



PIONEER
Pioneer Energy Services

MICRORESISTIVITY LOG

Company AMERICAN WARRIOR, INC.
Well HUBIN NO. 1-10
Field LIPPOLDT WEST
County HODGEMAN
State KANSAS

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Location: API #: 15-083-21952-00-00

SEC 10 TWP 23S RGE 23W

Permanent Datum GROUND LEVEL Elevation 2344'

Log Measured From KELLY BUSHING

Drilling Measured From KELLY BUSHING

Other Services

CNL/CDL
DIL/BHCS

Elevation
K.B. 2355'
D.F. N/A
G.L. 2344'

Date	7/18/2018
Run Number	ONE
Depth Driller	4720'
Depth Logger	4719'
Bottom Logged Interval	4718'
Top Log Interval	3800'
Casing Driller	8.625" @ 265'
Casing Logger	264'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	6300
Density / Viscosity	9.35 60
pH / Fluid Loss	9.5 10.0
Source of Sample	FLOWLINE
Rm @ Meas. Temp	.65 @ 89
Rmt @ Meas. Temp	.49 @ 89
Rmc @ Meas. Temp	.88 @ 89
Source of Rmt / Rmc	CHARTS
Rm @ BHT	.47 @ 123
Operating Rig Time	4 HOURS
Max Rec. Temp. F	123 DEGF
Equipment Number	108
Location	HAYS
Recorded By	J. HENRICKSON
Witnessed By	LUKE THOMPSON

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All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

JETMORE KANSAS

EAST TO 224 ROAD, SOUTH TO K ROAD, 2 1/4 WEST
NORTH INTO

Log Measured From: KELLY BUSHING

11 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES

www.pioneerenergy.com

785-625-3858

Your Pioneer Energy Services Crew

Engineer: J. HENRICKSON

Operator:

Operator:

Operator:

This Log Record Was Witnessed By

Primary Witness: LUKE THOMPSON

Secondary Witness:

Secondary Witness:

Secondary Witness:

Top - Bottom

A	BOREID	BOTTEMP	CASEOD	CASETHCK	FLUIDDEN	M	MATRXDEN
1	in 7.875	degF 123	in 5.5	in 0	g/cc 1	2	g/cc 2.71
NPORSEL	PERFS	SNDERR	SNDERRM	SPSHIFT	SRFTEMP	SZCOR	TDEPTH
Limestone	0	mmho/m 0	mmho/m -5	mV 47	degF 91	Off	ft 4719

Sensor	Offset (ft)	Schematic		Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58			GR-M&W (89-M&W)	3.00	3.50	50.00
CNLSC	37.48			CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	36.73						
LSD DCAL SSD	28.43 28.42 27.93			CDL-M&W (979-229)	8.50	4.00	250.00
ML-PSI STKBL ML (PSI-01) Stackable Microlog Tools	7.58						
MCAL	19.83						
MI	19.83						
MN	19.83						
RLL3	15.80						
RLL3F	15.79						
CILD	8.00			DIL-M&W (1987)	18.50	3.50	220.00

CILM

4.70

SP

0.20

Dataset: american_warrior_hubin_1_10.db: field/well/stackml/pass3.1
Total length: 43.08 ft
Total weight: 685.00 lb
O.D.: 4.00 in

