



Borehole

20-08-02

Log Event A

Borehole Information

Farm : <u>B</u>	Tank : <u>B-108</u>	Site Number : <u>299-E33-54</u>
N-Coord : <u>45,375</u>	W-Coord : <u>52,716</u>	TOC Elevation : <u>652.78</u>
Water Level, ft :	Date Drilled : <u>12/44</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.365</u>	ID, in. : <u>10</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>170</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.406</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>50</u>	

Borehole Notes:

Borehole 20-08-02 was drilled in December 1944 to a depth of 170 ft. Drilling records for this borehole were unavailable. However, according to the typical borehole construction for boreholes drilled in the B Tank Farm in 1944, this borehole was most likely constructed with a 10-in. casing placed inside a 12-in. casing from the ground surface to 170 ft. The 12-in. casing was assumed to be placed from the ground surface to 50 ft. The 10-in. casing may have been perforated from 50 to 170 ft. The casing thickness is presumed to be 0.365 in. for the 10-in. casing and 0.406 in. for the 12-in. casing, on the basis of the published thicknesses for schedule-40, 10-in. and 12-in. steel tubing, respectively. Therefore, the combined thickness of the double-cased interval from 0 to 50 ft is 0.771 in. A casing correction factor for 0.65-in. casing was used during data reduction, which may result in slightly lower calculated concentrations of the radionuclides. A correction for 0.365-in. casing was used for the interval from 50 ft to the bottom of the borehole.

The total logging depth achieved by the SGLS was 105.5 ft. The specific reason the logging depth did not reach the reported drilling depth is unknown. However, it is likely the borehole was modified after it was drilled by backfilling the borehole from its original depth of 170 ft to about 110 ft.

Equipment Information

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>11/1997</u>	Calibration Reference : <u>GJO-HAN-20</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>12/03/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>105.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>20.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Log Run Number :	<u>2</u>	Log Run Date :	<u>12/04/1998</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>21.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged by the SGLS in two log runs. The top of the borehole casing, which is the zero reference for the SGLS, is even with the ground surface. The total logging depth achieved was 105.5 ft.

Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 03/26/1999

Analysis Notes :

The pre-survey and post-survey field verification for the logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration 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 acquired during the logging operation.

A casing correction factor for a 0.65-in.-thick steel casing was applied to the data derived from the double-cased interval from 0 to 50 ft to determine the radionuclide concentration data during the analysis process. A 0.365-in. casing thickness was used for the interval from 50 to 105.5 ft.

Shape factor analysis was applied to the SGLS data and provides insights into the distribution of Cs-137 contamination and into the nature of zones of elevated total count 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.

Results/Interpretations:

The man-made radionuclides Cs-137 and Co-60 were detected around this borehole. The Cs-137 contamination was detected in vertically discontinuous regions throughout the borehole at varying concentrations. The measured concentrations were generally less than 10 pCi/g, with the maximum



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concentration of about 13 pCi/g occurring at a depth of 1 ft. Below the near-surface contamination, the maximum concentration was about 9 pCi/g at 57.5 ft.

Co-60 contamination was detected between depths of 88 and 104 ft. The measured concentrations were all below 0.2 pCi/g.

The K-40 concentrations increase at about 38 ft, representing the transition from the backfill material to the undisturbed Hanford formation sediments.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank B-108.