



# WE&T

water environment and technology

Asset Management

Membranes

Reuse

WEFTEC® 2016

September 2016

## REFLECTING ON INFRASTRUCTURE

STEPS TOWARD REHAB AND REPLACEMENT

**T**he U.S. Drought Monitor website (<http://droughtmonitor.unl.edu/>) shows that more than 60% of California is suffering "extreme to exceptional drought" conditions as the state suffers the worst drought in more than 150 years. Unfortunately, long periods of drought might be the new normal for the West Coast state.

All told, securing a sustainable water future is an urgent priority that we can no longer afford to put off until later.

### **Water reuse is affordable**

However, water reuse can, and must, play a crucial role as part of a multi-pronged approach to secure a resilient, viable water supply. Water reuse is a proven technology that can produce a droughtproof, sustainable water supply. According to the 2012 European Commission document, *A Blueprint to Safeguard Europe's Water Resources*, water reuse can improve the status of the environment both quantitatively by alleviating pressure as an alternative to water abstraction, as well as qualitatively by relieving the pressure of discharge from water resource recovery facilities to sensitive areas. Recycled water is a more reliable water source than other sources, such as imported surface water. As long as urban households and industries continue to use large quantities of water, wastewater will be available for reuse. Further, developing local sources of water can be less energy- and greenhouse gas-intensive in some areas than importing water from afar. When compared with such alternatives as desalination or water transfer, water reuse often requires lower investment costs and less energy, also contributing to reduced greenhouse gas emissions, according to *A Blueprint to Safeguard Europe's Water Resources*.

### **Water reuse's great challenge**

Enticing people to drink recycled water requires circumventing the pervasive *yuck factor*, a term coined by University



of Pennsylvania bioethicist Arthur Caplan to describe the influence of instinctive responses against new technology.

In the 1990s, attempts to develop water reuse in San Diego and Los Angeles were derailed by anti-water-reuse activists who used the emotive term *toilet to tap* with devastating effect. A \$55 million purification facility was built in Los Angeles at that time but never was used to produce drinking water; the water went to irrigation instead.

Similarly, opponents in Redwood City, Calif., delayed a wastewater reclamation project for nearly 2 years. In Fountain Valley, Calif., opposition to the Orange County Groundwater Replenishment System led engineers to pump highly treated wastewater into an underground basin, where it filters through layers of sand and



gravel before being piped to the homes and businesses that use it – injection and underground percolation were added strictly to allay psychological concerns.

### **Indications of a changing horizon**

To better understand Californians' current perceptions about recycled water, Xylem commissioned an independent poll earlier this year. The survey results are encouraging.

- 76% of respondents believe recycled water should be used as a long-term solution for managing water resources.
- 89% of California residents stated that they would be more willing to use recycled water after learning about the advanced treatment processes used to make it clean and safe.
- 88% agree that seeing a demonstration of the water purification process would make them more comfortable using and drinking recycled water.

Clearly, education is a key component of any successful campaign to strengthen support for recycled water across the state. The survey leads us to believe that California is well-positioned to lead the U.S. in accelerating the availability and acceptance of recycled water. California has the opportunity to champion the cause of gaining wider recognition for the benefits of recycled water, as well as furthering the

practice of water reuse as a routine means of securing a sustainable water supply.

After years of drought, the public is much more willing to accept reuse as part of the long-term solution. There are no more excuses. Not only have California residents experienced water supply cutbacks, but according to the 2015 University of California–Davis study, *Economic Analysis of the 2015 Drought for California Agriculture*, the drought has caused a statewide revenue loss of \$2.7 billion and 18,600 lost jobs. While these losses hit agriculture the hardest, the effect has spread to businesses and households as well.

Our survey results show the people of California are open to adopting water reuse techniques into their daily lives. They recognize how the solution can help to alleviate water shortages. This willingness to engage presents a significant opportunity that we must grasp.

It is incumbent on the water industry and community leaders to leverage the opportunity that exists and fill the current education and awareness void.

## **Making gains**

Resilience to water scarcity requires a range of solutions, including economic incentives, regulatory measures, and sustainable and innovative technology. Communities are responding to this challenge through storage, conservation, public outreach, groundwater management, and water reuse. The latter is a proven approach that can help meet growing water demands, while safeguarding existing water supplies.

These survey findings highlight the importance of raising awareness about existing potable reuse projects that are successfully delivering clean, safe water to people living in the U.S. and other communities around the globe. Nonpotable reuse projects treat wastewater for specific purposes such as industrial uses, agriculture, or landscape irrigation. Direct potable reuse, on the other hand, involves the planned introduction of recycled water either directly into a public water system or into a water supply upstream of a water treatment facility.

Operating under a stage-five drought last year, Texas became the first state in the U.S. to build a direct potable reuse facility, treating and recycling millions of gallons of wastewater. Both Wichita Falls and Big Springs, Texas, now use direct potable reuse.

Sadly, this is not the norm. According to the 2012 *Guidelines for Water Reuse*, published by the U.S. Environmental Protection Agency, of the 121.1 billion L (32 billion gal) of municipal wastewater produced annually in the U.S., less than 10% is reused intentionally.

In contrast, such countries as Israel and Singapore, which have struggled with water shortages, have adopted water reuse practices. Only a few years after establishing its Water Authority, Israel is leading the world in the use of salvaged water, effectively recycling 80% of household wastewater for agricultural use, according to the 2010 article, "Arid Israel recycles waste water on grand scale," from Reuters. In Singapore, a new membrane technology is being used to treat wastewater. After just a decade, the technology meets 30% of Singapore's water needs, with plans to triple volumes by 2060, according the 2014 article, "Drinking sewage: solving Singapore's water problem," from CNN. Now is the time to follow suit.

## **A smarter future**

We simply cannot afford to continue mismanaging our precious water supply. We must be smarter about how we use and reuse this finite resource. We have the technology and knowhow – what is required now is collaboration and political will to make water reuse an everyday reality.

Purified wastewater could provide enough potable water to supply all municipal needs for more than 8 million people, or approximately one-fifth of California's projected population in 2020, according to a report by the WaterReuse Association (Alexandria, Va.).

While recycled water is just one piece of the puzzle, it has the potential to help to address not only the current drought, but also our long-term water security. Let's reduce the stigma of recycled water that has existed in the past and create a future where we respect and value water, our most precious of resources.

---

**Ron Askin** is North America regional director for Xylem Inc. (Rye Brook, N.Y.).