POSEIDON RESOURCES CORPORATION

DESALINATION UPDATE

ISSUE 4 ◆ FALL 2003

Seawater Desalination

STATE-OF-THE ART TECHNOLOGY WITH PROVEN TRACK RECORD WORLDWIDE

Desalination has evolved into a desirable water supply alternative by tapping the largest reservoir in the world – the ocean. Seawater desalination technology, available for decades, is at work in many arid areas of the world such as the Middle East, the Mediterranean, and the Caribbean. The figure below shows the location of the existing desalination plants worldwide.

Desalination plants operate in more than 120 countries in the world, including Italy, Australia, Spain, Greece, Portugal, Japan, China, India, Saudi Arabia, Oman, United Arab Emirates, Malta, Gibraltar, Cape Verde, and Cyprus. Worldwide, desalination plants produce more than 3.5 billion gallons of potable water a day. Earlier this year, the first large-scale seawater reverse osmosis (RO) desalination plant in the United States began operation in Tampa, Florida. Overall desalination plant capacity has increased exponentially over the last 30 years.

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MAJOR DESALINATION PLANTS WORLDWIDE
The United States has 2 major municipal seawater-desalination plants — 1 in Tampa, Fla. and another inactive plant in Santa Barbara, Calif. Other countries with 1 or more large-scale plants are marked with red dots.

WHO BENEFITS FROM PUBLIC-PRIVATE PARTNERSHIPS?

Demand for water grows, the cost of traditional sources grows, but government's ability to advance new solutions does not. Absent creative solutions, the public stands to lose.

That is why Poseidon Resources is developing major seawater desalination plants using public-private partnerships that benefit everyone. Acting as a matchmaker between private innovation and public sector need, Poseidon arranges private sector assumption of the upfront risks of development, permitting, finance, construction and operation, and guarantees the public sector the best project with minimum risk at the lowest price. The ultimate winner is the ratepayer.

Consider the traditional approach of design-bid-build (DBB). The public entity specifies particulars, solicits bids and awards the project (typically) to the lowest bidder. With a DBB, the public entity shoulders all the risk. If a contractor fails to deliver, if the final product doesn't meet specifications or fails after a short period of time, if permitting cannot be accomplished, then there is significant cost that must be passed along to the entity's customers.

Our alternative is the design-build-own-operate-transfer (DBOOT) model tied to a water purchase agreement. Poseidon guarantees the desalination plant will deliver. In fact, we get paid only when water is delivered at agreed-upon levels of quality, quantity and timeliness.

The public agency wins with timely delivery of a new supply, with price certainty, while maintaining oversight of the project. The overall effect is reducing ratepayer risk for cost, schedule and performance issues.

Given the increasingly urgent need for new, reliable sources of water and increasingly squeezed public sector budgets, could there be a more elegant solution? We don't think so. ■

Poseidon Resources and Cabrillo Power Win APA Award for Desalination Demonstration Plant

SAN DIEGO – In May, Poseidon Resources Corporation and Cabrillo Power 1, LLC were honored with the American Planning Association (APA), San Diego section award for Innovative Use of Technology for a seawater desalination demonstration facility in Carlsbad. The facility is a testing and education project designed to validate technology, test environmental impacts, and educate the public and key stakeholder groups.

By winning the local award, the facility is automatically entered in the APA's statewide awards competition.

The award-winning, 36,000-gallon-per-day plant is located on the grounds of Cabrillo's Encina Power Station where Poseidon is planning to build a 50-million-gallon-per-day (mgd) desalination facility. Poseidon is discussing a public-private partnership arrangement with the San Diego County Water Authority and the City of Carlsbad to build the full-scale project, which could be producing high-quality drinking water by 2007.

"Since going into operation this past January, the demonstration facility has resoundingly proven the viability of seawater desalination," said Poseidon Senior Vice President Peter M. MacLaggan. "After processing millions of gallons of seawater and conducting thousands of analytical studies, we are confident of our ability to meet or exceed all State and Federal drinking water standards and maintain an environmentally friendly operation," he added. ■

Agua Hedionda Lagoon Foundation

Protecting a Precious Resource

The Agua Hedionda Lagoon Foundation was established as a non-profit organization in the early 1990's to serve as a steward representing and protecting all interests in and around the unique Carlsbad lagoon.

Located near Tamarack Beach, the lagoon supports a variety of enterprises and uses in its three distinct sections. The inner and largest section of the lagoon hosts Snug Harbor, offering motorized and passive watercraft and water-skiing. The middle lagoon is used by the Magdalena Ecke Family YMCA, and the outer lagoon is home to both the Hubbs-Seaworld Research Institute and the Carlsbad aquafarm.

An important facet to this multi-use lagoon is Cabrillo Power LLC's steam turbine generating plant that uses intake water from the outer lagoon. Cabrillo Power's routine operations, maintains tidal exchange and ensures a healthy, vibrant body of water. Cabrillo Power was recently awarded the prestigious Award of Excellence from National Oceanic and Atmospheric Administration (NOAA) for its environmental stewardship.

The Agua Hedionda Lagoon Foundation has welcomed Poseidon Resources as a lagoon partner in protecting this precious resource.

Poseidon Resources has shown a strong interest in working with the Lagoon Foundation and playing an active role in supporting the lagoon's overall environmental quality. The Foundation's Board of Directors voted unanimously to support the proposed desal facility, which is another compatible use that will keep the lagoon thriving. "The Foundation sees great potential in raising the bar on public water quality awareness through promoting the lagoon as a point source for drinking water," states Kent Bricker, current President of the Foundation. ■

Local Officials Tour Carlsbad Desalination Project

POSEIDON RESOURCES has created a fully operational desalination pilot plant on site at the Encina Power Plant. Local officials and media representatives have been touring the facility for a first-hand look at the process.

The pilot unit is a reduced version full scale 50 mgd facility that is planned, and currently produces 36,000 gallons of desalinated water per day. By running the scale model under the same conditions that will be present for the full-size plant, Poseidon is able to demonstrate the success and reliability of the technology and confirm the environmental safeguards of the project.

Visitors to the pilot plant see the intake area where seawater comes in from the Pacific Ocean, then watch as the process turns it into high-quality drinking water in 20 minutes and they then enjoy the "taste of tomorrow" at the end of the tour. The visitors have the opportunity to observe the on-site aquarium that is home to the most sensitive local sea dwellers, flourishing in the combined discharge from the power plant and the desalination facility. ■

Photo 1
Left to right:

Bruce Reznik
Bay Keeper

Bernie Rhinerson
SDCWA Board Chairman

Assemblywoman Christine Kehoe

Walter Winrow
Poseidon Resources

Photo 2
Left to right:

Ann Kulchin
Carlsbad City Council Member

Robert Greaney
City of Carlsbad Water Utilities

Ramona Finilla
Carlsbad City Council Member

Photo 3
Left to right:

Bernie Rhinerson
SDCWA Board Chairman

Congressman Duke Cunningham

Walter Winrow
Poseidon Resources

Photo 4
Left to right:

Paul Lewis
SDCWA Board of Directors

Bernie Rhinerson
SDCWA Board Chairman

Mayor Bud Lewis
Carlsbad Major
SDCWA Board of Directors

San Diego County Water Authority Board of Directors

Seawater Desalination *Continued from page 1*

Historically, the key concern related to the use of seawater desalination in a large-scale has been the high cost of water production. Cost-saving innovations in technology are transforming the once expensive option into a fiscally viable alternative. The developments in membrane technology and energy recovery during the past decade, combined with construction of large capacity plants, co-location with power plant facilities, and enhanced competition by using Design-Build-Own-Operate-Transfer project delivery have resulted in a dramatic decrease of the cost of desalinated water.

Concurrently, prolonged drought, dwindling sources such as Colorado River and Bay Delta water, and more stringent treatment requirements are driving up the costs of water and triggering the need for alternative local supplies.

The time is right for a new focus on seawater desalination, particularly as a feasible and attractive new supply option for Southern California. ■

Want More Information?

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

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