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About the Cover

Available exclusively throughout Australia and New Zealand from Garwood International, the new fully-electric Boschung Urban-Sweeper S2.0 (the 0 being for zero emissions) compact sweeper delivers all the performance of the Diesel-powered variant, with the added advantage of zero emissions.

► Turn to **Page 10** for the full story.



Building for a Brighter Future

Dear Readers,

While we suspected that the Covid-19 pandemic would have a massive and devastating impact on the entire planet, it's only as we continue to experience it, that we are beginning to understand just how far reaching the impacts of this unprecedented global disaster are. For all intents, Covid-19 has, and for that matter continues to have, a previously unimaginable impact on the day-to-day lives of pretty much every human on the planet.

Together with the horrific death toll and almost unimaginable levels of human suffering (both physically, emotionally and financially) Covid-19 has permanently changed the way that humans will interact both with each other and the environment as a whole. Then, of course, there is the economic toll.

Put simply, if in late 2019, someone had suggested to you that the levels of government borrowings and debt and that have been undertaken in Australia over the past four months would be widely welcomed and lauded by many as 'global best practice', you would have likely thought they'd taken leave of their senses. Yet, there we are – nearly \$260 billion committed so far and an expected deficit of well over \$550 billion... and by international standards, we're doing extremely well.

Perhaps most importantly, we, as a nation, can be fiercely proud of our collective achievements in managing Covid-19. I can say with full confidence, that when we started locking things down during February, nobody but NOBODY, would have dared to hope that our death toll would still be less than 110 almost six months later.

That's not to downplay the seriousness of the illness and the sheer tragedy of the lives that have been lost so far... but compared to the greater majority of countries, it's clear that

the measures implemented across Australia have been directly responsible for saving many thousands of lives.

While I'm at it, I would also like to offer my sincere thanks and congratulations to our Governments for their unprecedented levels of cooperation across all tiers, their rapid and decisive responses and, perhaps most importantly, the total lack of partisan politics. As well as helping to minimise the impact of Covid-19 and control its spread, the past 5 months have provided clear evidence of what can be achieved when party politics and self-interest are 'parked' in favour of working together for the true *'greater good of the nation'*.

That said, we are clearly not done yet. In fact, we're not out of the 'danger zone' yet (being in winter places us at a distinct disadvantage). Even as I type this, we're still attempting to reopen parts of the country, while other parts are going back into lockdown due to the dreaded 'second wave'. And unfortunately, there's still no real end in site.

With that in mind, as challenging as the task of shutting down and reopening an entire country and economy is, I believe 'the Covid-19 shutdown' has presented us with a unique opportunity in terms of our nation's growth and development – especially when it comes to construction of new water supply and renewable energy infrastructure, improvements and enhancements to existing infrastructure, and asset management and maintenance in general. It also provides us with a unique opportunity to reflect on how we, as humans, interact with our environment, and how we can improve that relationship.

Put simply, with so many activities not scheduled to return to full operation for the foreseeable future (read: until there's a vaccine), now is the perfect time for us to develop the facilities we need to provide the

entire nation - including rural and remote Australia - with long-term water security and large-scale renewable energy capabilities.

While it may seem, on the surface, to be counter-intuitive to 'spend' money at a time where government debt is at an all-time record high, I offer this simple response:

- Capital expenditure on water security and renewable energy infrastructure, or improvements to existing infrastructure and/or facilities (read: actual construction and maintenance, not endless feasibility studies) is an 'investment' in our future – and an extremely worthwhile one at that; and
- Major 'nation-building' construction projects offer outstanding levels of gainful employment and subsequent wide-spread economic activity – both of which are critical in ensuring that Australia can 'bounce back' from the Covid-19 shutdown in the shortest possible time and in the best possible shape.

Perhaps most importantly, this opportunity exists across Australia in its entirety, and can benefit all Australians, not just those in the major capitals.

While I feel certain that, given a choice, everyone would have happily foregone Covid-19 in its entirety, it is and always will remain a harsh reality in our world. And while it has caused almost immeasurable damage and suffering on so many levels, let's at least try and salvage some positives from the unintended consequences by using this unique circumstance to build / rebuild for a brighter future.



Anthony T Schmidt
Managing Editor

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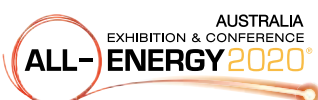


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Dr Bill Howcroft and Devmi Kurukulasuriya from the Deakin water tracer technology team at the CO2CRC Otway National Research Facility
Image courtesy: Wendy Timms, Deakin University

Researchers evaluate cost-effective carbon capture and storage

Deakin engineers have begun a major research program at the world's largest carbon capture and storage (CCS) demonstration project, near Port Campbell in south-west Victoria. The CO2CRC's Otway National Research Facility is Australia's first demonstration site for geological storage of carbon dioxide (CO₂).

Professor Wendy Timms from the School of Engineering said the project by Deakin's water tracer technology team would help demonstrate the environmental performance of the deep geological storage site.

"CO₂ has been safely stored at the Otway facility for more than 10 years. Our research will focus on reducing the cost of long-term CO₂ storage monitoring," Professor Timms said.

The site includes more than 1.5 kilometres of rock that acts as natural barriers to deep saline aquifers and buried carbon dioxide.

Professor Timms said the research team would develop new ways to track variations in water quality in the shallow groundwater above the natural rock barriers.

"Part of our research will track the normal variation in CO₂ activity in the soil and shallow groundwater because this can change over time, depending on rainfall and land use activities. This understanding of natural patterns will allow us to detect other changes that occur below the surface for any reason."

"The information we gather will improve monitoring of soil gas and shallow aquifers and lead to more cost-effective technologies at carbon sequestration sites around the world," Professor Timms said.

The Otway National Research Facility was established in 2008 to demonstrate that

CO₂ could be safely captured, transported, injected and stored in different geological formations underground with the overall goal of mitigating global climate change.

The process involves injecting CO₂ into a sandstone reservoir at depths of greater than 1.5km where it is trapped in the pore spaces of the rock and gradually turns into rock minerals over geological periods of time.

The International Energy Agency has identified CCS as a fundamental technology, essential to achieving global emissions reduction targets at the lowest cost. There are 59 large-scale CCS facilities globally – 21 in operation, three under construction and 35 in various stage of development. The largest operational project (Gorgon LNG CO₂ Injection Project) is located in Western Australia.

CO2CRC Chief Operations Officer, Dr Matthias Raab, said the Deakin study was part of the third stage of research at the facility.

"This partnership with Deakin allows us to build on a decade of successful monitoring research and look for cost reductions that could enable the development of more commercial CCS projects that have significant community and environmental value as Australia and the world adapts to climate change," Dr Raab said.

Professor Timms said the project was a fantastic opportunity for Deakin to be involved in research to mitigate climate change.

"We can apply our expertise to develop leading practices that improve environmental performance and reduce the costs of these important engineering projects," Professor Timms said.



Sydney Desalination Plant appoints Patricia McKenzie as Chair

Only July 1, the Board of Sydney Desalination Plant (SDP), announced the appointment of Patricia McKenzie as its new Chair, effective immediately.

Ms McKenzie has more than 35 years' experience in the Australian energy and infrastructure sector with a particular focus on industry governance, market design and regulatory reform.

She is a highly experienced Chair and non-executive director in the energy, health, government, and welfare sectors, and is currently serving as Chair of NSW Ports, and as a director at AGL Energy Limited and The Housing Connection.

Ms McKenzie was previously a director of the APA Group, Chair of Essential Energy and Healthdirect Australia Limited, and a director of Transgrid, Macquarie Generation and the Australian Energy Market Operator. She was CEO of Gas Market Company Limited.

Announcing the appointment, the Chief Executive Officer of SDP, Philip Narezzi, said Ms McKenzie brought to the job significant experience as a non-executive director, with extensive knowledge of and connections in, the wider infrastructure sector.

"On behalf of the Board and the management team, I welcome Patricia to SDP at a crucial time in the management of water resources in NSW, with many parts of the State still gripped by drought and water restrictions," Mr Narezzi said.

"Her experience as a non-executive director and her expertise will be a great asset to our organisation."

Ms McKenzie said she was pleased to join SDP as its new Chair, adding:

"SDP is an integral part of Sydney's water management system, making an important contribution to the water needs and expectations of millions of households and businesses in the metropolitan area."

"I look forward to working with the NSW State Government and its agencies to ensure SDP continues to supply drinking water to Sydney, not just during periods of extreme drought but as part of an integrated, world-class water management and delivery system," Ms McKenzie added.

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- Steve Murphy. NAC

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Illegal dumpers convicted after camera sting operation

A camera sting operation undertaken by inspectors from Western Australia's Department of Water and Environmental Regulation has resulted in convictions for a number of people caught illegally dumping waste on land that is part of a State park.

Covert surveillance was set up at Warbrook Road, Jandabup, in Perth's northern suburbs. They recorded five offenders dumping material ranging from asbestos to green waste on a total of 13 occasions.

The operation resulted in five men facing charges in the Joondalup Magistrates Court on June 5, 2020.

The first offence was detected on December 12, 2018, when a Toyota Landcruiser ute entered the area loaded with bricks and sand waste. The vehicle was photographed as the waste was dumped. Among the waste DWER inspectors found documents bearing the name Giuseppe Napoli. The distinctive vehicle also led inspectors to Mr Napoli and he was charged with Unauthorised Discharge of Waste under the Environmental Protection Act 1986. He pleaded guilty and was fined \$4,500 plus costs of \$418.

On April 12, 2019, a Nissan Patrol towing a trailer loaded with sheets of broken corrugated fencing material was recorded entering the site, then recorded a short time later leaving with an empty trailer. Samples of the fencing material were found to contain Chrysotile white asbestos. The broken sheets of asbestos were transported to the site on public roads in an uncovered trailer. Erol Raphael was charged under the Litter Act 1979 and faced an additional charge for failing to identify who was driving the vehicle. He was fined \$4,000 plus costs of \$418.

Daniel Edward Shackleton was charged over three separate occasions, on January

22 and 23, 2019, after chunks of demolished concrete were dumped at the site. It was alleged that a tip truck was hired to dump the waste. It was found that the behaviour was commercially driven. Mr Shackleton pleaded guilty and was fined \$9,000 plus \$418 costs.

Gerald Francis Stidworthy was photographed on three occasions in 2019, on August 6, August 12 and September 18, entering the site with a trailer full of waste and leaving with it empty. He pleaded guilty and was fined \$3,000 plus \$418 costs.

Christopher Thomas Winter pleaded guilty to charges related to five occasions in 2019 when he dumped green waste and sand. While the court acknowledged that the dumped material was relatively benign, the quantity was significant and was likely to have contained chemicals and pollutants which had the potential to detract from the beauty of the bushland, and could reduce the ability of the public to use and enjoy the area. Mr Winter was fined \$3,000 and ordered to pay costs of \$766.40.

Speaking about the operation, Western Australia Environment Minister, Stephen Dawson, said:

"This operation and the resulting convictions send a message that illegal dumping is not OK. Operations like this will continue so this should serve as a reminder for people to do the right thing."

"While it might seem that dumping green waste in bushland causes little harm, it's still damaging to the environment," the Minister added. "It's easy to dispose of waste legally, and people risk significant penalties if they do not."

In Western Australia, illegal dumping can be reported to DWER's *Pollution Watch Hotline* on 1300 784 782 or via email to: pollutionwatch@dwer.wa.gov.au

Plastic Free

The Inspiring Story of a Global Environmental Movement and Why It Matters

Rebecca Prince-Ruiz and Joanna Atherfold Finn

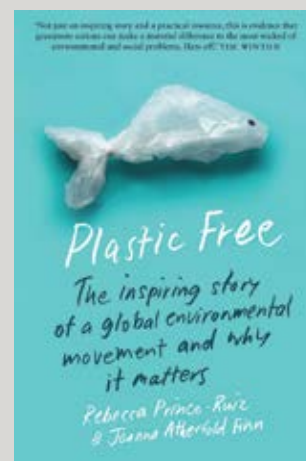
'Not just an inspiring story and a practical resource, this is evidence that grassroots actions by ordinary individuals and communities can make a material difference to the most wicked of environmental and social problems. Hats off.' — Tim Winton

In July 2011, Rebecca Prince-Ruiz challenged herself to go plastic free for the whole month. Starting with a small group of people in the city of Perth, the Plastic Free July movement has grown into a 250-million strong community across 177 countries, empowering people to reduce single-use plastic consumption and create a cleaner future.

This book shows how one of the world's leading environmental campaigns took off and shares lessons from its success.

From marine debris research expeditions to tracking what actually happens to our waste to sharing insights from behavioural research, it speaks to the massive scale of the plastic waste problem and how we can tackle it together.

Interweaving interviews from participants, activists, and experts, *Plastic Free* tells the inspiring story of how ordinary people have created change in their homes, communities, workplaces, schools, businesses, and beyond. Plastic Free offers hope for the future through the stories of those who have taken what looked like an insurmountable challenge and succeeded in innovative and practical ways, one step — and one piece of plastic — at a time.



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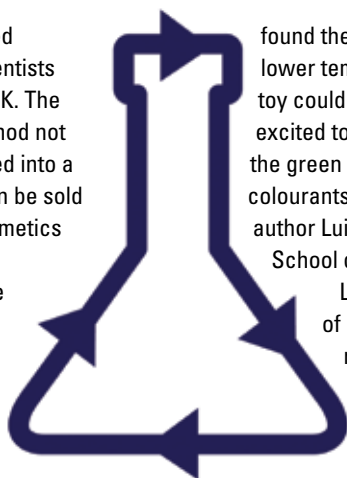
Chemical recycling makes useful product from waste bioplastic

A faster, more efficient way of recycling plant-based “bioplastics” has been developed by a team of scientists at the Universities of Birmingham and Bath in the UK. The team has shown how their chemical recycling method not only speeds up the process, it can also be converted into a new product – a biodegradable solvent – which can be sold for use in a wide variety of industries including cosmetics and pharmaceuticals.

Bioplastics, made from polylactic acid (PLA), are becoming increasingly common in products such as disposable cups, packaging materials and even children’s toys. Typically, once they reach the end of their useful life, they are disposed of in landfill or composted, biodegrading over periods of up to several months.

In a new study, researchers have shown that a chemical process, using a zinc-based catalyst developed at the University of Bath and methanol, can be used to break down real consumer plastics and produce the green solvent, called methyl lactate. Their results are published in the journal *Industrial & Engineering Chemistry Research*.

The team tested their method on three separate PLA products– a disposable cup, some 3D printer waste, and a children’s toy. They



found the cup was most easily converted to methyl lactate at lower temperatures, but even the bulkier plastic in the children’s toy could be converted using higher temperatures. “We were excited to see that it was possible to obtain high quantities of the green solvent regardless of samples’ characteristics due to colourants, additives, sizes and even molecular weight,” said lead author Luis Román-Ramírez of the University of Birmingham’s School of Chemical Engineering.

Lead researcher Professor Joe Wood, at the University of Birmingham, says: “The process we’ve designed has real potential to contribute to ongoing efforts to reduce the amount of plastic going into landfill or being incinerated creating new valuable products from waste.

