

DUAL SPACED NEUTRON
SPECTRAL DENSITY
LOG

Fold here

Service Ticket No.: 904287619						API No.: 15-055-22458-00						PGM Version: WL INSITE R5.0.5 (Build 8)									
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		1.5 S.O.		N/A			
Rmc @ Meas. Temp.				@				@				I-12109517									
Source Rmf		Rmc										S-12109515									
Rm @ BHT				@				@													
Rmf @ BHT				@				@													
Rmc @ BHT				@				@													
EQUIPMENT DATA																					
GAMMA				ACOUSTIC				DENSITY				NEUTRON									
Run No.		ONE		Run No.				Run No.		ONE		Run No.		ONE							
Serial No.		10971172		Serial No.				Serial No.		12153520		Serial No.		11019643							
Model No.		GTET		Model No.				Model No.		SDLT		Model No.		DSNT							
Diameter		3.625"		No. of Cent.				Diameter		5.5"		Diameter		3.625"							
Detector Model No.		T-102		Spacing				Log Type		GAM-GAM		Log Type		NEU-NEU							
Type		SCINT						Source Type		CS137		Source Type		AM241BE							
Length		8"		LSA [Y/N]				Serial No.		20791B		Serial No.		DSN-438							
Distance to Source		N/A		FWDA [Y/N]				Strength		1.5 Ci		Strength		15.0 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		TD	CSG	REC		0	150				30		-10		2.71 gr/cc		30	-10		LIME	

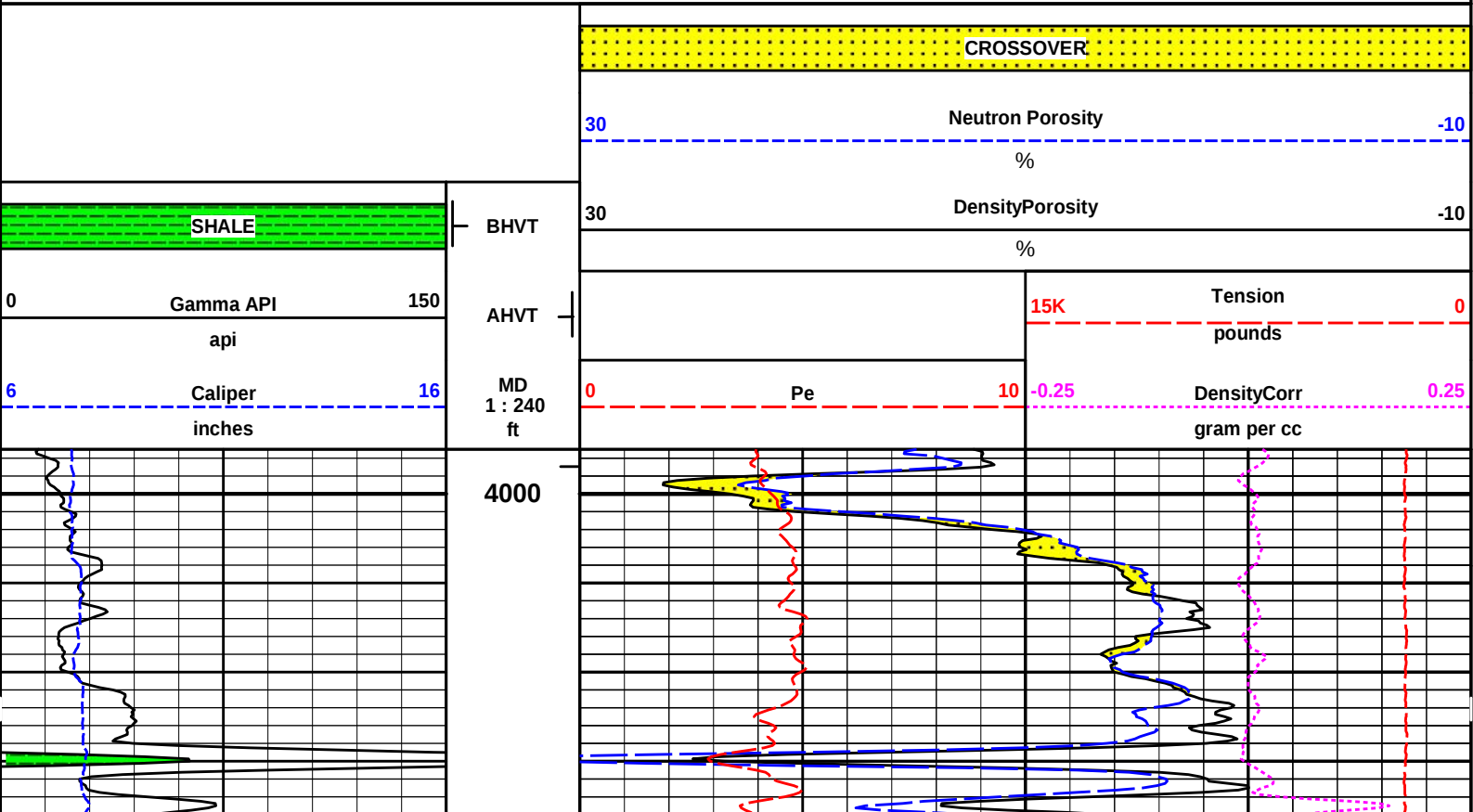
[illegible]

