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Central Docket Section (A-130)
U.S. Environmental Protection Agency
ATTN: Docket No. R-82-3
Washington, D.C. 20460

Subject: Comments on Proposed Rule 40 CFR 191: Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High Level and Transuranic Radioactive Wastes (47 Federal Register 58196-206, Dec. 29, 1982)

Dear Sir or Madam:

On behalf of the Natural Resources Defense Council (NRDC), I wish to offer the following comments on 10 CFR 191 as proposed:

1. Definition of the "accessible environment." In developing the proposed rule, the EPA staff defined the accessible environment to include the lithosphere that is more than one mile from the radioactive waste in the disposal system. All of the EPA analyses of health risks, economic considerations, alternatives, and other regulatory and environmental impacts that form the basis for the proposed Environmental Standards for Disposal were based on the one-mile distance. The early drafts of the Nuclear Regulatory Commission's 10 CFR 60 technical criteria were apparently also based on the one-mile definition. Sometime between Draft 19 and Draft 21 of the EPA proposed criteria, EPA relaxed, without just cause, the definition of accessible environment from one mile to 10 kilometers. We understand that this was due to pressure from OMB, DOE, and NRC. This effectively weakens the EPA criteria by a factor of about 6, the ratio of the two distances. We believe that one mile is excessive, but in any case a relaxation to 10 km cannot be justified by EPA's own substantive analysis. Because EPA has demonstrated the feasibility of a one-mile distance, the relaxation to 10 km is inconsistent with EPA's admonition that "disposal systems shall offer as much protection as is reasonably achievable." Furthermore, excluding the lithosphere between one mile and 10 kilometers makes a mockery of any lay person's concept of what the word "accessible" means.

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We propose as an alternative that, in the definition of accessible environment, the lithosphere distance be defined as the distance in any direction from the radioactive waste in the disposal system to the nearest aquifer capable of providing potable water for industrial, irrigation, or household use, but not more than 10 kilometers or less than one kilometer from the radioactive waste.

2. Appropriate level of risk. We support EPA's effort to limit the risks to future generations to a level no greater than the risks which those generations would be exposed to from equivalent amounts of unmined uranium ore. We believe a choice of 100 fatalities per 10,000 years should be used rather than 1000 fatalities per 10,000 years for the following reasons:

a. It is consistent with the releases from the lower risk ore bodies (see EPA, "Populations Risks From Uranium Ore Bodies," EPA 520/3-80-009, October 1980).

b. The actual health risk may be much higher than implied by 10^{-2} fatalities/year because EPA effectively ignores non-fatal cancers and genetic effects. Cancer incidence is 1.5-2.0 times cancer mortality, and the uncertainty in the genetic doubling dose is extremely large.

c. In deriving the release limits (Table 2, 47 Fed. Reg. 58206), EPA has apparently assumed low cancer risk coefficients. At 47 Fed. Reg. 58203, column 1, EPA assumes 1 mrem/year to the U.S. population would result in 40 deaths/year, implying a cancer risk coefficient of 40 fatalities/ (2.25×10^8) (10^{-3}) person-rem = 2×10^{-4} . While this is consistent with the 1977 UNSCEAR estimates and the lower range of the BEIR I estimates, the new Japanese ABCC mortality data and Hiroshima dose reassessments are consistent with a risk coefficient larger by a factor greater than two.

d. The economic arguments that EPA makes with regard to the choice of 1000 as opposed to 10,000 fatalities/ 10^4 years (47 Fed. Reg. 58203, column 2) applies equally to 100 as opposed to 1000 fatalities/ 10^4 years.

3. Assurance requirements (40 CFR 191.14). We strongly support retaining each of the assurance requirements. Given EPA's failure to explicitly establish independent requirements on the natural and engineered barriers to provide defense in depth, these assurance requirements are essential. It is imperative, for example, to ensure that the ALARA principle is applied to both the site selection and system designs as required under proposed 40 CFR 191.14(b). We might note in this regard that we do not believe DOE has met this requirement in the selection of the Hanford site. DOE has failed to consider potential sites beyond the immediate area in and around the Hanford Reservation.

We believe 40 CFR 191.14(f) rules out salt domes. EPA has said as much at 47 Fed. Reg. 58201, column 2, but the language could be made stronger. If 40 CFR 191.14(f) is thought by EPA not to rule out salt domes, then these assurance requirements have no teeth.

4. Maximally exposed individual (alternative approaches). The EPA estimates of the "Potential Individual Doses from Disposal of High Level Wastes in Geologic Repositories" (EPA-520/1-82-026) make it clear that these potential exposures are far too high, in some instances in excess of 1000 rem/year. (See also EPA 520/1-82-025, Table B-8, p. 219).

It is not sufficient to insure that the population risks due to a repository are no greater than those due to a reference ore body. The individual risks from a repository should also be made as low as the individual risk from the reference ore body. Failure to adequately protect the individual risks is inconsistent with EPA's assertion that "we have chosen to propose disposal standards that limit the risks to future generations to a level no greater than the risks which those generations would be exposed to from equivalent amounts of unmined uranium ore" (47 Fed. Reg. 58197).

It may be possible to argue on probability grounds that, if buried at sufficient depth, the probability of a direct hit on a canister resulting in excessive exposures to drilling personnel is low. On the other hand, at a minimum it is essential that the canister and waste form be sufficiently leach resistant to insure that drinking water contamination from a near miss does not exceed the contamination levels associated with inadvertent drilling into an ore body.

5. Institutional controls. EPA's relaxation of the period of reliance on institutional controls from 100 years to a few hundred years (40 CFR 191.15(b)) is unwarranted. The United States is barely 200 years old, and the entire planet is currently threatened by some 50,000 nuclear weapons.

6. We believe the assurance requirements must be augmented by an explicit statement that, in assessments of whether 40 CFR 191 requirements are met, conservative rather than "best estimate" assumptions should be made where uncertainties in calculational parameters are large.

7. We are opposed to limiting the period of assessment to 10,000 years. Paragraph 2 at 47 Fed. Reg. 58199, column 2, is an argument for considering a longer period, not an argument for limiting consideration to 10,000 years. We would not be opposed to a different standard during the post-10,000 period, but it is essential that protection during that period be assured by explicit criteria as well.

8. We see no justification for limiting the release limits (Table 2, 47 Fed. Reg. 58206) to the isotopes identified rather than including all isotopes with halflives exceeding 10 years.

General Comments

a. EPA should limit these proposed regulations to geologic disposal instead of broadening them to include alternatives other than sea or seabed disposal.

b. Any reference to the 500 mrem Federal Radiation Protection Guide (47 Fed. Reg. 58197) should be dropped. I cannot imagine that EPA still believes this is acceptable today much less applicable to generations 1000 years hence.

c. We are not sure that EPA's definition of high level waste does not permit certain categories of waste to fall between the cracks, that is fall outside of 10 CFR 61 (shallow land burial) or 40 CFR 191. This should be examined carefully.

d. We are also concerned that dilution of existing wastes is a permissible means of avoiding compliance with 40 CFR 191 requirements.

Sincerely,



Thomas B. Cochran