

HERMAN L. LOEB, LLC										SPECTRAL DENSITY DUAL SPACED NEUTRON LOG																			
COMPANY					PETRA 1-8					COMPANY					HERMAN L. LOEB, LLC														
WELL					ALFORD					WELL					PETRA 1-8														
FIELD/BLOCK					KIOWA					FIELD/BLOCK					ALFORD														
COUNTY					KANSAS					COUNTY					KIOWA														
STATE					KANSAS					STATE					KANSAS														
Permanent Datum					GL					Sect. 8					Twp. 30S					Rge. 18W					Other Services: MICROLOG ACRT BSAT				
Log measured from					KB					Elev. 2230.0 ft					Elev.: K.B.					2243.0 ft									
Drilling measured from					KB					13.0 ft above perm. Datum					D.F.					2242.0 ft									
Date					12-Apr-15										G.L.					2230.0 ft									
Run No.					ONE																								
Depth - Driller					5375.00 ft																								
Depth - Logger					5375.0 ft																								
Bottom - Logged Interval					5331.0 ft																								
Top - Logged Interval					4000.0 ft																								
Casing - Driller					8.625 in @ 634.0 ft										@														
Casing - Logger					634.0 ft															@									
Bit Size					7.875 in										@														
Type Fluid in Hole					Water Based Mud															@									
Density					9.3 ppg					61.00 s/qt																			
PH					11.00 pH					9.6 cp/m																			
Source of Sample					MUD PIT																								
Rm @ Meas. Temperature					0.440 ohmm @ 72.00 degF										@					@									
Rmf @ Meas. Temperature					0.39 ohmm @ 72.00 degF										@					@									
Rmc @ Meas. Temperature					0.530 ohmm @ 72.00 degF										@					@									
Source Rmf					Rmc					MEASURED																			
Rm @ BHT					0.26 ohmm @ 128.0 degF										@					@									
Time Since Circulation					5.0000 hr																								
Time on Bottom					12-Apr-15 06:36:45.000																								
Max. Rec. Temperature					128.0 degF @ 5375.0 ft										@					@									
Equipment					Location					11072142					LIBERAL														
Recorded By					J. BOLLUM																								
Witnessed By					J. CHRISTENSEN																								

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Service Ticket No.: 902313850				API Serial No.: 15-097-21820-00-00				PGM Version: WL INSITE R4.6.4 (Build 3)						
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	N/A				
Rmc @ Meas. Temp.		@		@			I962_S909							
Source Rmf	Rmc					ONE	MICROLOG	RUBBER	ADJ	N/A				
Rm @ BHT		@		@			11014296							
Rmf @ BHT		@		@										
Rmc @ BHT		@		@										
EQUIPMENT DATA														
GAMMA		ACOUSTIC				DENSITY		NEUTRON						
Run No.	ONE		Run No.	ONE		Run No.	ONE		Run No.	ONE				
Serial No.	11048627		Serial No.	10767683		Serial No.	10865884		Serial No.	11055304				
Model No.	GTET		Model No.	BSAT		Model No.	SDLT-I		Model No.	DSNT-I				
Diameter	3.625"		No. of Cent.	2		Diameter	4.5"		Diameter	3.625"				
Detector Model No.	T-102		Spacing	6"		Log Type	GAM-GAM		Log Type	NEU-NEU				
Type	SCINT					Source Type	CS137		Source Type	AM241BE				
Length	8'		LSA [Y/N]	NO		Serial No.	5168GW		Serial No.	DSN-424				
Distance to Source	10'		FWDA [Y/N]	NO		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	5375	4000	REC	0	150	30	-10	47.6	30	-10	2.71	30	-10	LIME

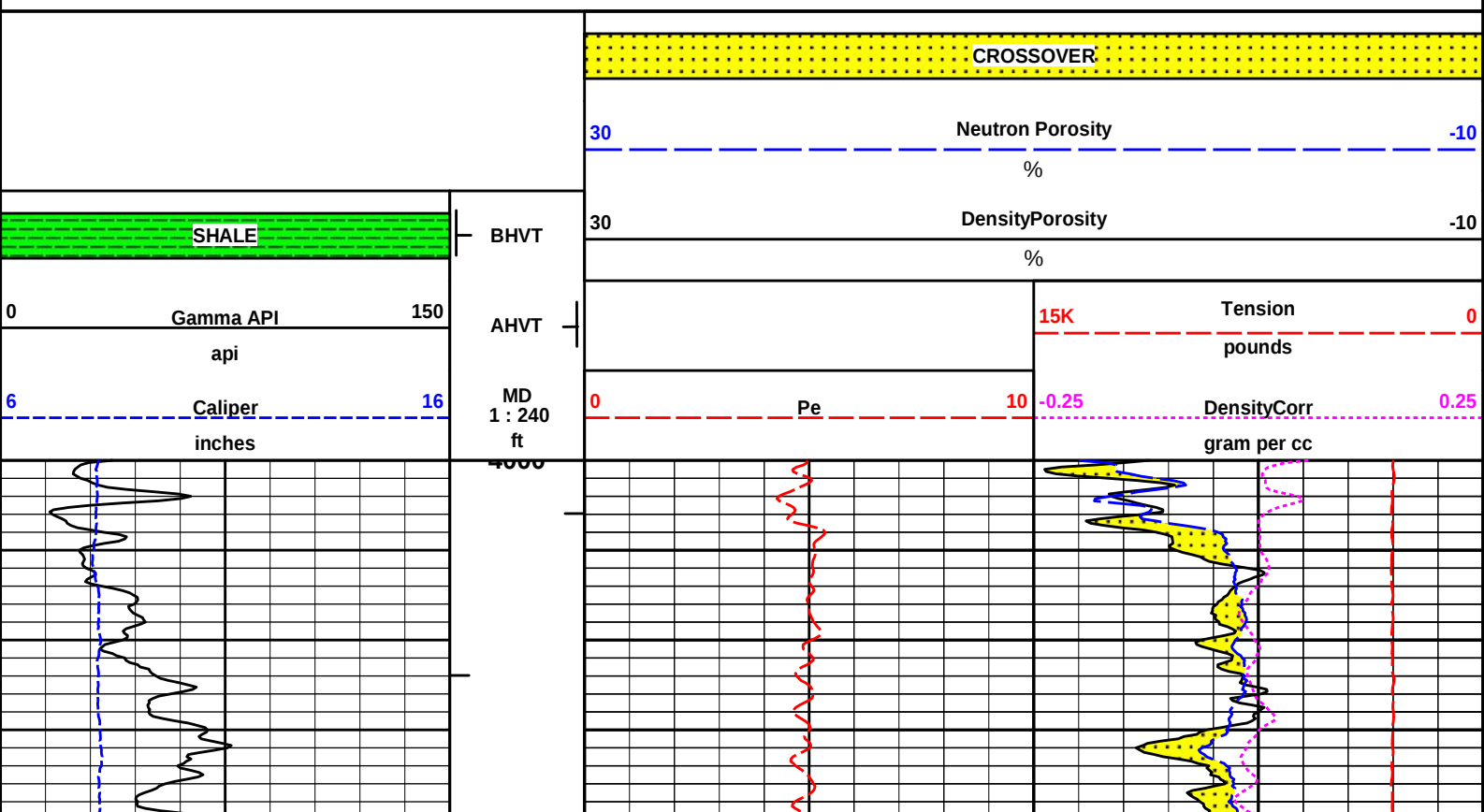
DIRECTIONAL INFORMATION															
Maximum Deviation @									KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING CHLORIDES REPORTED AT 10,000 MG/L LCM REPORTED AT 3 LB/BBL GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION PRE-CALIBRATIONS NOT PERFORMED DUE TO RAINFALL AND LIGHTNING															
TODAY'S CREW: F. VILLA & K. KING															
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123															
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															

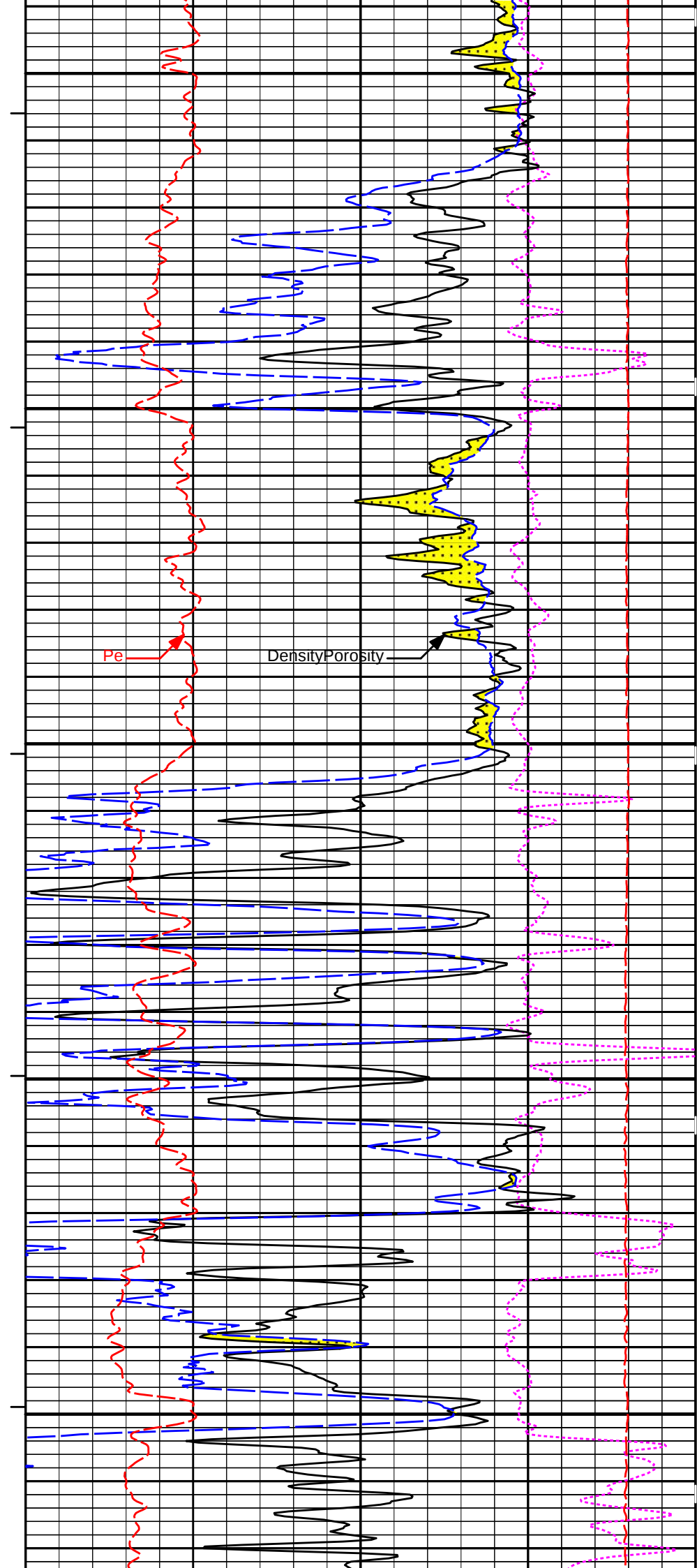
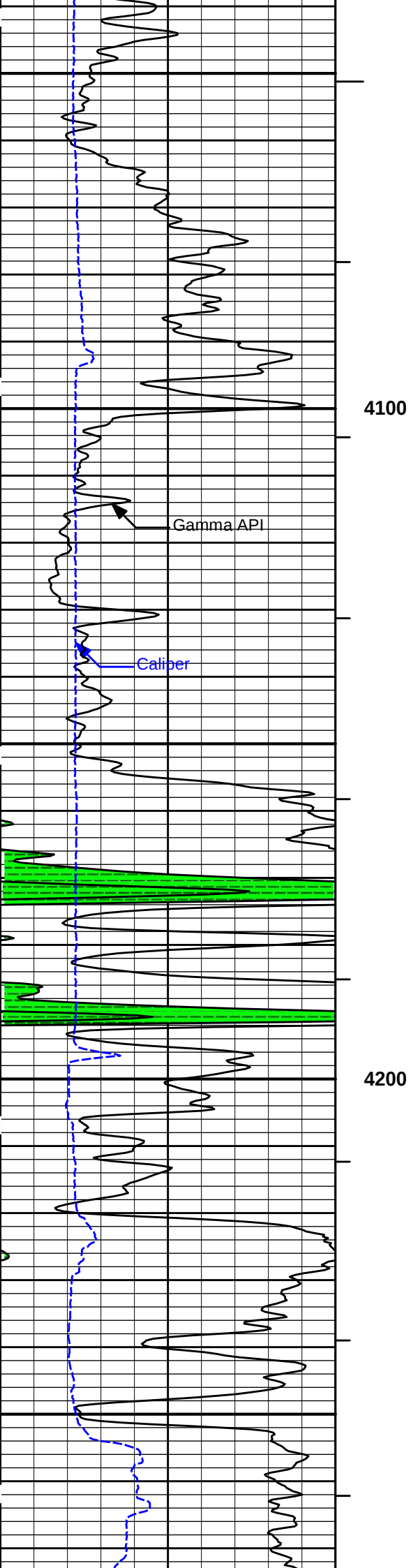
HALLIBURTON

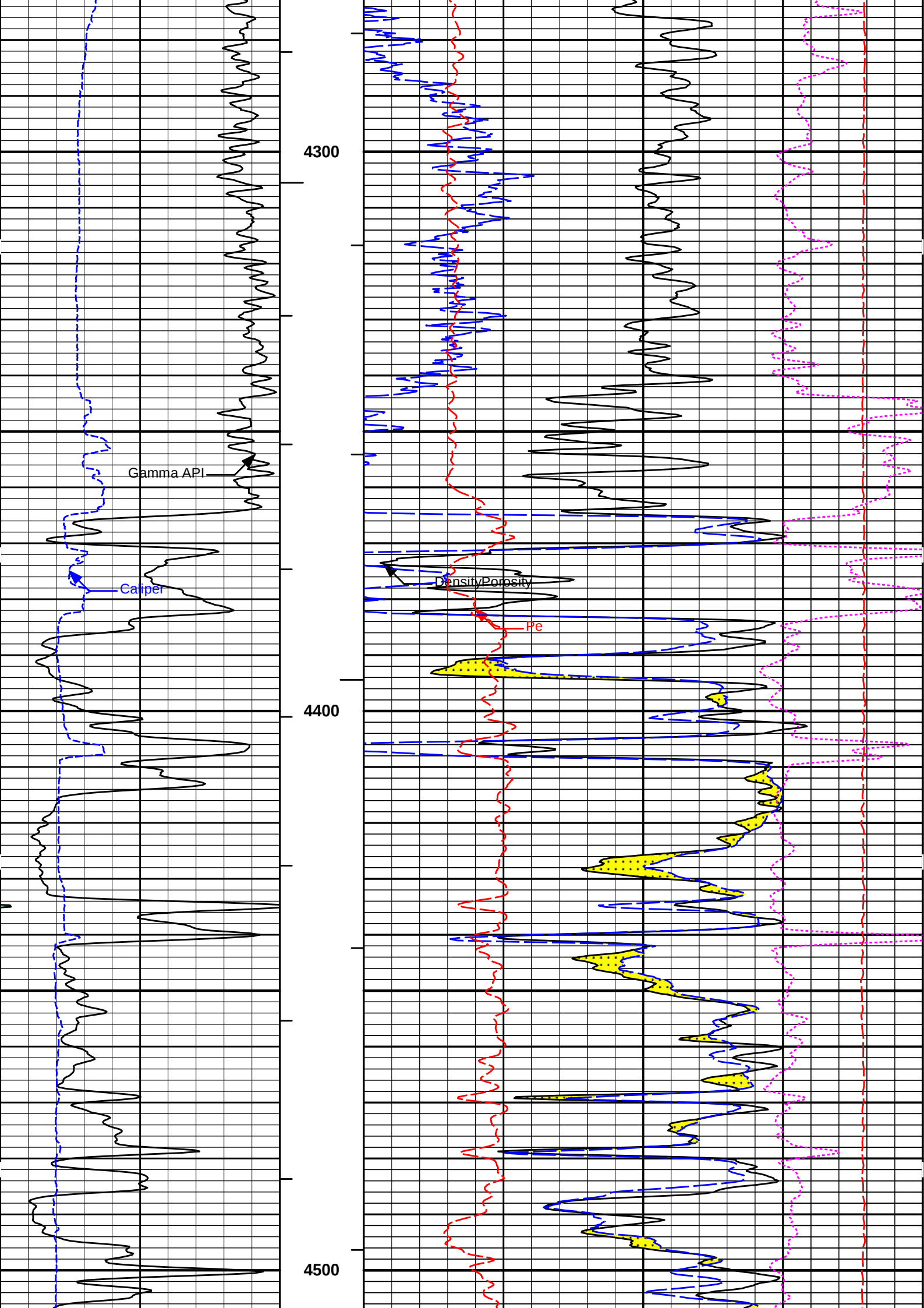
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Plot Range: 4000 ft to 5379 ft
Data: PETRA_1-8\Well Based\DETAIL\
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

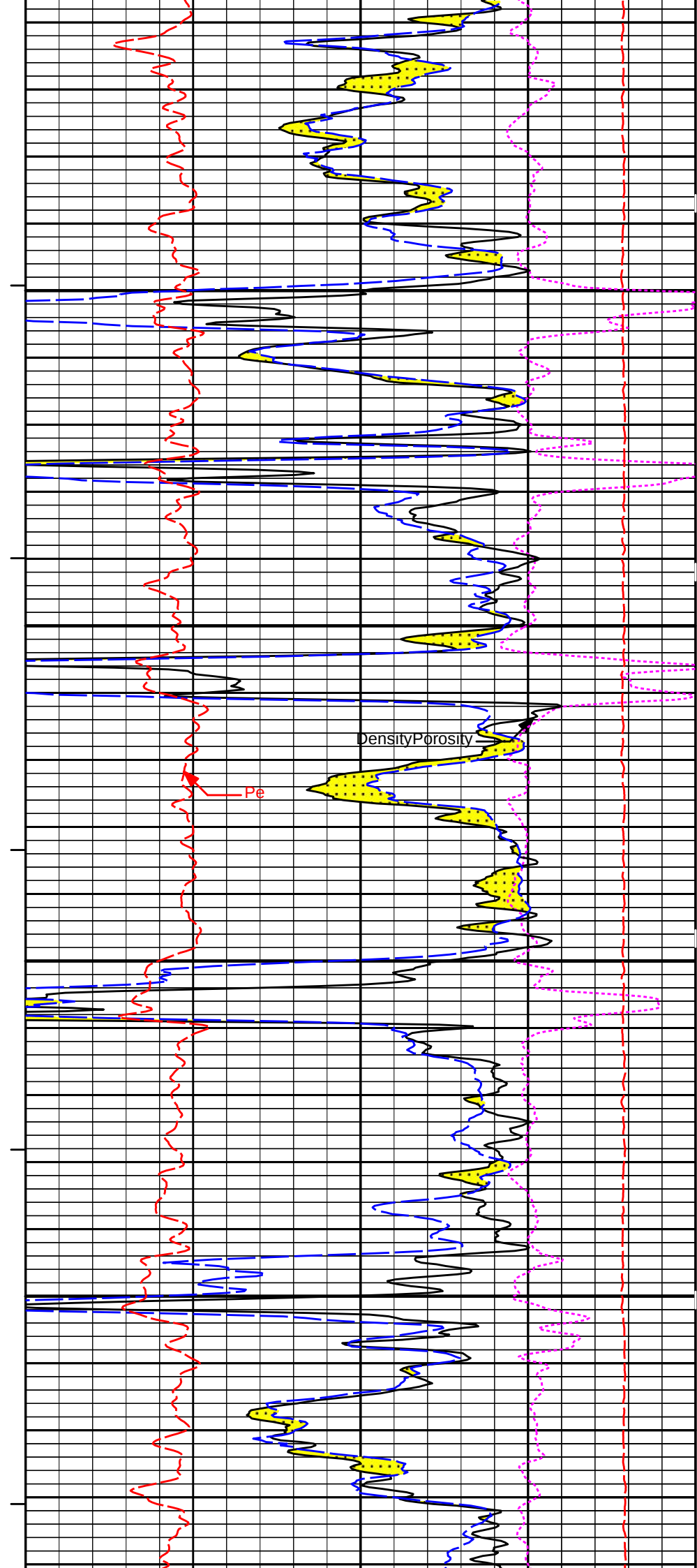
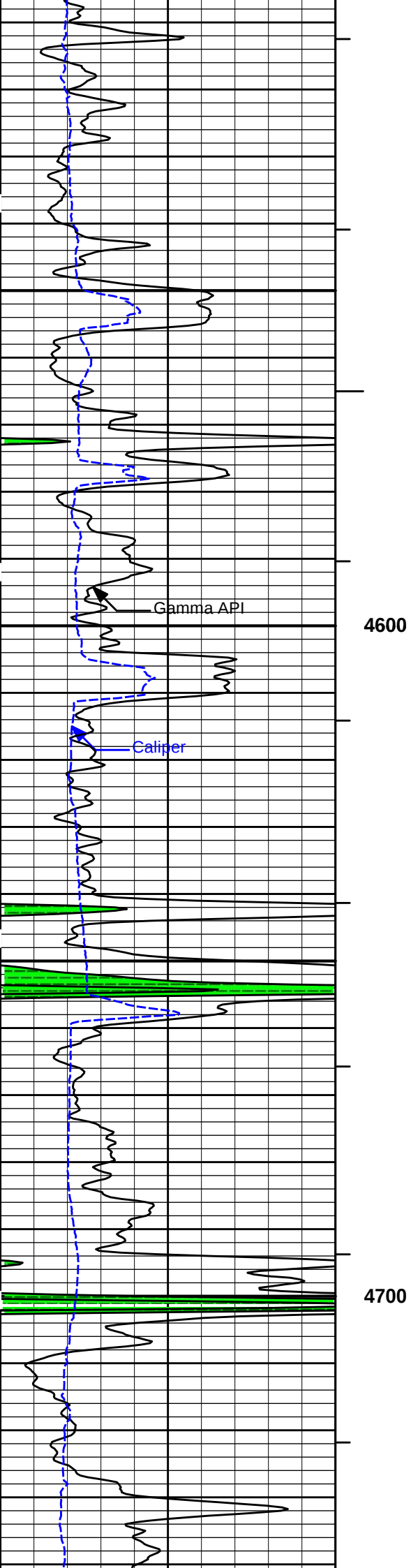
5 INCH MAIN LOG

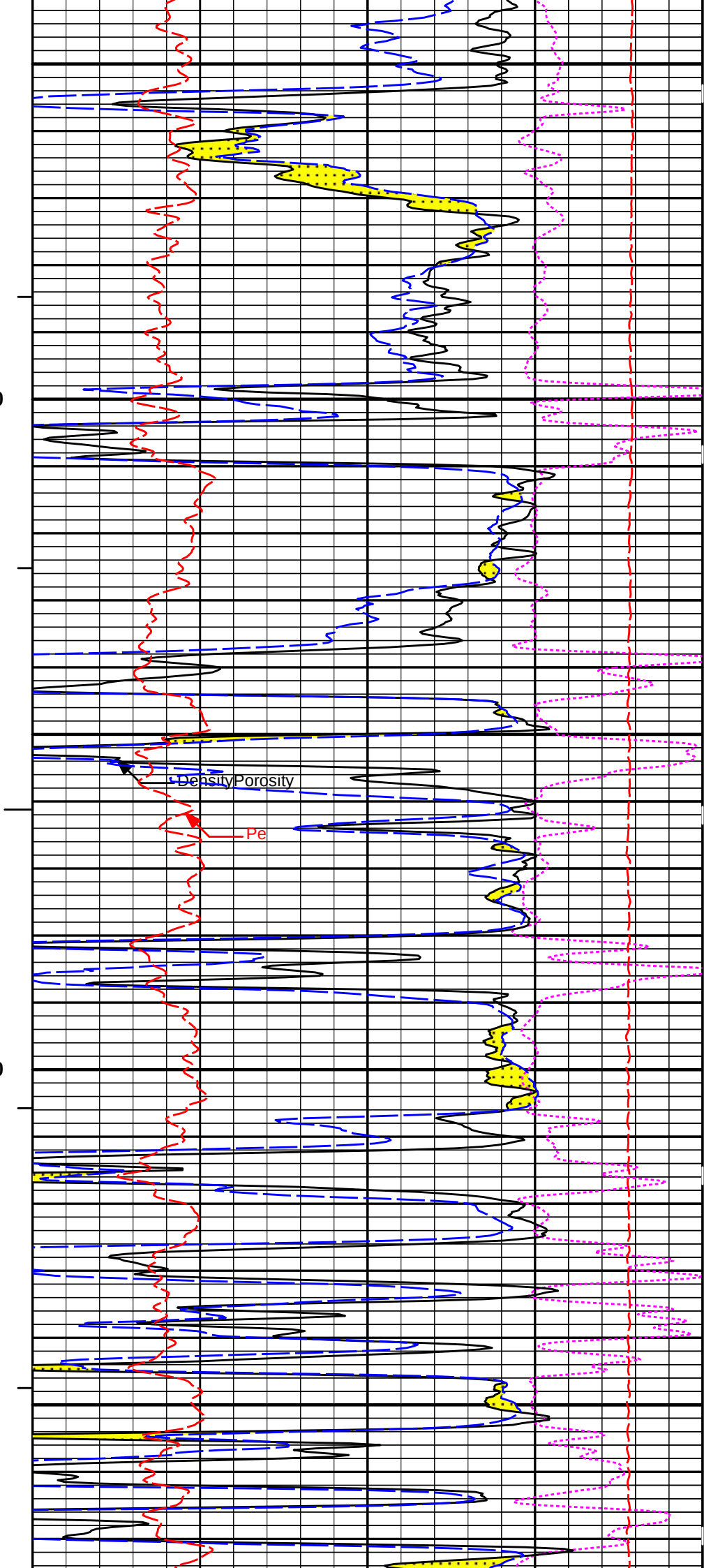
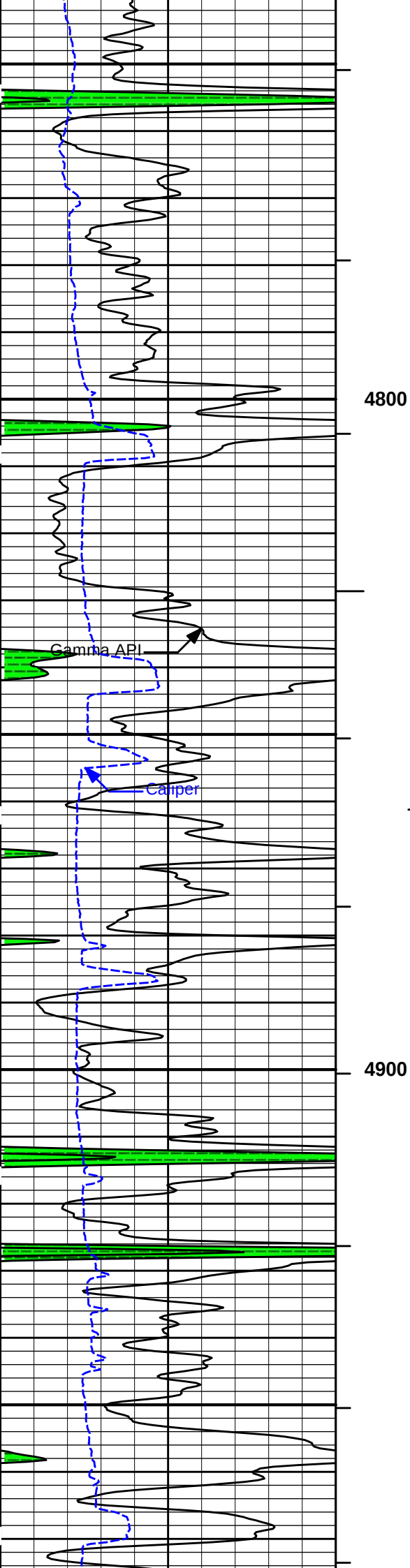
MEASURED DEPTH
MAIN SECTION 5" PER 100'

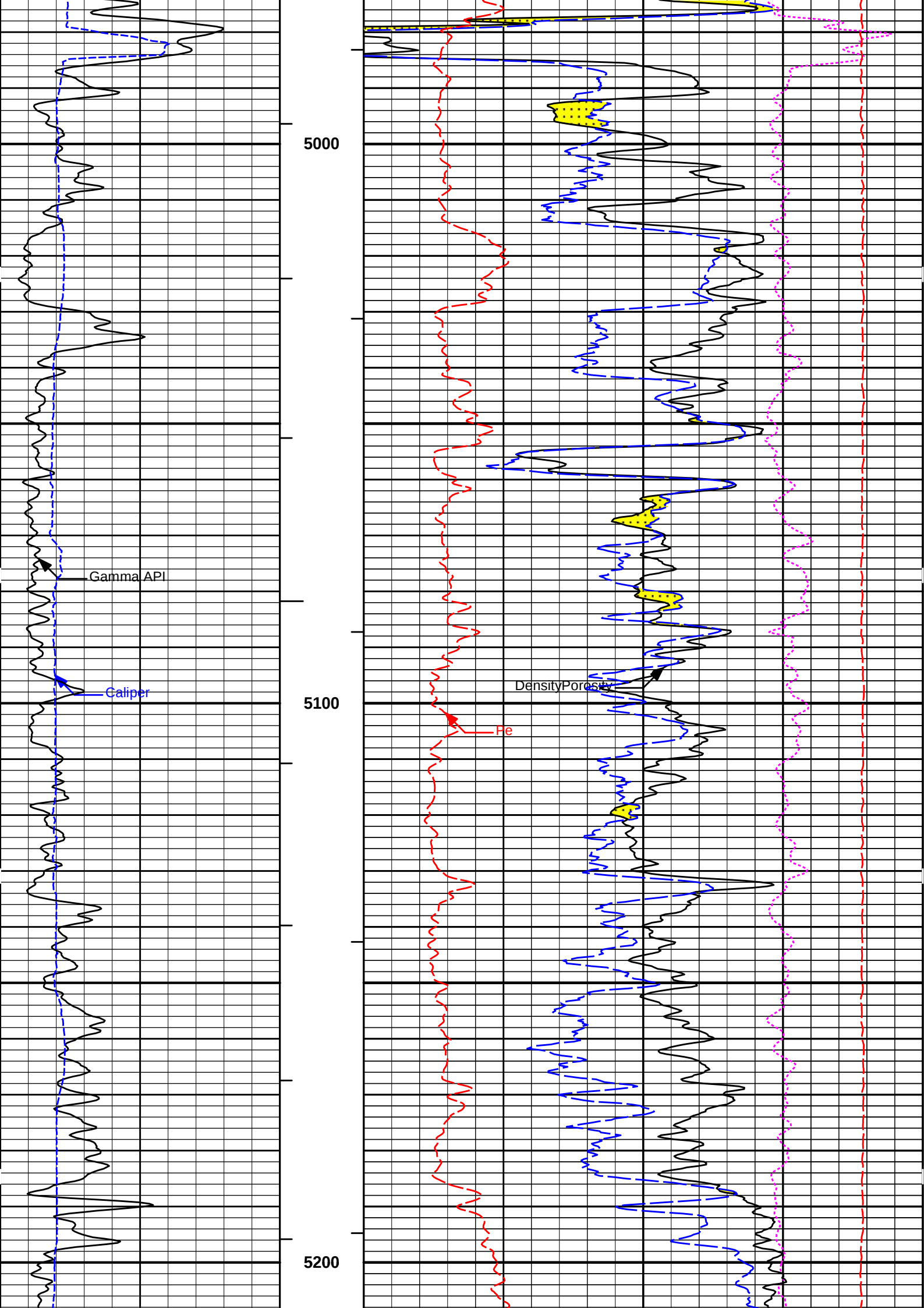


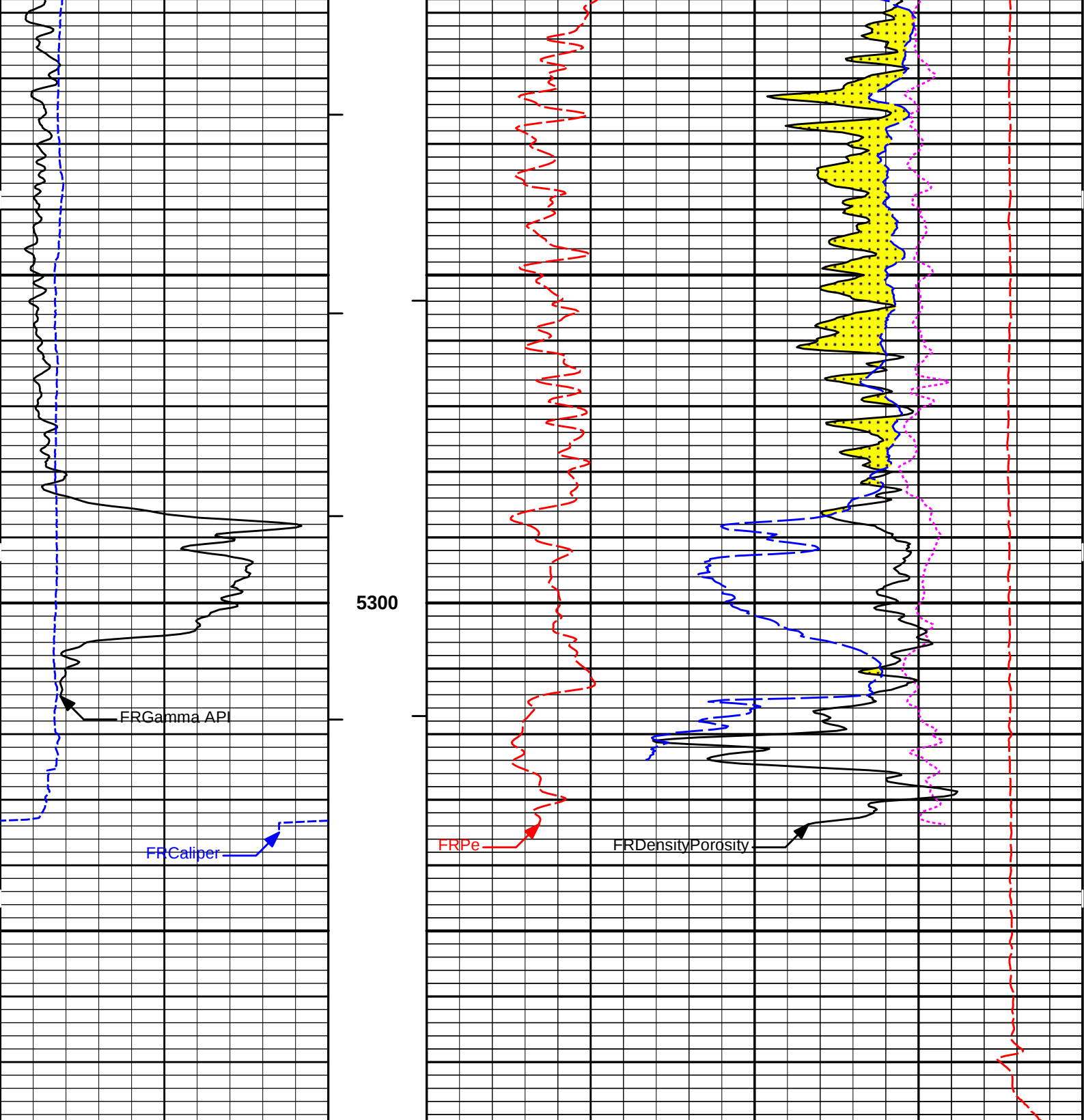












6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
	SHALE		BHVT	30	DensityPorosity				-10
					%				
				30	Neutron Porosity				-10
					%				
					CROSSOVER				

HALLIBURTON

Plot Time: 12-Apr-15 08:34:23
 Plot Range: 4000 ft to 5379 ft
 Data: PETRA_1-8(Well Based\DETAIL)
 Plot File: \\PORO\Porc_IO_5_MAIN_LIB

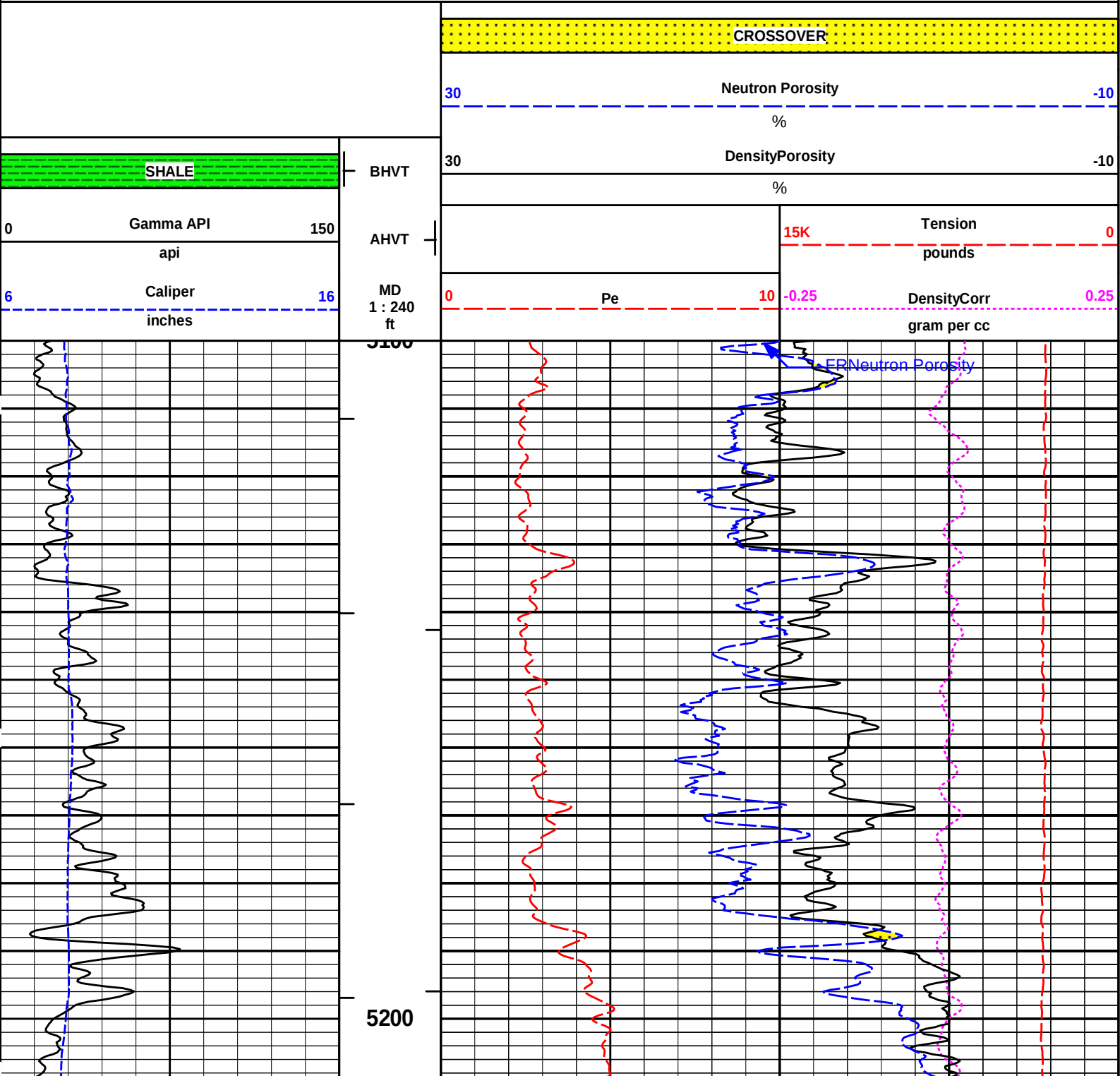
5 INCH MAIN LOG

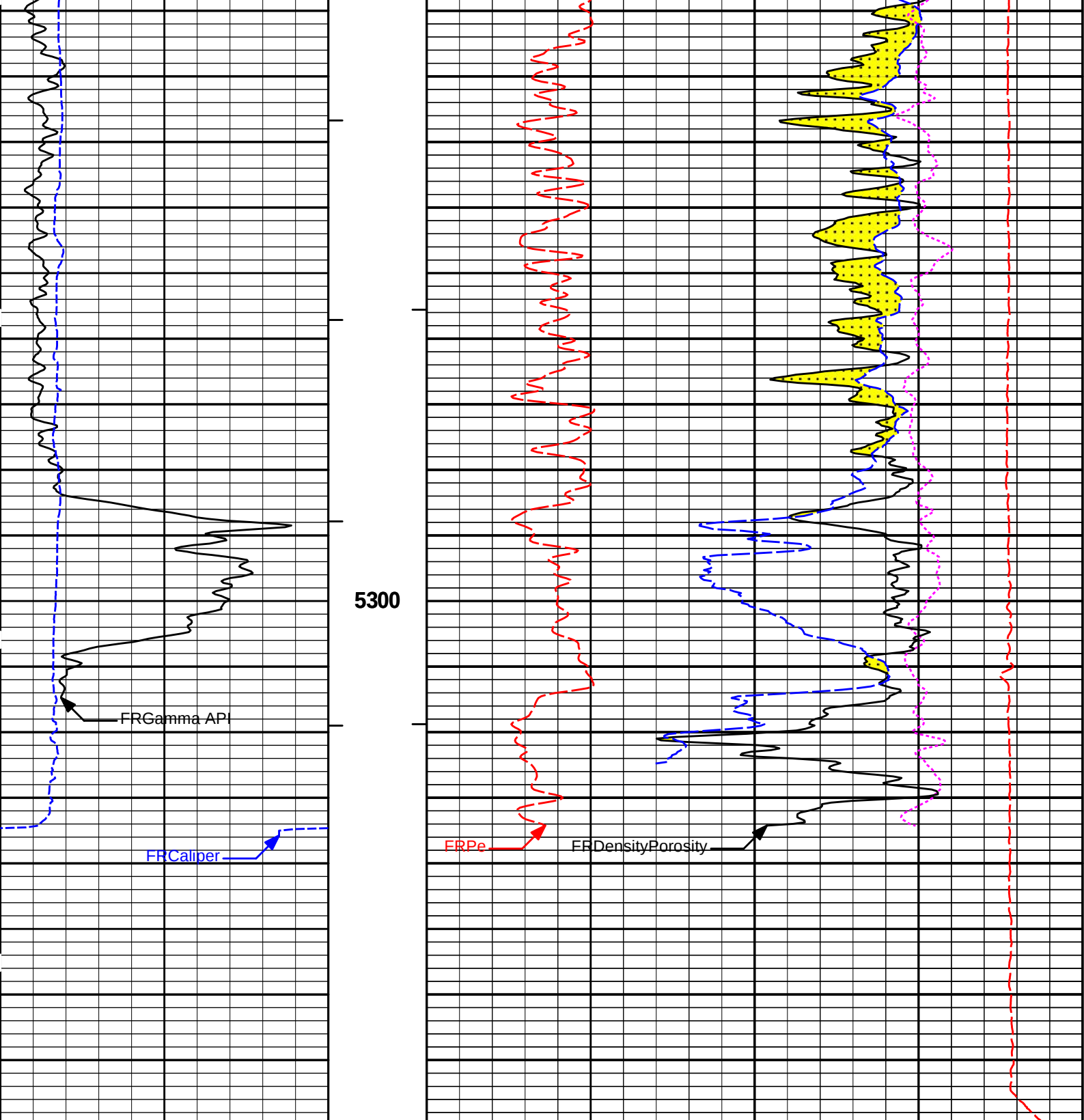
MEASURED DEPTH
MAIN SECTION 5" PER 100'

HALLIBURTON

Plot Time: 12-Apr-15 08:34:23
Plot Range: 5100 ft to 5379.58 ft
Data: PETRA_1-8\Well Based\REPEAT\
Plot File: \\PORO\Porosity_Q5_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: 12-Apr-15 08:34:25
 Plot Range: 5100 ft to 5379.58 ft
 Data: PETRA_1-8\Well Based\REPEAT\
 Plot File: \\PORD\Porc_IO_5_REP_LIR

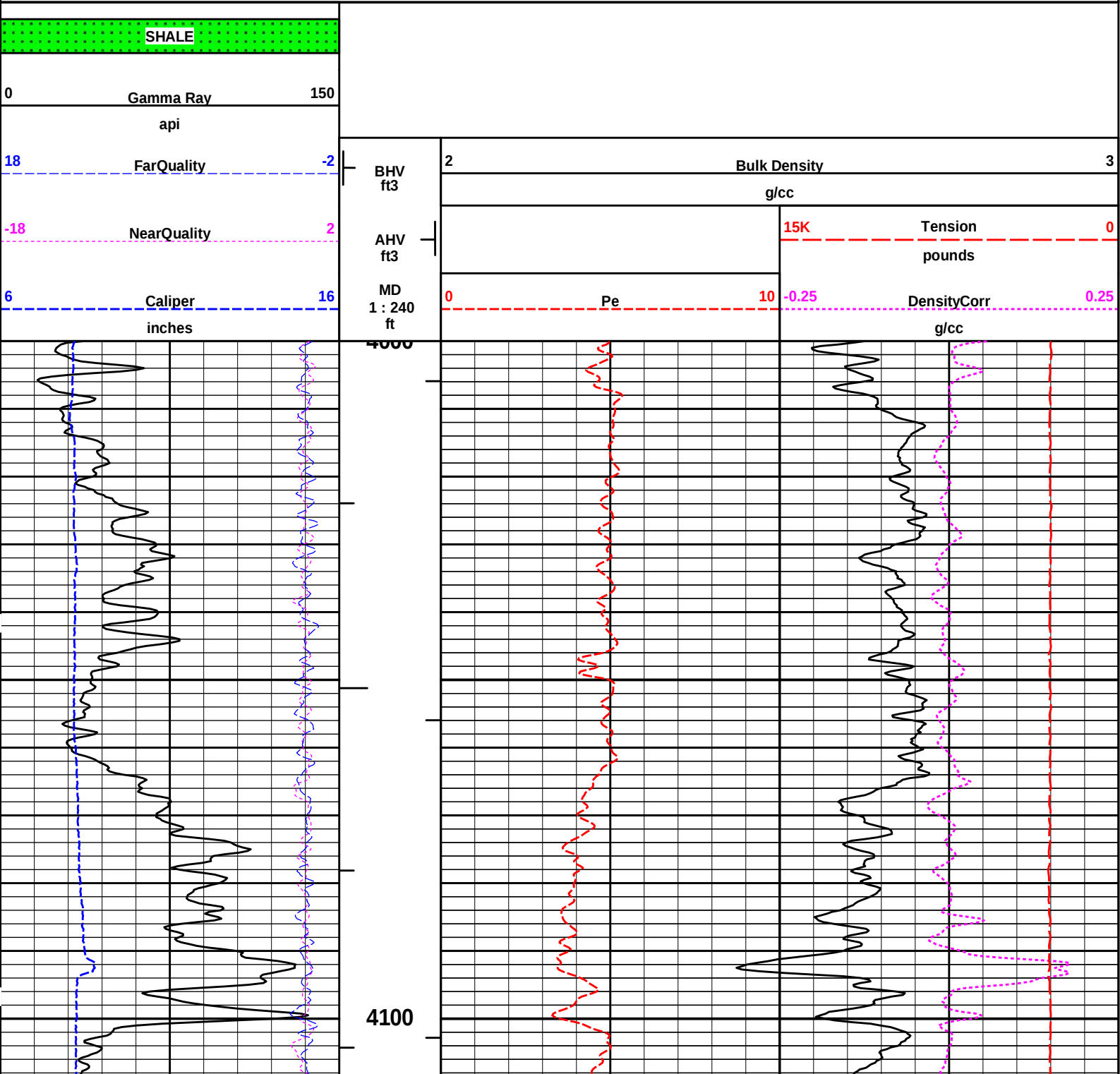
REPEAT SECTION

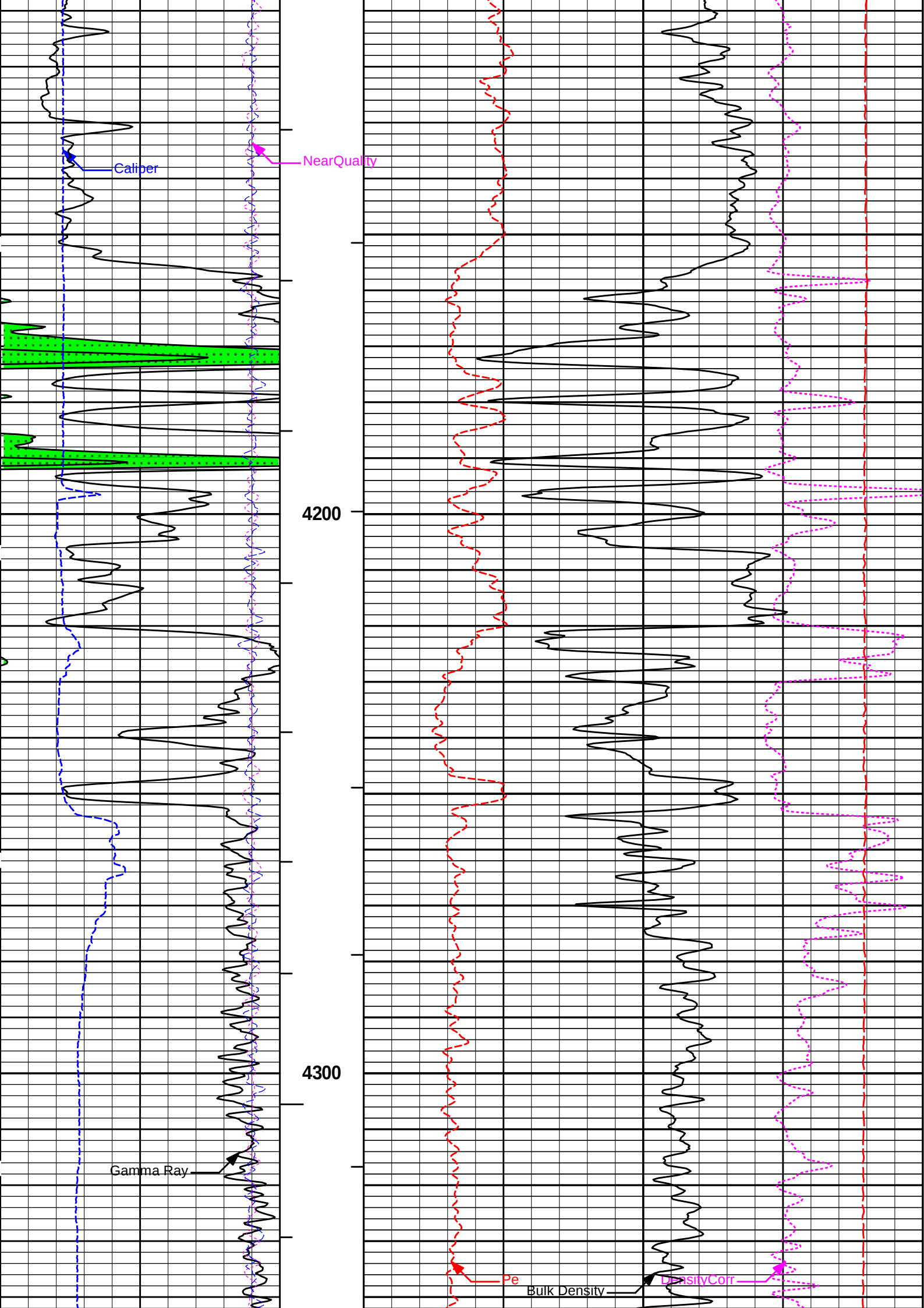
HALLIBURTON

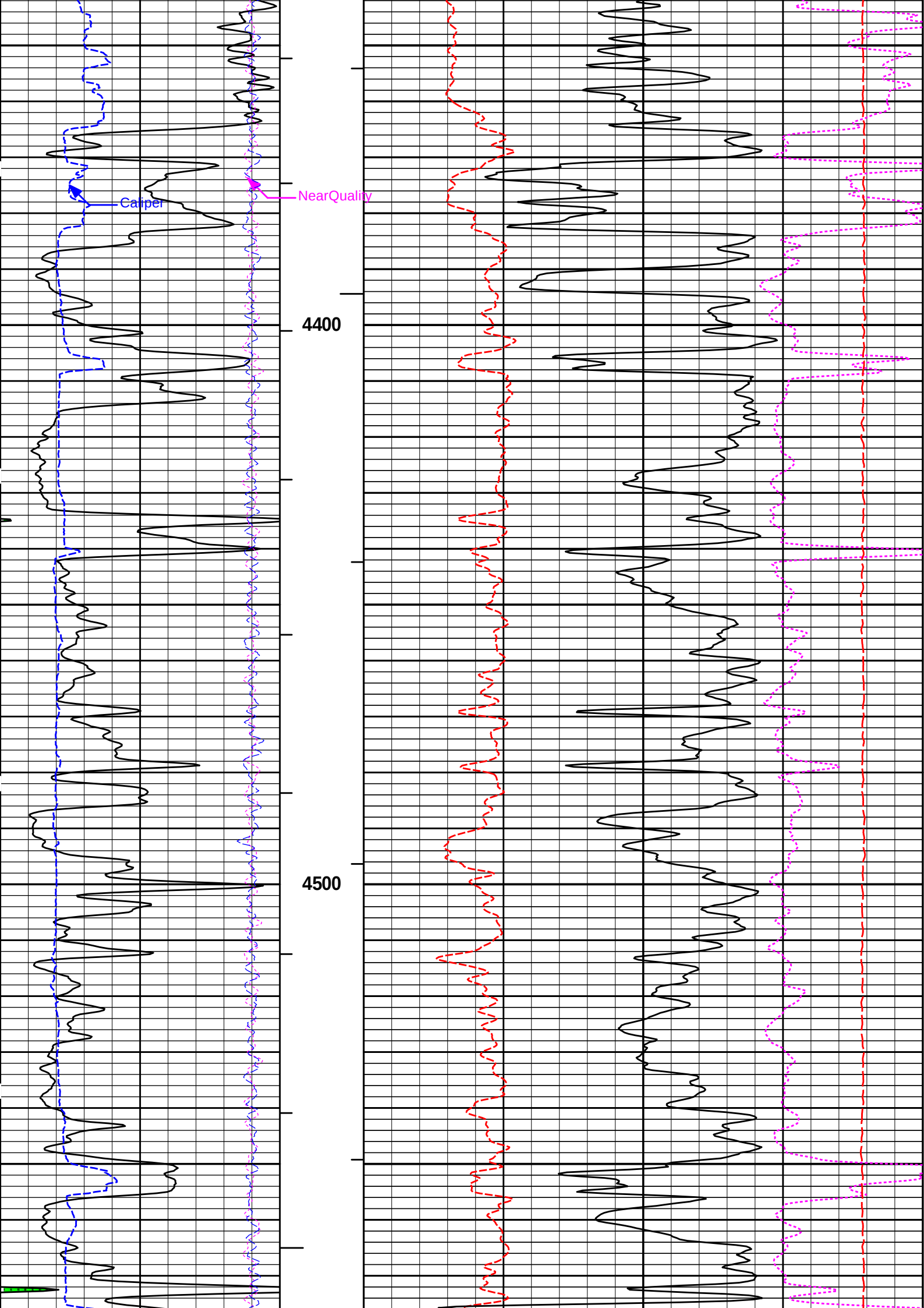
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Data: PETRA_1-8\Well Based\DETAIL\
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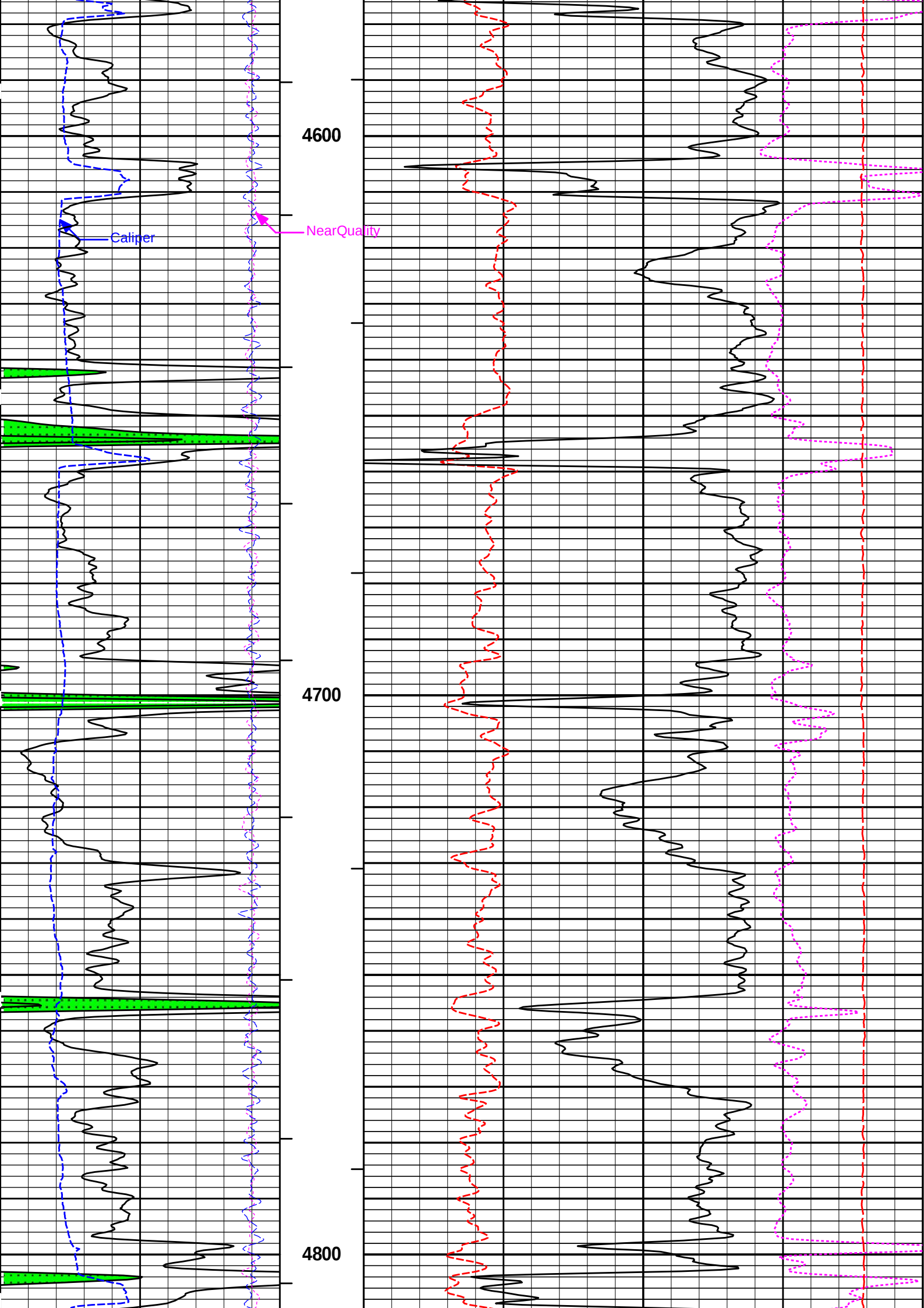
5 INCH MAIN LOG

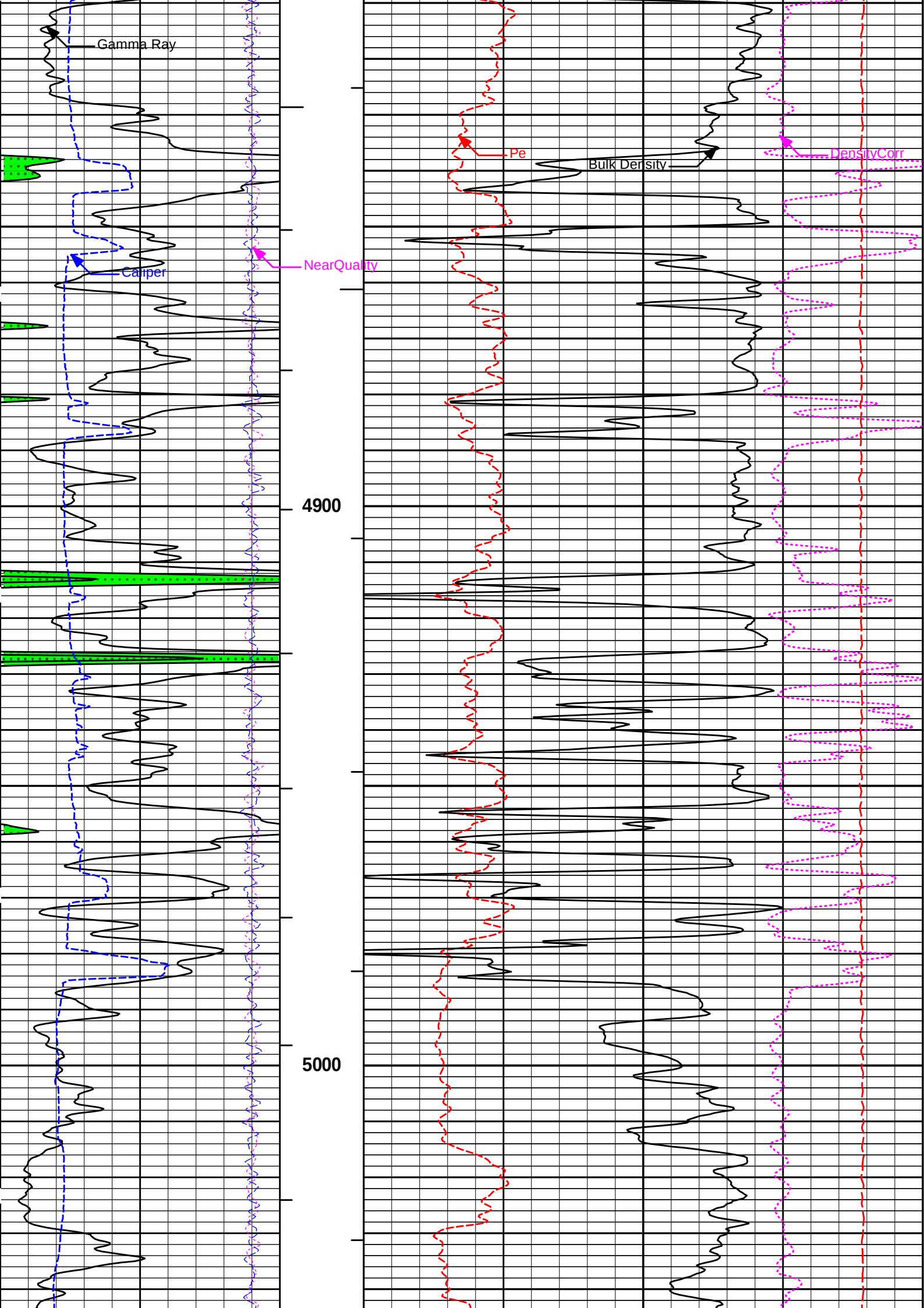
MEASURED DEPTH
MAIN SECTION 5" PER 100'

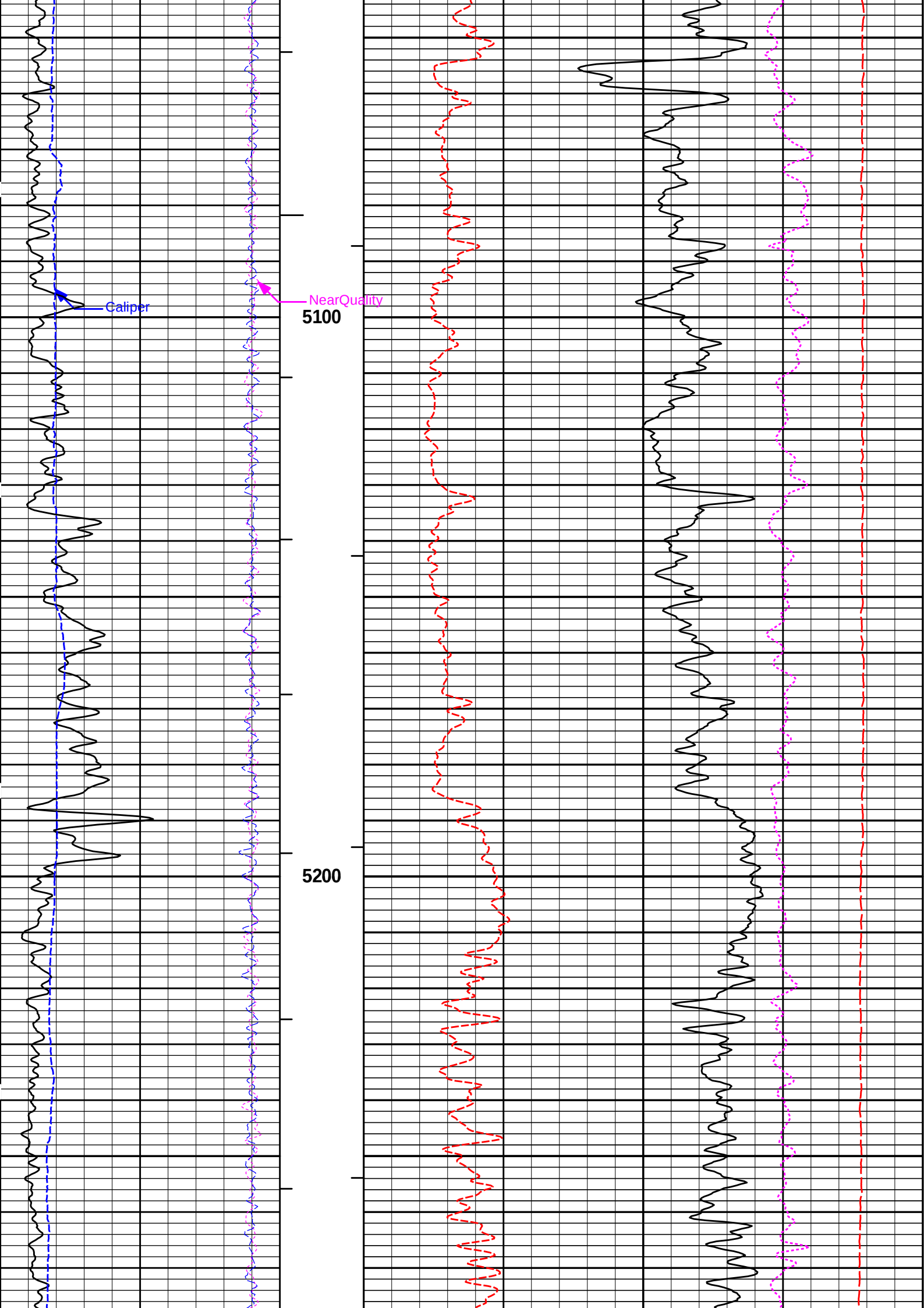


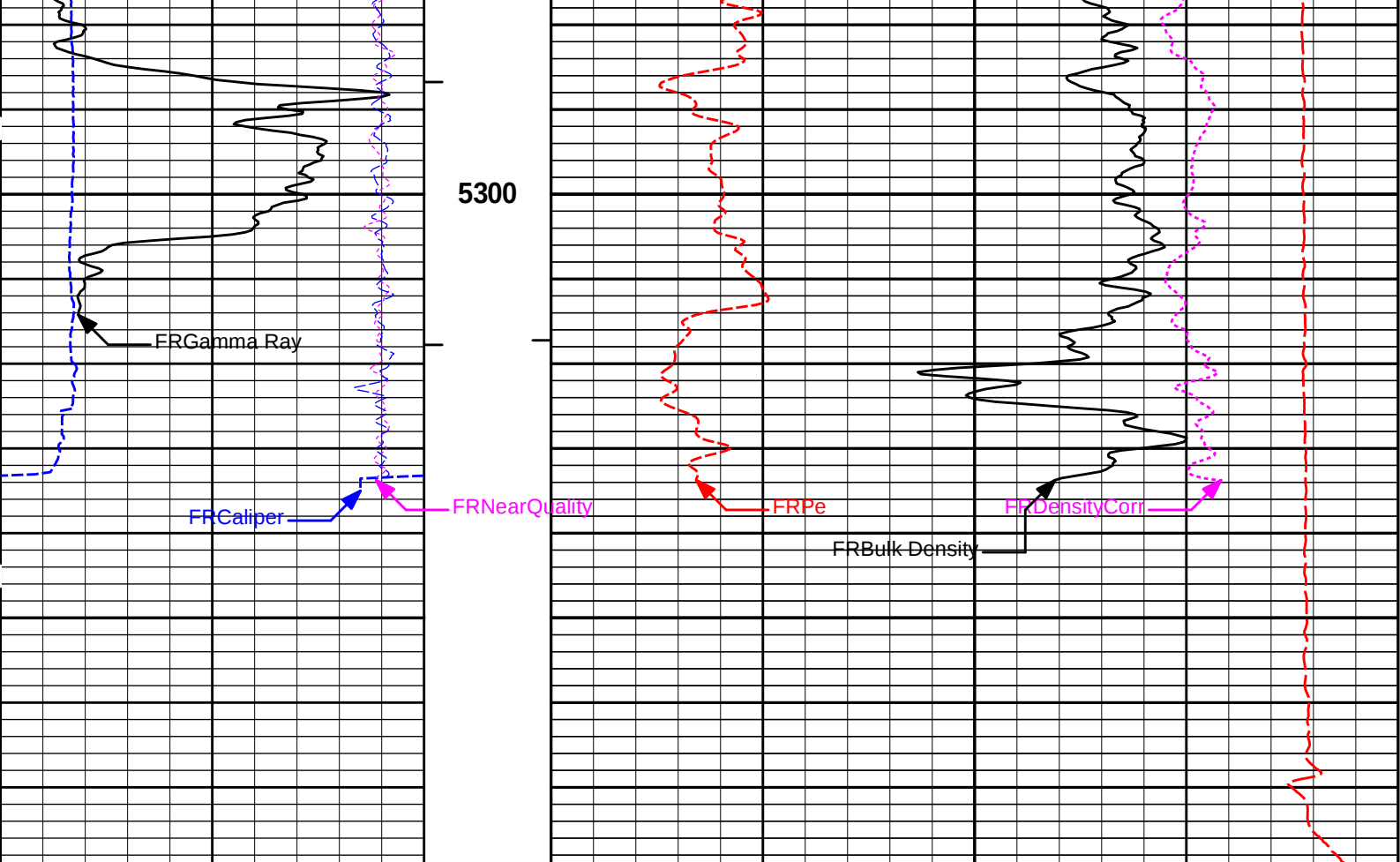












6	Caliper	16	MD 1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25
								g/cc	
-18	NearQuality	2	AHV ft3				15K	Tension	0
								pounds	
18	FarQuality	-2	BHV ft3	2	Bulk Density				3
					g/cc				
0	Gamma Ray	150							
	api								
	SHALE								

HALLIBURTON

Plot Time: 12-Apr-15 08:34:28
Plot Range: 4000 ft to 5379 ft
Data: PETRA_1-8\Well Based\DETAIL\
Plot File: \\LOCAL-1\PETRA_1-8\0001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIPORO\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

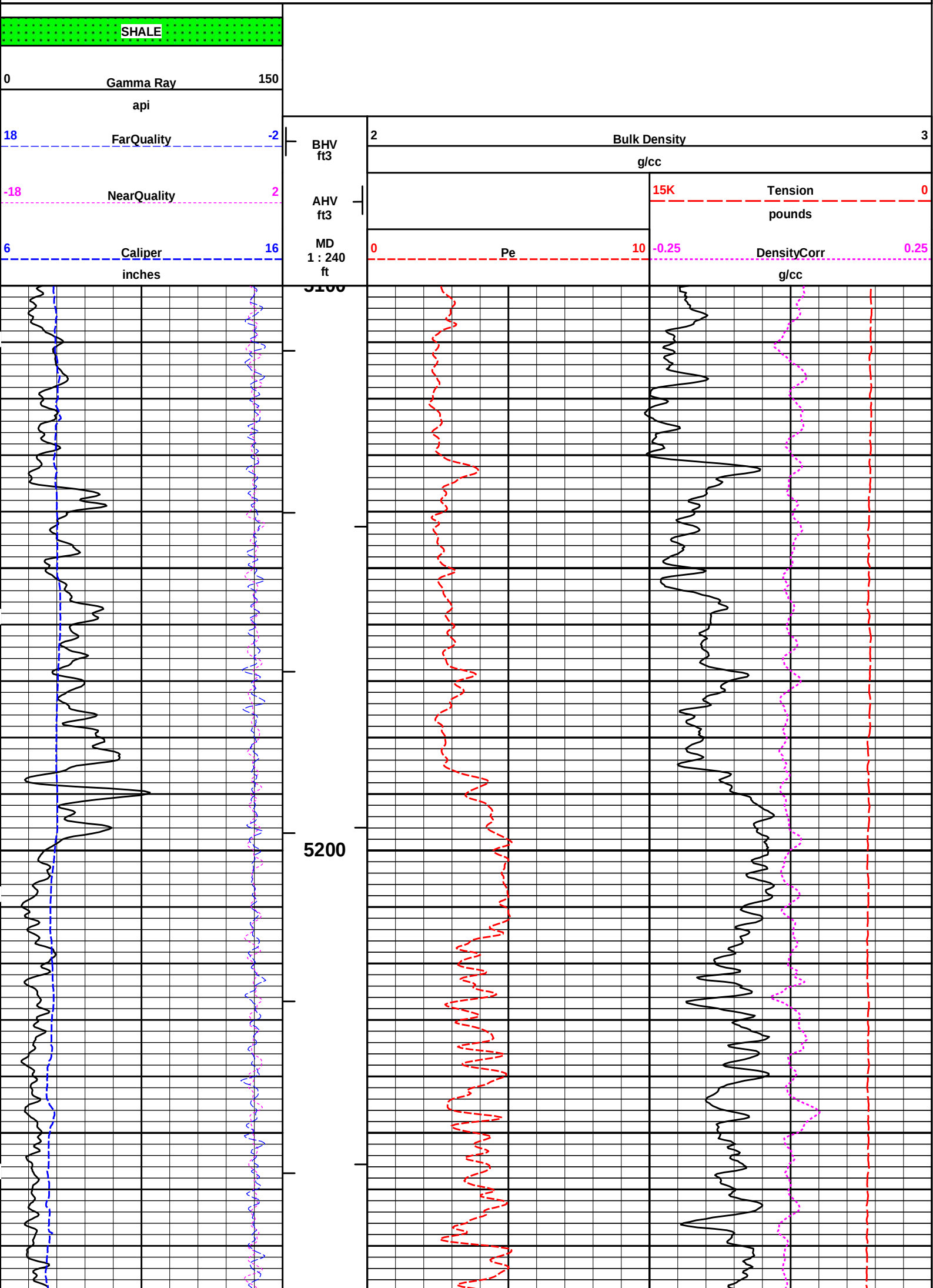
MEASURED DEPTH
MAIN SECTION 5" PER 100'

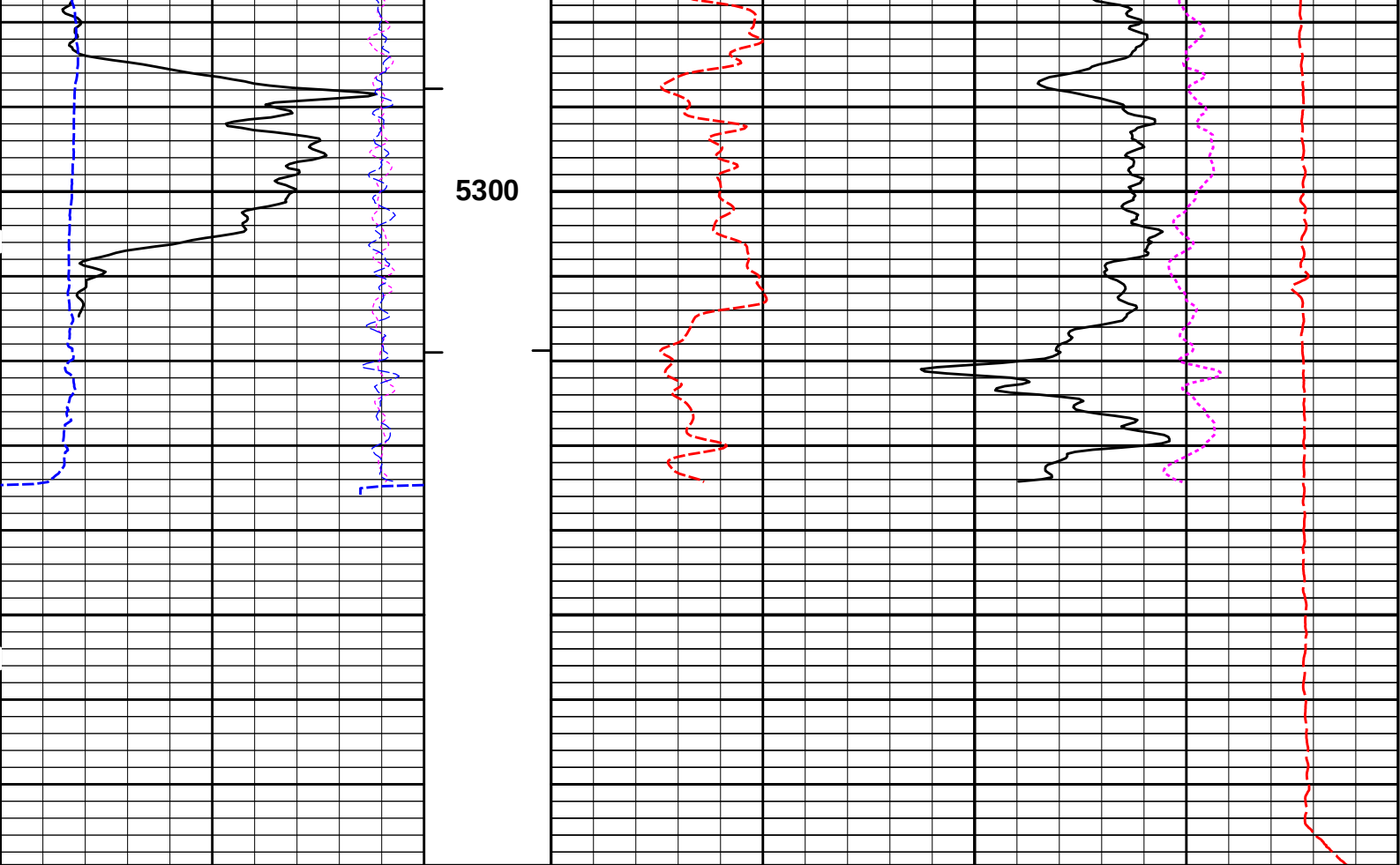
HALLIBURTON

Plot Time: 12-Apr-15 08:34:28
Plot Range: 5100 ft to 5379.58 ft
Data: PETRA_1-8\Well Based\REPEAT\
Plot File: \\LOCAL-1\PETRA_1-8\0001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIPORO\BULKD_5_REP_LIB

REPEAT SECTION

REPEAT SECTION





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

HALLIBURTON	Plot Time: 12-Apr-15 08:34:29 Plot Range: 5100 ft to 5379.58 ft Data: PETRA_1-8\Well Based\REPEAT\ Plot File: \\LOCAL-1\PETRA_1-8\0001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIPORO\BULKD_5_REP_LIB REPEAT SECTION
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HALLIBURTON
TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-12156658 135.00 lbs		Ø 3.625 in		← Load Cell @ 76.35 ft ← BH Temperature @ 75.79 ft	6.25 ft	80.04 ft

SP Sub-12345678
60.00 lbs

Ø 3.625 in →

← SP @ 72.01 ft

3.74 ft

73.79 ft

70.05 ft

GTET-11048627
165.00 lbs

Ø 3.625 in →

8.52 ft

← GammaRay @ 63.99 ft

61.53 ft

DSNT-11055304
174.00 lbs

DSN Decentralizer-
11019643
6.60 lbs

Ø 5.000 in* →

Ø 3.625 in →

9.69 ft

← DSN Far @ 54.59 ft

← DSN Near @ 53.84 ft

51.84 ft

SDLT-11014296
360.00 lbs

SDLT Pad-10865884
65.00 lbs
Microlog Pad-11014296
8.00 lbs

Ø 4.500 in →

Ø 4.750 in* →

Ø 4.750 in* →

10.81 ft

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

41.03 ft

IQ Flex-00000001
140.00 lbs

Ø 3.625 in →

5.67 ft

35.36 ft

BSAT-10747683
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 26.84 ft

15.77 ft

19.58 ft

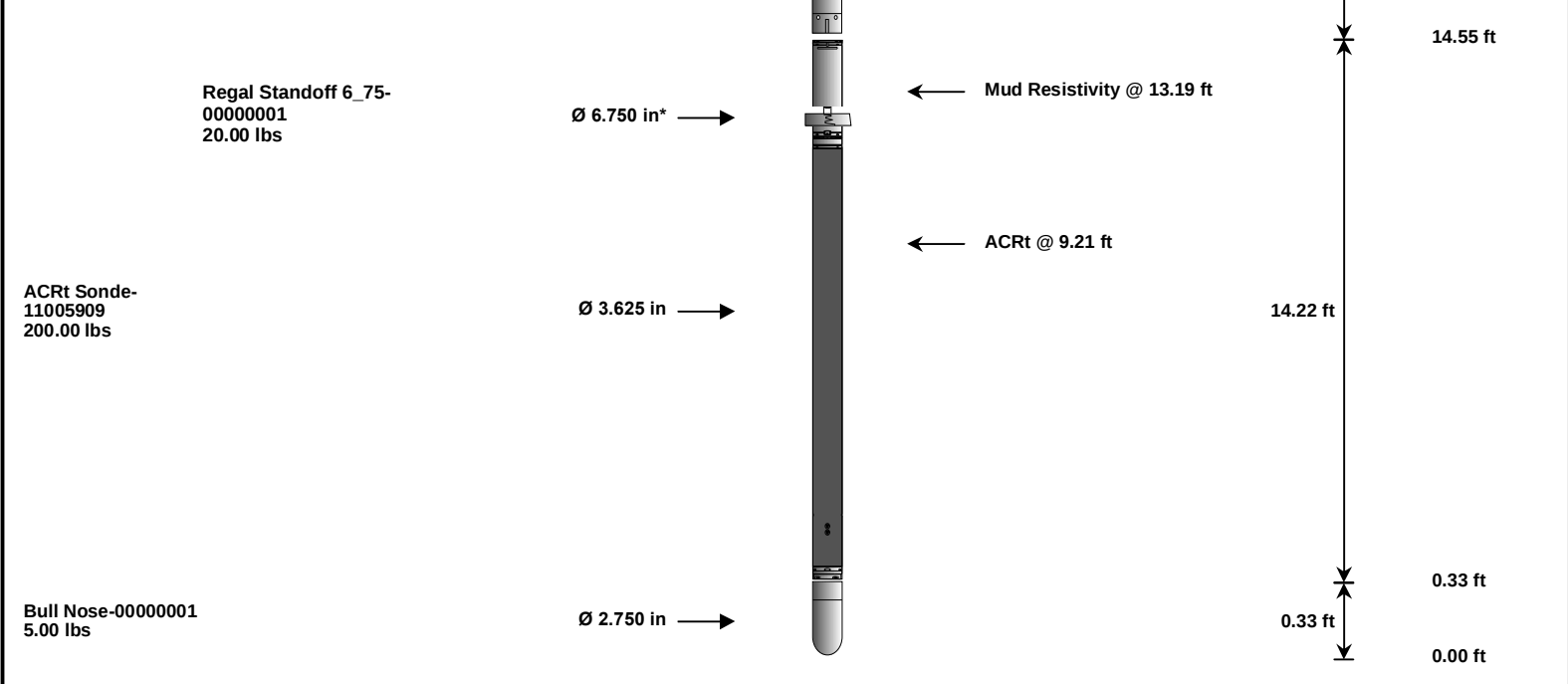
ACRt Instrument-
11022962
50.00 lbs

Centralizer 25-00000002
8.00 lbs

Ø 3.625 in →

Ø 4.000 in* →

5.03 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)	
RWCH	Releasable Wireline Cable Head		12156658	135.00	6.25	73.79	300.00	
SP	SP Sub		12345678	60.00	3.74	70.05	300.00	
GTET	Gamma Telemetry Tool		11048627	165.00	8.52	61.53	60.00	
DSNT	Dual Spaced Neutron		11055304	174.00	9.69	51.84	60.00	
DCNT	DSN Decentralizer		11019643	6.60	5.13	*	55.17	300.00
SDLT	Spectral Density Tool		11014296	360.00	10.81		41.03	60.00
SDLP	Density Insite Pad		10865884	65.00	2.55	*	43.24	60.00
MICP	Microlog Pad		11014296	8.00	1.00	*	43.53	60.00
IQF	IQ Flex tool		00000001	140.00	5.67		35.36	300.00
BSAT	Borehole Sonic Array Tool		10747683	300.00	15.77		19.58	60.00
ACRt	Array Compensated True Resistivity Instrument Section		11022962	50.00	5.03		14.55	120.00
OBCEN	Centralizer - 25 in. Overbody		00000002	8.00	2.08	*	15.92	300.00
ACRt	Array Compensated True Resistivity Sonde Section		11005909	200.00	14.22		0.33	120.00
RSOF	Regal Standoff 6.75in		00000001	20.00	0.52	*	12.25	300.00
BLNS	Bull Nose		00000001	5.00	0.33		0.00	300.00
Total				1,696.60	80.04			
* Not included in Total Length and Length Accumulation.								
Data: PETRA_1-8I0001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIDLE								
Date: 12-Apr-15 05:54:05								

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11048627	Reference Calibration Date:	30-Mar-15 15:50:45
Engineer:	SUHAIL BISHTI	Calibration Date:	30-Mar-15 15:53:53
Software Version:	WL INSITE R4.6.4 (Build 3)	Calibration Version:	1

Calibrator Source S/N: Error			
Calibrator API Reference:265.00 api			
Equivalent Calibrator API Reference:269.6 api			
Measurement	Measured	Calibrated	Units
Background	52.6	52.1	api
Background + Calibrator	324.9	321.7	api
Calibrator	272.3	269.6	api

DUAL SPACED NEUTRON SHOP CALIBRATION			
Tool Name:	DSNT - 11055304	Reference Calibration Date:	30-Mar-15 13:58:48
Engineer:	SUHAIL BISHTI	Calibration Date:	30-Mar-15 14:11:46

Software Version:WL INSITE R4.6.4 (Build 3)

Calibration Version:1

Logging Source S/N: DSN-424

Tank Serial Number: LIBERAL WATER TANK

Reference value assigned to Tank: 51.680

Snow Block S/N: 10013313

Calibration Tank Water Temperature: 65 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.982	0.981	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):	0.2114	0.2110	0.0004	+/- 0.0020
Calibrated Ratio:	9.74	9.73	0.014	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0619	0.02000 - 0.09000

PASS/FAIL SUMMARY

Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:SDLT - 11014296

Reference Calibration Date:04-Apr-15 11:09:13

Engineer:J. BOLLUM

Calibration Date:04-Apr-15 11:14:06

Software Version:WL INSITE R4.6.4 (Build 3)

Calibration Version:1

Host Tool Name:DSNT - 11055304

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-5117.98	-4633.65	-7000.00 - -1000.00
Pad Gain	0.0004228	0.0003904	0.000200 - 0.000600
Arm Offset	-1852.89	-2827.79	-5000.00 - 3000.00
Arm Gain	0.0004602	0.0004969	0.000300 - 0.000700
Arm Power	-0.000001182	-0.000003492	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + 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)	1.96	2.00	0.04	+/- 0.20
Medium Ring (in)	3.86	3.75	-0.11	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.58	6.50	-0.08	+/- 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
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Calibration-Coefficients Range Check:		Passed		
Ring-Measurement Check:		Passed		
PASS/FAIL SUMMARY				
Calibration-Coefficients Range Check:		Passed		
SPECTRAL DENSITY SHOP CALIBRATION				
Tool Name:	SDLT Pad - 10865884	Reference Calibration Date:	30-Mar-15 15:21:25	
Engineer:	SUHAIL BISHTI	Calibration Date:	30-Mar-15 15:40:38	
Software Version:	WL INSITE R4.6.4 (Build 3)	Calibration Version:	1	
Logging Source S/N: 5168 GW				
Aluminum Block S/N: LIBERAL ALUMINUM		Density: 2.598g/cc	Pe: 3.170	
Magnesium Block S/N: LIBERAL MAGNESIUM		Density: 1.684g/cc	Pe: 2.598	
DENSITY CALIBRATION SUMMARY				
Measurement	Previous Value	New Value	Control Limit	
Near Bar Gain	1.0190	1.0446	0.90 - 1.10	
Near Dens Gain	1.0070	1.0310	0.90 - 1.10	
Near Peak Gain	1.0048	1.0258	0.90 - 1.10	
Near Lith Gain	0.9599	0.9824	0.90 - 1.10	
Far Bar Gain	1.0137	1.0116	0.90 - 1.10	
Far Dens Gain	1.0013	1.0022	0.90 - 1.10	
Far Peak Gain	0.9903	0.9925	0.90 - 1.10	
Far Lith Gain	0.9610	0.9628	0.90 - 1.10	
Near Bar Offset	0.0598	-0.1770	NONE	
Near Dens Offset	0.1445	-0.0678	NONE	
Near Peak Offset	0.1409	-0.0376	NONE	
Near Lith Offset	0.4863	0.2983	NONE	
Far Bar Offset	0.0568	0.0770	NONE	
Far Dens Offset	0.1323	0.1242	NONE	
Far Peak Offset	0.1782	0.1569	NONE	
Far Lith Offset	0.3305	0.3154	NONE	
Near Bar Background	785.80	782.55	700 - 1450	
Near Dens Background	262.22	261.86	230 - 480	
Near Peak Background	116.57	114.91	100 - 210	
Near Lith Background	141.71	140.79	125 - 260	
Far Bar Background	489.51	492.11	450 - 900	
Far Dens Background	190.84	189.89	175 - 345	
Far Peak Background	75.80	75.89	70 - 140	
Far Lith Background	78.78	79.26	75 - 145	
CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.683	1.684	0.001	+/- 0.015
Pe	2.580	2.561	-0.019	+/- 0.150
ALUMINUM				
Density (g/cc)	2.601	2.598	-0.003	+/- 0.01500
Pe	3.146	3.129	-0.017	+/- 0.150
TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				

Background	0.0005	+/- 0.0110	0.0009	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	-0.0007	+/- 0.0140
Aluminum Block	-0.0009	+/- 0.0110	0.0011	+/- 0.0140
Resolution	8.50	6.00 - 11.50	8.99	6.00 - 11.50
Internal Verifier(B+D+P+L)	1300	1200 - 2700	837	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				

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	269.6	-----	-----	0.0	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0619	-----	-----	0.0000	+/- -.--	decp
SDLT-11014296						
Pad Extension	3.75	-----	-----	0.00	+/-0.20	in
Ring Diameter	8.25	-----	-----	0.00	+/-0.20	in
SDLT Pad-10865884						
Near(B+D+P+L)	1300.104	-----	-----	0.000	+/-12.776	cps
Far(B+D+P+L)	837.151	-----	-----	0.000	+/-14.450	cps

Data: PETRA_1-810001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIDLE	Date: 12-Apr-15 06:19:05
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	9.300	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	2.000	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	5375.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa /				

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	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
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	
GTET	BHSM	Borehole Size Source Tool	SDLT	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DSNO	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	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
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
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
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 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
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
Rwa / CrossPlot				
TPUL	Tension Pull	80.04	NO	
BS	Bit Size	80.04	NO	
HDIA	Measured Hole Diameter	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				
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
HDIA	Measured Hole Diameter	0.00	NO	
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	
HDIA	Measured Hole Diameter	0.00	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	

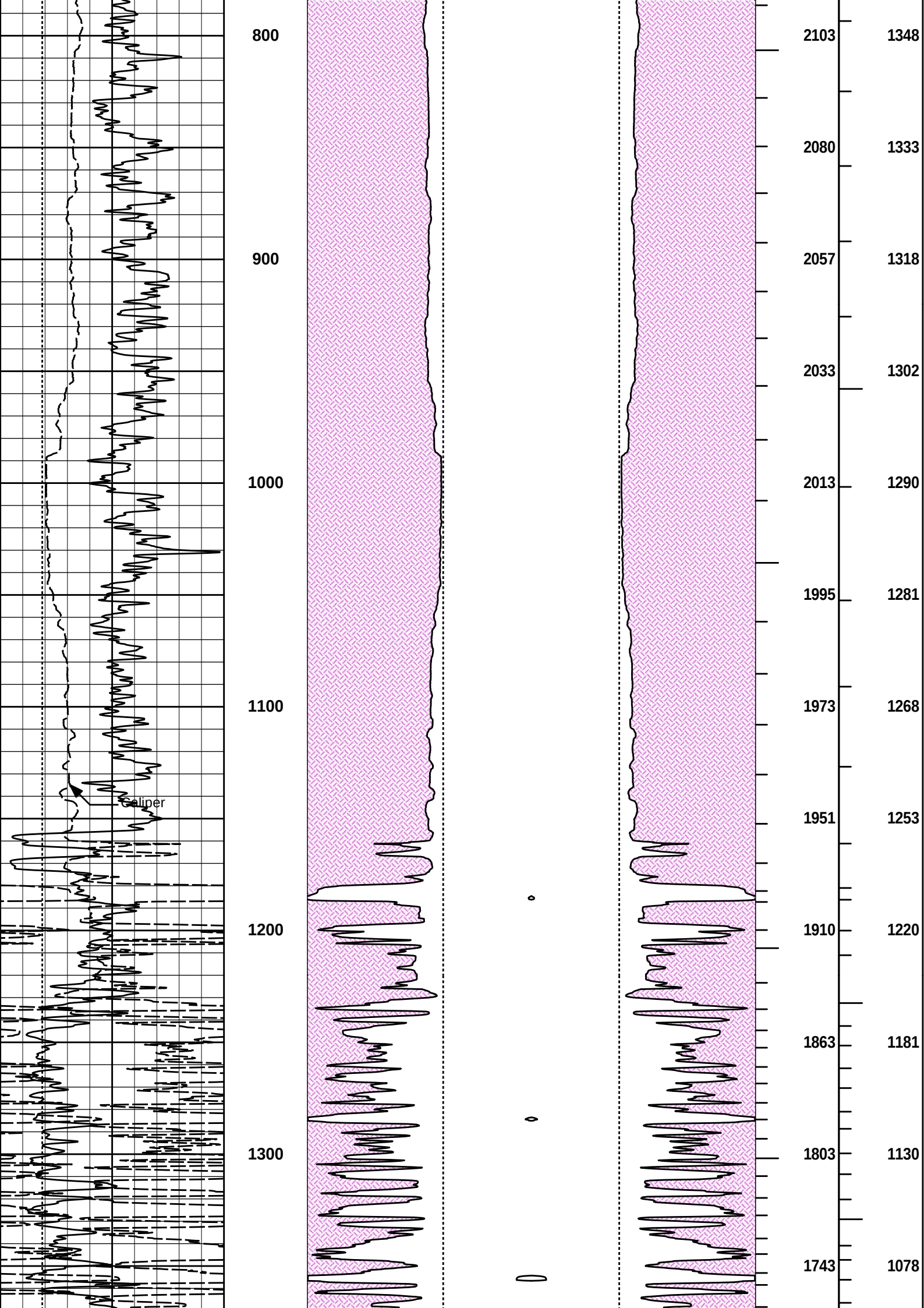
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R 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 Reference 12 KHz Real Signal	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	
HDIA	Measured Hole Diameter	0.00	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
NIX	Near X	43.66	BLK	0.920

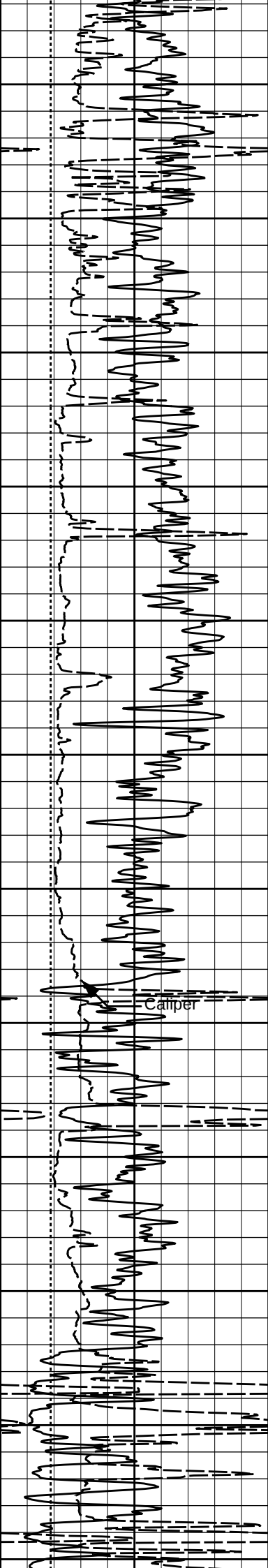
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	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	
HDIA	Measured Hole Diameter	0.00	NO	

Data: PETRA 1-8\0001 SP-GTET-DSN-SDL-FLEX-BSAT-BNIDLE

HALLIBURTON

ANNULAR HOLE VOLUME PLOT





1400

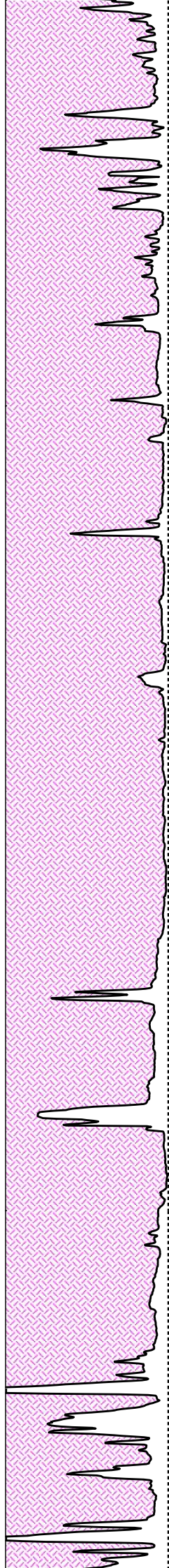
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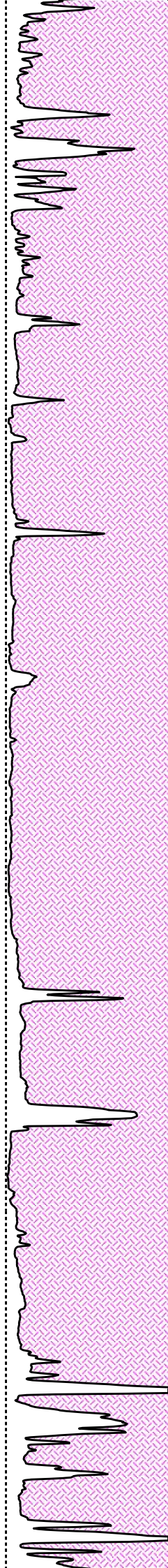
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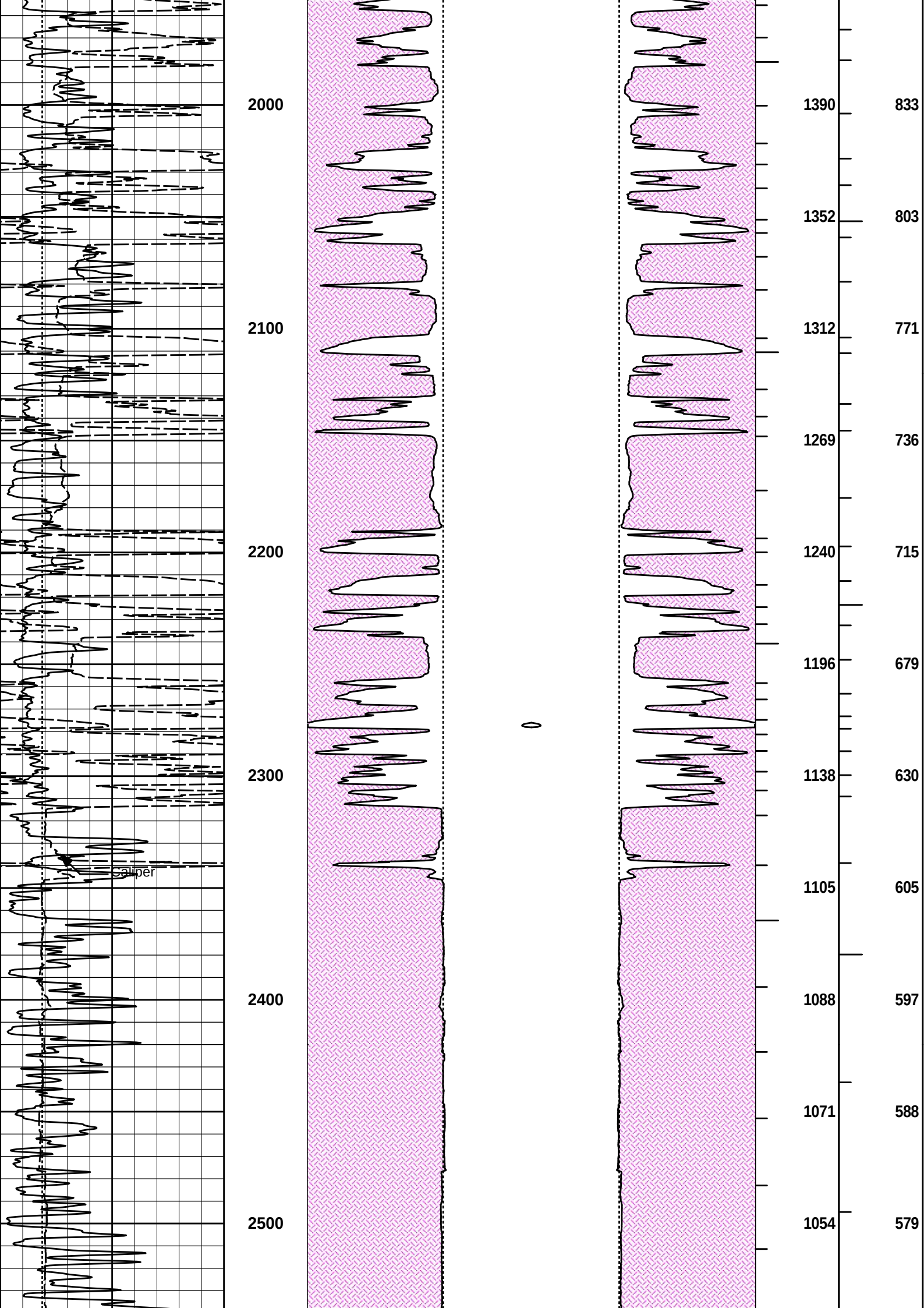
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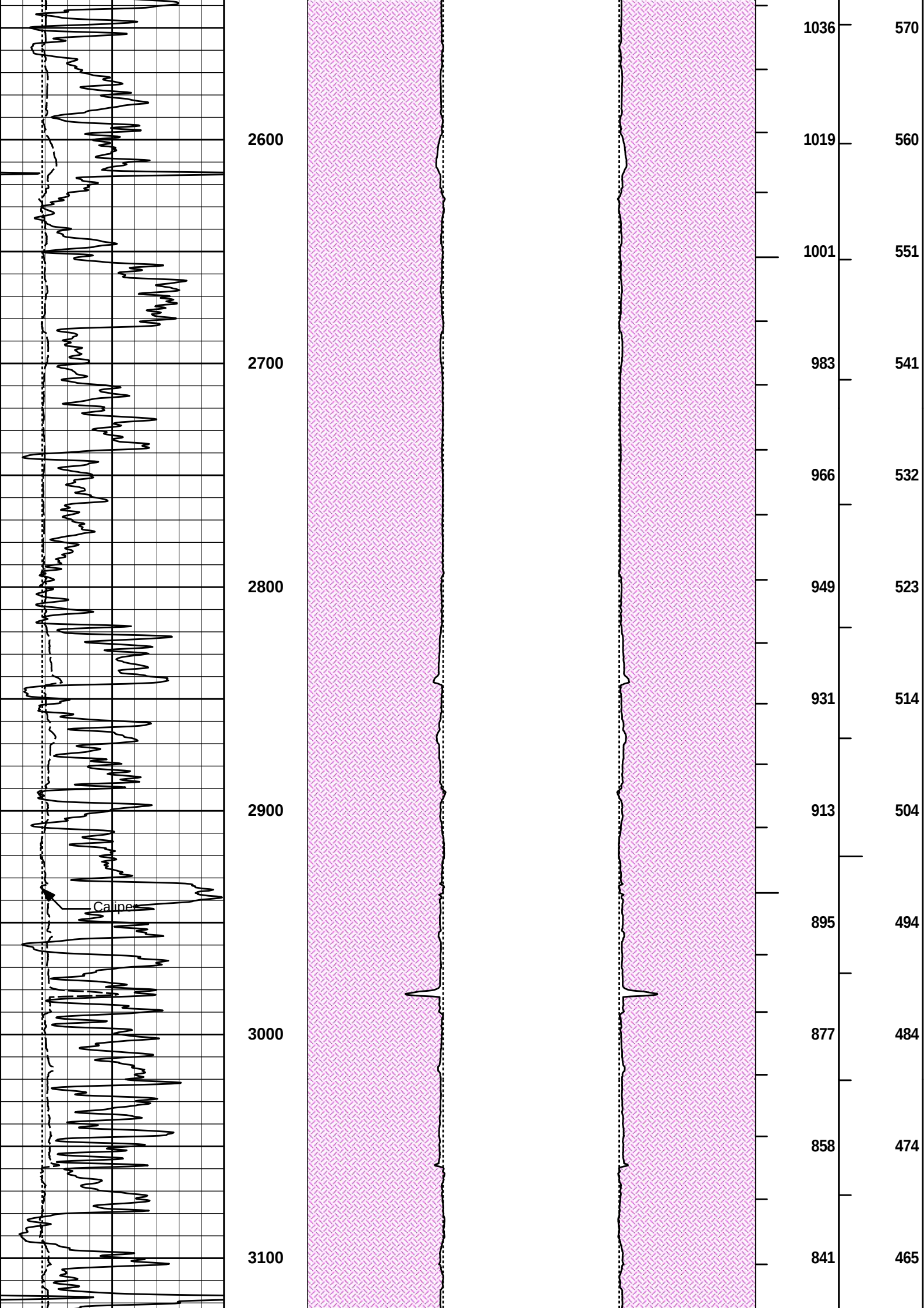
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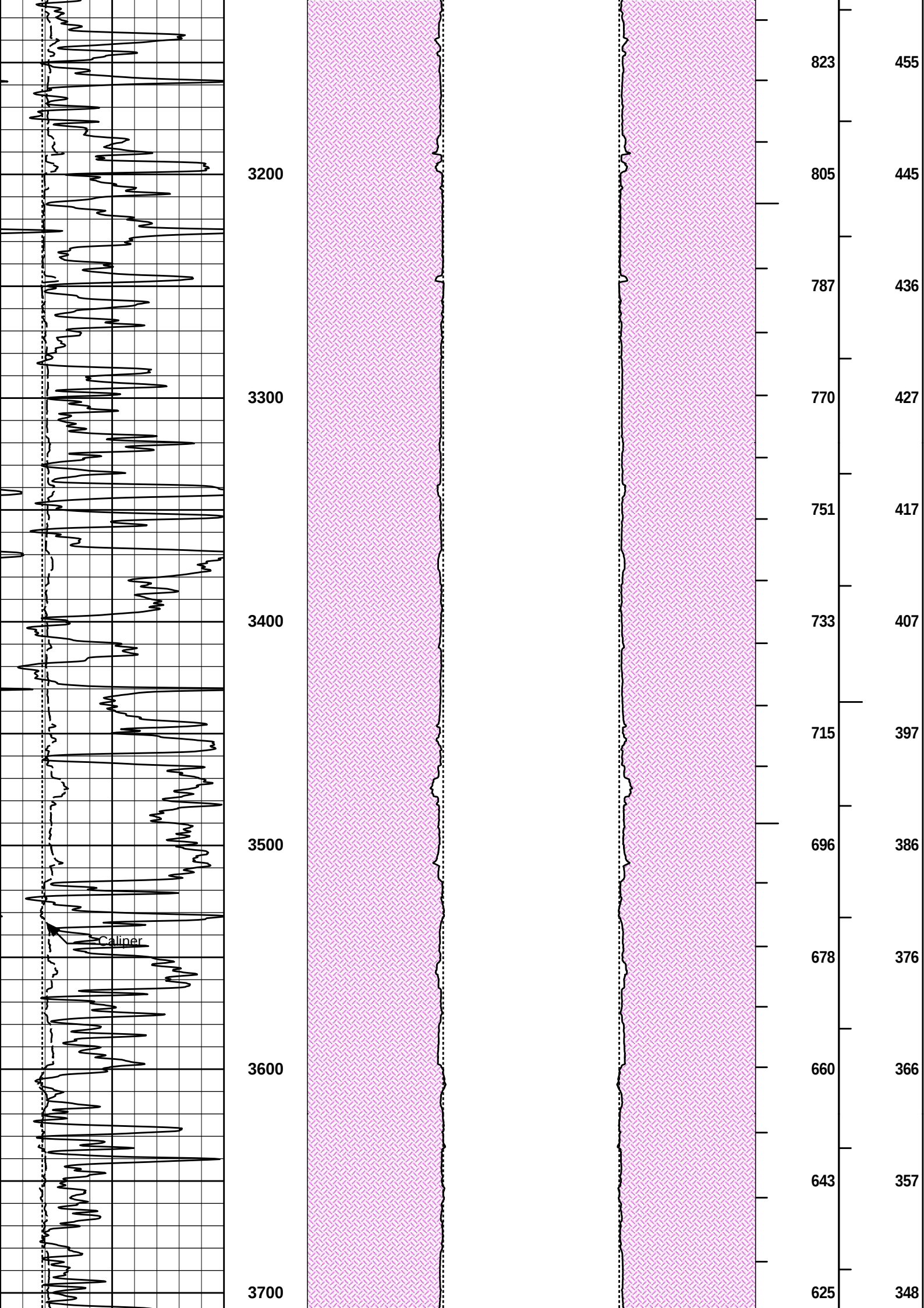
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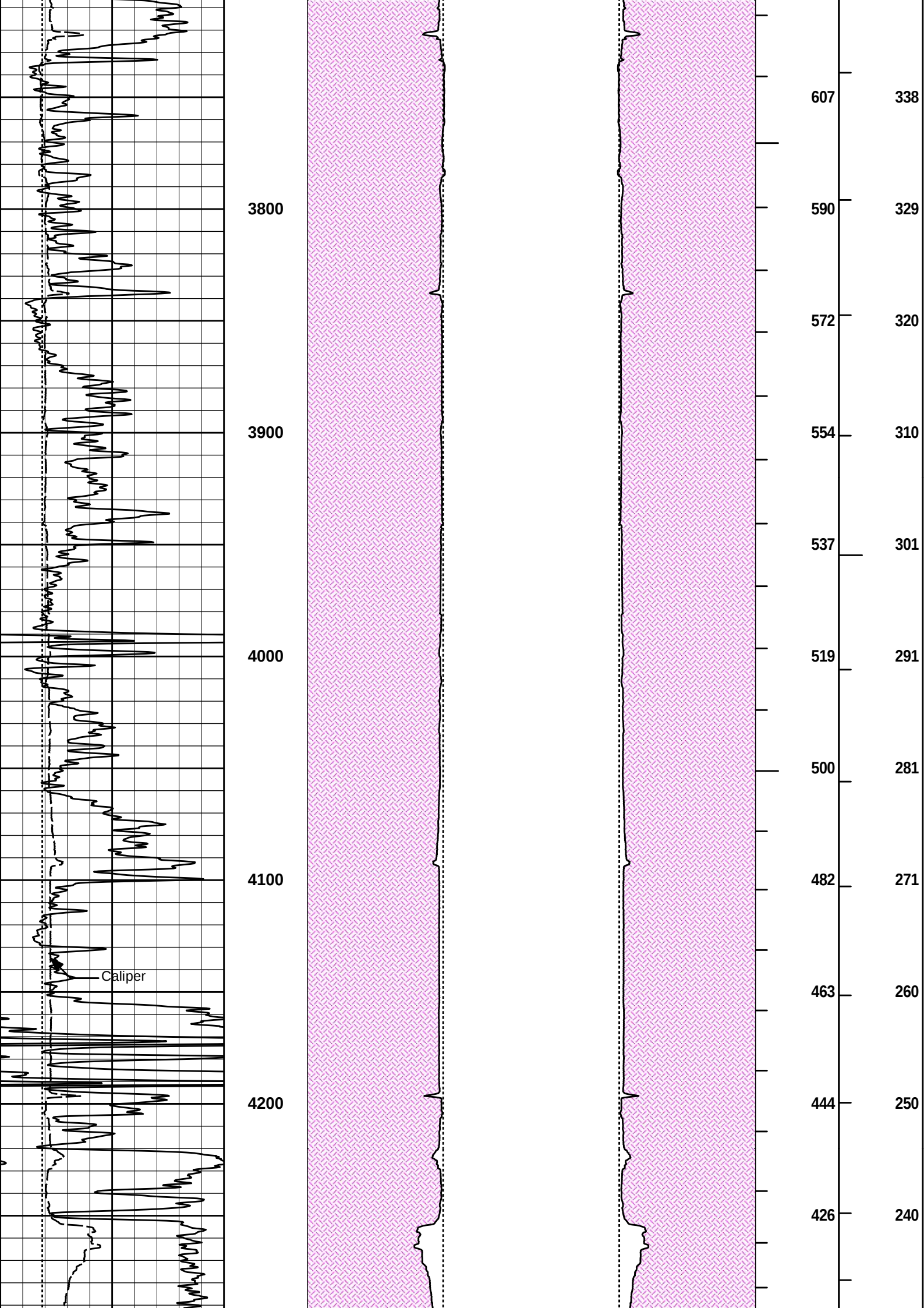
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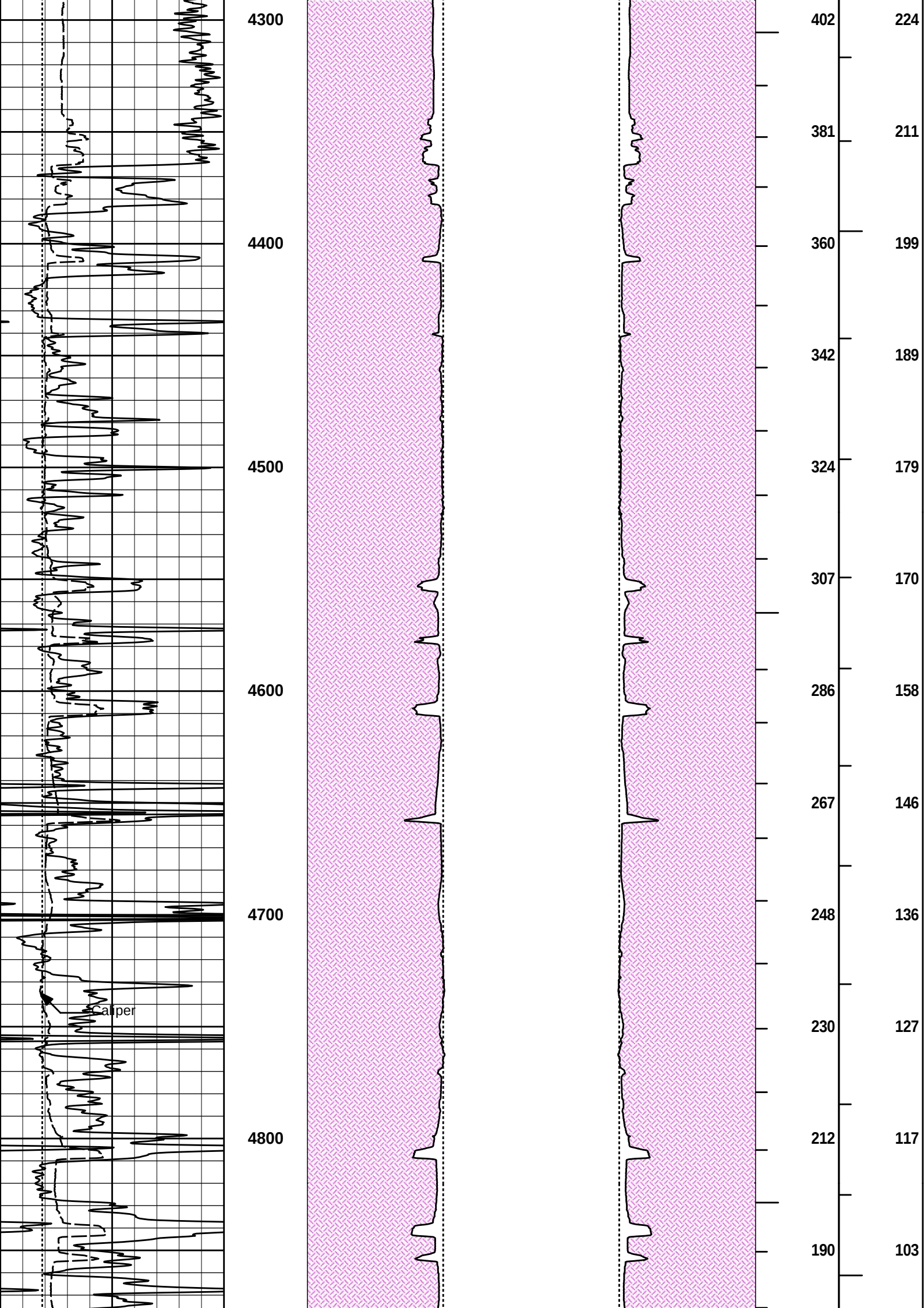
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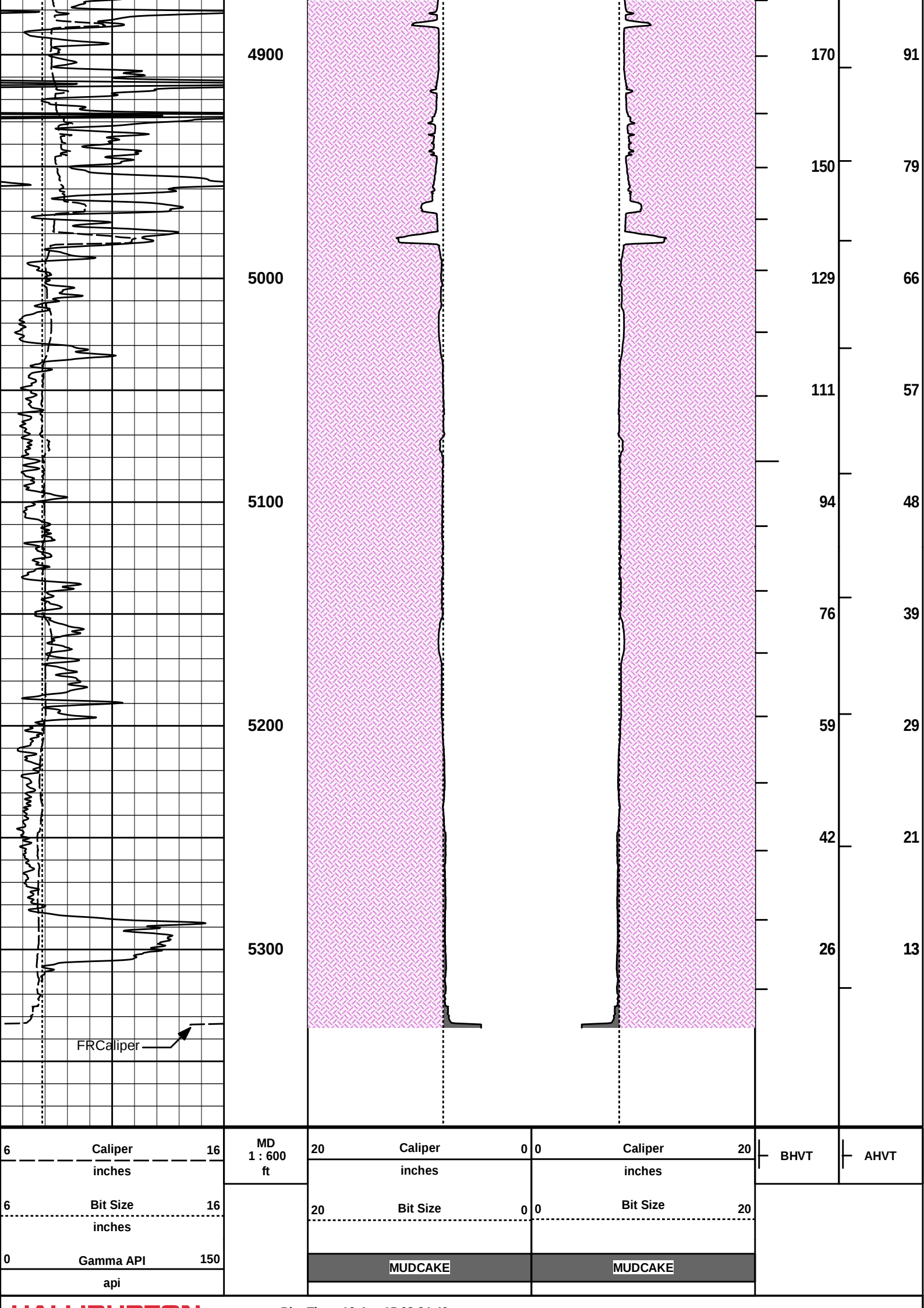












ANNULAR HOLE VOLUME PLOT

COMPANY	HERMAN L. LOEB, LLC		
WELL	PETRA 1-8		
FIELD	ALFORD		
COUNTY	KIOWA	STATE	KANSAS
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON LOG	