

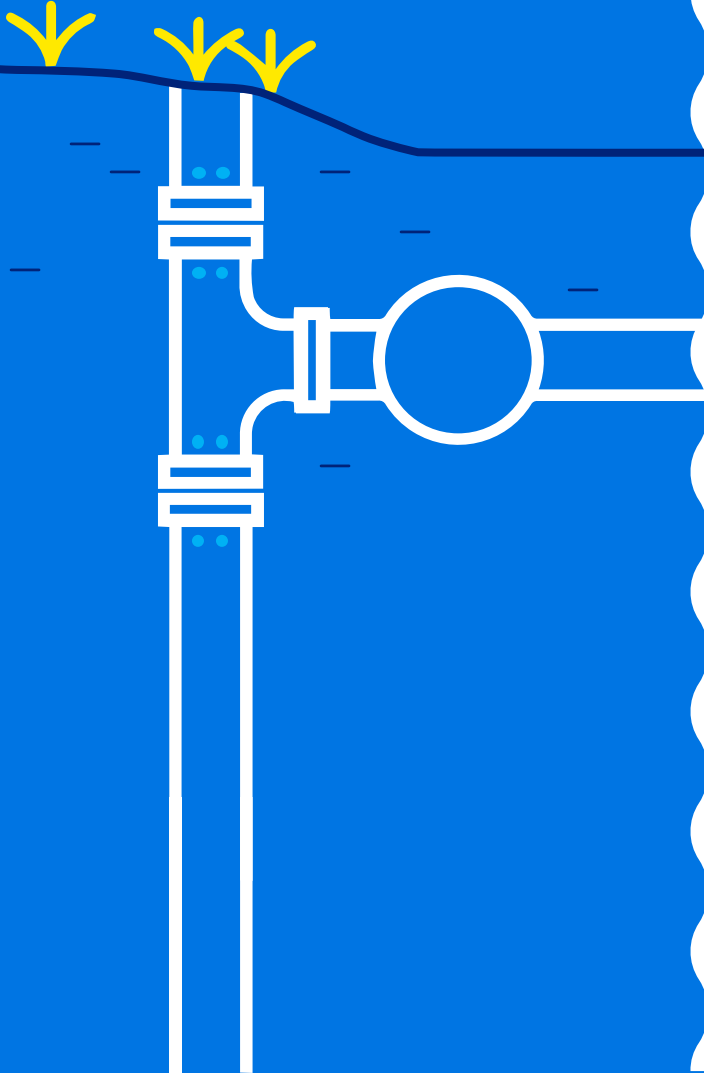


**Harnessing rainwater for hot water:  
Lessons and pathways from a decade  
of innovation at Aquarevo**

**Next Water '25: Birgit Jordan, Chris Madeley**

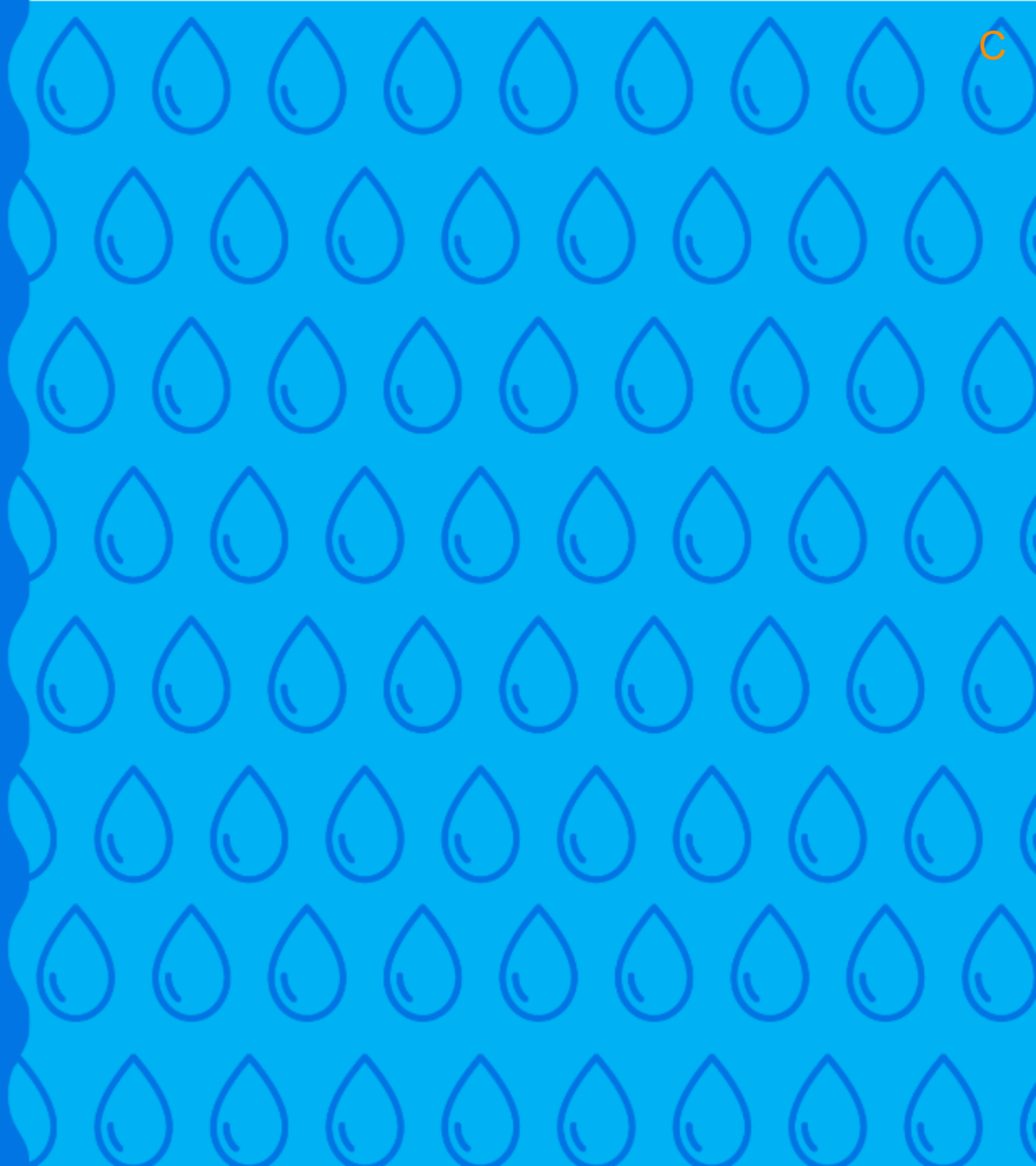
**South East  
Water** 

# Outline



- 01** About Aquarevo.
- 02** Aquarevo's rain-to-hot water quality journey - lessons and pathways.
- 03** Aquarevo in action: Results that Matter.
- 04** Key takeaways.
- 05** What next?
- 06** Questions?

# 01 About Aquarevo



## Development Timeline and Land Use

- The project has been constructed on the former Cranbourne sewage treatment plant site, which was decommissioned in 2012
- Planning development commenced in 2014, followed by construction in 2017, welcoming the first residents to the estate in 2019

## Community & Infrastructure

- The 42-hectare site consists of 467 residential lots, with a median size of 487 sqm.
- The development showcases smart decentralised infrastructure in a real world environment
- Aquarevo is home to Victoria's first large-scale rainwater harvesting system for hot water
- Reaching 95% completion in September 2025

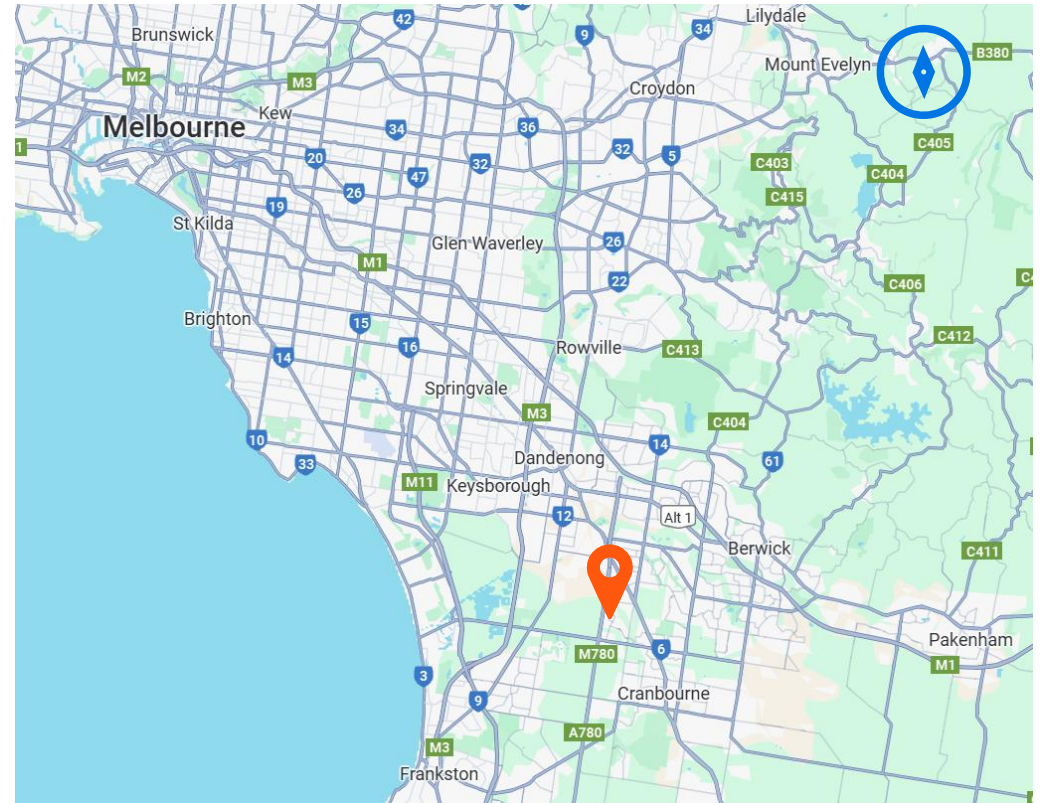


Image: Google maps

AQUAREVO  
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# Aquarevo's key integrated water goals

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## Up to 70% reduction in potable water use

