



VICTORIAN DESALINATION PROJECT

23 July 2010

DESAL SPOTLIGHT

Out on the desalination plant site this week, the 1200-strong construction team has continued to progress the 29 buildings that make up the desalination facility. On the reverse osmosis building, the 'heart' of the facility, more than 700 tonnes of structural steel frame has been erected and the first roof components installed.

On the pipeline and power alignment, crews have laid more than 23km of the 84km pipeline and more than 3800 individual pipe sections have been delivered, ready for installation. Meanwhile, power crews have installed more than 16km of conduit and recently started installing cable for the 87km underground power supply.

The project is about to reach a major milestone, with the start of underground tunnelling at the plant site. A tunnel boring machine (TBM) is an underground tunnelling machine, used to dig tunnels with minimal impact on the environment.

It's a worldwide tunnelling tradition to name TBMs before they start work. 'Wonthaggi Maggie' will start work this week building the inlet tunnel on a path that has been approved by the Independent Reviewer & Environmental Auditor, while 'Rocking Ruby' will start work in August. It will take some months to complete the tunnelling.

While the distance offshore of the intake and outlet tunnels is subject to final approval by the Environment Protection Authority (EPA), it is proposed that the intake tunnel will terminate approximately 1.2 kilometres from the plant site, or 790 metres from the Williamsons Beach shoreline and the outlet tunnel will terminate approximately 1.5 kilometres from the plant site, or 1.1 kilometres from the shoreline.

The TBMs consist of a rotating cutting wheel at the front, called a cutter head, followed by trailing support mechanisms. The TBMs will operate 15-20 metres underground, the cutter head excavating a length of ground, which is lined with pre-cast concrete rings, forming a watertight concrete tunnel. Hydraulic jacks then push the TBM forward a short distance, and the process is repeated all over again. Given that the TBMs work so deep underground and do not involve any percussive action, the risk of any disturbance is extremely low.

The TBMs are custom-built 'slurry shield' TBMs with a cutter head diameter of 4800mm, suitable for working in soft ground with very high water pressure and large amounts of ground water. The TBMs are being supplied by Herrenknecht from Germany, a world leader in tunnel boring machines.

A huge channel called a 'box cut' has been constructed on site to provide a launching pad for the two TBMs, measuring 27 metres deep, 150 metres wide at the top and 20 metres wide at the base. More than 300,000m³ of earth was excavated to build the box cut and 5000m³ of concrete used to line its walls, secured with huge soil nails ranging between 4 and 12 metres in length. When tunnelling is completed the box cut will be filled in.

Tunnel boring has been used on construction projects for more than 150 years and has proven to be a safe and environmentally sound method of tunnelling.

For this reason, TBMs are now used in construction projects all over the world, used to build everything from pipelines to huge road and rail tunnels beneath cities and the ocean. Best of all – using tunnelling as a construction methodology means that Williamsons Beach will remain open to the public at all times.