



Weatherford

**COMPACT TRIPLE COMBO
QUICKLOOK
LOGS**

COMPANY				EAST CHEYENNE GAS STORAGE LLC			
WELL				ECGS NO 6-16 WPD009-2			
FIELD				PEETZ WEST			
PROVINCE/COUNTY				LOGAN			
COUNTRY/STATE				USA/COLORADO			
LOCATION				SHL: 1646' FNL & 2199' FWL			
SEC	TWP	RGE	Other Services				
6	11N	52W					
API Number		WPD009-2					
Permit Number		05-075-09402					
Permanent Datum G.L., Elevation 4555 feet							
Log Measured From KB							
Drilling Measured From KB@ 12							
Date	23-SEP-2012						
Run Number	1						
Depth Driller	5260.00			feet			
Depth Logger	5260.00			feet			
First Reading	5257.00			feet			
Last Reading	1223.00			feet			
Casing Driller	1234.00			feet			
Casing Logger	1223.00			feet			
Bit Size	8.750			inches			
Hole Fluid Type	WBM						
Density / Viscosity	9.70 g/c3		51.00 CP				
PH / Fluid Loss	9.00		17.00 ml/10min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	3.46 @ 87.3			ohm-m			
Rmf @ Measured Temp	2.77 @ 87.3			ohm-m			
Rmc @ Measured Temp	4.15 @ 87.3			ohm-m			
Source Rmf / Rmc	CALC	CALC					
Rm @ BHT	2.12 @144.0		ohm-m				
Time Since Circulation	4 HOURS						
Max Recorded Temp	144.00		deg F				
Equipment Name	COMPACT						
Equipment / Base	13144	RK SPR					
Recorded By	J.LIU			T.BENICH			
Witnessed By	J.ASHBY						

BOREHOLE RECORD

Last Edited: 23-SEP-2012 09:50

Bit Size inches	Depth From feet	Depth To feet
8.750	1234.00	5260.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1234.00	36.00

REMARKS

SOFTWARE VERSION 13.03.7779

TOOLS RUN: SHA, MCG, MDN, MPD, MIS-D, SKJ, MIS-E, SKJ, MIM, MIE, SKJ, MFE, MAI RUN IN COMBINATION.

HARDWARE: MPD: 8" PROFILE PLATE USED.
MAI: TWO 1 INCH STANDOFFS USED.
MFE: ONE 1 INCH STANDOFF USED.
MDN: DUAL BOWSPRING USED.
MIM: ONE NONMETALIC CENTRALIZING BASKET USED.
MIE: ONE 1 INCH STANDOFF USED

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

DENSITY CALIPER UNDERGAUGED. REPROCESSED WITH BIT SIZE

TIGHT PULL AT 3995 FT. CLOSED CALIPERS TO PULL THROUGH. MAX TENSION AT 2000 LBS

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING =1700 CUBIC FEET

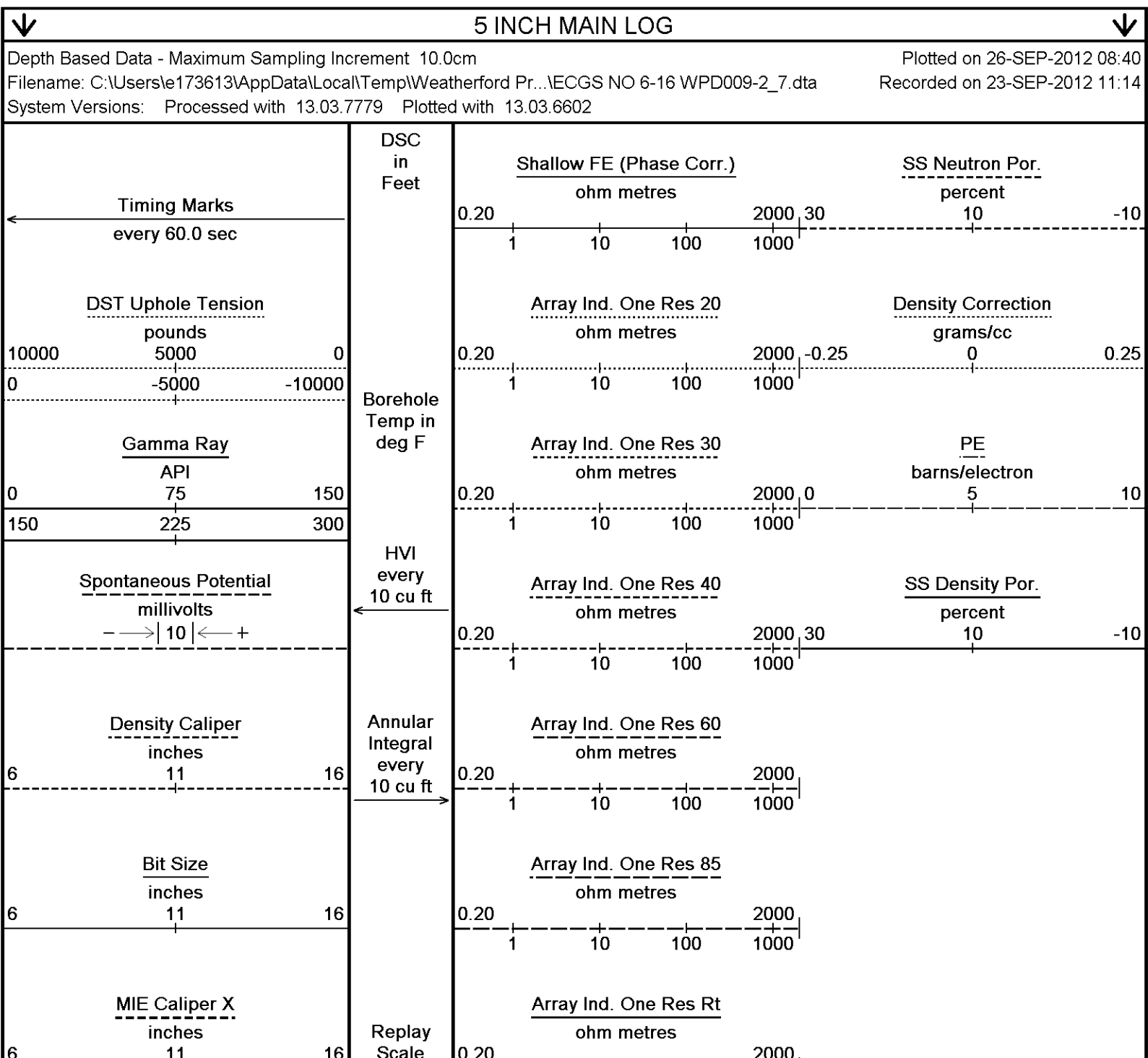
ANNULAR VOLUME WITH 7 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 620 CUBIC FEET

