

299-W18-151 (A7634)
Log Data Report

Borehole Information:

Borehole: 299-W-18-151 (A7634)		Site: 216-Z-12 Crib			
Coordinates (WA State Plane)		GWL (ft)¹: None	GWL Date: 01/03/06		
North 135480.448	East 566366.246	Drill Date 08/76	TOC² Elevation 684.19	Total Depth (ft) 17	Type Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	0.5	10 3/4	10	3/8	0.5	17

Borehole Notes:

Casing diameter and casing stickup measurements were acquired by the logging engineer using a caliper and steel tape. Measurements were rounded to the nearest 1/16 in. All logging measurements are referenced to the top of casing.

Kasper (1982) reports four shallow wells (151-156) were drilled in the 216-Z-12 crib in 1976. Plutonium activity was encountered in the wells at a depth of approximately 17 ft, which is considered to be the bottom of the excavation made to lay the distributor pipe. The driller's log reports hitting "hot dirt" at 15 ft, where drilling was discontinued. The maximum depth achieved with the SGLS was 12 ft from TOC.

Logging Equipment Information:

Logging System: Gamma 4N	Type: SGLS (60%) 45TP22010A	
Effective Calibration Date: 08/16/05	Calibration Reference: DOE/EM-GJ953-2005	
Logging Procedure: MAC-HGLP 1.6.5, Rev. 0		

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat		
Date	01/03/06	01/03/06		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	12.0	6.0		
Finish Depth (ft)	1.0	6.0		
Count Time (sec)	200	200		
Live/Real	R	R		
Shield (Y/N)	N	N		
MSA Interval (ft)	1.0	1.0		
ft/min	N/A	N/A		
Pre-Verification	DN041CAB	DN041CAB		
Start File	DN041000	DN041000		
Finish File	DN041011	DN041011		
Post-Verification	DN051CAA	DN051CAA		
Depth Return Error (in.)	0	0		

Log Run	1	2 Repeat			
Comments	No fine-gain adjustment.	No fine-gain adjustment.			

Logging Operation Notes:

Logging was conducted January 3, 2006 using SGLS logging system Gamma 4N. Pre- and post-survey verification measurements for the SGLS employed the Amersham KUT (⁴⁰K, ²³⁸U, and ²³²Th) verifier with serial number 115. An additional measurement was acquired at 6.0 ft at enhanced counting time (1000 seconds) to provide additional detail at the highest total gamma activity. All measurements were performed with a centralizer installed on the sonde. The top of casing is the reference depth for log data.

Analysis Notes:

Analyst:	Henwood	Date:	09/25/06	Reference:	GJO-HGLP 1.6.3, Rev. 0
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SGLS pre-run and post-run verification spectra were collected at the beginning and end of the day. All of the verification spectra were within the acceptance criteria. Examinations of spectra indicate that the detector functioned normally during logging, and the spectra are accepted.

Log spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Verification spectra were used to determine the energy and resolution calibration for processing the data using APTEC SUPERVISOR. Concentrations were calculated in EXCEL (source files G4NAug05.xls). Log data were corrected for a casing thickness of 3/8-in.

Results and Interpretations:

¹³⁷Cs was detected at 5 and 6 ft depths. The maximum concentration is approximately 0.5 pCi/g.

As described in the “Borehole Notes” section, this borehole was found to exhibit contamination near the bottom of the borehole at approximately 15 or 17 ft when it was drilled in 1976. The maximum depth achieved with the SGLS was 12 ft. Therefore, the SGLS did not enter the contaminated zone and no plutonium was detected.

Westinghouse Hanford Company (WHC) logged this borehole in 1993 with the Radionuclide Logging System (RLS) to a depth of 9.5 ft from ground surface. WHC reported no manmade contaminants except for minor amounts of ¹³⁷Cs between 4 and 6 ft, consistent with the current SGLS logging.

List of Plots:

- Man-Made Radionuclides
- Natural Gamma Logs
- Combination Plot (1 in. = 20 ft)
- Combination Plot (1 in. = 5 ft)
- Total Gamma and Dead Time

References

Kasper, R.B., 1982. *216-Z-12 Transuranic Crib Characterization: Operational History and Distribution of Plutonium and Americium*, RHO-ST-44, Rockwell International, Richland, Washington.

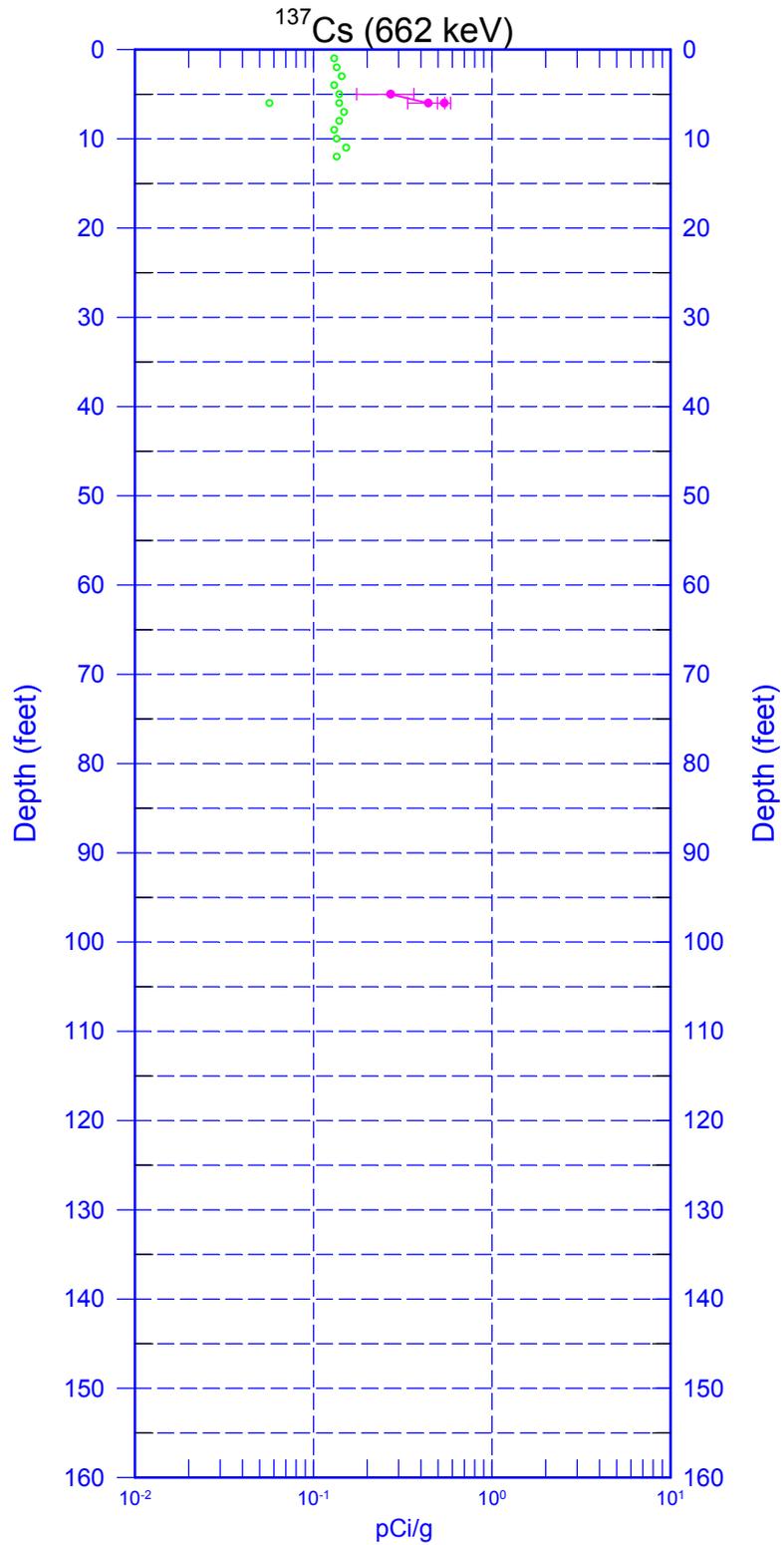
¹ GWL – groundwater level

² TOC – top of casing

³ N/A – not applicable

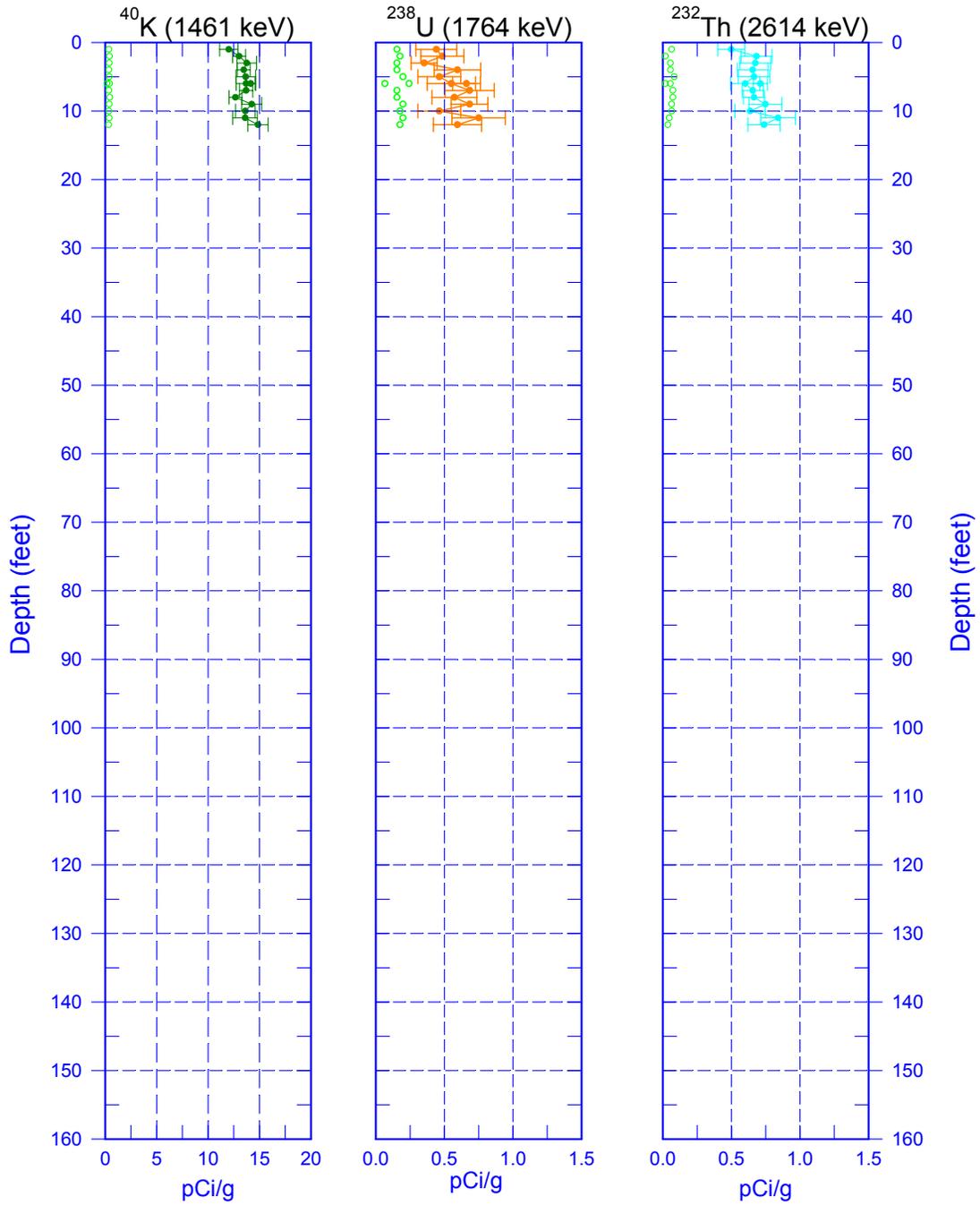
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Man-Made Radionuclides



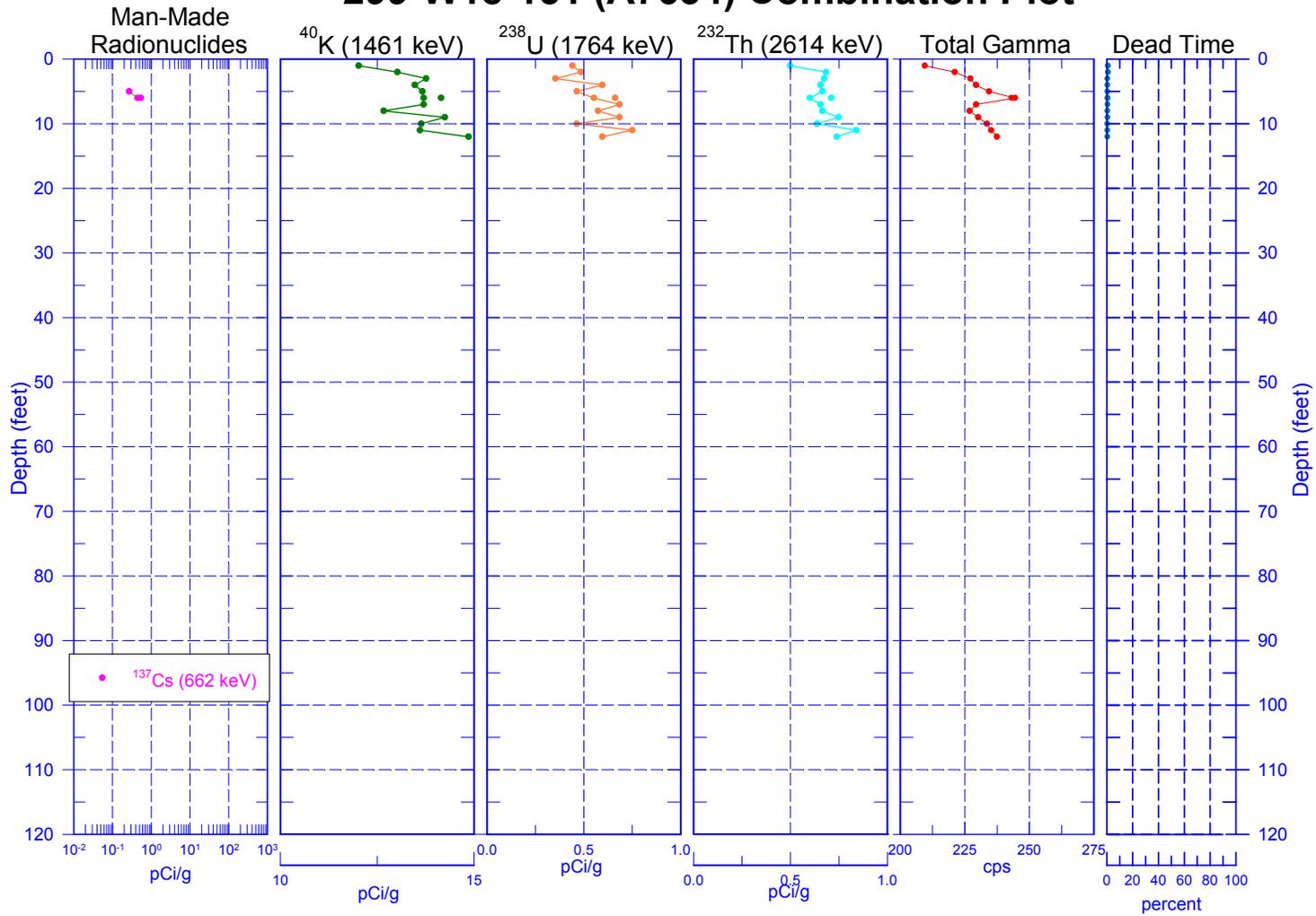
Zero Reference = Top of Casing

299-W18-151 (A7634) Natural Gamma Logs



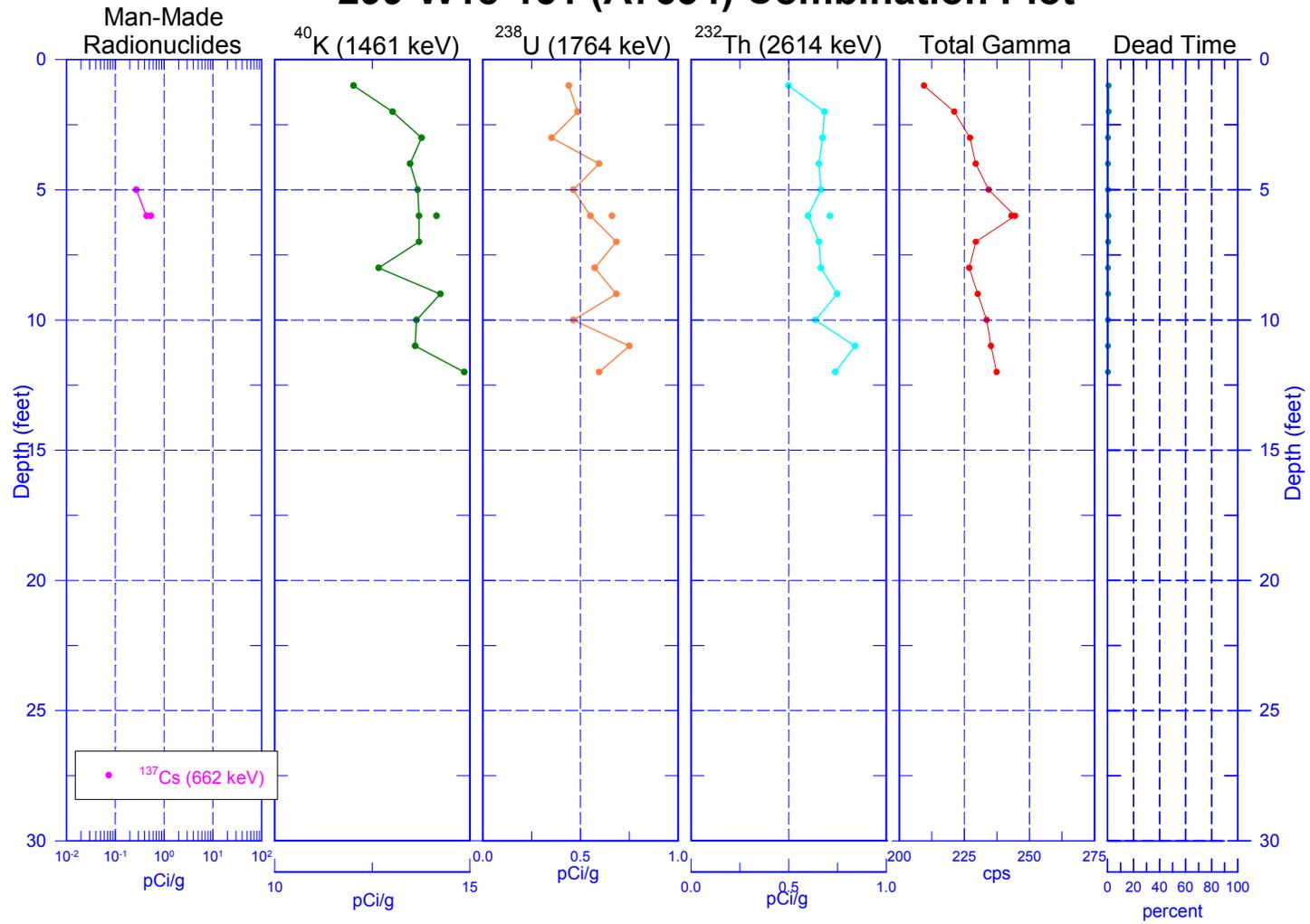
Zero Reference = Top of Casing

299-W18-151 (A7634) Combination Plot



Zero Reference = Top of Casing

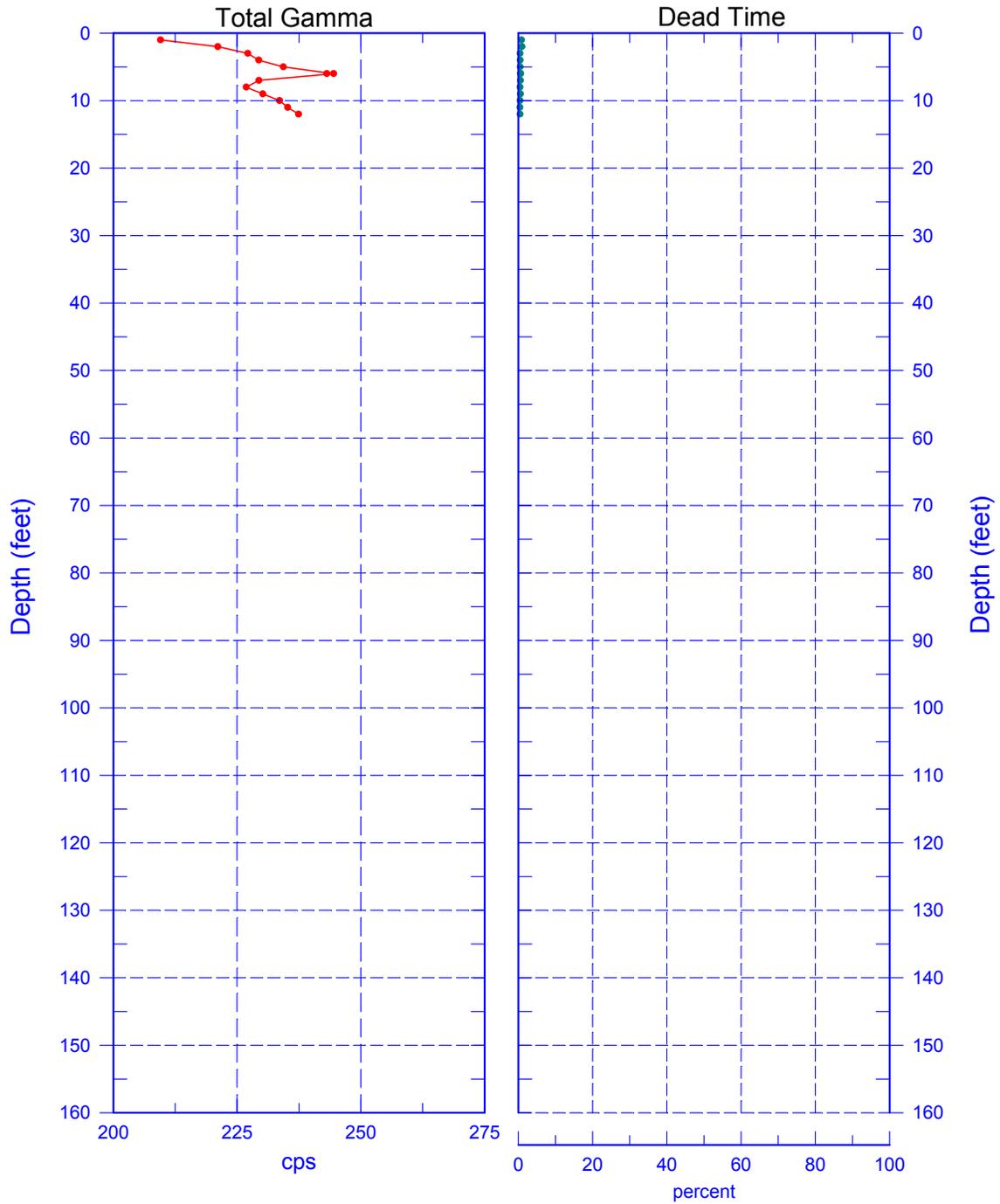
299-W18-151 (A7634) Combination Plot



Zero Reference = Top of Casing

299-W18-151 (A7634)

Total Gamma & Dead Time



Zero reference = Top of Casing