

HALLIBURTON

MICRO LOG

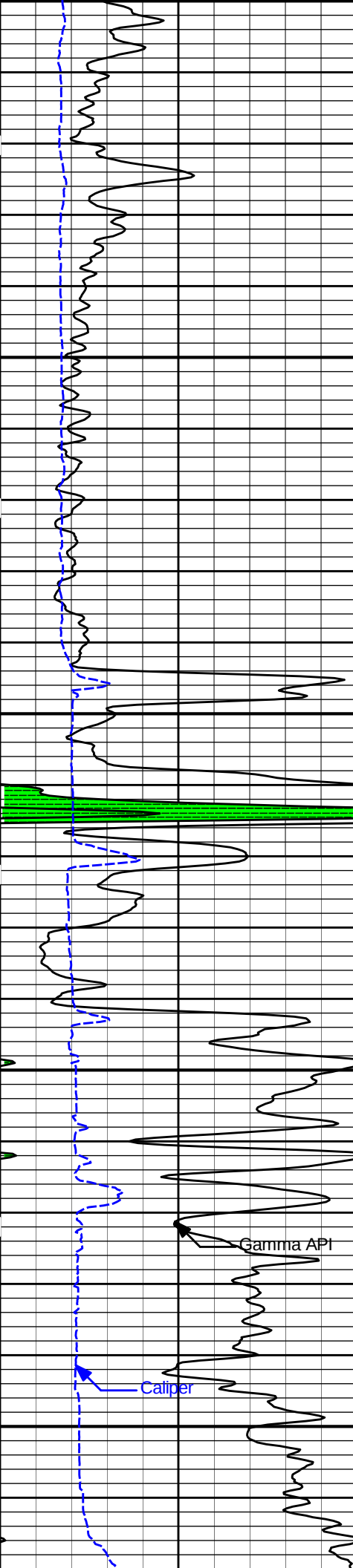
COMPANY		STRATA EXPLORATION			
WELL		RICHARDSON 1-3			
FIELD		GREENSBURG			
COUNTY		KIOWA			
STATE		KANSAS			
Permanent Datum		GL		Elev. 2208.0 ft	
Log measured from		KB		D.F. 2217.0 ft	
Drilling measured from		KB		G.L. 2208.0 ft	
Date		10-Apr-12			
Run No.		ONE			
Depth - Driller		4890.00 ft			
Depth - Logger		4890.0 ft			
Bottom - Logged Interval		4862.0 ft			
Top - Logged Interval		3900.0 ft			
Casing - Driller		8.625 in @ 622.0 ft			
Casing - Logger		622.0 ft			
Bit Size		7.875 in		@	
Type Fluid in Hole		WATER BASED MUD			
Density		9.2 ppq		65.00 s/qt	
PH		10.00 pH		10.8 cpqm	
Source of Sample		FLOW LINE			
Rm @ Meas. Temperature		0.310 ohmm @ 75.00 degF		@	
Rmf @ Meas. Temperature		0.27 ohmm @ 75.00 degF		@	
Rmc @ Meas. Temperature		0.360 ohmm @ 75.00 degF		@	
Source Rmf		MEAS		MEAS	
Rm @ BHT		0.22 ohmm @ 109.0 degF		@	
Time Since Circulation		10.0 hr			
Time on Bottom		10-Apr-12 09:46			
Max. Rec. Temperature		109.0 degF @ 4890.0 ft		@	
Equipment		10546696		LIBERAL	
Recorded By		T. HYDE			
Witnessed By		J. CHRISTENSEN			

COMPANY	STRATA EXPLORATION
WELL	RICHARDSON 1-3
FIELD	GREENSBURG
COUNTY	KIOWA
STATE	KANSAS
API No.	15-097-21721-00-00
Location	1700' FNL 1305' FEL
Other Services:	ACRT DSNT/SDLT MRIL

