CRC for
Water Sensitive Cities

Central Park Recycled Water Scheme

Location:
Sydney, NSW

Case Study — Prepared by Cooperative Research Centre for Water Sensitive Cities, September 2018

Australian Government
Department of Industry, Innovation and Science
Business Cooperative Research Centres Programme

Insight

World's biggest recycled water facility in the basement of a residential building

Project description

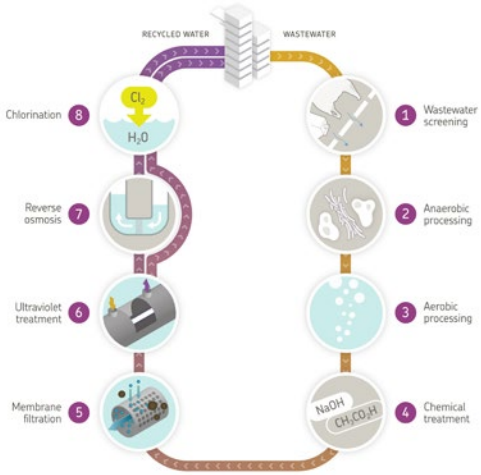
Basement collection, treatment and reuse of high wastewater in a high density urban development

A decentralised recycled water system has been delivered within a 5.8ha mixed use high density infill development site in Sydney. Wastewater is collected from precinct buildings (residential, commercial and retail) and an adjacent public sewer with top-up from stormwater runoff and rainwater. Wastewater is treated to the highest Australian standards for recycled water using a membrane bioreactor (MBR) and reverse osmosis (RO). The recycled water is distributed within the precinct to supply water for cooling towers, irrigation, toilet flushing and washing machines. The scheme will also be exported across the road to University of Technology Sydney once the infrastructure (under construction at the time of writing) is completed.

The drivers

Raise the bar for sustainable living using 'green technologies' in a high density urban development

- Achieve a minimum 5 Green Star rating for each building
- Become Australia's greenest and most self-sufficient mixed use urban development



What does this case study demonstrate?

Each case study has been selected to demonstrate specific solutions, benefits or enabling structures that support the creation of water sensitive cities. This case study focuses on:

- **Wastewater management and recycling**
- **Water sensitive precincts**
- **Alternative water supplies**
- **Governance and policy**

The innovations

Biggest membrane bioreactor (MBR) recycled water facility in the world built in the basement of a residential building

- **Decentralised wastewater treatment** – Water is treated through eight filtration and purification processes including MBR and RO technologies. The treatment system requires minimal space and doesn't generate noise or unpleasant smells so it can be incorporated into the basement levels of the building in a high density urban area.
- **Remotely controlled** – The wastewater treatment system has been designed to minimise operation and maintenance requirements so that it can be completely controlled remotely.
- **Collecting and treating all forms of urban water** – The system collects and treats wastewater from apartments, shops and offices. It also includes local rainwater and stormwater runoff, groundwater from the basement drainage systems and excess irrigation water from the gardens and green walls on-site.
- **Fit-for-purpose use of water** – Multiple pipelines are provided within the precinct to deliver water of a quality that is well suited to the intended use. This includes potable water from the closest water supply for drinking water and locally treated recycled water for toilet flushing, washing machines, irrigation, green wall watering, cooling towers, car washing and firefighting.
- **Supported by local energy** – An on-site central thermal tri-generation plant will provide energy for the wastewater treatment plant as well as the broader development.

The basement recycled water treatment plant

The outcomes

Cities providing ecosystem services	Cities as water supply catchments	Cities comprising water sensitive communities
• **Keeping wastewater out of the environment** – 1 million litres of treated wastewater will be used in the development, instead of being discharged to receiving environments.	• **Alternative water supply** – The recycled water plant will supply water to 2,000 residential apartments and 7,5000 m^2 of commercial and retail space. • **Potable water savings** – Residents will save up to 50% of potable water compared with typical developments.	• **Engaged customers** – Water use monitoring and monthly e-bills keep residents aware of their water use.

Business case

Costs	Benefits
• The developer funded sustainability initiatives including the provision of recycled water and local energy generation. • An integrated water cycle management approach means revenue can be extracted from the entire water cycle to pay for the infrastructure and operation of the recycled water scheme.	• Achieves a 5 Green Star rating for the development, which also achieves uplift value for the developer • Supports sustainable irrigation of gardens and green walls and addresses heat island effect • Means residents pay 20% less for water use
• Exporting the water to neighbouring customers assists with the scheme's economic viability.	• Achieves the sustainability objectives of building owners, and companies • Enables the City of Sydney's Decentralised Water Masterplan

The lessons

- **Privately operated decentralised water management** – There is an ongoing debate about the use of centralised versus decentralised water management and the operation of privately run water utilities, but Central Park provides a good example of a decentralised system being operated by a private utility. Decentralised (or precinct-based) water recycling in New South Wales has been enabled following changes to the *Water Industry Competition Act* in 2006. This allowed private water industry companies to obtain a licence to supply water services to the community and operate water treatment facilities. Central Park Water, as the private water licence holder at Central Park, is subject to the same licensing requirements as Sydney Water (the public utility). The Independent Pricing and Regulatory Tribunal (IPART) and the Minister for Finance and Services oversee its administration and operation.

Transferability

New South Wales has unique bespoke legislation for local recycled water schemes but, there is nothing preventing these types of recycled water schemes in other states. The *Water Industry Competition Act* allows licensed New South Wales water utilities to also retail drinking water (sourced from state supplies). Some states have different rules around the private sector retailing drinking water. Local regulations across Australia do not prevent on-site wastewater treatment systems.

Project collaborators

- Flow Systems (owner of the local water utility Central Park Plus, and water asset designer)
- City of Sydney (Local authority)
- Frasers Property
- Sekisui House
- Institute for Sustainable Futures at the University of Technology Sydney (research and sustainability advice)
- Elton Consulting
- NSW Government (IPART, Department of Planning Water and Energy Strategy, EPA)

Awards

- The scheme has received more than 50 awards: https://www.centralparksydney.com/explore/awards

Additional information

More information on Central Park and the wastewater recycling scheme can be found at:

- Central Park Plus
- Central Park Sydney, A Sustainable Habitat