STEP energy services

COMPENSATED NEUTRON

PEL DENSITY MICRO LOG

File No	TUL-70312
Company	VAL ENERGY, INC.
Well	GARISON #1-25
Field	NA
County	COWLEY
State	KANSAS
Country	USA
API No	15-035-24705-0000

Location :
660' FNL & 660' FEL
NE NE

LSD : **Sect :** 25 **Twp :** 33S **Rge :** 5E

Permanent Datum:	GL	**Elevations:**		**Services:**	
Drilling Measured From:	KB	**KB**	1322.00 Ft	CNT	PIT
Log Measured From:	KB	**DF**	1321.00 Ft	LDT	
Above Permanent Datum:	9.00 Ft	**GL**	1313.00 Ft	MLT	

Date	06-26-2019						
Run Number	1						
Depth--Driller	3535.0	Ft					
Depth--Logger	3535.0	Ft					
First Reading	3503.0	Ft					
Last Reading	222.0	Ft					
Casing--Driller	222.0	Ft					
Casing--Logger	222.0	Ft					
Bit Size	7.875	In					
Casing Size	8.625	In					
Hole Fluid Type	WBM						
Density	9.4						
Fluid Loss	10.8						
PH/Viscosity	9.5	44.0					
Sample Source	MEASURED						
RM@Measured Temp.	2.000 @ 70 F						
RMF@Measured Temp	1.600 @ 70 F						
RMC@Measured Temp.	2.400 @ 70 F						
Source RMF/RMC	CALCULATED	CALCULATED					
RM@BHT	1.320 @ 110 F						
Time Circulation Stopped	06-26-2019 06:15						
Max Recorded Temp.	110 F						
Equipment/Base	1022	TULSA, OK					
Recorded By	SHELDON TYLER						
Witnessed By	JOE BAKER						

Company VAL ENERGY, INC.
Well GARISON #1-25
Field NA
County COWLEY
State KANSAS
Country USA
API No. 15-035-24705-0000

Bitsize Intervals

Size (In)	Bottom (Ft)
7.875	3535.00

Casing Strings

Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
8.625	32.00	222.00	0.00

Run Number	1
Date	06-26-2019
Date/Time On Bottom	06-26-2019 09:15
Depth to Fluid	0.0 Ft
Salinity	1100.000
RMF@BHT	1.060 @ 110 F
RMC@BHT	1.580 @ 110 F

Run Number 1

Comments

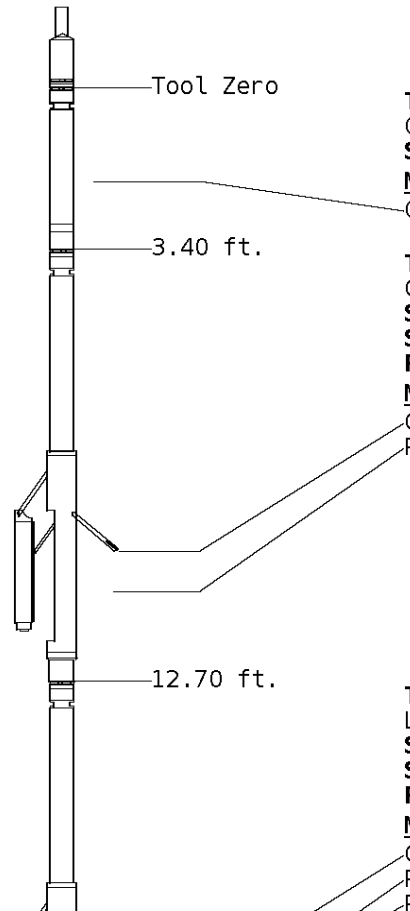
ALL PRESENTATIONS AS PER CUSTOMER REQUEST
GRT, CNT, LDT, MLT AND PIT RUN IN COMBINATION
CALIPERS ORIENTED ON X-Y AXIS
2.71 G/CC USED TO CALCULATE POROSITY
ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING
PHIN IS CALIPER CORRECTED

GRT: GRP, GRX
CNT: PHIN, CLCNIN, PHXN
LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN, PRXL, PECLX, LDENNX, LCORX
MLT: NOR_RF, INV_RF, MSCLPIN
PIT: ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS:
B.BROWN
K.WARREN

Tool String Schematic

Total Tool Length - 53.15 **ft.**
Maximum Outside diameter - 6.00 **in.**
Net Weight in Air - 943.00 **lbs.**



Tool: GRT-B **Length:** 3.40 **ft.** **O.D.** 3.60 **in.**
Gamma Ray Controller
Sonde ID :GRT-BB-006

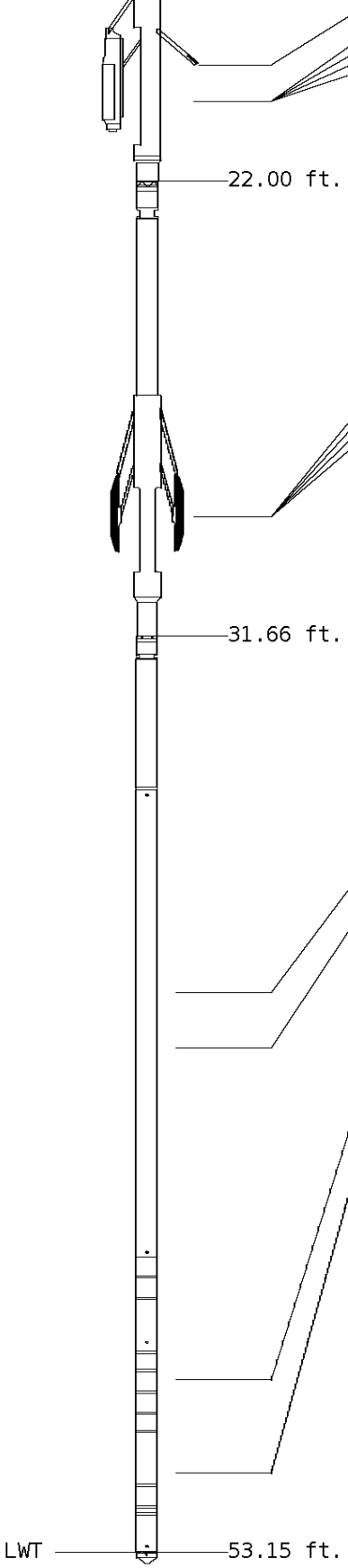
Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	51.15

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	43.75
PHIN	6.80	10.20	42.95

Tool: LDT-DA **Length:** 9.30 **ft.** **O.D.** 4.80 **in.**
Litho Density D Pad on NDT-A
Sonde ID :NDT-AE-003
Source ID :63558B
Pad ID :LDP-DA-50

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.00	18.70	34.45
PEL	7.00	19.70	33.45
PES	7.40	20.10	33.05



Measure Point	Tool Offset	Stack Offset	Bottom Offset
LDEN	7.20	19.90	33.25
LCOR	7.20	19.90	33.25

Tool: MST-DA **Length:** 9.66 **ft.** **O.D.** 6.00 **in.**
Micro Spherically Focused (IC)
Sonde ID :MST-DA-024

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	29.60	23.55
MSCLP	7.60	29.60	23.55
INV	7.60	29.60	23.55
NOR	7.60	29.60	23.55

Tool: PIT-CA **Length:** 21.49 **ft.** **O.D.** 3.62 **in.**
Phased Dual Induction w/ RM & D
Sonde ID :PIT-CA-069

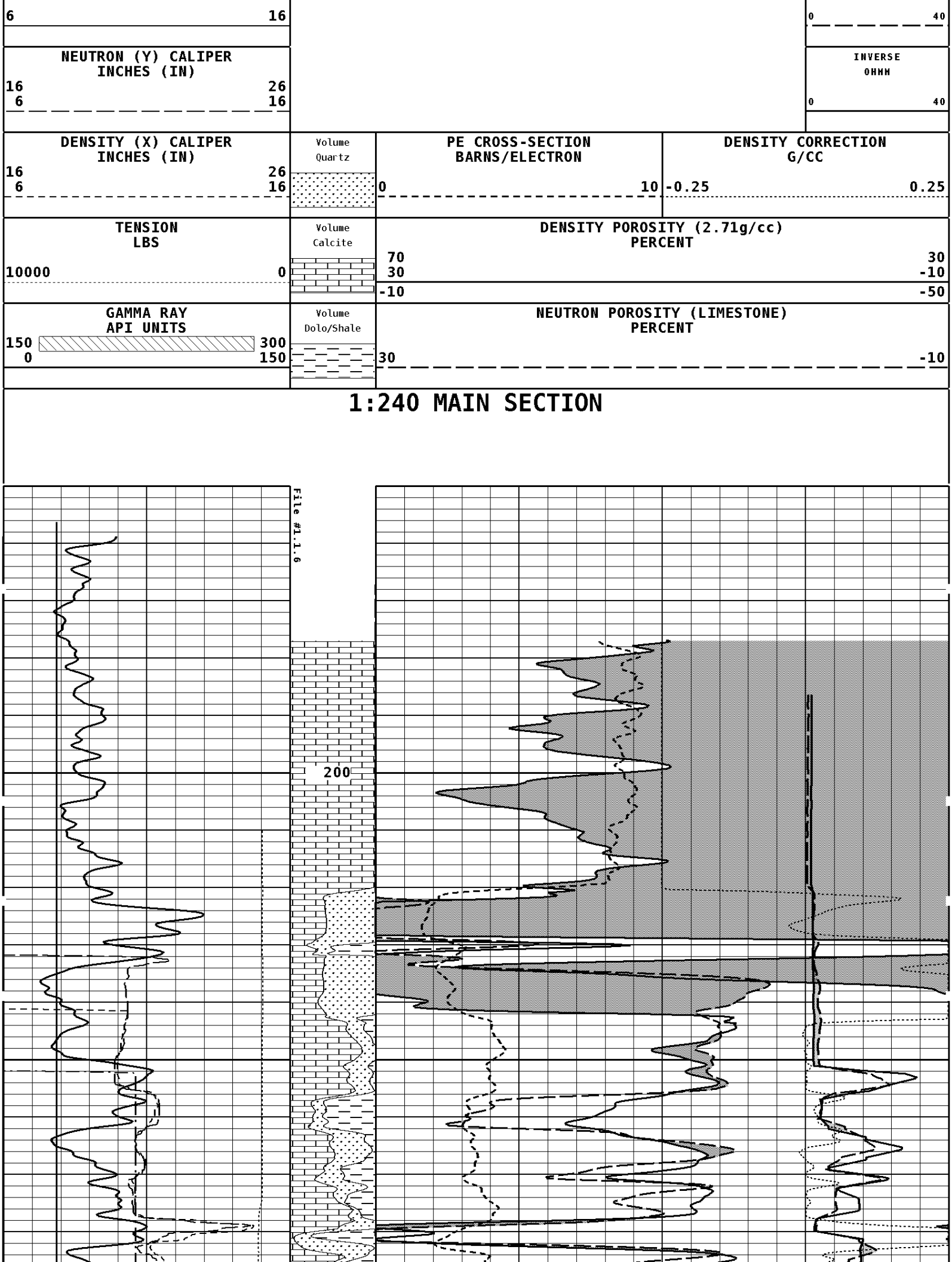
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	40.58	12.56
ILM	10.10	41.76	11.39
SFLU	17.49	49.15	4.00
SP	20.60	52.26	0.88

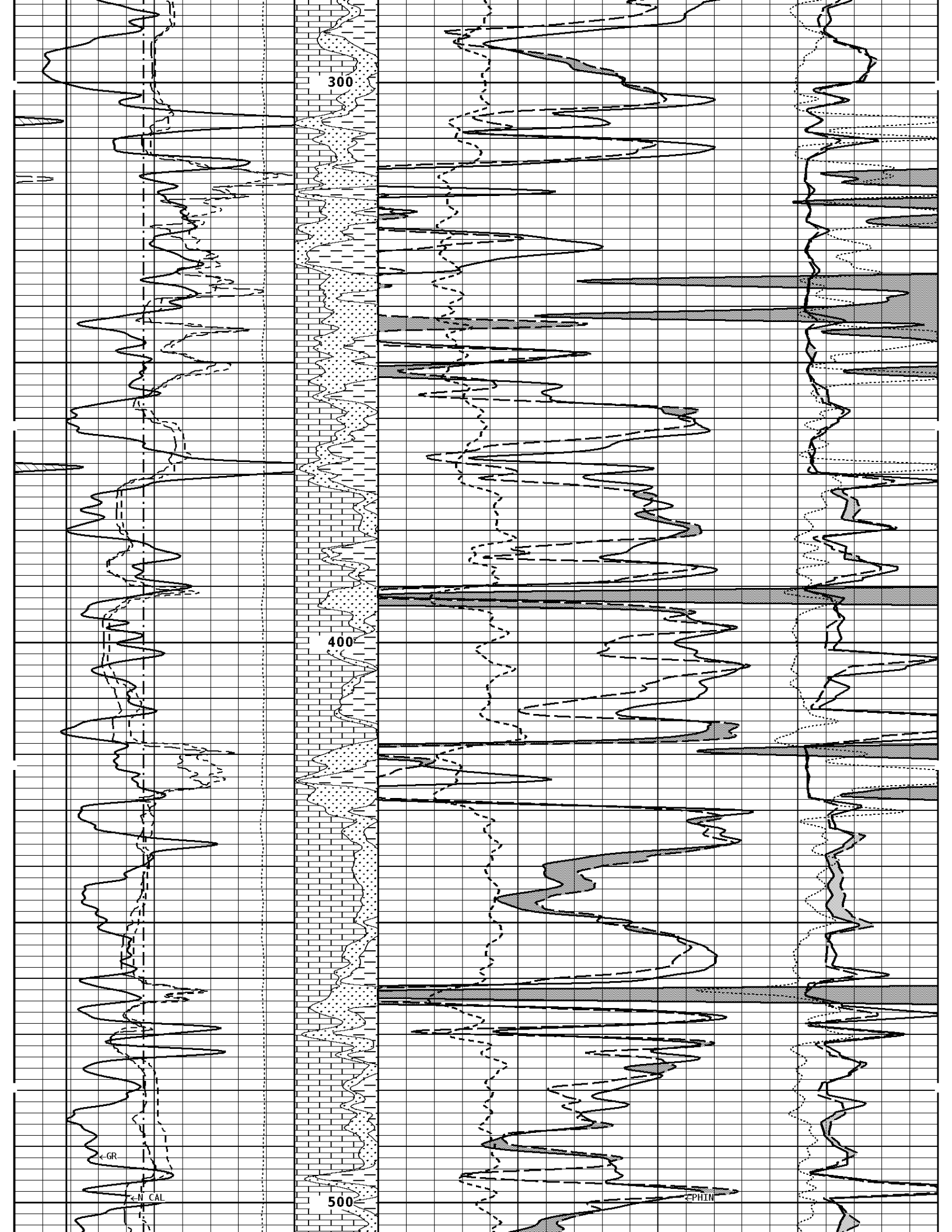
Well File: VAL_ENERGY_GARISON_1-25_JUNE26_MSTK **Scale:** 1:240 **Format:** NLD-240
Segment: V1.D1.S6 Reprocess of MAIN **Acquired:** 2019-06-26 09:23 3.4.1-13968
Reference: 0 **Processed:** 2019-06-26 10:22 3.4.1-13968

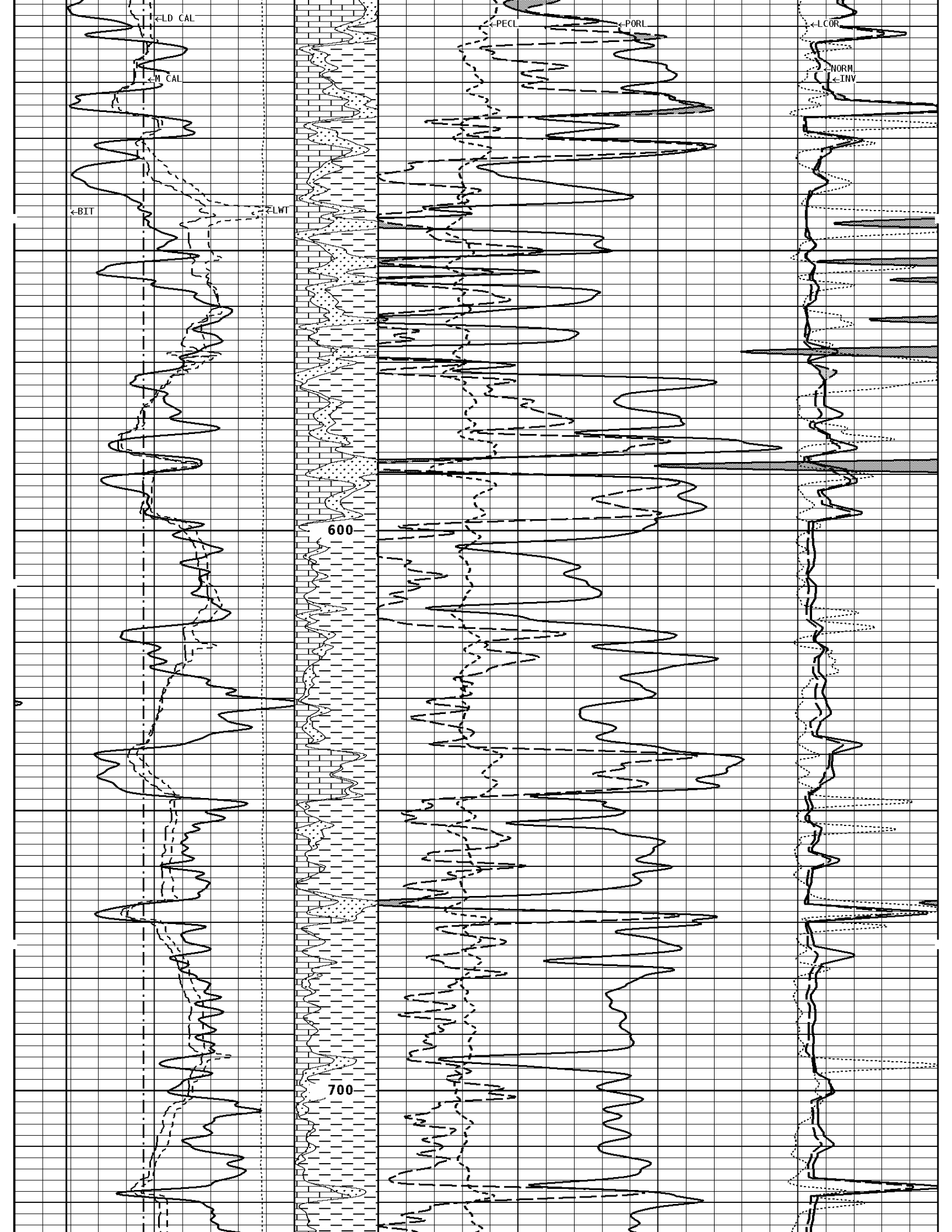
CALIPER MICRO
INCHES (IN)
16 **26**
6 **16**

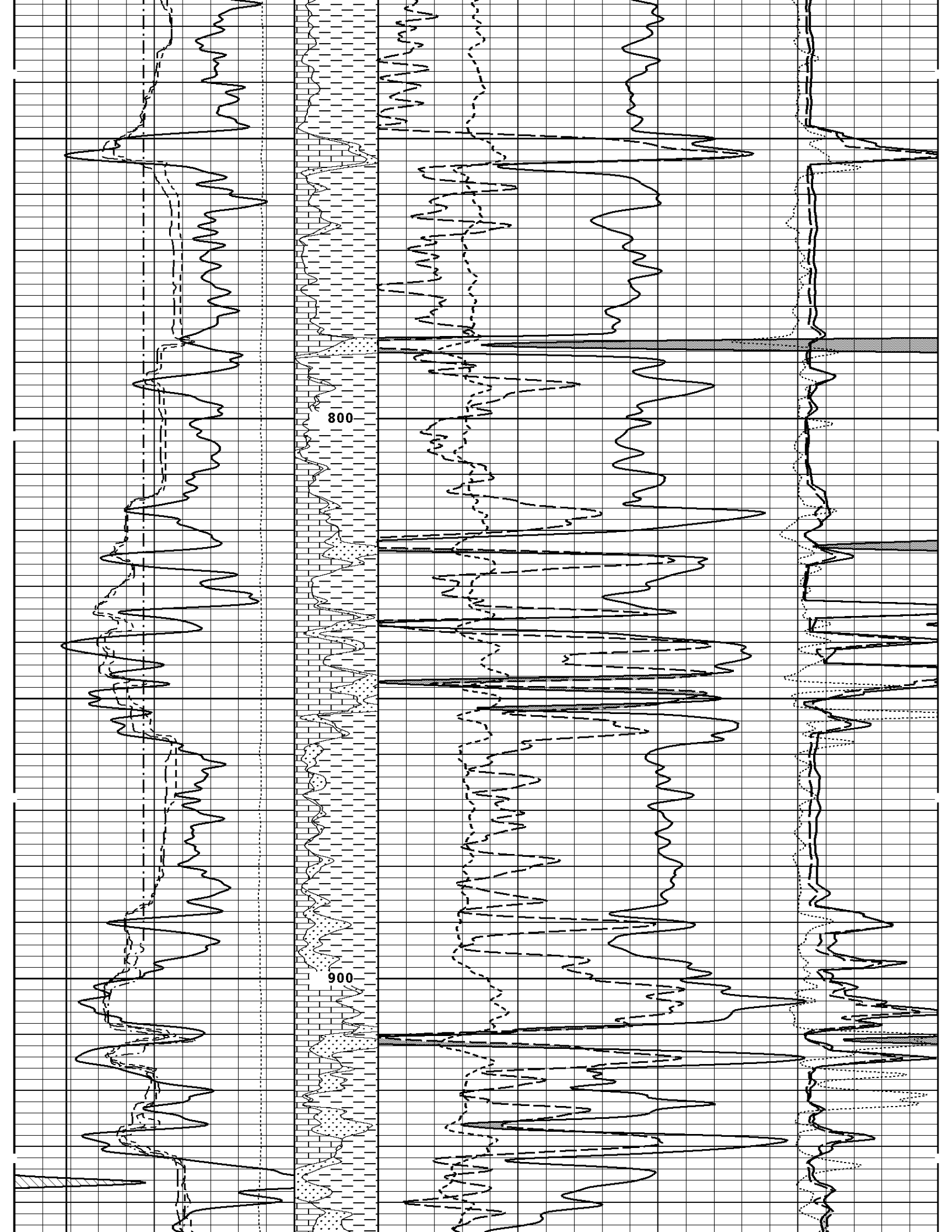
BIT SIZE
INCHES (IN)

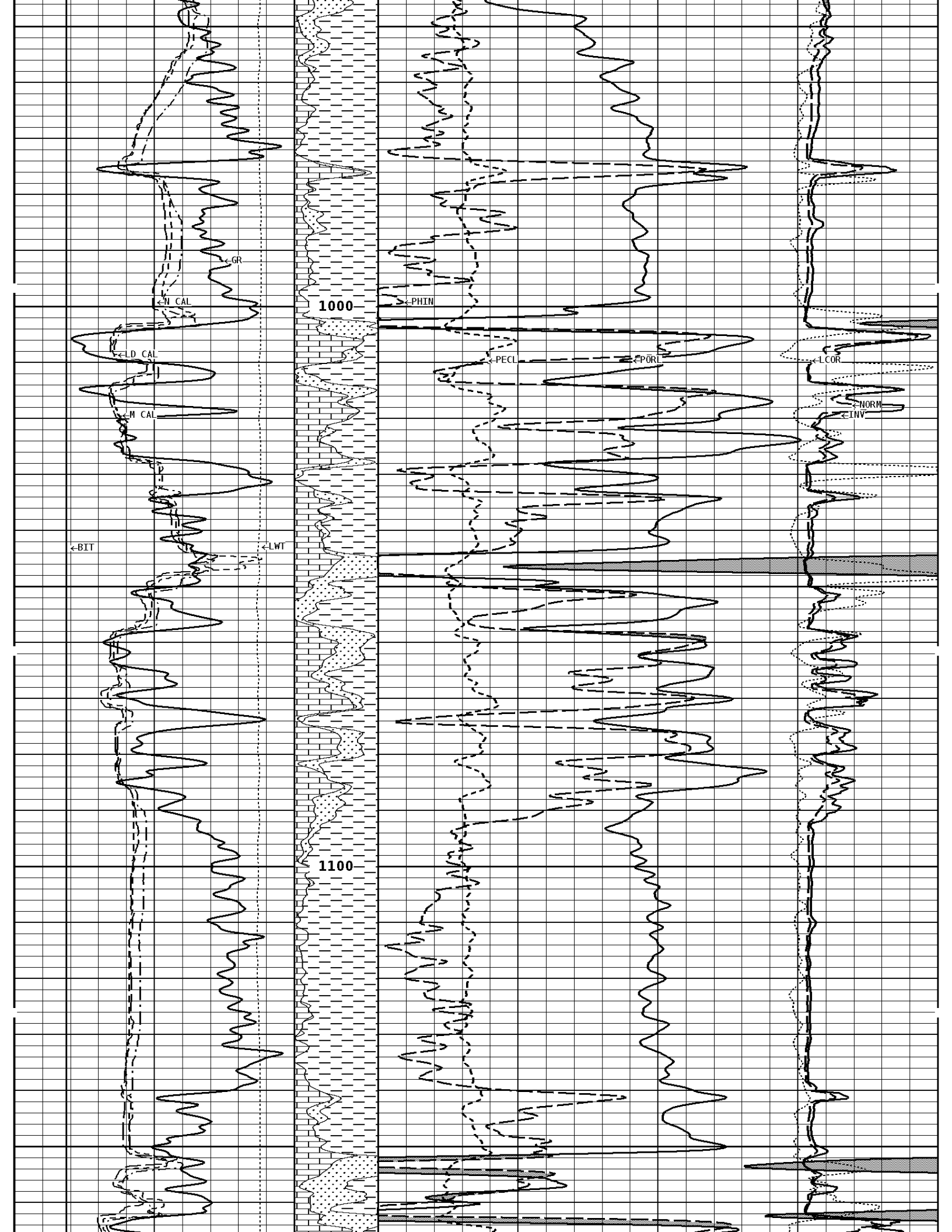
NORMAL
OHMM

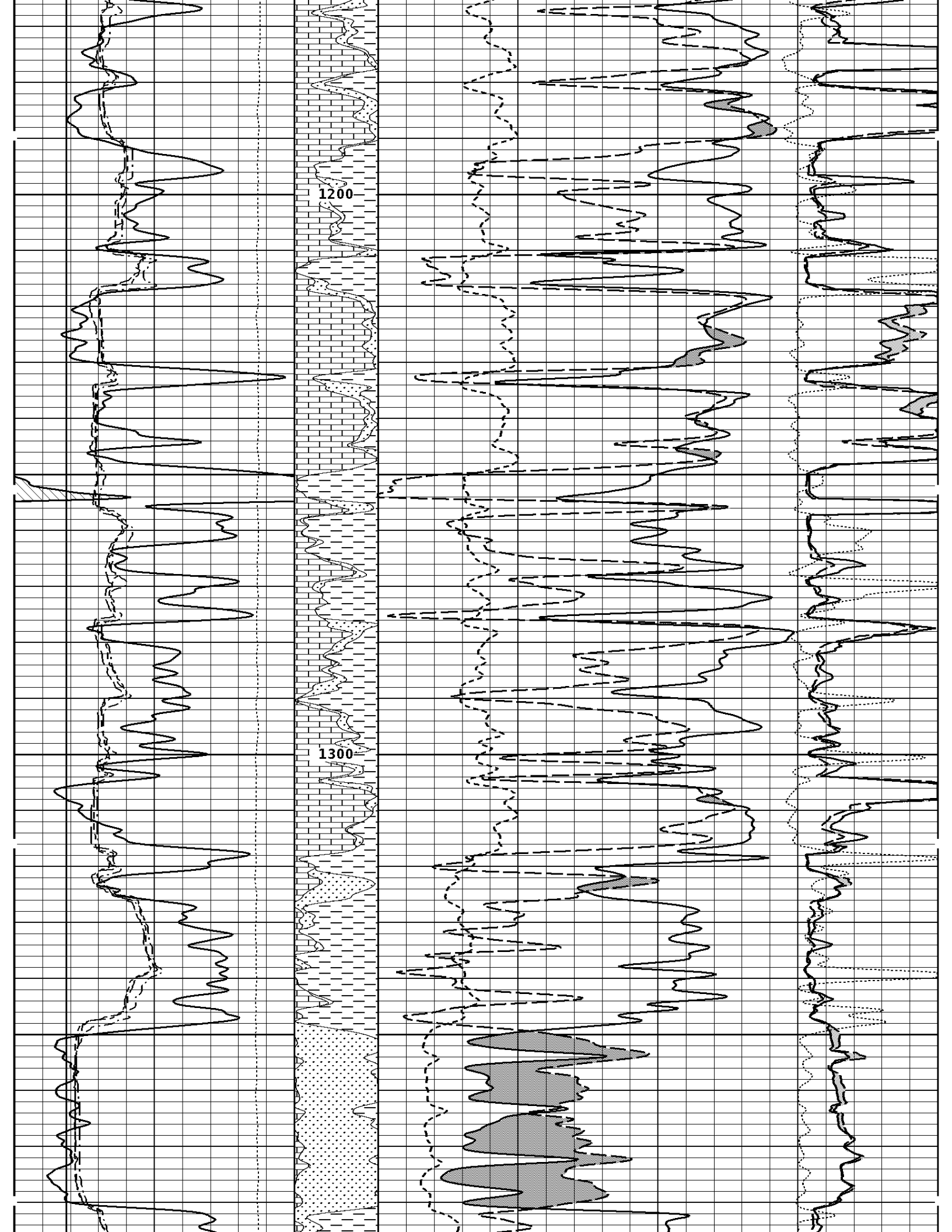

6
16
0
40
NEUTRON (Y) CALIPER
INCHES (IN)
16
26
6
16
INVERSE
OHMM
0
40
DENSITY (X) CALIPER
INCHES (IN)
16
26
6
16
Volume
Quartz
PE CROSS-SECTION
BARNS/ELECTRON
0
10
DENSITY CORRECTION
G/CC
-0.25
0.25
TENSION
LBS
10000
0
Volume
Calcite
DENSITY POROSITY (2.71g/cc)
PERCENT
70
30
-10
30
-10
-50
GAMMA RAY
API UNITS
150
300
0
150
Volume
Dolo/Shale
NEUTRON POROSITY (LIMESTONE)
PERCENT
30
-10
1:240 MAIN SECTION
File #1.1.6
200

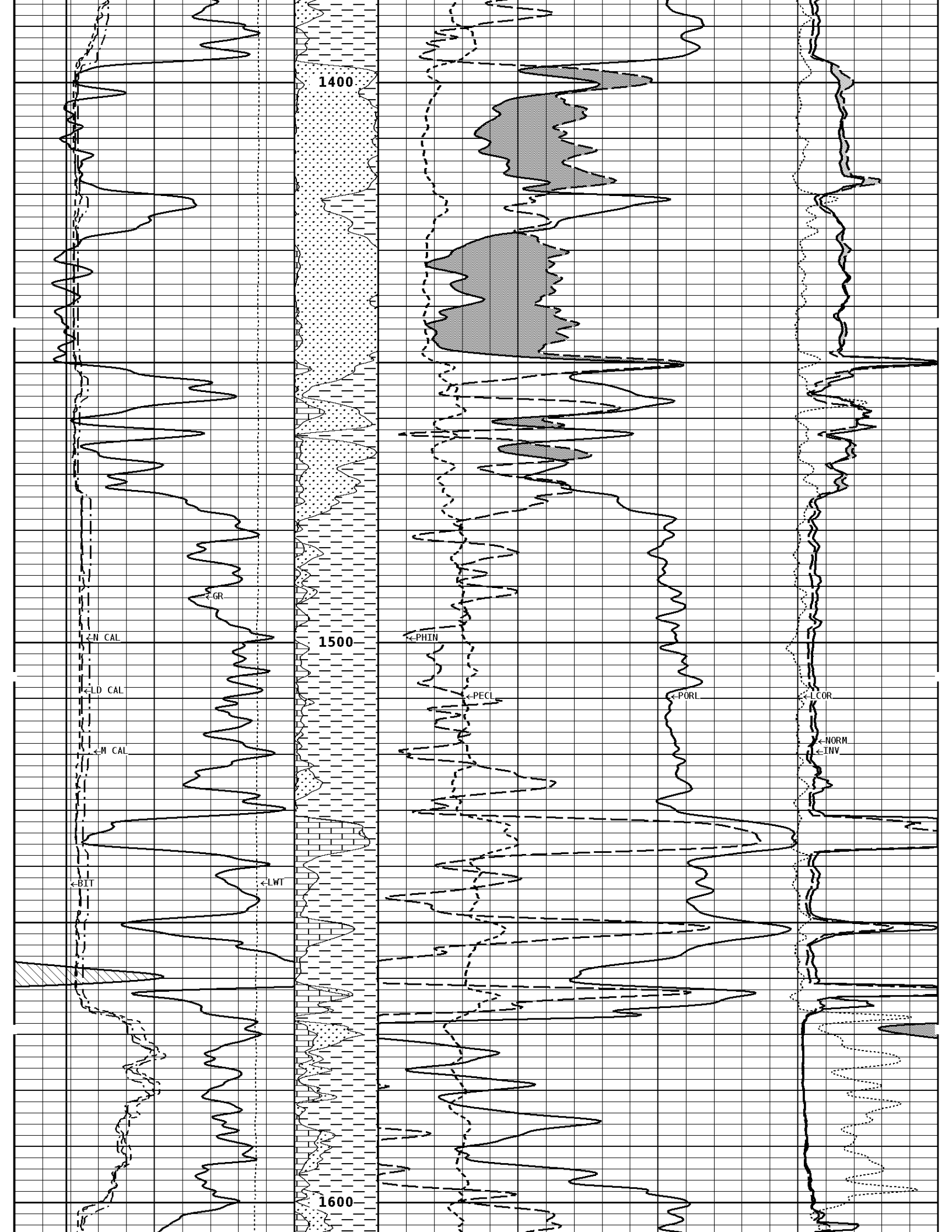

300
400
500
←GR
←N CAL
←PHIN

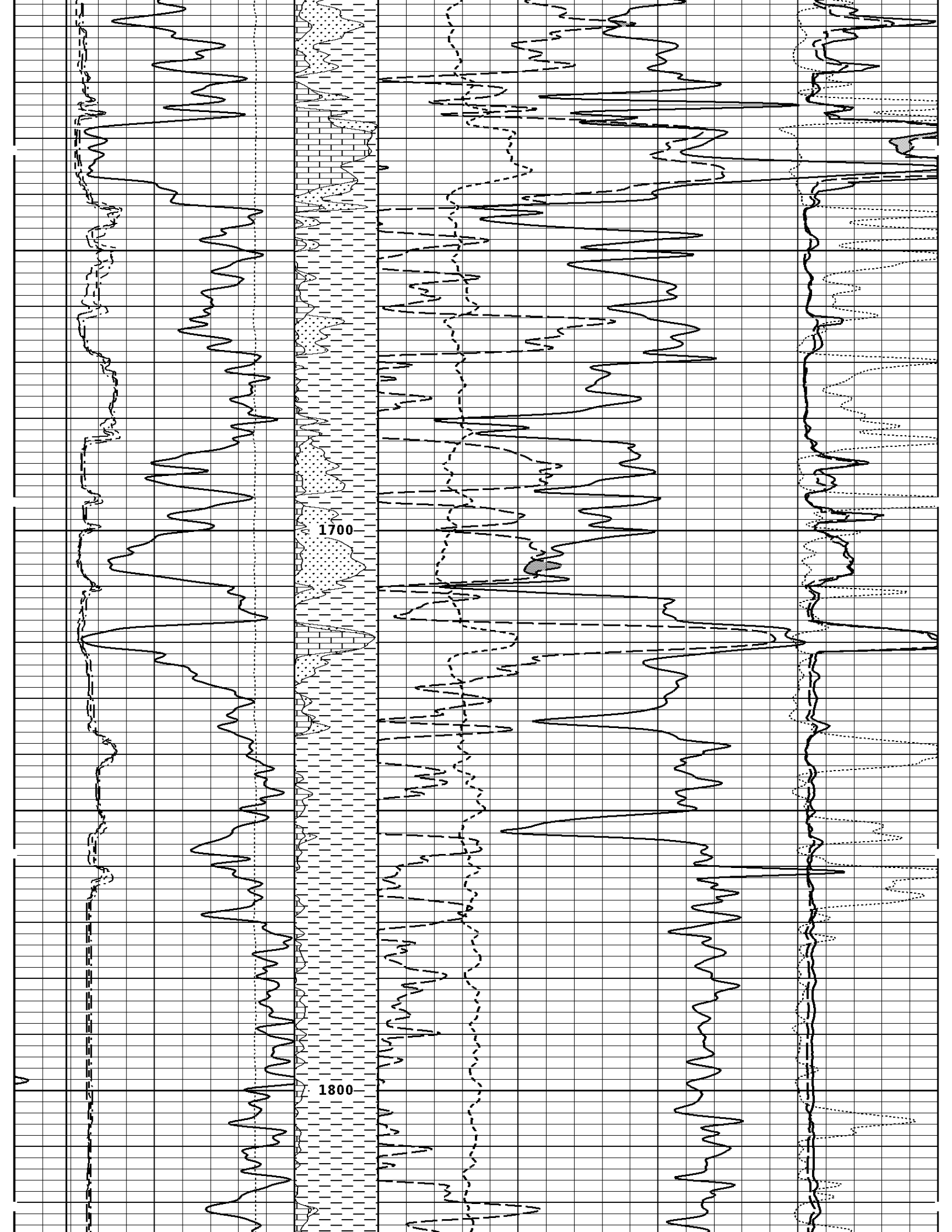

LD CAL
M CAL
BIT
LWT
PECL
PORL
LCOR
NORM
INV
600
700

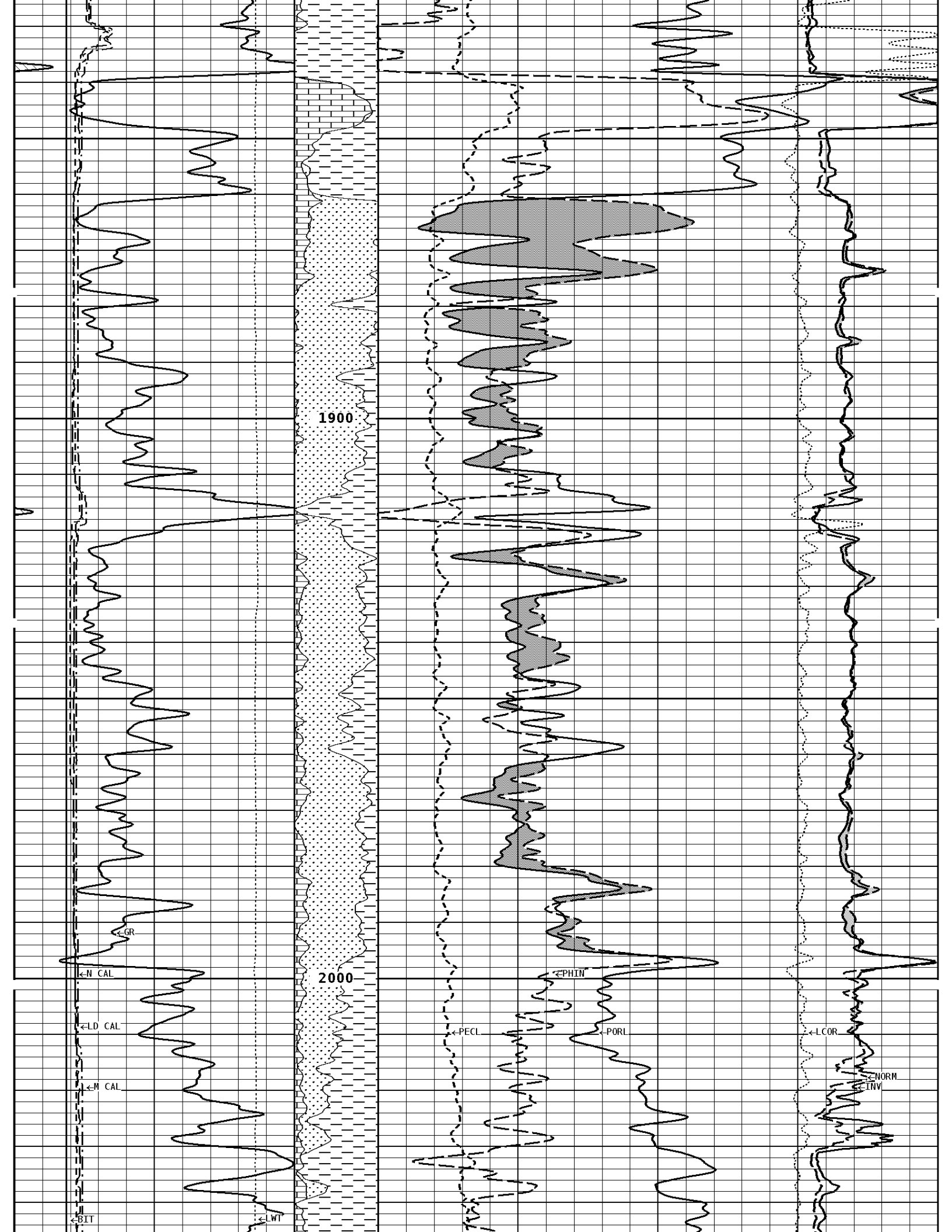

800
900

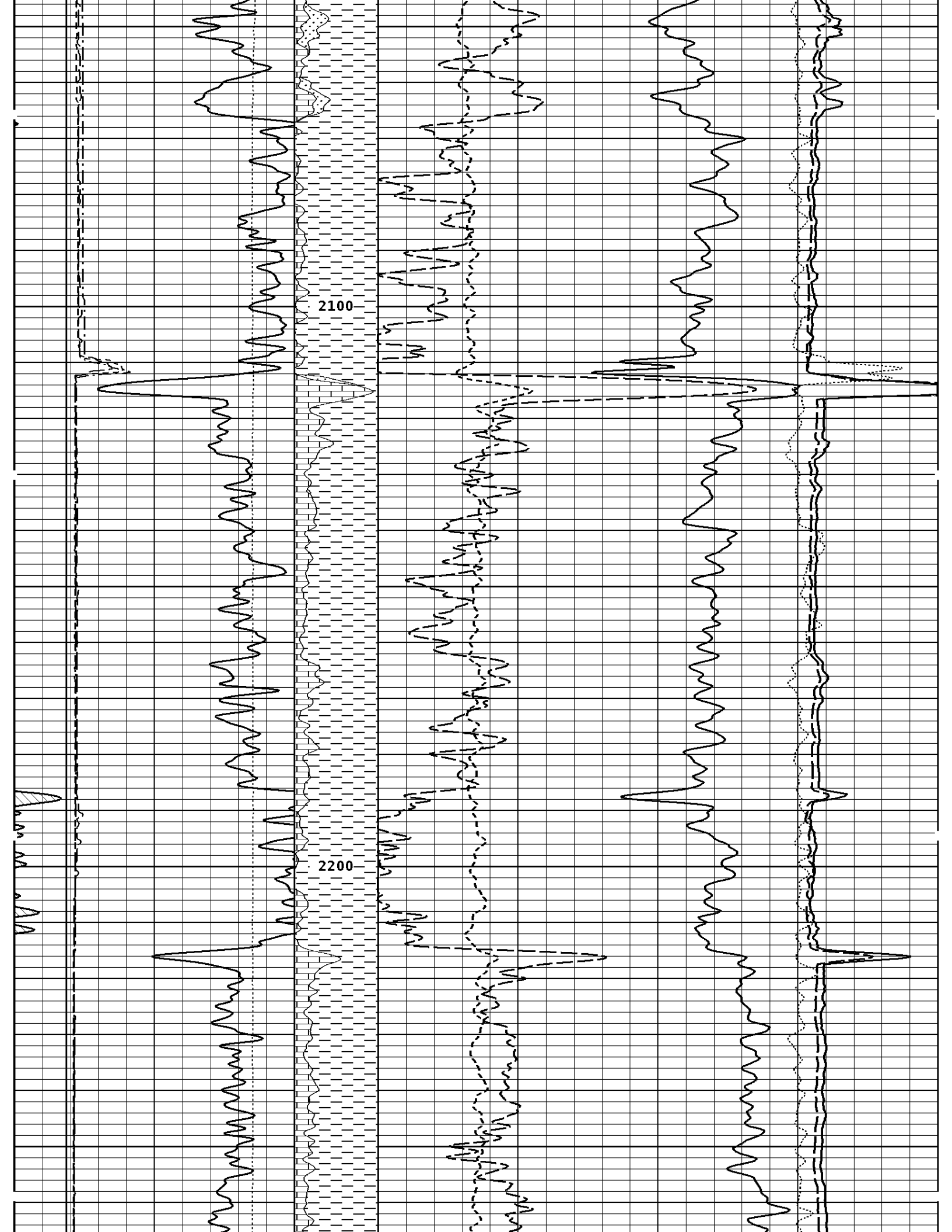

GR
N CAL
LD CAL
M CAL
BIT
LWT
1000
PHIN
PECL
PORL
LCOR
NORM
INV
1100

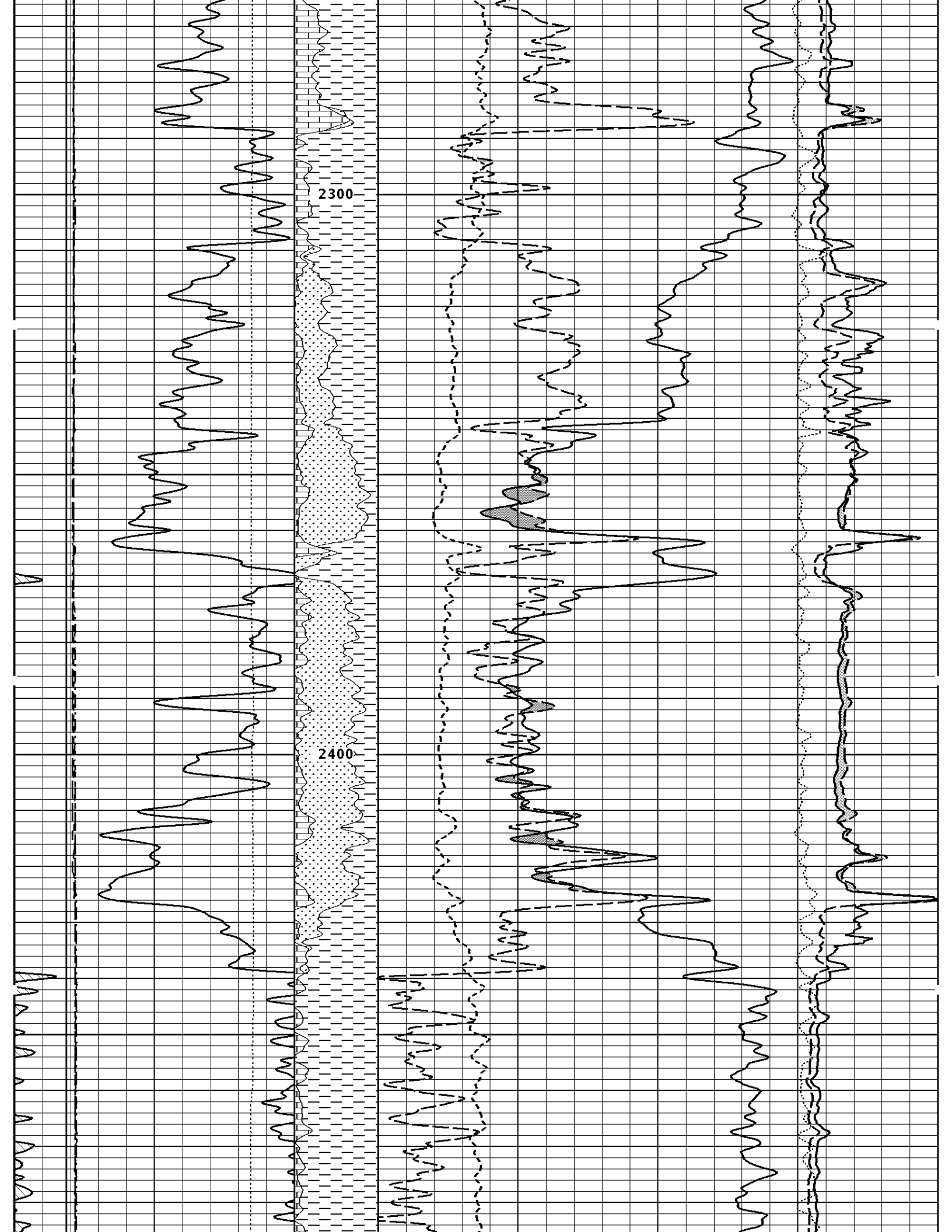

1200
1300

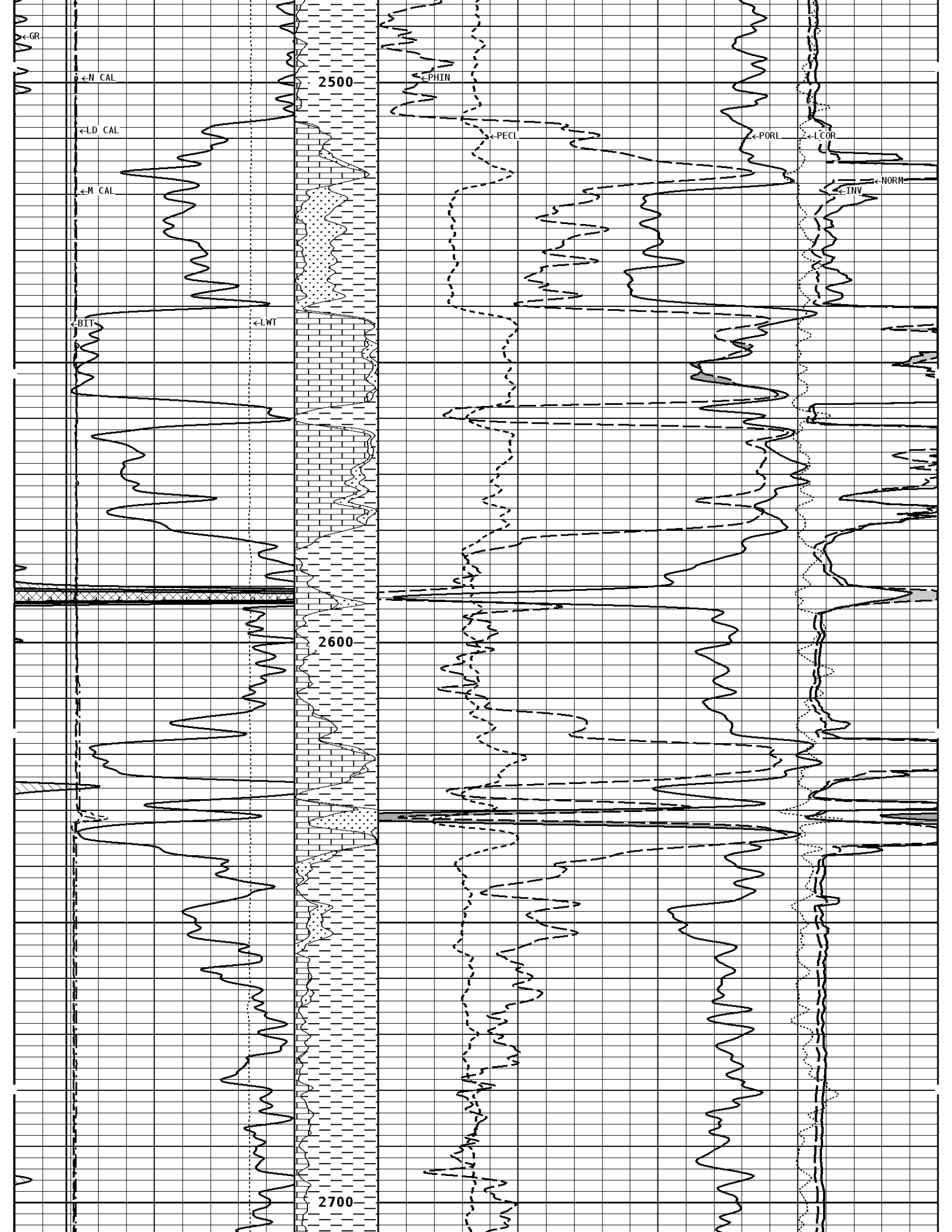

1400
1500
1600
GR
N CAL
LD CAL
M CAL
BIT
LWT
PHIN
PECL
PORL
LCOR
NORM
INV

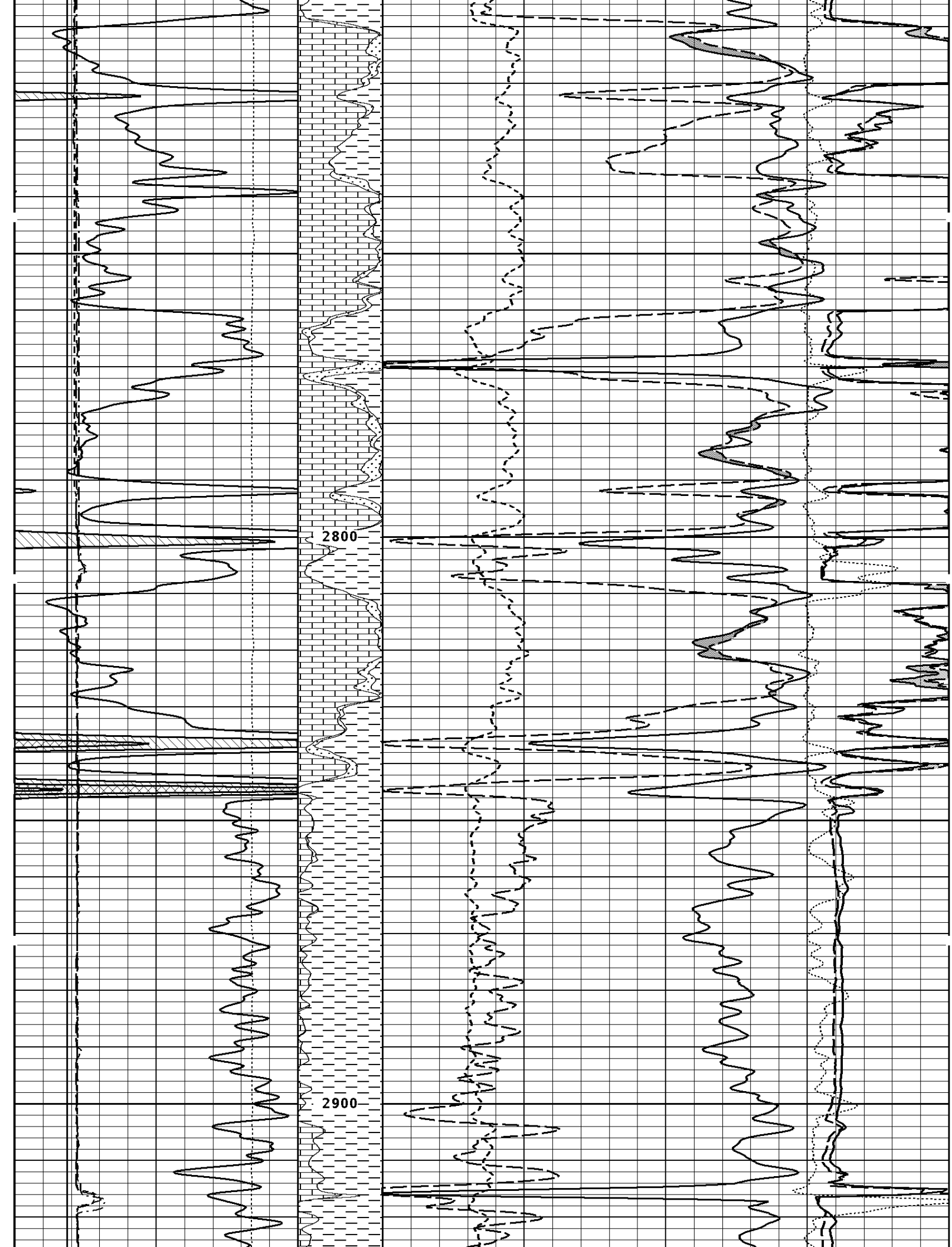

1700
1800

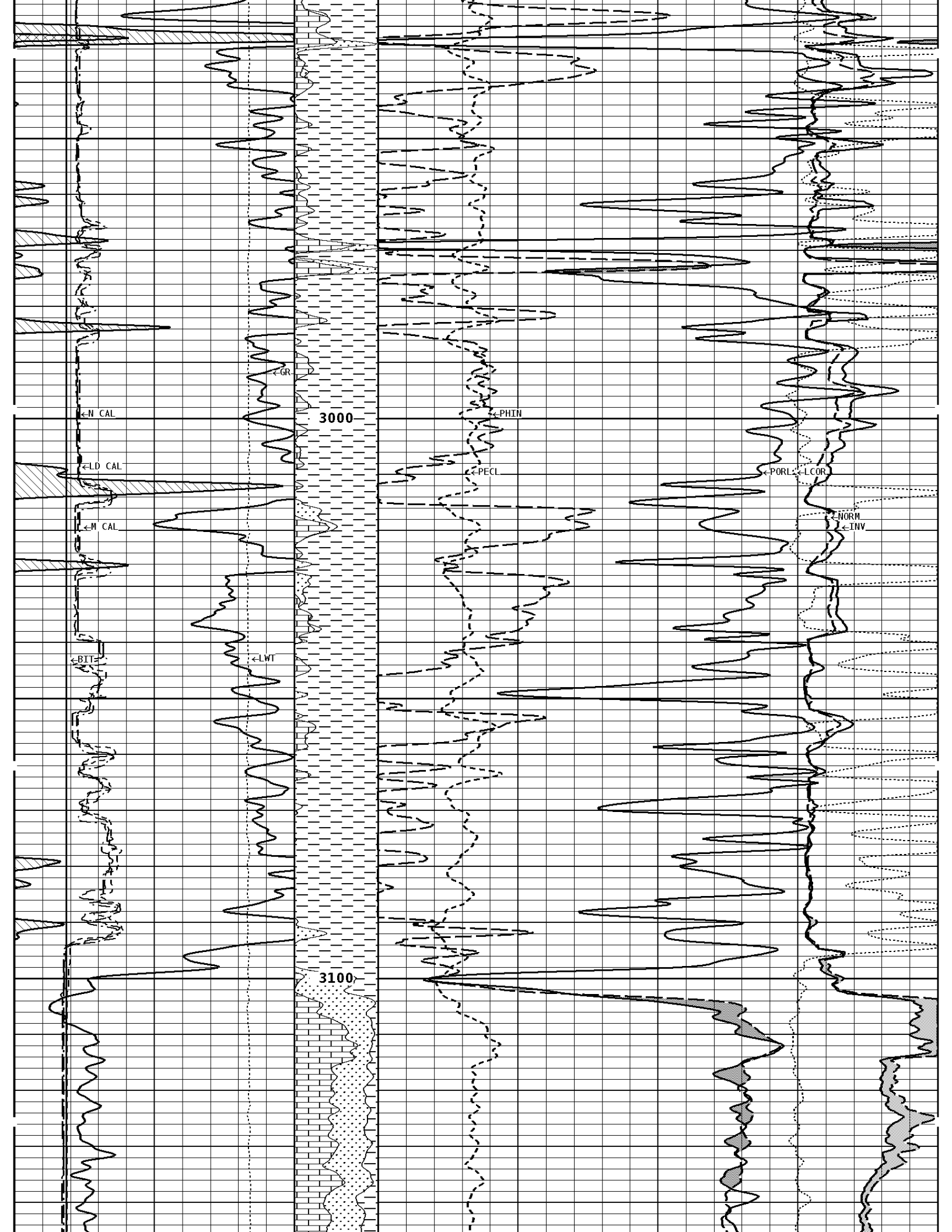

1900
2000
GR
N CAL
LD CAL
M CAL
BIT
LWT
PHIN
PECL
PORL
LCOR
NORM
INV

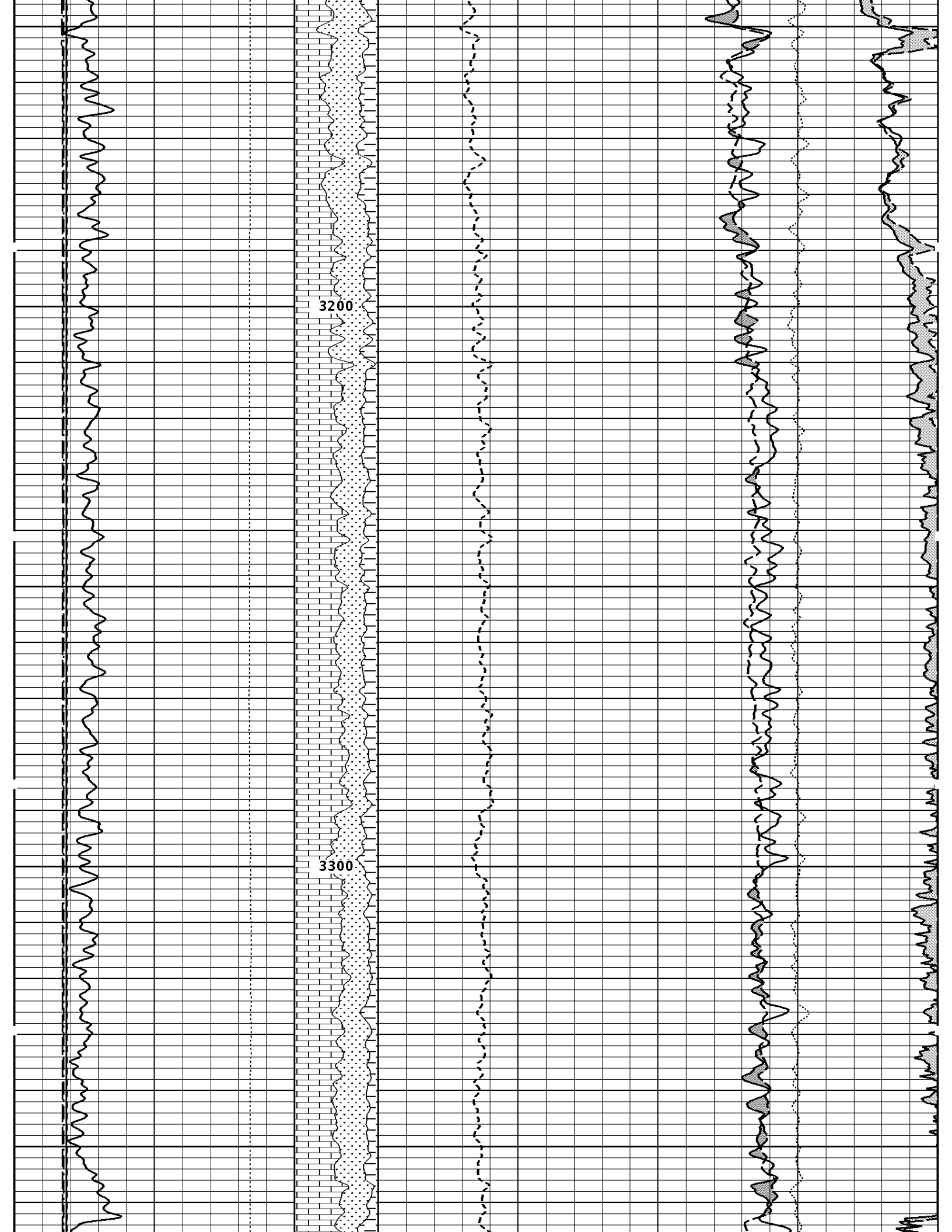

2100
2200


2300
2400


GR
N CAL
LD CAL
M CAL
BIT
LWT
2500
PHIN
PECL
PORL
LCOR
NORM
INV
2600
2700


2800
2900


←GR
←N CAL
3000
←PHIN
←LD CAL
←PECL
←PORL
←LCOR
←M CAL
←NORM
←INV
←BIT
←LWT
3100


3200
3300

1:240 MAIN SECTION

GAMMA RAY API UNITS	Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT
150 300 0 150		30 -10
TENSION LBS	Volume	DENSITY POROSITY (2.71g/cc) PERCENT

LBS	Calcite	PERCENT	
10000 ... 0		70 / 30 / -10	30 / -10 / -50

DENSITY (X) CALIPER INCHES (IN)	Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 ... 26 / 6 ... 16		0 ... 10	-0.25 ... 0.25

NEUTRON (Y) CALIPER INCHES (IN)	INVERSE OHMM
16 ... 26 / 6 ... 16	0 ... 40

BIT SIZE INCHES (IN)	NORMAL OHMM
6 ... 16	0 ... 40

CALIPER MICRO INCHES (IN)
16 ... 26 / 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:	VAL_ENERGY_GARISON_1-25_JUNE26_MSTK	**Scale:** 1:240	**Format:** NLD-240
Segment:	V1.D1.S3 Reprocess of REPEAT	**Acquired:**	2019-06/26 09:13 3.4.1-13968
Reference:	0	**Processed:**	2019-06/26 10:23 3.4.1-13968

CALIPER MICRO INCHES (IN)
16 ... 26 / 6 ... 16

BIT SIZE INCHES (IN)	NORMAL OHMM
6 ... 16	0 ... 40

NEUTRON (Y) CALIPER INCHES (IN)	INVERSE OHMM
16 ... 26 / 6 ... 16	0 ... 40

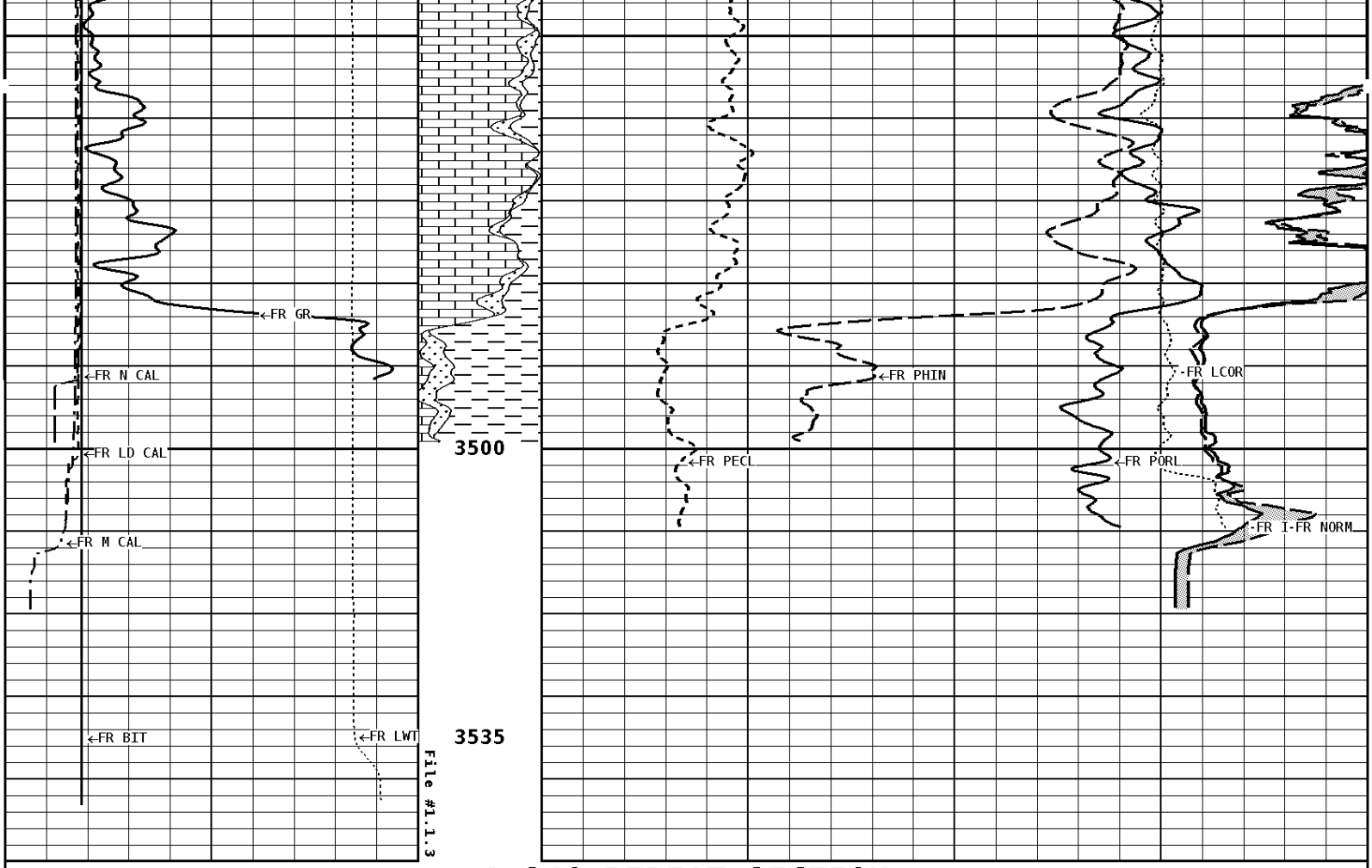
DENSITY (X) CALIPER INCHES (IN)	Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 ... 26 / 6 ... 16		0 ... 10	-0.25 ... 0.25

TENSION LBS	Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT	
10000 ... 0		70 / 30 / -10	30 / -10 / -50

GAMMA RAY API UNITS	Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT
150 ... 300 / 0 ... 150		30 ... -10

1:240 REPEAT SECTION


3300
3400
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		
INVERSE **OHMM** 0 40		
BIT SIZE **INCHES (IN)** 6 16		
NORMAL **OHMM** 0 40		
CALIPER MICRO **INCHES (IN)** 16 26 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: VAL_ENERGY_GARISON_1-25_JUNE26_MSTK **Scale:** 1:240 **Format:** LDT-240
Segment: V1.D1.S6 Reprocess of MAIN **Acquired:** 2019-06/26 09:23 3.4.1-13968
Reference: 0 **Processed:** 2019-06/26 10:22 3.4.1-13968

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

GAMMA RAY
API UNITS
150 — 300
0 — 150

-BHV AHV-
CU.FT

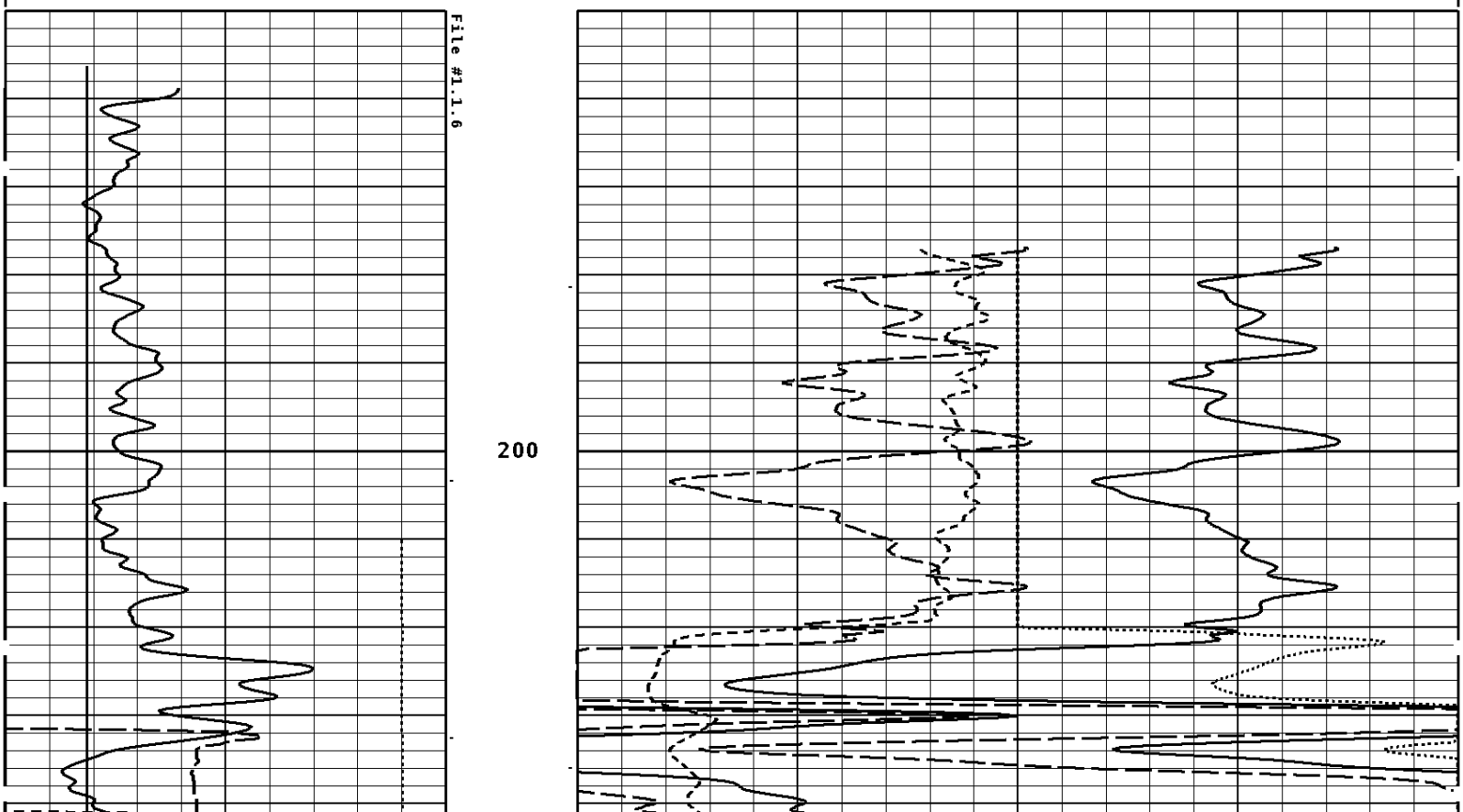
PE CROSS-SECTION
BARNS/ELECTRON
0 — 10

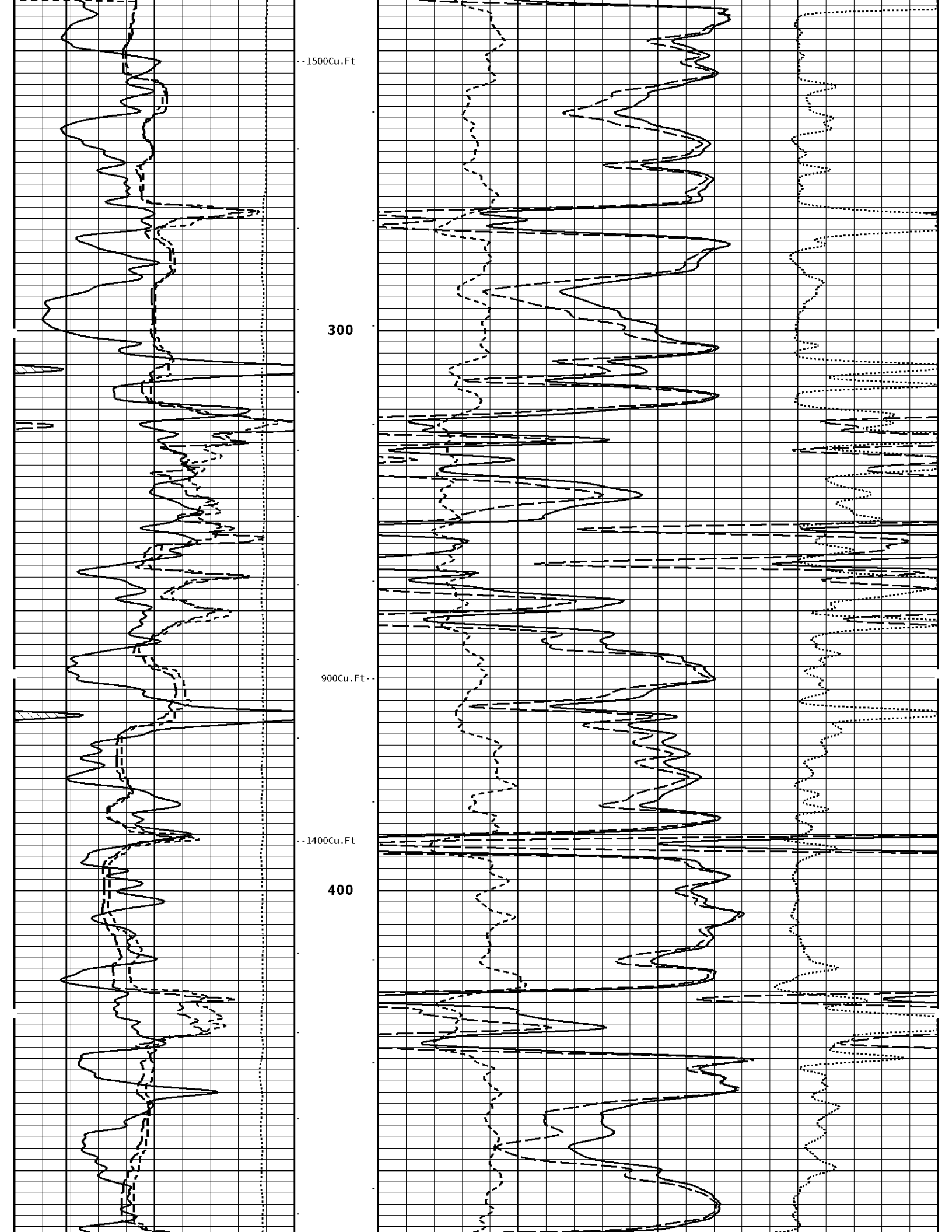
DENSITY CORRECTION
G/CC
-0.25 — 0.25

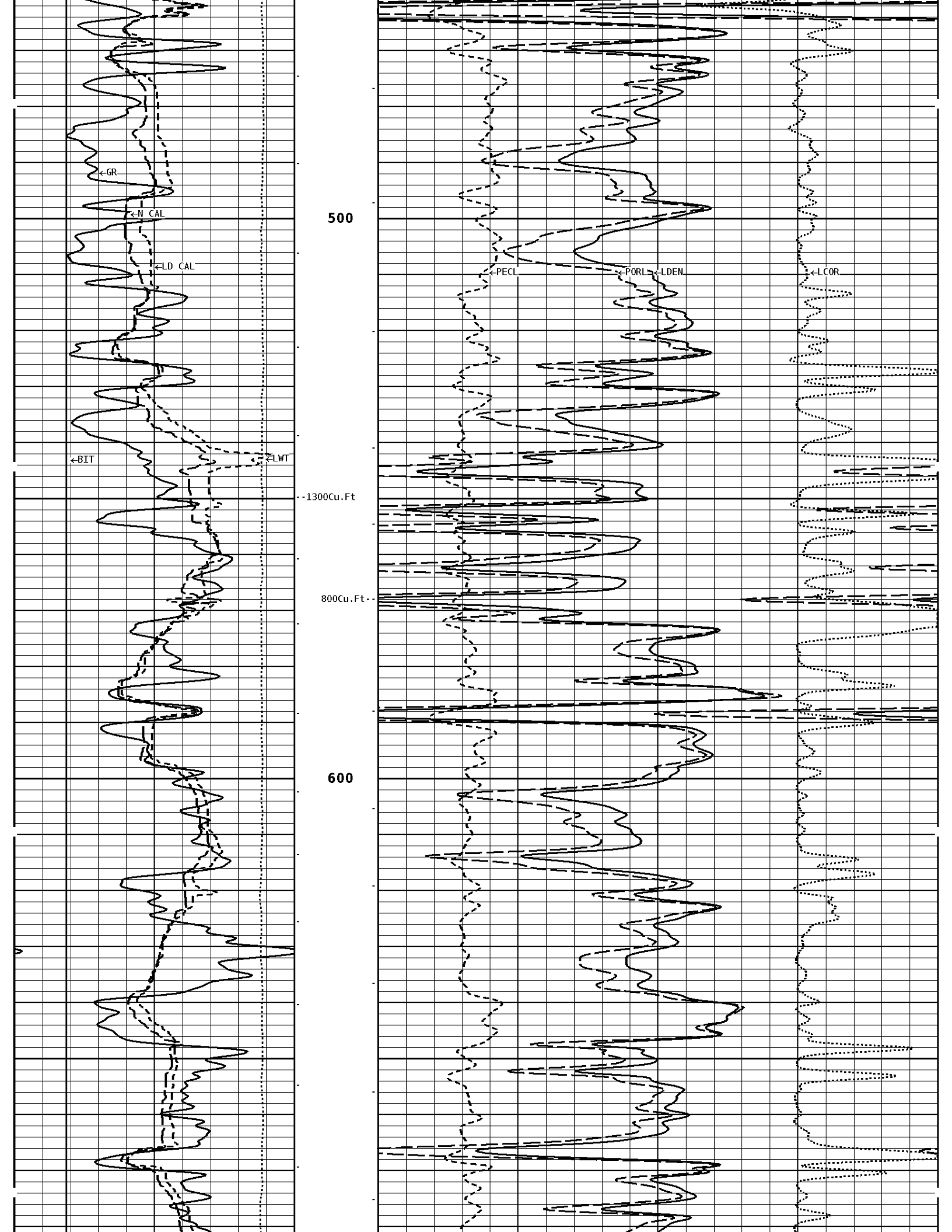
COMPENSATED BULK DENSITY
G/CC
3.0 — 4.0
2.0 — 3.0
1.0 — 2.0

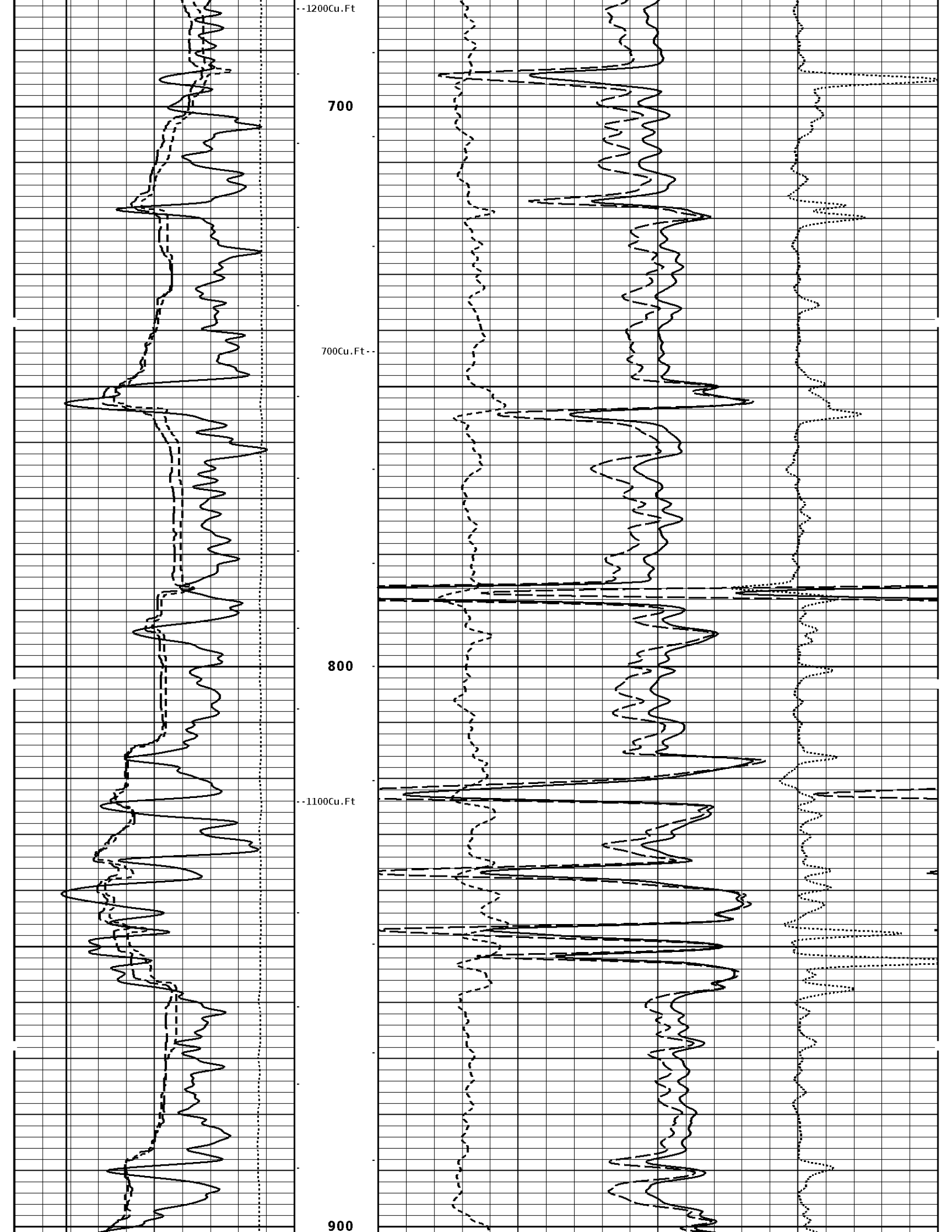
DENSITY POROSITY (2.71g/cc)
PERCENT
70 — 30
30 — -10
-10 — -50

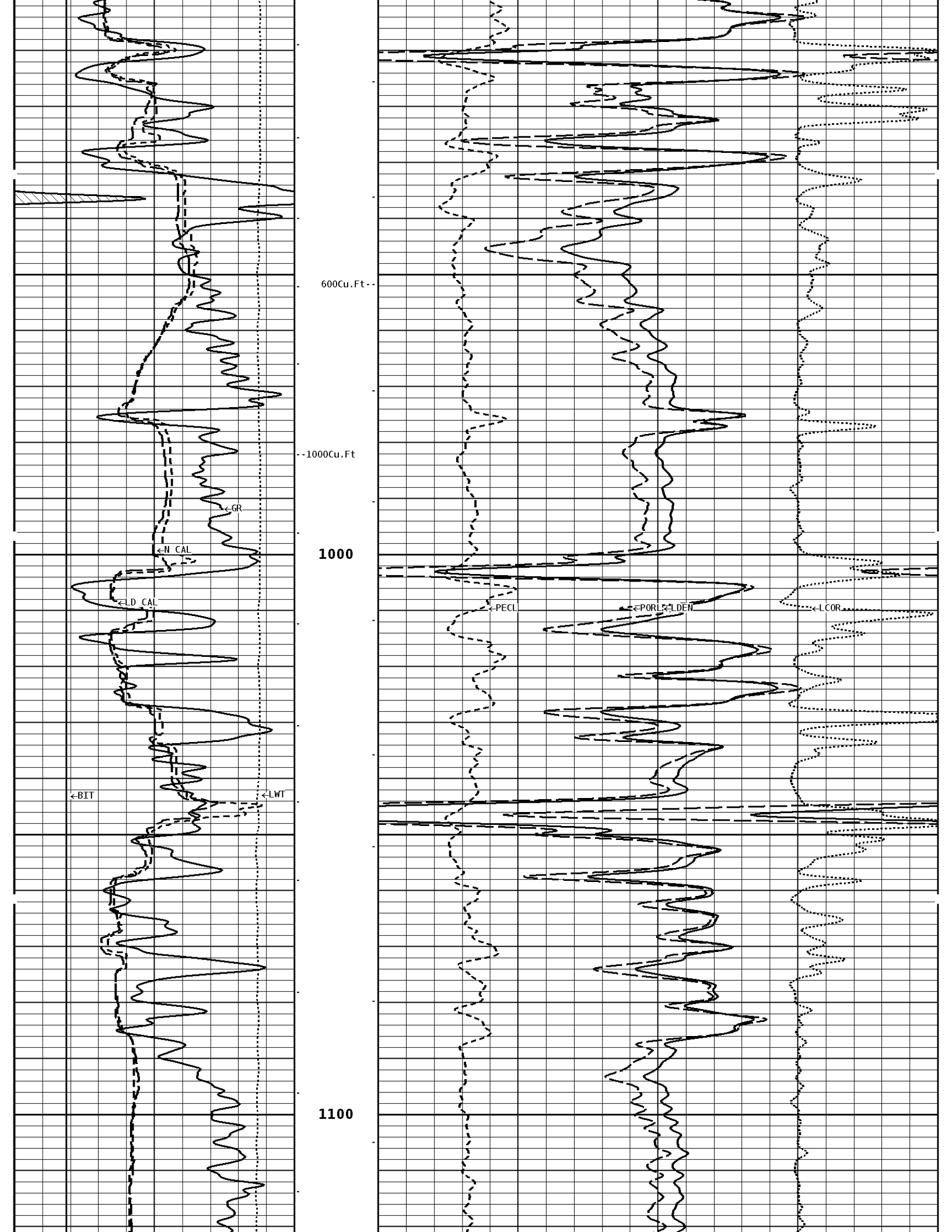
1:240 MAIN SECTION
BULK DENSITY

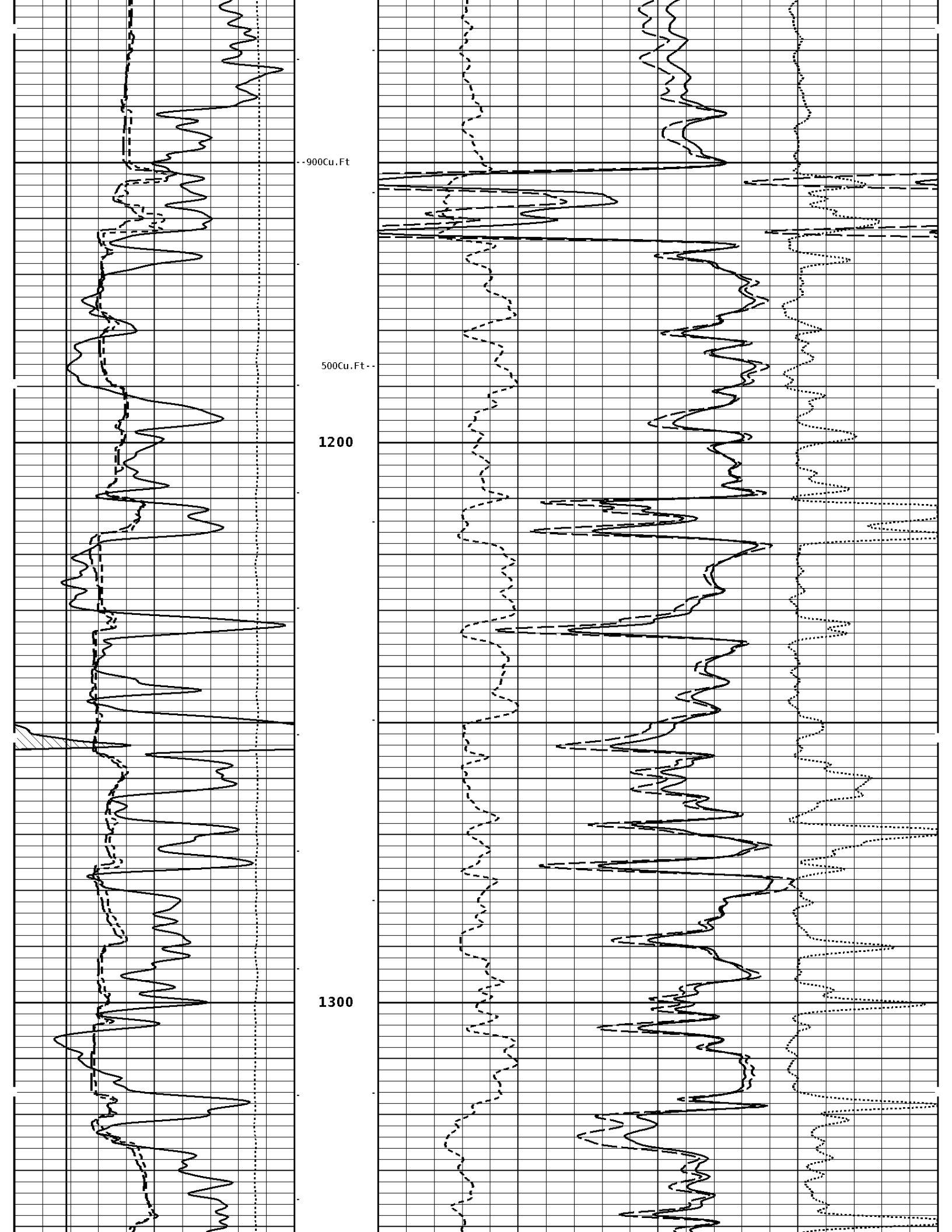


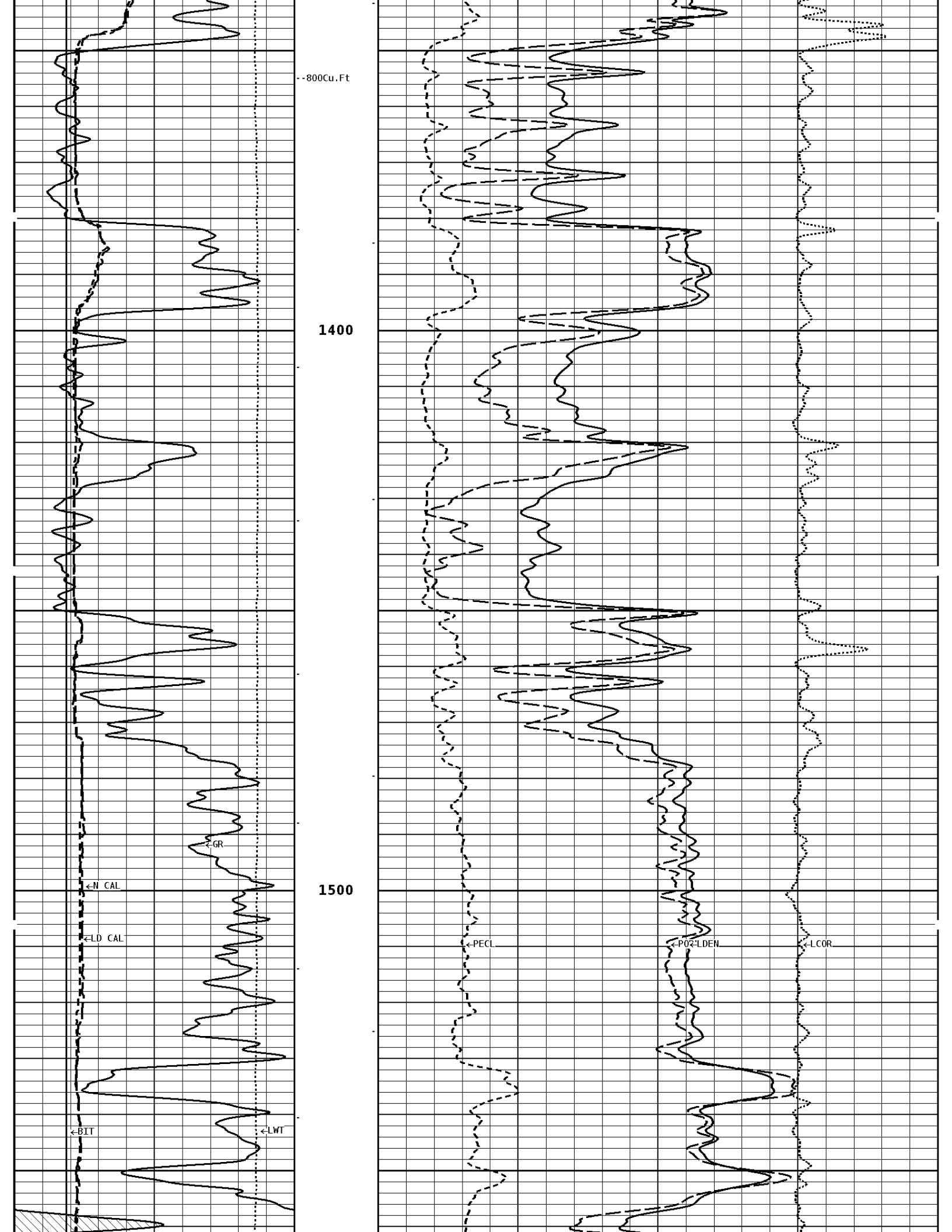

--1500Cu.Ft
300
900Cu.Ft--
--1400Cu.Ft
400

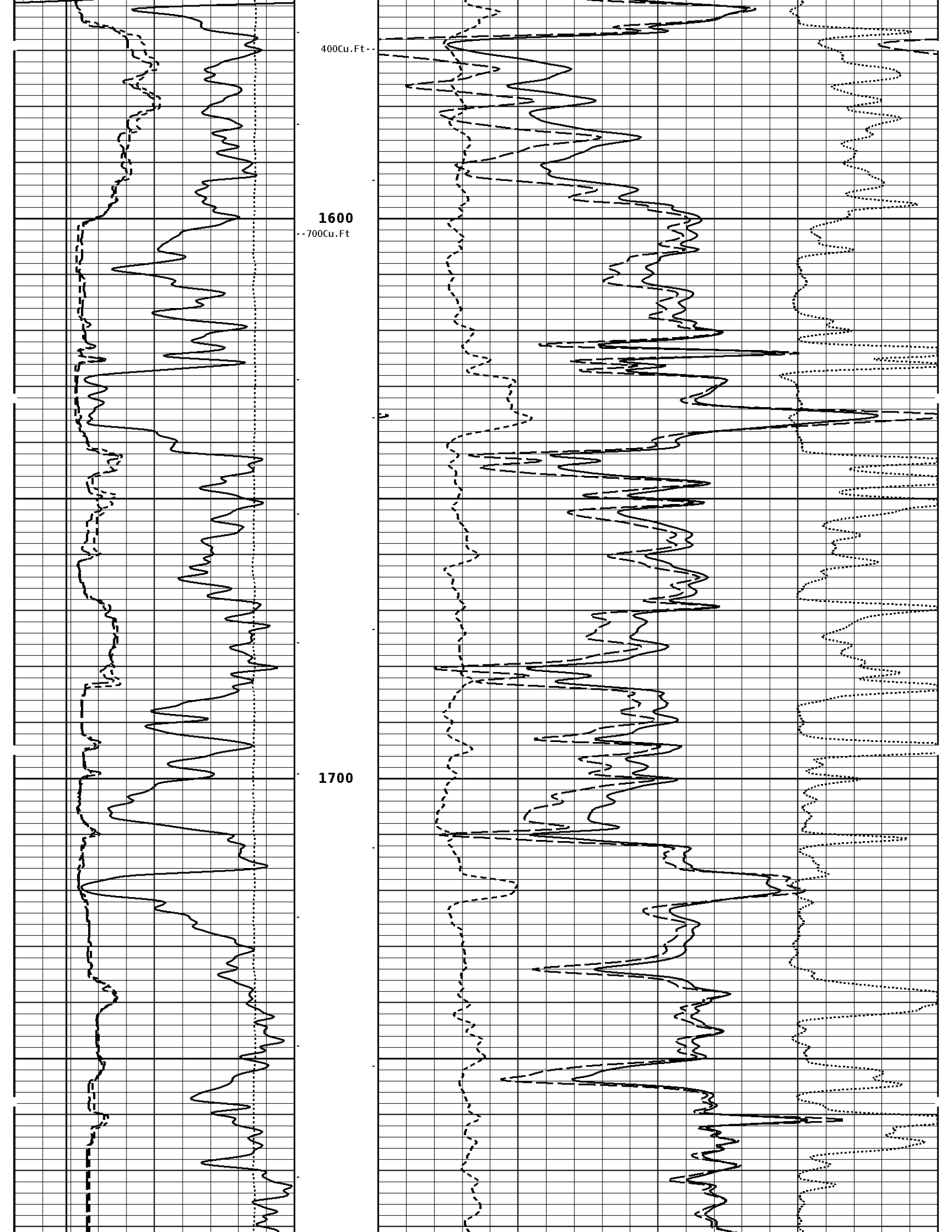

GR
N CAL
LD CAL
BIT
LWT
500
1300Cu.Ft
800Cu.Ft
600
PECL
PORL
LDEN
LCOR

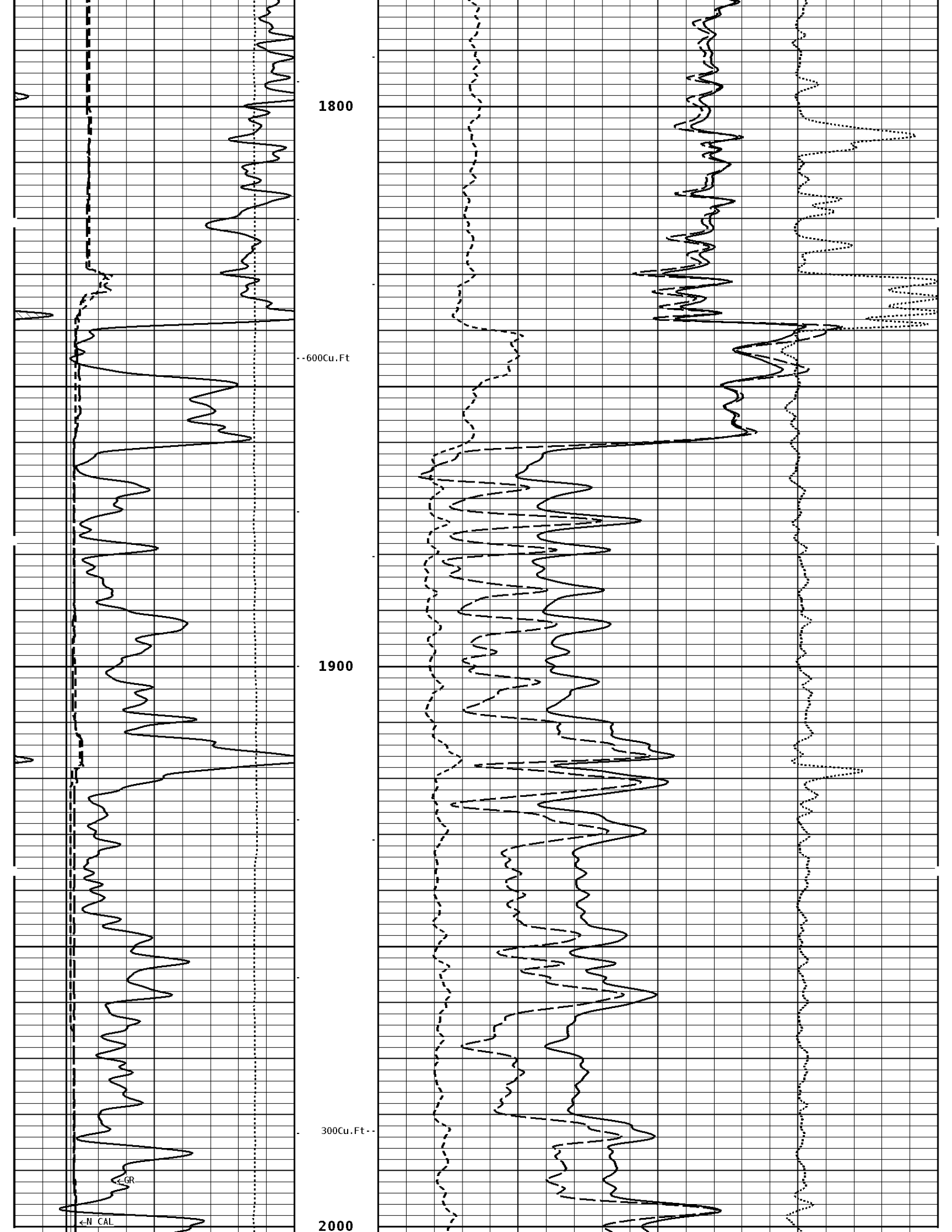

1200Cu.Ft
700
700Cu.Ft
800
1100Cu.Ft
900

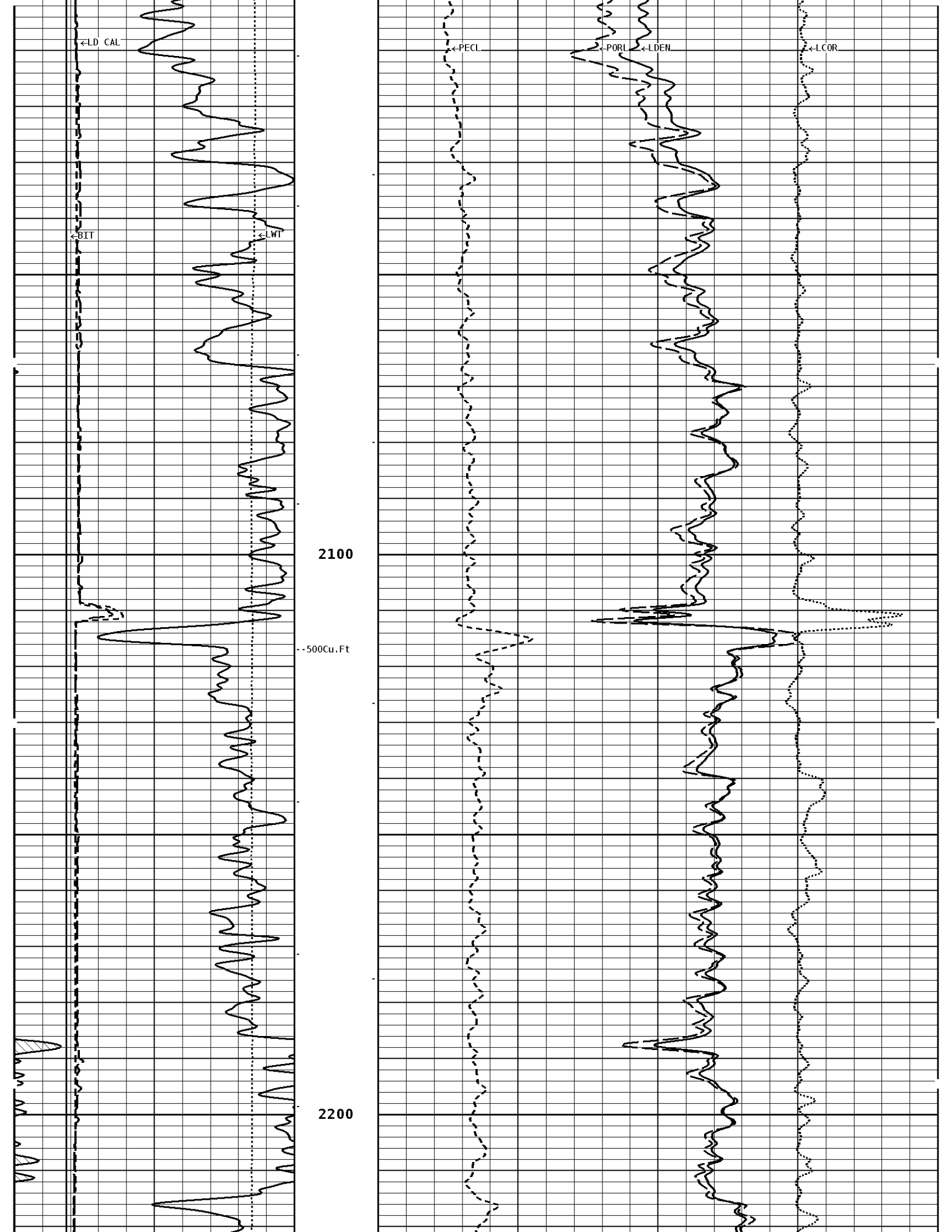

600Cu.Ft--
--1000Cu.Ft
←GR
←N CAL
1000
←LD CAL
←PECL
←PORL
←LDEN
←LCOR
←BIT
←LWT
1100

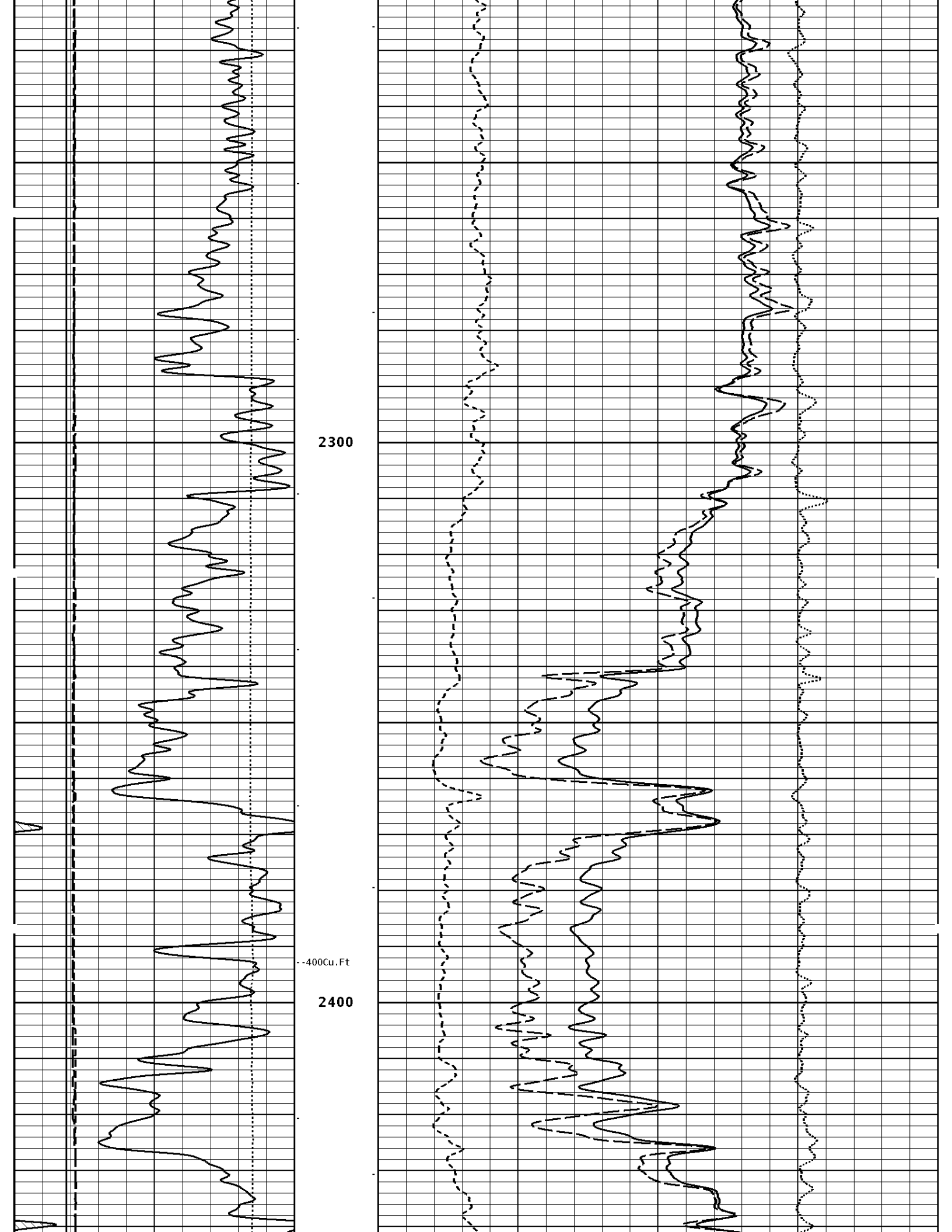

900Cu.Ft
500Cu.Ft
1200
1300

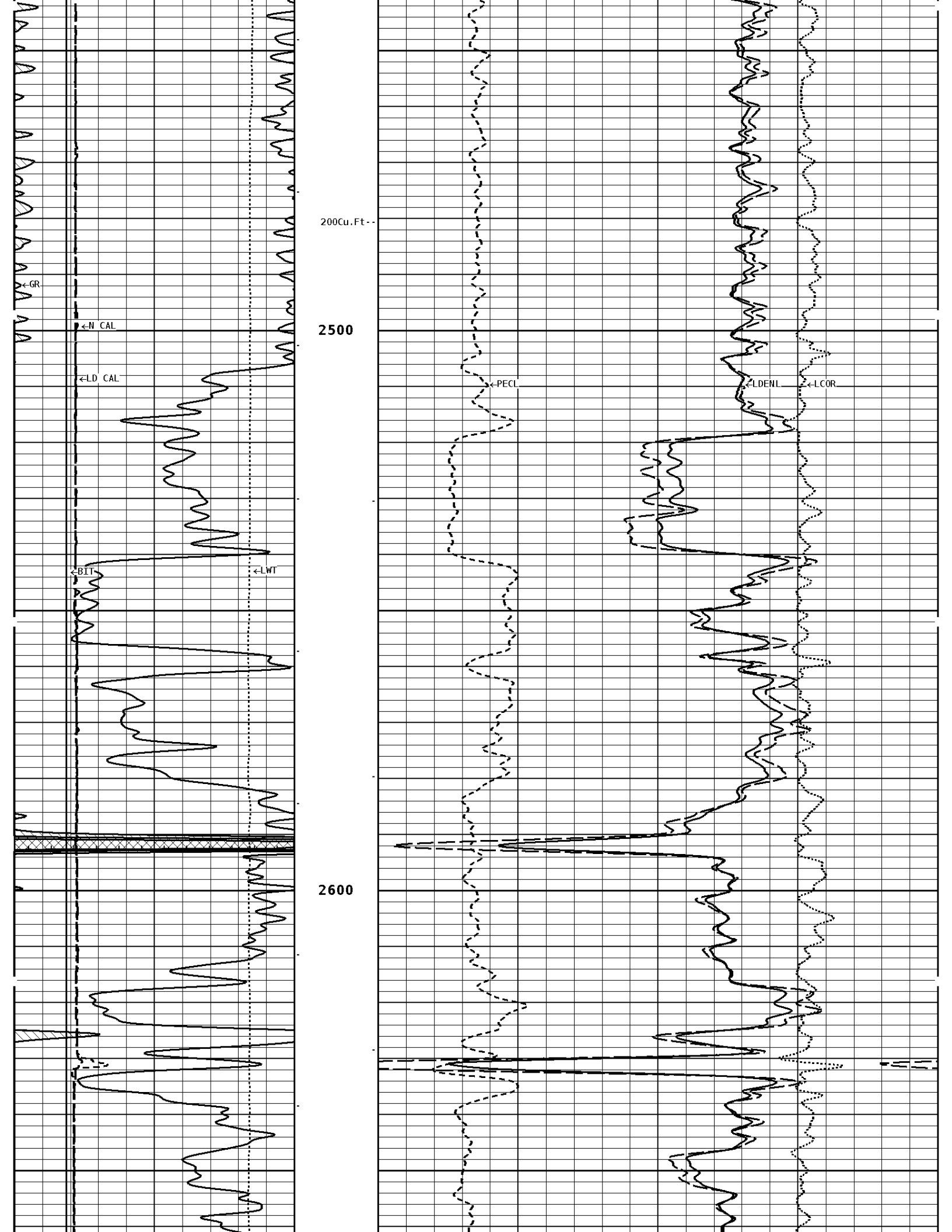

--800Cu.Ft
1400
1500
←GR
←N CAL
←LD CAL
←BIT
←LWT
←PECL
←POZ LDEN
←LCOR

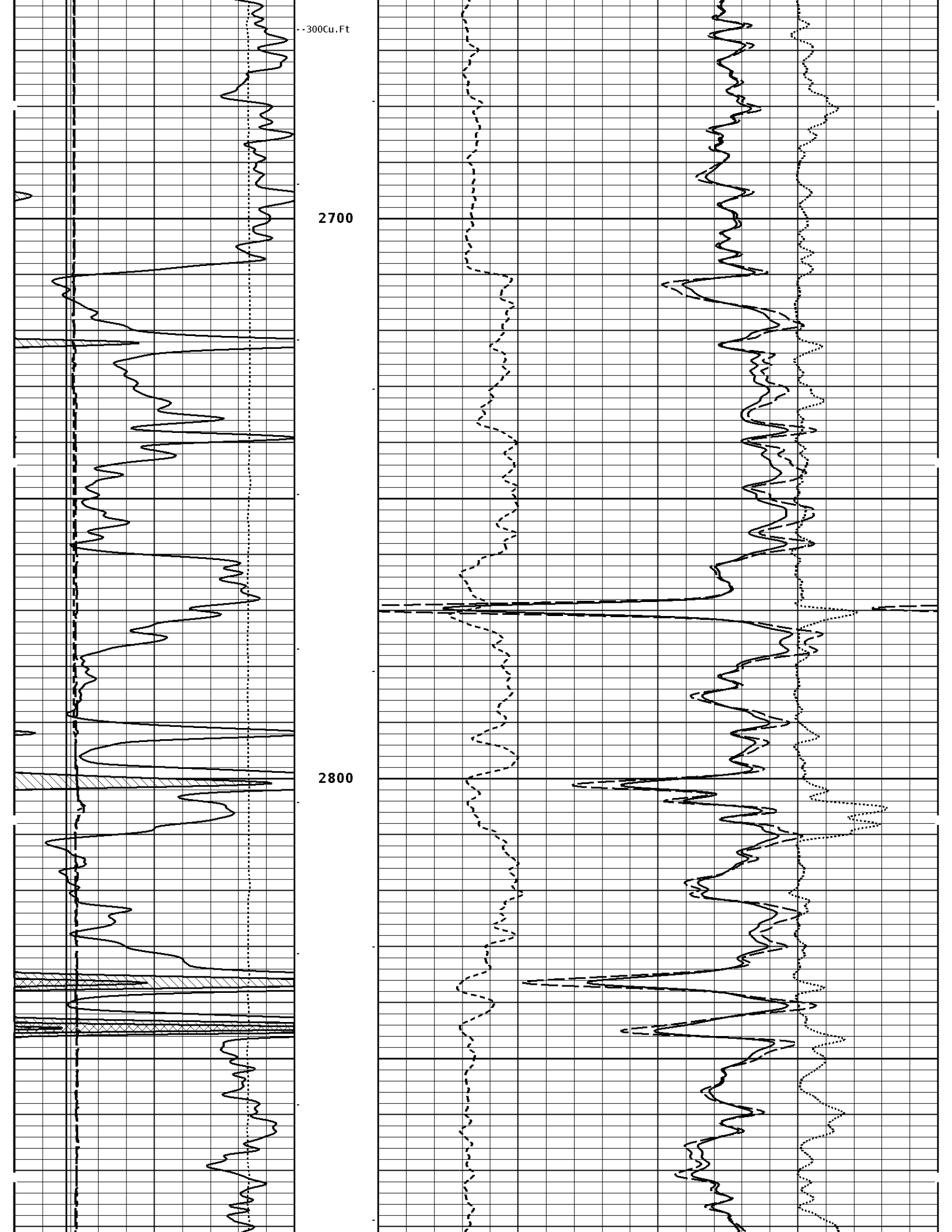

400Cu.Ft
1600
700Cu.Ft
1700

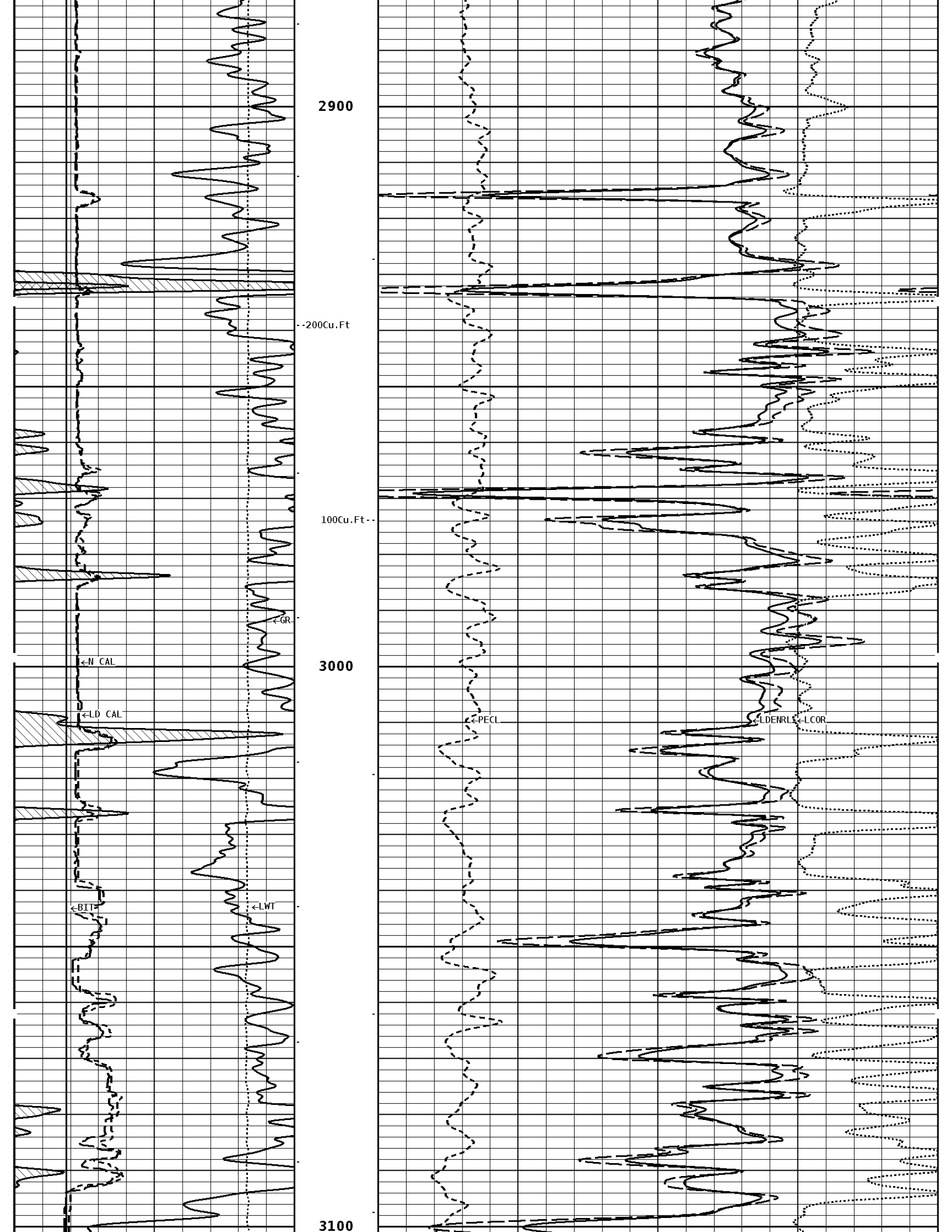

1800
--600Cu.Ft
1900
300Cu.Ft--
<GR
<N CAL
2000

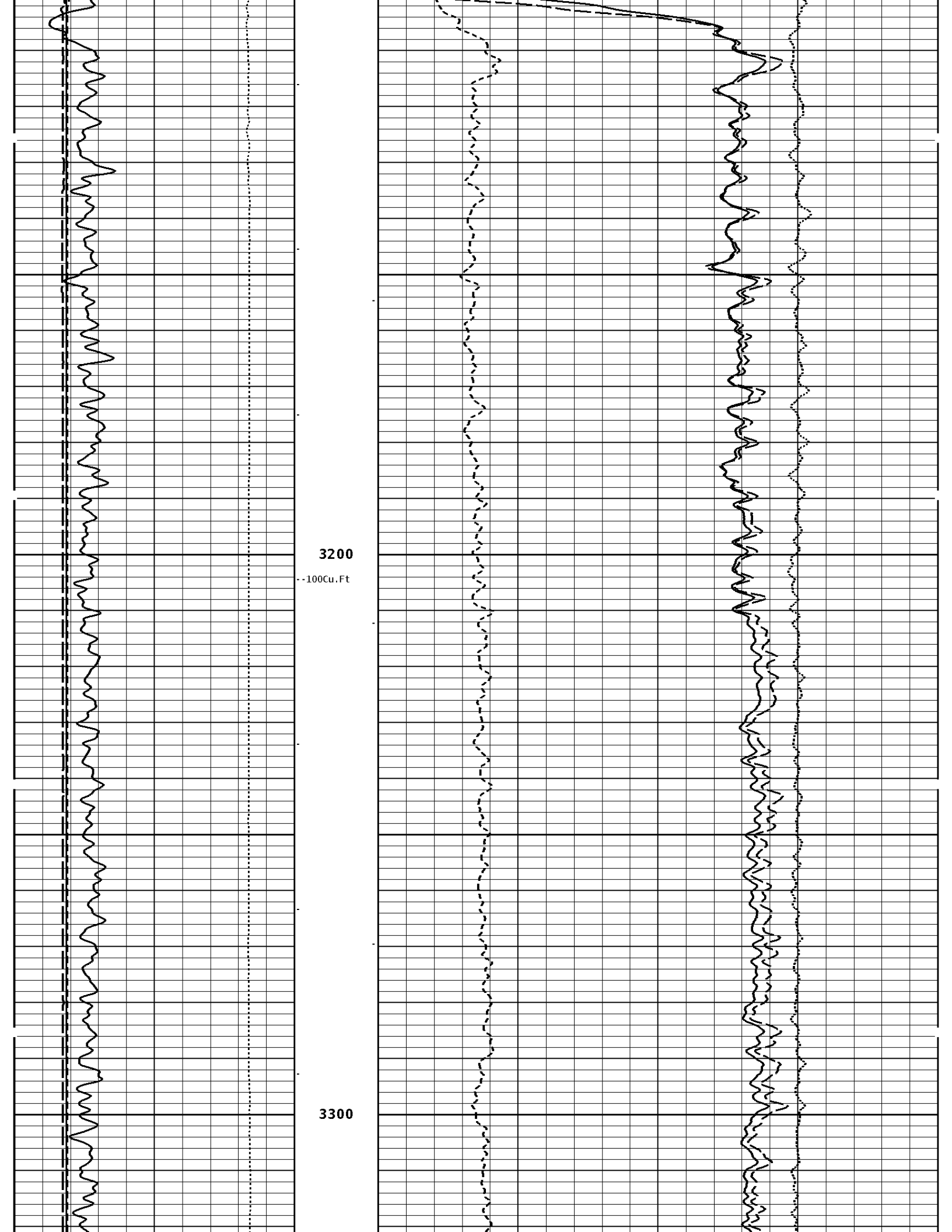

←LD CAL
←BIT
←LWT
←PECL
←PORL
←LDEN
←LCOR
2100
--500Cu.Ft
2200

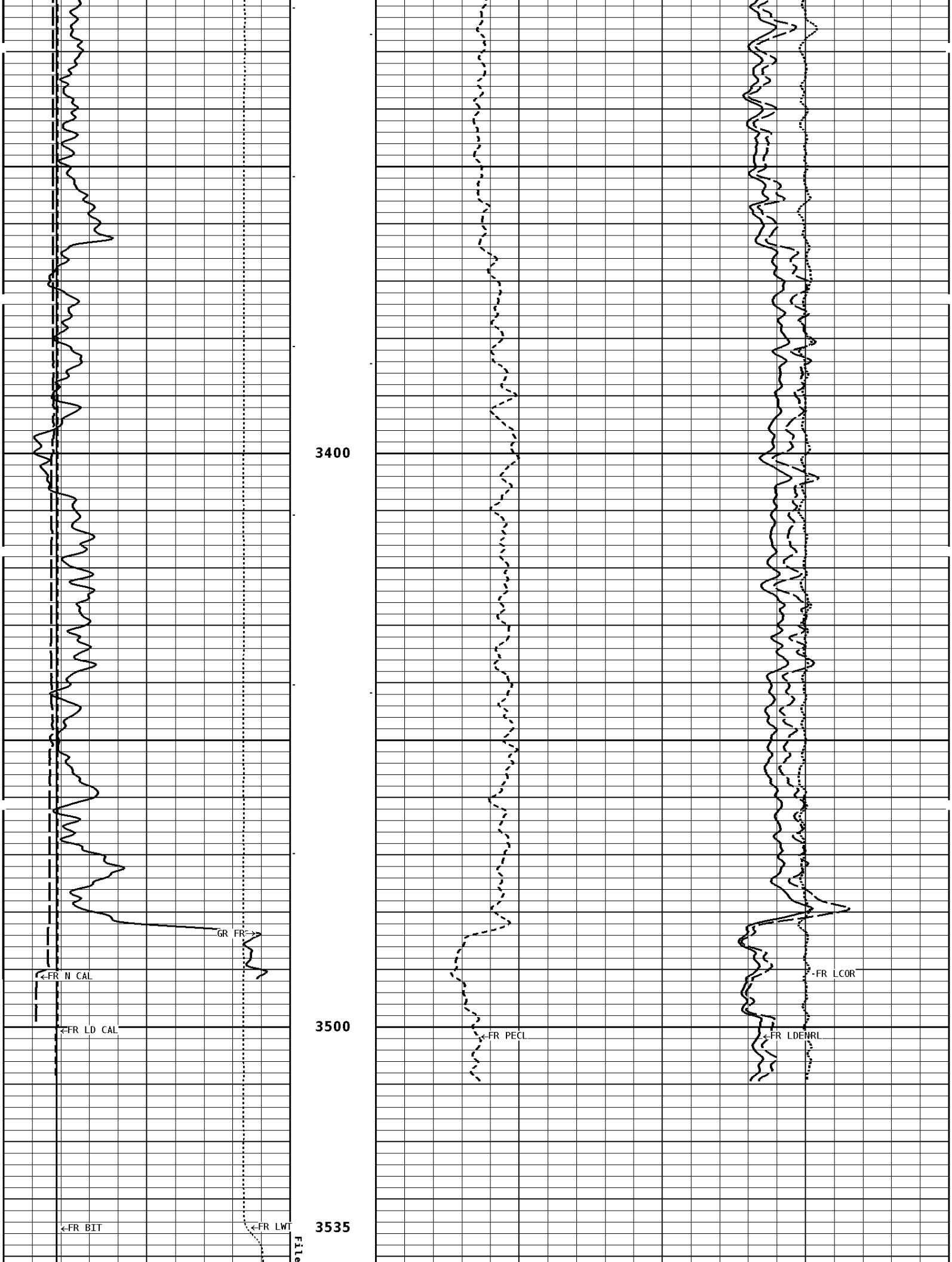

2300
--400Cu.Ft
2400

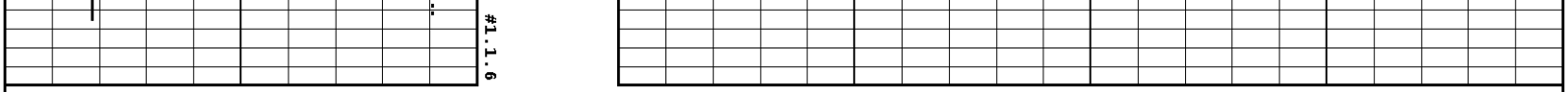

200Cu.Ft
GR
N CAL
LD CAL
2500
PECL
LDENL
LCOR
BIT
LWT
2600


--300Cu.Ft
2700
2800


2900
--200Cu.Ft
100Cu.Ft--
←GR
3000
←N CAL
←LD CAL
←PECL
←LDENRLS
←LCOR
←BIT
←LWT
3100


3200
--100Cu.Ft
3300


3400
3500
3535
GR FR
FR N CAL
FR LD CAL
FR BIT
FR LWT
FR PECL
FR LCOR
FR LDENRL



1:240 MAIN SECTION

BULK DENSITY

GAMMA RAY API UNITS	-BHV AHV- CU.FT	DENSITY POROSITY (2.71g/cc) PERCENT
150 300		70 30
0 150		30 -10
		-10 -50

TENSION LBS	COMPENSATED BULK DENSITY G/CC
10000 0	3.0 4.0
	2.0 3.0
	1.0 2.0

DENSITY (X) CALIPER INCHES (IN)	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26	0 10	-0.25 0.25
6 16		

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 Correction (PHI N)	Disable	

* Calibration Summary *

Shop Calibration
GRT-B

Performed : 16-May-2019 Time : 10:48
Sensor Suite : GR-GR5 ID : GRT-BB-006

	Measured Background	Measured Jig	Units	Calibrated Jig	Units
GR	68	335	CPS	160	GRAPI

Shop Calibration
CNT-AA

Performed : 15-MAY-2019 Time : 10:07
Sensor Suite : CALI-BCN ID : NDT-BB-146

	Jig - Measured Ring#1	Jig - Measured Ring#2	Jig - Calibrated Ring#1	Jig - Calibrated Ring#2	Units
CL # 1	9.3	14.0	6.0	12.0	IN.

Performed : 15-May-2019 Time : 10:13
Sensor Suite : BHC NEUT ID : CNP-AA-115
Source ID : N-1044

	Tank Measured	Tank Calibrated	Verification Jig	Units
N/F	4.1233	3.6893	3.7005	
Porosity	27.7	20.5	20.7	%

Shop Calibration
LDT-DA

Performed : 15-MAY-2019 Time : 09:36

Performed : 15-MAY-2019 Time : 09:36
Sensor Suite : CALI-LTH ID : NDT-AE-003

	Jig - Measured Ring#1	Ring#2	Jig - Calibrated Ring#1	Ring#2	Units
CL # 1	8.0	12.9	6.0	12.0	IN.

Performed : 15-May-2019 Time : 09:51
Sensor Suite : BHCPELNG ID : LDP-DA-50
Source ID : 63558B

Short Space

	BKGD	Al	Mg	Al+Fe	Units
LSW1	65	1136	1829	757	CPS
LSW2	69	1384	2188	1005	CPS
LSW3	252	3276	5296	2813	CPS
LSW4	314	2962	4299	2641	CPS
LSW5	28	56	64	51	CPS
LSW6	85	88	91	89	CPS
LSW7	52	57	57	57	CPS
LSW8	2	4	5	4	CPS
QS	0.241	0.215	0.232	0.216	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	93	1315	5321	810	CPS
LLW2	100	2342	9144	1734	CPS
LLW3	386	4324	16490	3785	CPS
LLW4	501	2034	6637	1864	CPS
LLW5	58	70	133	68	CPS
LLW6	158	150	145	150	CPS
LLW7	102	99	95	100	CPS
LLW8	4	8	20	7	CPS
QL	0.216	0.207	0.206	0.198	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration
MST-DA

Performed : 15-MAY-2019 Time : 10:36
Sensor Suite : CALI-MSN ID : MST-DA-024

	Jig - Measured Ring#1	Ring#2	Jig - Calibrated Ring#1	Ring#2	Units
CL # 1	6.7	11.0	6.0	12.0	IN.

Performed : 15-MAY-2019 Time : 10:37
Sensor Suite : MSTDA-NI ID : MST-DA-024

Internal

	Measured Zero	Reference	Units	Calibrated Zero	Reference	Units
INV-V	0.0	29853.4		0.00	1546.00	MV
NOR-V	0.0	29711.1		0.00	1646.00	MV
IN-C	0.0	58914.6		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					58.67	OHMM

Performed : 15-MAY-2019 Time : 10:37
Sensor Suite : MSTDAMSF ID : MST-DA-024

Internal

	Measured Zero	Reference	Units	Calibrated Zero	Reference	Units
MSFC	14.5	59121.5		0.00	1522.00	UA
MSFB	32755.1	32817.1		0.00	1522.00	MA
MOM1	1.0	62358.8		0.00	1522.00	MV
MSFRA					43.30	OHMM

STEP energy services

Company: VAL ENERGY, INC.

Well: GARISON #1-25

Location: 660' FNL & 660' FEL

Logged: 06-26-2019

K.B. Elev: 1322.0 Ft