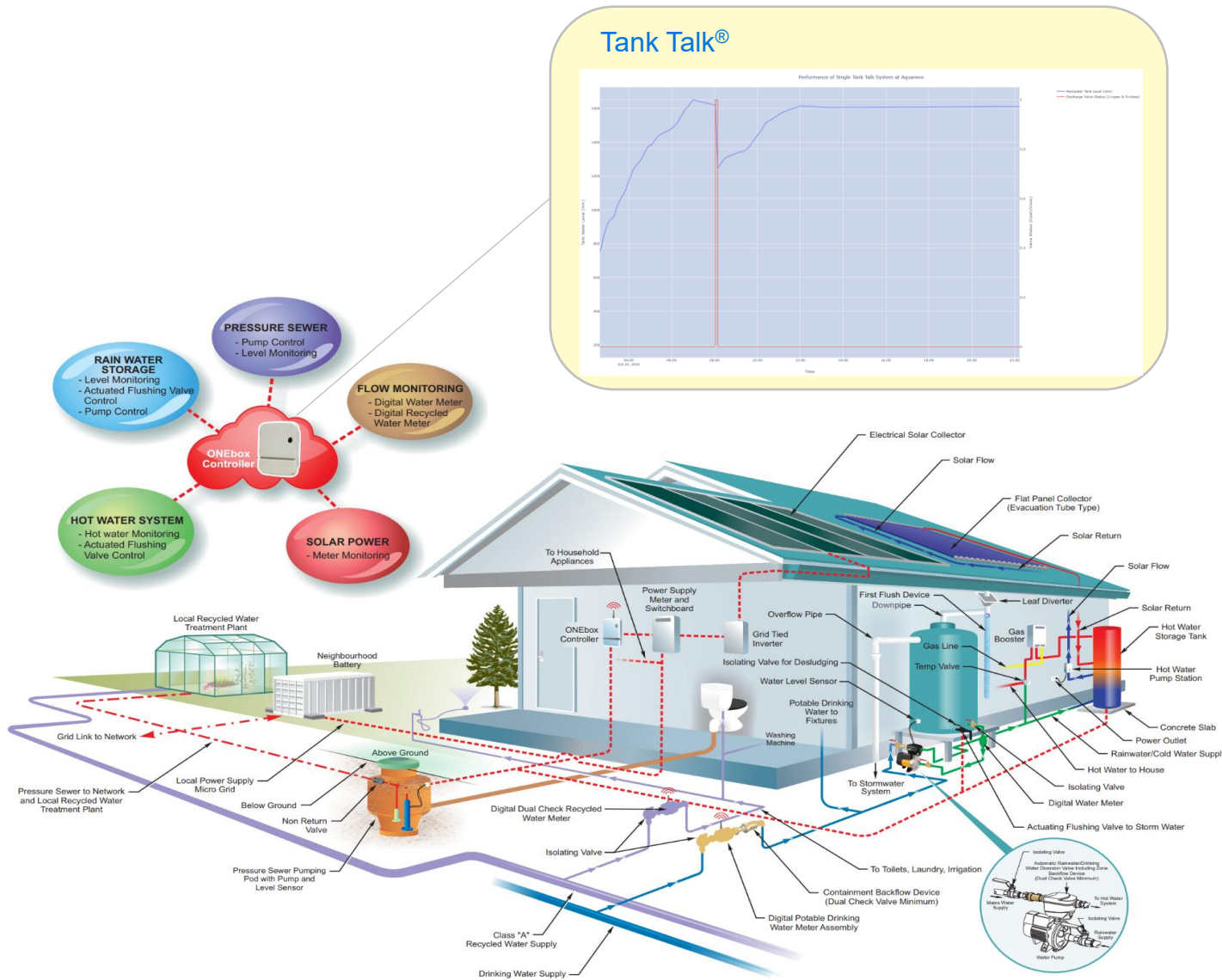
By combining the supply of rainwater for hot water in showers, baths, and laundry troughs, with the use of recycled water for toilets, washing machines, and garden irrigation, future proofing our precious water supplies.



## Up to 25% reduction in peak stormwater runoff

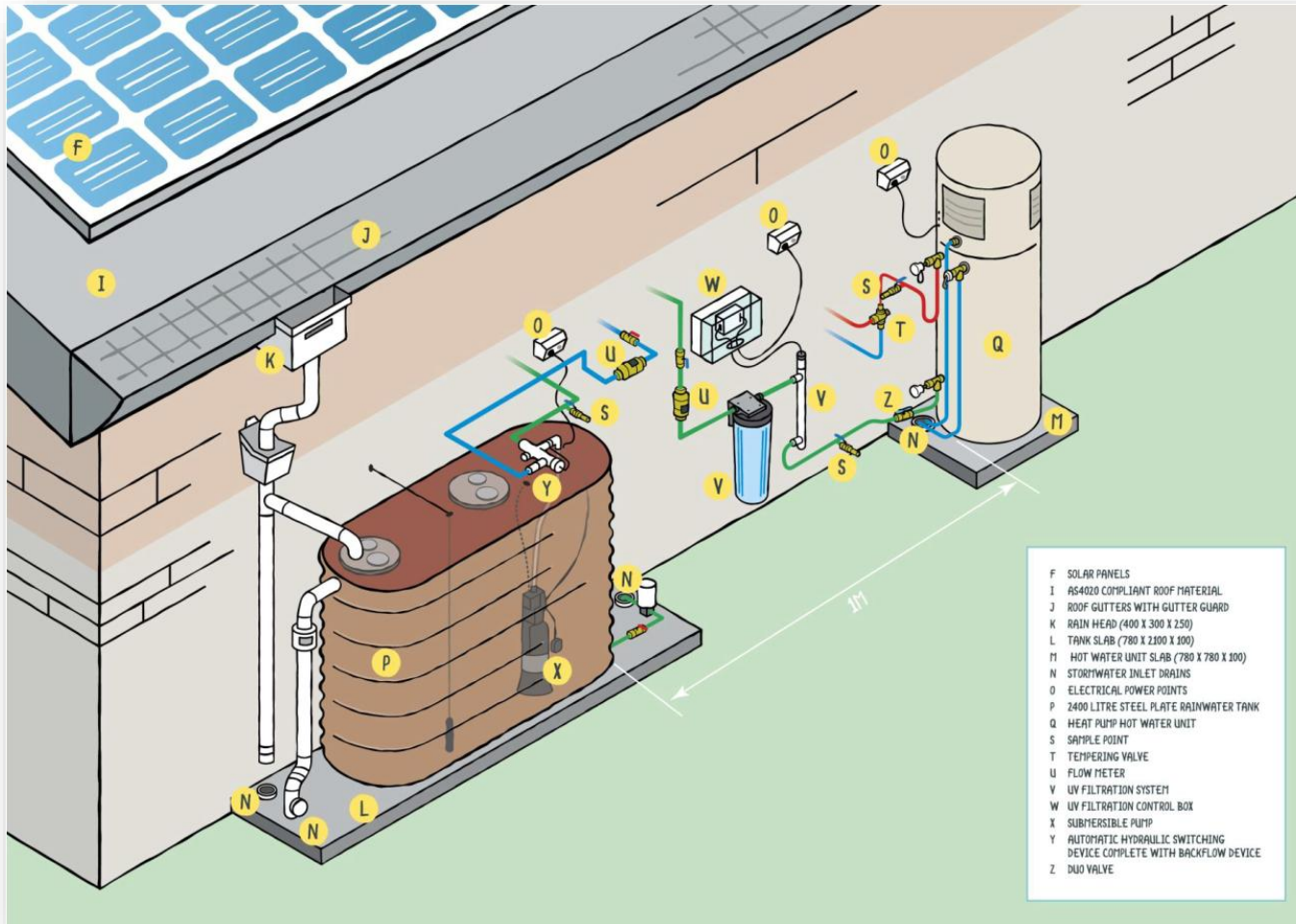
to help mitigate nuisance flooding and pressure on drainage systems using Tank Talk<sup>®</sup> smart technology.

# On property sustainable initiatives



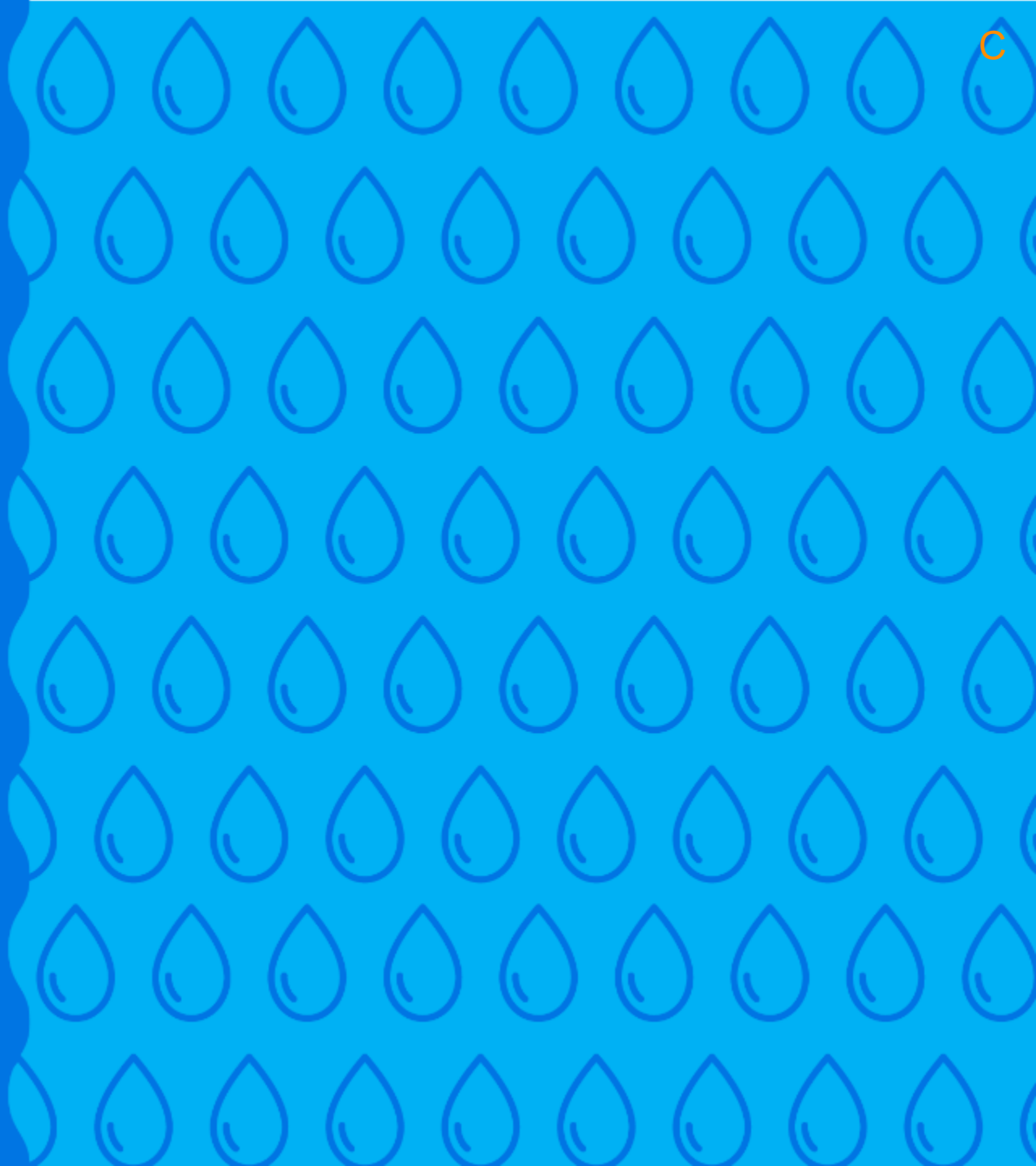
- **Smart Water Strategy:** A multi-source water system provides homes with a sustainable water supply and flood mitigation.
- **Potable Water:** Used for kitchens, bathroom vanities, and cold taps.
- **Heated Rainwater:** Specifically for showers, baths, and laundry troughs.
- **Recycled Water:** Dedicated for toilets and garden irrigation.
- **Washing Machines:** Can use any of the three water sources, with recycled water being the preferred option.

