

Integrated Water Strategy Desalination

May 2007

What is desalination?

Desalination is the process of making salty water drinkable¹. It is used widely around the world. The most common methods of desalination are thermal processes and reverse osmosis.

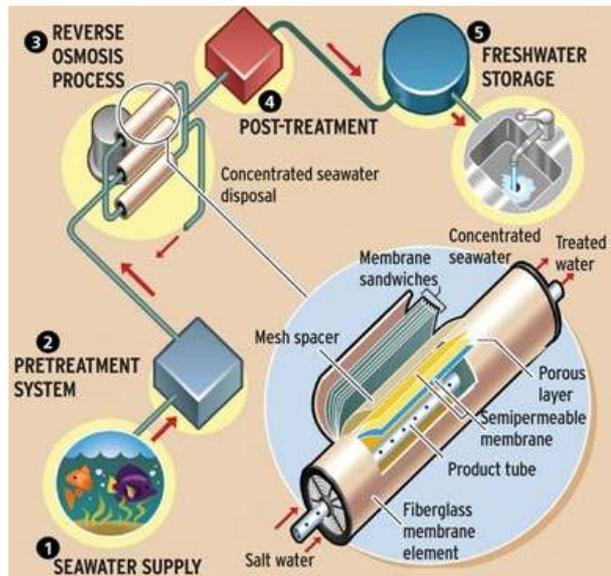
Taking salt out of water

Distillation: Boiling salty water and condensing the steam, or even just putting a dish of water in the sun and collecting the vapour on a clear cover are both very simple methods of distillation. Commercial desalination plants have been operating for decades, using the distillation process.

Membrane processes: A more recent development, and now more widely used, this process relies on what is called a semi-permeable membrane to separate salt from water. A synthetic membrane is made with pores so tiny that water molecules can pass through it, but other molecules, especially salts, cannot.

This separation does not happen easily though, and it requires very high pressures to force the water through the membrane. A natural process, called osmosis, operates in all living cells, to equalise the salt concentration on either side of the membrane. Because the process for desalination is the exact opposite, it is called reverse osmosis, or just RO.

A pre-treatment step is required before RO to provide high quality water and reduce membrane fouling. The most common pre-treatment steps include coagulation and filtration or microfiltration. ***This is the option we are considering for Agnes Water.***



Environmental Impacts

Energy use: The desalination process is very energy intensive and leads to greenhouse gas production.

Waste salt: The remaining salt needs to be disposed of appropriately, although coastal communities have a significant advantage over inland communities with regards to disposal options.

Where else do they use desalination?

Desalination plants are increasing worldwide with the reduction in capital and operating costs, and improvements in energy efficiency of RO systems. The Middle East is still the largest user of desalination and seawater desalination plants with capacity over 300 ML/d are being constructed there. There is increasing use in Europe in countries such as Spain and in North America with plants of over 100ML/d capacity in the Caribbean.

1. Australian Water Association

**For further information contact:
(07) 4974 6222**

