



Weatherford[®]

MICRORESISTIVITY LOG

GRAND MESA OPERATING COMPANY

WELL GLENNIS #1-27

FIELD WILDCAT

PROVINCE/COUNTY GOVE

COUNTRY/STATE U.S.A. / KANSAS

LOCATION 2141' FSL & 541' FEL

SW NE NE SE

SEC 27	TWP 13S	RGE 31W	Other Services MA/MFE	MPD/MDN	Elevations: KB 2853.00 DF 2852.00 GL 2848.00
API Number 15-063-22030		Permit Number		Permanent Datum G.L., Elevation 2848 feet	
Log Measured From KB		Drilling Measured From K.B.		Date 16-AUG-2012	
Run Number	ONE				
Depth Driller	4630.00 feet				
Depth Logger	4626.00 feet				
First Reading	4592.00 feet				
Last Reading	3600.00 feet				
Casing Driller	219.00 feet				
Casing Logger	218.00 feet				
Bit Size	7.875 inches				
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.10 g/c3		50.00 CP		
PH / Fluid Loss	10.00		8.00 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	0.97 @ 97.0 ohm-m				
Rmf @ Measured Temp	0.78 @ 97.0 ohm-m				
Rmc @ Measured Temp	1.16 @ 97.0 ohm-m				
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.79 @ 119.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	119.00		deg F		
Equipment Name	COMPACT				
Equipment / Base	13096		LIB		
Recorded By	L. SCOTT				
Witnessed By	KENT MATSON				
S.O.# / JOB#	3534518		LB12-217		

BOREHOLE RECORD

Last Edited: 16-AUG-2012 16:42

Bit Size inches	Depth From feet	Depth To feet
7.875	218.00	4626.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	218.00	24.00

REMARKS

Tools Ran: MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION.
 2.71 G/CC Limestone Density porosity used to calculate porosity
 Borehole Rugosity, Tight pulls, and washouts will affect data quality.
 All intervals logged and scaled per customer's request.
 Total hole volume from TD to Surface casing= cubic feet
 Annular hole volume with 5.5 Inch casing= cubic feet
 Service order: 3534518
 Rig: Murfin #24
 Engineer: L. Scott
 Operator(s): R. Venegas

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, 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. These interpretations are also subject to our general terms and conditions in our price schedule.

5 INCH MAIN

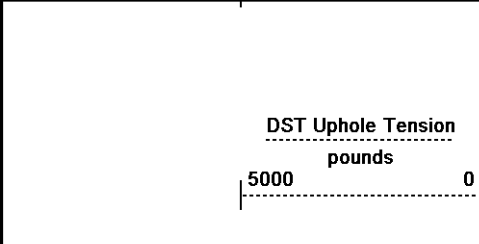
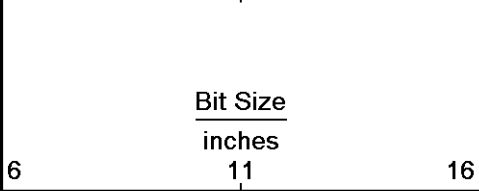
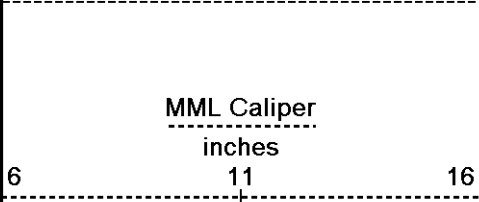
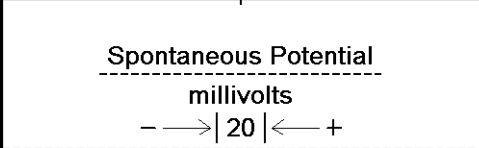
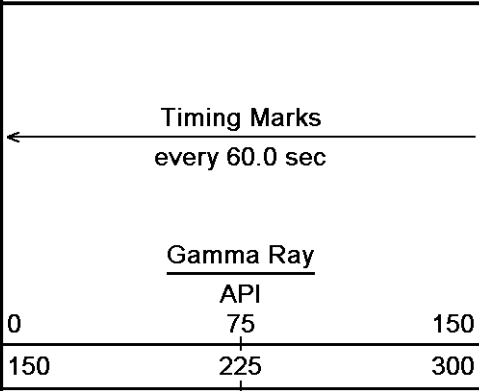
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 16-AUG-2012 18:08

Filename: C:\Minimus 13.02.6600\Data\Grand Mesa Op...\Grand Mesa Operating Glennis 1-27_002.dta

Recorded on 16-AUG-2012 15:54

System Versions: Logged with 13.02.6600 Plotted with 13.02.6600



Depth in Feet

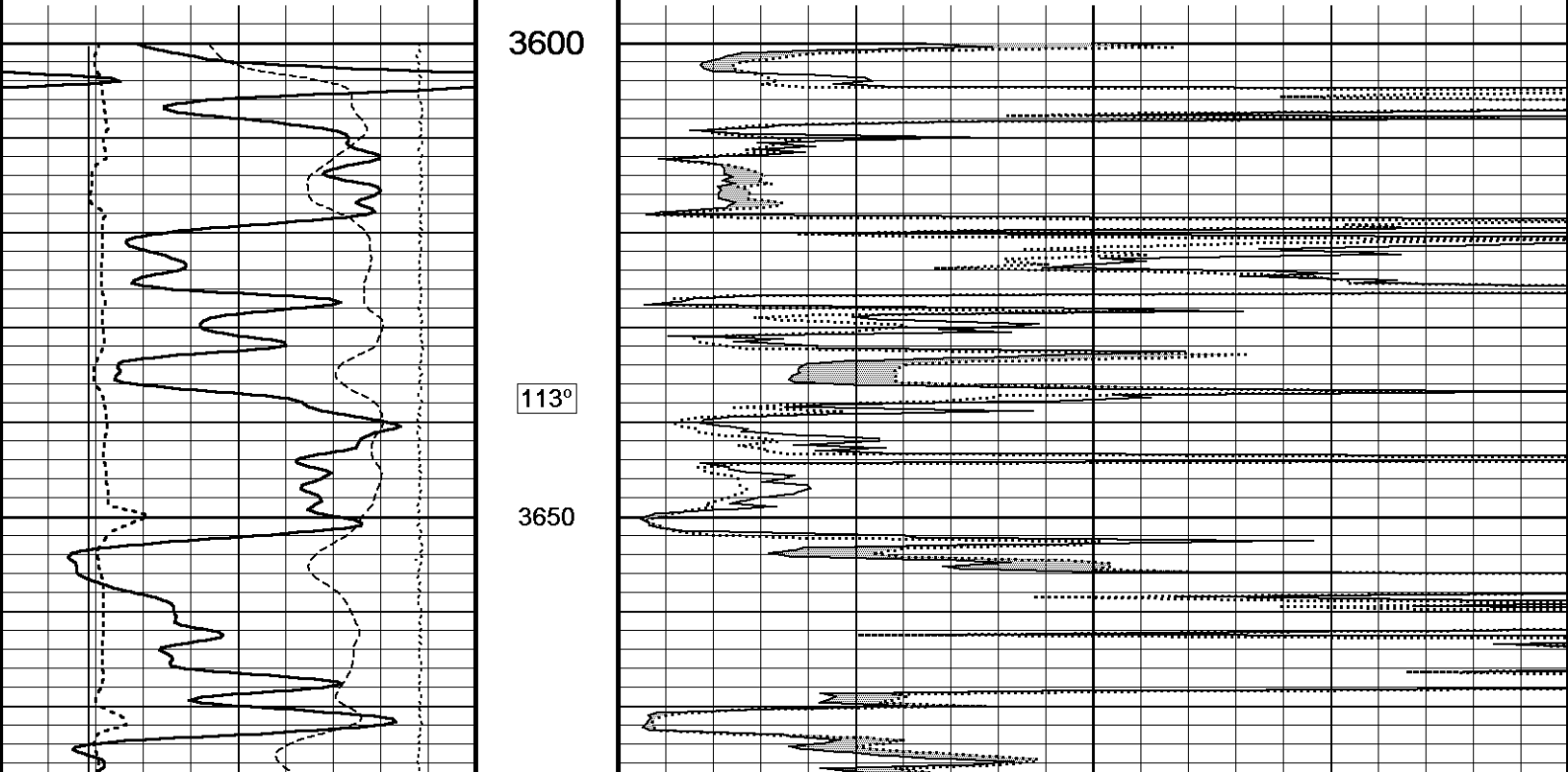
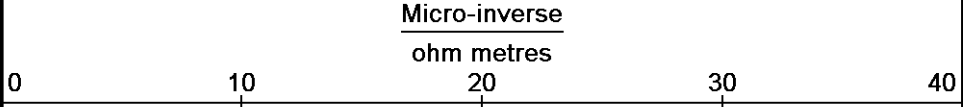
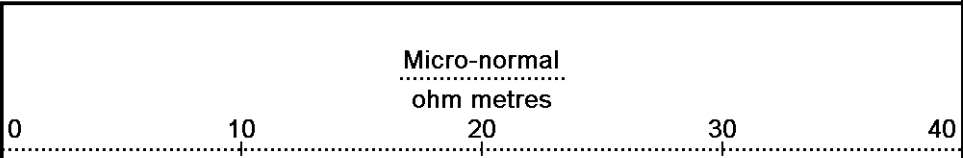
Borehole Temp in deg F

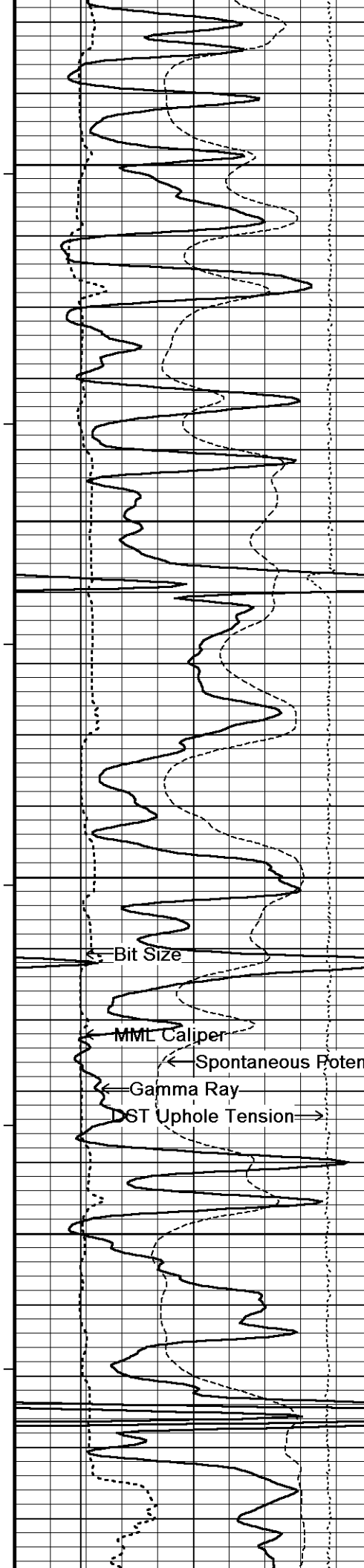
Replay Scale 1:240

3600

113°

3650





113°

3700

114°

3750

114°

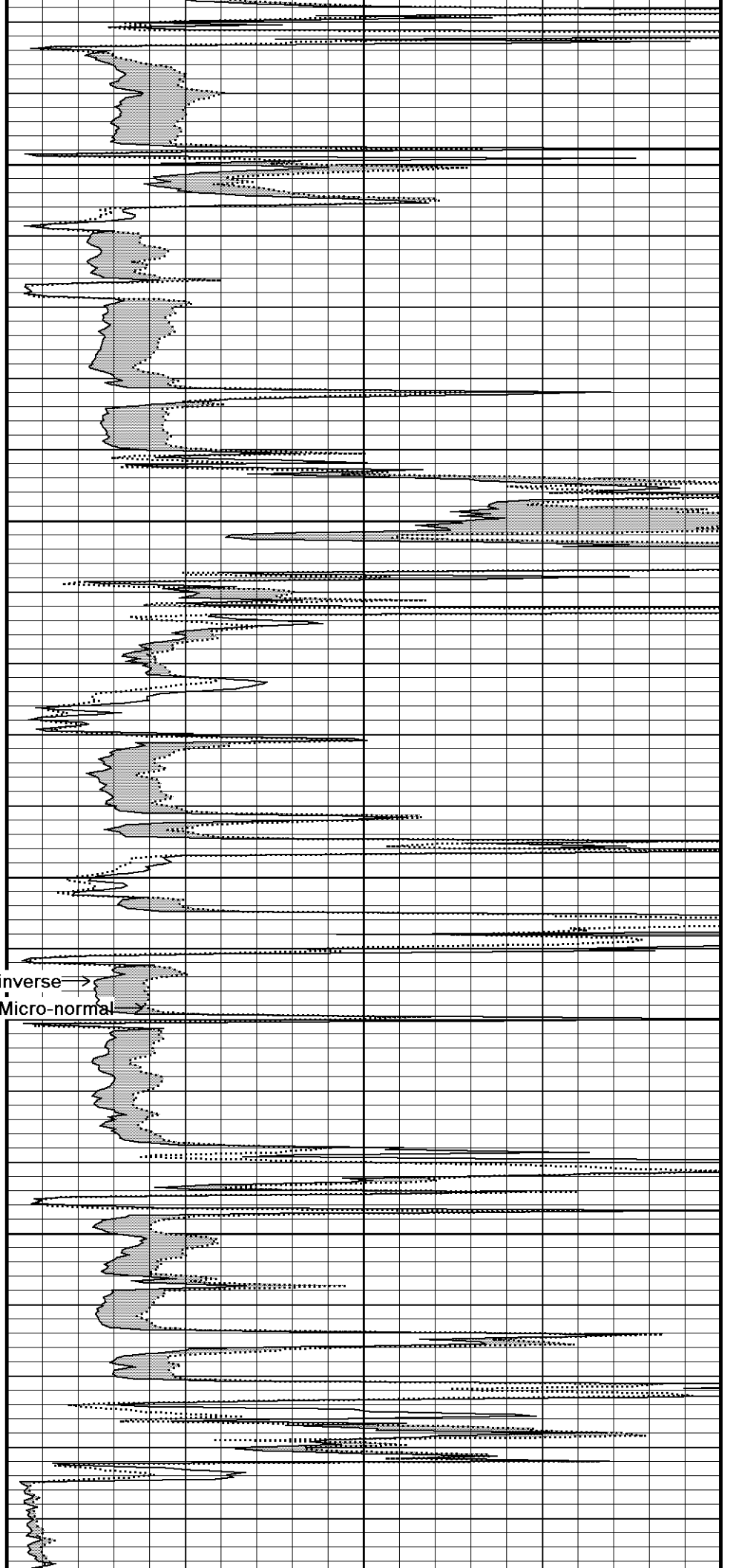
3800

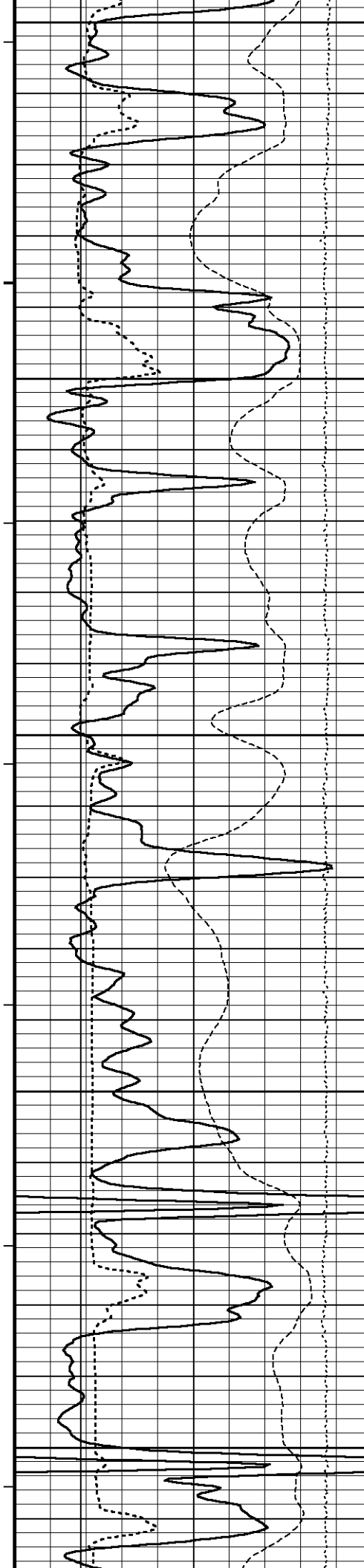
114°

3850

114°

Micro-inverse →
Micro-normal ↘





3900

115°

3950

115°

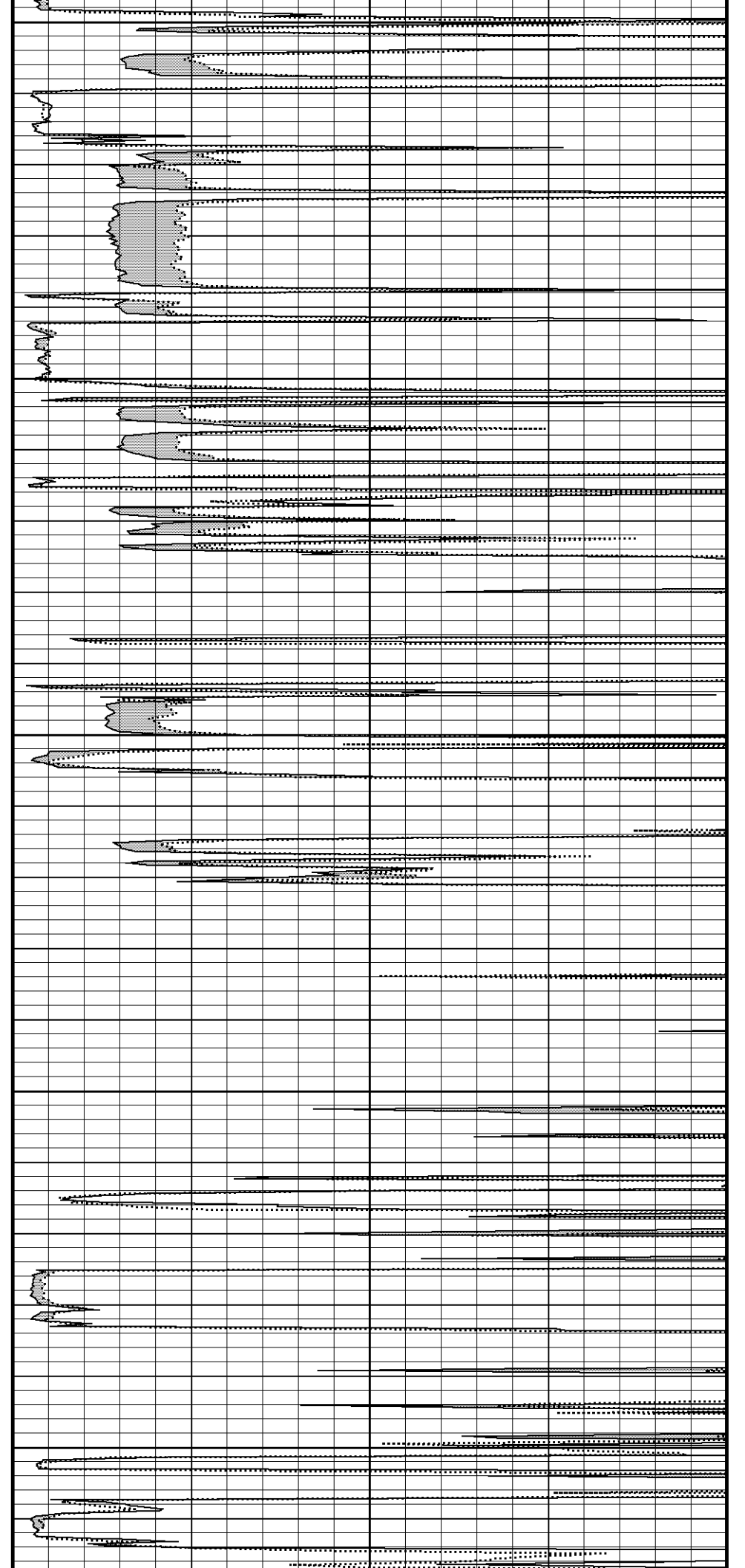
4000

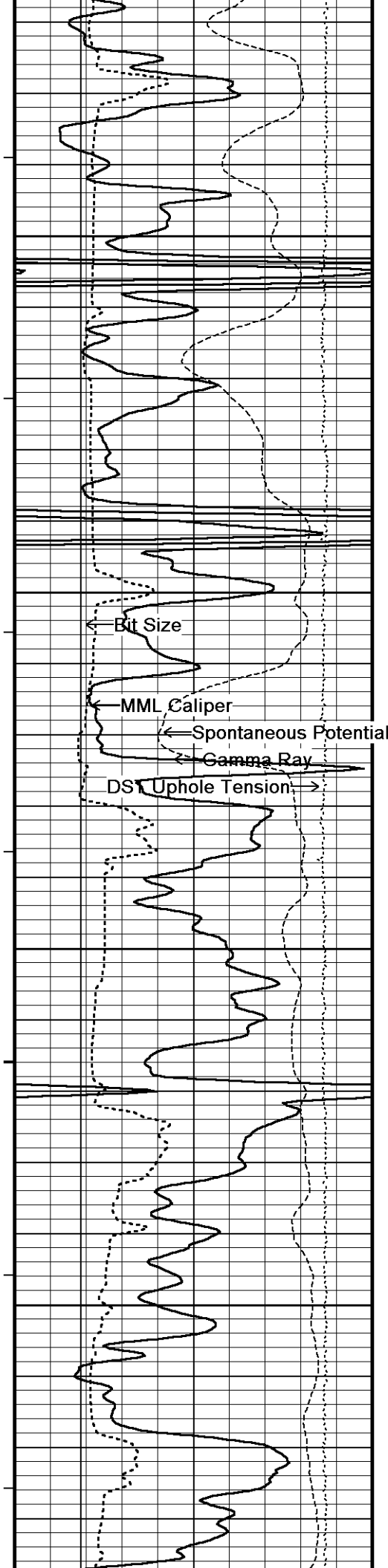
115°

4050

115°

4100





115°

4150

115°

4200

Micro-inverse

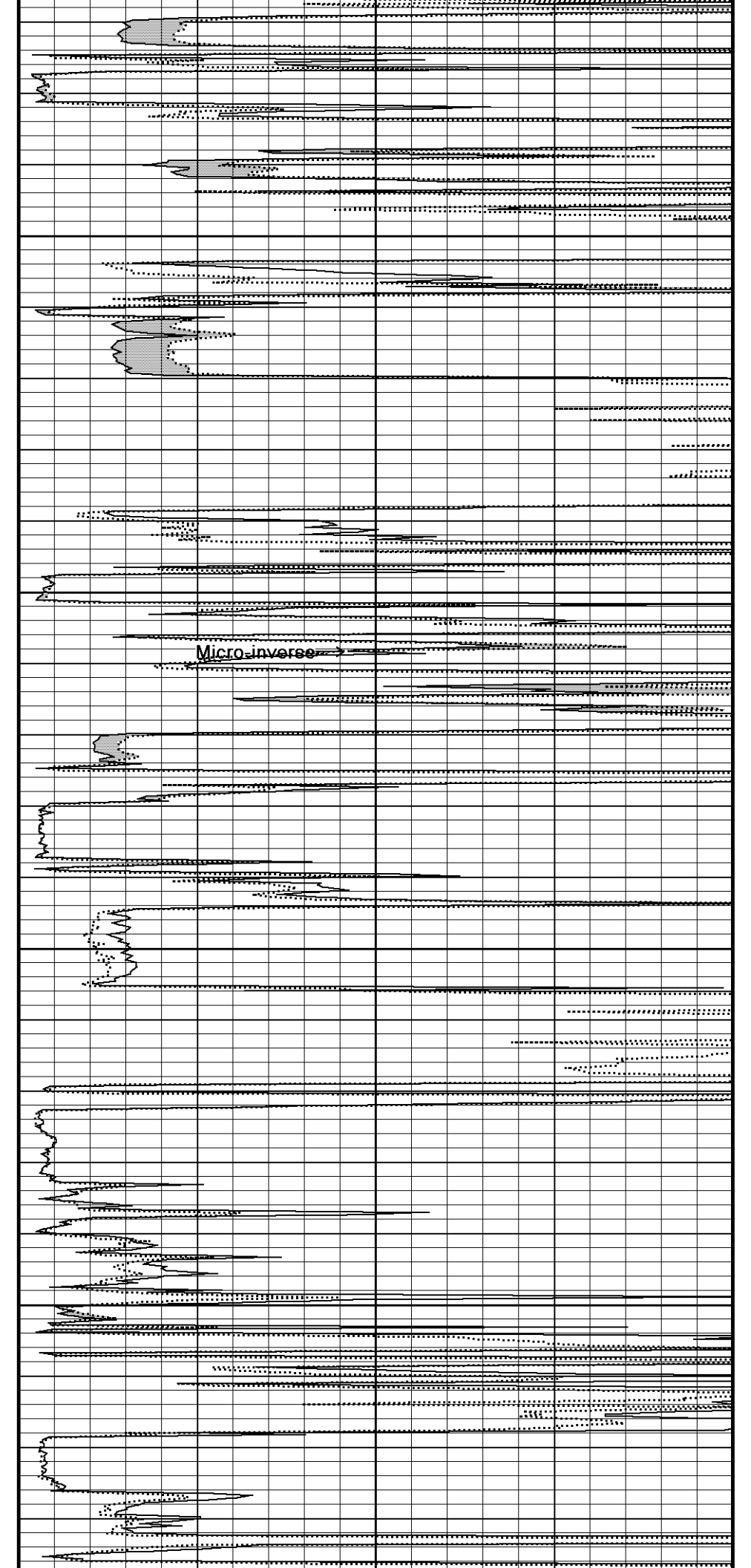
116°

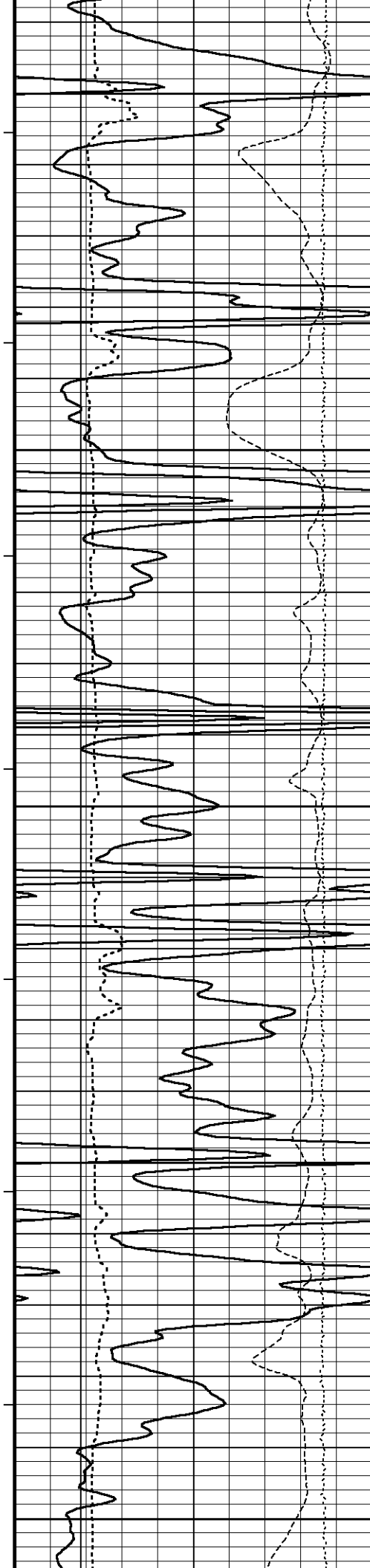
4250

116°

4300

4400





116°

4350

117°

4400

118°

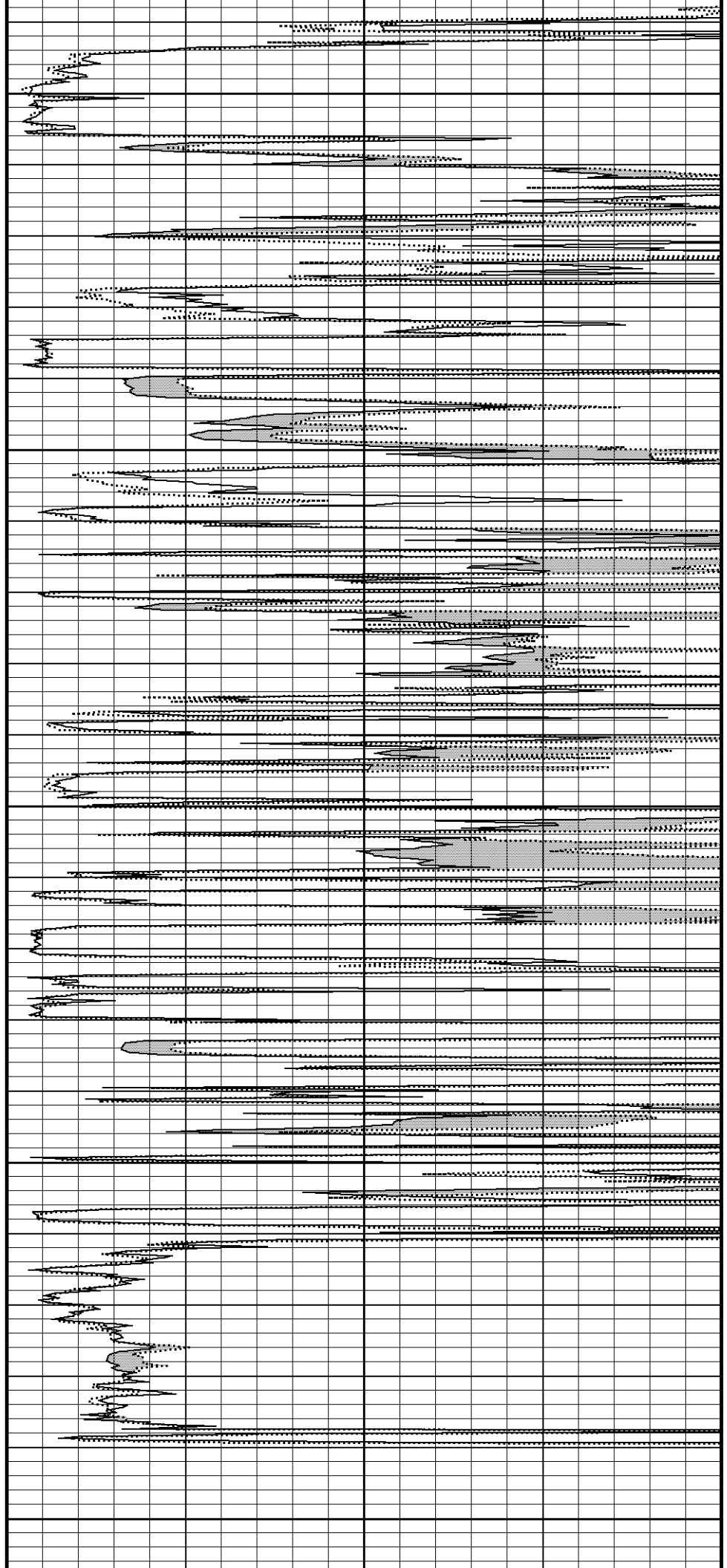
4450

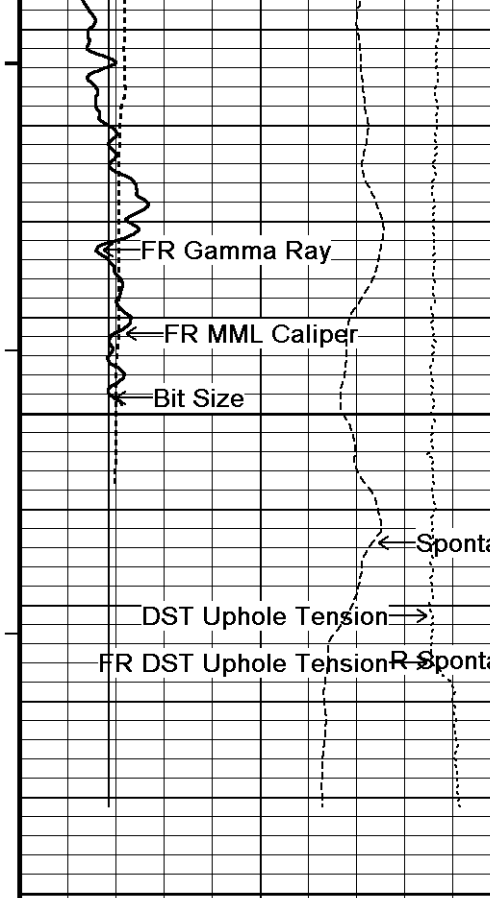
119°

4500

119°

4550





119°

4600

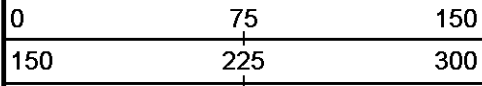
4650

Depth in Feet

Timing Marks every 60.0 sec

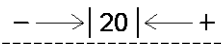
Gamma Ray

API



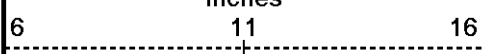
Spontaneous Potential

millivolts



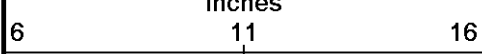
MML Caliper

inches



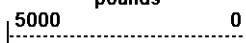
Bit Size

inches



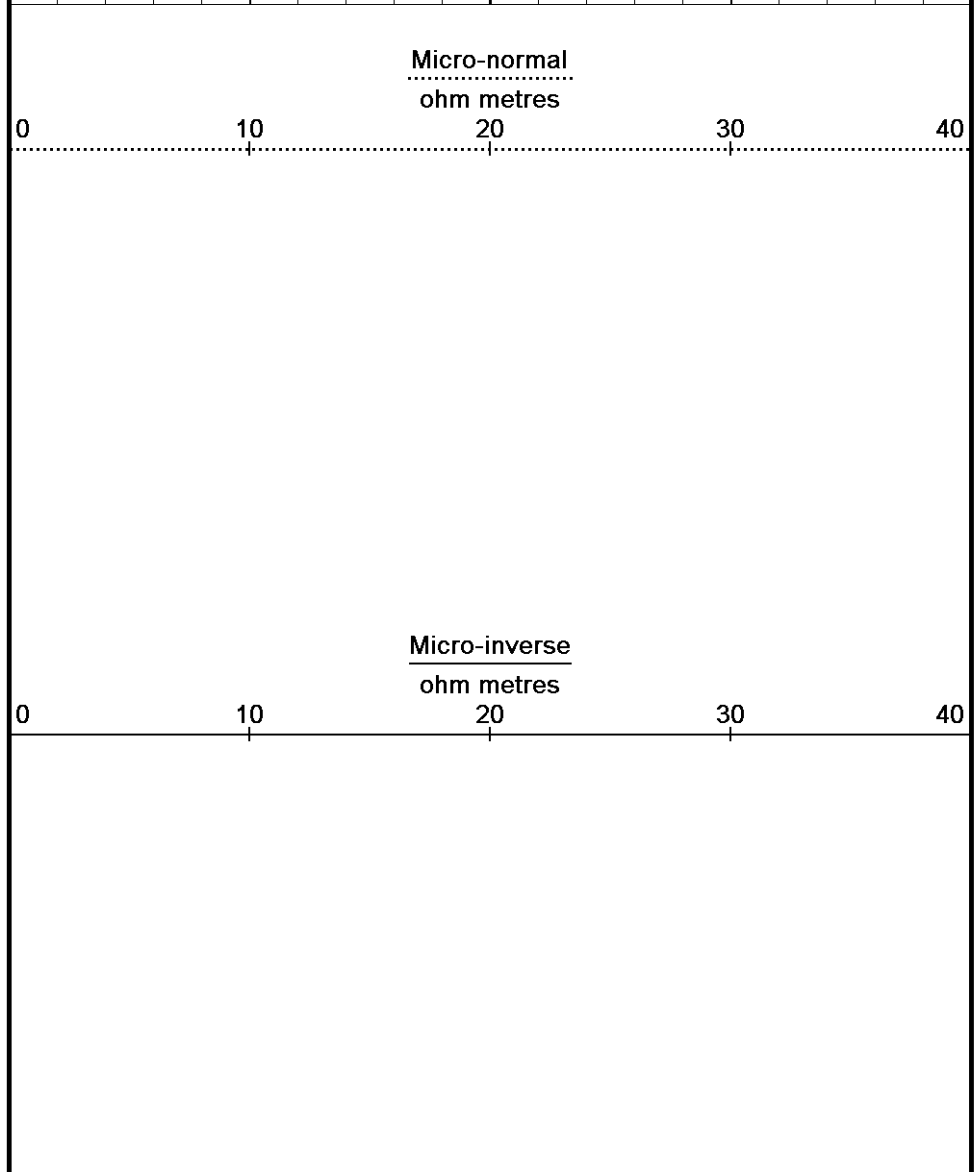
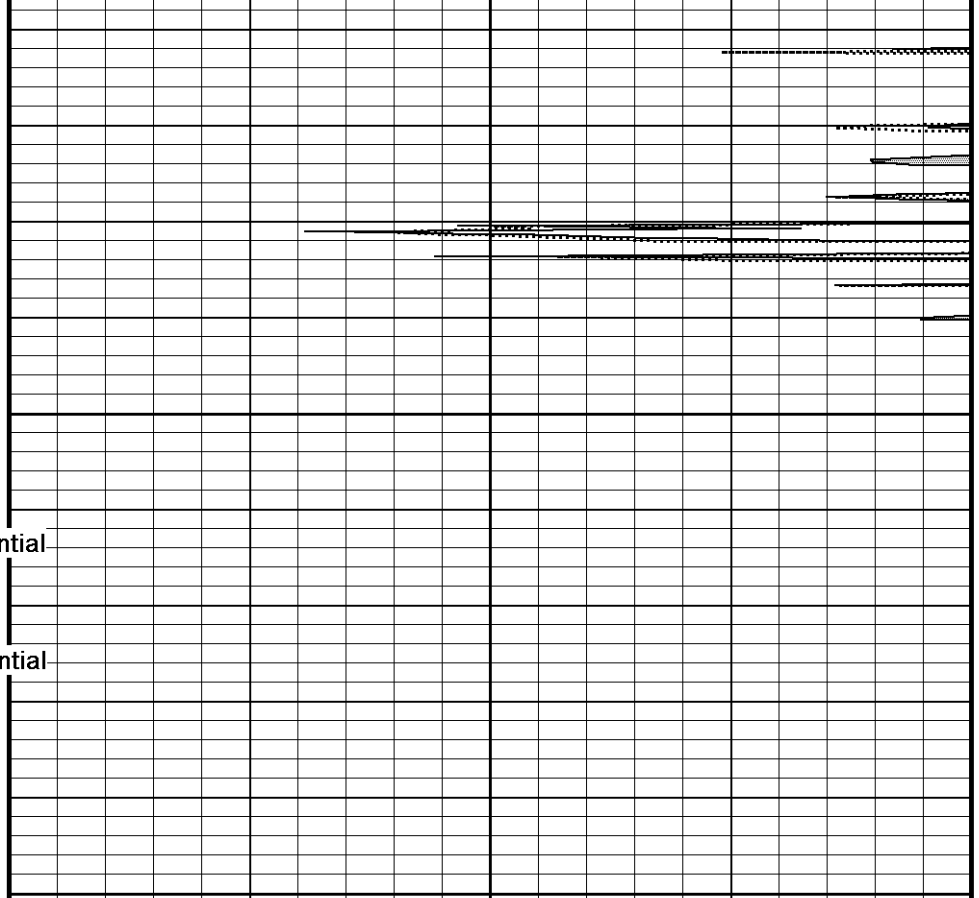
DST Uphole Tension

pounds



Borehole Temp in deg F

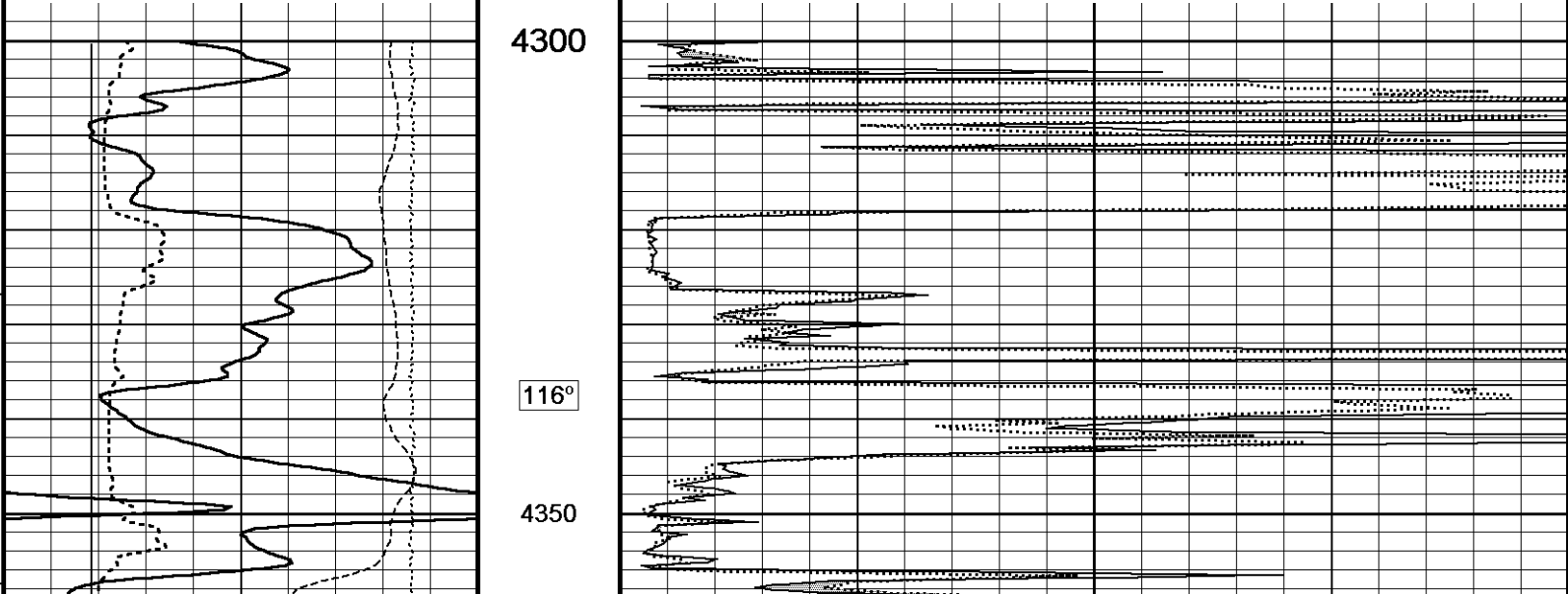
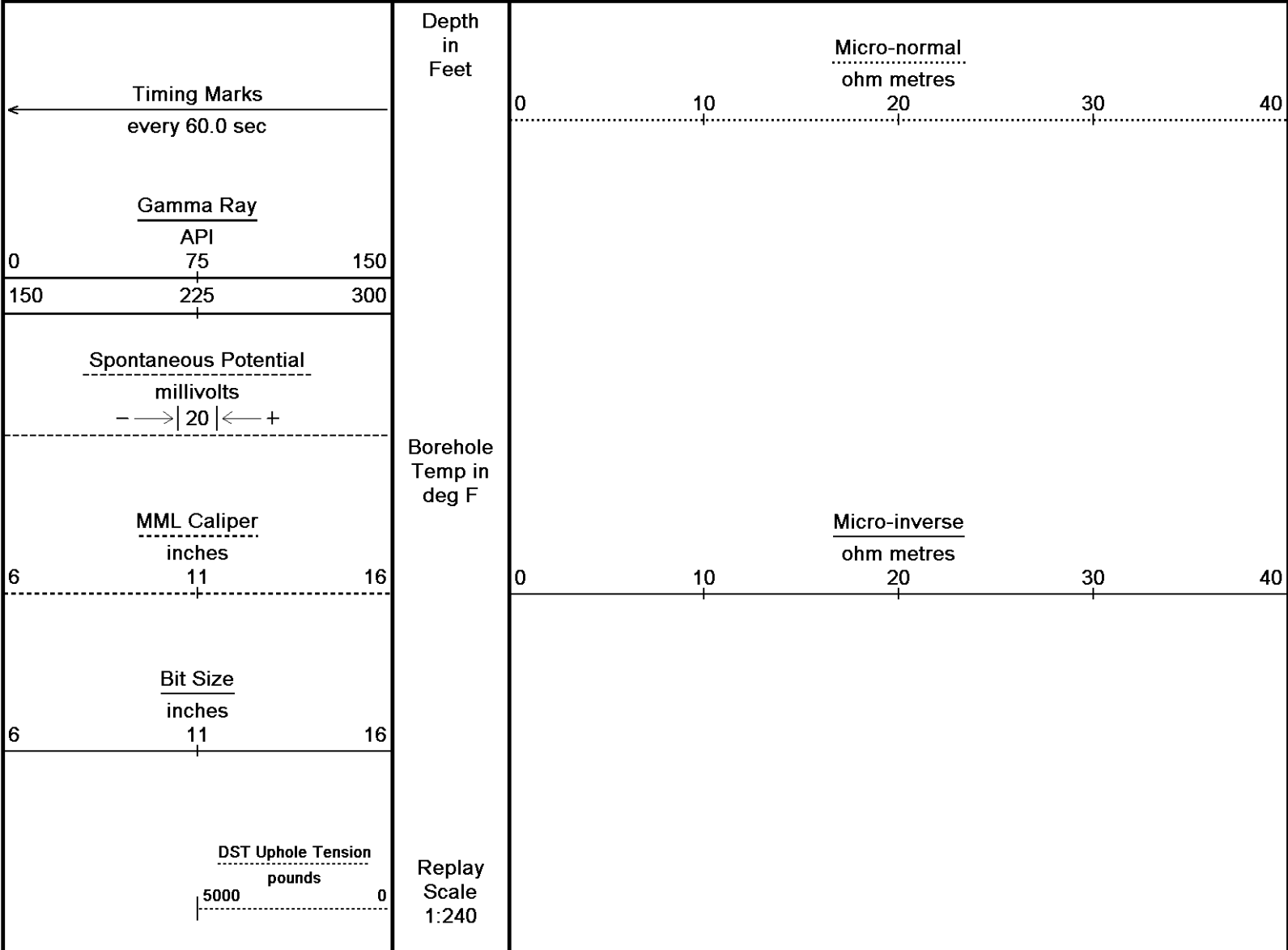
Replay Scale 1:240

