Stoller
Hanford Office

HGLP-LDR-020

299-E25-190 (A6595)
Log Data Report

Borehole Information:

Borehole:	299-E25-190 (A6595)		Site:	216-A-30 Crib	
Coordinates (WA St Plane)		GWL[1] (ft):	None	GWL Date:	06/05/06
North (m)	East (m)	Drill Date	Top of casing Elevation (ft)	Total Depth (ft)	Type
135597.333	575817.099	01/82	683.72	50	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	0.4	8 5/8	8	5/16	0.4	50

Borehole Notes:

Casing diameter and casing stickup measurements were acquired by the logging engineer using a caliper and steel tape. According to a well completion report, grout was placed around the 8-in. casing from 0 to 20 ft as a 10-in. surface casing was removed. The 8-in. casing was perforated from 22 to 49 ft. The borehole was filled with grout and a wooden plug was driven into the casing to disperse the grout through the perforations into the formation. The grout in the casing was subsequently drilled to allow access inside the casing to 50 ft. Logging measurements are referenced to the top of casing.

Logging Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34-TP40587A
Effective Calibration Date:	05/02/06	Calibration Reference:	DOE/EM-GJ1200-2006	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	11/02/06	11/02/06			
Logging Engineer	McClellan	McClellan			
Start Depth (ft)	0.0	21.0			
Finish Depth (ft)	50.0	16.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A[3]			
Pre-Verification	AE201CAB	AE201CAB			
Start File	AE201000	AE201051			
Finish File	AE201050	AE201056			
Post-Verification	AE201CAA	AE201CAA			
Depth Return Error (in.)	N/A	- 0.5			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected from 16 to 21 ft in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	11/08/06	Reference:	GJO-HGLP 1.6.3, Rev. 0

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

A casing correction for 0.3125-in.-thick casing was applied to the log data.

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 G1EMay06.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations.

Results and Interpretations:

^{137}Cs is detected near the ground surface, between 16 and 24 ft, and at 42 ft. The maximum concentration is measured at approximately 1 pCi/g at 17 ft.

In passive gamma-ray logging, the presence of anomalous gamma activity without detectable spectral lines associated with specific radionuclides may indicate the presence of a high-energy beta emitting radionuclide such as ^{90}Sr. (McCain and Koizumi 2002). Evidence of this situation is exhibited from 16 to 24 ft. Incoherent gamma activity in this interval may be representative of ^{90}Sr concentrations greater than 500 pCi/g.

As noted above, anomalous, incoherent gamma activity at low energies is most likely related to Bremsstrahlung associated with high-energy beta activity from ^{90}Sr. This phenomenon has been observed in three boreholes (299-E25-190, -191, and -193) within the 216-A-30 crib, at similar depths. A comparison plot of ^{137}Cs and total gamma activity for these three boreholes is included. Intervals with suspected ^{90}Sr in excess of 500 to 1000 pCi/g are also included. This plot shows ^{90}Sr distributed over at least half of the total length of the crib. It is recommended that further investigations be undertaken to determine the full extent of ^{90}Sr contamination in this crib.

The repeat section indicates good agreement of the naturally occurring KUT and ^{137}Cs concentrations.

References:

McCain, R.G. and Koizumi, C.J., June 2002. *Correlation of Spectral Gamma Log Response and Sr-90 Concentrations for a Steel-Cased Borehole*, GJO-2002-322-TAR

