

Tucker
ENERGY SERVICES

COMPENSATED NEUTRON

PEL DENSITY LOG

Company LEON C. SMITHERMAN JR.
Well MBF #5-1
Field COMBS
County COWLEY
State KANSAS
Country USA
API No. 15-035-24623-0000

File No : TUL-60086
Company : LEON C. SMITHERMAN JR.
Well : MBF #5-1
Field : COMBS
County : COWLEY
State : KANSAS
Country : USA
API No : 15-035-24623-0000

Location :
 330' FSL & 330' FEL
 SE SE SE

LSD : **Sect** : 5 **Twp** : 30S **Rge** : 5E

Permanent Datum: GL **Elevations:** **Services:**
Drilling Measured From: KB KB 1313.00 CNT
Log Measured From: KB DF 1312.00 LDT
Above Permanent Datum: 8.00 Ft GL 1305.00 PIT

Date	11-20-2014		
Run Number	1		
Depth--Driller	3100.0	Ft	
Depth--Logger	3102.0	Ft	
First Reading	3079.0	Ft	
Last Reading	210.0	Ft	
Casing--Driller	210.0	Ft	
Casing--Logger	210.0	Ft	
Bit Size	7.875	In	
Casing Size	8.625	In	
Hole Fluid Type	CHEM-GEL		
Density	9.3		
Fluid Loss	8.0		
PH/Viscosity	9.0	51.0	
Sample Source	MEASURED		
RM@Measured Temp.	2.000	@ 60 F	
RMF@Measured Temp	1.600	@ 60 F	
RMC@Measured Temp.	2.400	@ 60 F	
Source RMF/RMC	CALCULATED	CALCULATED	
RM@BHT	0.000	@ 106 F	
Time Circulation Stopped	11-20-2014 8:30 am		
Max Recorded Temp.	106	F	
Equipment/Base	127	TULSA	
Recorded By	SHELDON TYLER		
Witnessed By	LEON SMITHERMAN / TOM BLAIR		

The customer is hereby warned that by providing the log data herein, T. E. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. E. S. does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by T. E. S. personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by T. E. S. for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

Bitsize Intervals		Casing Strings			
Size (In)	Bottom (Ft)	Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
7.875	3100.00	8.625	32.00	210.00	0.00

Run Number	1	
Date	11-20-2014	
Date/Time On Bottom	11-20-2014 10:30 am	
Depth to Fluid	0.0 Ft	
Salinity	1000.000	
RMF@BHT	0.000 @ 106 F	
RMC@BHT	0.000 @ 106 F	

Run Number 1

Comments

ALL PRESENTATIONS AS PER CUSTOMER REQUEST
 GRT, CNT, LDT, AND PIT RUN IN COMBINATION
 CALIPERS ORIENTED ON X-Y AXIS
 2.71 G/CC USED TO CALCULATE POROSITY
 ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING
 PHIN IS CALIPER CORRECTED

CUSTOMER REQUESTED DETAIL PULLED TO 1800'

GRT: GRP, GRX
 CNT: PHIN, CLCNIN, PHXN
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN, PRXL, PECLX, LDENNX, LCORX

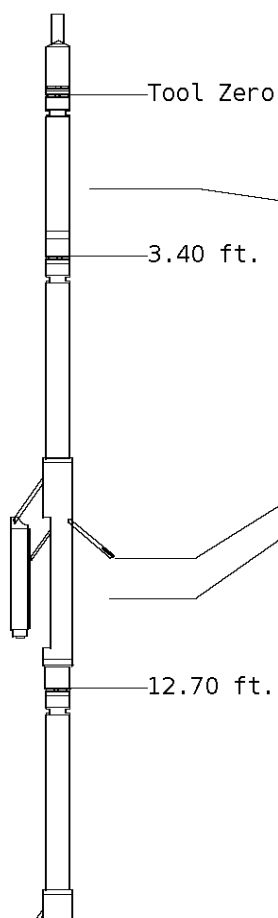
PIT: ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS:

J.JOHNSON
 B.BROWN

Tool String Schematic

Total Tool Length - 43.49 ft.
Maximum Outside diameter - 4.80 in.
Net Weight in Air - 743.00 lbs.



Tool: GRT-B **Length:** 3.40 ft. **O.D.** 3.60 in.
 Gamma Ray Controller
Sonde ID : GRT-BA-017

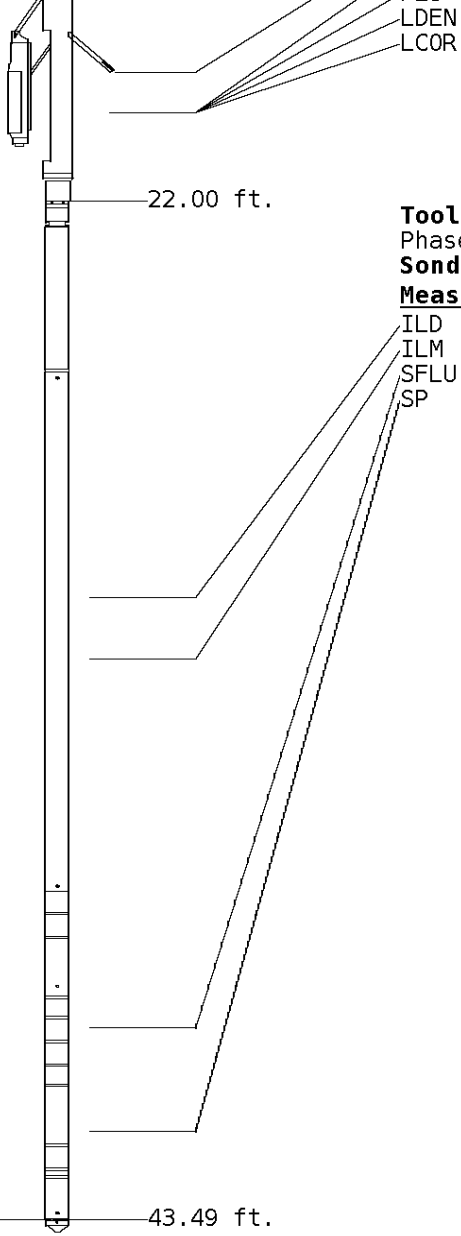
Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	41.49

Tool: CNT-AA **Length:** 9.30 ft. **O.D.** 4.36 in.
 Compensated Neutron A Pad on NDT-A
Sonde ID : NDT-BB-146
Source ID : N-1044
Pad ID : CNP-AA-115

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLCN	6.00	9.40	34.09
PHIN	6.80	10.20	33.29

Tool: LDT-DA **Length:** 9.30 ft. **O.D.** 4.80 in.
 Litho Density D Pad on NDT-A
Sonde ID : NDT-AH-152
Source ID : CSV-587
Pad ID : LDP-DA-50

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.00	18.70	24.79
PEL	7.00	19.70	23.79
PES	7.40	20.10	23.39



7.20 19.90 23.59
 7.20 19.90 23.59

Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-AB-18

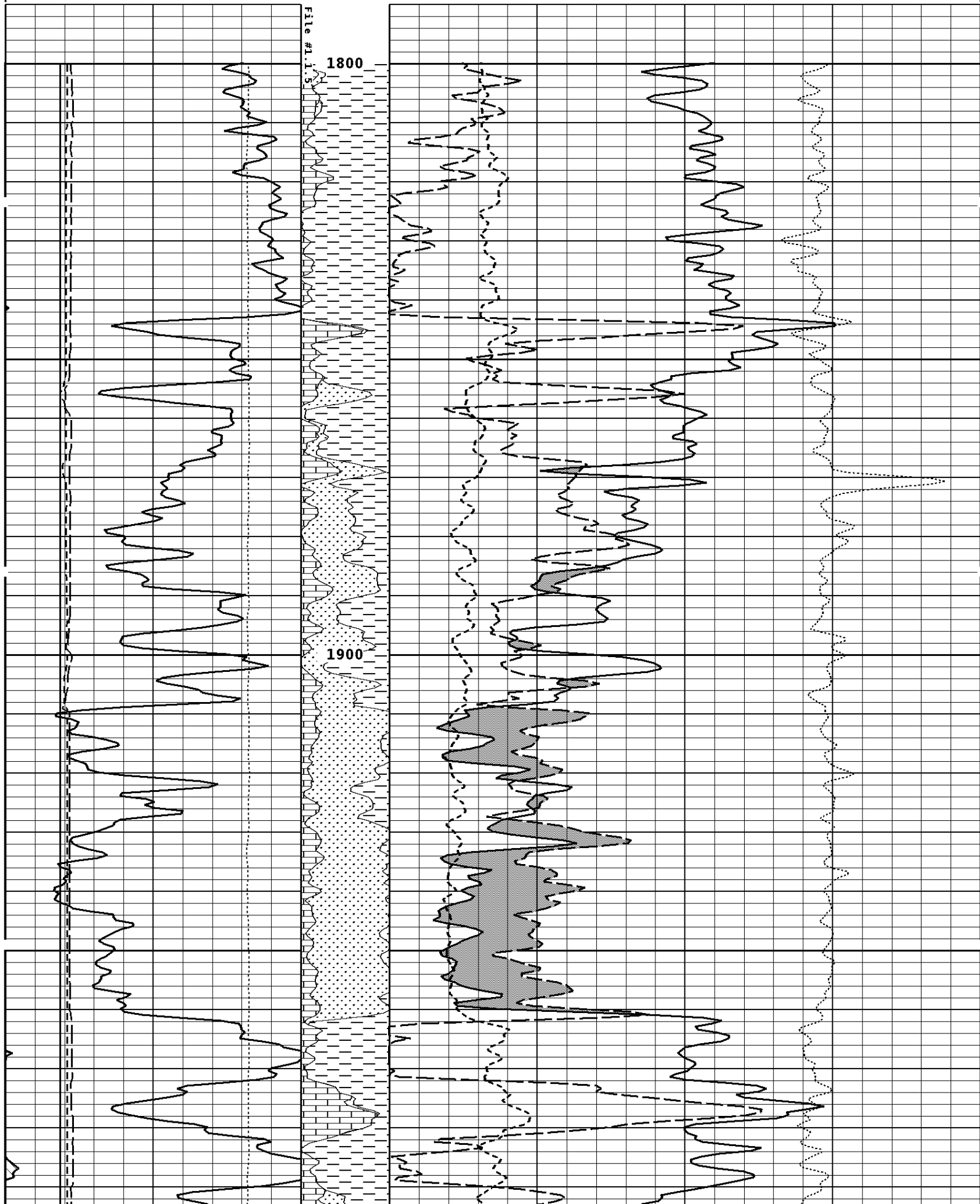
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	30.92	12.56
ILM	10.10	32.10	11.39
SFLU	17.49	39.49	4.00
SP	20.60	42.60	0.88

