

299-W14-51 (A7335) Log Data Report

Borehole Information:

Borehole: 299-W14-51 (A7335)			Site: 216-T-19 Crib		
Coordinates (WA St Plane)		GWL¹ (ft): None	GWL Date: 05/10/06		
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
135936.609	566841.947	12/82	667.45 ft	80	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	0	8 5/8	8	5/16	0	27
Welded steel	2.4	6 5/8	6	5/16	2.4	80

Borehole Notes:

The logging engineer measured the 6-in. casing diameters using a caliper and steel tape. The 8-in. casing dimensions are inferred from the driller's log. The driller's log states grout was placed in the annular space between the 6- and 8-in. casings. A grout plug was placed in the bottom of the 6-in. casing.

Logging Equipment Information:

Logging System:	Gamma 1N	Type:	SGLS (60%) HpGe
Effective Calibration Date:	04/05/06	Serial No.:	45-TP22020A
	Calibration Reference:	DOE-EM/GJ1183-2006	
	Logging Procedure:	GJO-HGLP 1.6.5, Rev. 1	

Logging System:	Gamma 4 H	Type:	NMLS
Effective Calibration Date:	11/06/07	Serial No.:	H310700352
	Calibration Reference:	HGLP-CC-021	
	Logging Procedure:	HGLP-MA-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	3		
Date	05/12/06	05/25/06	05/25/06		
Logging Engineer	McClellan	McClellan	McClellan		
Start Depth (ft)	75.0	43.0	16.0		
Finish Depth (ft)	15.0	35.0	3.0		
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	N/A	N/A		
Pre-Verification	AN025CAB	AN027CAB	AN027CAB		
Start File	AN025000	AN027000	AN027009		
Finish File	AN025060	AN027008	AN027022		
Post-Verification	AN022CAA	AN022CAA	AN022CAA		
Depth Return Error (in.)	- 0.5	N/A	0		
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment		

Neuron Moisture Logging System (NMLS) Log Run Information:

Log Run	4	5 Repeat			
Date	01/29/08	01/29/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	2.5	27			
Finish Depth (ft)	75.25	37			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
ft/min	N/A	N/A			
Pre-Verification	DHA62CAB	DHA62CAB			
Start File	DHA62000	DHA62292			
Finish File	DHA62291	DHA62332			
Post-Verification	DHA62CAA	DHA62CAA			
Depth Return Error (in.)	N/A	Low 1/2			
Comments	None	Repeat section			

Logging Operation Notes:

Logging was conducted with a centralizer on each sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate each system's performance. The moisture data was acquired approximately two years after SGLS data was acquired.

Analysis Notes:

Analyst:	Henwood; Legler	Date:	12/13/07;02/5/08	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre- and post-run verifications for the logging systems were performed before and after the day's data acquisition. The acceptance criteria were met.

A combined casing correction for 0.625-in. thick casing (0.3125+0.3125 for the 6- and 8-in. casings) was applied to the log data to 27 ft. Below this depth, a correction for the single 0.3125-in. thick casing was applied.

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 G1NApr06.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations.

NMLS spectra were processed in batch mode using APTEC SUPERVISOR to identify count rates. NMLS count rate data were converted to percent volumetric moisture with an EXCEL worksheet template identified as G4HNov07.xls using calibration for a 6-in diameter borehole casing.

Results and Interpretations:

Cs-137 is the only man-made radionuclide detected in this borehole. Cs-137 is detected at the ground surface and 45 ft at less than 1 pCi/g. The other detections of Cs-137 are statistical fluctuations and are not valid.

The repeat section indicates good agreement of the logging systems.

Total gamma log data acquired by Pacific Northwest Laboratory in 1984 in this borehole indicated no obvious intervals of elevated count rate and was consistent with the current SGLS log profile. A slightly elevated count rate at 45 ft is indicated in both sets of log data at the same depth where Cs-137 was identified by the SGLS.

