

HALLIBURTON

MICRO LOG

CULBREATH OIL & GAS COMPANY INC

BREEDEN 1-30

MORLAND-KANACO

SHERIDAN

KANSAS

COMPANY
WELL
FIELD/BLOCK
COUNTY
STATE

COMPANY **CULBREATH OIL & GAS COMPANY INC**
WELL **BREEDEN 1-30**
FIELD/BLOCK **MORLAND-KANACO**
COUNTY **SHERIDAN**
STATE **KANSAS**

API No. 15-179-21452-00-00
Location (SHL) 2310' FNL & 2310' FWL
SE SE NW
LAT: 39.241774997 N
LONG: 100.26699298 W
Sect. 30 Twp. 9S Rge. 26W
Elev: 2651.0 ft
10.0 ft above perm. Datum

Other Services:
GTET
IDT
DSNT
SDLT
MICROLOG
BSAT
ACRT
Elev.: K.B. 2661.0 ft
D.F. 2661.0 ft
G.L. 2651.0 ft

Permanent Datum GL
Log measured from KB
Drilling measured from KB
Date 11-Aug-18
Run No. ONE

Depth - Driller 4160.0 ft
Depth - Logger 4160.0 ft
Bottom - Logged Interval 4122.0 ft
Top - Logged Interval 3500.0 ft
Casing - Driller 8.625 in @ 265.0 ft
Casing - Logger 263.0 ft
Bit Size 7.875 in @
Type Fluid in Hole Water Based Mud @
Density 9.20 g/cc 50.00 sl/qt
PH 9.50 pH 1.5 cphm
Source of Sample MUD PIT
Rm @ Meas. Temperature 1.19 ohmm @ 75.00 degF
Rmf @ Meas. Temperature 0.95 ohmm @ 75.00 degF
Rmc @ Meas. Temperature 1.43 ohmm @ 75.00 degF
Source Rmf Rmc MEAS MEAS
Rm @ BHT 0.84 ohmm @ 140.0 degF
Time Since Circulation 06:44 hr @
Time on Bottom 11-Aug-18 04:14
Max. Rec. Temperature 140.00 degF @ 4160.0 ft @
Equipment Location 12156883 EL RENO, OK
Recorded By SEAN WOLTEMATH
Witnessed By LARRY NICHOLSON HAROLD BELLERIVE

Fold here

Service Ticket No.: 905062355				API No.: 15-179-21452-00-00				PGM Version: WL INSITE R5.6.3 (Build 4)						
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES								
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole							
Depth-Driller														
Type Fluid in Hole														
Density	Viscosity													
Ph	Fluid Loss													
Source of Sample						RESISTIVITY EQUIPMENT DATA								
Rm @ Meas. Temp		@	@	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other						
Rmf @ Meas. Temp.		@	@	ONE	ACRT	N/A	ECEN	N/A						
Rmc @ Meas. Temp.		@	@		I-11830684									
Source Rmf	Rmc				S-11830728									
Rm @ BHT		@	@											
Rmf @ BHT		@	@											
Rmc @ BHT		@	@											
EQUIPMENT DATA														
GAMMA			ACOUSTIC			DENSITY			NEUTRON					
Run No.	ONE		Run No.	ONE		Run No.	ONE		Run No.	ONE				
Serial No.	11013113		Serial No.	12173982		Serial No.	11213308		Serial No.	11019641				
Model No.	GTET		Model No.	BSAT		Model No.	SDLT		Model No.	DSNT				
Diameter	3.625"		No. of Cent.	N/A		Diameter	5.5"		Diameter	3.625"				
Detector Model No.	GTET		Spacing	N/A		Log Type	GAM-GAM		Log Type	NEU-NEU				
Type	SCINT					Source Type	Cs-137		Source Type	Am241Be				
Length	8"		LSA [Y/N]			Serial No.	5475GW		Serial No.	DSN-436				
Distance to Source	10'		FWDA [Y/N]			Strength	1.78 Ci		Strength	15.0 Ci				
LOGGING DATA														
GENERAL			GAMMA			ACOUSTIC			DENSITY			NEUTRON		
Run No.	Depth	Speed	Scale	Scale	Matrix	Scale	Matrix	Scale	Matrix	Scale	Matrix			
	From	To	ft/min	L	R	L	R	L	R	L	R			
ONE	TD	CSC	REC	0	150	30	10	17.6 us/ft	30	10	2.71 g/cc			

ONE	TD	CSC	REC	0	150	30	10	17.6 us/ft	30	10	2.71 g/cc	30	10	LIME
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ONE	TD	CSG	REC	0	150	30	-10	47.0 us/ft	30	-10	2.77 g/cc	30	-10	LIML
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DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@
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Remarks:

GTET-IDT-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION
 ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING
 CHLORIDES REPORTED AT 2000 PPM

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

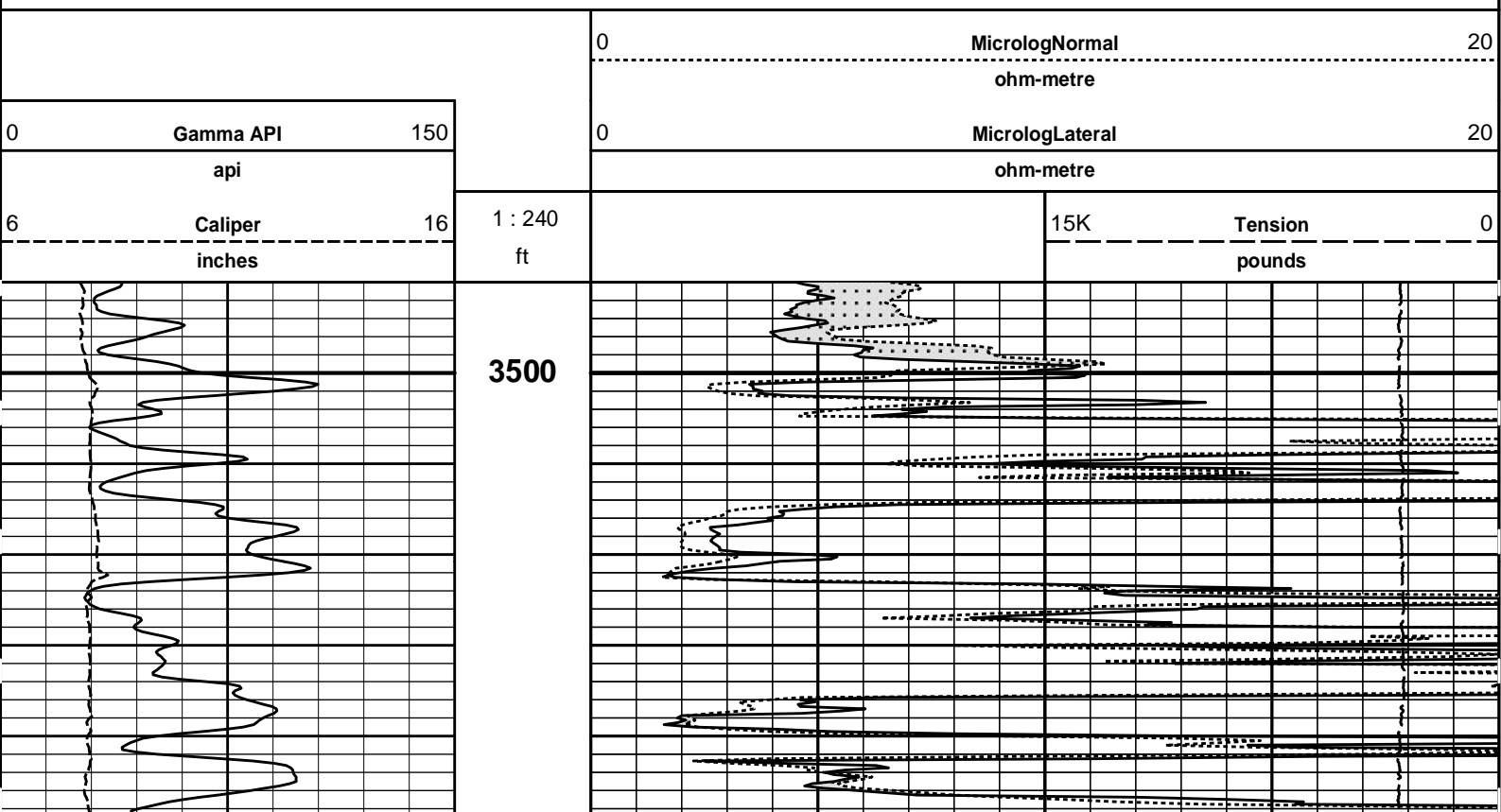
HALLIBURTON

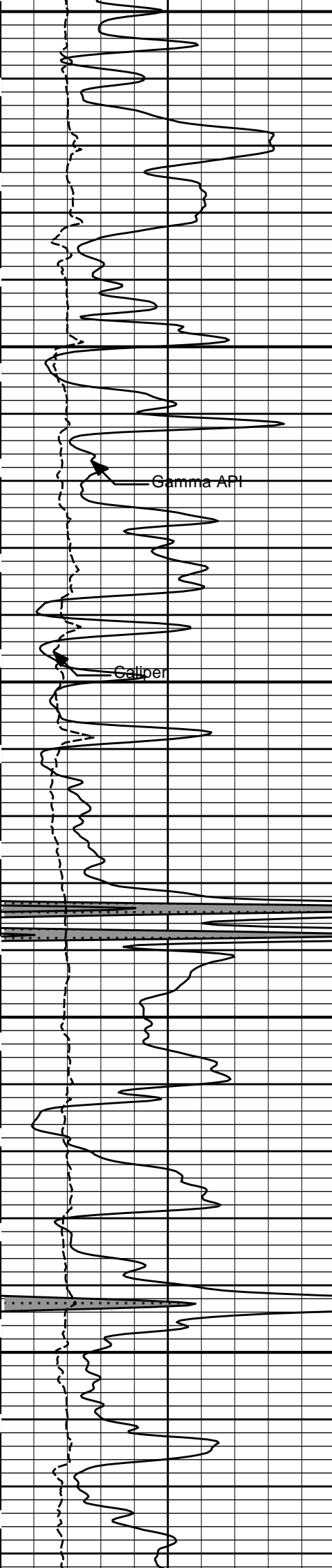
HALLIBURTON

Plot Time: 11-Aug-18 06:16:57
 Plot Range: 3490 ft to 4163.5 ft
 Data: CULBRTH_BREEDENWell Based\DETAILS\
 Plot File: \\LOCAL\CULBRTH_BREEDENWell Based\MICROLOG\Microlog_IQ_5_main

5 INCH MAIN LOG

MAIN LOG 5" PER 100'



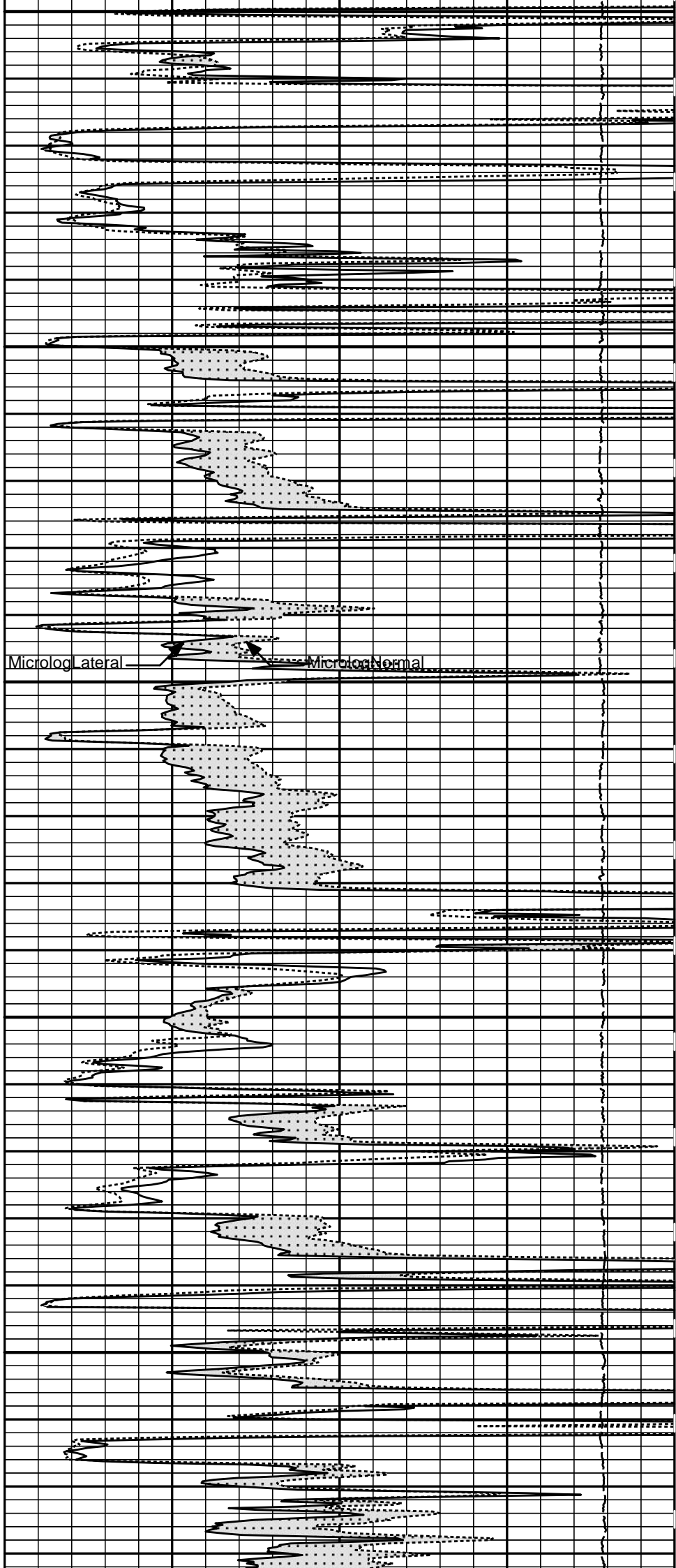


3600

Gamma API

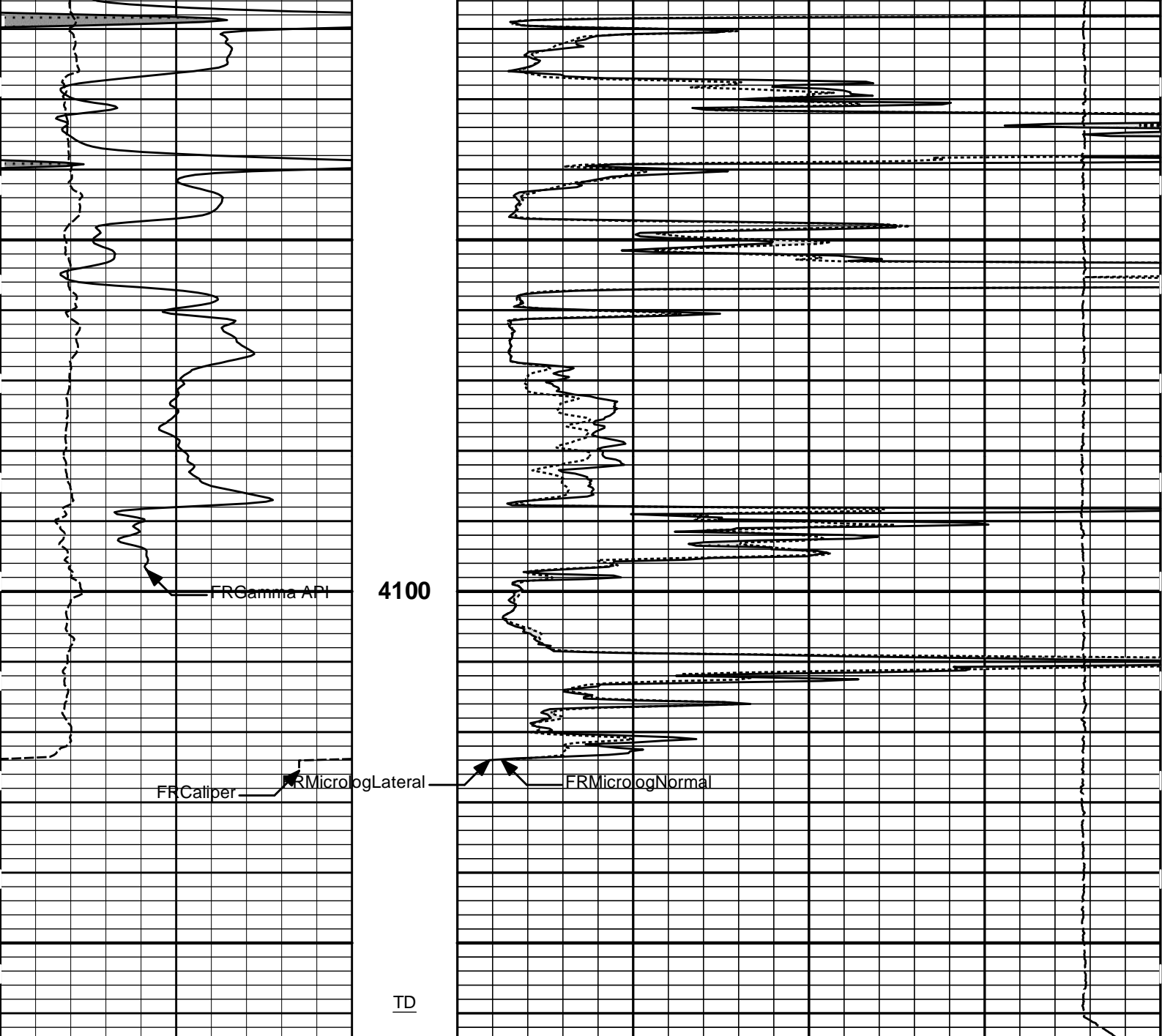
Caliper

3700



Microlog Lateral

Microlog Normal



6	Caliper	16	1 : 240	15K	Tension	0
	inches		ft		pounds	
0	Gamma API	150		0	MicrologLateral	20
	api				ohm-metre	
				0	MicrologNormal	20
					ohm-metre	

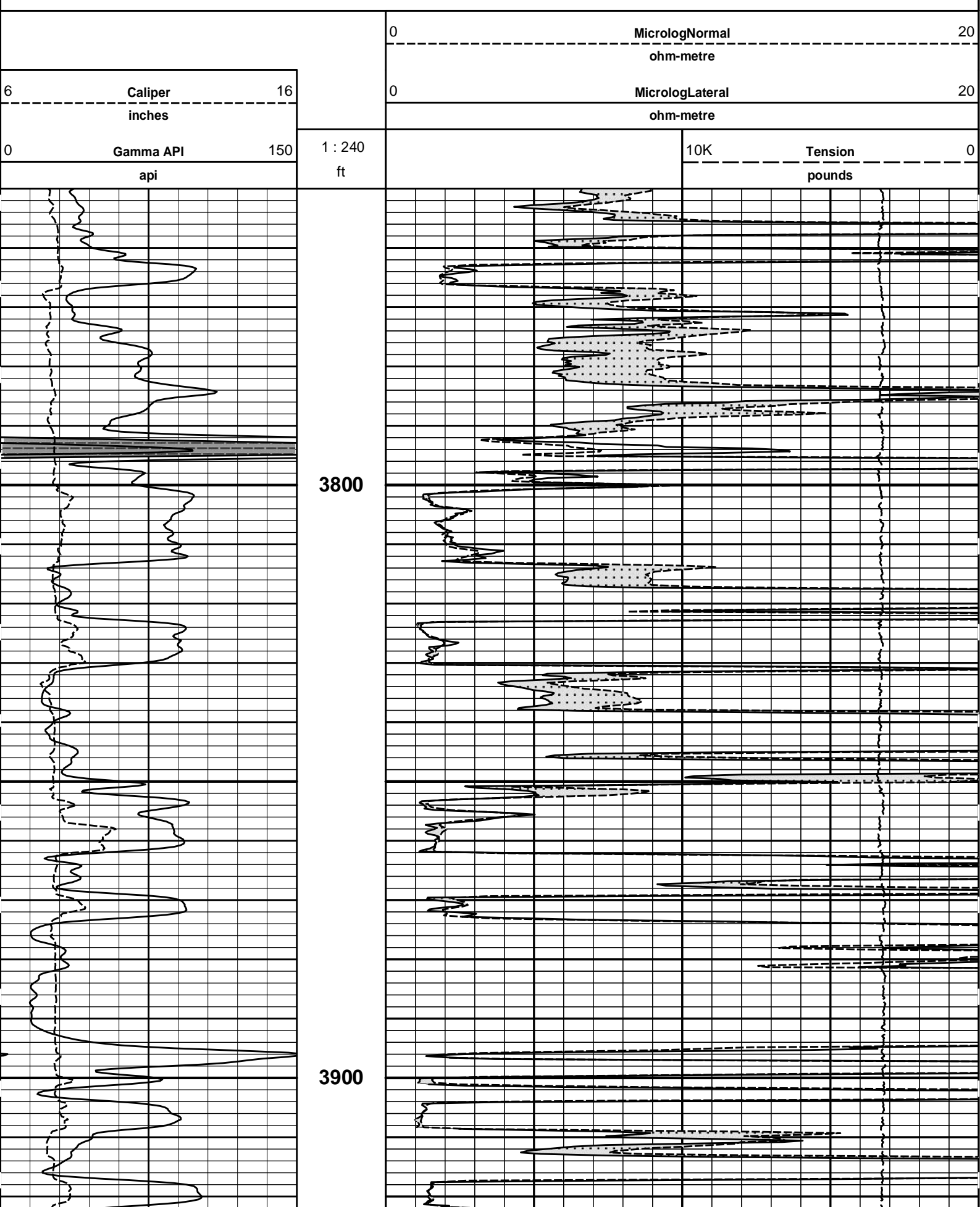
HALLIBURTON

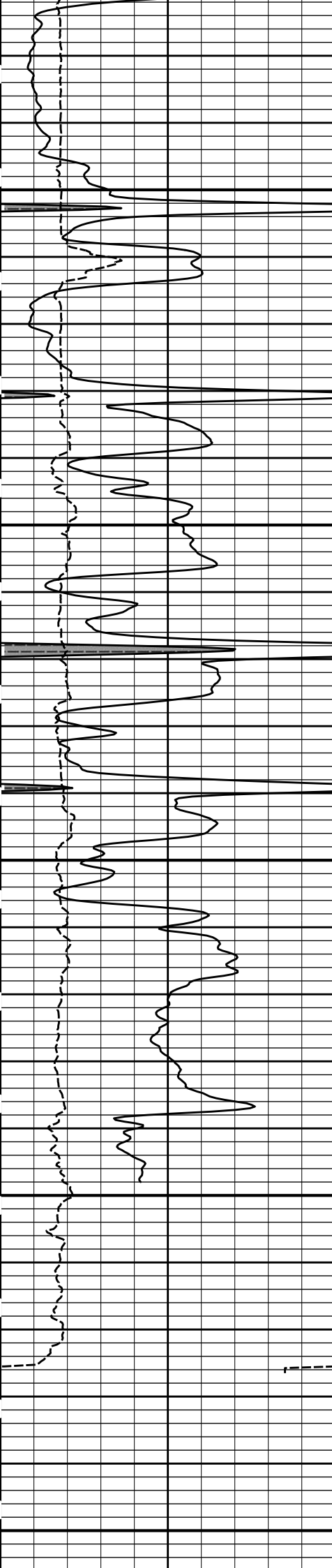
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 Plot Range: 3490 ft to 4163.5 ft
 Data: CULBRTH_BREEDENWell Based\DETAILS\
 Plot File: \\-LOCAL-CULBRTH_BREEDENWell Based\MICROLOG\Microlog_IQ_5_main

5 INCH MAIN LOG

MAIN LOG 5" PER 100'

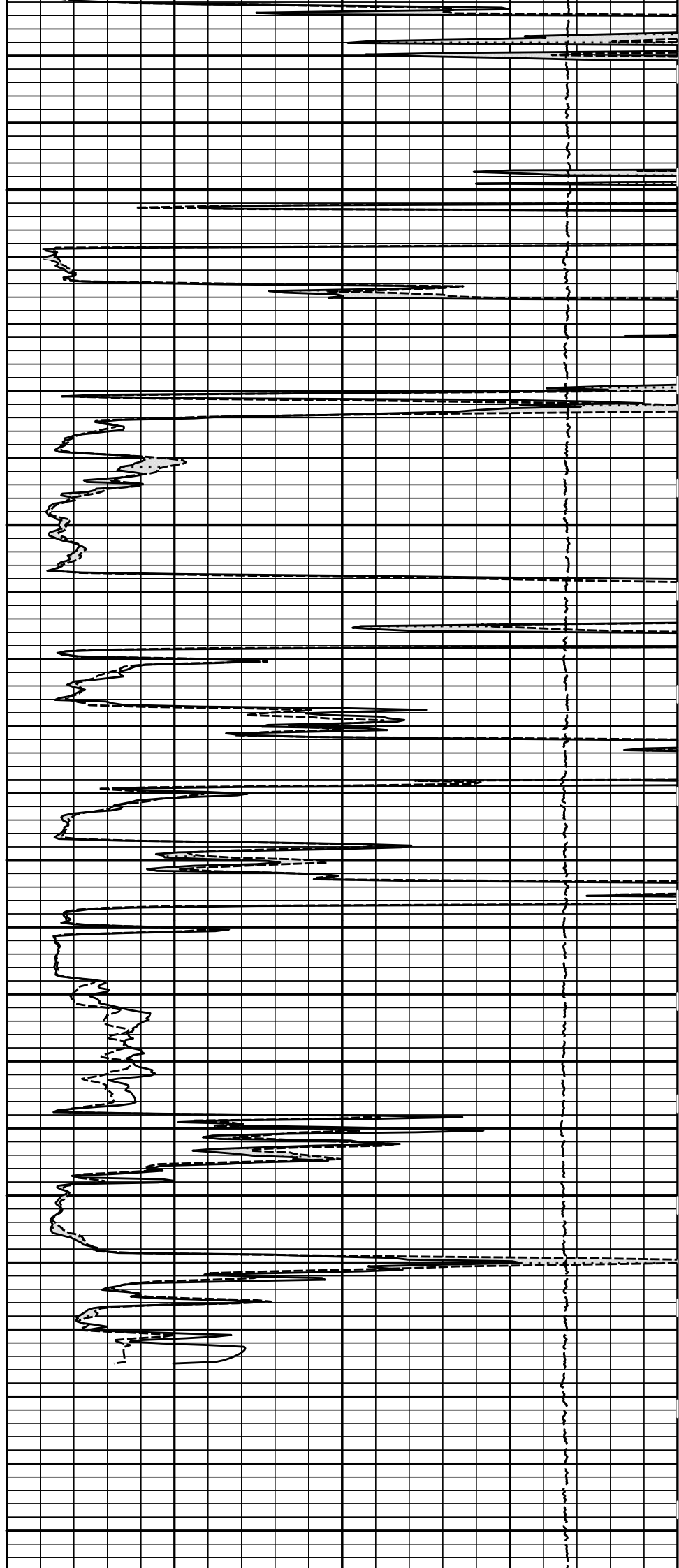
REPEAT SECTION





4000

4100



CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GEOK	Process Gamma Ray EVR?	Yes	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	SDLT	
IDT	WRTI	Survey Writing Interval	30	ft
IDT	SOPT	Smoothing Option	None	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	Yes	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTT	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
DSNT	UCLA	Classic Neutron Parameter utilized?	No	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	Yes	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Pore Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.6	
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRT?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	

BOTTOM

Data: CULBRTH_BREEDEN\0001 GTET-IDT-DSNT-SDLT-BSAT-ACRT\004 11-Aug-18 04:14 Up @4164.3f

Date: 11-Aug-18 05:22:38

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11013113

Reference Calibration Date: 02-May-18 11:20:36

Engineer: WHITLOCK

Calibration Date: 05-Aug-18 09:58:00

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Measurement	Measured	Calibrated	Units
Background	26.4	26.2	api
Background + Calibrator	253.6	252.1	api
Calibrator	227.2	225.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11013113

Reference Calibration Date: 05-Aug-18 09:58:00

Engineer: WHITLOCK

Calibration Date: 05-Aug-18 10:00:58

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Field Verification	Shop	Field	Units
Background	26.2	26.1	api
Background + Calibrator	252.1	251.2	api
Calibrator	225.9	225.0	api

Shop	Field	Difference	Tolerance
225.9	225.0	0.9	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11019641

Reference Calibration Date: 04-Aug-18 12:03:14

Engineer: SCHLIEM

Calibration Date: 04-Aug-18 12:26:27

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Logging Source S/N: DSN-436
Tank Serial Number: EL RENO HWT
Reference value assigned to Tank: 56.100
Snow Block S/N: 12156883
Calibration Tank Water Temperature: 89 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.97922	0.97742	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2364	0.2358	0.0006	+/- 0.0020
Calibrated Ratio:	10.5794	10.5599	0.019	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0667	0.02000 - 0.09000

PASS/FAIL SUMMARY

Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - 11019641

Reference Calibration Date: 04-Aug-18 12:26:27

Engineer: WHITLOCK

Calibration Date: 05-Aug-18 09:45:13

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Logging Source S/N: DSN-436

Snow Block S/N: 12156883

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0667	0.0665	-0.0002	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10960494

Reference Calibration Date: 01-Jan-70 00:00:00

Engineer: WHITLOCK

Calibration Date: 08-Jun-18 16:19:27

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Host Tool Name: DSNT - 11019641

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3977.11	-3977.11	-7000.00 - -1000.00
Pad Gain	0.0003897	0.0003897	0.0002000 - 0.0006000
Arm Offset	-3073.13	-3073.13	-5000.00 - 3000.00
Arm Gain	0.0005210	0.0005210	0.0003000 - 0.0007000
Arm Power	-0.000005094	-0.000005094	-0.000010000 - 0.000010000

The ring diameter is computed from: $\text{DIAMETER} = \text{PAD EXTENSION} + \text{ARM EXTENSION} + \text{TOOL DIAMETER}$

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
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SDLT CALIPER FIELD CALIBRATION

Tool Name: SDLT - 10960494

Reference Calibration Date: 08-Jun-18 16:19:27

Engineer: WHITLOCK

Calibration Date: 05-Aug-18 09:46:30

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.79	0.04	+/- 0.10

PASS/FAIL SUMMARY

Pad Extension Check:

Passed

Diameter Check:

Passed

MICRO LOG SHOP CALIBRATION

Tool Name: Microlog Pad - 10960494 **Reference Calibration Date:** 01-Jan-70 00:00:00
Engineer: WHITLOCK **Calibration Date:** 08-Jun-18 16:08:54
Software Version: WL INSITE R5.6.3 (Build 4) **Calibration Version:** 1
Host Tool Name: DSNT - 11019641

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.07	-0.07	-0.01	-0.01	ohmm
Calibration Point #1	0.00	0.00	0.00	0.00	ohmm
Calibration Point #2	20.00	20.00	20.00	20.00	ohmm
Internal Reference	19.92	19.92	19.98	19.98	ohmm

Measurement	Micro Log Normal	Micro Log Lateral	Units
	Tool Value	Tool Value	
Tool Zero	-0.11	0.18	V
Calibration Point #1	18.42	2.03	V
Calibration Point #2	5354.08	6974.83	V
Internal Reference	5331.77	6967.38	V

MICRO LOG FIELD CHECK

Tool Name: Microlog Pad - 10960494 **Reference Calibration Date:** 08-Jun-18 16:08:54
Engineer: WHITLOCK **Calibration Date:** 05-Aug-18 09:54:07
Software Version: WL INSITE R5.6.3 (Build 4) **Calibration Version:** 1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.07	-0.07	-0.01	-0.00	ohmm
Internal Reference	19.92	19.89	19.98	19.95	ohmm

Summary

Signal	Shop	Field	Difference	Tolerance
Microlog Normal	19.92	19.89	0.03	+/- 0.80
Microlog Lateral	19.98	19.95	0.03	+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 11213308 **Reference Calibration Date:** 08-Jun-18 10:39:59
Engineer: WHITLOCK **Calibration Date:** 08-Jun-18 11:01:29
Software Version: WL INSITE R5.6.3 (Build 4) **Calibration Version:** 1

Logging Source S/N: 5475GW

Aluminum Block S/N: EL RENO

Density: 2.581g/cc

Pe: 3.170

Magnesium Block S/N: EL RENO

Density: 1.687g/cc

Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0041	1.0112	0.90 - 1.10
Near Dens Gain	0.9869	0.9898	0.90 - 1.10
Near Peak Gain	0.9943	0.9998	0.90 - 1.10
Near Lith Gain	1.0181	1.0093	0.90 - 1.10
Far Bar Gain	1.0040	1.0066	0.90 - 1.10

Far Bar Gain	0.9932	0.9944	0.90 - 1.10
Far Dens Gain	0.9916	0.9923	0.90 - 1.10
Far Lith Gain	0.9744	0.9710	0.90 - 1.10
<hr/>			
Near Bar Offset	0.0934	0.0300	NONE
Near Dens Offset	0.2485	0.2218	NONE
Near Peak Offset	0.1593	0.1112	NONE
Near Lith Offset	-0.0690	0.0007	NONE
Far Bar Offset	0.0165	-0.0022	NONE
Far Dens Offset	0.1281	0.1192	NONE
Far Peak Offset	0.1238	0.1182	NONE
Far Lith Offset	0.2190	0.2467	NONE
<hr/>			
Near Bar Background	955.07	955.02	700 - 1450
Near Dens Background	316.53	316.75	230 - 480
Near Peak Background	138.87	138.74	100 - 210
Near Lith Background	168.67	169.41	125 - 260
Far Bar Background	482.41	482.24	450 - 900
Far Dens Background	194.46	191.91	175 - 345
Far Peak Background	77.48	77.25	70 - 140
Far Lith Background	79.35	80.04	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.688	1.687	-0.001	+/- 0.015
Pe	2.517	2.559	0.042	+/- 0.150
ALUMINUM				
Density (g/cc)	2.582	2.581	-0.001	+/- 0.01500
Pe	3.106	3.132	0.026	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0017	+/- 0.0110	0.0006	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	-0.0008	+/- 0.0140
Aluminum Block	-0.0005	+/- 0.0110	-0.0001	+/- 0.0140
Resolution	9.21	6.00 - 11.50	9.21	6.00 - 11.50
Internal Verifier(B+D+P+L)	1580	1200 - 2700	831	800 - 1700

PASS/FAIL SUMMARY

Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name: SDLT Pad - 11213308	Reference Calibration Date: 08-Jun-18 11:01:29
Engineer: WHITLOCK	Calibration Date: 05-Aug-18 09:57:45
Software Version: WL INSITE R5.6.3 (Build 4)	Calibration Version: 1

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1579.927	1575.636	-4.291	15.990
Far (B+D+P+L) cps	831.441	827.695	-3.746	15.874
Near Resolution	9.21	9.13	-0.080	0.50
Far Resolution	9.21	9.31	0.100	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRt Sonde - 11830728	Reference Calibration Date: 23-Feb-18 10:15:37
Engineer: WHITLOCK	Calibration Date: 06-Jun-18 13:24:46
Software Version: WL INSITE R5.6.3 (Build 4)	Calibration Version: 1
Host Tool Name: ACRt Instrument - 11830684	

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0279	1.05	0.95	1.0076	1.05	0.95	0.9997	1.05
A2 (50")	0.95	1.0334	1.05	0.95	1.0139	1.05	0.95	1.0097	1.05
A3 (29")	0.95	1.0346	1.05	0.95	1.0146	1.05	0.95	1.0081	1.05
A4 (17")	0.95	1.0279	1.05	0.95	1.0063	1.05	0.95	1.0018	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0001	1.05	0.95	0.9950	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9869	1.05	0.95	0.9818	1.05

SONDE OFFSET

Subarray	R12KHz (mmho/m)	R36KHz (mmho/m)	R72KHz (mmho/m)
A1 (80")	0.315	-4.964	-5.711
A2 (50")	0.409	-3.450	-5.485
A3 (29")	-11.648	-3.720	-3.783
A4 (17")	-90.980	-28.724	-23.707
A5 (10")	N/A	-76.200	-37.537
A6 (6")	N/A	280.488	149.005

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.82	1.3	Mud Cell	0.95	0.99	1.05
36K	1.0	1.80	2.0				
72K	1.0	1.05	2.0				

R-MUD VERIFICATION

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET CHK	PASS
TOOL OK TO LOG	

CALIBRATION SUMMARY

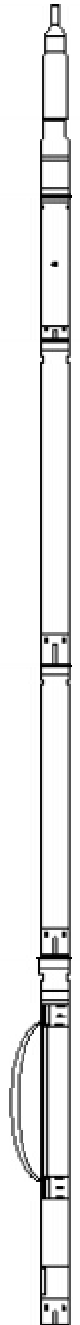
Sensor	Shop	Field	Post	Difference	Tolerance	Units
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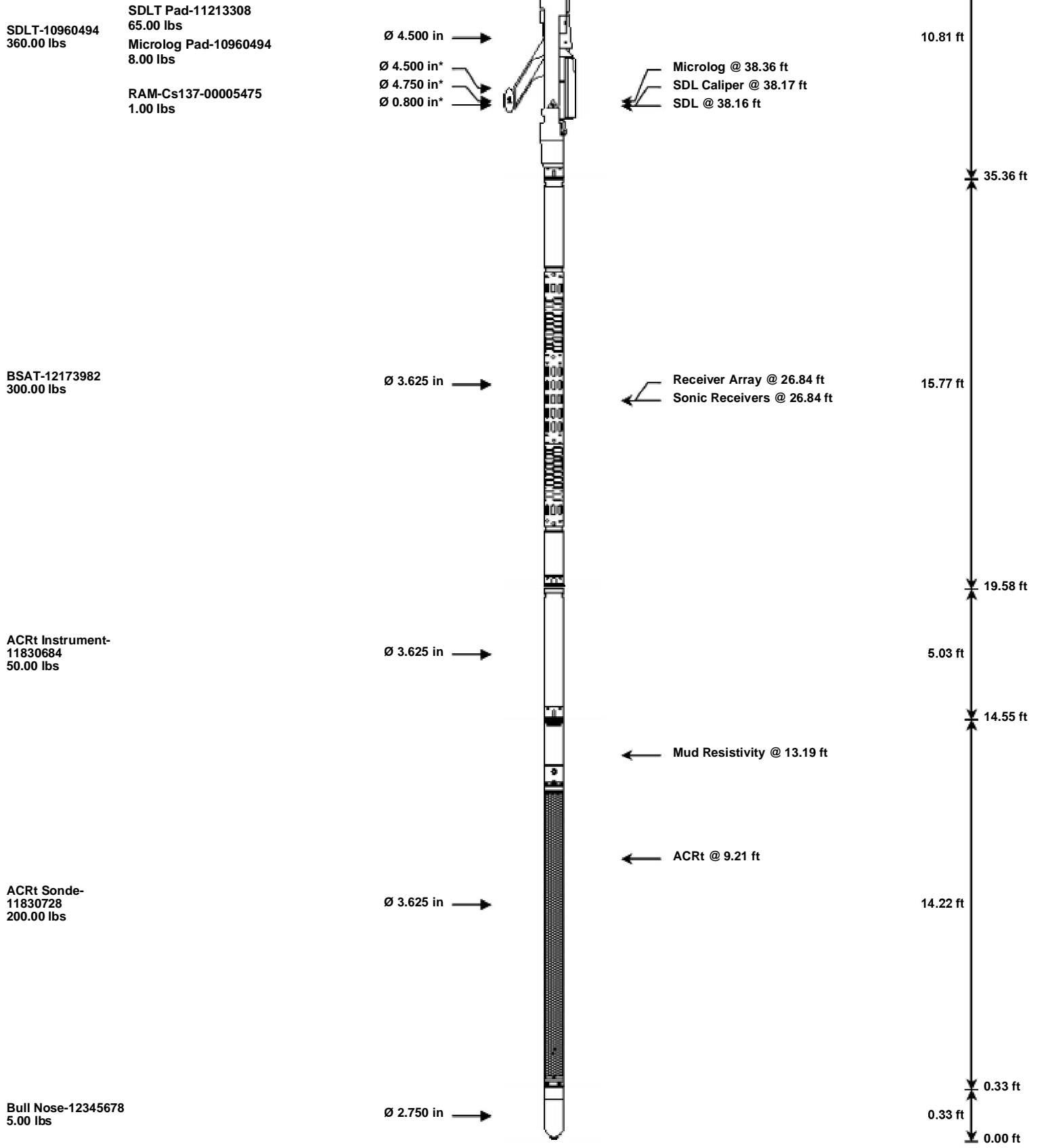
Gamma Ray Calibrator	225.9	225.0	-----	0.9	+/- 9.00	api
DSNT-11019641						
Snow-Block Porosity	0.0667	0.0665	-----	0.0002	+/- 0.0150	decp
SDLT-10960494						
Pad Extension	3.75	3.79	-----	-0.04	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
Microlog Pad-10960494						
MicroLog Normal	19.92	19.89	-----	0.03	+/-0.80	ohmm
MicroLog Lateral	19.98	19.95	-----	0.03	+/-0.80	ohmm
SDLT Pad-11213308						
Near(B+D+P+L)	1579.927	1575.636	-----	4.291	+/-15.990	cps
Far(B+D+P+L)	831.441	827.695	-----	3.746	+/-15.874	cps
ACRt Sonde-11830728						
Mud Cell	0.99	-----	-----	0	-----	ohm-m

Data: CULBRTH_BREEDEN\0001 GTET-IDT-DSNT-SDLT-BSAT-ACRT\IDLE Date: 11-Aug-18 05:25:57

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS_I 37.50 lbs	Weak Point 7000 lbs- CH_HOS_I 0.01 lbs	Ø 2.750 in → Ø 0.010 in* →		← Temperature @ 78.65 ft	3.03 ft	79.68 ft
XOHD-12345678 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	76.65 ft
SP Sub-11812437 60.00 lbs		Ø 3.625 in →		← SP @ 73.92 ft	3.74 ft	75.70 ft
				← Z-Accelerometer @ 71.51 ft		71.96 ft
GTET-11013113 165.00 lbs		Ø 3.625 in →			8.52 ft	
				← GammaRay @ 65.90 ft		63.44 ft
IDT-10886210 150.00 lbs		Ø 3.625 in →			7.58 ft	
						55.86 ft
DSNT-11019641 174.00 lbs	DSN Decentralizer- 11019641 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →			9.69 ft	
				← DSN Far @ 48.92 ft ← DSN Near @ 48.17 ft		46.17 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	CH_HOS_I	37.50	3.03	76.65	300.00
WP7K	Weak Point 7000 lbs	CH_HOS_I	0.01	0.01	* 77.45	300.00
XOHD	Hostile to Dits Cross Over	12345678	20.00	0.95	75.70	300.00
SP	SP Sub	11812437	60.00	3.74	71.96	300.00
GTET	Gamma Telemetry Tool	11013113	165.00	8.52	63.44	60.00
IDT	Insite Directional Tool	10886210	150.00	7.58	55.86	60.00
DSNT	Dual Spaced Neutron	11019641	174.00	9.69	46.17	60.00
DCNT	DSN Decentralizer	11019641	6.60	5.13	* 49.50	300.00
SDLT	Spectral Density Tool	10960494	360.00	10.81	35.36	60.00
SDLP	Density Insite Pad	11213308	65.00	2.55	* 37.57	60.00

Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005475	1.00	0.80	*	37.80	300.00
MICP	Microlog Pad	10960494	8.00	1.00	*	37.86	60.00
BSAT	Borehole Sonic Array Tool	12173982	300.00	15.77		19.58	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11830684	50.00	5.03		14.55	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11830728	200.00	14.22		0.33	120.00
BLNS	Bull Nose	12345678	5.00	0.33		0.00	300.00

Total **1,602.11** **79.68**

* Not included in Total Length and Length Accumulation.

Data: CULBRTH_BREEDEN\0001 GTET-IDT-DSNT-SDLT-BSAT-ACRT\004 11-Aug-18 04:14 Up @4164.3f **Date: 11-Aug-18 05:13:28**

COMPANY **CULBREATH OIL & GAS COMPANY INC**

WELL **BREEDEN 1-30**

FIELD **MORLAND-KANACO**

COUNTY **SHERIDAN** STATE **KANSAS**

HALLIBURTON

MICRO LOG