

# AMERICAN WATER WORKS ASSOCIATION

## Reuse gaining traction, experts say

June 17, 2009, SAN DIEGO — Reuse is gaining increasing acceptance among consumers. Several of the largest water projects in the world have been built to recycle water for indirect potable reuse.

“We wanted to be clear with the public” that the new groundwater replenishment system was treating sewer water and treating it to a high level of quality, Shivaji Deshmukh of the Orange County (Calif.) Water District told the audience at the H2Open Forum during the AWWA annual conference.

“We were very active in the community with face-to-face communication,” he said. Many of the agency’s staff were sent out to talk to “anyone who would listen.” The effort was successful because “without their support, we would not have been able to do it,” said Deshmukh.

Water Factory 21, the standard for water recycling for years, has been torn down to make way for the district’s new facilities which use microfiltration (MF), reverse osmosis (RO), ultraviolet disinfection and hydrogen peroxide to produce a near-distilled water quality before being injected into storage wells, he said.

**He used the word “purification”** to describe the treatment process, though he acknowledged the term is debated among reuse professionals.

With increasing demand because of growth and decreasing supply from imported sources, the development of the \$481-million project made sense.

Producing 72,000 acre-ft (88 million m<sup>3</sup>), the groundwater replenishment system contributes about 15 percent of the total water needs for the district and its customers. The cost is comparable to that of developing imported water, and the district receives a subsidy from the Metropolitan Water District of Southern California for operational costs.



**Shivaji Deshmukh,**  
**deputy director of the**  
**Orange County (Calif.)**  
**Water District**  
*Photo by John Kayser*

The water district partners with the Orange County Sanitation District, taking the higher quality sewer water for treatment and reducing the burden on the sanitation district's need for outfall sewers. The project, which uses half the energy needed to import water from Northern California, also provides protection against seawater intrusion.

The Singapore Board of Public Utilities has even more restricted access to water sources to serve 4.6 million people and attract new industry. The Singapore PUB is responsible for the full water cycle, from stormwater management and raw water supply to treatment, distribution, "used water" collection, sewage treatment and reclaimed water for direct and indirect use.

Mong Hoo Lim, the agency's deputy director, described Singapore's NEWater project, which treats used water with micro- and ultrafiltration, RO, and UV disinfection. After rejecting reuse in the 1970s because of high cost and unreliable technology, the agency revived the study of reuse in 1998.



**Mong Hoo Lim, deputy director of the Singapore Board of Public Utilities**  
*Photo by John Kayser*

A demonstration plant was audited by an international expert panel, which concluded that, as a water product, NEWater fell within World Health Organization guidelines and recommended it for indirect potable reuse. So in 2003, Singapore began large-scale implementation, and with the fifth plant online this summer, NEWater will account for 50 percent of the small nation's demand.

Strong political and grassroots support was critical to the success of the project, said Mong. The prime minister was shown drinking NEWater, and people felt "if it's good enough for the prime minister, it's good enough for me."

**The agency drew on research** into psychology, perception, learning styles and interpretation to assure effective communication about its message about NEWater and about water as a precious, limited resource to be protected from pollution.

A NEWater Visitor's Centre attracts 2,200 people a week and has become a popular tourist attraction, though not quite like Disneyland, he said. The center incorporates interactive exhibits, an animated feature, illustrations and tours of the treatment facility where it is located. The center won a national tourism award in the educational category.

Australia's Western Corridor Recycled Water Project has not yet achieved as much public acceptance for potable reuse.

The project in southeast Queensland is driven by climate change, urbanization and growth, a commitment to sustainability, and technical feasibility, Warren Traves told the attendees.

The Australian project encompasses a much larger area than either of the other two with three advanced water treatment plants able to treat up to 61 mgd (231 ML/day) and 120 miles (193 km) of large-diameter pipe. Treatment consists of MF/UF, RO, UV, and hydrogen peroxide. Important among environmental considerations is that this treatment uses about one-third the energy required for desalination and reduces nutrient releases to water bodies.

For indirect potable reuse, the project will capture dry-weather flows from six wastewater plants and treat the water to the standards of the Australian Drinking Water Guidelines and the new Australian Guidelines for Water Recycling before transfer to reservoirs.

However, with the relief of drought last October, a political decision was made to transfer the recycled water to the Wivenhoe Dam only if reservoir levels drop below 40 percent — which Traves said would be a few years away.



**Warren Traves,**  
**Australia's Western**  
**Corridor Recycled Water**  
**Project *Photo by John***  
***Kayser***