

Confidentiality Requested:

Yes No

**KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION**

Form ACO-1

January 2018

Form must be Typed

Form must be Signed

All blanks must be Filled

**WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

New Well Re-Entry Workover

Oil WSW SWD

Gas DH EOR

OG GSW

CM (Coal Bed Methane)

Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

Deepening Re-perf. Conv. to EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: _____

Confidential Release Date: _____

Wireline Log Received Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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GLOBAL OIL FIELD SERVICES, LLC

3256

REMIT TO 24 S. Lincoln
Russell, KS 67665

SERVICE POINT: Russell KS

DATE <u>3-19-18</u>	SEC. <u>25</u>	TWP. <u>11S</u>	RANGE <u>33W</u>	CALLED OUT	ON LOCATION	JOB START	JOB FINISH <u>4:30 PM</u>
LEASE <u>Michaelis</u>	WELL #. <u>251</u>	LOCATION <u>4 mls. South of Collier, 1/2 1/2</u>			COUNTY <u>Logan</u>	STATE <u>KS</u>	
OLD OR NEW (CIRCLE ONE) <u>NEW</u>			<u>WCS + WCS into</u>				

CONTRACTOR Southwind Drilling Inc R3 AG
 TYPE OF JOB Rotary Plug
 HOLE SIZE 7 7/8 T.D. 4730'
 CASING SIZE _____ DEPTH 2590'
 TUBING SIZE _____ DEPTH _____
 DRILL PIPE _____ DEPTH _____
 TOOL _____ DEPTH _____
 PRES. MAX _____ MINIMUM _____
 MEAS. LINE _____ SHOE JOINT _____
 CEMENT LEFT IN CSG. _____
 PERFS _____
 DISPLACEMENT _____

OWNER Richland Oil Investments LLC
 CEMENT AMOUNT ORDERED 255 sk 60/40 4% gel
1/2" Flu-sol

EQUIPMENT
 PUMP TRUCK # 409 CEMENTER Cody HELPER Brad
 BULK TRUCK # 473 DRIVER Kris
 BULK TRUCK # _____ DRIVER _____

COMMON _____ @ _____
 POZMIX _____ @ _____
 GEL _____ @ _____
 CHLORIDE _____ @ _____
 ASC _____ @ _____
 _____ @ _____
 _____ @ _____
 _____ @ _____
 _____ @ _____
 _____ @ _____
 HANDLING _____ @ _____
 MILEAGE _____ @ _____
 TOTAL _____

REMARKS:
2590' 50sk
1580' 100sk
280' 50sk
40' 10sk wiper plug
Rest hole 30sk Mousehole 15sk

CHARGE TO: Richland Oil Investments LLC
 STREET Po Box 166
 CITY Palco STATE KS ZIP 67657

Global Oil Field Services, LLC
 You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME _____
 SIGNATURE William Sanderson

SERVICE
 DEPTH OF JOB _____
 PUMP TRUCK CHARGE _____
 EXTRA FOOTAGE _____ @ _____
 MILEAGE _____ @ _____
 MANIFOLD _____ @ _____
 _____ @ _____
 TOTAL _____

PLUG & FLOAT EQUIPMENT
 _____ @ _____
 _____ @ _____
 _____ @ _____
 _____ @ _____
 _____ @ _____
 TOTAL _____

SALES TAX (if Any) _____
 TOTAL CHARGES _____
 DISCOUNT _____ IF PAID IN 30 DAYS

GLOBAL OIL FIELD SERVICES, LLC

3318

REMIT TO 24 S. Lincoln
Russell, KS 67665

SERVICE POINT: Russell KS

DATE <u>4-9-18</u>	SEC. <u>25</u>	TWP. <u>11S</u>	RANGE <u>33W</u>	CALLED OUT	ON LOCATION	JOB START	JOB FINISH <u>9:00pm</u>
LEASE <u>Michals</u>	WELL #. <u>25-1</u>	LOCATION <u>1/4 South of Oakley, 1/2 S 1/2 W 15+</u>		COUNTY <u>Logan</u>	STATE <u>KS</u>		
OLD OR <u>NEW</u> (CIRCLE ONE)							

CONTRACTOR Southwind Drilling Rig # 8

OWNER Richland Oil Co.

TYPE OF JOB Surface

HOLE SIZE <u>12 3/8</u>	T.D.
CASING SIZE <u>8 5/8</u>	DEPTH <u>226'</u>
TUBING SIZE	DEPTH
DRILL PIPE	DEPTH
TOOL	DEPTH
PRES. MAX.	MINIMUM
MEAS. LINE	SHOE JOINT

CEMENT LEFT IN CSG.
PERFS
DISPLACEMENT

CEMENT AMOUNT ORDERED 1655x 60/40 3%cc
2 1/2 gal

EQUIPMENT

PUMP TRUCK	CEMENTER <u>Cody</u>
# <u>409</u>	HELPER <u>Brad</u>
BULK TRUCK	
# <u>411</u>	DRIVER <u>KRIS</u>
BULK TRUCK	
#	DRIVER

COMMON	@	
POZMIX	@	
GEL	@	
CHLORIDE	@	
ASC	@	
	@	
	@	
	@	
	@	
	@	
	@	
	@	
HANDLING	@	
MILEAGE		
		TOTAL

REMARKS:
Ran 545 of 8 5/8 casing + bit hooked to rig
probe circulation hooked to pump truck pumped
1655x of cement displaced 13 bbl of 4/0 and
shut in.
Cement did not circulate to surface

CHARGE TO: Richland Oil Co.

STREET _____

CITY _____ STATE _____ ZIP _____

Global Oil Field Services, LLC
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME _____

SIGNATURE William L. ...

SERVICE

DEPTH OF JOB		
PUMP TRUCK CHARGE		
EXTRA FOOTAGE	@	
MILEAGE	@	
MANIFOLD	@	
	@	
	@	
		TOTAL

PLUG & FLOAT EQUIPMENT

	@	
	@	
	@	
	@	
	@	
		TOTAL

SALES TAX (If Any) _____

TOTAL CHARGES _____

DISCOUNT _____ IF PAID IN 30 DAYS



DRILL STEM TEST REPORT

Prepared For: **Richland Oil Investments, LLC.**

PO Box 166
Palco KS 67657

ATTN: Steve Murphy

Michaelis #25-1

25-11S-33W Logan,KS

Start Date: 2018.04.15 @ 19:03:00

End Date: 2018.04.16 @ 03:42:30

Job Ticket #: 51624 DST #: 1

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.04.19 @ 13:26:15



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Richland Oil Investments, LLC.

25-11S-33W Logan, KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51624

DST#: 1

ATTN: Steve Murphy

Test Start: 2018.04.15 @ 19:03:00

GENERAL INFORMATION:

Formation: **LKC 'E-F'**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:13:10

Time Test Ended: 03:42:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Spencer J. Staab

Unit No: 65

Interval: 4122.00 ft (KB) To 4150.00 ft (KB) (TVD)

Reference Elevations: 3087.00 ft (KB)

Total Depth: 4150.00 ft (KB) (TVD)

3080.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

Serial #: 8737

Outside

Press@RunDepth: 105.95 psig @ 4123.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.04.15

End Date:

2018.04.16

Last Calib.:

2018.04.16

Start Time: 19:03:01

End Time:

03:42:30

Time On Btm:

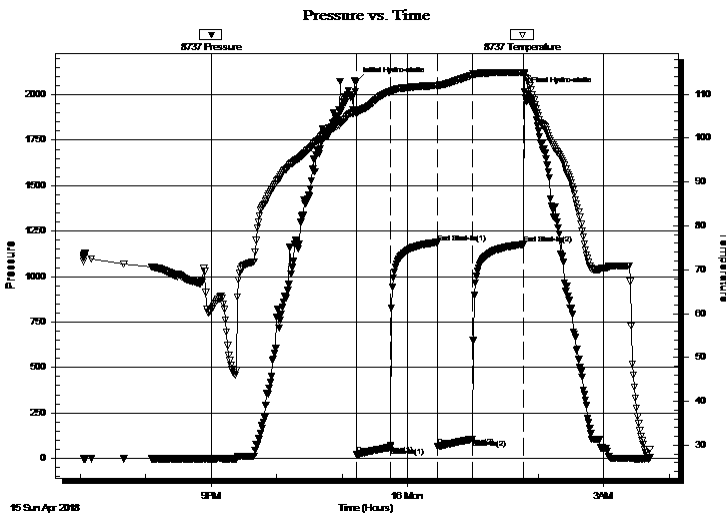
2018.04.15 @ 23:13:00

Time Off Btm:

2018.04.16 @ 01:47:20

TEST COMMENT: 30-IF-Weak Blow ; Built to 9"
45-ISI-No Return
30-FF-Weak Blow ; Built to 4"
45-FSI-No Return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2071.61	106.37	Initial Hydro-static
1	21.78	105.46	Open To Flow (1)
31	61.75	110.59	Shut-In(1)
75	1187.41	111.98	End Shut-In(1)
75	65.59	111.83	Open To Flow (2)
107	105.95	114.33	Shut-In(2)
154	1177.11	114.98	End Shut-In(2)
155	2018.57	114.60	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
180.00	MW 10%W 90%M	2.52

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Richland Oil Investments, LLC.

25-11S-33W Logan, KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51624

DST#: 1

ATTN: Steve Murphy

Test Start: 2018.04.15 @ 19:03:00

GENERAL INFORMATION:

Formation: **LKC 'E-F'**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:13:10

Time Test Ended: 03:42:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Spencer J. Staab

Unit No: 65

Interval: 4122.00 ft (KB) To 4150.00 ft (KB) (TVD)

Total Depth: 4150.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 3087.00 ft (KB)

3080.00 ft (CF)

KB to GR/CF: 7.00 ft

Serial #: 8653

Inside

Press@RunDepth: psig @ 4123.00 ft (KB)

Start Date: 2018.04.15

End Date:

2018.04.16

Start Time: 19:03:01

End Time:

03:42:30

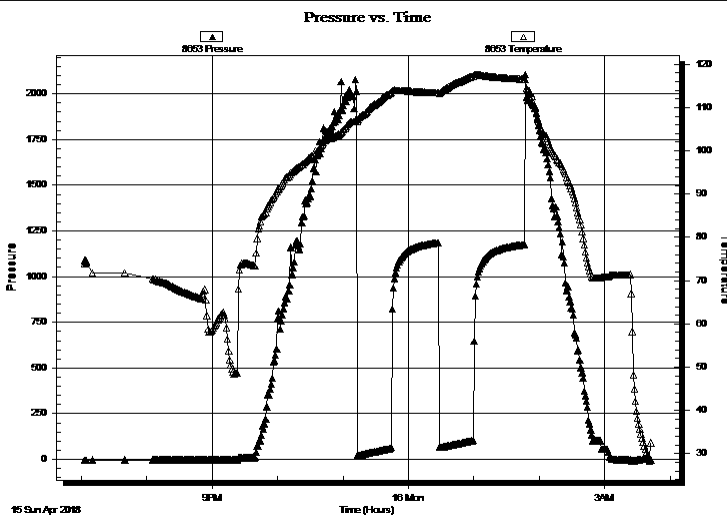
Capacity: 8000.00 psig

Last Calib.: 2018.04.16

Time On Btm:

Time Off Btm:

TEST COMMENT: 30-IF-Weak Blow ; Built to 9"
45-ISI-No Return
30-FF-Weak Blow ; Built to 4"
45-FSI-No Return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
180.00	MW 10%W 90%M	2.52

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51624

DST#: 1

ATTN: Steve Murphy

Test Start: 2018.04.15 @ 19:03:00

Tool Information

Drill Pipe:	Length: 4100.00 ft	Diameter: 3.80 inches	Volume: 57.51 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: 57.51 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 51000.00 lb
Depth to Top Packer:	4122.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	28.00 ft			
Tool Length:	56.00 ft			
Number of Packers:	1	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4095.00	
Shut In Tool	5.00			4100.00	
Hydraulic tool	5.00			4105.00	
Jars	5.00			4110.00	
Safety Joint	3.00			4113.00	
Packer	5.00			4118.00	28.00 Bottom Of Top Packer
Packer	4.00			4122.00	
Stubb	1.00			4123.00	
Recorder	0.00	8653	Inside	4123.00	
Recorder	0.00	8737	Outside	4123.00	
Perforations	24.00			4147.00	
Bullnose	3.00			4150.00	28.00 Bottom Packers & Anchor

Total Tool Length: 56.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51624

DST#: 1

ATTN: Steve Murphy

Test Start: 2018.04.15 @ 19:03:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

90000 ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.79 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
180.00	MW 10%W 90%M	2.525

Total Length: 180.00 ft Total Volume: 2.525 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

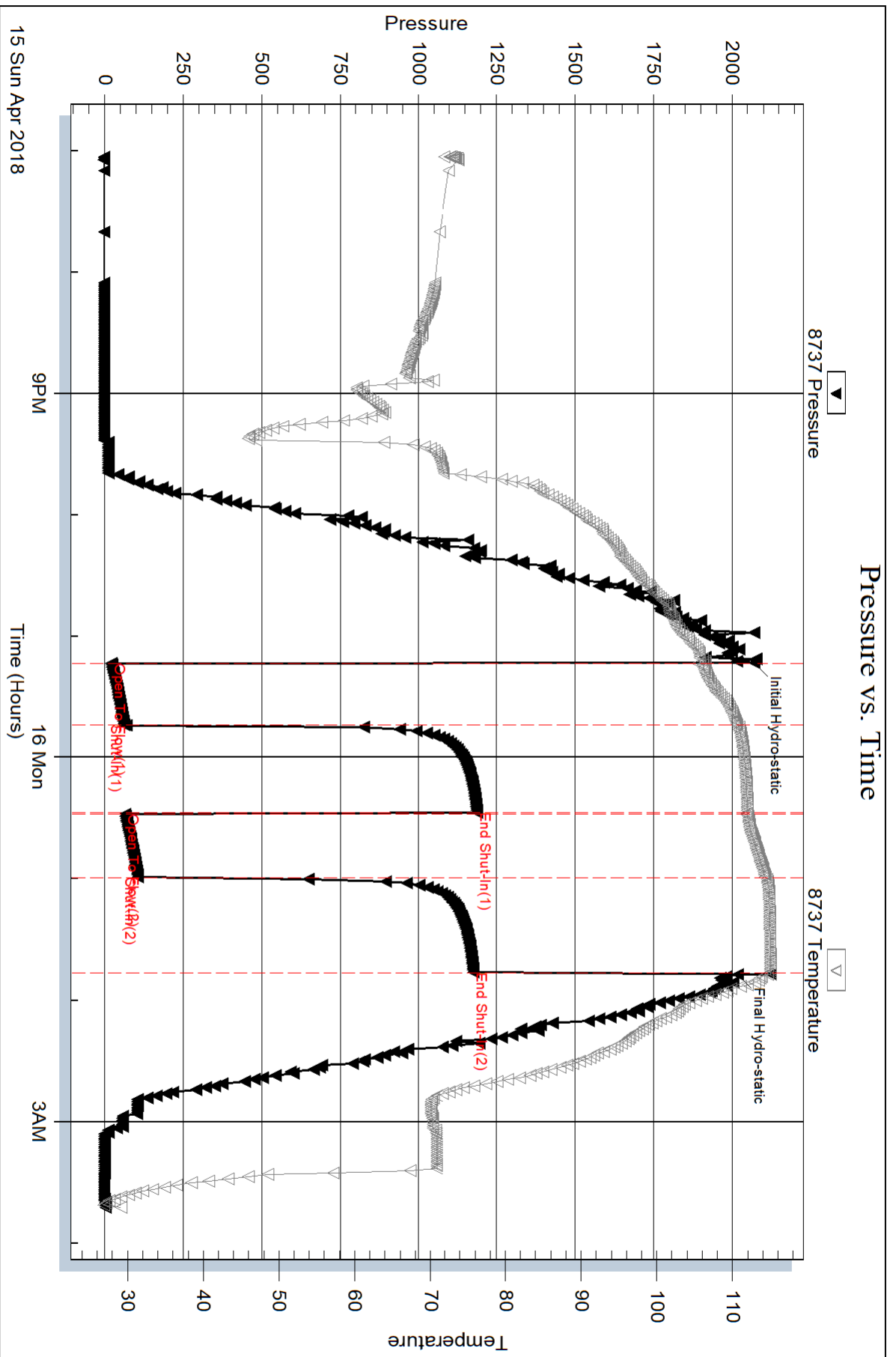
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 2#LCM

RW=.273@23F



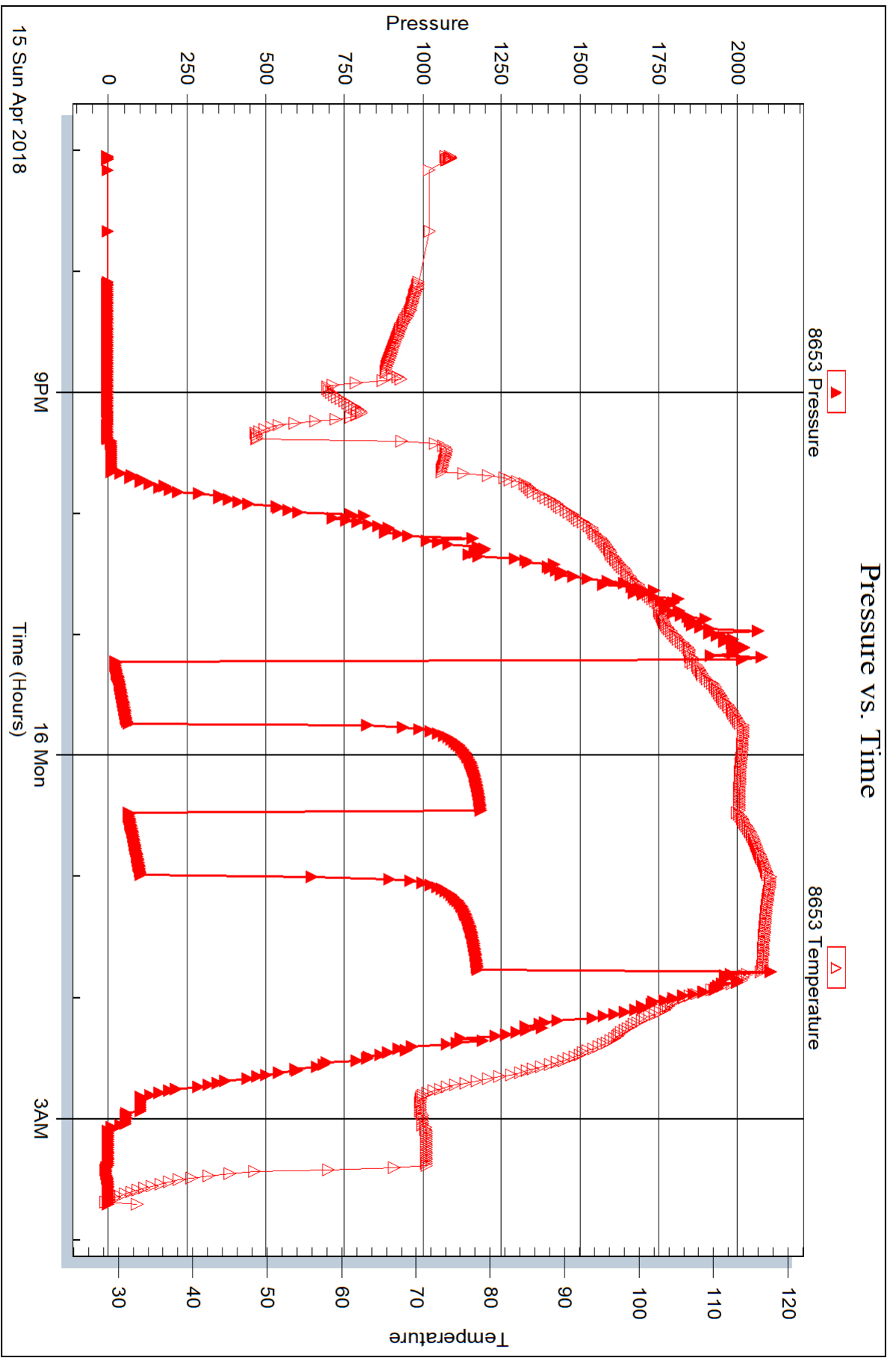
Serial #: 8653

Inside

Richland Oil Investments, LLC.

Michaels #25-1

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **Richland Oil Investments, LLC.**

PO Box 166
Palco KS 67657

ATTN: Steve Murphy

Michaelis #25-1

25-11S-33W Logan,KS

Start Date: 2018.04.16 @ 20:08:00

End Date: 2018.04.17 @ 03:29:09

Job Ticket #: 51625 DST #: 2

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.04.19 @ 13:21:45



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Richland Oil Investments, LLC.

25-11S-33W Logan, KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51625

DST#: 2

ATTN: Steve Murphy

Test Start: 2018.04.16 @ 20:08:00

GENERAL INFORMATION:

Formation: **LKC 'K'**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:08:40

Time Test Ended: 03:29:09

Test Type: Conventional Bottom Hole (Reset)

Tester: Spencer J. Staab

Unit No: 65

Interval: 4280.00 ft (KB) To 4312.00 ft (KB) (TVD)

Reference Elevations: 3087.00 ft (KB)

Total Depth: 4312.00 ft (KB) (TVD)

3080.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

Serial #: 8737 Outside

Press@RunDepth: 42.30 psig @ 4281.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.04.16

End Date:

2018.04.17

Last Calib.:

2018.04.17

Start Time: 20:08:01

End Time:

03:29:10

Time On Btm:

2018.04.16 @ 23:08:30

Time Off Btm:

2018.04.17 @ 01:41:30

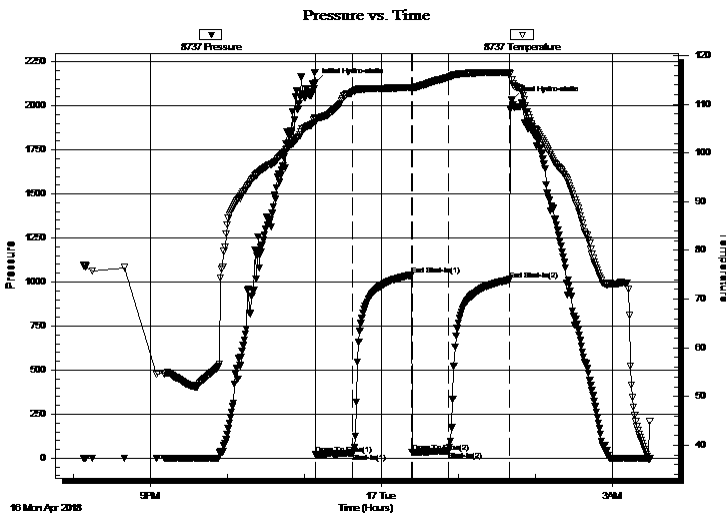
TEST COMMENT: 30-IF-Weak Blow ; Built to 3"

45-ISI-No Return

30-FF-Weak Blow ; Built to 1 1/2"

45-FSI-No Return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2131.25	107.19	Initial Hydro-static
1	20.76	106.29	Open To Flow (1)
30	30.43	112.60	Shut-In(1)
75	1039.36	113.47	End Shut-In(1)
76	33.57	113.07	Open To Flow (2)
104	42.30	115.55	Shut-In(2)
152	1014.19	116.55	End Shut-In(2)
153	2031.90	114.94	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
40.00	WM w /trace oil 20%W 80%M	0.56

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51625

DST#: 2

ATTN: Steve Murphy

Test Start: 2018.04.16 @ 20:08:00

Tool Information

Drill Pipe:	Length: 4257.00 ft	Diameter: 3.80 inches	Volume: 59.71 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: 59.71 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial 54000.00 lb
Depth to Top Packer:	4280.00 ft			Final 54000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	32.00 ft			
Tool Length:	60.00 ft			
Number of Packers:	1	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4253.00	
Shut In Tool	5.00			4258.00	
Hydraulic tool	5.00			4263.00	
Jars	5.00			4268.00	
Safety Joint	3.00			4271.00	
Packer	5.00			4276.00	28.00 Bottom Of Top Packer
Packer	4.00			4280.00	
Stubb	1.00			4281.00	
Recorder	0.00	8653	Inside	4281.00	
Recorder	0.00	8737	Outside	4281.00	
Perforations	28.00			4309.00	
Bullnose	3.00			4312.00	32.00 Bottom Packers & Anchor

Total Tool Length: 60.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 51625

DST#: 2

ATTN: Steve Murphy

Test Start: 2018.04.16 @ 20:08:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

78000 ppm

Viscosity: 46.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4500.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
40.00	WM w /trace oil 20%W 80%M	0.561

Total Length: 40.00 ft Total Volume: 0.561 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

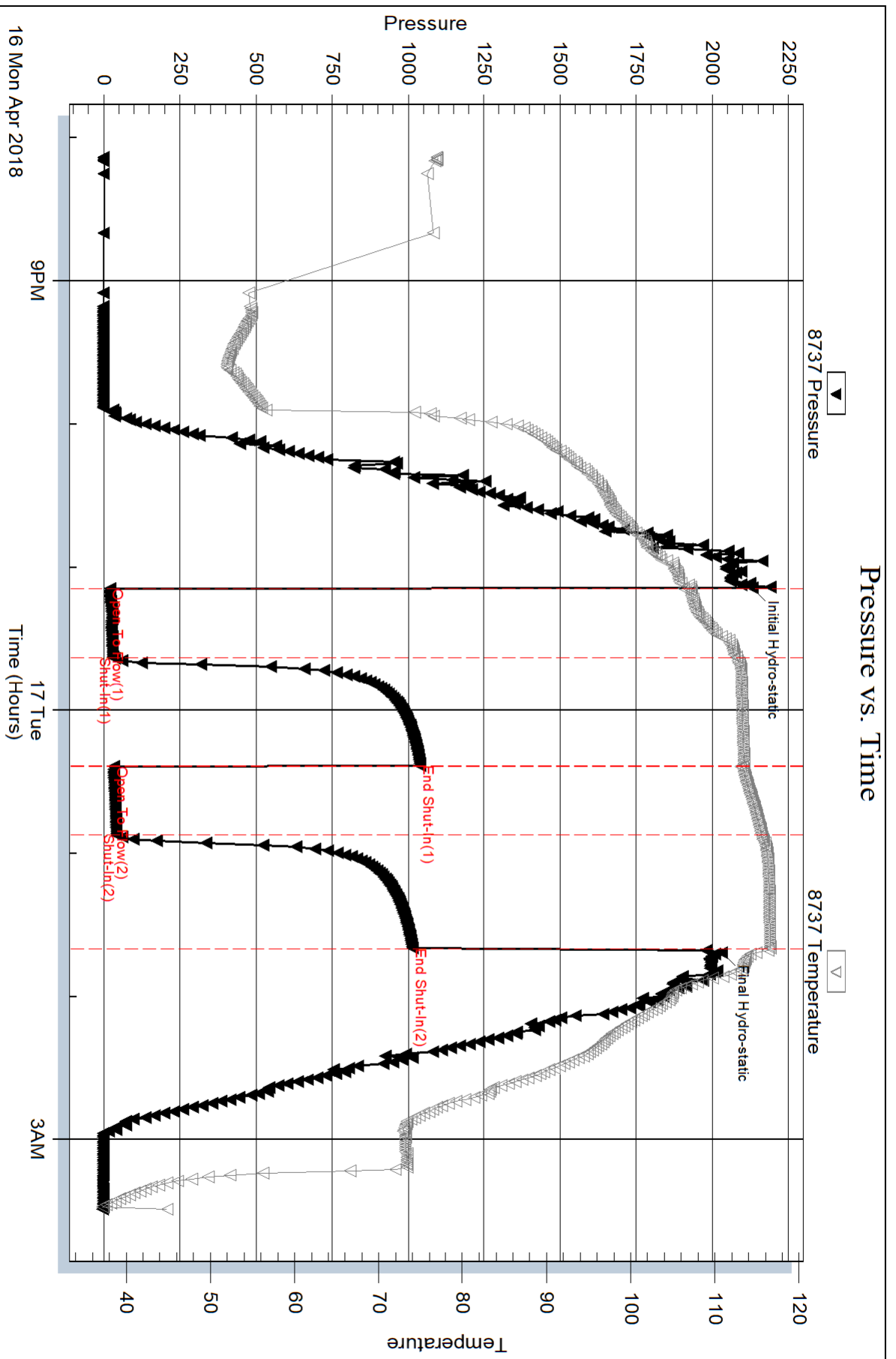
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 3#LCM

RW=.235@32F



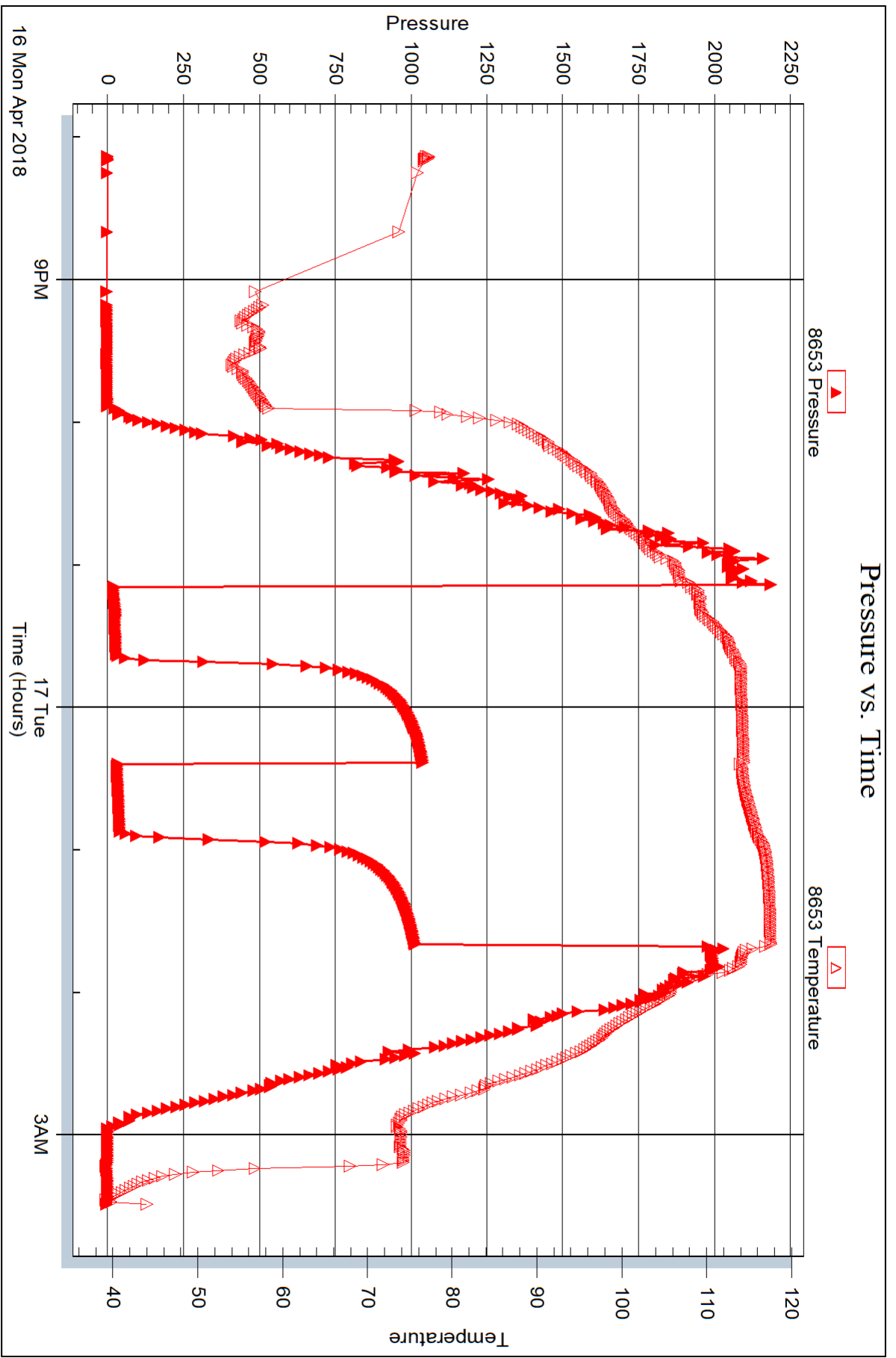
Serial #: 8653

Inside

Richland Oil Investments, LLC.

Michaelis #25-1

DST Test Number: 2





DRILL STEM TEST REPORT

Prepared For: **Richland Oil Investments, LLC.**

PO Box 166
Palco KS 67657

ATTN: Steve Murphy

Michaelis #25-1

25-11S-33W Logan,KS

Start Date: 2018.04.18 @ 08:28:00

End Date: 2018.04.18 @ 16:18:30

Job Ticket #: 65174 DST #: 3

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.04.19 @ 11:55:33



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Richland Oil Investments, LLC.

25-11S-33W Logan, KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 65174

DST#: 3

ATTN: Steve Murphy

Test Start: 2018.04.18 @ 08:28:00

GENERAL INFORMATION:

Formation: **Johnson**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:33:40

Time Test Ended: 16:18:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Spencer J. Staab

Unit No: 65

Interval: 4608.00 ft (KB) To 4650.00 ft (KB) (TVD)

Reference Elevations: 3087.00 ft (KB)

Total Depth: 4650.00 ft (KB) (TVD)

3080.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

Serial #: 8737 Outside

Press@RunDepth: 29.52 psig @ 4614.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.04.18 End Date: 2018.04.18

Last Calib.: 2018.04.18

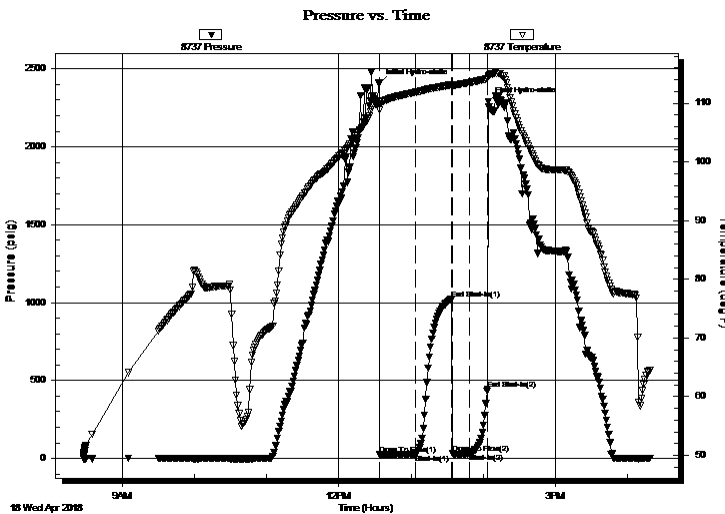
Start Time: 08:28:01 End Time: 16:18:30

Time On Btm: 2018.04.18 @ 12:33:30

Time Off Btm: 2018.04.18 @ 14:04:20

TEST COMMENT: 30-IF-Weak Blow ; Built to 2"
30-ISI-No Return
15-FF-Weak Surface Blow
15-FSI-No Return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2404.72	110.34	Initial Hydro-static
1	24.73	108.80	Open To Flow (1)
30	26.28	111.84	Shut-In(1)
61	1022.43	113.14	End Shut-In(1)
61	33.70	112.65	Open To Flow (2)
76	29.52	113.52	Shut-In(2)
90	446.23	114.16	End Shut-In(2)
91	2292.29	114.62	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	Oil Spotted Mud 100%M	0.14
7.00	OCM 20%O 80%M	0.10
3.00	Clean Oil	0.04

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Richland Oil Investments, LLC.
 PO Box 166
 Palco KS 67657
 ATTN: Steve Murphy

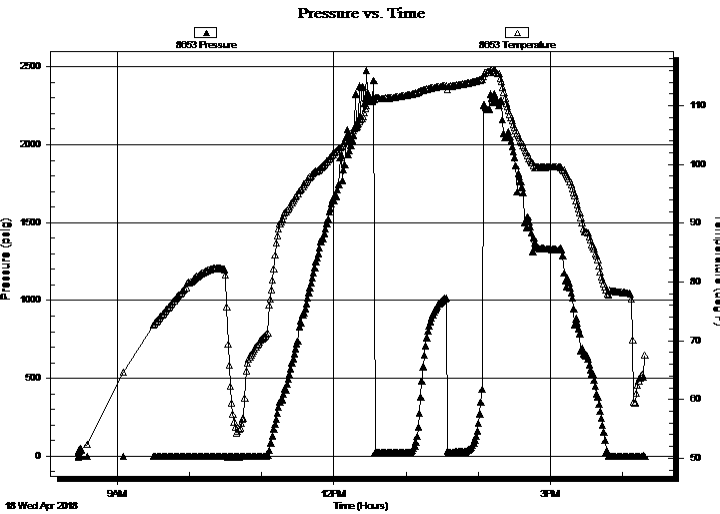
25-11S-33W Logan,KS
Michaelis #25-1
 Job Ticket: 65174 **DST#: 3**
 Test Start: 2018.04.18 @ 08:28:00

GENERAL INFORMATION:

Formation: **Johnson**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:33:40
 Time Test Ended: 16:18:30
Interval: 4608.00 ft (KB) To 4650.00 ft (KB) (TVD)
 Total Depth: 4650.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Spencer J. Staab
 Unit No: 65
 Reference Elevations: 3087.00 ft (KB)
 3080.00 ft (CF)
 KB to GR/CF: 7.00 ft

Serial #: 8653 Inside
 Press@RunDepth: psig @ 4614.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.04.18 End Date: 2018.04.18 Last Calib.: 2018.04.18
 Start Time: 08:28:01 End Time: 16:18:30 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30-IF-Weak Blow ; Built to 2"
 30-ISI-No Return
 15-FF-Weak Surface Blow
 15-FSI-No Return



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery		
Length (ft)	Description	Volume (bbl)
10.00	Oil Spotted Mud 100%M	0.14
7.00	OCM 20%O 80%M	0.10
3.00	Clean Oil	0.04

* Recovery from multiple tests

Gas Rates			
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 65174

DST#: 3

ATTN: Steve Murphy

Test Start: 2018.04.18 @ 08:28:00

Tool Information

Drill Pipe:	Length: 4606.00 ft	Diameter: 3.80 inches	Volume: 64.61 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 60000.00 lb
			<u>Total Volume: 64.61 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	4608.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	42.00 ft			
Tool Length:	70.00 ft			
Number of Packers:	1	Diameter: 6.75 inches		
Tool Comments:				

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4581.00	
Shut In Tool	5.00			4586.00	
Hydraulic tool	5.00			4591.00	
Jars	5.00			4596.00	
Safety Joint	3.00			4599.00	
Packer	5.00			4604.00	28.00 Bottom Of Top Packer
Packer	4.00			4608.00	
Stubb	1.00			4609.00	
Perforations	5.00			4614.00	
Recorder	0.00	8653	Inside	4614.00	
Recorder	0.00	8737	Outside	4614.00	
Perforations	33.00			4647.00	
Bullnose	3.00			4650.00	42.00 Bottom Packers & Anchor

Total Tool Length: 70.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Richland Oil Investments, LLC.

25-11S-33W Logan,KS

PO Box 166
Palco KS 67657

Michaelis #25-1

Job Ticket: 65174

DST#: 3

ATTN: Steve Murphy

Test Start: 2018.04.18 @ 08:28:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

27 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 64.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
10.00	Oil Spotted Mud 100%M	0.140
7.00	OCM 20%O 80%M	0.098
3.00	Clean Oil	0.042

Total Length: 20.00 ft

Total Volume: 0.280 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

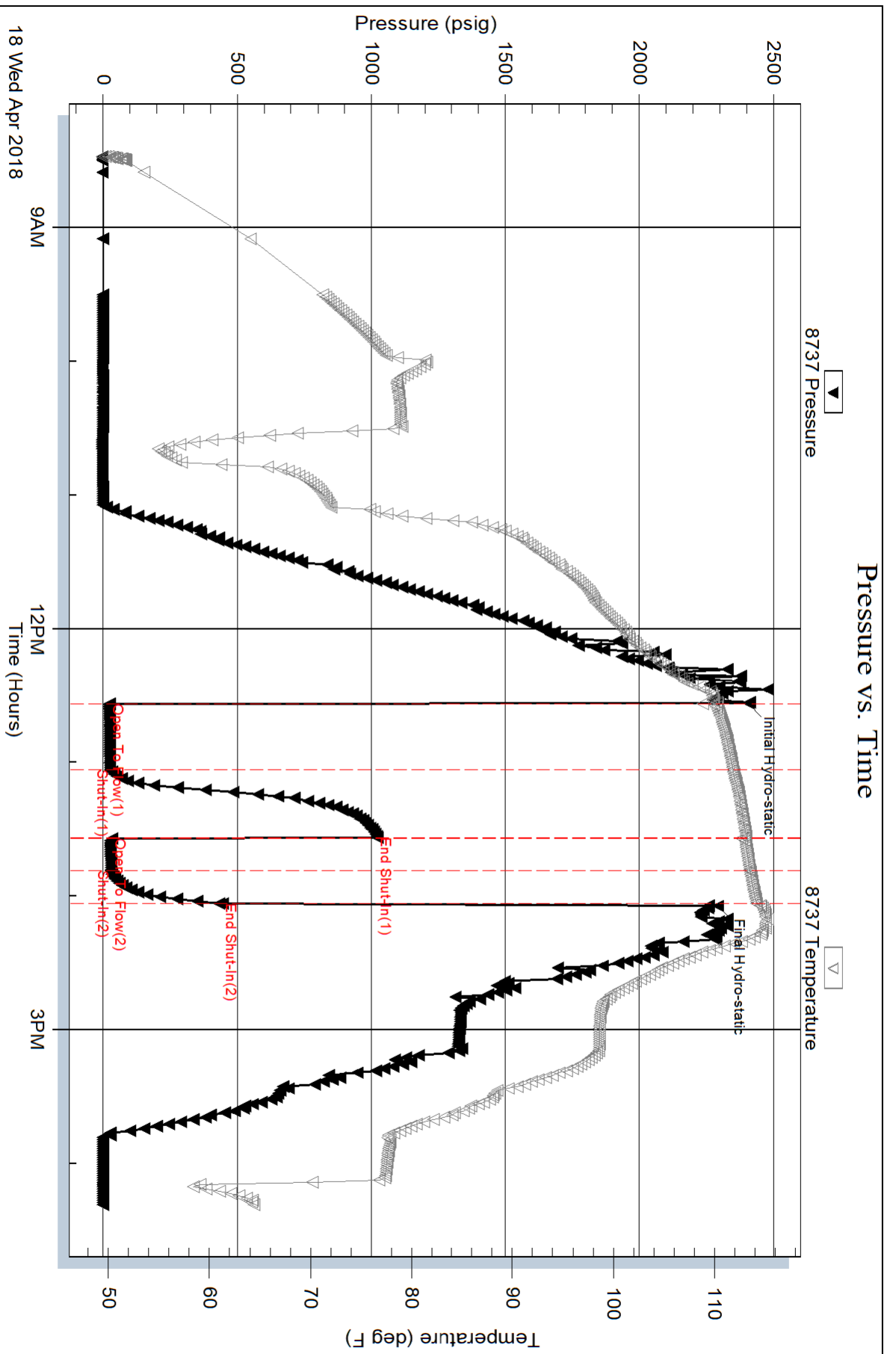
Recovery Comments: 2#LCM

Serial #: 8737

Outside Richland Oil Investments, LLC.

Michaelis #25-1

DST Test Number: 3



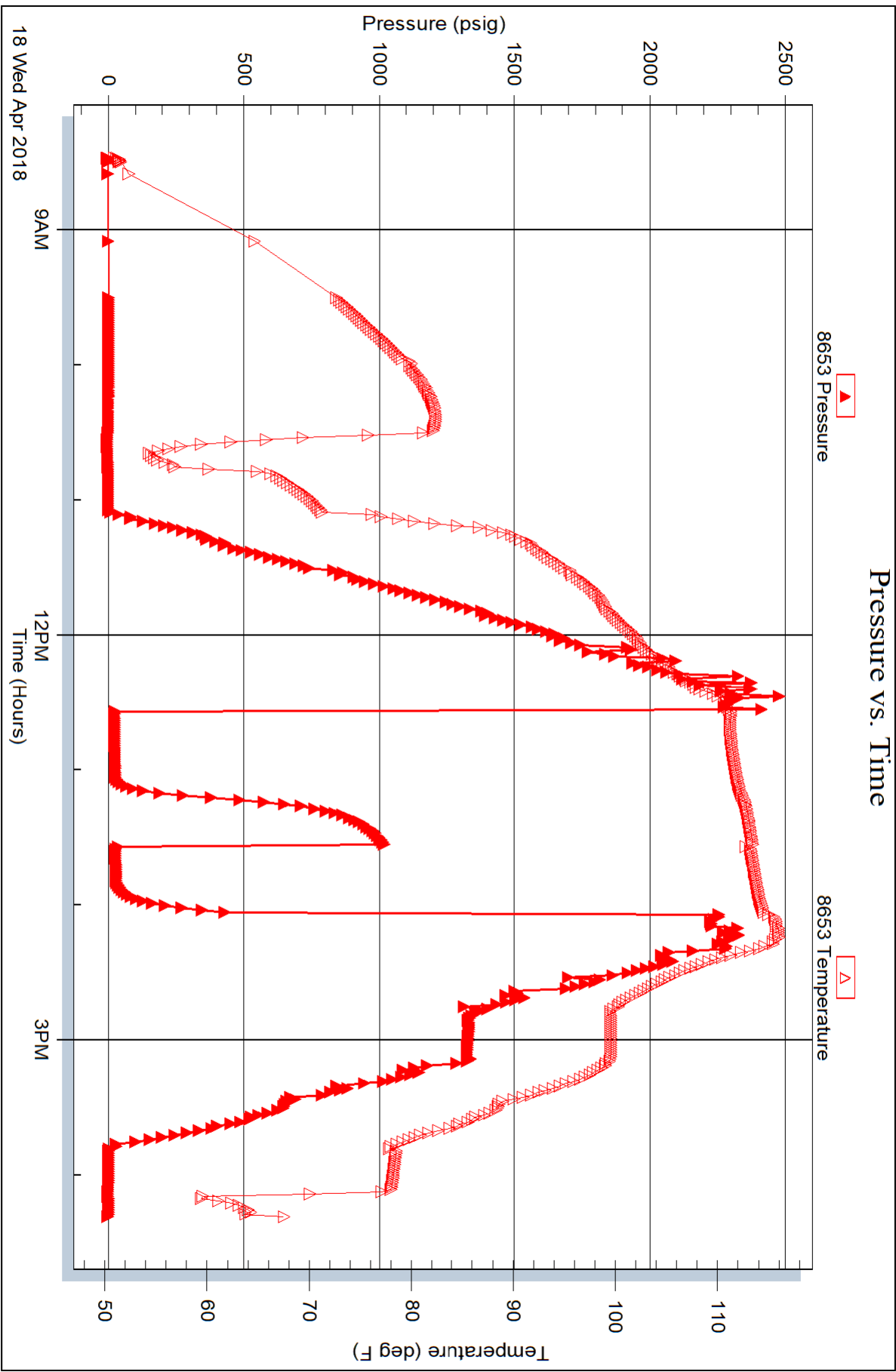
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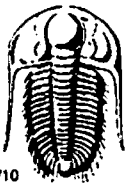
Inside

Richland Oil Investments, LLC.

Michaels #25-1

DST Test Number: 3





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 51624

Well Name & No. Michaelis # 25-1 Test No. 1 Date 04/15/2018
 Company Richland Oil Investments, LLC Elevation 3087 KB 3080 GL
 Address PO BOX 166 Palco Ks 67657
 Co. Rep / Geo. Steve Murphy Rig Southwind #8
 Location: Sec. 25 Twp. 14s Rge. 33w Co. Logan State Ks

Interval Tested 4122'-4150' Zone Tested LHC 'E-7'
 Anchor Length 28' Drill Pipe Run 4100' Mud Wt. 9.3
 Top Packer Depth 4117' Drill Collars Run - Vis 50
 Bottom Packer Depth 4122' Wt. Pipe Run - WL 8.8
 Total Depth 4150' Chlorides 2000 ppm System LCM 2#

Blow Description 77- Weak Blow, Built to 9"
1SD- No Return
77- Weak Blow, Built to 4"
7SD- No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>180</u>	<u>WML</u>		<u>10</u>	<u>90</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 180 BHT 115° Gravity - API RW 273 @ 23 °F Chlorides 90,000 ppm

- (A) Initial Hydrostatic 2071
- (B) First Initial Flow 21
- (C) First Final Flow 61
- (D) Initial Shut-In 1187
- (E) Second Initial Flow 65
- (F) Second Final Flow 105
- (G) Final Shut-In 1177
- (H) Final Hydrostatic 2018

- Test 1150
- Jars 250
- Safety Joint 75
- Circ Sub
- Hourly Standby
- Mileage 19827 198
- Sampler
- Straddle
- Shale Packer
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 1673

T-On Location 18:23
 T-Started 19:03
 T-Open 23:13
 T-Pulled 01:43 04/16/2018
 T-Out 03:41

Comments _____
 Ruined Shale Packer
 Ruined Packer
 Extra Copies
 Sub Total 0
 Total 1673
 MP/DST Disc't _____

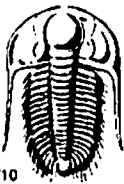
Initial Open 30
 Initial Shut-In 45
 Final Flow 30
 Final Shut-In 45

Approved By _____

Our Representative Spencer J. Staal *Thanks!*

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.

785-259-0056



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 51625

Well Name & No. Michaelis #25-1 Test No. 2 Date 04/18/2015
 Company Richland Oil Investments, LLC Elevation 3087 KB 3080 GL
 Address PO BOX 166 Palco Ks 67657
 Co. Rep / Geo. Steve Murphy Rig Southwind #8
 Location: Sec. 25 Twp. 11S Rge. 33W Co. Logan State Ks

Interval Tested 4280' - 4312' Zone Tested LKC 9'
 Anchor Length 32' Drill Pipe Run 4257' Mud Wt. 9.2
 Top Packer Depth 4275' Drill Collars Run - Vis 46
 Bottom Packer Depth 4280' Wt. Pipe Run - WL 8
 Total Depth 4312' Chlorides 4500 ppm System LCM 3#

Blow Description 67- Weak Blow; Built to 3"
68- No Return
77- Weak Blow; Built to 1 1/2"
78- No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>40'</u>	<u>WM w/trace oil</u>		<u>20</u>	<u>80</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 40' BHT 116° Gravity - API RW .235 @ 32° F Chlorides 78,000 ppm

- (A) Initial Hydrostatic 2131
- (B) First Initial Flow 20
- (C) First Final Flow 30
- (D) Initial Shut-In 1039
- (E) Second Initial Flow 33
- (F) Second Final Flow 42
- (G) Final Shut-In 1014
- (H) Final Hydrostatic 2031

- Test 1150
- Jars 250
- Safety Joint 75
- Circ Sub
- Hourly Standby
- Mileage 198 RT 198
- Sampler
- Straddle
- Shale Packer
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 1673

- T-On Location 19:48
- T-Started 20:08
- T-Open 23:08
- T-Pulled 01:38
- T-Out 03:28
- Comments _____
- Ruined Shale Packer
- Ruined Packer
- Extra Copies
- Sub Total 0
- Total 1673
- MP/DST Disc't _____

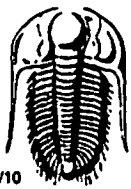
Initial Open 30
 Initial Shut-In 45
 Final Flow 30
 Final Shut-In 45

Approved By _____

Our Representative Spencer J. Staal Thanks!

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.

785-259-0050



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 65174

Well Name & No. Michaelis # 25-1 Test No. 3 Date 04/18/2018
 Company Richland Oil Investments, LLC Elevation 3087 KB 3080 GL
 Address PO BOX 166 Palco Mo 67657
 Co. Rep / Geo. Steve Murphy Rig Southwind #8
 Location: Sec. 25 Twp. 11s Rge. 33w Co. Logan State Mo

Interval Tested 4608' - 4650' Zone Tested Johnson
 Anchor Length 42' Drill Pipe Run 4606' Mud Wt. 9.3
 Top Packer Depth 4603' Drill Collars Run - Vis 64
 Bottom Packer Depth 4608' Wt. Pipe Run - WL 8.0
 Total Depth 4650' Chlorides 4000 ppm System LCM 2H

Blow Description: 77- Weak Blow; Built to 2"
1st- No Return
77- Weak Surface Blow
78- No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>10'</u>	<u>Oil spotted Mud</u>			<u>100%</u>	
<u>7'</u>	<u>OCM</u>		<u>20%</u>	<u>80%</u>	
<u>3'</u>	<u>Clear Oil</u>	<u>100%</u>			
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 20' BHT 114° Gravity 27° API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic <u>2404</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>08:00</u>
(B) First Initial Flow <u>24</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>08:28</u>
(C) First Final Flow <u>26</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>12:33</u>
(D) Initial Shut-In <u>10:22</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>14:03</u>
(E) Second Initial Flow <u>33</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>16:17</u>
(F) Second Final Flow <u>29</u>	<input checked="" type="checkbox"/> Mileage <u>198 RT 198</u>	Comments <u>Loaded Tools</u>
(G) Final Shut-In <u>446</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2292</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>30</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>15</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Shut-In <u>15</u>	<input type="checkbox"/> Day Standby	Total <u>1673</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1673</u>	

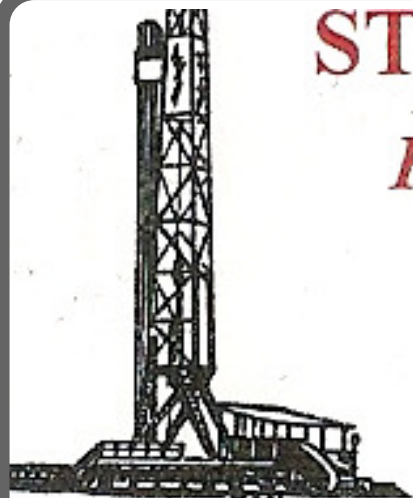
Approved By _____ Our Representative Spencer J. Stahl Thanks!

TriLOBITE Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.

785-259-0056

STEVEN P. MURPHY, P.G.

Petroleum Geologist (KS #228)



Cell 620.639.3030

Fax 785.387.2400

RR#1, Box 69

Otis, Kansas 67565

geomurphy@gbta.net

Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name: Michaelis #25-1

API: 15-109-21541-00-00

Location: Logan County

License Number: 34099

Spud Date: 4/9/18

Region: Kansas

Drilling Completed: 4/19/18

Surface Coordinates: 653' FSL & 1913' FWL (Approx NW SW SE SW)

Section 25-T11S-R33W

Bottom Hole Vertical well with minimal deviation, same as above

Coordinates:

Ground Elevation (ft): 3077'

K.B. Elevation (ft): 3087'

Logged Interval (ft): 3800'

To: TD

Total Depth (ft): 4730'

Formation: Topeka through Mississippian

Type of Drilling Fluid: Chemical - Andys

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Richland Oil Investments, LLC

Address: 608 E 1st

P.O. Box 166

Palco, KS 67657

GEOLOGIST

Name: Steven P. Murphy, PG

Company: Consulting Petroleum Geologist (KS License #228)

Address: 2105 Zarah Drive

Great Bend, KS 67530

LogTops (Datum)

The open-hole logging was performed by Pioneer Wireline. Logs included Compensated Neutron/Compensated Density, Dual Induction & Microlog.

Formation tops and datums from the open-hole logs include the following:

Top Anhydrite - 2574 (+513)
Base Anhydrite - 2599 (+488)
Heebner -4011 (-924)
Lansing - 4048 (-961)
Muncie Crk - 4194 (-1107)
Stark - 4271 (-1184)
BKC - 4346 (-1259)
Marmaton - 4363 (-1276)
Pawnee - 4469 (-1382)
Ft. Scott - 4524 (-1437)
Cherokee - 4548 (-1461)
Johnson -4585 (-1498)
Mississippian - 4650 (-1563)

DSTs

The following drillstem tests were performed by Trilobite Testing (Hays shop):

DST #1 4122-4150 (LKC "E-F")

30:45:30:60

IF: Wk blow built to 9", NR

FF: Wk blow built to 4", NR

Recovery: 180' MW

IHP: 2072 FHP: 2019

IFP: 22-62 ISIP: 1187

FFP 66-106 FSIP: 1177

BHT - 115 F

DST #2 4280-4312 (LKC "K")

30:45:30:45

IF: Wk blow built to 3", NR

FF: Wk blow built to 1.5", NR

Recovery: 40' WM w/tr oil

IHP: 2131 FHP: 2032

IFP: 21-30 ISIP: 1039

FFP 34-42 FSIP: 1014

BHT - 116 F

DST #3 4608-4650

30:30:15:15

IF: Wk blow built to 2", NR

FF: Wk surface blow, NR

Recovery: 3' oil, 7' OCM, 10' Oil sptd M

IHP: 2405 FHP: 2292

IFP: 25-26 ISIP: 1022

FFP: 34-30 FSIP: 114

BHT - 114 F

COMMENTS


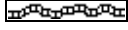
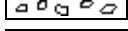
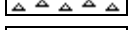
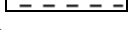







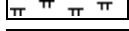

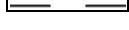
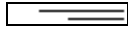
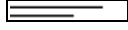

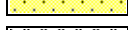
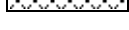
Based on the results of DST results it was recommended that this test be plugged.

Cleaned & dried drill cutting samples were shipped to the Wichita Well Sample Library as requested by the Kansas Geological Survey.


