Belmont Desalination Plant

FACT SHEET - TUNNELLING AND MARINE WORKS

HUNTER WATER

Hunter Water is building a desalination plant at Belmont so we can continue to meet the needs of our customers now and in the future.

Construction of the Belmont Desalination Plant will soon be diving into an exciting new phase.

In the coming months we will be starting offshore marine works to bring seawater into the desalination plant, including building the direct ocean intake structure and tunnelling from the plant site to the ocean intake. This will bring us another step closer to securing our water supply for future generations by turning seawater into fresh drinking water. We've engaged John Holland to carry out this work on our behalf.

Marine works overview

The offshore works will involve using specialised equipment including:

- a micro tunnel boring machine to construct the seawater intake pipeline beneath the seabed
- a jack-up barge stationed about 830 metres off Nine Mile Beach to help build the direct ocean intake structure, and
- other marine equipment, vessels, and helicopters to transfer workers to and from the marine construction area.

A marine construction zone, marked by lit yellow buoys, and 24-hour surveillance are in place to help keep the area safe.

Activity timeline*

2025 SEP OCT NOV DEC 2026 JAN FEB APR MAY JUN JUL AUG SEP OCT

Marine exclusion zone in place

Offshore surveys and investigations

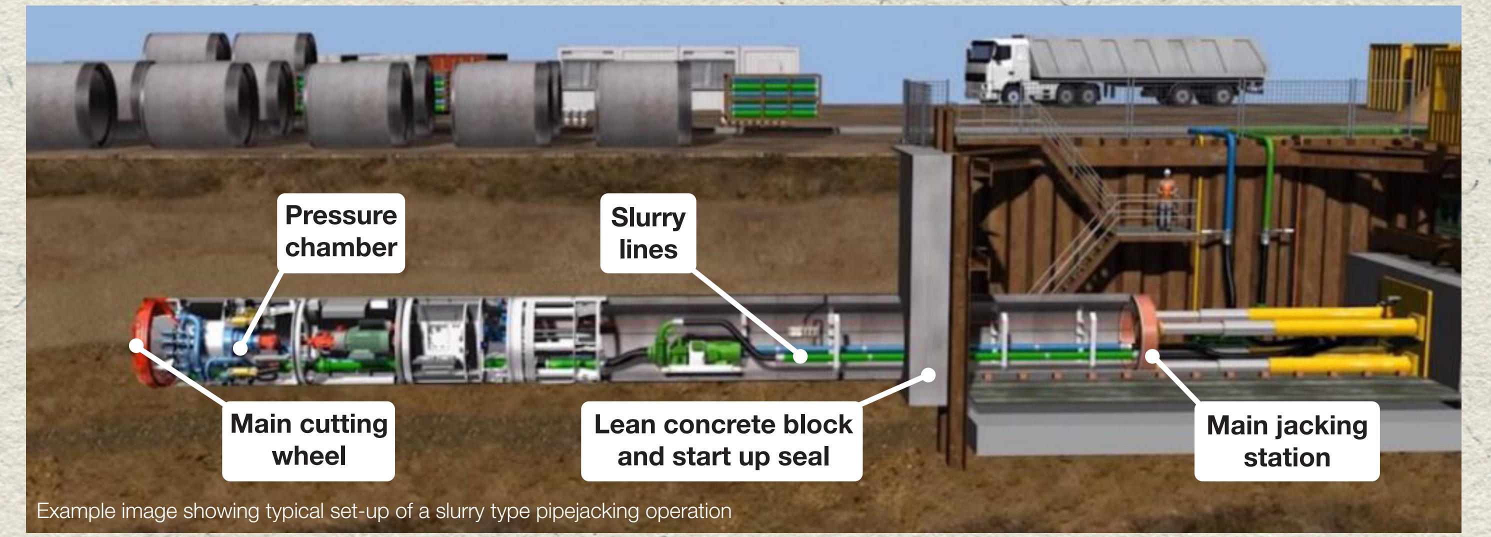
Tunnelling for intake pipeline

Construction of direct ocean intake

*Timeframes are weather and site conditions permitting, and subject to change

Building the seawater intake pipe

Tunneling is the key activity for building the ocean intake pipeline to bring seawater into the desalination plant. We'll be using a micro tunnel boring machine (MTBM) to dig through the seabed. As it moves forward, the machine will place concrete pipes behind it to form the tunnel. This innovative technique allows us to build the pipeline beneath the seabed, helping to protect the beach and marine environment and minimise disruption to beach users.



Example image showing typical set-up of a slurry type pipejacking operation

How does microtunnelling work?

Launch shaft excavation
