

299-W22-74 (A7878) Log Data Report

Borehole Information:

Borehole: 299-W22-74 (A7878)		Site: 216-S-20 Crib			
Coordinates (WA St Plane)		GWL¹ (ft): 170.3		GWL Date: 08/04/03	
North	East	Drill Date	TOC² Elevation (ft)	Total Depth (ft)	Type
133926.126 m	567547.903 m	12/82	685.22	174	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	1.95	8 5/8	8	5/16	+1.95	174

Borehole Notes:

The logging engineer measured the casing stickup using a steel tape. A caliper was used to measure the outside casing diameter. The caliper and inside casing diameter were measured using a steel tape, rounded to the nearest 1/16 in.; casing thickness was calculated. Total depth (174 ft) and the date drilled are derived from Hanford Wells (Chamness and Merz 1993). However, total logging depth was 169.0 ft, 1.3 ft above groundwater. Because of waste management issues, Stoller is not permitted to log below the water table. The logging engineer measured the depth to water. Coordinates and top of casing (TOC) elevation are derived from HWIS³. Logging data acquisition is referenced to the TOC.

Logging Equipment Information:

Logging System: Gamma 1E	Type: SGLS (70%) SN: 34TP40587A
Calibration Date: 07/03	Calibration Reference: GJO-2003-468-TAR
	Logging Procedure: MAC-HGLP 1.6.5, Rev. 0

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	3 Repeat		
Date	08/04/03	08/11/03	08/11/03		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	169.0	101.0	82.0		
Finish Depth (ft)	83.0	83.0	2.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	1.0		
ft/min	N/A ⁴	N/A	N/A		
Pre-Verification	AE012CAB	AE015CAB	AE015CAB		
Start File	AE012000	AE015000	AE015019		
Finish File	AE012086	AE015018	AE015099		

Log Run	1	2 Repeat	3 Repeat		
Post-Verification	AE012CAA	AE015CAA	AE015CAA		
Depth Return Error (in.)	-1	N/A	-1		
Comments	Fine-gain adjustment made after file -065.	No fine-gain adjustment.	No fine-gain adjustment.		

Logging Operation Notes:

Spectral gamma logging was performed in this borehole on August 8, and 11, 2003. Logging was conducted with a centralizer on the sonde and measurements are referenced to TOC. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	09/15/03	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for 0.3125-in.-thick casing was applied throughout the borehole.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1EJul03.xls using an efficiency function determined from annual calibrations. Dead time and water corrections were not necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclides (^{137}Cs and ^{60}Co) detected in the borehole, naturally occurring radionuclides (^{40}K , ^{238}U , ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. A comparison plot of Radionuclide Logging System (RLS) data collected in 1992 and current SGLS data is provided. A repeat log section of SGLS data is also included.

Results and Interpretations:

^{137}Cs and ^{60}Co were the man-made radionuclides detected in this borehole. ^{137}Cs was detected at a few sporadic locations in the borehole near its MDL of approximately 0.2 pCi/g. ^{60}Co was detected between 29 and 40 ft. The maximum concentration is 0.5 pCi/g at 38 ft in depth. A comparison of RLS and SGLS data shows no changes in radionuclide concentrations since 1992.

A notable change is observed in the KUT and total gamma logs at a depth of 60 ft. It is not known if this change reflects the borehole construction or lithology.

The repeat section indicated good agreement of the naturally occurring KUT.

References:

Chamness and Merz, 1993. *Hanford Wells*, PNL-8800 UC-903, Pacific Northwest Laboratory, Richland, Washington.

