

COMMUNITY UPDATE

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WELCOME

Welcome to the third edition of the Victorian Desalination Project Community Update.

Thank you to readers who took the time to send us their comments and suggestions on the last edition.

We were pleased to hear that many of you find the Update a useful source of news and information about the project, particularly enjoying the photos of it taking shape.

We also received some excellent story ideas.

We've taken those suggestions on board, and you'll see that reflected in this and future editions of the Community Update.

ONE YEAR ANNIVERSARY

It's now one year since construction began on the Victorian Desalination Project.

From an empty paddock 12 months ago, the desalination plant site is now a hive of activity, with foundations and concrete structures well underway on all of the 29 buildings that make up the desalination plant.

The first mechanical components have been installed, a major milestone for the project.

Both tunnel boring machines are now at work, carving out the seawater intake and outlet tunnels.

Following EPA approval of the design and location of the seawater intake and outlet structures, we are also preparing to start marine construction shortly.

The final design and location of the marine structures is based on detailed scientific and marine research, which built on the studies conducted as part of the Environment Effects Statement (EES).

Along the pipe and power supply, work is also continuing to progress well, with more than 35km of pipeline laid and 20km of underground power cable in place.

More than 3,000 people are now at work across the project and many local businesses continue to play a role in its delivery.

Over \$1 billion in contracts have been awarded to date, more than three quarters of them awarded to Australian companies and two thirds to Victorian suppliers.

We hope you enjoy the third edition of the Community Update.

FROM OCEAN TO TAP

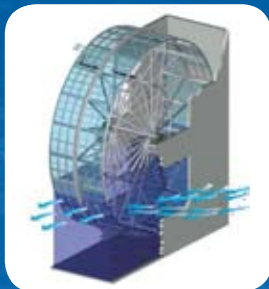
One topic that readers wanted to know more about was the desalination process. Let's take a closer look at how seawater will be converted to drinking water on the Victorian Desalination Project.

SCREEN AND FEED DRUMS

Three large drum screens, about 4 metres in diameter, will screen out large particles from the seawater as part of the filtration process.

The screens operate much like a water wheel, continually rotating the seawater to filter out seaweed and other larger materials.

The first drum screen will be installed this month.



DUAL MEDIA PRESSURE FILTERS (DMPFs)

72 dual media pressure filters will filter out even smaller particles from the seawater.

DMPFs operate very much like a swimming pool filter. Seawater is pushed under pressure through a thick bed of crushed anthracite coal and sand, common filtration materials, which will catch small particles and allow filtered water to pass through.

The first batch of DMPFs have already been installed at the plant site.



REVERSE OSMOSIS MEMBRANES

More than 55,000 reverse osmosis membranes will serve as the 'heart' of the desalination process, separating salt from seawater to create fresh drinking water.

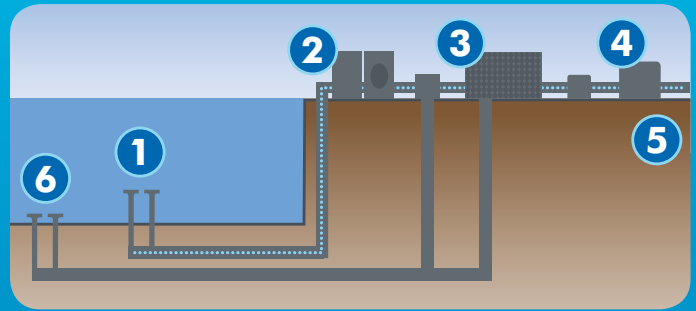
The membranes act like an ultra-fine sieve, capable of sifting out even the tiniest molecules.

The membranes will be housed inside the reverse osmosis building – the largest building on site.





THE DESALINATION PROCESS



1 SEAWATER INTAKE

Seawater will be drawn in from the ocean through specially designed intake structures.

2 FILTRATION

Seawater will be screened to remove large particles and then filtered to remove fine particles such as sand and sediment.

Read more about the DMPF arrival on page 4.

3 REVERSE OSMOSIS

The filtered seawater will then pass through two stages of reverse osmosis, where it will be pushed through ultra-fine membranes under high pressure.

Fresh water will pass through, leaving seawater concentrate behind.

4 REMINERALISATION

This desalination process will produce near-pure water, which must be treated with essential minerals like fluoride and calcium to meet Australian Drinking Water Guidelines and Victorian Health requirements.