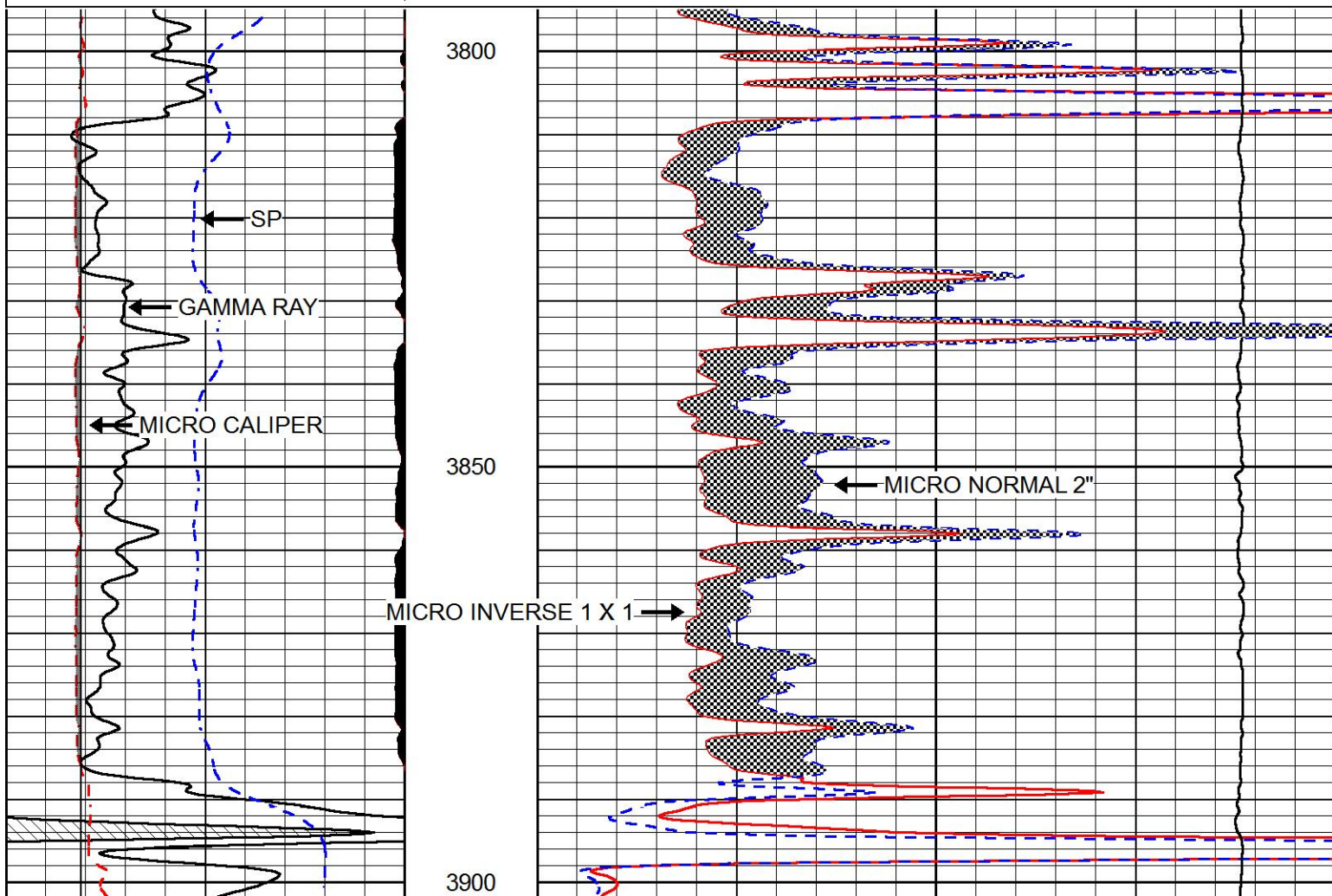


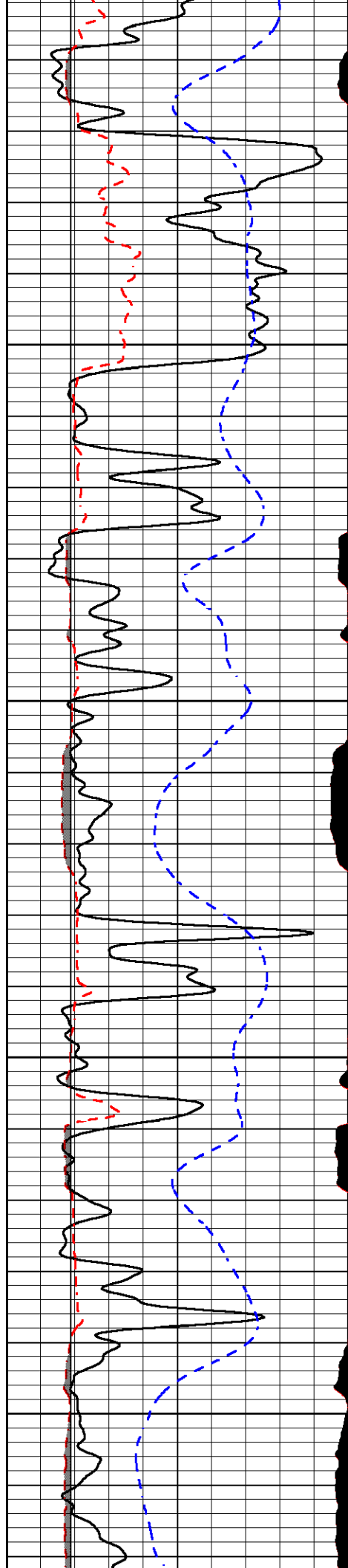
MAIN PASS

Database File american_warrior_hubin_1_10.db
Dataset Pathname stackml/pass3.1
Presentation Format micro
Dataset Creation Wed Jul 18 14:33:26 2018
Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
6	MICRO CALIPER (in)	16
6	BIT SIZE (in)	16
-200	SP (mV)	0

