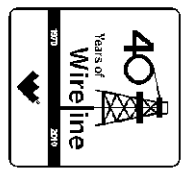




**Weatherford**<sup>®</sup>

**MICRORESISTIVITY LOG**

COMPANY SHAKESPEARE OIL COMPANY, INC.  
 WELL PETERSON #1-8  
 FIELD STRATFORD WEST  
 PROVINCE/COUNTY LOGAN  
 COUNTRY/STATE U.S.A. / KANSAS  
 LOCATION 1950' FSL & 1655' FWL SW/4



SEC 8 TWP 13S RGE 32W Other Services MAI/MFE MDN/MPD MSS

API Number 15-109-20997

Permit Number

Permanent Datum G.L., Elevation 2965 feet  
 Log Measured From K.B. @ 5 FEET above Permanent Datum  
 Drilling Measured From K.B.

Elevations: feet  
 KB 2970.00  
 DF 2968.00  
 GL 2965.00

Date	29-JUN-2011
Run Number	ONE
Depth Driller	4660.00 feet
Depth Logger	4658.00 feet
First Reading	4610.00 feet
Last Reading	3700.00 feet
Casing Driller	220.00 feet
Casing Logger	220.00 feet
Bit Size	7.875 inches
Hole Fluid Type	CHEMICAL
Density / Viscosity	9.40 lb/USg 68.00 CP
PH / Fluid Loss	9.50 10.40 ml/30Min
Sample Source	FLOWLINE
Rm @ Measured Temp	0.45 @ 94.0 ohm-m
Rmf @ Measured Temp	0.36 @ 94.0 ohm-m
Rmc @ Measured Temp	0.54 @ 94.0 ohm-m
Source Rmf / Rmc	CALC CALC
Rm @ BHT	0.37 @ 115.0 ohm-m
Time Since Circulation	4 HOURS
Max Recorded Temp	115.00 deg F
Equipment Name	COMPACT
Equipment / Base	13057 LIB
Recorded By	L. SCOTT
Witnessed By	DON WILLIAMS
S.O.# / JOB#	3531097 LB11-148

**BOREHOLE RECORD**

Last Edited: 29-JUN-2011 19:45

Bit Size inches 7.875	Depth From feet 220.00	Depth To feet 4658.00
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**CASING RECORD**

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	220.00	24.00

**REMARKS**

Tools Ran: MCG, MML, MDN, MPD, SKJ, MFE, MAI, MSS.  
 Hardware Used: MDN Dual Eccentralizer used. MPD 8 inch profile plate used. MFE MSS and MAI 0.5 inch standoffs used.  
 2.71 g/cc Limestone Density Matrix used to calculate porosity.  
 Sonic porosity calculated using a Limestone scale (47.5 usec/ft).  
 All intervals logged and scaled per customer's request.  
 Annular volume with 5.5 inch production casing= 171 cu. ft.  
 Service order #3531097  
 Rig: WW #2  
 Engineer: L. Scott  
 Operator(s): N. Adame

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 PASS

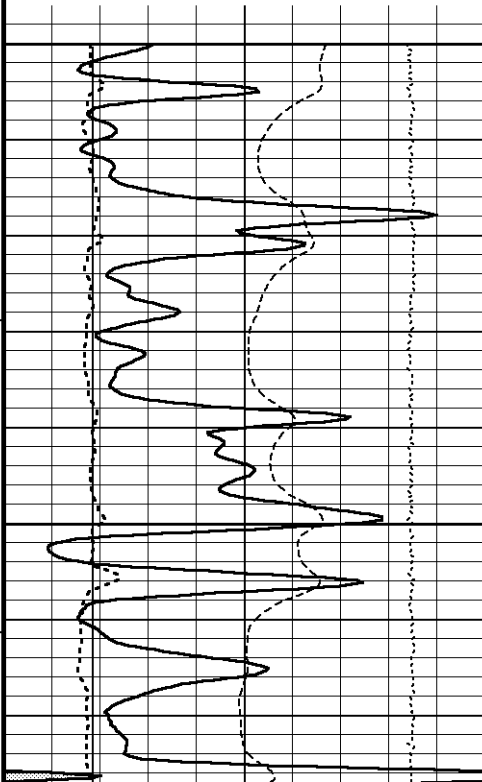
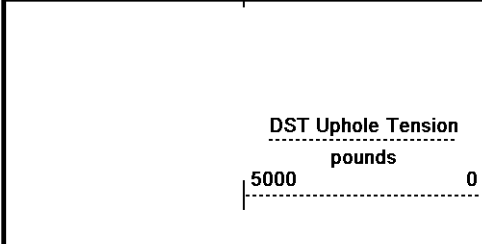
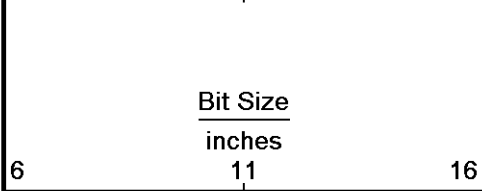
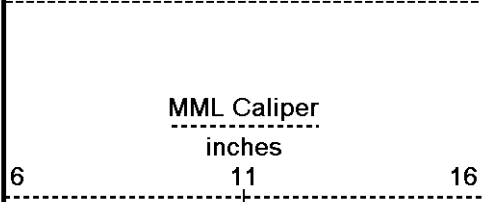
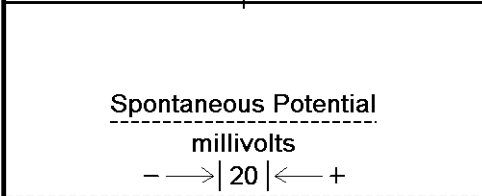
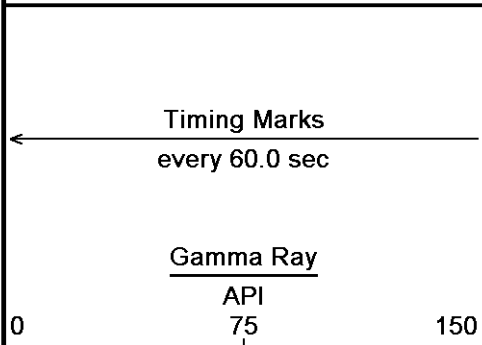
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 29-JUN-2011 21:08

Filename: C:\Minimus 11.02.3186\Data\Shakespeare Peter...\SHAKESPEARE PETERSON 1-8\_002.dta

Recorded on 29-JUN-2011 18:40

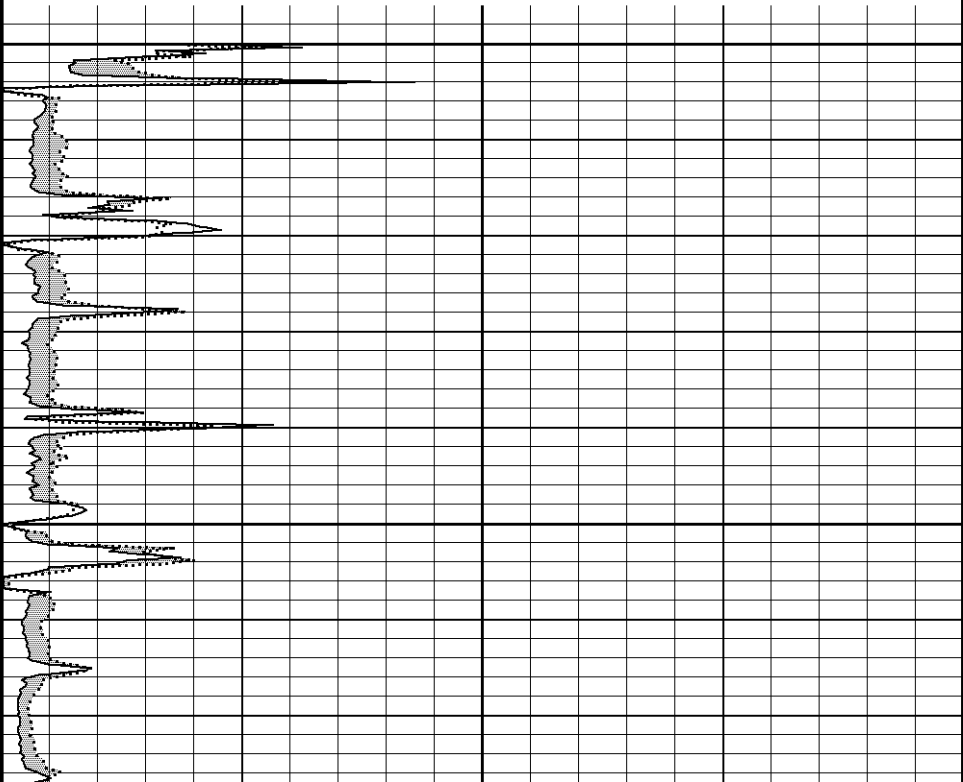
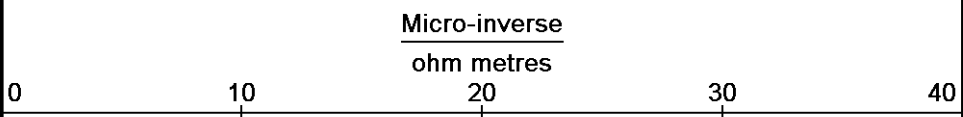
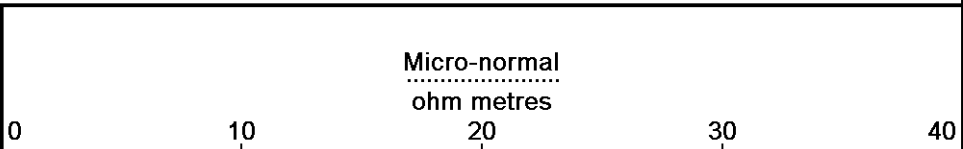
System Versions: Logged with 11.02.3186 Plotted with 11.02.3186

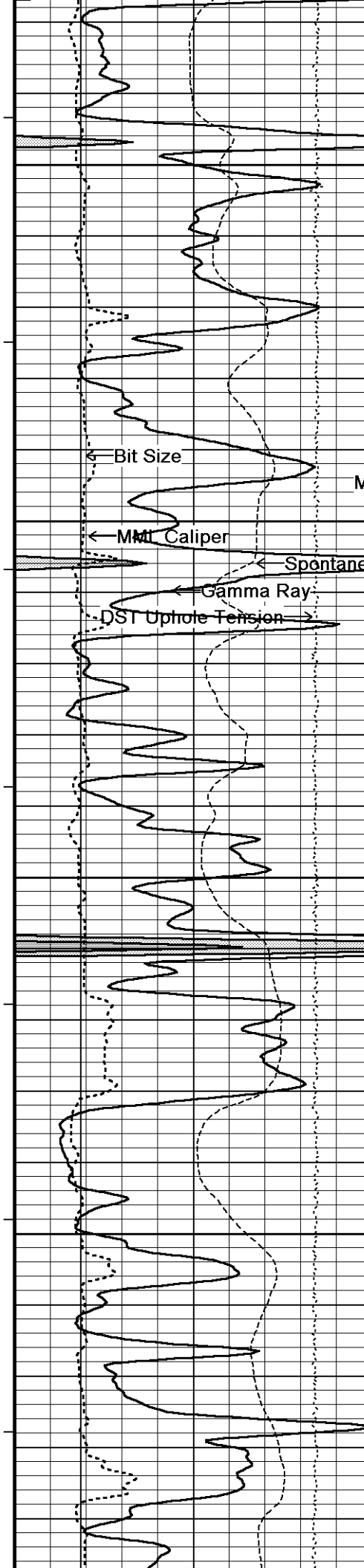


Depth  
in  
Feet

Borehole  
Temp in  
deg F

Replay  
Scale  
1:240





112°

3800

112°

Micro-inverse

Micro-normal  
3850

Spontaneous Potential

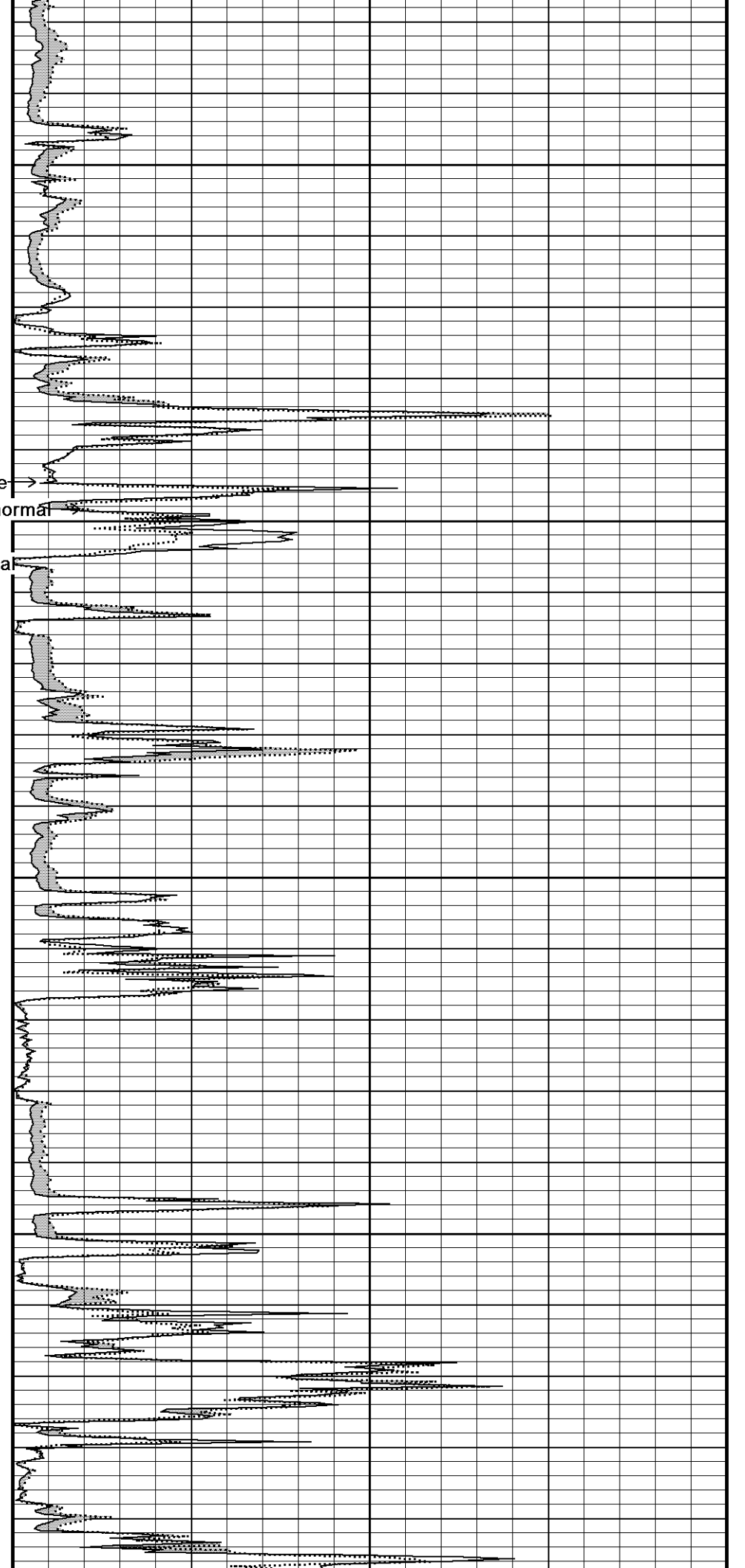
112°

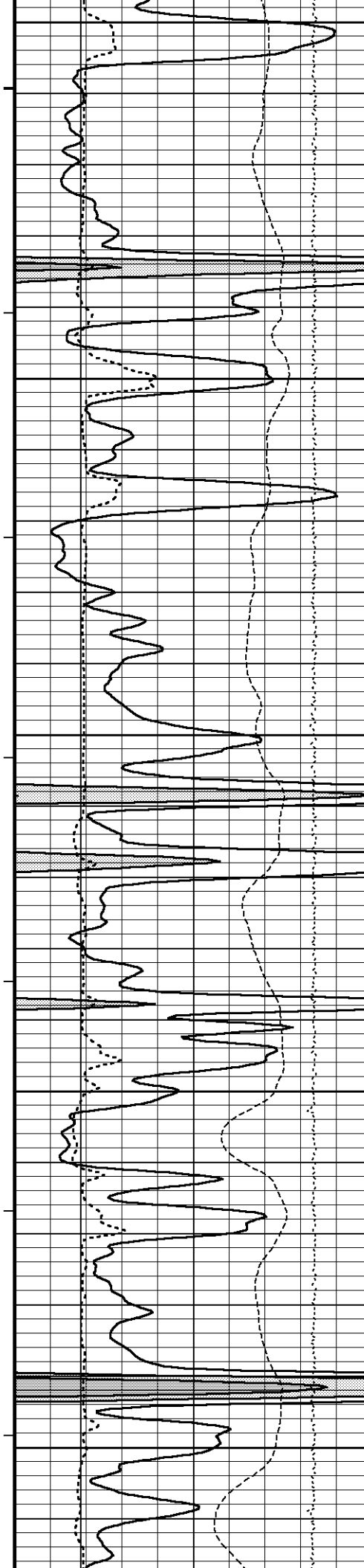
3900

112°

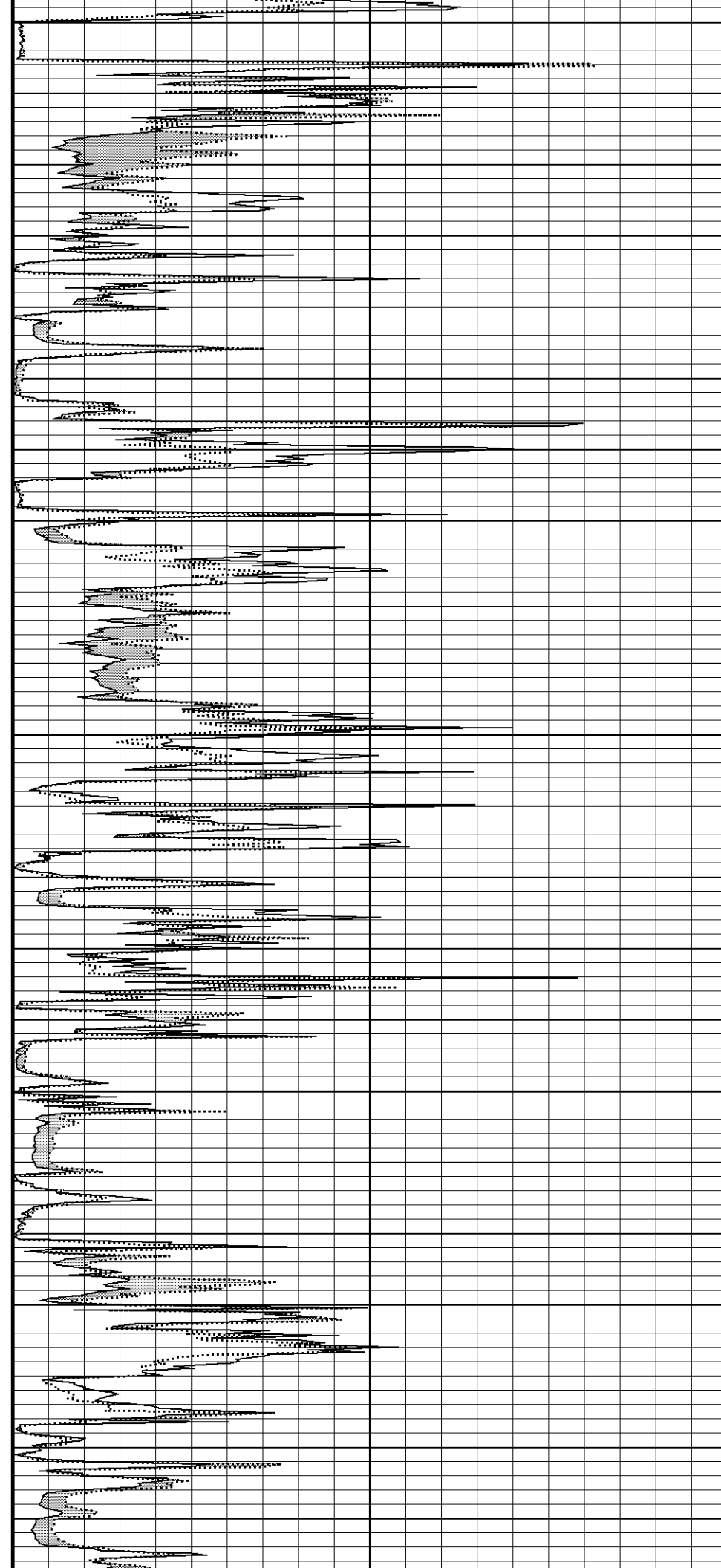
3950

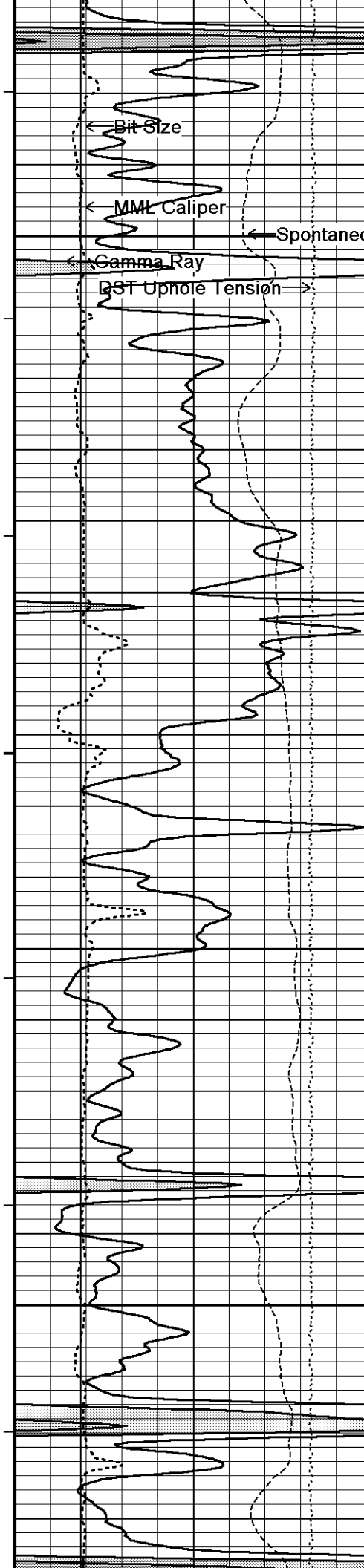
112°





4000  
112°  
4050  
112°  
4100  
112°  
4150  
113°  
4200





113°  
Micro-inverse  
Micro-normal  
Spontaneous F4250tial

113°

4300

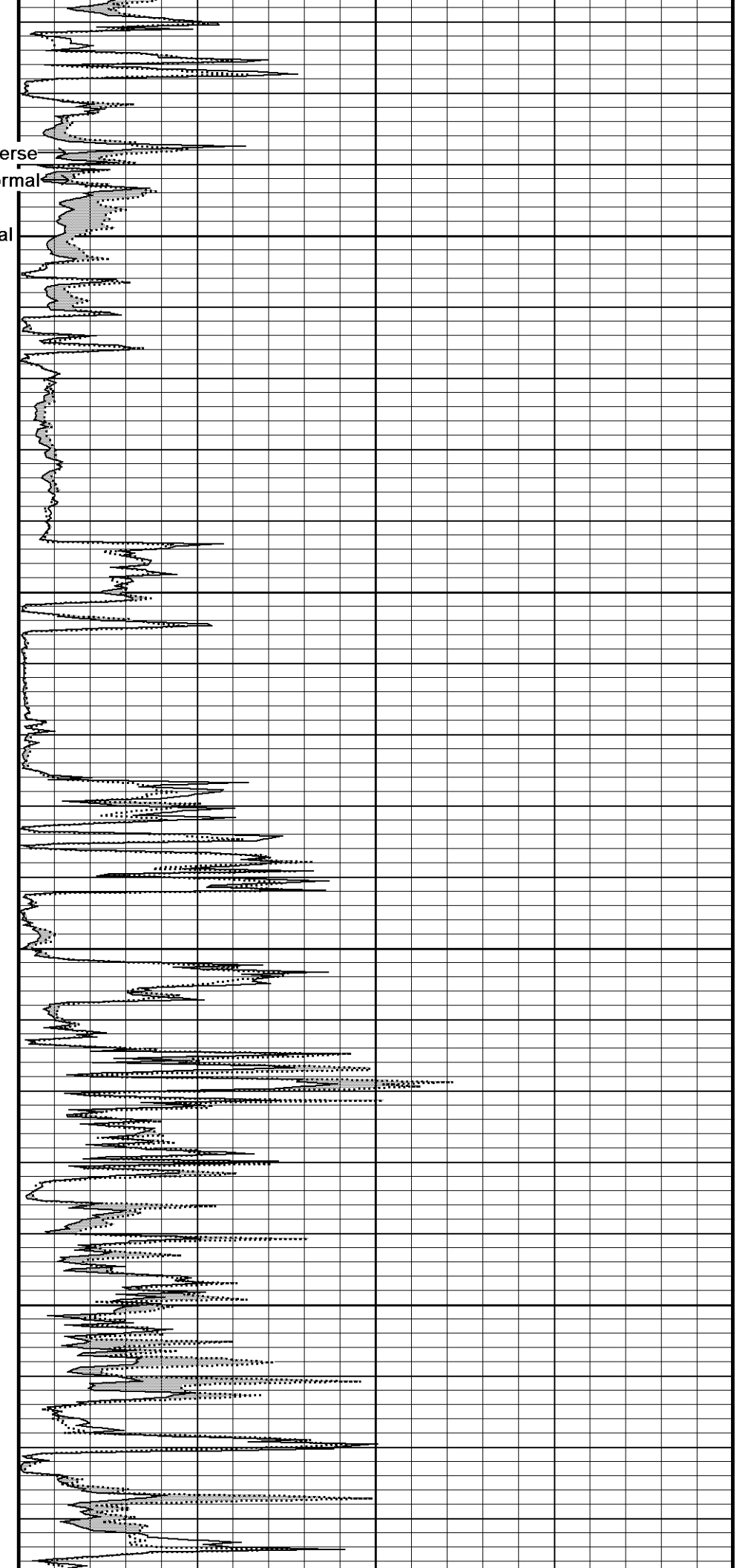
114°

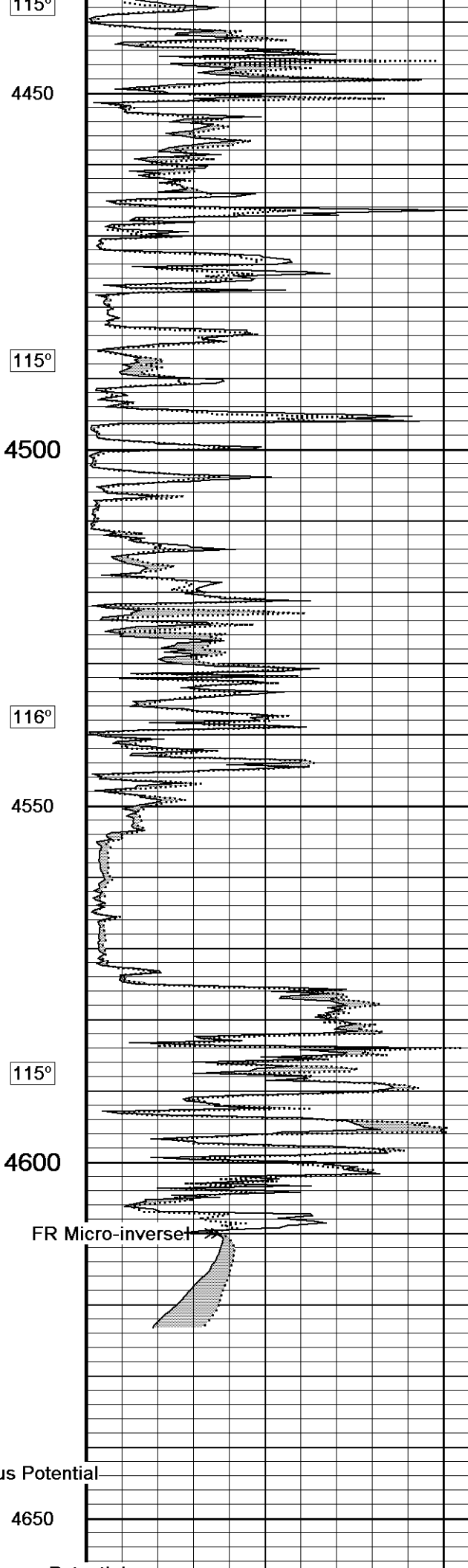
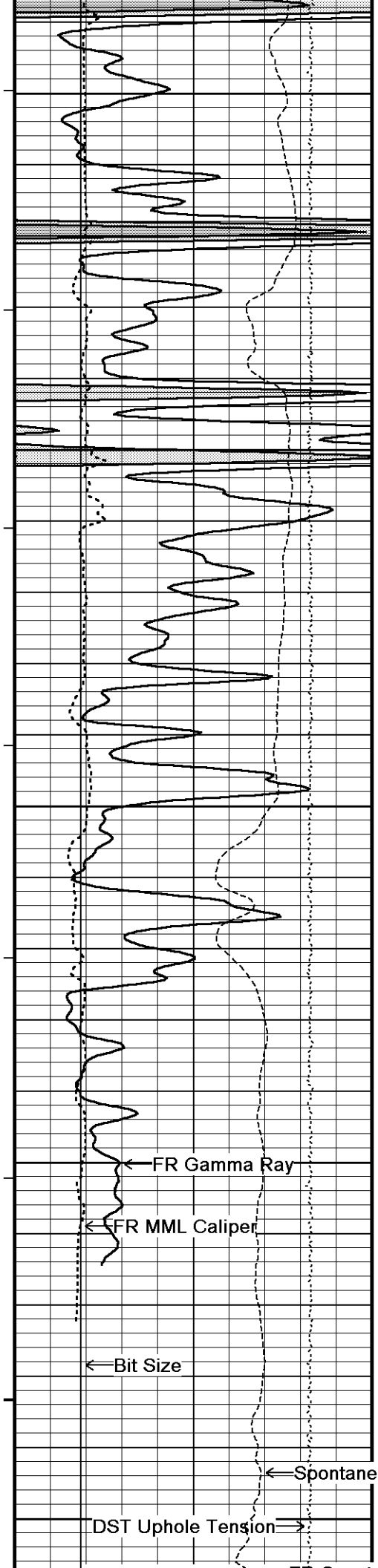
4350

114°

4400

4450





115°

4450

115°

4500

116°

4550

115°

4600

4650

← FR Gamma Ray

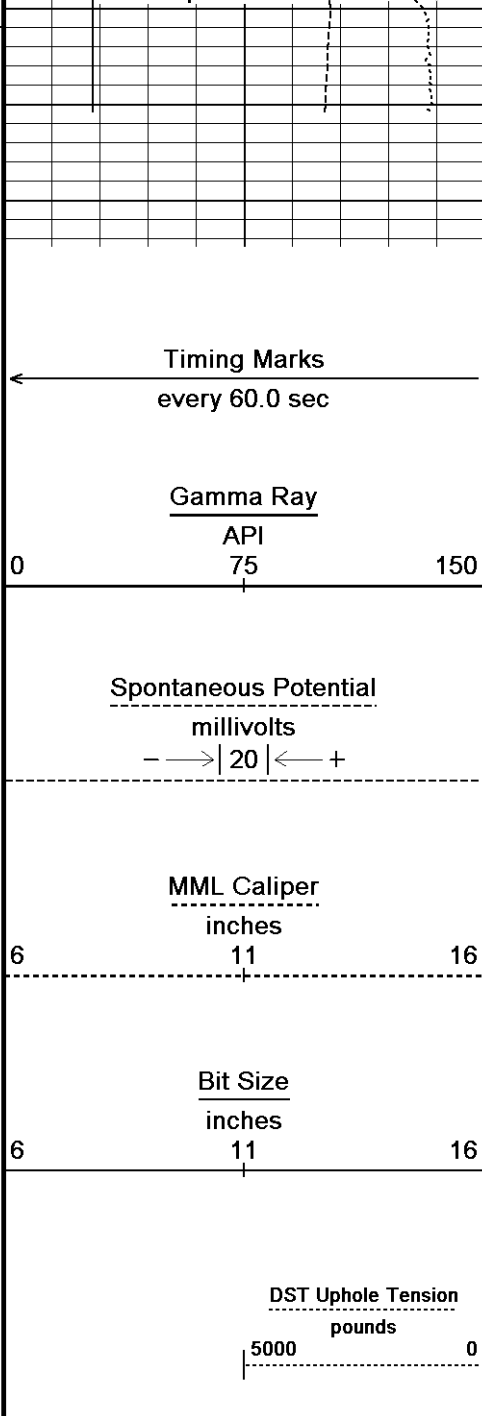
← FR MML Caliper

← Bit Size

← Spontaneous Potential

DST Uphole Tension →

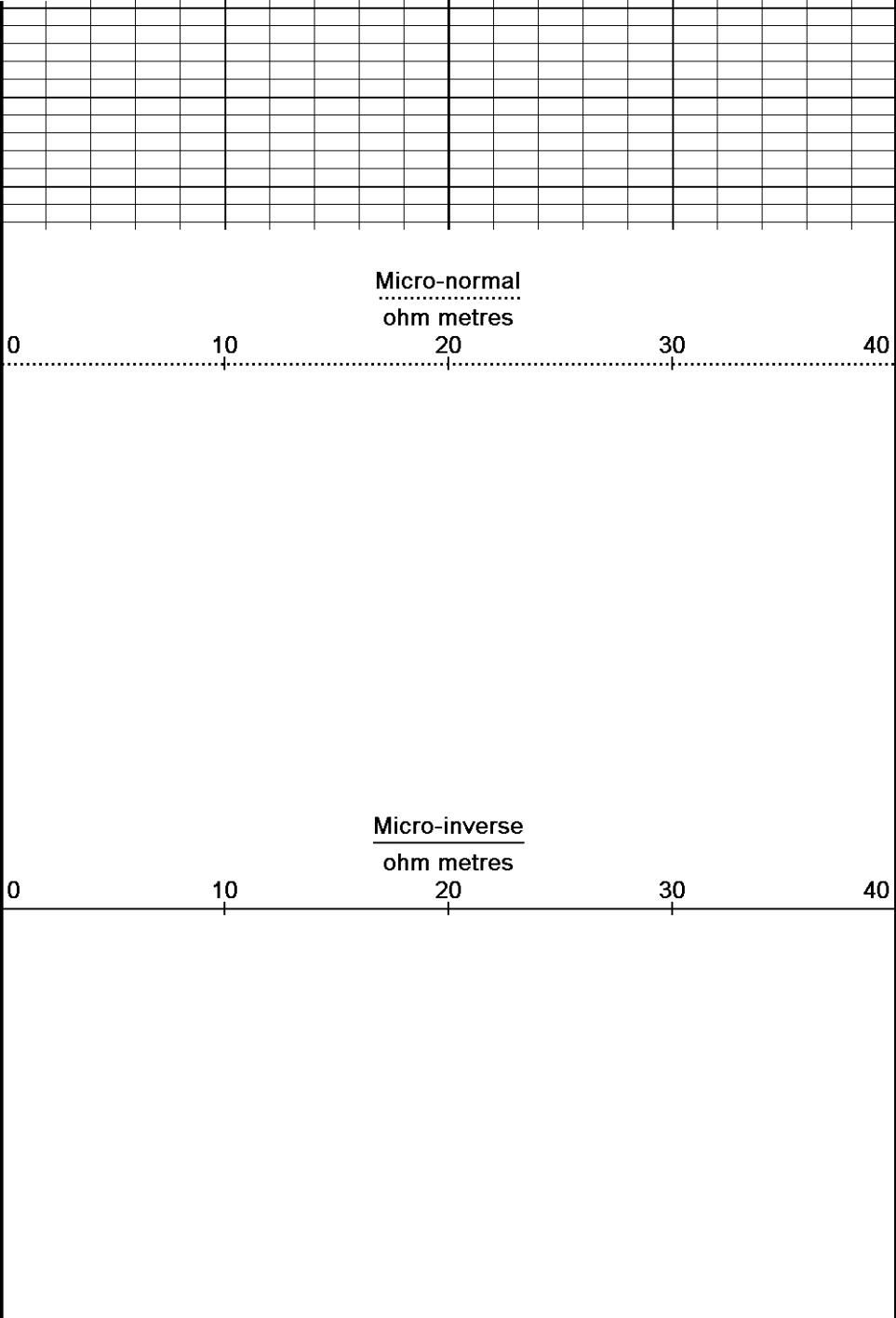
FR Micro-inverset



4682  
Depth  
in  
Feet

Borehole  
Temp in  
deg F

Replay  
Scale  
1:240

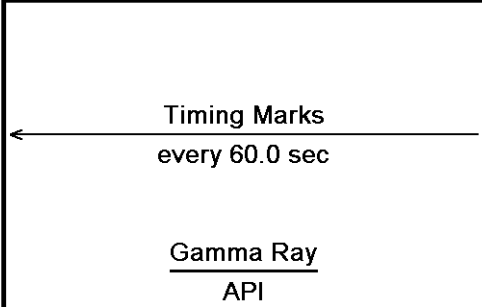


Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 29-JUN-2011 21:08  
 Filename: C:\Minimus 11.02.3186\Data\Shakespeare Peter...\SHAKESPEARE PETERSON 1-8\_002.dta  
 Recorded on 29-JUN-2011 18:40  
 System Versions: Logged with 11.02.3186 Plotted with 11.02.3186

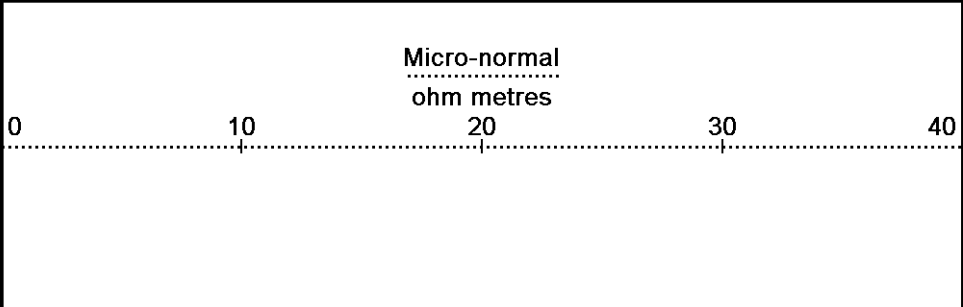
↑ 5 INCH MAIN PASS ↑

↓ 5 INCH REPEAT PASS ↓

Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 29-JUN-2011 21:08  
 Filename: C:\Minimus 11.02.3186\Data\Shakespeare Peter...\SHAKESPEARE PETERSON 1-8\_001.dta  
 Recorded on 29-JUN-2011 18:18  
 System Versions: Logged with 11.02.3186 Plotted with 11.02.3186



Depth  
in  
Feet



0 75 150

Spontaneous Potential

millivolts

-->|20|<-- +

-----

MML Caliper

inches

6 11 16

Bit Size

inches

6 11 16

DST Uphole Tension

pounds

5000 0

Borehole  
Temp in  
deg F

Micro-inverse

ohm metres

0 10 20 30 40

Replay  
Scale  
1:240

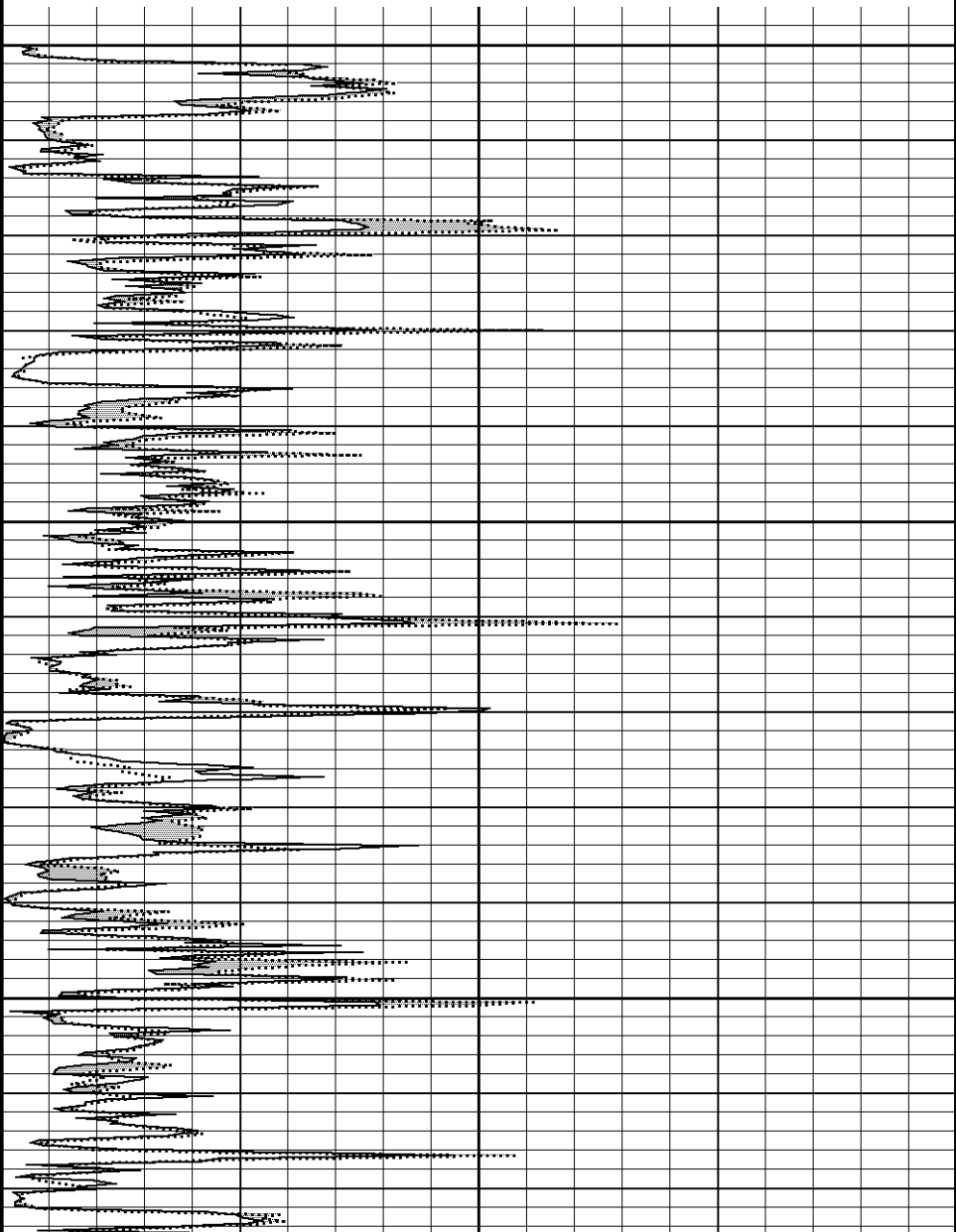
4350

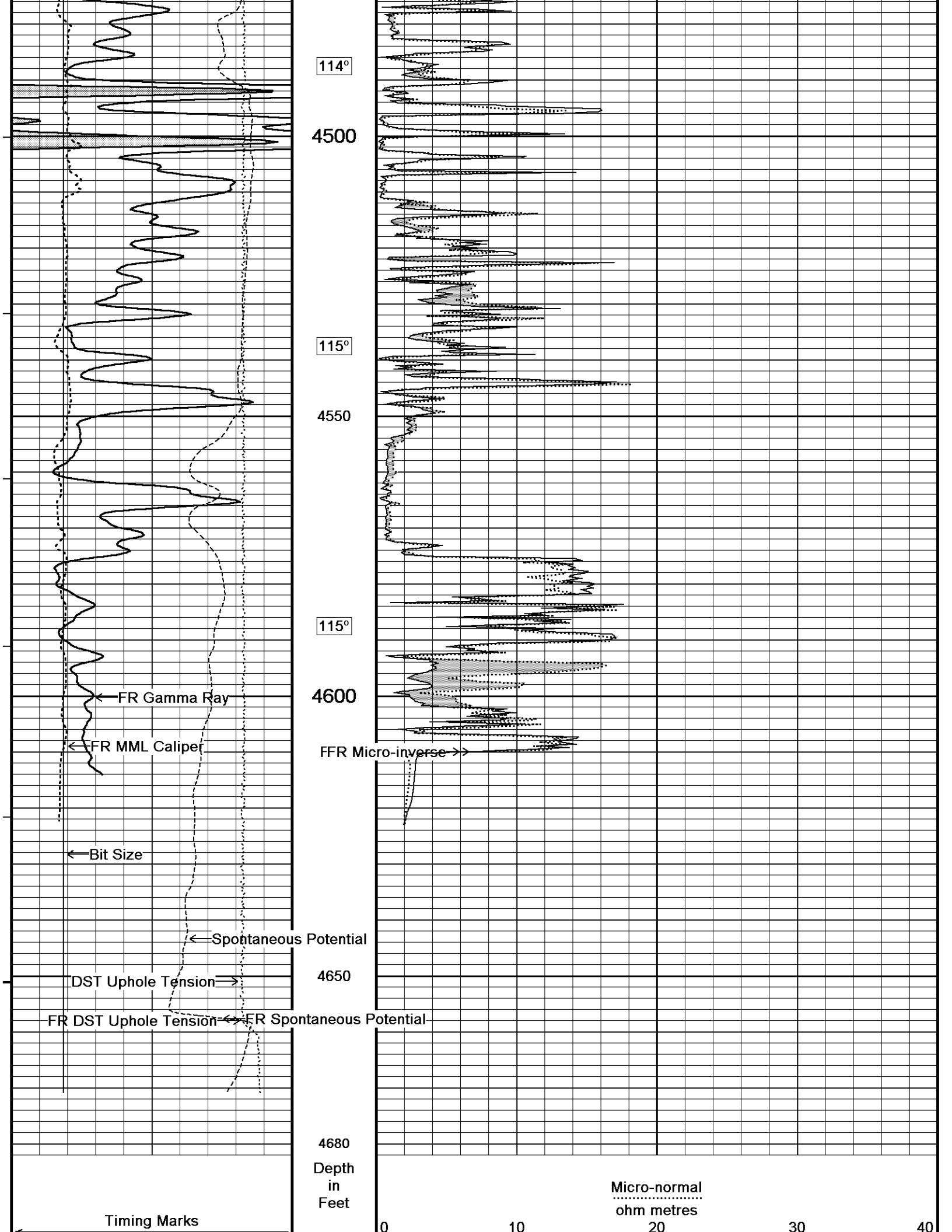
114°

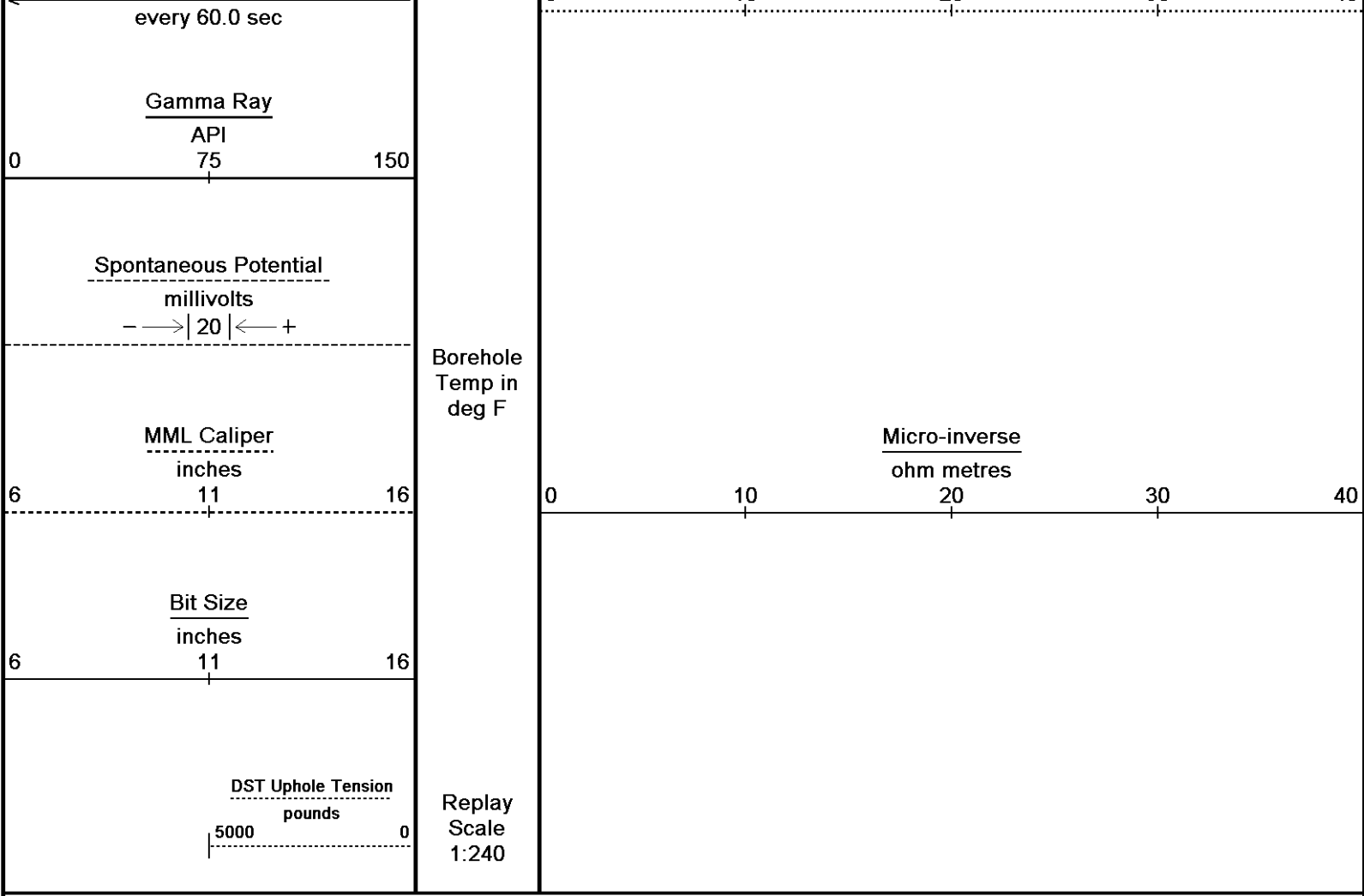
4400

114°

4450







Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 29-JUN-2011 21:08  
 Filename: C:\Minimus 11.02.3186\Data\Shakespeare Peter...\SHAKESPEARE PETERSON 1-8\_001.dta Recorded on 29-JUN-2011 18:18  
 System Versions: Logged with 11.02.3186 Plotted with 11.02.3186

↑ 5 INCH REPEAT PASS ↑

**BEFORE SURVEY CALIBRATION**  
 C:\Minimus 11.02.3186\Data\Shakespeare Peterson #1-8\SHAKESPEARE PETERSON 1-8.dta

General Constants All 000 Last Edited on 29-JUN-2011,16:55

<b>General Parameters</b>		
Mud Resistivity	0.450	ohm-metres
Mud Resistivity Temperature	94.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
<b>Hole/Annular Volume and Differential Caliper Parameters</b>		
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	
<b>Rwa Parameters</b>		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	1.000	
RWA Constant M	2.000	

**Down-hole Tension Calibration SMS 0** Field Calibration on 05-JUN-2011 04:37

Reading No	Measured	Calibrated (lbs)
1	13499.89	0.00
2	14983.70	496.00

SP Calibration MCG-B 34			Field Calibration on 20-APR-2011 14:53
	Measured	Calibrated (mV)	
Reference 1	106.7	100.0	
Reference 2	-95.0	-100.0	

Gamma Calibration MCG-B 34			Field Calibration on 28-JUN-2011 14:29
	Measured	Calibrated (API)	
Background	64	44	
Calibrator (Gross)	1113	769	
Calibrator (Net)	1049	725	

Gamma Constants MCG-B 34			Last Edited on 29-JUN-2011,16:56
Gamma Calibrator Number	grc38		
Mud Density	1.13	gm/cc	
Caliper Source for Processing	Bit Size		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	

High Resolution Temperature Calibration MCG-B 34			Field Calibration on 05-MAR-2011,23:56
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-B 34			Last Edited on
Pre-filter Length	11		

Caliper Calibration MML-A 4			Base Calibration on 16-MAY-2011 09:38	Field Calibration on 28-JUN-2011 14:15
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	14953	5.98		
2	18280	7.97		
3	21656	9.86		
4	25588	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	6.04	5.98		

Micro Normal and Micro Inverse Calibration MML-A 4				Base Calibration on 16-MAY-2011 09:23	Field Check on 28-JUN-2011 14:07
Base Calibration					
Channel	Resistor 1	Resistor 2	Measured	Calibrated (ohm-m)	
			Resistor 1	Resistor 2	
Micro Normal	12.1	60.1	2.6	12.8	
Micro Inverse	15.6	78.3	1.7	8.4	
Channel	Base Check (ohm-m)		Field Check (ohm-m)		
Micro Normal	32.2		32.2		
Micro Inverse	16.3		16.3		

Micro Normal and Micro Inverse Constants MML-A 4				Last Edited on 28-JUN-2011,14:06
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159			
Micro Normal K Factor	0.5110			
Micro Inverse K Factor	0.3380			
Standoff Offset	N/A			inches

Neutron Calibration MDN-A.B 65				Base Calibration on 16-MAY-2011 11:23	Field Check on 28-JUN-2011 14:23
Base Calibration					
	Measured		Calibrated (cps)		
	Near	Far	Near	Far	
	3166	99	3714	110	
Ratio	31.935		33.764		

Field Calibrator at Base		Calibrated (cps)
	1629	2336
Ratio		0.697
Field Check		Calibrated (cps)
	1621	2337
Ratio		0.693

### Neutron Constants MDN-A.B 65

Last Edited on 29-JUN-2011,16:56

Neutron Source Id	757	
Neutron Jig Number	5824NE	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.13	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	MCG External Temperature	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

### FE Calibration MFE-A.A 55

Base Calibration on 21-JUN-2011 10:19

Field Check on 28-JUN-2011 14:43

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	953.6	126.8
Base Check		281.3
Field Check		281.3

### FE Constants MFE-A.A 55

Last Edited on 29-JUN-2011,16:57

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

### Sonic Constants MSS-A.A 126

Last Edited on 29-JUN-2011,16:56

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft
Sonde Mode	Compensated	
Hole Type	Open Hole	

### Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A
Peak Amplitude Source		N/A

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing	Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Start Gain
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A
Use 4' Waveform to derive TR	N/A
Use 5' Waveform to derive TR	N/A
Use 6' Waveform to derive TR	N/A
3' Waveform Discriminator Level	N/A mV
4' Waveform Discriminator Level	N/A mV
5' Waveform Discriminator Level	N/A mV
6' Waveform Discriminator Level	N/A mV
3' Waveform Filter	N/A
4' Waveform Filter	N/A
5' Waveform Filter	N/A
6' Waveform Filter	N/A
Semblance Level	N/A
Semblance Window Width	N/A micro-sec
Sonic 1 Despiker	N/A N/A
Sonic 2 Despiker	N/A N/A

High Resolution Temperature Calibration MAI-A.A 45

Field Calibration on 13-AUG-2010,13:31

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

High Resolution Temperature Constants MAI-A.A 45

Last Edited on

Pre-filter Length	11
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Induction Calibration MAI-A.A 45

Base Calibration on 13-AUG-2010,13:32  
Field Check on 28-JUN-2011 14:42

Base Calibration					
Test Loop Calibration Channel	Measured		Calibrated (mmho/m)		
	Low	High	Low	High	
1	14.5	473.5	9.3	966.2	
2	5.2	373.4	7.6	821.4	
3	2.8	260.6	5.2	566.0	
4	1.6	132.2	2.6	279.2	
Array Temperature	86.2		Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	19.6	3845.9	
2	0.0	0.0	33.2	3632.1	
3	0.0	0.0	30.1	3050.7	
4	0.0	0.0	20.5	2094.1	
Deep	0.0	0.0	18.1	1920.8	
Medium	0.0	0.0	43.4	4051.4	
Shallow	0.0	0.0	50.4	5476.2	
Array Temperature	0.0		84.8		Deg F

Induction Constants MAI-A.A 45

Last Edited on 29-JUN-2011,16:56

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

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 65** Base Calibration on 16-MAY-2011 09:53  
Field Calibration on 28-JUN-2011 14:08

Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	13344	3.99	
2	21952	5.98	
3	30560	7.97	
4	38880	9.86	
5	48095	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.02	5.98	

**Photo Density Calibration MPD-B 65** Base Calibration on 16-MAY-2011 10:48  
Field Check on 28-JUN-2011 14:14

Density Calibration				
Base Calibration		Measured		Calibrated (sdu)
	Near	Far	Near	Far
Reference 1	51543	24465	59556	30836
Reference 2	20910	2298	24941	2541
Field Check at Base				
	1247.1	1201.6		
Field Check				
	1248.2	1194.8		

PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	227	1108		

Reference 1	19826	51340	0.390	0.371
Reference 2	5731	20764	0.280	0.272

Field Check at Base  
226.6      1107.8

Field Check  
226.0      1110.4

Density Constants MPD-B 65

Last Edited on 29-JUN-2011,16:56

Density Source Id	254	
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	1.13	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)
2.71	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	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 11.02.3186\Data\Shakespeare Peterson #1-8\SHAKESPEARE PETERSON 1-8.dta

Compact Comms Gamma  
MCG-B 34 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

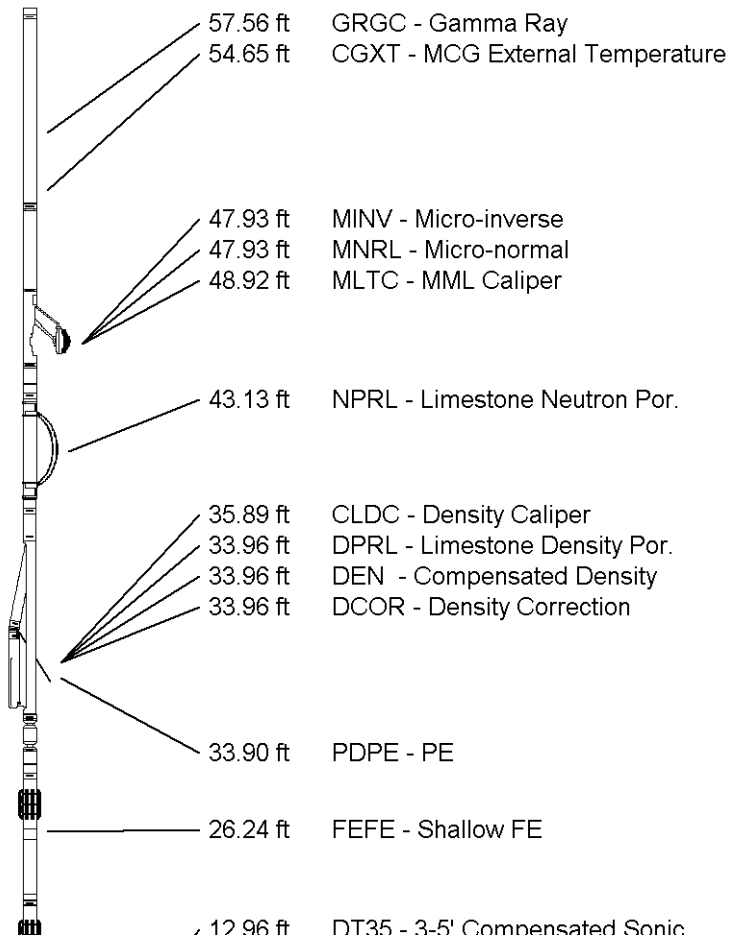
Compact Neutron  
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper  
MPD-B 65 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint  
SKJ-D.A 37 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric  
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic



MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction

MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 62.84 ft Weight: 480.6 lb



12.96 ft SPRL - Wyllie Lime. Sonic Por.

3.34 ft R400 - Array Ind. One Res 40

3.34 ft RTAO - Array Ind. One Res Rt

3.34 ft R600 - Array Ind. One Res 60

0.23 ft SPCG - Spontaneous Potential

Tool Zero (0.13ft from bottom)

-0.13 ft SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	SHAKESPEARE OIL COMPANY, INC.				
WELL	PETERSON #1-8				
FIELD	STRATFORD WEST				
PROVINCE/COUNTY	LOGAN				
COUNTRY/STATE	U.S.A. / KANSAS				
Elevation Kelly Bushing	2970.00	feet	First Reading	4610.00	feet
Elevation Drill Floor	2968.00	feet	Depth Driller	4660.00	feet
Elevation Ground Level	2965.00	feet	Depth Logger	4658.00	feet



MICRORESISTIVITY LOG

