

## **Q&A: Polybrominated Diphenyl Ethers (PBDEs) in the Great Lakes Basin: Reducing Risks to Human Health and the Environment, and Searching for Solutions to Key Challenges**

The IJC's Great Lakes Water Quality Board (WQB) is releasing a report, **Polybrominated Diphenyl Ethers (PBDEs) in the Great Lakes Basin: Searching for Solutions to Key Challenges**. This report is the second report on this topic; the first, an IJC report entitled, **Polybrominated Diphenyl Ethers (PBDEs) in the Great Lakes Basin: Reducing Risks to Human Health and the Environment**, originated from another report to the Commission prepared by the Great Lakes Water Quality Board. Both reports recommend a number of actions that governments can take to address PBDEs and other toxic flame retardants in the Great Lakes.

### **Questions and answers**

#### **1. What are PBDEs?**

- PBDEs are flame retardant chemicals. PBDE stands for **P**oly**B**rominated **D**iphenyl **E**ther. PBDEs are a group of 209 chemical compounds.

#### **2. How are PBDEs used?**

- PBDEs have been added to a wide range of commercial and consumer products, such as electronic devices, plastics, mattresses and carpets since the 1970s.
- PBDE use increased significantly in the 1980s as consumer products were increasingly treated with PBDE-based flame retardants.
- Examples of products containing PBDEs include:
  - Foam particles from furniture
  - plastic housings of electronic equipment
  - plastics in vehicle interiors
  - construction materials

#### **3. What are the health risks of PBDEs?**

- PBDEs are a risk to the environment and wildlife because they are persistent, toxic, and bioaccumulative, meaning they are stored in the tissues of living organisms.
- Adverse impacts on wildlife include increased mortality rates, malformations, and thyroid system and metabolic impairment.

#### **4. How did PBDEs end up in the Great Lakes?**

PBDEs enter the environment through several pathways:

- Surface and groundwater: Materials containing PBDEs may be discarded in landfill. Those materials break down over time and release their chemical compounds. Rain will transport those compounds into surface water or ground water. Industrial wastewater can also contain PBDEs.
- Sediments: Municipal sewage sludge left over from treated wastewater may contain PBDEs and, once discharged, may settle in sediments.
- Air: Materials may release PBDEs when they are processed or recycled. Materials may also release PBDEs during the day-to-day use of products containing them.

**5. Are all Great Lakes contaminated equally by PBDEs?**

- All five Great Lakes contain some level of PBDEs, but Erie and Ontario have the highest concentrations in water.
- Huron, Michigan and Superior are all relatively less contaminated.

**6. What have governments been doing about PBDEs?**

- The US and Canadian governments designated PBDEs as chemicals of mutual concern (CMCs) in May 2016 pursuant to Annex 3 of the 2012 Great Lakes Water Quality Agreement.
  - Annex 3 of the agreement commits the governments to protect human health and the environment through cooperative and coordinated measures.
- This sets in motion the development of a binational strategy, which may include research, monitoring, surveillance and pollution prevention and control provisions.

**Previously,**

- In the United States, federal initiatives and the prospect of regulation resulted in voluntary commitments from industry to phase out production and import of the principal PBDE mixtures.
- The Canadian government adopted regulations to restrict manufacture and import of a variety of PBDEs.
- Canada also ratified and implemented thresholds under the Stockholm Convention on Persistent Organic Pollutants.
  - This Convention requires prohibition and/or elimination of the production and use, as well as import and export, of the principal PBDE mixtures.

**7. Why has the IJC and its WQB issued these reports?**

- Since PBDEs are present in a range of consumer products and environmental media, the IJC and WQB believe that the governments need to take a comprehensive approach to reduce exposure by humans and other living organisms.
- A comprehensive approach is also needed to address other legacy persistent toxic substances that have a widespread presence in the Great Lakes basin ecosystem. The recommended strategy components presented in the IJC's report can be adapted to address other persistent toxic substances.

**8. What are IJC's recommendations?**

In its first report in November 2016, the IJC recommended that federal, state and provincial governments:

- Develop and implement a binational strategy to reduce PBDEs to the Great Lakes before the end of 2017;
- Apply equally effective restrictions on the manufacture, use and sale of PBDEs and PBDE containing products throughout the basin;
- Develop a plan for reducing and eliminating potential releases of PBDEs and other flame retardants in products during the recycling and disposal stages;
- Guide industry on methods to assess substitutes for PBDEs and encourage use of alternative non-chemical methods for addressing flammability; and
- Increase monitoring of PBDEs in the environment in order to assess the effectiveness of policies aimed at reducing their presence.

In this second report on PBDEs, the WQB address challenges in seeking alternatives to the use of PBDEs and other toxic chemicals as flame retardants, and explores the role of extended producer responsibility

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programs as a method to avoid the release of PBDEs during production, use, recycling and disposal. Recommendations in this report include:

- Governments at all levels should integrate product flammability and toxicity standards for flame retardants in products and redesign options to ensure protection from flammability and to protect the environment.
- The IJC should develop a multi-stakeholder-led trial run to complete this integration and that provides an effective example of a different style of regulatory development across the region.
- Public education is essential to expand consumer awareness of the presence of PBDEs in products, the issues with PBDE- containing products in use in their homes, and how they can reduce the associated risks.
- Governments and industry should complete research to increase understanding of the implications of different recycling and disposal methods for products containing PBDEs and other flame retardant chemicals used as a result of bans on PBDEs, such as organophosphate esters (OPEs), which are now found in elevated levels in the Great Lakes basin and are also classified as persistent organic pollutants.
- Industry should work with a full range of stakeholders, including governments, to develop an extended producer responsibility (EPR) program that creates proper recycling and disposal options for flame retardant-containing products. This could become a model for EPR programs for other toxics-containing products.

#### **9. What happens next?**

- IJC submits the WQB's report to the governments of Canada and United States.
- It is up to the governments to decide how to move forward on this issue.
- If asked, the IJC is willing to assist the governments with implementing the recommendations.