¹ GWL – groundwater level

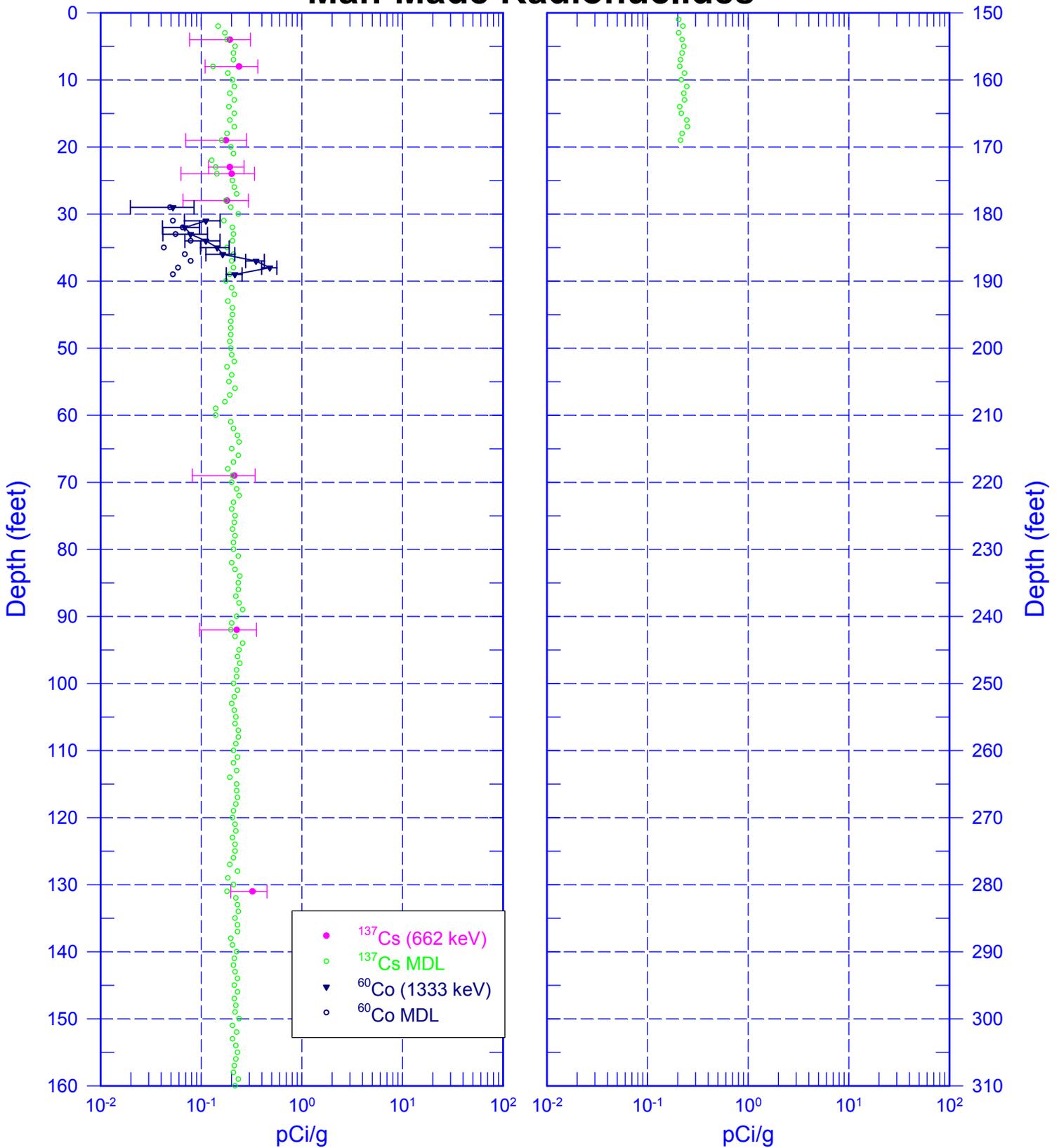
² TOC – top of casing

³ HWIS – Hanford Well Information System

⁴ N/A – not applicable

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Man-Made Radionuclides

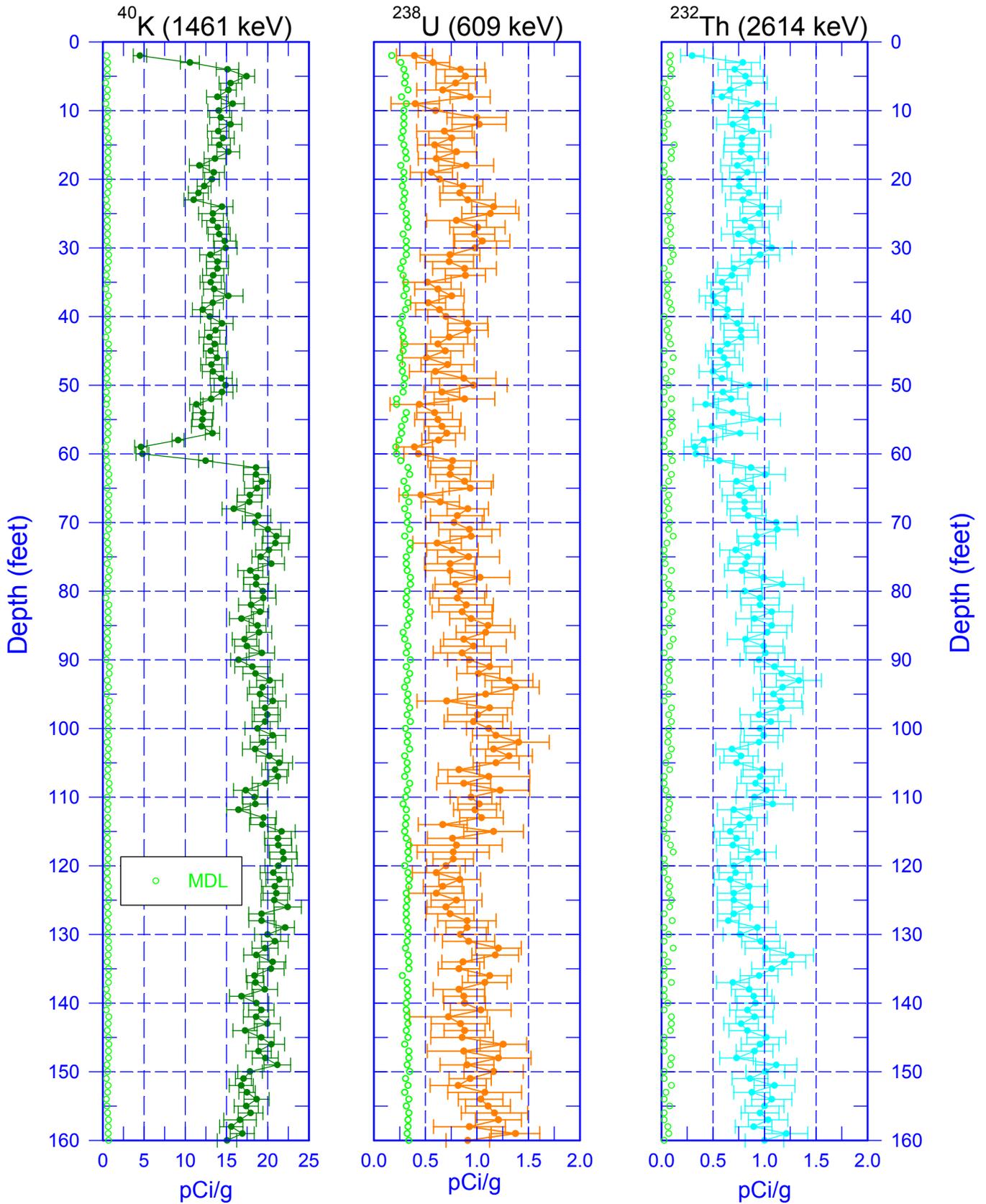


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/11/03

299-W22-74 (A7878) Natural Gamma Logs



