

HALLIBURTON

MICROLOG

COMPANY	CIMAREX ENERGY CO.		
WELL	HAMMER 19-6		
FIELD/BLOCK	LETTE		
COUNTY	HASKELL		
STATE	KANSAS		
COMPANY	CIMAREX ENERGY CO.	API No.	15-081-22032
WELL	HAMMER 19-6	Location	(SHL) 1650' FSL & 1650' FEL
FIELD/BLOCK	LETTE		
COUNTY	HASKELL		
STATE	KANSAS	Other Services:	DSN / SDL MICROLOG DIPMETER ACRT
Sect.	19	Twp.	30S
Rge.			31W
Elev.			2859.0 ft
Datum			9.0 ft above perm. Datum

Permanent Datum	GL	Elev.: K.B.	2859.0 ft
Log measured from	KB	D.F.	2859.0 ft
Drilling measured from	KB	G.L.	2850.0 ft

Date	18-Sep-13	Run No.	ONE
Depth - Driller	5700.00 ft	Depth - Logger	5704.0 ft
Bottom - Logged Interval	5650	Top - Logged Interval	4000
Casing - Driller	8.625 in	Casing - Logger	1850.0 ft
Bit Size	7.875 in	Type Fluid in Hole	WATER BASED MUD
Density	9.1 ppg	Viscosity	48.00 s/qt
PH	11.00 pH	Fluid Loss	6.0 cphm
Source of Sample	MUD PIT	Rm @ Meas. Temperature	0.800 ohmm @ 85.00 degF
Rmf @ Meas. Temperature	0.68 ohmm @ 85.00 degF	Rmc @ Meas. Temperature	0.920 ohmm @ 85.00 degF
Source Rmf	CALCULATED	Rmc	CALCULATED
Rm @ BHT	0.51 ohmm @ 137.0 degF	Time Since Circulation	6.0 hr
Time on Bottom	18-Sep-13 04:09	Max. Rec. Temperature	137.0 degF @ 5704.0 ft
Equipment	11230668	Location	LIBERAL
Recorded By	S. INGERSOLL	Witnessed By	T. KOLODZIEJ

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Service Ticket No.: 900738824 API Serial No.: 15-081-22032 PGM Version: WL INSITE R3.8.4 (Build 5)

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	CENT	
Rmc @ Meas. Temp.		@		@		10800784			
Source Rmf	Rmc								
Rm @ BHT		@		@					
Rmf @ BHT		@		@					
Rmc @ BHT		@		@					

EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	10748374	Serial No.		Serial No.	10714945	Serial No.	10755066
Model No.	GTET	Model No.		Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.		Diameter	5.3"	Diameter	3.625"
Detector Model No.	T-102	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE
Length	8"	LSA [Y/N]		Serial No.	5073GW	Serial No.	DSN-436
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC		DENSITY			NEUTRON				
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5704	1850	REC	0	150				30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@
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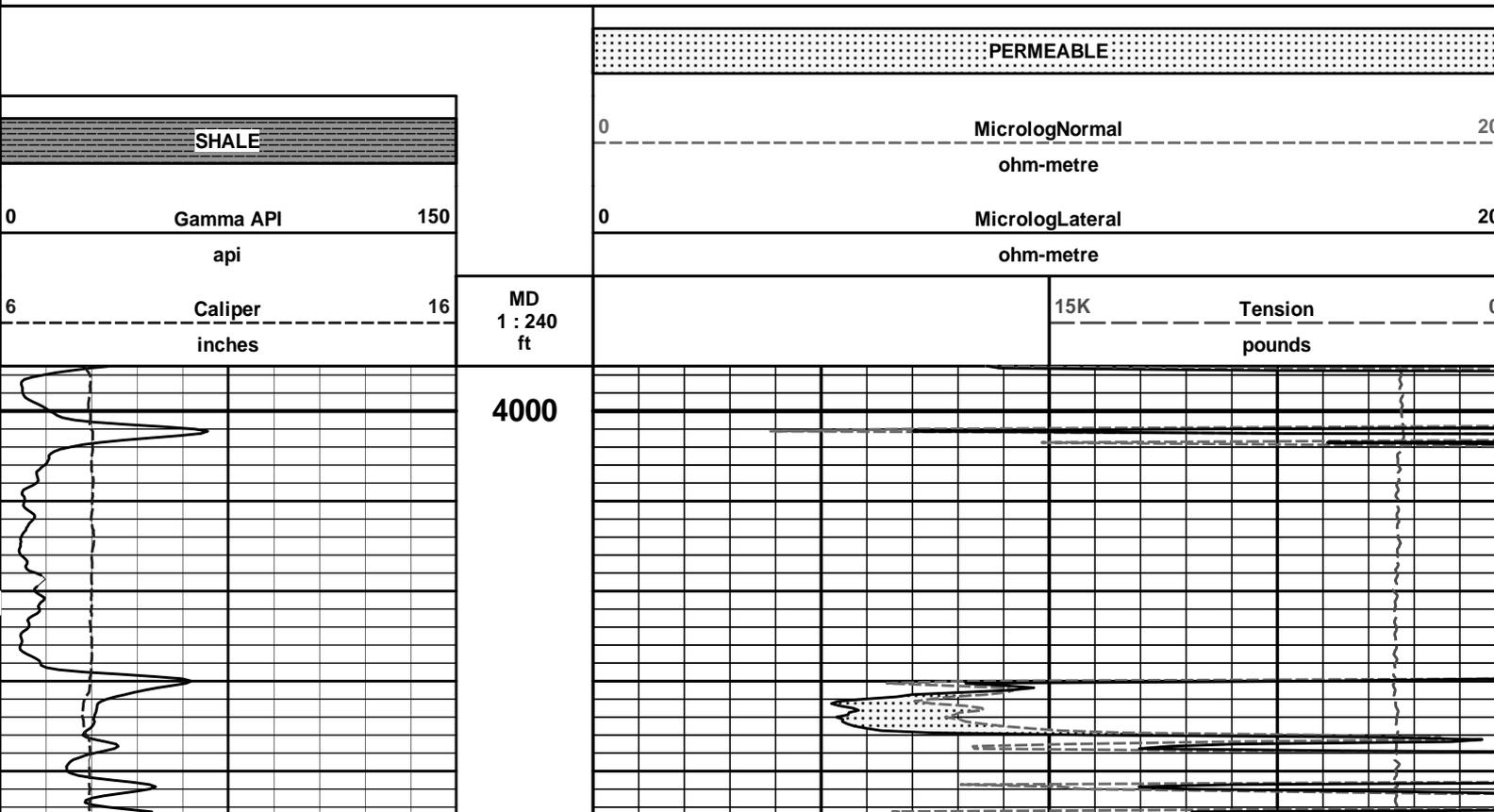
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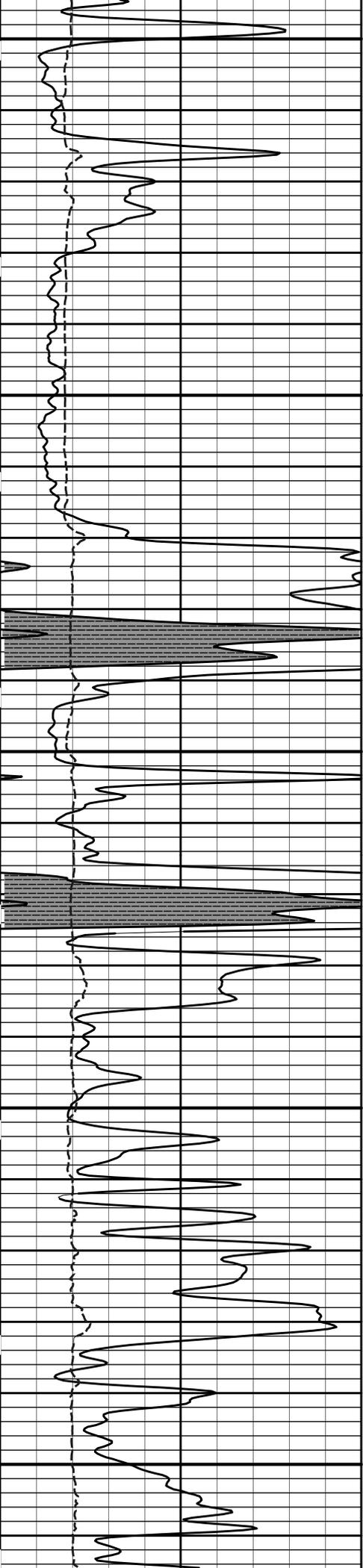
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR 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: 18-Sep-13 06:07:13
	Plot Range: 3995 ft to 5707.83 ft
	Data: HAMMER 19-6\Well BasedR1 DETAIL\
	Plot File: \\-LOCAL-HAMMER 19-6\Well Based\MICROLOG\Microlog_IQ_5_main_lib