“Our technique breaks down the plastics into their chemical building blocks before ‘rebuilding’ them into a new product, so we can guarantee that the new product is of sufficiently high quality for use in other products and processes.”

The chemical process has been tried up to 300 ml, so next steps would include scaling up the reactor further before it can be used in an industrial setting. The research was funded by the Engineering and Physical Sciences Research Council.



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Australia's business voice on sustainable development unifies to contribute to national policy

As the business world grapples with consumer and investor expectations that products and profit don't come at the expense of people and environment, the voice of for-purpose business is set to get louder. In a sector that has had multiple advocacy voices, the *Business Council for Sustainable Development Australia* (BCSD Australia) is set to strengthen its position with the research and advocacy work of the *Future Business Council* (FBC).

The FBC is closing and BCSD Australia will become home to the FBC alumni network and contacts. FBC is transferring its intellectual property to BCSD Australia. The Chair of FBC will also join the BCSD Australia Board.

"FBC's decision seeks to unify the voices for progressive, forward-looking business in Australia, which is best achieved by supporting BCSD Australia's mission: to accelerate the transition to a sustainable Australia by making more sustainable companies successful. FBC's considerable collateral will be carried forward by BCSD Australia," said outgoing FBC Chair, Toby Kent.

"BCSD Australia shares our commitment to driving business engagement and action for a better Australia. Its expansive member-led activities across the climate change and energy, biodiversity, people and cities and mobility agendas come at a pivotal moment for policy development, economic transformation, and public

expectations of the role of business in Australia," said Mr Kent.

"We are delighted that we can pass on our legacy to an organisation with such a strong focus on societal, environmental, governance and economic leadership."

Dr John Hewson, Chair of the BCSD Australia, said FBC had been instrumental in "making climate change a central focus in boardrooms across the nation with the fiduciary duties and climate change legal opinion, as well as providing a representative voice for Australia's future focussed business leaders."

"This aligns with BCSD Australia's business-leading Climate Action Statement in 2019 where its members committed to drive the necessary structural transformation needed to ensure emissions reach net zero in a timeframe supporting achievement of the Paris Agreement goals of limiting temperature rise to well below 2°C and preferably below 1.5°C," Dr Hewson said.

"As we emerge from this COVID-19 environment, the time is ripe to amplify the voice of for-purpose business and develop a policy, regulatory and fiscal environment that meets the changing expectations of our investor and the broader Australian community," Dr Hewson said.

"BCSD Australia will use this opportunity to set up a new dedicated program that drives the FBC work previously done under the Next Boom Agenda and the climate related financial disclosures."

Tom Quinn, Founder and inaugural Chair of FBC, made special thanks to the supporters who contributed to FBC work over its six-year life.

"We founded the FBC to provide a voice for companies leading the transformation to a smarter, zero carbon future in Australia. That voice is needed more than ever today and I'm confident that the Business Council for Sustainable Development Australia is well positioned to take FBC's legacy and our members interests forward.

"I would thank all - our members, our donors, our partners, our Board and our staff, past and present - who contributed to our work in so many different ways over the past six years. We are proud of our impact and our legacy," Mr Quinn added.

ABOUT BCSD AUSTRALIA

BCSD Australia is an Australian coalition of private and public organisations advocating for progress on sustainable development. Its mission is to be a catalyst for innovation and sustainable growth in a world where resources are increasingly limited. The Council provides a platform for companies to share experiences and best practices on sustainable development issues and advocate for their implementation, working with governments, non-governmental and intergovernmental organisations.

BCSD Australia's members include leading Australian businesses, from all sectors, who share a commitment to economic, environmental and social development, public sector enterprises institutions, business and industry non-government organisations and community organisations, representing more than 100,000 Australian employees.

For further information, including a full membership list, please visit: www.bcsda.org.au

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In keeping with its focus on developing high-performance, technologically advanced, and environmentally sustainable equipment, leading European surface cleaning equipment specialist Boschung has introduced a fully electric version of its renowned Urban Sweeper S2.

Known as the Urban-Sweeper S2.0 (the 0 being for zero emissions), this remarkable new compact sweeper delivers all the performance of the Diesel-powered variant, with the added advantage of zero emissions.

Sold and serviced nationally by Boschung's exclusive Australian distributor Garwood International, the first of the new units recently arrived in Australia - and it's already gaining significant interest from councils and contractors alike. Indeed, if the results of the first demo trials of the new unit are anything to go by, the new Boschung Urban-Sweeper S2.0 looks set to change the face of urban sweeping across Australia.



With councils and contractors looking to reduce the environmental impact of their day-to-day operations, the move away from fossil-fuel powered vehicles and equipment to either hybrid or full-electric variants is well and truly gaining momentum across Australia. While for many, the ultimate goal is to completely eliminate fossil-fuelled vehicles and equipment from their fleets, there are a number of critical considerations that need to be taken into account when moving to fully electric alternatives – particularly when it comes to performance. Garwood International Managing Director, Daniel McHugh, explained:

“While there can be no doubting the environmental benefits that stem from moving away from fossil fuel-powered vehicles and equipment to zero emission electric alternatives, there are a lot of things that have to be taken into account, especially when it comes to operational field equipment such as sweepers.”

“For example, while it might be relatively easy to manage driving distances and parking and charging opportunities for electric cars and bikes, operational vehicles such as trucks and sweepers usually have a full 8-hour shift of work to complete each day. And these work schedules generally don’t allow for significant vehicle downtime for charging.”

“In short, when moving to an electric-powered sweeper, as well as knowing that it is capable of completing the sweeping to the same (or better) high standard as the fossil fuel-powered equivalent, you also need to be sure that it has the power and performance to complete a full 8-hour shift,” he said.

“The new Boschung Urban-Sweeper S2.0 ticks all the boxes,” Daniel added.

“It has all of the features of the diesel-powered variant without any increase in weight, it delivers the same extremely high quality sweeping results – with the added advantage of extremely quiet operation – and it can work a full 8-hour shift on a single charge.”

PROVEN PERFORMANCE

Designed and manufactured at Boschung’s state-of-the-art facility in Payerne, Switzerland, the Urban-Sweeper S2.0 was launched in the European market some 18 months ago. Not surprisingly, the combination of performance, features and zero emission operation made it an immediate hit with councils, contractors, and major facilities owners across the UK and Europe.

With numerous units in operation, the Urban-Sweeper S2.0 has well and truly proven its performance in a wide range of ‘real-world’ conditions – earning it an enviable reputation both for its sweeping capabilities and its reliability in the field. Indeed, the Boschung Urban-Sweeper S2.0 has already become the urban sweeper of choice for many of the UK and Europe’s biggest cities, including the City of London, City of Birmingham and the City of Berlin, as well as major facilities including London’s Gatwick Airport.

Measuring just 1150mm(w) x 4300mm(L) x 1990mm(H) and with a curb-to-curb turning circle of only 6050mm, the Urban-Sweeper S2.0’s compact size and extraordinary manoeuvrability make it an ideal choice for sweeping footpaths, laneways, bike and recreational paths, car parks and pedestrian areas.

But don’t be fooled by the compact size... The Urban-Sweeper S2.0’s size belies both its performance capabilities and the high level of operator comfort on offer.

Designed with a focus on maximum productivity and performance, the Urban-Sweeper S2.0 features a standard sweeping width of 2300mm and a large 2m³ hopper with a tipping height of 1450mm for easy emptying into a standard skip bin or hopper. These features, together with the unit’s clever hopper screen design, centrally positioned 190-litre water tank and integrated water recycling system, all play a significant role in reducing the amount of down-time required to empty the hopper or refill the water tank.

Powered by a state-of-the-art 40kW electric drive with energy recovery, the Boschung Urban-Sweeper S2.0 custom-made battery includes 12 modules and a total of 4320 cells. The unit’s state-of-the-art intelligent battery management system features 24 temperature sensors that constantly monitor battery condition, automatically heating it up when needed, or cooling it off when it is too hot. The system also features an overcharging protection circuit, ensuring that the battery is optimised for a lifetime of performance.

The battery provides power to all engines and systems, including: the turbine, the brooms, the heater and air conditioning system, and the powertrain engines. The unit features an all-electric front wheel drive powered by 2 x 2.0kW wheel motors with a top ‘driving-mode’ speed of 40km/h, which helps to reduce transit time between the depot and the sweeping location.





OPTIMISED FOR AUSTRALIAN CONDITIONS

Recognising that climatic and sweeping conditions across Australia can differ significantly from those found across Europe – particular during the hotter months – the units being brought into Australia have been optimised to suit our local conditions. Garwood International's National Technical Manager, Reece McCrystal, explained:

"Before we brought the first unit into Australia, the team at Boschung worked with us to optimise the unit to suit Australian conditions, especially in terms of being able to cope with the harsh summer conditions."

"This not only involved optimising the battery management system to cater for



a wider range of operating temperatures – including significantly higher summer temperatures – but also things such as optimising the drive system and the in-cabin climate control to suit Australian conditions," he added.

The Australian Urban-Sweeper S2.0 uses the same battery technology as the Tesla car, which not only has the benefit of being widely proven both throughout Australia and internationally, but also offers the added benefit of an outstanding power-to-weight ratio. In fact, with a Gross Vehicle Weight of 3,500kg, the Urban-Sweeper S2.0 weighs exactly the same as its diesel-powered counterpart – but with the added benefit of zero emissions and no engine noise.

CHARGING OPTIONS

Supplied standard with a dedicated 3-phase AC charging station, the Boschung Urban-Sweeper S2.0 can also be charged with any standard 'Type 2' EV charging adaptor. Standard charging from zero to full takes 9 hours and provides enough power for a full 8-hour work shift.

An optional 3-phase DC Supercharger system is also available. Using the DC rapid charging option, the unit can be changed from zero to full capacity – ready for a full 8-hour shift – in only 2 hours.



"... it can work a full 8-hour shift on a single charge."

AUSTRALIA-WIDE SERVICE & SUPPORT

As well as ensuring that the new sweeper would be able to provide both the required sweeping performance and comfortable conditions for the operator in the height of the Australian summer, another major consideration was that of after-sales service and support.

"As is the case with any fully-imported equipment, our customers need to be sure that they can access comprehensive after-sales service and support – including spare parts and consumables – across Australia, quickly and efficiently, thereby minimising any potential downtime," Reece McCrystal said.

"With that in mind, before we took delivery of the first unit, I travelled to Boschung's main facility in Switzerland to take part in a series of comprehensive service and maintenance training courses covering all aspects of the new Urban-Sweeper S2.0. We then expanded our training here in Australia to ensure that all of our maintenance technicians are knowledgeable and qualified to work on the new units," he said.

"This local expertise is also fully supported by Boschung's extensive international resources and knowledge-base, as well as a full local inventory of spares and consumables for the units in Australia."

"In addition, thanks to the integrated BORRMA VISION management tool, technicians are able to establish a secure remote connection with the unit's on-board diagnostic system to check for faults or issues," Reece added.

"Needless to say, this combination of local, international and remote service capabilities provides our customers with the confidence of knowing that if they need service or parts, their equipment is fully supported Australia-wide."

COMFORTABLE, CONNECTED CABIN

Despite the Urban-Sweeper S2.0's compact size, its operator cabin is both deceptively spacious and extremely comfortable. The panoramic cabin offers generous views of both the working areas and surroundings, with operator visibility further enhanced by the streamlined, ergonomic, and uncluttered cabin layout.

The comfortable ergonomic seating, intuitive 'armrest' controls and efficient climate control system have all been designed with a focus on providing a



comfortable working environment for the operator. The cabin can even be pre-heated or pre-cooled while the unit is still connected to mains power prior to the operator arriving, delivering the dual benefits of an immediately comfortable cabin temperature, while reducing the amount of battery power required to bring the cabin to the required temperature.

The new generation touchscreen control unit provides an easy-to-operate and highly intuitive connection between the operator and each of the unit's key sub-systems, including the battery management system (BMS), drive system, brooms, suction, water and hopper. As well as providing control access, diagnostics and status messages for the operator via the in-cabin screen, the central control system can automatically report information regarding maintenance intervals and machine system status online.

The units also feature a built-in GPS and monitoring system which allows the operator to track where the sweeper has been, what's been swept and, if used in conjunction with a routing system, what remains to be done for the shift. The itinerary of the S2.0 can also be tracked via Smartphone using the secure RWIS app, or on computer via the secure BORRMA VISION management tool.

FEATURES & BENEFITS

- **No Engine Noise** – the extremely 'low-noise' operation makes it ideal for use late at night in inner-urban areas

- **No Emissions** – full electric 'zero emission' operation
- **8+ hour Battery** – sufficient capacity for a full 8-hour sweeping shift
- **No Weight Increase** – same curb weight and hopper capacity as the diesel-powered variant
- **Extended Service Intervals** – 2,000 hour service intervals vs. 600 hours for diesel-powered variant (fewer moving parts / fewer consumables / simpler layout / fewer possible mechanical issues)
- **Improved Suction** – Full electric operation allows for more control over fan-speeds and suction
- **Smooth & Stable Operation** – balanced design and even weight distribution
- **Outstanding Manoeuvrability** – articulated steering system provides curb-to-curb turning circle of only 6050mm
- **Excellent Hopper & Water Capacity** – large 2m³ hopper capacity and on-board water filtration and reuse system minimise downtime
- **Easy Emptying & Cleaning** – Hopper designed for easy emptying and clean out
- **Operator Friendly** – Comfortable, ergonomic cabin layout and intuitive controls
- **Quality European Design & Build** – built to last and keep performing even in the harshest conditions
- **Australia-Wide Service & Spares** – National after-sales service and support by Garwood International

A SWEEPER TO MEET EVERY NEED

Garwood International's expansion into the sweeper market started in 2017, when it partnered with Boschung to become the company's exclusive Australian and New Zealand distributor.

Keen to build on its well-earned reputation for the design, manufacture and supply of high-quality waste collection and compaction equipment and vehicles, the move to incorporate sweepers into its product offering was really a natural progression for the growing company. Garwood International's Managing Director, Daniel McHugh, explained:

"While expanding into the sweeper market had been a long-term goal for the company, we wanted to make sure that when we did it, we would be able to offer our customers a full suite of high-quality, reliable sweeping solutions."

"From compact footpath sweepers and mid-range units for urban environments, through to full-size highway sweepers

and specialist units for road works and pavement construction applications, we wanted to make sure that we had a comprehensive product offering to meet the needs of any sweeping challenge," he said.

"With that in mind, I travelled the world looking at what products were available and whether they'd be a good fit for us – especially in terms of quality, reliability and, perhaps most importantly, the equipment's ability to stand up to the harsh Australian operating environment," Daniel added.

"Needless to say, with both Boschung and Schwarze, we found their sweepers well and truly 'ticked all the boxes.'"

"Once we had established our partnership with Boschung, we started our discussions with Schwarze," Daniel said. "Schwarze had built a strong reputation throughout Australia for quality sweepers in both the local government and contractor market, and we felt their products were a perfect fit."



Garwood International was appointed as Schwarze Industries' exclusive Australian and New Zealand distributor in 2017, taking over sales, service and after-sales for both the Schwarze and Bonne branded sweepers.



Schwarze GS6 Tempest™ 6 Cubic Metre Regenerative Air Sweeper.

BELOW: Schwarze A4 Storm™ 3.6 Cubic Metre Regenerative Air Sweeper.

RIGHT: Available in a choice of models, Bonne heavy-duty Tractor and Trailer Brooms by Schwarze offer the ideal sweeping solution for road maintenance and construction sites.



Since that time, Garwood International has continued to build both the Schwarze and Bonne brands, with its sweeper business going from strength-to-strength.

"We're extremely proud to be the exclusive distributor for Schwarze throughout Australia and New Zealand," Daniel said.

"Together with the fact that both brands are held in extremely high regard in terms

of their quality, reliable and performance in the field, for us, signing the agreement with Schwarze also represented 'the last piece in the puzzle' in terms of us being able to provide our customers with a sweeper to meet every need," Daniel concluded.

For further information, please visit: www.garwoodinternational.com.au

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Specifically designed for road maintenance and construction, Bonne Tractor and Trailer Brooms from Garwood International deliver the quality, performance and reliability you need.

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LONG-TERM SOLUTION CRITICAL TO NEW MELBOURNE SUBURB

Project: Marigold Estate

Location: 1080 Doherty's Road Tarneit

Precaster: Reinforced Concrete Pipes
Australia

Client: Winslow Constructors

Developer: Growland

Good drainage design is one of the foremost concerns of any new development. What is immediately obvious is that new buildings create increased drainage flows and any risk of flooding must be eliminated. But less obvious is the impact of inadequate drainage that can lead to weakened foundations, mould, damp and even termites.

Robust and long lasting drainage products are the key to good drainage design and a new development project in one of Melbourne's expanding regions is ensuring that its new residents will benefit for years to come by the use of reinforced concrete pipes in its drainage system.

FOREVER HOMES AMIDST GREENERY

The development of Marigold Estate is currently underway in the quiet suburb of Tarneit North. Located just 27kms from Melbourne's CBD and only two minutes from the Tarneit Railway Station, the new development comprises three land holdings in Plumpton and will deliver 450 new homes to the new community.

Developer Growland hopes that Marigold Estate will encourage residents to build their forever homes, establishing themselves amongst a thriving community surrounded by greenery. Included in the development are multiple amenities including childcare centres, medical clinics and primary and secondary schools.

FOREVER HOMES REQUIRE FOREVER CONCRETE

Beneath Marigold Estate lies an intricate and well-designed drainage system comprising over 400 reinforced concrete pipes that have been manufactured and supplied by National Precast Master Precaster, Reinforced Concrete Pipes Australia (RCPA).

Precast concrete pipes were specified for this project because of their long term viability. Being manufactured in a factory-controlled environment, the pipes were able to be produced to a high level of accuracy and quality. Varying in radii, the pipes were cast vertically and set with an RRJ 2.34m rebate.





GENERATIONS TO BENEFIT

RCPA is happy with the outcome of the manufacture and installation of the precast concrete pipes and is proud of the role the drainage system will play in ensuring safe and healthy forever homes for the Estate's hundreds of residents.

Set to be completed in late 2020, Marigold Estate will create a nurtured community for many generations to come.

CONCRETE BENEFITTING MODERN DRAINAGE DESIGN PRINCIPLES

The pipes below the new Marigold Estate will serve to effectively control the amount of water runoff to mitigate flood risk, while maintaining the natural water cycle.

Being reinforced concrete, they will last over 100 years and their robustness will ensure easy, cost-effective and damage-free installation. That will pay off in the long term by requiring minimal maintenance, thereby benefiting people and nature alike. Further, they will preserve the quality of the water without chemicals leaching.

PIPES THAT ARE BETTER QUALITY, MORE ACCURATE AND LONGER LASTING

National Precast's CEO Sarah Bachmann comments: "off-site manufactured precast concrete pipes enable a higher level of quality and accuracy, while delivering an outstandingly durable and cost-efficient solution. As well, savings are afforded from installation differences

that make installation easier, reduce labour costs and minimise damage."

"Plus, they increase safety for workers both on and off-site. Considering the current events across the country and globe, safer construction is a necessary component for projects, and reducing the amount of people that need to be on site is a must to keep the community as safe as possible."

BarChip Inc.

The Synthetic Fibre Experts
www.barchip.com

BarChip Synthetic Fibre Precast Concrete Reinforcement

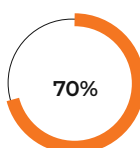
Eliminates Steel Corrosion
Increases Concrete Toughness
Decreases Production Times
Reduces Precast Element Costs



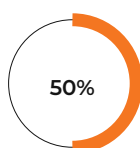
BarChip Delivers Precast Concrete Results!



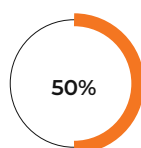
Reduction in
Steel Corrosion



Reduction in Carbon
Footprint



Increase in Precast
Production
Speeds



Decrease in
Precast Costs

When Performance Matters, Choose BarChip Synthetic Fibre.



Greener Concrete Reinforcement for Improved Concrete Sleeper Applications

by Associate Professor Olivia Mirza

Nowadays, Australia's population is over 25 million having increased by almost five times over the last century. As such, huge planning and investment are being made in the infrastructure to further overcome congestion and capacity issues. Accordingly, the railway connectivity will be an important factor towards the integration of regional and metropolitan economies for their mutual benefit.

By 2075, the population is forecast to double putting huge constraints on the railway network which will be required to keep pace with such growing demand. For instance, by 2026 there is already a forecast growth of 19% and 26% in the passenger and freight operations respectively [1]. Therefore, increasingly railway operational conditions characterise faster average speeds and frequency of services requiring the Australian railway infrastructure to be properly maintained towards ensuring

the safety, reliability and efficiency in connecting regions and cities.

One solution to this challenging task was to assess essential track components to ensure they could satisfy the line upgrades. According to researchers [2, 3], one of the critical track components is the sleeper which main function is to maintain the track gauge and redistribute the axle loads to the ballast.

Typically, railway sleepers are made from timber, steel and prestressed concrete despite recent concerns associated to the degradation, durability and high-cost of such conventional materials. For instance, wooden sleepers offer a comparatively cheap, lightweight and easy to install option despite being far more prone to wear and tear particularly with the shortage of high-quality timber.

On the other hand, steel sleepers were often seen as a middle ground between

the wooden and concrete alternatives, offering better load-bearing capacities with reduced dependence on the ballast bed. However, steel sleeper implementation remained fairly limited due to major drawbacks such as susceptibility to corrode and fatigue cracking at the rail seat.

In comparison, the modern prestressed concrete sleeper embodies superior load capacity, track stability and a longer service life requiring on average less maintenance. Other concerns related to the sleeper's material have long been acknowledged, resulting in premature failure of conventional sleepers and their associated replacement cost incurred as shown in Figure 2. In other words, prestressed concrete sleeper is being the preferred option nowadays despite timber historically dominating as a railway sleeper material.

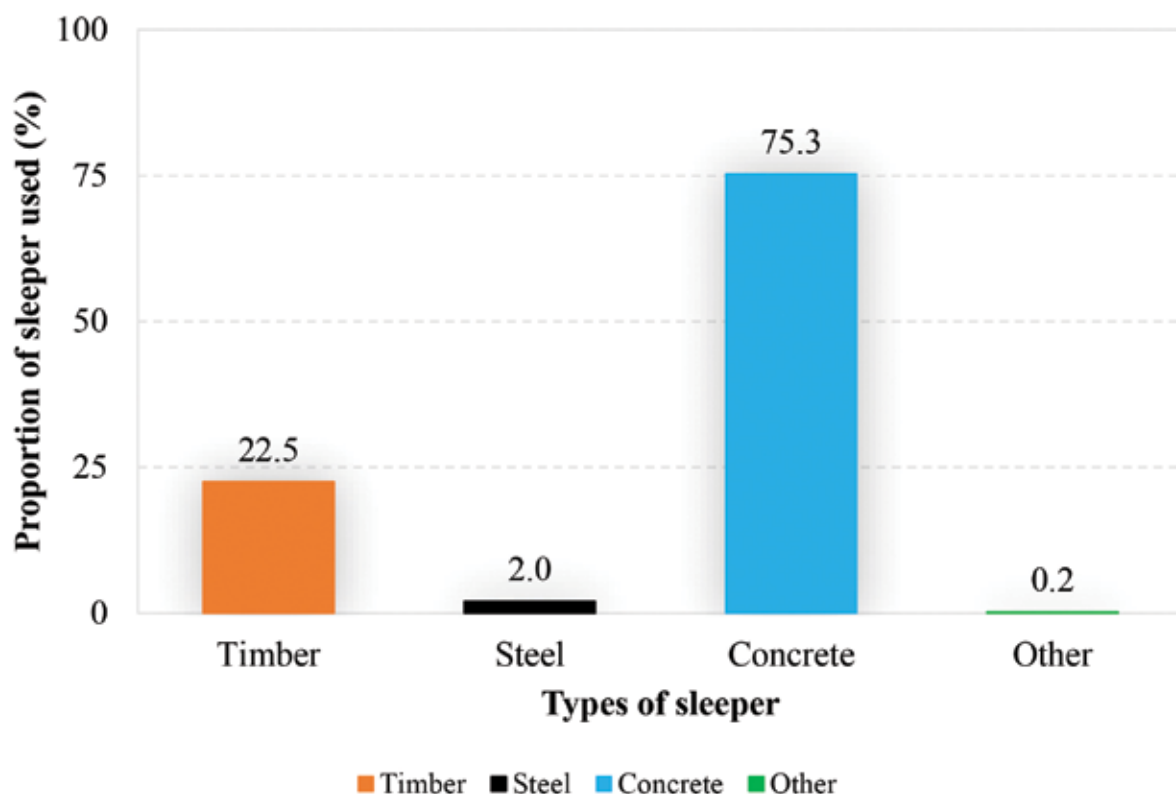


Figure 1: Use of railway sleeper material in European countries [UIC, cited in 4]

The most modern development in the field of railway sleeper highlights the benefits of composites sleeper being made from a combination of plastic, recycled rubber, and fibreglass. These are indeed engineered to possess adequate strength, damping and environmentally friendly characteristics to reduce the disposal cost. Nevertheless, the practical implementation of such sleepers remained fairly limited due to their unknown long-term behaviour and high manufacturing cost.

As a result, the idea was to implement new fibre technologies into the well-known and already mass-produced prestressed concrete sleeper to enhance its structural performances, reduce weight and overall cost while also being more sustainable. This innovative research is a collaboration between School of Engineering, Western Sydney University and BarChip. The Western Sydney University team include Associate Professor Olivia Mirza (the team leader), Mr. Christophe Camille and Ms. Dayani Kahagala (PhDs) and Mr. Todd Clarke from BarChip.

“For over 100 years we’ve just accepted that the best way to reinforce concrete is with steel. That might have been true in 1920, but will it still be true in 2020?”[5].

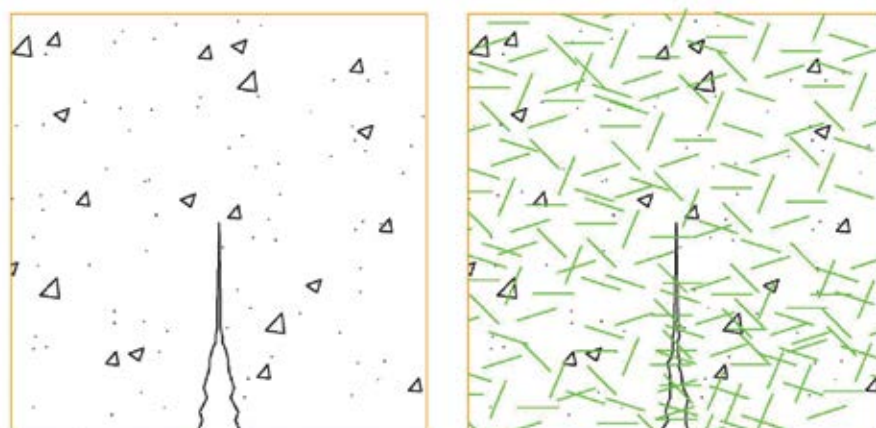


Figure 3: Illustration of cracks with and without the addition of macro-synthetic fibres

The BarChip macro-synthetic fibre concrete reinforcement is predominately made from a high-performance polypropylene base material, providing structural reinforcement in concrete, mortar and grout. This reinforcement system enables the distribution of high-tensile strength fibres throughout the entire concrete mix, intended at improving or controlling the residual strengths, durability and shrinkage characteristics of the concrete. BarChip macro-synthetic fibre technology is ideally suited to a wide range of applications including:

- Precast, paving and flooring works
- High deformation sprayed concrete works (i.e. tunnel linings)
- Railway Trackslab

Research recently conducted highlighted the benefits of BarChip fibres, namely BarChip 48 and BarChip MQ58 tested up to a fibre dosage of 2.0% by volume (i.e. approx. 18.2 kg/m³) which were found to significantly improve the post-cracking capacity and failure mechanism of concrete elements [6, 7]. In fact, these benefits directly result from the addition of fibres which suppress and stabilise the propagation of cracks throughout the concrete matrix.

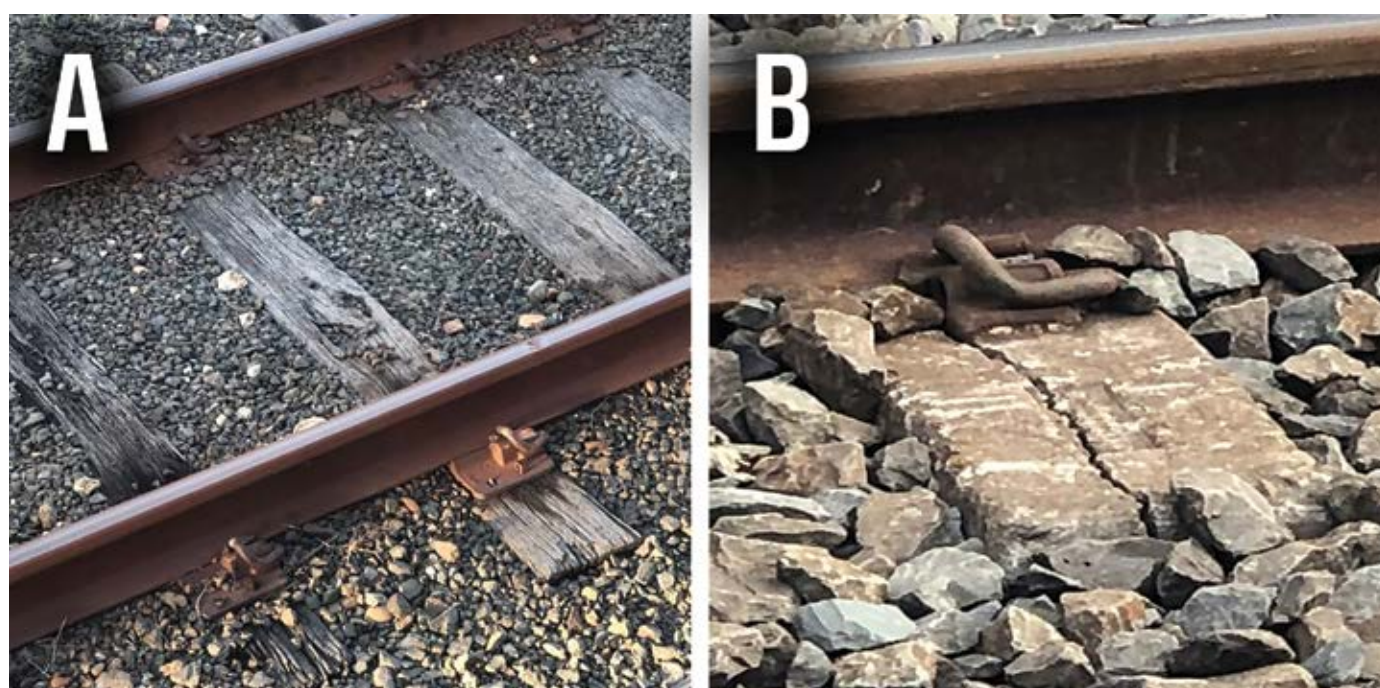


Figure 2: Typical failures of conventional sleeper – (a) timber & (b) prestressed concrete



Figure 4: BarChip macro-synthetic fibre concrete reinforcement [5]

These studies also underlined the fact that such reinforcement system could be implemented in the railway prestressed concrete sleeper as a partial or complete substitute to the steel wires. That is to say, such inclusion of fibres at an optimum dosage could result in a lighter, cheaper, eco-friendly and corrosion-free concrete sleeper.

