

# POSEIDON RESOURCES CORPORATION DESALINATION UPDATE

ISSUE 5 ♦ SPRING 2004

## Carlsbad Looks West For Water

**T**he Carlsbad City Council voted unanimously in January 2004 to proceed with the Environmental Impact Report (EIR) for Poseidon's Carlsbad Desalination Plant at the Encina Power Station.

Poseidon has proposed a \$230 million seawater desalination plant for Carlsbad, which could produce 50 million gallons of drinking water per day. Carlsbad will join the ranks of cities around the world that have turned to the ocean for a drought-proof water supply.

Currently, more than 21,000 desalination facilities throughout the world produce more than three billion gallons of drinking water per day.

The Council's action to prepare the EIR clears the way for gathering the detailed information that the City of Carlsbad will need to review and evaluate the proposed project, and provides for public comment and participation through the process.

The public-private effort would ensure that the City of Carlsbad and its ratepayers receive a contractually guaranteed quantity, quality and price for this critically

needed new water supply, while Poseidon takes the risk of developing, permitting, constructing, operating and financing the facility.

Poseidon proposed the concept of a desalination facility co-located with the power plant more than five years ago. Working with the City of Carlsbad, the concept



grew to include regional considerations. After further refinement, the project has focused again on Carlsbad and surrounding communities, ensuring the benefits of a local water supply to meet the participating water agencies

goals for reliable water for residents and businesses.

The City of Carlsbad and surrounding agencies have the opportunity to purchase water from the plant and guarantee high-quality water at an affordable price for the long-term. Carlsbad will retain land use control for the project and also benefit from improved public access to the beachfront and Agua Hedionda Lagoon.

What happens now? The EIR process is under way, and public hearings and input opportunities will begin this Summer. We invite you to follow this progress at [www.carlsbad-desal.com](http://www.carlsbad-desal.com). ■

## How Do We Get The Next Drop of Water? Public Private Partnerships for Infrastructure

If you have ever sailed on a cruise ship, or served on a United States Navy ship, then you already have experienced the use of desalination technology. Water-thirsty regions of the world have employed desalination technology for many years, resulting in a long track-record of successful projects. Desalination has been part of daily life in the Middle East for decades, and now facilities are operating in Mexico, Spain, Chile, Australia, and the Bahamas, as well as the United States.

As the United States begins catching up to the rest of the world with desal, our communities face the challenges of public infrastructure projects.

Certainly in California, public financing for major infrastructure projects is at a critical stage as State and local governments struggle with the current budget crisis, and try to forestall a water crisis.

Increasingly, local government is looking to private sectors partners to help overcome two of the most significant risks of project development — financing and technology. When the private sector takes the risk of financing, development, permitting, construction, and operation of major desal projects, the public and ratepayers are protected.

When we look for the next drop of water, the private sector can be a valuable partner for getting the job done. ■





Ernie Soczka, Cabrillo Power, welcomes Bob Fenner, President of Carlsbad Hi Noon Rotary

Poseidon Resources Corporation has welcomed visitors to the Carlsbad desalination pilot facility for a first-hand look at turning seawater into high-quality drinking water.

Visitors to the Carlsbad pilot plant, on the site of the Encina Power Station, marvel at the process of taking salty seawater through state-of-the-art technology and turning it into clean, pure drinking water in just 20 minutes.

We were proud to host a recent meeting of the Carlsbad Hi-Noon Rotary members, who took time to tour the pilot plant and sample the water.

Early in March we also held a tour with 120 local residents and members of the San Diego League of Women Voters.

"Having our own source of water is important," said league co-President Beryl Flom, who organized the tour at the Encina Power Plant in Carlsbad to get more people informed and interested in the project. "This business of importing our water (from the Colorado River) is risky," she said. "If the weather turns on us, we're going to be in trouble."

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## First Anniversary Celebration

What a year it's been! Cabrillo Power and Poseidon Resources are celebrating the first anniversary of the sea-water desalination test facility at the Encina Power Station, and it looks like 2003 was a great year for drinking water. The results of our first year of operation are in – and there is success on all fronts:



- Rigorous water quality testing has proven that the desalinated water produced by the pilot plant meets and exceeds standards for high-quality drinking water

- Respected scientists from the Scripps Institute of Oceanography have confirmed that our marine neighbors are not affected by the desal project

- Our saltwater nursery is flourishing – reproduction of our marine neighbors is not effected by the project

Up and running since January 2003, the test facility allows Poseidon to gather data during winter rains and routine lagoon dredging. These conditions are the most challenging for desalination because they increase silt in the water. In addition to helping the project team refine the technical processes associated with desalting seawater at this site, the facility has been pro-

viding a significant percentage the data required for the environmental review and regulatory permitting.

Steve Le Page of M-REP Consulting, a member of Poseidon's Marine Biology Team, designed and monitored a saltwater fish tank that replicated the conditions found in the nearshore environment once the full-scale desalination plant is operating. This test tank became home to many of the animals naturally living near the discharge jetty, including Kelp Bass, Sand Bass, Halibut, and the Red Sea urchin, among others.