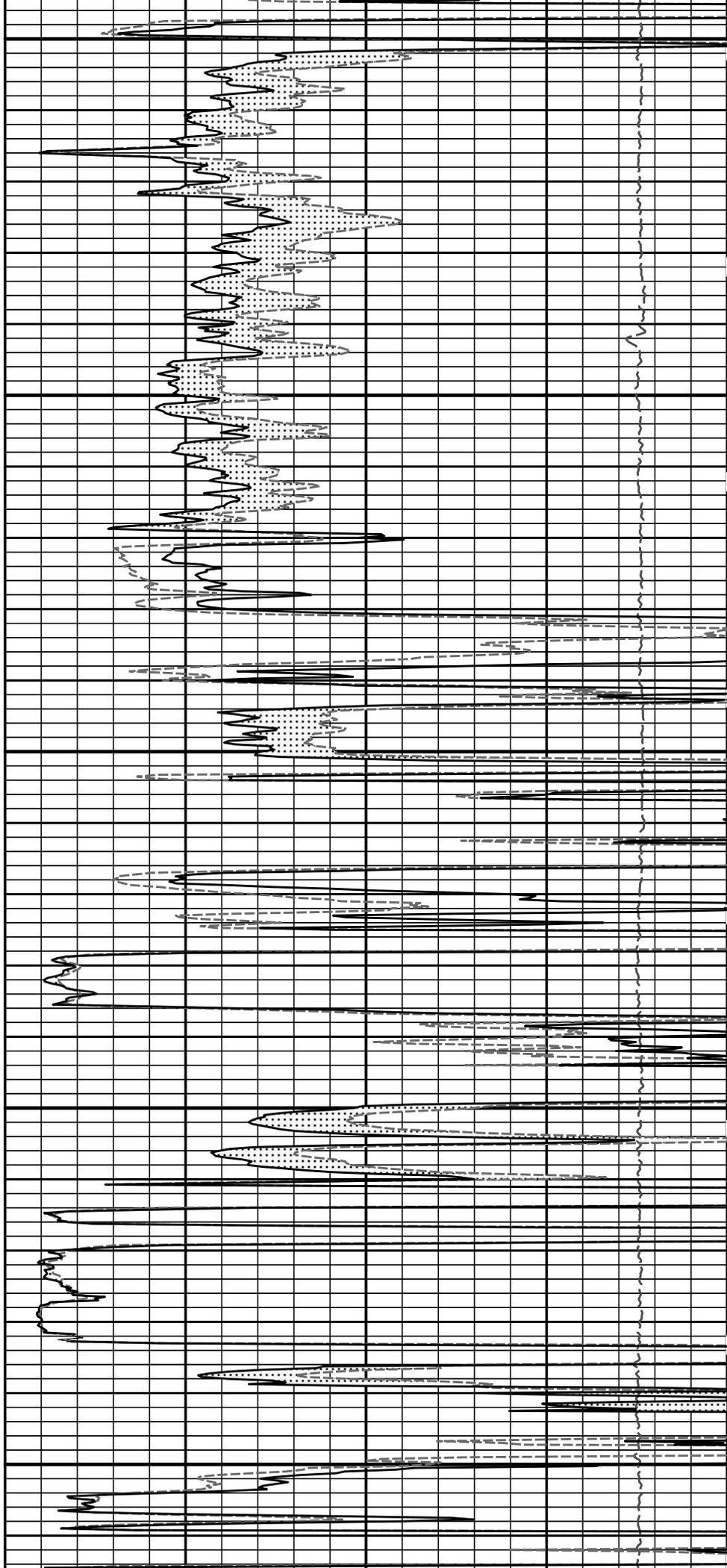
5 INCH MAIN LOG

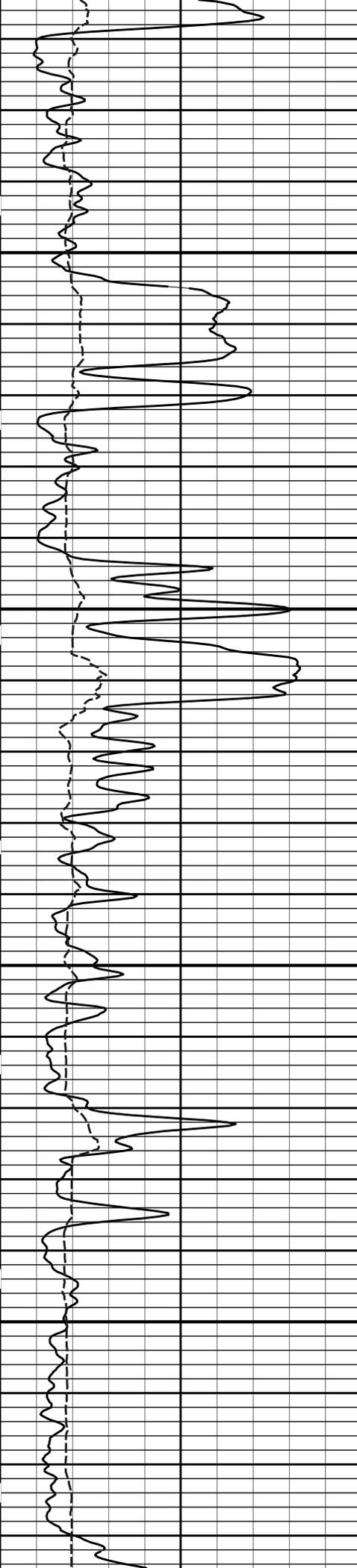




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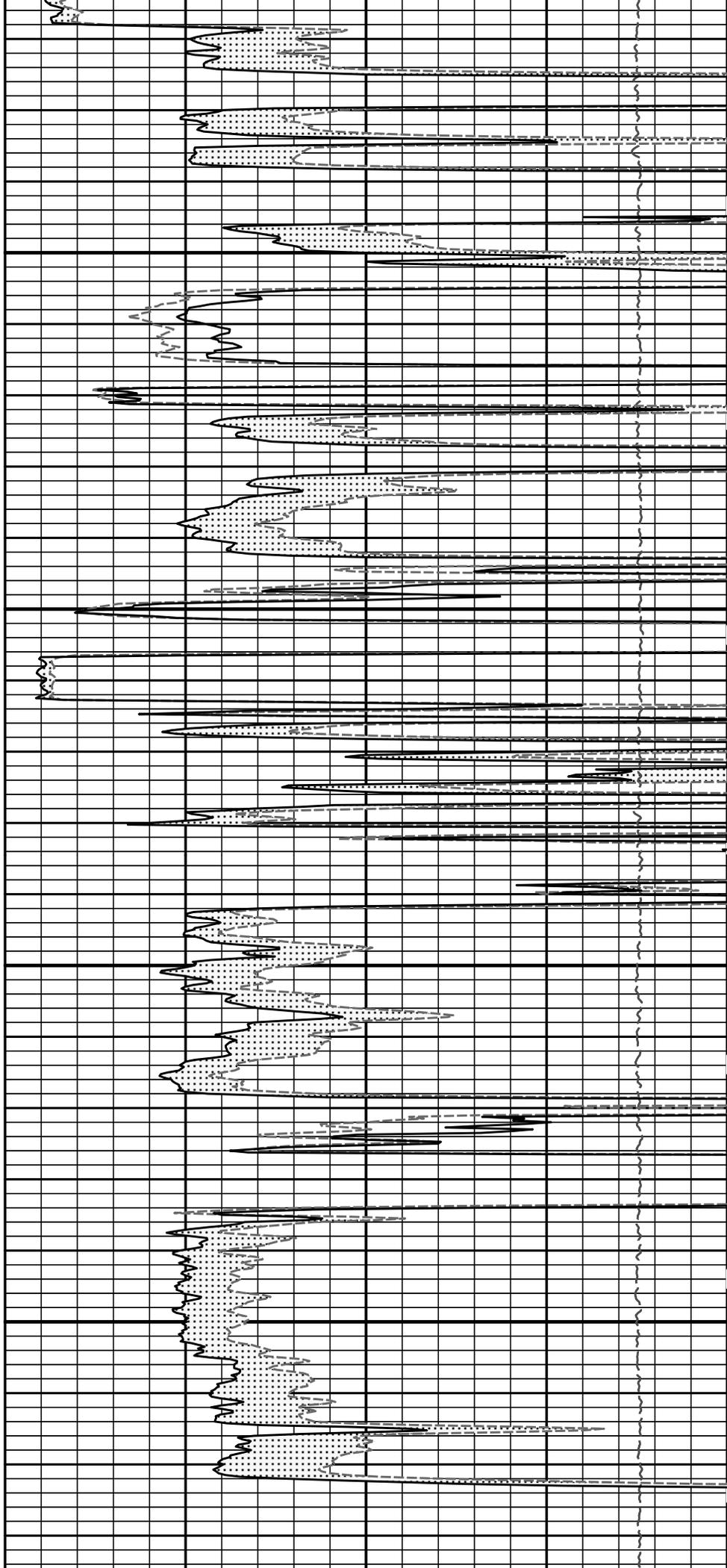
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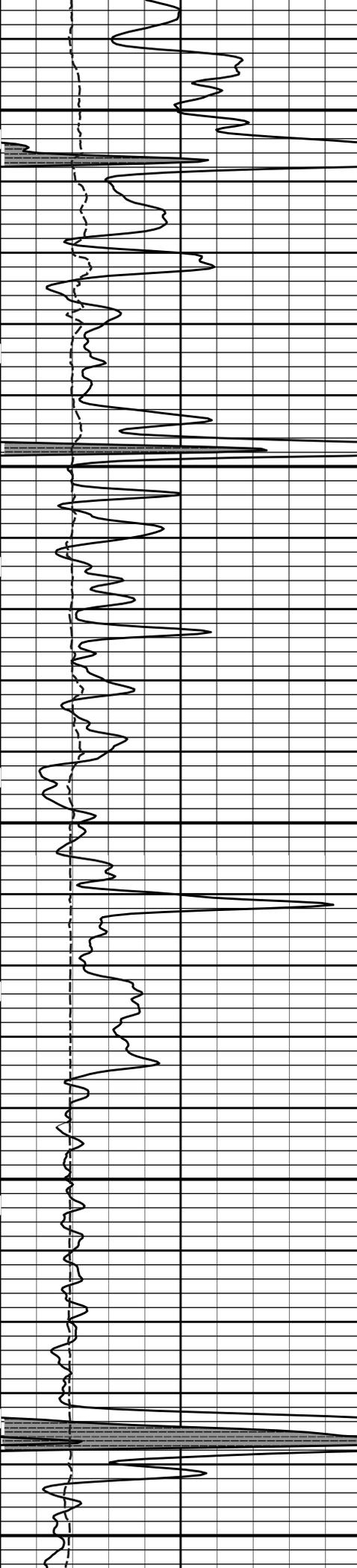