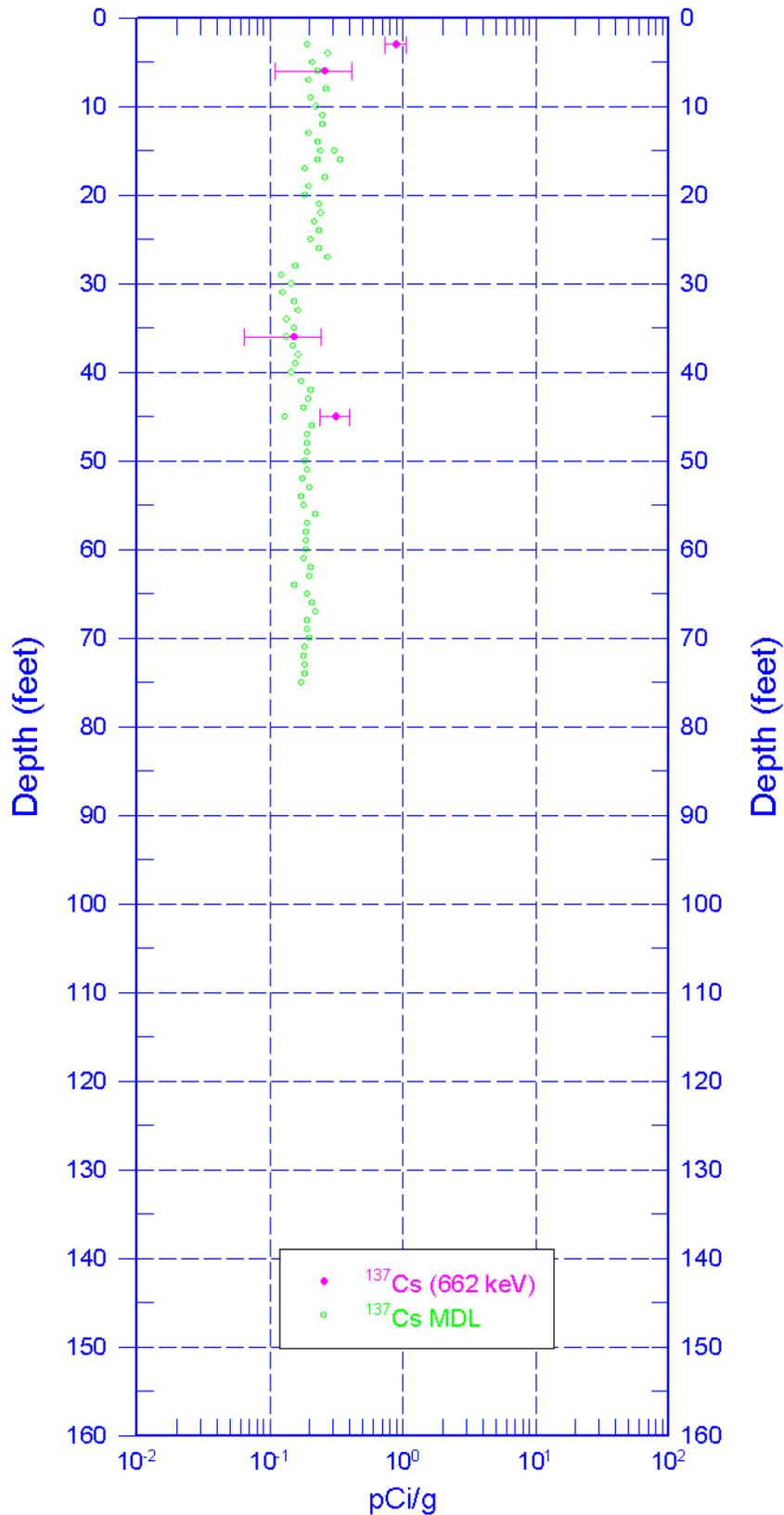
Neutron moisture data is converted to volumetric moisture, and the data acquired within the double cased and grouted interval (0 – 27 ft) is not valid and should be used qualitatively only.

List of Log Plots:

Man-made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Repeat Section of Natural Gamma Logs
Repeat Section of Moisture

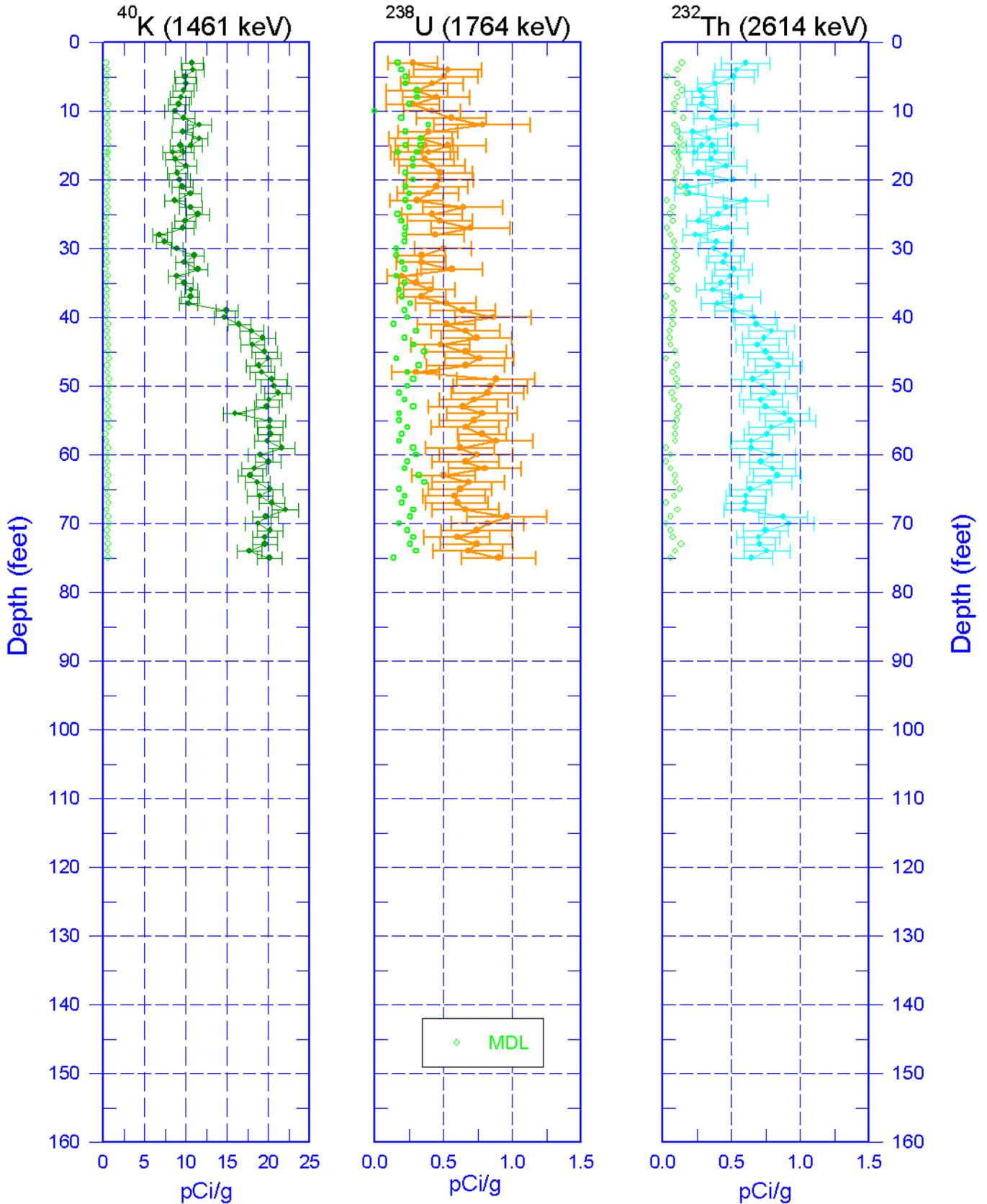
¹ GWL – groundwater level

299-W14-51 (A7335) Manmade Radionuclides



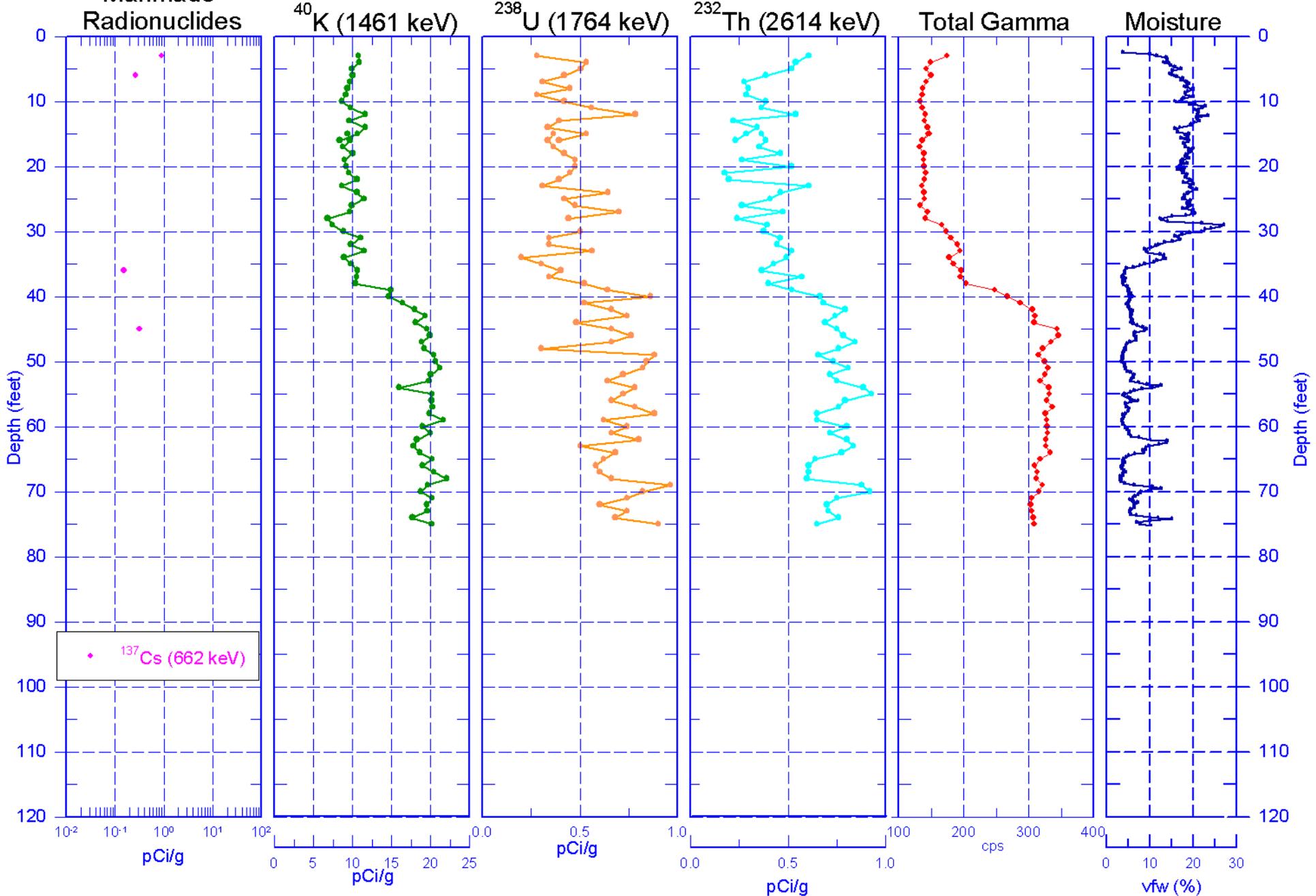
Zero Reference - Top of Casing

299-W14-51 (A7335) Natural Gamma Logs



Zero Reference = Top of Casing

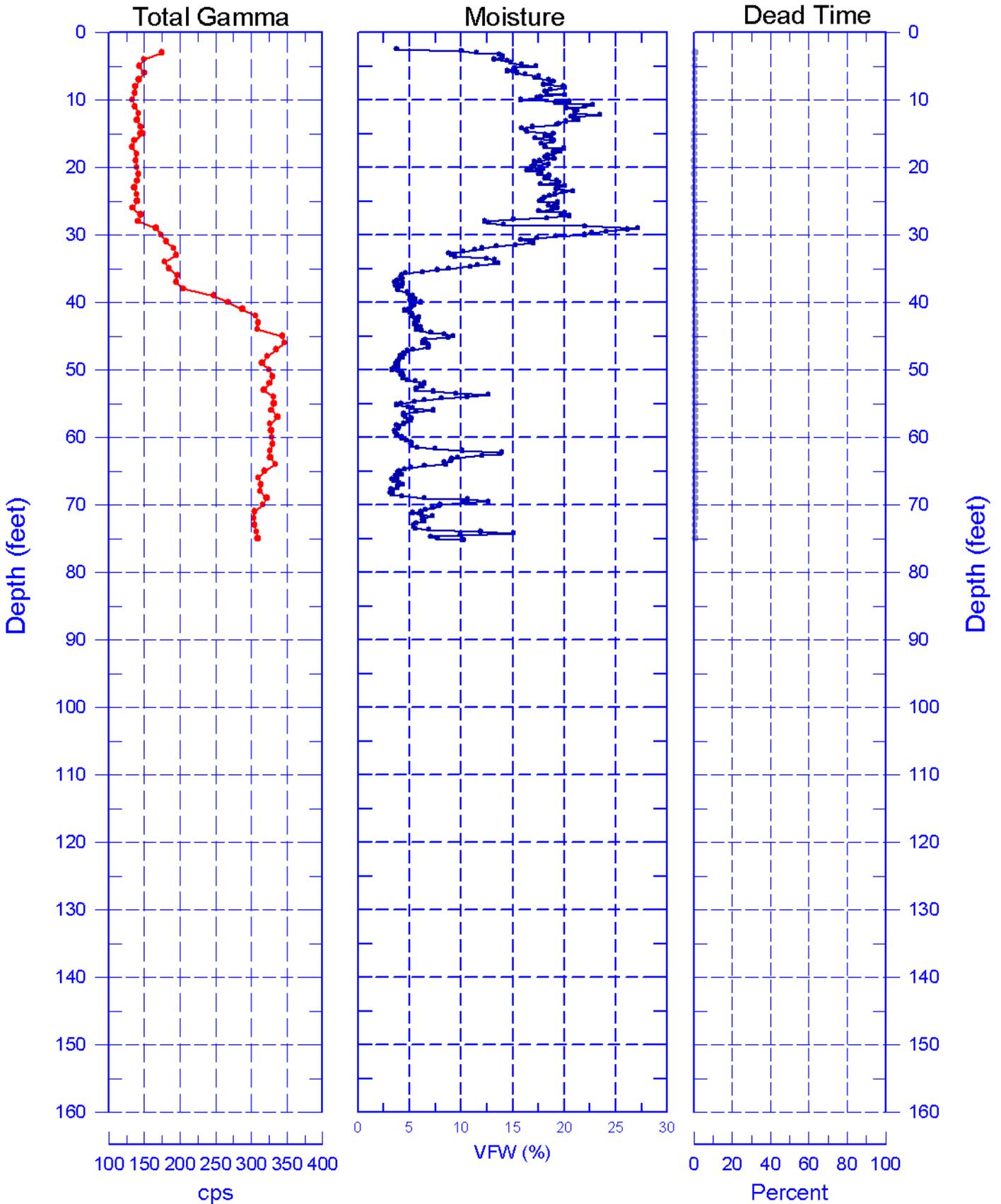
299-W15-41 (A7335) Combination Plot



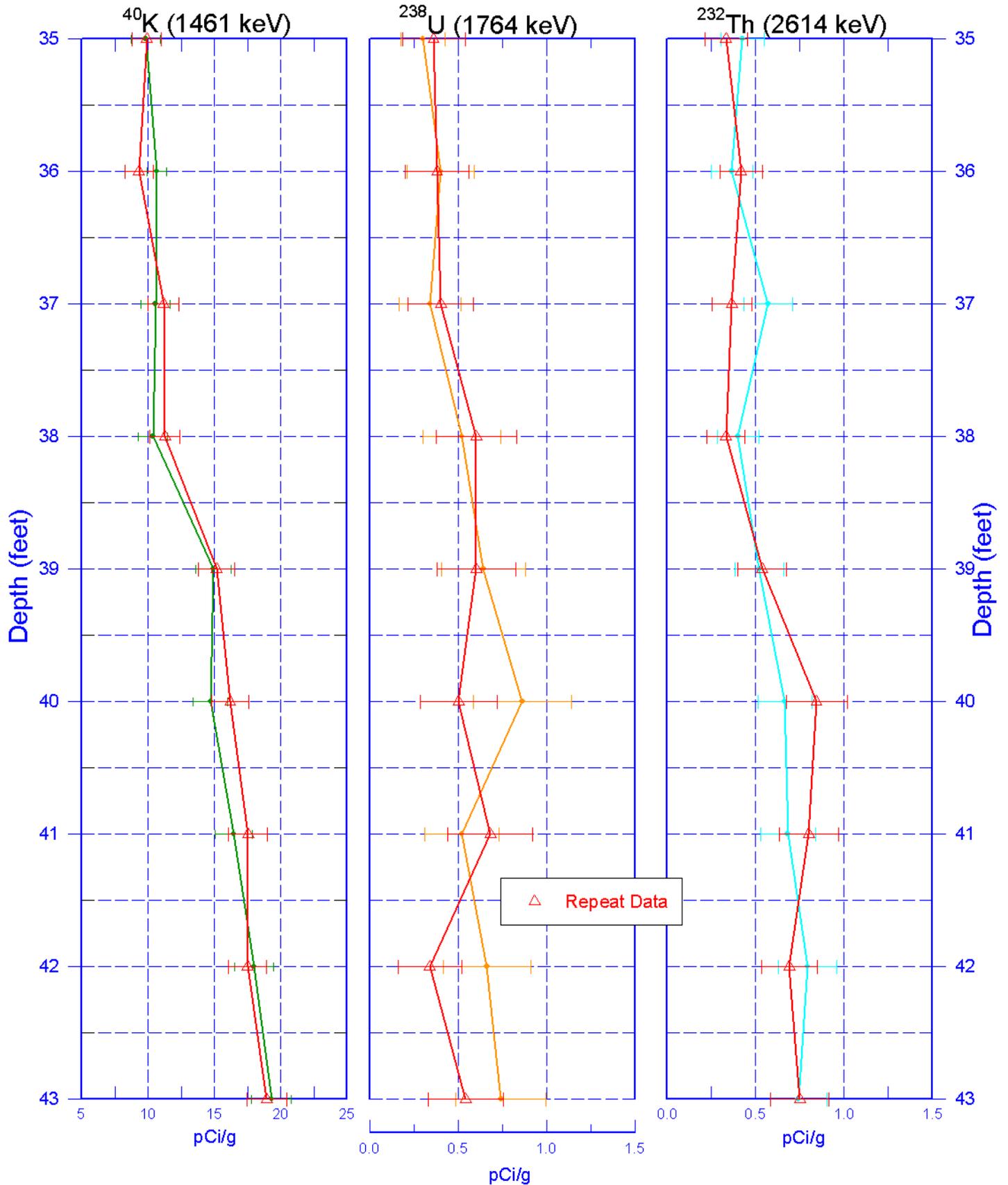
Zero Reference - Top of Casing

299-W14-51 (A7335)

Total Gamma, Moisture & Dead Time



Repeat Section of Natural Gamma Logs



299-W14-51 (A7335) Moisture Repeat Section

