

VICTORIAN DESALINATION PROJECT

FACT SHEET

December 2016

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FOR SURE.**

WATER TREATMENT PROCESSES

Just like drinking water supplied from water catchments, desalinated water is also treated to ensure the highest drinking water standards.

What sort of desalination technology is used at the plant?

Reverse osmosis technology is used at Victoria's desalination plant. It is more energy efficient and less visually intrusive than other methods.

What sort of standards does water produced at the desal plant need to meet?

All drinking water produced by the desalination plant must meet strict quality standards.

These standards are included in AquaSure's contract. They are set by the water authorities, and comply with the World Health Organisation Guidelines for Drinking Water Quality, the Australian Drinking Water Guidelines and Victorian health requirements.

How will my local water authority know if desal water meets the standards?

The quality of the desalinated water is continuously monitored online at various stages of the production process.

This monitoring ensures that water does not leave the plant unless it complies with the required standards.

In addition to this, the plant's transfer pipeline is fitted with seven delivery points, so that water authorities throughout Melbourne, South Gippsland and Westernport can all receive water from the desalination plant if and when they need it.

Each delivery point is equipped with a sophisticated water quality monitoring station, to enable your local water authority, DSE and AquaSure to monitor the quality of the water they are receiving in real-time.

If the water doesn't meet the required standards, it will not be accepted – it's that simple.

DID YOU KNOW?

The Perth Seawater Desalination Plant turns seawater from Cockburn Sound into nearly 140 megalitres of drinking water per day.

The plant opened in November 2006, becoming the first plant in Australia to provide desalinated water for large scale public consumption.

Today, the plant provides 17% of Perth's water needs.

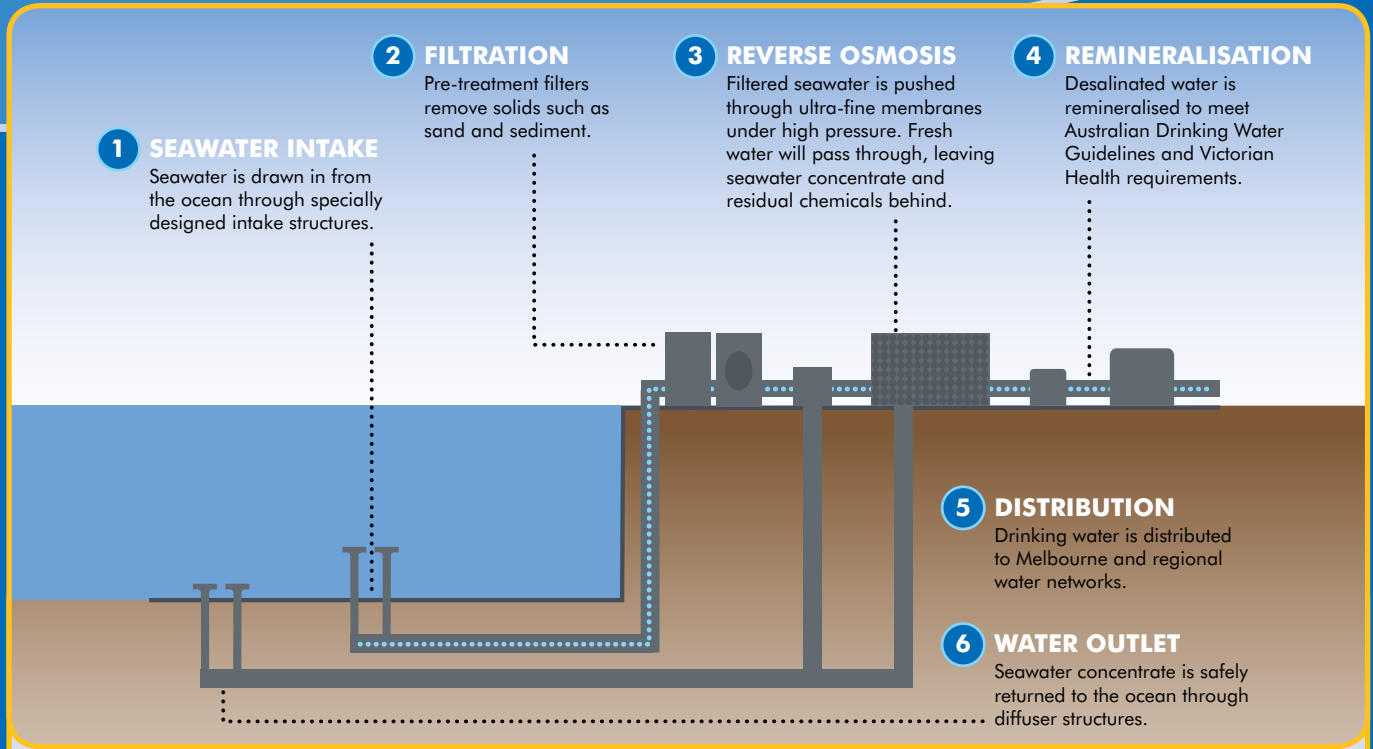
It uses the same desalination technology and the same treatment processes that are being used at Victoria's new desalination plant.



Lime treatment at Perth's desalination plant

HOW IS DESALINATED WATER TREATED?

The chart below explains the six basic stages of desalination, where chemicals are added and where they are removed. The final drinking water product will be exactly the same as your current drinking water supply.



Stage	Process	What's added?	Purpose
1	Seawater intake	Sodium hypochlorite (bleach)	Periodic chlorination to control biological growth inside seawater intake tunnel.
		Sodium bisulfite	Neutralises seawater after chlorination process.
2	Filtration	Ferric sulphate (coagulant)	Binds small particles together, making them easier to filter out.
		Polydadmec (coagulant aid)	Maximises performance of coagulant.
		Sulphuric acid	Lowers pH of seawater to maximise performance of coagulants.
3	Reverse osmosis	Anti-scalant	Prevents build-up on reverse osmosis membranes.
		Sodium hydroxide (caustic soda)	Maximises performance of reverse osmosis membranes.
		Sodium bisulfite	Preservation of membranes which are out of service.
		Membrane cleaning chemicals (caustic, detergent, acid)	Periodic cleaning of offline membranes.
<i>At this point, any chemicals used during the water treatment processes have been removed by the RO membranes, or completely neutralised.</i>			
4	Remineralisation	Hydrated lime and carbon dioxide	Stabilises desalinated water and corrects pH.
		Sodium hypochlorite (bleach)	Chlorination to safely disinfect water.
		Fluorosilicic acid	Fluoridation of drinking water is required under the <i>Fluoridation Act 1973</i> to help prevent tooth decay.
5	Water distribution	Nil	
6	Seawater concentrate outlet	Nil	

Does water from the desalination plant need to be mixed with other water sources before we drink it?

No. Water will be ready to drink as soon as it leaves the desalination plant. This is a requirement of AquaSure's contract.

Are any chemicals used to treat the water?

Yes. Treatment involves the use of a number of chemicals at different stages of the desalination process, each one for a different reason.

These are the same chemicals that are commonly used in drinking water treatment facilities all over Australia and around the world.

The table on the previous page lists the chemicals used, when and why. They all play a specific role in ensuring the water you receive is clean and hygienic.

Will all of those chemicals end up in my drinking water?

The desalination plant uses the same remineralisation process as any other drinking water treatment plant.

The drinking water produced by the plant is exactly the same as your current drinking water supply.

Will my water taste different?

Taste testing and experience from other Australian capital cities indicate that customers will not notice a difference in the taste of water.

How are the chemicals used in the treatment process be transported to site?

All chemicals are transported to site in trucks by appropriately certified contractors.

These companies transport chemicals to a wide range of different companies on our roads, every day of the week.

What kind of waste does the plant produce?

The desalination process generates two main waste streams – liquid waste (seawater concentrate or 'brine') and solid waste.

Seawater concentrate is returned to the ocean at the end of the desalination process, while solid waste is trucked away and disposed of at an offsite waste facility.

What is seawater concentrate?

For every litre of seawater that enters the desalination plant, around half is converted to drinking water, and the rest returned to Bass Strait.

Seawater concentrate contains seawater not used in the desalination process, salt and other elements that already occur naturally in seawater.

No active chemicals are present.

Will the seawater concentrate harm marine life?

Seawater concentrate is returned to Bass Strait through two outlet structures.

These structures are specially designed to rapidly dilute seawater concentrate into the ocean, ensuring the protection of marine life.

Detailed modelling and scientific research has been approved by the EPA and verified during commissioning.

The design of the outlet structures is based on those at other desalination plants, like the one in Perth.

Evidence from these plants suggests that the small area in which the seawater concentrate is dispersed will provide habitat for salt tolerant species such as mussels, sponges and some ascidians.

Video footage of marine life co-existing with marine structures can be viewed on the internet.

Is a permit required to discharge the seawater concentrate into Bass Strait?

Yes. Any form of discharge into public waters requires permission from the EPA.

The EPA issued an approval for the commissioning activities, under Section 30A of the Environment Protection Act 1970. The approval outlined the conditions under which commissioning activities had to be carried out.

Ongoing operations are carried out under a discharge licence issued by the EPA.

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What is solid waste?

Solid waste comprises primarily mineral matter, some organic matter filtered out of the seawater, and traces of chemicals added during the filtration stage.

One of these chemicals is ferric (iron) sulphate, which gives the solid waste a rusty red colour.

Ferric sulphate is a common coagulant used in many water treatment facilities around Australia and throughout the world.

It is used in the pre-treatment process to make particles in water bind together so that they can be filtered out.

Would the solid waste ever be disposed to the ocean?

No. This would be a significant violation of EPA guidelines and the environmental performance requirements for the project, and would put AquaSure's license to operate at serious risk.

It is also not physically possible. The solid waste looks and feels like soft clay, and the plant is simply not equipped with the infrastructure required to discharge such material to the ocean.

Can the solid waste be used for other purposes?

If it weren't for the salt content, the solid waste could be beneficially reused as an additive for soil remediation, as currently occurs elsewhere in Australia.

However, it currently has no beneficial reuse and will be disposed of at an off-site waste facility.

Strenuous efforts have been made to minimise the generation of this waste, and AquaSure is focussed on an ongoing program for developing and achieving beneficial reuse solutions in the near future.

Why can't the salt be removed from the solid waste?

There is currently no proven technology available to remove salt from solid waste at an industrial scale.

Finding a way to do so is the subject of extensive research by desalination and sustainability researchers all around the world.

What is the classification of the solid waste?

The solid waste has been classified as general industrial waste in accordance with EPA guidelines. This is consistent with other large desalination plants operating in Australia.

How much solid waste is expected to be produced?

The Environmental Effects Statement (EES) estimated that around 23 to 63 wet tonnes of solid waste would be produced by the plant each day.

AquaSure's design has minimised this quantity to the lower end of this range.

The plant will produce around 20 to 40 wet tonnes per day of solid waste, or about four garbage trucks per day.

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