

The Swedish Radiation Protection Authority's Regulations and General Advice on the handling of Ashes Contaminated by Caesium-137;

issued on February 10th, 2005.

On the basis of sections 3 and 7 of the Radiation Protection Ordinance (1988:293) the Swedish Radiation Protection Authority has issued the following regulations and general advice.¹

Applicability

1 § These regulations and general advice apply to the handling of contaminated ashes after production of energy obtained in combustion plants producing more than 30 tons of ashes dry matter (DM) per year.

The regulations in sections 18 and 20, 1 of the Radiation Protection Act (1988:220) shall not apply to the handling of contaminated ashes.

Concerning protection of workers there are regulations in the Radiation Protection Act.

Definitions

2 § Terms and concepts used in these regulations and general advice have the same meanings as in the Ordinance (2001:512) on the landfill of waste, the Ordinance (2001:1063) on waste and the Ordinance (2002:1060) on combustion of waste as well as the Swedish Standard SS 18 71 06 on solid biofuels and peat fuels – terminology. Furthermore, in these regulations and general advice is meant with

ashes: ashes that contain ashes of wood fuel,

contaminated ashes: ashes that contain more than 0.5 kilobecquerels per kilogram (kBq/kg) DM ¹³⁷Cs,

handling: any practice or measure after the production of contaminated ashes that implies recycling or disposal of the ashes or measures to prevent leaching of ¹³⁷Cs to the environment as well as measurements to determine the contents of ¹³⁷Cs in the ashes,

lichen land: land where lichen cover more than 25 percent of the surface area or land where reindeer permanently graze.

Protection against leaching

3 § When contaminated ashes are used as filling materials or are deposited, the environment shall be protected against leaching of ¹³⁷Cs. This protection shall be considered satisfactory if the inflow to drinking water in a water catchment in the vicinity is less than 1 Bq per litre.

Discharge of collected leachate into a surface water recipient may only take place if the content of ¹³⁷Cs in the leachate divided by the dilution in the recipient is less than 0.1 Bq per litre.

¹ Cf. Council Directive 96/29/Euratom of May 13, 1996, laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation. OJ L159, 29.6.1996, p. 1. (Celex 396L0029).

Recycling or disposal of contaminated ashes

Recycling and spreading

4 § Recycling of contaminated ashes onto woodlands may take place if the content of ^{137}Cs is less than 10 kBq/kg DM.

Contaminated ashes cannot be spread onto arable land or be blended with soil that is used or could be used to grow food provisions. Nor can recycling of contaminated ashes take place onto lichen-land where reindeer graze.

The National Board of Forestry has issued general advice on recycling of ashes.

Filling materials

5 § Contaminated ashes having a content of ^{137}Cs less than 10 kBq/kg DM may be used as filling materials outdoors, generally or for roads. The ashes shall be placed so that the dose-rate does not exceed 0.5 $\mu\text{Sv/h}$ as measured 1 metre from a coated surface.

General advice

The requirement on dose-rate according to section 5 should be considered fulfilled if the ashes are covered by a mineral coating (sand, clay, etc) at least 20 centimetres thick.

Landfill

6 § Contaminated ashes having a content of ^{137}Cs that is 10 kBq/kg DM or more shall be deposited on a landfill classified as a landfill for non-hazardous waste, or higher, according to the Ordinance (2001:512) on the landfill of waste.

7 § If contaminated ashes having a content of ^{137}Cs less than 10 kBq/kg DM are deposited, a landfill classified as a landfill for non-hazardous waste or higher shall be used, if a lower classification can't be justified.

Measurements

Requirements on the measurements

8 § If it can not be excluded that the expected content of ^{137}Cs in the ashes is close to or more than 10 kBq/kg DM, a measurement of the content of ^{137}Cs shall be performed at the combustion plant. The content of ^{137}Cs shall be considered to be more than 10 kBq/kg DM if the measured reading plus the uncertainty, expressed as one standard deviation, exceeds 10 kBq/kg DM.

The content of ^{137}Cs shall be considered to be less than 0.5 kBq/kg DM if the measured reading plus the uncertainty, expressed as one standard deviation, is less than 0.5 kBq/kg DM.

The method for sampling

9 § Checks by measurement of the content of ^{137}Cs in ashes shall be performed on composite samples consisting of primary samples.

Sampling of a lot, of ashes, shall be done by taking primary samples that are put together to a composite sample. One primary sample shall be taken from not more than 3 tons of ashes DM. Not more than 10 primary samples may be put together to one composite sample. The lot represented by the composite sample shall be stored in an identifiable manner until the result from the measurement is obtained.

General advice

The method for sampling should be according to Nordtest Metod NT Envir 004² or by an equally valuable method.

Recording and filing

10 § All measurements that are done to determine if the content of ¹³⁷Cs in the ashes exceeds 10 kBq/kg DM shall be recorded in a log-book. The recordings shall include

1. the date of measurement,
2. the content of ¹³⁷Cs and the uncertainty, expressed as one standard deviation,
3. the weight of the lot expressed in tons DM,
4. the measurement method used,
5. the person who performed the measurement,
6. the origin and species of wood fuel, if possible and
7. where the lot was placed if the content of ¹³⁷Cs exceeded 10 kBq/kg DM.

Measurements performed to show that the content of ¹³⁷Cs does not exceed 0.5 kBq/kg DM shall be recorded according to the points 1 - 6.

A copy of the log-book shall at request be sent to the Radiation Protection Authority not later than three months after the turn of the year considered in the report. The log-book shall be filed for at least ten years.

Environmental check

11 § At landfills according to sections 6 and 7 which are classified as landfills for non-hazardous waste or higher, measurements of ¹³⁷Cs shall be performed on ground water, surface water and leachate according to regulations from the Swedish Environmental Protection Agency.

The results of the measurements shall be recorded. A copy of the log-book shall at request be sent to the Radiation Protection Authority not later than three months after the turn of the year considered in the report. The log-book shall be filed for at least ten years.

Quality assurance

12 § The procedures for sampling and measurements, the routines for the handling of the lots of ashes as well as the procedures for environmental checks shall be documented. The personnel concerned shall have knowledge about and access to these documents.

Exemptions

13 § If special grounds exist the Radiation Protection Authority may grant exemptions from these regulations.

These regulations enter into force on January 1st, 2006. Concerning landfills that are in use on that date, measures to fulfil the requirements in sections 6 and 7 shall be taken not later than by the end of the year 2008.

On behalf of the Board of the Swedish Radiation Protection Authority

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² NT ENVIR 004: Solid Waste, Particular Materials: Sampling, (1996), ISSN 1238-4445