

MONITORING FOR EMERGING CONTAMINANTS IN PENNSYLVANIA WATERS

Andrew G. Reif, U.S. Geological Survey, Exton, Pennsylvania
J. Kent Crawford, U.S. Geological Survey, New Cumberland, Pennsylvania
Vicki S. Blazer, U.S. Geological Survey, Kearneysville, West Virginia

Primary Contact: Andrew G. Reif, U.S. Geological Survey, Eagleview Corporate Center, 770
Pennsylvania Drive, Suite 116, Exton, Pennsylvania 19341

ABSTRACT

In 2006, the U.S. Geological Survey, in cooperation with the Pennsylvania Department of Environmental Protection, conducted a survey of pharmaceutical compounds and antibiotics in surface waters and ground waters in south central Pennsylvania. Samples were collected from six wells in agricultural areas, from six streams upstream and downstream from agricultural operations, and from five other streams upstream and downstream from wastewater treatment plants. Almost none of the target compounds were detected in ground water. Only a few pharmaceuticals and antibiotics were measured in surface waters draining primarily agricultural areas. Likewise, few of these compounds were measured in surface waters upstream from wastewater treatment facilities. However, several pharmaceuticals and antibiotics were measured in streams downstream from wastewater treatment plants. The most frequently-detected pharmaceutical compound was carbamazepine; the most frequently-detected antibiotic was sulfamethoxazole.

In 2007, the work has been re-directed and expanded. For 2007, the list of target compounds includes pharmaceuticals, antibiotics, hormones and wastewater compounds and analysis of these emerging contaminants in streambed sediments has been added. The station list has been reduced to nine surface water sites downstream from wastewater treatment facilities, but an additional 27 sampling stations that are all part of Pennsylvania's Water Quality Network have been added. Finally, for 15 of the sampling stations, a fish-health component has been added to measure associations between fish health (reproductive issues, abnormalities, length-weight relations) and occurrence of measured emerging contaminants.

KEYWORDS

Emerging contaminants, pharmaceuticals, antibiotics, hormones, wastewater compounds, intersex fish, fish health, Pennsylvania streams, monitoring. sediment chemistry, water chemistry.