

RADIOACTIVE AMERICIUM 241 IN THE WASTE STREAM

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Smoke detectors used in people's homes use either a photoelectric detector or an ionizing detector. Most battery operated smoke detectors use an ionizing detector that contains the radioactive isotope Americium 241, which has a half life of 458 years. (1) Most of these ionizing detectors eventually wind up in the municipal waste stream, and in Marion County, this would probably mean incineration at the Marion Covanta incinerator in Brooks.

Incineration of Americium 241 creates large numbers of exceptionally small and nano-sized radioactive particulates [i.e., fine and ultrafine particulates (2)] that travel great distances in the air stream, and ultimately are deposited in ecosystems and our and other organisms' bodies.

To get a feel for the danger of such particulates, consider the following comments [next two paragraphs] written by the eminent scientist Dr. Rosalie Bertell (1,3):

"A typical Americium source contained in one ionizing detector intended for home use, would consist of 0.8 to 5.0 micro curies of Americium on a silver disc, coated with a very thin layer of gold. An industrial model may contain up to 15 micro curies. We usually speak of picoCuries of radiation, which are one millionth of a microCurie, as having biological significance for humans. According to Dr. Edward Martel, an expert on alpha particle emitters like Americium and Radium, one microCurie of Americium contains thousands of lethal doses if spread in a human population. Dr. Martel was a senior scientist at the US National Center for Atmospheric Research in Boulder, Colorado. Dr. Karl Morgan, Father of Health Physics and Emeritus Member of the International Commission on Radiological Protection, has stated that the risks are identical for Plutonium 239 and Americium 241. He adds that once in the environment, (after a fire or after having been discarded in a landfill), Americium is more of a risk than Plutonium because it is readily taken up by animals (including humans) and plants. (From the US Congressional Record House, page H521-H523, 1 February 1978 Legislation to Prohibit Sale of Smoke Detectors Containing Radioactive Isotopes)

Because Americium is soluble, it can accumulate in soil and water, and enter into drinking water, plants, fish and animals. In the human body, it moves into the blood stream and is stored in bone and liver...." [end quote]

Covanta representatives assert that radiation monitors at the Marion County incinerator would allow them to detect and reject waste containing "anything more than background radiation." (At a February 26, 2009 public forum a Covanta representative indicated that monitors are set at 1.5 times the background level of radiation.)

While it is reassuring that there are radiation monitors at the incinerator, such monitors are measuring gamma radiation (x-ray radiation) which is more penetrating, and not the alpha radiation emitted by Americium 241. The Health Physics Society notes that "instruments cannot detect alpha radiation through even a thin layer of water, dust, paper, or other material, because alpha radiation is not penetrating." (4)

The Institute for Energy and Environmental Research notes that if isotopes that are alpha emitters get "into the body, the high-energy alpha radiation can damage cells and cause cell mutations that can lead to cancer. The main health concern for [such isotopes] is inhalation of small particles or absorption through cuts or wounds." (5)

So where are the EPA and NRC on all of this? Recognizing such dangers, the EPA says you should "never burn a smoke detector in your fireplace." The EPA and NRC also, however, permit the disposal of ionizing smoke detectors as "ordinary trash." (6) It apparently hasn't occurred to them that some municipalities and counties unwisely send much of their waste to incinerators.

Until ionizing smoke detectors are outlawed (and replaced with photoelectric detectors), such "devices should be clearly labeled, tracked and returned to the manufacturer for ... proper handling [as] radioactive waste." (1)

(1) The Potential Hazard of Ionizing Radiation in Smoke Detectors - Rosalie Bertell - International Institute of Concern for Public Health 1/1/05
http://www.iicph.org/docs/radioactive_fire_detectors.htm

(2) The Deadliest Air Pollution Isn't Being Regulated or Even Measured - Peter Montague - Rachel's Democracy & Health News #915 7/12/07
<http://www.precaution.org/lib/07/ht070712.htm>

(3) Rosalie Bertell, Ph.D., GNSH
http://www.rosalieberzell.net/bio_rosalie_bertell.htm

(4) What Types of Radiation Are There? - Health Physics Society
<http://www.hps.org/publicinformation/ate/faqs/radiationtypes.html>

(5) Fissile Materials Health & Environmental Dangers - Institute for Energy and Environmental Research (and jointly with Physicians for Social Responsibility)
http://www.ieer.org/fctsheets/fm_hlth.html

(6) Americium: Radiation Protection - US EPA
<http://www.epa.gov/rpdweb00/radionuclides/ameridium.html>

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