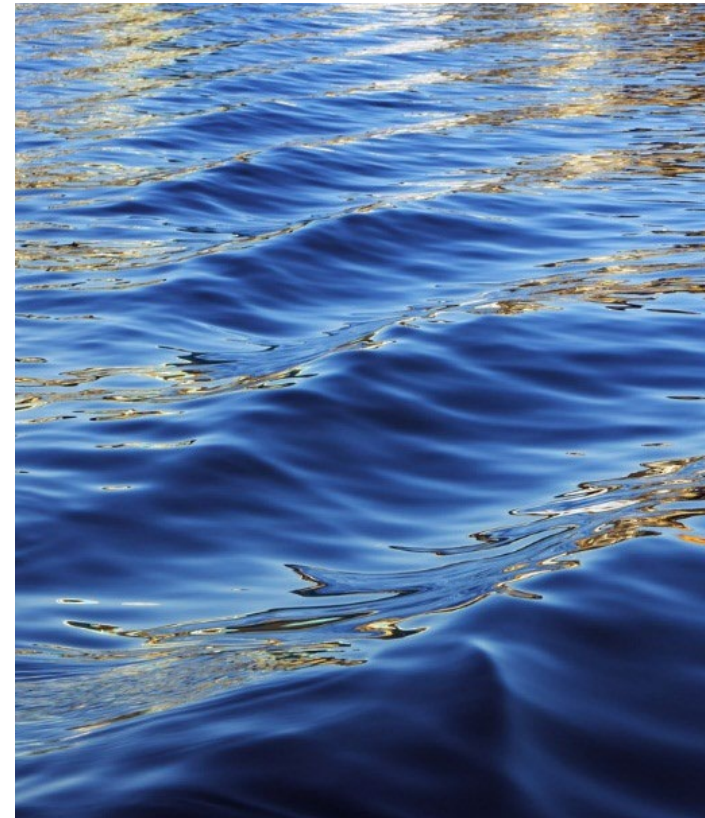


Harnessing RO Byproduct Water for Urban Cleaning

Advancing Local Water Sustainability



Introduction

- Brief overview of the initiative: Since 2022, RPAH (Royal Prince Alfred Hospital) and the CoS (City of Sydney Council) have spearheaded a pioneering initiative in Australia to capture and reuse RO reject water for street and footpath cleaning.
- Purpose: This sustainability project seeks to enhance water usage efficiency within SLHD by repurposing RO (reverse osmosis) concentrated water for suitable non-potable purposes, thereby contributing to a more sustainable water future for the local community.

Background & Problem Statement

- The issue of RO reject water wastage: The production of ultrapure water for kidney dialysis generates a substantial volume of wastewater (1.5 million litres RO reject water annually, typically discharged into sewer system), primarily in the form of RO concentrated water, and it is safe for various non-potable applications.
- Need for sustainable water management in community: It is critical to thoroughly assess the community's water demand, including volume requirements, usage profiles, quality standards, and the necessary coordination and infrastructure.

Project Objectives

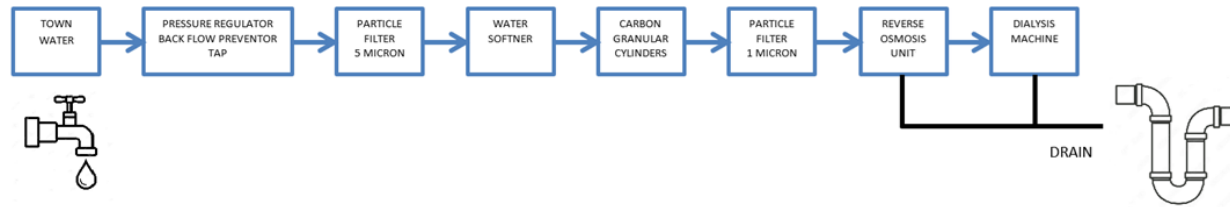


- Reduce potable water consumption
- Repurpose RO reject water efficiently
- Improve environmental and economic sustainability