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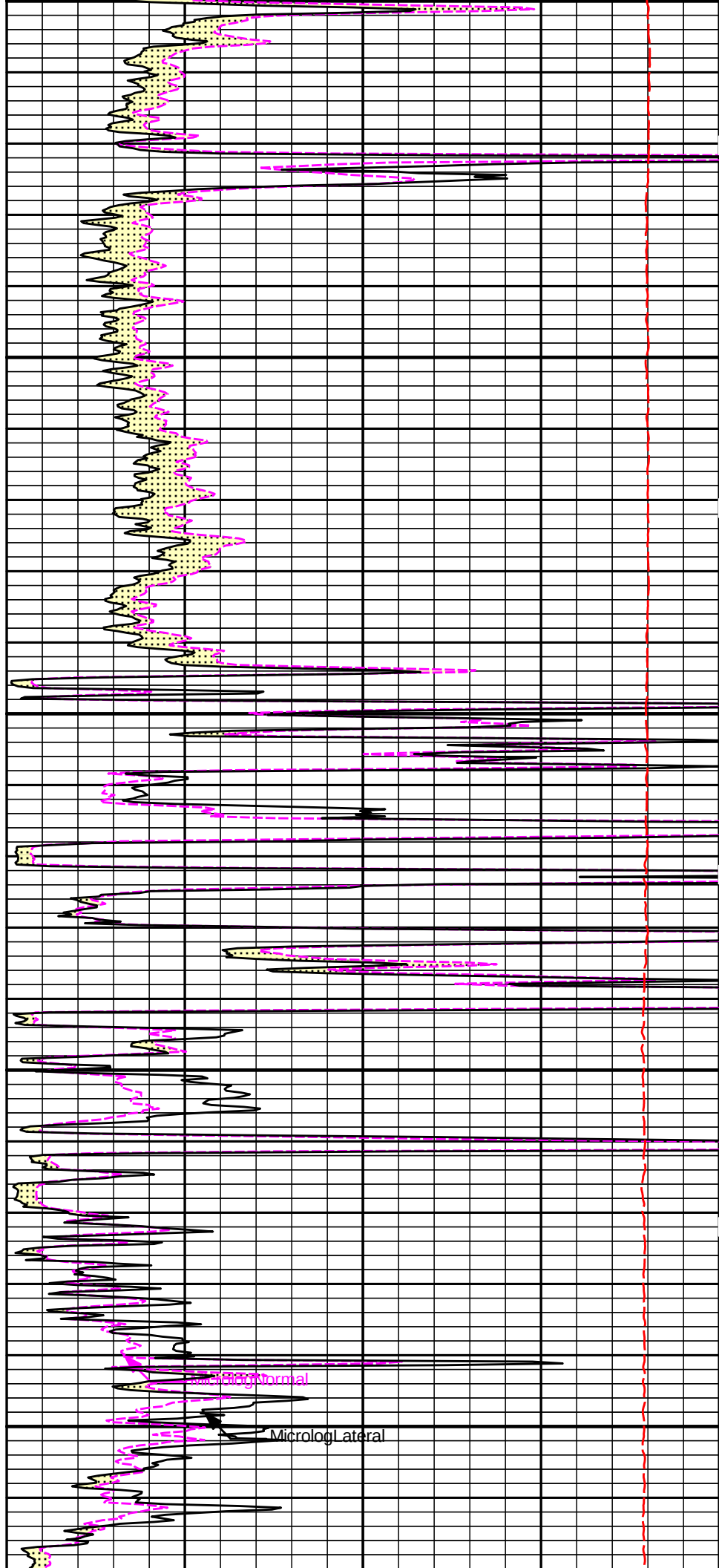
Service Ticket No.: 9425816		API Serial No.: 15-097-21721-00-00		PGM Version: WL INSITE R3.4.2 (Build 2)			
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE				RESISTIVITY SCALE CHANGES			
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample				RESISTIVITY EQUIPMENT DATA			
Rm @ Meas. Temp	@	@		Run No.	Tool Type & No.	Pad Type	Tool Pos.
Rmf @ Meas. Temp.	@	@		ONE	MICRO	RUBBER	ADJ.
Rmc @ Meas. Temp.	@	@			M296		
Source Rmf	Rmc						
Rm @ BHT	@	@					
Rmf @ BHT	@	@					
Rmc @ BHT	@	@					
EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.		Run No.	
Serial No.	11039640	Serial No.		Serial No.		Serial No.	
Model No.	GTET	Model No.		Model No.		Model No.	
Diameter	3.625"	No. of Cent.		Diameter		Diameter	
Detector Model No.	T-102	Spacing		Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8"	LSA [Y/N]		Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]		Strength		Strength	
LOGGING DATA							
GENERAL		GAMMA		ACOUSTIC		DENSITY	

