



## PCBs and Maryland's Waters

### What You Need to Know

#### What are PCBs?

Polychlorinated biphenyls, or PCBs, are a class of synthetic compounds that were widely used in commercial and industrial applications between the 1920s and 1970s. They do not burn readily, do not easily dissolve in water, and are good electrical insulators. Because of their physical and chemical properties, PCBs have been used as coolants, lubricants, heat transfer fluids, flame retardants, hydraulic fluids, and dielectric fluids. Although their manufacture was banned in the US in 1979, their resistance to environmental degradation means that they are still ubiquitous in both terrestrial and aquatic environments. PCBs are a probable human carcinogen, and while their concentration in the environment tends to be low, they bioaccumulate in aquatic organisms, meaning that they can pose a risk to human health through the consumption of fish. Other common names for PCBs include: Aroclor, Pyranol, Interteen, and Hyvol.

#### WHAT ARE SOURCES OF PCBs?

Despite their manufacturing ban, PCBs are widely dispersed throughout the environment. They can be found in the water, the soil, the air, and in fluvial and marine sediments. PCBs may be immobilized in the soil and sediment, but these media can also act as a source of PCBs to the water and air.

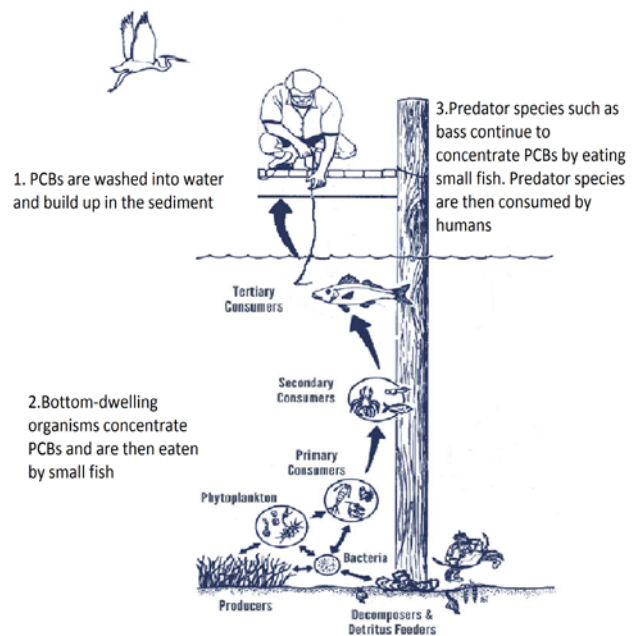
PCBs can also enter the environment as a result of:

- Fires, leaks and accidental spills from old equipment containing PCBs, such as: transformers, capacitors etc.
- Leaks from hazardous waste sites
- Illegal or improper dumping of PCB containing equipment

#### NATURAL ATTENUATION & IMMOBILIZATION

Since PCBs are no longer manufactured in the U.S., the amount of PCBs in the environment will decrease naturally over time, a process that is referred to as natural attenuation. Natural attenuation of PCBs can occur when PCB contaminated sediments are buried with non-contaminated materials or through natural breakdown, or biodegradation. PCBs are considered a persistent organic pollutant, meaning that the breakdown would occur very slowly.

#### HOW DO PCBs MOVE THROUGH THE FOOD CHAIN?



#### Eat Fish, Eat Smart

Fish can be an important part of healthy diet. They are a good source of high-quality protein and nutrients and are low in saturated fat. MDE provides [an assortment of information](#) on its [website](#) to teach about the safe consumption of fish. This includes waterbody-specific [Fish Consumption Guidelines](#) that are regularly issued by MDE, and a terrific video, "[Eat Fish, Eat Smart](#)" showing the best way to fillet a fish, in order to minimize PCB exposure.