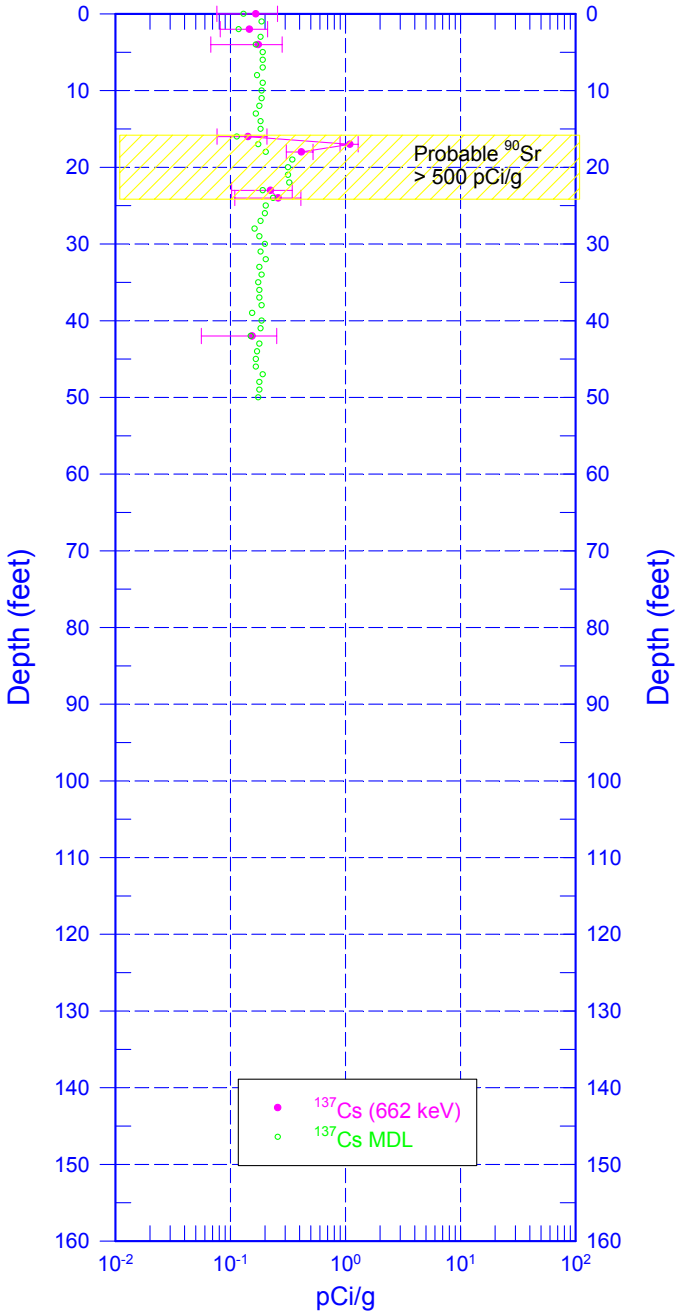
List of Plots:

Depth Scale: 1" = 20 ft

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
Repeat of Manmade Radionuclides
216-A-30 Cross Section
Repeat Section of Natural Gamma Logs

