Kansas Administrative Regulations

Department of Health and Environment

Article 35.—Radiation—Part 4. Standards for Protection Against Radiation.

28-35-223b. Waste classification.

(a) Classification of waste for near surface disposal. In classifying radiation waste, consideration shall be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. Consideration shall also be given to the concentration of short-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are efficient.

(b) Classes of waste.

(1) "Class A waste" is waste that is segregated from other waste classes at the disposal site. The physical form and characteristics of class A waste shall meet the minimum requirements set forth in K.A.R 28-35-223c(a). If class A waste also meets the stability requirements set forth in K.A.R. 28-35-223c(b), the requirement that such wastes be separated shall be waived.

(2) "Class B waste" is waste that must meet more rigorous requirements as to waste form to insure stability after disposal. The physical form and characteristics of class B waste shall meet both the minimum and stability requirements set forth in K.A.R. 28-35-223c.

(3) "Class C waste" is waste that must meet more rigorous requirements as to waste form to insure stability and that also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of class C waste shall meet both the minimum and stability requirements set forth in K.S.A. 28-35-223c.

(4) "Waste that is not generally acceptable for near-surface disposal" is waste for which waste form and disposal methods must be different, and in general more

stringent, than those specified for class C wastes. In the absence of specific requirements in this part, proposals for disposal of this waste may be submitted to the department for approval.

(c) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

(1) If the concentration does not exceed 0.1 times the value in Table 1, the waste shall be assigned to Class A.

(2) If the concentration exceeds 0.1 times the value in Table 1, the waste shall be assigned to Class C.

(3) If the concentration exceeds the value in Table 1, the waste shall not be generally acceptable for near-surface disposal.

(4) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in subsection (g) of this regulation.

(d) Classification determined by short-lived radionuclides.

(1) If the radionuclides are not listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. If a radionuclide is not listed in Table 2, it shall not be considered in determining waste classification.

(2) If the concentration does not exceed the value in Column 1 of Table 2, the waste shall be assigned to Class A.

(3) If the concentration exceeds the value in Column 1, Table 2, but does not exceed the value in Column 2, Table 2, the waste shall be assigned to Class B.

Table 1

Radionuclide	Concentration Curies/Cubic Meter
C-14	8

C-14 in activated metal	80
Ni-59 in activated metal	220
Nb-94 in activated metal	0.2
Tc-99	3
Alpha emitting transuranic nuclides with half-life greater than 5 years	100*
Pu-241	3,500*
Cm-242	20,000

* Units are nanocuries per gram

Table 2

	Concentration, Curies/Cubic Meter		
Radionuclide	**Column 1**	**Column 2**	**Column 3**
Total of all nuclides with less than 5 year halflife	700	**	**
H-3	40	**	**
Co-60	700	**	**
Ni-63	3.5	70	700
Ni-63 inactivated	35	700	7000

metal			
Sr-90	0.04	150	7000
Cs-137	1	44	4600

** There are no limits established for these radionuclides in Class B or Class C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentration of other nuclides in Table 2 independently determine the waste to be Class C.

(4) If the concentration exceeds the value in Column 2, Table 2, but does not exceed the value in Column 3, Table 2, the waste shall be assigned to Class C.

(5) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(6) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in subsection (g) of this regulation.

(e) Classification determined by both long- and short-lived radionuclides. If radioactive wastes contains a mixture of radionuclides, some of which are listed in Table 1, and some of which are listed in Table 2, classification shall be determined as follows:

(1) If the concentration of a nuclide listed in Table 1 is less than 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.

(2) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1, the waste shall be Class C, if the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(f) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it shall be assigned to Class A.

(g) The sum of the fractions rule for mixtures of radionuclides. For determining the classification of waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits shall all be taken from the same column of the same table. The sum of the fractions for the column shall be less than 1.0 if the waste class is to be determined by that column.

(h) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods. Such methods may include use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.

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***** Authenticated Kansas Administrative Regulation *****