The prospects of incorporating such BarChip fibres in railway sleepers is encouraging for a sustainable future, yet challenging in achieving the same capacity as prestressing steel reinforcement. As such, research is currently being undertaken at Western Sydney University on macro-synthetic fibre reinforced concrete (MSFRC) sleeper to comprehensively understand the structural behaviour and any associated benefits of such BarChip fibre incorporation. The MSFRC sleeper is reinforced by the synthetic fibres distributed throughout the sleepers..

The benefits of BarChip fibre concrete reinforcement for sleeper applications is assessed to comply with Australian Standard AS1085.14-2012. The essential standard tests for sleepers are (1) Rail seat vertical load test, (2) Centre bending moment test and (3) Development length [8].

Based on the in-situ track and support conditions of the sleeper, it is most likely that the section will experience a positive moment at the rail seat and a negative moment at the centre. This means that the rail seat and centre sections of the sleeper are safety-critical and as such must be assessed prior to

the implementation of BarChip macro-synthetic fibre reinforced concrete sleeper.

Understanding the contribution of BarChip fibres in the sleeper is key. Therefore, macro-synthetic fibre reinforcement was implemented at optimum dosage in the existing prestressed concrete sleeper to further evaluate any benefits as compared to an identical sleeper without the reinforcing BarChip fibres.

The potential implementation of such macro-synthetic fibre (i.e. BarChip) in railway sleeper as a partial or complete reinforcing alternative to steel is particularly in demand to allow for a cheaper, crack resistant, more environmentally friendly and corrosion-free concrete sleeper.

The first observation made in regards to the benefits of BarChip fibres is the cracking and failure mechanisms outlined in Figure 5.

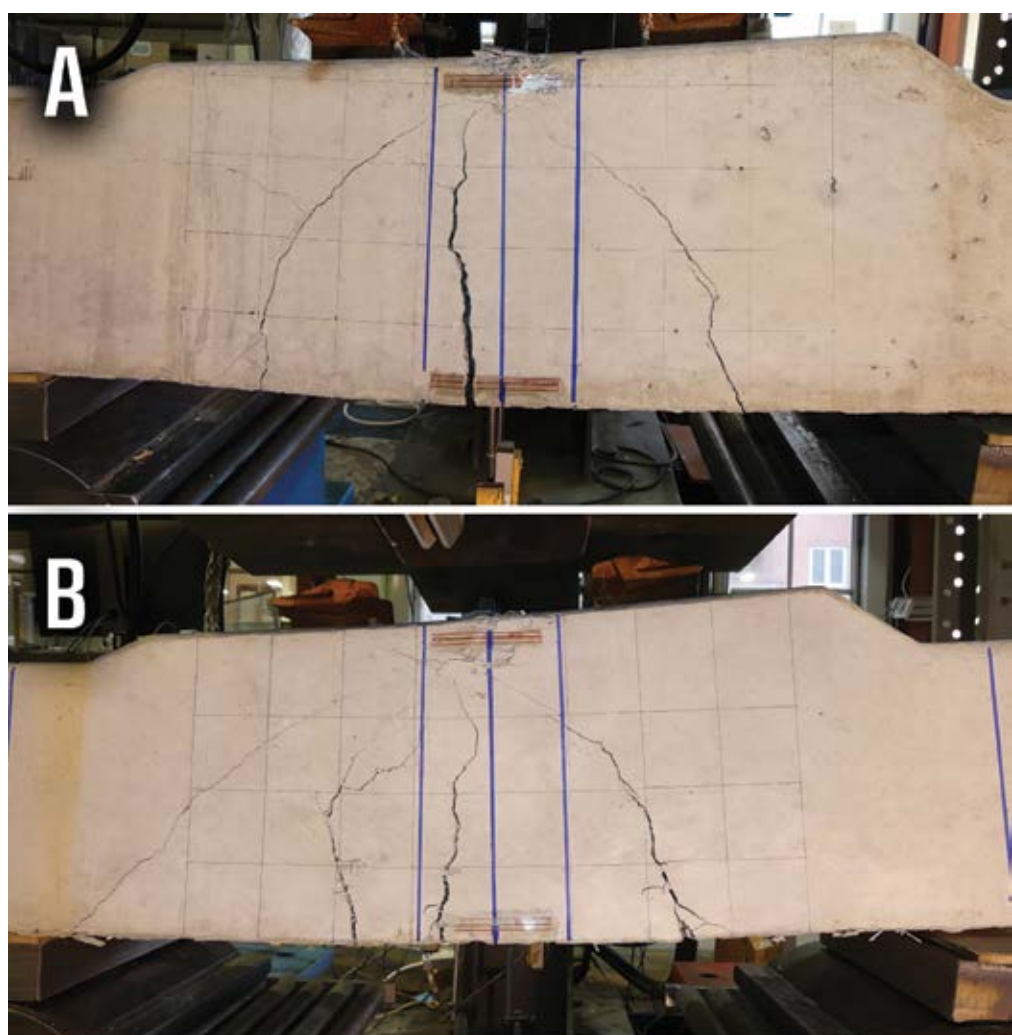


Figure 5: Rail seat positive bending moment test comparison for prestressed concrete sleeper (a) without BarChip fibres & (b) with BarChip fibres

Although both sleepers (i.e. with & without BarChip fibres) experienced flexural-shear cracks in the rail seat positive moment test, the MSFRC one exhibited a better distribution of cracks with smaller crack widths. Similar crack widths reductions are observed through the centre negative bending moment test presented in Figure 6.

It can be justified that conventional prestressed concrete sleeper exhibited mostly a shear-compression failure with local crushing as demonstrated in Figure 6-(a). In comparison, the sleeper reinforced with prestressing steel and BarChip fibres experienced predominantly flexural cracks towards a shear-tension failure with reduced local crushing.

Other benefits of incorporating BarChip fibres in sleepers can be observed through the post-cracking residual capacity outlined in the load versus deflection graphs.

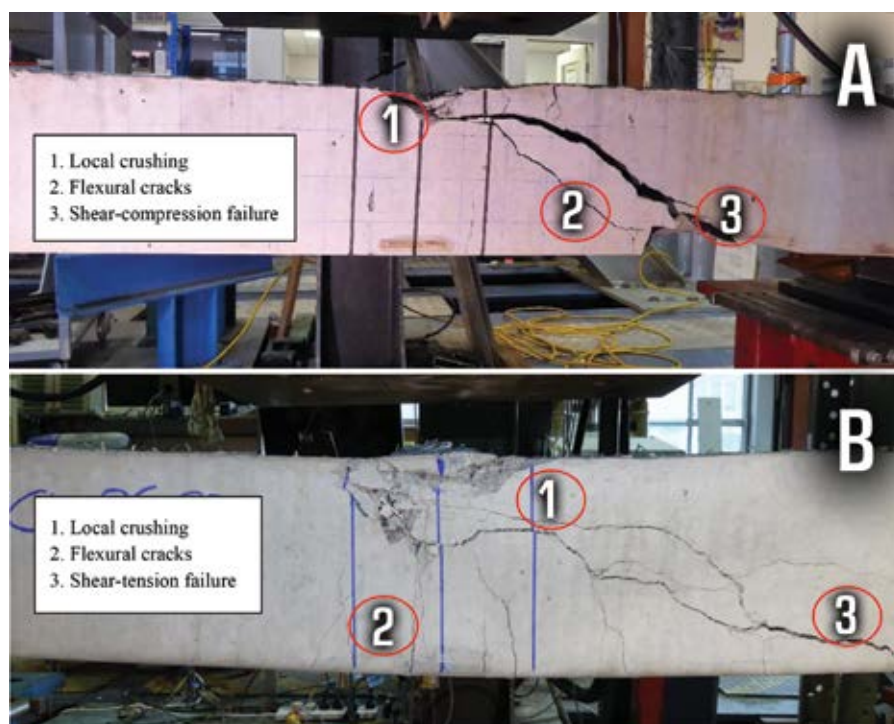


Figure 6: Centre negative bending moment test comparison for prestressed concrete sleeper (a) without BarChip fibres & (b) with BarChip fibres



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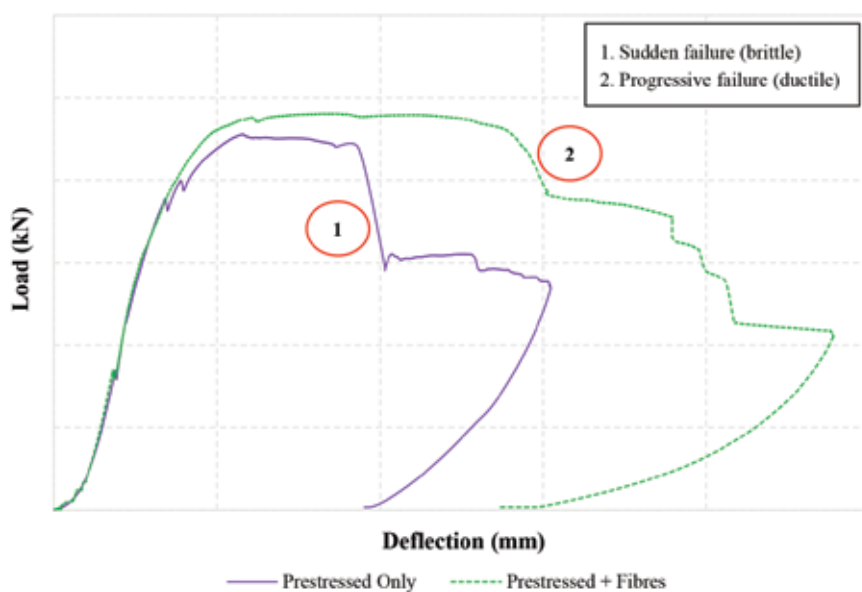


Figure 7: Rail seat positive bending moment test comparison for prestressed concrete sleeper reinforced with BarChip fibres

Figure 7 presents the improved serviceability behaviour of MSFRC sleeper in comparison to the conventional one although the presence of fibres insignificantly affects the ultimate load capacity. In other words, the BarChip reinforced sleeper was structurally sound up to larger deformations characteristically related to the additional ductility induced through the fibre bridging of cracks.

Shortly after the peak load, the conventional prestressed sleeper (i.e. no fibres) experienced a substantial drop in load corresponding to the sudden failure (i.e. brittle) in the bottom layer of prestressing tendons.

Comparatively, the MSFRC sleeper did not exhibit such drastic reduction in capacity through the presence of fibre assisting in the distribution of stresses across the section. As such, the sleeper incorporating fibres displayed a much slower progressive failure mechanism, a property desired in safety-critical railway track component.

Similarly, the centre negative bending moment test (Figure 8) highlighted the serviceability benefits of implementing BarChip fibres in railway sleeper. Indeed, the addition of fibres improved the failure mechanism towards a more ductile fracture with on average a 53% difference in deflection once the failure point is reached.

Such observations from the rail seat and centre tests demonstrate the potential benefits of BarChip macro-synthetic fibre reinforcement in terms of structural stability, serviceability and reduced maintenance (i.e. crack control) for sleeper applications. Further study is required to assess any potential reduction in the number of prestressing tendons while adding BarChip fibres as an eco-friendly alternative reinforcement method.

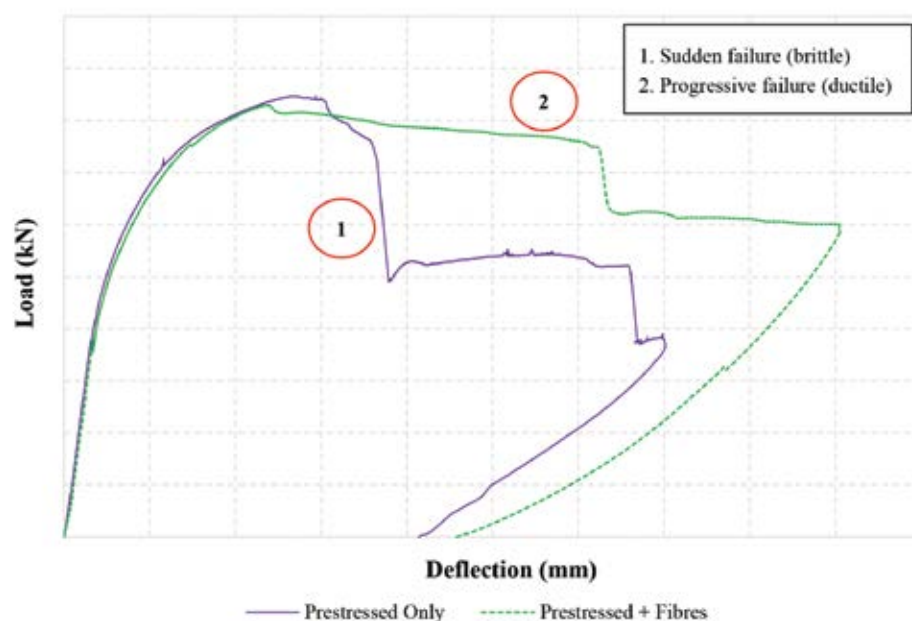


Figure 8: Centre negative bending moment test comparison for prestressed concrete sleeper reinforced with BarChip fibres

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Councils Get Jetting

Councils and water authorities across the country have been dealing with increased blocked sewer lines, with non-flushable items being used due to shortages of toilet paper with Corona pandemic. Councils had to readdress their requirements to unblock drains quickly and safely.

Aussie Pumps found that many operators were switching to high pressure water jetters rather than using ineffective conventional electro-mechanical “eels and snakes”. Aussie Pumps are also making operators aware that there are serious safety requirements when using these high pressure water jetters.

