



Department of Energy  
Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

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**AUG 02 1999**

Dr. Edgar Berkey  
Concurrent Technologies Corporation  
320 William Pitt Way  
Pittsburg, Pennsylvania 15238

Dear Dr. Berkey:

#### VADOSE ZONE LOGGING/DATA MINING

At the Expert Panel (Panel) review meetings at Hanford on May 14, 1999, several presentations were made regarding vadose zone monitoring in the tank farms and in ponds, cribs, and ditches. Much of the discussion focused on data collection, specifically borehole logging and associated techniques. The discussions occurred without much emphasis on the overall objectives and results of characterizing and monitoring contaminant distributions, delineating and quantifying the important environmental conditions that affect the redistribution of those contaminants, and measuring and evaluating the actual redistribution of contaminants based on temporal changes in contaminant distributions. My observation was that the Panel was left with the impression that Hanford's focus was on the tools for making the measurements and the data were interpreted as individual logs. In addition, the Panel stated that much more is needed to "mine" previously collected data and combine them with current data to make an integrated interpretation of the nature and extent of vadose zone contamination. The U.S. Department of Energy, Richland Operations Office (RL), agrees with this observation and I would like to provide an example of a recent success in "data mining" and to also provide an example of a recent success in data availability.

The enclosed report, "Results of 1998 Spectral Gamma-Ray Monitoring of Boreholes at the 216-Z-1A Tile Field, 216-Z-9 Trench, and 216-Z-12 Crib," PNNL-11978, provides an example of a task in which the end objective is delineated, the required data identified, and the specific data collection tools selected. The result is a task in which the data collected are compared to historical data, both geophysical logs and soil sample analyses, to determine if contamination has moved since it was disposed to the cribs. This activity confirms the importance of "data mining" in the performance of an integrated evaluation.

To successfully perform "data mining" it is necessary to provide accessibility of historical vadose zone data. Logging data are currently available in hardcopy and many logs are also available electronically, but the use of these data is spotty, depending on investigator's knowledge of the data and user friendliness of the electronic libraries. One recent successful improvement in electronic availability of logging data is the tank farm reports, which can be accessed via the Internet at <http://www.doegjpo.com/programs/hanf/HTFVZ.html>.

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Dr. Edgar Berkey

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If you want to discuss this matter further or require additional information, please contact me at (509) 373-0750.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Michael Thompson". The signature is fluid and cursive, with a long horizontal stroke at the end.

K. Michael Thompson, Senior Project Manager  
Groundwater Project

GWP:KMT

Enclosure