HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

PIONEER NATURAL RESOURCES USA, INC. | CAMPBELL et al ATU 1 | HUGOTON PONOMA | GRANT | KANSAS

COMPANY / WELL / FIELD/BLOCK / COUNTY / STATE

COMPANY **PIONEER NATURAL RESOURCES USA, INC.**

WELL **CAMPBELL et al ATU 1**

FIELD/BLOCK **HUGOTON PONOMA**

COUNTY **GRANT** STATE **KANSAS**

API No. 15-067-21747

Location (SHL) 221' FNL & 251' NW-NW-NW-NW

Sect. 27 Twp. 29 S Rge. 37 W

Other Services:
DSN / SDL
MICROLOG
ACRT

Permanent Datum	GL	Elev. 12.0 ft	Elev.: K.B. 3019.0 ft
Log measured from	KB	, 3007.0 ft above perm. Datum	D.F. 3019.0 ft
Drilling measured from	KB		G.L. 3007.0 ft

Date		24-Jul-13					
Run No.		ONE					
Depth - Driller		2957.00 ft					
Depth - Logger		2960.0 ft					
Bottom - Logged Interval		2937					
Top - Logged Interval		688					
Casing - Driller		8.625 in @ 695.0 ft		@		@	
Casing - Logger		688.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.1 ppg	54.00 s/qt				
PH	Fluid Loss	10.00 pH	12.0 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		0.820 ohmm @ 85.00 degF		@		@	
Rmf @ Meas. Temperature		0.70 ohmm @ 75.00 degF		@		@	
Rmc @ Meas. Temperature		0.940 ohmm @ 75.00 degF		@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		0.66 ohmm @ 108.0 degF		@		@	
Time Since Circulation		5.0 hr					
Time on Bottom		24-Jul-13 12:10					
Max. Rec. Temperature		108.0 degF @ 2960.0 ft		@		@	
Equipment	Location	10546696	LIBERAL				
Recorded By		SHELDON INGERSOLL					
Witnessed By		K. SWAFFORD					

Fold here

PGM Version: WL INSITE R3.8.4 (Build 5)

Service Ticket No.: 900593360 API Serial No.: 15-067-21747

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

Date	Sample No.						
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample							
Rm @ Meas. Temp		@	@	@	@	@	@
Rmf @ Meas. Temp.		@	@	@	@	@	@
Rmc @ Meas. Temp.		@	@	@	@	@	@
Source Rmf	Rmc						
Rm @ BHT		@	@	@	@	@	@
Rmf @ BHT		@	@	@	@	@	@
Rmc @ BHT		@	@	@	@	@	@

RESISTIVITY SCALE CHANGES

Type Log							
Depth							
Scale Up Hole							
Scale Down Hole							

RESISTIVITY EQUIPMENT DATA

Run No.							
Tool Type & No.		ACRT		11005909			
Pad Type		N/A					
Tool Pos.		1.5" S.O.					
Other							

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11048627	Serial No.		Serial No.	11014296	Serial No.	11055304
Model No.	GTET	Model No.		Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.		Diameter	5.3"	Diameter	3.625"
Detector Model No.	T-102	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-214BE
Length	8"	LSA [Y/N]		Serial No.	5168GW	Serial No.	DSN-424
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	2960	688	REC	0	150				30	-10	LIME	30	-10	LIME

DIRECTIONAL INFORMATION

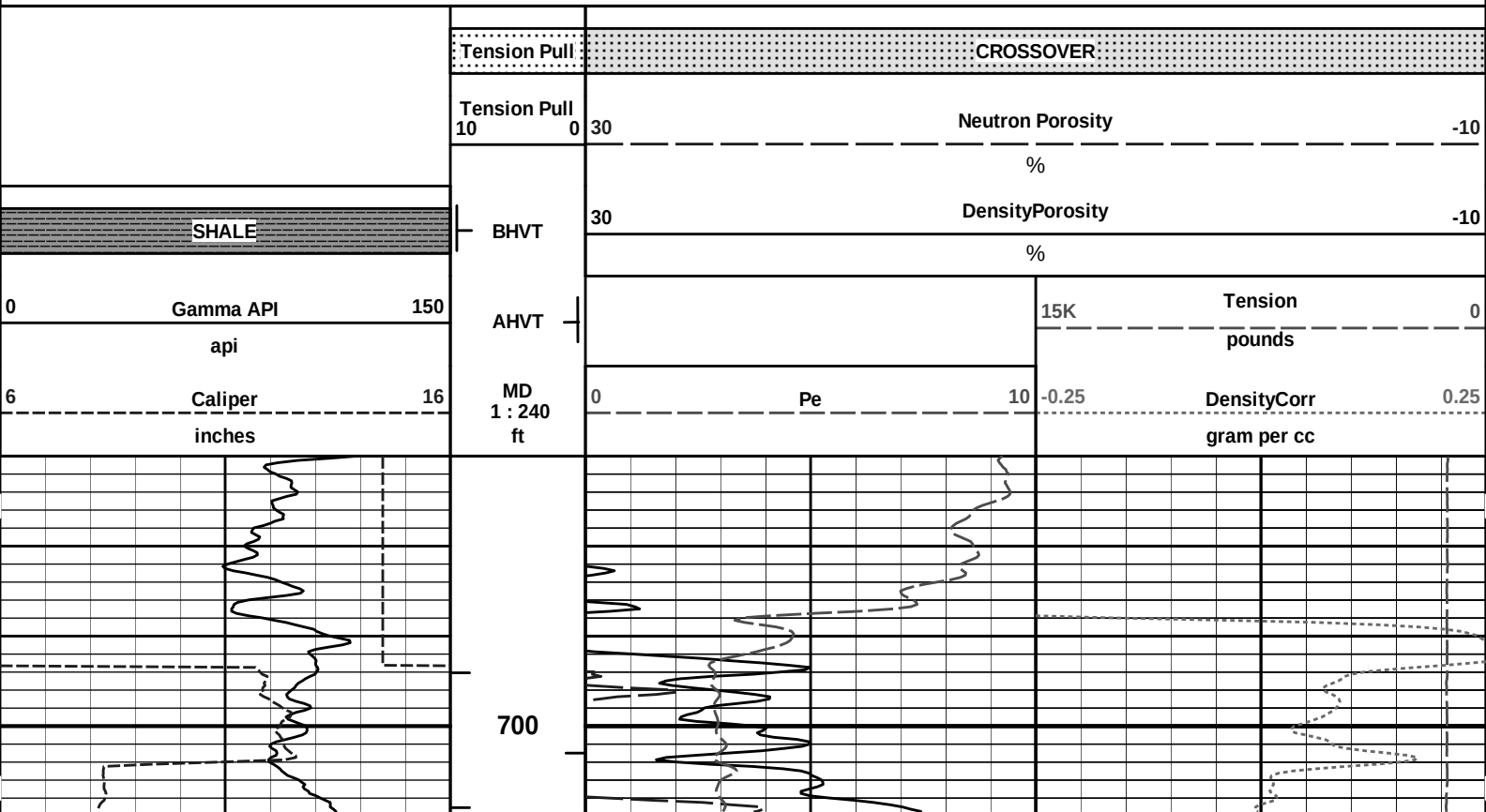
Maximum Deviation @	KOP @

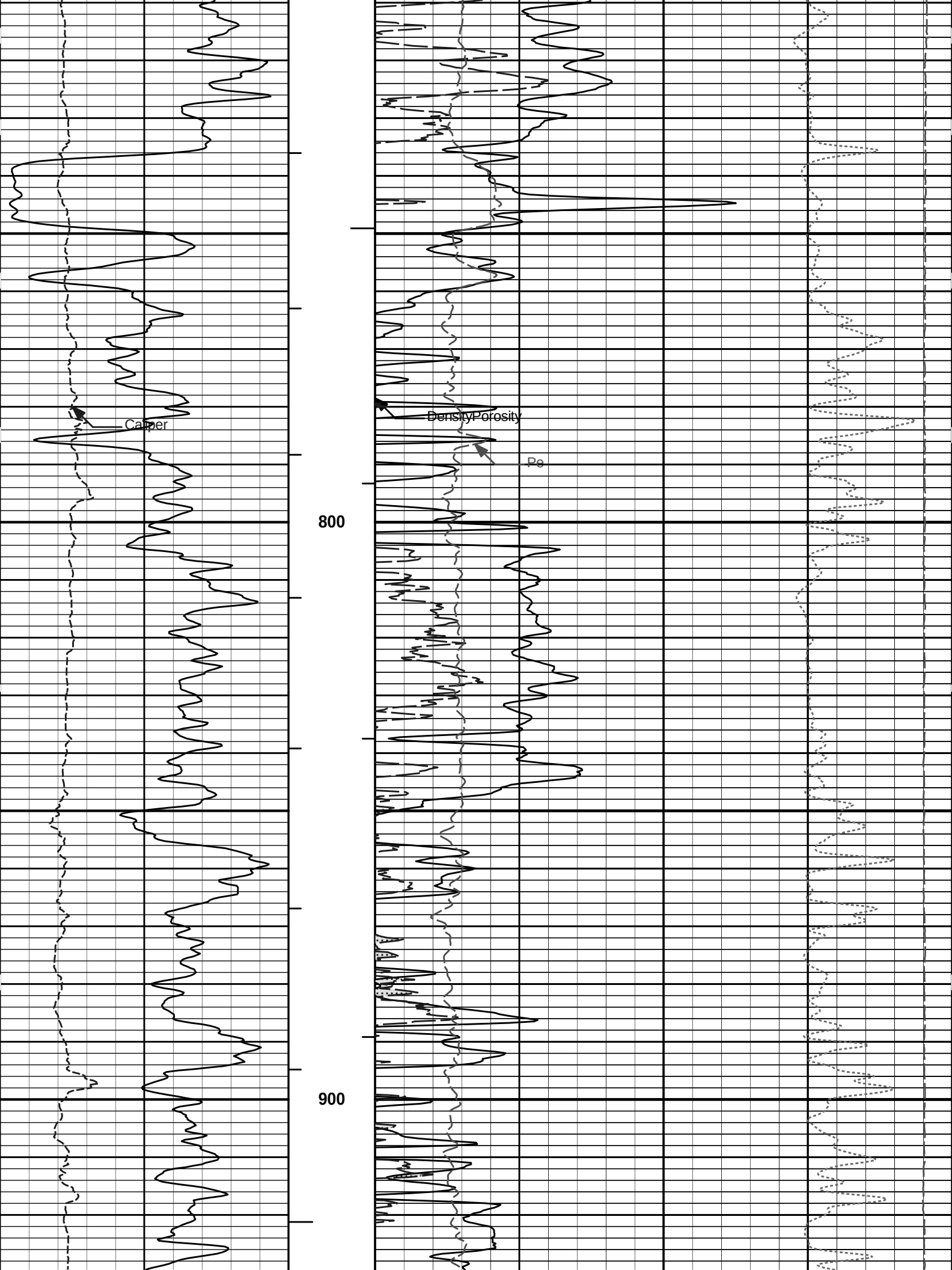
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.

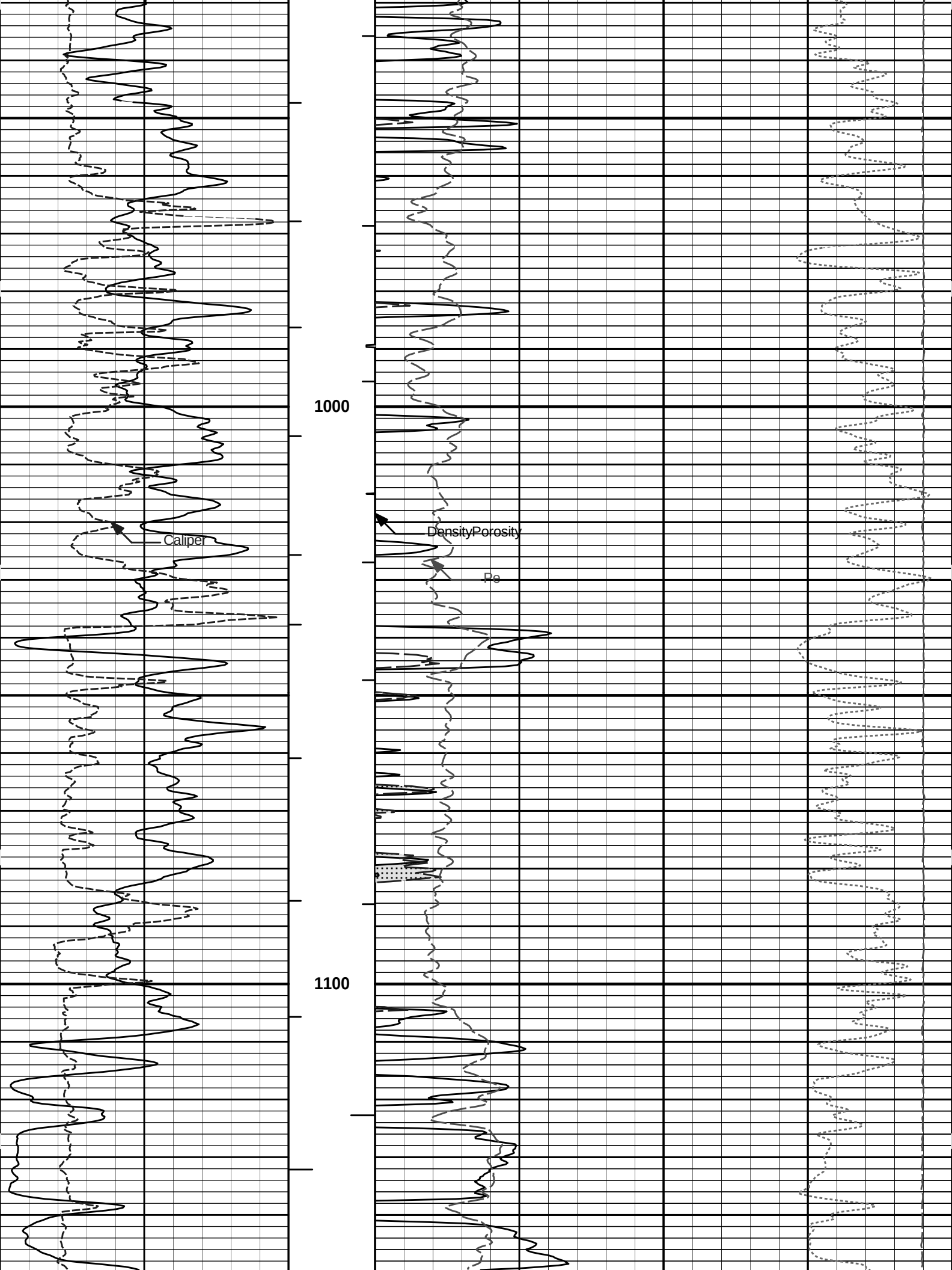
HALLIBURTON

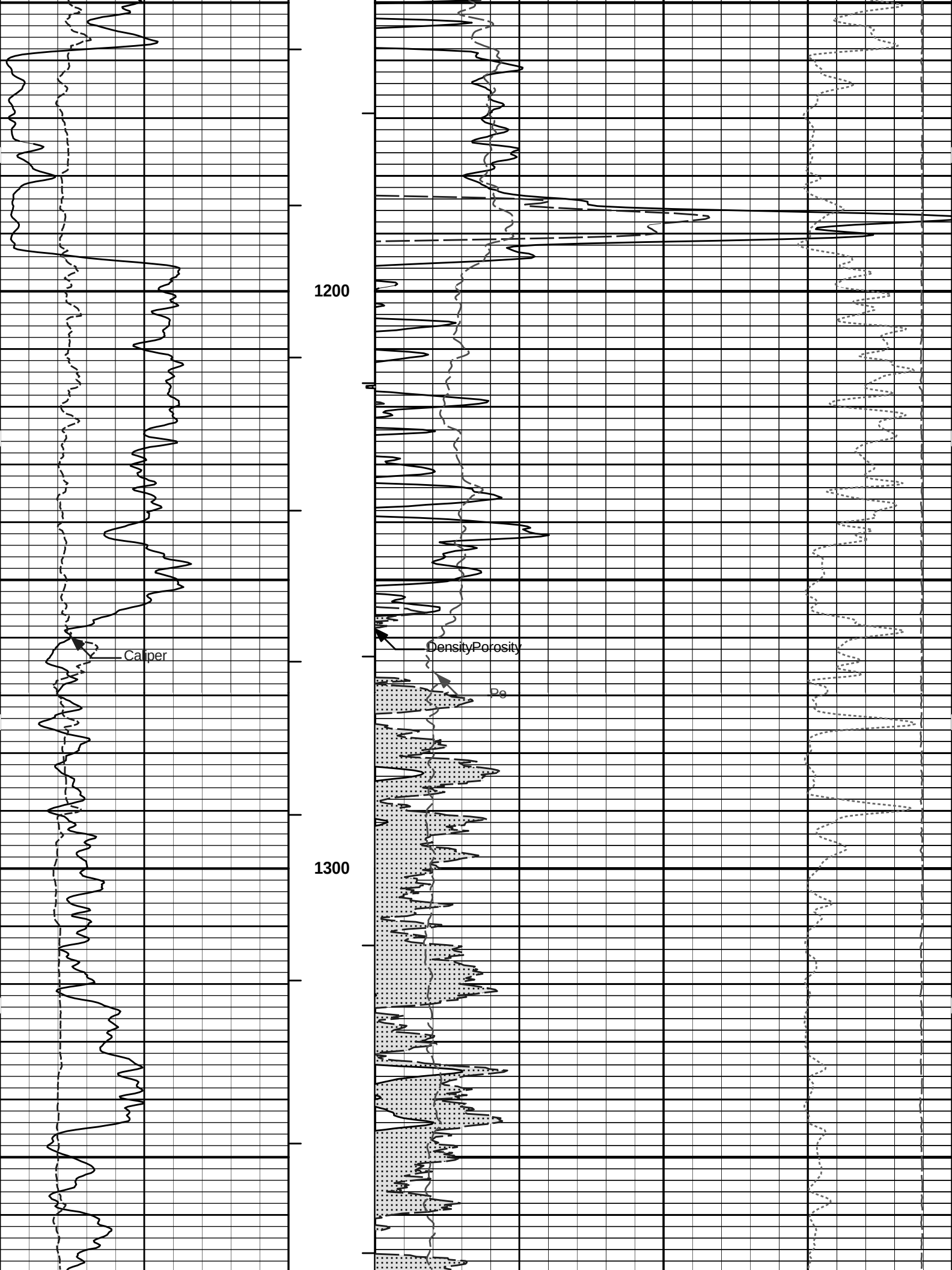
Plot Time: 24-Jul-13 15:15:52
Plot Range: 670 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

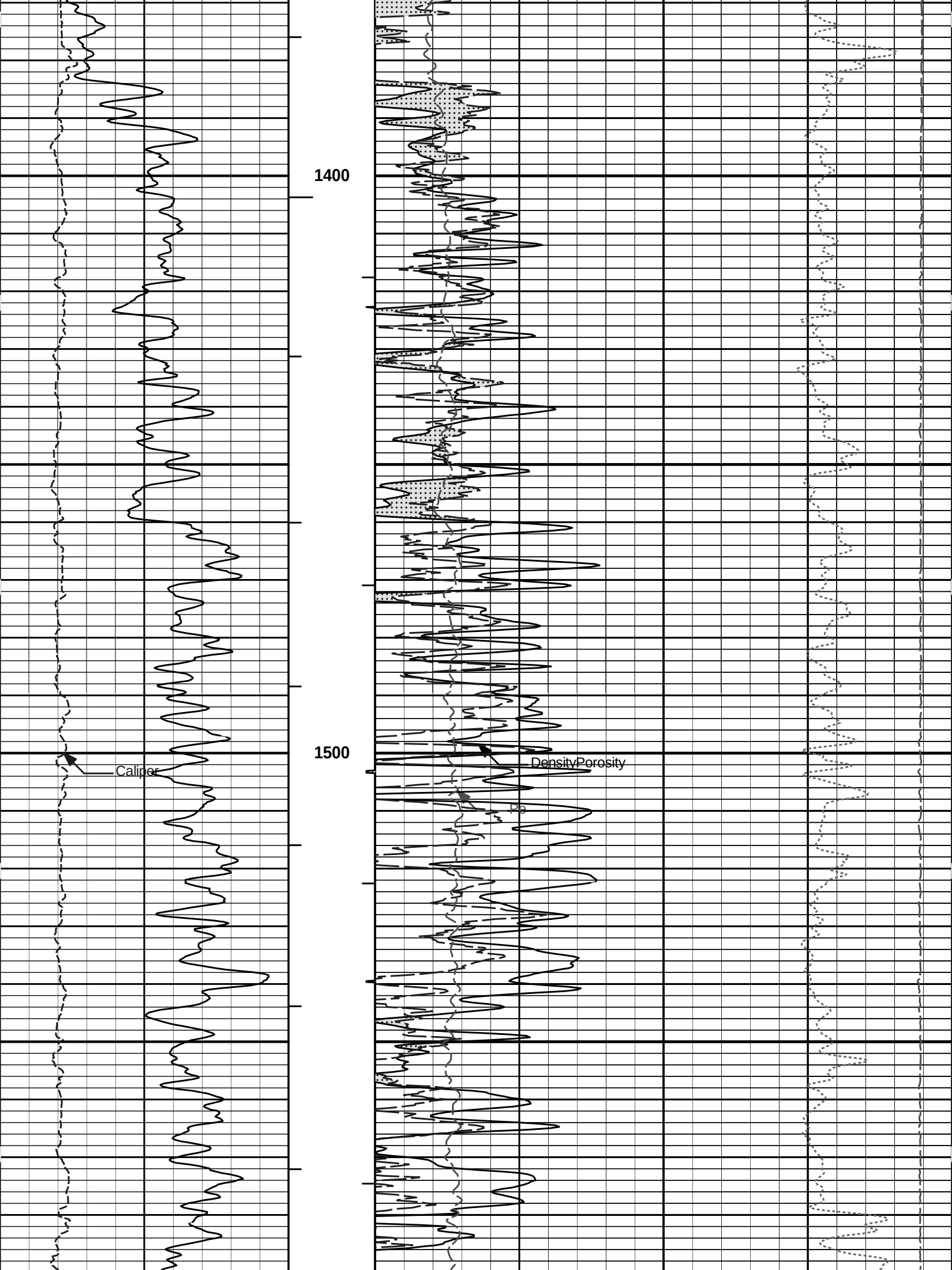
5 INCH MAIN LOG

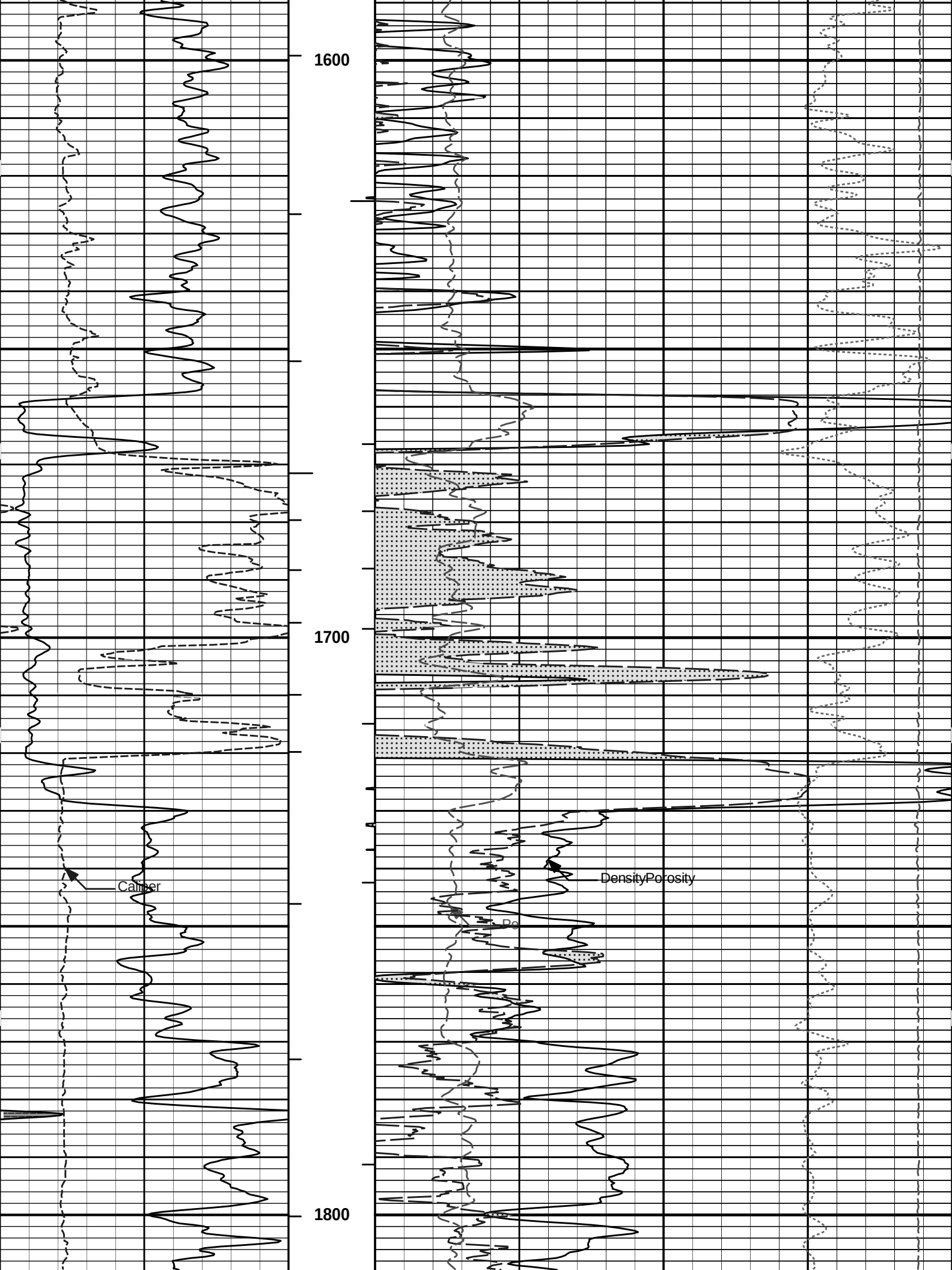


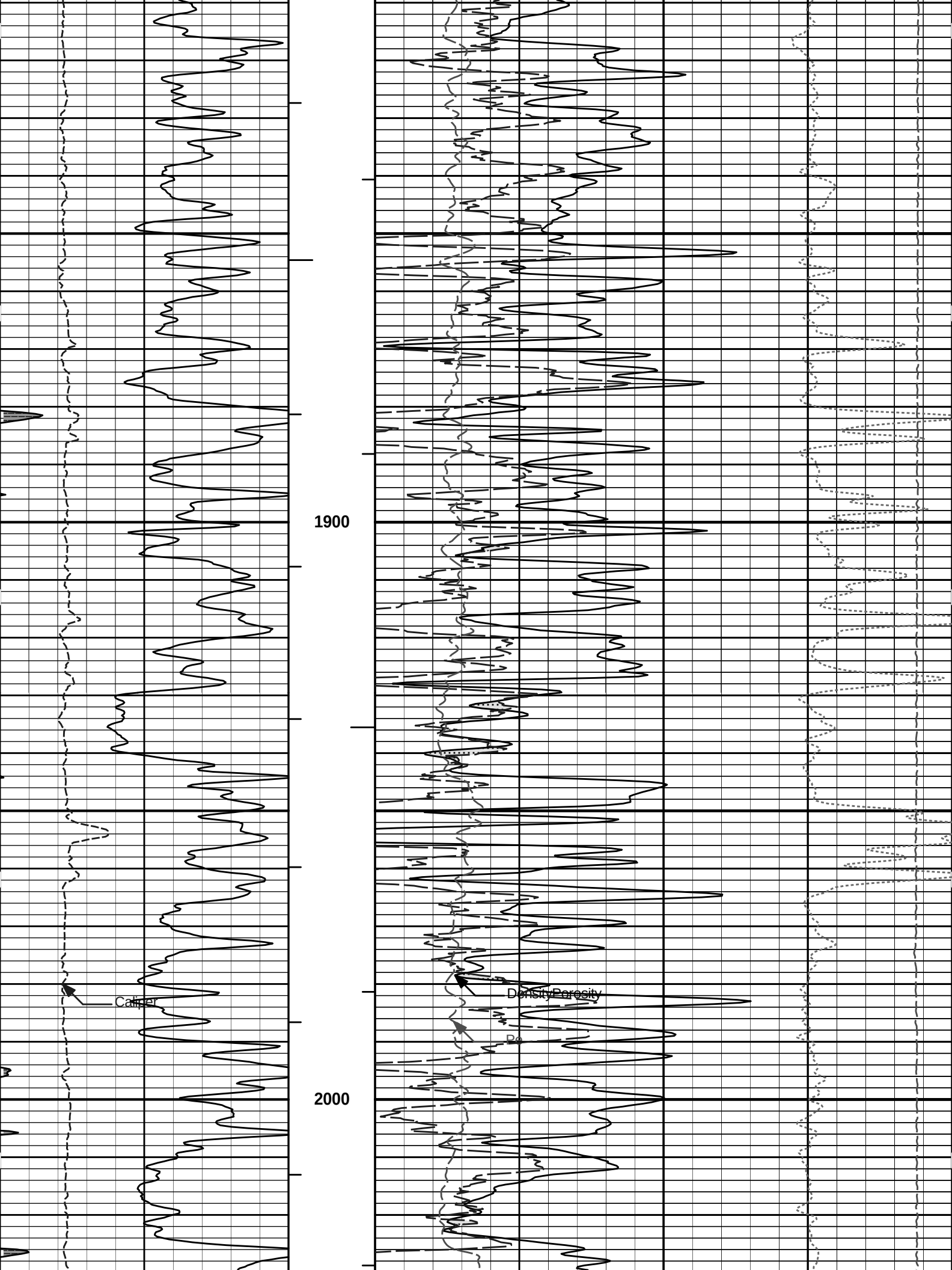

Caliper
DensityPorosity
Po
800
900

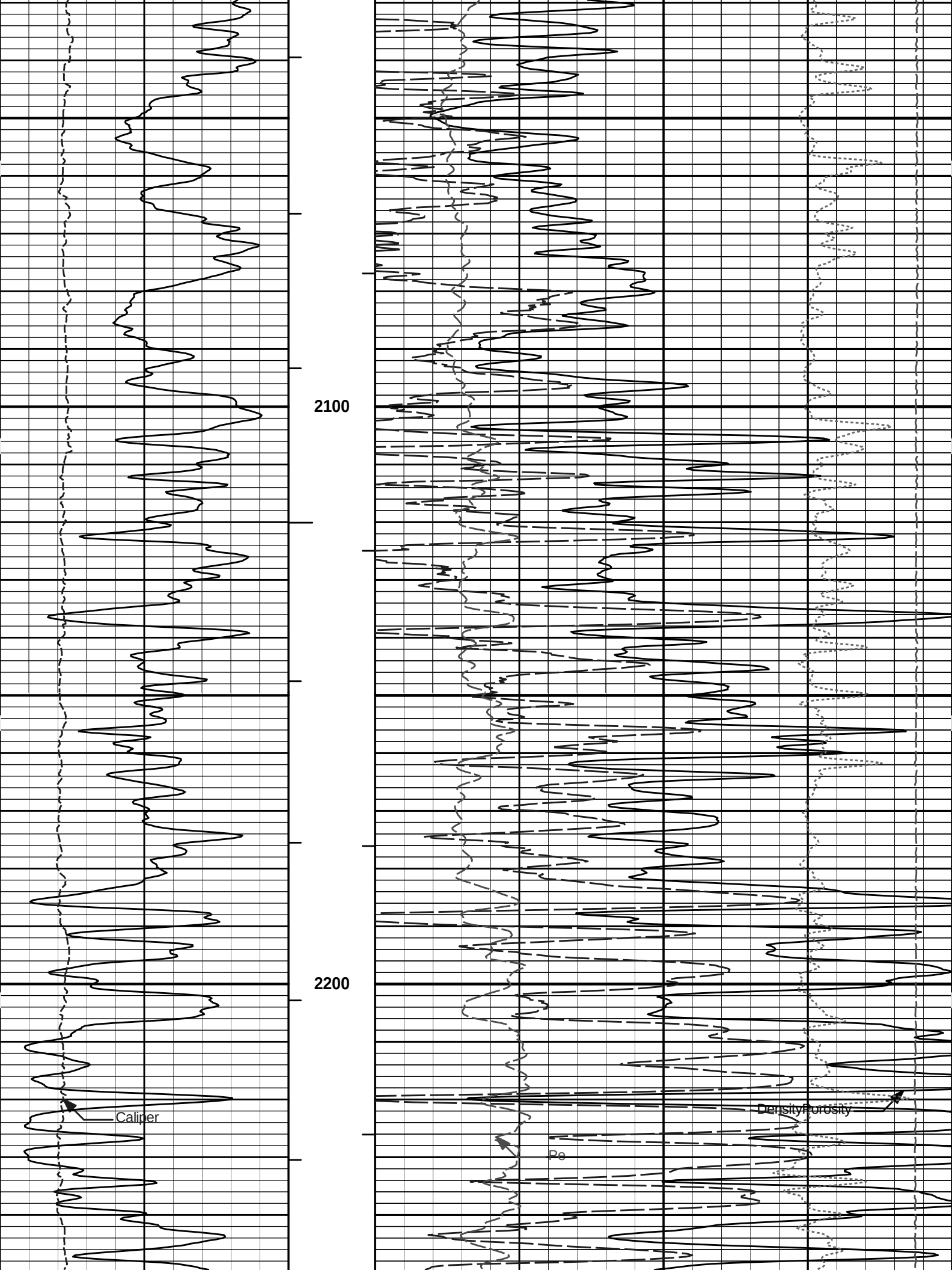

1000
1100
Caliper
DensityPorosity
Pe

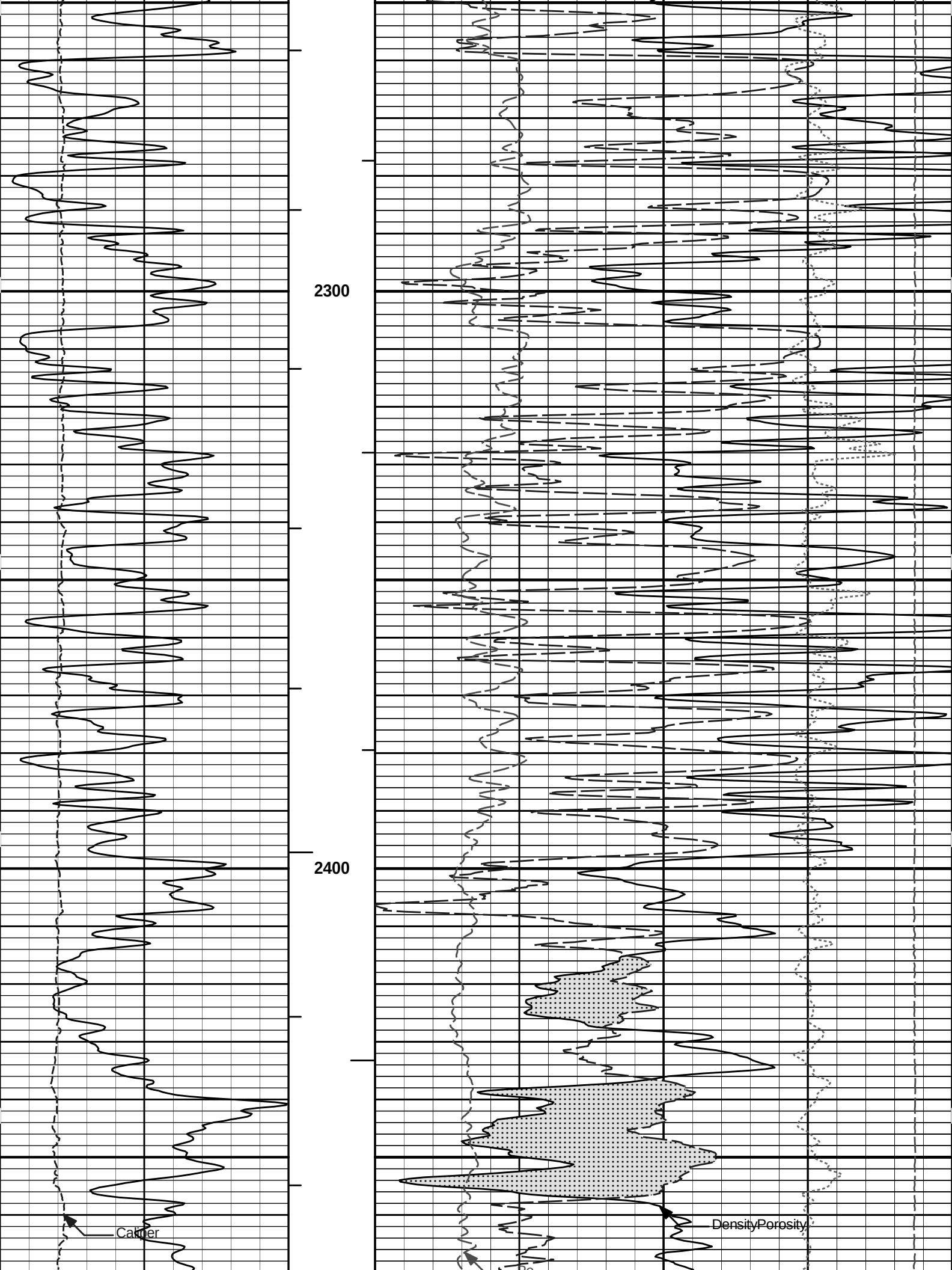

1200
1300
Caliper
DensityPorosity
Pe

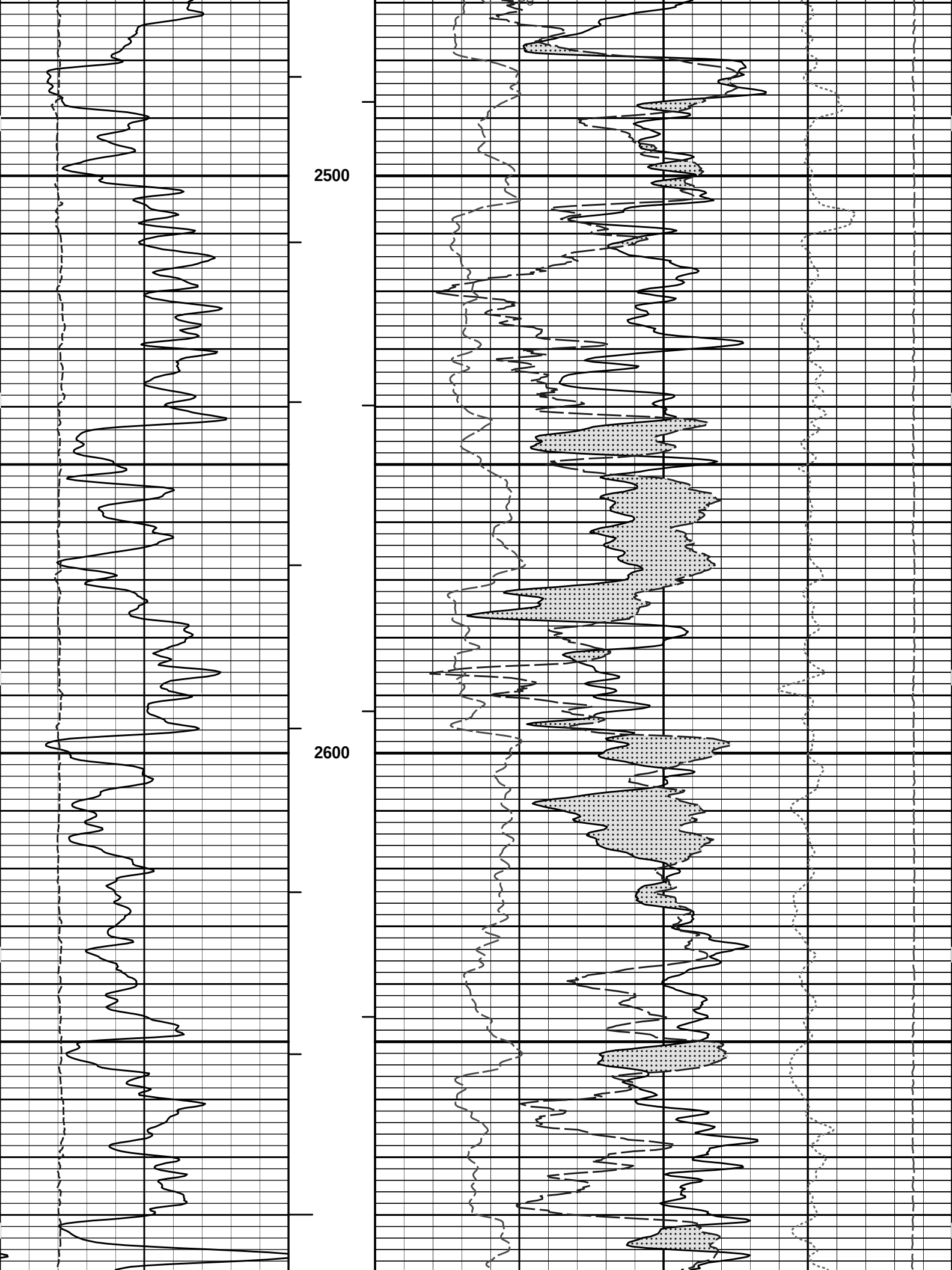

1400
1500
Caliper
DensityPorosity
Pe

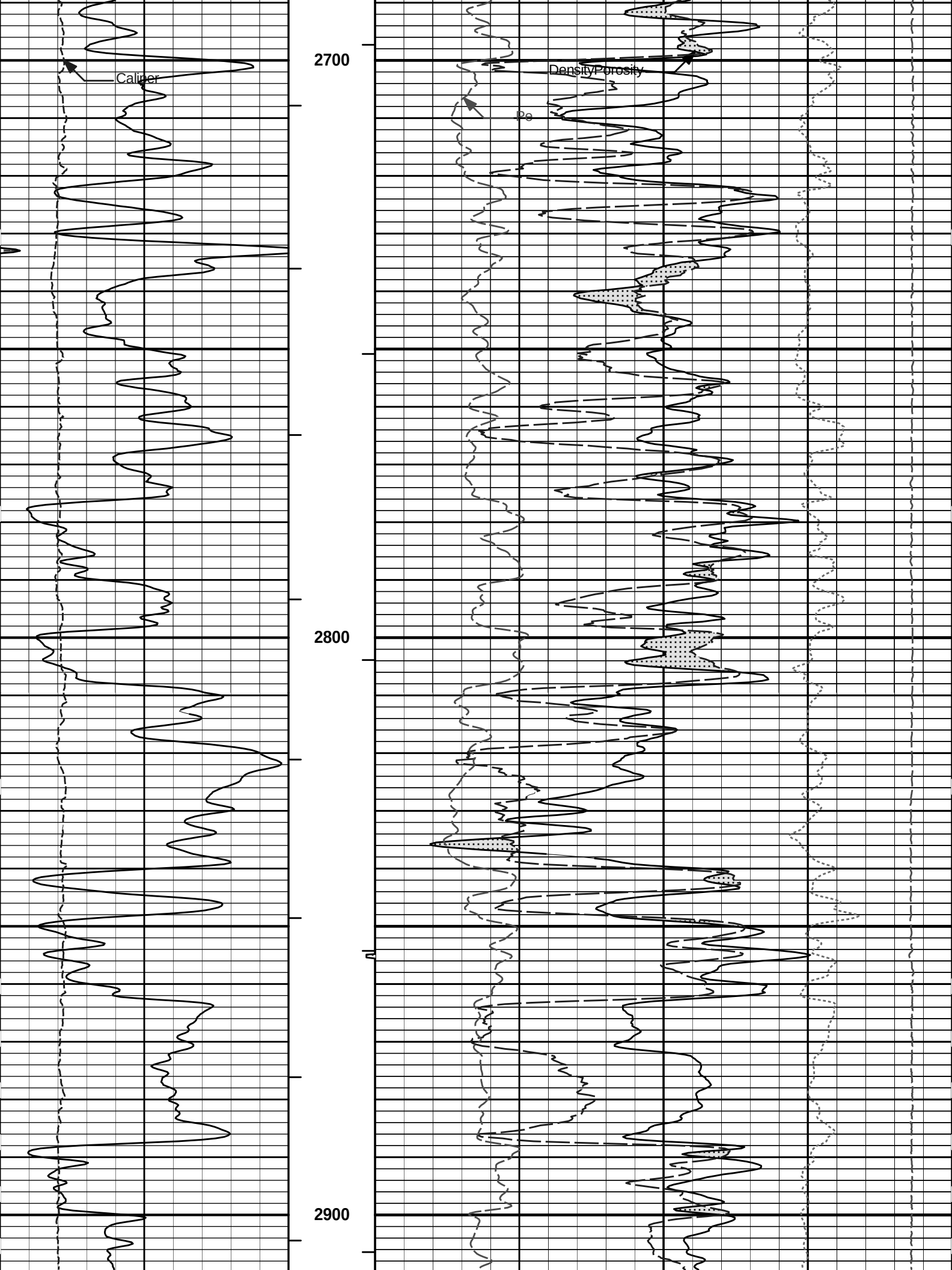

1600
1700
1800
Caliper
DensityPorosity
Po

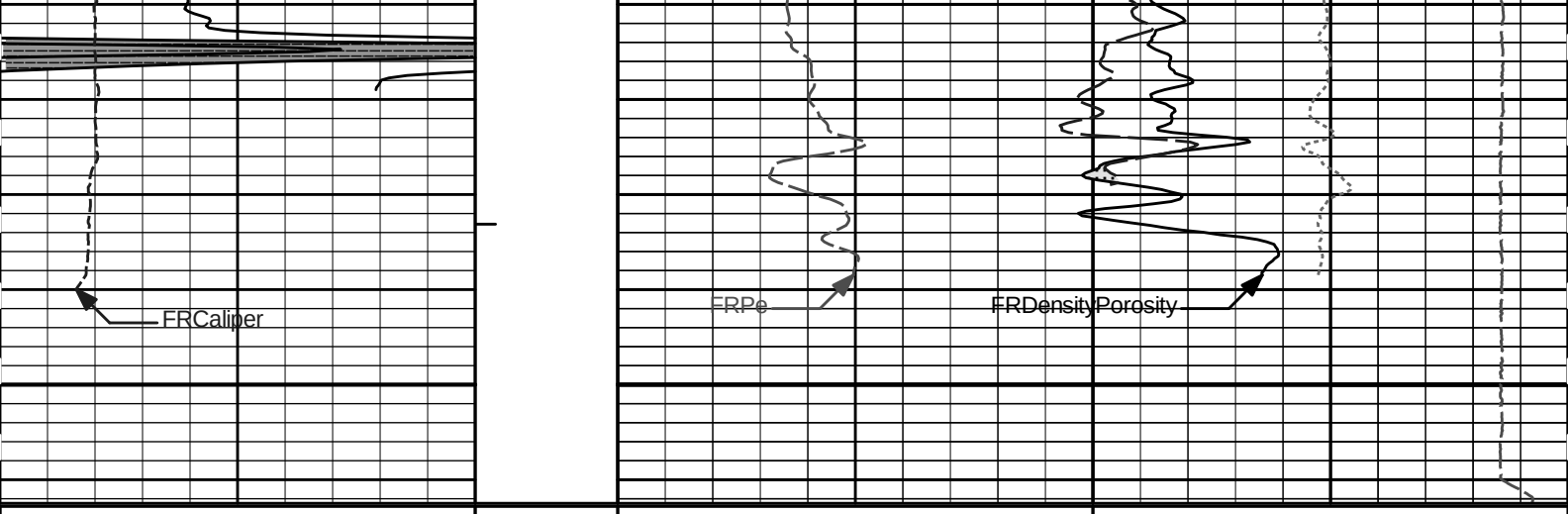

1900
2000
Caliper
DensityPorosity

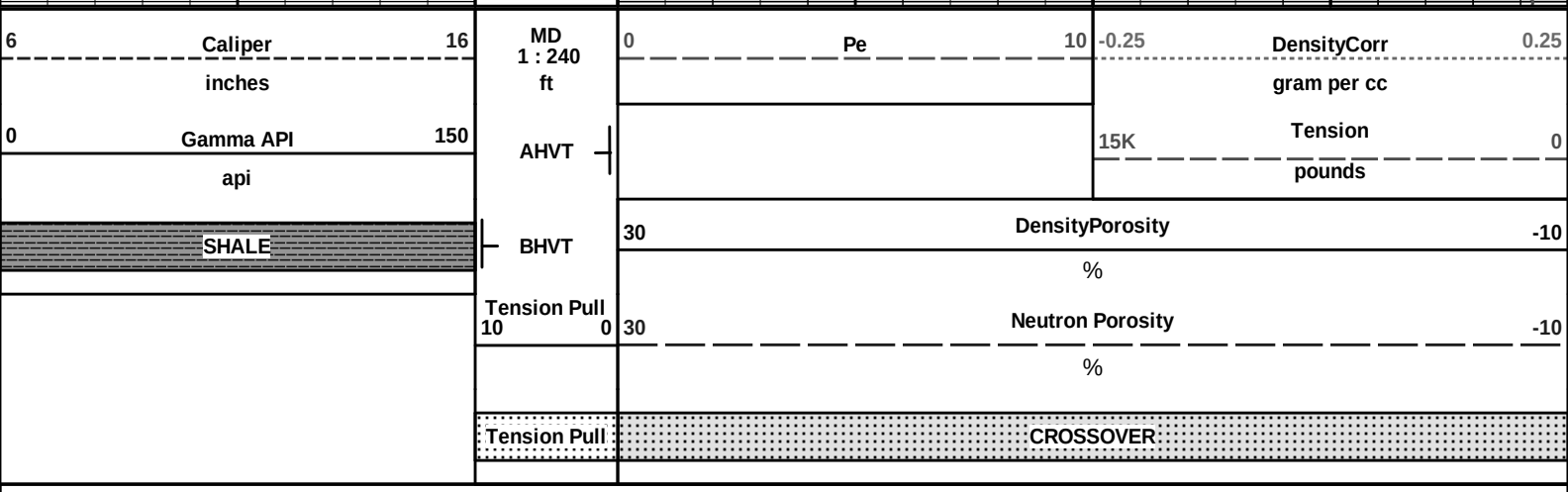

2100
2200
Caliper
DensityPorosity
Pe


2300
2400
Caliper
DensityPorosity


2500
2600


Caliper
2700
DensityPorosity
