
Radon in Water & Air - Health Risks & Control Measures

The intent of this fact sheet is to provide helpful information regarding radon in the air and in drinking water.

What is radon?

Radon is a naturally occurring element in the earth's crust and is one stage in a natural radioactive decay chain originating with Uranium. Radon is a gas, which can be present in water or within spaces in rock and soil.

How do people get exposed to radon?

Radon enters structures through soil, gas, and water. If drinking water is aerated such as at taps or is heated the radon is easily released into the air.

Where is radon found?

Levels of background radiation due to the presence of radon are relatively high in some parts of Massachusetts, in other New England states and the certain areas of the United States in general.

What are the health effects of radon?

The radioactive decay of radon produces fast-moving subatomic particles that can damage living cells. They cannot penetrate skin from outside the body, but cause damage once within the body.

Health risks of airborne radon are estimated primarily on the basis of lung-cancer mortality rates of uranium miners who worked in poorly ventilated mines.

What are the exposure routes of concern with radon?

The primary exposure pathway is inhalation and it will affect people to a greater degree from this route of exposure than from drinking the water.

When should corrective action be taken?

The "action levels" for radon are 4 pCi/L for radon in indoor air (USEPA) and 10,000 pCi/L for radon in water (State of Massachusetts guidance). Action could include taking steps to reduce indoor air exposures.

What are the risks of exposure to Radon compared with other risks?

Health risks from radon are similar to other low-level radiation exposures. Breathing high concentrations of radon over a lifetime increase an individual's risk of developing lung cancer, especially for smokers.

How can I control the exposure?

Treatment includes venting the air from the structure and may also involve treating the water. Air treatment is much more cost effective at risk reduction than water treatment.

Treating the water with air stripper technology, granular activated carbon, green sand or reverse osmosis are among some technologies available for this purpose. Venting must be done to the outdoors.

Other Sources of Information

Radon Decay Chain Process:

<http://www.radonguide.com/radon-decay-chain.html>

Treatment:

http://www.nesc.wvu.edu/pdf/DW/publications/ontap/tech_brief/TB14_Radionuclides.pdf

MassDPH

[DPH Website](#)

EPA:

<http://www.epa.gov/radon/>

Other New England States:

Maine:

<http://physics.umaine.edu/public-service/educational-outreach/radon-in-air-and-water/>

New Hampshire:

<http://des.nh.gov/organization/divisions/air/pehb/ehs/radon/index.htm>

Vermont:

<http://healthvermont.gov/enviro/rad/Radon.aspx>

MassDEP Regulations (310 CMR 22.00):

<http://www.mass.gov/dep/water/laws/regulati.htm#dw>