



(photo courtesy: sydneydesal.com.au)

# Desalination for Greater Sydney

Sydney Water has been providing world-class water services to Greater Sydney, the Blue Mountains and the Illawarra for 135 years, but with increasingly unprecedented weather events, climate change and growing demand for our services, we need to think about water differently.

Sydney currently relies on rainfall for over 85% of its water supply. We must ensure we have a sustainable, rainfall independent and safe water supply. This involves good water planning and looking at a range of water supply options to improve the long-term resilience and reliability of our most precious resource.

## The Greater Sydney Water Strategy

The Greater Sydney Water Strategy was jointly developed by the NSW Government and its agencies and recognises that our water system is reaching its limits. It proposes a range of solutions aimed at ensuring there is sufficient water for generations to come.

By engaging with our stakeholders and the community on the challenges and opportunities our city faces, we can better plan for a future which reflects our customers' values. This includes looking at alternative sources to supply drinking water, such as purified recycled water, desalination, and stormwater harvesting, as well as how we can make our systems and network more resilient.

The desalination process draws water from the ocean and transforms it into high-quality drinking water. Unlike rivers and dams, the amount of seawater in oceans is not affected by changing rainfall.

## Sydney Desalination Plant

The Sydney Desalination Plant at Kurnell is currently the only rainfall independent source of drinking water for Greater Sydney. It provides resilience for our water supply during extreme weather events including floods and droughts.

Starting in 2007, construction of the Sydney Desalination Plant took three years to complete and was built in response to the worst drought in a century. The drought returned in 2019, which saw Sydney's total dam storage levels fall below 60% and the plant recommenced production. Since then, the plant has remained operational to help address water quality issues arising from bushfires, flooding and significant maintenance tasks in Sydney Water's supply network.

The Sydney Desalination Plant has always been, and will continue to be, an essential component of Sydney's water supply and an integral part of our water resilient future.



The Sydney Desalination Plant can produce an average of 250 ML/d of drinking water for up to 1.5 million people - that's enough to fill more than 100 Olympic swimming pools per day and is equivalent to about 15% of Greater Sydney's drinking water needs.

The GSWS proposes a range of solutions to meet Greater Sydney's growing water needs, and this includes making better use of our existing assets by enabling a more flexible operating regime for the desalination plant.

The Sydney Desalination Plant was originally constructed with expansion in mind and the expectation that in the future it could produce up to 500 million litres of high-quality drinking water a day – double its current capacity. Desalination has the potential to provide up to 70% of our water needs by 2056.

### How does desalination work?

To make clean and safe drinking water from seawater, Sydney Desalination Plant uses a reverse osmosis membrane process. Seawater is drawn from the Tasman Sea each day through intake pipes. Once the water arrives at the plant, it is filtered and thoroughly cleaned. The seawater is then pumped at a very high pressure through the reverse osmosis system, which allows the water to pass through while removing salt and minerals which are carefully returned to the ocean effectively as saltier seawater.

The water produced by the reverse osmosis process is treated to meet the Australian Drinking Water Guidelines and NSW Health requirements. After treatment, it is pumped directly to the existing water distribution network along an 18km pipeline passing under Botany Bay to the Sydney Water supply network at Erskineville.

Sydney Desalination Plant feeds into the Potts Hill delivery system, which supplies water to about 1.5 million people across Sydney. Locations include Sydney CBD, the inner west, eastern suburbs, southern Sydney, parts of the Sutherland Shire and, at times, as far west as Auburn.

### Energy efficiency

The Sydney Desalination Plant was built with a strong commitment to minimising its environmental footprint and was designed to be energy efficient. The plant is

powered by 100% renewable energy from the Capital Wind Farm – the largest wind farm in Australia. Located near the NSW and ACT border, the Capital Wind Farm generates about 140 megawatts from 67 turbines – more than 3.5 times the power needed to run Sydney Desalination Plant at full production.

### Working together - Sydney Water and Sydney Desalination Plant

The Sydney Desalination Plant supports our water supply by reducing pressure on our water filtration plants during extreme weather events that can adversely affect the water quality of our dams and rivers. Ordering and supply of desalinated water between Sydney Water and Sydney Desalination Plant is covered in a joint decision framework. This framework considers the requirements of Sydney's water supply system as a whole and its operational activities. Sydney Water issues an annual water order to Sydney Desalination Plant following the principles set out in this framework.

