

# Tucker

WIRELINE SERVICES

## COMPENSATED NEUTRON PEL DENSITY LOG

File No. : TUL-56702  
 Company : BRUNGARDT OIL & LEASING, INC  
 Well : SELLEN'S 'A' #1  
 Field :  
 Country : RUSSELL  
 State : KANSAS  
 Country : USA

Location : API#: 15-167-23641-00-00  
 400' FNL & 400' FWL  
 SE NW NW NW

Sect : 12 Twp : 13S Rge : 14W

Recorded By : B.BAILEY  
 Witnessed By : B.HUTCHINSON

Date : OCT 25 2010  
 Run No. : 1

Permanent Datum : GL  
 Drilling Measured From : KB  
 Log Measured From : KB  
 Above Permanent Datum : 5.00 FT

Depth--Driller : 3180.0 FT  
 Depth--Logger : 3179.0 FT  
 Bottom Log Interval : 3146.0 FT  
 Top Log Interval : 1500.0 FT

Casing Depth--Driller: 219.0 FT  
 Casing Depth--Logger : 219.0 FT  
 Casing Diameter : 8.625 IN

Bit Size : 7.875 IN  
 Unit No. : 127  
 Location : TULSA

Elevations :  
 KB : 1635.00 FT  
 DF : 1634.00 FT  
 GL : 1630.00 FT

### Additional Services

MLT  
 PIT

The customer is hereby warned that by providing the log data herein, T. W. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. W. 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. W. 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. W. 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.

### Run Number 1

Depth To Fluid 0.0 FT  
 Fluid Type In Hole : WBM  
 Density : 9.100 SG  
 Viscosity : 46.000 SEC  
 pH : 9.500  
 Fluid Loss : 10.400  
 Salinity : 0.000 KPPM

RM Source : MEASURED  
 RM : 0.900 OHMM at 66 F  
 RM at BHT : 0.637 OHMM at 96 F

RMF Source : CALCULATED  
 RMF : 0.765 OHMM at 66 F  
 RMF at BHT : 0.542 OHMM at 96 F

RMC Source : CALCULATED  
 RMC : 1.025 OHMM at 66 F

RMC : 1.035 OHMM at 66 F  
 RMC at BHT : 0.733 OHMM at 96 F  
 Max Recorded Temp. : 96 F  
 Time Circulation Stopped :  
 Operating Rig Time, Hrs. : 2.0

**- Source Serial Numbers -**

Gamma CSV-587  
 Neutron N-1044

**- Sonde Serial Numbers -**

GRTB GRT-BA-14  
 CNT CNP-AA-116  
 LDTNG LDP-NG-02  
 MSTNG MST DA- 029  
 PIT PIT-AB-14

**Casing Strings**

Size (IN)	Weight (LB/FT)	Bottom (FT)
8.625	32.00	219.00

**- Comments -**

ALL PRESENTATIONS AS PER CUSTOMER REQUEST.

GRT, CNT, LDT, MLT, PIT RAN IN COMBINATION  
 CALIPERS ORIENTED ON THE X-Y AXIS.  
 PHIN IS CALIPER CORRECTED.  
 2.71 G/CC USED TO CALCULATE POROSITY.  
 ANNULAR HOLE VOLUME CALCULATED USING 5.500" PRODUCTION CASING.  
 DERTAIL FROM TD TO 1500' AS PER CUSTOMER REQUEST.

GRT: GRP.  
 CNT: PHIN, CLCNIN.  
 LDT: PORL, LCORN, PECLN, CLLDIN, LDENN, PORLLS, PECSN.  
 MLT: INV\_R, NOR\_R, MSCLPIN.  
 PIT: ILD, ILM, CIRD, SFLAEC, SPU.

OPERATORS:  
 M.BURKE  
 R.AUSTIN

THANK YOU FOR USING TUCKER WIRELINE SERVICES!

**Tool String Schematic**

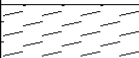
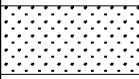
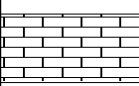
Total Tool Length - 52.95 ft.  
 Maximum Outside diameter - 6.00 in.  
 Net Weight in Air - 943.00 lbs.



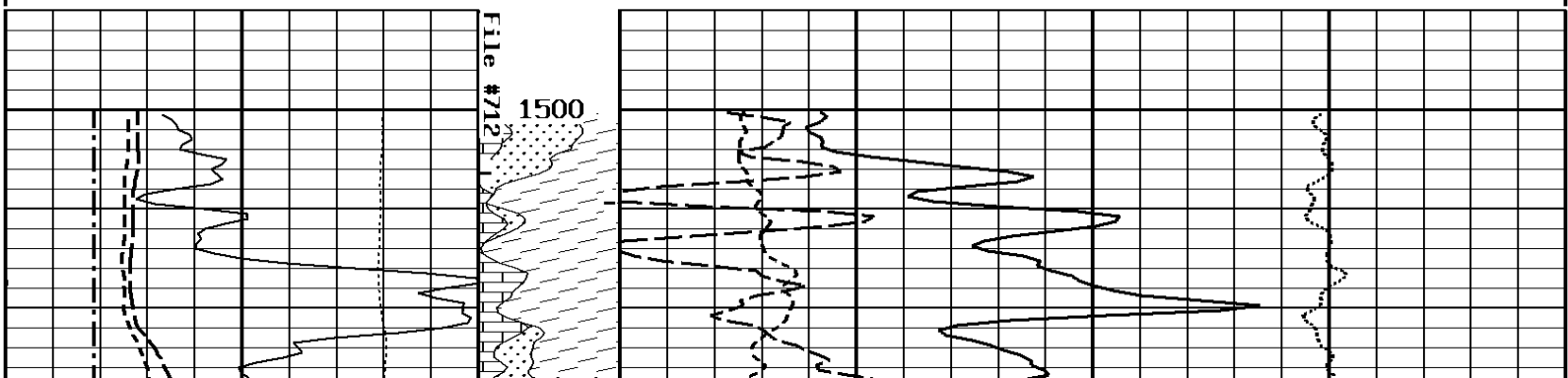
<b>Tool:</b> GRTB	<b>Length:</b> 3.40 ft. O.D.: 3.60 in.
<b>Sonde ID</b>	: GRT-BA-14
<b>Measure Point</b>	<b>Stack Offset</b> <b>Tool Offset</b> <b>Bottom Offset</b>
GRTB	3.00 3.00 50.95



LWT ——— 52.95 ft.

TENSION LBS								
10000	0							
BIT SIZE INCHES (IN)		Volume Dolo/Shale						
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							
NEUTRON (Y) CALIPER INCHES (IN)		Volume Calcite	NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)					
16	26		30			-10		
6	16							
GAMMA RAY API UNITS		-BHV AHV- CU, FT	DENSITY POROSITY PERCENT (2.71 g/cc)					
150	300	70					30	
0	150	30					-10	
		-10					-50	

