Planning our water future

Central Coast Council is planning for our future now to ensure our region has a sustainable and resilient water system that can adapt and respond to change. We need to consider new sources of water (supply) and find new ways to reduce the water we all use (demand). This series of information sheets provide an overview of the potential water supply and demand option types we are discussing with our community as we plan our water future together.

love water use it wisely

Central Coast Council

Supply option: **Desalination**

What is it and how does it work?

Desalination is the process of removing salts from saline or brackish water to create freshwater suitable for drinking.

A process called reverse osmosis is commonly used, where the saltwater is pushed through a membrane (a barrier with tiny holes) to remove the salt and mineral content.

The size of a desalination plant can range from a small unit, the size of a shipping container, to large plants which can provide hundreds of millions of litres of water a day.

What is currently in place on the Central Coast?

We have been progressing with a revision to an existing concept design and environmental approvals for a drought response desalination plant at Toukley. This proposal would be constructed in the unlikely event of a severe and ongoing drought – however, the design and approvals also consider how to make the design adaptable for the use as a long-term supply option as well.

Planning for this 'drought-contingency' measure is part of Council's existing Drought Management Plan. If built, the plant would be capable of producing up to 20 million litres of drinking water per day.

Things we need to consider

Desalination provides a reliable source of water that is not dependent on rainfall. It offers flexibility, as a desalination plant can be turned off, or its production capacity reduced, when other water is available.

Desalination plants have high upfront costs related to membrane treatment and power infrastructure.

Ongoing operational costs are also relatively high due to high energy use.

The direct environmental impact of a desalination plant can be managed through careful design and operation.

High energy use will result in greenhouse gas emissions if sourced from fossil fuels. These impacts can be offset, at a cost, by renewable energy production (e.g. through wind or solar).

How we're considering this option for the Central Coast Water Security Plan

The Toukley drought response desalination plant is also being considered as a long-term supply option. This site was shortlisted based on a range of criteria, including site availability, proximity to Council's water distribution network, power supply, access to seawater for raw water intake and brine discharge, and potential environmental and social impacts. The proposed intake structure type is being changed from a collection structure initially proposed under the dunes at Budgewoi Beach to a conventional direct ocean intake structure located off the coast between Noraville and Magenta.

The most appropriate size of the desalination plant being considered is between 20 to 30 million litres per day as both an ongoing baseload water supply option, and a drought response measure.

As noted above, a concept design has been completed for a desalination plant at Toukley capable of producing up to 20 million litres of water per day as a drought response measure.

See key results table for further detail about how this option is being considered in the plan.

Key results

The table below provides further detail about how this option is being considered in the plan.

	Category	Additional information
Potential additional water available	High	Higher potential to implement desalination within coastal communities.
Reliability and resilience	High	Improves the reliability of our system as it does not rely on rainfall. Ensures an ongoing water supply in long and severe droughts. Flexible to vary operation, based on water storage levels. Can be adaptable to upgrade to meet growth requirements or respond to drought.

Desalination plant, 20 megalitres of water per day (unscalable to 30 megalitres of water per day)

	Impact	Cost	Additional information
Indicative cost to build		$205 million	High cost to build.
Indicative cost to operate (assuming use of renewable energy)		$12 million per year (when at full capacity production)	High operating costs due to energy and chemical requirements.

Desalination plant, 30 megalitres of water per day

	Impact	Cost	Additional information
Indicative cost to build		$230 million	High cost to build.
Indicative cost to operate (assuming use of renewable energy)		$16 million per year (when at full capacity production)	High operating costs due to energy and chemical requirements.

	Impact	Additional information
Environmental impacts		High energy use. Options exist for offsets for greenhouse gas emissions to reduce impact. Low biodiversity impacts.
Cultural and social impacts		Low cultural and social impacts.
Timeframe for delivery		Approximately five years but can be accelerated during a drought.

Key: High Medium Low

Photo Sydney Water - Membrane racks, Osmosis room 4

Some information contained in this fact sheet was sourced from Hunter Water Corporation