

The Occurrence and Fate of Pharmaceuticals, Personal Care Products and Endocrine Disrupting Compounds in a Municipal Water Use Cycle:

A Case Study in the Cities of Ann Arbor, Grand Rapids, and Monroe

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Abstract

In 2005 a characterization of the occurrence and fate of a 22 compound target list of pharmaceuticals, personal care products and endocrine disrupting compounds (PPCPs and EDCs) was performed at various locations within the City of Ann Arbor's (Ann Arbor), City of Grand Rapids (Grand Rapids), and City of Monroe (Monroe) water use cycle. Monitoring occurred at four locations within the Ann Arbor and Grand Rapids water use cycle:

- Surface/source water
- Drinking water
- Wastewater influent
- Wastewater effluent

Monitoring occurred at two locations within the Monroe water use cycle:

- Surface/source water
- Drinking water

Laboratory analysis indicated the following number of target compounds identified in grab samples collected from Ann Arbor, Grand Rapids, and Monroe monitoring stations over the four sampling events:

- 18 of 22 compounds detected in source water
- 10 of 22 compounds detected in finished drinking water
- 21 of 22 compounds detected in wastewater influent
- 20 of 22 compounds detected in treated wastewater effluent

Results of this study indicate a reduction in the concentrations of certain compounds based on samples collected before and after source water and wastewater treatment processes. Data indicates some variability in the removal of PPCPs and EDCs in water and wastewater systems depending on the treatment process. Additionally, characterization of occurrence and concentration of analytes in source water supplies is similar in the three Michigan communities.