1:240 MAIN SECTION

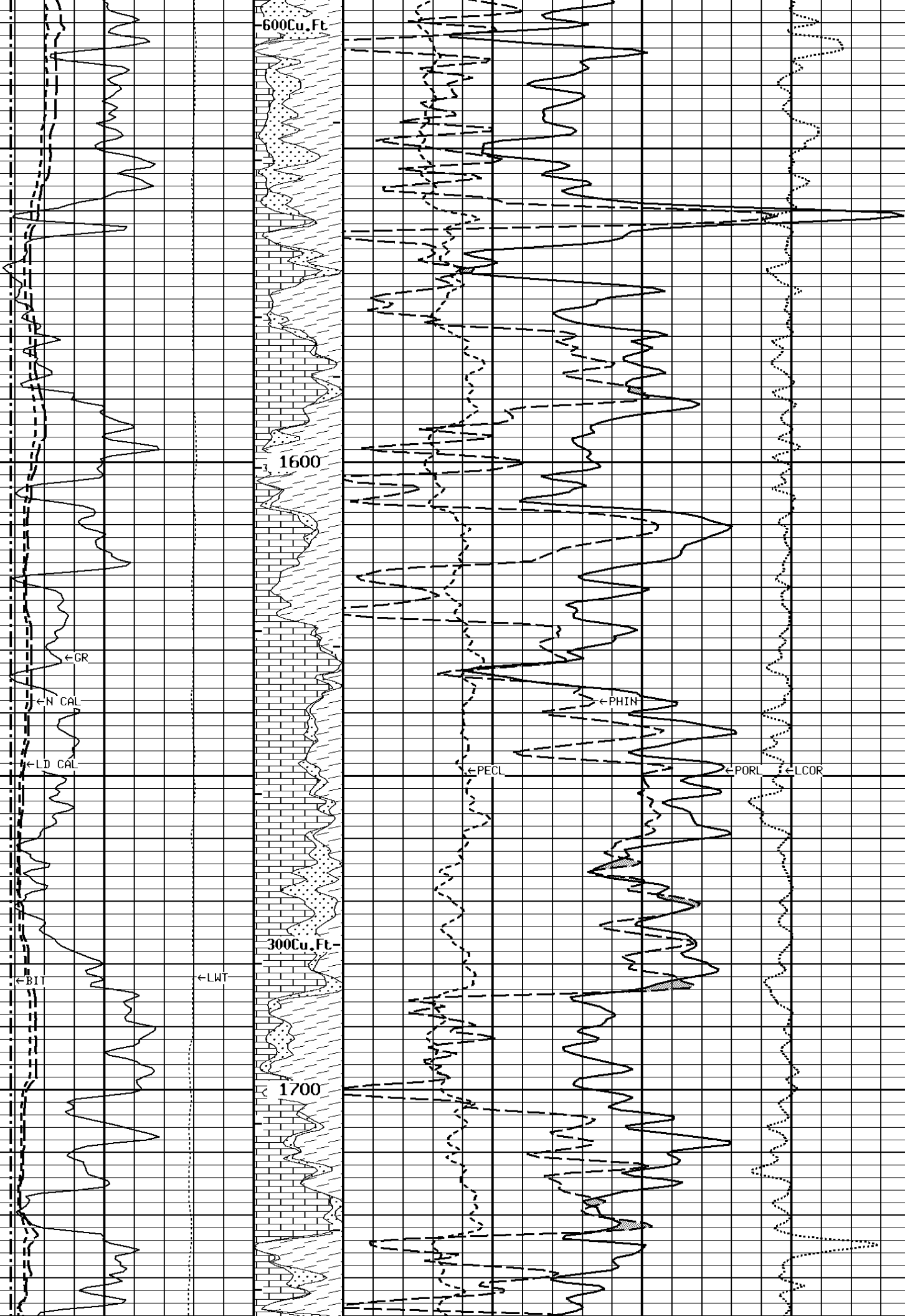


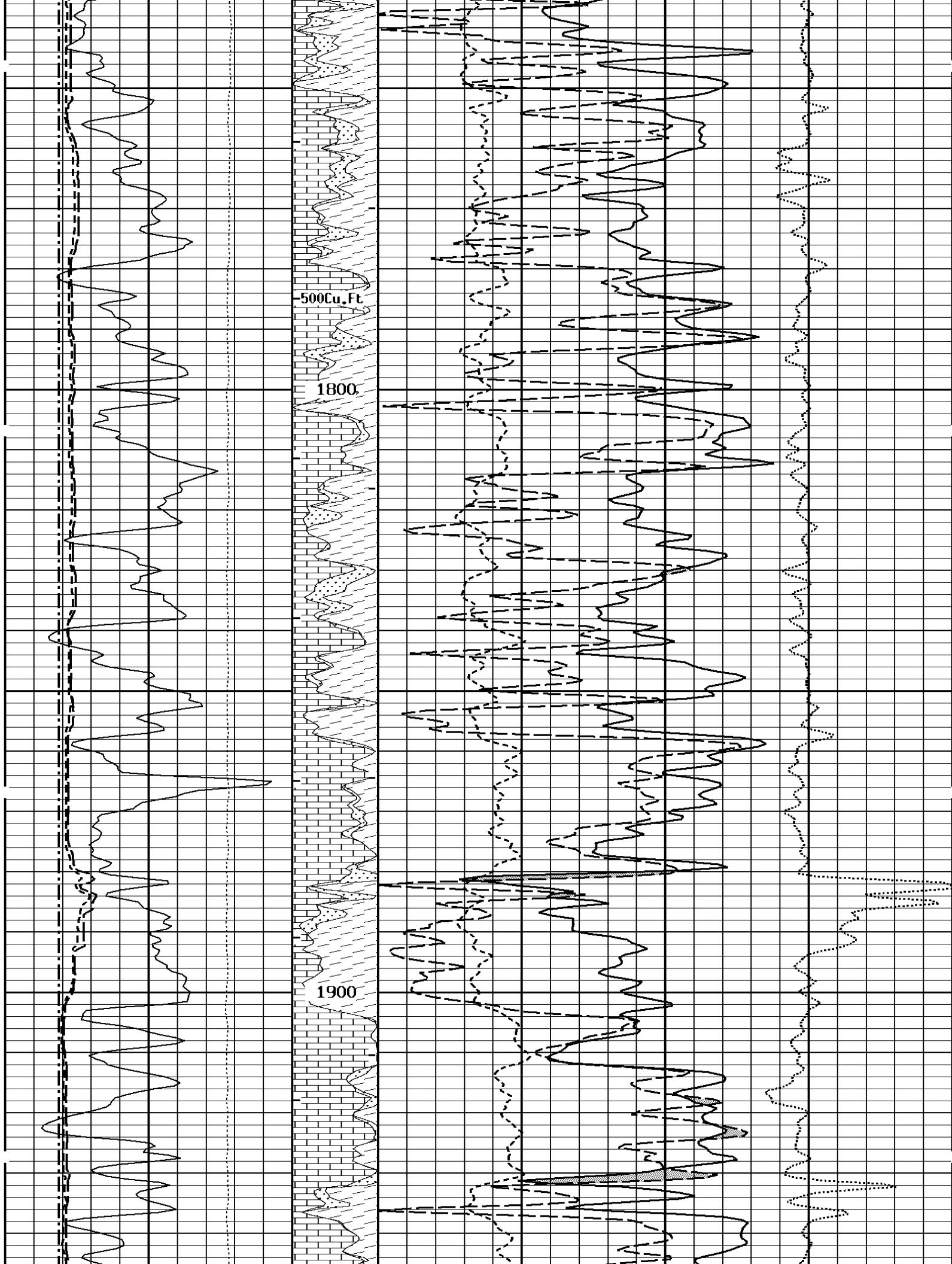
600Cu.Ft

1600

300Cu.Ft

1700

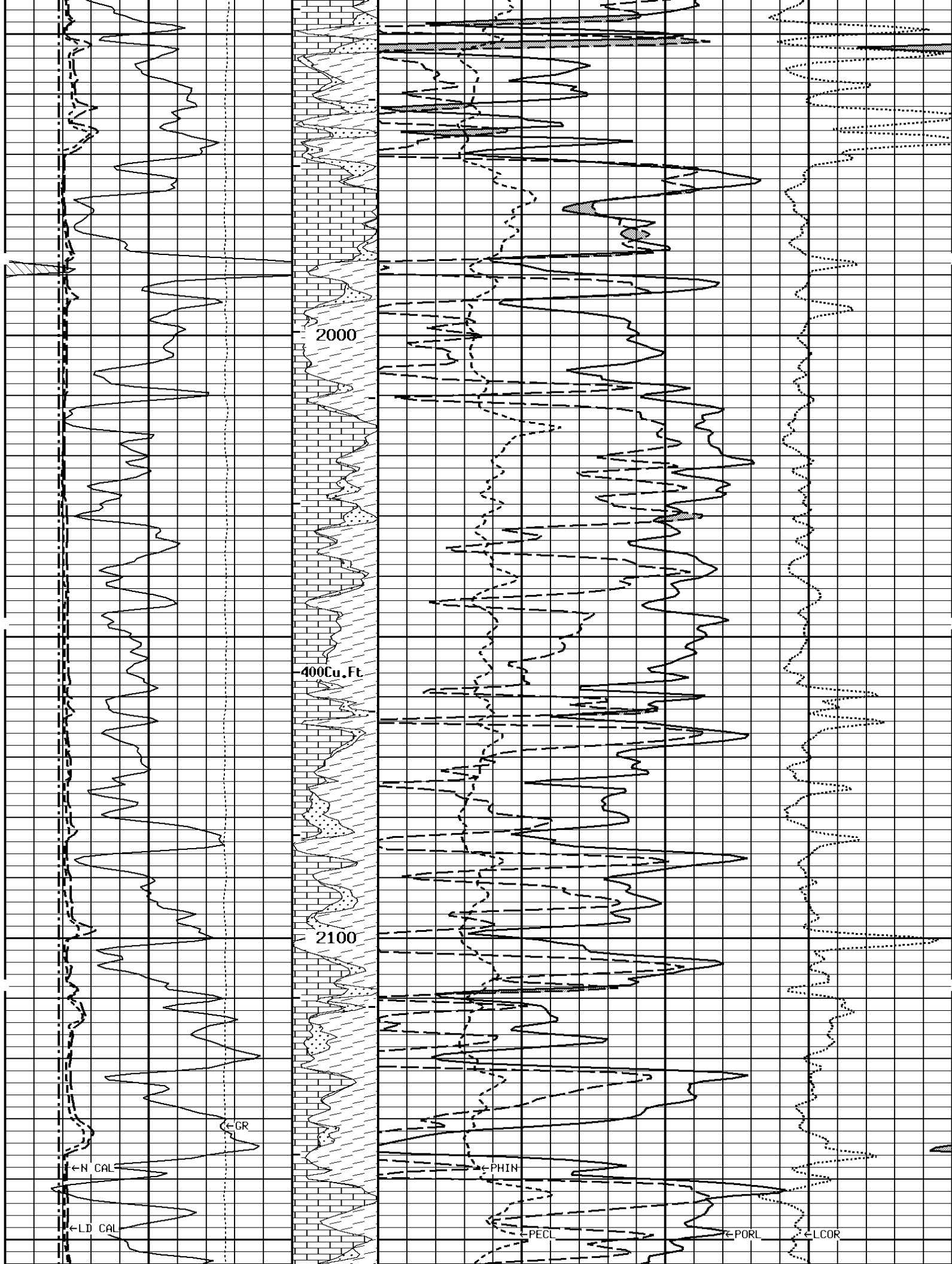


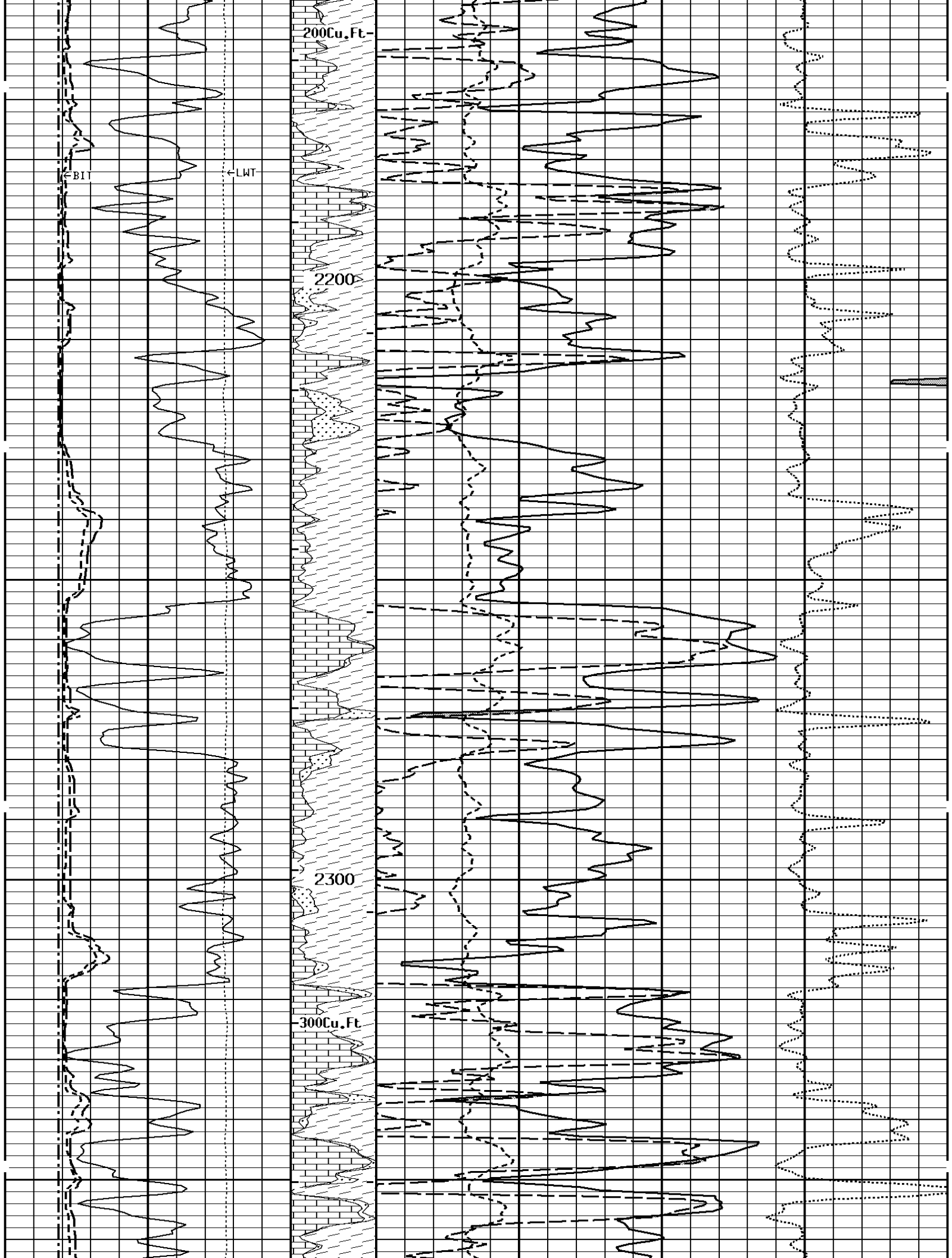


