

## ***“Clearable” Waste – Canada, with reference to international levels***

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According to the International Atomic Energy Agency (IAEA), “Clearance is defined as the removal of radioactive materials or radioactive objects from the regulatory control”.

<http://fti.neep.wisc.edu/pdf/fdm1231.pdf>

Some countries have adopted clearance levels for specific isotopes based on activity. However, in Canada, site-specific clearance levels which can be proposed which are to be approved by the CNSC (as the licensee).

### **Canada**

CNSC’s Regulatory Guide to Decommissioning Planning for Licensed Activities - **G-219**

[http://www.nuclearsafety.gc.ca/pubs\\_catalogue/uploads/G219\\_e.pdf](http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G219_e.pdf)

The Guide published by CNSC in 2000 states that decommissioning programs should optimize the clearance of materials and sites from regulatory control. “Different clearance levels may be proposed based on the specific radionuclide involved and the type of clearance sought (i.e. unconditional or controlled). In all cases, the resulting dose must be below the regulatory limits and in compliance with the ALARA (as low as reasonably possible) principle.” P. 15

As per the CNSC Guide, p. 2:

“contamination: (radiological and non-radiological)

A manufactured substance (or natural substance concentrated by human activity to a level not normally found in nature) that is in air, on/in solid materials, soil, surface water or ground water at a concentration or quantity that could pose a risk to human health or the environment).”

“clearance levels“:

The maximum permissible concentrations of radioactivity in or on materials, equipment and sites to be released from regulatory control (e.g., Bq/g, Bq/cm<sup>2</sup>, near-contact dose rate). Clearance levels may be expressed as unconditional or controlled, depending on whether the specific pathways of release, or destinations for reuse, recycling and/or disposal are specified.”

**Status of EU US IAEA Clearance Standards 2004:** <http://fti.neep.wisc.edu/pdf/fdm1231.pdf>

### **NUCLEAR SAFETY AND THE ENVIRONMENT – European Commission (date?)**

<http://ec.europa.eu/energy/nuclear/studies/doc/other/eur18041.pdf>

[Radioactive Waste Dispersal into Consumer Goods, Raw Materials and Regular Trash](http://www.acereport.org/radwaste2.html)

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### **Waste segregation based on clearance levels – Canada**

<http://www.wmsym.org/archives/2008/pdfs/8089.pdf>

Correspondence from CNSC: It should be noted that G-219 was published prior to (about 8 years) the publication of the Nuclear Substances and Radiation Devices Regulations (NSRDR, April 2008) that define, list and present requirements relating to clearance levels and clearance in general. So the NSRDR (2008) present the current information on clearance.

The NSRDR align the definition of clearance levels with current international recommendations. Two types of clearance levels are defined in the NSRDR, namely conditional and unconditional. The latter are listed in Schedule 2 of these regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-207/page-14.html>) while the former are to be developed by the licensee and approved by the CNSC as per criteria given in the NSRDR.

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### **Nuclear Substances and Radiation Devices Regulations (SOR/2000-207)**

Full Document: [HTML](#) | [XML](#) [265 KB] | [PDF](#) [403 KB]

Regulations are current to 2011-09-21 and last amended on 2010-05-13

### **SCHEDULE 2, (Section 1) UNCONDITIONAL CLEARANCE LEVELS**

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-207/page-14.html>

#### **Definitions under NSRDR**

<http://laws-lois.justice.gc.ca/PDF/SOR-2000-207.pdf>

“conditional clearance level” means an activity concentration that does not result in an effective dose (a) greater than 1 mSv in a year due to a low probability event referred to in the IAEA Safety Standard RS-G-1.7; or

(b) greater than 10 µSv in a year.

“exemption quantity” means any of the following:

(a) in respect of a radioactive nuclear substance set out in column 1 of Schedule 1,

(i) if the radioactive nuclear substance is uniformly distributed in material and not in bulk quantity, the corresponding activity concentration set out in column 2, or

(ii) the corresponding activity set out in column 3;

(b) in respect of a radioactive nuclear substance that is not set out in column 1 of Schedule 1,

(i) if the atomic number of the substance is equal to or less than 81,

(A) 10 Bq/g if the radioactive nuclear substance is uniformly distributed in material and not in bulk quantity, or

(B) 10,000 Bq,

(ii) if the atomic number of the substance is greater than 81 and the substance, or its short-lived radioactive progeny, does not emit alpha radiation,

(A) 10 Bq/g if the radioactive nuclear substance is uniformly distributed in material and not in bulk quantity, or

(B) 10,000 Bq, or

(iii) if the atomic number of the substance is greater than 81 and the substance, or its short-lived radioactive progeny, emits alpha radiation,

(A) 1 Bq/g if the radioactive nuclear substance is uniformly distributed in material and not in bulk quantity, or (B) 1,000 Bq; or

(c) in respect of more than one radioactive nuclear substance,

(i) if the radioactive nuclear substances are uniformly distributed in material and not in bulk quantity, the quotient obtained by dividing the total activity concentration by the sum of quotients obtained by dividing the activity concentration of each radioactive nuclear substance by its corresponding exemption quantity as referred to in paragraph (a) or (b), or

(ii) the quotient obtained by dividing the total activity by the corresponding sum of quotients obtained by dividing the activity of each radioactive nuclear substance by its corresponding exemption quantity as referred to in paragraph (a) or (b). (*quantité d'exemption*)