

Thompson Revision of Bair Draft

December 17, 1976

DOCUMENT **DOES NOT** CONTAIN ECIReviewed by *R. Schuette* Date *4/30/97*

Dr. J. L. Liverman
Office of the Assistant Administrator
for Environmental and Safety
Energy Research and Development
Administration
Washington, D.C. 20545

Dear Jim:

The Transuranium Technical Group met in Washington, D.C. on December 8, 1976 to review the data which suggest the possible contamination of the inhabitants of Bikini with plutonium.

The TTG views the issue of transuranium element contamination of present and future residents of the Bikini atoll as consisting of four major questions:

1. Do the residents of Bikini have plutonium burdens higher than those of other persons living in the same latitude?
2. If the Bikini residents do have increased plutonium burdens, what is the source of these burdens?
3. What future transuranic body burdens are projected for current residents and their descendants?
4. What potential health risks are associated with current and projected transuranic burdens of the Bikini residents?

In addressing the first of these questions, data presented to the TTG indicated that plutonium burdens of Bikini residents were 10 times greater than plutonium levels considered typical of residents of the continental United States. These estimates were derived from plutonium analysis of urine samples from Bikini residents and from residents of New York City. Unfortunately, the validity of both these sets of urine data is subject to question.

The New York City data, based on pooled samples, were not confirmed by a carefully collected large sample from one individual. This individual single sample was 10-fold lower than the pooled samples, and is in agreement with model estimates based on fallout plutonium burdens from autopsy data.

The Bikini data are highly suspect because the samples were not collected in a manner to avoid possible contamination of urine by plutonium-contaminated soil on the body and clothing of the person providing the sample, or from resuspended plutonium-contaminated soil in the air. Also, urine samples were generally pooled which prevented identification of possible sampling discrepancies.

The TTG concludes that the first question cannot be answered with available data and recommends that an effort be made to obtain urine samples from selected representative residents of Bikini under carefully controlled

conditions that would minimize possibilities of cross contamination. Samples should not be pooled from different individuals. Dietary, work, travel and recreational characteristics of the sampled individuals should be accurately recorded. Control samples must be similarly obtained and analyzed. These would most appropriately be obtained from non-exposed Marshallese. It would also be important to establish the U.S. value for fallout plutonium in urine.

With regard to the second question, the TTG was presented a brief review of information on plutonium in the Bikini environment and incomplete information on the dietary habits of the residents, and their sources of food. The TTG recognizes the need for continued monitoring of air, soil, water, and foodstuffs for plutonium and other transuranics. To minimize the cost of this effort a long range plan is needed that will assure identification of significant changes in levels of transuranics in these substances. Samples are required that will be truly representative of the air the residents breathe and the food they eat. This effort will, of course, become more important if the answer to the first question is positive.

An answer to the third question requires answers to the first two. The TTG recommends that when answers are obtained to questions 1 and 2, estimates of current body burdens and projected future body burdens should be made for current residents and their descendants, based on the best available models. The TTG does not believe in-vivo counting

offers much hope at the estimated current body burdens. However, if the revised projections indicate body burdens attaining nanocurie levels, then in-vivo counting of all residents would be desirable.

The fourth question, regarding possible health risks, depends upon current and future body burdens of transuranics in Bikini residents. Data presented to the TTG suggests that the average burden is ~ 20 pCi $^{239,240}\text{Pu}$, but may be higher or lower by a factor of ten or more. Using risk factors in the BEIR and similar reports, estimates of the health risk associated with this level of plutonium can be calculated and would be very small. However, the TTG believes this would be premature. Such estimates would better wait until the body burdens of the Bikini residents can be ascertained with more confidence. Also, such estimates of possible health consequences must be done in context with other radiation exposure, such as from the beta-gamma radiation from fission products dispersed on Bikini.

The TTG is aware that obtaining answers to the questions discussed above requires a considerable degree of cooperation from the Bikini people. Efforts to obtain this cooperation might result in psychological or sociological stresses far-exceeding the potential hazard from radiation. The TTG is in no position to evaluate this problem, but would feel that the overall welfare of the Bikini people should be placed above any concern for precise evaluation of minimal radiation risks.

In considering these questions, the TTG was handicapped by the lack of a concise but comprehensive summary of information on Bikini. Livermore, Brookhaven, HASL, the University of Washington and perhaps other Laboratories have collected data which would be useful in assessing the current levels of contamination on Bikini, and which would also provide guidance in planning additional studies. Such a summary should be prepared.

Sincerely yours,

W. J. Bair, Ph.D., Chairman
Transuranium Technical Group

WJB:mjs