controlled area need be considered. Consider a hypothetical example in which the water resources in the controlled area were found not to be of potable quality, and this were demonstrated and documented in the application for certification of compliance. Then, when examining the history of drilling for water in the Delaware Basin, the Department would need only consider boreholes created for water uses other than drinking, e.g., irrigation and control of dust.

The Agency is further proposing that the rate of human activity may be reduced in accordance with the criteria found in § 194.41, active institutional controls, and in § 194.43(c), passive institutional controls. A complete discussion of reduction of the human activity rate can be found under the discussion of those two portions of the criteria.

In assessing the consequences of human-initiated processes and events, the Agency is proposing that assumptions pertaining to characteristics of such processes and events be based on characteristics associated with current practice in the Delaware Basin. This approach is consistent with the approach the Agency is proposing for future state assumptions. For example, assumptions related to the type and amount of any drilling fluids, borehole depths, diameters, and seals should be assumed to remain consistent with the current practice in the Delaware Basin. For the specific case of borehole seals, EPA is further proposing that boreholes shall be assumed to be sealed at the rate boreholes have been sealed over the past 50 years in the Delaware Basin and that natural processes will degrade or otherwise affect the permeability of boreholes over the regulatory time frame.

The Agency has chosen in today's proposal to differ from the Appendix C Guidance for Implementation" which accompanied 40 CFR part 191 because EPA believes that the approach outlined above for assessing the likelihood and consequences of human-initiated processes and events is more appropriate for the WIPP than the method discussed in the guidance. Today's proposal is specific to the WIPP; the guidance, on the other hand, is generic. Moreover, the guidance only took into account drilling frequencies for oil and gas. The Agency believes that other human activities, such as drilling for potash and drilling for water, are equally important for consideration at the WIPP, as they too have the potential to affect the disposal system. Therefore, today's proposal requires consideration

of all human actions that could affect a waste disposal system. However, the Agency solicits comment on its proposed approach and the appropriateness of differing from the Appendix C guidance.

## **Results of Performance Assessments**

The Agency proposes to establish criteria for assessing the results of performance assessments required under the containment requirements of 40 CFR part 191. The Agency is proposing to require that the results of performance assessments be displayed as complementary cumulative distribution functions or "CCDFs." These CCDFs would display the releases of radionuclides over 10,000 years after disposal-summed and normalized according to Table 1, Note 6 of 40 CFR part 191-on the horizontal axis and the probability of releases occurring on the vertical axis.

In conducting performance assessments, there will be many parameter values that can affect the results of such assessments. For instance, gas generation by the waste, radionuclide solubilities, permeability of the host rock, and the porosity and transmissivity of surrounding aquifers entail parameter values that can affect the results of such performance assessments. These values may be difficult to quantify particularly over a 10,000-year period. Therefore, the Agency is proposing to require the development of probability distributions for parameter values in order to represent the probability of different values of the parameter occurring.

The Agency is further proposing to require that, in generating CCDFs, computational techniques be developed that sample randomly across the full range of probability distributions developed for uncertain disposal system parameter values used in performance assessments. In so doing, it is possible to convey the influence of parameter uncertainty upon the resulting CCDFs. Random sampling techniques can select a predetermined number of values from a parameter's probability distribution, the collection of which will represent the range of the distribution in successive stages of calculation.

The Agency is proposing to require that the entire range or "family" of CCDFs generated as a result of these sampling techniques be included in compliance applications. By requiring that all CCDFs be submitted, the Agency can evaluate whether given the conditions that exist at the disposal system, the disposal system could fail to comply with section 13 of 40 CFR part 191 in some of the CCDFs. By noting the number of total CCDFs generated that fail to comply, the Agency will gain insight into the performance of the disposal system over the 10,000-year time frame.

The Agency is proposing to place statistical criteria on the number of CCDFs generated. The Agency is proposing to require that the number of CCDFs generated be large enough such that the maximum CCDF generated exceeds the 99th percentile of the population of CCDFs with at least a 0.95 probability. A 95% confidence level is commonly recognized as being a good indicator of statistical acceptability. The Agency believes that the effect of this approach will be that the number of CCDFs generated will be large enough to ensure that a full range of realizations have been generated. EPA estimates that this will require several hundred realizations, although the number submitted in compliance with this requirement may ultimately be larger or smaller.

The Agency is proposing to require that the mean CCDF of the population of CCDFs meets the requirements of section 13(a) of 40 CFR part 191 with at least a 95 percent level of statistical confidence. The mean CCDF is calculated from a "family" of CCDFs whose parameters have an associated uncertainty to them, as discussed above. As a result, the mean will have its own associated uncertainty. This uncertainty around the location of the mean reduces the level of assurance with which we can state that the mean CCDF is in compliance with section 13 of 40 CFR part 191. One way of attaining statistical confidence in the mean is to determine how reproducible the mean is if recalculated. For example, first generate an ensemble of a certain number of CCDFs and calculate the mean. Next, generate an entirely new ensemble of the same number of CCDFs and compare the mean calculated for this new set to that of the first set. If the number of CCDFs generated is a statistically representative portion of the infinite population of CCDFs, then the two calculated means will likely agree. By placing a statistical confidence requirement on the mean of the CCDFs, the Agency hopes to ensure that a mean that is in compliance would upon recalculation from a new ensemble of CCDFs, still be in compliance. The Agency is proposing to require a 95 percent level of statistical confidence that the mean meets the requirements but solicits comment on other levels of confidence which may be more appropriate.

Before selecting the mean as the compliance indicator, the Agency