HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

COMPANY	CULBREATH OIL & GAS
WELL	JACK FABER 1-7
FIELD/BLOCK	WILDCAT
COUNTY	RAWLINS
STATE	KANSAS

COMPANY **CULBREATH OIL & GAS**

WELL **JACK FABER 1-7**

FIELD/BLOCK **WILDCAT**

COUNTY **RAWLINS** STATE **KANSAS**

API No. 15-153-21139-00-00

Location (SHL) 2272' FSL & 1980' FEL
S2 N2 NW SE

Other Services:
DSNT/SDLT
MICROLOG
IDT
BSAT
ACRT

Sect. 7 Twp. 5S Rge. 35W

Permanent Datum	GL	Elev. 3228.0 ft	Elev.: K.B. 3233.0 ft
Log measured from	KB	5.0 ft above perm. Datum	D.F. 3233.0 ft
Drilling measured from	KB		G.L. 3228.0 ft

Date	22-May-15		
Run No.	ONE		
Depth - Driller	4880.00 ft		
Depth - Logger	4882.0 ft		
Bottom - Logged Interval	4838.00 ft		
Top - Logged Interval	3500.00 ft		
Casing - Driller	8.625 in @ 344.0 ft	@	@
Casing - Logger	343.0 ft		
Bit Size	7.875 in	@	@
Type Fluid in Hole	Water Based Mud		
Density / Viscosity	9.3 ppg / 52.00 s/qt		
PH / Fluid Loss	8.00 pH / 8.0 cptm		
Source of Sample	MUD PIT		
Rm @ Meas. Temperature	1.374 ohmm @ 75.00 degF	@	@
Rmf @ Meas. Temperature	1.21 ohmm @ 75.00 degF	@	@
Rmc @ Meas. Temperature	1.452 ohmm @ 75.00 degF	@	@
Source Rmf / Rmc	MEASURED / MEASURED		
Rm @ BHT	0.86 ohmm @ 124.0 degF	@	@
Time Since Circulation	4.0000 hr		
Time on Bottom	22-May-15 12:00:00.000		
Max. Rec. Temperature	124.0 degF @ 4882.0 ft	@	@
Equipment / Location	11072142 / Liberal, KS, US		
Recorded By	JORGE ORLANDO PEREZ		
Witnessed By	ANTHONY LUNA		

Fold here

Service Ticket No.: 902429054 API Serial No.: 15-153-21139-00-00 PGM Version: WL INSITE R4.6.4 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

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

RESISTIVITY SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA

Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	ACRT	N/A	CENT	N/A
	I-11022962			
	S-11005909			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	11048627	Serial No.	10747684	Serial No.	11014296	Serial No.	11055304
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	EVEN	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS137	Source Type	AM241BE
Length	8"	LSA [Y/N]		Serial No.	5168GW	Serial No.	DSN-424
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 Ci	Strength	15.0 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	47.6 uSec/ft	30	-10	2.71 gr/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING

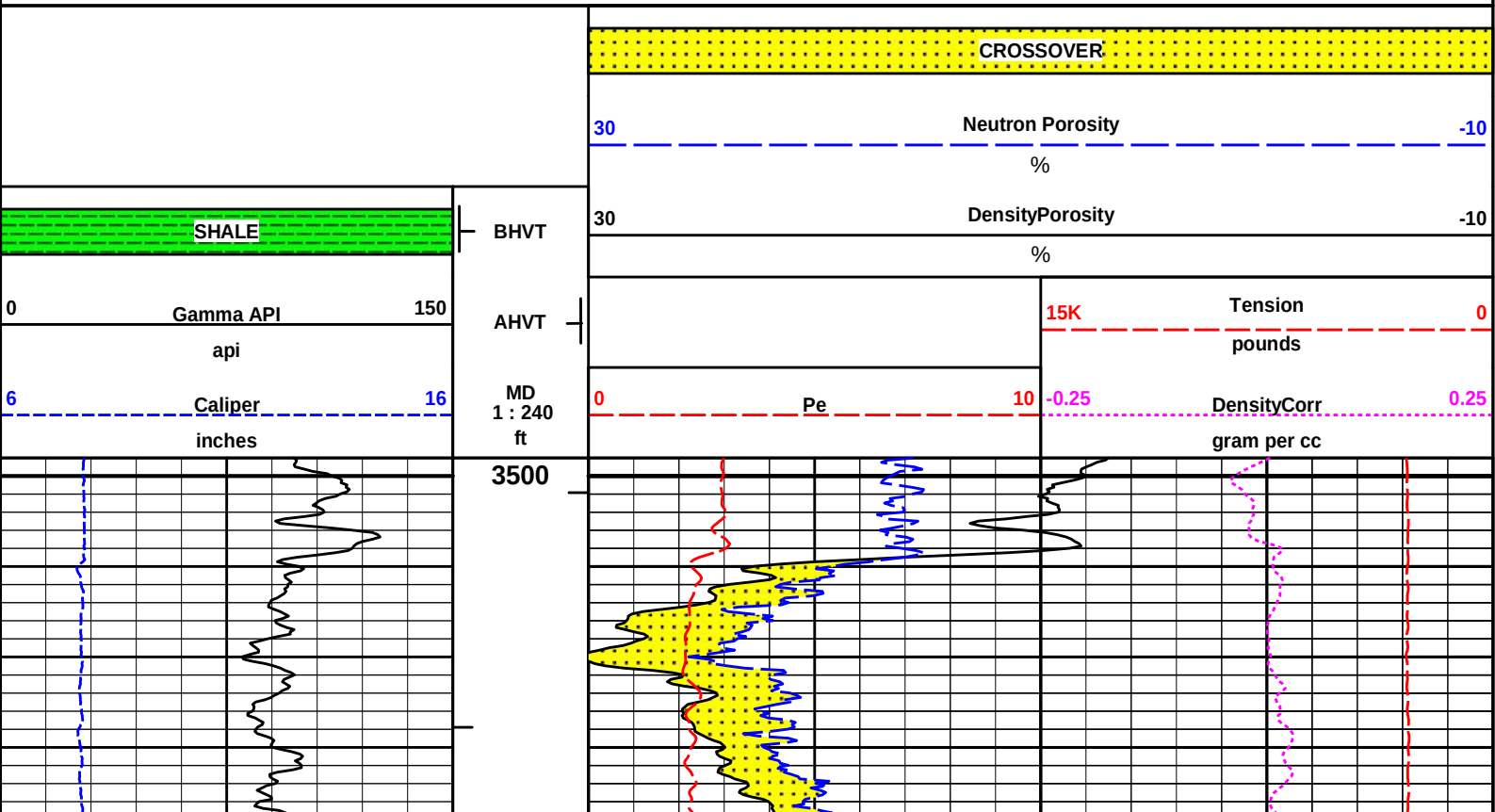
CHLORIDES REPORTED AT 500 ppm

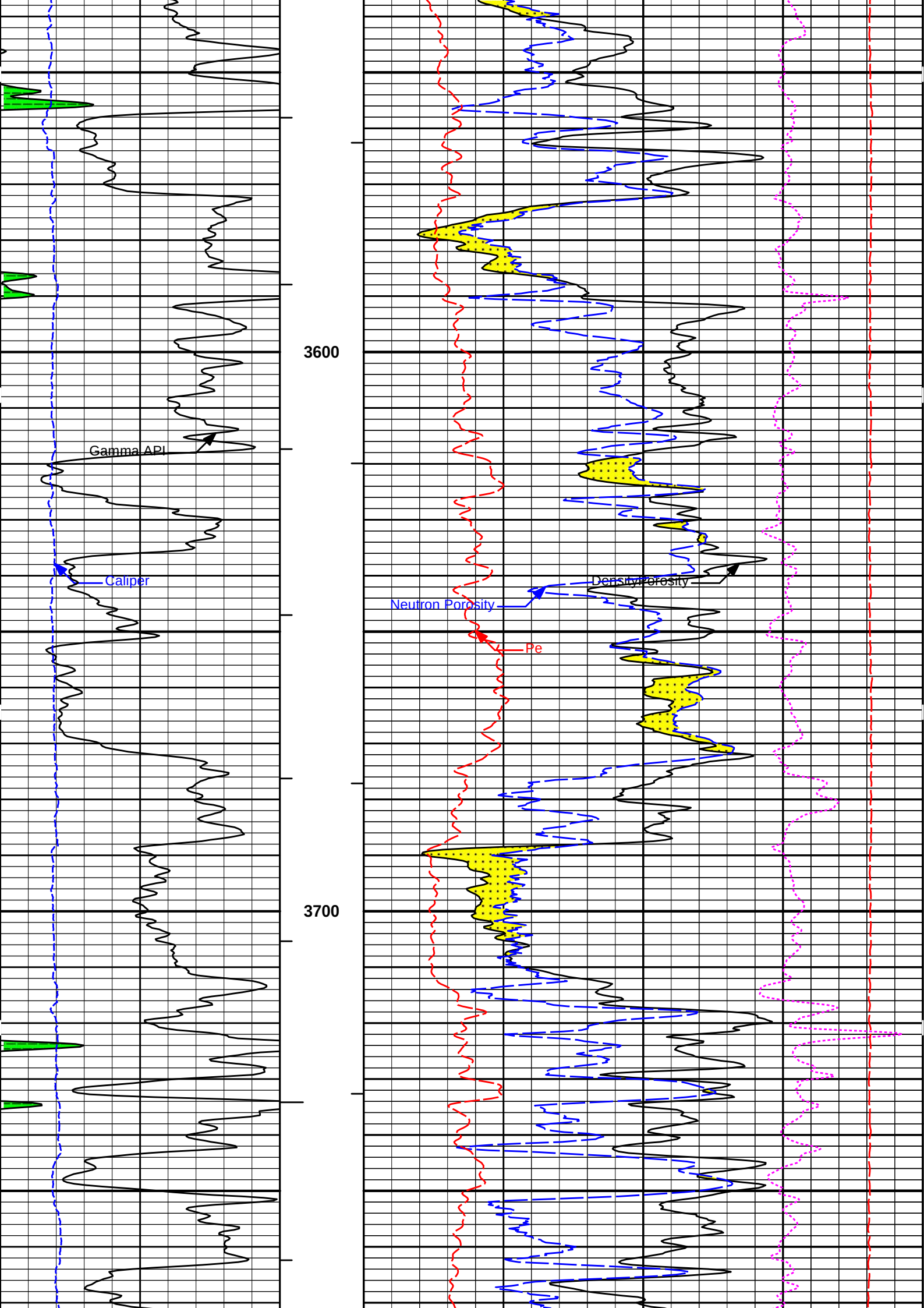
HALLIBURTON

Plot Time: 22-May-15 12:39:46
Plot Range: 3498 ft to 4887.17 ft
Data: JACK-FABER_1-7\Well Based\DETAILS
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

MEASURED DEPTH
MAIN SECTION 5" PER 100'