“The new safety standards, AS/NZS4233.1 divide jetting machines into Class A and Class B machines”, said Aussie Pumps’ Chief Engineer, John Hales.

“Class A machines can be operated without certification, provided the user has undergone training. Class B operators should be certified by registered RTO approved trainer and adhere to the rules of the way those machines are to be used,” John Hales added.

The difference between a Class A and Class B machine is simple. Class A machines are those operating between 800 bar/litres per minute and 5,600 bar/litres per minute. Bar/litres per minute are calculated by multiplying the machine’s rated pressure (bar) and the flow (litres per minute). For example, a 4,300 psi (300 bar) 20 litre machine is a Class B machine.

Whereas, an Aussie Cobra A, 4,000 (275 bar) psi 20 litre machine is a Class A machine.

CLASS A MACHINES ... TOO EASY!

Operators of Class A machines must be trained and competent in identifying hazards and controlling the risks, and must use suitable PPE.



Powered by a Kohler diesel engine, Aussie's trailer mounted jetter provides 5,000 psi and 16 lpm, and is classified as Class A which means no operator certification required.



Aussie Pumps keeping operators safe, and helping them get their job done faster!

The Class A machines made by Australian Pump are all rated at just under the Class B limit of just under 5,600 psi. Consequently, although they are equipped with lots of safety gear, safety glasses and safety plates to go over the drain when the job is being done are all standard equipment. Every machine also comes with a comprehensive nozzle pack for tackling a range of chokes including serious tree root infestations.

Aussie's *Cobra A Jetter* includes a 60 metre 5,000 psi super flexible sewer hose. Used in conjunction with an *Aussie Viper Mini Reel*, with an additional 60m of hose, the Cobra A has the capability to extend to 120m. That distance means you can clear chokes inside buildings without the need to remove the jetter from the ute or trailer.

CLASS B MACHINES CARRY HEAVY PENALTIES FOR INCORRECT USE

Operators of Class B machines that don't comply – in terms of either the machine or the operator certification - can be refused entry to sites. Additionally, in the event of a mishap, the owner of the machine, and possibly the operator, can be held liable if not properly certified.

When using a Class B machine, it must be shown that all the precautions laid down in the Standards were followed. Fines, penalty payments and payments to cover costs for injuries or damages, can easily run in to the hundreds of thousands of dollars.

Aussie Pumps are urging councils to check their existing equipment to ensure that both it and the operators fully comply with the applicable Standards.

For information on the new safety Standards, or to access a free copy of Aussie Pump's easy to follow guide “*High Pressure Water Jetting Safety Standards Made Simple*”, please contact Australian Pump Industries on 02 8865 3500.

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The Best of Both Worlds

While there will always be a discussion about what is the most effective and versatile method of pavement sweeping – especially in challenging conditions - one company has taken a different approach to the challenge. Rather than focusing on one particular sweeping methodology, leading German equipment manufacturer FAUN has combined the benefits of air circulation technology with high-performance vacuum sweeping to produce a sweeper that delivers the ‘best of both worlds’.

Distributed exclusively throughout Australia by Superior Pak, the state-of-the-art FAUN VIAJET 6 incorporates a patented air circulation system which combines the benefits of regenerative air sweeping with traditional vacuum sweeping. This unique design not only delivers outstanding sweeping performance across a wide range of surfaces, it also results in a significant reduction in fine dust emissions from the sweeper – another critical factor in sweeper design. Glen Fuller, Sales Manager – Sweepers with Superior Pak, explained:

“When it comes to sweepers, ensuring the dust emissions are kept to an absolute minimum is as important as the machine’s sweeping capabilities.”

“After all, there’s no point in picking up the dirt and debris from the pavement surface, just to have it blown back out of the sweeper into the atmosphere.”

The FAUN air circulation system continuously transports the extracted air from the debris container to the blowing nozzle behind the suction nozzle. When loaded with new debris, the already moistened and heated air is once again sucked into the suction nozzle and recirculated. The quantity of recirculating air can be variably adjusted between 30 and 70 % depending on the application.

Only the relatively small proportion of air which is not recirculated flows out smoothly under the machine. Fine dust emissions from the FAUN road sweeper with the air circulation system are therefore approximately 50 % lower than for pure suction road sweepers.

Importantly, this unique design means that the VIAJET 6 does not blow dust around. Clean exhaust air is expelled behind the sweeper units on the portion of the road which is already clean. Adding water to the blast air also enables the road to be cleaned in the working area of the suction nozzle.

DEVELOPED TO SUIT AUSTRALIAN CONDITIONS

When it comes to sweeping equipment, versatility and performance are paramount. Even sweeping routes that cover a relatively small geographic area tend to present a range of different sweeping conditions. What’s more, these conditions can, and often do change from week-to-week, due to things including weather events, traffic loadings, seasonal conditions, or any other number of factors.



The state-of-the-art FAUN VIAJET 6 incorporates a patented air circulation system which combines the benefits of regenerative air sweeping with traditional vacuum sweeping.



Specifically developed to meet the demands of harsh Australian operating conditions, the FAUN VIAJET 6 delivers the ideal combination of features, capacity and manoeuvrability to suit a wide range of applications. From suburban streets and roads, through to major arterials, rural roads and transport hardstand areas, the VIAJET 6's size, features and capacity make it an ideal choice for councils, contractors and road authorities alike.

"Needless to say, when it comes to choosing a sweeper to meet your needs, you need to be sure that it has the capacity to cope with an array of variables, including different pavement types and terrains, a range of debris types and loadings, wet and dry conditions, etc.," Glen Fuller said.

"Over the past six months, our demo unit has been subjected to pretty much every type of sweeping condition imaginable, from major CBD areas and inner-city streets, through to metropolitan arterials, suburban streets and rural roads – many of which had extremely high leaf and debris loadings. It really has been put through its paces," he said.

"In every instance – no matter what we put it through - the FAUN VIAJET 6 delivered the goods, collecting the debris and fines, and leaving a clean, debris-free pavement," Glen added.

For further information or to enquire about a demo of the new FAUN VIAJET 6, contact Superior Pak on: 1800 013 232 or visit: www.superiorpak.com.au

BELOW: The FAUN air circulation system recirculates air to the blowing nozzle behind the suction nozzle. When loaded with new debris, the already moistened and heated air is once again sucked into the suction nozzle and recirculated.



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The ‘stress-free’ approach vehicle ownership and maintenance

Whether it's scheduling planned maintenance, managing breakdowns and repairs, or calculating and managing budgets, fleet maintenance can represent a major challenge for fleet and equipment owners. Together with the workload involved, maintenance costs can quickly spiral out of control... and that can have a major negative impact on a business' bottom line.

With that in mind, leading equipment manufacturer Superior Pak has developed a whole-of-life maintenance solution which takes the stress out of fleet maintenance.

"All vehicle fleets will have downtime as the result of either planned or unplanned maintenance," said Keith Clark, National Service & Aftermarket Manager with Superior Pak.

"As a fleet manager, you need your equipment to be fully-operational, ready to work and in optimum safe working condition, and you need to be confident that your maintenance contractor can deliver that."

"At Superior Pak, our goal is to deliver a complete package - beginning with a superior product and extending all the way to lifelong service - taking the stress out of

maintenance planning and budgeting, while helping our customers to ensure that their equipment is fully operational and delivering maximum productivity," he said.

"With that in mind, our 'Stress-Free' whole-of-life maintenance solutions have been specifically developed to take the stress and complexity out of equipment maintenance," he added. "These fixed-price maintenance options not only provide our customers with the confidence of knowing that their equipment is being professionally maintained by our fully-trained team of specialist technicians, they also provide the benefit of knowing in advance what the cost will be – for the life of the contract."

Comprising a choice of three service levels (Silver, Gold & Platinum), Superior Pak's 'Stress-Free' contract maintenance provides equipment owners with a comprehensive planned and breakdown maintenance solution to meet their specific needs and budget.

Each of the three contract levels offers a range of different inclusions:

- **SILVER** - the base level SILVER contract includes servicing and general maintenance & repairs.

- **GOLD** - the mid-level GOLD contract level includes servicing and general maintenance & repairs, together with a breakdown & callout service during business hours (6am – 6pm Monday to Friday). It also includes coverage for hydraulic pack cylinders, oils and hoses, as well as body repair work.

- **PLATINUM** - the top PLATINUM level of cover includes all of the above, together with a breakdown/callout service outside of business hours.

Superior Pak has successfully run outcome-based contract maintenance across Australia since 1999, and during that period has achieved a consistent documented vehicle availability of 99%+ for its customers. It provides 24/7 service and breakdown cover Australia-wide and prides itself on both its service capabilities and response times. Indeed, Superior Pak currently provides its clients with a 60-minute response during normal working hours and a 90-minute response outside of work hours.

For further information, please visit: www.superiorpak.com.au

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With over 120 service personnel and 37 service vehicles distributed across all service centres, Superior Pak has modern service facilities strategically placed in every Australian capital, as well as remote sites covering all metro and regional areas. The company also operates two service facilities in New Zealand.



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Australian Government

Computer modelling helps analyse arsenic contamination in groundwater

Naturally occurring (geogenic) groundwater arsenic contamination is a problem of global significance, with noteworthy occurrences in large parts of the alluvial and deltaic aquifers in South and Southeast Asia. To address this problem tremendous research efforts have been dedicated over the last two decades to better understand the sources and distribution of arsenic-polluted groundwater.

Now, an Australian team of scientists from Flinders University, CSIRO and the University of Western Australia, together with their colleagues at the Swiss Federal Institute of Aquatic Science and Technology (Eawag), have used computer modelling to integrate much of what has been learned over the years into computer simulations that mimic the complex interactions between groundwater flow, solute transport and geochemical reaction mechanisms.

RECONSTRUCTING THE PAST TO PREDICT FUTURE ARSENIC BEHAVIOUR

The research team selected a highly arsenic polluted site near Hanoi (Vietnam) to develop and test their computer model.

Such models are important to analyse field observations, to unravel which chemical and physical processes play a role, and to predict the behaviour of arsenic within aquifers – where and when pollution may occur in the future.

“Our computer modelling integrates much of what field- and laboratory-based researchers have learned over the past two decades to better understand the sources and distribution of arsenic-polluted groundwater,” says Dr Ilka Wallis, the lead author of the new study.

“We were fortunate that at this study site a lot of valuable data were collected over the last 15 years,” Dr Wallis explains.

“This was extremely useful to test if our computer model was able to reproduce the complex geochemical processes that occur when arsenic is released and transported in aquifers.”

In a first step they used the tiny concentrations of tritium that had entered the groundwater system from the atmosphere during the times of nuclear bomb testing,



and its decay product helium, a noble gas, to reconstruct how fast and where the groundwater was moving over the last 5 decades. Once the model simulations were able to match the concentrations that were measured, additional complexity was added to the model in order to simulate how arsenic was mobilised and transported in the Holocene aquifer.

THE RIVER-GROUNDWATER INTERFACE ACTS AS REACTION HOTSPOT

At the study site, changes in groundwater flow occurred over the past 50 years since the city of Hanoi markedly increased the extraction of groundwater to satisfy its steadily increasing water demand; this showed to be the main trigger for arsenic pollution in the aquifer. The computer modelling allowed the researchers to pinpoint the source of arsenic down to the river muds that are regularly deposited at the more slow-flowing zones of the Red River.

The organic matter contained in those muds fuelled a biogeochemical reaction that led to the release of arsenic and its km-long transport into the aquifer underlying the Van Phuc village, a process that continues to this day.

Employing their developed computer model in predictive mode the researchers were able to illustrate the interplay of four key factors on the evolution and longevity of arsenic release at surface water/groundwater interfaces, (i) the

abundance of reactive organic matter; (ii) the abundance of iron oxides; (iii) the magnitude of groundwater flow; and (iv) river mud deposition rate.

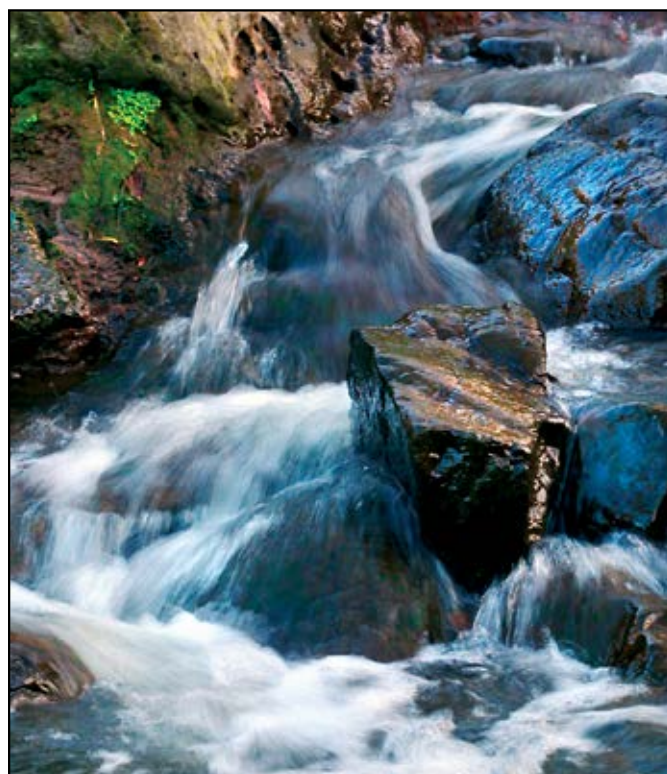
The paper, *‘The river-groundwater interface as a hotspot for arsenic release’* (April 2020) by Ilka Wallis, Henning Prommer, Michael Berg, Adam J. Siade, Jing Sun and Rolf Kipfer, has now been published in Nature Geoscience DOI: 10.1038/s41561-020-0557-6

ARSENIC

Arsenic is one of the most common inorganic contaminants found in drinking water worldwide. This metalloid occurs as a natural component in many sediments. Where arsenic becomes dissolved into the groundwater this can cause extensive groundwater pollution.

The inorganic salts of arsenic are tasteless and odourless, but highly toxic to humans. If ingested over long periods, even low concentrations can cause damage to health, including hyperpigmentation of the skin, hyperkeratosis on the palms and soles, disorders of liver, cardiovascular and kidney function, and various types of cancer. Problems arise from the fact that, firstly, arsenic concentrations can vary widely at the local level and, secondly, people in many areas are completely unaware of the risk because their groundwater wells have never been screened for arsenic.

Concentrations below 10 µg/L are considered safe. This concentration is therefore recommended by the World Health Organization as a guideline value for arsenic in drinking water.



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Building better water infrastructure for South Australians

Australia's leading water infrastructure provider John Holland has been awarded a major contract to deliver critical water infrastructure in South Australia.

In partnership with Guidera O'Connor, John Holland has been selected by SA Water to deliver part of its \$1.6 billion 2020-24 capital program. Together, John Holland and Guidera O'Connor will deliver capital projects for SA Water under a four-year framework agreement for up to \$500 million, focused on water services across southern metropolitan Adelaide and regional areas of South Australia.

As part of the new joint-venture, John Holland will deliver the engineering design and construction for the renewal and upgrade of essential water assets, including:

- Brownfield and greenfield water assets
- Water storage tanks
- Pipe networks, water treatment plants
- Pump stations and reservoirs.