Pe
2800
2900





HALLIBURTON

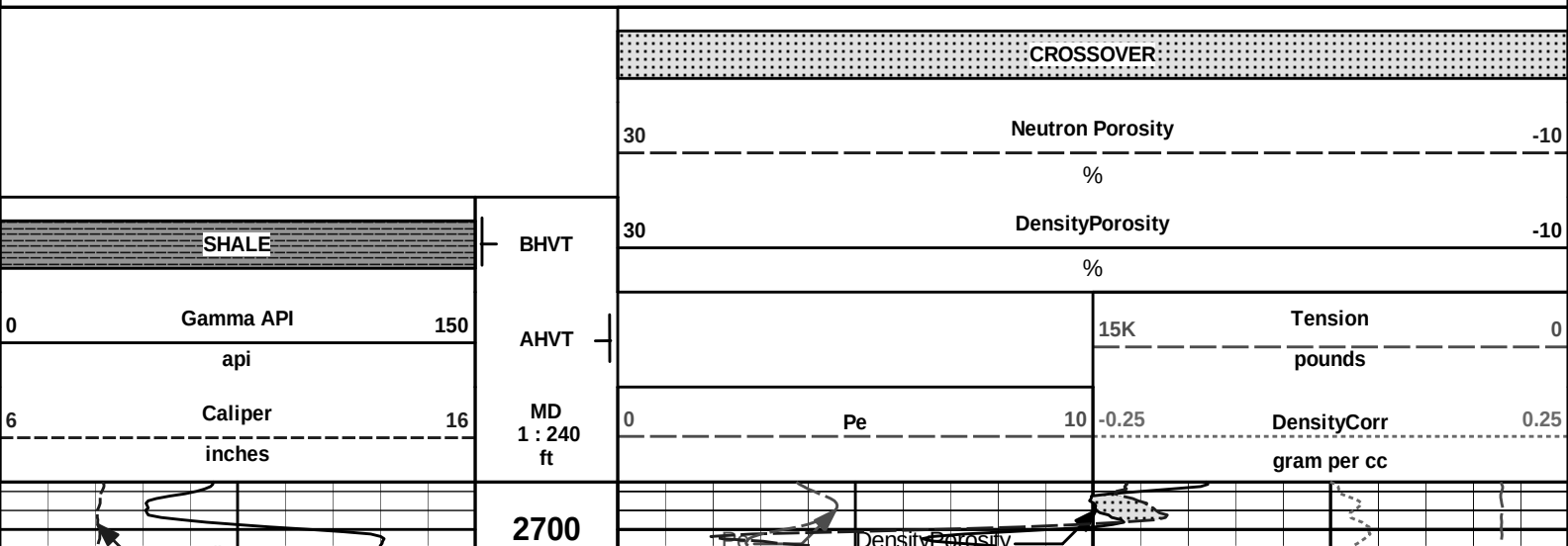
Plot Time: 24-Jul-13 15:16:08
Plot Range: 670 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

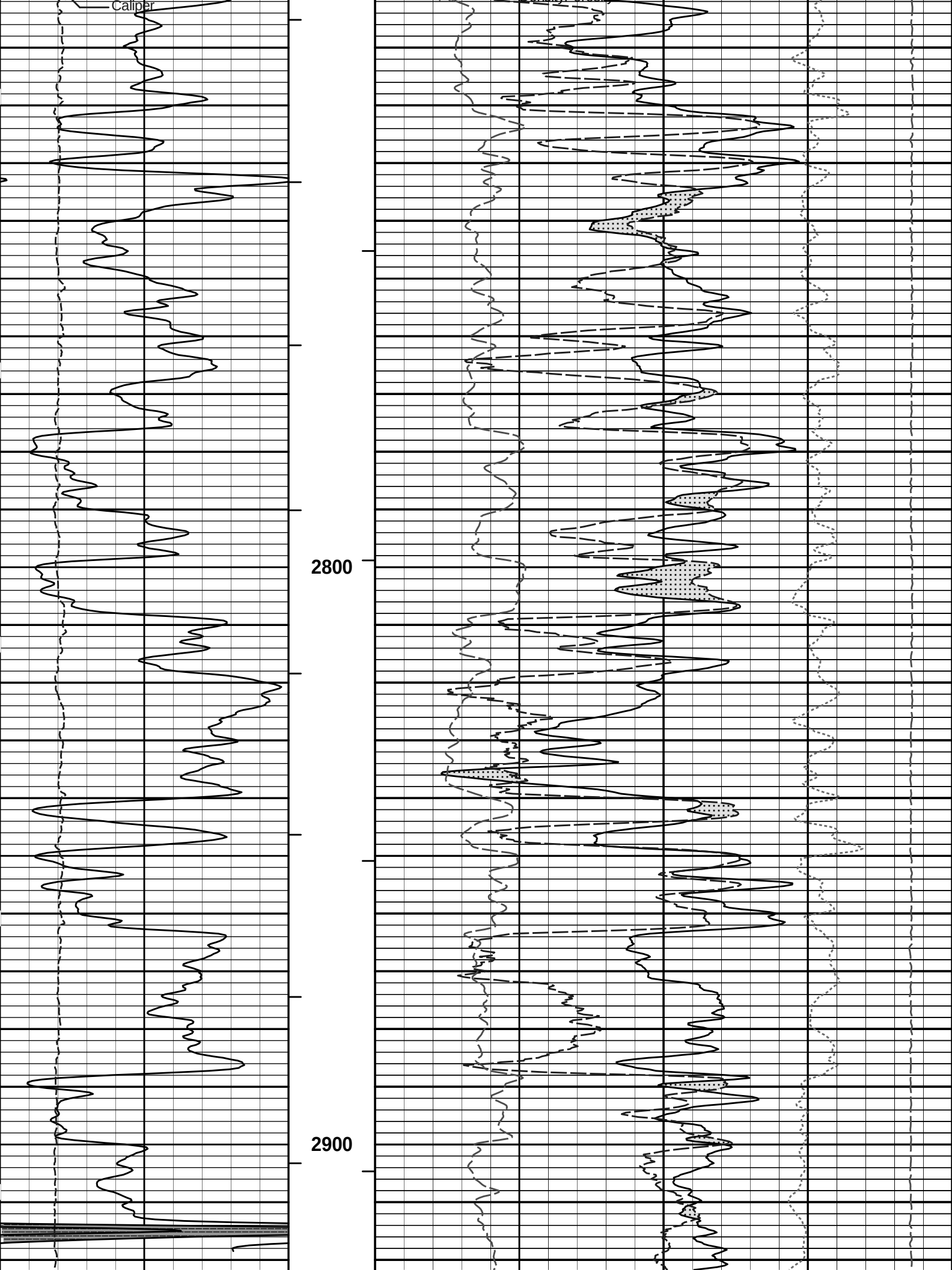
5 INCH MAIN LOG

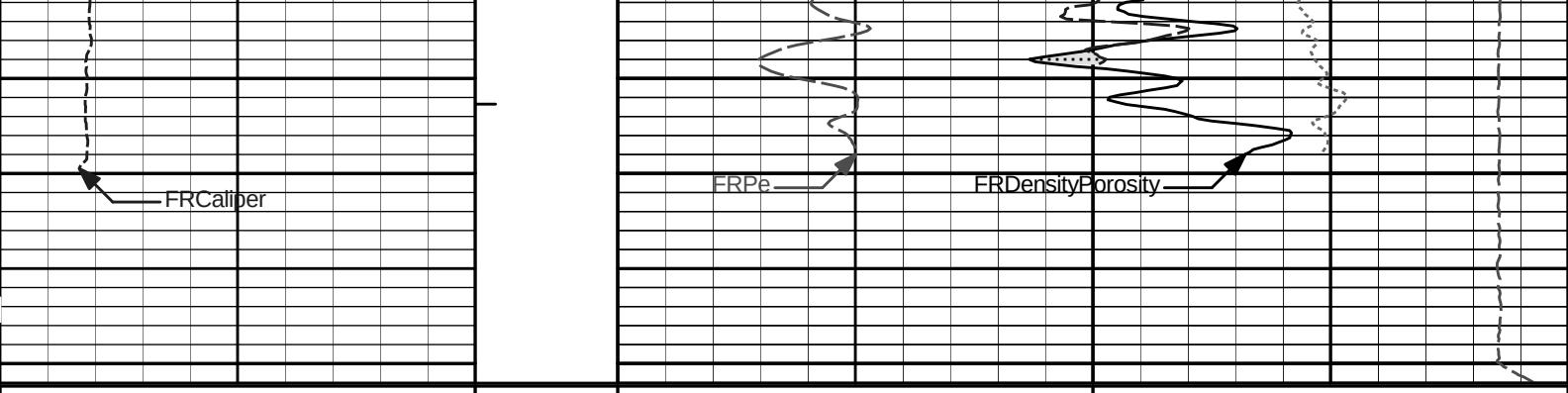
HALLIBURTON

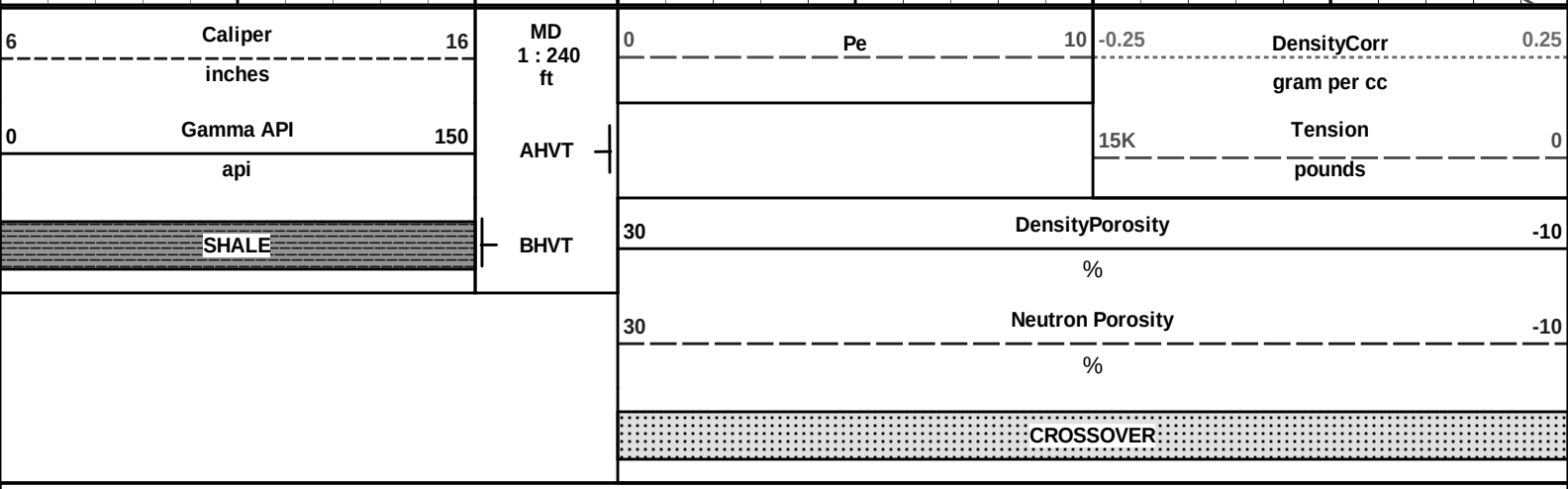
Plot Time: 24-Jul-13 15:16:08
Plot Range: 2695 ft to 2962.08 ft
Data: CAMPBELL_et_al_\Well Based\R1 REPEAT
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION




Caliper
2800
2900





HALLIBURTON

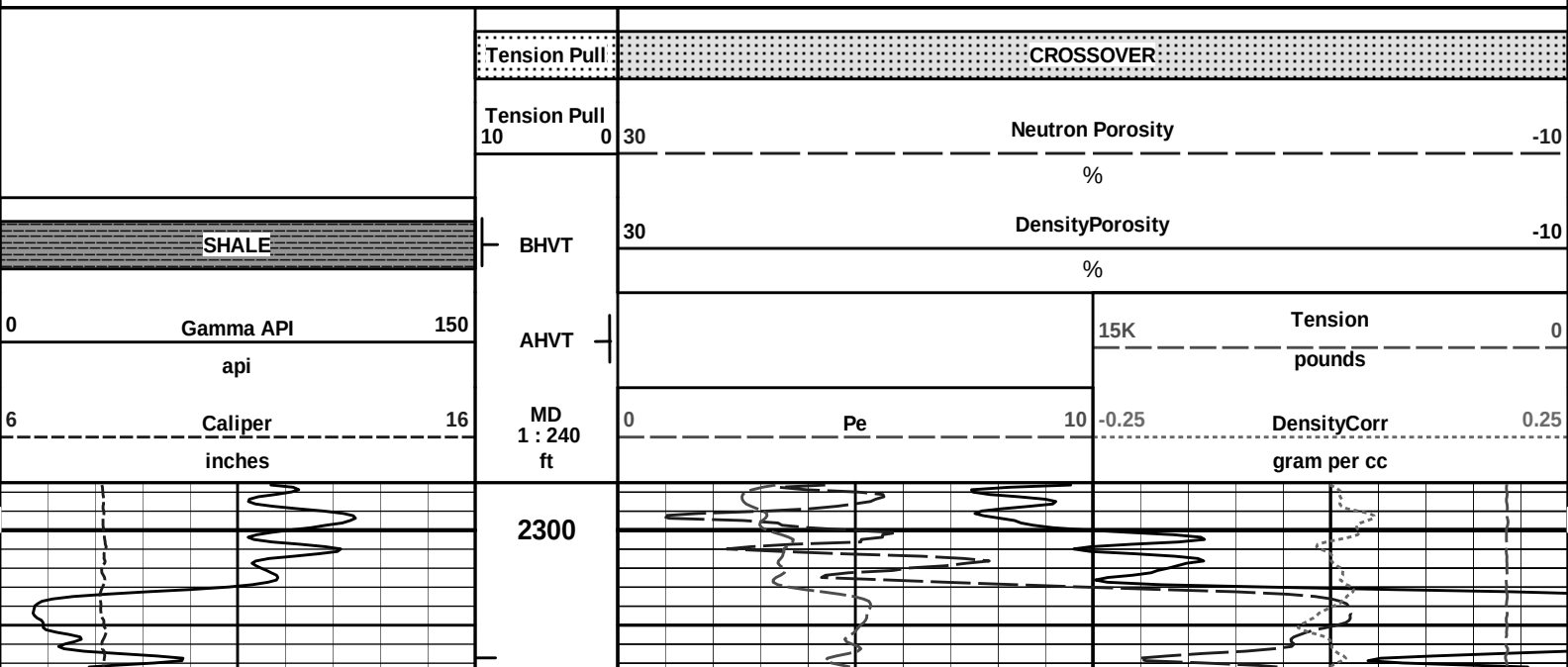
Plot Time: 24-Jul-13 15:16:12
Plot Range: 2695 ft to 2962.08 ft
Data: CAMPBELL_et_al_\Well Based\R1 REPEAT
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

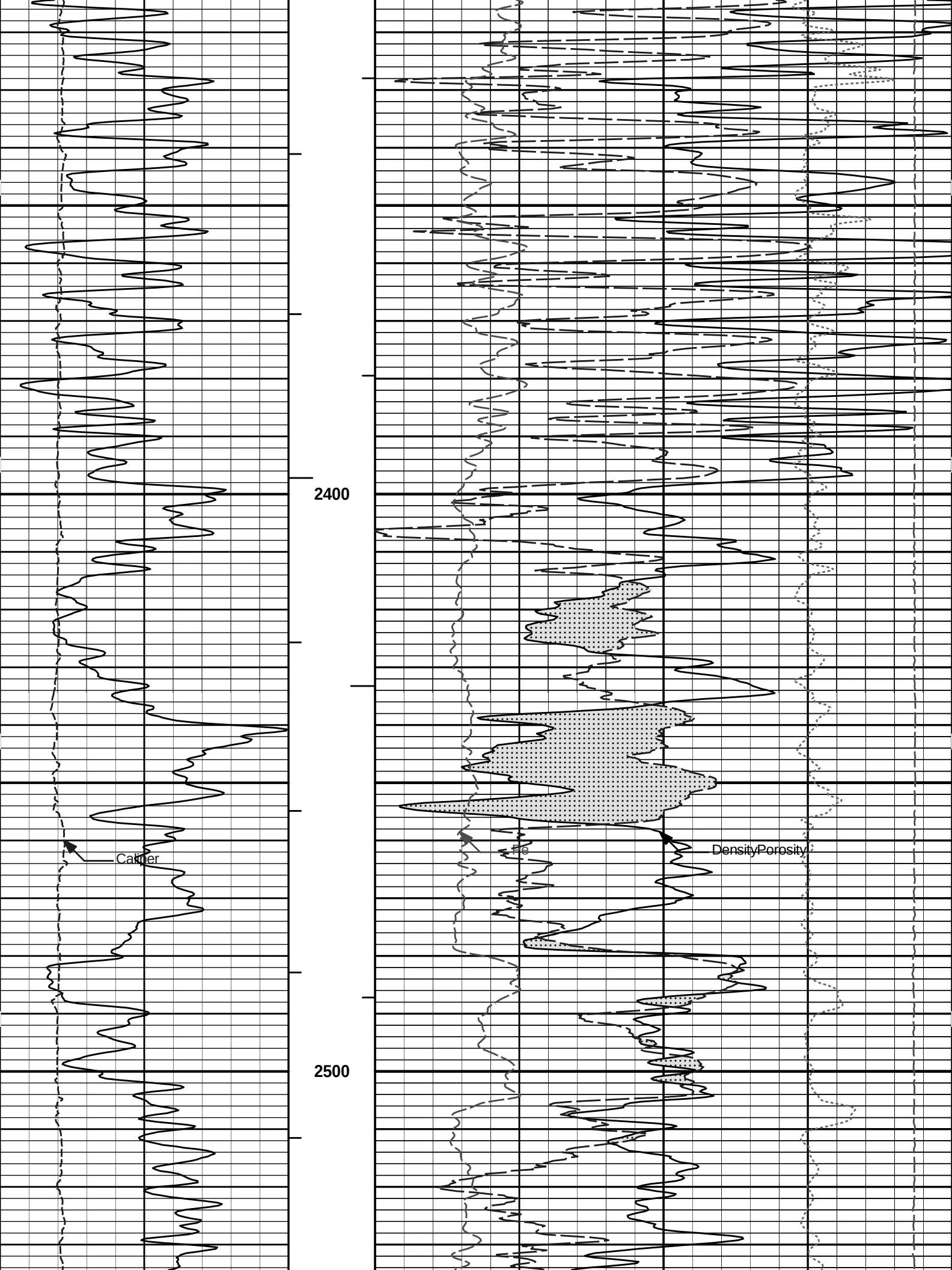
REPEAT SECTION

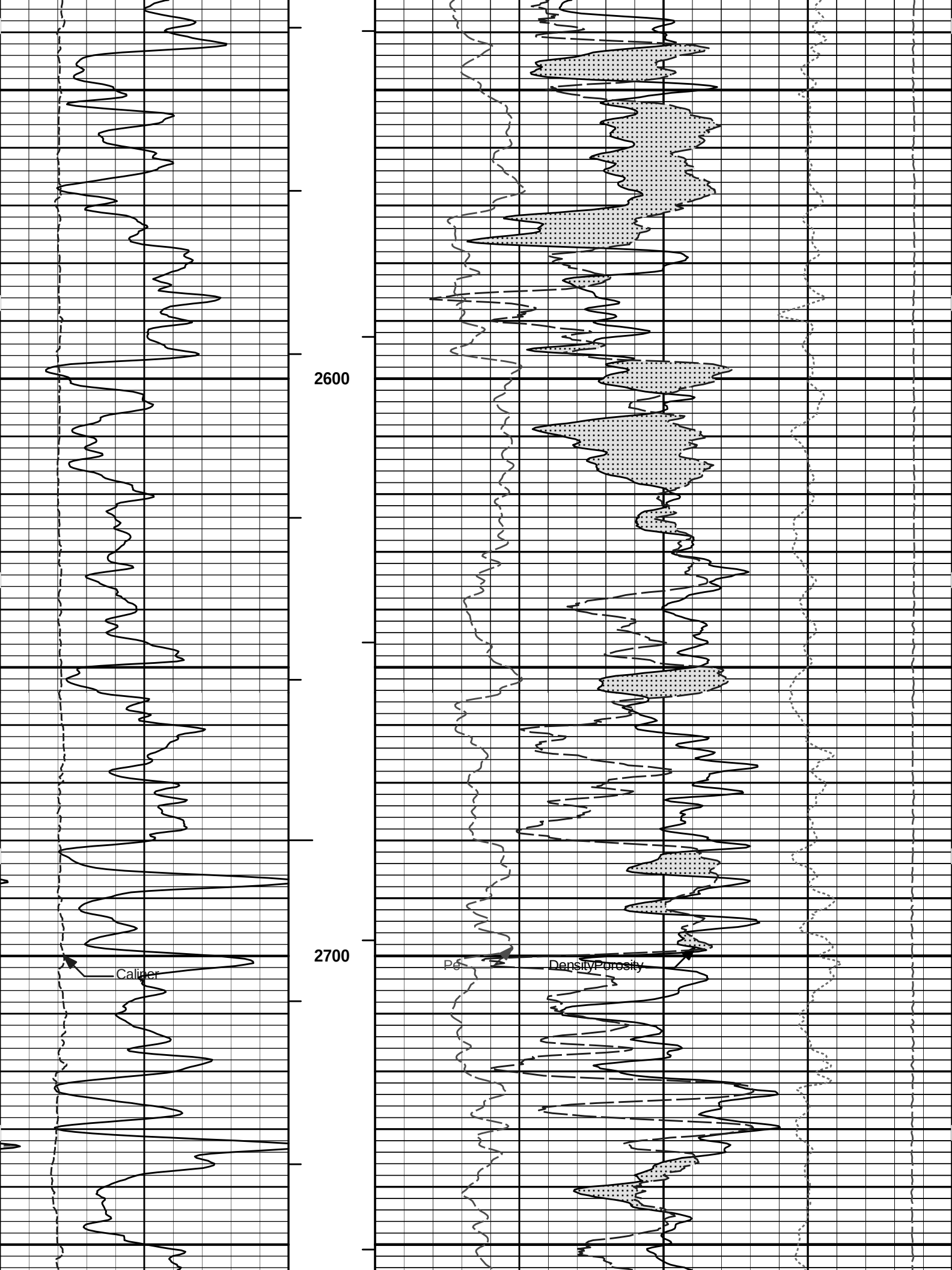
HALLIBURTON

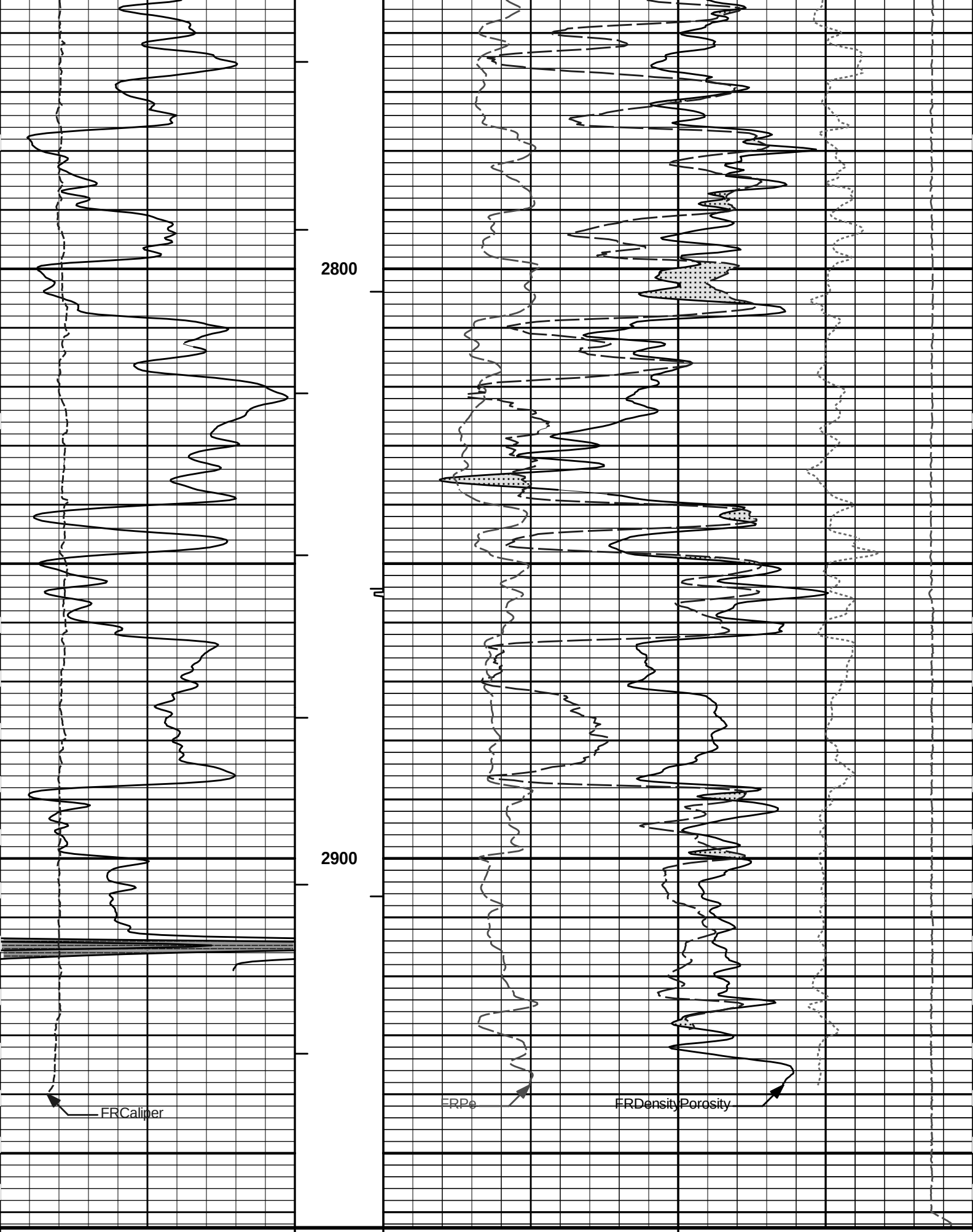
Plot Time: 24-Jul-13 15:16:12
Plot Range: 2295 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

DOLOMITE MATRIX

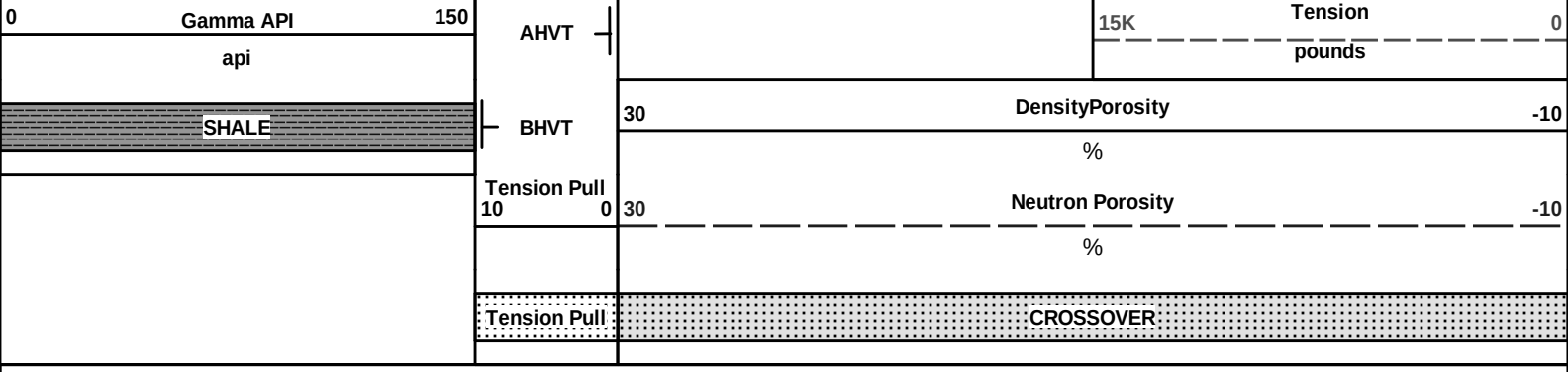



2400
2500
Caliper
DensityPorosity


2600
2700
Caliper
Density/Porosity



6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240 ft					gram per cc	



HALLIBURTON

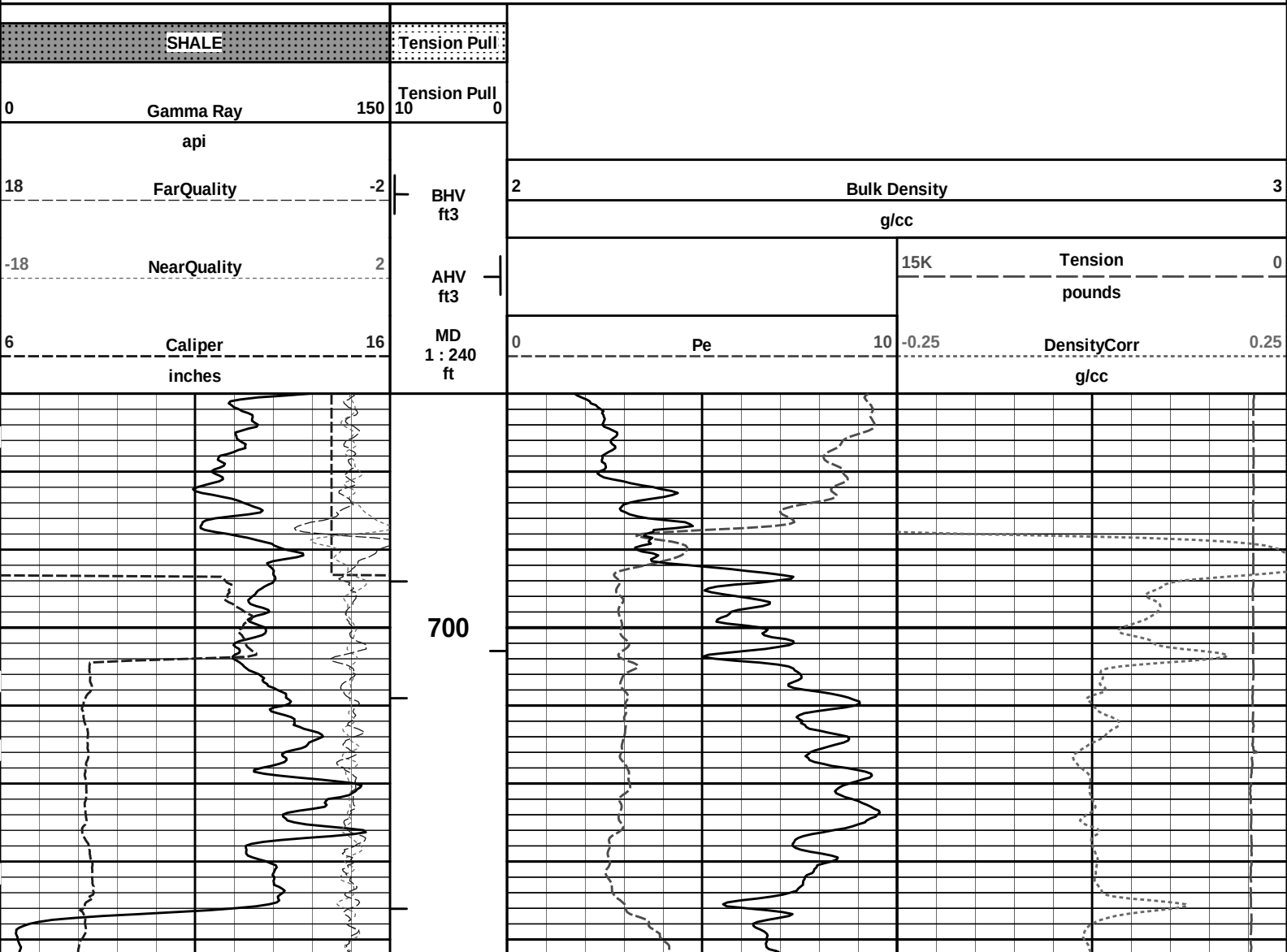
Plot Time: 24-Jul-13 15:16:15
Plot Range: 2295 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING\
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

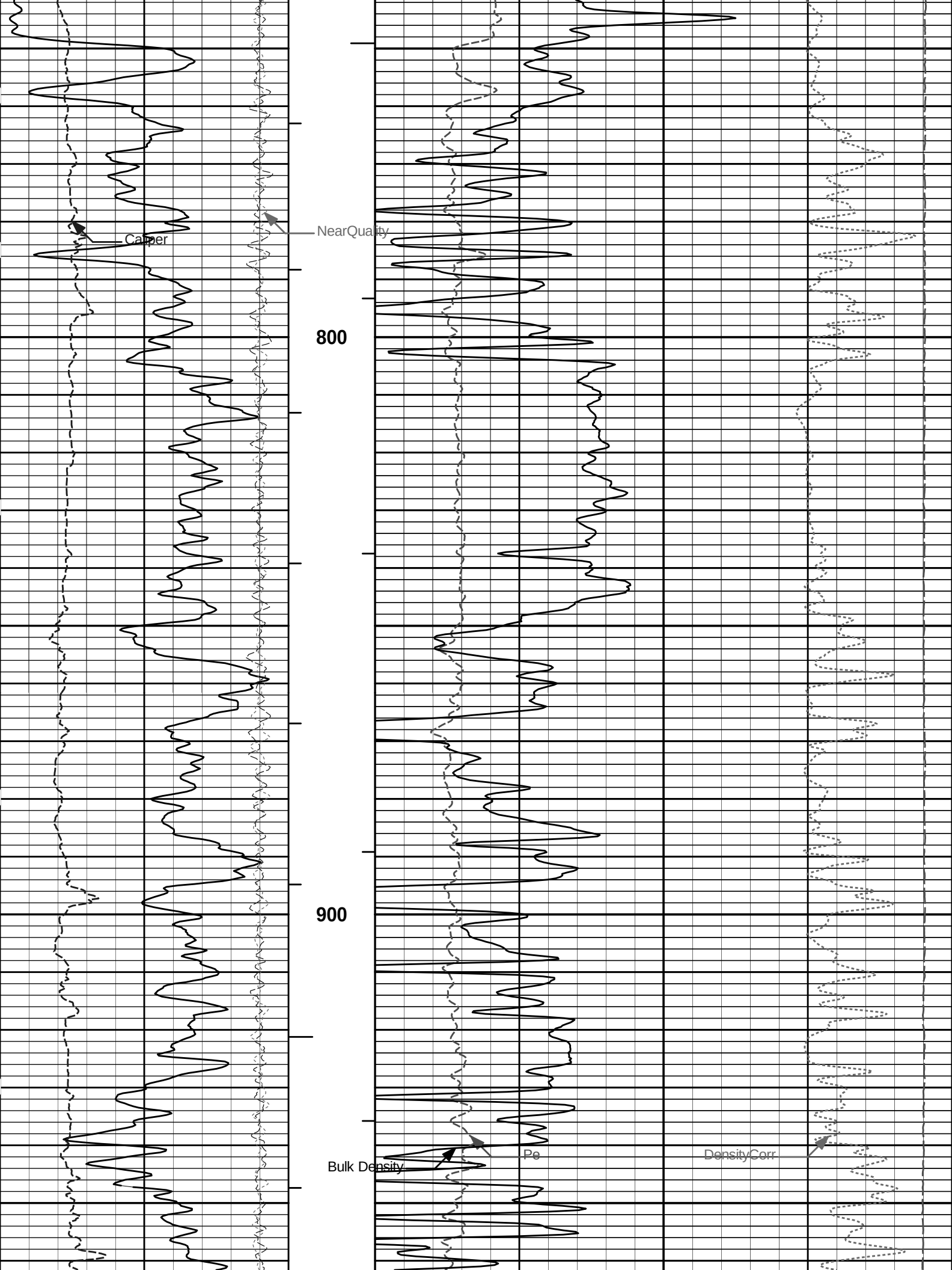
DOLOMITE MATRIX

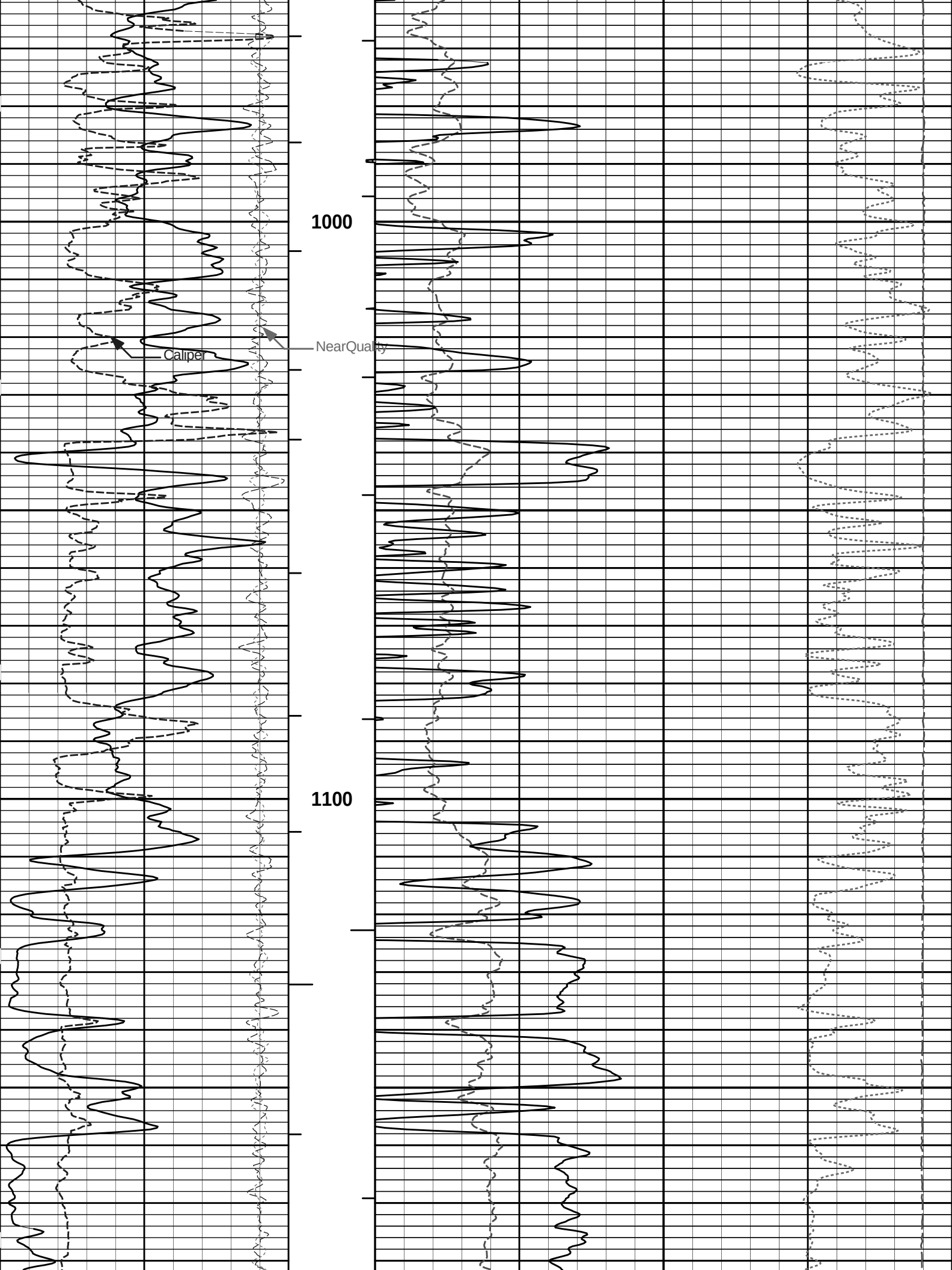
HALLIBURTON

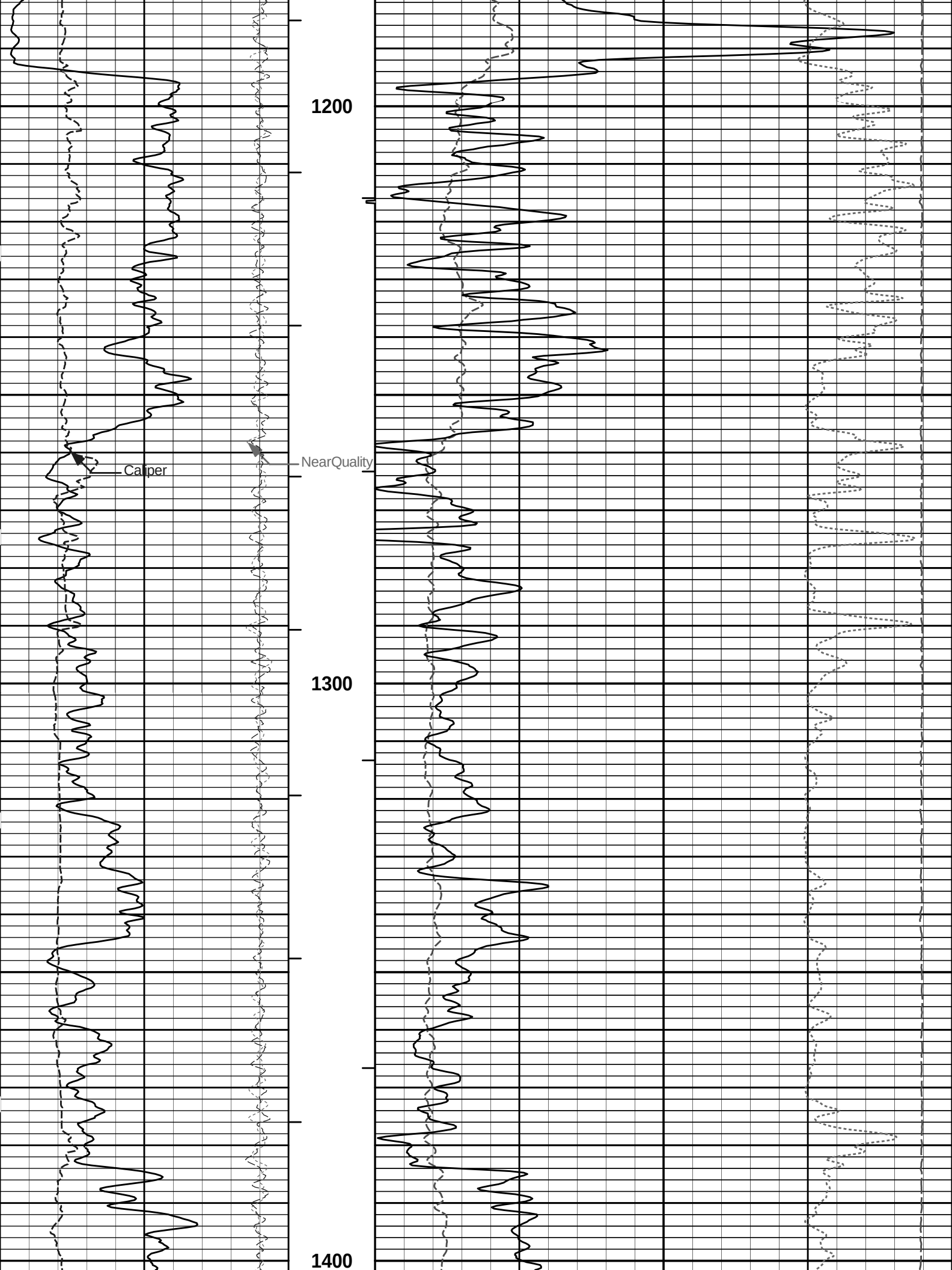
Plot Time: 24-Jul-13 15:16:15
Plot Range: 670 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING\
Plot File: \\-LOCAL-\CAMPBELL_et_al_\Well Based\POROSITY\BULKD_5_MAIN_LIB

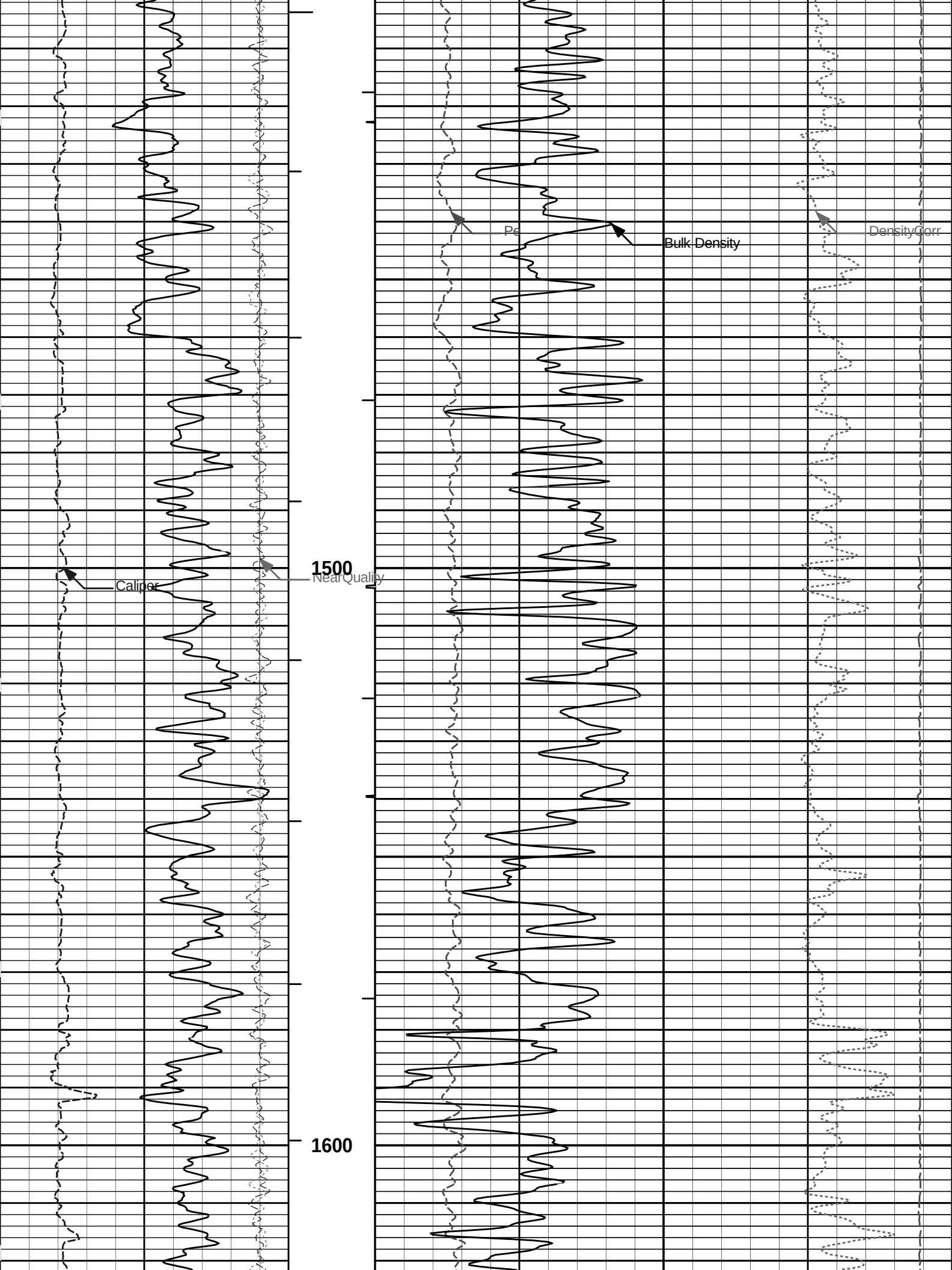
5 INCH MAIN LOG

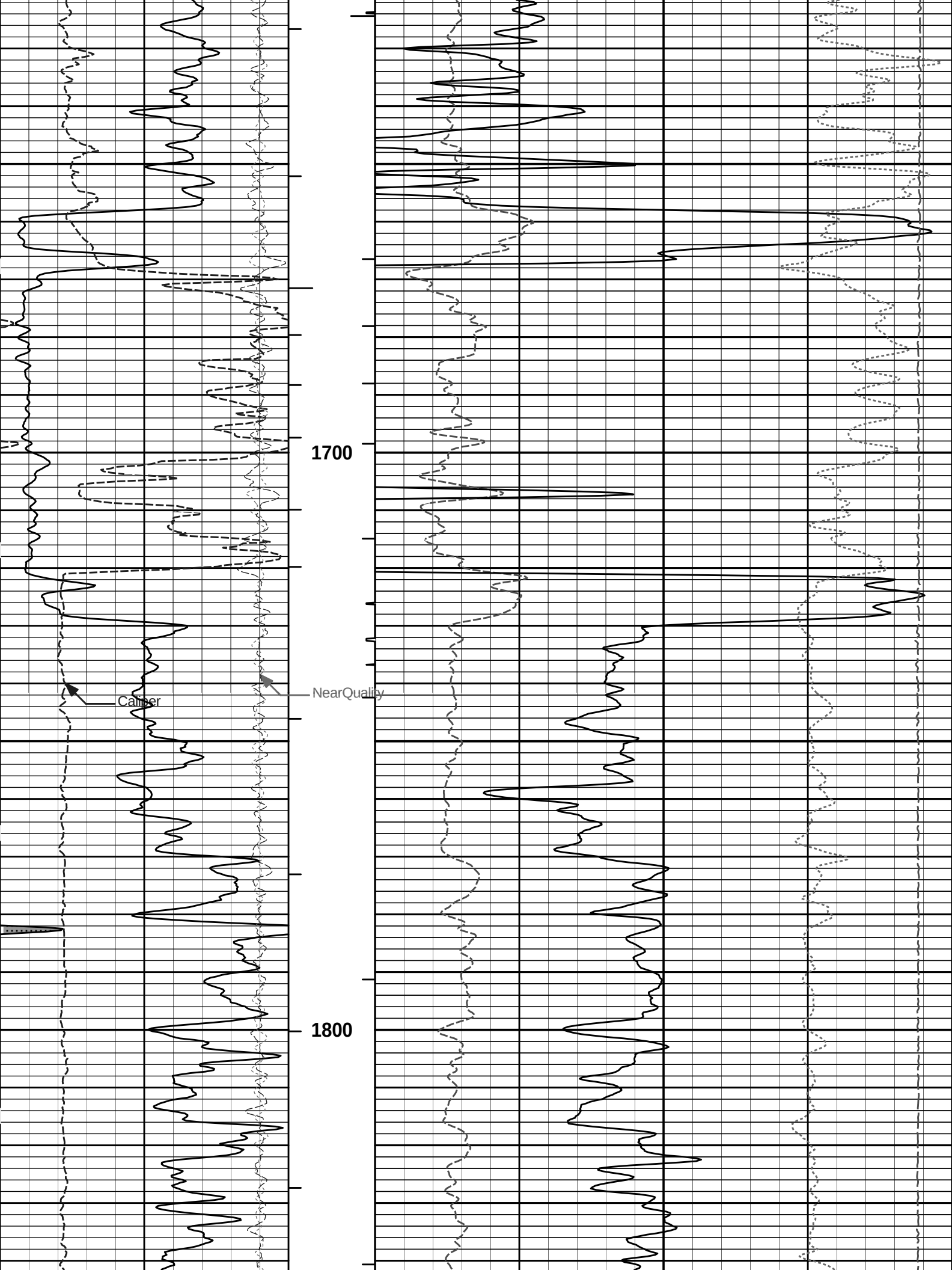


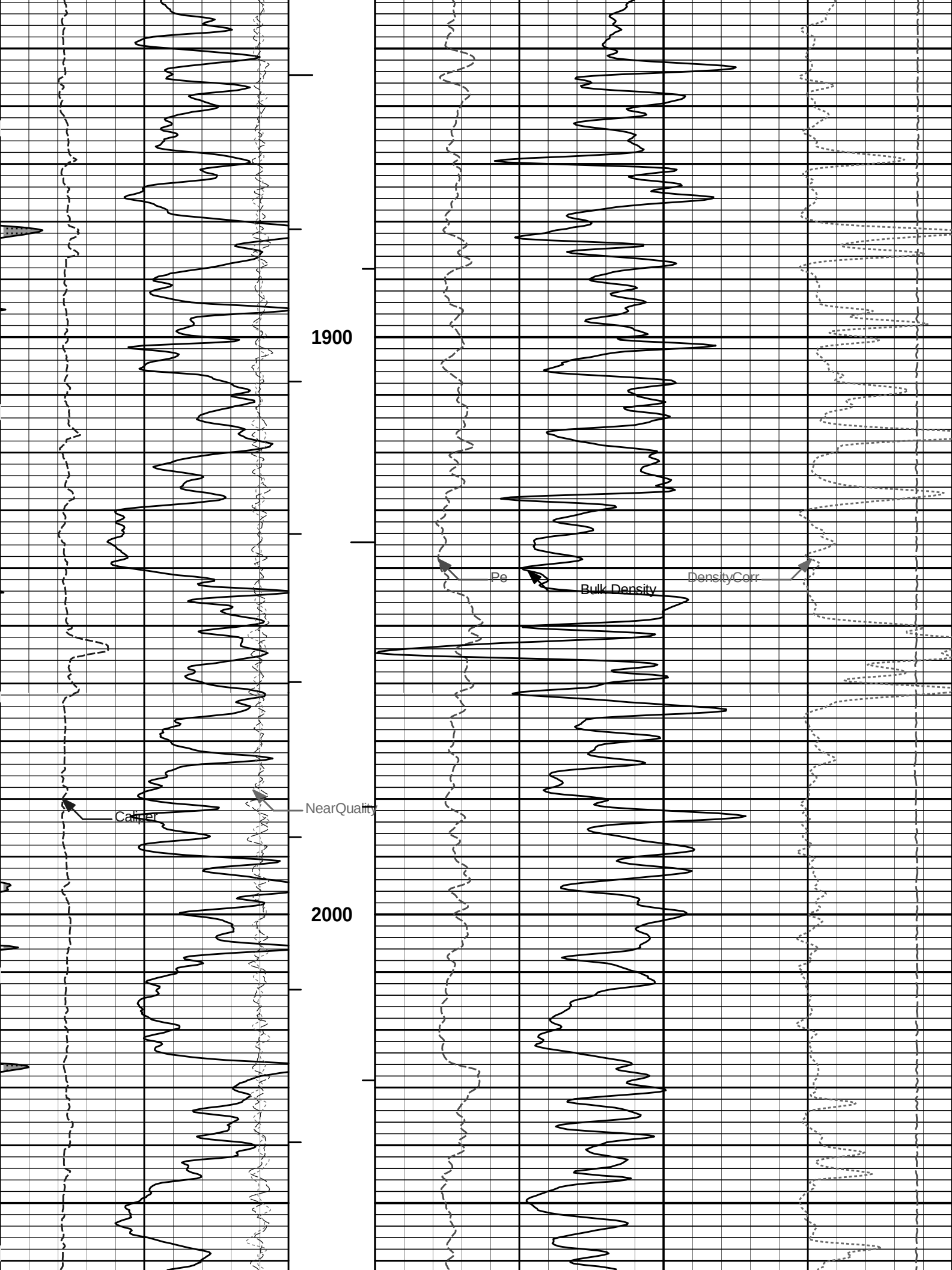

Caliper
NearQuality
800
900
Bulk Density
Pe
DensityCorr

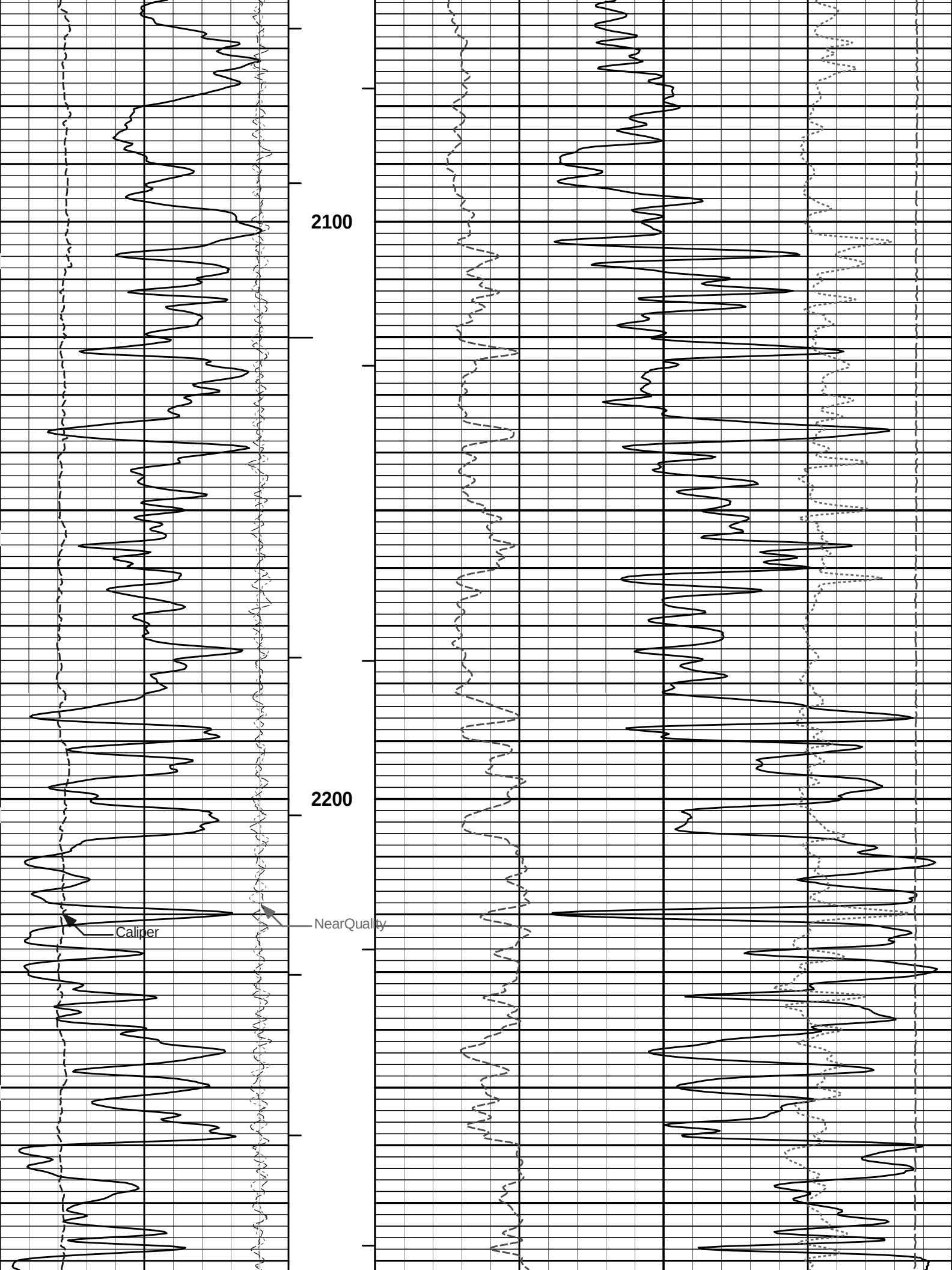

1000
1100
Caliper
NearQuality

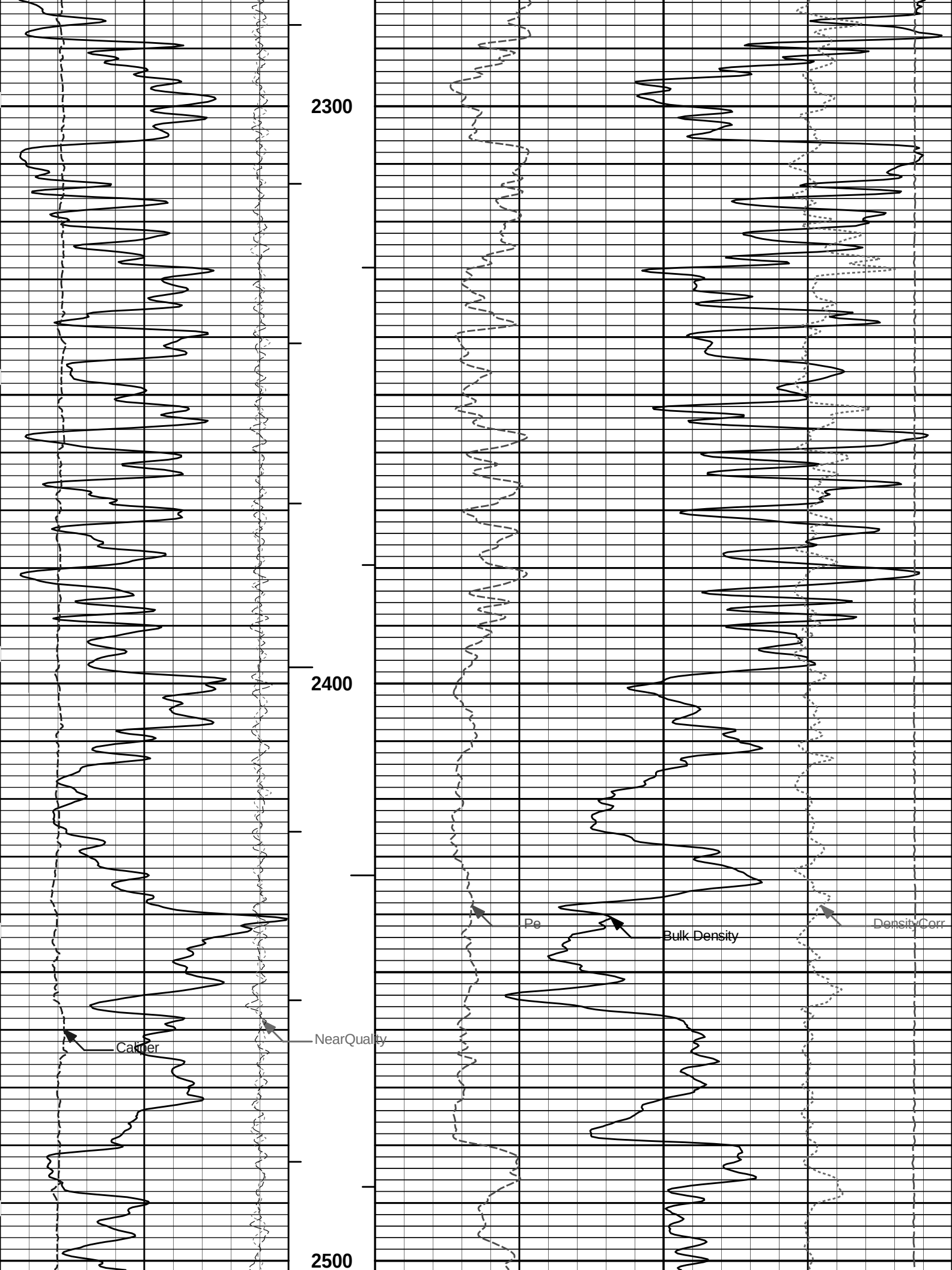

1200
1300
1400
Caliper
NearQuality

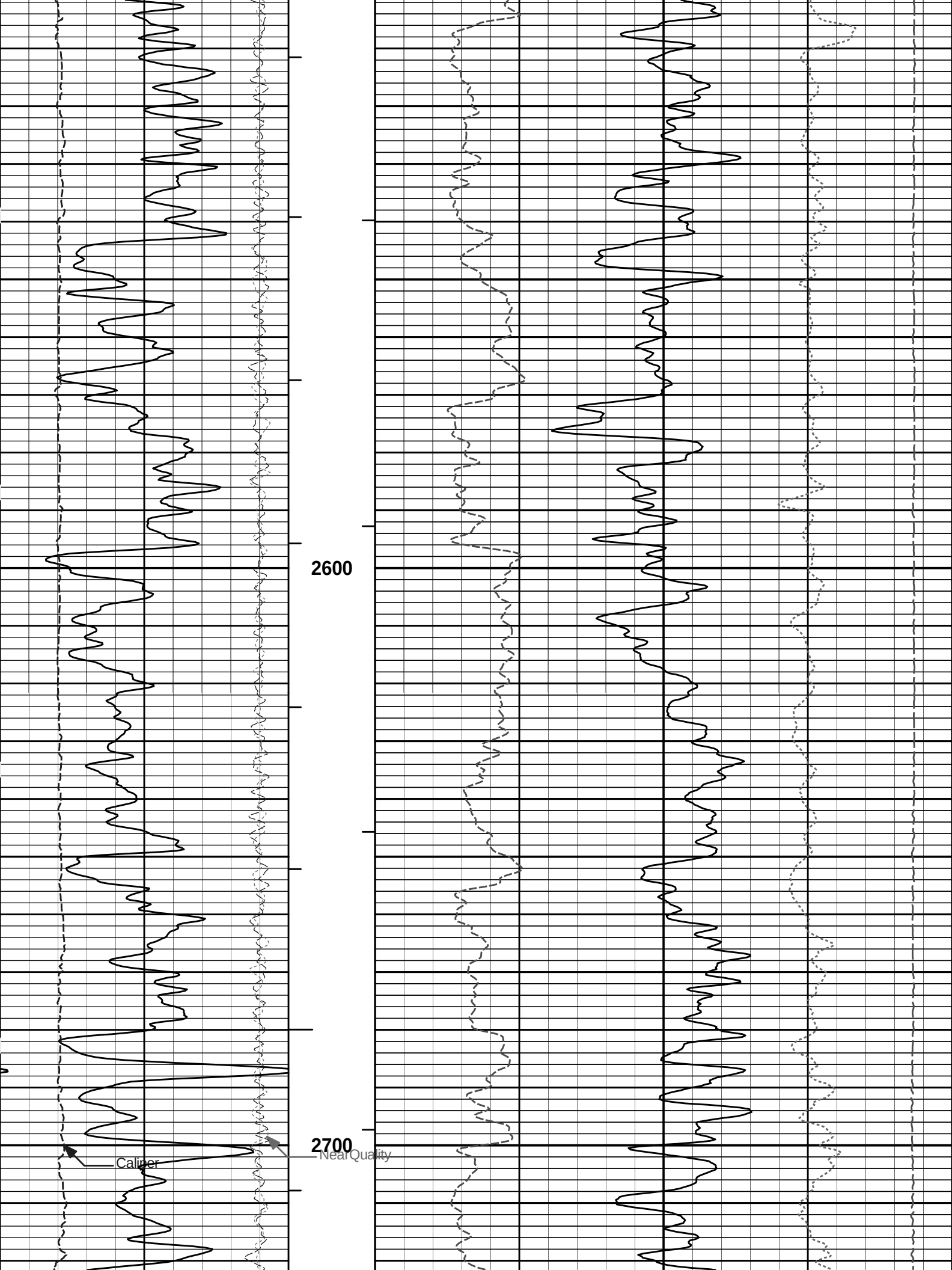

Caliper
NearQuality
Pe
Bulk Density
DensityCorr
1500
1600

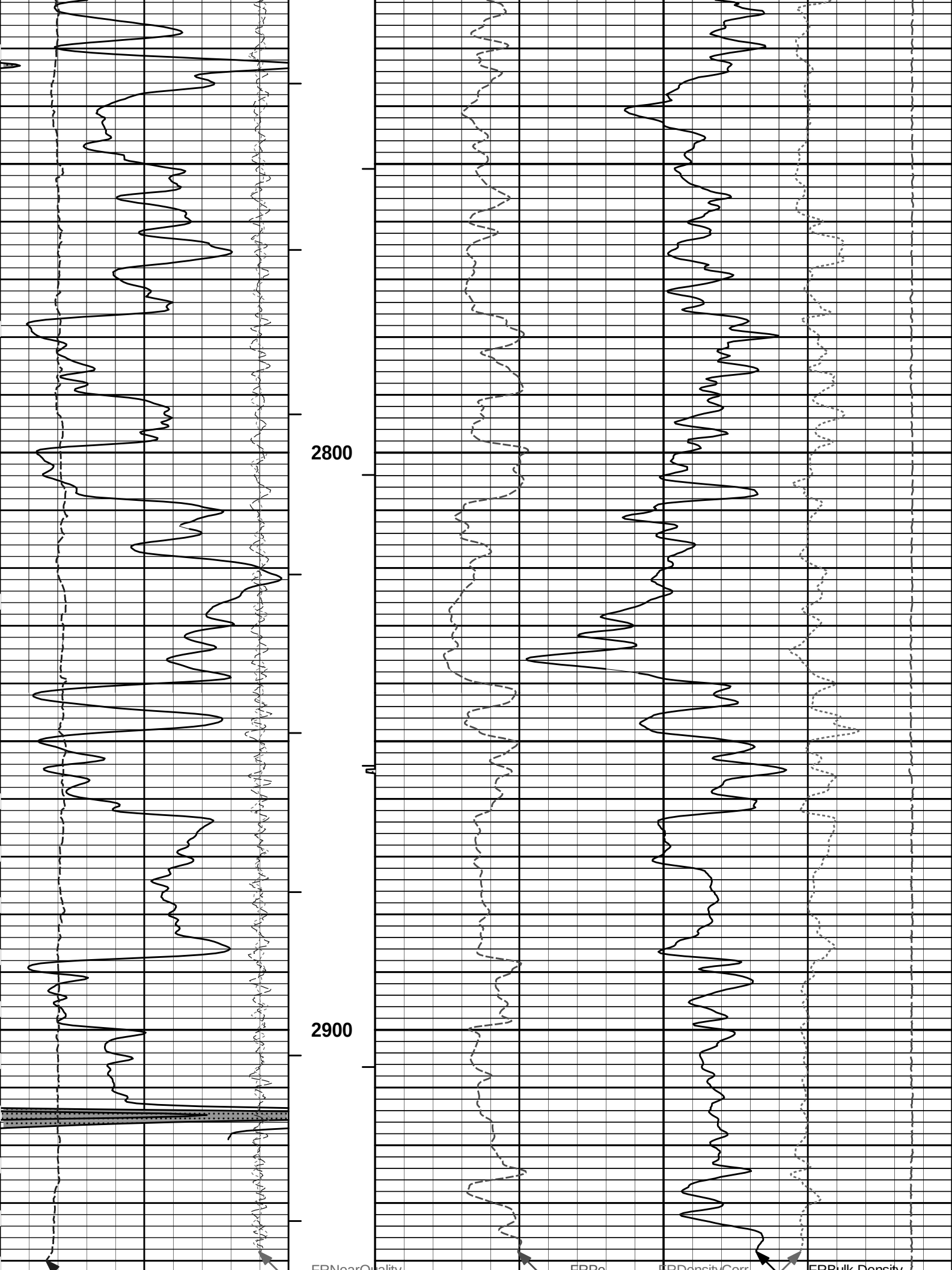

1700
1800
Caliper
NearQuality

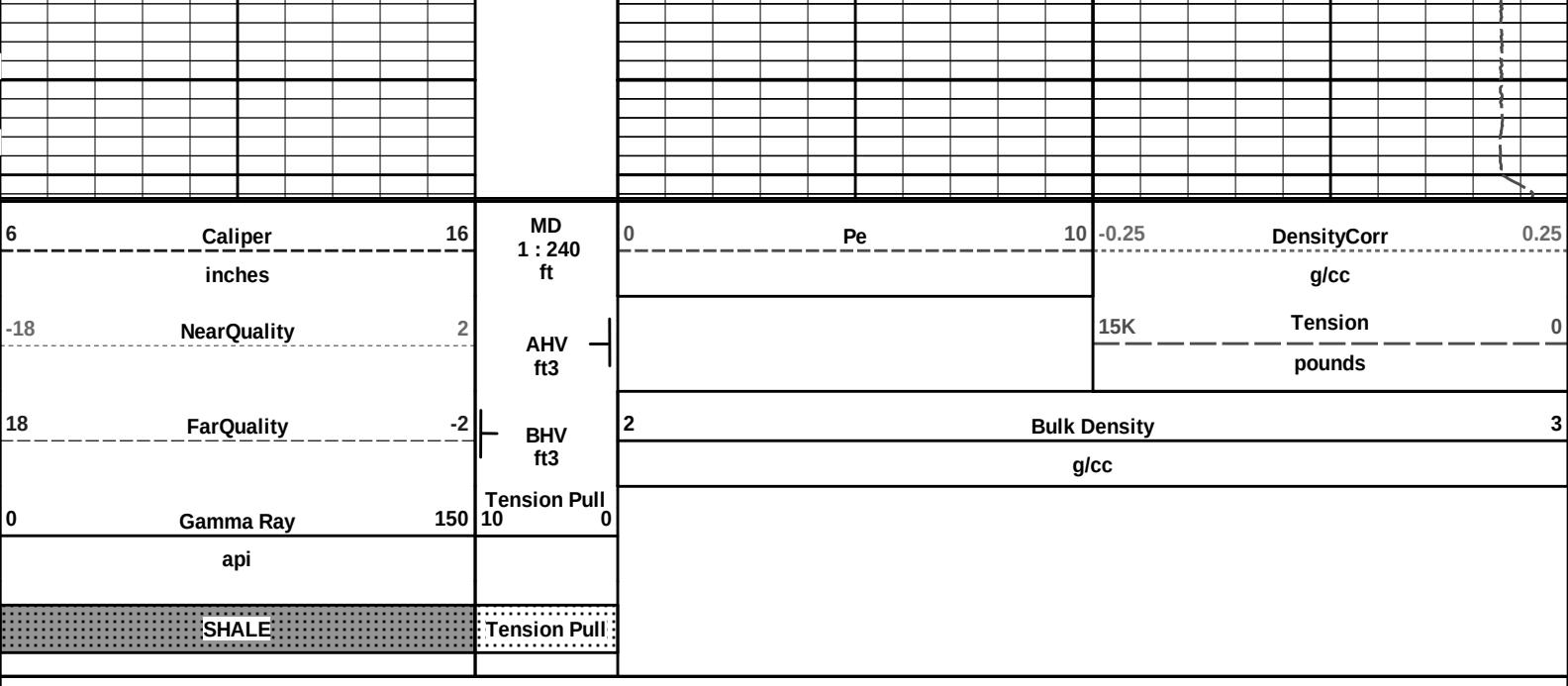

1900
2000
Caliper
NearQuality
Pe
Bulk Density
DensityCorr


2100
2200
Caliper
NearQuality


2300
2400
2500
Caliper
NearQuality
Pe
Bulk Density
DensityCorr


2600
2700
Caliper
NearQuality


2800
2900
ERNearQuality
ERPe
ERDensityCorr
ERBulk Density



HALLIBURTON

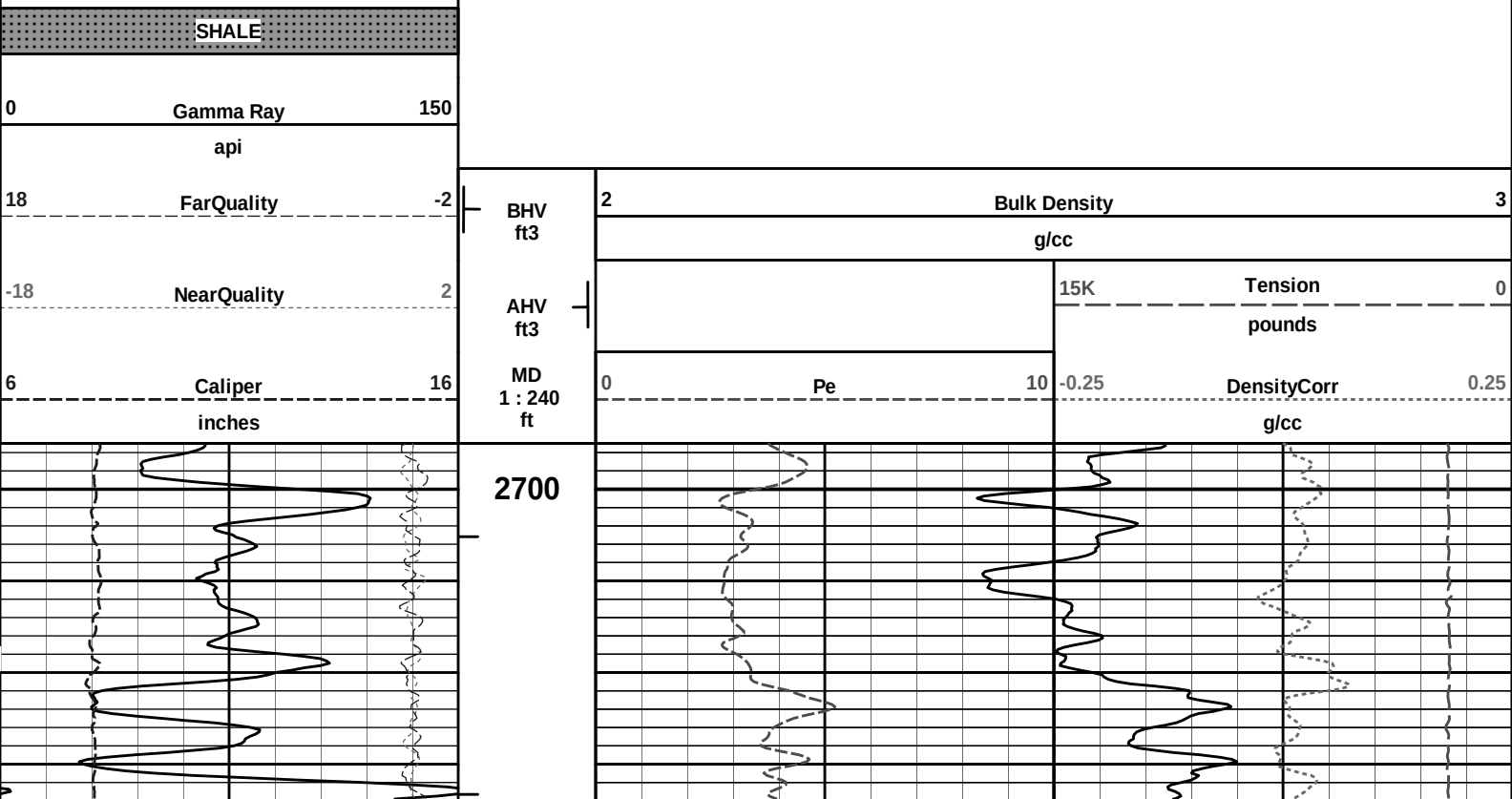
Plot Time: 24-Jul-13 15:16:19
Plot Range: 670 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING\
Plot File: \\-LOCAL-\CAMPBELL_et_al_\Well Based\POROSITY\BULKD_5_MAIN_LIB

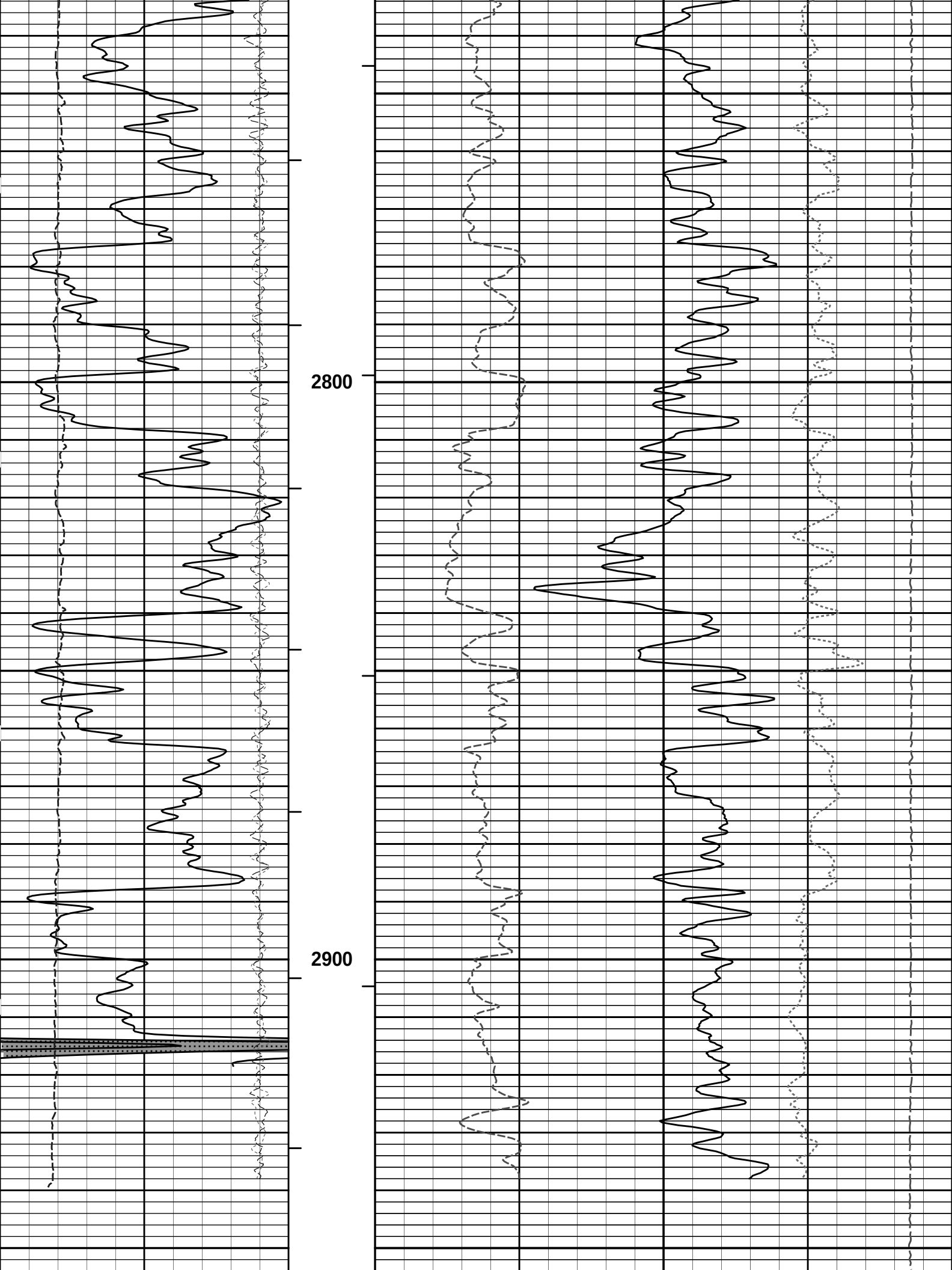
5 INCH MAIN LOG

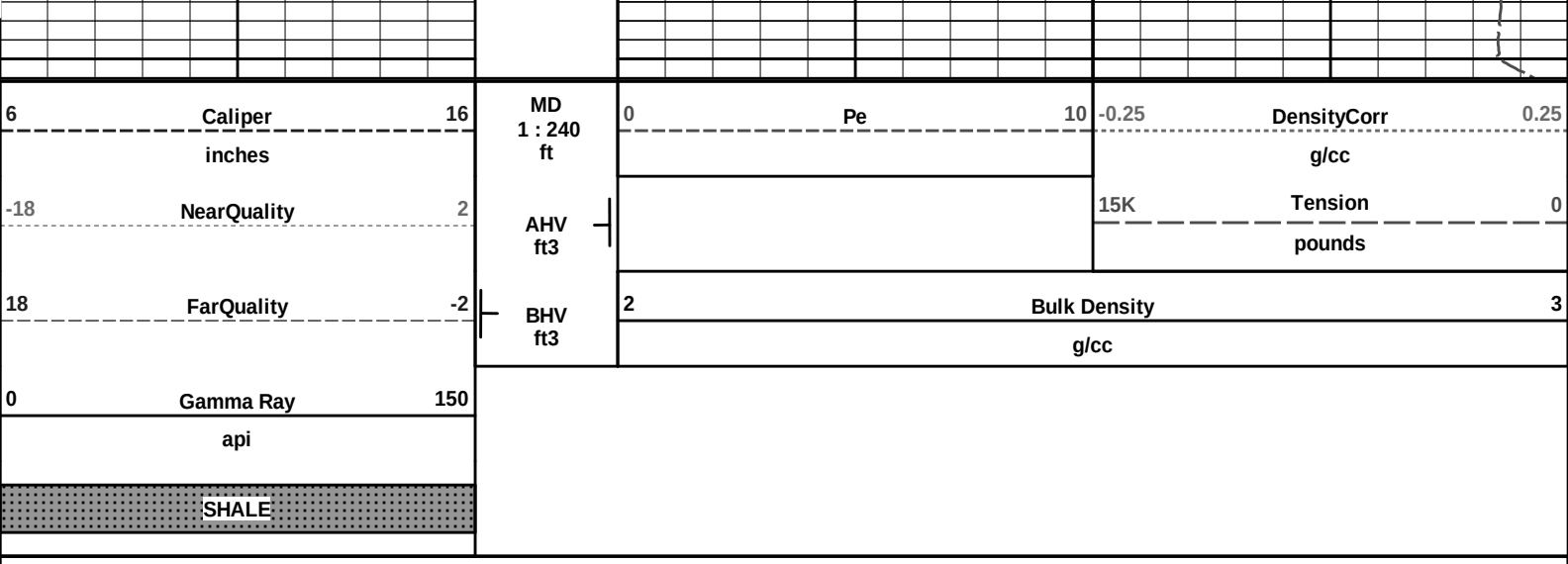
HALLIBURTON

Plot Time: 24-Jul-13 15:16:19
Plot Range: 2695 ft to 2962.08 ft
Data: CAMPBELL_et_al_\Well Based\R1 REPEAT\
Plot File: \\-LOCAL-\CAMPBELL_et_al_\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION




2800
2900



HALLIBURTON

Plot Time: 24-Jul-13 15:16:21
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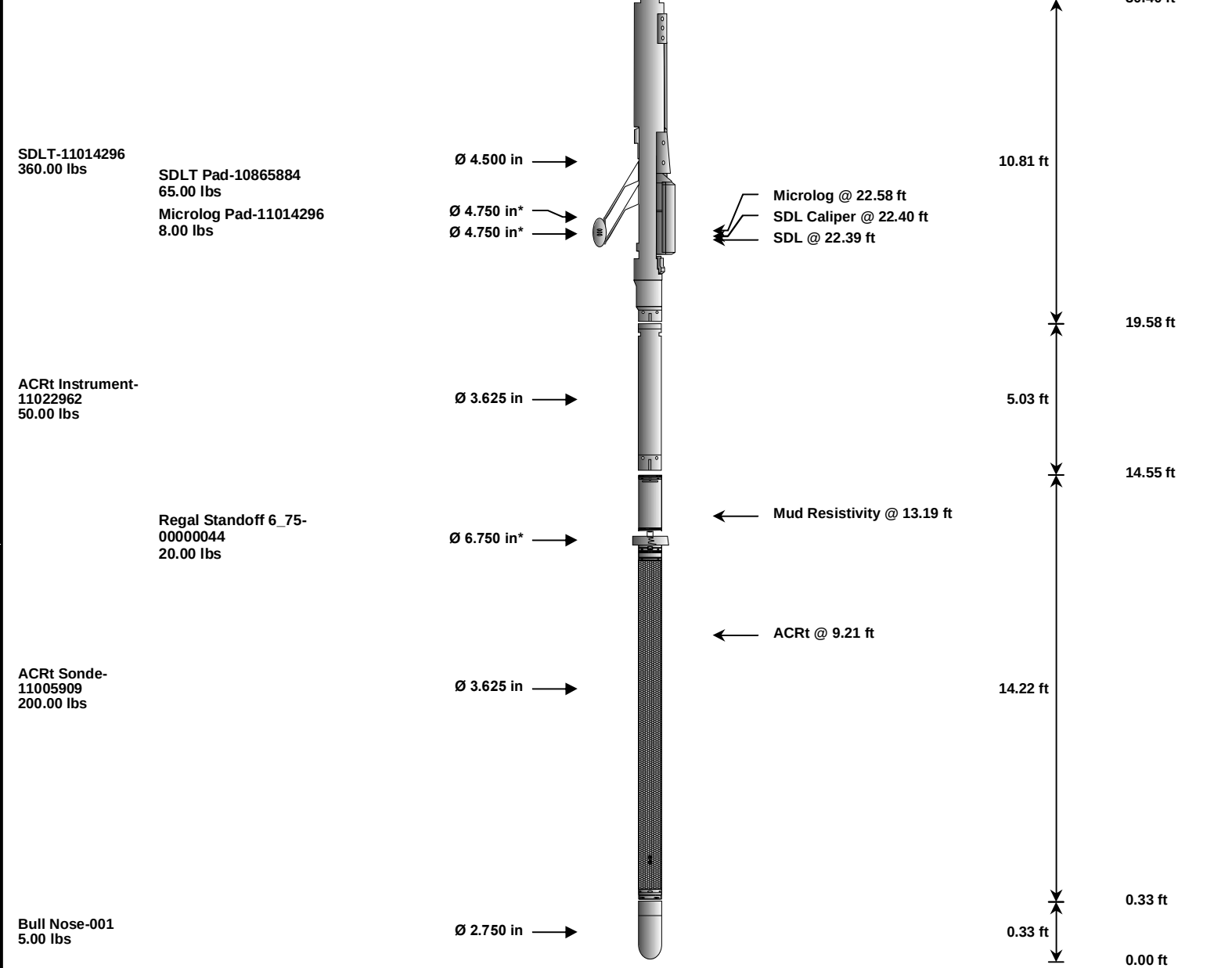
Data: CAMPBELL_et_al_\Well Based\R1 REPEAT\
Plot File: \\-LOCAL-\CAMPBELL_et_al_\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head-00000021 30.00 lbs		Ø 3.625 in			1.92 ft	55.21 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	53.29 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in		SP @ 50.56 ft	3.74 ft	52.34 ft
GTET-11048627 165.00 lbs		Ø 3.625 in		GammaRay @ 42.54 ft	8.52 ft	48.60 ft
DSNT-11055304 174.00 lbs	DSN Decentralizer-11005605 6.60 lbs	Ø 5.000 in* Ø 3.625 in		DSN Far @ 33.15 ft DSN Near @ 32.40 ft	9.69 ft	40.08 ft
						30.40 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CH	Standard OH Cable Head	00000021	30.00	1.92		53.29	300.00
XOHD	Hostile to Dits Cross Over	TRK696	20.00	0.95		52.34	300.00
SP	SP Sub	11441455	60.00	3.74		48.60	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52		40.08	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69		30.40	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13	*	33.73	300.00
SDLT	Spectral Density Tool	11014296	360.00	10.81		19.58	60.00
SDLP	Density Insite Pad	10865884	65.00	2.55	*	21.79	60.00
MICP	Microlog Pad	11014296	8.00	1.00	*	22.08	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11022962	50.00	5.03		14.55	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11005909	200.00	14.22		0.33	300.00
RSOF	Regal Standoff 6.75in	00000044	20.00	0.52	*	12.12	300.00
BLNS	Bull Nose	001	5.00	0.33		0.00	300.00
Total			**1,163.60**	**55.21**			

* Not included in Total Length and Length Accumulation.

Data: CAMPBELL_et_al_\0001 SP-GTET-DSN-SDL-ACRT-BN\IDLE **Date: 24-Jul-13 11:35:14**

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.100	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	2957.00	ft
	SHARED	BHT	Bottom Hole Temperature	120.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	Temperature Correction Type	None	
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	SHCO	View More Correction Options	No	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	
	DSNT	LHWT	Logging Horizontal Water Tank?	No	
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	No	
	SDLT Pad	CB	Logging Calibration Blocks?	No	
	SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
	SDLT Pad	DTWN	Disable temperature warning	No	
	SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc

SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: CAMPBELL_et_al_\0001 SP-GTET-DSN-SDL-ACRT-BN\004 24-Jul-13 12:52 Up @2962.8f **Date: 24-Jul-13 13:56:45**

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CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11048627 **Reference Calibration Date:** 17-Jun-13 14:38:32

Engineer: THOMAS HYDE **Calibration Date:** 02-Jul-13 07:19:00

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Calibrator Source S/N: TB146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	51.2	51.2	api
Background + Calibrator	320.3	320.9	api
Calibrator	269.2	269.6	api
GAPI Conversion Factor	0.3131		api/cps

Measurement	Tool Value	Std. Deviation	Units
Background	163.6	14	cps
Background + Calibrator	1,025.0	28	cps

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11048627 **Reference Calibration Date:** 02-Jul-13 07:19:00

Engineer: SHELDON INGERSOLL **Calibration Date:** 23-Jul-13 10:15:10

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Calibrator Source S/N: TB146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Field Verification	Shop	Field	Units
Background	51.2	14.1	api
Background + Calibrator	320.9	285.2	api
Calibrator	269.6	271.1	api

Measurement	Tool Value	Std. Deviation	Units
Background	45.1	6	cps
Background + Calibrator	911.0	27	cps
GAPI Conversion Factor	0.3131		api/cps

Shop	Field	Difference	Tolerance
269.6	271.1	-1.5	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - 11055304**	**Reference Calibration Date:**	**20-May-13 10:05:01**
Engineer:	**THOMAS HYDE**	**Calibration Date:**	**02-Jul-13 09:34:44**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Logging Source S/N: 696

Tank Serial Number: LIBERAL_NEUTRON

Reference value assigned to Tank: 51.680

Snow Block S/N: 696

Tool Temperature: 75.3 degF

Calibration Tank Water Temperature: 72 degF

Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.975	0.977	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2100	0.2107	0.0007	+/- 0.0020
Calibrated Ratio:	9.70	9.72	0.022	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0592	0.02000 - 0.09000

PASS/FAIL SUMMARY

Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed
Water-Tank Change Check:	Passed
Temperature Check:	Passed
Water-Tank Stats Check:	Passed
Snow-Block Stats Check:	Passed

INPUTS (Old/New)

Accumulation Times: 60, 300, 60 seconds

Measurement	Background		Water Tank		Snow Block	
	Prev	Current	Prev	Current	Prev	Current
Near (raw, cps):	0.00	0.00	16537.25	16695.09	19135.52	19447.06
Far (raw, cps):	1.38	0.08	1768.75	1790.81	4436.67	4692.92
Ratio (DTC):	N/A	N/A	9.900	9.949	4.545	4.473

Relative Standard Deviations

Calibration Step	Near Deviation	Far Deviation	Control Limits
Tank	1.00	0.98	0.837 - 1.163

Tank	1.00	0.98	0.887 - 1.108
Snow Block	0.92	0.96	0.630 - 1.370

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	**DSNT - 11055304**	**Reference Calibration Date:**	**02-Jul-13 09:34:44**
Engineer:	**SHELDON INGERSOLL**	**Calibration Date:**	**23-Jul-13 10:18:34**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Logging Source S/N: 696

Snow Block S/N: 696

Tool Temperature: 96.40 degF

NEUTRON FIELD-CHECK SUMMARY

	Shop Value	Field Value	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0592	0.0625	0.0034	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

Accumulation Times (SB): 60 Seconds

INPUTS

Measurement	Value	Comment
Near	20036.64	(Raw, cps)
Far	4707.14	(Raw, cps)
Ratio	4.51	(DTC)

SB RELATIVE STANDARD DEVIATIONS

Measurement	RSTD	Control Limit
Near	0.97	0.635 - 1.365
Far	0.98	0.635 - 1.365

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 11014296**	**Reference Calibration Date:**	**02-Jul-13 08:47:44**
Engineer:	**THOMAS HYDE**	**Calibration Date:**	**02-Jul-13 08:56:23**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11055304**		

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Calibrator Small Ring Diameter: 6.500 in

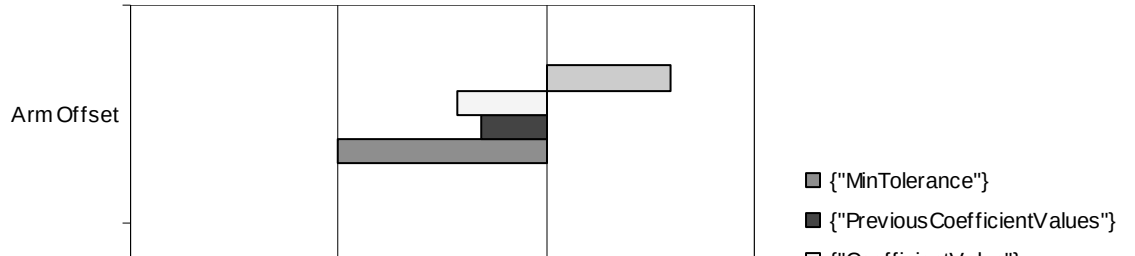
Calibrator Medium Ring Diameter: 8.25 in

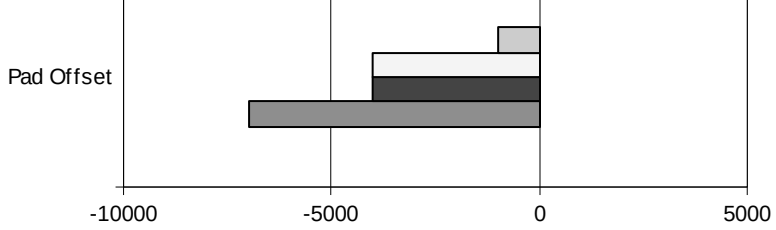
Calibrator Large Ring Diameter: 15.000 in

Tool Diameter: 4.50 in

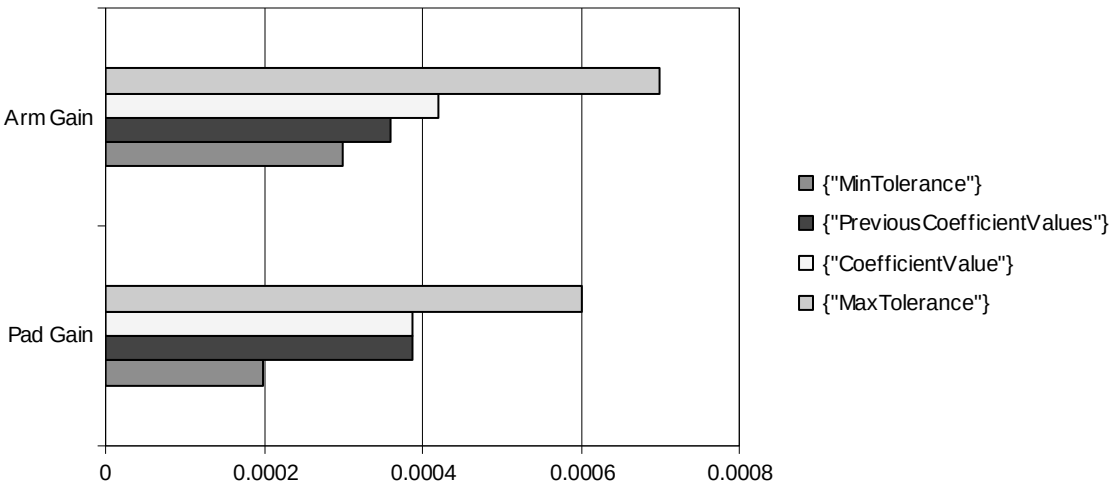
CALIBRATION COEFFICIENTS

SDLT Caliper - Offsets

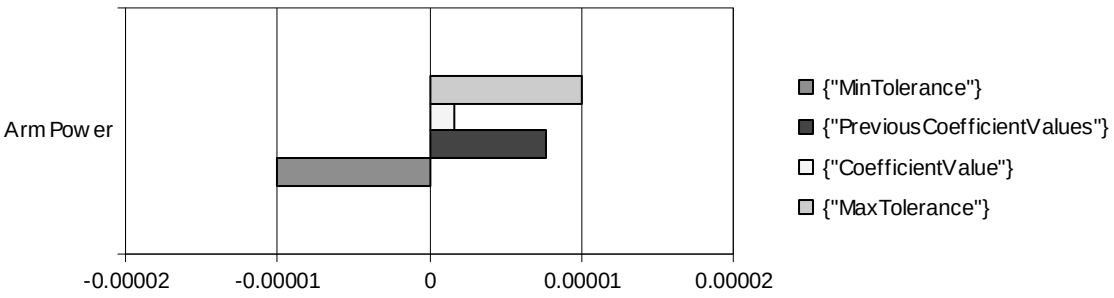




SDLT Caliper - Gains



SDLT Caliper - Power



CALIBRATION RINGS				
Measurement	**Current Reading (Previous Coeff.)**	**Calibrated (New Coeff.)**	**Change**	**Control Limit On New Value**
PAD EXTENSION:				
Small Ring (in)	2.01	2.00	-0.0100	+/- 0.200
Medium Ring (in)	3.77	3.75	-0.0200	+/- 0.200
RING DIAMETER:				
Small Ring (in)	6.48	6.500	0.0200	+/- 0.200
Medium Ring (in)	8.12	8.25	0.1300	+/- 0.200
Large Ring (in)	15.00	15.000	0.0000	+/- 0.200

RAW TOOL VALUES				
	Pad Values - cnts		**Arm Values - cnts**	
Measurement	**Previous**	**New**	**Previous**	**New**
Small Ring - Pad Only	9171	9209	N/A	N/A
Medium Ring - Pad Only	13700	13740	N/A	N/A

Medium Ring - Pad & Arm	4624	4491	10713	10531
Small Ring - Pad & Arm	3991	3971	6943	6923
Large Ring - Pad & Arm	4751	4755	25574	25575

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

DENSITY CALIPER FIELD CALIBRATION

Tool Name: SDLT - 11014296 **Reference Calibration Date:** 02-Jul-13 08:56:23

Engineer: SHELDON INGERSOLL **Calibration Date:** 23-Jul-13 10:22:13

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Ring Diameter: 8.25 in

Tool Diameter: 4.50 in

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.80	0.05	+/- 0.10
Ring Diameter	8.25	8.25	-0.00	+/- 0.15

RAW TOOL VALUES

Measurement	Shop	Field	Change
Pad Extension - Pad Only	13740	13865	125
Pad Extension - Pad & Arm	4491	3690	-801
Arm Extension - Pad & Arm	10531	11246	715

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 10865884 **Reference Calibration Date:** 02-Jul-13 08:02:39

Engineer: THOMAS HYDE **Calibration Date:** 02-Jul-13 08:23:04

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Logging Source S/N: 5168GW

Aluminum Block S/N: LIBERAL Density: 2.598g/cc Pe: 3.170

Magnesium Block S/N: LIBERAL Density: 1.684g/cc Pe: 2.598

Pad Temperature: 78.8 degF

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0462	1.0424	0.90 - 1.10
Near Dens Gain	1.0164	1.0151	0.90 - 1.10
Near Peak Gain	1.0269	1.0032	0.90 - 1.10
Near Lith Gain	1.0077	0.9769	0.90 - 1.10
Far Bar Gain	1.0106	1.0105	0.90 - 1.10
Far Dens Gain	0.9990	0.9990	0.90 - 1.10
Far Peak Gain	0.9932	0.9935	0.90 - 1.10
Far Lith Gain	0.9691	0.9686	0.90 - 1.10
Near Bar Offset	-0.2173	-0.1830	NONE
Near Dens Offset	0.0248	0.0348	NONE
Near Peak Offset	-0.0835	0.1140	NONE

Near Lith Offset	0.0314	0.2870	NONE
Far Bar Offset	0.0502	0.0518	NONE
Far Dens Offset	0.1209	0.1216	NONE
Far Peak Offset	0.1339	0.1302	NONE
Far Lith Offset	0.2676	0.2676	NONE

Near Bar Background	826.00	825.17	700 - 1450
Near Dens Background	273.42	273.92	230 - 480
Near Peak Background	119.55	119.89	100 - 210
Near Lith Background	145.87	145.76	125 - 260
Far Bar Background	509.93	510.22	450 - 900
Far Dens Background	197.78	199.46	175 - 345
Far Peak Background	78.17	78.04	70 - 140
Far Lith Background	81.35	81.01	75 - 145

Source Strength: 1.30 Ci

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.684	-0.001	+/- 0.015
Pe	2.525	2.561	0.036	+/- 0.150
ALUMINUM				
Density (g/cc)	2.597	2.598	0.001	+/- 0.015
Pe	3.138	3.129	-0.009	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0008	+/- 0.0110	0.0008	+/- 0.0140
Magnesium Block	-0.0013	+/- 0.0110	-0.0010	+/- 0.0140
Aluminum Block	0.0003	+/- 0.0110	0.0001	+/- 0.0140
Resolution	9.21	6.00 - 11.50	8.96	6.00 - 11.50
Internal Verifier(B+D+P+L)	1365	1200 - 2700	869	800 - 1700

PASS/FAIL SUMMARY

Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed
Background Stats Check:	Passed
Background Change Check:	Passed
Background Temperature Check:	Passed
Magnesium Stats Check:	Passed
Aluminum Stats Check:	Passed
Source Strength:	Passed

HV Gain Range Check:	Passed

ENGINEER DISPLAY - DENSITY CALIBRATION SUMMARY

BACKGROUND CHANGE CHECKS

Measurement	Previous Value	New Value	Change	Control Limit
Near Barite	826.00	825.17	-0.83	+/- 6.63
Near Density	273.42	273.92	0.50	+/- 3.82
Near Peak	119.55	119.89	0.34	+/- 2.53
Near Lithology	145.87	145.76	-0.11	+/- 2.79
Far Barite	509.93	510.22	0.29	+/- 5.22
Far Density	197.78	199.46	1.68	+/- 3.26
Far Peak	78.17	78.04	-0.13	+/- 2.04
Far Lithology	81.35	81.01	-0.34	+/- 2.08

RAW COUNT RATES (cps)

Accumulation Times (BKG, MAG, AL): 300, 300, 300 Seconds

Measurement	Background		Magnesium Block		Aluminum Block	
	Previous	Current	Previous	Current	Previous	Current
Near Above	9.62	9.88	18.95	19.10	17.55	17.68
Near Cesium High	110.12	109.35	112.04	111.69	112.78	112.51
Near Cesium Low	113.25	112.31	117.03	117.02	117.93	117.25
Near Valley	49.98	49.57	83.05	83.06	80.00	78.65
Near Barite	826.00	825.17	10218.68	10221.50	8466.84	8464.59
Near Density	273.42	273.92	7268.94	7276.07	5648.78	5653.92
Near Peak	119.55	119.89	4395.82	4407.71	3629.10	3621.58
Near Lithology	145.87	145.76	4511.54	4536.75	3639.84	3633.76
Far Above	5.73	6.22	14.23	14.06	7.80	7.69
Far Cesium High	81.03	81.68	79.37	80.15	80.78	82.08
Far Cesium Low	79.23	79.47	79.45	80.37	79.05	80.27
Far Valley	33.66	32.89	63.60	63.88	36.32	37.10
Far Barite	509.93	510.22	11338.26	11330.52	2892.51	2890.77
Far Density	197.78	199.46	11019.89	11019.75	2562.79	2563.89
Far Peak	78.17	78.04	6722.48	6726.94	1516.62	1518.29
Far Lithology	81.35	81.01	4151.39	4165.67	999.29	1001.69

RELATIVE STANDARD DEVIATIONS

Measurement	Background	Magnesium Block	Aluminum Block	Control Limits
Near Barite	0.96	1.06	1.02	0.84 - 1.26
Near Density	1.02	1.02	1.03	0.84 - 1.26
Near Peak	1.02	1.04	1.03	0.84 - 1.26
Near Lithology	0.99	1.07	0.94	0.84 - 1.26
Far Barite	1.02	1.05	1.05	0.84 - 1.41
Far Density	1.03	0.95	1.03	0.84 - 1.41
Far Peak	1.04	1.06	1.00	0.84 - 1.41
Far Lithology	0.97	1.21	1.10	0.84 - 1.41

SOURCE STRENGTH CHECK		
Measurement	**Value**	**Control Limits**
Far Density Aluminum - Far Density Bkg (cps)	2364	2010 - 3750
Source Strength: 1.30 Ci		
Remaining Source Life: 3.63 yr		
Remaining Source Life based on decay calculation: xxx yr		

TEMPERATURE - HIGH VOLTAGE SUMMARY		
Measurement	**Value**	**Control Limits**
HV Gain Average	1.085	0.875 - 1.125
HV Gain Difference	0.430	0.00 - 0.40
HV Control Voltage	1.14	0.50 - 1.75
Pad Temperature	78.8 degF	
Instrument Temperature	73.9 degF	

SPECTRAL DENSITY FIELD CHECK

Tool Name:	**SDLT Pad - 10865884**	**Reference Calibration Date:**	**02-Jul-13 08:23:04**
Engineer:	**SHELDON INGERSOLL**	**Calibration Date:**	**23-Jul-13 10:42:03**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Pad Temperature: 107.0 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	**Shop**	**Field**	**Change**	**Control Limit +/-**
Near (B+D+P+L) cps	1364.751	1368.700	3.949	14.932
Far (B+D+P+L) cps	868.728	866.653	-2.075	16.115
Near Resolution	9.21	9.09	-0.120	0.50
Far Resolution	8.96	8.99	0.030	1.00

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
HV Gain Change Check:	Passed
Background Statistical Check:	Passed
Background Temperature Check:	Passed

BACKGROUND RAW COUNT RATES (cps) Accumulation Time (BKG): 180 Seconds		
Measurement	**Near**	**Far**
Above	9.31	6.41
Cesium High	109.46	82.22
Cesium Low	113.14	80.19
Valley	49.96	32.86
Barite	826.92	510.19
Density	273.40	198.45
Peak	119.95	77.69
Lithology	148.43	80.32

RELATIVE STANDARD DEVIATIONS		
Measurement	**Background**	**Control Limits**
Near Barite	1.04	0.84 - 1.26
Near Density	0.99	0.84 - 1.26
Near Peak	0.93	0.84 - 1.26
Near Lithology	0.96	0.84 - 1.26
Far Barite	0.99	0.84 - 1.41
Far Density	1.00	0.84 - 1.41
Far Peak	0.90	0.84 - 1.41
Far Lithology	1.06	0.84 - 1.41

TEMPERATURE - HIGH VOLTAGE SUMMARY			
Measurement	**Value**		**Control Limits**
HV Gain Average	1.010		0.875 - 1.125
HV Gain Difference	0.400		0.00 - 0.40
HV Control Voltage	1.15		0.50 - 1.75
Pad Temperature	107.0	degF	
Instrument Temperature	102.9	degF	

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	269.6	271.1	----------	-1.5	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0592	0.0625	----------	-0.0033	+/- 0.0150	decp
SDLT-11014296						
Pad Extension	3.75	3.80	----------	-0.05	+/-0.10	in
Ring Diameter	8.25	8.25	----------	0.00	+/-0.15	in
SDLT Pad-10865884						
Near(B+D+P+L)	1364.751	1368.700	----------	-3.949	+/-14.932	cps
Far(B+D+P+L)	868.728	866.653	----------	2.075	+/-16.115	cps

HALLIBURTON

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
SP Sub				
PLTC	Plot Control Mask	50.56	NO	
SP	Spontaneous Potential	50.56	BLK	1.250
SPR	Raw Spontaneous Potential	50.56	NO	
SPO	Spontaneous Potential Offset	50.56	NO	
GTET				
TPUL	Tension Pull	42.54	NO	

GR	Natural Gamma Ray API	42.54	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	42.54	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	42.54	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	32.30	NO	
RNDS	Near Detector Telemetry Counts	32.40	BLK	1.417
RFDS	Far Detector Telemetry Counts	33.15	TRI	0.583
DNTT	DSN Tool Temperature	32.40	NO	
DSNS	DSN Tool Status	32.30	NO	
ERND	Near Detector Telemetry Counts EVR	32.40	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	33.15	BLK	0.000
ENTM	DSN Tool Temperature EVR	32.40	NO	
	SDLT			
TPUL	Tension Pull	22.40	NO	
PCAL	Pad Caliper	22.40	TRI	0.250
ACAL	Arm Caliper	22.40	TRI	0.250
	ACRt Sonde			
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000

F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

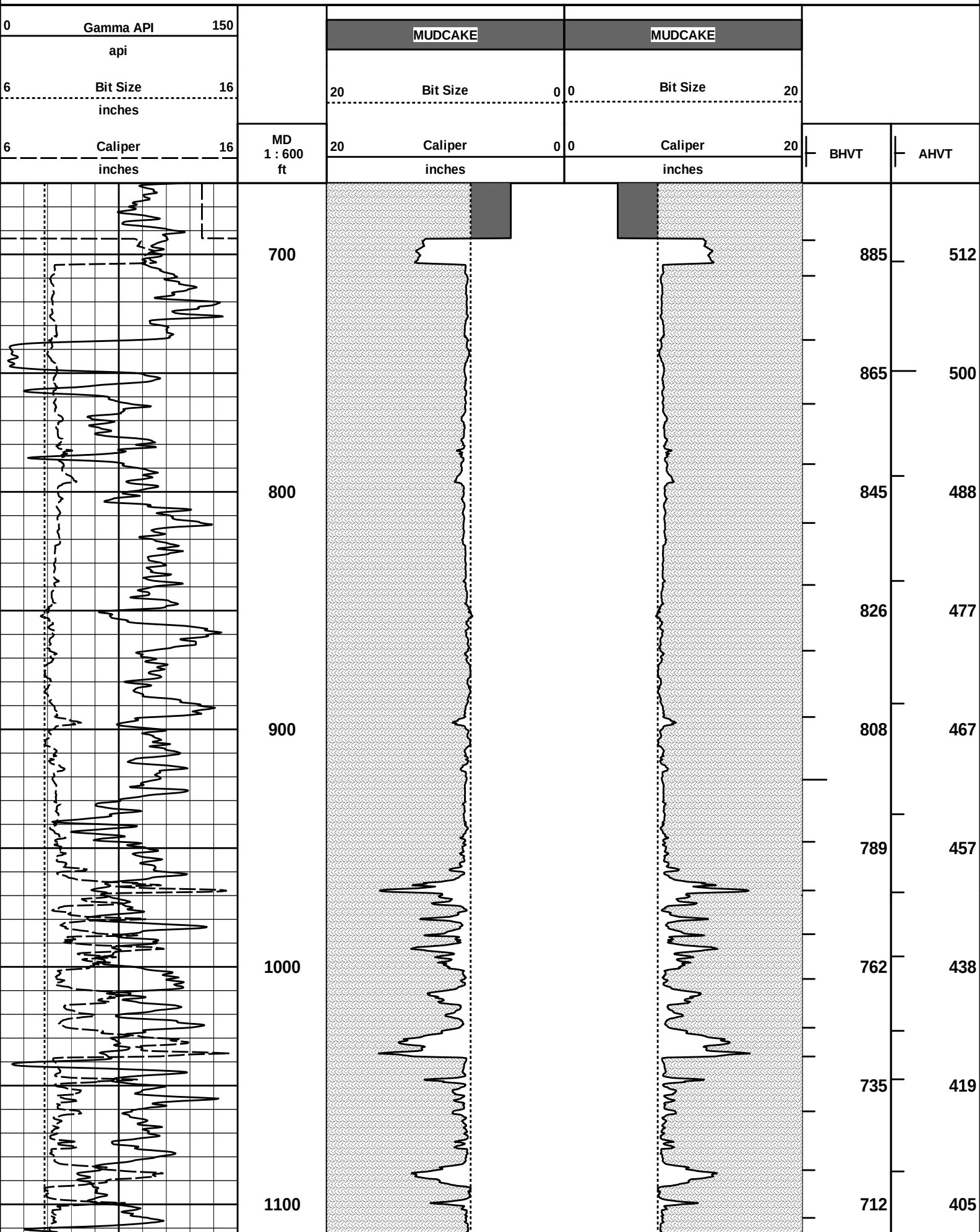
Microlog Pad

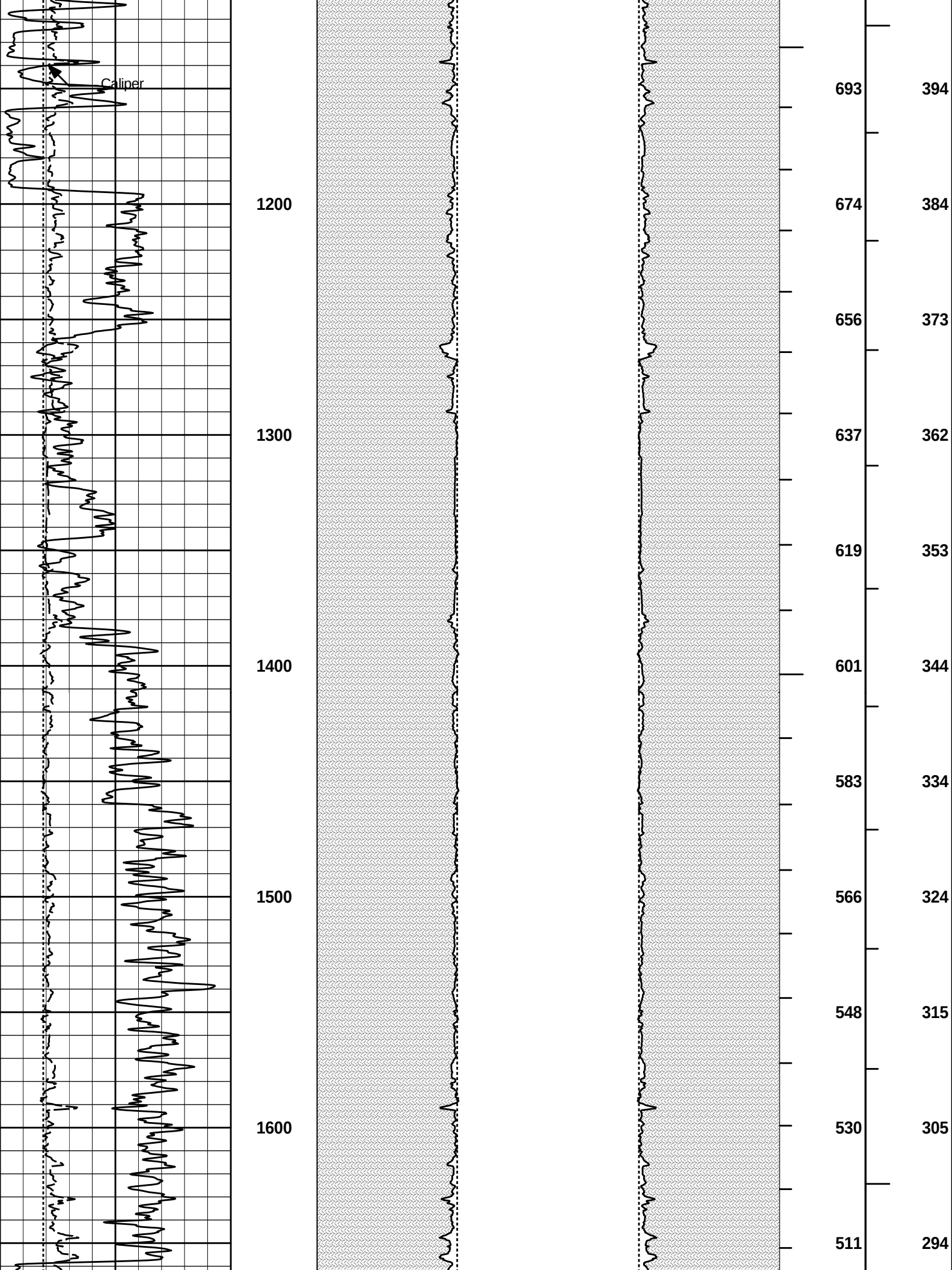
TPUL	Tension Pull	22.58	NO	
MINV	Microlog Lateral	22.58	BLK	0.750
MNOR	Microlog Normal	22.58	BLK	0.750

SDLT Pad

TPUL	Tension Pull	22.39	NO	
NAB	Near Above	22.21	BLK	0.920
NHI	Near Cesium High	22.21	BLK	0.920
NLO	Near Cesium Low	22.21	BLK	0.920
NVA	Near Valley	22.21	BLK	0.920
NBA	Near Barite	22.21	BLK	0.920
NDE	Near Density	22.21	BLK	0.920
NPK	Near Peak	22.21	BLK	0.920
NLI	Near Lithology	22.21	BLK	0.920
NBAU	Near Barite Unfiltered	22.21	BLK	0.250
NLIU	Near Lithology Unfiltered	22.21	BLK	0.250
FAB	Far Above	22.56	BLK	0.250
FHI	Far Cesium High	22.56	BLK	0.250
FLO	Far Cesium Low	22.56	BLK	0.250
FVA	Far Valley	22.56	BLK	0.250
FBA	Far Barite	22.56	BLK	0.250
FDE	Far Density	22.56	BLK	0.250
FPK	Far Peak	22.56	BLK	0.250
FLI	Far Lithology	22.56	BLK	0.250
PTMP	Pad Temperature	22.40	BLK	0.920
NHV	Near Detector High Voltage	21.79	NO	
FHV	Far Detector High Voltage	21.79	NO	
ITMP	Instrument Temperature	21.79	NO	
DDHV	Detector High Voltage	21.79	NO	

ANNULAR HOLE VOLUME PLOT




Caliper
1200
1300
1400
1500
1600
693
674
656
637
619
601
583
566
548
530
511
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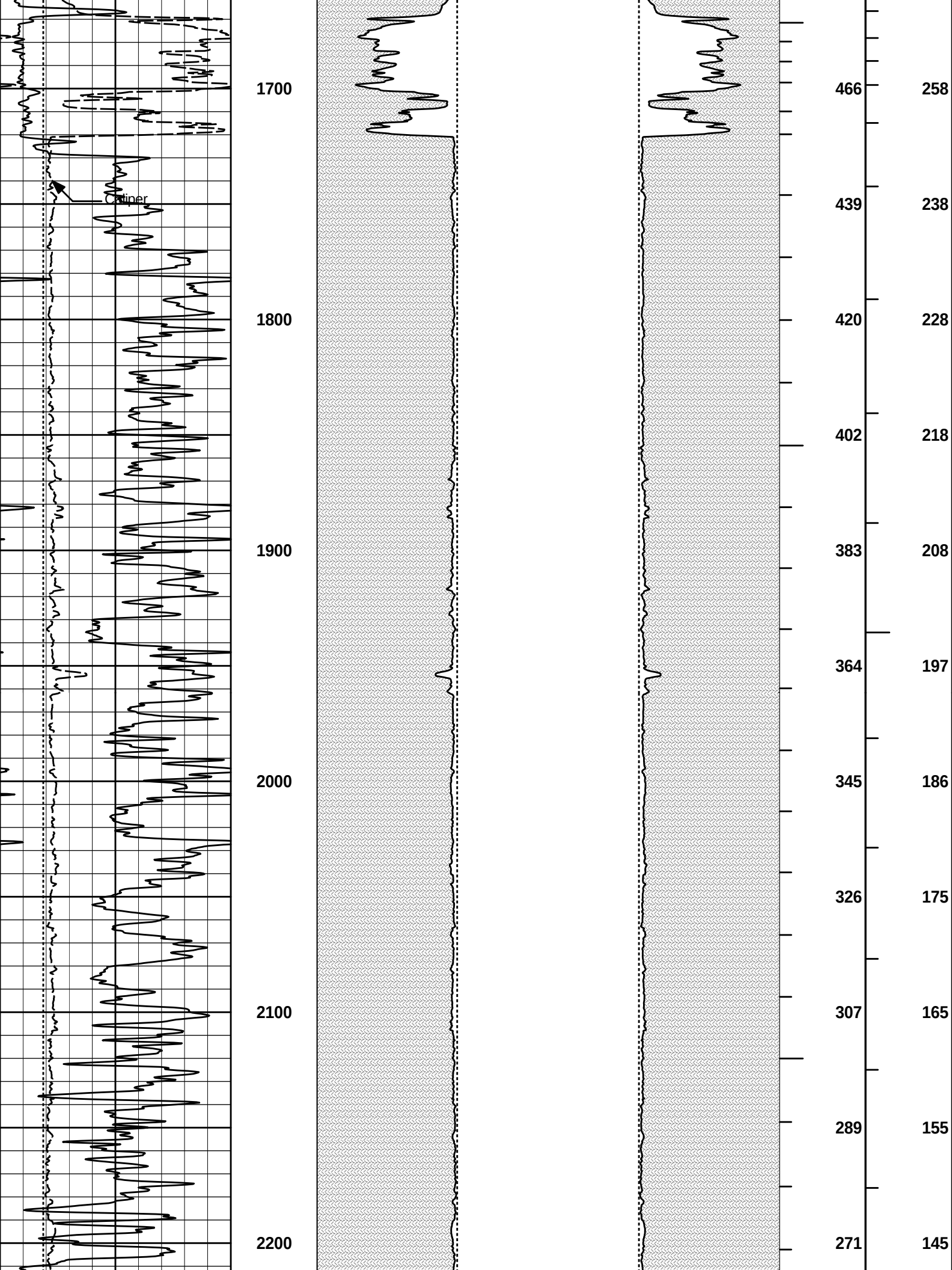
384
373
362
353
344
334
324
315
305
294


Caliper
1700
1800
1900
2000
2100
2200
466
439
420
402
383
364
345
326
307
289
271
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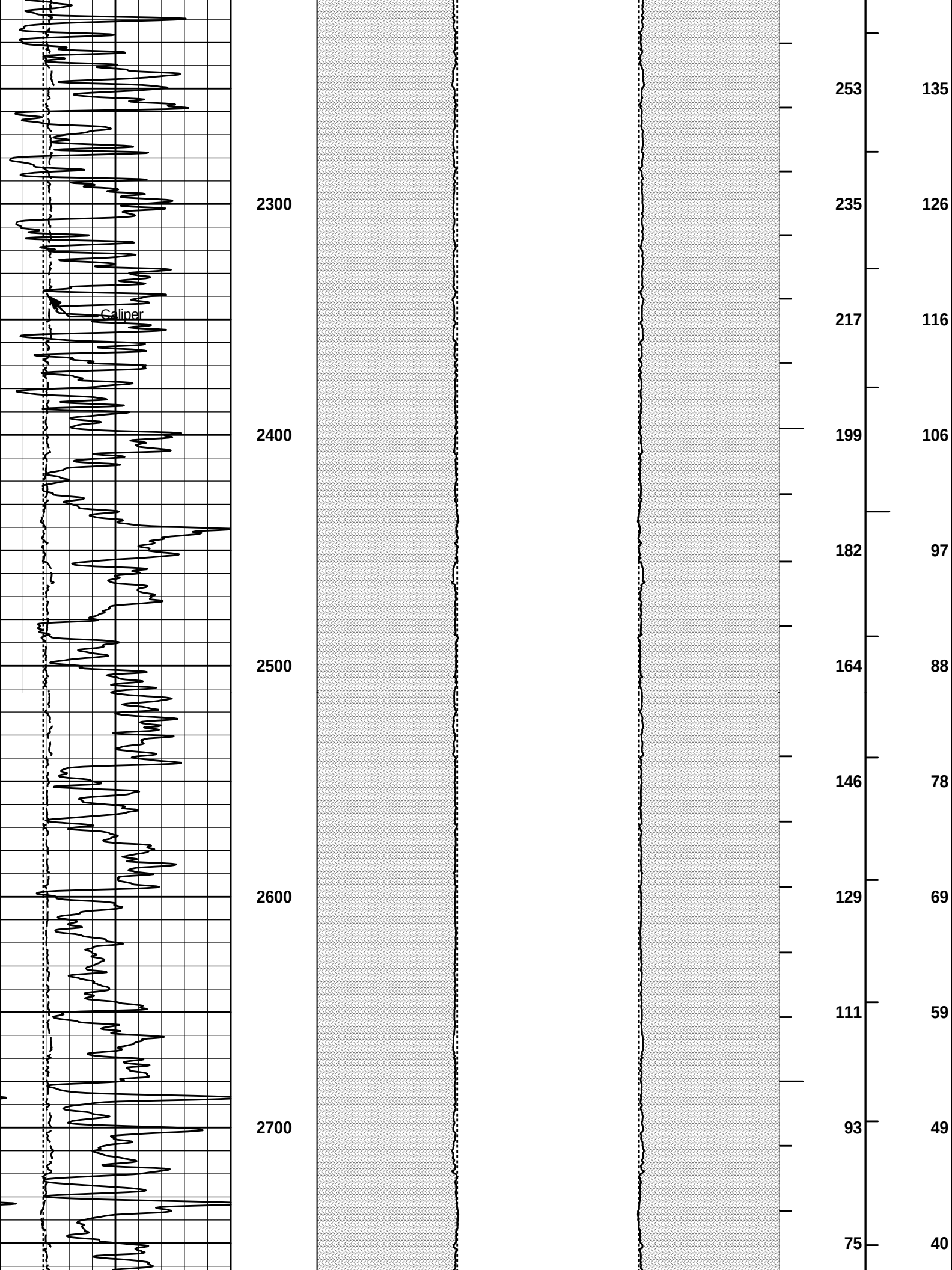
238
228
218
208
197
186
175
165
155
145


Caliper
2300
2400
2500
2600
2700
253
135
235
126
217
116
199
106
182
97
164
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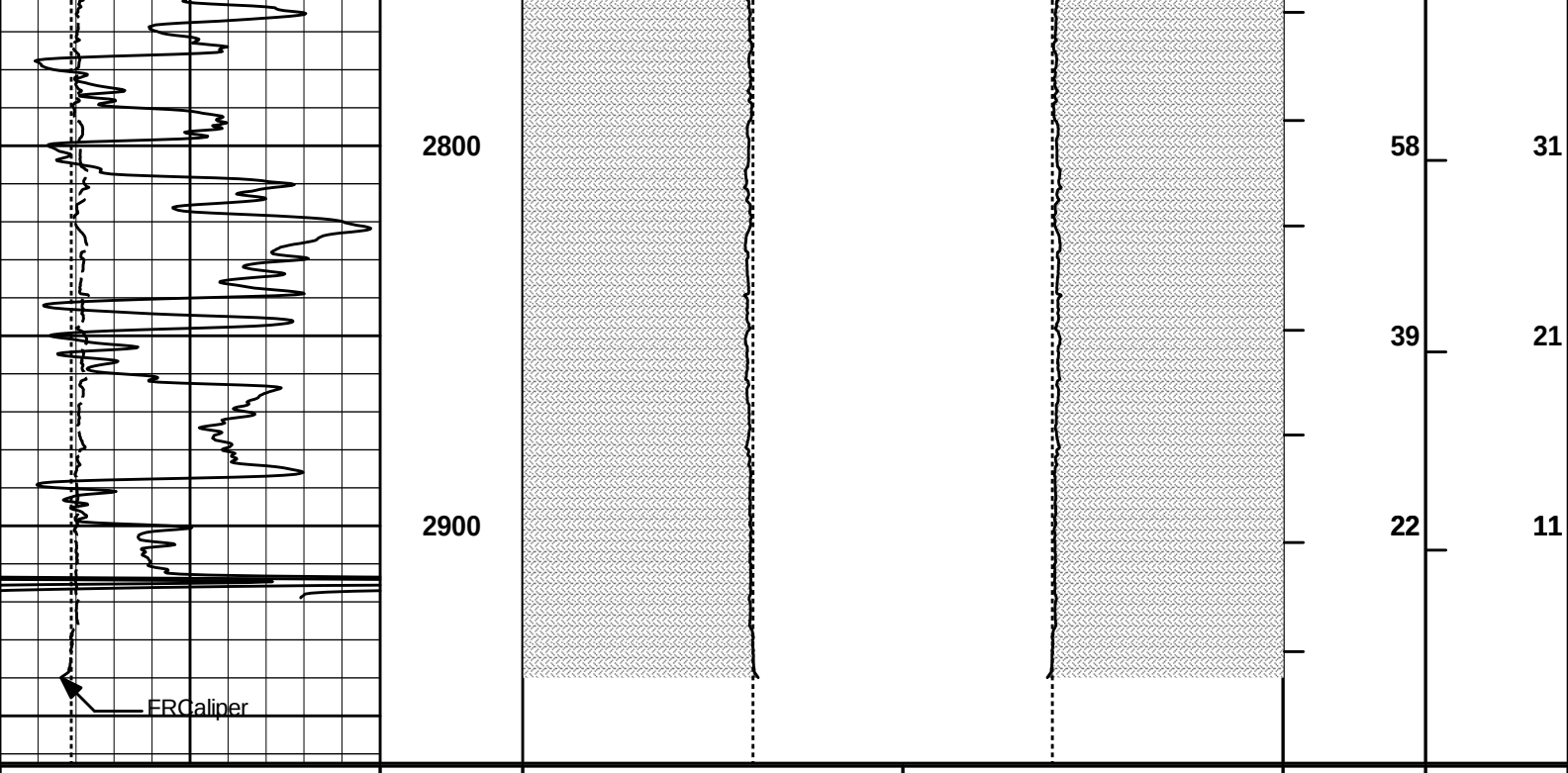
146
78
129
69
111
59
93
49
75
40



6 Caliper 16	MD 1 : 600 ft	20 Caliper 0	0 Caliper 20	BHVT	AHVT
inches		inches	inches		
6 Bit Size 16		20 Bit Size 0	0 Bit Size 20		
inches					
0 Gamma API 150		MUDCAKE	MUDCAKE		
api					

HALLIBURTON

Plot Time: 24-Jul-13 15:16:25
Plot Range: 670 ft to 2962.5 ft
Data: CAMPBELL_et_al_\Well Based\R1 CASING\
Plot File: \\-LOCAL-\CAMPBELL_et_al_\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**PIONEER NATURAL RESOURCES USA, INC.**		
WELL	**CAMPBELL et al ATU 1**		
FIELD	**HUGOTON PONOMA**		
COUNTY	**GRANT**	STATE	**KANSAS**

HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG