

299-E13-54 (A5869)
Log Data Report

Borehole Information:

Borehole: 299-E13-54 (A5869)		Site: 216-B-52 Trench			
Coordinates (WA St Plane)		GWL¹ (ft): None		GWL Date: None	
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
134280.885	573298.297	08/82	746.33	50	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.2	8 5/8	8	5/16	2.2	50

Borehole Notes:

The logging engineer measured the 8-in. casing and stickup using a steel tape. Measurements were rounded to the nearest 1/16 in. Casing depth is derived from *Hanford Wells* (Chamness and Merz 1993), which also reports grout in the annular space outside the 8-in casing.

Logging Equipment Information:

Logging System: Gamma 1E	Type: SGLS (70%) SN: 34TP40587A
Calibration Date: 10/04	Calibration Reference: DOE-EM/GJ713-2004
Logging Procedure: MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat		
Date	11/03/04	11/03/04		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	49.0	34.0		
Finish Depth (ft)	3.0	29.0		
Count Time (sec)	100	100		
Live/Real	R	R		
Shield (Y/N)	N	N		
MSA Interval (ft)	1.0	1.0		
Ft/min	N/A ²	N/A		
Pre-Verification	AE019CAB	AE019CAB		
Start File	AE020000	AE020047		
Finish File	AE020046	AE020052		
Post-Verification	AE020CAA	AE020CAA		

Log Run	1	2 Repeat			
Depth Return Error (in.)	0	0			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate system performance. Before logging, the borehole was swabbed and no contamination was detected.

Analysis Notes:

Analyst:	Henwood	Date:	01/05/05	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 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 G1EOct04.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 dead time exceeds 6.4 percent; no corrections for water were necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (¹³⁷Cs) detected in the borehole, naturally occurring radionuclides (⁴⁰K, ²³⁸U, ²³²Th [KUT]), a combination of man-made, KUT, 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 man-made and natural radionuclides are also included. A comparison log plot of data acquired using the Radionuclide Logging System (RLS) in 1999 by Waste Management Federal Services NW with the current log data is provided.

Results and Interpretations:

¹³⁷Cs and ⁶⁰Co were the man-made radionuclides detected in this borehole. ¹³⁷Cs was detected from the ground surface to 12 ft and from 21 to 49 ft. The maximum concentration was measured at approximately 1800 pCi/g at 24 ft.

⁶⁰Co was detected at 38 and 42 ft at a maximum concentration of 0.6 pCi/g.

The repeat sections indicate good agreement of the man-made and naturally occurring radionuclides.

A comparison of RLS data collected in 1999 with the current SGLS data suggests no movement of contaminants. ¹²⁵Sb, observed in 1999, was not detected with the SGLS.

References:

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

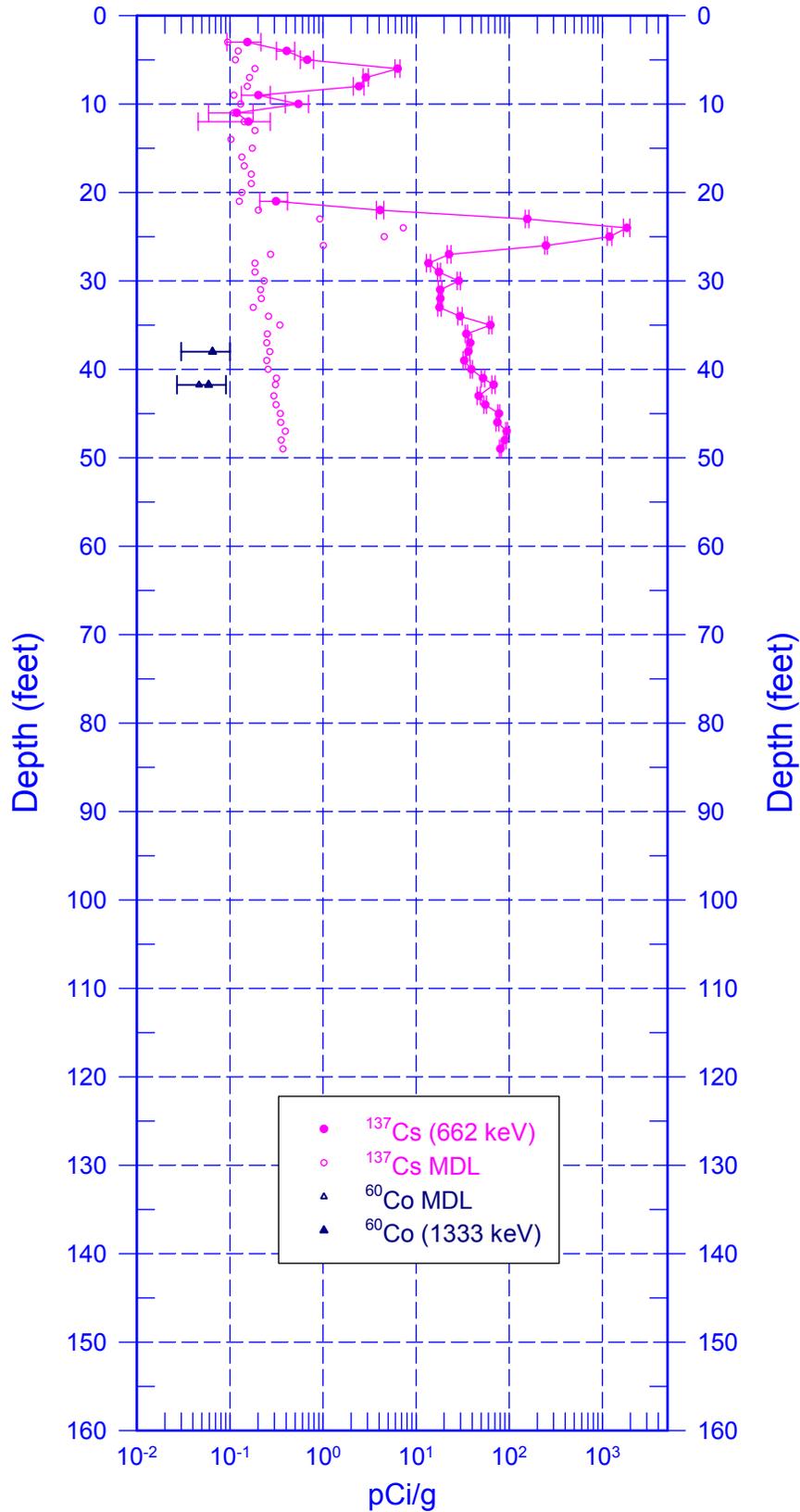
Ledgerwood, R.K., 1993. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

¹ GWL – groundwater level

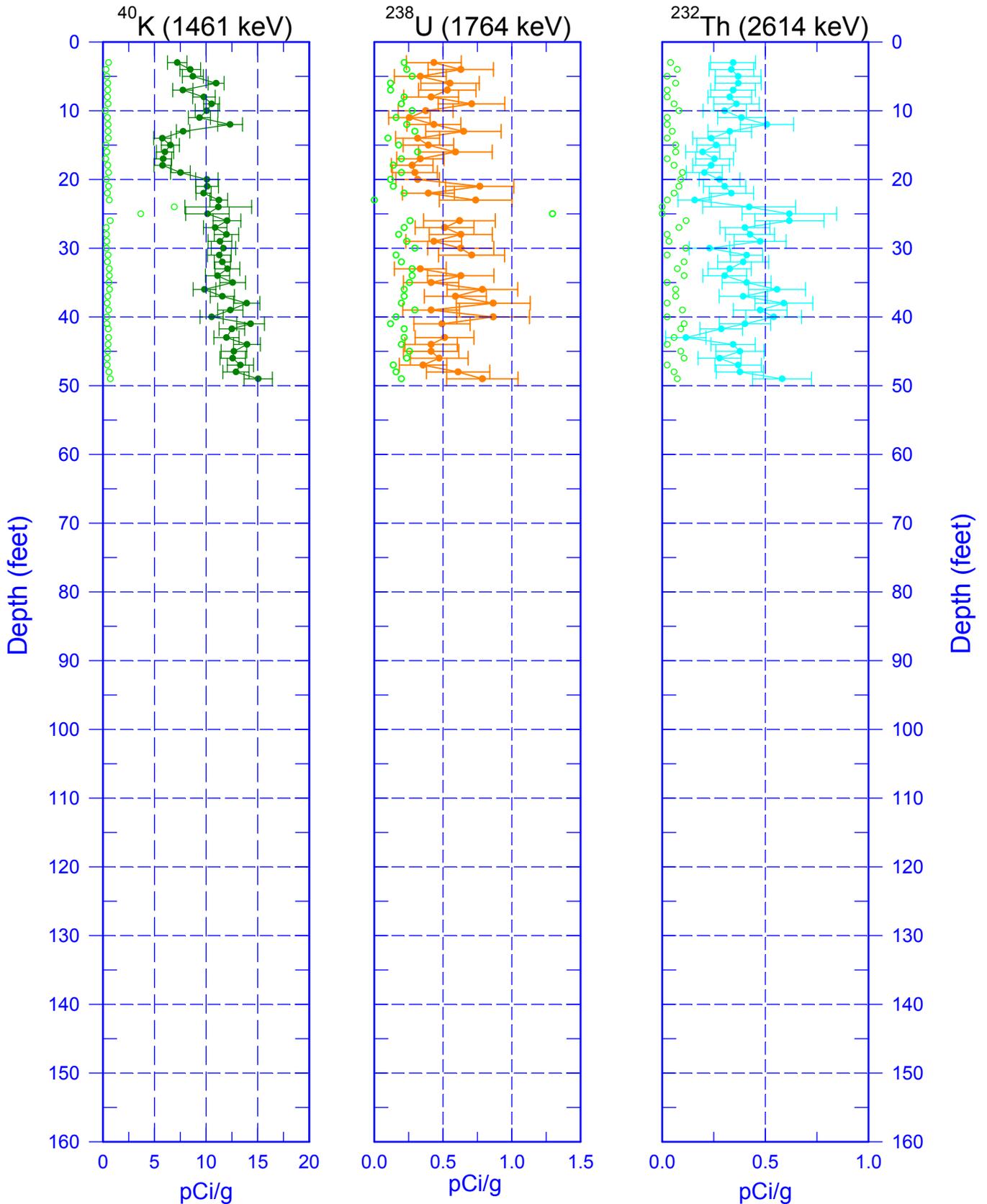
² N/A – not applicable

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Man-Made Radionuclides



299-E13-54 (A5869) Natural Gamma Logs

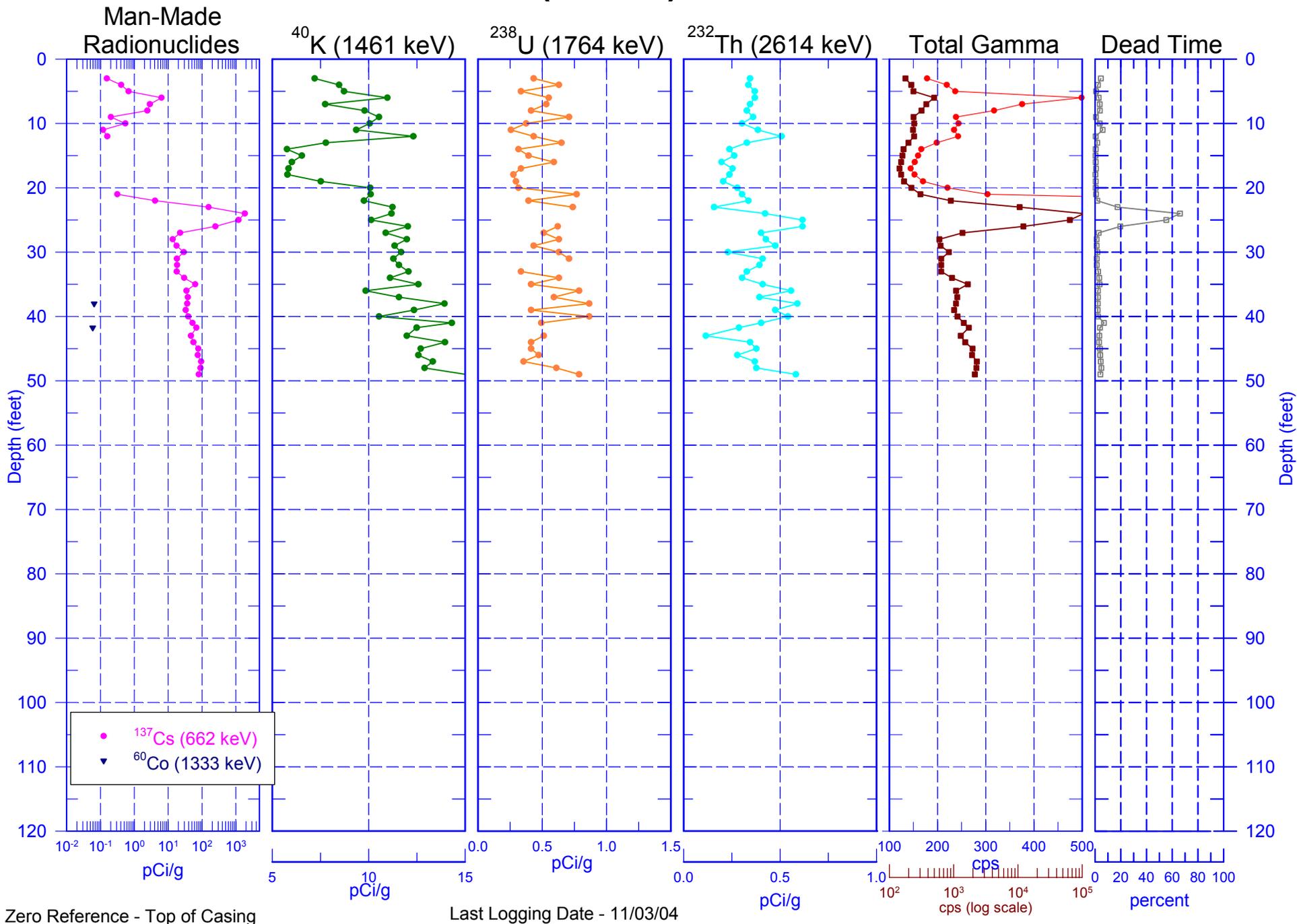


Zero Reference = Top of Casing

○ MDL

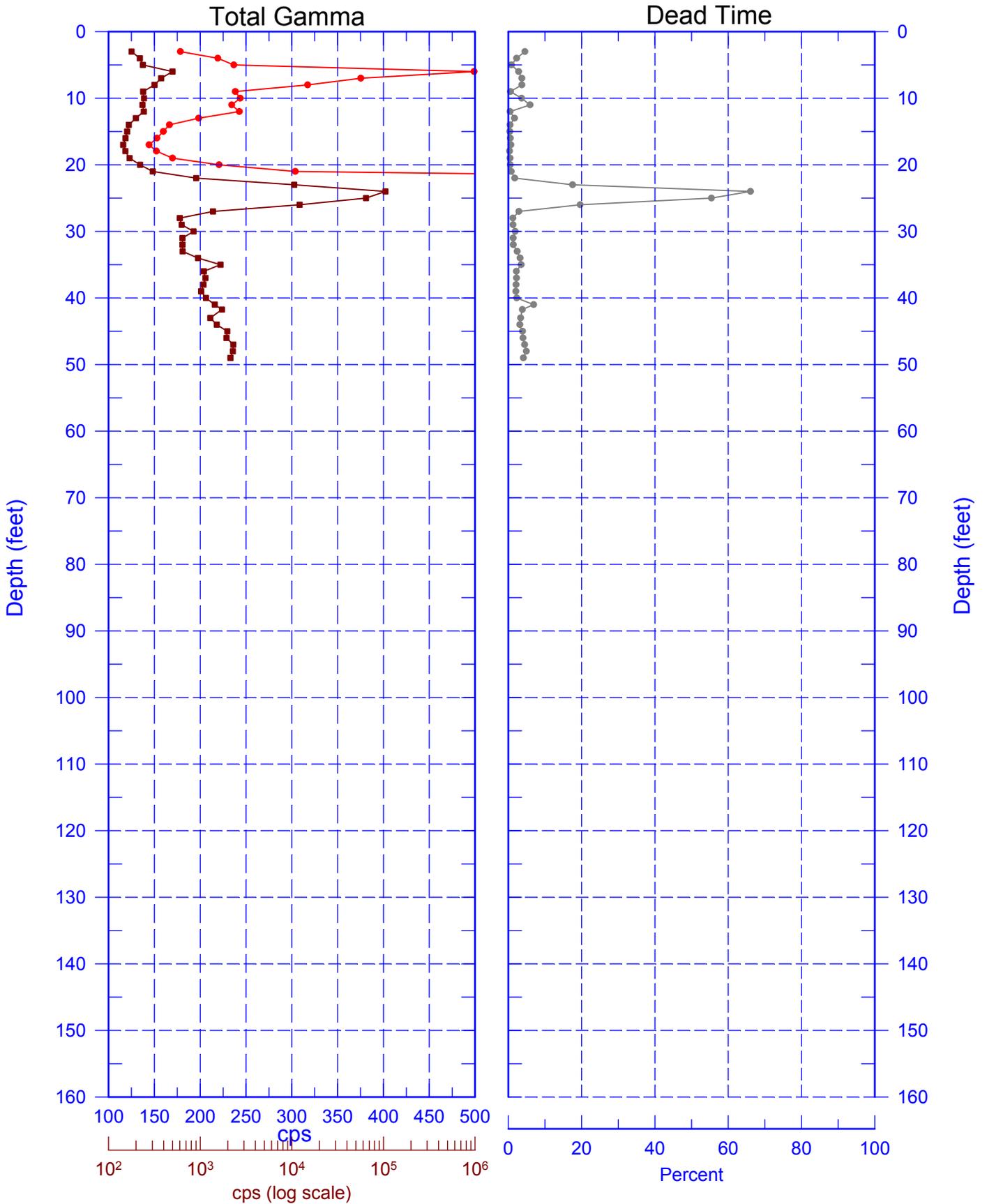
Last Log Date - 11/03/04

299-E13-54 (A5869) Combination Plot



299-E13-54 (A5869)

Total Gamma & Dead Time

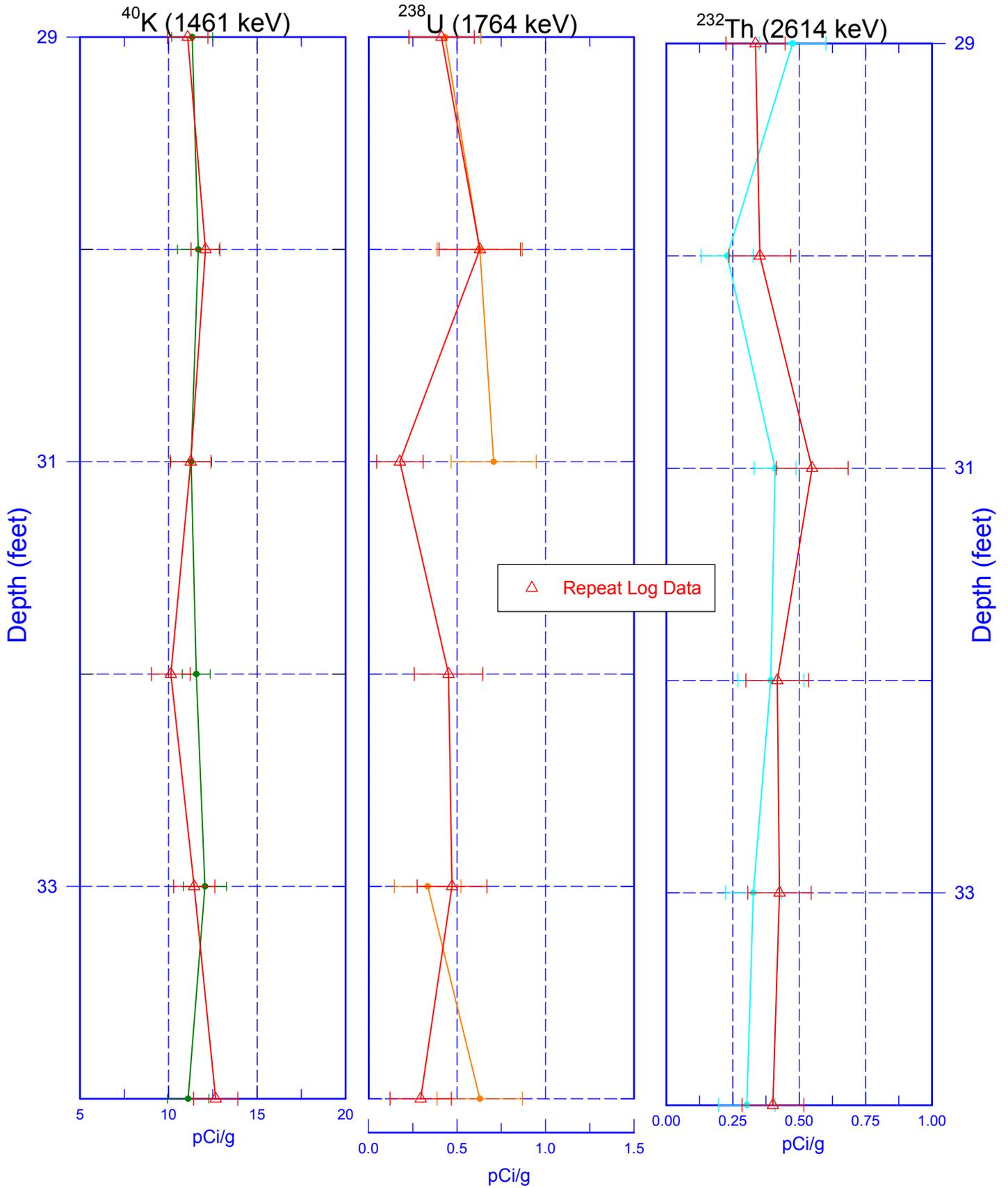


Reference - Top of Casing

Last Log Date - 11/03/04

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Repeat Section of Natural Gamma Logs

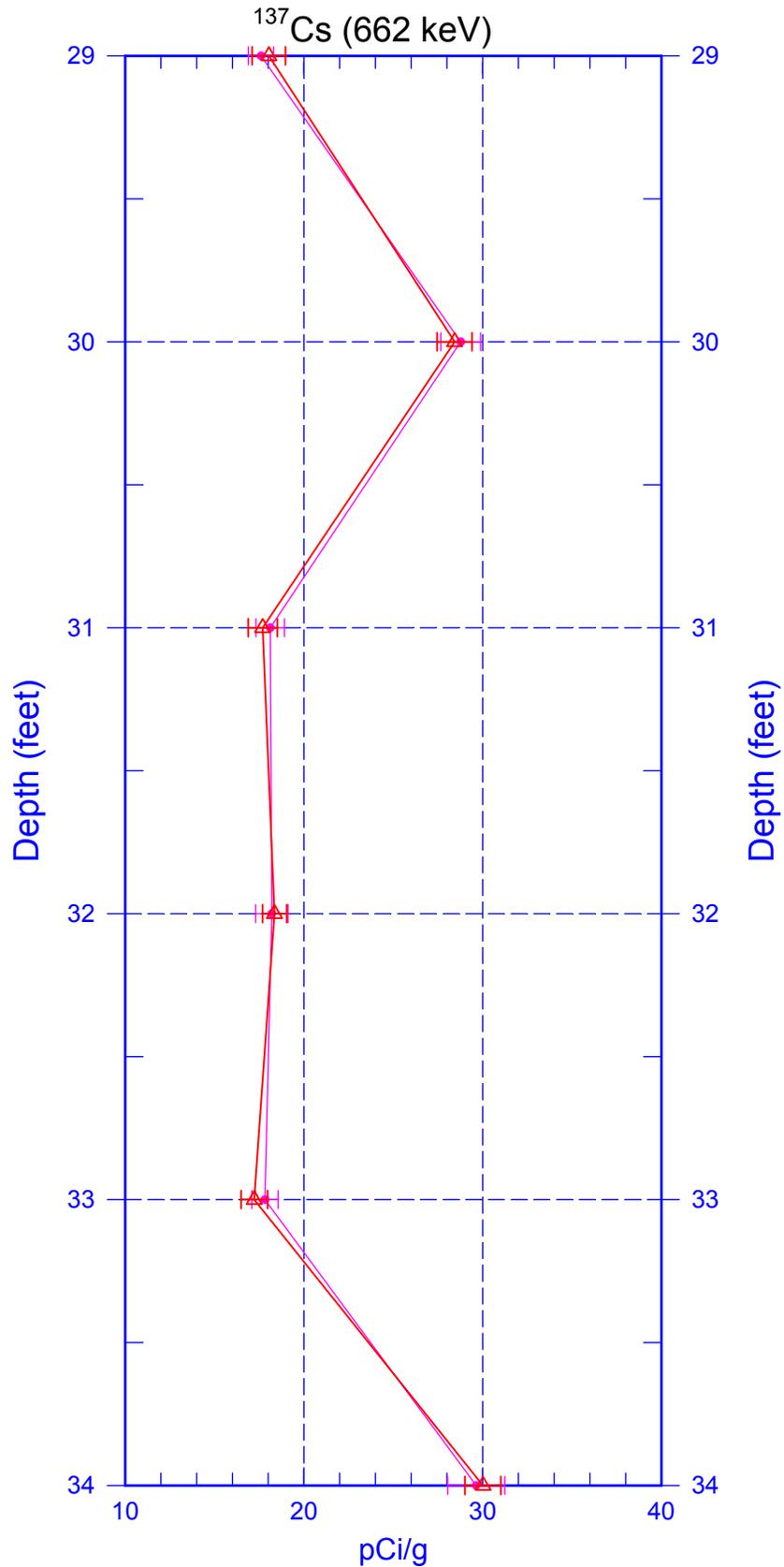


Zero Reference - Top of Casing

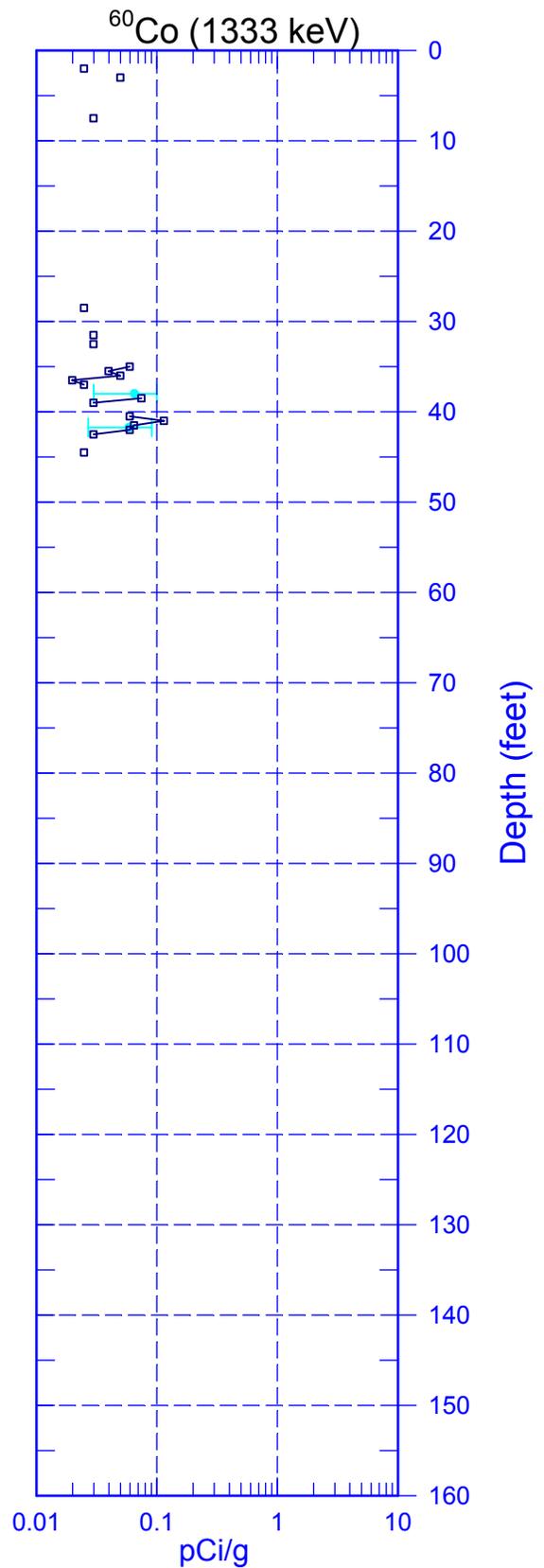
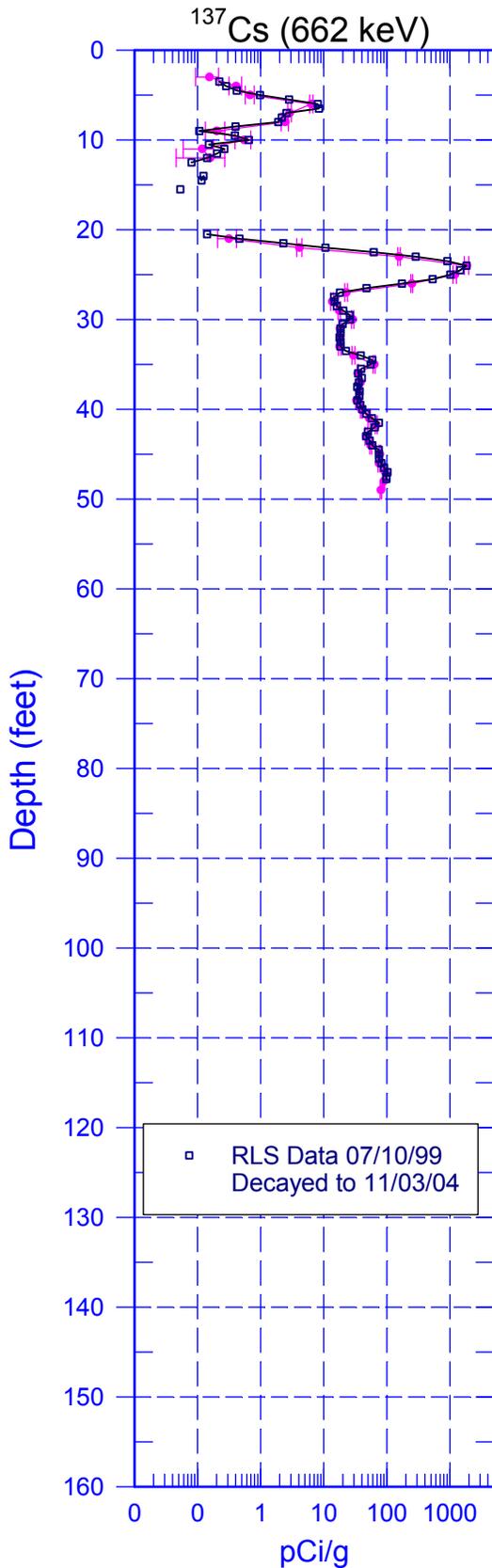
Last Log Date - 11/03/04

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Man-Made Repeat (29 - 34 ft)



299-E13-54 (A5869) SGLS & RLS Comparison



Zero Reference = Top of Casing

Last Log Date - 11/03/04