PROFILES IN REUSE:
Onsite Reuse

WATEREUSE

The amount of water on Earth does not change—all water has been recycled naturally since the beginning of time.

While nearly 70 percent of the planet is covered by water, only two and a half percent is freshwater, and only one percent is accessible. Water reuse, also known as water recycling, is the process of intentionally capturing wastewater, stormwater, saltwater, or graywater and cleaning it for a designated beneficial freshwater purpose such as drinking, industrial processes, surface or ground water replenishment, and environmental restoration.

WATER QUALITY

Most of the water in our buildings is not used for human consumption. A fit-for-purpose treatment approach enables water to be cleaned to the level required for a specific use, avoiding costly over treatment. Onsite reuse can produce water that is safe and functional for its intended use such as toilet flushing or industrial processes. For onsite reuse, recycled water is treated based on stringent state and local recycled water regulations to protect public health.

WHAT IS ONSITE WATER REUSE?

Onsite water reuse is the process of collecting, treating, and reusing alternative water sources within a building or across multiple buildings for non-potable applications such as toilet flushing, irrigation, cooling towers, and industrial processes. Alternative water sources include graywater, blackwater, rainwater, stormwater, and foundation drainage.

BENEFITS OF ONSITE REUSE

Onsite water reuse systems represent a significant opportunity to transform the way water is managed. Onsite water reuse can provide water security for businesses, improve water access for underserved communities, and serve as a central component of climate-resilient infrastructure. The benefits of onsite water reuse include:

WATER SUPPLY
Onsite systems provide additional water supply and offset demands on valuable potable water supplies, important during periods of drought.

RESILIENCE
Onsite systems can manage stormwater, treat wastewater, and supply water for building occupants during natural disasters such as floods and earthquakes.

EFFICIENCY
Onsite reuse can efficiently serve customers who are not easily reached with centralized systems and allow for infill development in communities where legacy infrastructure is at full capacity.

ENVIRONMENTAL PROTECTION
Onsite reuse helps reduce pollution by diverting surface runoff and wastewater that could otherwise contribute to flooding, sewer overflows, and surface water contamination.

COST SAVINGS
Onsite systems can help reduce water and sewer bills for customers. They can also alleviate strain on infrastructure, resulting in significant savings for utilities.

EXAMPLES OF ONSITE WATER REUSE

Communities and businesses have adopted a wide variety of onsite and distributed water reuse systems to meet needs such as improving water quality, resiliency, and availability.

TRANSFORMING WATER MANAGEMENT | SAN FRANCISCO, CALIFORNIA

The Living Machine at San Francisco Public Utilities Commission's headquarters was one of the first systems in the United States to recycle graywater and blackwater for onsite reuse including toilet flushing. The system includes a constructed curbside wetland for treatment and chlorine and UV for disinfection. The utility is now conducting ongoing studies to purify the building's recycled water and produce water that meets or exceeds drinking water standards. After building the Living Machine in 2012, San Francisco became the first municipality to adopt an ordinance for similar systems at other downtown buildings. This effort has led to innovative projects like the Fifteen Fifty development, a residential high-rise with a membrane bioreactor system to treat up to 7,500 gallons per day of graywater.

PERMITTING AND DEVELOPMENT CENTER | AUSTIN, TEXAS

Austin Water opened its new city building in 2022 with two cutting-edge systems to demonstrate onsite reuse. OSCAR (On-Site Collection and Reuse) is a fit-for-purpose rainwater and air-conditioning condensate reuse system that supplements CLARA (Closed-Loop Advanced Reclaimed Assembly), the building's blackwater recycling system. The project is anticipated to save the City of Austin almost one and half million gallons of drinking water annually, and to reduce the site's potable water use by 75%.

EMORY UNIVERSITY | ATLANTA, GEORGIA

The WaterHub at Emory University serves multiple purposes by conserving water, protecting the environment, and advancing research. The system is designed to recycle up to 400,000 gallons of municipal wastewater per day, reducing Emory's total water demand by 40%. The recycled water fills boilers, cooling systems, and toilets on campus. A thriving greenhouse serves as part of the treatment process as well as a center for research and education.

ALLIANZ FIELD | ST. PAUL, MINNESOTA

A little rain can't stop Minnesota United FC, the soccer team that plays on top of an innovative rainwater reuse system developed by the City of Saint Paul and Capitol Region Watershed District. The system includes a 675,000-gallon underground storage tank and a "smart hub" that adjusts based on weather forecasts. The treated water serves stadium toilets, laundry, and irrigation, and will supply irrigation at future developments nearby. Reusing rooftop runoff was important for developing this site, where infiltration was restricted due to contamination from historic land use.

BATTERY PARK | NEW YORK, NEW YORK

Within the Battery Park City development, six separate in-building reuse systems treat a total of 165,000 gallons of wastewater and rainwater per day to provide non-potable water to seven buildings and a public park. Reuse reduces local strain on the city's overtaxed combined sewer system, minimizing overflows and flooding while providing building cooling water and irrigating green roofs. Thermal energy recovery systems use building heat to reduce the energy demand.

About the WateReuse Association

The WateReuse Association is the nation's only trade association solely dedicated to advancing laws, policy, funding, and public acceptance of recycled water. WateReuse represents a coalition of utilities that recycle water, businesses that support the development of recycled water projects, and consumers of recycled water. In addition to supporting members throughout the country, WateReuse has active local sections in Arizona, California, Colorado, Florida, the Mid-Atlantic, Nevada, New Mexico, South Carolina, the Pacific Northwest, and Texas. To learn more, visit **www.watereuse.org**.