



PERSISTENT ORGANIC POLLUTANTS (POPs) FACT SHEET SERIES

PBDEs

POLYBROMINATED DIPHENYL ETHERS

HIGHLIGHTS

- PBDEs are human-made chemicals used in flame-retardants. They do not occur naturally.
- Burning household goods releases PBDEs into the atmosphere.
- PBDEs accumulate in the food chain, biomagnify and are persistent.
- PBDEs have been found in Arctic mammals.
- Despite a European ban on PBDEs, in 1998 there were 40 times more PBDEs in the environment of Sweden than there had been in 1972.
- North American women have PBDE levels 40 times greater than concentrations found in Sweden.
- Canada banned the use of the most toxic PBDE compound (penta-PBDE) in 2005.
- Scientists warn environmental contamination by PBDEs is doubling every five years.
- PBDEs are monitored in the Yukon and are below Health Canada guidelines.

WHAT ARE PBDES?

Polybrominated Diphenyl Ethers (PBDEs) do not occur naturally. They are a human-made chemical used in flame-retardants. PBDEs are added to products like electronic devices, couches, foam padding in vehicles, and clothes. As flame-retardants, they help reduce the risk of death by fire by up to 45 percent.

PBDEs are now found throughout the environment in sewage, animals, fish, humans and food. PBDEs are fat-soluble and build up in the fatty tissues of both animals and humans from before birth until death. PBDEs cannot be dissolved in water, and tend to accumulate in sediments.

HOW DO PBDES ENTER THE ENVIRONMENT?

There are several theories about how PBDEs get into the environment. The primary release point is from manufacturing, when PBDEs are added or mixed into products. They are also released from landfills when sunlight and water break down discarded products containing PBDEs. Insects have been seen eating this material, which then travels up the food chain. High concentrations of PBDE and related compounds have been found everywhere, including in fish-eating birds and mammals, human blood and breast milk. This suggests that PBDEs accumulate in the environment and food chains by concentrating in living tissues and increase at each link in a food chain.

PBDEs are also considered airborne

pollutants, which can be released when household garbage is burned. Current tests show that levels in the Yukon at Little Fox Lake are low, similar to other parts of the Western Arctic and are well below Health Canada guidelines.

PBDEs are not manufactured in Canada but are imported in finished products. Canada is working with industry to minimize the impact of PBDEs on the environment. The substances that are likely of greatest concern are being phased out of use in Canada.

HOW TOXIC ARE PBDES?

PBDEs are considered toxic. Early testing done on PBDEs suggest that they are as toxic as other POPs, which have been banned since the mid-1960s. Levels of PBDEs are slowly increasing. Levels of all organic POPs, including PBDEs, are monitored in lake trout from Kusawa and Laberge lakes and are below Health Canada guidelines.

Although the acute toxicity of PBDE is low, there is concern for its long-term effects on the endocrine (glandular) system. The chemical structure of PBDE resembles a thyroid hormone and studies indicate that PBDEs could interfere with the metabolism and distribution of thyroid hormones in the body. The effects may include reduced learning capacity and hyperactive behaviour. This effect was observed when baby mice came into contact with very low doses of PBDEs.

Although human breast milk contains

PBDEs, scientists have determined that the benefits of breastfeeding outweigh the risks.

The most common exposure to PBDEs is through indoor air and not through food. PBDEs can be emitted from upholstery, carpets, fabrics, etc.

WHERE TO FIND MORE INFORMATION ON THE WEB:

● Health Canada

<http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/envIRON/pbde-edpb/index-eng.php>
http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/envIRON/pbde-edpb/pbde_fish-edpb_poisson-eng.php
<http://www.hc-sc.gc.ca/sr-sr/finance/tsri-irst/proj/persist-org/index-eng.php>

● Environment Canada

<http://www.chemicalsubstanceschimiques.gc.ca/fact-fait/pbde-eng.php>
http://www.ec.gc.ca/TOXICS/EN/detail.cfm?par_substanceID=201&par_actn=s1
http://www.ec.gc.ca/CEPARRegistry/documents/subs_list/PBDE_draft/PBDEfaq.cfm

● Indian and Northern Affairs Canada, Northern Contaminants Program

www.inac-ainc.gc.ca/ncp/index_e.html

● Arctic Borderlands Ecological Knowledge Society

www.taiga.net

● Government of Yukon, Environment

<http://www.environmentyukon.gov.yk.ca/monitoringenvironment/>

● Our Stolen Future

<http://www.ourstolenfuture.org/newscience/oncompounds/PBDE/whatarepbdes.htm>

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- Ikononou, Michael et al. "Congener patterns, spatial and temporal trends of polybrominated diphenyl ethers in biota samples from the Canadian west coast and the Northwest Territories," *Organohalogen Compounds*, 47 (2000), pp. 77-80.
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The Yukon Contaminants Committee co-ordinates the Northern Contaminants Program for the territory. Its members represent Canada, Yukon and the Council of Yukon First Nations, Yukon Conservation Society, and Yukon College.

Since its establishment in 1991, the Committee has acted as a link between the scientific community and Northerners on contaminants issues. Please direct any comments to the Yukon Contaminants Committee (867) 667-3283 or toll-free 1 (800) 661-0451, ext. 3283

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