We begin by excavating a launch shaft onshore, which provides access for the MTBM. A slurry treatment plant will also be assembled on site near the launch shaft to process slurry, which is a mixture of water and solid particles generated during the tunnelling activity.

Tunnel boring begins
The MTBM is lowered into the launch shaft and positioned on the main jacking station, which hydraulically pushes it through the ground and beneath the seabed. As the MTBM moves forward, precast concrete pipes are inserted behind it and jacked forward, forming a continuous tunnel. This process is known as pipejacking.

Offshore connection
The MTBM travels beneath the seabed to direct ocean intake structure offshore.

Recovery
Divers assist in safely retrieving the MTBM from the ocean, ensuring a controlled and environmentally sensitive recovery.

Protecting the marine environment

The Belmont Desalination Plant's marine impacts have been thoroughly assessed including:

- an Environmental Impact Statement, prepared by experts and approved by the NSW Department of Planning, Housing and Infrastructure.
- a Marine Environment Impact Assessment reviewed effects on species, seabed habitats and water quality.
- intake-shaft construction underwent a focused assessment as part of the project modification process.
- a Marine Monitoring Program ensures ongoing audits, inspections and independent checks.

Planning approval documents can be accessed at hunterwater.com.au/desal

Marine construction management

We are working with Transport for NSW Maritime, AMSA, Marine Rescue, Water Police, the Harbour Master, and the Port of Newcastle to ensure safe navigation during offshore construction works. The following safeguards will be in place:

- a marine construction zone to protect vessels.
- a Marine Traffic Management Plan coordinated with authorities.
- onboard watchkeepers to manage collision risk.
- a dedicated marine-fauna observer throughout offshore works.

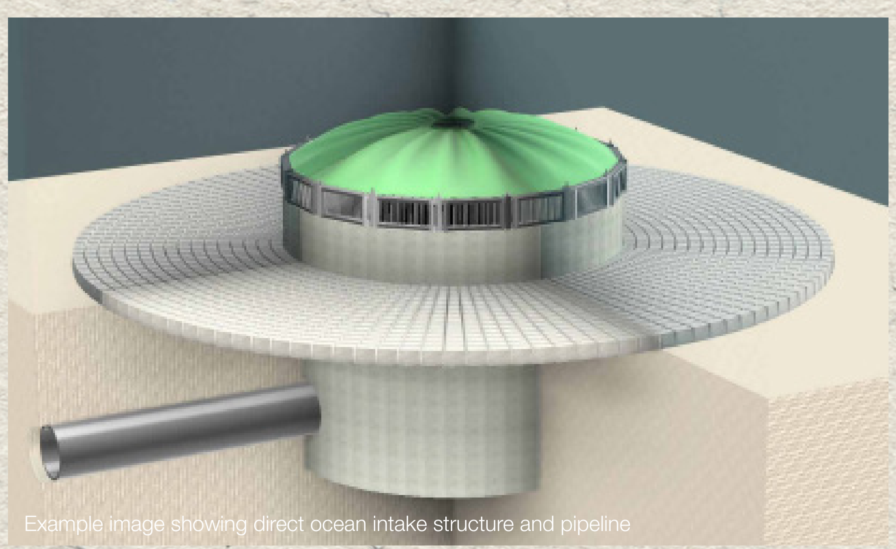
Building the direct ocean intake structure

A direct ocean intake is a specialised system that draws seawater from the ocean through an offshore intake structure. This structure features low-velocity intake ports and screening to prevent debris and marine life from entering. The seawater then travels through the submerged intake pipeline to an onshore pump station and central well, before pre-treatment filtration followed by desalination using reverse osmosis.