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3700
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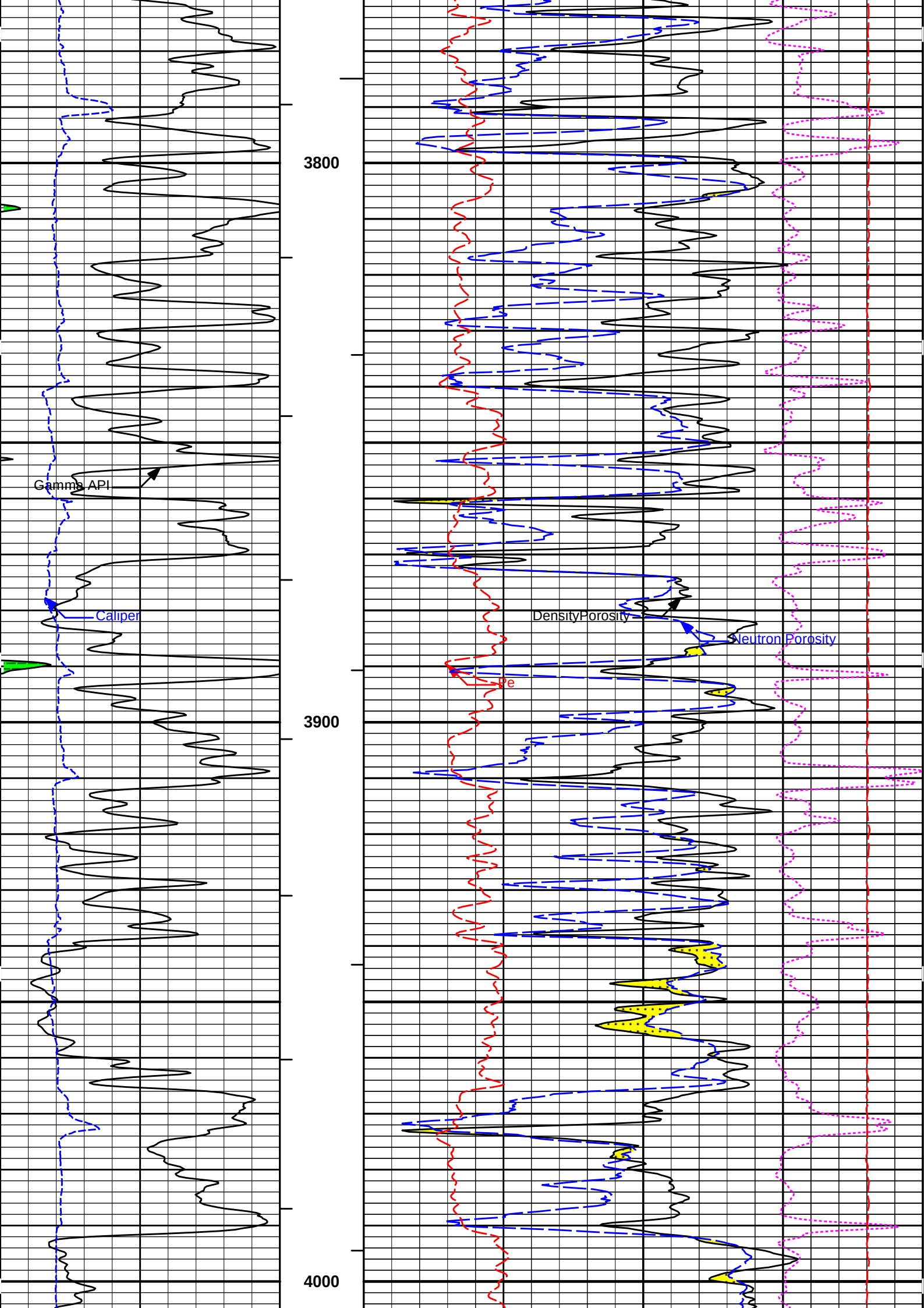
Caliper
Neutron Porosity
Density Porosity
Pe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Caliper
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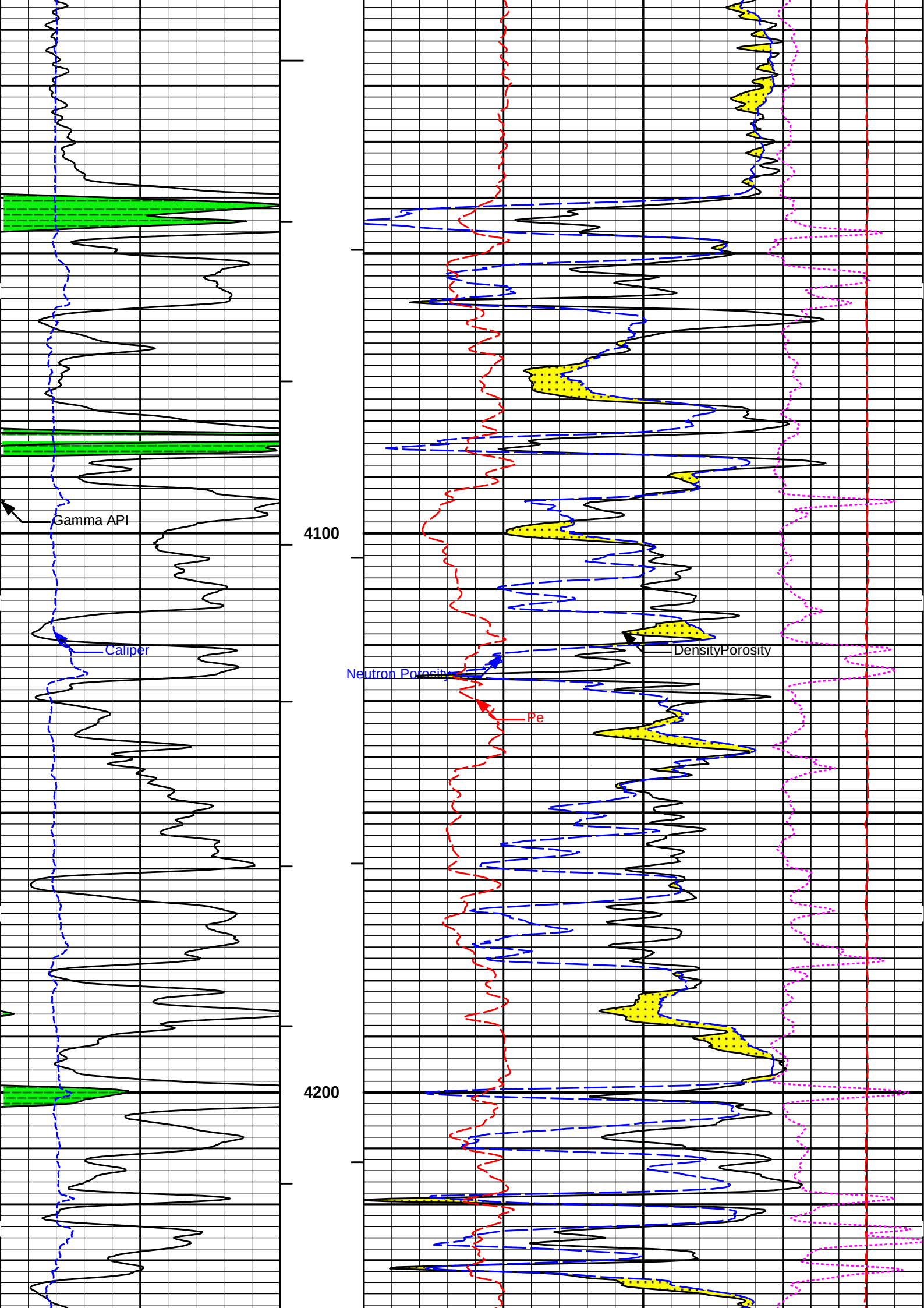
NeutronPorosity
