

THE WATER CRISIS

Good to the Last Drop?

As the American Southwest reels from one of the worst droughts on record, some parched communities are opting for a once-unthinkable conservation measure: extracting drinking water from urine and other liquid waste. The small Texas city of Big Spring is the latest to take the plunge, announcing that late next year it will begin adding 2 million gallons of recycled water daily to the drinking supply. San Diego recently began a pilot project of its own, hoping to make believers of the one-third of its population who oppose or are unsure about the technique.

While so-called toilet-to-tap ventures certainly sound unpleasant, skeptical citizens should take heed of the rigorous filtration process that makes recycled wastewater as safe to drink as conventional tap water. "Water treatment involves many steps between commode and faucet," says Mike Markus, an environmental engineer at the Orange County Water District in California, which has been processing liquid sewage into drinking water since 2008.

Sewer water undergoes initial cleansing at a sanitation plant to remove solid waste and add beneficial bacteria that break down sludge. A recycling facility then forces the water through holes in tiny, strawlike fibers. The water that makes it to the hollow center of the fibers, now freed of suspended solids and microorganisms, gets propelled through even finer pores in another membrane, which traps dissolved chemicals. A dab of hydrogen peroxide and a flash of ultraviolet light serve as the final sterilizing gatekeepers before the water reenters potable supplies. "We test the water for over 400 compounds—pharmaceuticals, endocrine-disruptor chemicals—and we've never had a violation," Markus says.

So if toilet-to-tap has such a sparkling safety record, why haven't more communities bought in? Money is one issue. Orange County's recycling facility costs

about \$27 million per year to operate. But the bigger obstacle may be psychological. Fortunately, a little education can change minds quickly. "When we offer people a taste, they say, 'This tastes like water,'" he says. "I see that a lot: skepticism followed by conversion."



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