Executive General Manager – Infrastructure, Andrew English said the contract built on John Holland's successful partnership with SA Water.

"We are pleased to be given the opportunity to build on our strong relationship with SA Water, following the Murray Bridge wastewater treatment plant project," Mr English said.

"John Holland has decades of experience utilising state-of-the-art technologies to deliver vital water infrastructure across Australia."

General Manager Infrastructure VIC/SA/TAS Struan Collins said the project would deliver wide-ranging benefits for local communities.

"South Australia is one of the driest jurisdictions on earth, therefore we understand the importance of delivering reliable and sustainable water services for communities across the State," Mr Collins said.

General Manager Water Services Mal Shepherd said the program would have long-lasting impacts.

"In collaboration with SA Water, we are striving to deliver innovative solutions that are reliable, resilient and sustainable for future generations," Mr Shepherd said.

"In securing this program our team displayed a compelling appreciation of how to collaboratively deliver value throughout the project lifecycle."

Wastewater treatment technology doesn't have to be new to be disruptive

By Matt Hale, International Sales & Marketing Director, HRS Heat Exchangers

The term 'disruptive technology' can be found everywhere across wastewater treatment, from conferences to whitepapers, and from small industrial and manufacturing sites to large municipal wastewater treatment plants. There is no doubt that disruptive technologies have the power to transform sustainability in the water sector, but it is important to realise that a technology does not need to be new in order to be disruptive. The widespread use of previously niche systems, or the novel use of well-established technologies like heat exchangers, can be equally transformative.

What is meant by disruptive?

A disruptive innovation is typically described as one which creates a new market or value network, leading to the displacement of market-leading businesses and products. High profile examples from everyday life include the Internet, mobile phones, Amazon and television streaming services.

However, it is also evident that while the terms disruptive innovation and disruptive technology may be new, the fundamental idea is not. From the Iron Age overtaking the Bronze Age, to the invention of gunpowder, the steam engine and the internal combustion engine, human history is littered with examples of transformational developments which have changed the course of global civilisation.

Part of a wider agenda

The current high level of disruptive technological development and implementation is itself part of a wider industrial development, which is often referred to as Industry 4.0.



The global growth in anaerobic digestion has shown that the decentralisation of water treatment is technically feasible.

This fourth industrial revolution refers to the increased use of technology, automation and data across industries as diverse as agriculture and healthcare; and water treatment and the environmental sector are no different.

While some people dismiss Industry 4.0 as a marketing buzzword, there is no denying the effects that digitisation, data capture and analysis, and automation are having across the economy.

Examples of disruptive technology

There have been plenty of disruptive developments in the treatment of wastewater streams through history, from sewer systems and trickling filters, to the use of activated sludge, anaerobic digestion and nutrient recovery. Some of the current areas which have the most potential for disruption, either because they are new, or because they are becoming increasingly common, include:

- Decentralised wastewater treatment – The development of smaller, decentralised

treatment technology has the potential to improve levels of sanitation and access to clean water around the world. Several universities and companies are working on practical solutions for sustainable, small scale wastewater treatment units.

- Phosphorus recovery – Economic, political and environmental factors are already combining to make the recovery of this valuable nutrient from waste streams and sludges routine at commercial wastewater treatment facilities. Consultants are also turning their attention to phosphorus recovery at smaller scale installations, such as septic tanks and agricultural effluent.
- Wastewater mining – While the recovery of some key nutrients, such as phosphorus, is now common, an improved understanding of the scarcity of resources and moves towards the development of a true circular economy means that the next generation of wastewater treatment plants is likely to include physical, chemical



Matt Hale, International Sales & Marketing Director at HRS Heat Exchangers.



Evaporation and concentration systems based on heat exchangers have a small footprint, making them ideal for decentralised water treatment.

and biological systems to recover key materials (including carbon, nutrients and rare metals) for reuse in processes as diverse as farming, food production and industrial manufacturing.

- Zero Liquid Discharge – Commonly abbreviated to ZLD, this technique refers to waste treatment techniques which remove the liquid streams, usually employing a combination of processes such as filtration and crystallisation to remove suspended and dissolved materials to leave a number of solid residues – which often contain valuable co-products or components (see above) and water. Now categorised as a mature technology, it is an example of a disruptive technology which is rapidly becoming mainstream.

Using existing technology for disruptive purposes

There are many drivers for the adoption of all or some of these techniques in wastewater treatment, including environmental, economic and social factors. However, the good news for companies wanting to evaluate and introduce such technology is that the techniques already exist.

For example, many of the processes described above involve some form of evaporation to concentrate residues for extraction and as part of the purification of wastewater streams. As heat transfer and evaporation specialists, HRS Heat Exchangers already produce a range of heat exchangers and systems which are suitable for any or all the above processes. The patented HRS Unicus series of scraped surface heat exchangers are particularly suitable for use in evaporation systems, such as those used for ZLD and material recovery.

The HRS evaporators used in ZLD systems are run at lower pressures to reduce the boiling point of the liquid, enabling multi-effect evaporation. In multi-effect evaporation, steam from a previous evaporation stage is used as the thermal energy for the next stage, which works at a lower boiling point. In this way, multiple evaporation stages are combined, delivering considerable energy savings. For many components, crystal precipitation is also favoured at lower temperatures; so, lowering the evaporation temperature helps to boost product recovery rates.

The HRS ZLD process consists of an evaporation concentration phase where a concentrated solution is concentrated as much as possible. From that point on there are two possibilities:

1. *Concentration to maximum solubility without the formation of suspended solids.* This is then followed by a cooling step which causes solids precipitation and separation of the solids which are formed; the liquid fraction is then returned to the evaporator. This method can be applied for a product that has a sharp change of maximum solubility with temperature.
 2. *Concentration to just above the saturation point, followed by a separation tank where the solids and liquids are separated.* The liquid fraction is then returned to the evaporator. This method can be applied for a product which solubility does not change too much with temperature.
- Both the evaporation and cooling steps result in a high degree of material fouling on the inside of the equipment. To combat this, HRS Unicus Series scraped-surface evaporators are used, as they maintain thermal efficiency and remove fouling as it occurs in the evaporation process.

In addition, HRS R series scraped surface heat exchangers are also used for cooling the crystal-loaded slurry that is obtained in the crystallisation tanks.

ABOUT HRS HEAT EXCHANGERS

Located in Melbourne, HRS Heat Exchangers is part of the HRS Group which operates at the forefront of thermal technology, offering innovative heat transfer solutions worldwide across a diverse range of industries.

With almost 40 years' experience in the wastewater sector, specialising in the design and manufacture of an extensive range of turnkey systems and components, incorporating our corrugated tubular and scraped surface heat exchanger technology, HRS units are compliant with global design and industry standards.

HRS has a network of offices throughout the world: Australia, New Zealand, UK, Spain, USA, Malaysia and India, with manufacturing plants in the UK, India and Spain.

Please visit: www.hrs-heatexchangers.com



HRS Unicus Series scraped-surface evaporators are used to maintain thermal efficiency and remove fouling during evaporation in ZLD installations.



City of Melbourne powers up renewable energy deal

A group of prominent Melbourne universities and businesses has secured a multi-million-dollar deal to power their operations using wind energy produced in regional Victoria. The purchasing group of seven large energy users includes RMIT University, Deakin University, Cbus Property, ISPT, Fulton Hogan, Citywide Asphalt, and Mondelez International.

Deputy Lord Mayor Arron Wood said this is the second purchasing agreement facilitated by Council through the *Melbourne Renewable Energy Project* (MREP).

"Combined, the two projects represent the equivalent of a five per cent reduction in the city's emissions, and a tangible shift towards renewable energy in the national grid," the Deputy Lord Mayor said.

"The new group includes 14 shopping centres, nine office buildings, seven educational campuses, and four manufacturing facilities."

"The agreement starts in July and most of the wind power will be produced at the Yaloak South Wind Farm near Ballan, with the remaining energy coming from other wind farm projects in regional Victoria," Deputy Lord Mayor Wood added.

Tango Energy will provide 110 GWh of renewable electricity per year to the purchasing group over 10 years.

The initiative follows the successful *Melbourne Renewable Energy Project*, which saw Council lead a consortium to purchase 88 GWh of renewable energy, and led to the construction of an 80 MW wind farm at Crowlands, near Ararat.

"The deal is equivalent to providing enough renewable power for more than 22,000 households a year. When you add MREP1 that jumps to enough power for 40,000 households a year," the Deputy Lord Mayor said.

"Renewable energy investments can and should play a significant role in supporting our economic recovery from COVID-19.

"The purchase of renewable energy certainly has a positive environmental impact, but it also makes economic sense. We know the energy market can fluctuate a lot. Like MREP1, the MREP2 project allows the buying group to lock in price certainty. So

it's not only good for our planet, but great for the hip pocket," he said.

"Our partners in the business and education sectors have shown enormous leadership by stepping up to help transition Melbourne to a reliable clean energy future," the Deputy Lord Mayor added.

Environment portfolio Chair Cr Cathy Oke said accelerating the transition to renewable energy is key to reducing the municipality's emissions, but this can only happen with private sector involvement.

"The second Melbourne Renewable Energy Project will reduce greenhouse gas pollution by 123,000 tonnes a year, that's the equivalent of taking more than 28,000 cars off the road every year," Cr Oke said.

"It's also a significant step towards our goal for all of Melbourne to be powered by 100 per cent renewable energy."

Earlier this year, the City of Melbourne moved to fast-track a range of initiatives to further reduce its carbon emissions, including reaching Council's zero emissions target for the municipality 10-years earlier by 2040, after declaring a Climate and Biodiversity Emergency in 2019.

"We have already reduced emissions from the City of Melbourne's operations by more than 50 per cent in six years and we're accredited as being carbon neutral – but we must do more, and we can't do it alone," Cr Oke said.

Speaking about the new renewable energy deal, RMIT Executive Director of Property Services and Procurement, Chris Hewison said that RMIT University was excited to lead the MREP2 buying group, as the project clearly aligns with RMIT's desire to embed sustainability into all the University's activities.

"RMIT's ongoing involvement in the Renewable Energy Project is an opportunity to demonstrate sustainability leadership in our community while driving significant progress toward our goal to be carbon neutral by 2030," Chris Hewison added. "The University has benefitted from the economy of scale through the group procurement process and our united aim to be leaders and champions for impactful change in the communities we serve and beyond."

The sentiments were echoed by Deakin University Chief Operating Officer, Kean Selway, who said: "Deakin University is pleased to be a partner in the Melbourne Renewable Energy Project 2. As one of our core values, we take our commitment to economic, social and environmental sustainability very seriously and as a key part of this, our responsibility in the transition to cleaner energy sources. This project is a very important step in achieving our target of being carbon neutral by 2025 and contributing to a more sustainable future for all."

Importantly, the new energy deal will play a major role in reducing the carbon footprint of their commercial operations.

Fulton Hogan Infrastructure Services CEO, Matthew MacMahon, explained:

"This project will enable Fulton Hogan to power all of our quarries, asphalt plants and blending facilities right across Victoria with renewable, carbon neutral electricity. This will result in more than 7,000t of carbon removed from the environmental footprint of the products we manufacture, and the roads and infrastructure we build across the state."

Mondelez International Director of Integrated Supply Chain, Mohamed Shalaby said: "With brands including Cadbury and the Natural Confectionery Company, we're incredibly proud of the fact that we make many of Australia's most loved foods here in Melbourne. We're committed to reducing the impact of our operations on the planet, and using 100 per cent renewable electricity for the two Melbourne factories that make so many of our popular Cadbury and The Natural Confectionery Company products will play a significant part in reducing our carbon footprint in Australia."

"We've really valued working alongside other businesses that are looking to support the local renewables sector. The shift to 100 per cent renewable electricity in Victoria represents a more than 80 per cent reduction in carbon emissions from the total electricity used to make our products in Australia," Mohamed Shalaby added.



LPE and Allume bringing solar electricity to over a million Australians living in apartments

Siemens Gamesa confirms order for 496 mw Bay of Saint Briec offshore wind power plant

Siemens Gamesa Renewable Energy (SGRE) has received the firm order from Ailes Marine, an affiliate of Iberdrola, for 62 SG 8.0-167 DD offshore wind turbines for 496 MW Bay of Saint Briec offshore wind power plant. This order also includes a 10-year agreement for turbine maintenance services.

"We are extremely excited to add France to the many markets around the world where our offshore wind turbines contribute to providing clean energy and combatting climate change," said Andreas Nauen, CEO of the Siemens Gamesa Offshore Business Unit.

"Making Bay of Saint Briec Siemens Gamesa's first firm offshore order in France is a historic moment and a testament to our dedication to growth in the market, and to driving the globalization of offshore wind energy," Mr Nauen added. "We thank Ailes Marines for their confidence in our products as well as our manufacturing plans for France."

Filippo Cimitan, Managing Director of Siemens Gamesa Renewable Energy France, added: "This is excellent news for the energy transition, the offshore wind energy sector, and the industry in France. This first firm order is an important step toward the concretization of our industrial plant project in Le Havre, and confirms our status as the leading supplier of offshore wind turbines in the market."

The main components of the 62 turbines of the Bay of Saint Briec offshore wind power plant will be produced at Siemens Gamesa's planned offshore wind turbine factory in Le Havre.

The Bay of Saint Briec offshore wind power plant will produce the equivalent of the electricity consumption of 835,000 people.

Javier García Perez, President of Ailes Marines and Iberdrola's International Offshore Business Director said, "By selecting Siemens Gamesa Renewable Energy's 8 MW wind turbines, Saint-Briec offshore wind farm secures a best-in-class, high-performance technology. Ailes Marines is fully committed to the development of the French offshore wind industry, which is creating thousands of high-skilled jobs, driving the green economic and industrial recovery of France and contributing to delivering the renewables-led net zero targets."

KEY PROJECT FIGURES

- Area: 75 km²
- Turbines: 62 Siemens Gamesa SG 8.0-167 DD, each with an 8 MW capacity
- Installed capacity: 496 MW
- Annual production: 1,820 GWh, the equivalent of the annual electricity consumption of 835,000 people (including heating)

ABOUT SIEMENS GAMESA RENEWABLE ENERGY

Siemens Gamesa is a global leader in the wind power industry, with a strong presence in all facets of the business: offshore, onshore and services. As of May 2020, Siemens Gamesa has over 3,500 offshore wind turbines in operation globally with a combined capacity of more than 15.5 GW. The company's experiences reach back as far as 1991, when it established the world's first offshore wind power plant.

Please visit: www.siemensgamesa.com

With over 2 million people enjoying solar, those in apartments have been missing out – until now. LPE has teamed up with Allume Energy, to provide a solar electricity solution for apartment living that finally enables apartment complexes to a shared solar solution. They will be utilising Allume's Australian designed and manufactured SolShare technology in partnership with LPE's unique electricity supply model to enable these communities to finally have a sustainable option.

