PIONEER

Pioneer Energy Services

Dual Compensated Porosity Log

API No. 15-135-25870-00-00

Company LARSON ENGINEERING, INC.

Well LIVINGSTON-KSU NO. 1-26

Field ARNOLD

County NESS State KANSAS

Location N/2-NE-NE-NE
157' FNL & 330' FWL
Sec: 26 Twp: 16S Rge: 25W

Other Services
DIL
MEL

Elevation
K.B. 2575
D.F.
G.L. 2566

Permanent Datum	GROUND LEVEL Elevation 2566
Log Measured From	KELLY BUSHING 9 Ft. Above Perm. Datum
Drilling Measured From	KELLY BUSHING
Date	5/27/15
Run Number	ONE
Type Log	CNL / CDL
Depth Driller	4605
Depth Logger	4603
Bottom Logged Interval	4572
Top Logged Interval	3600
Type Fluid In Hole	CHEMICAL
Salinity, PPM CL	3,700
Density	9.4
Level	FULL
Max. Rec. Temp. F	122
Operating Rig Time	4 HOURS
Equipment -- Location	15 Hays
Recorded By	J. HENRICKSON
Witnessed By	VERN SCHRAG

Borehole Record

Run No.	Bit	From	To
ONE	12.25	0	254
TWO	7.875	254	TD

Casing Record

Size	Wgt.	From	To
8.625	23#	0	254

<<< Fold Here >>>

Comments

Thank you for using Pioneer Energy Services
785.625.3858

ARNOLD KANSAS
3/4 WEST, SOUTH INTO(RIGHT OFF HIGHWAY)

Log Variables

DatabaseC:\ProgramData\Warrior\Data\larson_livingston_ksu_1_26.db
Dataset field/well/stack/pass3.1/_vars_

Top - Bottom

M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m

2	1	Off	Limestone	1	2.71	396	0

SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	57	0	5.5	0	4598	100	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			GR-M&W (233-M&W)	3.00	3.50	50.00
GR	33.00					
			CNT-M&W (CNT-825)	5.50	3.50	100.00
CNLSC	29.86					
CNSSC	29.11					
			CDL-M&W (94-965)	8.50	4.00	250.00
LSD	20.85					
DCAL	20.83					
SSD	20.35					
RLL3F	15.80					
RLL3	15.80					
			DIL-PSI1985 (1985)	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					

Dataset: larson_livingston_ksu_1_26.db: field/well/stack/pass3.1
Total length: 35.50 ft
Total weight: 620.00 lb
O.D.: 4.00 in

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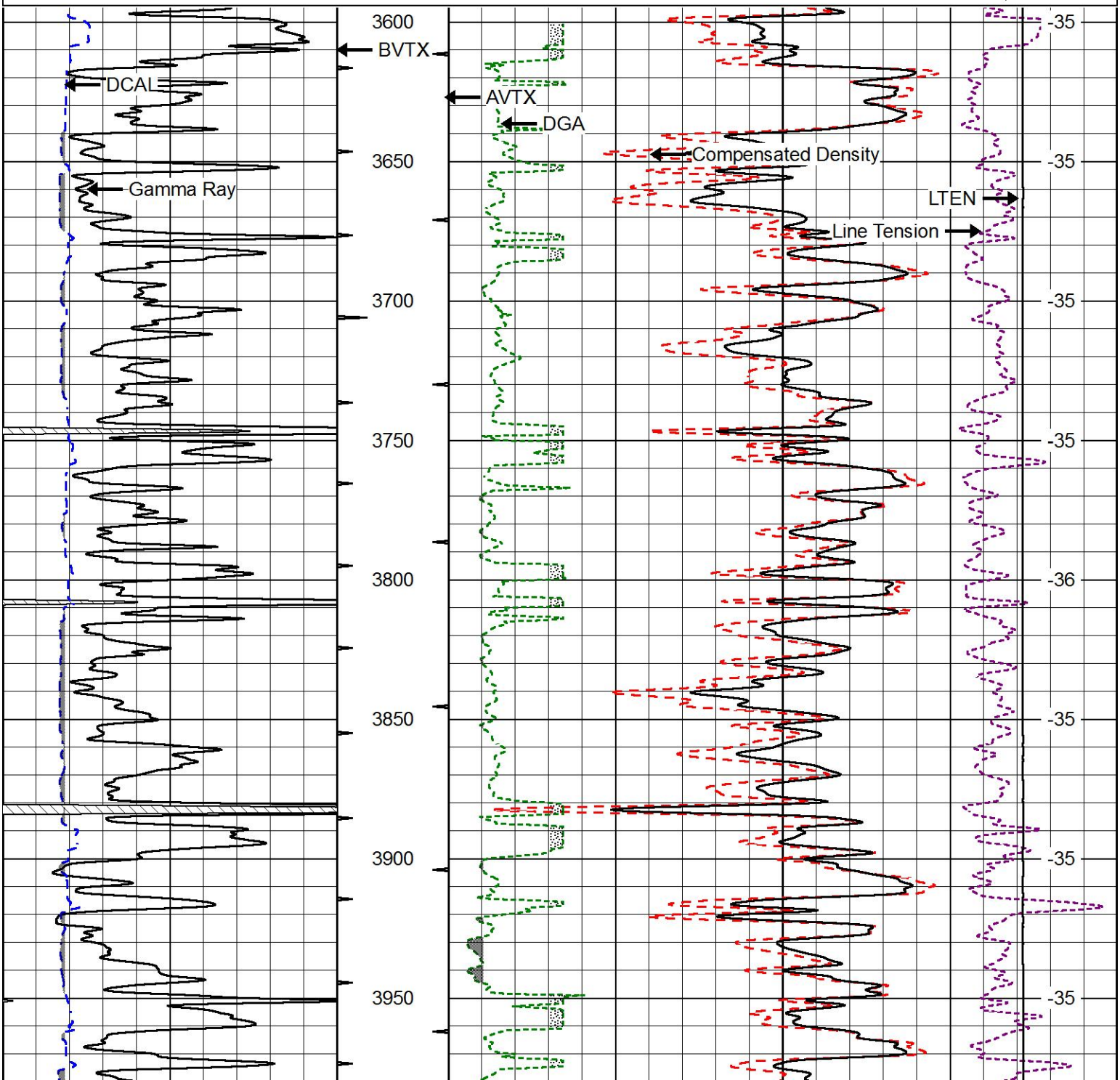
MAIN PASS

