



Borehole **50-09-07**

Log Event **A**

**Borehole Information**

Farm : <u>T</u>	Tank : <u>T-109</u>	Site Number : <u>299-W10-144</u>
N-Coord : <u>43,397</u>	W-Coord : <u>75,857</u>	TOC Elevation : <u>670.42</u>
Water Level, ft : <u>88.9</u>	Date Drilled : <u>3/31/1974</u>	

**Casing Record**

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>94</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.250</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>94</u>	

Cement Bottom, ft. : 94      Cement Top, ft. : 0

**Borehole Notes:**

Borehole 50-09-07 was originally drilled in March 1973 to a depth of 94 ft with 6-in. casing. In March 1977, the top 20 ft of the 6-in. casing was perforated with two cuts per foot. The driller's log notes that the bottom portion of the casing was not perforated because the 6-in. casing was apparently broken. A 4-in. casing was installed inside the 6-in. casing and the annulus between the two casings was grouted with 109 gal of cement.

The tops of both casings, which are the zero reference for the SGLS, are approximately even with the ground surface.

**Equipment Information**

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-14</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

**Logging Information**

Log Run Number : <u>1</u>	Log Run Date : <u>12/18/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>8.0</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>12/19/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>90.0</u>	Counting Time, sec.: <u>200</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>



Borehole **50-09-07**

Log Event **A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>12/23/1997</u>	Logging Engineer:	<u>Bob Spatz</u>
Start Depth, ft.:	<u>31.0</u>	Counting Time, sec.:	<u>200</u>	L/R :	<u>L</u> Shield : <u>N</u>
Finish Depth, ft. :	<u>7.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

**Logging Operation Notes:**

Borehole 50-09-07 was logged in three runs. The total logging depth achieved by the SGLS was 90 ft. Spectra were collected at intervals of 0.5 ft using a 200-s counting time. At the time of logging, there was water in the borehole at a depth of 88.9 ft.

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**Analysis Information**

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Analyst :	<u>D.L. Parker</u>		
Data Processing Reference :	<u>MAC-VZCP 1.7.9</u>	Analysis Date :	<u>05/11/1998</u>

**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the field verification spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra.

A casing correction factor that does not match actual field conditions was used because an appropriate casing correction factor for the two casing thicknesses and intervening grout was not available. A casing correction factor for a 0.50-in.-thick steel casing was applied to the concentration data during the analysis process. Use of this casing correction factor will cause radionuclide concentrations to be undercalculated.

**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.

**Results/Interpretations:**

The man-made radionuclide Cs-137 was detected by the SGLS. Cs-137 contamination was detected only at the ground surface and at a depth of 2.5 ft.

Apparent K-40 concentrations range from about 8 to 10 pCi/g between 1 and 38 ft and then increase slightly to about 12 to 14 pCi/g below about 38 ft. U-238 and Th-232 concentrations increase sharply below about 82 ft.