Log Event A

Borehole # 11-03-10

Borehole Information

Farm : AX	**Tank :** AX-103	**Site Number :** 299-E25-117
N-Coord : 41,761	**W-Coord :** 47,602	**TOC Elevation :** 681.90
Water Level, ft :	**Date Drilled :** 1/31/1975	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
This borehole was drilled in January 1975. It was driven to 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness of schedule-40, carbon-steel pipe. The zero reference is the top of the borehole pipe, which is even with the ground surface.

Equipment Information

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

Log Run Information

Log Run Number : 1	**Log Run Date :** 09/17/1996	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 99.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 8.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 09/18/1996	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 9.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 11/27/1996

Analysis Notes :

This borehole was logged in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and system efficiency, confirming the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these verification spectra 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.

The man-made radionuclide Cs-137 was identified in this borehole. The presence of Cs-137 was noted continuously from the ground surface to 14.5 ft and intermittently from 14.5 to 35.5 ft. Detectable quantities (less than 0.3 pCi/g) were also noted from 45.5 to 46.5 ft, at 50.5 ft, from 66 to 68 ft, and at 99 ft. The majority of the contamination was detected within back-fill material (consisting of coarse-grained sand and silt with minor gravel) that overlies and surrounds the tank. The deeper contamination was detected within undisturbed sediments (consisting of fine to coarse sand and gravelly sand) that underlie the base of tank. The maximum Cs-137 concentration was about 7 pCi/g at the ground surface and 3 to 4 pCi/g in the near-surface continuous zone.

Between 1.5 ft and 7 ft, it was not possible to identify many of the 609-keV peaks used to derive the U-238 concentrations. This occurred because high gamma-ray activity associated with the nearby Cs-137 peak (661 keV) created an elevated Compton continuum extending to the 609-keV region, causing the MDL to exceed the measured U-238 concentration. Between 1.5 ft and 7 ft, it was not possible to identify a few of the 1460- and several of the 2614-keV peaks used to determine the K-40 and Th-232 radionuclide assay, probably because the high 661-keV radiation associated with the Cs-137 contamination produced spectral distortions that caused the MDLs associated with the 1460- and 2614-keV peaks to exceed the measurable radionuclide concentrations.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank AX-103.

Log Plot Notes:

Separate log plots show the man-made radionuclide (Cs-137) and the naturally occurring radionuclides (KUT). 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 of a radionuclide, which 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, 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

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with the SGLS data.