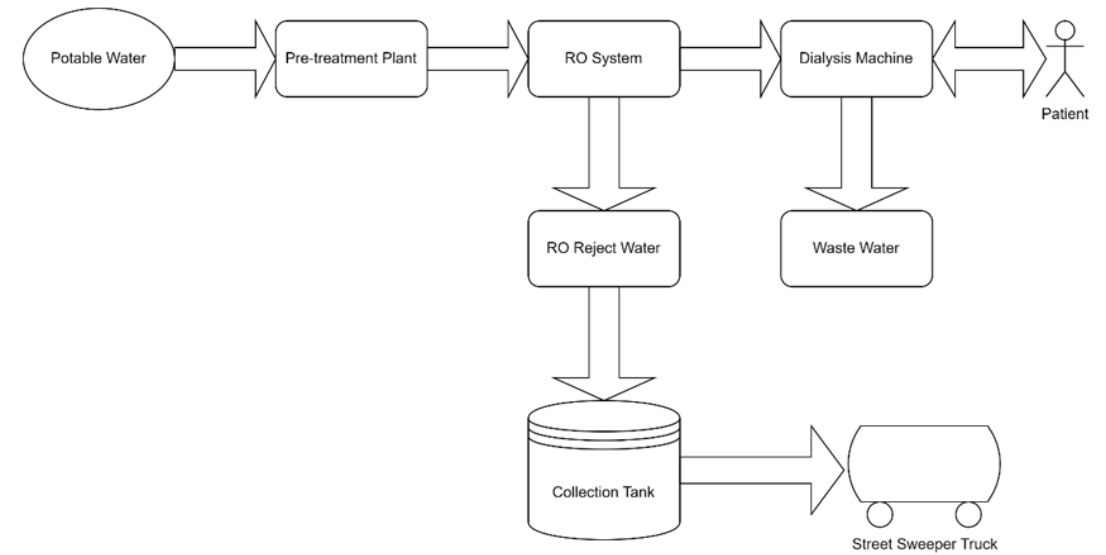


Drainage or Reusage ?

Dialysis Water Treatment



RPAH Dialysis Water Flow





(a) – Project site



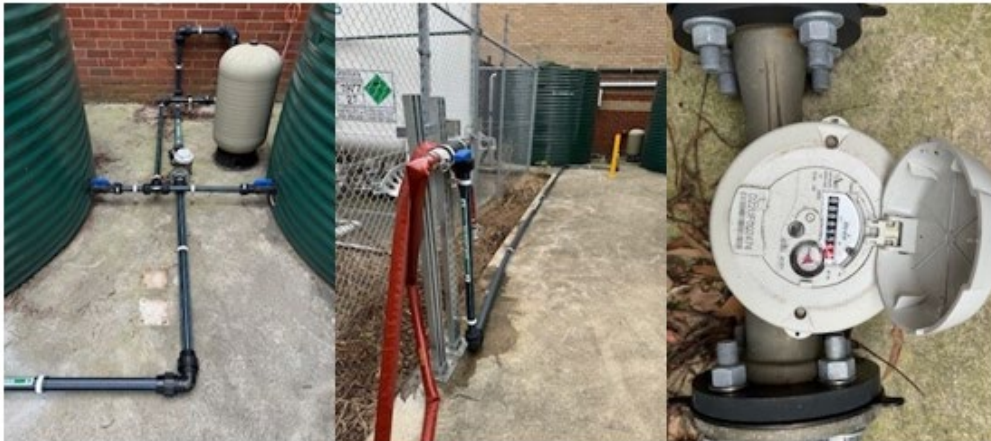
(b) – Tanks



(c) – Pump controller



(d) – Water pump



(e) – Pipes and connectors

(f) – Output hose

(g) – Water meter

Figure 10 – On-site photos of SLHD RO Reject Water Harvesting and Reusing System

Innovation & Process

- Repurposing RO reject water – RO treated water is clean and safe for drinking and non-potable applications.
- Infrastructure and system integration – including two 10,000 litre tanks

Collaboration & Stakeholders

- Partners: RPA & City of Sydney Council
- Roles of each organization: SLHD and CoS established a clear strategic direction for the water reuse initiative, focusing on sustainability and efficient resource management. This vision was effectively communicated across the organization, aligning all stakeholders with the project's goals, and ensuring coordinated efforts in its implementation. The biomedical team of SLHD provided guidance that kept the project focused on its objectives, timeline, and techniques.
- Importance of public-private collaboration: The effective leadership demonstrated a commitment to excellence and innovation, guiding the project through strategic vision and effective management. The project's success relies on the collaboration between multiple parties, including the Kidney Centre (RPAH), Integra Water, the CoS and the SLHD CIE teams.

Implementation Process

- Water collection and treatment (sweeper trucks with tanks)
- Infrastructure modifications
- System integration with municipal services (street cleaning team)



