

FEB 24 1983

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Review of DOE Document, "Waste Classification,
A Proposed Methodology for Classifying
Low-Level Radioactive Waste"

General Comments

This report is another effort to classify waste by total hazard, and considers a method by which the chemical hazard should be taken into account even though the radioactive hazard may be small. While interesting, the report has little practical use for low-level waste classification. It does not relate directly to the impacts of groundwater migration, intrusion, or trench gas and does not address disposal site long-term stability and minimizing long-term care requirements. General disposal requirements for licensing of a disposal site must be directly related to a calculated index of harm such as millirem/year. The report does appear useful for comparison of non-radiological hazards.

Body of The Report

The basic formula for the Waste Classification Index (WCI) is based on a hazard index which takes into account the sum of the number of toxic materials in the waste multiplied by the hazard index of each radio-toxic or chemically toxic material in the waste. The hazard index is composed of two factors which describe (1) the nature and amount of toxic materials disposed in the soil, and (2) the available biological hazard which exists when those materials leave the soil and enter an environmental pathway. The effective concentration of a given toxic material is a function of the initial concentration of the hazardous material, time, and containment provided by engineered features, waste form, and waste container. A waste form factor is introduced, and is defined as the maximum fraction of material that could be released from a container in the first year after the container is breached. Waste form factor values have been calculated for cement, urea-formaldehyde, bitumen, and vinyl ester-styrene. An attempt to develop an availability factor considers the relationship between the concentration of a substance in the soil and the dose rate in man. An availability pathway

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scenario is proposed to provide a method to analyze the relative mobility of waste substances.

Conclusion

In our opinion, the report contains information that is interesting but is too academic. If this effort is to offer real help in waste classification, it should be concentrated on comparing the risk of radiological exposure with the risk of exposure to chemicals and other non-radiological exposures. Hazards comparison would be feasible only if the risk comparison can be made. The methodology is probably too general as proposed to be very useful as a practical tool for waste management decisions.

Original Signed By

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