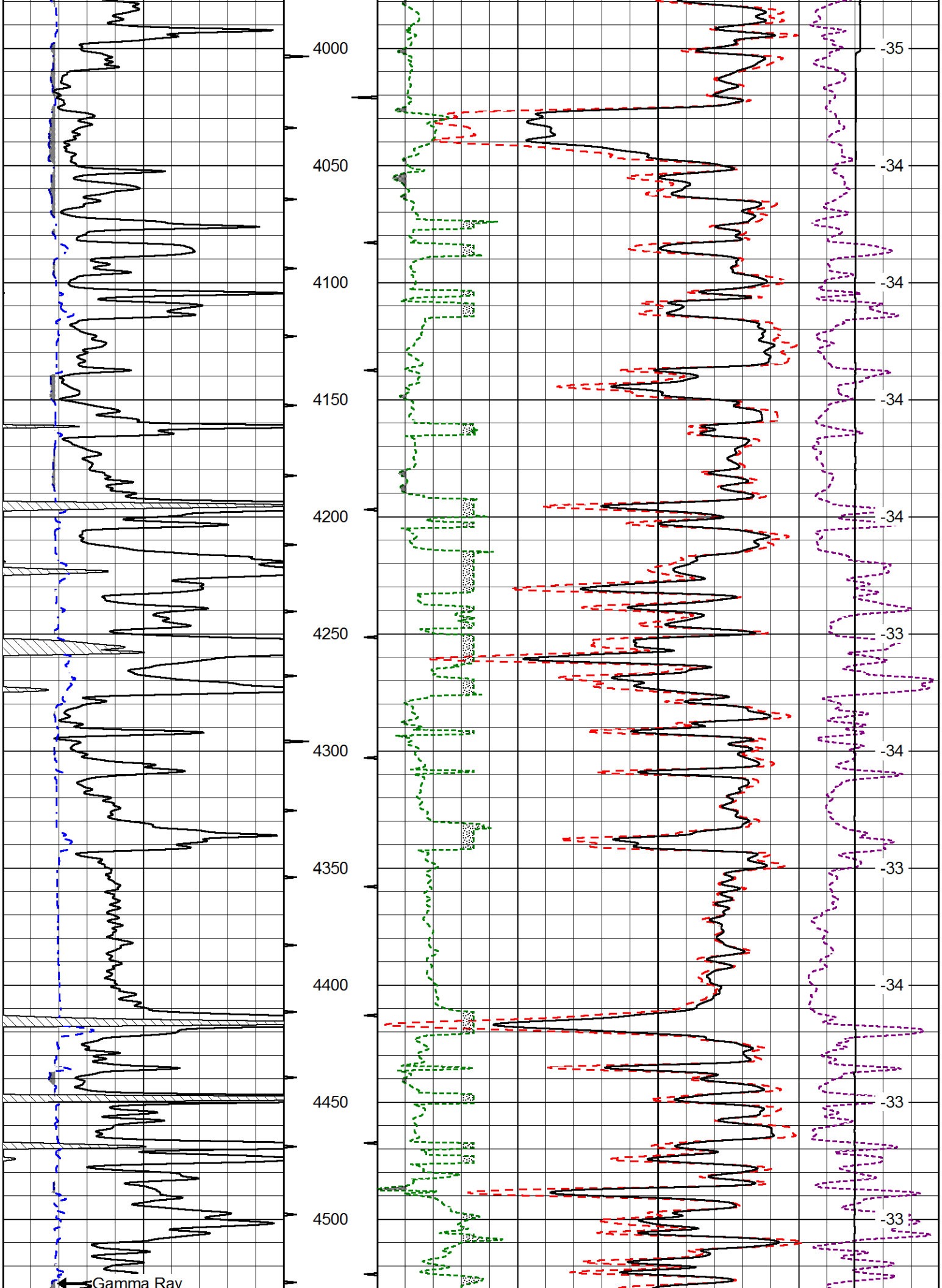
Database File	larson_livingston_ksu_1_26.db
Dataset Pathname	stack/pass3.1
Presentation Format	cdl
Dataset Creation	Wed May 27 04:14:48 2015
Charted by	Depth in Feet scaled 1:600