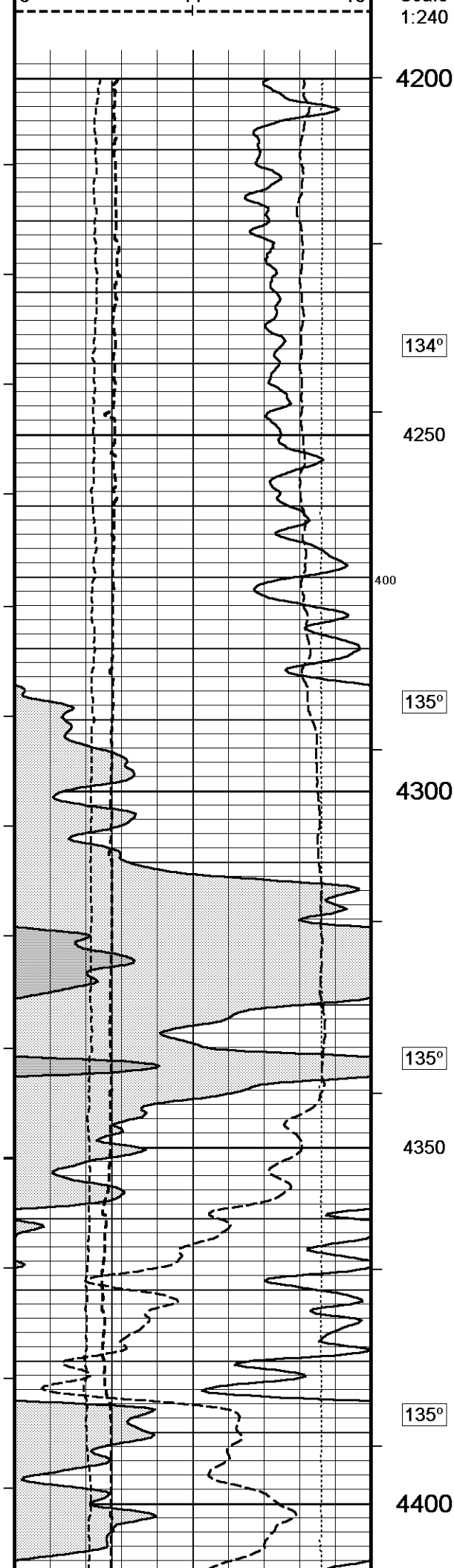
SERVICE ORDER: #3535291

OPERATOR: B.PECK
S.ELMORE
J.BARTZ

RIG: CADE 22

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.





1:240

4200

134°

4250

400

135°

4300

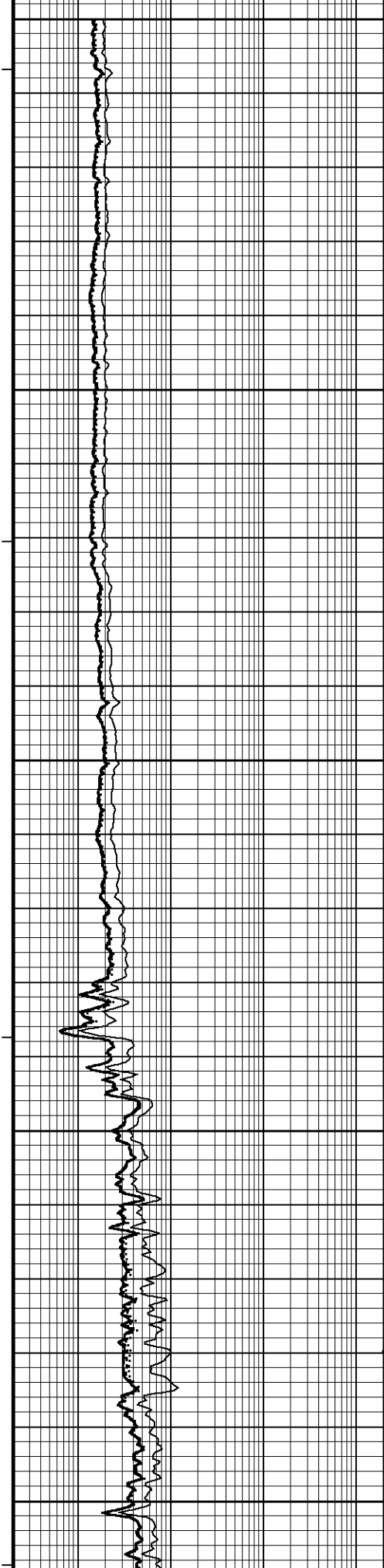
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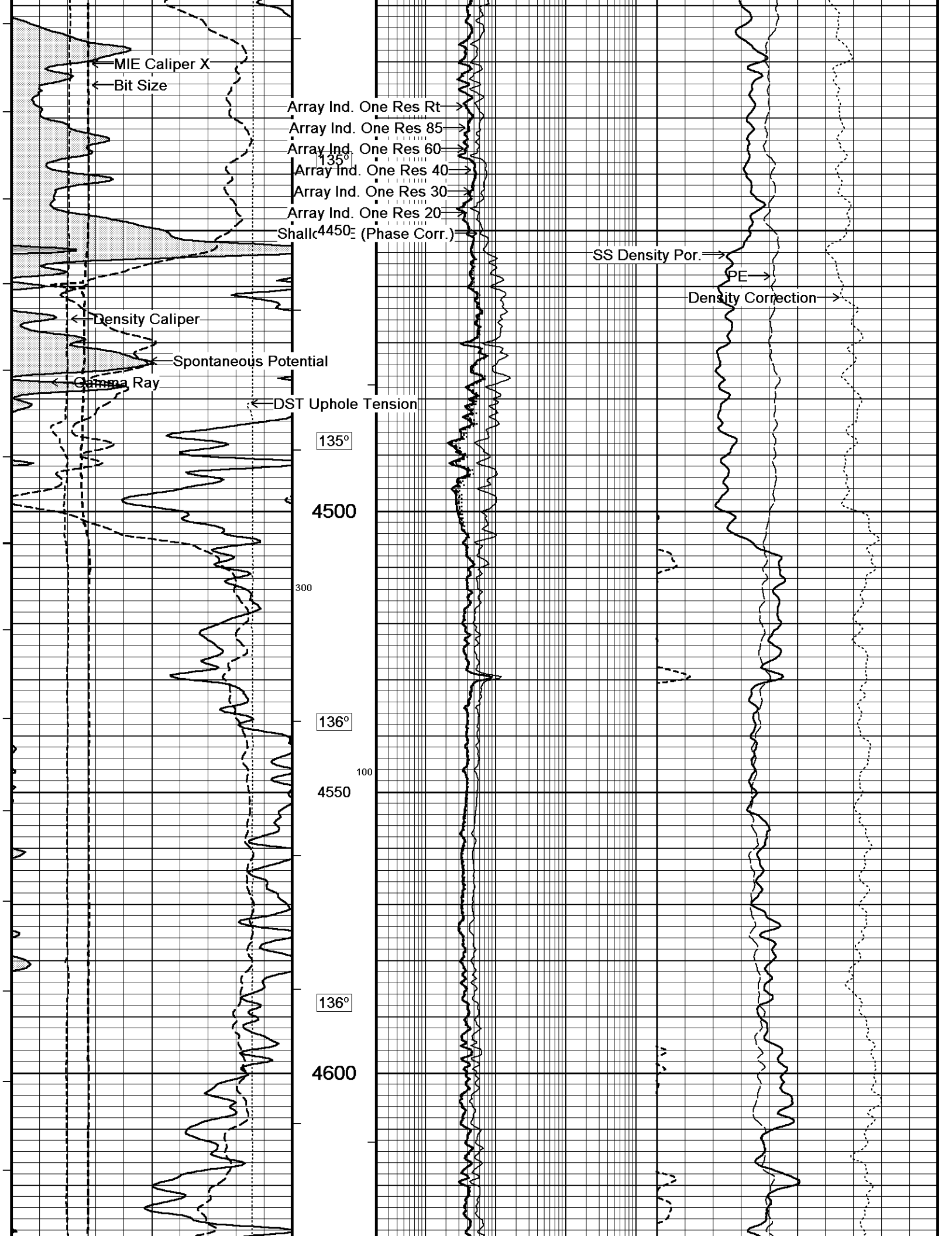
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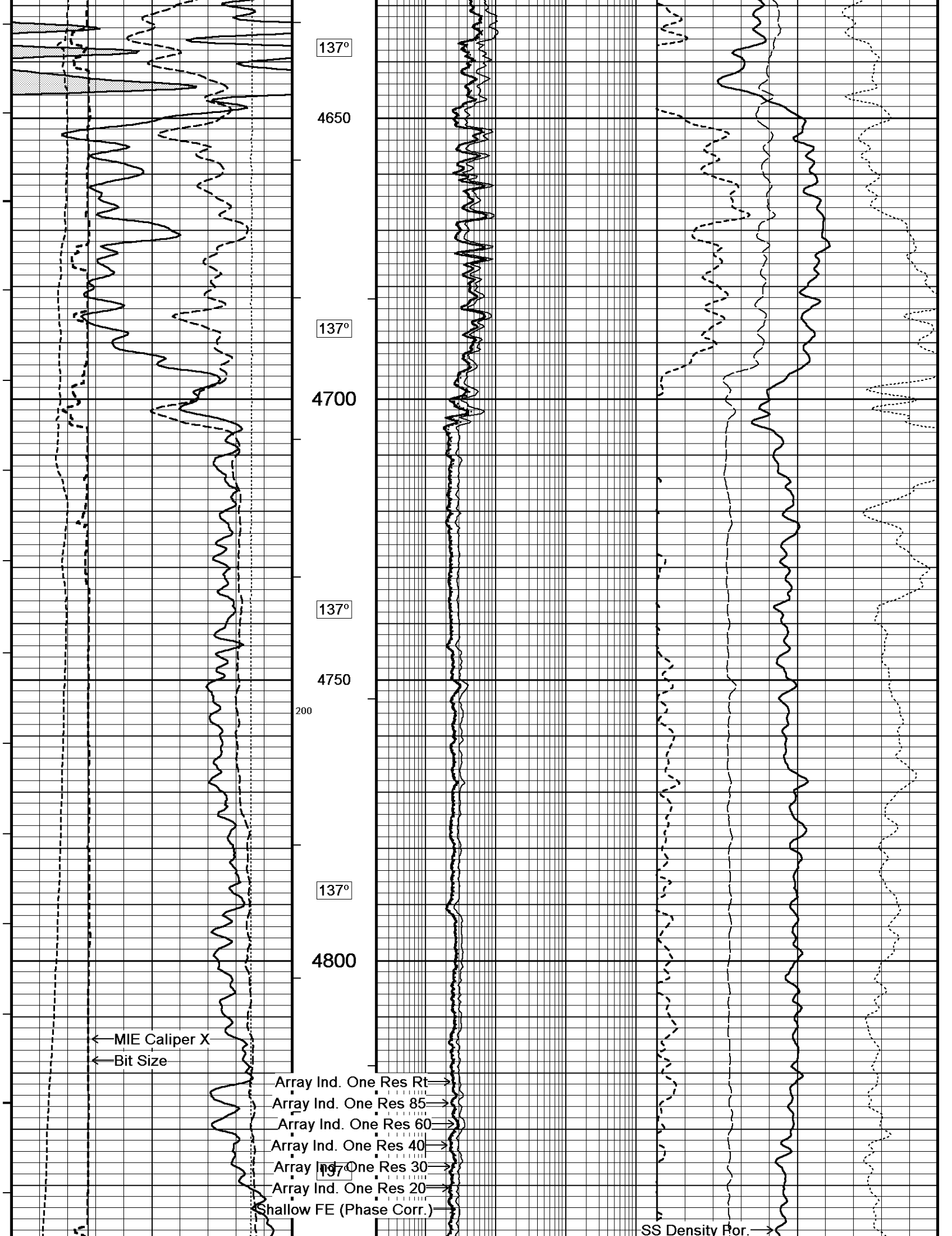
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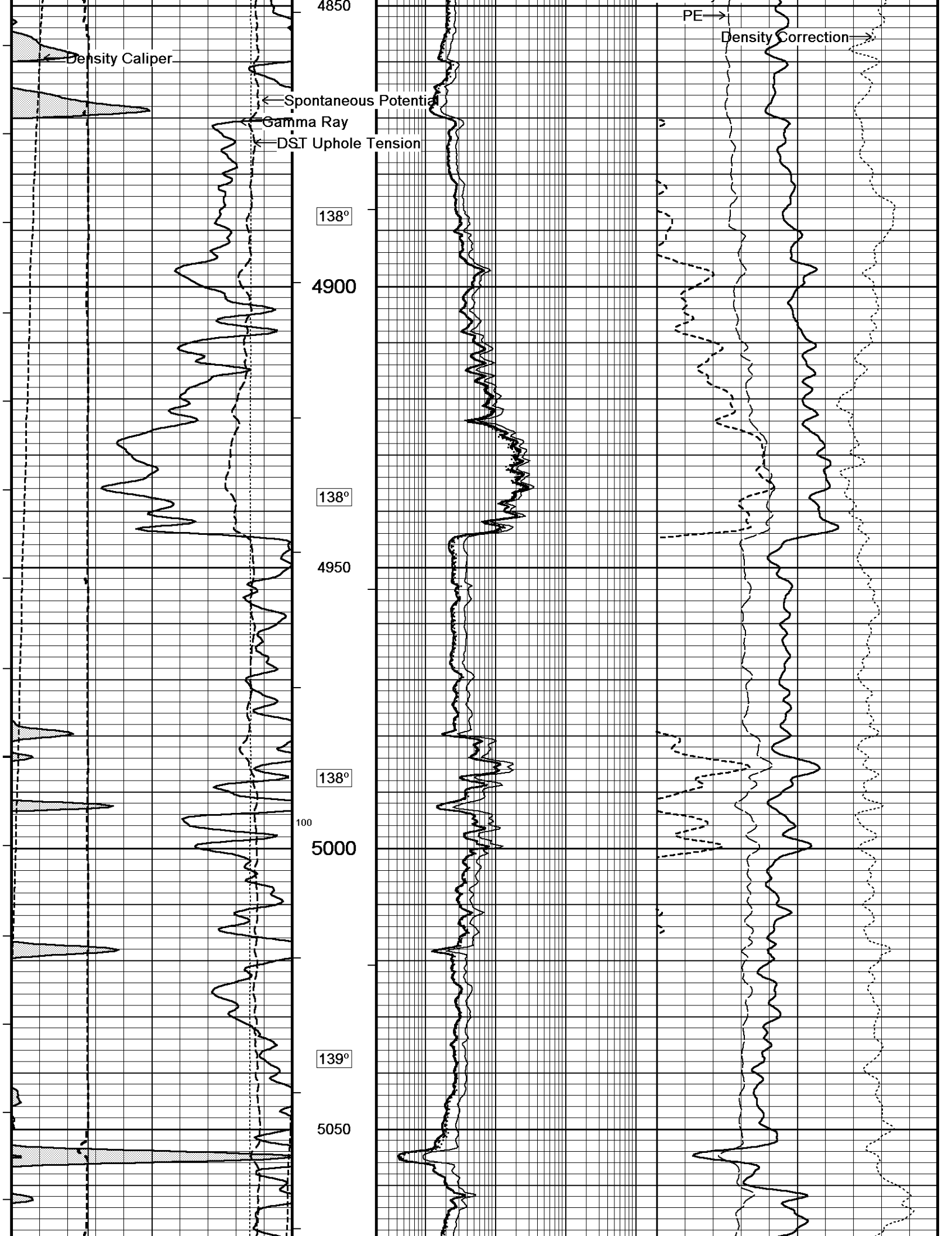
4400

