



Demonstration plants and visitor centres, and adoption of purified recycled water for drinking

International experience indicates that if a city or region is considering purified recycled water for drinking, creating a demonstration project or foundation plant incorporating a visitor experience so that people can touch, see, hear, learn and taste, helps create acceptance of this option to enhance the water supply.

Around the world, many places have followed a similar pathway in considering purified recycled water for drinking. They build a demonstration plant, with some sort of visitor tour or experience. This early step can allow for stakeholders, regulators and community members to learn about the water cycle, and how purified recycled water replicates the water cycle to meet the town's needs. Later, there may be a decision about whether to adopt it as part of the drinking water supply.

Most places that follow this pathway, go on to adopt purified recycled water for drinking. Every town or city's path is unique. The timing can vary, for example Singapore built a technical demonstration plant as a separate first step, then created the NEWater visitor centre. Windhoek learnt from a technical demonstration style plant elsewhere, and does not include a visitor experience. Valley Water (California) and Cape Town have used existing plants created for another purpose, as demonstration plants for purified recycled water consideration.

Some visitor/education centres do not include a technical demonstration plant. They can have a much broader, holistic focus on water overall. Visitor experiences should explain the water cycle – this creates a base of understanding that supports all water futures. Understanding where our water comes from and the water cycle means that when the time is right, the community has an understanding of resource recovery, and that technologies can accelerate what happens in the water cycle naturally. In this context, people are often happy to accept purified recycled water as a sustainable, climate resilient source of water.

Of course, community engagement isn't just about demonstration plants and visitor centres – there is usually a broad education/engagement campaign as well. Nonetheless, there is a clear correlation between demonstration plants/visitor centres, and implementation of purified recycled water for drinking.

Investing in a demonstration plant/visitor experience can also benefit a broader audience. They can provide technical guidance, mentoring and training for other towns or regional areas. Some trial both membrane-based treatment trains (using reverse osmosis) plus low energy carbon-based treatment trains, which can benefit inland areas as they don't create a brine stream to dispose of. There is a wide range in style, and cost for demonstrations – from a few hundred thousand dollars to much higher.



Some places have adopted purified recycled water for drinking without building a demonstration project. This can occur where a scheme was built very quickly (due to drought, such as Texas) or where the environment is quite mature and there are other schemes and plants nearby (such as California). In Beaufort West, South Africa, the community of about 10,000 people had heard about new technology in use elsewhere, and requested a solution for their town.

Towns with demonstration plants or visitor centres

Below are the cities, towns or communities that WSAA is aware have built demonstration plants or visitor centres. Visitor spaces are increasing around the world, so there may be others. This list focusses mainly on fixed demonstration plants. Many places conduct small lab-based pilots as an early exploratory exercise, whereas fixed demonstration plants generally occur at a point where cities/towns require a water supply augmentation of some kind, and have a decision ahead about whether to adopt a particular option.

This list also generally excludes mobile demonstration plants, which often come earlier – as a way of creating early engagement, before there is a specific decision to proceed or not. They also can be a shared resource among multiple entities across several towns or a state.

Anecdotally, the water industry often looks at purified recycled water for drinking alongside other options and finds it compares well on cost and other outcomes, but sometimes the option is dismissed due to policy bans or fear the community will not accept the option. However more than 35 cities globally have adopted this option, and the creation of a demonstration project has played a key role in many of those. This list shows that investing in a demonstration plant/visitor experience, is a very reliable way to help the community understand purified recycled water for drinking and the contribution it can make to a resilient water supply.

City/town/community that built a demonstration plant/visitor centre	Has the city/town implemented purified recycled water for drinking?
1. Perth, Western Australia – Demonstration plant at Beenyup (the Groundwater Replenishment Trial) and visitor centre	Implemented
2. Singapore – Demonstration plant + NEWater Visitor Centre	Implemented
3. San Diego, California USA - Demonstration plant + Visitor Centre	Implementing
4. Hampton Roads, Virginia USA - SWIFT Research Centre	Implementing
5. Monterey, California USA - Demonstration plant	Implemented
6. Windhoek, Namibia - No formal Demonstration plant but used the designs of the Stander demonstration Plant in Pretoria in creating the plant in 1968	Implemented
7. Scottsdale, Arizona USA - Decades of indirect potable reuse, now City of Scottsdale Water Campus is effectively a Demonstration plant (gained direct potable reuse permit 2018)	Implemented
8. El Paso, Texas USA - 1 year trial with tours of Fred Hervey plant, now building a new visitor centre	Implemented



9. Water Replenishment District of Southern California, USA - Demonstration plant	Implemented
10. Los Angeles, California USA - 2 demonstration plants, Hyperion Environmental Learning Centre in LA and Glendale.	Already have an operating IPR system at Terminal Island, and there is full intention (already publicly committed) to go near 100% water reuse, mostly from purified recycled water for drinking, by 2035. (See the LA news video)
11. Cape Town, South Africa - Used the temporary plant commissioned during Day Zero, as a demonstration plant.	Due to implement purified recycled water. Full scale Faure plant in design.
12. Gwinnett County, Georgia USA - Gwinnett Environmental and Heritage Center (not focussed on demonstrating purified recycled water)	Implemented
13. Loudoun County, Virginia USA – visitor centre	Implemented
14. Padre Dam, California USA – Demonstration plant + visitor centre with tours	Implementing
15. Luggage Point, South East Queensland Australia (Western Corridor scheme) – no demonstration plant; and a formal visitor centre was designed but not built. The Gibson, Bundamba and Luggage Point advanced water treatment plants were all opened for tours and site tours were given to almost 200 business, community, school and local groups, and presentations were given to more than 370 community groups.	Implemented but as a drought option
16. Soquel Creek, California USA - Did a mock demo, a trailer with equipment and educational materials including Global Connections Map, but no operating treatment system.	Implementing, and the mobile trailer was a key part of winning public acceptance after a long struggle.
17. Orange County Water District, California USA - Created Water Factory 21 in 1975 and used it to demonstrate the effectiveness of the technology to stakeholders from all over the globe (they are considered the textbook case for community engagement), before replacing it in 2008 with their current Groundwater Replenishment System	Implemented
18. Ventura, California USA - A visitor experience (re-used San Diego artwork)	Implementing
19. San Jose/Santa Clara, California USA - Silicon Valley Advanced Water Purification Center. Using a non-drinking facility as a demonstration	Implementing
20. Las Virgenes, California USA – Demonstration plant + visitor centre	Implementing
21. Oxnard, California USA - Education centre	Implemented

Places considering purified recycled water for drinking, but a decision not made yet

There can be a time lag between a demonstration project and any decision to proceed – each city has its own context, and a range of different approvals can go towards an ultimate decision. WSAA is aware of one demonstration project where there was a specific decision not to proceed with purified recycled water after a demonstration - Denver (below), because a water supply augmentation wasn't needed.

There are a range of demonstration projects that are still 'pending' because there hasn't been a decision yet – especially in Florida – it's too early to know what outcomes will follow.



Denver, Colorado USA - 1980s Demonstration plant	Not a community rejection, but have not needed to augment supply yet due to years of sustained demand reduction. Still included as part of Denver Water's long-range planning.
LOTT Alliance, Washington (Lacey, Olympia, Thurston County, Tumwater) – Visitor centre	No decision yet
South Jordan, Utah, USA – Demonstration plant	No decision yet
Nevada USA - Truck based pilot, successful, now implementing a full scale 2 MGD demo plant. Waterworks Facility is a non-purified recycled water education centre	No decision yet
La Vendée France - Demonstration plant	No decision yet (due 2024)
Florida USA – a range of pilot and demonstration projects. Some have gained public acceptance. Tampa had an unsuccessful public launch, interestingly there was no demonstration plant. Some of the better-known schemes are Altamonte Springs (PureALTA Demonstration plant), Jacksonville, Hillsborough County (Tampa), Palm Beach County (Green Cay) and Clearwater. Some are planning demonstration plants/visitor centres.	No actual implemented schemes yet, but legislation has been passed by parliament to eliminate most surface water discharges which will likely lead to significantly more recycling including purified recycled water.
Places that do a water education centre not just about purified recycled water for drinking	
Louisville Kentucky - Louisville Kentucky's Water Tower does not hide the fact that there is wastewater in upstream water supplies, but would not be categorised as a demonstration advanced water purification facility.	
Some other places that are not created exclusively to enhance understanding of purified recycled water:	
<ul style="list-style-type: none"> • Brightwater Environmental Education/Community Center in King County, Washington • Fairmount Water Works Interpretive Center, Philadelphia, Pennsylvania • Las Vegas Springs Preserve, Las Vegas, Nevada • The Oregon Garden, Silverton, Oregon • Vancouver Water Resources Education Centre, Vancouver, Washington • Jackson Bottom Education Center, Hillsboro, Oregon • Central Coast Blue, San Luis Obispo, California (not a demonstration centre but included advanced water purification) 	

Statistics

Below are some statistics about support for purified recycled water for drinking, in several towns that conducted a demonstration project.

Santa Clara Valley Water District (San Jose, California USA): 93.4% of tour visitors support



groundwater replenishment for drinking; 85.5% support direct distribution.

Perth, Western Australia: Prior to the tour support averages 74%, after it jumped to 93%.

Singapore: 98% acceptance rate – 92% of respondents would drink NEWater directly, another 16% would drink it mixed with reservoir water (this relates to community acceptance overall, not just in relation to the visitor centre).

El Paso, Texas USA: 84% supported it before outreach [engagement] commenced (including a visitor centre and other elements); 3 years later 77% strongly supported it (an increase).

Pure Water Arizona (mobile demonstration plant): Post tour survey found an increased understanding of water purification from 56% before the tour to 95% who rated 'good' or 'excellent' afterwards.

About WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 22 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

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