

**§ 63.312 Required characteristics of the reasonably maximally exposed individual.**

The reasonably maximally exposed individual is a hypothetical person who meets the following criteria:

- (a) Lives in the accessible environment above the highest concentration of radionuclides in the plume of contamination;
- (b) Has a diet and living style representative of the people who now reside in the Town of Amargosa Valley, Nevada. DOE must use projections based upon surveys of the people residing in the Town of Amargosa Valley, Nevada, to determine their current diets and living styles and use the mean values of these factors in the assessments conducted for §§ 63.311 and 63.321;
- (c) Uses well water with average concentrations of radionuclides based on an annual water demand of 3000 acre-feet;
- (d) Drinks 2 liters of water per day from wells drilled into the ground water at the location specified in paragraph (a) of this section; and
- (e) Is an adult with metabolic and physiological considerations consistent with present knowledge of adults.

HUMAN INTRUSION STANDARD

**§ 63.321 Individual protection standard for human intrusion.**

- (a) DOE must determine the earliest time after disposal that the waste package would degrade sufficiently that a human intrusion (see § 63.322) could occur without recognition by the drillers.
- (b) DOE must demonstrate that there is a reasonable expectation that the reasonably maximally exposed individual receives, as a result of the human intrusion, no more than the following annual dose:
  - (1) 0.15 mSv (15 mrem) for 10,000 years following disposal; and
  - (2) 1.0 mSv (100 mrem) after 10,000 years, but within the period of geologic stability.

(c) DOE's analysis must include all potential environmental pathways of radionuclide transport and exposure, subject to the requirements of § 63.322.

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**§ 63.322 Human intrusion scenario.**

For the purposes of the analysis of human intrusion, DOE must make the following assumptions:

- (a) There is a single human intrusion as a result of exploratory drilling for ground water;
- (b) The intruders drill a borehole directly through a degraded waste package into the uppermost aquifer underlying the Yucca Mountain repository;
- (c) The drillers use the common techniques and practices that are currently employed in exploratory drilling for ground water in the region surrounding Yucca Mountain;
- (d) Careful sealing of the borehole does not occur, instead natural degradation processes gradually modify the borehole;
- (e) No particulate waste material falls into the borehole;
- (f) The exposure scenario includes only those radionuclides transported to the saturated zone by water (e.g., water enters the waste package, releases radionuclides, and transports radionuclides by way of the borehole to the saturated zone); and
- (g) No releases are included which are caused by unlikely natural processes and events.

GROUND-WATER PROTECTION STANDARDS

**§ 63.331 Separate standards for protection of ground water.**

DOE must demonstrate that there is a reasonable expectation that, for 10,000 years of undisturbed performance after disposal, releases of radionuclides from waste in the Yucca Mountain disposal system into the accessible environment will not cause the level of radioactivity in the representative volume of ground water to exceed the limits in the following Table 1:

TABLE 1—LIMITS ON RADIONUCLIDES IN THE REPRESENTATIVE VOLUME

| Radionuclide or type of radiation emitted | Limit                        | Is natural background included? |
|---|------------------------------|---------------------------------|
| Combined radium-226 and radium-228 .....  | 5 picocuries per liter ..... | Yes.                            |