

## **New source of drinking water hinges on pilot project**

By Lily Leung

Monday, October 11, 2010

After years of planning and debate, construction will start in January on a pilot water-purification plant that could lead to a new source of drinking water for San Diego.

The plant will test a process that turns wastewater into tap water. San Diego could implement the technology for the water system if it's deemed safe and the City Council approves.

City officials already have begun explaining the complicated process by holding a series of meetings to educate residents about the potentially far-reaching technology involved with indirect potable reuse or reservoir augmentation. Critics call it "toilet-to-tap" and worry about its safety.

"Education is essential," said Marsi Steirer, deputy director of water resources for San Diego.

Orange County Water District officials run the largest, planned indirect potable reuse facility in the world, recycling 70 million gallons of wastewater each day. Similar technology exists in Fairfax, Va., and El Paso, Texas.

San Diego's demonstration project is set to start processing wastewater in April at the rate of about 1 million gallons a day.

The process starts with wastewater that already has been treated to levels deemed acceptable for use on landscaping and in industrial processes.

It's pumped through thousands of tiny straws that screen out bacteria, protozoa and suspended particles.

The water then is forced through tubes filled with plastic membranes to remove large molecules. The process, used by bottled-water companies, is called reverse osmosis.

The twice-filtered water is finally exposed to high-intensity light and hydrogen peroxide for additional scrubbing.

Workers will monitor the water quality at each step and work with the California Department of Public Health.

Residents will be able to tour the facility for free.

Treated water from the pilot program will go to the city's recycled water system for irrigation and industrial use. None of the purified water will be injected into a reservoir — though that eventually would be the case if the technology proves safe and the city expands the treatment facility for full-scale production.

The city plans to test the purification process for about 18 months and issue a report by summer 2012. The final decision to build a full-scale plant hinges on mayor and City Council approval.

A temporary water-rate increase that ended on Sept. 1 paid for most of the \$11.8 million pilot project, with grants covering the rest.

Water officials from Orange County said their project, which went online in January 2008, has been a success. One challenge was getting through an “aggressive outreach campaign” to change public perception of the treatment process, said Gina DePinto, spokeswoman for the Orange County Water District.

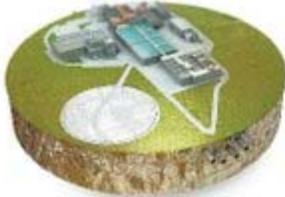
About 4,000 people toured the Orange County facility last year. At the end of the tours, DePinto said visitors typically take a drink of the end product “and they say, ‘It tastes like water.’”

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**Finish: City drinking water**

The circle of recycling will be complete when the water is sent back to taps for human consumption.



**Potable Water Treatment Plant**

Water from the reservoir will be treated to meet state and federal health and safety standards for drinking water.



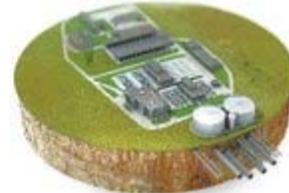
**San Vicente Reservoir**

If Phase 3 is approved, water from the Advanced Water Purification Facility will be sent to the San Vicente Reservoir, where it will mix with local runoff and imported water.



**Start: city wastewater**

Wastewater from the city goes to the North City Water Reclamation Plant in Sorrento Valley.



**North City Water Reclamation Plant**

Water is reclaimed using traditional methods. The reclaimed water is sent out for irrigation and industrial uses, but in Phase 2, a portion of this water will be sent to the Advanced Water Purification Facility on site.

Reclaimed water for irrigation and industry



**Advanced Water Purification Facility**

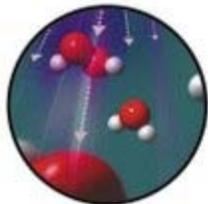
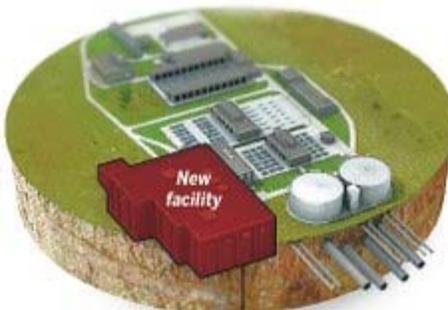
Advanced water purification is a **three-step process** that cleans water to a level similar to that of distilled water. During Phase 2 the purified water is monitored and tested before it is sent out for irrigation and industrial uses.

**Water purification**

Starting next year, the city of San Diego will begin the second phase of a water-purification process that will turn wastewater into tap water. If water quality is acceptable at the end of Phase 2 testing, and the plan is approved by the City Council and mayor, a final phase would be implemented to complete the circle and provide recycled water to residents.

Source: City of San Diego Public Utilities

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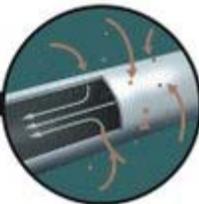
**Step 3: Ultraviolet light**

Intense ultraviolet light breaks up remaining organic molecules. Hydrogen peroxide then oxidizes the remnants of broken molecules, disinfecting the water.



**Step 2: Reverse osmosis**

Water, under great pressure, is then forced through a semipermeable membrane with holes small enough to let only water molecules pass through.



**Step 1: Microfiltration**

Water is sucked through thousands of tiny straws — each no wider than three hundredths the thickness of a human hair — that filter out bacteria, protozoa and suspended particles.