Pe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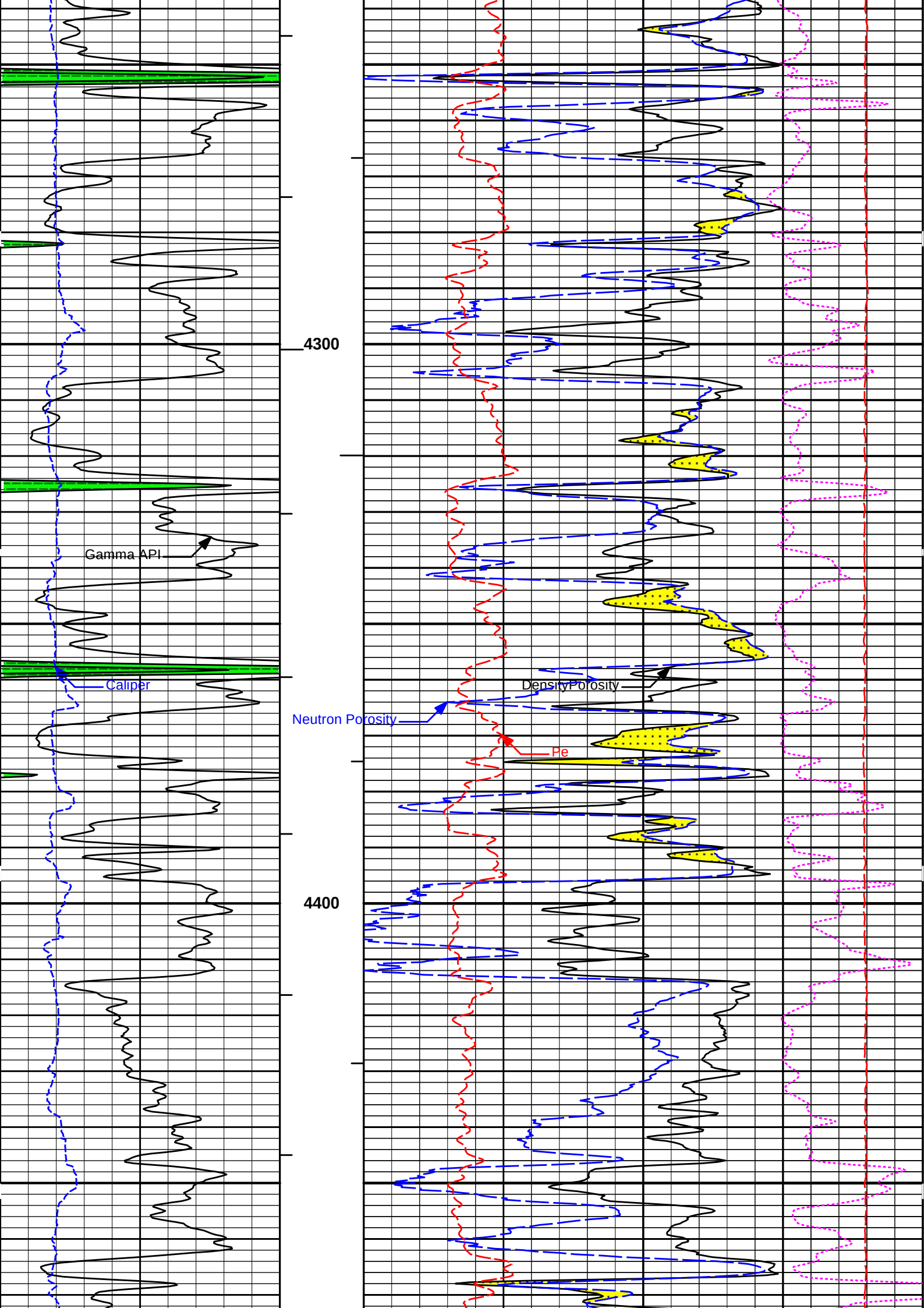
DensityPorosity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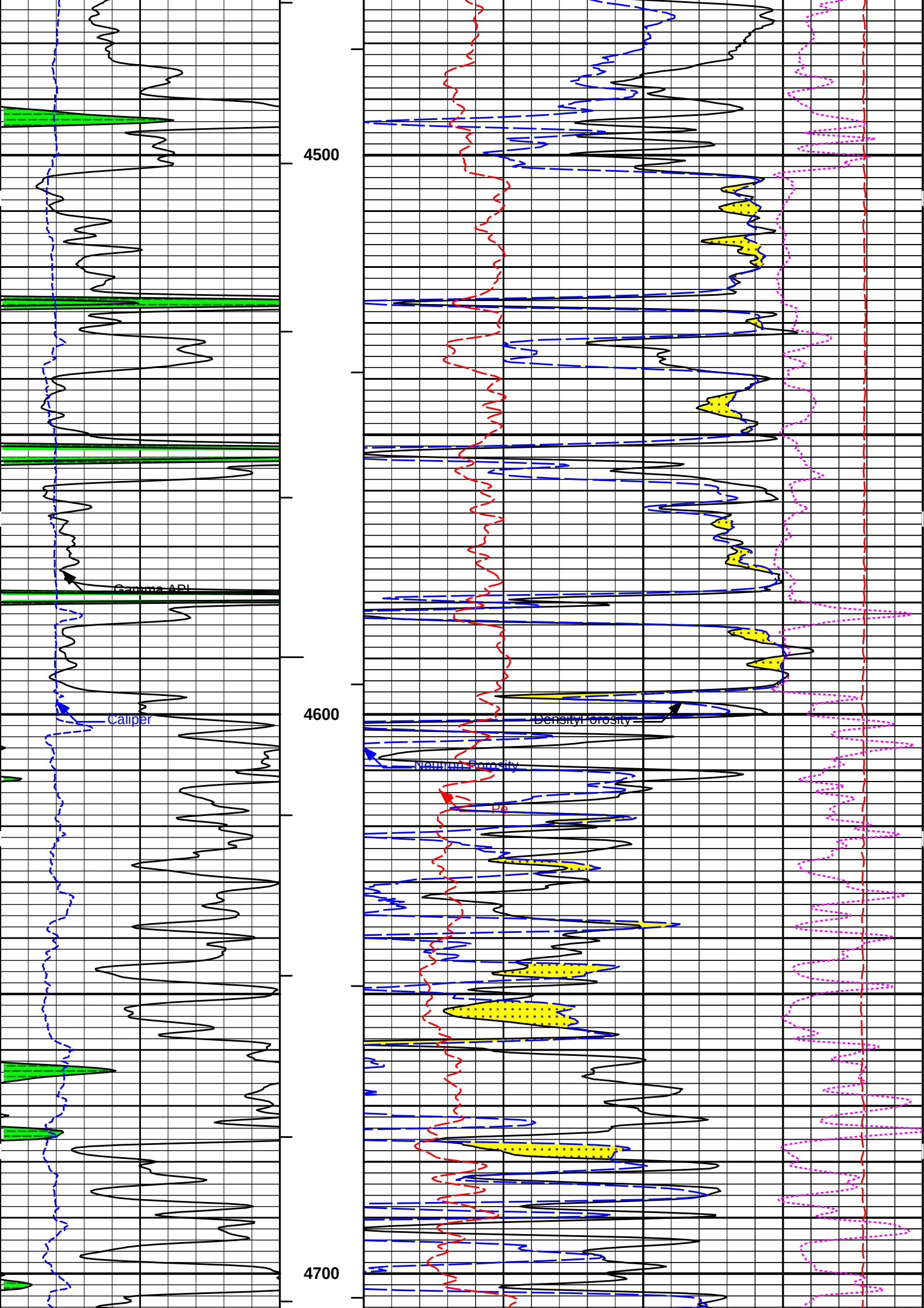
Gamma API
Caliper
Neutron Porosity
DensityPorosity
Pe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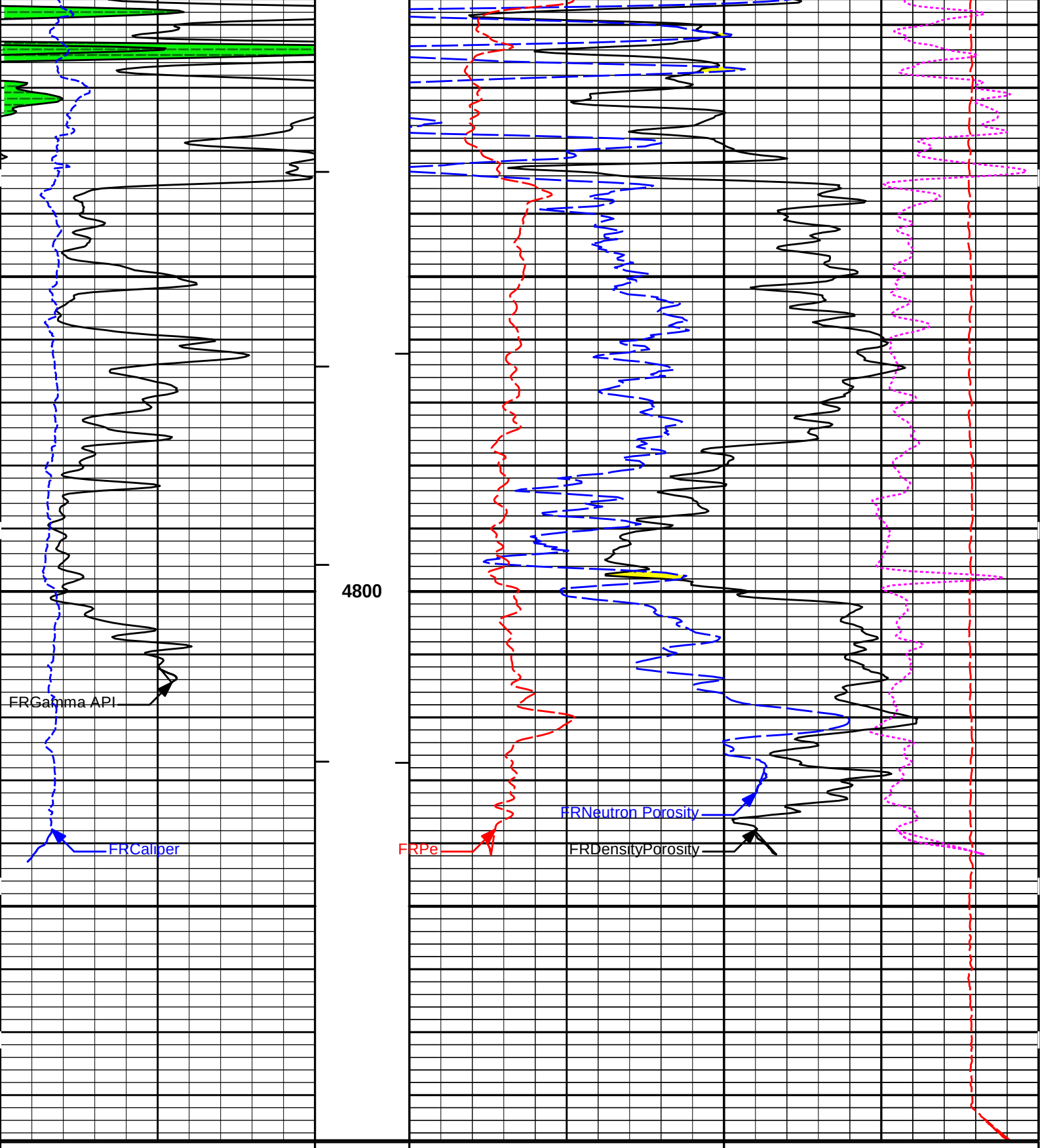
4600
4700
Gamma API
Caliper
Density Porosity
Neutron Porosity
Pe