5 WATER DISTRIBUTION

From the plant, fresh drinking water will be distributed to the Melbourne and regional water networks through an 84km long pipeline.

Read more about the pipeline on page 8 and 9.

6 WATER OUTLET

Seawater concentrate will be safely returned to the ocean through diffuser structures more than a kilometre offshore. Ocean currents will dilute the concentrate within seconds.

DID YOU KNOW?

- For every litre of seawater that passes through the desalination plant, half will be converted to drinking water, and half returned to Bass Strait.
- The desalination process takes around one hour.

TAKING IT TO THE STREETS

The transport of 72 large filtration units to the desalination plant site is a major logistical exercise.

The biggest road transport delivery for the whole of the Victorian Desalination Project started last month with the first of 72 Dual Media Pressure Filters (DMPFs) trucked from the Port of Melbourne to the desalination plant site.

Power crews travel ahead of the convoy to lift any low hanging wires



Traffic management teams work throughout the night to ensure the safety of other road users



The DMPFs arrive at the desalination plant site where they are offloaded and installed immediately



Briefing the traffic control team and support crews



Negotiating the bridges and city streets of Melbourne



Each DMPF measures 15.1 metres by 5.2 metres.

VicRoads approves transportation of over-dimensional loads and specifies the route that the load must take.

While this is routine for major construction projects, planning these transport moves is a massive logistical exercise, involving extensive consultation and coordination with road authorities and local councils to ensure the movement happens with minimal disruption to local traffic.

"We start planning for such moves many months in advance, to make sure all the required permits and approvals are in place," explained Thiess Degrémont's Logistics Coordinator, Mark Sutton.

"The loads are all transported at night along an approved route for over-dimensional loads.

"They are escorted by pilot vehicles and we have our own traffic control team to ensure the safety of other road users.

"We drive through the route many times in advance, with height sensitive radars and equipment to check for any overhanging areas.

"Everything is planned to the minute to ensure both the safety of other road users and the timely delivery of the DMPFs."

Delivery of the remaining DMPFs will occur at regular intervals over the coming months, with up to two filters being delivered to the plant site at a time.

JACK-UP BARGE READY TO ANCHOR

Work will soon begin on the next component of the Victorian Desalination Project – the seawater intake and outlet structures.

Two seawater intake structures will be installed on the seabed to slowly draw seawater into the plant, while two outlet structures will return seawater concentrate to Bass Strait at the end of the desalination process.

The installation will be carried out from a 'jack-up barge', a mobile work platform from which offshore construction work can be safely carried out.

Measuring 55 x 32 metres in size, the barge comes equipped with a crane, a pile top rig, a helicopter pad and accommodation for workers.

Owing to the specialised nature of the marine works, the barge was transported from The Netherlands to Western Port on a semi-submersible vessel.

Once at Western Port, the transport vessel was partly submerged and the jack-up barge was floated off.

The barge will remain at Western Port for a number of weeks for final preparations and loading of the intake and outlet structures on board.

Tugs will then tow the barge into position off Williamsons Beach.

The barge will be secured by anchors and its four self elevating legs jacked down onto the seabed, with the platform sitting well above the water to ensure that work can be safely carried out.

A temporary marine exclusion zone will apply around the jack-up barge at all times during construction to protect the safety of the marine crew and members of the public.

Full details of the marine exclusion zone can be found at www.aquasure.com.au

HOW WAS THE JACK-UP BARGE TRANSPORTED?



The barge was transported from The Netherlands on a semi-submersible vessel called 'Fjell.'



Fjell submerged and the jack-up barge was floated on.



Fjell emerged and set sail for Australia. The same process happened in reverse to unload the barge at Western Port.



Without a doubt, the most popular article in our last edition was about “Wonthaggi Maggie” the tunnel boring machine (TBM).

You wanted to know more about these fascinating machines and how the tunnelling process works.

