



**Weatherford**<sup>®</sup>

SPECTRAL GAMMA RAY

COMPANY MULL DRILLING COMPANY, INC.

WELL BLEUMER # 1-13

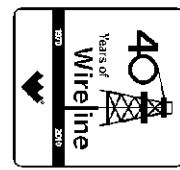
FIELD WILDCAT

PROVINCE/COUNTY GRAY COUNTY

COUNTRY/STATE U.S.A. / KANSAS

LOCATION 2112' FNL & 778' FWL

SW/4 NW/4



SEC 13 TWP 26S RGE 30W Other Services MPD/MDN MML

API Number 15-069-20371 MSS MA/MFE

Permit Number

Permanent Datum G.L., Elevation 2772 feet

Log Measured From KB

Drilling Measured From K.B.

Elevations: KB 2785.00 DF 2783.00 GL 2772.00

Date 07-MAY-2012

Run Number ONE

Depth Driller 6200.00 feet

Depth Logger 6193.00 feet

First Reading 6139.00 feet

Last Reading 3700.00 feet

Casing Driller 464.00 feet

Casing Logger 462.00 feet

Bit Size 7.875 inches

Hole Fluid Type CHEMICAL

Density / Viscosity 9.40 lb/USg 57.00 CP

PH / Fluid Loss 8.50 8.00 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 0.87 @ 70.0 ohm-m

Rmf @ Measured Temp 0.70 @ 70.0 ohm-m

Rmc @ Measured Temp 1.04 @ 70.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.49 @ 129.0 ohm-m

Time Since Circulation 5 HOURS

Max Recorded Temp 130.00 deg F

Equipment Name COMPACT

Equipment / Base 13096 LIB

Recorded By A. GIAMBALVO

Witnessed By PAUL GERLACH

S.O. / JOB # 3534535 LB12-115

**BOREHOLE RECORD**

Last Edited: 07-MAY-2012 07:55

Bit Size inches	Depth From feet	Depth To feet
7.875	462.00	6193.00

**CASING RECORD**

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	13.00	462.00	24.00

**REMARKS**

Tools Ran: MCG, SGS, MML, MDN, MPD, SKJ, MFE, MSS, MAI.  
 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 inch production casing from TD to Surface Casing = 1468 cu. ft.  
 Total hole volume from TD to Surface Casing = 2248 cu. ft.  
 Service order: #3534535  
 Rig: Duke # 9  
 Engineer: A. Giambalvo  
 Operator(s): J. LaPoint, 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

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 07-MAY-2012 08:26

Filename: C:\Minimus 11\_03\_4044\Data\M...Mull Drilling Company, Inc. Bleumer # 1-13 Run 1\_001.dta

Recorded on 07-MAY-2012 03:49

System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

Timing Marks  
every 60.0 sec

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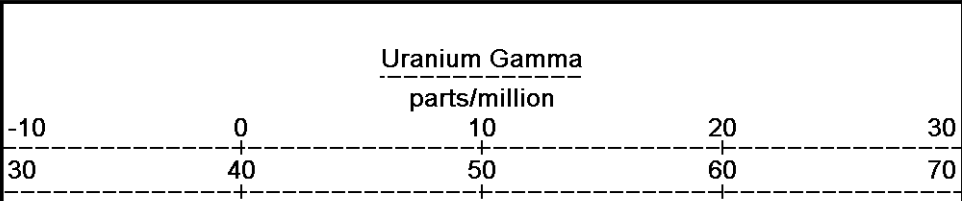
SGS Gamma Ray  
API

0	75	150
150	225	300

Depth in Feet

Borehole Temp in deg F

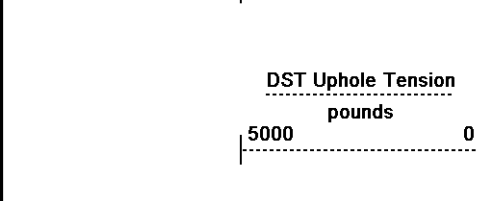
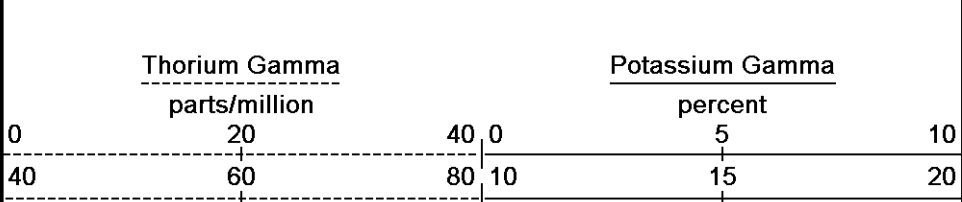
HVI every 10 cu ft



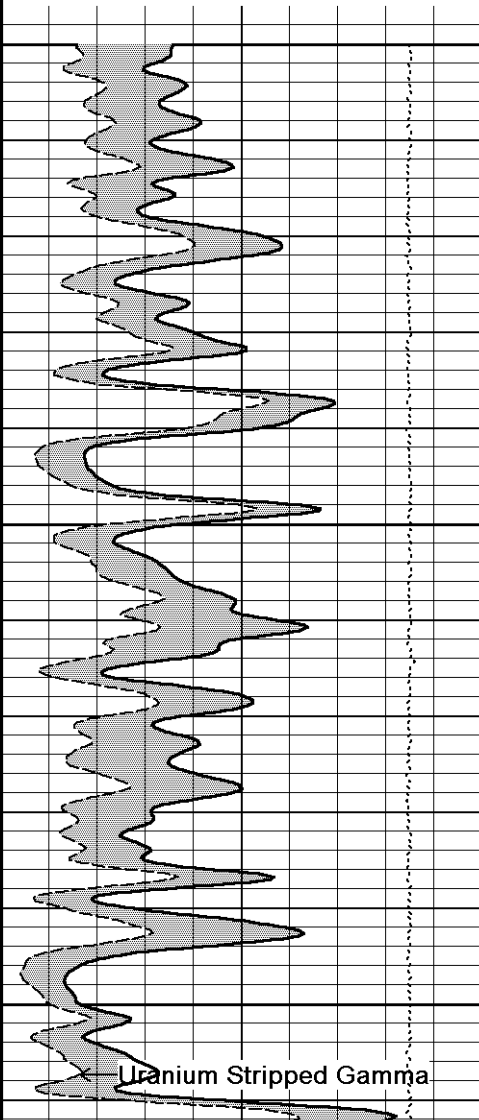
Uranium Stripped Gamma  
API

0	75	150
150	225	300

Annular Integral every 10 cu ft



Replay Scale 1:240



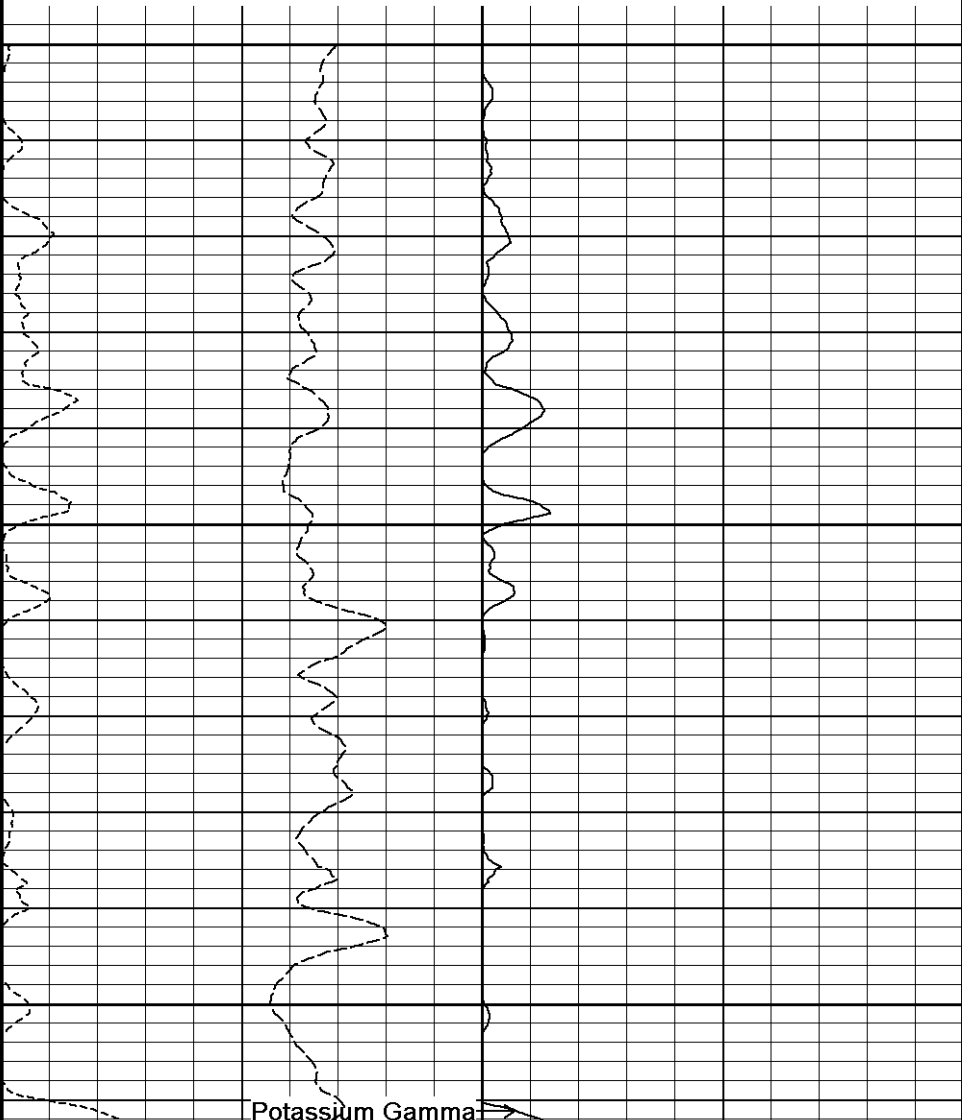
3700

115°

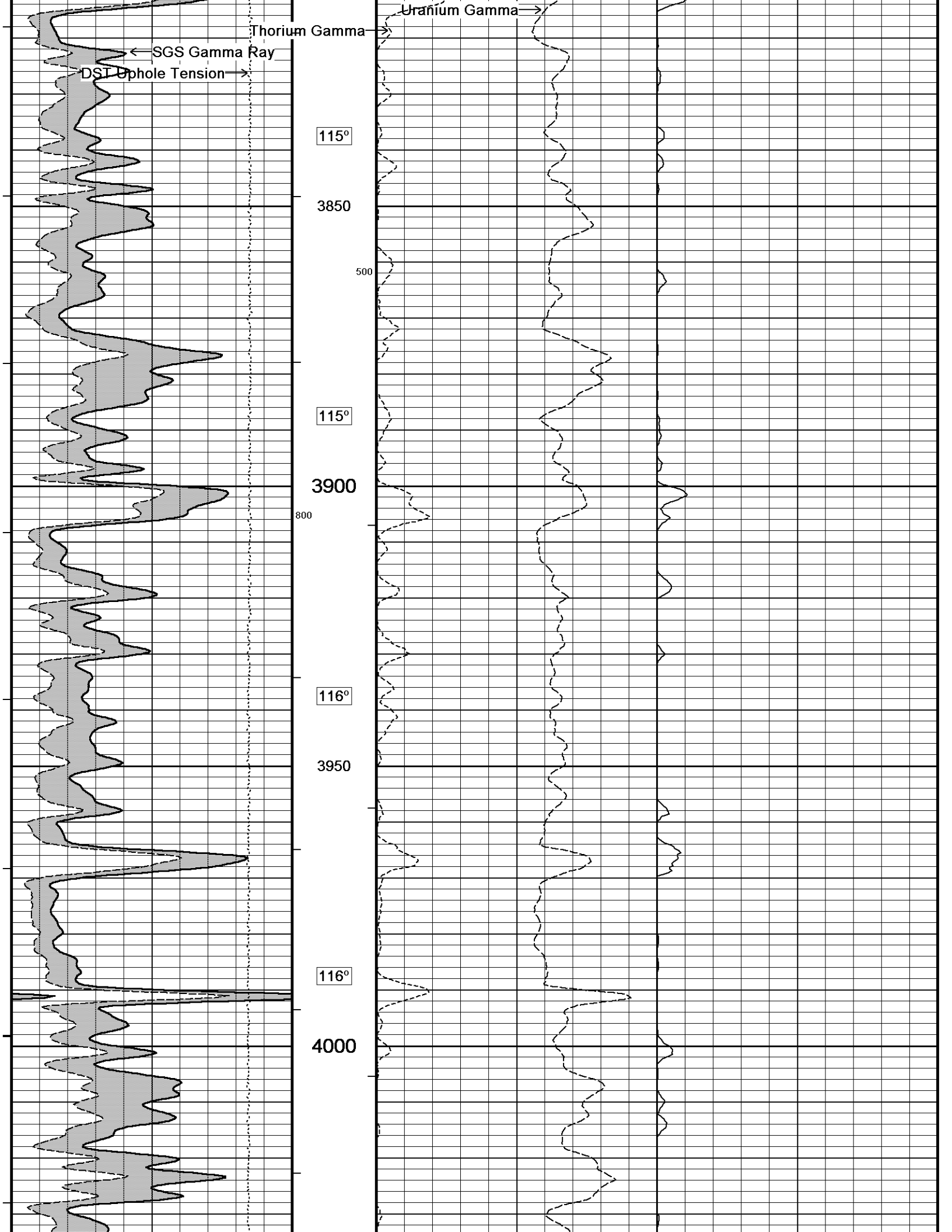
3750

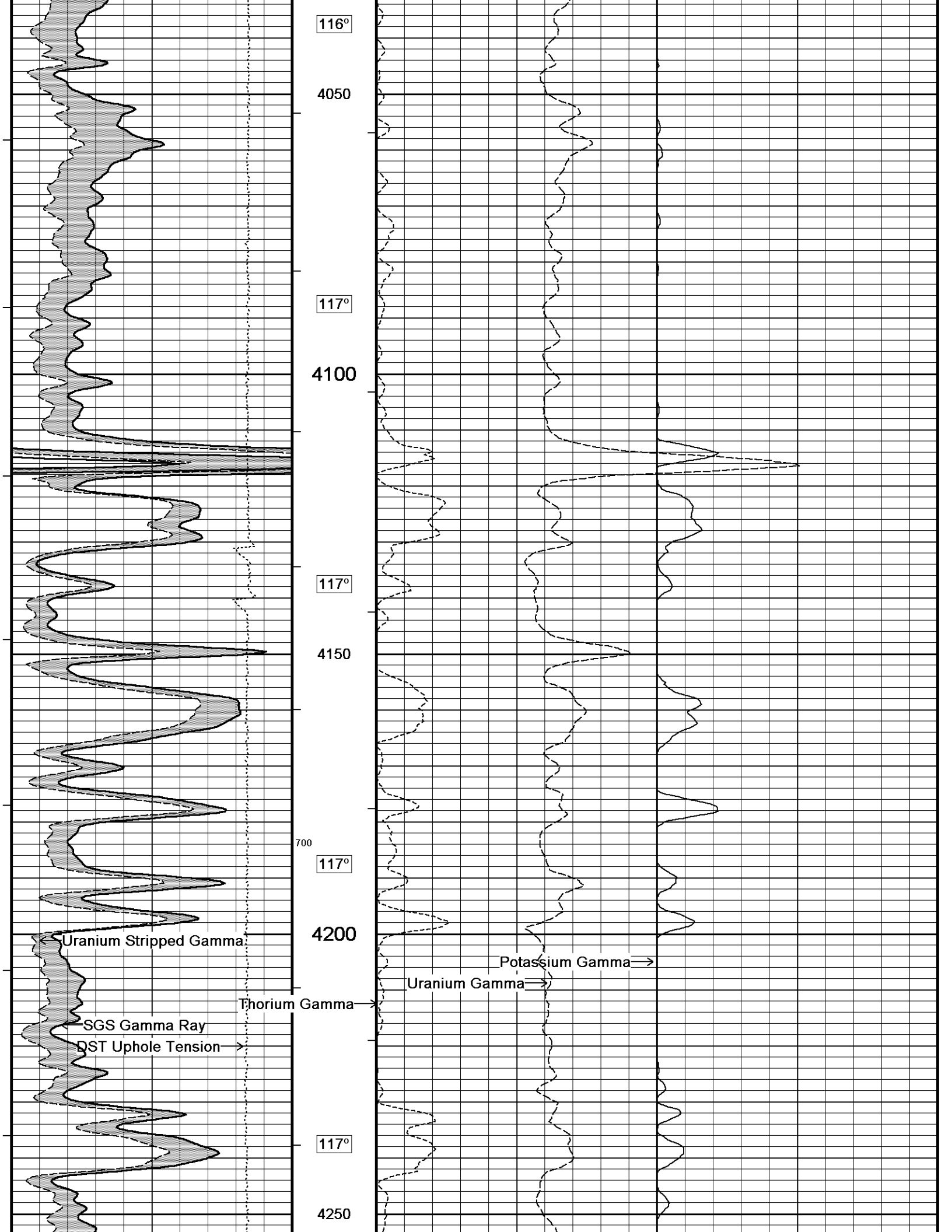
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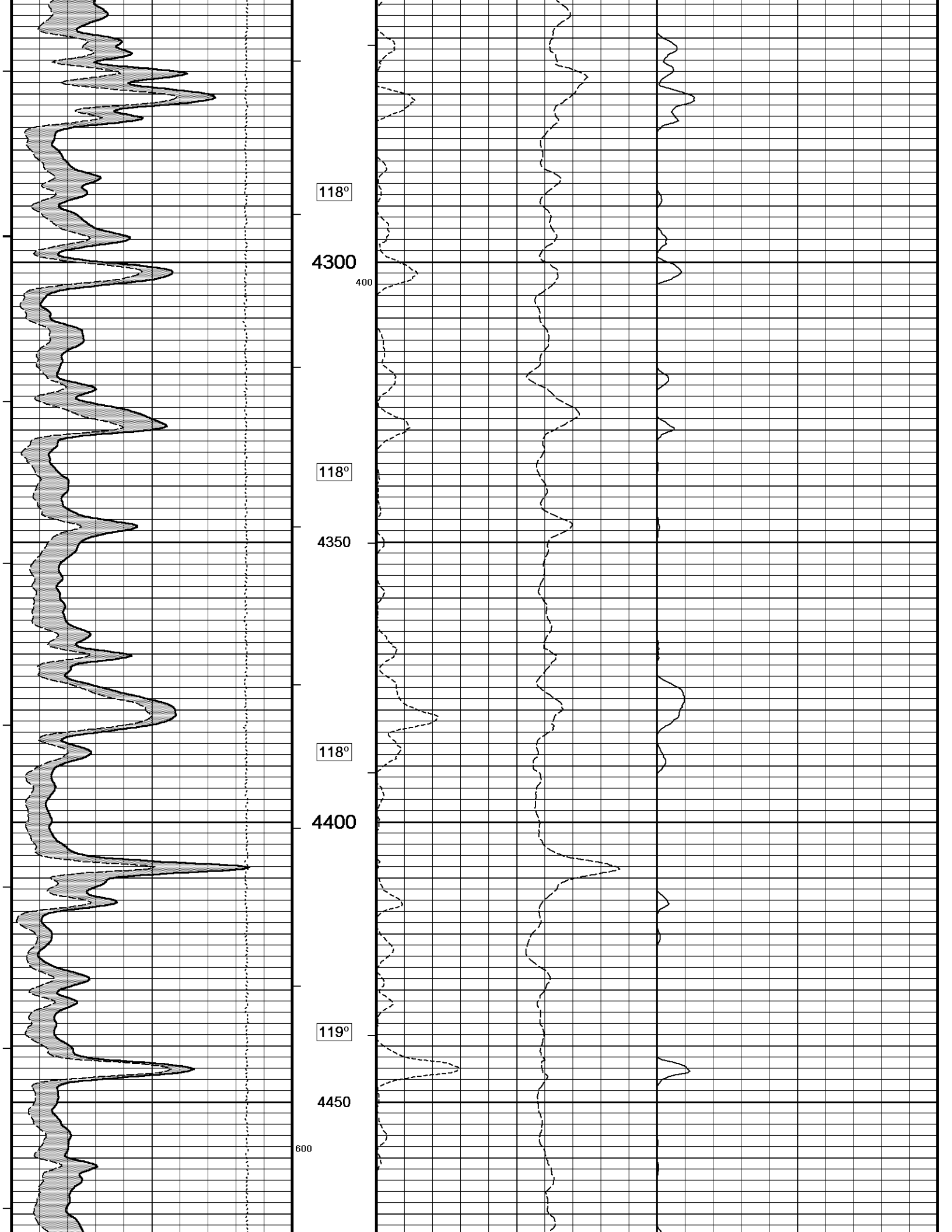
3800

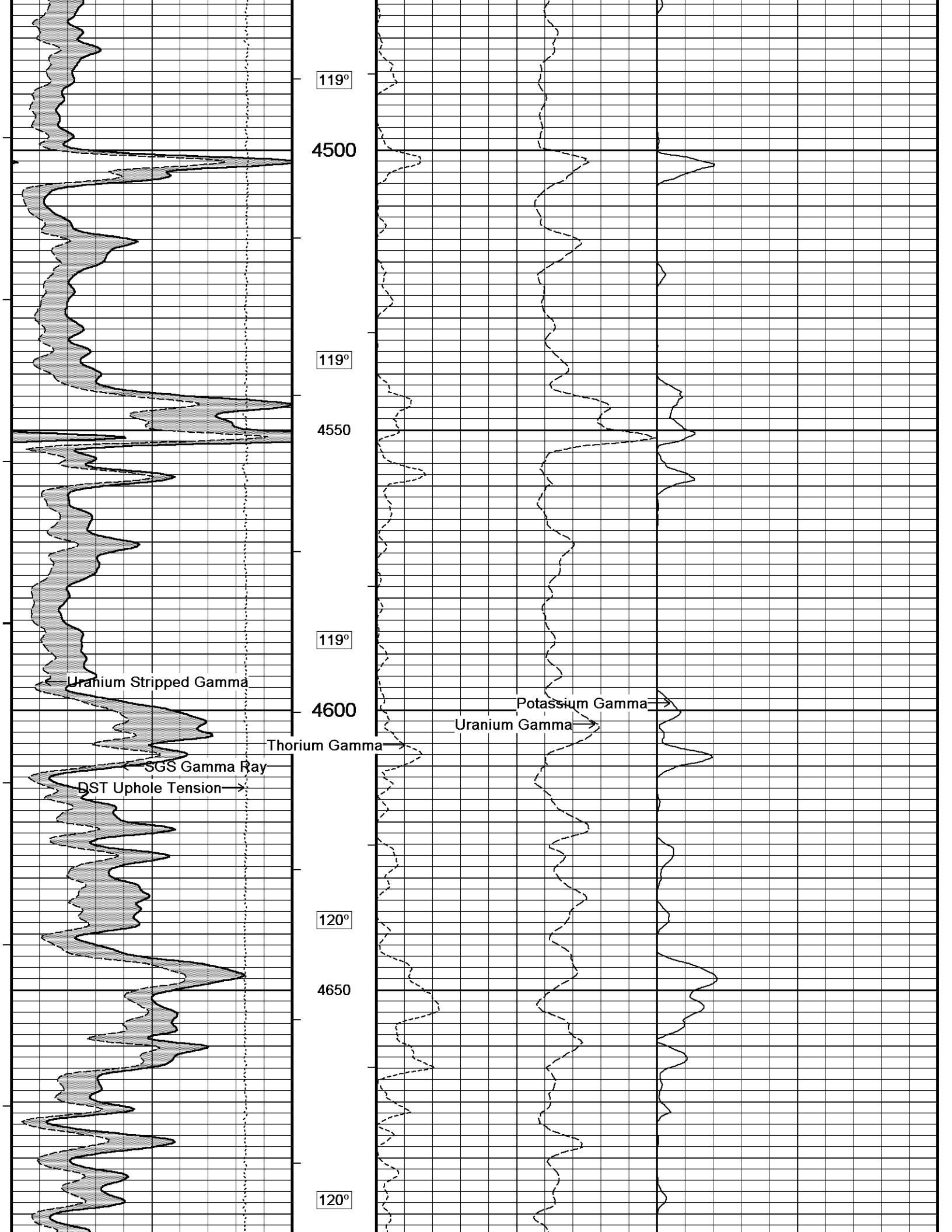


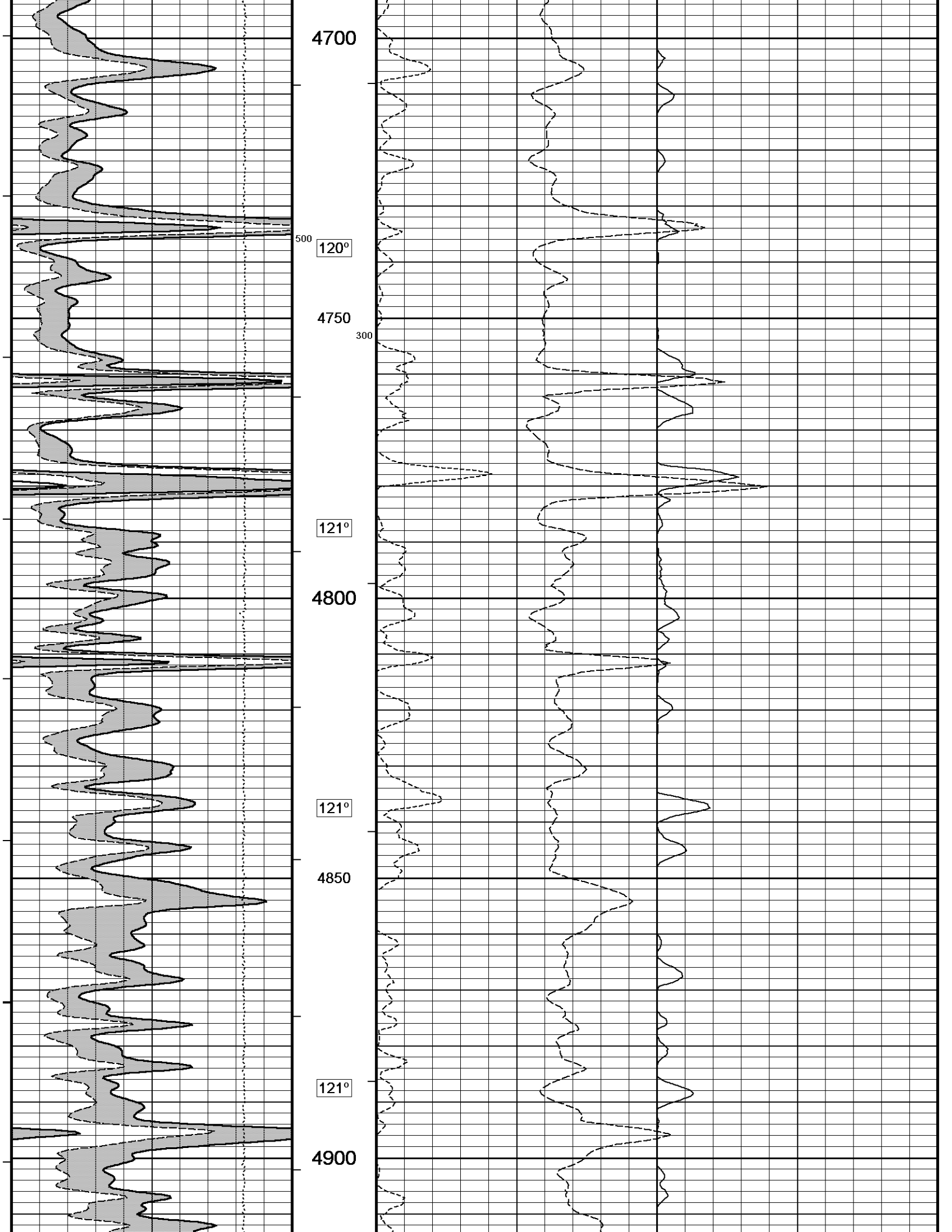
Potassium Gamma

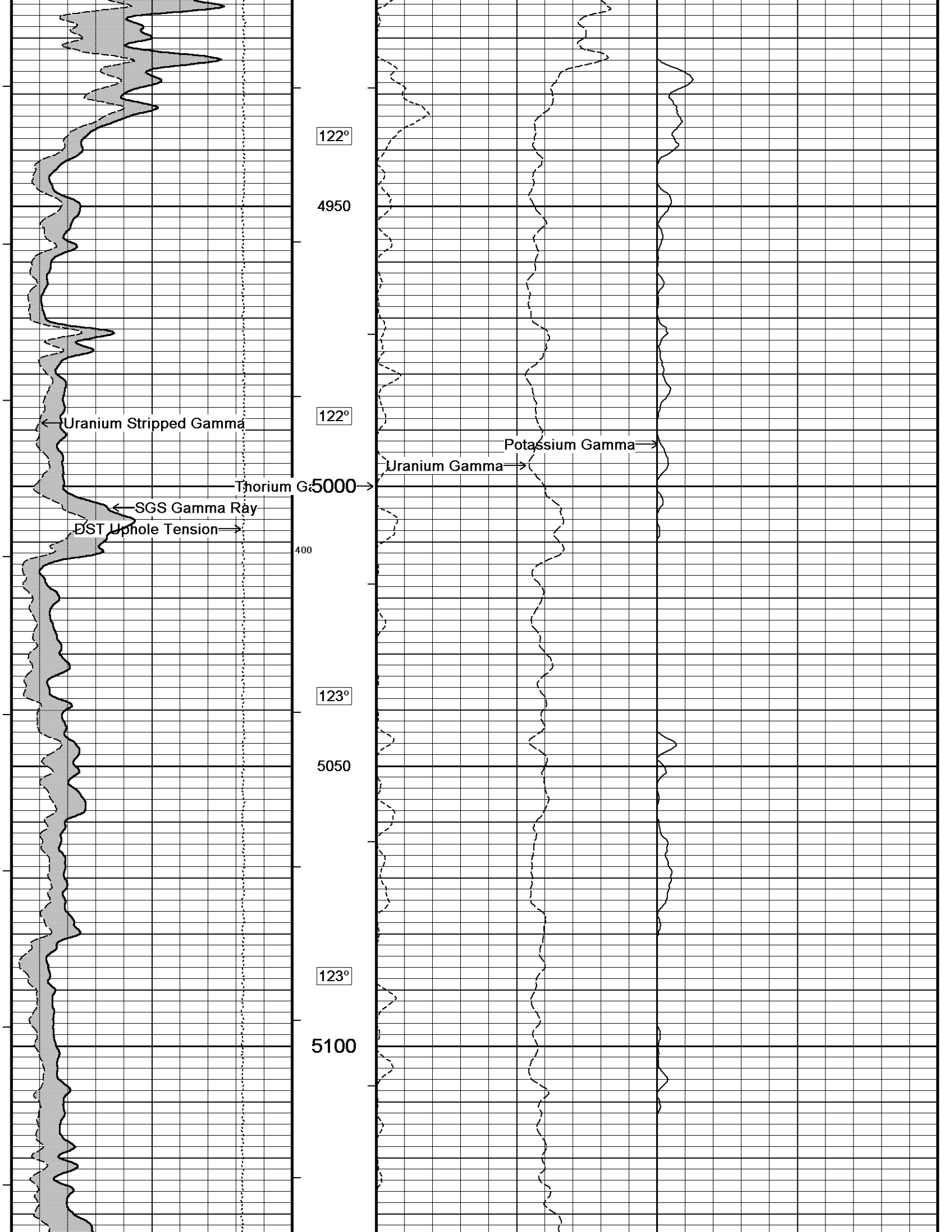




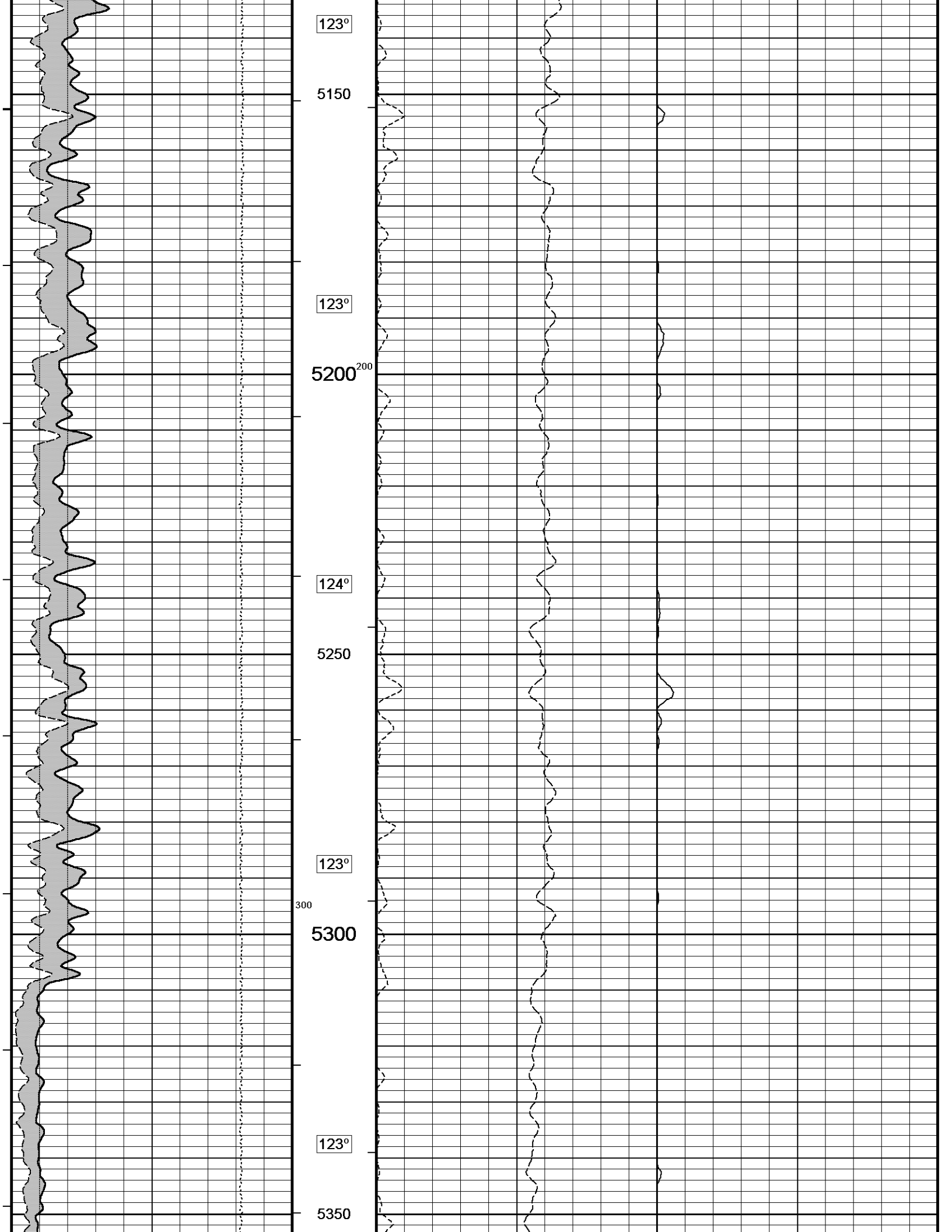


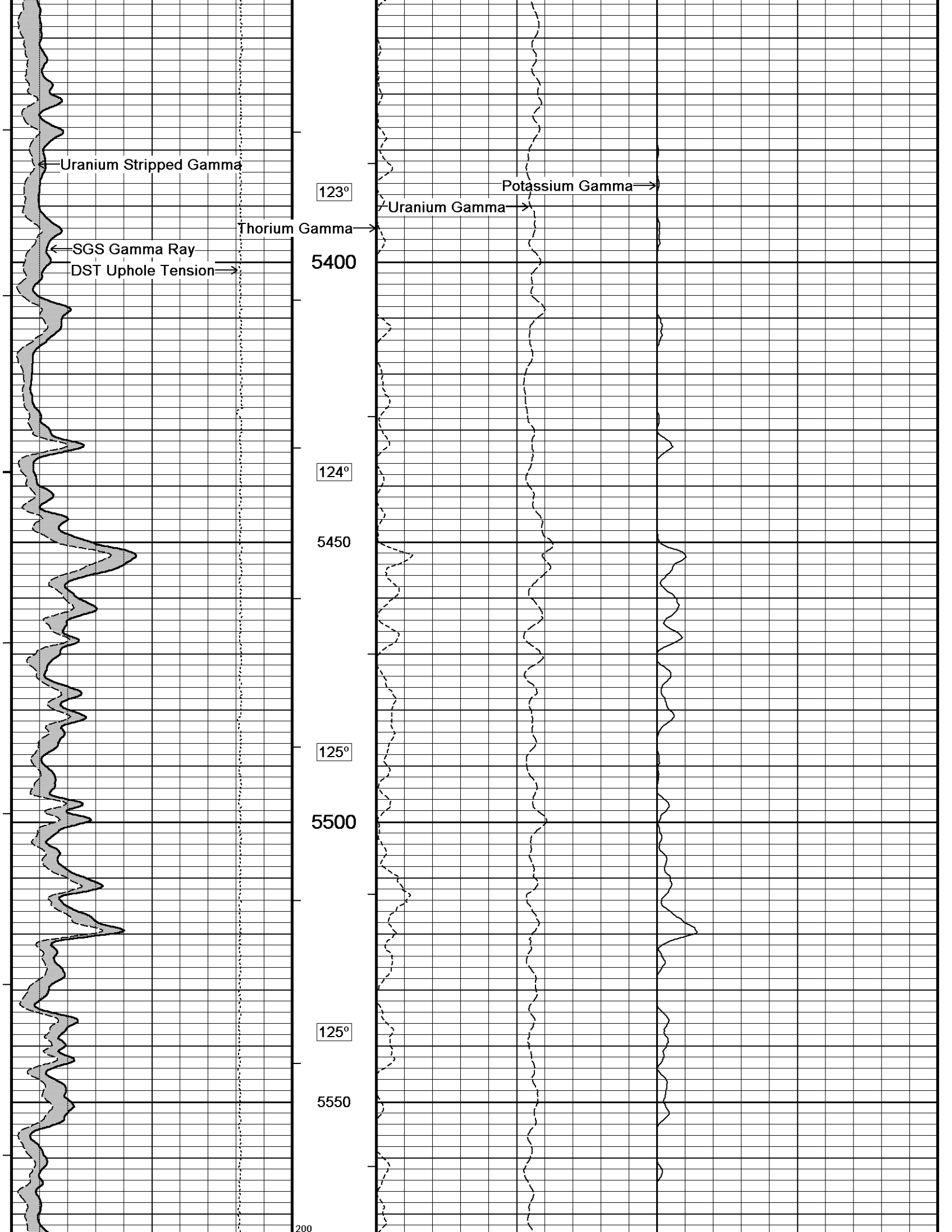


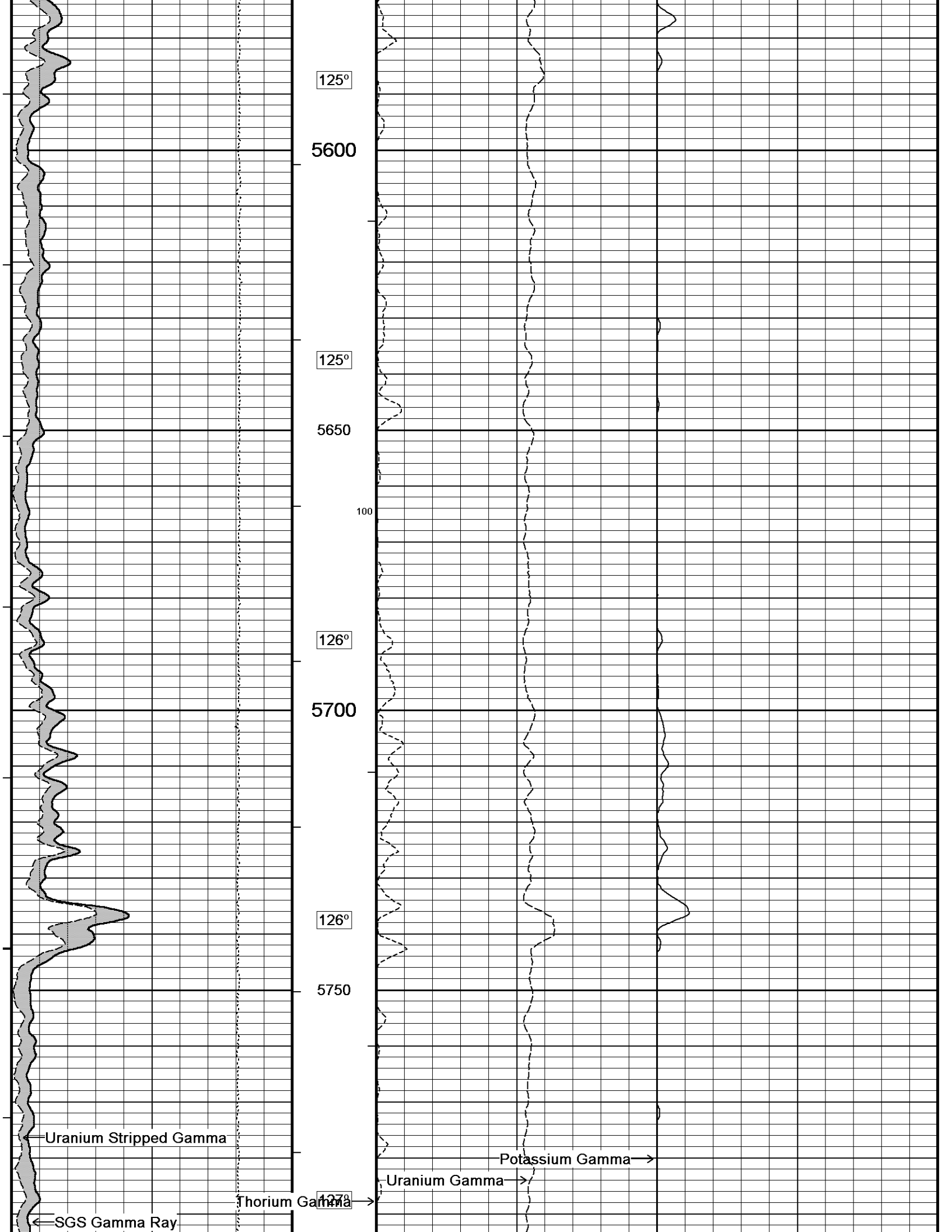


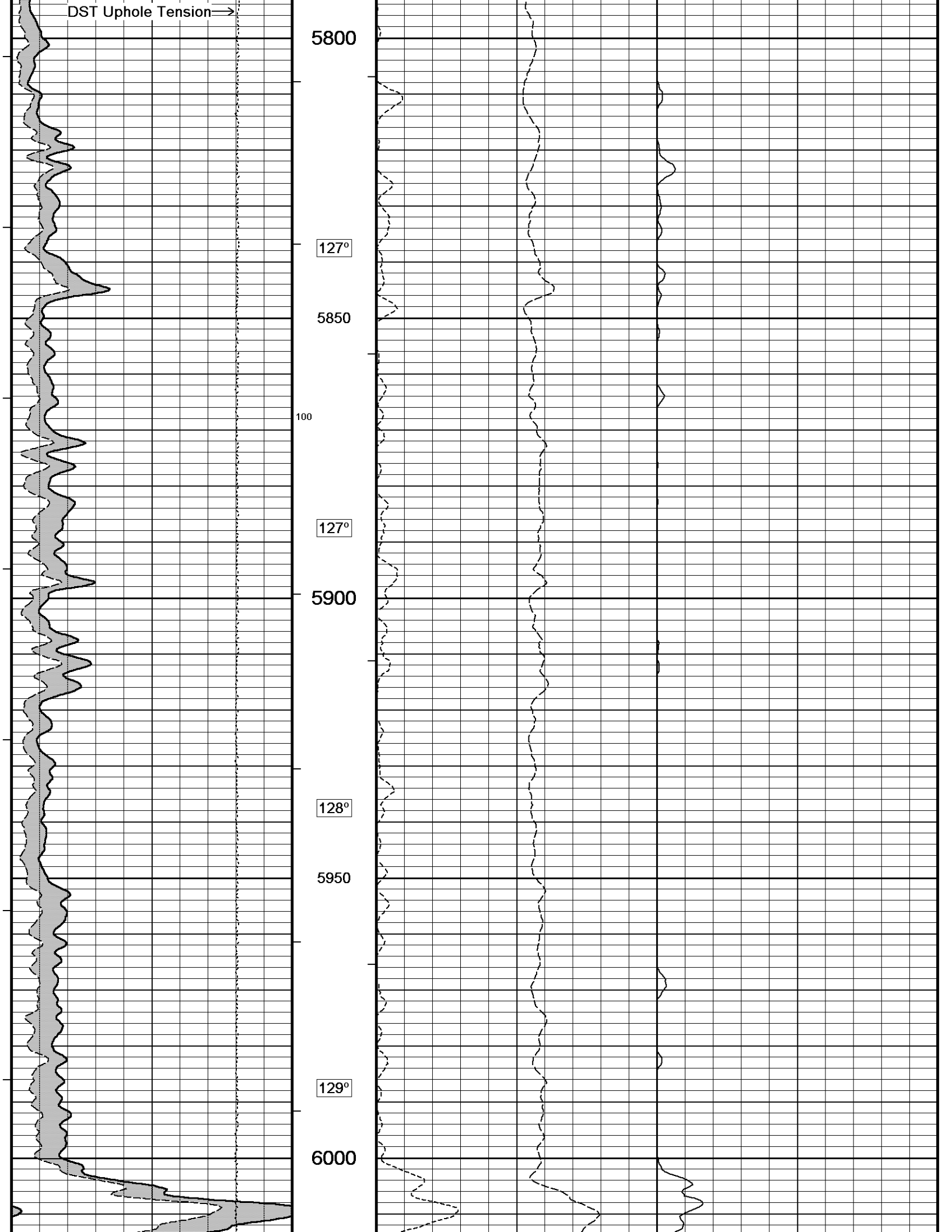












DST Uphole Tension →

5800

127°

5850

100

127°

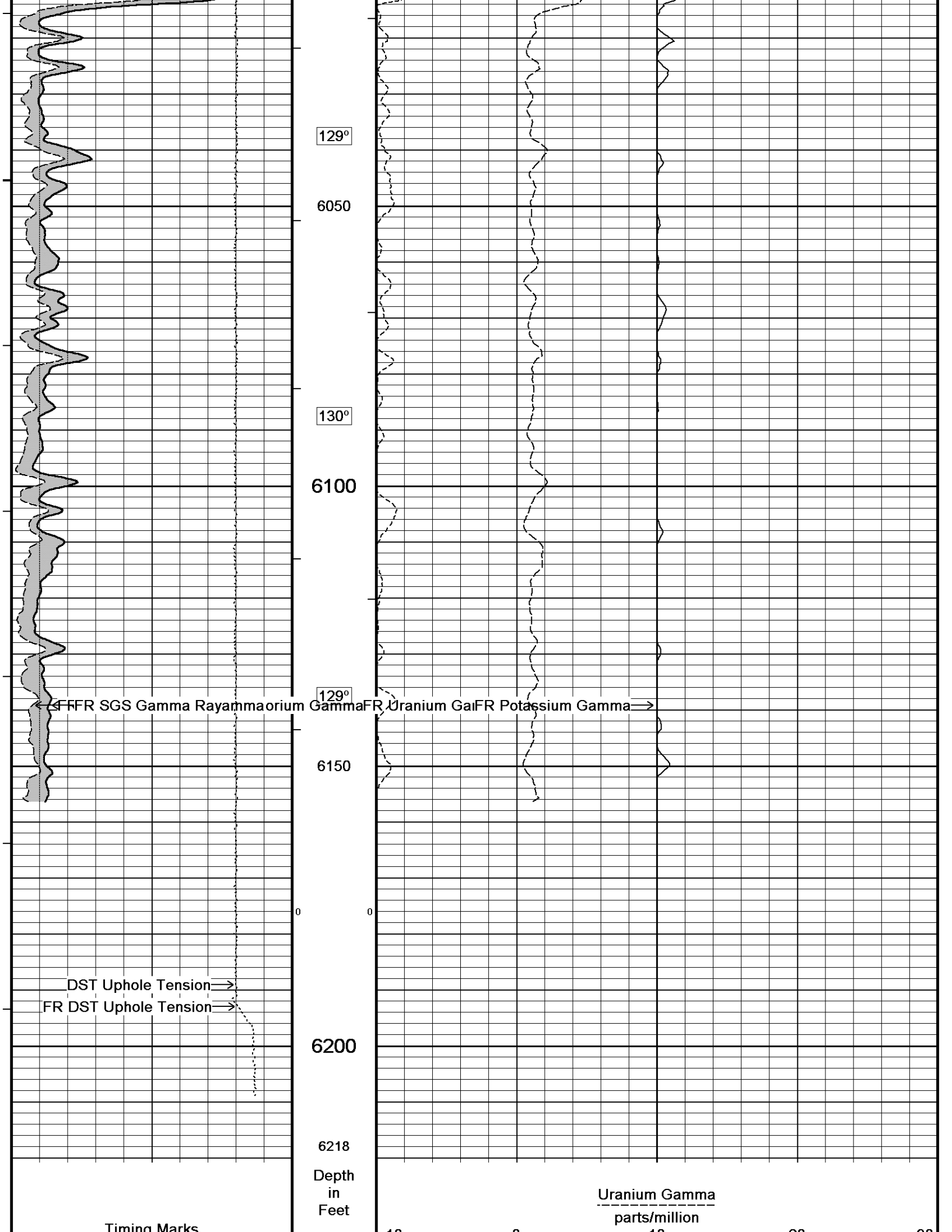
5900

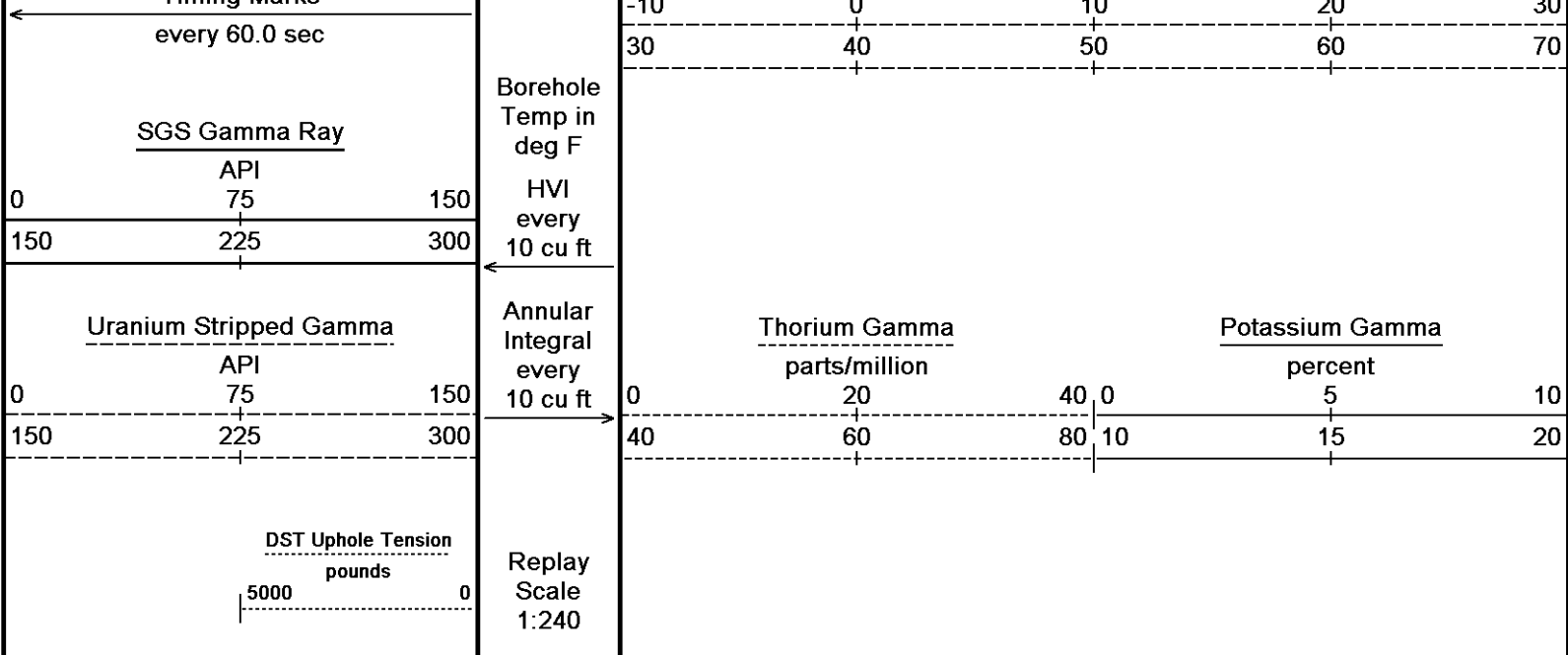
128°

5950

129°

6000



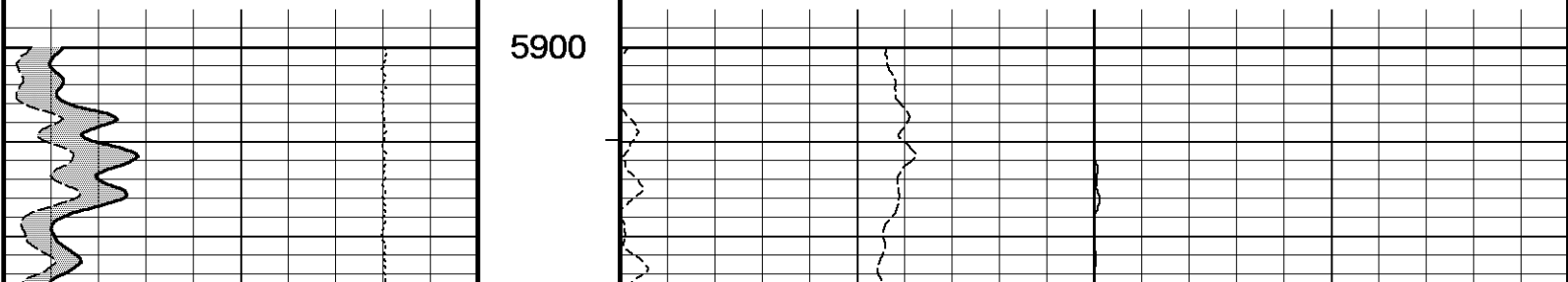
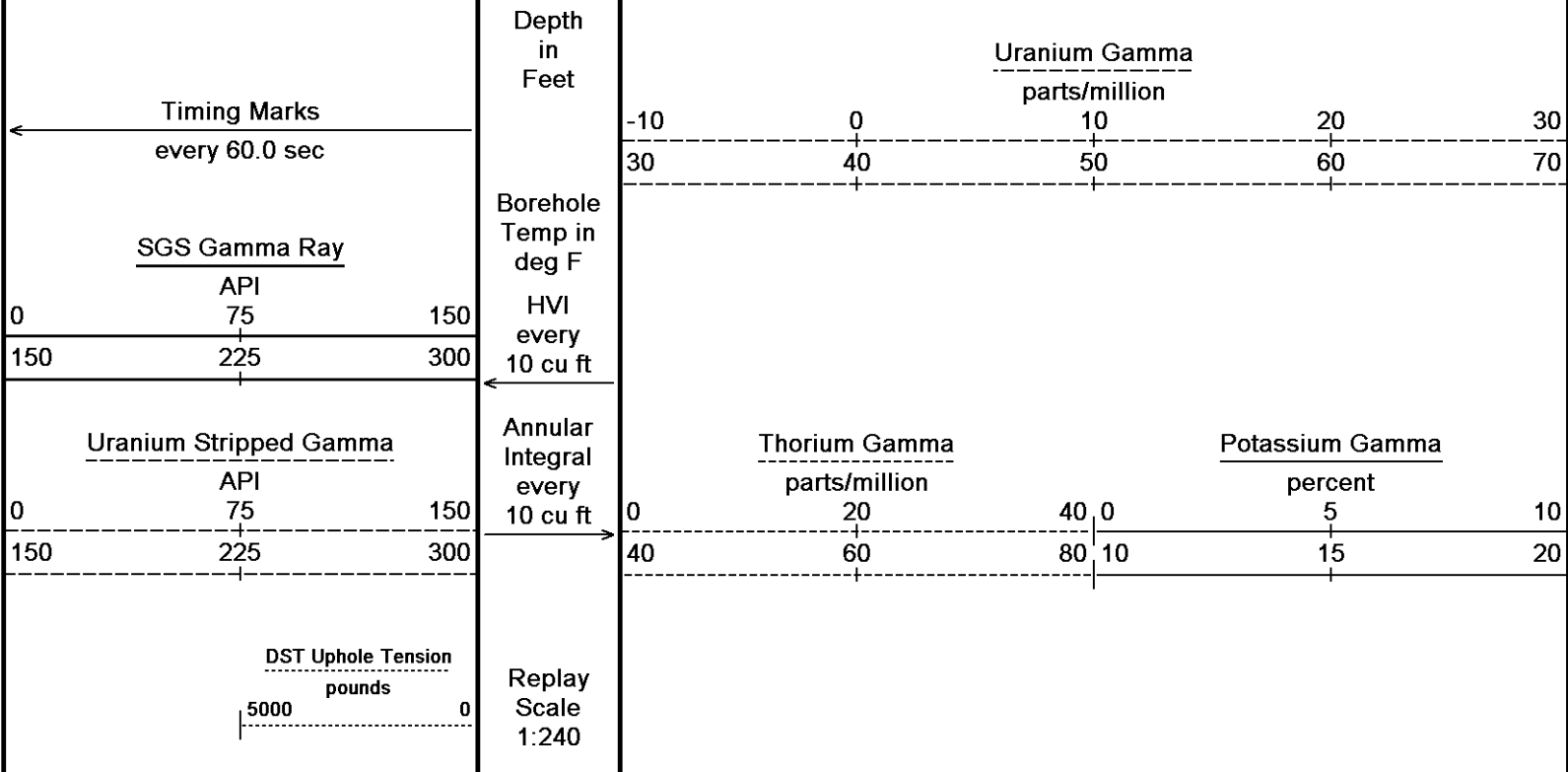


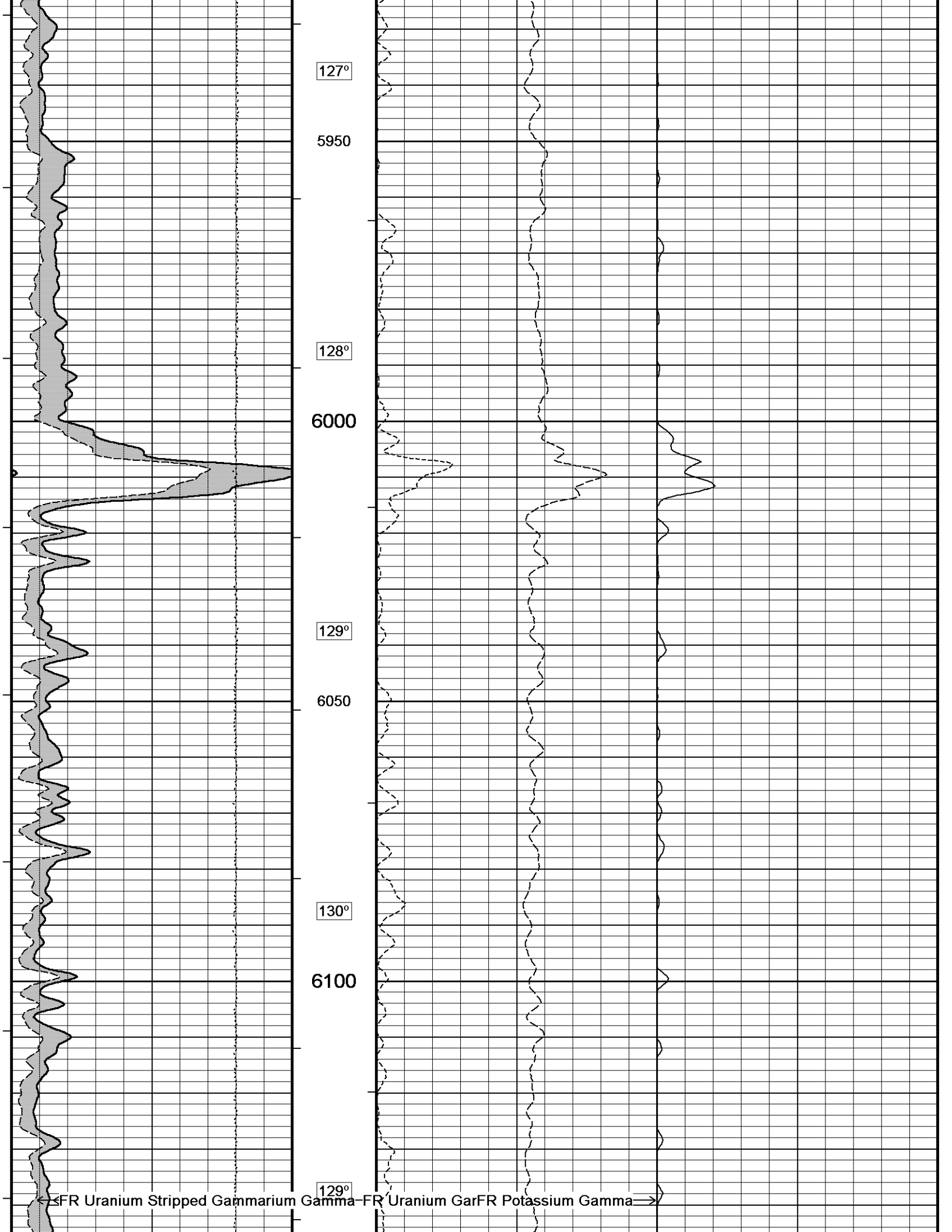
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 07-MAY-2012 08:27  
 Filename: C:\Minimus 11\_03\_4044\Data\M...Mull Drilling Company, Inc. Bleumer # 1-13 Run 1\_001.dta Recorded on 07-MAY-2012 03:49  
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

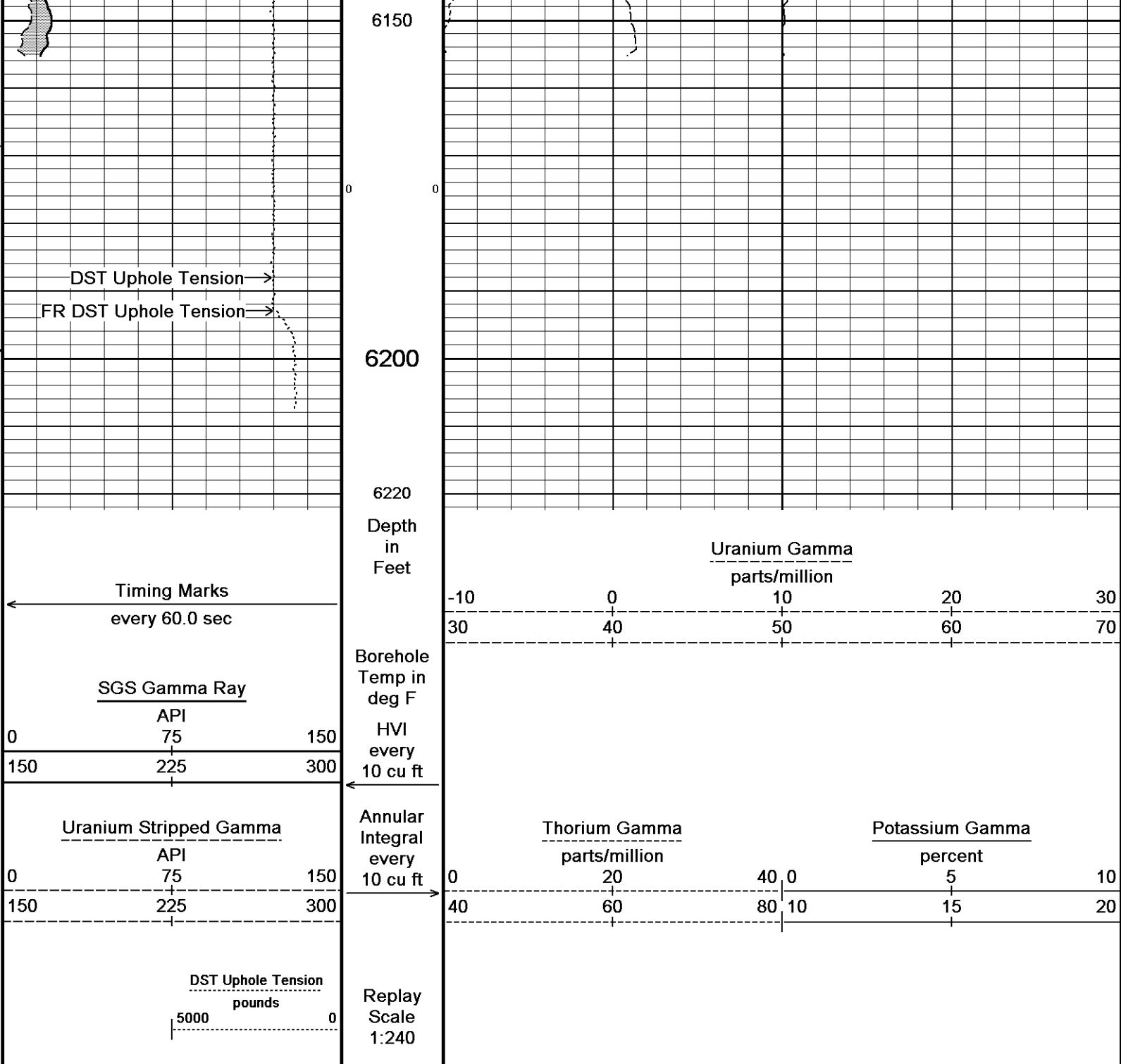
5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 07-MAY-2012 08:27  
 Filename: C:\Minimus 11\_03\_4044\Data\Mull Dr...Mull Drilling Company, Inc. Bleumer # 1-13 Run 1.dta Recorded on 07-MAY-2012 03:22  
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044







Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 07-MAY-2012 08:27  
 Filename: C:\Minimus 11\_03\_4044\Data\Mull Dr...Mull Drilling Company, Inc. Bleumer # 1-13 Run 1.dta  
 Recorded on 07-MAY-2012 03:22  
 System Versions: Logged with 11.03.4044 Plotted with 11.03.4044

REPEAT SECTION

### BEFORE SURVEY CALIBRATION

C:\Minimus 11\_03\_4044\Data\Mull Drilling Company, Inc. Bleumer # 1-13\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1\_001.dta

General Constants All 000 Last Edited on 07-MAY-2012,02:08

General Parameters

Mud Resistivity	0.870	ohm-metres
Mud Resistivity Temperature	70.000	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	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.000	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters	
Porosity used	Limestone Density Por.
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 23-FEB-2012 23:25

Reading No	Measured	Calibrated (lbs)
1	13693.36	0.00
2	14387.39	407.90

**Gamma Calibration MCG-B 39**

Field Calibration on 02-APR-2012 14:02

	Measured	Calibrated (API)
Background	74	49
Calibrator (Gross)	752	505
Calibrator (Net)	678	456

**Gamma Constants MCG-B 39**

Last Edited on 07-MAY-2012,00:51

Gamma Calibrator Number	GRC141	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

**SP Calibration MCG-B 39**

Field Calibration on 02-APR-2012,14:02

	Measured	Calibrated (mV)
Reference 1	100.0	100.0
Reference 2	-100.0	-100.0

**High Resolution Temperature Calibration MCG-B 39**

Field Calibration on 02-APR-2012,14:03

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

**High Resolution Temperature Constants MCG-B 39**

Last Edited on

Pre-filter Length	11
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**Caliper Calibration MML-A 4**

Base Calibration on 0C3170021008,  
Field Calibration on 0C4060524000

Base Calibration	Measured	Calibrator Size (in)
Reading No		
1	15017	5.98
2	18447	7.97
3	21786	9.86
4	25801	11.92
5	0	0.00
6	N/A	N/A

Field Calibration	Measured Caliper (in)	Actual Caliper (in)
	6.08	5.98

**Micro Normal and Micro Inverse Calibration MML-A 4**

Base Calibration on 0C3170023008,  
Field Check on 0C4060525000

Base Calibration	Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.7	78.3	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.2	62.2

Micro Normal	62.9	62.9
Micro Inverse	48.3	48.3

Micro Normal and Micro Inverse Constants MML-A 4

Last Edited on 0C4060A13004,

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 N/A inches

Neutron Calibration MDN-B.J 387

Base Calibration on 0C31C0938008  
 Field Check on 0C4060537000

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	2956	91	3714	110
	32.635		33.764	

Field Calibrator at Base

	Calibrated (cps)	
Ratio	2214	3169
	0.699	

Field Check

	Calibrated (cps)	
Ratio	2202	3182
	0.692	

Neutron Constants MDN-B.J 387

Last Edited on 07-MAY-2012,00:51

Neutron Source Id P0204NN  
 Neutron Jig Number NEDC117  
 Epithermal Neutron No  
 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  
 Formation Fluid Salinity Source Constant Value  
 Formation Fluid Salinity 0.00 kppm  
 Barite Mud Correction Not Applied

FE Calibration MFE-B.J 352

Base Calibration on 0C31B0831004  
 Field Check on 0C4060523000

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.7	126.8
Base Check		281.5
Field Check		281.5

FE Constants MFE-B.J 352

Last Edited on 07-MAY-2012,00:52

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 07-MAY-2012,00:53

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	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 178

Base Calibration on 0C31B0B06000,  
Field Check on 0C4060521000

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
Channel 1	17.6	484.7	9.3	966.2
Channel 2	6.2	391.4	7.6	821.4
Channel 3	4.0	264.5	5.2	566.0
Channel 4	2.3	135.1	2.6	279.2

Array Temperature 77.0 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	12.3	3762.6
2	0.0	0.0	29.6	3466.9
3	0.0	0.0	27.3	3014.1
4	0.0	0.0	18.8	2064.7

Deep	0.0	0.0	15.9	1995.3
Medium	0.0	0.0	40.3	3955.3
Shallow	0.0	0.0	45.3	5081.7
Array Temperature		0.0		72.7 Deg F

Induction Constants MAI-A.A 178

Last Edited on 07-MAY-2012,03:16

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		Constant Value	
Temp. for Rm Corr.		N/A	
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	

High Resolution Temperature Calibration MAI-A.A 178

Field Calibration on 0C4030110004,

	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	68.00	68.00

High Resolution Temperature Constants MAI-A.A 178

Last Edited on 0C4060522000,

Pre-filter Length	11
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Caliper Calibration MPD-B 35

Base Calibration on 0C31C0A2C008  
Field Calibration on 0C4060527000

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	20688	3.99
2	30944	5.98
3	41312	7.97
4	50976	9.86
5	61184	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.99	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 0C31C0B00008  
Field Check on 0C406052B000

Density Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Base Calibration				
Reference 1	62298	31871	59556	30836
Reference 2	26887	2863	24941	2541
Field Check at Base				
	1142.9	1359.1		
Field Check				
	1145.7	1361.2		

PE Calibration	Base Calibration	Measured		Calibrated
		WS	WH	Ratio
	Background	204	1008	
	Reference 1	23049	62096	0.374
	Reference 2	7079	26739	0.267
	Field Check at Base			
		204.4	1008.1	
	Field Check			
		206.4	1011.8	

Density Constants MPD-B 35

Last Edited on 07-MAY-2012,00:52

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	1.13	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	

Spectral Gamma Calibration SGS-E.J 150

Base Calibration on 14-NOV-2011,14:14  
Field Calibration on 14-NOV-2011,14:09

Base Calibration					
Potassium Calibrator	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
	Background	79.9	23.1	2.2	0.8
Calibrator (Gross)	204.7	109.8	22.0	0.9	1.3
Calibrator (Net)	124.8	86.7	19.7	0.2	-0.1
Concentrations	K %	U ppm	Th ppm		
	5.8	0.0	0.0		
Uranium Calibrator					
Uranium Calibrator	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
	Background	79.9	23.1	2.2	0.8
Calibrator (Gross)	480.7	164.8	14.5	7.2	4.1
Calibrator (Net)	400.8	141.7	12.3	6.5	2.7
Concentrations	K %	U ppm	Th ppm		
	0.0	9.8	0.0		

**Thorium Calibrator**

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	397.7	137.8	11.3	6.3	15.0
Calibrator (Net)	317.8	114.7	9.0	5.6	13.6

Concentrations	K %	U ppm	Th ppm
	0.0	0.0	44.3

**Mixture Calibrator**

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	914.0	361.7	43.2	12.9	17.8
Calibrator (Net)	834.0	338.5	41.0	12.1	16.4

**Field Calibration**

**Gamma Ray**

	Measured	Calibrated (API)
Background	112	23
Calibrator (Gross)	1354	273
Calibrator (Net)	1242	250

**Mixture Calibrator**

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	79.9	23.1	2.2	0.8	1.4
Calibrator (Gross)	914.0	361.7	43.2	12.9	17.8
Calibrator (Net)	834.0	338.5	41.0	12.1	16.4

**Spectral Gamma Constants SGS-E.J 150**

Last Edited on 30-APR-2012,12:03

Mixture Calibrator Number	147-1	
Potassium Calibrator Number	148-1	
Uranium Calibrator Number	150-1	
Thorium Calibrator Number	149-1	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

**DOWNHOLE EQUIPMENT**

C:\Minimus 11\_03\_4044\Data\Mull Drilling Company, Inc. Bleumer # 1-13\Mull Drilling Company, Inc. Bleumer # 1-13 Run 1\_001.dta

MCB-A.A 11B Tension Cablehead  
 MCB-A.A 161 LG: 2.40 ft WT: 19.8 lb OD: 2.24 in

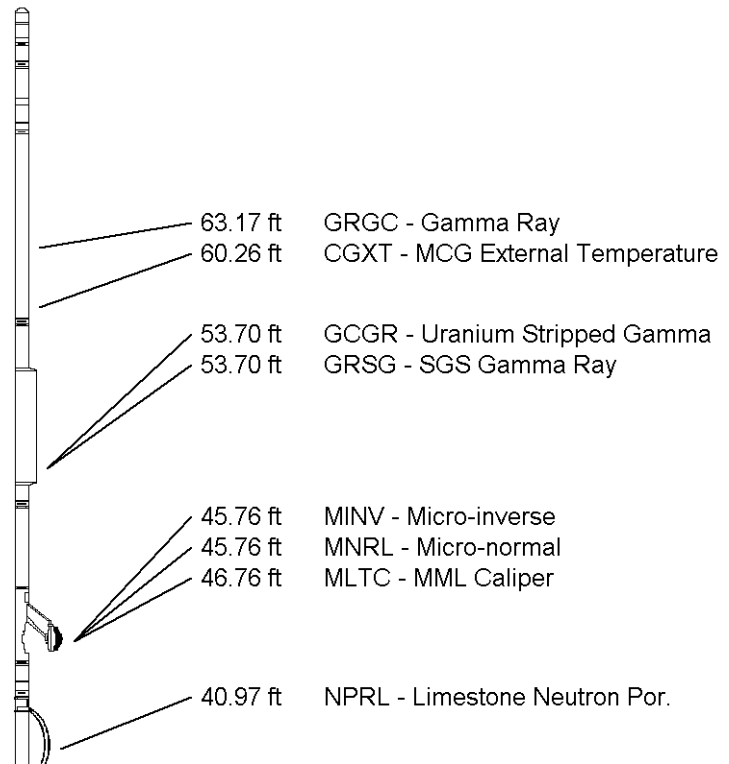
SHA-F Compact Swivel Head Adaptor  
 SHA-F 59 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

Compact Comms Gamma  
 MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Spectral Gamma Ray Sub  
 SGS-E.J 150 LG: 7.78 ft WT: 105.8 lb OD: 3.54 in

Compact Micro-log  
 MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron  
 MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in



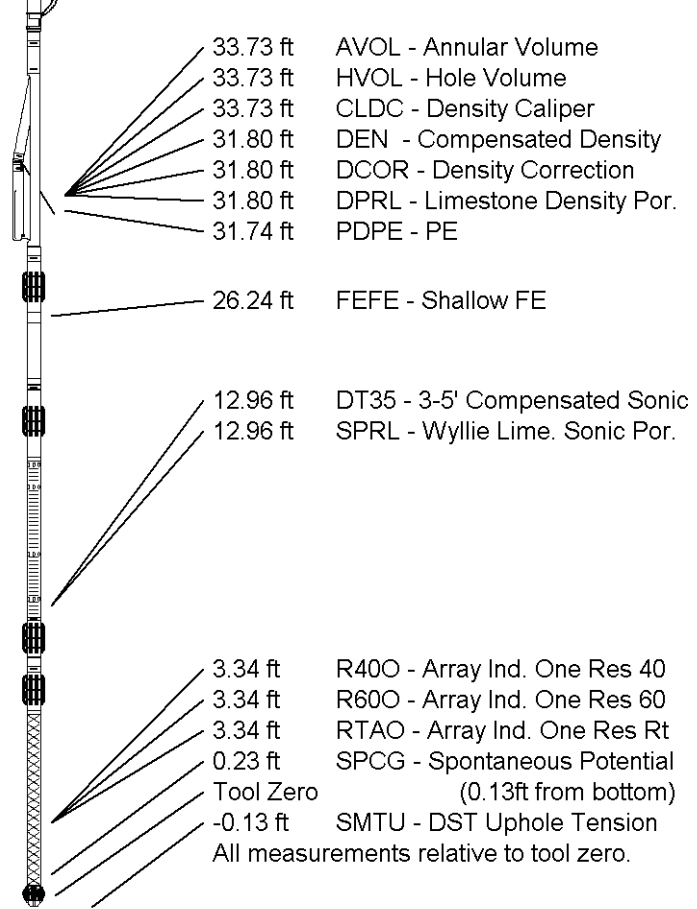
Compact Density/Caliper  
 MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric  
 MFE-B.J 352 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 178 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 73.59 ft Weight: 608.5 lb



COMPANY	MULL DRILLING COMPANY, INC.
WELL	BLEUMER # 1-13
FIELD	WILDCAT
PROVINCE/COUNTY	GRAY COUNTY
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2785.00	feet	First Reading	6139.00	feet
Elevation Drill Floor	2783.00	feet	Depth Driller	6200.00	feet
Elevation Ground Level	2772.00	feet	Depth Logger	6193.00	feet



SPECTRAL GAMMA RAY