0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
15000	LINE TENSION (lb)	0



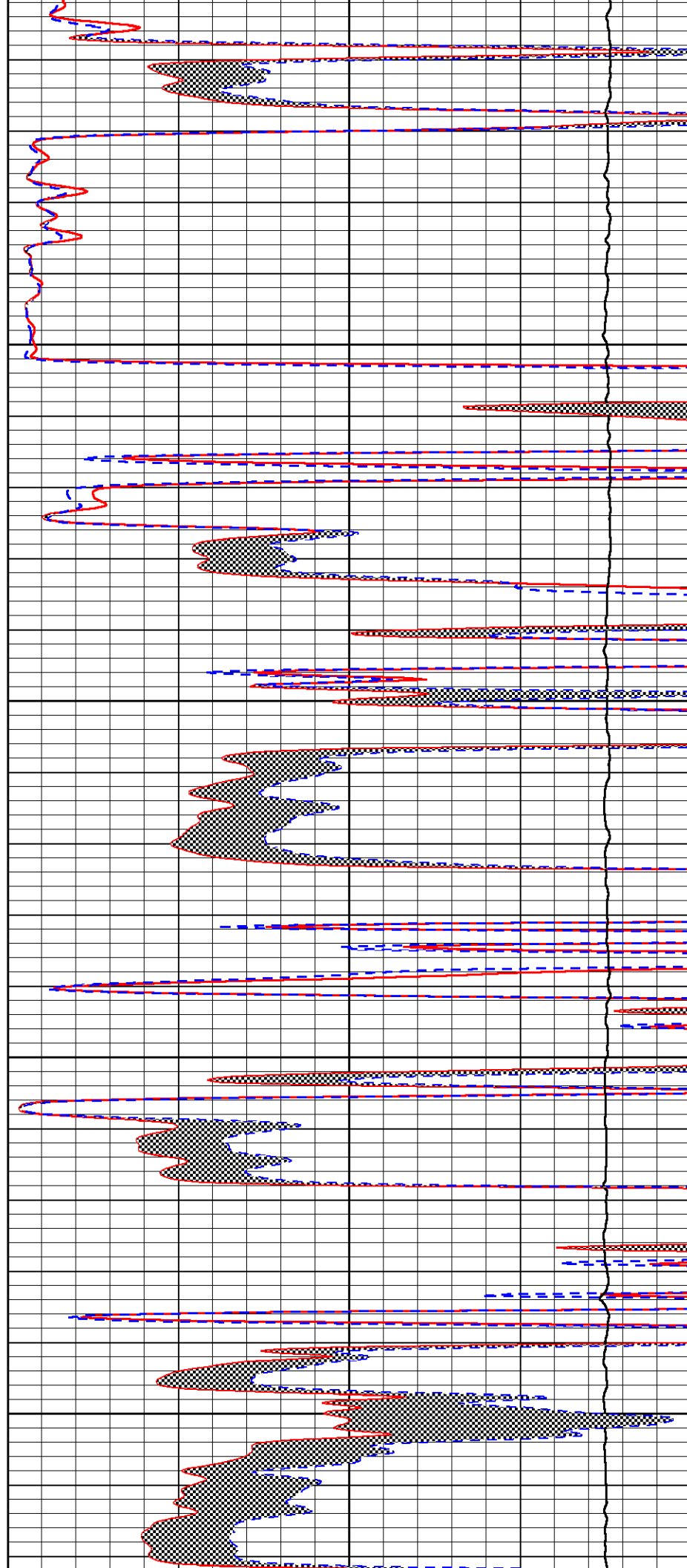