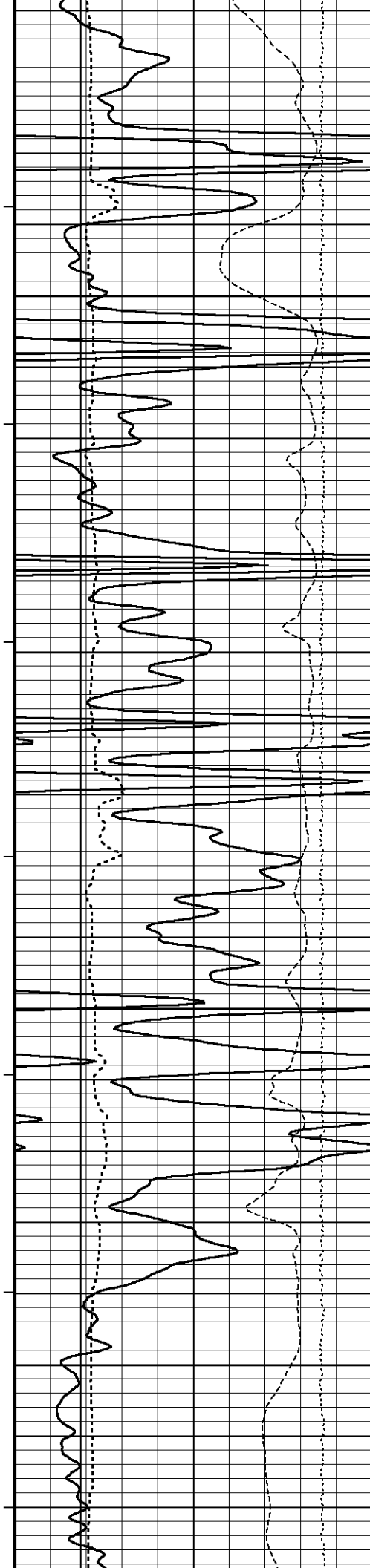


↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment: 10.0cm
 Plotted on 16-AUG-2012 18:08
 Filename: C:\Minimus 13.02.6600\Data\Grand Mesa Op...\Grand Mesa Operating Glennis 1-27_001.dta
 Recorded on 16-AUG-2012 15:35
 System Versions: Logged with 13.02.6600 Plotted with 13.02.6600





116°

4400

117°

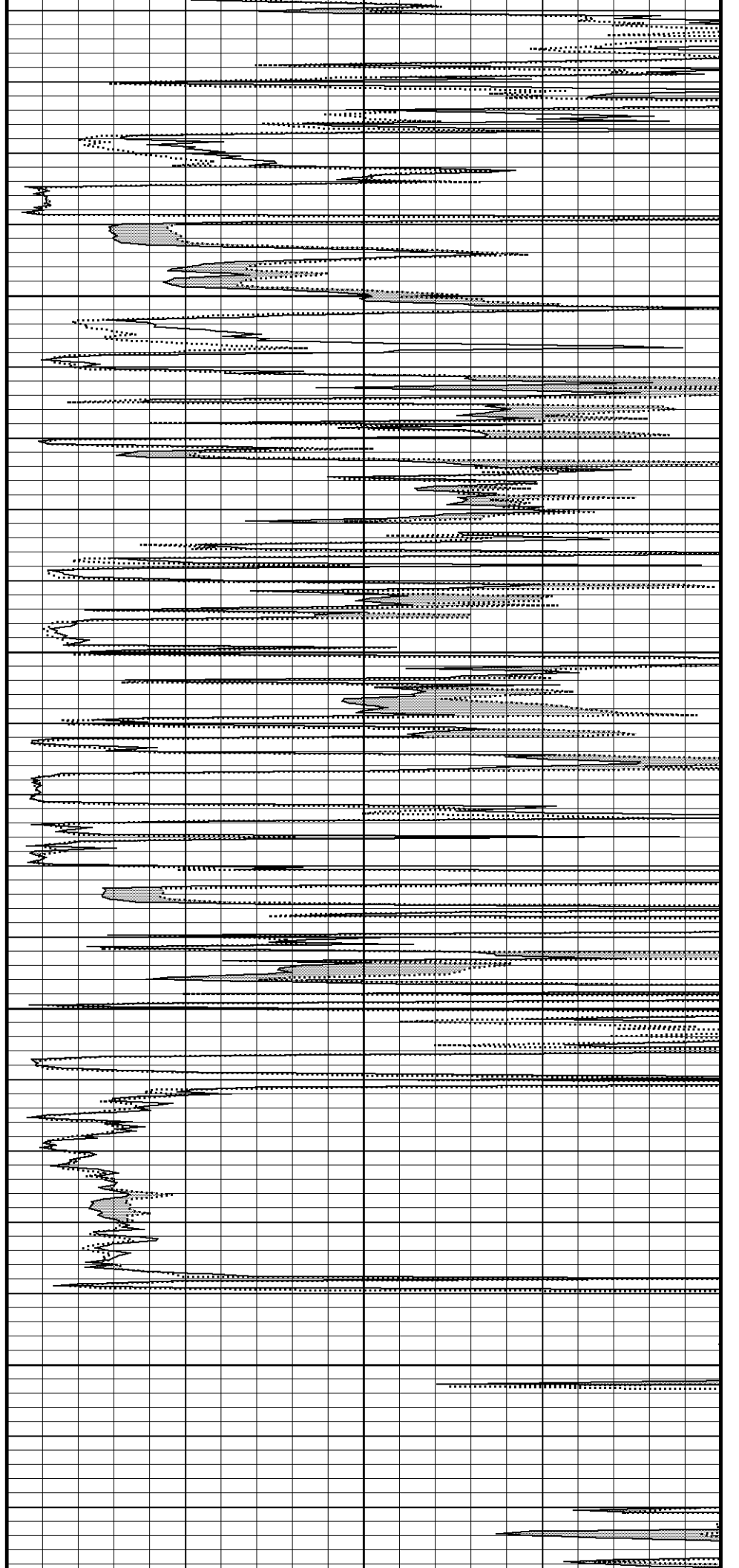
4450

118°

4500

118°

4550



General Constants All 000

Last Edited on 16-AUG-2012,14:05

General Parameters

Mud Resistivity	0.970	ohm-metres
Mud Resistivity Temperature	97.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Four Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration SMS 0

Field Calibration on 25-JUL-2012 21:44

Reading No	Measured	Calibrated (lbs)
1	15962.51	0.00
2	17047.62	562.20

Gamma Calibration MCG-D.K 442

Field Calibration on 13-AUG-2012 09:24

	Measured	Calibrated (API)
Background	69	46
Calibrator (Gross)	1150	771
Calibrator (Net)	1081	725

Gamma Constants MCG-D.K 442

Last Edited on 16-AUG-2012,14:05

Gamma Calibrator Number	GRC38	
Mud Density	1.09	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012 16:34

	Measured	Calibrated (mV)
Reference 1	100.2	100.0
Reference 2	-99.9	-100.0

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 17-JUL-2012,16:35

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-D.K 442

Last Edited on

Pre-filter Length	11
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Caliper Calibration MML-A 4

Base Calibration on 24-JUL-2012 08:53
Field Calibration on 13-AUG-2012 09:01

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15504	5.98
2	18771	7.97
3	22124	9.86
4	25894	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
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Micro Normal and Micro Inverse Calibration MML-A 4

Base Calibration on 24-JUL-2012 08:59

Field Check on 13-AUG-2012 09:03

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.7	78.4	5.0	25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	62.9		62.9	
Micro Inverse	48.2		48.2	

Micro Normal and Micro Inverse Constants MML-A 4

Last Edited on 16-AUG-2012,14:06

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	1.0000		
Micro Inverse K Factor	1.0000		
Standoff Offset	N/A	inches	

Neutron Calibration MDN-A.B 66

Base Calibration on 17-JUL-2012 10:54

Field Check on 13-AUG-2012 09:29

Base Calibration

Ratio	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3220	101	3714	110
	31.859		33.764	
Field Calibrator at Base			Calibrated (cps)	
			1595	2289
Ratio			0.696	
Field Check			Calibrated (cps)	
			1598	2276
Ratio			0.702	

Neutron Constants MDN-A.B 66

Last Edited on 16-AUG-2012,14:05

Neutron Source Id	P0204NN		
Neutron Jig Number	5824NE		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	4.26	cu	
Dolomite Sigma	4.70	cu	
Formation Pressure Source	Constant Value		
Formation Pressure	0.00	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	Constant Value		
Formation Fluid Salinity	0.00	kppm	
Barite Mud Correction	Not Applied		

FE Calibration MFE-B.J 353

Base Calibration on 17-JUL-2012 15:58

Field Check on 13-AUG-2012 09:00

Base Calibration

Reference	Measured		Calibrated (ohm-m)	
Reference 1	0.0		0.0	
Reference 2	964.8		126.8	
Base Check			280.6	
Field Check			280.9	

FE Constants MFE-B.J 353

Last Edited on 16-AUG-2012,14:06

Running Mode	No Sleeve
MFE K Factor	0.1268

Caliper Source for FE correction	Density Caliper	
Caliper Value for FE correction	N/A	inches
Rm Source for FE correction	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Stand-off	0.5	inches

High Resolution Temperature Calibration MAI-A.A 167

Field Calibration on 17-JUL-2012,13:53

	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 17-JUL-2012,13:49

Pre-filter Length 11

Induction Calibration MAI-A.A 167

Base Calibration on 17-JUL-2012,13:55

Field Check on 13-AUG-2012 08:59

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.3	474.2	9.3	966.2
2	6.3	388.4	7.6	821.4
3	3.3	259.4	5.2	566.0
4	1.9	133.0	2.6	279.2

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	13.3	3838.4
2	0.0	0.0	29.6	3476.3
3	0.0	0.0	29.1	3052.2
4	0.0	0.0	19.8	2081.0
Deep	0.0	0.0	18.6	2048.1
Medium	0.0	0.0	42.2	3990.5
Shallow	0.0	0.0	43.0	5053.7

Array Temperature 0.0 79.3 Deg F

Induction Constants MAI-A.A 167

Last Edited on 16-AUG-2012,14:06

Induction Model

RtAP-WBM

Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	8.0000	
Stand-off Fin Angle	45.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Squasher Start	0.0020	mhos/metre
Squasher Offset	N/A	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A) 1.00

Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

Caliper Calibration MPD-B 64

Base Calibration on 04-AUG-2012 20:18
Field Calibration on 13-AUG-2012 09:10

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	11106	3.99
2	20221	5.98
3	28496	7.97
4	37105	9.86
5	46524	11.92
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.94	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 17-JUL-2012 15:04
Field Check on 13-AUG-2012 09:08

Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
	Near	Far	Near	Far	
Reference 1	59921	33969	59556	30836	
Reference 2	25388	2962	24941	2541	

Field Check at Base	1193.4	1388.8
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Field Check	1183.8	1378.0
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PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	214	1064		
Reference 1	22602	59722	0.382	0.371
Reference 2	6872	25249	0.275	0.272

Field Check at Base	214.1	1063.8
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Field Check	213.4	1055.9
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Density Constants MPD-B 64

Last Edited on 16-AUG-2012,14:06

Density Source Id	18235B	
Nylon Calibrator Number	DNCE695	
Aluminium Calibrator Number	DACD698	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.09	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix Density (gm/cc)	Depth (ft)
2.87	
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

0.00
0.00
0.00

0.00
0.00
0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.6600\Data\Grand Mesa Operating Glennis #1-27\Grand Mesa Operating Glennis 1-27_001.dta

Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

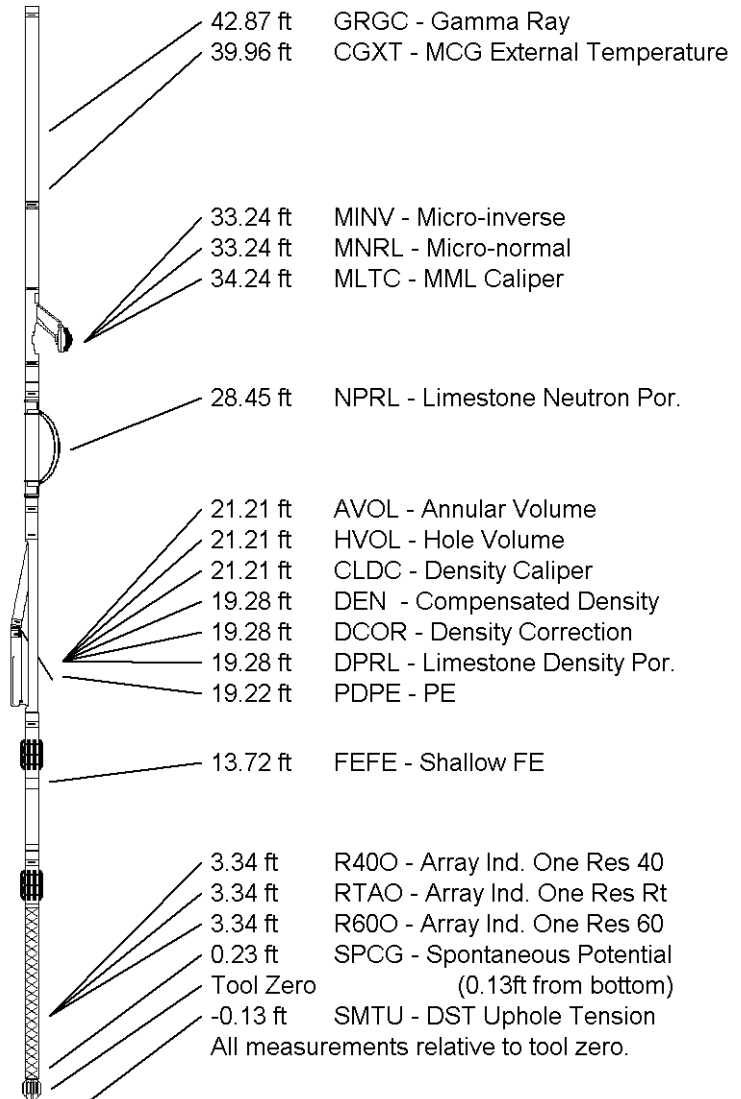
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.16 ft Weight: 383.6 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	GLENNIS #1-27
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2853.00	feet	First Reading	4592.00	feet
Elevation Drill Floor	2852.00	feet	Depth Driller	4630.00	feet
Elevation Ground Level	2848.00	feet	Depth Logger	4626.00	feet



Weatherford[®]

MICRORESISTIVITY LOG

