

# The Distance Between Toilet and Tap

## **Recycled Sewage Water Could Become a Wave of Future Supply if Public Understood Science and Moved Beyond Imagery**

By Deanna Glick

**M**any of us might imagine the water we drink as trickling down from pure, natural sources somewhere in the mountains. But that's far from reality.

The truth is, our drinking water comes from a variety of not-so-sanitary sources and goes through a lengthy cleaning process before it's safe to ingest. Nonetheless, public perception of water — where it comes from, what's in it and how it makes its way to our tap — is often skewed when powerful images take the place of education.

That's why the innovative and environmentally friendly technology of recycling sewage water for human consumption hasn't really taken off in the past. Attitudes appear to be changing, though, due in part to necessity and to better understanding of the psychology behind selling the idea to the public.

Persistent drought and projected population growth that add up to future water shortages have forced attention back onto the process, known officially as "indirect potable water reuse," but termed "toilet to tap" by skeptics.

"The emotional part is really a big hurdle," said Mas Dojiri, a division manager for the Los Angeles Sanitation Department. "If you say 'toilet to tap' without describing the steps in between, people are going to say 'I'm not drinking that.'"



*A display at the Orange County Groundwater Replenishment System (OCGRS) illustrates the effects of filtration. From right to left: unfiltered effluent; post-micro filtration effluent; post-reverse osmosis effluent.*

Those often-glossed-over steps involve multiple filtration processes, reverse osmosis and exposure to bacteria-eating microorganisms, hydrogen peroxide, chlorine and UV light. All of this results in water that meets or exceeds the government's drinking water standards.

"The method makes water that is 'abundant and safe' " said Brent Haddad, PhD, associate professor of environmental studies at the University of California, Santa Cruz, in the *American Psychological Association's Monitor*. "The technology is remarkable and can treat water to an often higher quality than the water that originally entered the system."

In fact, many probably don't realize much of our water supply includes highly treated wastewater because modern water-purification technology is so reliable. Officials admit that there's no proof about the long-term safety of any water treatment process. Still, opposition to recycled sewage comes more from what psychologists identify as an automatic "yuck factor" response rather than substantiated safety concerns.

"Emotional factors are very powerful influences on people's behavior," said Paul Slovic, a University of Oregon psychology professor who has studied and consulted on water reuse. "Image and assumption are very important motivators of behavior. With the reuse of water, the image and assumption of the toilet to tap are quite negative. These negative assumptions overpower the logical analysis of things, so you have to look at what the science says."







*OCGRS workers monitor the filtration process from the control room of the Fountain Valley, Calif. facility.*



*Reverse osmosis vessels take the microfiltration effluent and turn it into pure water that will be pumped out to spreading grounds and returned naturally to the drinking water supply.*

Slovic and other city officials and psychologists who have researched and consulted on the issue say comprehensive education about the science and process of recycling and purifying water, as well as emphasizing the need to employ alternatives on a crowded planet with diminishing resources, make a difference.

“People have this idea that some manufacturer in the sky generates new, pure water coming down from the stream as opposed to the fact that we are reusing the same molecules over and over,” Slovic said. “People don’t have a good understanding of water.”

This requires projects that employ water reuse to develop an effective outreach program to overcome the emotional side of public perception that lingers even after the science is explained. Officials say the lack of such might have spelled doom for a water reuse plan in Los Angeles that ended almost as soon as it began.

## **Orange County Soaking Up Water Reuse Project**


By Deanna Glick

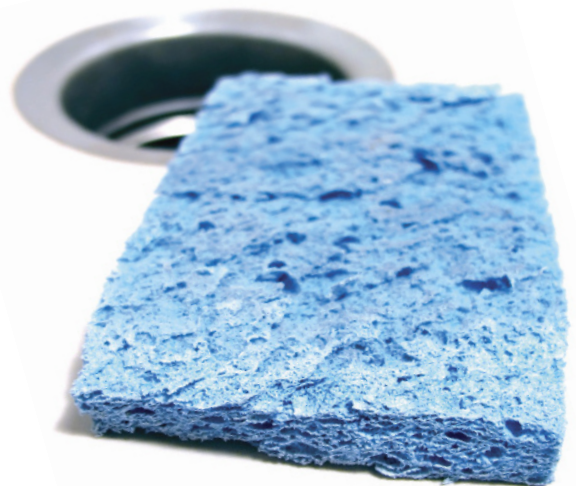
**P**roponents of recycling treated sewage into tap water are looking to a region of drought-ridden Southern California as an example of what could be the answer to providing enough water for the long haul in an era of looming water shortages. Officials in Orange County began operating the world's largest, most modern reclamation plant late last year.

Paul Rozin, a psychology professor at the University of Pennsylvania who consulted on the project, said Orange County offers hope for a technology that's been unfairly scrutinized in the past and that its residents provide a good example for the rest of the public.

“It’s a start,” Rozin said. “It’s very clear in terms of ecology and economy that (water reuse) is the way to go. The problem is, in all of our life, we avoid things that are offensive or disgusting. But we can’t do that in this world. Every seat has been sat on and the air we breathe has been breathed by someone else.”

According to published reports, the new, \$490-million facility employs a sophisticated system across 20 acres that can transform 70 million gallons of sewage per day into water for human consumption. The water will be injected into the county's vast groundwater basin to combat saltwater intrusion and supplement drinking water supplies for 2.3 million people.

California health officials were expected to certify that the reclaimed water meets drinking water standards before opening ceremonies Jan. 25. 





The city lost its battle with public perception a few years after building a \$55 million reclamation system in the eastern San Fernando Valley. The plant was closed in 2000 after a period of political wrangling.

According to published reports, public hearings on the reclamation project's safety were held in 1995. The Los Angeles Regional Water Quality Control Board, the state Department of Health Services, the state Environmental Protection Agency and the Los Angeles City Council approved the proposal, which involved treated sewage water being pumped to spreading fields where, over five years, it would filter through sandy soil and gravel into an underground reservoir. The system would have provided enough water to supply 120,000 homes in the region.

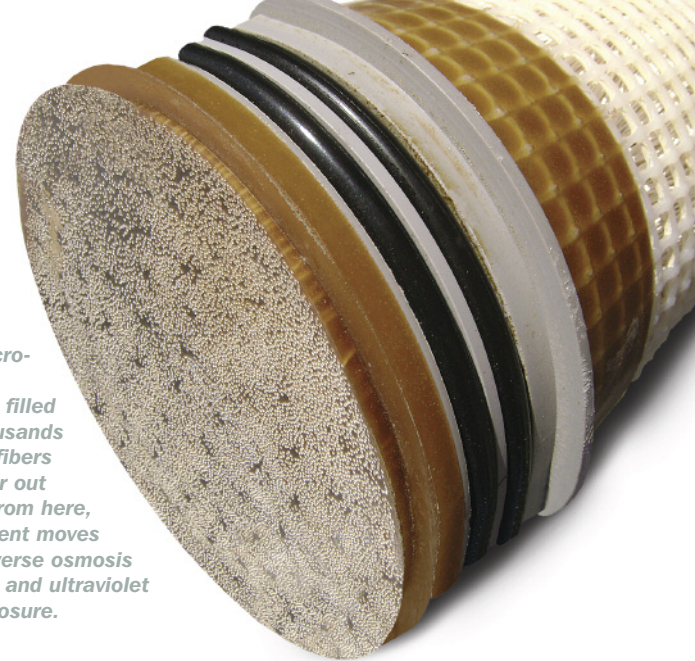
It wasn't until five years later that the official announcement of its completion came, just before an election and around the time the issue of Valley secession made the ballot. Officials who had approved the plan years before echoed public protest and the phrase "toilet to tap" was born.

"It was the catch phrase, like 'If it doesn't fit, you must acquit,'" Dojiri recalls. "I knew the minute I heard it the plan was dead. It really was effective. But it really was a misnomer. ... Someone once said we're all drinking recycled dinosaur piss anyway. People laugh, but it's true. We're all drinking some form of recycled water. It isn't all new water. All we're doing is speeding up the natural process that happens in rivers and lakes. That's what treatment plants do."

Today, municipalities here and abroad have found success with recycling sewage water. Orange County, an affluent region in the heart of Southern California, just opened its own half-billion-dollar reclamation program and similar projects are under study in San Diego, San Jose, Texas, Florida, Australia and Singapore. Recently, the Los Angeles Department of Water and Power began reconsidering plans to recycle wastewater, according to the *Los Angeles Times*.

Slovic said education about the benefits of such projects help people get over perceived risks.

"We operate on senses and if something carries strong benefits it will seem to have




Each micro-filtration vessel is filled with thousands of microfibers that filter out waste. From here, the effluent moves on to reverse osmosis filtration and ultraviolet light exposure.

fewer risks," Slovic said. "If one sees the benefit of the technology as good, that will depress the sense of risk and lead to tolerance of risk."

Orange County's program has faced minimal opposition and, in fact, been embraced by elected officials as well as civic, community and environmental organizations due to an extensive marketing and outreach campaign. The main ingredient: honesty.

Ron Wildermuth, district communications director for the Orange County Water District told the *Times*: "We started telling people from the start that we're purifying sewage water."

Jeff Beller, assistant division manager with the L.A. Sanitation Department, said that ultimately limited options for dealing with the environmental impact of overpopulation will force the issue.

"Our choices become more and more limited as our population grows," Beller said. "As our backs get pushed up against the wall, people will probably tend to get over these things." 

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