December 18, 2007

EIS Office
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
1551 Hillshire Dr.
Las Vegas, NV 89134

RRR000454

Dear Mr. Edward F. Sproat, III:

This is in response to *DRAFT Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* [DOE/EIS-0250F-S1D]. We are responding on behalf of the Department of Health and Human Services (DHHS), U.S. Public Health Service.

This document was reviewed by the Centers of Disease Control and Prevention's Radiation Studies Branch. Following is a summary of important information regarding the radiological impacts to public health and safety which can be found in the subject document (hereafter referred to as the SEIS):

1.

- In February 2002, DOE submitted the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (FEIS). Since 2002, DOE has continued developing the Yucca Mountain repository design, construction and operation plans. The SEIS is meant to supplement the FEIS by considering the potential environmental impacts of the current design parameters. The SEIS also updates the impact of transporting spent nuclear fuel and high-level radioactive waste to the repository based on DOE decisions made after completion of the FEIS.
- The entire project is expected to last 105 years including 5 years of construction, 50 years of operation, 50 years of monitoring and a 10 year closure period which will overlap the 50 year monitoring period.
  The primary changes in the SEIS compared to the FEIS are:
  o The population projections have changed. The SEIS assumes operations will begin in 2017 and continue 50 years; therefore, the population projection was updated to the year 2067. The FEIS population projection was for the year 2035.
  o The SEIS used CAP88-PC Version 3 to calculate collective dose to the public and dose to the maximally exposed individual. CAP88-PC has been approved and validated by EPA.
  o In the SEIS, DOE used a latent cancer fatality conversion factor of 0.0006 per person-rem. This conversion factor is recommended by the Interagency Steering Committee on Radiation Standards which is composed of several federal and state agencies including the CDC. In contrast, the FEIS used two conversion factors: 0.0004 per person-rem for workers and 0.0005 per person-rem for the public. The resulting health impact in the SEIS is greater than that estimated by the FEIS.

- DOE used a conservative approach in determining the potential doses to the public. For example, it was assumed that the maximally exposed member of the public would reside continuously for 70 years at the site boundary in the prevailing downwind direction.
- Doses and health impacts were estimated for the entire 105 year project period.
  - The highest estimated dose in any one year to the maximally exposed member of the public is 6.8 millirem. This is less than 4 percent of the annual 200 millirem average background dose to the public from ambient levels of naturally occurring radon-222 and its decay products.
  - The collective dose for the projected population of 17,000 persons within 80 kilometers of the repository is 13,000 person-rem. The SEIS projects this population will receive 2.5 million person-rem during the same 105 year period due to natural background radon exposure. Therefore, about 99 percent of the potential population dose will result from exposure to naturally occurring radioactive materials.
- DOE identified and analyzed 14 accident scenarios which could happen during the 105 year project period. The accident scenario that would result in the highest offsite population impact would be the drop and breach of a canister containing spent nuclear fuel assemblies. The estimated health impact to the offsite population in this scenario would be less than 1 additional latent cancer fatality.
- DOE analyzed hypothetical sabotage events and determined the scenario resulting in the greatest public health impact involved a high energy density device penetrating a rail or truck cask. There would be 28 latent cancer fatalities in an exposed urban population. If the event occurred in a rural area, the probability of a single latent cancer fatality in the exposed population is estimated to be 0.055.
- DOE estimated the health impact to the population from exposure to spent nuclear fuel and high-level radioactive waste during transport to the repository.
  - For incident-free transport, there would be about 1 latent cancer fatality among members of the public. The maximally exposed member of the public is considered to be a service station attendant who could receive 0.21 rem over 50 years of shipments. This is based on very conservative assumptions.
  - The worst case transportation scenario would involve a high-temperature, long-duration fire that engulfs a cask. For an urban area, the population dose would be about 16,000 person-rem resulting in an estimated 9 cancer fatalities. For a rural area, the population dose would be about 21 person-rem with an estimated likelihood of a latent cancer fatality of 0.012. In a fire scenario, the maximally exposed member of the public (urban or rural) could receive 34 rem resulting in a probability of latent cancer fatality of 0.02.

- The SEIS provided projections of doses and radionuclide concentrations for two postclosure periods:
  - The period up to 10,000 years after repository closure would result in a mean and median annual individual dose that would not exceed 0.24 millirem and 0.12 millirem respectively to the reasonably maximally exposed individual (REMI).
  - The post-10,000-year period would result in a mean and median annual individual dose that would not exceed 2.3 millirem and 0.98 millirem respectively to the REMI.

Conclusion:

The public health impacts estimated by the SEIS are minimal and based on conservative assumptions. The methods used to calculate these results are widely accepted by advisory groups

and federal regulatory agencies. ⌉

Thank you for the opportunity to review and comment on this document. Please send us a copy of any future EAs or EISs which may indicate potential public health impacts and are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

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