

HALLIBURTON

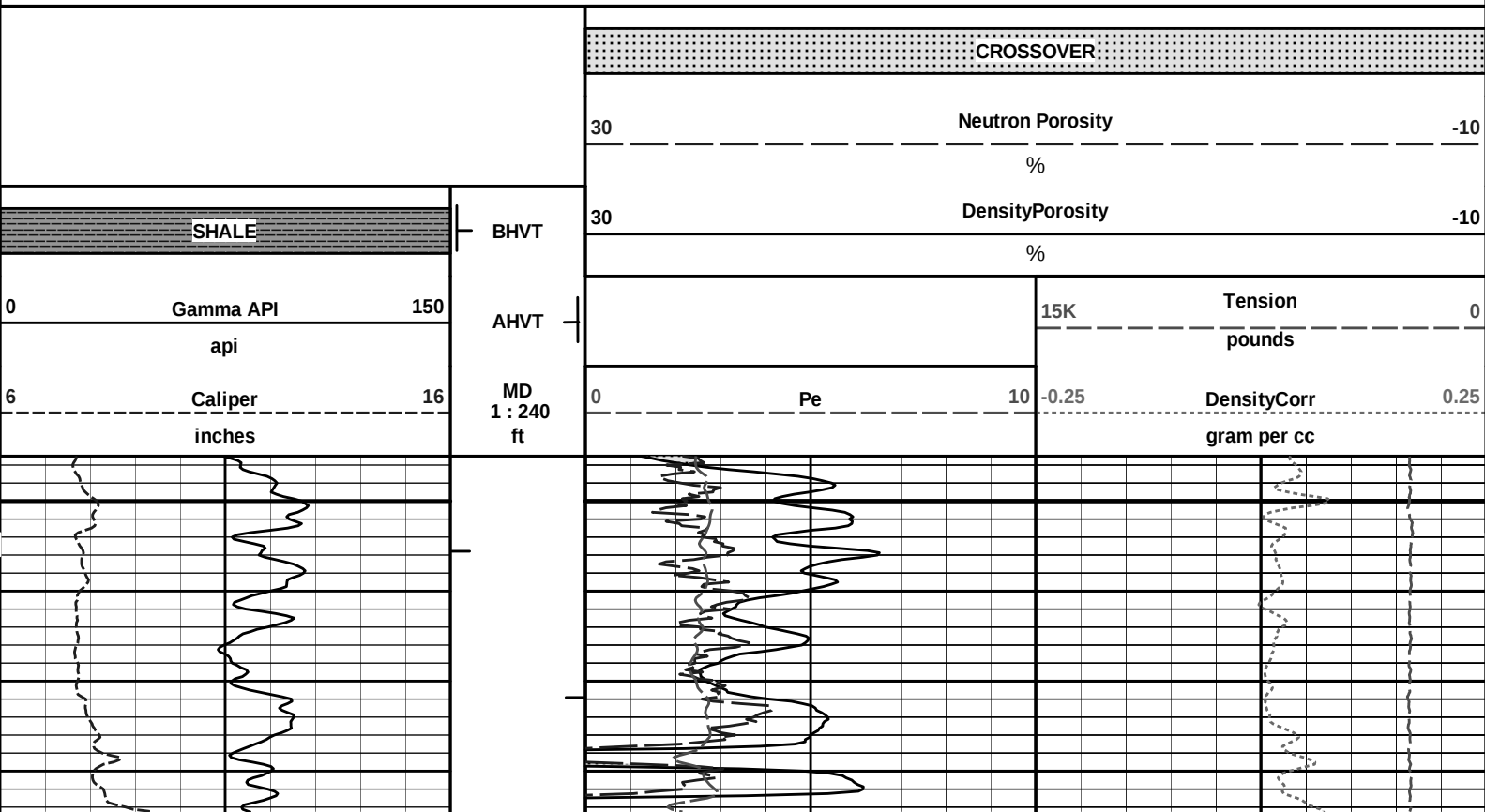
DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

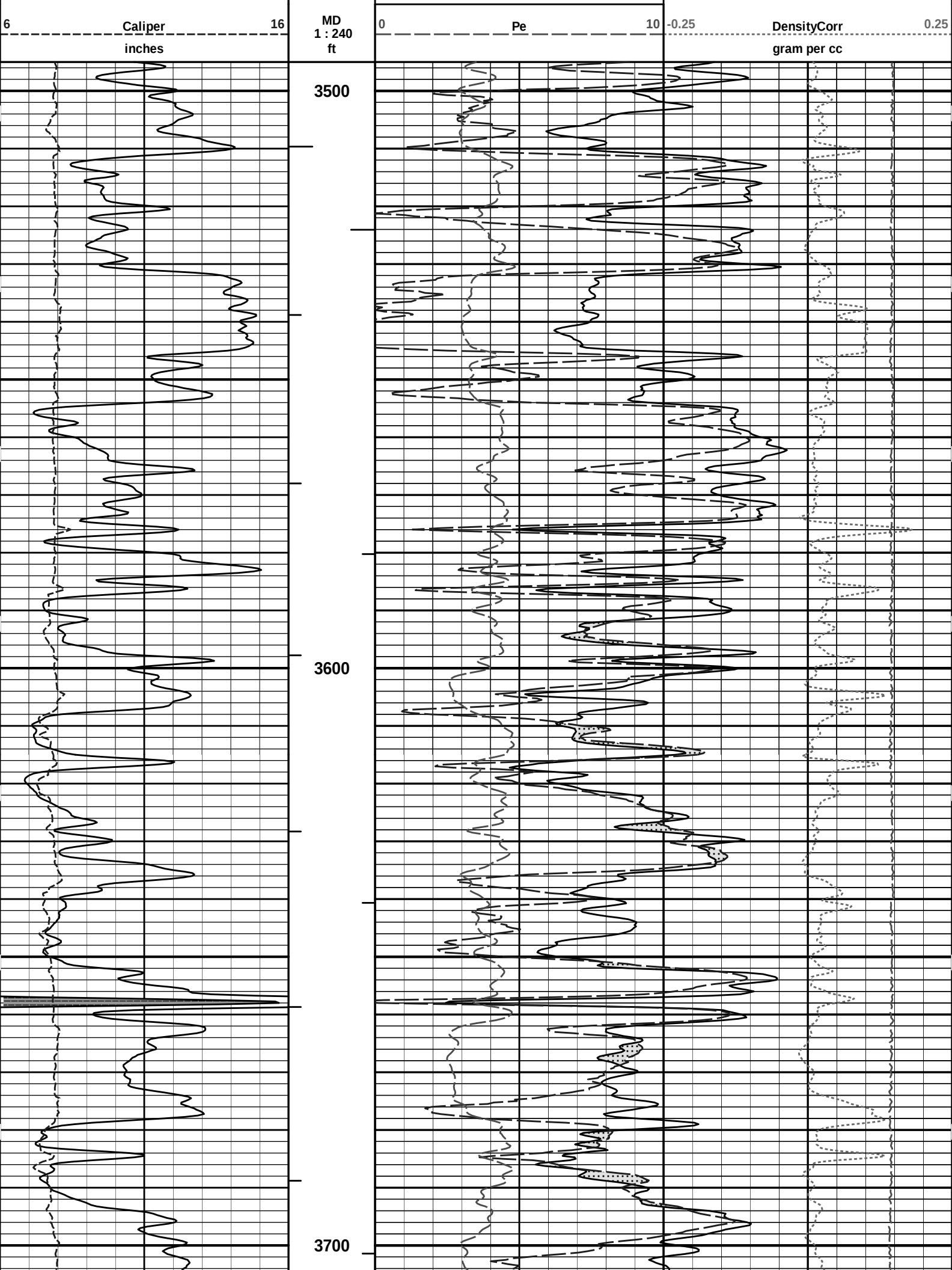
COMPANY		HARTMAN OIL CO., INC.	
WELL		GANO UNIT #1-36	
FIELD/BLOCK		WILDCAT	
COUNTY		GRAHAM	
STATE		KANSAS	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		01-Oct-13	
Run No.		ONE	
Depth - Driller		4100.00 ft	
Depth - Logger		4097.0 ft	
Bottom - Logged Interval		4053	
Top - Logged Interval		2050	
Casing - Driller		8.625 in @ 295.0 ft	
Casing - Logger		296.0 ft	
Bit Size		7.875 in	
Type Fluid in Hole		WATER BASED MUD	
Density		9.2 ppg	
Viscosity		65.00 s/qt	
PH		11.00 pH	
Fluid Loss		5.8 cpm	
Source of Sample		MUD PIT	
Rm @ Meas. Temperature		0.900 ohmm @ 85.00 degF	
Rmf @ Meas. Temperature		0.77 ohmm @ 85.00 degF	
Rmc @ Meas. Temperature		1.040 ohmm @ 85.00 degF	
Source Rmf		CALCULATED	
Rmc		CALCULATED	
Rm @ BHT		0.63 ohmm @ 124.0 degF	
Time Since Circulation		3.0 hr	
Time on Bottom		01-Oct-13 03:32	
Max. Rec. Temperature		124.0 degF @ 4097.0 ft	
Equipment		11230668 LIBERAL	
Recorded By		S. INGERSOLL	
Witnessed By		K. NOAH	

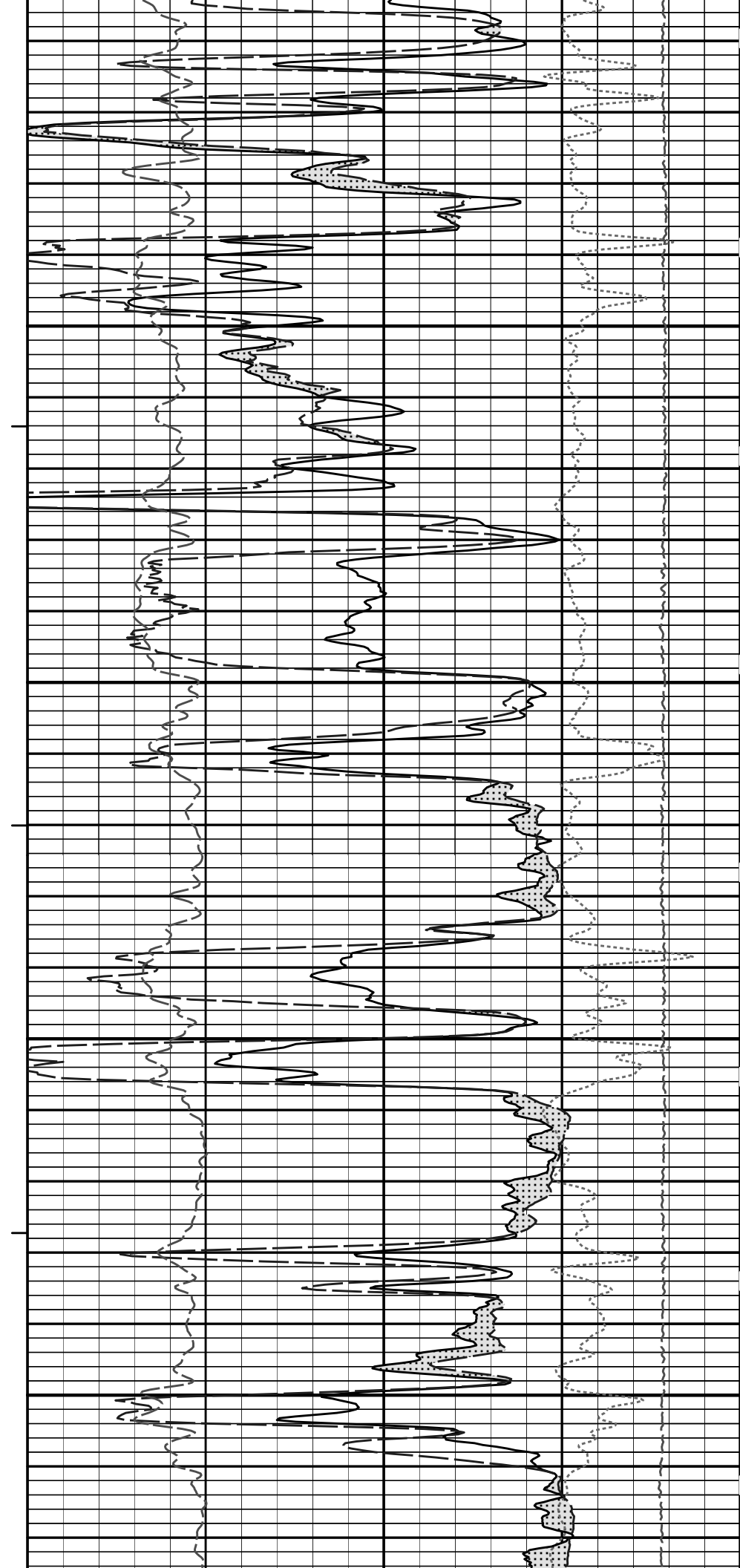
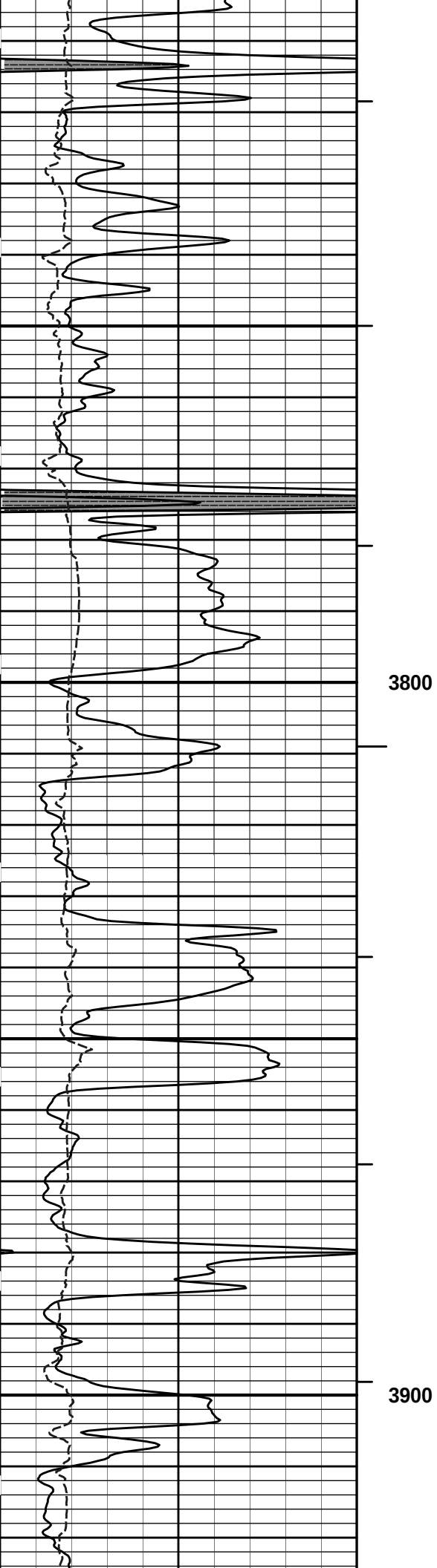
Fold here

