prevent or substantially delay the movement of water or radionuclides toward the accessible environment; the impact on worker exposures to radiation (at the WIPP and off-site) both during and after incorporation of engineered barriers; the increased ease or difficulty in removing the waste from the disposal system; the increased or reduced risk of transporting the waste to the disposal system; the increased or reduced uncertainty in compliance assessment; the increased or reduced public confidence in the performance of the disposal system; the increased or reduced total system costs; the impact, if any, on other waste disposal programs from the incorporation of engineered barriers; and the effect on mitigating the consequences of human-initiated processes and events.

It would be inappropriate to limit the study only to the impact of engineered barriers on the performance of the WIPP. If this were done, the possibility would exist that an engineered barrier may be selected, for example, which marginally improves the disposal system's performance, yet results in much higher environmental risks at treatment sites. This increase in risk would contravene the Agency's objective of protecting human health and the environment. EPA solicits comment on this approach to selecting engineered barriers and on whether an alternative list of factors should be specified for consideration.

The Agency proposes that the benefit/ cost study described above include separate analyses for different categories of waste potentially destined for disposal at the WIPP. The Agency believes that benefits and costs of engineered barriers can differ depending on whether they are applied to existing waste that is already packaged, existing waste that is not yet packaged or is in need of repackaging, or to-be-generated waste. Therefore, the Agency is proposing that these different categories of waste be analyzed separately.

Finally, EPA is proposing that engineered barrier alternatives be considered both alone and in combination. In this way, assurance can be had that the full range of alternative applications of engineered barrier systems has been considered.

Importantly, today's proposal requires the results of the benefit/cost study to be included in any compliance application and for the results to be used to justify the selection or rejection of any engineered barrier. This will help the Agency understand why particular barriers were selected while others were not, as well as help the Agency to evaluate the appropriateness of such selections.

The Agency solicits comments on other potential approaches to the treatment of engineered barriers in the WIPP compliance criteria. In particular, the Agency is interested in receiving comment on the option of specifying a performance standard for engineered barriers similar to that specified by the Nuclear Regulatory Commission in 10 CFR part 60 regulations for disposal of high-level radioactive waste. Under this approach, a maximum radionuclide release rate would be established for the engineered barrier system. Engineered barriers selected for the disposal system would have to contain radionuclide releases within the established rate.

Consideration of the Presence of Resources

Section 14 of 40 CFR part 191 includes the following requirement: "Places where there has been mining for resources, or where there is a reasonable expectation of exploration for scarce or easily accessible resources, or where there is a significant concentration of any material that is not widely available from other sources, should be avoided in selecting disposal sites. Resources to be considered shall include minerals, petroleum or natural gas, valuable geologic formations, and ground waters that are either irreplaceable because there is no alternative source of drinking water available for substantial populations or that are vital to the preservation of unique and sensitive ecosystems. Such places shall not be used for disposal of the wastes covered by this part unless the favorable characteristics of such places compensate for their greater likelihood of being disturbed in the future."

EPA is proposing that any application for certification of compliance shall include information which demonstrates that the favorable characteristics of the WIPP compensate for the presence of resources and the likelihood of human-initiated processes and events as a result of the presence of those resources. If, after full consideration of the potential effects of resource recovery activities the WIPP is still predicted to meet the requirements of 40 CFR part 191, then the Agency will assume that the requirements of this part and section 14(e) of 40 CFR part 191 have been fulfilled. The Agency solicits comment on this approach.

Removal of Waste

Another assurance requirement included in the 40 CFR part 191 disposal standards involves the removal of waste from the disposal system. Specifically, 40 CFR part 191 mandates that: "Disposal systems shall be selected so that removal of most of the wastes is not precluded for a reasonable period of time after disposal." In order to address this requirement, EPA is proposing criteria to require a plan for removing waste from the disposal system using the best technology available at the time of application.

Individual and Ground-Water Protection Requirements

The Agency incorporated requirements in 40 CFR part 191 for the protection of individuals and groundwater. The individual protection requirements of 40 CFR part 191 limit annual committed effective doses of radiation to members of the public to no more than 15 millirem. The groundwater protection requirements limit releases to ground water to no more than the limits set by the maximum contaminant level for radionuclides (MCL) established in 40 CFR part 141 under section 1412 of the Safe Drinking Water Act (SDWA), 42 U.S.C. 300g-1. Both of these requirements are concerned with human exposure to radionuclides from disposal systems and, like the containment requirements of 40 CFR part 191, both limit such exposure for 10,000 years.

The proposed criteria address the following issues: the definition of a protected individual, the consideration of exposure pathways, the consideration of underground sources of drinking water, the scope of compliance assessments, and the basis for a determination of compliance with these requirements (results of compliance assessments).

With regard to identifying protected individuals, the Agency is proposing to require that assessments regarding individual exposures to radiation from the disposal system be based upon the assumption that individuals reside at the point on the surface of the accessible environment where they would be expected to receive the highest exposure from radionuclide releases from the disposal system. This helps ensure that the individual most likely to receive the highest exposure from the disposal system is accounted for and protected.

In assessing individual doses, the Agency proposes to require consideration of all potential pathways (associated with undisturbed performance) for radionuclide transport. The pathways which need to be considered include land-surface pathways (including direct radiation exposure), surface or ground-water pathways, and air pathways, as well as

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