



Borehole **60-00-06**

Log Event A

Borehole Information

Farm : <u>U</u>	Tank : <u>U</u>	Site Number : <u>299-W18-51</u>
N-Coord : <u>37,822</u>	W-Coord : <u>75,700</u>	TOC Elevation : <u>666.74</u>
Water Level, ft :	Date Drilled : <u>10/31/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.365</u>	ID, in. : <u>10</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>151</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.500</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>49</u>	

Borehole Notes:

This borehole was completed in October 1944 to a depth of 151 ft. The upper portion of this borehole is double cased with 10-in. and 12-in. tubing. Twelve-inch diameter casing extends from the ground surface to a depth of 49 ft. Ten-inch casing was then placed inside the 12-in. casing and extends to the borehole completion depth. The 10-in. casing was perforated with six 0.5-in. by 3.0-in. slots around the casing on 12-in. centers, staggered, from a depth of 48 to 148 ft. The drill records state that 1/2 sack of cement was placed at the bottom of the 10-in. casing, but the records make no mention of cement or grouting material being placed in the annulus between the 10-in. and 12-in. casings. The specified wall thickness for 10-in., schedule-40 steel tubing is 0.365-in., and the wall thickness for 12-in., schedule-40 steel tubing is 0.406 in. The SGLS was only able to log to a depth of 125 ft. The cause of the blockage at that depth is unknown.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>12/12/1995</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>125.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>46.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>2</u>	Log Run Date : <u>12/13/1995</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>27.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



Borehole **60-00-06**

Log Event A

Log Run Number :	<u>3</u>	Log Run Date :	<u>12/13/1995</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>47.0</u>	Counting Time, sec.:	<u>100</u>	L/R :	<u>L</u> Shield : <u>N</u>
Finish Depth, ft. :	<u>26.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst :	<u>E.P. Baumgartner</u>	Analysis Date :	<u>6/13/1996</u>
Data Processing Reference :	<u>P-GJPO-1787</u>		

Analysis Notes :

This borehole was logged in three log runs using the Spectral Gamma Logging System (SGLS). The pre- and post-survey field verification spectra show consistent activities, indicating the logging system was calibrated correctly. However, during log run 1, the instrumentation drift was excessive, requiring two adjustments of the fine gain. Because of the gain drift, log run 1 required three separate energy versus channel number recalibrations during processing of the data to maintain proper peak identification. Depth overlaps, where data were collected on separate days at the same depth, occurred in this borehole at about 46 and 26 ft. The calculated concentrations in the overlap zones were within the statistical uncertainty of the measurements, indicating very good consistency for the logging system.

The log data for this borehole were processed using only the casing-correction factor for the 10-in. casing because the true casing-correction factor for double-cased boreholes has not been determined. The upper 49 ft of this borehole shows a significant decrease in the calculated concentrations related to the shielding effect of the 12-in. casing.

Cs-137 was the only man-made radionuclide identified in this borehole. Only three measured concentrations of Cs-137 were greater than 1 pCi/g. The upper two values were 1.6 pCi/g at the surface and 1.05 pCi/g at a depth of 0.5 ft. There is a continuous zone of contamination from 49.5 to 53 ft with a peak of 1.2 pCi/g at a depth of 52.5 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank U-111.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The headings of these plots identify the energy of the specific gamma peaks used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainty for the calculated concentrations at the 95-percent confidence level. The minimum detection level (MDL) is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made radionuclides, the naturally occurring radionuclides, the total gamma count derived from the SGLS and the WHC gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.