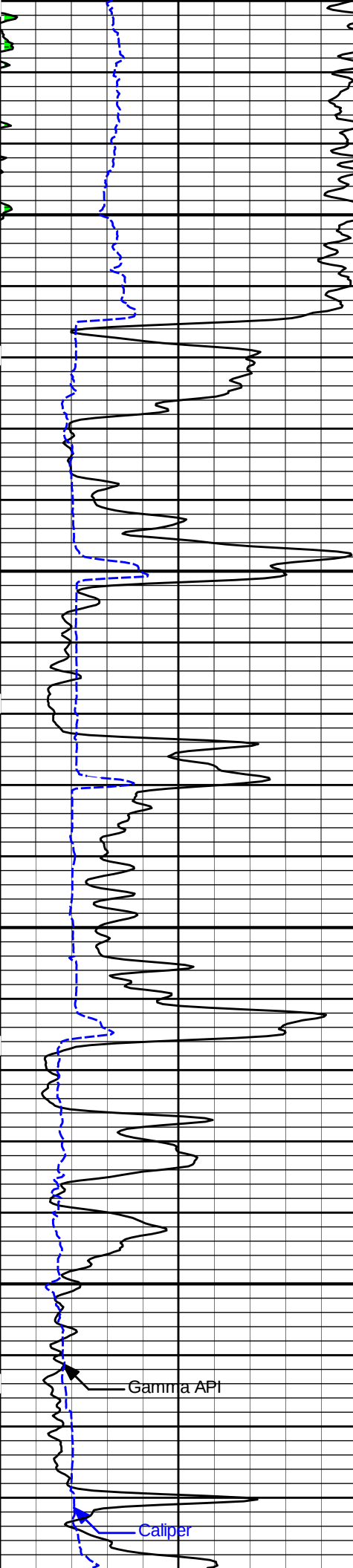
GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON							
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix		
No.	From	To	ft/min	L	R	L	R		L	R		L	R			
ONE	4890	3900	REC	0	150											
DIRECTIONAL INFORMATION																
Maximum Deviation								@	KOP							@
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING																
CHLORIDES 7000 MG/L																
LCM 1 PPB																
TODAY'S CREW K. KING V. JAMIE																
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KANSAS 620-624-8123																
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.																
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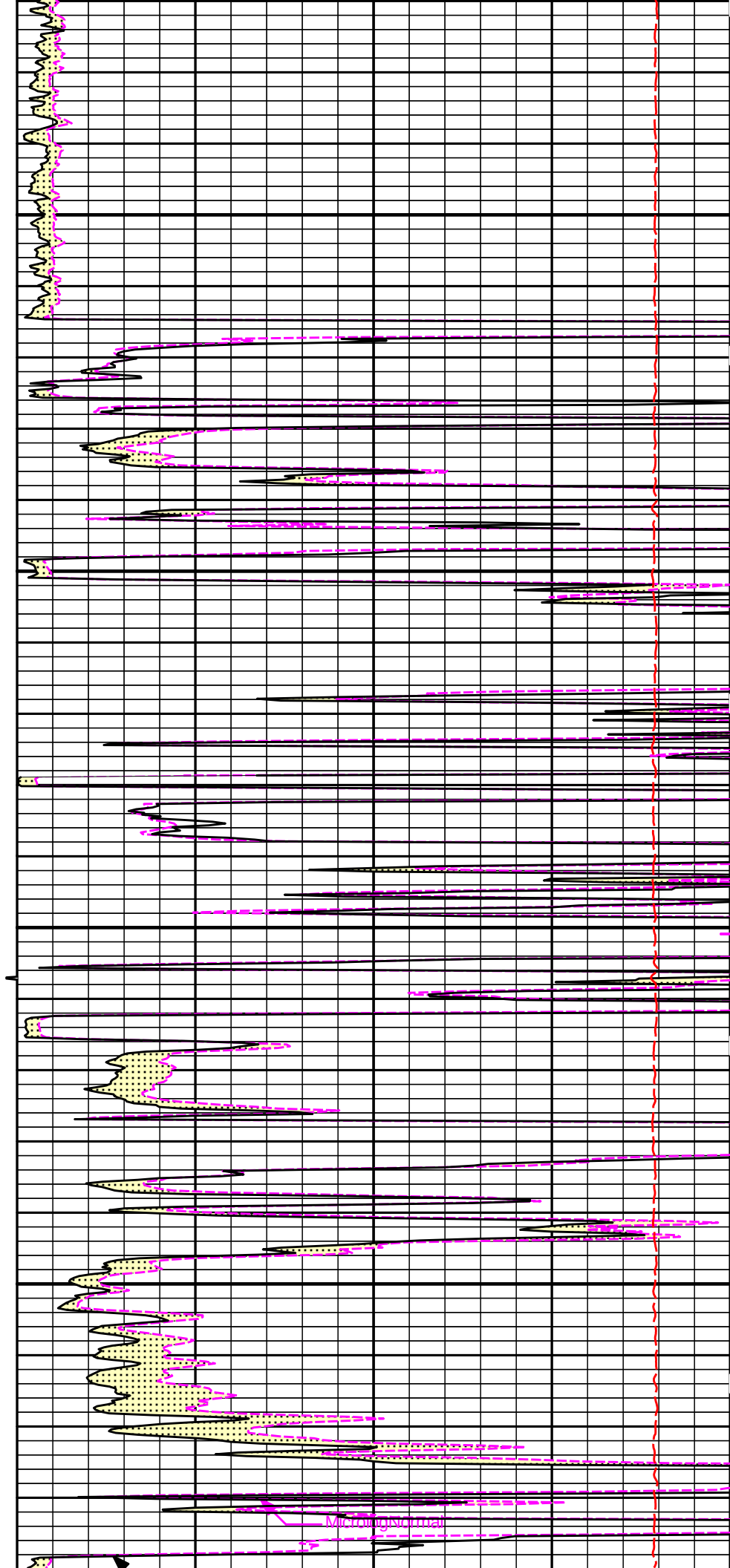
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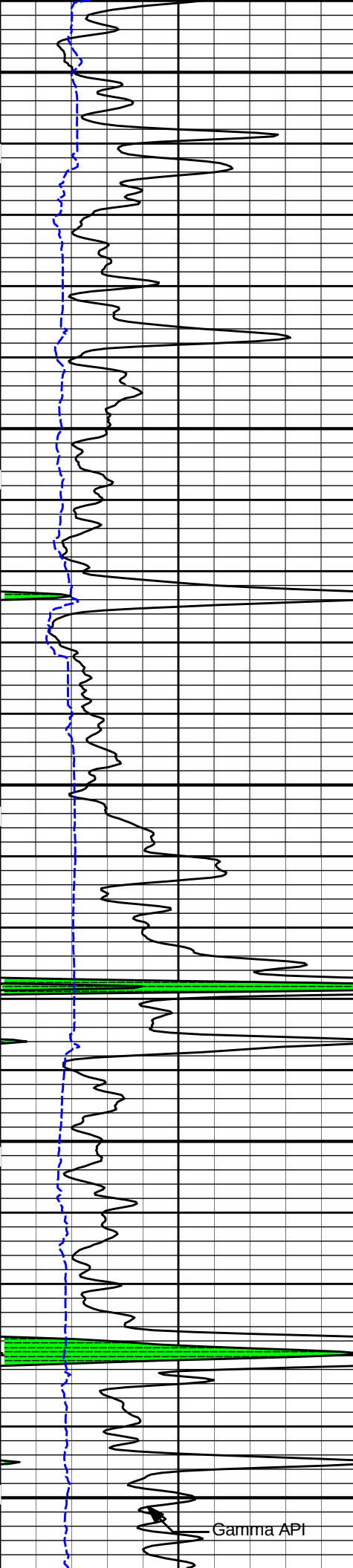




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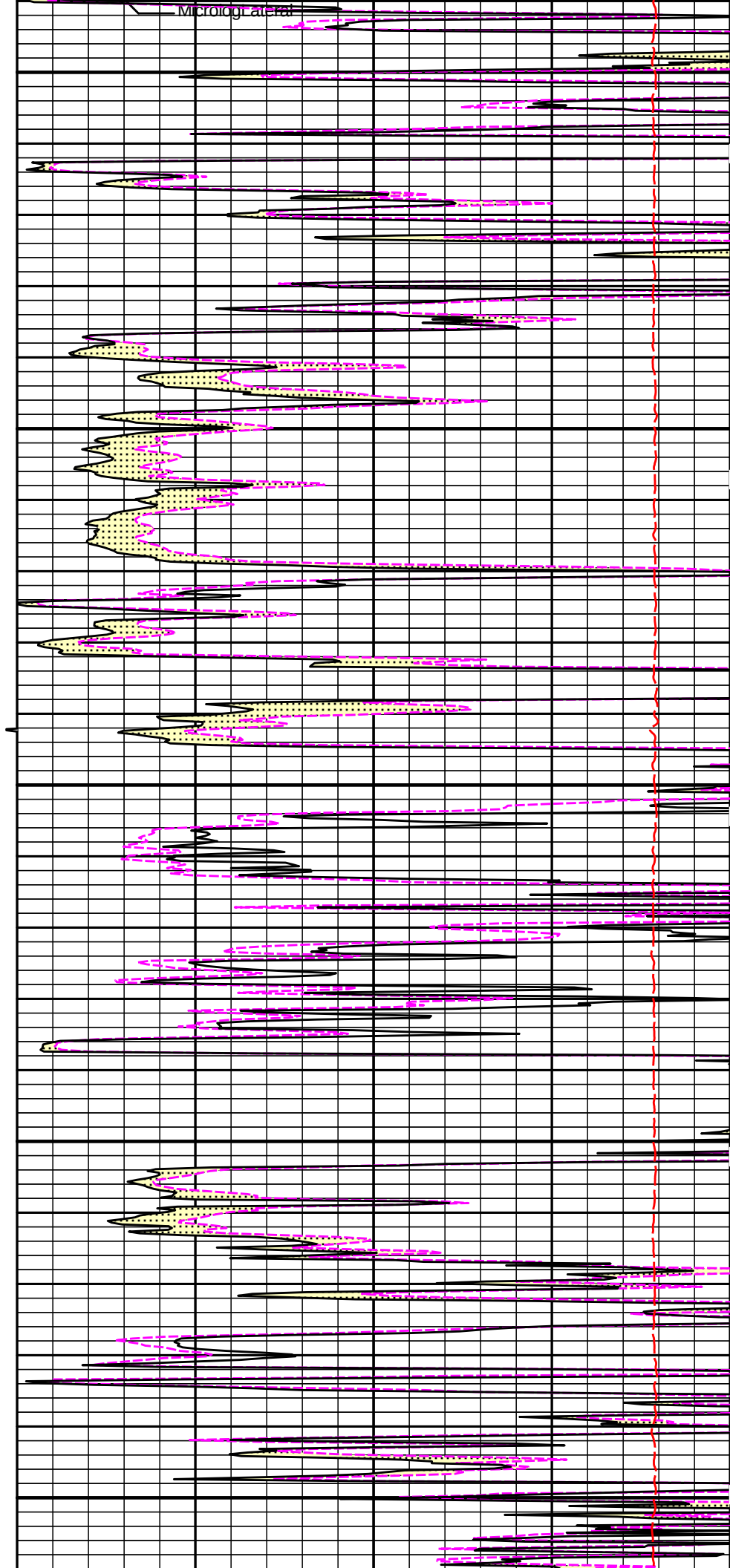