TUNNELLING TICKING ALONG

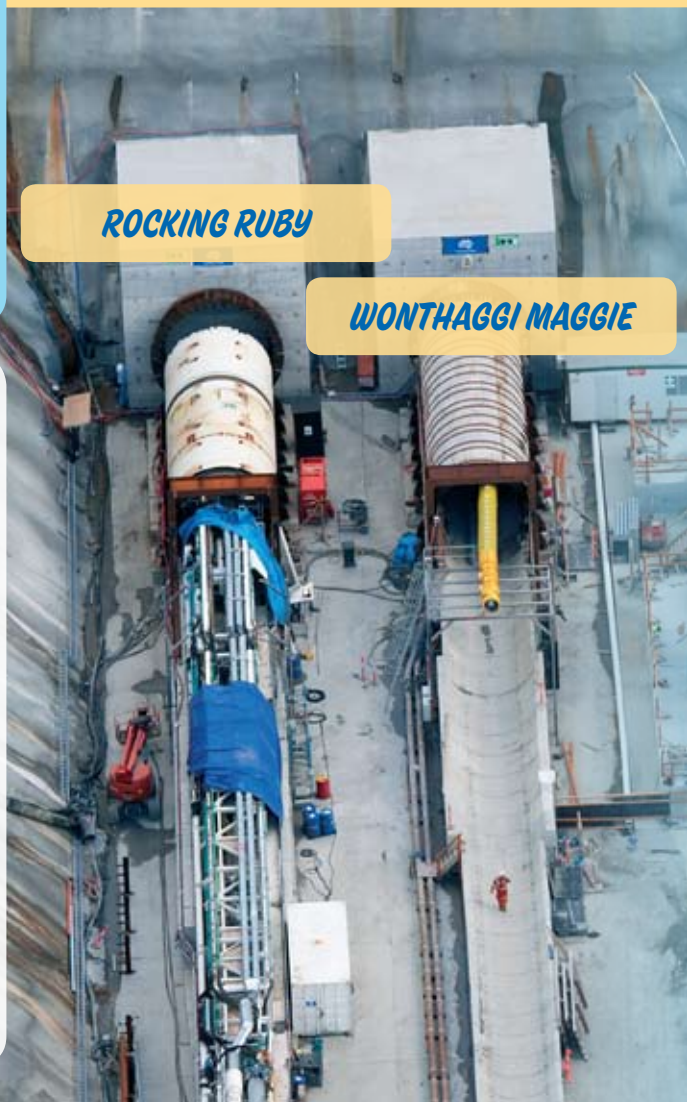
Since tunnelling began at the start of August, “Wonthaggi Maggie” has now bored half of the 1.2 kilometre long seawater intake tunnel.

She was recently joined by “Rocking Ruby” a second tunnel boring machine carving the 1.5 kilometre long outlet tunnel.

Both machines are operating 15–20 metres underground, with the tunnels due for completion early next year.

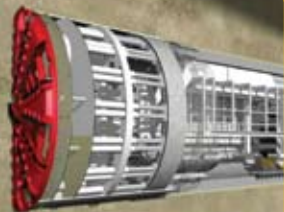
ROCKING RUBY

WONTHAGGI MAGGIE



TUNNELLING – A STEP BY STEP GUIDE

1



THE TUNNEL IS BORED

The TBMs have a rotating, cutting wheel at the front which, pushed ahead by hydraulic jacks, excavates a short length of ground around 1.5 metres long.

Excavated material is crushed and mixed with water to turn it into a slurry, making it easy to remove from the tunnel through a special pipeline.

2



CONCRETE SEGMENTS ARE DELIVERED

A fully automatic crane delivers a constant supply of pre-cast concrete segments into the tunnel, lifting them and placing them onto a conveyor belt.

3



CONCRETE SEGMENTS ARE PLACED

A fully automatic ‘erector’ lifts the segments off the conveyor belt and into place, with millimetre precision.

The concrete segments are secured by cylinders and bolted together immediately after installation.



A specially designed service vehicle is used to ferry supplies to the tunnelling crews.



A look inside the control cabin of Wonthaggi Maggie.

DID YOU KNOW?

Contrary to popular belief, the underground tunnels are not made of pipe. They are made from almost 11,000 pre-cast concrete segments, all made in Australia.



Inside a completed section of tunnel



4

THE RING OF SEGMENTS IS COMPLETED

The ring of six segments is completed with a special 'keystone' segment inserted at the front.



5

TUNNELLING BEGINS AGAIN

The TBM's hydraulic jacks push off against the ring of concrete segments that have just been installed, and the whole process is repeated again.



To watch an animation of a tunnel boring machine in action, drop into the Community Information Centre in Wonthaggi or visit the video gallery at www.aquasure.com.au

PIPE JACKING COMMENCES AT BASS RIVER



A special construction technique known as pipe jacking has started underneath the Bass River to protect the environmental values of the waterway.