Well File: LEON_MBF_5-1_NOV20_STK
Segment: V1.D1.S5_FINAL_MAIN
Reference: 0

Scale: 1:240 **Format:** NLD-240
Acquired: 2014-11/20 10:14 3.4.0-13284
Processed: 2014-11/20 11:02 3.4.0-13284

BIT SIZE INCHES (IN)					
6	16				
NEUTRON (Y) CALIPER INCHES (IN)					
16	26				
6	16				
DENSITY (X) CALIPER INCHES (IN)					
16	26				
6	16				
		Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON		DENSITY CORRECTION G/CC
			0	10	-0.25
				0.25	
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT		
10000	0		70	30	
			30	-10	
			-10	-50	
GAMMA RAY API UNITS		Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT		
150	300		30		
0	150		-10		

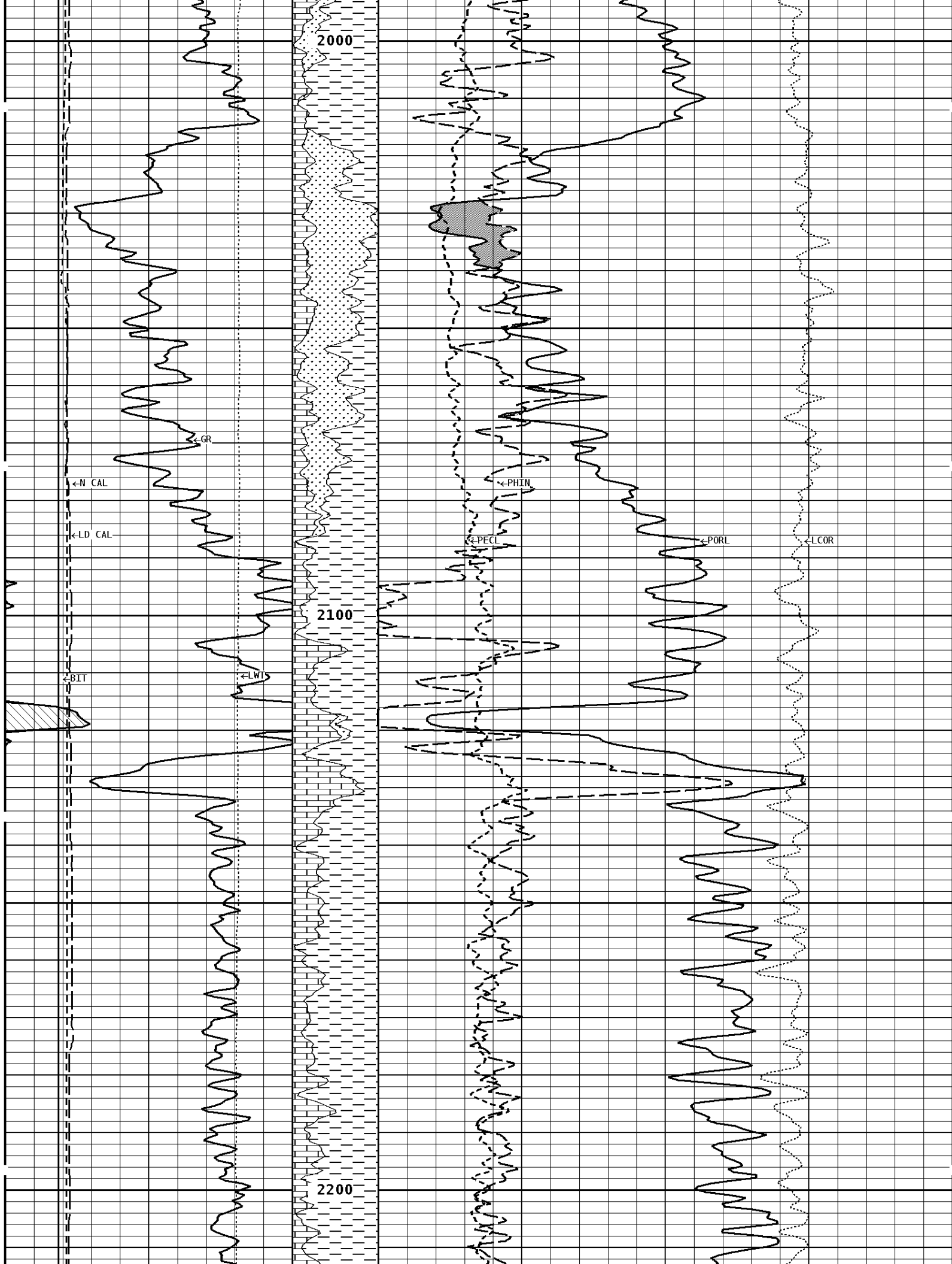
1:240 MAIN SECTION

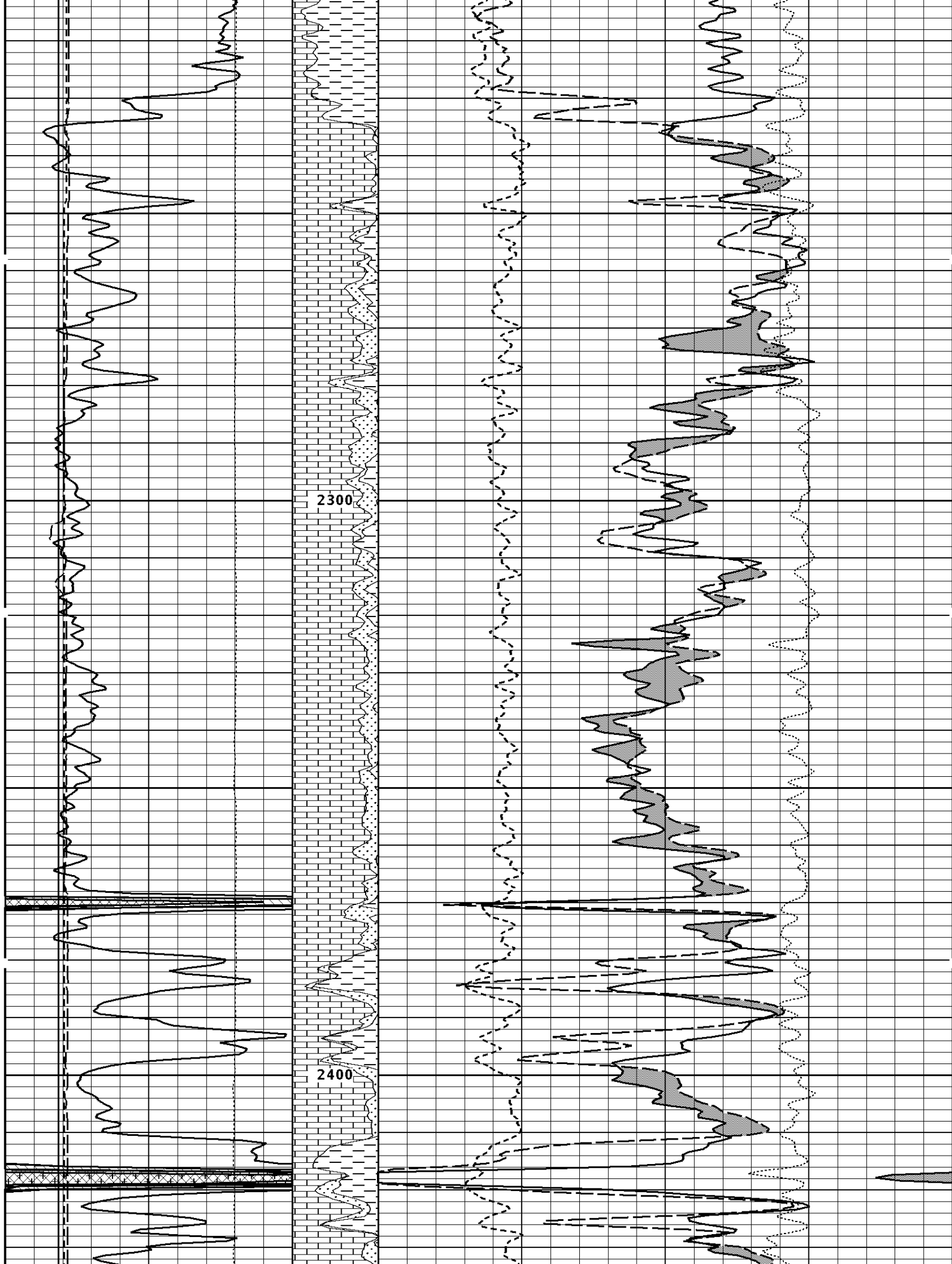


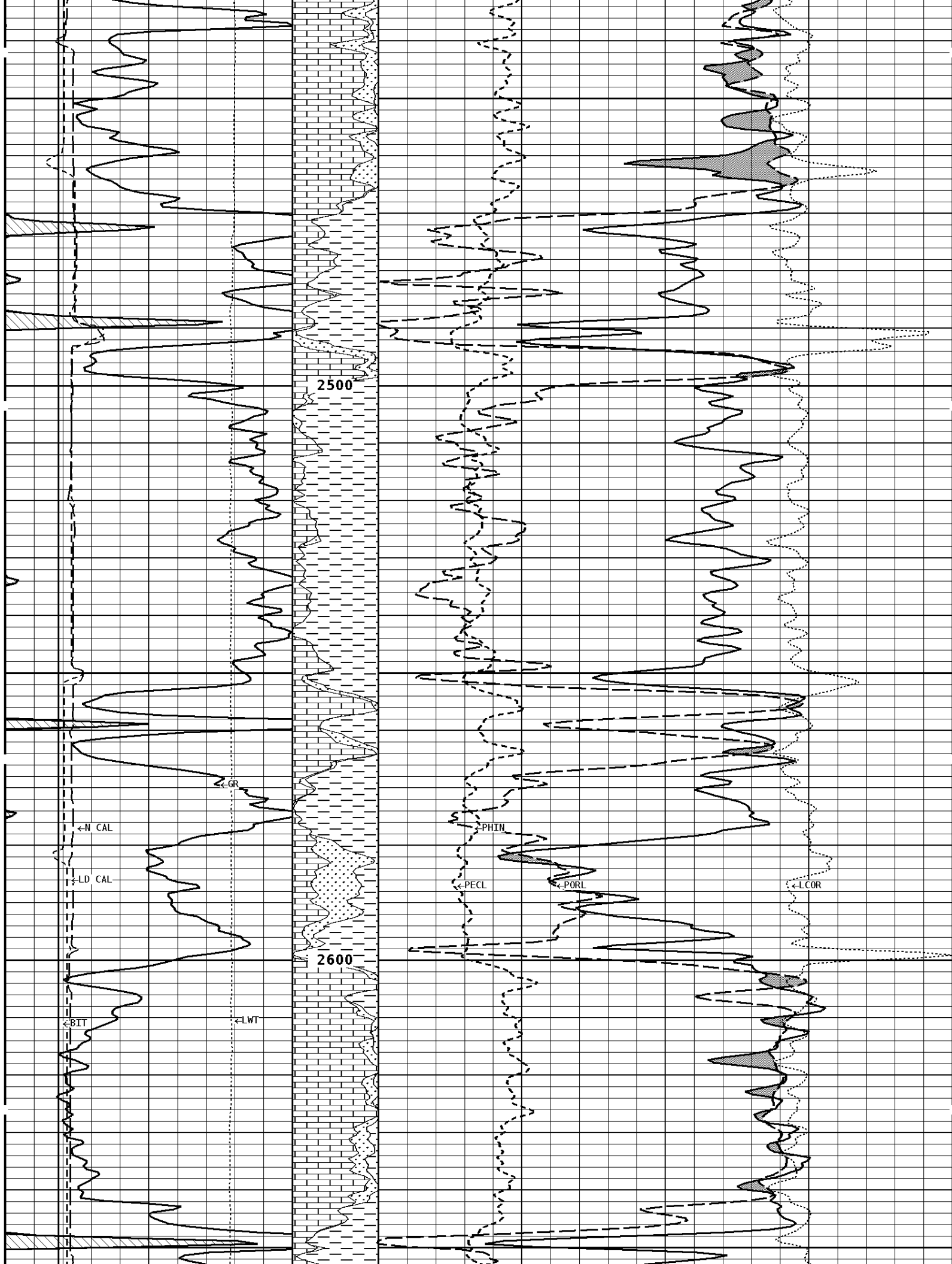
