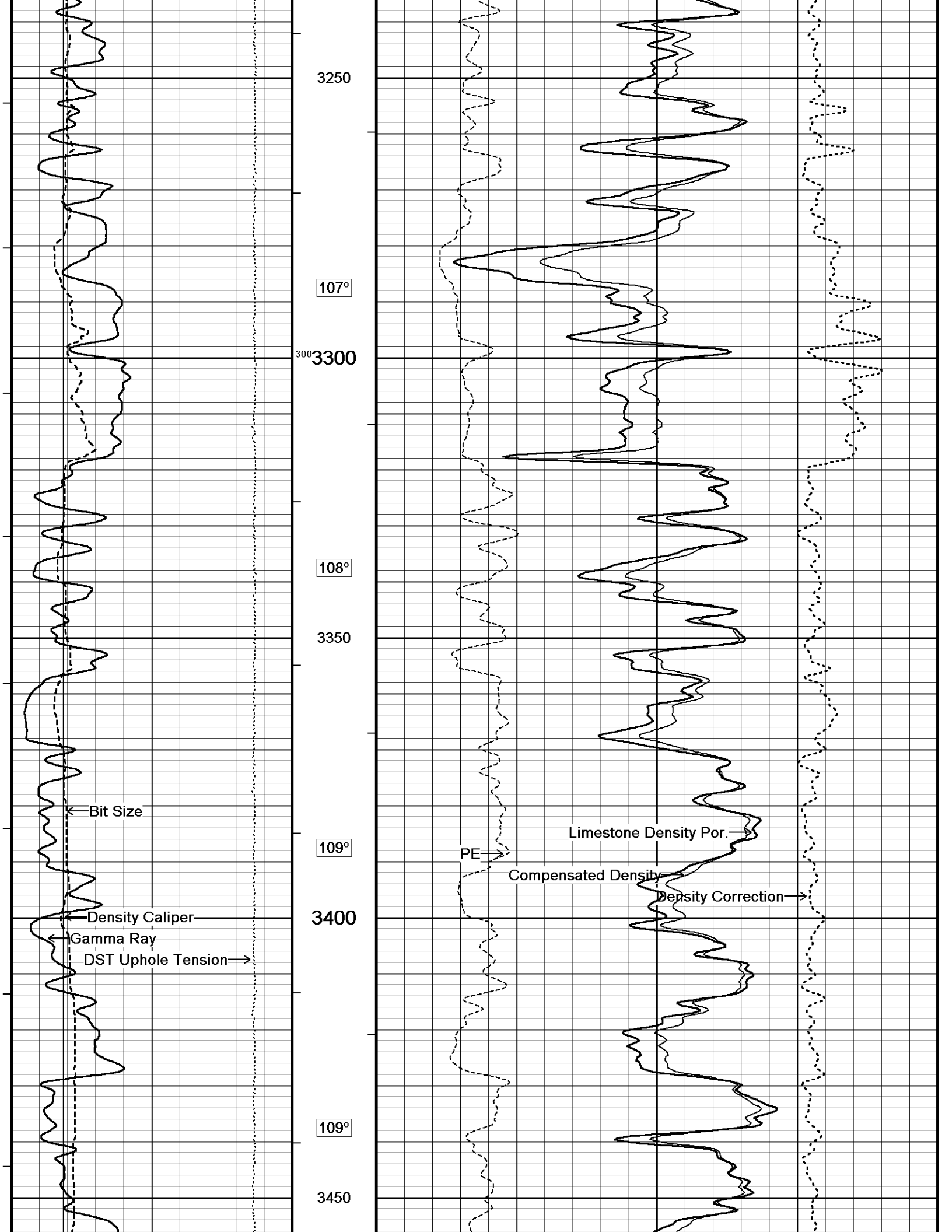
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_001.dta — Recorded on 05-DEC-2011 09:51
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

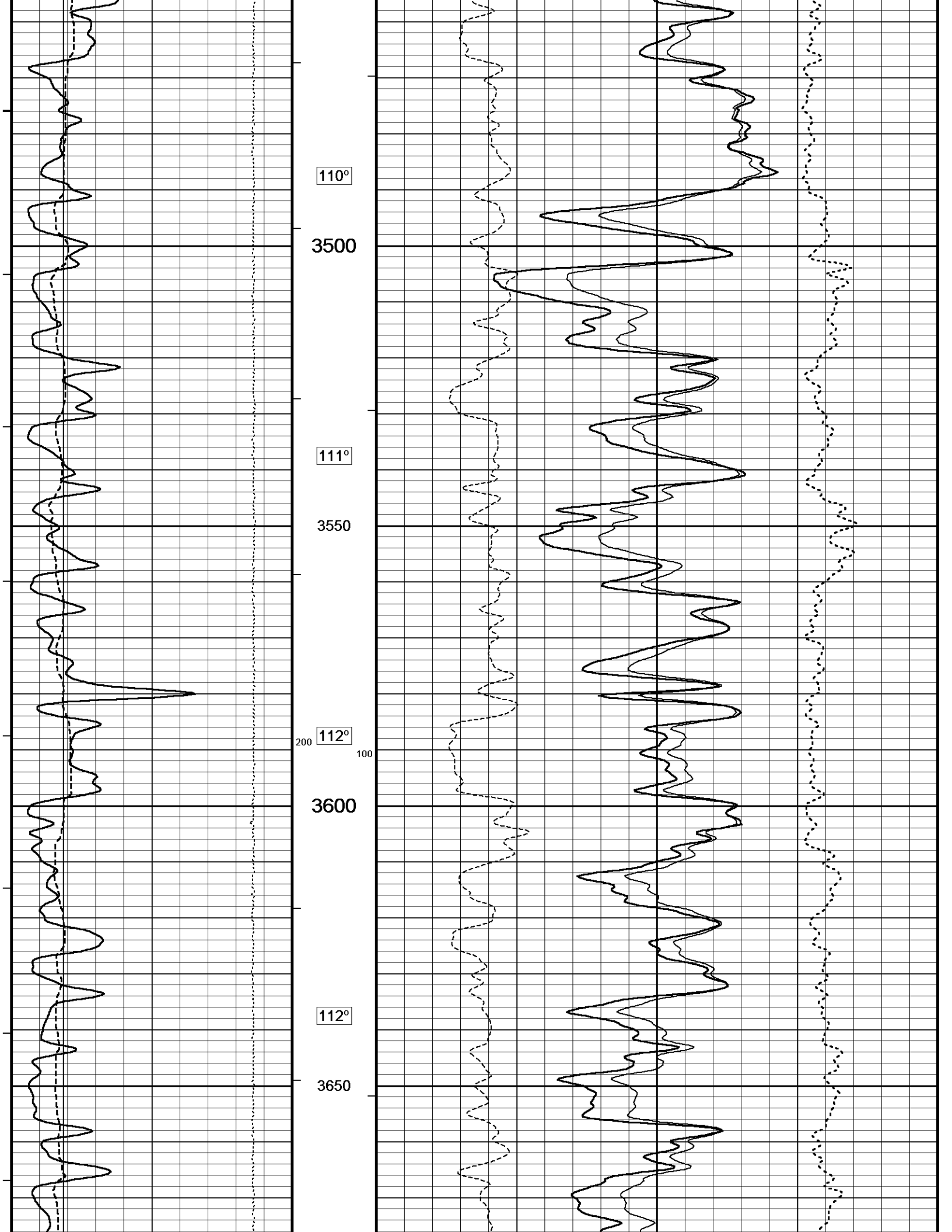
REPEAT SECTION

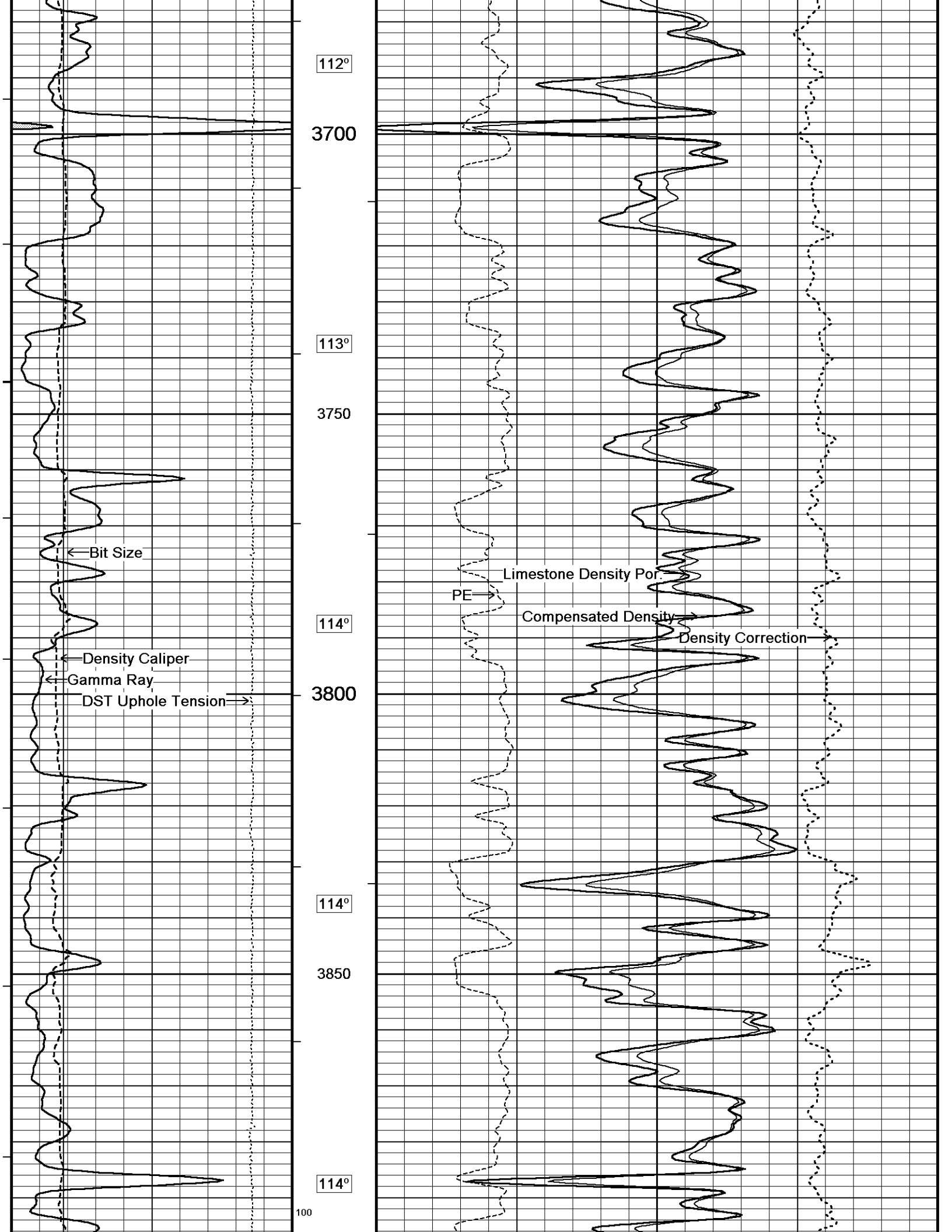
5 INCH MAIN

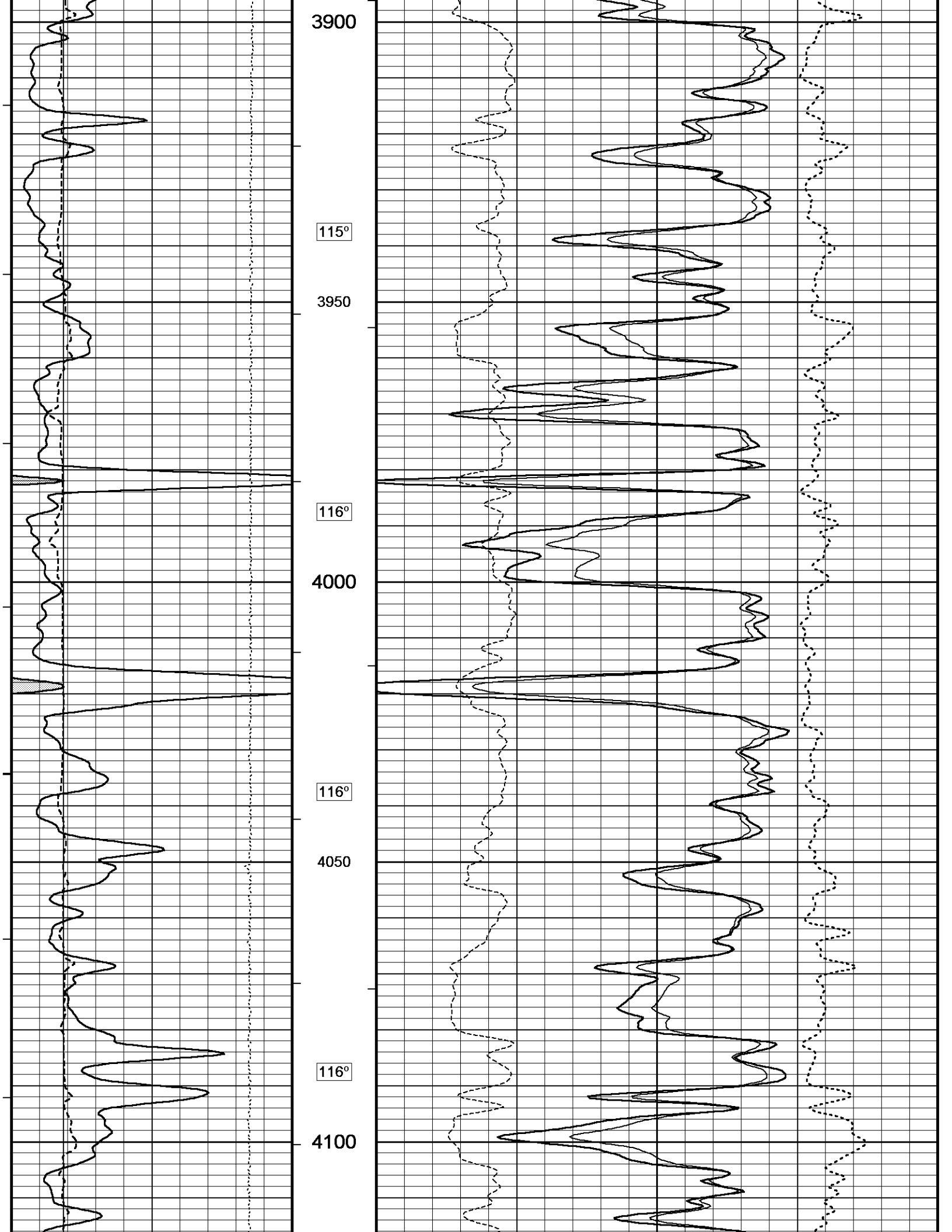
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta — Recorded on 05-DEC-2011 10:22
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

