



CITY OF SANTA BARBARA DESALINATION FAQs

About Santa Barbara's Desalination Plant

Who is Charles E. Meyer and why is the plant named after him?

Charles E. Meyer served as a Water Commissioner for the City of Santa Barbara for 17 years and as chairman of the Water Commission for 5 years. The plant is named after him for his passionate dedication to the development of more resilient water supplies for the City and his instrumental role in the selection, siting, and completion of the initial desal facility.

Why does the City need a desalination plant?

The City of Santa Barbara relies on multiple water sources to meet customer's needs—including surface water from Gibraltar Reservoir, Cachuma Reservoir, and the State Water Project, as well as groundwater and conservation. With the constant threat of natural disasters (i.e., earthquakes, wildfires, droughts), some of these sources can be less reliable or unavailable, making desal water a key addition.

How does desalination work?

Seawater enters the City's desalination facility from 2,500 feet offshore, passing through wedge wire screens with 1 mm openings (see photo on page 2) at velocities of less than half a foot per second, which is less than typical ocean currents. Once onshore, the seawater passes through a series of filters that remove sediment, bacteria, viruses, and minerals from the water. The water is then pushed at a high pressure through reverse osmosis membranes to remove salt and other minerals.

Before the finished water is ready to be pumped into the water system and distributed to customers, natural minerals are reintroduced into the water to make it compatible with the City's other water supplies. The waste product from the desalination process, referred to as brine, is about twice as salty as normal seawater. The brine is blended with the City's treated wastewater and is discharged into the ocean over a mile and a half offshore. Discharge flow rates of brine and treated wastewater leaving the City's outfall pipe are controlled to protect sea life and comply with state regulations.

How long does it take for a drop of seawater to go from the ocean to the City's drinking water system?

It takes approximately 1.5 hours from seawater entering the intake structure to the time potable water enters the City's distribution system.

What percentage of the City's water supply does the desalination plant provide?

The plant produces 3,125 acre-feet of water per year, which is approximately 30 percent of annual City demands. Extraordinary water conservation from residents and businesses will remain critical to meeting water demands during the current drought.

Has desalination technology improved since the original plant was constructed?

The reactivated plant uses 40 percent less energy than the original plant by using high-efficiency pumps, motors, and improved filter technology, which greatly reduces its electricity demand and carbon footprint.

Did the City consider subsurface intakes?

Yes, the City conducted a study that found subsurface intake, in which pipes are installed under the ocean floor,

infeasible due to several factors including geology and ocean floor movement.

How much desalinated water should water customers expect to receive?

Depending on water supplies, water demands, and where customers are located in Santa Barbara, customers should expect to receive some combination of surface water supplies from Cachuma and Gibraltar reservoirs, the State Water Project, groundwater supplies from City wells, and desalinated water. Please see our [desalinated water distribution map](#).

What is the maximum permitted capacity of the desalination plant?

The desalination plant is currently designed to produce 3, 125 acre-feet per year (AFY) or approximately 3 million gallons of water per day. The City's permits allow for up to 10,000 AFY or approximately 10 million gallons per day.

What does the intake look like?

The ocean intake pipes are equipped with wedge wire screens recognized by the State Water Resources Control Board as a best available technology for screened ocean intakes. The screens are made of durable copper-nickel alloy and have 1 millimeter openings to minimize marine life entrainment and impingement.



Is conservation still needed now that we have desal water?

Desalinated water alone cannot solve all of our water challenges; the City continues to examine all opportunities to increase the quantity and improve the quality of our water supplies. Conservation will continue to be an important part of ensuring a sustainable water supply for Santa Barbara. The impacts of our current drought are expected to linger even after the drought has ended as it will likely take five to ten years of normal rainfall to recharge local groundwater basins.

How many people work at the plant? Is it staffed 24/7?

The plant has a staff of 12 people. There are state-certified plant operators onsite running the plant around the clock when the plant is in production.

Are plant tours available?

Recurring plant tours will be offered starting in fall 2018. [Check here](#) for updates.

Desal Water Quality

What changes should water customers expect related to desalinated water?

The most notable difference with desal water is that it is generally softer. Softer water contains lower levels of naturally occurring calcium and magnesium, meaning it could eliminate or reduce the use of water softeners for some customers, and may require some businesses to change their private water conditioning system settings. This [map](#) depicts the approximate region and percentages of desal water that will be delivered to City of Santa Barbara water customers. Some customers may also experience seasonal changes in their water quality when the blending of desal water, groundwater, and surface water supplies fluctuates.