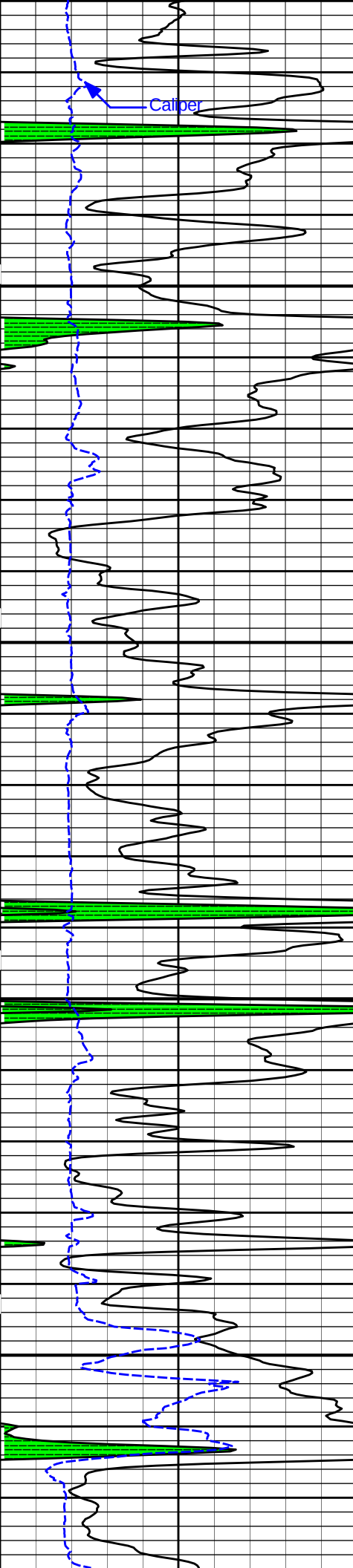


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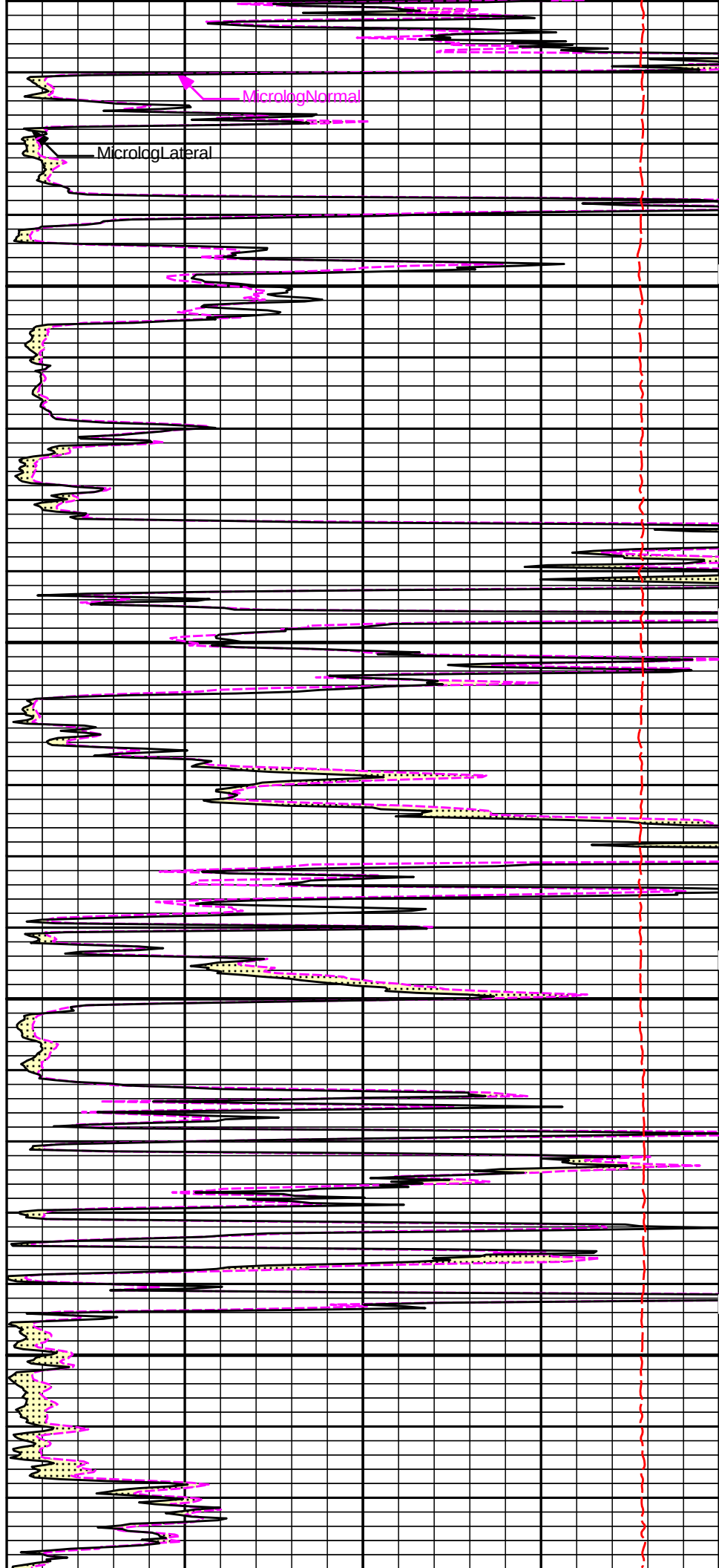
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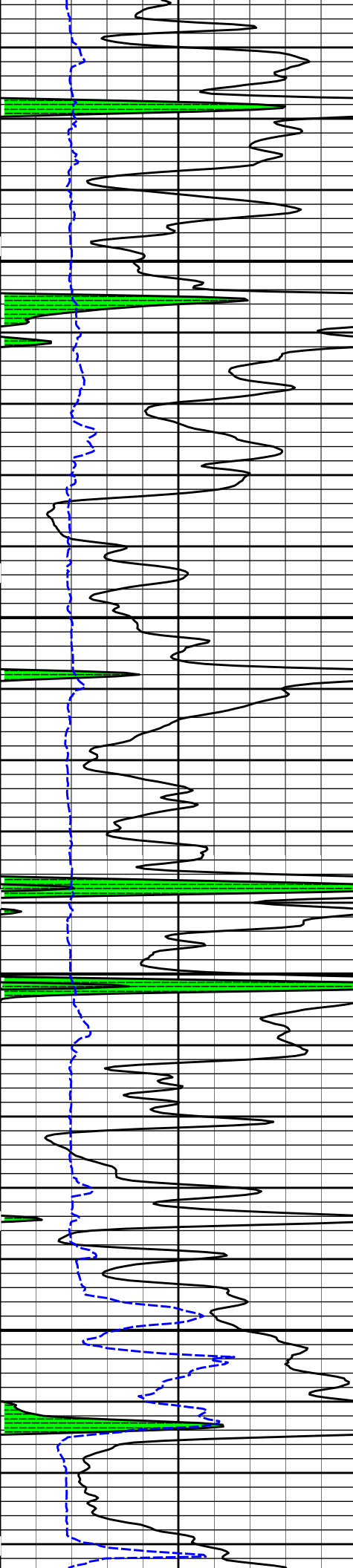




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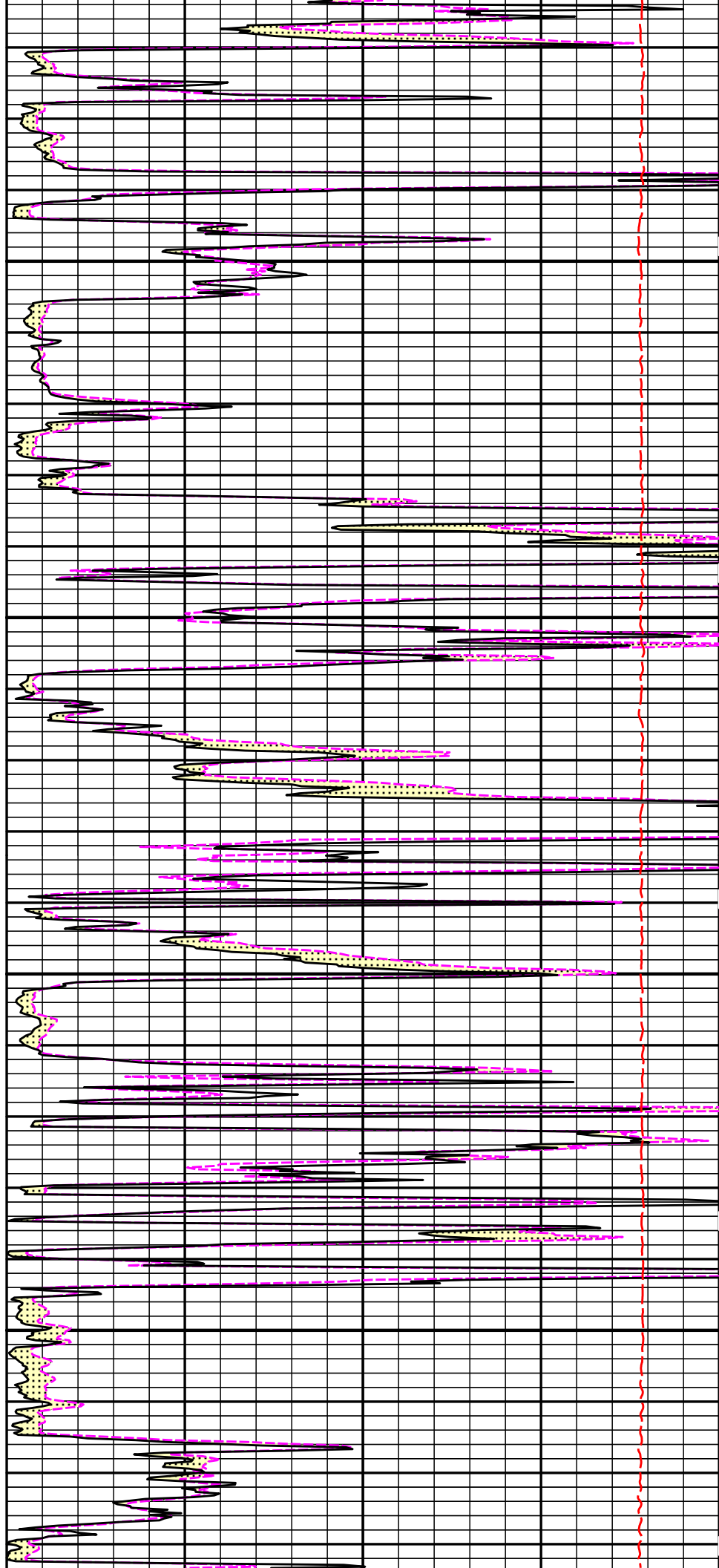
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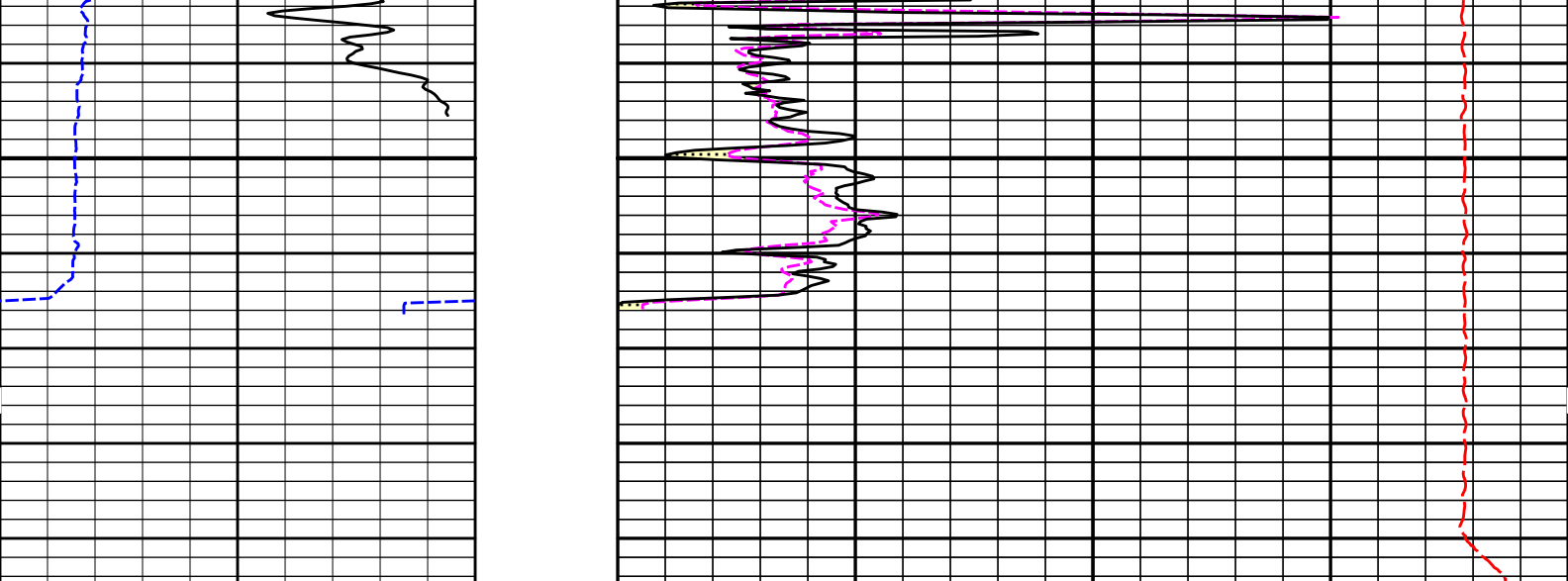




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4800





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

HALLIBURTON

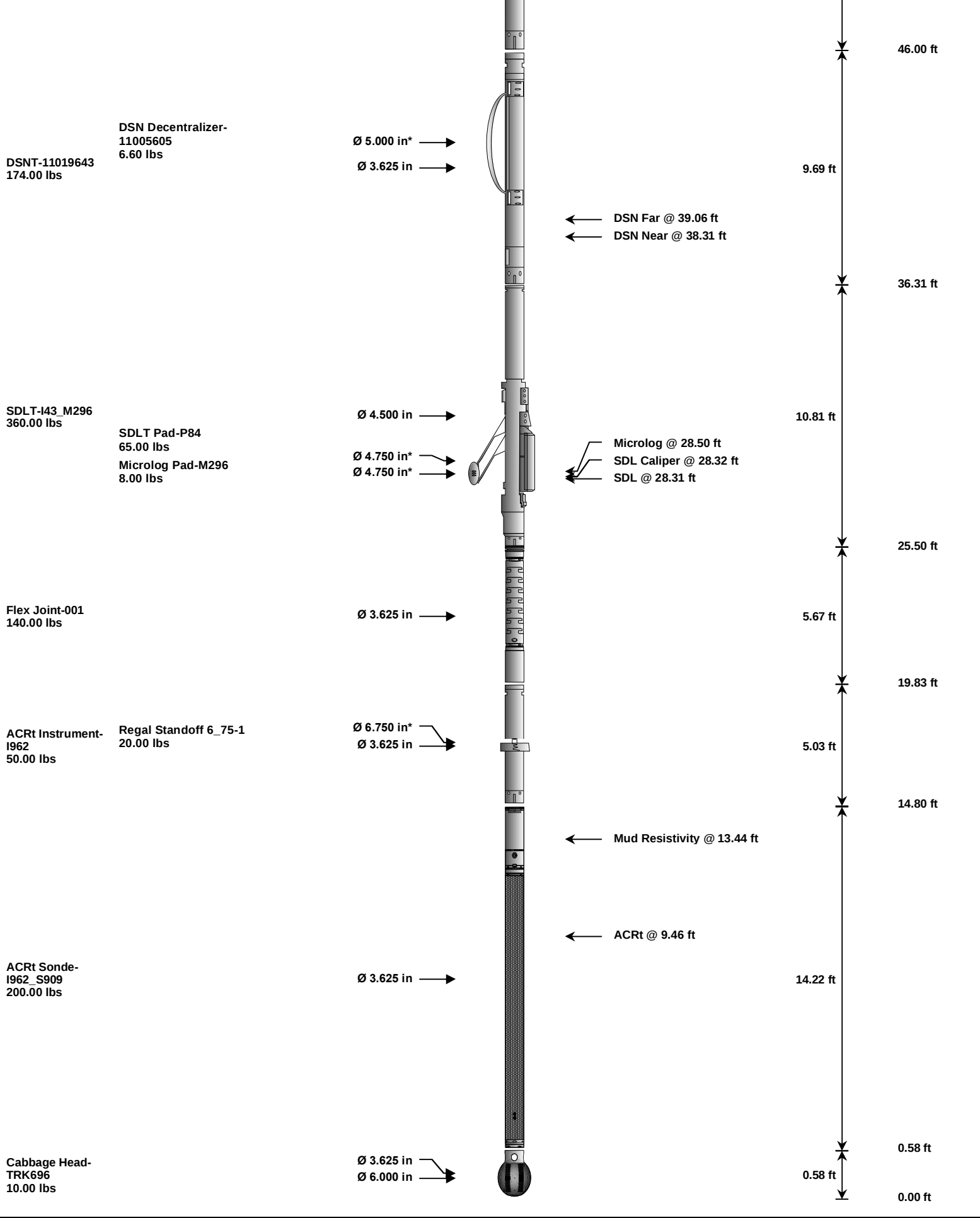
Plot Time: 10-Apr-12 11:10:22
Plot Range: 4598 ft to 4894.75 ft
Data: RICHARDSON_1_3\Well Based\DAQ-0001-003\
Plot File: \\-LOCAL-IRICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\MICRO\Microlog_IQ_5_rep.lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in →		← Temperature @ 61.21 ft	3.03 ft	62.24 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	59.21 ft
SP Sub-001 60.00 lbs		Ø 3.625 in →		← SP @ 56.48 ft	3.74 ft	58.26 ft
						54.52 ft
GTET-11039640 165.00 lbs		Ø 3.625 in →		← GammaRay @ 48.46 ft	8.52 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_696	37.50	3.03	59.21	300.00
XOHD	Hostile to Dits Cross Over		TRK696	20.00	0.95	58.26	300.00
SP	SP Sub		001	60.00	3.74	54.52	300.00
STTT	Tool String Test Tool		110000010	125.00	2.50	49.00	300.00

GTET	Gamma Telemetry Tool	11039640	165.00	8.52	46.00	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69	36.31	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13 *	39.64	300.00
SDLT	Spectral Density Tool	I43 M296	360.00	10.81	25.50	60.00
SDLP	Density Insite Pad	P84	65.00	2.55 *	27.71	60.00
MICP	Microlog Pad	M296	8.00	1.00 *	28.00	60.00
FLEX	Flex Joint	001	140.00	5.67	19.83	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I962	50.00	5.03	14.80	300.00
RSOF	Regal Standoff 6.75in	1	20.00	0.52 *	17.08	300.00
ACRt	Array Compensated True Resistivity	I962 S909	200.00	14.22	0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58	0.00	300.00
Total			1,316.10	62.24		
* Not included in Total Length and Length Accumulation.						
Data: RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE						
Date: 10-Apr-12 08:50:23						

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11039640	Reference Calibration Date:	22-Feb-12 20:28:49
Engineer:	C. MARLOWE	Calibration Date:	25-Mar-12 12:10:59
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1
Calibrator Source S/N: TB146 Calibrator API Reference:265.00 api Equivalent Calibrator API Reference:269.6 api			
Measurement	Measured	Calibrated	Units
Background	48.9	48.9	api
Background + Calibrator	318.5	318.5	api
Calibrator	269.6	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11039640	Reference Calibration Date:	25-Mar-12 12:10:59
Engineer:	T. HYDE	Calibration Date:	10-Apr-12 08:16:54
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1
Calibrator Source S/N: TB146 Calibrator API Reference:265.00 api Equivalent Calibrator API Reference:269.6 api			
Field Verification	Shop	Field	Units
Background	48.9	37.8	api
Background + Calibrator	318.5	307.3	api
Calibrator	269.6	269.5	api
Shop	Field	Difference	Tolerance
269.6	269.5	0.1	+/- 9.00

MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - M296	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	C. HAVERKAMP	Calibration Date:	22-Mar-12 14:13:42
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

CALIBRATION COEFFICIENT SUMMARY			
Measurement	Micro Log Normal	Micro Log Lateral	

		Measured	Calibrated	Measured	Calibrated	Units
Tool Zero		-0.06	-0.06	-0.37	-0.37	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		19.95	19.95	19.90	19.90	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	0.34	-0.68	V
Calibration Point #1	16.26	126.19	V
Calibration Point #2	5354.60	7042.88	V
Internal Reference	5340.17	7009.02	V

MICRO LOG FIELD CHECK

Tool Name: Microlog Pad - M296

Reference Calibration Date: 22-Mar-12 14:13:42

Engineer: T. HYDE

Calibration Date: 10-Apr-12 08:16:05

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.06	-0.06	-0.37	-0.36	ohmm
Internal Reference	19.95	19.91	19.90	19.86	ohmm

Summary				
Signal	Shop	Field	Difference	Tolerance
Microlog Normal	19.95	19.91	0.04	+/- 0.80
Microlog Lateral	19.90	19.86	0.04	+/- 0.80

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11039640						
Gamma Ray Calibrator	269.6	269.5	-----	0.1	+/- 9.00	api
Microlog Pad-M296						
MicroLog Normal	19.95	19.91	-----	0.04	+/-0.80	ohmm
MicroLog Lateral	19.90	19.86	-----	0.04	+/-0.80	ohmm

Data: RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE

Date: 10-Apr-12 09:20:17

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	9.300	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	2.000	ohmm
	SHARED	TDM	Temperature of Mud	75.0	°F

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	4890.00	ft
SHARED	BHT	Bottom Hole Temperature	117.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	NONE	
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
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	DSNO	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	
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	
BOTTOM				
Data: RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE			Date: 10-Apr-12 09:21:05	

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
CH_HOS				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	56.48	NO	
SP	Spontaneous Potential	56.48	BLK	1.250
SPR	Raw Spontaneous Potential	56.48	NO	
SPO	Spontaneous Potential Offset	56.48	NO	
GTET				
TPUL	Tension Pull	48.46	NO	
GR	Natural Gamma Ray API	48.46	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	48.46	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	48.46	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	38.21	NO	
RNDS	Near Detector Telemetry Counts	38.31	BLK	1.417
RFDS	Far Detector Telemetry Counts	39.06	TRI	0.583
DNTT	DSN Tool Temperature	38.31	NO	
DSNS	DSN Tool Status	38.21	NO	
ERND	Near Detector Telemetry Counts EVR	38.31	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	39.06	BLK	0.000
ENTM	DSN Tool Temperature EVR	38.31	NO	
SDLT				
TPUL	Tension Pull	28.32	NO	
PCAL	Pad Caliper	28.32	TRI	0.250
ACAL	Arm Caliper	28.32	TRI	0.250
ACRt Sonde				
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000

F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	
SDLT Pad				
TPUL	Tension Pull	28.31	NO	
NAB	Near Above	28.13	BLK	0.920
NHI	Near Cesium High	28.13	BLK	0.920
NLO	Near Cesium Low	28.13	BLK	0.920
NVA	Near Valley	28.13	BLK	0.920
NBA	Near Barite	28.13	BLK	0.920
NDE	Near Density	28.13	BLK	0.920
NPK	Near Peak	28.13	BLK	0.920
NLI	Near Lithology	28.13	BLK	0.920
NBAU	Near Barite Unfiltered	28.13	BLK	0.250
NLIU	Near Lithology Unfiltered	28.13	BLK	0.250
FAB	Far Above	28.48	BLK	0.250
FHI	Far Cesium High	28.48	BLK	0.250
FLO	Far Cesium Low	28.48	BLK	0.250
FVA	Far Valley	28.48	BLK	0.250
FBA	Far Barite	28.48	BLK	0.250

FBA	Far Baffle	28.48	BLK	0.250
FDE	Far Density	28.48	BLK	0.250
FPK	Far Peak	28.48	BLK	0.250
FLI	Far Lithology	28.48	BLK	0.250
PTMP	Pad Temperature	28.32	BLK	0.920
NHV	Near Detector High Voltage	27.71	NO	
FHV	Far Detector High Voltage	27.71	NO	
ITMP	Instrument Temperature	27.71	NO	
DDHV	Detector High Voltage	27.71	NO	
Microlog Pad				
TPUL	Tension Pull	28.50	NO	
MINV	Microlog Lateral	28.50	BLK	0.750
MNOR	Microlog Normal	28.50	BLK	0.750
Data: RICHARDSON_1_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE			Date: 10-Apr-12 09:21:30	

COMPANY	STRATA EXPLORATION		
WELL	RICHARDSON 1-3		
FIELD	GREENSBURG		
COUNTY	KIOWA	STATE	KANSAS
HALLIBURTON		MICRO LOG	