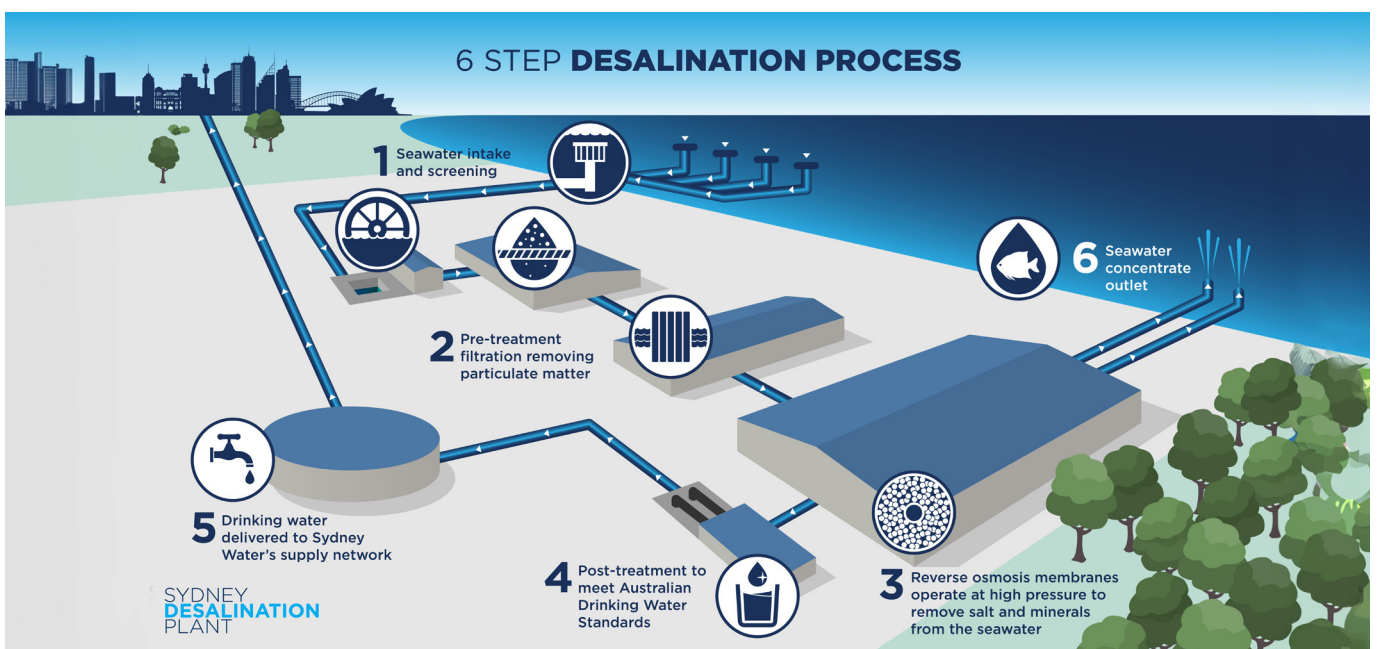
### Environmental impact

Sydney Desalination Plant was built with a strong focus on the environment. One third of the plant's site at Kurnell has been kept as a conservation area, where native species of flora and fauna are regularly monitored. A six-year independent marine monitoring program in the local seawaters shows that there is no impact to the environment and marine life. The program was one of the most stringent and comprehensive programs of its kind ever undertaken for a desalination plant of this size.

### Best value for customers

Sydney Desalination Plant's (SDP) prices are regulated by the Independent Pricing and Regulatory Tribunal (IPART). In setting the price, IPART incorporates efficiency adjustments that ensures best value for money for our customers. Sydney Water's bills remain among the lowest in Australia.

Sydney Water is exploring preliminary planning options for additional rainfall-independent water supply sources to ensure we have a sustainable, reliable and safe water supply that is more resilient to climate change and increasing demand for our services.



Graphic courtesy: sydneydesal.com.au