6 Caliper 16	MD	0 Pe 10
inches	1 : 240	
	ft	
0 Gamma API 150	AHVT	
api		
SHALE	BHVT	

-0.25 DensityCorr 0.25	
gram per cc	
15K Tension 0	
pounds	
30 DensityPorosity -10	
%	
30 Neutron Porosity -10	
%	
CROSSOVER	

HALLIBURTON

Plot Time: 22-May-15 12:39:54
Plot Range: 3498 ft to 4887.17 ft
Data: JACK-FABER_1-7\Well Based\DETAILS\
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

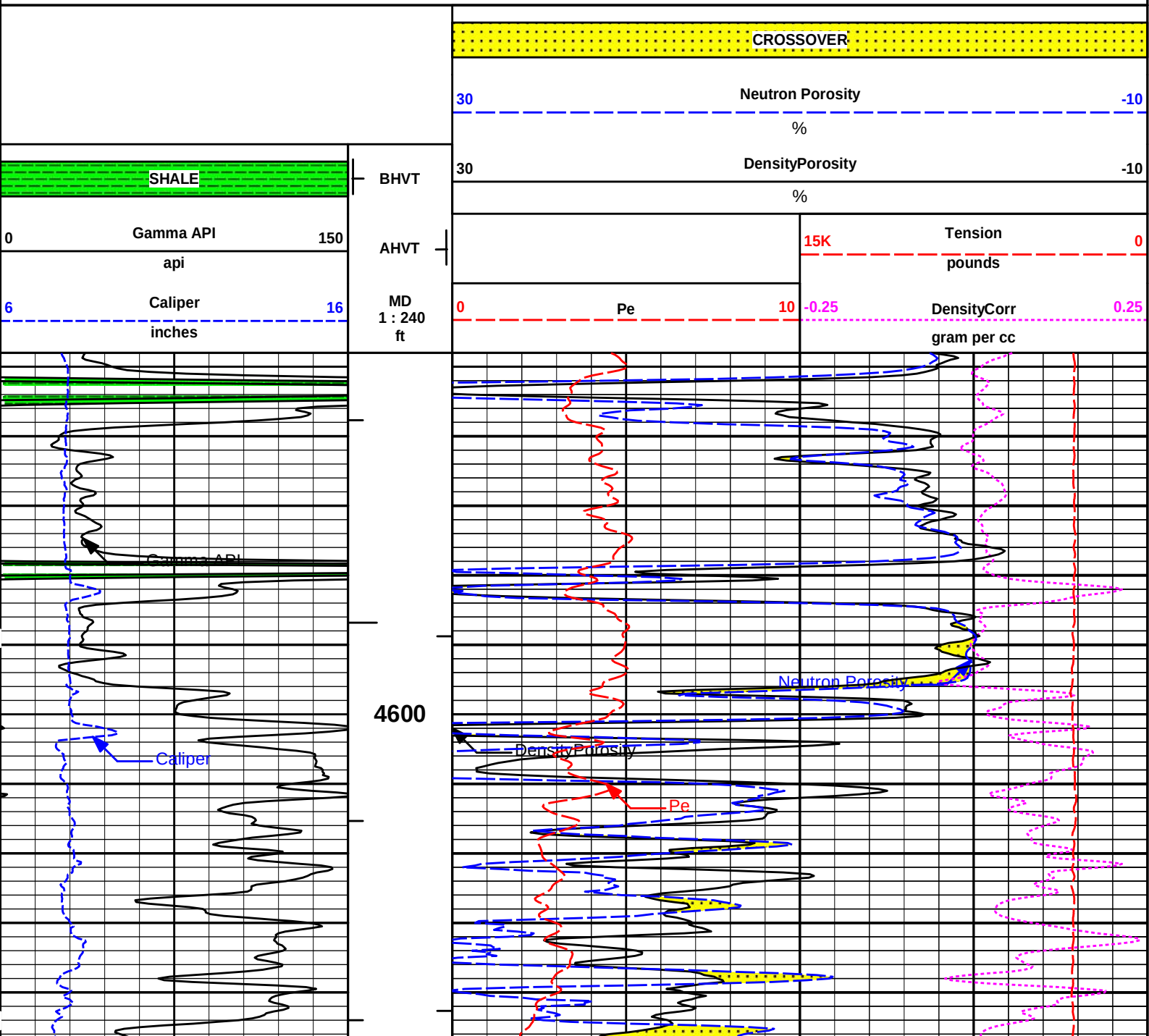
5 INCH MAIN LOG

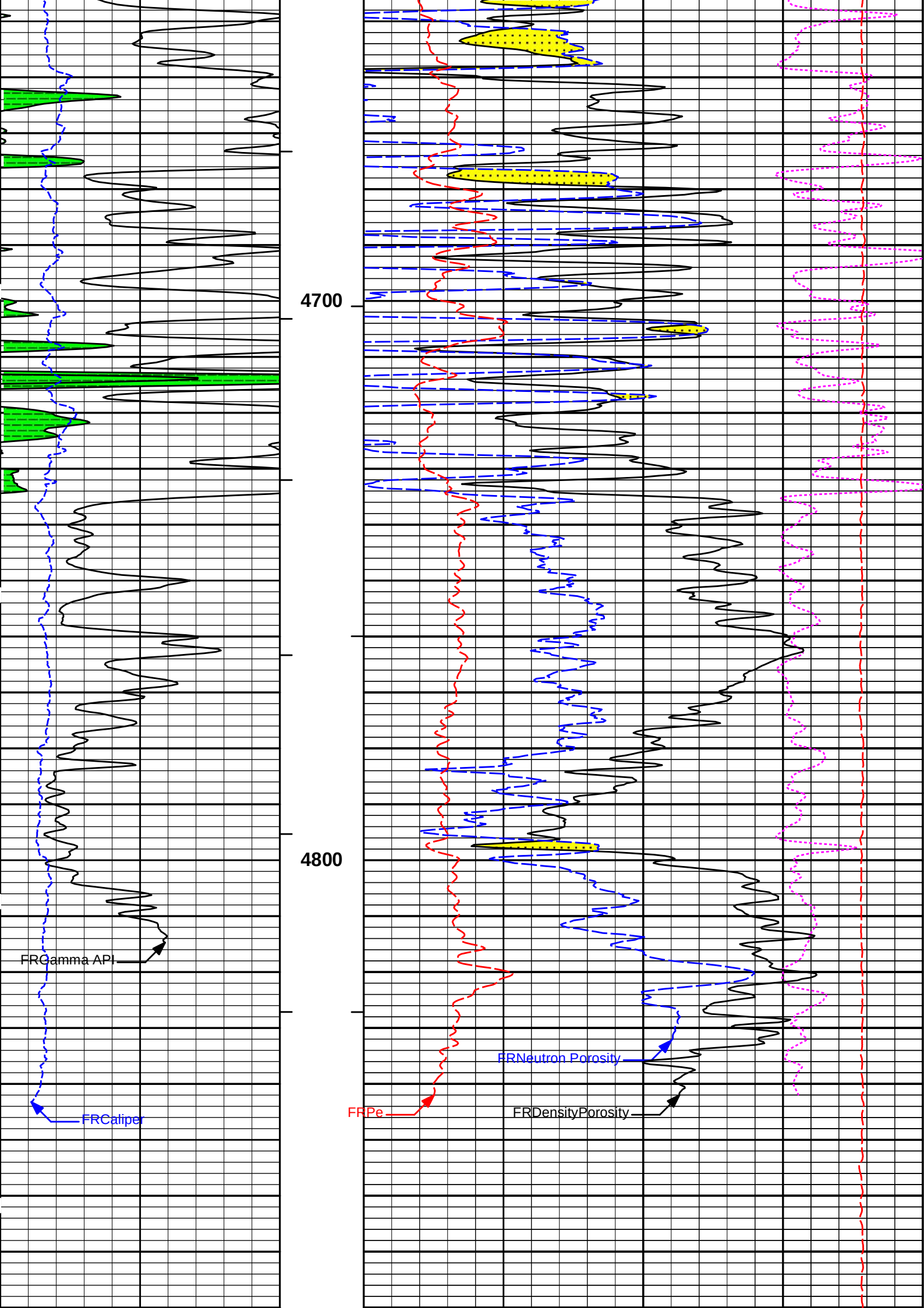
MEASURED DEPTH
MAIN SECTION 5" PER 100'

HALLIBURTON

Plot Time: 22-May-15 12:39:54
Plot Range: 4548 ft to 4887.42 ft
Data: JACK-FABER_1-7\Well Based\REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION

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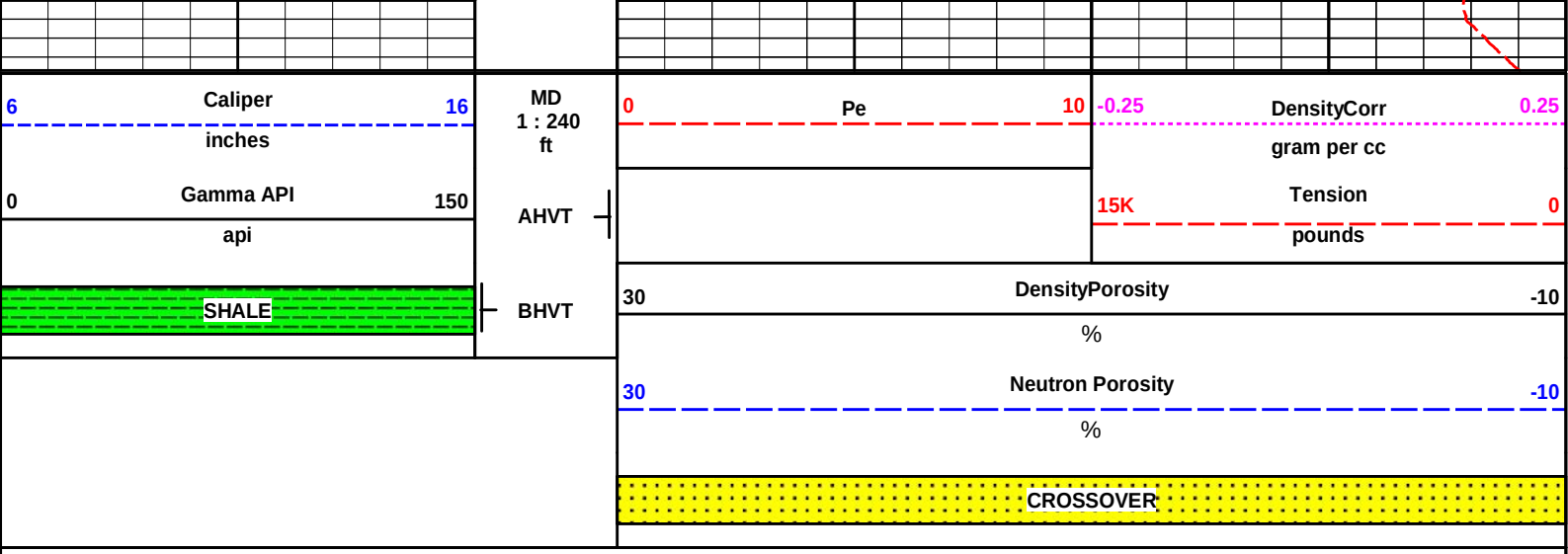
4800
FRGamma API
FRCaliper
FRPe
FRNeutron Porosity
FRDensityPorosity



HALLIBURTON

Plot Time: 22-May-15 12:39:56
Plot Range: 4548 ft to 4887.42 ft
Data: JACK-FABER_1-7\Well Based\REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