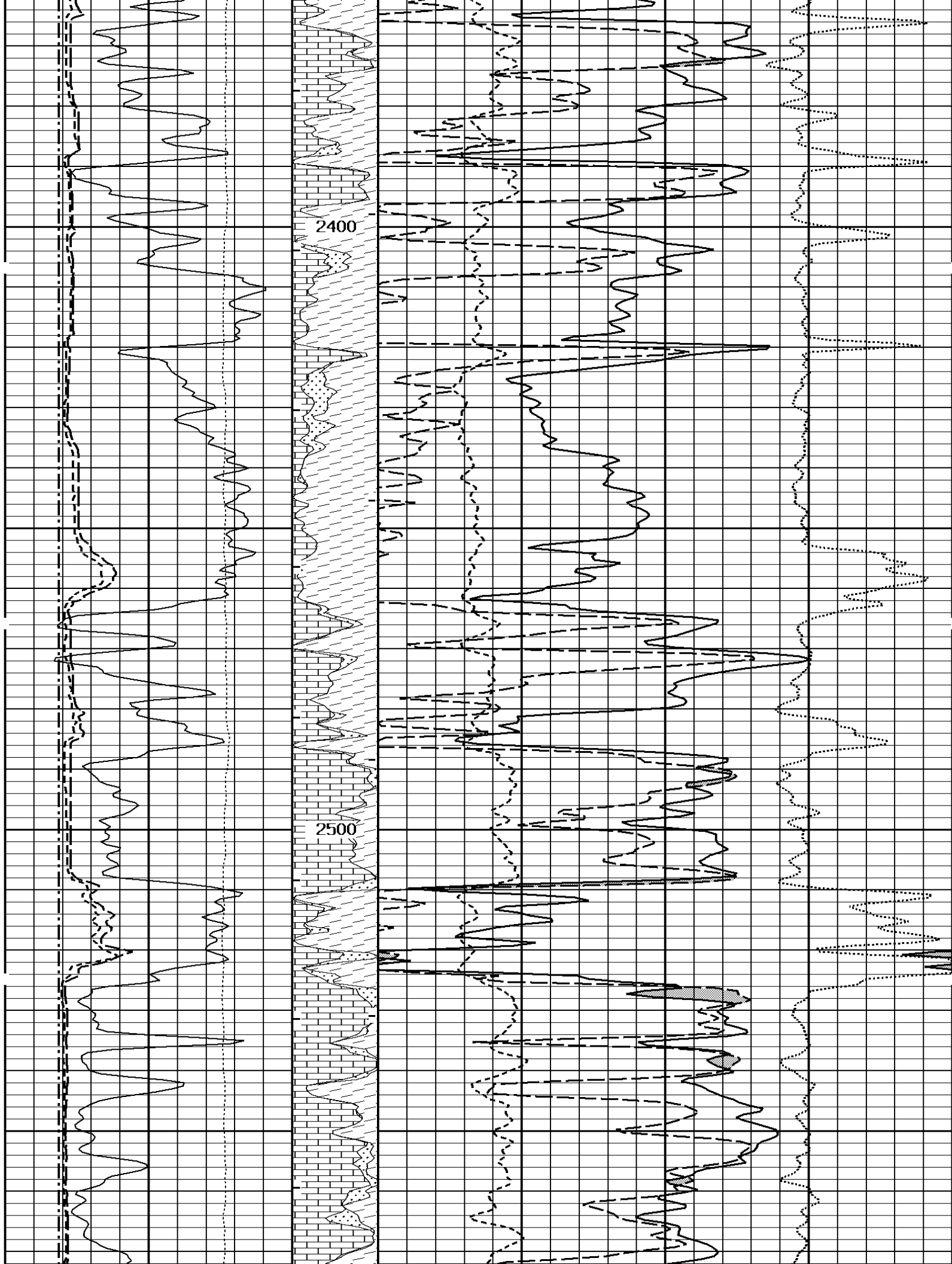
500Cu.Ft

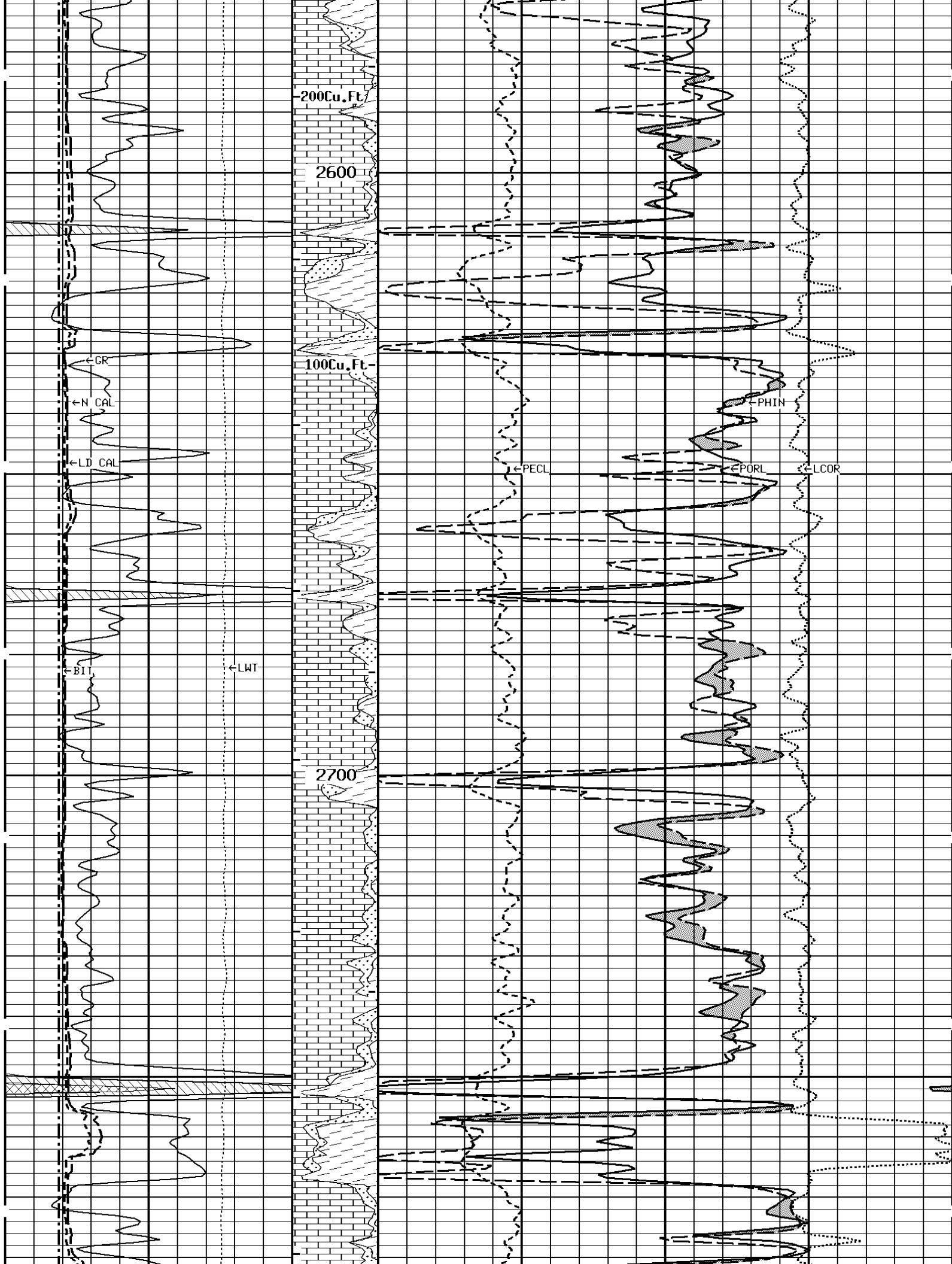
1800

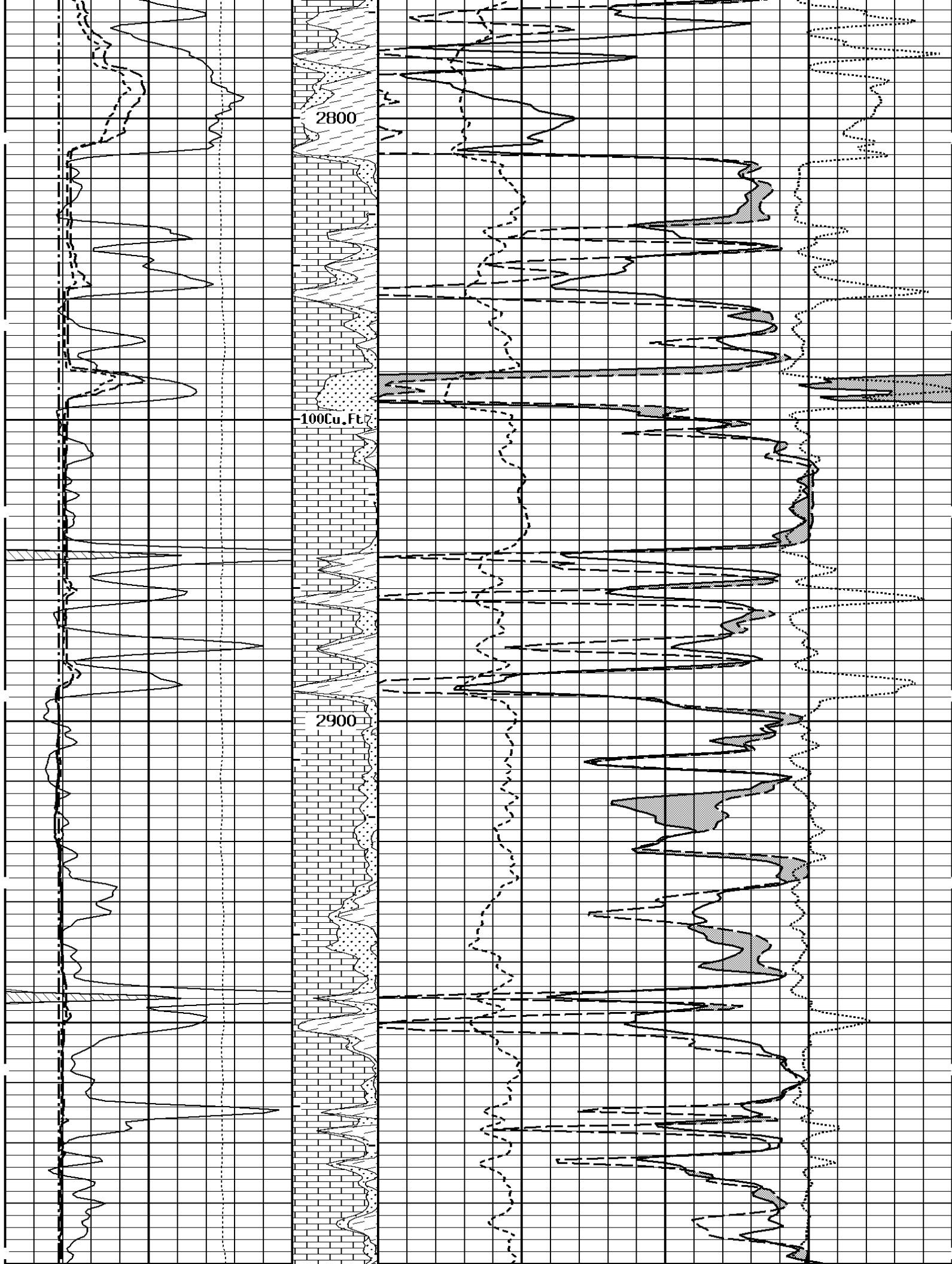
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