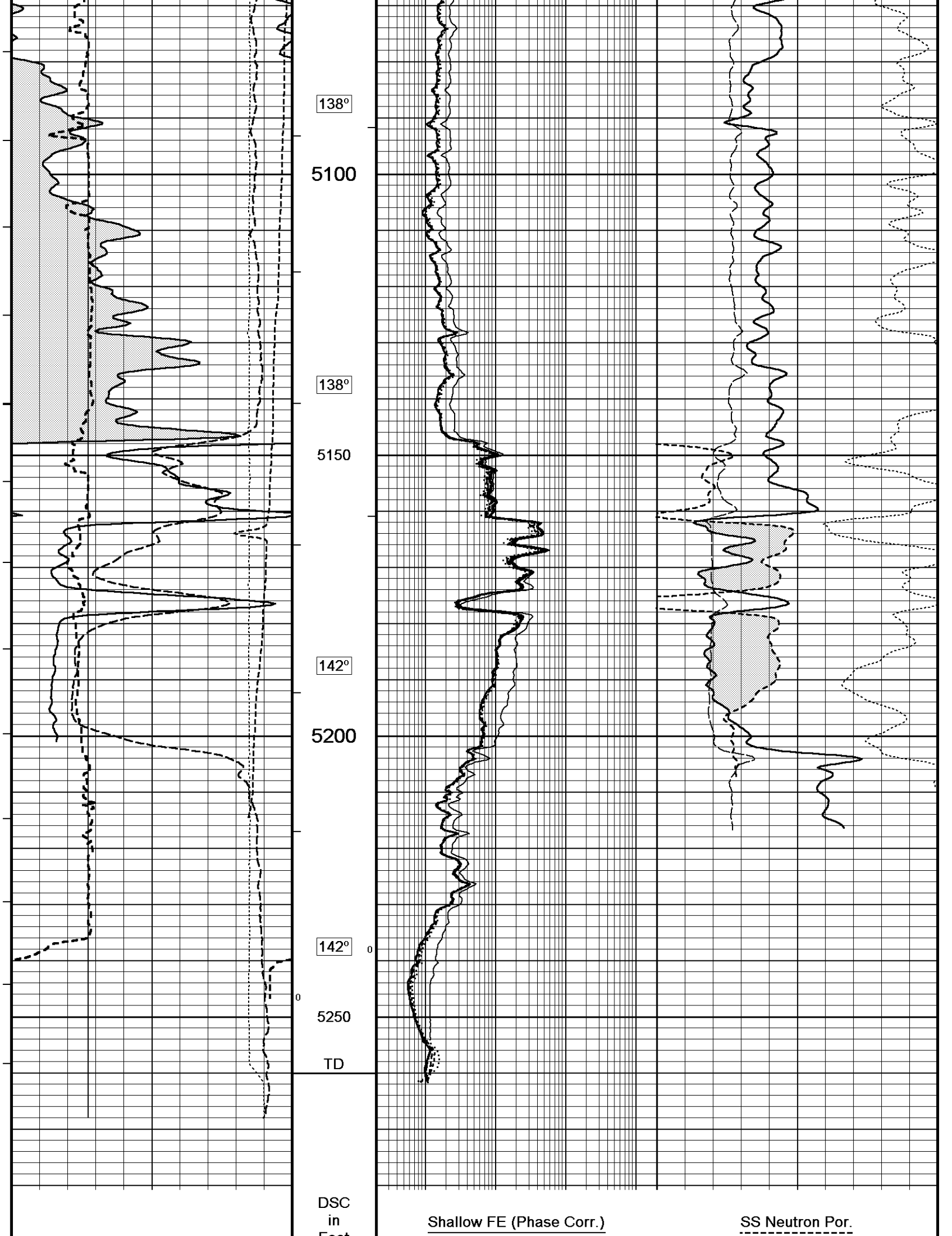
1 10 100 1000

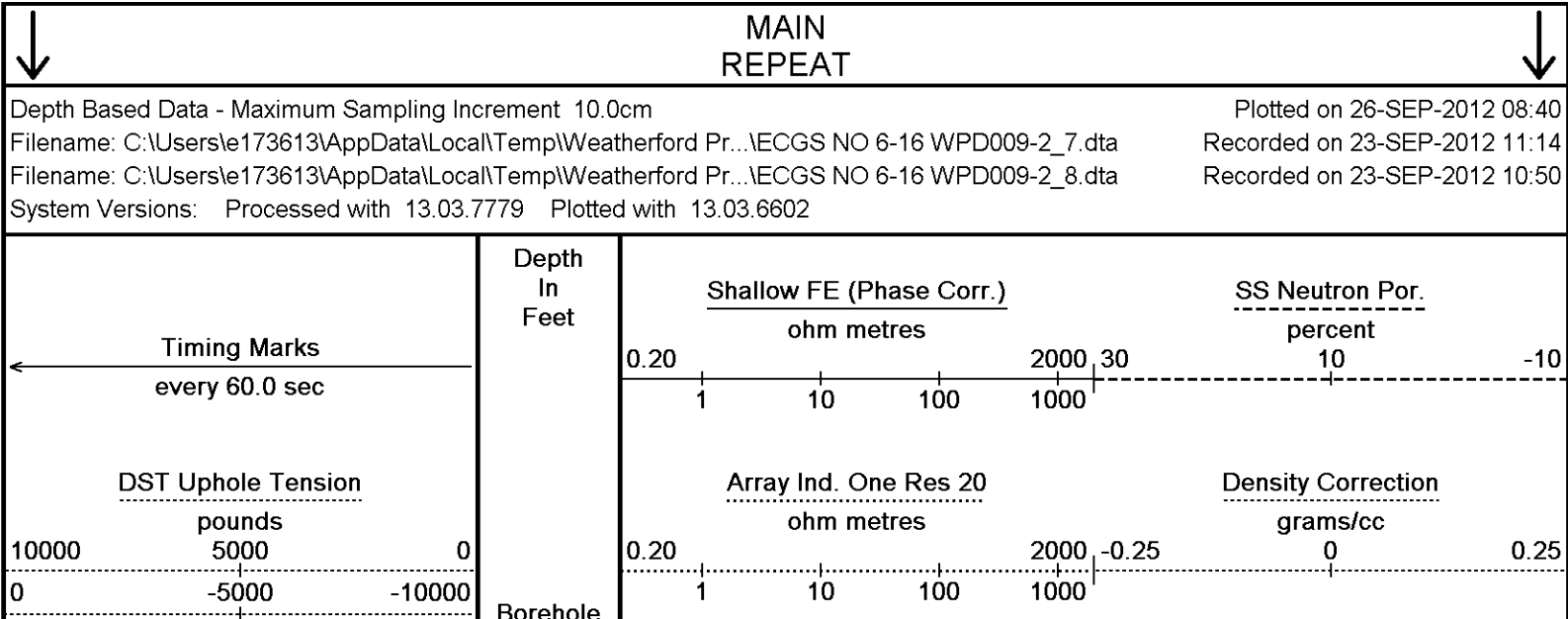
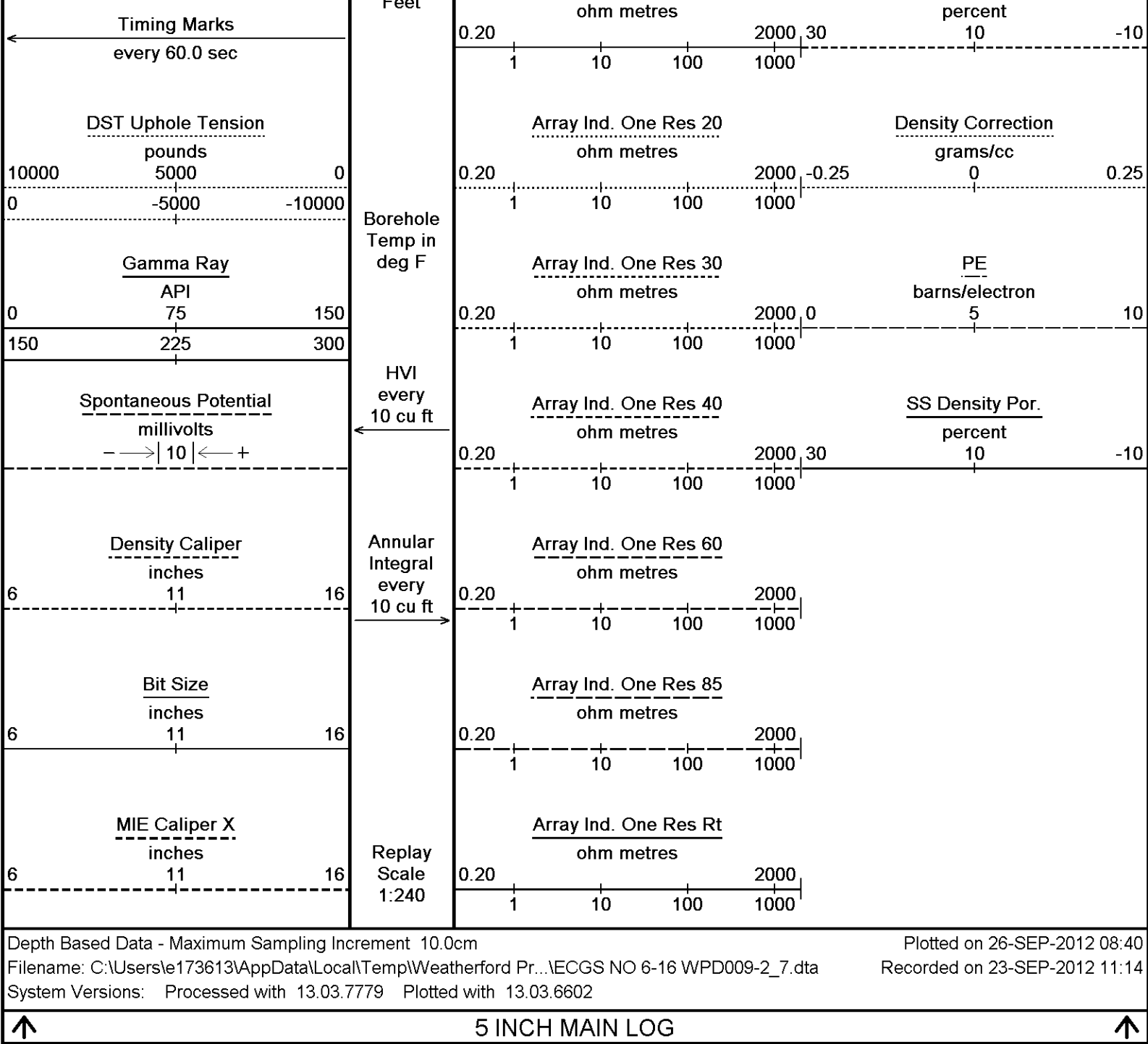


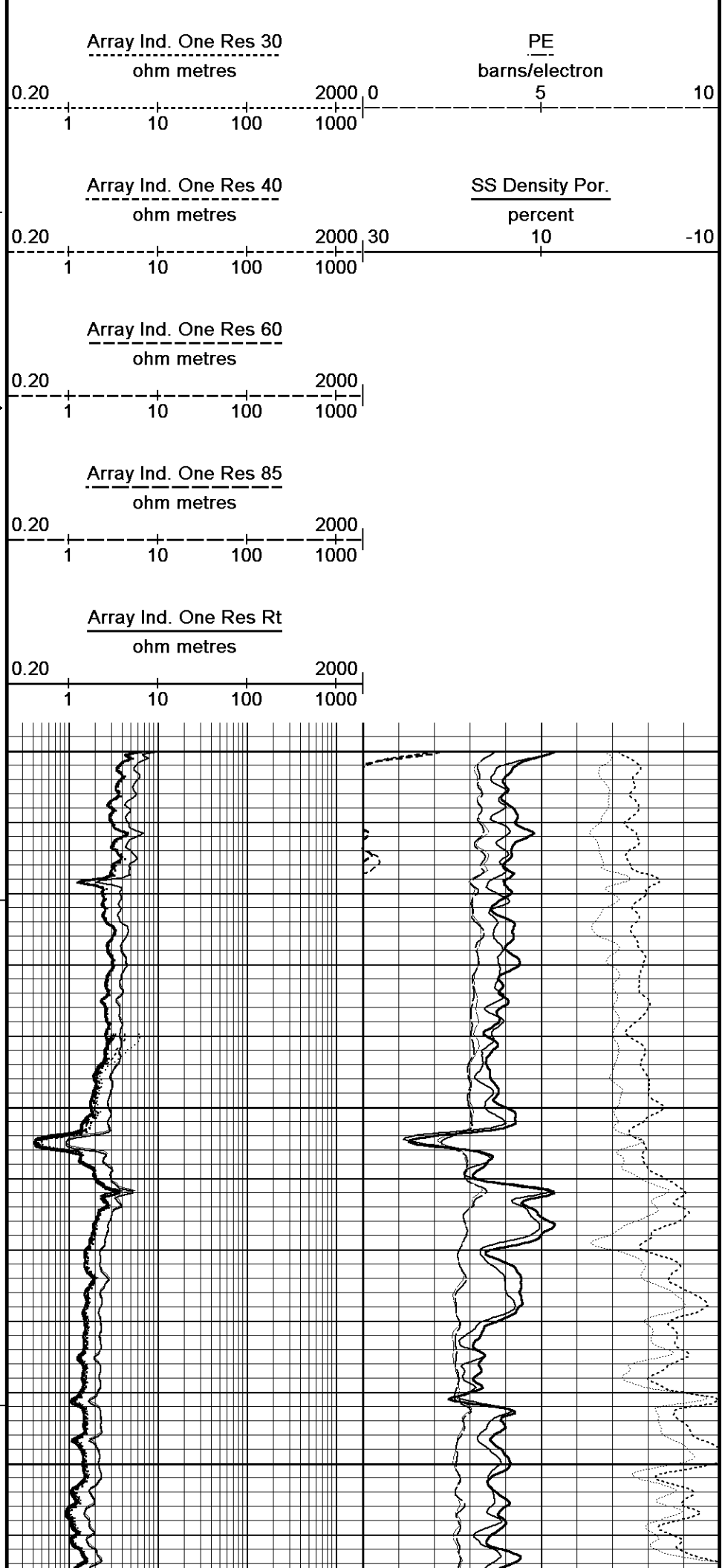
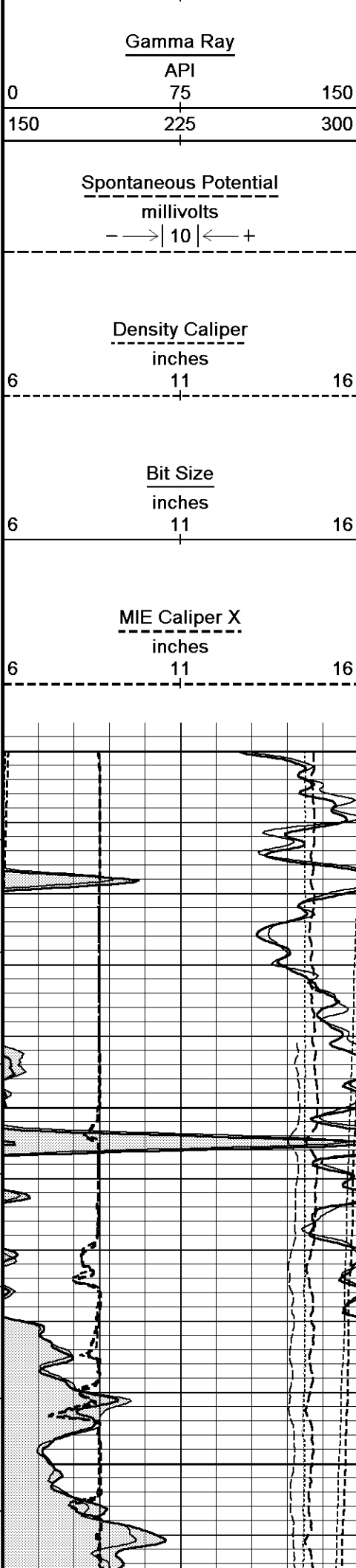


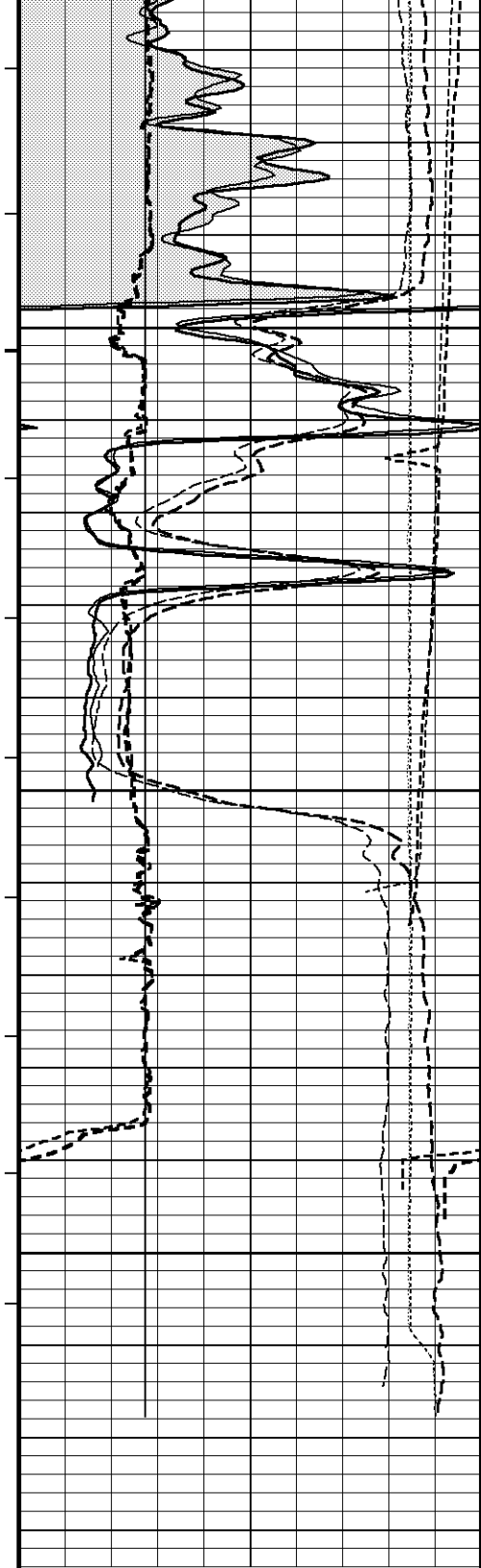












138°

5150

142°

5200

142°

5250

TD

Depth
In
Feet

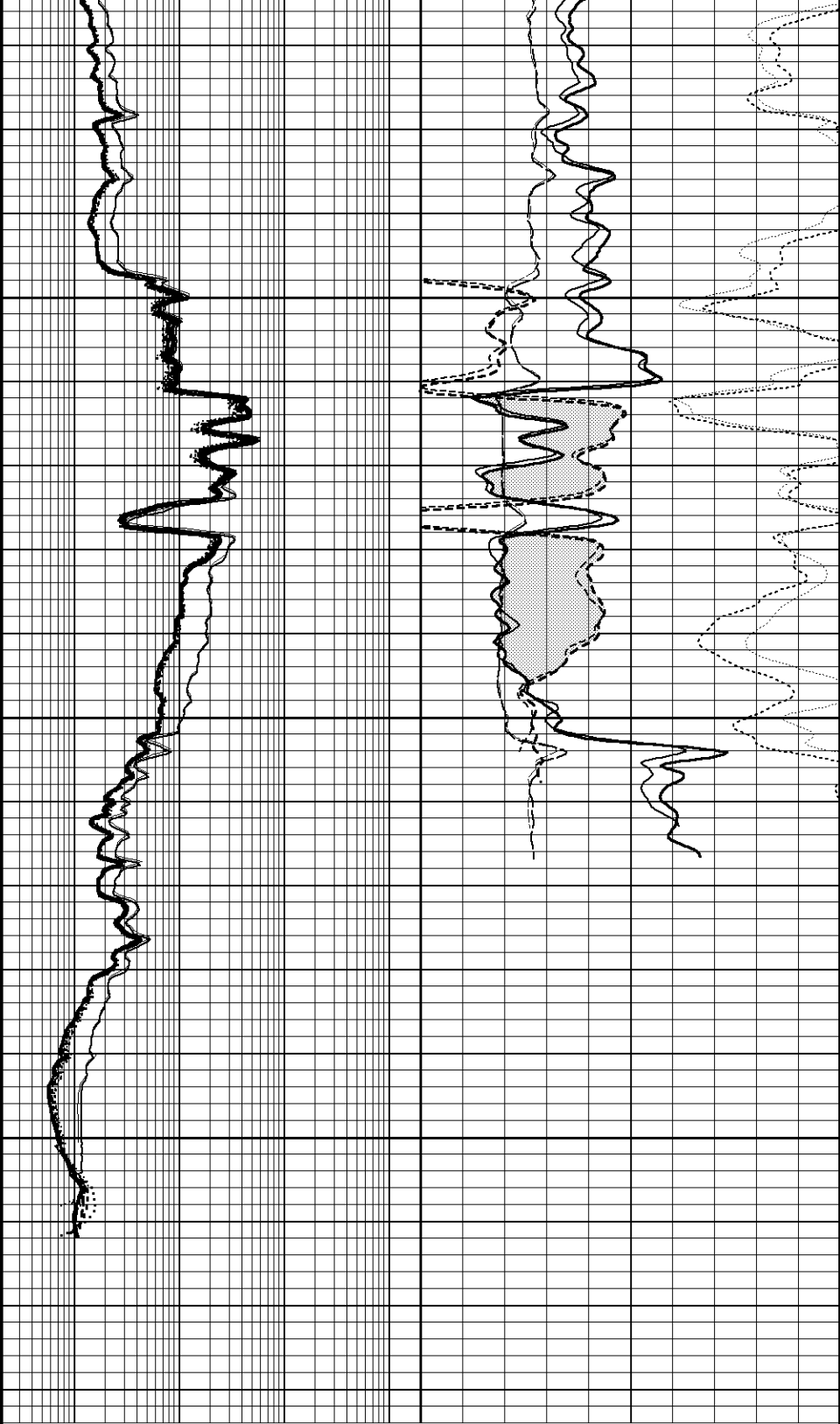
Timing Marks
every 60.0 sec

DST Uphole Tension
pounds

10000 5000 0
0 -5000 -10000

Gamma Ray
API

Borehole
Temp in
deg F



Shallow FE (Phase Corr.)
ohm metres

0.20 1 10 100 1000 2000 30

Array Ind. One Res 20
ohm metres

0.20 1 10 100 1000 2000 -0.25

Array Ind. One Res 30
ohm metres

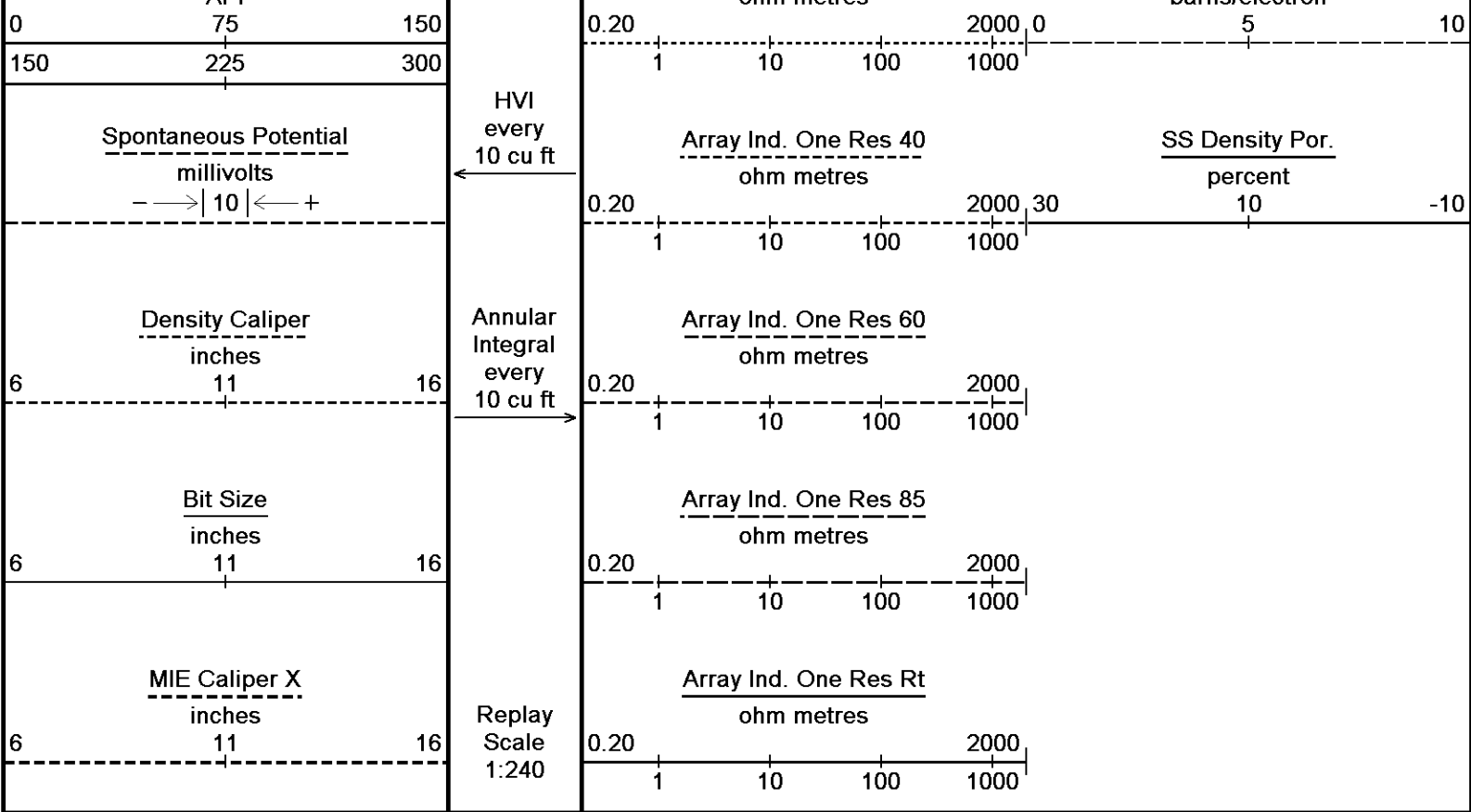
SS Neutron Por.
percent

10 -10

Density Correction
grams/cc

0 0.25

PE
barns/electron



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Users\le173613\AppData\Local\Temp\Weatherford Pr...IECGS NO 6-16 WPD009-2_7.dta
Filename: C:\Users\le173613\AppData\Local\Temp\Weatherford Pr...IECGS NO 6-16 WPD009-2_8.dta
System Versions: Processed with 13.03.7779 Plotted with 13.03.6602

↑ MAIN REPEAT ↑

BEFORE SURVEY CALIBRATION			
C:\Users\le173613\AppData\Local\Temp\Weatherford PreView\0\IECGS NO 6-16 WPD009-2_7.dta			
Down-hole Tension Calibration All 000			Field Calibration on 24-OCT-2010 03:34
Reading No	Measured		0
1	15659.85		0.00
2	15734.68		370.00
General Constants All 000			Last Edited on 23-SEP-2012,13:52
General Parameters			
Mud Resistivity	3.460	ohm-metres	
Mud Resistivity Temperature	87.300	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	MIE Caliper X		
HVOL Caliper 2	N/A		
Annular Volume Diameter	7.000	inches	
Caliper for Differential Caliper	None		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Deep Induction		
RWA Constant A	0.610		
RWA Constant M	2.150		

Down-hole Tension Calibration SMS 0
Field Calibration on 23-SEP-2012 09:39

Reading No	Measured	Calibrated (lbs)
1	15638.44	0.00
2	16772.04	490.00

Gamma Calibration MCG-D.K 483		Field Calibration on 22-SEP-2012 22:34	
	Measured	Calibrated (API)	
Background	124	85	
Calibrator (Gross)	885	604	
Calibrator (Net)	761	519	

Gamma Constants MCG-D.K 483			Last Edited on 25-SEP-2012,16:17		
Gamma Calibrator Number	GRCC119				
Mud Density	1.00	gm/cc			
Caliper Source for Processing	Bit Size				
Tool Position	Eccentred				
Concentration of KCl	0.00	kppm			

SP Calibration MCG-D.K 483		Field Calibration on 23-SEP-2012,10:15	
	Measured	Calibrated (mV)	
Reference 1	100.0	100.0	
Reference 2	-100.0	-100.0	

High Resolution Temperature Constants MCG-D.K 483		Last Edited on 23-SEP-2012,10:16
Pre-filter Length	11	

Neutron Calibration MDN-B.J 372		Base Calibration on 11-SEP-2012 10:37	
Base Calibration		Field Check on 19-SEP-2012 08:56	
	Measured	Calibrated (cps)	
	Near Far	Near Far	
	2935 90	3714 110	
Ratio	32.738	33.764	
Field Calibrator at Base		Calibrated (cps)	
		2265 3365	
Ratio		0.673	
Field Check		Calibrated (cps)	
		2282 3344	
Ratio		0.000	

Neutron Constants MDN-B.J 372		Last Edited on 25-SEP-2012,16:16	
Neutron Source Id	P31115B		
Neutron Jig Number	NJ5299		
Epithermal Neutron	No		
Caliper Source for Processing	Bit Size		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	7.00	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	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		

Imager Pad Check MIE-A.A 173		Field Check on 12-SEP-2012 09:28	
Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified

Sonde Configuration	Imager Mode	degrees
Arm-Pad Kit	Normal Pads (12.25 in)	
Centre Pad 1 Rotational Offset	0.00	
Image/Borehole Ovality Reference	Azimuth of Pad 1	degrees
Non Active Buttons	Omit	feet
Search Angle	0.00	feet
Correlation Interval	3.28	mAmp
Correlation Step	1.64	mAmp
Current Offset	0.0000	
Squasher Start	N/A	
Image Processing	Enabled	

Navigation Constants MIE-A.A 173

Last Edited on 22-SEP-2012,23:05

Magnetic Declination	7.15	degrees	East
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Magnetometer Parameters MIE-A.A 173

Date Of Last Magnetometer Calibration	23-AUG-2012,08:58		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.010964	-0.998834
Offset	0.014865	-0.019075	0.015130

Magnetometer Constants MIE-A.A 173

Last Edited on

Magnetometer Calibrator Number	000
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Accelerometer Parameters MIE-A.A 173

Date Of Last Accelerometer Calibration	8-AUG-2012,14:18		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.112478	-1.107188	-1.099214
Offset	0.008132	0.004011	0.006751

Accelerometer Constants MIE-A.A 173

Last Edited on 05-SEP-2012,16:48

Accelerometer Calibrator Number	000
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Accelerometer Temperature Characterisation

X Accelerometer

Serial Number	228			
Calibration Date	10-Jul-2007			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.38745e-005	-9.26831e-009	1.17995e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.71979e-004	6.20757e-007	-4.67664e-010

Y Accelerometer

Serial Number	229			
Calibration Date	10-Jul-2007			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	1.46083e-005	5.28186e-009	2.04363e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.68135e-004	7.37732e-007	-8.65499e-010

Z Accelerometer

Serial Number	212			
Calibration Date	10-Jul-2007			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	2.92968e-005	-2.00645e-008	1.96637e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.56822e-004	5.65937e-007	1.73081e-011

Caliper Calibration MIE-A.A 173

Base Calibration on 22-SEP-2012 23:13

Field Calibration on 22-SEP-2012 23:16

Base Calibration

Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)
1	24690	25434	5.97
2	34724	35775	7.96
3	44567	45459	9.87
4	56108	57251	11.92

5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25363	26152	25925	25306	5.97
2	33861	34843	34504	33588	7.96
3	42302	43083	42709	41981	9.87
4	51973	52931	52879	51641	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured Pads 1-5 Caliper(in) 7.93	Measured Pads 3-7 Caliper(in) 7.83		Actual Caliper(in) 7.96	
	Measured Pad 2 Caliper(in) 3.81	Measured Pad 4 Caliper(in) 3.79	Measured Pad 6 Caliper(in) 4.05	Measured Pad 8 Caliper(in) 4.06	Actual Caliper(in) 7.96
Caliper Constants MIE-A.A 173				Last Edited on 29-APR-2012 09:20	
Caliper Difference for BRKT		0.120	inches		
FE Calibration MFE-A.A 76				Base Calibration on 10-SEP-2012 11:36 Field Check on 19-SEP-2012 08:38	
Base Calibration					
		Measured	Calibrated (ohm-m)		
Reference 1		0.0	0.0		
Reference 2		964.4	126.8		
Base Check			279.9		
Field Check			280.1		
FE Constants MFE-A.A 76				Last Edited on 25-SEP-2012,16:16	
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Caliper Source for FE correction		Bit Size			
Caliper Value for FE correction		N/A	inches		
Rm Source for FE correction		Temperature Corr			
Temp. for Rm Corr.		MCG External Temperature			
Stand-off		1.0	inches		
High Resolution Temperature Calibration MAI-B.A 219				Field Calibration on 10-AUG-2011,00:10	
		Measured	Calibrated(Deg F)		
Lower		50.00	50.00		
Upper		75.00	75.00		
High Resolution Temperature Constants MAI-B.A 219				Last Edited on 10-SEP-2012,10:18	
Pre-filter Length		11			
Induction Calibration MAI-B.A 219				Base Calibration on 08-MAY-2012,15:56 Field Check on 19-SEP-2012 08:29	
Base Calibration					
Test Loop Calibration					
Channel		Measured	Calibrated (mmho/m)		
		Low	High	Low	High
1		17.4	478.1	9.3	966.2
2		5.8	380.3	7.6	821.4
3		3.5	258.5	5.2	566.0
4		1.9	136.0	2.6	279.2
Array Temperature		77.2	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
		Low	High	Low	High
1		0.0	0.0	12.2	3791.7
2		0.0	0.0	30.9	3535.9
3		0.0	0.0	28.6	3055.1
4		0.0	0.0	19.3	2027.9
Deep		0.0	0.0	16.5	1948.3
Medium		0.0	0.0	42.7	4087.3
Shallow		0.0	0.0	47.5	5281.3

Array Temperature

0.0

64.9

Deg F

Induction Constants MAI-B.A 219

Last Edited on 25-SEP-2012,16:16

Induction Model	RtAP-WBM		
Caliper for Borehole Corr.	Bit Size		
Hole Size for Borehole Correction	N/A	inches	
Tool Centred	No		
Stand-off Type	Fins		
Stand-off	1.00	inches	
Number of Fins on Stand-off	6.0000		
Stand-off Fin Angle	60.00	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-C.A 196

Base Calibration on 11-SEP-2012 13:59

Field Calibration on 19-SEP-2012 08:45

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15672	3.99
2	24368	5.97
3	32940	7.96
4	41136	9.87
5	50464	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.91	7.96

Photo Density Calibration MPD-C.A 196

Base Calibration on 11-SEP-2012 15:19

Field Check on 19-SEP-2012 08:44

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	37007	13951	52994	19128
Reference 2	17051	1942	25185	2558

Field Check at Base

601.7	931.8
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Field Check

598.3	935.0
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PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	110	536		
Reference 1	11578	36914	0.315	0.309
Reference 2	4580	16980	0.272	0.274

Field Check at Base

110.3 536.4

Field Check

111.2 540.3

Density Constants MPD-C.A 196

Last Edited on 25-SEP-2012,16:16

Density Source Id	P15771B	
Nylon Calibrator Number	DNC-D-527	
Aluminium Calibrator Number	DAC-D-527	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.16	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)	
2.65	5208.00	
2.68	5060.00	
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:\Users\le173613\AppData\Local\Temp\Weatherford PreView\0\ECGS 6-16 WPD009-2_INITIAL6.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor

SHA-H 142 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact Comms Gamma

MCG-D.K 483 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron

MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-C.A 196 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

MIS-A.A Compact Inline Bowspring sub

MIS-A.A 70 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 585 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub

MIS-E.A 334 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in



SKJ-D.A Compact Knuckle Joint
SKJ-D.A 112 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact MMI Memory Section
MIM-A.A 173 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section
MIE-A.A 173 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 143 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 76 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-B.A 219 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 77.00 ft Weight: 586.4 lb



Tool Zero (0.13ft from bottom)
All measurements relative to tool zero.

COMPANY	EAST CHEYENNE GAS STORAGE LLC
WELL	ECGS NO 6-16 WPD009-2
FIELD	PEETZ WEST
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	USA/COLORADO

Elevation Kelly Bushing	4567.00	feet	First Reading	5257.00	feet
Elevation Drill Floor	4566.00	feet	Depth Driller	5260.00	feet
Elevation Ground Level	4555.00	feet	Depth Logger	5260.00	feet



Weatherford®

COMPACT TRIPLE COMBO
QUICKLOOK
LOGS