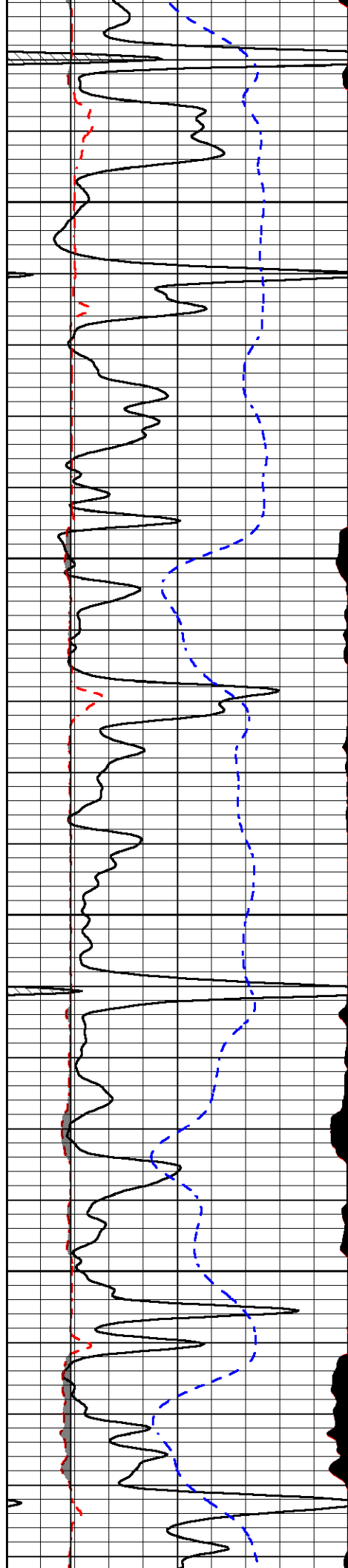
3950

4000

4050

4100



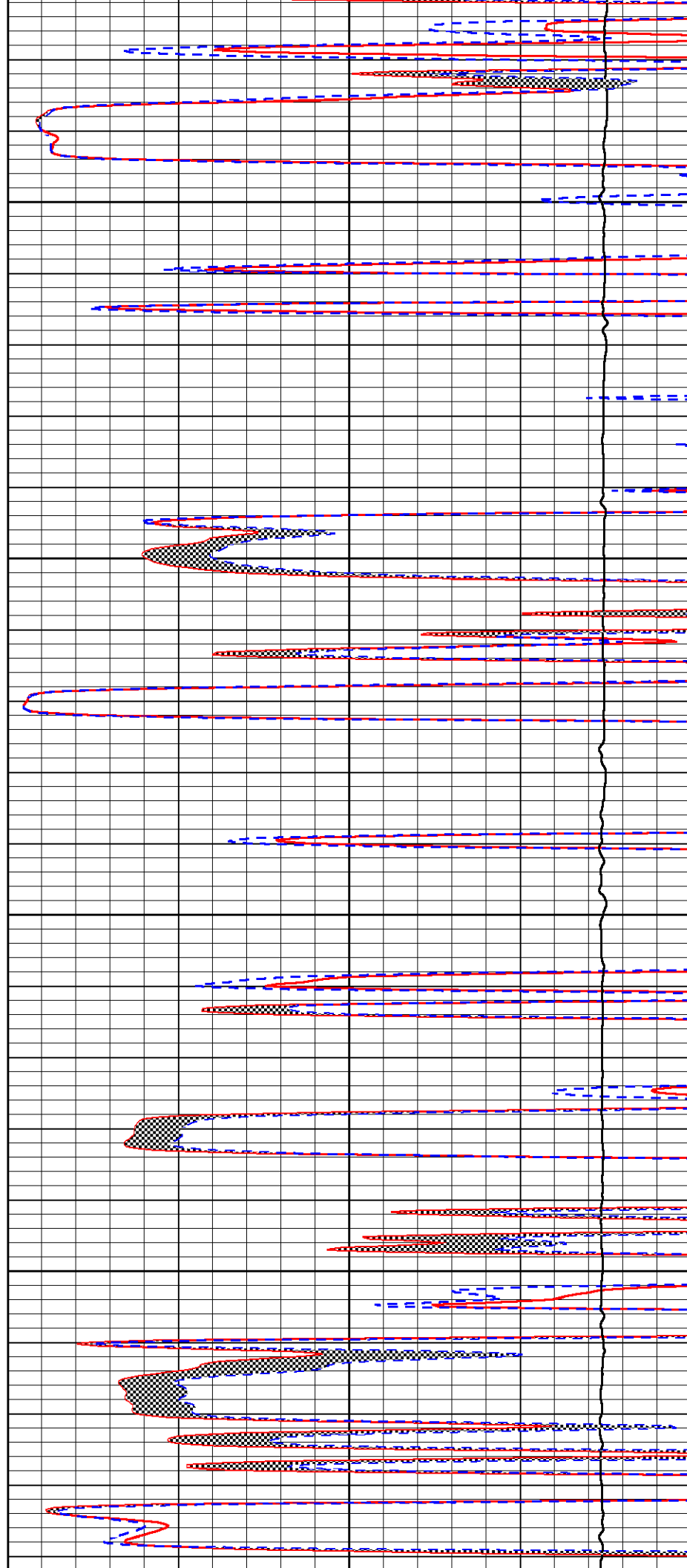