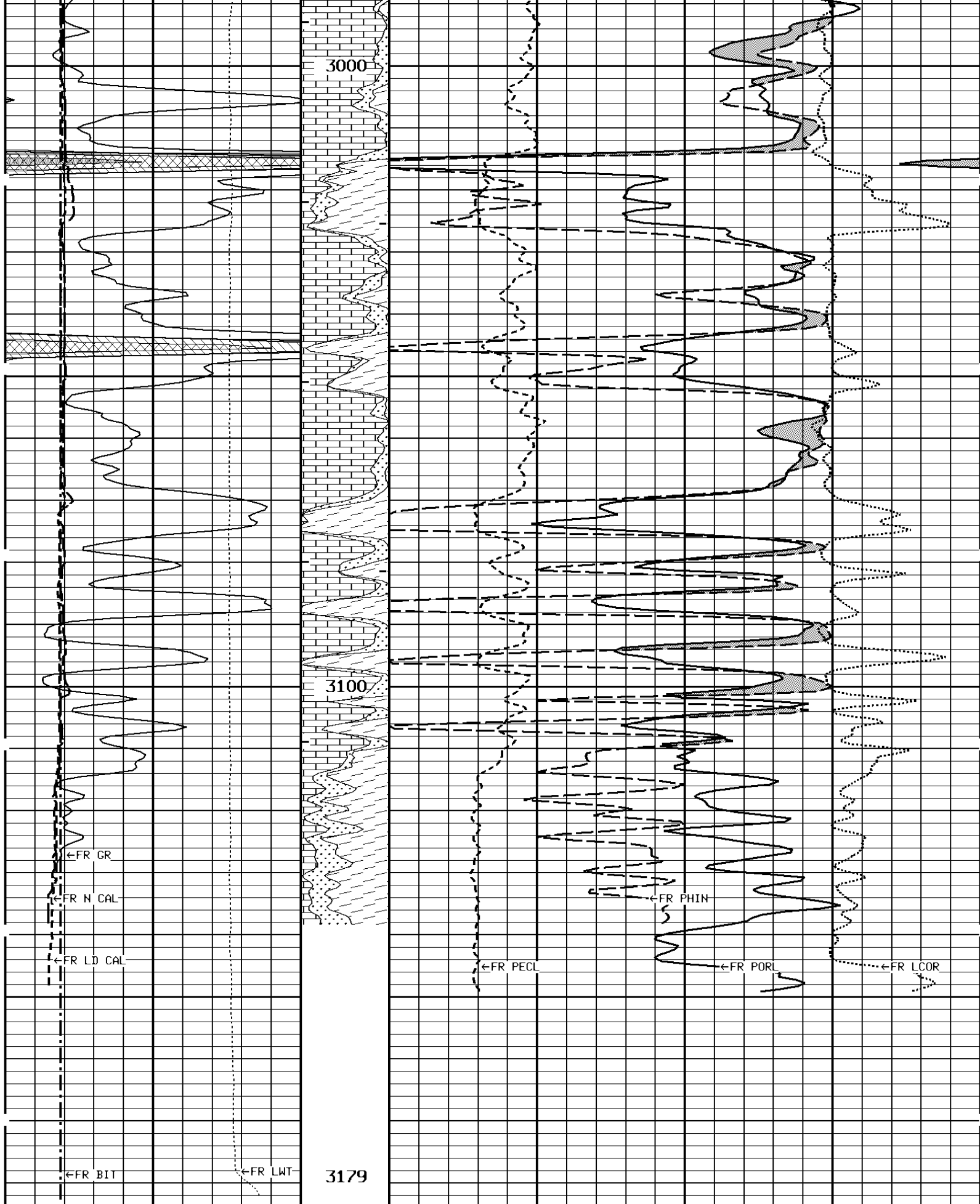







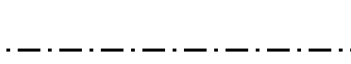
2800

100 Cu. Ft.

2900

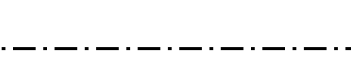
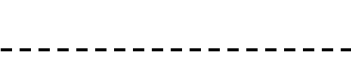


