Fact sheet

Get curious · Get informed · Get involved



Desalination for livestock water

Many groundwater sources in the Northern and Yorke region are too saline for livestock consumption. Desalination is one way producers can improve their water quality.

Water salinity and livestock

Water is as important for livestock health and productivity as feed during summer. Poor quality water can reduce animal production, impair fertility and in extreme cases cause mortality.

Salinity is one of the major concerns for livestock water supplies. Excessive salt intake can cause scouring, decreased productivity and in extreme cases mortality. Young, pregnant, lactating, or weak animals (from poor nutrition or disease) are less tolerant of salt than older, healthy dry stock. Stock grazing saltbush and other salty feed sources are less tolerant than stock grazing pastures, hay and grain.

As water becomes saltier, stock drink more than they would fresh water. Additionally, feed intake will decrease at higher salinity levels.

Sheep are more tolerant than cattle. Pigs and poultry are the least tolerant to salinity.

Livestock	Total dissolved solids (mg/L)		
	No effect	Initial scouring. Animals will adapt.	Production losses and decline in animal health and condition expected.
Dry mature sheep[a]	0-4,000	4,000-10,000	10,000-13,000
Lambs[b]			5,000-10,000
Lactating ewes[c]			3,800
Beef cattle[a]	0-4,000	4,000-5,000	5,000-10,000
Poultry[a]	0-2,000	2,000-3,000	3,000-4,000
Pigs[a]	0-4,000	4,000-6,000	6,000-7,000

Sources:
[a] Australian New Zealand Guidelines for Fresh and Marine Water Quality 2023.
[b] Making More From Sheep. *Water Quality for Sheep.*
[c] *Agriculture Victoria 2016.* Managing farm water supplies



This fact sheet is funded by the South Australian Drought Hub through the Australian Government's Future Drought Fund.

SOUTH AUSTRALIAN DROUGHT RESILIENCE ADOPTION & INNOVATION HUB

This program received funding from the Australian Government's Future Drought Fund

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

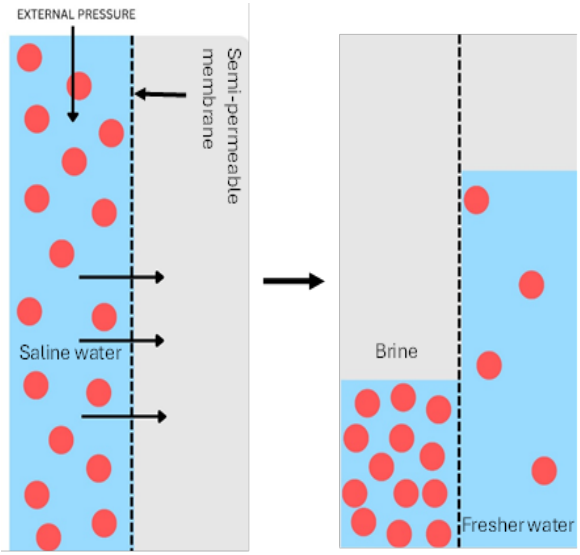
SA DROUGHT HUB

Desalination

Desalination is one solution available to landholders to overcome saline water sources.

There are multiple ways to desalinate water. **Reverse osmosis** is the method this fact sheet will describe.

Reverse osmosis is the engineered movement of water through a semi-permeable membrane. High pressure is applied to saline water to force it through the membrane. The membrane allows passage of water but traps the salt particles, producing fresh water. The salinity level of the fresh water produced by desalination depends on the salinity of the water source, and pre-treatment may be required to remove contaminants and microorganisms such as Iron-related bacteria.



Waste management

Desalination produces a highly saline by-product (brine). This brine is not suitable for consumption or irrigation and may contain chemicals used in the pre-treatment process. Brine must be disposed of in a manner which will not affect the surrounding environment.

Brine should be disposed of using an **evaporation pond** or by **aquifer injection**.

Evaporation ponds are the most common option used in Australia. The ponds hold the brine until the water evaporates, leaving salt crystals behind, which are removed as required. Ponds need to be carefully designed to suit the climate (temperature, solar radiation, humidity) of the area. and the volume of brine produced. A well-constructed pond will minimise or eliminate brine leakage into the surrounding environment. Lining with a durable plastic is a good option.

Check with your local Landscape Board whether this is a Water Affecting Activity before construction.

Aquifer injection involves using an injection well to dispose of the brine into shallow or deep aquifers. This is only suitable for small quantities of brine disposal, and when done correctly should not degrade the quality of the aquifer.

This is considered a Water Affecting Activity under the *Landscape South Australia Act 2019* – contact your local Landscape SA board to discuss before you act to avoid penalties.

Water testing

Water testing should be carried out regularly for all farm water supplies.

Desalination units are built to suit the water source, meaning that a water test is required prior to purchase – consult your local Landscape Board or agricultural consultant for help if required.

Other considerations

Ensure that the property has the required license, permit or allocation that may be required to extract water from a dam or bore.

For any matters relating to water licences, please contact the Department of Environment and Water – Water Licencing Office on 8372 7561 (option 3) or email DEWwaterlicencing@sa.gov.au.

Desalination units require a power source (grid or solar), and infrastructure for housing the unit and brine disposal. Consider these additional costs when developing a budget.

Contact your local Landscape Board for advice on water quality, infrastructure and regulations when planning to install a desalination unit.

We're here to help

Not sure where to start or who to talk to? Get in touch with your local Landscape Board. We can assist you to find the right connections.

LANDSCAPE SOUTH AUSTRALIA NORTHERN AND YORKE

Northern and Yorke Landscape Board
Email: ny.landscapeboard@sa.gov.au
Phone: 08 8841 3444

www.landscape.sa.gov.au/ny