Concurrently, the same species were kept in another tank representing their normal seawater condition. After a year of comparing the two groups, the Biology Team found that there was no difference in the health and survivability of the animals held at the slightly higher salinity. Although the final report is in progress, tests indicate that sea urchins could reproduce without any effect at the projected higher levels of salinity and temperature.

Additional testing and study is on-going at the pilot plant, ensuring that desalination in Carlsbad will proceed in an environmentally responsible way. ■



### OUR NEWEST RELEASE!

WE ARE PROUD TO ANNOUNCE the newest release of our Purified Drinking Water From the Sea, March 2004.

**Seawater Desalination On-Site Demonstration Fish Tank**

Understanding the effects to the marine biota resulting from the proposed desalination plant is an important consideration in the environmental review and permitting for the project. The reverse osmosis process used to desalinate seawater generates a by-product with an elevated concentration of natural sea salts. Under full-scale operation, the flow of concentrated seawater from the desalination facility to the marine environment would result in increased salinity of between 1 to 8% in the immediate vicinity of the point of discharge (a maximum of 2.7 parts per thousand [ppt]) and then quickly defuse to background levels after mixing with the surrounding seawater.

Marine fishes and invertebrates are well adapted to deal with changes in their environment. These changes include temperature, salinity, and pressure (resulting from moving to different depths). Changes in salinity can be due to rainfall runoff, which decreases salinity, or conversely, evaporation in shallow lagoons, which increase salinity. Based on existing scientific literature, the maximum salinity levels that will be experienced at the point of discharge are within the tolerance levels of our coastal marine biota.

Tank Set-up: Seawater leaving the Encina Power station's cooling system (33.5 ppt) and the concentrated seawater produced by the desalination process (67 ppt) are combined in the tank to provide a salinity concentration within the expected range of the combined power plant/desalination facility discharge (35.7-36.2 ppt). An overflow drain has been provided to keep the tank level constant.

The species displayed in this tank have been recorded in the vicinity of discharge channel. The species selected for this demonstration are of economic or sport interest, or representative of a diverse and healthy environment. ■

**Species of Economic and Sports Fishing Importance:**

**Kelp Bass (*Paralabrax clathratus*)**

The kelp bass ranges from Washington to southern Baja California. It is a solitary fish found mainly in or near kelp beds and is mostly found at depths between 8-70 feet. Prey items include anchovies, octopi, squid, crabs, and shrimp. The kelp bass is an important sport fishing resource.



**Barred sand bass (*Paralabrax nebulifer*)**

The barred sand bass ranges from Central California to southern Baja California and is usually found on sand bottoms near rocks in waters less than 100 feet. Prey items include small fish and invertebrates.

The barred sand bass is an important sport fishing resource and is one of the most common fish caught in the industry.

**California halibut (*Paralichthys californicus*)**

The California halibut ranges from Washington to southern Baja California and is found mostly on sand bottoms or near rocks from the surf zone to a depth of 600 feet. Juveniles mainly inhabit sandy or mud bottoms of bays and estuaries. Prey items consist of anchovies, queenfish, and other small fish species. This species will move inshore during late winter and early spring to spawn. The California halibut is an important resource to both the sport and commercial fishing industries.



**Red sea urchin (*Strongylocentrotus franciscanus*)**

The Red sea urchin is found on exposed rocky shores from low intertidal to 300 feet. The color of the spines can range from red to black. Brown algae, primarily the giant sea kelp are their primary food source. This species is an important commercial fishing resource.

**Other Species:**



**Yellow Crab (*Cancer Anthonyi*)**



**Bay Blenny (*Hypsoblennius Gentilis*)**



**Sea Cucumber (*Parastichopus Parvimensis*)**



**Aggregating Anemone (*Anthropleura Elegantissima*)**



**Ochre Starfish (*Pisaster Ochraceus*)**



**Bat star (*Asterina Miniata*)**



**Giant Rock Scallop (*Crassadoma Gigantea*)**



**Bay Mussel (*Mytilus Galloprovincialis*)**



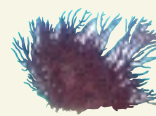
**Wavy Turban Snail (*Lithopoma Undosum*)**



**Chestnut Cowrie (*Cypraea Spadicea*)**



**Giant Keyhole Limpet (*Megathura Crenulata*)**



**Brown Gorgonian (*Muricea Fruticosa*)**



**Sand Castle Worm (*Phragmatopoma Californica*)**



## Community Update

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Visitors got a close look at a pilot desalination plant that has been chugging away in a small, fenced enclosure for a year, drawing water from Agua Hedionda Lagoon and producing about 40,000 gallons per day of drinking water.

We also are proud of our recent affiliation as new members of the San Diego North Economic Development Council. Poseidon was welcomed by Joe Gabaldon, Chair of the Board and Ron Mittag, President, and we look forward to active participation. The mission



Peter MacLaggan, Poseidon Resources senior vice president, describes the desalination process to the San Diego League of Women Voters

of the San Diego North EDC is to actively facilitate strategic leadership initiatives that will drive the cohesive, long-range development of the region, working to carefully grow the economic base of San Diego North by retaining and attracting new business. ■

## Want More Information?

For more information about desalination, please call Poseidon Resources at **(619) 595-7802**.

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