



science in ACTION

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

EPA and USGS scientists conduct study to determine prevalence of newly-emerging contaminants in treated and untreated drinking water

Scientists from the U.S. Environmental Protection Agency (EPA) and U.S. Geological Survey (USGS) are collaborating on a research study to determine the presence of contaminants of emerging concern in treated and untreated drinking water collected from 25 drinking water treatment plants from across the United States.

Sampling took place between 2010 and 2012. Study results are expected to be published in peer-reviewed scientific journals in 2015.

Treatment plants chosen for this study receive waters impacted by a variety of waste sources including municipal waste, septic systems and livestock production.

The contaminants being examined currently are not regulated in drinking water by EPA and little is known about their prevalence. Samples are being analyzed for 247 chemical and microbiological constituents, including a wide range of chemicals used in homes, businesses and industries.

Improvements in analytical chemistry instrumentation now allow scientists to measure very low amounts of contaminants. The samples are being analyzed for:

- 111 prescription and nonprescription pharmaceuticals and their metabolites
- 40 metallic and nonmetallic trace elements
- 17 perfluorinated compounds
- 10 industrial chemicals
- 10 fragrances
- 9 polycyclic aromatic hydrocarbons

- 9 hormones
- 8 pesticides
- 7 detergent-related chemicals
- 5 household chemicals
- 5 viruses
- 4 bacteria
- 4 plant and animal sterols
- 3 phosphorous-based flame retardants
- 3 fungi
- 2 protozoa

High quality drinking water depends on the condition of the source water from which it is drawn and the treatment it receives before being consumed. In the United States, water from rivers, streams, lakes, reservoirs and aquifers is treated to make it safe to drink. A possible source of contaminants in drinking water may be treated wastewater, which is commonly discharged into surface water and ground water aquifers by wastewater treatment plants.

Although wastewater treatment is designed to remove pathogens and solid materials, low levels of contaminants may remain in the water after wastewater treatment. Natural processes including vaporization, dilution, decomposition, and reactions to sunlight act to decrease the concentration of contaminants in the water prior to its treatment in drinking water facilities.

Water drawn from some sources, however, may have a higher potential for contaminants to be present in finished drinking water. This may be particularly true if a drinking water treatment plant is located:

- Downstream from a wastewater facility;
- In an area with a high density of household septic treatment systems; or
- In an area of intense livestock production.

Study results are expected to provide important baseline information on the presence of contaminants in treated and untreated drinking water. The dataset is also expected to provide qualitative information on the efficacy of differing drinking water treatment technology in removing these contaminants. Research results will provide scientific data to inform the next generation of EPA drinking water safety standards.

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