LPE and Allume are implementing this partnership to help create sustainable strata communities for the future, who have struggled for years for fair solar solutions. This is the most cost-effective option yet, and one that presents no risk to residents or body-corporates. There is also a range of social benefits – such as giving access to solar and clean electricity to all apartment complexes including those in lower socioeconomic communities that otherwise couldn't afford it.

According to LPE and Allume, until now, there has been no product that can utilise a single shared roof space, and investors who own strata properties have not wanted to invest their own capital in solar technology. With LPE's Solar for Strata solution, LPE supply and maintain the Solar system at no capital cost to the body corporate or residents, and the solar electricity is much less costly for residents than general grid electricity. This means that everyone benefits and there is an incentive to take the sustainable option.

Brendan, Chair of Urban apartment's body corporate said, after a successful pilot program: "We have been wanting to install solar for many years, but no solution worked for all residents and the body corporate community."

“With LPE an Allume we managed to not only have the solar system installed by LPE at no cost to us or the residents, but we can now enjoy the benefits of cheaper, greener electricity.”

“Our residents feel good knowing that they are helping the environment by using renewable power and they are saving money whilst doing it,” Brendan added.

Many future pilot programs across New South Wales and Queensland are rolling out with similar anticipated success.

Each system is designed to generate enough solar electricity to support a strata community’s daytime electricity needs. Electricity is distributed in real-time across all residents within the complex, allowing maximum on-site solar usage, leading to optimised savings for residents. LPE then combines the solar and general grid electricity consumed into a single, easy to understand bill.

Over 1.5 million Australians living in apartments within strata schemes located throughout Queensland and New South Wales will be able to access the solution.

Damien Glanville, LPE CEO, believes there is no better way to save on electricity bills whilst also creating a sustainable community.

“This is the first time strata apartment communities have had a decent solution that allows all residents to access a shared solar solution with one rooftop installation that gives them fair access to the savings generated from solar and allows them to become a sustainable community,” he added.

LPE is looking forward to providing an accessible solution for all communities to become sustainable and reduce costs.

For further information, please visit:

www.localityenergy.com.au



Jemena calls for renewable gas certification to unlock Australia’s bioenergy potential

Leading energy infrastructure company, Jemena, has called for a national approach to green accreditation for renewable gases, such as biomethane and hydrogen, as part of its recent submission to the Australian Renewable Energy Agency (ARENA) *Bioenergy Roadmap*. Jemena claims that a certification system would enable customers to purchase verified and accredited zero emission gas as is currently the case for renewable electricity.

Jemena Executive General Manager, Gas Distribution, Dr Jennifer Purdie said as Australia looks to recover from the economic impacts of COVID-19, renewable gas could unlock regional jobs, business growth, enhance energy security, and be injected into the network with no impact to customer appliances.

“Australia has the capacity to be a world leader in zero emission gas. Several green hydrogen gas trials have commenced for domestic and international markets across the nation, including our own *Western Sydney Green Gas* project, in which the first electrolyser in New South Wales will be installed later this year. This technology utilises solar and wind power to create carbon neutral hydrogen gas, which is stored in the Jemena Gas Network, making it accessible to homes, business and the vehicle industry,” said Dr Purdie.

“In addition, we also have the capacity to unlock our bioenergy sector. Well established in Europe, bioenergy is a proven ‘here and now’ fuel source and can help Australia address the energy trilemma of affordability, reliability and sustainability.

“Renewable gases have a huge role to play in lowering emissions in sectors such as heavy transport, manufacturing and our gas networks.”

TIME TO UNLOCK AUSTRALIA’S BIOENERGY POTENTIAL

Bioenergy is derived from plants, animals, and their by-products and residues such as agriculture, farming, human and forestry wastes and remains. Converted into

biomethane, it can provide reliable and responsive carbon neutral energy for homes and businesses.

According to Bioenergy Australia, the total contribution of the biofuels industry to the US economy in 2016 was \$459 billion, employing 4.65 million direct and indirect workers. It’s estimated the Australian biofuels industry could provide 250,000 jobs, mostly in regional areas.

“In addition to employment opportunities, there are clear benefits for customers who want green energy. We estimate that there are approximately 30 petajoules of biomethane gas in close proximity to the Jemena Gas Network alone, enough to supply all current New South Wales natural gas residential customers and support the NSW Government’s drive towards zero emissions by 2050,” Dr Purdie said.

BIOENERGY ROADMAP

Jemena’s submission to ARENA’s Bioenergy Roadmap has been delivered, along with a letter of support signed by members of the sector as well as industry associations and groups, representing thousands of large and small businesses across Australia.

“Australia is uniquely placed to benefit from the renewable gas industry. The energy industry can work collaboratively with the bioenergy and hydrogen sectors to store natural gas, and renewably-generated gases in existing infrastructure. The Jemena Gas Network for example, can act like a giant battery and bring renewable gas to more than 1.4 million customers for cooking, heating and hot water.

“In our submission, we have committed to leading the development of a certification system to recognise biomethane as a renewable and net zero emission energy source. Achieving this will kick start projects that can go to market quickly, which will be important as we get back on our feet following the Coronavirus pandemic,” Dr Purdie said.

For more about Jemena’s *Western Sydney Green Gas* project, please visit: www.jemena.com.au



Solar farm construction method to reduce dust and save 'bonsai forest'

by Andrew Spence

A new technique to preserve native vegetation and reduce dust is being rolled out during construction of a solar farm in South Australia.

The method, developed by South Australian company *Succession Ecology*, involves the use of a roller to flatten vegetation ahead of panel installation rather than tearing up the landscape with a grader. It will be used at the 280MW Cultana Solar Farm north of Whyalla, when construction begins later this year following a successful trial of the method at the 1100-hectare site in December 2018.

Solar farms in arid and semi-arid zones are notorious for generating large amounts of dust, which not only plague local communities but also lead to the reduced performance of panels and require large amounts of water and other suppressants to control.

Succession Ecology's Glenn Christie came up with the idea after leading a project to revegetate the former ash dam at a decommissioned coal-fired power station at Port Augusta in South Australia in 2017 and 2018. He said the use of a smooth 20-tonne roller in the solar farm trial flattened the plants and the ground without breaking the surface.

"It was a bit of lightbulb moment – it's not just about revegetation and biodiversity, there can be really practical outcomes so applying it to a solar farm made sense," Christie said.

"These plants such as saltbush and bluebush have such deep root systems that reach down metres and metres because they have to be able to withstand five-year droughts.

"The roller sort of stunts the plant and puts it into a kind of sleep mode for three to six months and that's the time that you need to have all of the construction happening."

The Cultana Solar Farm site is on an 1100ha site 10km to the north of the township of Whyalla, which is about 350km northwest of the South Australian capital Adelaide.

Although some Western Myall trees would have to be cleared from the site, Christie described the site as a "bonsai forest" because the majority of the native vegetation were "knee-highs" and "ankle-biters".

He said flattening the ground with a roller instead of a grader was slightly cheaper and also reduced the need for water trucks to suppress dust and dump trucks to remove debris.

"Then there are the cost savings when it's operating – if you've got less dust you've got more production from the panels, less cleaning costs," Christie said.

"And if the bonsai forest works as we expect, it will lead to lower temperatures on the ground, which means the panels themselves will be cooler and will produce better."

"We really want to nail down the economics and then we can roll it out in any arid or semi-arid area in Australia or elsewhere in the world," he added.

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Australia after Corona:

Investing in water infrastructure is an investment in our long-term future

by Warwick Lorenz, Managing Director, Australian Pump Industries



The story is contributed by Warwick Lorenz, Managing Director of Australian Pump Industries. Lorenz is a veteran of the water industry having been drafted out of an advertising and journalist's career at what was the old Tutt Bryant Group into managing its water pump manufacturing division, Pacific Pump. He has lived through the destruction of Australia's industrial manufacturing sector, experienced the challenges of the "recession we had to have" and tasted the temporary delights of the Australian mining boom. He has worked with farmers, miners, the construction industry, defence, marine and food processing. Warwick is passionate about Australian manufacturing, agriculture and industry and is a long-time advocate for major water reform.

We Australians have a right to feel confident about a speedy recovery from the Coronavirus. It's not just a health issue but to many Australians, a devastating economic one as well!

The fact that our population is only 25 million people in a huge island continent is a blessing we rarely appreciate. That low population compared to economic wealth, enables us to isolate, co-operate and communicate with one another in a totally positive way, given the right leadership.

One of the major issues we've seen to come out of this, is what appears to be normally squabbling leaders showing a remarkable co-operation under Scott Morrison's leadership. The fact that the PM and parliament were able to swiftly move to incorporate State Premiers of both political persuasions into a Federal Cabinet - working together in a combined effort to defeat the virus - is inspiring and should be a lesson to all of us.

It shows that our leaders can rise to the occasion in extreme circumstances.



Frankly, we haven't seen anything like this level of co-operation since the second world war!

BEATING CORONA

We can be confident that Australia will probably come out of this earlier, and more successfully, than the greater majority of other countries. Our isolation from the rest of the world is a gift. If you are going to be isolated anywhere, being in Australia, "an earthly paradise", is a very comfortable place to be.

What's more, the greater majority of people are being nice to each other! That's something we don't normally even think about. The few isolated cases of panic, rudeness, fear and anxiety are normal and can be overlooked because of the reality of the miniscule percentage of Australians that were involved.

We will beat Corona. We should be confident. We should not deviate from our plans and we should follow the instructions of the health experts who advise our government policies.

SO WHAT ABOUT THE ECONOMICS?

Now we get to the serious problem. There are businesses that have closed down that may never re-open. Hardest hit are the service industries. We have learned that we can make our own coffee at home. The population is experimenting with home cooking, but we know that once we are open for business again, in all those areas, many of us will swing back to our "habits of convenience".

The government won't make a surplus this year, maybe not next year, or even for five years in terms of their targets, but I believe that they do know what they're doing economically and the elephant in

the room is the question of our overseas customers.

We Australians have discovered during the corona crisis, that we don't manufacture as much product as we used to. Not just machinery, but also food - including processed vegetables and seafood, much of which is to some extent imported. Our supermarkets are full of imported products.

Let's not even think about automobiles and the million odd cars we buy every year which are now imports.

When it comes to imports, we're junkies... and we pay for it with raw materials from the mining industry and primary product from our farmers. 73% of all products exported from Australia come out of the mining and resource industry. That is \$300 billion per year on average.

We all know that China is our biggest customer. But if they ever stop buying, we have a real economic problem. Will they stop? We hope not... and to be honest, it's highly unlikely considering the important role our raw materials play in their economy!

I am in no doubt that as the world bounces back (which it will do) we are in for a recovery as a flow-on from that.

Meanwhile, our government is doing everything it can to pump money into the economy to minimise the shock.

GOVERNMENT PUMPS INFRASTRUCTURE

Considering that all three layers of government together, collect around \$550B in tax every year, it would not be unreasonable for us to expect that the infrastructure projects that we undertake now aren't just urban transit jobs. We would rather a long-term view of the development of the country. If anything, the Coronavirus has made us realise that

Australia's isolation provides both benefits and opportunities.

The last forty years have seen much of Rural and Regional Australia in dire straits. The millennial drought was an unparalleled disaster for thousands of farmers, who suffered, largely in silence, "waiting for rain".

What a hardy, patient, and largely silent sector of the population our farmers are. I believe that if the National Farmers Federation were doing their job, they would have harnessed the political power of the agricultural community and done something about a massive program to demand water security action. Unfortunately, the leadership wasn't there and the opportunity presented by the drought lost.

Alarming, some of our Premiers have reportedly made comments along the lines of *"...building dams doesn't make it rain"*. It's hard to believe someone actually said that but, that's the level of understanding you get from some urban politicians. Can we do more? Considering we haven't done anything for the last 30 or 50 years, the answer is obviously a resounding ...YES!

WATER IS LIFE

The benefits of a truly effective Regional Water Program must extend beyond minor short-term funding to Shire Councils so they can put more bores down. We need to expand our focus beyond the short-term and attempt to solve the issue on a semi-permanent, or even hopefully a permanent basis.

It takes vision and it takes money... but most of all, *it takes the will to do it!*

The general feeling in the bush is that nobody in parliament actually cares enough to really do anything to fight for regional water security. Sadly, the majority of farmers are fatalistic and to a large extent, accept the lack of water security as 'their lot'.

Sadly, the six years of the most recent drought - as with the droughts before it, and no doubt, the droughts to come - also took a tragic and largely unreported toll on human life, with countless suicides by farmers who simply 'couldn't take any more'. Tragically, for so many on the land, the heartbreak of the drought is just dangerous and potentially deadly as the Covid-19 virus.



WAR CABINET ON WATER SECURITY

When it comes to the lack of action on water security (e.g. why dams aren't being / can't be built; challenges with managing river flows; seemingly endless issues with water allowances for irrigation, industry and/or consumption; and problems with the water trading scheme), the default position for politicians is to blame a lack of co-operation between the states and the federal government.

LET'S FIX THAT!

We can use the lessons learnt from the Covid-19 National Cabinet and apply them to 'National Water Security' – not just for the major capitals, but for the entire country.

The lessons of the drought are dramatic. As are the lessons we should have learned from the recent “fire season from hell” and Covid-19. Put simply, combined government action works. The Coronavirus issue continues to show us that on a daily basis. When all levels of government and all sides of the political spectrum put self-interest aside and work together, honestly and sincerely and for the ‘genuine good of the Nation’ we, as a country, can achieve anything.

With that in mind, my question for our Prime Minister is simply this:

Why don't we have a war cabinet on water security and take this on as a national visionary project?

We can update Bradfield's plan from 1933, to bring water from the northern rivers into the inland and provide that

security. Sadly, since that document was originally published some 87 years ago, there have been numerous studies – many costing millions of dollars and funded by the taxpayers – that went absolutely nowhere.

Here's a list of those documents that led us into a kind of paralysis on getting these things done:

- Australian Government Productivity Commission. 2017, National Water Reform, **“Productivity Commission Inquiry Report, Overview & Recommendations”**
- Climate Council of Australia Limited, 2018, **“Deluge and Drought: Australia's Water Security in a Changing Climate”**
- **Draft Great Artesian Basin Strategic Management Plan 2018**
- **Murray-Darling Basin Royal Commission Report, 2019**

WHAT OUR LEADERS SAY

Correspondence with key federal parliamentarians who are believers in water security for the inland, has resulted in some encouraging paragraphs as quoted below:

“The National Water Infrastructure Development Fund is providing \$59.5 million for 89 studies around the country to assess available water resources and the feasibility of new dams and pipelines.”

David Littleproud, Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management 6 July, 2018.

“Australian farmers are enduring some of the toughest conditions in recent history, and I appreciate your work and advocacy to support them. The Commonwealth Government has a comprehensive plan that includes our \$3.9 billion investment in the Future Drought Fund which will grow to \$5 billion over 10 years.”

Hon Ben Morton, Assistant Minister to the Prime Minister and Cabinet. 27th August, 2019.

“The Rookwood Weir project is also aimed at stimulating expansion of existing agricultural operation, increasing high value agricultural and horticultural investments, as well as bolstering the water security of industrial and urban customers in the Rockhampton and Gladstone communities.”

