

THE AUSTRALIAN MINING REVIEW

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5,500 jobs for QLD with 2 prescribed projects **P04**



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MINE CLOSURES

THE \$4 BILLION ANNUAL REMEDIATION MARKET

COVERAGE BEGINS **P23**

(Image source: Alcoa). A rehabilitated area near Alcoa's Huntly bauxite mine in WA's southwest that was first logged for timber, prior to Alcoa commencing activity in the area. It was then mined for bauxite. The area has been landscaped and planted with the Northern Jarrah Forest species.

Analysis by CSIRO projects nearly 240 mines will reach closure by 2040, estimating annual spend of between \$4b - \$8b on mine closure and remediation activities.

These closures highlight the growing demand for specialist solutions and technologies capable of optimising environmental, social and governance (ESG) outcomes post-mining.

In this first of a six-part series on ESG, the *Australian Mining Review* speaks with CSIRO and CRC TiME about sustainable and innovative mine closure solutions that go beyond land rehabilitation and into asset repurposing and waste recovery.

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Contents



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The winner of our Sqwincher giveaway is **Karl from Red Hill Minerals**.

Red Hill Minerals is a junior-mid tier explorer based in Perth, WA, with iron ore assets in the Pilbara.

Congratulations Karl!

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03

NEWS

News	03
Explorers On The Move	16
Mining Lifestyle	18
Equipment	20
ESG	22



49

INDUSTRY FOCUS

Companies Gearing Up	49
Conveyors & Belting Solutions	66
Diesel Engineering Solutions	75
Workshop Safety	77
Water in Mining	78
Automation Solutions	83
Heavy Haulage Solutions	84
Tyre Equipment & Solutions	88
Electrical Contractors	90
Pipes & Pipelines	91
Weather Monitoring	94
2nd Hand Equipment	95
Industrial Tool & Toolmakers	96
Remote Power Generators	98
Proximity Detectors	100
Payload Monitoring	102
Industrial Recycling	104
Fluid Handling Flow Control	105
Shotcreting	106
Facilities Management	108
Office & Business Furniture	110
Courses in Training & Mining	112
Condition Monitoring	114



23

FEATURES

ESG Introduction	23
ESG – Mine Closure Planning & Rehabilitation – CSIRO	24
ESG – Mine Closure Planning & Rehabilitation – CRC TiME	26
FMG Eliwana Mine	32
Yangibana Rare Earths	35
Rio Tinto Gudai-Darri Mine	38



116

TECHNICAL TALK

Pipes & Pipelines	116
Rockbreaking Solutions	120
Dewatering Solutions	122



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BACKING AUSTRALIAN RARE EARTHS AND LITHIUM PROJECTS TO THE TUNE OF \$1.7bn

The Federal Government has committed up to \$840m to deliver Australia's first combined and largest rare earths mine and refinery in the Northern Territory, which will be operated by Arafura Rare Earths (ASX: ARU).

Located 125km north of Alice Springs, the refinery at Arafura's Nolans project will create over 300 new jobs in the Territory – over 200 jobs during construction and over 125 full time jobs ongoing, including the company's 20% target for local indigenous employment.

The package consists of \$500m from the Critical Minerals Facility, \$115m from Export Finance Australia (EFA), \$200m from the Northern Australia Infrastructure Facility (NAIF) and \$30m from the Modern Manufacturing Initiative.

Prime Minister Anthony Albanese says this investment plays a vital role in securing Australia's place as a renewable energy superpower.

"This project is a major vote of confidence in the Northern Territory, which continues to punch above its weight in global trade," he said.

The Nolans project will pioneer rare earth separation technology in Australia, with the mine producing magnet feed rare earths (NdPr) and supplying about 4% of global demand.

Arafura Rare Earths chief executive Darryl Cuzzubbo says this investment demonstrates the company's capacity to play a leading role in the Federal Government's Critical Minerals Strategy.

"We'll be supplying the rare earths oxide which is referred to as NdPr [with its demand] expected to close to double by the end of this decade," he said.

"This will be the first NdPr mine to oxide processing plant in Australia."

The Federal Government recently expanded the Critical Minerals Facility and the NAIF to a combined \$11b.

Northern Territory Chief Minister Eva Lawler says there are record levels of investment into exploration.

"The mining and processing of critical minerals is a priority opportunity for the Territory to create more work opportunities for Territorians," she said.

Federal Resources and Northern Australia Minister Madeleine King says the nation's critical minerals are crucial to new low-emissions technologies.

"The combined funding from the Critical Minerals Facility and the NAIF will help Australia build downstream industries and support our goal to become a renewable energy superpower by 2030," she said.

"To meet our net zero targets we will need more mining, not less, to build the solar panels, batteries and wind farms we need to reduce emissions."

The Federal Government is also making a \$230m investment in Liontown Resources' (ASX: LTR) Kathleen Valley lithium project in WA, which is expected to create about 900 jobs during construction and 450 ongoing jobs during operations.

With \$110m from the Clean Energy Finance Corporation (CEFC) and \$120m from EFA, the Federal Government's investment aims to help the battery minerals producer secure the final stages of construction of the lithium project, north of Kalgoorlie in WA's Eastern Goldfields region.

The CEFC and EFA investments are part of a \$550m financing package from a group of Australian and international financial institutions.

Liontown Resources managing director and chief executive Tony Ottaviano says that "having this funding in place provides strong endorsement for our project and a platform of financial certainty from which to move forward".

"We are consequently well-positioned to deliver the remaining milestones to first production mid-year and ramp-up towards anticipated positive cashflows," he said.

At the end of CY23, the lithium project was more than 72% complete, with the commencement of underground mine development in November last year.

Liontown has secured substantial offtake agreements with Tesla, the Ford Motor Company and more.

The latest \$550m debt facility agreement comes from a syndicate of commercial lenders including Commonwealth Bank of Australia, National Australia Bank Limited and Societe Generale.

The company aims to create a pathway to downstream processing, with the proj-

ect potentially producing 500kt of spodumene concentrate every year.

It will be one of the world's lowest emissions hard rock lithium producers, powered by at least 60% renewable energy.

Prime Minister Albanese says Australia must build stronger partnerships with major international markets to compete on the world stage and become a renewable energy superpower.

"We have engaged with the United States Inflation Reduction Act and have doubled our investment in the Critical Minerals Facility," he said.

"We are already working closely with Germany on hydrogen production.

"Germany has recognised that Australia has some of the best natural conditions in the world to produce green hydrogen, and they have the technology to help us do it.

"At the ASEAN-Australia Special Summit, the leaders in our region reaffirmed their commitment to action on climate change.

"We announced the Southeast Asia Investment Financing Facility to drive two-way investment in areas like clean energy and infrastructure."

The Minerals Council of Australia chief executive Tania Constable has welcomed the Federal Government's announcement to underwrite support for the two critical minerals projects by Arafura Resources and Liontown Resources. **AMR**

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MORE THAN 5,500 JOBS AS QUEENSLAND FAST-TRACKS 2 TOWNSVILLE-MOUNT ISA PROJECTS

The Queensland Government has declared two major projects in the Townsville-Mount Isa Corridor, both with the potential for more than 5,500 jobs, as “prescribed projects”, allowing the State’s Coordinator-General to fast-track them with local governments and regulators.

Project Green Poly will create one of Australia’s first integrated mine-to-manufacturing polysilicon supply chains, with the \$7.8b investment expected to create 4,400 jobs around Townsville during construction and operation of a facility that will run for 30 years or more.

The Eva copper mine project near Mt Isa and Cloncurry will add a new stream of copper mining and smelting, boosting local supply for solar, wind and battery energy manufacturing.

The mine is expected to operate for at

least 15 years and generate up to 1,250 jobs in construction and operations and extend the life of local copper mining and smelting jobs.

Queensland State Development and Infrastructure Minister Grace Grace says the State is ready to be the home to renewables-linked mining, manufacturing and exporting.

“Project Green Poly will create the Queensland-based polysilicon supply chain the world needs to expand solar and battery energy generation,” she said.

“It will further boost the Townsville region as a renewable energy mining, processing and manufacturing hub.

“The Eva copper mine project plans to provide a new source of copper concentrate that has the potential to feed Mount Isa’s copper smelter.



The site of the Eva copper mine project in Queensland.

“Harmony Gold Mining Company already has key mining approvals for the project and my prescribed project declaration means the Office of the Coordinator-General can now provide additional assistance to coordinate remaining approvals.

“Priorities will include establishing a renewable energy source that can help run mining operations until the project connects to CopperString 2032.

“The project will support Mount Isa’s future, in line with our \$50m Mount Isa Transition Fund support package, announced in February 2024.

Harmony Gold Mining Company Limited chief executive Peter Steenkamp says the recognition of Eva’s distinct strategic importance and potential to contribute to the economic development of Queensland’s North West supports Harmony’s confidence in the project.

“The Eva copper project near Mount Isa, Queensland is transformational for Harmony as we transition into a global gold-copper producer,” he said.

“As one of the world’s largest gold producers, sustainability is embedded in our operating practices.

“Our people are our most important asset and this support from the Queensland Government will enable Harmony to continue creating long-term value for all its stakeholders, wherever we operate.”

Queensland Resources and Critical Minerals Minister Scott Stewart says there is a “bright future ahead for the North West Minerals Province and the broader Mount Isa region”. **AMR**

BELLEVUE GOLD PROJECT REOPENS AFTER 20-YEAR HIATUS



The Bellevue gold project has reopened after lying dormant for more than 20 years.

Bellevue Gold (ASX: BGL) has officially reopened its namesake gold project in WA after sitting dormant for more than 20 years.

The company expects to produce more than 1.8moz of gold over the initial 10-year mine life of the project and with a mineral resource of 3.1moz at 9.9g/t gold, the mine will be one of Australia’s highest-grade gold mines.

Bellevue Gold aims to be a net-zero emission site by 2026, with the lowest greenhouse gas intensity of any major Australian gold project. This will allow the company to market ‘green gold’, a product which has the potential to attract a price premium.

Wind and solar power are expected to provide up to 80% of the facility’s overall power needs.

The earliest operations at the Bellevue gold project date back to the early 1900s

with operations restarted in 1986 before closing in 1996 due to historically low gold prices. The project was inactive until 2017 when Bellevue Gold restarted exploration.

WA Mines and Petroleum Minister David Michael congratulated Bellevue Gold on the reopening of its project.

“Congratulations to Bellevue Gold on the opening of its remarkable gold mining project, which will deliver economic benefits to the Eastern Goldfields and jobs for local communities,” he said.

“I commend Bellevue Gold for working closely with the Tjiwarl Aboriginal Corporation to deliver mutually beneficial outcomes, and for committing to ongoing engagement.

“It is also encouraging to see the Bellevue gold project aim for net zero emissions as WA’s resources sector will play a key role in the State’s transition to a low carbon economy.” **AMR**

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COVALENT LITHIUM

OPENS MT HOLLAND LITHIUM MINE & CONCENTRATOR



(L-R) WA Mines and Petroleum Minister David Michael, Wesfarmers managing director Rob Scott, Sociedad Química y Minera de Chile chief executive Ricardo Ramos, WA Premier Roger Cook, WA Treasurer Rita Saffioti and Wesfarmers Chemicals, Energy and Fertilisers managing director Ian Hansen.

The WA Government has congratulated joint venture partners Covalent Lithium, Wesfarmers and Sociedad Química y Minera de Chile (SQM) on the successful opening of the Mt Holland lithium mine and concentrator project.

The Mt Holland lithium project consists of an open-cut mine and concentrator, located 110km southeast of Southern Cross in the Wheatbelt region, and a refinery currently being constructed in the Kwinana Industrial Area.

With an expected cost of \$2.6b, the project is supporting 1,000 jobs during construction and 350 jobs during operations.

Mt Holland will produce 380,000tpa of spodumene concentrate, which will be refined into 50,000t of battery-quality lithium hydroxide.

The Kwinana refinery is expected to deliver its first lithium hydroxide in early 2025.

Mt Holland mined its first ore in December 2022 and began crushing in May 2023. The concentrator was successfully commissioned in the second half of 2023 and is now in the ramp-up phase.

WA Treasurer Rita Saffioti says "our \$60m commitment to support the Moorine Rock to Mt Holland road upgrades has been

essential to getting this project off the ground".

"WA has hit a number of milestones as we progress towards becoming a global battery materials manufacturing hub, and this investment in lithium hydroxide will further support these earlier successes," she said.

"It's great to see the refinery set up in the Kwinana Industrial Area, which has excellent road, rail, port and energy connections."

WA Mines and Petroleum Minister David Michael says the State remains a globally significant battery and critical minerals processing hub.

"Lithium became WA's second most valuable mineral in 2022-23, with sales of \$20b and royalties of \$930m," he said.

"This impressive increase in production has seen WA consolidate its position as the largest global producer of lithium, a rank we have held since passing Chile in 2012."

Spodumene concentrate production is now underway, with the plant ramping up to nameplate production and on track to deliver 100,000t in FY24.

Once construction of the Covalent

refinery in Kwinana is complete and commissioned, Covalent Lithium will be a fully-integrated producer and supplier of premium, battery-grade lithium hydroxide for the global electric vehicle market.

Wesfarmers managing director Rob Scott says the lithium joint venture is one of Wesfarmers' key growth platforms.

"When we made our initial investment into Mt Holland four years ago, we saw an opportunity to enter the lithium market and leverage our expertise in chemical processing here in WA," he said. "It's pleasing to see the successful commissioning and ongoing ramp-up of spodumene production."

"We are continuing to advance studies to expand the Mt Holland mine and concentrator, and the next key milestone for Covalent is completing construction of the Kwinana refinery, which remains on track for late 2024."

SQM chief executive Ricardo Ramos says the successful commissioning of the concentrator is one step closer to realising Covalent's vision of enabling clean energy on a large scale.

"We are excited to see the project coming to fruition," he said.

"Covalent will produce enough battery-grade lithium hydroxide to enable the

manufacture of more than one million electric vehicles each year.

"We are confident that the high quality of the Mt Holland deposit and the joint venture's expertise in downstream processing will position Covalent to support global decarbonisation efforts." **AMR**

PROJECT SUMMARY

Mine life: about 50 years at current production rates

Production capacity when fully operational: lithium ore – 2mtpa; spodumene concentrate – 380,000tpa (on track to produce 100,000t by mid CY24); battery-grade lithium hydroxide – 50,000tpa

Key milestones: mining commenced: February 2022; concentrator construction completion: H2 CY23; first spodumene concentrate production: H2 CY23; refinery construction completion: late CY24; first lithium hydroxide product expected: H1 CY25

IMPROVING AUS-CHINA'S ECONOMIC EXPORT RELATIONSHIP



Bankwest Curtin Economics Centre senior research fellow Dr Daniel Kiely

Prime Minister Anthony Albanese and Federal Foreign Affairs Minister Penny Wong hosted trade talks with China Foreign Minister Wang Yi in Canberra on Wednesday, March 20 to discuss Australia's exports to China.

In what the Prime Minister called "a very constructive dialogue", the leaders discussed the improving economic relationship with China.

According to the December 2023 Resources and Energy Quarterly, iron ore exports are expected to bring in \$131b for Australia in FY24, up from \$124b last year, before declining to \$102b in FY25.

In FY23, about 81% of Australia's export earnings came from China. In CY22, China imported 71% of the global share of iron ore.

With this heavy reliance on China's import of Australia's iron ore, Bankwest Curtin Economics Centre senior research fellow Dr Daniel Kiely says Australia must diversify its iron ore trade.

"Given the volatility in iron ore and mineral prices, Australia needs to diversify markets, products and services," he said.

"It's naive to think China would not look to do likewise by diversifying its iron ore suppliers.

"Countries like China are understandably looking to make sure they have secure supply of key products, including critical minerals and iron ore – and they are look-

ing to diversify their supply of these products."

Australia's iron ore grade, or hematite ore, also known as direct shipping ore (DSO), averages 56-62%, with competitors such as Brazil and Guinea having higher-grade iron ores of about 65% iron.

Fortescue Metals chief executive Dino Otranto says the company is well-placed to supply iron ore to global markets, especially in Asia, for decades to come.

"As a low-cost iron ore producer, we continue to see healthy demand from our customers for our products, with our second highest first half shipments in H1 FY24.

"We expect China to remain a very important market for us, with a natural synergy between Fortescue's iron ore supply and the raw material needs of China's steel industry.

"We see Fortescue as well placed to participate in the future growth of the world's steel industry, particularly in Southeast Asia, India and elsewhere.

"Through Iron Bridge and our project in Gabon, we are diversifying and pursuing new market opportunities across the world, including into Europe."

China's investment into Australia is worth about \$85b, which is about 2% of overall investment into the country, according to Dr Kiely.

"We need to look at tapping into and maximising the emerging opportunities to include green products and decarbonisation agenda – now, and beyond the next decade," he said.

"Australia needs to look for diversification downstream to remove ourselves, to some extent, from the risk and volatility of mineral prices, through activities such as processing, chemical processing and manufacturing."

The Federal Government's Critical Minerals Strategy 2023-2030 aims to grow Australia's critical minerals sector and expand downstream processing in the country.

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FENIX RESOURCES

SECURES \$70M HAULAGE AND LOGISTICS CONTRACTS

(Image source: Fenix Resources) MV Ballard — Twin Peaks maiden shipment from Fenix's Geraldton Port facilities.

Fenix Resources (ASX: FEX), via its wholly owned subsidiaries, has been appointed haulage and logistics services provider for Gold Valley's mid-west iron ore operations.

Over the next three years, Fenix will provide transport and logistics for 3mt of iron ore product, generating more than \$70m in revenue for the company.

These agreements comprise a haulage and logistics agreement and a port

services agreement to cover the transportation and handling of Gold Valley's iron ore products from a new inland port.

Under the logistics agreement, Fenix-Newhaul will transport 3mt of iron ore from Gold Valley's mid-west operations, which will then be delivered by Gold Valley to Fenix's inland port terminal at Ruvidini rail siding and hauled by Fenix-Newhaul to Fenix's facilities at Geraldtonport.

As part of the port services agreement, Fenix Port Services will provide comprehensive services required for handling and storage of Gold Valley's ore from delivery to Geraldton port up to the point the ore has been loaded onto export vessels.

Fenix executive chairman John Welborn commented on the contracts.

"Gold Valley has recently acquired one of the largest iron ore projects in the mid-

west and represents a perfect logistics partner for Fenix," he said.

"The partnership has the potential to provide long term benefits to both Fenix and Gold Valley as both companies promote economic growth in the mid-west.

"The agreements with Gold Valley provide an immediate boost to Fenix's revenues and are a pleasing expansion of our third-party logistics business." **AMR**

FIRST TWIN PEAKS SHIPMENT COMPLETED

Fenix has also hauled, loaded and shipped the first shipment of iron ore from the Twin Peaks direct shipping iron ore project in WA.

This first shipment contained 59,275t of +60% iron "Fenix TP lump" direct shipping ore and product from Twin Peaks will boost Fenix's iron ore production and revenues.

In November 2023, Fenix executed an ore purchase agreement with 10M, granting it the right to purchase 500kt of high-grade ore from Twin Peaks.

Under the agreement, 10M is responsible for all mining and processing activities up until the ore is loaded onto Fenix haul trucks at the mine site stockpile.

Fenix will assume title and ownership of the ore upon collection at the mine gate for consideration to 10M of a fixed \$40/wmt mine gate payment.

Fenix is also responsible for all haulage, storage, loading and marketing of the iron ore, retaining a fixed amount of \$60pwmt to cover transport, port logistics, marketing and sales expenses incurred.

Mr Welborn says the company's partnership with 10M has supported their transition from explorer to producer.

"Fenix's unique integrated mining, logistics and port services businesses provides an exciting platform for growth for both the company and the many projects in the region seeking to advance production," he said.

Mining is continuing at Twin Peaks and Fenix expects to complete the haulage, storing, loading, shipment and marketing of the 500kt of Twin Peaks iron ore during 2024.

MINERAL RESOURCES TO DEVELOP LITHIUM PROCESSING HUB

Mineral Resources (ASX: MIN) will acquire the Lake Johnston nickel concentrator plant and tenure and turn it into a lithium processing hub.

Owned by Poseidon Nickel (ASX: POS), Lake Johnston lies 185km southwest of Kalgoorlie in WA, covers an area of 86km² and comprises of one exploration licence and 10 mining leases.

To acquire Lake Johnston, Mineral Resources will pay \$1m upon execution of a binding heads of agreement with

Poseidon, \$6.5m on completion of the sale and purchase agreement and \$7.4m 12 months post completion.

Lake Johnston has front-end capacity of 1.5mtpa and is capable of being converted to treat lithium ores, including dense media separation fines.

The asset is licenced to operate to 2041 and has an active groundwater extraction licence. On-site infrastructure includes an airstrip, 200-person camp, electrical infrastructure, workshops and laboratories.

Studies by Mineral Resources indicated repurposing a brownfields site would reduce the approvals timelines by two years compared to a greenfields development.

Mineral Resources managing director Chris Ellison said this is an exciting opportunity for the company.

"This is an exciting opportunity to develop MinRes' third lithium processing hub in the Goldfields and the first to include flotation capacity to treat fines," he said.



Mineral Resources is on track to develop its third lithium processing hub.

"We intend to bring our expertise in spodumene production to Lake Johnston, which has the potential to service projects throughout the world's most prospective region for lithium."

The transaction is conditional upon the completion of legal due diligence, the assignment of third-party agreements and consent for the transfer of all the rights and obligations for the tenements. **AMR**

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FORTESCUE AND MAGMATIC RESOURCES PARTNER UP FOR MYALL PROJECT

Aerial view of mining quarry.

Magmatic Resources (ASX: MAG) and FMG Resources — a subsidiary of Fortescue (ASX: FMG) — have executed farm-in and joint venture agreement at the Myall gold-copper project.

Located in central NSW, the project comprises of a continuous 244sqm tenement which covers the northern extension of the Junee-Narromine volcanic belt.

It hosts significant porphyry-associated copper-gold mineralisation and has a mineral resource estimate of 110mt at 0.27% copper, 0.07g/t gold and 0.8g/t silver.

Fortescue can earn an initial 51% interest in the Myall project by spending \$6m in exploration across a four-year period. FMG can then earn an additional 24% interest (for a total interest of 75%) by spending an extra \$8m in exploration over a further two years.

During the initial earn-in period, Magmatic — via its wholly-owned subsidiary MOD — will operate and undertake all exploration activities. Once FMG earns a 51% interest, it will solely fund and manage exploration activities.

Magmatic executive chairman David Richardson says the company is excited to

partner with Fortescue.

“We are excited to joint venture and partner with Fortescue to advance our exploration efforts across the Myall project area,” he said.

“Myall has many of the signatures of a tier one copper-gold deposit and Magmatic has recognised the need to partner with a major to further advance the project following the maiden resource.”

Additionally, Fortescue will make a strategic investment and subscribe for 75,946,151 Magmatic shares to hold a 19.9% stake.

Fortescue has the right to appoint one nominee director to Magmatic’s board and if its interest increases to above 20%, the company has the right to appoint an additional nominee director to the board.

“Fortescue’s cornerstone investment in MAG will allow the company to simultaneously advance our other two projects at Wellington North and Parkes which are strategically located near Alkane Resources’ Boda-Kaiser deposits and Tomingley gold operations respectively,” Mr Richardson said. **AMR**

SOUTH AUSTRALIAN MINING EXPORTS INCREASED TO OVER \$5B IN 2023

Mineral and petroleum exports in South Australia have increased by 14.3% to more than \$5b in 2023, according to figures from the Australian Bureau of Statistics (ABS).

Of the \$17.9b in exports recorded in 2023, the resources sector contributed \$5b, however, this doesn’t include an additional \$2b in confidential energy and mineral goods, mainly copper ores and uranium.

More than \$3b came from iron and steel, refined copper and lead — highlighting the significance of the energy and mining sectors driving South Australia’s export growth.

Furthermore, iron ore exports reached almost \$1.2b for the year.

South Australian Energy and Mining Minister Tom Koutsantonis commented on the exports.

“We are seeing the resources sector thrive as we focus on the global energy transition,” he said.

“Shifting towards exporting more value-added products, like refined copper, is the right direction for South Australia’s economy.

“Copper’s indispensability to electrification technologies makes it a critical mineral for global decarbonisation.

“Forecasts predicting a surge in global copper demand surpassing current supply capabilities presents a very big opportunity for South Australia.

“We host 70% of Australia’s copper resource.

“We’re in prime position to open up opportunities for growing our economy through our resource exports and assist



Mining exports in South Australia increased by 14.3% in 2023.

other countries as they transition to low carbon economies.”

The resources sector 2023 exploration spending was the highest since 2012 — when tens of millions of dollars were spent discovering the extent of the Carapateena and Prominent Hill copper mines.

Hosting 16.8bt of magnetite iron resources in the Northern Gawler, Southern Gawler and Braemar provinces it could be beneficial using hydrogen to extract the ore.

With the resources sector already a pillar of South Australia’s economy, exporting a green product would be game-changing.

AMR

GETTING TO KNOW INDUCTION BEND MANUFACTURER: **INDUCTABEND**



Australia's premier induction bend manufacturer Inductabend specialises in high integrity heat induction bending of pipe and other sections for gas pipelines, mining and construction. Generally, if it can't be cold bent, it can be induction formed.

Founded in 1992 by Barry Crouch and Rob Stead, the business has been servicing the mining, oil and gas and building industries in Australia for over 30 years.

Its founders both had extensive experience in manufacturing and engineering, with Barry having previously worked as an engineer for the SEC and Rob owning and operating several manufacturing businesses.

Their first experience working together was running Smithweld, a specialist cold rolling and bending company.

After a few years cold rolling, the opportunity to purchase an induction bending machine, originally brought into Australia to assist with the construction of coal fired power plants, presented itself and thus Inductabend was born.

As managing director, Barry has been involved in the day-to-day operations of Inductabend from the beginning. He and other long serving employees including general manager John Rea contribute to the wealth of experience and knowledge Inductabend has at its disposal to aid its customers in ensuring their bends are made to fit their purpose.

Presently, the business is entering a transitory phase with the directors committing to the long-term future of the business in Australia. This is being done through investing in, updating and upgrading its plant and equipment, as well as continuous investment in research and development of new cutting-edge induction bending (and heat treatment) technologies.

New management is also being implemented with the introduction of Nathan and Jordan Crouch into the business. Both are experienced professionals with backgrounds in civil engineering (utilities water and gas), finance and accounting.

What Is Induction Bending?

Induction bending is a hot bending process specifically designed to produce high

quality pipe bends with mechanical properties equivalent to or exceeding those possessed by the mother pipe the bend it's produced from.

Inductabend has continued to develop and improve its capabilities, product offerings and overall quality as the core value adding proposition for Australia's industrial markets.

"We work with our customers to tailor bend geometries and mechanical characteristics to their needs. In order to ensure consistent performance of our bends we employ a wide range of destructive and non-destructive testing methods to create custom testing programs tailored to our client's pipeline application and risk profile".

Products

Inductabend owns and operates three induction bending machines that cover a wide range of applications. Pipe diameters from DN25 to DN900 with wall thicknesses of up to 100mm can be bent to the purchaser's exact desired angle and radius (generally 2.5D and up) with custom tangent lengths on each end of the bend.

Complex compound bends can also be produced, including S bends and even helical bends for specialist applications.

Induction bending is compatible with a wide range of materials including all carbon steels, alloy steels, high X grade steels, stainless steels, nickel alloys, titanium and other exotic alloys.

Recently, Inductabend internally developed a new world-first method of bending that allows us to utilise induction bending for the forming of bends with radii from 14m and up, allowing for gradual consistent changes in direction to minimise wear on steel pipelines whilst maintaining their desired mechanical properties.

Additional services such as end preparations for welding, Victaulic grooving and coating are also available to customers when placing orders with Inductabend.

Inductabend also owns some cold field benders (up to DN1200 capacity) that are available for dry hire. **AMR**



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- Other specialist heating applications
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- Cold field bending machines also available for hire (up to DN1200)

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BLUESCOPE EYES SOUTH32'S \$2.53B COAL DEAL

BlueScope Steel Limited (ASX: BSL) has announced it is considering its option to weigh in on South32 Limited's (ASX: S32) plan to sell its Illawarra Metallurgical Coal business.

South32 announced yesterday that it had agreed to sell its Illawarra Metallurgical Coal (IMC) business for \$2.53b (\$US1.65 billion) as the miner presses ahead with its strategy to move away from coal to focus on zinc and copper.