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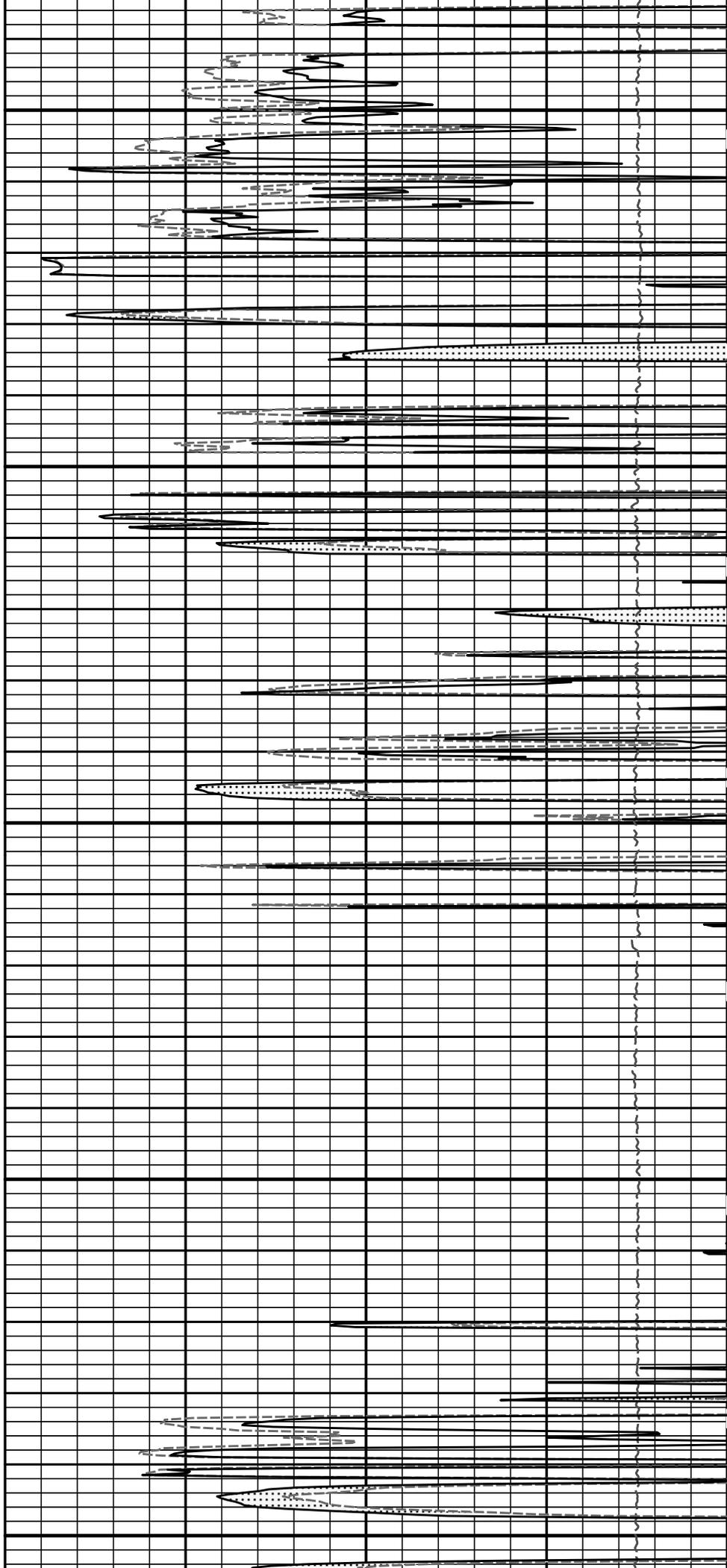


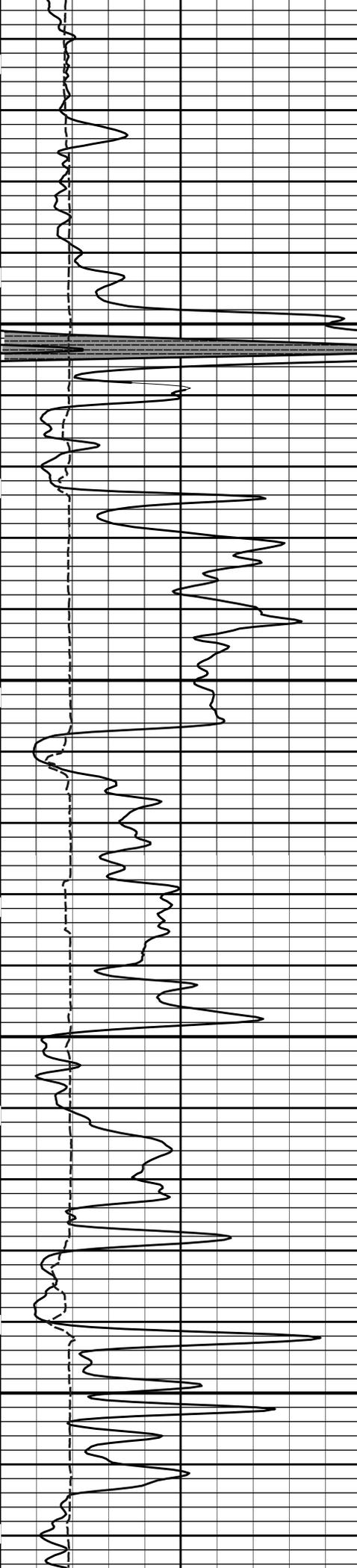


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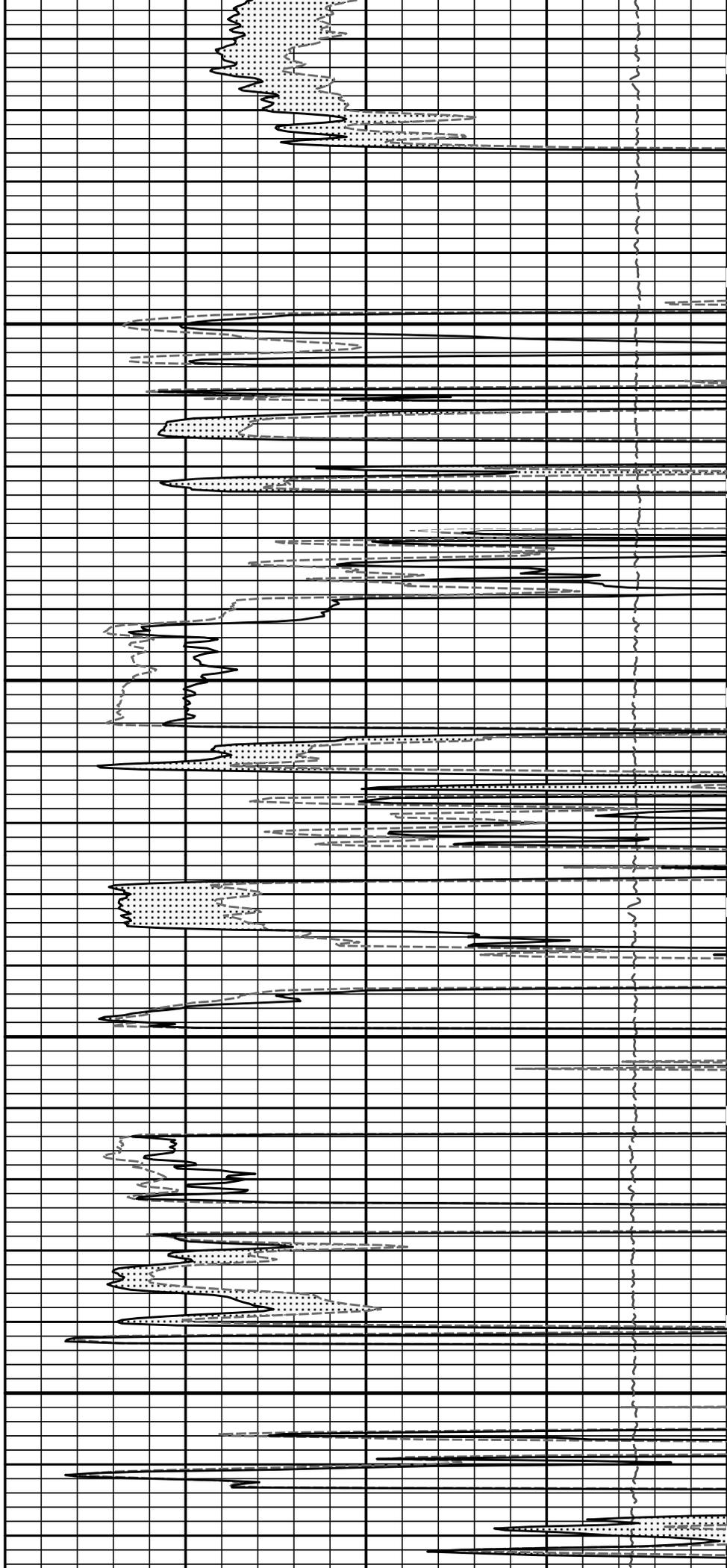
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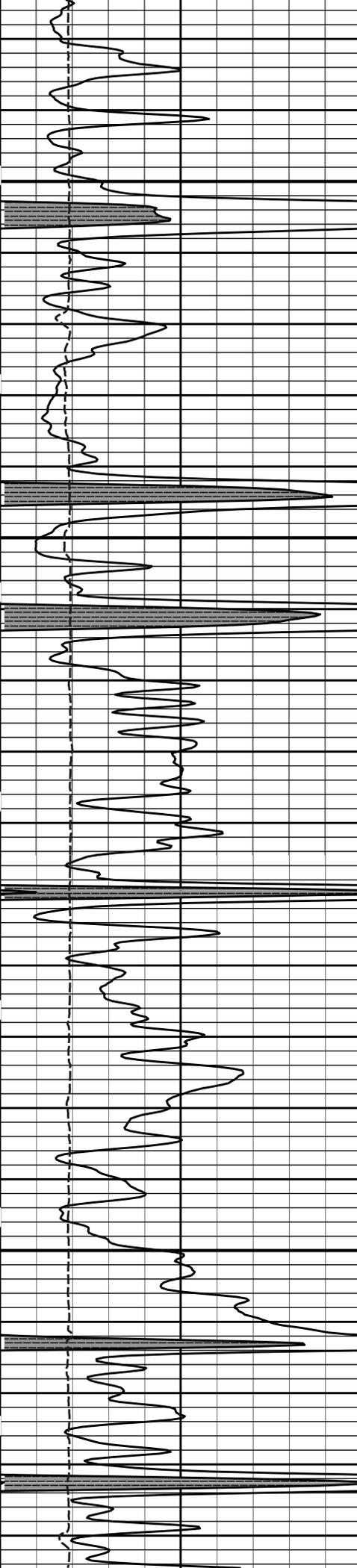




