



Weatherford

**RESISTIVITY LOG
MGS-MDL**

SCALE 2":100 LINEAL

COMPANY

SAVIA PERU S.A

WELL

LO06-29D

FIELD

LOBITOS

PROVINCE/COUNTY

PIURA

COUNTRY/STATE

Peru

LOCATION

N: 9 508 656.13 m
E: 459 052.36 m

Other Services

MPD
MDN

Permanent Datum SEA LEVEL, Elevation 50.000 feet

Log Measured From KB

Drilling Measured From KB

Elevations:

KB 50.00
DF 50.00
GL -335.00

Date 17-SEPT-2013

Run Number 1

Service Order 846

Depth Driller 8691.00 feet

Depth Logger 8676.00 feet

First Reading 8649.00 feet

Last Reading 4982.00 feet

Casing Driller 4982.00 feet

Casing Logger 4982.00 feet

Bit Size 8.500 inches

Hole Fluid Type WATER BASED

Density / Viscosity 11.50 lb/USg 17.00 CP

PH / Fluid Loss 9.00 5.00 ML/30MIN

Sample Source MUD PIT

Rm @ Measured Temp 0.27 @ 75.0 ohm-m

Rmf @ Measured Temp 0.16 @ 75.0 ohm-m

Rmc @ Measured Temp 0.50 @ 75.0 ohm-m

Source Rmf / Rmc PRESS FILTER

Rm @ BHT 0.18 @ 117.0 ohm-m

Time Since Circulation 08:00 16SEPT

Max Recorded Temp 117.00 deg F

Equipment / Base TAL

Recorded By YANINA MENDEZ

Witnessed By AUGUSTO ORTEGA

REMARKS

1. Objective: to obtain accurate open hole Gamma Ray, 1 arm Caliper , Nuclear and Resistivity (Dual Laterolog) log in 8.5" section.
2. This is the first run on the hole and on Compact Well Shuttle - Messenger Conveyance.
3. Maximum recorded temperature measured by Gamma Ray External Temperature sensor: 137 °F.
4. Mud resistivity measurements: Rm= 0.27@ 75 °F, Rmf= 0.16 @ 75 °F, Rmc= 0.50 @ 75 °F.
5. Mud resistivity measurements at BHT: Rm= 0.18 @ 117 °F, Rmf = 0.10 @ 117 °F, Rmc= 0.33 @ 117 °F.
6. Deviated well with a maximum deviation of 62.70° @ 4031 ft MD and a maximum dogleg of 5.53 @ 1306 ft MD.
7. Well sketch as per driller's depth.
8. Bottom not tagged due to nature of the conveyance. Maximun depth recorded in Log header (8676ft) is the maximun depth reached by the induction tool in the run.
9. Logging speed below 30ft/min (following operational procedures)
10. Main section from 8676ft to 4982ft, as requested.
11. No repeat section performed due to the method used for this job.
12. Resistivities curves (Dual Laterolog) presented in this log are not corrected for borehole conditions.
13. Neutron log is corrected by temperature and borehole size by the density caliper.
14. Density log is corrected for mud density and borehole size by the density caliper.
15. Density matrix = 2.72g/cc. from TD to 7200ft (Mogollon) and 2.68g/cc from 7200ft to Casing Shoe (Rio Bravo) as per client request.
16. Hole volume= 1918 ft^3
17. Annular volume= 945 ft^3 for a casing of 7"
18. Caliper Average 9.85 in
19. Flow test were done at the following depths: 300ft, 1000ft, 2000ft, 3000ft, 4000ft, 5000ft, 6000ft, 7000ft, 8000ft, 8620ft

Crew at your service:

Y. Mendez, J. Guerrero, G. Robladillo, J. Jimenez, C. Viera.

BOREHOLE RECORD

Last Edited: 17-SEP-2013 11:40

Bit Size
inches

17.000

Depth From
feet

0.00

Depth To
feet

1994.00

17.000	0.00	1994.00
12.250	1994.00	4982.00
8.500	4982.00	8691.00

CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
k55	13.380	0.00	1994.00	54.50
N80	9.625	0.00	4982.00	43.50

WELL DIAGRAM

13.38 in Casing: 0.00 ft

9.63 in Casing: 0.00 ft

17.00 in Bit size: 0.00 - 1994.00 ft

13.38 in Casing shoe: 1994.00 ft

12.25 in Bit size: 1994.00 - 4982.00 ft

9.63 in Casing shoe: 4982.00 ft

8.50 in Bit size: 4982.00 - 8691.00 ft

Total bit depth: 8691.00 ft

Temperature: 117.00 Degrees F

DOWNHOLE EQUIPMENT

C:\YANINA'S INFORMATION\playing_well mgr\Savia\LO6-29D\New Folder2\Final_Data.dta

Shuttle Running Tool 3.5" (SRT A)
SRT-A 10 LG: 6.47 ft WT: 37.5 lb OD: 2.52 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 168 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MBS-F.A 200v Compact Battery Sub
MBS-F.A 71 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-B Compact Inline Standoff sub
MIS-B 99 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Stiff Bridle Electrode Sub.
MBE-C.B 259 LG: 12.33 ft WT: 77.2 lb OD: 2.28 in

Compact Stiff Bridle Electrode Sub.

Compact Stiff Bridge Electrode Sub.
MBE-D.A 136 LG: 12.33 ft WT: 77.2 lb OD: 2.24 in

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

MIS-B Compact Inline Standoff sub
MIS-B 98 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-E.A Compact Knuckle Joint
SKJ-E.A 171 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-A.A Compact Inline Bowspring sub
MIS-A.A 236 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-C.A 441 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 197 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

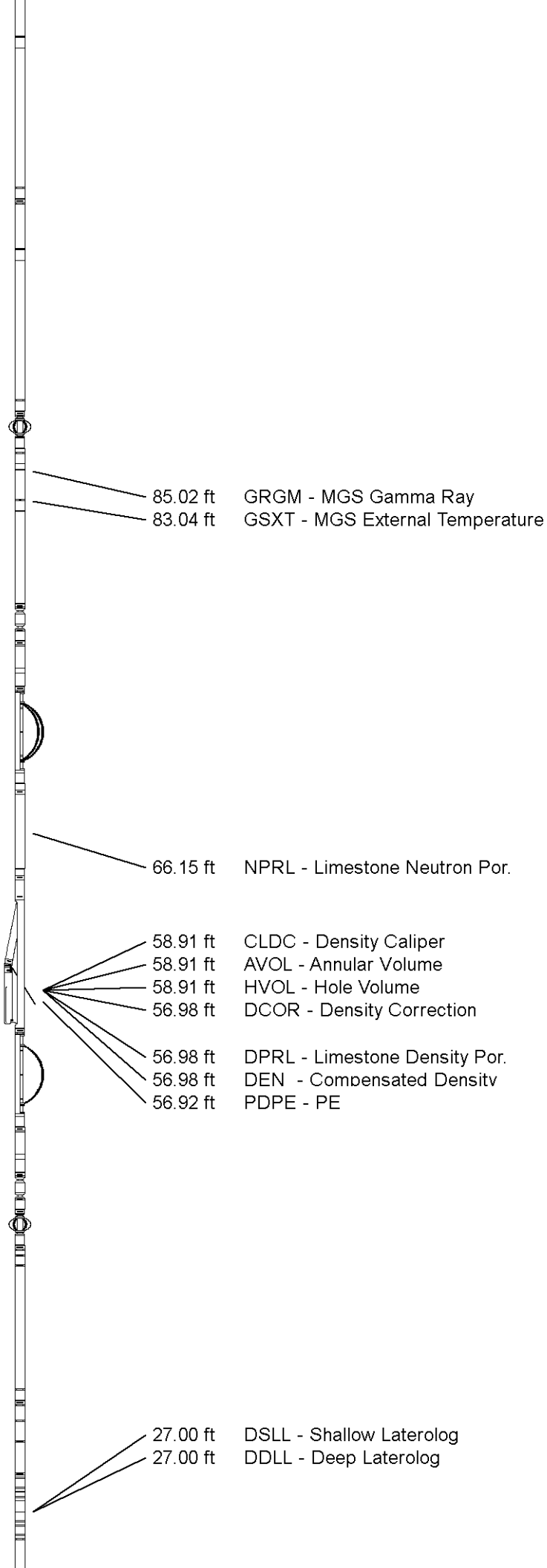
SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 479 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 180 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-B Compact Inline Standoff sub
MIS-B 307 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

