



PIONEER
Pioneer Energy Services

MICRORESISTIVITY LOG

Company COBALT ENERGY, LLC		Company COBALT ENERGY, LLC
Well CHEYENNE 'A' #1-4		Well CHEYENNE 'A' #1-4
Field CHEYENNE		Field CHEYENNE
County BARTON		County BARTON
State KANSAS		State KANSAS
Location: API #: 15-009-26245-00-00		Other Services
552' FSL & 338' FWL		CNL/CDL DIL
SEC 4 TWP 19S RGE 12W		
Permanent Datum	GROUND LEVEL	Elevation 1811'
Log Measured From	KELLY BUSHING	K.B. 1816'
Drilling Measured From	KELLY BUSHING	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	2600'	
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 DEGF	
Equipment Number	108	
Location	HAYS	
Recorded By	J. HENRICKSON	
Witnessed By	BOB O'DELL	

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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.

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.pioneerres.com 785-625-3858

Your Pioneer Energy Services Crew

Engineer: J. HENRICKSON
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

Primary Witness: BOB O'DELL
Secondary Witness:
Secondary Witness:
Secondary Witness:

Top - Bottom

A	BOREID	BOTTEMP	CASEOD	CASETHCK	FLUIDDEN	M	MATRXDEN
1	in 7.875	degF 111	in 5.5	in 0	g/cc 1	2	g/cc 2.71
NPORSEL	PERFS	SNDERR	SNDERRM	SPSHIFT	SRFTEMP	SZCOR	TDEPTH
Limestone	0	mmho/m 0	mmho/m 0	mV 28	degF 42	Off	ft 3459

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

CILM

4.70

SP

0.20

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

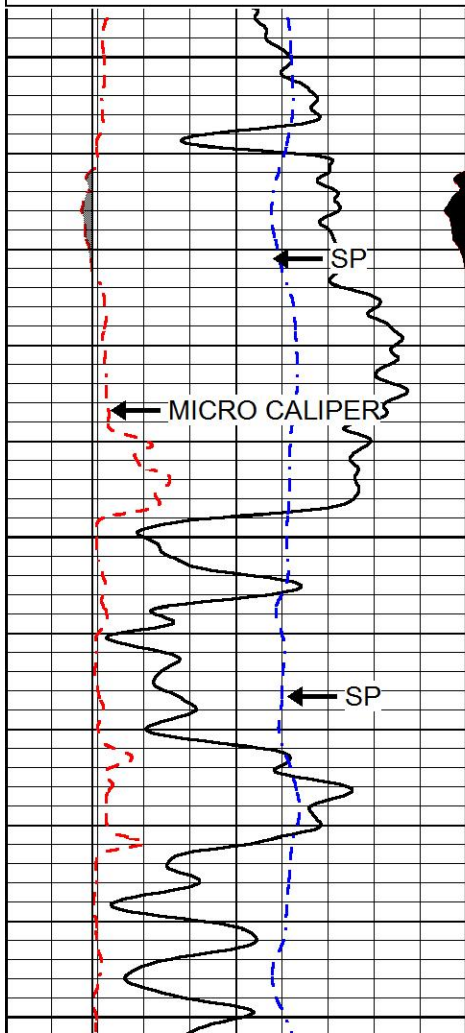


MAIN PASS

Database File cobalt_cheyenne_a_1_4.db
Dataset Pathname stackml/pass3.1
Presentation Format micro
Dataset Creation Tue Jan 15 11:32:58 2019
Charted by Depth in Feet scaled 1:240