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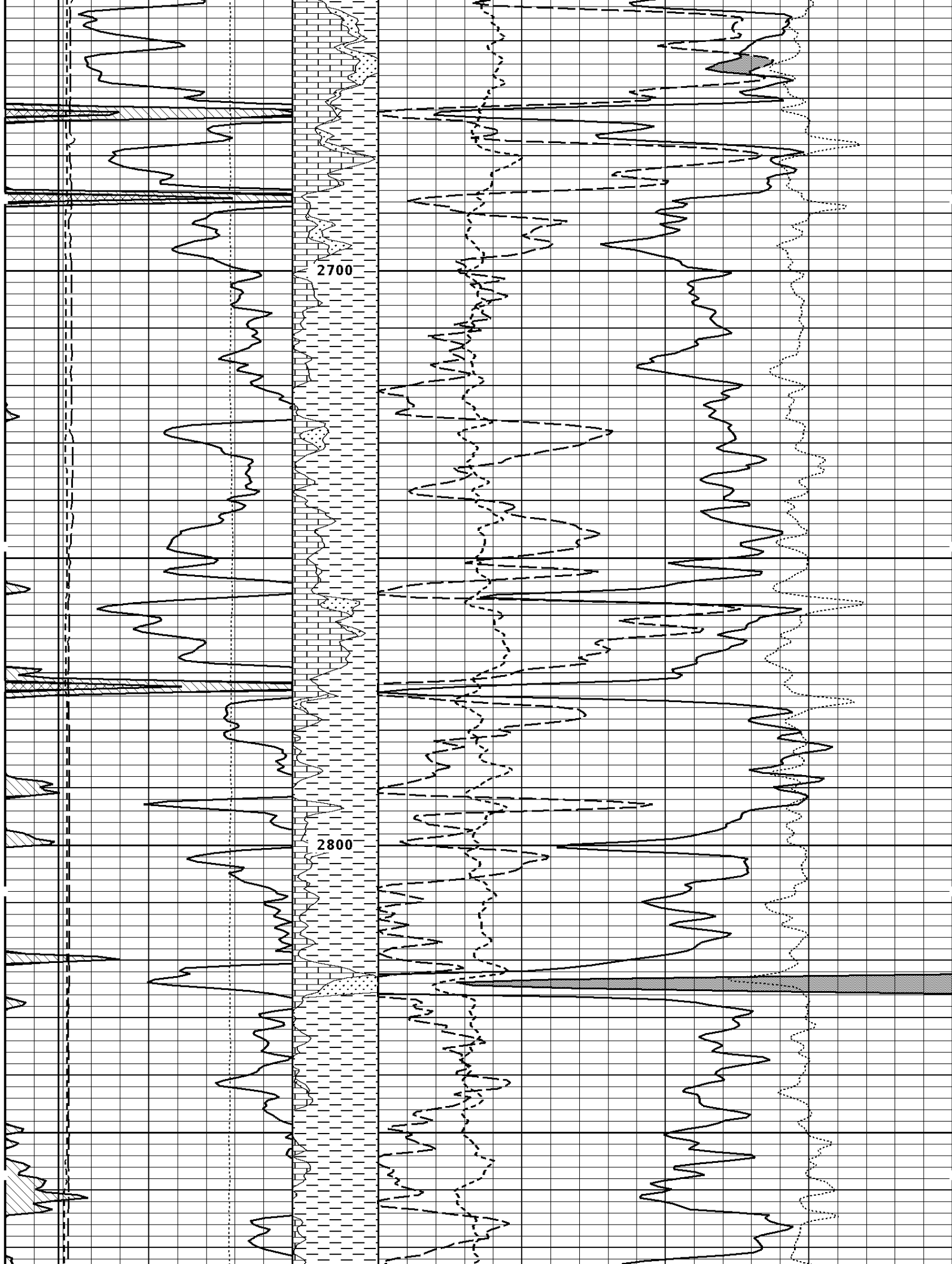
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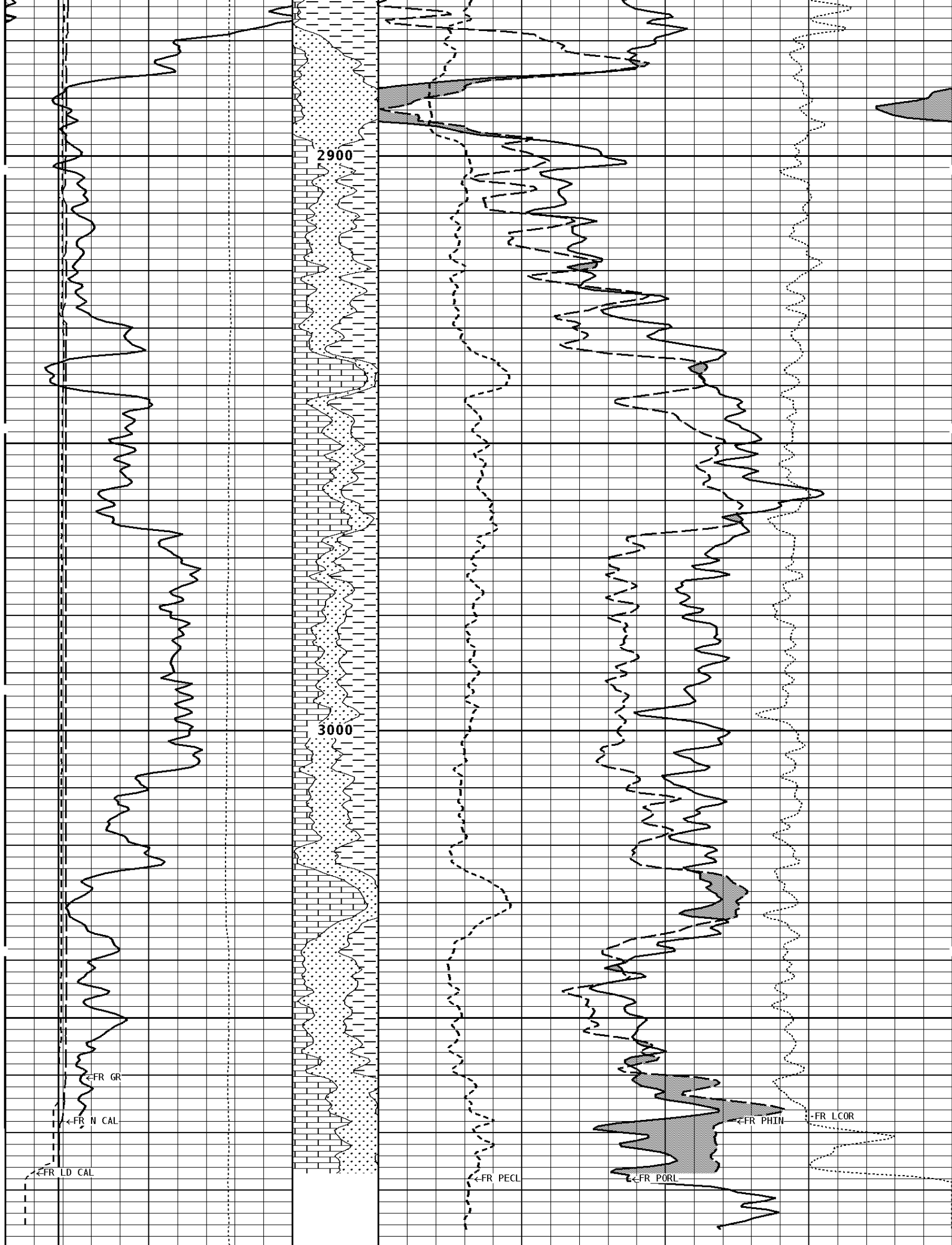
1900











2900

3000

←FR GR

←FR N CAL

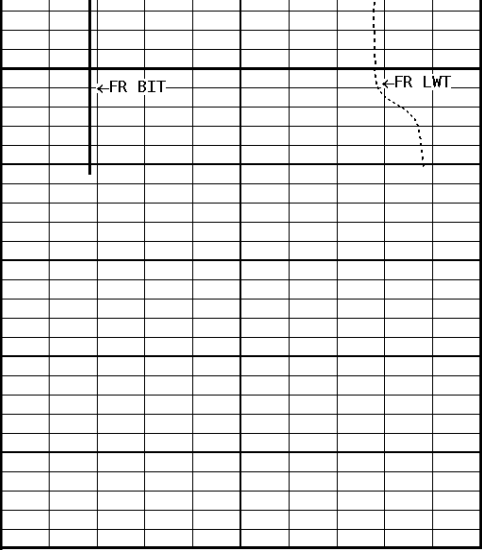
←FR LD CAL

←FR PECL

←FR PORL

←FR PHIN

←FR LCOR



3100
3102

File #1.1.5

1:240 MAIN SECTION

GAMMA RAY API UNITS 	Volume Dolo/Shale 	NEUTRON POROSITY (LIMESTONE) PERCENT 30 ----- -10	
TENSION LBS 10000 ----- 0	Volume Calcite 	DENSITY POROSITY (2.71g/cc) PERCENT 70 ----- 30 30 ----- -10 -10 ----- -50	
DENSITY (X) CALIPER INCHES (IN) 16 ----- 26 6 ----- 16	Volume Quartz 	PE CROSS-SECTION BARNS/ELECTRON 0 ----- 10	DENSITY CORRECTION G/CC -0.25 ----- 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 ----- 26 6 ----- 16			
BIT SIZE INCHES (IN) 6 ----- 16			