# 1:240 MAIN SECTION

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

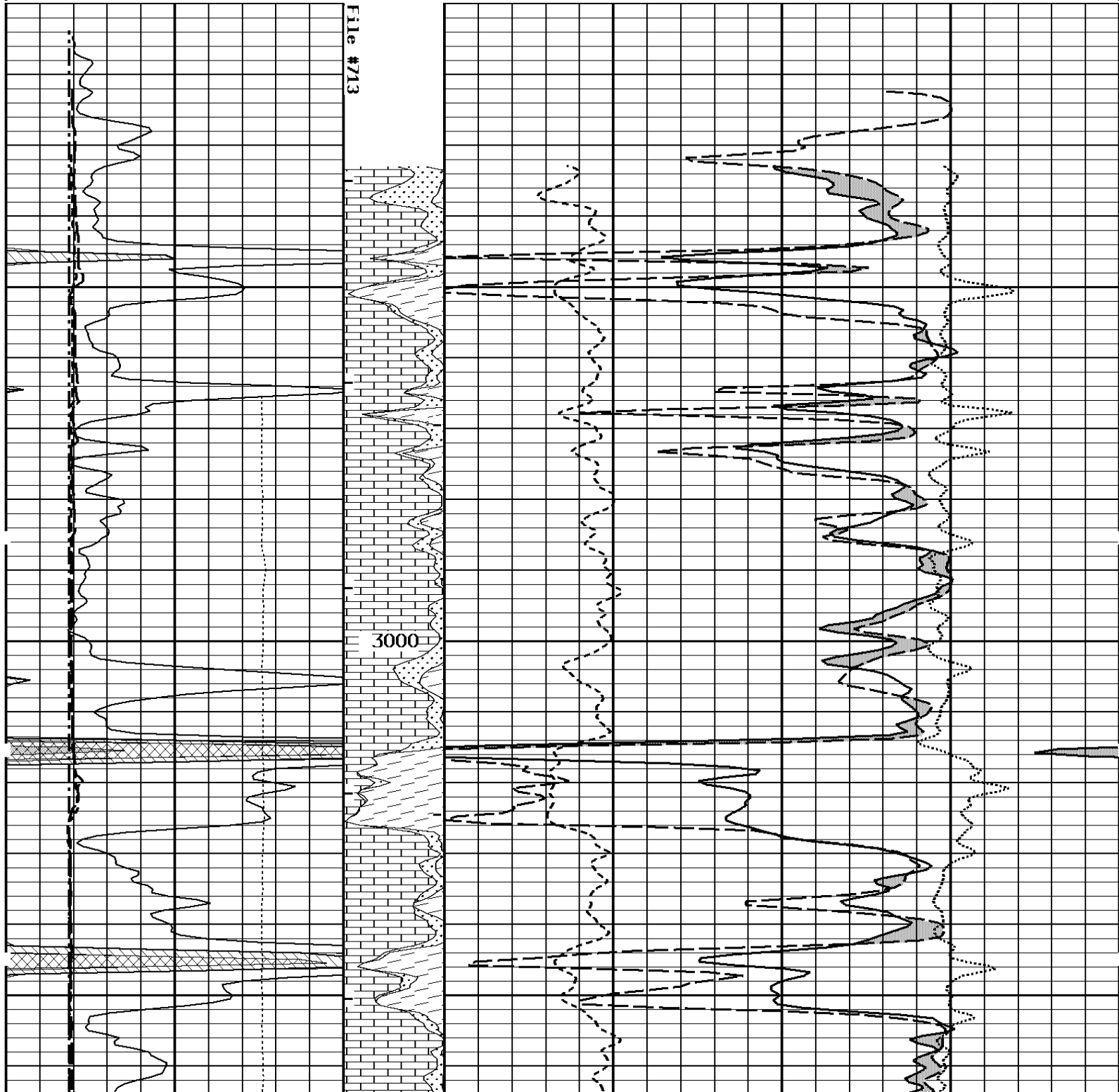
\* Borehole Zone Factors \*

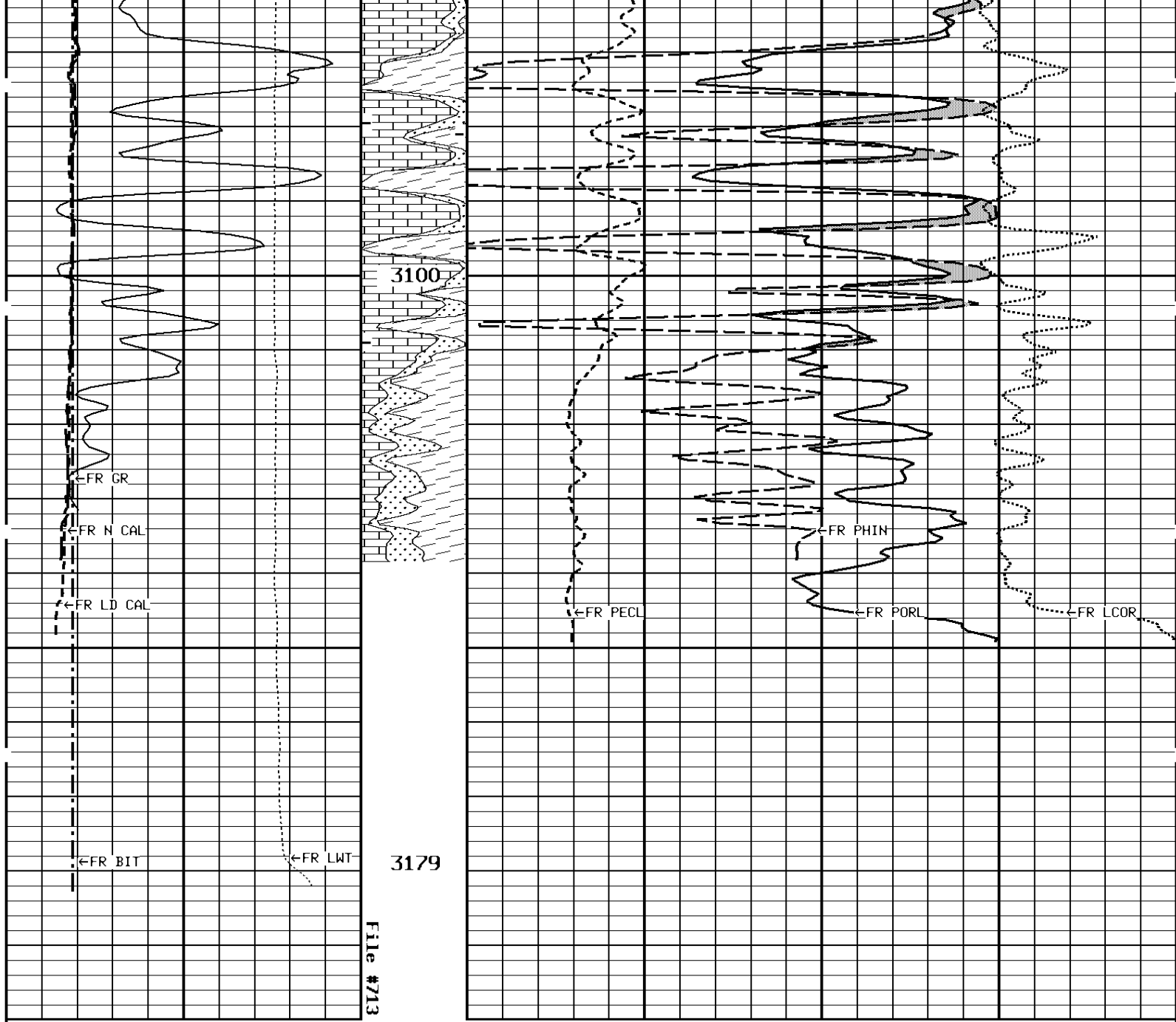
<b>Zone 1    99999.0    to    0.0    F</b>
Matrix Density_____ 2.71    G/C3 Fluid Density_____ 1.00    G/C3 Formation Matrix_____ Limestone Drill Bit Size_____ 7.875    IN Production Casing Diameter_____ 5.500    IN Casing Correction (PHI N)_____ Disable

<b>TENSION LBS</b> 10000 0			
<b>BIT SIZE INCHES (IN)</b> 	<b>Volume Dolo/Shale</b>		
6	16		
<b>DENSITY (X) CALIPER INCHES (IN)</b> 	<b>Volume Quartz</b>	<b>PE CROSS-SECTION BARNS/ELECTRON</b>	<b>DENSITY CORRECTION G/CC</b>
16 6	26 16	0 10	-0.25 0.25
<b>NEUTRON (Y) CALIPER INCHES (IN)</b>	<b>Volume Calcite</b>	<b>NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)</b>	

16 6	INCHES (IN)	26 16	calcrete	30	PERCENT (LIMESTONE MATRIX)	-10
GAMMA RAY API UNITS		-BHV AHV- CU.FT		DENSITY POROSITY PERCENT (2.71 g/cc)		
150 0		300 150		70 30 -10		30 -10 -50

1:240 REPEAT SECTION





1:240 REPEAT SECTION

<b>GAMMA RAY</b> API UNITS 150 0 300 150		<b>-BHV AHV-</b> CU,FT 70 30 -10	<b>DENSITY POROSITY</b> PERCENT (2.71 g/cc) 30 -10 -50	
<b>NEUTRON (Y) CALIPER</b> INCHES (IN) 16 6 26 16		Volume Calcite 30	<b>NEUTRON POROSITY</b> PERCENT (LIMESTONE MATRIX) -10	
<b>DENSITY (X) CALIPER</b> INCHES (IN) 16 6 26 16		Volume Quartz 0	<b>PE CROSS-SECTION</b> BARNS/ELECTRON 10-0.25	<b>DENSITY CORRECTION</b> G/CC 0.25

BIT SIZE INCHES (IN)		Volume Dolo/Shale
6	16	
TENSION LBS		
10000	0	

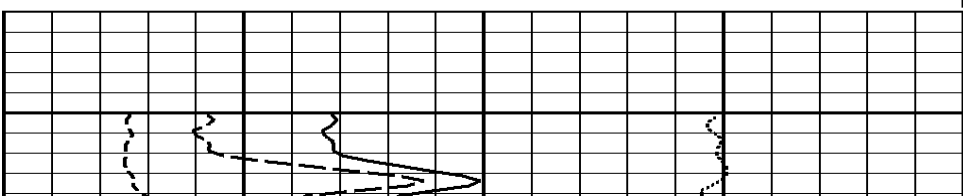
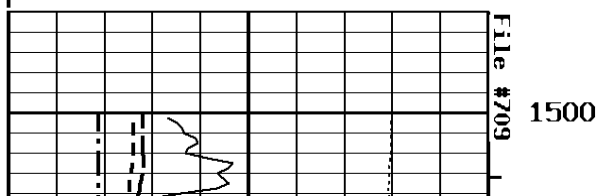
\* Borehole Zone Factors \*

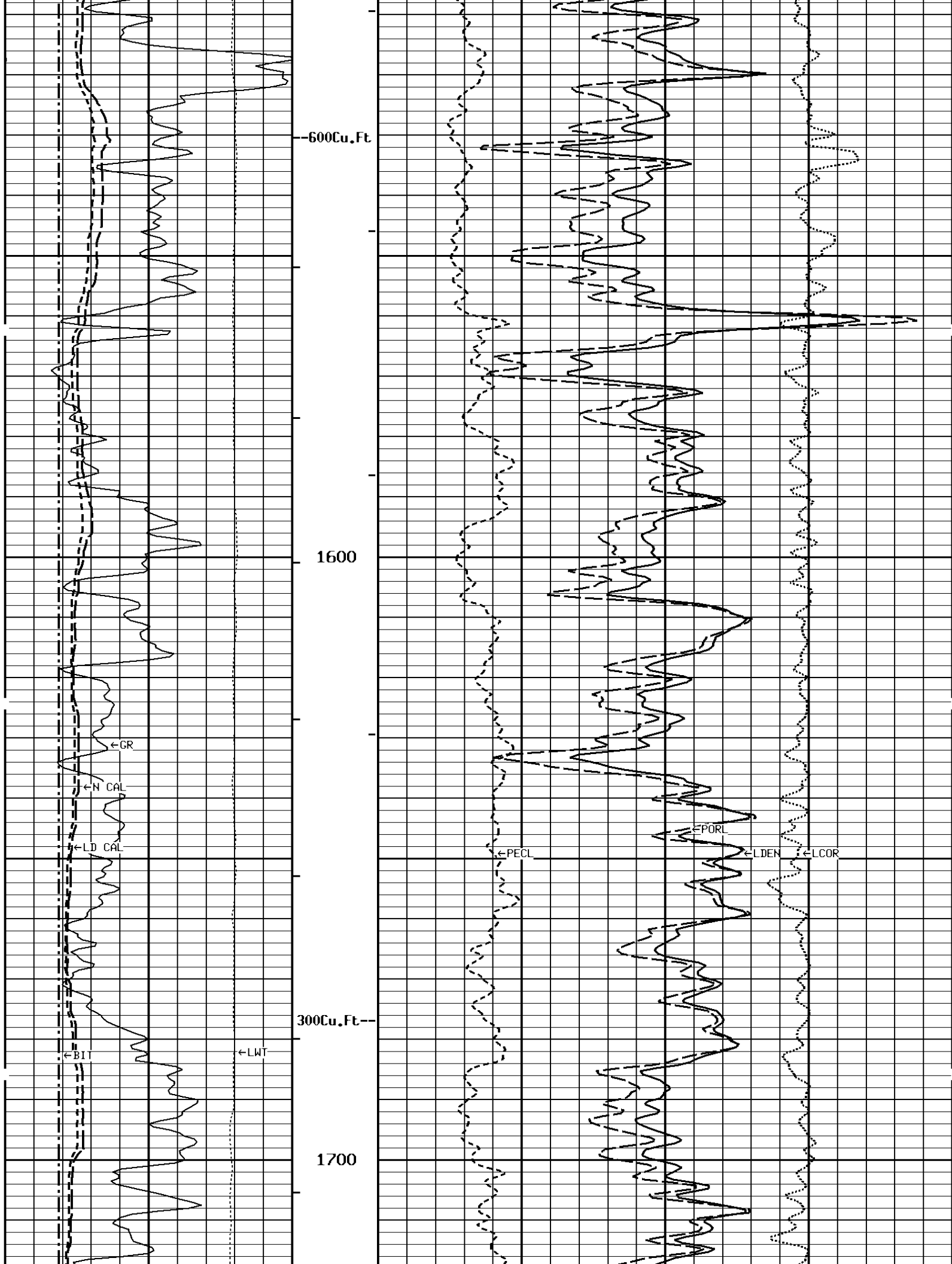
Zone 1 99999.0 to 0.0 F		
Matrix Density	2.71	G/C3
Fluid Density	1.00	G/C3
Formation Matrix	Limestone	
Drill Bit Size	7.875	IN
Production Casing Diameter	5.500	IN
Casing Correction (PHI N)	Disable	