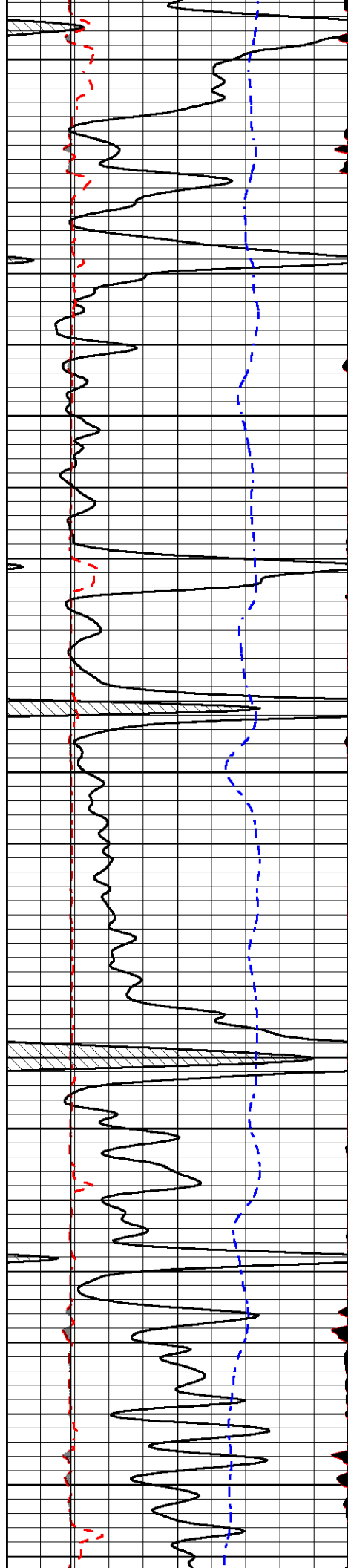
4150

4200

4250

4300





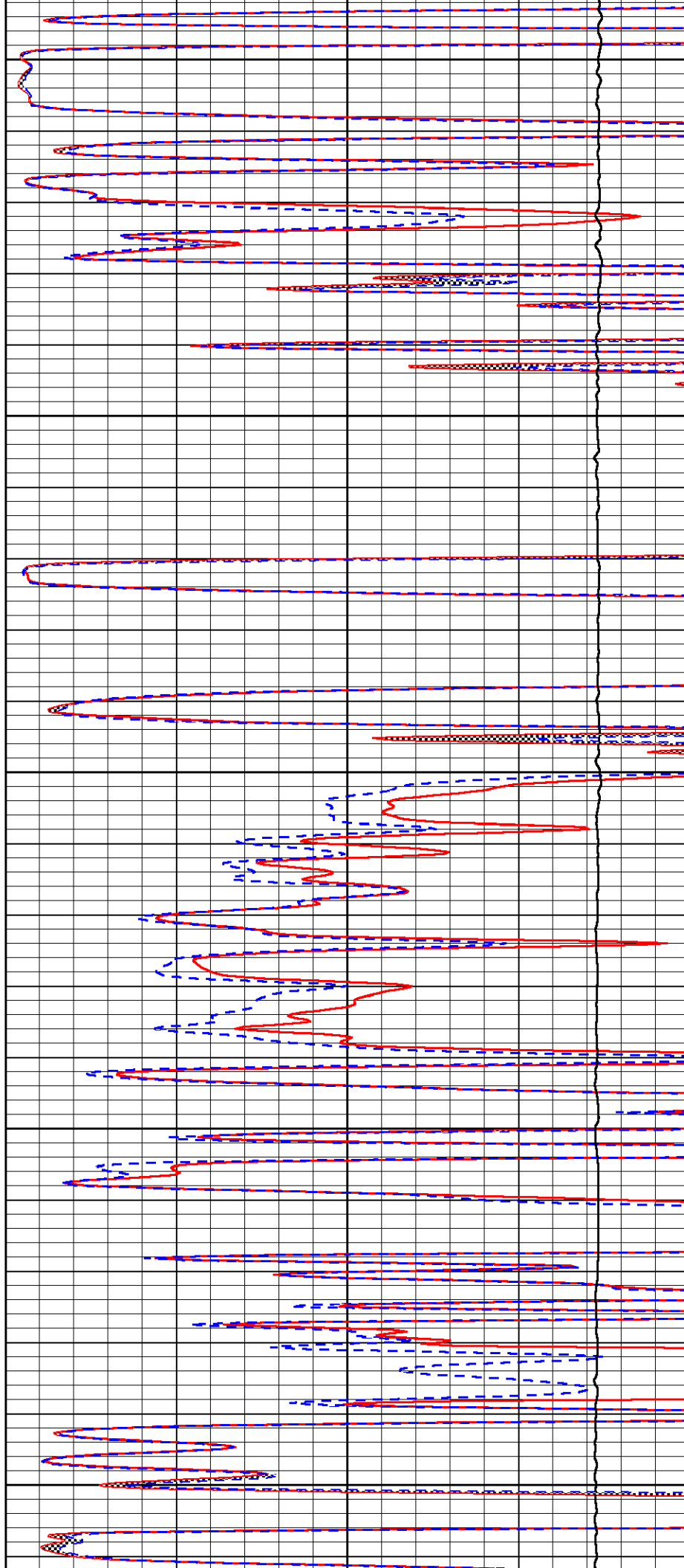