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

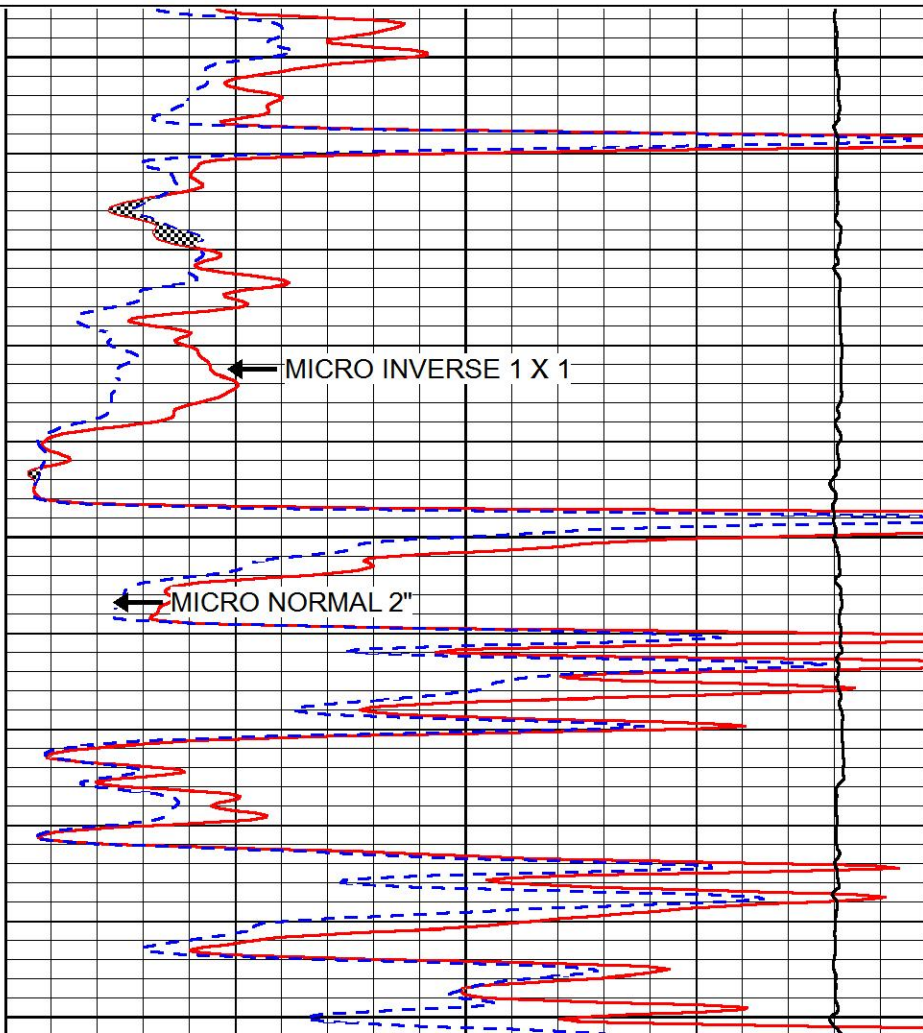
0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
15000	LINE TENSION (lb)	0

