



Borehole **10-04-07**

Log Event **A**

**Borehole Information**

Farm : <u>A</u>	Tank : <u>A-104</u>	Site Number : <u>299-E24-66</u>
N-Coord : <u>41,262</u>	W-Coord : <u>47,819</u>	TOC Elevation : <u>689.36</u>
Water Level, ft :	Date Drilled : <u>5/31/1962</u>	

**Casing Record**

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>125</u>	

**Borehole Notes:**

This borehole was drilled in May 1962 to a depth of 75 ft using 6-in.-diameter casing. In October 1976, the borehole was extended to a depth of 127 ft and completed at 125 ft using 6-in.-diameter casing. There is no indication in the driller's log that the borehole was perforated or grouted.

The casing thickness is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing. The top of the casing is the zero reference for the SGLS. The casing lip is even with the ground surface.

**Equipment Information**

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

**Logging Information**

Log Run Number : <u>1</u>	Log Run Date : <u>09/25/1996</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>30.0</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>09/26/1996</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>36.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>3</u>	Log Run Date : <u>09/27/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>37.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>29.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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**Logging Operation Notes:**

This borehole was logged in three log runs. The total logging depth achieved by the SGLS was 125 ft.

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**Analysis Information**

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Analyst : R.R. Spatz

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 03/24/1998

**Analysis Notes :**

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for 0.280-in.-thick casing was applied to the log data during the analysis process.

Shape factor analysis was applied to the SGLS. Insights are provided into the distribution of radionuclide contaminants and into the nature of zones of elevated gamma-ray activity not attributable to gamma-emitting radionuclides.

**Log Plot Notes:**

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. 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 and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of the shape factor analysis results is also included. The plot is used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

**Results/Interpretations:**

The only man-made radionuclide detected around this borehole was Cs-137. Cs-137 contamination was detected continuously from the ground surface to 6 ft at concentrations ranging from 0.3 to 10.5 pCi/g. The maximum Cs-137 concentration measured in this borehole, except for the value at the ground surface, was 7 pCi/g at 2 ft. Cs-137 contamination occurs intermittently from 14 to 19 ft at concentrations just above the MDL (0.2 pCi/g). An isolated occurrence of Cs-137 was detected at 34 ft at the MDL. At the bottom of the borehole, Cs-137 contamination occurs intermittently from 120 to 125 ft at concentrations ranging from the MDL to 0.8 pCi/g.

The K-40 concentrations decrease at 10 ft from a background of about 15 pCi/g above this depth to about 13



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pCi/g between 10 and 59 ft. Below 59 ft, the K-40 concentrations increase to a general background of about 17 pCi/g. Below 85 ft, the K-40 concentrations decrease slightly to about 15 pCi/g; this concentration remains fairly constant to the bottom of the borehole (125 ft). The U-238 and Th-232 concentrations increase perceptibly below 59 ft.

An analysis of the shape factors associated with applicable segments of the spectra was performed. Comments on the interpretation of the shape factor results are presented in the Tank Summary Data Report for tank A-104.