

Polybrominated Diphenyl Ether (PBDE) – A Growing Threat to Human Health and Wildlife

Willamette Riverkeeper and the Audubon Society of Portland – November 2008.

The Issue

Flame retardants are in many products, from clothing to household goods to help reduce their flammability. Furniture, curtains, computers, carpets and more frequently contain them. The main fire retardant mixed into our everyday products is Polybrominated Diphenyl Ether (PBDE). In recent years we have learned that PBDEs are known to accumulate in the environment and could have harmful effects on human health and wildlife.

PBDEs leach out of the items to which they were added and enter the air, land, and water. Today we know that:

- Recent studies by the U.S. Geological Survey (USGS) are showing increases in PBDEs, as opposed to some other traditional toxics which are declining in prevalence – such as PCBs.
- PBDEs have been shown in animals to cause thyroid hormone disruption and to interfere with developing reproductive and nervous systems.
- PBDEs closely mimic how PCBs behave, specifically how they bioaccumulate.
- Because of the high volume of consumer products in the United States, the US has the highest recorded levels of PBDEs in the environment.
- The flame retardant industry phased out the manufacture of the octaBDE and pentaBDE, the worst known forms, though many products still exist that contain these.
- DecaBDE is still in widespread use, which is a significant issue because the deca form breaks down into the other more harmful forms.

New Data and Heightened Concern

In the past few years there has been a growing concern about heightened levels of PBDE in the environment. From breast milk to Osprey eggs, PBDEs are being seen in many places. PBDEs are listed by the US EPA as a potential carcinogen.

In wildlife PBDEs are being seen increasingly, especially in birds of prey such as Osprey and Peregrine Falcon. A study published in 2008 by the State of California found high levels of PBDE in Peregrines. The fear is that heightened levels of PBDEs in bird eggs will result in decreases in reproductive rates. Historically similar concerns have been voiced, hearkening back to the impact of PCBs.

A recent study conducted by NOAA Fisheries in Oregon and Washington found concentrations of PBDE in juvenile salmon. Studies in 2002 and 2004 found PBDE in osprey eggs in the lower Columbia River. Given the amount of fish that osprey consume, PDBE accumulates in their tissue – the act of bioaccumulation – causing potential harm to their eggs.

Other States Take Action

Because of the very real risk that PBDEs create, in the past few years Maine, and Washington have taken state action to reduce the presence and potential threat of decaBDE .

Maine: Bans use of decaBDE in furniture and mattresses effective as of January, 2008 and use of decaBDE in electronics to take effect in 2010

Washington: In 2007 the State of Washington banned the use of decaBDE in mattresses and other products. The Washington law prohibits the manufacture, sale, or distribution of most products containing polybrominated diphenyl ethers (PBDEs) after January 1, 2008. It also directs the Department of Ecology and the Department of Health to report to the Legislature regarding the availability of alternatives to the use of decaBDE. In November of 2008, the State of Washington issued its first report on safe alternatives to deca-BDE.

Multiple other states are considering state laws to phase out the use of this chemical.

Oregon Should Take Action

One of the critical issues with PBDEs is that today we understand the impact that DDT, and PCBs had on the natural world, but did that knowledge give us enough wisdom to get ahead of potential emerging issues? Because we understand the growing pervasiveness of PBDEs in the environment, and their chemical structure, there is a very real concern about their potential impact on osprey and other wildlife. Can we take steps to prevent a significant negative outcome from increased levels of PBDEs in the environment today? In Oregon, the answer should be yes.

For more information contact Travis Williams at 503-223-6418, or Bob Sallinger at 503-292-6855.

For background information, check out these links:

Washington State Report - <http://www.ecy.wa.gov/pubs/0807062.pdf>

Oregon Department of Human Services Webpage -
<http://www.oregon.gov/DHS/ph/envtox/pbde.shtml>

ATSDR Fact Sheet - <http://www.atsdr.cdc.gov/toxprofiles/phs68-pbde.html>

US EPA PBDE Site - <http://www.epa.gov/oppt/pbde/>

Facts from Our Stolen Future -
<http://www.ourstolenfuture.org/newscience/oncompounds/PBDE/whatarepbdes.htm>

Washington State Law -
<http://www.ecy.wa.gov/programs/swfa/pbt/pbdeLAW.html>