

## **PHARMACEUTICALS AND PERSON CARE PRODUCTS**

### **ENVIRONMENTAL HEALTH ISSUE PROFILE**

Community Action for a Renewed Environment (CARE)  
Environmental Sustainability for the Salina Community

**Issue:** Pharmaceuticals and chemicals in personal care products are being detected in local rivers and streams that are sources for drinking water.

**Background:** Pharmaceuticals refer to prescription and non-prescription over-the-counter therapeutic drugs and veterinary drugs. Personal care products refer to products used for personal and cosmetic reasons such as insect repellents, soaps, fragrances, cosmetics, sun-screen products, and vitamins. When discussing this issue, the U.S. EPA combines pharmaceuticals and personal care products or PPCPs.

Reasons for concern:

- Large quantities of PPCPs enter the environment daily. PPCPs are added to city sanitary sewers through excretion, bathing, and flushing. In the U.S., tons of unused pharmaceuticals are flushed down the drain annually by hospitals, long-term care facilities, veterinary clinics, residential homes, and prisons. Although this process is legal and was formally encouraged, typical wastewater treatment facilities are not designed to treat or remove pharmaceuticals before the water is discharged to local receiving waters.
- Sewage systems are not equipped for PPCP removal. Wastewater treatment plants are biological processes designed to treat domestic human waste and are typically not engineered to treat or remove PPCP chemicals. PPCP chemicals will pass through the treatment plant and enter the receiving stream aquatic environment, which are often the source of drinking water for communities downstream.
- The risks are uncertain. To date, no evidence has been found of human health effects from PPCPs in the environment. However, potential impacts from some of these chemicals to aquatic organisms at low concentrations include—
  - persistence in the environment – bioaccumulation
  - chronic toxicity
  - endocrine disruption
- The number of PPCPs is growing. More than 100 individual PPCPs have been identified (as of 2007) in environmental samples and drinking water.

U.S. Geological Survey (USGS) used five newly developed analytical methods to measure concentrations of 95 organic wastewater contaminants (OWCs) in water samples from a network of 139 streams across 30 states during 1999 and 2000. OWCs were found in 80% of the streams sampled. In another study, USGS found small-mouth bass in the Shenandoah River with an intersex condition (an hermaphroditic condition where male bass have testicular oocytes which are female reproductive cells), a condition that has been linked to lowered sperm production, trouble reproducing, and other negative health consequences. Researchers believe the condition may be caused by endocrine-disrupting compounds, including natural and synthetic estrogens.

EPA's four-pronged approach for PPCPs in water is aimed at strengthening scientific knowledge, improving public understanding, building partnerships for stewardship, and taking regulatory action when appropriate.

### **Standards:**

The federal government (EPA) doesn't require testing for PPCP-type chemicals in wastewater discharge or water supply intake. Maximum contaminant levels exist for constituents regulated by the Safe Drinking Water Act, which do not include PPCP-type of chemicals. The city of Salina reports annually to the public the concentrations of constituents detected in treated water compared to the regulated standards.

In October 2009, the Office of National Drug Control Policy issued guidelines for the proper disposal of prescription drugs. This is available on the Web at [www.whitehousedrugpolicy.gov/publications/pdf/prescrip\\_disposal.pdf](http://www.whitehousedrugpolicy.gov/publications/pdf/prescrip_disposal.pdf). It discourages the flushing of prescription drugs to the sewer unless the label specifically gives instructions to do so (the risk of certain drugs to children or pets were deemed more than the risk of adding these relatively few drugs to the sewage system). The guidelines encourage use of community take-back programs or other collection events. It suggests a method for preparing the drugs for trash disposal, if collection programs aren't available.

### **Community-Specific Indicators:**

**What does the data say?** Testing for pharmaceuticals in the drinking water supply or treated wastewater has not been conducted. The city of Salina is in compliance with testing for regulated constituents.

**Who is affected?** Potentially the entire community and aquatic organisms in receiving streams could be affected—in addition to all the communities downstream that use surface water for their drinking water supplies (Topeka).

**How is the community affected?** Currently, little is known as to the impact of discharging trace chemicals from PPCPs to the general population or the environment. It is known that in other communities, the feminization of male fish has occurred in surface waters where pharmaceuticals (endocrine disruptors) have been detected.

**What are the contributing factors and behaviors of the community?** PPCPs are added to sewers through excretion, bathing, and flushing. It is unknown how many residents and businesses practice the flushing of pharmaceuticals, but it is believed that this occurs because it has been the standard method for disposing of drugs.

**How does the community protect itself?** At this time, the best solution is preventing drugs from entering the wastewater stream. The Saline County Sheriff's Office has a pharmaceutical collection program.

### **Data Sources:**

#### **Where did the data come from?**

U.S. Environmental Protection Agency – <http://www.epa.gov/ppcp/>

Kansas Dept of Health and Environment – <http://www.kdheks.gov/waste/guidance/sw07-01.pdf>

Kansas Board of Pharmacy – <http://www.kansas.gov/pharmacy/faq.html>

USGS – <http://ks.water.usgs.gov/pubs/abstracts/emt.est.v36.html>

#### **Age of data?**

1-10 years old

#### **Additional data needed?**

Possibly conduct tests for presence of pharmaceuticals in city of Salina's drinking water supply and wastewater discharge.

*Paper prepared by Barb Johnson and Mike and Carol White, January 2010.*