Simon Zanatta, Chief of Staff, for Hon Dr Anthony Lynham, Minister for Natural Resources, Mines and Energy, 13th September, 2019

“The National Water Grid Authority will lead a robust and science based assessment of Australia's water resources to identify real opportunities where new water infrastructure can be built. It will look to harvest unallocated water storage and supply infrastructure.”

Hon Michael McCormack, Deputy Prime Minister, 23 September 2019

“Through the National Water Grid Authority, the government will work closely with state and territory governments to build a National Water Grid. State and territory governments are responsible to bring forward new proposals to the Authority and are primarily responsible to regulate, plan, allocate and manage water infrastructure and resources.”

Hon David Littleproud, Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management. 25 November, 2019.

You can see there does appear to be a degree of willingness there but, there is also a degree of fatalistic acceptance that:

A. Some in parliament are firmly opposed to the construction of dams or any alterations to natural waterways regardless of the benefits;

B. Some believe that the capital cost

is too high and we can't justify the investment; and
C. It's simply too hard.

WHAT ABOUT THE \$30 BILLION 100 DAMS PROJECT?

In early 2013, then leader of the opposition, Tony Abbott touted a plan to build 100 dams that would hopefully drought proof the inland and provide water security for a huge part of the country. It was a plan that, perhaps not surprisingly given the generally 'turbulent' nature of politics at the time, never got off the ground following his election.

Now, regardless of politics and/or opinions in relation to our former Prime Minister Abbott, I believe this plan is worth another look.

In short, the project encompassed the construction of 100 dams across the country as part of a huge flood prevention, fuel power station and "food bowl" irrigation program. This inspiring and dramatic scheme included a \$500 million plan to raise the Warragamba Dam, as well as new dams for the Hunter Valley and along the Lachlan River in NSW. Part of the proposal was also to include piping water 1,500 kilometres from the Kimberleys to Perth so that our sandgroper friends never have to be concerned about water restrictions again.



In a forward document published in the lead up to the 2013 federal election, the former Shadow Minister for Finance, Andrew Robb, reportedly wrote,

"The Coalition Government will not support the construction of dams for the simple task of building them. However, it will back projects that bring demonstratable community benefits."

He also commented that many opportunities to pursue projects that would enhance water security, mitigate floods, provide hydro-power and most importantly grow the prosperity of regional Australia have been missed by previous governments.

"Halleluiah!" I thought.

Unfortunately, Andrew is no longer in Parliament but, even Greg Hunt who prior to the 2013 election was Shadow Minister for Climate Change, Environment and Urban Water Environmental suggested at the time that \$30 billion that would get it done. He said projects would be approved and implemented if the Liberal Nationals won power.

The claim also was that this would double Australia's food production capability, something we obviously need to do if we are going to break our dependence on the mining industry!

SO, WHERE ARE THE DAMS?

These documents quoted above go back more than seven years and still, we haven't really moved - apart from begrudging acceptance by the Queensland State Government to finally get moving on the Rookwood Weir in Rockhampton. That dam alone will generate 2,000 additional jobs in Queensland and is calculated to deliver a billion dollars extra in agricultural income for the area per annum.

SO, WHAT'S THE HOLD UP?

It seems so obvious that the only thing that should hold us back from having WATER SECURITY in this country is money or know-how.

We in the business know the equipment capability of the construction industry in Australia. We know that we are world class and that we can build anything. Turn us loose on a pyramid that took Pharaoh Cheops 20 years to build and we could do it in a heartbeat.





So, what's the problem? It isn't the capability, or the materials. Talk to Boral, Holcim or Hanson or even Mr Wagner in Toowoomba, and they'll tell you they will find and manufacture enough concrete to do whatever you want done! These are innovative, progressive and dynamic organisations in a business that produced up to 30 million cubic metres of concrete last year. My bet is they could double their capacity if they were given the opportunity.

So, it's not material and it's not machinery, it's not know-how, it's not money!

Surely we could spare a paltry \$30 billion to drought-proof the country? When you consider the cost of even one year of drought, \$30 billion truly does become a 'paltry' sum. Imagine that, with \$550 billion in taxation, \$30 billion to provide WATER SECURITY that will be the foundation of the country's wealth, development and our children's and grandchildren's future for the next 50 to 100 years!

Unfortunately, when these questions are put to the majority of politicians, the response is still one of 'competing priorities' and, more often than not, the time it will take to get approvals and State Government co-operation.

Interestingly, while that 'lack of cooperation between governments' may have worked as a functional excuse in the past, our recent experiences with the major bushfires (where governments are successfully working together to bolster and share firefighting and recovery resources) and, of course, our ongoing experiences with Covid-19 (which has seen the establishment and outstandingly successful operation of a 'National Cabinet') have proved once and for all what can be achieved if the willingness and demand are there!

Put simply, there is NO EXCUSE not to provide nationwide, long-term water security.

SO WHAT CAN WE DO?

To quote our American cousins, "write to your Congressman". Our politicians react to media attention and it's media that influences public opinion. And while there always seems to be a good supply of 'complainers and nay-sayers' occupying the airwaves with reasons why we shouldn't build dams, I believe it's time that the benefits of a nation-building project such as this gets the exposure it deserves. I feel certain that it can garner wide-spread support – after

all, a truly national WATER SECURITY plan can, and will, benefit all.

None would question that Covid-19 has wreaked havoc on our economy. History has shown, time and again, that one of the most effective methods of guiding an economy out of a major downturn, is to invest in worthwhile, 'nation-building' infrastructure. Money needs to be spent, but it needs to be spent wisely. It needs to be used for something productive and visionary.

We've got the money, we know where it comes from, we know where it goes to! We need to inform ourselves about what can be done to drought-proof the country.

As the freest and most affluent people on the planet, I believe we have the opportunity to secure the long-term future of the entire country... and it's an opportunity we simply must take.

Send us your comments. Argue with us, debate it. If we are wrong, we want to know where we are wrong, as there must be some flaw in all of the arguments above or else, surely somebody would have provided WATER SECURITY by now!

Please feel free to email me at: wlorenz@aussiepumps.com.au

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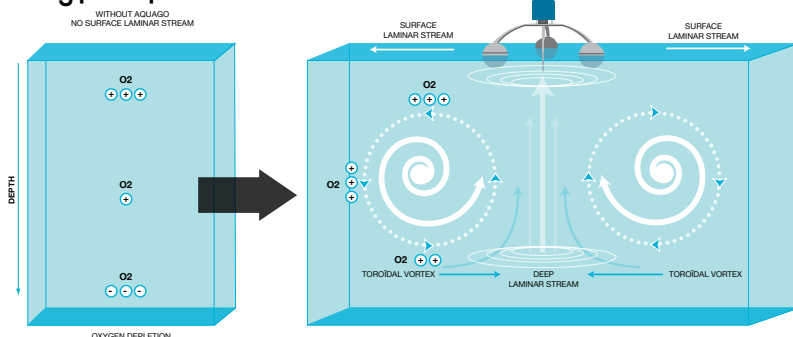
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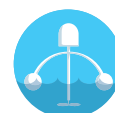
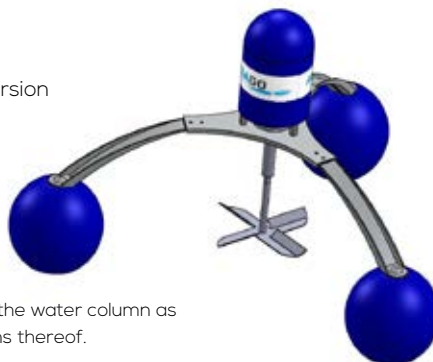
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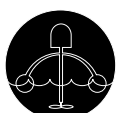


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MRWA approves Geopress K to help protect valuable water assets



Viega's Geopress K underground piping system has been approved by Melbourne Retail Water Agencies (MRWA) to be used in the management and protection of the city's major water resources. The announcement comes after a successful field trial with a Victorian Government owned retail water corporation that supplies around 100 billion litres of drinking water each year to customers.

Engineers at City West Water, which provides drinking water, sewerage, trade waste and recycled water services in Melbourne's central business district, inner and western suburbs, describe the revolutionary system as a game changing product.

"I see Geopress K as being a major player in the market and changing the way works are done," says Programmed Water Operations Manager Dylan Thomas. (Programmed provides maintenance services for City West Water across Melbourne's West.)

Manufactured from first-grade Polymer materials and non-ferrous components, Geopress K is a more efficient and cost-effective method for SDR11 HDPE pipes for potable water and recycled water applications.



Geopress K Tapping Valve and fittings. Image courtesy Viega Australia



ABOVE: Viega Propress being installed.
Image courtesy Viega Australia

BELOW: Viega Propress and Viega Geopress K being used in the same application.
Image courtesy Viega Australia



“Any leak obviously has a water loss factor as well as a money factor to it, which is compounded when you have multiple leaks on the one system,” says Thomas. “So, any opportunity where you can avoid going back to, is definitely an advantage.”

QUICK AND EASY INSTALLATION OF UNDERGROUND SUPPLY LINES

What makes Geopress K so significant to the gas and utilities, plumbing, engineering and civil engineering sectors is its revolutionary tapping valve, which combines a tapping band and isolation valve within the one device.

“There’s nothing else like it in the market,” says Glenn Lewindon, Civil & Utilities Account Manager at Viega.

“Live tapping of the main supply line takes only a few minutes. And, due to the integrated miller for PE pipes, drilling can be carried out without having to use an external drilling machine – or disconnecting water from the main line.”

Viega’s Geopress K system is free of elastomers and its Glass Fibre-reinforced, high-strength polymer connectors feature internal sealing, which allows pipes with damaged surfaces to be permanently pressed without preparation. Supply lines can be quickly and easily installed.

“These features make our connectors the perfect choice for harsh underground conditions,” Mr Lewindon added. “The system also means no hot works, generators or pipe preparation are required. It offers the reliability of permanent-press connection technology with internal sealing that’s robust and extremely economical. Put simply, in our opinion, it’s the most reliable underground supply line solution.”

For further information on Viega Geopress K, please visit: www.viega.com.au

“The only options we had to connect poly pipes prior to Geopress K were either welding techniques or mechanical fittings, and both can be problematic,” says Thomas.

“Welding takes specialised equipment and is not maintenance-friendly – your only option is to cut out and replace damaged pieces – while mechanical systems don’t react well to movement, so when atmospheric conditions cause pipes to shrink and expand, the fittings can move and fail.”

PROTECTING VALUABLE WATER ASSETS

Thomas says Geopress K’s installation credentials were appealing because it “... looked easy to install and offered more effective solutions for the long-term”.

“Viega’s products are very user-friendly and it’s especially comforting knowing that they have been through rigorous testing processes,” he explains. “We were impressed to learn during our training sessions just how much quality control the products go through at Viega.”

With billions of litres of water lost each year to due ill-fitting, leaking pipes, Thomas says Viega’s Geopress K not only provides peace of mind but also saves money.

ABOUT VIEGA

Worldwide, more than 4,000 people are employed by the Viega Group, which is among the leading manufacturers of installation technology. Viega is working to continue its long-term success at nine locations.

The family-owned business was founded in Attendorf, Germany, in 1899. In the 1960s, the course was set for the internationalisation of the group. Viega brand products are used all over the world.

While production is concentrated at its four main sites in Germany, the McPherson/USA group manufactures solutions specially designed for the North American market. Installation technology as a core skill drives growth forward. Pre-wall and drainage technology belong to the product range alongside piping systems. The range consists of approximately 17,000 articles, which are used nearly everywhere: in building services installations, in utilities or in industrial plant construction and shipbuilding.

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New Enerpac E-Pulse torque wrench pump ideal for repetitive fastening jobs

A global leader in compact and portable high pressure hydraulics, Enerpac is introducing to Australia, New Zealand PNG its latest E-Pulse Torque Wrench Pump engineered for safe, rapid and reliable high volume fastening applications.

The Enerpac EP3504TB-M .63 kW (.85hp) Electric Hydraulic Torque Wrench Pump – which is part of a broader E-Pulse family, available with five valve options – is designed for ergonomic, portable and safe use where weight and power are critical factors.

The pumps feature new ‘Smart Controls’ that enable their motors to maintain constant power and provide higher flow than traditional .75 kW (one-half horsepower) pumps. An adjustable speed control provides extraordinary precision as needed, says Enerpac National Sales Manager Darryl Lange, while the E-Pulse pumps also feature a new interactive pendant that delivers visual and tactile feedback. The pumps’ durable aluminium housings, integrated heat exchangers and highly efficient permanent magnet motors minimise heat buildup in the toughest environments. The interactive pendant provides the operator a number of usage options for optimal efficiency.

“The E-Pulse Torque Wrench Pump – with 3.208 litre (.8 US gallon) and NEMA 5-15 plug - is the pinnacle of bolting equipment. The variable speed knob allows the user to adjust the speed to their application so an operator can precisely control large and small hydraulic tools to complete work accurately and safely,” Darryl Lange said.

“The E-Pulse Hydraulic Pump is the only pump available on the market that allows an operator to vary the speed between 25% and 100% of full speed,” he said.

Features include:

- Broad range of high performance through Smart Controls that enable the motor to maintain constant power across the pressure range

- 24V DC power regulator, which minimises effects of poor power supply
- Six-piston block design, which provides even oil flow for smooth operation of tools
- High-efficiency permanent magnet, direct-drive motor enables continuous use and long service life
- Built-in thermal protection. Integrated heat exchanger minimises heat buildup
- System components enclosed for protection
- IP sealing effectiveness rating: 54 on the Pump, 67 on the Pendant
- Safety and convenience-oriented pendant and cord management system



New Enerpac E-pulse torque wrench pumps are compatible with a wide range of fastening technologies.



Enerpac's state-of-the-art E-Pulse Torque Wrench Pump engineered for safe, rapid and reliable high volume fastening applications.



Using the Interactive Torque Wrench Pendant, users can set pressure and operate in manual or auto-cycle mode.

intelligent auto-cycle function enables press and release actuation to cycle wrench until final torque is achieved and will improve application completion speed.

- Draining oil is not required for pump element maintenance. Convenient oil fill port, oil level indicator and automatic breather

E-Pulse Hydraulic Electric Pumps have a smart, brushless DC motor and controller that varies the speed to maximise flow at any pressure. For bolting applications, the user can set pressure and operate in manual or auto-cycle mode. The use of the

"The E-Pulse Pump is the only hydraulic torque wrench pump on the market with intelligent auto-cycle functionality," Mr Lange said.

E-Pulse Pumps feature an innovative design constructed of lightweight materials such as an aluminium chassis and high efficiency components which deliver a durable system in a lightweight, compact package.



For the most challenging and repetitive industrial applications, Enerpac E-Pulse Pumps provide a leading power-to-weight ratio in a fast, yet portable pump.

"Through innovative design and advanced features, E-Pulse pumps are designed to drive higher levels of productivity and power to a number of hydraulic tools, including torque wrenches, cylinders, cutters, pullers, presses, punches, spreaders and benders. An E-Pulse pump can serve as the heart to any hydraulic system," he added.

Like all Enerpac products, the E-Pulse range is backed in the field by long-established and extensive Enerpac sales and engineering support networks that ensure optimum safety and uptime of Enerpac equipment wherever it is used.

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