



Borehole **51-01-09**

Log Event A

Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-101</u>	Site Number : <u>299-W15-155</u>
N-Coord : <u>41,655</u>	W-Coord : <u>75,800</u>	TOC Elevation : <u>672.04</u>
Water Level, ft :	Date Drilled : <u>12/31/1973</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>112</u>	

Borehole Notes:

According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : <u>1</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>12/27/1995</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>112.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>41.5</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>12/27/1995</u>	Logging Engineer: <u>Bob Spatz</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>42.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : P-GJPO-1787

Analysis Date : 8/12/1996

Analysis Notes :

This borehole was logged with the SGLS in two logging runs. The pre-survey field verification spectrum from log run 2 did not pass the acceptance criteria established for the peak shape and system efficiency. A Nonconformance Report issued in August 1996 (N-96-05) identified this failure to have been caused by a power supply malfunction that resulted in a low detector bias voltage being supplied to the logging tool. This malfunction occurred during the mornings because of inadequate system warm-up time. This report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically underestimated by about 10 percent. Therefore, the data from log run 2 (between depths of 0 and 42 ft) may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectrum for log run 2 passed the acceptance criteria for the peak shape and system efficiency, providing evidence the logging system was operating appropriately after an initial warm-up time. Verification spectra from log run 1 passed the acceptance criteria established for the peak shape and detector efficiency, providing evidence the logging system was operating appropriately after an initial warm-up time. Both the pre- and post-survey spectra for log run 1 passed the acceptance criteria, confirming that the system was operating within specifications. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification. The energy calibration and peak-shape calibration from verification spectra that successfully met the acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

A depth overlap, where data were collected by separate logging runs at the same depth, occurred in this borehole at between depths of 41.5 and 42.5 ft. The concentrations of the naturally occurring gamma-ray emitting radionuclides (K-40, U-238, and Th-232) were calculated using the separate data sets acquired at the common depth points. The measured concentrations of these isotopes were within the statistical uncertainty of the measurements, indicating very good repeatability.

Cs-137, processed U-238, and processed U-235 were the only man-made radionuclides identified in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to about 35 ft, at a few intermittent locations, and at the bottom of the borehole. The maximum Cs-137 concentration was about 10 pCi/g at 1 ft in depth; concentrations in the remainder of the borehole were less than 1 pCi/g.

Processed U-238 was measured at 67.5 ft in depth with a concentration of 22 pCi/g. Processed U-235 was identified at 68 ft with a concentration of about 1 pCi/g.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TX-101 and TX-102.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (e.g., K-40, U-238, and Th-232). The natural radionuclides can be used for lithology interpretations. The headings of the



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plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes both the man-made and natural radionuclides, in addition to 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.

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.