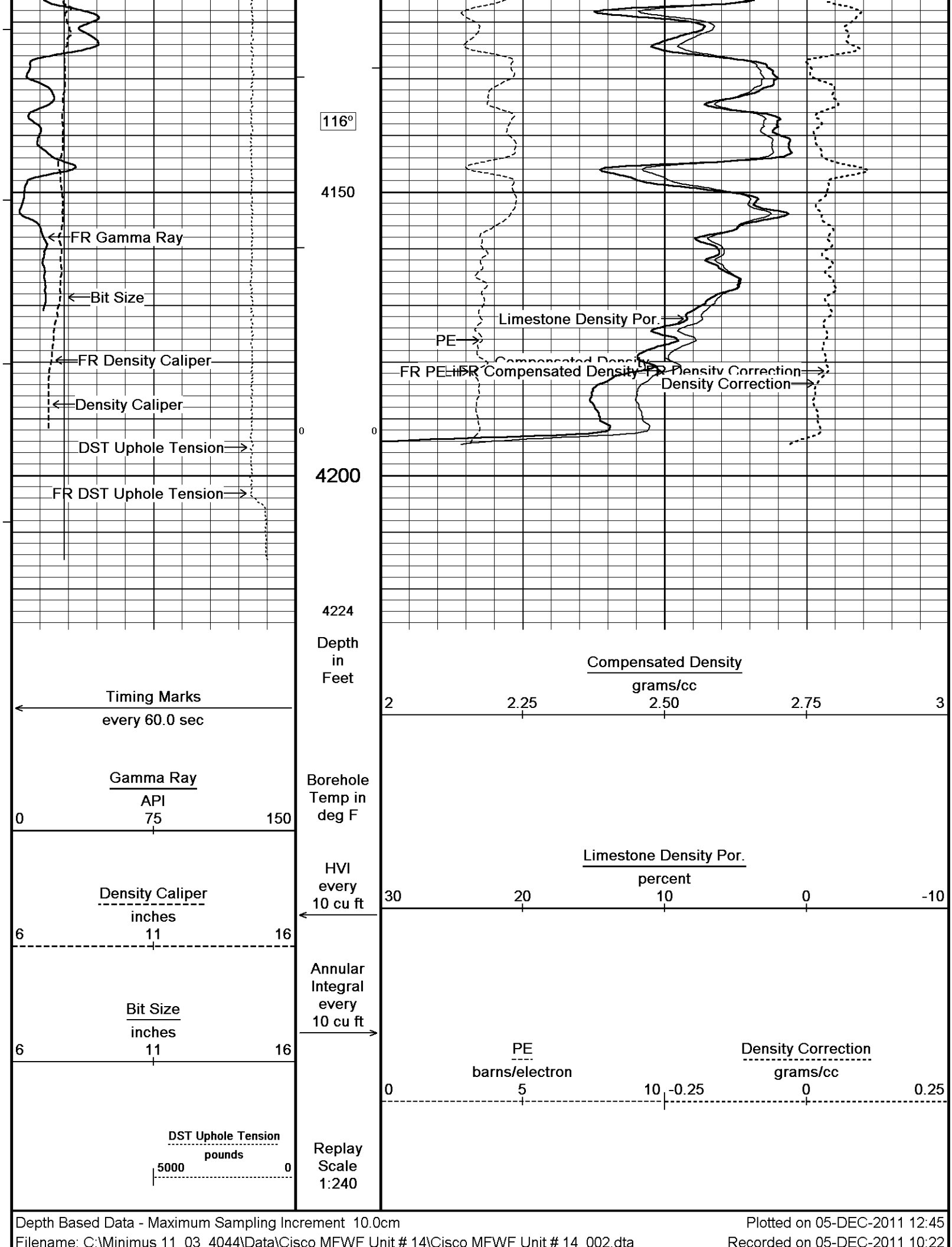



3250
107°
300
3300
108°
3350
109°
3400
109°
3450
Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension
PE
Limestone Density Por.
Compensated Density
Density Correction


110°
3500
111°
3550
200
112°
100
3600
112°
3650


112°
3700
113°
3750
Bit Size
Limestone Density Por
PE
Compensated Density
Density Correction
114°
Density Caliper
Gamma Ray
DST Uphole Tension
3800
114°
3850
114°
100


3900
115°
3950
116°
4000
116°
4050
116°
4100



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 05-DEC-2011 12:45

Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta

Recorded on 05-DEC-2011 10:22

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 05-DEC-2011 12:45
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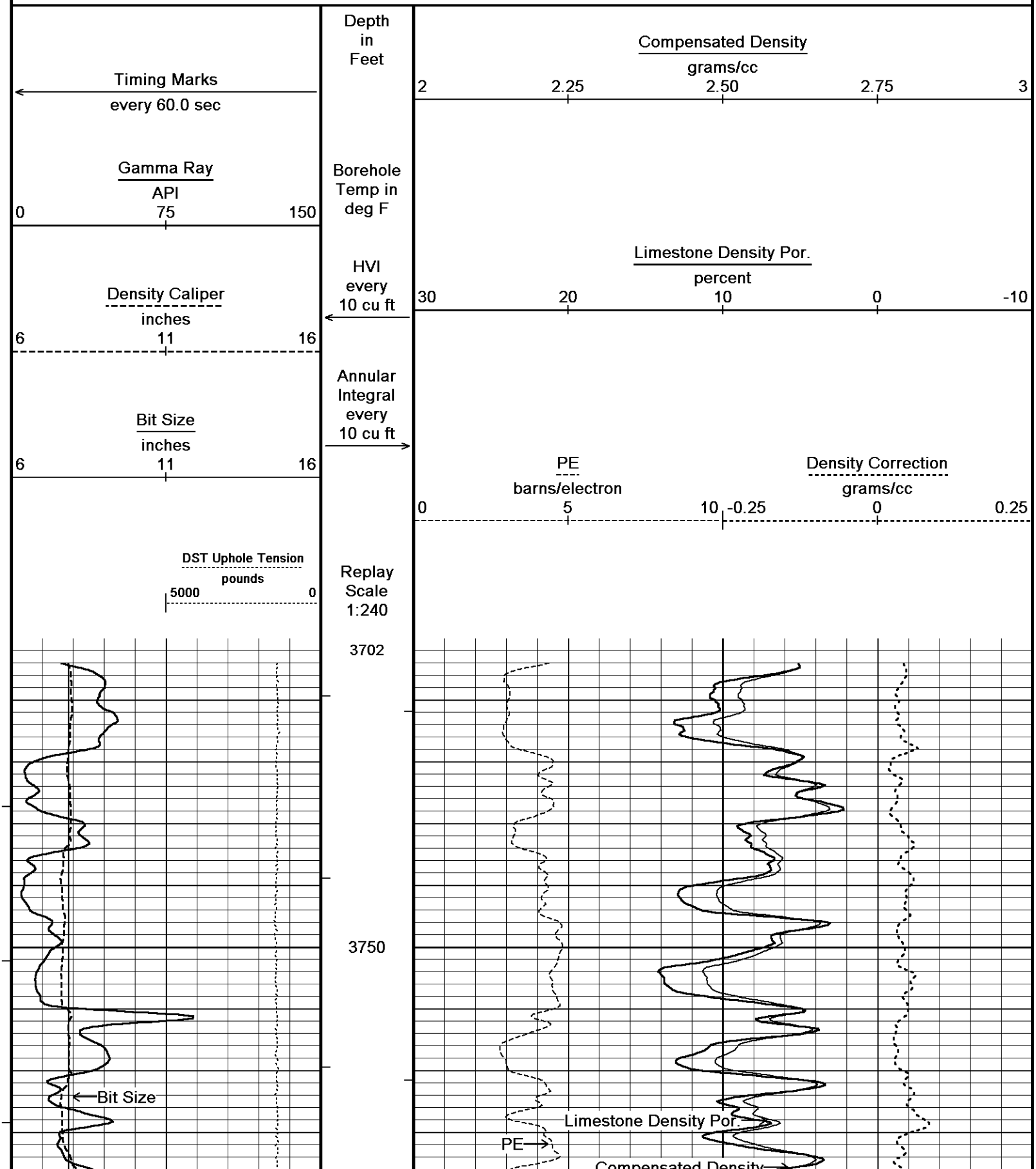
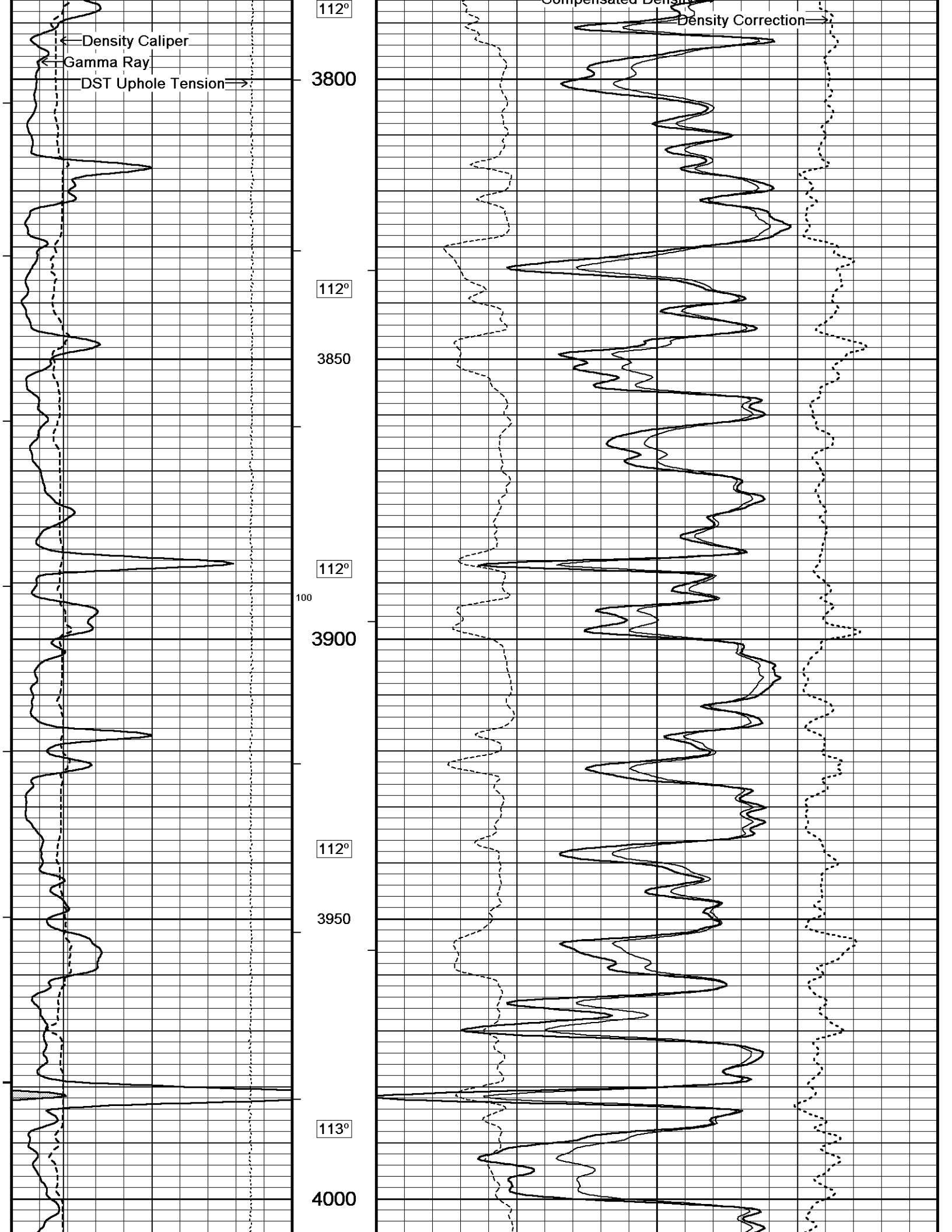
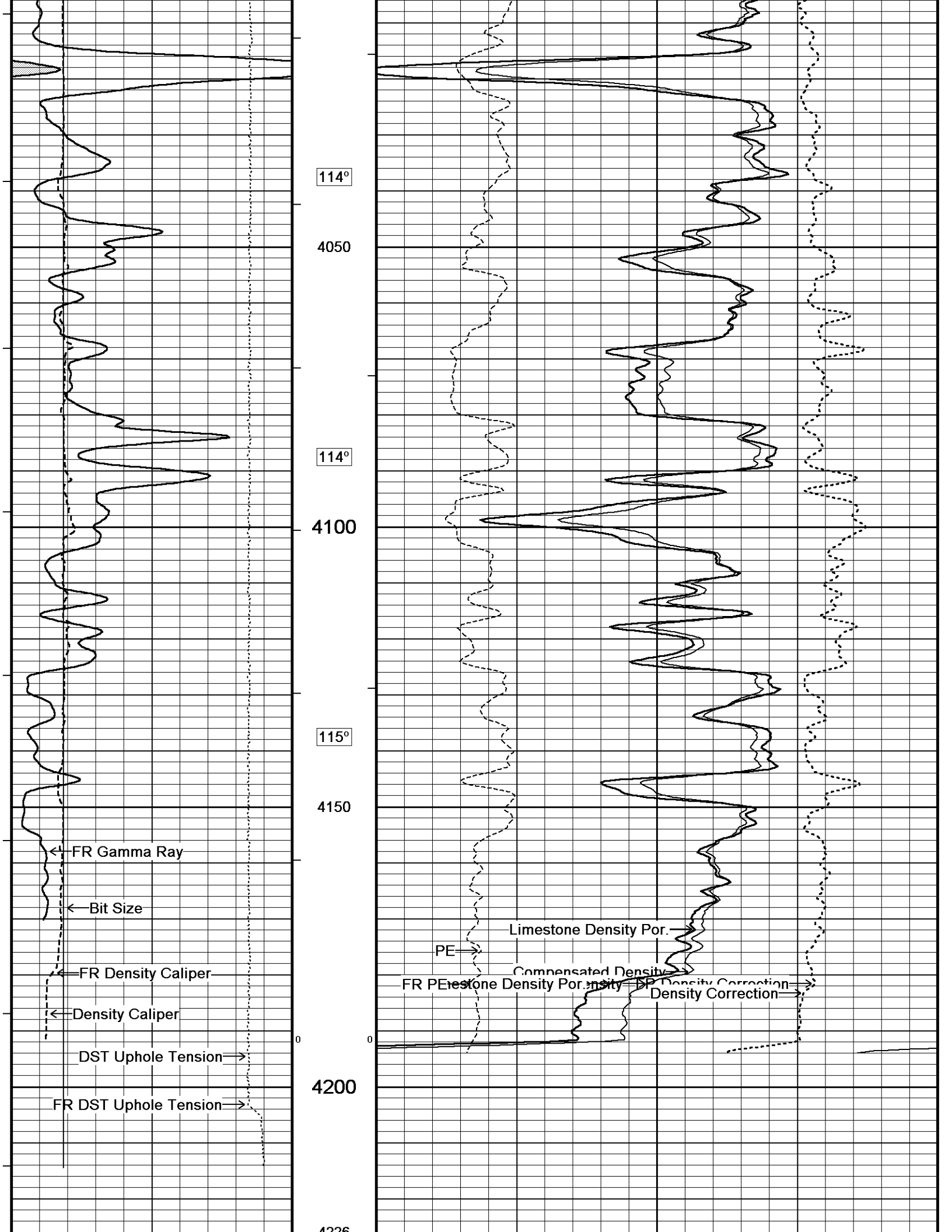
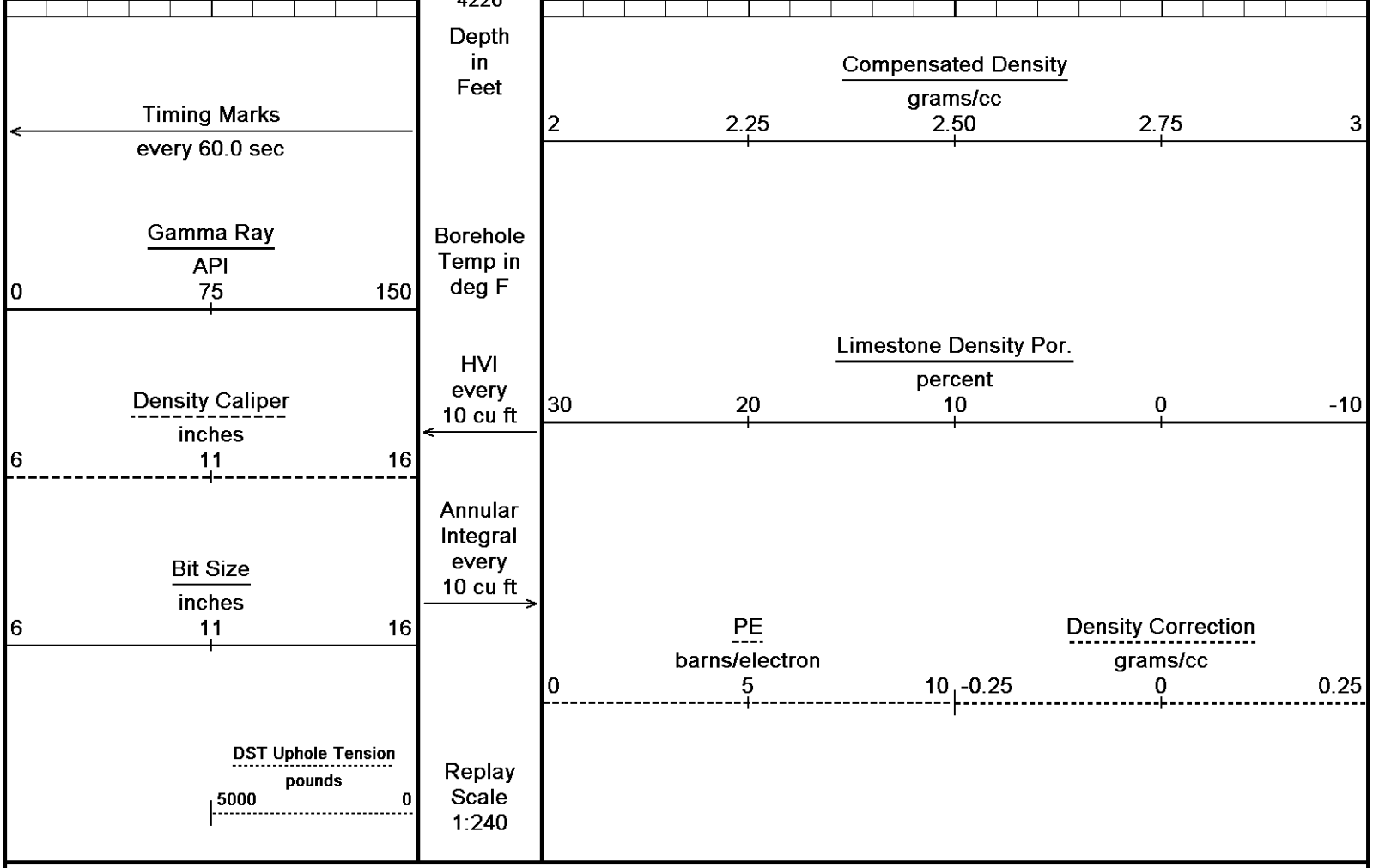



Density Caliper
Gamma Ray
DST Uphole Tension
Density Correction
112°
3800
112°
3850
112°
100
3900
112°
3950
113°
4000


114°
4050
114°
4100
115°
4150
4200
FR Gamma Ray
Bit Size
FR Density Caliper
Density Caliper
DST Uphole Tension
FR DST Uphole Tension
Limestone Density Por.
PE
Compensated Density
FR PE
Density Correction
0
0



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 05-DEC-2011 12:45
Filename: C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_001.dta — Recorded on 05-DEC-2011 09:51
System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta

General Constants All 000

Last Edited on 05-DEC-2011,03:00

General Parameters		
Mud Resistivity	0.640	ohm-metres
Mud Resistivity Temperature	86.000	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. Six Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 23-OCT-2011 03:19

Reading No	Measured	Calibrated (lbs)
1	12734.06	0.00
2	13523.27	454.00

Gamma Calibration MCG-D.K 442

Field Calibration on 04-DEC-2011 22:30

	Measured	Calibrated (API)
Background	72	20
Calibrator (Gross)	1747	476
Calibrator (Net)	1675	456

Gamma Constants MCG-D.K 442

Last Edited on 05-DEC-2011,03:01

Gamma Calibrator Number	GRC141	
Mud Density	1.07	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 07-NOV-2011,09:01

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

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 07-NOV-2011,09:01

	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

Caliper Calibration MML-A 9

Base Calibration on 17-OCT-2011 11:45
Field Calibration on 04-DEC-2011 22:18

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15145	5.98
2	18563	7.97
3	21887	9.86
4	25872	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 9

Base Calibration on 17-OCT-2011 11:28
Field Check on 04-DEC-2011 22:21

Base Calibration

	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.1	59.5	2.6	12.8
Micro Inverse	15.6	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	16.4

Micro Normal and Micro Inverse Constants MML-A 9

Last Edited on 05-DEC-2011,03:03

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 19-OCT-2011 15:30
Field Check on 04-DEC-2011 22:37

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2769	86	3714	110
Ratio	32.016		33.764	

Field Calibrator at Base

Calibrated (cps)

	2150	3003
Ratio	0.716	

Field Check	Calibrated (cps)	
	2381	1226
Ratio	1.941	

Neutron Constants MDN-A.B 39

Last Edited on 05-DEC-2011,03:03

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 21-NOV-2011 10:01
Field Check on 04-DEC-2011 22:11

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	959.2	126.8
Base Check		281.1
Field Check		281.1

FE Constants MFE-A.A 67

Last Edited on 05-DEC-2011,03:02

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 19-OCT-2011 14:25
Field Check on 04-DEC-2011 22:09

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) 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

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	13.7	3867.1

2	0.0	0.0	30.0	3584.1	
3	0.0	0.0	27.9	3078.3	
4	0.0	0.0	19.8	2046.5	
Deep	0.0	0.0	17.2	1954.7	
Medium	0.0	0.0	40.3	4114.2	
Shallow	0.0	0.0	44.9	5368.6	
Array Temperature		0.0		68.3	Deg F

Induction Constants MAI-A.A 188

Last Edited on 05-DEC-2011,03:02

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	0.50	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.	Borehole Temp. Unfilt.	
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 28-NOV-2011 10:07
Field Calibration on 04-DEC-2011 22:12

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13805	3.99
2	22448	5.98
3	31025	7.97
4	39247	9.86
5	48400	11.92
6	N/A	N/A

Field Calibration

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

Photo Density Calibration MPD-B 65

Base Calibration on 28-NOV-2011 10:33
Field Check on 04-DEC-2011 22:17

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60872	28838	59556	30836
Reference 2	24326	2449	24941	2541

Field Check at Base

1237.1	1179.7

Field Check

1234.4	1182.7

PE Calibration

Base Calibration

	WS	WH	Ratio	Calibrated Ratio
Background	225	1100		
Reference 1	22729	60656	0.378	0.371
Reference 2	6549	24175	0.274	0.272

Field Check at Base

224.7	1100.1

Field Check

222.4	1095.8

Density Constants MPD-B 65

Last Edited on 05-DEC-2011,03:02

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	1.07	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 (m)
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	

DOWNHOLE EQUIPMENT

C:\Minimus 11_03_4044\Data\Cisco MFWF Unit # 14\Cisco MFWF Unit # 14_002.dta

Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

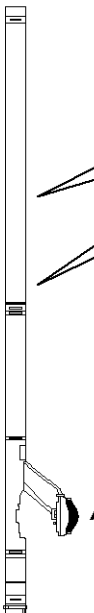
Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

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

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

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

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



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.

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

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

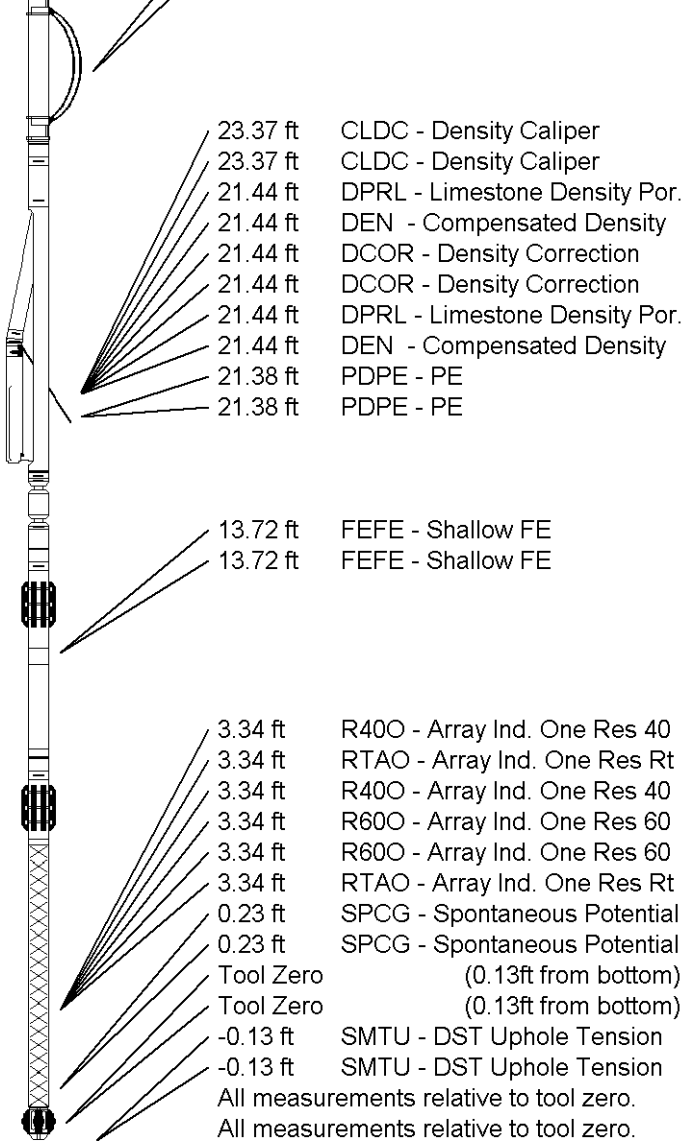
Compact Focussed Electric
MFE-A.A 67 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

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

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

Total	Length: 50.32 ft	Weight: 407.9 lb



COMPANY	CISCO OPERATING LLC.
WELL	MFWF UNIT # 14
FIELD	MISSOURI FLATS NORTHEAST
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2586.00	feet	First Reading	4182.00	feet
Elevation Drill Floor	2584.00	feet	Depth Driller	4200.00	feet
Elevation Ground Level	2575.00	feet	Depth Logger	4203.00	feet

Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON

40 Years of Wireline 1970 2010