

# PerryLakes

GROUNDWATER MANAGEMENT PROJECT

## What is the project about?

Groundwater levels have gradually fallen under large parts of Perth as a result of drier winters and extracting groundwater to irrigate ovals and private gardens. As a result, shallow lakes like Perry Lakes have dried and the availability of water for irrigation has been reduced.

To address this issue at Perry Lakes, the Town of Cambridge together with the CSIRO and the Water Corporation are investigating ways of increasing lake levels by adding alternative sources of water to nearby groundwater. This will help the lakes survive and allow the Town of Cambridge to continue irrigating parks and ovals in the area.

One climate independent source of water is treated wastewater. More than 111 billion litres of highly treated wastewater are currently discharged into the Indian Ocean each year.

The Town of Cambridge together with the Water Corporation and CSIRO have proposed that highly treated wastewater be used to maintain groundwater levels and thereby raise lake levels. Approximately 2 billion litres could be pumped each year from the Subiaco Wastewater Treatment Plant to the Perry Lakes Reserve where the water would infiltrate to the groundwater near the lakes. This could increase lake water levels by around one metre over time.



## How will the project work?

A series of underground trenches will be placed near the lakes and filled with highly treated wastewater to infiltrate through the soil to the groundwater.

Adding this water will stop the existing groundwater from flowing towards the sea and this will gradually build groundwater levels.

This process will remove the need to pump groundwater into the lakes each summer and allow the Town of Cambridge to continue to irrigate Perry Lakes and Alderbury Reserves in the future.

After the infiltrated water mixes with the existing groundwater it will flow under Bold Park to emerge at the ocean near South City Beach in approximately eight to ten years time.



# What is treated wastewater?

Wastewater is the spent or used water from a community. It comes from domestic, commercial and industrial sources, although it is actually 99.97% water because the greatest volume comes from showers, baths and washing machines. The rest is dissolved and suspended matter.

Wastewater treatment is a series of processes that remove pollutant materials from water. Different levels of treatment remove different materials including solids, oil and greases, detergents, nutrients, heavy metals and bacteria. These processes are carried out at wastewater treatment plants.



# Is treated wastewater safe to use?

Treated wastewater has been used to irrigate country parks and ovals in Western Australia for over 50 years without any reported major health or environmental incidents. Over 4 billion litres is also being safely added to groundwater each year along the coast between Mandurah and Yanchep.

Treated wastewater from the Subiaco Wastewater Treatment Plant has been used to irrigate McGillivray Oval for over three years. A similar quality of treated wastewater is intended to replenish groundwater near Perry Lakes.

CSIRO has been testing what happens to treated wastewater filtered through sand into groundwater just south of Perry Lakes for over 18 months. They have found that the quality of the water improves over time because it undergoes natural soil and groundwater "cleansing" processes.

# What about hormones and other chemicals?

There has been lots of discussion in the media about chemicals and hormones from certain pharmaceutical products (such as the contraceptive pill, anti-depressants or personal care products) being present in wastewater and potentially harming people or the environment.

Research has demonstrated that concentrations of these compounds are very low after secondary treatment of wastewater. Furthermore, laboratory tests have shown that even when they are high, their concentrations can be reduced to very low levels through natural processes.

The water infiltrated near Perry Lakes will be treated to a high standard to ensure that these chemicals do not have any significant impacts on the environment.

# Why can't stormwater be used instead?

Using stormwater to maintain lake levels was considered, however the quality of stormwater is often the same or lower than the quality of treated wastewater. Also the water levels in the lakes need to be higher in the summer months, when there is little or no stormwater available.



# Will the water reach residential bores?

The treated wastewater will not be extracted by private bores for at least ten years as the flow direction is under Bold Park. By this time the water would be indistinguishable from existing groundwater.

It is important to note, however, that the Department of Health specifies that residential bores should not be used for drinking water, filling pools, food preparation or cooking unless the water has been professionally tested and treated.

# Who will fund and approve the project?

If the project goes ahead it will be funded by the Town of Cambridge, with technical assistance from the CSIRO and the Water Corporation.

The Town's funding commitment is on the basis of receiving financial support from State and Federal governments as the project may lead to other projects of a similar nature being implemented to protect local wetlands and lakes. The project has already had a conceptual review by the Departments of Water, Health and Environment and Conservation and the Conservation Council of WA.

The project will need to be cost effective and require formal environmental approval before it can commence. It will be up to the Town of Cambridge to decide if the project proceeds.

# Has the community been consulted about the project?

People surveyed in 2000 for the Town of Cambridge's Perry Lakes Environmental Management Plan strongly supported restoring water in the lakes. They recommended that the Town look at alternative water sources, including treated wastewater and stormwater.

A community forum was held on 2nd May 2007 at the Town of Cambridge offices to inform the community about the project and respond to feedback. Over 40 people attended and a large majority indicated support for the concept. The proposal has also been debated at the Town of Cambridge's Development and Sustainability Committee and at Council meetings.

# Is this project similar to the Water Corporation's Groundwater Replenishment Trial?

No. The Groundwater Replenishment Trial being undertaken by the Water Corporation will trial injecting wastewater (which has been treated so that it is of drinking water quality) into groundwater lying 200 m underground. Following several years of monitoring and subject to community support, environmental and health approvals, a full scale groundwater replenishment scheme may be implemented where the water is used as part of Perth's drinking water supply.

More information about this project can be found at [www.watercorporation.com.au](http://www.watercorporation.com.au) and clicking on "Groundwater Replenishment".



## If it does proceed, how will the project be monitored?

Perry Lakes is one of the most studied wetland systems on the Swan Coastal Plain so there is already a wealth of information about the site. Additional monitoring will be undertaken to collect information before and during the project looking for evidence of rising water levels in the lake and checking on water quality.

## What are the benefits?

There will be significant benefits to the local lake environment as a result of the project. Plants and animals that rely on groundwater to survive, such as long-necked tortoises, waterfowl, frogs and flooded gums, will have access to more water.

People using the lake area for recreation or other activities will be able to enjoy the lakes again and the attraction of the surrounding parkland will be greatly enhanced.



## Myths and Facts

**Myth:** Sewage is going to be added to Perry Lakes

**Fact:** Sewage is the term used to describe raw or untreated wastewater. This is not the type of water that will be used. Only highly treated wastewater will be infiltrated near the lakes, where it will be further treated by the soil and in the groundwater. A similar quality of water is used to irrigate turf on McGillivray Oval where people play sports such as rugby without any health issues. All infiltrated water is expected to mix with groundwater and flow under Bold Park to discharge to the ocean in eight to ten years time.

**Myth:** The treated wastewater is high in nutrients such as nitrogen and phosphorous and will cause algal blooms in the lakes

**Fact:** Nitrogen levels in the treated wastewater are similar to those currently in the lakes and surrounding groundwater. These levels should decrease even further with time in the groundwater through natural processes. Phosphorous declines rapidly when added to yellow sands or limestone, both of which are common at Perry Lakes. In addition, the water will be added to the sand near the lakes through underground trenches, **not directly into the lakes themselves**. The infiltrated water will then flow away from the lakes and under Bold Park.

**Myth:** Wastewater contains high concentrations of hormones and pharmaceuticals that damage the environment.

**Fact:** Measurements have shown that these compounds are barely detectable after secondary treatment of wastewater. Furthermore, laboratory tests have shown that high concentrations can be reduced to low levels within a matter of days through natural groundwater filtering processes so there is even less risk to the environment.

**Myth:** Adding water may release arsenic from the soils near the lakes

**Fact:** The only possibility of arsenic being released around the lakes arises from disturbing peat. Peat is an organic material commonly found in waterlogged areas such as wetlands. If peat is disturbed and allowed to dry out, it can release arsenic. The peat around Perry Lakes is more likely to dry out if no water is added to the groundwater near the lakes. Therefore the proposal should reduce the risk rather than increase it.

**Myth:** The main benefits are increased land prices around the lakes and these have overtaken consideration of the environment.

**Fact:** One of the main reasons for undertaking this project is to ensure there is enough water to sustain water dependent plants and animals, including water birds and long-necked tortoises. There are also significant social benefits, such as ensuring people can still use Perry Lakes and Alderbury Reserves for sport and recreation by maintaining a continued bore water supply as well as adding to the amenity of the parkland by returning permanent water to the area.

**Myth:** The Water Corporation will save money by disposing wastewater at Perry Lakes.

**Fact:** The Water Corporation currently discharges most of Perth's treated wastewater to the ocean and there are no cost savings for them in the proposal. This project is one of several the Water Corporation is involved in to encourage more water recycling and reduce the amount of treated wastewater going to the ocean. The project will also contribute to the State Water Plan target of 20% recycling by 2012.



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