

C5929 Log Data Report

Borehole Information:

Borehole:		C5929		Site:		216-B-55	
Coordinates (WA St Plane)		GWL¹ (ft):		None		GWL Date: 01/08/08	
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type		
Not available	Not available	01/08	Not available	32	Push		

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	1.6	7	5 3/4	5/8	1.6	50

Borehole Notes:

The logging engineer measured the casing diameter with a caliper and steel tape. One casing length is 5 ft. The RCT reported finding contamination on the drill bit when it was removed from the borehole. However, measurements from a swab indicated no detectable contamination. A plastic sleeve was placed over each logging sonde to prevent contamination of equipment. All measurements are referenced to ground surface.

Logging Equipment Information:

Logging System:	Gamma 4N		Type:	SGLS 60% HpGe
Effective Calibration Date:	09/20/07	Calibration Reference:	Serial No.:	45TP22010A
		Logging Procedure:	HGLP-CC-022, Rev. 1	
			HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1C		Type:	HRLS planar HpGe
Effective Calibration Date:	11/22/07	Calibration Reference:	Serial No.:	39A314
		Logging Procedure:	HGLP-CC-024	
			HGLP-MAN-002, Rev. 0	

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

Logging System:	Gamma 4H (without AmBe source)		Type:	PMLS
Effective Calibration Date:	Not required	Calibration Reference:	Serial No.:	H310700352
		Logging Procedure:	None required	
			HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	01/15/08	01/15/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	15.0			
Finish Depth (ft)	30.0	20.0			
Count Time (sec)	100	100			
Live/Real	R	R			

Log Run	1	2 Repeat			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Pre-Verification	DN911CAB	DN911CAB			
Start File	DN911000	DN911031			
Finish File	DN911030	DN911036			
Post-Verification	DN911CAA	DN911CAA			
Depth Return Error (in.)	N/A	0			
Comments	No fine gain adjustment	No fine gain adjustment			

High Rate Logging System (HRLS) Log Run Information:

Log Run	7	8 Repeat			
Date	01/21/08	01/21/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	10.0	10.0			
Finish Depth (ft)	15.0	15.0			
Count Time (sec)	300	300			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.5	0.5			
Pre-Verification	AC188CAB	AC188CAB			
Start File	AC188000	AC188011			
Finish File	AC188010	AC188013			
Post-Verification	AC188CAA	AC188CAA			
Depth Return Error (in.)	N/A	+ 0.5			
Comments	No fine gain adjustment	No fine gain adjustment			

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	5	6 Repeat			
Date	01/16/08	01/16/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	10.0			
Finish Depth (ft)	31.25	16.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Pre-Verification	DH992CAB	DH992CAB			
Start File	DH992000	DH992126			
Finish File	DH992125	DH992150			
Post-Verification	DH992CAA	DH992CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Passive Neutron Logging System (PNLS) Log Run Information:

Log Run	3	4 Repeat			
Date	01/15/08	01/15/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	10.0			
Finish Depth (ft)	31.0	16.0			

Log Run	3	4 Repeat			
Count Time (sec)	60	60			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Pre-Verification	DH982CAB	DH982CAB			
Start File	DH982000	DH982032			
Finish File	DH982031	DH982038			
Post-Verification	DH982CAA	DH982CAA			
Depth Return Error (in.)	N/A	- 0.5			
Comments	None	None			

Logging Operation Notes:

Logging was conducted with no centralizer on the sondes. All measurements are referenced to ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	01/28/08	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 each day's data acquisition. The acceptance criteria were met.

A casing correction for a 5/8-in. thick casing was applied to the SGLS and HRLS data.

The moisture data are reported in counts per second, as calibrations are limited to 6- and 8-in. boreholes.

Passive neutron data are used qualitatively and no calibration is required. Passive neutron logging detects neutron activity originating from the sediments. The most likely sources are (alpha, neutron) reactions that occur when alpha particles interact with light elements (such as oxygen, nitrogen or fluoride compounds) in the soil matrix, or to a lesser extent, spontaneous fission from radionuclides such as Pu-240. In either case, passive neutron activity is considered a qualitative indicator of the presence of transuranic (TRU) radionuclides, even where no characteristic gamma emissions are detected. However, the absence of passive neutron activity cannot be taken as definitive proof that TRU radionuclides are not present. Below the nanocurie range, TRU radionuclides may not exist in sufficient concentrations that a neutron flux would be evident.

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 template identified as G4NSept07.xls and G1cNov07.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing and dead time as determined from annual calibrations. HRLS data are substituted for SGLS data where dead time exceeds approximately 40 percent.

Results and Interpretations:

Cs-137 was detected from 8 to 30 ft. The maximum concentration was measured at approximately 38,000 pCi/g at 13 ft.

Moisture data indicate some variability.

The passive neutron data indicate no neutron flux that could be attributed to TRU radionuclides.

Repeat sections acquired for each logging system indicate good repeatability.

List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides

Natural Gamma Logs

Combination Plot

Total Gamma, Passive Neutron, & Moisture

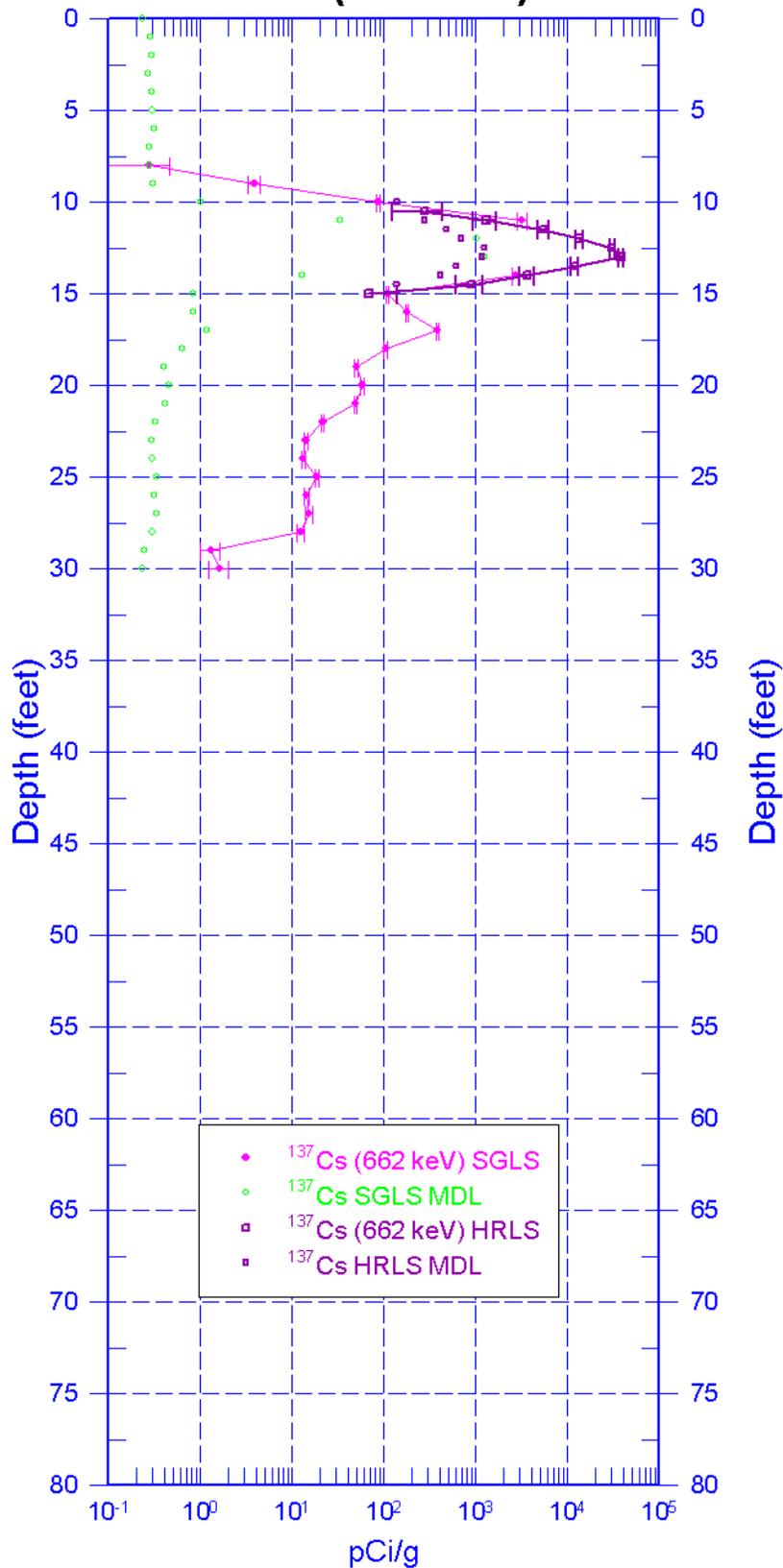
Repeat of Manmade Radionuclides

Repeat Section of Natural Gamma Logs

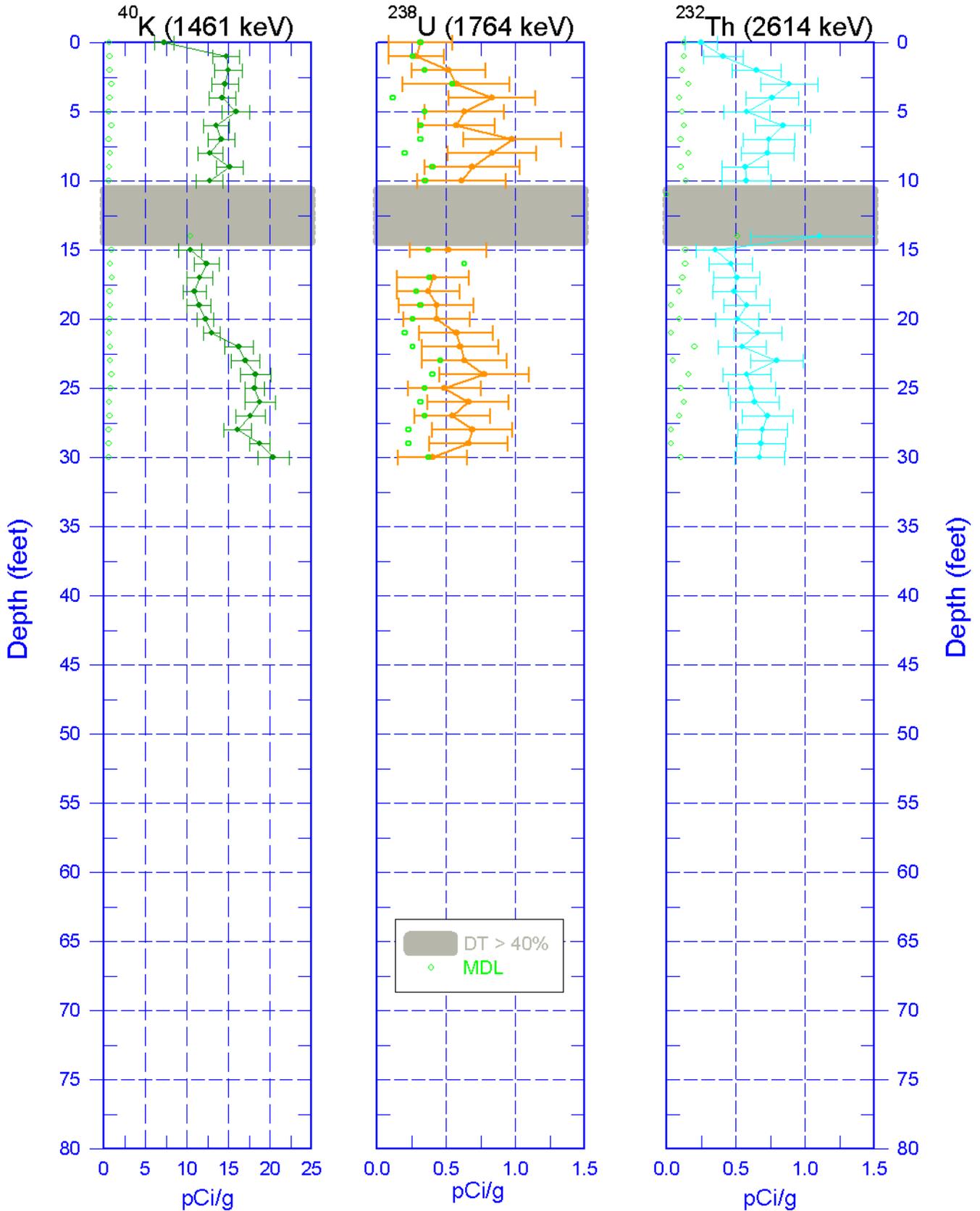
Repeat of Passive Neutron & Moisture

¹ GWL – groundwater level

C5929 Manmade Radionuclides ¹³⁷Cs (662 keV)

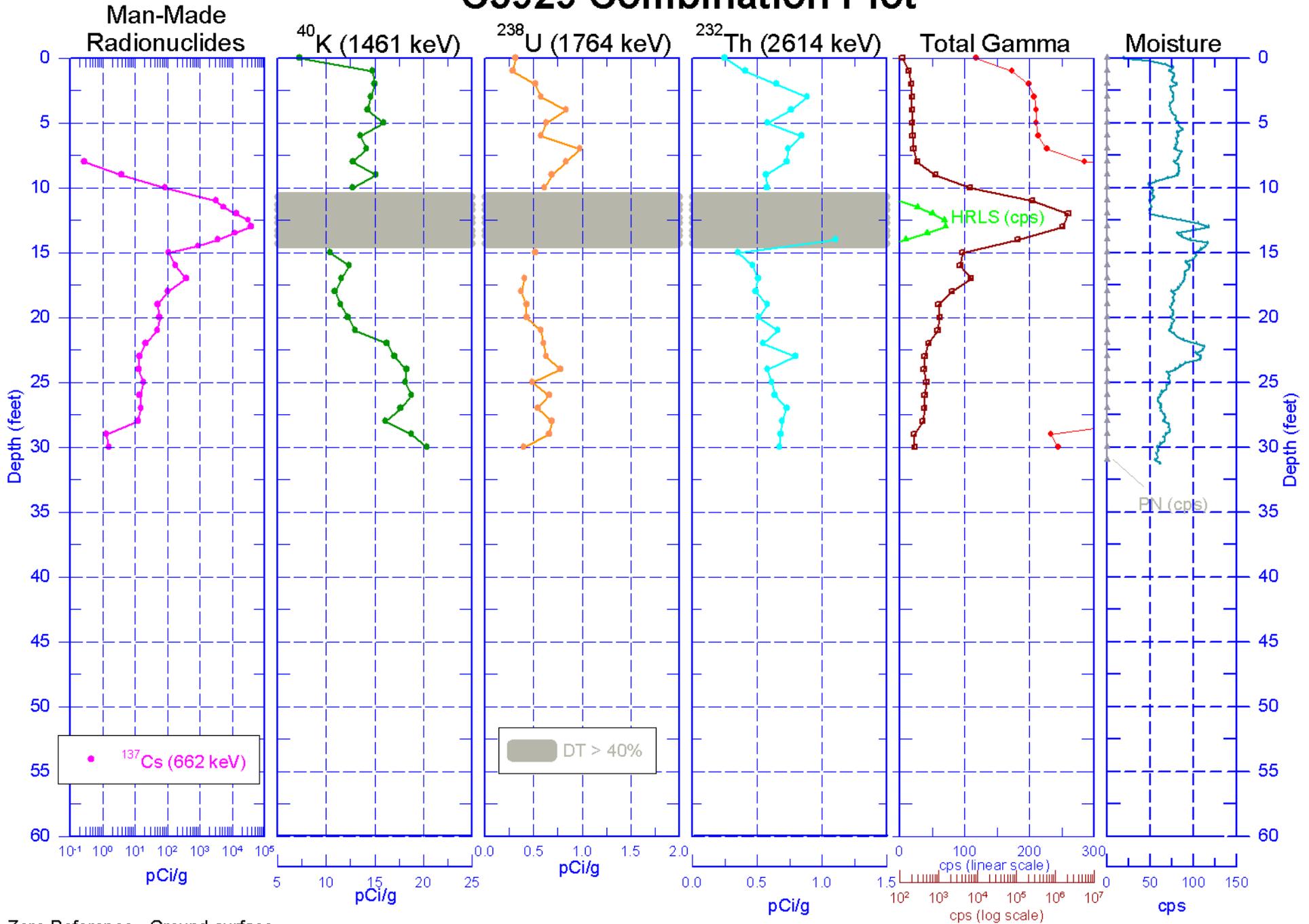


C5929 Natural Gamma Logs



Zero Reference = Ground surface

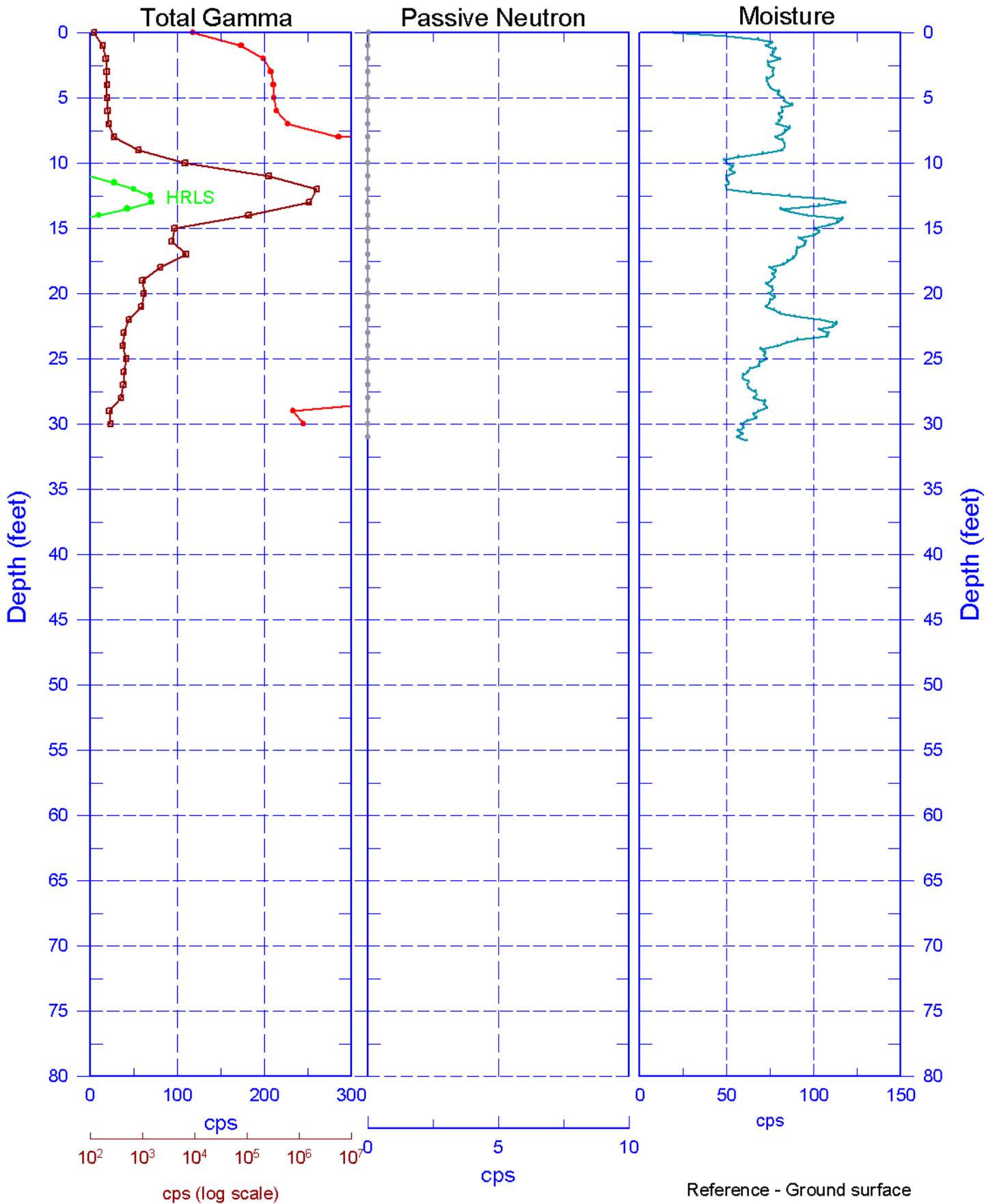
C5929 Combination Plot



Zero Reference - Ground surface

C5929

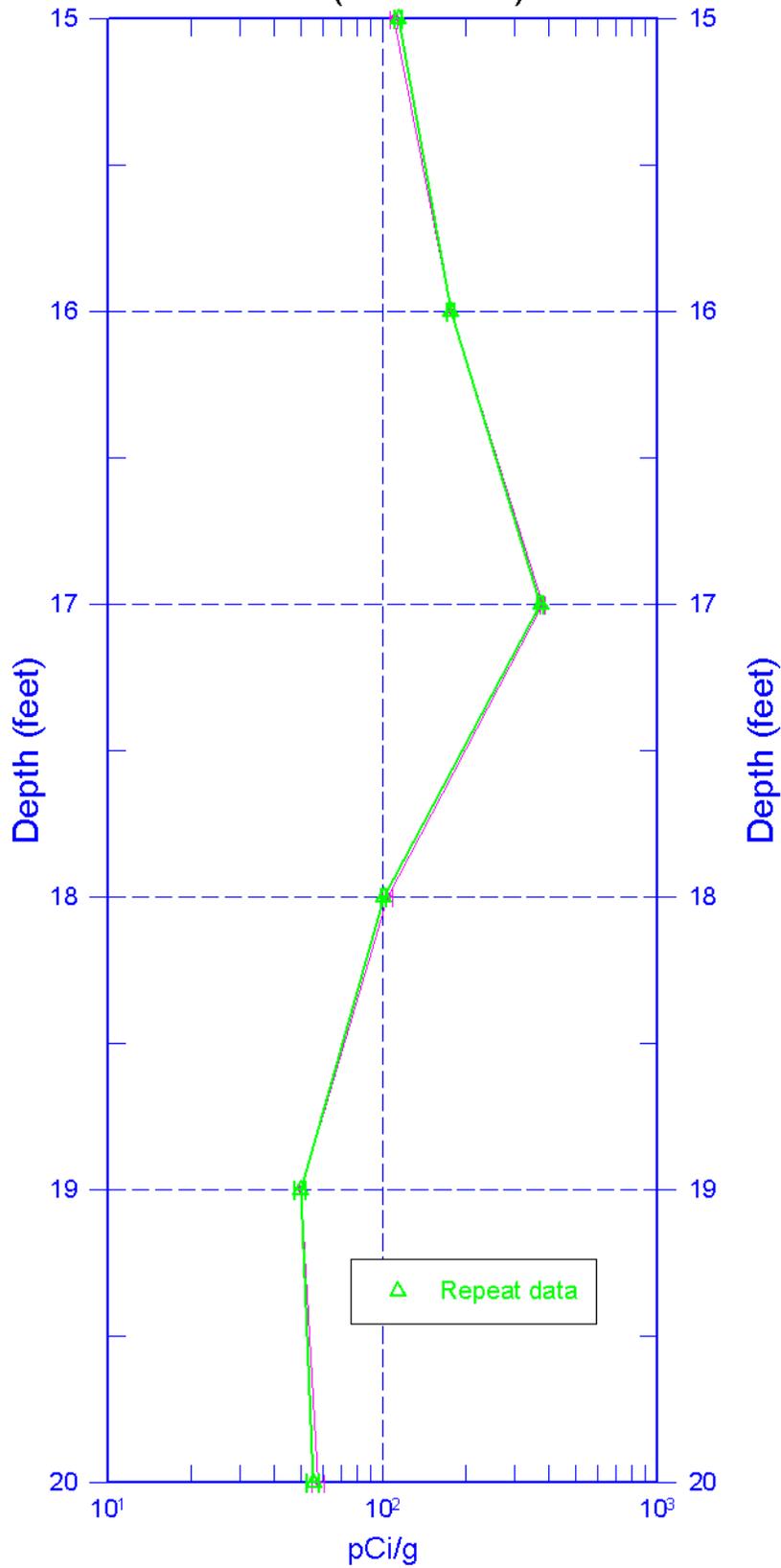
Total Gamma, Passive Neutron & Moisture



C5929

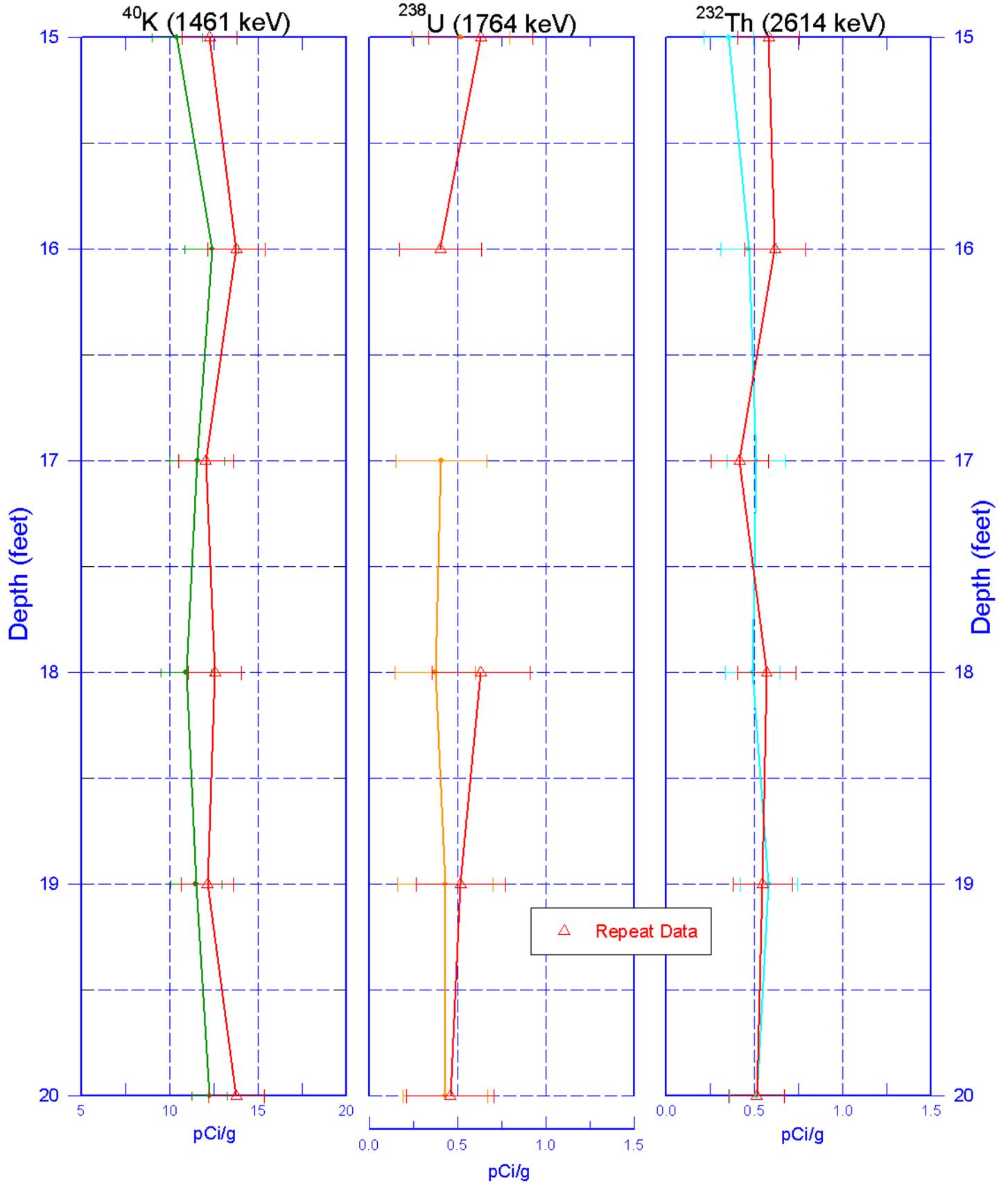
Repeat of Manmade Radionuclides

¹³⁷Cs (662 keV)



C5929

Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

Repeat of Passive Neutron & Moisture

