August 2007

Reducing Mercury in the Environment

Reducing mercury in the environment is one of the Virginia Department of Environmental Quality's highest priorities. To accomplish this, DEQ is working to gain a better understanding of mercury sources and the extent of contamination, reduce mercury and its use, and more effectively address mercury-related issues. As this work progresses, DEQ remains dedicated to ensuring that people's exposure to mercury is as low as possible.

Mercury and human exposure

Mercury is a naturally occurring metal that is released to the environment from some manufacturing and industrial activities. Once mercury is deposited in streams, rivers, lakes or wetlands, natural biological processes can convert it into a toxin called methylmercury. Fish become contaminated with methylmercury when they are exposed to it from water and sediment and eat other organisms that contain the toxin. Eating contaminated fish is the primary way people are exposed to mercury. DEQ and the Virginia Department of Health work together to ensure that elevated mercury levels detected by DEQ result in fish consumption advisories issued by the health department. The advisories are available on the VDH website and are posted at public access points to streams, rivers and lakes.

Monitoring contaminated waters

As part of DEQ's fish tissue and sediment monitoring program, the agency takes samples at 80 to 100 sites every year in streams, rivers and lakes, generally covering the entire state every five years. The fish tissue and sediment samples are tested for a variety of pollutants, including mercury.

Rivers contaminated by industrial incidents

The North Fork of the Holston River in southwest Virginia and the South River and the South Fork Shenandoah River in the Shenandoah Valley have elevated levels of mercury, caused by two industrial pollution incidents. DEQ, in partnership with the South River Science Team, regularly takes samples of water, fish tissue and sediments in the South River and the South Fork Shenandoah River with money from a trust fund established by Du Pont Co. Mercury was used by Du Pont in fiber production between 1929 and 1950. Mercury contamination in the South River was discovered in the 1970s and now extends to the South Fork Shenandoah River. The North Fork of the Holston River became contaminated with mercury from the Olin Corp.'s Saltville facility. Olin has been addressing contamination in the river with assistance from the U.S. Environmental Protection Agency and DEQ since the 1980s.

DEQ biologists collect fish tissue and sediment samples in the Blackwater River in eastern Virginia to investigate mercury contamination.

Mercury-sensitive waters

In recent years, states from Florida to Maryland and from the Great Lakes to New England have discovered elevated levels of mercury in fish from waters that do not have any direct mercury sources. These findings prompted DEQ to conduct additional monitoring in waters without significant, known sources of mercury pollution in eastern Virginia.

DEQ has found that fish in at least 11 waters in eastern Virginia are contaminated with mercury. Sampling results triggered fish consumption advisories in the Great Dismal Swamp Canal (including Lake Drummond), portions of the Blackwater River and Dragon Run Swamp, and eight other rivers and small lakes. These waters appear to be mercury-sensitive, meaning that they are more likely than other waters to have natural conditions that are favorable for the conversion of mercury into methylmercury. The waters share three characteristics: low levels of oxygen, high amounts of organic matter and low pH, which indicates that they are acidic. These traits are common of swamps, streams and rivers in Virginia's coastal areas.

Other waters

Some bodies of water in central and western Virginia contain fish with elevated levels of mercury. The source of mercury for these waters is unknown.

DEQ
Virginia Department of Environmental Quality

629 East Main Street ~ Richmond, Virginia 23219
804-698-4000 ~ (toll-free in Virginia) 800-592-5482
www.deq.virginia.gov

Efforts to study and reduce mercury

DEQ has identified the waters that are contaminated with mercury as having "impaired" water quality. These waters are included in what is commonly known as the impaired waters list that is submitted to EPA. DEQ develops pollution limits, called total maximum daily loads or TMDLs, and cleanup plans for impaired waters. TMDLs, once they are completed for waters with elevated mercury levels, will form the basis for future restoration efforts of these rivers.

In an effort to gain perspective from public partners about mercury-sensitive waters in eastern Virginia, DEQ formed the Mercury Advisory Committee. Representatives from DEQ, other government agencies, industry and academia participate. DEQ seeks advice from the committee on locations for additional investigations in Virginia's coastal waters.

DEQ also assembled a committee of air, water, waste and pollution prevention experts in 2006 to develop a strategy on how the agency should address mercury in the environment. The committee is working on a way to integrate DEQ's efforts for a unified approach to reducing mercury contamination.

Recent legislation

The reduction of mercury in the environment is also being addressed through recent legislative and regulatory changes.

- The 2006 Virginia General Assembly passed legislation to reduce mercury from coal-fired power plants and required DEQ to begin a study on whether additional steps should be taken in Virginia to control mercury emissions. In 2007, the agency began a detailed assessment on the effects of mercury in air emissions. It includes studies on the risk to human health from eating fish contaminated with mercury, how the metal is deposited from air emissions and costs associated with pollution controls. From these studies, DEQ plans to evaluate the effectiveness of regulations that limit mercury emissions and how these emissions may affect Virginia's environment, especially its rivers, lakes and estuaries. The final report is due to the House of Delegates and Senate natural resource committees by October 2008.

- The Air Pollution Control Board began developing regulations to address mercury emissions in 2005 and is considering adopting regulations to implement the legislation affecting coal-powered power plants.

- Separate legislation was also passed to reduce mercury in the steel manufacturing process by requiring the removal and recycling of mercury in automobile convenience light switches, commonly found under the hoods and trunks of cars with model year 2002 and older. If the switches are not removed, mercury is released into the air during the steel recycling process. DEQ is working in partnership with the Virginia Automobile Recyclers Association to remove mercury-containing switches from automobiles during the dismantling process.

Preventing mercury's use in businesses

One of the best ways to reduce mercury is to prevent its use in businesses. DEQ promotes and coordinates voluntary efforts across the state to reduce or eliminate the use of mercury. The agency works with partners to support efforts that reduce mercury in office buildings and health care facilities, and in the past few years, DEQ has partnered with the Virginia Dental Association, VDH and EPA on a series of mercury reduction projects.

Online Resources

Virginia DEQ website

Power Plant Emissions
www.deq.virginia.gov/air/sab/mercury.html

Mercury Advisory Committee
www.deq.virginia.gov/fishtissue/hgcommittee.html

Virginia Mercury Study
http://www.deq.virginia.gov/air/vamercury/vamercurystudy.html

Mercury Switch Program
www.deq.virginia.gov/waste/mercuryswitch.html

Pollution Prevention
www.deq.virginia.gov/p2/mercury/homepage.html

South River Science Team
www.deq.virginia.gov/fishtissue/mercury.html

Virginia Department of Health website

Fish consumption advisories
www.vdh.virginia.gov