Respectfully submitted,

Steven P. Murphy, PG
 Consulting Petroleum Geologist
 (KS License #228)

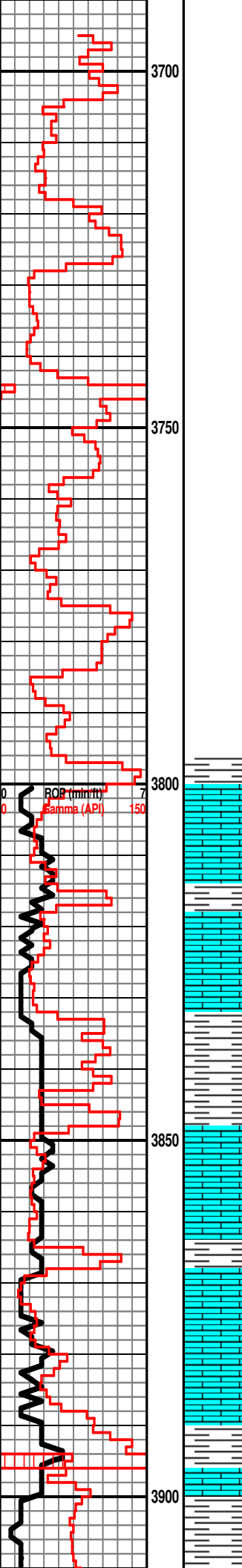
ROCK TYPES

 Anhy  Bent  Brec  Cht  Clyst	 Coal  Congl  Dol  Gyp  Igne	 Lmst  Meta  Mrlst  Salt  Shale	 Shcol  Shgy  Slst  Ss  Till
---	---	--	---

OTHER SYMBOLS

OIL SHOW  Even  Spotted  Ques	 Dead  Gas	INTERVAL  Core  Dst	EVENT  Conn  Rft  Sidewall
--	---	--	---

Curve Track 1 ROP (min/ft) ——— Gamma (API) ———	Depth	Lithology	Oil Shows	Geological Descriptions	REMARKS
0 ROP (min/ft) 7 0 Gamma (API) 150	3650				<p style="text-align: center;">Southwind Drilling Rig #8 MIRU on 4/9/18</p> <p style="text-align: center;">8 5/8" Surface Casing @ 226' w/165 sx</p> <p style="text-align: center;">NOTE: The following tops are based on ROP & sample examination. Please refer to the header above for log tops:</p> <p style="text-align: center;">ANHYDRITE TOP - 2574 (+513) ANHYDRITE BASE - 2601 (486)</p>



Geologist on location on 4/14/18 @ 10 PM

Begin examination of wet & dry samples @ 3800'

LS: crm-gry, f-vfxln, foss, chalky, dense, NS

SH: gry-grm-blk

LS: as above

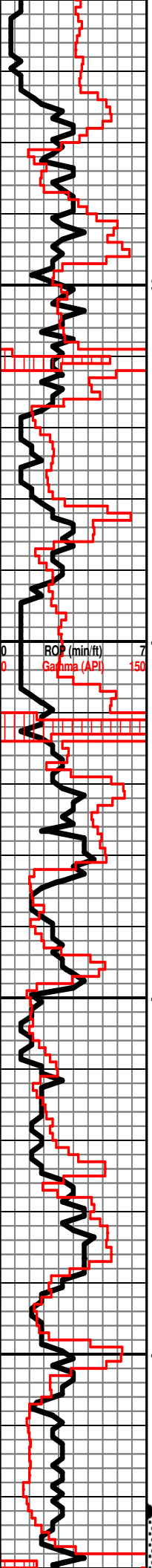
LS: crm-tan, vfxln, sl foss, sl chalky, dense, NS

LS: wht-tan, vfxln, dense, chalky, NS

LS: crm-gry, fxl, sl foss, chalky, sl cherty, NS

LS: as above w/gry sh

SH: blk-gry



SH: as above

LS: crm-gry, fxln, foss, chalky, NS

LS & SH: as above

3950

LS: wht-tan-gry, fxln, foss, dense, NS

SH: blk-gry

LS: wht-tan-gry, fxln, foss, dense, NS

LS: as above, w/abund gry sh, NS

4000

LS: as above

HEEBNER 4011 (-924)
SH: blk, carb

SH: gry-blk-red

LS: crm-tan, vfxln, sl foss, dense, NS

4050

LANSING 4050 (-963)

LS: wht-gry, fxln, chalky, sl foss, NS

LS: as above w/blk-gry sh

LS: wht-gry, vfxln, dense, foss, chalky, NS

LS: wht-gry, vfxln, dense, foss, chalky, NS

SH: blk-gry-gm-red

4100

LS: wht-tan, fxln, sl foss, NS

SH: red-gm-gry-blk

LS: wht-gry, vfxln, dense, chalky, NS

LS: as above, minor cht, NS

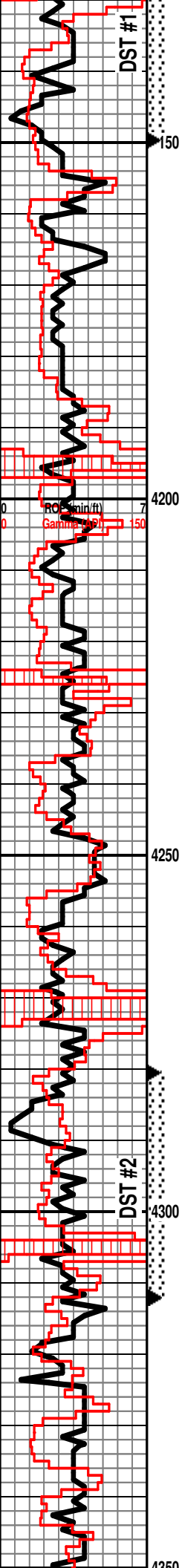
DST #1 4122-4150 (LKC "E-F")
30:45:30:60

IF: Wk blow built to 9", NR

FF: Wk blow built to 4", NR

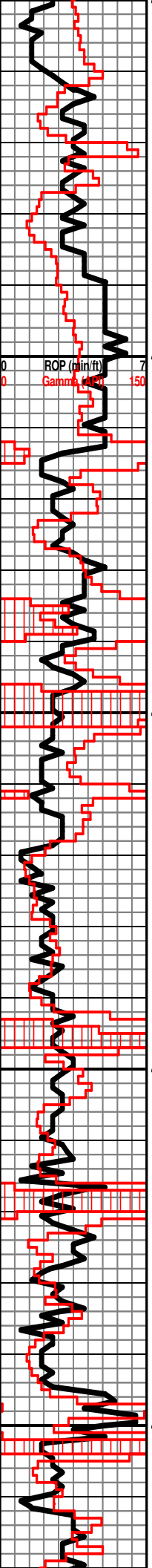
Recovery: 180' MW

IHP: 2072 EHP: 2010



DST #1
 150
 LS: wht-tan-gry, vfxln, sl chalky, dense, NS
 w/gry sh
 LS: wht-tan-gry, f-vxln, chalky, dense, NS
 LS: wht-gry, vfxln, chalky, dense, NS
 LS: as above
 MUNCIE CRK 4195 (-1108)
 SH: blk, carb
 LS: crm-tan, vfxln, chalky, dense, NS
 LS: crm-tan-gry, vfxln, dense, NS
 LS: crm-gry, vfxln, dense, NS
 SH: blk, carb
 LS: crm-tan-brn, vfxln, dense, NS
 SH: blk-gm-gry
 LS: wht-tan-brn, vfxln, dense, chalky, NS
 LS: as above
 STARK 4274 (-1187)
 SH: blk, carb
 LS: crm-tan, fxln, ool, fr-gd inxln por, fsfo on
 brk (gsy), str odor
 LS: as above
 SH: blk, carb
 LS: wht-tan-brn, vfxln, chalky, dense, NS
 SH: blk-gry-gm
 LS: wht-gry, vfxln, dense, chalky, NS
 LS: as above
 BKC 4342 (-1255)
 SH: blk-brn-gry-red
 DST #2
 4200
 4250
 4300
 DST #3
 4350

IHP: 2072 FHP: 2019
 IFP: 22-62 ISIP: 1187
 FFP 66-106 FSIP: 1177
 BHT - 115 F
 30" LS: crm, fxln, fr ppt por, vssfo, sl odor
 CFS @ 4150'
 60" LS: crm, fxln, dense, chertv, NS
 Pipe Strap - 1.14' Short
 Deviation Survey @ 4150' - 3/4
 DST #2 4280-4312 (LKC "K")
 30:45:30:45
 IF: Wk blow built to 3", NR
 FF: Wk blow built to 1.5", NR
 Recovery: 40' WM w/tr oil
 IHP: 2131 FHP: 2032
 IFP: 21-30 ISIP: 1039
 FFP 34-42 FSIP: 1014
 BHT - 116 F
 CFS @ 4312'



SH & SST: red-gm (wash red)

MARMATON 4363 (-1276)

LS: wht-crm-gry, vfxln, dense, chalky, NS

SH: blk-brn-gry-grn

LS: crm-brn-gry, vfxln, dense, sl chalky, NS

LS: as above

wht-tan-gry, vfxln, dense, sl
chalky, NS

SH: blk-gry-grm & gry silty sst

SH & silty SST: as above

LS: wht-tan-brn, vfxln, dense, sl foss, NS

SH: blk-gry-grm

SH: blk, carb

LS: wht-tan, vfxln, dense, NS

SH: blk-gry

LS: wht-tan-brn, vfxln, dense, NS

PAWNEE 4470 (-1383)

LS: wht-tan, vfxln, dense, cherty, NS
(w/abund multic SH)

SH: blk, carb

LS: wht-tan, vfxln, dense, cherty, NS

SH: blk-gry-grm

FT SCOTT 4525 (-1438)

LS: wht-tan-gry, vfxln, v. dense, chalky,
cherty, NS

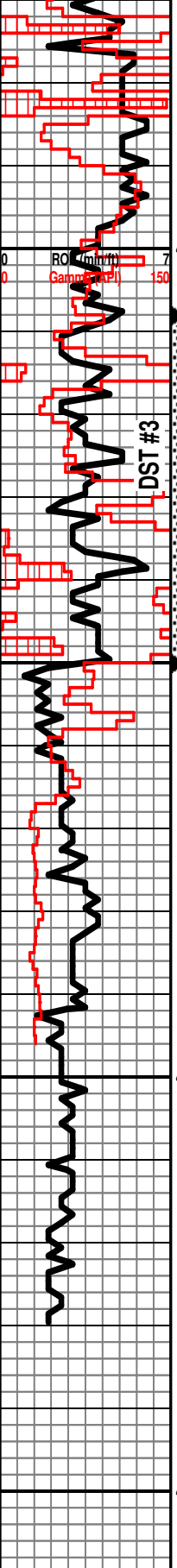
LS: as above

CHEROKEE 4552 (-1465)

SH: blk, carb

LS: crm-tan, vfxln, v. dense, sl chalky,
cherty, NS

LS: as above



SH: blk, carb

JOHNSON 4584 (-1497)

LS: wht-tan-gry, vfxln, dense, cherty, chalky, NS

LS: as above

SH: blk

LS: crm-tan-gry, f-vfxln, mostly dense, some w/gd ppt & vug por, ssfo, spotty stn, fr odor

LS: as above

SH: gry-grn-blk-yel

LS: wht-crm, pelletal, fxln, sl chalky, dense, NS

LS: as above

LS: as above

LS: as above

LS: as above

LS: as above

RTD - 4730'
LTD - 4729'

DST #3 4608-4650
30:30:15:15
IF: Wk blow built to 2", NR
FF: Wk surface blow, NR
Recovery: 3' oil, 7' OCM, 10' Oil sptd M
IHP: 2405 FHP: 2292
IFP: 25-26 ISIP: 1022
FFP: 34-30 FSIP: 114
BHT - 114 F

CFS @ 4650'
Short trip 12 stands

CFS @ 4730'

Deviation Survey @ TD - 1/4 deg



PIONEER
Pioneer Energy Services

**DUAL INDUCTION
LOG**

Company **RICHLAND OIL INVESTMENTS, LLC**
Well **MICHAELIS #25-1**
Field **WILDCAT**
County **LOGAN** State **KANSAS**

Location: **API #: 15-109-21541-00-00**
653' FSL & 1913' FWL
SEC 25 TWP 11S RGE 33W
Permanent Datum **GROUND LEVEL Elevation 3077'**
Log Measured From **KELLY BUSHING**
Drilling Measured From **KELLY BUSHING**

Other Services
**CNL/CDL
MEL**

Elevation
K.B. 3087'
D.F. N/A
G.L. 3077'

Date	4/19/2018
Run Number	ONE
Depth Driller	4730'
Depth Logger	4729'
Bottom Logged Interval	4728'
Top Log Interval	200'
Casing Driller	8.625" @ 226'
Casing Logger	224'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	4000
Density / Viscosity	9.3 64
pH / Fluid Loss	10.0 8.0
Source of Sample	FLOWLINE
Rm @ Meas. Temp	0.60 @ 50
Rmt @ Meas. Temp	0.45 @ 50
Rmc @ Meas. Temp	0.81 @ 50
Source of Rmf / Rmc	CHARTS
Rm @ BHT	0.24 @ 123
Operating Rig Time	3 HOURS
Max Rec. Temp. F	123
Equipment Number	91
Location	HAYS
Recorded By	D. SCHMIDT
Witnessed By	STEVE MURPHY

<<< Fold Here >>>

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.

**OAKLEY (HWY 40 & 83),
4 WEST TO 400 RD, 4 SOUTH,
WEST INTO**

Log Measured From: KELLY BUSHING 10 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858

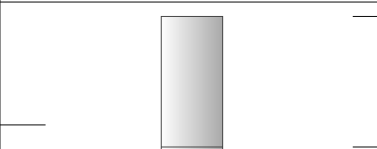
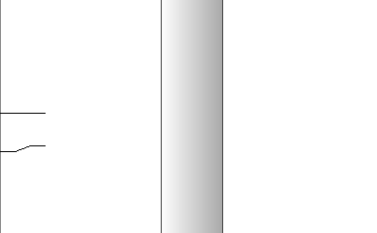
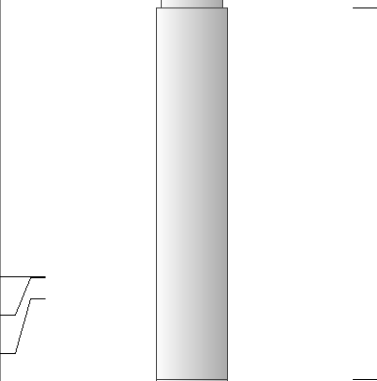
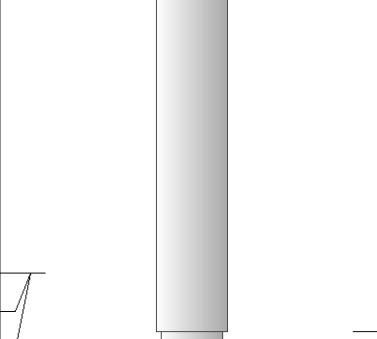
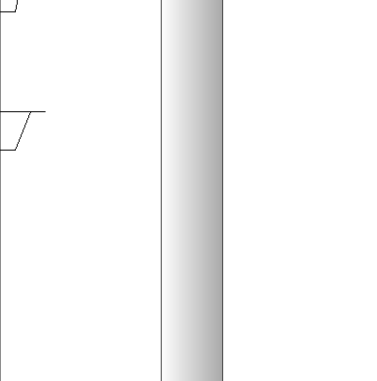
Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: D. SCHMIDT	Primary Witness: STEVE MURPHY
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

Database C:\ProgramData\Warrior\Data\richland_michaelis 25-1.db
 Dataset field/well/STKML/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	-94	0
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	50	0	5.5	0	4729	123	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

			DIL-PSI HIGH TEMP (933 (HT))	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					
Dataset:			richland_michaelis 25-1.db: field/well/STKML/pass3.1			
Total length:			43.08 ft			
Total weight:			685.00 lb			
O.D.:			4.00 in			

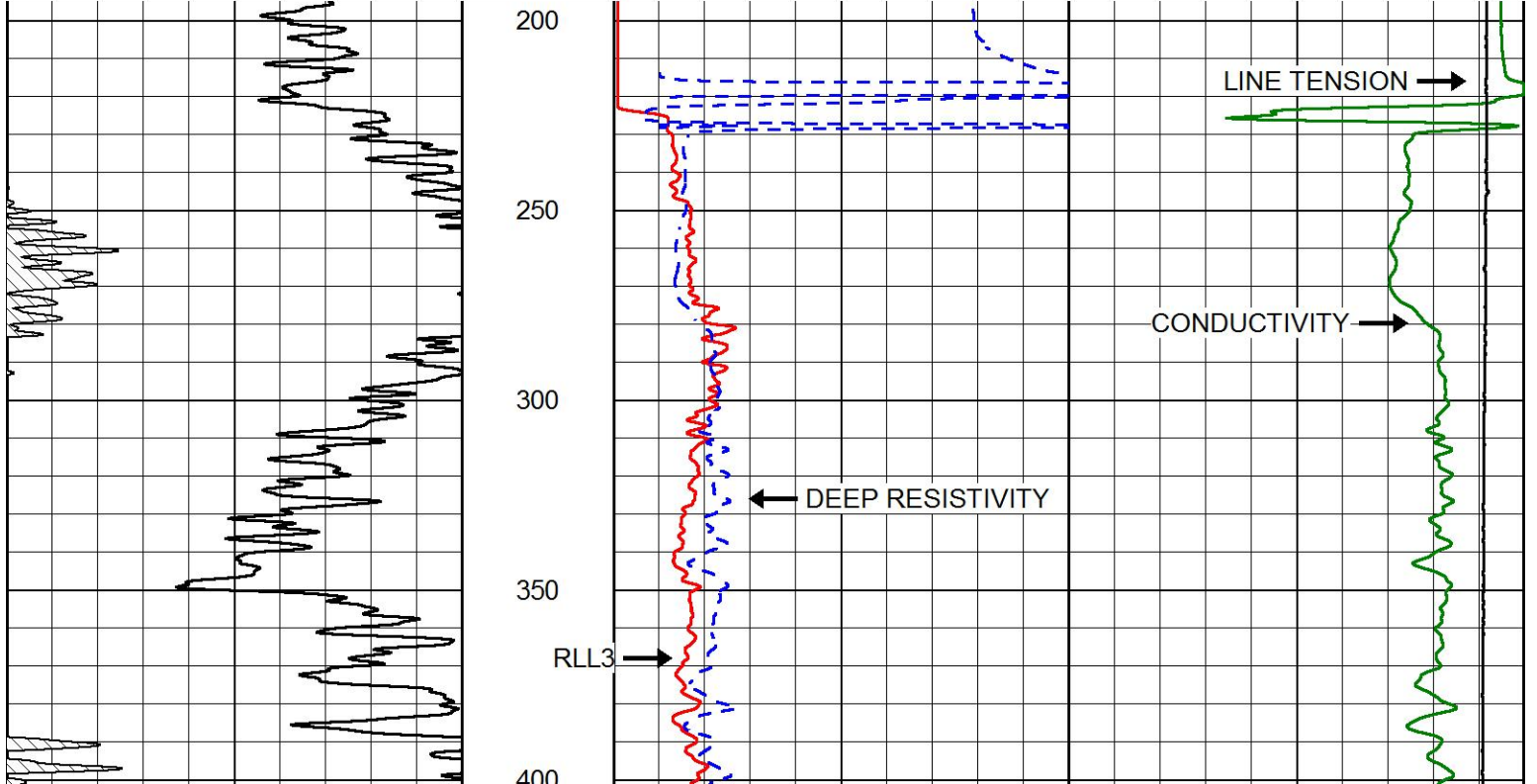


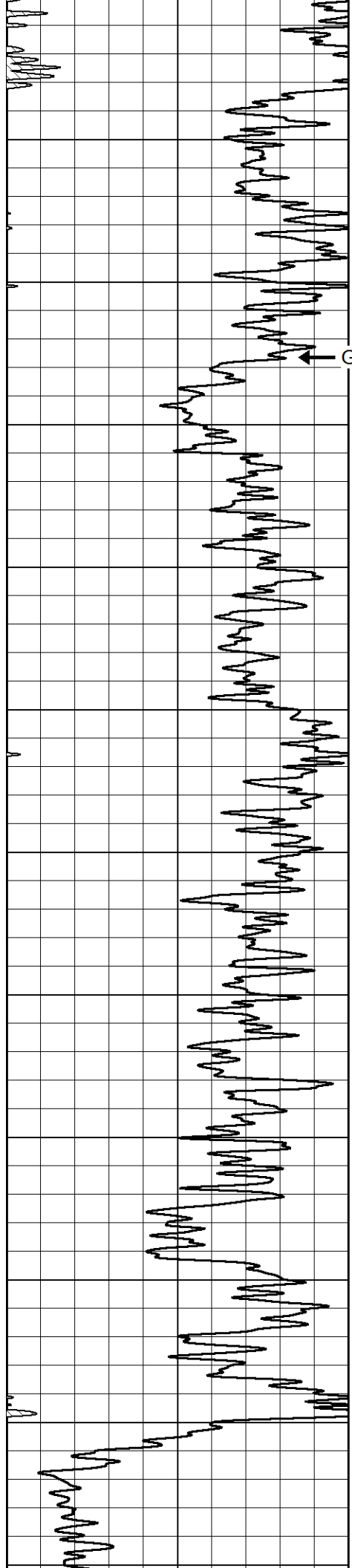
PIONEER
Pioneer Energy Services

MAIN PASS

Database File	richland_michaelis 25-1.db
Dataset Pathname	STKML/pass4.1
Presentation Format	dil2in
Dataset Creation	Thu Apr 19 05:19:33 2018
Charted by	Depth in Feet scaled 1:600

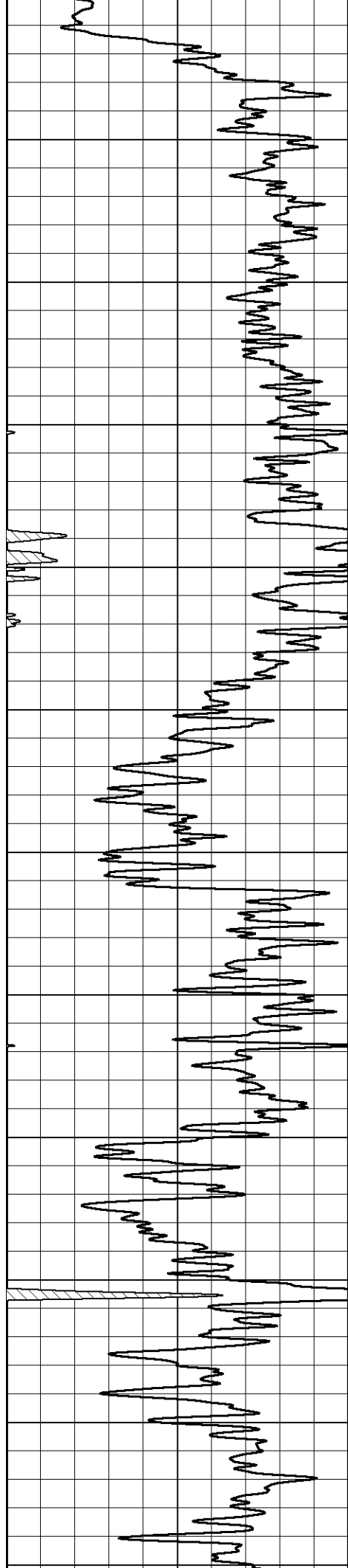
GAMMA RAY	1000	CONDUCTIVITY (mmho/m)	0
(GAPI)	15000	Line Tension (lb)	0
0	0	RLL3 (Ohm-m)	50
150	0	DEEP RESISTIVITY (Ohm-m)	50
	50	RLL3 (Ohm-m)	500
	50	Deep Resistivity (Ohm-m)	500



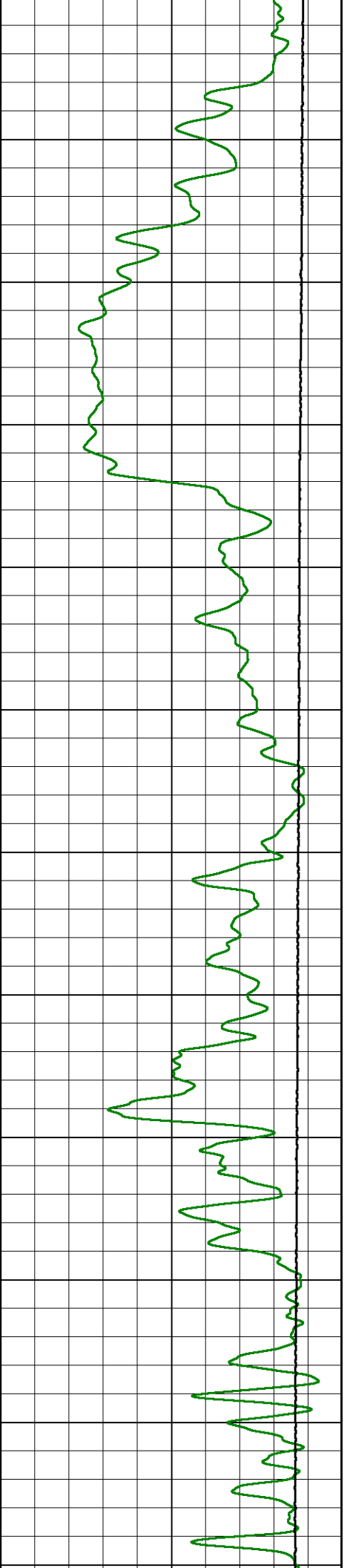
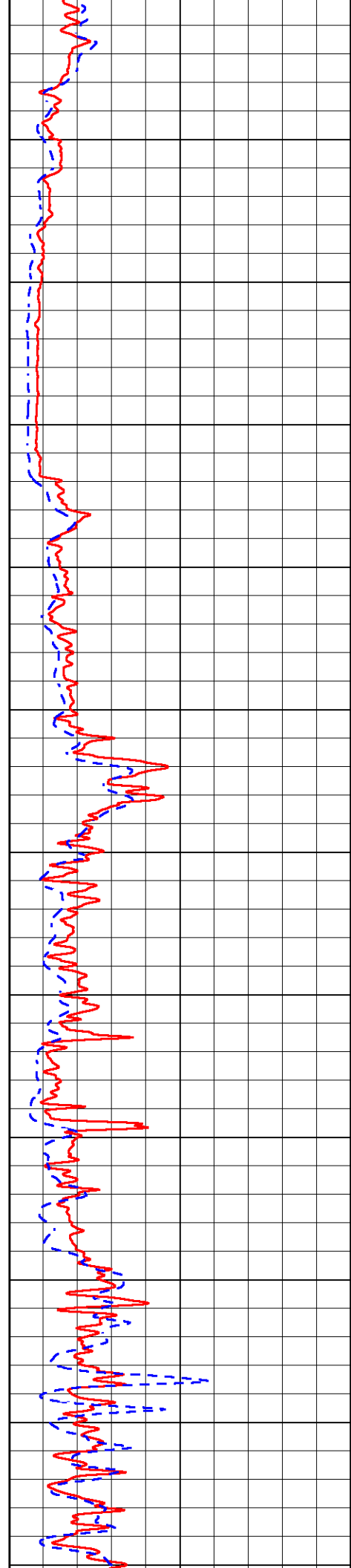


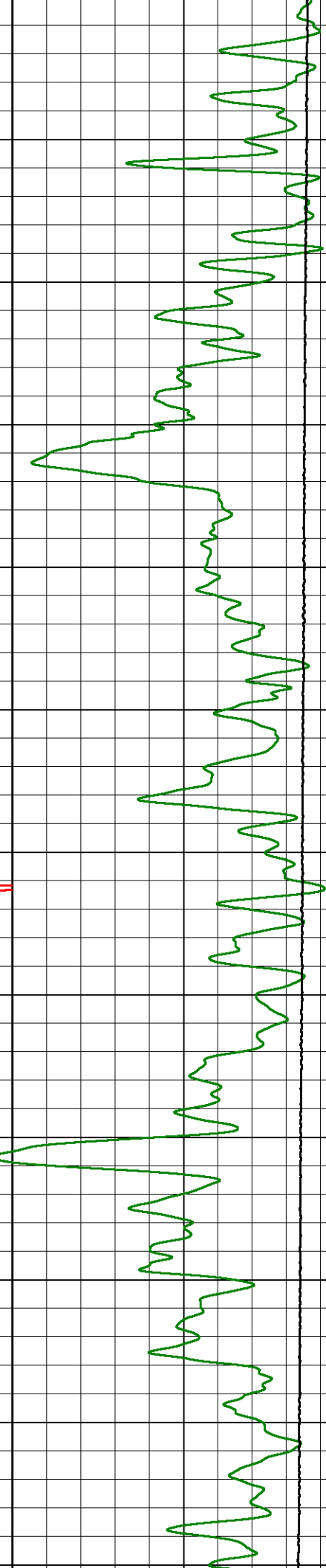
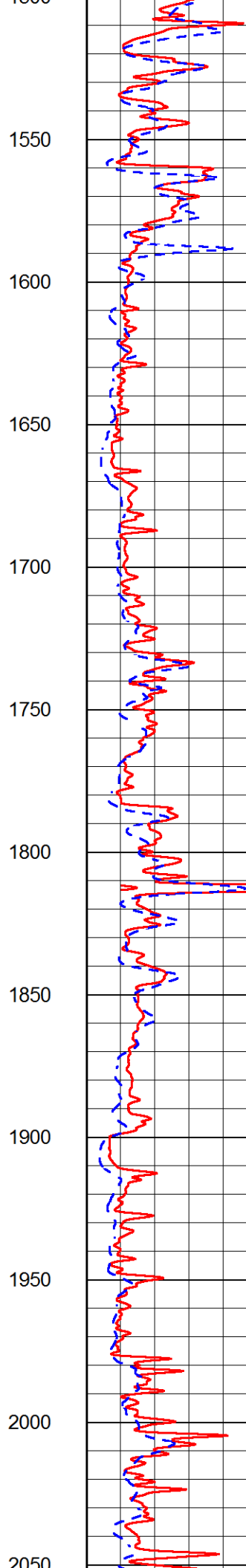
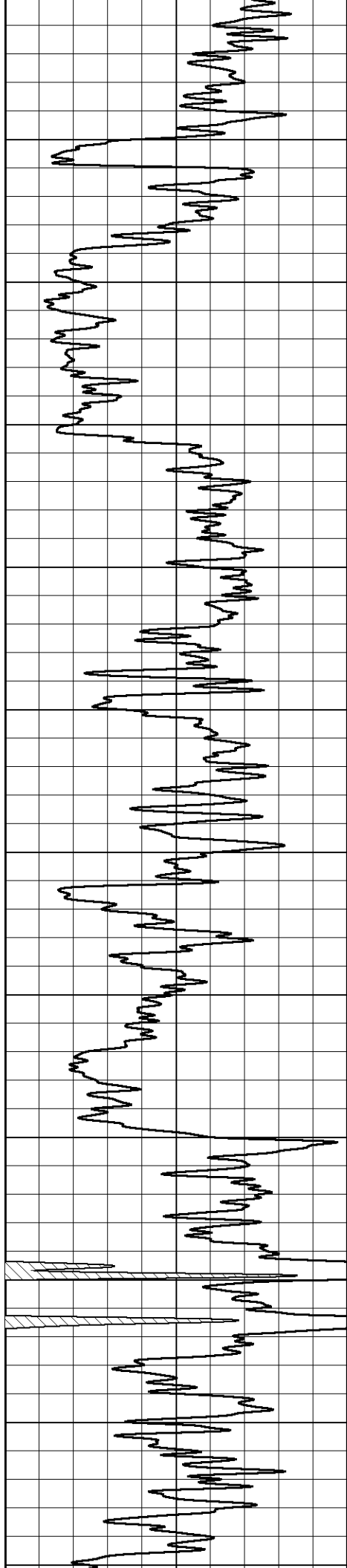
100
450
500
550
600
650
700
750
800
850
900
950

