

# **Guidelines for Water Reuse**

## **U.S. Environmental Protection Agency**

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## Foreword

In an effort to help meet growing demands being placed on available water supplies, many communities throughout the U.S. and the world are turning to water reclamation and reuse. Water reclamation and reuse offer an effective means of conserving our limited high-quality freshwater supplies while helping to meet the ever growing demands for water.

For many years, effluent discharges have been accepted as an important source for maintaining minimum stream flows. The investment in treatment technologies required to meet restrictive discharge limits has led an increasing number of industries and communities to consider other uses for their treated wastewater effluents as a means to recover at least a part of this investment. Further, as sources of water supplies have become limited, there has been greater use and acceptance of reclaimed wastewater effluents as an alternative source of water for a wide variety of applications, including landscape and agricultural irrigation, toilet and urinal flushing, industrial processing, power plant cooling, wetland habitat creation, restoration and maintenance, and groundwater recharge. In some areas of the country, water reuse and dual water systems with purple pipe for distribution of reclaimed water have become fully integrated into local water supplies.

The *2004 Guidelines for Water Reuse* examines opportunities for substituting reclaimed water for potable water supplies where potable water quality is not required. It presents and summarizes recommended water reuse guidelines, along with supporting information, as guidance for the benefit of the water and wastewater utilities and regulatory agencies, particularly in the U.S. The document updates the *1992 Guidelines* document by incorporating information on water reuse that has been developed since the 1992 document was issued. This revised edition also expands coverage of water reuse issues and practices in other countries. It includes many new and updated case studies, expanded coverage of indirect potable reuse and industrial reuse issues, new

information on treatment and disinfection technologies, emerging chemicals and pathogens of concern, economics, user rates and funding alternatives, public involvement and acceptance (both successes and failures), research activities and results, and sources of further information. It also includes as an updated matrix of state regulations and guidelines, and a list of state contacts. This information should be useful to states in developing water reuse standards, and revising or expanding existing regulations. It should also be useful to planners, consulting engineers and others actively involved in the evaluation, planning, design, operation or maintenance of water reclamation and reuse facilities.

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## Acknowledgements

The *Guidelines for Water Reuse* debuted in 1980 and was updated in 1992. Since then, water reuse practices have continued to develop and evolve. This edition of the Guidelines offers new information and greater detail about a wide range of reuse applications and introduces new health considerations and treatment technologies supporting water reuse operations. It includes an updated inventory of state reuse regulations and an expanded coverage of water reuse practices in countries outside of the U. S. Dozens of reuse experts contributed text and case studies to highlight how reuse applications can and do work in the real world.

The 2004 *Guidelines for Water Reuse* document was built upon information generated by the substantial research and development efforts and extensive demonstration projects on water reuse practices throughout the world, ranging from potable reuse to wetlands treatment. Some of the most useful sources drawn upon in developing this update include: proceedings from American Water Works Association/Water Environment Federal (AWWA/WEF) Water Reuse conferences, WEF national conferences, and WaterReuse conferences; selected articles from WEF and AWWA journals; materials provided by the *Guidelines* review committee; and a series of WERF reports on water reclamation and related subjects published by the National Research Council/National Academy of Sciences, WEF/AWWA.

Please note that the statutes and regulations described in this document may contain legally binding requirements. The summaries of those laws provided here, as well as the approaches suggested in this document, do not substitute for those statutes or regulations, nor are these guidelines themselves any kind of regulation. This document is intended to be solely informational and does not impose legally-binding requirements on EPA, States, local or tribal governments, or members of the public. Any EPA decisions regarding a particular water reuse project will be made based on the applicable statutes and regulations. EPA will continue to review and update these guidelines as necessary and appropriate.

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