

# essentialfacts

## The Western Treatment Plant – a remarkable community asset

### A history of innovation

---

Melbourne Water's Western Treatment Plant at Werribee is a significant and fascinating public asset, with more than 100 years of history. Its origins can be traced to the findings of an 1888 Royal Commission into Melbourne's public health, which led to a proposal for a new and effective treatment system for Melbourne's sewage – a sewage farm. Previously, Melbourne's sewage was collected in open channels and discharged into the Yarra River and Hobsons Bay.

British sanitation engineer James Mansergh, who was appointed by the Government to design a sewage disposal system for Melbourne, recommended in 1890 that sites be established at Mordialloc and Werribee (because of low rainfall and suitable soil). A single site at Werribee was adopted on the basis of cost and land availability and, in 1892, the newly established Melbourne Metropolitan Board of Works began buying land and developing the site. The first Melbourne homes were connected to the sewerage system in 1897.

In addition to land filtration in the 1930s, grass filtration was adopted as the winter treatment method and the first sewage treatment lagoon was constructed in 1936. Collection and treatment facilities have been continually upgraded to meet the needs of Melbourne's growing population. The first large modern lagoon was installed in 1986.

In 1897, there were 32 houses at the plant's original township of Cocoroc, and a town hall, football team and ground, swimming pool, tennis courts, four schools and a post office. This increased to nearly 100 houses in the early 1950s, and by the 1970s, some 500 people were living in Cocoroc.



# essentialfacts

## Treatment on a grand scale

---

Every day, Melbourne produces about 925 million litres of sewage that has to be managed and treated. The Western Treatment Plant provides an essential public health service, treating about 52% of Melbourne's sewage, or about 485 million litres a day. It serves about 1.6 million people in the central, northern and western suburbs.

The Plant is some 11,000 hectares in area and is a world leader in environmentally-friendly sewage treatment. Treated effluent is discharged from the plant to Port Phillip Bay under an accredited EPA Victoria licence.

Modern lagoon systems treat sewage by passing it slowly through a chain of ponds, allowing naturally-occurring bacteria to consume biodegradable matter.

The first stage of lagoon treatment is anaerobic (without oxygen), where bacteria digest organic material and produce biogas. Membrane lagoon covers capture biogas, which generates electricity and reduces greenhouse gas emissions and odour. Biogas, including methane, is produced during the treatment process and is used as fuel to generate electricity to run the plant.



## Environmental upgrade

---

A major \$160 million environmental upgrade of the Western Treatment Plant was undertaken to help improve the health of Port Phillip Bay, following the landmark four-year Port Phillip Bay Environmental Study. The study, commissioned by Melbourne Water and managed by the CSIRO, found that the bay was healthy by world standards but recommended reducing nitrogen loads. Among other sources, nitrogen is found in the treated effluent discharged to the bay from the Western Treatment Plant. The upgrade replaced land and grass filtration by enhancing modern lagoon systems for sewage treatment. Two massive, high technology lagoons allow naturally occurring bacteria to digest sewage and sunlight to provide low-level disinfectant. These natural processes have been complemented by new technology to increase nitrogen removal, as part of Melbourne Water's commitment to protecting the long-term health of the bay modern lagoon system with the latest technology to reduce nitrogen.

As a result of the upgrade, a large supply of high quality recycled water can be used for agricultural, horticultural and other applications. The upgrade is also opening up opportunities for renewable energy generation and new agricultural land uses at the plant.

# essentialfacts

The Victorian Coastal Award for Excellence 2006 in Water Quality was awarded to Melbourne Water in recognition of the environmental improvements achieved through the upgrade. The award recognises excellence in “developing, adopting or implementing practices that have improved water quality in the marine environment”.

## Meeting future needs

---

Melbourne Water is committed to reducing the impact of the Western Treatment Plant, and protecting our environment for future generations. A number of initiatives to reduce the impact of the plant are underway.

### **Water recycling**

Melbourne Water aims to contribute significantly to the Victorian Government’s target of 20% water recycling by 2010. By then, it is estimated that 30,000 million litres of recycled water a year will be used to irrigate paddocks at the Western Treatment Plant. Cattle and sheep will graze on these paddocks, which have previously been irrigated through land and grass filtration treatment processes.

Many water recycling schemes that are currently underway will use recycled water from the Western Treatment Plant, including the Werribee Irrigation District and the Werribee Tourist Precinct.

Supply of recycled water to the Werribee Tourist Precinct began in 2003 after the completion of a six-kilometre pipeline from the Western Treatment Plant. The pipeline has sufficient capacity to meet future demand for recycled water in the precinct of up to 660 million litres a year. The Werribee Park Golf Club and the National Equestrian Centre are the first recycled water customers to the west of Melbourne. The Werribee Tourist Precinct also includes the historic Werribee Mansion and Victoria’s Open Range Zoo.

When fully operational the water recycling disinfection plant will distribute up to 8500 million litres of recycled water will flow to vegetable growers. The Plant will also provide recycled water to households and major recreational areas such as sporting grounds, parks and gardens.

Supplying recycled water will take pressure off the Werribee River and underground aquifers, which were the previous main sources of irrigation water in the region.

# essentialfacts

## Meeting the greenhouse challenge

Melbourne Water has achieved its 2005-06 target of 35% reduction in greenhouse gas emissions and has met its renewal energy target of 40% target for the same year.

Energy requirements at the Western Treatment Plant are significant because of the technology used to reduce nitrogen levels in the modern lagoon system as part of the \$160 million environmental upgrade.

Melbourne Water uses renewable energy at its two sewage treatment plants by capturing and using biogas to generate electricity as well as using hydro-electric power generation. The recent Western Treatment Plant upgrade significantly boosted our renewable energy supplies. We are able to generate 60% of the plant's total energy needs onsite and, at the same time, we are reducing greenhouse gas emissions (and odour).

The phasing out of land treatment of raw sewage will also result in significant reductions in our annual greenhouse gas emissions.



## Making the most of biosolids

Biosolids are the treated, dried sludge produced from sewage treatment. Storing biosolids at our treatment plants has been standard practice since they were commissioned. This is not sustainable and we are seeking new, beneficial uses for biosolids.

Melbourne Water is exploring opportunities for the further use of biosolids produced at our sewage treatment plants. Biosolids have been used successfully in Australia for soil conditioning and potting mixes, composting, land rehabilitation, landscaping, forestry, brick manufacture and agriculture. However, biosolids at the Western Treatment Plant are high in contaminants as a result of trade waste inputs from Melbourne's west and are unsuitable for agricultural use.

# essentialfacts

Techniques using new technologies to remediate the stored biosolids at the Western Treatment Plant are being assessed. These include phytoremediation, in which pollutants are removed from soils by uptake into plants.

## **Agricultural practice**

The Werribee Agriculture Group, a separate business unit of Melbourne Water, manages the grazing of 15,000 cattle and 40,000 sheep on over 8500 hectares of land at the Western Treatment Plant. Sheep grazing commenced in 1899 and cattle grazing in 1902 to deal with the permanent supply of lush pasture produced by irrigation of the land.

The business is continuing to pursue agricultural opportunities as land uses change from sewage treatment to effluent irrigation. This change provides an opportunity to greatly improve the profitability and viability of the livestock operation.

Other opportunities that could be considered further include various types of crops that could be used as energy sources and a sustainable level of tree planting that provides biodiversity, shelter belts and storage benefits.

## Preserving conservation values

---

The Western Treatment Plant is one of the world's most significant wetlands, and areas of the plant have been declared a wetland of international significance under the Ramsar Convention.

### **A haven for birds**

The Western Treatment Plant contains a network of lagoons, wetlands, inter-tidal and shoreline areas that provide a haven for thousands of birds.

The wetlands, which draw expert ornithologists from around the world, attract an amazing array of birdlife including thousands of migratory waders that fly 12,000 kilometres south from Siberia to avoid the harsh northern Winter.



# essentialfacts

Over 270 species have been recorded at the plant, with waterfowl including the Pink-Eared, Blue-Billed and Black ducks, Australian Shelduck, and grebes favouring the lagoons. Up to 50,000 Pink-Eared ducks have been recorded at one time at the plant. Coots and Eastern Swampheens use pond fringes, while swans and pelicans tend to roost on small, muddy islands among the dead trees, and Straw-Necked and White Ibis roost on the trees in Lake Borrie at the plant.

## Environment Improvement Plan

Changes to sewage treatment practices as part of the environmental upgrade of the Western Treatment Plant have implications for waterbirds and shorebirds, nationally threatened species and listed migratory species.

Melbourne Water's conservation management program includes extensive stakeholder consultation, wildlife studies and habitat maintenance activities. The program takes its direction from the *Ramsar and Conservation Management Plan – Western Treatment Plant, The Spit Nature Conservation Reserve and Adjacent Habitats*. It is the basis for monitoring and managing the ecology and maintaining environmental values of the area. Melbourne Water works closely with the community to monitor the plant's performance and an updated Environment Improvement Plan was published in August 2003 after community consultation.

## Educational discovery

The Western Treatment Plant is popular with school, scientific and professional interest groups, such as birdwatchers. Tours and community open days are held regularly. For tour information, visit [melbournewater.com.au/education](http://melbournewater.com.au/education)

The Melbourne Water Discovery Centre is situated at the plant, and incorporates interactive displays on all aspects of the water cycle. A huge satellite photograph of Melbourne has been installed in the centre's foyer and visitors can walk across it and locate their homes within the context of the larger catchment.



## Further information

For information on any aspect of Melbourne Water's role in managing the water cycle, please call 131 722 or visit [melbournewater.com.au](http://melbournewater.com.au)