PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company COBALT ENERGY, LLC
Well CHEYENNE 'A' #1-4
Field CHEYENNE
County BARTON State KANSAS

Location: API #: 15-009-26245-00-00
552' FSL & 338' FWL
SEC 4 TWP 19S RGE 12W

Other Services: CNL/CDL, MEL

Permanent Datum: GROUND LEVEL Elevation 1811'
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

Elevation: K.B. 1816', D.F. N/A, G.L. 1811'

Date	1/15/2019				
Run Number	ONE				
Depth Driller	3460'				
Depth Logger	3459'				
Bottom Logged Interval	3458'				
Top Log Interval	300'				
Casing Driller	8.625" @ 346'				
Casing Logger	346'				
Bit Size	7.875"				
Type Fluid in Hole	CHEMICAL				
Salinity,ppm CL	12800				
Density / Viscosity	9.2	50			
pH / Fluid Loss	9.5	11.2			
Source of Sample	FLOWLINE				
Rm @ Meas. Temp	.25 @ 62				
Rmf @ Meas. Temp	.19 @ 62				
Rmc @ Meas. Temp	.34 @ 62				
Source of Rmf / Rmc	CHARTS				
Rm @ BHT	.14 @ 111				
Operating Rig Time	2 HOURS				
Max Rec. Temp. F	111 DEG/F				
Equipment Number	108				
Location	HAYS				
Recorded By	J. HENRICKSON				
Witnessed By	BOB O'DELL				

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Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

GREAT BEND KANSAS
NORTH ON HWY 156 TO NE 40TH, 1/2 WEST,
1/8 NORTH, EAST INTO

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

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

Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: J. HENRICKSON	Primary Witness: BOB O'DELL
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

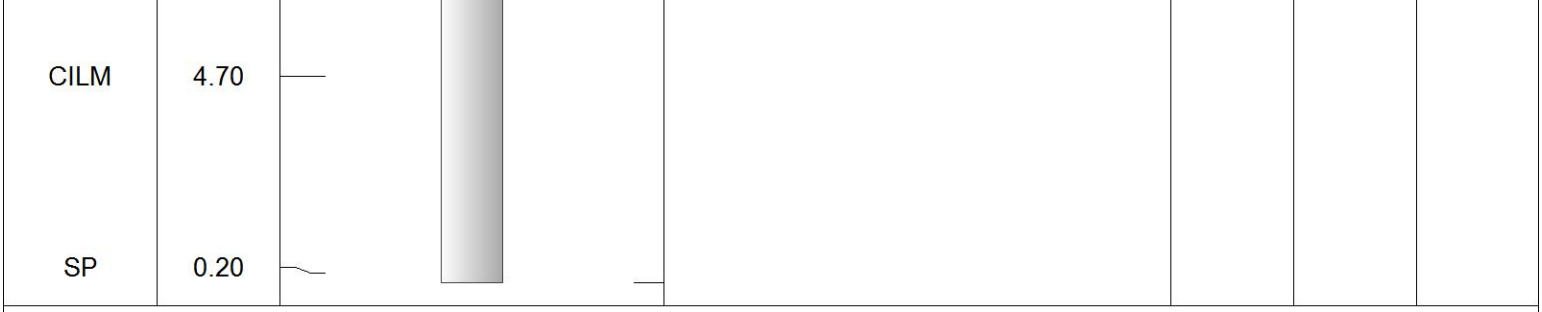
DatabaseC:\ProgramData\Warrior\Data\cobalt_cheyenne_a_1_4.db
Dataset field/well/stackml/pass3.1/_vars_

Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	111	5.5	0	1	2	2.71

NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	28	42	Off	3459

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			GR-M&W (89-M&W)	3.00	3.50	50.00
GR	40.58					
CNLSC	37.48		CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	36.73					
			CDL-M&W (934-5002)	8.50	4.00	250.00
LSD	28.43					
DCAL	28.42					
SSD	27.93					
			ML-PSI STKBL ML (PSI-01) Stackable Microlog Tools	7.58	4.00	65.00
MCAL	19.83					
MI	19.83					
MN	19.83					
RLL3	15.80					
RLL3F	15.79					
			DIL-M&W (PSI 988)	18.50	3.50	220.00
CILD	8.00					



Dataset: cobalt_cheyenne_a_1_4.db: field/well/stackml/pass3.1
Total length: 43.08 ft
Total weight: 685.00 lb
O.D.: 4.00 in

