

FORMER CLOCK FACTORY SITES IN BRISTOL: Q & A ABOUT RADIIUM

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Main Points

- Radium is a radioactive material that was used in painting clock dials at former clock factories in Bristol.
- The CT DPH has evaluated radiation levels measured at these sites.
- None of the radiation levels were high enough to cause immediate health problems or to require moving building occupants.
- Some areas were found to have radiation levels that present a low health risk with long-term exposure.
- It is important that exposure to radiation be ended. The EPA and CT DEP are evaluating the best clean-up method.

Background

This fact sheet was developed by the CT Department of Public Health (DPH) to update site workers and others about the former clock factory sites in Bristol. The Connecticut Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA), the federal Agency for Toxic Substances and Disease Registry (ATSDR) and the Connecticut Department of Public Health have been investigating the use of radium at these sites. Radium is a radioactive material that was used in painting dials on clocks because it makes paint glow in the dark. It was believed to be used from the early 1900's through the 1940's in the production of clocks.



The former Ingram Clock Factory and Sessions Clock Company in Bristol used radium in their clock production. The Ingram clock factory complex was torn down in the late 1960's. Bristol Instrument Gears, DABKO Co., NuTECH, CT Graphics and C&R Printing are housed at the old Sessions Clock Company complex.

This fact sheet summarizes the findings of a Public Health Assessment that evaluated radiation contamination data collected by the CT DEP, EPA and the U.S. Department of Energy. This evaluation was done to determine whether a risk to public health exists at these sites.

What are the Types of Radiation?

Radiation is produced when unstable elements such as radium decay (break down) and give off radioactive particles or rays. *Radon* is a gas formed when radium decays. The hazard associated with radiation depends on:

- the form of radiation;
- the element that is radioactive and its decay products; and
- the route of exposure.

Forms of Radiation Associated with Radium

Alpha is a heavy particle that is mainly a hazard to internal organs exposed to radium or radon. These particles only travel a short distance (inches) in air and cannot go through the skin.

Beta is a light particle that can sometimes penetrate the skin. Beta particles can travel several feet through the air and may expose the skin and internal organs of those living or working near the radium dust.

Gamma is a ray that can penetrate nearly any substance. Gamma rays can travel great distances in air, and expose those living or working near the radium dust.

What are the Health Effects of Radium Radiation Exposure?

The health effects of radiation are well studied at higher levels of exposure, but the long-term effects of exposure to low levels of radiation - such as those found in the clock factories - have never been observed in humans. We assume that radiation exposure increases the risk of cancer by a small amount. That means the lower the exposure, the lower the risk.

Radiation is energy that may damage the human body by damaging cells or their genetic material (DNA). Some forms of radiation are known to cause cancer. There are 3 types of potential exposures when radium is present:

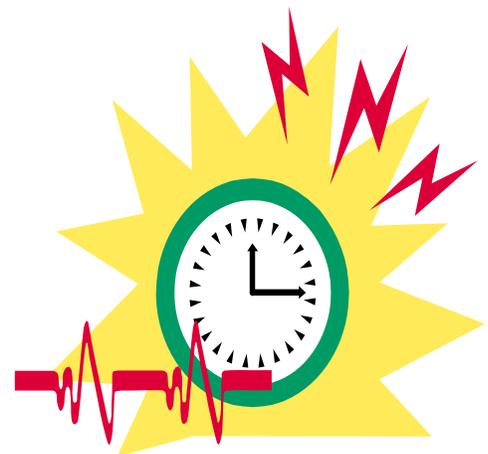
- *gamma ray exposure* occurs when people are near the radium;
- *radon exposure*, occurs when radium decays into radon and is inhaled (breathed); and
- *radium dust exposure* occurs through *inhalation and ingestion (through the mouth)* of airborne dust.

For both radon and radium, the hazard comes from radioactive materials getting into the body. The effects are mainly to specific organs:

- the lungs for radon and its decay products
- lungs and bone for inhaled or ingested radium.

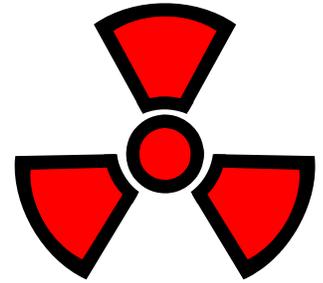
Bone cancer is connected with radium exposures. It was found among workers who worked directly with radium and ingested large amounts of it over a long period of time. It is important to remember that the health effects of radiation exposure vary according to:

- * how long you were exposed; and



How is Exposure to Radiation Measured?

The DEP can measure the amount of radiation exposure caused by radium contamination in the buildings. The unit for this measurement is called a millirem. We are all exposed to background radiation, at about 350 millirems per year. Radiation occurs naturally in the environment from the sun, cosmic rays, and other sources. Background radiation refers to these naturally occurring sources, as well as medical exposures (X-rays).



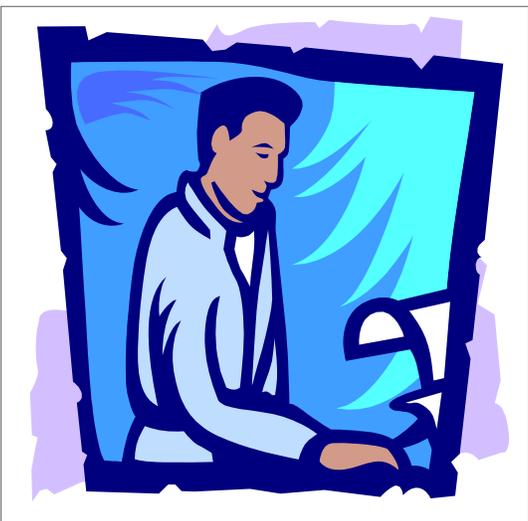
Ingram Building Complex: This factory complex was torn down in the late 1960's. Therefore, no radiation surveys were conducted at the site.

Former Sessions Clock Company: Radiation surveys were conducted at each of the companies now located on this site. The results of the evaluation of these surveys are below.

What Were the Results of the Assessment?

The EPA has established a clean-up level for radioactive contamination of 15 millirems per year. Radiation was detected in two locations at the former Sessions Clock Factory at levels above that level. One of these locations is a storage area on the fourth floor of building A. The other location is an old storage area on the third floor of building D. Neither of these areas are currently occupied. Both of these areas are part of the DABKO CO.

One area of the first floor of the Bristol Instrument Gears building has radiation levels at the EPA risk-



I Work at the Former Sessions Site. What Do the Results Mean For My Health?

None of the radiation levels found were high enough to pose an immediate health risk to people working in the buildings. Some unoccupied areas had radiation levels that were of health concern for long-term (life-time) exposures. These are levels that are above the EPA clean-up level of 15 millirem per year. These areas are located in storage areas where people are not likely to be exposed for extended periods of time, further reducing the likelihood of any health risks.

Should I Talk with my Doctor or Health Provider?

It is always wise to consult with your medical provider if you have questions about your health. The DPH believes it is unlikely that any radium exposures at the site will cause health effects.

What Should be Done About the Contamination?

Although levels of radiation are not high enough to cause immediate health problems, it is important that exposures to radiation contamination above the EPA level be stopped to minimize potential long-term health effects. The EPA and CT DEP are reviewing the health assessment findings to decide on the best clean-up method.

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(Prepared by the State of Connecticut Department of Public Health, Division of Environmental Epidemiology and Occupational Health. This factsheet is funded, in part, by funds from the Comprehensive Environmental Response, Compensation, and Liability Act trust fund through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of