VICTORIAN DESALINATION PROJECT

FACT SHEET

AQSFS001002

THE DESALINATION PROCESS

Desalination is the process of removing salinity (dissolved salts) from a salt water source.

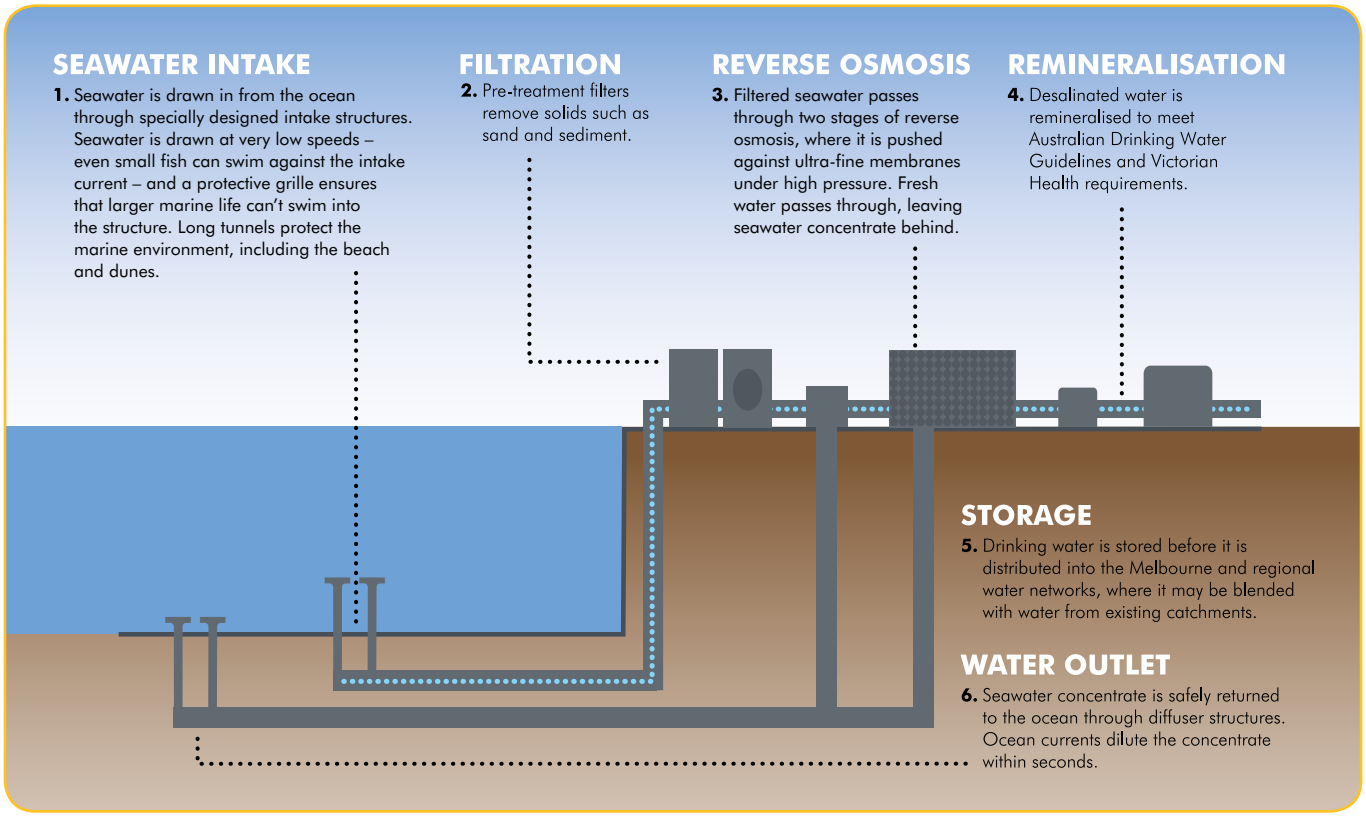
It has been commonly used for more than 100 years in dry climates such as the Middle East, Spain, Malta, Cyprus and parts of the United States where access to traditional water supplies is limited.

In Australia there are large-scale desalination plants in Sydney, Perth, the Gold Coast and Adelaide, as well as the Victorian Desalination Project at Wonthaggi.

Various methods can be used to desalinate seawater. Reverse osmosis technology is used at the Victorian Desalination Project as it is more energy efficient and less visually intrusive than other methods.

Reverse osmosis is the process where pressure is applied to water to force it to move from an area of higher salt concentration to an area of lower salt concentration. Salt water is pushed against fine membranes under high pressure to separate the salt and water molecules.

Each reverse osmosis membrane has a surface area of 40.9 square metres. The membrane material is wrapped rather like a closed umbrella inside each cylinder.



