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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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January 26, 1993



Ms. June M. Hennig
United States Department of Energy
Richland Operations Office
P. O. Box 550, MSIN A5-21
Richland, WA 99352

Dear Ms. Hennig:

Re: Liquid Effluent Retention Facility (LERF) Shelby Tube Sampling and Testing

This is in response to your letter to Dave Jansen, dated December 17, 1992, concerning the request by the Washington State Department of Ecology (Ecology) to collect Shelby Tube Samples from LERF basin #42, and to run permeability tests on these samples.

The following major conclusions can be made after reviewing all the documents which supported your letter referenced above:

- The effect of freeze/thaw cycling on soil/bentonite liners, as demonstrated by Dr. Haug, is highly dependant on the percentage of Bentonite (clay) particles in the liner matrix. Dr. Haug's research shows that the permeability of soil/bentonite containing 13% bentonite (as used for LERF) was reduced from the initial 1.3×10^{-9} to 7.0×10^{-10} , after four freeze/thaw cycles.
- The loss of volume of the soil/bentonite sample (13% bentonite) after the fourth freeze/thaw cycle was very minor (0.28%), and inadequate to forecast a desiccation problem in the liner.

In light of the above, and the other considerations mentioned in your referenced letter, it has become clear to us that the permeability of the Soil/Bentonite liner in the LERF basins should not have been affected by the weather conditions during construction. Shelby Tube Sampling will only jeopardize the quality of the multi-liner system in the basin, without significantly raising the degree of confidence in the liners impermeability. Shelby Tube Sampling is not required for the permitting process of this facility.



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Your investigations and research concerning this issue are appreciated.

If you have any questions about any of the above, please contact me at (509) 736-3016.

Sincerely,



Moses Jaraysi
Nuclear and Mixed Waste Management Program

MJ:mf

- cc: Dan Duncan, EPA
- Dana Bryson, DOE-RL
- ~~B. A. Austin, WHC~~
- J. D. Williams, WHC
- David Jansen, Ecology
- David Nylander, Ecology
- G. Thomas Tebb, Ecology

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Subject: LIQUID EFFLUENT RETENTION FACILITY (LERF) SHELBY TUBE SAMPLING AND TESTING

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