Construction of the pipe and power corridor for the Victorian Desalination Project involves the crossing of over 100 roads and waterways.

Careful assessments of potential environmental and local traffic impacts are carried out to determine the most appropriate construction methodology for each particular crossing.

Traditional 'open cut' trenching involves digging a trench, laying pipe, backfilling the trench and then reinstating the land.

This can be a relatively fast and simple crossing technique for roads and waterways, with environmental management plans guiding activities.

An alternative construction technique known as 'pipe jacking' is considered in areas that are more environmentally sensitive, difficult to access or where surface activities cannot be disrupted.

Pipe jacking does not require a trench. Instead, a vertical pit or 'shaft' is dug on either side of the road or waterway to be crossed.

To make the shafts a safe place to work, walls are lined with 'sheet piles', interlocking sheets of steel driven into the ground with a vibrating hammer.

An underground tunnel boring machine (TBM) is then used to push lengths of pipe through the ground, forming a continuous string of pipe with minimal disruption at the surface.

Once the pipe is installed, the shafts are backfilled, sheet piles removed and reinstatement works carried out to return the area to its original condition.

The TBM recently completed its first crossing under Boundary Drain near Koo Wee Rup and is now at work at the Bass River near Kernot.

Pipe jacking usually takes several months, with equipment and workers on site throughout.

As Environmental Officer Craig Gibson explained, "With pipe jacking, we can install the pipeline without having to dig a trench.

"It is a long and slow process, but means we can carry out the work with minimal disruption to the waterway and surrounding environment."



The TBM is lowered into the shaft. Weighing nearly 40 tonnes, the TBM has a 2.8 metre rotating cutting face which can bore up to 12 metres per day, depending on ground conditions.



The idea for this story was suggested by Mr Eddie Green, a retired welder from Rhyll.

CONNECTING THE PIPELINE

A specialist welding crew is a key part of the pipeline construction team, responsible for almost 14,000 welds to connect more than 6,200 pieces of pipe.

Once sections of pipe are lowered into the trench by crane and carefully slotted together, the welding team can begin the delicate task of joining the pipes together.

A special welding technique known as a flux core arc weld is used to join sections of pipe together.

Unlike more common gas welding techniques, this method uses a continuous coil of wire electrode, heated at high temperatures, to fuse sections of pipe together.

One of the advantages of this method is that work can continue to be carried out, even in windy conditions.

Pipes are securely welded together from both the inside and outside – a process that can take up to an hour and a half to complete.

Each and every weld along the pipeline is inspected by a qualified welding inspector to make sure it meets Australian Quality Standards.

Independent third party inspections are also carried out – one of the highest rates of quality inspection in the country – to ensure a secure, watertight pipeline to transfer water to Melbourne and regional communities.

With the welding process generating temperatures of up to 1100°C, great care is also taken to ensure the safety of workers.

The welder's uniform includes a flame retardant shirt and aluminium shielded gloves, while a specially designed air-fed welding helmet provides face protection and a continuous supply of air.

Welding equipment has been carefully selected for operation inside a confined space, and a ventilation system operates inside the pipes to deliver a constant supply of fresh air while the welders are at work.



SUMMER SET TO SIZZLE ON THE BASS COAST

Tourist season on the Bass Coast sees a great influx of holiday makers to the area, as people flock to enjoy the region's beautiful beaches, activities and natural attractions.

Popular activities include the Phillip Island Penguin Parade, the Bunurong Coastal Drive between Inverloch and Cape Paterson, great surfing and fishing spots, and some of the area's best local produce at the many cafes and restaurants scattered throughout the region.

Ken Hore, Tourism Manager for Bass Coast Shire Council, explained that the area's unique mix of natural coastline and tourism activities makes it a popular destination for holiday makers, with more than 3 million visitors heading to the region each year.

"The Bass Coast has a permanent population of around 28,000, which almost triples during the peak tourist season," said Ken.

"We are gearing up for another bumper tourist season this year, with activities like the Woolamai Picnic Races, the Phillip Island Jazz Festival, Kilcunda Lobster Festival and the Bass Coast Agricultural Show adding to the list of great experiences for people to see and enjoy."

To ensure tourist accommodation remains readily available, Bass Coast Shire Council led the establishment of the highly successful Housing Accord, which has provided workers on the desalination project with an entirely new and exclusive accommodation option – privately owned homes that have never been rented before.