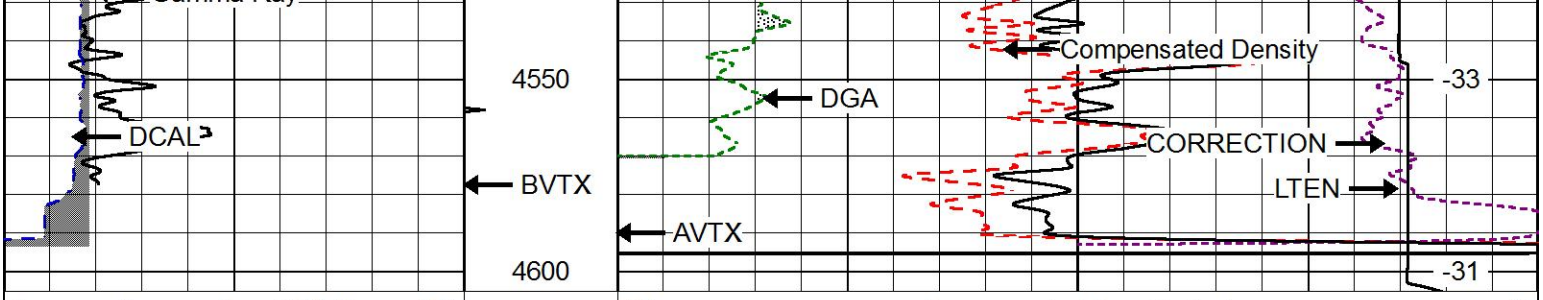
0	Gamma Ray (GAPI)	150
6	DCAL (in)	16

30	Compensated Density (pu)				-10
2	Bulk Density (g/cc)				3
15000	Line Tension (lb)				0
2.625	DGA	3.425	-0.25	Correction (g/cc)	0.25

LSPD (ft/min)




4000
4050
4100
4150
4200
4250
4300
4350
4400
4450
4500
-35
-34
-34
-34
-34
-33
-34
-33
-34
-33
-33
Gamma Ray



0	Gamma Ray (GAPI)	150
6	DCAL (in)	16

30	Compensated Density (pu)	-10
2	Bulk Density (g/cc)	3
15000	Line Tension (lb)	0
2.625 DGA 3.425	-0.25 Correction (g/cc)	0.25
	LSPD (ft/min)	

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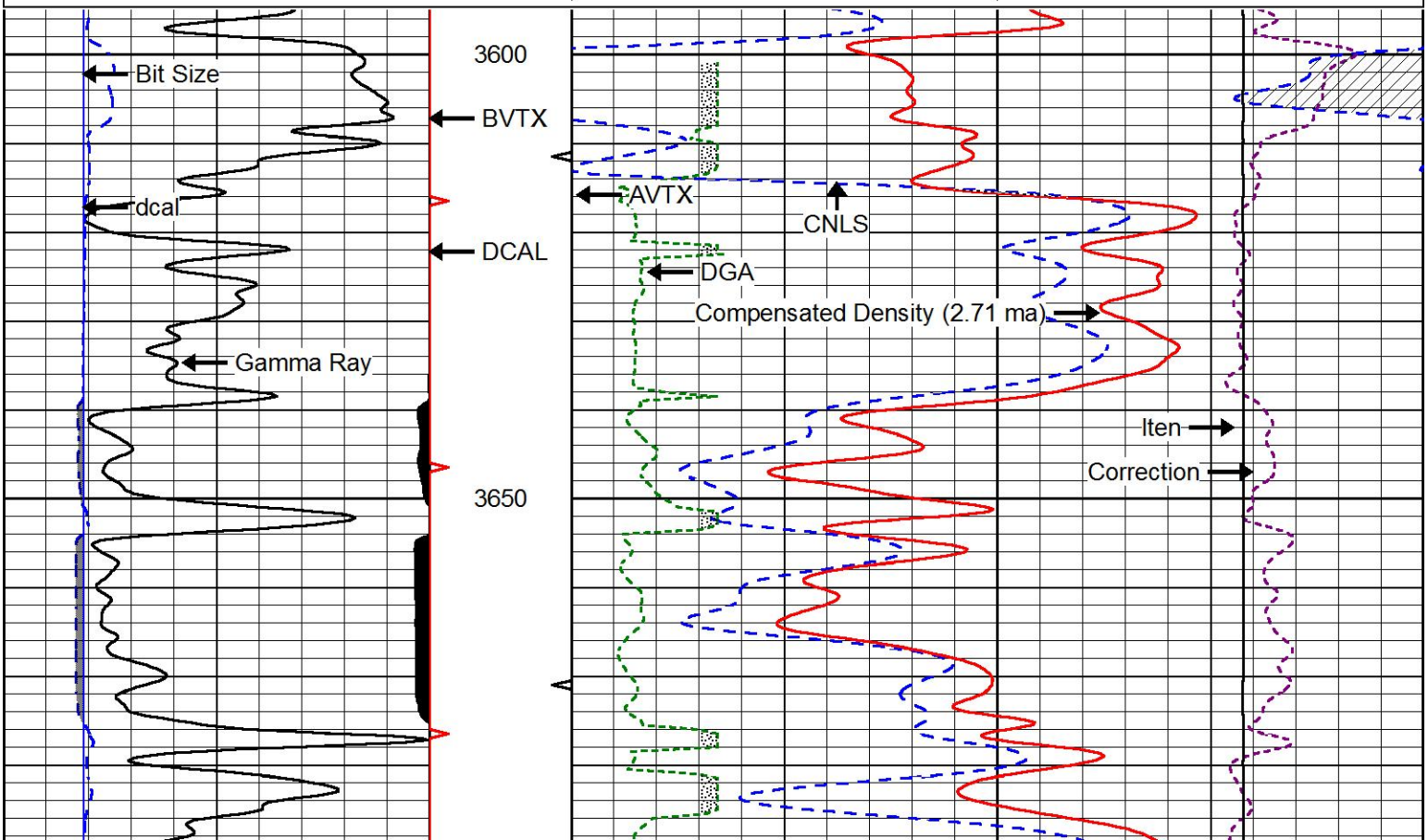
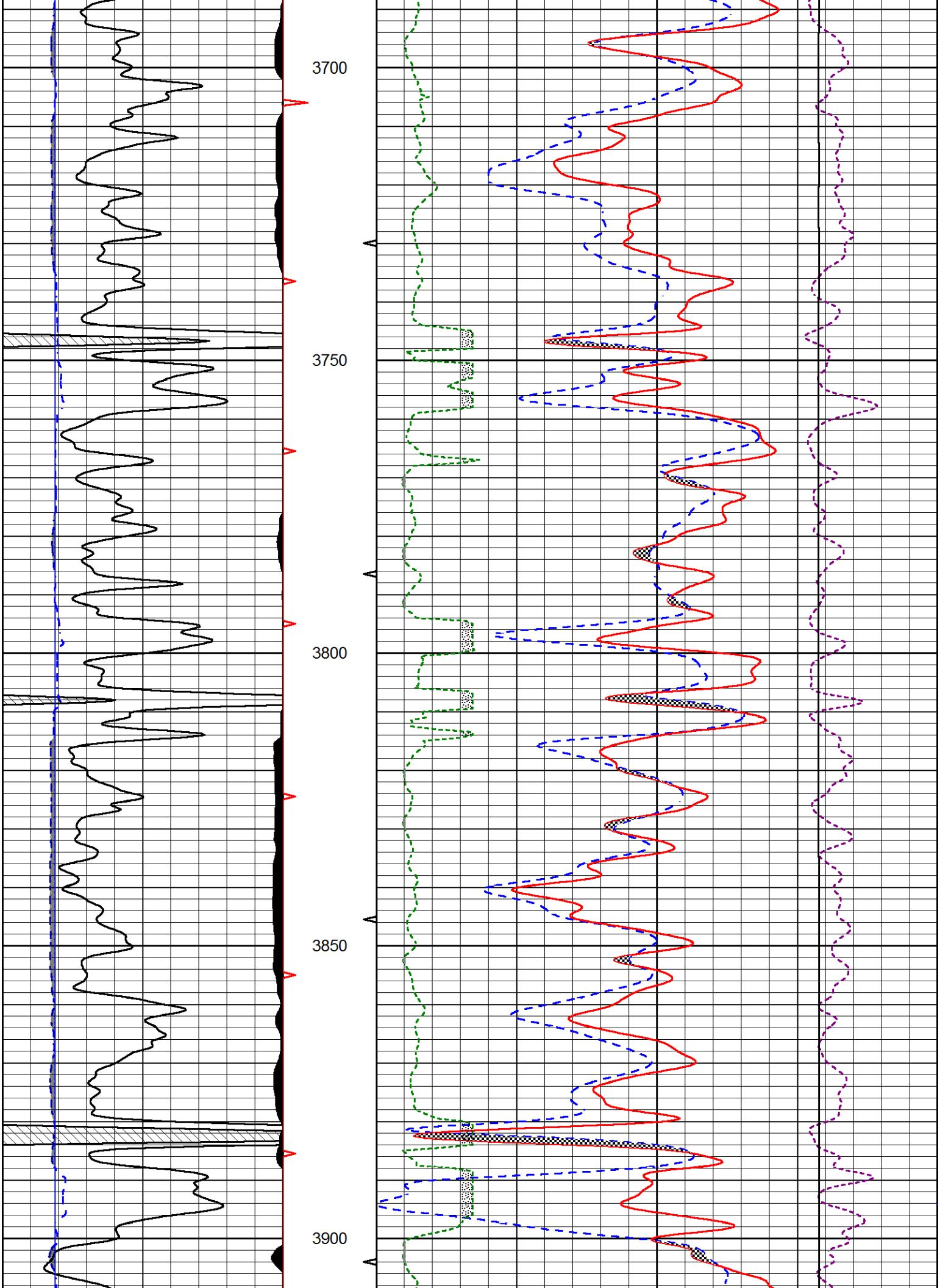
MAIN PASS

