



Weatherford

**RESISTIVITY LOG
MGS-MDL**

SCALE 5":100 LINEAL

COMPANY

SAVIA PERU S.A

WELL

LOG-33D

FIELD

LOBITOS OFFSHORE

PROVINCE/COUNTY

PIURA

COUNTRY/STATE

PERU

LOCATION

**N: 9°508,652.99 m
E: 459,049.25 m**

Latitude
Longitude

Other Services
MDN
MPD

Permanent Datum SEA LVL, Elevation 335 feet

Log Measured From DF

Drilling Measured From DF

Elevations:
KB 385.00
DF 385.00
GL 335.00

Date

04-AUG-2013

Run Number

1

Service Order

834

Depth Driller

8150.00 feet

Depth Logger

8128.25 feet

First Reading

8101.25 feet

Last Reading

5708.00 feet

Casing Driller

5707.00 feet

Casing Logger

5708.00 feet

Bit Size

8.500 inches

Hole Fluid Type

WBAC

Density / Viscosity

11.50 lb/USg 48.00 Sec/qt

PH / Fluid Loss

9.40 5.00 ml/30Min

Sample Source

ACTIVE PIT

Rm @ Measured Temp

0.81 @ 75.0 ohm-m

Rmf @ Measured Temp

0.622 @ 75.0 ohm-m

Rmc @ Measured Temp

1.481 @ 75.0 ohm-m

Source Rmf / Rmc

PRESS

Rm @ BHT

1.092 @103.0 ohm-m

Time Since Circulation

1 HOUR

Max Recorded Temp

103.00 deg F

Equipment / Base

2 TALARA

Recorded By

J. GUERRERO

Witnessed By

A. ORTEGA

E. ROLDAN

REMARKS

- Objective: To obtain accurate open hole Gamma Ray, Neutron, Caliper, Resistivity Log (Dual Laterolog) in Compact Well Shuttle - Messenger Conveyance.
- Maximum recorded temperature 103 degF recorded.
- Fluid resistivity measurements during logging operation: Rmf= 0.622 @ 70deg F, Rm=0.807@ 70Deg F, Rmc=1.481@ 70degF.
- This is a deviated well with a maximum deviation of 65.30 degrees @ 2814.00 ft.
- Well sketch per driller's depth.
- Bottom not tagged due to nature of the conveyance. Maximum depth recorded in Log header (8128.25ft) is the maximum depth reached by the induction tool in the run.
- Logging speed below 30 ft/min (following operational procedure).
- Main Section from 8128.25ft to 5708 ft, as requested.
- No Repeat Section performed due to deployment method used in the job.
- Resistivity curves (Dual laterolog) presented in this log are not corrected for borehole conditions.
- Neutron log is corrected by temperature and borehole size by the density caliper.
- Density log is corrected for mud density and borehole size by density caliper. Matrix used: 2,68 g/cc
- Calculated Volumes and caliper averages from 8128.25ft to 5708 ft, for a future 7.0 O.D casing:
Hole Volume= 1235 FT 3
Annular Volume = 605 FT 3
Caliper Average = 9.76 in.
- Flow test were done at the following depths: 200ft, 2000ft, 4000ft ,5500ft, 6500ft, 7500ft, 7975ft.

Crew at your service

J. Guerrero, A. Baca, H. Quezada, J. Escobar, E. Roldan

BOREHOLE RECORD

Last Edited: 06-AUG-2013 08:59

Bit Size
inches

17.000

Depth From
feet

0.00

Depth To
feet

1224.00

17.000	0.00	1224.00
12.250	1224.00	5707.00
8.500	5707.00	8150.00

CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	13.375	0.00	1224.00	48.00
CASING	9.625	0.00	5707.00	43.00

WELL DIAGRAM

13.38 in Casing: 0.00 ft

9.63 in Casing: 0.00 ft

17.00 in Bit size: 0.00 - 1224.00 ft

13.38 in Casing shoe: 1224.00 ft

12.25 in Bit size: 1224.00 - 5707.00 ft

9.63 in Casing shoe: 5707.00 ft

8.50 in Bit size: 5707.00 - 8150.00 ft

Total bit depth: 8150.00 ft

Temperature: 103.00 Degrees F

DOWNHOLE EQUIPMENT

D:\LOGS\PERU\TALARA\LO6-33D-CWS\merge-PROCESS-lo6-33d2.dta

Shuttle Running Tool 3.5"

SRT-A.A 31 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 507 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MBS-F.A 200v Compact Battery Sub

MBS-F.A 116 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in

Compact Memory Sub E.B

MMS-E.B 148 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub

MIS-E.B 640 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Stiff Bridle Electrode Sub.

MBE-C.B 261 LG: 12.33 ft WT: 77.2 lb OD: 2.28 in

Compact Stiff Bridle Electrode Sub.

Compact Stiff Bridle Electrode Sub.
MBE-C.B 262 LG: 12.33 ft WT: 77.2 lb OD: 2.28 in

Compact Stiff Bridle Electrode Sub.
MBE-A.A 56 LG: 12.33 ft WT: 77.2 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 230 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Short Gamma
MGS-C.A 43 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 57 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 170 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 486 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 755 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-A.B 175 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 238 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 756 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

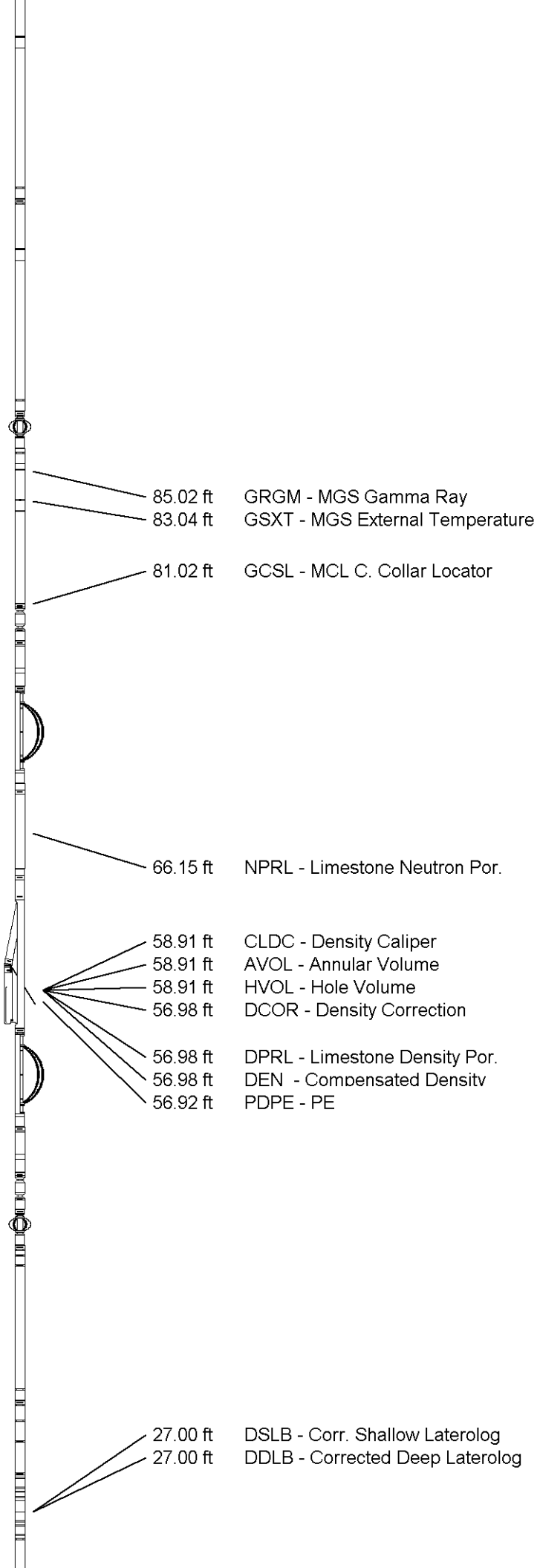
SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 479 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 177 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 641 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Upper Guard sub
MUG-B.B 260 LG: 8.98 ft WT: 68.3 lb OD: 2.24 in

Compact Laterolog Electrode Sub.
MLE-D.A 228 LG: 12.34 ft WT: 92.6 lb OD: 2.24 in



Compact Lower Guard Sub.
MLG-B.B 257 LG: 8.00 ft WT: 55.1 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 152 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

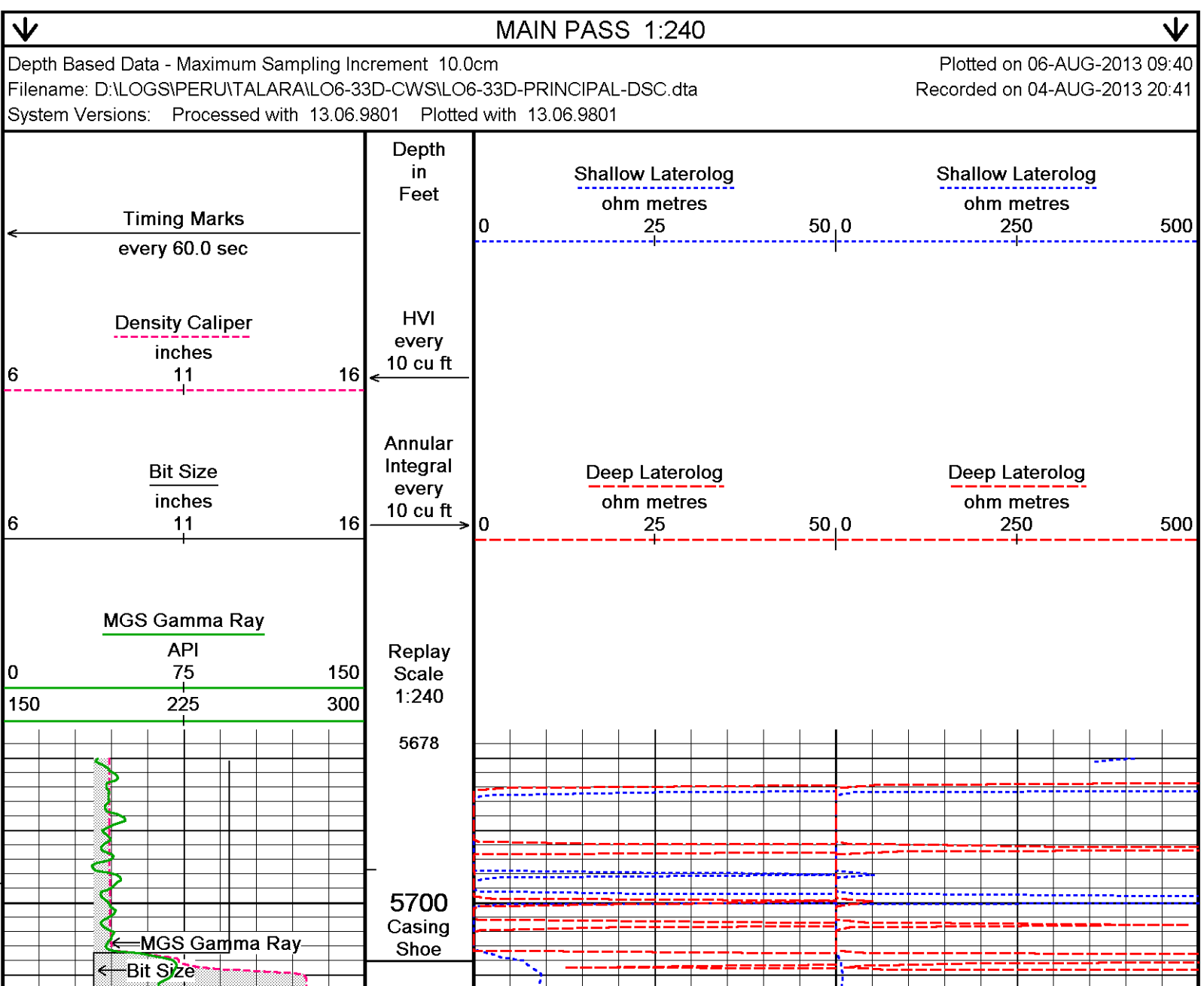
Compact Induction
MAI-B.A 223 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

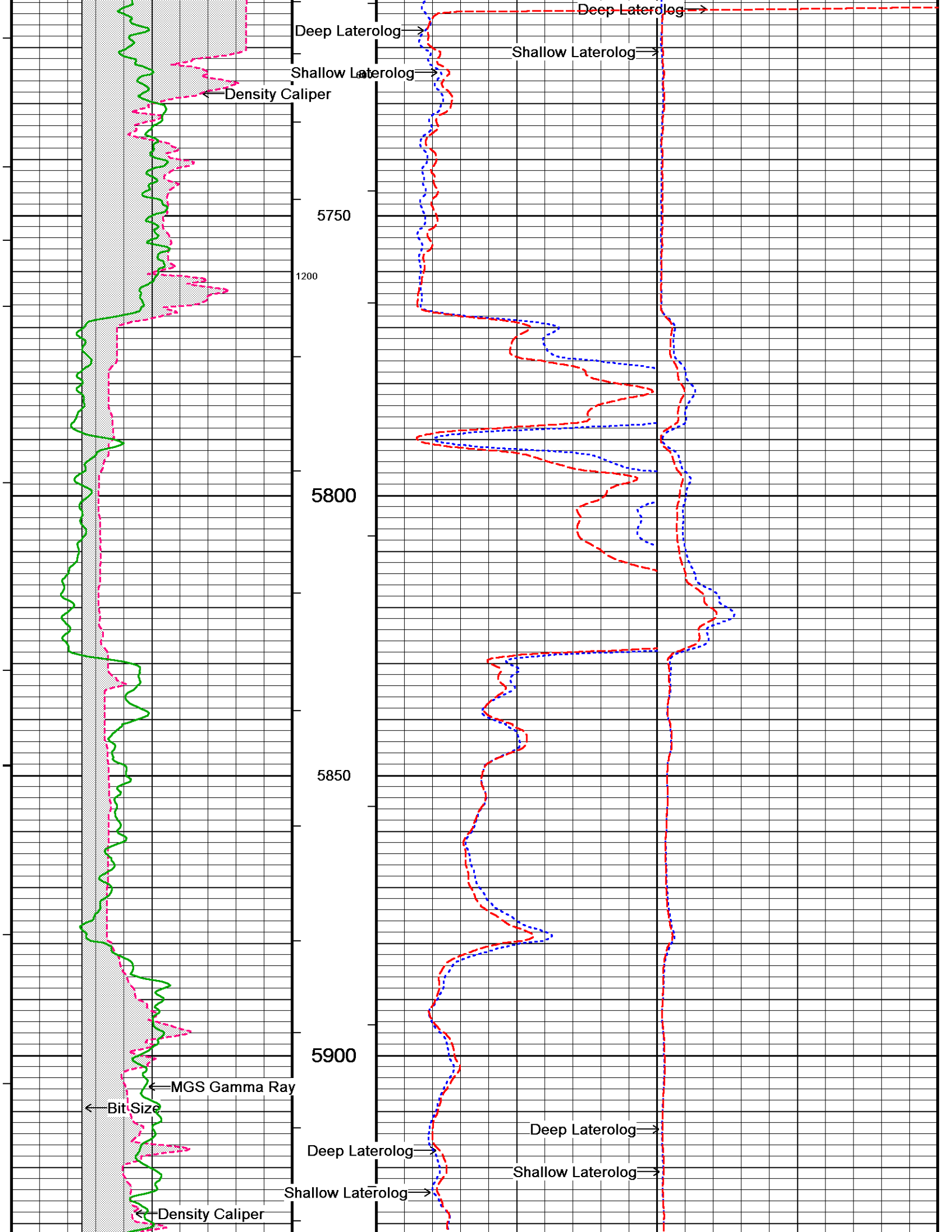
Total Length: 158.25 ft Weight: 1131.0 lb

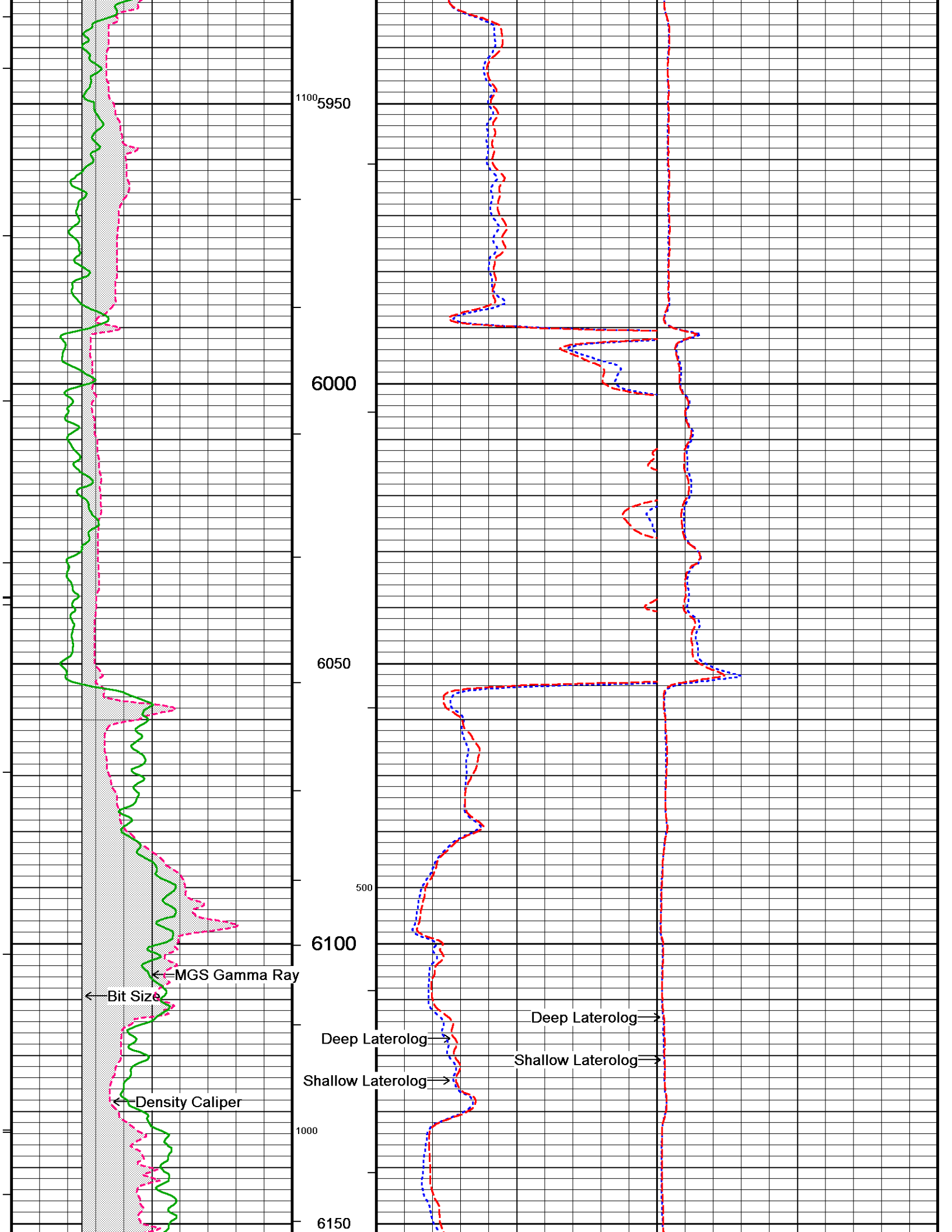


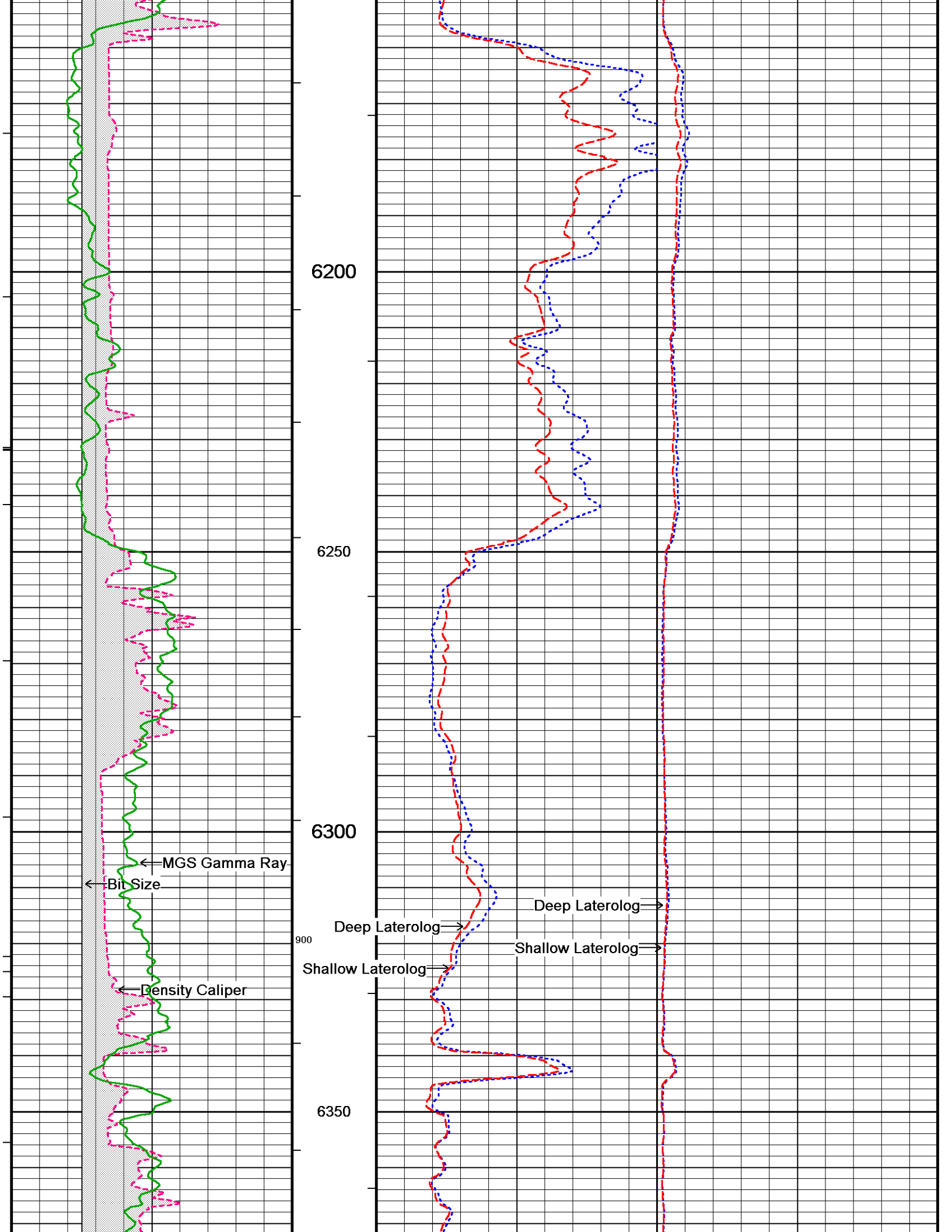
Tool Zero (0.13ft from bottom)
-0.13 ft SMTU - DST Uphole Tension
All measurements relative to tool zero.