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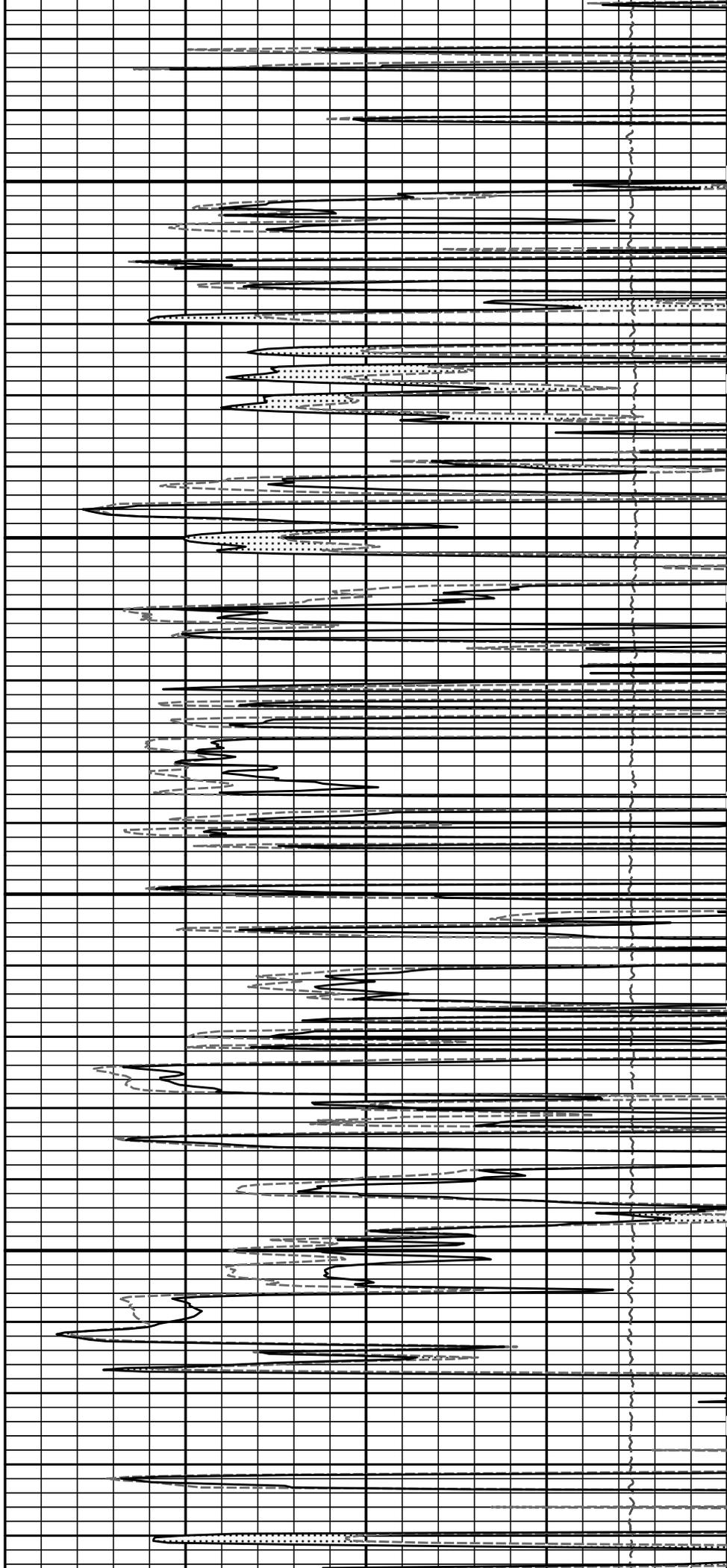
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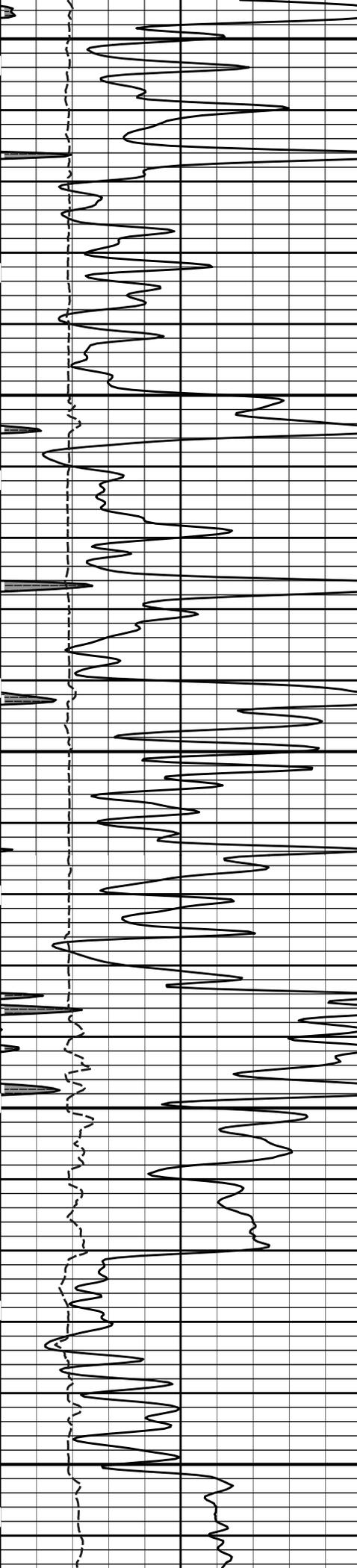




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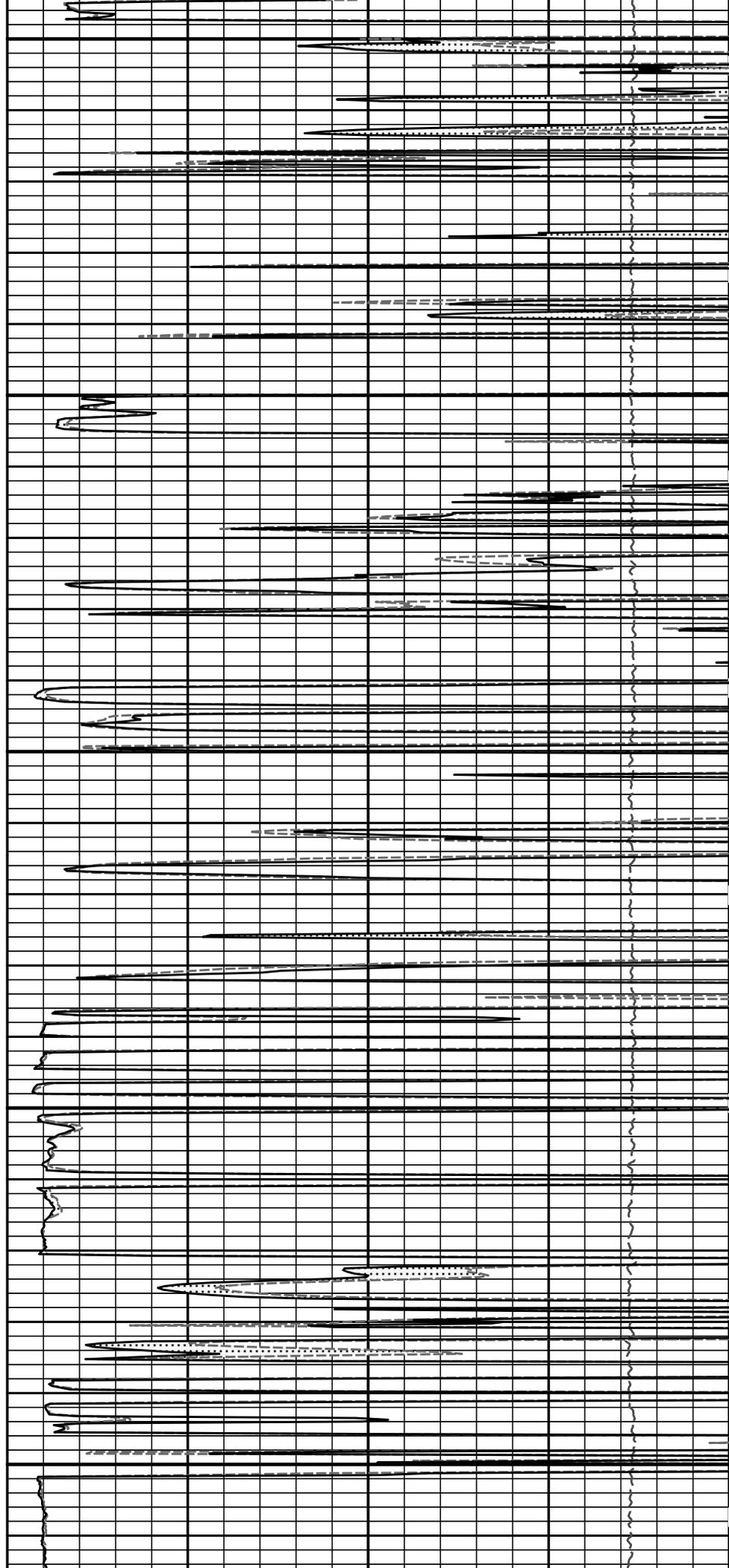
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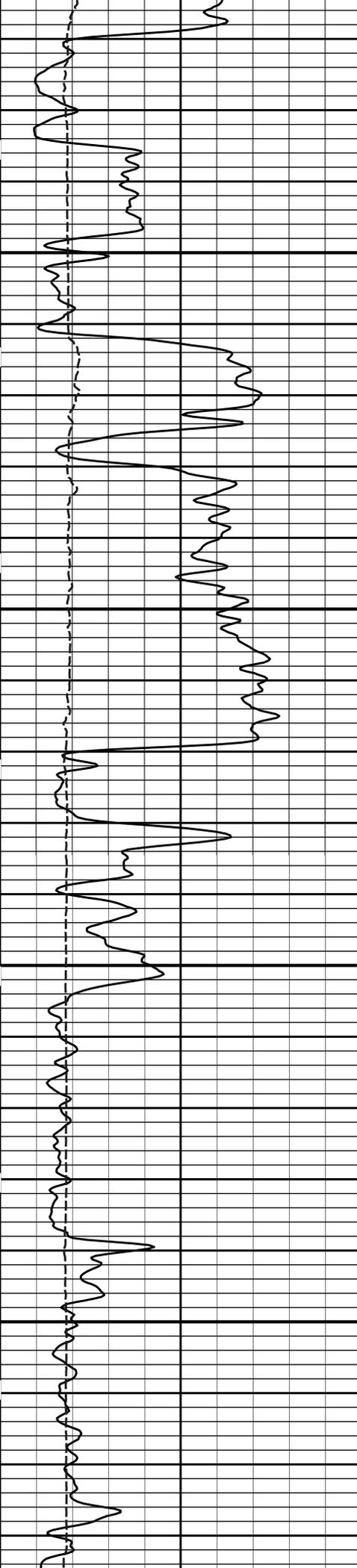