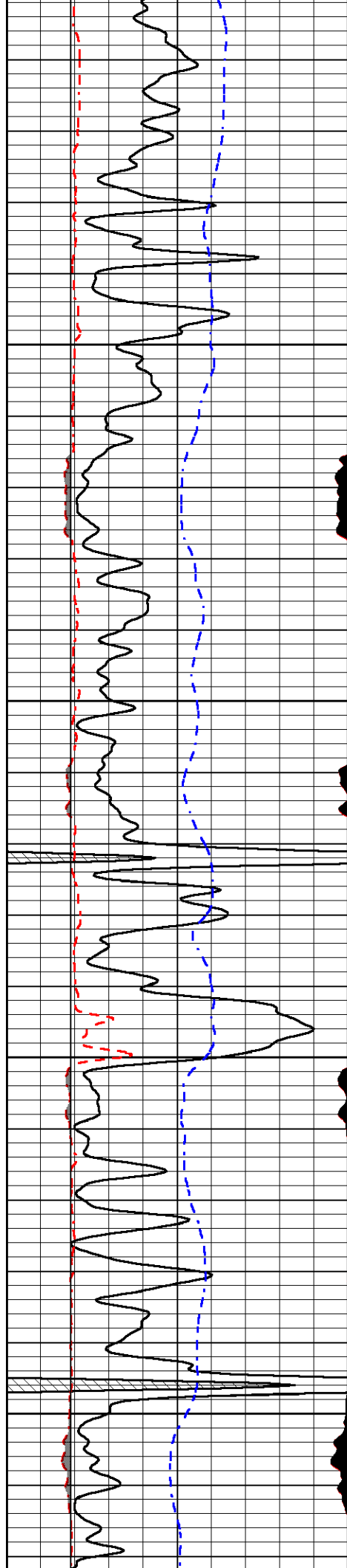


2600

2650

2700



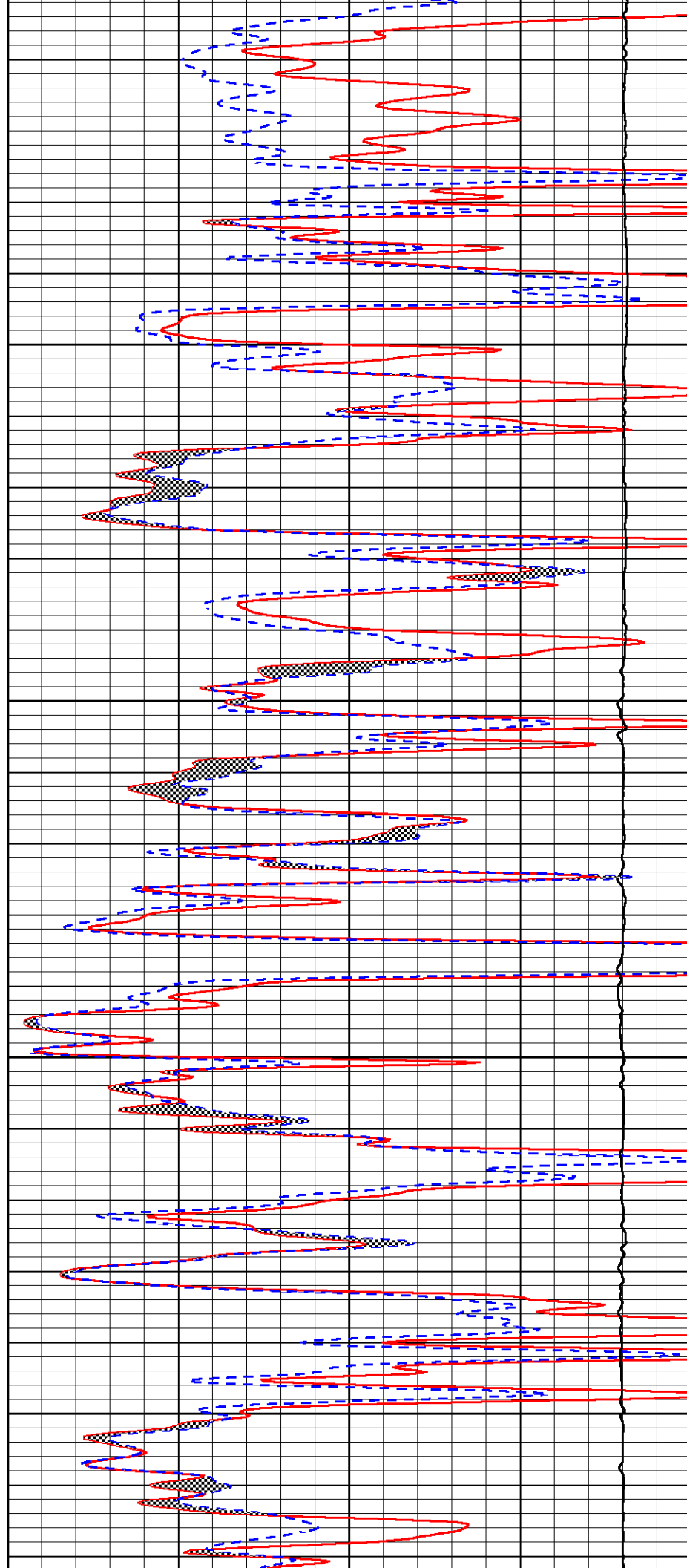


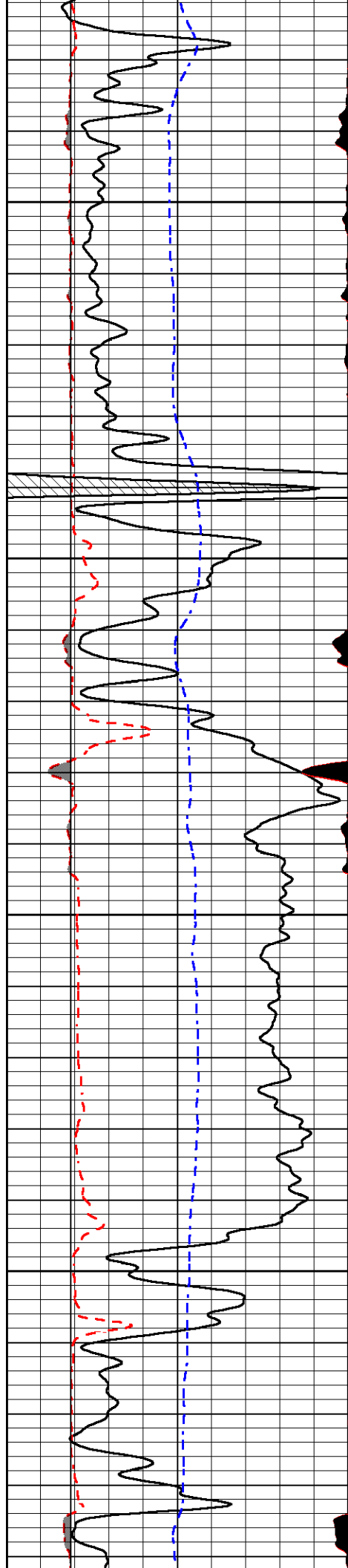
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2800

2850

2900



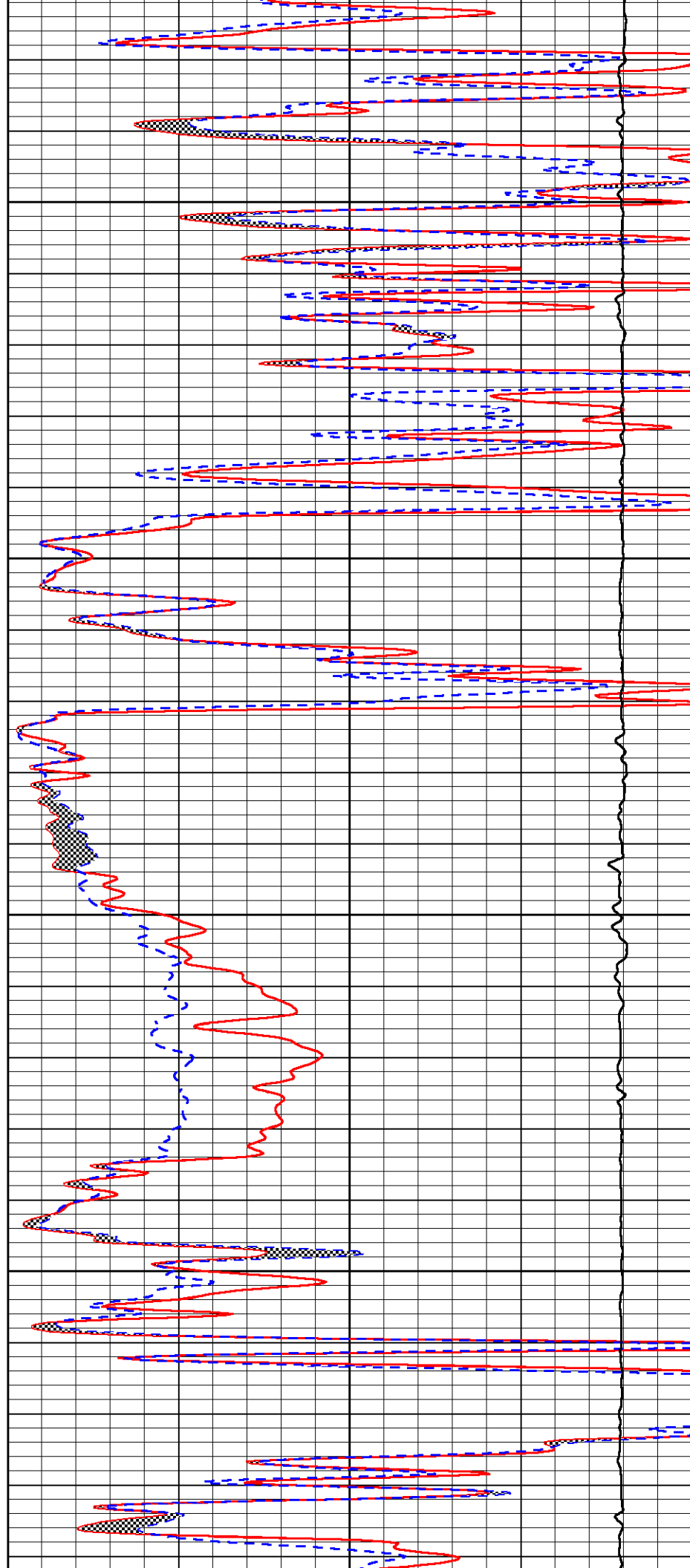


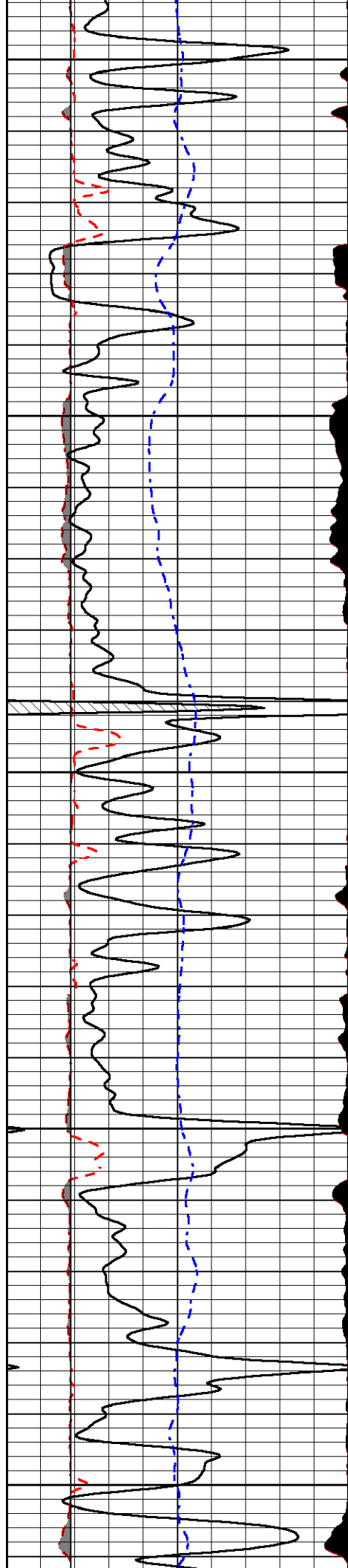
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3000

3050

3100





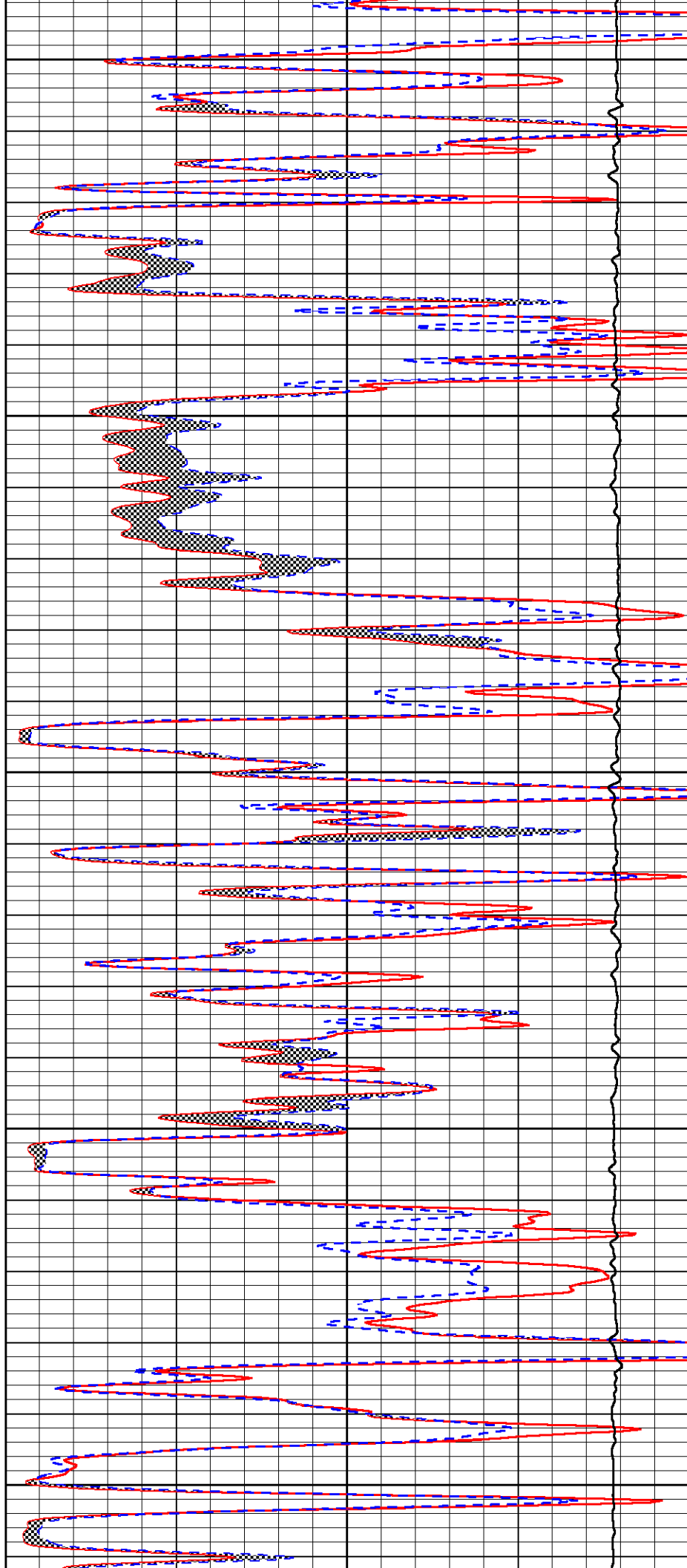
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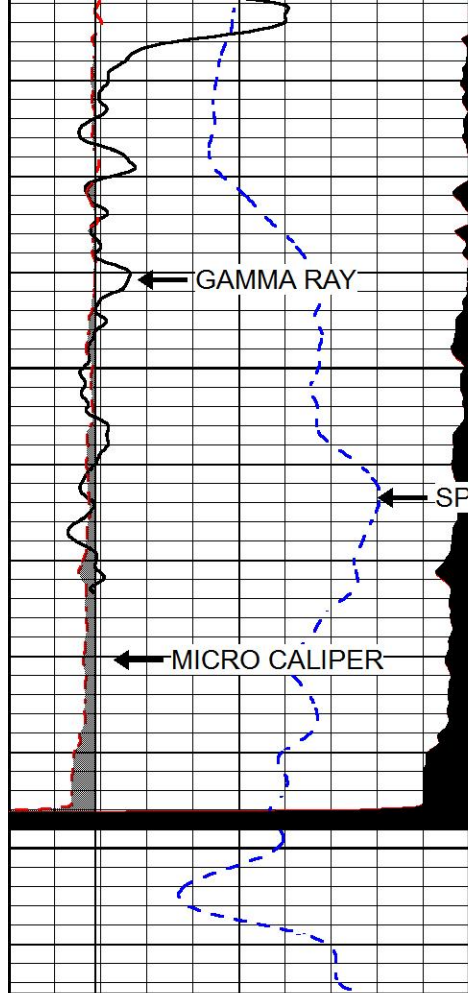
3200

3250

3300

3350

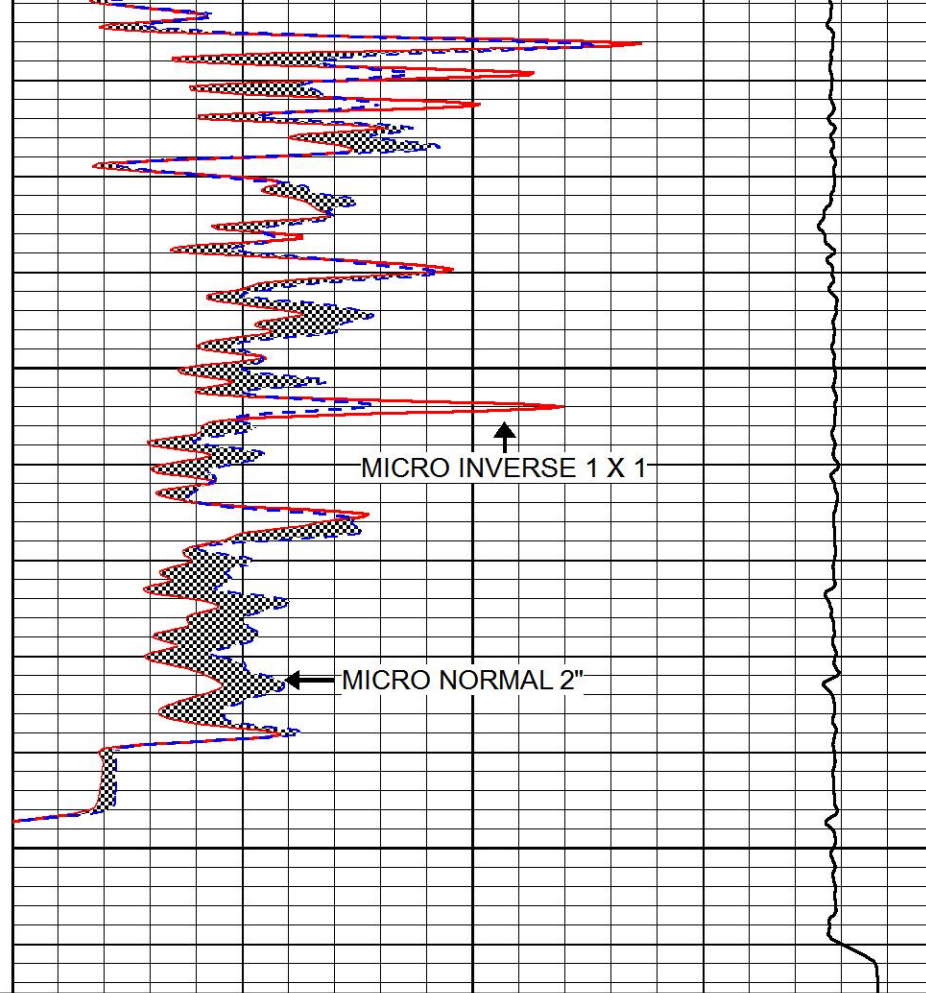




0	GAMMA RAY (GAPI)	150
6	MICRO CALIPER (in)	16
6	BIT SIZE (in)	16
-200	SP (mV)	0

3400

3450



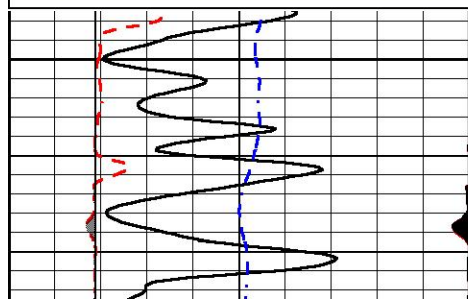
0	MICRO INVERSE 1 X 1 (Ohm-m)	40
0	MICRO NORMAL 2" (Ohm-m)	40
15000	LINE TENSION (lb)	0



REPEAT SECTION

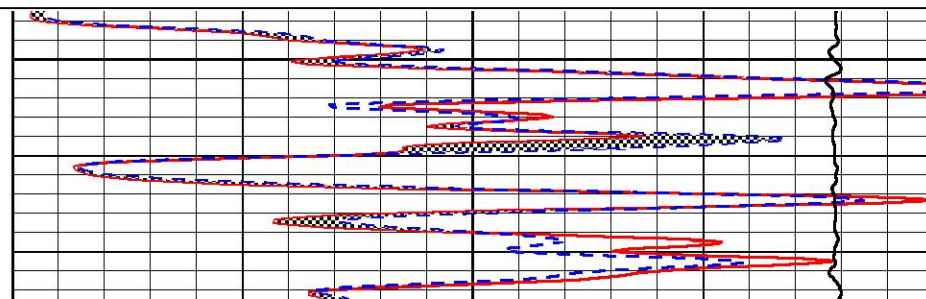
Database File cobalt_cheyenne_a_1_4.db
 Dataset Pathname stackml/pass2.1
 Presentation Format micro
 Dataset Creation Tue Jan 15 11:33:19 2019
 Charted by Depth in Feet scaled 1:240

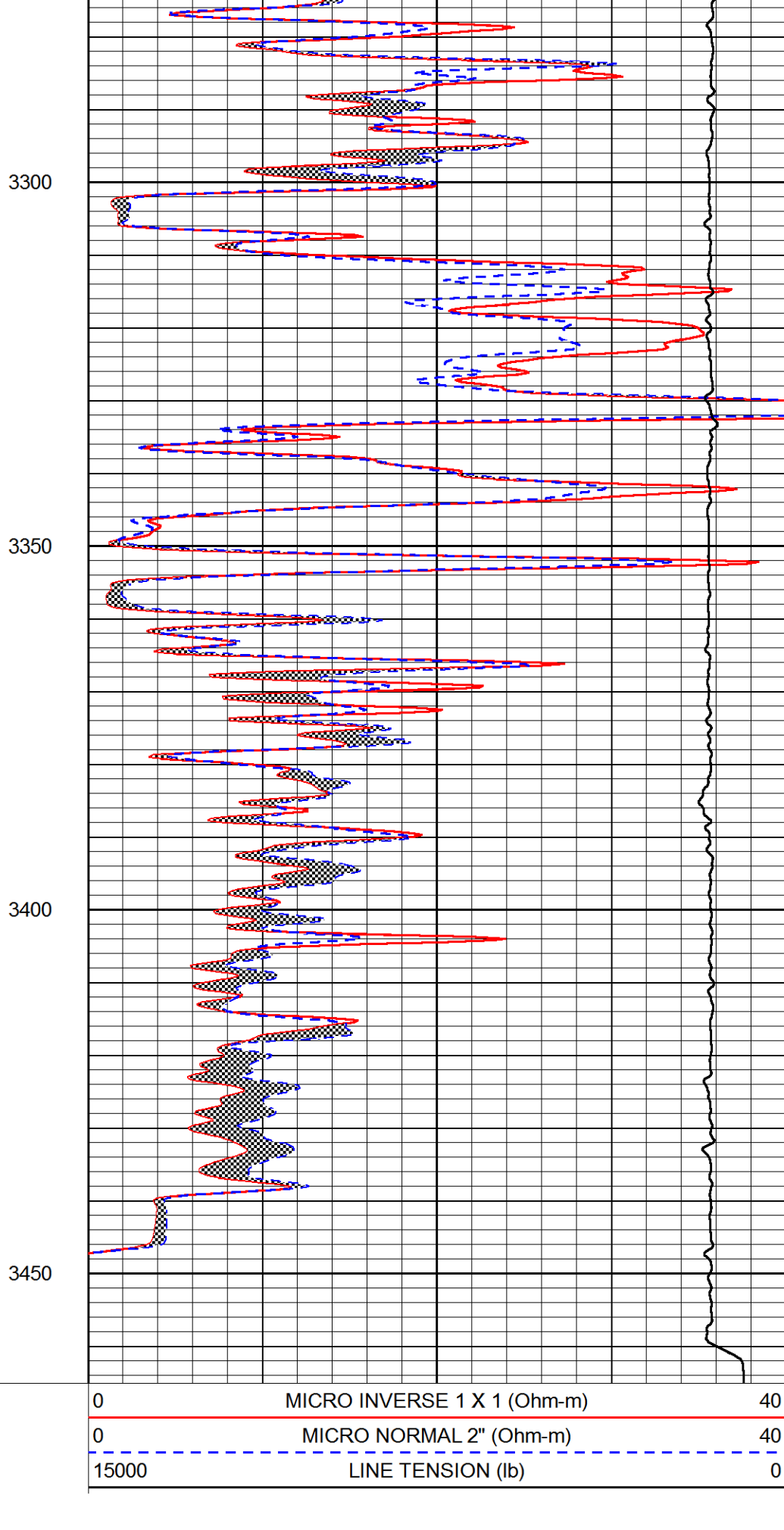
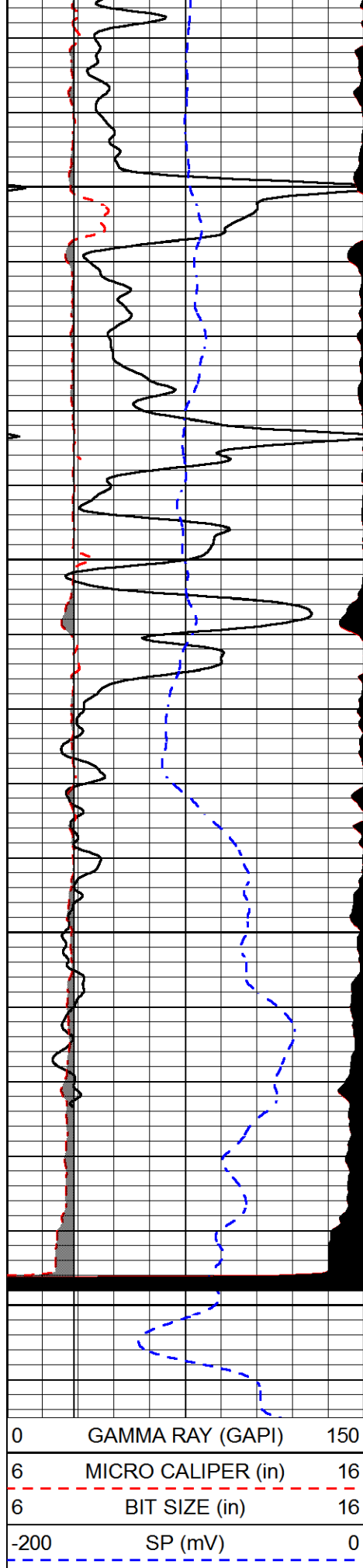
0	GAMMA RAY (GAPI)	150
6	MICRO CALIPER (in)	16
6	BIT SIZE (in)	16
-200	SP (mV)	0



3250

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





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

Calibration Report

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
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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