RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 41-12-04

Log Event A

Borehole Information

Farm : SX	**Tank :** SX-112	**Site Number :** 299-W23-68
N-Coord : 35,206	**W-Coord :** 75,829	**TOC Elevation :** 664.16
Water Level, ft :	**Date Drilled :** 3/31/1956	

Casing Record

Type : Steel-welded	**Thickness :** 0.313	**ID, in. :** 8
Top Depth, ft. : 0	**Bottom Depth, ft. :** 125	

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 03/1995	**Calibration Reference :** GJPO-HAN-1	

Logging Information

Log Run Number : 1	**Log Run Date :** 6/29/1995	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 13.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 6/30/1995	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 123.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 43.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 3	**Log Run Date :** 7/7/1995	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 12.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 44.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : A.W. Pearson

Data Processing Reference : Data Analysis Manual Ver. 1 Analysis Date : 10/19/1995

Analysis Notes :

Borehole 41-12-04 was logged in three runs in a move-stop-acquire mode that collected spectra for 100 seconds every 0.5 ft. Gain drifts during run 2 necessitated multiple energy calibrations during data processing to maintain proper radionuclide identification, whereas runs 1 and 3 were analyzed using only one energy calibration for each run. The 1-week time interval between runs 2 and 3 was due to equipment troubleshooting, a holiday, and logging of borehole 41-12-03.

The verification spectra showed that the data collection system was working acceptably, although the energy resolution of the verification spectrum before run 3 was poorer (by about 10 percent) than normal. This did not affect radionuclide identification or system's efficiency.

Correction factors for 0.33-in.-thick steel casing were used during data processing because correction factors for 0.31-in.-thick casing were not available. As a result, the calculated concentrations will be only slightly high.

Cs-137 was the only man-made radionuclide identified, occurring intermittently throughout the length of the borehole at concentrations slightly above the minimum detectable activity (MDA).

The total gamma log indicates several changes of lithology below about 65 ft. In addition, a slight U-238 anomaly of unknown origin appears near 32 ft in the backfill material. This anomaly cannot be due to a true lithology change.

The repeatability was within the statistical variation of the plotted points for the regions of overlap logging.

See the Tank Summary Data Report for SX-112 for additional log analysis.

Log Plot Notes:

Three log plots are provided. One shows the Cs-137 concentrations. Another shows the naturally occurring radionuclides (K-40, U-238, and Th-232), which can be used for lithology interpretations. A combination plot includes logs of Cs-137, natural gamma, total gamma derived from the spectral data, and data from the WHC Tank Farms gross gamma logging system. The headings of the Cs-137 and natural gamma 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 MDA. The MDA of a radionuclide represents the lowest concentraton at which positive identification of a gamma-ray peak is statistically defensible. If the reported concentration is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and detection is not ensured with 95-percent certainty.

The Tank Farms gross gamma plot is the latest available from WHC. No attempt has been made to adjust the plot for depth discrepancies.