The BHP spinoff agreed to sell the coal business to an entity owned by Golden Energy and Resources (GEAR) and M Resources, building on GEAR's metallurgical coal holdings in Australia, in the deal expected to be finalised in H1 FY25.

BlueScope has since released a statement indicating that it may intervene on the deal.

In the statement BlueScope noted it has "a longstanding supply agreement with IMC out to 2032 for supply of a blend of metallurgical coal from its Appin and Dendrobium mines".

"BlueScope has ongoing rights under the long-term supply contract, including pre-emption acquisition rights in favour of BlueScope, and the company will consider its position."

South32 chief executive Graham Kerr says the sale of IMC will "realise significant value for our shareholders and is consistent with our strategy to reshape our portfolio toward commodities critical in the transition to a low-carbon future".

"It will streamline our portfolio, strengthen our balance sheet and unlock capital to invest in our high-quality development projects in copper and zinc," he said.

"The transaction will also simplify our business and reduce our capital intensity."

Completion of the deal remains subject to numerous other conditions being met, including BlueScope's contractual rights and approval by the Foreign Investment Review Board (FIRB).

GEAR, with its headquarters in Singapore, is a leading resources company in the Asia Pacific region.

"GEAR and M Resources are established participants in the Australian metallurgical coal industry, with a strong commitment to environmental and safety standards, who are well positioned to continue Illawarra Metallurgical Coal's contribution to the local steel industry and the Illawarra and Macarthur regions," Mr Kerr said.

GEAR's operations in Australia include mining of metallurgical coal through its

subsidiary Stanmore Resources Limited and gold mining through its stake in Ravenswood Gold Pty Ltd.

"Our focus remains the safe and reliable operation of Illawarra Metallurgical Coal," Mr Kerr said.

"Over the coming months we will work with the buyer, our workforce, the local community, government, customers and suppliers to support a successful transition of ownership.

"Illawarra Metallurgical Coal produces high-quality metallurgical coal, a key ingredient in the production of steel, which will be required until low-carbon steel becomes economically viable on a commercial scale." **AMR**

KING EXPECTS FULL INVESTIGATION INTO BALLARAT GOLD MINE COLLAPSE

WorkSafe Victoria is investigating a fatal mine collapse on Wednesday March 13 at Victory Minerals' Ballarat gold mine at Mount Clear in the State's west.

A 37-year-old Bruthen man lost his life and a 21-year-old Ballarat man was seriously injured after a rockfall in the underground mine.

Federal Resources Minister Madeleine King says her thoughts are with the family and friends of the young man who died mining.

"We must remember this is a dangerous job," she said.

"The prosperity of our nation is the resources sector and it's built off the hard work of the young men and women, like the young man who has sadly died in this accident.

"I expect a full investigation and I know that that will be under way and, again, my thoughts are with his workmates and family at this very sad time."

Emergency services were called to the mine site at Woolshed Gully Drive about 4.50pm on the day.

Two people were pinned by fallen rocks while 29 workers were able to take refuge in a safety pod.

The incident occurred 500m underground about 3km from the mine entry.

It is understood workers were undertaking hand-mining operations, specifically air leg mining, when two of them were trapped by a rock fall about 4.30pm.

The death is the 10th confirmed workplace fatality for 2024, according to WorkSafe

Victoria, with 14 work-related deaths at the same time last year.

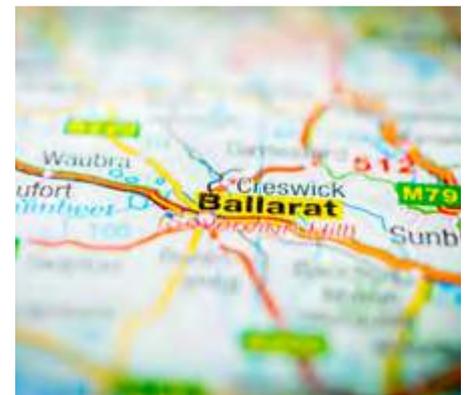
Australian Workers' Union branch secretary Ronnie Hayden says the two workers were "air-legging" on unsupported ground which gave way.

"This should have been avoided - they should not have been doing that task in that mine," he said.

"We are going to be pushing very hard to make sure that the industrial manslaughter laws are used.

"Since industrial manslaughter laws have come in, we've had 169 Victorians killed at work." Minerals Council of Australia chief executive Tania Constable says safety is the most important issue for the mining industry.

"This tragic event is a reminder of the need



to always prioritise safety above all else," she said.

"The minerals industry will continue to work hard to eliminate fatalities, injuries and occupational illnesses."

The Victorian Police is preparing a report for the State Coroner. **AMR**



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transportation of mine site kiln shells, slew rings, mill shells and frames. All safely delivered on-time and on-budget to regional destinations across Australia.

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With an extensive overseas network and offices in Vietnam, Prime Global Logistics provide its client with global reach with a local touch. Their proven strategic logistical solutions applied to individual

projects means they have extensive and practical experience and knowledge to tackle the movement of any over-sized part, from anywhere in the world.

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GOV NEEDS TO DO MORE TO PROMOTE GREEN EXPLOSIVES, NEW STUDY FINDS

A new report from the Institute for Energy Economics and Financial Analysis (IEEFA) has found that a government incentive program would accelerate the adoption of green explosives by miners.

Miners consume about half of Australia's ammonia through explosives and a shift to green explosives could be done with a minimal increase in operating costs.

The IEEFA report found that by switching ammonia production facilities from fossil gas to green hydrogen Australia could lead the world in the production of green ammonia and lay the foundation for a new green hydrogen industry.

IEEFA Australia chief executive Amandine Denis-Ryan says "ammonia production stands out as a logical early adopter of green hydrogen".

"Changing these processes is a relatively quick, simple step that could expedite the emergence of a green hydrogen industry in Australia," she said.

"Unlike other sectors, ammonia's production process already involves hydrogen as an intermediary product, and Australia's existing ammonia plants are perfectly placed geographically in regions with abundant renewable resources."

The Pilbara, Kwinana, the Hunter and Gladstone regions have been identified as potential hydrogen hubs under Australia's National Hydrogen Strategy and offer the potential of large-scale demand clusters.

The IEEFA stated switching all of Australia's current ammonia production away from gas would create demand for around 350,000t of green hydrogen.

Co-author of the report Cameron Butler says "traditionally the ammonia supply chain has been highly energy-intensive".

"Ammonia production accounts for roughly 5% of Australia's total gas use, making it the second-highest user of gas across Australia's manufacturing sectors," he said.

"Decarbonising ammonia facilities presents the opportunity of a triple win – alleviating domestic gas market pressure, reducing emissions and catalysing Australia's emerging green hydrogen industry."

However, the report finds that progress is currently slow.

Widespread adoption is being hindered by relatively high production costs for green hydrogen, a lack of demand at premium prices and insufficient policy drivers.

With more than half of Australia's ammonia used to produce explosives, miners wield significant influence and could play a pivotal role in accelerating the transition to green hydrogen.

According to IEEFA's analysis, shifting to green explosives would be affordable for miners.

Switching to 20% green ammonia by 2025 would increase their operating costs by less than 0.1% while a complete switch to 100% green ammonia by 2030 would increase costs by a maximum of 0.4%, the study found.

"By setting green explosives adoption targets, miners could guarantee offtake and provide the certainty required to shift investment from suppliers," Mr Butler said.

"However, miners currently lack incentives to do so.



Ammonia production could prove a logical early adopter of green hydrogen.

"Government will be crucial in driving and complementing action by miners by addressing data transparency challenges and reducing investment risk."

And it's likely incentivisation would also encourage ammonia producers to alter their processes.

CSBP, a major global supplier of explosive-grade ammonium nitrate, and manufacturer of ammonia and other industrial chemicals, is planning to expand its ammonia plant in Kwinana, WA.

The IEEFA says the planned expansion presents a powerful opportunity to demonstrate the large-scale integration of renewables and green hydrogen in the domestic ammonia supply chain.

Under current proposals, the expanded plant would be fuelled by gas, according to the IEEFA.

However, if the expansion was based on green hydrogen instead, it could create demand for about 53,000t of green hydrogen.

"The expansion of CSBP's ammonia plant provides a timely and pivotal moment for miners to catalyse change and drive the adoption of green ammonia in Australian mining and the emergence of a green hydrogen industry," Ms Denis-Ryan said.

"The convergence of miner influence, market-driven incentives and government support forms a compelling case for accelerating the transition to green ammonia.

"By embracing this opportunity, government and industry could kickstart the emergence of a green hydrogen industry for Australia."

Combined emissions from facilities producing ammonia and its derivatives such as ammonium nitrate are around 4mt of carbon dioxide equivalent (MtCO_{2e}), or just under 1% of Australia's annual emissions.

While just above half of Australia's ammonia production is used to produce explosives, the remainder is used for exports or to produce fertilisers.

The IEEFA says government support will be crucial to drive and complement action by miners, by addressing data transparency challenges and reducing investment risk.

Adapting existing schemes such as Renewable Energy Certificates could drive investment in explosives inputs, according to the report.

The IEEFA also said the creation of a similar market-based mechanism offers the opportunity of recognition for miners' action, in addition to financial incentives and competitive advantages for ammonia producers.

"Other emerging initiatives such as a hydrogen Guarantee of Origin (GO) scheme could also provide a consistent, accurate approach to tracking emissions from production of hydrogen and derivative products such as ammonia," according to the report.

"Investment support can cover shortfalls in miners' commitments, while regulatory measures can mandate full decarbonisation of explosives production.

"Other measures such as legislating Scope 3 emissions reductions or placing limits on the use of offsets would also accelerate action across the ammonia supply chain."

AMR

GOLDEN TIMES AHEAD FOR QUEENSLAND'S LARGEST GOLD MINE

Queensland's largest gold mine — the Ravenswood gold project — is set to operate for another 16 years following the recent renewal of four crucial mining leases.

Not only does the renewal of the leases cement the long-term future for Ravenswood but it also paves the way for significant expansion with plans to increase processing from 2.5mtpa to 8.4mtpa.

Located in North Queensland, the Ravenswood gold project is a cornerstone of the state's economy, supporting more

than 400 employees and partnering with suppliers from the region.

Ravenswood Gold chief executive Brett Fletcher says the renewal of the mining lease is an exciting time for the company.

"The renewal of our mining leases is another exciting and positive step forward for the future of the Ravenswood gold project," he said.

"Long term certainty is critical for business confidence and continued investment.

"Our positive relationship with the

Queensland Government allows us to confidently continue to invest in the long-term future of the Ravenswood gold mine and the region."

Recently, Ravenswood Gold completed a three-year \$350m expansion which included a new fleet of mobile mining equipment, a new crusher, a 12MW ball mill, processing equipment and a 100mt tailings storage facility.

The renewal of a mining lease 30km northeast of Ravenswood allows the company to undertake a feasibility study on a historical prospect known as Last Chance.

Queensland Resources and Critical Minerals Minister Scott Stewart commented on the extension.

"The extension of these mining leas-



(Image source: Ravenswood Gold) Ravenswood gold project.

es secures the long-term future for Ravenswood Gold and sets the stage for substantial expansion, contributing to the economic development of the region," he said.

"Queensland's mining landscape is exciting, continuously growing and evolving, exactly as we see here with Ravenswood Gold." AMR



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IMS have added the new BP1200-48TB track electric twin power blender to its impressive collection of blenders and pugmills, the new BP1200-48TB has four separate feed hopper each five meters long holding 12m³ each. All feed hopper conveyors are fitted with belt scales and controlled by a PLC control and recording system that can be operated from an iPad or phone from its own Wi-Fi system from a loader or site office. A Cat C7 Generator powers the Nord electric motors all fitted with invertors offering variable speed to each feed hopper conveyor. The generator can be connected to mains power and could power an extra 24-meter radial stacker increasing the stockpile capacity.



A new IMS-PM1200-20TB Track Pugmill with twin 10m³ feed hoppers has just commissioned to Braeside Quarry on the New England Highway Warrick in Qld, the options the PM1200-20TB offered Braeside improved product management with the twin feed hoppers blending fines into roadbase to make spec or having two different products available ready for moisture control and CTB. The PLC control and recording system can be operated from an iPad in a loader managing all aspects of the operation including loading trucks and multiple trailers stopping when the required weight has been reached for each unit and recording the ID number of each load.



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Lincoln Mineral's Green Iron project is focused on producing a coarse-grind, high-grade iron ore concentrate.

A 1.2bt magnetite mineral resource has been confirmed for Lincoln Minerals' (ASX: LML) Green Iron project in South Australia.

The resource comprises of an average head grade of 25.7% iron and an average concentrate grade of 66.4% iron and 5% silicon dioxide.

This resource is considered significant due to the optimal location of the resource, the potential scale of the project, supportive metallurgical characteristics and the new preference of high-quality magnetite feedstock for green steel production.

Lincoln has also begun a partnering process for the Green Iron project and

1.2BT MAGNETITE MINERAL RESOURCE FOR GREEN IRON

is seeking to identify a funding and project partner to advance the project to operational status.

The initial phase involves progressing the project to definitive feasibility study status (DFS) and completing necessary approval documents. Previous DFS studies and regulatory approvals were not finalised, however, were well advanced.

The commencement of a partnering process is the first step towards unlocking shareholder and regional value from its magnetite resource.

Lincoln chief executive Jonathon Trewartha commented on the partnership.

"Magnetite, with its environmental advantages, has emerged as an appealing

option for sustainable, low carbon steel production," he said.

"Lincoln's Green Iron project, focused on producing a coarse-grind, high-grade iron ore concentrate, is expected to attract interest from potential steel producers, as has been the case with other peers in the region.

"The project's unique properties, positive environmental impact, and proximity to established infrastructure and workforce contribute significantly to the project's attractiveness."

Value realised from the Green Iron project will fund and fast-track development of Lincoln's Kookaburra graphite project, also in South Australia. **AMR**

VISIBLE GOLD INTERSECTED AT HILLGROVE



Diamond drilling has identified visible gold at Hillgrove.

Visible gold mineralisation has been identified at Larvotto Resources' (ASX: LRV) Hillgrove gold-antimony project in NSW.

The company recently completed its first diamond drilling program at Hillgrove which aimed to extend the high-grade gold and antimony mineralisation identified in drilling completed in 2022.

Multiple zones of visible gold were identified in quartz-carbonate breccias and quartz-carbonate veins associated with wider carbonate altered breccias that

also hosted visible stibnite mineralisation. Larvotto managing director Ron Heeks commented on the drilling program.

"The diamond drilling program at Bakers Creek was always a priority, aimed at building on the significant high-grade intercepts from drilling undertaken in 2022," he said.

"It was pleasing to complete the program so quickly and note numerous instances of visible gold across multiple sections of the drill core.

"Identifying visible gold in the deeper part of the Hillgrove system helps confirm that it may be geologically similar to the high-grade gold and antimony systems identified at the Costerfield mine operated by Mandalay and the high-grade gold mineralisation identified by Southern Cross Gold in Central Victoria."

Located 23km east of Armidale and covering an area of 254km², Hillgrove is Australia's largest antimony deposit. It consists of four exploration leases, 48 granted mining leases and has a mineral resource estimate of 1.4moz gold.

Hillgrove has been mined for both gold and antimony since 1857, with continuous antimony production for more than 30 years until 2002 when the price fell to an all-time low.

Larvotto is now working on the delivery of an initial ore reserve estimate for Hillgrove with drill core currently being cut for assay and initial results expected in early April.

AMR

EXPLORATION RESTARTS AT WELLINGTON NORTH

Exploration has restarted at Magmatic Resources' (ASX: MAG) Wellington North project in NSW.

Three prospects — Boda Southwest, Lady Ilse North and Rose Hill — have been identified for immediate follow-up exploration work with all hosting confirmed porphyry gold-copper mineralisation and limited existing drilling.

Boda Southwest lies on the eastern boundary of Wellington and represents a potential continuation of the intrusive complexes and related magnetic highs associated with the Boda and Kaiser mineral resources 2km to the northeast.

Upcoming exploration will consist of a close spaced soil geochemistry program over the area to test for porphyry pathfinder elements and identify suitable drilling targets.

Previous drilling at Lady Ilse North highlighted the porphyry potential of the area with past work returning intervals of 13m at 0.72g/t gold and 0.36% copper.

The area to the north and northwest of Lady Ilse is sparsely explored with new work consisting of 40 to 50 holes testing the basement for extensions and identify follow-up drill targets.

Past drilling at the Rose Hill prospect intersected intrusion-hosted copper-gold porphyry mineralisation including 71m at 0.43% copper, 0.30g/t gold and 57ppm molybdenum from surface with mineralisation open along strike.

Three to five reverse circulation holes will be drilled to further test the shallow copper-gold potential with additional drilling to be considered pending results.

Magmatic managing director Adam McKinnon said the company is excited to resume drilling at Wellington North.

"Exploration has been limited at the project [Wellington] over the last couple of years with the company's focus squarely on the Corvette and Kingswood discoveries at Myall," he said.

"Our first target area will be Boda Southwest, a sparsely tested area just over two kilometres from Alkane's Boda mineral resource, to be followed by work at Lady Ilse North and at Rose Hill.

"Given the similar geological setting, exceptionally close proximity and the dozens of prospective targets identified, we believe the Wellington North project



Follow-up exploration work will be undertaken at three prospects within the Wellington North project.

has enormous potential to deliver further Boda-scale discoveries."

Currently, Magmatic's technical team are completing the necessary landholder and regulatory approvals to allow work to begin. **AMR**



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(Image source: QRC) Exceptional Woman in Queensland Resources award winner Sonia Winter.



(Image source: QRC) Exceptional Woman in Queensland Resources in Technological Innovation award winner Claire Graham.



(Image source: QRC) Exceptional Female QMEA Student award winner Lexi Croce.

HIGH ACHIEVERS SHINE

AT QUEENSLAND RESOURCES AWARDS FOR WOMEN

Three engineers, a workplace support manager and a dragline operator have received awards at this year's Resources Awards for Women.

Hosted on International Women's Day (March 8) by the Queensland Resources Council (QRC) and Women in Mining and Resources Queensland, the event celebrated the contribution of women in Queensland's resources industry.

Held at the Brisbane Convention and Exhibition Centre, the event was led by BHP president Australia Geraldine Slattery and QRC chief executive Janette Hewson.

Ms Hewson says the number of women in Queensland's resources sector had almost doubled in the past 20 years to 22.1% of the total workforce.

"The resources sector is making good progress towards reaching our target of 30% female participation by 2026, but our members are working hard to employ more women at a faster rate to meet this milestone," she said.

"26.1% of executive management positions in Queensland's resources sector are now held by women, which is almost double the level of representation in 2015-16, with the proportion of women working in operational and production roles growing by 58% over the same period.

"Significantly, the number of women in trade roles has increased by almost 40% over the past year, in a clear sign our industry is becoming more diverse and inclusive in its attraction, recruitment and retention programs."

BHP head of global resource engineering excellence Sonia Winter received the Exceptional Woman in Queensland Resources award. Ms Winter began her career in the resources industry 20 years ago and she was one of the first women employed through BHP's graduate mining engineer program.

Tanya Olive received the Exceptional Tradeswoman/Operator/Technician in Queensland Resources award. After starting in the sector 16 years ago in an administrative role, Ms Olive is now a dragline operator at Jellinbah Group.

Aurizon freight operator Claire Graham received the Exceptional Woman in Queensland Resources in technological innovation award. Ms Graham received the award for her work leading the implementation of a new program that uses sensor data to monitor conditions, predict faults and schedule proactive maintenance of the company's locomotive fleet.

This year's Exceptional Young Woman in Queensland Resources award winner was Ashara Moore who works at BHP's Saraji coal mine. After starting her career as the sole engineer on remote construction projects, she is now a portfolio lead where she heads a team of engineers and is responsible for over \$45m in projects.

Year 12 high school student Lexi Croce was this year's Exceptional Female Queensland and Minerals Energy Academy (QMEA) student. Ms Croce is a member of Moranbah State High School's science, technology, engineering and mathematics (STEM) innovation experience team which won last year's state competition.

Anglo American support manager Kanae Dyas is this year's inclusion and diversity champion in Queensland resources. She has championed diversity and equity and is dedicated to improving health and safety outcomes for women and marginalised people.

Furthermore, Anglo American won this year's award for excellence in diversity programs and performance in Queensland resources. In 2020, the company introduced a global initiative that has significantly increased the number of women in senior management positions.

AMR



AUSTRALIANS URGED TO SHARE THOUGHTS ON MINING INDUSTRY

The survey will allow Australians to share their views on mining.

Australians aged 18 and over are invited to participate in a survey aimed at shaping the future of mining research for the country.

Science and community engagement company Voconiq was engaged by Australia's national science agency CSIRO to conduct the survey which aims to explore Australians attitudes towards the mining industry.

The last surveys undertaken in 2014 and

2017 produced important insights on expectations for how mining is conducted in the country.

This survey gives all Australian's, not just those in the mining industry, the opportunity to share their views on mining, its role in the national economy, the world's energy transition, global development and the producing of materials for low emission technologies.

CSIRO director of mineral resources Rob

Hough says public insights are invaluable for the company's future research.

"Mining plays a crucial role in producing the materials necessary for the transition to low emission technologies, global electrification and global development in general, and conversations generated from surveys like this will help shape the industry's future, balancing its growth with community expectations," he said.

"Your insights will be instrumental in

guiding our ongoing research."

The survey is open now and will close on April 11.

CSIRO will use the results to inform future mining related research initiatives that lead to public reports and academic publications. **AMR**

ALCOA BUCKS TREND OF MALE-DOMINATED INDUSTRY



(Image source: Alcoa) Interim vice president of Australian operations Tanya Simmonds.



(Image source: Alcoa) Wagerup alumina refinery manager Jodie Giraudo.

While correcting gender inequality remains a challenge across many industries — particularly in mining and resources — Alcoa is bucking the trend with women leading across its operational value chain.

Women are leading the company's bauxite mines, an alumina refinery, an aluminium smelter and the overall Australian operations.

Alcoa interim vice president of Australian operations Tanya Simmonds says that gender is not a determining factor in identifying the best person for the job at Alcoa.

"I faced some of those discriminatory attitudes myself 10 years ago when I was up against males for a senior role," she said.

"But today if there's a male and female up for the same job, the sort of unconscious bias that may have once led to the male being deemed the better candidate has largely disappeared."

Ms Simmonds has been no stranger to gender bias during her career. Upon being appointed financial controller for Alcoa's Portland aluminium smelter in 2005 she was mistaken as the manager's personal assistant on more than one occasion.

Rather than take offence, she made a point of introducing herself to as many people as she could across the company and the outcome was a growing mutual respect and understanding.

This shift in perception is common across Alcoa's leadership team in recent years as they develop their careers in traditionally male-dominated workplaces.

Recently appointed Wagerup alumina refinery manager Jodie Giraudo says while

it's been difficult working in mining, the landscape is changing.

"Early on, I documented it [discrimination and sexual harassment] for my manager to provide the evidence needed to trigger change," she said.

"Initially, I thought it was a gender issue but it's not. What I was being exposed to was a cultural issue that allowed people to work who weren't exhibiting the right values.

"Getting to the heart of the culture and fixing those issues is what leads to a more inclusive workplace. And that's occurring broadly across the industry."

Ongoing studies by management consulting firm McKinsey and Company have found that organisations with the greatest gender diversity are 25% more likely to experience above average profitability.

Ms Simmonds says that while Alcoa is building gender equality, the key to long term sustainability is to focus on attracting and retaining women into entry level roles. Last year, 44% of recruited apprentices were female while that figure sits at more than 30% this year.

"We've got some really good programs with schools and universities. We need to continue those and up the ante to ensure we have opportunities for women when they finish their education and training," she said.

"As we continue to build our leadership teams, from operational supervisors to senior executives, we are certainly creating the right role models and visible career paths for young women coming up through the ranks and that is something I'd like to see continue."

AMR

THIESS

FIRST CUSTOMER FOR TOYOTA HYDROGEN FUEL CELL GENERATOR, TO USE IN NSW MINING OPERATIONS

Thiess will be the first customer to take delivery of Toyota's locally assembled EODev GEH2® hydrogen fuel cell stationary power generator.

The 110kVA GEH2® generator was developed through partnership between Toyota Motor Europe and French firm EODev using Toyota fuel cell technology, the same one that powers the Mirai FCEV. Toyota aims to produce 28 GEH2® generators at its \$3.27m Altona facility in Victoria this year – and up to 100 units over the next three years – for its mining, construction and events customers in Australia and New Zealand.

Toyota Australia president and chief executive Matthew Callachor says this is a proud moment for the company.

"This is a great day for us at Toyota and all of our like-minded partners that have brought this important project to fruition as we aim to help drive towards a more sustainable future," he said.

"For Toyota, it's part of our multi-pathway approach to decarbonisation by providing Australian customers with a range of technologies and mobility solutions, including power generation, that help reduce carbon emissions.

"We are firmly committed to growing, and investing in, the hydrogen economy here in Australia and I'm particularly pleased that Thiess is set to become our first customer for this innovative hydrogen fuel cell generator.

"Toyota has long-standing shared history with Thiess that started when Sir Leslie Thiess imported the very first LandCruisers into Australia to work on the Snowy Hydro Scheme in 1958.

"Thiess then gained the Queensland and other state distribution rights from our parent company in Japan and was instrumental in building our brand here, particularly in rural and regional Australia.

"Now, we are working together again in a new era as we collectively aim to build a better future for all Australians."

Thiess group executive for assets, autonomy and digital Ramesh Liyanage says Thiess is planning to use the generator in its mining operations in NSW and is looking to add a second unit in the future as part of its own decarbonisation program.

"This year, as Thiess celebrates 90 years of operations – we are well-progressed in our journey to reduce carbon emissions from our operations, and we are determined to make a meaningful contribution towards decarbonising the world's resources sector," he said.

"We're pleased at the prospect of being the first customer to take the locally-assembled hydrogen fuel cell generator unit and are excited to be partnering with Toyota once again, this time on cutting-edge technology that has the power to shape a more sustainable future for the world."



A Toyota worker assembling the EODev GEH2® generator at Toyota's Altona production facility.

The GEH2® power generator can also be used to provide emergency backup power for hospitals, commercial buildings and anywhere where stable power supply is required.

The GEH2® power generator has been in production since 2021 at EODev's manufacturing facility in France and is currently sold across several European markets, in North America, in the Middle East, and in Australia.

In October 2023, Toyota Australia announced it was partnering with EODev to assemble the generators at Altona and make them available through its local



Toyota celebrated the completion of its first EODev GEH2® generator. (L-R) Blue Diamond Machinery director Justin Pitts, Toyota Australia president and chief executive Matthew Callachor, Thiess group executive for assets, autonomy and digital Ramesh Liyanage, EODev chief executive Jeremie Lagarrigue.

retail partner Blue Diamond Machinery (BDM).

It will also export units to New Zealand with Toyota New Zealand acting as the distributor in that market.

AMR

THIESS ADVANCES SUSTAINABLE MINING JOURNEY

Following the release of its 2023 sustainability report, Thiess has made progress towards its 2025 decarbonisation target with scope one emissions reduced by 21% and scope two emissions reduced by 12% during 2023.

These efforts were enhanced by the diversification of Thiess' commodities and services to rebalance its thermal coal revenue to less than 25% by the end of 2027.

Thiess has set an additional diversification

target to rebalance its portfolio to consist of less than 20% thermal coal revenue by the end of 2030, with executive chair and chief executive Michael Wright commenting on the company's overall efforts.

"I am very proud of our ongoing efforts to decarbonise our global operations through improving efficiencies, adopting renewable energy solutions where possible, and collaborating and trialling new and emerging lower emissions technology," he said.

"Following the acquisition of MACA in 2022 and Thiess' targeted organic growth, 2023 has seen us extend our commodities portfolio to include more of the critical minerals needed to power the global energy transition and expand our capabilities into civil and crushing to offer our clients more choice and value in a range of new services."

Other highlights from the sustainability report include:

- rehabilitation of 632ha of post-mining land;

- recycling and reuse of 3088MI of water;
- commencement of battery electric and hybrid light vehicle trials in Australia, the USA and Chile;
- zero class one and class two environmental incidents recorded.

Thiess further integrated data in 2023 from its companies — Thiess, MACA, Fleetco and RTL — to enable a more accurate understanding of its sustainability progress. AMR

HITACHI & BLUVEIN PARTNER FOR MINING FLEET ELECTRIFICATION

Hitachi Energy and BluVein have signed a memorandum of understanding (MoU) to accelerate the electrification of heavy haul mining fleets.