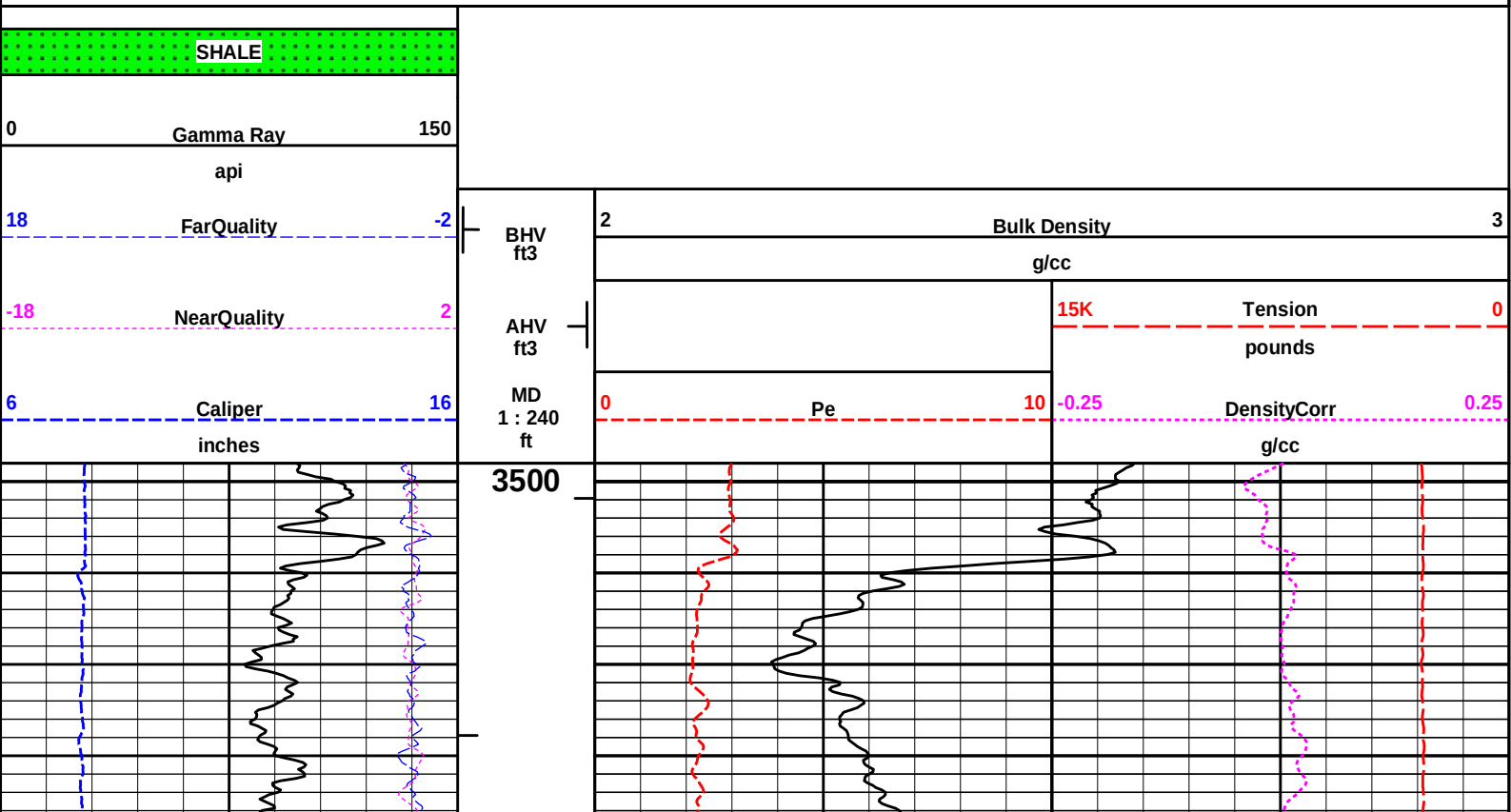
REPEAT SECTION

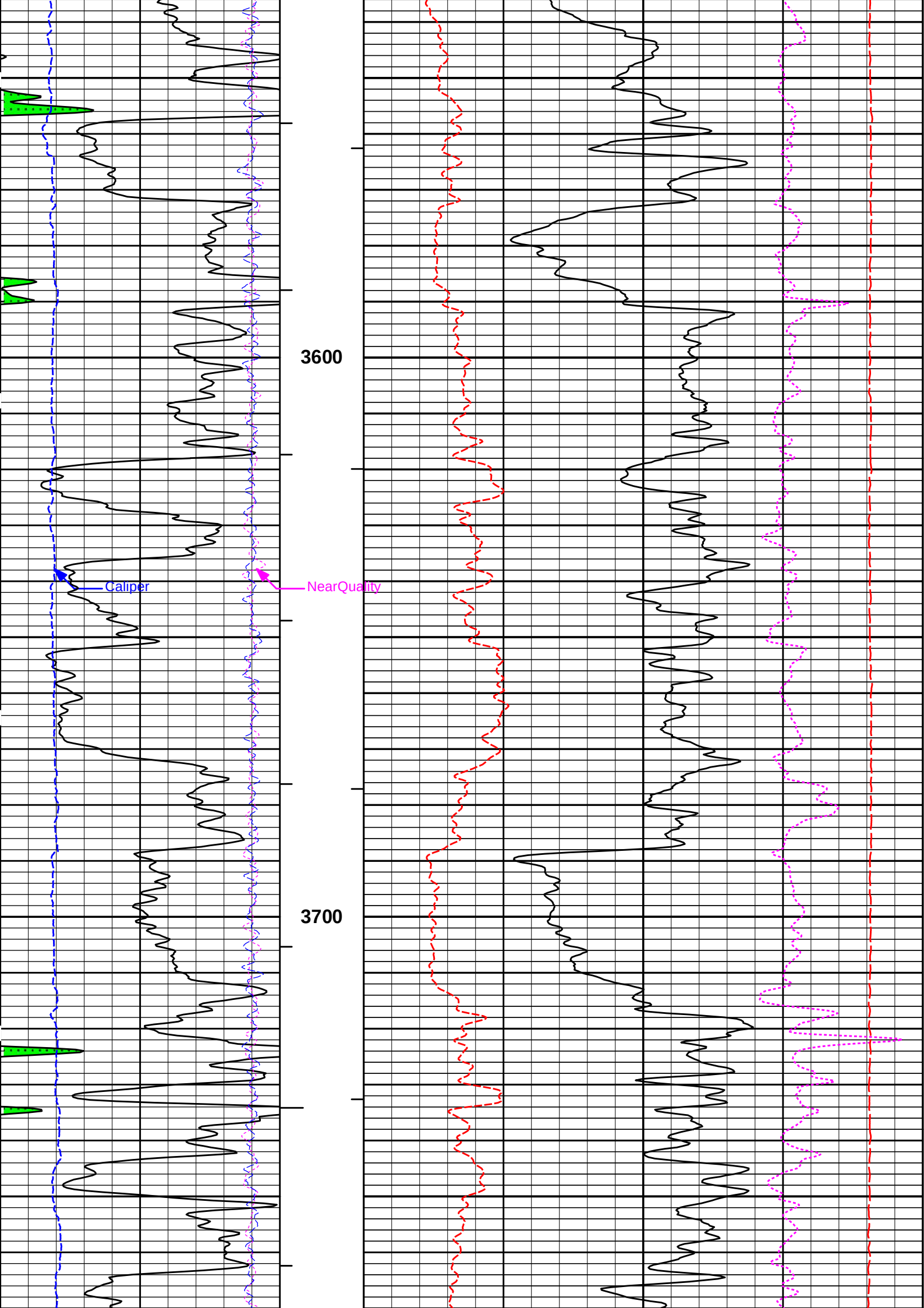
HALLIBURTON

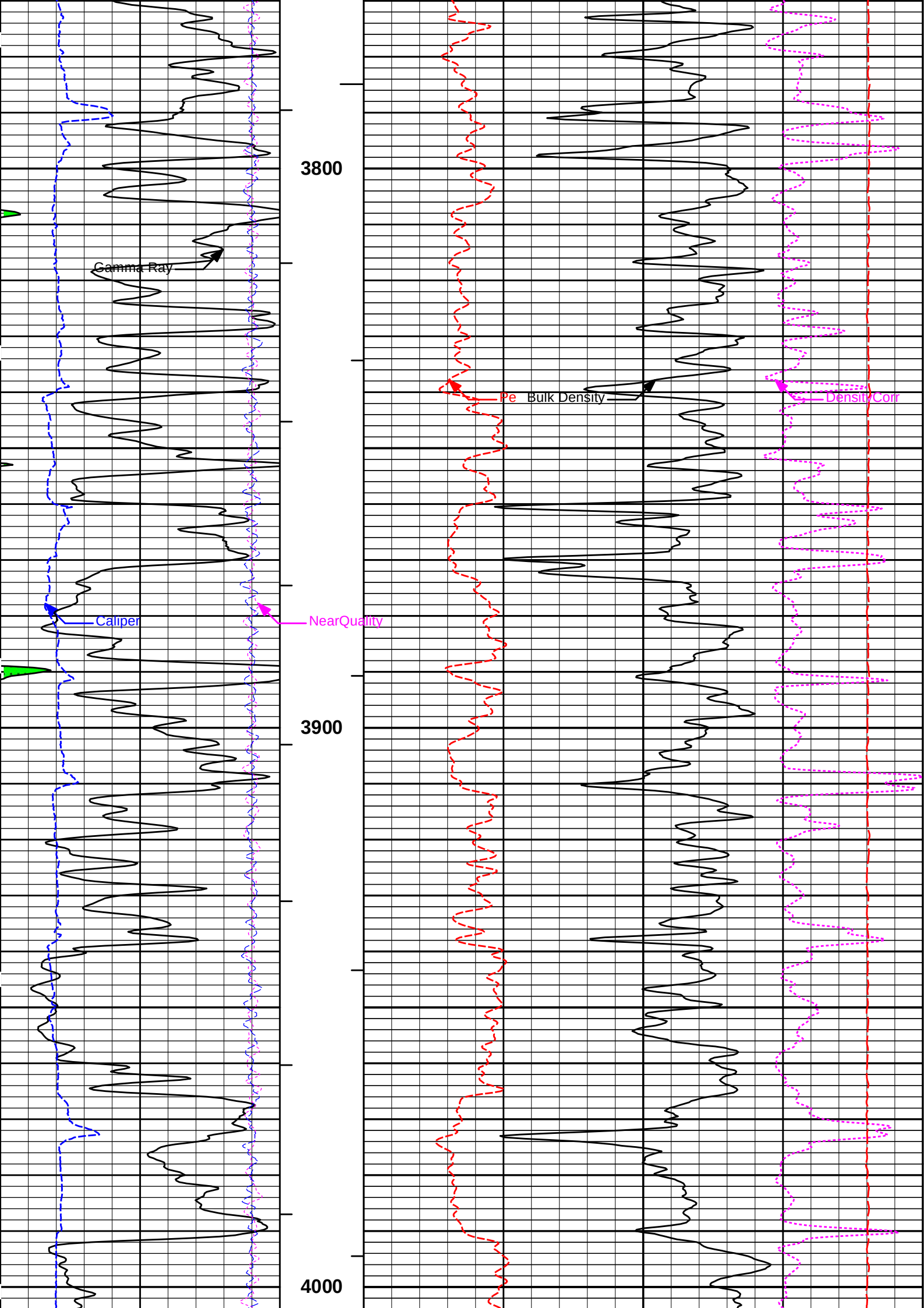
Plot Time: 22-May-15 12:39:57
Plot Range: 3498 ft to 4887.17 ft
Data: JACK-FABER_1-7\Well Based\DETAILS\
Plot File: \\-LOCAL-\JACK-FABER_1-7\Well Based\POROSITY\BULKD_5_MAIN_LIB

