Weatherford

COMPENSATED NEUTRON SONIC POROSITY OVERLAY

COMPANY	SHAKESPEARE OIL CO., INC
WELL	JANZEN 6-36
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	950' FNL & 450' FWL NE SW NW NW

SEC 36	TWP 16S	RGE 34W	Other Services
Latitude			MPD/MDN MML
Longitude			MAI/MFE
API Number	15-171-21043		MSS

Permanent Datum GL, Elevation 3104 feet	Elevations:	feet
Log Measured From KB	KB	3116.00
Drilling Measured From KB @ 12 FEET	DF	3114.00
	GL	3104.00

Date	08-APRI-2014			
Run Number	ONE			
Service Order	5872-84189232			
Depth Driller	4850.00	feet		
Depth Logger	4849.00	feet		
First Reading	4836.00	feet		
Last Reading	3850.00	feet		
Casing Driller	264.00	feet		
Casing Logger	267.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEM			
Density / Viscosity	9.30 lb/USg		45.00 CP	
PH / Fluid Loss	10.00		8.80 ml/30Min	
Sample Source	PIT			
Rm @ Measured Temp	0.40 @ 86.0	ohm-m		
Rmf @ Measured Temp	0.32 @ 86.0	ohm-m		
Rmc @ Measured Temp	0.48 @ 86.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.31 @109.0	ohm-m		
Time Since Circulation	4 HRS			
Max Recorded Temp	109.00	deg F		
Equipment / Base	13057		LIB	
Recorded By	D. COLE			
Witnessed By	M. HERNDON			
JOB #	LB 14-108			

BOREHOLE RECORD

Last Edited: 08-APR-2014 22:54

Bit Size inches	Depth From feet	Depth To feet
7.875	264.00	4850.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
CASING	8.625	0.00	264.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.08.211.

- 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 3850 FEET: 340 CU.FT.

- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3850 FEET: 180 CU.FT.

- RIG: SOUTHWIND 70

- ENGINEER: D. COLE.

- OPERATOR: J. DUNLAP

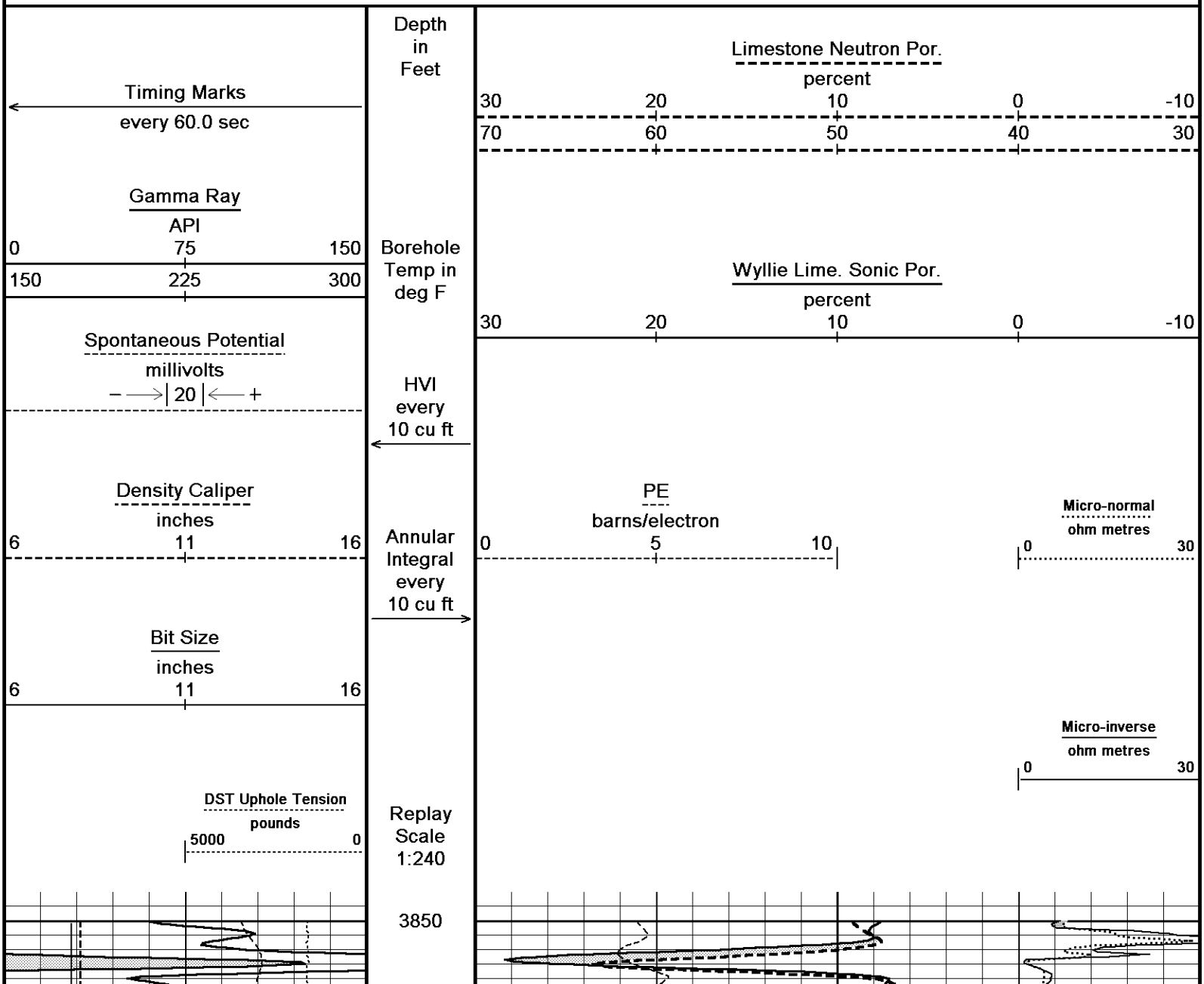
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

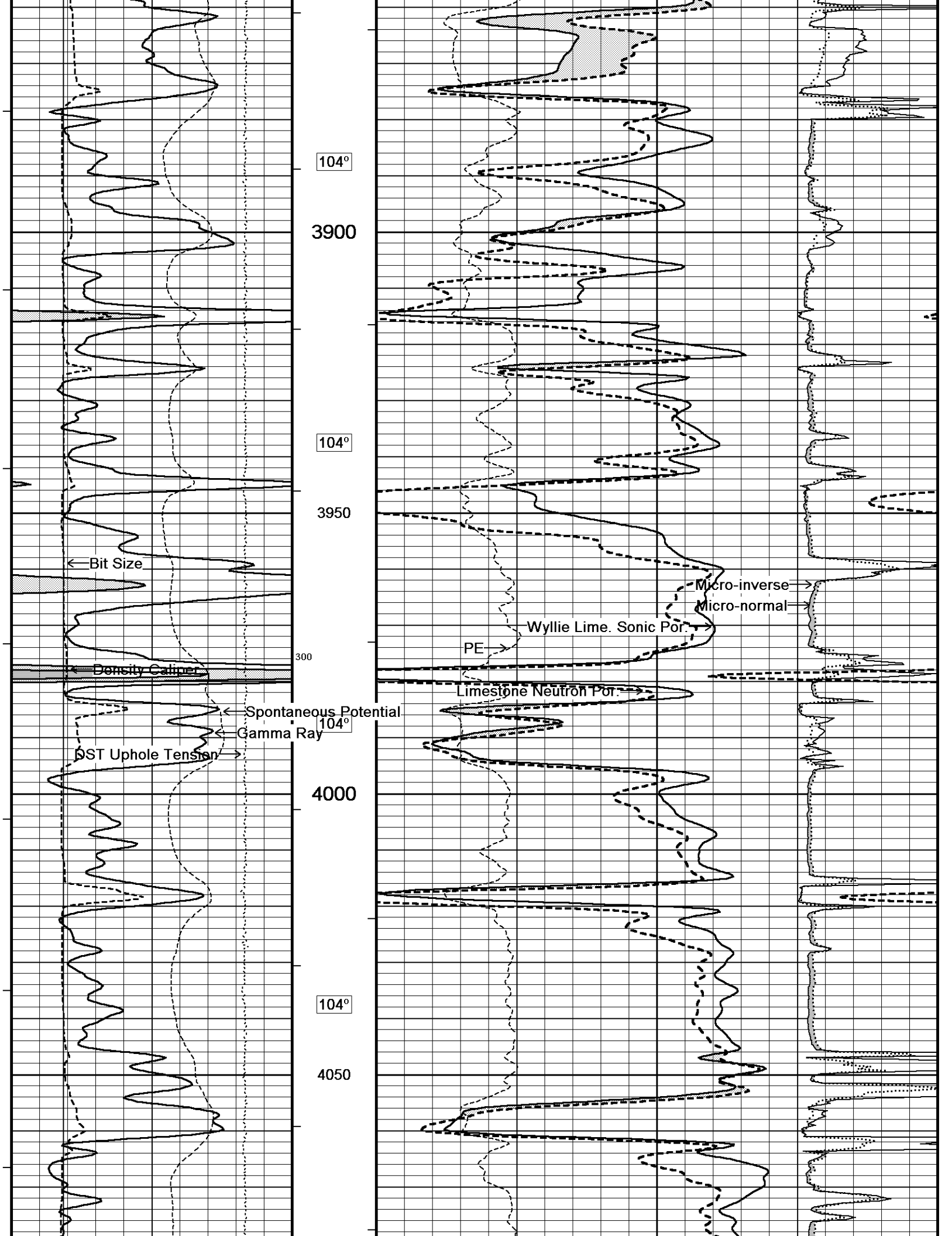
5 INCH MAIN

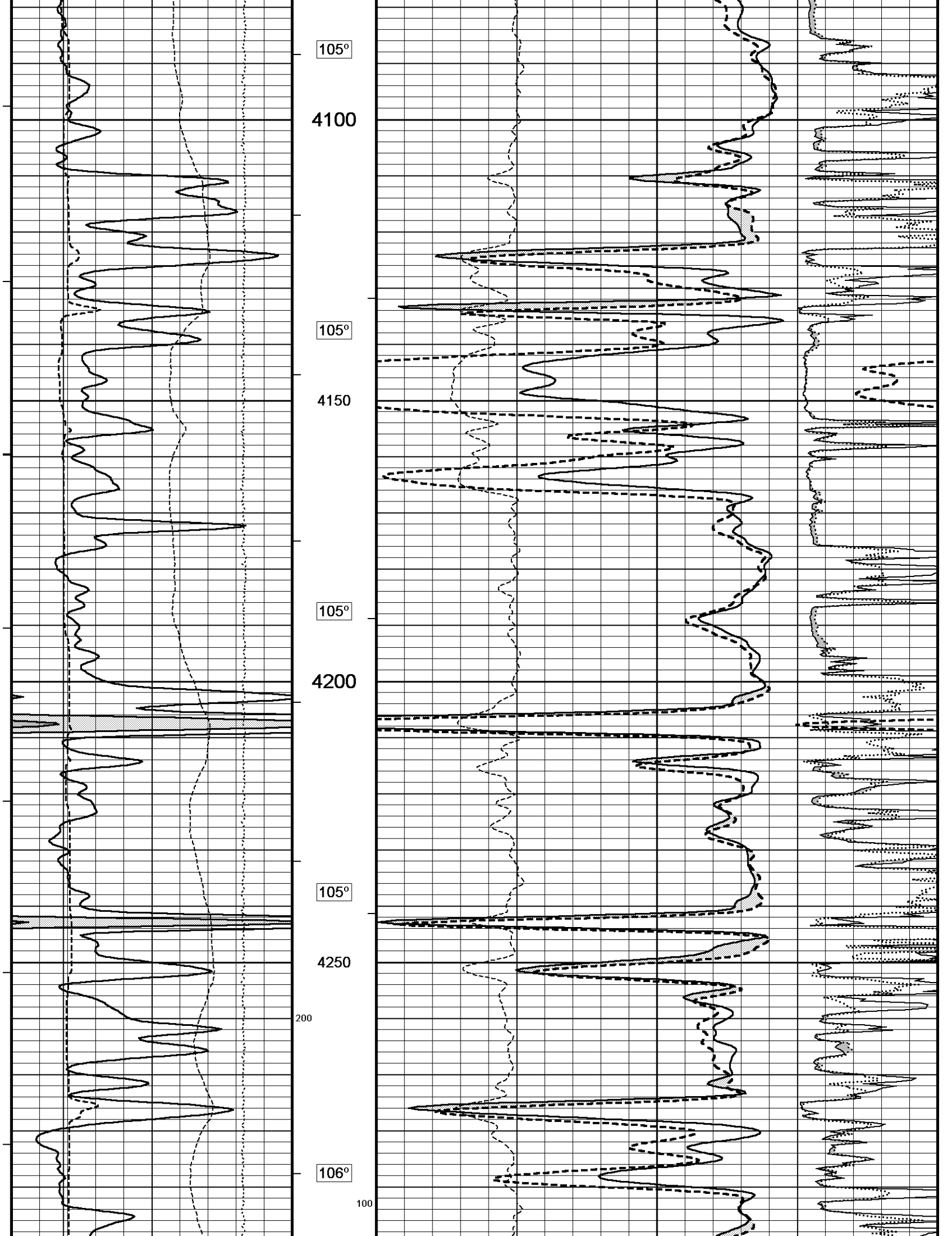
Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 09-APR-2014 02:40

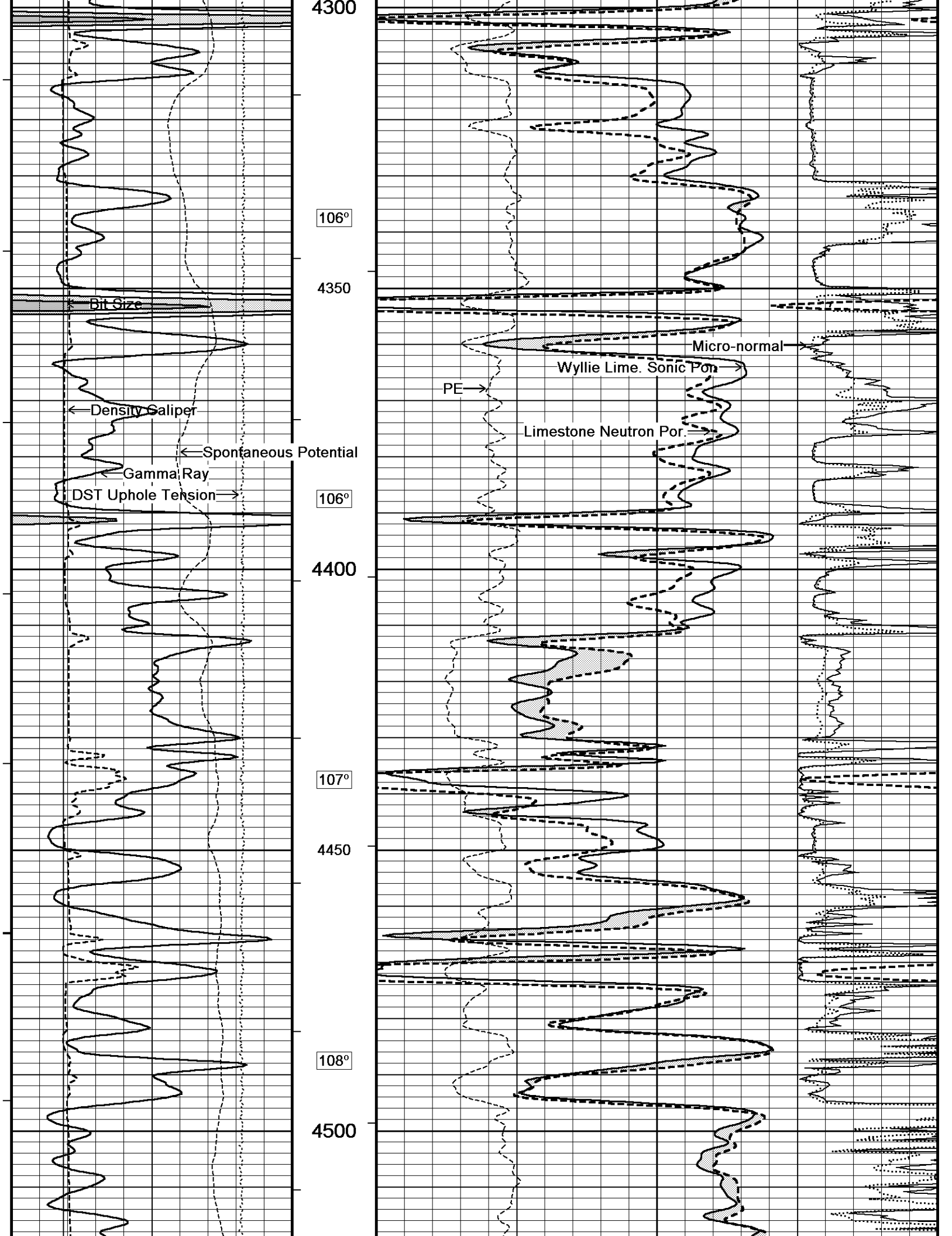
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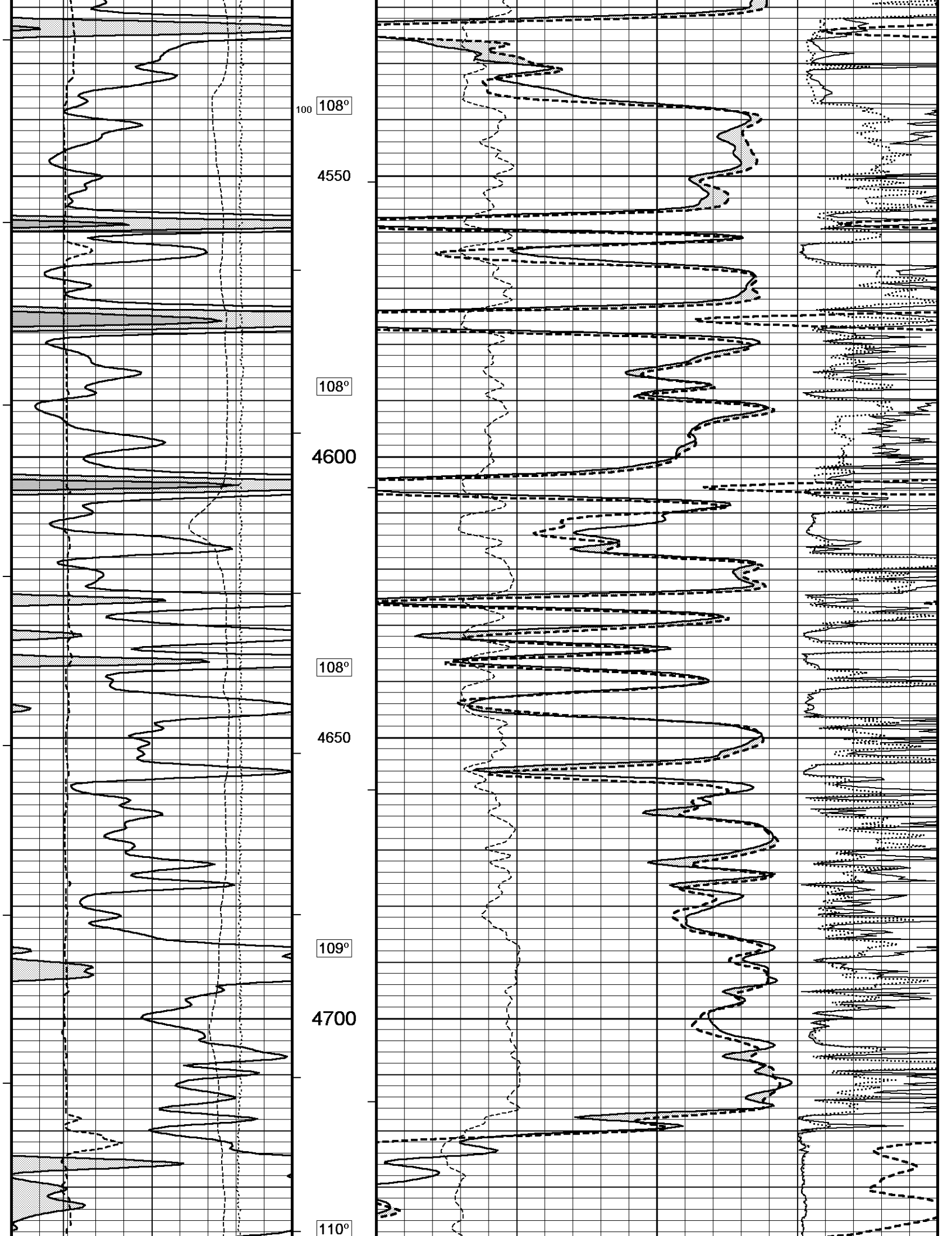
System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

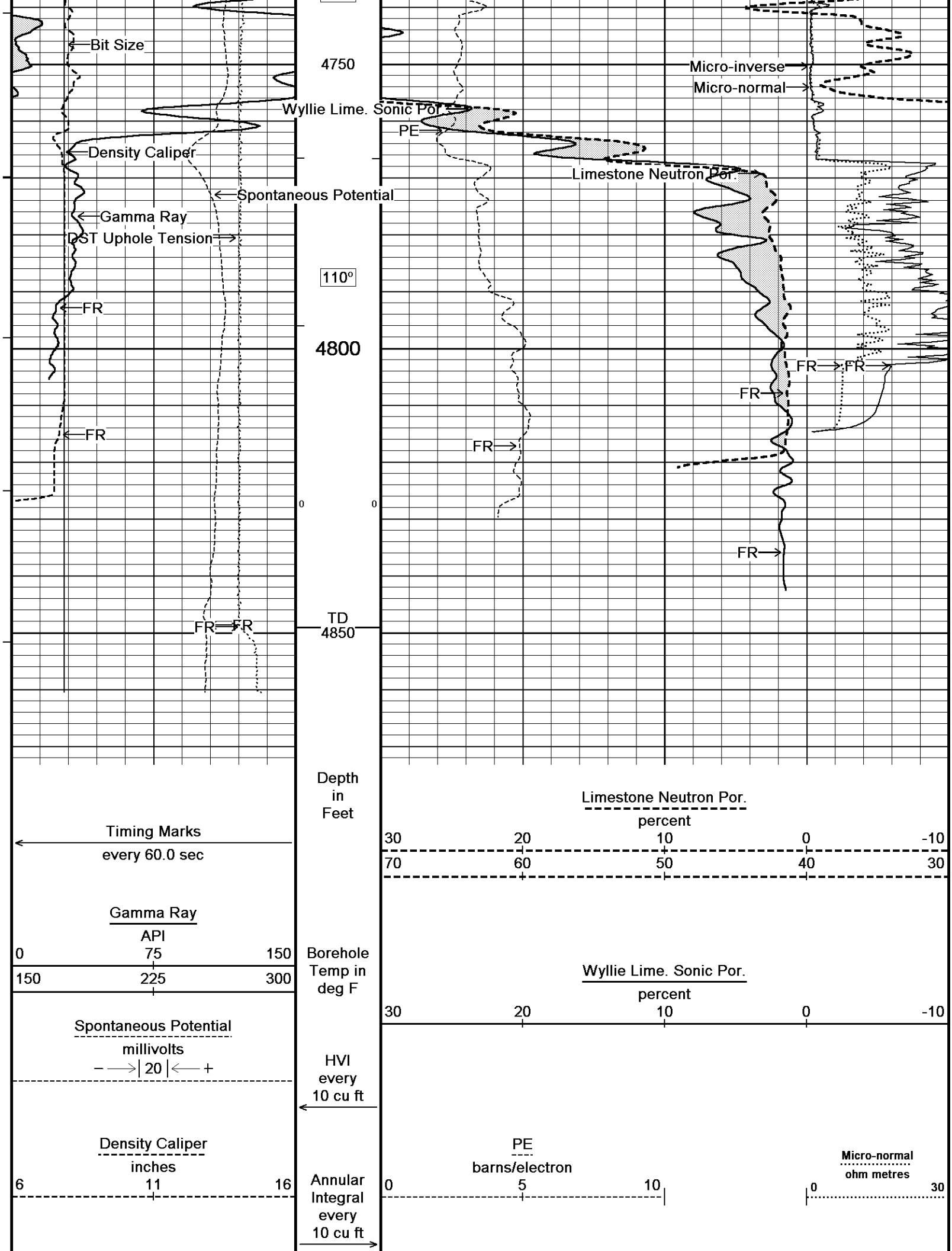


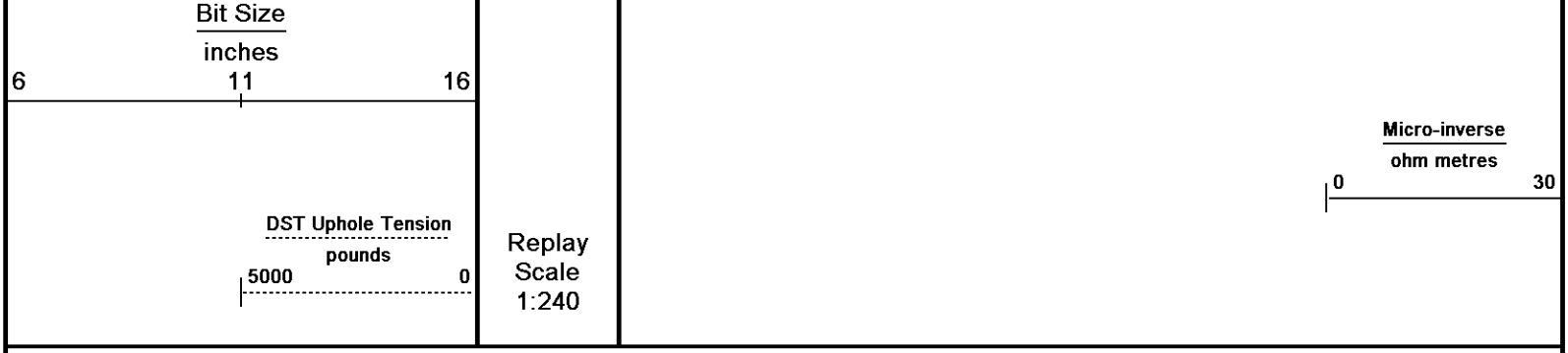

104°
3900
104°
3950
Bit Size
Micro-inverse
Micro-normal
Wyllie Lime. Sonic Por.
PE
300
Density Caliper
Limestone Neutron Por.
Spontaneous Potential
104°
Gamma Ray
DST Uphole Tension
4000
104°
4050


105°
4100
105°
4150
105°
4200
105°
4250
200
106°
100


4300
106°
4350
Bit Size
Micro-normal
Wyllie Lime. Sonic Por.
PE
Density Caliper
Limestone Neutron Por.
Spontaneous Potential
Gamma Ray
DST Uphole Tension
106°
4400
107°
4450
108°
4500


100
108°
4550
108°
4600
108°
4650
109°
4700
110°


Bit Size
4750
Micro-inverse
Micro-normal
Wyllie Lime. Sonic Por.
PE
Density Caliper
Limestone Neutron Por.
Spontaneous Potential
Gamma Ray
DST Uphole Tension
110°
FR
4800
FR
FR
FR
FR
FR
FR
FR
0
0
TD
4850
Depth
in
Feet
Timing Marks
every 60.0 sec
Limestone Neutron Por.
percent
30 20 10 0 -10
70 60 50 40 30
Gamma Ray
API
0 75 150
150 225 300
Borehole
Temp in
deg F
Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10
Spontaneous Potential
millivolts
– 20 +
HVI
every
10 cu ft
Density Caliper
inches
6 11 16
PE
barns/electron
0 5 10
Micro-normal
ohm metres
0 30
Annular
Integral
every
10 cu ft



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 09-APR-2014 02:40

Filename: C:\Minimus 13.08.2113\Logs\SHAKESPEARE ...\SHAKESPEARE JANZEN 6-36 DETAIL.dta

System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

5 INCH MAIN

BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Logs\SHAKESPEARE JANZEN 6-36\SHAKESPEARE JANZEN 6-36 REPEAT.dta

General Constants All 000

Last Edited on 09-APR-2014,00:05

General Parameters		
Mud Resistivity	0.400	ohm-metres
Mud Resistivity Temperature	86.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Water Level Switch	
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	MMR 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	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.K 443

Field Calibration on 05-APR-2014 15:02

	Measured	Calibrated (API)
Background	73	49
Calibrator (Gross)	1158	774
Calibrator (Net)	1085	725

Gamma Constants MCG-D.K 443

Last Edited on 09-APR-2014,00:06

Gamma Calibrator Number	GRC38	
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 443

Field Calibration on 05-MAR-2014,20:50

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-D.K 443

Last Edited on 05-MAR-2014,20:50

Pre-filter Length	11

Micro Normal and Micro Inverse Calibration MMR-B.A 98

Base Calibration on 24-MAR-2014 13:44

Field Check on 24-MAR-2014 13:47

Base Calibration

Channel	Measured Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Calibrated (ohm-m) Resistor 2
Micro Normal	11.7	59.5	5.0	25.0
Micro Inverse	15.5	77.1	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	76.2	76.2
Micro Inverse	59.1	59.1

Micro Normal and Micro Inverse Constants MMR-B.A 98

Last Edited on 24-MAR-2014,13:47

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	0.0000	inches

Neutron Calibration MDN-A.B 65

Base Calibration on 02-APR-2014 11:47
Field Check on 05-APR-2014 15:11

Base Calibration

	Measured Near	Measured Far	Calibrated (cps) Near	Calibrated (cps) Far
	2916	94	3714	110
Ratio	30.984		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1762	2457
Ratio	0.717	

Field Check

	Calibrated (cps)	
	1753	2453
Ratio	0.714	

Neutron Constants MDN-A.B 65

Last Edited on 05-APR-2014,15:02

Neutron Source Id	PN-521	
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	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	

Sonic Constants MSS-A.A 126

Last Edited on 19-MAR-2014,17:48

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 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

Photo Density Calibration MPD-B 31

Base Calibration on 02-APR-2014 10:28
Field Check on 05-APR-2014 14:34

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Background	661	814		
Reference 1	43693	22248	59556	30836
Reference 2	17883	1854	24941	2541
Field Check at Base	661.2	814.3		
Field Check	664.7	816.6		

PE Calibration

Base Calibration	WS	WH	Ratio	Calibrated Ratio
Background	122	585		
Reference 1	18087	43581	0.418	0.371
Reference 2	5283	17800	0.300	0.272
Field Check at Base	122.3	585.3		
Field Check	122.9	587.2		

Density Constants MPD-B 31

Last Edited on 09-APR-2014,00:06

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	1.11	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	

Caliper Calibration MPD-B 31

Base Calibration on 02-APR-2014 10:39
Field Calibration on 05-APR-2014 14:29

Base Calibration

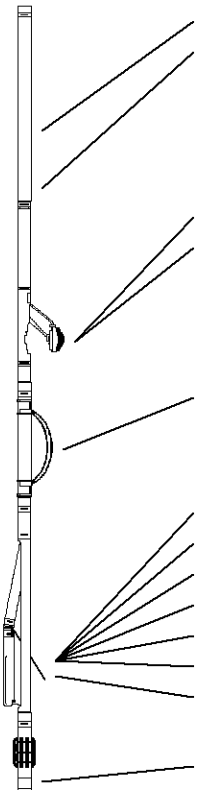
Reading No	Measured	Calibrator Size (in)
1	18192	3.99
2	27035	5.98
3	35696	7.97
4	44016	9.86
5	53216	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.94	7.97

DOWNHOLE EQUIPMENT

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Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

- 56.02 ft GRGC - Gamma Ray
- 53.11 ft CGXT - MCG External Temperature

Compact Micro-Resistivity
MMR-B.A 98 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

- 45.76 ft MINV - MMR MicroLog Inverse
- 45.76 ft MNRL - MMR MicroLog Normal

Compact Neutron
MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

- 40.97 ft NPRL - Limestone Neutron Por.

Compact Density/Caliper
MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

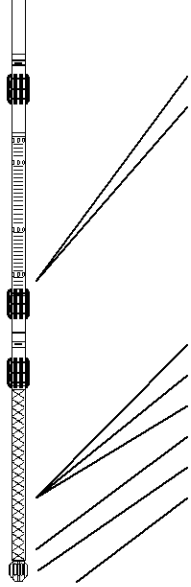
- 33.73 ft CLDC - Density Caliper
- 33.73 ft AVOL - Annular Volume
- 33.73 ft HVOL - Hole Volume
- 31.80 ft DPRL - Limestone Density Por.
- 31.80 ft DEN - Compensated Density
- 31.80 ft DCOR - Density Correction
- 31.74 ft PDPE - PE

Compact Focussed Electric

- 26.24 ft FEFE - Shallow FE

MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in



12.96 ft	SPRL - Wyllie Lime. Sonic Por.
12.96 ft	DT35 - 3-5' Compensated Sonic

Compact Induction
MAI-A.A 158 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	RTAO - Array Ind. One Res Rt
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.

Total Length: 61.30 ft Weight: 456.4 lb

COMPANY	SHAKESPEARE OIL CO., INC
WELL	JANZEN 6-36
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3116.00	feet	First Reading	4836.00	feet
Elevation Drill Floor	3114.00	feet	Depth Driller	4850.00	feet
Elevation Ground Level	3104.00	feet	Depth Logger	4849.00	feet

Weatherford®

COMPENSATED NEUTRON
SONIC POROSITY
OVERLAY