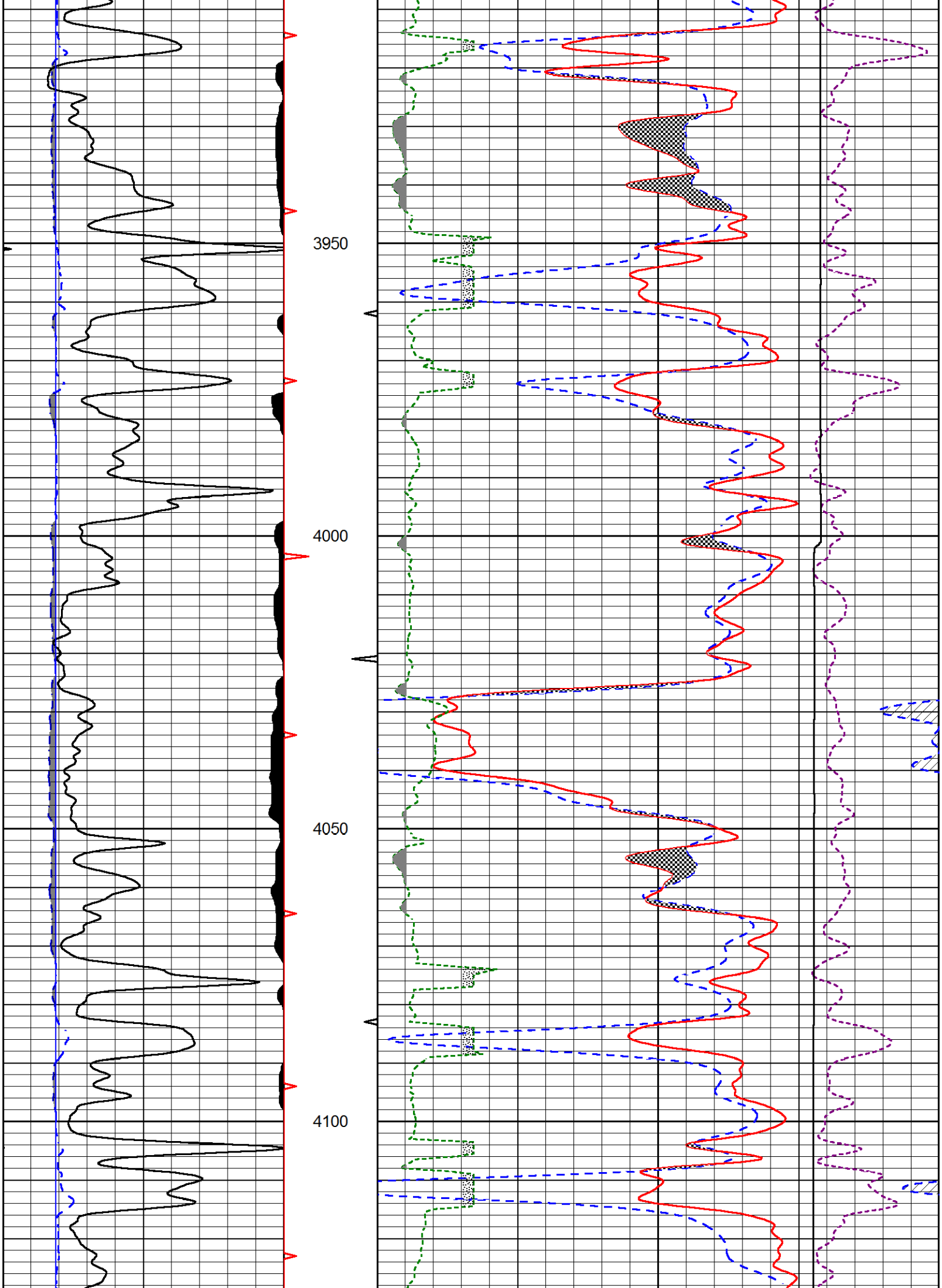
Database File	larson_livingston_ksu_1_26.db
Dataset Pathname	stack/pass3.1
Presentation Format	cndlspec
Dataset Creation	Wed May 27 04:14:48 2015
Charted by	Depth in Feet scaled 1:240

