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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DEC 8 1992

Dr. Peter Myers
Staff Director, Board on
Radioactive Waste Management
National Research Council
National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418

Dear Dr. Myers:

On November 19, 1992, I sent you a letter requesting the National Academy of Sciences (NAS) to send the Environmental Protection Agency (EPA) a proposal to study three issues outlined in the 1992 Energy Policy Act. I am sending this letter to give you a clear sense of the questions EPA would like answered so that your study can be of the most use to us. We have framed specific questions and approaches in an attempt to take the most advantage of your technical and scientific expertise. As you know, EPA, as the administrative agency responsible for setting the standards for the Yucca Mountain site, must exercise its own discretion and apply its own expertise before reaching any final decisions for those standards, but will do so based upon and consistent with your findings.

Some questions and approaches that would be helpful to us to have examined are included in the list below:

(1) Whether a health-based standard based upon doses to individual members of the public from releases to the accessible environment (as that term is defined in the regulations contained in subpart B of part 191 of title 40, Code of Federal Regulations, as in effect on November 18, 1985) will provide a reasonable standard for protection of the health and safety of the general public?

It would be helpful to EPA's subsequent standard development if this assessment examined the comparative effectiveness of an individual dose standard, a collective dose standard, and other types of limits a standard for Yucca Mountain might include. In addition, it would be helpful for the assessment to consider specifically the implications and anticipated results of an individual dose standard, including an analysis of the total collective dose levels (summations in person-rem of non-truncated individual doses) likely to result from the application of different individual dose standards at Yucca Mountain. When evaluating possible individual dose limits, we would note that past EPA actions have considered a range of from 1 to 25 mrem/year. It would also be helpful if the assessment would clearly indicate the intended form of the individual dose standard that might be used

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(i.e., probabilistic (risk), deterministic, expected value, maximum individual, average of the critical population group, etc). Related issues that the panel may want to consider include:

- The uncertainty in the relationship between the individual and collective dose.

- The impact of different time periods of assessment for the standard and the relationship of time period to individual dose, collective dose, or other types of limits the standard might impose.

- Whether a defined "static biosphere" assumption is desirable to make a dose (or risk) standard workable. If so, what should be the nature of that assumption?

- The protectiveness of an individual dose standard, a population dose standard, or other types of limits the standard might impose in light of the possibility of natural or human-initiated disruptive events.

(2) Whether it is reasonable to assume that a system for post-closure oversight of the repository can be developed, based upon active institutional controls, that will prevent an unreasonable risk of breaching the repository's engineered or geologic barriers or increasing the exposure of individual members of the public to radiation beyond allowable limits?

This question seems intended to look at the effectiveness of active institutional controls as a method of protection at a Yucca Mountain repository. It could be approached through an examination of different types of active control systems and their cost, since cost is a factor in determining the long term viability of any active control system. The Academy could first determine the types of intrusive events that could take place at the Yucca Mountain site, then evaluate the effectiveness of various types of active institutional controls to mitigate these events. Some possible issues to consider include:

- Natural and human-initiated disruptive events.

- The types of actions that fall within the definition of "active institutional controls" and what credit for prevention or remediation should be given these actions.

- The historical record of institutional controls to prevent problems at other disposal sites.

- The durability of active institutional controls over various time periods, and how society can assure continuous control for those periods.

(3) Whether it is possible to make scientifically supportable predictions of the probability that the repository's engineered or geologic barriers will be breached as a result of human intrusion over a period of 10,000 years?

In answering this question EPA hopes that the panel can arrive at an unambiguous definition of "scientifically supportable predictions of the probability." This would be particularly helpful as we proceed to a rule promulgation consistent with the NAS findings. Some possible issues to consider include:

- For perspective, how does the human intrusion case compare to making a "scientifically supportable prediction of the probability" of naturally occurring disruptive events over 10,000 years?

- Whether the determination of a "scientifically supportable prediction of the probability" is dependent on the probability value, and, if so, what is that relationship?

- Can scientifically supportable predictions result from calculations based on simplifying assumptions about future human behavior made to reduce uncertainty?

EPA expects that the Academy's proposal will include provisions for public meetings and substantive opportunity for public input. As stated in the 1992 energy legislation the proposal must also include an expected completion date of December 31, 1993

We look forward to working with you on these issues, and realize that the precise questions and approaches you consider may be changed or augmented depending on the results of your studies. For discussion of any desired clarification of these issues you should contact Mr. J. William Gunter, Director of the Criteria and Standards Division in this Office. He can be reached at (202) 233-9290.

Sincerely,

/s/ Nuzman for

Margo T. Oge
Director, Office of Radiation
and Indoor Air

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