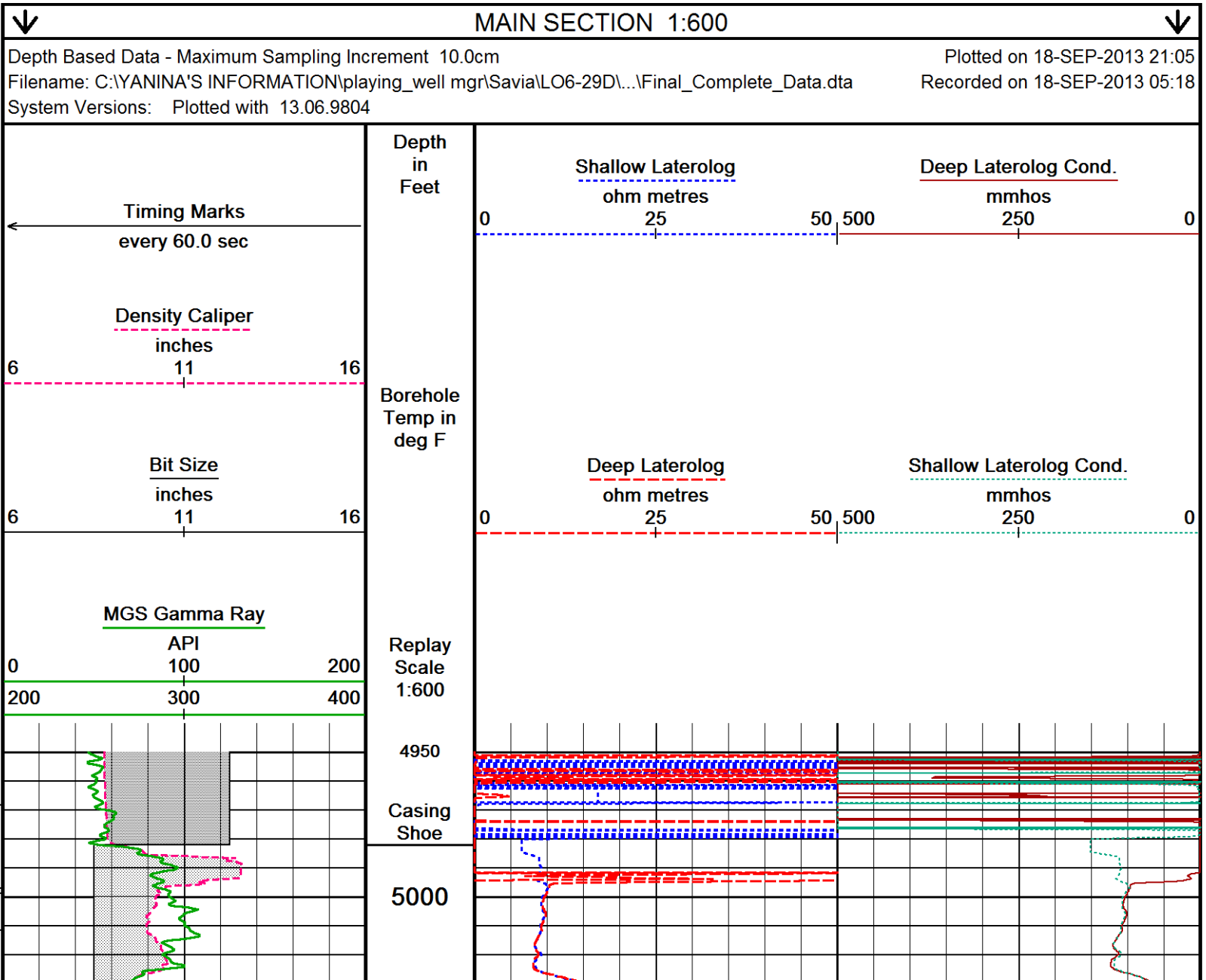
Compact Induction
MAI-B.J 367 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

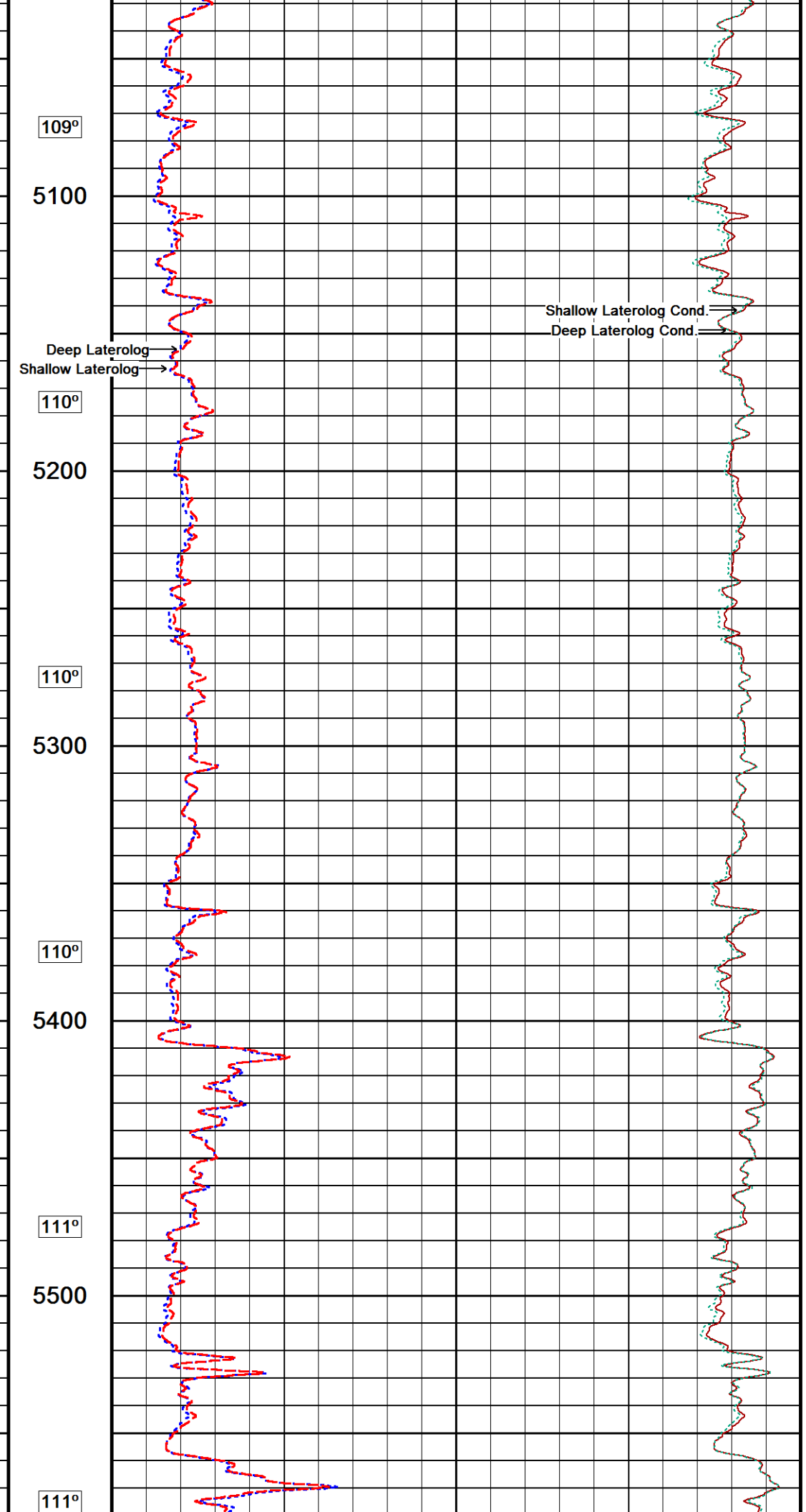
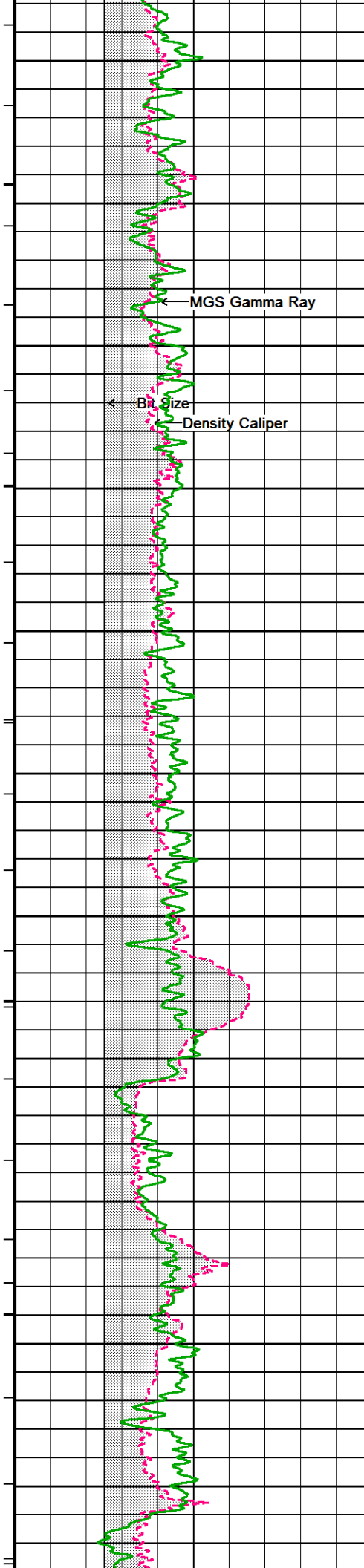
Total Length: 158.10 ft Weight: 1131.0 lb

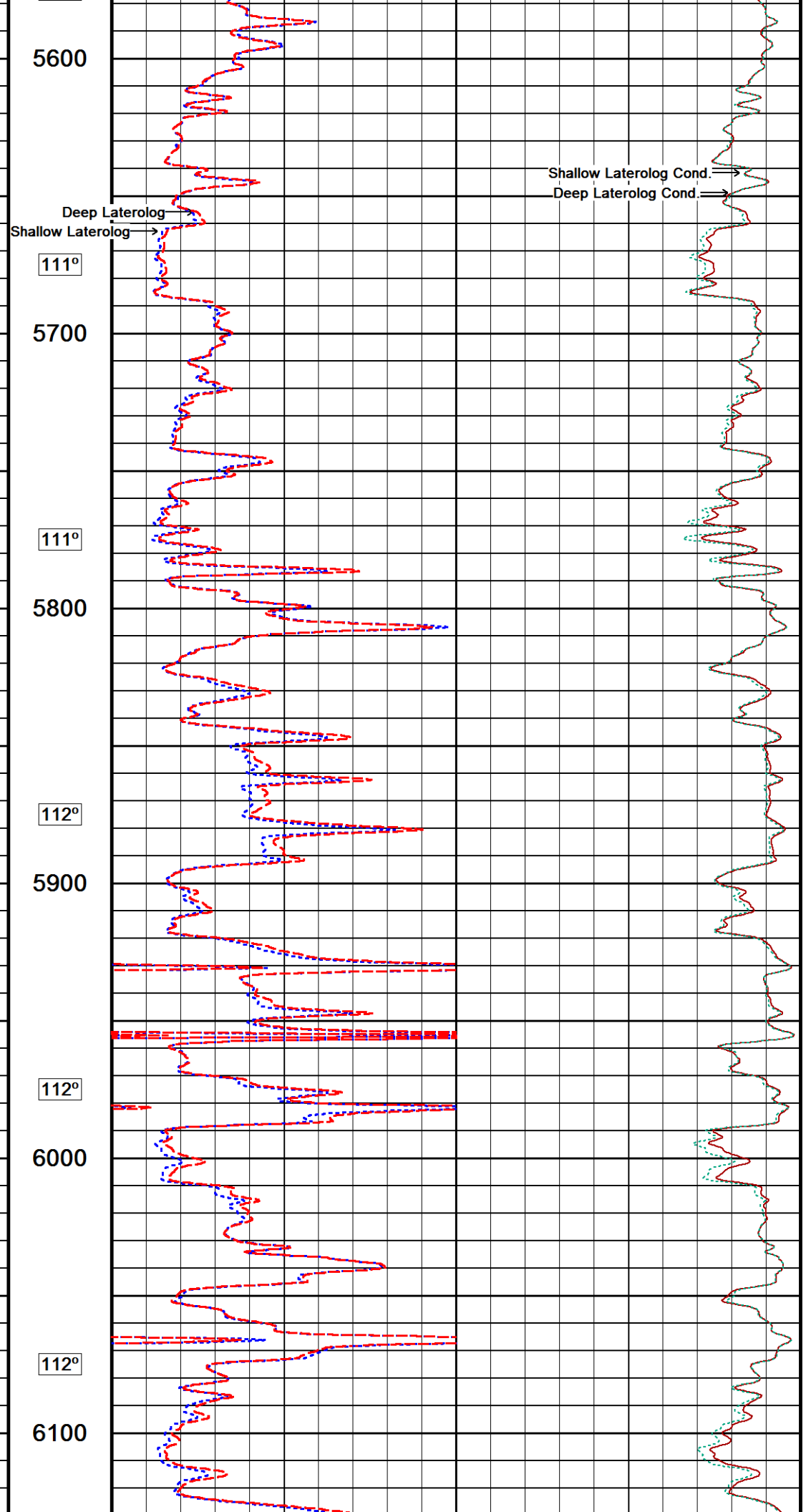
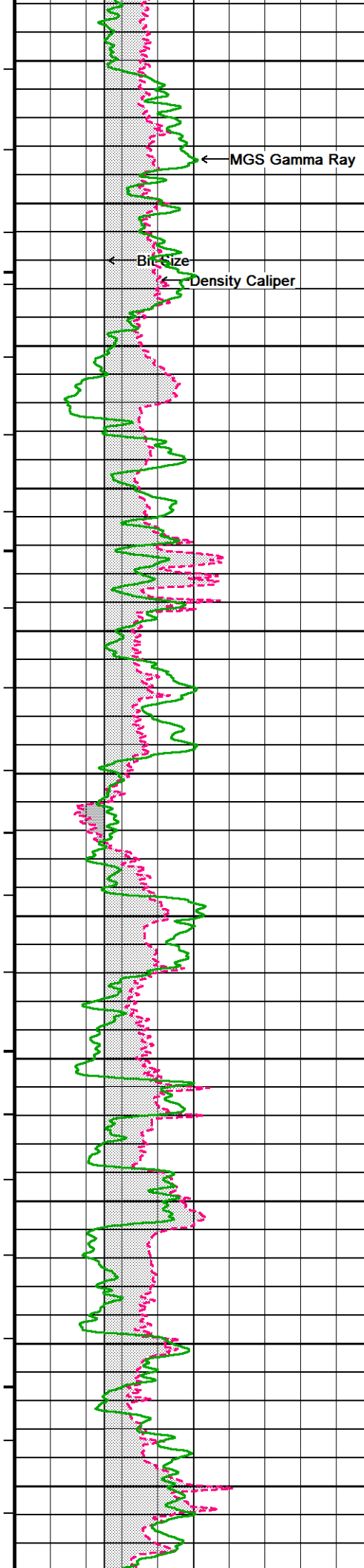


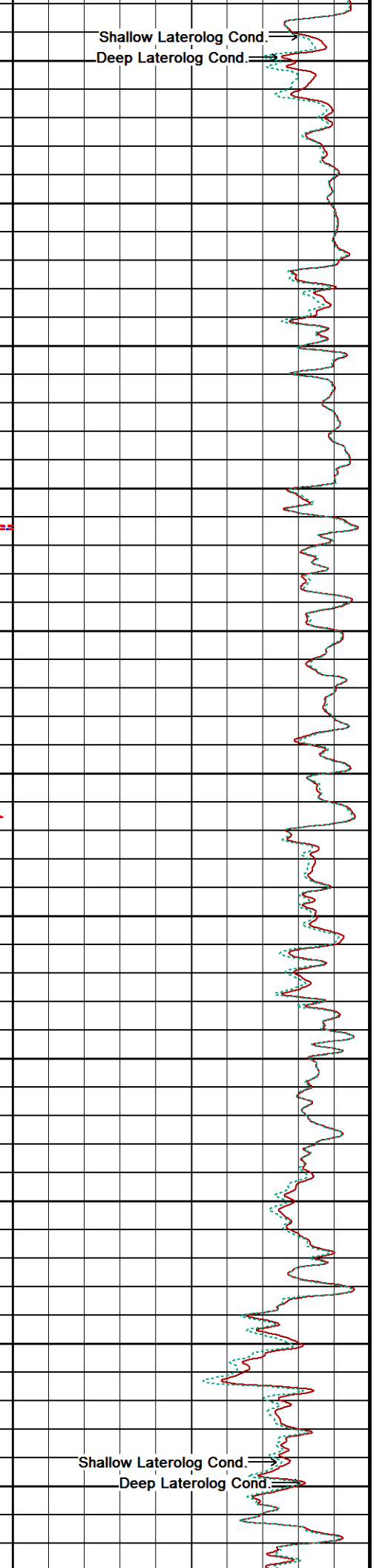
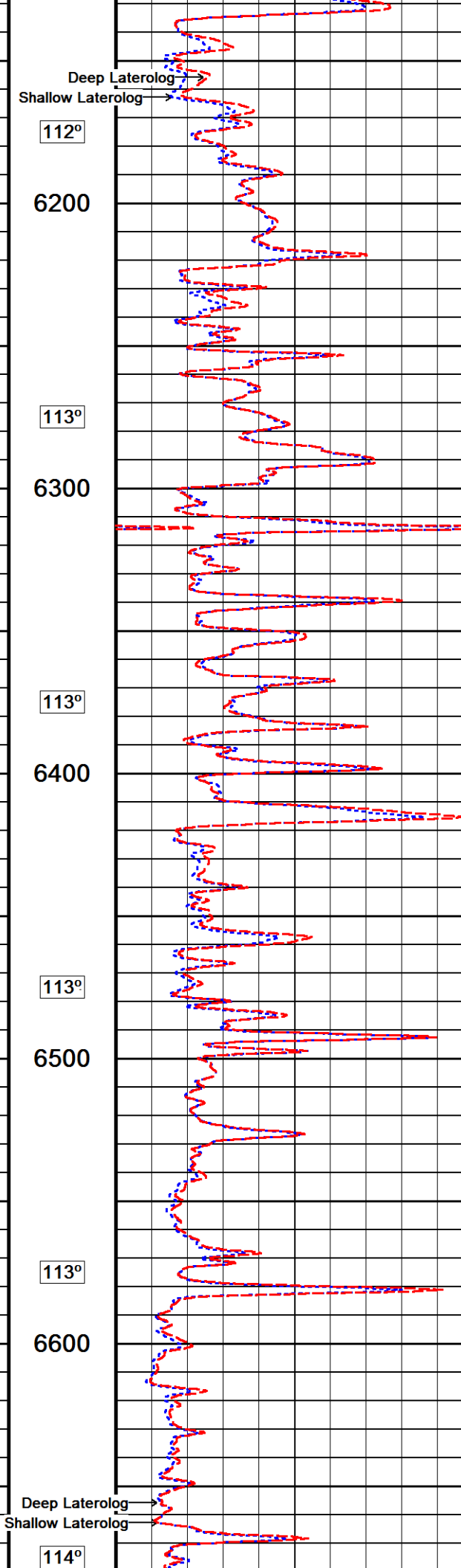
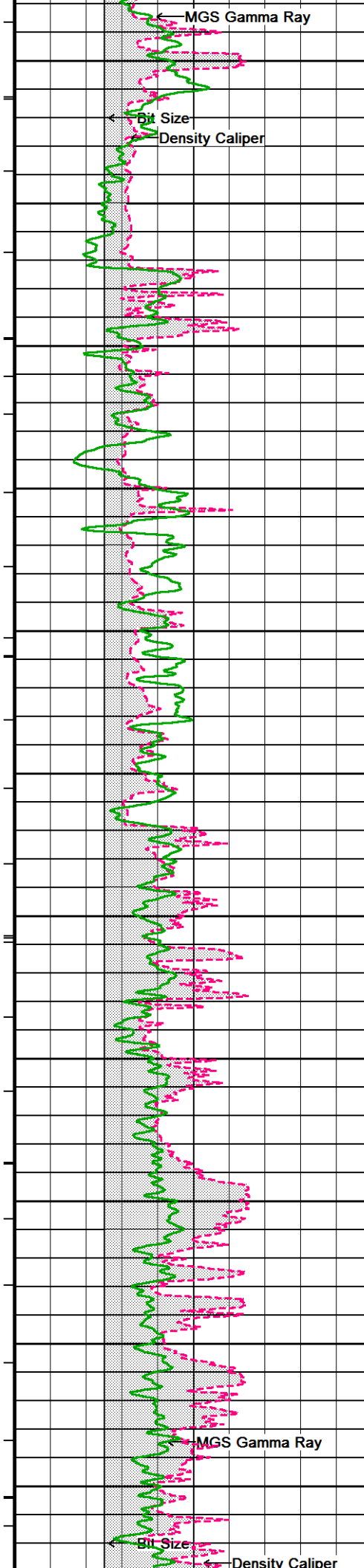
Tool Zero (0.13ft from bottom)
All measurements relative to tool zero.

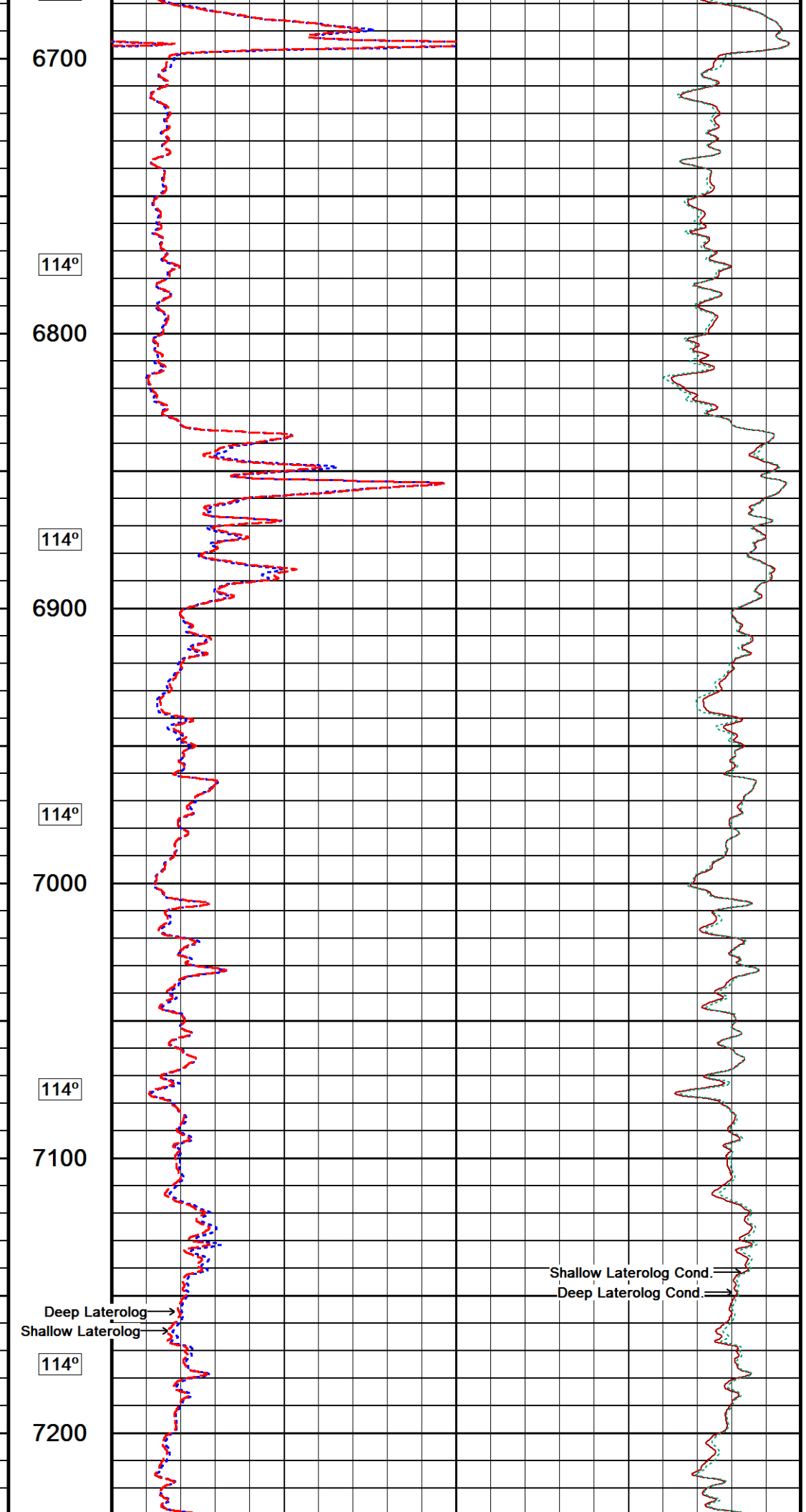
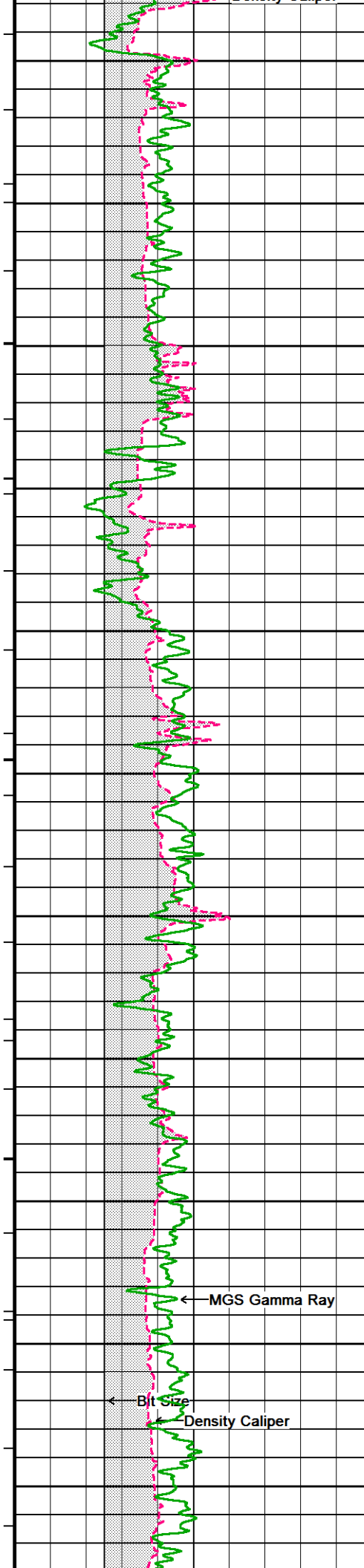
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

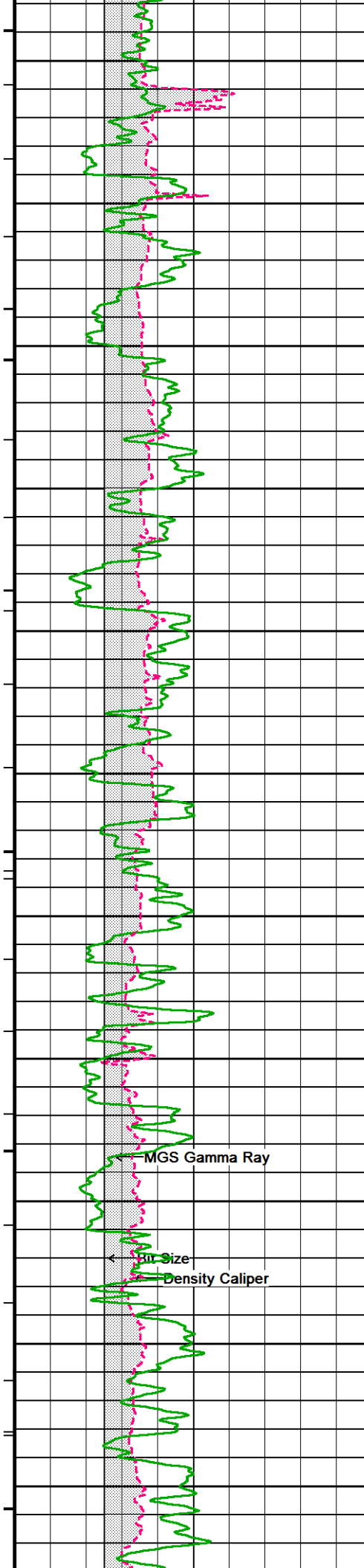












114°

7300

114°

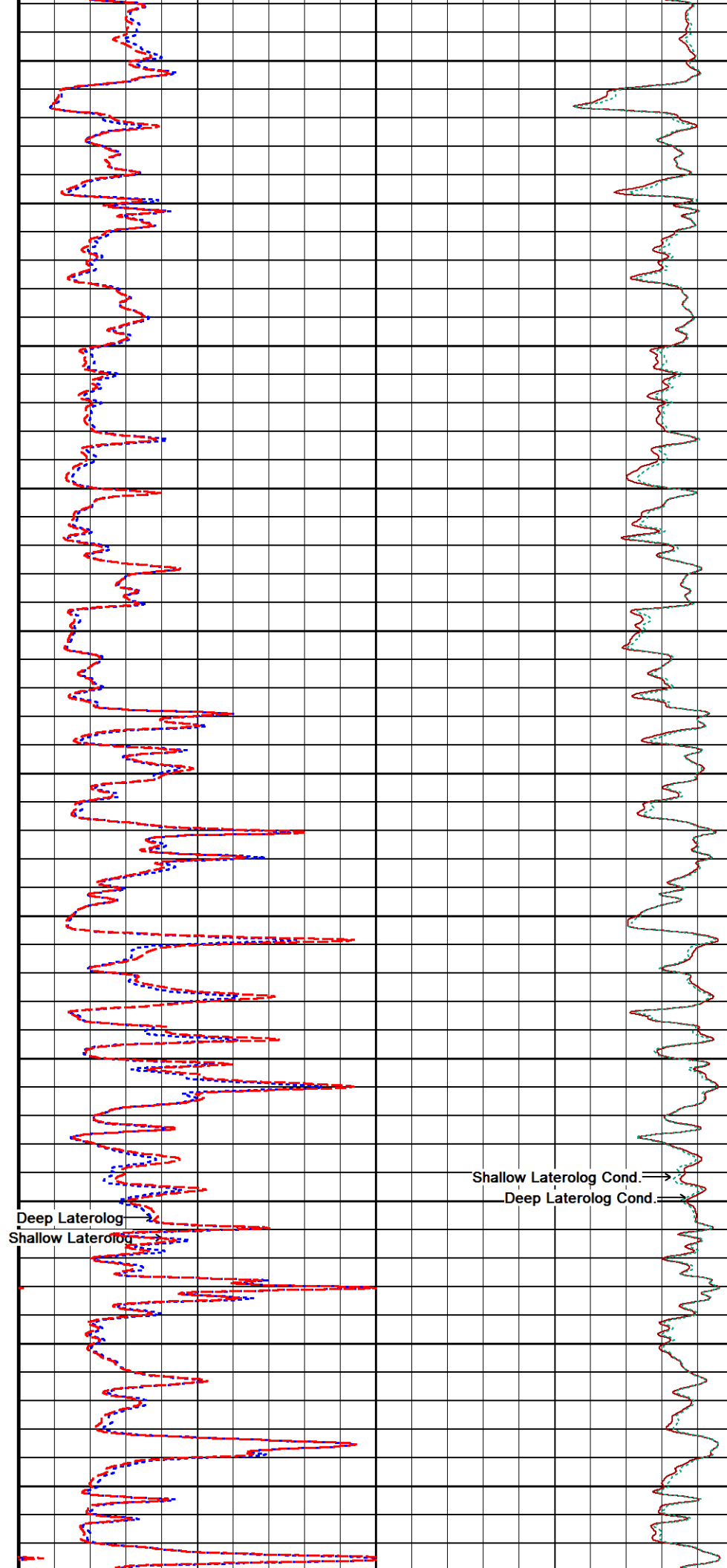
7400

114°

7500

115°

7600



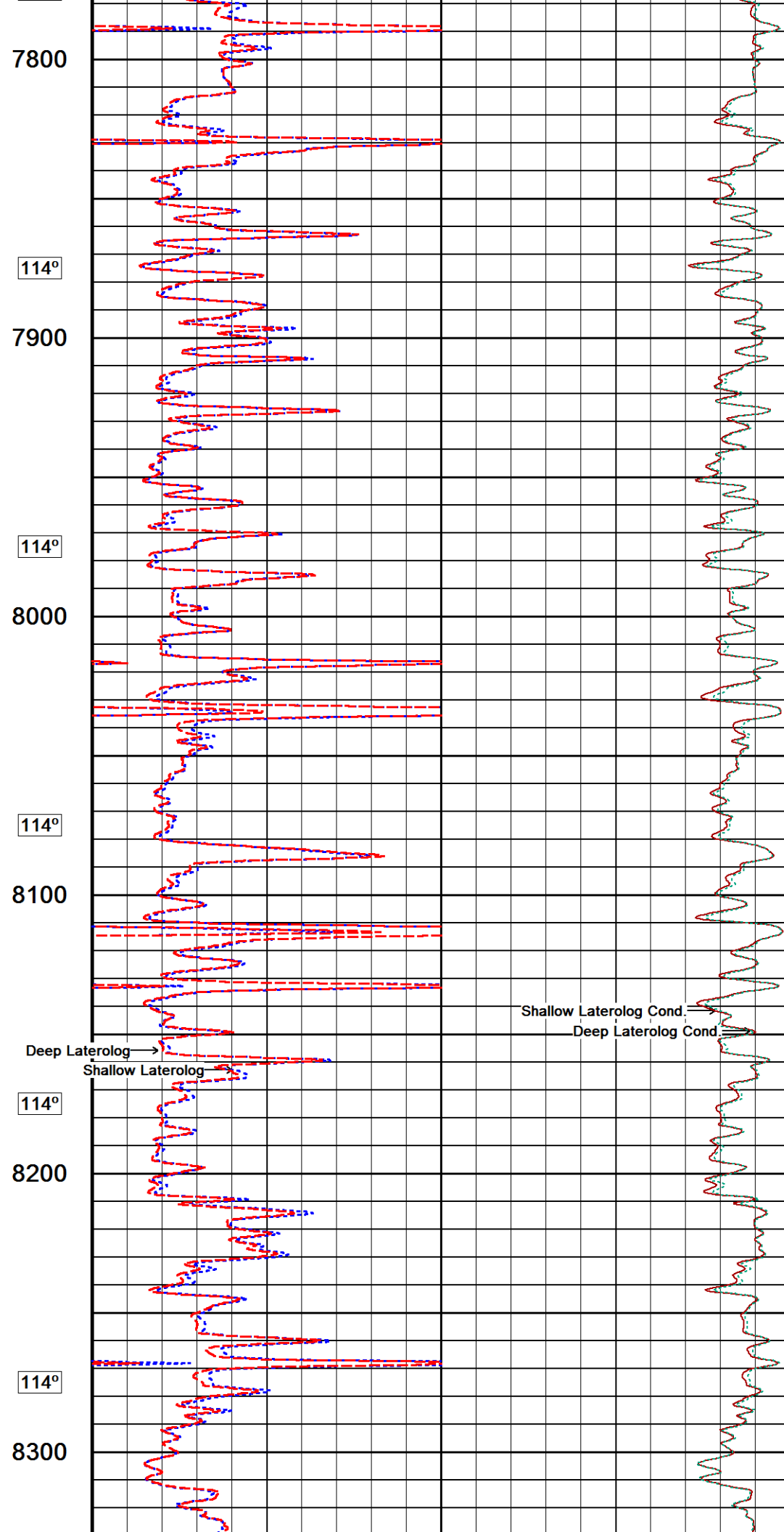
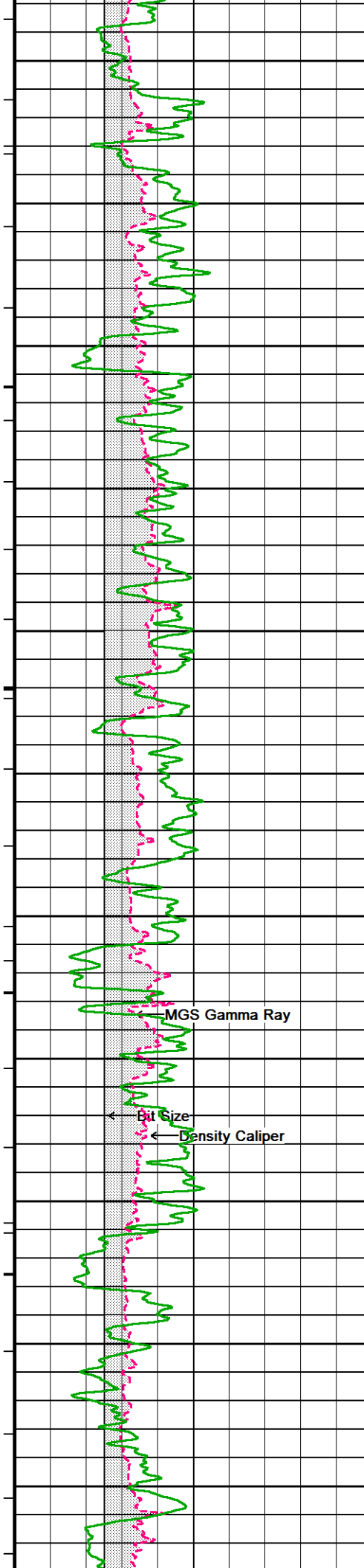
Deep Laterolog

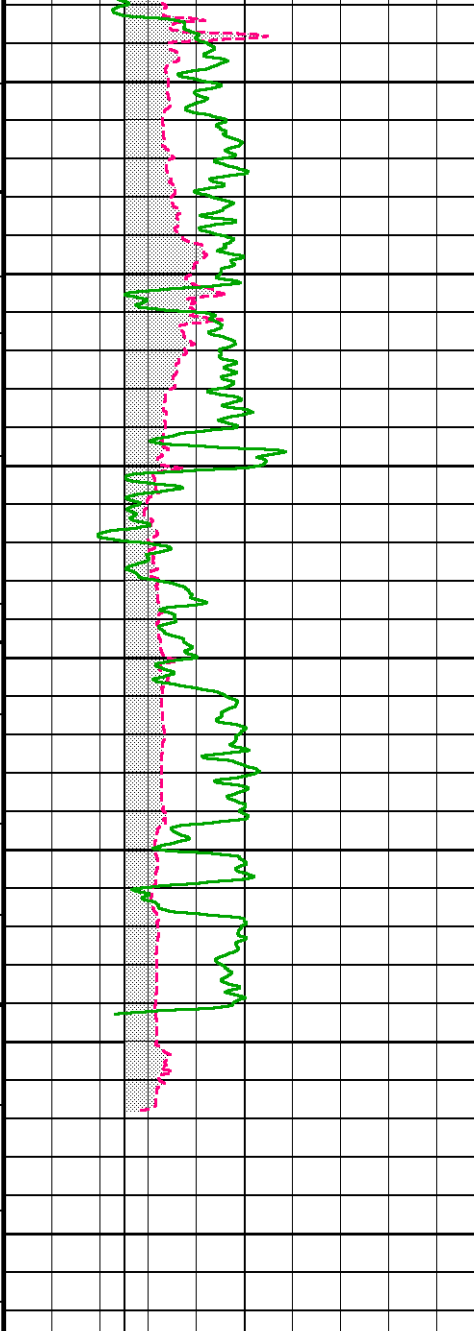
Shallow Laterolog

114°

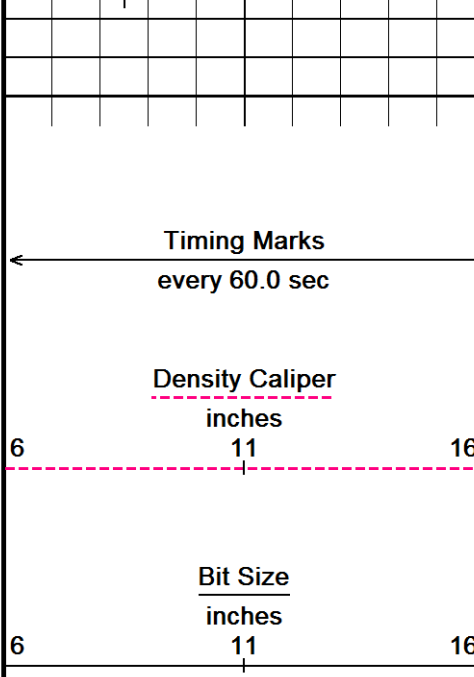
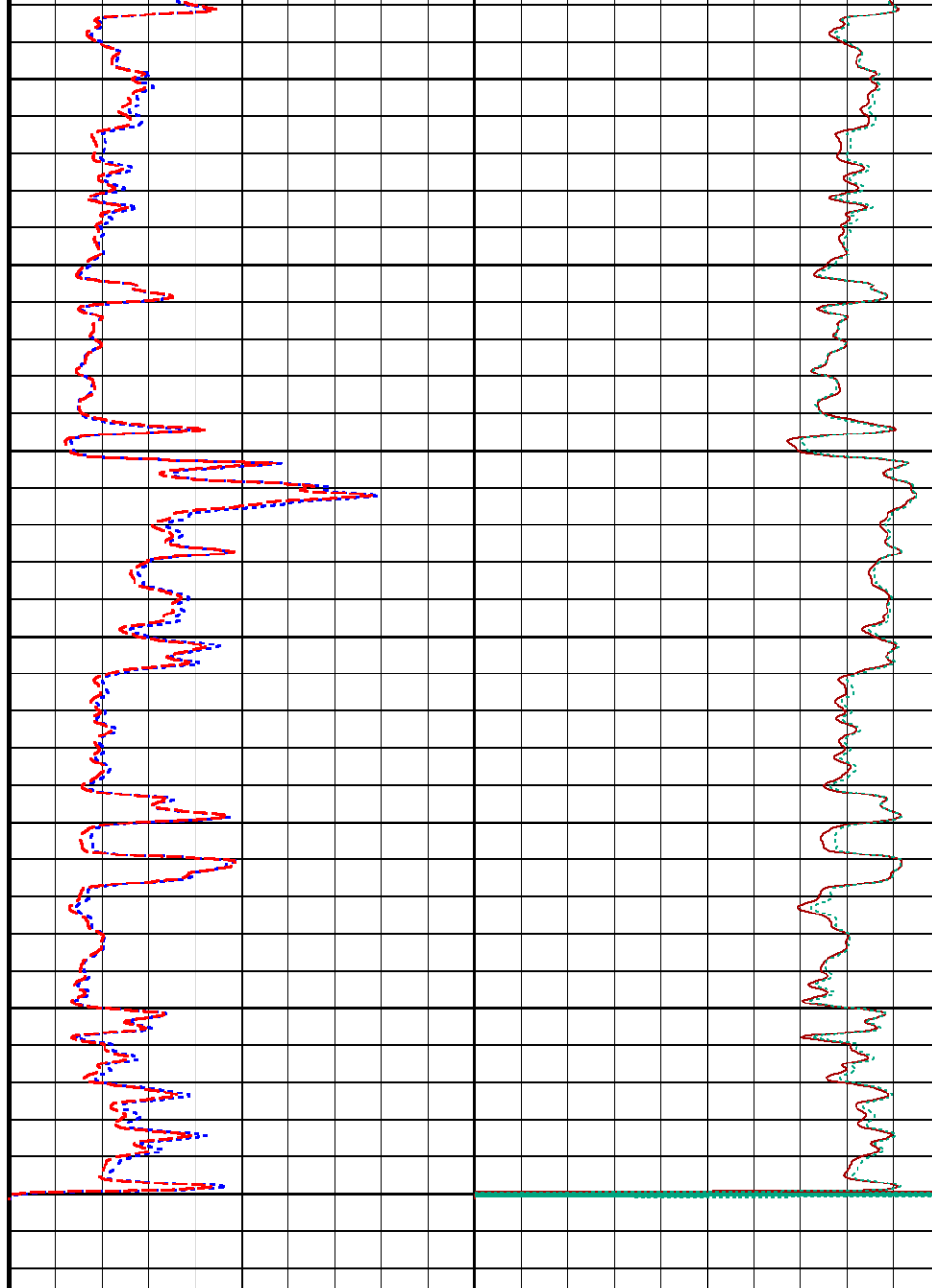
7700

114°

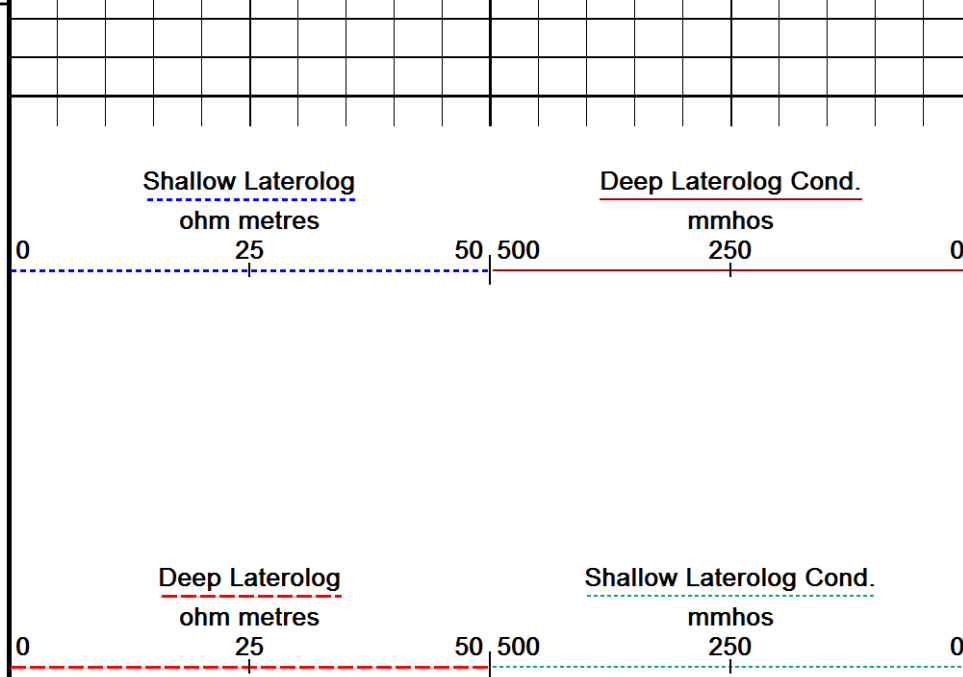




114°
8400
116°
8500
117°
8600
TD
8700
Depth
in
Feet



Timing Marks
every 60.0 sec
Density Caliper
inches
6 11 16
Bit Size
inches
6 11 16
Borehole
Temp in
deg F



MGs Gamma Ray

Shallow Laterolog
ohm metres
0 25 50 500
Deep Laterolog Cond.
mmhos
0 250 0
Deep Laterolog
ohm metres
0 25 50 500
Shallow Laterolog Cond.
mmhos
0 250 0

0	API 100	200	Replay Scale 1:600	
200	300	400		
Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\YANINA'S INFORMATION\playing_well mgr\Savia\LO6-29D\...\Final_Complete_Data.dta System Versions: Plotted with 13.06.9804				
Plotted on 18-SEP-2013 21:05 Recorded on 18-SEP-2013 05:18				
↑	MAIN SECTION 1:600			↑

BEFORE SURVEY CALIBRATION			
C:\YANINA'S INFORMATION\playing_well mgr\Savia\LO6-29D\New Folder2\Final_Data.dta			
General Constants All 000			Last Edited on 17-SEP-2013,05:31
General Parameters			
Mud Resistivity	0.270	ohm-metres	
Mud Resistivity Temperature	75.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid Processing	N/A		
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 17-SEP-2013 05:33
Logging Parameters			
Firmware Version	2v40		
Caliper Open On	MAI		
Caliper Open Delay		minutes	
Caliper Closed On	Unknown		
Caliper Closed Delay	N/A	minutes	
Sample Rate	1.00	seconds	
Use Deep Sleep	Yes		
Delay Deep Sleep	No		
Deep Sleep Wake Time	360.0	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	852.0	seconds	
Pulse Pressure Discriminator	1765.0	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	

Bad Status Reply	00.0	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		
	Measured	Calibrated (API)
Background	93	62
Calibrator (Gross)	945	630
Calibrator (Net)	851	568
Field Calibration on 16-SEP-2013 09:35		
Gamma Constants MGS-C.A 43		
Last Edited on 17-SEP-2013,02:44		
Gamma Calibrator Number	145	
Mud Density	1.38	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%
High Resolution Temperature Calibration MGS-C.A 43		
	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	200.00	200.00
Field Calibration on 16-SEP-2013,09:36		
High Resolution Temperature Constants MGS-C.A 43		
Last Edited on 16-SEP-2013,09:35		
Pre-filter Length	11	
Laterolog Calibration MLE-D.A 228		
Base Calibration		
	Measured	Calibrated (ohm-m)
Channel	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	227.4
Base Calibration on 29-JUN-2013 11:22		
Field Check on 16-SEP-2013,21:28		
Laterolog Constants MLE-D.A 228		
Last Edited on 17-SEP-2013,02:31		
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 Bridle 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	1.00	v/v
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 197

Base Calibration on 17-SEP-2013 02:30
Field Calibration on 17-SEP-2013 02:31

Base Calibration

Reading No

Measured

Calibrator Size (in)

1	16753	3.98
2	26256	5.96
3	45952	9.86
4	57280	11.93
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)

Actual Caliper (in)

11.93	11.93
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COMPANY SAVIA PERU S.A

WELL LO06-29D

FIELD LOBITOS

PROVINCE/COUNTY PIURA

COUNTRY/STATE Peru

Elevation Kelly Bushing	50.00	feet	First Reading	8649.00	feet
Elevation Drill Floor	50.00	feet	Depth Driller	8691.00	feet
Elevation Ground Level	-335.00	feet	Depth Logger	8676.00	feet



RESISTIVITY LOG

MGS-MDL

SCALE 2":100 LINEAL

Weatherford[®]