

Annex

NEWater

Against the backdrop of climate change and growing water demand, NEWater is an important pillar in our efforts to ensure a secure and sustainable water supply for the long term.

NEWater has passed more than 150,000 scientific tests and is well within the World Health Organisation (WHO) Guidelines for Drinking-water Quality and United States Environmental Protection Agency (USEPA) drinking water standards. Twice a year, it undergoes rigorous audit processes by an external panel comprising international experts in fields such as engineering, water chemistry, toxicology, and microbiology.

There are currently five NEWater factories – Bedok and Kranji which opened in 2003, Ulu Pandan in 2007, and two NEWater factories in Changi in 2010 and 2017.

Most of the NEWater produced is supplied to industries which require large volumes of ultra-pure water, such as wafer fabrication in the semiconductor industry as well as air-con cooling of commercial buildings. With the introduction of NEWater to industries in 2003, Singapore's wafer fabrication facilities were the first in the world to utilise recycled water instead of potable water. Switching to ultra-clean, high-grade NEWater led to a win-win situation where the wafer fabrication companies saw cost savings, while freeing up a large amount of potable water for other uses. Today, NEWater is supplied to more than 850 non-domestic customers, including wafer fabrication plants, petrochemical refineries, power stations, and commercial premises.

Aside from industrial use, NEWater is also invaluable in supplementing reservoir levels, especially during dry spells. Blended with rainwater in the reservoirs, it is further treated in our waterworks before they are piped to households as tap water.

To ensure sustainability of NEWater, PUB continues to pursue opportunities to optimise NEWater production by improving the recovery process and reducing energy consumption.

Transitioning to a Three-node Used Water Management System

BNF, with a treatment capacity of 18mgd today, is the oldest NEWater facility alongside the Kranji NEWater Factory (KNF). BNF is nearing the end of its operational lifespan. It will be decommissioned and replaced with a third NEWater Factory at Changi Water Reclamation Plant with a treatment capacity of 50mgd. Construction is also ongoing for a NEWater factory within the Tuas Water Reclamation Plant, which will replace the existing Ulu Pandan NWF, while there are plans to redevelop KNF and integrate it within the new Kranji Water Reclamation Plant. This is in line with Singapore's long-term plan for our used water management system to transition to a three-node system with the Deep Tunnel Sewerage System (DTSS) at its core— a long-term solution to meet the needs for used water collection, treatment, and disposal. The DTSS conveys used water by gravity flow to three water reclamation plants in the east (Changi), west (Tuas), and north (Kranji), with NEWater production also consolidated at these facilities.

NEWater Visitor Centre

As the cornerstone of an extensive public education programme to help Singaporeans appreciate the safe technology behind NEWater, the NEWater Visitor Centre (NVC) helped to bridge the gap between scientific understanding and public perception.

Launched together with BNF, NVC is an education hub that promotes water sustainability, with a focus on the genesis of NEWater—then a completely foreign idea to Singaporeans—in a fun and educational way to visitors from all walks of life.

The NVC tour offers a range of engaging experiences for visitors. At the Waterwise Arcade, participants can gain insights into practical water conservation methods in their daily lives. Younger children can immerse themselves in an interactive game by assuming the role of a 'Water Hero' avatar. Visitors also have the chance to explore the 'NEWater Factory' to gain a deeper understanding of the NEWater story and the 3-step filtration process.

Besides the guided tours, NVC has also been providing complimentary educational programmes that allow for hands-on experiential learning. One example is the Rain Garden Workshop tailored for younger children. During the workshop, participants construct their own mini-raingardens using substrates of different sizes to gain an understanding about

how water filtration works. Through the activity, participants will be able to appreciate how NEWater is produced through the key process of ultrafiltration on an industrial scale.

Timeline – NEWater Milestones

Year	Milestone
1998	PUB and ENV initiated the Singapore Water Reclamation Study (NEWater Study)
May 2000	Prototype NEWater demonstration plant opened at the Bedok Water Reclamation Plant
Aug 2002	NEWater made its public debut at the National Day Parade
Jan 2003	Bedok and Kranji NEWater Factories officially opened
Feb 2003	NEWater Visitor Centre officially opened
Jun 2004	Third NEWater Factory at Seletar Water Reclamation Plant officially opened (closed in 2011)
Mar 2007	Ulu Pandan NEWater Factory officially opened
May 2010	Changi NEWater Factory 1 (Sembcorp) officially opened
Jan 2017	Changi NEWater Factory 2 (BEWG ¹ -UESH ²) officially opened

¹ Beijing Enterprises Water Group Limited (BEWG)

² UES Holdings Pte Ltd (UESH)