This partnership will fast-track the development of a high-powered, fast and flexible charging system for surface and underground mines and quarries in Australia and across the world.

Hitachi's advanced power electronics and digital charging technologies will allow BluVein's e-rail charging technology to deliver electricity safely and reliably to haul

truck of up to 400mt while transporting materials.

BluVein chief executive James Oliver said the partnership supports the company's mission of delivering a dynamic connector to help reduce decarbonisation goals.

"This MoU supports BluVein's mission of partnering with a technology leader to deliver a universal dynamic connector that facilitates the removal of fossil fuel from mines and help propel the industry globally to meet its decarbonisation goals," he said.

"Together, we are helping the industry move to a more sustainable and responsible future."

BluVein will focus on its e-rail and connection of the truck, while Hitachi will power and monitor the system with its advanced power electronics and digital solutions.

Hitachi head of grid and power quality solutions and service business Marco Beradi commented on the partnership.

"This strategic collaboration with BluVein will enable our mining customers to trial next-generation dynamic charging solutions vital for achieving net-zero emission targets without compromising on operating practices or productivity," he said.



(Image source: BluVein) Front view of the electric haul truck.

"We believe this new collaborative approach will deliver on our common goal to accelerate the transition to all-electric mining and a carbon-neutral future."

Hitachi and BluVein are also exploring the off-vehicle hardware requirements for BluVein1 for underground and smaller fleets. AMR

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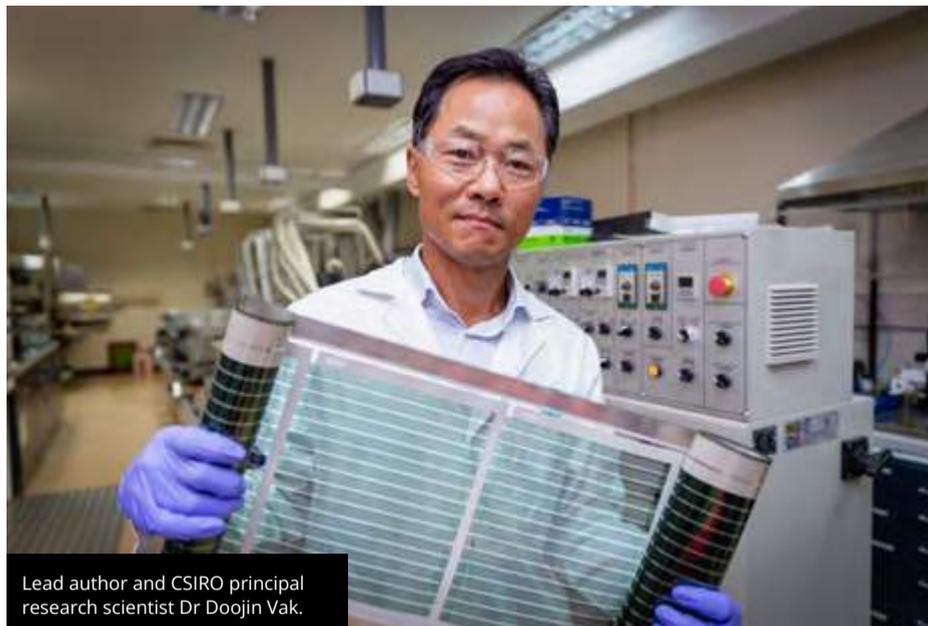
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CSIRO's Renewable Energy Systems group leader, Dr Anthony Chesman.



Lead author and CSIRO principal research scientist Dr Doojin Vak.

BREAKTHROUGH IN PRINTED SOLAR CELLS, FOR DEPLOYMENT IN MINING AND REMOTE REGIONS

In what is being termed a clean energy breakthrough, CSIRO's scientists have led an international team to develop a lightweight and flexible solar technology that pushes the boundaries of where solar cells can be used.

Where silicon solar panels are typically rigid and heavy, the team have set a new efficiency record with its fully roll-to-roll printed solar cells, which are highly flexible and portable, being on thin plastic films.

These printed solar cells can be deployed across urban construction, mining operations, emergency management, disaster relief, space, defence and personal electronics to help meet the growing demand for renewable energy.

CSIRO's Renewable Energy Systems group leader Dr Anthony Chesman says the achievement is the result of more than a decade's research and development.

"CSIRO's thin and light-weight solar cells are now on the cusp of emerging from the lab to create clean energy in the real world," he said.

"We've solved several engineering problems to achieve record results across a large surface area of interconnected modules.

"Roll-to-roll printing allows for the solar cells to be manufactured on very long, continuous rolls of plastic, which can dramatically increase the rate of production.

"As these methods are already widely used in the printing industry, this makes their production more accessible for Australian manufacturers.

"The successful commercialisation of printed flexible solar cells has the potential to create significant economic and environmental benefits for Australia and the world."

The results were achieved in collaboration with researchers from the University of Cambridge, Monash University, the University of Sydney, the University of New South Wales and have been published in the leading journal Nature Communications.

CSIRO principal research scientist Dr Doojin Vak says an automated system produces a comprehensive dataset that will pave the way to use machine learning in future research.

"We developed a system for rapidly producing and testing over ten thousand solar cells a day – something that would have been impossible to do manually," he said.

"This allowed us to identify the optimal settings for the various parameters in the roll-to-roll process and quickly pinpoint the conditions that deliver the best results."

Incorporating an advanced material called perovskite, CSIRO's printed solar

is different from the silicon solar panels found on Australian roofs.

"Perovskites are a class of emerging solar cell material," Dr Vak said.

"They're remarkable because they can be formulated into inks and used in industrial printers.

"We've also alleviated the need to use expensive metals, such as gold, in their production by using specialised carbon inks, which further reduces production costs."

Acknowledging that perovskite solar cells currently trail silicon solar panels in efficiency and lifetime when produced at scale, Dr Chesman sees the application of flexible panels to be very different.

"As these perovskite solar cells are printed onto plastic films, they are very lightweight, highly flexible and portable," he said.

"The rigidity and weight of conventional silicon solar panels can make moving them difficult.

"Our thin, lightweight solar can be easily transported anywhere there is sun.

"We even sent the solar panels to space last week to test their performance, with a view to further optimise and ultimately provide a reliable energy source for future space endeavours."

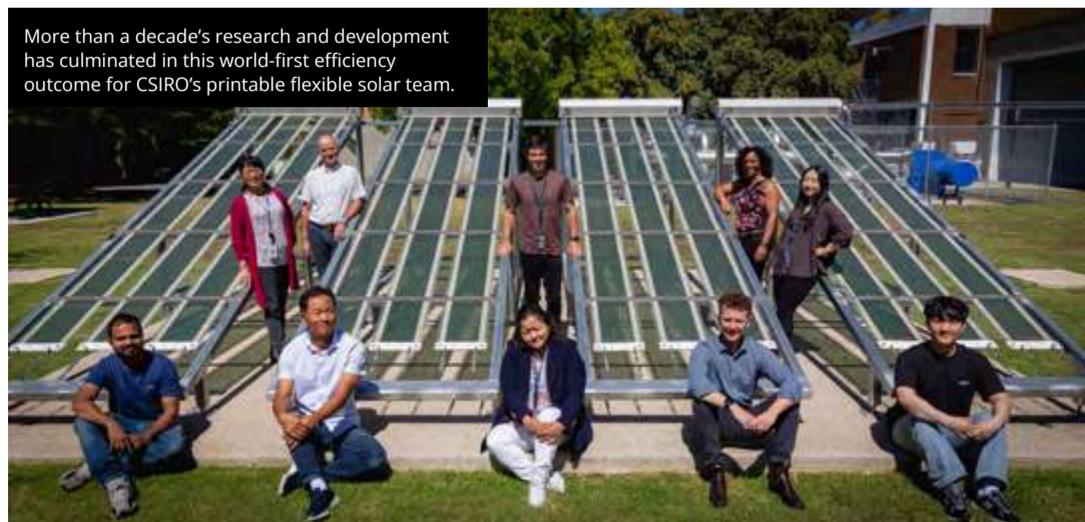
CSIRO is actively seeking industry partners

to further develop and commercialise this technology.

This activity received funding from the Australian Renewable Energy Agency (ARENA) as part of the agency's Research and Development Program – Solar PV Research.

The results and more technical details:

- Flexible solar cells have been produced using a production method in which all components of the device were fully printed from inks
- The solar cells were printed using roll-to-roll techniques, which can be used to print solar cells on a long, continuous roll of plastic
- The team demonstrated performances for solar cells of 15.5% efficiency on a small scale and 11% for a 50cm² module, which is a record for fully printed solar cells
- The solar cells contain perovskite, an emerging class of solar material which can be formulated into inks for printing
- Automatic screening was used to optimise the printing process
- Carbon-based inks have been used to replace gold in the solar cell, dramatically reducing the cost while maintaining high performance
- Technoeconomic modelling has been used to predict the production cost in Australia **AMR**



More than a decade's research and development has culminated in this world-first efficiency outcome for CSIRO's printable flexible solar team.



CSIRO's lightweight, flexible solar technology will help meet the growing demand for renewable energy.

ESG

environmental, social & governance

In the first of a six-part series across 2024, the **Australian Mining Review** looks at the very latest news, technologies, thought leaders and mining businesses in the environmental, social and governance (ESG) space.

Mine Closure Planning & Rehabilitation

This edition, we speak with:

- **CSIRO** Futures senior manager Dominic Bamfield about mine closures and transitions
- **CRC TIME** chief executive Dr Guy Boggs about mine rehabilitation
- **Envirostay** - environmentally sustainable solutions to erosion and sediment control
- **Envirostraw** with the importance of carbon capture to achieve net zero emissions by 2050
- **Mineral World** with choosing the right partner for ESG assessment
- **Envirosuite** with the company's latest **Responsible Mining** white paper

A NEW LIFE FOR TAILINGS

Recovering and re-mining mine waste has emerged as a potentially financially alluring prospect as the mineral intensity of the clean energy transition requires new solutions to avoiding supply shortfalls.

The financial institution, World Bank, has indicated the production of minerals such as graphite, cobalt and lithium could increase by nearly 500% by 2050 to meet the growing demand for clean energy technologies.

It has estimated that more than 3bt of minerals and metals will be needed for the solar, wind, geothermal power and energy storage requirements for projects to built to meet carbon reduction targets.

With current resources either depleted or declining in quality and new resources proving difficult to find and mine, it may be worth turning to the debris of past operations — tailings.

According to the Minerals Research Institute of WA, the worldwide value of precious, critical and strategic metals in tailings is expected to exceed \$5.13t (US\$3.4t).

IMDEX chief geoscientist Dr Dave Lawrie said technology has a role to play in characterising the tailings and defining the ore for extraction.

"You could probably bring these mines back with much less local community and environmental impact and much better ESG credentials," he said.

"There seems to be a realisation now that we do need these metals and it seems to be becoming more acceptable now to try to restart this activity in Europe.

"But if you want to make a case to re-open them in some way, it's very difficult to make an economic case unless you know what's in them, and that's the role of technology."

In collaboration with Geoscience Australia, RMIT University and the University of Queensland, the Federal Government has released an Atlas of Australian Mine Waste.

So far, the Atlas has identified 1050 sites across the country as possible sources of critical minerals.

Federal Resources Minister Madaleine King says the Atlas can provide additional opportunities for the extraction of valuable resources from previously mined rock and earth.

"Some of the minerals we need now, and into the future, may not just be in the ground – they're also in rock piles and tailings on mine sites around the country," she said.

"These minerals might not have been of interest when first extracted but could now be in hot demand as the world seeks to decarbonise – for example, cobalt in the tailings of copper mines.

"This new atlas puts these potentially lucrative sites on the map for the first time and may open new sources of critical materials." **AMR**



New solutions, such as using tailings, are needed to avoid mineral supply shortages.

THE YEARLY \$4B MARKET IN MINE CLOSURES & TRANSITIONS

BY ASHLEIGH DORRELL



(Image source: CSIRO) CSIRO Futures senior manager Dominic Banfield.

CSIRO Futures senior manager and lead author of the report Dominic Banfield to discuss the challenges related to mine closures and rehabilitation, as well as how this can be done in a more sustainable manner.

"We began by consulting industry players who work in mine closure and focused on their existing challenges – we spent a lot of time identifying what those challenges currently are," he said.

"We then worked with a mix of operators, researchers, and solutions providers to understand how those challenges could potentially be solved, and what opportunities there were for Australian businesses to provide those solutions."

The report identified four opportunities including: engagement and partnership, waste reduction and recovery, mine rehabilitation and land use transitions.

Engagement and Partnership

Engagement and partnership solutions enable effective engagement, co-design and mutually beneficial partnerships to improve social performance, reduce social and governance risks and optimise outcomes.

"It's important to recognise that mine closure is not just a technical challenge – it's also a social challenge," Mr Banfield said.

"We identified solutions that can help to facilitate really effective engagements with various stakeholders, and to develop productive partnerships between miners, communities and mine closure solutions providers."

Co-design and partnerships solutions can support sustainable partnerships with community stakeholders through facilitation and capability development services.

They also support transparency, governance and delivery of mine closure outcomes through data management solutions.

Indigenous-lead training services enable culturally sensitive and mutually beneficial collaborations with Aboriginal and Torres Strait Islander communities.

Businesses can provide short to medium-term support and capability-building for the industry while also implementing training programs to build internal capabilities.



Linking Futures, an Indigenous-owned business, is developing a cross-cultural understanding in complex stakeholder relationships by training commercial and collaborative capabilities of businesses.

Furthermore, businesses delivering software solutions can improve data transparency through improved collection and access.

Software company K2fly offers a cloud-based solution for heritage management that captures data from multiple sources and integrates it for analysis, change detection and visualisation.

The tool enables improved stakeholder engagement and heritage management, particularly with Traditional Owners.

Effective stakeholder engagement can be supported by products and services that enable data-driven engagement, governance and decisions, effective and inclusive communication of complex information.

Waste Reduction and Recovery

A significant amount of mine waste is generated throughout the mining lifecycle and resource-intensive activities are required to reduce risks the waste may present.

For example, excess tailings can increase risks associated with environmental contamination by toxic substances as well as causing physical instability of tailings storage facilities.

Proactively managing the mine site during and after operations can reduce the volume of waste generated and the associated liabilities and risks.

New Century Resources is recovering zinc concentrate from historic zinc, lead

Australia has a unique billion-dollar opportunity to create a new industry to support mine closures and transitions, according to a report developed by Australia's national science agency CSIRO and research organisation CRC TImE.

Drawing insights from mining industry databases and analysis by CSIRO, the report projects annual spending regarding mine closure and rehabilitation activities to exceed \$4b by 2040.

The *Australian Mining Review* interviewed



Limestone crusher on rehabilitated area of mining.



and silver mine tailings at its Century mine in Queensland, while EnviroGold is developing a full-scale pilot program for the recovery of gold, silver, zinc, lead and copper within tailings.

"We looked at the whole mining life cycle and the waste that's created during that cycle," Mr Banfield said.

"By applying waste hierarchy and waste management principles you can reduce the liabilities at the end of the mine's life, while potentially generating value from that mined waste."

Mine Rehabilitation

Mine rehabilitation solutions improve the performance or cost-effectiveness of mine rehabilitation activities to ensure that mined land is safe, stable, non-polluting and able to support an appropriate land use.

Common challenges include physical stability of the land, hydrological systems, pollutant management and revegetation and biodiversity.

"The category of rehabilitation activities includes the typical activities associated with closing a mine site," Mr Banfield said.

"This includes undertaking earthworks to make sure the site is safe and stable, reforming waterways, making sure there's no contamination or pollutants left on the site and revegetating the site with native flora which also helps to prevent erosion."

While rehabilitation varies between sites, it generally ensures that the mined land is safe, stable and non-polluting to support the agreed land use.

Rehabilitation of the Ensham mine in Queensland faced multiple challenges,

including water contamination, erosion issues and a topsoil deficit.

Collaboration between Innovate Enviro, SoilCyclers and Cammel Consulting demonstrated the upcycling of overburden material to topsoil and the bioremediation of saline pit water.

Land Use Transition

These solutions address the challenges that prevent the establishment of post-closure land uses on mined land to generate lasting economic, social or environmental value and offset the costs of managing ongoing liabilities.

"One of the emerging opportunities is for service providers to help facilitate the use of mines after the mine has closed by developing new productive uses there, whether that is a facility that gives value to the community, or a healthy ecosystem that provide benefits for the environment," Mr Banfield said.

"There are some really innovative solutions coming through in that space."

Transitioning a site beyond mining gives an opportunity to generate lasting social, environmental and economical value.

The transitioned land can be used for recreation and tourism, waste management, recycling, energy generation and storage.

Lake Kepwari in WA was created from the conversion of a coal mining pit, an open-cut mine pit in NSW has been converted into a bio-reactor landfill (dubbed the Woodlawn Eco-Precinct) and the Hannans North tourist mine in WA has been converted into a visitor attraction and educational site.

Technology and Mine Closure

Many companies are turning to novel technology-based solutions to help with closing a mine.

"We're seeing emergence of quite a few companies that are offering digital solutions that support more effective engagements or more effective planning," Mr Banfield said.

"We're also seeing companies use satellite or drone services to monitor revegetation on site and increase the success of that process.

"We are witnessing companies beginning to develop new solutions for on-site remediation of contaminants.

"These contaminants can vary significantly so there's a broad range of potential solutions that will be needed.

"A novel example that is being explored is the use of bio-based remediation solutions such as enzymes or plants instead of chemical treatments."

Not all of the required solutions are technology based. For example, there is a strong need for services that aid in post-closure land use transitions.

"To facilitate new land uses, we will need experts with an understanding of the challenges surrounding mine closure to turn their attention to identifying opportunities that match diverse land use opportunities - such as businesses or community facilities - with the unique characteristics of mined land assets to optimise their value after mining activities cease," Mr Banfield said.

When done correctly and smoothly, the transition back to a community can create assets that have ongoing benefit for communities. **AMR**



IMPORTANCE OF MINE REHABILITATION

BY ASHLEIGH DORRELL

New insights drawn from CRC TiME, CSIRO and mining industry databases project that around 240 mines are expected to approach closure in Australia by 2040.

It's important to note that mine closure and post-mine transition activities, including land rehabilitation as well as workforce planning, accomplish optimal environmental, social and economic outcomes.

The *Australian Mining Review* spoke with CRC TiME chief executive Dr Guy Boggs about the impact mine closure has on local communities as well as the process involved in rehabilitating a mine.

Part of the Federal Government's flagship Cooperative Research Centre Program, CRC TiME is a research organisation dedicated to examining and helping transform what happens economically, environmentally, socially and culturally after a mine closes and operations cease.

Impact on Communities

Determining the use of a mine once it's closed remains a challenge in the mining industry with the optimal use of the mine site varying based on factors such as location, community values and infrastructure.

"The first thing to recognise is that mines change communities," Dr Boggs said.

"They create jobs, they create new infrastructure, and they'll have permanent

or transitory infrastructure for those communities.

"One of the first things we need to say is *'what are the future economic opportunities beyond the mine, what do they look like for this region and what sort of implications do they have for the workforce that currently exists in that community.'*"

One such community where a lot of work is happening at the moment is in Collie, WA, where the State government is doing a lot of work to attract investment into that town to stimulate new economic opportunities and workforce development.

But there are still implications for what sort of jobs are created as part of these new industries and how they fit with the current skills – or even if there's a need for retraining.

"Most of our mines occur on the Indigenous estate and all should have a relationship to First Nations communities," Dr Boggs said.

"For First Nations communities, the cultural healing process that can be achieved through really great rehabilitation projects is incredibly valuable and important.

"We're finding in a lot of these closure projects, particularly the closure of mines that may have been authorised in a previous environment decades ago, might not reflect our values of today.

As every community is different, CRC TiME is researching how to understand the

communities that a mine is operating in.

Mine Rehabilitation Process

The process of planning to close a mine should begin before the initial design of the mine.

As every resource is finite, it might be the market that causes a mine to close or exhaustion of the resource or the ore body.

"We need to be planning for closure from well and truly before the mine has started," Dr Boggs said.

"It's important to start before the mine is even approved because it will affect how the mine is designed.

"Where the infrastructure is located or how the pit is designed might be influenced by the potential legacy of the mine."

For example, if the post-mine future use is as a pumped hydro storage facility, then the mine could be designed differently to enable it to catch water in a particular way, or the energy infrastructure could be built in a specific way so that it can be repurposed at closure.

Mine closure planning and delivery activities, including the creation of final landforms and rehabilitation, occur over the life of a mine.

Once mining is complete, intense closure activities, including the removal or transfer of mine infrastructure and other activities occur.

When the mine goes into closure process, the stages of rehabilitating the site and the landforms (backfilling pits) becomes a part of that process.

The aim is for the workforce to transition to new opportunities as the mine goes from operating to closure.

Over time, once rehabilitation and other activities are complete, the aim is for land to be available for new use.

Careful Closure of a Mine

As with everything, there are both positives and negatives to mine rehabilitation as well as what happens after mining ends.

"One of the issues — and I'm not underestimating how important it is — is we know that mining changes communities and changes landscapes," Dr Boggs said.

"When it comes to community, at the end of closure, there can be negative aspects associated with that.

"We will always need research and continual thinking about how we are minimising those impacts.

"We want to have a world-leading resources sector and, in the current climate, making sure that we meet our ESG commitments and are show up as responsible miners.

"We need to be able to demonstrate that we can rehabilitate, close and transition mines to a positive state at the end of it.



“From a risk management perspective, it’s really important that we do a good job to make sure that mining is trusted.” Dr Boggs then went on to add that innovation plays a key role in repurposing mining assets.

“We see land competition, particularly in this energy transition, and we’re seeing new elements of competition for land access between the mining industry and other sectors,” he said.

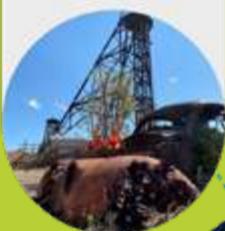
“Obviously, the closure process is a wonderful step where different sectors can start to connect, leading to mined land becoming part of a future energy project or integrated into agricultural projects.

“The other thing that we haven’t previously recognised and, which is really important to Australia, is that we’re seeing competition for land in areas we haven’t seen before.

“So there’s a great opportunity here – if we solve the rehabilitation closure issues – to get greater opportunity for land repurposing, reuse and shared use.”

AMR

Hannans North Tourist Mine
Kalgoorlie, WA
Historic gold mine converted into a visitor attraction and educational site.



Clean energy hub
Kidston, QLD
Gold mine under transition to develop renewable energy generation and storage site with solar, wind and pumped hydro technologies.
Image: Genex Power



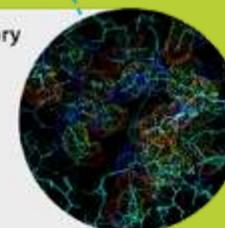
Woodlawn Eco-Precinct
Tarago, NSW
Open-cut mine pit converted into a bio-reactor landfill creating bio-gas to fuel a power generator. Site also holds aquaculture facilities, solar and wind farm.
Image: Veolia



Lake Kepwari
Collie, WA
Recreational lake that was created from conversion of a coal mining pit via local river diversion.
Image: CRC TIME



SUPL: Stawell Underground Physics Laboratory
Stawell, VIC
Laboratory located in an operational gold mine 1km underground, where conditions are optimal for research into dark matter, neutrinos and geoscience.





ENVIRONMENTAL SOLUTIONS:

ENVIROSTAY'S REVOLUTIONISING APPROACH

When it comes to environmental rehabilitation, few companies exhibit the level of innovation and commitment as Envirostay. Specialising in rehabilitation, erosion control and sediment solutions for the civil, mining, and construction sectors, Envirostay has emerged as a leader in sustainable practices in these industries which are often plagued by environmental challenges.

Envirostay's hydromulching and hydroseeding services are at the core of their offerings. Hydromulch is used for mine site revegetation, roadside rehabilitation and soil stabilisation on steep embankments. Hydroseeding, on the other hand, is commonly used for flat or gently sloping sites for revegetation purposes. These services are tailored to specific project needs, ensuring both effectiveness and environmental sustainability.

Complete mine rehabilitation is a special-

ised area where Envirostay excels, focusing on sustainable methodologies, microbial soil rebuilding systems and carbon sequestration rehabilitation solutions. Their approach includes a thorough assessment of the project area, followed by the implementation of a turnkey solution. Envirostay incorporates the latest scientific developments into their practices, utilising specially formulated soil amelioration products and soil microbe inoculated hydromulch blends. These products are designed to rehabilitate disturbed areas post-mining, accelerating ecosystem recovery.

One notable area of expertise is tailings dam capping, where Envirostay's mineral microbe soil building technology can reduce the amount of topsoil required for capping. They also offer a range of soil binding polymer solutions for short and long-term dust suppression on tailings facilities and stockpile stabilisation. These



solutions can be applied using spray trucks, helicopters, or fixed-wing aircraft, providing versatile options for every individual project requirement.

Envirostay is also a certified installer of GeoSpray; a revolutionary product used for non-structural stabilisation of embankments and control of erosion and sediment. GeoSpray forms a tough and flexible membrane that binds to the soil, guarding against erosion within 12 hours of application and remaining effective for up to 20 years, depending on rate of application. This is applied using specialised machinery and is used for a range of solutions including, erosion and weed management of explosive bund embankments, clean water diversion drains and erosion protection of drains and embankments.

Perhaps the most important aspect of Envirostay is their commitment to offering a complete project management solution for rehabilitation and erosion control projects - beginning to end. This includes overseeing projects from inception to completion and providing post-project monitoring to ensure environmental goals are met and exceeded.

In conclusion, Envirostay represents a paradigm shift in environmental solutions. Their innovative approach, commitment to sustainability, and comprehensive services set them apart as a leader in the field. As environmental concerns continue to grow, companies like Envirostay are paving the way for a more sustainable future. **AMR**

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MINING INDUSTRY GETS GREENER WITH BIOGROWTH'S CARBON CAPTURE TECHNOLOGY

The Australian mining industry faces a pressing challenge: achieving net zero emissions by 2050, as set out in the Minerals Council of Australia's Climate Action Plan. Carbon capture is a crucial element of this fight, and EnviroStraw's BioGrowth program and product line is emerging as a game-changer.

BioGrowth isn't your typical carbon capture solution. Instead of focusing on capturing emissions at the source, it tackles the problem at the ground level – literally. This innovative program utilises beneficial soil microbes to sequester carbon in the soil. By regenerating depleted soil, BioGrowth offers a multitude of benefits for mining companies working towards their ESG (Environmental, Social, and Governance) goals.

How BioGrowth captures carbon and benefits miners

EnviroStraw's BioGrowth program is specifically designed for remediating and revegetating mine sites with disturbed and depleted soil. It utilises a unique blend of microbes that promote healthy plant growth which in turn, absorb atmospheric carbon dioxide through photosynthesis, and the microbes then store the captured carbon in the soil. This process offers a multitude of advantages for mining companies:

- **Reduced carbon footprint** - by promoting carbon sequestration, BioGrowth helps companies significantly reduce their overall carbon footprint. This reduction translates to lower compliance costs

under carbon pricing schemes and demonstrates a strong commitment to environmental sustainability.

- **Revenue generation** - the captured carbon can be converted into tradable carbon credits, creating a new revenue stream for mining companies. This revenue can help offset the costs of land revegetation and contribute to the project's overall profitability.
- **Enhanced reputation** - adopting BioGrowth's program can serve as a tangible demonstration of a company's commitment to environmental sustainability. This not only helps in meeting regulatory requirements and achieving ESG (Environmental, Social, and Governance) goals but also enhances

a company's reputation among consumers, investors, and other stakeholders who increasingly value sustainability.

Beyond carbon capture: additional benefits of BioGrowth

BioGrowth's advantages extend beyond carbon capture and include economic and environmental multipliers. Promoting healthy plant growth significantly improves soil health and helps reduce erosion. This not only benefits the environment but also promotes cost savings through limiting costly reworks. BioGrowth's focus on economic and environmental sustainability makes it a compelling solution for the mining industry's path towards net zero emissions.

AMR



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NAVIGATING THE ESG LANDSCAPE IN MINING:

CHALLENGES, PARTNERSHIPS AND THE PATH TO PREMIUM VALUATION

The growing emphasis on Environmental, Social, and Governance (ESG) criteria in the mining sector underscores the industry's shift towards sustainability and responsible investment, however, integrating ESG practices comes with its challenges, particularly for companies aiming to balance profitability with environmental stewardship and social responsibility.