## Why are PCBs a Problem?

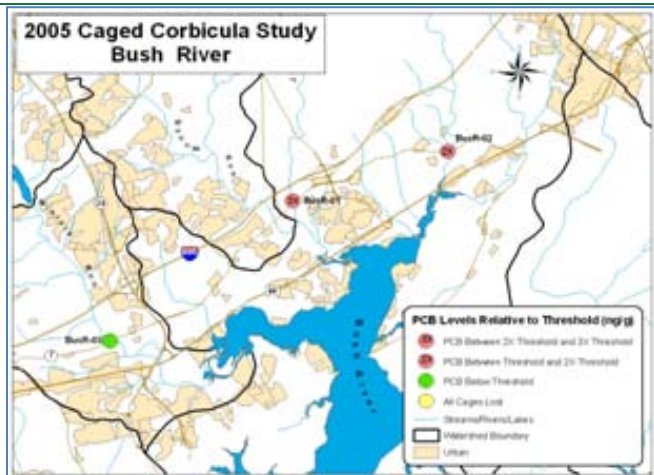
**They are toxic ...** PCBs are reasonably anticipated to be a human carcinogen and are known to have adverse effects on the immune, reproductive, endocrine and neurological systems.

**They persist in the environment ...** PCBs do not occur naturally in the environment and do not readily break down. They are very stable chemical compounds; therefore, once in the environment, PCBs linger for long periods of time.

**They can bioaccumulate ...** Because PCBs do not easily degrade and readily bind to organic material, they have the ability to build up or bioaccumulate in the fatty tissue of fish and other animals. Human consumption of PCB contaminated fish is a significant source of exposure. Large predatory fish, like largemouth bass and walleye, and bottom feeding fish, like catfish and carp, are most likely to have elevated levels of PCBs in their tissue.

Additional information can be found at the Agency for Toxic Substances & Disease Registry's [Toxic Substances Portal](#).

## Programs in Maryland to Address PCBs



### Tracking PCBs in the Aquatic Environment

To locate sources of PCBs and to determine if PCBs will be found in fish and other animal tissue, the Environmental Assessment and Standards Program at MDE conducts tracking studies using clams as a study organism. Clams make good study organisms because they filter sediment from the water column, where PCBs are typically found. The clams are deployed for 30 days and retrieved, and then the clam tissue is tested for the presence of total PCBs. These studies have been carried out in waterbodies across the state, including the Anacostia River, Back River and Bush River. Sites are selected where significant PCB sources are anticipated in the watershed.

### Total Maximum Daily Load (TMDL) Program

A PCB TMDL is the calculation of the maximum amount of PCBs a water body can receive while still meeting water quality standards. The purpose of a PCB TMDL is to ensure that PCB levels in a given waterbody will be reduced to the point where eating fish from that waterbody will be safe. A PCB TMDL should result in acceptable PCB concentrations that do not negatively affect human health or other living resources. Under a PCB TMDL, Allocations are assigned to PCB source categories limiting PCB discharges.

In Maryland, PCB concentrations should not exceed 39 ng/g in fish tissue and should not exceed 0.64 ng/L in the water column.

[25 PCB TMDLs](#) have been calculated and submitted to the EPA for approval as of 2014. The first MD PCB TMDL, the [Tidal Potomac and Anacostia PCB TMDL](#), was approved by the EPA in 2007.

### [Land Restoration Program \(LRP\):](#)

Under the MDE's LRP, the following programs address sites that are or may be contaminated with PCBs and other hazardous waste:

- The **Site Assessment Program** assesses potential hazardous waste sites to determine the next step of action. The LRP website provides a [fact sheet](#) for each project site.
- The [Voluntary Cleanup Program](#) and the [Controlled Hazardous Substances Program](#) work cooperatively with EPA to remediate PCB contaminated sites.

### [Stormwater MS4 Program:](#)

Municipal Separate Stormwater Systems (MS4s) must develop strategies for achieving their PCB TMDL allocations. MDE provides [guidance](#) for actions that can be taken to address PCB sources.

## PCBs & The Chesapeake Bay Agreement

In June 2014, [The Chesapeake Bay Watershed Agreement](#) was signed by representatives from the entire Chesapeake Bay watershed including states as far north as New York and as far west as West Virginia. The overarching aim of the agreement is to promote an environmentally and economically sustainable Chesapeake Bay.

**Toxic Contaminant Goal:** To ensure that the Bay watershed is free of toxic contaminants such as PCBs, that can negatively affect human health and living resources.