299-E33-342 (C5857)
Log Data Report

Borehole Information:

Borehole:		299-E33-342 (C5857)		Site:	100 ft N of 241-BY Farm
Coordinates (WA St Plane)		GWL[1] (ft):	235.1	GWL Date:	04/15/08
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Not available	Not available	04/08	Not available	244	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	0.7	11 3/4	10 3/4	1/2	0.7	98
Threaded steel	2.3	9 5/8	8 11/16	15/32	2.3	242.5

Borehole Notes:

The logging engineer measured the casing diameters with a caliper and steel tape. The onsite geologist reported the casing depths.

Logging Equipment Information:

Logging System:	Gamma 4L		Type: / Serial No.:	SGLS HpGe (60%) / 45TP32211A
Effective Calibration Date:	12/31/07	Calibration Reference:	HGLP-CC-027	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

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

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat
Date	03/21/08	03/21/08	04/15/08	04/15/08
Logging Engineer	Pearson	Pearson	Spatz	Spatz
Start Depth (ft)	100.0	10.0	244.0	155.0
Finish Depth (ft)	0.0	0.0	97.0	140.0
Count Time (sec)	100	100	100	100
Live/Real	R	R	R	R
Shield (Y/N)	N	N	N	N
MSA Interval (ft)	1.0	1.0	1.0	1.0
Pre-Verification	DL211CAB	DL211CAB	DL271CAB	DL271CAB
Start File	DL211000	DL211101	DL271000	DL271148
Finish File	DL21100	DL21121	DL271147	DL271163
Post-Verification	DL211CAA	DL211CAA	DL271CAA	DL271CAA
Depth Return Error (in.)	0	0	N/A	N/A
Comments	Fine gain adjustment after files -089	No fine gain adjustment	Fine gain adjustment after files –096 and -134	No fine gain adjustment

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Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat	7	8 Repeat
Date	03/21/08	03/21/08	04/16/08	04/16/08
Logging Engineer	Pearson	Pearson	Spatz	Spatz
Start Depth (ft)	0.0	0.0	97.0	140.0
Finish Depth (ft)	100.0	10.0	235.50	155.0
Count Time (sec)	15	15	15	15
Live/Real	R	R	R	R
Shield (Y/N)	N	N	N	N
MSA Interval (ft)	0.25	0.25	0.25	0.25
Pre-Verification	DHC62CAB	DHC62CAB	DHD12CAB	DHD12CAB
Start File	DHC62000	DHC62401	DHD12000	DHD12555
Finish File	DHC62400	DHC62441	DHD12554	DHD12615
Post-Verification	DHC62CAA	DHC62CAA	DHD12CAA	DHD12CAA
Depth Return Error (in.)	+ 1.0	0	N/A	- 2.0
Comments	None	None	None	None

Logging Operation Notes:

Logging was conducted with a centralizer on the sondes. Data were mostly acquired in a single casing. Exceptions include a few depth intervals below the bottom of each casing where the sonde entered an open hole. All measurements are referenced to ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	05/28/08	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post-run verifications for the logging systems were performed before and after each day's data acquisition. The acceptance criteria were met.

Two different sized casings were used in drilling this borehole. A casing correction for a 1/2-in. thick casing was applied to the SGLS data to 98 ft; from 98 to 100 ft, no casing correction was applied for log run 1. Below 100 ft, a casing correction for a 15/32-in. thick casing was applied to 242.5 ft; from 242.5 to 244 ft, no correction for casing was applied. Data acquired below 237 ft were corrected for water; it was determined the total gamma log indicated attenuation from water at 237 ft rather than the depth of 235.1 ft that was measured with an e-tape before logging started.

The moisture data are reported in counts per second, as there is no valid calibration available for the casings used in this borehole. The data reflect relative moisture content.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G4LDec07.xls using efficiency functions and corrections for casing, dead time, and water as determined from annual calibrations.

Results and Interpretations:

Cs-137 was detected near the ground surface (5 ft) at a concentration of approximately 15 pCi/g.

Co-60 was detected at 143 ft and from 241 to 244 ft. The maximum concentration was 0.28 pCi/g at 242 ft. It is possible that the contamination is in the groundwater rather than the sediments.

MDLs for processed uranium (U-238 and U-235) are plotted because some investigators believe the 216-BY cribs may be a source of uranium contamination in the groundwater in the area. No uranium was detected in the vadose zone.

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Moisture data indicate relatively high moisture at approximately 118 and 142 ft, which may indicate thin intervals of fine-grained sediment. Co-60 is detected at 143 ft and may be the result of lateral migration from a distant source along the sediment layer.

Repeat sections acquired for each logging system indicate good repeatability.

List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides (2 pages)
Natural Gamma Logs (2 pages)
Combination Plot (3 pages)
Combination Plot (0 to 280 ft)
Total Gamma & Moisture (0 to 280 ft)
Repeat of Manmade Radionuclides (0 to 10 ft)
Repeat of Manmade Radionuclides (140 to 155 ft)
Repeat Section of Natural Gamma Logs (0 to 10 ft)
Repeat Section of Natural Gamma Logs (140 to 155 ft)
Repeat Section for Total Gamma & Moisture (140 to 155 ft)

[1] GWL – groundwater level

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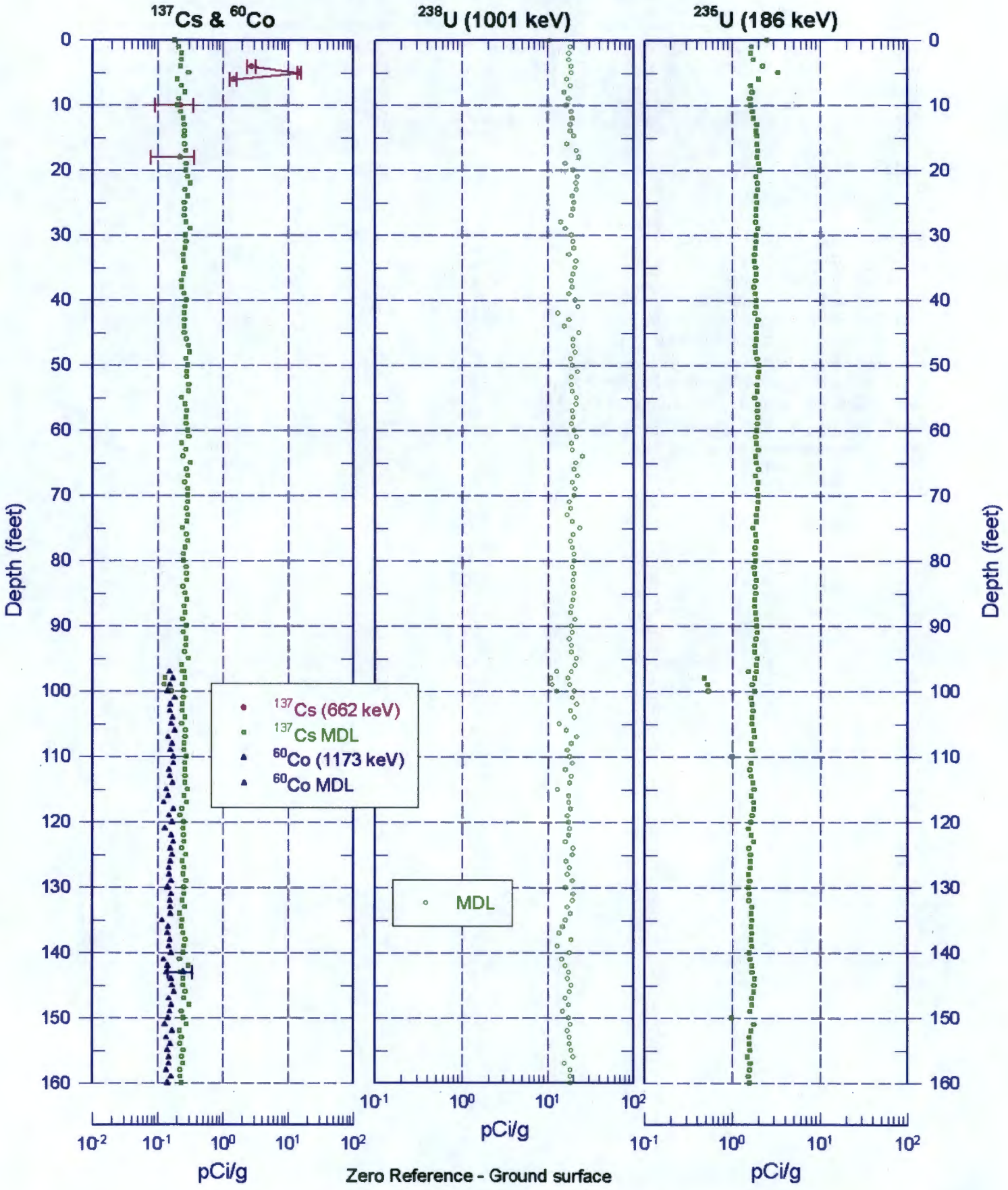
299-E33-342 (C5857)
Man-Made Radionuclides



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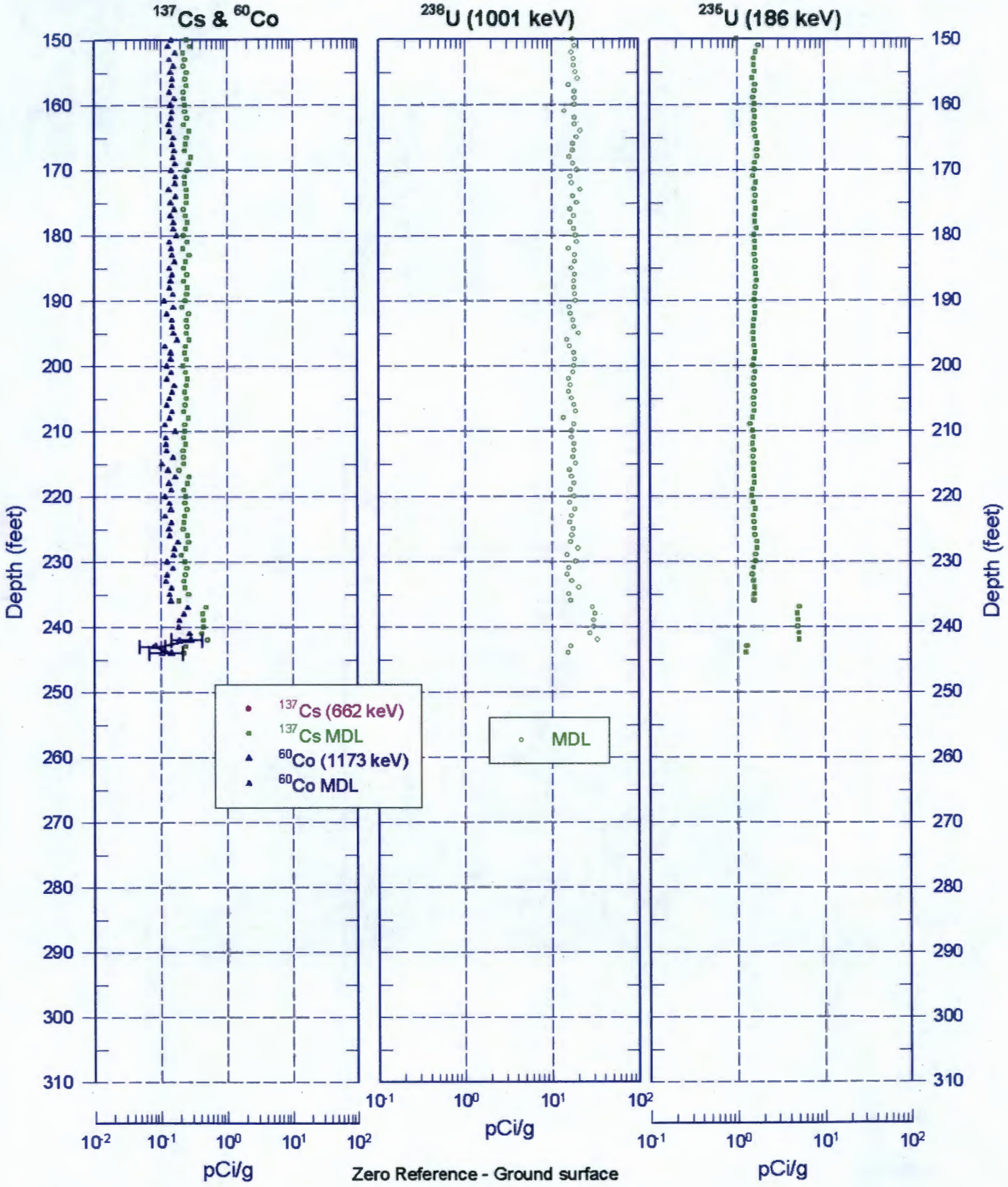
299-E33-342 (C5857)
Man-Made Radionuclides



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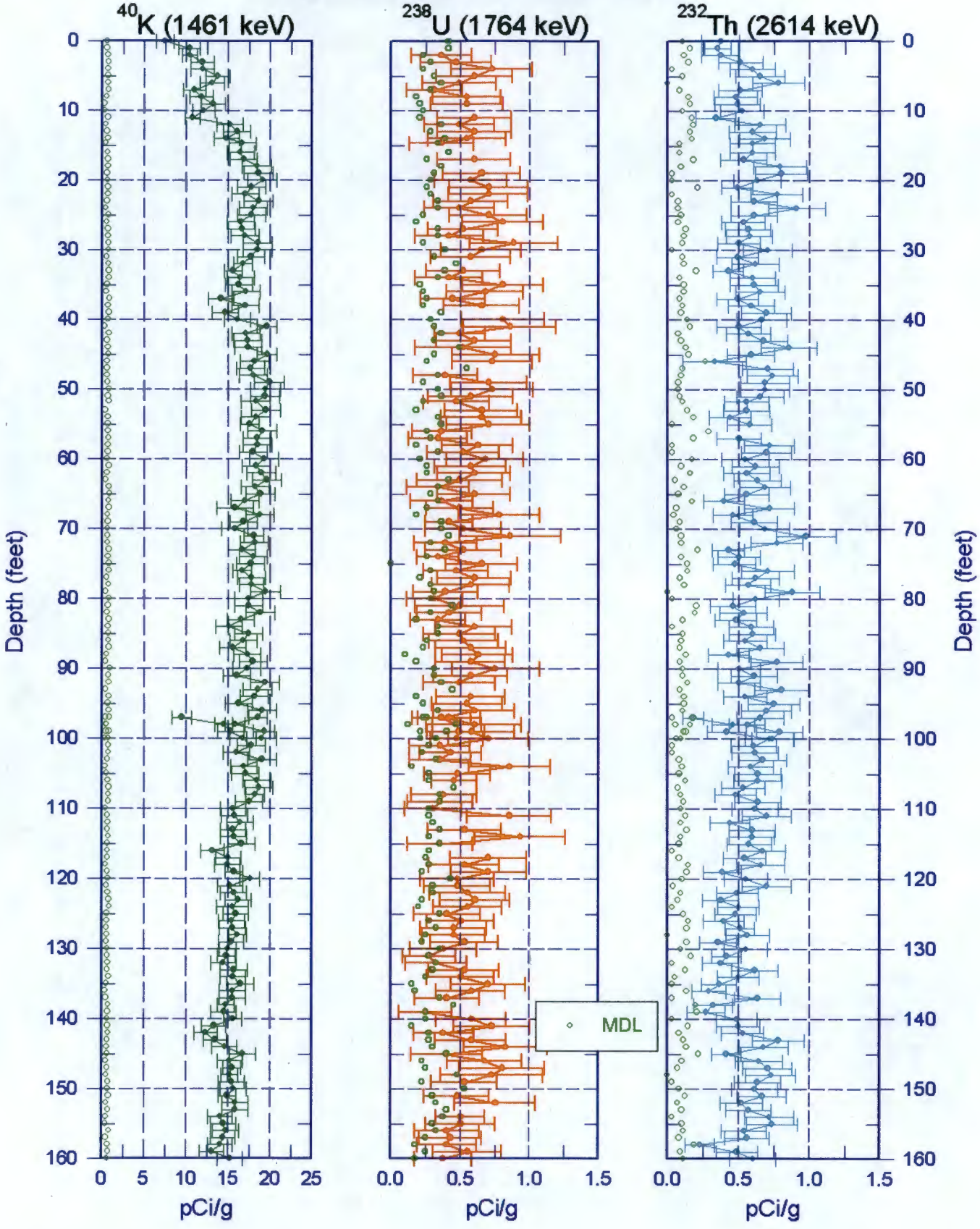
299-E33-342 (C5857)
Natural Gamma Logs



Zero Reference - Ground surface

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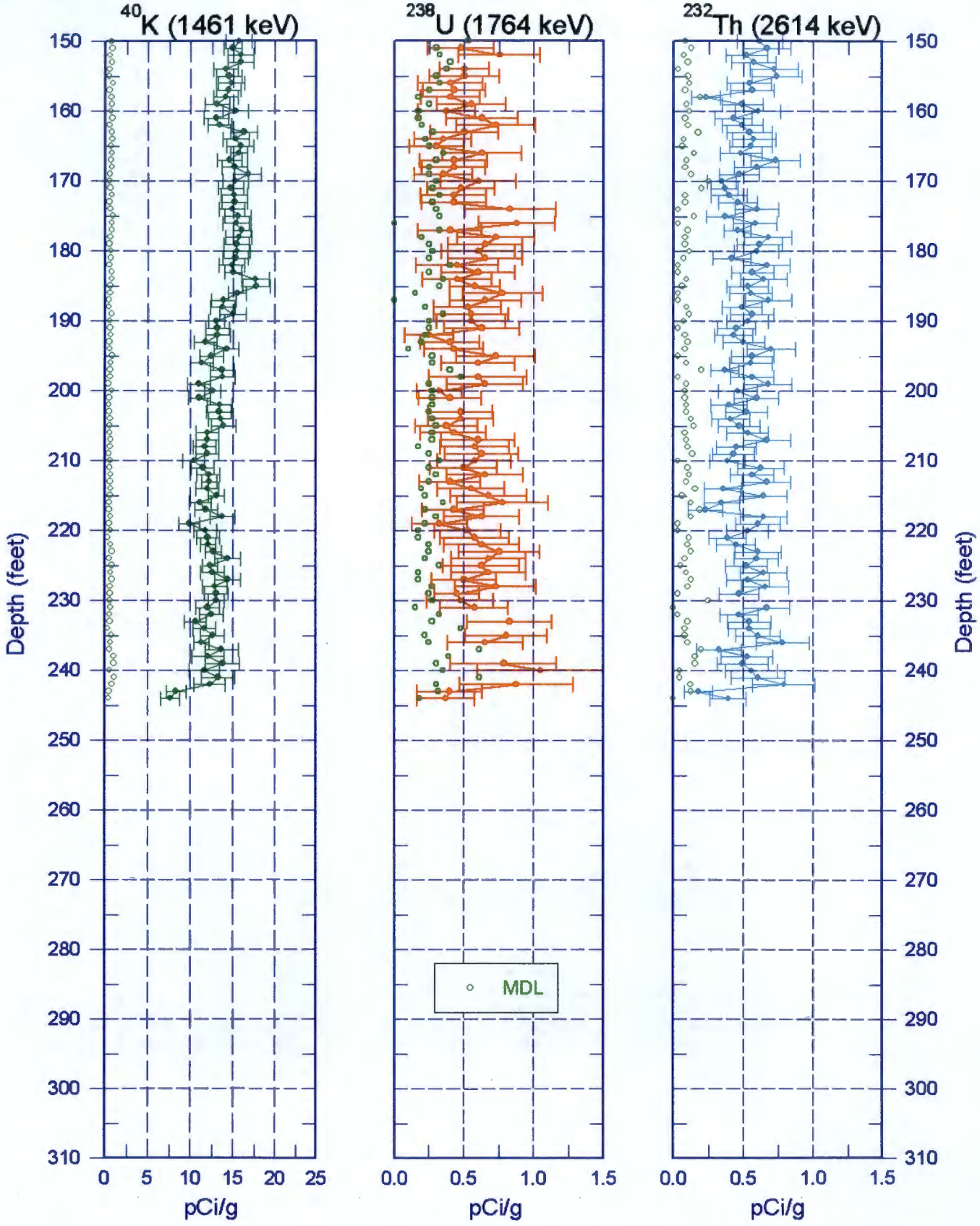
299-E33-342 (C5857)
Natural Gamma Logs



Zero Reference - Ground surface

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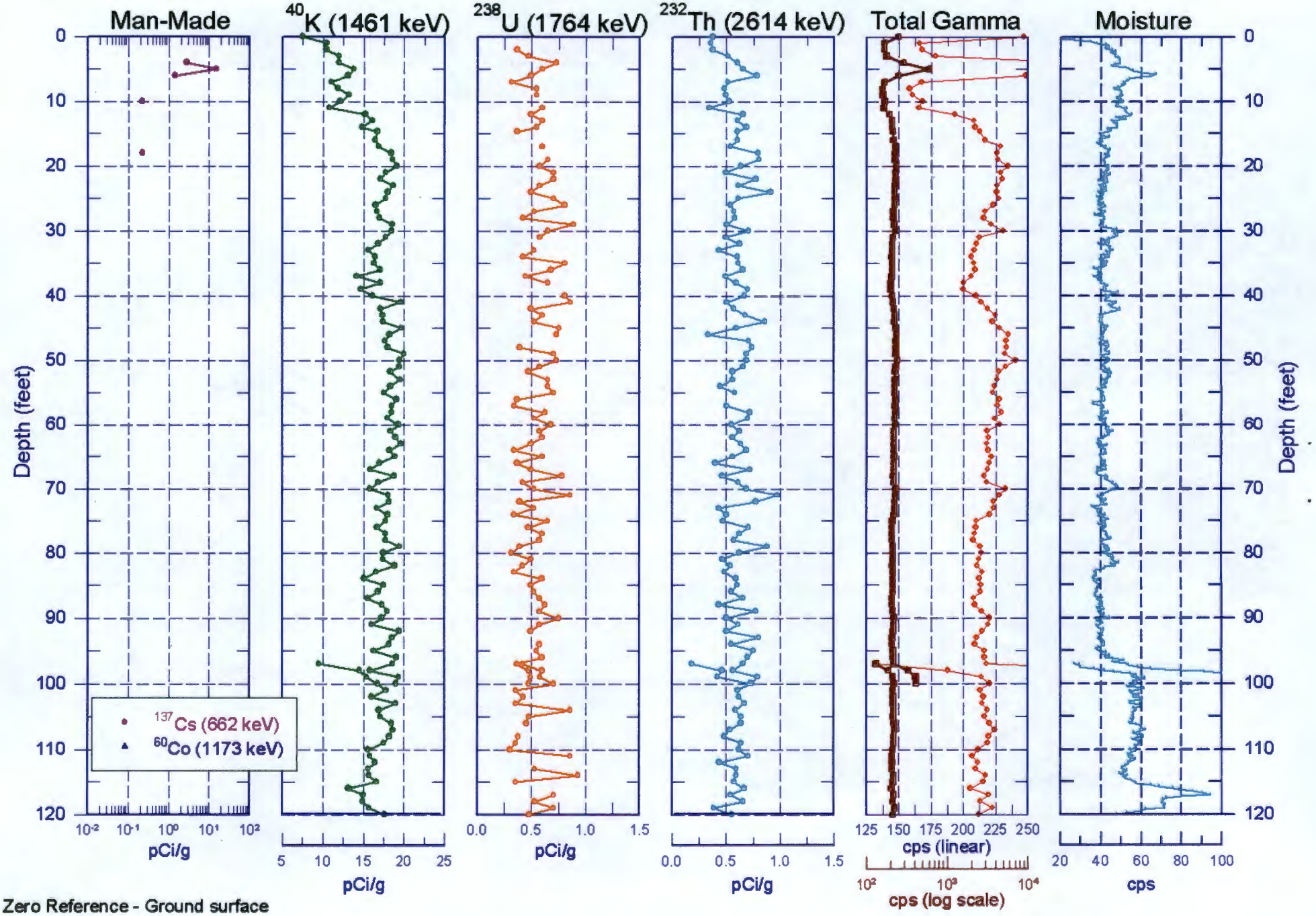
299-E33-342 (C5857) Combination Plot



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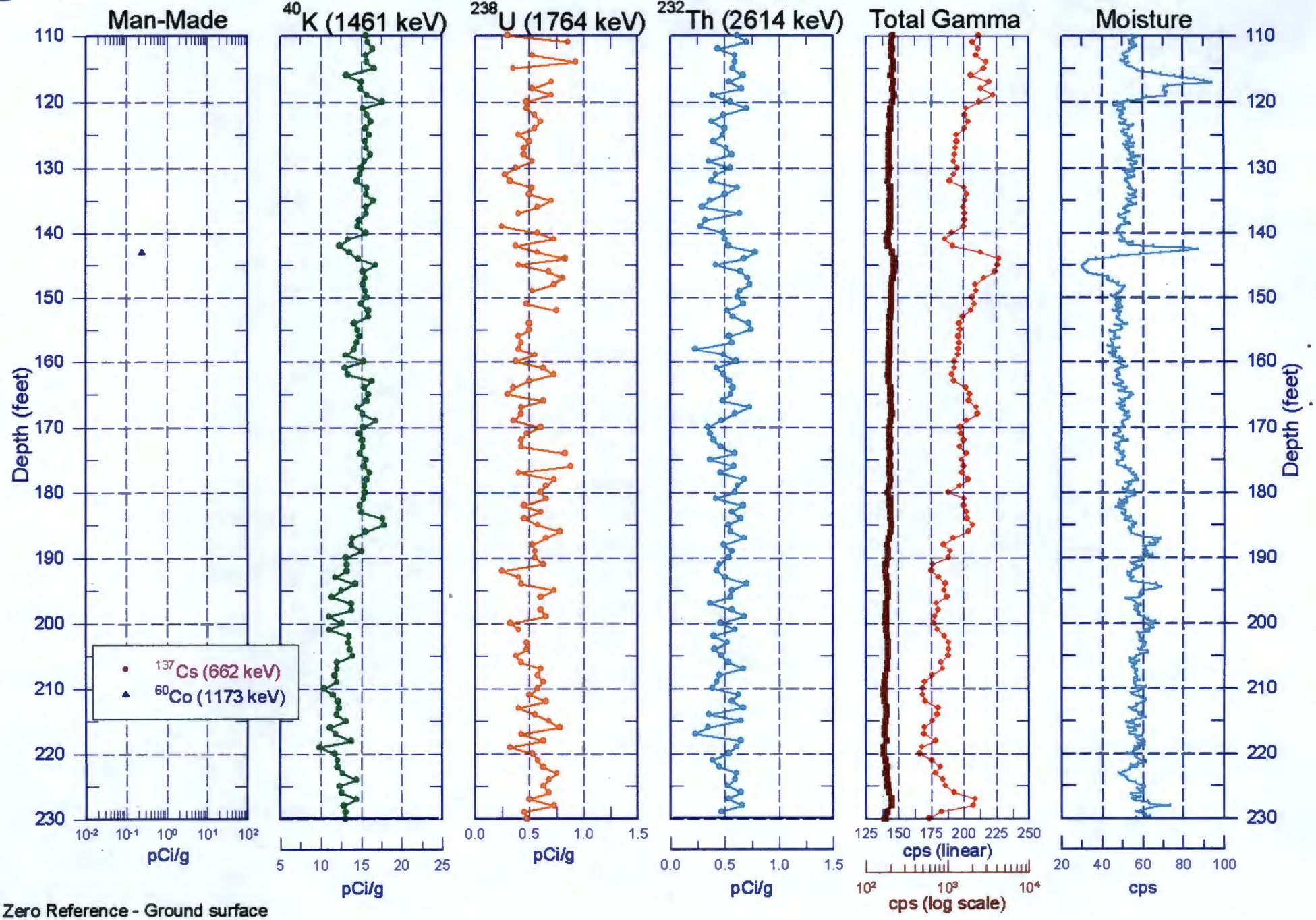
299-E33-342 (C5857) Combination Plot



Zero Reference - Ground surface

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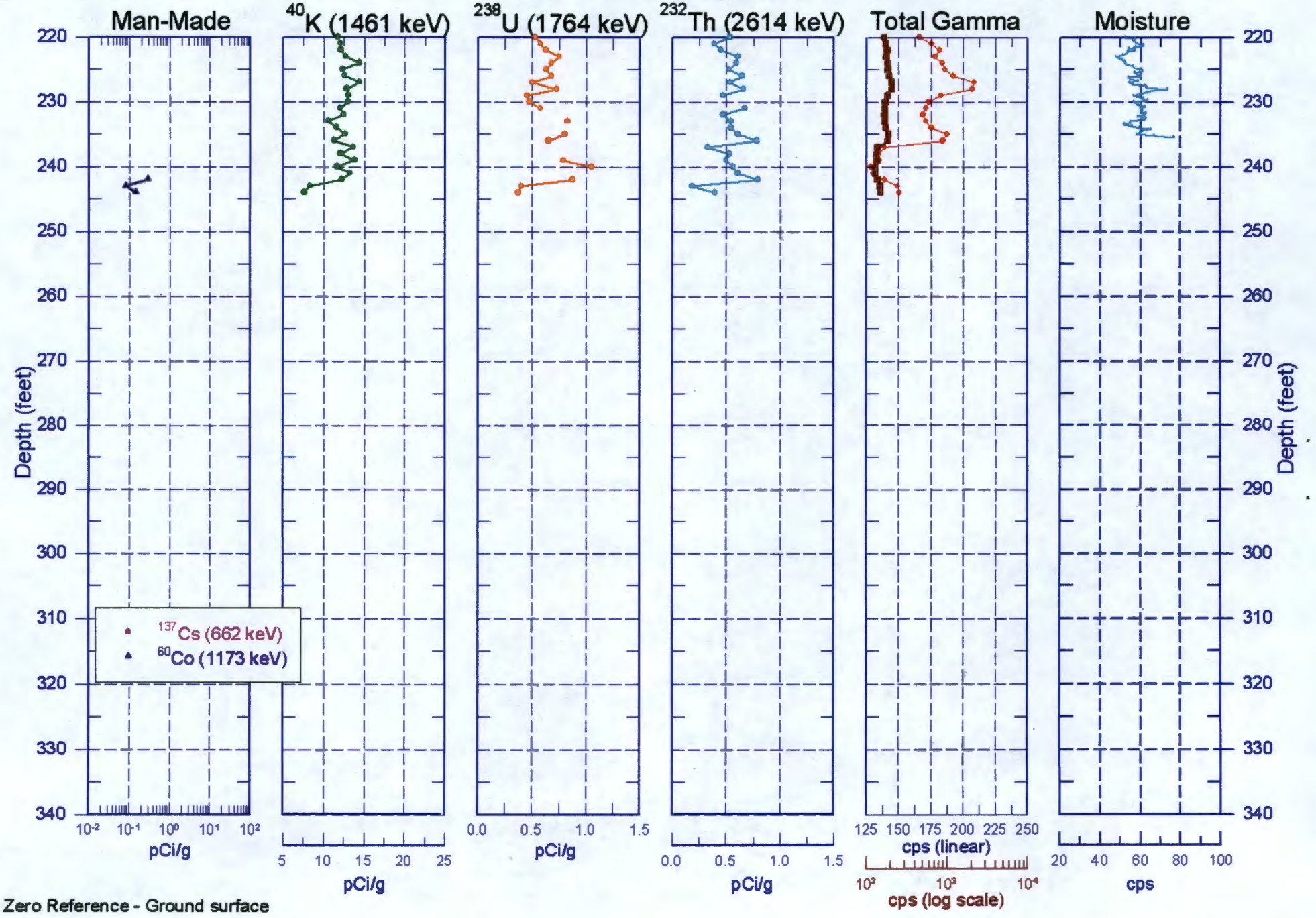
299-E33-342 (C5857) Combination Plot



Zero Reference - Ground surface

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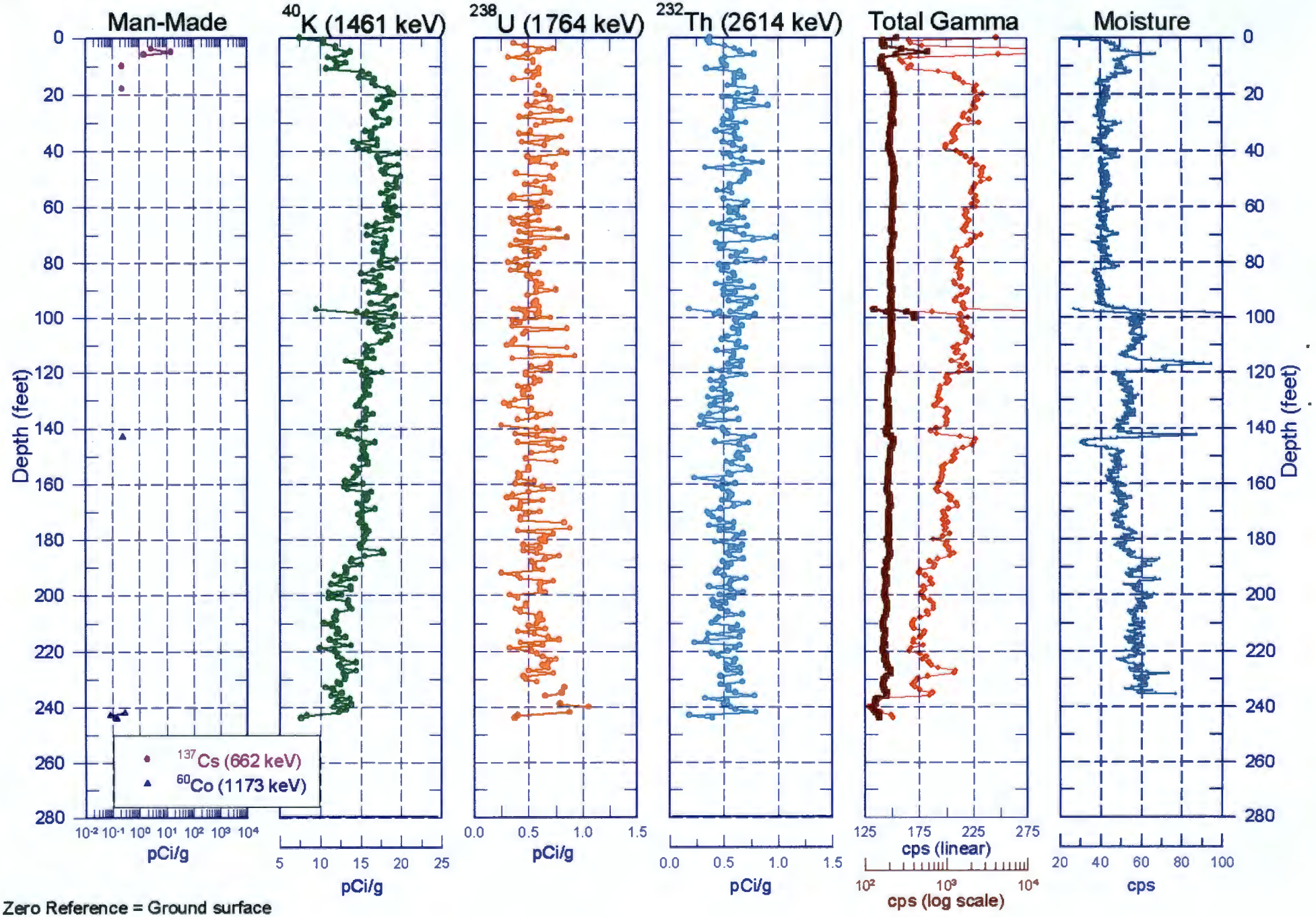
299-E33-342 (C5857) Combination Plot



Zero Reference = Ground surface

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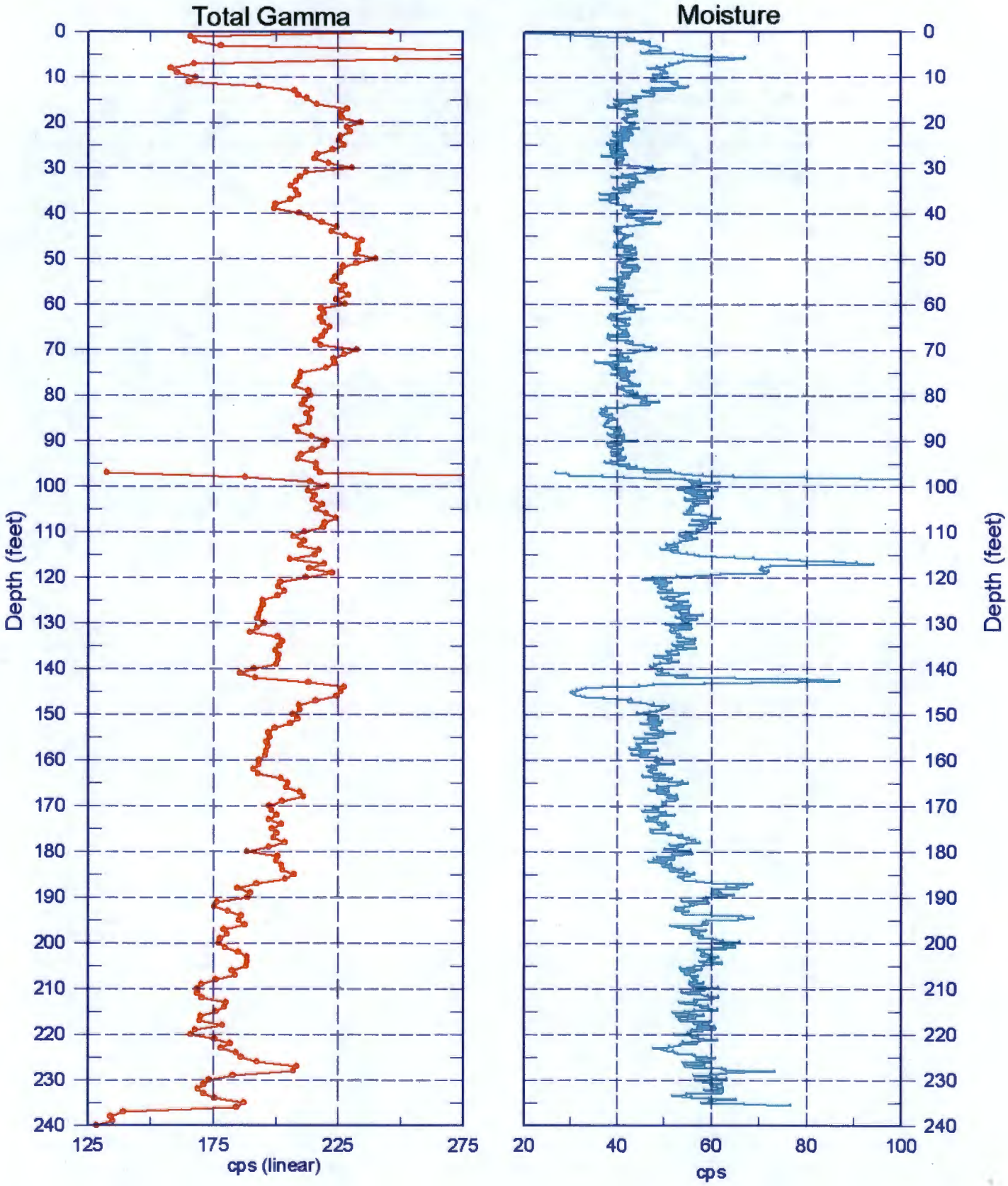
299-E33-342 (C5857)
Total Gamma & Moisture



Reference - Ground Surface

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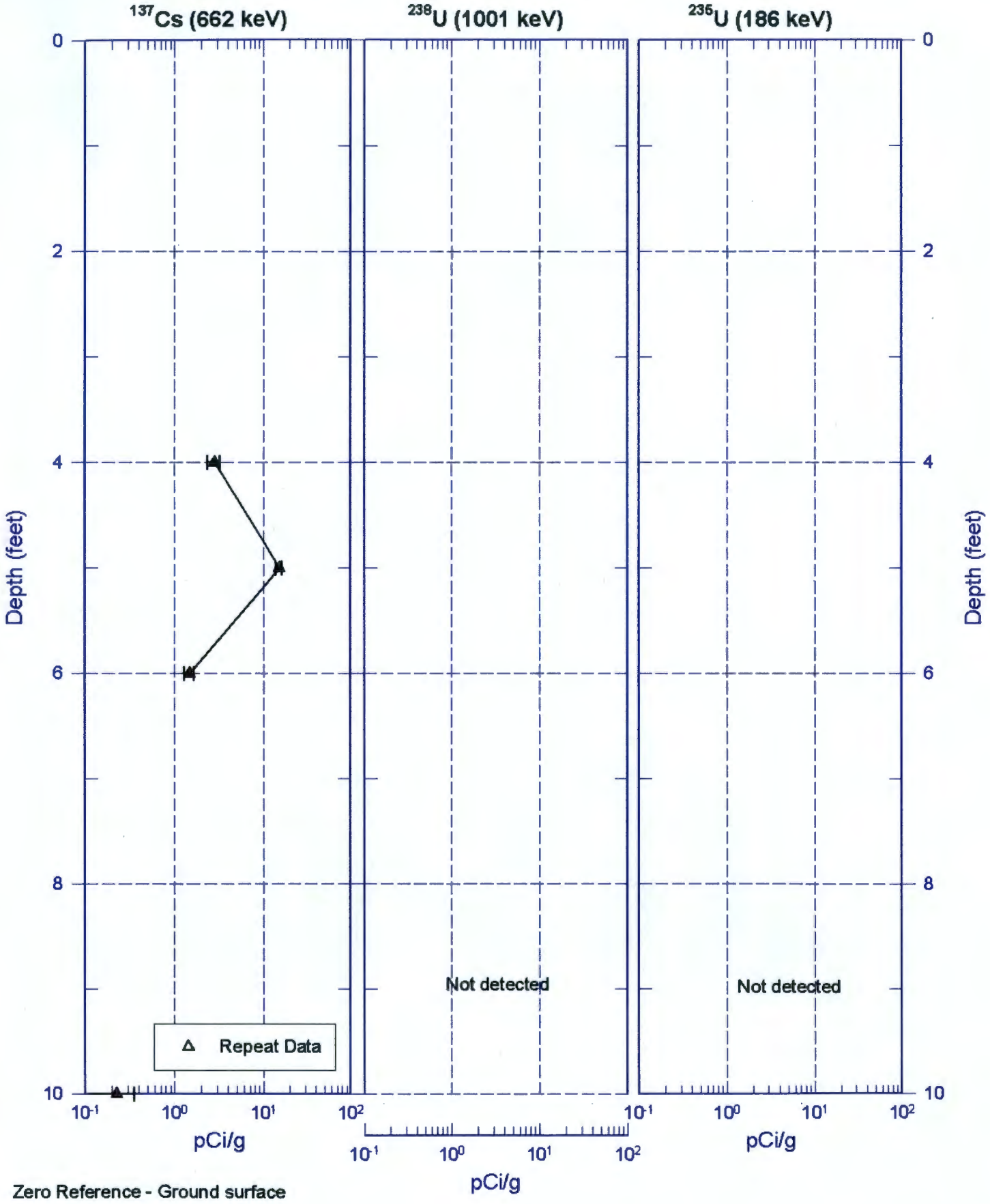
299-E33-342 (C5857)
Repeat of Manmade Radionuclides



Zero Reference - Ground surface

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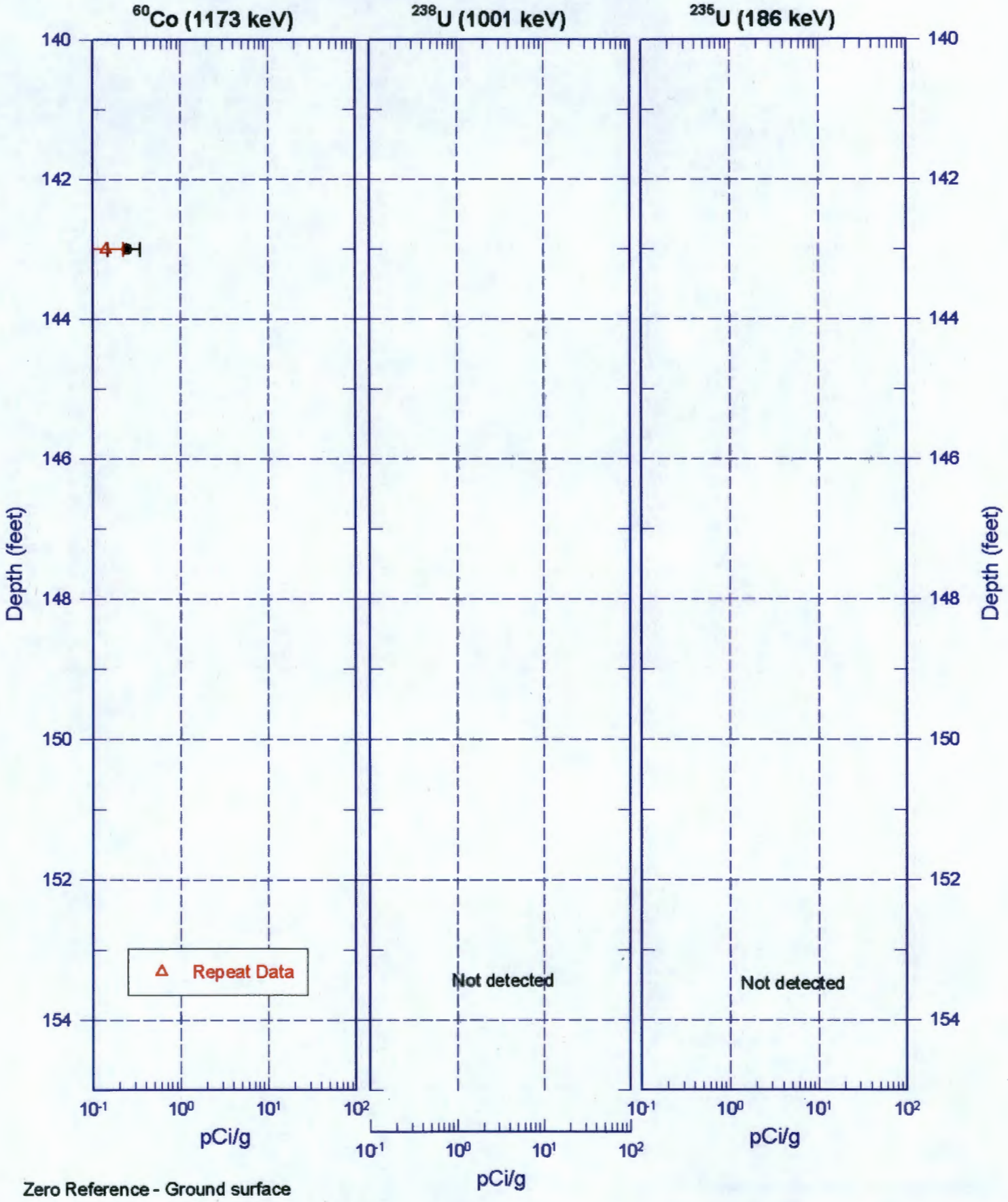
299-E33-342 (C5857)

Repeat of Manmade Radionuclides



Zero Reference - Ground surface

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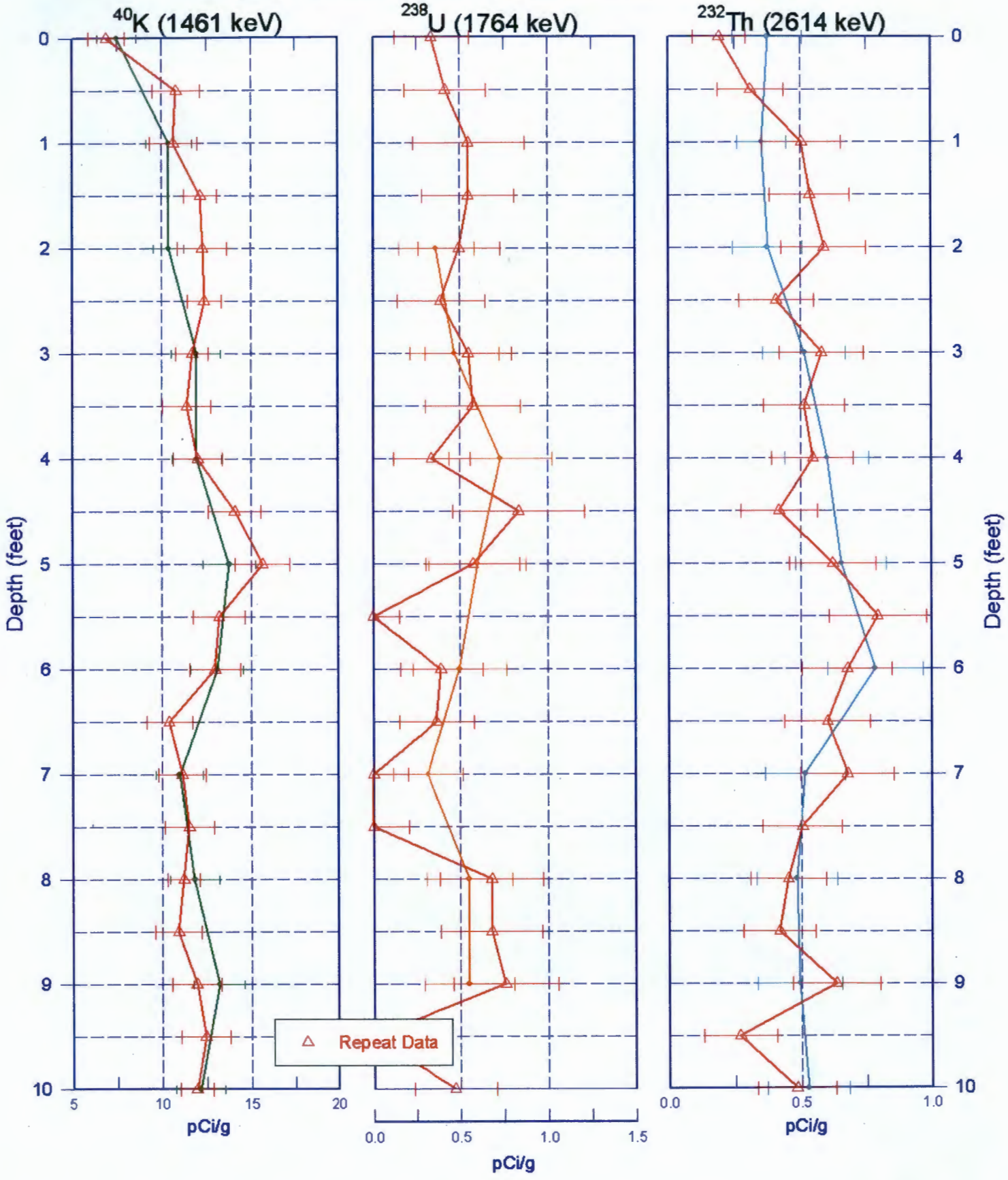
299-E33-342 (C5857)

Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

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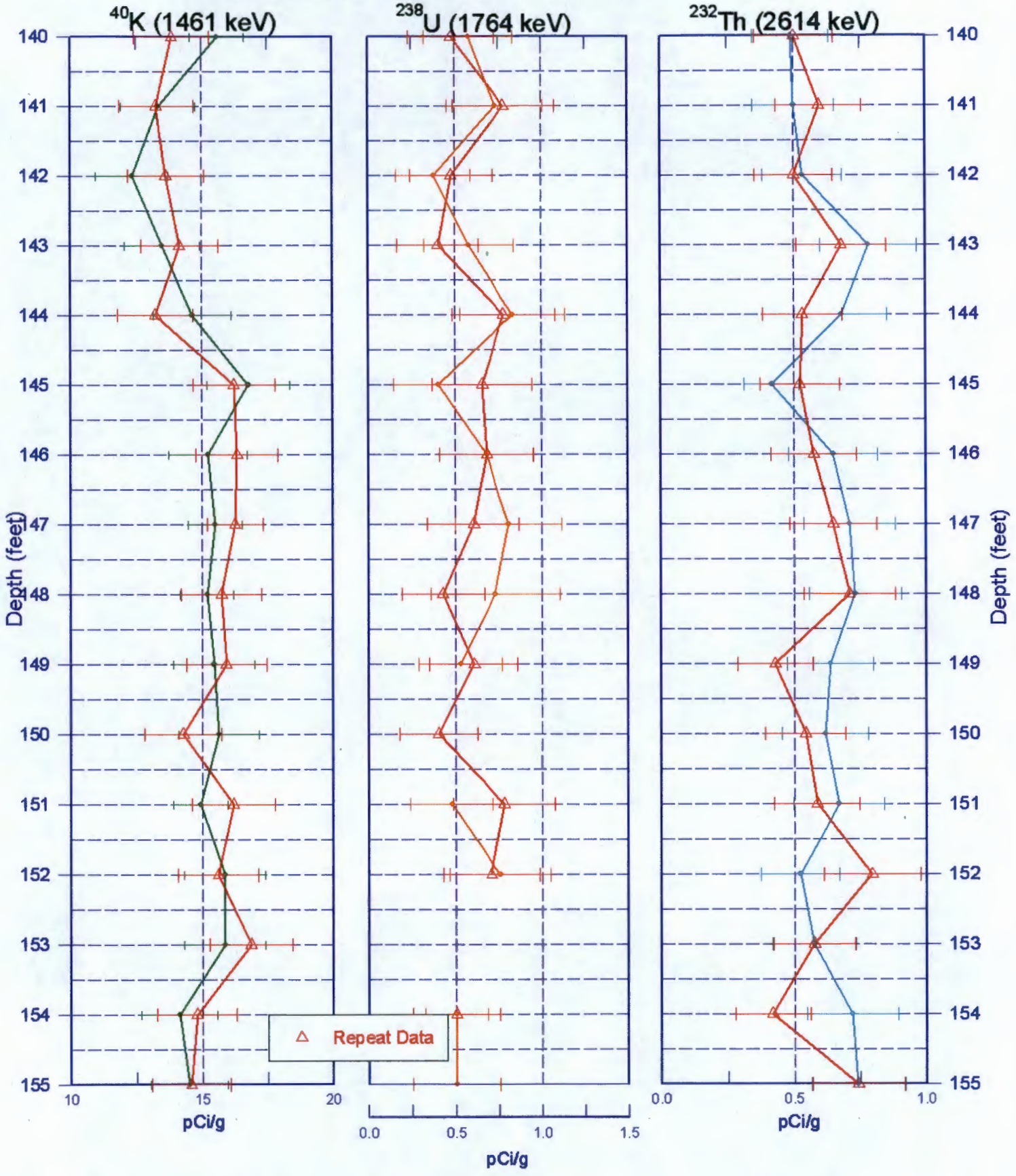
299-E33-342 (C5857)

Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

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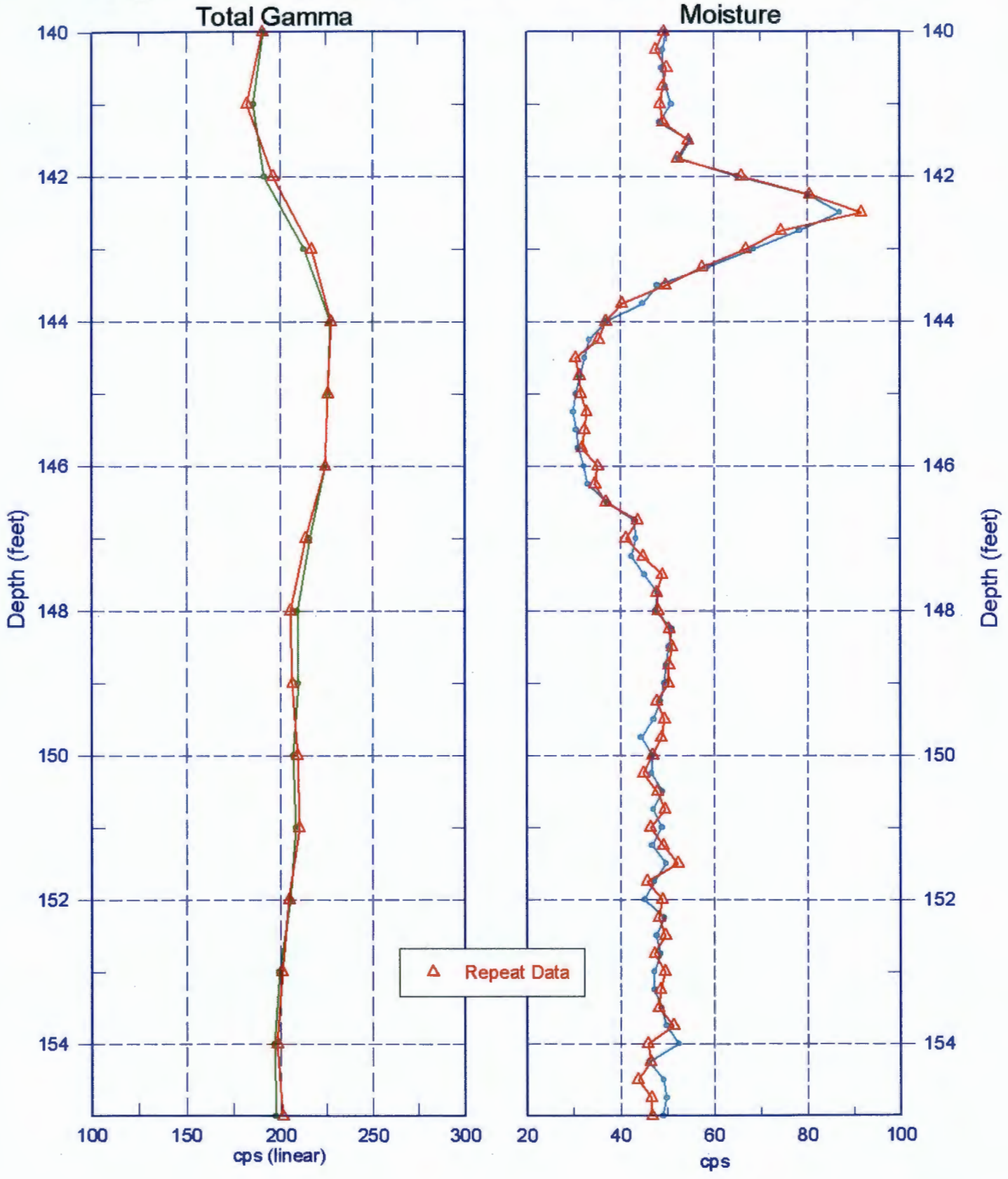
299-E33-342 (C5857)

Repeat Section for Total Gamma & Moisture



Reference - Ground surface