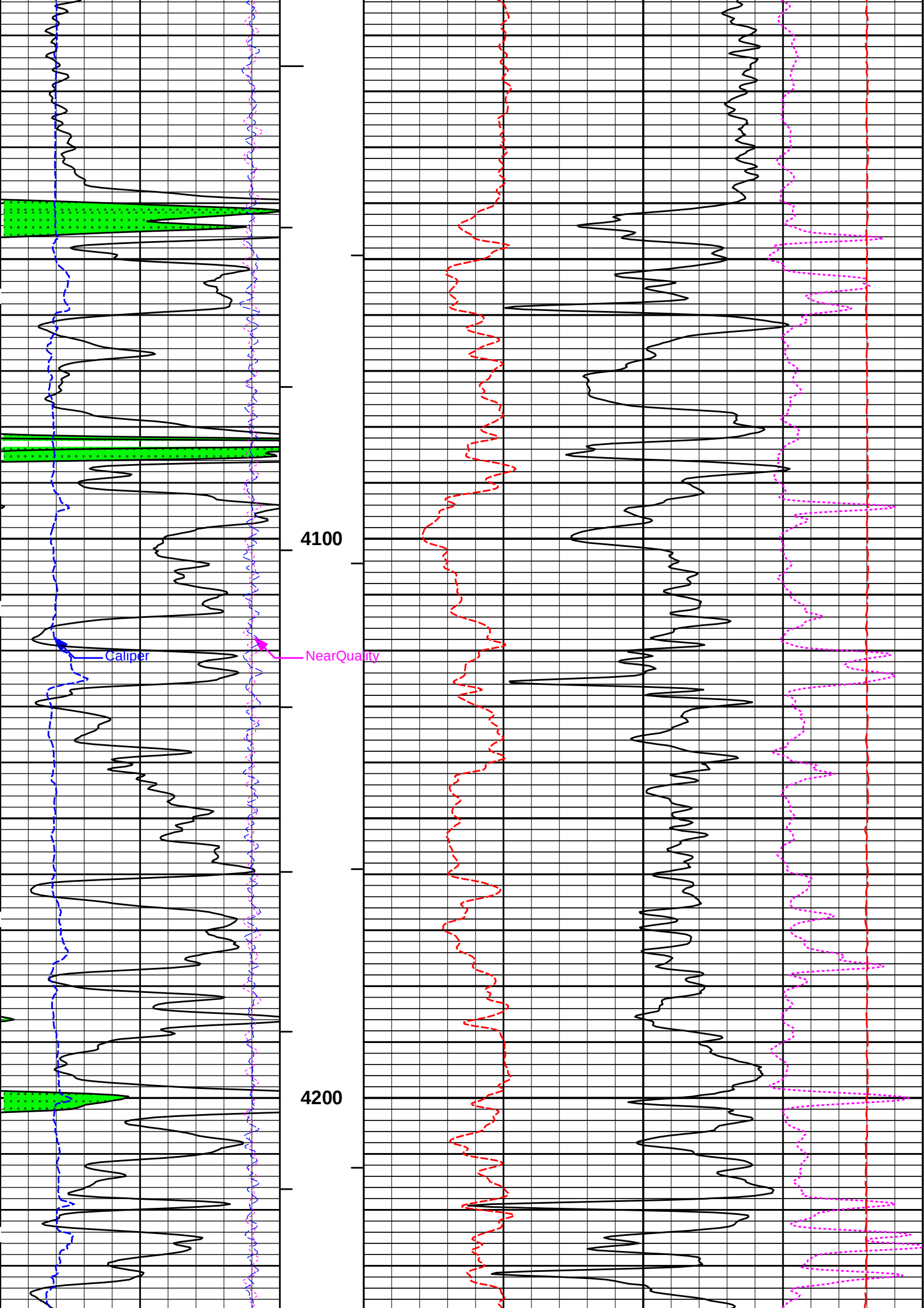
5 INCH MAIN LOG

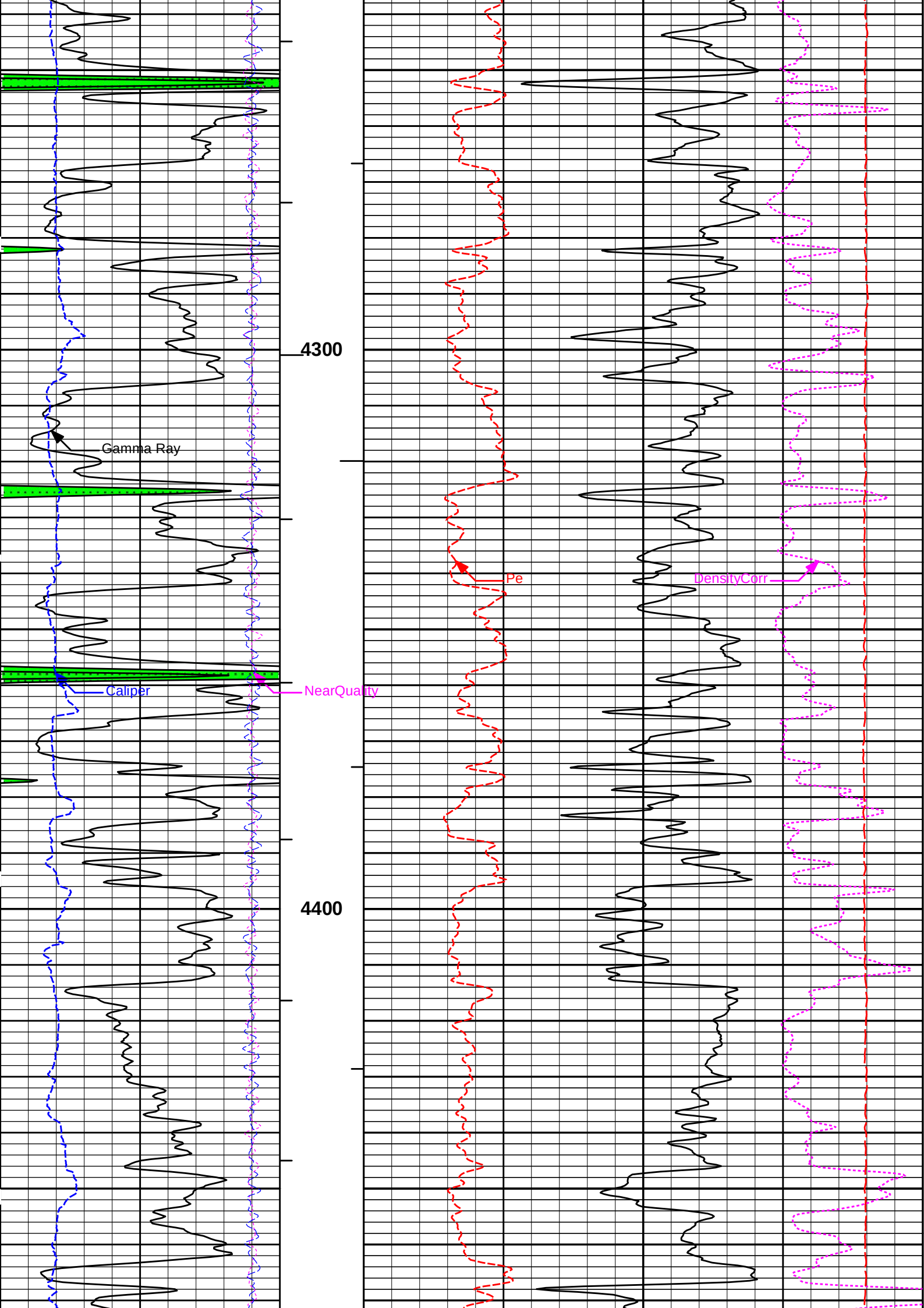
MEASURED DEPTH
MAIN SECTION 5" PER 100'

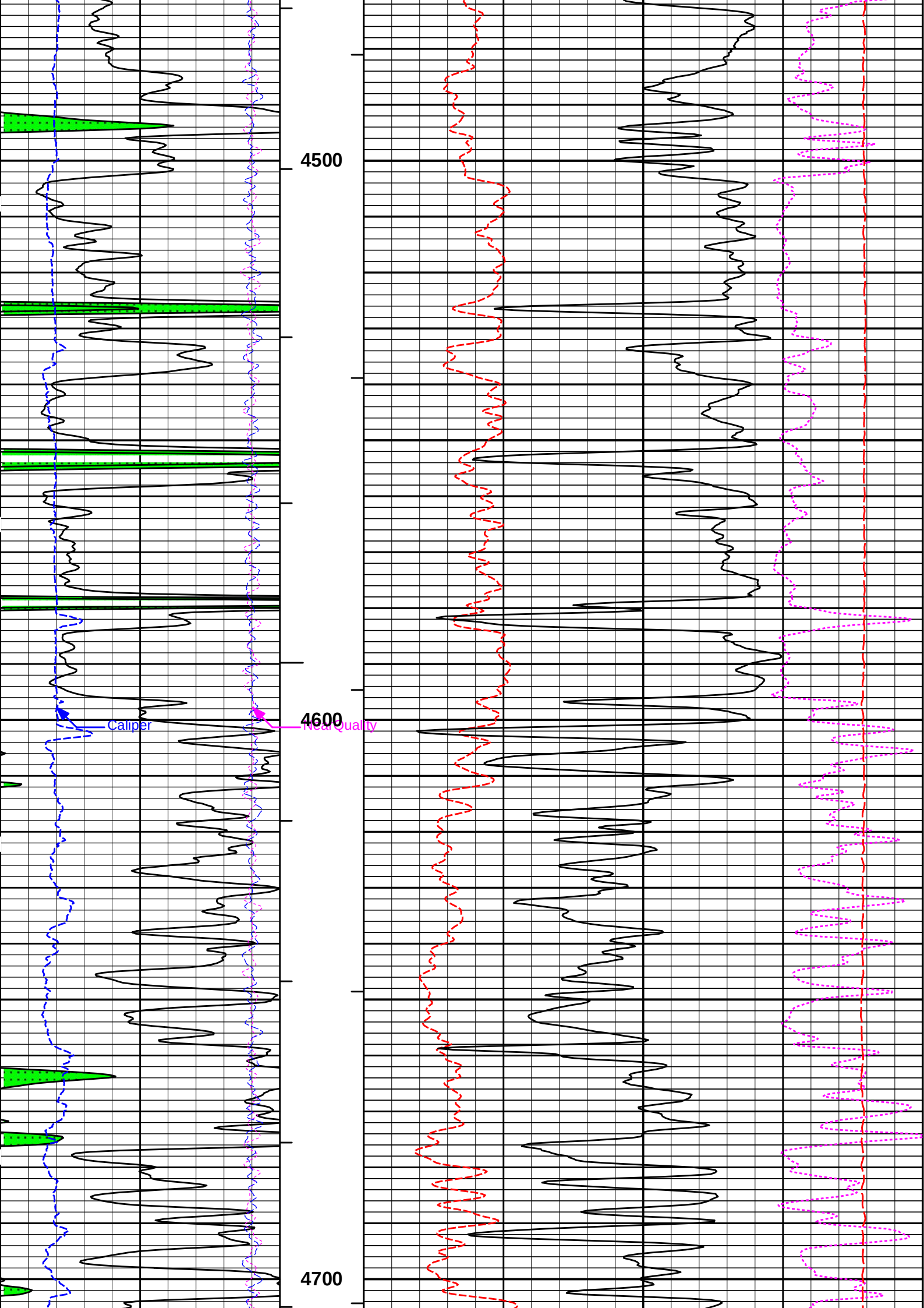


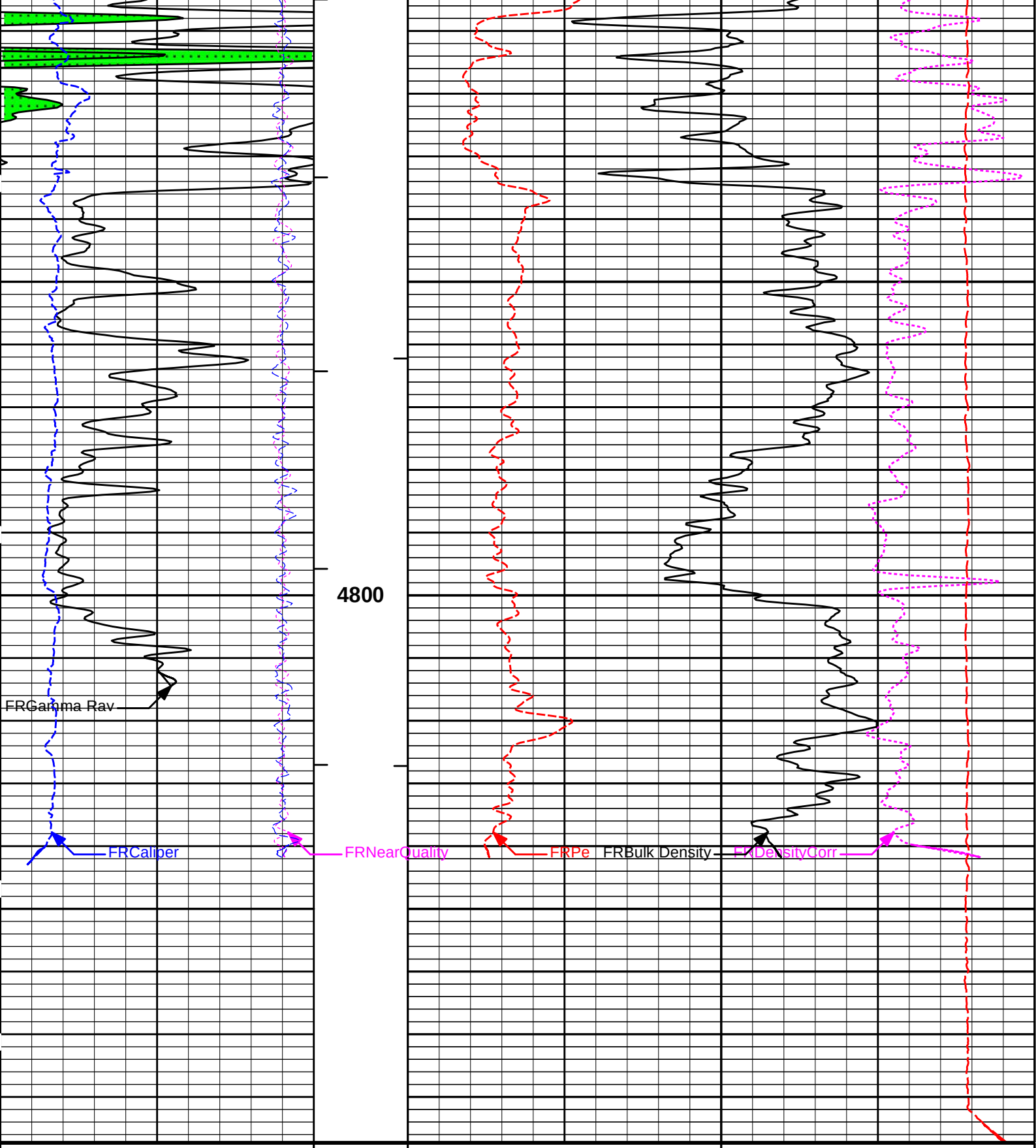

3600
3700
Caliper
NearQuality


3800
3900
4000
Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
DensityCorr


4100
4200
Caliper
NearQuality


4300
4400
Gamma Ray
Caliper
NearQuality
Pe
DensityCorr


4500
4600
4700
Caliper
Neut Quality



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				

HALLIBURTON

Plot Time: 22-May-15 12:40:03
Plot Range: 3498 ft to 4887.17 ft
Data: JACK-FABER_1-7\Well Based\DETAILS\
Plot File: \\-LOCAL-\JACK-FABER_1-7\Well Based\POROSITY\BULKD_5_MAIN_LIB

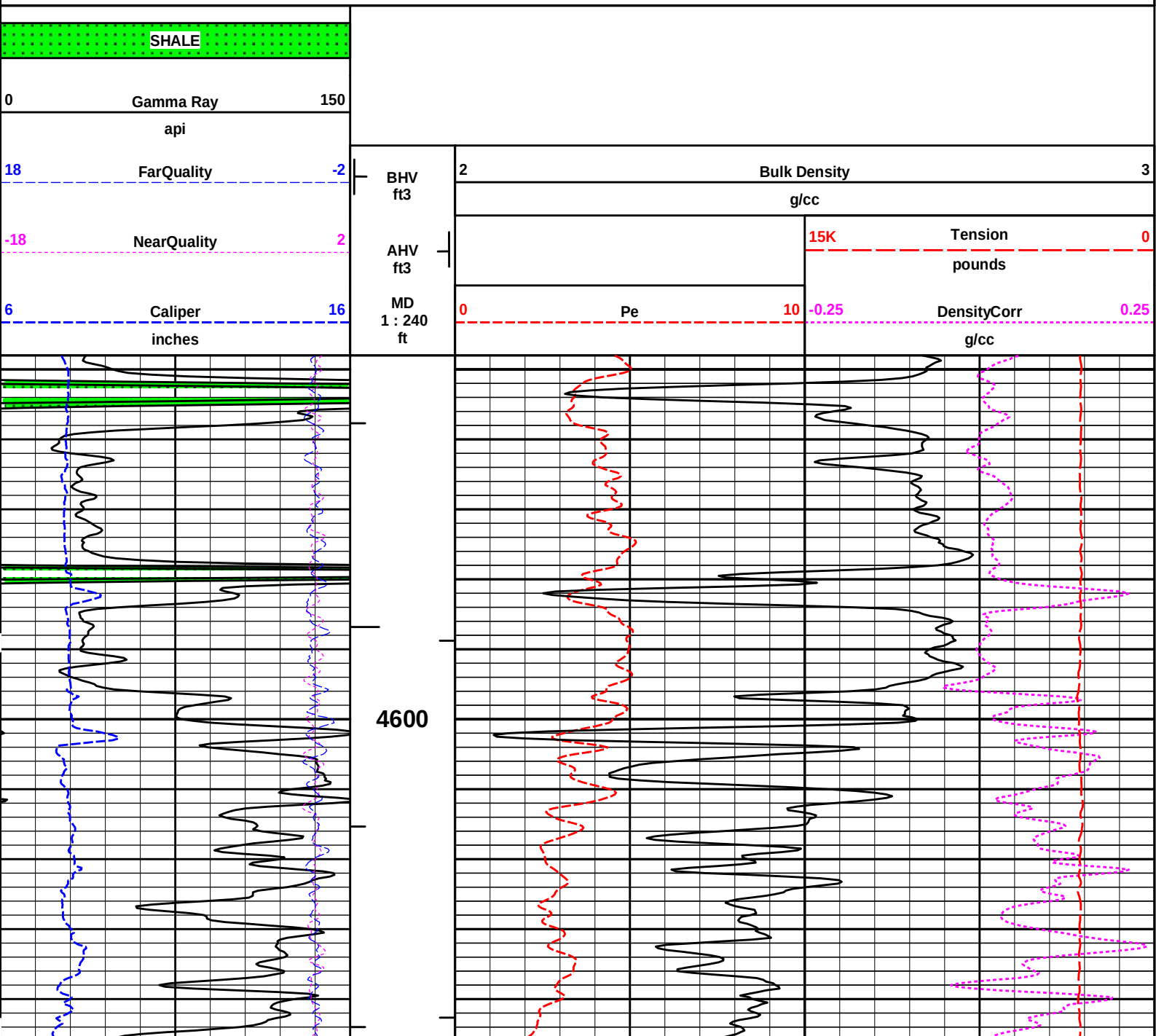
5 INCH MAIN LOG

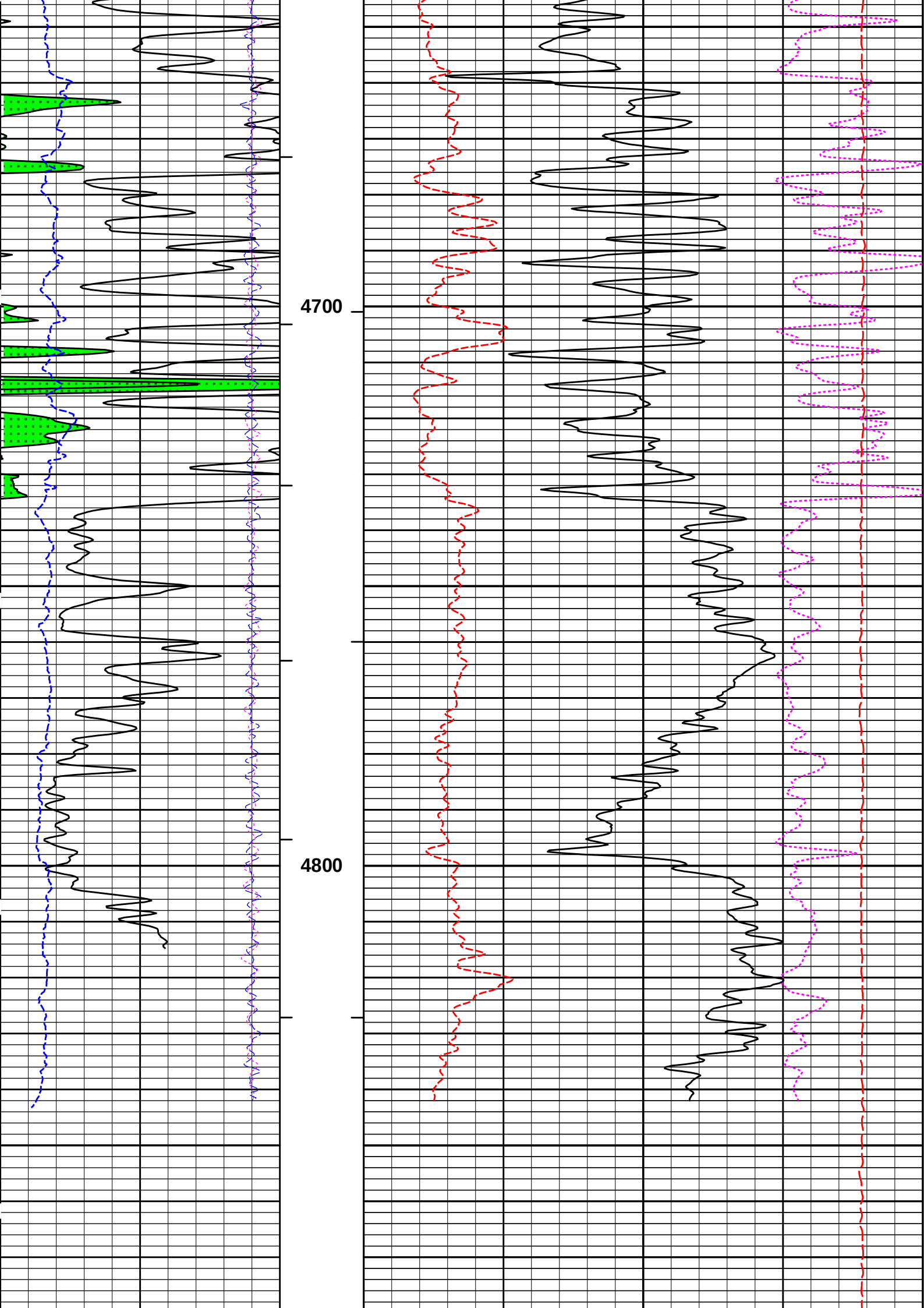
MEASURED DEPTH
MAIN SECTION 5" PER 100'

HALLIBURTON

Plot Time: 22-May-15 12:40:03
Plot Range: 4548 ft to 4887.42 ft
Data: JACK-FABER_1-7\Well Based\REPEAT\
Plot File: \\-LOCAL-\JACK-FABER_1-7\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

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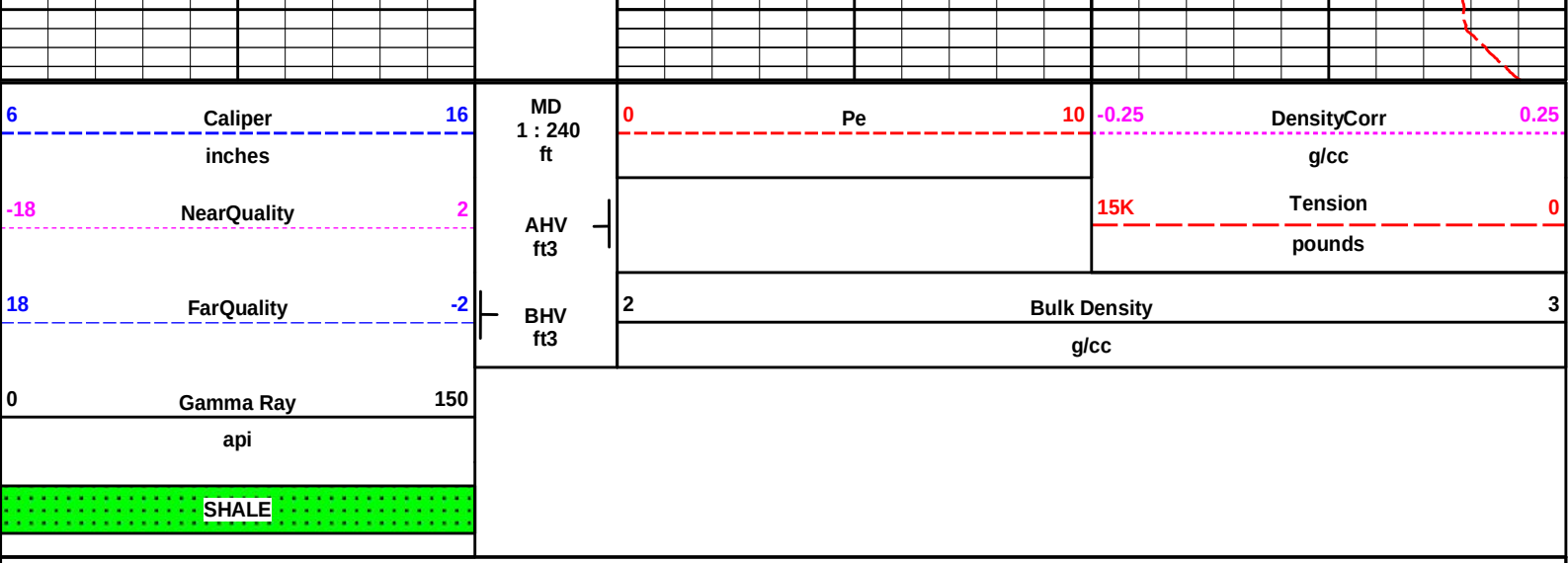


