



Weatherford

MICRORESISTIVITY LOG

COMPANY			SHAKESPEARE OIL COMPANY, INC.		
WELL			JANZEN #3-26		
FIELD			PENCE EAST		
PROVINCE/COUNTY			SCOTT		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			1000' FSL & 1200' FEL		
SEC 26	TWP 16S	RGE 34W	Other Services		MAI/MFE
Latitude			MPD/MDN		
Longitude			MSS		
API Number	15-171-21067				
Permanent Datum GL, Elevation 3107 feet					
Log Measured From KB					
Drilling Measured From KB @ 12 feet			Elevations: KB 3119.00 DF 3117.00 GL 3107.00		
Date	23-JUN-2014				
Run Number	ONE				
Service Order	7577-90708978				
Depth Driller	4890.00		feet		
Depth Logger	4890.00		feet		
First Reading	4844.00		feet		
Last Reading	3750.00		feet		
Casing Driller	266.00		feet		
Casing Logger	266.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30 lb/USg		57.00 CP		
PH / Fluid Loss	10.50		9.60 ml/30Min		
Sample Source	MUD PIT				
Rm @ Measured Temp	0.44 @ 94.0		ohm-m		
Rmf @ Measured Temp	0.35 @ 94.0		ohm-m		
Rmc @ Measured Temp	0.53 @ 94.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.36 @115.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	115.00		deg F		
Equipment / Base	13244		LIB		
Recorded By	JEFFREY RANDLE		ADAM SILL		
Witnessed By	WES HANSEN				
JOB #	LB14-187				

BOREHOLE RECORD

Last Edited: 23-JUN-2014 10:23

Bit Size inches	Depth From feet	Depth To feet
7.875	266.00	4890.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	266.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - TWO 0.5 INCH STANDOFFS USED ON MSS.
 - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX 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: 2072 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3750 FEET: 196 CU.FT.

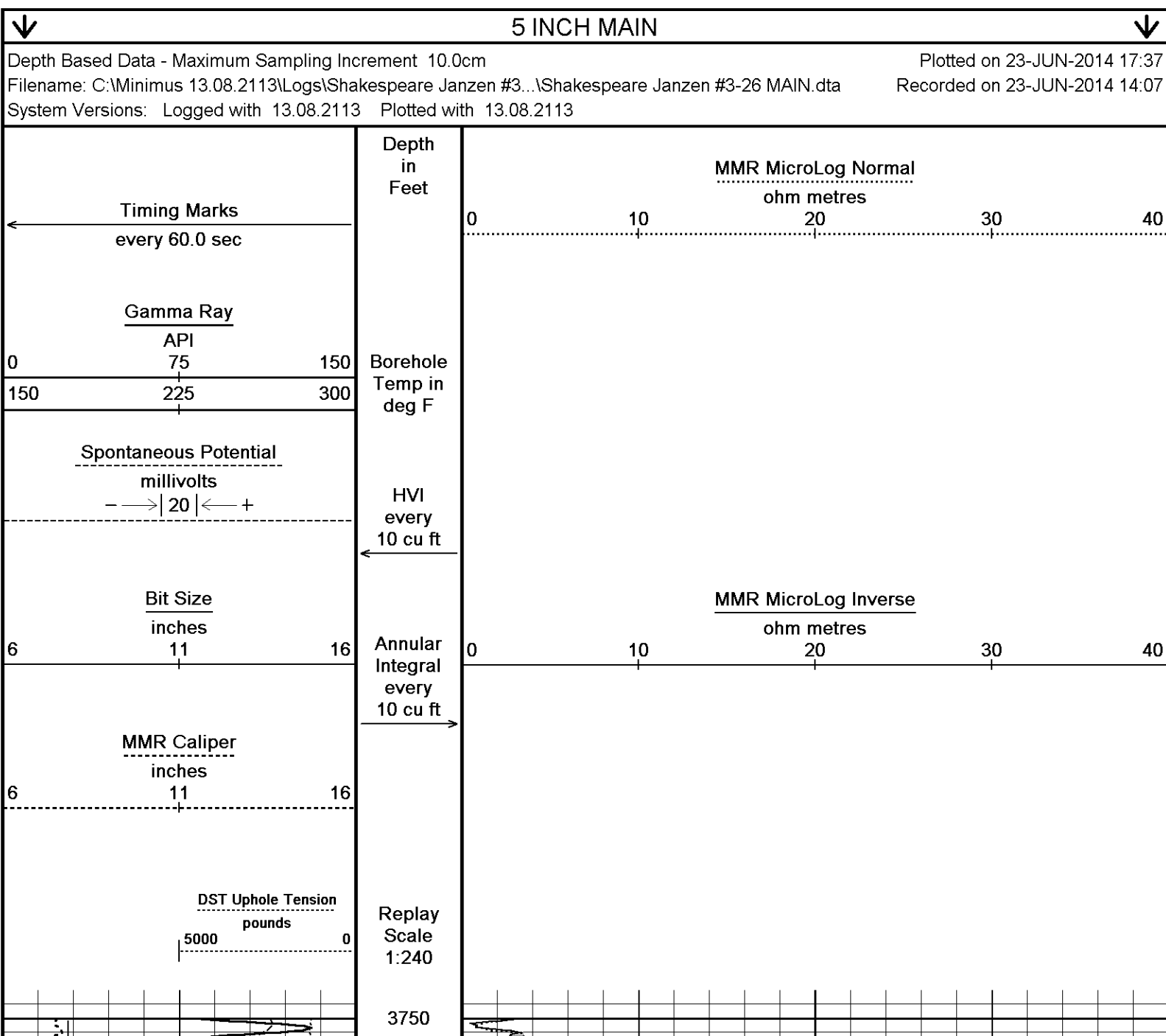
- RIG: SOUTHWIND DRILLING #70.

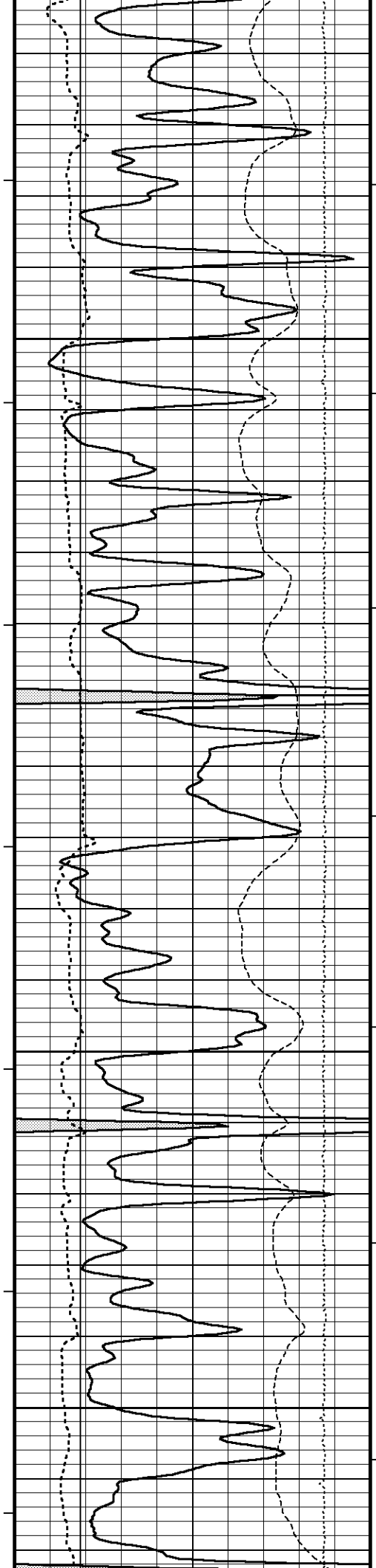
- ENGINEER: A. SILL.

- OPERATOR: J. HOLCOMB.

- JUNIOR FIELD ENGINEER: J. RANDLE.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.





108°

3800

109°

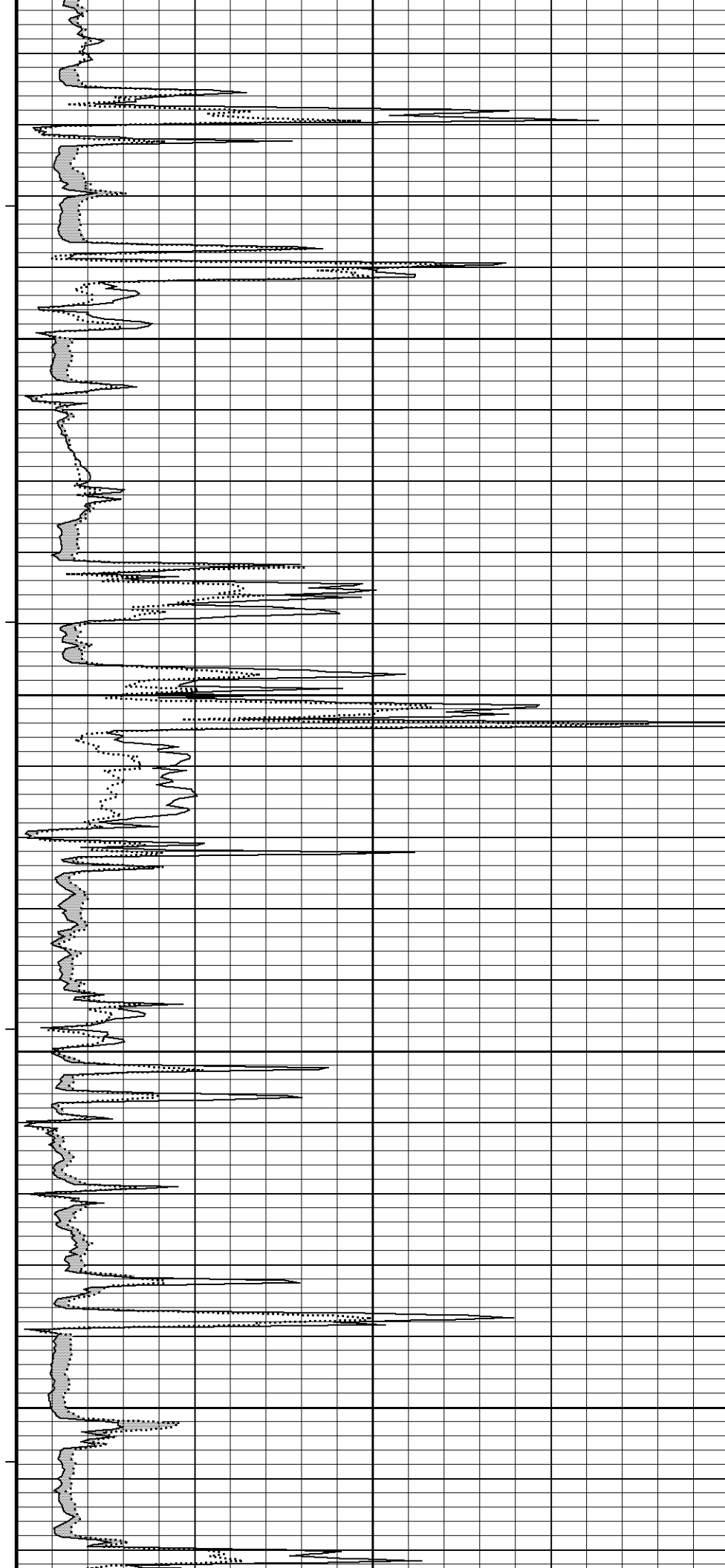
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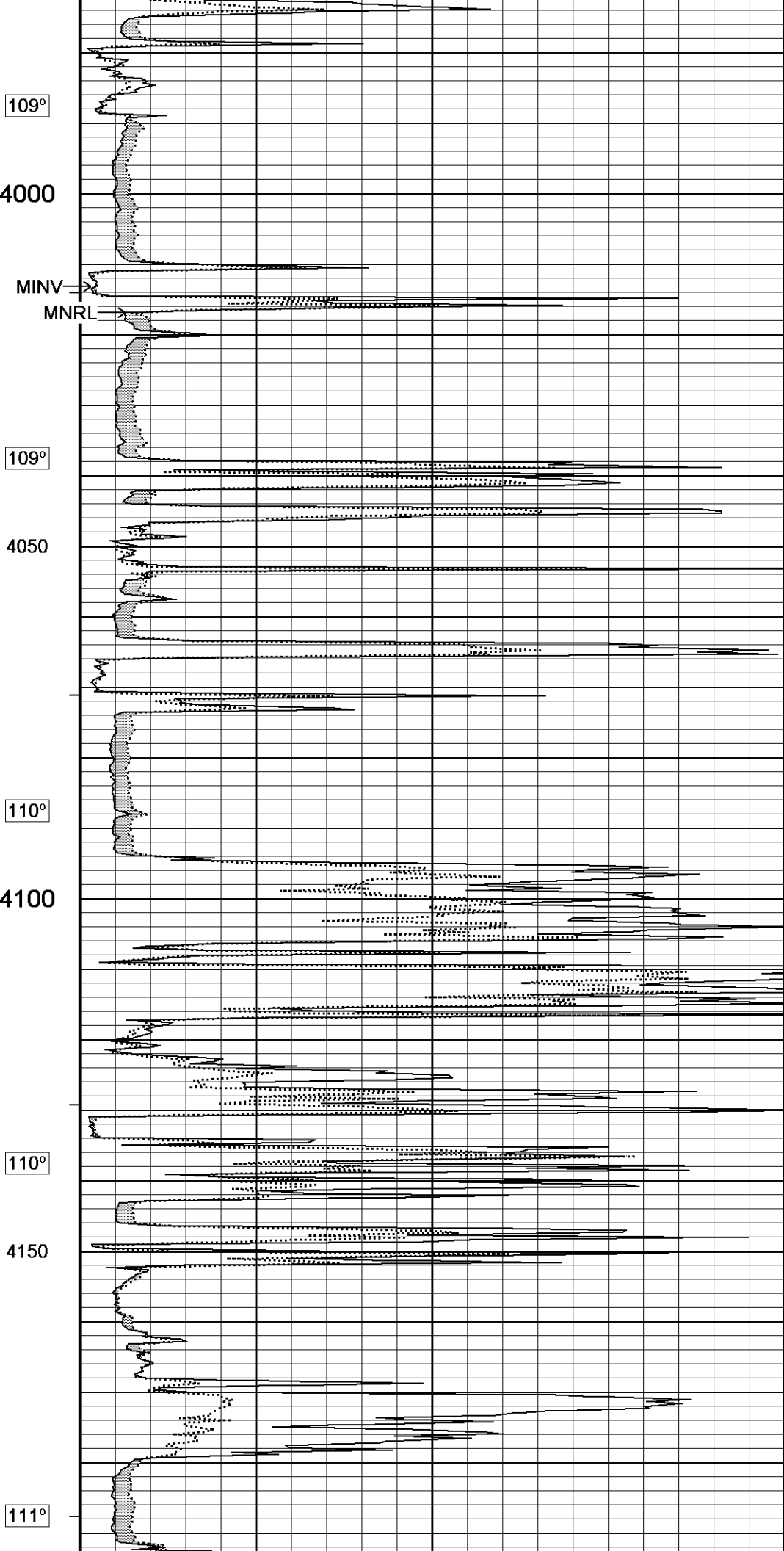
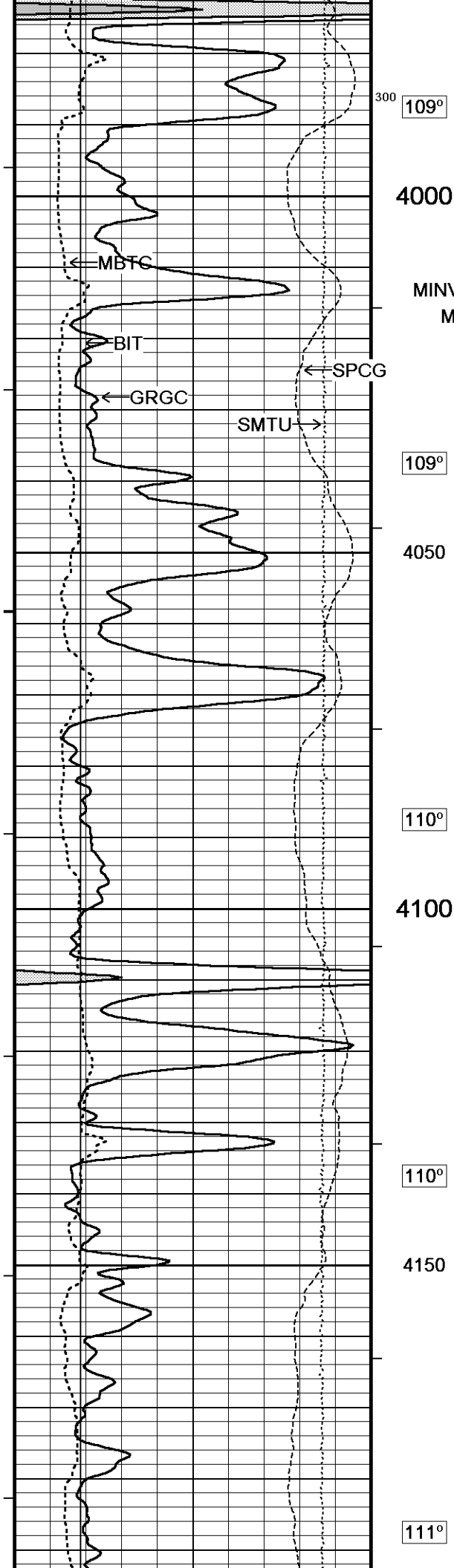
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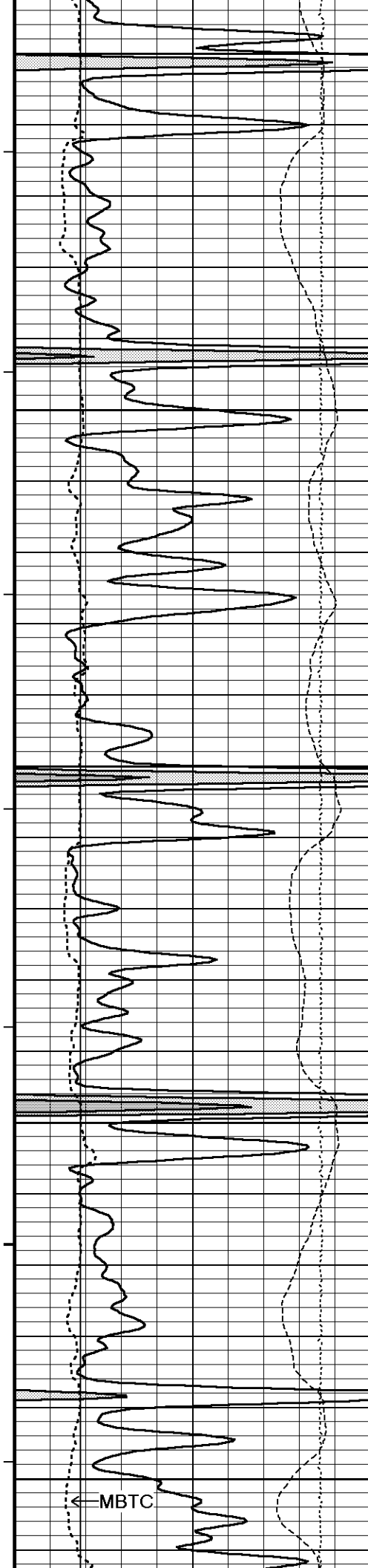
3900

109°

3950







4200

111°

4250

200

111°

4300

100

111°

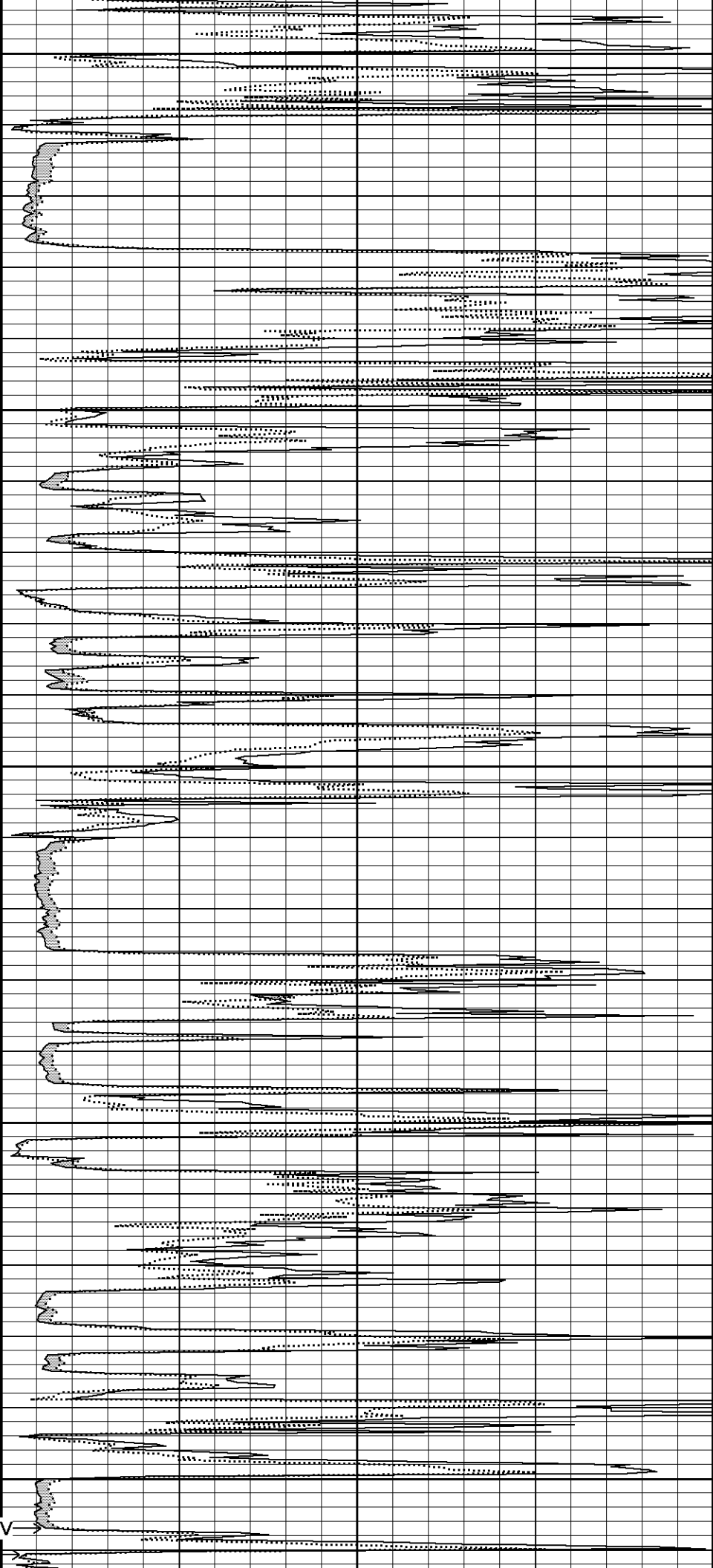
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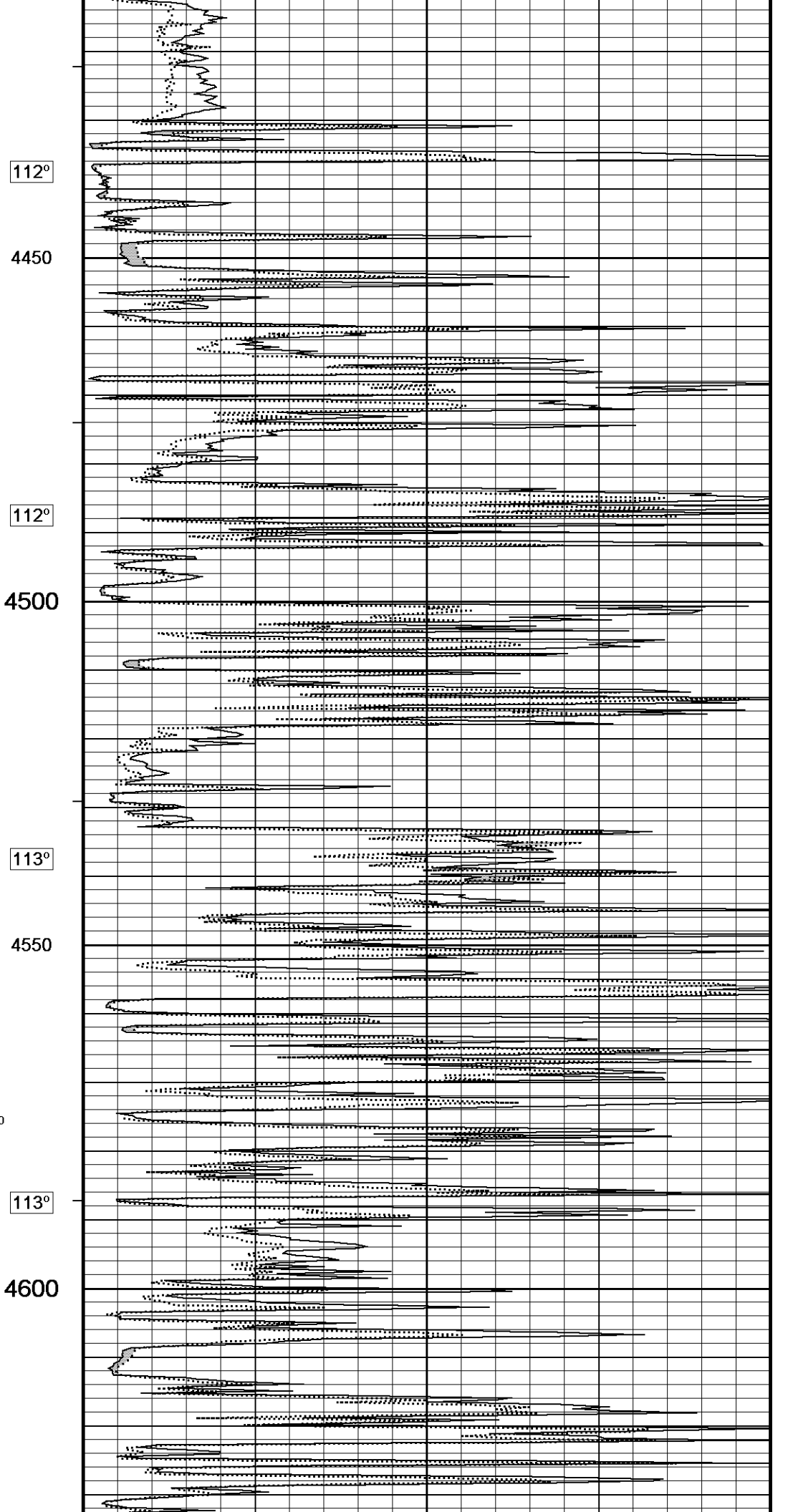
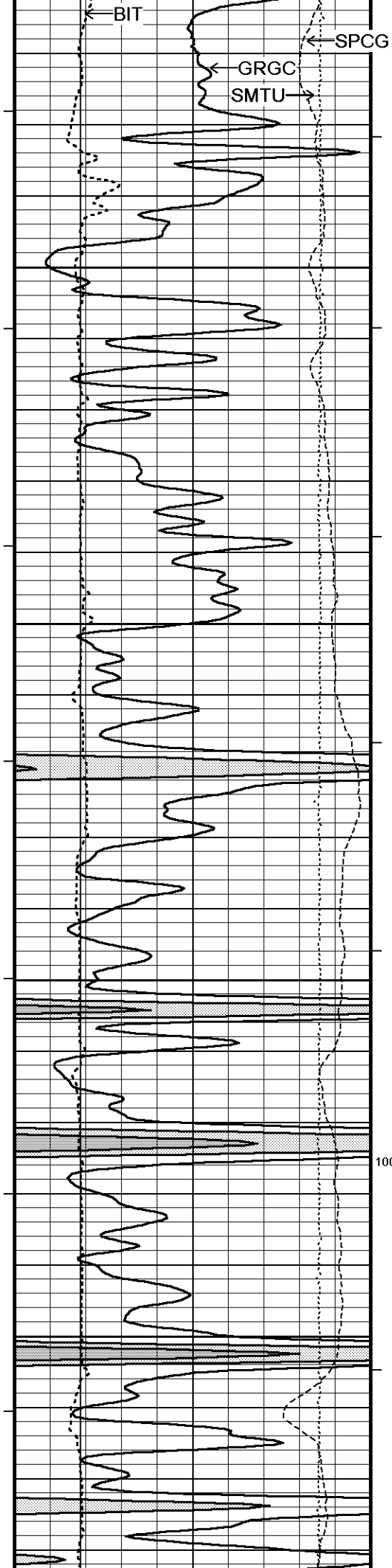
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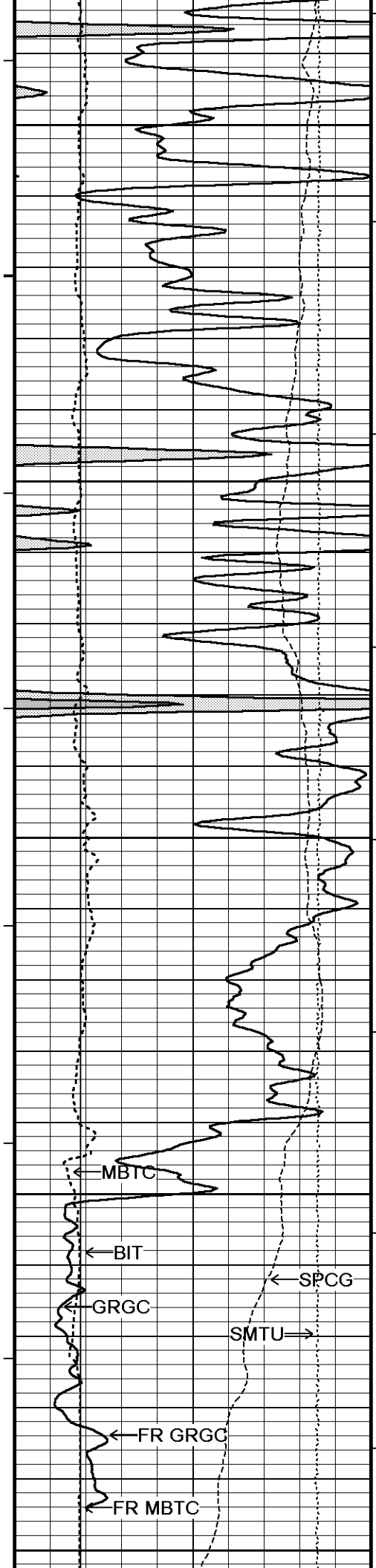
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MINV

MNRL







113°

4650

114°

4700

114°

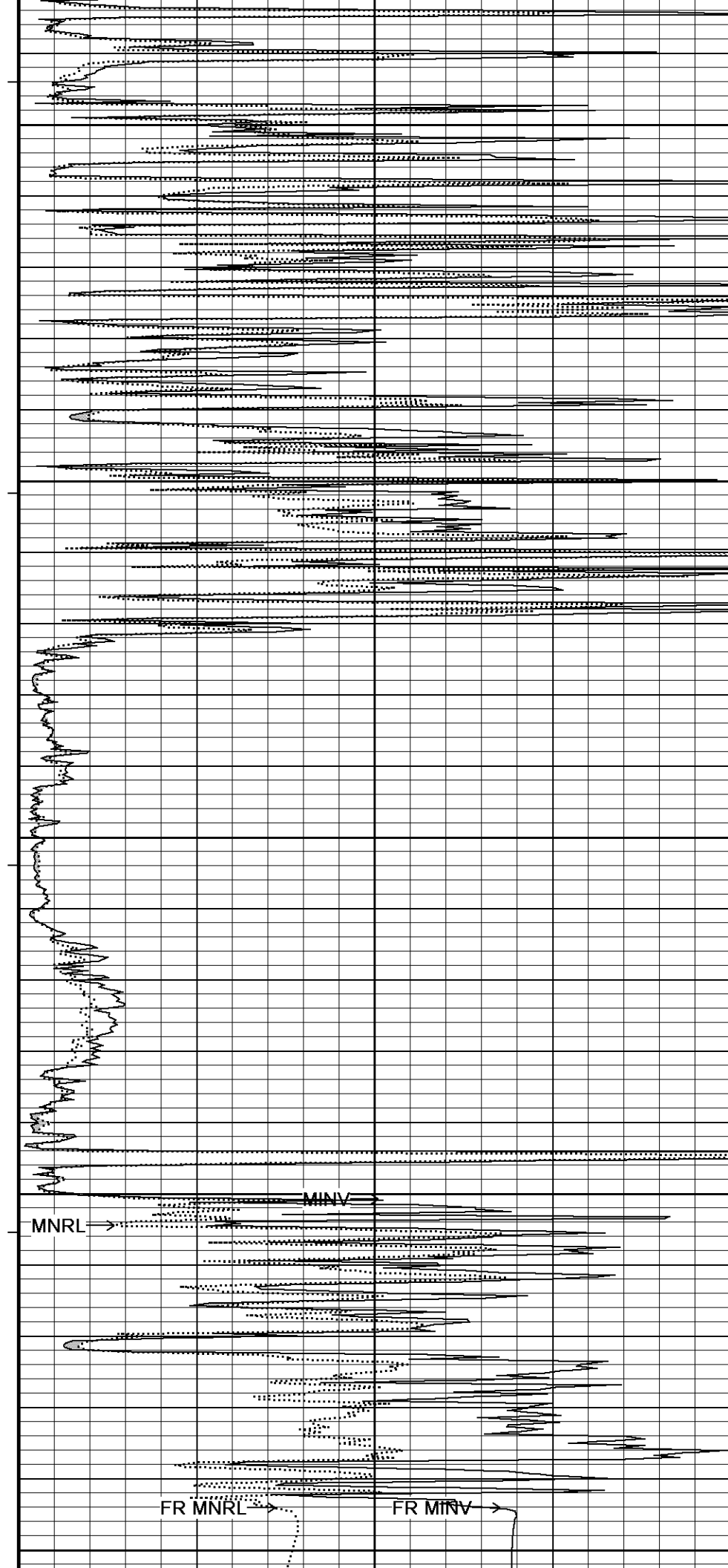
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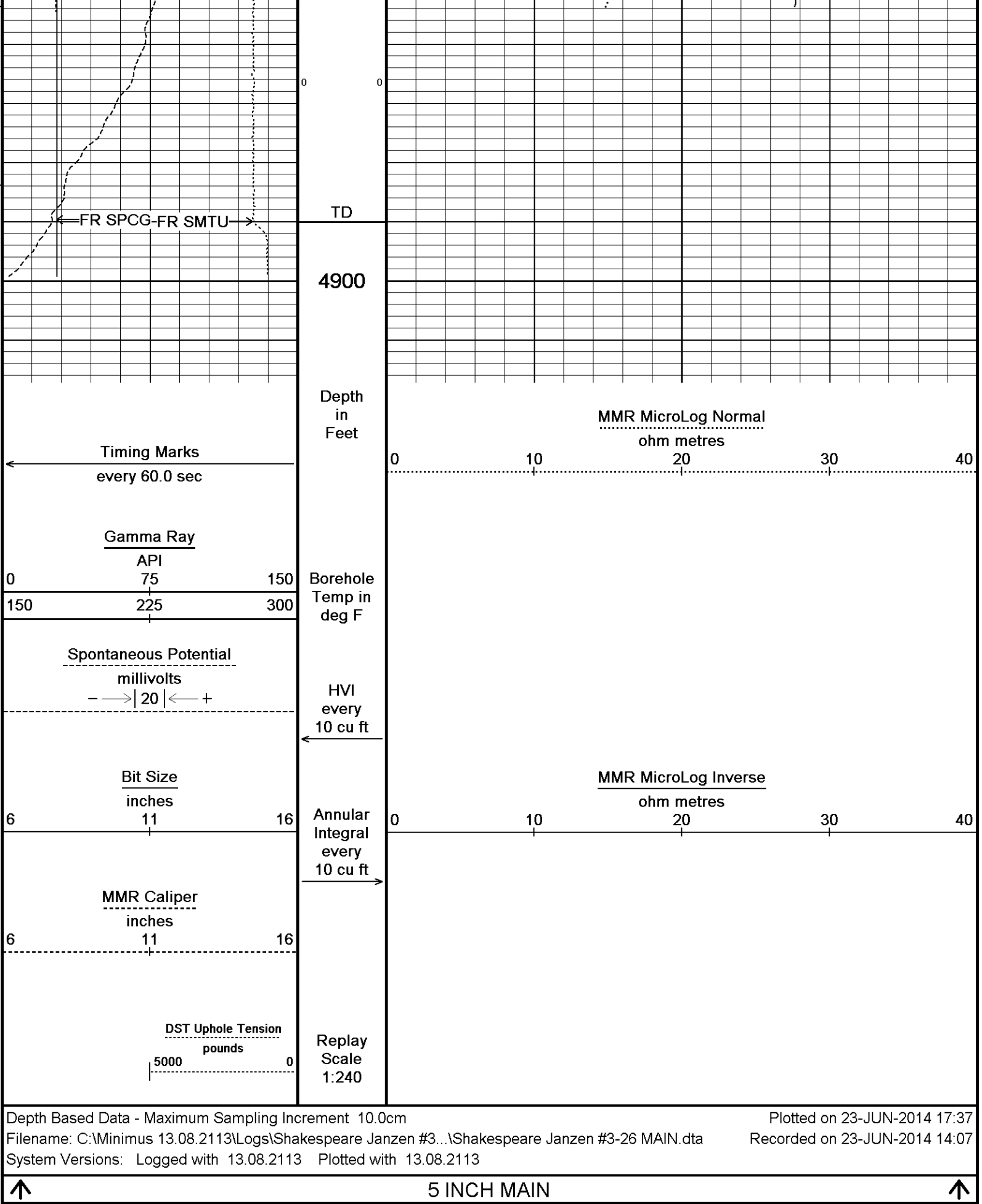
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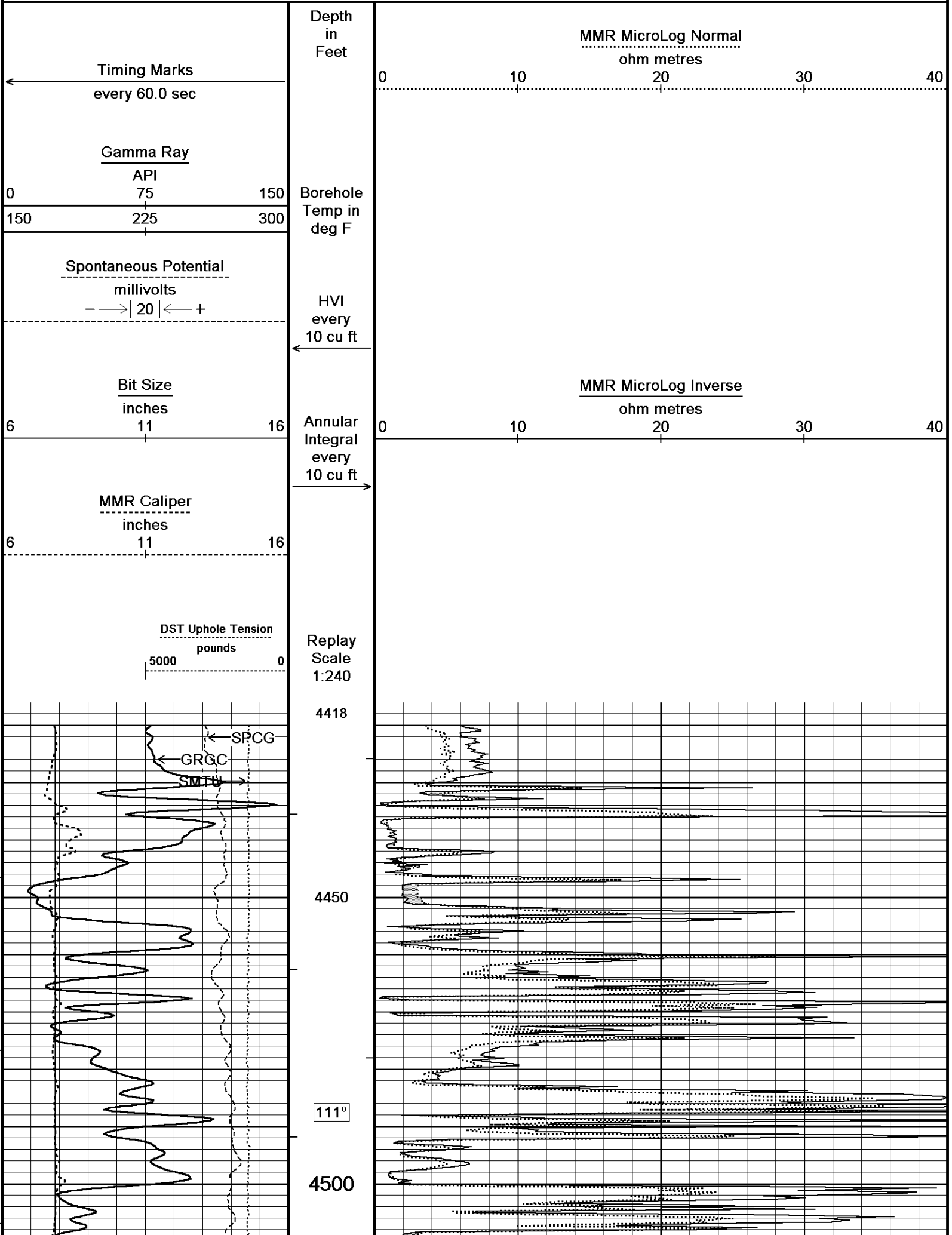
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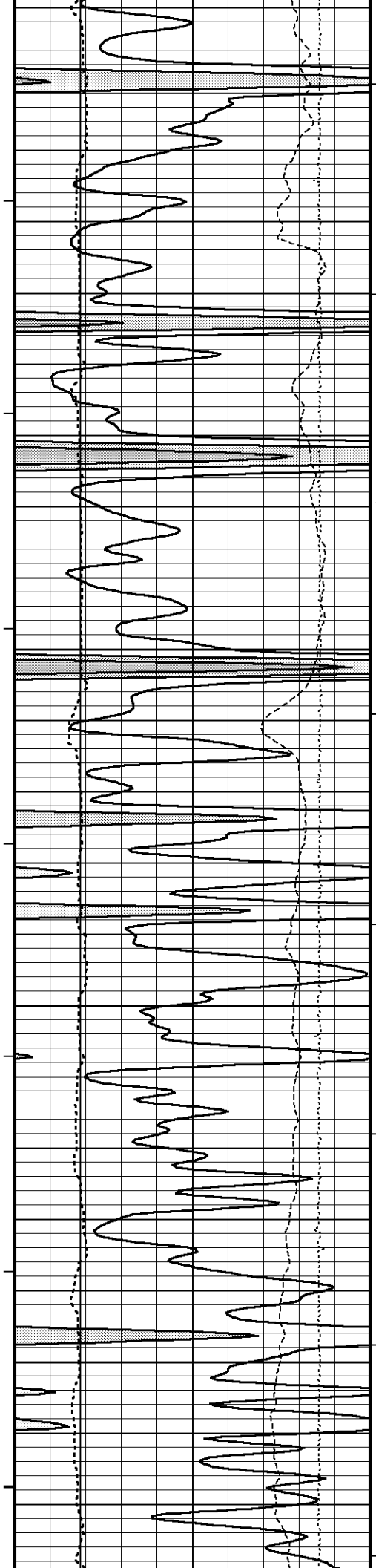
114°

4850









112°

4550

100

112°

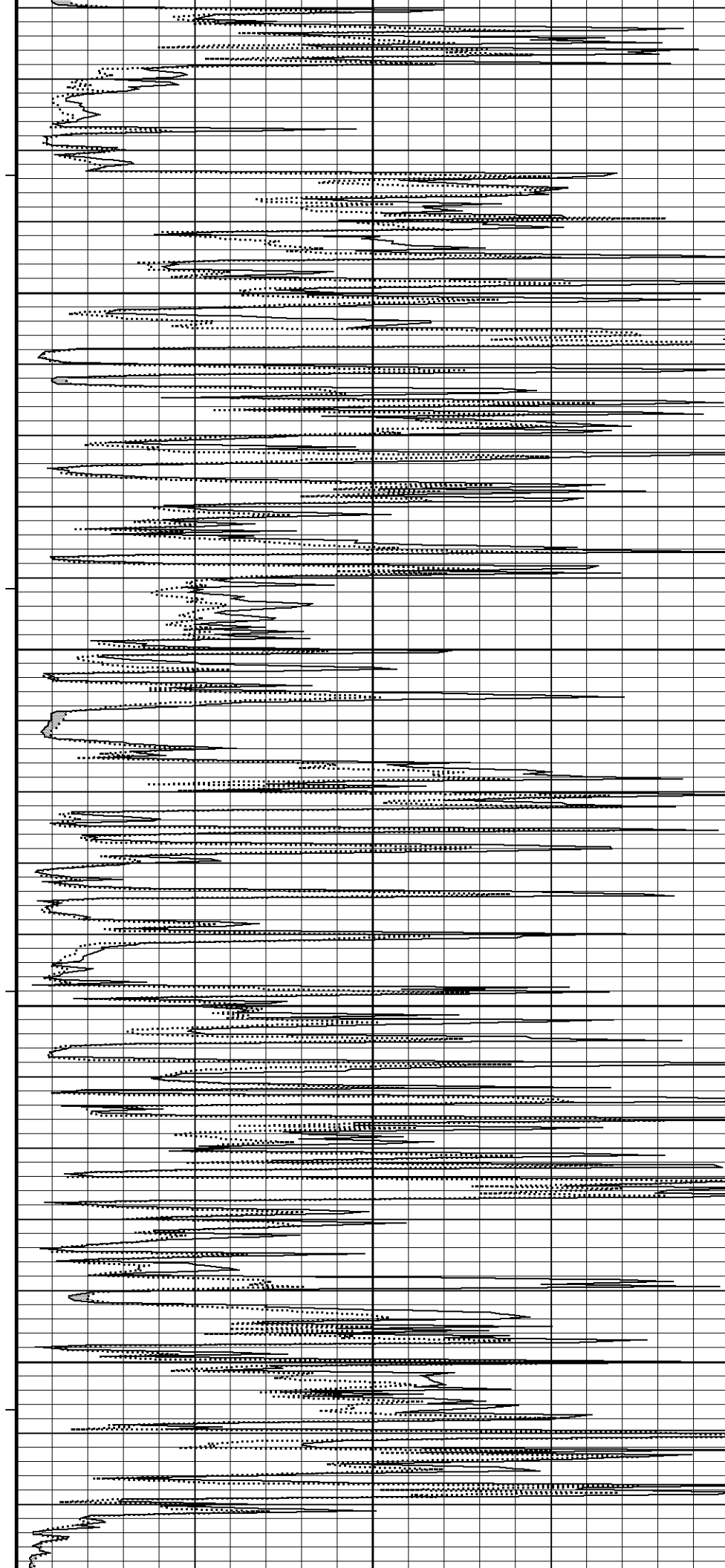
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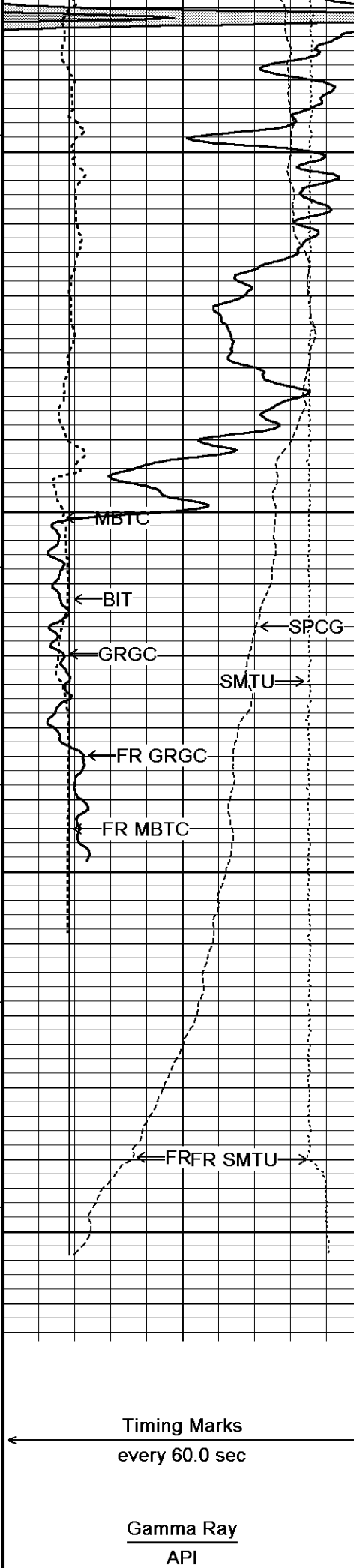
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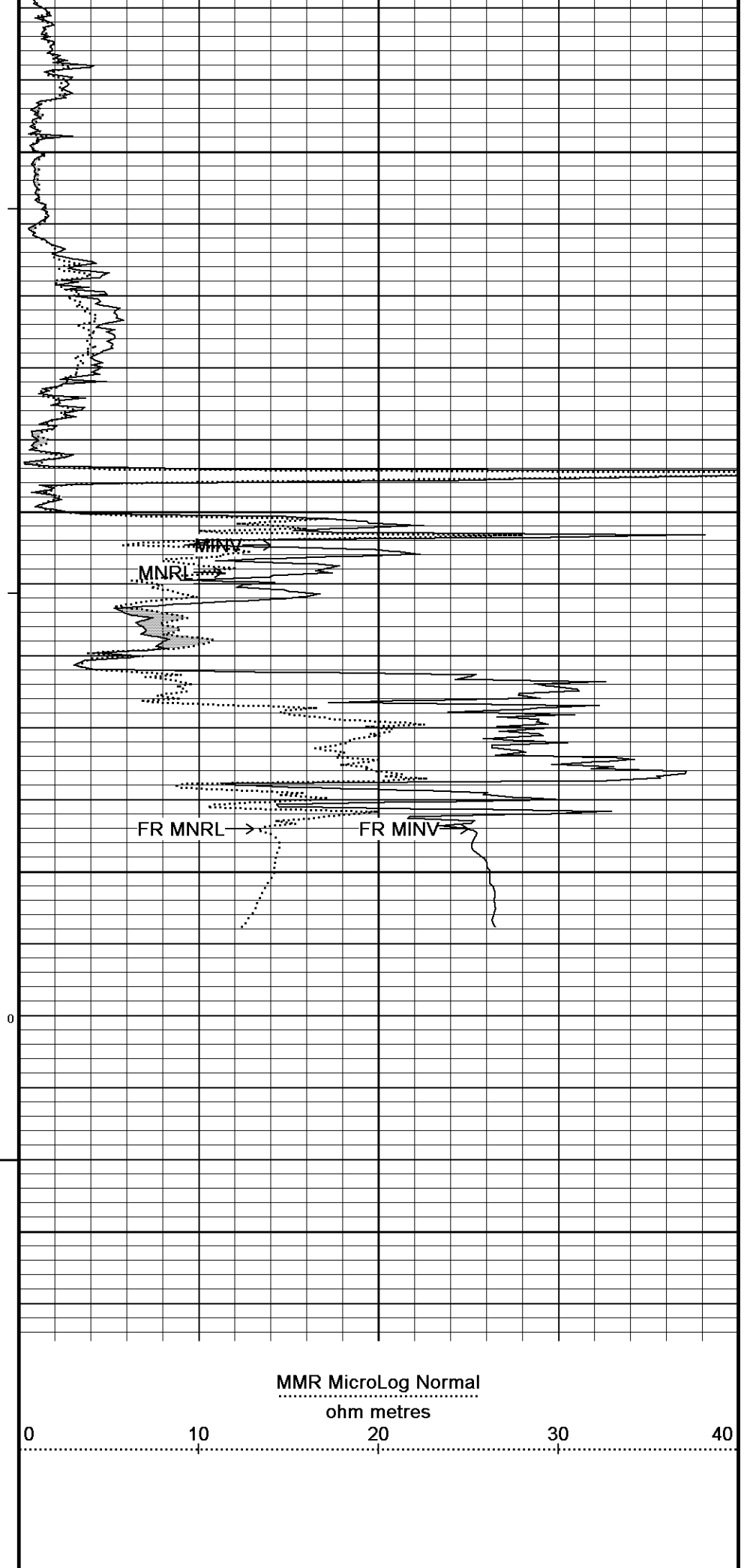
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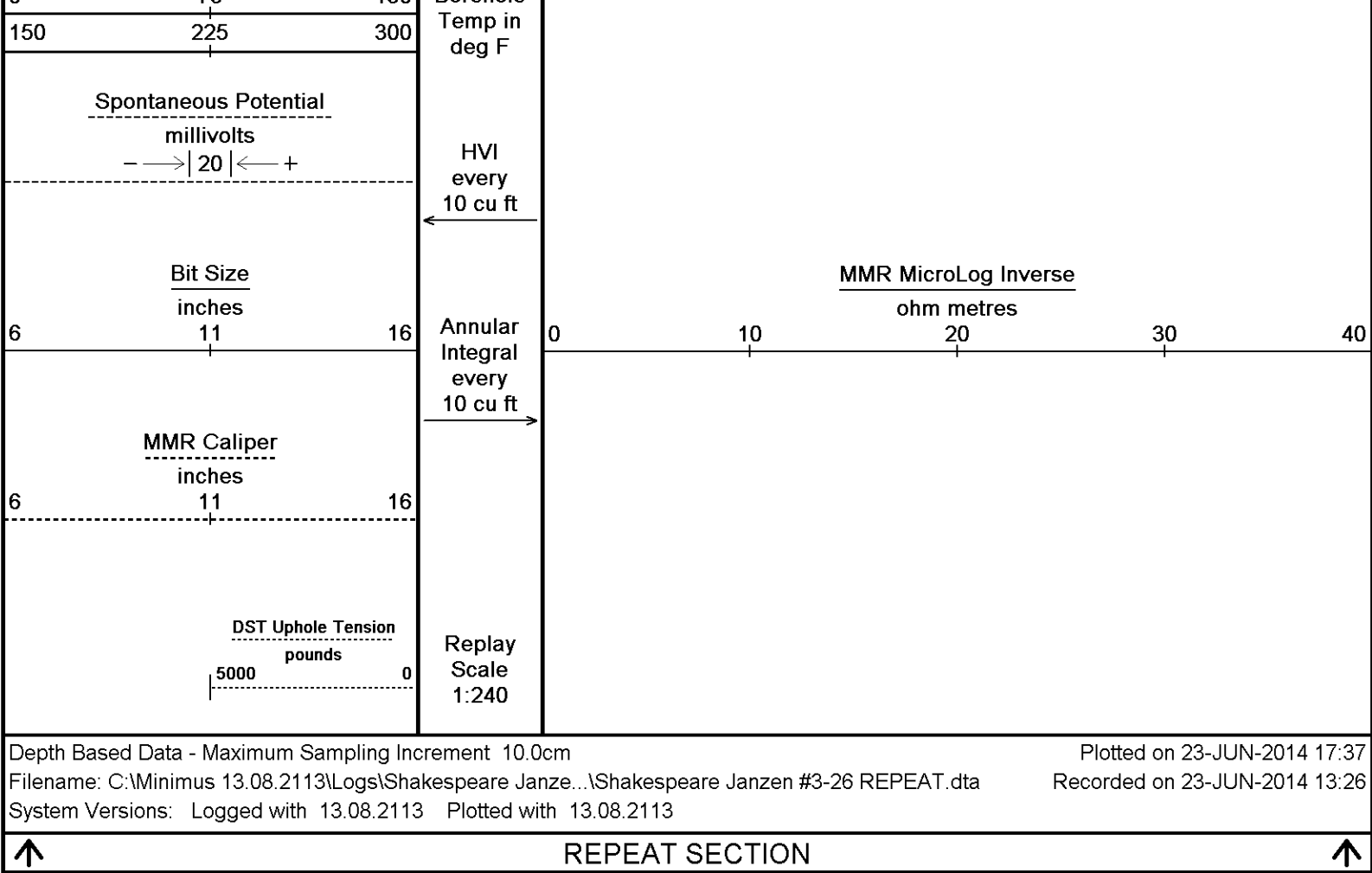
4700





113°
4750
114°
4800
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4900





BEFORE SURVEY CALIBRATION			
C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #3-26\Shakespeare Janzen #3-26 REPEAT.dta			
General Constants All 000		Last Edited on 23-JUN-2014,11:26	
General Parameters			
Mud Resistivity	0.440	ohm-metres	
Mud Resistivity Temperature	94.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid 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	Crossplot Porosity		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0		Field Calibration on 23-JUN-2014 12:33	
Reading No	Measured	Calibrated (lbs)	
1	15669.38	0.00	
2	16235.25	481.00	
Gamma Calibration MCG-D.K 442		Field Calibration on 23-JUN-2014 06:39	
	Measured	Calibrated (API)	
Background	71	48	
Calibrator (Cross)	1157	772	

Calibrator (Gross)	1157	775
Calibrator (Net)	1086	725
Gamma Constants MCG-D.K 442		Last Edited on 23-JUN-2014,10:28
Gamma Calibrator Number	GRC038	
Mud Density	1.11	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%
High Resolution Temperature Calibration MCG-D.K 442		Field Calibration on 10-MAY-2014,10:22
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MCG-D.K 442		Last Edited on 10-MAY-2014,10:22
Pre-filter Length	11	
SP Calibration MCG-D.K 442		Field Calibration on 10-MAY-2014 10:40
	Measured	Calibrated (mV)
Reference 1	98.8	99.0
Reference 2	-98.4	-98.8
Caliper Calibration MMR-C.A 248		Base Calibration on 20-JUN-2014 09:22 Field Calibration on 23-JUN-2014 06:23
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13560	5.98
2	16725	7.97
3	19859	9.86
4	23840	11.92
5	0	0.00
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.98	7.97
Micro Normal and Micro Inverse Calibration MMR-C.A 248		Base Calibration on 20-JUN-2014 09:12 Field Check on 23-JUN-2014 06:22
Base Calibration		
	Measured	Calibrated (ohm-m)
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2
Micro Normal	9.9 49.5	5.1 25.6
Micro Inverse	9.9 49.5	3.4 16.9
Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.9	93.9
Micro Inverse	62.2	62.2
Micro Normal and Micro Inverse Constants MMR-C.A 248		Last Edited on 23-JAN-2014,17:04
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	0.0000	inches
Neutron Calibration MDN-B.J 387		Base Calibration on 08-MAY-2014 14:03 Field Check on 23-JUN-2014 06:44
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	2970 91	3714 110
Ratio	32.668	33.764
Field Calibrator at Base		Calibrated (cps)
		1688 2486
Ratio		0.679

Field Check	Calibrated (cps)		
Ratio	1689	2475	0.680
Neutron Constants MDN-B.J 387			Last Edited on 23-JUN-2014,11:27
Neutron Source Id	P58125B		
Neutron Jig Number	5824NE		
Epithermal Neutron			
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	None		
Formation Pressure	N/A	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
FE Calibration MFE-A.A 55			Base Calibration on 20-JUN-2014 09:41 Field Check on 23-JUN-2014 06:14
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	950.7	126.8	
Base Check		281.7	
Field Check		281.8	
FE Constants MFE-A.A 55			Last Edited on 23-JUN-2014,11:27
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 73			Last Edited on 23-JUN-2014,11:28
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
2'	N/A	N/A	N/A
			Start Gain
			Discriminator (mV)
			N/A

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		N/A		
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	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

Induction Calibration MAI-A.A 5

Base Calibration on 21-JAN-2014,09:50
Field Check on 23-JUN-2014 06:13

Base Calibration

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		16.3	470.8	9.3	966.2
2		5.6	376.1	7.6	821.4
3		2.6	266.1	5.2	566.0
4		1.6	130.0	2.6	279.2

Array Temperature 71.1 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	15.1	3862.6
2	0.0	0.0	31.7	3591.0
3	0.0	0.0	29.8	2971.7
4	0.0	0.0	20.8	2126.4
Deep			18.4	1912.4
Medium			43.0	3861.7
Shallow			47.2	5372.9

Array Temperature 0.0 73.4 Deg F

Induction Constants MAI-A.A 5

Last Edited on 23-JUN-2014,11:28

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	mmhos/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	
High Resolution Temperature Calibration MAI-A.A 5			
			Field Calibration on 21-JAN-2014,15:43
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MAI-A.A 5			
			Last Edited on 09-MAY-2014,12:22
Pre-filter Length		11	
Caliper Calibration MPD-D.A 480			
			Base Calibration on 08-MAY-2014 14:36
			Field Calibration on 23-JUN-2014 06:16
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	17491	3.99	
2	27463	5.98	
3	37484	7.97	
4	47415	9.86	
5	58518	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	8.03	7.97	
Photo Density Calibration MPD-D.A 480			
			Base Calibration on 08-MAY-2014 14:53
			Field Check on 23-JUN-2014 06:21
Density Calibration			
Base Calibration			
	Measured	Calibrated (sdu)	
	Near	Far	Near
Background	1275	1464	
Reference 1	55908	26147	59556 30836
Reference 2	22982	2651	24941 2541
Field Check at Base			
	1274.5	1464.0	
Field Check			
	1270.4	1465.1	
PE Calibration			
Base Calibration			
	Measured	Calibrated	
	WS	WH	Ratio
Background	241	1140	
Reference 1	23265	55701	0.422 0.371
Reference 2	6806	22836	0.303 0.272

Field Check at Base	240.7	1139.6
Field Check	239.4	1136.0

Density Constants MPD-D.A 480

Last Edited on 23-JUN-2014,10:28

Density Source Id	P50557B
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	1.11 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 (m)
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

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #3-26\Shakespeare Janzen #3-26 REPEAT.dta

CBH-C, Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

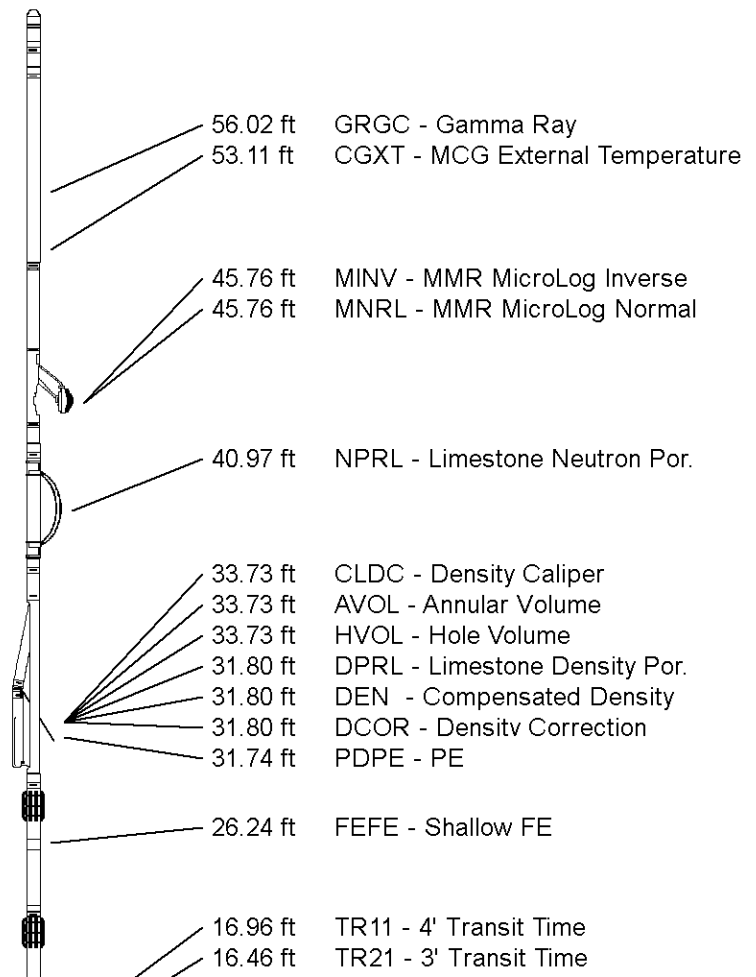
Compact Micro-Resistivity
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-D.A 480 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

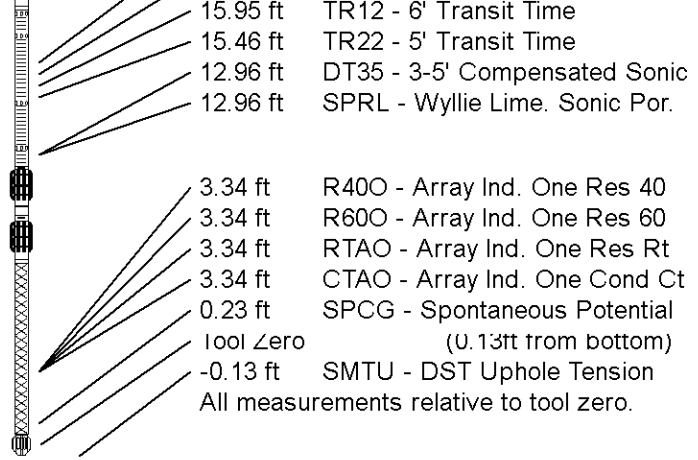
Compact Sonic
MSS-A.A 73 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in



Compact Induction

MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	JANZEN #3-26
FIELD	PENCE EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3119.00	feet	First Reading	4844.00	feet
Elevation Drill Floor	3117.00	feet	Depth Driller	4890.00	feet
Elevation Ground Level	3107.00	feet	Depth Logger	4890.00	feet



Weatherford®

MICRORESISTIVITY LOG