

# Delivering the Melbourne to Geelong Pipeline

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**In August 2010, Barwon Water contracted Abigroup to construct an underground pipeline connecting Melbourne’s water supplies with Geelong as part of its long-term goal to secure the region’s water supply. As construction continues, Abigroup shares its progress with *The Australian Pipeliner*.**

Construction of the Melbourne to Geelong Pipeline (MGP) began in November 2010. Then Victorian Premier John Brumby said that Geelong needed an independent source of water because of unreliable rainfall patterns.

“A couple of good months of rain do not make up for 13 years of drought and the impacts of climate change,” said Mr Brumby. “With the MGP, Geelong’s water supply will be boosted by a rainfall-independent source of water.”

The project involves a 59 km, 800 mm diameter pipeline that consists of a combination of mild steel cement-lined (MSCL) and glass-reinforced pipe with a pressure rating of PN16. The pipeline will have the capacity to transfer up to 16 GL/a of water from Melbourne’s supply network at Cowies Hill, west of Werribee, to storage basins at Lovely Banks, Geelong.

In addition to the pipeline, the project involves 21 minor tributary crossings and two major river crossings; civil construction of a new pump station; a new hydraulic surge protection system comprising a pressure sustaining valve and a new, welded steel surge tank; two steel surge vessels and a compressor package; and an onsite rock crushing plant.

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## Contract, contractor and client

A fixed-price lump-sum construction contract methodology over two separable portions has been adopted for the MGP, and Barwon Water has taken responsibility for design, pipe and valve supply, approvals and land access.

Abigroup says that fortnightly contract meetings are held with Barwon Water to help resolve any issues that may arise, and that all correspondence is managed through Teambinder, a document control and project information management software, to track all contractual correspondence.

“All contractual issues are dealt with in a transparent and amicable fashion,” says Abigroup Project Manager Allan Haynes. “The scope separation with Barwon Water responsible for key construction inputs such as pipe procurement and land access means that a close working relationship with clear and timely communication has been fundamental in achieving the successes that the project has achieved thus far.”



### **The project team**

The Abigroup MGP team is based at Cowies Hill Reservoir, which is located at the start of the project on the outskirts of Melbourne's rapidly expanding western suburbs. The team comprises a full-time Foreman, Project Manager, Senior Professional Engineer – Mechanical/Electrical, Professional Engineer – Pipe laying, Professional Engineer – Civil/Mechanical, Environmental Advisor, as well as finance and administrative staff to ensure compliance with the contract and occupational health, safety and environment requirements.

"Due to the time constraints on this project, we have split the pipeline in multiple sections with up to six pipelaying crews working simultaneously," says Abigroup Water National Engineering Manager Simon Bowles.

"In addition, a team of ecologists from Biosis Research assists with completing specialist ecological activities, and two wildlife carers are responsible for the handling of fauna during site stripping and clearing."

### **Pipelaying challenges**

Mr Haynes says that the alignment chosen for the pipeline is quite challenging as it involves diverse landscapes, river crossings and assorted landowners and stakeholders.

"The Environmental Management Plan (EMP) to which our works must comply is one of the strictest we have ever worked with," adds Abigroup Senior Environmental Advisor Lyndal McDonald. "This has required us to structure our delivery team and processes accordingly."

Some sections of the pipeline involve pipelay in tightly-confined corridor widths – as small as 5 m in some instances – and in very hard rock. The route runs past the Werribee Gun Club, so work had to be co-ordinated to minimise disturbance to club members.

Abigroup was also required to lay pipe through newly-established residential road reserves. "Consultation and co-ordination of works with property owners, council, developers and authorities has been vital in the success for construction through these areas," says Mr Haynes.

The project intersects numerous ecologically-protected areas that are covered under the Federal Environment Biodiversity Conservation Act 1999.

"Matters of national environmental significance include the nationally-listed natural temperate grassland of the Victorian Volcanic Plains and the habitat for significant fauna species, including the golden sun moth, striped legless lizard and growling grass frog," says Mr McDonald. "Strict onsite management from Abigroup has contributed to the success of construction in these areas."

Abigroup is continuously incorporating measures during construction to avoid impact to areas of protected vegetation and species by:

- Minimising corridor widths in sensitive areas;
- Refining construction methodology;
- Fencing and signing off protected areas as 'no-go' zones;
- Reducing the construction footprint in endangered habitats; and,
- Staging works to avoid impact to fauna breeding seasons.

### Crossing running water

Halfway through the project, the team faced its largest challenge with the scheduled crossing of the Werribee River. The crossing was completed by an open-cut method. The main reason for this is because river manager Melbourne Water prefers to visibly inspect all pipes and cables that cross its assets.

Due to the ground conditions at the time of the river crossing, trench shields were employed as the safest option, thus providing the best outcomes for a very tight window of opportunity. This also allowed for installation of the MSCL pipe and welding activities to be conducted within a safe environment.

"Excellence in water engineering and safety was demonstrated through close partnerships formed between the Abigroup project team, site crews, ecologists, archaeologists, Barwon Water and external stakeholders," says Mr Bowles.

Mr Haynes says that two months of planning went into devising a works method statement that encompassed all elements of construction, safety and innovation whilst meeting each of the state and federal requirements imposed on the project.

"Input from stakeholders – including Melbourne Water, Southern Rural Water, Barwon Water, the Victorian Department of Sustainability and Environment and Heritage Victoria – was a positive test of the team's channels of communication," says Mr McDonald. "Meetings, workshops, site investigations and a risk workshop were held to ensure the team understood all constraints and drivers."

In addition to the Werribee River, the MGP involved a crossing at Little River. Abigroup says the constructability of the river crossings was constrained by the range of environmental, seasonal and onsite requirements to protect habitat for aquatic species, as well as a directive from the Victorian Government to maintain river flows downstream for the duration of works.

As the construction corridor was limited to a 10 m wide stretch, the team had to brainstorm innovative means of incorporating all the environmental controls while maintaining water flows, establishing sufficient work space to manoeuvre plant and vehicles to accommodate trenching, and without compromising site safety.

To achieve this, the team commissioned a custom-built manifold and pump system for crossing the Werribee River to ensure upstream water flow was diverted around the construction corridor.

The design of the pumps was developed to specifications considering:

- Fluctuating flow rates – up to 38 ML at peak down to 9 ML regular environmental flows;
- Threat of inundation; and,
- Capacity of the pumps to handle a flow of 400 litres per second without scouring the river.

In addition to the constrained construction footprint, environmental obligations and maintaining river flows, Abigroup was required to manage the excavation and reinstatement of the heritage-listed Cobbledicks Ford, which crosses the Werribee River.

The bluestone ford was built during the 1860s and was an important river crossing between Melbourne and the Werribee Plains. The ford crossing is valued by the local community and is listed as a place of heritage significance by Heritage Victoria.

## The MGP legacy

The MGP is scheduled for completion in February 2012. Abigroup says that its future projects will benefit greatly from the increased environmental awareness and knowledge acquired during construction of this project.

"The onsite techniques developed to avoid impact to protected vegetation and species are truly innovative," says Abigroup Water General Manager Chris Bulloch. "This project builds upon the local knowledge base and will leave a legacy of responsibility with each of the team members to be passed on to future projects and clients."

### Northern Pipeline Interconnector – Stage 2

In January this year, The Australian Pipeliner reported on the Northern Pipeline Interconnector (NPI) – Stage 2 project, a 48 km underground, reverse-flow water pipeline located in Queensland that extends from the Noosa water treatment plant to NPI – Stage 1 at Eudlo.

In addition to working on the MGP, Abigroup is currently providing resources in the areas of construction, engineering, environmental science and community engagement for this project as part of the Northern Network Alliance, a joint venture which also includes LinkWater Projects, McConnell Dowell and KBR.

**Image caption:** Image 1: 800 mm pipe for the MGP alongside the trench; Image 2: Pipe being lowered into the trench; Image 3: Construction works at the Werribee River crossing; Image 4: The pipeline route involved a crossing at Werribee River; Image 5: Laying of heritage-listed cobblestones by hand across Werribee River; Image 6: Pouring of concrete to form a total encasement to the MSCL pipe under both river and cobblestones.