The direct ocean intake structure is built using precast caissons, which are large concrete rings that will be lowered from a jack-up barge onto the seabed. The caissons are stacked on top of each other, forming the walls of the intake structure.

The structure is around 15 metres wide and tall, with about 9 metres of the structure sitting beneath the seabed and around 6 metres above the ocean floor.

The direct ocean intake is low-velocity, meaning the flow rate of seawater entering the intake will be quite slow and much less than currents in the area.


Example image showing direct ocean intake structure and pipeline

Key marine construction activities...

- Transporting equipment or materials by tugs and barges to the jack-up-barge
- Installing three steel piles into the ocean bed that will extend above water level with an access platform for the marine works. The piles will be marked yellow and include lighting for safe navigation
- Handling of large precast caissons (a concrete structure that goes under water to build the intake structure walls) that will be lowered off the barge, onto the seabed and secured together under water with the help of qualified divers
- Dredging a small quantity of existing bed material inside the intake structure to secure it to the seabed
- Connecting the intake pipeline to the direct ocean intake structure to transport seawater into the plant
- Recovery of the micro tunnel boring machine once the pipeline connection is complete
- Installing a dome roof on top of the low-flow side grills where the sea water flows through, preventing sea life from being drawn though with the water.

Once marine works are complete, the jack-up barge will leave the area.

Did you know...
Once in operation, the Belmont Desalination Plant will be able to produce up to 30 million litres of drinking water a day (that's about 12 Olympic pools!), helping to keep the Lower Hunter's taps flowing, even during drought.

