

Australia's desal experience bodes well for California

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View of some of the hardware at the Carlsbad Desalination Project. — *Charlie Neuman*

Congratulations to San Diego for finally completing your 50 million-gallon-per-day Carlsbad desalination plant, scheduled for opening Dec. 14. When project developer Poseidon and the San Diego County Water Authority started this journey 18 years ago, Australia had no major seawater desalination plants.

Australia is known as the land “of drought and flooding rains” and we have learned the bitter lesson of not having adequate diversity of water sources during the tough times.

Facing the worst drought in 1,000 years (1997 to 2010), in just eight years, Australian state water utilities built six large seawater desalination plants ranging in size from 35 million to 120 million gallons per day in all mainland state capitals as well as a 60 million-gallon-per day potable water recycling system in Brisbane.

The total investment in these water security measures was around \$15 billion Australian (about \$11 billion U.S.) to provide water security in the face of climate change, increasingly volatile weather patterns and population growth.

The people of San Diego can feel proud that they can now source their own drinking water from the inexhaustible supply of the Pacific Ocean. They have not only increased their water security but have reduced the amount of water they take from people in inland U.S. that depend on it for agriculture and community use, and who have no alternative supply.

Perth, Western Australia, has a similar climate to San Diego, characterized by winter rains and long hot summer droughts. Climate change in southwestern Australia over the past 40 years has dramatically reduced annual water yield from dams, which, since 1911, had been the major source of the city's drinking water. In fact, this year (the worst on record), inflow to dams has been less than the annual evaporation loss. Starting in 2004, Perth built two large seawater desalination plants that now operate 100 percent of the time and supply 40 percent of the city's water, the balance coming from groundwater. The Carlsbad desalination plant will also operate 100 percent of the time as a base-load plant and will supply around 9 percent of San Diego's potable water.

In Melbourne, by contrast, the final stages of construction of the 120 million-gallon-per-day Victorian Desalination Plant (Australia's largest) were marred by the impact of heavy rainfall when the drought broke.

While there was some questioning of the need for the plant by Australia's "Monday morning quarterbacks," the reality was that Melbourne's main dam was down to just 20 percent. Had the drought continued, Melbourne could have run out of water. Now, just three years after the rain, Victoria is once again in the grip of drought (as is all of inland eastern Australia) and media comment is now about Melbourne "looking to the desalination plant for its water security."

We are aware that there is some concern in California that seawater desalination plants might impact on the marine environment. Western Australia's experience with the Kwinana desalination plant over the past nine years provides clear evidence those fears are without foundation. The Kwinana plant is located in a semi-enclosed bay with a low-velocity open intake and concentrate return diffuser system. Operating at 100 percent flow for all those nine years, the open intake has had no effect on the fisheries of Cockburn Sound, and the highly monitored outfall diffuser system has had no adverse impact on the marine environment. In fact, the diffuser pipework looks like an artificial reef and is a haven for a large diversity of marine life.

Our real-world experience in Western Australia leaves us in no doubt that the Carlsbad desalination plant will be a great success. We learned that it is important to develop a diverse portfolio of water resources that act independent of weather and climate, including desalination, recycling and conservation, and the entire San Diego region will benefit from the Carlsbad facility going online.

It will prove to have no adverse impact on the ocean and pave the way for more desalination plants that will bolster the water supplies of California's coastal communities. It will provide a new level of water security to San Diego consumers and justify many times over the persistence of the San Diego County Water Authority and Poseidon in pursuing this significant milestone.

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