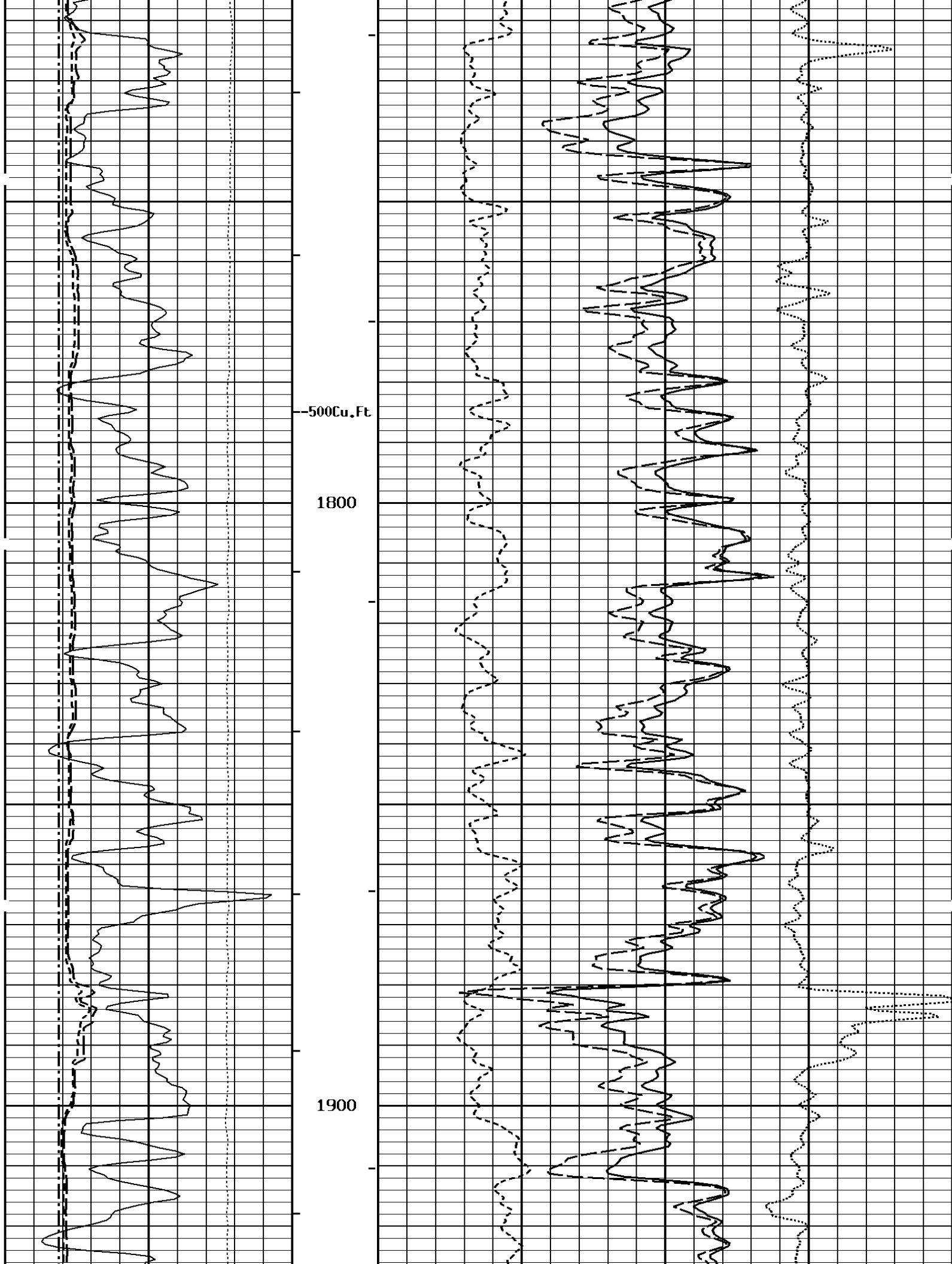
TENSION LBS	
10000	0
BIT SIZE INCHES (IN)	
6	16
DENSITY (X) CALIPER INCHES (IN)	
16	26
6	16
NEUTRON (Y) CALIPER INCHES (IN)	
16	26
6	16
GAMMA RAY API UNITS	
150	300
0	150

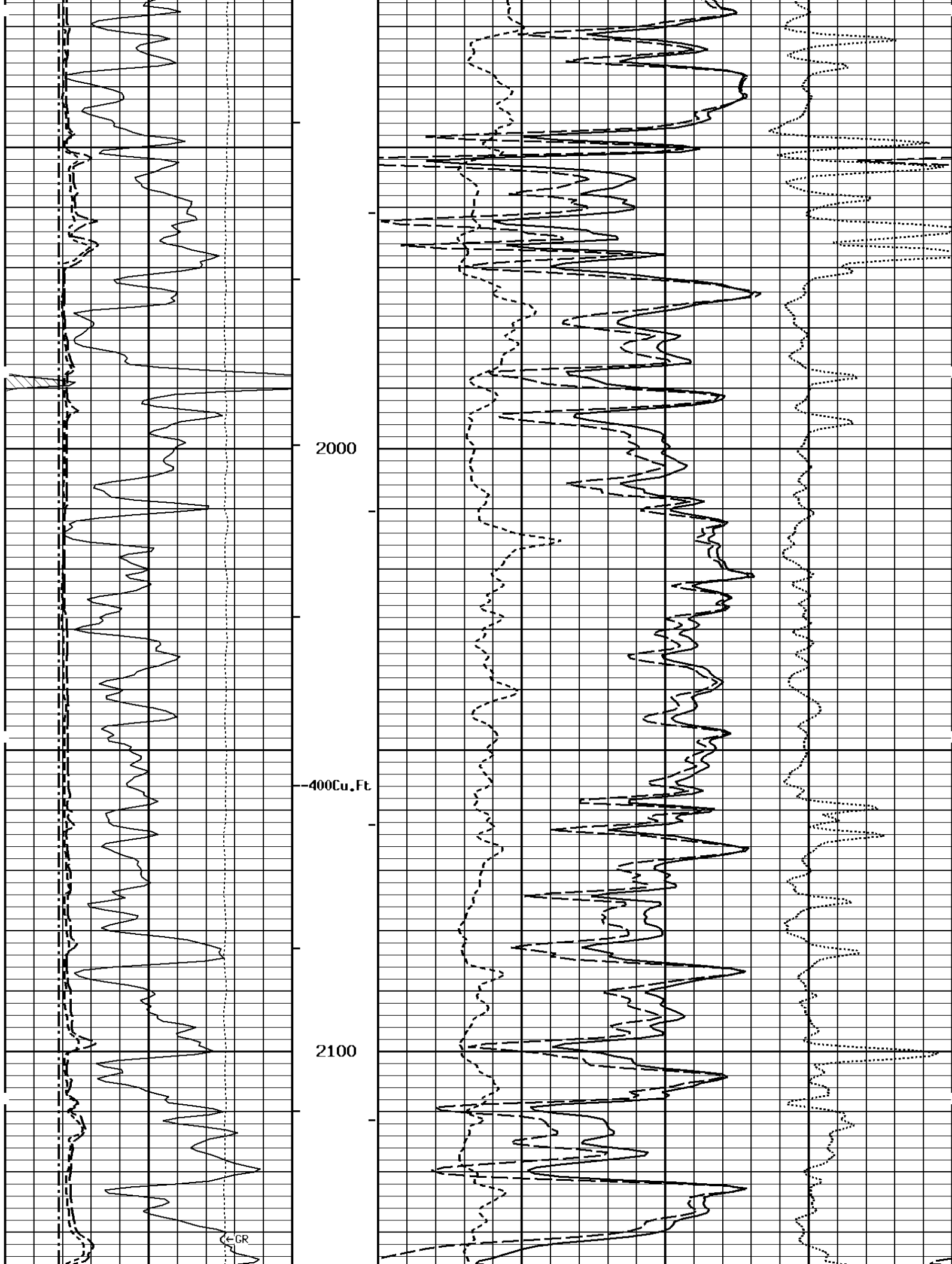
PE CROSS-SECTION BARN/SECTRON		DENSITY CORRECTION G/CC	
0	10	-0.25	0.25
DENSITY POROSITY PERCENT (2.71 g/cc)			
70			30
30			-10
-10			-50
COMPENSATED BULK DENSITY G/CC			
3.0			4.0
2.0			3.0
1.0			2.0