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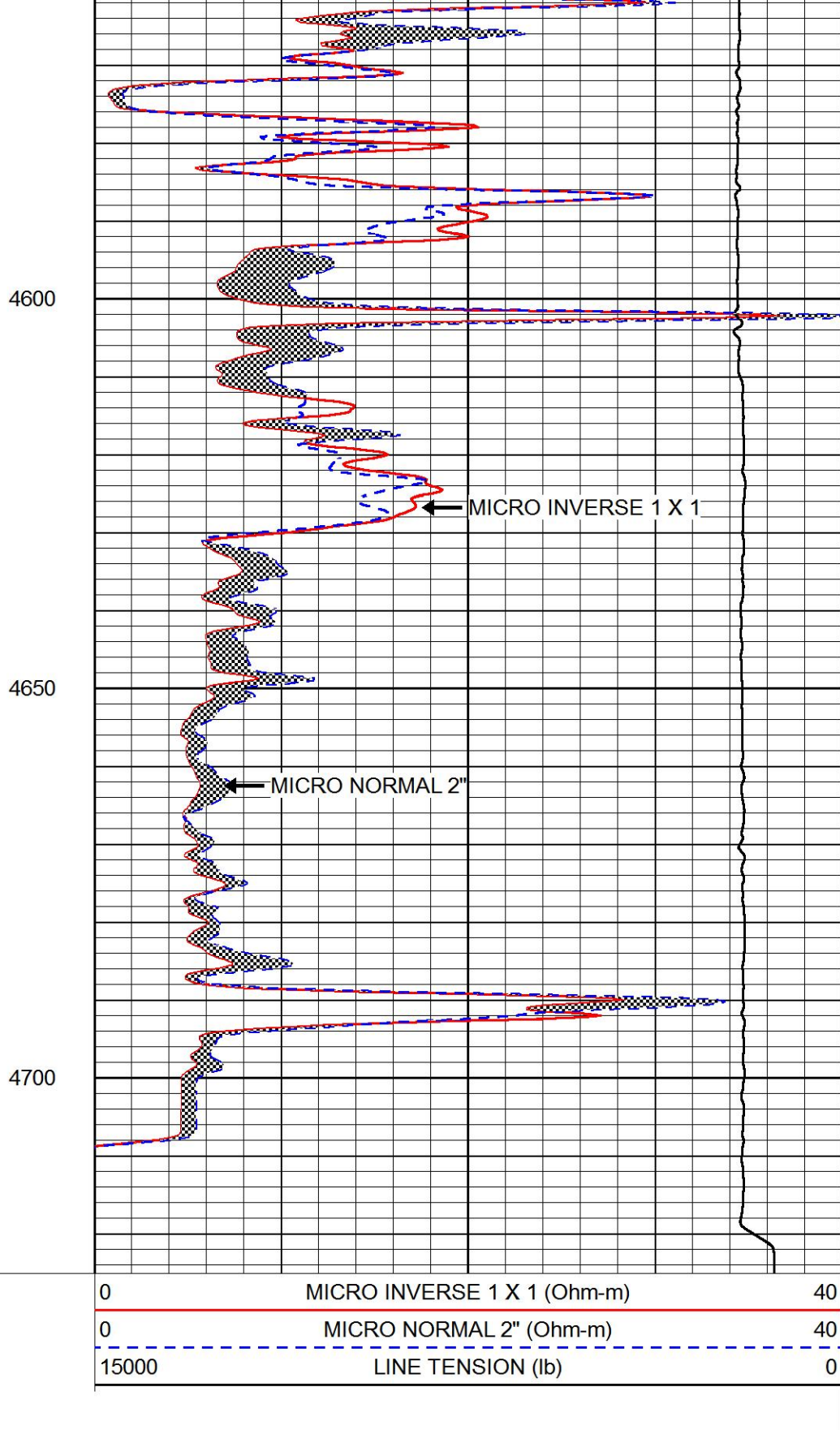
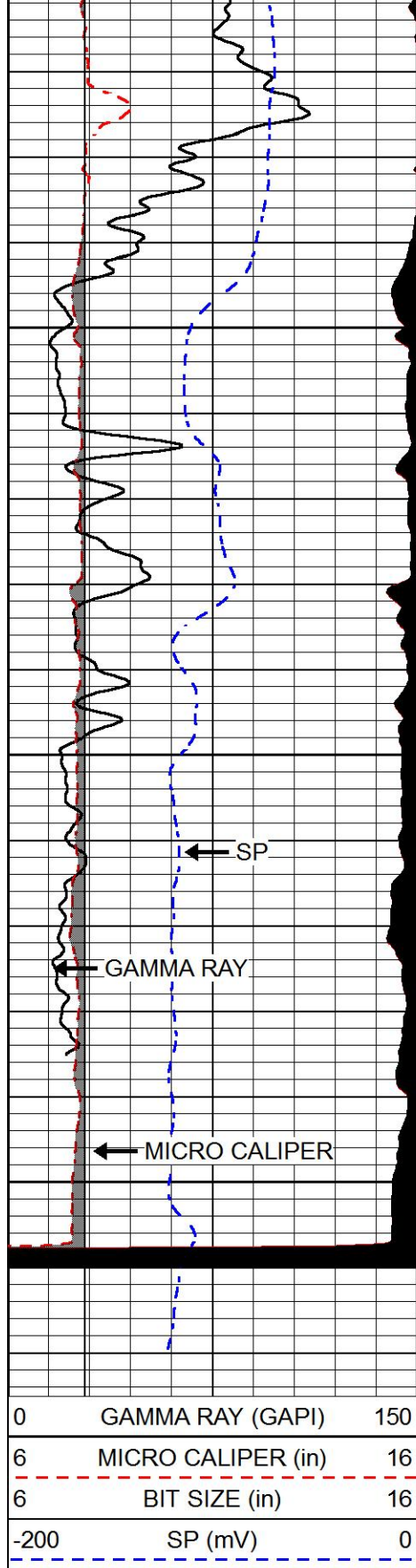
4400