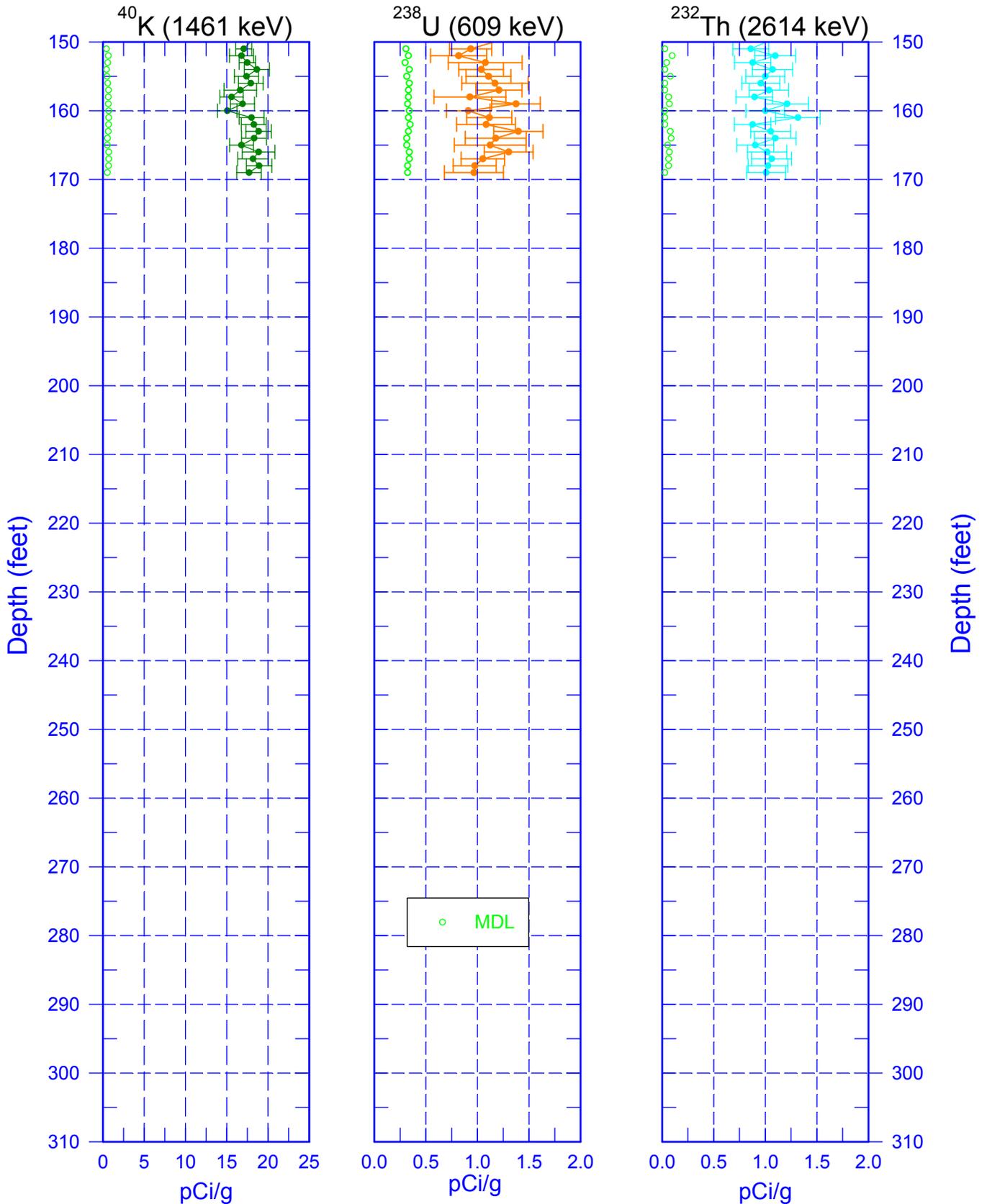
Zero Reference = Top of Casing

Depth scale: 1" = 20 ft

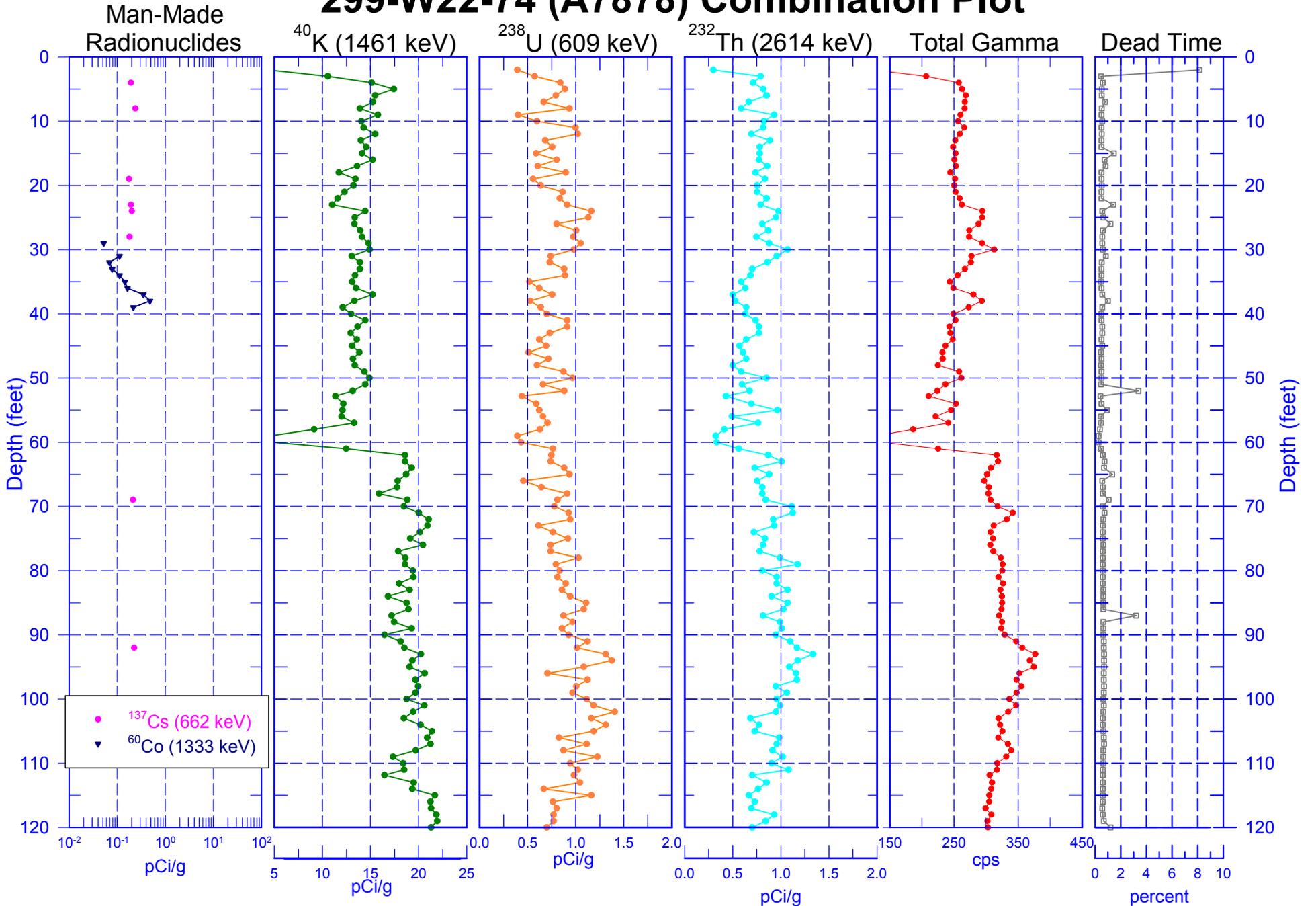
Last Log Date - 08/11/03

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Natural Gamma Logs



299-W22-74 (A7878) Combination Plot

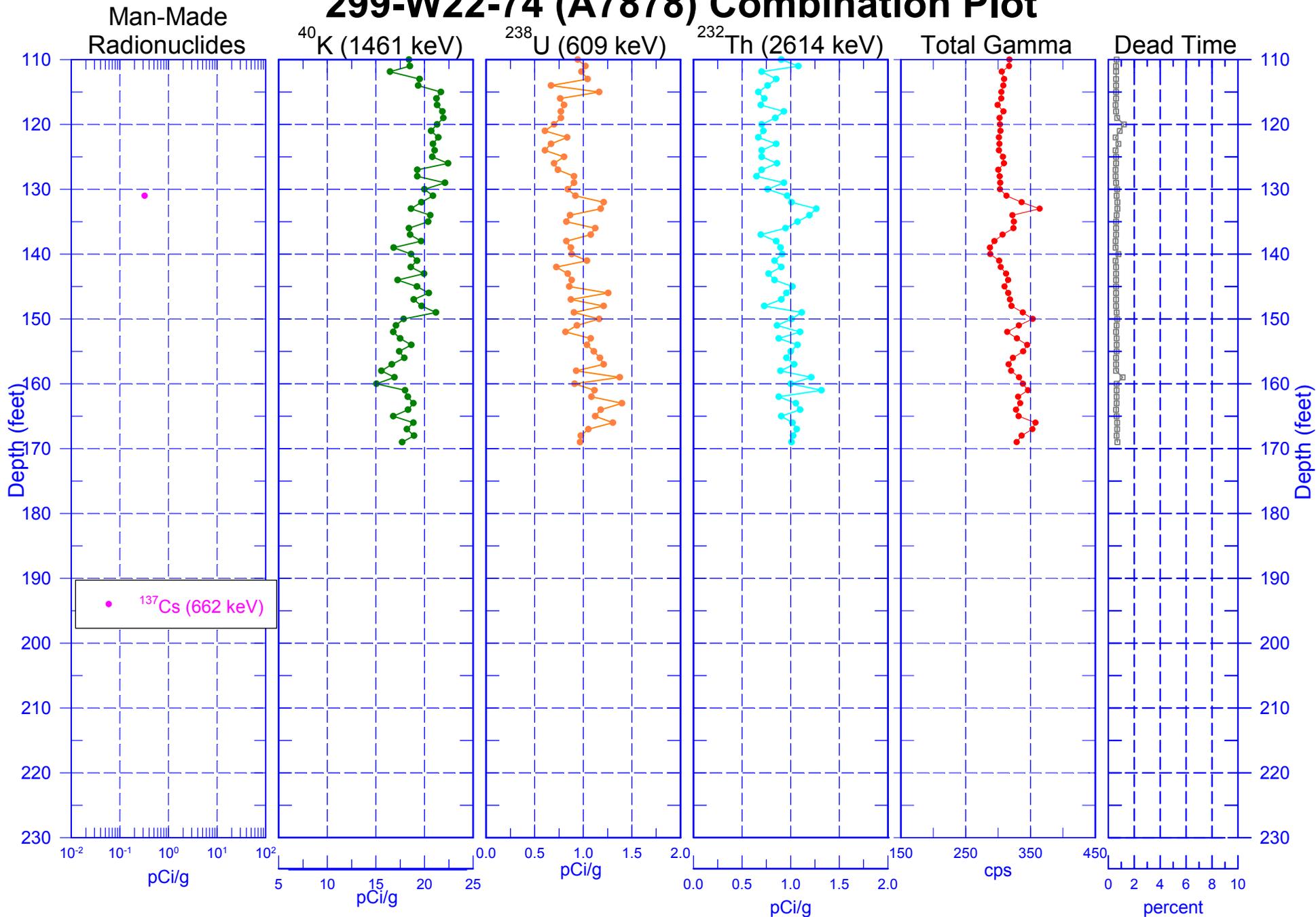


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Logging Date - 08/11/03

299-W22-74 (A7878) Combination Plot



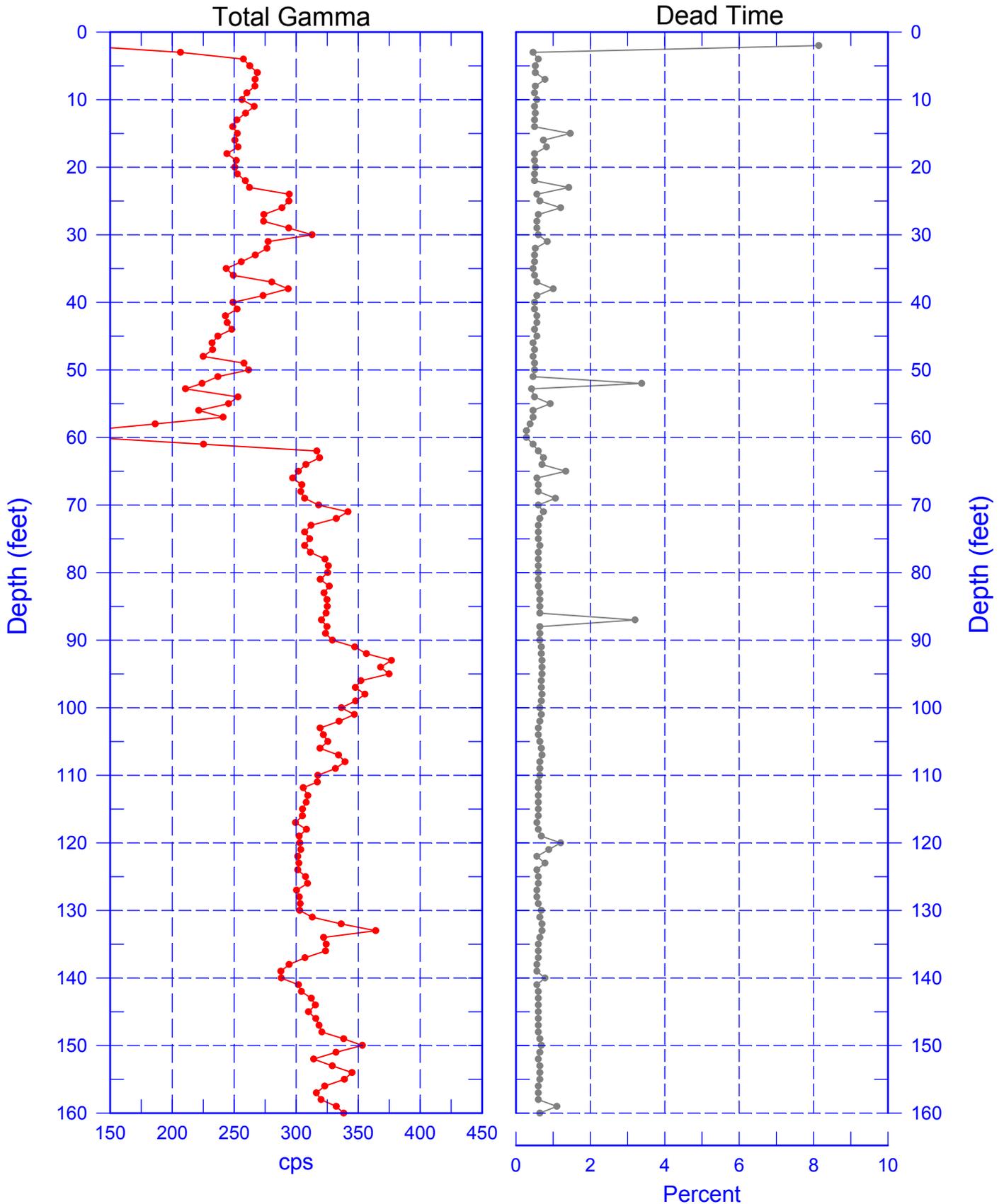
Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Logging Date - 08/11/03

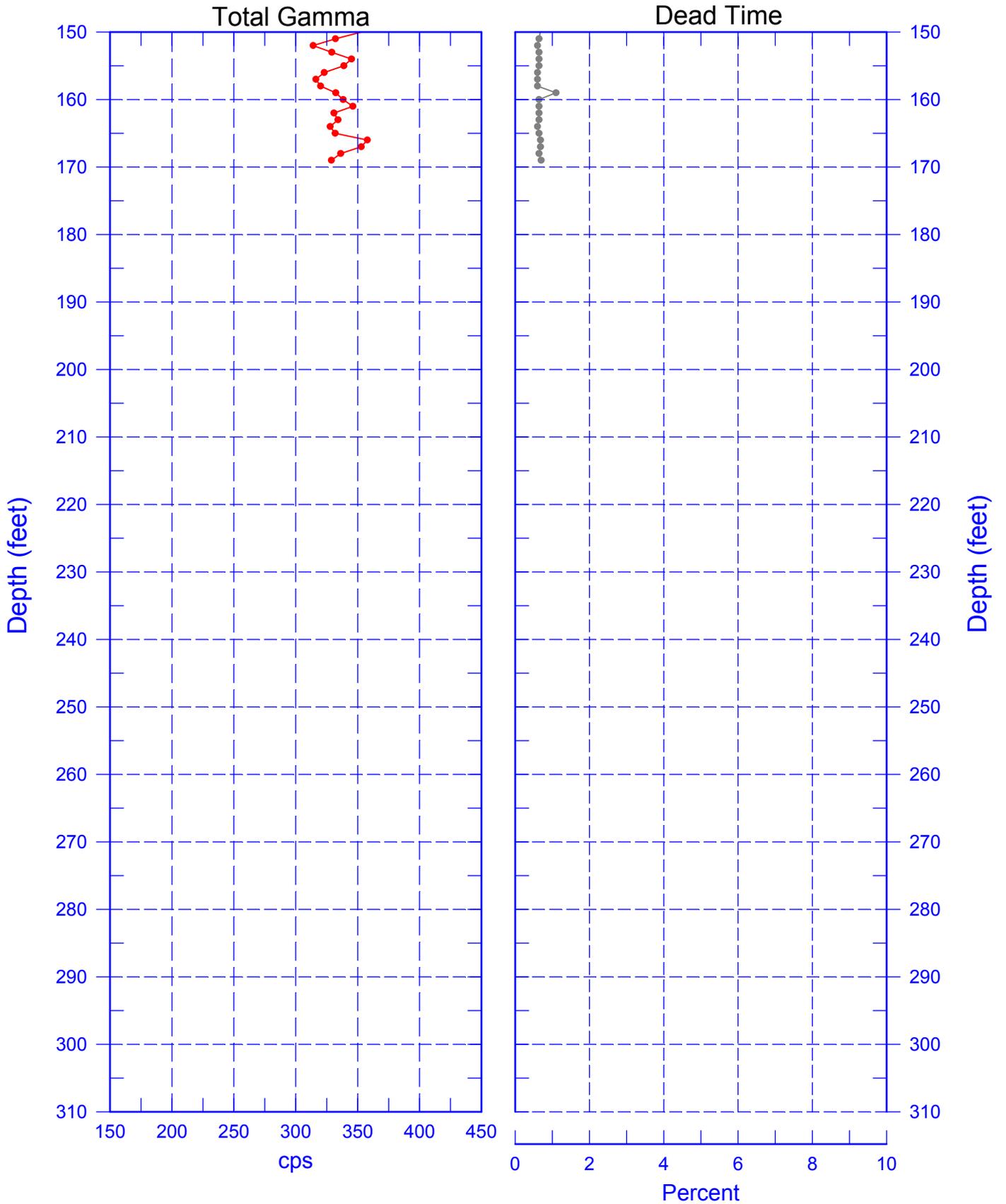
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Total Gamma & Dead Time



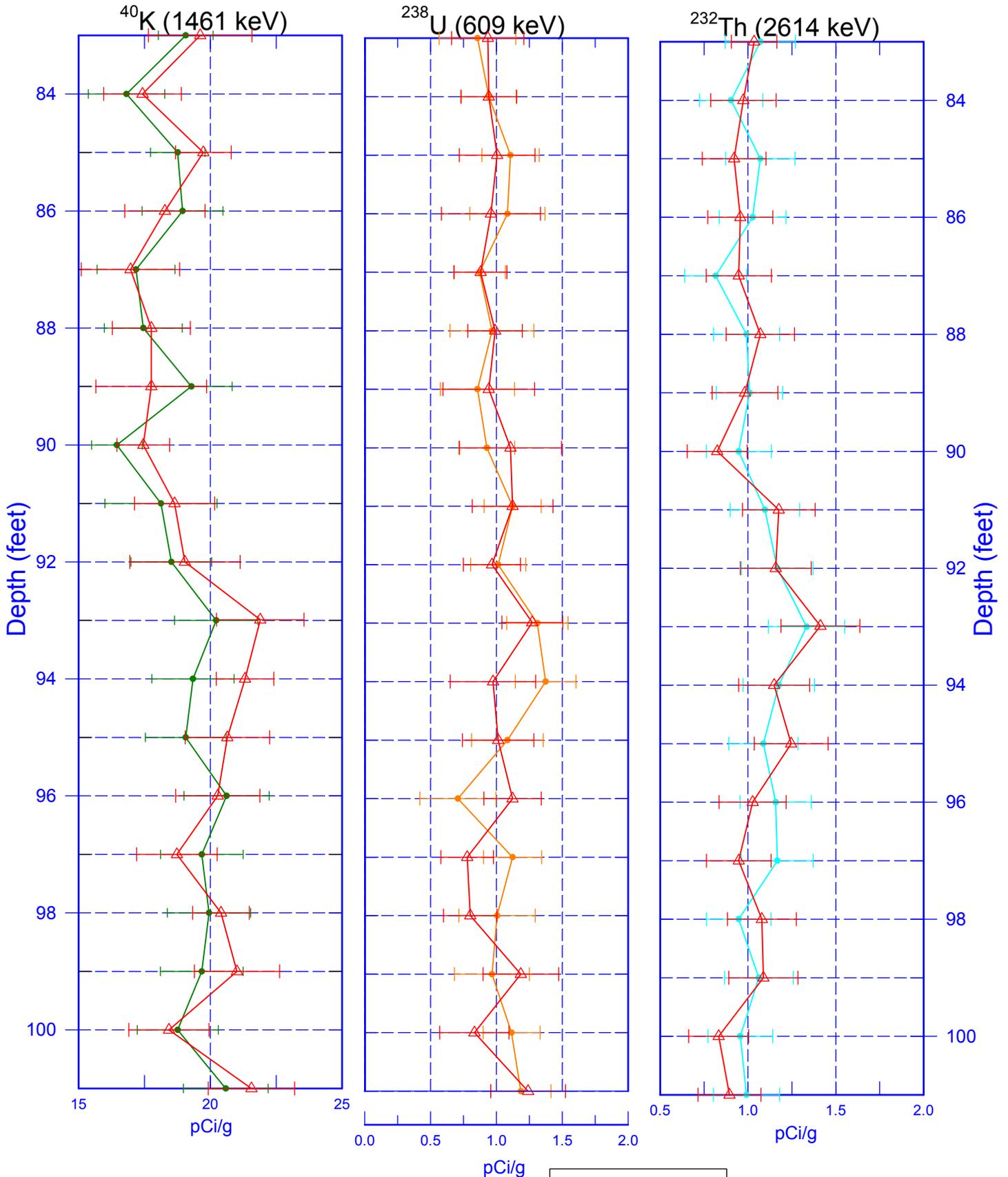
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Total Gamma & Dead Time



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Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

△ Repeat data

Last Log Date - 08/11/03