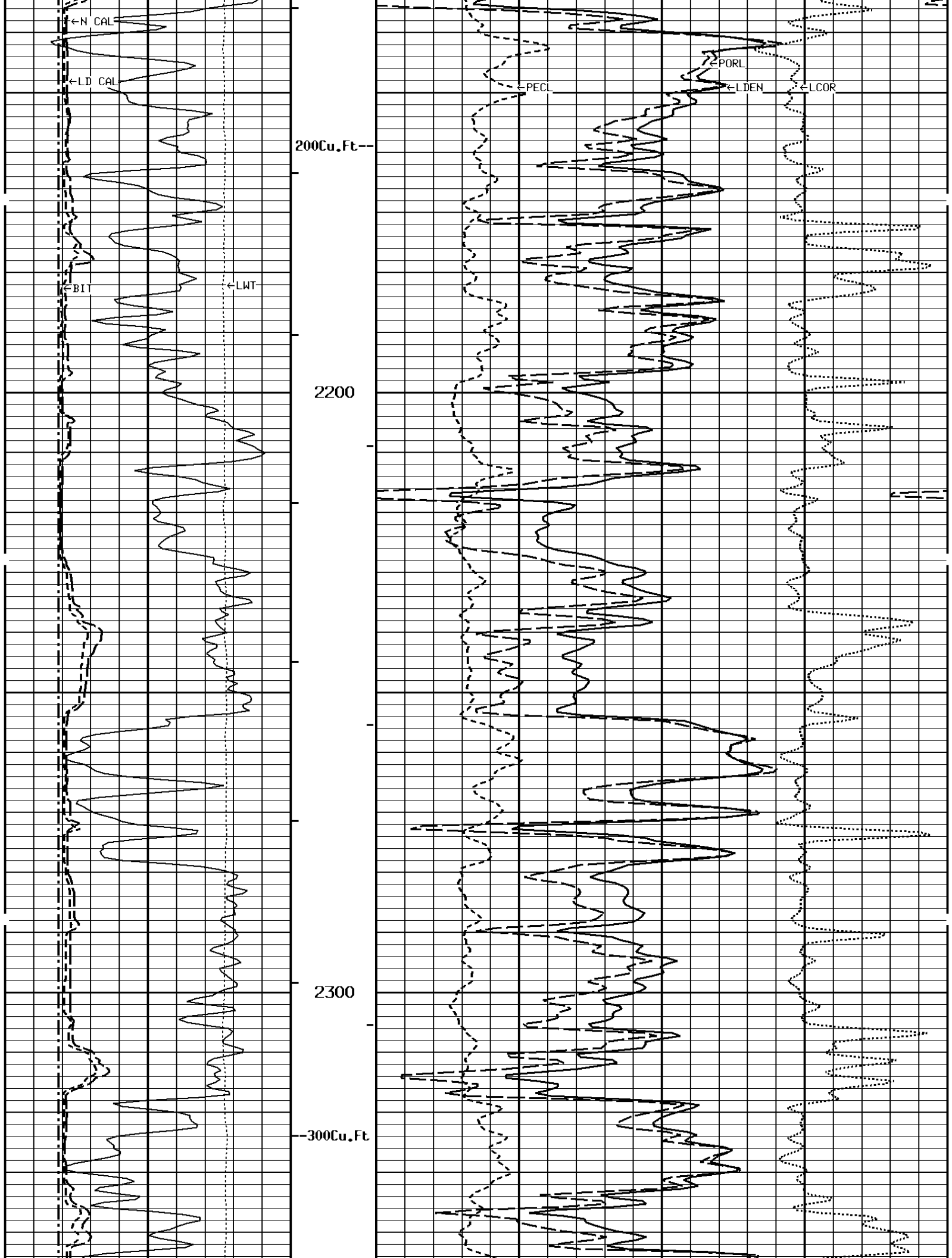
1:240 MAIN SECTION  
BULK DENSITY

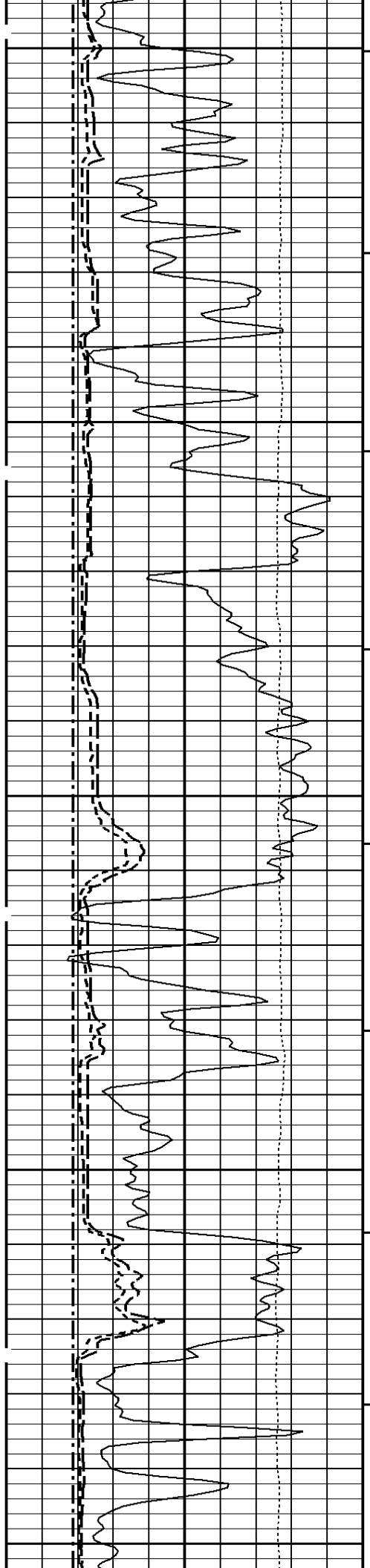






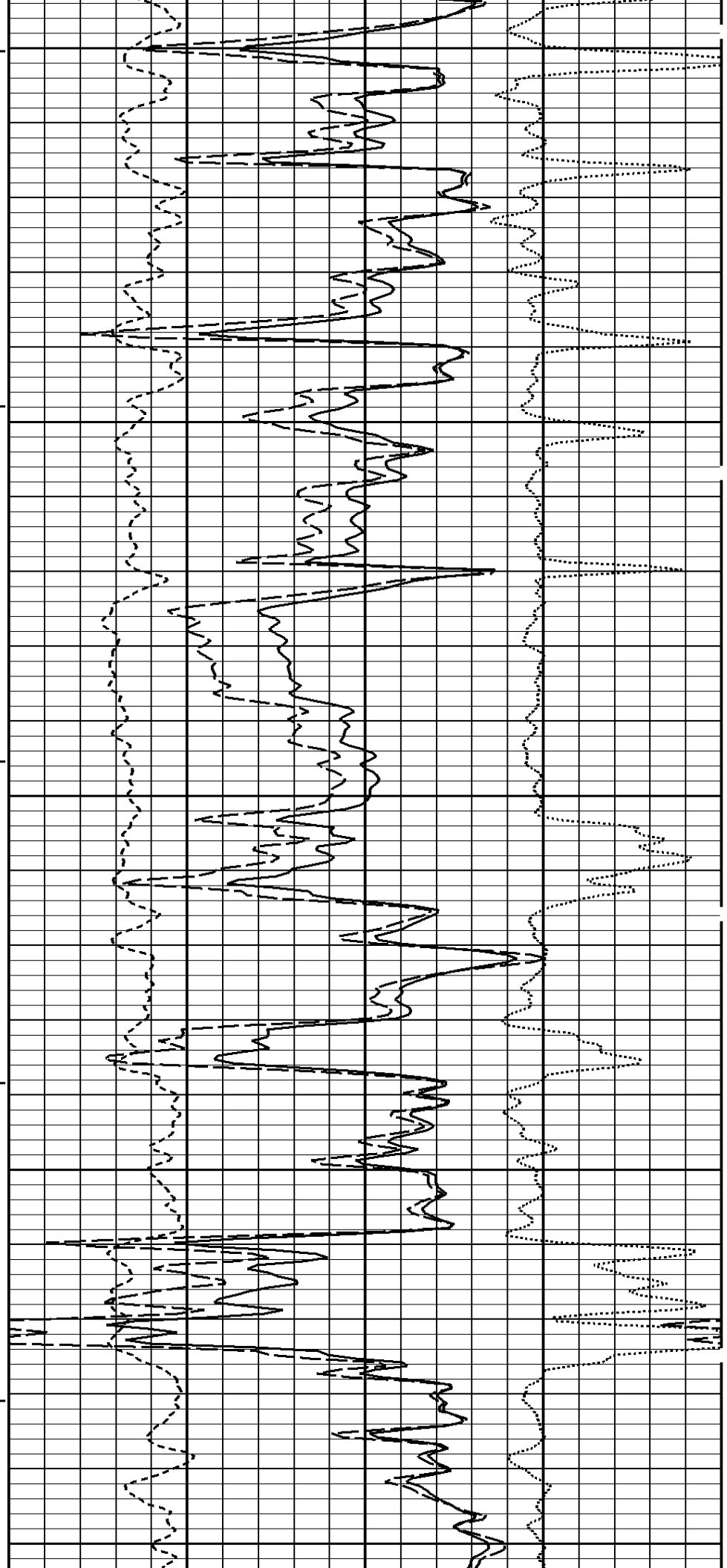


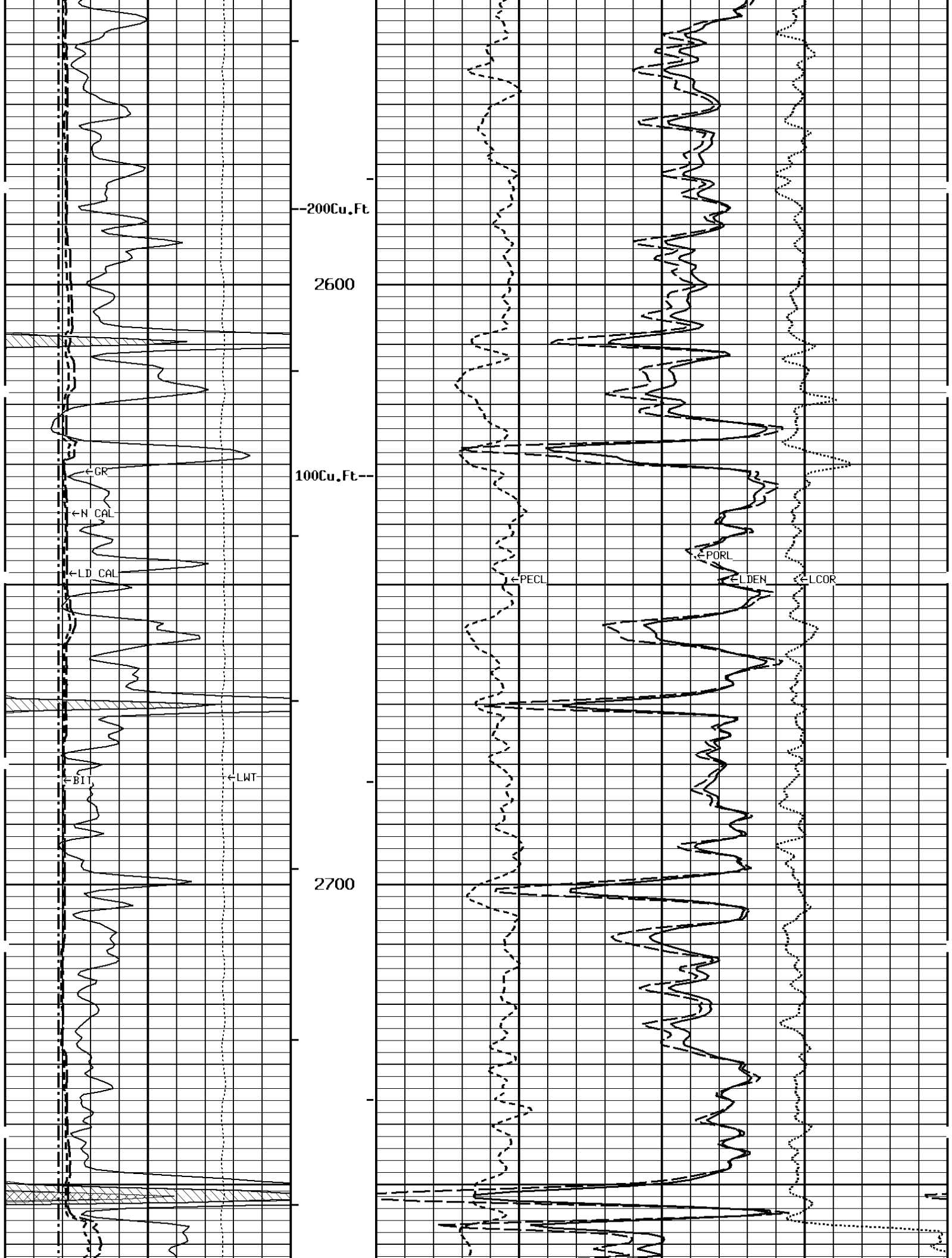


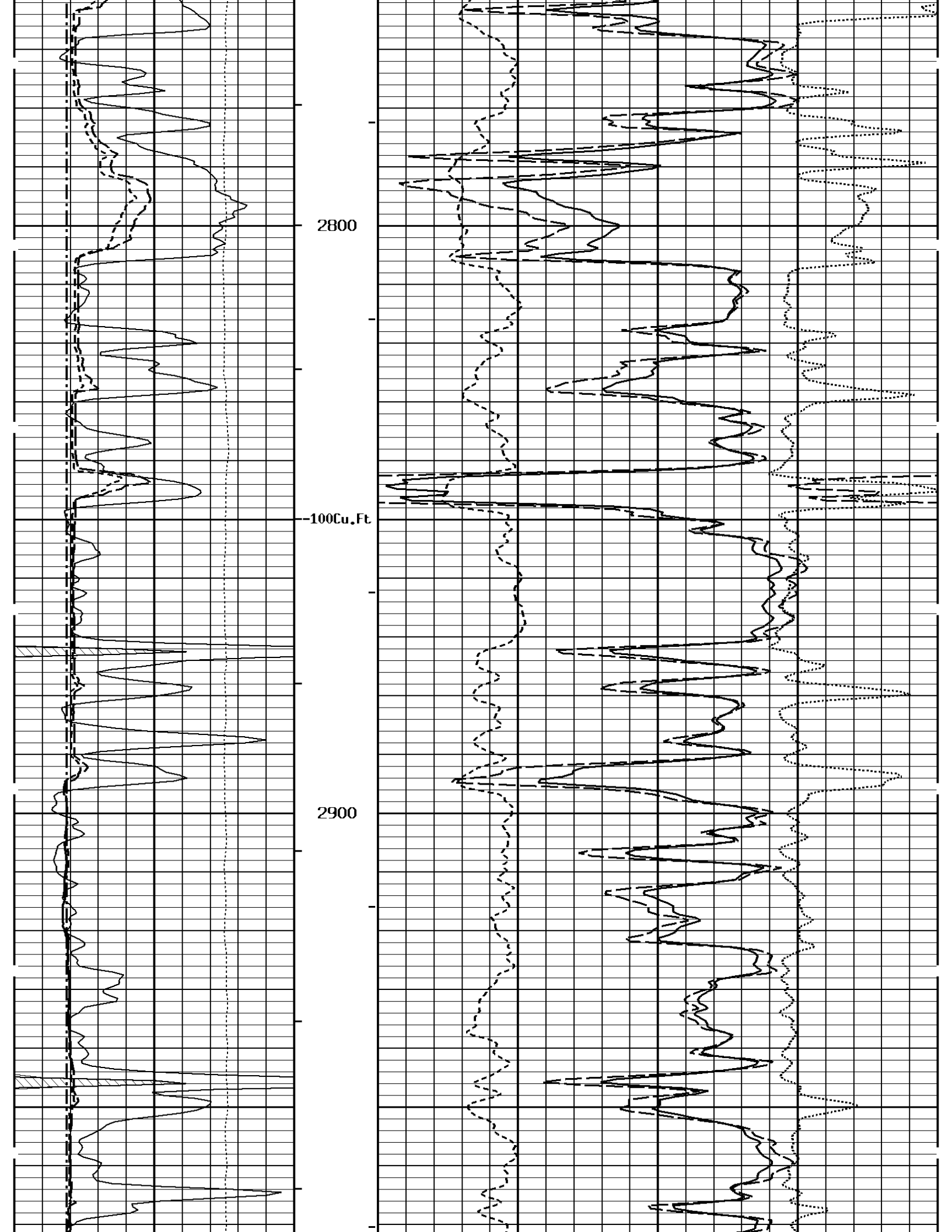


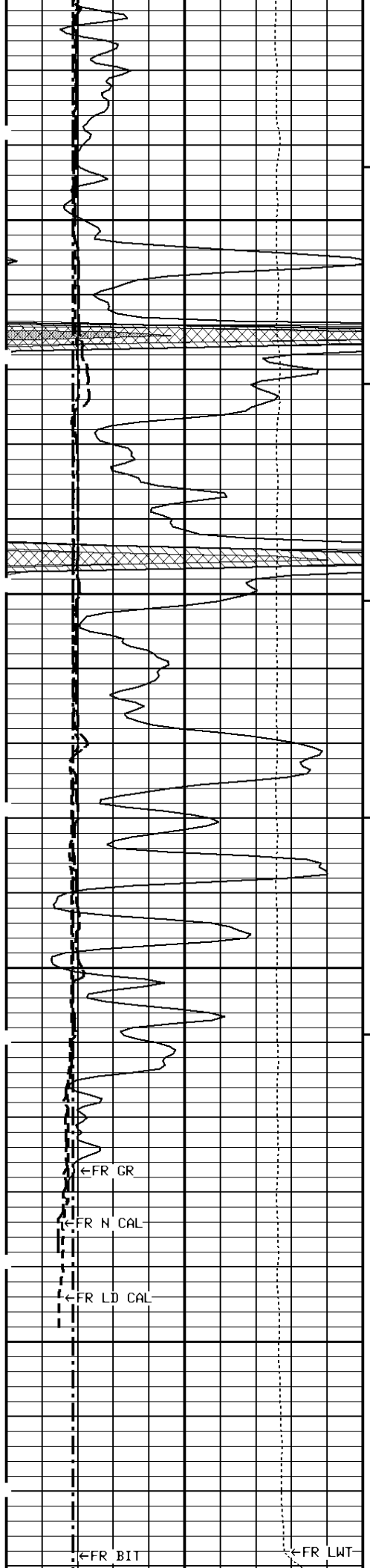
2400

2500





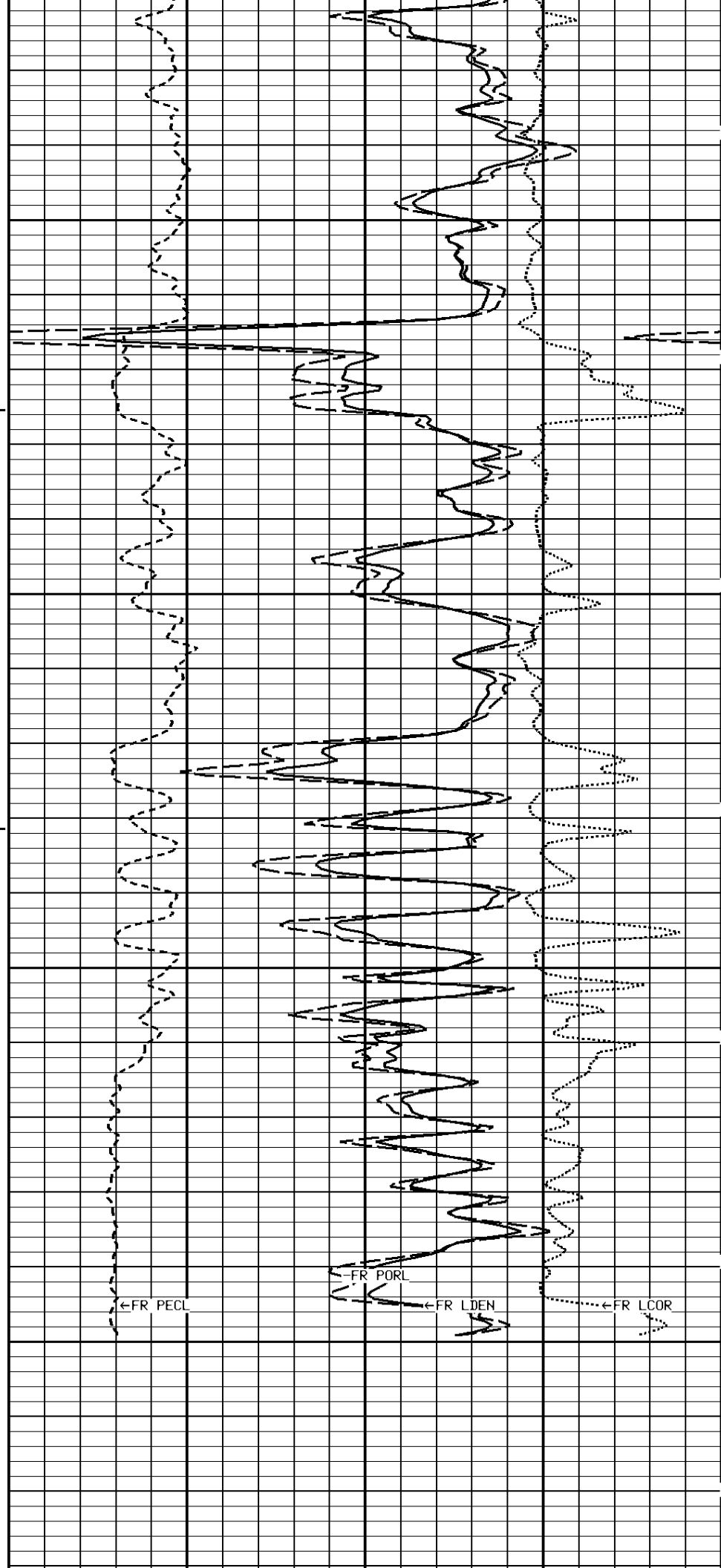




3000

3100

3179



←FR GR

←FR N CAL

←FR LD CAL

←FR BIT

←FR LWT

←FR PECL

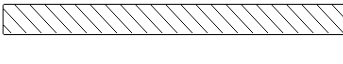
←FR PORL

←FR LDEN

←FR LCOR

File #709

1:240 MAIN SECTION  
BULK DENSITY

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

\* Borehole Zone Factors \*

Zone 1 99999.0 to 0.0 F		
Matrix Density_____	2.71	G/C3
Fluid Density_____	1.00	G/C3
Formation Matrix_____	Limestone	
Drill Bit Size_____	7.875	IN
Production Casing Diameter_____	5.500	IN
Casing Correction (PHI N)_____	Disable	

\* Calibration Summary \*

<b>Shop Calibration</b>				
GRTB				
Performed : 21-Aug-2009		Time : 15:26		
Sensor Suite : GR-GR5		ID : GRT-BA-14		
	Measured	Units	Calibrated	Units
	Background	Jig	Jig	
GR	49	347	175	GRAPI
		CPS		

**Shop Calibration  
CNT**

Performed : 26-Aug-2010                      Time : 10:32  
 Sensor Suite : BHC NEUT                      ID : CNP-AA-116  
 Source ID : N-1044

	Tank		Verification		Units