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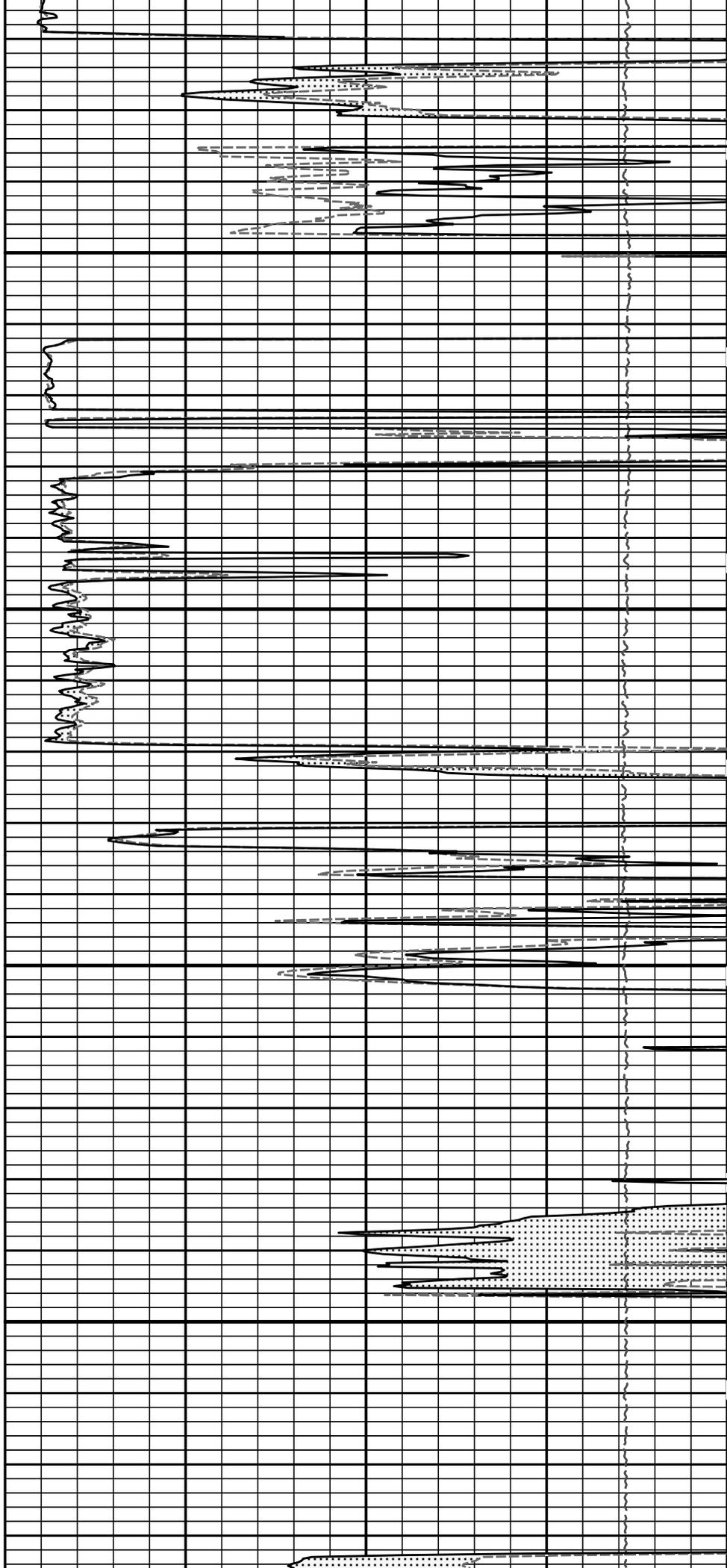
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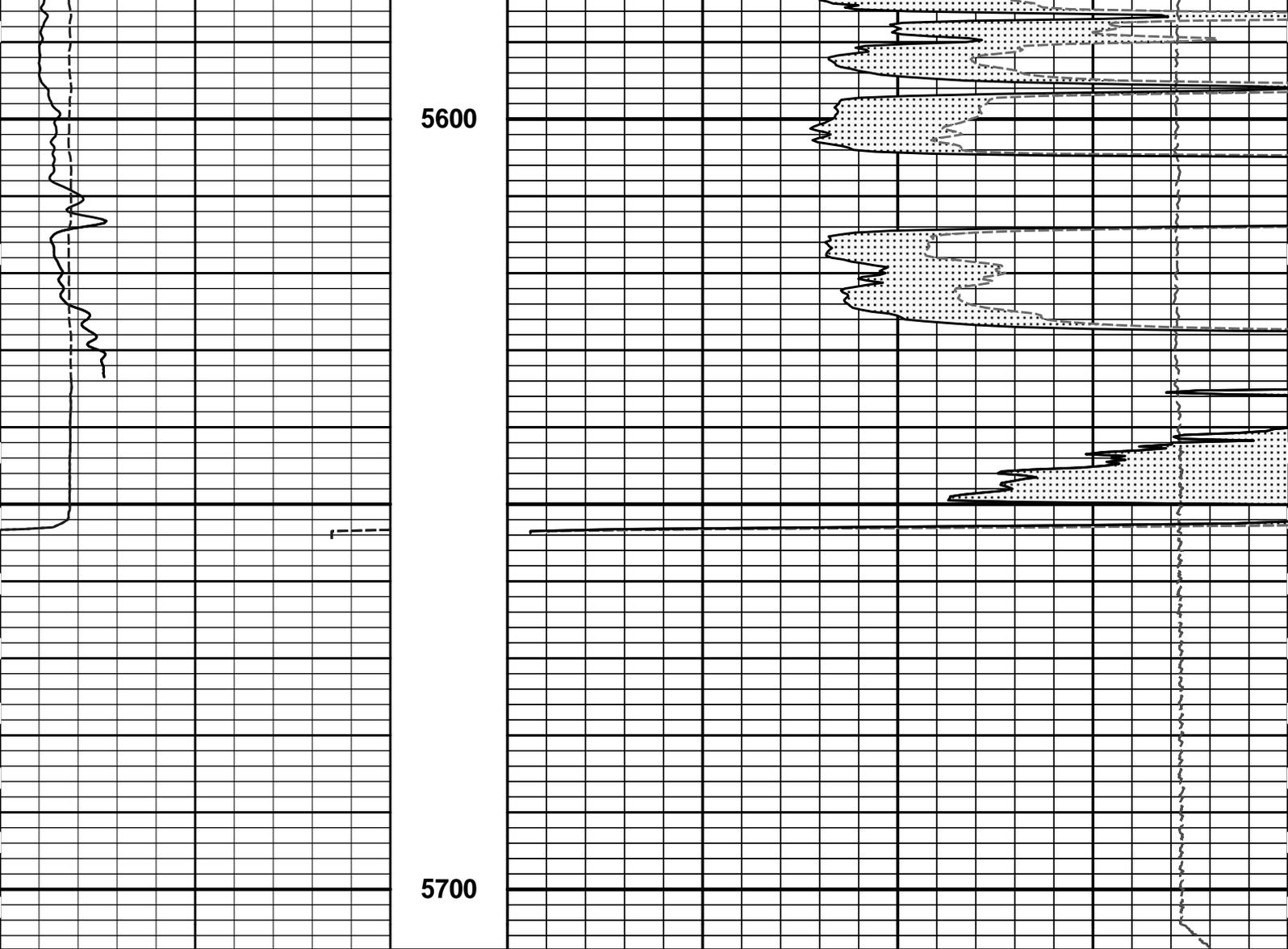




5400

5500





5600

5700

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

HALLIBURTON

Plot Time: 18-Sep-13 06:07:52
 Plot Range: 3995 ft to 5707.83 ft
 Data: HAMMER 19-6\Well Based\R1 DETAIL\
 Plot File: \\-LOCAL-HAMMER 19-6\Well Based\MICROLOG\Microlog_IQ_5_main_lib

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 18-Sep-13 06:07:53
 Plot Range: 5395 ft to 5709.08 ft
 Data: HAMMER 19-6\Well Based\R1 REPEAT\
 Plot File: \\-LOCAL-HAMMER 19-6\Well Based\MICROLOG\Microlog_IQ_5_rep_lib

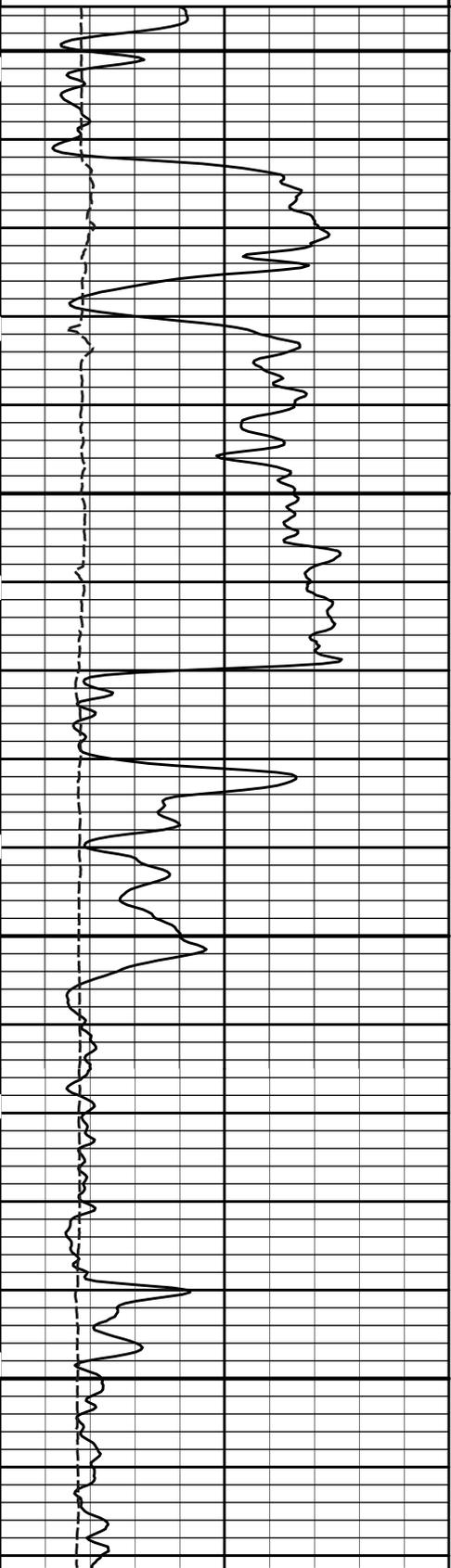
REPEAT SECTION

SHALE		
0	Gamma API	150
api		
6	Caliper	16
inches		

PERMEABLE

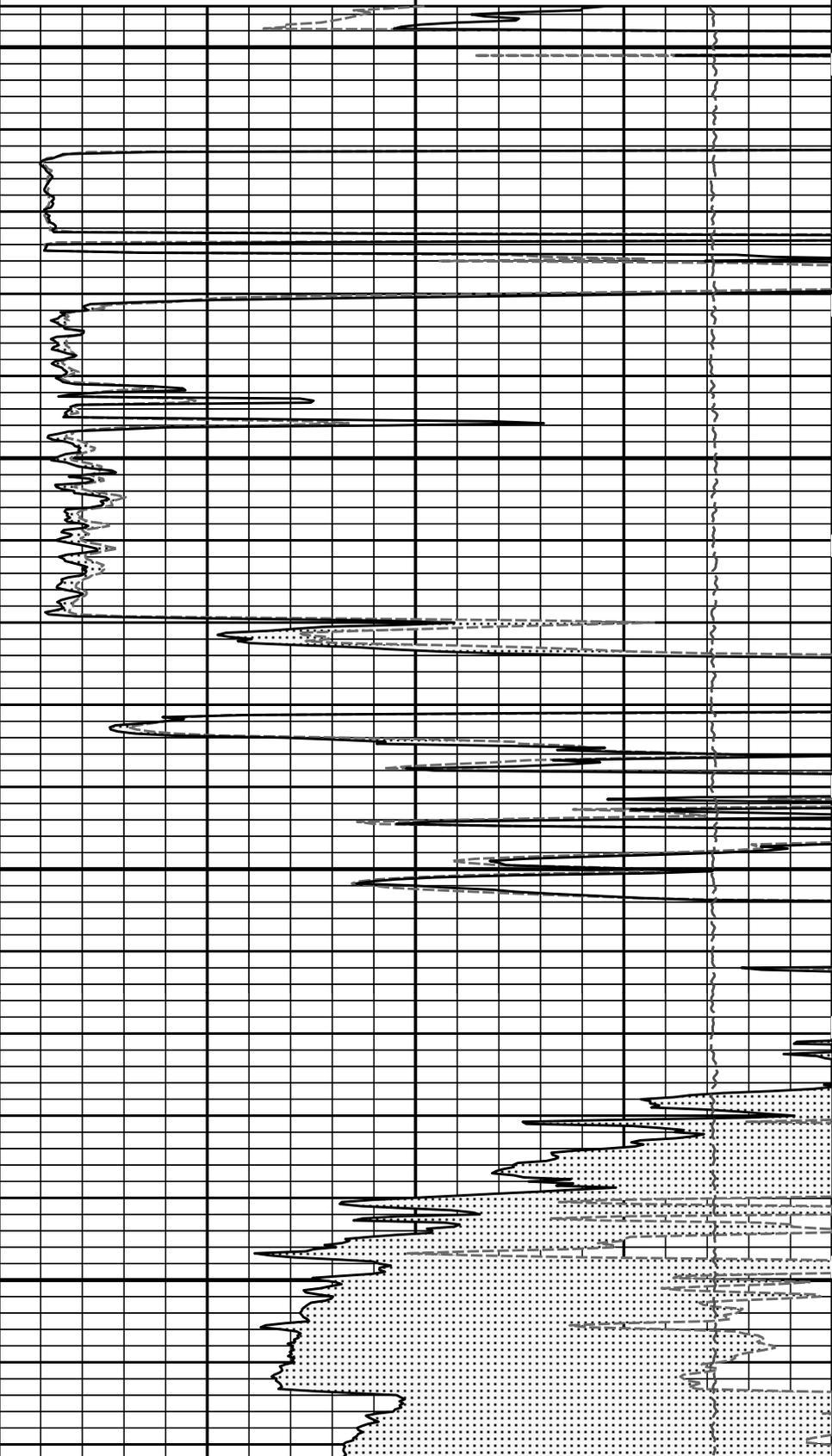
0	MicrologNormal	20
ohm-metre		
0	MicrologLateral	20
ohm-metre		

MD 1 : 240 ft	15K	Tension pounds	0
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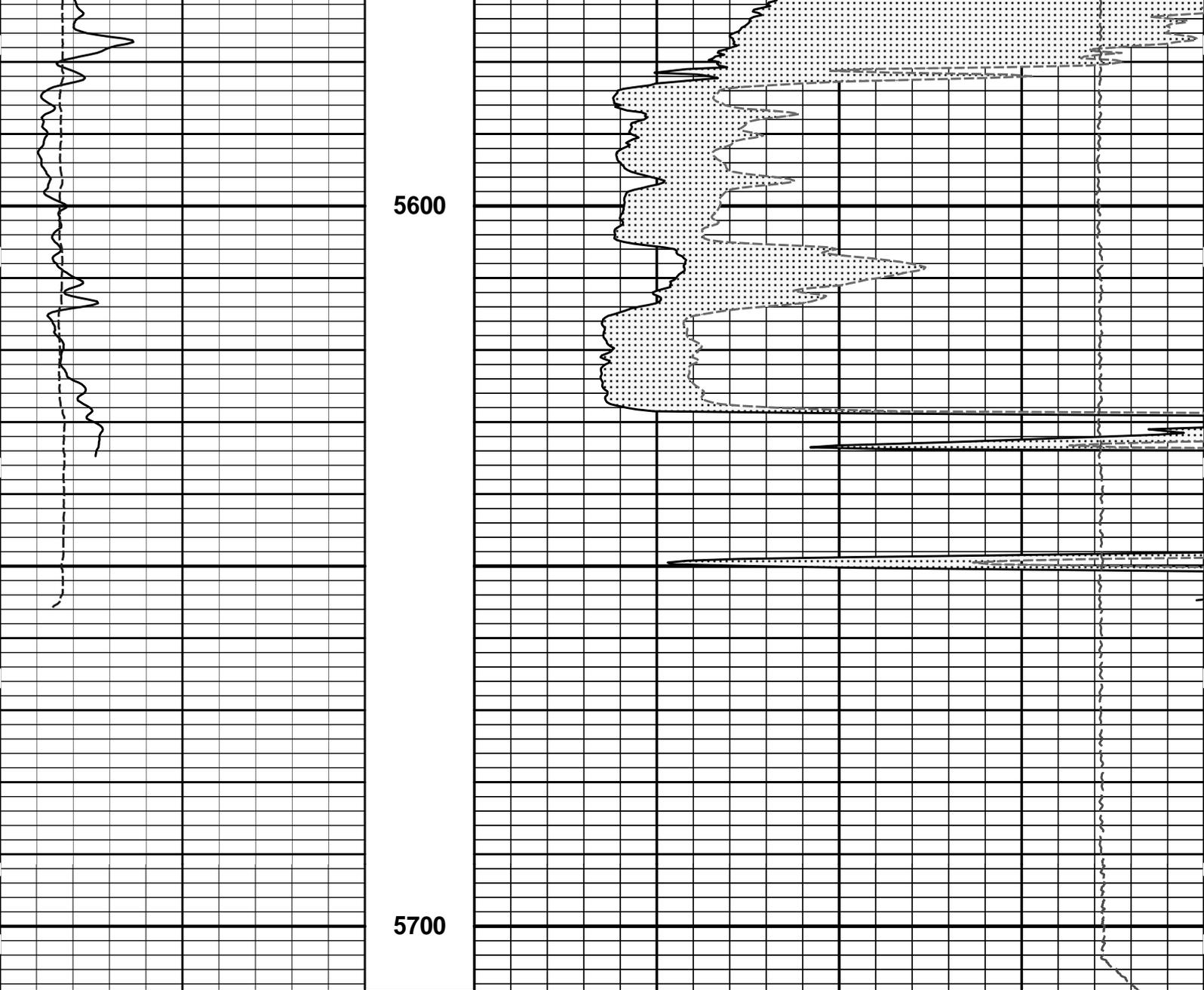
5400

5500



15K

Tension
pounds



6	Caliper	16
	inches	
0	Gamma API	150
	api	
SHALE		

MD
1 : 240
ft

15K	Tension	0
	pounds	
0	MicrologLateral	20
	ohm-metre	
0	MicrologNormal	20
	ohm-metre	
PERMEABLE		

HALLIBURTON

Plot Time: 18-Sep-13 06:07:56
 Plot Range: 5395 ft to 5709.08 ft
 Data: HAMMER 19-6\Well Based\R1 REPEAT\
 Plot File: \\-LOCAL-HAMMER 19-6\Well Based\MICROLOG\Microlog_IQ_5_rep_lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						89.73 ft
RWCH-12027542 135.00 lbs		Ø 3.625 in →		← Load Cell @ 86.04 ft ← BH Temperature @ 85.48 ft	6.25 ft	83.48 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in →		← SP @ 81.70 ft	3.74 ft	79.74 ft
GTET-10748374 165.00 lbs		Ø 3.625 in →		← GammaRay @ 73.67 ft	8.52 ft	71.22 ft
DSNT-10755066 174.00 lbs	DSN Decentralizer- 10755066 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 64.28 ft ← DSN Near @ 63.53 ft	9.69 ft	61.53 ft
SDLT-10685803 360.00 lbs	SDLT Pad-10714945 65.00 lbs Microlog Pad-10685803 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		← Microlog @ 53.72 ft ← SDL Caliper @ 53.53 ft ← SDL @ 53.52 ft	10.81 ft	50.72 ft
IQ Flex-10000954 140.00 lbs		Ø 3.625 in →			5.67 ft	45.05 ft
XRMI Isolator- 00000001 32.50 lbs		Ø 4.500 in →			1.30 ft	43.74 ft

XRMI-I Instrument-
11682412
290.00 lbs

Ø 4.500 in →

13.00 ft

XRMI-I Mandrel-
11682413
206.00 lbs

Ø 5.000 in →
Ø 4.500 in →

11.16 ft

30.74 ft

Pads 2, 4, 6 @ 22.35 ft
Pads 1, 3, 5 @ 22.12 ft

19.58 ft

ACRt Instrument- Centralizer 25-00000001
10811256 8.00 lbs
50.00 lbs

Ø 3.625 in →
Ø 4.000 in* →

5.03 ft

14.55 ft

← Mud Resistivity @ 13.19 ft

← ACRt @ 9.21 ft

ACRt Sonde-
10800784
200.00 lbs

Ø 3.625 in →

14.22 ft

Bull Nose-00000003
5.00 lbs

Ø 2.750 in →

0.33 ft

0.33 ft

0.00 ft

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12027542	135.00	6.25	83.48	300.00
SP	SP Sub	12345678	60.00	3.74	79.74	300.00
GTET	Gamma Telemetry Tool	10748374	165.00	8.52	71.22	60.00
DSNT	Dual Spaced Neutron	10755066	174.00	9.69	61.53	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	* 64.86	300.00
SDLT	Spectral Density Tool	10685803	360.00	10.81	50.72	60.00
SDLP	Density Insite Pad	10714945	65.00	2.55	* 52.93	60.00
MICP	Microlog Pad	10685803	8.00	1.00	* 53.22	60.00
IQF	IQ Flex tool	10000954	140.00	5.67	45.05	300.00
	Isolator for the XRMI tool	00000001	32.50	1.30	43.74	300.00
XRMI	XRMI Navigation - Insite	11682412	290.00	13.00	30.74	30.00
XRMI-I	XRMI Imager - Insite	11682413	206.00	11.16	19.58	30.00
ACRt	Array Compensated True Resistivity Instrument Section	10811256	50.00	5.03	14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	00000001	8.00	2.08	* 15.92	300.00

ACRT	Array Compensated True Resistivity Sonde Section	10800784	200.00	14.22	0.33	300.00
BLNS	Bull Nose	00000003	5.00	0.33	0.00	300.00
Total			1,905.10	89.73		
* Not included in Total Length and Length Accumulation.						
Data: HAMMER 19-6\0001 SP-GTET-DSN-SDL-XRMI-ACRT-BN006 18-Sep-13 04:08 Up @5708.3f					Date: 18-Sep-13 05:58:37	

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.100	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	5700.00	ft
	SHARED	BHT	Bottom Hole Temperature	130.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	XRMI-I Instrument	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	XRMI-I Instrument	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	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	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
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
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
XRMI-I Instrument	WRTI	Survey Writing Interval	30	ft
XRMI-I Instrument	SOPT	Smoothing Option	None	
XRMI-I Mandrel	DIMG	Process XRMI?	Yes	
XRMI-I Mandrel	ROTI	Rotate Image (N-E-S-W-N)?	Yes	
XRMI-I Mandrel	AGN	Use Button Auto Gain?	Yes	
XRMI-I Mandrel	BCLR	Button Auto Gain Color	127	
XRMI-I Mandrel	BFIL	Button Auto Gain Filter	0.020	
XRMI-I Mandrel	BGAN	Button Gain Value	0.001	
XRMI-I Mandrel	BOFF	Button Offset	0	
XRMI-I Mandrel	DIPE	Process Dipmeter Calculations?	Yes	
XRMI-I Mandrel	BHCS	Process Borehole Corrections?	Yes	
XRMI-I Mandrel	CLOK	Process Caliper Outputs?	Yes	
XRMI-I Mandrel	CMAX	Caliper Maximum Limit	100.0	in
XRMI-I Mandrel	CMIN	Caliper Mimimum Limit	3.5	in
XRMI-I Mandrel	NAVS	Navigation Source Tool	XRMI-I Instrument	
XRMI-I Mandrel	BHVC	Radius type for borehole volume calcuations	Elliptical	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: HAMMER 19-610001 SP-GTET-DSN-SDL-XRMI-ACRT-BN006 18-Sep-13 04:08 Up @5708.3f

Date: 18-Sep-13 05:45:39

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 10748374

Reference Calibration Date: 02-Aug-13 14:20:06

Engineer: THOMAS HYDE

Calibration Date: 03-Sep-13 10:36:47

Software Version: WL INSITE R3.8.4 (Build 5)

Calibration Version: 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	44.2	44.4	api
Background + Calibrator	275.0	276.4	api
Calibrator	230.8	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 10748374 **Reference Calibration Date:** 03-Sep-13 10:36:47
Engineer: S. INGERSOLL **Calibration Date:** 17-Sep-13 21:39:14
Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Calibrator Source S/N: TB-185
 Calibrator API Reference:228.00 api
 Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	44.4	35.1	api
Background + Calibrator	276.4	273.7	api
Calibrator	232.0	238.6	api

Shop	Field	Difference	Tolerance
232.0	238.6	-6.6	+/- 9.00

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10685803 **Reference Calibration Date:** 07-Aug-13 16:03:28
Engineer: THOMAS HYDE **Calibration Date:** 05-Sep-13 09:46:41
Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1
Host Tool Name: DSNT - 10755066

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4540.73	-5035.21	-7000.00 - -1000.00
Pad Gain	0.0003893	0.0004015	0.000200 - 0.000600
Arm Offset	-2828.82	-2028.23	-5000.00 - 3000.00
Arm Gain	0.0005533	0.0005309	0.000300 - 0.000700
Arm Power	-0.000007296	-0.000006519	-0.000010000 - 0.000010000

The ring diameter is computed from: $DIAMETER = PAD\ EXTENSION + ARM\ EXTENSION + TOOL\ DIAMETER$
 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)	2.13	2.00	-0.13	+/- 0.20
Medium Ring (in)	3.83	3.75	-0.08	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.36	6.50	0.14	+/- 0.20
Medium Ring (in)	8.19	8.25	0.06	+/- 0.20
Large Ring (in)	15.10	15.00	-0.10	+/- 0.20

PASS/FAIL SUMMARY

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

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check: Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name: **SDLT - 10685803**

Reference Calibration Date: **05-Sep-13 09:46:41**

Engineer: **S. INGERSOLL**

Calibration Date: **17-Sep-13 21:48:24**

Software Version: **WL INSITE R3.8.4 (Build 5)**

Calibration Version: **1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.67	-0.08	+/- 0.10
Ring Diameter	8.25	8.28	0.03	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

MICRO LOG SHOP CALIBRATION

Tool Name: **Microlog Pad - 10685803**

Reference Calibration Date: **07-Aug-13 15:47:10**

Engineer: **THOMAS HYDE**

Calibration Date: **05-Sep-13 09:33:39**

Software Version: **WL INSITE R3.8.4 (Build 5)**

Calibration Version: **1**

Host Tool Name: **DSNT - 10755066**

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.32	0.00	-0.00	-0.07	ohmm
Calibration Point #1	-0.32	0.00	0.06	0.00	ohmm
Calibration Point #2	19.73	20.00	19.99	20.00	ohmm
Internal Reference	19.65	19.92	20.00	20.01	ohmm

Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero		0.13		0.07	V
Calibration Point #1		-0.08		23.19	V
Calibration Point #2		5317.19		6889.35	V
Internal Reference		5294.83		6892.05	V

MICRO LOG FIELD CHECK

Tool Name: **Microlog Pad - 10685803**

Reference Calibration Date: **05-Sep-13 09:33:39**

Engineer: **S. INGERSOLL**

Calibration Date: **17-Sep-13 21:45:16**

Software Version: **WL INSITE R3.8.4 (Build 5)**

Calibration Version: **1**

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	0.00	-0.00	-0.07	-0.06	ohmm
Internal Reference	19.92	19.89	20.01	19.98	ohmm

Summary

Signal	Shop	Field	Difference	Tolerance
Microlog Normal	19.92	19.89	0.03	+/- 0.80
Microlog Lateral	20.01	19.98	0.03	+/- 0.80

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
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Gamma Ray Calibrator	232.0	238.6	-----	-6.6	+/- 9.00	api
SDLT-10685803						
Pad Extension	3.75	3.67	-----	0.08	+/-0.10	in
Ring Diameter	8.25	8.28	-----	-0.03	+/-0.15	in
Microlog Pad-10685803						
MicroLog Normal	19.92	19.89	-----	0.03	+/-0.80	ohmm
MicroLog Lateral	20.01	19.98	-----	0.03	+/-0.80	ohmm

Data: HAMMER 19-6\0001 SP-GTET-DSN-SDL-XRMI-ACRT-BN006 18-Sep-13 04:08 Up @5708.3f

Date: 18-Sep-13 05:55:29

HALLIBURTON**INPUTS, DELAYS AND FILTERS TABLE**

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	81.70	NO	
SP	Spontaneous Potential	81.70	BLK	1.250
SPR	Raw Spontaneous Potential	81.70	NO	
SPO	Spontaneous Potential Offset	81.70	NO	
GTET				
TPUL	Tension Pull	73.67	NO	
GR	Natural Gamma Ray API	73.67	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	73.67	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	73.67	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	63.43	NO	
RNDS	Near Detector Telemetry Counts	63.53	BLK	1.417
RFDS	Far Detector Telemetry Counts	64.28	TRI	0.583
DNTT	DSN Tool Temperature	63.53	NO	
DSNS	DSN Tool Status	63.43	NO	
ERND	Near Detector Telemetry Counts EVR	63.53	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	64.28	BLK	0.000
ENTM	DSN Tool Temperature EVR	63.53	NO	
SDLT				
TPUL	Tension Pull	53.53	NO	
PCAL	Pad Caliper	53.53	TRI	0.250
ACAL	Arm Caliper	53.53	TRI	0.250
XRMI-I Mandrel				
TPUL	Tension Pull	22.35	NO	
PAD1	XRMI Pad 1 values	22.12	NO	
PAD2	XRMI Pad 2 values	22.12	NO	
PAD3	XRMI Pad 3 values	22.12	NO	
PAD4	XRMI Pad 4 values	22.12	NO	

