



# Ocean-Water Desalination: A Solution or a Problem?

## What is desalination?

- ◆ Desalination is the process of removing salts and other minerals from otherwise undrinkable water to produce freshwater for human consumption and other uses.
- ◆ To produce this fresh water, desalination facilities withdraw enormous amounts of brackish or seawater through large pipes along (“surface”) or beneath the seafloor (“subsurface”).

## What happens to the remaining water and salt that is removed?

- ◆ Extracted salts, minerals, and a percentage of source water mix to form a hyper saline slurry commonly referred to as brine. Brine has a much higher salt concentration compared to salt water, which creates disposal challenges.
- ◆ Brine waste is commonly disposed of in the ocean. To reduce environmental impacts during disposal, brine can be mixed with other water sources to reduce salinity and/or discharged through diffusers. Diffusers stimulate brine mixing with ocean water and are used to disperse brine at several different discharge points from desalination facilities.



Desalination plant in Lanzarote, Canary Islands.

## What are the environmental impacts of desalination?

- ◆ Most forms of desalination are energy-intensive. Desalination has the potential to increase fossil fuel dependence, increase greenhouse gas emissions, and exacerbate climate change if renewable energy sources are not used for freshwater production.
- ◆ Desalination surface water intakes are a huge threat to marine life. Mature fish, larvae, and other marine life can be significantly injured or killed when they become trapped or sucked into open water surface intake pipes.
- ◆ The State Water Resources Control Board estimates that open ocean intakes used by coastal power plants in California kill 70 billion fish larvae and other marine life on an annual basis. These same open ocean intakes are being proposed for use at desalination plants throughout California.
- ◆ Brine waste also poses a potential threat to marine life and water quality, as it contains dangerously high concentration of salts and other minerals. Because of its high density and salinity, brine waste can accumulate in and around disposal areas smothering bottom dwelling species and significantly altering coastal ecosystems.

## Why isn't desalination the solution to our water problems?

- ◆ Desalination's energy-intensive process is expensive and environmentally harmful, making it a costly strategy to bolster regional water supplies. The average price per

acre foot of desalinated water is often 2-4 times more expensive than other water sources.

- ◆ Ocean desalination is not efficient. It requires roughly two gallons of ocean water for every one gallon of freshwater produced. This means one large desalination facility is not going to solve regional water supply problems.

### Are there alternatives to desalination?

- ◆ Water conservation, water use efficiency, storm water capture and reuse, and recycled water expansion are proven effective strategies to increase regional water supplies and often cost less than desalination. In addition, these alternatives provide pollution abatement, habitat restoration, and flood control benefits, which are commonly overlooked during cost/benefit assessments.

### What is Heal the Bay's stance on desalination?

- ◆ Before desalination is even explored, it is important that water conservation, water use efficiency, storm water capture and reuse, and recycled water expansion are maximized.
- ◆ Each day roughly 10 million gallons of urban runoff flows through Los Angeles County stormdrains, picking up pollutants and eventually reaching the ocean without the benefit of any treatment. That volume raises to 10 billion gallons during a rain. Capturing, treating, and reusing this water could be a significant local water source.
- ◆ Hyperion Wastewater Treatment Facility releases more than 250 million gallons of treated water into Santa Monica Bay every day. If all of Hyperion's water was treated to a higher standard and reused, it could substantially reduce the region's reliance on imported sources while simultaneously creating a new source of local water in the region.
- ◆ If desalination is pursued as a freshwater source, it must use the best available technology to minimize marine life impacts. The State Water Resources Control Board recently adopted a desalination policy requiring desalination plants in California to use subsurface intakes, or minimize their marine life impacts via surface intakes to a level consistent with subsurface intakes.
- ◆ The marine impacts from ocean desalination facilities can be significant; we want to ensure that these impacts are avoided at all costs.

