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**Engineers**  
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CIVIL EDITOR



Gold Coast Desalination  
**First Water**  
30 November

# NEW DESALINATION PLANT OPENS ON GOLD COAST

FEATURES: ■ MINING ■ LIABILITY/RISK

## New products

### New range of harnesses

Capital Safety recently launched its new DBI-SALA fall protection range for miners.

Capital Safety advises that body belts such as miner's belts and rigging belts have been removed from the safety standard and are no longer supplied with a certification mark.

This has led to the company developing a new range of miner's harnesses for workers/sites requiring a conformance mark where personnel are required to work in restraint and/or fall arrest.

The new products consist of the Mine Utility range, the ExoFit XP Miner's Harness and the Delta Miner's Harness. Each product has been designed to provide a safe, simple and functional harness and belt combination designed to cover all mining applications.

The Mine Utility Range incorporates a specially designed Mine Utility Belt that is claimed to be better in features and comfort than any other miner's belt available. The Mine Utility Belt is available as a separate unit.

For more information on this range visit [www.capitalsafety.com](http://www.capitalsafety.com).

### Gate valve for mine applications

Tyco Water has just released its new Auslite seated shouldered end gate valve for mining applications.

The body and bonnet are cast ductile iron, coated and lined with a bonded epoxy for corrosion protection.

The ductile iron valve wedge is encapsulated with EPDM (ethylene propylene diene monomer) for a drop tight seal.

It runs in anti-friction guide liners for low operating torques.

A straight through full bore avoids debris traps and maximises flow.

The stem seal housing is made from stainless steel incorporating two o-rings and a wiper seal.

The stem is grade 431 stainless steel, engaging a DR gun-metal wedge nut. The stem has a backsealing facility which allows stem seals to be replaced under full operating pressure.

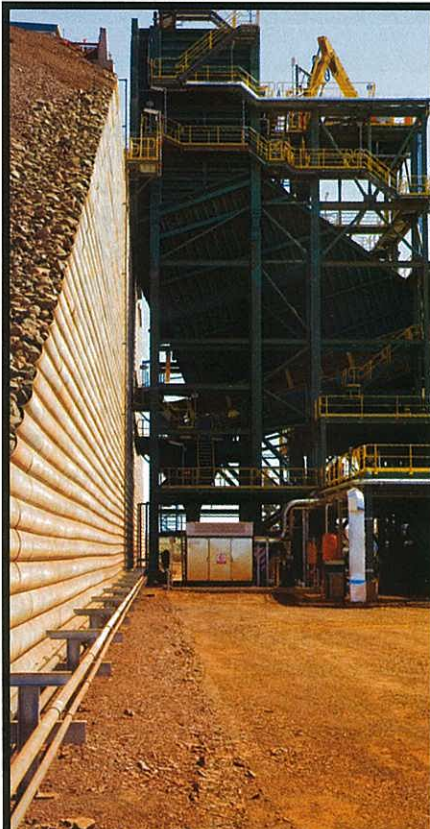
The valve is made to AS 2638.2: 2006 and is rated to an allowable operating pressure of 2500kPa and available in sizes DN100 (15kg) and DN150 (20kg).

The valve is of a new lightweight design that makes it easier to lift and install.

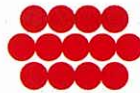


The Auslite gate valve has been designed for mining applications.

For more information contact Hilton Terry at Tyco Water on [herry@tycowater.com](mailto:herry@tycowater.com).



TerraMet® dump wall at Rio Tinto's Yandi JSE iron ore mine in the Pilbara Region of WA.



