

How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

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Best Practices Support Sustainable Water Systems

Preparing water systems to operate sustainably helps utilities optimize processes in terms of the triple bottom line: environmental impact, social aspects, and economics. The tools and practices presented here can

be used to enhance a utility's performance regarding these three factors. When combined, these tools and practices support overarching sustainability principles and maximize triple bottom line benefits.

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WATER
TREATMENT
PLANT

WATER TABLE

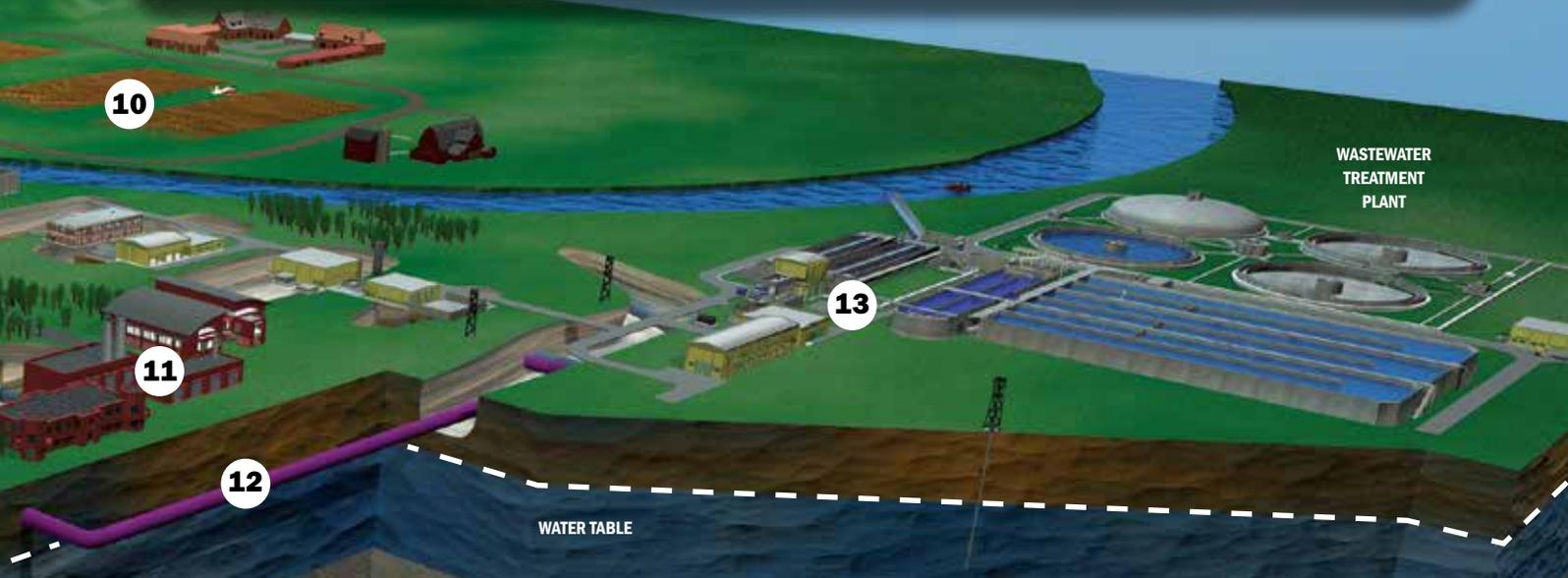
Editor's Note: To see more images in the *How Water Works* series, visit AWWA's *How Water Works* Resource Community (www.awwa.org/howwaterworks). Also, an interactive CD, posters and related products can be purchased from the AWWA Store (www.awwa.org/store).

SOME ILLUSTRATION ELEMENTS EXAGGERATED FOR EMPHASIS.

PIPELINE KEY

 UNTREATED WATER	 WASTEWATER
 TREATED WATER	 RECLAIMED WATER

1. Proper **emergency planning and demand forecasting** enable utilities to be less vulnerable to effects of extreme weather events and more resilient when recovering from weather events, with fewer service disruptions and minimal societal impact.
2. **Integrated water resources management** allows a utility to cultivate a diverse supply portfolio, arranging diversified water sources vital to meeting future water demands, ensuring public health, and providing economic and environmental sustainability.
3. **Asset management** is essential for water infrastructure sustainability when assets near the end of their useful life, approaching a need for replacement. Proper asset management keeps utilities informed of the functioning status of their assets, leading to fewer “surprise” replacements.
4. Third-party **rating systems** provide a sustainability-focused framework for evaluating projects from planning stages through operations and maintenance.
5. **Water loss control** represents utility accountability efforts regarding operations, employing auditing of water supplies and implementing controls to minimize system losses and optimize supply efficiency. Reducing losses results in financial gains and efficient water use.
6. **Stakeholder engagement** is critical to any project; public meetings, surveys, and other tools are most effective when there is two-way communication. Stakeholders are heard, and their feedback furthers sustainable project improvements.
7. Conducting a **cost-benefit analysis** demonstrates a utility's sustainable return on investments and can help determine appropriate rates.



8. **Water conservation** involves long-term improvements in water use efficiency and is critical to ensuring an adequate water supply today and for future generations. Water conservation efforts can have a large effect when conducted through commercial, industrial, and institutional sectors.
9. **Green infrastructure**, such as bioswales or permeable pavers, cost-effectively manages stormwater and improves water quality before the water reaches a treatment facility. City parks are a great way to incorporate this type of infrastructure while creating a community amenity.
10. **Source water protection** encompasses protecting drinking water sources from contamination and pollution, such as from agricultural runoff, and is key to sustaining safe and reliable drinking water supplies. Protecting source water results in financial savings during treatment processes and benefits the environment.
11. **Energy efficiency** is critical to high-energy-intensive functions of utility operation and maintenance. Energy efficiency benefits the environment and can help shift system operating costs away from energy bills to more sustainable solutions.
12. **Water reuse** is a viable approach to address existing and anticipated water shortages. Used water from homes and businesses is highly treated to be reused to augment and sustain a community's available water supply.
13. **Effective utility management (EUM)** is a process for water and wastewater utilities to identify and address their management needs. EUM is based on systems that promote activities for making water-sector utilities more sustainable, helping to ensure the sustainability of the communities they serve.