SC 722-4
CHEN

United States Department of the Interior

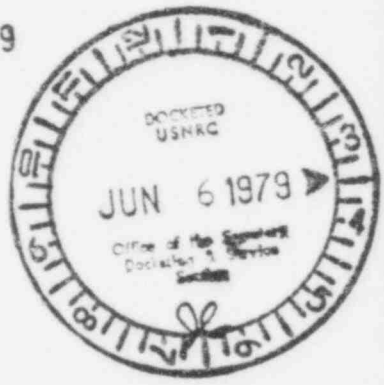
GEOLOGICAL SURVEY
RESTON, VA. 22092

OFFICE OF THE DIRECTOR

DOCKET NUMBER
PROPOSED RULE PR- Misc Notice
Reg. Guide

In Reply Refer To:
EGS-ER-79/458
Mail Stop 760

30 MAY 1979



Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention: Docketing Service Branch

Dear Sir:

We have reviewed Regulatory Guide 3.11.1 on embankment retention systems for uranium mill tailings and have the following comments:

General Comments

Most tailings-dam failures occur because unsuitable tailings materials are entrapped in the embankment. Entrapment takes place when standard dam construction methods are used, resulting in upstream, progressive enlargement of the embankment. We therefore strongly urge use of the downstream method as outlined in these references:

Kealy and Soderberg, 1969, Design of dams for mill tailings: U.S. Bureau of Mines, IC 8410.

Klohn, E. J., 1972, Design and construction of tailing dams: Canadian Institute of Mining, Transactions, v. 75, p. 50-66.

We would like to emphasize, also, that provision must be made for adequate control to prevent overtopping of the tailings embankment by excessive runoff.

We recommend that the responsibility for inspection should be placed on the shoulders of a registered civil engineer, engineering geologist, or geotechnical engineer who is independent of the mill owner. In our experience, people in these disciplines are generally better qualified for this particular task than are mining engineers.

Acknowledged by 6/13

7907120385

342 008

Specific Comments

Section C, 1g. Although earthquakes or seismicity are mentioned in a few places in the guide, the engineering data compilation for subsection 1g should specifically require descriptions of maximum credible earthquake (MCE), design-basis earthquake (DBE), and the estimated ground-motion spectra. The data and methods used in the derivation of the earthquakes and spectra should also be provided. This information would provide the necessary background for evaluating the results of stability and stress analyses, and for determining and justifying the approximate risks involved.

Similarly, the technical consideration given to possible subsidence (mine workings and karst) or landslides, including any necessary geologic exploration, in either the embankment or pond foundations or sides should be reviewed and evaluated, particularly in regard to possible inducement by the DBE or MCE.

Section C, 2c. Inspection should include the valley slopes below and around the embankment and pond as well as the embankment itself, and should be directed particularly to evidence of liquefaction, subsidence, bedrock fracturing, landslides, and other forms of natural slope instability.

Section C, 2c(7). We suggest that in addition to piezometer readings within the dam or embankment, the guide should indicate the advisability of measuring pertinent ground-water levels prior to construction and periodically during operation. Measurement of ground-water levels at one or more appropriate locations downgradient from embankments or dams could be significant, whether the measurements reflected conditions in an extensive unconfined aquifer or in a local perched water body. Periodic measurements would permit early detection of hydrologic effects of seepage to the water table as well as of natural changes in ground-water storage.

Section C, 2d. We certainly encourage special inspections after several natural geologic phenomena, but the term "significant" requires definition. This could be done by specifying threshold magnitudes for each type of phenomena for stated distances from the site. Such a magnitude/distance scale for earthquakes was described recently by the Corps of Engineers for dams that would require post-event inspection and reporting of effects (33 CFR Part 222, paragraph 222.6, amended in Federal Register v. 44, no. 32 dated February 14, 1979).

Thank you for the opportunity to comment.

Sincerely yours,

J. R. Balsley

Acting Director