*** Borehole Zone Factors ***

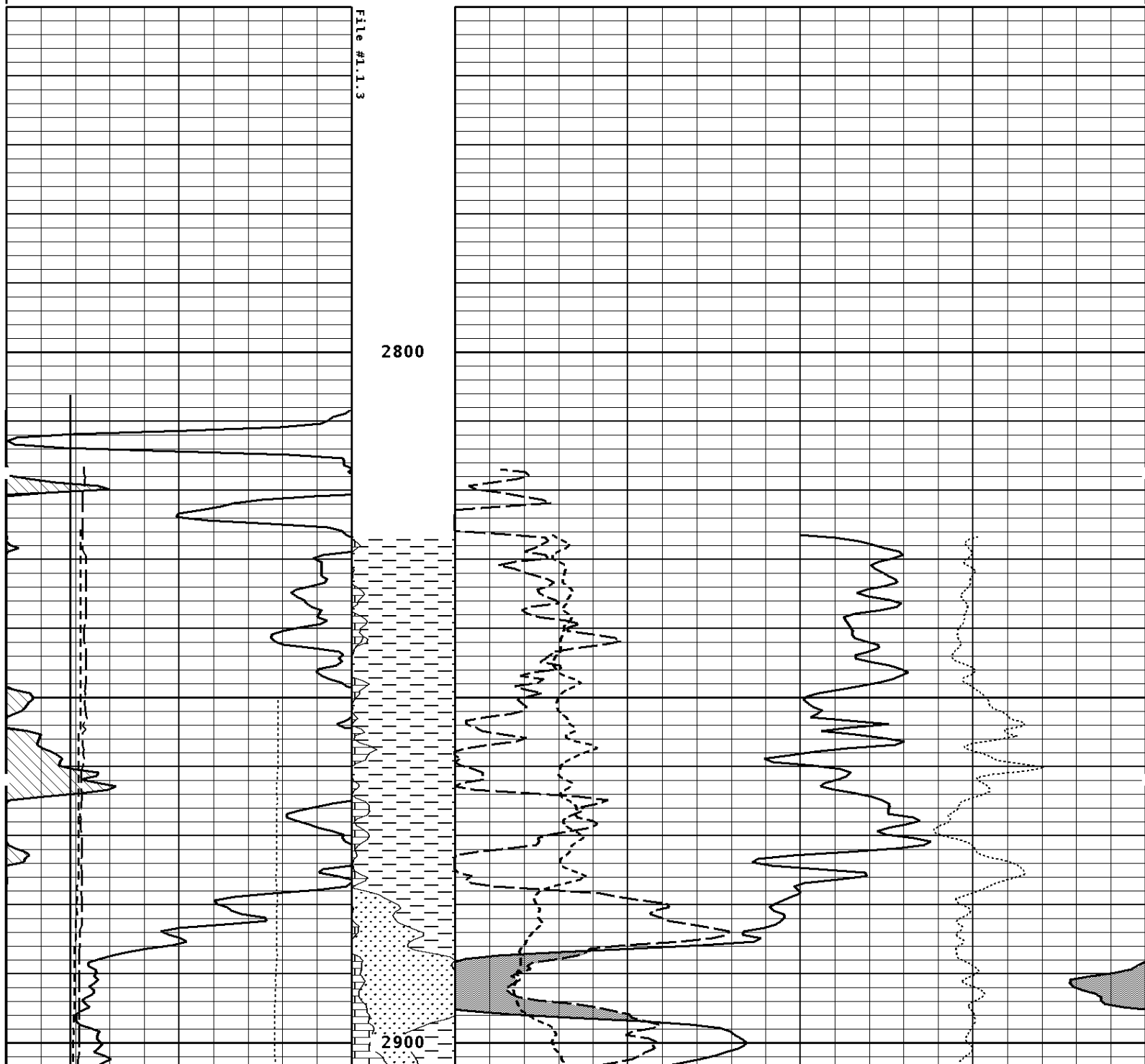
Zone 1 99999.0 to 0.0 Feet	
Matrix Density _____	2.71 g/cc
Fluid Density _____	1.00 g/cc
Formation Matrix _____	Limestone
Drill Bit Size _____	7.875 in
Casing Diameter _____	5.500 in
Casing Thickness _____	0.250 in
Casing Correction (PHI N) _____	Disable

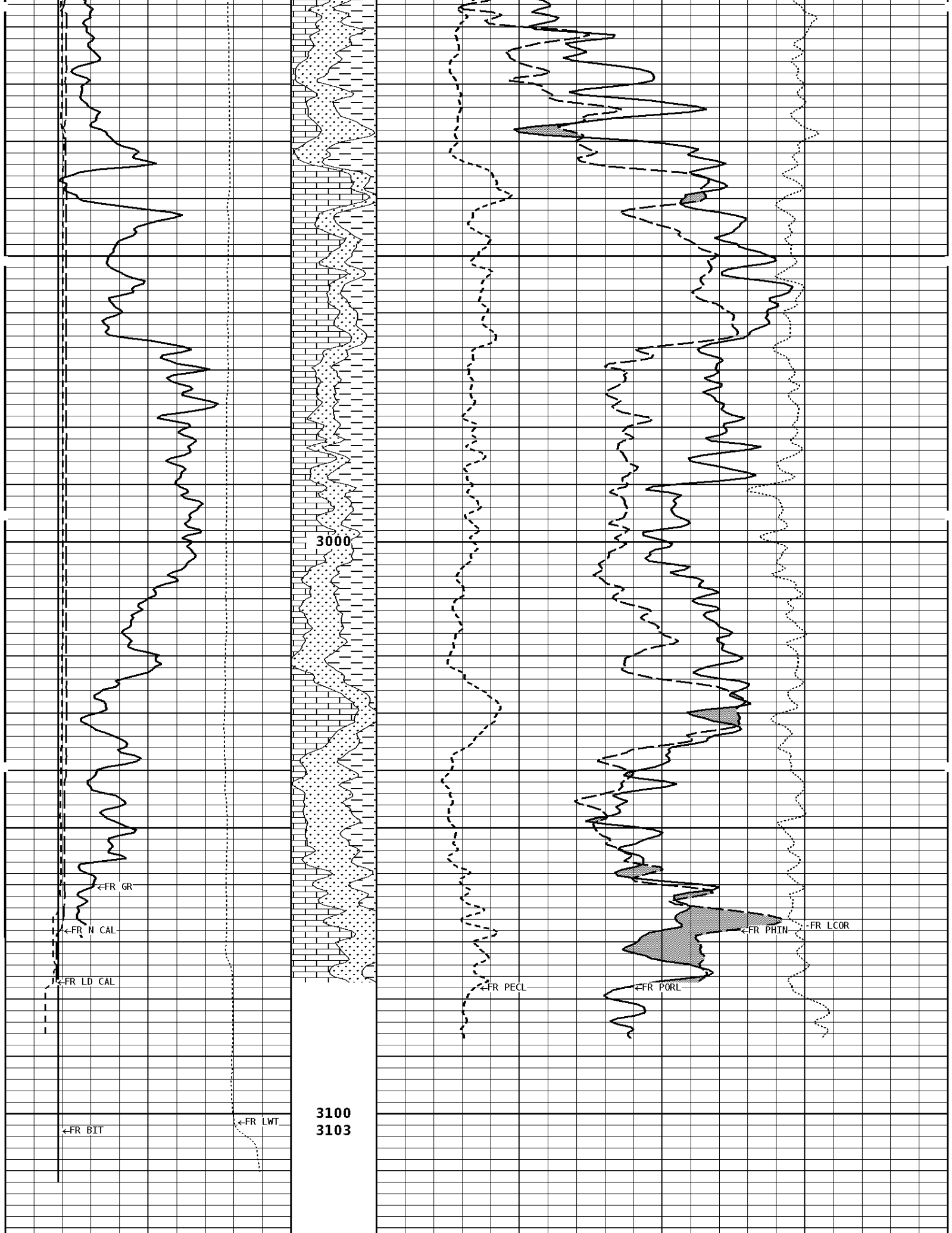
Well File: LEON MBF 5-1 NOV20 STK	Scale: 1:240	Format: NLD-240
Segment: V1.D1.S3 DS REPEAT	Acquired: 2014-11/20 10:01 3.4.0-13284	
Reference: 0	Processed: 2014-11/20 10:01 3.4.0-13284	

BIT SIZE INCHES (IN) 6 ----- 16
NEUTRON (Y) CALIPER INCHES (IN) 16 ----- 26 6 ----- 16

DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON		DENSITY CORRECTION G/CC	
16	26		0	10	-0.25	0.25
6	16		-----			
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT			
10000	0		70			
-----			30			
			-10			
GAMMA RAY API UNITS		Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT			
150	300		30			
0	150		-----			

1:240 REPEAT SECTION





3000

←FR GR

←FR N CAL

←FR LD CAL

←FR BIT

←FR LWT

3100
3103

←FR PECL

←FR PURL

←FR PHIN

←FR LCOR

File #1.1.3

1:240 REPEAT SECTION

GAMMA RAY API UNITS 150 300 0 150	Volume Dolo/Shale 	NEUTRON POROSITY (LIMESTONE) PERCENT 30 -10	
TENSION LBS 10000 0	Volume Calcite 	DENSITY POROSITY (2.71g/cc) PERCENT 70 30 30 -10 -10 -50	
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16	Volume Quartz 	PE CROSS-SECTION BARNs/ELECTRON 0 10	DENSITY CORRECTION G/CC -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16			
BIT SIZE INCHES (IN) 6 16			

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 Feet			
Matrix Density	_____	2.71	g/cc
Fluid Density	_____	1.00	g/cc
Formation Matrix	_____	Limestone	
Drill Bit Size	_____	7.875	in
Casing Diameter	_____	5.500	in
Casing Thickness	_____	0.250	in
Casing Correction (PHI N)	_____	Disable	

Well File: LEON MBF_5-1 NOV20 STK	Scale: 1:240	Format: LDT-240
Segment: V1.D1.S5 FINAL MAIN	Acquired: 2014-11/20 10:14 3.4.0-13284	
Reference: 0	Processed: 2014-11/20 11:02 3.4.0-13284	

BIT SIZE INCHES (IN) 6 16
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16
TENSION LBS 10000 0

PE CROSS-SECTION BARNs/ELECTRON 0 10	DENSITY CORRECTION G/CC -0.25 0.25
COMPENSATED BULK DENSITY G/CC 3.0 4.0 2.0 3.0	

GAMMA RAY
API UNITS



-BHV ANV-
CU.FT

1.0

DENSITY POROSITY (2.71g/cc)
PERCENT

2.0

70

30

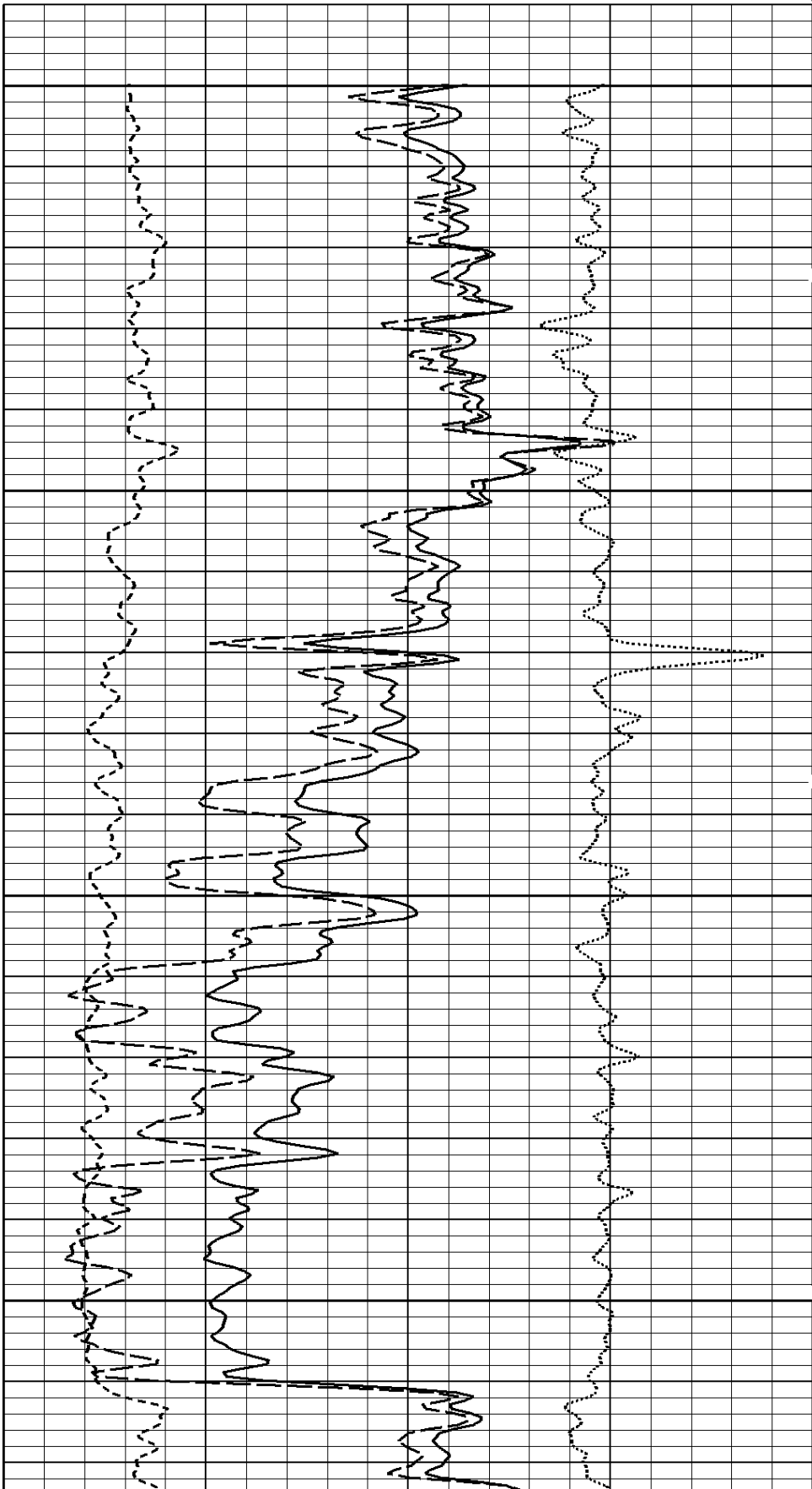
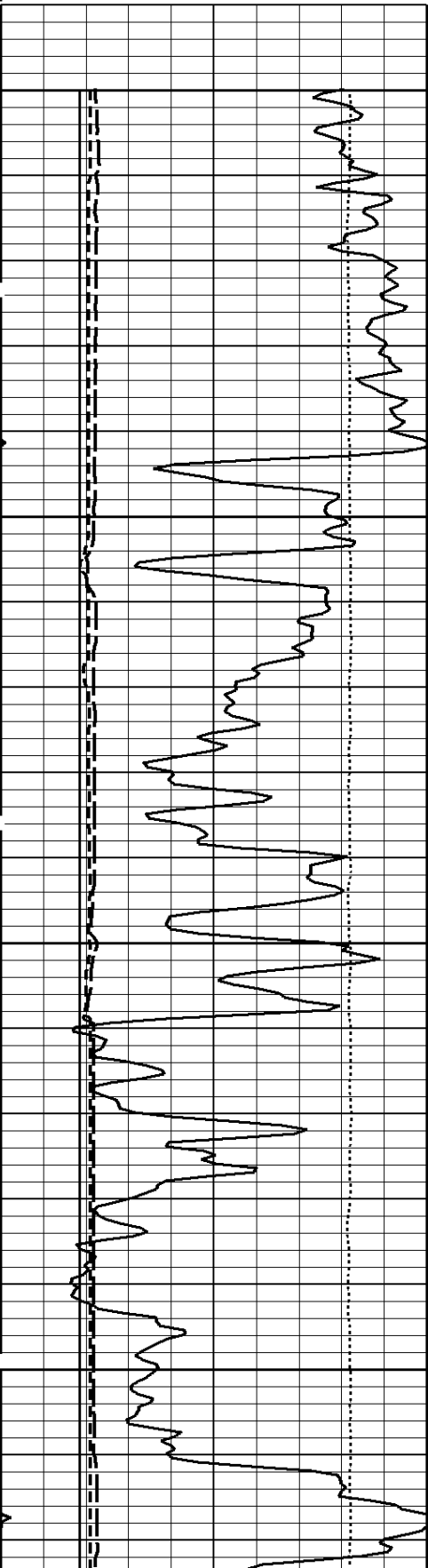
-10

