

## **DESALINATION OF SEA WATER – A NEW LIFE LINE OR AN EXPENSIVE PIPEDREAM?**

*Desalination has been touted as the saviour for Australia's current water shortage. Will it solve our long term water supply problems in Australia or will it be an expensive pipe dream?*

Desalination is the conversion of sea water into fresh drinking water through a process called **reverse osmosis**.

Saudi Arabia has long been using desalination plants for nearly all their drinking water. They have invested billions of dollars into their system.

Australia with its current water shortage is now starting to research it, but is it a case of "too-little, too-late?" Has the horse bolted, before we shut the gate?

Currently in West Australia (W.A) there is a proposal underway to build a \$360 million desalination plant in Kwinana in Perth. A \$4 million research project has been completed which has given the green light to build the plant in Kwinana, an industrial suburb of Perth.

Victoria has a similar proposal and is currently conducting a research and feasibility study with N.S.W to follow suit.

- Sydney is believed to have only 2 ½ to 3 years of water left, at the current rate.

In this article we take a brief look at the Desalination plant that is about to be built in Perth Western Australia, where it will be able to convert sea water to fresh water.

### **How do we convert sea water into fresh water?**

There are a couple of ways to convert sea water to fresh.

1. Boil sea water and collect and condense the steam. This requires a lot of energy.
2. An improved technique is to pump sea water through membranes, which trap the salt molecules and produces clean fresh water. This is known as **reverse osmosis**.

### **How do we know its going to work?**

On Rottnest Island just off the West Australian coast a small scale version has been running over the past few years.

- Filtered sea water is pumped using a high pressure (to an equivalent of 600m below sea level) pump
- As its being pumped, 6 membranes within the pipe, block larger salt molecules.
- An equivalent of two standard salt sachets (like the ones used to salt your food in takeaway restaurants) removed per glass of water.
- The removed salt brine is then pumped back to sea.

The desalination plant meets 70% of the island's needs, and is powered by a 100kw source which provides 500 kilolitres of fresh water per day (18.3 Megalitres per annum).

A 600kw wind generator on Rottnest Island provides power for rest of the island and also the desalination plant.

**Kwinana Plant**

- The Kwinana plant will be 25 Megawatt which is 250 times the size of the Rottnest Island plant and will provide 50 Gigalitres per annum.
- The plant will also contribute 100,000 tonnes per year of greenhouse gases.

To combat the contribution of greenhouse gases, 20,000 cars will have to be removed from the road or an extra 8,000 hectares of trees (or an equivalent of 9 sq kms) will have to be planted, which the W.A Government is currently examining.

To get the equivalent power source for this desalination plant, the W.A Government will have to set-up over **40** wind generators, the size of Rottnest's islands, just to meet the power demands of the plant.

**Cost per glass**

The cost per glass of desalinated water will be 0.004c, which compares well with the current price of 0.003c per glass using the current system of water supply.

- However the cost to the environment does not reflect this price.

**Conclusion**

The new desalination plant for Kwinana is planned to be completed by October 2006. But who will build it? The W.A Government still hasn't secured a tendered contract partner to build it.

- The 50 Gigalitre per annum capacity falls way short of Perth's current water demand of 1300 Gigalitres per annum.
- There will be a huge impact on the environment, at a time when we need to consider cutting Greenhouse gas emissions not increasing them, for the sake of everyone on the planet.

Considering that agriculture, industry, evaporation and wastage contribute to 88% of our water usage [See Table 1], shouldn't we focus on the causes of water shortage rather than just providing an expensive cure?

<b>Market Sector</b>	<b>Percentage</b>
Agriculture	70%
Domestic	12%
Industry	9%
Other (eg. evaporation, wastage etc.)	<10%

**Table 1:** Water usage in Australia in 2004 [Source: ABC TV: Landline Program]

Will this become a futile exercise in our struggle for life in Australia or the sign of a new horizon and a brighter future?

---

*Source: ABC TVs- Quantum Program*