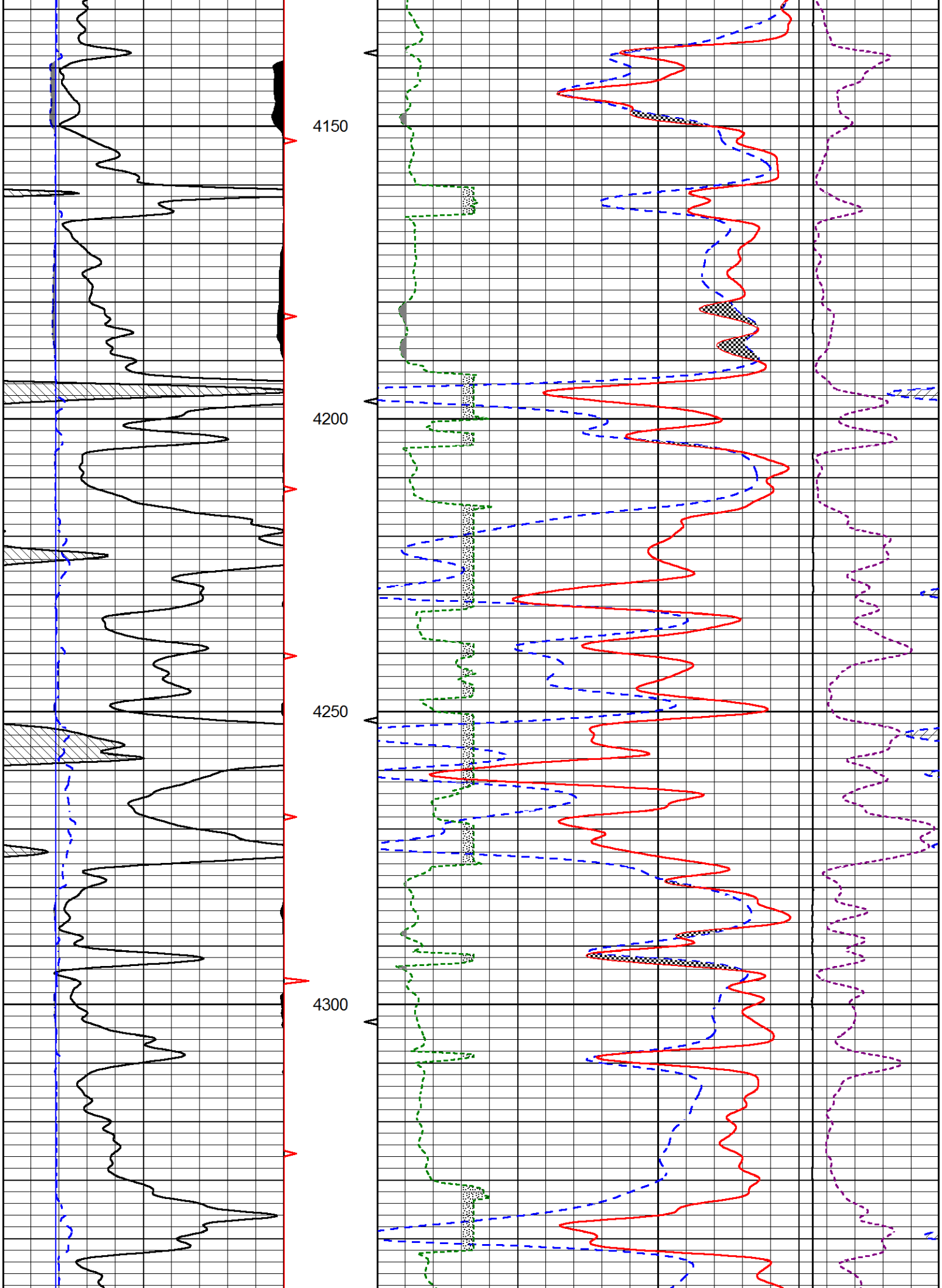
0	Gamma Ray (GAPI)	150
6	dcal (in)	16

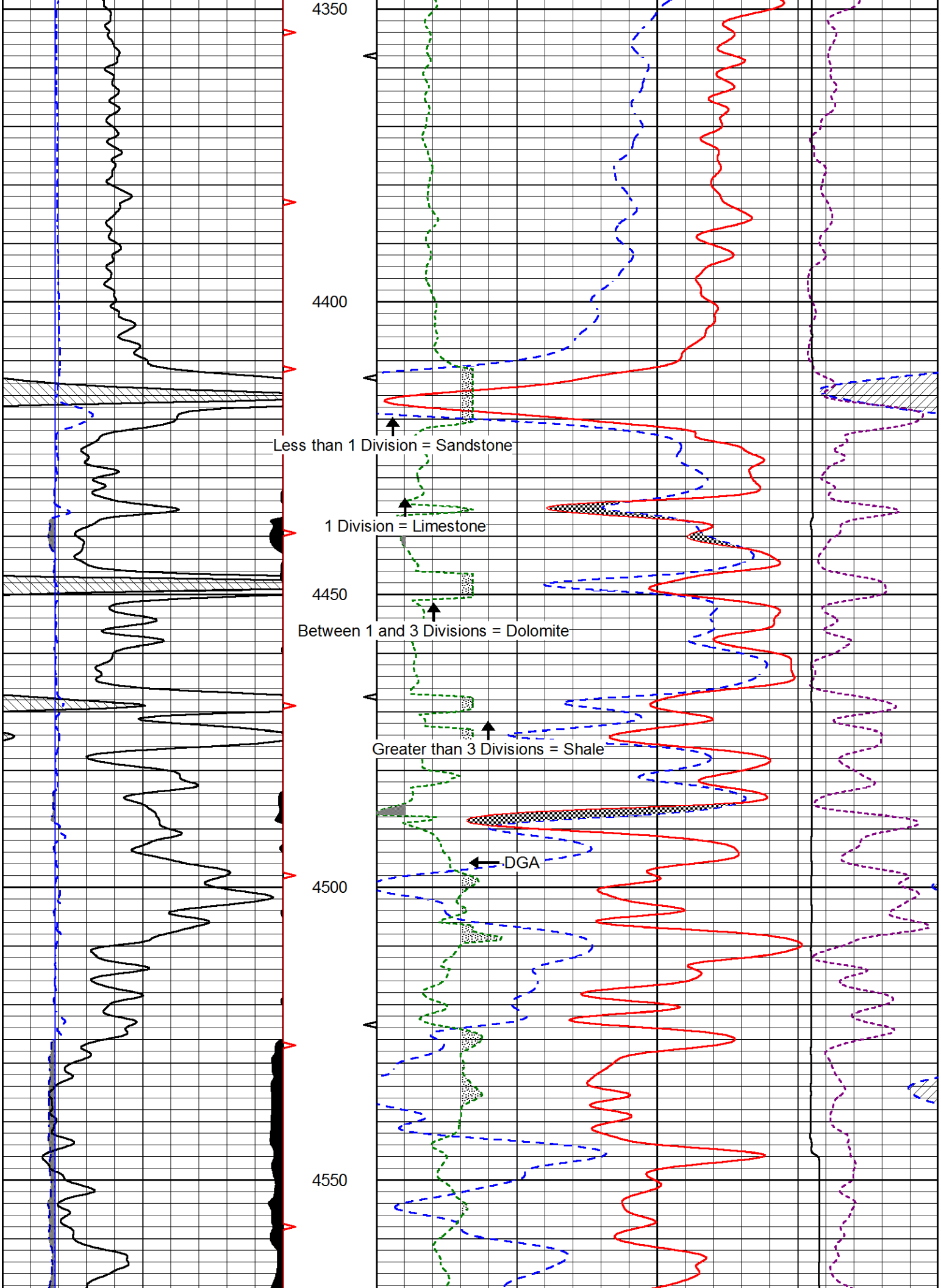
30	CNLS (pu)	-10
30	Compensated Density (2.71 ma) (pu)	-10
10000	Iten (lb)	0
2.625 DGA 3.425	-0.25 Correction (g/cc)	0.25