How does the City treat desalinated water to ensure it does not cause corrosion or other negative impacts to water pipes or supporting infrastructure?

The desal treatment process includes water conditioning—the addition of powdered lime—to harden the water to make it compatible with the water distribution system. The City is also performing ongoing lead

and copper monitoring and corrosion testing in the distribution system to ensure the desal water has no negative impacts to the City's water pipes and supporting infrastructure.

How often is the water quality tested?

The water quality is continuously monitored by analyzers, combined with multiple, daily sampling performed by the plant operators or our contracted accredited laboratory.

Would a red tide or algal bloom in the ocean affect the desal water quality or treatment?

A red tide or algal bloom would not affect the plant's finished water quality as these contaminants could not pass through the reverse osmosis (RO) membranes. If the algal bloom concentration becomes too high, it could affect the pre-treatment filtration efficiency of the plant. If this happens, the plant could be shut down until the algal bloom has subsided to prevent damage to the treatment equipment (i.e., fouling of the RO membranes).

Would an oil spill in the ocean affect the desal water quality or treatment?

The seawater intake structure is located on the bottom of the ocean, and oil naturally floats on the ocean's surface. However, in the event of an oil spill, the desal plant would likely be shut down to protect treatment equipment.

Reactivation and Long-Term Plans

Why did the City put the original plant into long-term storage?

When the original facility was constructed in 1991, the desalination process technology only allowed relatively short periods of inactivity before the reverse osmosis membranes (used for treatment) began to deteriorate. Due to sufficient surface supplies and significantly reduced demand following the drought, the City put the plant into long-term storage, since this was the most cost-effective option for ratepayers. Significant technological advances have been made since that time.

How much does desalination cost?

The costs for the desal plant and other water supplies are included in customer rates and charges. The cost to reactivate the plant is approximately \$72 million. With better loan terms and an improved design that saves on operating costs, the annual cost of desalination is less than originally estimated. Annual operating costs are estimated to be about \$4.1 million at full production (for 3,125 AFY of water supply), and about \$1.4 million in non-operation or standby mode. The plant could be put in standby mode during certain periods to reduce operating costs. Additionally, the City received a \$10 million Proposition 1 grant approved by voters in 2014, which significantly reduces costs to our water customers.

Why did the desalination plant construction and reactivation cost more than originally budgeted?

There were unforeseen conditions, such as contaminated soils that had to be remediated, and subsurface infrastructure planned to be reused had to be replaced. The unanticipated construction challenges for the desal plant required an additional investment of \$15 million. While this is a substantial increase, these funds are necessary for successful plant completion and an investment in securing Santa Barbara's water supply future.

How will the desalination costs be financed?

The City has taken out a State Revolving Fund Loan to finance the \$72 million capital cost to reactivate the desalination plant. The terms of this loan are a 20-year payback period with a 1.6 percent interest rate, which results in annual payments of approximately \$4.2 million.

What happened to the money when the City sold off the original membranes?

When the 1990s desalination plant was put into long-term storage, a portion of the reverse osmosis membrane treatment equipment was sold, reducing the capacity of the originally planned regional facility to the capacity required for the City's needs only. The sale helped to recover the City's costs associated with permitting of the permanent facility, and also reduced the long-term costs to rate payers for maintaining the facility.

Will the desalination plant be operated after the drought?

The City's current adopted policy considers desalinated water as a drought supply. However, the City's existing permits allow for a range of operating scenarios that could include non-drought operations. When the drought emergency ends and our groundwater supplies have recovered from drought-related pumping, the role of desalinated water in the City's Long Term Water Supply Plan will be considered by the City Council. The City Council is expected to engage in this policy discussion as part of the next Long-Term Water Supply Plan update.

Is the desalination plant a regional facility?

Currently, the City is the sole owner of the plant and has continued to renew its permits since the original construction in 1991. The desalination plant could potentially be expanded to serve as a regional water supply facility to benefit other South Coast communities. Regionalizing the desal plant could be accomplished through approval of water supply agreements and exchanges with other South Coast water agencies. At the time of construction in 1991, Montecito Water District and Goleta Water District were partners in the temporary desal plant project. To make the facility a permanent water supply, an extensive environmental review and permitting process was required. When the review and permitting efforts were completed in 1996, Montecito Water District and Goleta Water District declined to participate in the project further and did not pay for the process of making the facility permanent.