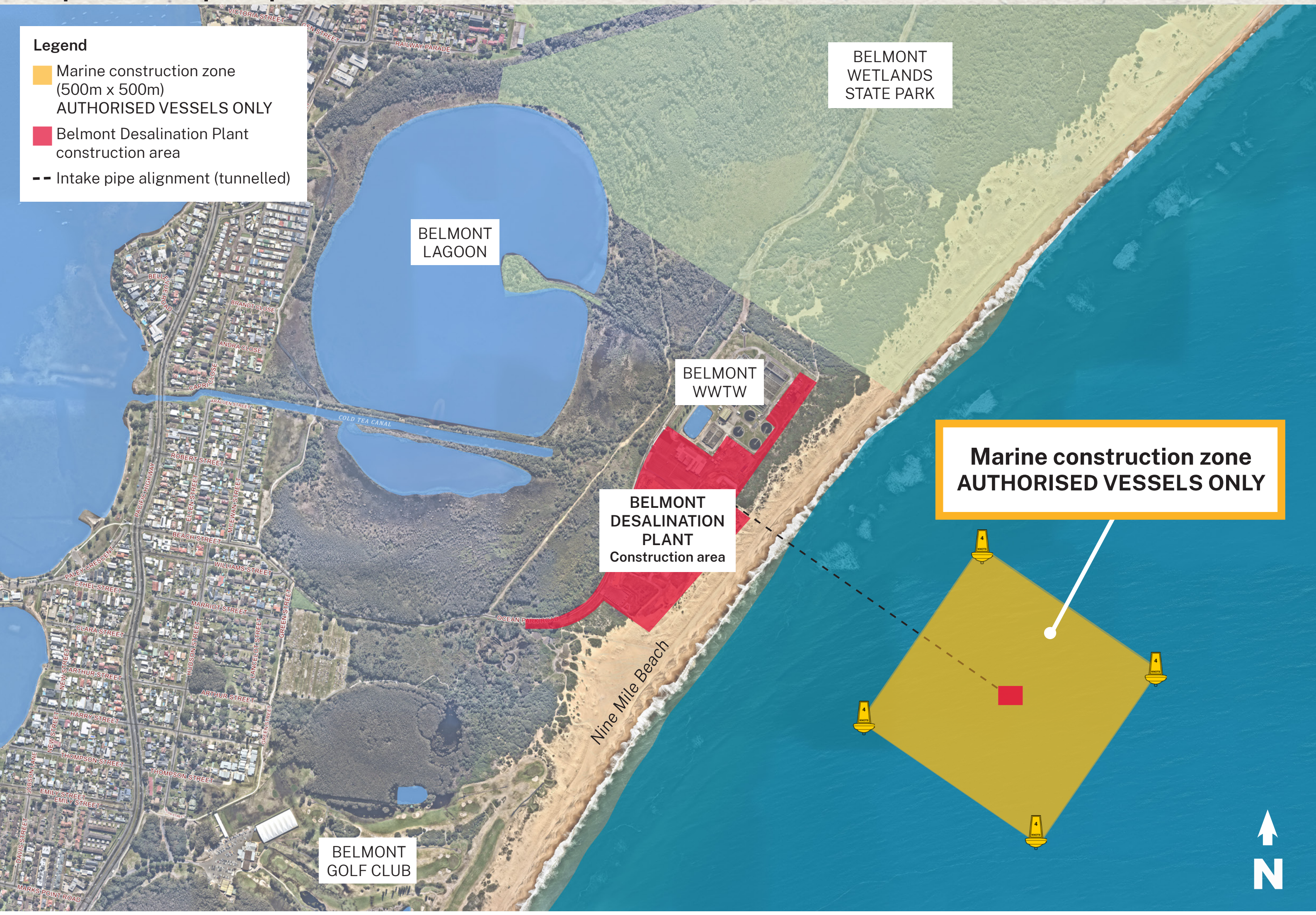

Example image showing jack-up barge, three piles to guide intake structure placement, and helicopter transporting workers to site.

A jack-up barge, similiar to the one pictured here, will be set up around 830 metres off Nine Mile Beach to enable construction of the direct ocean intake structure on the ocean floor.

To help ensure marine works can be completed safely, a construction zone is in place around the jack-up barge, marked by lit, yellow buoys.

Marine construction zone

A marine construction zone, marked by lit yellow buoys, and 24-hour surveillance are in place to help keep the area safe.



No unauthorised vessels or persons are permitted to enter the marine construction zone.

Offshore vessels are fitted with surveillance and entry to exclusion zone is reported to the authorities.

How will the marine works affect me?

Noise & Activity: Those closest to the marine construction zone might hear some noise from offshore piling and notice more vessels and helicopters in the area.

Shift Changes: Construction crews will be working day and night during tunnelling activities, so you may see workers coming and going at different times.

Truck Deliveries: Starting from November 2025, around 140 truckloads of concrete pipes will be delivered over four months during normal construction hours.

Marine Safety: Boaters and ocean users should avoid the marked exclusion zone around the offshore site. Surveillance will be in place, and any entry will be reported.

Nine Mile Beach will remain open during tunnelling and marine construction activities.

Our work schedule

Marine works will start from late September 2025 and continue through to late 2026.

Tunnelling activities will take place 24 hours a day, seven days a week over three to four months - we expect this will be from late September 2025 into early 2026.

Offshore works at the jack-up barge will take place from 5am to 8pm seven days per week, until the end of 2026.
Helicopters transporting workers to and from Lake Macquarie Airport to the jack-up barge will run from 6am to 7pm seven days per week.

Onshore construction activities will continue Monday to Friday from 7am to 6pm, and Saturdays from 8am to 1pm.

Find out more ... hunterwater.com.au/desal | desal@hunterwater.com.au | 1800 965 051