	Measured	Calibrated	Jig		
N/F	3.8824	3.6889	3.6916		
Porosity	23.6	20.5	20.5		%

Performed : 07-MAR-2010                      Time : 09:04  
 Sensor Suite : CALI-BCN                      ID : CNP-AA-116

CL # 1	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
	8.2	14.2	6.0	12.0	IN.

**Shop Calibration  
LDTNG**

Performed : 14-APR-2009                      Time : 14:57  
 Sensor Suite : CALIPEL                      ID : LDP-NG-02

CL # 1	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
	6.2	12.2	6.0	12.0	IN.

Performed : 02-Sep-2010                      Time : 10:41  
 Sensor Suite : BHCPELNG                      ID : LDP-NG-02  
 Source ID : CSV-587

	Short Space				Units
	BKGD	Al	Mg	Al+Fe	
LSW1	70	487	788	328	CPS
LSW2	73	579	915	419	CPS
LSW3	283	1424	2236	1218	CPS
LSW4	362	1356	1872	1207	CPS
LSW5	36	44	46	43	CPS
LSW6	95	96	96	95	CPS
LSW7	60	61	59	61	CPS
LSW8	2	3	3	3	CPS
QS	0.226	0.223	0.239	0.218	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

	Long Space				Units
	BKGD	Al	Mg	Al+Fe	
LLW1	110	657	2747	420	CPS
LLW2	122	1071	4344	788	CPS
LLW3	457	2034	7421	1767	CPS
LLW4	588	1191	3019	1108	CPS
LLW5	65	69	85	68	CPS
LLW6	194	189	182	189	CPS
LLW7	118	120	112	119	CPS
LLW8	4	5	10	5	CPS
QL	0.244	0.223	0.238	0.227	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC