

## 699-37-66 (C5704) Log Data Report

### Borehole Information:

<b>Borehole:</b> 699-37-66 (C5704)		<b>Site:</b> ERDF			
<b>Coordinates (WA St Plane)</b>		<b>GWL<sup>1</sup> (ft):</b> 207.05	<b>GWL Date:</b> 12/04/07		
<b>North (m)</b>	<b>East (m)</b>	<b>Drill Date</b>	<b>TOC Elevation</b>	<b>Total Depth (ft)</b>	<b>Type</b>
Unknown	Unknown	12/07	Unknown	339	Becker

### Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Becker	2.2	9	6	0.620	2.2	339

### Borehole Notes:

Logger measured depth to water employing an e-tape. Zero reference is the ground surface. Casing dimensions are derived from published values for Becker dual wall casings.

### Logging Equipment Information:

<b>Logging System:</b>	Gamma 1L	<b>Type:</b>	SGLS HPGe (60%)
<b>Effective Calibration Date:</b>	7/09/07	<b>Serial No.:</b>	47TP32211A
	<b>Calibration Reference:</b>	HGLP-CC-019	
	<b>Logging Procedure:</b>	HGLP-MAN-002, Rev. 0	

### Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat		
Date	12/04/07	12/04/07		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	339.0	70.0		
Finish Depth (ft)	0.0	36.0		
Count Time (sec)	60	60		
Live/Real	R	R		
Shield (Y/N)	N	N		
MSA Interval (ft)	1.0	1.0		
ft/min	N/A	N/A		
Pre-Verification	AL004CAB	AL004CAB		
Start File	AL004000	AL004340		
Finish File	AL004339	AL004374		
Post-Verification	AL004CAA	AL004CAA		
Depth Return Error (in.)	Low 2 ¼	0		
Comments	Fine gain adjustment made at bottom of borehole before logging began.	Repeat Section.		

### Logging Operation Notes:

Data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the Amersham KUTh-118 field verifier. A centralizer was not installed on the sonde. Maximum logging depth achieved was 399.0 ft.

**Analysis Notes:**

<b>Analyst:</b>	LEGLER	<b>Date:</b>	2/29/08	<b>Reference:</b>	GJO-HGLP 1.6.3, Rev. 0
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The pre- and post-survey verification spectra met the acceptance criteria established for the system, but the verification file AL004CAB had a measurement below the lower control limit for 1461 keV energy line.

A casing correction for a Becker dual-wall casing of 0.62 in thickness was applied during analysis. Casing joints at 10 ft., intervals are approximately 1.115" thick; no corrections for the casing joints were made. A water correction factor was also applied during analysis from 207.05 ft to total depth of borehole logged.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify peaks and count rates. Concentrations were calculated using an EXCEL template identified as G1LJuly04.xls using an efficiency function and corrections for casing, dead time, and water as determined by annual calibrations.

**Results and Interpretations:**

The only manmade radionuclide detected was Cs-137, which was detected at 94 ft near the MDL. Inspection of the individual spectrum indicates that this detection is a statistical fluctuation and is not considered valid.

The influences of casing joints at 10 ft intervals are apparent on the log plots.

The repeat section indicates good agreement between naturally occurring KUT, indicating that the logging system was working properly.

**List of Log Plots:**

Depth Reference is top of casing

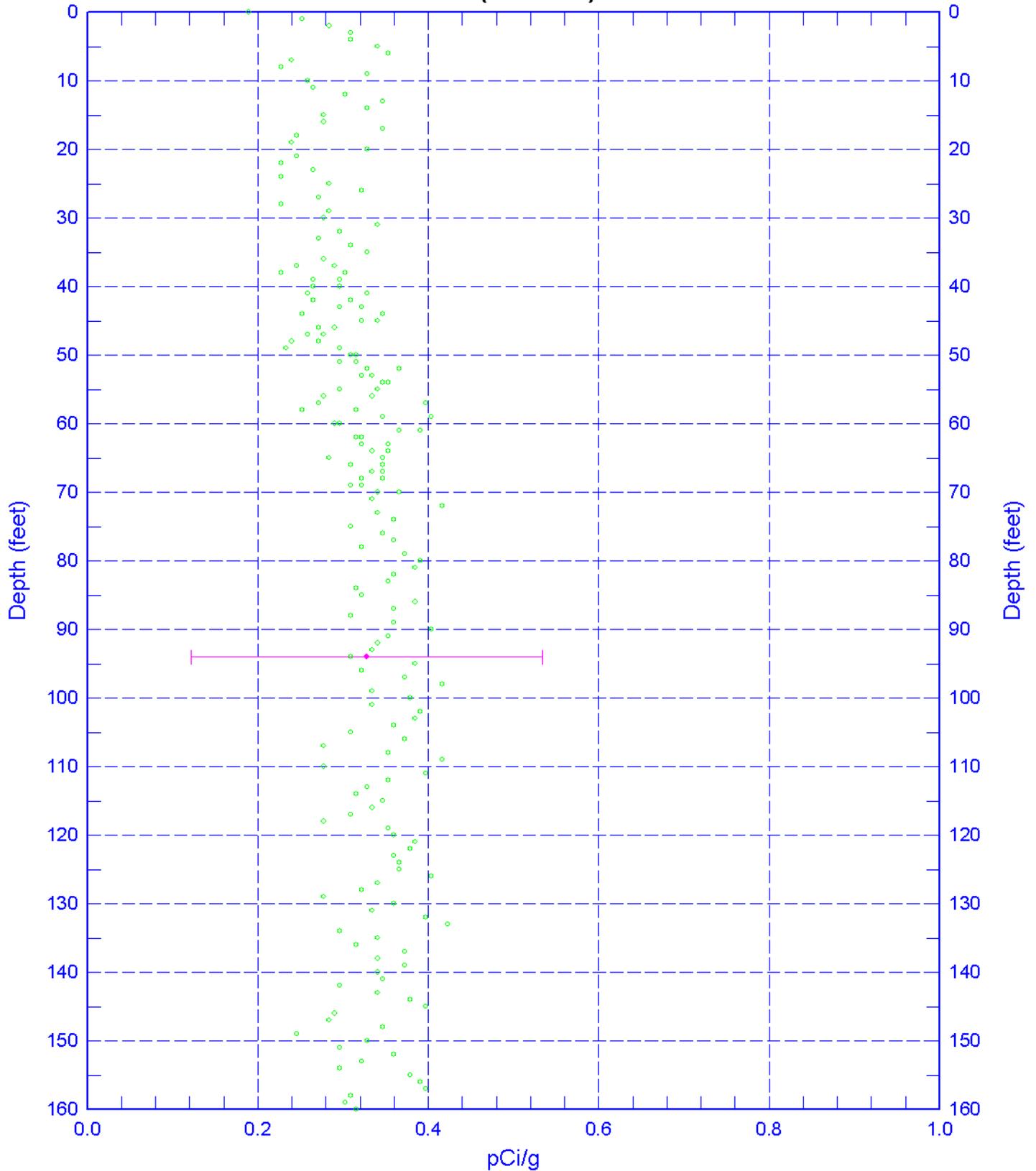
- Man-made Radionuclides
- Natural Gamma Logs
- Combination Plot
- Combination Plot (0-340 ft)
- Total Gamma & Dead Time
- Repeat Section of Natural Gamma Logs

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<sup>1</sup> GWL – groundwater level

# 699-37-66 (C5704) Manmade Radionuclides

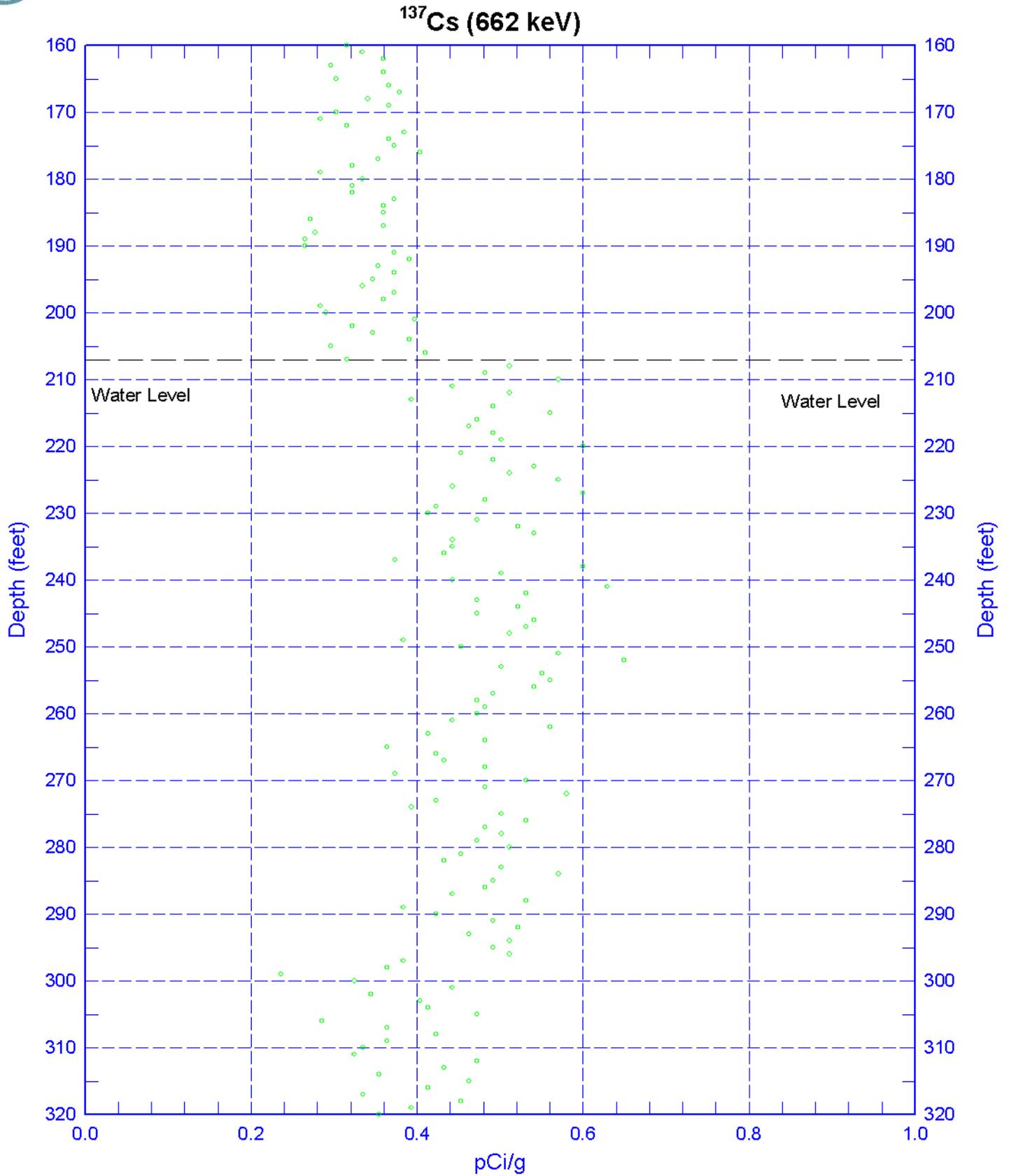
<sup>137</sup>Cs (662 keV)



Zero Reference - Ground Surface

• MDL

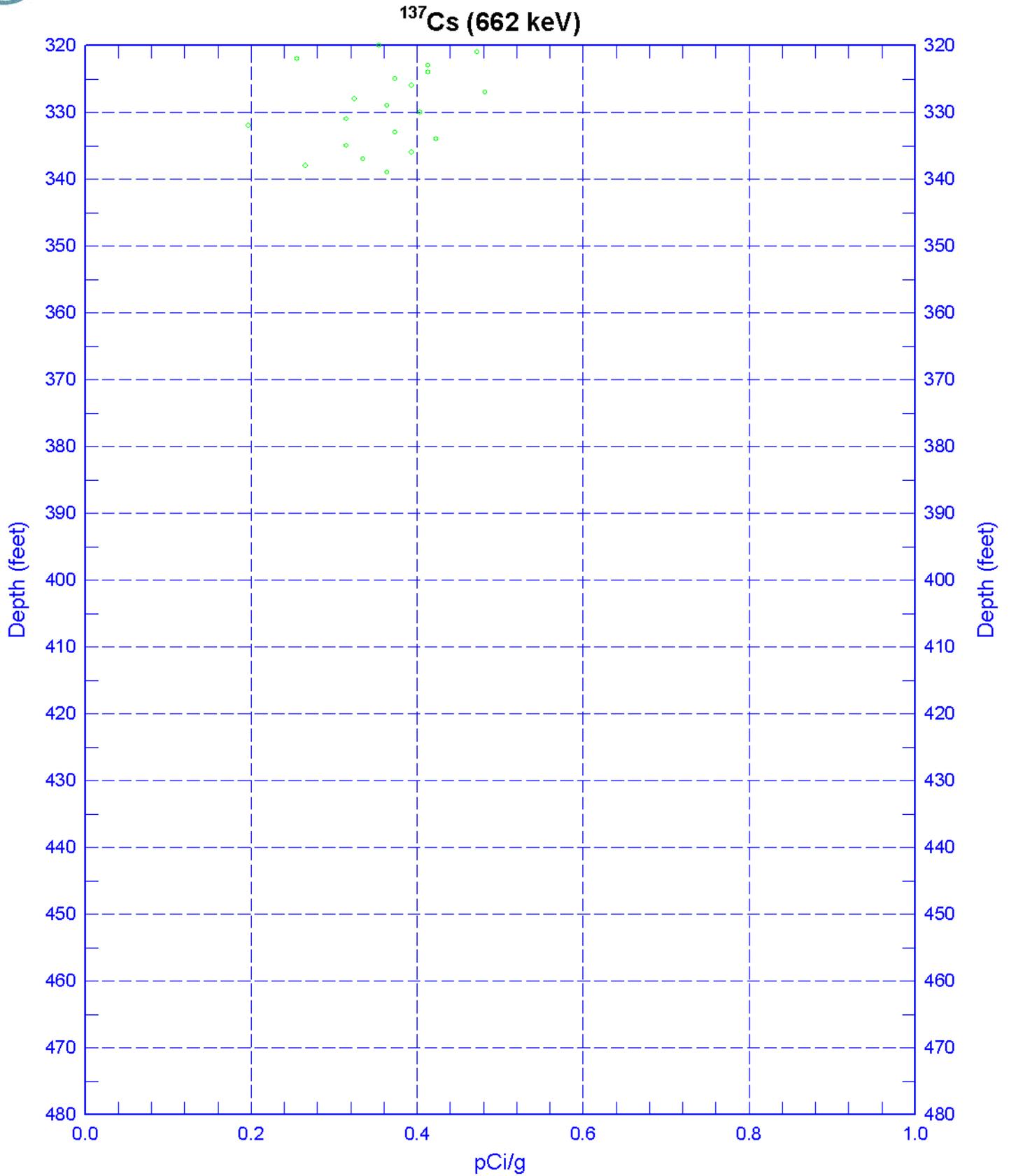
# 699-37-66 (C5704) Manmade Radionuclides



○ MDL

Zero Reference - Ground Surface

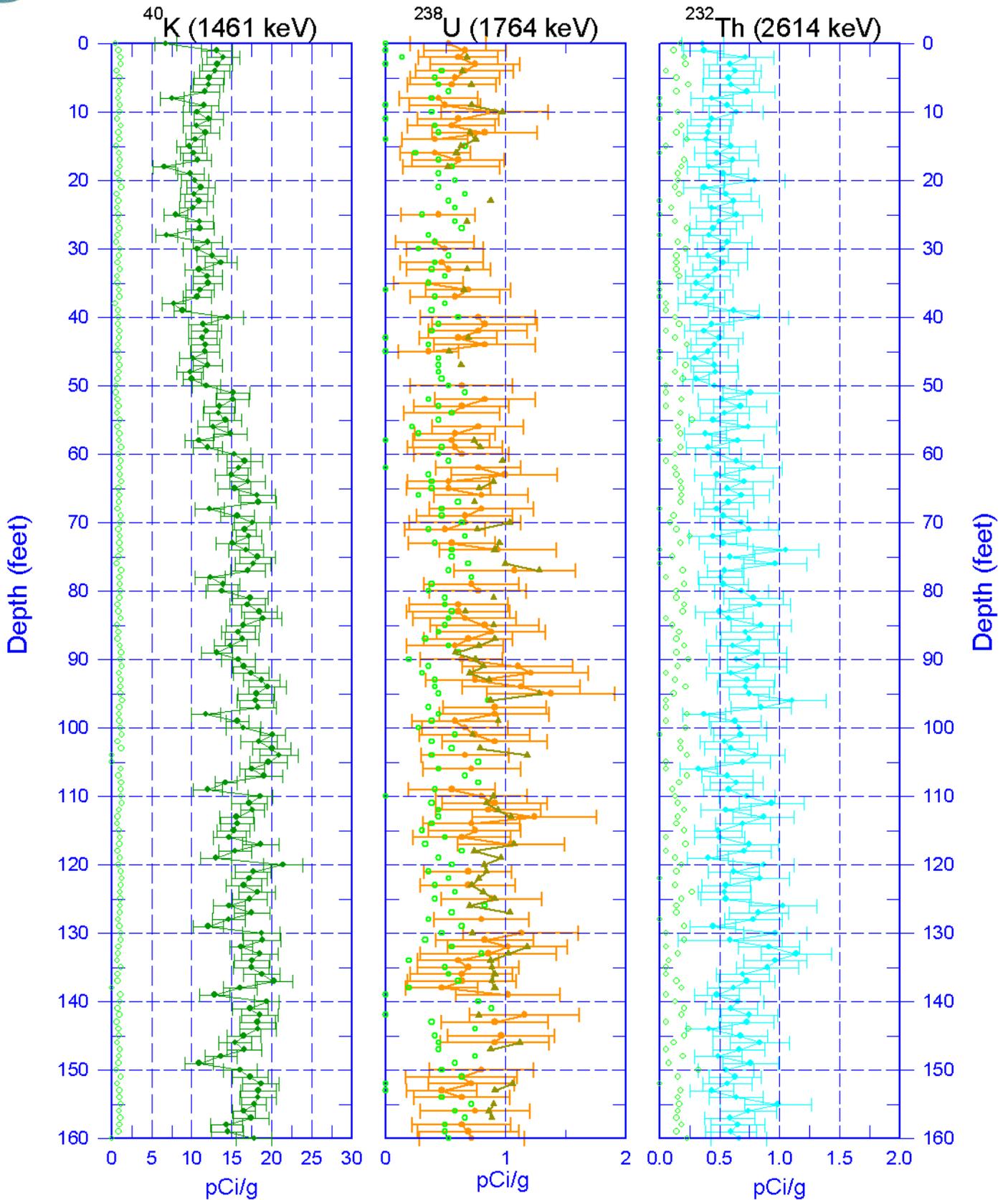
# 699-37-66 (C5704) Manmade Radionuclides



○ MDL

Zero Reference - Ground Surface

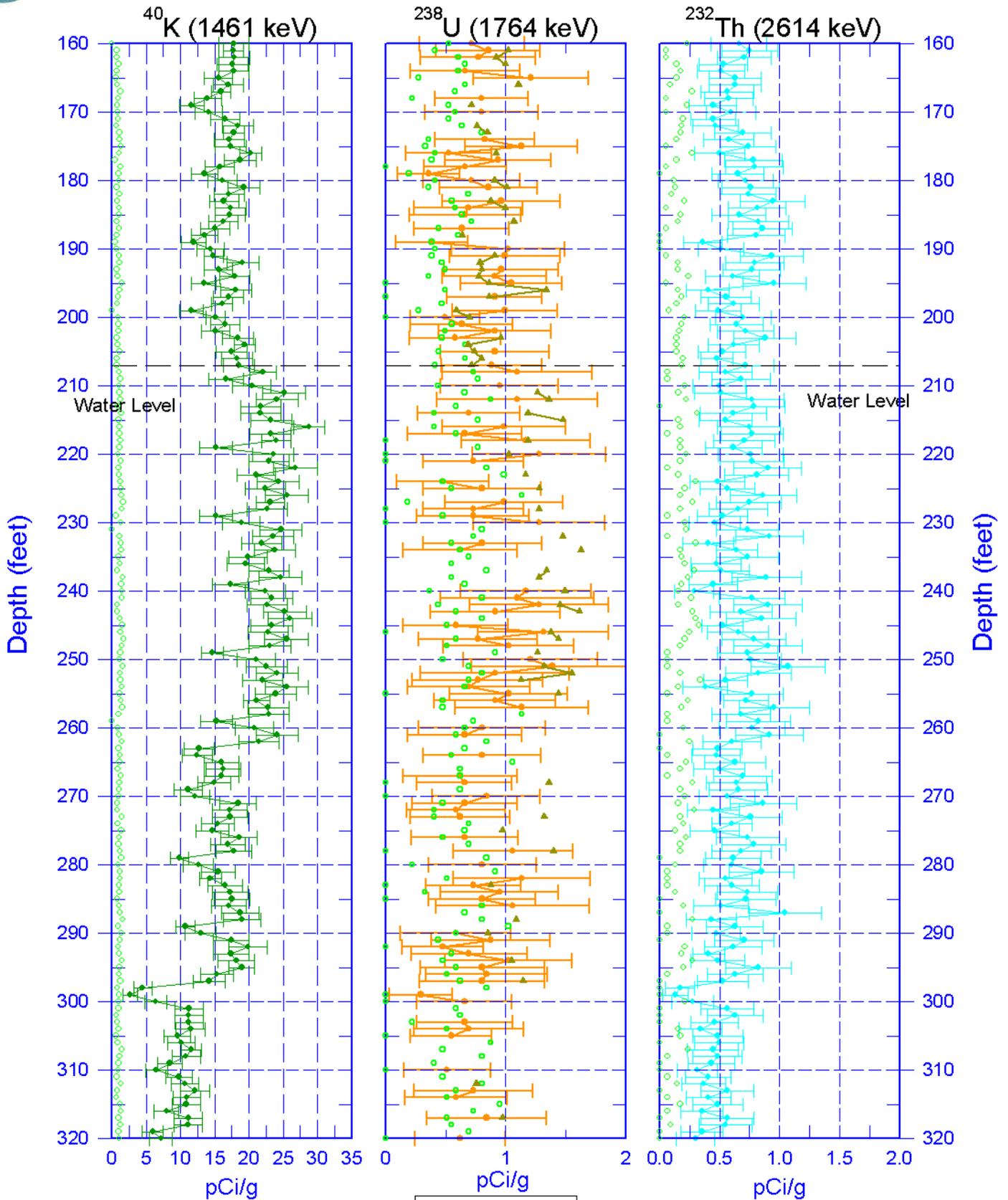
# 699-37-66 (C5704) Natural Gamma Logs



Zero Reference - Ground Surface

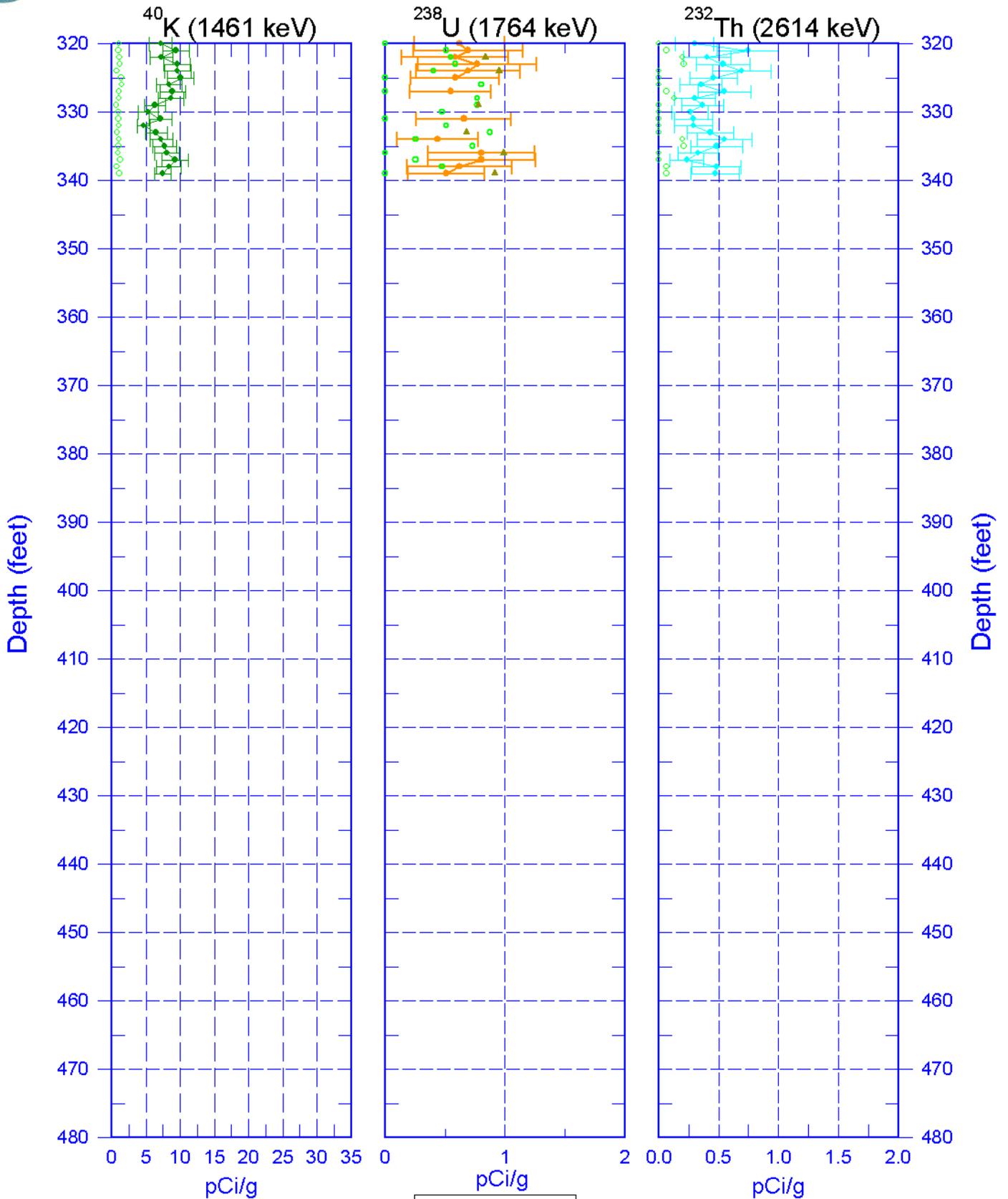


# 699-37-66 (C5704) Natural Gamma Logs



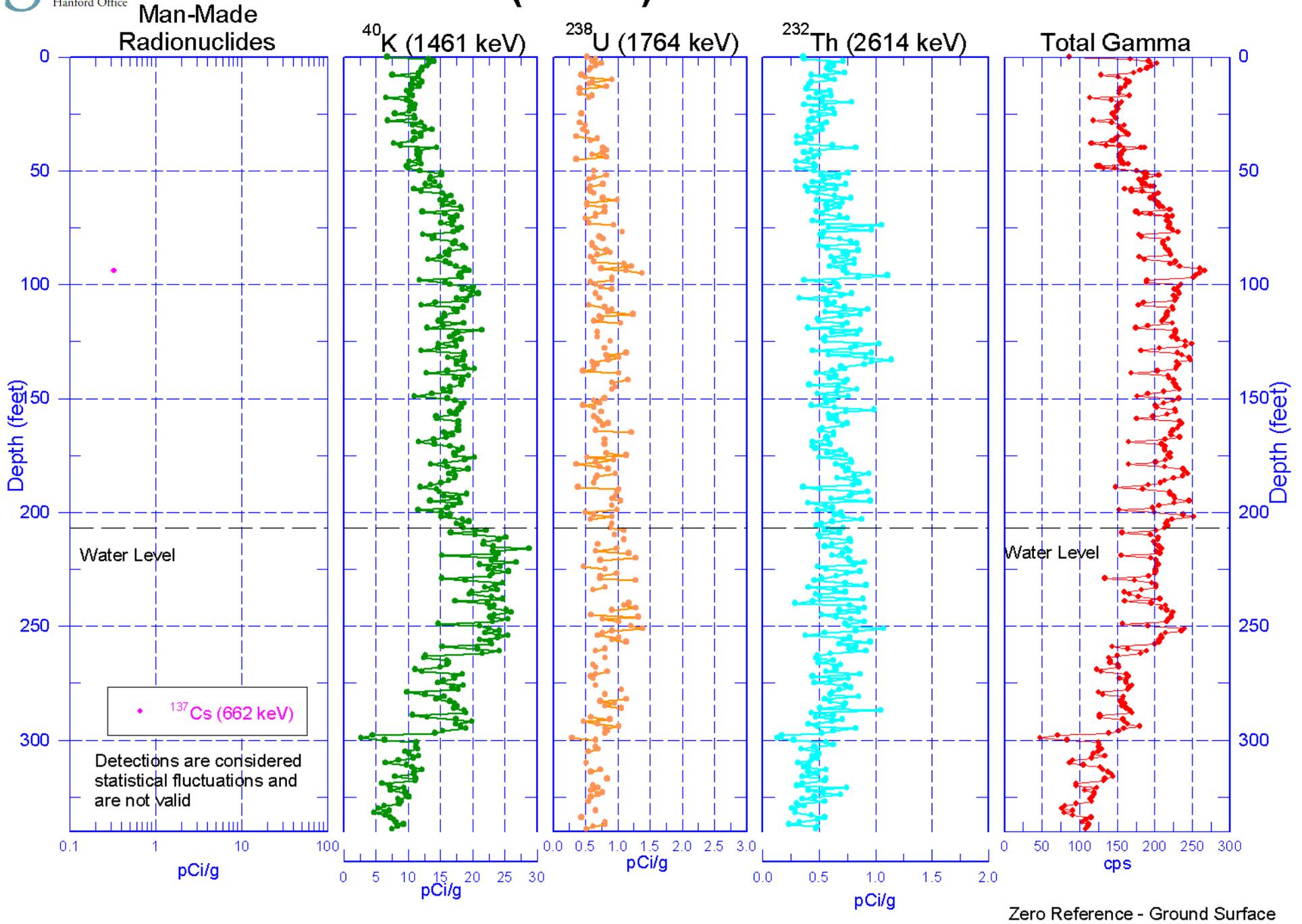
Zero Reference - Ground Surface

# 699-37-66 (C5704) Natural Gamma Logs

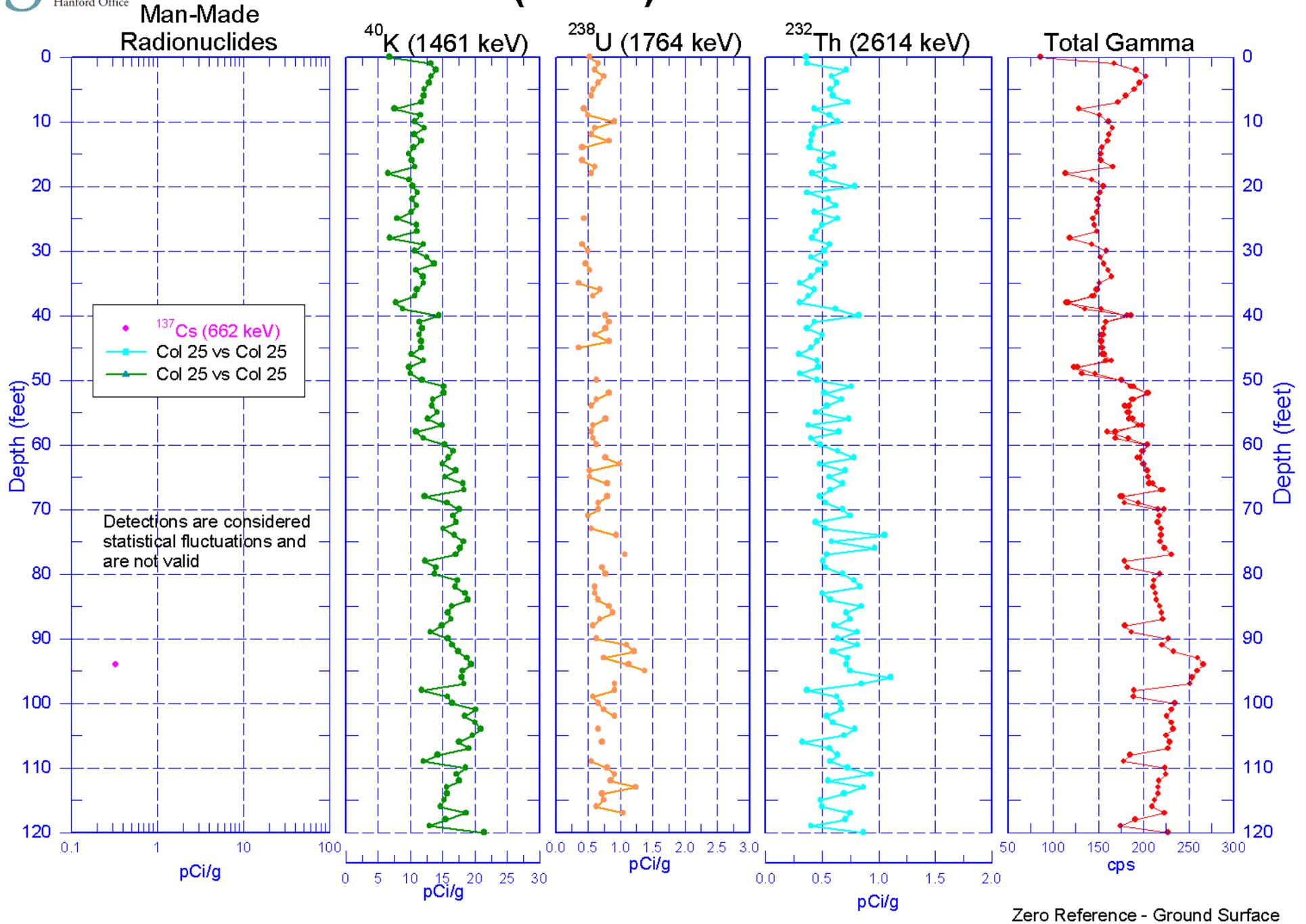


Zero Reference - Ground Surface

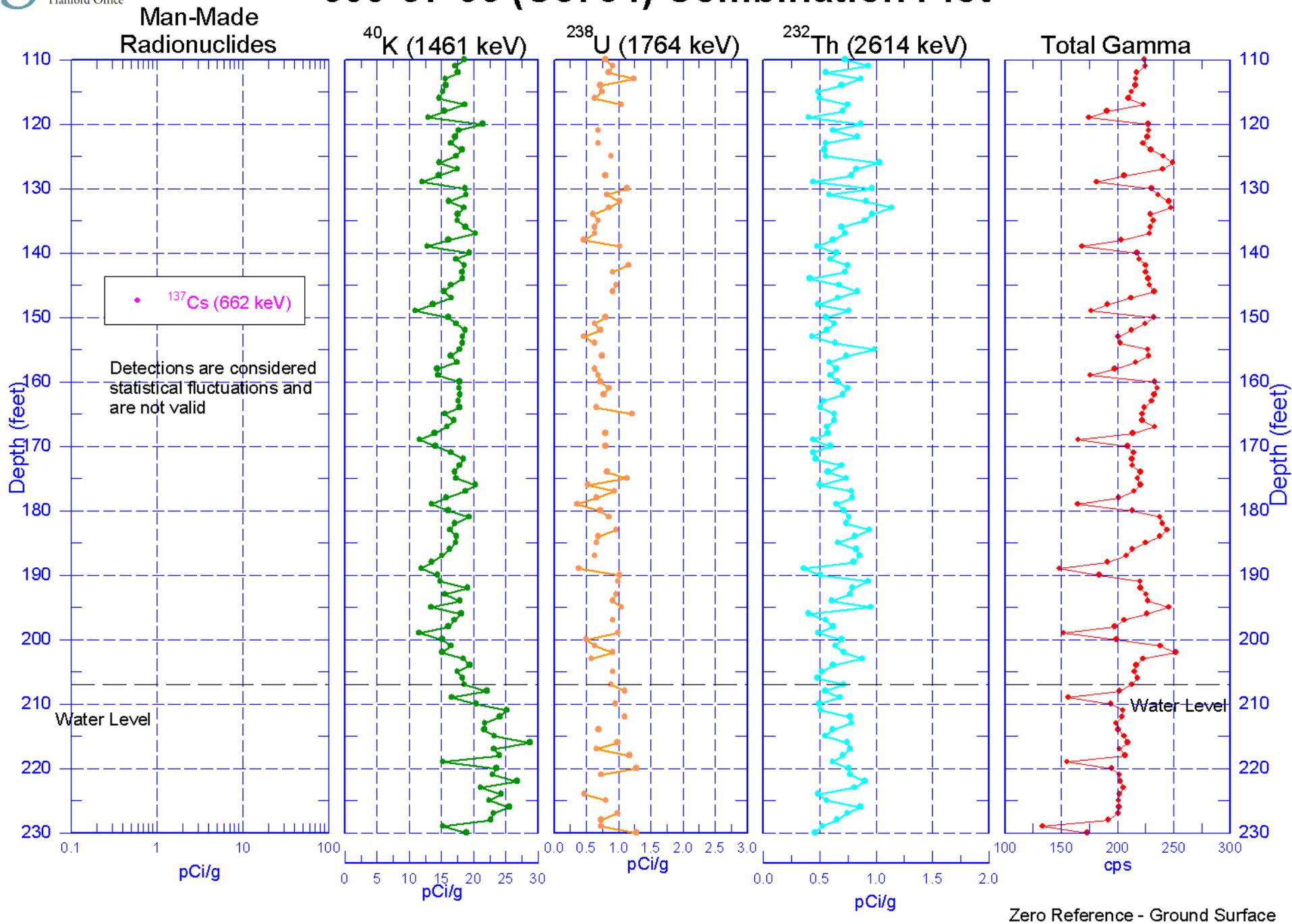
# 699-37-66 (C5704) Combination Plot



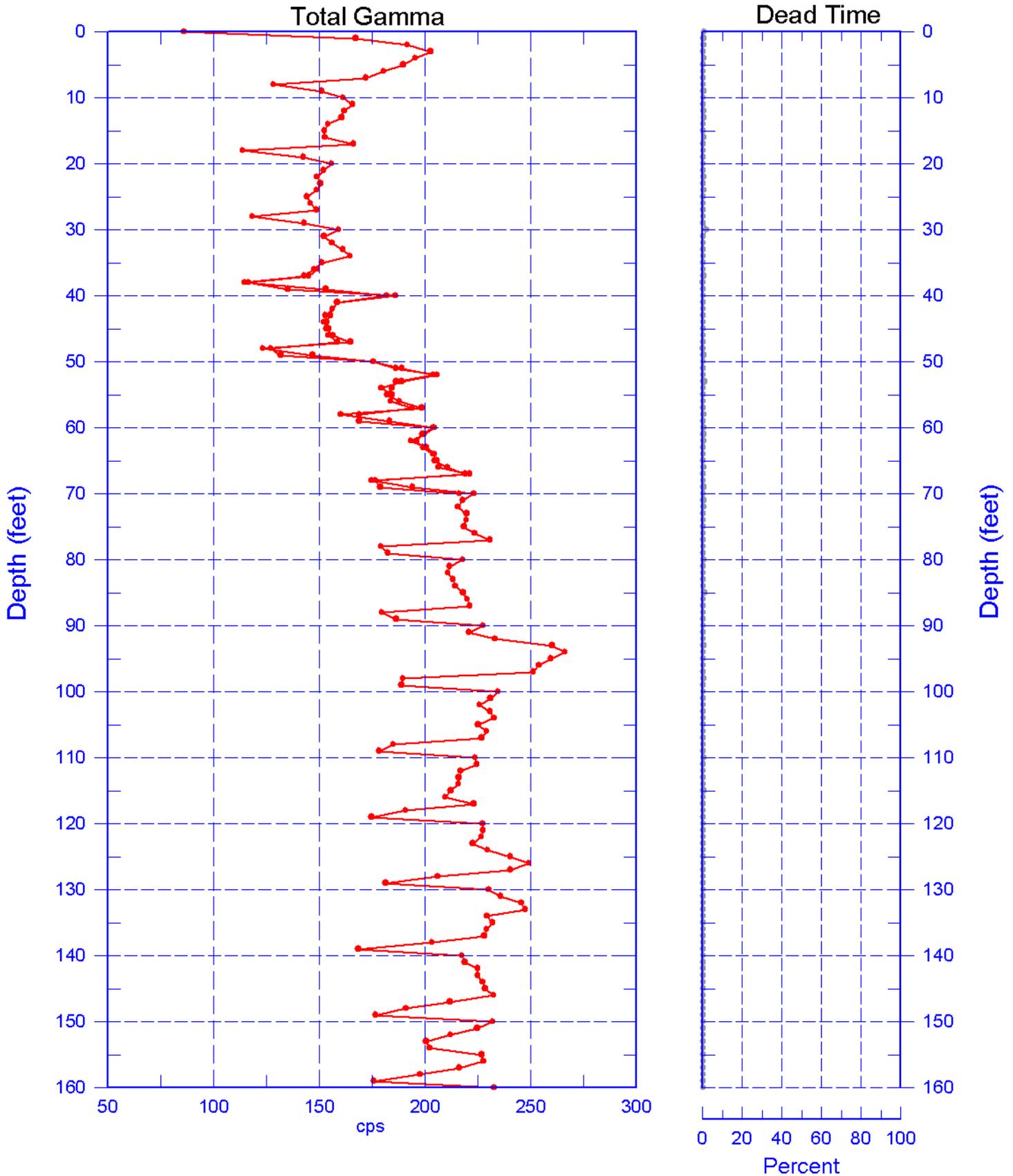
# 699-37-66 (C5704) Combination Plot



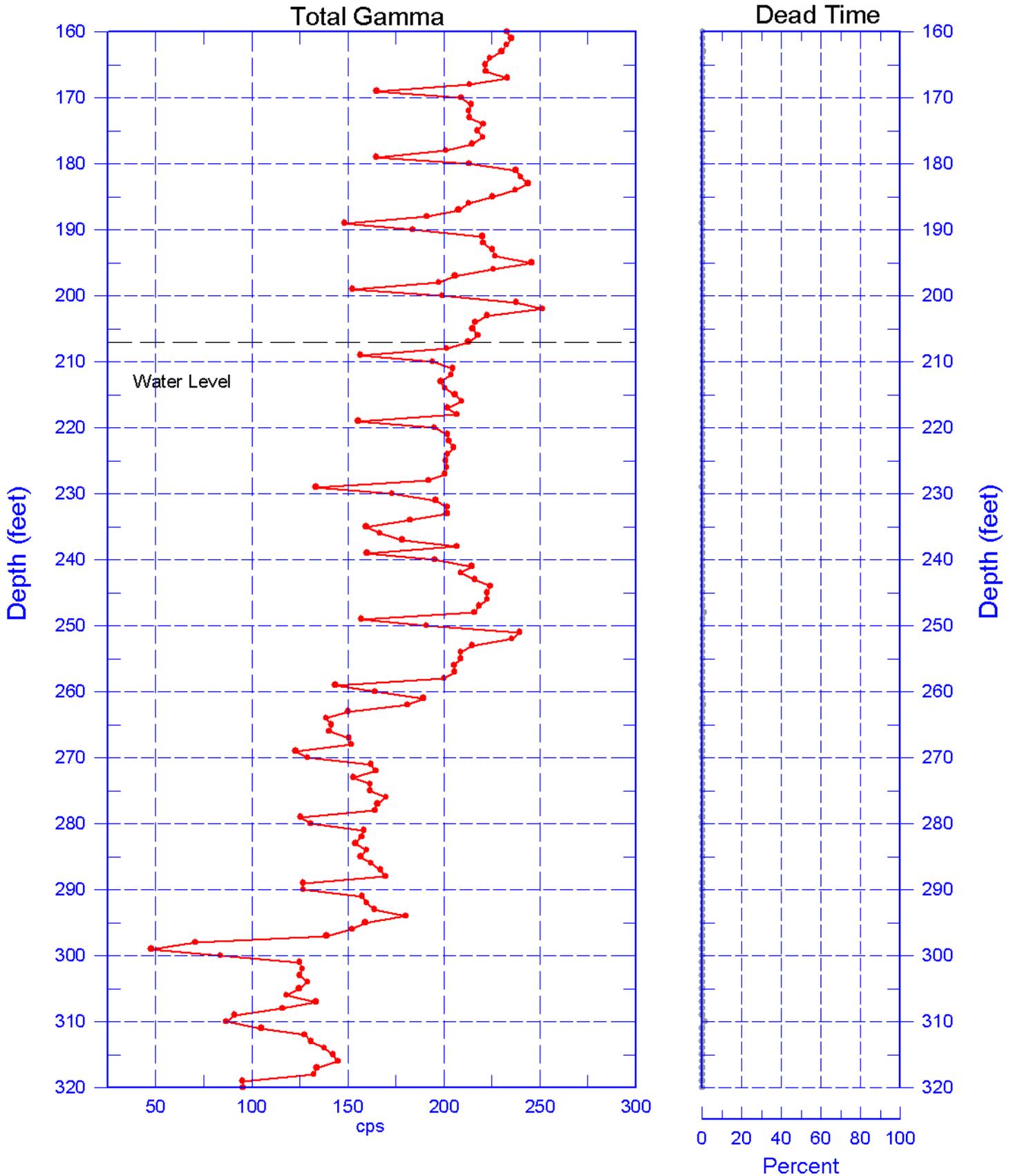
# 699-37-66 (C5704) Combination Plot



# 699-37-66 (C5704) Total Gamma & Dead Time

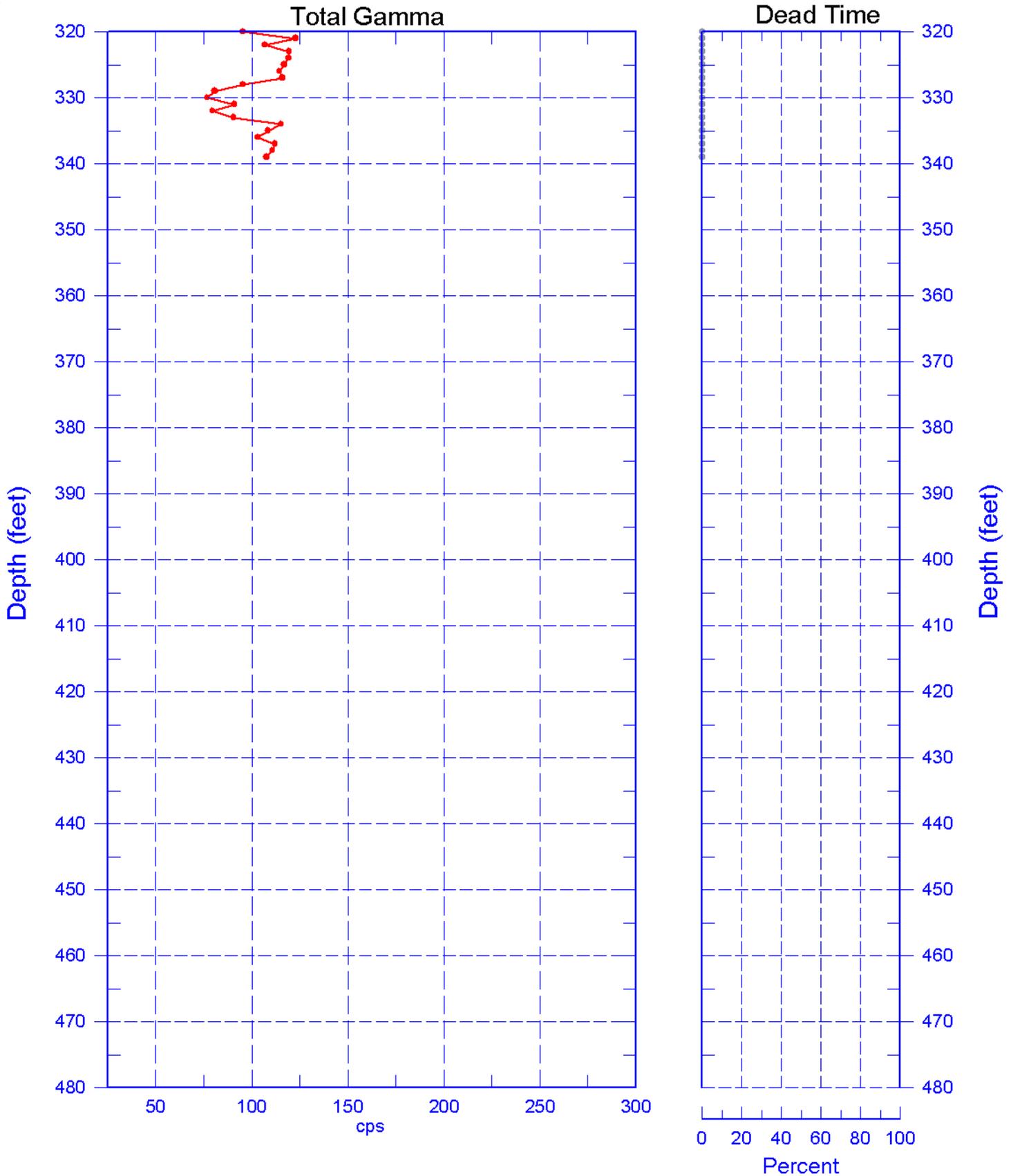


# 699-37-66 (C5704) Total Gamma & Dead Time

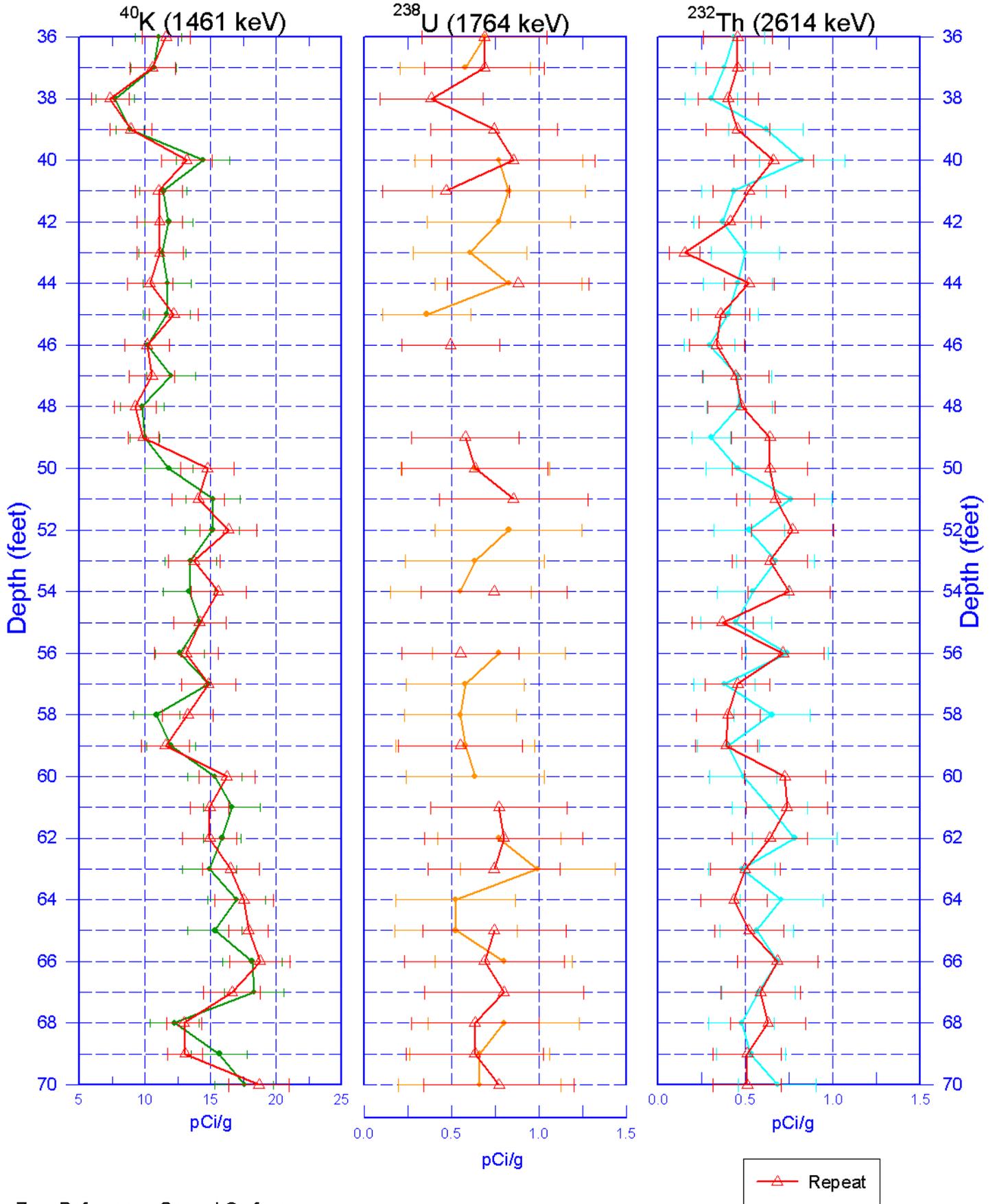


# 699-37-66 (C5704)

## Total Gamma & Dead Time



**Repeat Section of Natural Gamma Logs**



Zero Reference - Ground Surface