

# What are the impacts of urban salinity?

Salinity damage shortens the life of urban infrastructure such as roads, buildings, paving, water and sewage pipes and can have detrimental effects on vegetation such as trees, gardens, lawns and playing fields. This leads to costly maintenance and repair by homeowners and councils.

Symptoms of urban salinity include bare patches in lawns and sporting fields; rising damp in buildings; salt crusting on bricks, concrete and pavers; corrosion of underground services, pipelines etc; road surfaces breaking up and areas that are continually damp.

The movement of excess water and salt in parks and gardens can affect plant growth and cause plant death. Sports grounds and recreation areas affected by urban salinity may become bare, unattractive and unusable. Soil properties can be altered significantly making it hard to revegetate these areas.

Pockets of native vegetation in and around urban landscapes may also be affected. This can have serious consequences including the disappearance of native flora and fauna and poor downstream water quality.



## Prevention

To manage urban salinity the problem normally needs to be addressed at both the catchment (the surrounding rural and urban landscape) and local levels. This is because the groundwater responds to both catchment and local factors. Management practices within an urban centre alone are not normally sufficient.

Management at the catchment level principally involves the maintenance of adequate vegetation cover and the implementation of appropriate land and water management practices (as outlined in [Dryland Salinity Management](#)).

At the local level, in the urban centre itself, there a number of management strategies that councils and residents could implement.

These include:

- ~Avoiding over-watering public parks, sports fields, home gardens and lawns
- ~Planting large native trees and shrubs in open spaces
- ~Investigating the extent of leaking channels and pipes and implementing a pipe replacement program using corrosion resistant materials
- ~Assessing the likelihood that current and proposed water storages, artificial lakes and drainage basins contribute to groundwater recharge, with strategies to minimise where possible
- ~Ensuring that water drains away from infrastructure developments to avoid ponding
- ~Connecting septic tanks to piped sewerage systems where possible
- ~Connecting roof drainage to stormwater systems, rather than sillage pits
- ~Monitoring changes to watertable levels and groundwater quality by installing piezometer ('monitoring bore') networks
- ~Encouraging residents to establish gardens with low water requirements.

New houses, buildings or infrastructure in current or potentially salt-affected areas should be built to withstand the effects of salinity. Corrosion resistant materials should be widely used. Durable water-resistant membranes (eg. damp courses in houses) may often be appropriate.

## Sources of information

Information in this brochure has been derived from a number of sources including these Government agencies & publications:

City of Wagga Wagga

<http://www.wagga.nsw.gov.au/www/html/347-salinity-publications.asp>

Western Sydney Regional Organisation of Councils

<http://www.wsroc.com.au/page.aspx?pid=164&vid=6>

NSW Department of Natural Resources

<http://www.naturalresources.nsw.gov.au/salinity/index.htm>



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# Urban Salinity





# So, what is salinity?

Salts are a natural part of the landscape in Australia and are found in the rocks, soil and shallow groundwater. Some salt is also carried within rain drops. Changes in land use over time have caused salts normally stored in soils and rocks to be dissolved in water and brought to the surface. When the water evaporates, the salts concentrate at or near the land's surface, and salinity can become a problem. It should be remembered though that whilst salt occurs naturally, the way we use and manage our land and water resources has a large impact on salinity.

In New South Wales the area of salt affected land is currently reported to be 120,000 hectares with the potential to rise to over 5 million hectares. A number of towns and large rural centres in the state are affected by salinity.

Parts of the Murrumbidgee Irrigation Area are also affected by salinity and a high watertable, although the [MIA Envirowise](#) program is working towards combating this problem.



## How does urban salinity occur?

Like many urban areas, Griffith and its villages are located in a salty landscape. Over watering of lawns, gardens and sporting fields can cause the groundwater to rise to the surface, bringing with it salts. Leaky pipes (stormwater, town water supply and sewage) and swimming pools can also cause water table levels to rise. Urban salinity can also be related to sub-surface water flows being impeded by structures such as roads and by poor drainage conditions. There may also be some influence to the mobility of salt and watertable depth locally, due to the use of water in the surrounding irrigation area.

In addition, clearing of native vegetation for urban development and blocking or changing natural drainage paths (such as by building roads, levees, detention basins and channels) can lead to localised salinity.

Sources of salt in urban areas include swimming pools, food products, fertilisers, soaps and detergents, industry and building materials and effluent (sewage).

Recognising the solubility of salt in water is the key to understanding urban salinity processes. When water comes into contact with buildings and other infrastructure, salt can be carried with it. As the water evaporates (or dries) the salt crystals grow and expand, causing physical damage to bricks, mortar and other construction materials. The salt crystals often form a white crust on the surface of bricks. Homeowners often try to wash off the unsightly residue, but this only helps the salt crystals grow even bigger, worsening the problem.

Some building methods may also contribute to the development of salinity. Compacted surfaces can restrict groundwater flow and concentrate salt in one area. By cutting into slopes to build, groundwater or saline soil may be intercepted and exposed. In addition, fill used to build up an area may be a source of salt, or it may be less permeable, preventing good drainage.



## Identifying Salinity

The items on the following checklist were taken from Western Sydney Regional Organisation of Councils [Good Housekeeping to Manage Urban Salinity](#) and are either typical symptoms of urban salinity, or are processes which may contribute to urban salinity. It should be noted that some of these indicators may not be related to salinity at all and can be caused by other unrelated issues. Urban salinity is usually associated with a combination of these indicators, and any one indicator in isolation cannot be used to diagnose salinity.

### *Gardens and lawns*

- ~Plants seem to be stressed or dying.
- ~There are bare or yellow patches in the lawn that are not due to drought, pests, or other factors e.g. watering with soapy water, compaction or lack of nutrients.

### *Buildings*

- ~White crystals or stains are visible on bricks, cement or pavers. (Note: This does occur normally on new bricks, or could be related to water from another source eg sprinklers or a swimming pool)
- ~The mortar between the bricks is powdery or disappearing.
- ~Some bricks or pavers seems to be flaking or crumbling, or seem to be wearing away.
- ~Concrete seems to be wearing, corroding, or cracking.
- ~Down pipes are corroding at ground level.

## *Drainage and water*

- ~There are water logged areas that are present even when it hasn't been raining recently. (Note: this could be due to broken pipes)
- ~Water collects against the house during rain.
- ~The basement or area under the house is often damp.
- ~There is a rubble pit, or disconnected down pipes on the site.

## *Other indicators*

- ~Recurring cracks or potholes in nearby roads or footpaths, not related to heavy traffic or other obvious causes.
- ~Cracking or corroding kerbs and gutters in the street.
- ~Neighbour's properties seem to have similar indicators of salinity.
- ~Grass or plants in the nature strip or local parks are yellow or are dying



## Good housekeeping for salinity

If your home is in an area where salinity is known or if you have observed salinity damage around your house you should always seek professional advice. The following information is only provided as a basic guide which may assist in managing urban salinity.

- ~Is the damp proof course intact, visible, and not covered by paving, rendering or garden beds?
- ~Are your garden beds located away from the house walls or footings?
- ~Are the gutters and down pipes well maintained and in good repair?
- ~Have the underground pipes been checked for damaged or leaks?
- ~Have poorly drained areas been investigated and attended to?
- ~If your house is raised; is there under-floor ventilation, and is it working?
- ~Are any paved areas and paths sloping away from the house?
- ~Are outdoor taps, hoses and sprinkler systems leak free?
- ~Are you only watering your garden when it needs it?
- ~Have you minimized your garden's water needs eg. by reducing lawn area, mulch or planting Waterwise plants?
- ~Have you checked whether you need to plant salt tolerant species?
- ~If you are extending or repairing your house have you thought about using salt resistant building materials or techniques?