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Ventures

Procorp technology uses sand to clean, soften water



Tom Lynn

Nick Vollendorf tests water at the Procorp Enterprises lab in Wauwatosa. The water-technology start-

up, which expects sales of about \$10 million this year, is working on some proposals to help Saudi Arabia solve some of its water needs.

By [John Schmid](#) of the Journal Sentinel

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Only two years ago, Waukesha looked ripe for Procorp Enterprises LLC, a water-technology start-up.

With concentrated radium in its wells, the city encouraged Procorp to test a prototype reactor that strips radium out of the water and traps it in tiny mineral pellets that could be used in concrete and road construction.

That was before Waukesha reversed course.

Last year, the city opted to deal with its water problems by tapping into Lake Michigan, a politically sensitive diversion that still requires multiple approvals.

Also last year, the recession forced Procorp to cut staff, in part because its main investor, Ohio-based Thieman Enterprises LLC, was blindsided on its real estate holdings.

But water scarcity, pollution and demand are increasing all over the globe. And fresh from a trip last month to Saudi Arabia, which is investing heavily in water technology, Procorp President Eric Fessler said the company is back in growth mode.

"We're seeing a rebound," Fessler said.

He expects sales to spring back to about \$10 million in 2010 after skidding to about \$4 million last year. While the privately held company doesn't release earnings, Fessler said the firm operates in the black.

"We're still investing the major portion of our earnings in R&D," he said.

Procorp employs 13 people at its offices in the Milwaukee County Research Park, many of them water engineers, down from 17 at its peak.

Saudi proposals

The Saudis sometimes seem to have greater reserves of crude oil than drinkable water.

The desert kingdom desalinates as much of the ocean as it can, a process that's as messy as it is energy intensive. And the groundwater under its sands often has radium and other minerals, much like Waukesha, Fessler said.

"We are preparing proposals for a number of sites," said Fessler, who met directly with the Saudi minister of water and electricity. Procorp also is bidding to build a wastewater treatment plant in Madison. Just as the Milwaukee Metropolitan Sewerage District strips organic byproducts from wastewater to sell Milorganite fertilizer, Procorp also says it can create fertilizer in Madison. The main difference for Madison is that Procorp would use a different process from Milorganite, which relies on microbes and bio-solids.

Procorp holds the U.S. license to use a Dutch-patented water-treatment technology. Its reactors use fine grains

of sand as the catalyst for crystals that grow into hard little pellets of calcium, limestone and phosphate. Procorp believes these minerals can be resold as commodities, including fertilizer. And the Saudis have lots of sand.

Pellet reactors have multiple applications, Fessler said. They avoid discharging sludge back into municipal sewers or landfills. Calcified "hard water," meanwhile, clogs pipes and boilers and shortens the life of equipment.

Unlike many water softeners, Procorp doesn't require salt, which is a major environmental advantage in places like California, said Mike Alvord, the operations manager at Valencia Water Company, a privately owned water utility in the outer sprawl of Los Angeles.

Customers of Valencia Water are repelled by the limestone taste from local aquifers and the damage from the calcium that hardens in pipes, dishwashers and showers. Hard water also leaves skin irritably dry, Alvord said, prompting many around Valencia to install salt-based water softeners. But home softeners are under fire from environmentalists who balk at the excessive chloride they dump directly into municipal waste systems and groundwater, often damaging California crops in the process. Local regulators are preparing fines for anyone who flushes excessive chloride into the municipal systems.

"It's an economic issue," said Alvord. Two years ago, Valencia Water installed a Procorp pellet reactor capable of processing 1,000 gallons per minute. Valencia plans to install more in the future, as soon as California's economy improves.

New applications

Fessler, a chemical engineer, said Procorp's labs are developing new applications for the pellet reactors. Among them is the radium-removal process that Procorp developed in 2008 when it built a pilot reactor on a contaminated well in Waukesha.

It handled only 20 to 30 gallons a minute. But it was enough to measure a 90% absorption rate of the radium into the pellets. According to Procorp's literature, the water fell to 1 picocurie per liter, which is safely below the radium standards imposed by the U.S. Environmental Protection Agency of 5 picocuries.

Procorp filed a patent application on the technology, which it calls Radiocap, and registered Radiocap as a trademark. It wanted a contract to build a reactor in Waukesha that processes 1.5 million gallons of water a day.

It even worked with materials scientists at the University of Wisconsin-Milwaukee to develop safe uses for the radium-laced limestone pellets as a concrete additive. "Waukesha is so eager to get Lake Michigan that they lost interest in Procorp," Fessler said.

Work on Radiocap, along with Procorp's existing water-treatment reactors in California, drew the attention of the Saudis, who contacted Fessler. The phone call from the Saudis came at a good time, Fessler said:

"The Saudis are receptive."

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Waukesha could solve their problem and help a local company in the process.

However it appears that Waukesha would rather take the easy way out and dump their sewage into Wauwatosa's creek.

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It may take a little time (everybody is still thinking short term yet), but the worldwide water shortage is not going to get any better. This company will benefit as a result.

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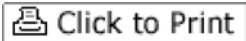


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