

Summary of 40 CFR Part 191
Prepared for the
Blue Ribbon Commission on America's Nuclear Future

Title: Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level Waste, and Transuranic Radioactive Waste

Issued: Pursuant to the Nuclear Waste Policy Act of 1982 (Section 121)

Amended: Pursuant to the WIPP Land Withdrawal Act of 1992 (Section 8)

Proposed Rule (47 FR 58196, December 29, 1982)

EPA proposed disposal standards consisting of two primary elements:

- *Containment requirements* giving radionuclide-specific release limits to the accessible environment over 10,000 years
 - Release limits calculated based on estimate of population health effects
 - “Very unlikely releases” could not exceed 10 times the release limits
 - Accessible environment begins 10 km from repository
- *Assurance requirements* are qualitative provisions intended to provide additional confidence in the disposal system

EPA proposed containment requirements because they were deemed to adequately protect the general environment and population, while involving less uncertainty than projecting future exposures to individuals. However, EPA recognized that the overall protection afforded by the containment requirements could still allow situations in which individuals or localized populations were unacceptably exposed because of high radionuclide concentrations in ground water. EPA requested comment on the advisability of addressing individual exposures.

The 10,000-year compliance period was selected because it was considered long enough to distinguish among the capabilities of different sites in a variety of geologic media, yet remained “reasonably predictable” while avoiding the major climatic and geologic changes that could be expected at longer times. The concept of the “accessible environment” involved a judgment that some portion of the geologic medium surrounding the repository could be considered part of the disposal system for purposes of hindering the movement of radionuclides.

Final Rule (50 FR 38066, September 19, 1985)

EPA's final disposal standards retained containment requirements as the primary protection standard, but added three new elements:

- *Individual-protection standard* limiting doses to individual members of the public
 - Applies in the accessible environment for 1,000 years
- *Ground-water standards* for “special sources of ground water”
 - Applies inside the controlled area or within 5 km outside for 1,000 years
 - “Special source” defined as Class 1 by 1984 EPA Protection Strategy
 - supplies drinking water for thousands of people
 - is irreplaceable in that no alternative is available
- “*Reasonable expectation*” as the standard for regulatory judgment of compliance
 - Recognizes that absolute proof is impossible and uncertainties exist

The final rule also clarified several aspects of the proposal. The term “controlled area” was introduced to refer to that area surrounding the repository inside which the containment and individual-protection requirements do not apply. The controlled area was defined as no more than 100 square kilometers, extending no more than 5 km in any direction from the repository (as opposed to the proposed 10 km). The release limits were defined based on an estimated 1,000 premature cancer deaths over 10,000 years from 100,000 metric tons of heavy metal, within the range of unmined uranium ore. The rule also contained guidance to implement the standards.

First Circuit Court of Appeals Ruling (NRDC v EPA, 824 F.2nd 1258, July 17, 1987)

The First Circuit vacated EPA’s disposal standards and remanded them to the Agency. Specifically, the Court ruled that:

- The individual-protection and ground-water protection standards are arbitrary and capricious because they protect only certain classes of ground water for a limited area outside the controlled area, are therefore likely contrary to the “endangerment” provisions of part C of the Safe Drinking Water Act, and show no indication that the Agency tried to reconcile the SDWA with the NHPA;
- The 1,000-year compliance period for the individual-protection standard is not sufficiently justified relative to the 10,000-year period for the containment requirements;
- The Agency did not provide sufficient notice and opportunity to comment on the ground-water protection standards, which were not contemplated in the proposed rule and relied upon the Agency’s 1984 Ground-water Protection Strategy in defining certain classes of ground water.

The First Circuit denied challenges to the 10,000-year compliance period for the containment requirements, the “reasonable expectation” of compliance provision, and the non-applicability of the assurance requirements to NRC-regulated facilities (as long as NRC revises its requirements). In passing, the Court noted that a “controlled area” was implied by the NHPA.

WIPP Land Withdrawal Act of 1992

The WIPP LWA reinstated EPA’s disposal standards, with the exception of the individual-protection and ground-water protection provisions. EPA was directed to issue final disposal regulations and apply these standards to the Waste Isolation Pilot Plant (WIPP). EPA was also directed to issue compliance criteria for the WIPP (later issued as 40 CFR part 194). EPA’s disposal standards were not to apply to sites under section 113(a) of the NHPA.

Proposed Amendments (58 FR 7924, February 10, 1993)

EPA proposed to address the individual-protection and ground-water protection provisions by

- Making the compliance period consistent with the containment requirements
- Applying SDWA standards for all underground sources of drinking water in the accessible environment

Final Amendments (56 FR 66398, December 20, 1993)

EPA’s final amended disposal standards retained the elements of the proposed amendments. EPA used these standards for certification of the WIPP in 1999, for its subsequent recertification in 2006, and for its current review of the second recertification application.