

Information Sheet

Information about Mineral Substances

This Information Sheet has been developed to provide information on the requirements under the *Radiation Safety Act 1999* which are applicable to mineral substances.

What is a Mineral Substance?

A mineral substance is a mineral¹ situated outside the boundaries of land the subject of a mining lease, mineral development licence or exploration permit within the meaning of the *Mineral Resources Act 1989*.

A mineral substance is also a substance into which a mineral has been changed as a result of the processing of the mineral. (Note: This may occur on land the subject of a mining lease, mineral development or exploration permit.)

When is a Mineral Substance a 'Radioactive Substance'?

Section 5 of the *Radiation Safety Regulation 2010* states that a mineral substance is a 'radioactive substance' if the concentration of the radionuclide in the substance is equal to, or more than, 10 times the concentration for that nuclide stated in schedule 1, column 2 of the Regulation. If a mineral substance falls within the definition of 'radioactive substance', the requirements of the *Radiation Safety Act 1999* apply (e.g. the licensing and approval processes).

The following examples provide advice on how to determine whether a mineral substance is a radioactive substance.

(a) Mineral substance containing natural uranium or natural thorium

If it has been determined that a mineral substance contains only natural uranium or natural thorium, the mineral substance is a 'radioactive substance' if the concentration of either parent radionuclide² is equal to, or greater than, 10Bq.g^{-1} .

(b) Mineral substance containing processed material

If it has been determined that the parent radionuclide and its progeny are no longer in secular equilibrium in a mineral substance, the concentrations of each radionuclide in the substance (i.e. the parent and the progeny radionuclides) must be considered to determine whether the mineral substance is a 'radioactive substance'.

If the concentration of any of the radionuclides is equal to, or more than, 10 times the corresponding concentration of that radionuclide stated in schedule 1, column 2 of the *Radiation Safety Regulation 2010*, the mineral substance is prescribed as a 'radioactive substance'.

¹ For the purposes of the *Radiation Safety Act 1999*, 'mineral' has the meaning given to it in section 6 of the *Mineral Resources Act 1989*.

² The progeny nuclides were taken into consideration when the prescribed concentrations were derived. It is assumed that the parent radionuclide and its progeny are in secular equilibrium.

What are the Legislated Controls on Mineral Substances?

A person who possesses a mineral substance that is not prescribed as a radioactive substance may still be subject to certain legislated requirements. These requirements are detailed as follows:

(a) Radiation dose requirements

Under section 58 of the *Radiation Safety Regulation 2010*, a person who possesses a mineral substance must ensure that another person does not receive a total effective dose of ionising radiation emitted from the substance that is –

- for public exposure of the other person – more than 1 mSv a year; or
- for occupational exposure of the other person – more than 20 mSv a year.

A person in possession of such material should adopt procedures to ensure that this requirement is satisfied.

(b) Disposal requirements

Under section 78 of the *Radiation Safety Regulation 2010*, a mineral substance may be disposed of, other than into the air, water or sewerage system, if:

- (i) the gross alpha and gross beta concentrations in the leachate, determined as a result of carrying out the TCLP³ in relation to the substance, are not each more than 10 times the relevant concentration stated in the NHMRC, NRMCC 'Australian Drinking Water Guidelines'; and
- (ii) for a substance that contains -
 - only 1 of the radionuclides stated in schedule 1, column 1 of the *Radiation Safety Regulation 2010* - the concentration of the radionuclide is less than 10 times the concentration stated in schedule 1, column 2 of the Regulation; or
 - more than 1 of the radionuclides stated in schedule 1, column 1 of the Regulation - the substance's disposal factor⁴ is not more than 1.

(c) Licensing, storage and other requirements

Please contact Radiation Health for information on the legislated requirements if a mineral substance falls within the definition of 'radioactive substance'.

Enquiries

For further information, please contact the Radiation Health, Health Protection Unit of the Department of Health. The contact details for Radiation Health are:

Office Radiation Health
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15 Butterfield Street
HERSTON QLD 4006

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Health Protection Unit
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FORTITUDE VALLEY BC QLD 4006

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³ 'TCLP' means the toxicity characteristics leaching procedure stated in AS1439.2 – 1997 Wastes, sediments and contaminated soils, Part 2: Preparation of leachates – Zero headspace procedure.

⁴ 'disposal factor', means the total of the amounts worked out by applying the following formula to each of the radionuclides: Disposal factor = C/MC; where - 'C', means the radionuclide's concentration (in Bq/gram) and 'MC', means 10 times the concentration stated in schedule 1, column 2 of the Regulation shown opposite the radionuclide