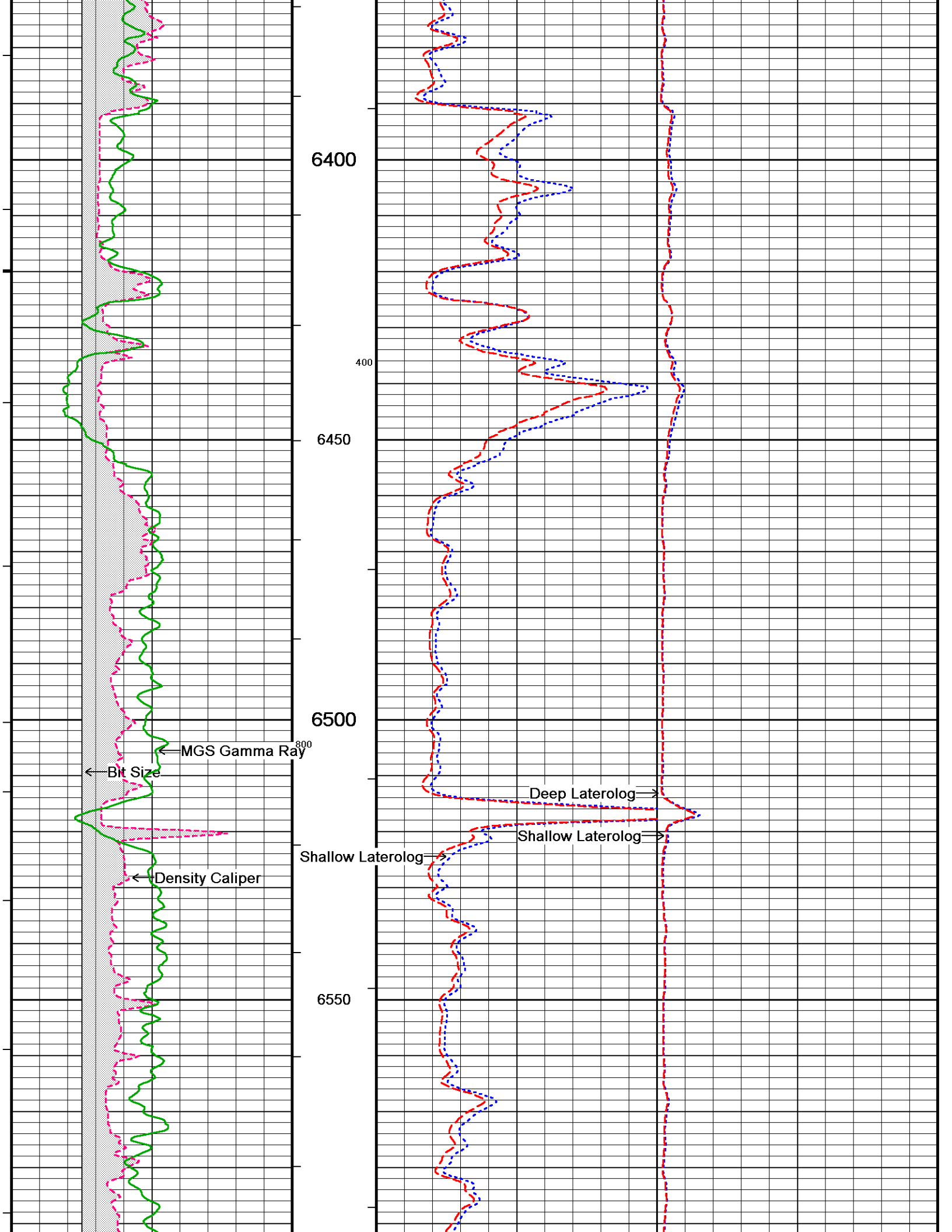
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

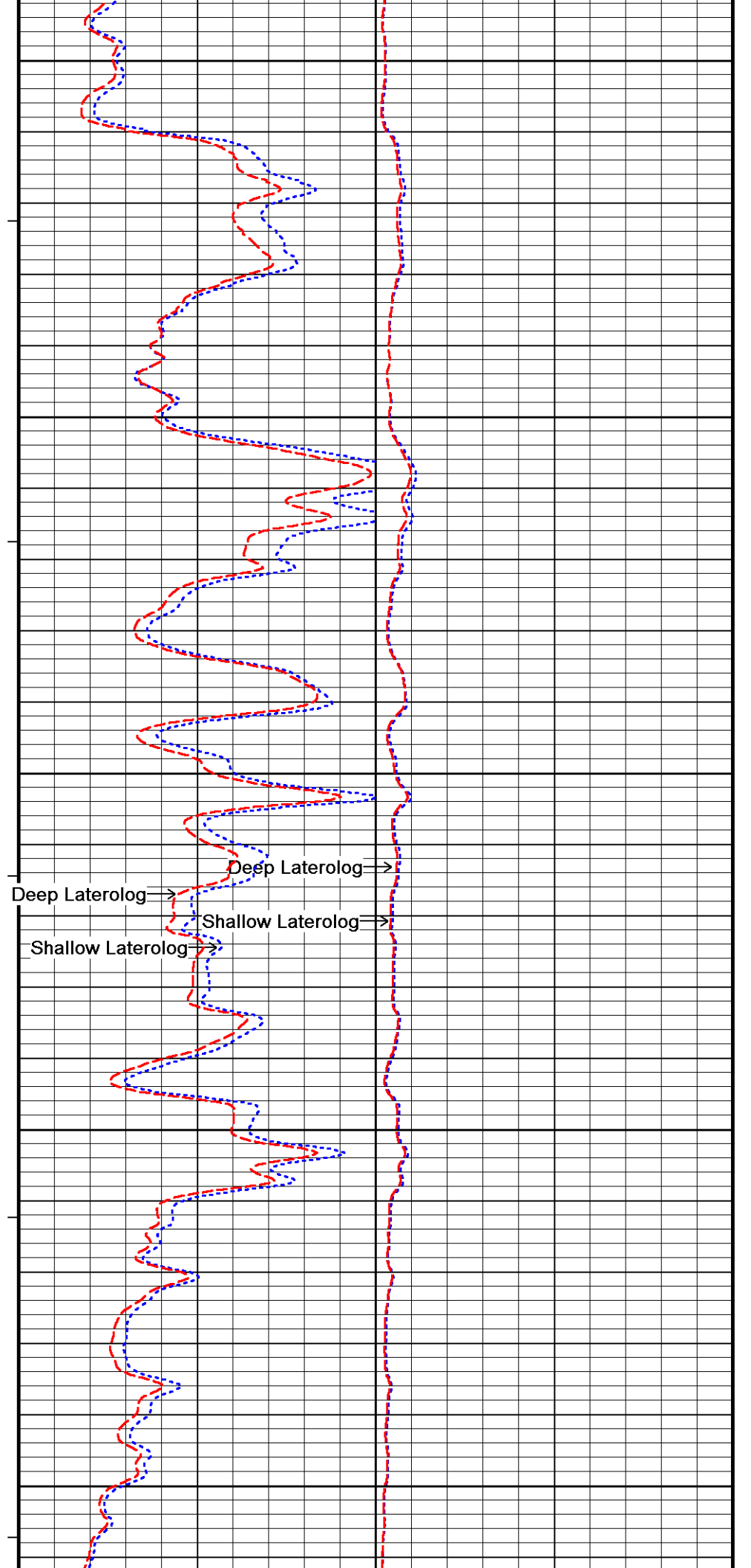
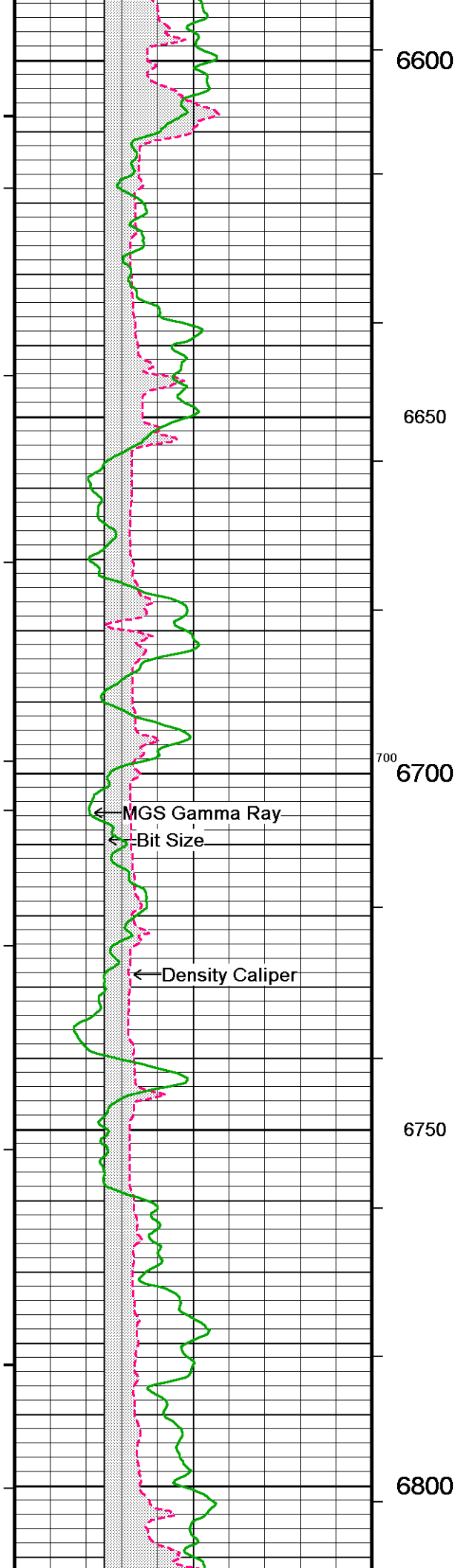


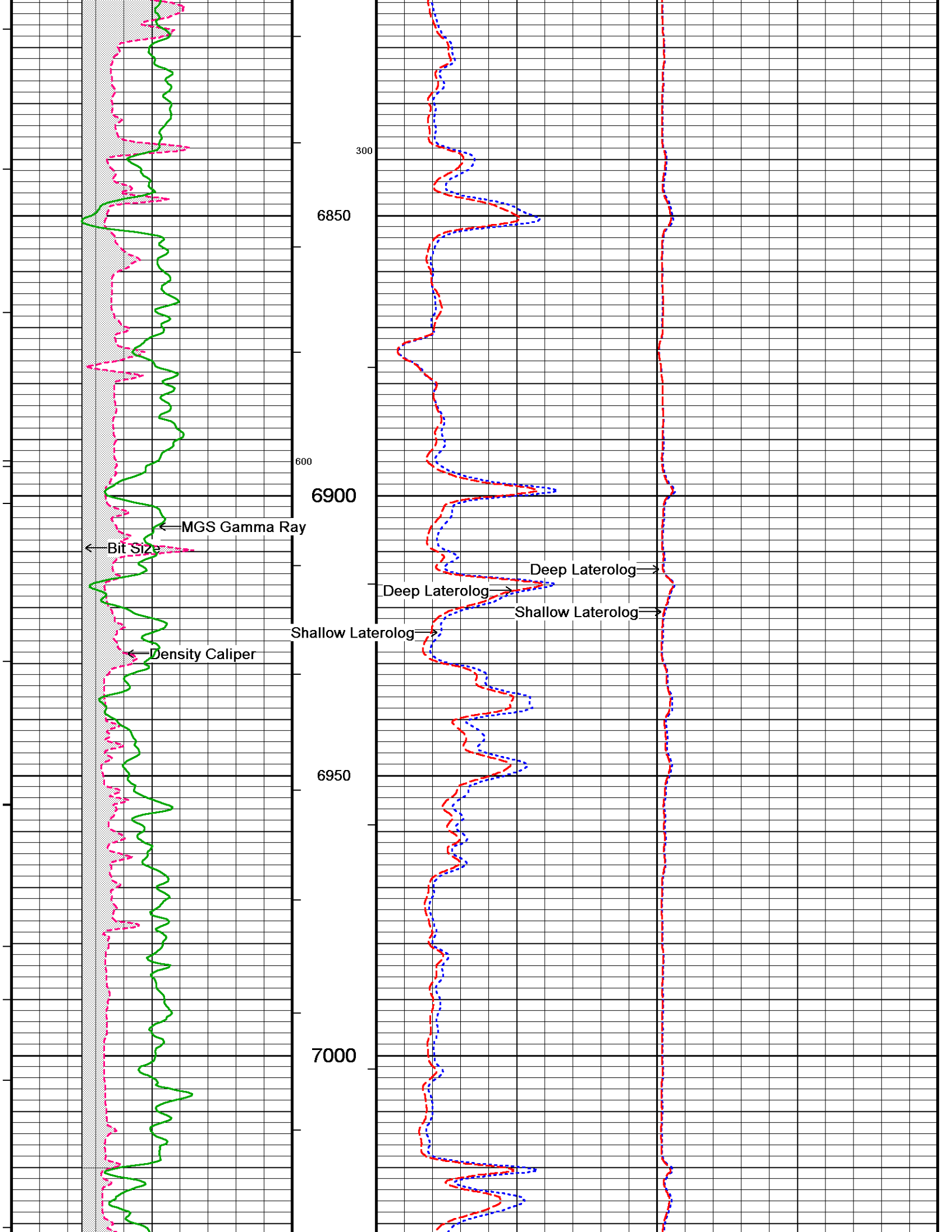


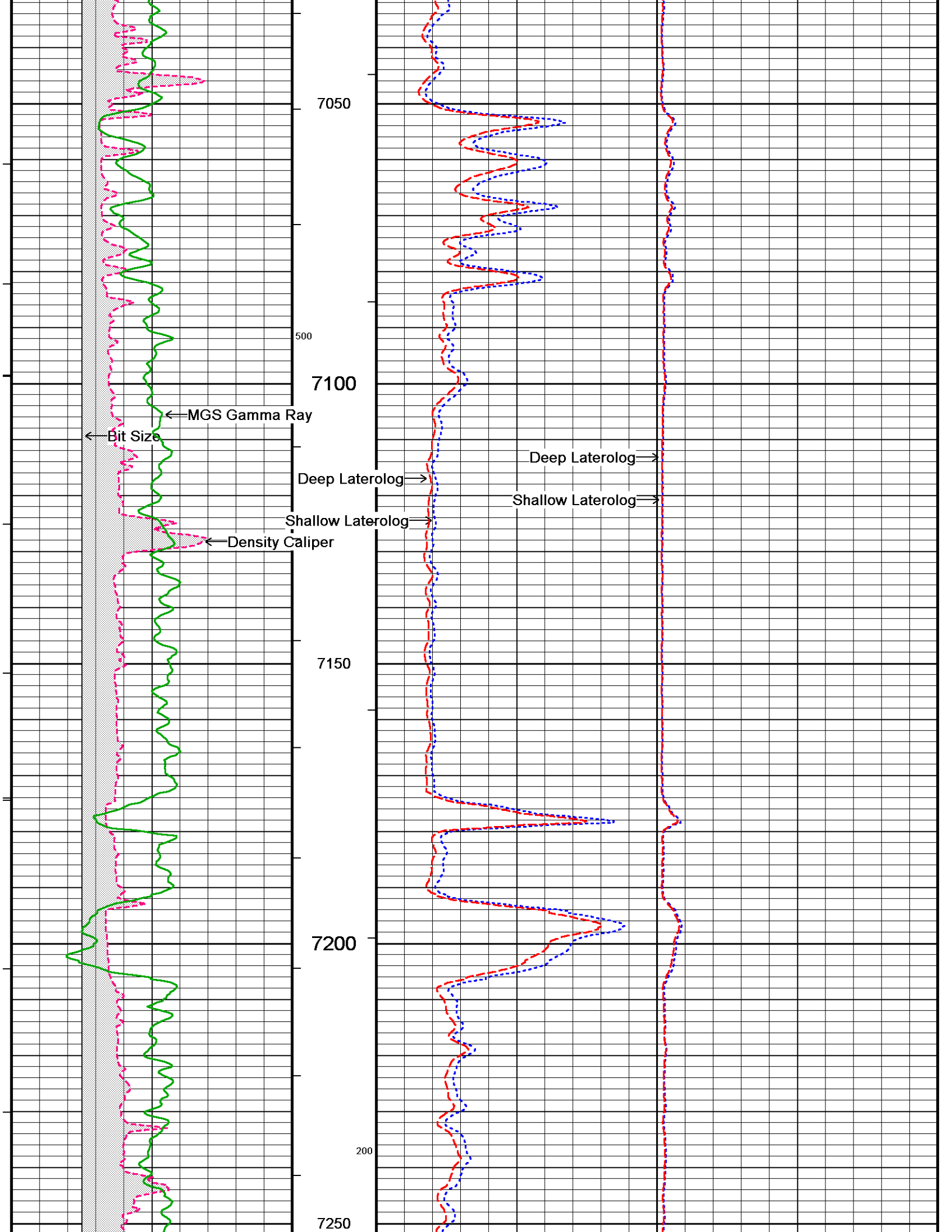


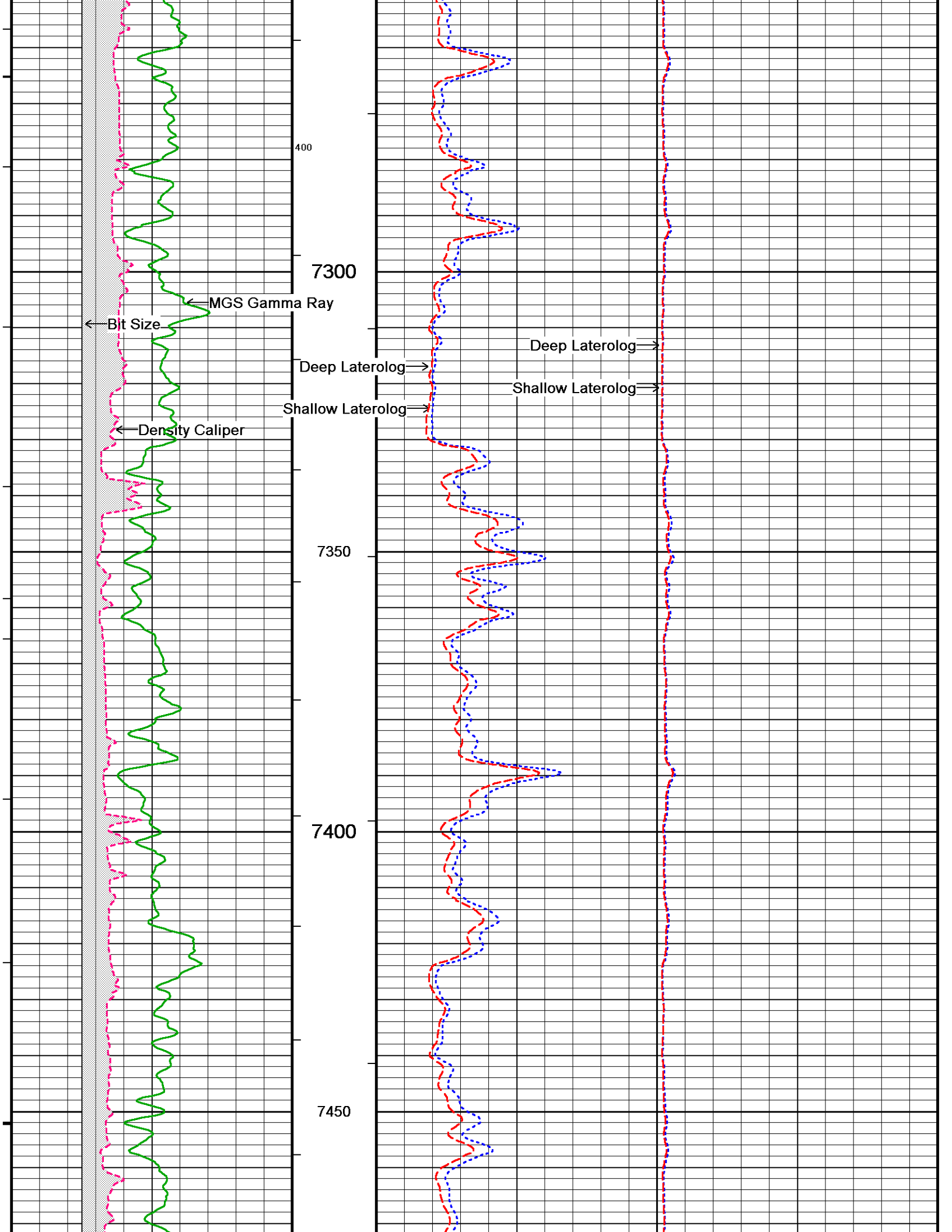


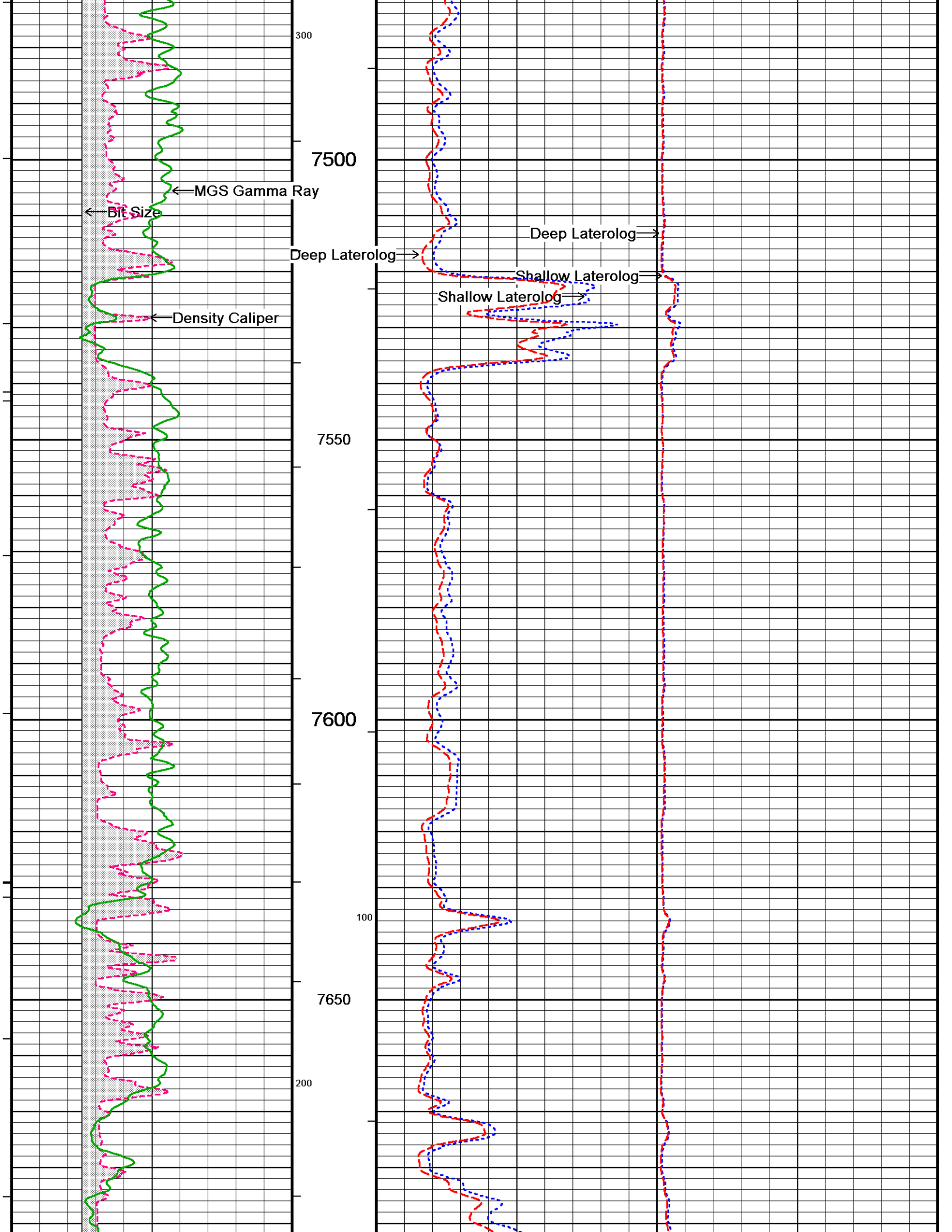


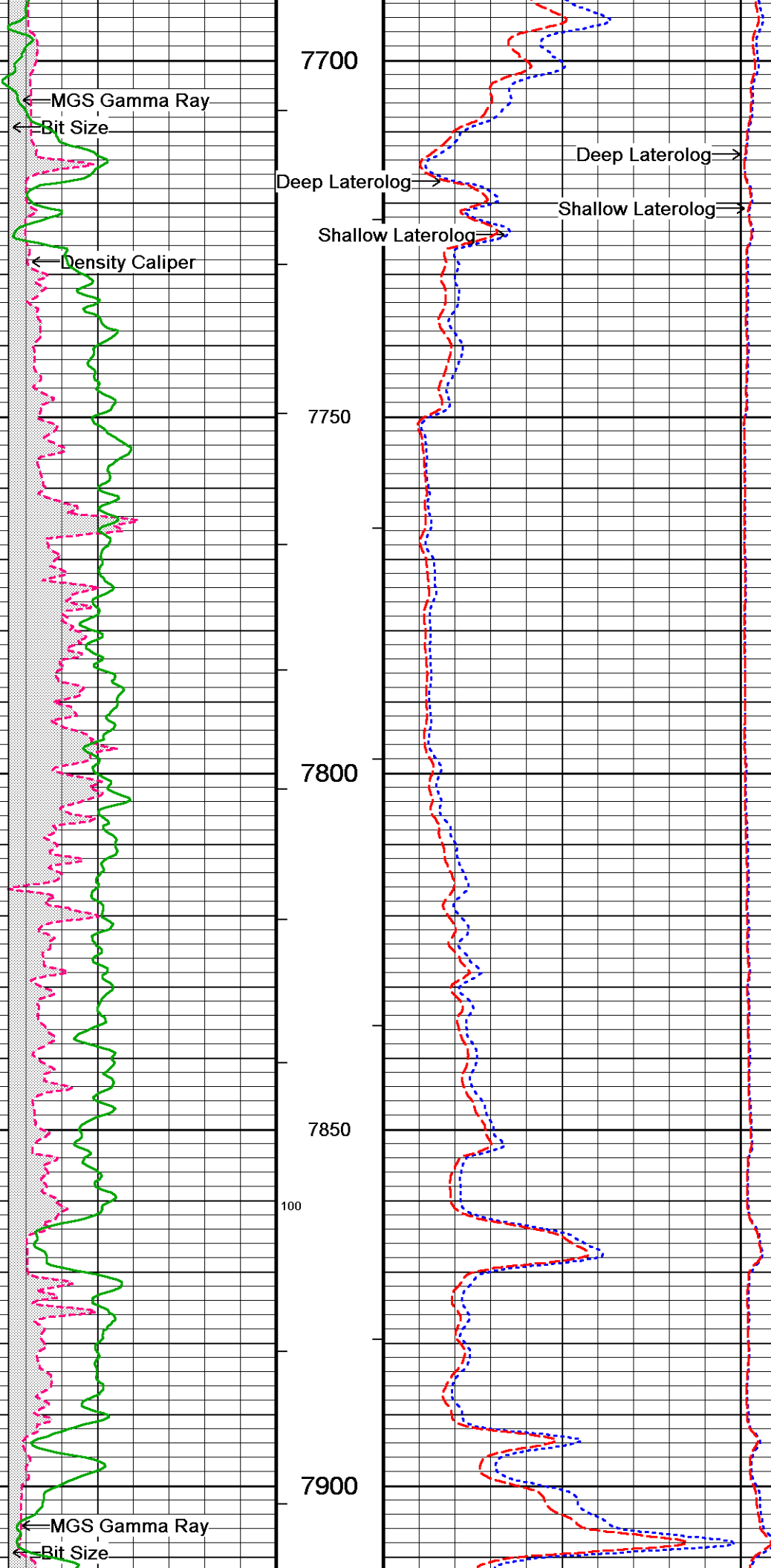


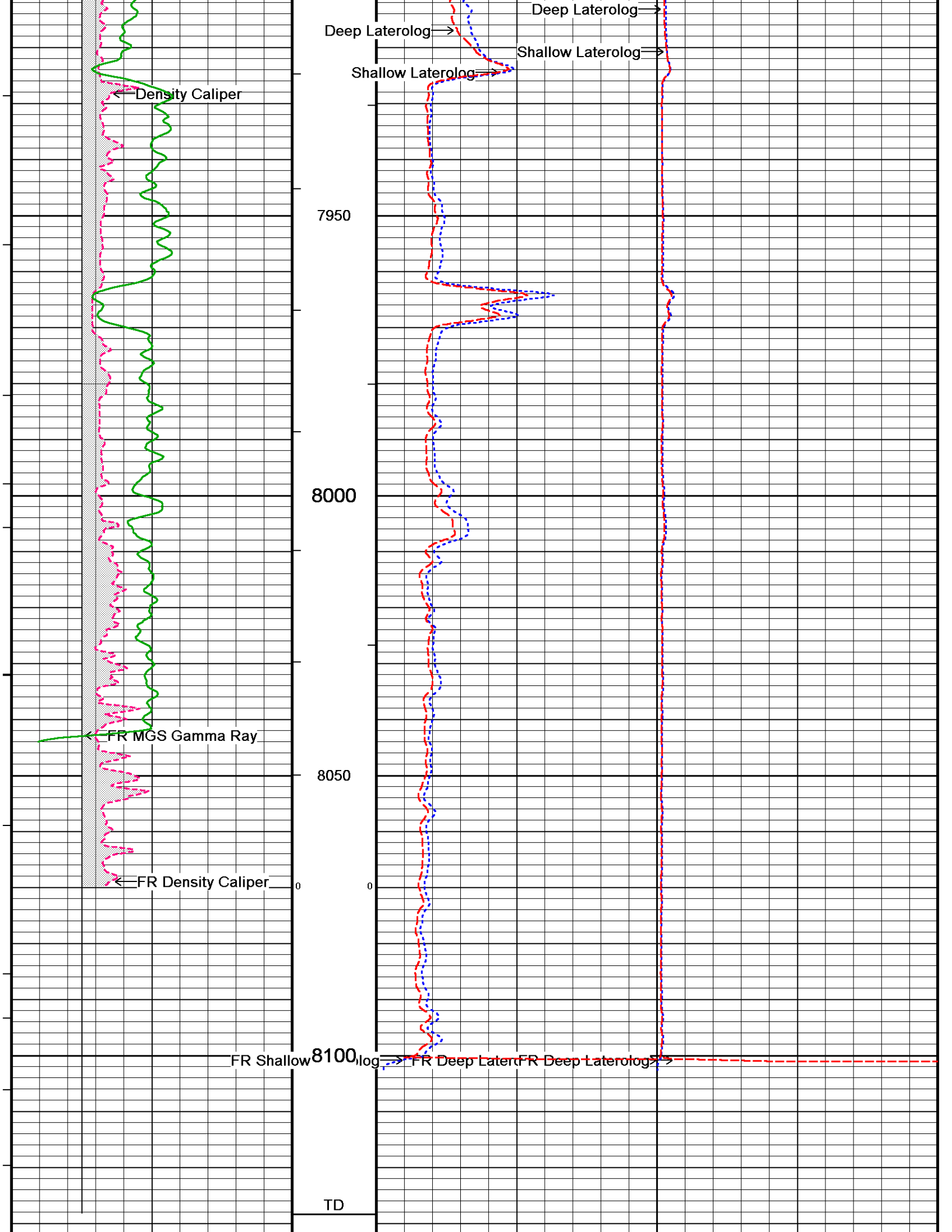


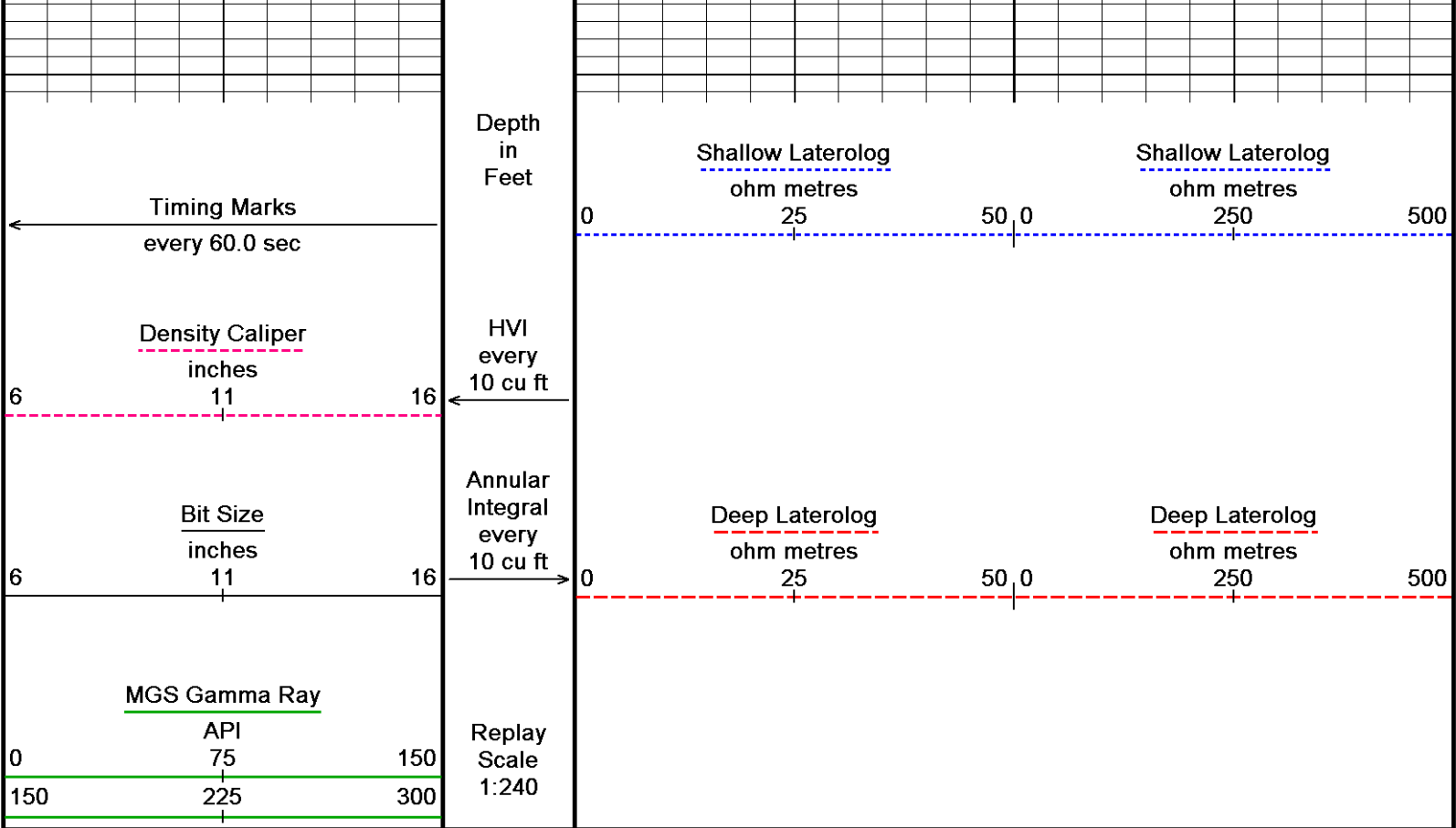












Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: D:\LOGS\PERUITALARA\LO6-33D-CWS\LO6-33D-PRINCIPAL-DSC.dta
 System Versions: Processed with 13.06.9801 Plotted with 13.06.9801

Plotted on 06-AUG-2013 09:40
 Recorded on 04-AUG-2013 20:41

MAIN PASS 1:240

BEFORE SURVEY CALIBRATION

D:\LOGS\PERUITALARA\LO6-33D-CWS\merge-PROCESS-lo6-33d2.dta

General Constants All 000 Last Edited on 04-AUG-2013,22:15

General Parameters		
Mud Resistivity	0.810	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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	7.000	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

MMS Parameters MMS-E.B 148 Last Edited on 04-AUG-2013 00:08

Logging Parameters		
Firmware Version	2v40	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes

Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	Yes	
Delay Deep Sleep	No	
Deep Sleep Wake Time	420.0	minutes
Deep Sleep Wake on Temperature	No	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	No	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	20.0	seconds
Pulse Duration Status Pulse From	10.0	seconds
Pulse Duration Caliper Close From	60.0	seconds
Pulse Duration Caliper Open From	65.0	seconds
Pulse Duration Release Pulse From	90.0	seconds
Pulse Duration Release Pulse To	120.0	seconds
Pulse Release Duration	80.0	seconds
Pulse Discriminator Pressure Band	214.0	seconds
Pulse Pressure Discriminator	436.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	40.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	30.0	seconds
Caliper Close To		seconds
Caliper Open To	85.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MLE,MAI

Gamma Calibration MGS-C.A 43

Field Calibration on 03-AUG-2013 22:11

	Measured	Calibrated (API)
Background	19	12
Calibrator (Gross)	843	543
Calibrator (Net)	824	531

Gamma Constants MGS-C.A 43

Last Edited on 04-AUG-2013,22:15

Gamma Calibrator Number	140	
Mud Density	1.37	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

Laterolog Calibration MLE-D.A 228

Base Calibration on 29-JUN-2013 11:22

Field Check on 03-AUG-2013 21:49

Base Calibration

Channel	Resistor 1	Measured		Calibrated (ohm-m)	
		Resistor 1	Resistor 2	Resistor 1	Resistor 2
Shallow	0.0		1009.8	0.0	1284.6
Deep	0.0		1008.9	0.0	747.1
Groningen	0.0		1008.4	0.0	796.8

Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Shallow		45.8		45.8
Deep		26.6		26.6
Groningen		227.3		227.3

Laterolog Constants MLE-D.A 228

Last Edited on 04-AUG-2013,22:17

Squasher Start	40000	ohm-m
Shallow Laterolog K Factor	1.2846	
Deep Laterolog K Factor	0.7471	
Groningen Laterolog K Factor	0.7968	
Interference Rejection	50 Hz	

SP Connection SP Bridge Electrode (Lower)
Groningen Connection Groningen Electrode (Upper)

Borehole Correction Constants

Bridle Type	Shuttle	
Stand-off	0.50	inches
Caliper Source	Density Caliper	
Hole Size	N/A	inches
Mud Resistivity Source	Temperature Corrected	
Temp. for Rm Corr.	MGS External Temperature	

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-C.A 238

Base Calibration on 26-JUL-2013 19:09
Field Calibration on 03-AUG-2013 22:17

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16776	3.98
2	24865	5.96
3	33504	7.99
4	41564	9.86
5	50704	11.93
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.01	7.99

COMPANY	SAVIA PERU S.A
WELL	LO6-33D
FIELD	LOBITOS OFFSHORE
PROVINCE/COUNTY	PIURA
COUNTRY/STATE	PERU

Elevation Kelly Bushing	385.00	feet	First Reading	8101.25	feet
Elevation Drill Floor	385.00	feet	Depth Driller	8150.00	feet
Elevation Ground Level	335.00	feet	Depth Logger	8128.25	feet



RESISTIVITY LOG

MGS-MDL

SCALE 5":100 LINEAL

Weatherford®