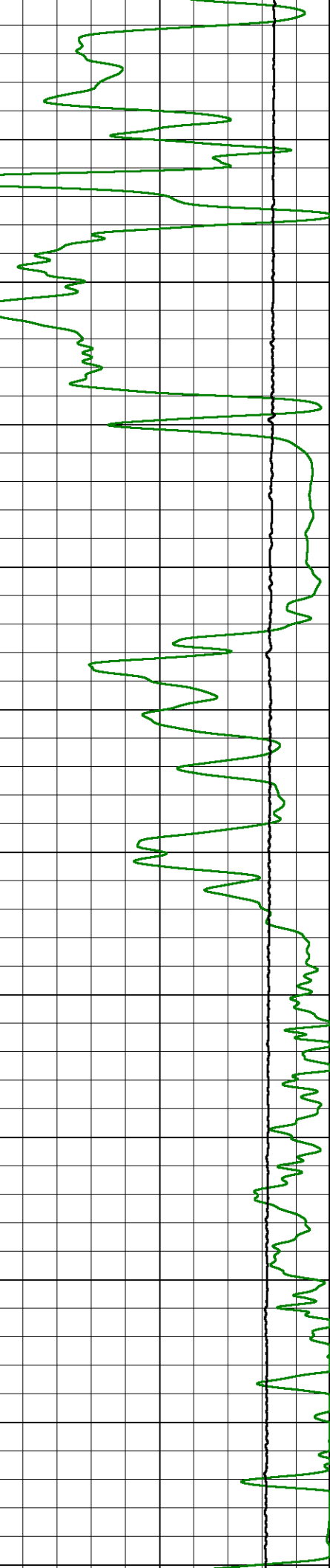
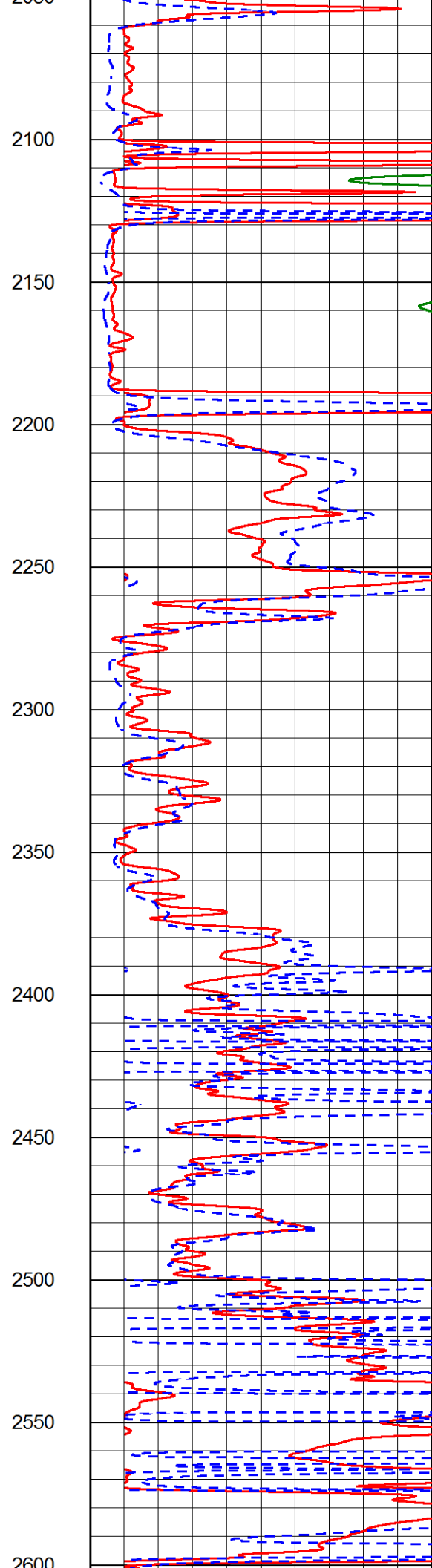
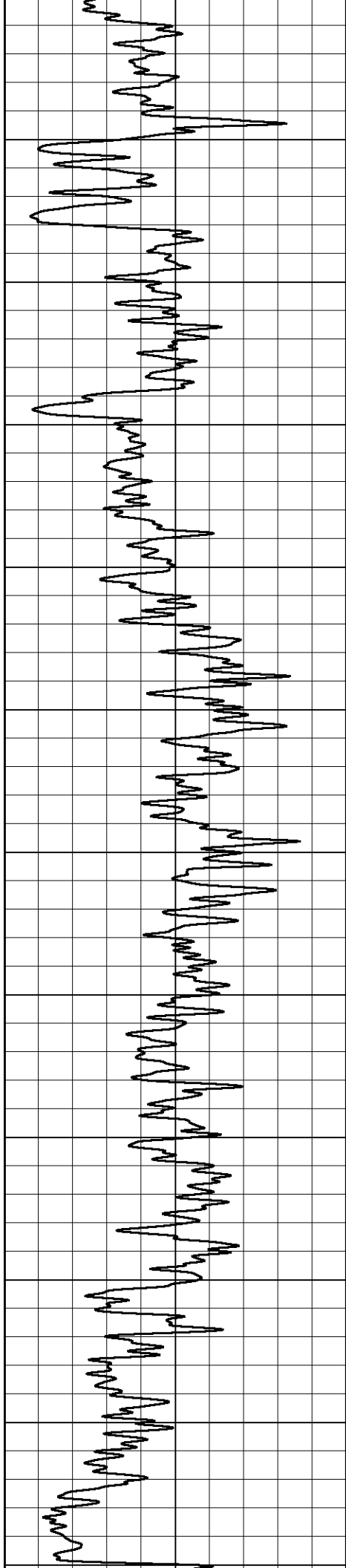


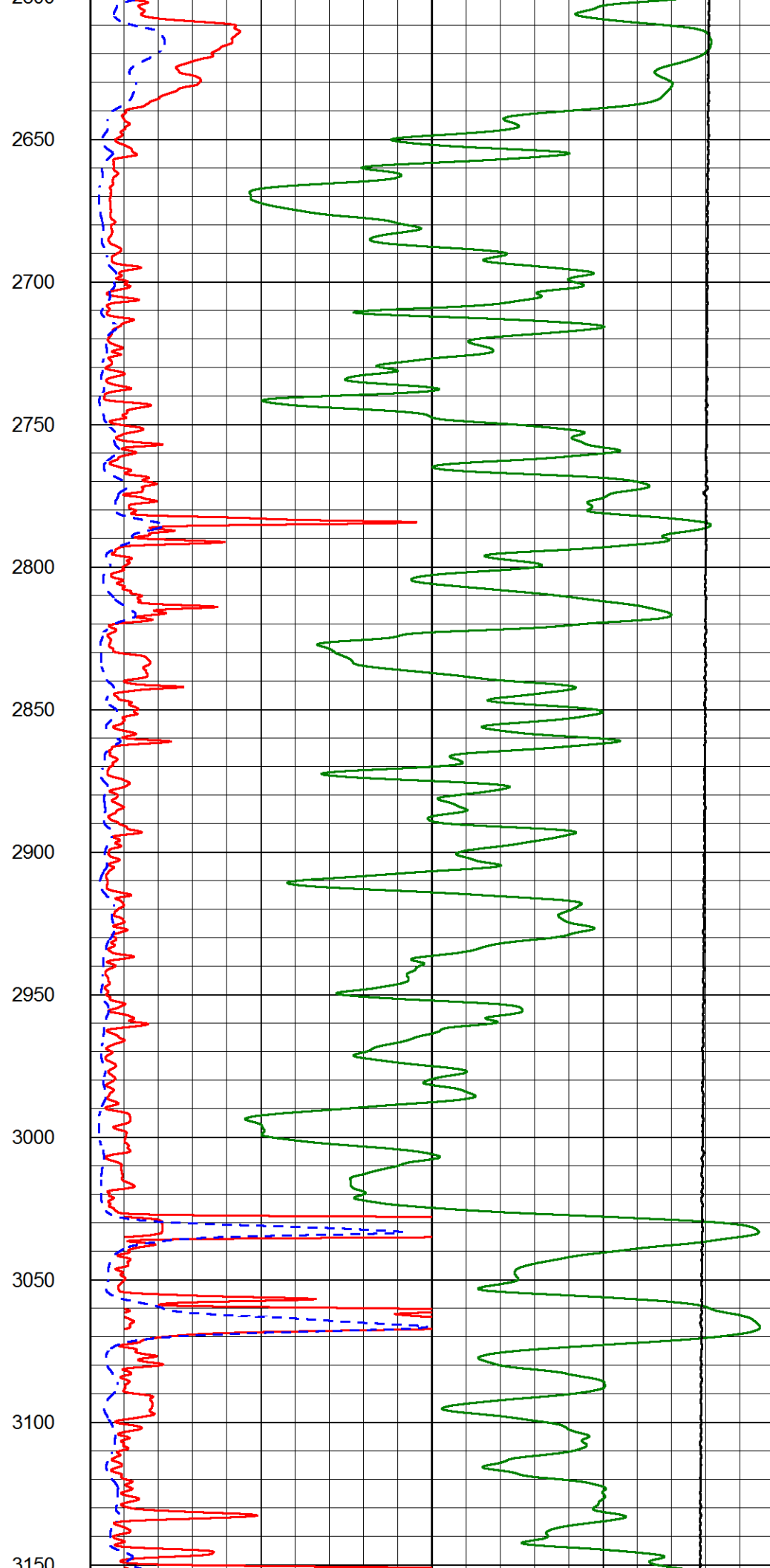
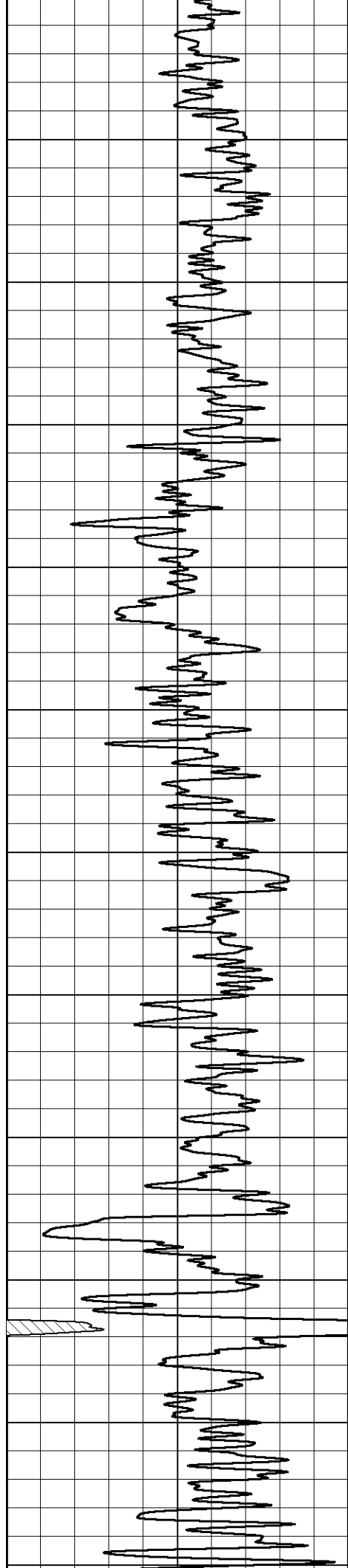


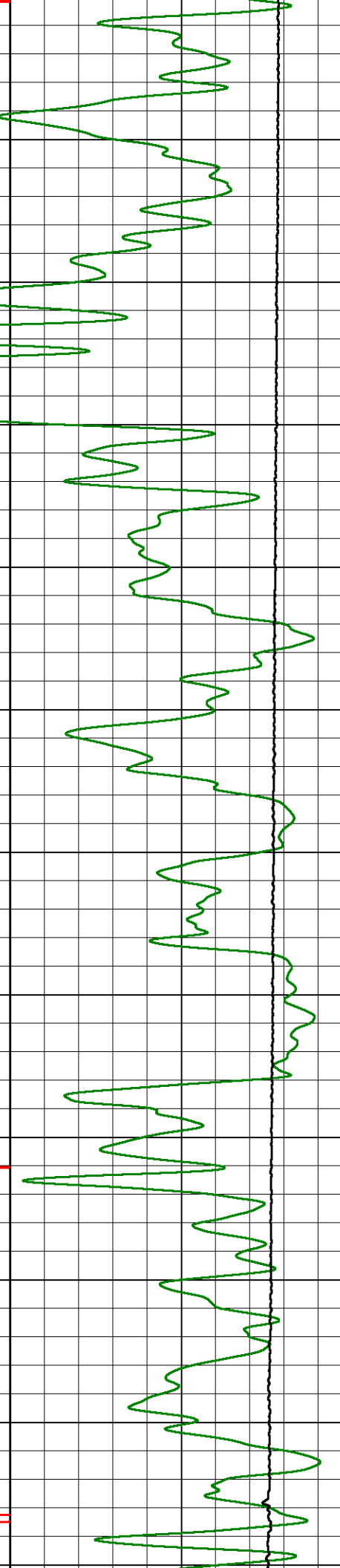
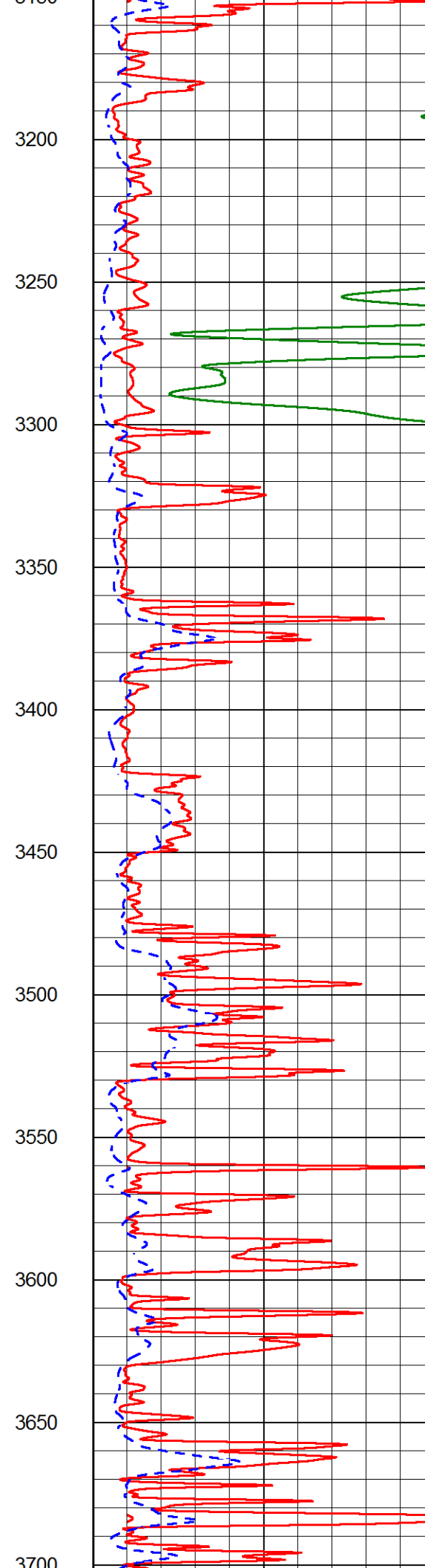
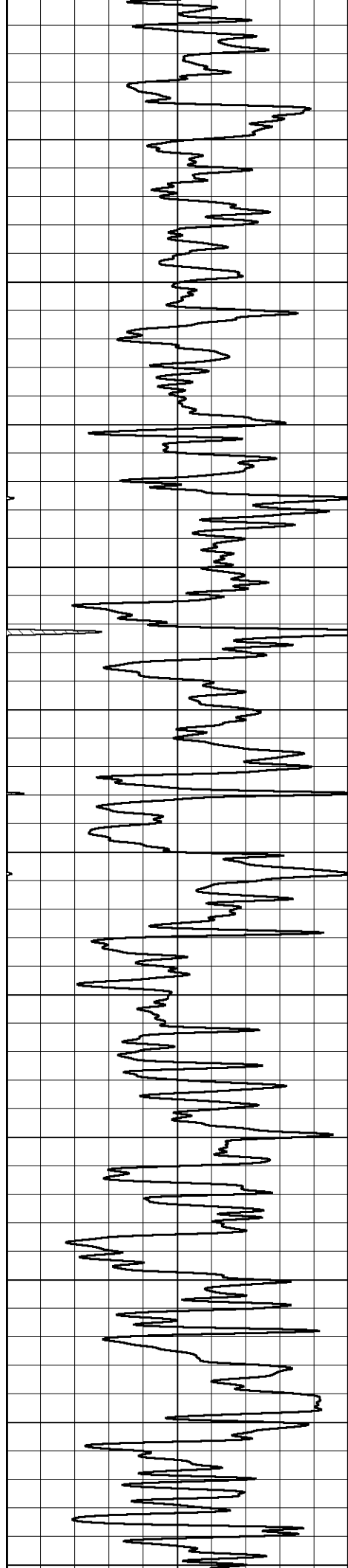
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500

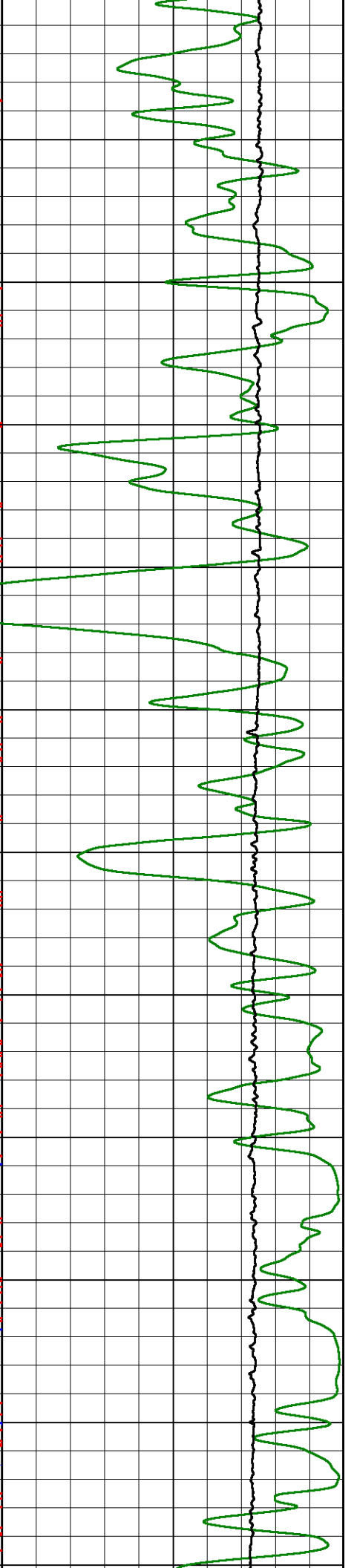
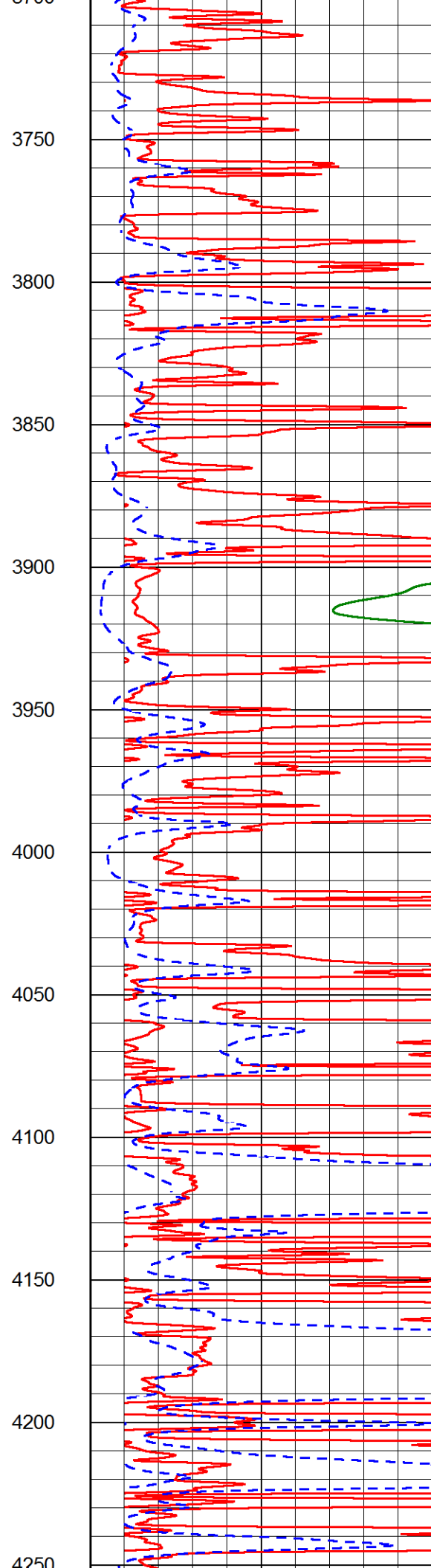
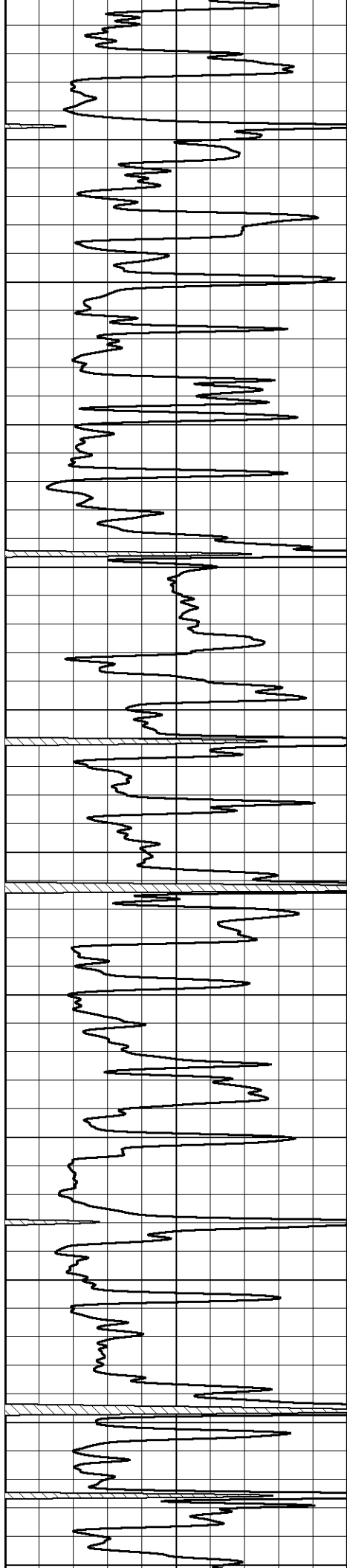


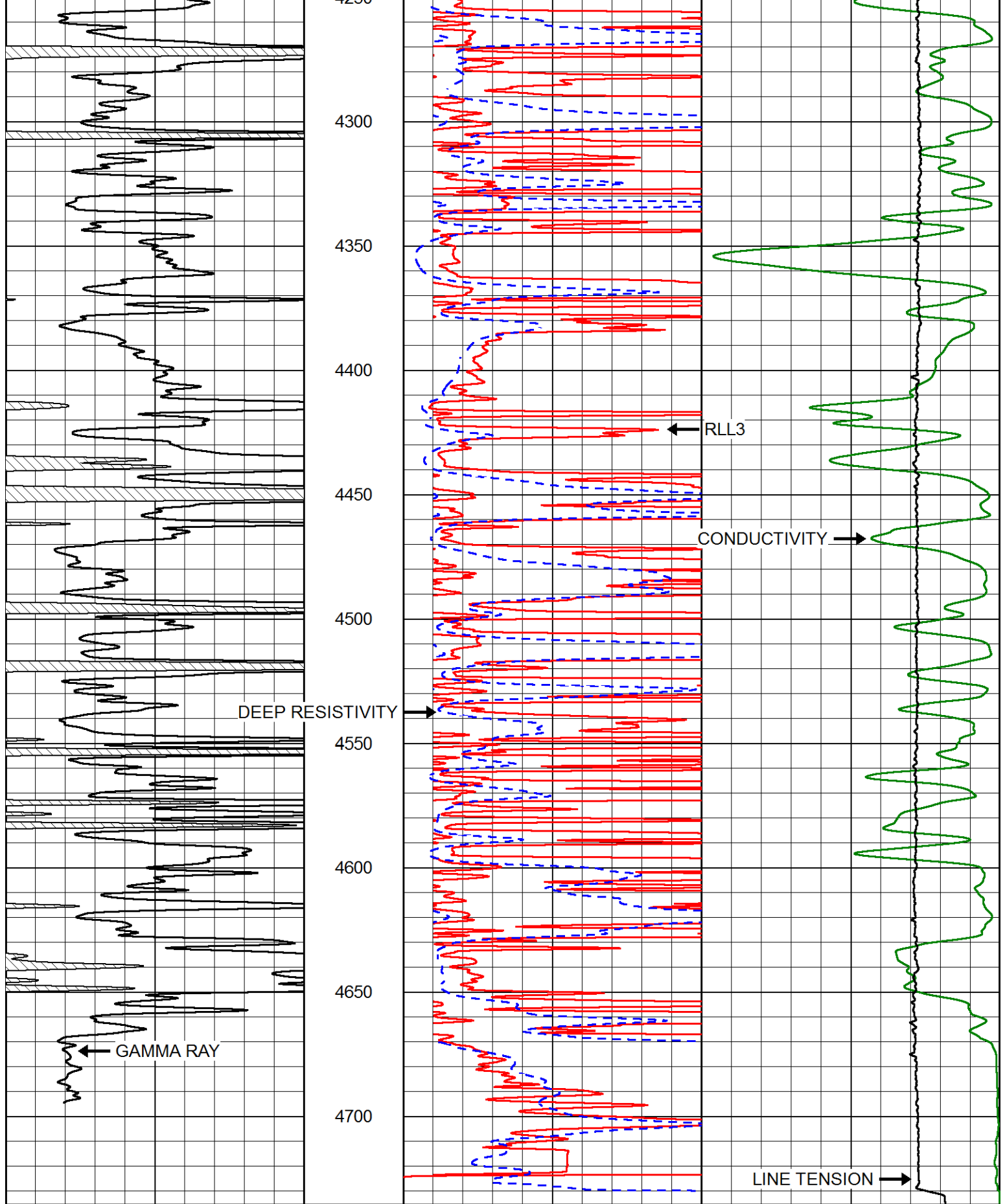












GAMMA RAY
(GAPI) 0 150

1000 CONDUCTIVITY (mmho/m) 0
15000 Line Tension (lb) 0

0 RLL3 (Ohm-m) 50
0 DEEP RESISTIVITY (Ohm-m) 50
50 RLL3 (Ohm-m) 500
50 DEEP RESISTIVITY (Ohm-m) 500

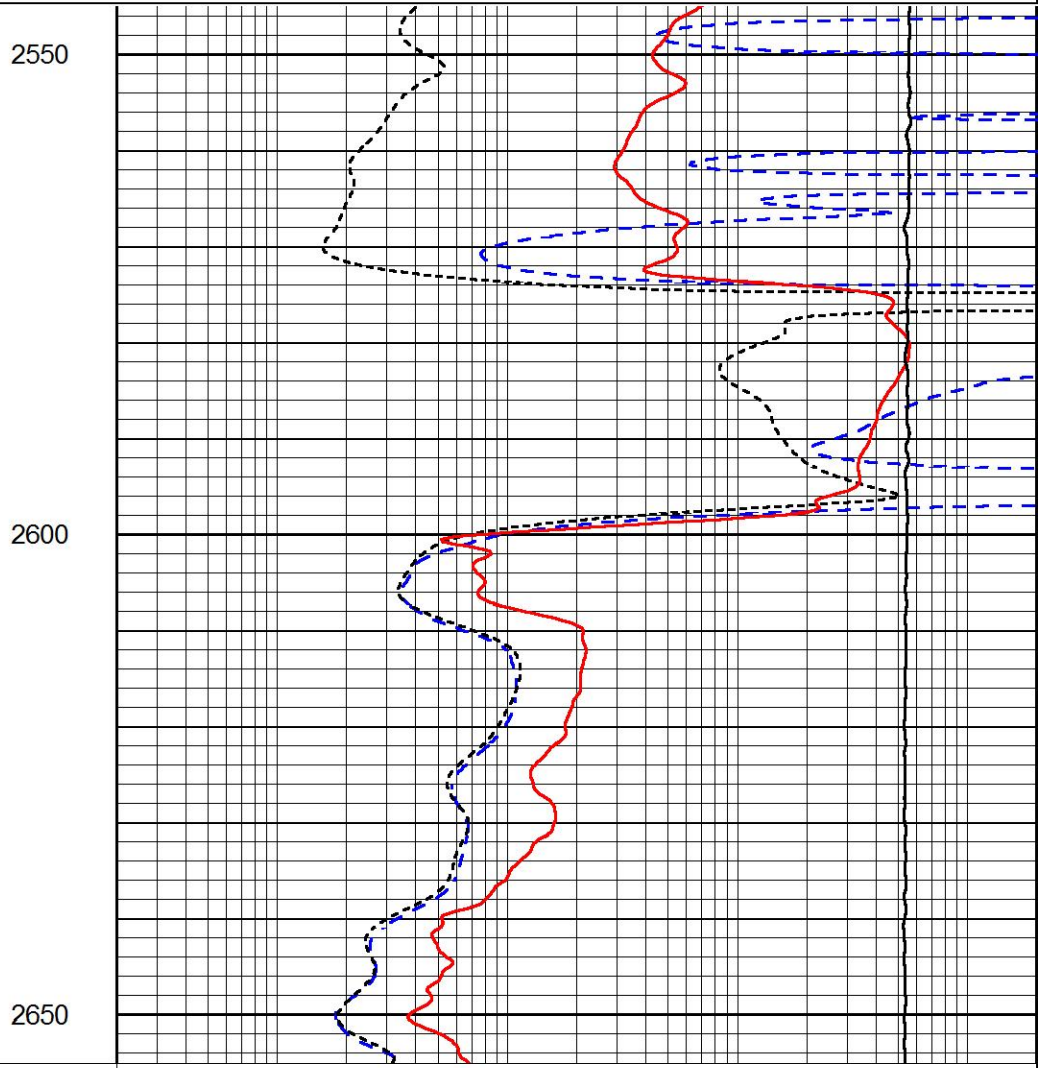
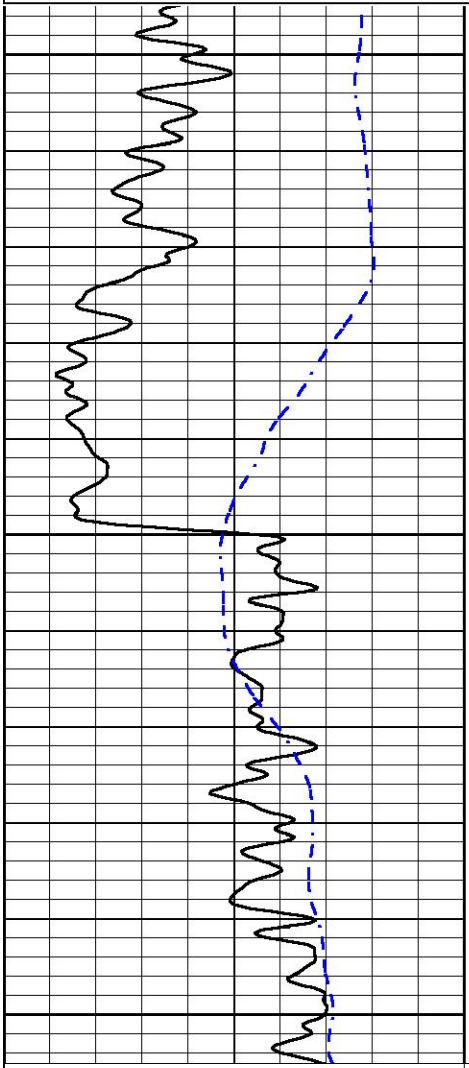


MAIN PASS

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass4.1
 Presentation Format dil
 Dataset Creation Thu Apr 19 05:19:33 2018
 Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	LINE TENSION (lb)	0



0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	LINE TENSION (lb)	0

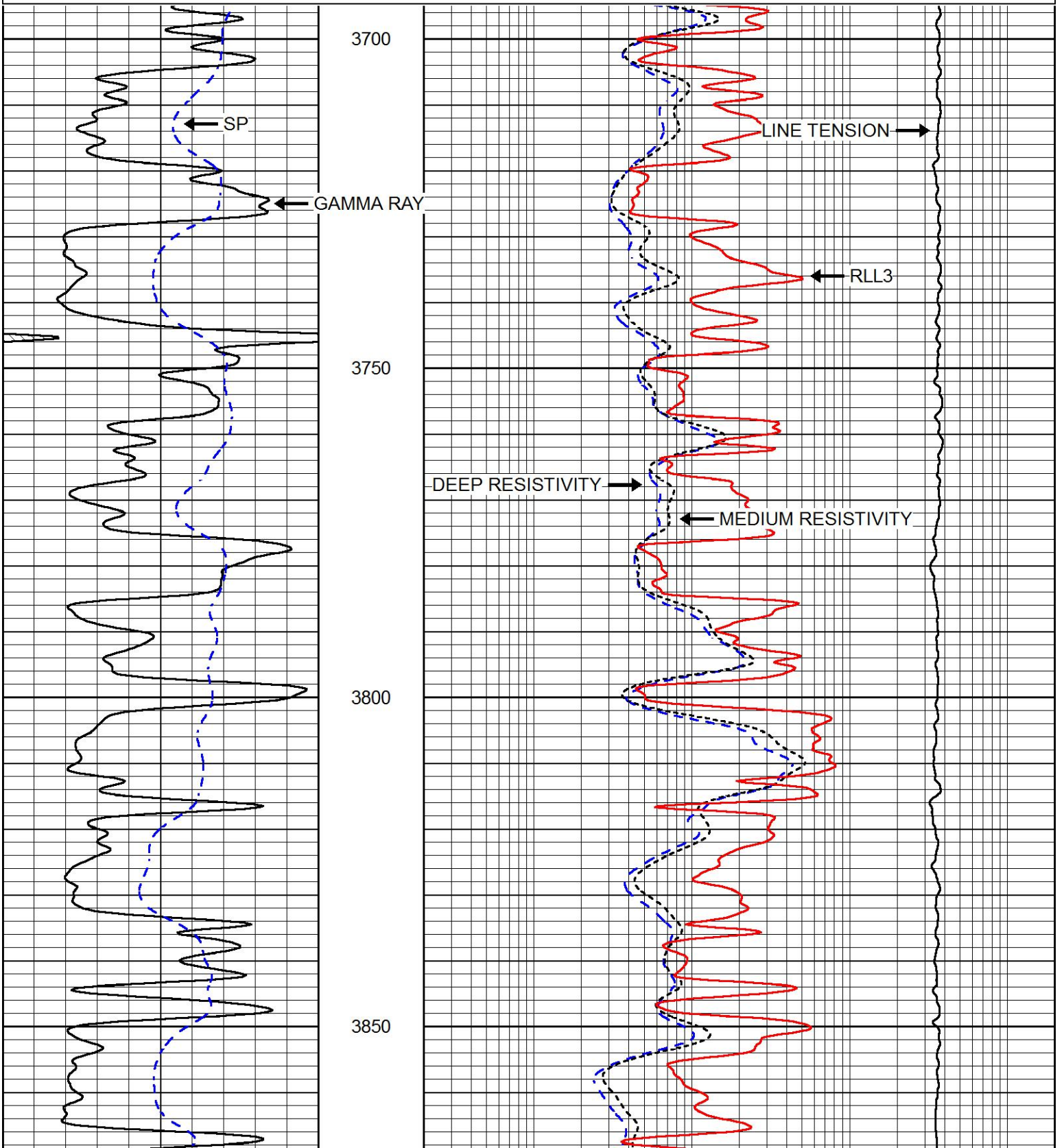


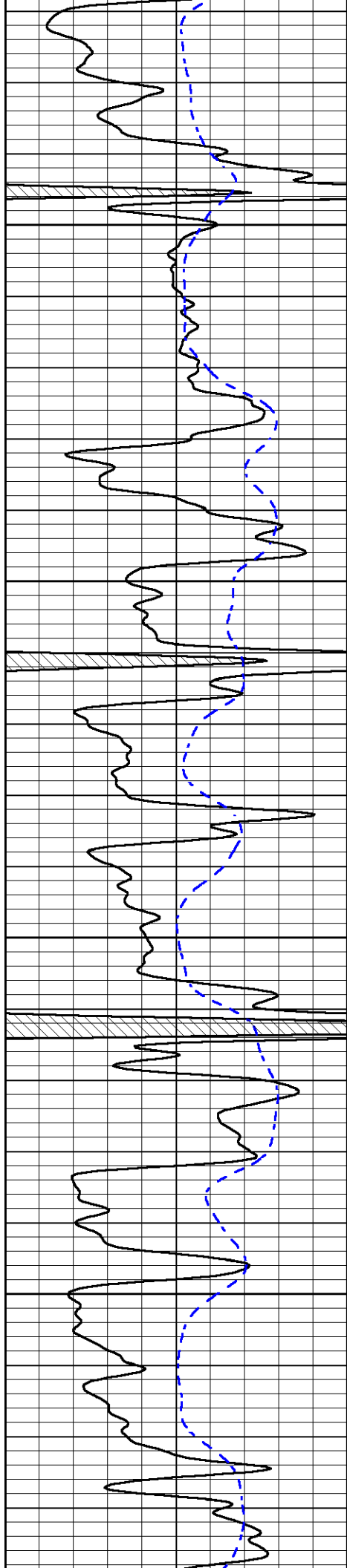
MAIN PASS

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Presentation Format dil
 Dataset Creation Thu Apr 19 04:47:31 2018
 Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	LINE TENSION (lb)	0



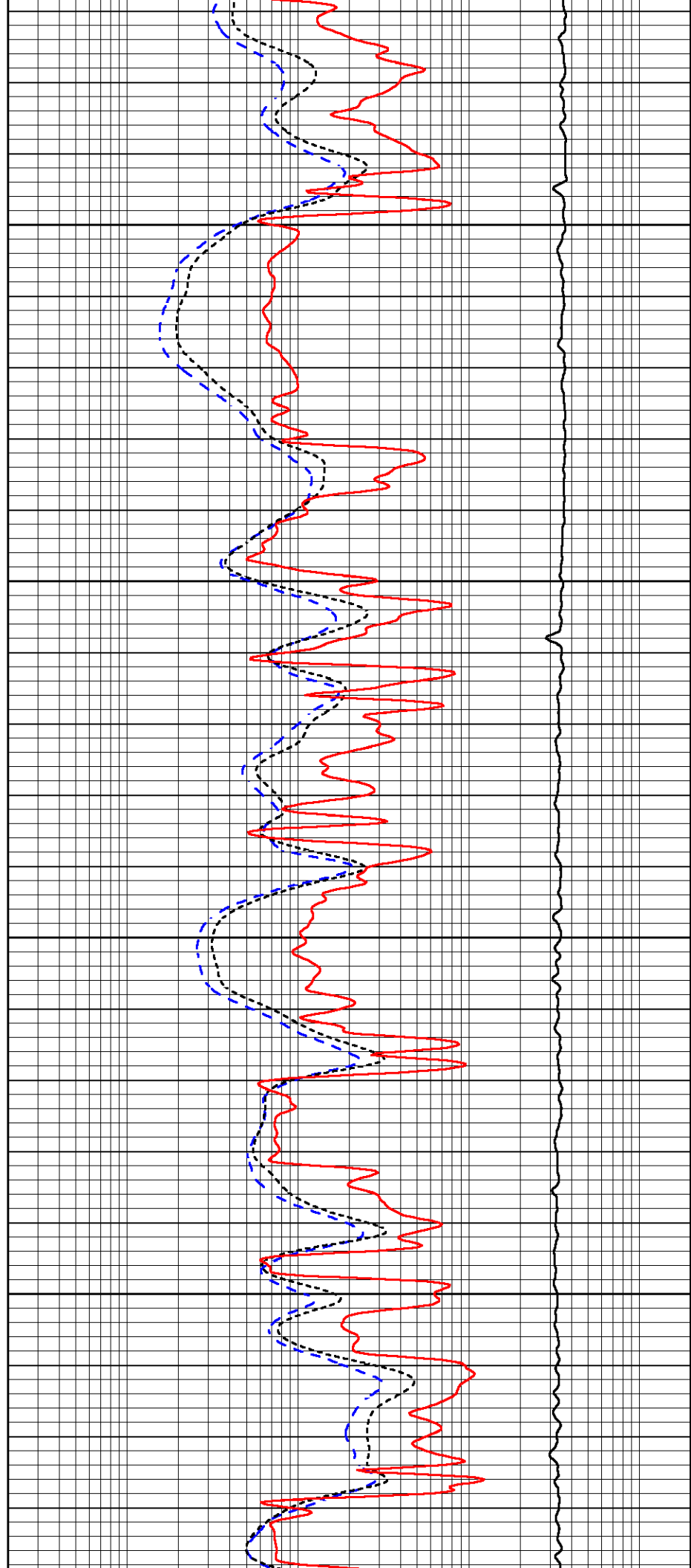


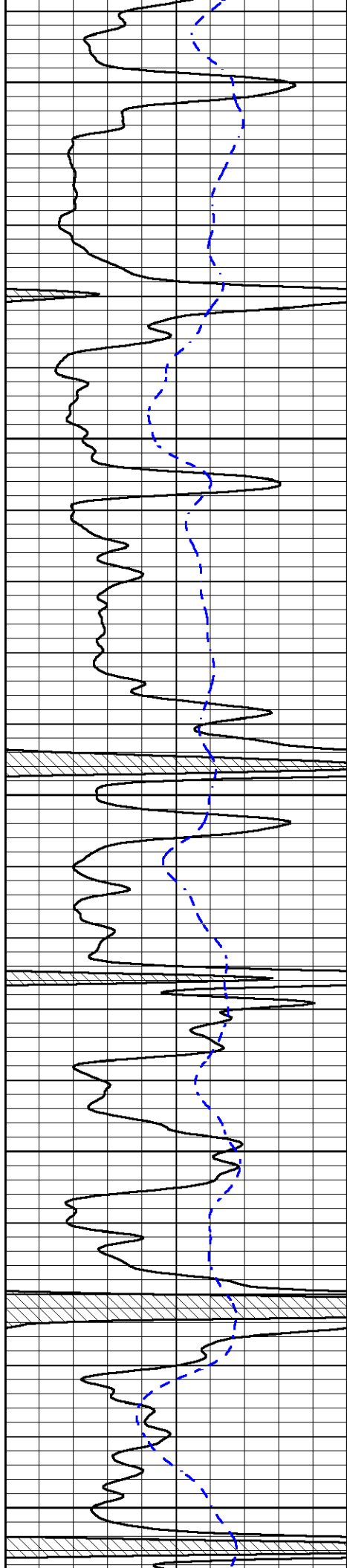
3900

3950

4000

4050





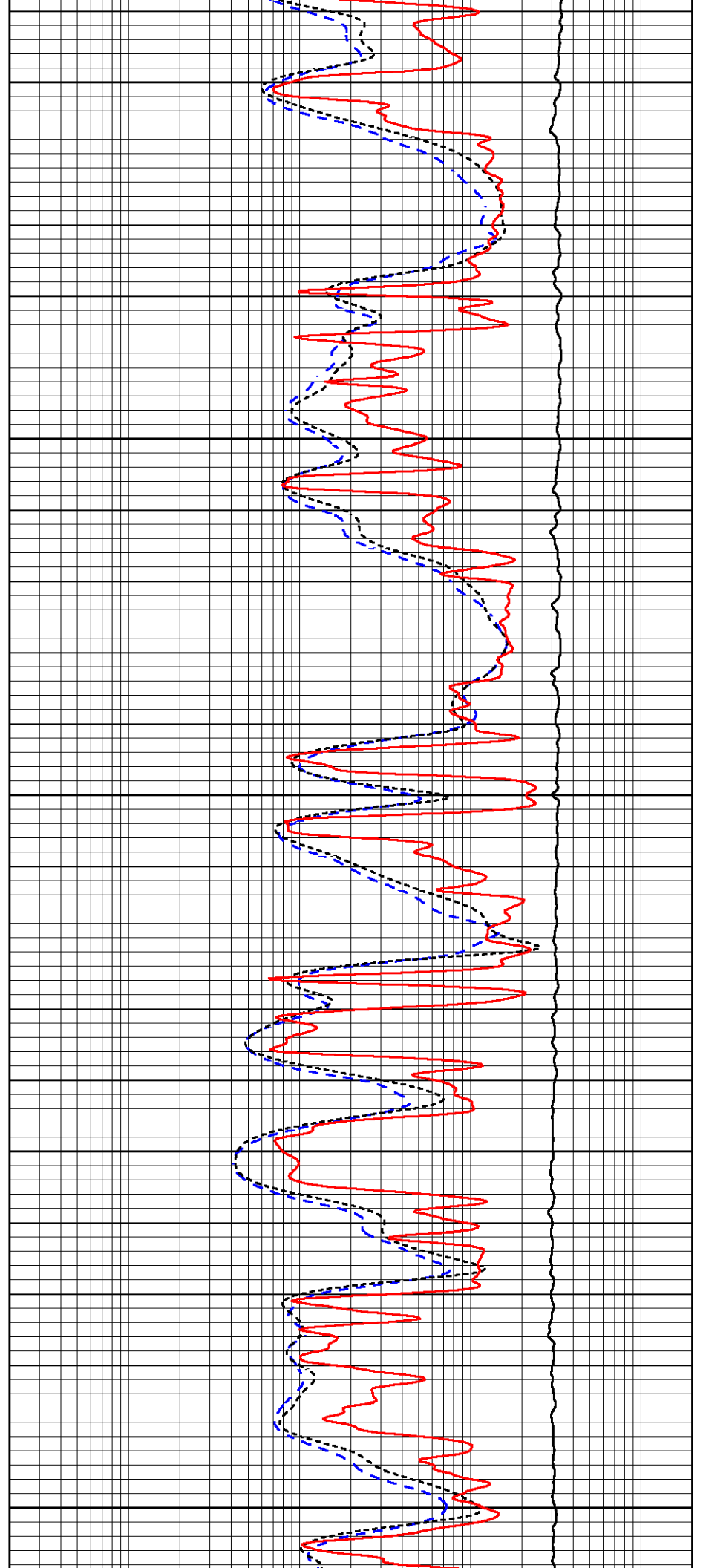
4100

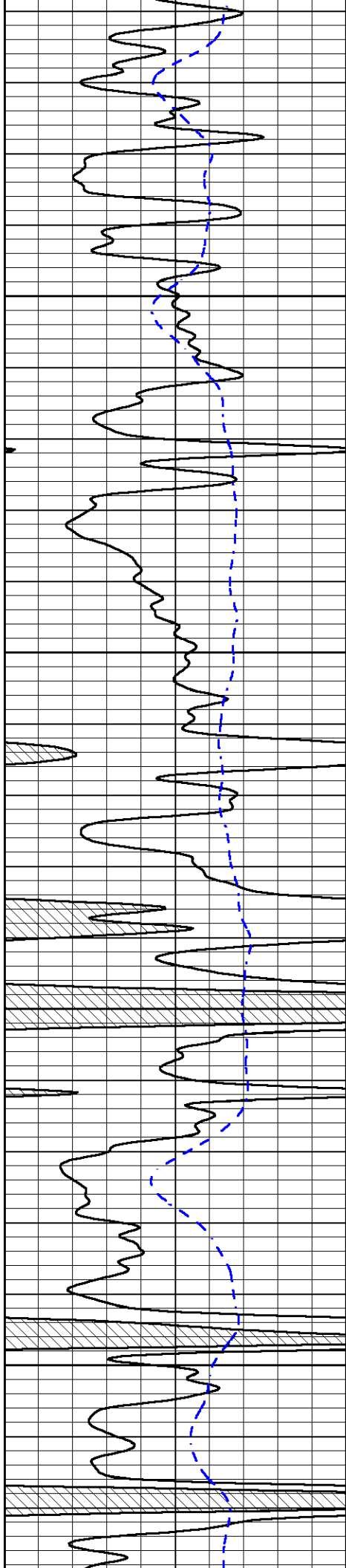
4150

4200

4250

4300



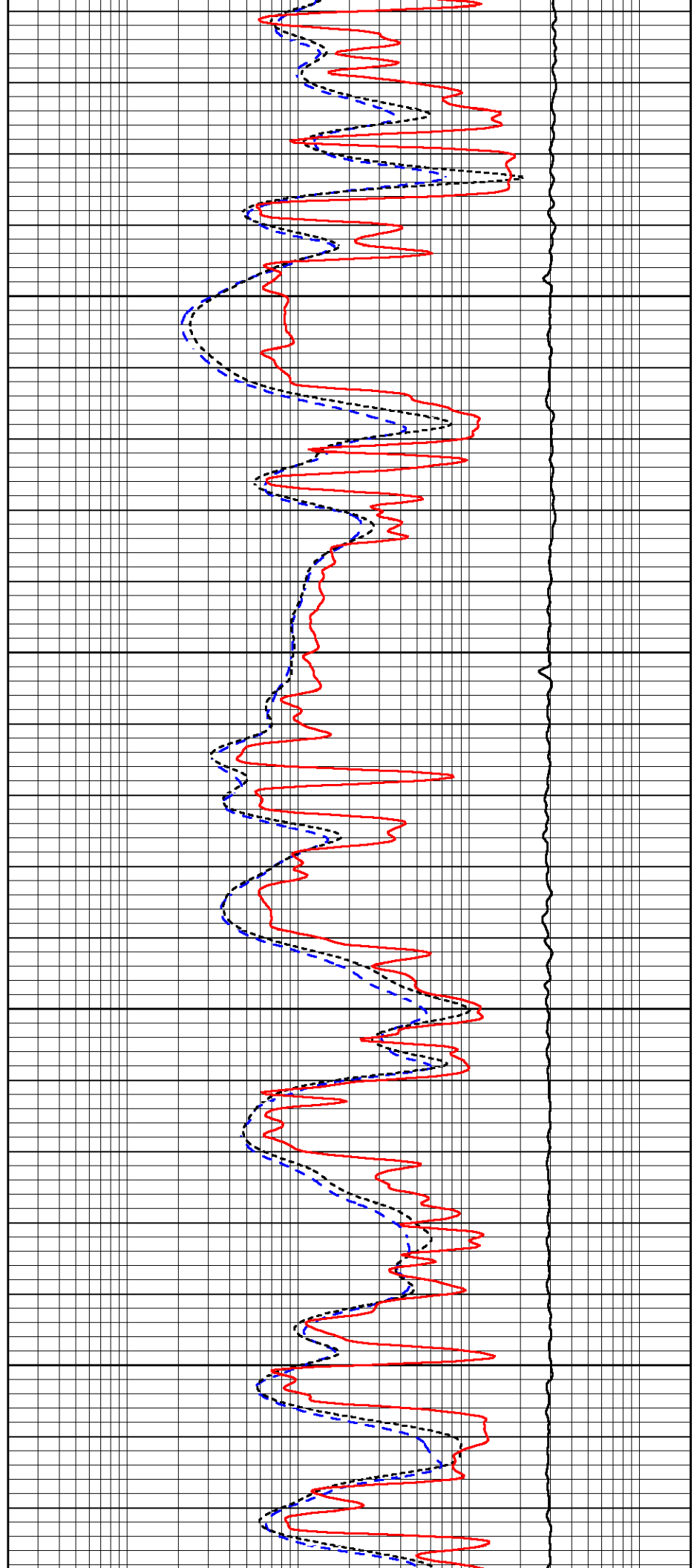


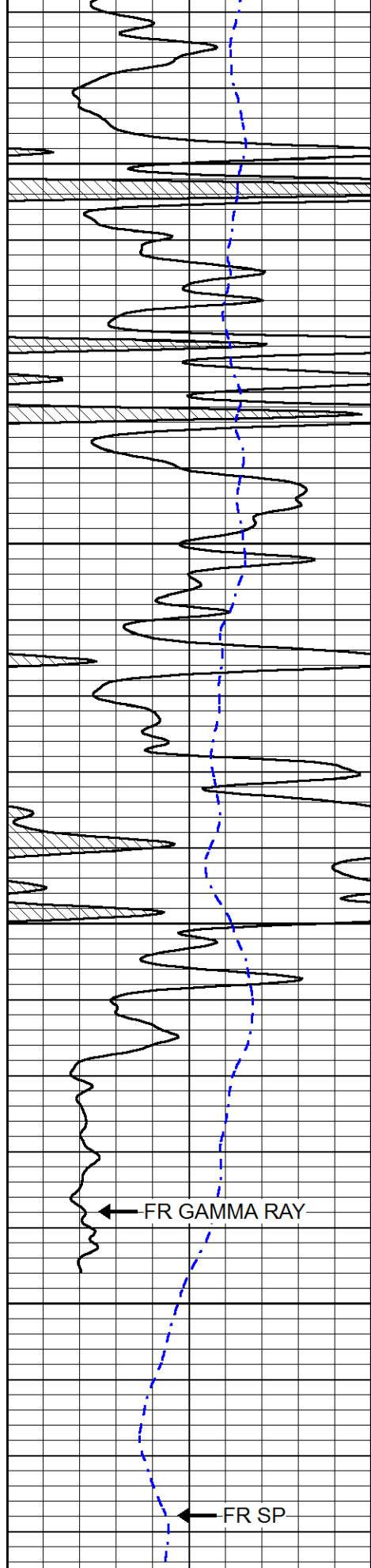
4350

4400

4450

4500





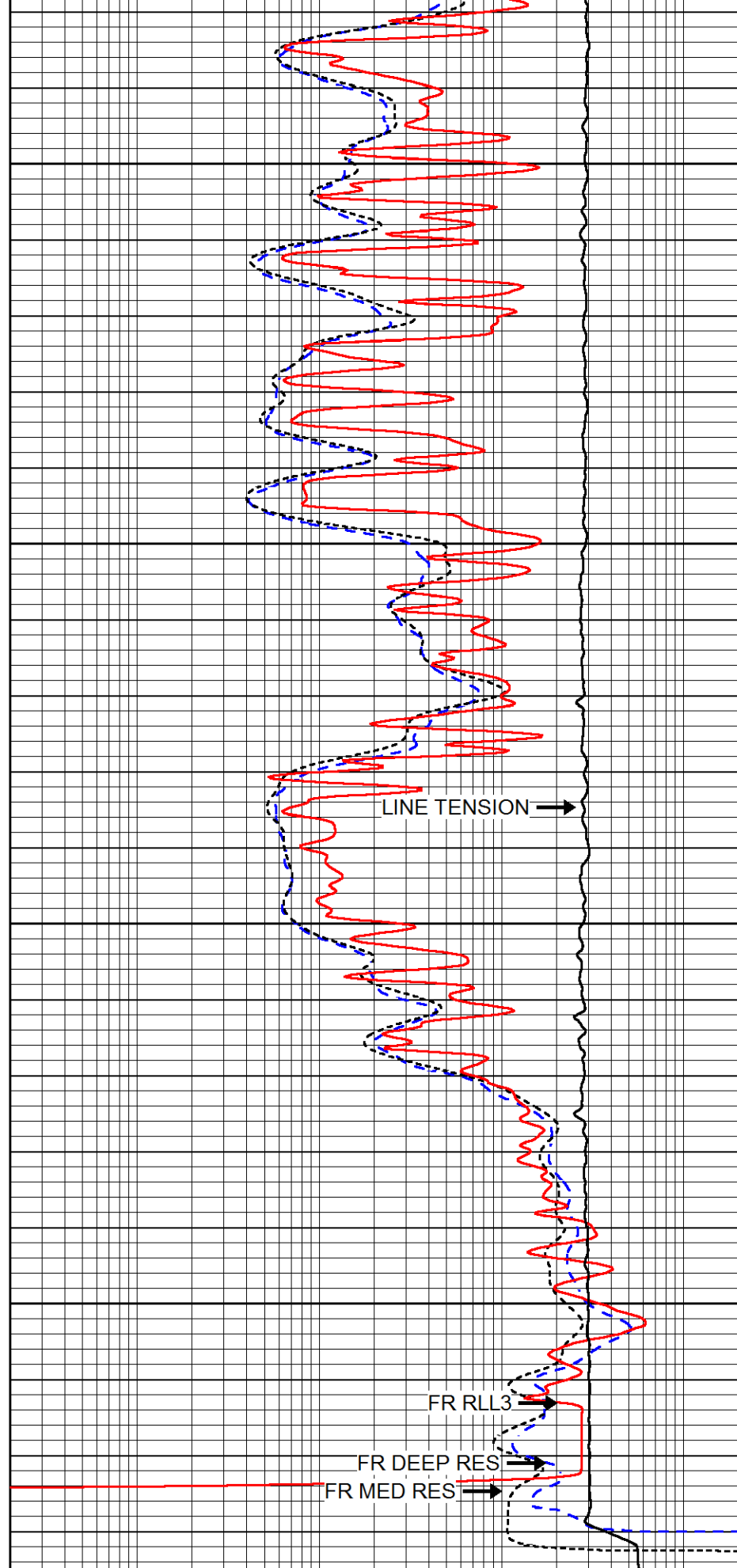
4550

4600

4650

4700

0 GAMMA RAY (GAPI) 150
 -200 SP (mV) 0



0.2 DEEP RESISTIVITY (Ohm-m) 2000
 0.2 MEDIUM RESISTIVITY (Ohm-m) 2000
 0.2 RLL3 (Ohm-m) 2000

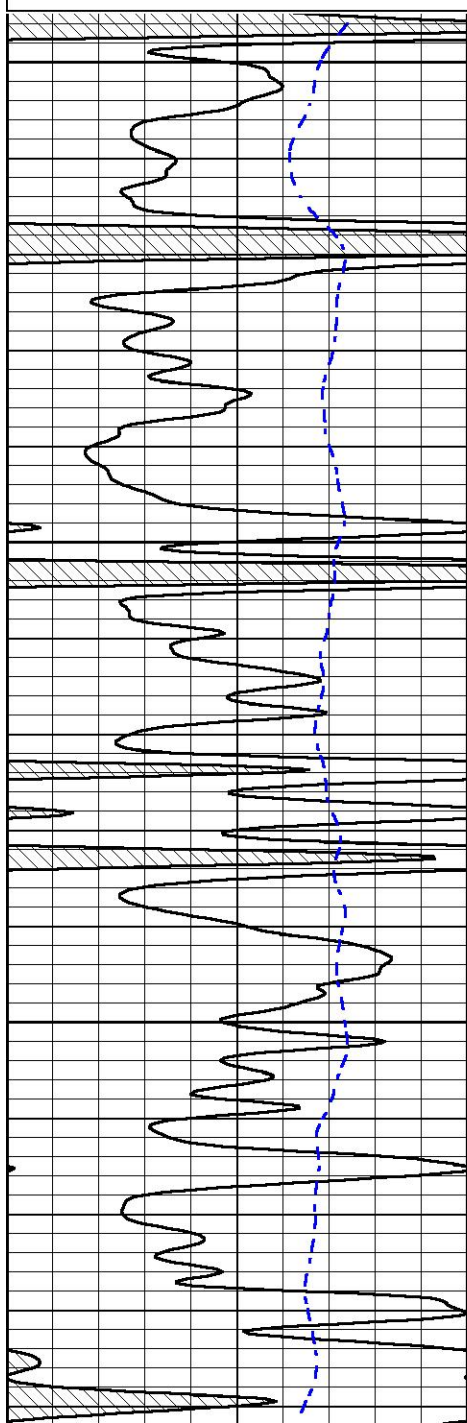


REPEAT SECTION

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass2.1
 Presentation Format dil
 Dataset Creation Thu Apr 19 04:42:57 2018
 Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

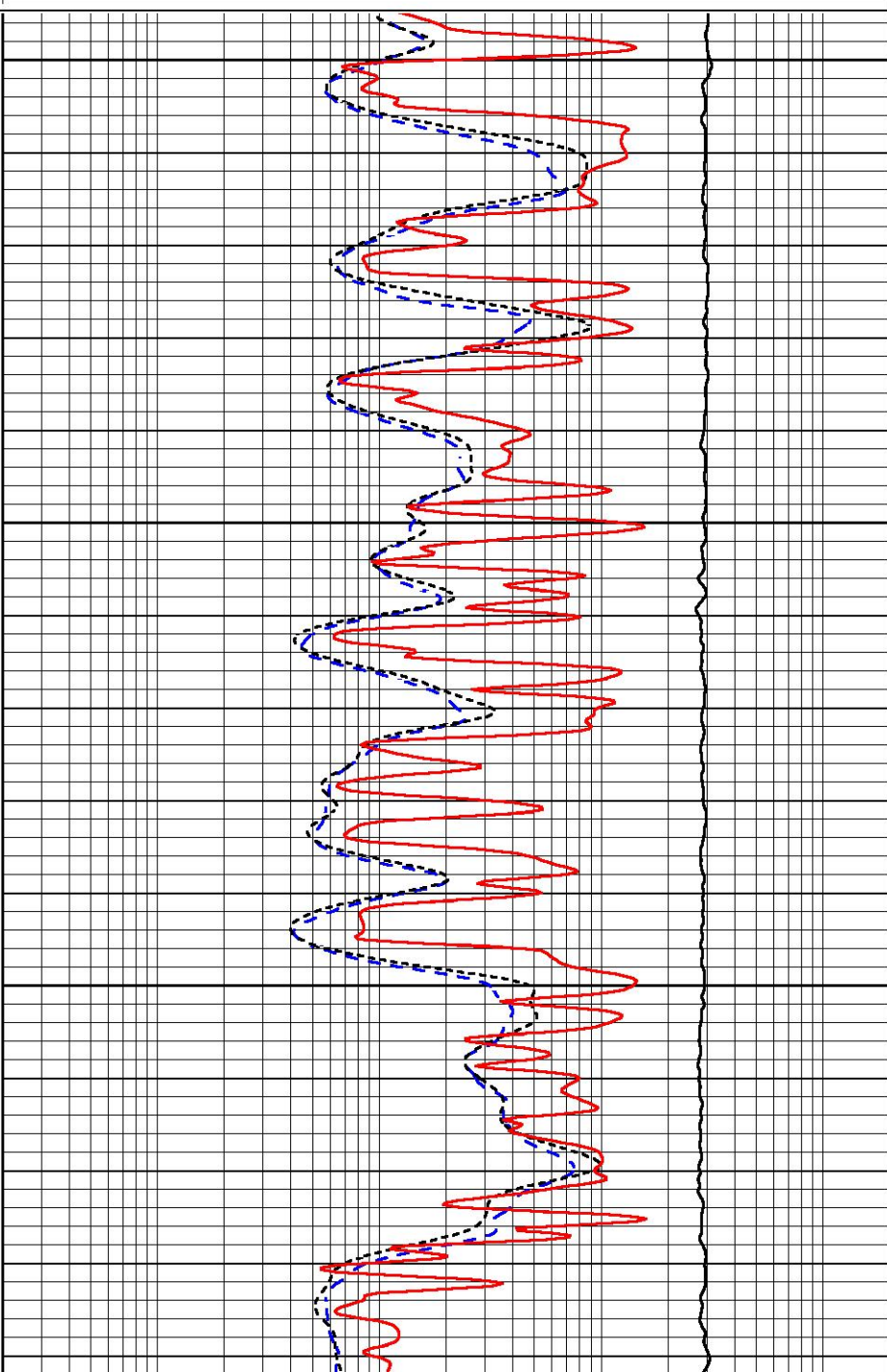
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	LINE TENSION (lb)	0

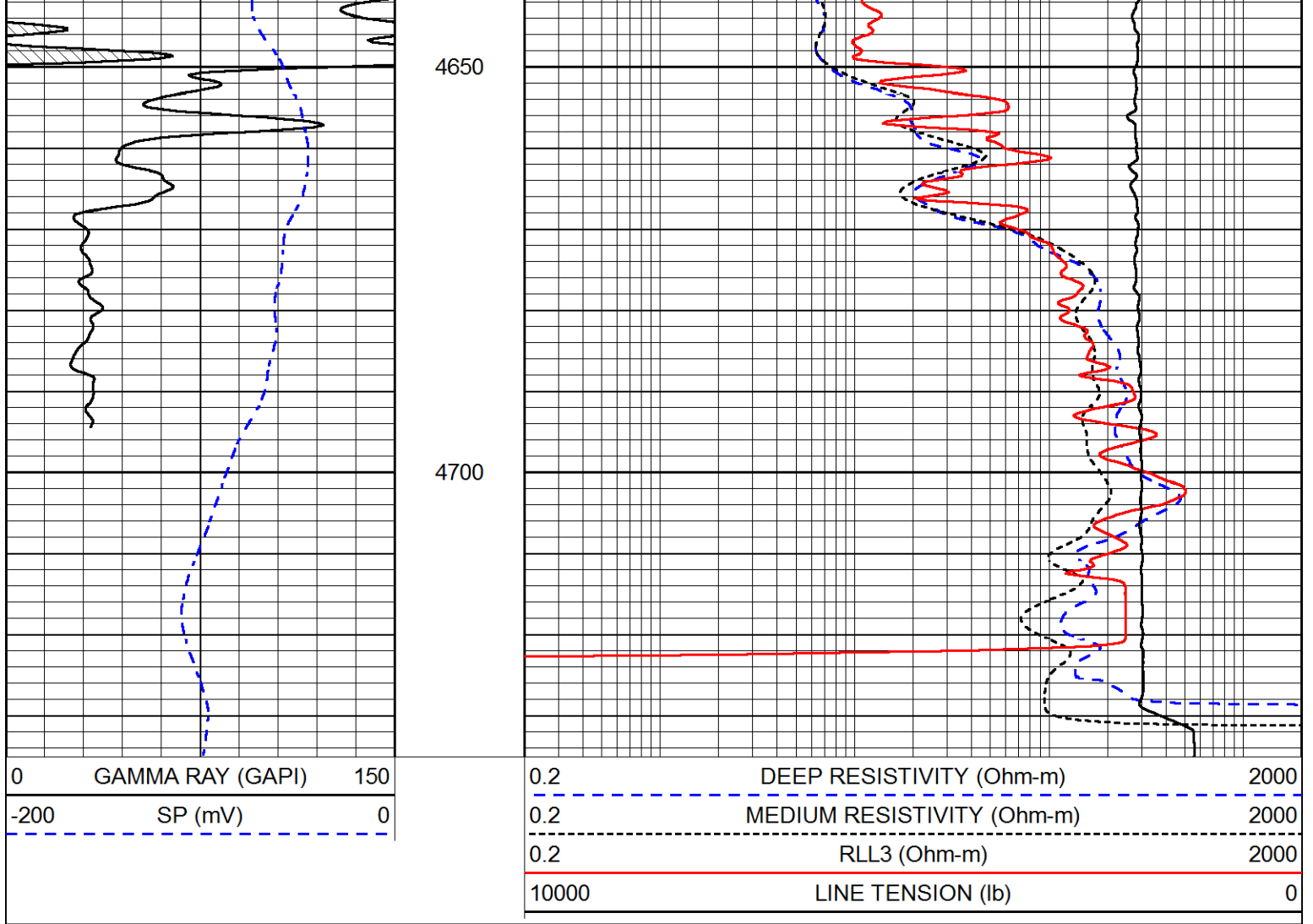


4500

4550

4600





Calibration Report

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Dataset Creation Thu Apr 19 04:47:31 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
 Calibration Performed: Mon Apr 16 20:15:16 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop	mmho/m	Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-18.200
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-60.500

Microlog Calibration Report

Serial-Model: PSI-01-PSIML
 Performed: Mon Apr 16 11:11:21 2018

	Readings		References			Results	
	Zero	Cal	Zero	Cal	Ohm-m	m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-0.7000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	32000.0000	-0.6000
Caliber	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.8750

Compensated Density Calibration Report

Serial-Model: 182-152-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Thu Apr 19 03:28:52 2018

Master Calibration

	<u>Density</u>		<u>Far Detector</u>	<u>Near Detector</u>	
Magnesium	1.755	g/cc	4992.81	6098.44	cps
Aluminum	2.660	g/cc	945.67	3945.60	cps
Spine Angle = 75.33			Density/Spine Ratio = 0.526		
	<u>Size</u>		<u>Reading</u>		
Small Ring	4.50	in	1.09		
Large Ring	15.00	in	1.03		

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: MON APR 16 10:30:30 2018

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
 Tool Model: M&W
 Calibration Performed: Mon Jan 15 11:20:44 2018

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps

 <p>PIONEER Pioneer Energy Services</p>	Company	RICHLAND OIL INVESTMENTS, LLC
	Well	MICHAELIS #25-1
	Field	WILDCAT
	County	LOGAN
	State	KANSAS



DUAL COMP POROSITY LOG

Company RICHLAND OIL INVESTMENTS, LLC
 Well MICHAELIS #25-1
 Field WILDCAT
 County LOGAN
 State KANSAS

Company RICHLAND OIL INVESTMENTS, LLC
 Well MICHAELIS #25-1
 Field WILDCAT
 County LOGAN State KANSAS

Location: API #: 15-109-21541-00-00
 653' FSL & 1913' FWL
 SEC 25 TWP 11S RGE 33W
 Permanent Datum GROUND LEVEL Elevation 3077'
 Log Measured From KELLY BUSHING
 Drilling Measured From KELLY BUSHING
 Other Services DIL/MEL
 K.B. 3087'
 D.F. N/A
 G.L. 3077'

Date	4/19/2018						
Run Number	ONE						
Type Log	CNL/CDL						
Depth Driller	4730'						
Depth Logger	4729'						
Bottom Logged Interval	4700'						
Top Logged Interval	3700'						
Type Fluid In Hole	CHEMICAL						
Salinity, PPM CL	4000						
Density	9.3						
Level	FULL						
Max. Rec. Temp. F	123						
Operating Rig Time	3 HOURS						
Equipment -- Location	91 HAYS						
Recorded By	D. SCHMIDT						
Witnessed By	STEVE MURPHY						
Borehole Record							
Run No.	Bit	From	To	Size	Wgt.	From	To
ONE	12.25"	0'	226'	8.625"	23#	0'	226'
TWO	7.875"	226'	TD				
Casing Record							

<<< Fold Here >>>

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.

OAKLEY (HWY 40 & 83),
 4 WEST TO 400 RD, 4 SOUTH,
 WEST INTO

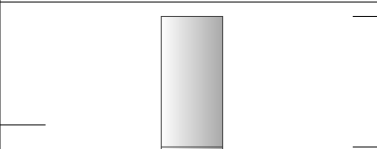
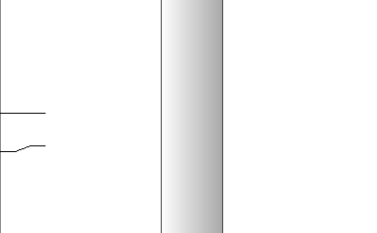
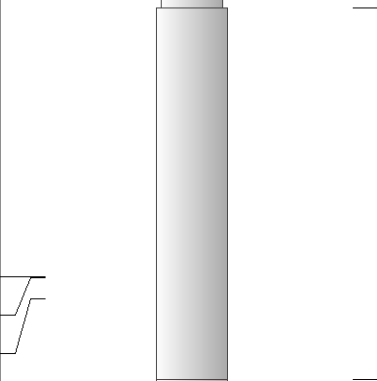
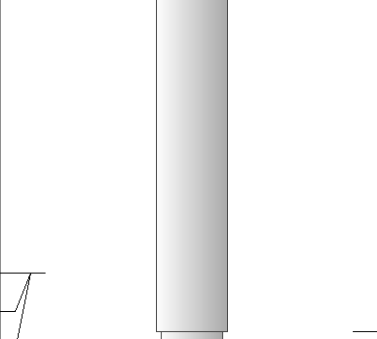
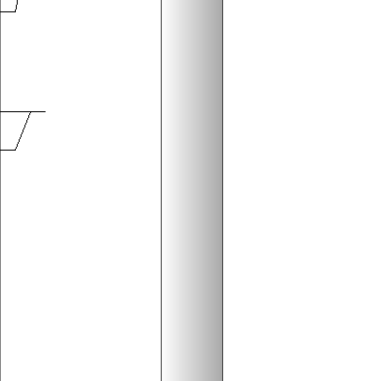
Log Measured From: KELLY BUSHING 10 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858

Your Pioneer Energy Services Crew		This Log Record Was Witnessed By	
Engineer: D. SCHMIDT	Operator:	Primary Witness: STEVE MURPHY	Secondary Witness:
Operator:	Operator:	Secondary Witness:	Secondary Witness:
Operator:		Secondary Witness:	

Top - Bottom

M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m
2	1	Off	Limestone	1	2.71	-94	0
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	50	0	5.5	0	4729	123	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

CILD 8.00

CILM 4.70

SP 0.20

DIL-PSI HIGH TEMP (933 (HT))

18.50

3.50

220.00

Dataset: richland_michaelis 25-1.db: field/well/STKML/pass3.1
 Total length: 43.08 ft
 Total weight: 685.00 lb
 O.D.: 4.00 in

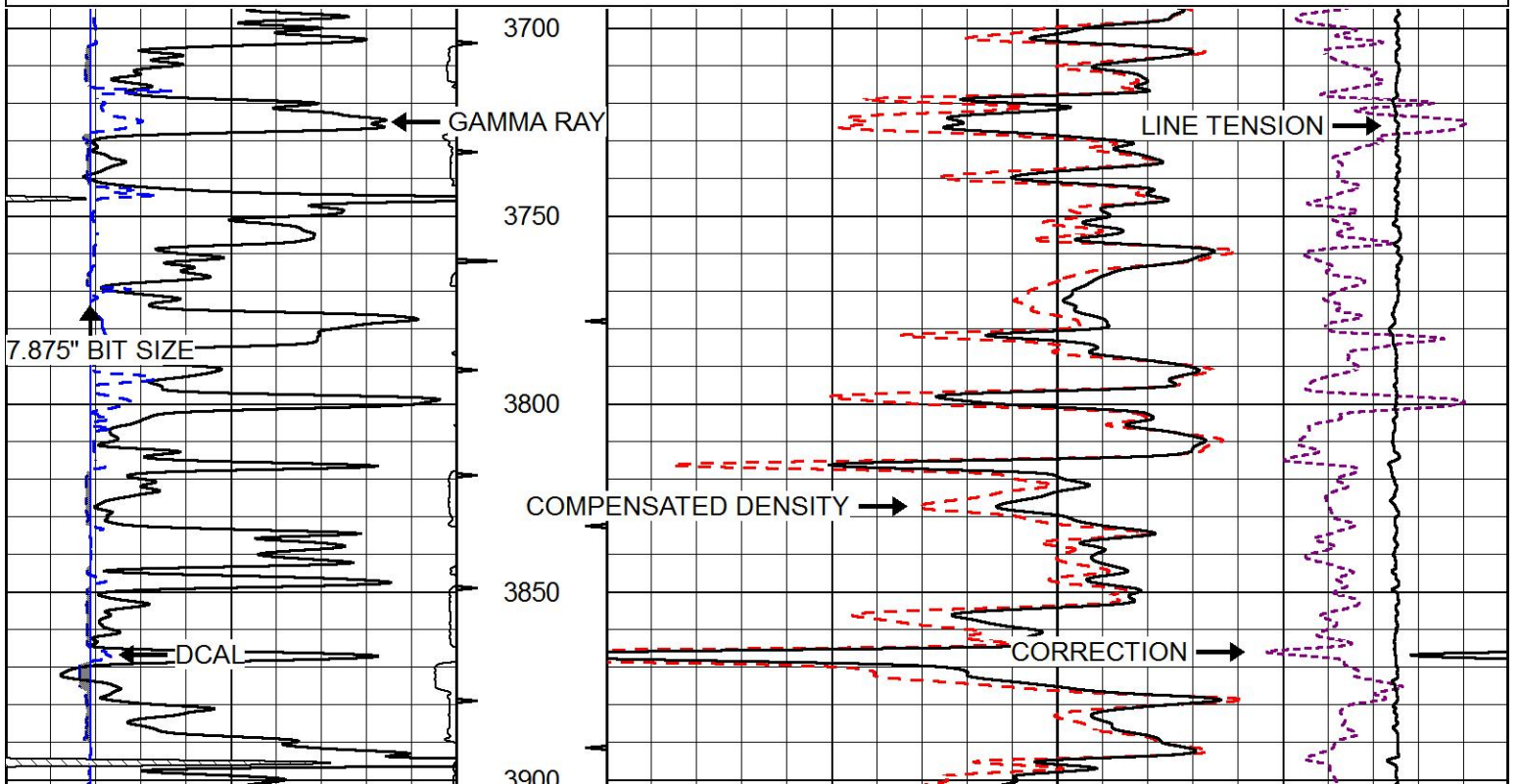
PIONEER
 Pioneer Energy Services

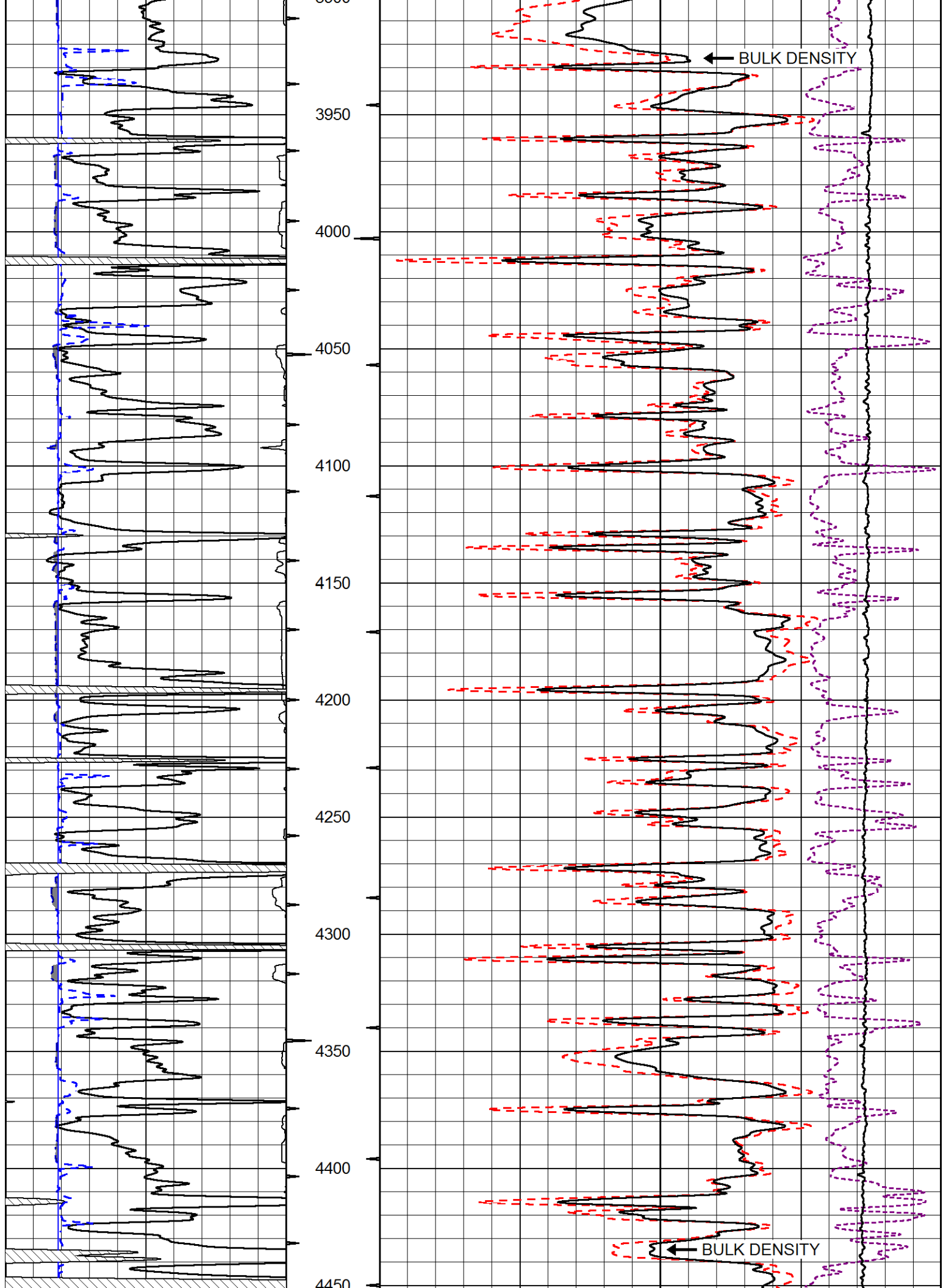
MAIN PASS

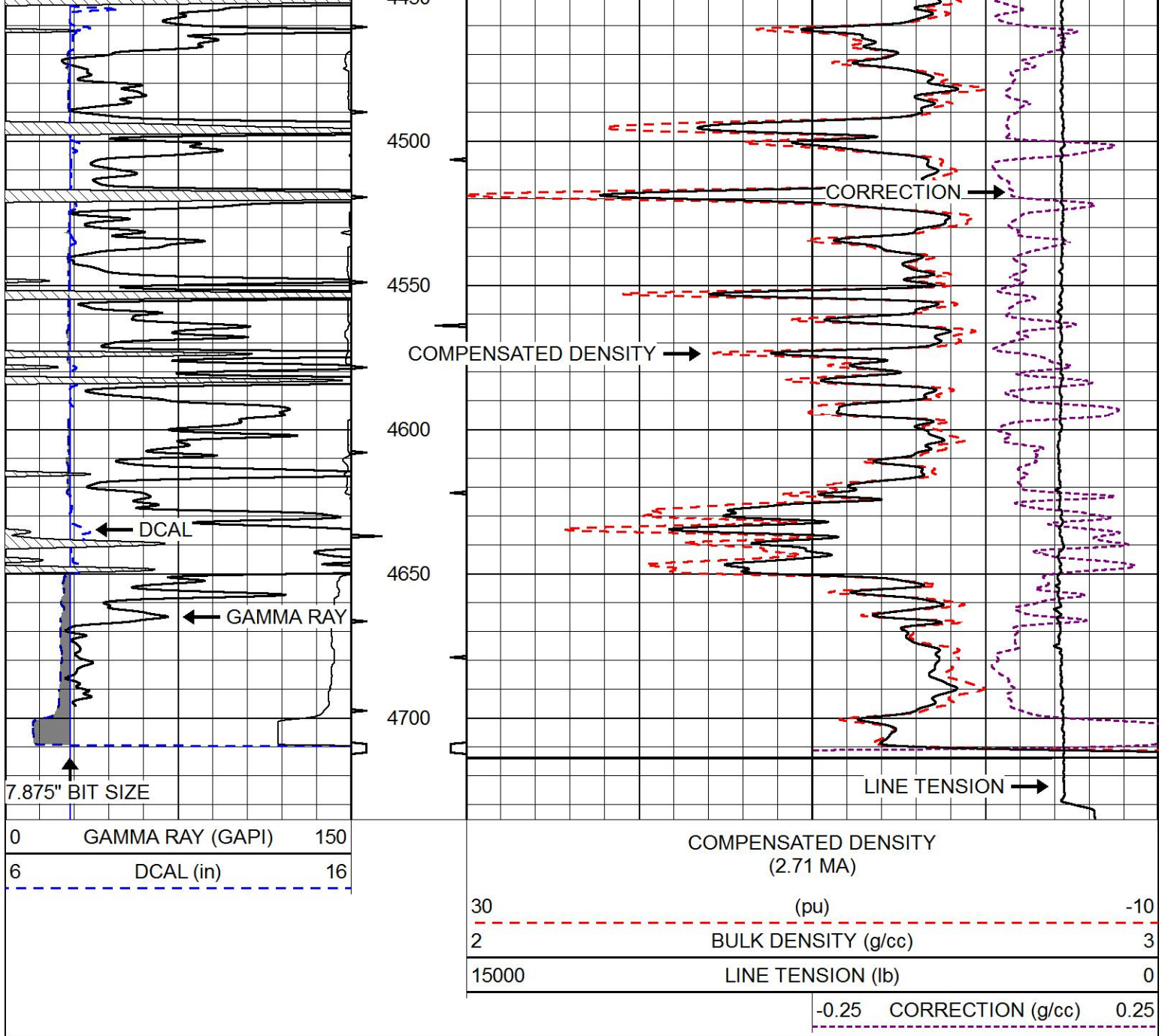
Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Presentation Format cdl
 Dataset Creation Thu Apr 19 04:47:31 2018
 Charted by Depth in Feet scaled 1:600

0	GAMMA RAY (GAPI)	150
6	DCAL (in)	16

COMPENSATED DENSITY (2.71 MA)	
30	(pu) -10
2	BULK DENSITY (g/cc) 3
15000	LINE TENSION (lb) 0
-0.25	CORRECTION (g/cc) 0.25

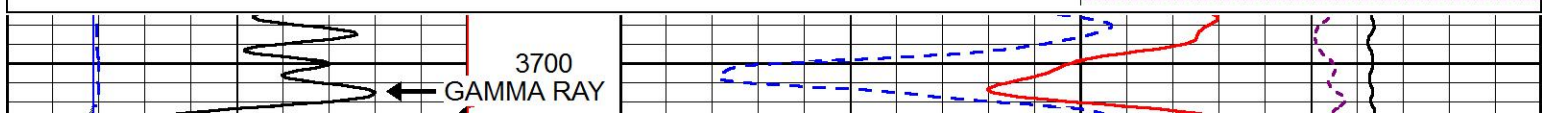
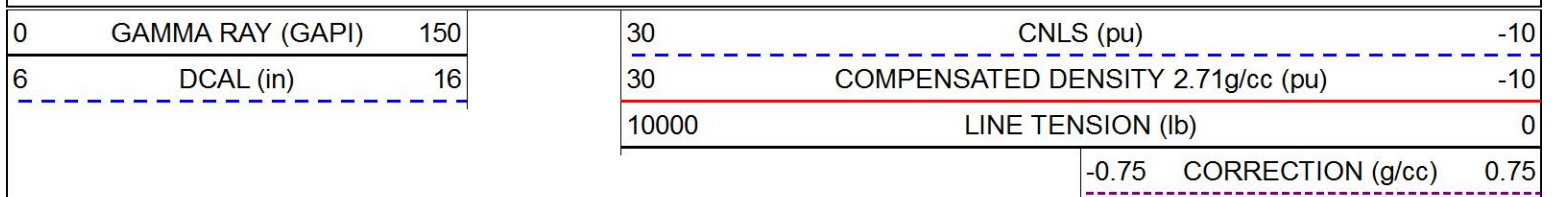


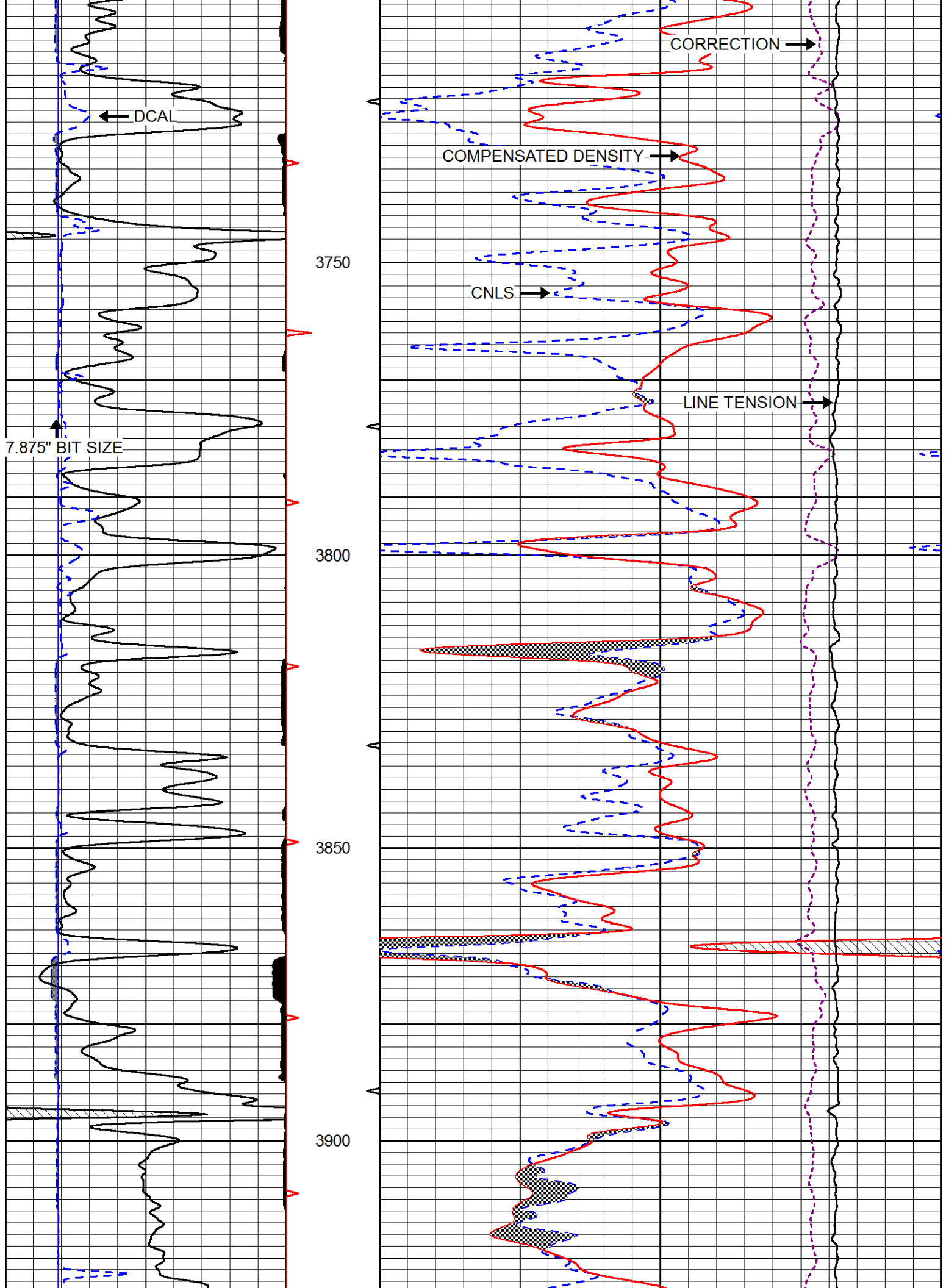


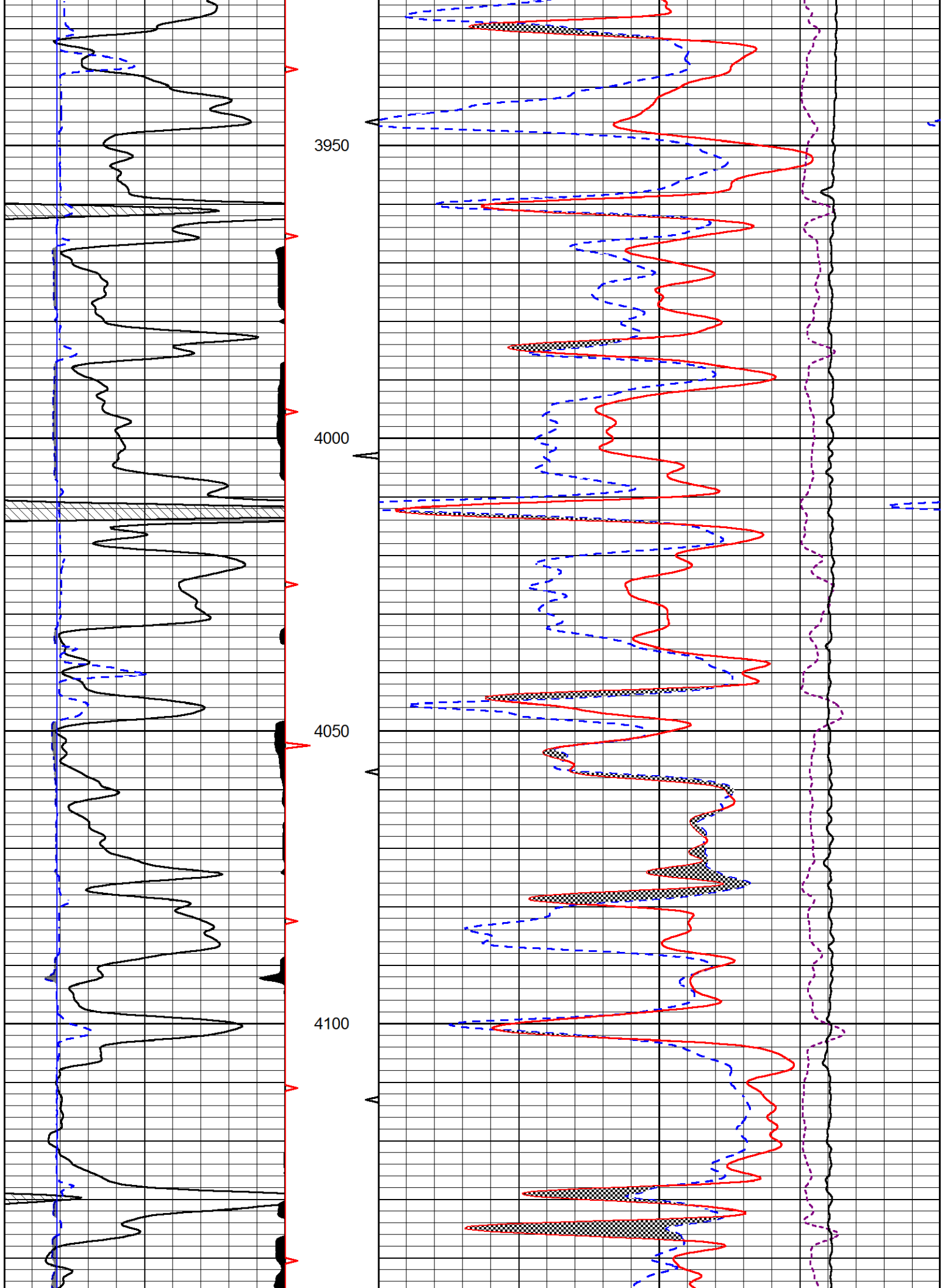


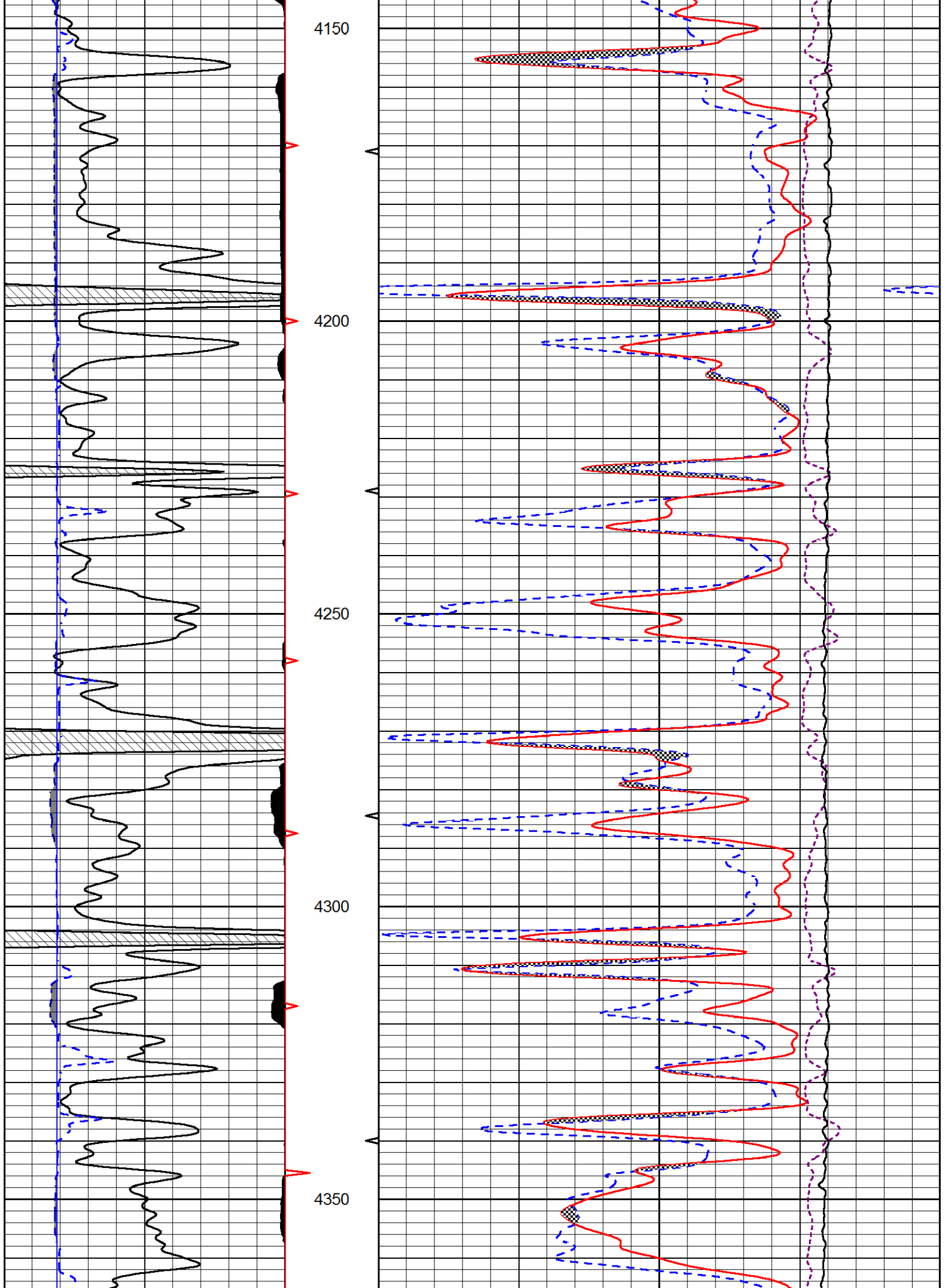
MAIN PASS

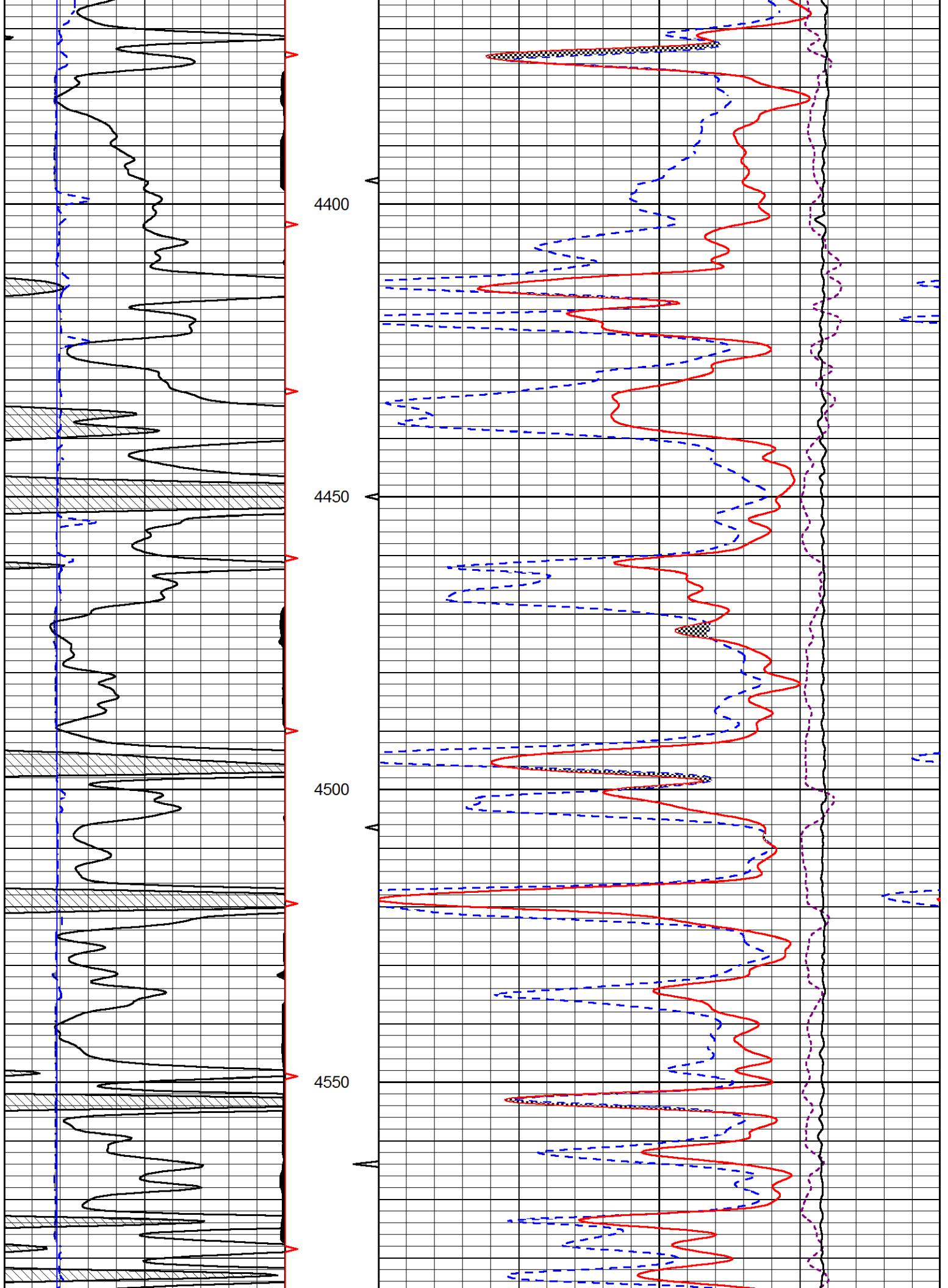
Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Presentation Format cndlspec
 Dataset Creation Thu Apr 19 04:47:31 2018
 Charted by Depth in Feet scaled 1:240

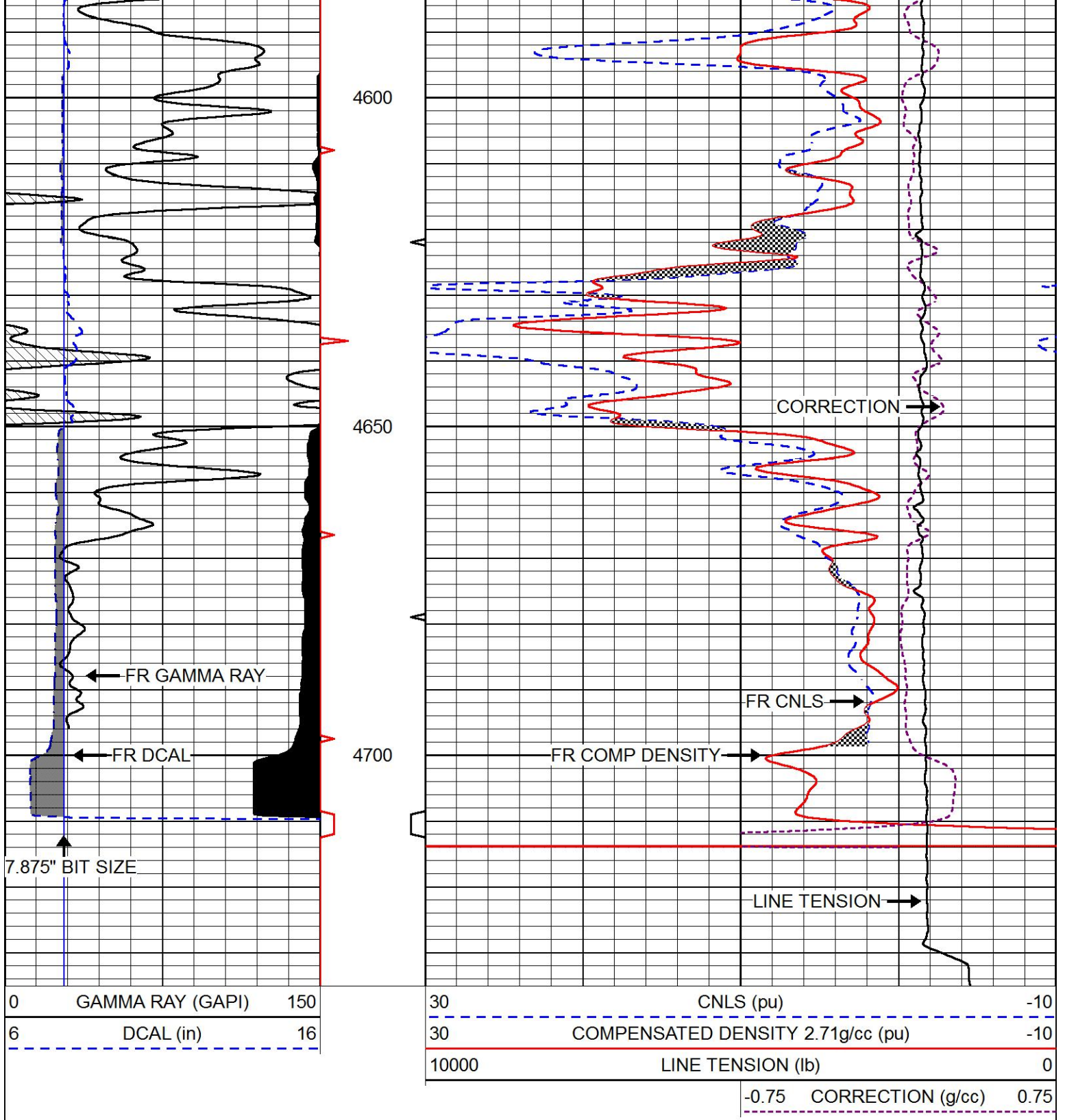








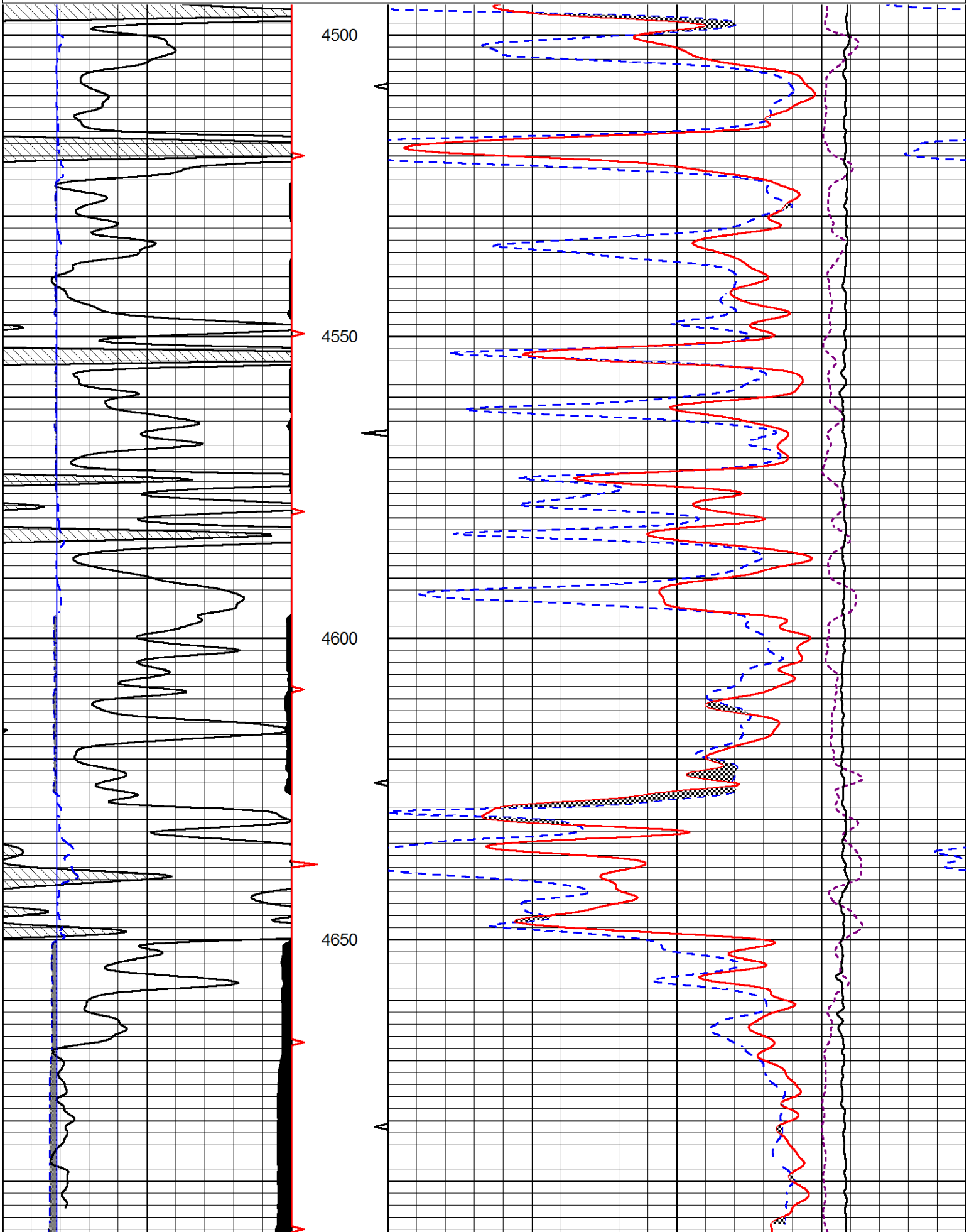


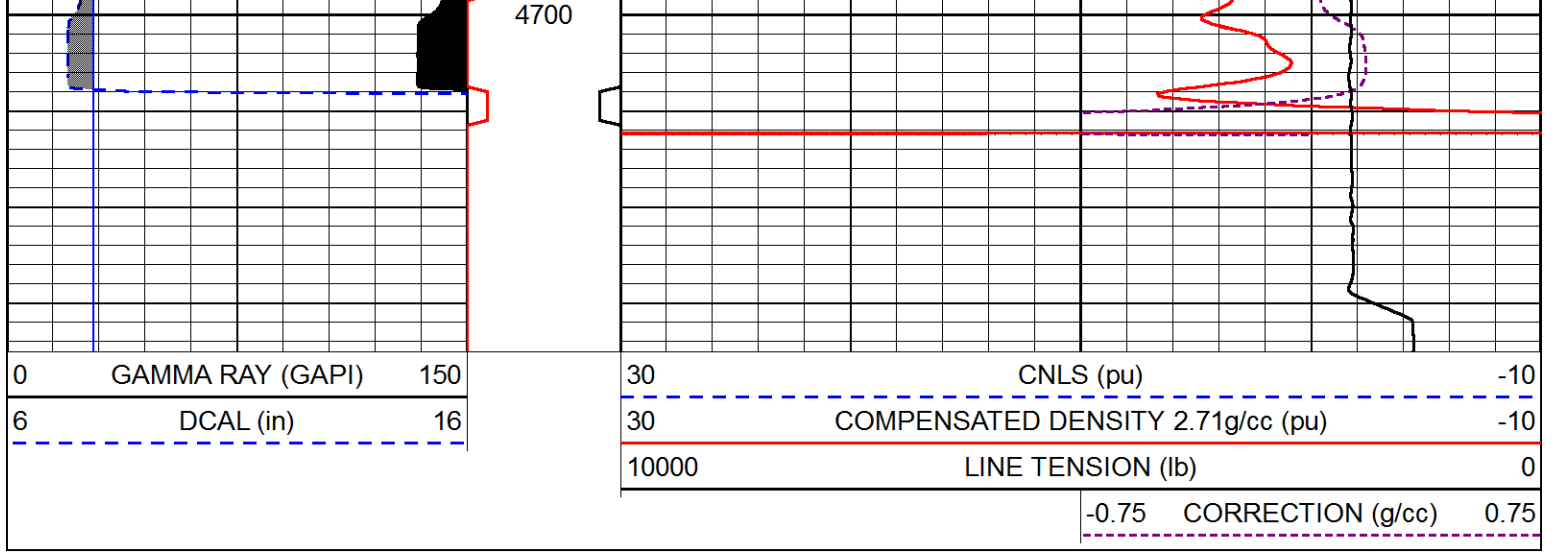


REPEAT SECTION

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass2.1
 Presentation Format cndlspec
 Dataset Creation Thu Apr 19 04:42:57 2018
 Charted by Depth in Feet scaled 1:240







Calibration Report

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Dataset Creation Thu Apr 19 04:47:31 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
 Calibration Performed: Mon Apr 16 20:15:16 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-18.200
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-60.500

Microlog Calibration Report

Serial-Model: PSI-01-PSIML
 Performed: Mon Apr 16 11:11:21 2018

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-0.7000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	32000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.8750

Compensated Density Calibration Report

Serial-Model: 182-152-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Thu Apr 19 03:28:52 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4992.81	6098.44	cps
Aluminum	2.660	g/cc	945.67	3945.60	cps

	Size		Reading
Small Ring	4.50	in	1.09
Large Ring	15.00	in	1.03

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: MON APR 16 10:30:30 2018

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
 Tool Model: M&W
 Calibration Performed: Mon Jan 15 11:20:44 2018

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps



PIONEER
 Pioneer Energy Services

Company RICHLAND OIL INVESTMENTS, LLC
 Well MICHAELIS #25-1
 Field WILDCAT
 County LOGAN
 State KANSAS



PIONEER
Pioneer Energy Services

**MICRORESISTIVITY
LOG**

Company	RICHLAND OIL INVESTMENTS, LLC
Well	MICHAELIS #25-1
Field	WILDCAT
County	LOGAN
State	KANSAS

Location:	API #: 15-109-21541-00-00	Other Services
	653' FSL & 1913' FWL	CNL/CDL DIL
Permanent Datum	GROUND LEVEL	Elevation 3077'
Log Measured From	KELLY BUSHING	K.B. 3087'
Drilling Measured From	KELLY BUSHING	D.F. N/A
		G.L. 3077'

Date	4/19/2018
Run Number	ONE
Depth Driller	4730'
Depth Logger	4729'
Bottom Logged Interval	4728'
Top Log Interval	3700'
Casing Driller	8.625" @ 226'
Casing Logger	224'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	4000
Density / Viscosity	9.3 64
pH / Fluid Loss	10.0 8.0
Source of Sample	FLOWLINE
Rm @ Meas. Temp	0.60 @ 50
Rmt @ Meas. Temp	0.45 @ 50
Rmc @ Meas. Temp	0.81 @ 50
Source of Rmf / Rmc	CHARTS
Rm @ BHT	0.24 @ 123
Operating Rig Time	3 HOURS
Max Rec. Temp. F	123
Equipment Number	91
Location	HAYS
Recorded By	D. SCHMIDT
Witnessed By	STEVE MURPHY

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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.

**OAKLEY (HWY 40 & 83),
4 WEST TO 400 RD, 4 SOUTH,
WEST INTO**

Log Measured From: KELLY BUSHING 10 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858






Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: D. SCHMIDT	Primary Witness: STEVE MURPHY
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

Database C:\ProgramData\Warrior\Data\richland_michaelis 25-1.db
 Dataset field/well/STKML/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	-94	0
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
0	50	0	5.5	0	4729	123	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

CILD 8.00

CILM 4.70

SP 0.20

DIL-PSI HIGH TEMP (933 (HT))

18.50

3.50

220.00

Dataset: richland_michaelis 25-1.db: field/well/STKML/pass3.1
 Total length: 43.08 ft
 Total weight: 685.00 lb
 O.D.: 4.00 in

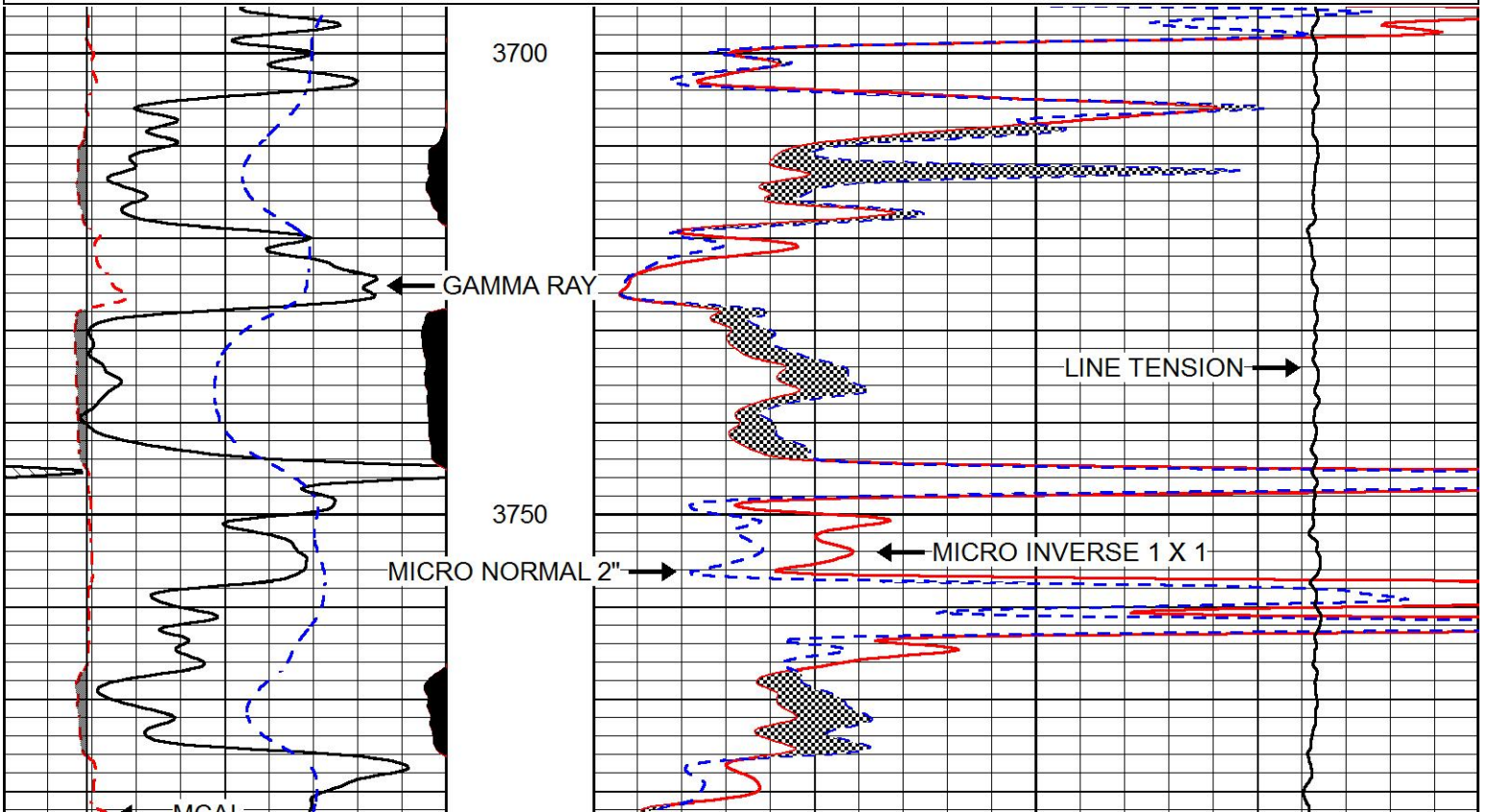


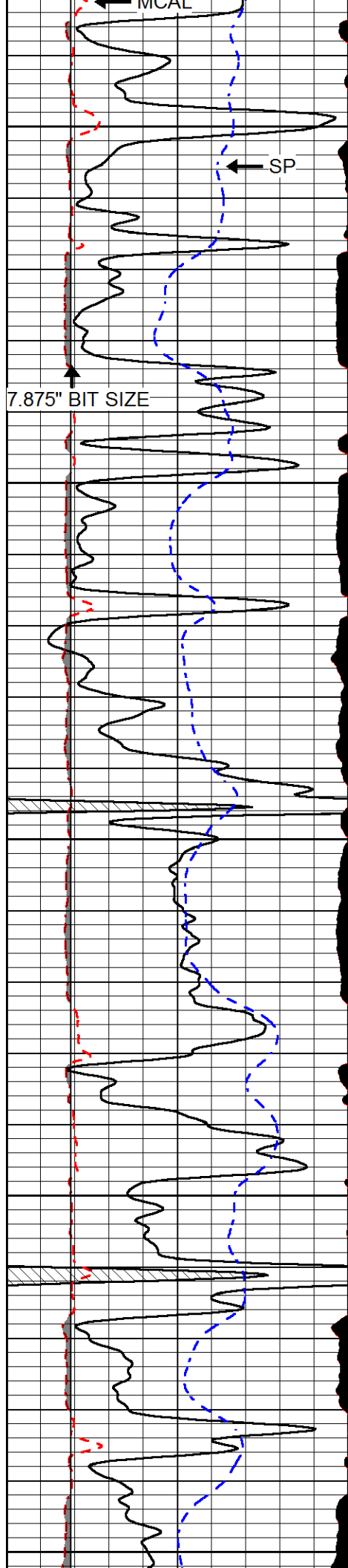
MAIN PASS

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Presentation Format micro
 Dataset Creation Thu Apr 19 04:47:31 2018
 Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
6	MCAL (in)	16
2.875	mcals (in)	7.875
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
10000	Line Weight (lb)	0





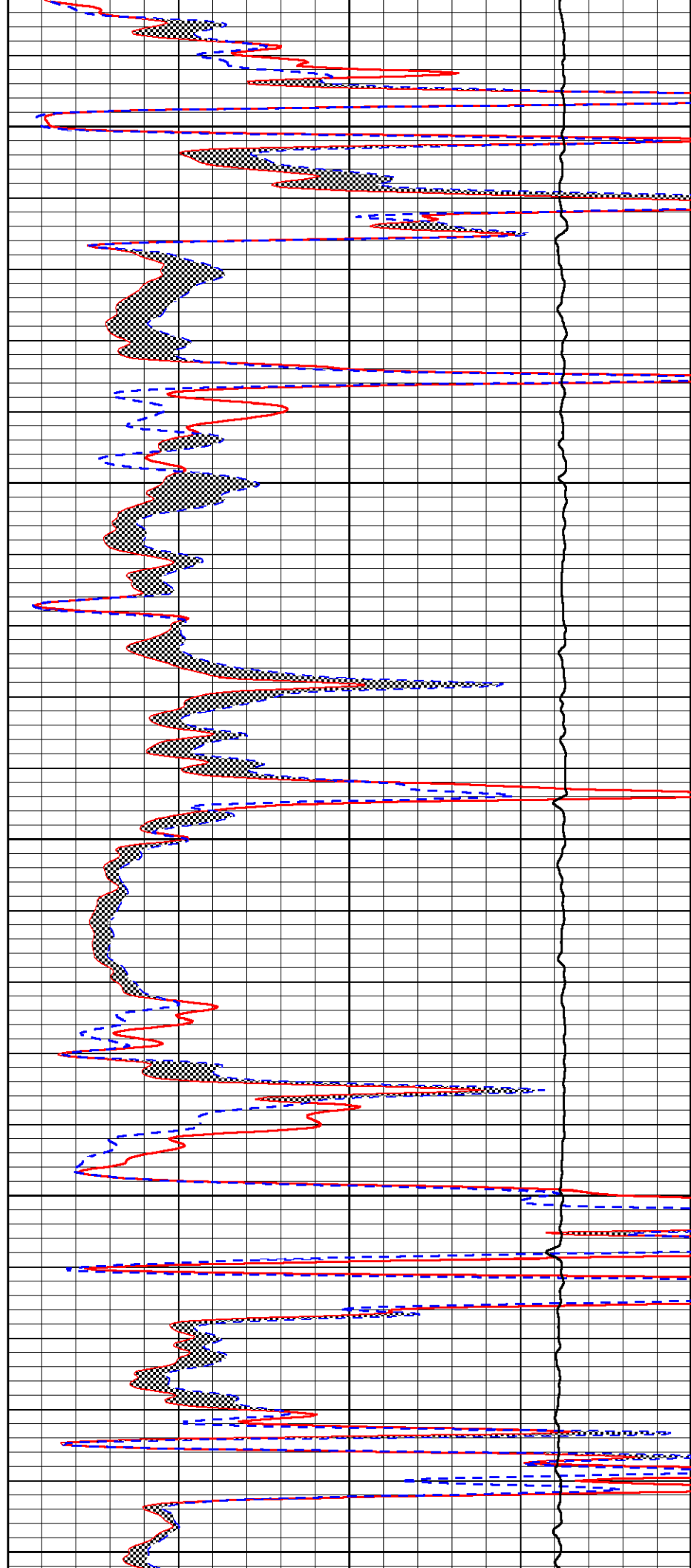
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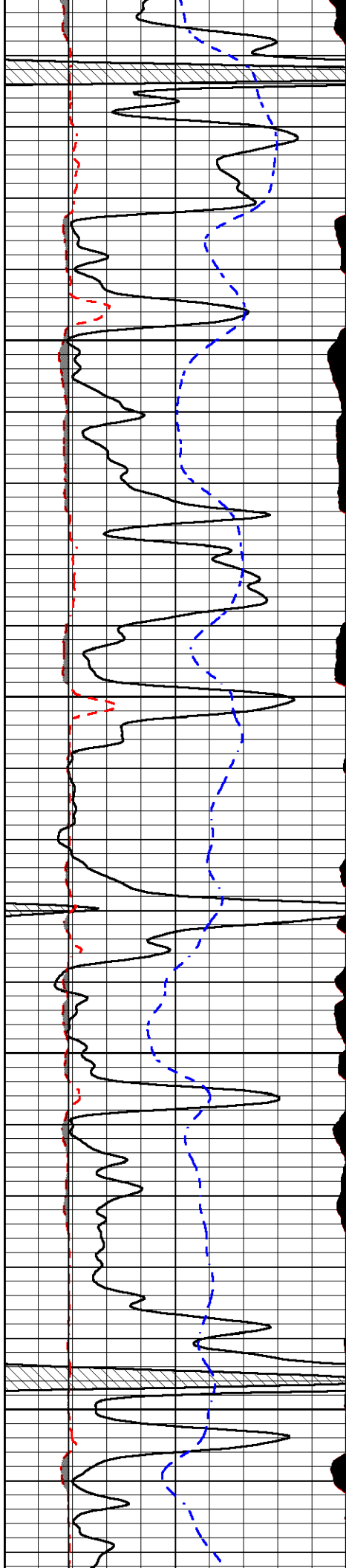
3850

3900

3950

4000



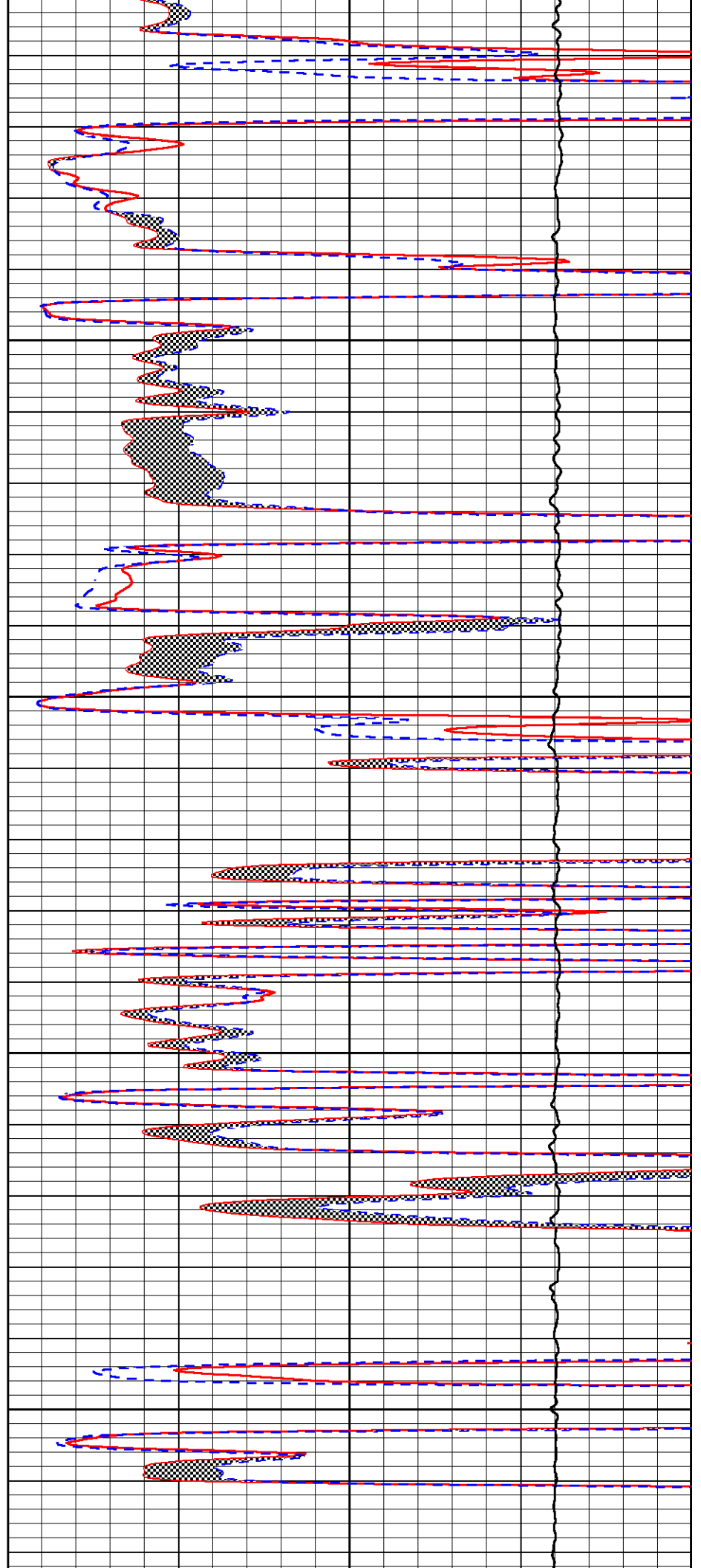


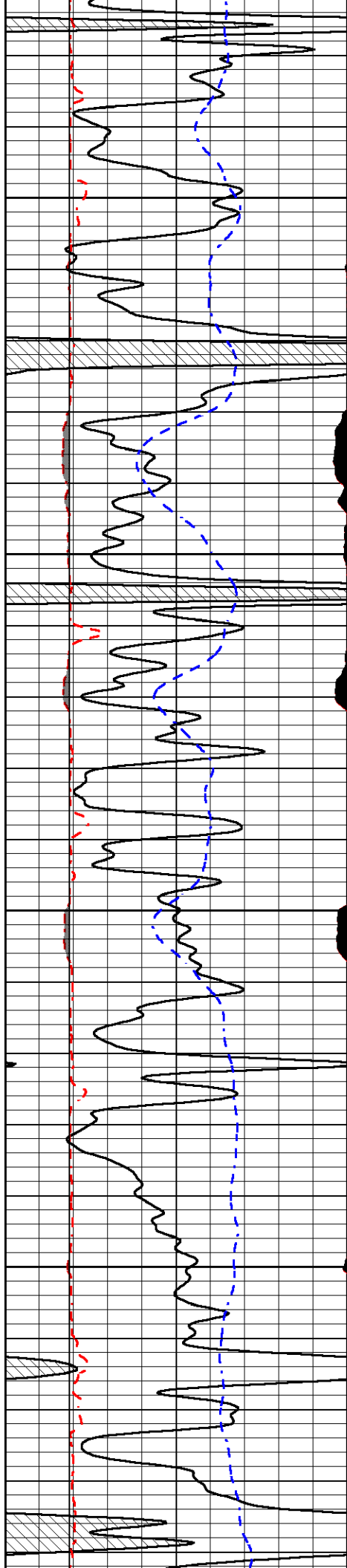
4050

4100

4150

4200



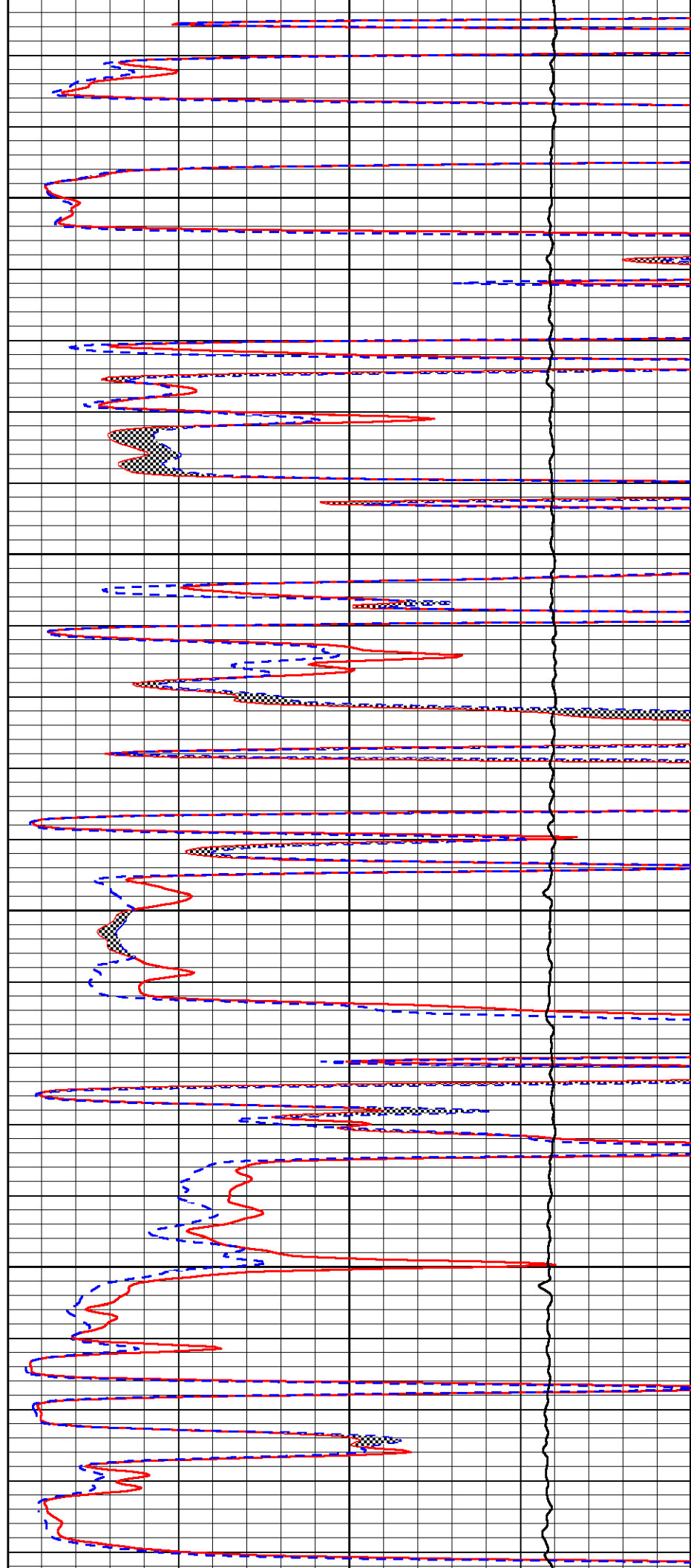


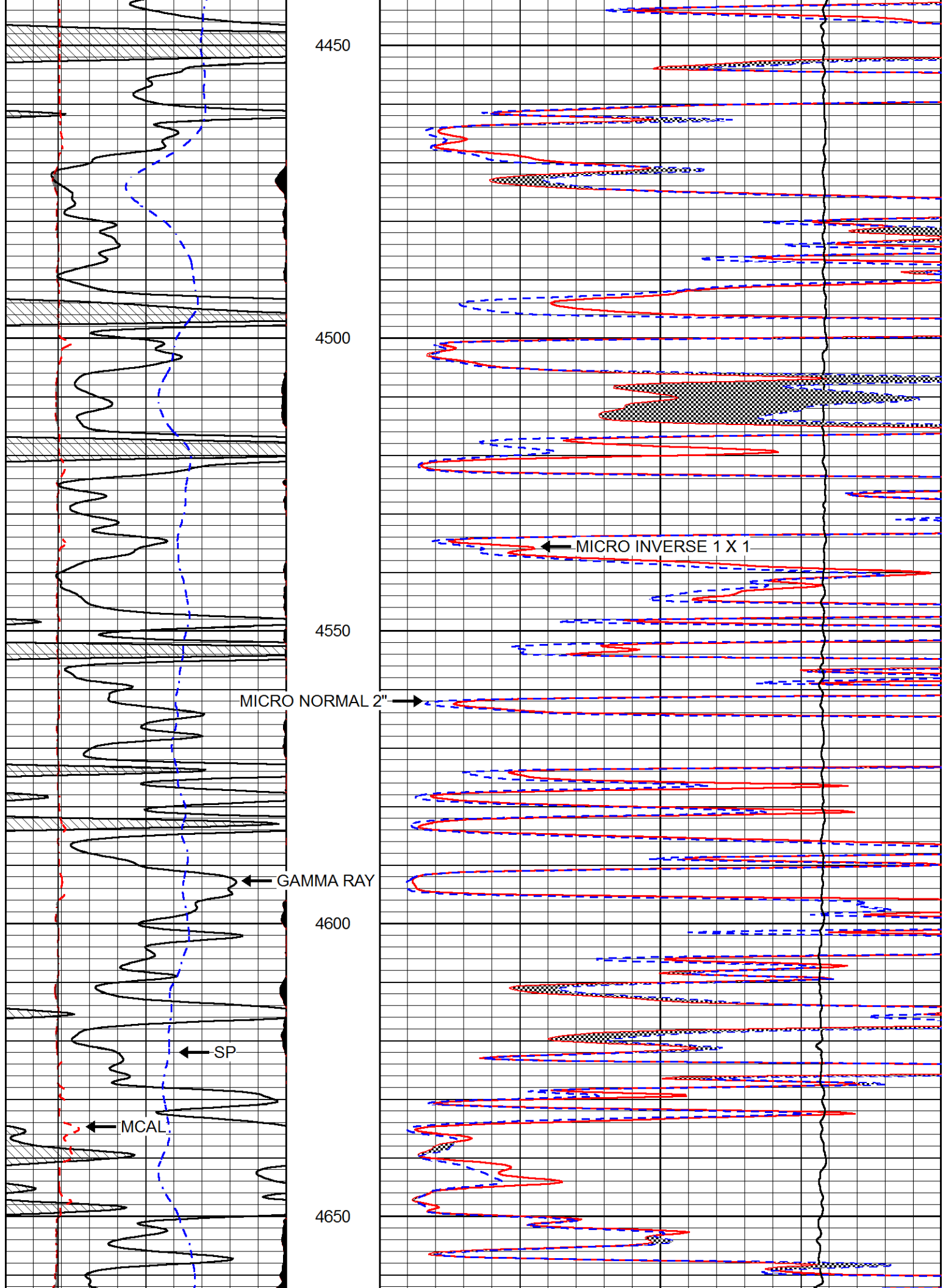
4250

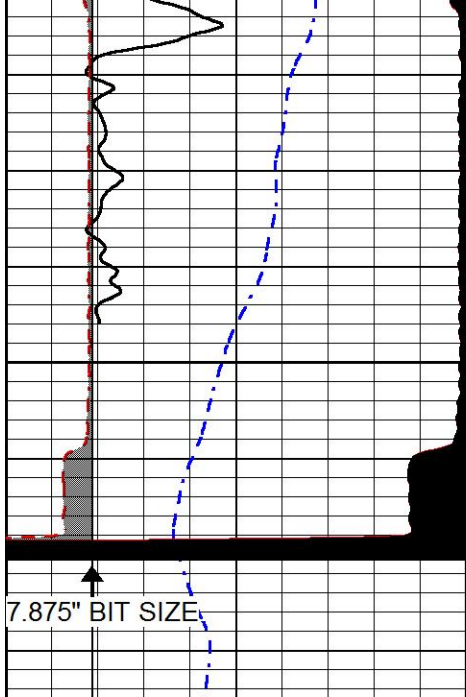
4300

4350

4400



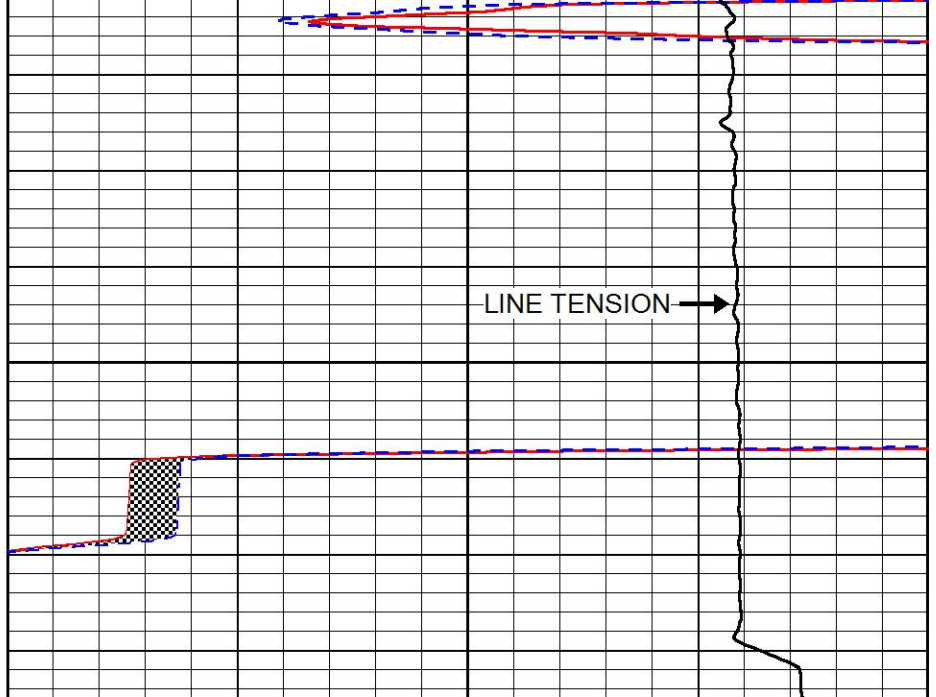




4700

7.875" BIT SIZE

0	GAMMA RAY (GAPI)	150
6	MCAL (in)	16
2.875	mcal (in)	7.875
6	Bit Size (in)	16
-200	SP (mV)	0



LINE TENSION

0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
10000	Line Weight (lb)	0

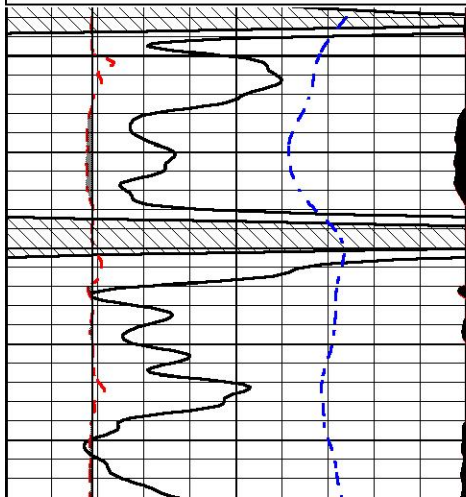


REPEAT SECTION

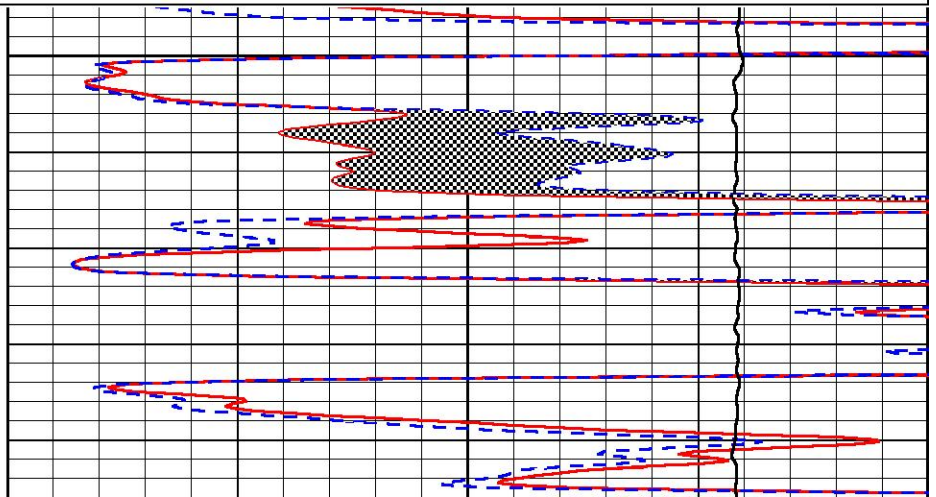
Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass2.1
 Presentation Format micro
 Dataset Creation Thu Apr 19 04:42:57 2018
 Charted by Depth in Feet scaled 1:240

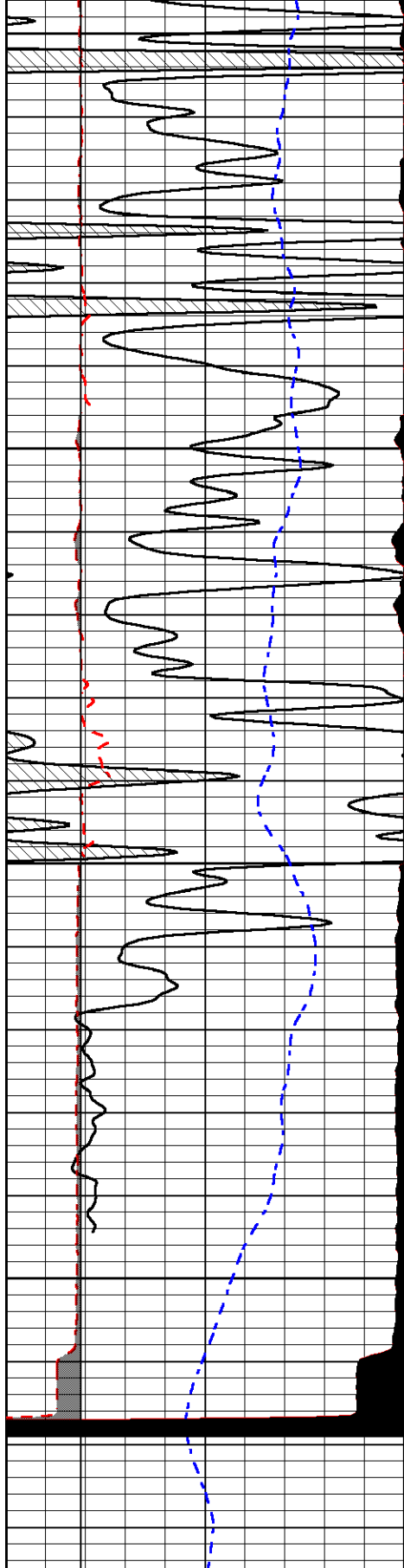
0	GAMMA RAY (GAPI)	150
6	MCAL (in)	16
2.875	mcal (in)	7.875
6	Bit Size (in)	16
-200	SP (mV)	0

0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
10000	Line Weight (lb)	0



4500





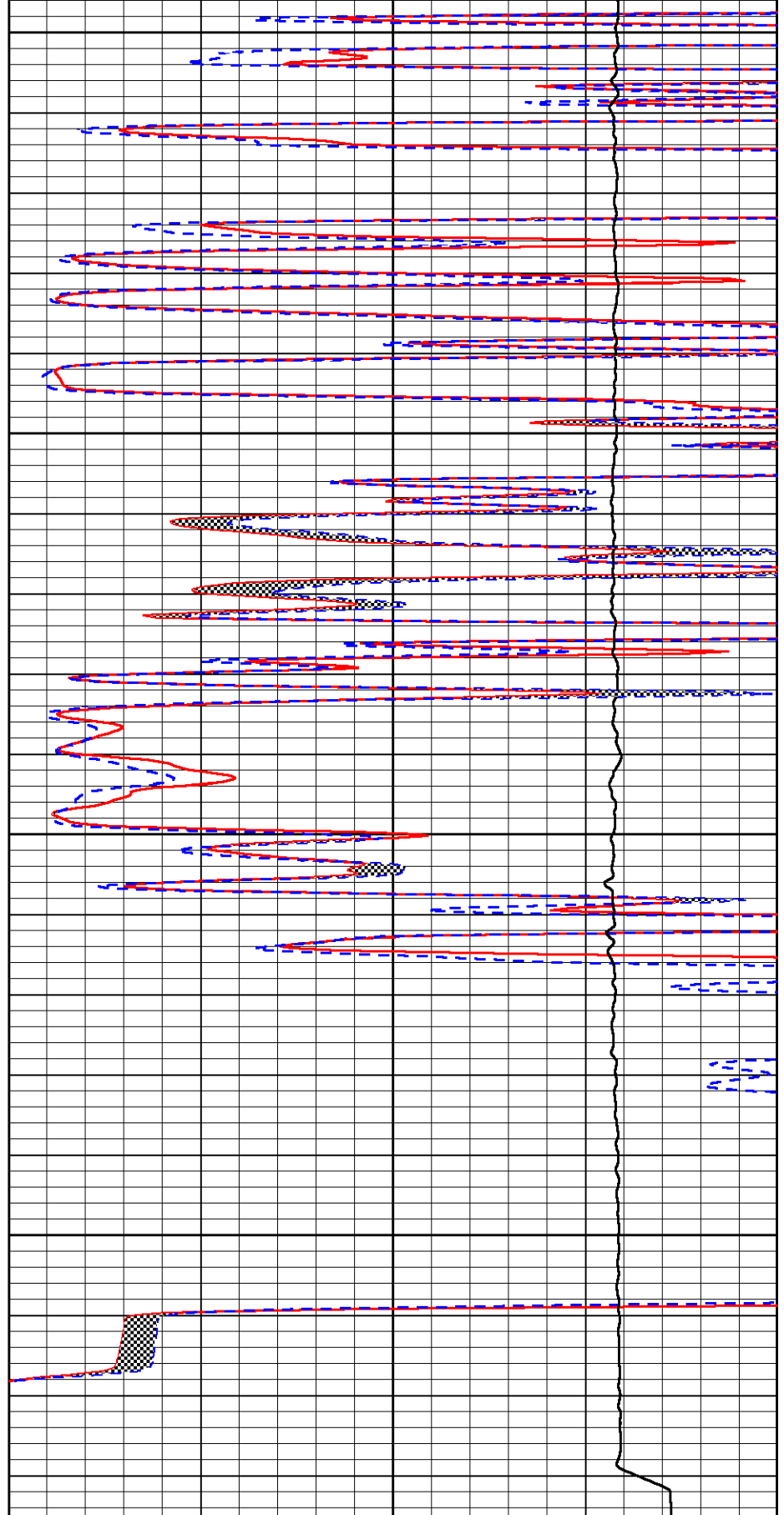
4550

4600

4650

4700

0	GAMMA RAY (GAPI)	150
6	MCAL (in)	16
2.875	mcal (in)	7.875
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
10000	Line Weight (lb)	0

Calibration Report

Database File richland_michaelis 25-1.db
 Dataset Pathname STKML/pass3.1
 Dataset Creation Thu Apr 19 04:47:31 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
 Calibration Performed: Mon Apr 16 20:15:16 2018

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-18.200
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-60.500

Microlog Calibration Report

Serial-Model: PSI-01-PSIML
 Performed: Mon Apr 16 11:11:21 2018

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-0.7000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	32000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.8750

Compensated Density Calibration Report

Serial-Model: 182-152-M&W
 Source / Verifier: 16955B / 2ci
 Master Calibration Performed: Thu Apr 19 03:28:52 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4992.81	6098.44	cps
Aluminum	2.660	g/cc	945.67	3945.60	cps
Spine Angle = 75.33			Density/Spine Ratio = 0.526		
	Size		Reading		
Small Ring	4.50	in	1.09		
Large Ring	15.00	in	1.03		

Compensated Neutron Calibration Report

Serial Number: 207-MW
 Tool Model: M&W
 Calibration Performed: MON APR 16 10:30:30 2018

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	
Tool Model:	M&W	
Calibration Performed:	Mon Jan 15 11:20:44 2018	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.6000	GAPI/cps



PIONEER

Pioneer Energy Services

Company	RICHLAND OIL INVESTMENTS, LLC
Well	MICHAELIS #25-1
Field	WILDCAT
County	LOGAN
State	KANSAS