# New report details innovations in water reuse

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In drought-prone states like California, Colorado and others, every drop of water is precious. A newly published national report provides comprehensive guidelines for innovative water-saving techniques, with Colorado State University expertise playing a key role.

Sybil Sharvelle, associate professor in the Department of Civil Engineering and co-leader of CSU's One Water Solutions Institute, recently chaired a national committee of experts who wrote the new guidelines. They call for safe, cost-effective expansion of water reuse systems in commercial and multi-residential buildings, as well as municipal districts.

The new "Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems" outlines how to design reliable, efficient and safe building-scale water reuse systems. Such systems aren't yet widespread, and thanks to the committee's efforts, municipalities now have guidance to provide developers with regulations, and a consistent approach to projects. A non-potable water program was pioneered in the City of San Francisco several years ago, with a handful of projects coming online in recent years.

Decentralized non-potable water systems use various local water sources and extend to the building, neighborhood or district scale. The report focused on these complex, multi-use systems that go beyond the single residential scale, Sharvelle explained.

The water systems can use graywater, blackwater, wastewater, roof

runoff or stormwater that is collected onsite. This water can then be used for non-potable applications like flushing toilets, running laundry machines or irrigation.

"These systems are up and coming," Sharvelle said. "More and more developers are wanting to do them, and systems have popped up here and there, but everything to date has been case by case."

Sharvelle, who previously served on a National Research Council panel providing analysis of stormwater and graywater for recycling, chaired the national committee, funded by the Water Environment and Reuse Foundation. The committee created guidelines for protecting public health as decentralized non-potable water systems come online. The guidelines included a microbial risk assessment to determine pathogen reduction targets that was based on new U.S. EPA research.

"The critical thing here is that developers are wanting to build buildings that are off-the-grid with efficient and sustainable use of resources," Sharvelle said. "And aside from that, there is the benefit of reduced water use in buildings. Water savings of around 50 percent are easily achieved through these systems. It's a great way to diversify the portfolio of water sources in a city, in a way that's not infrastructure-intensive for utilities."

Provided by Colorado State University