

C5931 Log Data Report

Borehole Information:

Borehole: C5931		Site: 216-B-55	
Coordinates (WA St Plane)		GWL¹ (ft): None	GWL Date: 01/08/08
North (m)	East (m)	Drill Date	TOC Elevation
Not available	Not available	01/08	Not available
		Total Depth (ft)	Type
		50	Push

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	1.45	7	5 3/4	5/8	1.45	50

Borehole Notes:

The logging engineer measured the casing diameter with a caliper and steel tape. One casing length is 5 ft. All measurements are referenced to ground surface.

Logging Equipment Information:

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

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

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

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

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3 Repeat		
Date	01/08/08	01/08/08	01/08/08		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	48.0	30.0	30.0		
Finish Depth (ft)	30.0	0.0	25.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	0.5		

Log Run	1	2	3 Repeat		
Pre-Verification	DN881CAB	DN881CAB	DN881CAB		
Start File	DN881000	DN881019	DN881050		
Finish File	DN881018	DN881049	DN881060		
Post-Verification	DN881CAA	DN881CAA	DN881CAA		
Depth Return Error (in.)	0	0	0		
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment		

High Rate Logging System (HRLS) Log Run Information:

Log Run	8	9 Repeat		
Date	01/18/08	01/18/08		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	17.0	13.5		
Finish Depth (ft)	10.0	12.5		
Count Time (sec)	300	300		
Live/Real	R	R		
Shield (Y/N)	N	N		
MSA Interval (ft)	0.5	0.5		
Pre-Verification	AC186CAB	AC186CAB		
Start File	AC186000	AC186015		
Finish File	AC186014	AC186017		
Post-Verification	AC187CAA	AC187CAA		
Depth Return Error (in.)	0	0		
Comments	No fine gain adjustment	No fine gain adjustment		

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	4	5 Repeat		
Date	01/08/08	01/08/08		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	48.25	16.0		
Finish Depth (ft)	0.0	10.0		
Count Time (sec)	15	15		
Live/Real	R	R		
Shield (Y/N)	N	N		
MSA Interval (ft)	0.25	0.25		
Pre-Verification	DH932CAB	DH932CAB		
Start File	DH932000	DH932194		
Finish File	DH932193	DH932218		
Post-Verification	DH932CAA	DH932CAA		
Depth Return Error (in.)	0	0		
Comments	None	None		

Passive Neutron Logging System (PNLS) Log Run Information:

Log Run	6	7 Repeat		
Date	01/08/08	01/08/08		
Logging Engineer	Spatz	Spatz		
Start Depth (ft)	48.0	16.0		
Finish Depth (ft)	0.0	10.0		
Count Time (sec)	60	60		
Live/Real	R	R		

Log Run	6	7 Repeat			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Pre-Verification	DH942CAB	DH942CAB			
Start File	DH942000	DH942049			
Finish File	DH942048	DH942055			
Post-Verification	DH942CAA	DH942CAA			
Depth Return Error (in.)	0	0			
Comments	None	None			

Logging Operation Notes:

Logging was conducted with a centralizer on the sondes. All measurements are referenced to ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	01/23/08	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.

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 6 to 48 ft. The maximum concentration was measured at approximately 46,000 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