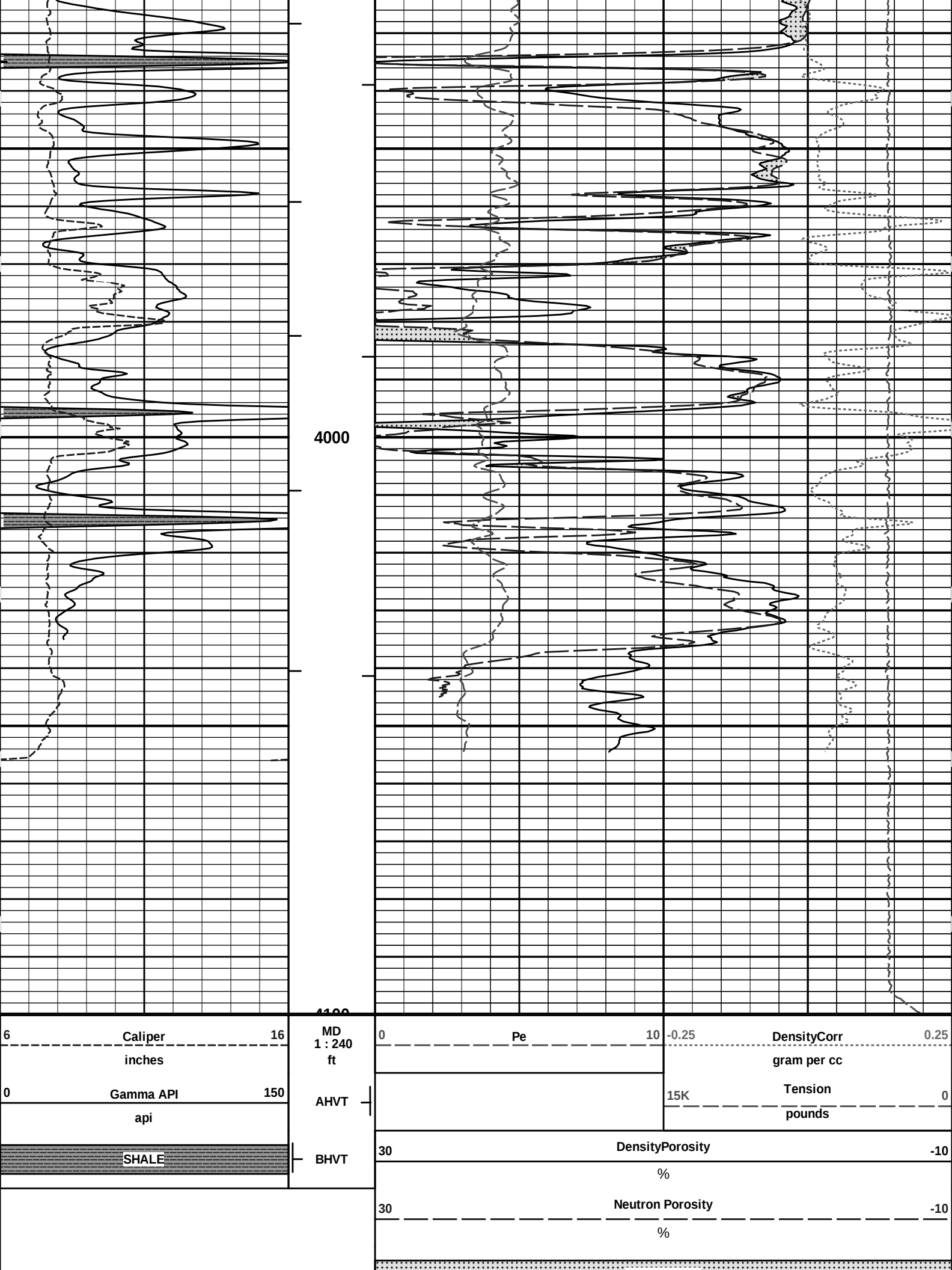
Service Ticket No.: 900787243				API Serial No.: 15-065-23953				PGM Version: WL INSITE R3.8.4 (Build 5)							
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES									
Date	Sample No.					Type Log	Depth	Scale Up Hole	Scale Down Hole						
Depth-Driller															
Type Fluid in Hole															
Density	Viscosity														
Ph	Fluid Loss														
Source of Sample						RESISTIVITY EQUIPMENT DATA									
Rm @ Meas. Temp						@		@	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other		
Rmf @ Meas. Temp.						@		@	ONE	ACRT	N/A	CENT			
Rmc @ Meas. Temp.						@		@		19029775					
Source Rmf	Rmc														
Rm @ BHT						@		@							
Rmf @ BHT						@		@							
Rmc @ BHT						@		@							
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.	ONE			Run No.	ONE			Run No.	ONE			Run No.	ONE		
Serial No.	10748374			Serial No.	10747684			Serial No.	10714945			Serial No.	10755066		
Model No.	GTET			Model No.	BSAT			Model No.	SDLT			Model No.	DSNT		
Diameter	3.625"			No. of Cent.	2			Diameter	5.3"			Diameter	3.625"		
Detector Model No.	T-102			Spacing	.5'			Log Type	GAM-GAM			Log Type	NEU-NEU		
Type	SCINT							Source Type	CS-137			Source Type	AM-241BE		
Length	8"			LSA [Y/N]				Serial No.	5073GW			Serial No.	DSN-436		
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	4097	296	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.														
CHLORIDES REPORTED AT 3000 ppm.														









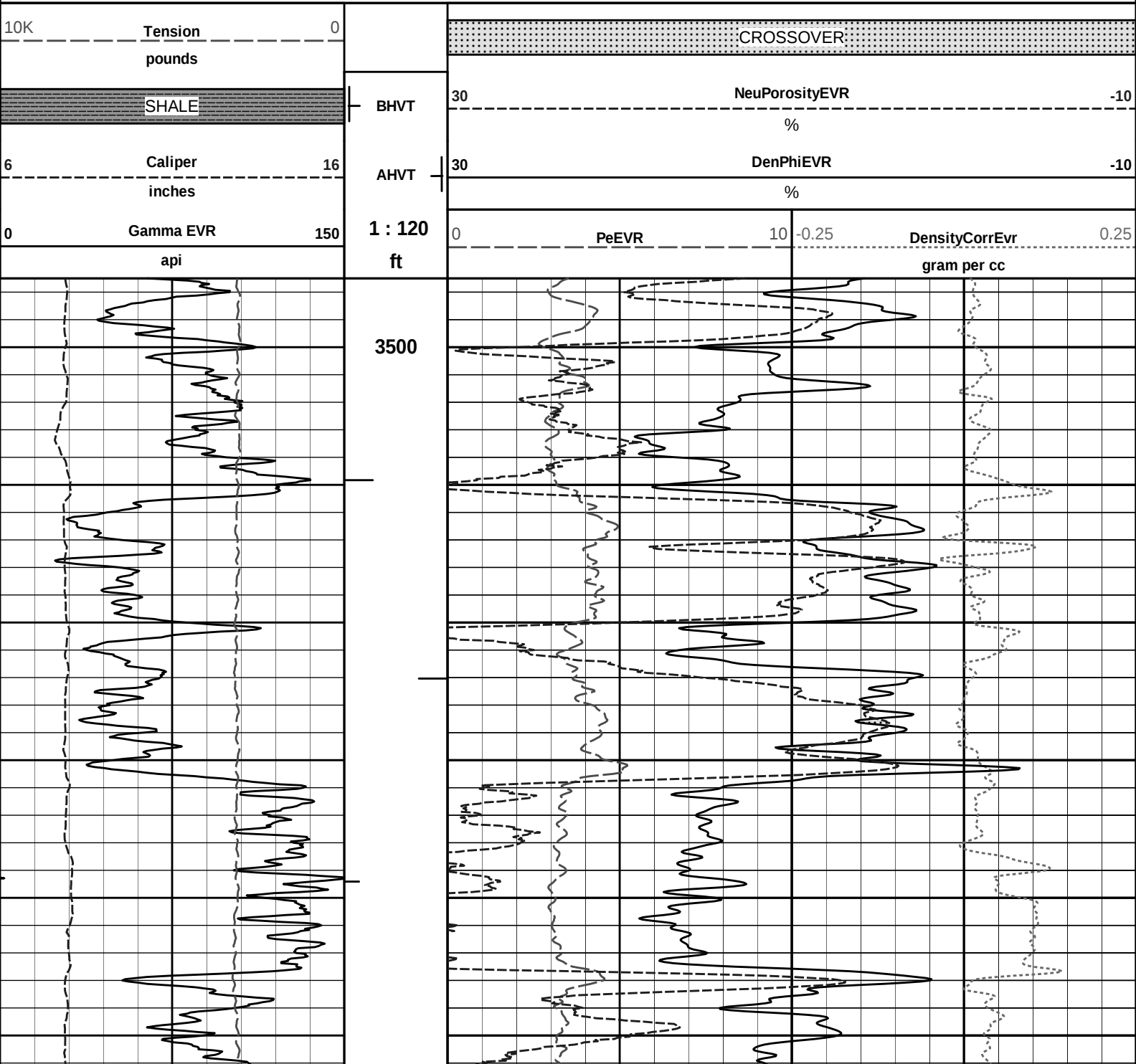
CROSSOVER

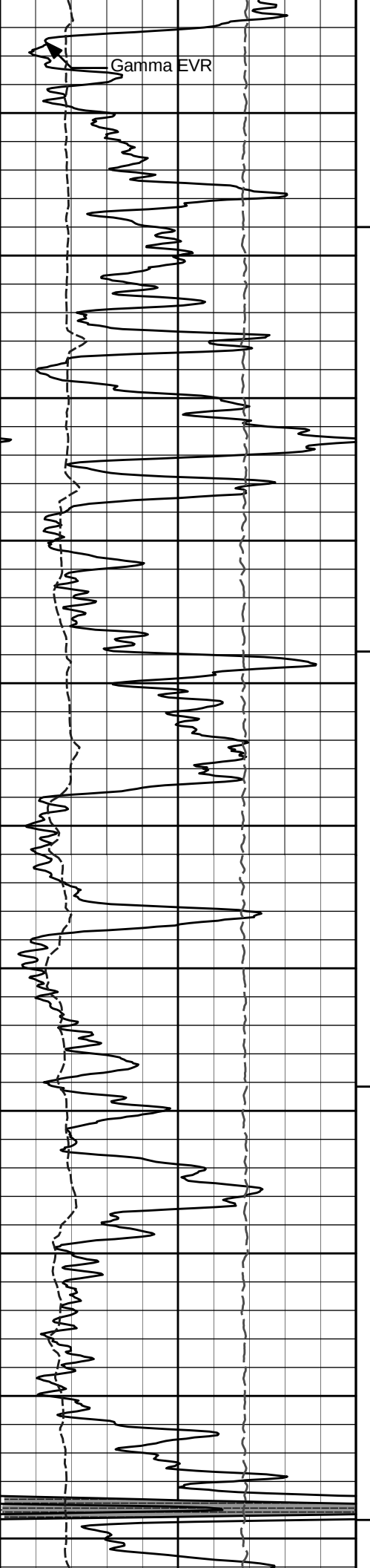
Plot Time: 01-Oct-13 06:37:40
Plot Range: 3495 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\R1 LOWER DETAIL
Plot File: \I\POROSITY\Porosity_IQ_5_MAIN_LIB

HALLIBURTON

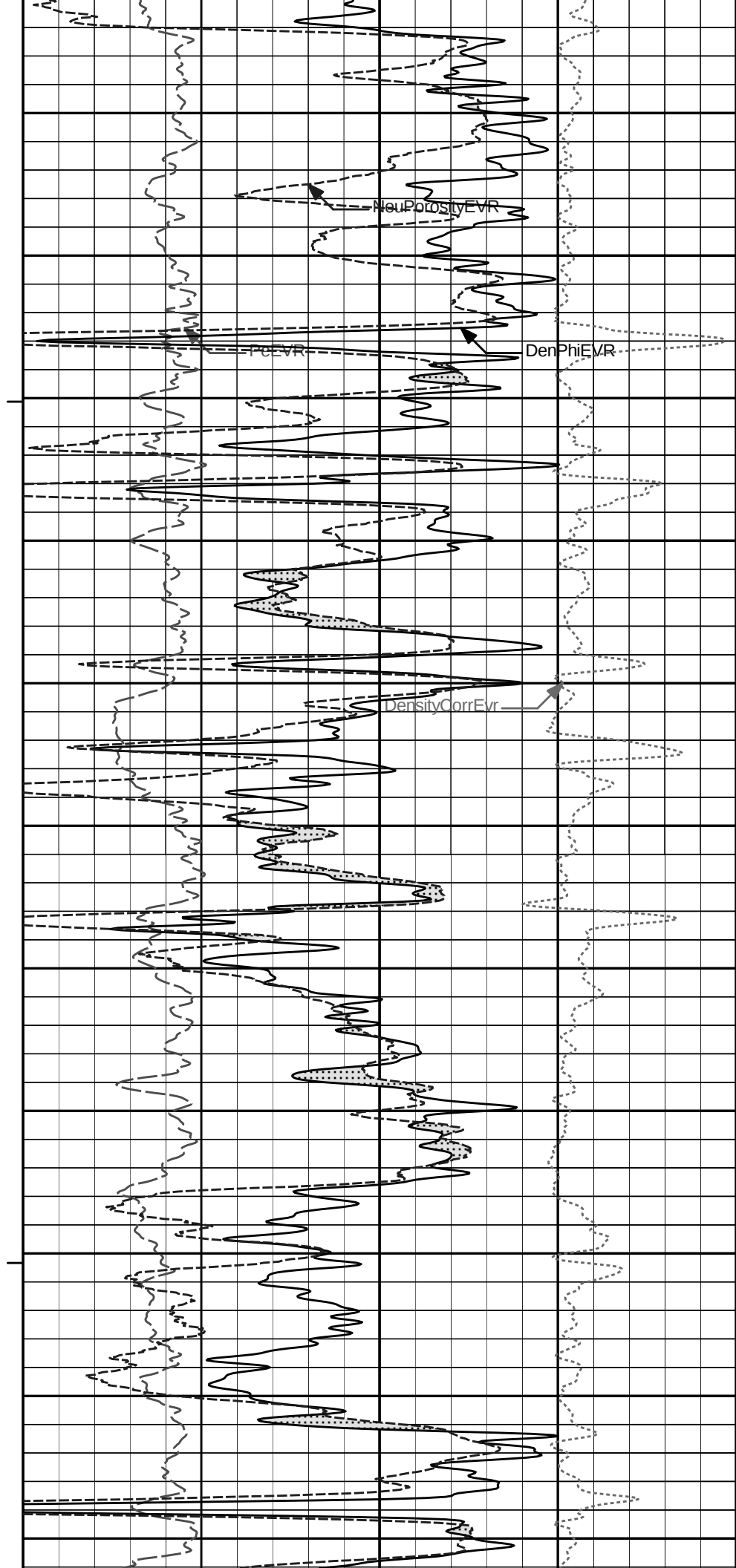
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Plot Range: 3495 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\R1 LOWER DETAIL*
Plot File: \\POROSITY\Porosity_EQR_LIB

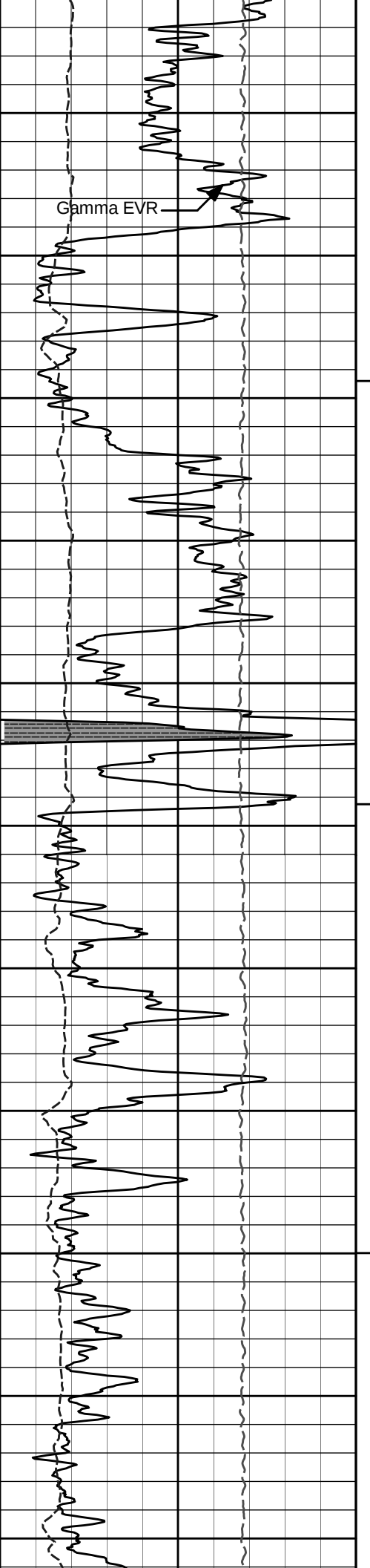
MAIN PASS 10" = 100'





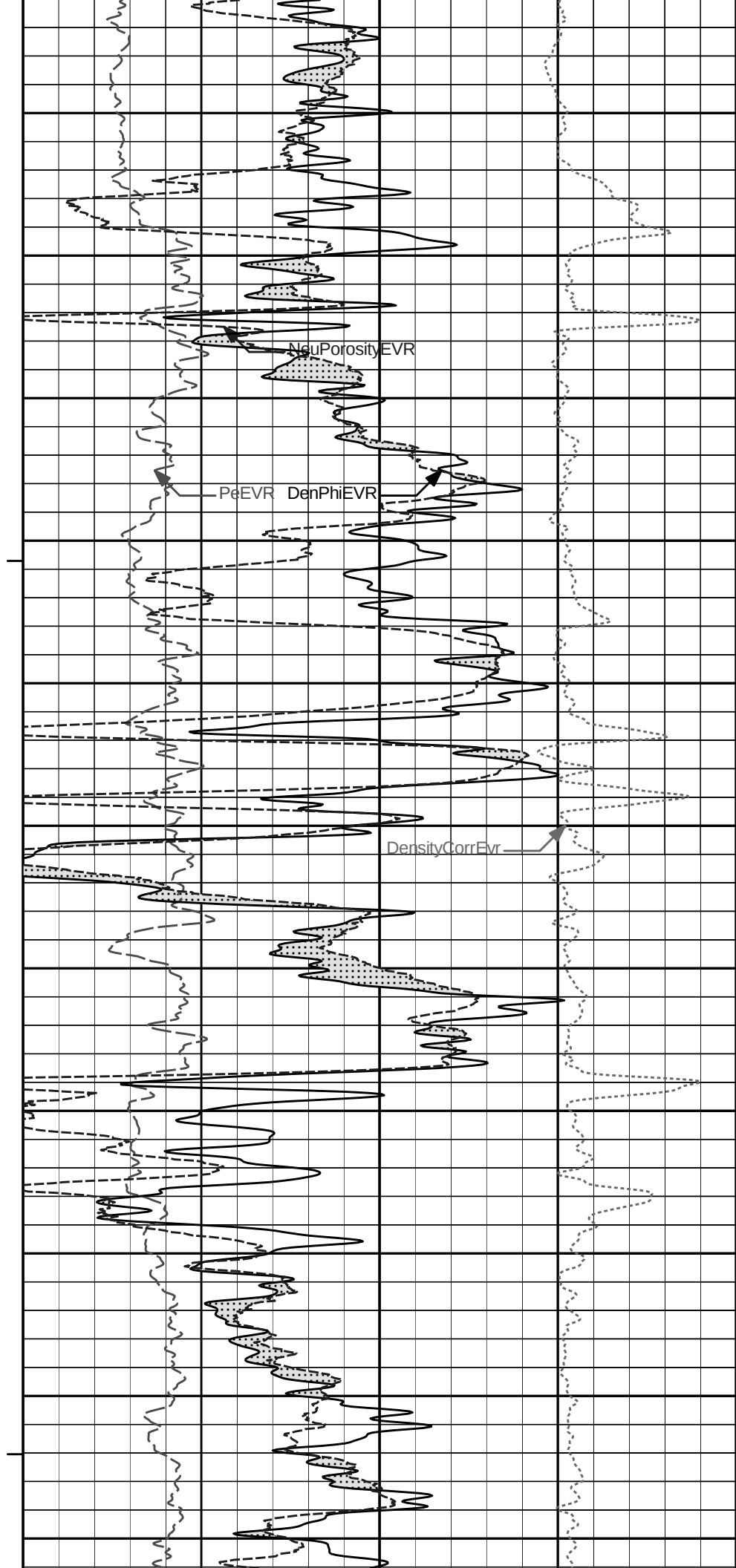
3600





Gamma EVR

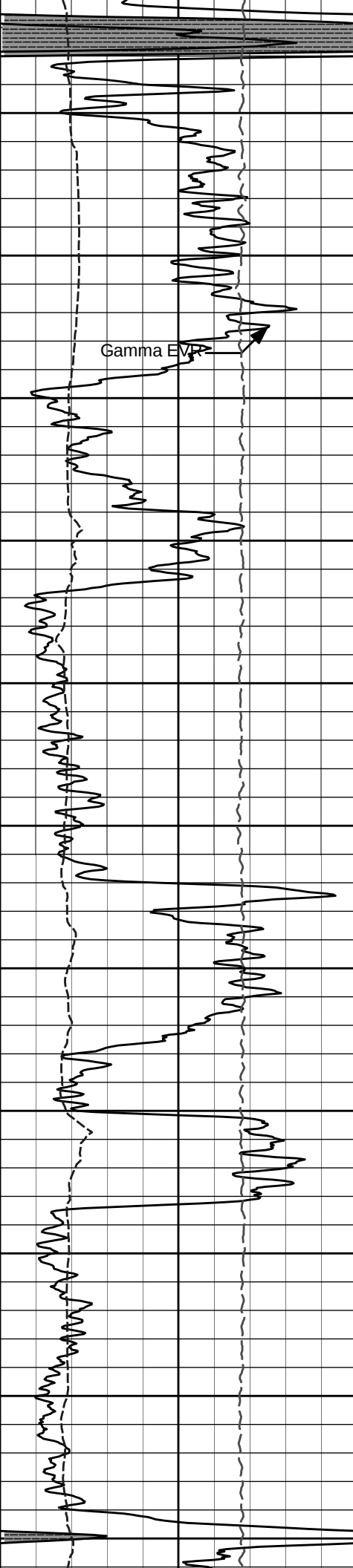
3700



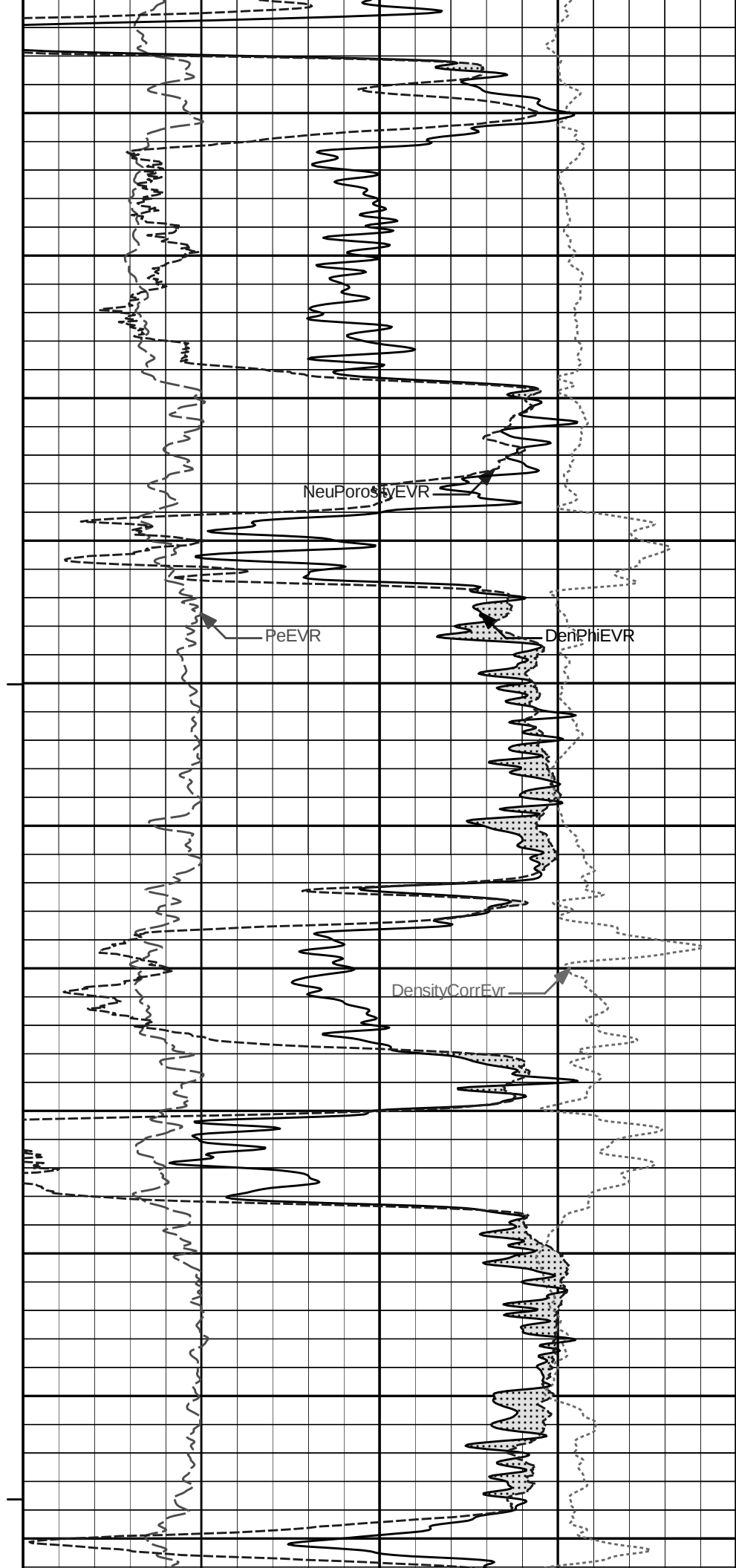
NeuPorosityEVR

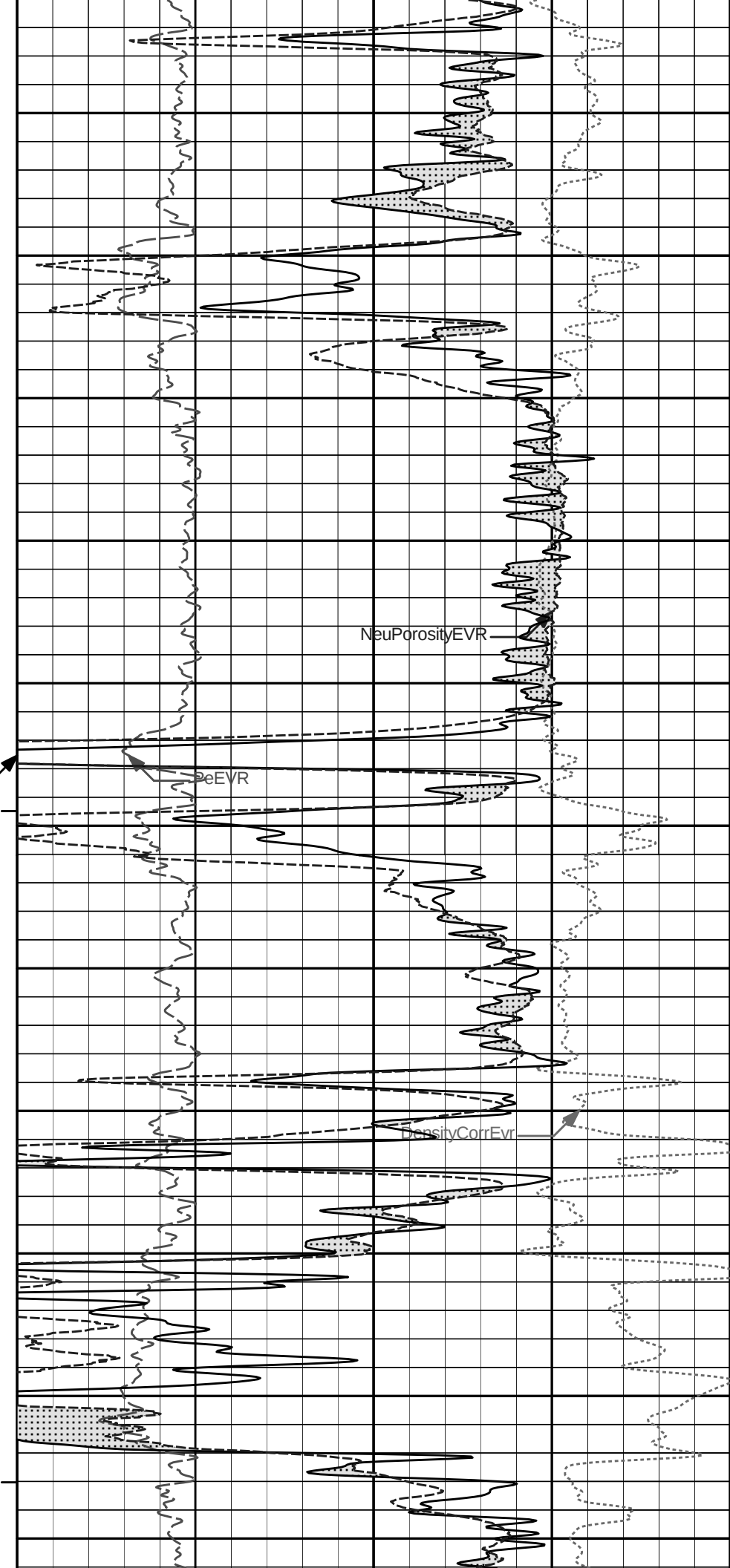
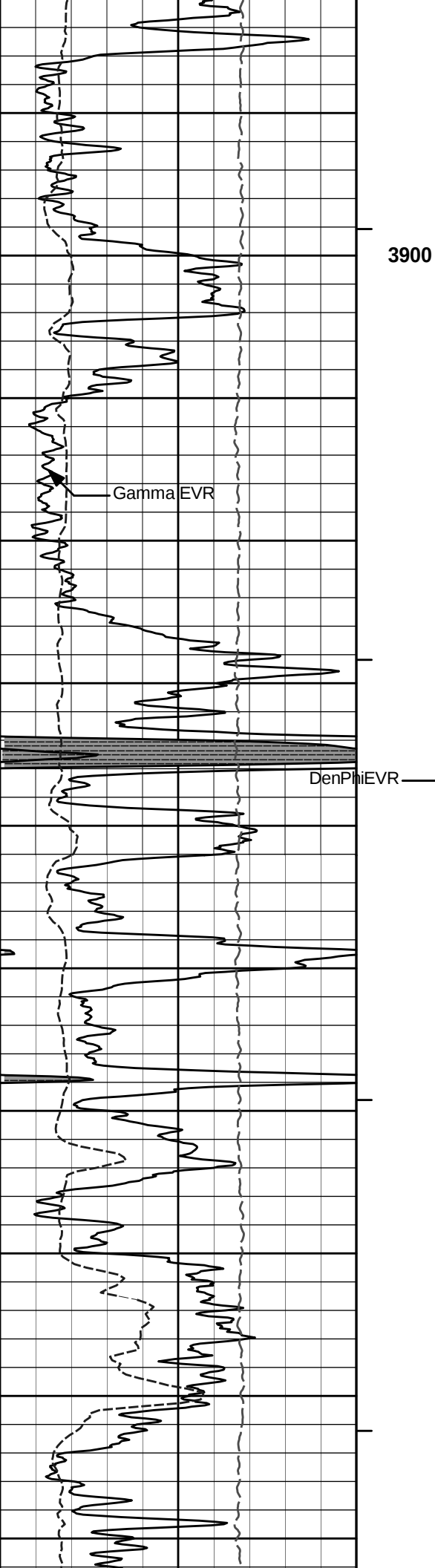
PeEVR DenPhiEVR

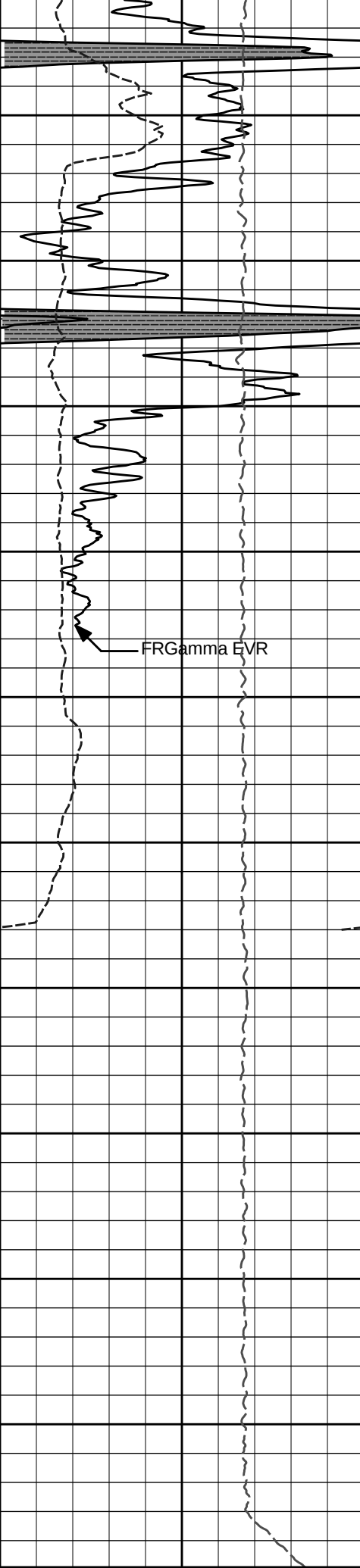
DensityCorrEvr



3800



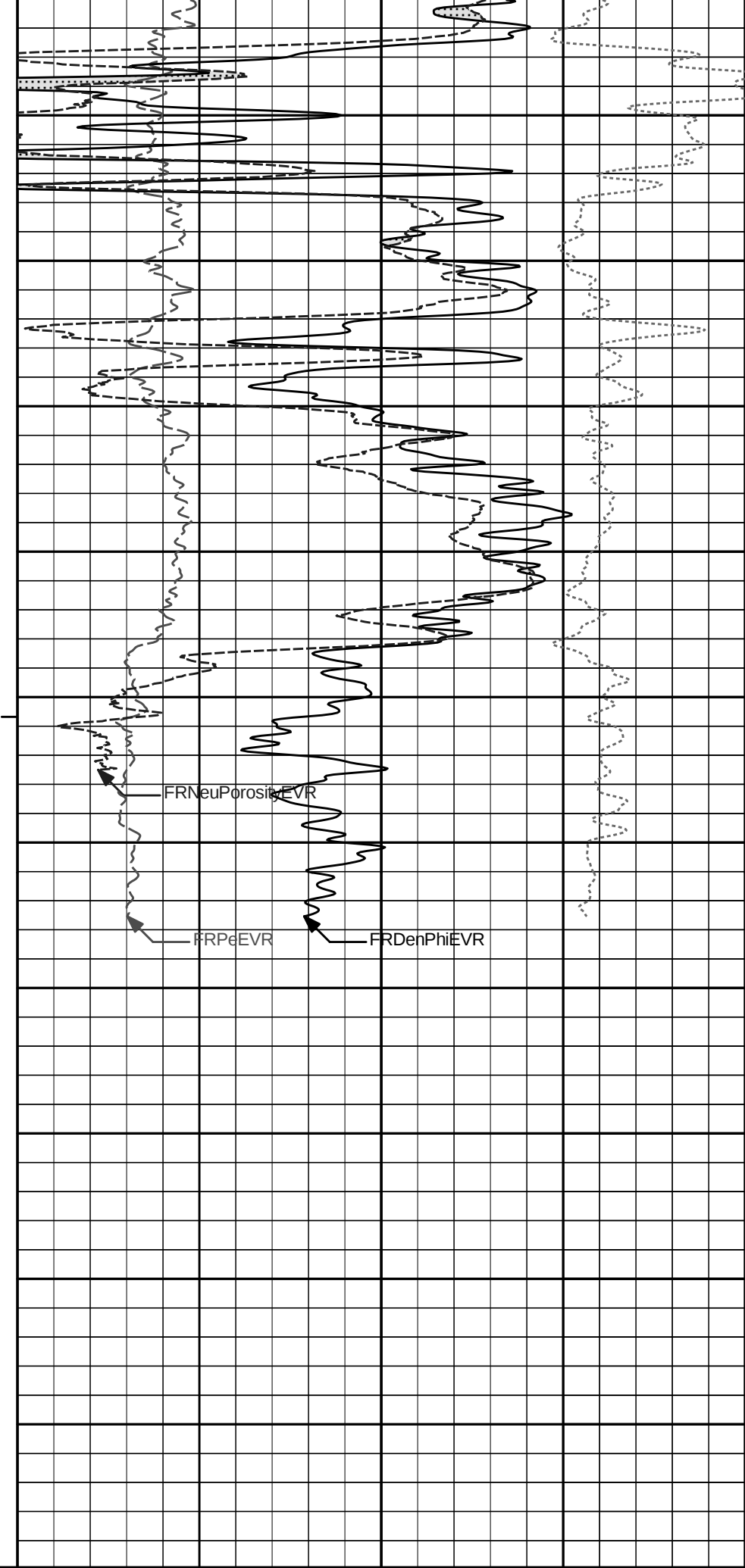




4000

FRGamma EVR

1 : 120



FRNeuPorosityEVR

FRPeEVR

FRDenPhiEVR

PeEVR

10 -0.25

DensCorrEvr

0.25

api		ft	PeEVR		DensityCorrEVR	
					gram per cc	
6	Caliper	16	AHVT	30	DenPhiEVR -10	
inches				%		
SHALE			BHVT	30	NeuPorosityEVR -10	
				%		
10K	Tension	0		CROSSOVER		
pounds						

HALLIBURTON

Plot Time: 01-Oct-13 06:37:48
Plot Range: 3495 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\R1 LOWER DETAIL*
Plot File: \\POROSITY\Porosity_IQ_EVR_LIB

MAIN PASS 10" = 100'

HALLIBURTON

Plot Time: 01-Oct-13 06:37:48

Plot Range: 3700 ft to 4099.58 ft

Data: GANO_UNIT_1-36\Well Based\R1 REPEAT\

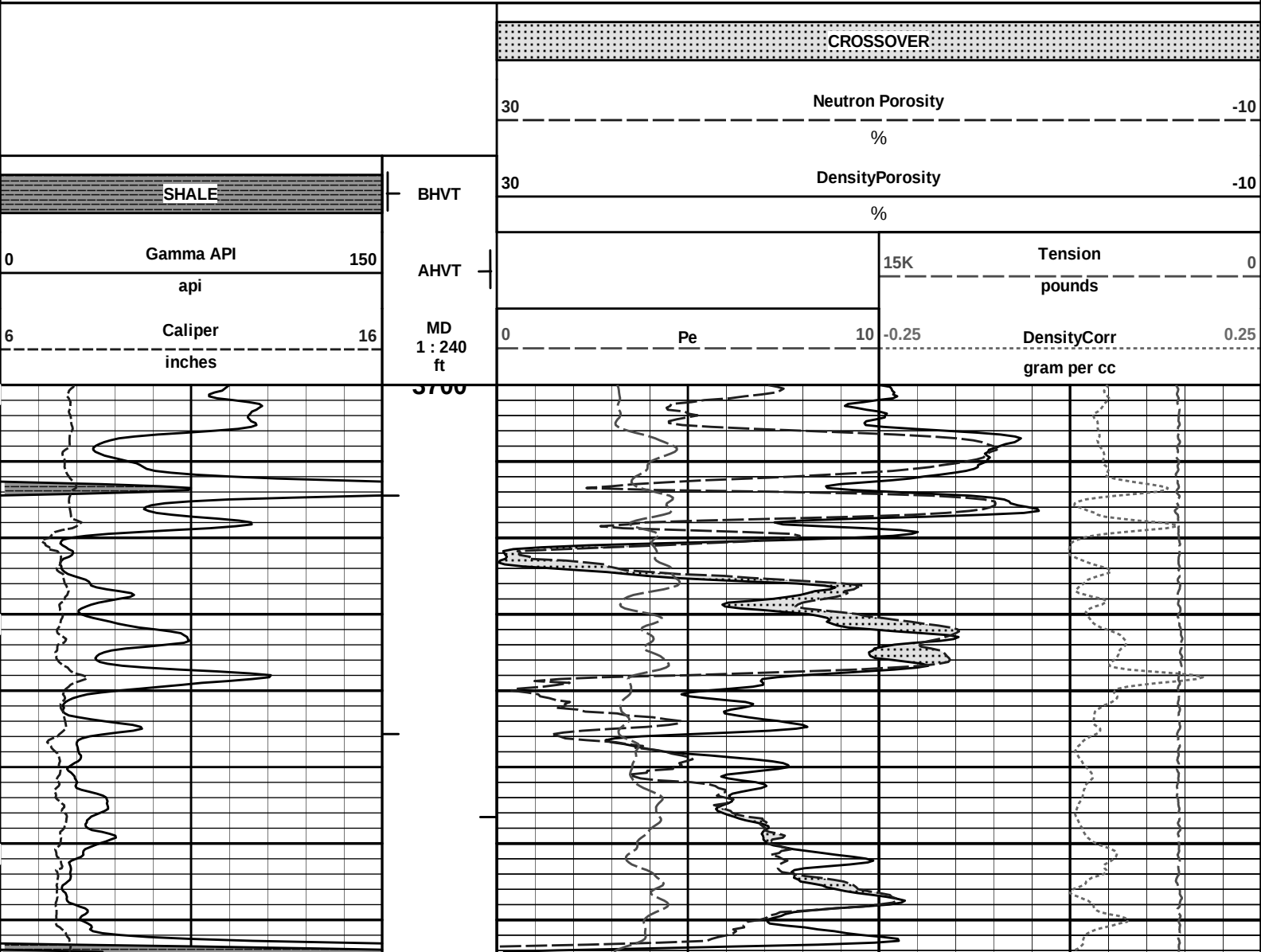
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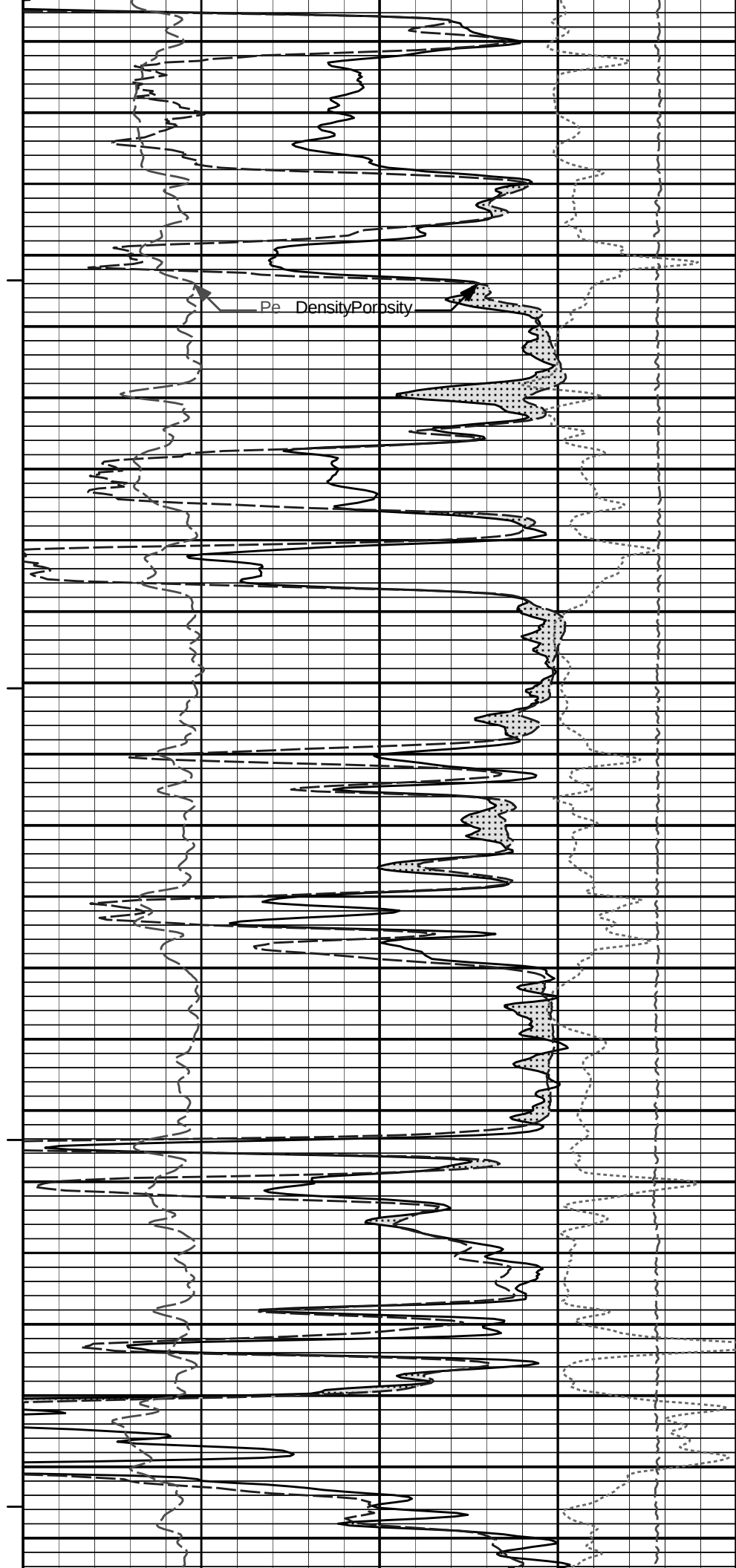
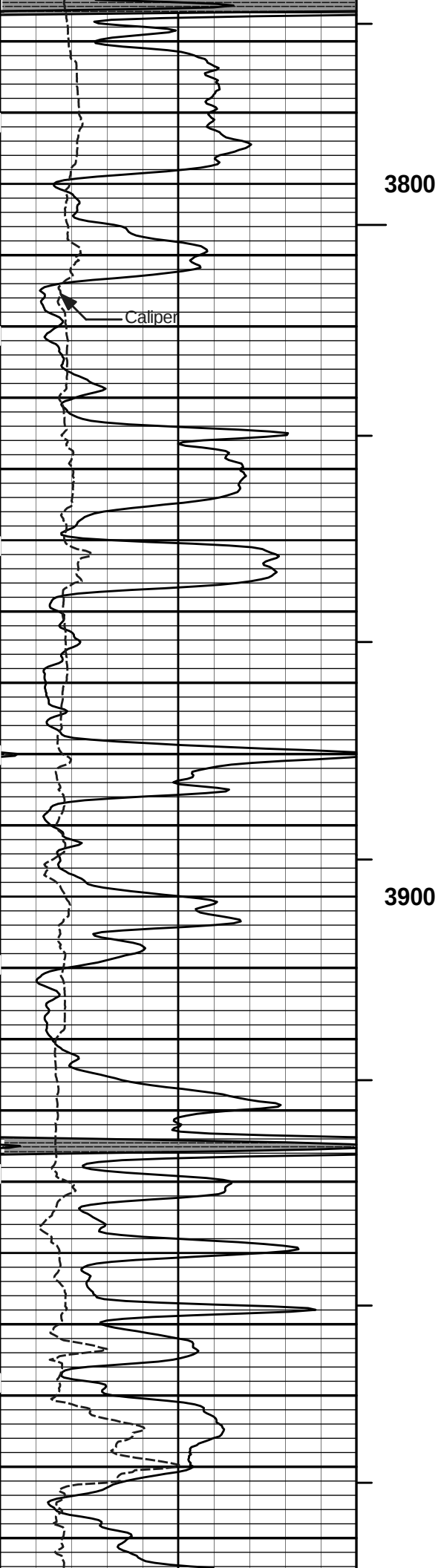
REPEAT SECTION

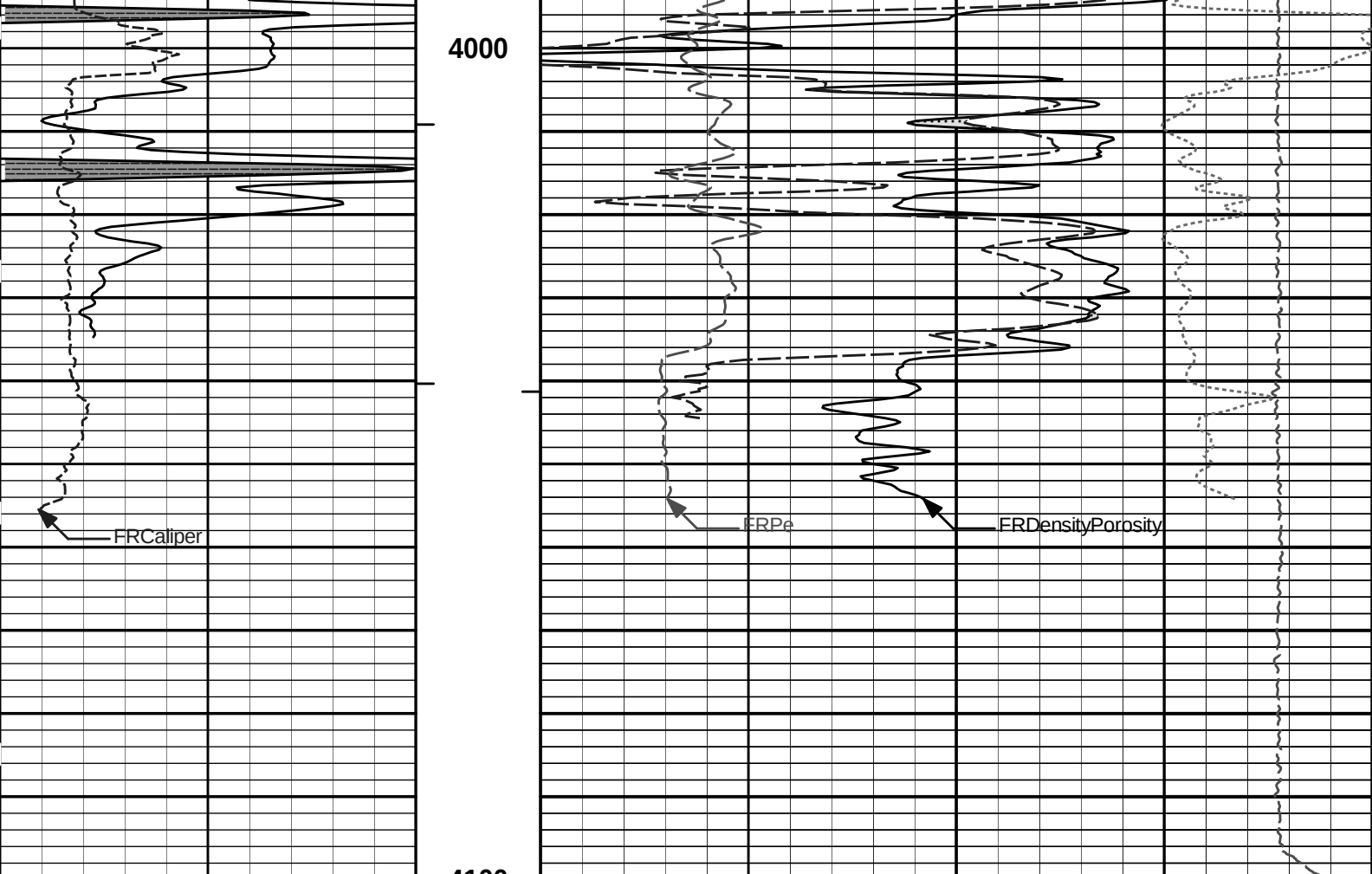
HALLIBURTON

Plot Time: 01-Oct-13 06:37:48
Plot Range: 3700 ft to 4099.58 ft
Data: GANO_UNIT_1-36\Well Based\R1 REPEAT\
Plot File: \\POROSITY\Porosity_IQ_5_REP_LIB

REPEAT SECTION







6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
	SHALE		BHVT	30	DensityPorosity				-10
					%				
				30	Neutron Porosity				-10
					%				
					CROSSOVER				

HALLIBURTON

Plot Time: 01-Oct-13 06:37:51
Plot Range: 3700 ft to 4099.58 ft
Data: GANO_UNIT_1-36\Well Based\R1 REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION

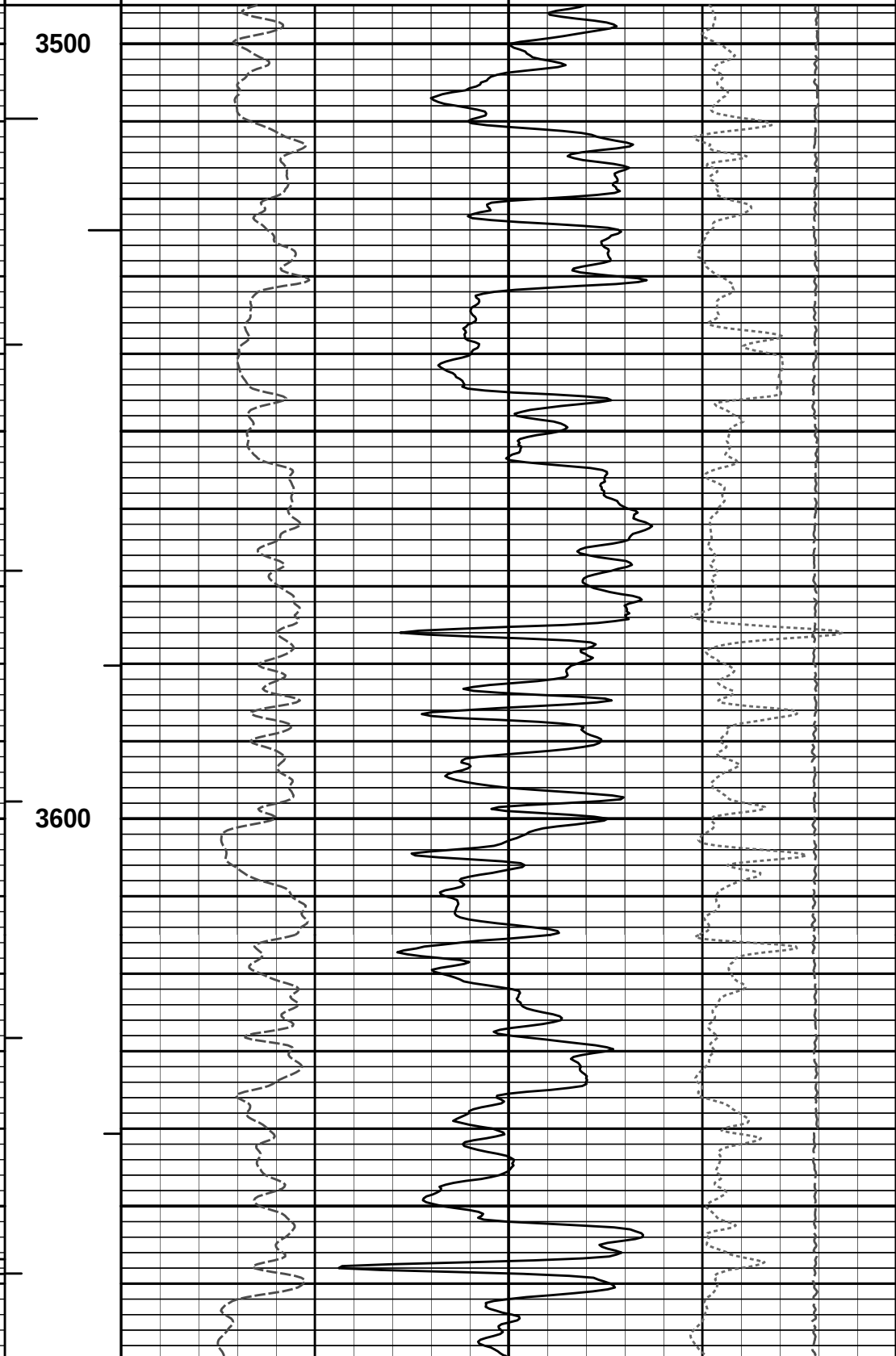
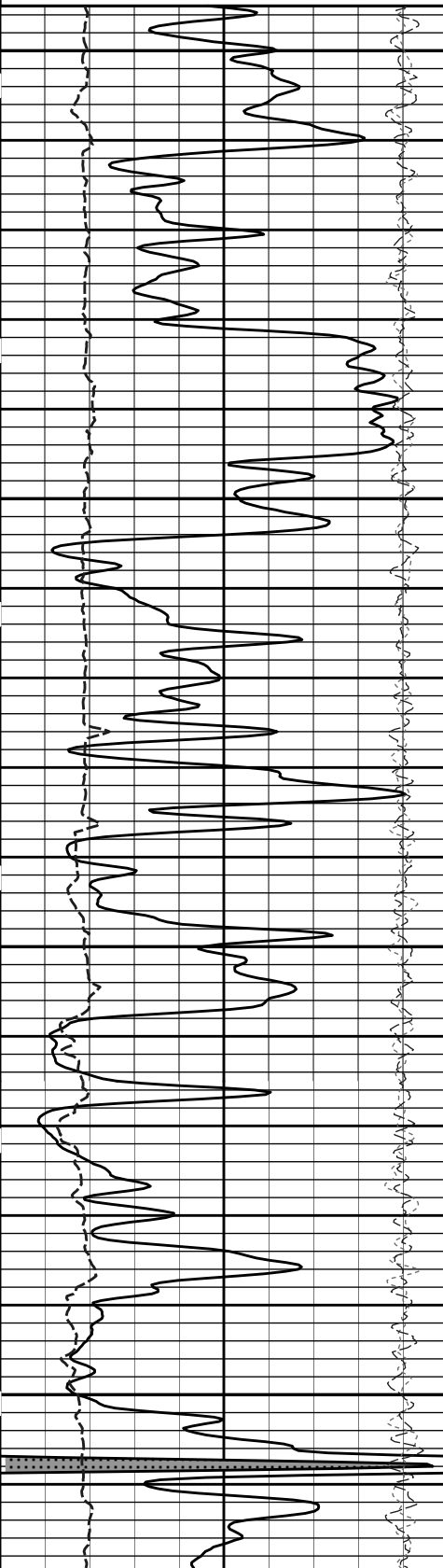
HALLIBURTON

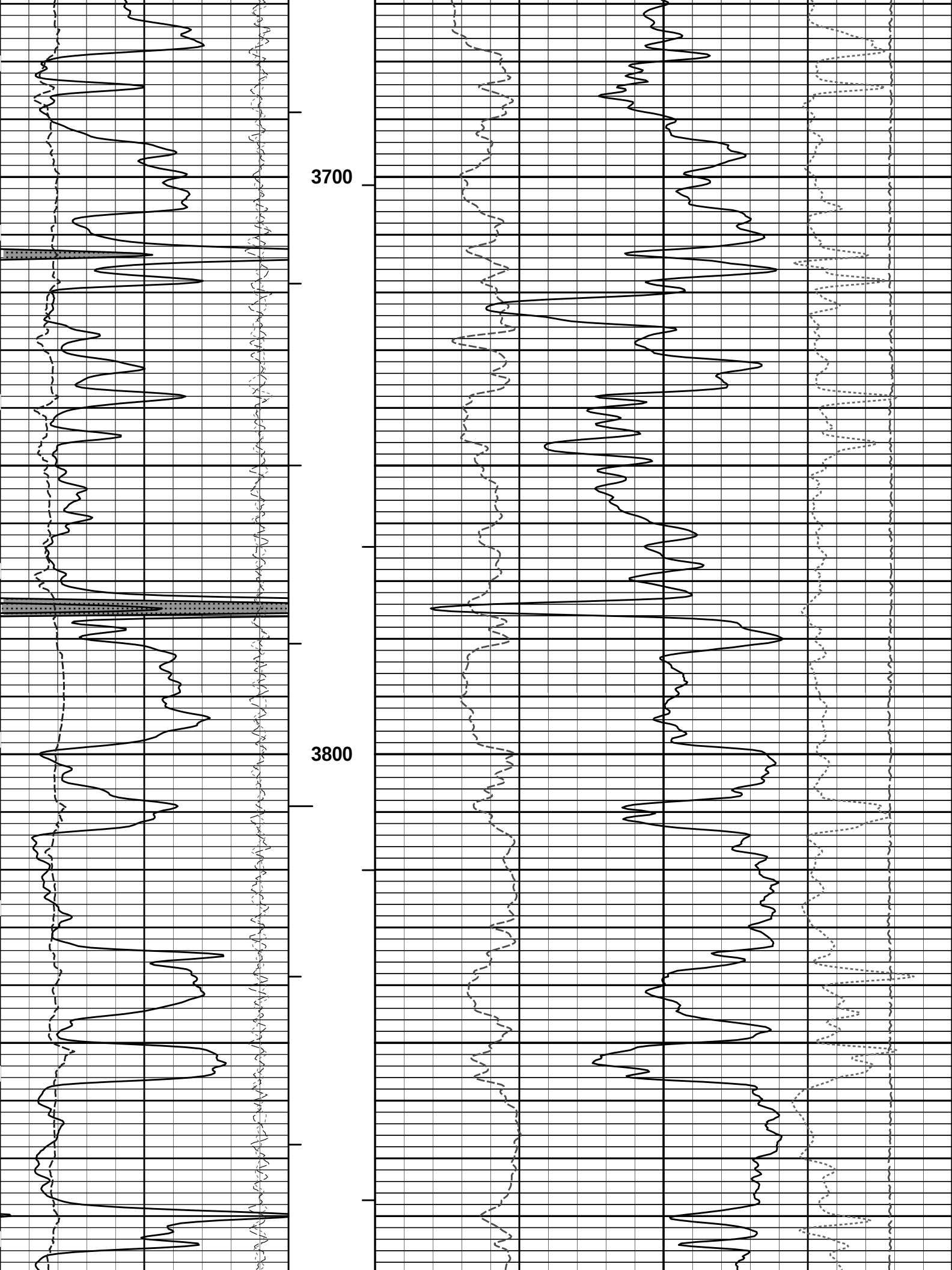
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Plot Range: 3495 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\R1 LOWER DETAIL\
Plot File: \\LOCAL-IGANO_UNIT_1-36\Well Based\POROSITY\BULKD_5_MAIN_LIB

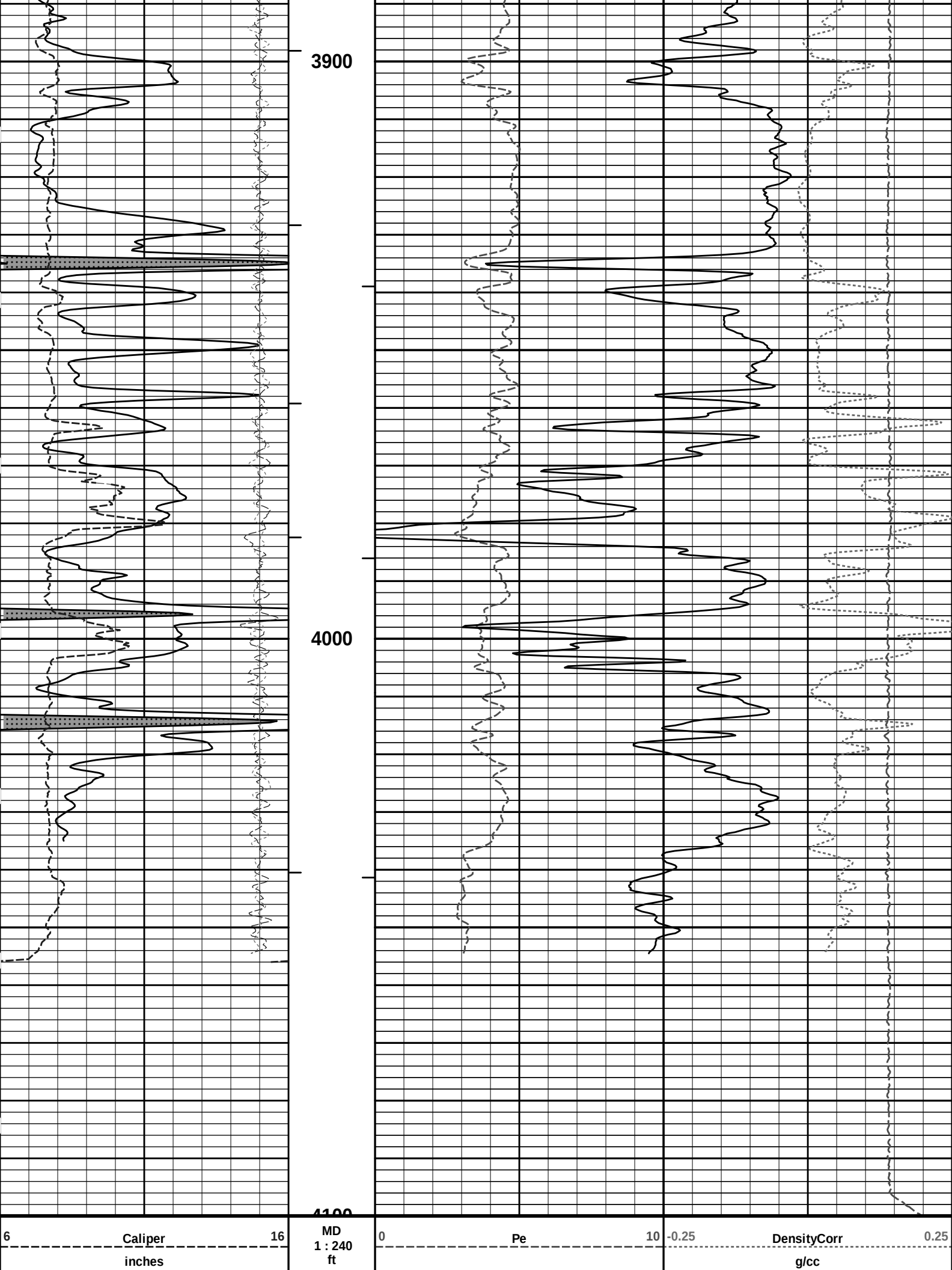
5 INCH MAIN LOG

SHALE		
0	Gamma Ray	150
	api	
18	FarQuality	-2
	NearQuality	2
-18		
6	Caliper	16
	inches	

BHV ft3 AHV ft3 MD 1 : 240 ft	2	Bulk Density		3
		g/cc		
			15K	Tension pounds
	0	Pe	10	-0.25
				DensityCorr g/cc
				0.25





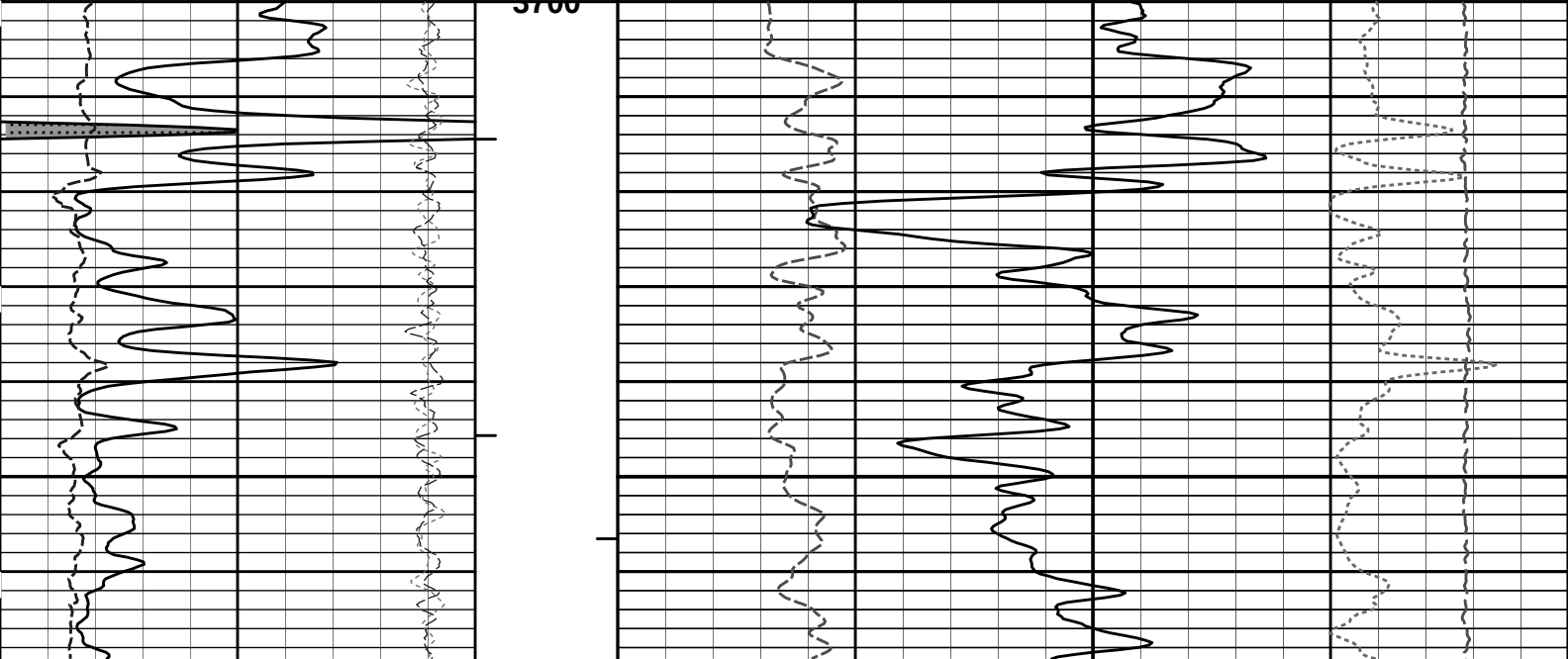


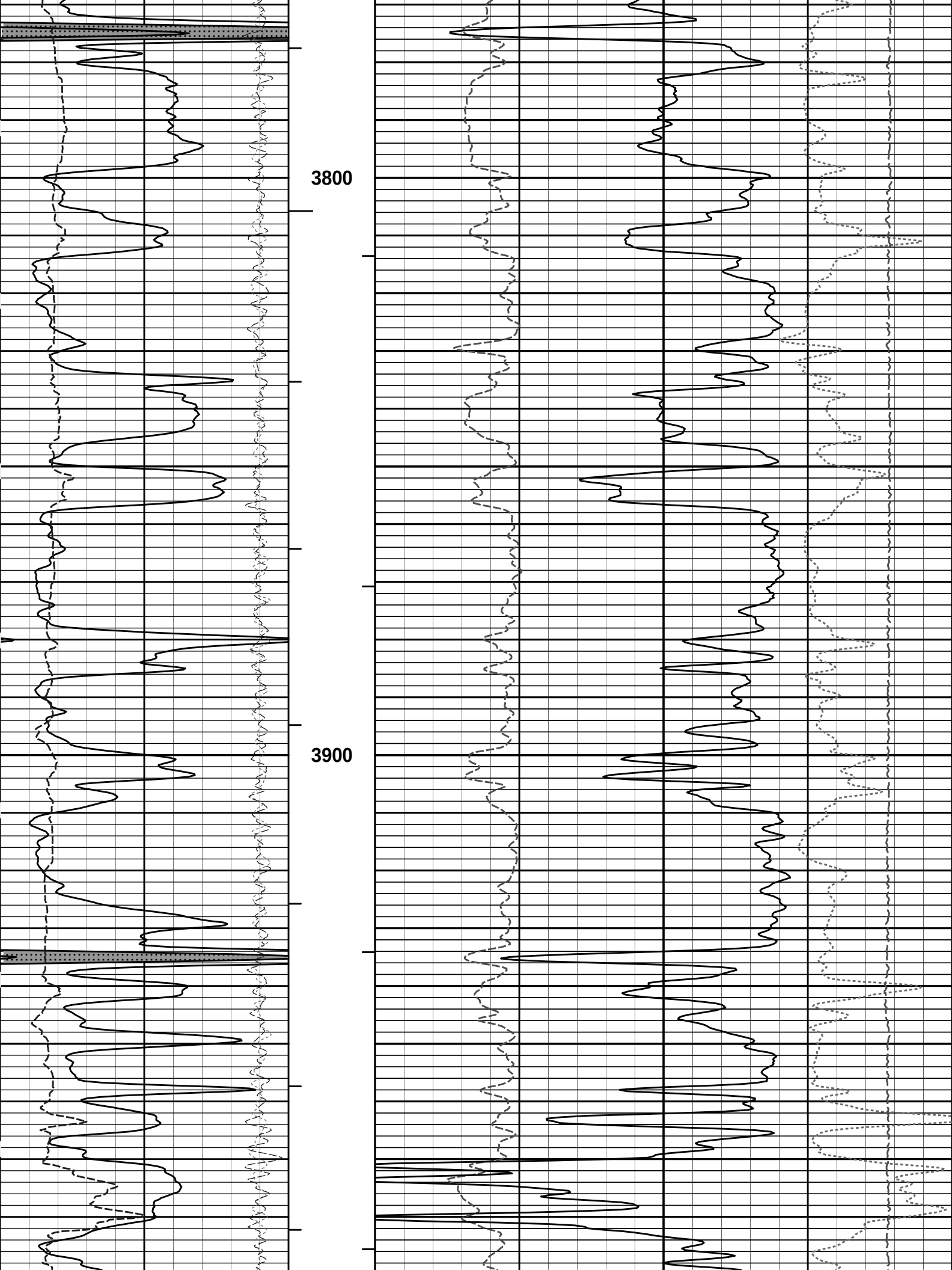
HALLIBURTON

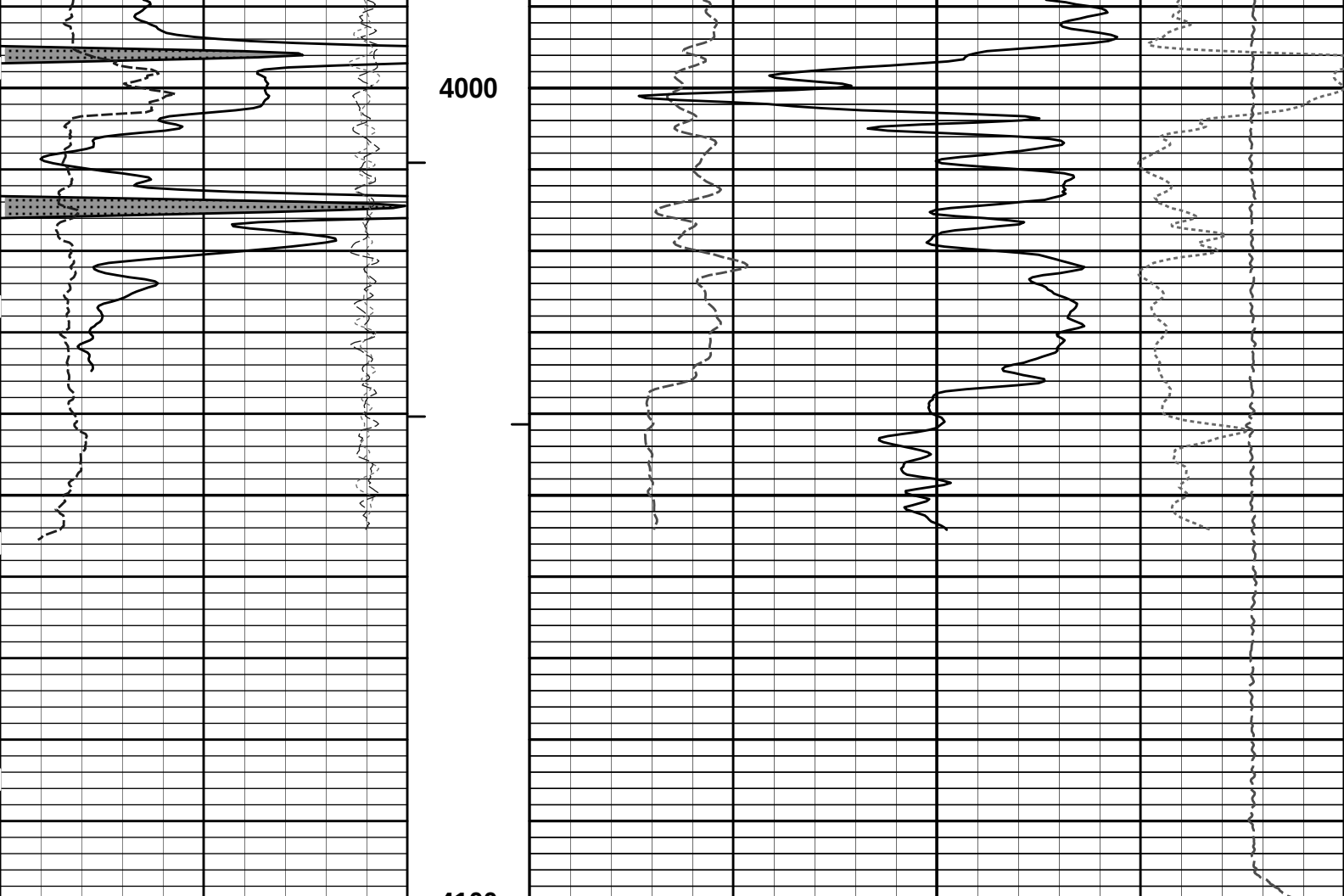
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Plot Range: 3495 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\R1 LOWER DETAIL\
Plot File: \\-LOCAL-IGANO_UNIT_1-36\Well Based\POROSITY\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

SHALE						
0	Gamma Ray	150				
api						
18	FarQuality	-2	BHV ft3	2 Bulk Density 3		
				g/cc		
-18	NearQuality	2	AHV ft3	15K Tension 0		
				pounds		
6	Caliper	16	MD 1 : 240 ft	0	Pe	10
				-0.25	DensityCorr	0.25
inches			g/cc			







6		Caliper	16	MD 1 : 240 ft		0		Pe	10	-0.25	DensityCorr	0.25	
		inches										g/cc	
-18		NearQuality	2			AHV ft3					15K	Tension	0
													pounds
18		FarQuality	-2	BH ft3		2		Bulk Density		3			
										g/cc			
0		Gamma Ray	150										
		api											
		SHALE											

HALLIBURTON

Plot Time: 01-Oct-13 06:37:54
Plot Range: 3700 ft to 4099.58 ft
Data: GANO_UNIT_1-36\Well Based\IR1 REPEAT\
Plot File: \\-LOCAL-IGANO_UNIT_1-36\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
						80.04 ft

RWCH-12027542
135.00 lbs

Ø 3.625 in →

← Load Cell @ 76.35 ft
← BH Temperature @ 75.79 ft

6.25 ft

73.79 ft

SP Sub-12345678
60.00 lbs

Ø 3.625 in →

← SP @ 72.01 ft

3.74 ft

70.05 ft

GTET-10748374
165.00 lbs

Ø 3.625 in →

← GammaRay @ 63.99 ft

8.52 ft

61.53 ft

DSN Decentralizer -
Large Hole-00000001
6.60 lbs

Ø 5.000 in* →

DSNT-10755066
174.00 lbs

Ø 3.625 in →

← DSN Far @ 54.59 ft
← DSN Near @ 53.84 ft

9.69 ft

51.84 ft

SDLT-10685803
360.00 lbs

SDLT Pad-10714945
65.00 lbs
Microlog Pad-10685803
8.00 lbs

Ø 4.500 in →

Ø 4.750 in* →
Ø 4.750 in* →

Microlog @ 44.03 ft
SDL Caliper @ 43.84 ft
SDL @ 43.83 ft

10.81 ft

41.03 ft

IQ Flex-10000954
140.00 lbs

Ø 3.625 in →

5.67 ft

35.36 ft

Centralizer 25-00000002
8.00 lbs

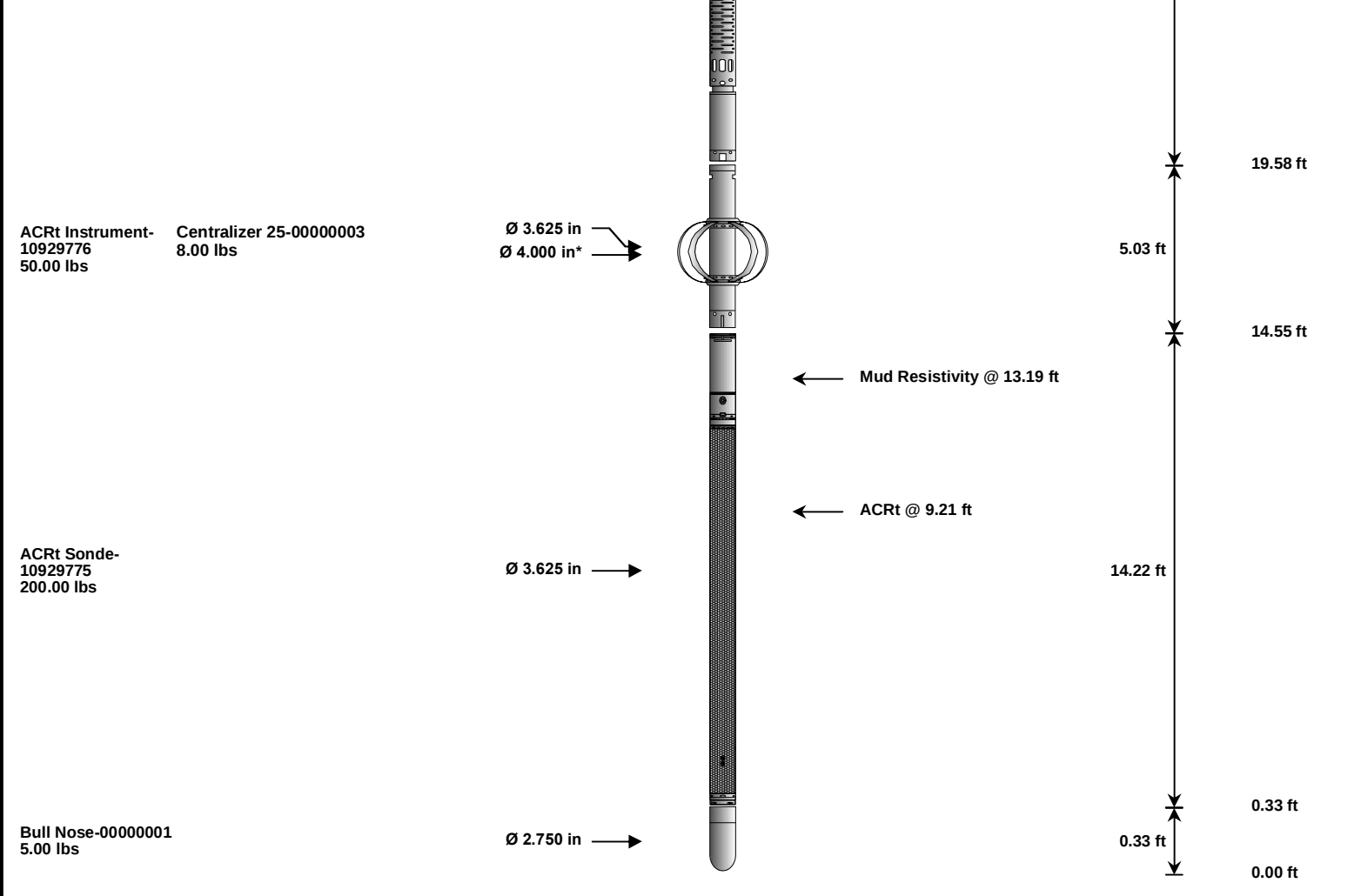
Ø 4.000 in* →

BSAT-10747684
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 26.84 ft

15.77 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		12027542	135.00	6.25	73.79	300.00
SP	SP Sub		12345678	60.00	3.74	70.05	300.00
GTET	Gamma Telemetry Tool		10748374	165.00	8.52	61.53	60.00
DSNT	Dual Spaced Neutron		10755066	174.00	9.69	51.84	60.00
DCNT	DSN Decentralizer Large Hole		00000001	6.60	9.42	* 55.17	300.00
SDLT	Spectral Density Tool		10685803	360.00	10.81	41.03	60.00
MICP	Microlog Pad		10685803	8.00	1.00	* 43.53	60.00
SDLP	Density Insite Pad		10714945	65.00	2.55	* 43.24	60.00
IQF	IQ Flex tool		10000954	140.00	5.67	35.36	300.00
BSAT	Borehole Sonic Array Tool		10747684	300.00	15.77	19.58	60.00
OBCEN	Centralizer - 25 in. Overbody		00000002	8.00	2.08	* 32.51	300.00
ACRt	Array Compensated True Resistivity Instrument Section		10929776	50.00	5.03	14.55	300.00
OBCEN	Centralizer - 25 in. Overbody		00000003	8.00	2.08	* 15.87	300.00
ACRt	Array Compensated True Resistivity Sonde Section		10929775	200.00	14.22	0.33	300.00
BLNS	Bull Nose		00000001	5.00	0.33	0.00	300.00
Total				1,684.60	80.04		
				* Not included in Total Length and Length Accumulation.			
Data: GANO_UNIT_1-3610001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE				Date: 01-Oct-13 01:25:18			

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	GTET	GEOK	Process Gamma Ray EVR?	No	

	DSNT	DEOK	Process DSN EVR?	No	
	SDLT Pad	DNOK	Process Density EVR?	No	
3400.00					
	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	9.200	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	4100.00	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?	Yes	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	Yes	
	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	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	Yes	
	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	DEI	Formation Density Fluid	1.000	g/cc

Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
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: GANO_UNIT_1-36\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\004 01-Oct-13 03:32 Up @4100.3f				Date: 01-Oct-13 05:02:33

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:GTET - 10748374Reference Calibration Date:02-Aug-13 14:20:06

Engineer:THOMAS HYDECalibration Date:03-Sep-13 10:36:47

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

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	44.2	44.4	api
Background + Calibrator	275.0	276.4	api
Calibrator	230.8	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:GTET - 10748374Reference Calibration Date:03-Sep-13 10:36:47

Engineer:S. INGERSOLLCalibration Date:30-Sep-13 20:11:26

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

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	44.4	66.4	api
Background + Calibrator	276.4	298.2	api
Calibrator	232.0	231.8	api

Shop	Field	Difference	Tolerance
232.0	231.8	0.2	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10755066

Reference Calibration Date: 01-Jul-13 16:27:31

Engineer: THOMAS HYDE

Calibration Date: 05-Sep-13 10:15:26

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

Calibration Version: 1

Logging Source S/N: DSN-436
Tank Serial Number: 105060
Reference value assigned to Tank: 51.680
Snow Block S/N: 08910
Calibration Tank Water Temperature: 70 degF
Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value

Gain:	0.952	0.949	0.900 - 1.100
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WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change

Porosity (decp):	0.2114	0.2107	0.0008	+/- 0.0020
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Calibrated Ratio:	9.74	9.72	0.026	+/- 0.050
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VERIFIER		
Measurement	Value	Control Limit

Snow-Block Porosity (decp):	0.0594	0.02000 - 0.09000
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PASS/FAIL SUMMARY

Background Check:	Passed
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Gain-Range Check:	Passed
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Snow-Block Check:	Passed
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DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - 10755066

Reference Calibration Date: 05-Sep-13 10:15:26

Engineer: S. INGERSOLL

Calibration Date: 30-Sep-13 20:14:04

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

Calibration Version: 1

Logging Source S/N: DSN-436
Snow Block S/N: 08910

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change

Snow-Block Porosity (decp):	0.0594	0.0566	-0.0028	+/- 0.0150
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PASS/FAIL SUMMARY

Block Change Check:	Passed
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Snow Block Stat Check:	Passed
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Temperature Check:	Passed
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DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10685803

Reference Calibration Date: 07-Aug-13 16:03:28

Engineer: THOMAS HYDE

Calibration Date: 05-Sep-13 09:46:41

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

Calibration Version: 1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4540.73	-5035.21	-7000.00 - -1000.00
Pad Gain	0.0003893	0.0004015	0.000200 - 0.000600
Arm Offset	-2828.82	-2028.23	-5000.00 - 3000.00
Arm Gain	0.0005533	0.0005309	0.000300 - 0.000700
Arm Power	-0.000007296	-0.000006519	-0.000010000 - 0.000010000

The ring diameter is computed from: $\text{DIAMETER} = \text{PAD EXTENSION} + \text{ARM EXTENSION} + \text{TOOL DIAMETER}$

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	2.13	2.00	-0.13	+/- 0.20
Medium Ring (in)	3.83	3.75	-0.08	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.36	6.50	0.14	+/- 0.20
Medium Ring (in)	8.19	8.25	0.06	+/- 0.20
Large Ring (in)	15.10	15.00	-0.10	+/- 0.20

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check: Passed

Ring-Measurement Check: Passed

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check: Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 10685803	Reference Calibration Date:	05-Sep-13 09:46:41
Engineer:	S. INGERSOLL	Calibration Date:	30-Sep-13 20:18:00
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.66	-0.09	+/- 0.10
Ring Diameter	8.25	8.34	0.09	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check: Passed

Diameter Check: Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	SDLT Pad - 10714945	Reference Calibration Date:	08-Aug-13 14:33:02
Engineer:	THOMAS HYDE	Calibration Date:	05-Sep-13 09:09:01
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Logging Source S/N: 5073GW

Aluminum Block S/N: LIBERAL ALUMINUM

Density: 2.598g/cc

Pe: 3.170

Magnesium Block S/N: LIBERAL MAG BLOCK

Density: 1.684g/cc

Pe: 2.598

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
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Near Bar Gain	1.0388	1.0085	0.90 - 1.10
Near Dens Gain	1.0170	0.9997	0.90 - 1.10
Near Peak Gain	1.0228	0.9751	0.90 - 1.10
Near Lith Gain	0.9941	0.9320	0.90 - 1.10
Far Bar Gain	1.0113	1.0097	0.90 - 1.10
Far Dens Gain	1.0021	0.9993	0.90 - 1.10
Far Peak Gain	0.9966	0.9933	0.90 - 1.10
Far Lith Gain	0.9720	0.9693	0.90 - 1.10
Near Bar Offset	-0.0733	0.2064	NONE
Near Dens Offset	0.0979	0.2553	NONE
Near Peak Offset	0.0284	0.4332	NONE
Near Lith Offset	0.2218	0.7457	NONE
Far Bar Offset	0.0922	0.1155	NONE
Far Dens Offset	0.1623	0.1874	NONE
Far Peak Offset	0.2014	0.2290	NONE
Far Lith Offset	0.3537	0.3758	NONE
Near Bar Background	969.80	966.00	700 - 1450
Near Dens Background	321.20	319.70	230 - 480
Near Peak Background	141.23	140.22	100 - 210
Near Lith Background	172.03	169.95	125 - 260
Far Bar Background	493.95	494.14	450 - 900
Far Dens Background	192.00	191.86	175 - 345
Far Peak Background	75.79	75.83	70 - 140
Far Lith Background	79.52	79.76	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.684	0.002	+/- 0.015
Pe	2.571	2.564	-0.007	+/- 0.150
ALUMINUM				
Density (g/cc)	2.588	2.598	0.010	+/- 0.01500
Pe	3.185	3.133	-0.052	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0007	+/- 0.0110	-0.0031	+/- 0.0140
Magnesium Block	-0.0014	+/- 0.0110	0.0001	+/- 0.0140
Aluminum Block	-0.0002	+/- 0.0110	0.0007	+/- 0.0140
Resolution	9.84	6.00 - 11.50	9.12	6.00 - 11.50
Internal Verifier(B+D+P+L)	1596	1200 - 2700	842	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

Aluminum Quality Check:		Passed
Gains Check:		Passed
Changes in Calibration Blocks:		Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name: SDLT Pad - 10714945

Reference Calibration Date: 05-Sep-13 09:09:01

Engineer: S. INGERSOLL

Calibration Date: 30-Sep-13 20:21:33

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

Calibration Version: 1

Pad Temperature: 82.3 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1595.873	1596.740	0.867	16.065
Far (B+D+P+L) cps	841.591	839.762	-1.829	15.940
Near Resolution	9.84	9.94	0.100	0.50
Far Resolution	9.12	9.36	0.240	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:

Passed

Bkg Resolution Check:

Passed

Bkg Verification Check:

Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10748374						
Gamma Ray Calibrator	232.0	231.8	-----	0.2	+/- 9.00	api
DSNT-10755066						
Snow-Block Porosity	0.0594	0.0566	-----	0.0028	+/- 0.0150	decg
SDLT-10685803						
Pad Extension	3.75	3.66	-----	0.09	+/-0.10	in
Ring Diameter	8.25	8.34	-----	-0.09	+/-0.15	in
SDLT Pad-10714945						
Near(B+D+P+L)	1595.873	1596.740	-----	-0.867	+/-16.065	cps
Far(B+D+P+L)	841.591	839.762	-----	1.829	+/-15.940	cps

Data: GANO UNIT 1-3610001 SP-GTET-DSN-SDI-FLEX-BSAT-ACRT-BN1004 01-Oct-13 03:32 Un @4100.3f

Date: 01-Oct-13 05:03:06

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	72.01	NO	
SP	Spontaneous Potential	72.01	BLK	1.250
SPR	Raw Spontaneous Potential	72.01	NO	
SPO	Spontaneous Potential Offset	72.01	NO	
GTET				

GTET				
TPUL	Tension Pull	63.99	NO	
GR	Natural Gamma Ray API	63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	63.99	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	53.74	NO	
RNDS	Near Detector Telemetry Counts	53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.59	TRI	0.583
DNTT	DSN Tool Temperature	53.84	NO	
DSNS	DSN Tool Status	53.74	NO	
ERND	Near Detector Telemetry Counts EVR	53.84	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR	53.84	NO	
SDLT				
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250
BSAT				
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	
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	
SDLT Pad				
TPUL	Tension Pull	43.83	NO	
NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920
NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	

Microlog Pad

TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750

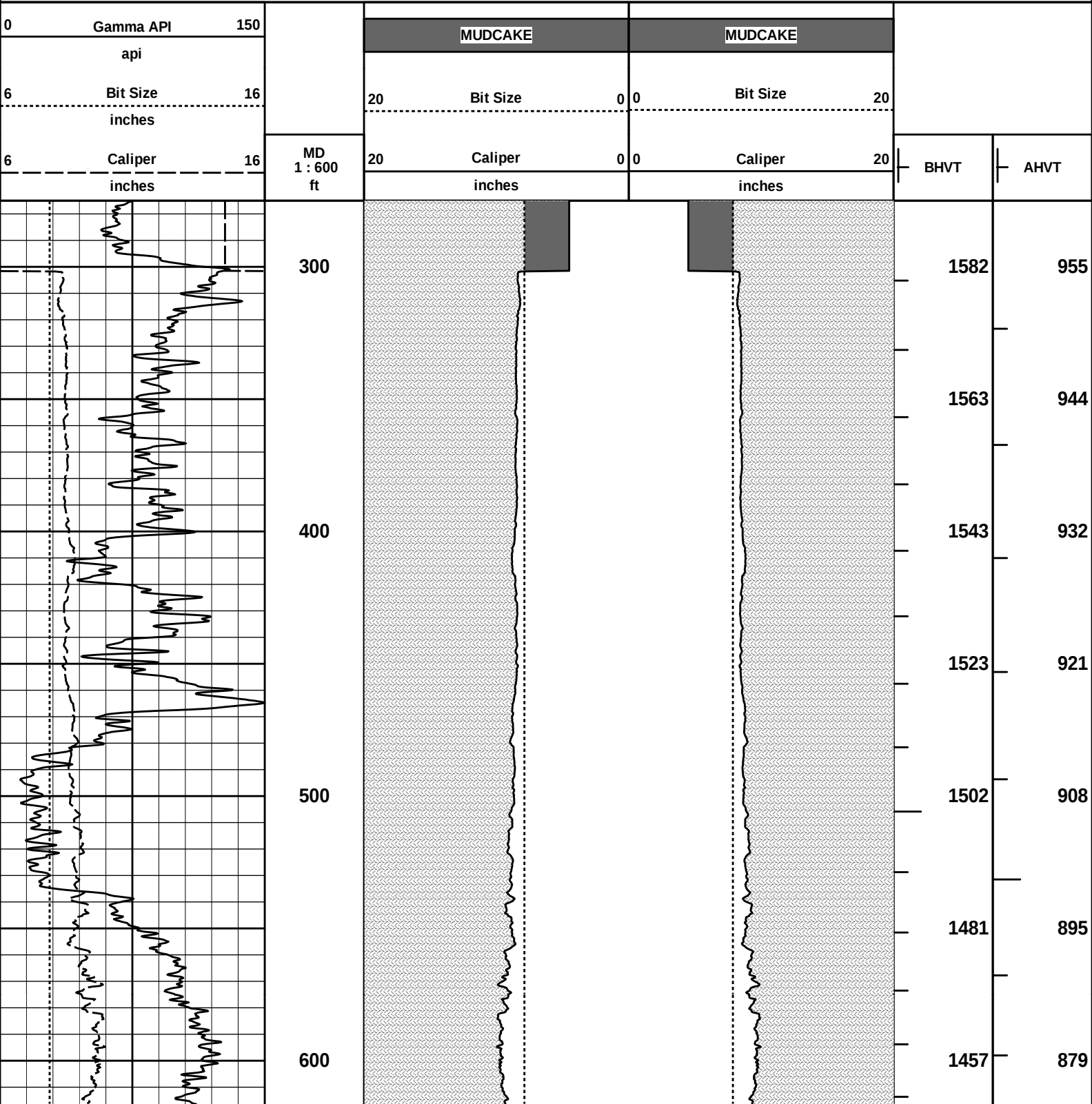
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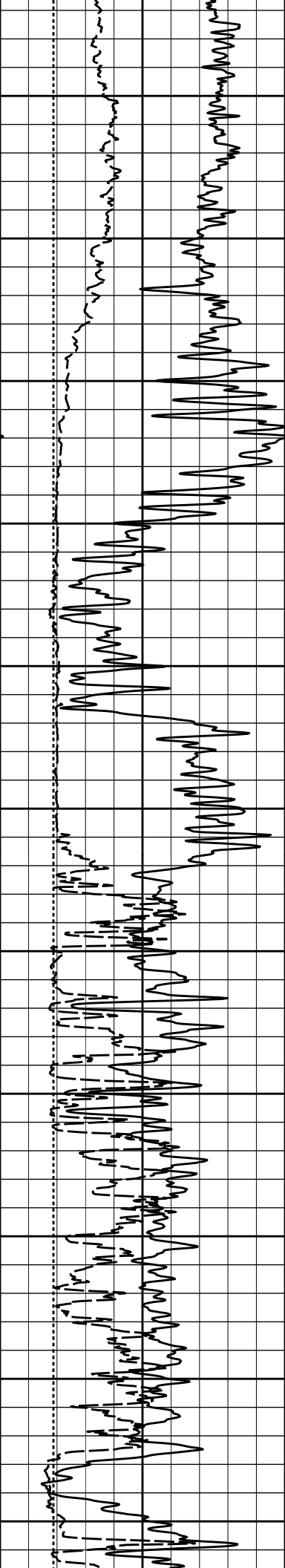
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ANNULAR HOLE VOLUME PLOT





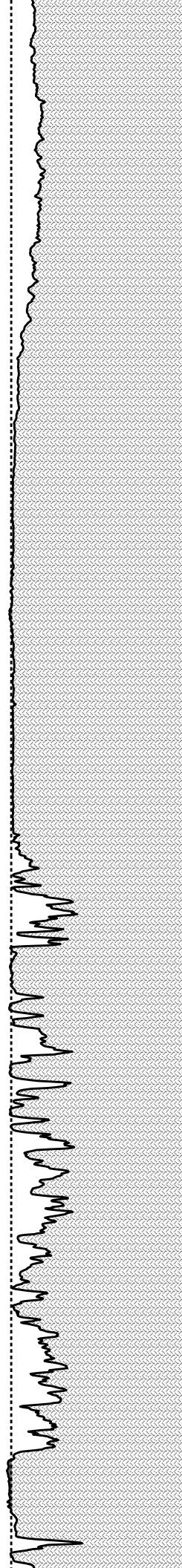
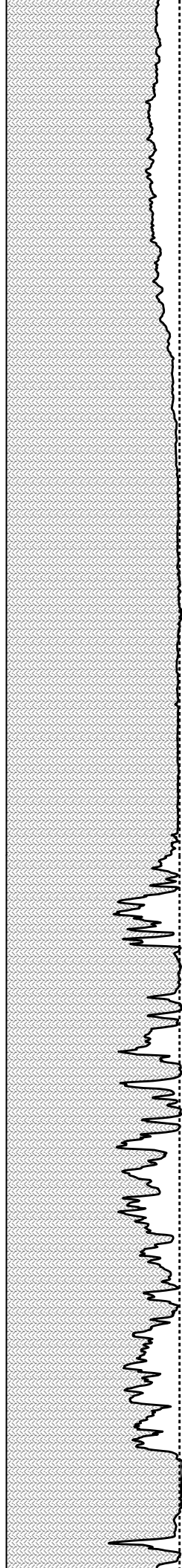
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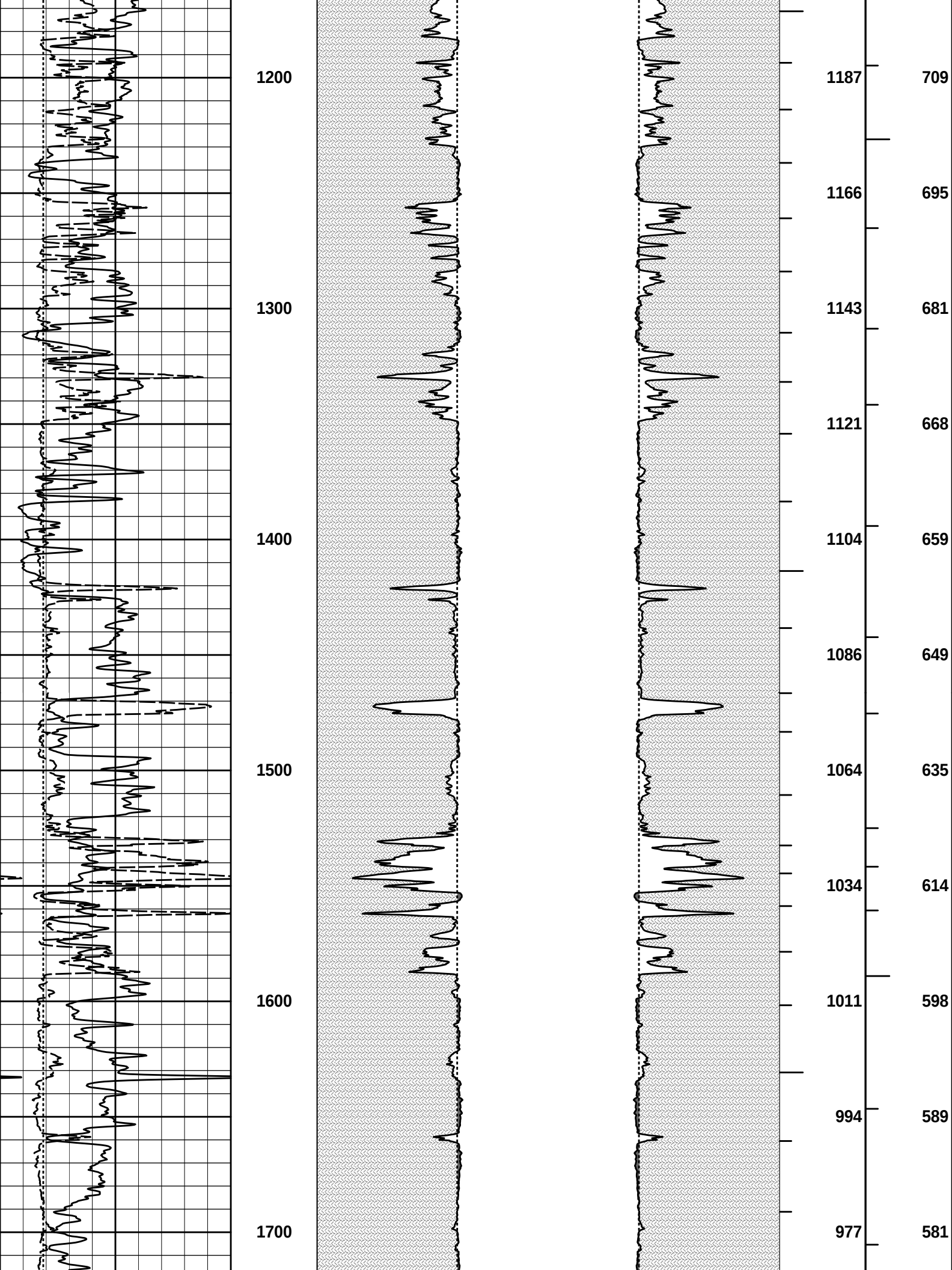
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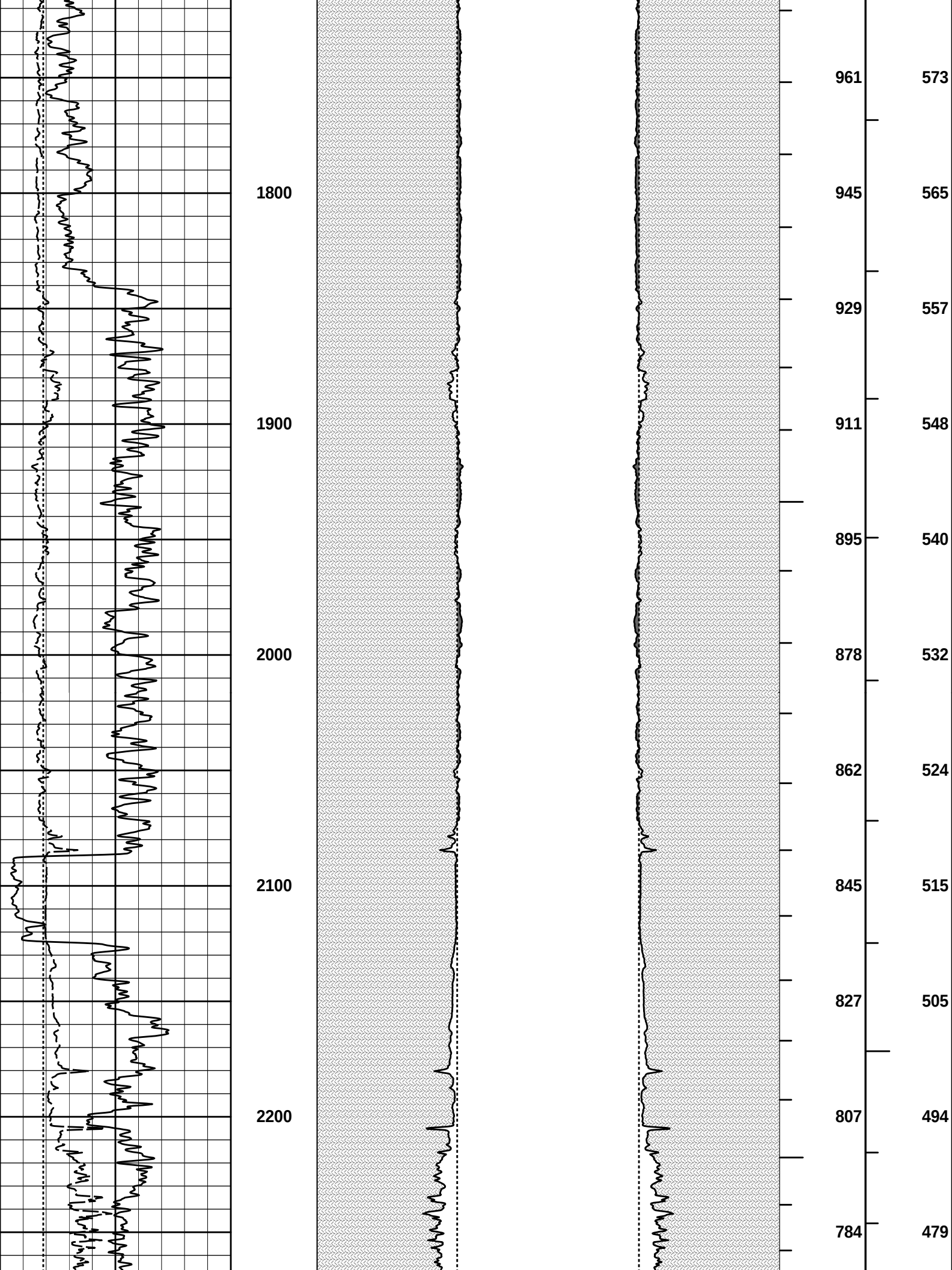
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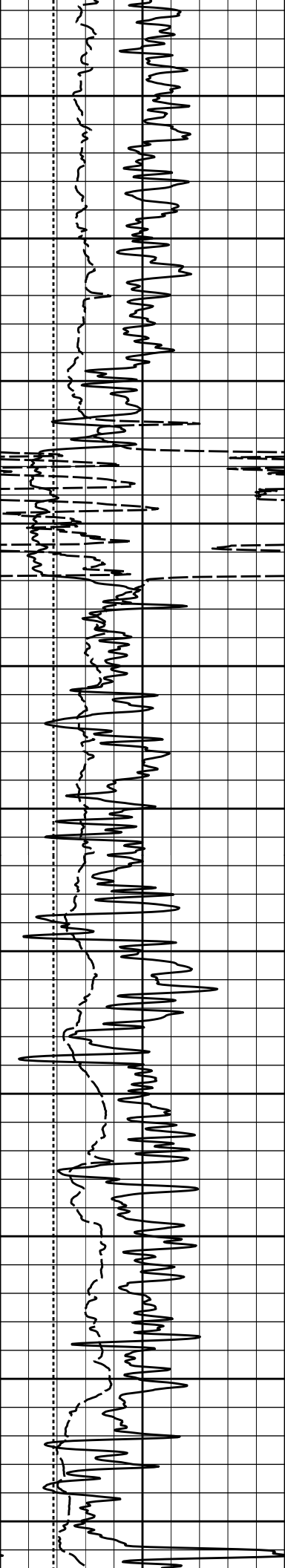
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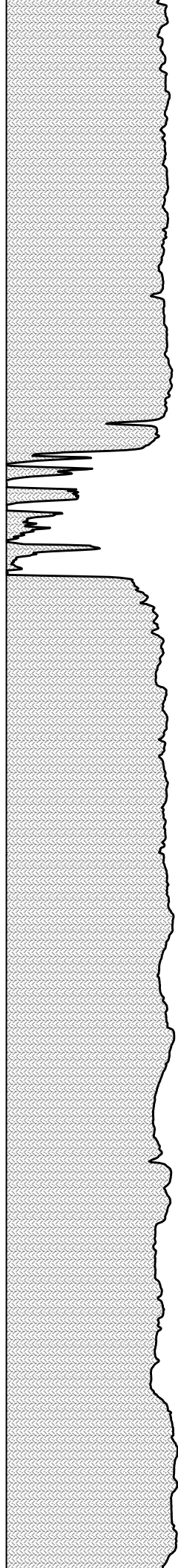
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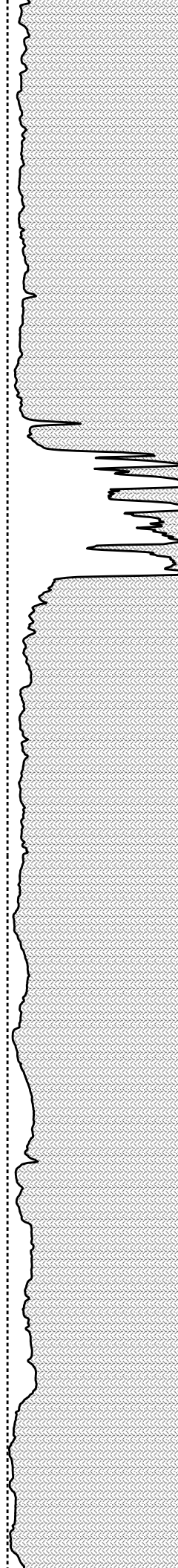
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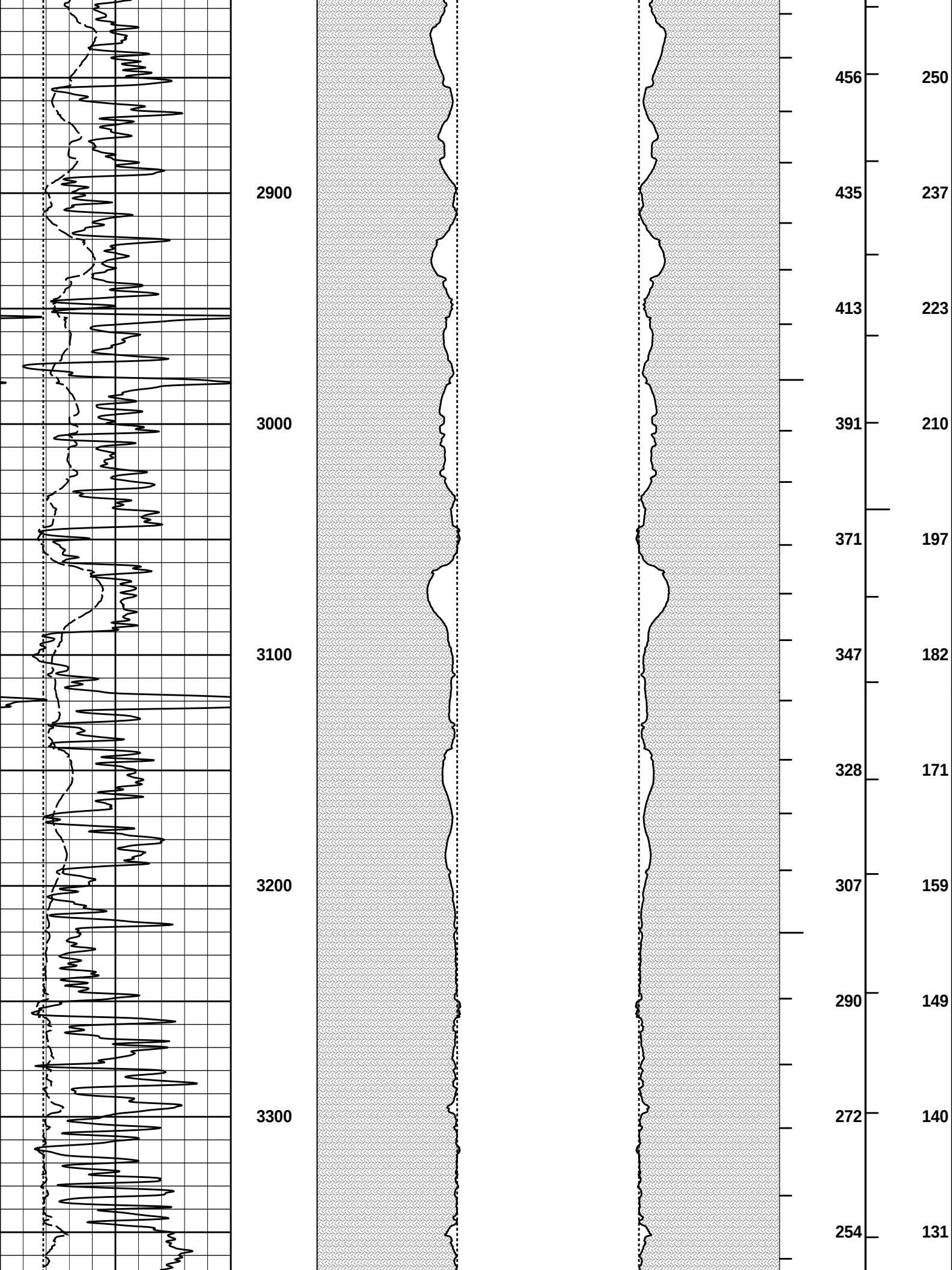
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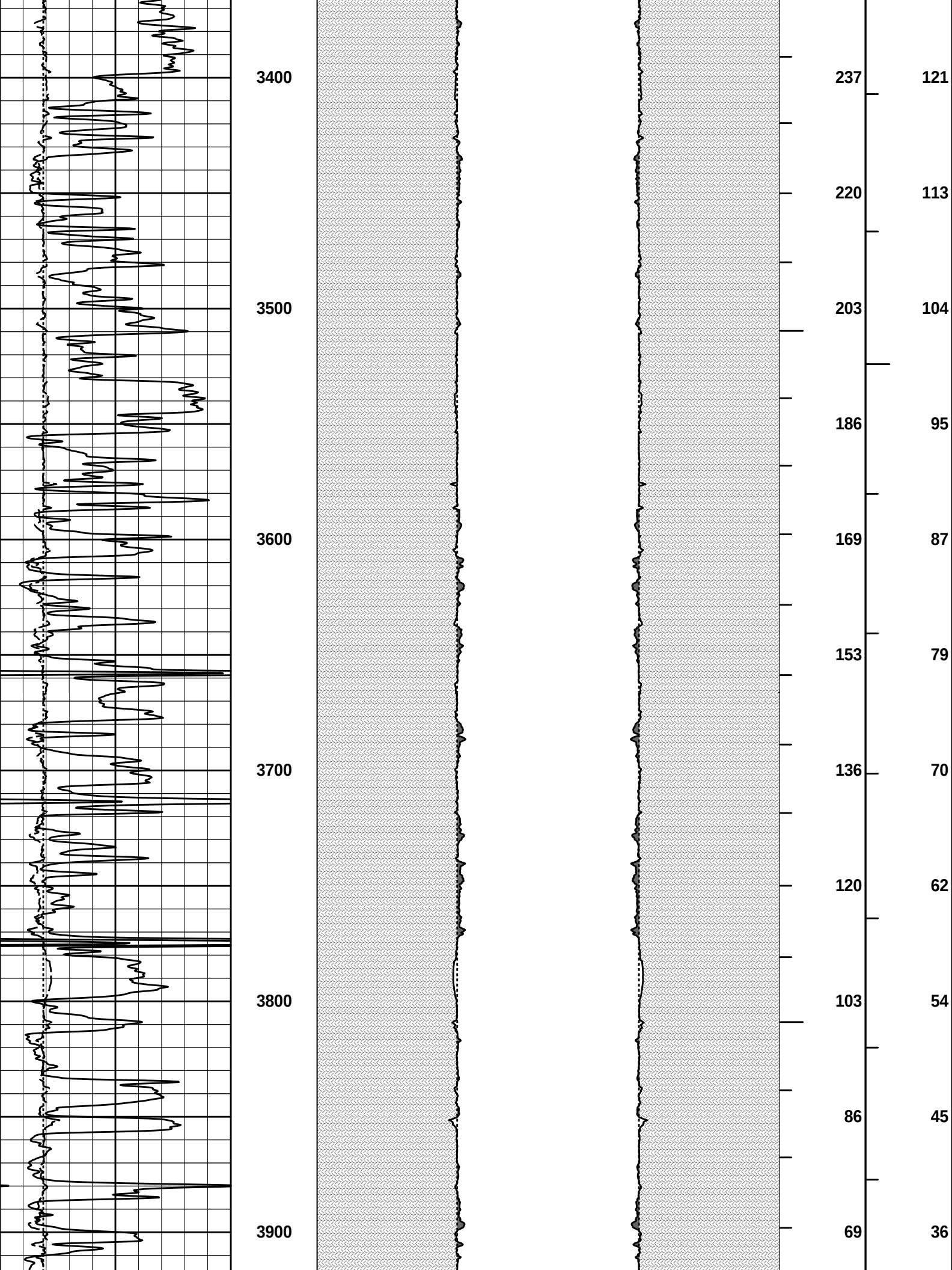
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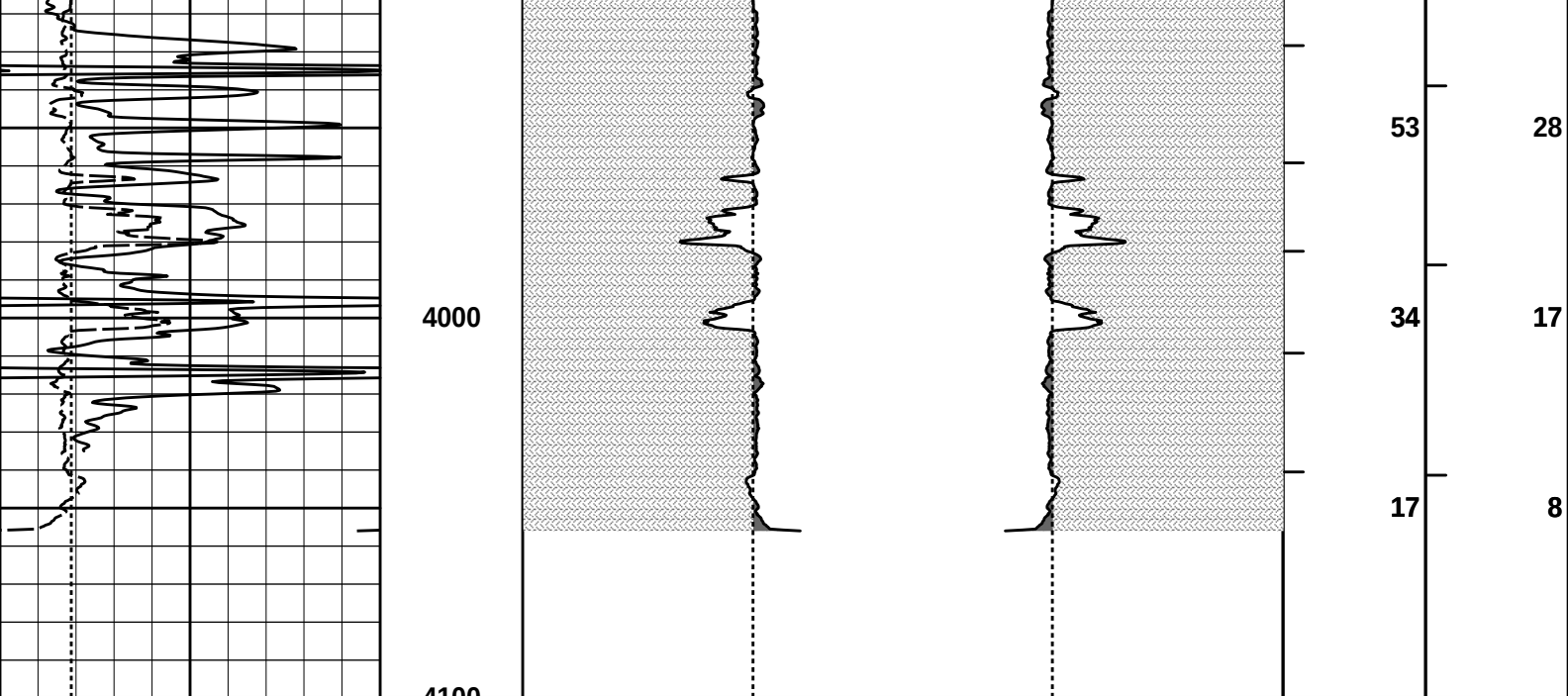
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276

264







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

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Plot Time: 01-Oct-13 06:38:15
Plot Range: 275 ft to 4099.83 ft
Data: GANO_UNIT_1-36\Well Based\IR1 CASING\
Plot File: \\-LOCAL-IGANO_UNIT_1-36\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	HARTMAN OIL CO., INC.		
WELL	GANO UNIT #1-36		
FIELD	WILDCAT		
COUNTY	GRAHAM	STATE	KANSAS
HALLIBURTON		DUAL SPACED NEUTRON SPECTRAL DENSITY LOG	