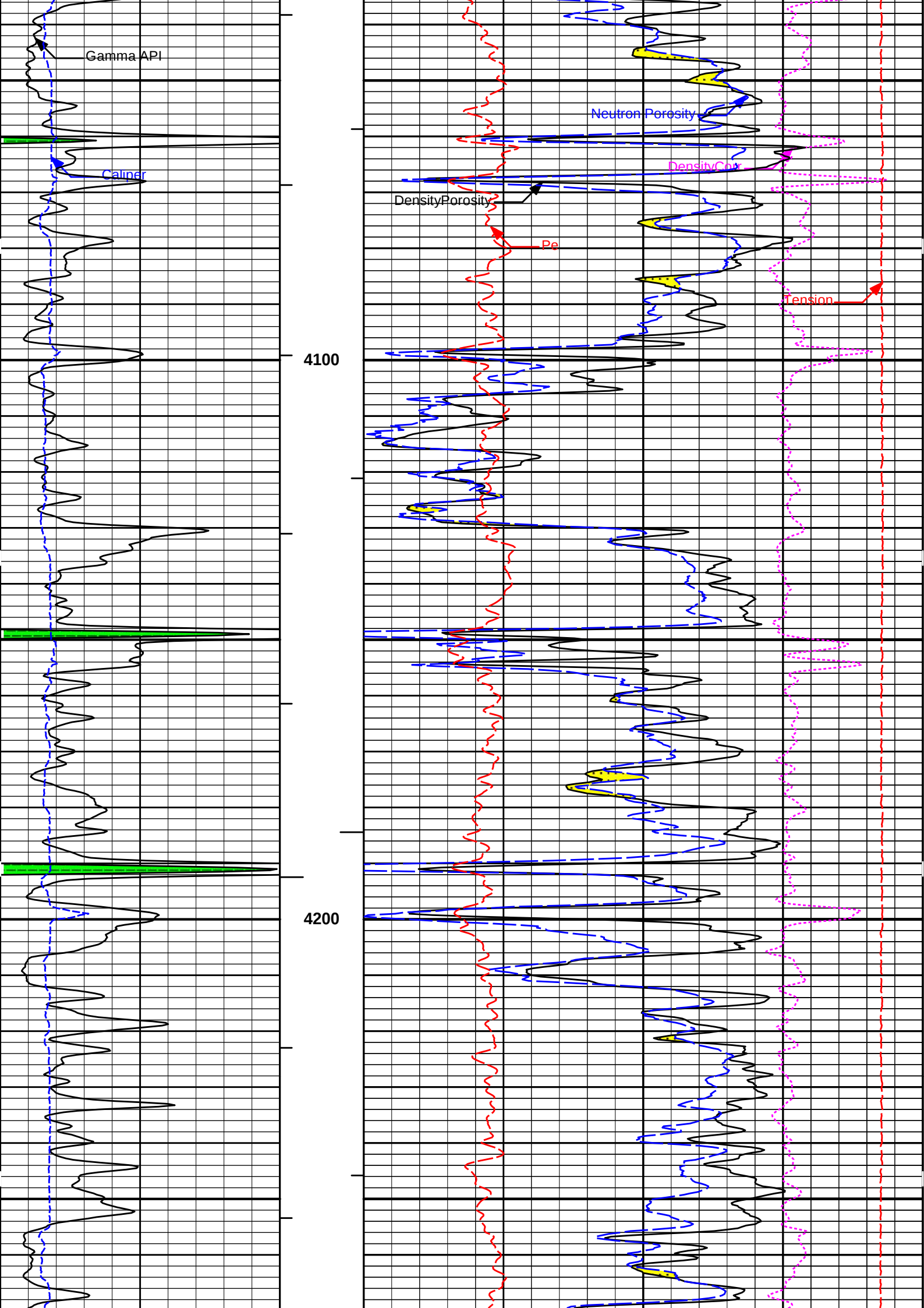
HALLIBURTON

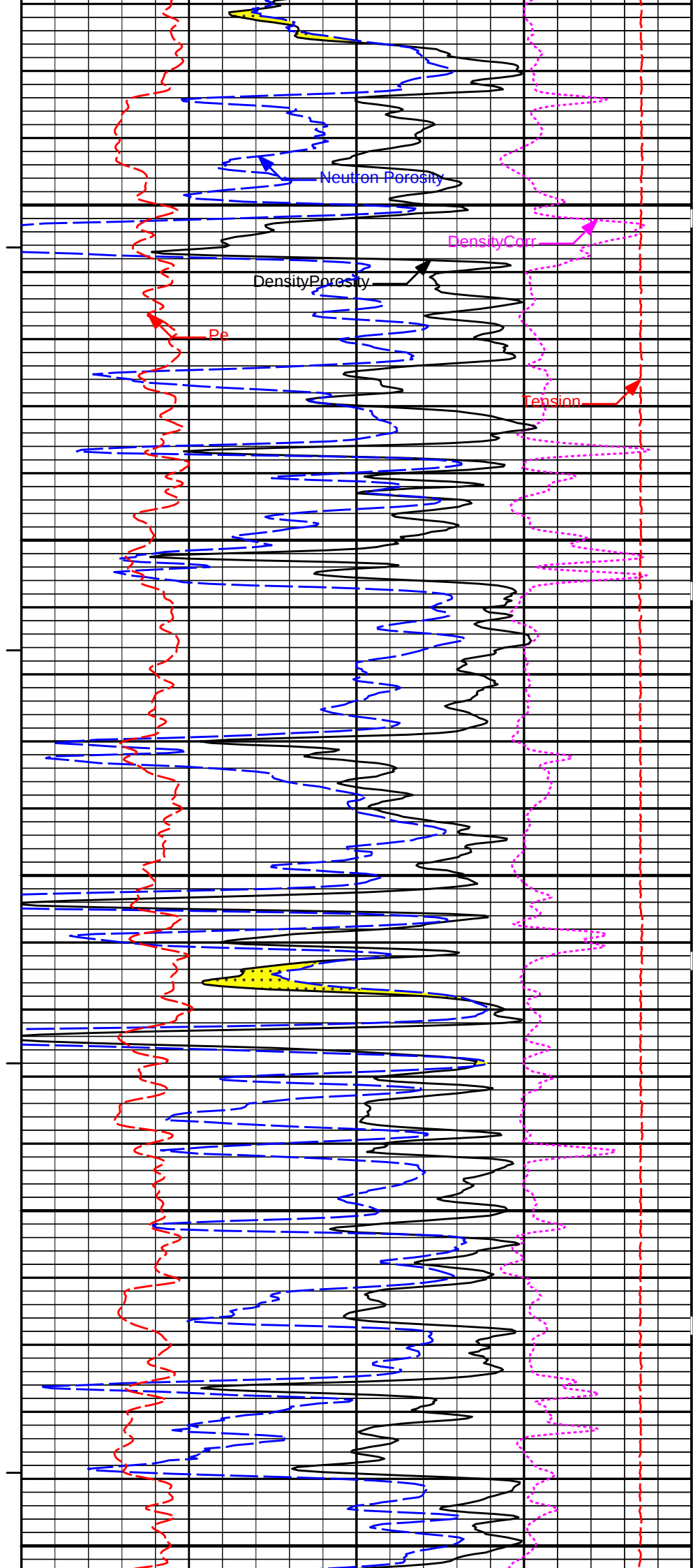
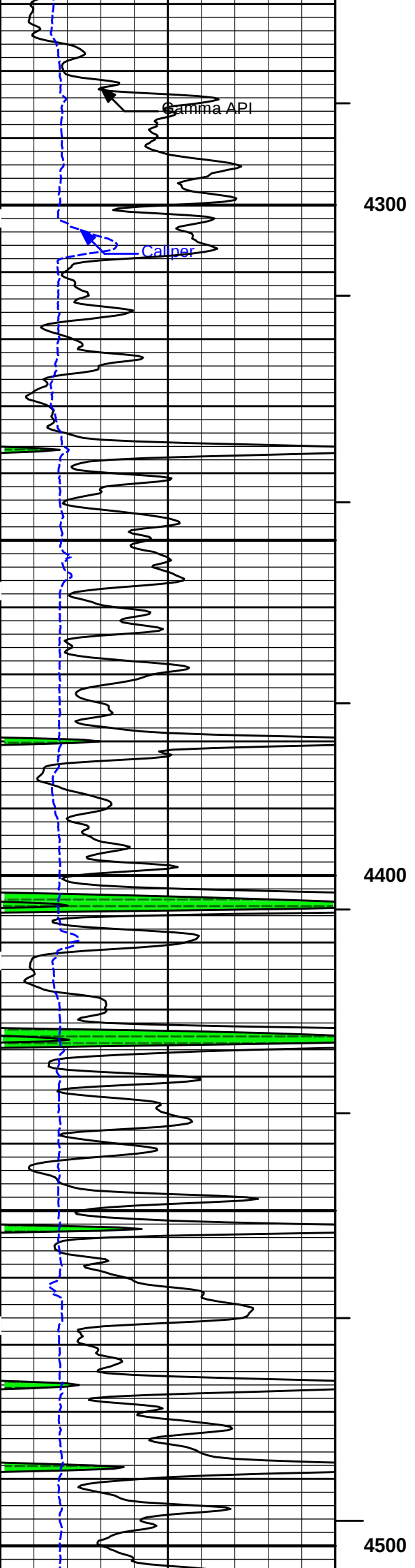
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Plot Range: 3995 ft to 4806.17 ft
Data: BECKER_7\Well Based\DAQ-0001-004\
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

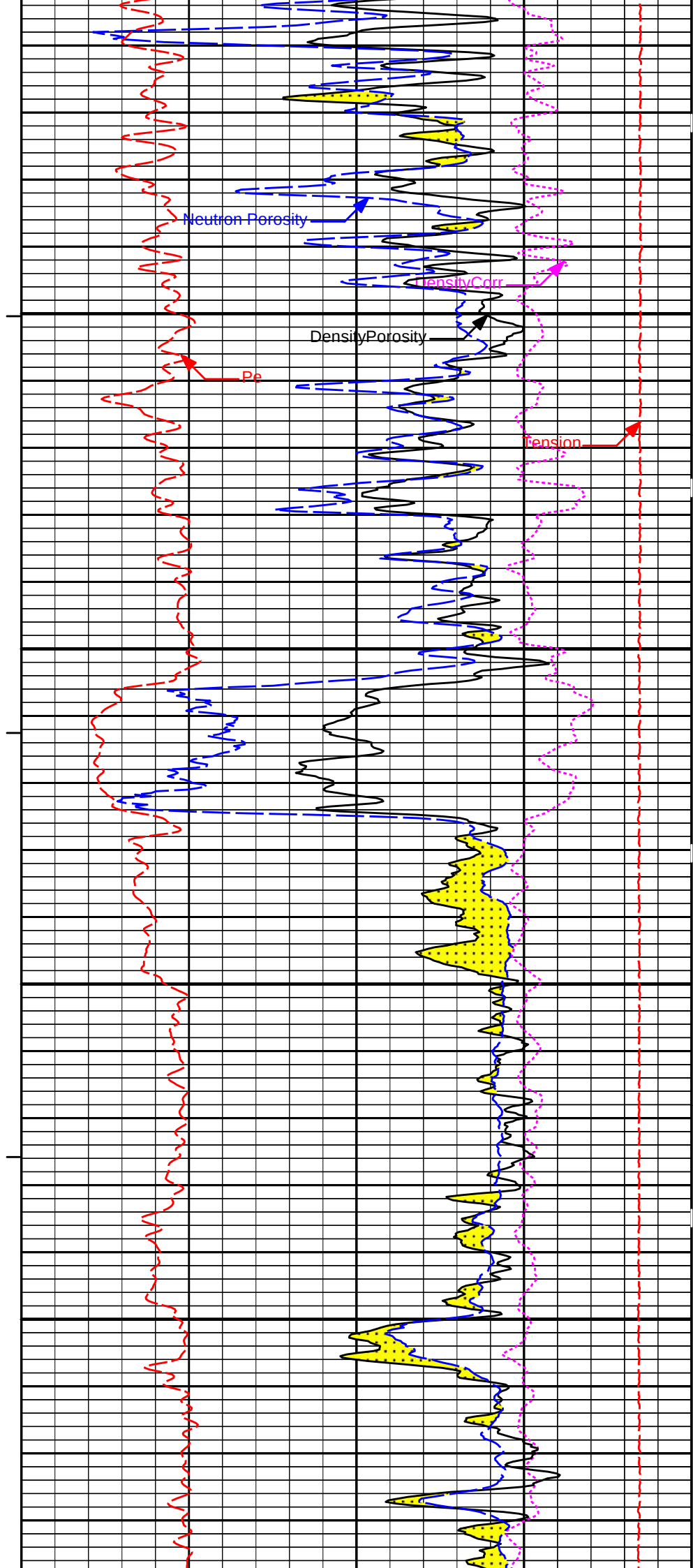
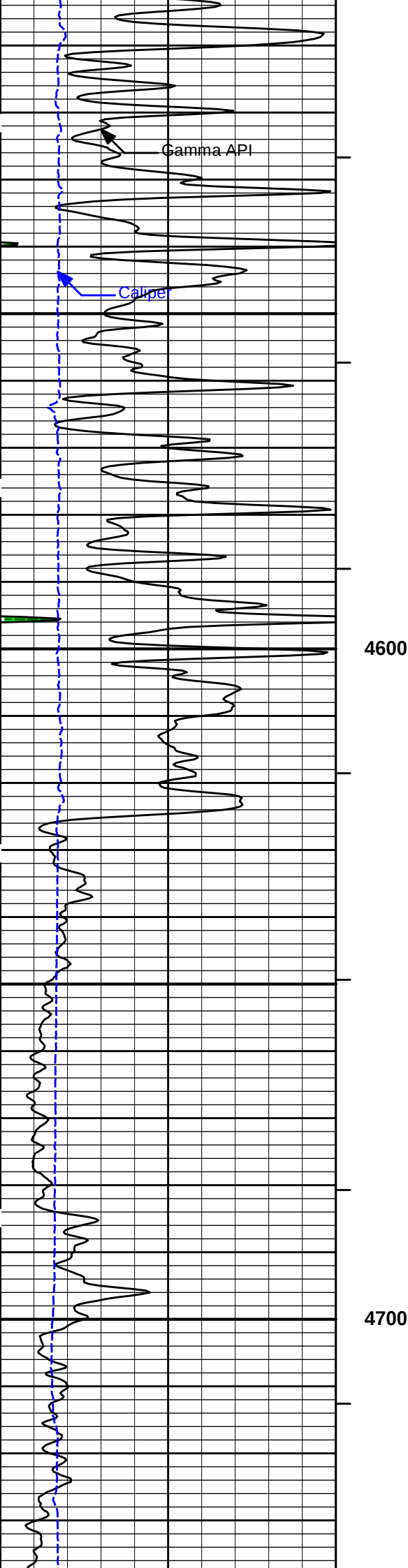
5 INCH MAIN LOG

