Case study – Port Macquarie-Hastings Council

Managing a recycled water cross-connection event

As councils work to future-proof their water supply to ensure water security for their communities, recycled, or reclaimed water, is increasingly forming part of councils' strategy. Recycled water has many uses as the quality level required is different, depending on the end use - for example water to irrigate playing fields does not need to be of drinking water standard.

A cross-connection can happen when pipes supplying recycled water are accidentally connected to the drinking water supply. Customers drink the water, assuming it is safe and unintentionally drink water which could make them unwell.

This case study describes how a recycled water cross-connection occurred at the Port Macquarie Running Festival and how council managed the incident.

This case study is a resource for regional and county council decision-makers, including Councillors and operations staff of council-owned local water utilities.

About Port Macquarie–Hastings Council

- Port Macquarie–Hastings Council is responsible for the area of Camden Haven, Wauchope and Port Macquarie on the mid-north coast of NSW.
- The local government area is home to around 84,000 residents across 3,700 square kilometres.
- Council manages around $2 billion in community assets, including $1.13 billion in water and sewage assets. Council began supplying recycled water in 2007.

Figure 1 Map showing the location of Port Macquarie-Hastings local government area on the Mid North coast of NSW

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System context

PMHC manages 2 recycled water treatment plants (RWTPs) in Port Macquarie and Bonny Hills. This recycled water helps reduce the demand for the raw water that is used to produce drinking water. The recycled water provided is not intended for drinking. Instead, it is used for other purposes (see box, Uses of recycled water in Port Macquarie–Hastings).

Uses of recycled water in Port Macquarie–Hastings Council area

- Irrigation and watering of public parks, open space areas, sporting fields, bowling greens, nurseries, etc.
- Toilet flushing
- Vehicle washing and detailing
- Commercial laundry washing

Recycled water travels from the treatment plant to a storage reservoir, and then on through a series of pumps and pipes to its end destination.

For this case study, the system starts with the RWTP in Port Macquarie. This plant originally started operation with the capacity to produce 1 ML/day. To meet increasing demand for water, it was upgraded in 2017 to produce 2 ML/day. The treatment system shown in Figure 2 produces high-quality recycled water.

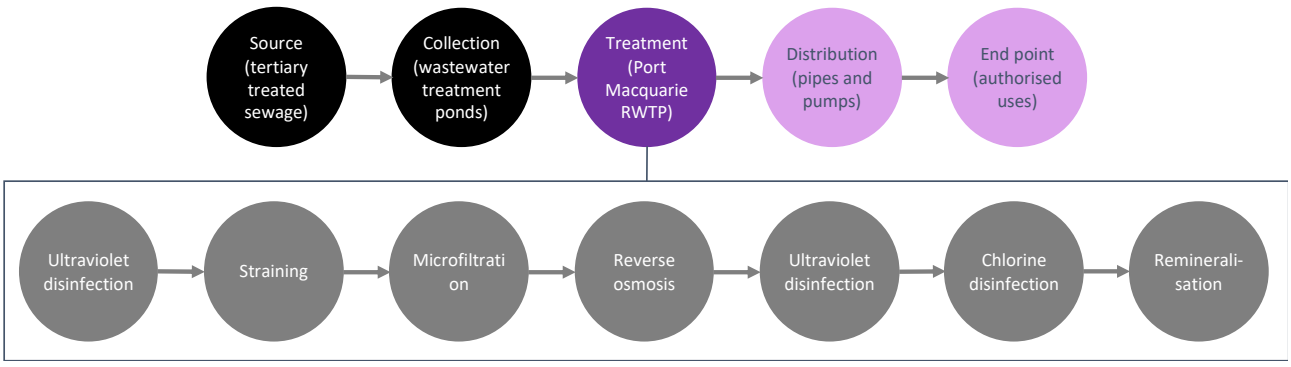

Figure 2. Port Macquarie recycled water treatment system showing the collection of wastewater, treatment processes and distribution of recycled water to the end users.

The event

In March 2019, runners and visitors participating in the Port Macquarie Running Festival were given access to a drinking water connection which had been inadvertently plumbed into the recycled water system.

Over the weekend of 9 and 10 March 2019, runners and visitors worked up a thirst at the Port Macquarie Running Festival. Just over a week later, on 19 March 2019, it was identified that the council had inadvertently given the event organiser incorrect information about a water connection point for 3 mobile water stations.

The Council and event organisers worked together to advise participants of the mix-up. Fortunately, as the water was of a high quality and there was limited ingestion over a short 2-day period, there were no reports of illness or adverse events. The recycled water was treated in accordance with Australian Guidelines for Water Recycling but was not approved for drinking.

Council governance

Port Macquarie-Hastings Council is a general-purpose council under the *Local Government Act 1993* (NSW) and has a range of obligations under that Act. As part of its functions, the Council has several water business obligations. This includes providing drinking water, sewage service and recycled water.

As part of its recycled water obligations, Council must meet requirements of the Public Health Act 2010 (NSW), Local Government Act 1993 (NSW) and levels of service agreed with the community.

The NSW Department of Planning and the Environment has adopted the AGWR framework for approving recycled water schemes of local water utilities. The department uses the framework for approving recycled water schemes under:

- Section 60 of the *Local Government Act 1993* (NSW)

  or
- Section 292 of the *Water Management Act 2000* (NSW).

When implementing a recycled water scheme, water suppliers have a responsibility to ensure that it is managed properly, people are not exposed to health risks, and the environment is not exposed to risks such as erosion and degradation of soils and waterways. The AGWR's risk-management framework for the provision and use of safe recycled water focuses on prevention by identifying and managing risks from water source to end point.

The AGWR framework has 12 elements that cover product management, environmental management, public health management and quality management. The overall framework incorporates aspects from standards such as ISO 9001, ISO 14001 and HACCP (Hazard Analysis Critical Control Point), with which you may already be familiar.

Overview of risks

Even though there were no reports of illness in the runners, visitors and community, PMHC and the community were exposed to several risks and consequences from the event, some of which are summarised in Table 1.

Risk	Consequence to Council	Impacts
Operational disruption and extra activity in responding to the incident	• Increased cost (unplanned nature; challenging to coordinate) • Staff fatigue • Potential failure to meet other system obligations and levels of service	• Financial • Reputation • Public health • Work, health and safety • Compliance
Loss of reputation for town because of error	• Potential reduction in tourism • Impact on regional economy • Political fallout	• Financial • Political
Lack of awareness in the community of recycled water benefits and impacts of unauthorised use	• Potential fear of recycled water • Loss of confidence in council	• Public health • Political • Reputation

Table 1. Overview of risks posed to Port Macquarie-Hastings Council from the recycled water cross-connection

Insights gained

Some of the key insights learned from this event include:

- update process and procedure for using and maintaining water filling stations and identify responsible officers within the organisation
- include placement and connection of mobile water stations in future risk assessments for events with mobile water stations
- audit compliance and end user controls for all recycled water signage across network
- identify potable water connection points at likely future event sites
- induct new council events and recreation staff on process and procedure for water filling stations
- update emergency response plan, including advice to communications team
- develop annual training package for water supply staff about correct process and approvals for reclaimed water connections
- stringent water quality and other controls, such as backflow and plumbing checks, are important risk-management measures for recycled water systems.

Considerations

- Are you aware of the benefits of recycled water use?
- Have you visited your recycled water treatment plant recently?
- Does your council have a recycled water quality management system in place?
- When was the last time your recycled water quality management system was audited for compliance?
- Are you familiar with your council's authorised uses for recycled water?
- Are you aware of the effects of unauthorised use of recycled water?
- Do you know how recycled water connection points are identified within your local government area?

References

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