PAD4	XRMI Pad 4 values	22.12	NO	
PAD5	XRMI Pad 5 values	22.12	NO	
PAD6	XRMI Pad 6 values	22.12	NO	
OD1	EMI Odd Button Values Pad 1	22.12	NO	
OD2	EMI Odd Button Values Pad 2	22.35	NO	
OD3	EMI Odd Button Values Pad 3	22.12	NO	
OD4	EMI Odd Button Values Pad 4	22.35	NO	
OD5	EMI Odd Button Values Pad 5	22.12	NO	
OD6	EMI Odd Button Values Pad 6	22.35	NO	
EV1	EMI Even Button Values Pad 1	22.14	NO	
EV2	EMI Even Button Values Pad 2	22.32	NO	
EV3	EMI Even Button Values Pad 3	22.14	NO	
EV4	EMI Even Button Values Pad 4	22.32	NO	
EV5	EMI Even Button Values Pad 5	22.14	NO	
EV6	EMI Even Button Values Pad 6	22.32	NO	
ITMP	Instrument Temperature	19.58	NO	
EMIM	Tool Mode	19.58	NO	
HAZI	Hole Azimuth	21.87	NO	
HAZI	Hole Azimuth - Down Delay	22.37	NO	
ZACC	Accelerometer Z	22.12	NO	
TPUL	Tension Pull	22.35	NO	
FIR1	Current Button R - Pad 1	22.12	NO	
FIR2	Current Button R - Pad 2	22.35	NO	
FIR3	Current Button R - Pad 3	22.12	NO	
FIR4	Current Button R - Pad 4	22.35	NO	
FIR5	Current Button R - Pad 5	22.12	NO	
FIR6	Current Button R - Pad 6	22.35	NO	
FIX1	Current Button X - Pad 1	22.12	NO	
FIX2	Current Button X - Pad 2	22.35	NO	
FIX3	Current Button X - Pad 3	22.12	NO	
FIX4	Current Button X - Pad 4	22.35	NO	
FIX5	Current Button X - Pad 5	22.12	NO	
FIX6	Current Button X - Pad 6	22.35	NO	
SIR1	Current Slow Button R - Pad 1	22.12	BLK	3.000
SIR2	Current Slow Button R - Pad 2	22.35	BLK	3.000
SIR3	Current Slow Button R - Pad 3	22.12	BLK	3.000
SIR4	Current Slow Button R - Pad 4	22.35	BLK	3.000
SIR5	Current Slow Button R - Pad 5	22.12	BLK	3.000
SIR6	Current Slow Button R - Pad 6	22.35	BLK	3.000
SIX1	Current Slow Button X - Pad 1	22.12	BLK	3.000
SIX2	Current Slow Button X - Pad 2	22.35	BLK	3.000
SIX3	Current Slow Button X - Pad 3	22.12	BLK	3.000
SIX4	Current Slow Button X - Pad 4	22.35	BLK	3.000
SIX5	Current Slow Button X - Pad 5	22.12	BLK	3.000
SIX6	Current Slow Button X - Pad 6	22.35	BLK	3.000
EMMR	Phasor Voltage - Real Part	22.12	NO	
EMMX	Phasor Voltage - Imaginary Part	22.12	NO	
PADV	Pad Voltage	19.58	BLK	0.250
ITMP	Instrument Temperature	19.58	BLK	0.000
CON1	Conductivity Pad 1	22.12	BLK	3.000
CON2	Conductivity Pad 2	22.35	BLK	3.000
CON3	Conductivity Pad 3	22.12	BLK	3.000
CON4	Conductivity Pad 4	22.35	BLK	3.000
CON5	Conductivity Pad 5	22.12	BLK	3.000
CON6	Conductivity Pad 6	22.35	BLK	3.000
CON7	Conductivity Pad 7	22.12	NO	
CON8	Conductivity Pad 8	22.35	NO	
CON9	Conductivity Pad 9	22.12	NO	
CON10	Conductivity Pad 10	22.35	NO	
CON11	Conductivity Pad 11	22.12	NO	
CON12	Conductivity Pad 12	22.35	NO	
CON13	Conductivity Pad 13	22.12	NO	
CON14	Conductivity Pad 14	22.35	NO	
CON15	Conductivity Pad 15	22.12	NO	
CON16	Conductivity Pad 16	22.35	NO	
CON17	Conductivity Pad 17	22.12	NO	
CON18	Conductivity Pad 18	22.35	NO	
CON19	Conductivity Pad 19	22.12	NO	
CON20	Conductivity Pad 20	22.35	NO	
CON21	Conductivity Pad 21	22.12	NO	
CON22	Conductivity Pad 22	22.35	NO	
CON23	Conductivity Pad 23	22.12	NO	
CON24	Conductivity Pad 24	22.35	NO	
CON25	Conductivity Pad 25	22.12	NO	
CON26	Conductivity Pad 26	22.35	NO	
CON27	Conductivity Pad 27	22.12	NO	
CON28	Conductivity Pad 28	22.35	NO	
CON29	Conductivity Pad 29	22.12	NO	
CON30	Conductivity Pad 30	22.35	NO	
CON31	Conductivity Pad 31	22.12	NO	
CON32	Conductivity Pad 32	22.35	NO	
CON33	Conductivity Pad 33	22.12	NO	
CON34	Conductivity Pad 34	22.35	NO	
CON35	Conductivity Pad 35	22.12	NO	
CON36	Conductivity Pad 36	22.35	NO	
CON37	Conductivity Pad 37	22.12	NO	
CON38	Conductivity Pad 38	22.35	NO	
CON39	Conductivity Pad 39	22.12	NO	
CON40	Conductivity Pad 40	22.35	NO	
CON41	Conductivity Pad 41	22.12	NO	
CON42	Conductivity Pad 42	22.35	NO	
CON43	Conductivity Pad 43	22.12	NO	
CON44	Conductivity Pad 44	22.35	NO	
CON45	Conductivity Pad 45	22.12	NO	
CON46	Conductivity Pad 46	22.35	NO	
CON47	Conductivity Pad 47	22.12	NO	
CON48	Conductivity Pad 48	22.35	NO	
CON49	Conductivity Pad 49	22.12	NO	
CON50	Conductivity Pad 50	22.35	NO	
CON51	Conductivity Pad 51	22.12	NO	
CON52	Conductivity Pad 52	22.35	NO	
CON53	Conductivity Pad 53	22.12	NO	
CON54	Conductivity Pad 54	22.35	NO	
CON55	Conductivity Pad 55	22.12	NO	
CON56	Conductivity Pad 56	22.35	NO	
CON57	Conductivity Pad 57	22.12	NO	
CON58	Conductivity Pad 58	22.35	NO	
CON59	Conductivity Pad 59	22.12	NO	
CON60	Conductivity Pad 60	22.35	NO	
CON61	Conductivity Pad 61	22.12	NO	
CON62	Conductivity Pad 62	22.35	NO	
CON63	Conductivity Pad 63	22.12	NO	
CON64	Conductivity Pad 64	22.35	NO	
CON65	Conductivity Pad 65	22.12	NO	
CON66	Conductivity Pad 66	22.35	NO	
CON67	Conductivity Pad 67	22.12	NO	
CON68	Conductivity Pad 68	22.35	NO	
CON69	Conductivity Pad 69	22.12	NO	
CON70	Conductivity Pad 70	22.35	NO	
CON71	Conductivity Pad 71	22.12	NO	
CON72	Conductivity Pad 72	22.35	NO	
CON73	Conductivity Pad 73	22.12	NO	
CON74	Conductivity Pad 74	22.35	NO	
CON75	Conductivity Pad 75	22.12	NO	
CON76	Conductivity Pad 76	22.35	NO	
CON77	Conductivity Pad 77	22.12	NO	
CON78	Conductivity Pad 78	22.35	NO	
CON79	Conductivity Pad 79	22.12	NO	
CON80	Conductivity Pad 80	22.35	NO	
CON81	Conductivity Pad 81	22.12	NO	
CON82	Conductivity Pad 82	22.35	NO	
CON83	Conductivity Pad 83	22.12	NO	
CON84	Conductivity Pad 84	22.35	NO	
CON85	Conductivity Pad 85	22.12	NO	
CON86	Conductivity Pad 86	22.35	NO	
CON87	Conductivity Pad 87	22.12	NO	
CON88	Conductivity Pad 88	22.35	NO	
CON89	Conductivity Pad 89	22.12	NO	
CON90	Conductivity Pad 90	22.35	NO	
CON91	Conductivity Pad 91	22.12	NO	
CON92	Conductivity Pad 92	22.35	NO	
CON93	Conductivity Pad 93	22.12	NO	
CON94	Conductivity Pad 94	22.35	NO	
CON95	Conductivity Pad 95	22.12	NO	
CON96	Conductivity Pad 96	22.35	NO	
CON97	Conductivity Pad 97	22.12	NO	
CON98	Conductivity Pad 98	22.35	NO	
CON99	Conductivity Pad 99	22.12	NO	
CON100	Conductivity Pad 100	22.35	NO	

UIR2	Current Button R No Delay - Pad 2	22.12	NO	
UIR4	Current Button R No Delay - Pad 4	22.12	NO	
UIR6	Current Button R No Delay - Pad 6	22.12	NO	
UIX2	Current Button X No Delay - Pad 2	22.12	NO	
UIX4	Current Button X No Delay - Pad 4	22.12	NO	
UIX6	Current Button X No Delay - Pad 6	22.12	NO	
TPUL	Tension Pull	22.35	NO	
ARM1	Caliper 1 measurement	22.12	BLK	0.000
ARM2	Caliper 2 measurement	22.12	BLK	0.000
ARM3	Caliper 3 measurement	22.12	BLK	0.000
ARM4	Caliper 4 measurement	22.12	BLK	0.000
ARM5	Caliper 5 measurement	22.12	BLK	0.000
ARM6	Caliper 6 measurement	22.12	BLK	0.000
MOTV	Motor Voltage Monitor 1	22.12	BLK	0.000
PRES	Caliper percentage of total compression of the spring	19.58	BLK	0.000
HAZI	Hole Azimuth	22.12	NO	
RB	Relative Bearing	22.12	NO	
AZI1	PAD1 Azimuth	22.12	NO	
DEVI	Inclination	22.12	NO	

ACRt Sonde

TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000

F3X3	ACRT 72KHz - 6in X value	3.23	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

SDLT Pad

TPUL	Tension Pull	53.52	NO	
NAB	Near Above	53.35	BLK	0.920
NHI	Near Cesium High	53.35	BLK	0.920
NLO	Near Cesium Low	53.35	BLK	0.920
NVA	Near Valley	53.35	BLK	0.920
NBA	Near Barite	53.35	BLK	0.920
NDE	Near Density	53.35	BLK	0.920
NPK	Near Peak	53.35	BLK	0.920
NLI	Near Lithology	53.35	BLK	0.920
NBAU	Near Barite Unfiltered	53.35	BLK	0.250
NLIU	Near Lithology Unfiltered	53.35	BLK	0.250
FAB	Far Above	53.70	BLK	0.250
FHI	Far Cesium High	53.70	BLK	0.250
FLO	Far Cesium Low	53.70	BLK	0.250
FVA	Far Valley	53.70	BLK	0.250
FBA	Far Barite	53.70	BLK	0.250
FDE	Far Density	53.70	BLK	0.250
FPK	Far Peak	53.70	BLK	0.250
FLI	Far Lithology	53.70	BLK	0.250
PTMP	Pad Temperature	53.53	BLK	0.920
NHV	Near Detector High Voltage	52.93	NO	
FHV	Far Detector High Voltage	52.93	NO	
ITMP	Instrument Temperature	52.93	NO	
DDHV	Detector High Voltage	52.93	NO	

Microlog Pad

TPUL	Tension Pull	53.72	NO	
MINV	Microlog Lateral	53.72	BLK	0.750
MNOR	Microlog Normal	53.72	BLK	0.750

Data: HAMMER 19-610001 SP-CTET.DSN.SDI.YRML.ACRT-RM006 18-Sep-13 04:08:11n @5708 3f

Date: 18-Sep-13 05:44:57

COMPANY **CIMAREX ENERGY CO.**

WELL **HAMMER 19-6**

FIELD **LETTE**

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