



Non-Market Valuation of Recycled Water: Subiaco Strategic Resource Precinct Case Study

Project IRP2

The CRCWSC explored the potential role of recycled water in transforming the area surrounding the Subiaco Wastewater Treatment Plant into a strategic resource precinct. The results indicated the demand and willingness to pay for recycled water is sensitive to price and groundwater conditions.

Introduction

Many cities and surrounding urban areas face increasing pressure on water supplies due to population growth and climate change. Options like recycling treated wastewater and stormwater could make a big difference to water security, sustainability and liveability. The CRCWSC explored current and future non-residential demand for recycled water from the Subiaco Wastewater Treatment Plant (WWTP) to better understand the potential uses and value of recycled water in the area.

Case study methodology

The Subiaco WWTP is one of the largest treatment plants in Western Australia, currently servicing a catchment of around

240,000 people that includes the Perth central business district. A major stormwater drain also runs beneath the WWTP and eventually discharges into the Indian Ocean. Very little treated wastewater (10%) and stormwater (0%) is currently recycled. Together, these 'new' sources could supply 13–16% of the annual water consumption of the catchment.

We surveyed a cross-section of non-residential organisations with substantial water requirements in the area surrounding the Subiaco WWTP (see Figure 1). We asked each organisation how much they were willing to pay for recycled water (a non-market valuation technique known as contingent valuation) to estimate an overall willingness to pay. We used another valuation technique (a contingent behaviour survey) to obtain information on how the demand for recycled water would change if existing groundwater allocations were reduced by 10%, 25% and 50%. We also obtained additional information on the current and future land and water use, and the factors influencing willingness to pay and demand.

Results

Our results show that under the current conditions, where organisations retain access to groundwater, there is insufficient demand for recycled water to justify developing additional treatment and distribution infrastructure. Current willingness to pay for recycled water by existing non-residential land users is below the cost of extracting groundwater, so installing the required infrastructure to provide wastewater would not be feasible. For a representative organisation, the estimated willingness to pay for recycled water for outdoor use was \$AUD112/ML (95% CI: \$50–\$175). We also found willingness to pay for recycled water varied with land use type.

We found a clear and strong relationship between groundwater availability and demand for recycled water.



Figure 1: Subiaco Wastewater Treatment Plant (blue) and odour buffer zone (orange). Source: Water Corporation

For each hypothetical allocation cut scenario, demand decreased as the assumed recycled water price increased (Figure 2).

Both land and water use are well established and unlikely to undergo substantial change in the foreseeable future, irrespective of recycled water availability. And most organisations do not differentiate between stormwater and treated wastewater in terms of willingness to pay, provided that quality and safety standards are met.

Lessons learned

This work gave rise to some key insights relevant for policy:

- Recycled water policy can incorporate captured stormwater in addition to treated wastewater, given the

evidence suggests organisations view the two sources as functionally equivalent.

- The cost of and access to alternative water sources, such as groundwater, plays an important role in determining the quantity of recycled water demanded, and the price organisations are willing to pay. A holistic approach to the total water supply portfolio is therefore needed when considering water supply policy.
- The price of scheme water serves as an upper bound to organisations' willingness to pay for recycled water.
- Faced with reduced access to groundwater, organisations will consider potential trade-offs to the level of service/amenity provided as a substitute to purchasing recycled water.

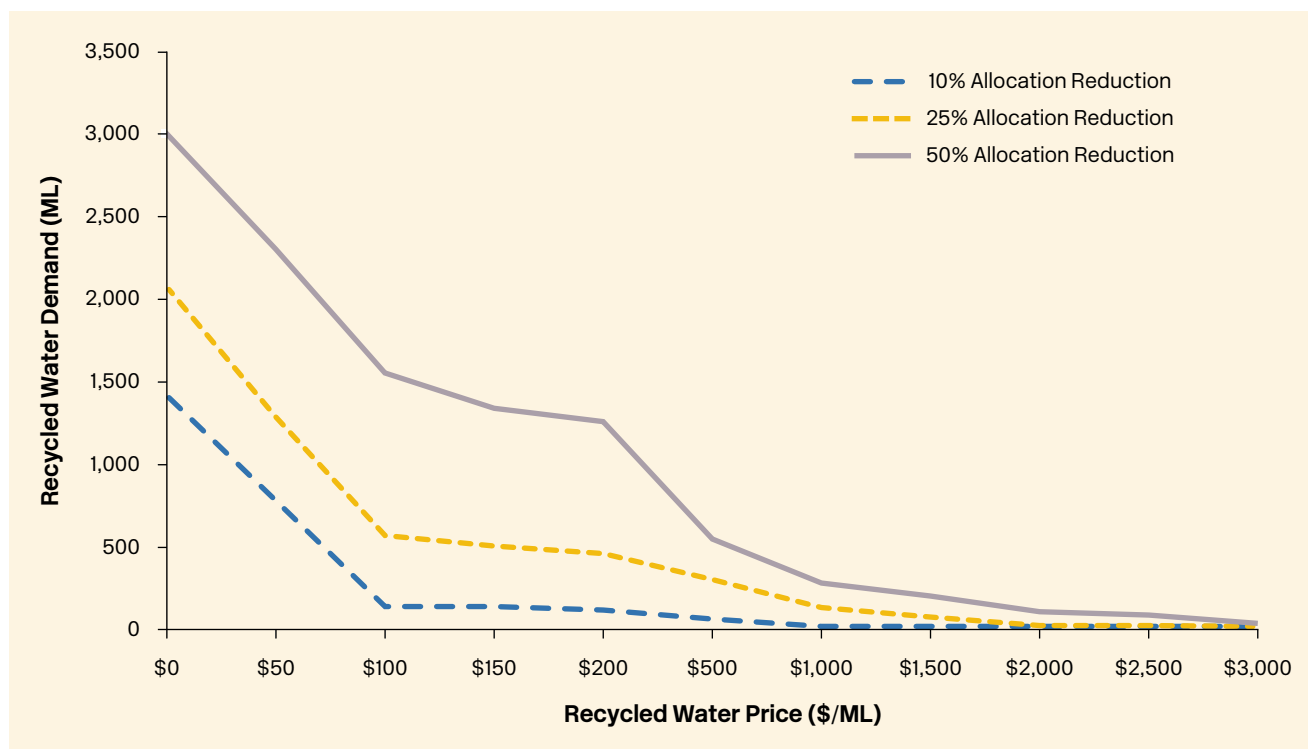


Figure 2: Overall demand curve – volumes demanded under 10%, 25% and 50% allocation reduction scenarios (n=16)

Further reading


Blackmore, L., Iftekhar, S. and Fogarty, J. (2020). Subiaco Strategic Resource Precinct Case Study: Non-Market Valuation of Recycled Water – Final Report. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.


CRC for Water Sensitive Cities. (2017). Ideas for the Subiaco Strategic Resource Precinct Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

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