

Desal plant at sea: Easier to swallow?

By KELLY NIX

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A FLORIDA-BASED water company says an offshore water desalination plant is the solution to the Peninsula's water woes. A partner with the firm said he will tell state officials the project is better than California American Water Co.'s plans for a desal plant in Moss Landing.

Water Standard Company in Boca Raton wants to use a giant tanker fitted with an onboard reverse osmosis system to desalinate and purify water. The ships would be located at least five miles offshore.

Skip Griffin, senior vice president of PBS&J, the engineering and environmental science firm working with the water company, said he'll notify the California Public Utilities Commission about the project, expected to cost an estimated \$132 million.

The tankers are called "seawater conversion vessels."

"Using this technology has a lot of benefits," Griffin said. "Because it minimizes and is sensitive to environmental issues, is more flexible and uses the cleanest, least expensive power generation equipment available."

Griffin said he will inform a consultant for the CPUC, in town next week for a series of public scoping meetings, that the offshore desal project is the best solution for the Monterey Peninsula's water crisis. The consultant is listening to public comments before preparing an environmental impact report for Cal Am's Coastal Water Project.

Although shipboard desalination has never been done on the scale proposed by the Florida company, the board of directors for the Monterey Peninsula Water Management District thought the idea was worth considering. At the board's Oct. 16 meeting, members added it to a list of proposed water solutions for the Peninsula.

"There is nothing new about what we are doing," Griffin said, "except it's on a ship."

The project is yet another idea to solve water problems on the Peninsula, which needs a drought-free water source to replace the pumping from the Carmel River the state says is harmful to steelhead trout and red-legged frog populations.

Farthest along in the rush to provide the Peninsula with a drought-free water supply is Cal Am, which is trying to construct its proposed Coastal Water Project, a \$190 million desal operation at the Moss Landing power plant.

“The technology looks very interesting and definitely appears to have some advantages,” said Catherine Bowie, Cal Am’s community relations manager. “However, it is difficult to compare this project to ours or any other until some basic questions are answered.”

Minimal environmental impacts?

The process involves parking a massive tanker at least five to 10 miles offshore. An intake system of variable length, from 80 to 100 feet, would draw water from the ocean at a depth where there is very little sea life because it is beyond sunlight penetration. The telescoping, “multi-depth intake anti-entrainment system” also would not touch the ocean floor. The tanker, dubbed a “mother ship,” would not be visible from shore.

Brine discharge, a major issue with land-based desal plants because environmentalists contend the high salinity concentration harms organisms when it’s dumped back into the ocean, wouldn’t be as much of a problem, said Andrew Gordon, founder and CEO of Water Standard Company, and the brainchild behind shipboard desal.

“We wouldn’t discharge the [brine] directly into the ocean without treating it first,” Gordon said. “The local jurisdictions would decide how much brine would be diluted.”

The tanker would dilute brine through a “salinity plume deterrent system,” which can discharge brine with no temperature differential. Once-through cooling systems, commonly used by power plants and which could be shared by onshore desal plants, usually discharge brine at a higher temperature than the ocean, something environmentalists say can also harm marine life.

There are options for transporting water from the tanker to shore. One idea is to use a seabed pipeline to send the water ashore to water storage tanks. Another proposal involves using the mother ship to fill one or more smaller “shuttle ships,” or tug barges to carry the water ashore. The shuttle ships, Griffin said, would be “food-grade” quality and similar to those used in transporting orange juice.

“When water comes off the ship, it will be put onto a barge and we will have to take that ship on shore and pump it into a storage system,” Griffin said.

The water would be stored in onshore tanks, similar to the 102 storage tanks on the Peninsula owned by Cal Am, and would be transferred at night to cut down on the “visual pollution.”

“I’m pretty confident we would use additional storage tanks,” he said.

Like the tankers, tug barges would use turbine engines fueled by biodegradable soy- and rapeseed-based biodiesel, an environmentally friendly alternative to using petroleum-based fuel.

“They [produce] ultra-clean emissions,” and are less toxic than table salt, Griffin said.

This might be appealing to the California Coastal Commission, which has recently expressed concerns with land-based, power-hungry desal plants and their contribution to greenhouse gases.

No once-through cooling

The major benefit to using offshore desalination, its creators contend, is its limited environmental impacts. There is virtually no impact on the shoreline, and the effect on air quality is greatly reduced, its proponents claim.

“We will have zero impingement,” Griffin said.

That’s because, he said, the water will be drawn at a very low velocity and would not impinge marine life such as fish and crustaceans, which are often killed in the process. Impingement occurs when sea life and debris are caught on screens used to prevent clogging a desal cooling system.

Entrainment, which occurs when small organisms such as phytoplankton are sucked into the system and killed, would be minimal because of finer screens, Griffin said.

“Going out where there are fewer organisms to begin with, and using a small-diameter screen,” Griffin said, “will greatly reduce entrainment.”

Using a global positioning system, the seawater conversion vessel would be slowly moving and would not anchor. And the tankers, Griffin said, can operate under catastrophic conditions — such as a violent weather, a big earthquake or a tsunamis — which could devastate a land-based desal plant. “The ship can be moved out of the way in the event of a disaster,” Griffin said.

Griffin said the desal system would be able to provide at least 20 million gallons per day, plenty to offset illegal pumping from the Carmel River.

“We are subject to what the public wants us to provide,” Griffin said. “If we were able to get this up to 30 mgd [million gallons per day] that would be a nice cost break.”

The City of Santa Cruz and the Soquel Creek Water District have expressed interest in the idea. “We want more customers to keep the cost down,” Griffin added.

Gordon, whose former company developed software technology for the space shuttle and space station, has attracted a credible list of corporate heavyweights for the project.

Included in the arsenal is V. Ships, the “world’s largest provider of ship management,” with a fleet of more than 900 vessels; Pall Corporation, a filtration and separation technology company, which builds desal systems; GE Energy, which builds turbine engines for aircraft and ships; Siemens Marine; and Arthur Gallagher, the third largest U.S. brokerage and risk management services firm.

Is the idea too good to be true?

Although great on paper, Cal Am raised questions about the proposal. “What is the permitting path for this type of project and what is the likelihood of approval from important agencies, such as the coastal commission or department of health services?” asked Bowie, Cal Am’s community relations manager.

According to Gordon, the permits would be the same needed for a land-based desal plants. “We would need to go to the approximately 29 federal, state and local agencies that regulate land-based [projects] as anybody would,” he said.

But the group contends it would be less difficult to obtain the permits than a land-based plant. “The fact we are out on the open ocean will mitigate some issues significantly,” Griffin said.

Although touted by its creators as the end-all, be-all of desal projects, groups such as the Sierra Club, which is not only concerned with the environmental impacts but whether a large desal project would promote growth on the Peninsula, will likely not allow it to be put in place without serious opposition.

“We are not making the growth issue go away,” Griffin said. “That is something the community has to argue out.”

Bowie said Cal Am hasn’t learned enough of the project to decide whether it’s good for the Peninsula.

“Our attitude toward this project is precisely the same as our attitude toward Pajaro/Sunny Mesa,” Bowie said. “If it can be done faster, cheaper and better, then we are all for it. At this point, we do not have the information to judge whether or not the project meets that criteria.”

The Pajaro/Sunny Mesa Community Services District has proposed a 20 million-gallon-per-day desal facility at the old National Refractories site in Moss Landing, which would be operated by San Diego-based Poseidon Resources Corp.

The Peninsula has been waiting decades for an alternative water supply. Bowie said at some point, something has to be done. “The longer we wait, the more expensive any project becomes,” she said. “At the time the Carmel River Dam was proposed, the impact to customers was estimated at about \$20 a month. Now we’re looking at a \$191 million dollar project that will more than double customers’ bills. Time is an important factor in protecting the ratepayers, and it is my belief that at a certain point it will be time to stop analyzing possibilities and start implementing a solution.”