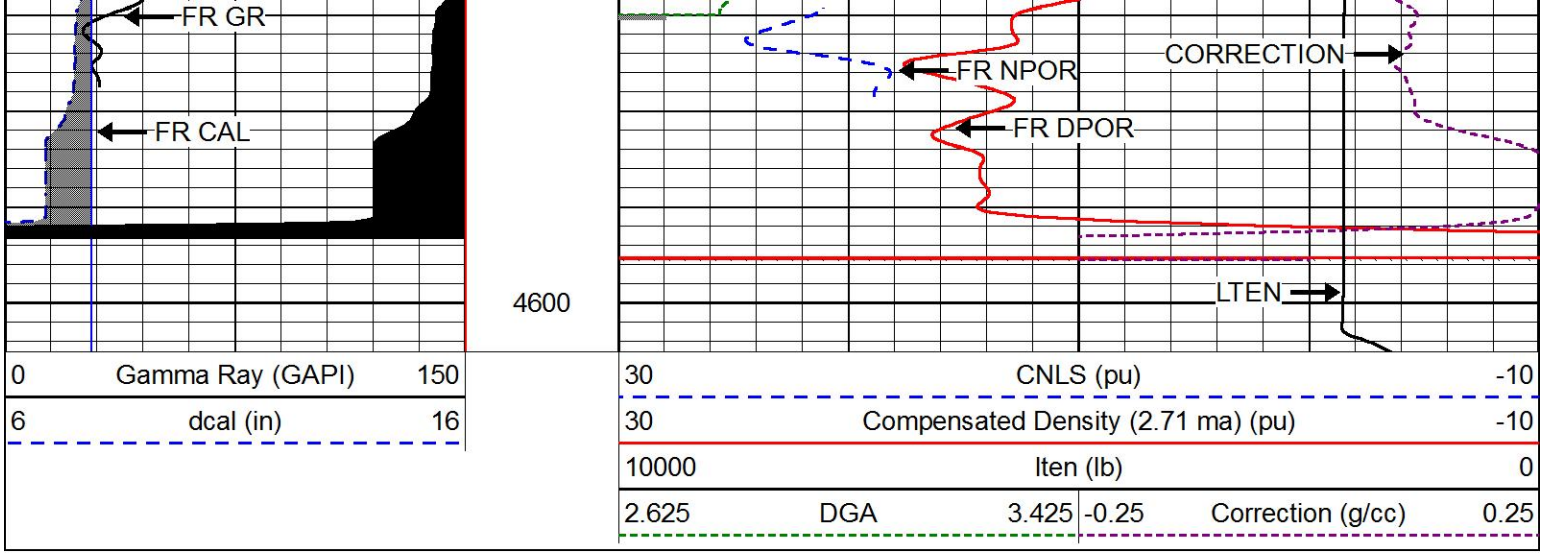



3700
3750
3800
3850
3900


3950
4000
4050
4100


4150
4200
4250
4300


4350
4400
Less than 1 Division = Sandstone
1 Division = Limestone
4450
Between 1 and 3 Divisions = Dolomite