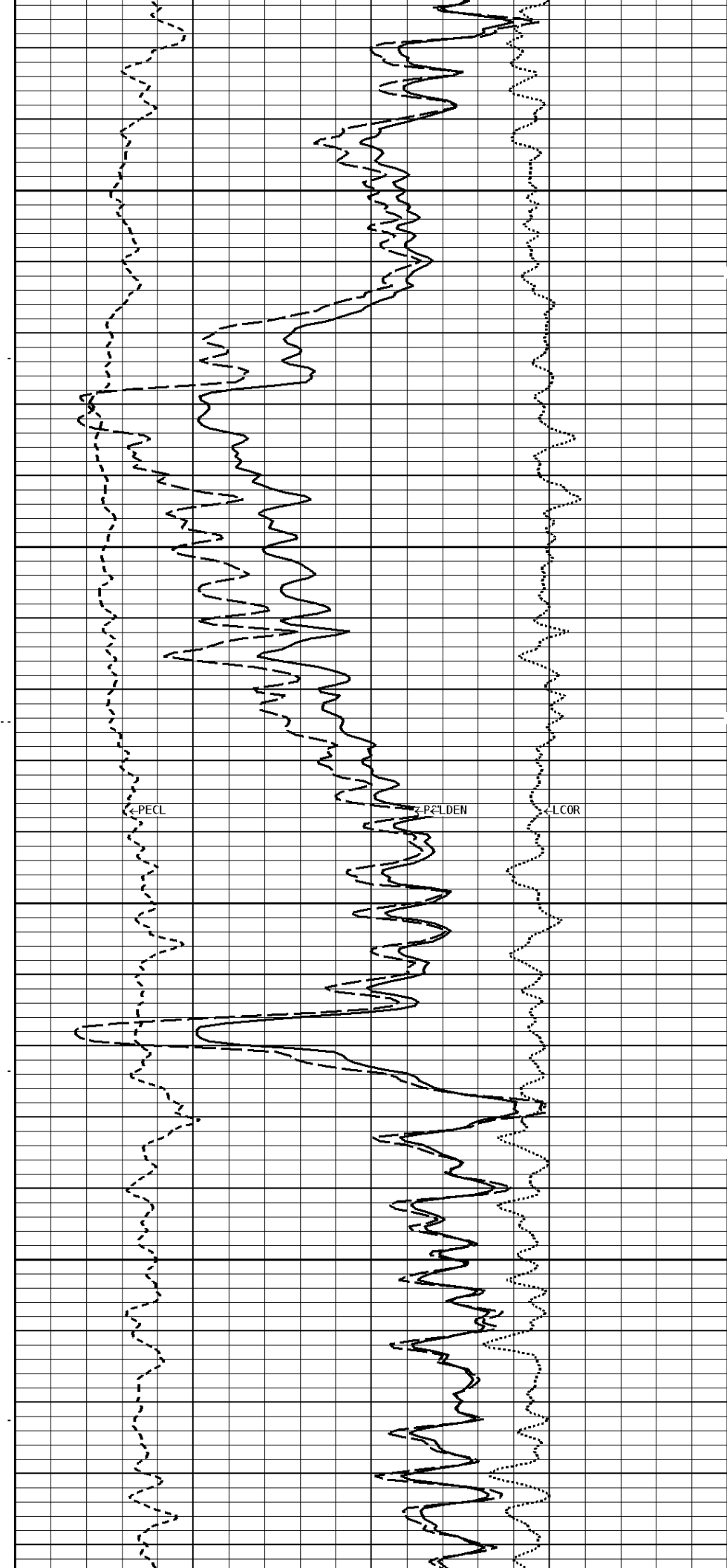
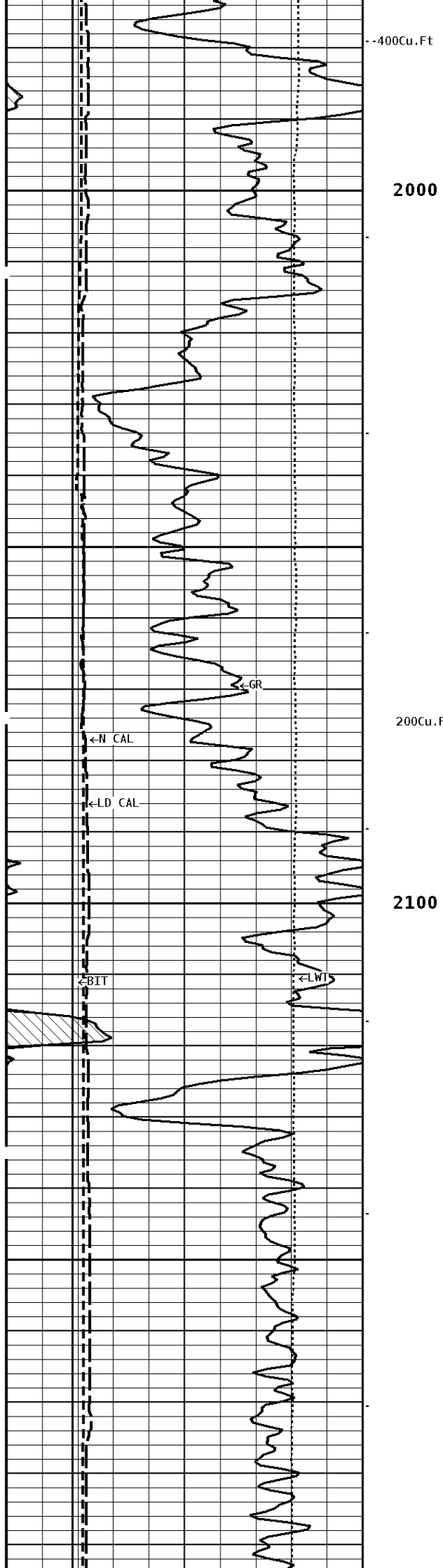
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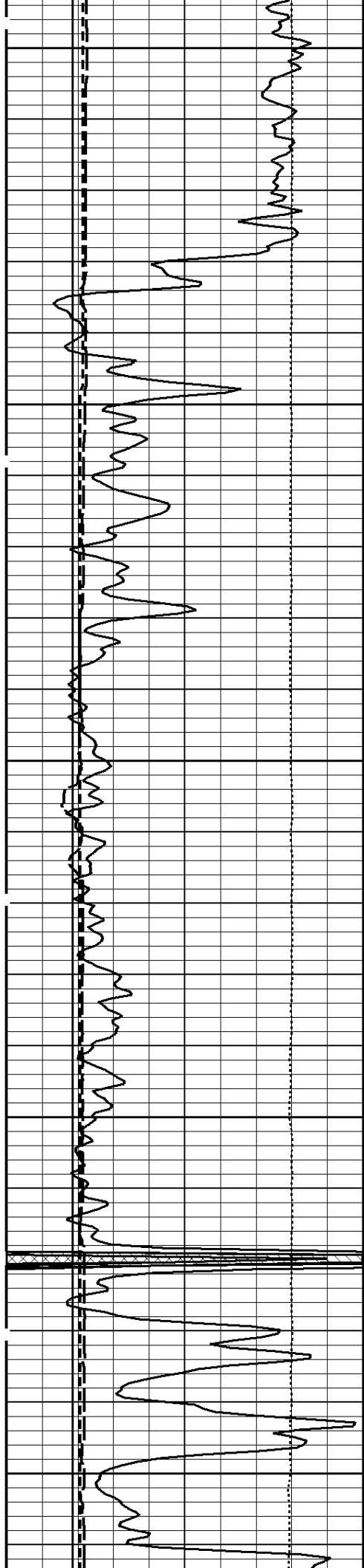
-10

-50

1:240 MAIN SECTION BULK DENSITY





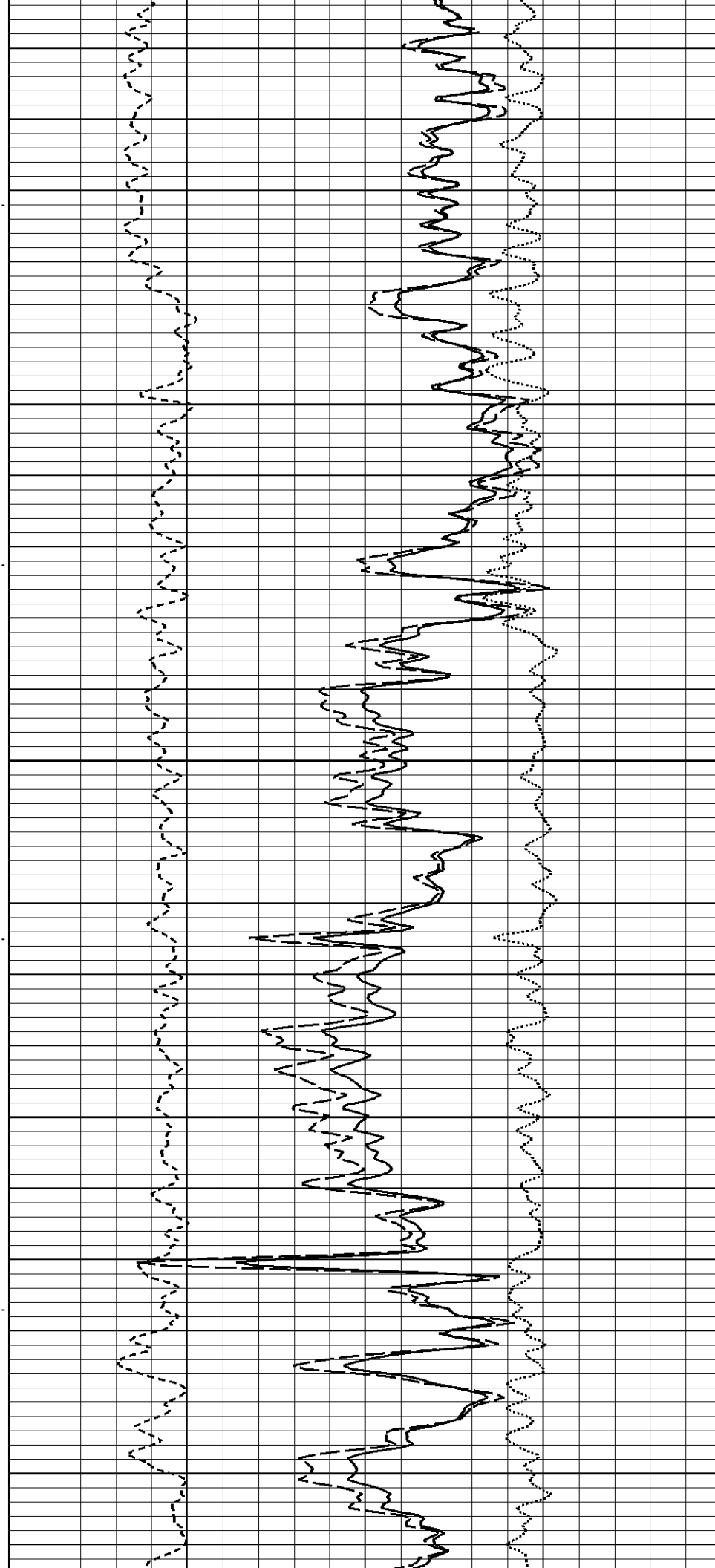


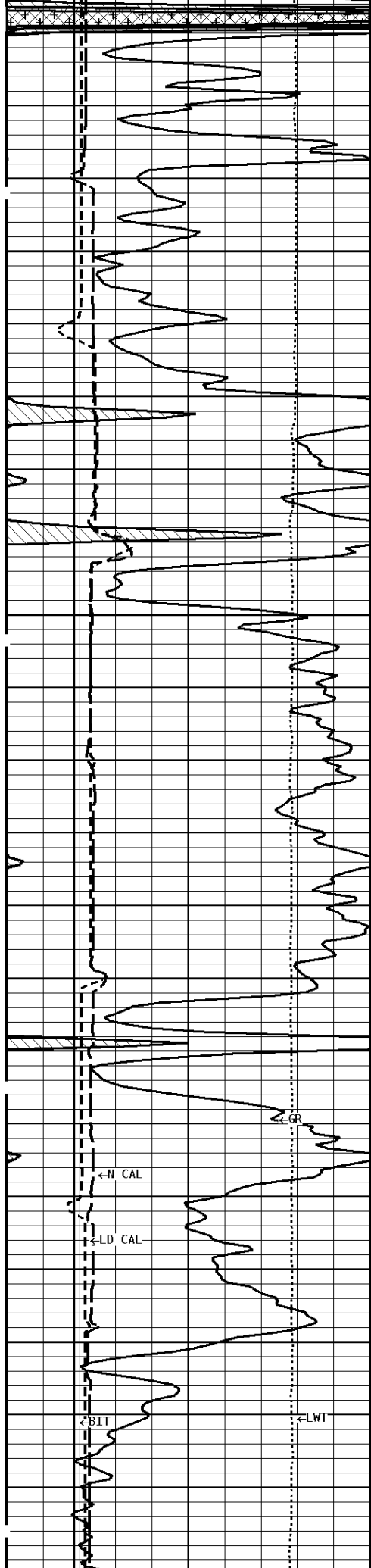
2200

--300Cu.Ft

2300

2400



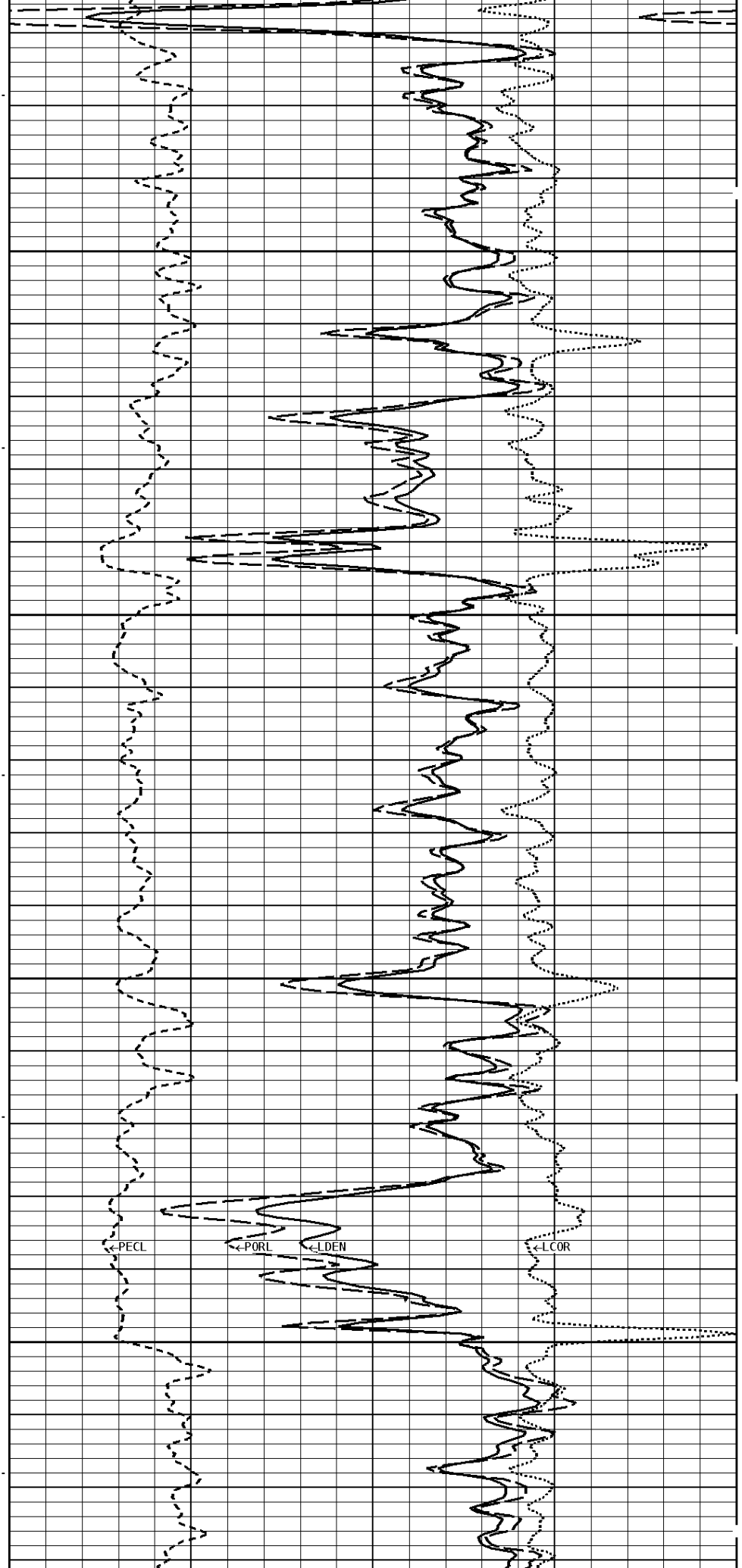


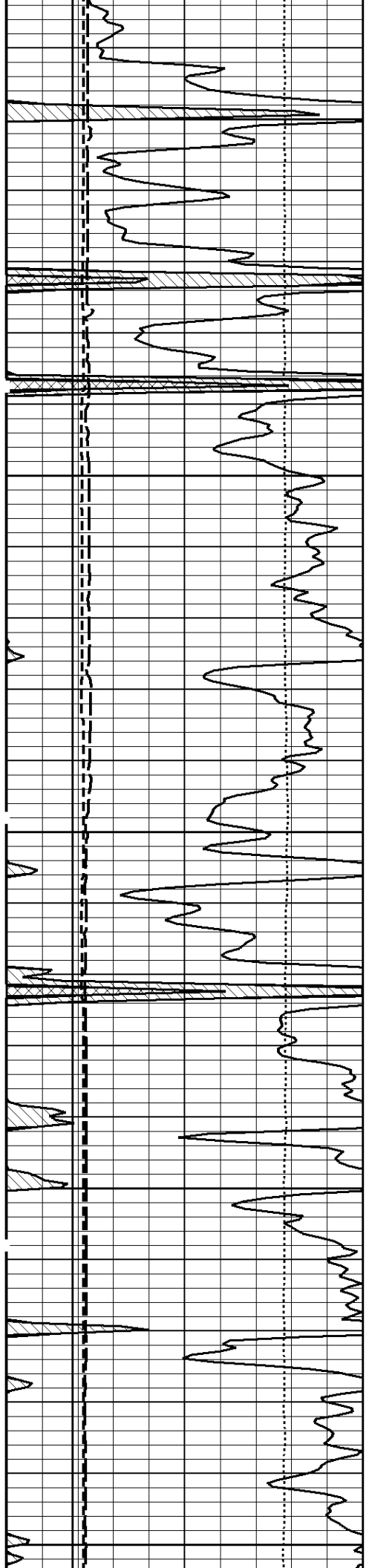
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200Cu.Ft

100Cu.Ft

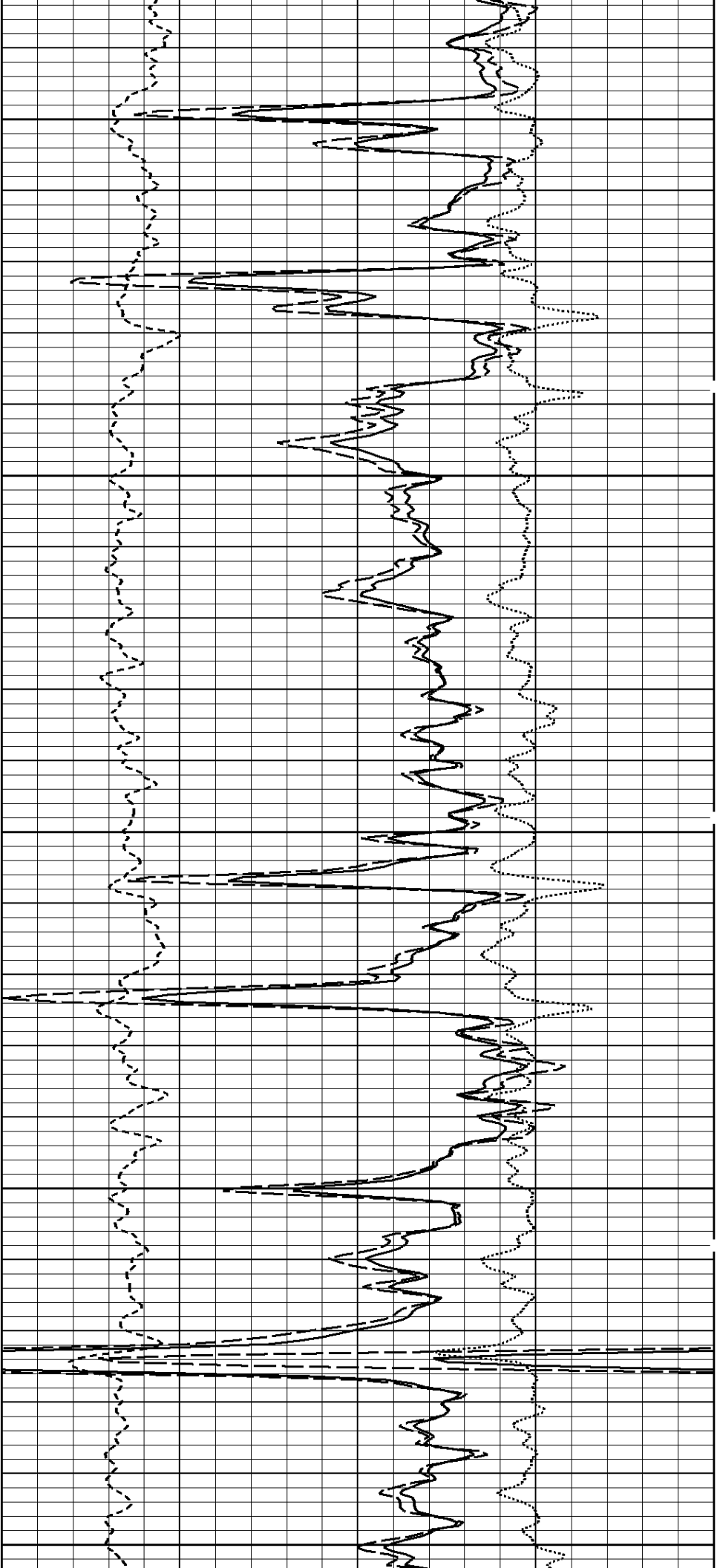
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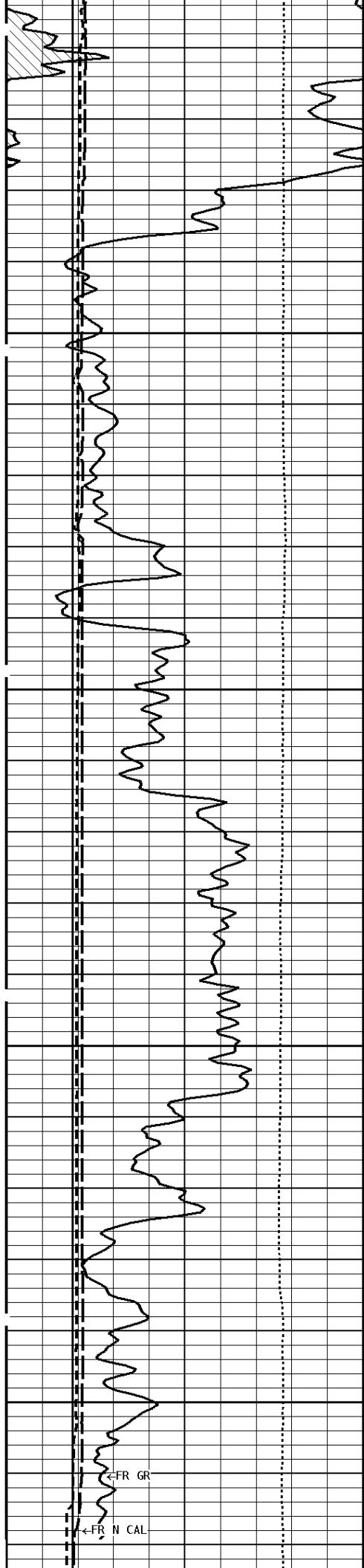




2700

-100Cu.Ft
2800



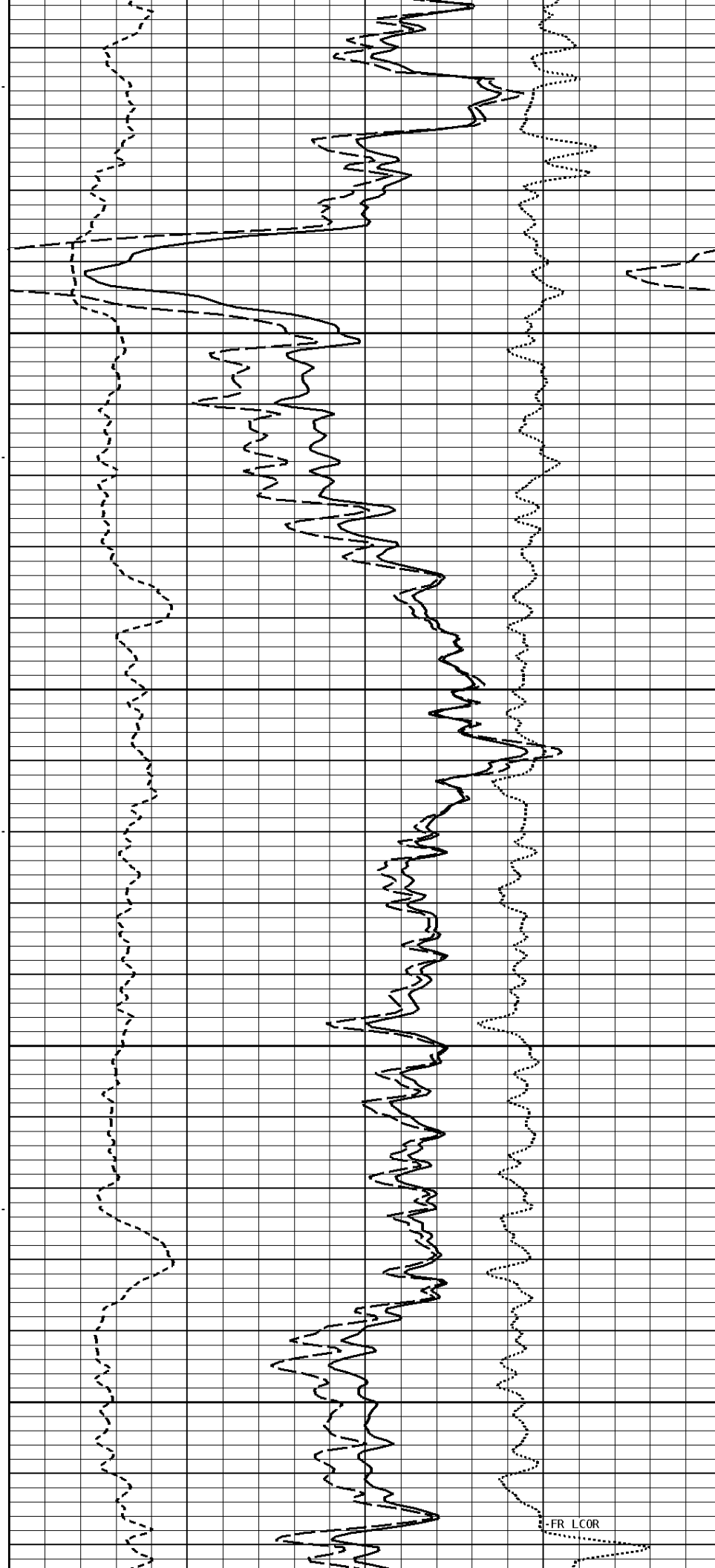


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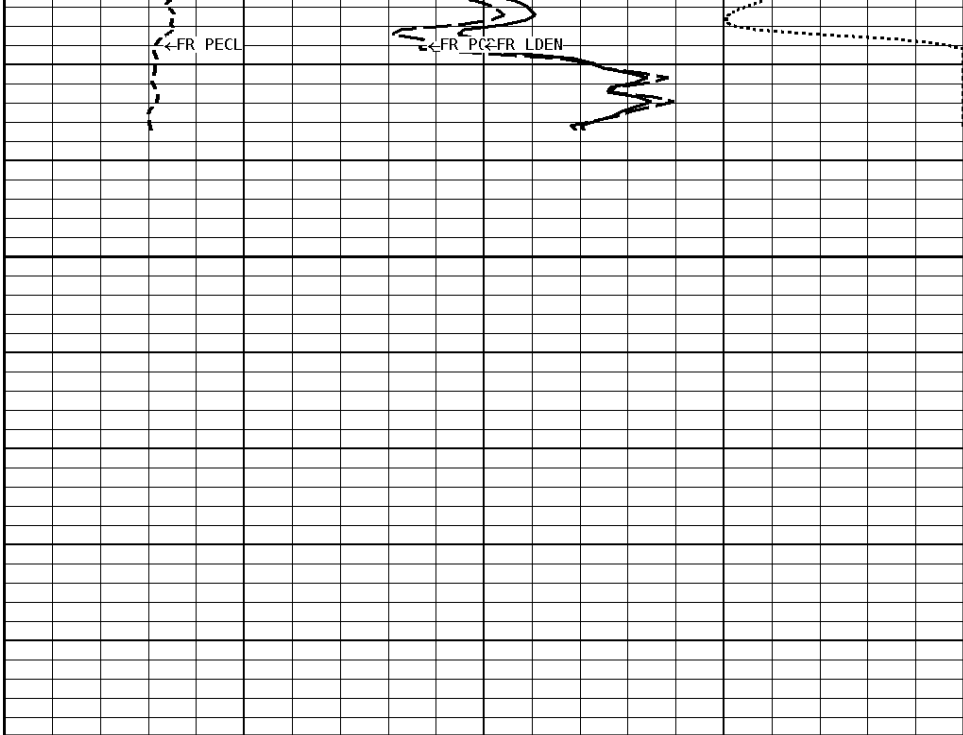
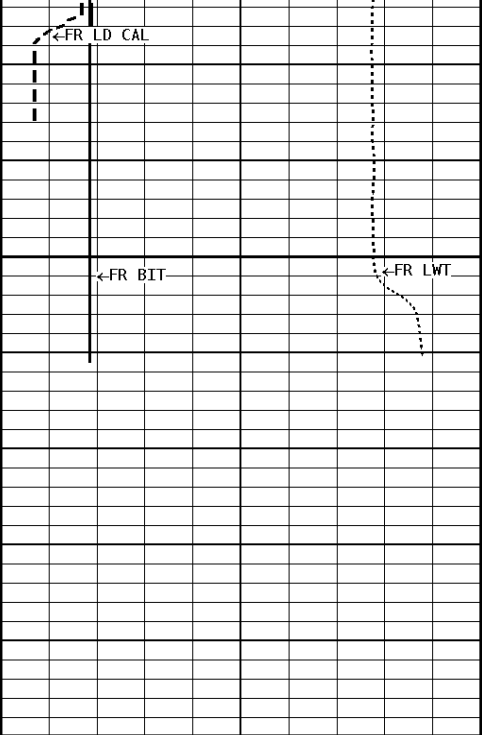
3000

←FR GR

←FR N CAL



←FR L COR



1:240 MAIN SECTION
BULK DENSITY

GAMMA RAY API UNITS	-BHV AHV- CU. FT	DENSITY POROSITY (2.71g/cc) PERCENT
150 0		70 30
300 150		-10 -50
TENSION LBS		COMPENSATED BULK DENSITY G/CC
10000		3.0 2.0 1.0
0		4.0 3.0 2.0
DENSITY (X) CALIPER INCHES (IN)		PE CROSS-SECTION BARN/ELECTRON
16 6		0
26 16		10
NEUTRON (Y) CALIPER INCHES (IN)		DENSITY CORRECTION G/CC
16 6		-0.25
26 16		0.25
BIT SIZE INCHES (IN)		
6		
16		

*** Borehole Zone Factors ***

Zone 1 99999.0 to 0.0 Feet		
Matrix Density	_____	2.71 g/cc
Fluid Density	_____	1.00 g/cc
Formation Matrix	_____	Limestone
Drill Bit Size	_____	7.875 in
Casing Diameter	_____	5.500 in
Casing Correction (PHI N)	_____	Disable

*** Calibration Summary ***

Shop Calibration GRT-B		
Performed :	10-NOV-2014	Time : 15:34
Sensor Suite :	GP, GP5	ID : GPT BA 017

Sensor Suite : GR-GR3 ID : GR1-DA-017
 Measured Units Calibrated Units
 Background Jig Jig
 GR 56 363 CPS 175 GRAPI

**Shop Calibration
 CNT-AA**

Performed : 04-NOV-2014 Time : 13:41
 Sensor Suite : CALI-BCN ID : NDT-BB-146

	Jig - Measured		Jig - Calibrated		Units
CL # 1	Ring#1	Ring#2	Ring#1	Ring#2	IN.
	9.1	13.9	6.0	12.0	

Performed : 04-Nov-2014 Time : 13:46
 Sensor Suite : BHC NEUT ID : CNP-AA-115
 Source ID : N-1044

	Measured	Tank Calibrated	Verification Jig	Units
N/F	3.9817	3.6893	3.6924	
Porosity	25.2	20.5	20.5	%

**Shop Calibration
 LDT-DA**

Performed : 04-NOV-2014 Time : 10:42
 Sensor Suite : CALI-LTH ID : NDT-AH-152

	Jig - Measured		Jig - Calibrated		Units
CL # 1	Ring#1	Ring#2	Ring#1	Ring#2	IN.
	7.4	10.7	6.0	12.0	

Performed : 04-Nov-2014 Time : 10:58
 Sensor Suite : BHCPELNG ID : LDP-DA-50
 Source ID : CSV-587

	BKGD	Al	Short Space Mg	Al+Fe	Units
LSW1	71	485	775	327	CPS
LSW2	76	551	866	410	CPS
LSW3	280	1322	2051	1151	CPS
LSW4	339	1261	1730	1129	CPS
LSW5	32	41	42	40	CPS
LSW6	92	94	94	94	CPS
LSW7	59	60	57	60	CPS
LSW8	2	2	3	2	CPS
QS	0.215	0.224	0.244	0.219	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

	BKGD	Al	Long Space Mg	Al+Fe	Units
LLW1	103	570	2365	371	CPS
LLW2	115	900	3687	680	CPS
LLW3	427	1766	6421	1572	CPS
LLW4	551	1066	2669	1006	CPS
LLW5	65	69	79	69	CPS
LLW6	170	169	161	168	CPS
LLW7	114	111	108	109	CPS
LLW8	5	6	10	6	CPS
QL	0.195	0.208	0.198	0.212	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC



Company: LEON C. SMITHERMAN JR.
 Well: MBF #5-1
 Location: 330' FSL & 330' FEL
 Logged: 11-20-2014
 K.B. Elev: 1313.0 Ft