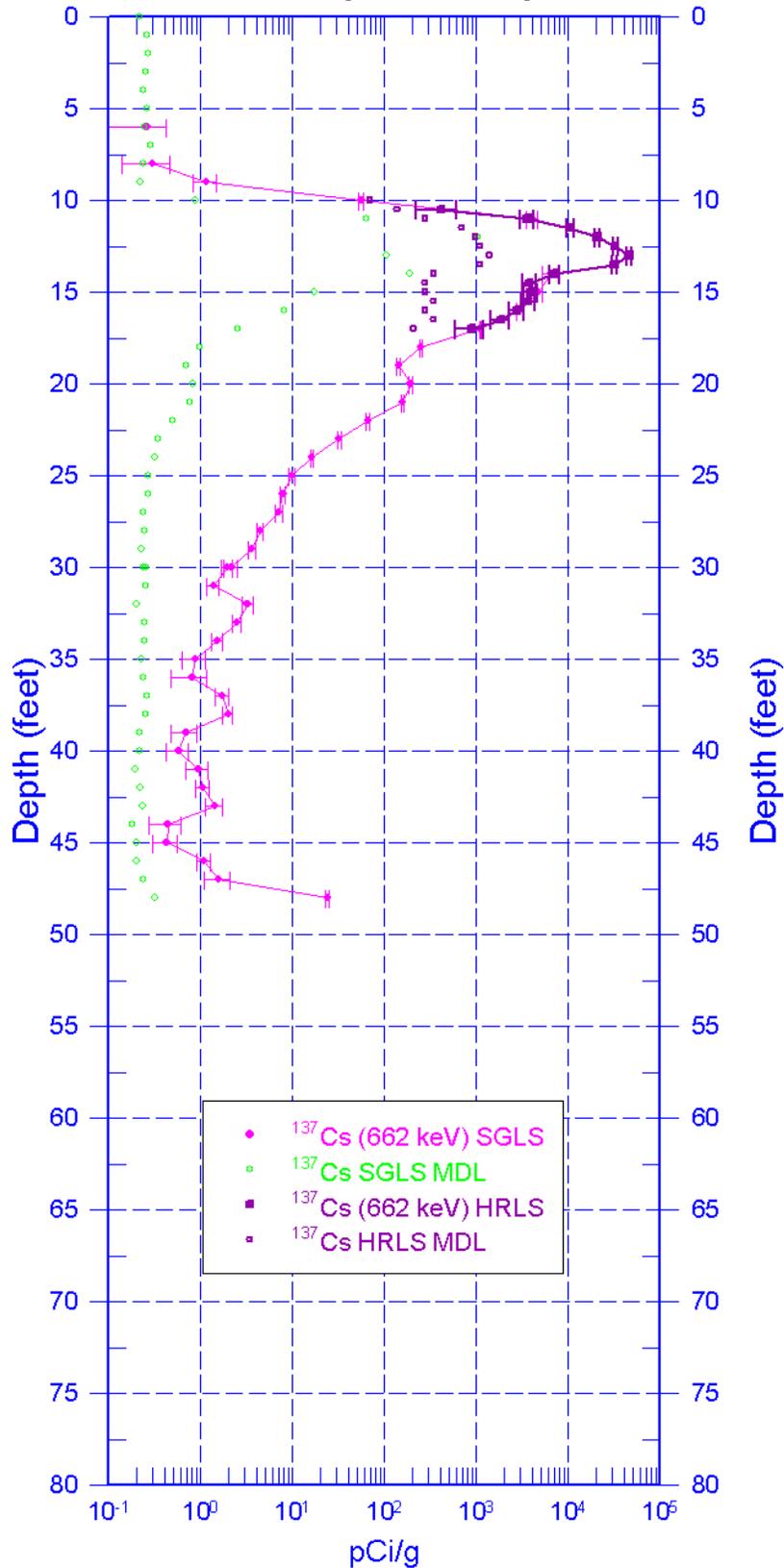
Repeat of Manmade Radionuclides

Repeat Section of Natural Gamma Logs

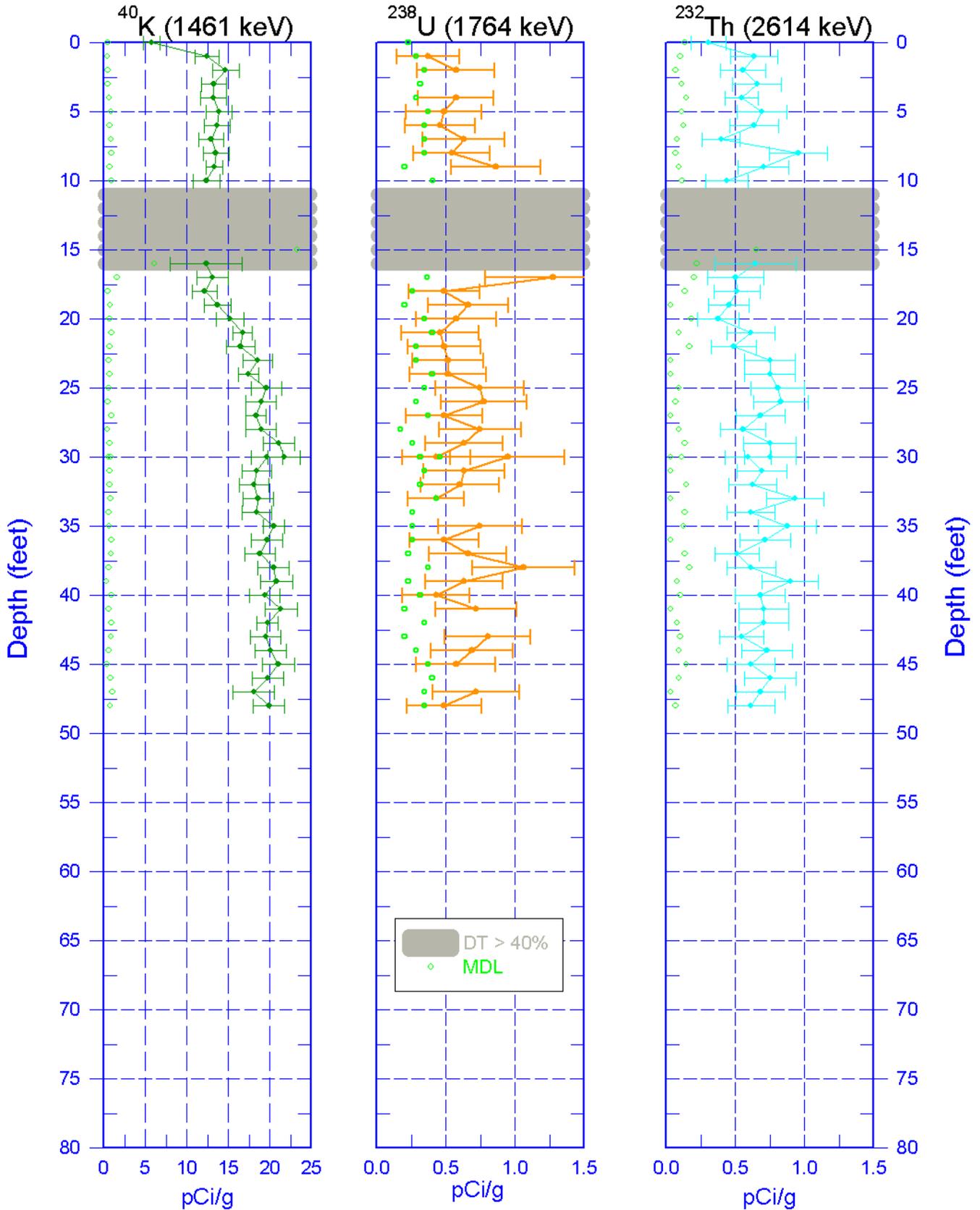
Repeat of Passive Neutron & Moisture

¹ GWL – groundwater level

C5931 Manmade Radionuclides ¹³⁷Cs (662 keV)

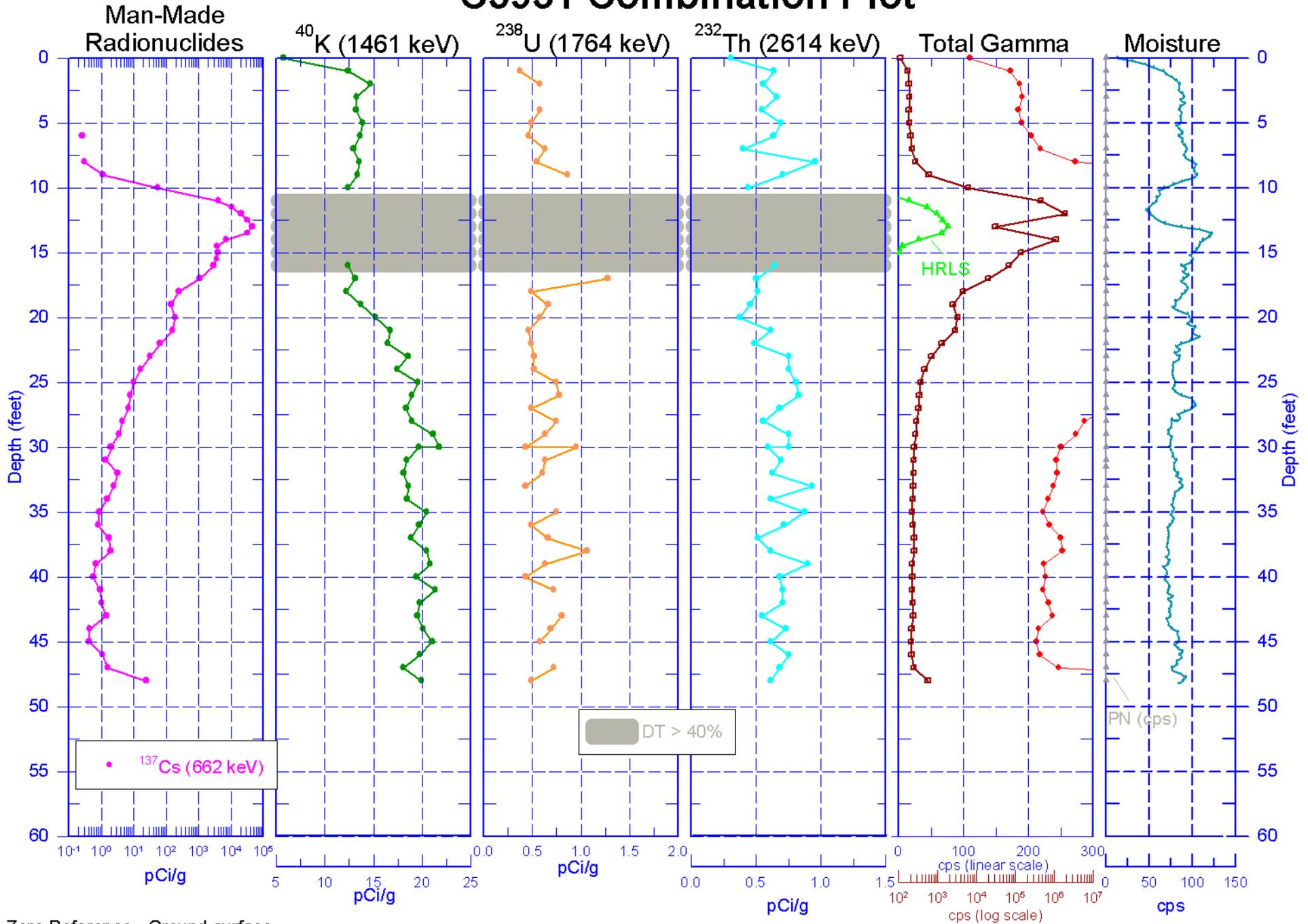


C5931 Natural Gamma Logs



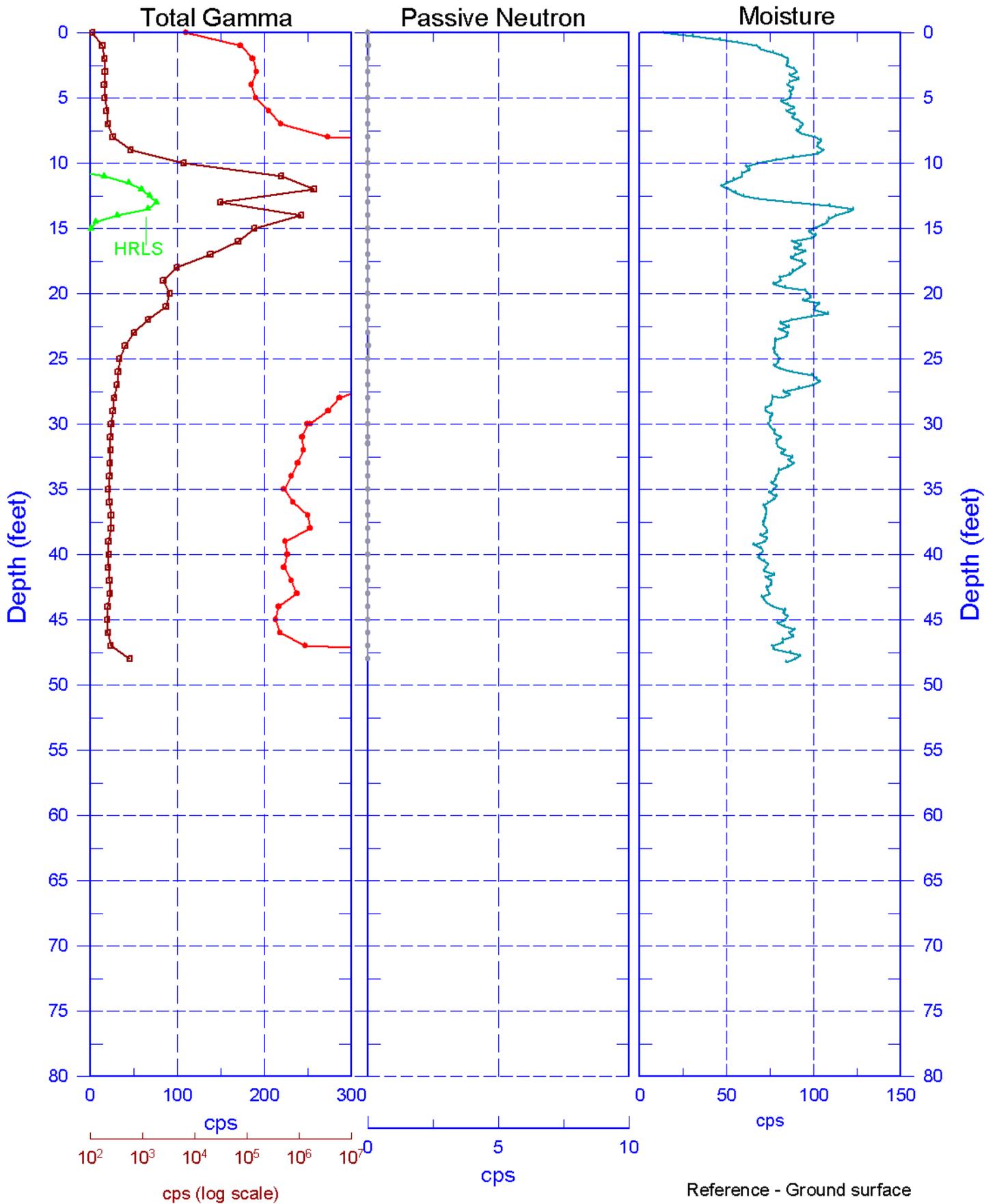
Zero Reference = Ground surface

C5931 Combination Plot



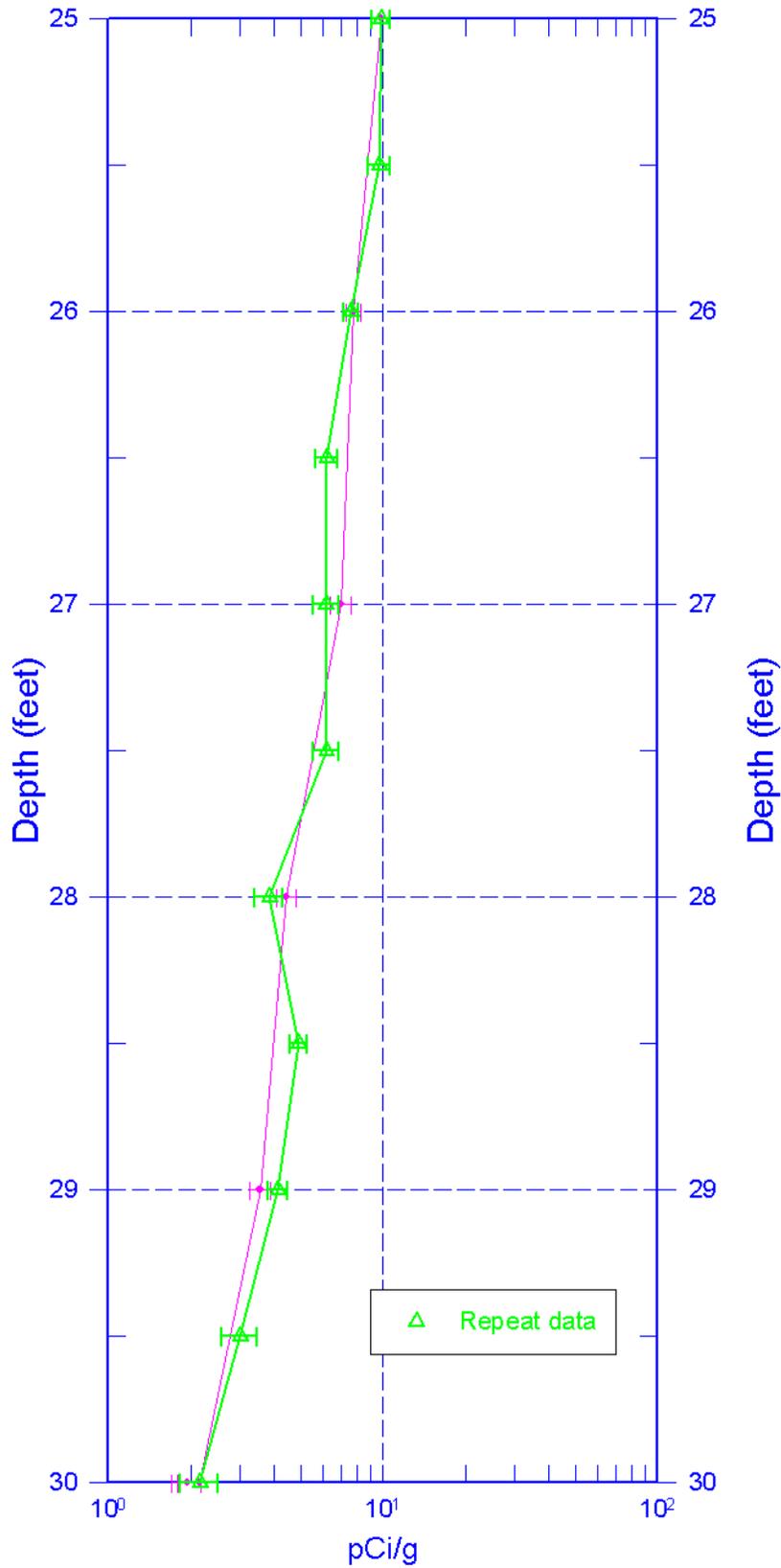
C5931

Total Gamma, Passive Neutron & Moisture



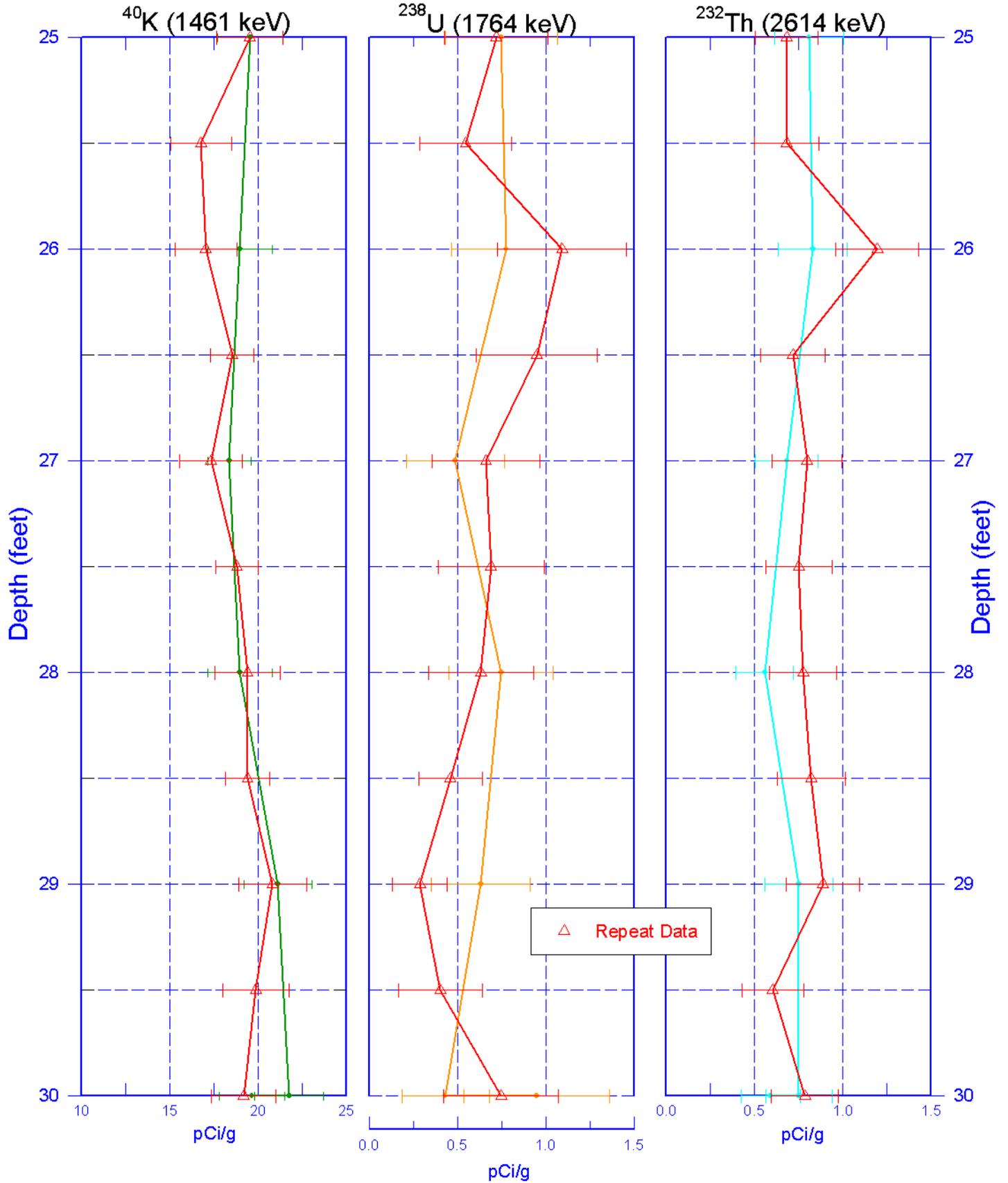
C5931

Repeat of Manmade Radionuclides



C5931

Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

C5931

Repeat of Total Gamma, Passive Neutron & Moisture