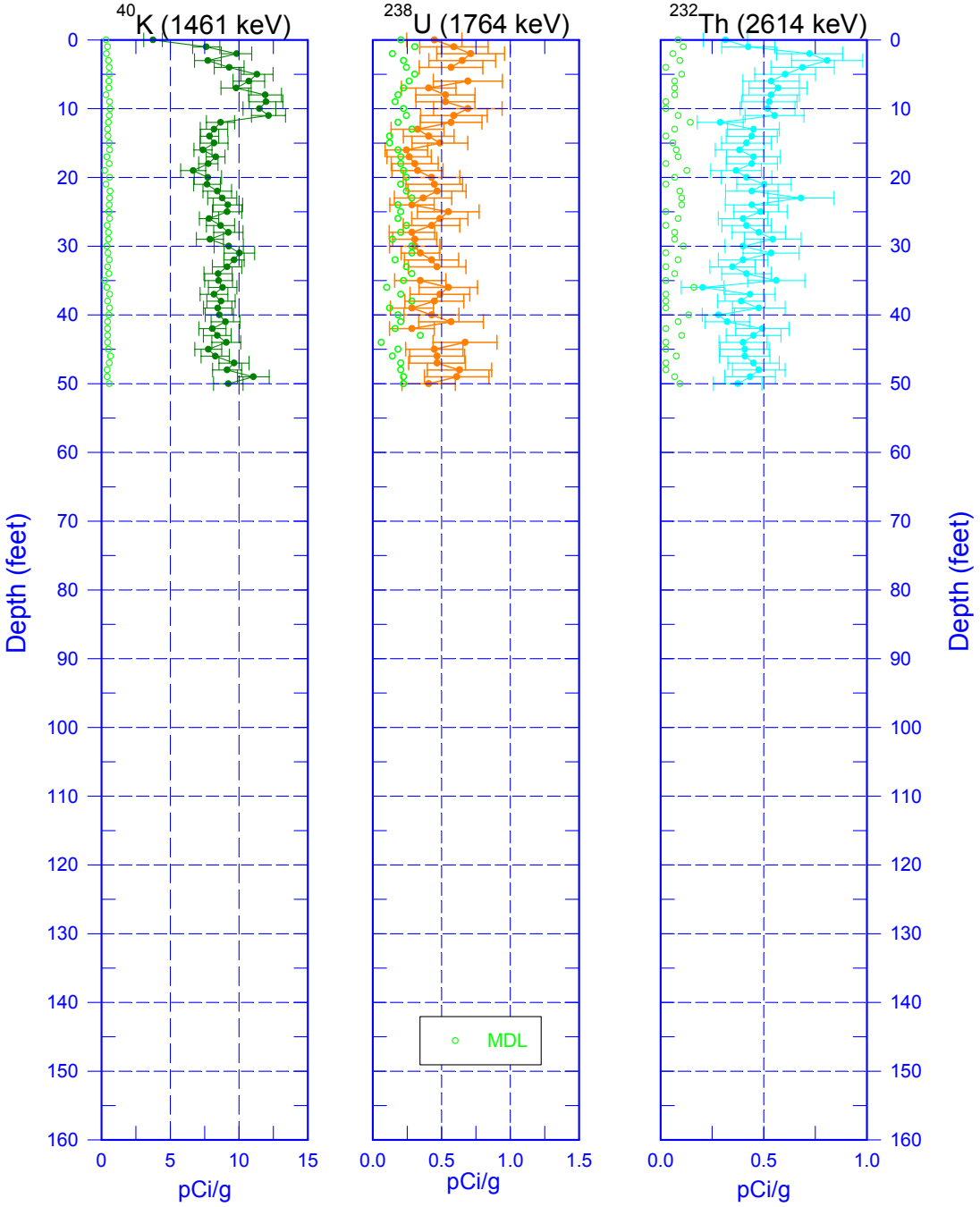
[1] GWL – groundwater level

299-E25-190 (A6595)
Manmade Radionuclides



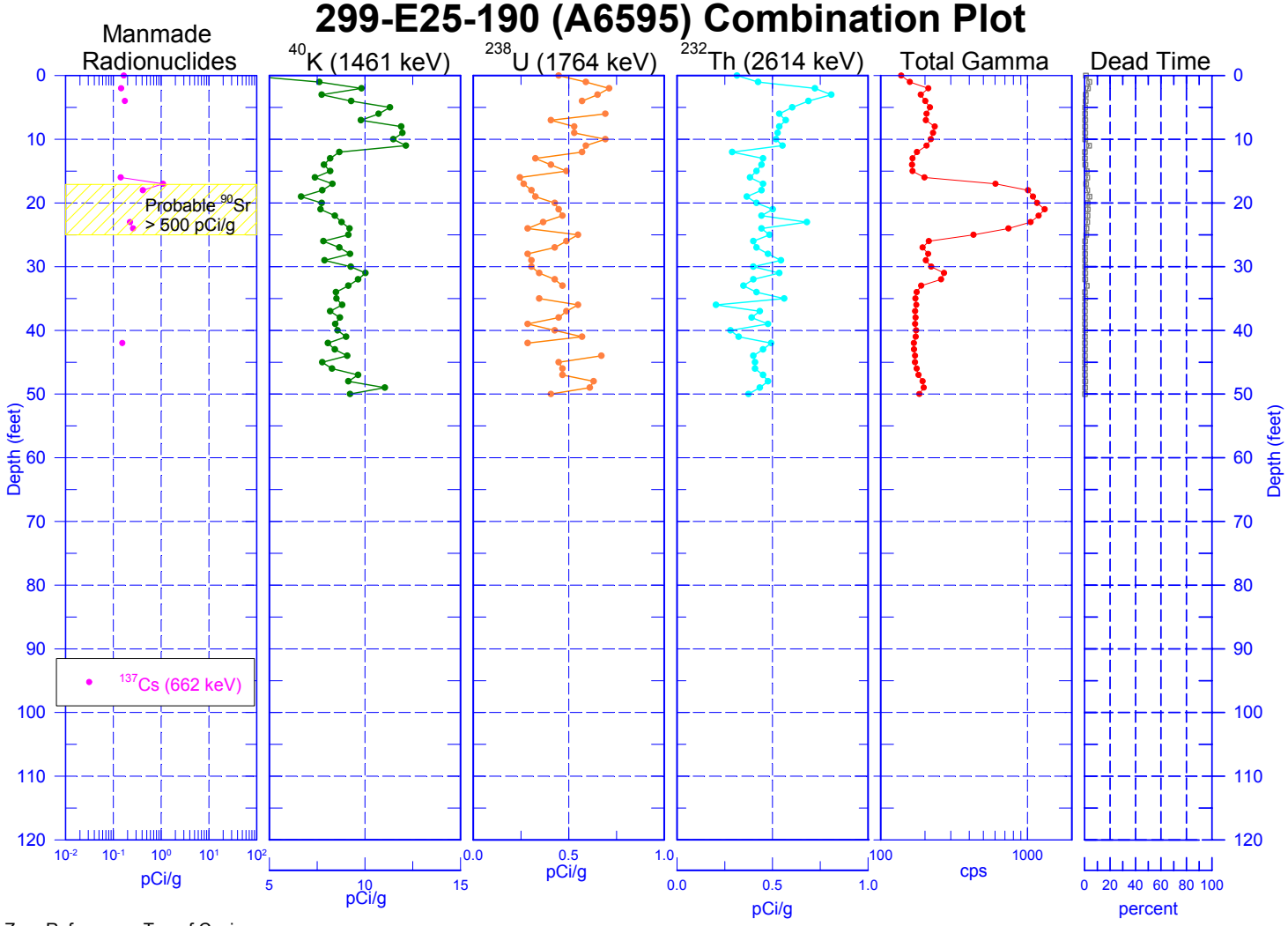
Zero Reference - Top of Casing

299-E25-190 (A6595)
Natural Gamma Logs



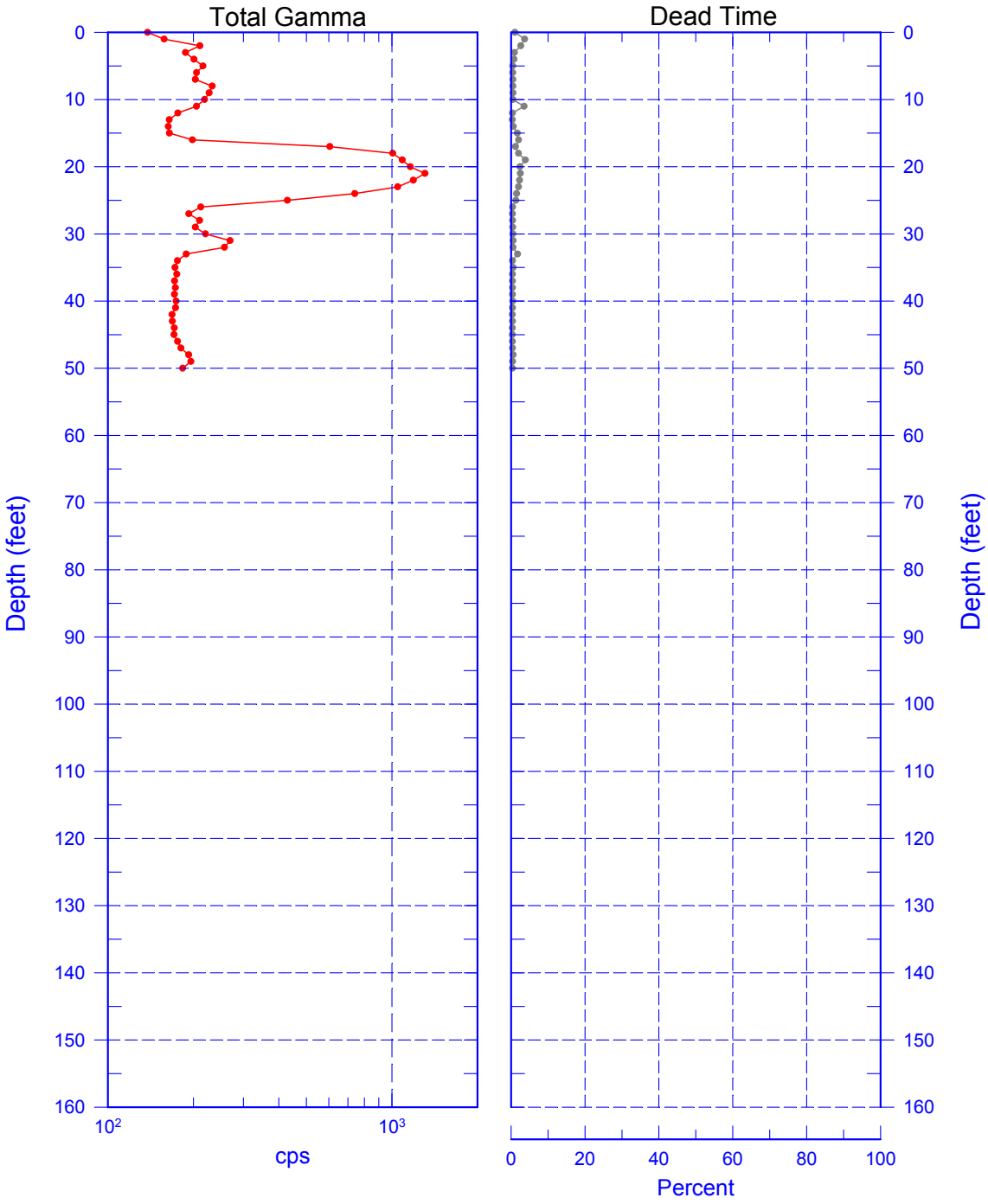
Zero Reference = Top of Casing

299-E25-190 (A6595) Combination Plot



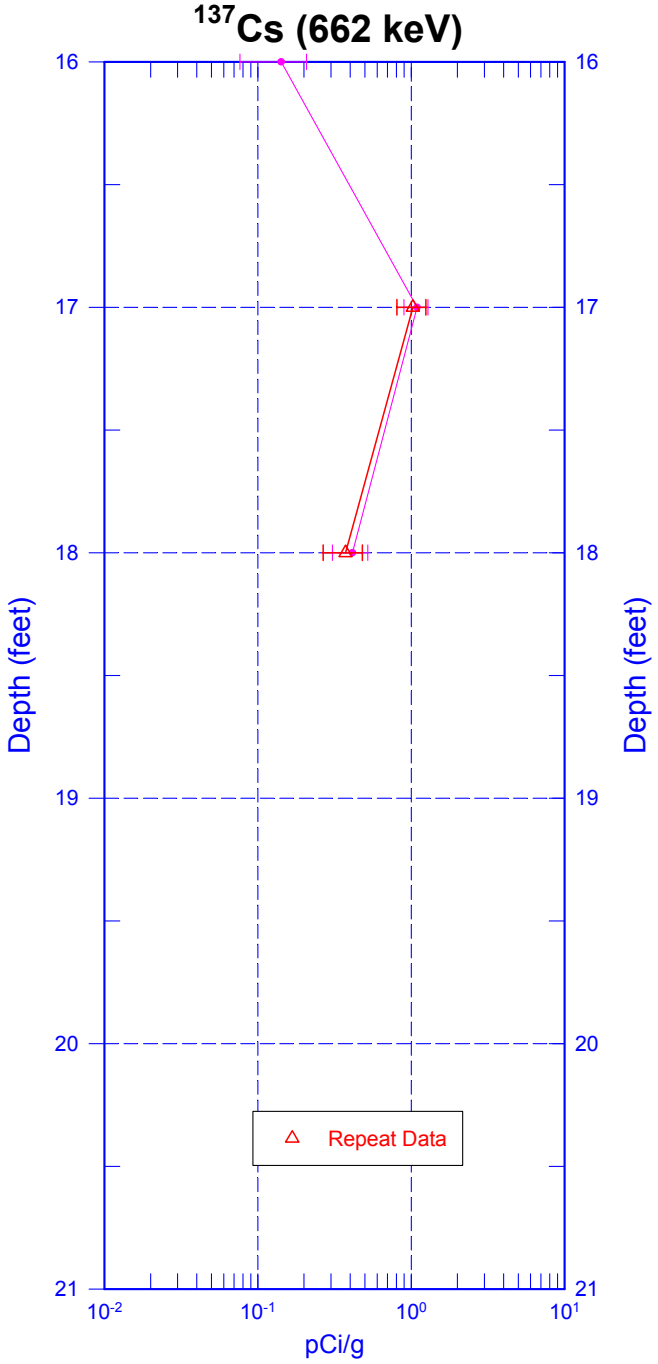
Zero Reference - Top of Casing

299-E25-190 (A6596)
Total Gamma & Dead Time



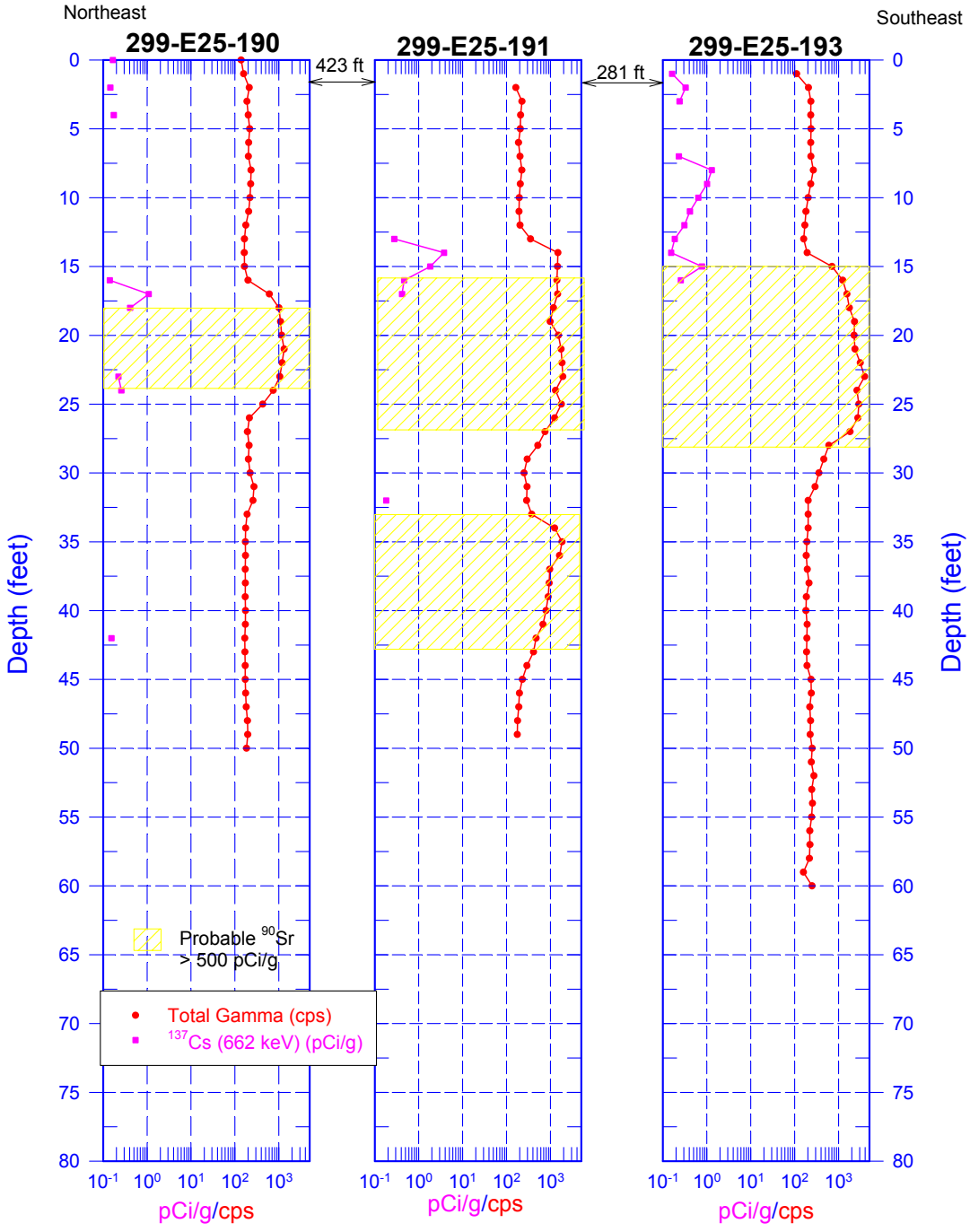
Reference - Top of Casing

299-E25-190 (A6595)
Repeat of Manmade Radionuclides



Zero Reference - Top of Casing

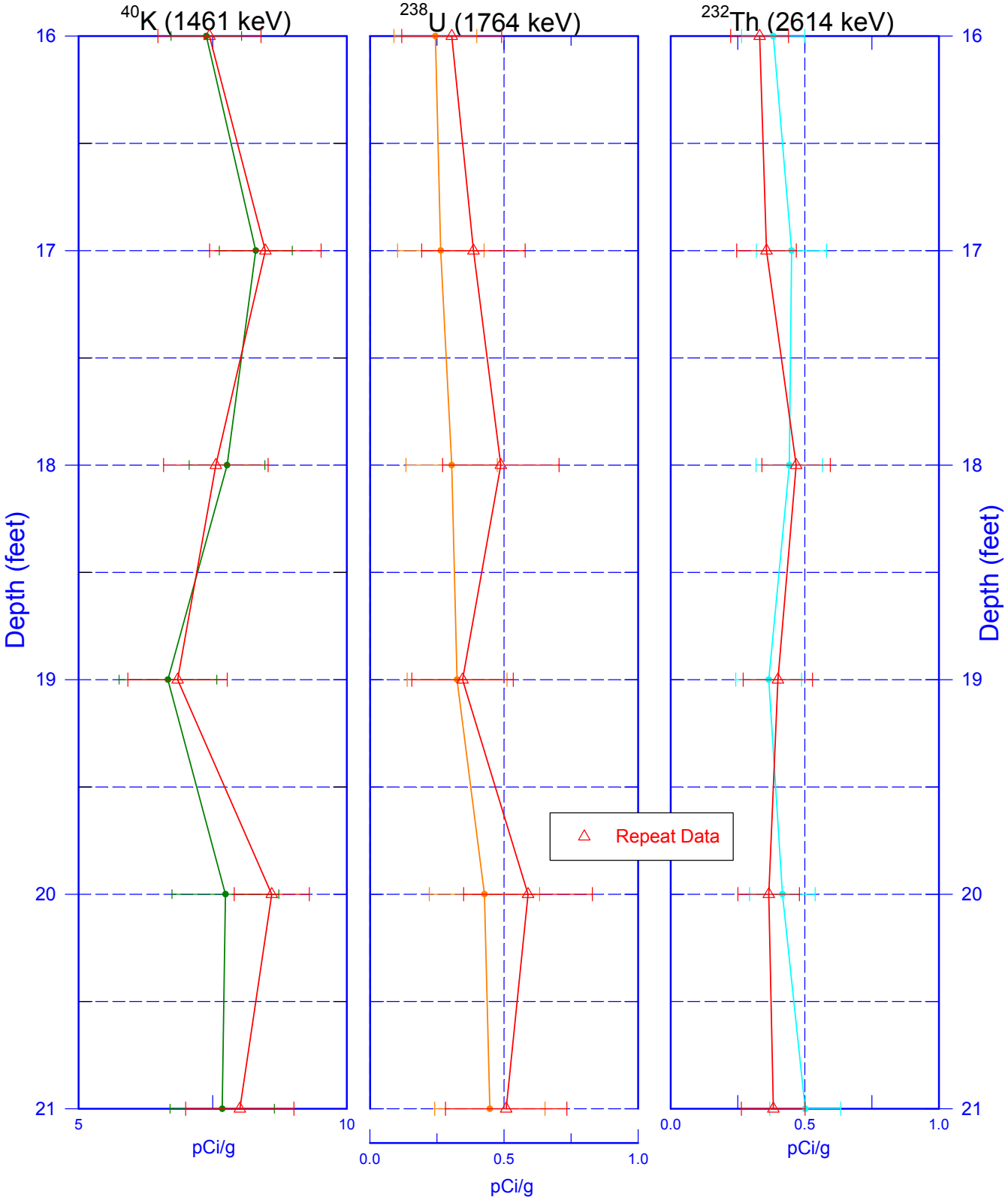
216-A-30 Crib Cross Section



Zero Reference = Top of Casing

299-E25-190 (A6595)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing