

# URBAN WATER

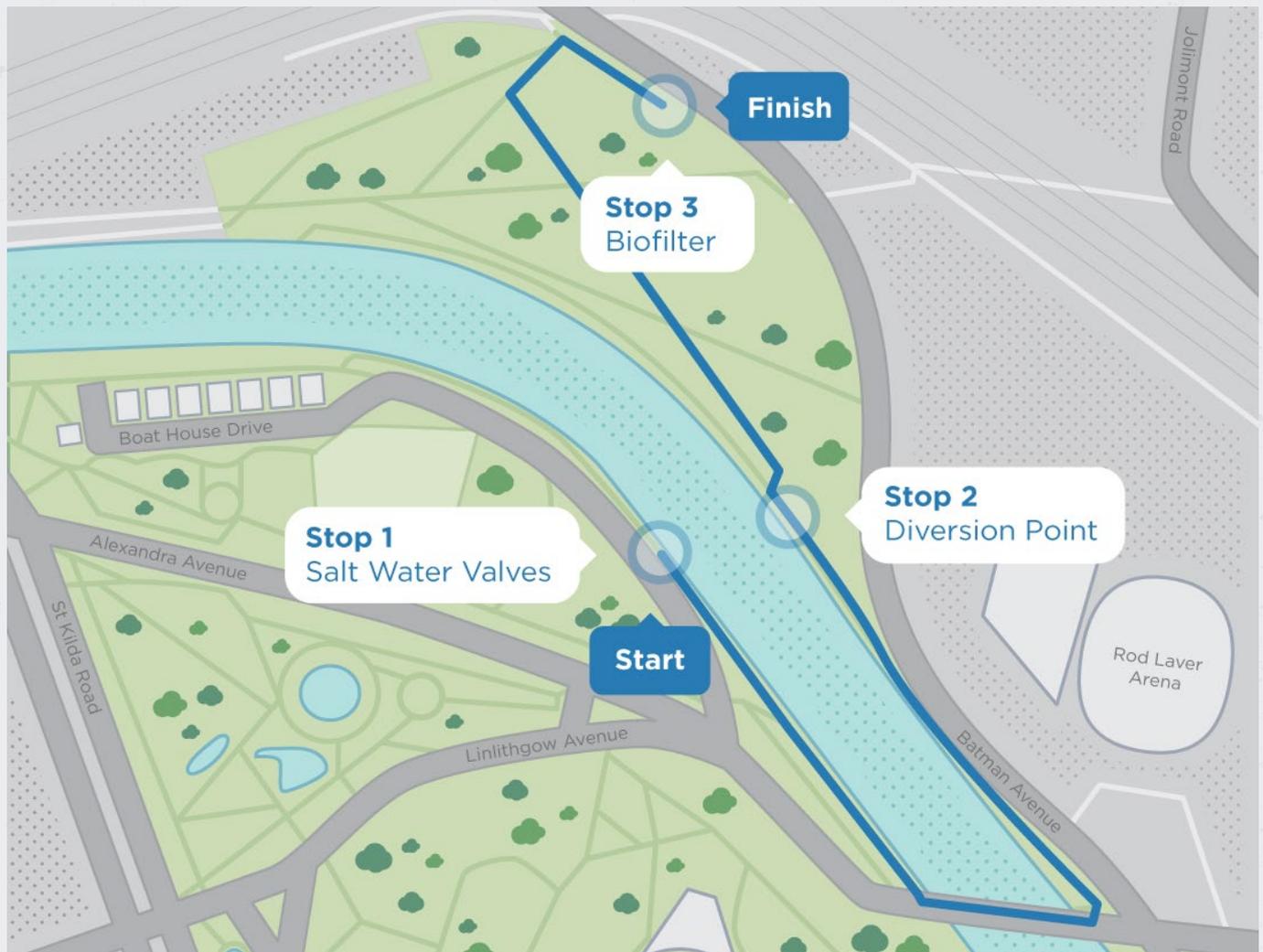
Discover how water creates a livable city



Water capture and reuse

## Walking tour

### Birrarung Marr Stormwater harvesting



Click through the sections below as you go on a self-guided walking tour of the stormwater harvesting system in Queen Victoria Gardens. You can use your mobile device to access this tour on site, or download the printable version from the menu on the right.

This tour begins on Boathouse Drive, half-way between the boat sheds and the Swan Street Bridge. As you stand on the bank of the Yarra River and looking across the water towards the MCG and Melbourne Park tennis centre, you can see a drain outfall into the river (a brick structure at the water's edge, protected by a handrail). This is the start of the tour.