Figure 6(a)(b) - Original hose setup and water collecting spot in July 2023

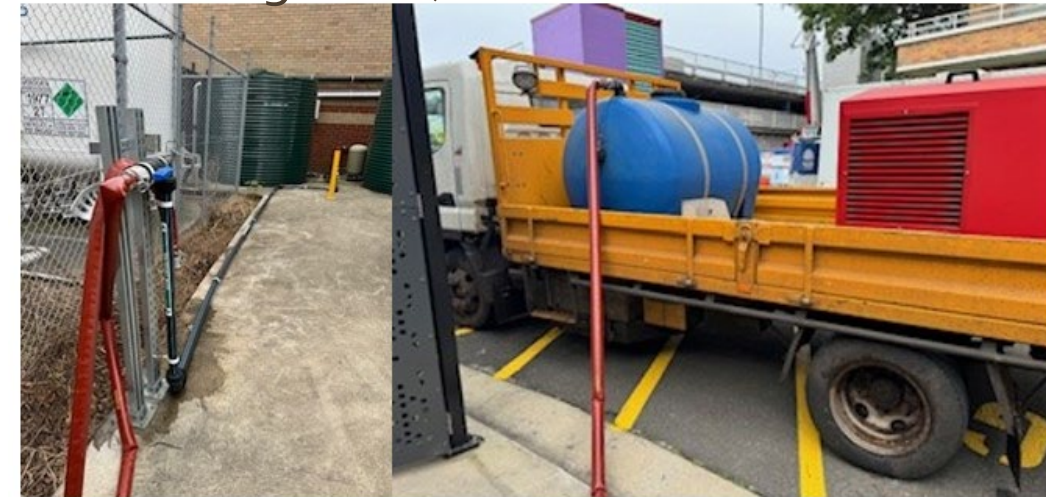


Figure 6(c)(d) - New hose setup and water collecting spot in July 2024

Innovation & Unique Aspects

- First-of-its-kind hospital-municipality water reuse model
- Custom engineering solutions
- Scalable & replicable framework: By integrating continuous improvement into every aspect of the water reuse initiative, SLHD ensures that the project not only meets its current objectives but also adapts to future challenges and opportunities. This approach sustains the initiative's success and reinforces its role as a leading example of sustainable water management in healthcare.

Evidence of Outcomes

- Reduction in water usage: By repurposing approximately 20,000 litres of RO reject water each week for street and footpath cleaning, the project has significantly reduced the community's reliance on potable water.
- Cost savings for the community
- Improved environmental footprint



Community & Environmental Benefits

- Contribution to local sustainability efforts: One of the most significant achievements of this project is water conservation. By repurposing approximately 20,000 litres of RO reject water each week for street and footpath cleaning, the project has significantly reduced the community's reliance on potable water.
- Positive public and municipal collaboration: Through commitment to continuous improvement, staff empowerment, and a focus on innovation, the leadership at SLHD and CoS demonstrated effective management and set a high standard for excellence in the water reuse initiative. The leadership not only guided the project to success but also established a framework for future sustainability efforts.

Scalability & Future Applications

- Potential replication in other healthcare facilities
- Expanding applications beyond street cleaning
 - ✓ Potential use in cooling systems, landscaping, and sanitation
 - ✓ Broader implications for healthcare and urban planning



Challenges & Lessons Learned

- Regulatory considerations: To ensure safety and compliance, the Integra Water conducted a risk assessment of the project. The water quality of the RO product is assessed through direct measurement of specific contaminants, estimation based on water recovery data from the RO plant and local water authority, and water quality data provided by the dialysis service provider (Integra Water, 2023).
- Key takeaways for future projects: By maintaining a strong focus on consumer needs and actively engaging to the community, SLHD and CoS have ensured that this sustainability initiative not only meets environmental goals but also aligns closely with the expectations and priorities of the people it serves. This consumer-centric approach makes the initiative a potential model for similar efforts in other regions.



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Recognition & Awards

- Acknowledgment from industry bodies
 - [ACHS WINNER - Quality Improvement Awards 2024](#)
- Support and positive feedback



Conclusion & Call to Action

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Date: 04/09/2024

TRIM Number: 2024/S08213

Jon Gowdy
Executive Director
Capital Infrastructure Engineering SLHD
Royal Prince Alfred Hospital,
Building 28, Susan St
Camperdown 2050

Dear Jon,

I am writing on behalf of the City of Sydney Council to express our appreciation for the successful collaboration between the Royal Prince Alfred Hospital and our organisation in developing a pioneering sustainability initiative.

This collaboration, which commenced with the installation of infrastructure to capture side stream water from the new kidney dialysis unit at the hospital, represents a significant milestone in our shared commitment to sustainability. The initiative to repurpose this water for filling our street cleaning trucks and sweepers, which began in March 2024 after careful optimisation, risk assessment, and trials,

The project is a testament to what can be achieved when two organisations unite with a common goal. By utilising water that would have otherwise gone down the drain, we have reduced water wastage and reduced carbon emissions by reducing vehicles' travel time to refill and set a powerful example of innovative resource management.

This project dramatically benefits our organisation, as it aligns perfectly with our sustainability objectives and enhances our ability to maintain the city's cleanliness in an environmentally responsible manner. The initiative showcases a collective approach to shaping a bold solution towards sustainability—a model that we hope will resonate widely, especially in these unprecedented times when resource conservation is more critical than ever.

Thank you once again for your partnership and support.

Warm regards,



Neil Palagedara
Executive Manager, Property Services
City of Sydney Council

Green, Global, Connected.

- Summary of key points: SLHD has developed a sustainable method to repurpose this reject water for applications where high-quality water is not required, such as street cleaning using specially equipped vehicles.
- Encouragement for adoption in other healthcare settings: This innovative project has the potential to serve as a model for other healthcare facilities and municipalities across SLHD and beyond, inspiring similar efforts to maximise the reuse of water resources.
- Collaboration: The collaboration between SLHD and CoS exemplifies how public institutions can work together to tackle environmental challenges and promote sustainability at a local level.

Q&A

- Invite questions from the audience