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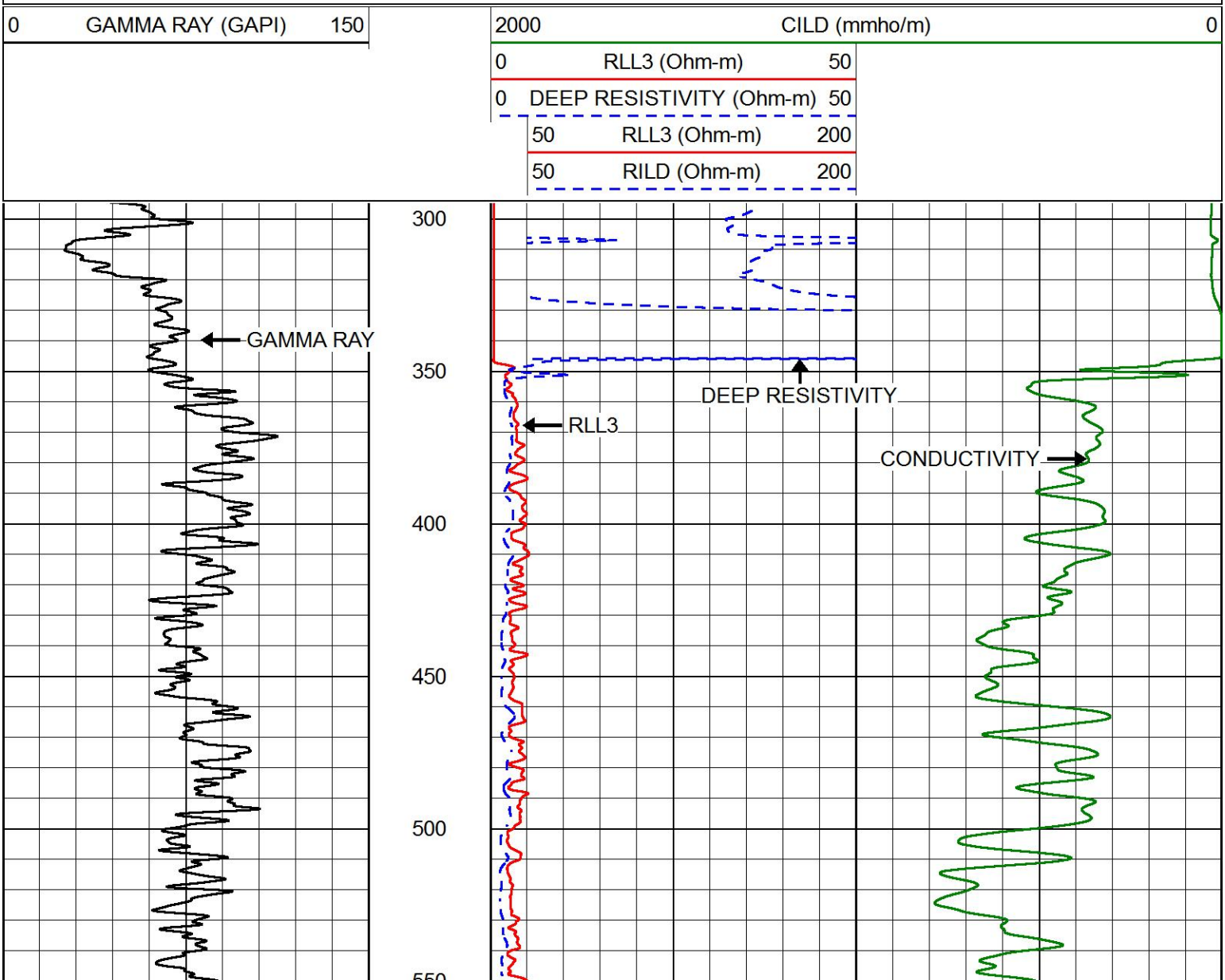