#### Tour Information

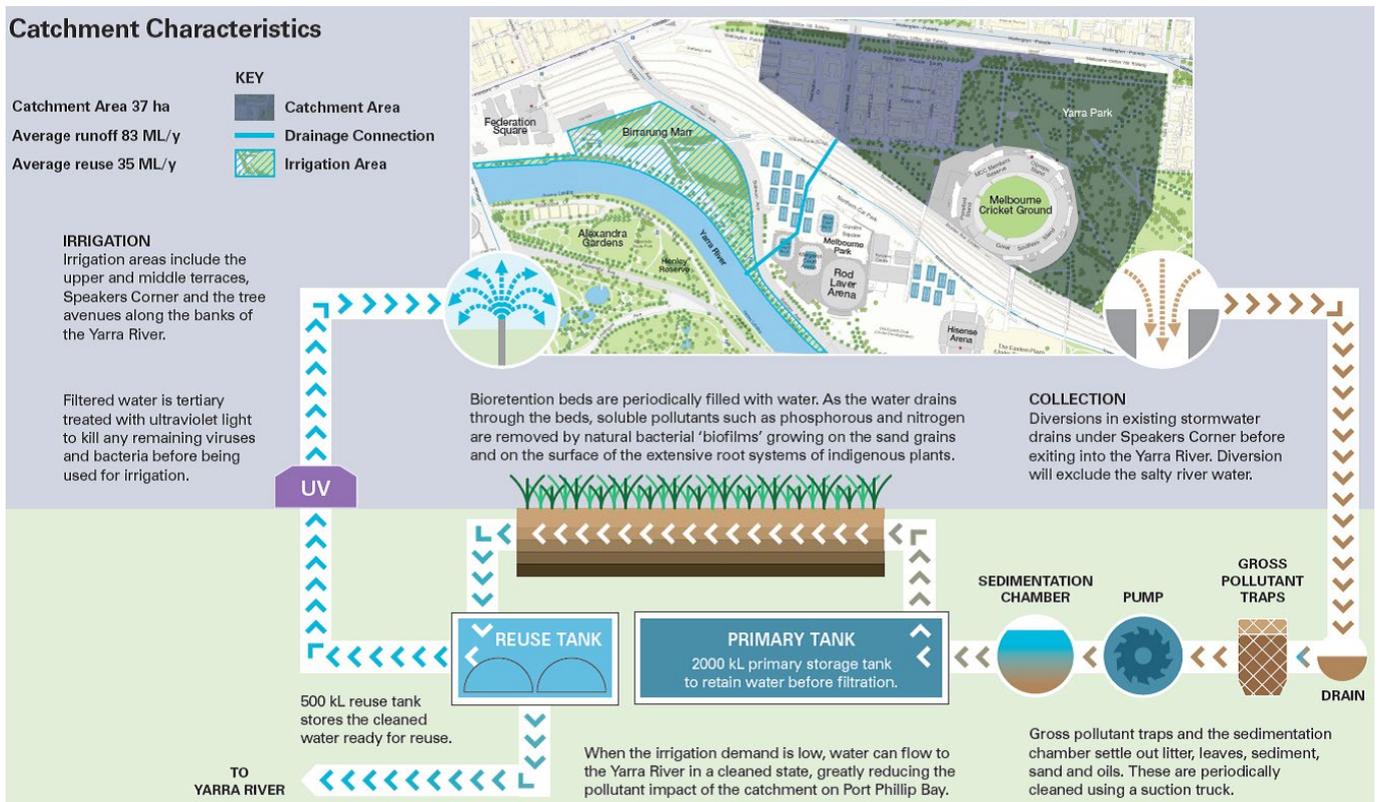
**Walking time**  
30 minutes

**Distance**  
1.3 kilometres

## Project details

### Overview

- Birrarung Marr is an 8.3 hectare park located on the opposite side of the Yarra River to where you currently stand. Transformed from a rail yard into parkland in 2002, Birrarung Marr is the newest large park in the inner Melbourne area. It takes about 45 million litres of water to keep the park healthy and green every year.
- The new stormwater harvesting system in Birrarung Marr captures, treats and stores stormwater for irrigation reuse in the park. This has reduced use of potable water for irrigation by 70 per cent.



### How the system works

Birrarung Marr is the low point for a 37-hectare catchment area, as you can see by looking at the areas behind the park. The catchment's existing stormwater drainage network flows into the river through the drain that you can see directly across the water.

The new harvesting system diverts stormwater from this point and pumps it up to the higher part of the park (nearer to the CBD), where it is treated and stored for reuse.

A gross pollutant trap prevents large objects, sand and oils from entering the system. Water is then pumped to the dual storage tanks via a sedimentation chamber, which removes small particle pollution matter.

The underground dual tanks are located on the elevated Upper Terrace of Birrarung Marr. The primary storage tank can store up to two million litres of water. This water is periodically pumped to the biofiltration bed on the surface for treatment.

The biofiltration bed contains indigenous plants. As the water drains through the soil and roots, these plants naturally remove soluble pollutants such as phosphorus and nitrogen. The treated water filters back down into the secondary storage tank, where half a million litres are stored for irrigation. Any excess is returned to the Yarra River.

## Tour

### Stop 1

You are standing in Alexandra gardens looking across the river towards Birraring Marr. This vantage point allows you to see into the drain on the other side of the river where stormwater used to flow directly into the river. Now, this water is diverted and pumped up to the storage tank to the far left of the park.

This section of the Yarra River changes level with the tide and contains a mix of fresh and salty water. Saline water is not suitable for irrigation, so we installed one-way flow valves inside the drain (you might be able to see these valves within the drain). The valves ensure that water from the Yarra does not flow back into the system.

When the storage tanks and diversion weir are full, Rubber Tideflex valves allow the water to flow out to the river while also preventing any saline water from washing back into the weir. The valves are made using rubber that defaults to a certain shape. They open when there is sufficient water pressure behind them and close when the pressure drops.



**To move on to the next stop, follow the Capital City Trail along beside the Yarra River towards the Swan Street Bridge and away from the central city. Cross the bridge and walk back along the edge of the river in the direction of the central city.**



**Continue along the river's edge until you reach the drain and diversion point you were looking at from Stop 1. There should be a public toilet on the right and a drain protected by a hand rail at the water's edge. This is Stop 2.**

### Stop 2

You are standing at the diversion point for the stormwater harvesting system. This is where water is taken from the stormwater drain and diverted into the system.

Beneath the ground is a litter removal trap, known as a GPT (gross pollutant trap). The water passes through the GPT before entering the diversion weir and protects the diversion pumps from larger material in the stormwater.

Beneath the ground is a diversion weir where the stormwater pools before it is pumped up to the storage tank on the Upper Terrace. The weir was constructed within the existing twin culvert at this location. The weir excludes saline water from the Yarra and retains stormwater within the culvert to be pumped to storage. When the primary storage tank is full or flow exceeds the capacity of the pumps, stormwater flows into the river through the valves you saw at Stop 1.

In the diversion weir there are two pumps that transfer stormwater to the primary storage tank on the Upper Terrace. The diversion pumps activate when the primary tank is below capacity. They switch off automatically when the tank is full.

The pumps also shut off when salt, measured via electrical conductivity meter, is detected above 750 Qs/cm in the water. If the water is too saline to harvest, an automated valve empties water from the diversion weir. This prevents the primary storage tank from filling up with saline water.

**To move on to Stop 3, follow the footbridge in the direction of the city onto the Upper Terrace. Turn right at the top of the path and cross the lawn, walking towards the long park bench. Behind the bench is the biofilter, a garden bed that cleans the water. This is Stop 3.**

Stop 3

**You are standing on the Upper Terrace, looking at the biofilter. Beneath the flat lawn is the dual tank system. This is made up of two tanks. Dirty stormwater is pumped from the lower terrace and stored in the primary tank. From here, it is pumped up to the biofilter, where “it soaks through the plants and soil to become clean. The clean water flows back underground to the second tank, where it is stored until it is needed to irrigate the gardens.**

The dual tank system is about 54 metres long by 20 metres wide and is made of concrete that was poured on site. The soil beneath the tank is Coode Island silt, which has a tendency to settle over time. The concrete tank is able to withstand slight shifting without membrane breakages. In total, the tanks hold 2.5 million litres of water.

You will have noticed that the tanks are located a long way from the diversion point (stop 2). It is not ideal to have the

tanks so far from the diversion point (on the lower terrace), but the constraints of the site limited the possible locations. The top of the tanks are about 4 metres below the surface of the lawn.

The biofilter is one of the only parts of the system that can be seen above-ground and is the main treatment process in the stormwater harvesting system. As the stormwater soaks through the garden bed, nutrients are removed from the water.



You will have noticed that the tanks are located a long way from the diversion point (stop 2). It is not ideal to have the tanks so far from the diversion point (on the lower terrace), but the constraints of the site limited the possible locations. The top of the tanks are about 4 metres below the surface of the lawn.

The biofilter is one of the only parts of the system that can be seen above-ground and is the main treatment process in the stormwater harvesting system. As the stormwater soaks through the garden bed, nutrients are removed from the water.

## This is how it works

The flooding and resting cycle time is based on how long it takes for the water to soak through the substrate layers. This, in turn, is determined by the hydraulic conductivity of the filter media. The cycle time is pre-set. It is adjusted over time as the filter medium clogs and increases the detention time. Replacing the top of the filter media on an annual basis helps renew the conductivity.

The clean water drains naturally to the secondary tank where it is stored for irrigation.

**You have completed the tour!**



### Contact us by email or phone:

✉ [urbanlandscapes@melbourne.vic.gov.au](mailto:urbanlandscapes@melbourne.vic.gov.au)

☎ 03 9658 9658

💻 [www.melbourne.vic.gov.au](http://www.melbourne.vic.gov.au)



This website was delivered in partnership  
with the State Government of Victoria