# Rainwater-to-hot water systems



- **Rainwater is collected** via dedicated roof catchment area, **filtered, UV-treated, and heated** using heat pump system hot water service.
- **A 4 stage multi-barrier disinfection** approach was designed.
- Each property is equipped with a **OneBox+<sup>®</sup> controller** for real-time monitoring and a **Tank Talk<sup>®</sup> smart tank system**.
- **Maintenance strategy:**
  - 3-month post-install inspection
  - Annual maintenance cycle
  - Continuous asset monitoring

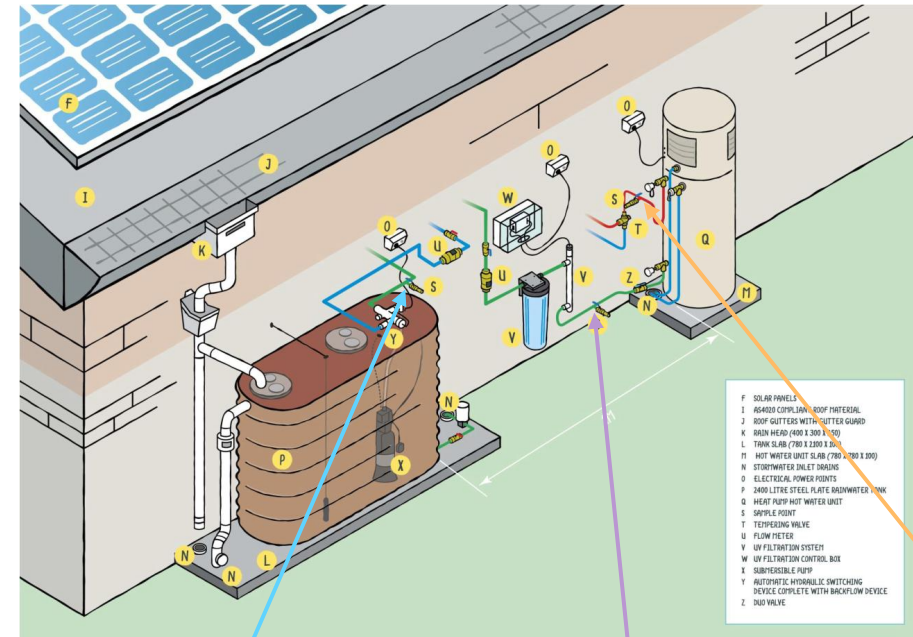
## **02 Aquarevo's rain-to-hot water quality journey – lessons and pathways**



# Water quality monitoring program 2018-24

- **6.5 years of data**
- **1,069 site visits** across 395 occupied homes.
- **Over 63,000 analytical reports** from 1,185 sampling points.
- **Sampling stages** 3-month post-install (57 parameters), and annual follow-up (5 parameters) over 10 years.\*
- **Microbial and chemical risk assessments** 2017, 2020, 2021, 2022 and 2024, benchmarked against the Australian Drinking Water Guidelines (ADWG).
- **Independent monitoring program review** 2025, recommended a refreshed scaled back program.

\*subject to water availability at the time of sampling



# Water quality program review outcomes/results

## No significant water quality issues detected



Post-treatment sampling at hot water outlets showed **no concerning or persistent exceedances** of drinking water guidelines. Minor exceedances typically found pre-treatment were **sporadic and too low in magnitude to present significant risks to health.**

## UV-only disinfection is a viable alternative



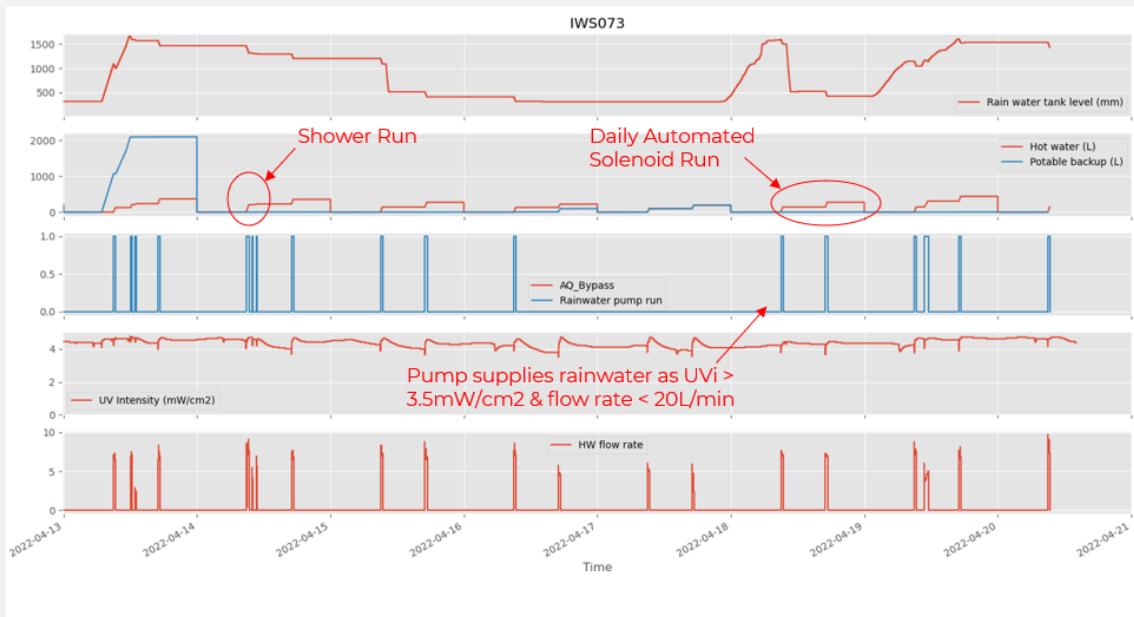
**Microbial and chemical risk assessments confirmed no increase in health risk**, with exposure levels remaining **within accepted safety thresholds.**

## Monitoring can be streamlined



Consistent results support shifting from intensive lab testing to a **risk-based, preventative monitoring approach**, guided by Hazard Analysis Critical Control Points (HACCP) Plan, ISO 22000, and ADWG frameworks.

A revised HACCP plan is currently underway to reflect this evolution.



New UV-based control being tested at the Aquarevo house



Gutter guard / bird proof mesh (Image: Water Futures)

# Other reviews

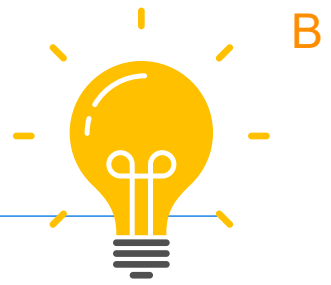
## System Review 2022

Optimisation opportunities identified:

- Refinement of Tank Talk<sup>®</sup> algorithms
- Resolution of downpipe blockages
- Investigation of UV-only disinfection

## Whole-of-rain-to-hot Project Review 2025

- Currently underway
- Includes water balance, asset management, engagement, governance, future directions



# Some lessons learned

## Risk is relative to scale



- Household rainwater-to-hot water systems pose **negligible public health risk compared to centralised drinking water networks**. Risk management approaches should consider this difference.

## Data transforms understanding



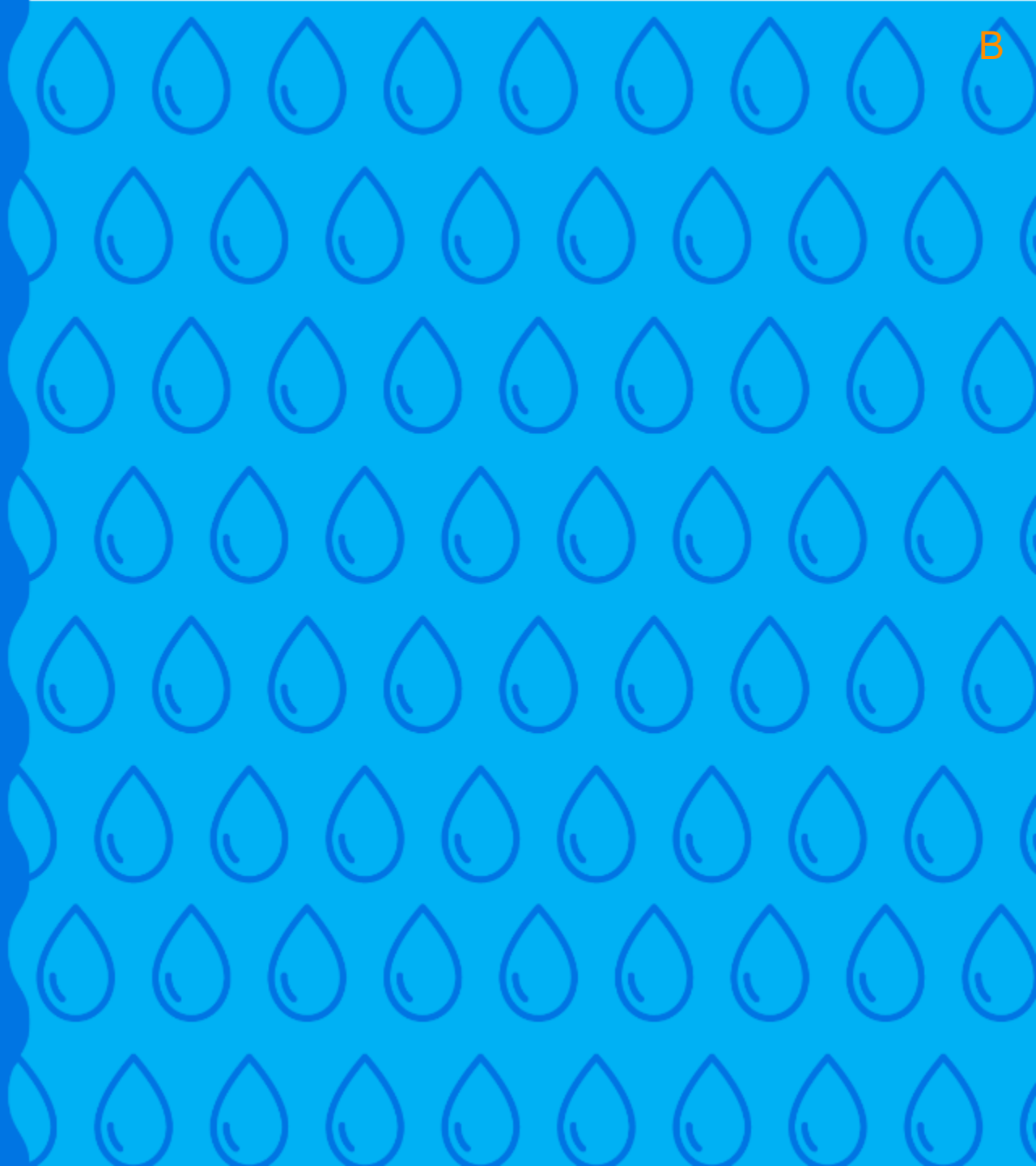
- Long-term, real-world monitoring** of treated and untreated rainwater water **revealed insights into quality risks and behaviours that modelling alone could not provide**. These findings will guide future system designs, maintenance, and help define regulatory frameworks for decentralised systems.

## Quality management is a journey



- Building a fit-for-purpose **quality management system for alternative water sources requires flexible frameworks** that evolve with new insights; HACCP and supporting programs continue to be refined throughout the project.

# 03 Aquarevo in action





# Results that matter





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- **Over 29 million litres** of potable water saved annually (between Jul 2024 and Jun 2025)
- **188 tours and presentations** provided to national and international audiences
- **6.5 years of real-world water quality data** analysed, and peer reviewed
- **Consistently safe** water quality delivered
- **Innovative system design optimisations and plumbing solutions** established and validated
- **Tank Talk®** development catalysed
- **Water treatment effectiveness proven** through challenge testing and long-term implementation
- **Patented technology** for rain-to-hot system and UV-based control methodology

## 04 Key takeaways

# Aquarevo's decentralised rain-to-hot water model...

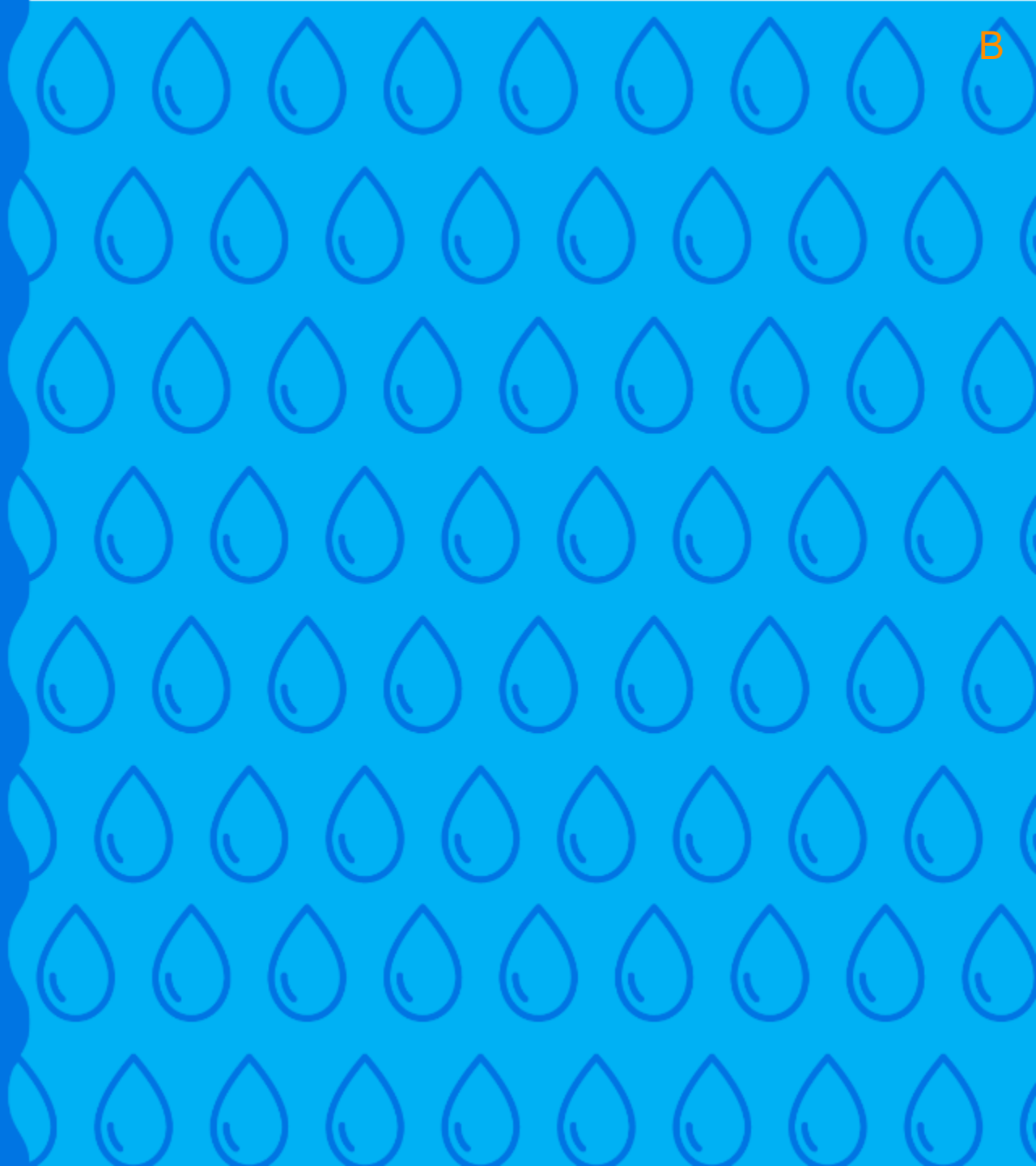
## Impact

-  • **Proves a safe, scalable model** for delivering rainwater-to-hot-water at lot and precinct scale
-  • **Reduces potable water use** and mitigates stormwater impacts
-  • **Contributes to resilient, water-sensitive urban design**
-  • **Enables water utilities to take on active roles beyond the meter**

## What made it work

-  • **A scalable model** – small enough to manage, large enough to prove
-  • **Rigorous health-based water quality management**
-  • **Smart controls and digital monitoring**
-  • **Strategic optimisation and engagement**

## 05 What next?



# Next steps

## Mainstream



Transition from pilot to **business-as-usual** delivery.

## Scale



Assess **lot-scale vs community-scale** rainwater harvesting systems to identify optimal scalability and performance trade-offs.

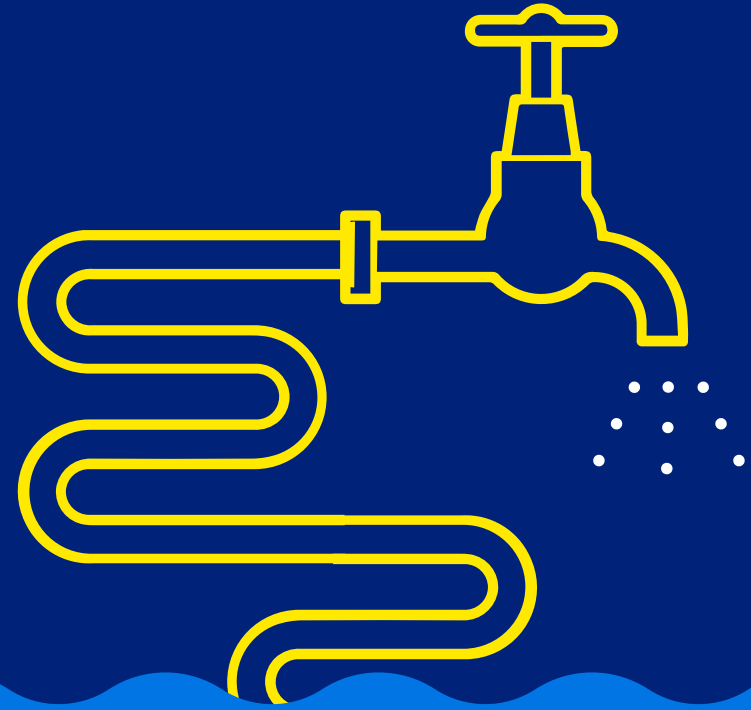
## Expand



Explore how this model can be adapted for **high-density and regional contexts and expanded uses**.

What do you think?





**Thank you!**

**Questions?**