More than 600 homes have been listed on the Accord to date.

A Traffic Management Liaison Group has also been established, which meets regularly to discuss plans to minimise local traffic impacts.

For more information on what to see and do on the Bass Coast this holiday season, visit www.visitbasscoast.com



SUMMER EVENTS ON THE BASS COAST

INVERLOCH FUN RUN AND BILLY CART DERBY *14 November 2010, Inverloch*

The A'Beckett Street hill again becomes the course for the 8th annual Billy Cart Derby and Fun Run – open to all age groups.

PHILLIP ISLAND JAZZ FESTIVAL *19 November 2010, Phillip Island Adventure Resort, 2128 Phillip Island Tourist Road, Cowes* The theme for the 6th Phillip Island Jazz Festival is 'Red Hot Jazz', featuring bands like Michael McQuaid and his Red Hot Rhythmakers.

WOOLAMAI RACES *27 November 2010, Trews Road, Woolamai* Enjoy a great family-friendly day out at this very picturesque country race track.

BASS COAST AGRICULTURAL SHOW *8 January 2011, Wonthaggi Recreation Reserve, Korumburra Road, Wonthaggi*

The Bass Coast Agricultural Show returns for another bumper year, packed with events, displays, rides and performances – unbeatable fun for the whole family.

FANCY A STROLL? The Bass Coast is home to stunning walking trails including the Screw Creek Nature Walk around Inverloch and the Bass Coast Rail Trail from Wonthaggi to Anderson – the only coastal rail trail in Victoria.

The more adventurous can try the spectacular George Bass Coastal Walk – a 16km return walk from Kilcunda to the Punchbowl.



GREEN ROOF READY TO BLOSSOM

One of the key design features of Victoria's new desalination plant will be its 'green roof', completely covered with indigenous plants and vegetation to blend the plant into the surrounding landscape.

Around 98,000 indigenous plants will cover the roof of the reverse osmosis building.

Somerville company Fytogreen was recently awarded a \$4.3 million contract to supply the green roof and is looking forward to the challenge.

"The green roof will be the biggest of its kind in the country, requiring us to come up with innovative solutions to plant such a large area of roof in a wind-prone, coastal environment," said Fytogreen Managing Director, Geoff Heard.



"We've been growing a prototype roof since 2009 to test the different species and growing conditions, to make sure we are using indigenous species that are best suited to this environment.

"The end result will be a living tapestry of indigenous ground covers, tussocks and low shrubs that reflects the changing seasons and environment," said Mr Heard.

Fytogreen will source the bulk of the plants, materials and supplies locally as well as partnering with several local landscape contractors to complete the contract.

Installation of the living green roof is expected to be complete around the middle of next year.



A prototype roof has been growing successfully in Gippsland since 2009.

INDIGENOUS APPRENTICE TAKES OUT VICTORIAN AWARD

Fourth year carpentry apprentice on the Victorian Desalination Project, Roy Briggs, was recently awarded a coveted Wurreker Award by the Victorian Aboriginal Education Association Incorporated (VAEAI) and Skills Victoria.



The Wurreker Awards are held annually to recognise and celebrate achievements made by individuals, organisations and training providers who are working to create positive, tangible outcomes for Koorie individuals and communities.

Roy received the Private Sector Employee Award, in recognition of the commitment and dedication he has shown to gaining and succeeding in his apprenticeship.

Since joining the project team in July, Roy has been busy constructing formwork, as well as gaining exposure to working on a large scale infrastructure project.

"It's a real honour to have been nominated and to win the award," said Roy.

"It's also great to see how a big project like this comes together and I'm hoping it will give me really good experience for the future."

Roy is one of more than 20 Indigenous apprentices and trainees currently involved with the project.

Design and construction contractor Thiess Degremont has been working closely with group training organisations who share the project's commitment to opening up employment pathways for Indigenous people.

The Victorian Desalination Project Community Update is a quarterly publication designed to keep you informed of the latest project news and progress.

You can download copies of this newsletter from our website or pick up a copy from the Community Information Centre.

CONTACT US

Visit the Victorian Desalination Project Community Information Centre 33–35 Murray St, Wonthaggi
Opening hours: Tuesday–Friday 9.30am–4.30pm, Saturday 9am–12pm.



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