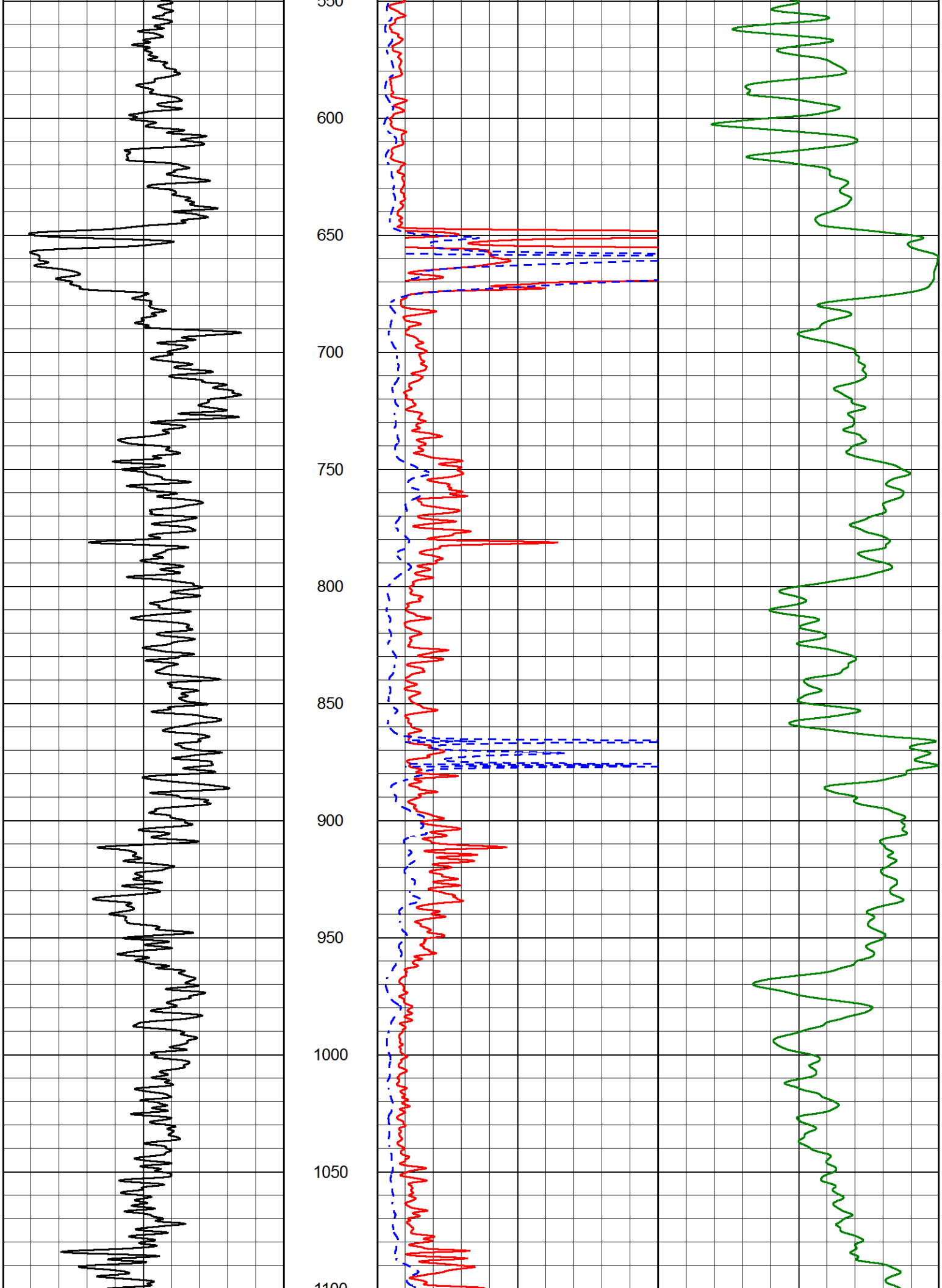
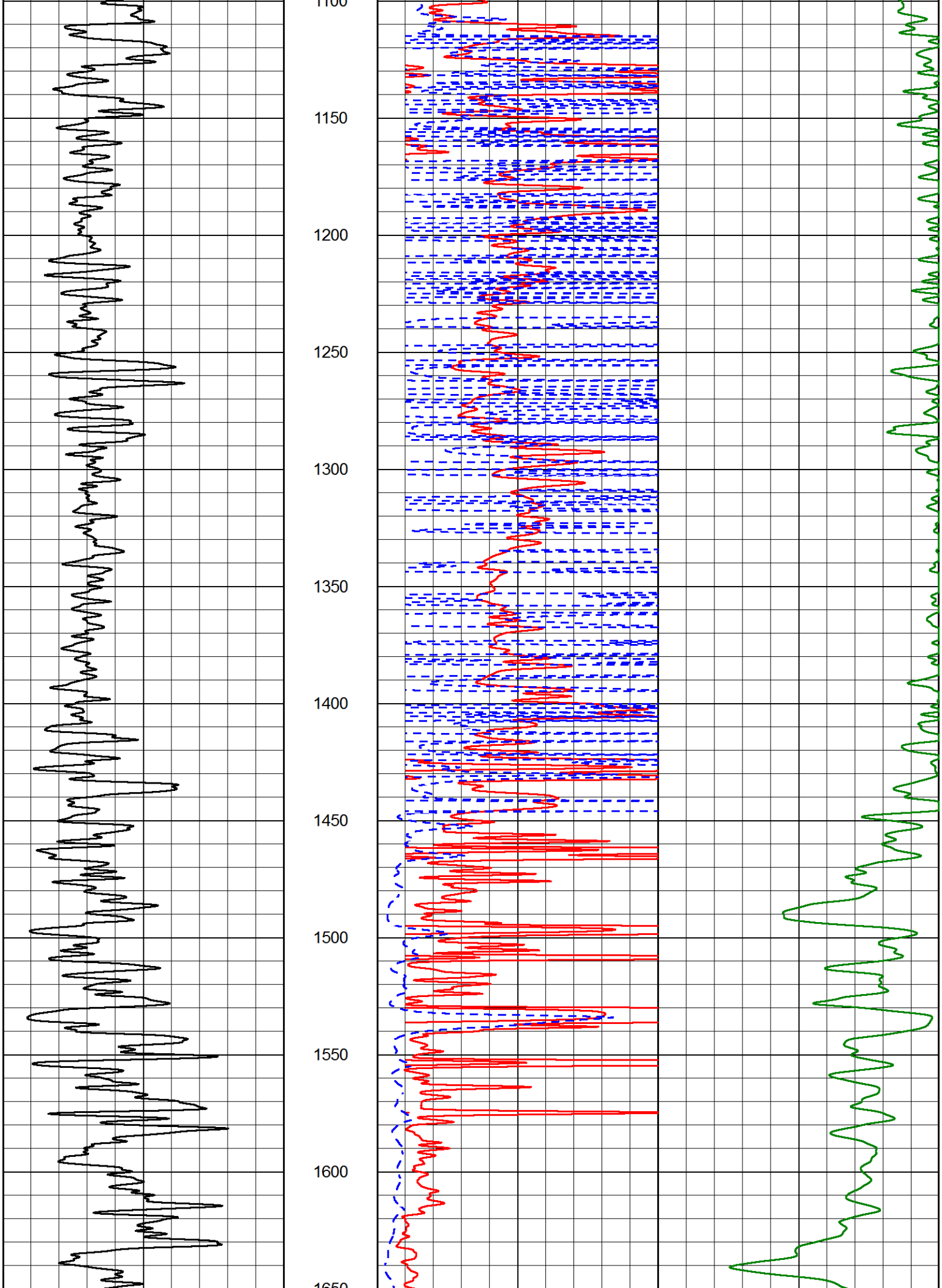
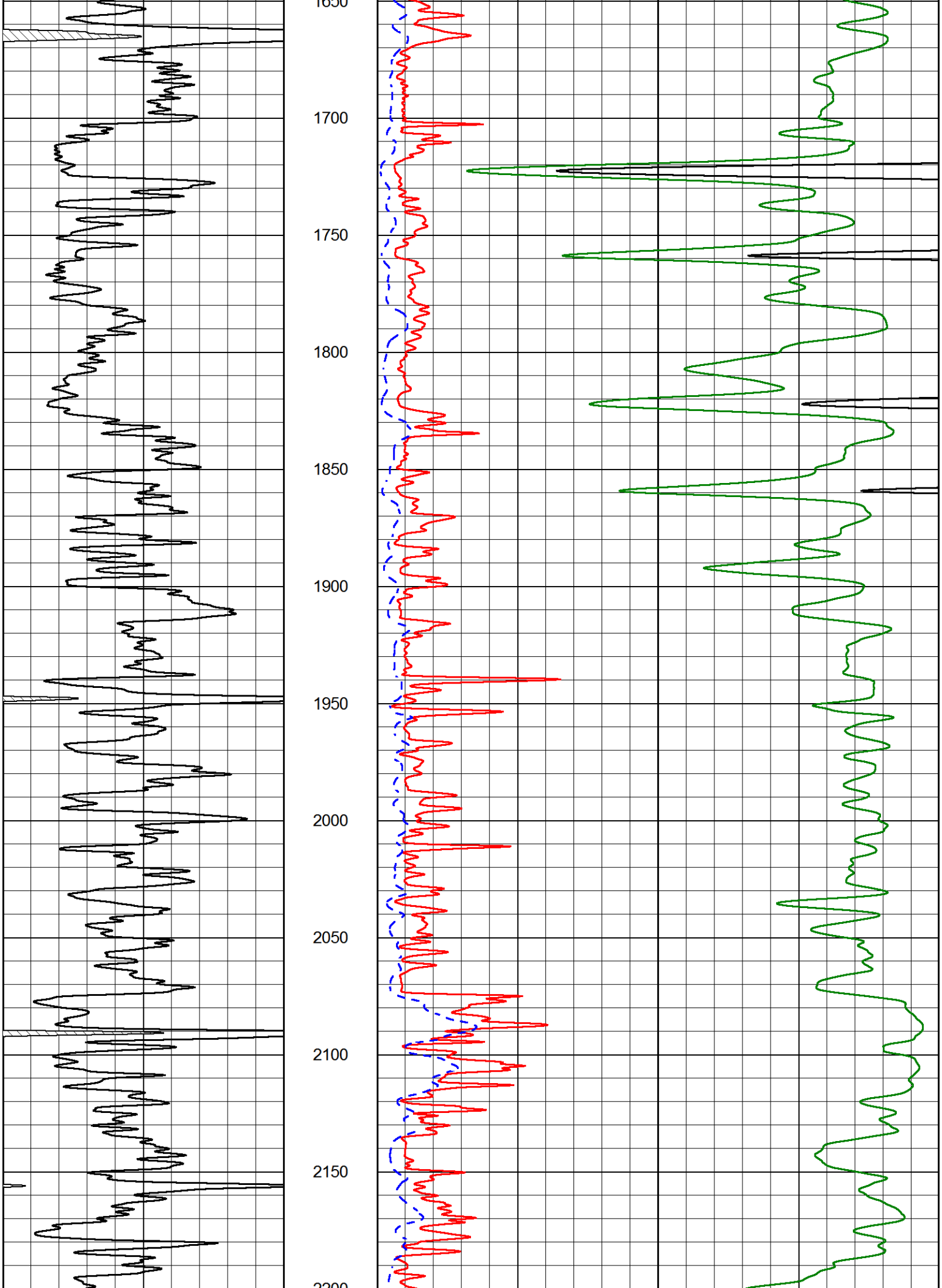
MAIN PASS

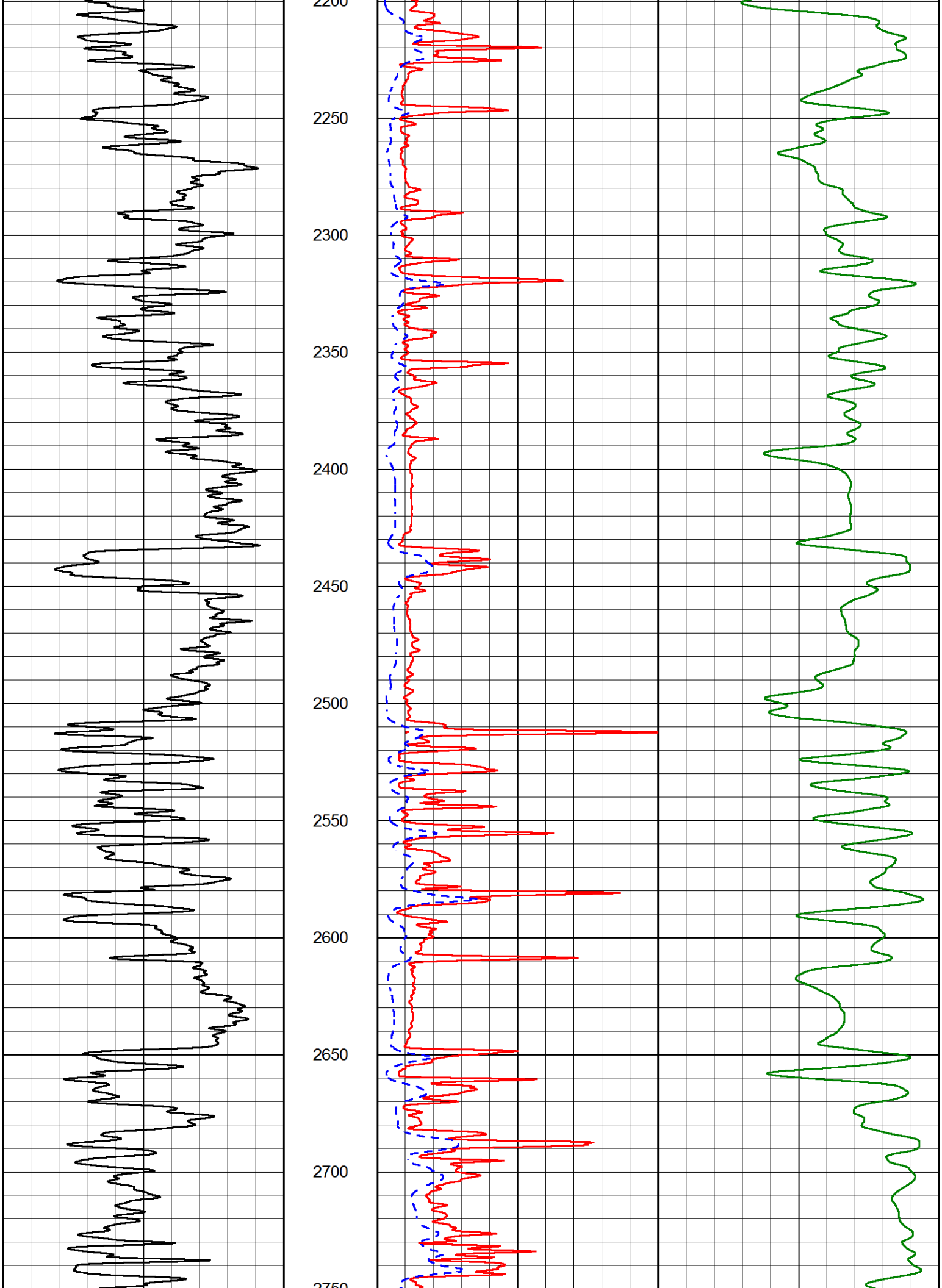
Database File	cobalt_cheyenne_a_1_4.db
Dataset Pathname	stackml/pass3.1
Presentation Format	dil2in
Dataset Creation	Tue Jan 15 11:32:58 2019
Charted by	Depth in Feet scaled 1:600

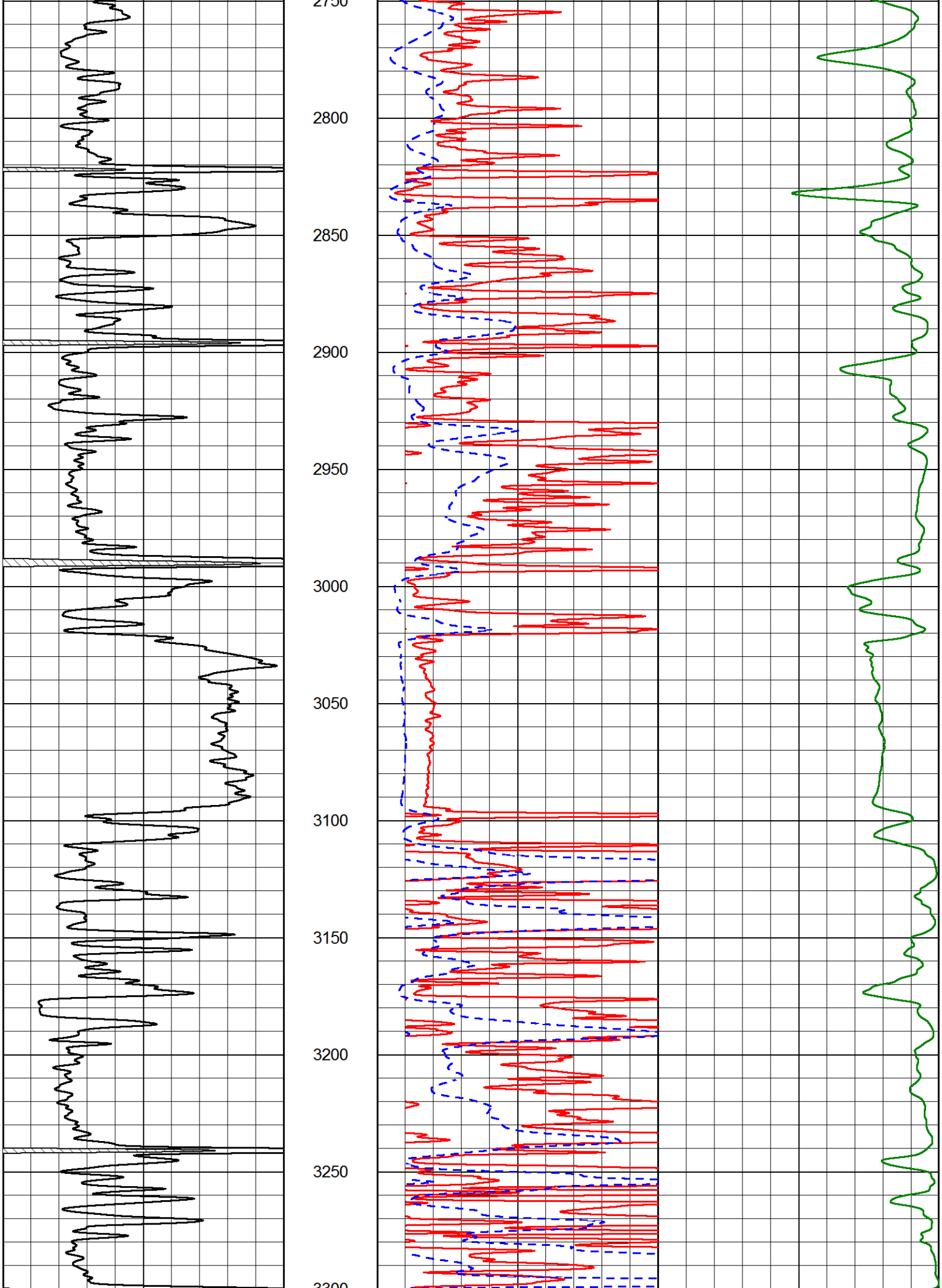


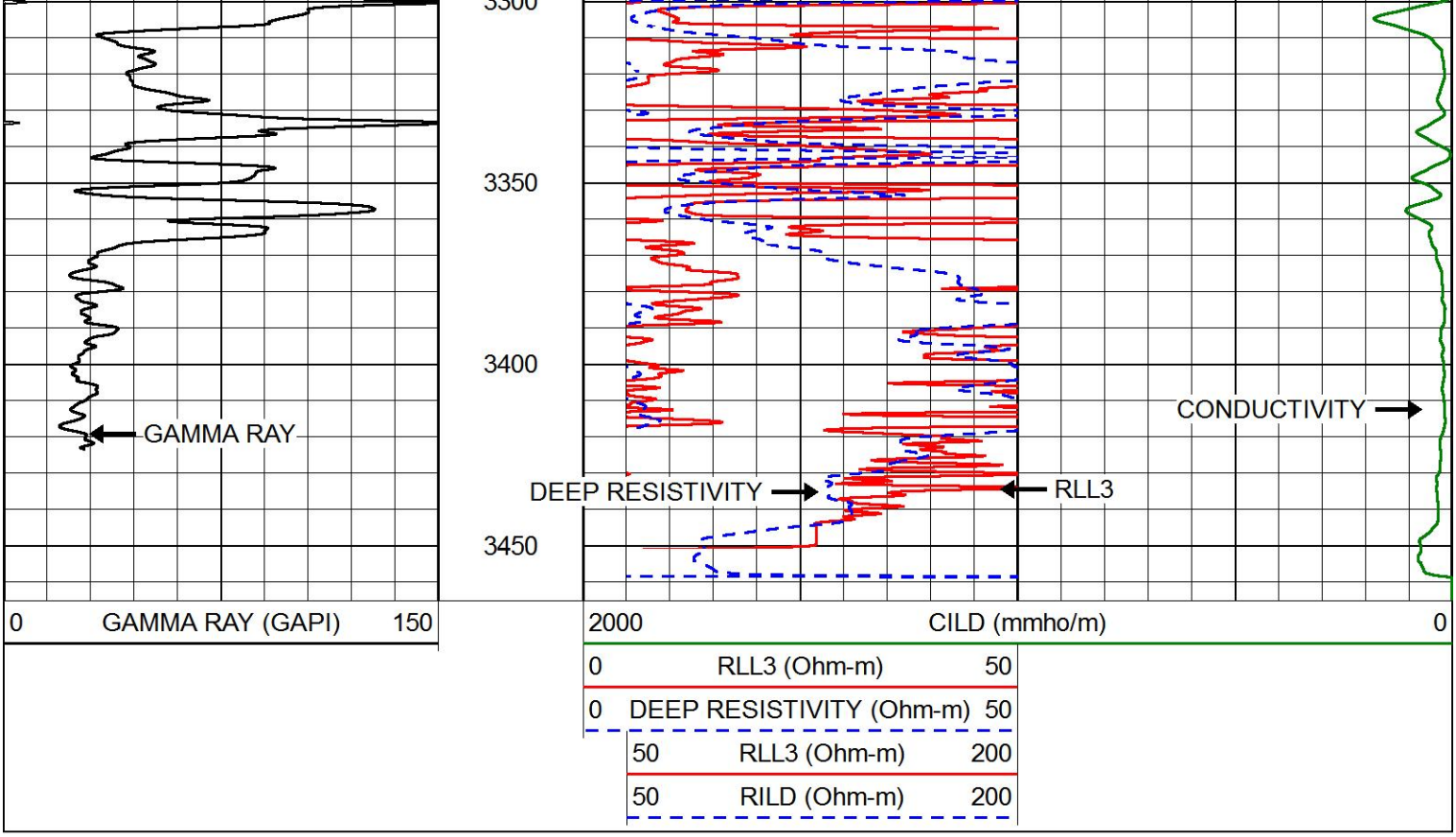

550
600
650
700
750
800
850
900
950
1000
1050
1100


1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650


1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150
2200


2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
2700
2750


2750
2800
2850
2900
2950
3000
3050
3100
3150
3200
3250



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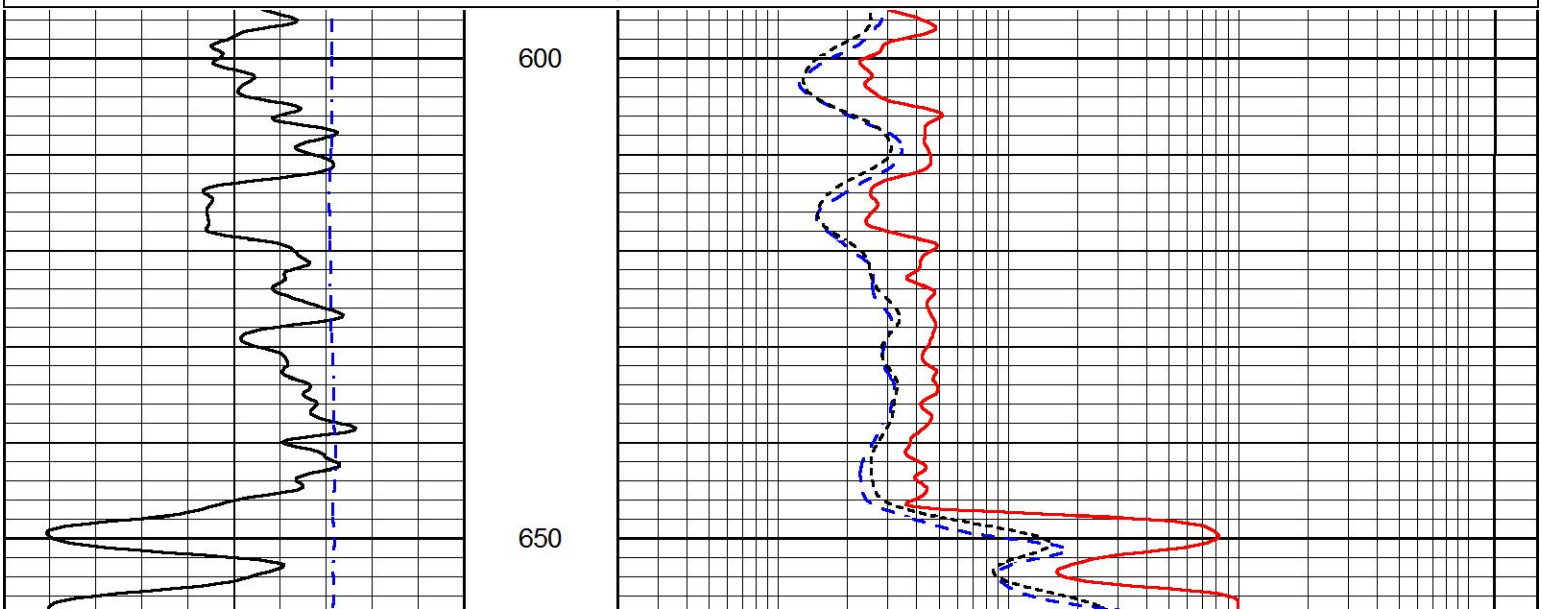
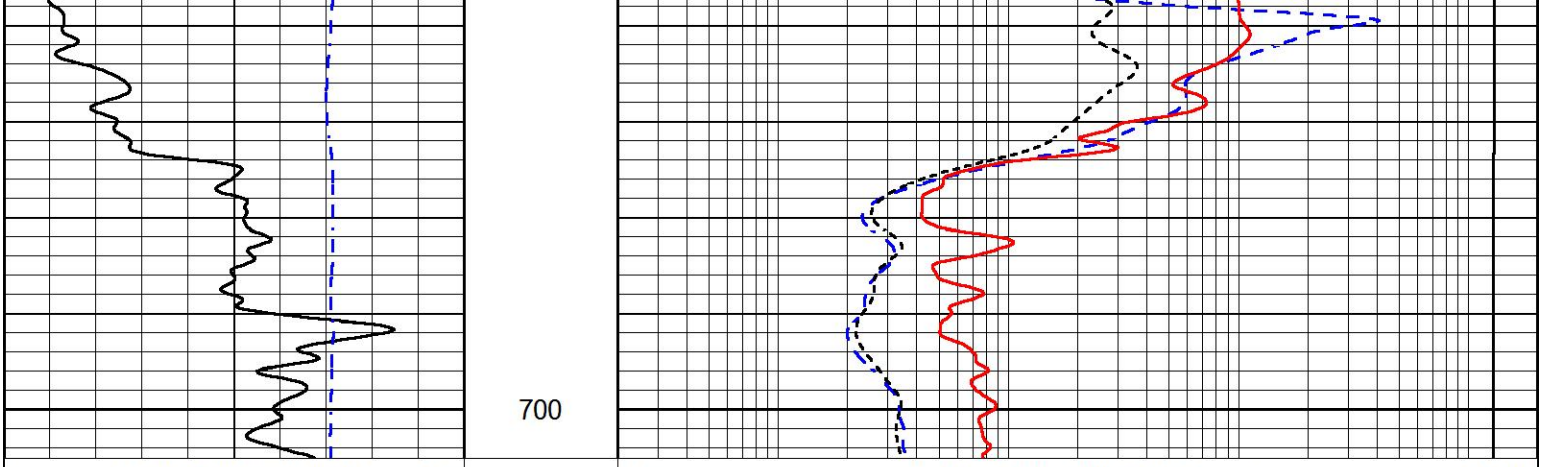
MAIN PASS

Database File	cobalt_cheyenne_a_1_4.db
Dataset Pathname	stackml/pass3.1
Presentation Format	dil
Dataset Creation	Tue Jan 15 11:32:58 2019
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
15000	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
15000	LINE TENSION (lb)	0

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Database File	cobalt_cheyenne_a_1_4.db
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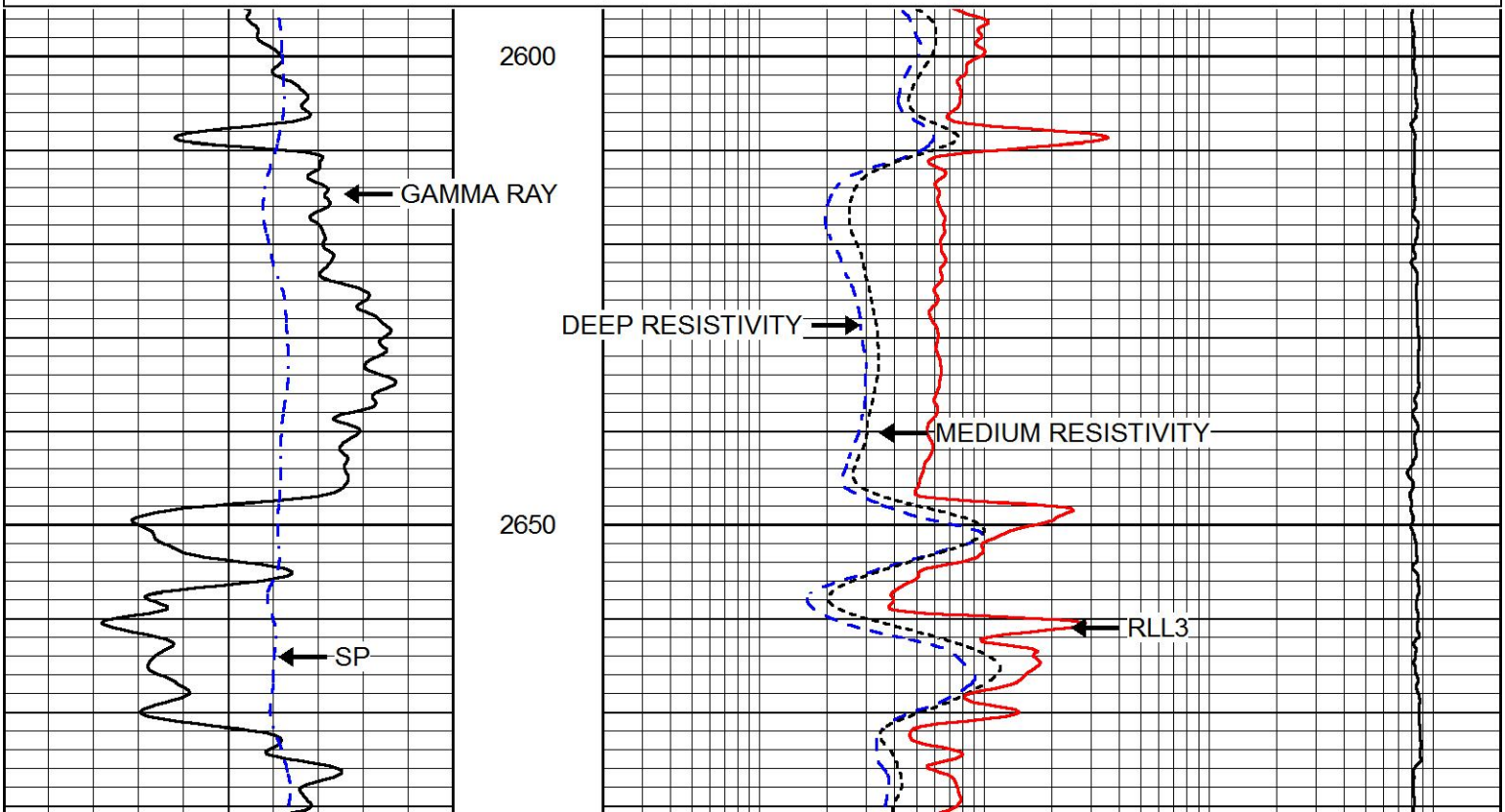
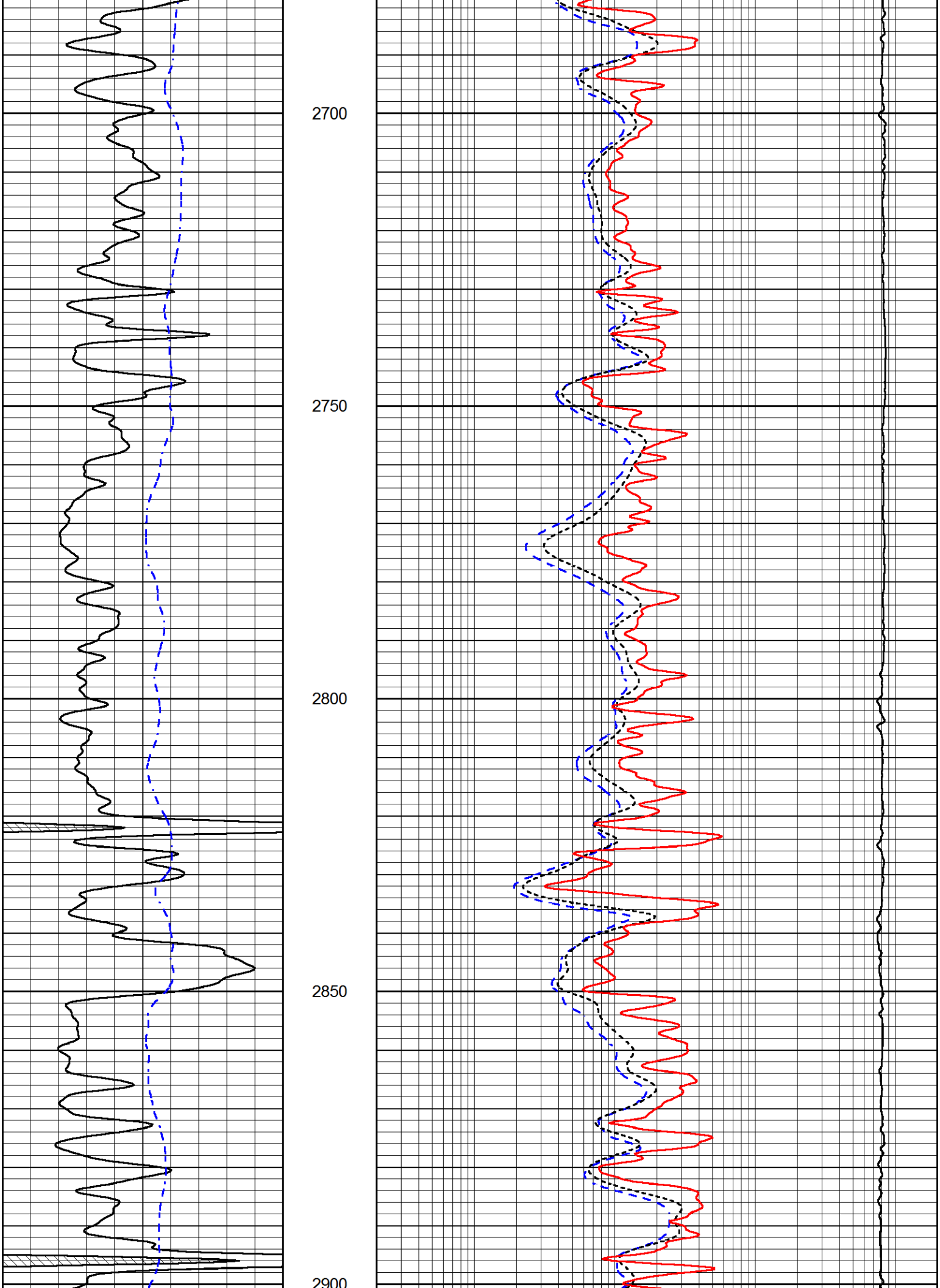
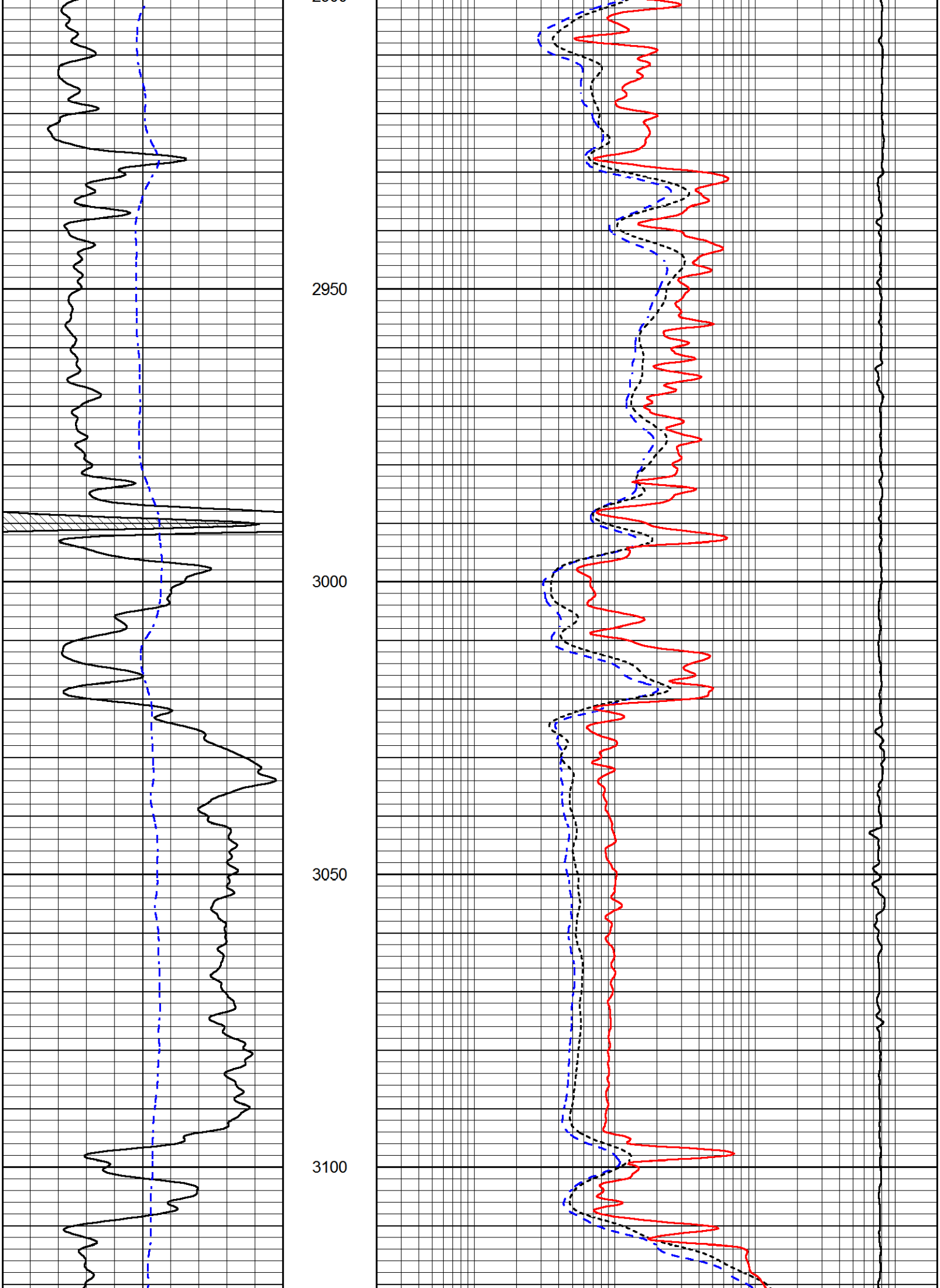
Presentation Format	dil
Dataset Creation	Tue Jan 15 11:32:58 2019
Charted by	Depth in Feet scaled 1:240

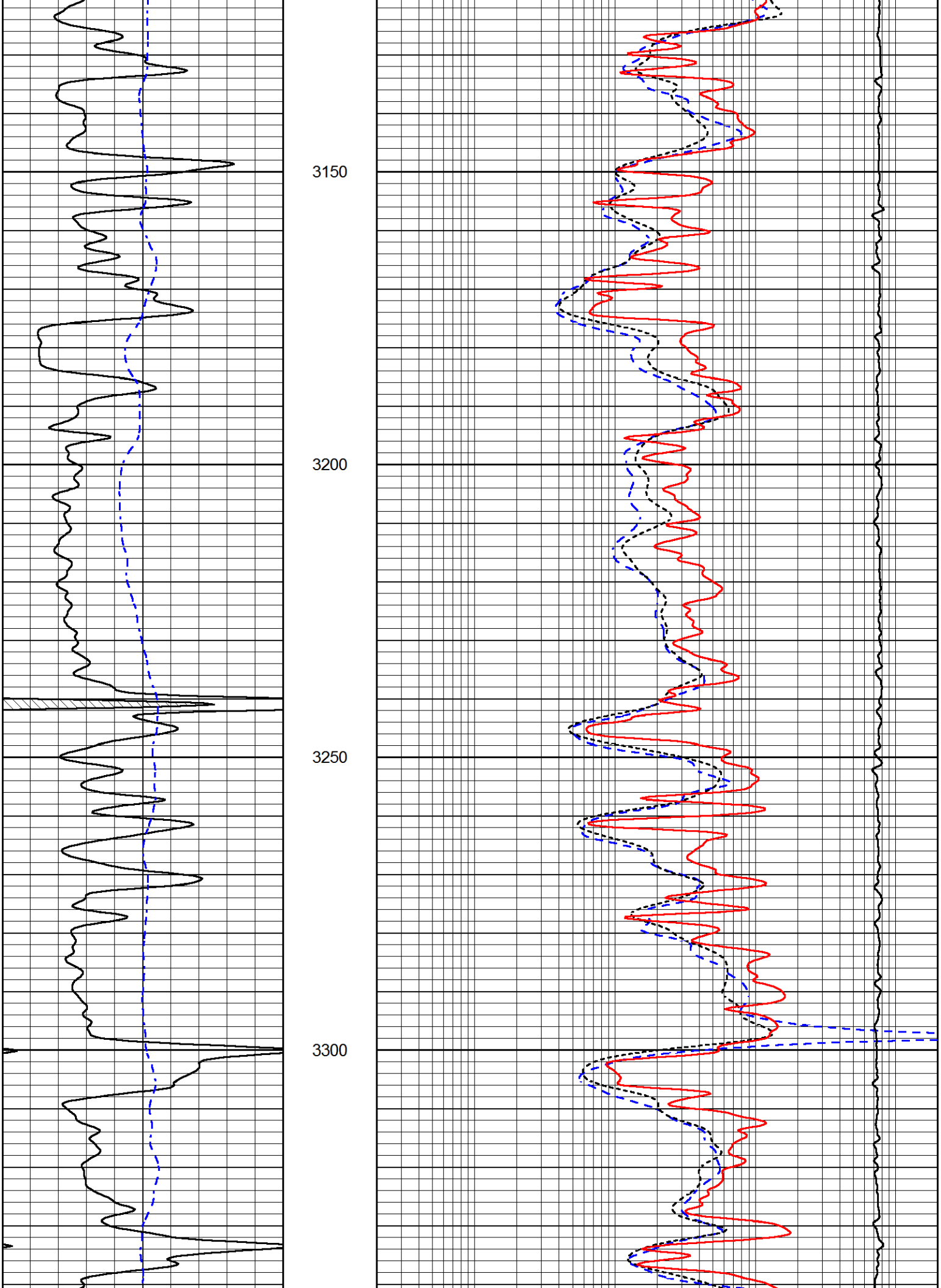
0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

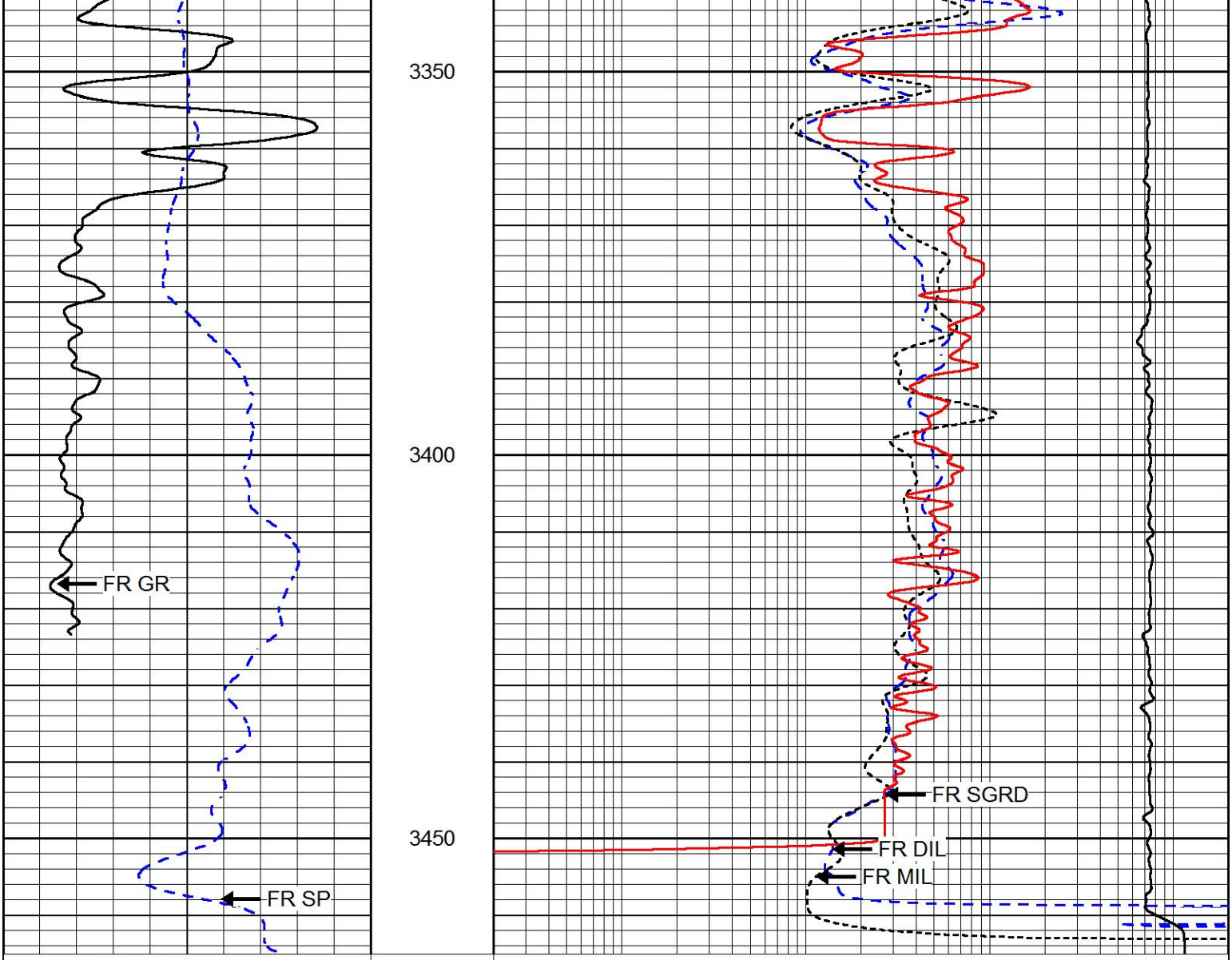
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0




2700
2750
2800
2850
2900


2950
3000
3050
3100


3150
3200
3250
3300



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
15000	LINE TENSION (lb)	0

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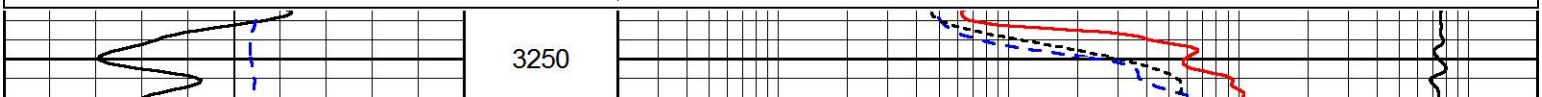
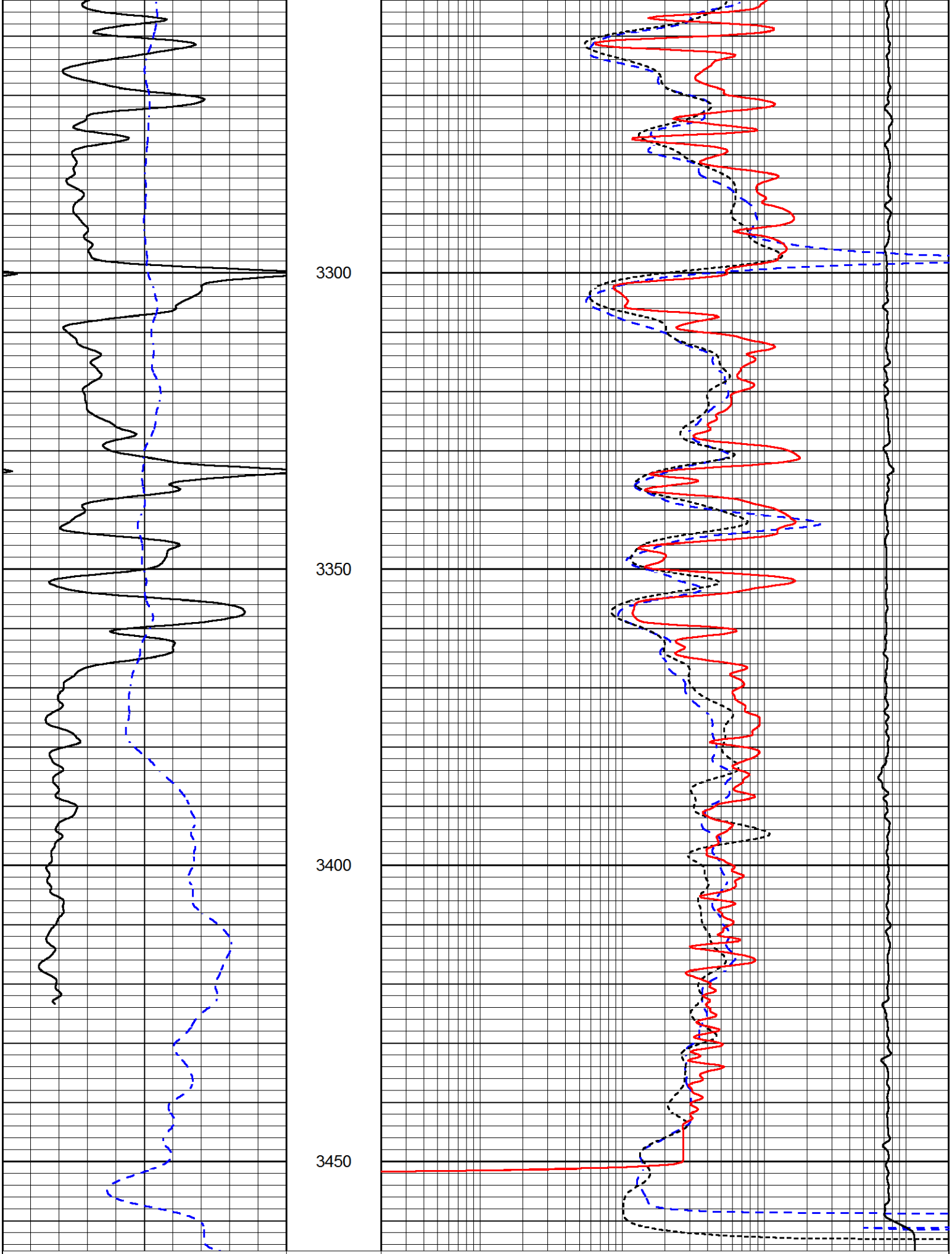
REPEAT SECTION

Database File	cobalt_cheyenne_a_1_4.db
Dataset Pathname	stackml/pass2.1
Presentation Format	dil
Dataset Creation	Tue Jan 15 11:33:19 2019
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
15000	LINE TENSION (lb)	0




3300
3350
3400
3450
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
15000	LINE TENSION (lb)	0

Calibration Report

Database File	cobalt_cheyenne_a_1_4.db
Dataset Pathname	stackml/pass3.1
Dataset Creation	Tue Jan 15 11:32:58 2019

Dual Induction Calibration Report

Serial-Model:	PSI 988-M&W
Calibration Performed:	Tue Nov 20 10:50:19 2018

	Readings		References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.540	-44.000
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.380	-17.000

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	52000.0000	-1.2000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	52500.0000	-0.9000
Caliper	1.0001	1.1397	6.5000	18.5000	in	86.0000	-82.6000

Compensated Density Calibration Report

Serial-Model:	934-5002-M&W
Source / Verifier:	/
Master Calibration Performed:	Wed Aug 29 11:03:55 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	3720.16	2661.79	cps
Aluminum	2.675	g/cc	696.57	1725.83	cps

Spine Angle = 75.50

Density/Spine Ratio = 0.532

	Size		Reading
Small Ring	4.00	in	1.16
Large Ring	14.00	in	1.01

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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Company	COBALT ENERGY, LLC
Well	CHEYENNE 'A' #1-4
Field	CHEYENNE
County	BARTON
State	KANSAS