4450

4500

4550



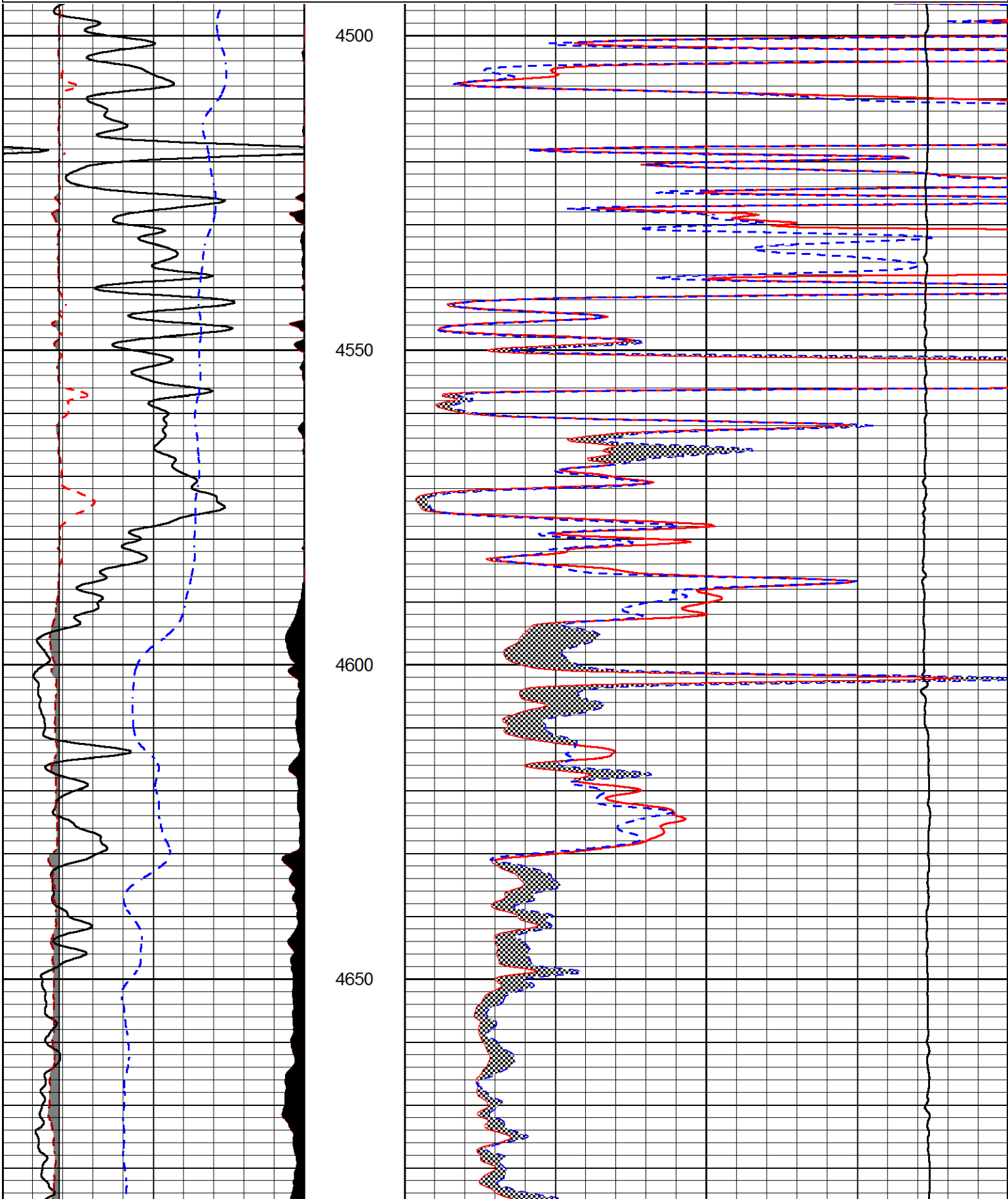


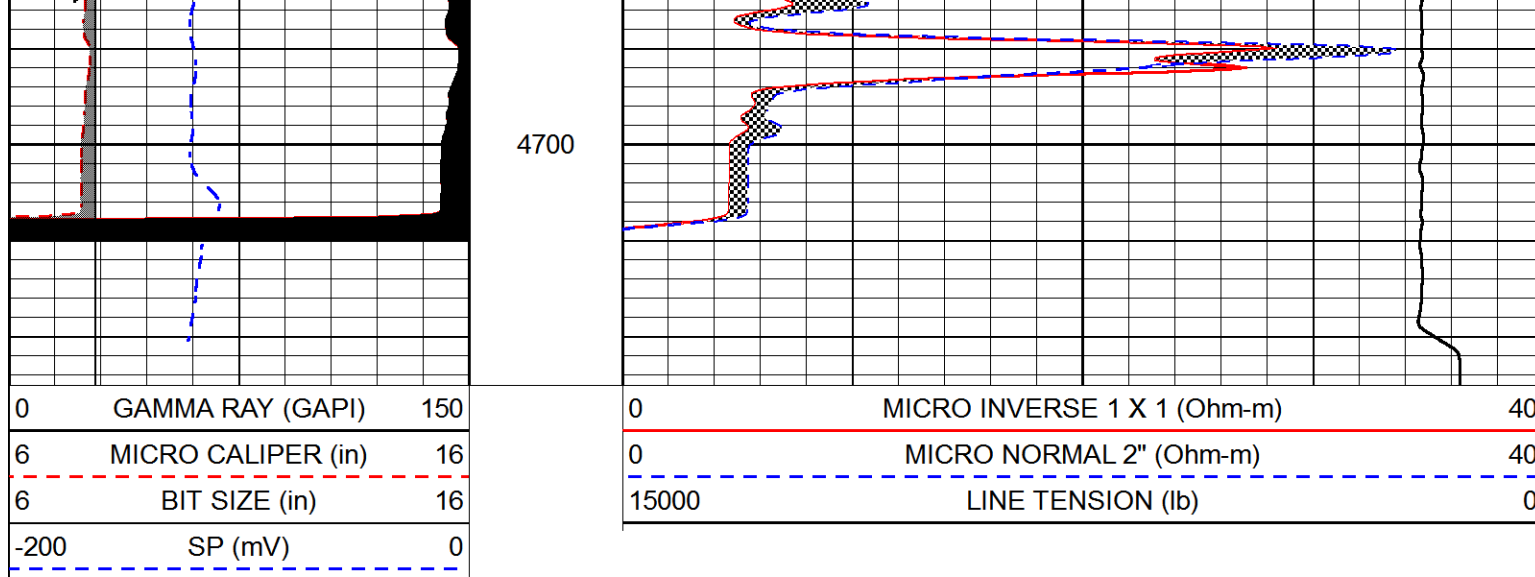
REPEAT SECTION

Database File american_warrior_hubin_1_10.db
 Dataset Pathname stackml/pass2.1
 Presentation Format micro

0	GAMMA RAY (GAPI)	150
6	MICRO CALIPER (in)	16
6	BIT SIZE (in)	16
-200	SP (mV)	0

0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
15000	LINE TENSION (lb)	0





Calibration Report		
Database File	american_warrior_hubin_1_10.db	
Dataset Pathname	stackml/pass3.1	
Dataset Creation	Wed Jul 18 14:33:26 2018	

Dual Induction Calibration Report

Serial-Model:	1987-M&W
Calibration Performed:	Tue Apr 11 17:07:38 2017

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.530	-36.500
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.440	-110.500

Microlog Calibration Report

Serial-Model:	PSI-01-PSI STKBL ML
Performed:	Thu Mar 31 18:14:32 2016

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-1.0000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	29500.0000	-1.0000
Caliper	1.0001	1.1397	6.5000	18.5000	in	86.0000	-82.6500

Compensated Density Calibration Report

Serial-Model:	979-229-M&W
Source / Verifier:	21170B /
Master Calibration Performed:	Tue Jun 26 07:59:32 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	7726.98	9910.47	cps
Aluminum	2.680	g/cc	1442.93	6391.03	cps

Spine Angle = 75.35

Density/Spine Ratio = 0.533

	Size		Reading
Small Ring	4.00	in	1.16
Large Ring	16.00	in	1.03

Compensated Neutron Calibration Report

Serial Number: tk10-MW
Tool Model: M&W
Calibration Performed: Wed Nov 16 11:21:36 2016

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: 89-M&W
Tool Model: M&W
Calibration Performed: Tue Apr 11 17:08:01 2017

Calibrator Value: 1000.0 GAPI
Background Reading: 0.0 cps
Calibrator Reading: 6.2 cps
Sensitivity: 0.5200 GAPI/cps



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