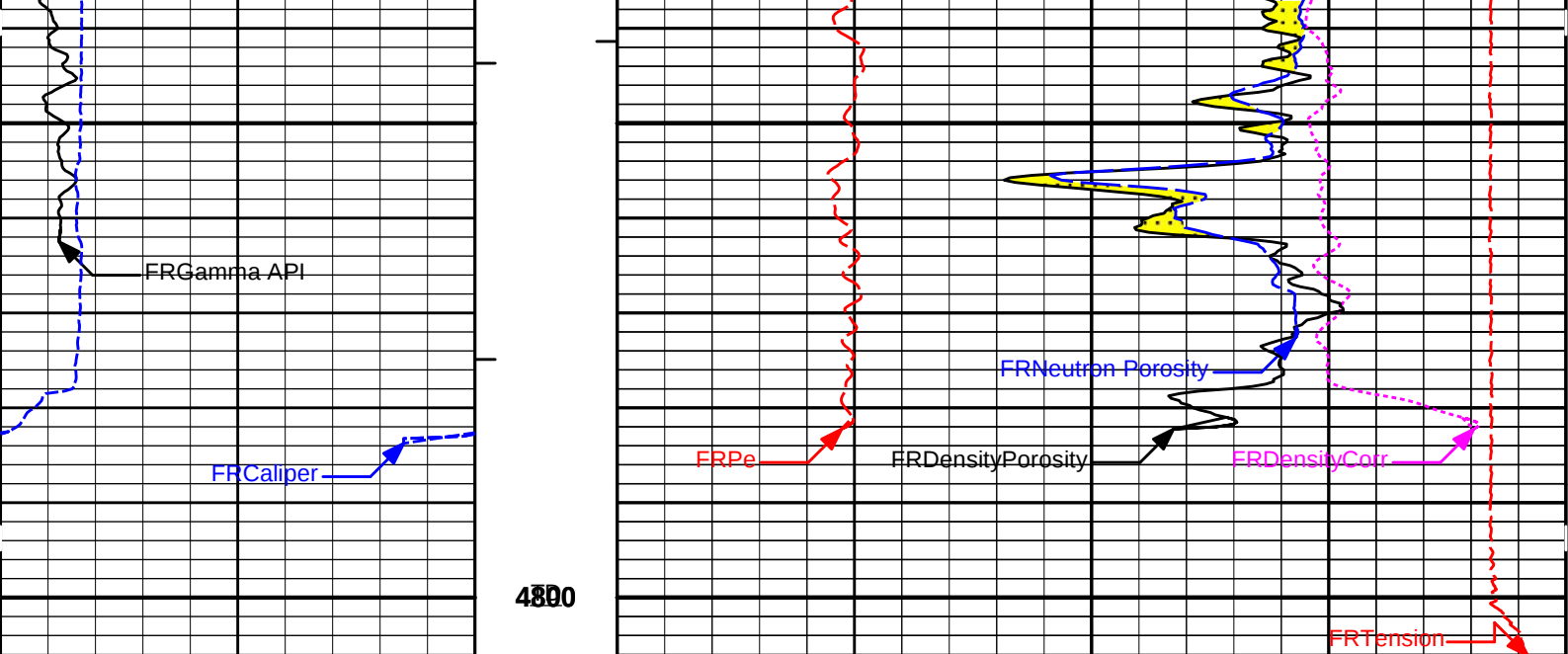
MEASURED DEPTH
MAIN SECTION 5" PER 100'











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: 10-Sep-17 15:35:22
Plot Range: 3995 ft to 4806.17 ft
Data: BECKER_7\Well Based\DAQ-0001-004\
Plot File: \\POROSITY\Porosity_IQ_5_MAIN_LIB

5 INCH MAIN LOG

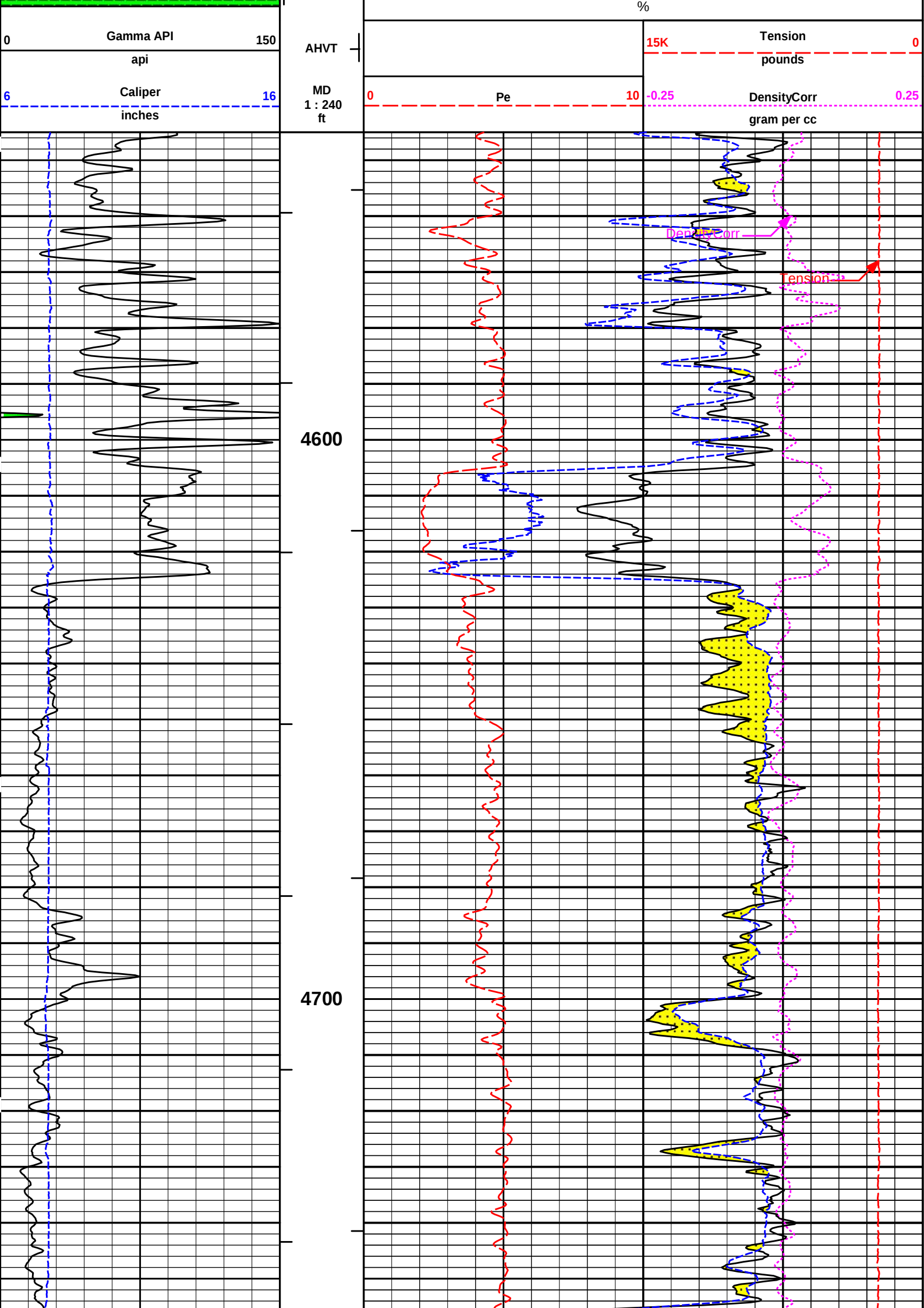
MEASURED DEPTH
MAIN SECTION 5" PER 100'

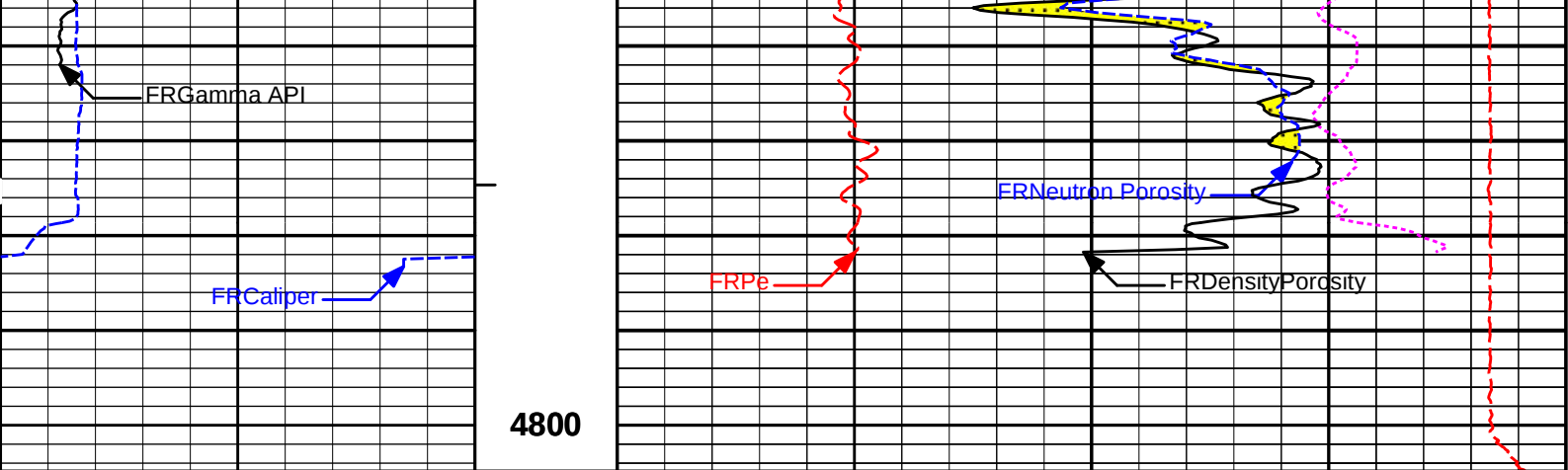
HALLIBURTON

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Plot Range: 4545 ft to 4804.83 ft
Data: BECKER_7\Well Based\REPEAT\
Plot File: \\POROSITY\Porosity_IQ_5_REP_LIB

REPEAT SECTION

					CROSSOVER				
				30	Neutron Porosity			-10	
					%				
				30	DensityPorosity			-10	
	SHALE		BHVT						





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				
					%				
				30	Neutron Porosity				
					%				
					CROSSOVER				

HALLIBURTON

Plot Time: 10-Sep-17 15:35:24
Plot Range: 4545 ft to 4804.83 ft
Data: BECKER_7\Well Based\REPEAT\
Plot File: \\POROSITY\Porosity_Q5_REP_LIB

REPEAT SECTION

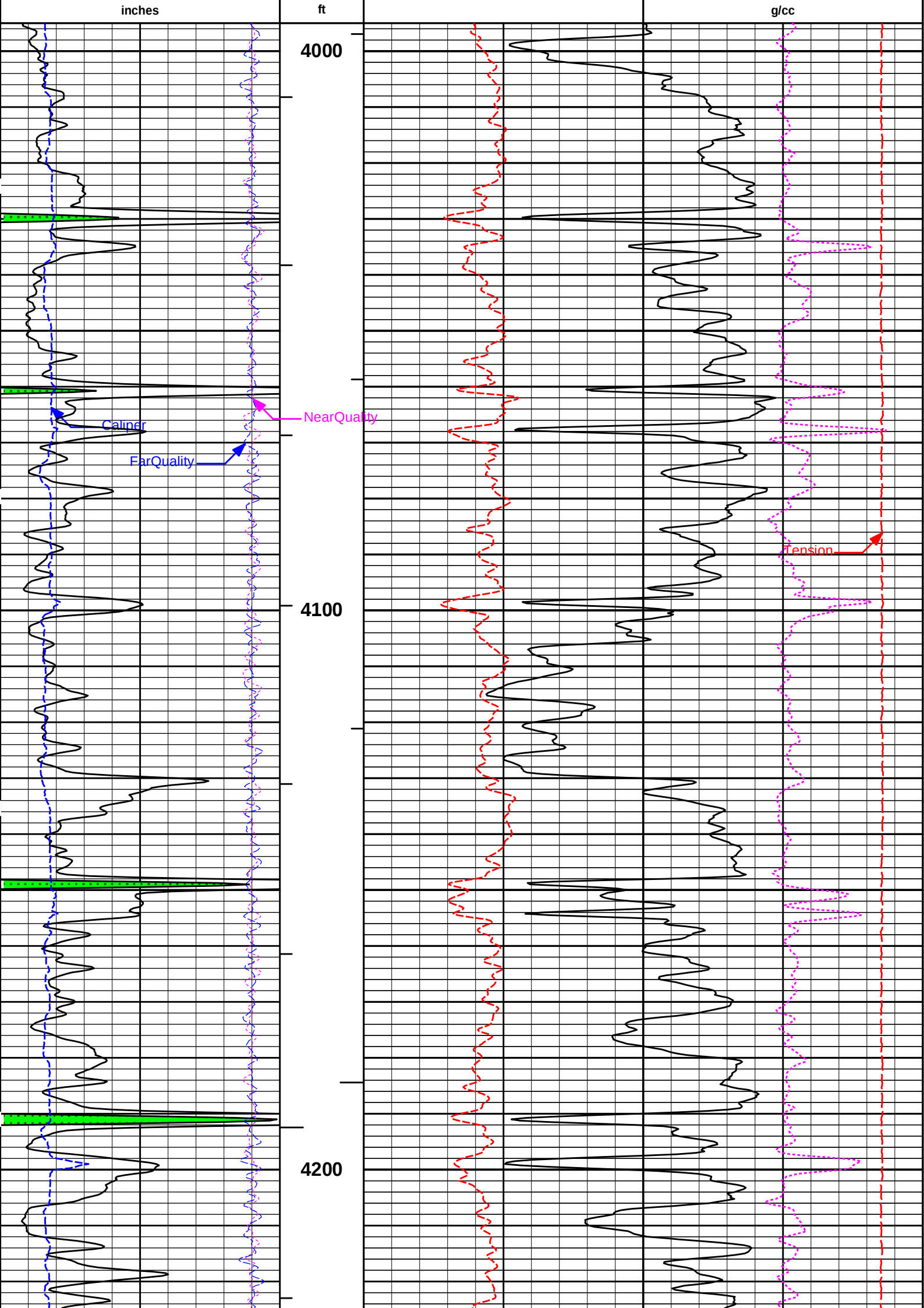
HALLIBURTON

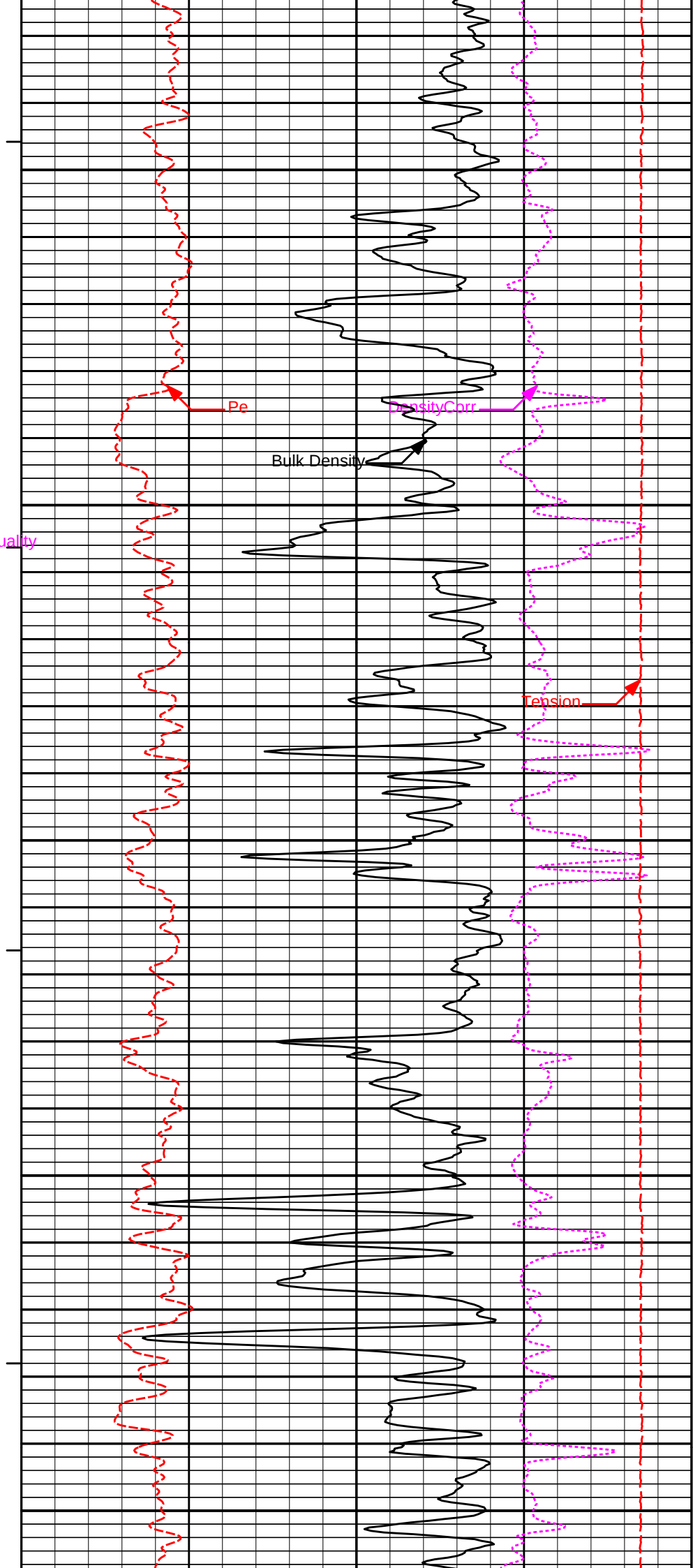
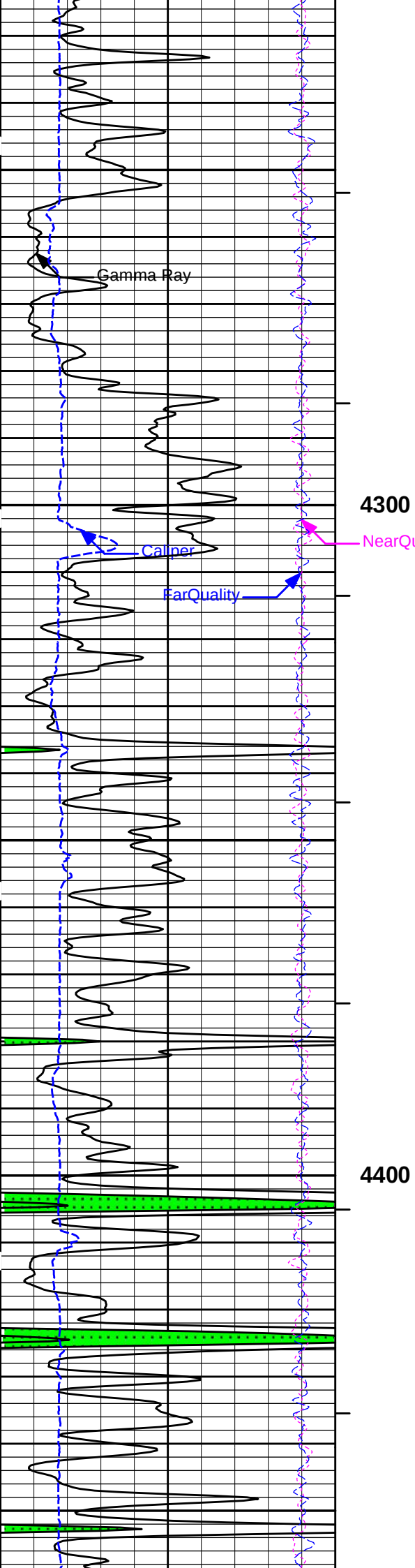
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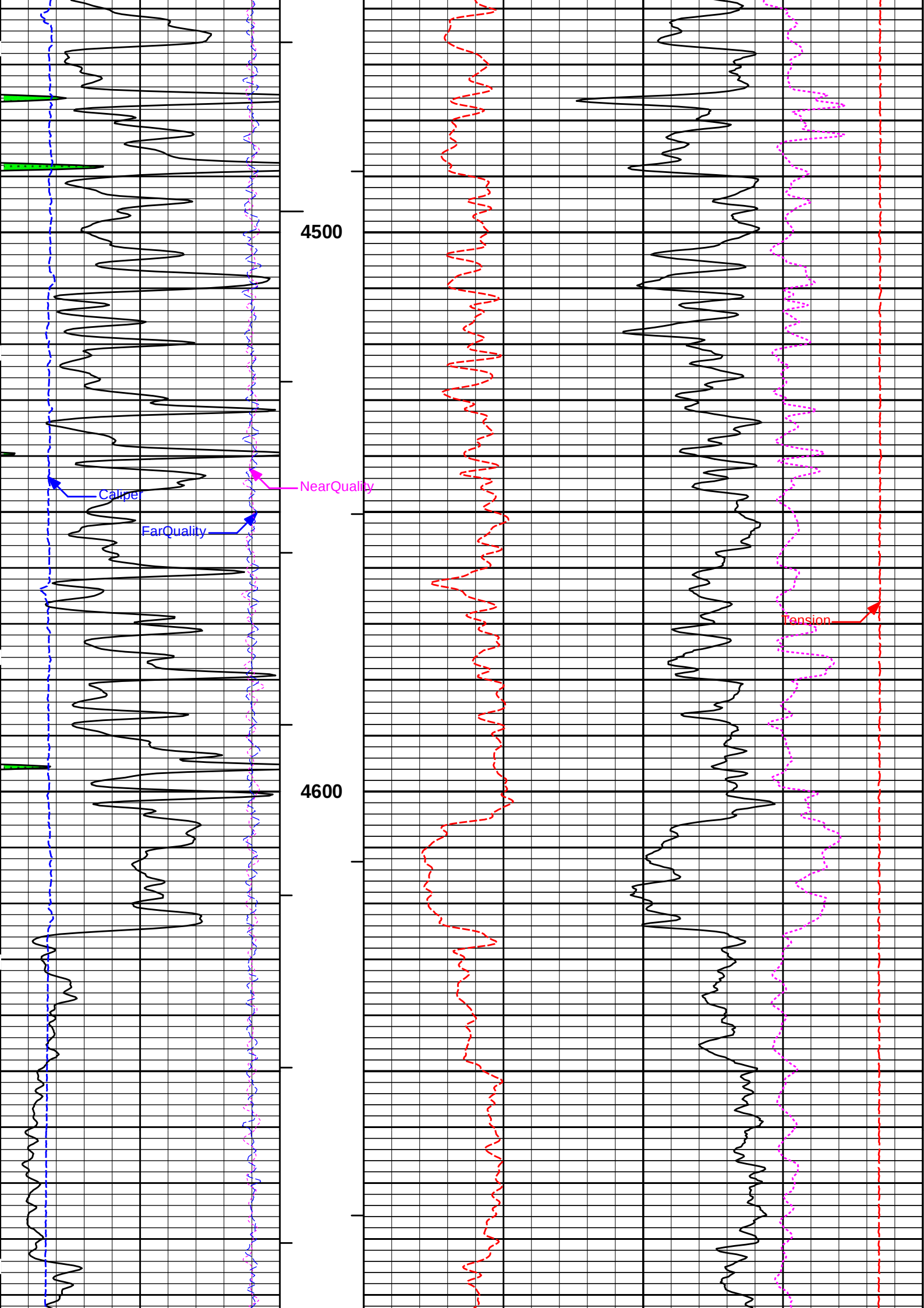
5 INCH MAIN LOG

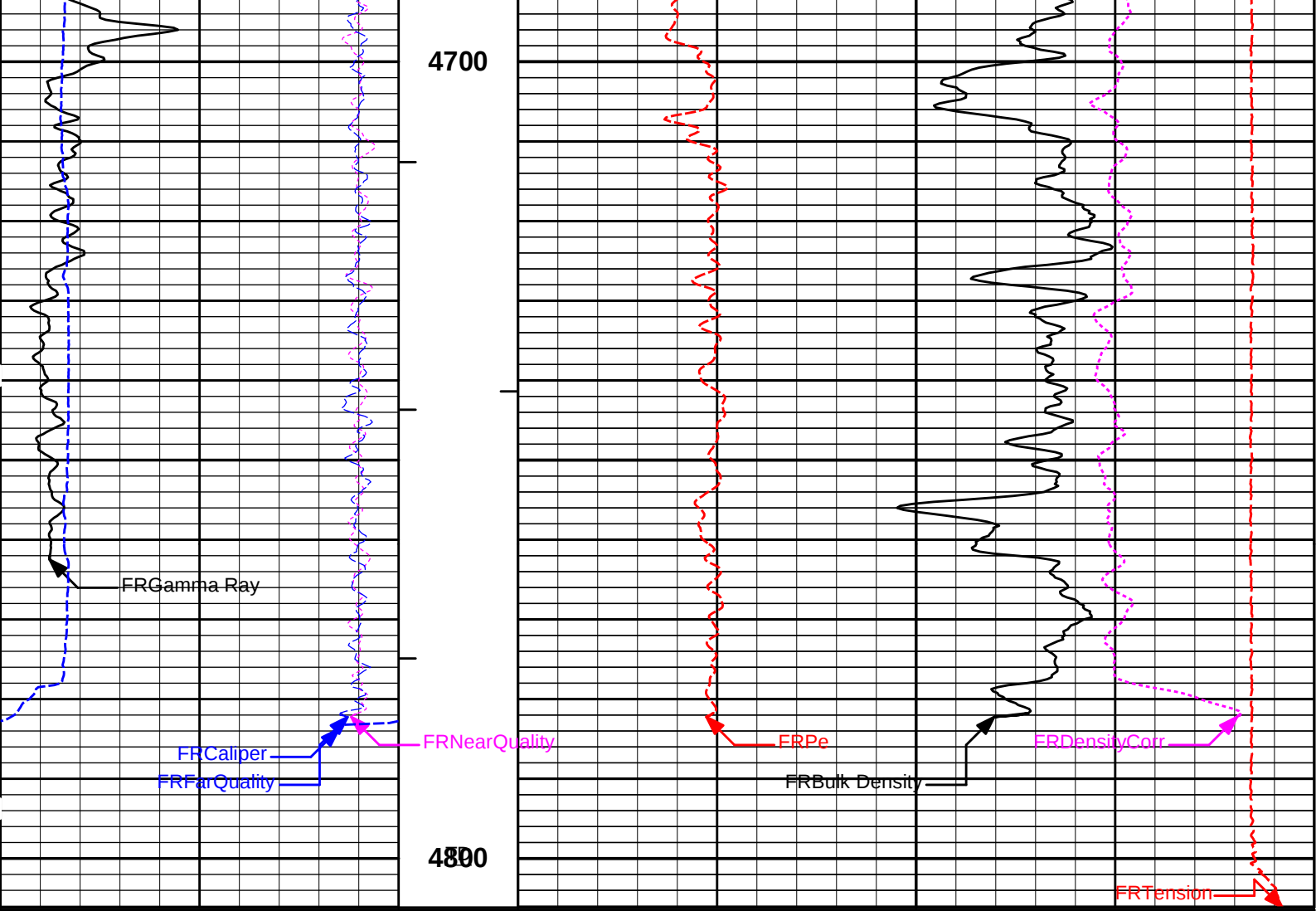
MEASURED DEPTH
MAIN SECTION 5" PER 100'

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









6	Caliper	16	MD 1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25	
	inches									
-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: 10-Sep-17 15:35:27
Plot Range: 3995 ft to 4806.17 ft
Data: BECKER_7\Well Based\DAQ-0001-004\
Plot File: \\LOCAL-1\BECKER_7\Well Based\POROSITY\BULKD_5_MAIN_LIB

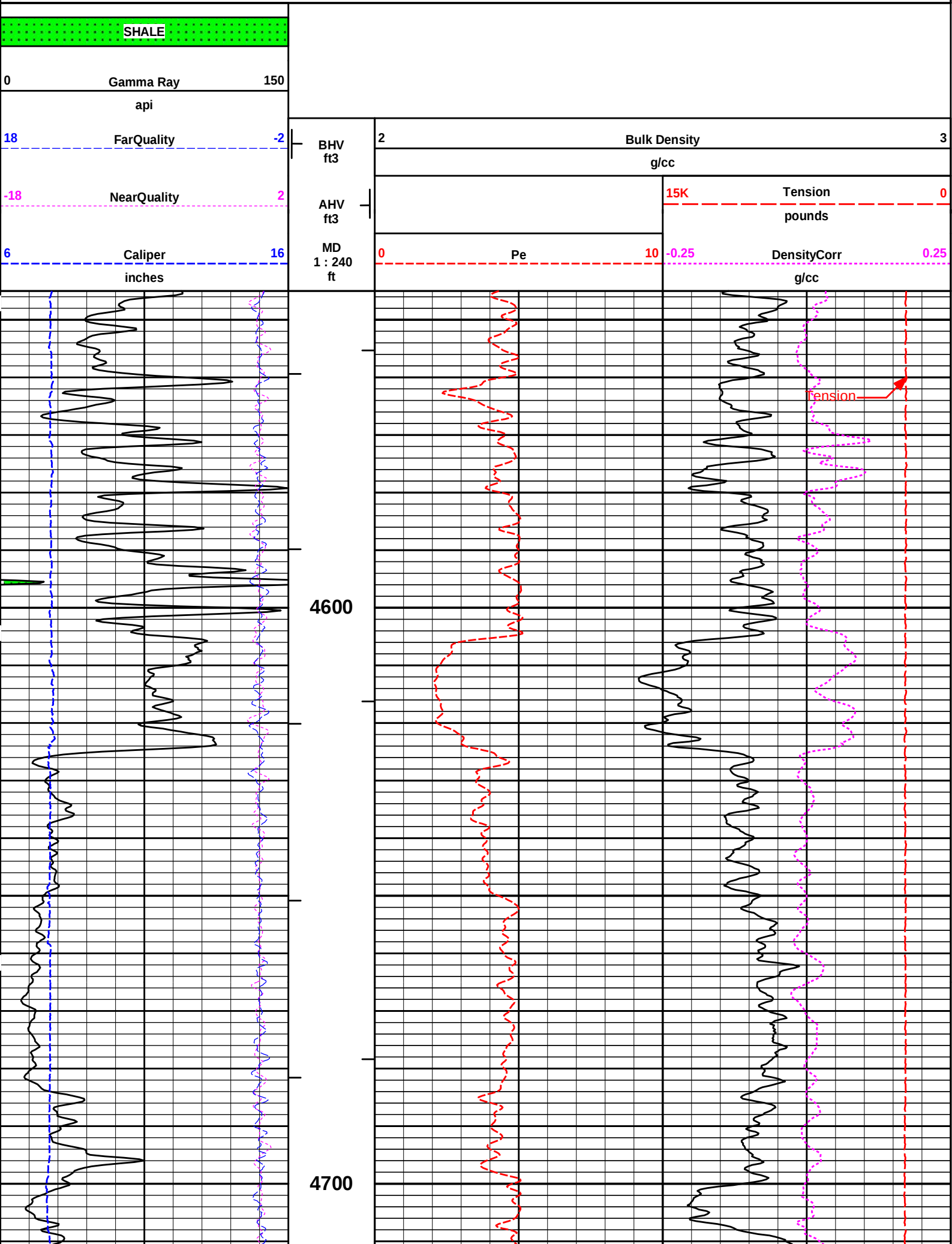
5 INCH MAIN LOG

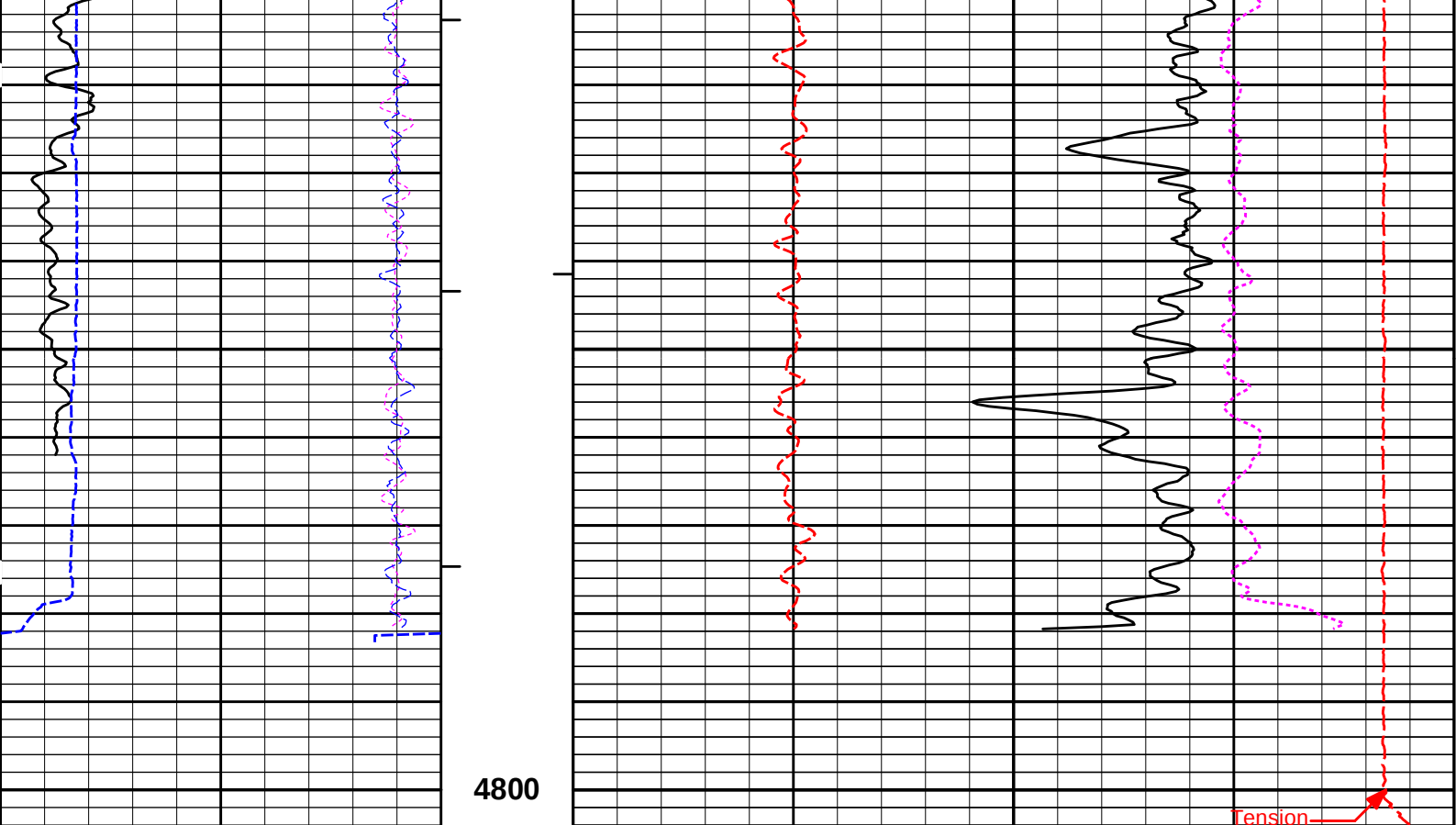
MEASURED DEPTH
MAIN SECTION 5" PER 100'

HALLIBURTON

Plot Time: 10-Sep-17 15:35:27
Plot Range: 4545 ft to 4804.83 ft
Data: BECKER_7\Well Based\REPEAT\
Plot File: \\LOCAL-1\BECKER_7\Well Based\POROSITY\BULKD_5_MAIN_LIB

REPEAT SECTION





4800

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	BHV ft3	2 Bulk Density 3					
				g/cc					
0	Gamma Ray	150							
	api								
SHALE									

Tension

HALLIBURTON

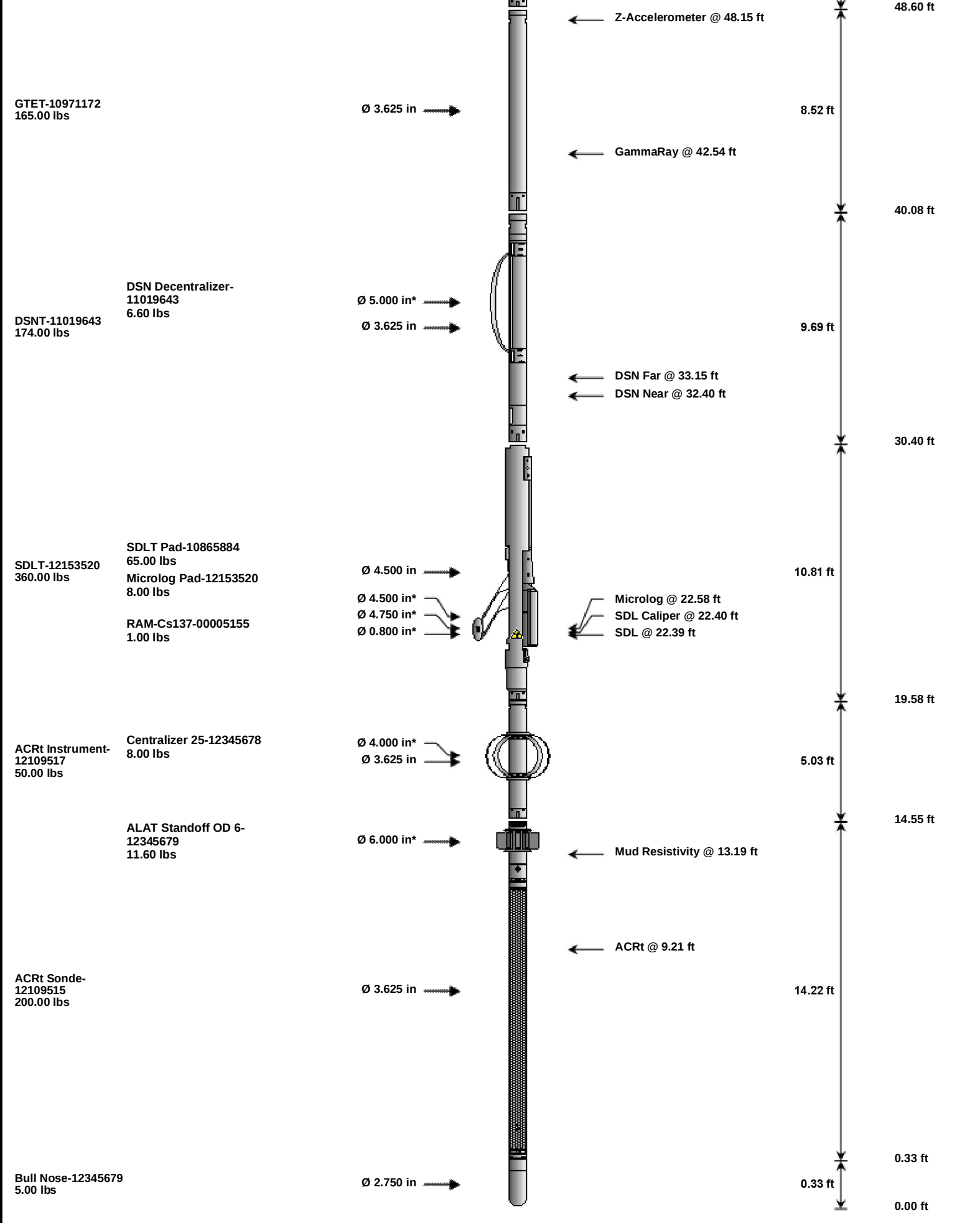
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Data: BECKER_7\Well Based\REPEAT\
Plot File: \\LOCAL\BECKER_7\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-11459024 37.50 lbs	Weak Point 7000 lbs- 12345678 0.01 lbs	Ø 2.750 in Ø 0.010 in*		← Temperature @ 55.29 ft	2.50 ft	55.79 ft
XOHD-11569312 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	53.29 ft
SP Sub-11441709 60.00 lbs		Ø 3.625 in		← SP @ 50.56 ft	3.74 ft	52.34 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	11459024	37.50	2.50	53.29	300.00
WP7K	Weak Point 7000 lbs	12345678	0.01	0.01	*	54.09
XOHD	Hostile to Dits Cross Over	11569312	20.00	0.95	52.34	300.00
SP	SP Sub	11441709	60.00	3.74	48.60	300.00
GTET	Gamma Telemetry Tool	10971172	165.00	8.52	40.08	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69	30.40	60.00
SDLT	SDLT Pad	10865884	65.00	10.81	19.58	50.00
Microlog Pad	Microlog Pad	12153520	8.00	5.03	14.55	50.00
RAM-Cs	RAM-Cs	137-00005155	1.00	14.22	0.33	50.00
ACRT	ACRT Instrument	12109517	50.00	0.00	0.00	50.00
ALAT	ALAT Standoff OD	6-12345679	11.60			50.00
Bull Nose	Bull Nose	12345679	5.00			50.00

DCNT	DSN Decentralizer	11019643	6.60	5.13	*	33.73	300.00
SDLT	Spectral Density Tool	12153520	360.00	10.81		19.58	60.00
SDLP	Density Insite Pad	10865884	65.00	2.55	*	21.79	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005155	1.00	0.80	*	22.02	300.00
MICP	Microlog Pad	12153520	8.00	1.00	*	22.08	60.00
ACRt	Array Compensated True Resistivity Instrument Section	12109517	50.00	5.03		14.55	120.00
OBCEN	Centralizer - 25 in. Overbody	12345678	8.00	2.08	*	16.24	300.00
ACRt	Array Compensated True Resistivity Sonde Section	12109515	200.00	14.22		0.33	120.00
ALATS	Array Laterolog Tool OD 6 Standoff	12345679	11.60	1.00	*	13.19	60.00
BLNS	Bull Nose	12345679	5.00	0.33		0.00	300.00
Total			1,171.71	55.79			
* Not included in Total Length and Length Accumulation.							
Data: BECKER_7I0001 GTET-DSNT-SDLT-ACRtIDLE							
Date: 10-Sep-17 13:43:35							

 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	8.950	ppg		
	SHARED	WAGT	Weighting Agent	Natural			
	SHARED	BSAL	Borehole salinity	0.00	ppm		
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm		
	SHARED	WPHS	OBM Water Phase Salinity NaCl	0.00	ppm		
	SHARED	OFOW	Base Oil Fraction from Oil/Water Ratio	1.00			
	SHARED	OBMT	Oil based Mud Type	Diesel			
	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	CSOD	Inner Casing OD size	8.500	in		
	SHARED	CSWT	Casing Weight	17.00	lbpf		
	SHARED	ISOC	Is Outer Casing Present?	No			
	SHARED	COOD	Outer Casing OD size	0.000	in		
	SHARED	CSWT	Outer Casing Weight	0.00	lbpf		
	SHARED	CSCM	Casing Cemented	Yes			
	SHARED	CMTY	API Cement Class	H			
	SHARED	CMWT	Cement Weight	16.500	ppg		
	SHARED	CSTR	Compressive Strength	1000.00	psia		
	SHARED	ST	Surface Temperature	75.0	degF		
	SHARED	TD	Total Well Depth	4810.00	ft		
	SHARED	BHT	Bottom Hole Temperature	124.0	degF		
	SHARED	SVTM	Navigation and Survey Master Tool	NONE			
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET			
	SHARED	TEMM	CBM Temperature Master Tool	GTET			
	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	
	Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
	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	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTT	Temperature Correction Type	None	
	DSNT	DNTT	DSN Tool Temperature	75.0	degF
	DSNT	DNFT	DSN Fixed Temperature Value	200.0	degF
	DSNT	DNTT	Top Zone Temperature Value	75.0	degF
	DSNT	DNBT	DSN Bottom Zone Temperature Value	200.0	degF
	DSNT	DTDT	Top Depth for Temperature Gradient Calculation (Measured Depth)	0	ft
	DSNT	DBDT	Bottom Zone Temperature Depth (Measured Depth)	10000	ft
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	DNFP	DSN Fixed Pressure Value	14.70	psia
	DSNT	DNTP	DSN Top Zone Pressure Value	14.70	psia
	DSNT	DNBP	DSN Bottom Zone Pressure Value	14.70	psia
	DSNT	DTDP	Top Depth for Pressure Gradient Calculation (Measured Depth)	0	ft
	DSNT	DNDP	Bottom Zone Pressure Depth (Measured Depth)	0	ft
	DSNT	SHCO	View More Correction Options	No	
	DSNT	HSCO	Correct for Holesize?	Yes	
	DSNT	MCCO	Correct for Mud Cake?	No	
	DSNT	MWCO	Correct for Mud Weight?	No	
	DSNT	BSCO	Correct for Borehole Salinity?	No	
	DSNT	FSCO	Correct for Formation Salinity?	No	
	DSNT	SGCO	Correct for Formation Sigma?	No	
	DSNT	SIGM	Sigma Matrix	0.00	
	DSNT	SIGW	Sigma Water	0.00	
	DSNT	CTCO	Correct for Casing Thickness?	Yes	
	DSNT	CMCO	Correct for Cement Thickness?	Yes	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	
	DSNT	LHWT	Logging Horizontal Water Tank?	No	
	DSNT	USND	Use Var StandOff?	Yes	
	DSNT	BHSM	Borehole Size Source Tool	SDLT	
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	SDLT	SAO	SDL Backup Arm Offset	0.00	in
	SDLT	PAO	Pad Arm Offset	0.00	in
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	Microlog Pad	MINO	Microlog Lateral Offset	0.00	ohmm
	Microlog Pad	MNOO	Microlog Normal Offset	0.00	ohmm
	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	MLPE	Higher PE Accuracy?	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	
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	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	LSFU	ACRT Long Space Array No of Frequency Used	3	
ACRt Sonde	MSFU	ACRT Middle 17 Space Array No of Frequency Used	3	
ACRt Sonde	SSFU	ACRT Short Space Array No of Frequency Used	2	
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	
ACRt Sonde	HRFL	High-Resistivity Version (Tar Sand Only)?	No	
BOTTOM				

Data: BECKER_710001 GTET-DSNT-SDLT-ACRtIDLE
Date: 10-Sep-17 13:45:27



CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 10971172

Reference Calibration Date: 14-Jul-17 15:53:59

Engineer: WHITLOCK

Calibration Date: 04-Sep-17 09:33:42

Software Version: WL INSITE R5.0.5 (Build 8)

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	25.3	25.1	api
Background + Calibrator	259.0	257.1	api
Calibrator	233.7	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 10971172

Reference Calibration Date: 04-Sep-17 09:33:42

Engineer: WHITLOCK

Calibration Date: 04-Sep-17 09:38:31

Software Version: WL INSITE R5.0.5 (Build 8)

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	25.1	24.1	api
Background + Calibrator	257.1	255.9	api
Calibrator	232.0	231.7	api

Shop	Field	Difference	Tolerance
232.0	231.7	0.3	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11019643

Reference Calibration Date: 03-Jul-17 11:40:27

Engineer: T. HYDE

Calibration Date: 03-Jul-17 11:55:03

Logging Source S/N: DSN-438

Tank Serial Number: 10730320

Reference value assigned to Tank: 56.100

Snow Block S/N: 668

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:	1.02375	1.02291	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):	0.2360	0.2358	0.0003	+/- 0.0020
Calibrated Ratio:	10.5683	10.5597	0.009	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0690	0.02000 - 0.09000

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

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - 11019643

Reference Calibration Date: 03-Jul-17 11:55:03

Engineer: WHITLOCK

Calibration Date: 04-Sep-17 10:28:09

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

Logging Source S/N: DSN-438

Snow Block S/N: 668

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0690	0.0741	0.0051	+/- 0.0150

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 12153520

Reference Calibration Date: 16-Jul-17 09:04:46

Engineer: T. HYDE

Calibration Date: 16-Jul-17 09:15:37

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

Host Tool Name: DSNT - 11019643

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4999.24	-4827.59	-7000.00 - -1000.00
Pad Gain	0.0003776	0.0003732	0.0002000 - 0.0006000
Arm Offset	-3298.36	-3861.19	-5000.00 - 3000.00
Arm Gain	0.0004826	0.0005319	0.000300 - 0.000700

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)	3.73	3.75	0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.55	6.50	-0.05	+/- 0.20
Medium Ring (in)	8.19	8.25	0.06	+/- 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 - 12153520

Reference Calibration Date: 16-Jul-17 09:15:37

Engineer: WHITLOCK

Calibration Date: 04-Sep-17 09:21:44

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.75	0.00	+/- 0.10
Ring Diameter	8.25	8.35	0.10	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 10865884

Reference Calibration Date: 24-Aug-17 11:23:24

Engineer: T. HYDE

Calibration Date: 24-Aug-17 11:42:16

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

Logging Source S/N: 20791B

Aluminum Block S/N: EL RENO ALUMINUM

Density: 2.581g/cc

Pe: 3.170

Magnesium Block S/N: EL RENO MAGNESIUM

Density: 1.687g/cc

Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	0.9954	0.9902	0.90 - 1.10
Near Dens Gain	1.0009	1.0022	0.90 - 1.10
Near Peak Gain	1.0204	1.0067	0.90 - 1.10
Near Lith Gain	1.0177	0.9798	0.90 - 1.10
Far Bar Gain	1.0074	1.0105	0.90 - 1.10
Far Dens Gain	0.9955	0.9954	0.90 - 1.10
Far Peak Gain	0.9934	0.9941	0.90 - 1.10
Far Lith Gain	0.9729	0.9715	0.90 - 1.10
Near Bar Offset	0.3329	0.3796	NONE
Near Dens Offset	0.2570	0.2455	NONE
Near Peak Offset	0.0842	0.1932	NONE
Near Lith Offset	0.0696	0.3811	NONE

Near Lith Offset	0.0000	0.0011	NONE
Far Bar Offset	0.1940	0.1702	NONE
Far Dens Offset	0.2685	0.2711	NONE
Far Peak Offset	0.2758	0.2703	NONE
Far Lith Offset	0.3932	0.4038	NONE
Near Bar Background	746.92	745.40	700 - 1450
Near Dens Background	248.02	247.88	230 - 480
Near Peak Background	108.57	110.03	100 - 210
Near Lith Background	133.69	133.02	125 - 260
Far Bar Background	588.08	589.53	450 - 900
Far Dens Background	230.50	230.28	175 - 345
Far Peak Background	91.05	89.65	70 - 140
Far Lith Background	94.33	94.00	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.691	1.687	-0.004	+/- 0.015
Pe	2.525	2.559	0.034	+/- 0.150
ALUMINUM				
Density (g/cc)	2.581	2.581	0.000	+/- 0.01500
Pe	3.149	3.132	-0.017	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0003	+/- 0.0110	0.0019	+/- 0.0140
Magnesium Block	0.0002	+/- 0.0110	-0.0019	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	-0.0000	+/- 0.0140
Resolution	8.39	6.00 - 11.50	8.91	6.00 - 11.50
Internal Verifier(B+D+P+L)	1236	1200 - 2700	1003	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 - 10865884

Reference Calibration Date: 24-Aug-17 11:42:16

Engineer: WHITLOCK

Calibration Date: 04-Sep-17 10:39:19

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

Pad Temperature: 85.8 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1236.342	1238.398	2.056	14.260
Far (B+D+P+L) cps	1003.465	1005.370	1.905	16.946
Near Resolution	8.39	8.49	0.100	0.50
Far Resolution	8.91	8.90	-0.010	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-10971172						
Gamma Ray Calibrator	232.0	231.7	-----	0.3	+/- 9.00	api
DSNT-11019643						
Snow-Block Porosity	0.0690	0.0741	-----	-0.0051	+/- 0.0150	decp
SDLT-12153520						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.35	-----	-0.10	+/-0.15	in
SDLT Pad-10865884						
Near(B+D+P+L)	1236.342	1238.398	-----	-2.056	+/-14.260	cps
Far(B+D+P+L)	1003.465	1005.370	-----	-1.905	+/-16.946	cps
Data: BECKER_710001 GTET-DSNT-SDLT-ACRtIDLE Date: 10-Sep-17 13:44:28						
HALLIBURTON 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			55.79	NO	
BS	Bit Size			55.79	NO	
HDIA	Measured Hole Diameter			0.00	NO	
CH_HOS						
DHTN	DownholeTension			0.00	BLK	0.000
SP Sub						
PLTC	Plot Control Mask			50.56	NO	
SP	Spontaneous Potential			50.56	BLK	1.250
SPR	Raw Spontaneous Potential			50.56	NO	
SPO	Spontaneous Potential Offset			50.56	NO	
GTET						
TPUL	Tension Pull			42.54	NO	
GR	Natural Gamma Ray API			42.54	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API			42.54	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution			42.54	W	1.416 , 0.750
HDIA	Measured Hole Diameter			0.00	NO	
ACCZ	Accelerometer Z			0.00	BLK	0.083
DEVI	Inclination			0.00	NO	
DSNT						
TPUL	Tension Pull			32.30	NO	
RNDS	Near Detector Telemetry Counts			32.40	BLK	1.417
RFDS	Far Detector Telemetry Counts			33.15	TRI	0.583
DNTT	DSN Tool Temperature			32.40	NO	
DSNS	DSN Tool Status			32.30	NO	
FNDS	Near Detector Telemetry Counts FWD			33.15	BLK	0.583

ERNDRND	Near Detector Telemetry Counts EVR	32.40	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	33.15	BLK	0.000
ENTM	DSN Tool Temperature EVR	32.40	NO	
HDIA	Measured Hole Diameter	0.00	NO	
SDLT				
TPUL	Tension Pull	22.40	NO	
PCAL	Pad Caliper	22.40	TRI	0.250
ACAL	Arm Caliper	22.40	TRI	0.250
ACRt Sonde				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter 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	
TCVM	Temperature Correction Values Loop On	2.73	NO	

TDV	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	
Microlog Pad				
TPUL	Tension Pull	22.58	NO	
MINV	Microlog Lateral	22.58	BLK	0.750
MNOR	Microlog Normal	22.58	BLK	0.750
SDLT Pad				
TPUL	Tension Pull	22.39	NO	
NAB	Near Above	22.21	BLK	0.920
NHI	Near Cesium High	22.21	BLK	0.920
NLO	Near Cesium Low	22.21	BLK	0.920
NVA	Near Valley	22.21	BLK	0.920
NBA	Near Barite	22.21	BLK	0.920
NDE	Near Density	22.21	BLK	0.920
NPK	Near Peak	22.21	BLK	0.920
NLI	Near Lithology	22.21	BLK	0.920
NBAU	Near Barite Unfiltered	22.21	BLK	0.250
NLIU	Near Lithology Unfiltered	22.21	BLK	0.250
FAB	Far Above	22.56	BLK	0.250
FHI	Far Cesium High	22.56	BLK	0.250
FLO	Far Cesium Low	22.56	BLK	0.250
FVA	Far Valley	22.56	BLK	0.250
FBA	Far Barite	22.56	BLK	0.250
FDE	Far Density	22.56	BLK	0.250
FPK	Far Peak	22.56	BLK	0.250
FLI	Far Lithology	22.56	BLK	0.250
PTMP	Pad Temperature	22.40	BLK	0.920
NHV	Near Detector High Voltage	21.79	NO	
FHV	Far Detector High Voltage	21.79	NO	
ITMP	Instrument Temperature	21.79	NO	
DDHV	Detector High Voltage	21.79	NO	
HDIA	Measured Hole Diameter	0.00	NO	
Data: BECKER_710001 GTET-DSNT-SDLT-ACRtIDLE			Date: 10-Sep-17 13:45:04	

COMPANY	HARTMAN OIL COMPANY, INC.		
WELL	BECKER #7		
FIELD	DAMME		
COUNTY	FINNEY	STATE	KANSAS
HALLIBURTON		DUAL SPACED NEUTRON SPECTRAL DENSITY LOG	