Greater than 3 Divisions = Shale
DGA
4500
4550



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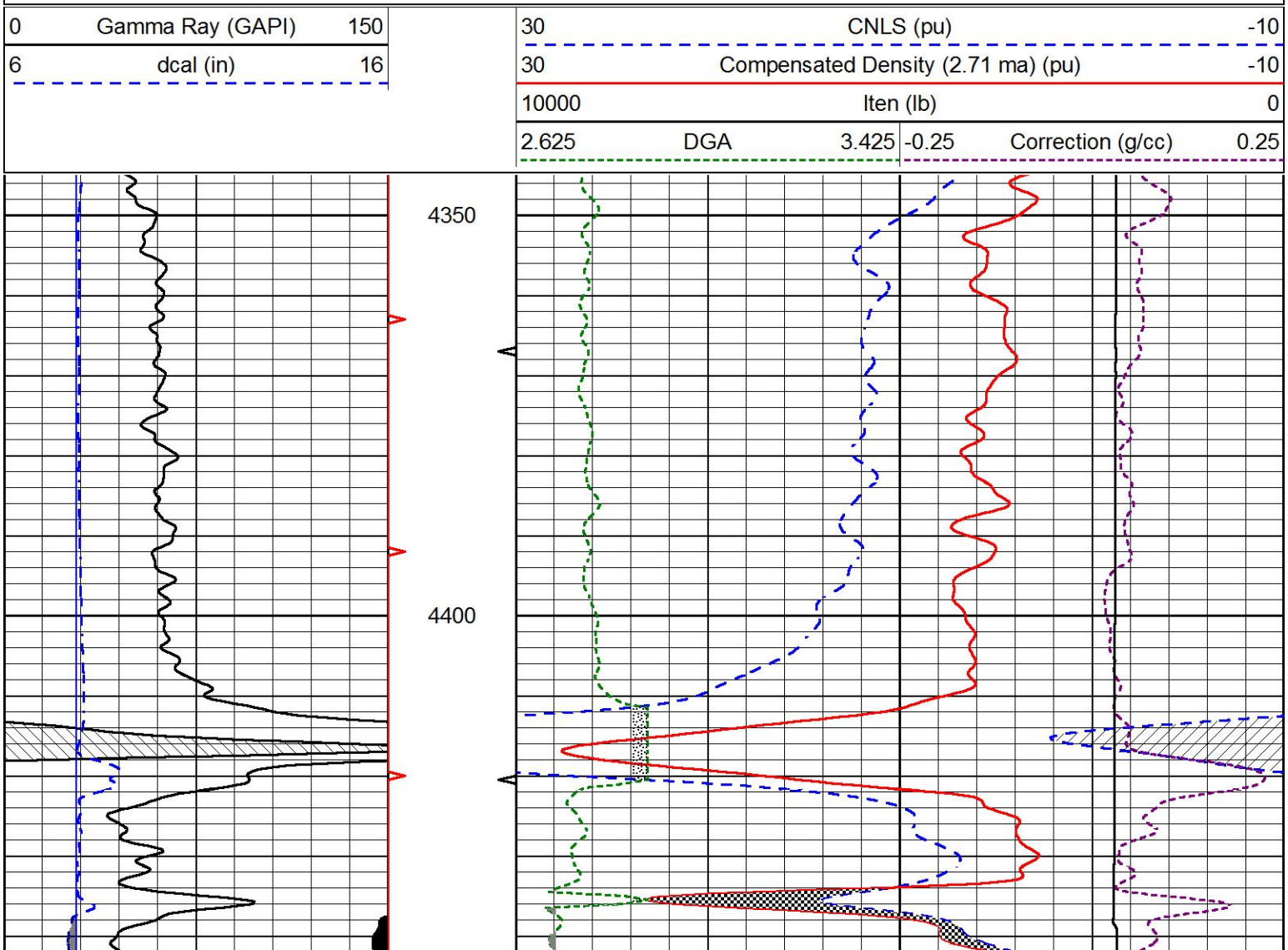
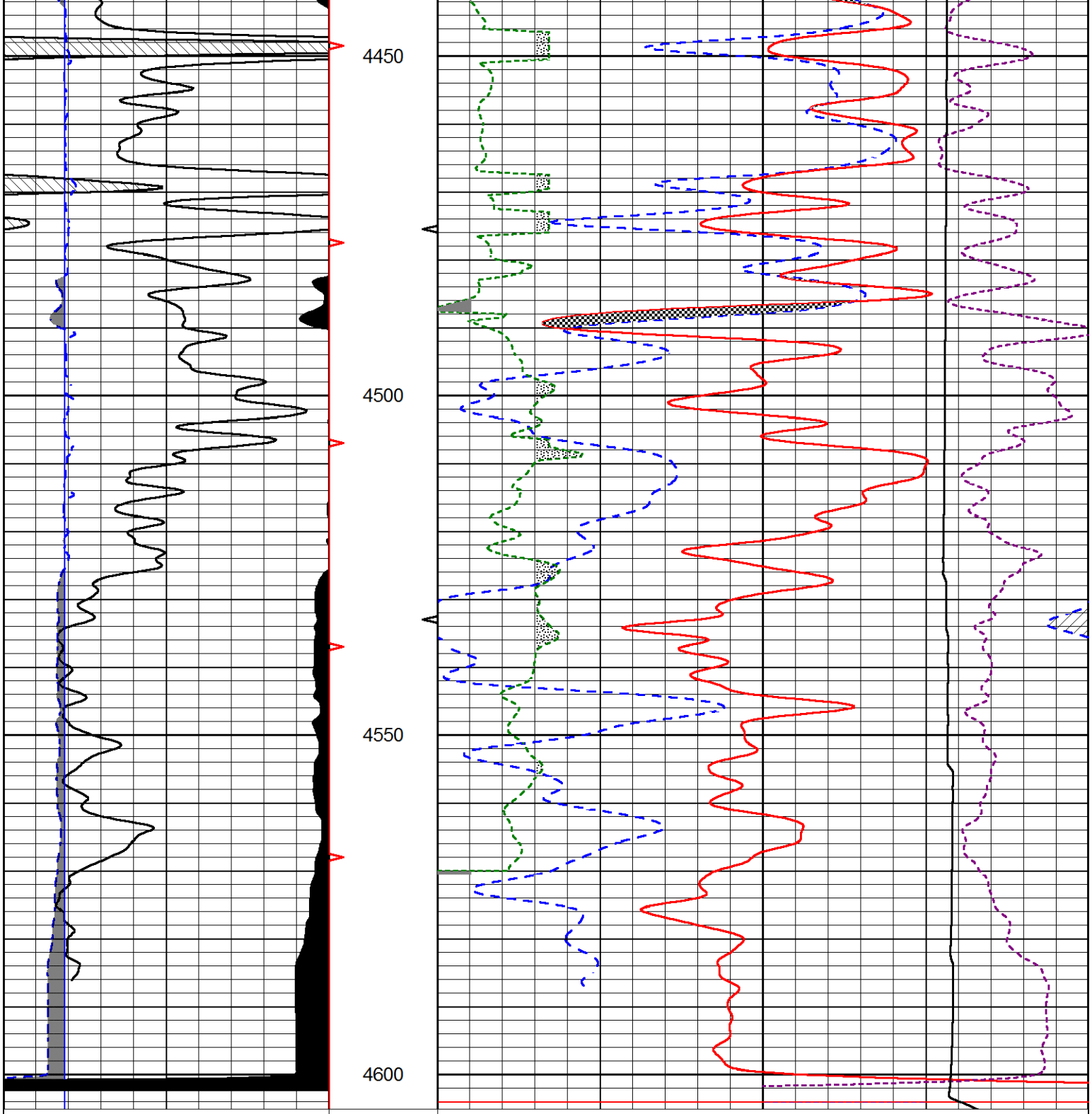
REPEAT SECTION

Database File	larson_livingston_ksu_1_26.db
Dataset Pathname	stack/pass2.1
Presentation Format	cndlspec
Dataset Creation	Wed May 27 03:20:29 2015
Charted by	Depth in Feet scaled 1:240





Calibration Report

Database File	larson_livingston_ksu_1_26.db
Dataset Pathname	stack/pass3.1
Dataset Creation	Wed May 27 04:14:48 2015

Dual Induction Calibration Report

Serial-Model:	1985-PSI1985
Calibration Performed:	Thu Apr 23 11:27:30 2015

Loop:	Readings Air	Readings Loop	References Air	References Loop		Results Gain	Results Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.450	-29.000
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.340	-27.000

Compensated Density Calibration Report

Serial-Model: 94-965-M&W
Source / Verifier: 16954B / 601
Master Calibration Performed: Wed Apr 22 10:03:39 2015

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	5782.14	7492.41	cps
Aluminum	2.685	g/cc	1038.09	4675.93	cps

Spine Angle = 74.65 Density/Spine Ratio = 0.522

	Size		Reading
Small Ring	4.00	in	1.03
Large Ring	14.00	in	1.45

Compensated Neutron Calibration Report

Serial Number: CNT-825
Tool Model: M&W
Calibration Performed: Tue Apr 21 10:09:01 2015

Detector	Readings		Target		Normalization
Short Space	6240.00	cps	1000.00	cps	1.6025
Long Space	460.00	cps	1000.00	cps	1.9500

Gamma Ray Calibration Report

Serial Number: 233-M&W
Tool Model: M&W
Calibration Performed: Wed Apr 22 10:09:28 2015

Calibrator Value: 100.0 GAPI

Background Reading: 65.0 cps
Calibrator Reading: 207.0 cps

Sensitivity: 0.5700 GAPI/cps

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Company	LARSON ENGINEERING, INC.
Well	LIVINGSTON-KSU NO. 1-26
Field	ARNOLD
County	NESS
State	KANSAS