Stoller
Hanford Office

DOE-EM/GJ847-2005

299-W15-50 (C4302)
Log Data Report

Borehole Information:

Borehole:	299-W15-50 (C4302)		Site:	216-Z-7 Crib	
Coordinates (WA St Plane)		GWL[1] (ft) :	None	GWL Date:	None
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
Not available	Not available	02/05	Not available	341	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	0.5	11 3/4	10 3/4	1/2	0.5	210
Threaded Steel	3.0	8 5/8	7 5/8	1/2	3.0	341

Borehole Notes:

The logging engineer measured the casing and stickup using a steel tape. Measurements were rounded to the nearest 1/16 in.

Logging Equipment Information:

Logging System:	Gamma 4E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	05/04	Calibration Reference:	DOE-EM/GJ692-2004	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	3	4	5 Repeat
Date	01/18/05	01/19/05	01/19/05	02/10/05	02/10/05
Logging Engineer	Spatz	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	209.5	31.5	7.5	335.0	230.5
Finish Depth (ft)	8.5	8.5	0.5	208.5	215.5
Count Time (sec)	100	100	100	100	100
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
MSA Interval (ft)	1.0	1.0	1.0	1.0	1.0
ft/min	N/A[2]	N/A	N/A	N/A	N/A
Pre-Verification	DE571CAB	DE581CAB	DE581CAB	DE651CAB	DE651CAB
Start File	DE571000	DE581000	DE581024	DE651000	DE651128
Finish File	DE571201	DE581023	DE581031	DE651127	DE651143
Post-Verification	DE571CAA	DE581CAA	DE581CAA	DE651CAA	DE651CAA
Depth Return Error	- 1	N/A	0	N/A	- 3

Log Run	1	2 Repeat	3	4	5 Repeat
(in.)					
Comments	No fine gain adjustment.	No fine gain adjustment.	No fine gain adjustment.	No fine gain adjustment.	No fine gain adjustment.

Logging Operation Notes:

Logging was conducted January 18 and 19, 2005, through a single string of 11-¾-in. in outside depth (OD) casing to a depth of 209.5 ft. Additional logging occurred February 10, 2005, after the borehole had been deepened to approximately 341 ft. The logging in February was conducted through a single string of 8-5/8-in. OD casing to a depth of 335 ft. All logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the ground surface. Two repeat sections were collected in this borehole to evaluate system performance. Before logging on January 18, the borehole was swabbed and elevated readings were indicated that were attributed to the existence of radon in the borehole by the Radiological Control Technician (RCT). The borehole was again swabbed February 18 from the ground surface to 200 ft and no contamination was detected.

Analysis Notes:

Analyst:	Henwood	Date:	03/10/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

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 0.5-in.-thick casing was applied to the log data.

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 G4EJul04.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Dead time corrections are applied to the data where it exceeds 4.7 percent. A correction for water was applied to the data below 212 ft.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclides (^{137}Cs and ^{125}Sb) 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. Repeat log sections for natural radionuclides are also included.

Results and Interpretations:

^{137}Cs was the man-made radionuclide detected in this borehole. ^{137}Cs was detected at a few sporadic locations at concentrations near the MDL of 0.2 pCi/g.

The repeat sections generally indicates good agreement of the naturally occurring radionuclides. Enhanced radon was observed in the spectra acquired during log run 1 on January 18 as evidenced by the comparison of the 1764 keV peak acquired during log run 2 on the next day.

References:

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, Pacific Northwest Laboratory, Richland, Washington.

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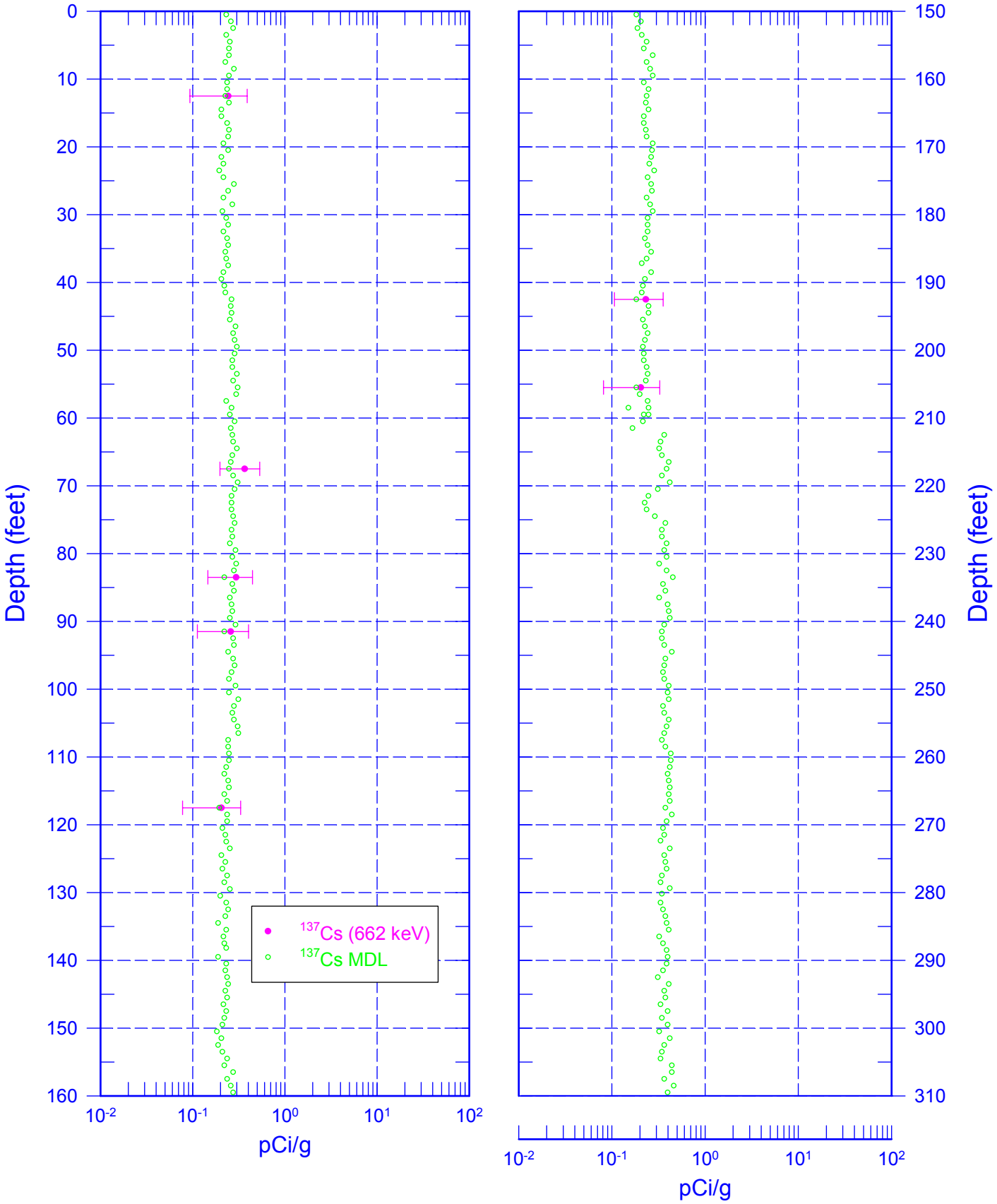
[1] GWL – groundwater level

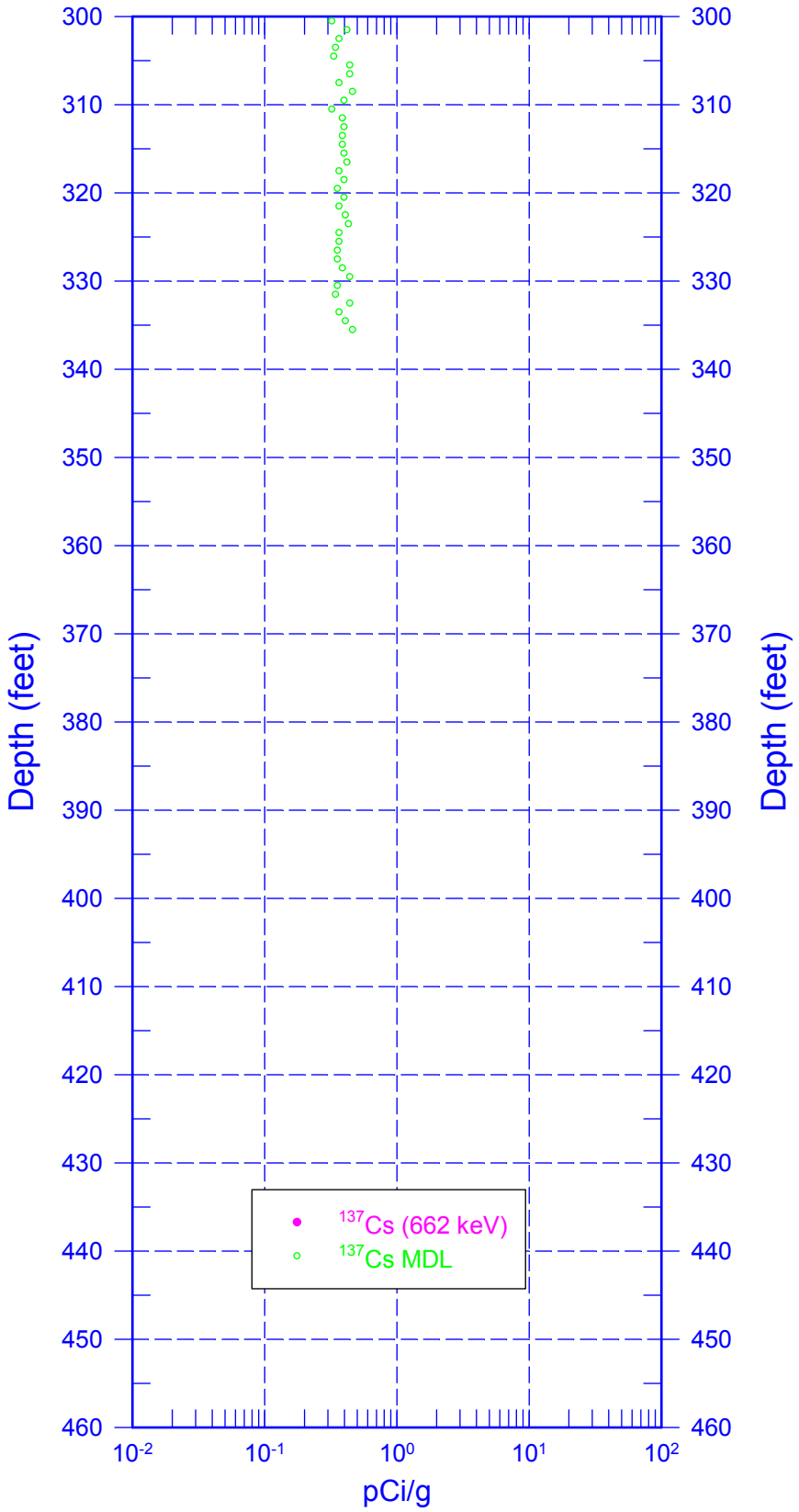
299-W15-50 (C4302)
Man-Made Radionuclides



Zero Reference - Ground Surface

Last Log Date - 02/10/05

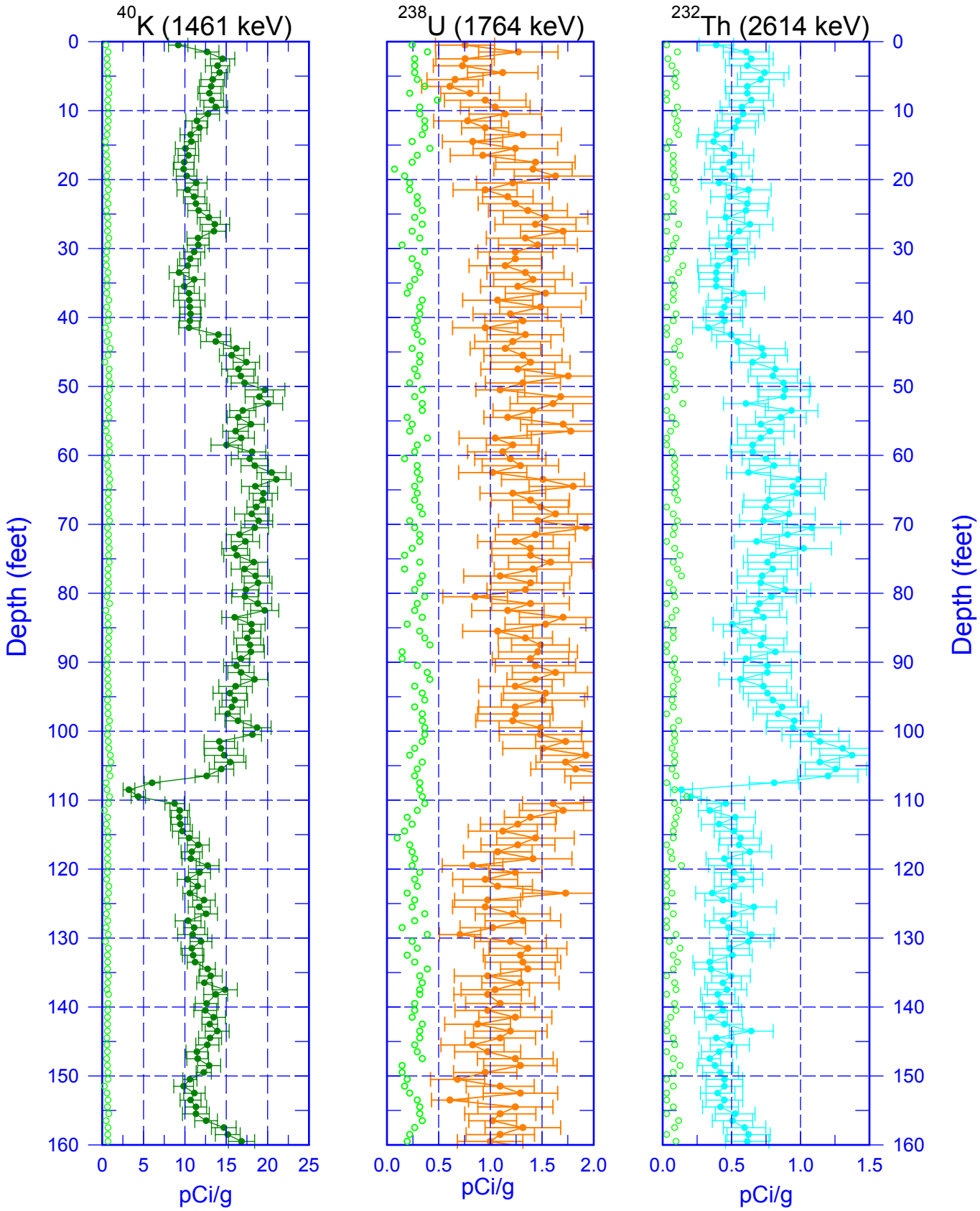
299-W15-50 (C4302)
Man-Made Radionuclides



Zero Reference - Ground Surface

Last Log Date - 02/10/05

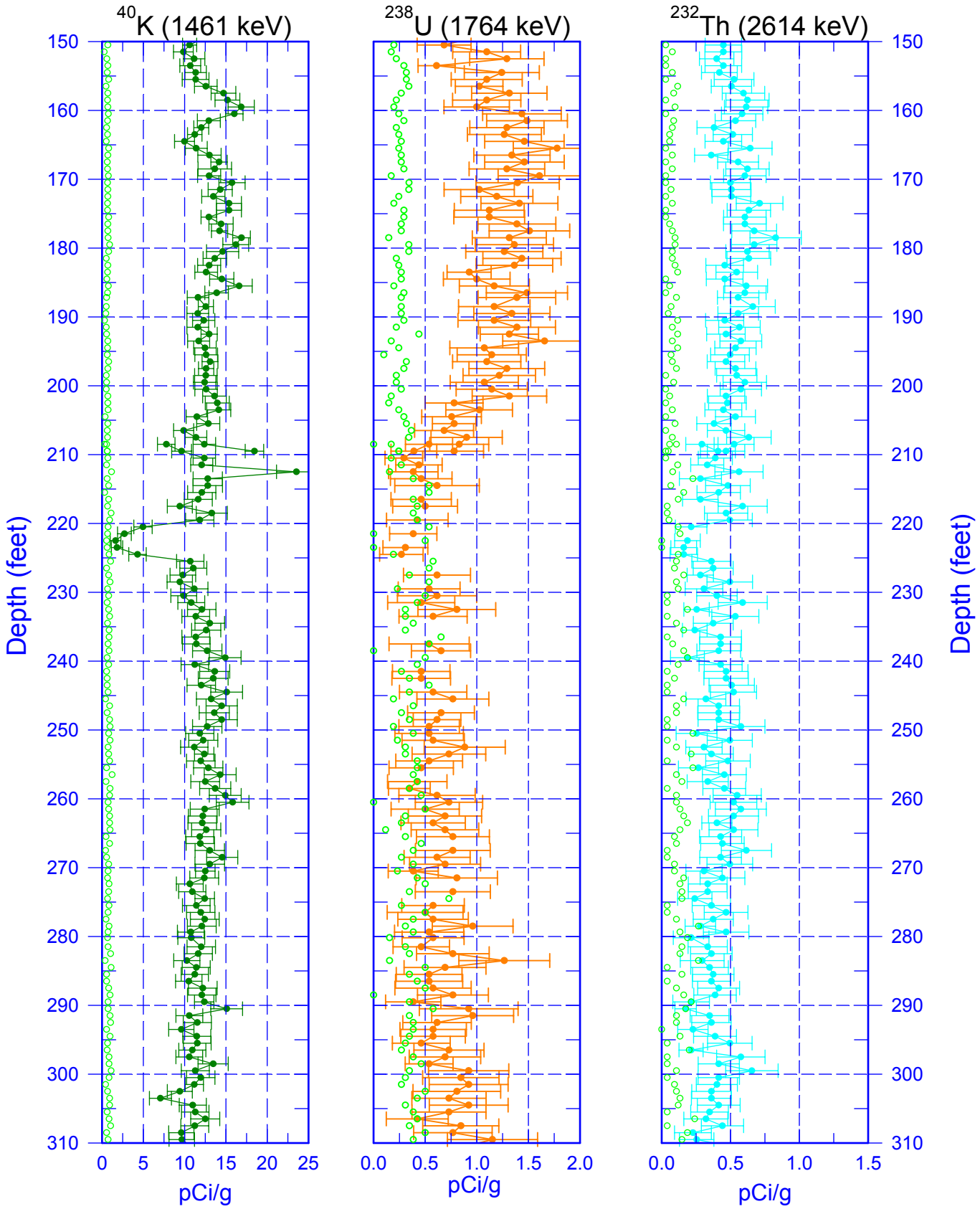
299-W15-50 (C4302)
Natural Gamma Logs



Zero Reference = Ground Surface

Last Log Date - 02/10/05

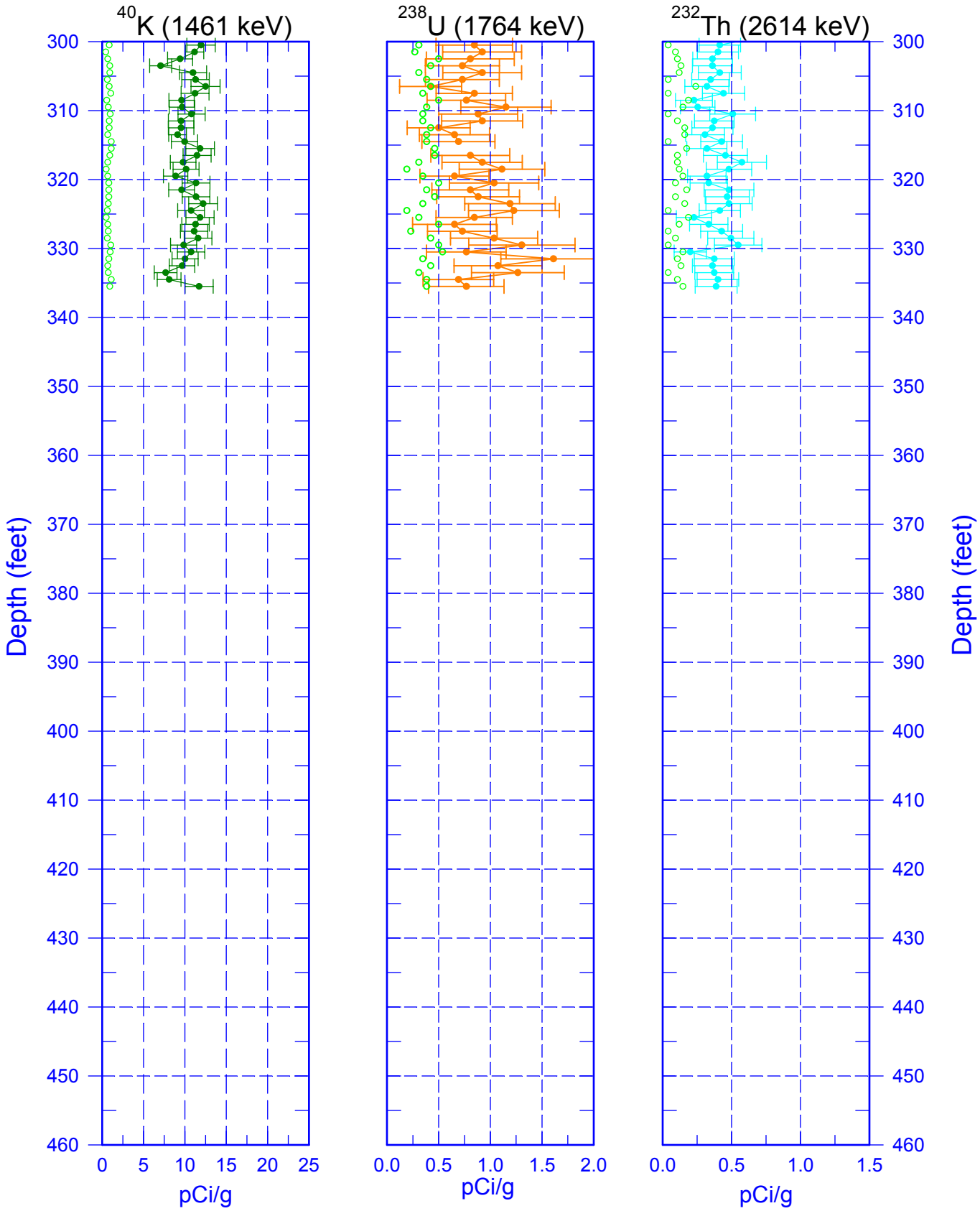
299-W15-50 (C4302)
Natural Gamma Logs



Zero Reference - Ground Surface

Last Log Date - 02/10/05

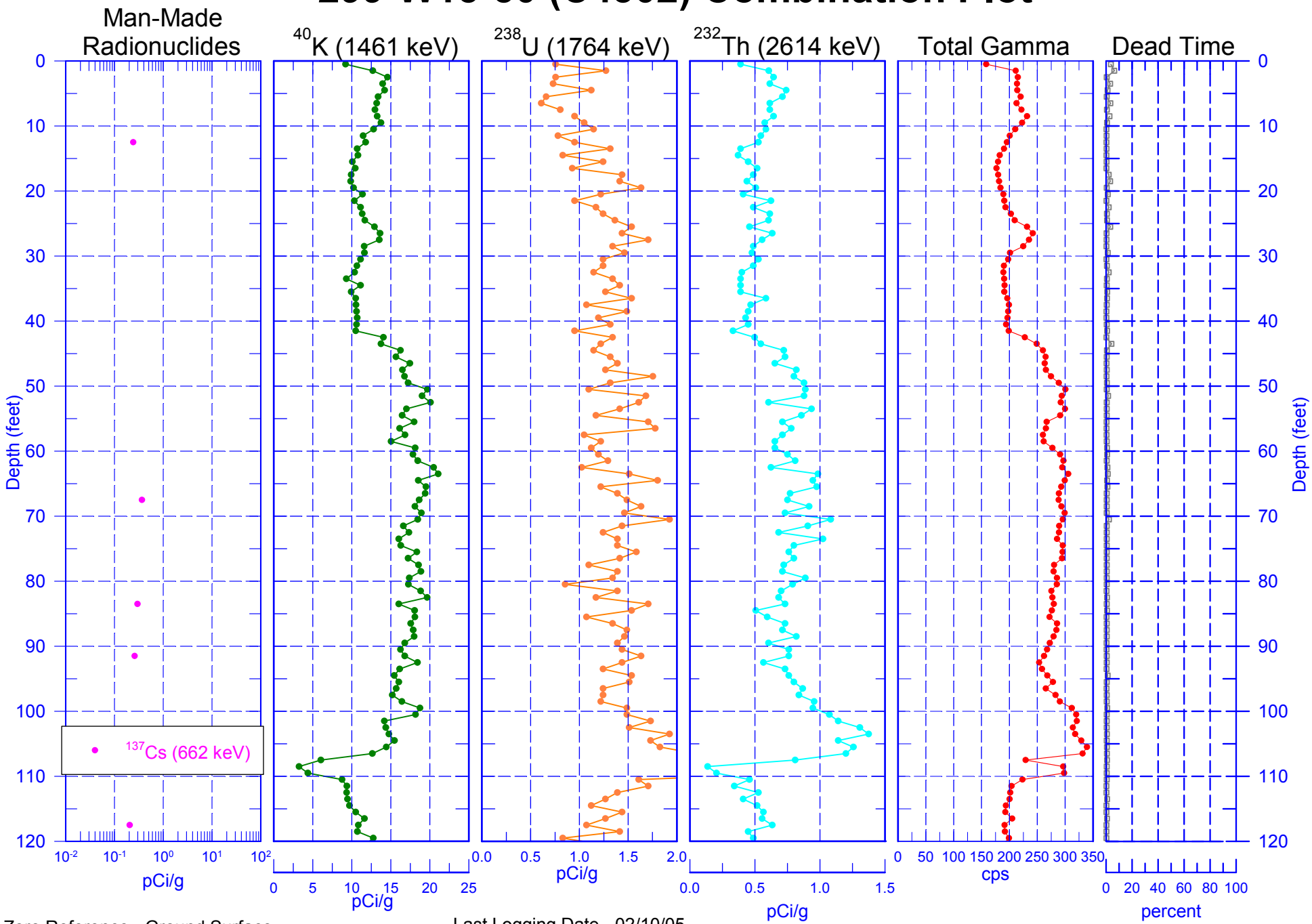
299-W15-50 (C4302)
Natural Gamma Logs



Zero Reference - Ground Surface

Last Log Date - 02/10/05

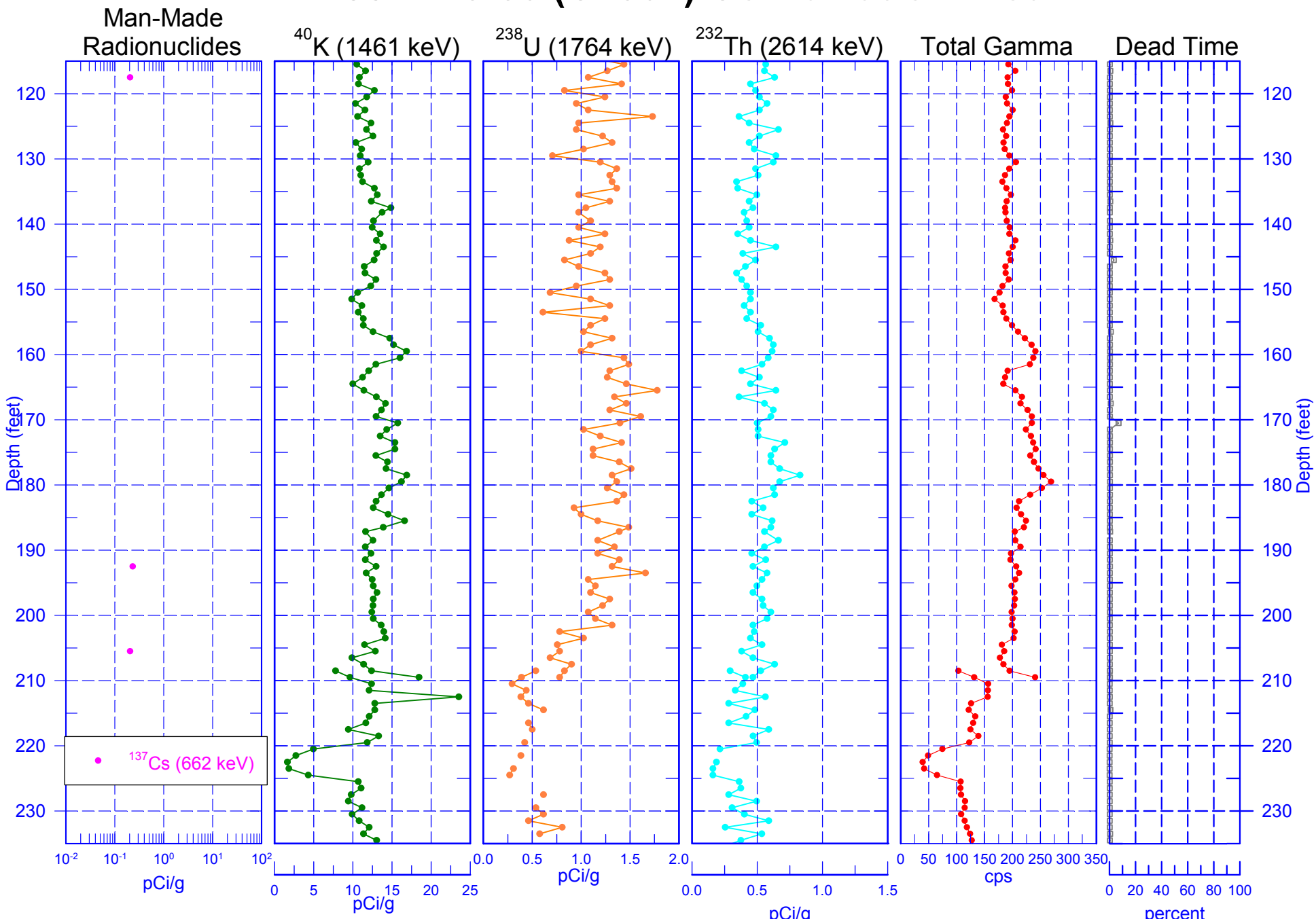
299-W15-50 (C4302) Combination Plot



Zero Reference - Ground Surface

Last Logging Date - 02/10/05

299-W15-50 (C4302) Combination Plot



Zero Reference - Ground Surface

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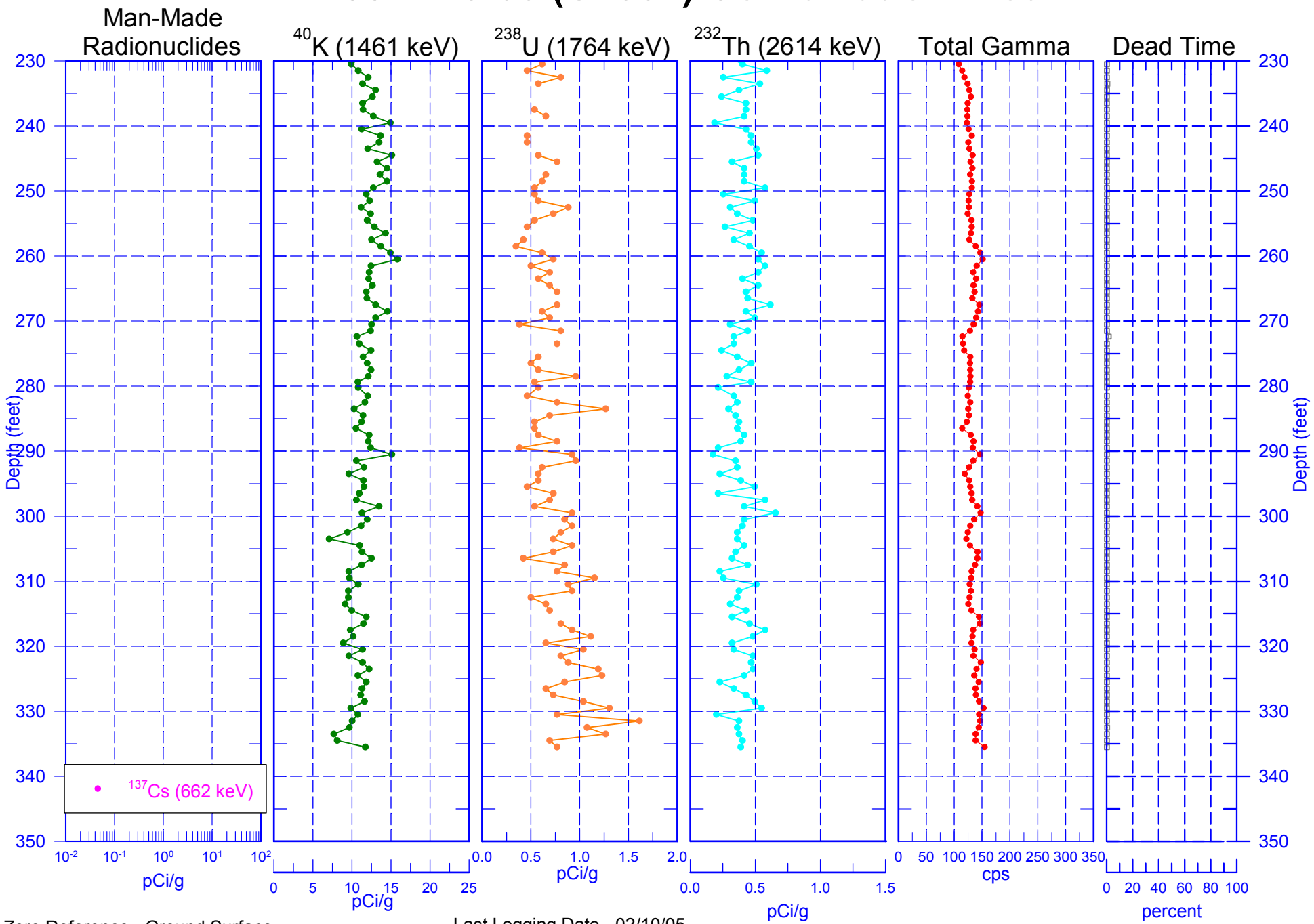
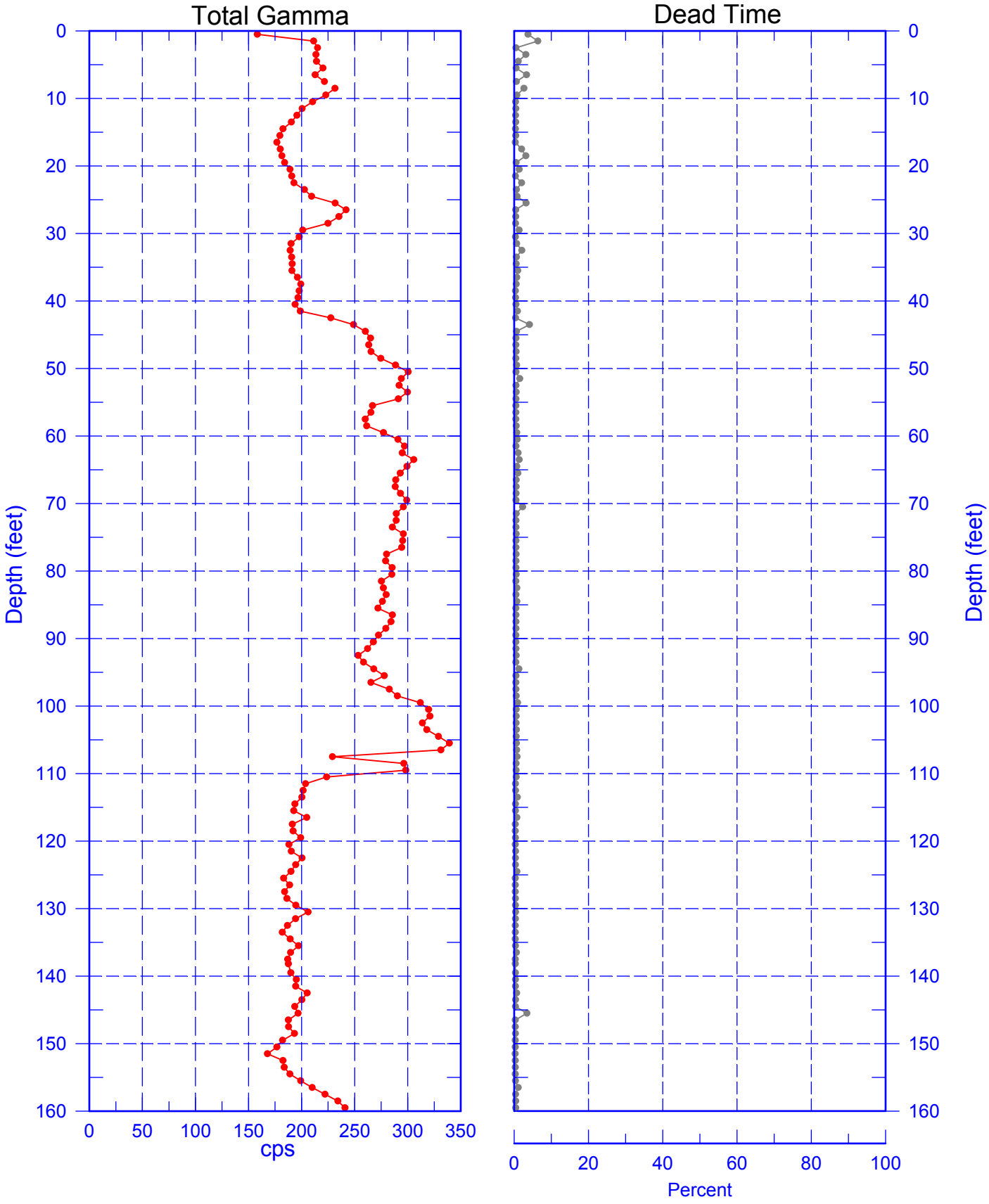


Zero Reference - Ground Surface

Last Logging Date - 02/10/05

299-W15-50 (C4302)
Total Gamma & Dead Time



Reference - Ground Surface

Last Log Date - 02/10/05

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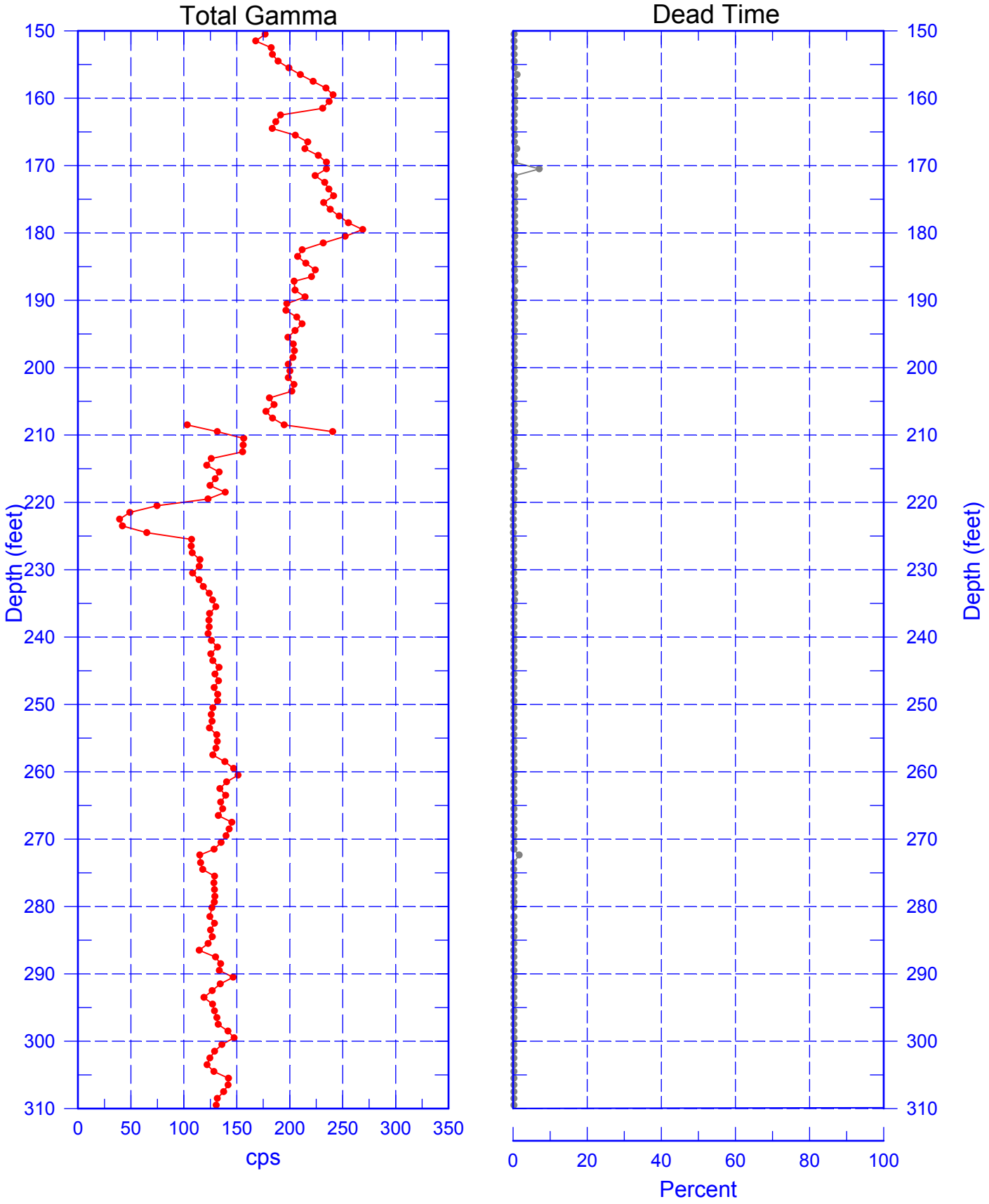
Total Gamma & Dead Time



Reference - Ground Surface

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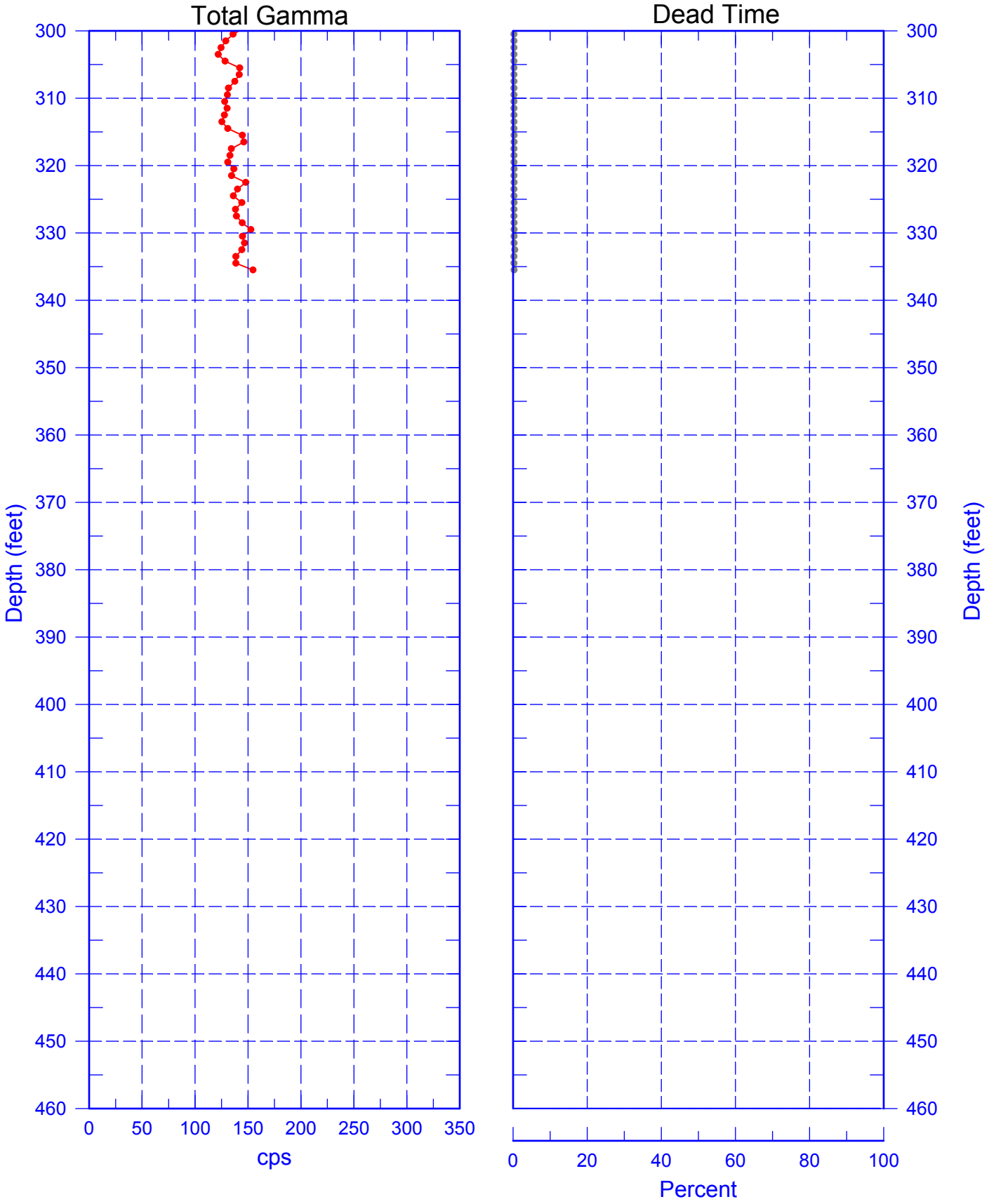
Total Gamma & Dead Time



Reference - Ground Surface

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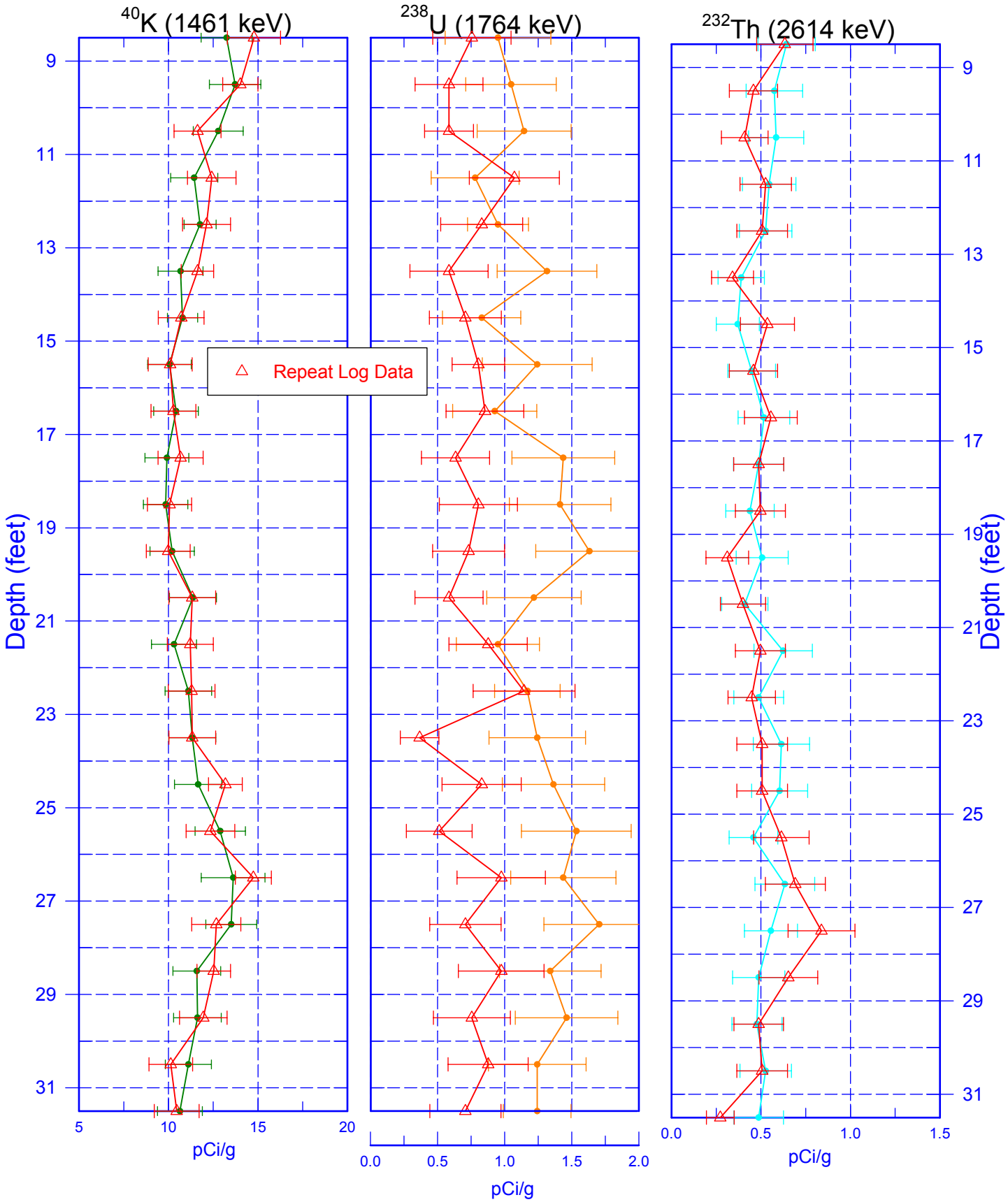
299-W15-50 (C4302)

Repeat Section of Natural Gamma Logs



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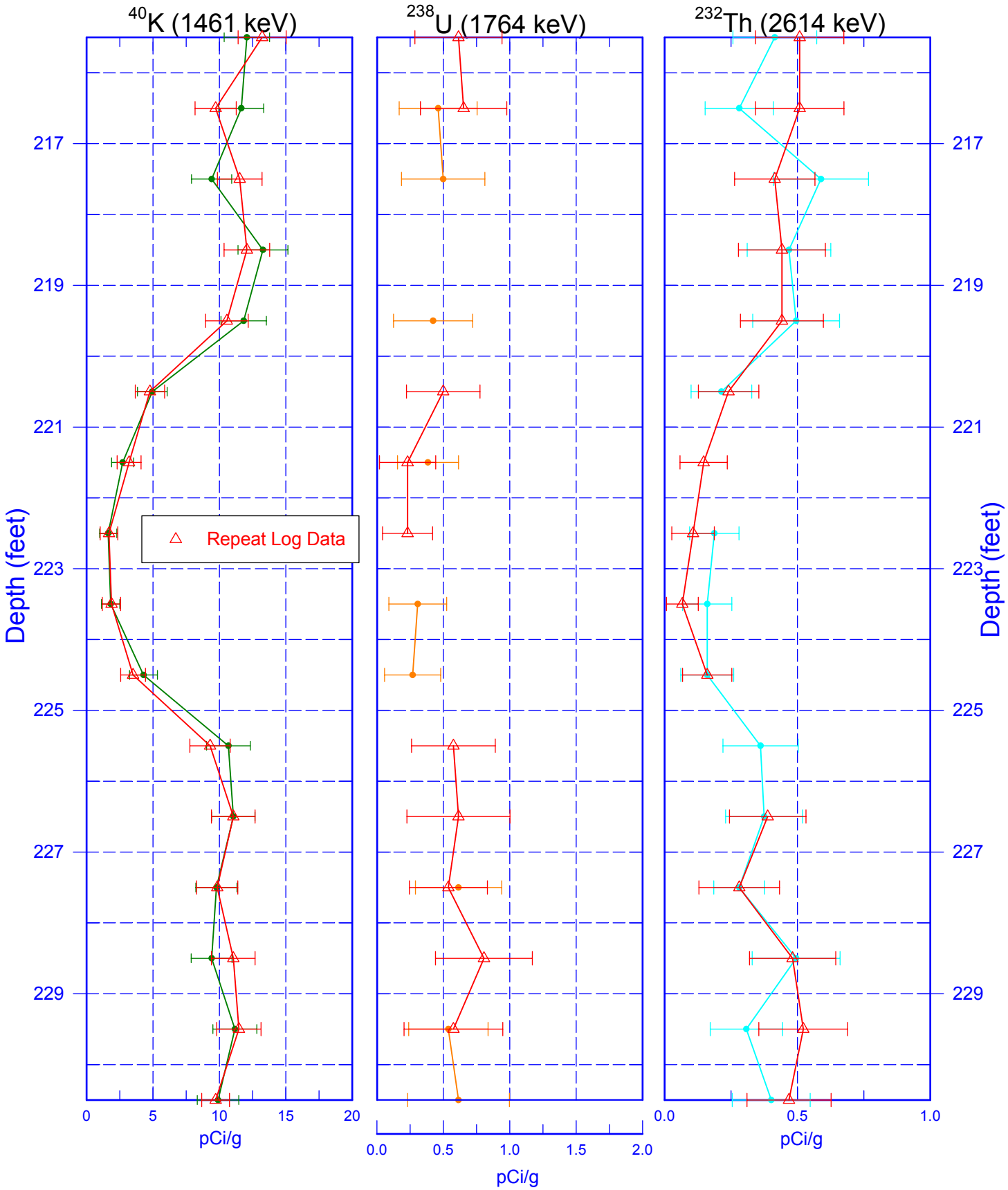
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Last Log Date - 02/10/05