

# HALLIBURTON

## SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

COMPANY	OXY USA INC.
WELL	SHELL B-2
FIELD	AMAZON DITCH
COUNTY	FINNEY
STATE	KANSAS
COMPANY	OXY USA INC.
WELL	SHELL B-2
FIELD	AMAZON DITCH
COUNTY	FINNEY
STATE	KANSAS
API No.	15-055-22131
Location	(SHL) 2310' FNL & 330' FWL
Other Services:	BSAT DSN/SDL ACRT
Secl.	17
Twp.	22S
Rge.	34W
Elev.	2977.2 ft
Elev.:	K.B. 2988.2 ft
D.F.	2987.2 ft
G.L.	2977.2 ft

Permanent Datum	GL	Elev. 2977.2 ft
Log measured from	KB	11.0 ft above perm. Datum
Drilling measured from	KB	G.L. 2977.2 ft

Date	01-Apr-12
Run No.	ONE
Depth - Driller	5065.00 ft
Depth - Logger	5067.0 ft
Bottom - Logged Interval	5057
Top - Logged Interval	3600
Casing - Driller	8.625 in @ 1820.0 ft
Casing - Logger	1818.0 ft @
Bit Size	8.875 in @
Type Fluid in Hole	W/BM @
Density	9.2 ppg 47.00 s/qt
PH	9.00 pH 8.0 cp/m
Source of Sample	MUDPT
Rm @ Meas. Temperature	1.230 ohmm @ 88.00 degF @
Rmf @ Meas. Temperature	1.04 ohmm @ 85.00 degF @
Rmc @ Meas. Temperature	1.410 ohmm @ 88.00 degF @
Source Rmf	MEAS Rmc MEAS @
Rm @ BHT	0.88 ohmm @ 125.0 degF @
Time Since Circulation	12.0 hr
Time on Bottom	01-Apr-12 15:06
Max. Rec. Temperature	125.0 degF @ 5067.0 ft @
Equipment	10975786 FTSM
Recorded By	WHITLOCK
Witnessed By	ANDREA HOWSON
	INGERSOLL
	AUSTIN GARNER

Fold here

Service Ticket No.: 9405509		API Serial No.: 15-055-22131		PGM Version: WL INSITE R3.4.2 (Build 2)			
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.
Rmf @ Meas. Temp.	@	@		ONE	ACRT	N/A	1.5" S.O.
Rmc @ Meas. Temp.	@	@			I816S708		
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.	10971172	Serial No.	11014316	Serial No.	I378M477P870	Serial No.	10951378
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625	No. of Cent.	2	Diameter	4.5	Diameter	3.625
Detector Model No.	GTET	Spacing	.5	Log Type	GAM-GAM.	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM241BE
Length	8"	LSA [Y/N]	YES	Serial No.	20784B	Serial No.	373
Distance to Source	N/A	FWDA [Y/N]	YES	Strength	1.5 CI	Strength	15 CI
LOGGING DATA							
GENERAL		GAMMA		ACOUSTIC		DENSITY	
						NEUTRON	

Run No.	GENERAL		Speed ft/min	GAMMA		ACOUSTIC		Matrix	DENSITY		NEUTRON		Matrix	
	Depth			Scale		Scale			Scale		Scale			
	From	To		L	R	L	R		L	R	L	R		
ONE	TD	CSG	REC	0	150	30	-10	47.6	30	-10	2.71	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.

REPEAT PULLED FROM 4200-3600 AT CUSTOMERS REQUEST.

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

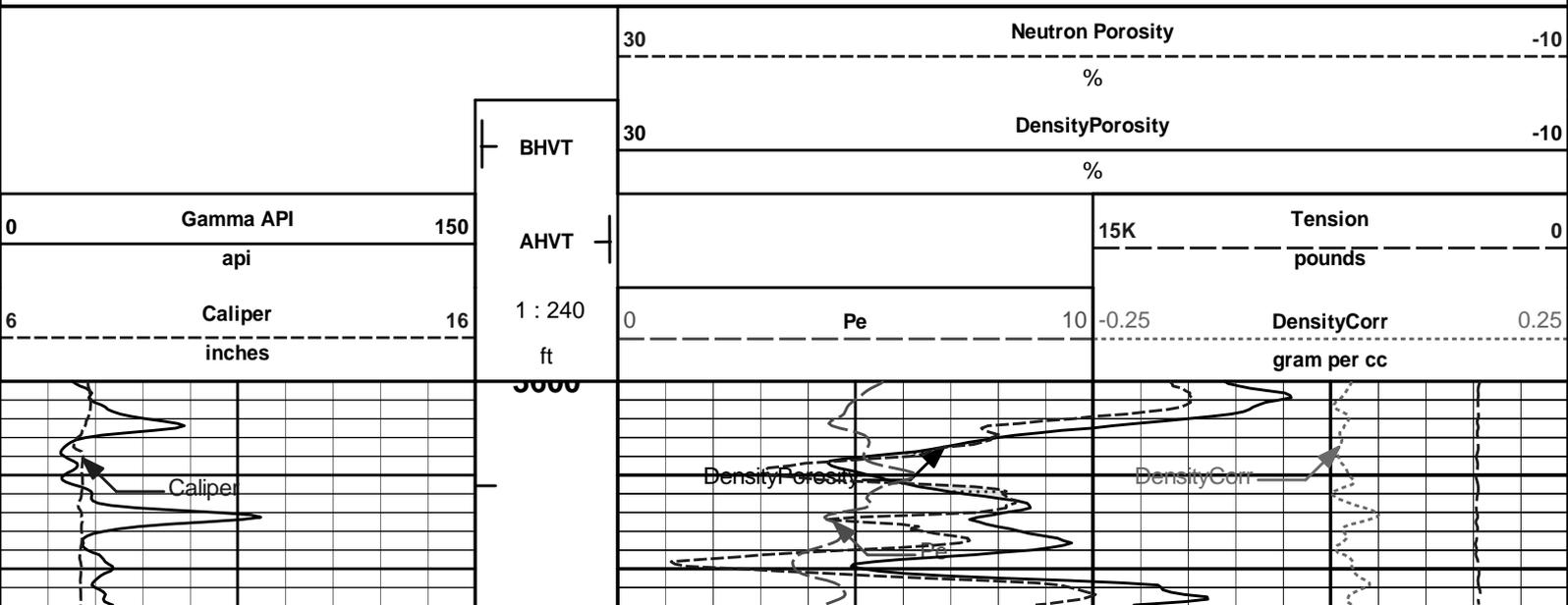
HALLIBURTON

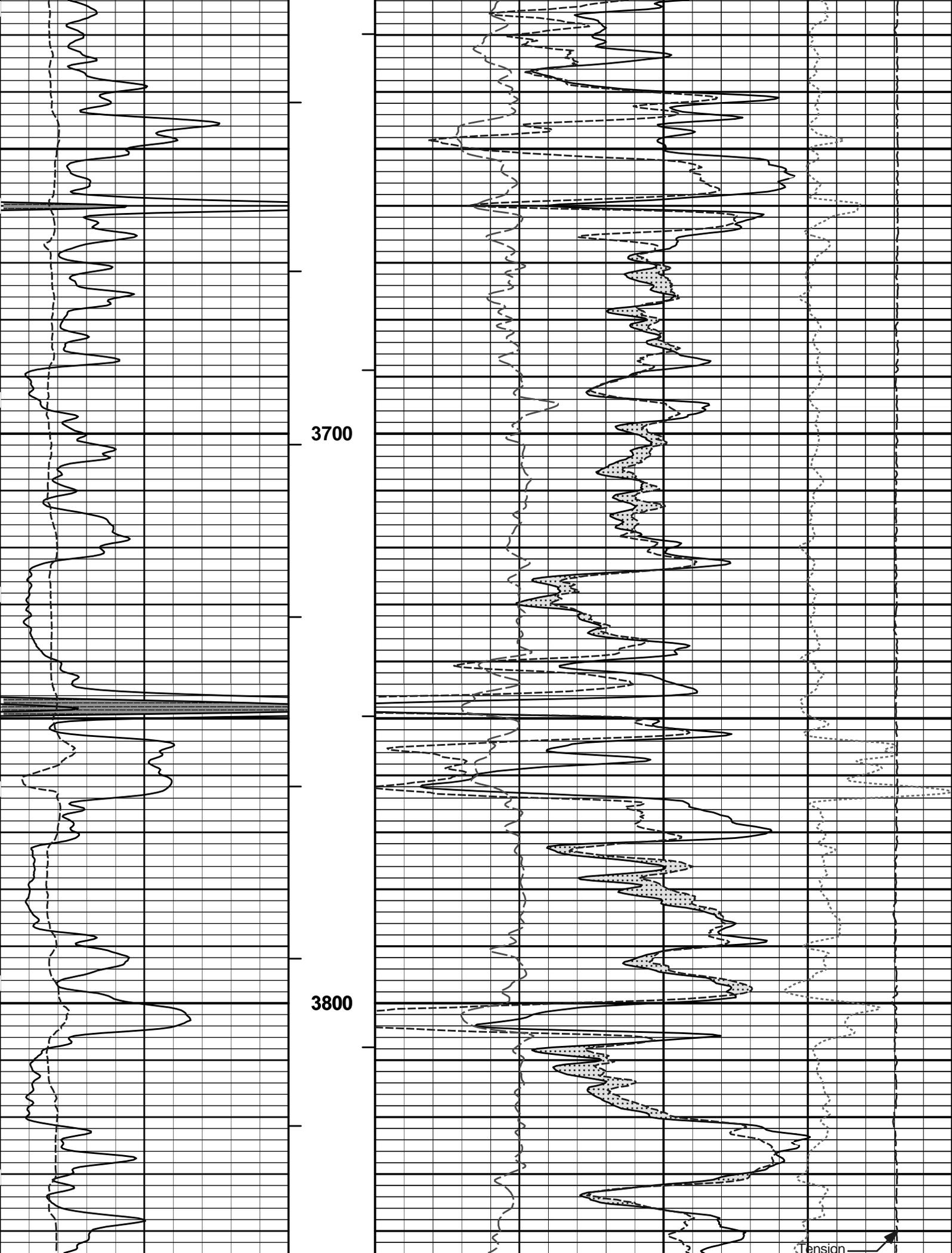
**HALLIBURTON**

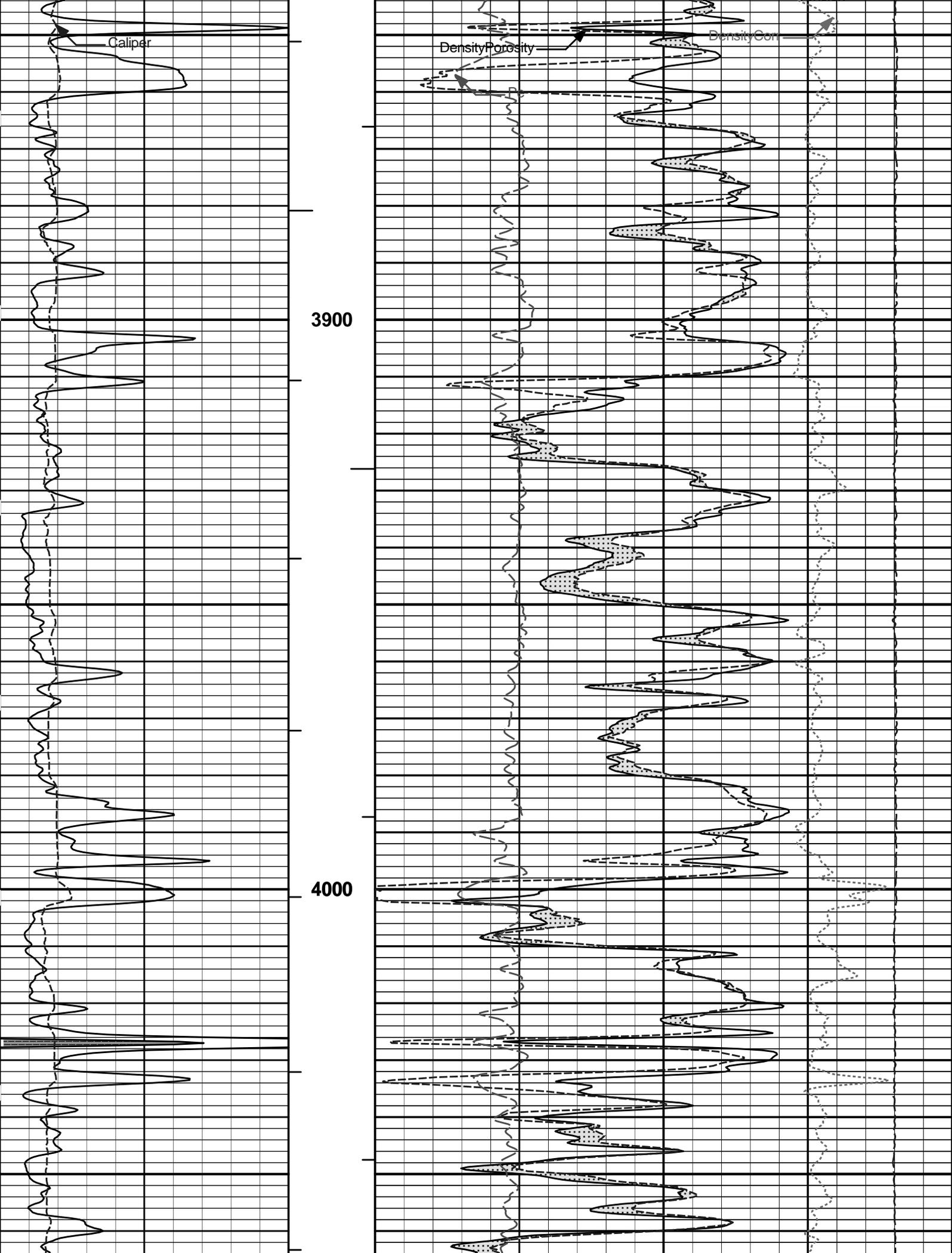
Plot Time: 01-Apr-12 17:20:01  
 Plot Range: 3600 ft to 5071 ft  
 Data: OXY\_SHELL\_B-2\Well Based\DAQ-0001-004\_MAIN  
 Plot File: \\POROSITY\Porosity\_IQ\_5\_MAIN

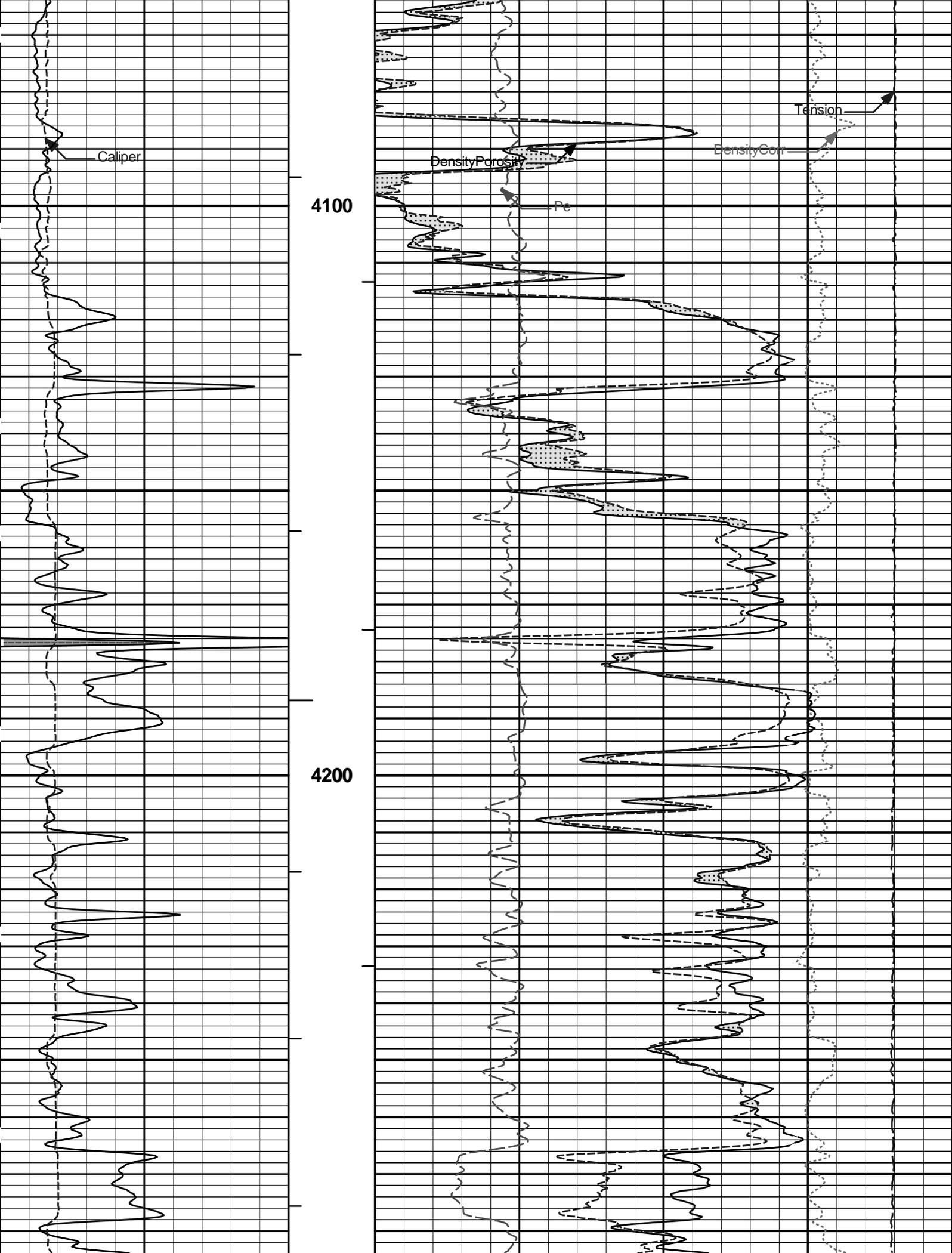
**5 INCH MAIN LOG**

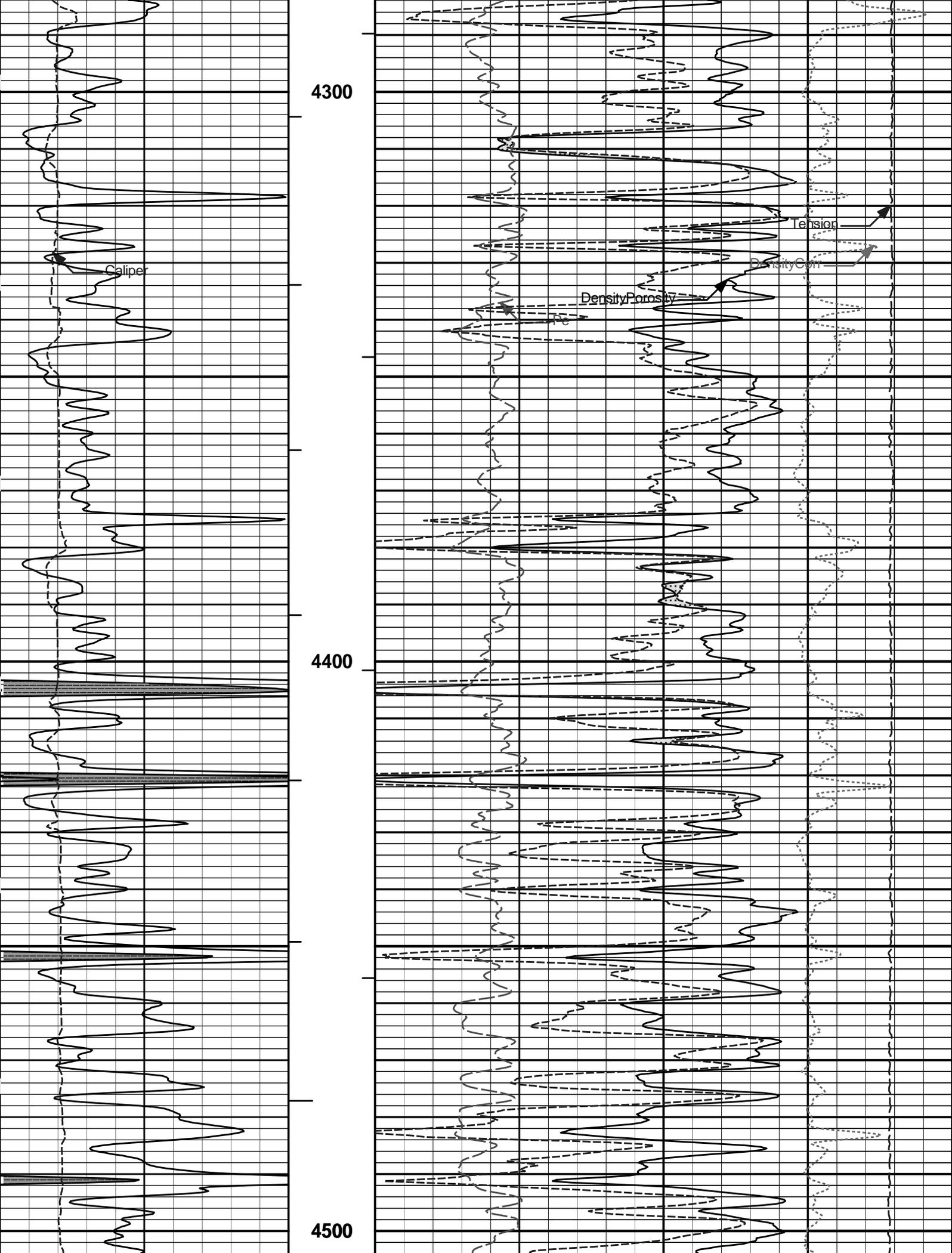
**MAIN SECTION 5" PER 100'**

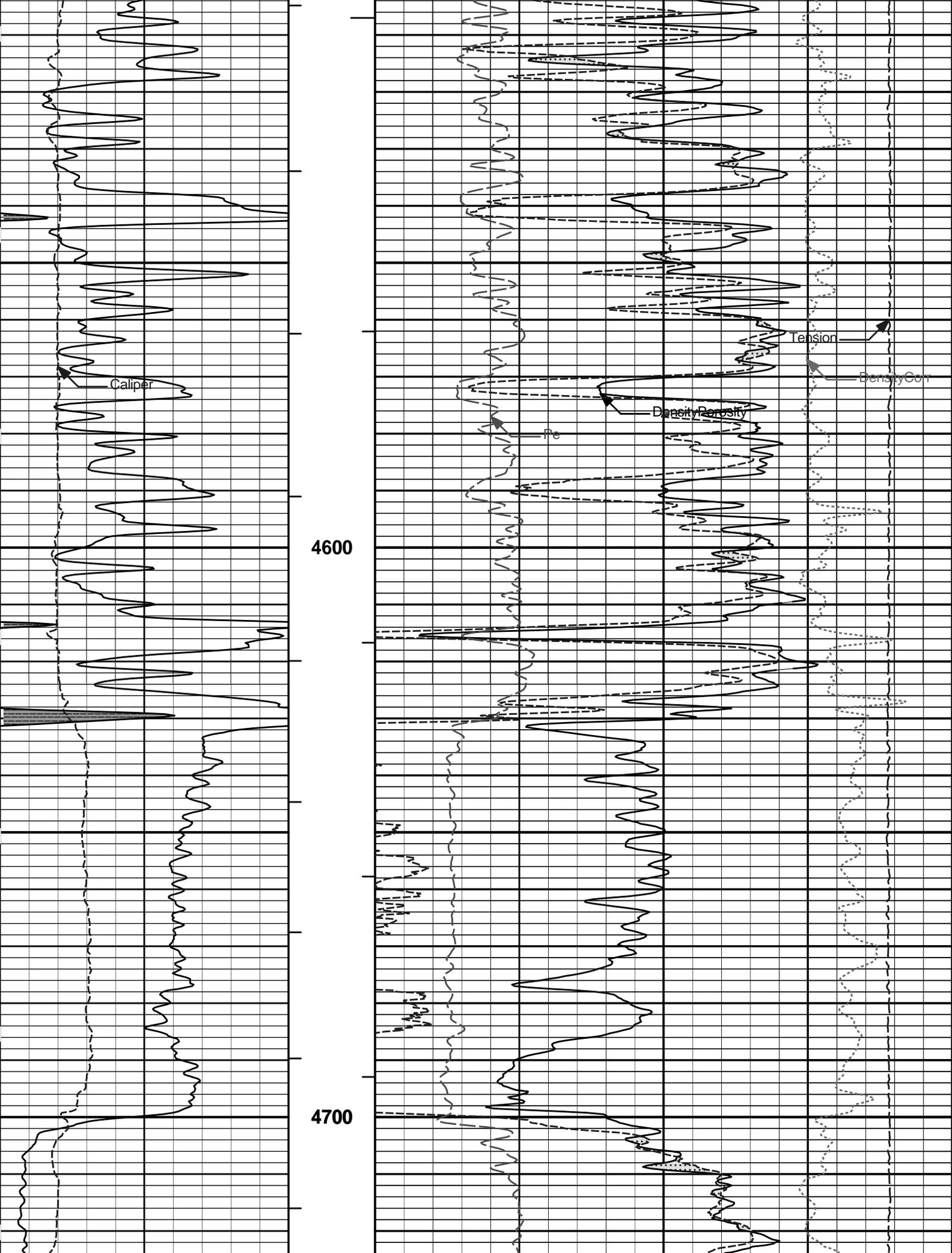


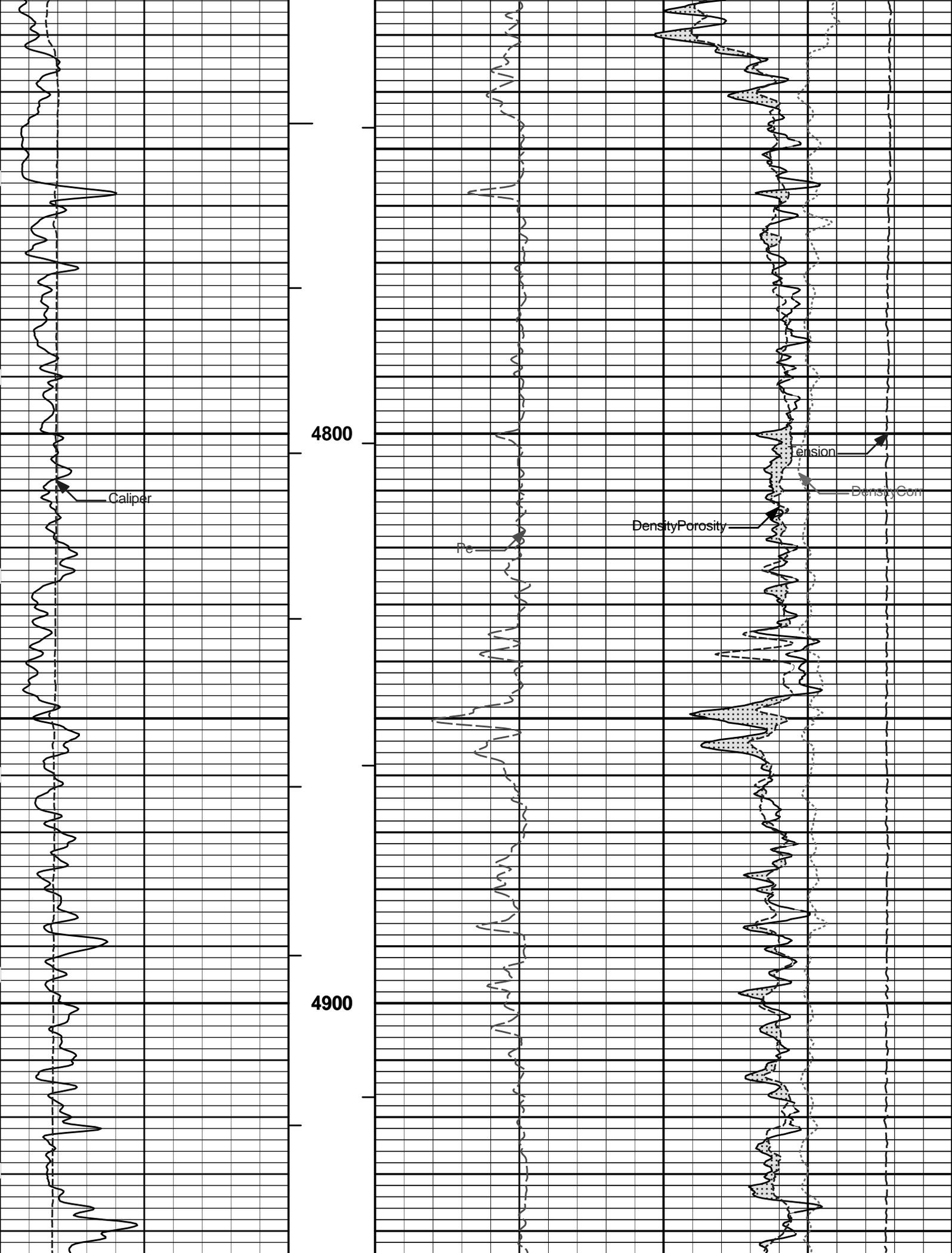


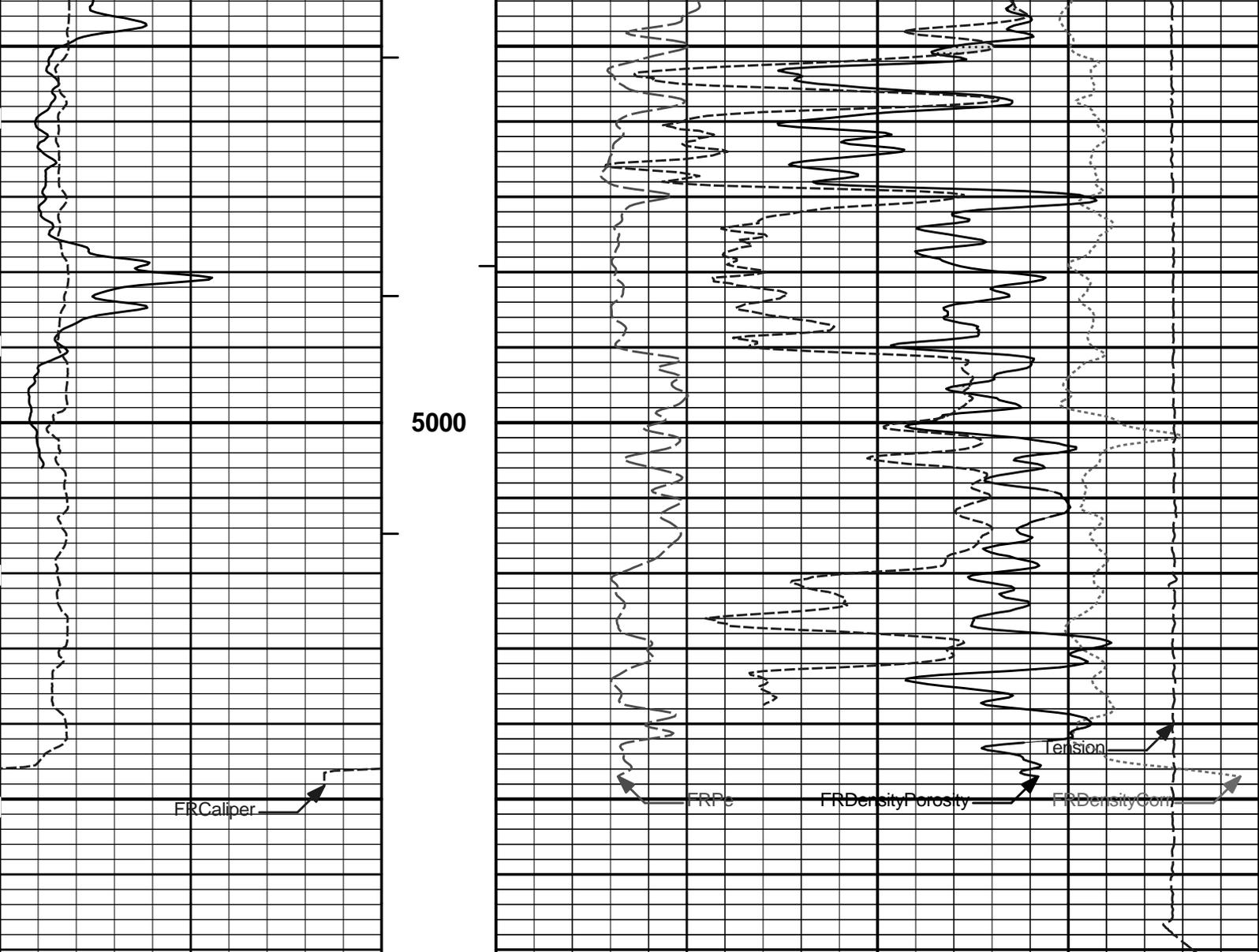












6	Caliper	16	1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25
	inches							gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
			BHVT	30	DensityPorosity				-10
								%	
				30	Neutron Porosity				-10
								%	

**HALLIBURTON**

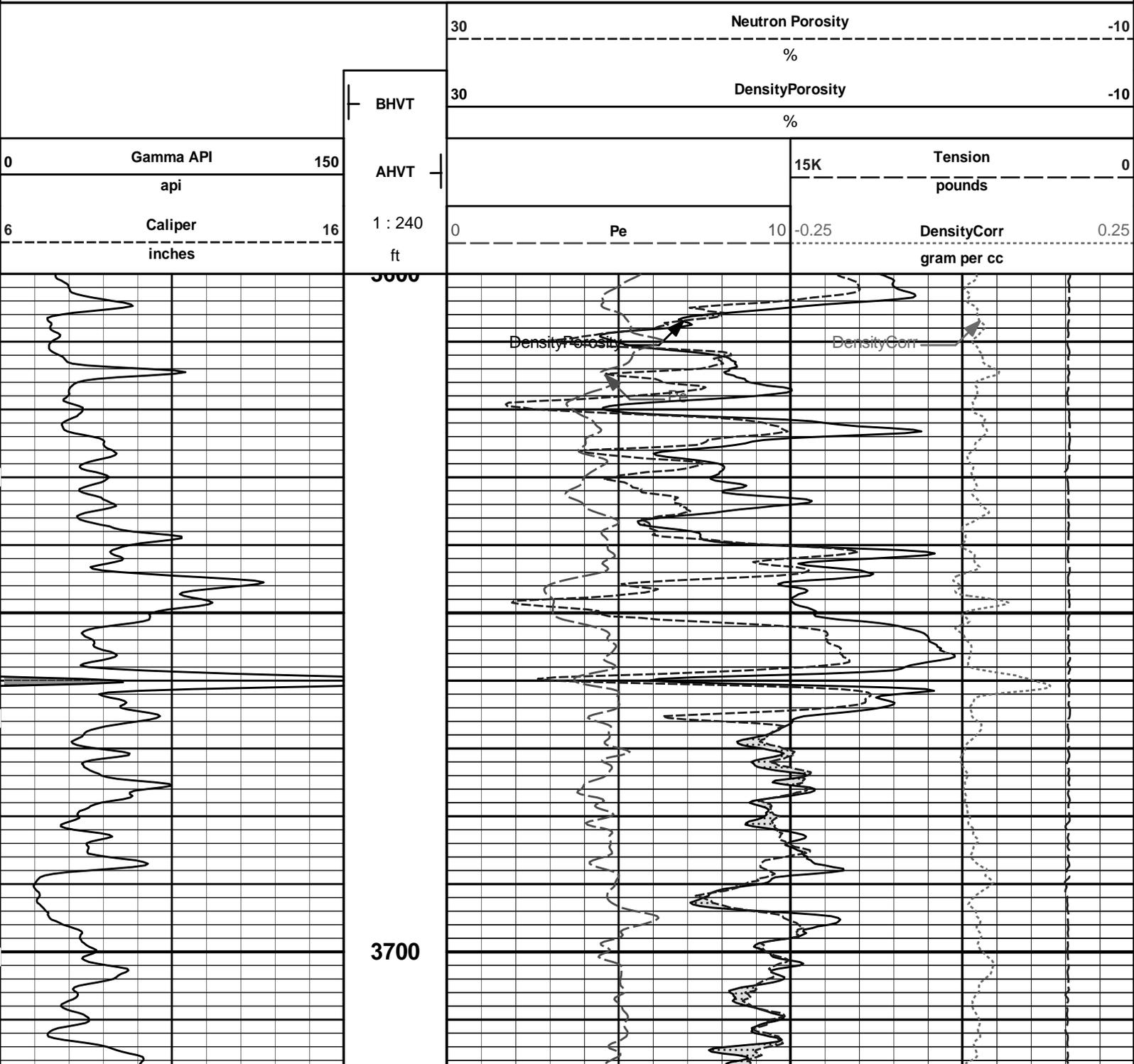
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 Data: OXY\_SHELL\_B-2\Well Based\DAQ-0001-004\_MAIN  
 Plot File: \\POROSITY\Poro\_IQ\_5\_MAIN

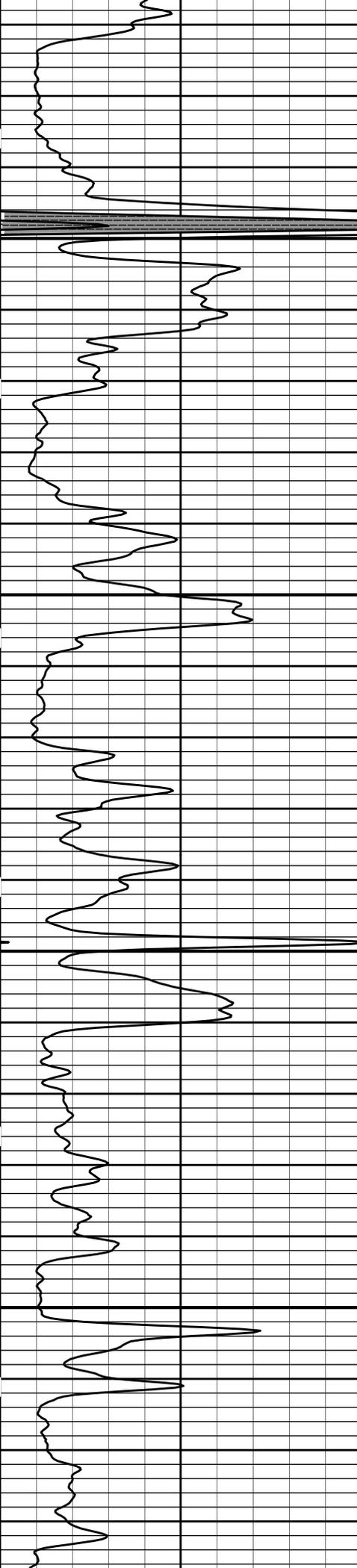
**5 INCH MAIN LOG**

**MAIN SECTION 5" PER 100'**

# 5 INCH REPEAT SECTION

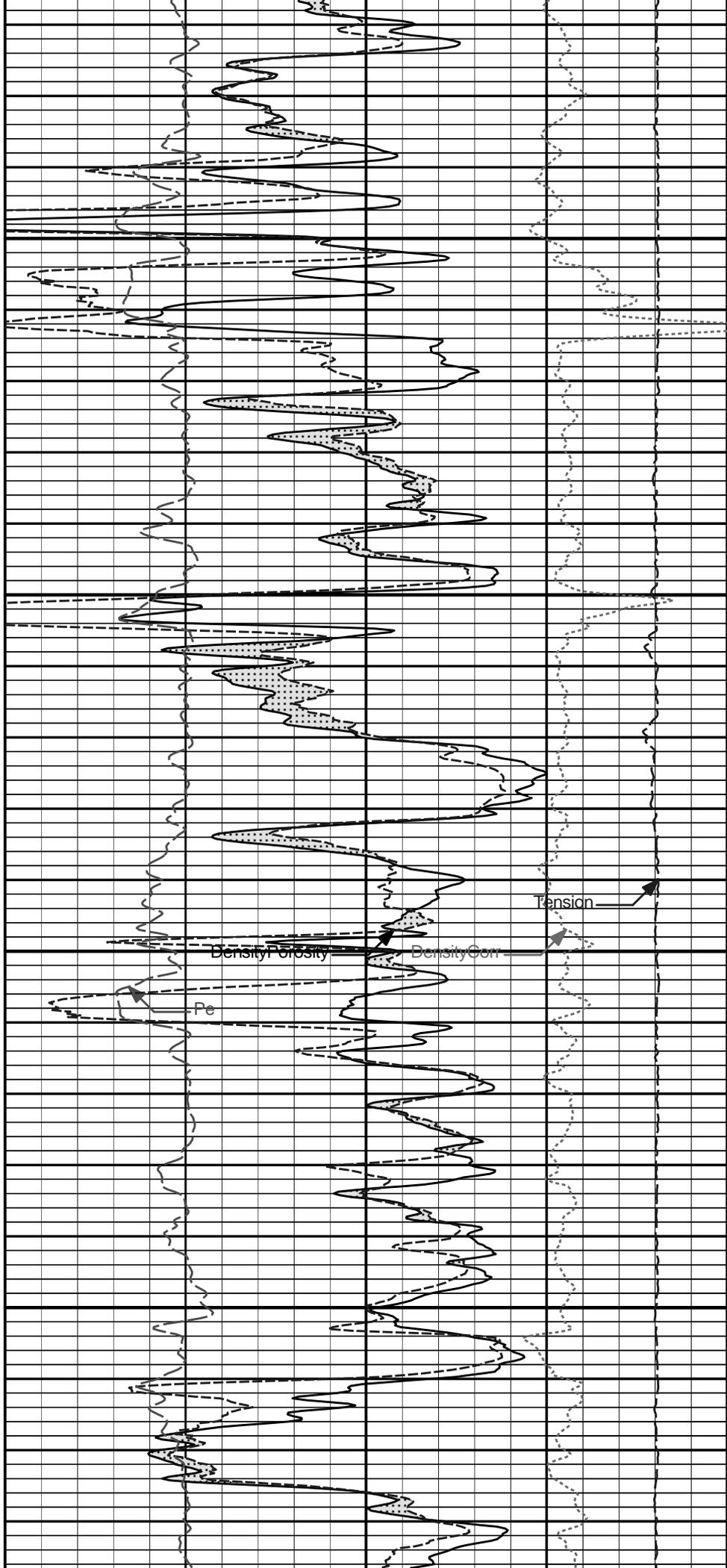
## 5 INCH REPEAT SECTION

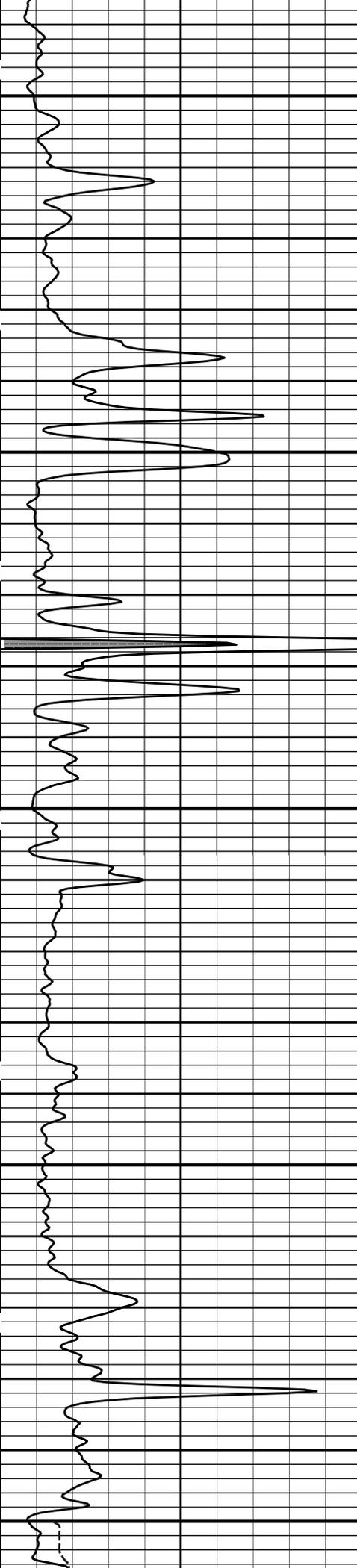




3800

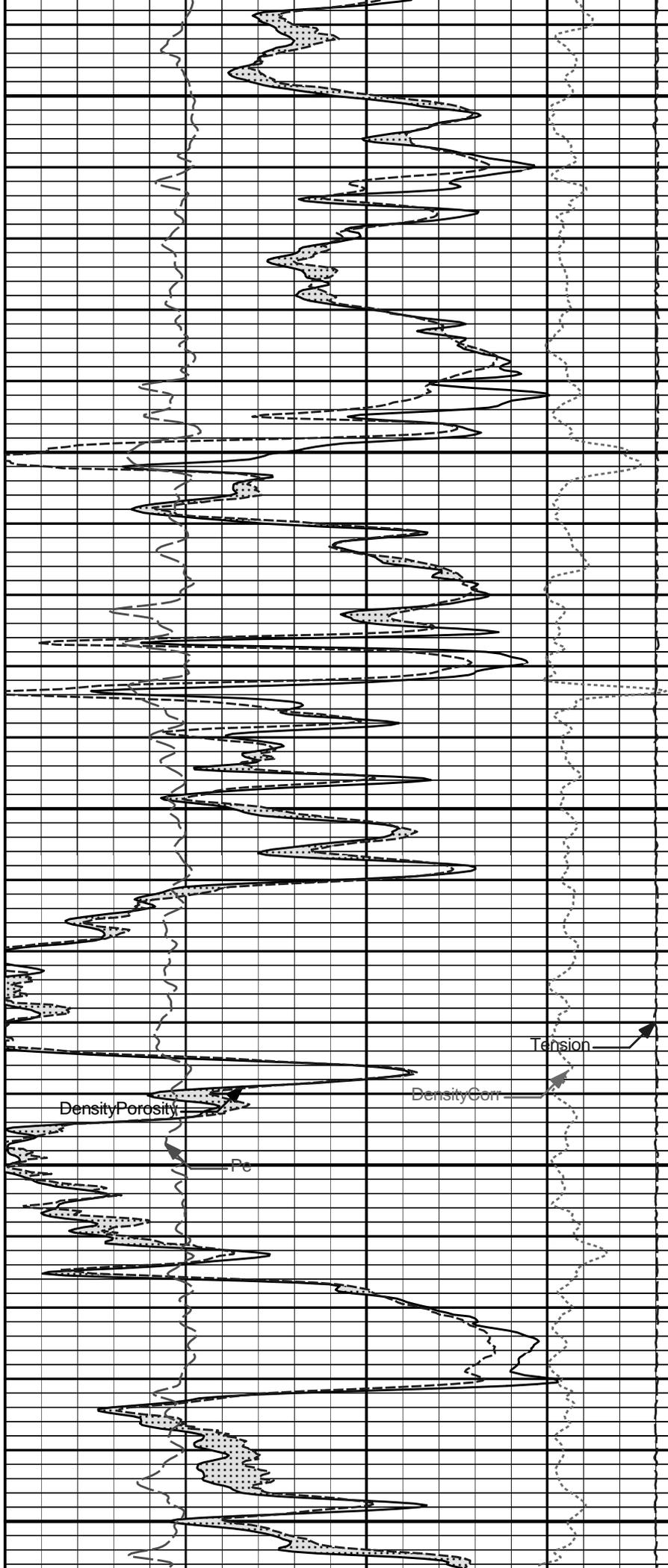
3900





4000

4100

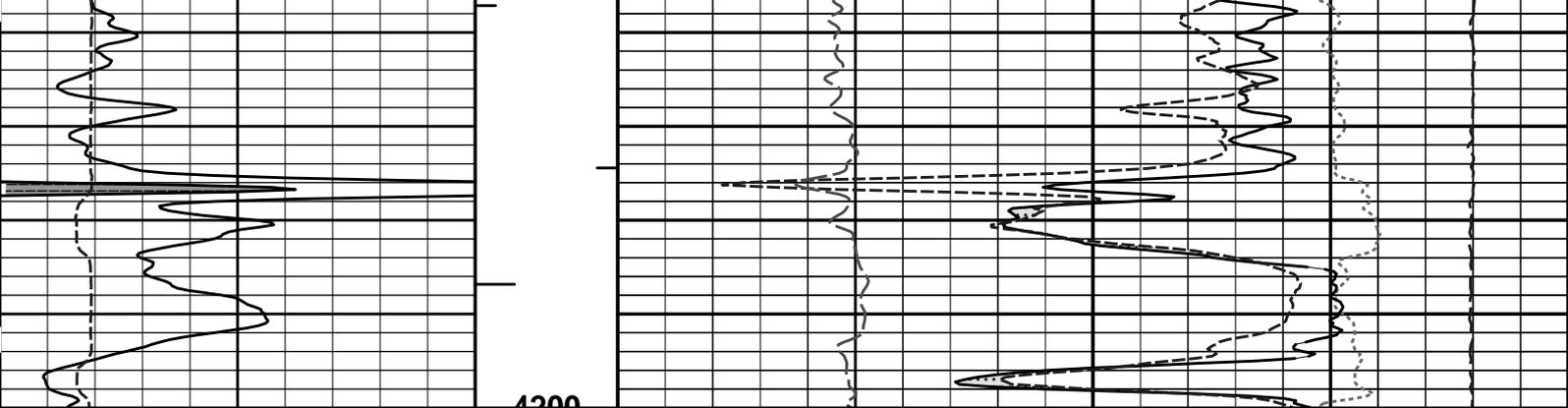


DensityPorosity

Pc

DensityCorr

Tension



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

**HALLIBURTON**

Plot Time: 01-Apr-12 17:20:15  
 Plot Range: 3600 ft to 4200 ft  
 Data: OXY\_SHELL\_B-2\Well Based\DAQ-0001-003\  
 Plot File: \\POROSITY\Porosity\_IQ\_5\_MAIN

**5 INCH REPEAT SECTION**

**5 INCH REPEAT SECTION**

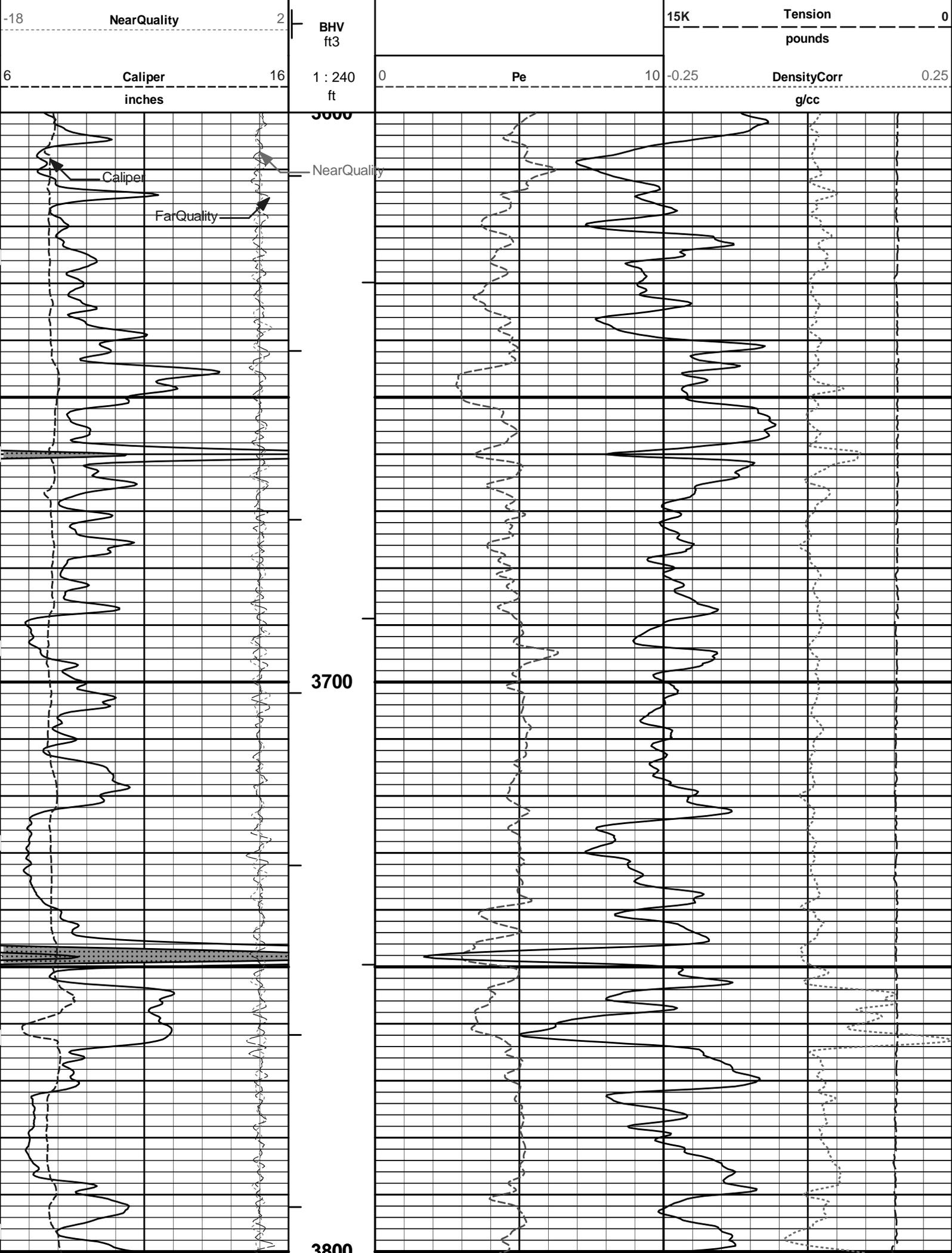
**HALLIBURTON**

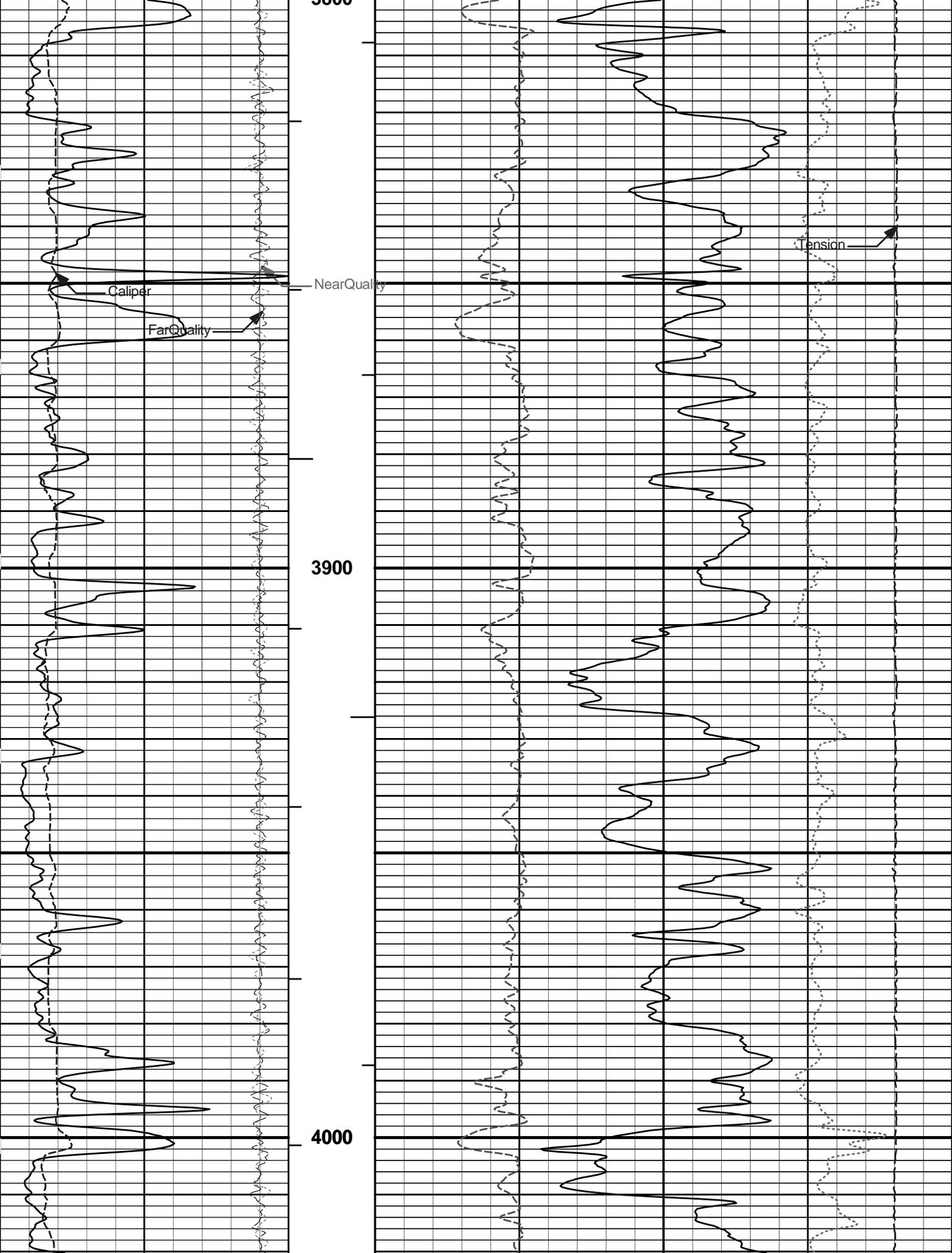
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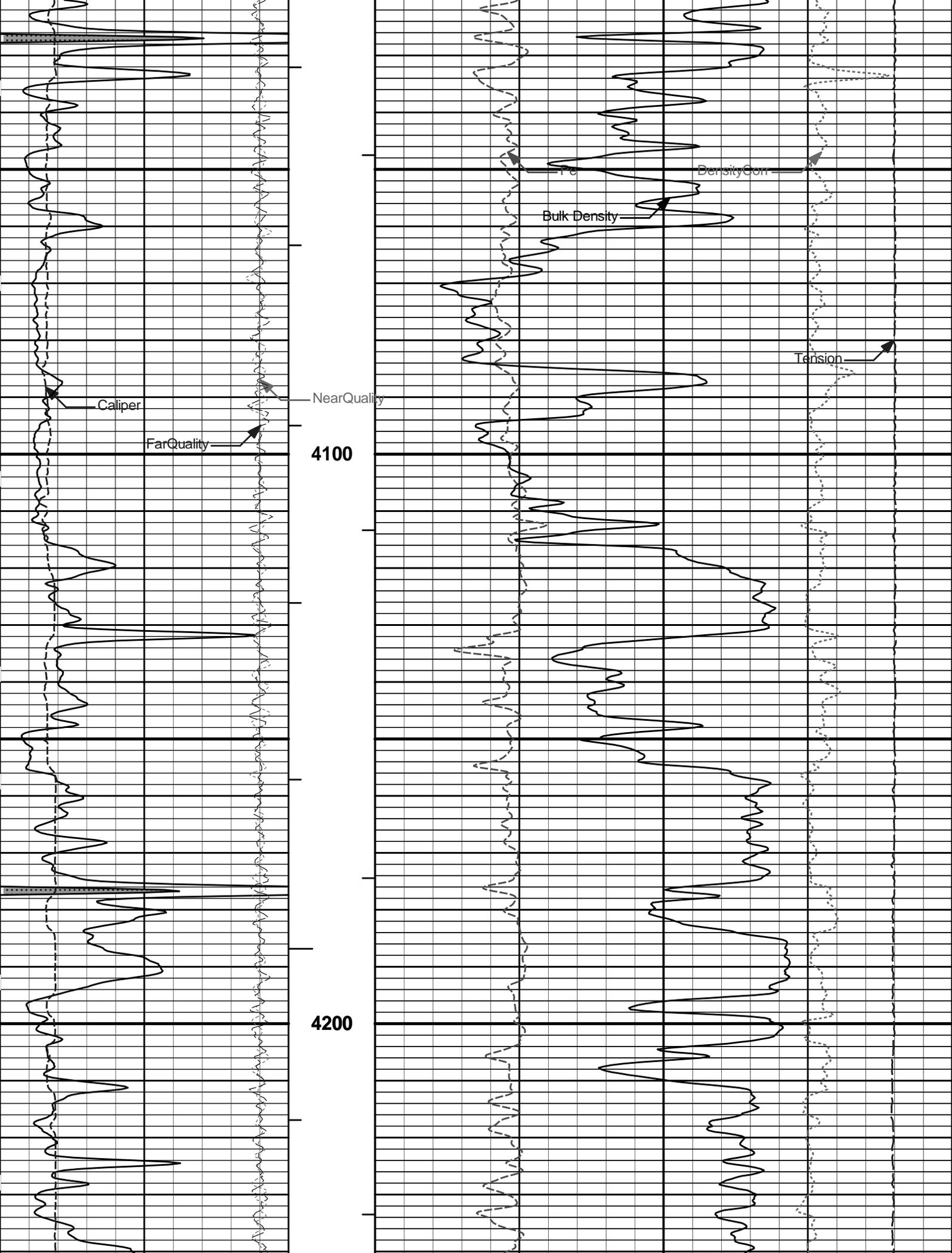
**5 INCH MAIN LOG**

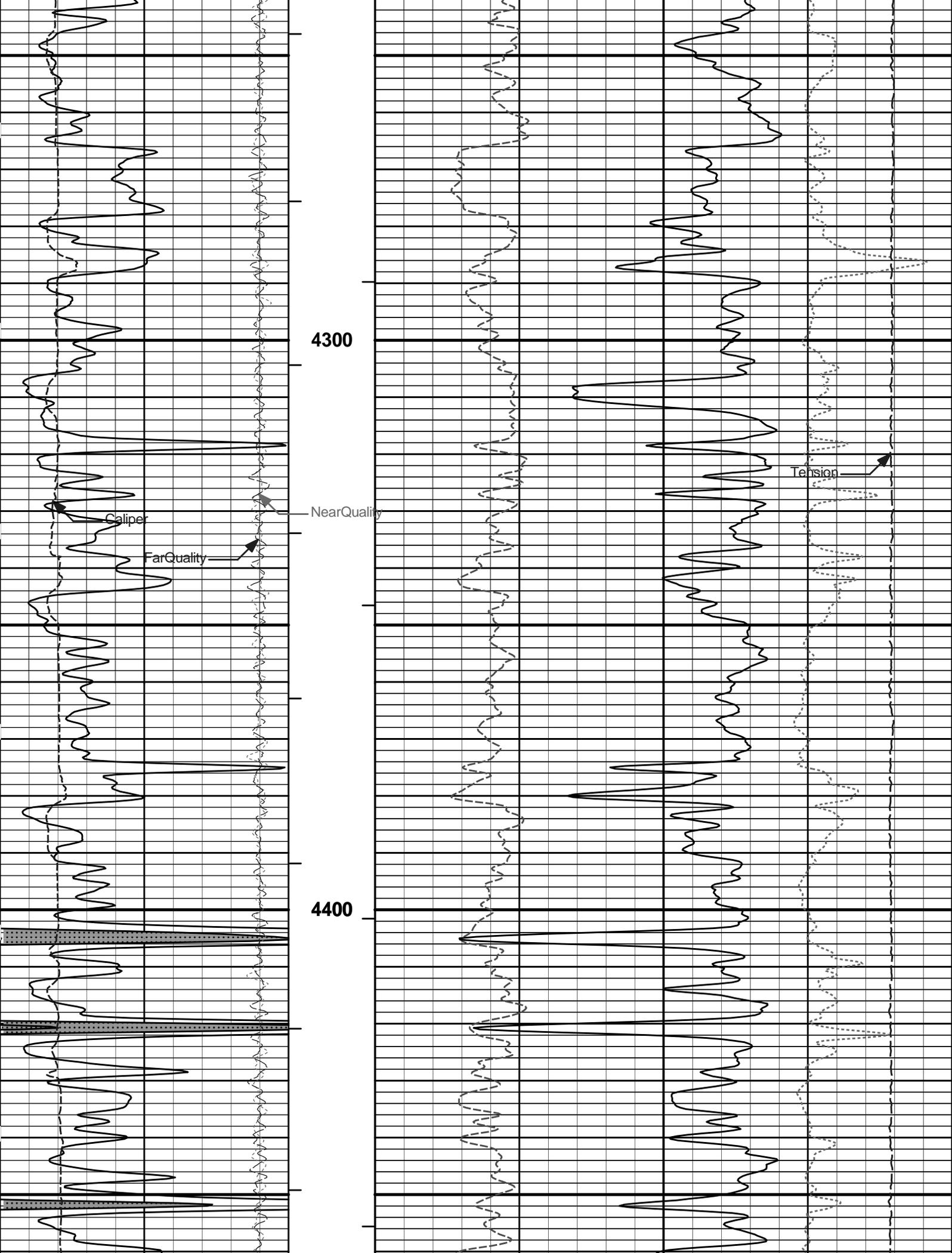
**MAIN SECTION 5" PER 100'**

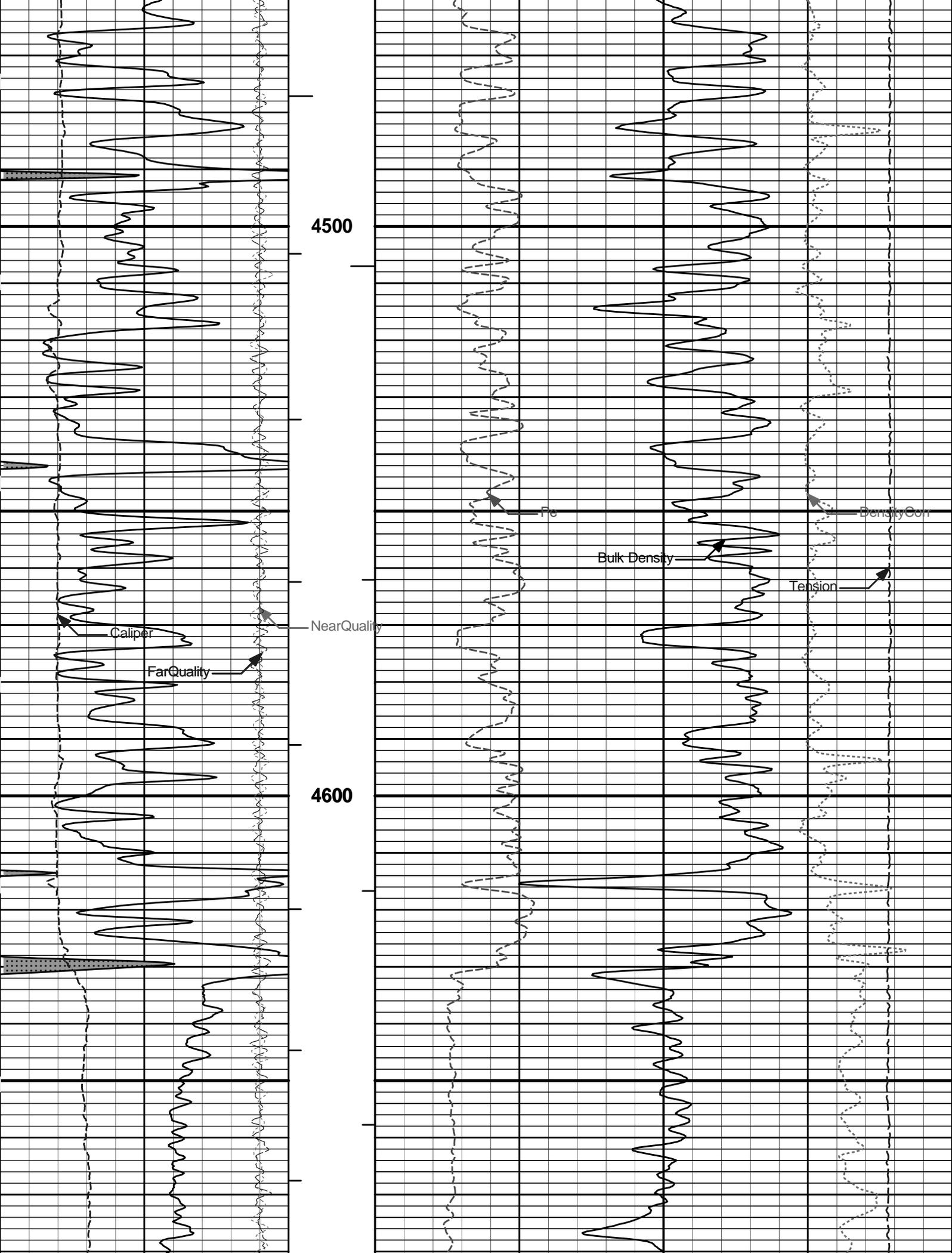
0	Gamma Ray	150							
	api								
18	FarQuality	-2	AHV	2	Bulk Density				3
			ft3		g/cc				

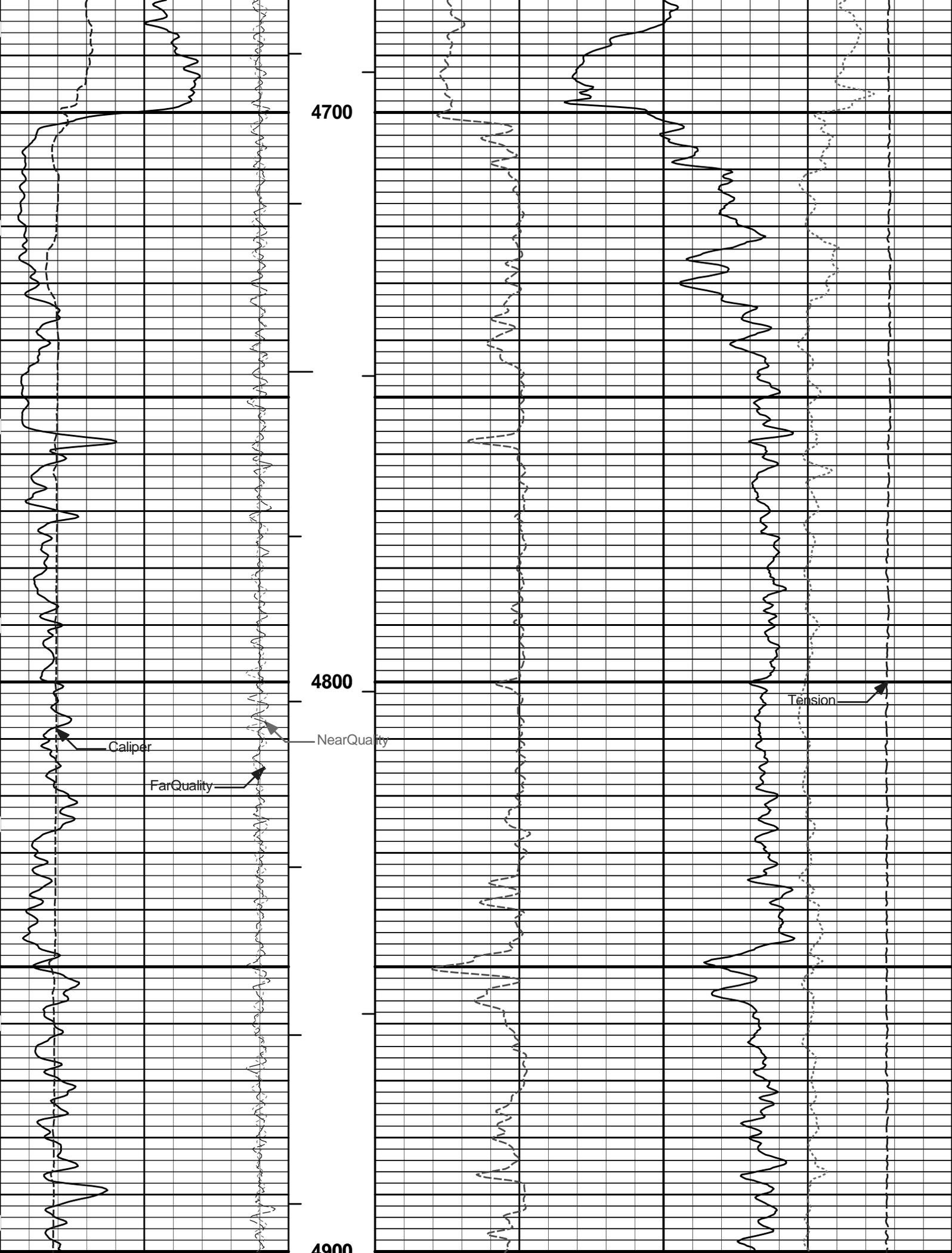


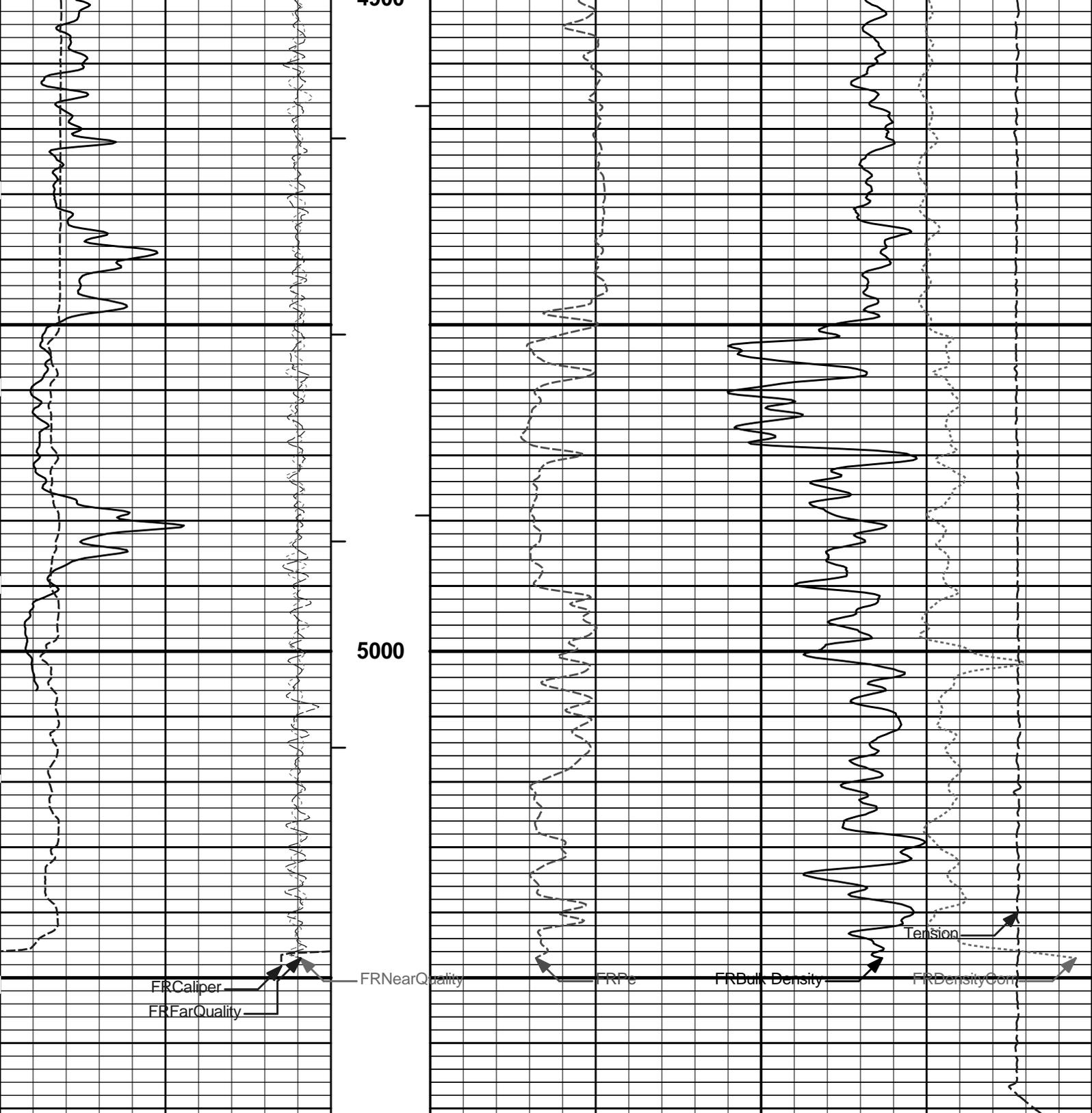












6	Caliper	16	1 : 240	0	Pe	10	-0.25	DensityCorr	0.25
	inches		ft					g/cc	
-18	NearQuality	2	BHV			15K		Tension	0
			ft3					pounds	
18	FarQuality	-2	AHV			2		Bulk Density	3
			ft3					g/cc	
0	Gamma Ray	150							
	api								

# 5 INCH MAIN LOG

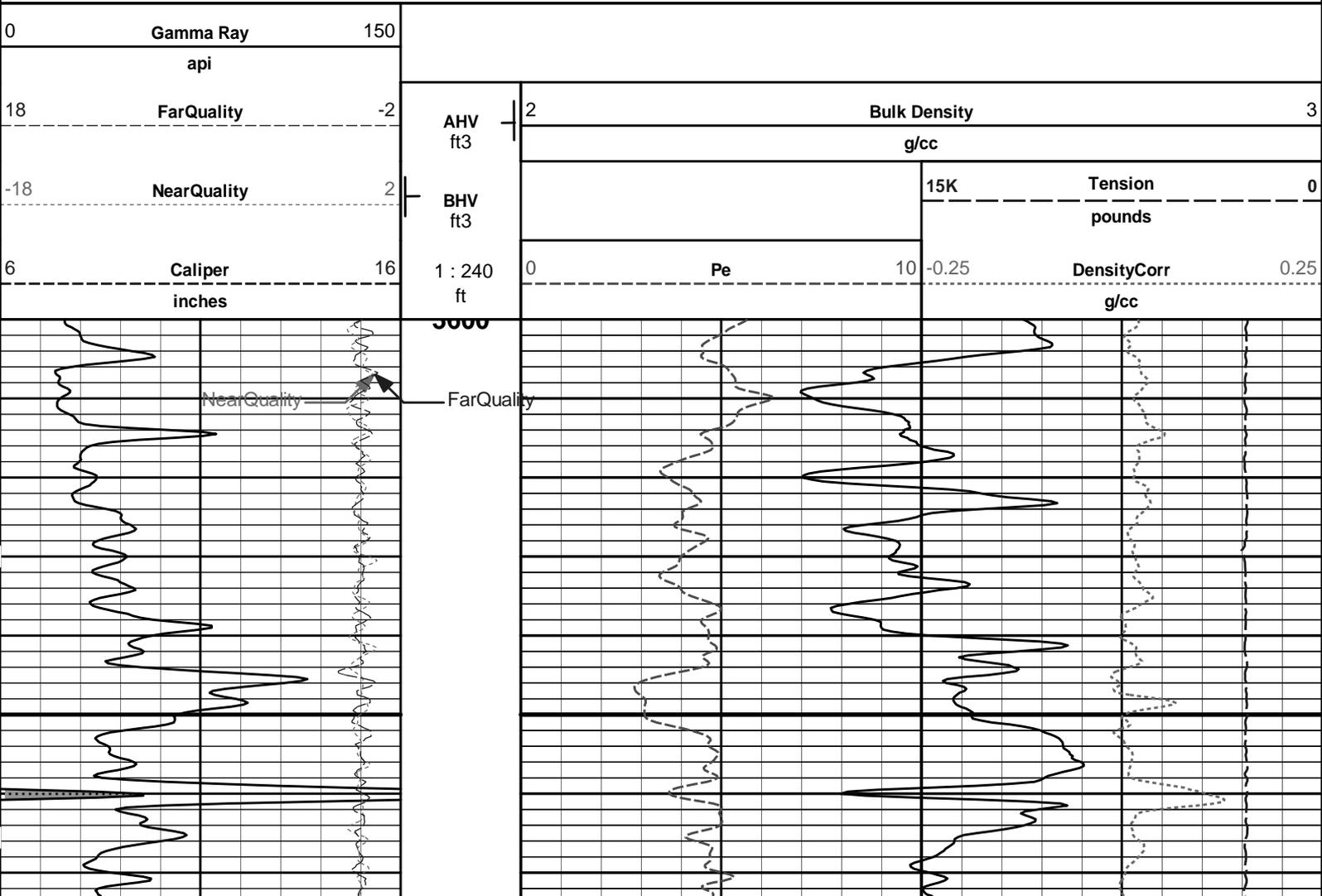
## MAIN SECTION 5" PER 100'

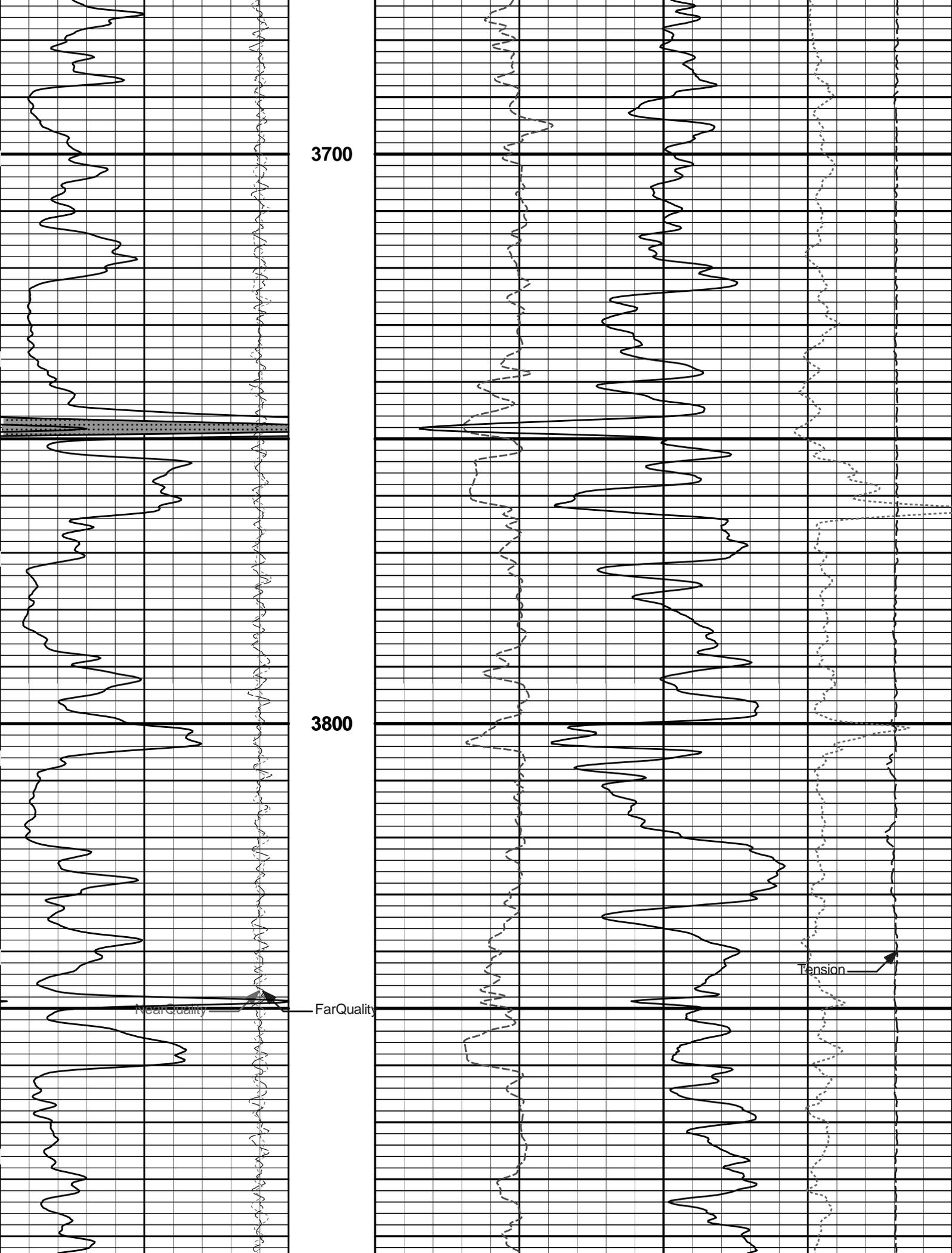
**HALLIBURTON**

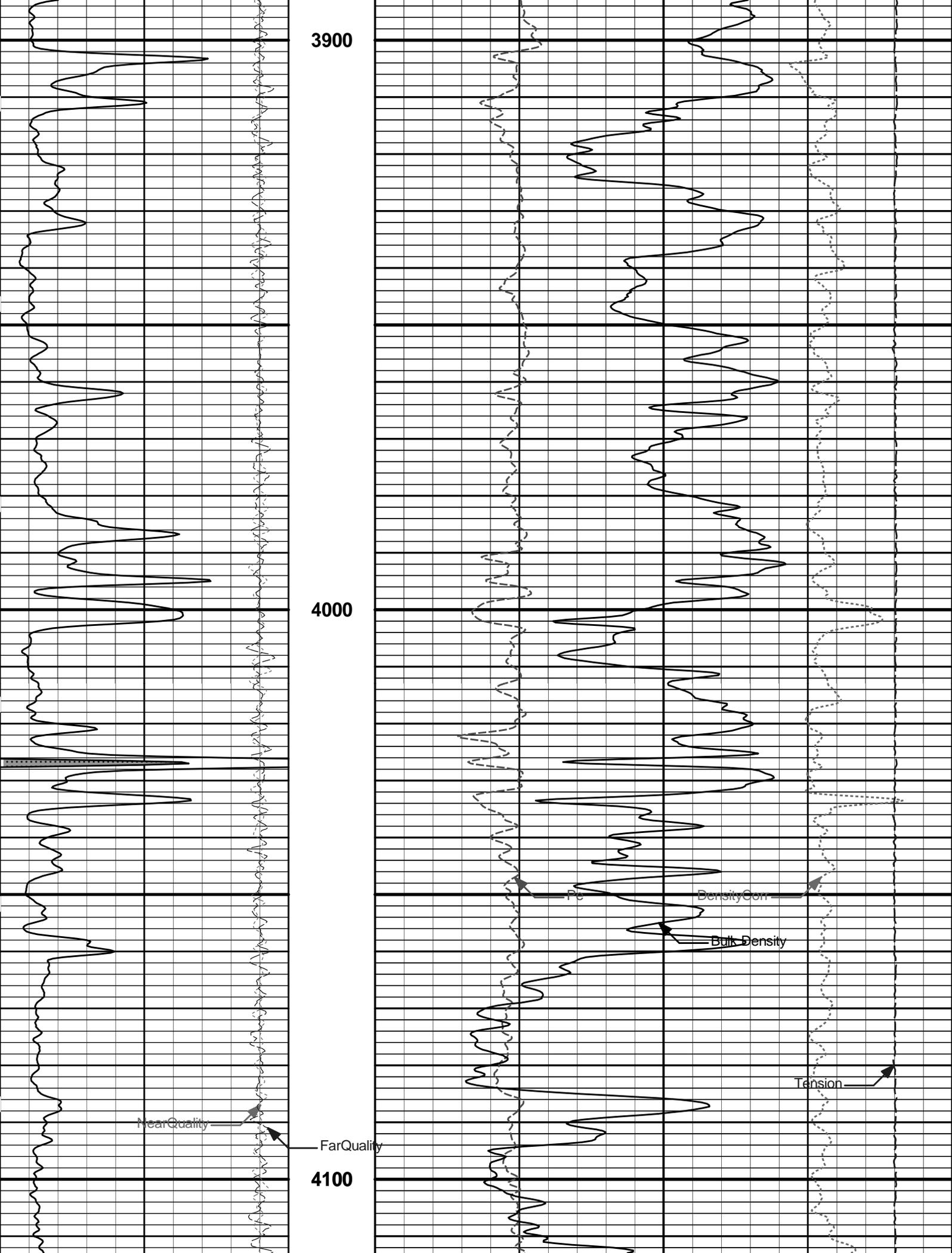
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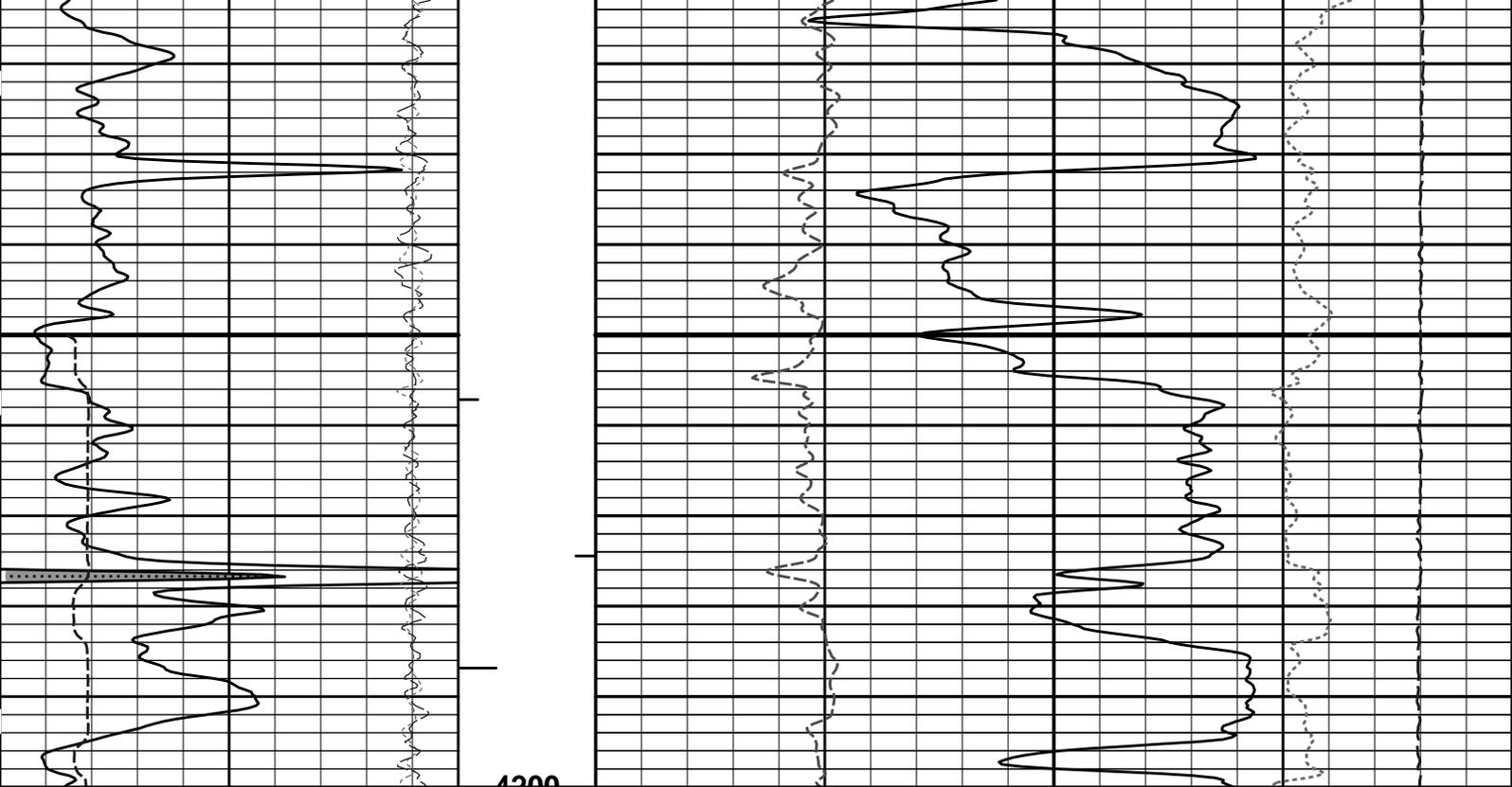
## 5 INCH REPEAT SECTION

## 5 INCH REPEAT SECTION









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

**HALLIBURTON**

Plot Time: 01-Apr-12 17:20:20  
 Plot Range: 3600 ft to 4200 ft  
 Data: OXY\_SHELL\_B-2\Well Based\DAQ-0001-003\  
 Plot File: \\LOCAL\OXY\_SHELL\_B-2\0001 GTET-BSAT-FLEX-DSN-SDL-ACRT-CBG\POROSITY\BULKD\_5\_MAIN\_IQ

**5 INCH REPEAT SECTION**

**5 INCH REPEAT SECTION**

**HALLIBURTON**

**CALIBRATION REPORT**

**SURFACE TENSION SHOP CALIBRATION**

Tool Name:	Depth Panel - 10842695	Reference Calibration Date:	28-Dec-07 12:33:23
Engineer:	GUTHMUELLER	Calibration Date:	07-Jan-08 09:52:53
Software Version:	WI INSITE R2.0 (Build 22)	Calibration Version:	1

SURFACE TENSION LOAD CELL				
Measurement	Load Cell Value	Measurement	Calibrated	Units
Low	10285.21	-35.81	0.00	lbs
High	17061.79	6736.91	6770.00	lbs

DOWNHOLE TENSION SHOP CALIBRATION			
Tool Name:	CH_HOS - CH_HOS_I	Reference Calibration Date:	07-Nov-11 21:53:28
Engineer:	WHITLOCK	Calibration Date:	10-Feb-12 05:29:34
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

DOWNHOLE LOAD CELL				
Measurement	Tool Value	Measurement	Calibrated	Units
Low	1695.54	-190.76	0.00	lbs
High	9060.32	856.01	1076.00	lbs

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 10971172	Reference Calibration Date:	07-Feb-12 10:09:50
Engineer:	WHITLOCK	Calibration Date:	27-Feb-12 09:55:44
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Calibrator Source S/N: TB-79  
 Calibrator API Reference:222.00 api  
 Equivalent Calibrator API Reference:225.9 api

Measurement	Measured	Calibrated	Units
Background	34.1	34.3	api
Background + Calibrator	258.2	260.2	api
Calibrator	224.1	225.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 10971172	Reference Calibration Date:	27-Feb-12 09:55:44
Engineer:	WHITLOCK	Calibration Date:	30-Mar-12 10:13:47
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Calibrator Source S/N: TB-79  
 Calibrator API Reference:222.00 api  
 Equivalent Calibrator API Reference:225.9 api

Field Verification	Shop	Field	Units
Background	34.3	22.9	api
Background + Calibrator	260.2	247.2	api
Calibrator	225.9	224.3	api

Shop	Field	Difference	Tolerance
225.9	224.3	1.6	+/- 9.00

ACCELEROMETER SHOP CALIBRATION			
Tool Name:	GTET - 10971172	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	WHITLOCK	Calibration Date:	20-Oct-08 14:40:55
Software Version:	WL INSITE R2.2 (Build 2)	Calibration Version:	1

Horizontal-1 Telemetry	Horizontal-2 Telemetry	Vertical Telemetry	Units
-85.64	-67.18	-16422.00	cnts

Coefficient	Coefficient Value	Tolerance
Gain	-0.000061	-----

Offset	-0.005	-----
Noise	0.0000	0.0000 - 0.0000

Orientation	Measured	Tolerance	Calibrated	Tolerance
Horizontal	-76.41	-0.10 - 0.10	0.00	-0.10 - 0.10
Vertical	-16422.00	0.90 - 1.10	1.00	0.90 - 1.10

**DUAL SPACED NEUTRON SHOP CALIBRATION**

<b>Tool Name:</b> DSNT - 10951378	<b>Reference Calibration Date:</b> 07-Feb-12 13:10:35
<b>Engineer:</b> WHITLOCK	<b>Calibration Date:</b> 05-Mar-12 12:23:01
<b>Software Version:</b> WL INSITE R3.4.2 (Build 2)	<b>Calibration Version:</b> 1

Logging Source S/N: DSN-373  
 Tank Serial Number: FTSM HWT  
 Reference value assigned to Tank: 56.100  
 Snow Block S/N: 10975786  
 Calibration Tank Water Temperature: 75 degF  
 Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.009	1.006	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):	0.2365	0.2358	0.0008	+/- 0.0020
Calibrated Ratio:	10.58	10.56	0.025	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0803	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

**DUAL SPACED NEUTRON FIELD CALIBRATION**

<b>Tool Name:</b> DSNT - 10951378	<b>Reference Calibration Date:</b> 05-Mar-12 12:23:01
<b>Engineer:</b> WHITLOCK	<b>Calibration Date:</b> 30-Mar-12 10:18:20
<b>Software Version:</b> WL INSITE R3.4.2 (Build 2)	<b>Calibration Version:</b> 1

Logging Source S/N: DSN-373  
 Snow Block S/N: 10975786

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0803	0.0811	0.0007	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed

**DENSITY CALIPER SHOP CALIBRATION**

Tool Name: SDLT - I378\_M477\_P870

Reference Calibration Date: 01-Jan-70 00:00:00

Engineer: WHITLOCK

Calibration Date: 30-Mar-12 10:30:06

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

**CALIBRATION COEFFICIENTS**

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-2823.93	-2823.93	-7000.00 - -1000.00
Pad Gain	0.0003704	0.0003704	0.000200 - 0.000600
Arm Offset	-2190.19	-2190.19	-5000.00 - 3000.00
Arm Gain	0.0005308	0.0005308	0.000300 - 0.000700
Arm Power	-0.000005823	-0.000005823	-0.000010 - 0.000010

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)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 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 - I378\_M477\_P870

Reference Calibration Date: 30-Mar-12 10:30:06

Engineer: WHITLOCK

Calibration Date: 30-Mar-12 10:32:19

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

**MEASURED CALIPER VALUES**

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.76	0.01	+/- 0.10
Ring Diameter	8.25	8.25	0.00	+/- 0.15

**PASS/FAIL SUMMARY**

Pad Extension Check: Passed  
 Diameter Check: Passed

**ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION**

Tool Name: ACRT Sonde - I816\_S708

Reference Calibration Date: 21-Sep-11 13:58:42

Engineer: HOFKAMP

Calibration Date: 03-Jan-12 09:45:28

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

**TYPICAL GAIN RANGE**

Subarray	R12KH-	R26KH-	R72KH-
----------	--------	--------	--------

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0353	1.05	0.95	1.0124	1.05	0.95	1.0031	1.05
A2 (50")	0.95	1.0437	1.05	0.95	1.0210	1.05	0.95	1.0094	1.05
A3 (29")	0.95	1.0354	1.05	0.95	1.0124	1.05	0.95	1.0009	1.05
A4 (17")	0.95	1.0255	1.05	0.95	1.0019	1.05	0.95	0.9959	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9971	1.05	0.95	0.9892	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9959	1.05	0.95	0.9887	1.05

**TYPICAL SONDE OFFSET RANGE**

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	0.928	2	-6	-4.573	-2	-8	-5.812	-2
A2 (50")	-7	0.314	-1	-6	-3.738	-2	-7	-5.333	-2
A3 (29")	-27	-12.244	-9	-9	-4.322	-3	-7	-4.343	-1
A4 (17")	-180	-99.972	-60	-45	-31.306	-15	-39	-24.956	-13
A5 (10")	N/A	N/A	N/A	-150	-99.875	-50	-80	-47.603	-10
A6 (6")	N/A	N/A	N/A	175	327.313	525	90	166.084	270

**TRANSMITTER CURRENT GAIN**

Signal	Lower	R	Upper
12K	0.6	0.8154	1.3
36K	1.0	1.1504	2.0
72K	1.0	1.3123	2.0

**R-MUD VERIFICATION**

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	1.004	1.05

**SPECTRAL DENSITY SHOP CALIBRATION**

<b>Tool Name:</b> SDLT Pad - I378_M477_P870	<b>Reference Calibration Date:</b> 07-Feb-12 10:44:34
<b>Engineer:</b> WHITLOCK	<b>Calibration Date:</b> 05-Mar-12 10:04:59
<b>Software Version:</b> WL INSITE R3.4.2 (Build 2)	<b>Calibration Version:</b> 1

Logging Source S/N: 20784B

Aluminum Block S/N: FTSM AL BLOCK

Density: 2.581g/cc

Pe: 3.170

Magnesium Block S/N: FTSM MG BLOCK

Density: 1.687g/cc

Pe: 2.594

**DENSITY CALIBRATION SUMMARY**

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0295	1.0402	0.90 - 1.10
Near Dens Gain	1.0210	1.0433	0.90 - 1.10
Near Peak Gain	1.0285	1.0808	0.90 - 1.10
Near Lith Gain	1.0504	1.0861	0.90 - 1.10
Far Bar Gain	1.0096	1.0107	0.90 - 1.10
Far Dens Gain	1.0022	1.0030	0.90 - 1.10
Far Peak Gain	0.9978	0.9996	0.90 - 1.10
Far Lith Gain	0.9872	0.9798	0.90 - 1.10
<hr/>			
Near Bar Offset	-0.0854	-0.1837	NONE
Near Dens Offset	-0.0149	-0.2146	NONE
Near Peak Offset	-0.0798	-0.5189	NONE
Near Lith Offset	-0.2768	-0.5818	NONE
Far Bar Offset	0.0320	0.0197	NONE
Far Dens Offset	0.0782	0.0658	NONE
Far Peak Offset	0.0898	0.0656	NONE
Far Lith Offset	0.1440	0.1823	NONE

Near Bar Background	901.39	900.68	700 - 1450
Near Dens Background	295.56	293.31	230 - 480
Near Peak Background	128.95	128.47	100 - 210
Near Lith Background	158.39	157.51	125 - 260
Far Bar Background	543.29	546.24	450 - 900
Far Dens Background	211.48	212.31	175 - 345
Far Peak Background	83.59	84.47	70 - 140
Far Lith Background	87.68	87.24	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.687	0.005	+/- 0.015
Pe	2.541	2.554	0.013	+/- 0.150
ALUMINUM				
Density (g/cc)	2.579	2.581	0.002	+/- 0.01500
Pe	3.069	3.127	0.058	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0015	+/- 0.0110	-0.0027	+/- 0.0140
Magnesium Block	-0.0015	+/- 0.0110	0.0002	+/- 0.0140
Aluminum Block	-0.0007	+/- 0.0110	0.0002	+/- 0.0140
Resolution	9.12	6.00 - 11.50	8.62	6.00 - 11.50
Internal Verifier(B+D+P+L)	1480	1200 - 2700	930	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

### SPECTRAL DENSITY FIELD CHECK

Tool Name:	SDLT Pad - I378_M477_P870	Reference Calibration Date:	05-Mar-12 10:04:59
Engineer:	WHITLOCK	Calibration Date:	30-Mar-12 10:12:50
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Pad Temperature: 72.8 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1479.967	1477.817	-2.150	15.508
Far (B+D+P+L) cps	930.256	927.659	-2.597	16.502
Near Resolution	9.12	9.01	-0.110	0.50
Far Resolution	8.62	8.65	0.030	1.00

**PASS/FAIL SUMMARY**

Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

**MICRO LOG SHOP CALIBRATION**

<b>Tool Name:</b> Microlog Pad - I378_M477_P870	<b>Reference Calibration Date:</b> 15-Dec-11 10:52:18
<b>Engineer:</b> WHITLOCK	<b>Calibration Date:</b> 16-Feb-12 13:59:17
<b>Software Version:</b> WL INSITE R3.4.2 (Build 2)	<b>Calibration Version:</b> 1

**CALIBRATION COEFFICIENT SUMMARY**

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.18	-0.14	-0.00	-0.00	ohmm
Calibration Point #1	-0.04	0.00	-0.00	0.00	ohmm
Calibration Point #2	19.96	20.00	19.99	20.00	ohmm
Internal Reference	19.81	19.86	19.99	20.00	ohmm

Measurement	Micro Log Normal	Micro Log Lateral	Units
	Tool Value	Tool Value	
Tool Zero	0.43	0.82	V
Calibration Point #1	37.45	1.94	V
Calibration Point #2	5295.78	6863.62	V
Internal Reference	5257.79	6861.95	V

**MICRO LOG FIELD CHECK**

<b>Tool Name:</b> Microlog Pad - I378_M477_P870	<b>Reference Calibration Date:</b> 16-Feb-12 13:59:17
<b>Engineer:</b> WHITLOCK	<b>Calibration Date:</b> 12-Mar-12 09:38:40
<b>Software Version:</b> WL INSITE R3.4.2 (Build 2)	<b>Calibration Version:</b> 1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.14	-0.14	-0.00	-0.00	ohmm
Internal Reference	19.86	19.81	20.00	19.95	ohmm

Summary				
Signal	Shop	Field	Difference	Tolerance
Microlog Normal	19.86	19.81	0.05	+/- 0.80
Microlog Lateral	20.00	19.95	0.05	+/- 0.80

**CALIBRATION SUMMARY**

Sensor	Shop	Field	Post	Difference	Tolerance	Units
<b>Depth Panel-10842695</b>						
Tension Zero	0.00	-----	-----	0.00	-----	lbs
Tension Cal	6770.00	-----	-----	0.00	-----	lbs
<b>CH_HOS-CH_HOS_I</b>						
DH Tension Zero	0.00	-----	-----	0.00	-----	lbs
DH Tension Cal	1076.00	-----	-----	0.00	-----	lbs
<b>GTET-10971172</b>						
Gamma Ray Calibrator	225.9	224.3	-----	1.6	+/- 9.00	api
<b>DSNT-10951378</b>						
Snow-Block Porosity	0.0803	0.0811	-----	-0.0008	+/- 0.0150	decg
<b>SDLT-I378_M477_P870</b>						
Pad Extension	3.75	3.76	-----	-0.01	+/- 0.10	in

ad Extension	3.75	3.75	-----	-0.01	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.000	+/-0.15	in
<b>ACRt Sonde-I816_S708</b>						
Mud Cell	1.004	-----	-----	0.000	-----	ohm-m
<b>SDLT Pad-I378_M477_P870</b>						
Near(B+D+P+L)	1479.967	1477.817	-----	2.150	+/-15.508	cps
Far(B+D+P+L)	930.256	927.659	-----	2.597	+/-16.502	cps
<b>Microlog Pad-I378_M477_P870</b>						
MicroLog Normal	19.86	19.81	-----	0.05	+/-0.80	ohmm
MicroLog Lateral	20.00	19.95	-----	0.05	+/-0.80	ohmm
<b>Data: OXY_SHELL_B-2I0001 GTET-BSAT-FLEX-DSN-SDL-ACRT-CBGIDLE</b>				<b>Date: 01-Apr-12 13:30:41</b>		

# 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	9.200	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	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	5085.00	ft
	SHARED	BHT	Bottom Hole Temperature	135.0	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	
	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.	Centered	
	BSAT	MBOK	Compute BCAS Results?	Yes	
	BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
	BSAT	FLHI	Frequency Filter High Pass Value?	15000	Hz
	BSAT	DTFL	Delta -T Fluid	189.00	uspf
	BSAT	DTMT	Delta -T Matrix Type	Limestone 47.5	
	BSAT	DTSH	Delta -T Shale	100.00	uspf
	BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
	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	0.200	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?	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
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes		
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		

BOTTOM

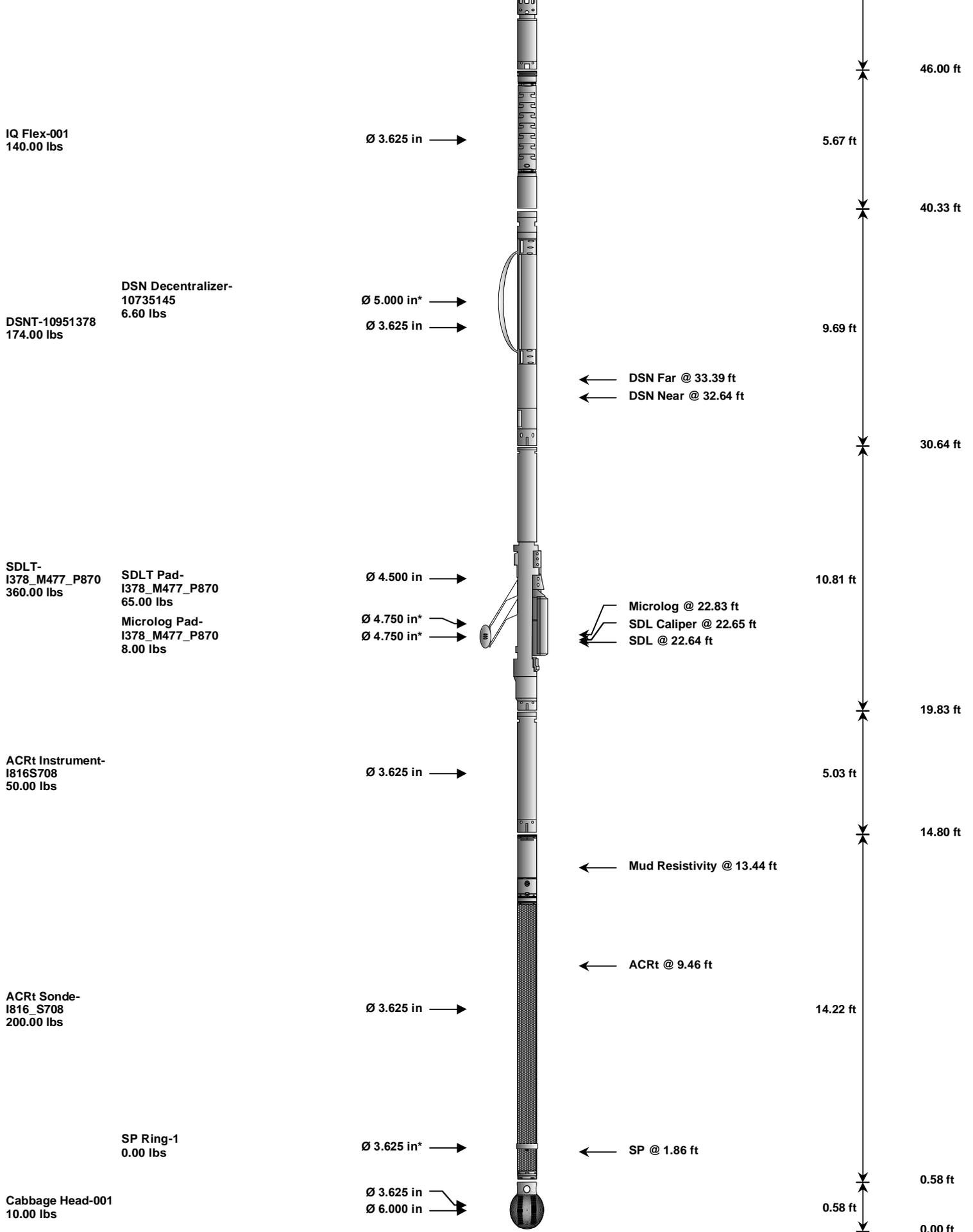
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Date: 01-Apr-12 13:31:46

**HALLIBURTON**

**TOOL STRING DIAGRAM REPORT**

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS_I 37.50 lbs		Ø 2.750 in →		← Temperature @ 72.30 ft	3.25 ft	73.55 ft
GTET-10971172 165.00 lbs		Ø 3.625 in →		← GammaRay @ 64.23 ft	8.52 ft	70.30 ft
BSAT-11014316 300.00 lbs		Ø 3.625 in →		← Sonic Receivers @ 53.26 ft	15.77 ft	61.78 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	CH_HOS_I	37.50	3.25	70.30	300.00
GTET	Gamma Telemetry Tool	10971172	165.00	8.52	61.78	60.00
DSNT	Downhole Sonic Arrow Tool	11011216	200.00	15.77	46.00	60.00

BSAT	Borehole Sonic Array Tool	11014316	300.00	15.77	46.00	60.00
IQF	IQ Flex tool	001	140.00	5.67	40.33	300.00
DSNT	Dual Spaced Neutron	10951378	174.00	9.69	30.64	60.00
DCNT	DSN Decentralizer	10735145	6.60	5.13 *	33.97	300.00
SDLT	Spectral Density Tool	I378_M477_P870	360.00	10.81	19.83	60.00
SDLP	Density Insite Pad	I378_M477_P870	65.00	2.55 *	22.04	60.00
MICP	Microlog Pad	I378_M477_P870	8.00	1.00 *	22.33	60.00
ACRt	Array Compensated True Resistivity Instrument Section	I816S708	50.00	5.03	14.80	300.00
ACRt	Array Compensated True Resistivity	I816_S708	200.00	14.22	0.58	300.00
SP	SP Ring	1	0.00	0.25 *	1.86	300.00
CBHD	Cabbage Head	001	10.00	0.58	0.00	300.00

**Total** **1,516.10**    **73.55**

\* Not included in Total Length and Length Accumulation.

Data: OXY\_SHELL\_B-2\0001 GTET-BSAT-FLEX-DSN-SDL-ACRT-CBG\IDLE

Date: 01-Apr-12 13:27:04



Plot Time: 01-Apr-12 17:20:20

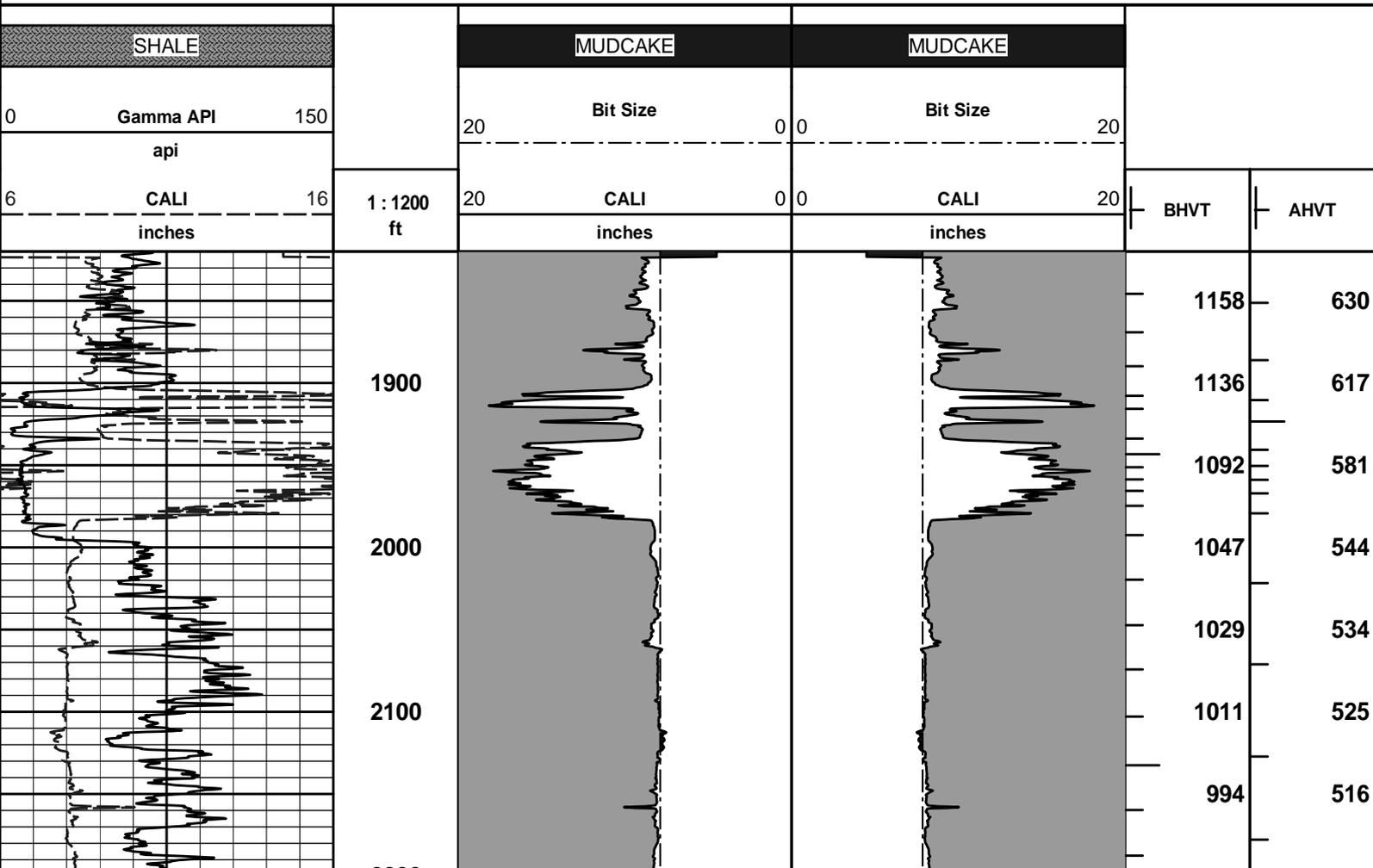
Plot Range: 1820 ft to 5071 ft

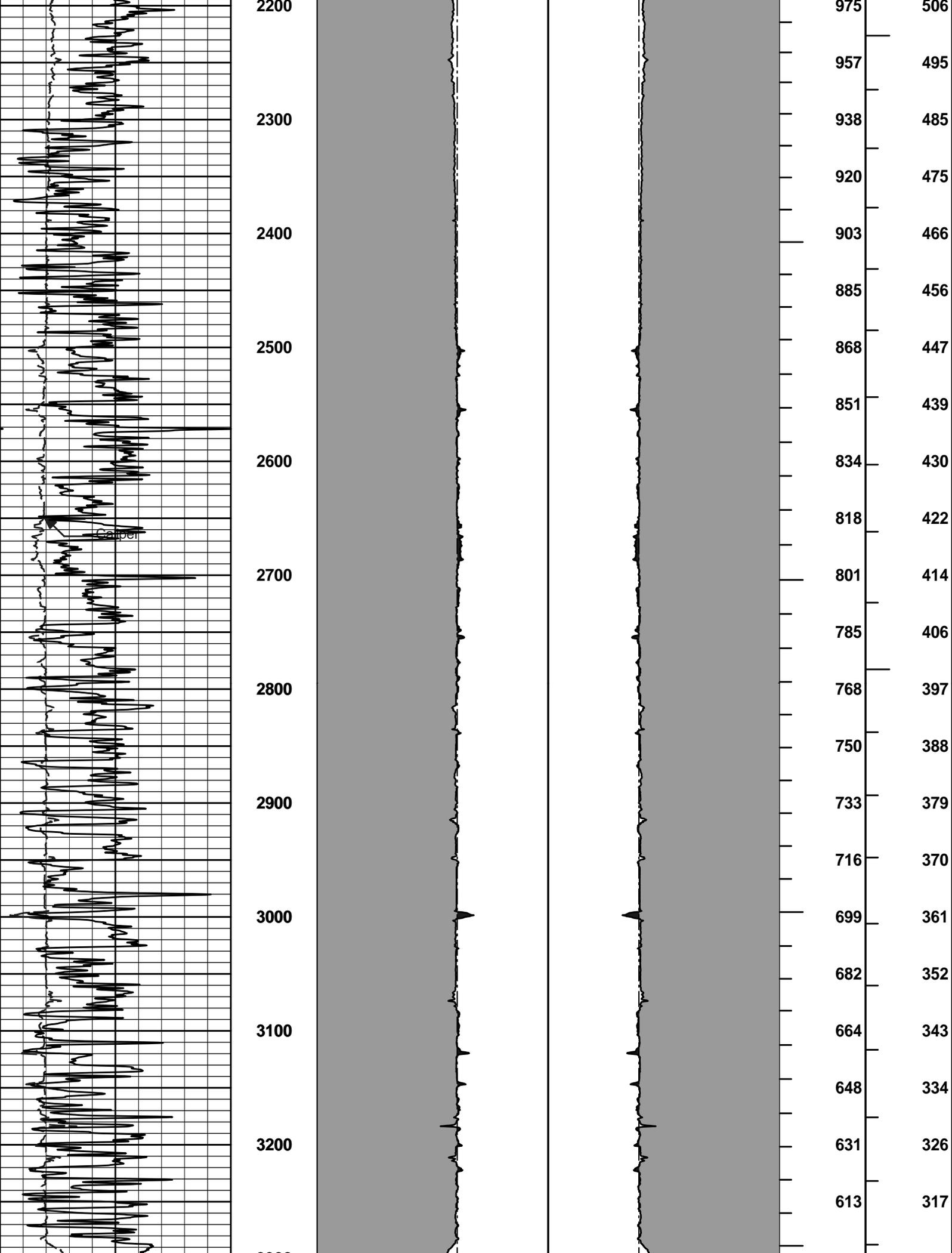
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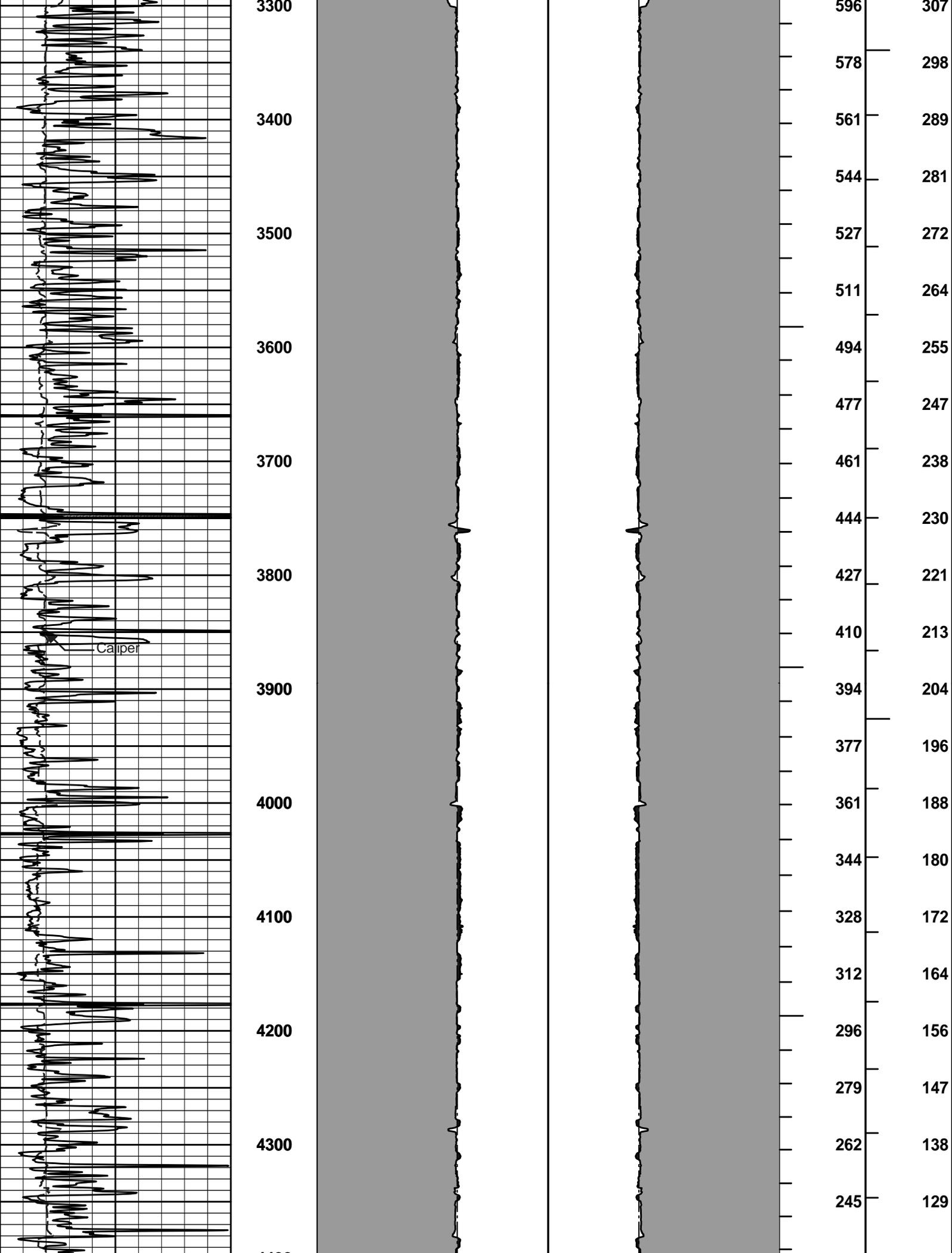
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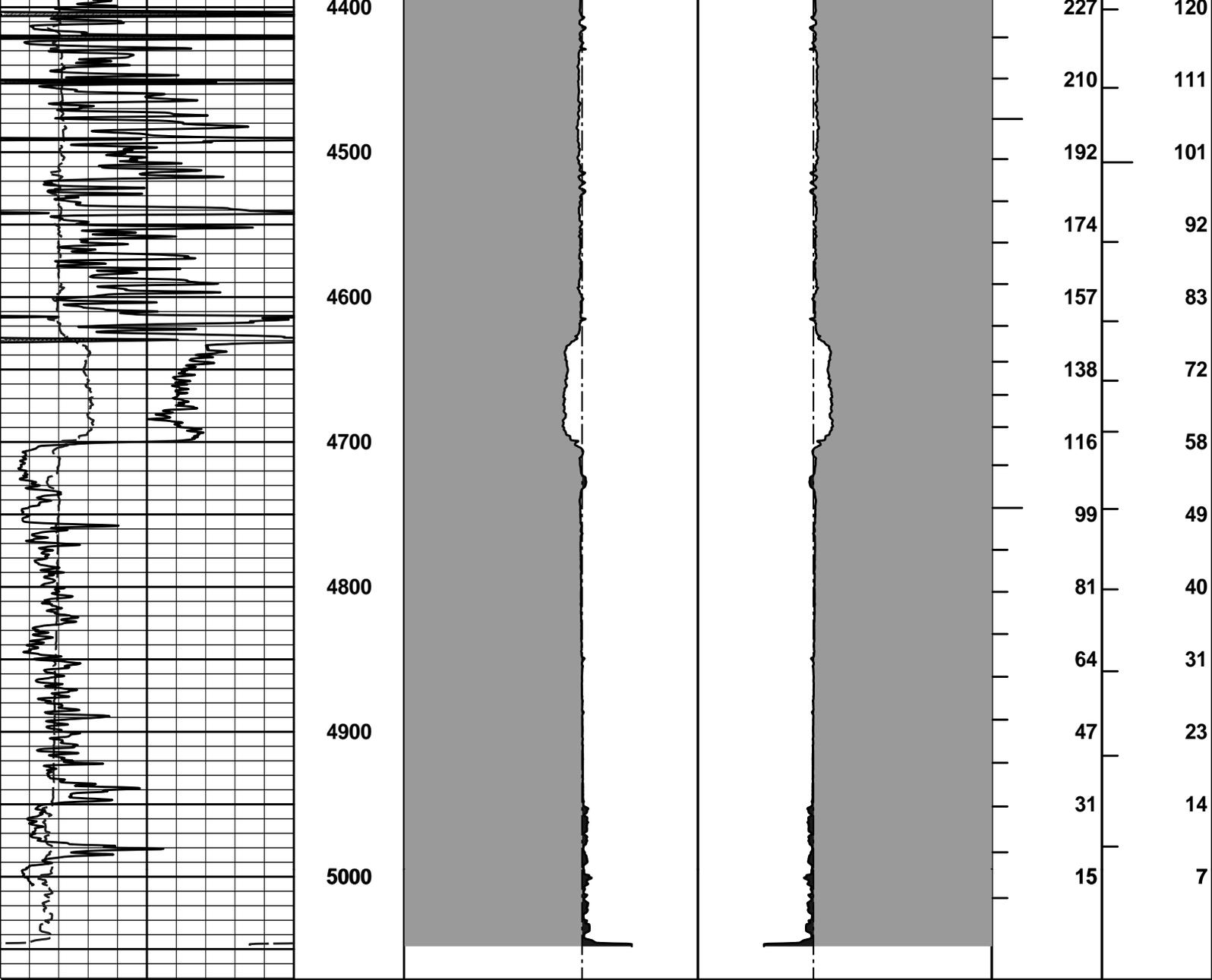
## ANNULAR HOLE VOLUME PLOT

AHV PLOT CALCULATED FOR 5.5" CASING









6	CALI	16	1 : 1200 ft	20	CALI	0 0	20	BHVT	AHVT
	inches			20	inches	0 0	20		
0	Gamma API	150		20	Bit Size	0 0	20		
	api								
	SHALE				MUDCAKE		MUDCAKE		

**HALLIBURTON**

Plot Time: 01-Apr-12 17:20:27  
 Plot Range: 1820 ft to 5071 ft  
 Data: OXY\_SHELL\_B-2\Well Based\DAQ-0001-004\_MAIN  
 Plot File: \\LOCAL\OXY\_SHELL\_B-2\0001 GTET-BSAT-FLEX-DSN-SDL-ACRT-CBG\POROSITY\AHV Plot\_INSITE\_IQ

## ANNULAR HOLE VOLUME PLOT

AHV PLOT CALCULATED FOR 5.5" CASING