HALLIBURTON

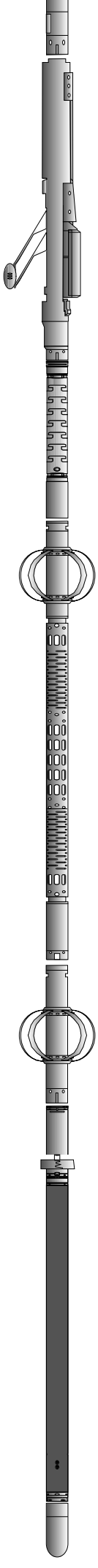
Plot Time: 22-May-15 12:40:05
Plot Range: 4548 ft to 4887.42 ft
Data: JACK-FABER_1-7\Well Based\REPEAT\
Plot File: \\-LOCAL-\JACK-FABER_1-7\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head-12156658 30.00 lbs		Ø 3.625 in →			1.92 ft	83.29 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in →		← SP @ 79.59 ft	3.74 ft	81.37 ft
GTET-11048627 165.00 lbs		Ø 3.625 in →		← GammaRay @ 71.57 ft	8.52 ft	77.63 ft
IDT-1094 150.00 lbs		Ø 3.625 in →			7.58 ft	69.11 ft
DSNT-11055304 174.00 lbs	DSN Decentralizer-11055304 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 54.59 ft	9.69 ft	61.53 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*

Microlog @ 44.03 ft

SDL Caliper @ 43.84 ft

SDL @ 43.83 ft

10.81 ft

41.03 ft

IQ Flex-00000001
140.00 lbs

Ø 3.625 in

5.67 ft

35.36 ft

Centralizer 25-00000001
8.00 lbs

Ø 4.000 in*

BSAT-10747684
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

14.55 ft

Regal Standoff 6_75-00000001
20.00 lbs

Ø 6.750 in*

Mud Resistivity @ 13.19 ft

ACRt @ 9.21 ft

ACRt Sonde-11005909
200.00 lbs

Ø 3.625 in

14.22 ft

0.33 ft

Bull Nose-00000001
5.00 lbs

Ø 2.750 in

0.33 ft

0.00 ft

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)

CH	Standard OH Cable Head	12156658	30.00	1.92		81.37	300.00
SP	SP Sub	12345678	60.00	3.74		77.63	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52		69.11	60.00
IDT	Insite Directional Tool	1094	150.00	7.58		61.53	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69		51.84	60.00
DCNT	DSN Decentralizer	11055304	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	10747684	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	00000001	8.00	2.08	*	32.37	300.00
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			**1,749.60**	**83.29**			

* Not included in Total Length and Length Accumulation.

Data: JACK-FABER_1-7\0001 SP-GTET-IDT-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 22-May-15 09:58:18**

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	4880.00	ft
	SHARED	BHT	Bottom Hole Temperature	115.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	IDT	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
	SHARED	TEMM	Temperature 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	
	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	
IDT	WRTI	Survey Writing Interval	30	ft
IDT	SOPT	Smoothing Option	None	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
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	

BOTTOM

Data: JACK-FABER_1-7\0001 SP-GTET-IDT-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 22-May-15 10:03:09**

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CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11048627 **Reference Calibration Date:** 16-Apr-15 18:44:45

Engineer: JORGE ORLANDO PEREZ **Calibration Date:** 30-Apr-15 12:33:23

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	54.0	57.1	api
Background + Calibrator	309.3	326.7	api
Calibrator	255.2	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11048627**	**Reference Calibration Date:**	**30-Apr-15 12:33:23**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**22-May-15 03:43:16**
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

Field Verification	Shop	Field	Units
Background	57.1	53.5	api
Background + Calibrator	326.7	324.6	api
Calibrator	269.6	271.1	api

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

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - 11055304**	**Reference Calibration Date:**	**30-Apr-15 12:09:18**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**30-Apr-15 12:24:44**
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: 68 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	**Prev. Value**	**New Value**	**Control Limit On New Value**
Gain:	0.975	0.974	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	0.015	+/- 0.050

VERIFIER		
Measurement	**Value**	**Control Limit**
Snow-Block Porosity (decp):	0.0678	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 - 11055304**	**Reference Calibration Date:**	**30-Apr-15 12:24:44**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**22-May-15 03:51:29**
Software Version:	**WL INSITE R4.6.4 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: DSN-424

Snow Block S/N: 10013313

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0678	0.0681	0.0003	+/- 0.0150

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 11014296**	**Reference Calibration Date:**	**30-Apr-15 11:00:03**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**30-Apr-15 11:05:11**
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	-4182.24	-4272.56	-7000.00 - -1000.00
Pad Gain	0.0003939	0.0003999	0.000200 - 0.000600
Arm Offset	-3383.61	-3237.10	-5000.00 - 3000.00
Arm Gain	0.0005099	0.0005031	0.000300 - 0.000700
Arm Power	-0.000004570	-0.000004135	-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)	2.01	2.00	-0.01	+/- 0.20
Medium Ring (in)	3.73	3.75	0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.49	6.50	0.01	+/- 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 - 11014296**	**Reference Calibration Date:**	**30-Apr-15 11:05:11**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**22-May-15 03:41:23**
Software Version:	**WL INSITE R4.6.4 (Build 3)**	**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	8.27	0.02	+/- 0.15

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 10865884**	**Reference Calibration Date:**	**30-Mar-15 15:40:38**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**30-Apr-15 10:16:57**
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	1.0446	1.0433	0.90 - 1.10
Near Dens Gain	1.0310	1.0224	0.90 - 1.10
Near Peak Gain	1.0258	1.0249	0.90 - 1.10
Near Lith Gain	0.9824	1.0030	0.90 - 1.10
Far Bar Gain	1.0116	1.0141	0.90 - 1.10
Far Dens Gain	1.0022	1.0010	0.90 - 1.10
Far Peak Gain	0.9925	0.9963	0.90 - 1.10
Far Lith Gain	0.9628	0.9685	0.90 - 1.10
Near Bar Offset	-0.1770	-0.1612	NONE
Near Dens Offset	-0.0678	0.0110	NONE
Near Peak Offset	-0.0376	-0.0267	NONE
Near Lith Offset	0.2983	0.1329	NONE
Far Bar Offset	0.0770	0.0551	NONE
Far Dens Offset	0.1242	0.1399	NONE
Far Peak Offset	0.1569	0.1314	NONE
Far Lith Offset	0.3154	0.2797	NONE
Near Bar Background	782.55	780.96	700 - 1450
Near Dens Background	261.86	261.58	230 - 480
Near Peak Background	114.91	115.44	100 - 210
Near Lith Background	140.79	141.68	125 - 260
Far Bar Background	492.11	488.98	450 - 900
Far Dens Background	189.89	190.40	175 - 345
Far Peak Background	75.89	75.85	70 - 140
Far Lith Background	79.26	78.91	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.684	-0.001	+/- 0.015
Pe	2.577	2.550	-0.027	+/- 0.150
ALUMINUM				
Density (g/cc)	2.595	2.598	0.003	+/- 0.01500
Pe	3.108	3.118	0.010	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits

QUALITY				
Background	0.0000	+/- 0.0110	-0.0010	+/- 0.0140
Magnesium Block	-0.0007	+/- 0.0110	-0.0007	+/- 0.0140
Aluminum Block	0.0000	+/- 0.0110	0.0011	+/- 0.0140
Resolution	8.51	6.00 - 11.50	8.93	6.00 - 11.50
Internal Verifier(B+D+P+L)	1300	1200 - 2700	834	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:** 30-Apr-15 10:16:57

Engineer: JORGE ORLANDO PEREZ **Calibration Date:** 22-May-15 03:36:41

Software Version: WL INSITE R4.6.4 (Build 3) **Calibration Version:** 1

Pad Temperature: 57.6 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1299.658	1304.356	4.698	14.596
Far (B+D+P+L) cps	834.143	833.330	-0.813	15.892
Near Resolution	8.51	8.62	0.110	0.50
Far Resolution	8.93	9.11	0.180	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-11048627						
Gamma Ray Calibrator	269.6	271.1	----------	-1.5	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0678	0.0681	----------	-0.0003	+/- 0.0150	decp
SDLT-11014296						
Pad Extension	3.75	3.76	----------	-0.01	+/-0.10	in
Ring Diameter	8.25	8.27	----------	-0.02	+/-0.15	in
SDLT Pad-10865884						
Near(B+D+P+L)	1299.658	1304.356	----------	-4.698	+/-14.596	cps
Far(B+D+P+L)	834.143	833.330	----------	0.813	+/-15.892	cps

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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	

TENS	Tension	0.00	NO	

Rwa / CrossPlot				
TPUL	Tension Pull	83.29	NO	
BS	Bit Size	83.29	NO	
HDIA	Measured Hole Diameter	0.00	NO	

SP Sub				
PLTC	Plot Control Mask	79.59	NO	
SP	Spontaneous Potential	79.59	BLK	1.250
SPR	Raw Spontaneous Potential	79.59	NO	
SPO	Spontaneous Potential Offset	79.59	NO	

GTET				
TPUL	Tension Pull	71.57	NO	
GR	Natural Gamma Ray API	71.57	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	71.57	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	71.57	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	

IDT				
TPUL	Tension Pull	62.53	NO	
ACCX	Accelerometer X	62.53	NO	
ACCY	Accelerometer Y	62.53	NO	
ACCZ	Accelerometer Z	62.53	NO	
MAGX	magnetometer x with unit	62.53	NO	
MAGY	Magnetometer Y with unit	62.53	NO	
MAGZ	magnetometer z with unit	62.53	NO	
IAMP	Accelerometer Temperature	62.53	NO	
MTMP	Magnetometer Temperature	62.53	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
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	
Microlog Pad				
TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750

Data: JACK-FABER_1-7\0001 SP-GTET-IDT-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 22-May-15 10:03:34**

COMPANY	**CULBREATH OIL & GAS**		
WELL	**JACK FABER 1-7**		
FIELD	**WILDCAT**		
COUNTY	**RAWLINS**	STATE	**KANSAS**

HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG