



Weatherford

**COMPENSATED NEUTRON
SONIC POROSITY
OVERLAY**

COMPANY										SHAKESPEARE OIL CO., INC.									
WELL										BAHM 2-21									
FIELD										WILDCAT									
PROVINCE/COUNTY										SCOTT									
COUNTRY/STATE										U.S.A. / KANSAS									
LOCATION										335' FNL & 2120' FEL									
PERMIT NUMBER										SE NW NW NE									
SEC 21		TWP 16S		RGE 34W		Other Services				MPD									
Latitude		38.655160581				MAI/MFE													
Longitude		-101.080919172																	
API Number		15-171-21101																	
Permanent Datum GL, Elevation 3135 feet																			
Log Measured From KB																			
Drilling Measured From KB @ 10 FEET																			
Date		02-NOV-2014																	
Run Number		ONE																	
Service Order		7036-102129390																	
Depth Driller		4890.00				feet													
Depth Logger		4890.00				feet													
First Reading		4877.04				feet													
Last Reading		3800.00				feet													
Casing Driller		267.00				feet													
Casing Logger		266.00				feet													
Bit Size		7.875				inches													
Hole Fluid Type		WBM																	
Density / Viscosity		9.20		lb/USg		53.00		CP											
PH / Fluid Loss		10.00				8.90		ml/30Min											
Sample Source		MUDPIT																	
Rm @ Measured Temp		0.425 @ 75.0				ohm-m													
Rmf @ Measured Temp		0.34 @ 75.0				ohm-m													
Rmc @ Measured Temp		0.51 @ 75.0				ohm-m													
Source Rmf / Rmc		CALC				CALC													
Rm @ BHT		0.297 @110.0				ohm-m													
Time Since Circulation		4 HOURS																	
Max Recorded Temp		111.00				deg F													
Equipment / Base		13096		LIB															
Recorded By		DEREK CARTER																	
Witnessed By		TIM PRIEST																	
IOB #		LB14-343																	

BOREHOLE RECORD					Last Edited: 02-NOV-2014 12:41
Bit Size inches		Depth From feet		Depth To feet	
7.875		267.00		4890.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	267.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 14.03.4558
- TOOL STRING: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION
- HARDWARE: MDN: DUAL BOWSPRING ECCENTRALIZER MFE: 1 X 0.5 INCH STANDOFF MSS: 2 X 0.5 INCH STANDOFF MAI: 2 X 0.5 INCH STANDOFF
- 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 3800 FT.: 360 CU. FT.

- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO 380 FT.: 280 CU. FT.

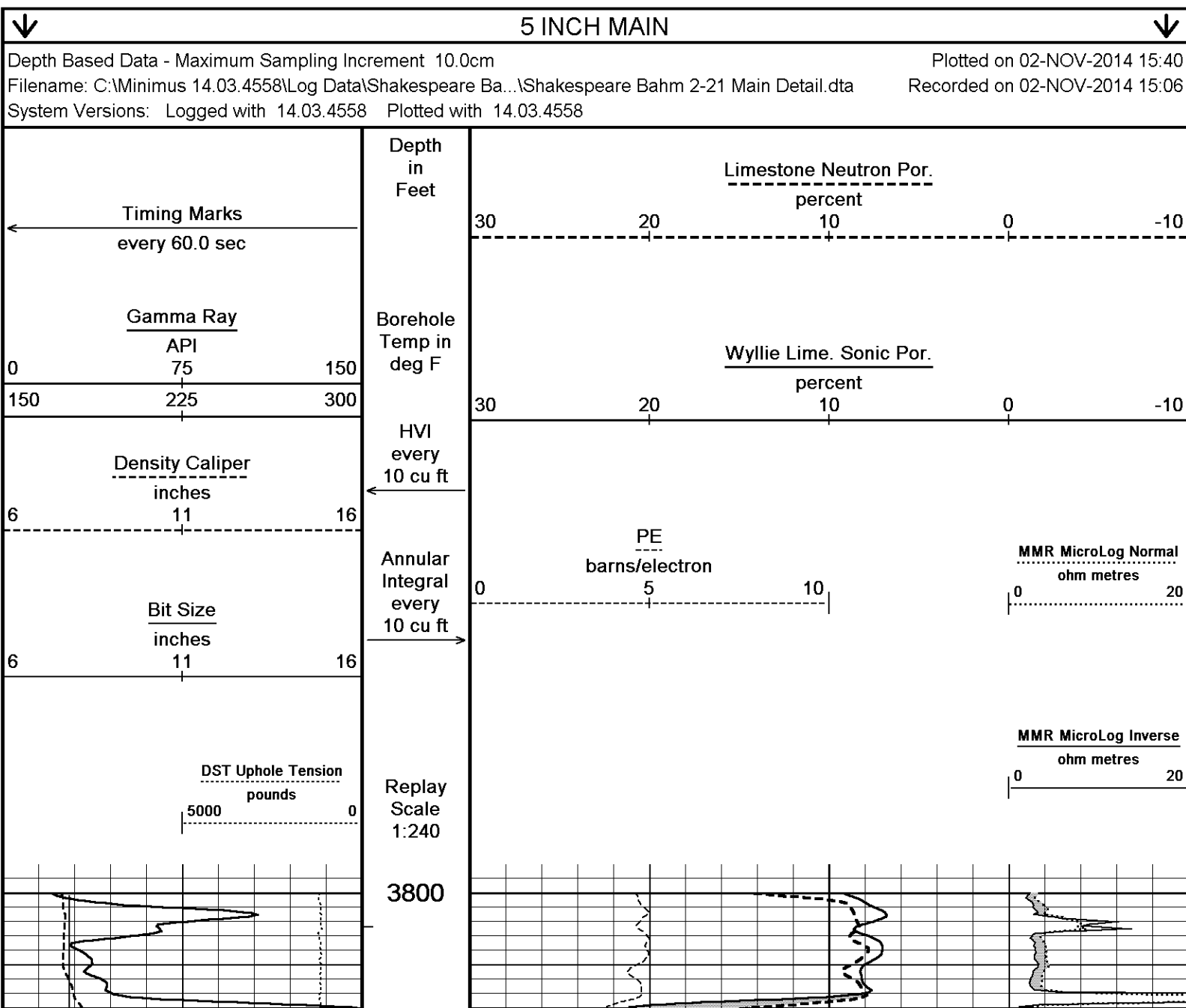
- SERVICE ORDER # 7036-102129390

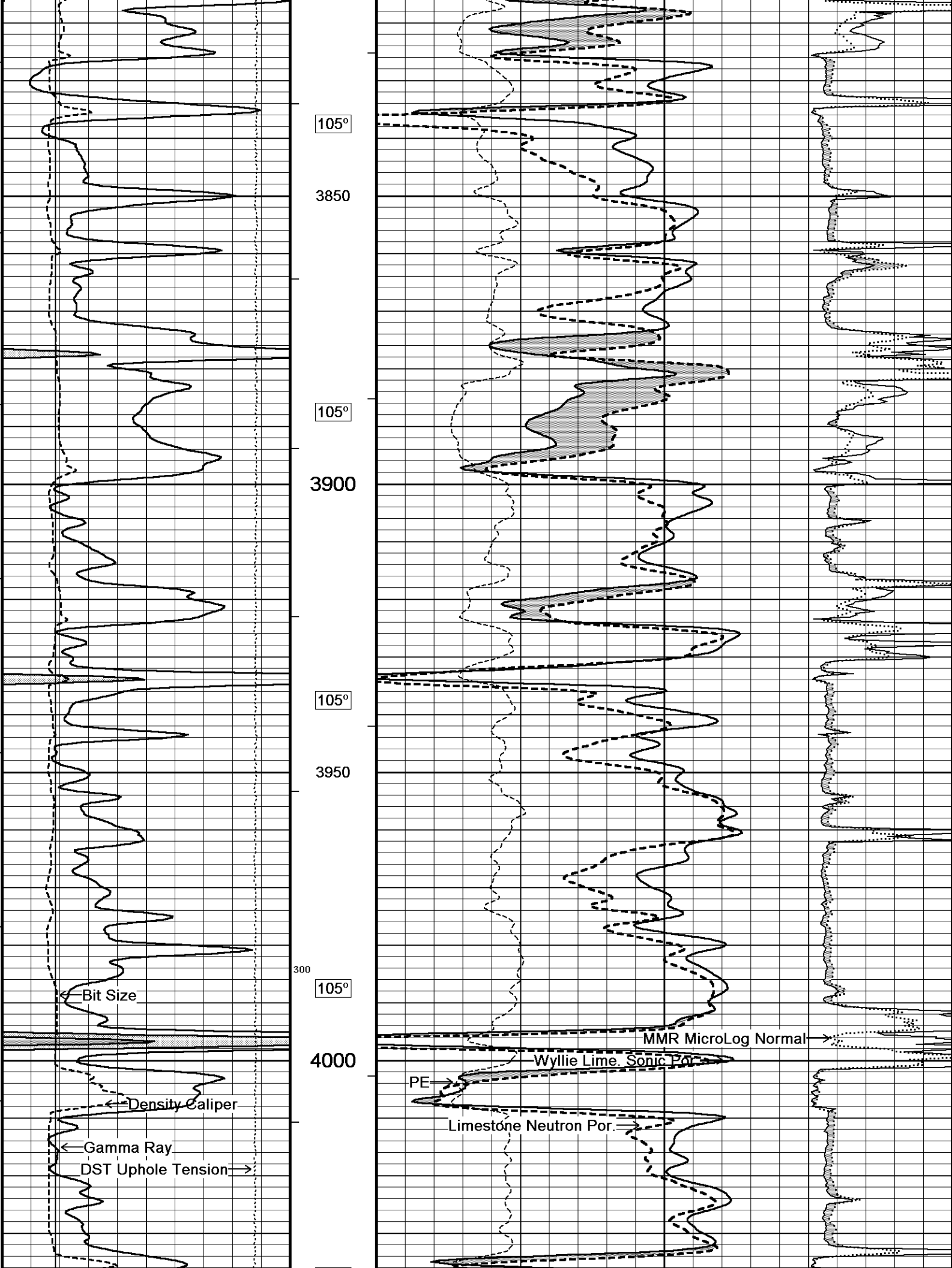
- RIG: H.D. DRILLING #2

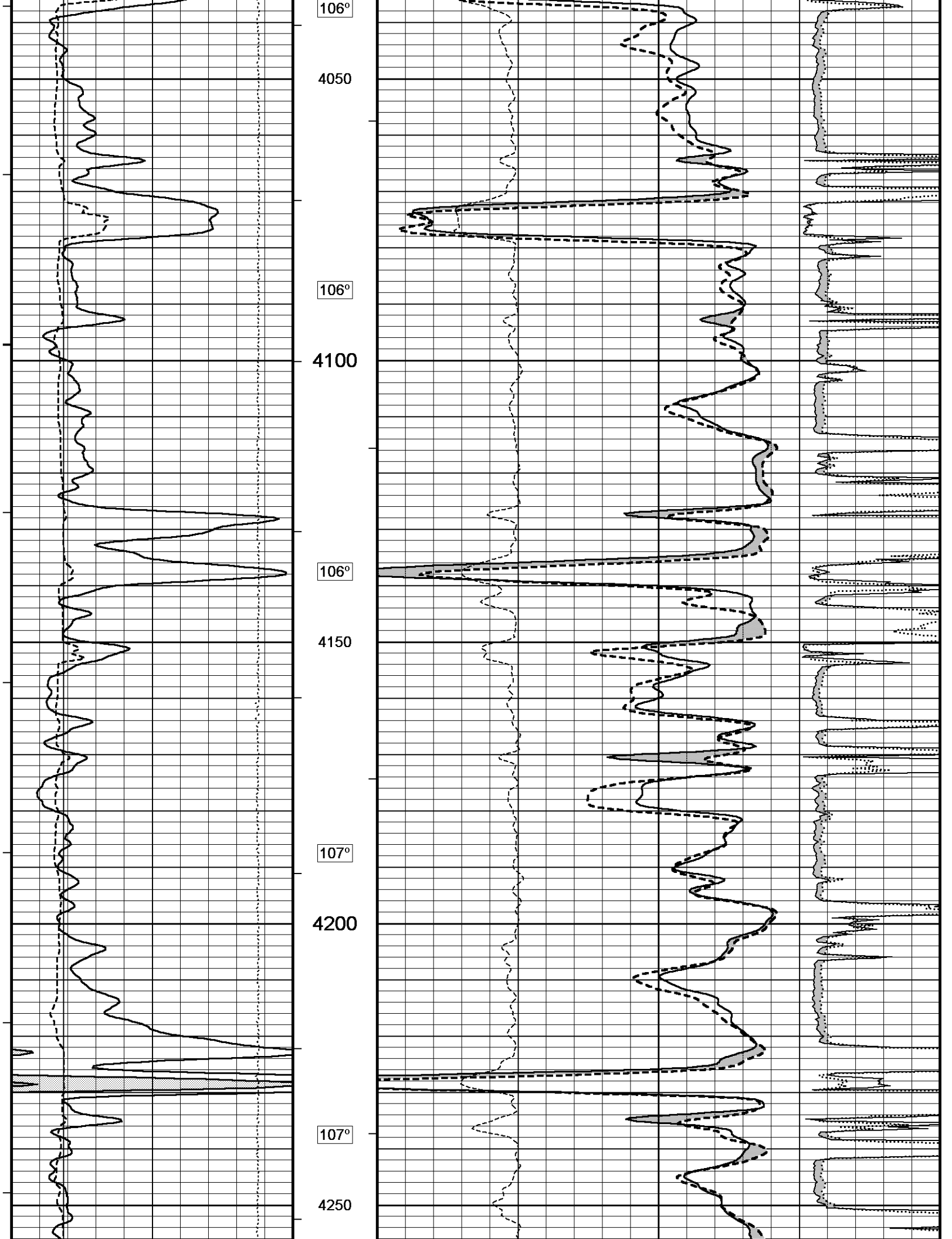
- ENGINEER: DEREK CARTER

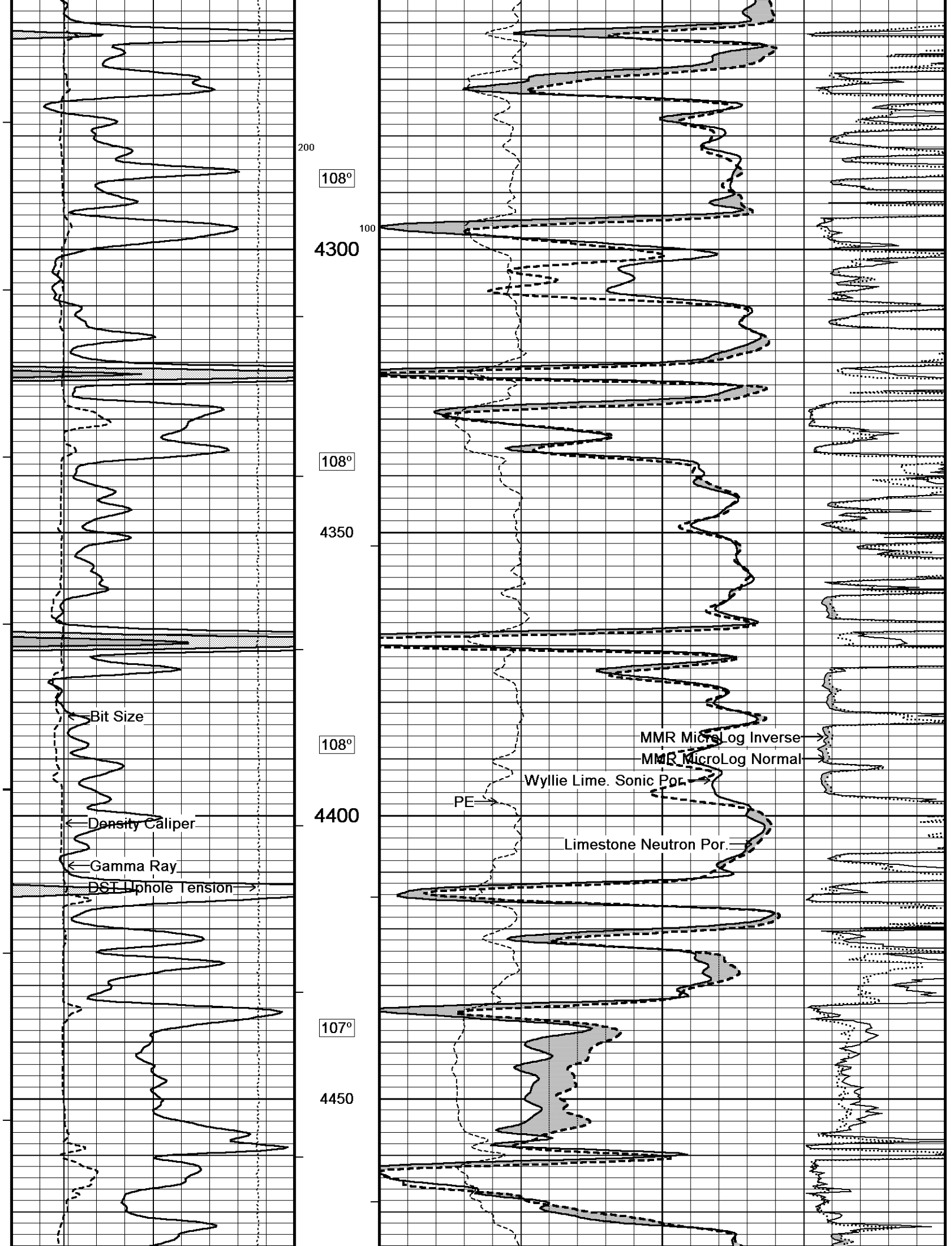
- OPERATORS: CARLOS RAMIREZ

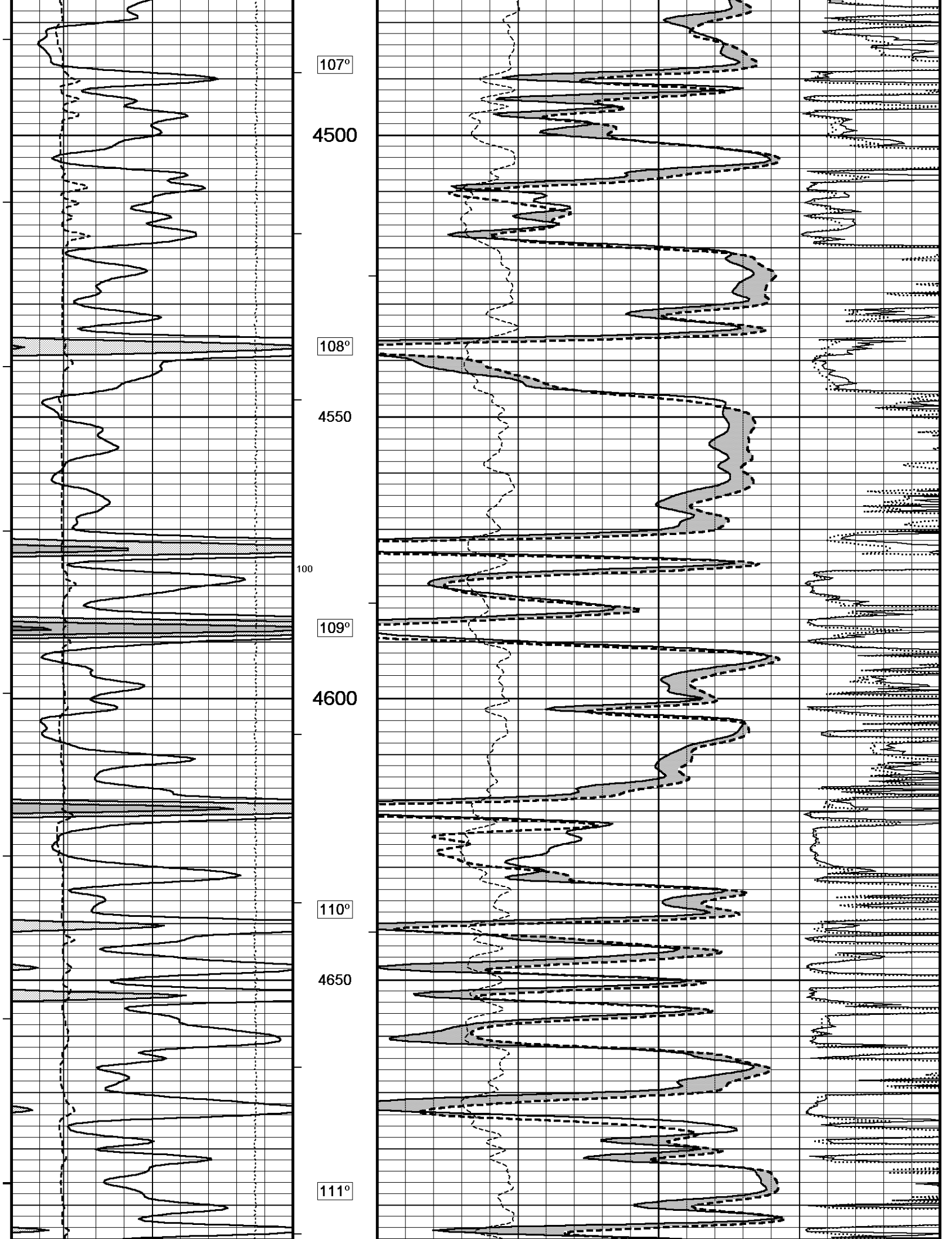
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will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

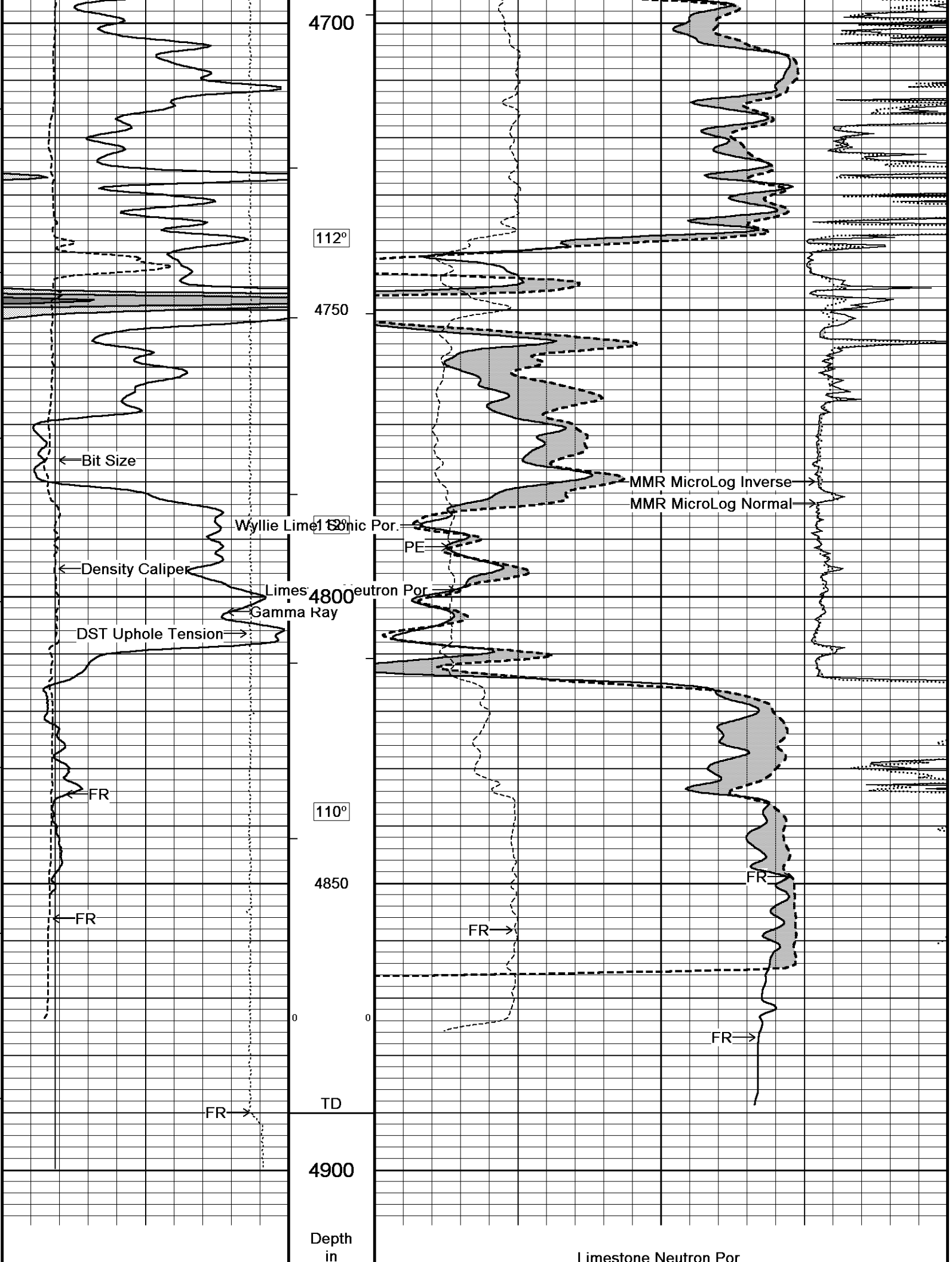


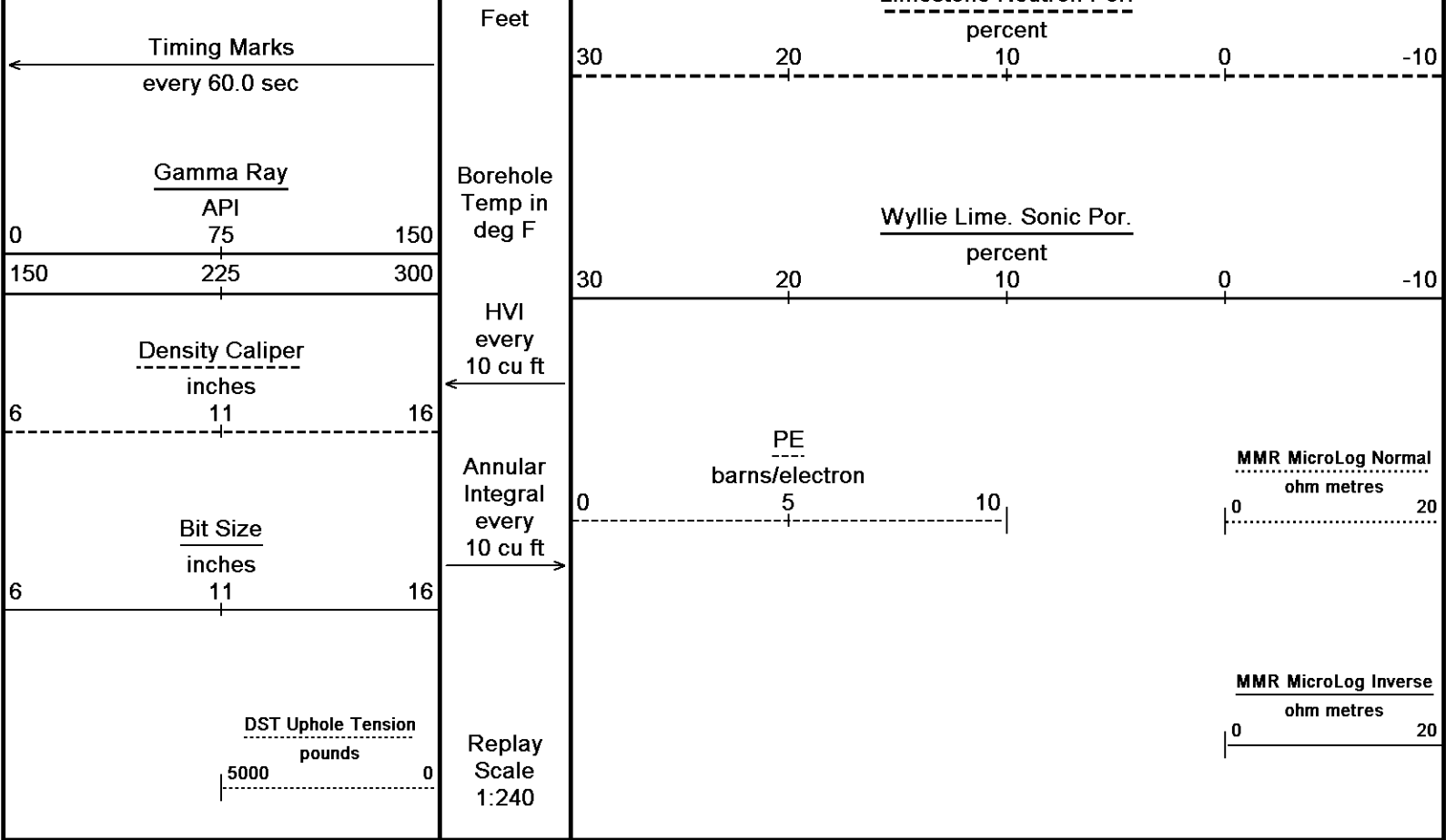












Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 02-NOV-2014 15:40
 Filename: C:\Minimus 14.03.4558\Log Data\Shakespeare Bahm 2-21\Shakespeare Bahm 2-21 Main Detail.dta Recorded on 02-NOV-2014 15:06
 System Versions: Logged with 14.03.4558 Plotted with 14.03.4558

↑ 5 INCH MAIN ↑

BEFORE SURVEY CALIBRATION			
C:\Minimus 14.03.4558\Log Data\Shakespeare Bahm 2-21\Shakespeare Bahm 2-21 Main.dta			
General Constants All 000		Last Edited on 02-NOV-2014,13:30	
General Parameters			
Mud Resistivity	0.425	ohm-metres	
Mud Resistivity Temperature	75.000	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	None		
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		
Gamma Calibration MCG-D.K 469		Field Calibration on 28-OCT-2014 13:39	
	Measured	Calibrated (API)	
Background	68	45	
Calibrator (Gross)	1149	770	
Calibrator (Net)	1082	725	

Ratio 1.492  Counts/API

Gamma Constants MCG-D.K 469

Last Edited on 02-NOV-2014,12:42

Gamma Calibrator Number GRC038
 GRC-M Calibrator Jig in Use? NO
 Inactive Background Jig in Use? NO
 Mud Density 1.10 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 469

Field Calibration on 12-MAY-2014,02:16

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-D.K 469

Last Edited on 13-JUL-2014,14:53

Pre-filter Length 11

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 24-OCT-2014 15:09

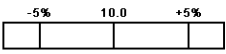
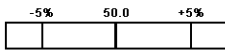
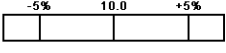
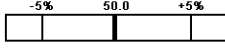
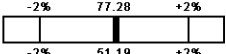
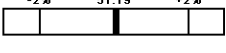
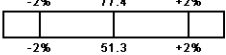
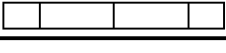
Field Check on 02-NOV-2014 09:45

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.0	49.9	5.1	25.6
Micro Inverse	10.0	49.9	3.4	16.9

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	77.4	77.4
Micro Inverse	51.3	51.3

Micro Normal & Micro Inverse Calibration Tolerance MML-A 3

Micro Normal Res. 1	10.0		ohm	Micro Normal Res. 2	49.9		ohm
Micro Inverse Res. 1	10.0		ohm	Micro Inverse Res. 2	49.9		ohm
Micro Normal Base Check	77.4		ohm-m				
Micro Inverse Base Check	51.3		ohm-m				
Micro Normal Field Check	77.4		ohm-m				
Micro Inverse Field Check	51.3		ohm-m				

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 02-NOV-2014,09:43

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 152

Base Calibration on 24-OCT-2014 12:40

Field Check on 02-NOV-2014 10:04

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	2866	87	3714	110
	33.093		33.764	

Field Calibrator at Base

	Calibrated (cps)
Ratio	1779 2659
	0.669

Field Check

	Calibrated (cps)
Ratio	1774 2651
	0.669

Neutron Calibration Tolerances MDN-A.B 152

Near Reading	2866	-25%3500+25%	cps
Ratio	33.093	-5%33+5%	
Base Check	0.669	0.650.70.75	
Field Check	0.669	0.6490.6690.689	

Far Reading	87	-50%106+50%	cps
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Neutron Constants MDN-A.B 152

Last Edited on 02-NOV-2014,09:59

Neutron Source Id	P0204NN	
Neutron Jig Number	5824NE	
Air Hole Processing	Legacy	
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	

Sonic Constants MSS-A.A 126

Last Edited on 02-NOV-2014,09:34

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

Caliper Calibration MPD-C.A 216

Base Calibration on 24-OCT-2014 11:23
Field Calibration on 02-NOV-2014 09:42

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	18960	3.99
2	28807	5.98
3	38852	7.97
4	48518	9.86
5	59792	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.95	7.97

Caliper Calibration Tolerances MPD-C.A 216

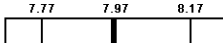
Short Arm Field Cal. 7.95  in

Photo Density Calibration MPD-C.A 216

Base Calibration on 24-OCT-2014 11:46
Field Check on 02-NOV-2014 09:40

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1094	1297		
Reference 1	59838	31173	59556	30836
Reference 2	24858	2730	24941	2541

Field Check at Base

1094.4 1296.6

Field Check

1094.8 1289.1

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	201	974		
Reference 1	25019	59646	0.423	0.371
Reference 2	7097	24723	0.290	0.272

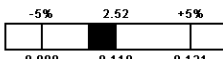
Field Check at Base

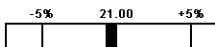
201.2 973.6

Field Check

198.8 975.3

Photo Density Calibration Tolerances MPD-C.A 216

Near Density Ratio 2.47 

Far Density Ratio 20.84 

PE Calibration 0.124

Near Den. Field Check 1094.8

PE WS Field Check 198.8

Far Den. Field Check 1289.1

PE WH Field Check 975.3

Density Constants MPD-C.A 216

Last Edited on 02-NOV-2014,12:41

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	1.10	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	
0.00	0.00	

DOWNHOLE EQUIPMENT

C:\Minimus 14.03.4558\Log Data\Shakespeare Bahm 2-21\Shakespeare Bahm 2-21 Main.dta

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 234 LG: 1.58 ft WT: 15.4 lb OD: 2.240 in

Compact Comms Gamma
MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

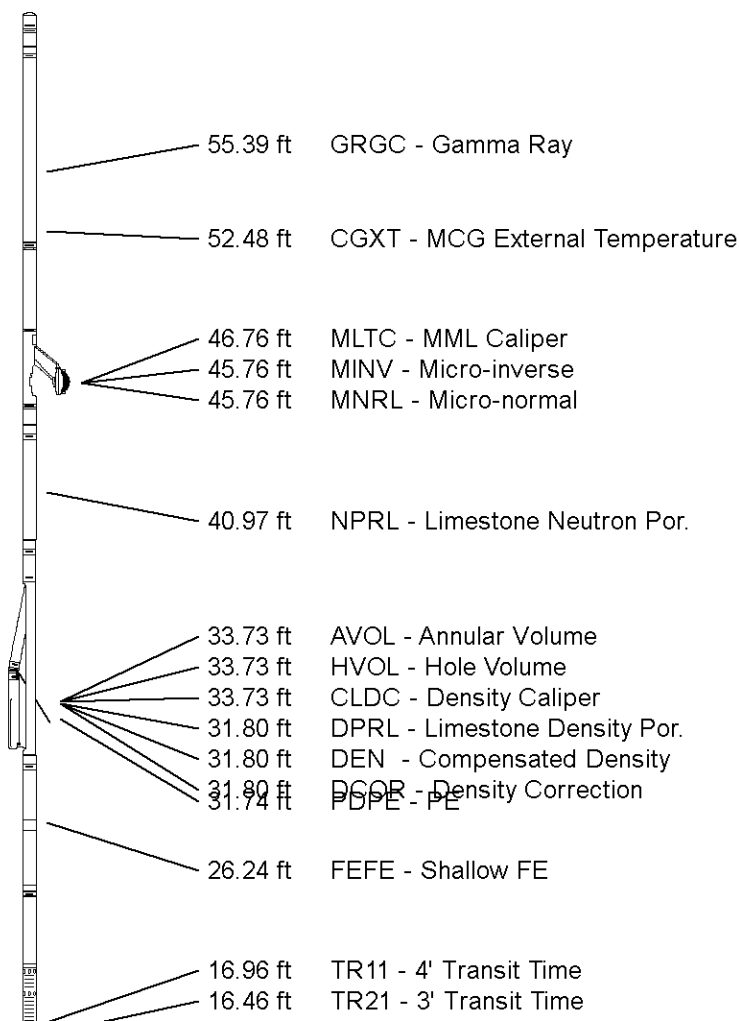
Compact Micro-log
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.240 in

Compact Neutron
MDN-A.B 152 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

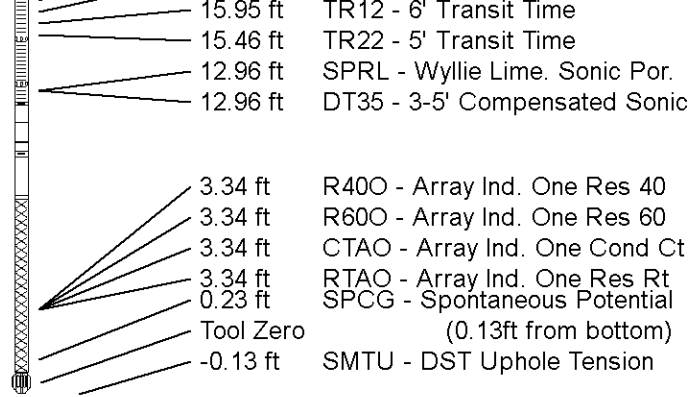
Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in



Compact Induction

MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 62.25 ft Weight: 471.8 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	BAHM 2-21
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3145.00	feet	First Reading	4877.04	feet
Elevation Drill Floor	3143.00	feet	Depth Driller	4890.00	feet
Elevation Ground Level	3135.00	feet	Depth Logger	4890.00	feet



Weatherford®

COMPENSATED NEUTRON
SONIC POROSITY
OVERLAY