

Making waves with water

Water Department moving in positive direction with desalination

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Ryan Alsop, the director of government and public relations with the Long Beach Water Department, talks about the Long Beach Desalination Project near the Haynes Generating Station in Long Beach.
(Scott Smeltzer / Staff Photographer)

The Long Beach Water Department is bubbling with pride - the stuff of expectant parents.

Throughout the year, the news front has been percolating with positive growth in a cutting-edge technology that might prove essential to nothing less than survival: the desalination industry.

For instance, the Association of Metropolitan Water Agencies (AMWA) recently presented the Gold Award for Competitiveness Achievement to the Long Beach Water Department, recognizing its innovative and sound financial courses, while praising the department's effort to seek new business opportunities and meet customer service needs and expectations.

The award was mainly a result of the department's day-to-day managerial operations, but also its push to develop a groundbreaking desalination technology, which has been awarded protection by the U.S. Patent Office.

The Nanofiltration Process, known as the Long Beach Method, is considered to be up to 30 percent more energy efficient than reverse osmosis, the current state-of-the-art technology, according to Ryan Alsop, spokesman for the Water Department.

The patent should be issued in the first quarter of 2007.

The process is now being tested on a large scale

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- a 300,000 gallon-per-day, fully operational facility at the Haynes Generation Station grounds in East Long Beach that includes a two-stage nanofiltration system. The project uses the Long Beach Method, which aims to save energy by pushing seawater through two membranes at less pressure than traditional desalination technology.

If the research proves successful, the city hopes to build a full-scale project to handle 10 million gallons per day.

The research could take up to five



The microfiltration system at the Long Beach Desalination Project is just part of a large process. (Scott Smeltzer / Staff Photographer)
years to complete.

"We are in a research and development mode only," Alsop said.

That research must prove to be cost-effective and environmentally friendly, according to Alsop.

"The facility we have (currently) produces no water for public consumption ... and releases no brine into any body of water," Alsop said.

The plant, he added, also has received full Coastal Commission approval for the department's bathymetry survey and hydrogeological testing, meaning no negative environmental impact from a system that's an alternative to traditional open ocean intake and discharge systems.

To date, the research effort has received substantial support - about \$10 million. Of that, about \$6 million is from the federal Interior Department, another \$3 million is from the state Department of Water Resources and about \$1 million is from the city's Water Department.

The aim with the research is to reduce the city's reliance on outside water sources by at least 10 percent, Alsop said. The city's waste supplies are from ground water, imported and recycled sources. The imported water, Alsop noted, becomes more and more expensive.

"Imported water is the biggest expenditure for the Water Department," he added.

The research is receiving positive federal and state support, not only through funding but with scientists from those agencies participating in the research.

"There are a lot of smart people involved," Alsop added.

The technology being used at the research plant was invented by Diem Vuong, a retired Long Beach Water Department engineer and administrator.

Since 1999, Vuong has been the mastermind behind the Water Department's effort to turn ocean water into drinking water - and the Vietnam native may end up having a more dramatic impact on the future of the city's water system.

Vuong invented a desalination process that saw success in a prototype lab that he convinced the city to build in a nook of its waste treatment plant.

That success helped the city to secure state and federal funding to build the 300,000-gallon-per-day desalination research plant that will test operational costs and energy consumption. And scientists are taking notice.

For instance, the year began with a tour by the U.S. Office of Naval Research of the Long Beach facility, which is in partnership with the U.S. Department of Interior's Bureau of Reclamation. The Jan. 18 and 19 research review involved officials from the Expeditionary Unit Water Purifier (EUWP) - consisting of officials from the Office of Naval Research, the U.S. Bureau of Reclamation, the U.S. Army Tank Automotive Research and Development Command, U.S. Naval Facilities Engineering Service Center, Naval Surface Warfare Command, Sandia National Lab and the Environmental Protection Agency.

Alsop said the research is the largest effort of its kind in the U.S., and it's been pegged for three stages of work:

Phase 1: Test the department's dual-pass nanofiltration process.

Phase 2: Focus on optimization of membrane selection and vessel configuration used to cut the overall energy requirement.

Phase 3: Test new concepts for disinfection and microbial fouling control of the membranes utilizing ultraviolet light and chlorine dioxide.

In the research and development stage, there's also an effort to be environmentally responsive. And the focus is to find a "natural filter" on the sandy sea floor, eliminating compacting ocean species that would otherwise be destroyed during the intake of the ocean water or possibly injured in the discharge of highly concentrated brine.

Alsop emphasized that the Water Department has no plans to build any facility that will dump anything - especially highly concentrated brine - into the water.

An innovative Under Ocean Floor Intake & Discharge Demonstration System is being planned at Cherry Beach at the foot of the bluffs at Junipero Avenue.

No actual work is under way at this time, but engineers are researching the hydrology of the under-water sand filtering in that area, and determining the feasibility of that process. The proposal calls for a system of pipes 30 feet under the sand, and the scientists want to determine if they can capture and release water through natural sand filtration, as opposed to direct ocean intake, Alsop said.

Long Beach's effort to turn sea water into clear water began almost 10 years ago, when the program received the green light for development by Congress on Oct. 9, 1996.

Five years later, the 9,000-gallon- per-day pilot plant began operation. A month later after the pilot began, the federal government awarded \$1 million in the Energy and Water Appropriations Bill.

In August 2003, the 300,000-gallon- per-day prototype plant received the state Coastal Commission's development permit, clearing the way for construction in November 2003.

Another \$3 million was put into the development for the department's Under Ocean Floor Intake & Discharge Demonstration System by the state Department of Water Resources. The plan won the state Coastal Commission approval in April.

The Water Department signed a desalination production incentive agreement with the Metropolitan Water District of Southern California. The August 2005 deal provided a \$62.5 million price tag over a 20-year period, and will allow the water district to receive desalinated water from a potential full-scale plant.