WATER NOW AND FOR THE FUTURE. FOR SURE.

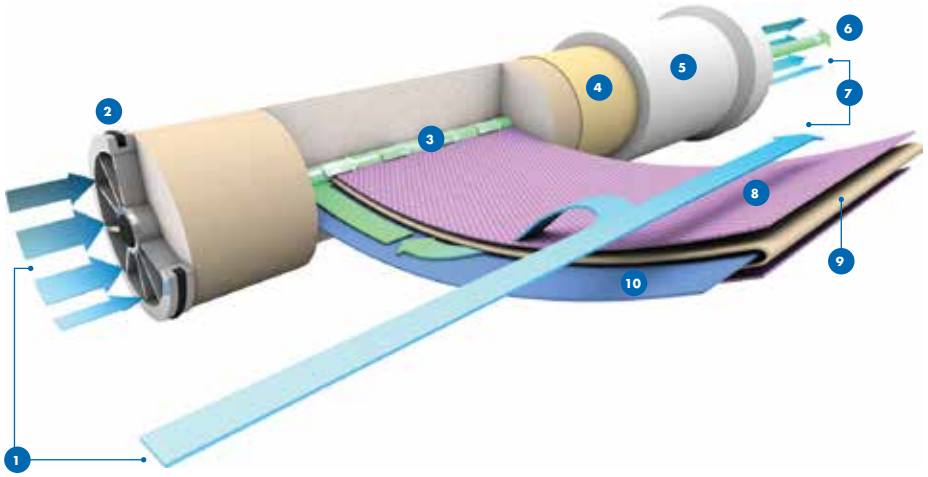
The Victorian Desalination Project uses a two pass reverse osmosis process to remove minerals and salts and produce a product that meets strict water quality requirements.

The major benefit of desalination is that it can continue to deliver high quality drinking water even if there is no rain.

Did you know...

- The VDP can produce up to 440 megalitres of water per day
- 650 metres head pressure is involved in the reverse process. This is the equivalent of being 650 metres below the sea surface. A fire hose generally operates at about 290m head pressure. A human being can only survive to about 120 metres depth
- 440ml of freshwater is produced from 1000ml of seawater
- Salt water contains 3.7% of salt compared with 0.012% in drinking water
- It takes 12 hours for the desalinated water to move through the underground pipeline to Cardinia, at full flow
- The water takes 20 minutes to move through the two-pass reverse osmosis system
- The intake flow rate of the seawater is very slow – taking 20 minutes to move through the tunnel and get to the plant – travelling at 3.5 km per hour (half normal walking speed)

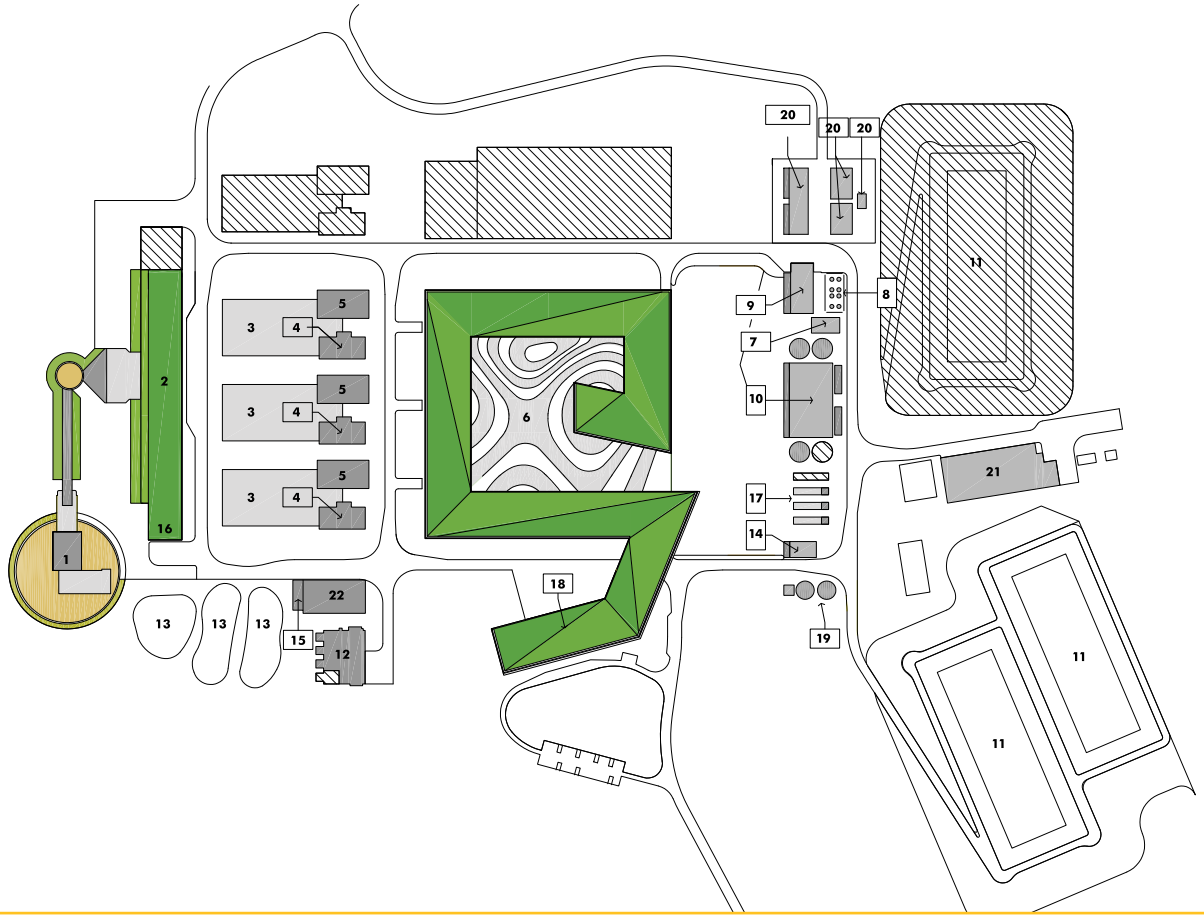
Reverse Osmosis Membrane



1. Seawater
2. Brine seal
3. Permeate collection tube
4. Reverse osmosis (RO) membrane housing
5. Pressure vessel
6. Permeate
7. Concentrated sea water/brine
8. Brine side spacer
9. RO membrane
10. Permeate side

Reverse Osmosis Processing Plant

This is a plan view of the layout of the reverse osmosis processing plant. Water moves through the process from left to right. It takes about one hour for a water drop to move through from the seawater lift pump station (1) through the plant to the treated water storage (11).



1 SEAWATER LIFT PUMP STATION
Transfers seawater to the pump station via intake structures located on the seabed.

2 SCREEN & FEED PUMP STATION
Houses screen filters that remove large particles from seawater.

3 PRETREATMENT DMPF
Houses Dual Media Pressure Filters (DMPF) to remove fine particles from seawater.

4 DMPF BACKWASH
Collects backwash from the DMPFs and pumps it through to the Backwash Treatment Building.

5 BACKWASH TREATMENT BUILDING
Treats and stores backwash from the DMPF process before it is pumped to the Solids Treatment Building.

6 REVERSE OSMOSIS BUILDING
Water passes through two stages of reverse osmosis where minerals and salts are removed.

7, 8 AND 9 CHEMICAL BUILDINGS
House chemicals like fluoride and carbon dioxide used to potabilise the desalinated water.

10 LIME STORAGE AND SATURATION
Houses lime used to remineralise the desalinated water.

11 TREATED WATER STORAGE
Stores potable water prior to distribution.

12 SOLIDS TREATMENT BUILDING
Settlement and centrifuge process used to dewater the backwash waste prior to transfer offsite.

13 STABILISATION PONDS
Treatment ponds used for the stabilisation and treatment of outfall waters.

14 UTILITIES BUILDING

15 AND 16 ELECTRICAL ENCLOSURES

17 POTABILISATION SYSTEM
Point for mixing of chemicals to produce safe drinking water.

18 ADMINISTRATION COMPLEX
Contains reception, offices, meeting rooms and plant control room.

19 FIRE SERVICES BUILDING

20 SUBSTATIONS
Contain electrical equipment and transformers.

21 TRANSFER PUMP STATION AND SURGE VESSELS
Pumps potable water into the transfer pipeline.

22 PROCESS BUILDING
Houses chemicals used to assist the reverse osmosis process.

FUTURE PLANT EXPANSION ZONES TO 200GL

WATER NOW
AND FOR THE FUTURE.
FOR SURE.

Reverse Osmosis building

CONTACT US

Visit the Victorian Desalination Project Community Information Centre Shop 2, 33–35 Murray St, Wonthaggi

Opening hours
Tuesday–Friday 9.30am–4.30pm, Saturday 9am–12pm.

FREECALL
1800 811 214

WEB
www.aquasure.com.au

EMAIL
contactus@aquasure.com.au

POST
AquaSure C/– PO Box 7387
St Kilda Road, Melbourne
VIC 8004

DECEMBER 2016

Printed on Tudor RP an Australian made paper that contains 100% recycled fibre. No chlorine bleaching occurs in the recycling process and Australian Paper is ISO 14001 certified. Sales of Tudor RP support Landcare Australia.

State Government Victoria

AQUASURE

WATERSURE