## Reinforced Earth

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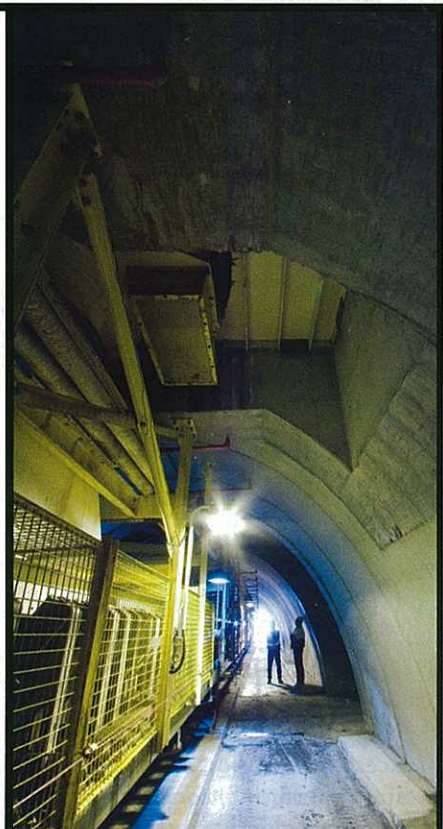
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View of coal feeder unit inside the TechSpan® reclaim tunnel at the Newpac coal mine in NSW.

## Award for enclosed belt conveyor

Innovative Conveying Systems International Limited (ICSI) recently won the Excellence in Transport and/or Conveying category of the 2008 Australian Bulk Handling Awards.

The award recognises companies that have introduced new or improved practices or technology that affects conveying and transport systems with a positive impact on performance, reliability, efficiency and the environment.

ICSI's managing director Michael Pietsch said ICSI has spent 10 years researching and developing the ICS Belt system.

"Considering we've been commercial for less than two years, this is a major achievement for us," he said.

The flexible enclosed belt system is designed to convey a wide range of materials from fine powders to large rocks over long distances, around obstacles and up steep inclines.

It can be used in a range of applications from grain handling to iron ore mining.

A key design feature of the system is its belt corrugations. These make it possible for the belt to change direction within a very short distance in the horizontal and vertical planes. For example, the 400 Series version, which is capable of conveying over 1500t/h, can negotiate a horizontal radius as tight as 6m.



An ICSI conveyor being used to load iron ore.

Another design feature is the belt's J-section, which enables the belt to be suspended from idlers and allows it to assume the pouch shape and fill to more than 80% of total available volume.

The 150 Series belt has a capacity of up to 170t/h (3m/s @ 80% volume and a bulk density of 1t/m<sup>3</sup>), a maximum belt speed of 3m/s, particle size of 60mm and a maximum bulk load of 16kg/m. ■

## Precast arch tunnels for coal mine

A new conveyor tunnel and a transport drift tunnel, comprising TechSpan precast concrete arches, are being constructed at Rio Tinto's Kestrel coal mine in Queensland's Bowen Basin.

The client and its engineering consultant Halliburton KBR considered various design options for the tunnels, such as combining the two tunnels into one to economise on excavation and to using steel arches instead of concrete.

Steel was discounted due to the risk of excessive corrosion due to aggressive groundwater conditions (the precast incorporates flyash to reduce permeability, thus making the reinforcing less susceptible to corrosion).

The Reinforced Earth Company (RECO) was appointed to design, manufacture, deliver and supervise the installation of the precast concrete arches and base slab systems for both tunnels.

The precasting is being carried out by BB&D Civil and the project is being completed by BGC Contracting.

According to RECO's engineering manager Chris Lawson, "the combination of grade and depth of fill means shear connections are necessary to maintain the longitudinal stability of the arch units. Due to transport capacity limitations, the footing units have been limited to a maximum weight of 25t, which also limits their width to 1.1m.

Because the units are narrow, the in-situ shear connectors have to be included to prevent rotation.

Altogether, nine types of base slabs and 21 different arch types are required for the project.

At the interface of the precast arch portal and the bored tunnel, the arch has to support 20m of fill. As the height of fill reduces, nearing the tunnel entrance, the base slab design changes until a minimum fill height of 2.75m is reached.

The arch units are installed using two cranes with the arches being placed directly opposite each other, helping to facilitate installation on the steep slope. ■