Choosing the right partner for ESG assessment and ensuring a cost-effective transition are critical steps for mining companies.

The Challenge of ESG in Mining

The primary challenge in implementing ESG practices within the mining sector is the inherent environmental impact associated with mining operations, including land degradation, water pollution, and greenhouse gas emissions. Social challenges, such as labour rights and community relations, also present significant hurdles.

Additionally, governance demands transparency, ethical business practices and compliance with an ever-evolving regulatory landscape.

Choosing the Right ESG Partner

Selecting an ESG partner with a robust understanding of the mining industry's unique challenges is crucial. The ideal partner should offer:

- **Expertise in the mining sector:** Knowledge of specific environmental and social issues related to mining.
- **Comprehensive ESG services:** A range of services from initial assessment to strategy implementation and monitoring.
- **Global and local regulatory knowledge:** Understanding of both international ESG frameworks and local regulations.
- **Technology-driven solutions:** Use of technology for tracking and reporting ESG metrics.

The Benefits of ESG Compliance

Despite the challenges and initial costs, ESG compliance offers numerous benefits:

- **Risk Management:** ESG practices help identify and mitigate environmental and social risks, potentially saving costs related to legal issues, remediation and reputational damage.
- **Investor Attraction:** Increasingly, investors are prioritising companies with strong ESG records, recognising them as better long-term investments.
- **Market Access and Premium Pricing:** Companies leading in ESG can access new markets and may command premium pricing for their products, as consumers and partners are willing to pay more for sustainably sourced minerals.
- **Operational Efficiency:** ESG initiatives often lead to more efficient operations, reducing waste and energy consumption, which can offset the costs of ESG compliance.

For mining companies, the journey towards ESG compliance is both a challenge and an opportunity. The costs associated with ESG assessments and implementing sustainable practices are counterbalanced by the benefits of risk mitigation, operational efficiencies, and the potential for premium product pricing.

Choosing the right ESG partner is a crucial step in this journey, enabling companies to navigate the complexities of ESG compliance effectively. As the market continues to evolve, those companies that proactively embrace ESG principles are likely to find themselves at a competitive advantage, attracting investment and securing their position in a more sustainable and responsible mining future. **AMR**



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RESPONSIBLE MINING IS NOT A DISTANT ASPIRATION

Author: Andres Quijano, Envirosuite Sales Manager - Americas at Envirosuite
 Andres Quijano has over 15 years of experience providing hardware and software solutions to environmental professionals. He's been on a mission to enable sustainable mining operations at some of the world's most complex sites for the past decade.



Envirosuite provides mining operators with digital solutions to demonstrate responsible practices and gain operational flexibility.

In an era where environmental stewardship and ethical practices take center stage, the mining industry is currently moving towards a transformative shift towards Responsible Mining in order to meet increased supply demands.

The global mining industry stands at a crossroads, facing challenges and opportunities that will shape its trajectory for decades to come. To ensure a prosperous future for mining and deliver meaningful results to shareholders, communities, and regulators, a decisive action plan is needed. This action plan hinges on the adoption of Responsible Mining practices, which has the potential to trigger a once-in-a-generation reset of regulatory policy and community expectations.

The numbers suggest an increasing need to demonstrate responsible mining practices

According to statistics in our latest white paper on Responsible Mining:

- Over the next 10-15 years, we can expect a global shortage of critical minerals
- 9/10 institutional investors say they factor ESG and sustainability into decisions.
- 67% of institutional investors feel they have a "responsibility to invest sustainably"

A once-in-a-generation reset for the mining industry to take on ESG and sustainability requirements

The adoption of Responsible Mining practices will continue to be a foundation of strategic milestones for the mining industry as it moves forward into a rapidly changing world. There is a currently a once-in-a-generation opportunity to fundamentally reset within the prevailing regulatory landscape and set a new bar for stakeholder expectations.

This paradigm shift is not just about meeting increasing ESG requirements but about embracing a profound com-

mitment to transparency, sustainability, and ethical practices. Mining companies are presented with the chance to reposition themselves as leaders in responsible resource management, setting new industry standards that prioritise environmental preservation and social responsibility. This transformation extends beyond short-term gains; it is a strategic move that secures the industry's long-term viability.

By embracing Responsible Mining, producers can demonstrate their unwavering dedication to sustainable practices, fostering trust and credibility among regulators, local communities, and stakeholders. Mining companies can forge meaningful partnerships that empower local inhabitants and preserve their cultural heritage.

The journey to Responsible Mining is not just one of compliance requirements; it is a proactive commitment to shaping a brighter and more responsible future for the industry while safeguarding the

Earth's precious resources for generations to come.

Today's mining operators remain focused on staying within imposed limits in order to avoid costly stoppages. Despite these measures, a variety of challenges at a mine site can hinder efficiency and lead to a constant struggle of balancing productivity targets against compliance thresholds.

Learn more about how the leading mining companies are bridging sustainability commitments and delivering results in Envirosuite's latest white paper "*Extracting a better future*". **AMR**



SCAN THE QR CODE OR CLICK HERE TO GET A COPY OF THE WHITE PAPER

Extracting a better future



How leading mining companies are bridging sustainability commitments and delivering results



Scan to download the white paper





FORTESCUE AND THE ROAD TO REAL ZERO

BY ASHLEIGH DORRELL

(Image source: Fortescue) Eliwana processing plant.

Greenhouse gas emissions are one of the main causes of global warming and according to the CSIRO's June 2023 update, Australia emitted 465.2mt of carbon dioxide equivalent, a 0.8% increase compared to June 2022.

Energy production is the largest contributor with energy (burning fossil fuels) and stationary energy (mining, manufacturing and residential) contributing to 32.6% and 22.3% of the total emissions, respectively.

Mining giant Fortescue (ASX: FMG) is just one of Australia's many mining companies aiming to reduce its carbon footprint and is leading the sector regarding its response to customer, community and investor expectation to reduce and eliminate carbon emissions.

The company's Eliwana mine in WA is on track to become the company's first site to go green through its deployment of renewable energy generation and battery storage, followed by the deployment of a zero-emission mining fleet.

The *Australian Mining Review* spoke with Fortescue general manager Eliwana,

Vanessa Forster, about the company's Eliwana mine and the shift towards electric vehicles.

"Eliwana will be one of the first of our sites to go green as we not only move toward electric excavators and battery electric haul trucks, but also through powering the site with green energy," she said.

"This will mean the whole operational ecosystem, including forklifts, lighting plants, light vehicles, floor sweepers, generators and beyond will all eventually be powered by green energy."

Beginning operations in December 2020, Eliwana produces a premium high-grade hematite product — known as Western Pilbara Fines — which complements the company's Fortescue Blend.

The mine includes a 30mtpa dry ore processing facility and 143km of rail which links the mine to the Hamersley rail line. The ore processing facility and dual stacker reclaimer means Eliwana has the capacity to direct load onto trains up to 9000tph.

Eliwana is now producing at an annualised run rate of 30mtpa, contributing to

Fortescue's low-cost status and providing greater flexibility to capitalise on market dynamics.

Green Revolution

After releasing its decarbonisation roadmap in September 2022, Fortescue aims to reduce operating costs by eliminating spend on diesel, natural gas and carbon offsets.

"In executing our roadmap, we are using well-established technologies and, in some cases, using those technologies in new ways," Ms Forster said.

"We believe battery electric, green hydrogen and green ammonia will be critical, and we are taking practical steps to apply the best solution to each different situation.

"Eliwana will be one of our first sites to transition to real zero.

"Real zero means no fossil fuels, and where possible, no offsets."

In October 2023, Fortescue received its first T 264 haul truck at Eliwana from Liebherr, forming part of a deal for the

supply of 120 zero emission T 264 trucks to be deployed to Fortescue by 2030.

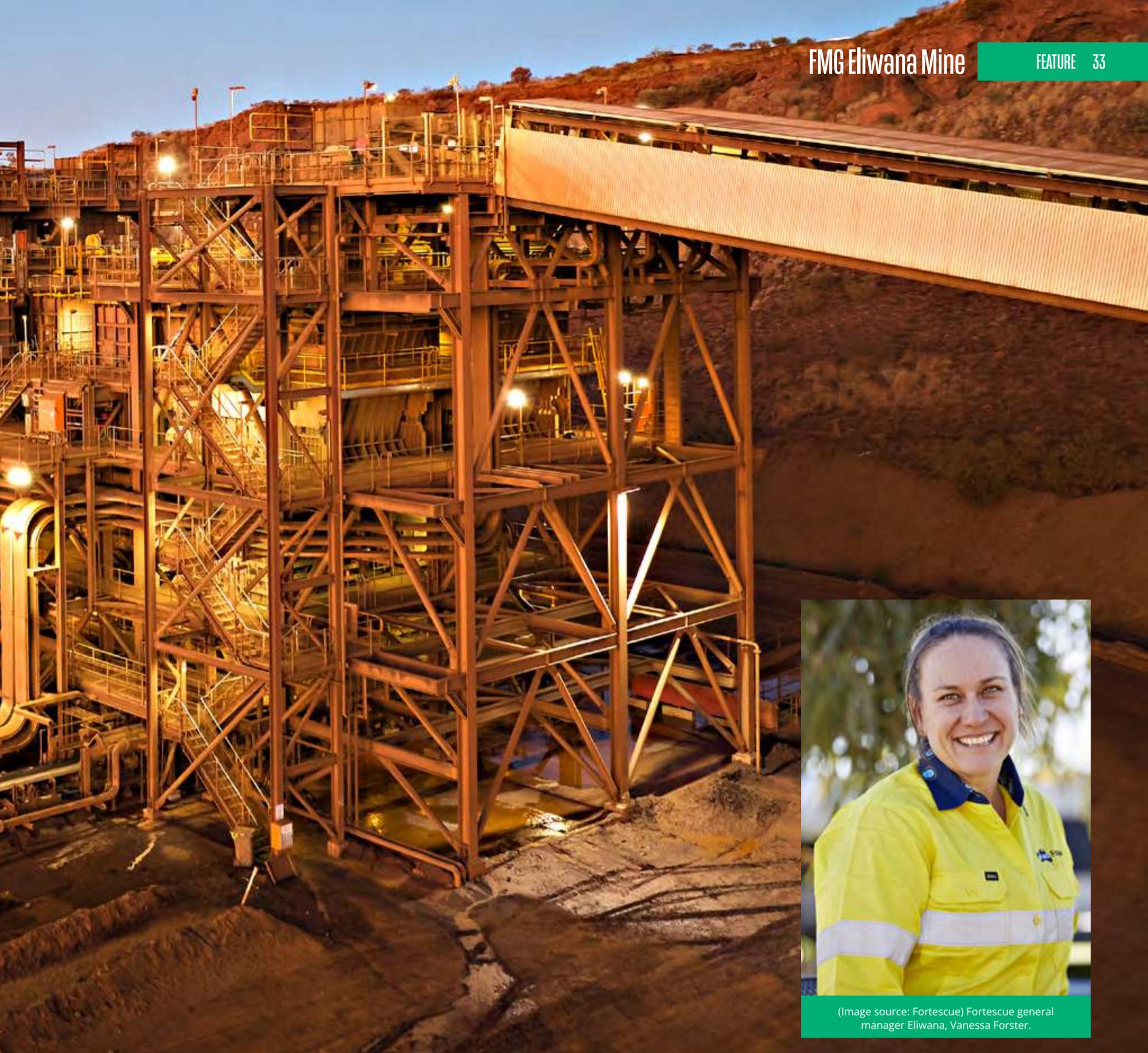
The first trucks will be diesel powered and converted to Fortescue's in-house battery solution — developed by Fortescue WAE — before the end of the decade.

"The Pilbara Energy Connect (PEC) project, together with the Chichester Solar Gas Hybrid Project, will deliver up to 25% of our daytime stationary energy requirements from solar power by FY25," Ms Forster added.

"The project will enable renewable electricity generated at any of Fortescue's sites to move between our operations in Port Hedland, Iron Bridge, Cloudbreak, Christmas Creek, Solomon and Eliwana, via over 500km of transmission lines."

In late 2023, construction began on a 132km transmission line and a 220kV substation to connect Solomon and Eliwana.

The transmission line and substation will be used to electrify Eliwana's mining fleet with the grid connection allowing the mine to receive renewable energy by the end of 2025.



(Image source: Fortescue) Fortescue general manager Eliwana, Vanessa Forster.

Transition to Battery System Haul Trucks

In March 2022, Fortescue acquired Williams Advanced Engineering (WAE), giving the company critical technology and expertise in high-performance battery systems and electrification.

The acquisition enables the company to develop the zero emission battery solutions needed to decarbonise its mining fleet.

“Last year, we deployed our first battery electric haul truck prototype, Roadrunner, to our Christmas Creek operations for site-based testing,” Ms Forster said.

“Integrated with a 1.4MWh prototype power system, Roadrunner is the only surface mining truck capable of fast charging in 30 minutes and storing regenerated power as it drives downhill.

“As part of this testing, we are gaining insights that will be incorporated into our future zero emissions haul truck fleet.”

Fortescue plans to have its first battery electric production trucks operational in the Pilbara during 2026. **AMR**



(Image source: Fortescue) Haul trucks at Eliwana.

COLLINSVILLE

READY TO RIDE AS COMMUNITY 'PUMP' BIKE TRACK BUILD DATE ANNOUNCED



The location of Darcy Munro Park in Collinsville, Queensland.

DARCY MUNRO PARK PUMP TRACK



Collinsville in Queensland will be “pumping” thanks to Bowen Rail Company and construction of a new \$300,000 bike track for local bike riders, scooter enthusiasts, and skateboarders.

Whitsunday Regional Council has announced that works on the Darcy Munro Park Pump Track will begin on 2 April, with stage one of the four-stage circuit expected to be ready for locals young and old to showcase their riding, cornering, and jumping skills by early May.

Bowen Rail Company has fully-funded the first stage of the bike track, which is a circuit designed for users to apply a push-and-pull technique rather than pedalling to make their way over a series of rollers, jumps, and berms. Council will manage the construction works.

Bowen Rail Company general manager Brendan Lane says the business is excited to see such a safe, active, fun, and social community asset built for the people of Collinsville.

The funding for the project is part of a 2019 Infrastructure Access Agreement signed with Council for the construction of the Carmichael Rail Network (CRN).

The CRN entered operation in early 2022 and connects the Carmichael mine to

Aurizon’s Newlands System about 70km south of Collinsville.

“We wanted the construction of the Carmichael Rail Network to leave a positive legacy in Collinsville beyond the significant economic benefits of employing locals and awarding contracts to local businesses, or having rail workers spend their wage in local hotels, stores, and pubs,” Mr Lane said.

“Better playground equipment and new and more diverse activities for older kids were two things that resonated loudly in the 2021 Collinsville Masterplan, and the Pump Track is a perfect fit.

“The beauty of this new addition to Darcy Munro Park is it will be accessible to everyone, young or young at heart, and a toddler on a balance bike will benefit as much as an X-Games superstar.

“We’re deeply grateful for the incredible support we’ve received from Collinsville and the greater Whitsunday region as we’ve built our railway and grown from a startup to a thriving rail operator.

“Our team can’t wait to see their friends and family out there shredding around enjoying the Pump Track - and having a crack on it themselves.”

Whitsunday Regional Council Capital

Program and Network Planning director Adam Hagy says detailed design of all four stages had been completed, with each adding new levels of challenge.

“We have the full picture of what the finished product looks like and we’re confident the design will provide fun, challenge, and learning for years to come,” he said.

“Naturally, stage one is most suitable for beginners and intermediates to get a foothold as stages two through four come online.

“The timing of stages two through four will be subject to future budgets, and incremental development will ensure the facility grows with the community.”

About Bowen Rail Company

The Bowen Rail Company (BRC) is a Queensland rail freight business launched in August 2020.

Headquartered in Bowen, North Queensland, BRC combines world-leading technology with clever solutions to transport Queensland’s high-quality resources for export to the world.

BRC’s GT46C-ACe Gen III locomotives help its local workforce work more efficiently,

safely, and with a smaller environmental footprint.

Its first customer was Bravus Mining and Resources’ Carmichael mine.

BRC operates on the Carmichael Rail Network, a 200km railway connecting the Carmichael mine 160km northwest of Clermont in central Queensland to the Newlands Rail System.

The company transports high quality coal from Carmichael to the North Queensland Export Terminal north of Bowen.

Here, Carmichael coal is exported to nations around the world where it is used alongside renewables to help lift people out of energy poverty while at the same time reducing emissions intensity as the world transitions over coming decades to a low carbon future.

The Carmichael Rail Network was built as part of the Carmichael mine and rail project, through which more than \$2b was paid to regional Queensland contractors and businesses.

Both Bowen Rail Company and Bravus Mining and Resources are part of the Bravus group of Australian businesses delivering integrated energy and infrastructure services. **AMR**



FULL STEAM AHEAD FOR YANGIBANA

BY KATE DZIENIS

Hastings Technology Metals Limited's (ASX: HAS) owned Yangibana project is a world-class rare earths deposit located about 250km north-east of Carnarvon in the Gascoyne region of WA, producing a mixed rare earth carbonate (MREC) containing primarily of neodymium (Nd) and praseodymium (Pr).

The project includes 650sqm of tenement package covering an area known as the Gifford Creek ferrocarnatite complex and, since its discovery in 2014, it has progressed steadily from exploration to construction with expected production to begin by Q2 CY25.

More than a year ago, in January 2023, Hastings Technology Metals took 100% ownership of Yangibana, which now comprises several significant deposits across the tenement holdings including Bald Hill, Frasers, Yangibana West, Yangibana and Auer deposits.

Operations

There are two stages of development planned for the Yangibana project, with Stage 1 focused on the mine and beneficiation plant to produce rare earth concentrate and Stage 2 to see a hydrometallurgical plant constructed to process the concentrate into MREC.

Mining operations will consist of open pit mining including conventional drill, blast, load and haul with an estimated ore feed of 1.1mtpa into the processing plant.

The mined ore will be processed through a circuit of crushing, grinding, floatation, tailings and handling with an output of up to 37,000tpa of rare earth concentrate at 27% TREO.

Once Stage 2 is completed, the Yangibana plant will have an output of up to 15,000tpa of MREC at 59% TREO to be shipped to customers for further downstream processing into NdPr oxides.

Once operational, the Yangibana project will support production of around 3,400tpa of NdPr for use in rare earth magnets over its initial mine life of 17 years.

Half Year Results

In H1 CY23, significant progress was achieved across development works for Yangibana.

Construction of critical non-processing infrastructure was finalised, including the practical completion of the Kurrbili accommodation village, comprising 294 rooms, kitchen, messing facilities, medical centre, administration buildings, sports courts and landscaping.

Airport facilities at the Yangibana Airstrip were also completed.

In December 2023, Hastings received delivery of the first piece of major long-lead equipment for the beneficiation plant, with the shell of the SAG mill arriving at the Port of Dampier.

At 31 December 2023, \$142m had been spent on non-process infrastructure and long-lead equipment for the beneficiation plant.

Before that, Hastings announced an increase in the capital cost estimate of Yangibana's Stage 1 to \$503m.

This increase was due to requirements to install a concentrate dryer to meet product moisture content specifications, as well as additional holding costs due to changes in the funding and production schedule.

The remaining capital cost is estimated at \$361m, with \$142m already invested in early works as of 31 December 2023.

High Demand

The materials due to come from the Yangibana project are used in the manufacturing of permanent magnets,

a key component in new and upcoming technology including renewable energy wind turbines and electric vehicles. Permanent magnets are the strongest magnets available and are key to the efficient conversion of electrical energy into motion.

According to Hastings, by 2032 anticipated global rare earth magnet demand is forecast to outstrip supply by the equivalent of 13 times the projected NdPr output of Yangibana – this means the demand for permanent magnets used in electric vehicles and wind turbines is expected to grow at a compound annual growth rate of 7.8% in the next 10 years.

Other demand sources for permanent magnets include robotics, consumer electronics, industrial applications and air conditioning.

Hastings predicts the demand for rare earth elements – in particular NdPr – will far exceed current production rates by 2025, resulting in a sizeable supply gap growing to 2032.

Hastings is confident that its first concentrate from Yangibana, expected in Q2 CY24, will meet the increase in demand. **AMR**



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MAKING IT EASIER

RIO PAVING THE WAY OF THE FUTURE:

GUDAI-DARRI MINE

BY KATE DZIENIS



(Image: Copyright © 2023 Rio Tinto) The solar plant powering Gudai-Darri in the Pilbara, WA.

Previously known as the Koodaideri mine, Rio Tinto's (ASX:RIO) Gudai-Darri mine in the Pilbara region of Western Australia is the company's first greenfield mine and the most technologically advanced, allowing for a predicted mine life of more than 40 years.

Construction on the site began in April 2019, supporting more than 3,000 jobs during the construction and design phase. Located on land belonging to Traditional Owners, the Banjima People, the mining giant said it had consulted with them and with the Yindjibarndi People through the planning and development stage of the mine.

Rio Tinto's initial \$2.6b investment was disrupted by supply chain issues and the Covid-19 pandemic (labour shortages), leading to a \$4.3b increase in capital cost estimates.

It wasn't until June 2022 that first ore was produced.

Despite the disruptions, Rio Tinto chief technical officer Mark Davies said in June

2022 that, "the safe and successful delivery of Gudai-Darri, in the midst of a global pandemic, is testament to the resilience and hard work of thousands of Rio Tinto employees and contractors, including a range of local WA suppliers, as well as Pilbara Aboriginal businesses".

A total of \$3.2b in goods and services were sourced within WA during the construction phase of Gudai-Darri with contracts valued at \$1.5b.

Contracts were awarded directly to WA-registered businesses including NRW, Primero, DTMT Construction Company, Southern Cross Electrical Engineering and Monadelphous Engineering Associates.

This included more than \$100m awarded directly to local Aboriginal businesses including White Springs, Lorrex Contracting, Hicks Civil & Mining, Brida, Karijini Development, Yurala Contracting Services and Karlka FenceWright WA.

Fourth Quarter Results

In the company's fourth quarter production results released on 16 January

2024, Rio Tinto said iron ore production of 331.5mt last year was 2% higher than 2022 while sales of 331.8mt (on a 100% basis) were 3% or 10mt higher and the second highest on record.

For the December quarter, Rio Tinto shipped 86.3mt of iron ore from its Pilbara mines down slightly from, 87.3mt a year ago.

Rio said the performance was due to improved productivity supported by ongoing implementation of the company's Safe Production System, including the ramp up of its Gudai-Darri mine to nameplate capacity of 43mtpa, within 12 months of commissioning, which more than offset mine depletion.

Rio Tinto chief executive Jakob Stausholm says real progress is shaping the company's portfolio for the future.

"There is good demand for the materials we produce, and our purpose and long-term strategy make more sense than ever...the work we are doing today is creating a stronger Rio Tinto for years to

come, as we invest in profitable growth while continuing to deliver attractive shareholder returns," he said.

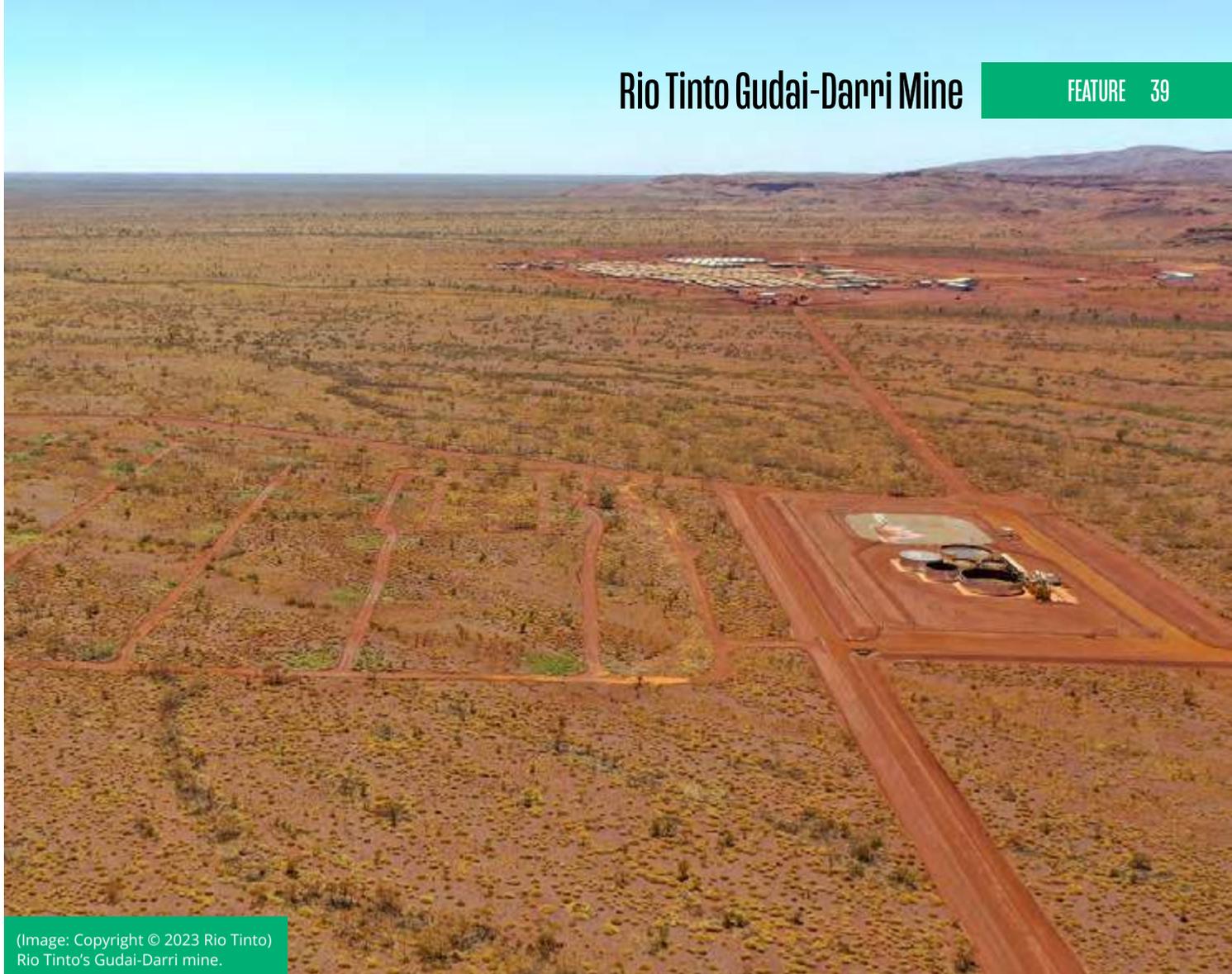
Technological Advancement

Gudai-Darri's unprecedented use of technologies is taking the mining industry to a whole new level.

The optimisation of mine safety and increasing productivity is the driving force behind the use of high-tech robotics and autonomous vehicles, with Rio Tinto being a driving force of major changes to how mining is done across the country, and indeed the world.

In October 2023, Rio Tinto managing director of Pilbara mines Matthew Holcz praised the technological innovations at Gudai-Darri on the back of news that planned capacity increase will be achieved through upgrades within the plant.

"What we have learnt during the rapid ramp-up of Gudai-Darri has given us the confidence to find better ways to increase capacity at our newest and most technologically advanced mine," he said.



(Image: Copyright © 2023 Rio Tinto) Rio Tinto's Gudai-Darri mine.

Gudai-Darri features an unprecedented deployment of technology, including the use of robotics for the ore sampling laboratory as well as for distribution of parts in their workshop.

It is revolutionary, and it is mining innovation at its finest.

The mine site has 26 CAT 793F autonomous haul trucks, three CAT MD6310 and two MD6250 autonomous drills, with the trucks implementing real-time ore tracking using sensors to provide live dig face progression.

There are also plans to advance the development of zero-emissions autonomous haul trucks, and once that's complete, it's anticipated that the world's first operational deployment of Caterpillar 793 zero-emissions autonomous haul trucks will be at Gudai-Darri.

The technology doesn't stop there though. The world's first autonomous water

carts are also at the site, used for dust suppression to enhance productivity by enabling mine operations to digitally track water consumption and reduce waste, whilst the AutoHaul™ autonomous train, fully operational in mid-2019 is monitored remotely by operators from Rio Tinto's operational centre in Perth – more than 1,500km away.

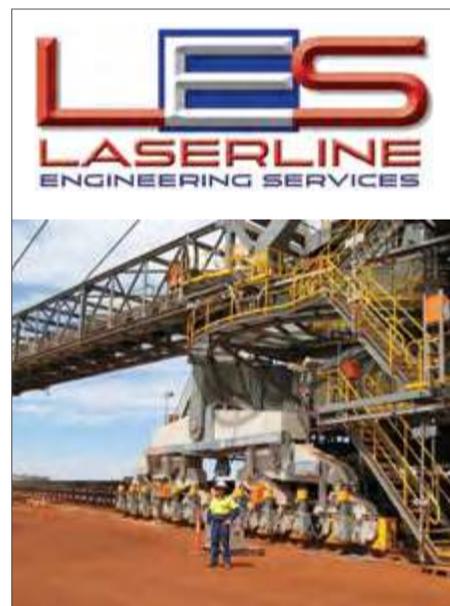
The company has also invested in a rotatable bucketwheel reclaimer, a fully automated and integrated robotic ore sampling laboratory with the help of Rocklabs powered by Scott, and a solar farm consisting of about 83,000 solar panels made up of photovoltaic cells – expected to supply about one-third of the mine's average electricity demand once fully commissioned.

The Future Of Mining

Gudai-Darri represents what is possible and what is achievable in the mining industry, leading the charge for the deployment of automation and advanced

technology, while exhibiting the state's capabilities in technological innovation.

With the mine using advanced data analytics in conjunction with automation, Rio Tinto's Gudai-Darri is the prime example of a mine living in the future. **AMR**



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(Image: Copyright © 2023 Rio Tinto) A steel beam rail bridge at the Gudai-Darri mine.



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REAZ CONTINUES TO EXPAND OPERATIONS ACROSS AUSTRALIA

Electrical engineering solutions provider REAZ Australia continues to see increased demand across Australia with its range of products and services proving to be particularly popular in the mining sector.

The company now has teams operating in Queensland, New South Wales, Western Australia, South Australia and the Northern Territory.

REAZ offers a plethora of IECEx certified explosive proof equipment ranging from lights, warning systems and air conditioning to isolators, junction boxes and safety IS barriers, ensuring the safety of personnel and equipment within a hazardous area of any kind.



Reaz director Andrew Zupo said: "We are the sole distributors of Wolog & INVT, Lanbao, who are world leaders in low voltage motors, drives & sen-

sors, which are becoming more widely used in mining and water applications."

"We are also seeing our range of Low Harmonic VSD's gaining popularity because of their energy saving capabilities."

REAZ, which started in 2008 as a single man operation in Victoria, has since grown into a highly successful business, now comprising of a team of sales staff and highly trained engineers working across the country.

REAZ Australia, which offers a wide array of electrical and mechanical engineering products including motors, drives, IECEx hazardous area EX equipment and sensors suitable for a wide range of applications within the commercial, manufacturing and mining sectors, continues to expand its product range.

The company also carries out extensive testing and evaluation of products prior to their introduction to REAZ products portfolio.

"We stock and supply an extensive range of LV and MV motors, drives, soft starters, switchgear, LV and MV supply transformers, PM Motors and Drives, Safety Light



Reaz supply Wolog motors which have one of the best track records in terms of motors for hazardous and non-hazardous atmospheres.

In a sector where safety, reliability, efficiency, and minimum downtime are the top priority, our motors rank amongst the market leaders in electric motors and drives for high and low voltage applications.

Curtains and Scanners - machine safety devices, Switchboards, as well as PLC and HMI equipment," Mr Zupo said.

"REAZ values building strong relationships with its manufacturers and vendors ensuring that REAZ can provide the highest degree of support to its customers.

"We are also capable of providing our engineering and programming services and

our team of trained engineers are always fit for the task.

"We are your complete Automation Warehouse and Support."

For more information
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Our aim is to empower our drive and automation customers towards globally recognised superior products and to be an organisation that reflects quality and reliability.

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YURALA:

THE PILBARA'S FASTEST GROWING INDIGENOUS-OWNED CIVILS BUSINESS



Proudly established by the Smith Family in 2013, Yurala is a rapidly growing civils company, quickly becoming the most successful Indigenous owned business in the Pilbara Region of Western Australia.

As a 100% Indigenous owned business, Yurala was founded on the vision to exponentially increase Indigenous employment and making a positive contribution to the Pilbara community and surrounding areas.

The family expanded this vision with the development of Yurala Welding in 2018, offering great opportunities for the employment of trade assistants, welders, boilermakers, and apprenticeships in the specialised area of welding and fabrication.

We provide opportunities for success in the mining industry and are continuously inspired by our families' beliefs of working independently.

As a family owned and operated business, we take pride in what we do, and are committed to developing lasting relationships with our clients. Yurala is a company where you can expect strong leadership, promotion of governance and best practice.

Civil Work

Yurala specialises in civil earthworks, providing a range of services to the mining and civil industries across WA and Australia. Our team of highly skilled professionals have the expertise to support and resource small and large-scale projects, and are committed entirely to building capacity and maximising productivity.

Through our direct experiences in managing projects, we focus on timely project delivery based on quality outcomes and exceeding all our clients' expectations thanks to our high standards of safety and industry-leading systems.

We understand the high pressure

environment that comes with mining and civil industries, and in doing so cater to all our clients' unique needs. You can trust our in-depth experience, precise approach and track record to deliver your project that meets the highest standards of quality and integrity following all safety guidelines and timely outcomes.

The team at Yurala provides high level project management skills and experience delivering:

- Detailed bulk earthworks
- Road surface upgrades and road maintenance
- Site embedded services
- Site rehabilitation and remediation
- Road construction
- Airport refurbishment

Gudai Darri Project

Since 2021, Yurala has been supporting Rio Tinto's operations by having a permanent presence on the mine site, delivering regular and ad-hoc services for a number of projects, including:

- The collection and delivery of blast ore samples
- Maintaining unsealed roads and dust suppression
- Maintenance of signage and demarcation
- Landfill management
- Crushing and Screening stemming products
- Ad-hoc general site civil works
- Ad-hoc site embedded works

At Yurala, we are adept in helping to bridge the gap with our clients and Aboriginal people, and supporting business development and sustainability.

To discuss how we can meet your project requirements, get in touch with us today.

FOR MORE INFO
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KARLKA FENCEWRIGHT

PROVIDING ITS SERVICES TO GUDAI-DARRI



Established in 2010, Karlka FenceWright is a 100%-owned Indigenous business which offers both supply and installation services of security fencing products and materials across Australia. Karlka FenceWright are 100% owned by the Karlka Nyiyaparli Aboriginal Corporation RNTBC who are the Registered Native Title Body Corporate for the Nyiyaparli people.

With extensive experience across sectors, Karlka FenceWright offer tailored security fencing solutions to their clients, along with unmatched quality, expertise and customer services.

With triple ISO certification (ISO9001, ISO14001 and ISO45001) and more than 10 years of mining experience, Karlka FenceWright understand their clients' needs and requirements.

To ensure all projects are completed on time and to the highest standard, strict systems and processes are in place to ensure the safety of staff throughout the project term.

All materials are produced in their Malaga facility, with AUS MADE certification received for their manufacturing process. This in house manufacturing allows Karlka FenceWright to work closely with clients to customise products which meet project specifications.

Karlka FenceWright also offer maintenance services to new and existing fencing assets.

Gudai-Darri

Beginning production in 2022, the Gudai-Darri iron ore mine is Rio Tinto's newest and most technologically advanced mine, sitting on Banjima country and hosting

a suite of technological innovations including autonomous trucks, drills, water carts and trains, and a solar farm just to name a few.

The project reached its planned annual production capacity of 43mt less than 12 months from first ore and Rio is now looking to increase production capacity to 50mtpa.



Karlka FenceWright was approached by Worley Parsons and provided the package to tender on. The company visited the site several times to identify the scope and ensure the bid was inclusive of all project requirements.

Under the contract, Karlka FenceWright were engaged to supply and install just under 300km of stock fencing with a variety

of custom gates and specialised floodway fences along both sides of the new rail alignment. The fence included customised bat prevention disks which were installed along the alignment to reduce the risk of bats being caught or injured in the fence. This fence is the primary prevention for cattle and wildlife entering the rail corridor and is critical to rail operations.

Other Partnerships

As a tier one fencing company, Karlka FenceWright has operated on a wide range of projects and has worked with the likes of BHP, Roy Hill, FMG, Mineral Resources and AngloGold.

Previous projects that Karlka FenceWright has worked on include:

- Coolawanyah Station Fencing – Rio Tinto
- Newman Village Fencing Upgrade – BHP
- Boolgeeda Airport – Sodexo
- Bunbury Outer Ring Road – Southwest Gateway Alliance
- Harold E Holt Naval Base – Halston Construction
- Canningvale Substation – JLL
- Yandi Mine – BHP
- Kers Bore Aerodrome – CSI Mining
- Hedland Terminal Substation – Horizon Power
- Delamere Defence Base – Lendlease

With a constant focus on innovation, improvement and progression, Karlka FenceWright focus on their clients' requirements and tailor solutions that meet the needs of the project. The team goes above and beyond to provide advice and assistance throughout the project timeline. **AMR**



Specialists in the supply and installation of fences and gates

Combining technical expertise with quality fencing products and safe, innovative installation techniques, Karlka FenceWright delivers security fencing solutions safely with a level of professionalism unmatched by its competitors.

Whether it is an urgent fencing repair that needs to be completed today or several kilometres of security fencing in a remote location, Karlka FenceWright's professionalism, expertise and project management systems ensure that all projects are completed safely on-time, on-budget and to the highest standard possible.



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EXCEPTIONAL TECHNOLOGY WITH ROCKLABS



Scott Technology's mining business Rocklabs, have been in the automation and robotic solutions industry for 55 years, providing the highest quality sample preparation equipment for mine sites globally.

As one of the very few sample prep businesses that has in-house engineering and manufacturing, our service capabilities are designed on a global scale, with our footprint of distribution networks in more than 100 countries and a dedicated team of 21 agents across the world to ensure clients have personalised service and reliability for parts.

Since 1969, we've been a global innovator in the sample preparation field, and our dedication to excellence plays a central part in the success of world class companies in the fields of metals and minerals research, mining, and exploration.

Mining & Sample Preparation

The production machinery we design and build at Rocklabs delivers productivity gains and exceptional reliability to many of the world's leading companies. With mine sites moving the human element away from on-site machinery to improve

safety and address labor challenges, Rocklabs has made sure to stay one step ahead in designing and manufacturing autonomous equipment readily made for unique requirements.

In recent years Rocklabs have moved away from bespoke customised automated solutions. We have adopted a productisation strategy where we will invest our own capital to produce an automation product that we believe will fit the market needs. This approach allows us to test and validate the product before releasing it to the market. Reducing the risk for our customers and ourselves. In addition, we can leverage our automation background to create semi, or fully automated, systems as well as field automation such as our automated refuelling systems.

With Rocklabs moving to less complex systems, our Automated Modular System (AMS) was born, with each piece of equipment built to be a modular, and fully adaptable so your mine site can successfully work with a full scale, end-to-end sample preparation system, or utilise a single piece of Rocklabs equipment within an existing system.

Automated Modular System

When it comes to Rocklabs' AMS, our specifically designed linear line has been constructed with the ability to see high yield production value of up to 350 samples per day, and when there are requirements to start producing more samples, linear lines can be added and adjusted easily.

Rocklabs' pulverisers and crushers harness cutting-edge technology to deliver unparalleled performance and reliability to your mine or commercial laboratory.

Rio Tinto's Gudai-Darri

Rocklabs, together with its partners Malvern Panalytical, collaborated closely with Rio Tinto on its Gudai-Darri mine to deploy an unprecedented level of industry-leading autonomous technology and robotics for producing high levels of samples.

As a world first mine site with almost full autonomy, Rocklabs' partnership with Rio Tinto and its Gudai-Darri mine means safer sampling of iron ore, a decrease in time delays, and a stronger production yield.

Mineral Resources Ltd

Specialist teams at Rocklabs are working

with Mineral Resources Limited on their Onslow Project which is due to be delivered in June 2024. This project is set to re-define mining in WA through world-first autonomous machinery and it's ambition to be the lowest carbon footprint mine in the world.

Autonomous Benefits

With the mining industry facing unparalleled safety regulations, there has been focus in recent years of moving people from the dangers of heavy equipment and harsh environments. Rocklabs is continuing to design specialised solutions to simplify processes, increase proficiency, and improve safety records.

Known for our quality and reliability, Rocklabs' equipment is designed for trouble-free operation and minimal maintenance. Together with Scott, our machines are backed by extensive warranty and worldwide support, meaning you'll have access to parts and services wherever you are.

MORE INFO
www.scottautomation.com

AMR

ACCURATE RESULTS, BETTER DECISIONS

Your success is based on the decisions you make, and those decisions are based on the results you get. So we take our role in getting you accurate results and consistent representative sampling seriously. Consistent representative sampling and accurate results are standard at Rocklabs because there is no room for error when it comes to your mine's next move.

rocklabs.com



 **ROCKLABS**
powered by SCOTT



DIALIGHT: THE WORLD LEADER IN LED INDUSTRIAL LIGHTING TECHNOLOGY

Industrial work sites are home to some of the harshest environments on the planet with hazards including airborne contaminants such as dusts, chemical vapors and volatile organic compounds, as well as windblown dirt and salt spray, extreme temperatures, corrosion, shock and vibration, unstable power conditions, and even flammable, explosive and combustible atmospheres.

These hazardous environments make light duty and commercial grade off-the-shelf lighting unable to stand up to the task of lighting critical areas, creating a safety risk for employees.

Industrial work sites require industrial grade LED lighting solutions that are proven to last in the harshest conditions and ensure the safety of workers.

Dialight is the world leader in industrial LED lighting technology with millions of fixtures installed worldwide.

With an expansive line of rugged and dependable products, Dialight is known the world over as an innovator in Industrial LED Lighting technology.

The Dialight Difference

Dialight uses sealed electronics and lenses to prevent chemical and environmental attack on critical components. Their power supplies are specifically designed to perform under extreme conditions and their advanced mechanical designs optimise thermal dissipation.

Sealed critical components with Dialight's unique five step powder coating process, and corrosion-resistant stainless steel hardware all protect Dialight fixtures from highly corrosive environments such as coastal and marine applications. Long-life potted drivers and rugged, proven mechanical designs protect against vibration and shock related failures.

SafeSite

Dialight's SafeSite product line is designed for hazardous locations such as those containing explosive gases, dusts or fibers, and adheres to UL 844, CSA or IECEx/ATEX standards. These standards require luminaires to prevent and/or contain explosions depending on the nature and severity of the classified location.

Vigilant & ProSite

Dialight's Vigilant and ProSite product line is designed for heavy industrial and mining applications particularly those containing harsh environmental conditions. The Vigilant and ProSite product range is the ideal solution for maximum performance and longevity for industrial environments, offering a faster return on investment.

Lighting Solution for Rio Tinto Gudai-Darri

Dialight proudly supplied a complete lighting solution for Rio Tinto Gudai-Darri through various contractors and EPCs. With close to 4000 light fixtures supplied, Dialight put forward a complete end-to-end solution. A break down of the site projects are below.

- Processing plant - Worley (EPC) - Lighting design by LSAU. Electrical Contractor: SCEE. Fixtures: Vigilant Area light, Vigilant Bulkhead, Vigilant Floods, DuroSite Shower lights
- NPI (Non-Processing Infrastructure) - Primero (D&C) - Lighting design By Dialight. Fixtures: Vigilant Floods, Vigilant High Bays, Vigilant Bulkheads, Vigilant Area light, DuroSite Linear,

- StreetSense, DuroSite Shower lights
- Stackers & Reclaimers - Paradigm Engineers (EPC) & FL Smidth - Lighting design by LSAU & Dialight. Fixtures: Vigilant Floods & Vigilant Bulkheads
- AN Facilities & Production Hubs - Weststate (Electrical Contractor). Lighting design By Dialight. Fixtures: Vigilant Floods & Vigilant Bulkhead
- EPCM - Fredon (EPC) - Lighting design by Dialight. Electrical Contractor: Tec Services. Fixtures: Vigilant Floods
- Camp - Fredon (EPC) - Lighting design by Dialight. Electrical Contractor: Tec Services. Fixtures: Vigilant Floods, DuroSite Linears, DuroSite Bulkheads, StreetSense

At Dialight we deeply understand the harsh environments that our customers depend on our fixtures to illuminate each day. That's why our fixtures are built specifically for safety and longevity in these conditions and most offer our industry-leading 10-year warranty.

FOR MORE INFO
www.dialight.com

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Dialight

World Leading Hazardous &
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We see a world where heavy industry is transformed to be safer, more productive, and environmentally friendly through illumination. We enable industrial customers operating in demanding environments to reduce their energy costs, maintenance costs, and carbon footprint while maximising the safety and productivity of their facilities.

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- EPD Verified
- 10-Year Warranty*



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*On Most Models

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The only flexible screw splice in **POLYURETHANE**

In order to meet the most extreme environments and the most demanding requirements, **MLT** created the **SUPER-SCREW® PREMIUM** : the first flexible splice to screw in **POLYURETHANE**, designed for extremely abrasive applications*.

The polyurethane that composes the upper part of this new **SUPER-SCREW®** splice provides a considerable gain in abrasion resistance (15 mm³), while maintaining the flexibility, perfect integration and strength of **SUPER-SCREW®**.

Applications



Cement plants



Quarries and surface mines



Heavy industries

VERY HIGH ABRASION RESISTANCE (15 mm³)

THE ADVANTAGES

- Very high abrasion resistance (15 mm³)
- Polyurethane: reduced friction
- Permanent solution
- Reduces downtime of your conveyor
- Optimizes your productivity
- Easy and quick to install (1 to 2 persons)
- Self installation, low cost investment
- Leak proof and flexible
- Compatible with small pulley diameter
- Compatible with conveyor scrapers

EVEN FASTER

EASY SCREW SOLUTION



NEW

In order to optimize screwing time of the **SUPER-SCREW® PREMIUM** splice, **MLT** created **Easy Screw Solution**. This system of screws pre-positioning will allow you to save even more time in your belt splicing.

Types of steel for screws and inserts available

Steel screws and inserts

High resistance, it's the perfect choice for most applications : **Quarries, Cement Plants, Mines, etc.**



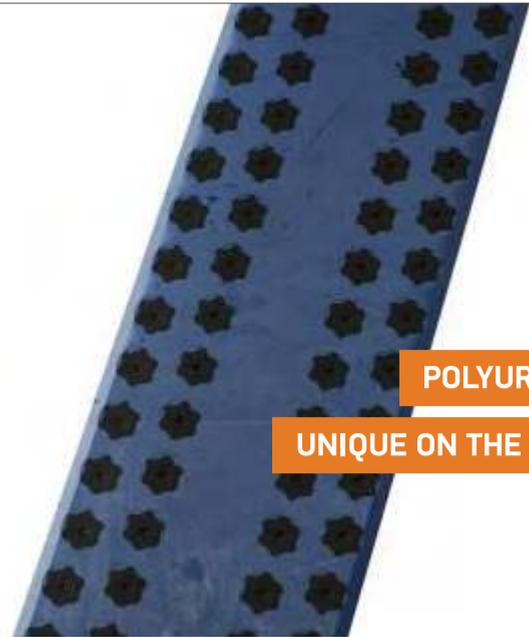
*Only compatible with applications with anti-abrasive and oil-resistance requirements



MLT Asia Pacific

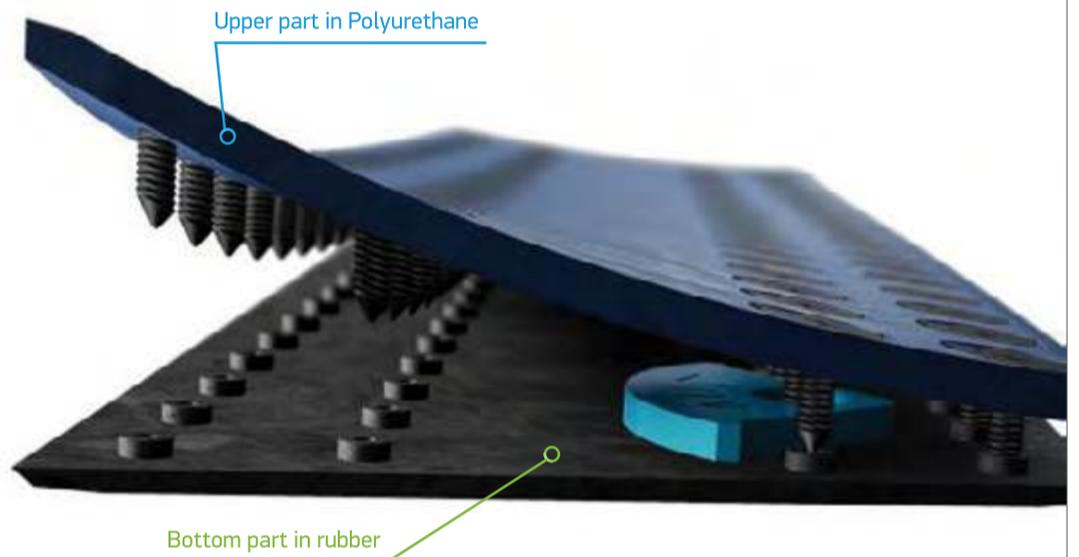
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POLYURETHANE

UNIQUE ON THE MARKET



Bottom part in rubber

Technical data

Belt thickness before skiving		mm		6+2		6+3		8+3		10+3	
		inch		1/4" + 1/16"		1/4" + 1/8"		5/16" + 1/8"		3/8" + 1/8"	
Skiving blades (mm)		6.5		2.5		6.5		3.5		8.5	
Type*	Type of belt	Belt tension	Operating tension	Min pulley Ø, mm	Screw dimensions						
		N/mm	PIW								
65 - 6mm	630/2 630/3	630	360	200	5x14 - 5x16						
	630/4										
65 - 8mm	630/2 630/3	630	360	230	5x16 - 5x18						
	630/4										
85 - 8mm	800/2 800/3	800	450	250	5x16 - 5x18						
	800/4										
85 - 10mm	800/2 800/3	800	450	300	5x18 - 5x20						
	630/4										
105 - 8mm	1000/3 1000/4	1000	570	300	5x18 - 5x20						
	1000/5 1000/6										
105 - 10mm	1000/3 1000/4	1000	570	350	5x20 - 5x22						
	1000/5 1000/6										

Spacers: One size spacer

*Our splicing solutions have been engineered for normal applications. For tough and abrasive environments, we encourage you to select an upper Super-Screw® size (please check specifications before)

	65 - 6mm	65 - 8mm	85 - 8mm	85 - 10mm	105 - 8mm	105 - 10mm
Hardness, shA	75	85	75	85	75	85
Top Cover Thickness, mm (± 1 mm)	6	8	8	10	8	10
Bottom Cover Thickness, mm (± 1 mm)	3					
Top Cover Thickness, (inch)	1/4	5/16	5/16	3/8	5/16	3/8
Bottom Cover Thickness, (inch)	1/8					
Width of SUPER-SCREW®, mm (inch)	116 (4 9/16)			160 (6 5/16)		
Width to be skived on trailing edge, mm (inch)	58 (2 5/16)			80 (3 1/8)		
Width to be skived on leading edge, mm (inch)	58 (2 5/16)			80 (3 1/8)		
Screw Diameter, mm	5					
Number of screws required for 1 m	184			276		
Number of spacers required for 1 m	4					
Number of PZ2 Bits required for 1m	1					

Packaging

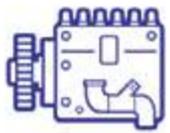
ROLL packaging	65 - 105					
Length of SUPER-SCREW®	3 m roll					
Installation tools / Spacers / PZ bits / Screws / Easy Screw Solution	Included					
KIT packaging	65 - 105					
Belt width, mm (inch)	650 (25 1/2)	800 (31 1/2)	1000 (39 1/4)	1200 (48)	1400 (55)	1600 (63)
Length of SUPER-SCREW®, mm (inch)	675 (26 1/2)	832 (31 3/4)	1057 (41 1/2)	1260 (49 1/2)	1462 (57 1/2)	1665 (65 1/2)
Screws / Installation tools / Spacers / PZ bit	Included					

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Why Choose Us:

- ✓ 12 month Australia wide warranty on all parts and service*
- ✓ Trusted and authorised dealers for the worlds leading brands: Bosch, Denso, Garrett, Delphi, Manta, Unichip & many more
- ✓ State of the art equipment, two 4WD dyno's and the latest in scan tools and test benches coupled with our expertly trained technicians

About United Fuel Injection

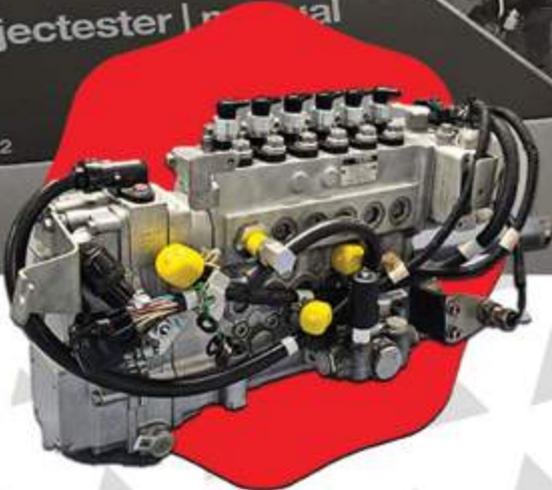
United Fuel Injection have all of your diesel needs covered from vehicle servicing, spare parts, turbochargers, fuel injection services and everything in between. Comprised of 4 core departments: **Fuel Injection, Diesel Performance, Heavy Diesel and Turbochargers.** Contact us today to find out what we can do for you.

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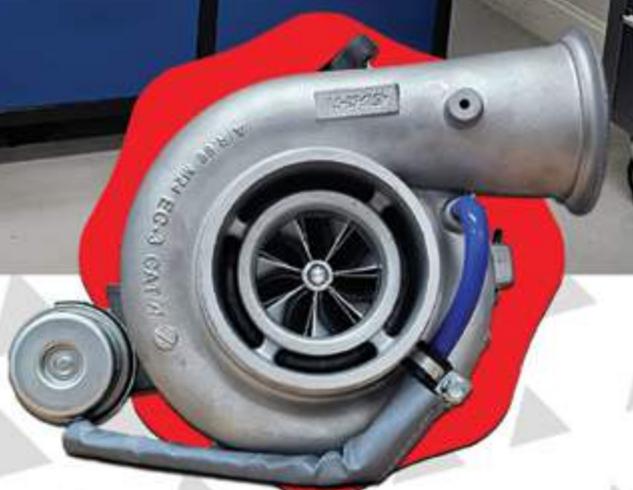
FUEL PUMPS

Testing, Service & Repair available for most models and types of Diesel Fuel Pumps. Including the older Mechanical style, right up to the latest model Common Rail Fuel Pumps. We can service, repair and test fuel pumps from manufacturers such as: Bosch, CAT, Cummins, Denso, Siemens VDO.



FUEL INJECTORS

We overhaul most models and types of Diesel Fuel Injectors. All overhauled Injectors are assembled in our state-of-the-art clean room. Injectors from the older Mechanical style, right up to the latest Common Rail Fuel Injectors. We can overhaul Bosch, Denso, Isuzu, Komatsu, CAT, Cummins and many more Injectors.



TURBOCHARGERS

Turbocharger diagnostics, servicing, repair and supply of new Turbos. We are Garrett Master Distributors and employ the most experienced operational staff in Western Australia. We can also overhaul Turbos from all other manufacturers including: CAT, Cummins, Detroit, IHI, Mitsubishi and Borg Warner.



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- ✓ Each Injector, Pump or Turbo is rebuilt and tested by expertly trained technicians, not manufacturing production lines.



AMW2024 AT DARLING HARBOUR!

REGISTER NOW!

**AMW2024 is on at Sydney ICC
Darling Harbour 17-19 April, 2024!**

Australian Manufacturing Week (AMW2024) is run by the Australian Manufacturing Technology Institute Limited (AMTIL) with the NSW Government as the Major Sponsor.

This huge event will occupy more than 6,560 square metres of exhibition space at the Sydney ICC at Darling Harbour. More than 215 organisations have already taken stands to showcase the latest manufacturing technologies, processes, and support services.

Don't miss out!

There will be seven Zones on the show floor of Australian Manufacturing Week, each showcasing its own areas of expertise. These include:

The **Austech Machine Tools Zone**, specifically targeting the metalworking, machine tool and ancillary market in the global manufacturing space. The Austech Machine Tool Zone is proudly sponsored by finlease.

The **Additive Manufacturing Zone**, showcasing various techniques within Additive Manufacturing include Stereolithography, Selective Laser Sintering, Material Extrusion, Sheet lamination, Binder jetting, Cold Spray processing, Material jetting, Direct-Energy-Deposition, and many more of the most advanced technologies within this sector.

The **Australian Manufacturers Pavilion** showcases the capabilities of Australia's precision engineering and advanced manufacturing industry. The Australian Manufacturers Pavilion is where AMW2024 celebrates the very best in Australian manufacturing.

The **Manufacturing Solutions Zone** offers a concentration of optimised solutions to the most common challenges experienced by manufacturers. From materials handling and warehousing to integrated manufacturing and safety solutions. The Manufacturing Solutions Zone incorporates everything from equipment for ma-

terials handling and logistics, to safety and software products. This Zone is proudly sponsored by The Execution Factor.

The **Robotics & Automation Zone** will feature the latest state-of-the-art equipment and processes for the optimisation of manufacturing operations. There will be Industrial robotics, Automated Solutions, Instrumentation Control Systems, Measurement, Pneumatics, IOT Solutions, Industry 4.0 and Digitalisation.

The **Weld and Air Solutions Zone** will highlight advanced welding processes and provide high-quality interactive experiences that demonstrate the latest developments and applications in the welding sector. Welding is critical in metal fabrication and manufacturing. In fact, it is used in creating more than half of all of products manufactured in Australia today.

And the **Plastic Technology Zone**, which is your opportunity to see and feel the latest in plastics machinery, mould-making technologies, recycling materials, and the many plastics manufacturing processes. Plastic technology is a specialised branch of study which includes the study of diverse types of chemicals that exhibits plasticity.

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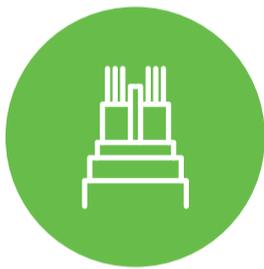
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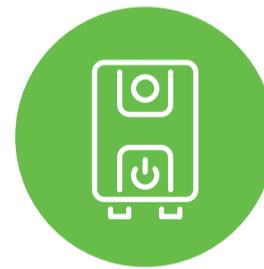
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Based at Brendale on the northside of Brisbane, and servicing customers Australia wide, Milin Transport is a well-established family-owned company catering to a range of heavy haulage and freight option.

We specialise in outer gauge loads, shipping container transportation, heavy haulage up to 63 tonne, trailers, crane operations and last minute hot shot deliveries, and are experts in our field committed to personalised transport solutions.

Milin Transport has been servicing a wide range of mining and general clients since 2002, specialising in meeting our customers' requirements with honesty and integrity and delivering all goods with the highest level of safety and customer satisfaction.

The Fleet

Our transport fleet consists of crane trucks with capacity to lift to 6 tonnes, tilt trays up

to 14 tonnes, a sideloader, F/Top singles B-Doubles A-Doubles, both F/Tops and tautliners, and road trains. We also have extendable flat top and drop deck trailers with ramps and drive over B-Doubles with ramps.

Milin Transport's modern fleet is made up of Kenworth K200, 220s and 610SAR prime movers meeting all NHVAS and HML requirements. Utilising our vehicles ensures your freight is delivered quickly and safely, regardless if your consignment is a single item or a full truck load.



We have solo and two-driver teams on stand-by, ready to travel anywhere across Australia with continuous updates throughout transit and estimated arrival times.

Our experienced operators and management team are here to ensure that the best outcomes are available to meet your needs, guiding you in selecting the right vehicle and arranging the transportation schedule.

Services On Offer

When it comes to transportation, there are many factors to take into consideration, including the truck and bed size required to move your load, what routes to take, load securing, permit requirements, pilot vehicles, signage and more.

Milin Transport's team of experts will take care of the entire process, leaving you to focus on your business. We pride ourselves in finding solutions to all situations and

believe no problem is too big to overcome.

Services include:

- Contract logistics
- Project logistics
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As a diverse and specialised contract company built on a solid foundation of unmatched quality, excellent service delivery, unparalleled safety and a firm commitment to our community, AMS offers a seamless and transparent approach to all aspects of the business, from mine site project contracts to workshop fabrication.

With vast exposure and experience in the underground and surface mining operations, we have proven that experience and safety, coupled with a

positive outlook, produces results that are sought after by clients all across the country.

The specialised team at Adroit are proven experts in complete underground mining services, surface projects and infrastructure services, passionate about doing the extra 1% in providing solutions that genuinely impact and strengthen Australia's mining industry, one project at a time.

Underground Mining Services

- Paste reticulation, installation
- Plant Maintenance
- De-watering circuits, installs, maintenance
- Deluge systems
- Ventilation upgrades

- Vent door install and maintenance including brattices
- Hangers and fan installations
- Egress systems
- On-site maintenance and preservation
- Air leg/machine installs
- U/G service works
- General mine site fabrication and fitting

Above Ground Services

- Infrastructure upgrades
- Surface de-watering
- Poly welding
- Project works
- Site services
- Concreting
- Carpentry and building requirements
- Mill maintenance including pumps and conveyers

- Primary crusher maintenance, including concave and mantle rebuilds
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- Boilermaker, Fitter and Carpenter labour hire
- T/A labour

Our project solutions meet the unique needs of your operation, meaning we deliver mining services that handle everything.

At AMS, we tailor our services to meet the specific needs of our clients, delivering greater value and quality so your project is delivered on time and on budget.

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NON NUCLEAR DENSITY MEASUREMENT



Density meters play a crucial role in diverse industries particularly Mining, serving purposes such as monitoring slurries and facilitating billing processes. However, prevailing meters in the market often grapple with issues of poor accuracy, potentially hazardous components such as Nuclear, or both. Typically, slurries undergo measurement through pumping within a pipe, generating an inferred reading from the sample. Alternatively, grab sampling involves taking samples from the slurry, necessitating laboratory analysis and resulting in prolonged turnaround times. The advent of the new real-time, non-nuclear density meter addresses these shortcomings by enabling the accurate and repeatable measurement of the entire sludge/slurry without the use of hazardous materials.

Territory Instruments is excited to introduce the The Red Meter, which employs a straightforward methodology combined

with sophisticated algorithms, empowers process engineers by delivering measurement data that is both accurate and empowering. The device continuously reads multiple variables, including density, media pressure, flow rate, and solids accumulator, utilising its integrated computer to perform calculations. This data is displayed on-screen and can be exported to third-party systems. Red Meter's disruptive technology aims to establish a new standard in industrial measurement, transcending legacy limitations and revitalizing crucial sectors of the global economy.

Operational simplicity defines the Red Meter's approach, as it measures the weight of the material in the pipe through deflection measurements. This process, devoid of radiation, combines with advanced mathematical formulas and algorithms to provide an accurate density reading every second. The Red Meter functions as more than a mere sensor; it concurrently

measures multiple variables, recording real-time analytics through its general-purpose computer and software. This flexibility allows customisation based on individual process and application needs.

Accompanied by the built-in software, Ruby, the Red Meter offers a user-friendly display with extensive customisation options. Users can alter the color scheme, configure display units, and access data locally or remotely when connected to the internet.

Red Meter's technology incorporates various components contributing to higher repeatability, superior accuracy, and extended product life. An abrasion-resistant liner ensures compatibility with diverse carrier liquids and abrasive particulates, enhancing the cartridge's longevity. The flexible cartridge, coupled with a high-precision displacement laser, measures deflection, which is translated into weight. The contin-

uous measurement capability, recording thousands of measurements per second, drastically reduces wait times from hours or days to milliseconds.

Boasting an accuracy of +/- 0.5% over a 6:1 density range, the Red Meter surpasses many continuous measurement techniques. Noteworthy is its superior response time, sampling up to 50 times per second, and adaptability to any pipe diameter and most specific gravity ranges.

Territory Instruments is a leading sales and service business for process measuring and control equipment, such as analysers, field instruments (pressure, flow, level etc), environmental measurement devices, control valves and other test and measurement products - across Australia.

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REDMETERS

Australia's most innovative non-nuclear density meter

Territory Instruments is very proud to represent Red Meters in Australia, South East Asia and New Zealand. The Red Meter is an industrial measurement system providing key measurement data which can be used to optimise processes in real time. The data provided by a Red Meter can be used to calculate and measure density, pressure, flow rate and accumulated solids.



- » Accuracy ± 0.5%
- » Repeatability ± 0.4%
- » Selectable Display Options
- » PIN-Secured configuration & calibration menu
- » Remote Interface (HMI)
- » Remote Support & Upgrades
- » Two 4-20 mA Outputs possible.



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IS THIS ACCESS SYSTEM COMPLIANT?

The short answer is no! Not by Australian standards.

This is a typical outcome of an audit conducted by Smith Global to check compliance of access systems on earthmoving and heavy haulage equipment. "In fact it's not unusual for us to identify multiple areas of concern that need to be immediately addressed" shares Kerren Smith, Managing Director of Smith Global Consulting Engineers, with over 45 years of experience in the mining industry.



Kerren Smith

In the high-stakes world of mining, safety isn't just a priority – it's a necessity. Yet, despite advancements in technology and regulations, many mining companies unknowingly overlook a critical safety aspect: their earthmoving equipment access systems, unaware they may not meet today's stringent standards, putting their employees at serious risk.

The QLD Government department that investigated a number of recent incidents leading to serious injuries and death related to access systems on earthmoving equipment in Queensland and other states, suggest that significant similarities exist across the mining industry, requiring operators to audit their equipment and operating practices to ensure the lessons learnt are not forgotten.



IDENTIFYING THE PROBLEM

Across Australia, mining companies face a myriad of challenges, including navigating complex safety standards. With numerous regulations to adhere to, it's easy for companies to fall behind, especially in areas where potential issues aren't immediately obvious. As a result, earthmoving equipment access systems often remain unchecked and non-compliant and remain a grave risk to the workforce.

CHALLENGES IGNORED

Why do companies overlook this crucial aspect of safety? The answer lies in the complexities of compliance. With ever-evolving standards and regulations, it's a daunting task to stay abreast of the latest requirements. Moreover, the lack of obvious indicators of non-compliance can lead to a false sense of security, perpetuating the "if it's not broken, why fix it" mentality.

"With over 120 years of experience in heavy haulage equipment, we've seen firsthand how compliance oversights can occur," states Smith. "Our focus on real-world experience allows us to identify and address these issues effectively."

THE SOLUTION

With over 25 years of experience in designing workplace-safe access systems, including mine-site dual-powered road trains, Smith Global offers a comprehensive end to end solution tailored to a clients specific needs. From assessment to certification, they handle every aspect of the process, ensuring seamless implementation and peace of mind. "At Smith Global, we don't just tick boxes for compliance; we prioritize competence," emphasizes Smith. "Our team leverages our extensive auditing experience to design and project manage modifications tailored to each client's unique needs."

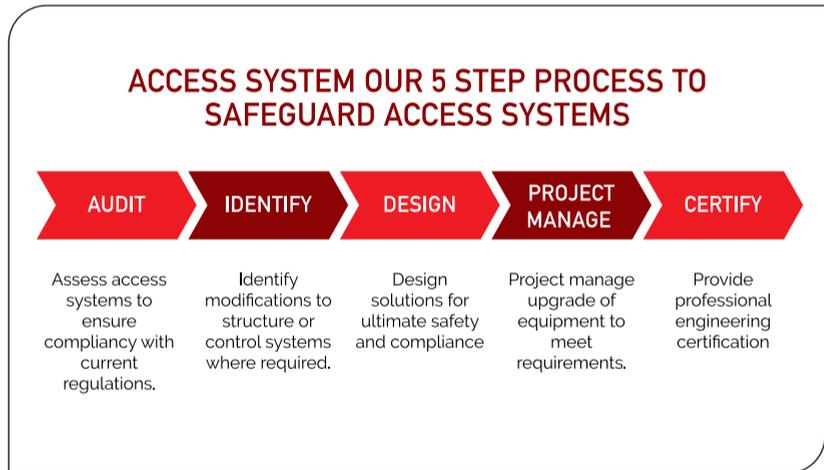
KEY OUTCOMES AND BENEFITS

1 COMPREHENSIVE ASSESSMENT

Our experienced engineers conduct thorough assessments, identifying potential risks and recommending tailored solutions.

2 COMPETENCE-CENTRIC APPROACH

We prioritize competence, going beyond mere compliance to design access systems that prioritize user safety.



3 END-TO-END SERVICE

From assessment to certification, we handle every aspect of the process, ensuring seamless implementation.

4 PROVEN TRACK RECORD

Trusted by some of Australia's largest mine companies and mine sites, we've designed workplace-safe access systems for over 25 years.

RESULTS AND RECOGNITION

Smith Global Consulting Engineers are trusted by some of Australia's largest mine companies like RIO, Glencore, South 32 and Jellinbah Resources. Smith Global have audited & upgraded workplace-safe access systems at many locations including Ensham, Cawarral Creek, Baralaba, Foxleigh, Jellinbah. With a proven track record and multiple Worksafe awards across Queensland, Victoria, and South Australia, Smith Global are committed to ensuring the safety and well-being of your workforce.

FIND OUT MORE

Don't wait for an incident to occur. Contact Smith Global Consulting Engineers for a comprehensive assessment and ensure the safety of your workforce and operations.

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WA'S FABRICATION SPECIALISTS



Specialist steel fabrication company Arch Engineering has been operating since 1970.

With the capacity to complete a wide variety of fabricated steel projects for the mining, process, oil and gas industries, it can manage, implement, and integrate all aspects of complex industry projects from drafting, fabrication through to surface treatment and delivery.

The business, located in Bibra Lake, WA, has a 3000m² facility and employs a skilled workforce with commitment and experience to match all project requirements.

Arch's fabrication team is experienced and possesses strong capabilities to execute wide ranging fabrication projects for mining, oil and gas.

The team is committed to high quality standards and efficiency to ensure client expectations can be met, and boasts quality management system certification to ISO 9001:2008.

Arch Engineering's fabrication workshops are equipped for all type of fabrication and modularisation services.

They incorporate three fully equipped workshops utilising four overhead cranes with up to 20t capacity capable of handling all types of fabrication.

Its mining and mineral processing services include:

- A wide range of structural packages
- Screening equipment
- Crushing equipment
- Conveyors
- Shuttles
- Chutes
- Mining consumables and tools
- Plate work fabrication
- Pipe supports and clamps
- Railway equipment
- Handrails, stairs, walkways
- Trusses
- Silo conveyors
- Monorail structures
- General steel fabrication

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All workshops are fully equipped for all types of fabrication services.

Facilities incorporate three fully equipped workshops utilising 4 overhead cranes with up to 20 tonne capacity capable of handling all types of fabrication such as:

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PETRO Industrial stands as a premier supplier of fuel, lubrication, and AdBlue dispensing products, uniquely positioned to deliver tailored “Plug-n-Play” Storage, Gauging, Monitoring, and Management SOLUTIONS to meet diverse client needs. With extensive in-house capabilities, the company excels in designing, engineering, manufacturing, delivering, installing, commissioning, and maintaining projects of various sizes.

Catering to industries like Mining, Road transport, Rail, Construction, Fuel distribution, Fuel depots, Marine, Aviation, Agriculture, Fuel stations, Food & Drink, PETRO Industrial’s modular tanks offer flexible scalability and relocation, aligning with the cost-effective “Plug-n-Play” concept. Expertise extends to crafting safe, compliant long-distance fuel transfer systems for high and low flow, and generator applications using single or multiple tanks.

Beyond product supply, PETRO Industrial supports clients with local government approvals, development applications, and ongoing consultations. Dispensing equipment from major brands like PIUSI, Graco, Donaldson, Fill-Rite, Flomax, TCS, and Adblue is also provided.

A notable offering is PETRO Industrial’s electronic Fuel Management System (FMS), iPETRO. Available in basic and advanced options, iPETRO

records comprehensive data, transferred to the client’s unique account on the iPETRO Cloud Web Portal. The system offers 24/7 after-sales technical support. The advanced iPETRO Pro version features customizable options, including remote consoles, automatic vehicle identification, real-time data transfer, tank gauge links, low-level notifications, real-time activity alerts, unauthorized dispensing alarms, and advanced reporting capabilities.

In conclusion, PETRO Industrial emerges as the go-to partner for Bulk Fuel Storage and dispensing needs, providing reliable, custom solutions backed by years of industry expertise.

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FULFILLED BY ADEPT

Have you ever thought that what may have started off in a core tray at some remote location may often find its way into your home of office?

Adept Conveyor Technologies has been involved in producing core tray handling systems in the exploration industry for many years.

From core sample tray conveyors to roller racks and benches to drill core handling systems, Adept designs and manufactures roller racking system solutions for the mining industry and exploration teams at the best price and with the shortest lead time.

Occupational Health & Safety at Site

Adept Conveyor Technologies' mobile roller conveyor racks deliver optimum workflow, efficiency and ergonomics effectively and reliably.

There is no lifting work required by core tray operators as the roller racks can be detached and moved to make other configurations.

The team at Adept can assist in the mitigation of occupational health and safety issues by providing proper hardware solutions in the manual handling of materials handling.

Static and gravity systems offer low inertia and free movement of core sample trays throughout the sampling area with ease of operation for all manual handling staff.

Most equipment requires no external power source to operate, providing the most economical options in system design and startup costs.

The cost of ownership is incredibly low, with the equipment being virtually maintenance-free.

Adept specialises solely in core shed design, using standard stock roller racking parts, and has designed many systems that can meet your exact requirements.

A wide range of gravity roller table conveyors are available to suit any core shed application.

Adept at Warehousing Solutions

The bulk of their business started more than 40 years ago in the warehouse distribution area in both Sydney and Melbourne.

During this time, the business has witnessed many changes and, more recently, the advent of e-commerce in the past 8-10 years.

Whilst many of the major distribution companies have witnessed massive expansion in their distribution warehouses, as they each strive to deliver customer orders on ever shortening delivery frequencies, others will continue to provide the basics that they as a supplier and their customers will require.

In a nutshell, all warehouse facilities will store back-up and replacement stocks of product and retain the facility to despatch the stock as required.

This satisfies the restocking demands of their branch offices and stores, or to the individual customer as a discrete order.

What Contributes to Successful Distribution?

Whilst not all warehouses will prepare smaller discrete customer orders, those that do will benefit from having a system that allows for:

- Efficient processing of orders;
- Simple pick / pack / despatch of goods;
- Optimisation of order flow throughout the warehouse;
- Integrated solution to handle the day-to-day order flow, plus the unexpected or seasonal surge;
- Adaptability to change as the business changes and grows;
- Optimal use of available space to

allow order processing to proceed whilst other warehouse operations are taking place.

Smart Warehouse System

A fully-integrated conveyor system may form part of the modern automated process and can start from a very basic or semi-manual system with the ability to be reconfigured and adapted into a "Smart Warehouse System".

This system comprises automation for:

- smart picking;
- auto-routing throughout the warehouse;
- scanning;
- carton sealing;
- weight check;
- label application and sorting of individual or batch-picked orders into dedicated destination zones for freight and courier pick up.

Generated waste from the picking process can also be quite adequately handled via trash removal conveyor systems to compactors should the volumes of generated trash be large.

Heart and Pulse of Every Business

The heart of each business lies in its stock and inventory, with its pulse dependent on how quickly and efficiently the goods are despatched

Having a fully adaptable and smart warehousing and distribution solution is the lifeblood of any business focused on physical goods.

Adept Conveyor Technologies has for many years taken the tasks presented by each unique warehouse application and designed purpose-built handling solutions to suit specific customer and site applications.

As a supplier with extensive field experience drilling and mine sites, Adept services all exploration and analysis operations at remote sites as well as large and small industrial warehouses.

Adept offers the ability to purchase direct from the manufacturer with full in-house design and engineering expertise, cutting out resellers with limited product and engineering application knowledge.

All parts are manufactured in Australia to quality benchmark standards and all systems are installed and commissioned right around Australia.

Getting to the Core

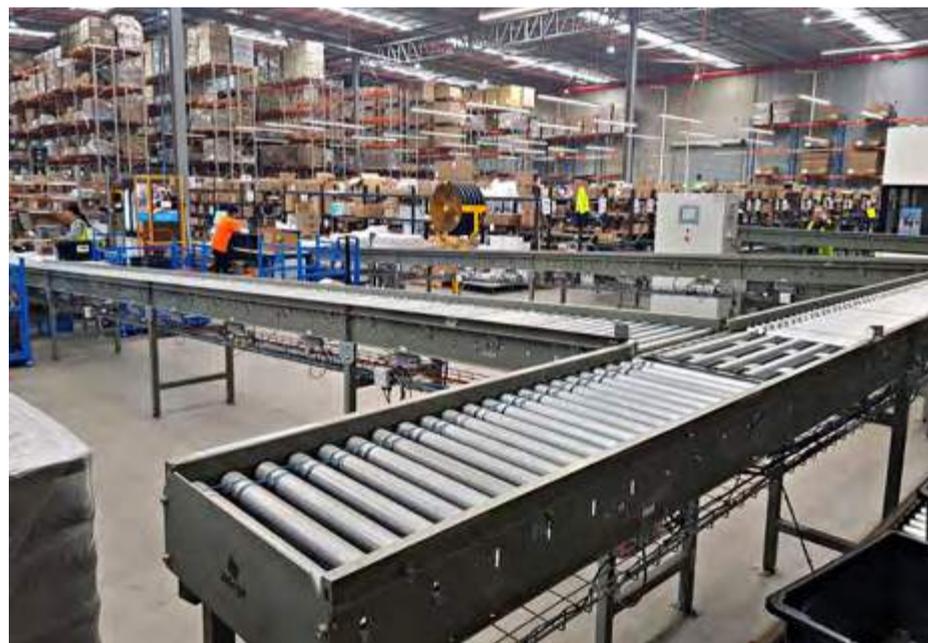
Adept has a comprehensive range of products relating to core sample tray conveyor benches.

Need some more information, or just wish to discuss what the industry is currently doing?

Contact Adept Conveyor Technologies now.

See details in the advertisement next page.

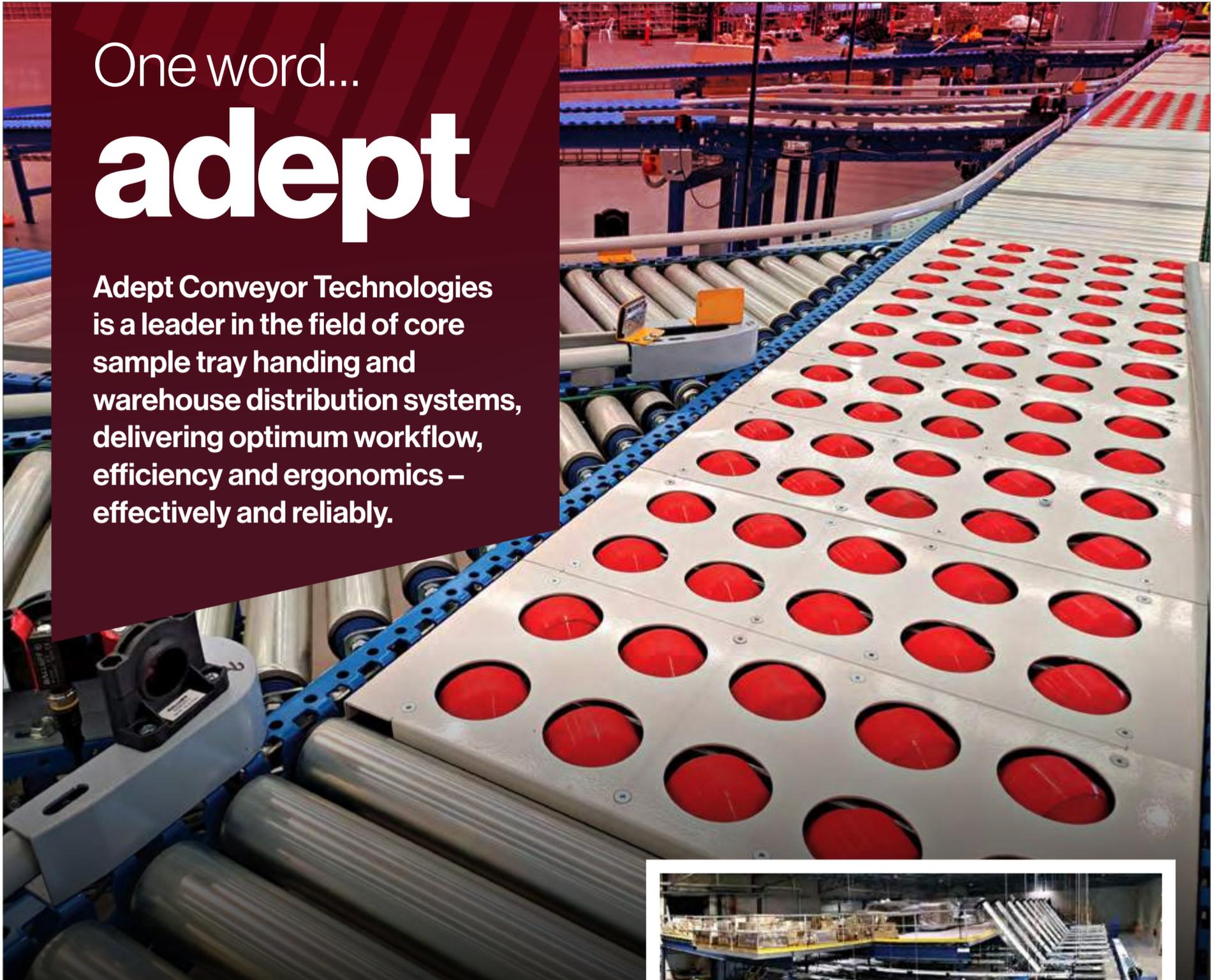
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One word...

adept

Adept Conveyor Technologies is a leader in the field of core sample tray handling and warehouse distribution systems, delivering optimum workflow, efficiency and ergonomics – effectively and reliably.



Solutions for Mining and Exploration Geologists:

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- ✓ Core tray roller racks
- ✓ Core roller benches
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- ✓ Static and gravity conveying equipment
- ✓ Handle and store drilling assays with confidence

Solutions for Warehouse Distribution Systems:

Covering all systems, from basic and semi-manual to smart systems, for both large and small businesses.

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Looking after people's wellbeing, whether they are facing extreme difficulty or just need some support along their journey, is what chaplaincy is all about. And looking after people is what builds the foundations of communities that people like to support, enjoy working in and love to live in.

One area that every community is connected to is the local school and YouthCARE supports wellbeing in over 600 public school communities throughout Western Australia. Over 460 YouthCARE Chaplains walk alongside students, parents, teachers and principals from regions including

the Kimberley, Pilbara and Goldfields. Regardless of location, the availability of accessible, non-judgemental pastoral care helps build community – and for YouthCARE, it starts in schools.

Chaplaincy positively impacts several sectors and circumstances, that's why our chaplains' connections extend beyond the school gates. With various academic backgrounds and life experiences, YouthCARE Chaplains deliver care, respect, compassion and service to your community – wherever you are in WA.

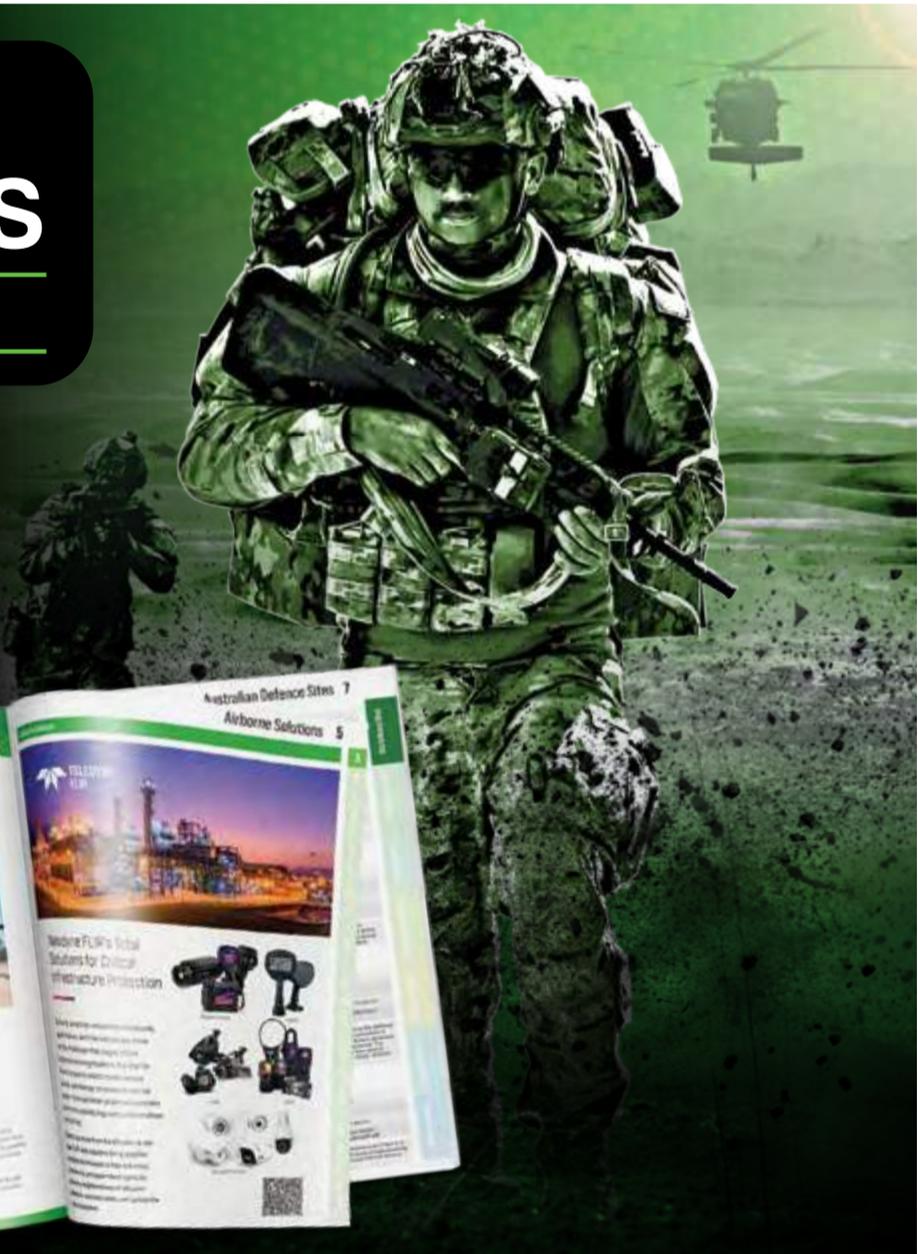
Talk with us about how our school chaplains can support your community.

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FROM THE FIELD: CONVEYOR HEALTH MONITORING SYSTEMS THE FIRST 5 YEARS

REAL WORLD RESULTS, FINDINGS, AND LEARNINGS

Having installations now moving into their fifth year of operation, it is time to look back at the infield learnings and experiences, along with the potential capabilities of conveyor health monitoring systems as the technology has matured through field experience.

The below editorial is designed to give you a brief technology introduction, an indication of what can be expected in the day to day running of a CHMS (Conveyor Health Monitoring System), outputs, reliability, and user interactions.

TECHNOLOGY INTRODUCTION

Distributed Acoustic Sensing systems utilise fibre optic cables installed into the stringer of a conveyor to monitor vibrations caused by the rotating idlers. Monitoring these idler vibrations in real time allows the condition of those idlers to be displayed as part of daily report and gives instantaneous reporting of idlers that have escalated to serious "high priority" conditions.

Results:

24/7 autonomous inspection with automatic reporting.

Having a CHMS system on your conveyors means having a check list in your inbox before you get to your desk with your coffee each morning. Sitting down you have a list of every idler on each conveyor that needs your attention including the following data.

- Where it is located
- Its severity
- Which side of the conveyor the fault is on
- How long that has that idler fault been present for

Frame	Channel	Current Priority	Previous Priority	Fault Range	Date Added
1	RHS (1)	2	2	-	01/03/2024 09:02:10
5	RHS (1)	2	2	3 - 6	23/02/2024 23:18:27
85	RHS (1)	2	2	84 - 85	16/01/2024 13:14:24
100	RHS (1)	2	2	100 - 101	23/02/2024 17:07:31

Figure 1. Sample Daily Report

A report is typically generated just before the start of the inspector's shift so they can assess the number of idlers that require inspection which allows them to determine the amount of time the task will take prior to getting started. An indication of idler condition change versus the previous day is also presented by comparing the current and previous priority, this can be a clearing event where an idler has been swapped out and the system has recognised this or an idler progressing and getting worse.

Reliability

Idler fault detection through manual inspections is

inherently unreliable, this comes down to several factors including the physical limitations of human senses (eyes and ears) plus idler faults are not consistent with time and vary with intensity, attempting to find a bad idler when it is not faulting audibly and is in a quiet condition proves impossible to accomplish.

The amount a user tends to rely on CHMS systems comes with use especially when that use is supported through Hawk's Post-Commissioning period. After handover training inspectors begin to trust the system with greater levels than they trust their own system with one user noting "if the system reports a fault here then there is a fault here, it's just a matter of time before it fails."

A typical example of this reliability is noted in Figure 2.

May 30 - Change out		
HAWK System Reported Replacement Idlers	Raw Coal Replaced Idlers	HAWK Detection Accuracy
3	Idler Type not Available	
19	Idler shortage	
58	58	100%
132	132	100%
164	164	100%
329	329	100%
409	409	100%
445	445	100%
454	454	100%
484	483	+/- 1 Frame
504	504	100%
509	509	100%
528	528	100%
533	532	+/- 1 Frame
550/551	550	100%
562/563	562	100%
594	594	100%
623	623	100%
627	627	100%
655	655	100%
661	661	100%
665	665	100%
667	667	100%
674	674	100%
724/725	724	100%
789	789	100%
838	838	100%
851	Idler shortage	
856	Idler shortage	
865/866	Idler shortage	
871	Idler shortage	
873	Idler shortage	
875	Idler shortage	
899	Idler shortage	
HAWK Detection Accuracy		100%

Figure 2. Typical Project Result

Findings:

Idler Priority field definitions

Each individual inspector has several different things that they consciously or subconsciously look for. A CHMS system can be programmed to match a given inspector, but a standard for idler fault priority has been established as a starting point so that all inspectors can communicate idler conditions utilising a common language. Table 1 provides an example of such priority definitions.

Priority Designation	Priority Indication	Description	Idler Description
P1 (Priority 1)	Emergency	An idler so severely damaged that its fault is a risk to continued safe operation of the belt. Audible from distances Greater than 10m away, Significant noise, bad grinding, banging, pinging and will often produce significant heat.	Severe wear, Loss of shell structure, end disc separation, total seizure of bearing, non-concentric rotation, Bearing Dropped out of fixing point.
P2 (Priority 2)	Alarm	Idler is audible beyond 5 meters, generally picked up even in drive by inspection, may also be a quiet idler but produce elevated heat signature.	Audible consistent loud grinding, banging, slapping, or clanging, can sound a bit like a train as the fault rotates around. Often, no physical damage is visible aside from grease leakage.
N (Normal Operation)	None	An idler in normal condition	Idler may be dirty or have minor surface rusting but is otherwise in good condition and rotates well.

Table 1. Priority Definitions

Detection of inaudible Faults

One interesting finding from field installations is that some idlers produce fault frequencies that are detectable by the CHMS but not detectable by human senses (audible or visual). There are several reasons for this but many of them come down to the fact that fault energy from certain frequencies does not leave the structure to become airborne and therefore audible. However, As the CHMS sensing Fibre is in contact with the structure itself it is possible to detect all vibrational energies within the structure and just not those that harmonics of the structure are most prone to emitting.

Utility of thermography for difficult idlers identified by CHMS.

The use of forward thermographic cameras to confirm exact fault locations when idlers are indicated as faulting by the CHMS. When dealing with inaudible faults thermography acts as a way of confirming which idler in the identified area is the specific idler fault. Some Sites elect to change all idlers in the frame all at once (reasoning that the idler cost is significantly smaller than the maintenance cost of swapping the idler) whilst other sites will elect to swap the problematic.

Regardless of the change out method it has been found that the utilisation of a thermal camera is a useful tool for identifying idlers in early fault conditions prior the failure that are not yet detectable by human senses.

Whilst a slow and inefficient inspection tool when used without a CHMS the thermographic camera allows an infield conformation of faulting idlers that are otherwise impossible to find without the CHMS and Thermographic Camera.

It is recommended that sites adopt a maximum allowable temperature for both total and above ambient to give inspectors a guide as to when change outs should be made as "next available downtime" or "immediately." **AMR**



Tired of Idler Failure and Downtime?

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MLT SUPER-SCREW® CASE STUDY

The only Super-Screw splice joint that offers flexible, permanent belt join that is innovative and easy to install

In this case, a phosphate mine long transfer conveyor belt had an emergency breakdown during production. A request for belt splicing by conventional hot splicing on a new belt was too challenging and complicated.



Customer Issues

Conveyor downtime was 16 hours with the previous way of belt splicing and on top of that, they needed 8 people to splice the belt on site.



Customer Belt Technical Specifications

- Belt type: Ferroflex 2000N/mm
- Belt length: 2.2km
- Belt width: 1600mm
- Product being conveyed: Sterile Phosphate

MLT Answer

The only solution that made it possible without having expensive downtime was the use of MLT SUPER-SCREW® Original flexible splice joint that can be quickly installed on-site. This has resulted in reduced conveyor downtime (5 hours) and the number of people allocated to belt splicing.



MLT MS® FASTENER CASE STUDY

The only screw-on metal fastener that is innovative and easy to install

The MS® Fastener is an innovative and fast solution to join your belts by simply screwing them together. Designed and patented by MLT, this mechanical splice is extremely easy to install. MS® Fastener is a metal fastener to be installed with screws. The MS® falls into the category of truly revolutionary in the metal fastener market, as it is more economical, practical, and safe to use.

Customer Issues

A coal-powered power station in Central Coast NSW had multiple emergency belt breakdowns on all its coal feeder conveyors, a quick solution was required to rejoin new belts on-site with a metal fastener without the need for special tooling or installation templates.

Customer Belt Technical Specifications

- Belt type: PN450, 3 ply, M grade
- Belt width: 900mm
- Product being conveyed: Coal

MLT Answer

The only solution that made it possible without having expensive downtime was the use of MLT MS® Fastener which can be quickly installed on-site with a hammer and a cordless drill driver. Conveyor downtime has been drastically reduced as well as being able to install during a small window of opportunity for shutdown with production up and running again shortly afterwards.

For more information on MLT Group product range, visit www.mltgroup-conveyor.com

AMR

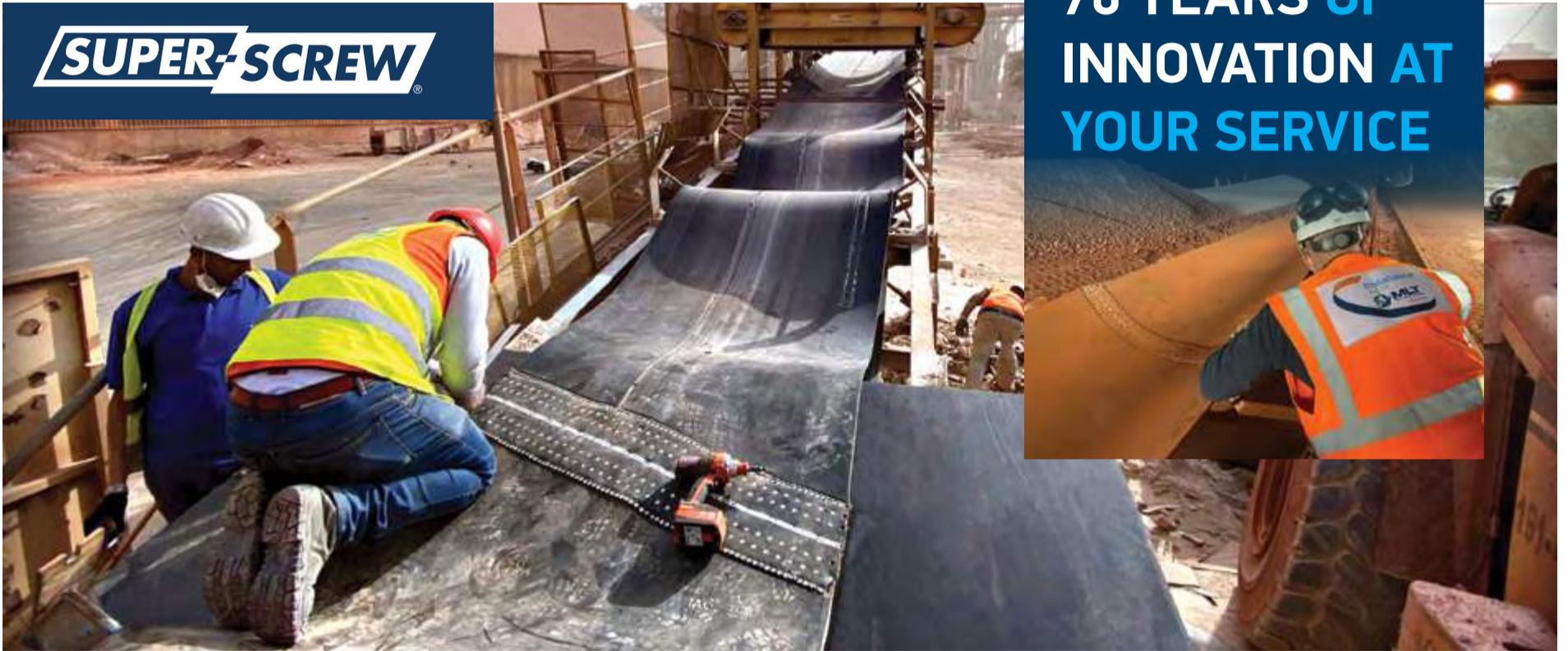


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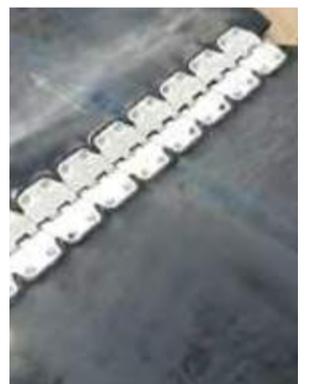
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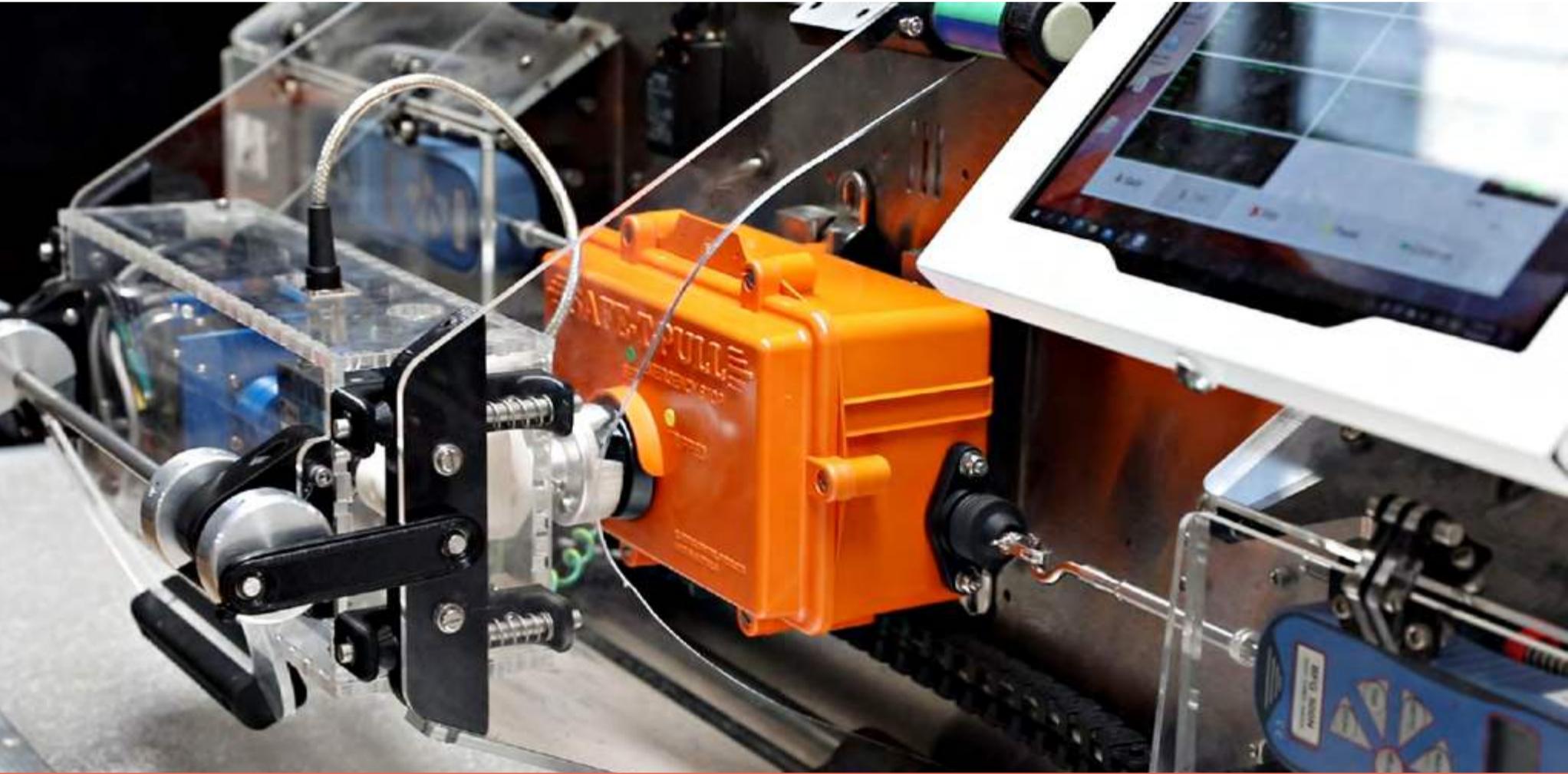
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Unit 2, 4 Shaw Road Ingleburn NSW 2565 

sales@mlt-lacing.com 

02 9605 6555 

www.mltgroup-conveyor.com 



SAFE-T-PRODUCTS ARE UNDERGOING SIL CERTIFICATION THROUGH RIGOROUS, INDEPENDENT TESTING

Our devices are undergoing testing to meet the required standards for safety systems that demand a high level of reliability. These systems require a SIL rating, and the devices used in these systems must meet specific failure rate criteria as part of the overall SIL calculation.

To determine the failure rate, the device must undergo comprehensive testing to ensure compliance through a full Failure Modes and Effects Analysis (FMEA). Most devices on the market have not undergone actual testing but have been reviewed to state their compliance should they be subjected to testing. Safe-T-Products made the deliberate choice to follow a comprehensive independent testing regime to attain full compliance. While it may be a lengthy process, the benefits will far surpass the time and effort invested.

Obtaining SIL certification through real-life testing conducted by an independent certification authority will offer certainty and confidence in Safe-T-Products devices among safety-driven industries.

BENEFIT OF FULLY INDEPENDENT TESTING

1. **Independent Verification:** Engaging third-party testing facilities for device

durability assessments and partnering with functional safety auditing companies to conduct a comprehensive device FMEA offers an impartial and unbiased evaluation of the device's safety and performance.

2. **Certification Authority:** Securing a well-documented durability safety test certification that can be relied upon and will be recognised by relevant certification authorities and regulatory bodies is crucial for trust in the testing process.

3. **Safety Integrity Level (SIL):** SIL serves as a measure for assessing the performance of safety systems employed across diverse industries. Having a fully endorsed performance level applicable to any SIL calculation ensures that Safe-T-Products' devices are well-suited for a broad range of safety-critical applications.

4. **Real-Life Certification:** The certification is not merely a letter of intent but a concrete, real-life documented safety test certification, offering tangible evidence of the devices' safety and reliability.

5. **Industry Recognition:** With the

successful completion of rigorous independent testing, industries with stringent safety requirements, such as manufacturing, process control, and others, can have certainty and confidence in Safe-T-Products' pull wire devices meeting their specific requirements.

Roadmap to achieving SIL Certification

TESTING OF ELECTRICAL COMPONENT - Completed

To prove compliance with IEC 60947-5-1, Safe-T-Products designed a microswitch to meet the stringent specifications required to pass certification.

AUTO MECHANICAL DURABILITY TESTER - Completed

To prove our pull wire devices can handle 6050 cycles, we developed a custom Automation Tester, perfected over eight years, which accurately simulates real-life conditions, ensuring our products meet rigorous durability standards.

MECHANICAL CYCLE DURABILITY TEST - Completed

Together with SIMTARS, using our Automation Tester, we completed 6050 full-cycle tests on nine samples, in three materials over a three-week period.

ENVIRONMENTAL DURABILITY TEST - Completed

The next phase is subjecting devices to extreme conditions, including high and low temperatures, humidity changes, and saltwater exposure over 96-hour tests, ensuring resilience in diverse environments.

ELECTRICAL DURABILITY TESTING

The next phase involves shock and vibration resistance, electrical integrity at 2500 V, reset functionality, and operation after wire disengagement.

FAILURE MODE & EFFECTS ANALYSIS (FMEA)

The final, and most significant, milestone in the certification process involves the engagement of an independent functional safety auditing company. Their role is to conduct a comprehensive FMEA assessment and determine the SIL rating of Safe-T-Products pull wire devices. Once their assessment, review of documentation, and the completion of a rigorous testing regime confirm compliance with the applicable safety standards, they will issue certification.

This safety test documentation and certification offer invaluable assurance to our end-users as it signifies that our pull wire devices not only meet but exceed the high safety standards required for their critical applications. Furthermore, it serves as tangible evidence of Safe-T-Products unwavering commitment to safety and quality assurance. This certification also adds substantial credibility to our claim that the company's pull wire devices are meticulously designed and manufactured to the most rigorous industry standards, ensuring the utmost safety and reliability for our customers. **AMR**



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ANNEXUS WA

LEADING PROVIDER OF CONVEYOR BELT SCRAPERS



AnnexusWA recently completed the acquisition of the global DirtWhacker brand and manufacturing facility. This acquisition has further strengthened our position as a leading provider of conveyor belt scrapers and automation solutions for the bulk handling industry.

The acquisition of DirtWhacker aligns with our long-term strategic vision to provide the most innovative and reliable products and services to our customers. The integration of the DirtWhacker brand into the Annexus WA family of

products will enable us to offer a broader range of conveyor belt scrapers and automation solutions, providing enhanced value and increased efficiencies to our customers.

The DirtWhacker conveyor belt scrapers, with their unique patented parallelogram design and air bladder system ensures a constant blade to belt angle of 90° and constant blade to belt pressure no matter the blade wear.

AnnexusWA supplies and installs the Dirt-

whacker range of Primary and Secondary conveyor belt cleaners. Our scrapers are mounted on or near the head pulley and reduce >90% of carryback residue. We also offer diagonal and V plough belt cleaning systems, designed for demanding applications. These are mounted on the inside of the belt near the tail pulley.

Our range of cleaners are highly effective in eliminating carryback, resulting in a safer and cleaner working environment while extending the life of the belt. The DirtWhacker cleaners also reduce main-

tenance and the overall costs associated with conveyor belt ownership.

We offer a 90-day trial that we are happy to demonstrate and discuss further.

For more information, visit
www.annexuswa.com,
call 08 9302 2576 or email
solutions@annexus.com

AMR



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M: +61 (0) 408 607 465
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Stuart Erskine
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E: sales@annexuswa.com



DirtWhacker Conveyor Belt Cleaning System

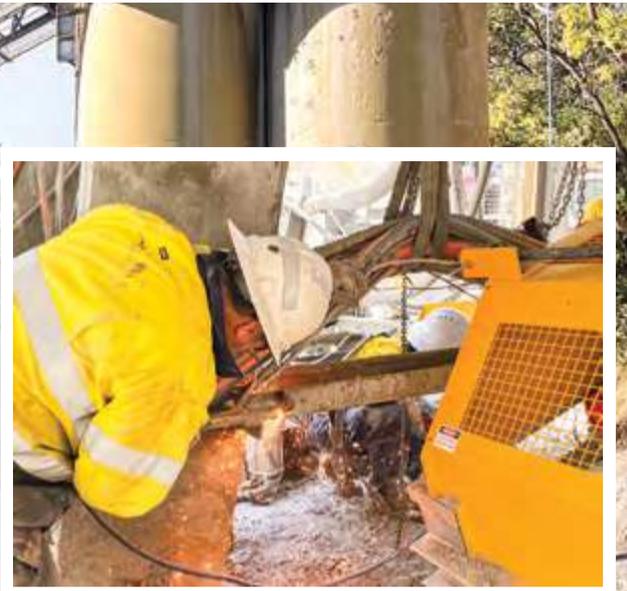
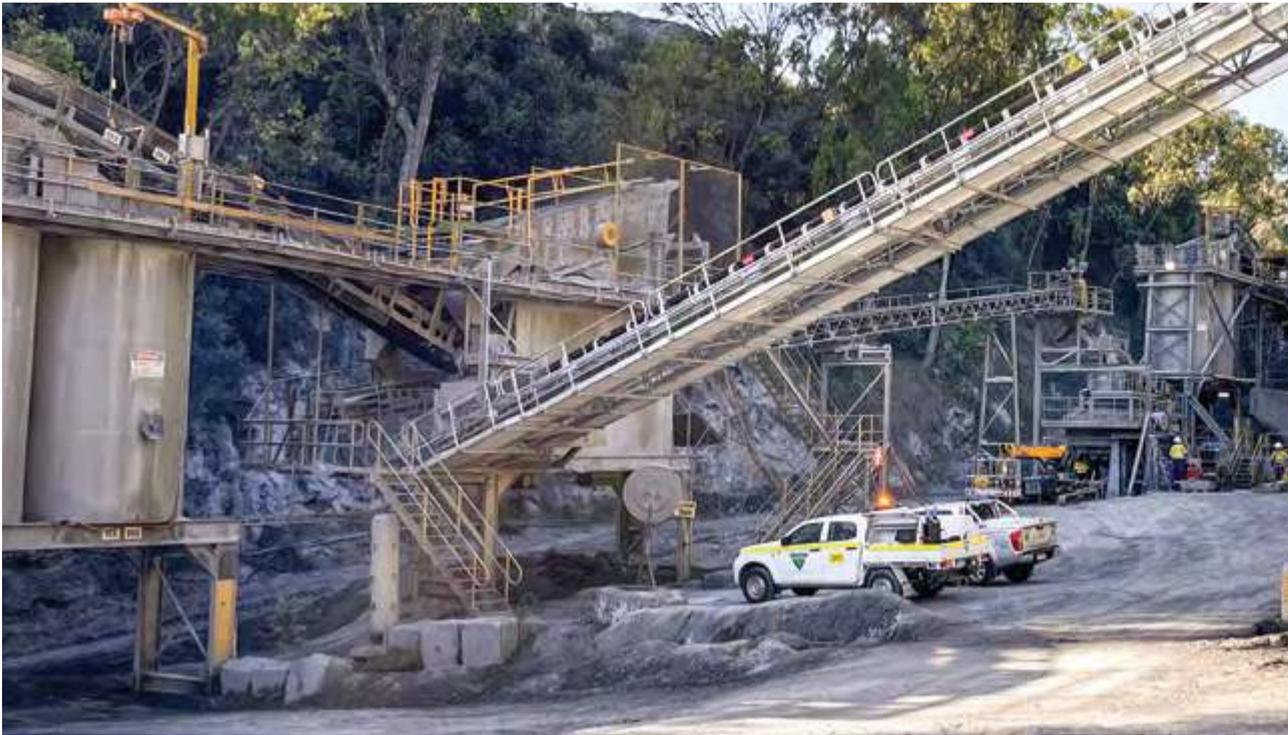
The DirtWhacker conveyor belt scrapers, with their unique patented parallelogram design and air bladder system ensures a constant blade to belt angle of 90° and constant blade to belt pressure no matter the blade wear.

Features:

- ✓ Extended conveyor belt life
- ✓ Constant blade to belt pressure
- ✓ Blades operate independently
- ✓ Cleaner working environment
- ✓ Lower maintenance
- ✓ Longer blade life
- ✓ Less carry back
- ✓ Less down time
- ✓ Constant blade angle of 90° due to patented parallelogram design



dirtwhacker.com.au



EXPERT QUARRY & MINE MANUFACTURE SERVICES

QMM, pride themselves on delivering quality services tailored to the unique needs of quarry and mine operations.

A recent project involved the design, engineering, fabrication, and installation of a conveyor system for a major quarry near Adelaide. From meticulous measurements to precise drafting and fabrication, QMM's turnkey approach ensured seamless execution from start

to finish. With a keen focus on meeting stringent specifications and adhering to Australian standards, the team tackled challenges head-on, ensuring compliance and efficiency every step of the way.

This project exemplifies QMM's commitment to excellence, collaboration, and client satisfaction, showcasing expertise in delivering innovative solutions to the mining and quarrying industry.



Project Overview Conveyor System Installation

The specifications for the conveyor system were precise: a belt width of 900mm, a capacity of 300 tonnes/hr, and a length of 30.8m. However, the project went beyond mere numbers. Various components were crafted to ensure optimal performance, including the design and installation of a new head chute, head drum, gearbox, tail drum, conveyor belt, safety guarding, stairways, walkways, platforms, and ladders – all engineered to comply with relevant Australian standards.

Efficiency was paramount in this endeavor, with the project being completed within a client-specified timeframe of just 10 weeks. This prompt execution was achieved through strategic planning and thorough attention to detail at every stage of the process.

A key challenge arose from the requirement to install a 900mm belt, presenting a tight fit due to the smaller size of the pre-existing belt. This obstacle demanded an innovative approach and methodical planning. Leveraging advanced 3D scanning technology, the QMM team adeptly navigated space constraints and design intricacies.

Additionally, installation complexities included the use of a 130T crane and the intricate task of integrating equipment into existing structures. However, through strategic project management and the expertise of



skilled labor, these hurdles were promptly addressed, ensuring the project's seamless completion.

Above all, this project exemplified QMM's core values of excellence and collaboration. By embracing a multidisciplinary team approach involving engineers, draftsmen, boilermakers, and fitters, QMM ensured a comprehensive solution that not only met but exceeded client expectations. This dedication to excellence and client satisfaction underscores QMM's commitment to delivering innovative solutions that enhance efficiency and productivity in a variety of material handling operations.



QMM SERVICES

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- + Shutdown Expertise
- + Turnkey Material Handling Solutions
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B&C BELTING INTRODUCES THE BMS CLOUD



When a conveyor belt fails, it can wreak havoc on production, work schedules, and it can impact worker safety. The costs associated with belt failure may include but not limited to loss of production, equipment repair, labour costs, safety risks and may include environmental impacts.

For over two decades, B&C Belting Solutions has delivered a comprehensive array of conveyor belt monitoring systems. These systems are adept at identifying deviations in performance, often detecting issues before they escalate into full-fledged defects.

Delivering unparalleled coverage, the BMS2000 (Belt Management System) stands as our flagship offering. This system provides real-time monitoring of belt behaviour and location, empowering operators and maintenance staff to promptly identify any alterations in the belt.

Utilising specially crafted BMS frames, this system has established itself as the premier solution in today's market.

Trusted by tier 1 suppliers to safeguard their Conveyor Assets, the BMS 2000 stands out as the preferred choice among industry professionals.

BMS Cloud Platform

The BMS Cloud Platform offers a comprehensive overview of all sites equipped with operational conveyor belts. Through a simple interface, users can swiftly identify the health status of each belt, indicated by a green or red indicator, and ascertain any recorded events, such as trips or warnings related to drift, width, or sensor summing. Additionally, the system compares these events against a 25-day summary, highlighting trends of increasing or decreasing occurrences. A warning sign alerts users if thresholds deviate from the original equipment manufacturer's recommendations.

In addition to event monitoring, the cloud system presents essential belt benefits, including width, length, construction, number of belts in the system, and splice details. These splice details precisely pinpoint the location of events on the belt, along with the date and time of occurrence,

providing users with comprehensive insights for effective maintenance planning and troubleshooting.

B&C Belting is developing this data even further using AI to look at change and variation over the longer term.

These features and our commitment to ongoing development is why customers keep returning to B&C Belting Solutions again and again.

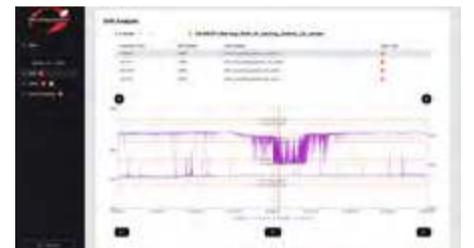
RFID Functionality

Utilising RFID functionality, the BMS2000 enables precise location pinpointing to the meter, facilitating swift identification of incidents or alerts. Furthermore, the RFID functionality allows the belt to be stopped at predetermined locations, ensuring efficient maintenance interventions.

With this capability, splice identification and location monitoring become seamless and straightforward, enhancing overall system effectiveness and reliability.

Operation and Installation

User-Friendly Interface: Our system is



intentionally designed to be user-friendly, ensuring that users do not require specialised training to comprehend or operate it. With the recent introduction of the BMS platform, usability has been further optimised for enhanced convenience.

Efficient Maintenance: Users can promptly address issues as they arise by easily navigating the system and identifying areas of concern. Control rooms also gain the ability to visualise incident locations and utilise cameras to review specific event occurrences. This functionality significantly improves visibility and supports production, particularly in scenarios involving remote operations.

AMR

Delivering comprehensive conveyor belt monitoring systems



Our flagship BMS2000 offers real-time monitoring of belt behaviour and location, highlighting immediate alterations to the belt.

Features include:

- Ultrasonic sensing
- Touch screen
- Time and date stamped data
- Self-cleaning sensors
- Can be programmed for automatic trip and or alarm
- Self-diagnosis of the system
- Change to the width can be set to alarm or trip
- The belt can be divided into sections with individual settings
- Can automatically adjust tolerances to the load data input

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ALETEK DPFs: BUILT TO PROTECT



Mitigating Harmful Emissions

In 2012 the World Health Organisation classified diesel emissions as class 1 carcinogens, highlighting the urgent need for measures to reduce their impact.

To combat this issue and strive for cleaner air and reduced environmental impact, Diesel Particulate Filters (DPFs) have become indispensable in the underground mining industry.

DPFs function as aftermarket or factory-fitted accessories within the engine ecosystem, effectively trapping diesel particulate matter and diminishing carbon monoxide and hydrocarbon emissions. Positioned within the existing exhaust system, these filters play a pivotal role in curbing harmful pollutants emitted by mobile mining machinery.

Engineering Excellence

Not all DPFs are created equal. The core performance of Aletek DPFs surpasses others due to their unique filter medium. Engineered with precision and crafted from high-grade materials, these filters exhibit unmatched durability and resilience. Aletek's advanced filtration technology ensures a reduction of more than 99% in Diesel Particulate Matter (DPM).

Streamlined Maintenance

One common concern with DPFs is the burden of regular maintenance and cleaning. However, Aletek DPFs address this challenge with superior filters that allow for greater storage capacity, ensuring they retain more diesel particulate matter for extended periods.

As a result, maintenance and cleaning

intervals are significantly reduced, minimising downtime and maximising operational efficiency. This streamlined approach not only benefits productivity but also translates into cost savings over the lifespan of the equipment, contributing to a lower Total Cost of Ownership (TCO).

Powering Performance

Aletek filters not only excel in emission control but also enhance engine performance. By minimising exhaust backpressure and optimising airflow, these filters facilitate smoother engine operation, leading to optimised power output and fuel efficiency.

Setting the Standard

Aletek Diesel Particulate Filters represent the gold standard in emission control and engine optimisation. With their

unparalleled filtration technology, robust construction, hassle-free maintenance, and exceptional performance benefits, choosing Aletek filters are the obvious choice for those dedicated to achieving cleaner air.

The adoption of Aletek DPFs in the mining industry is not just a choice for compliance but a proactive step towards operational efficiency and higher performance. Through their innovative design and superior performance, Aletek filters are leading the way in mitigating harmful emissions and advancing sustainable practices in mining operations worldwide.

For more information please visit us at www.aletek.com.au

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**DIG
GING
DEEP**

DIESEL PARTICULATE FILTERS
HARMFUL DPM REDUCTION OF >99%

**S
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**BUILT TO
PROTECT**

Underground diesel emissions are harmful. In 2012, the World Health Organisation classified diesel emissions as a class 1 carcinogen. Aletek are committed to tackling DPM for *Cleaner Air Underground*.





Quality Global Brands and Personalised Service: LK DIESEL SERVICE'S WINNING FORMULA

For over 50 years LK Diesel Service has had a strong and evergrowing partnership between Lloyd Lang and Ted Kuhlwind – the L and K of LK Diesel Service Pty Ltd.

What started as a small workshop in Racecourse Road, Newmarket, Victoria, has now become Australia's award winning diesel engine solutions, designed to empower your business.

LK Diesel has looked after Engines, Generators, Filters, Pumps and parts to best cater for all your diesel needs.

LK Diesel Service is a specialised sales and service provider to the industrial and commercial diesel engine market, the new engine sales department is in the privileged position of being able to offer our customers a variety of quality global brands in their diesel-powered projects

LK Diesel Service is very much involved with repairing and overhauling industrial and commercial engines as well as supplying service exchange units for the mining, rail, construction, building and agricultural industries including field servicing at any location.

Operating a well-equipped workshop, which includes an engine dynamometer, bead blaster, overhead crane, welding facilities, spray booth etc, LK Diesel has also assisted with overhauls and repairs to marine engines up to 10,000 h.p, being able to design and build to customer specifications, equipment for agricultural and industrial purposes such as irrigation pumps and generating sets. They have further re-powered various machines such as Atlas Copco, commercial road sweepers, Deutz, Kubota and other engines of that range.

LK Diesel service has always strived to pro-

vide high quality, personalised service to the mining and many other industries, we have always been proud of the fact that we are able to supply genuine OEM (Original Equipment Manufacturer) parts for Deutz, Kubota, Kohler and Hatz engines.

Over the years since our inception in 1967 and as a result of our commitment to maintain the integrity and reliability of

our customers engine we have been recognised by our suppliers with numerous awards.

Early in 2023 we were very excited to received awards from Deutz Australia for Dealer of the year for 2022, Kubota Australia, Kubota Dealer Excellence for 2022 and from Kohler Australia, Best Servicing dealer for 2022. **AMR**



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- 2022's Kubota Dealer Excellence Award
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With fully integrated secure CAT-M LTE cellular connectivity, the ALTAIR io™ 4 device comes with automatic connection to MSA Grid cloud-based software.

The ALTAIR io™ 4 Wearable Gas Detection is available through the MSA+ subscription program, which gives access to powerful cloud-based solutions, enabling faster implementation, increased warranty coverage and automatic software and firmware upgrades — with minimal capital expenditure.

Over-The-Air Updates

The ALTAIR io™ 4 device gets better with time through over-the-air software updates delivered to the fleet with complete control and unmatched ease. It's as simple as releasing the update from the grid software and the devices will update safely the next time they charge.

Digital Device Assignment

With the MSA id RFID tagging system, digitally assigning ALTAIR io™ 4 devices is as simple as a tap and returning them happens with just a click when they are returned to the charger.

Automatic Bump & Calibration

When in the dock, the ALTAIR io™ 4 Gas Detection Wearable knows when it needs a bump test or calibration to be

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- Pump Pipe and Accessories
- Well Cleaning Chemicals
- Filter Packs



120 Years of Innovation Supporting the Australian Mining Industry



Johnson Screens, a brand of Aqseptence Group, is the leading global provider of screening and auxiliary solutions. We support a wide range of industries, such as water wells, environmental, energy, chemicals, food and beverage, and mining, with our highly engineered and precisely fabricated products.

For 120 years, Johnson Screens has provided the innovation the Water Wells industry requires with the tradition customers want. Our complete solutions in screens and casing, pump pipe, chemicals, filter packs and accessories include exclusive and well-known products used in dewatering and water wells for mining applications, such as Muni-Pak Screens, Shur-Bolt Casing and Shur-Pak Filter Pack.

With a global footprint, Johnson Screens has been in Australia for 70 years. Having been located in Brisbane since 1991, we will soon operate from our new Eagle Farm manufacturing facility. Close to the city and near central transportation infrastructure (Brisbane Airport and Port of Brisbane), our new facility is designed following Lean Manufacturing principles and processes developed in our Johnson Screens and Aqseptence Group global locations. That will give us the ability to streamline manufacturing processes and reduce lead times while maintaining our capacity to continue delivering high-quality, innovative products and solutions and better fulfilling the demands of the Australian mining industry.

Tel: +617 3867 5555
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Learn More about our solutions at
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Johnson Screens

A brand of
Aqseptence Group

Complete Solutions for MAR/ASR Wells

Managed Aquifer Recharge (MAR) and Aquifer Storage and Recovery (ASR) are demanding applications where well components are submitted to harsh conditions or taken to their limits. Besides knowledge of the application, those involved in the design and implementation of those projects must have a complete understanding of the limitations of individual components and their compatibilities. A comprehensive solution is needed to increase their ability to provide reliable wells while balancing expenses.

By combining the tradition and knowledge with which we have led the water wells industry for 120 years with innovative equipment specially designed for these applications, Johnson Screens provides complete solutions supported by technical and construction experience in some of the most demanding projects in the world and the most reliable water well equipment in the industry.

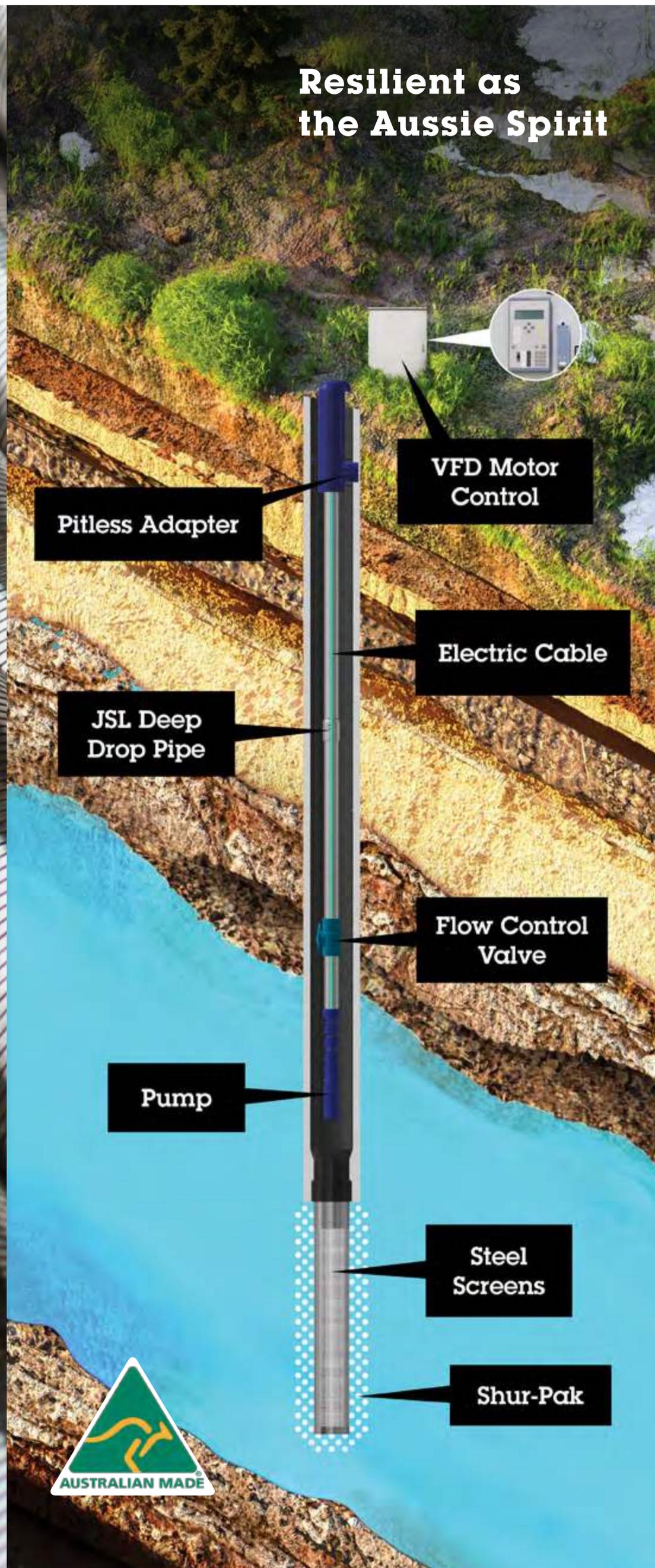
Our complete solutions include screens, casing, pump pipes with threaded and fast installation, anti-rotational connections, filter packs, and other accessories to ensure the safe and reliable operation of your MAR/ ASR water well.

Learn more about our solutions at johnsonscreens.au/water-wells

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Resilient as the Aussie Spirit



ADVANCING AUSTRALIAN MINING WATER MANAGEMENT

Efficient water management is crucial for success in Australia's mining industry, which faces unique challenges and harsh water conditions. The recent collaboration between Cornell Pumps and Source Pumps represents a significant leap forward in revolutionising dewatering and water management practices within the sector.

This partnership not only provides cutting-edge pumping solutions but also ensures that the Australian mining industry can access genuine Cornell products, mitigating the risks of counterfeit imitations, while prioritising sustainability and operational efficiency.

Cornell Pumps is globally renowned for its pump technology, offering a diverse range of pumps tailored specifically for mining applications, from dewatering to slurry handling. With Source Pumps' profound understanding of the mining industry and local presence, this partnership guarantees that mining operators across Australia receive authentic Cornell products, reducing downtime and operational stoppages associated with non-genuine alternatives.

Additionally, the partnership's offering provides operators with access to Cornell's innovative CoPilot system that enables remote monitoring, real-time alerts, and optimised system efficiency, further minimising downtime and maximising productivity.

Source Pumps has strong manufacturing capabilities, specialising in bespoke dewatering packages tailored to the unique needs of mining operations. With expertise in designing customised solutions, Source Pumps ensures that customers receive comprehensive dewatering systems optimised for efficiency and performance in challenging mining environments.

This capability, backed by Cornell, adds a unique dimension to the partnership, allowing mining operators to address specific water management challenges with tailored solutions designed specifically for their operations.

Source Pumps, as Cornell's preferred distributor in Australia, validates their position as a trusted partner in delivering Cornell's cutting-edge pumping solutions to the Australian mining industry.

With this endorsement, mining operators can have confidence in the quality and reliability of the products and services offered by Source Pumps. With the backing of Cornell, Source Pumps has committed to high stock availability, ensuring lead times are minimised. This proactive approach to inventory management ensures that mining operators can access equipment promptly, reducing waiting times and expediting project timelines.

In addition to delivering genuine Cornell products and utilising CoPilot technology, the partnership elevates standards of

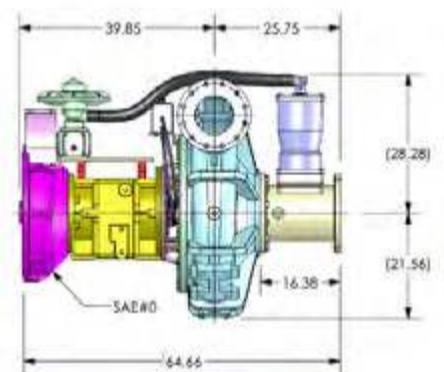


Michael Papadeas (International Mining Sales Director - Cornell Pump) Sam Reynolds (Mining Market Manager - Source Pumps) and Marcus Davi (Vice President - Cornell Pump).

technical support and after-sales services for mining customers. Leveraging Source Pumps' extensive network and Cornell Pumps' reputation for reliability, mining operators can expect comprehensive support throughout the product lifecycle.

Sustainability remains a central focus of the collaboration, as Cornell Pumps and Source Pumps spearhead a solution to shift towards more responsible water management practices in mining operations. Through promoting water conservation, reducing energy consumption, and minimising environmental footprints, the partnership aims to foster sustainable development within the mining industry.

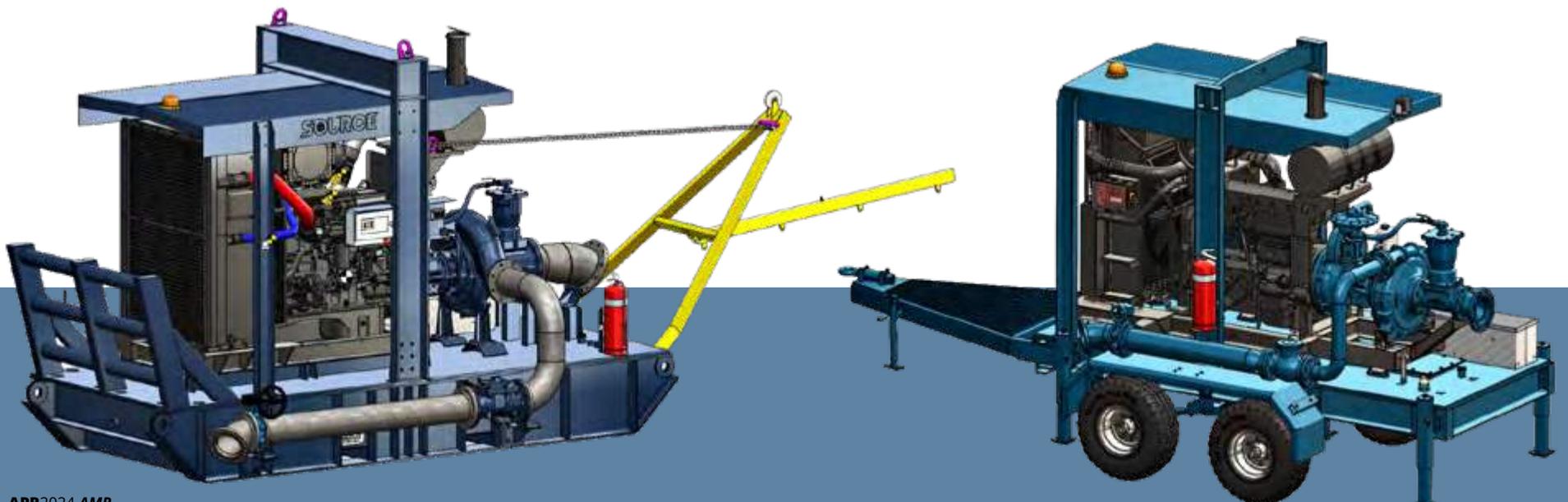
Looking ahead, the Cornell and Source Pumps partnership holds immense potential for driving innovation and advancing sustainability in mining water management. Through collaboration, knowledge exchange, and technology transfer, this alliance is poised to tackle evolving challenges and unlock new opportunities within the sector.



Cornell 6822MX-RP-EM (200/180)

As Australia's mining industry continues to evolve, this partnership stands as a beacon for driving positive change, promoting operational excellence, and prioritising environmental stewardship in the pursuit of sustainable mining practices.

FOR MORE INFO
www.sourcepumps.com.au
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SOURCE

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- ✓ Industry leading consultation and engineering
- ✓ Product training, maintenance and support
- ✓ Australia wide presence

From consultation and design to manufacturing and commissioning, Source Pumps partners with clients requiring current and continued dewatering and water transfer solutions in mining, construction, quarry or desalination and wastewater industries.



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A TRUSTED LIFELINE FOR REMOTE SITES.

Established in 1989, Laverton-based — Cartage specialises in supplying remote outback and mining projects in regional WA and the Northern Territory with potable water, sand, fuel, and various other bulk haulage requirements.

Desert Sands also offers earthworks and mobile and on-site concrete delivery to clients for various construction projects.

In response to increasing demand for portable concrete supply and delivery, Desert Sands Cartage recently increased its capabilities by adding a Porta-Batch mobile concrete batching plant to its fleet, with a 50-tonne cement silo.

The batching plant can produce more than 32 cubic metres of concrete per hour and

can be deployed at most remote locations in the Outback.

This is one of two similar batching plants Desert Sands Cartage has put to work to supply large-scale construction projects in remote areas.

Servicing Remote Regions

Desert Sands director Rex Ryles says his company can mobilise to remote locations to service its clients, whether it be to batch and deliver concrete using its new Porta-Batch plant, deliver earthworks materials and services, alongside many other services for mining, civil, and local government projects.

"We can also provide potable drinking water for personnel mobilised on-site for all

stages of the mining process, for example, exploration, earthworks, and construction phases," he said.

"No matter where your site is located, we travel far and wide to ensure you and your staff are looked after and have a reliable source of drinking water."

No job is too big or too small for Desert Sands Cartage, with clients ranging from the local Shire to larger operations such as Gruyere gold mine, Anglo Gold Ashanti sites, and various other large-scale mining projects.

A Range of Cartage Solutions

Desert Sands Cartage Contractors provide services including but not limited to:

Side tipper haulage, mobile batching

plant/concrete delivery, supply and delivery of potable water alongside diesel and petroleum fuels, screened sands, river rock and blue metal materials.

Other services include maintenance grading, road building, site works, construction and excavator and loader-work.

Desert Sands can also provide contract screening, semi-drop deck hire, front-end loader hire, road maintenance and constructions for local government organisations, general civil works, bulk tipper haulage and much more. **AMR**

For more information, visit
www.desertsandscartage.com.au
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Incorporated in 2009 and Australian owned, PLC Hardware is an independent distributor of automation hardware and is trusted by hundreds of customers who regularly buy from us.

With more than 14 years of experience in selling automation products to Australian industries, PLC Hardware provides customers with an alternate supply channel, that enables them to source their automation hardware, at realistic prices.

The core products that PLC Hardware supplies are from major manufacturers including, Rockwell Automation, Siemens, Hitachi, Schneider, Omron, GE FANUC, Mitsubishi, Panasonic, Cermate, Phoenix Contact and DA Vision.

While PLC Hardware typically focuses on supplying our core automation products, we also have access to a wide range of industrial control products such as power supplies, safety devices, and sensors just to name a few.

WHY CHOOSE PLC HARDWARE?

Availability — With a large supplier base, we can often source products with faster ETAs than local authorised distributors.

Reduced Costs

PLC Hardware has invested heavily in establishing wholesale trade links with source countries such as America, China, Japan, Singapore and Germany. Price reductions of 40% or more can be realised.

PLC Hardware is in the business of parallel importing. We are not the authorised distributors of the brands we carry apart from Hitachi, Cermate & DA Vision.

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G&A LOMBARDI

SUPPLYING AUSTRALIA QUALITY SINCE 1972

G&A Lombardi are the premier provider of on and off highway haulage equipment in Forrestfield, Western Australia. We provide new and used trailer sales, service and spare parts to a broad sector of the transport industry Australia-wide.

At G&A Lombardi, we hold in excess of 3,000 line items in our spare parts inventory with a service and repairs department that is open 84 hours per week. Our commitment is to provide superior support to the transport industry – support that it deserves.

Our History

As a family-owned business trading for 52 years, the company was founded by Jack Lombardi together with his two brothers Giulio and Mario. Since its inception in 1972, G&A Lombardi has seen incredible growth in the heavy transport industry and now with Jack's son Peter at the helm as director since 1992, the name has become synonymous in WA with trailer sales, repairs and parts.

G&A Lombardi's success as a reputable specialist in its industry has seen the company develop strong business relationships to enhance its service to the transport industry.

- The sole WA dealer for Roadwest Transport equipment and sales
- The MaxiTRANS distributor in WA
- The dealer for Tag-A-Long Trailers in WA
- The dealer for Faymonville Trailers to the MAX for Australia and New Zealand

Trailer Sales

With a talented and experienced trailer sales team, G&A Lombardi is the state's go

to company thanks to its dedicated supply of high-quality Australian-made heavy duty transport trailers.

We supply new trailers for a range of industries such as, but not limited to, mining, general freight, heavy haulage, specialised haulage, wind power, agriculture and farming. Whether you require a drop deck, side tipper or a special heavy transport trailer, G&A Lombardi will ensure a smooth transaction from start to finish.

Service & Repairs

G&A Lombardi is committed to keeping your trailer working at its best throughout its entire lifecycle. With our state-of-the-art workshop and quality workmanship we can ensure your trailer will get the service it requires.

Our expertise means we can offer premium service and repairs performed by fully qualified and experienced mechanics and fabricators. It's all about ensuring your trailer is working to its fullest potential ensuring that your project keeps moving forward.



Spare Parts

G&A Lombardi has an experienced Spare Parts team ready to provide the parts you need for your trailer. Thanks to our shop front we have the ability to stock a full range of trusted brand-name parts for all types of trailers and provide the industry expertise that fits your needs.

RoadWest Transport Equipment & Sales

G&A Lombardi takes pride that it is the sole WA dealer for RoadWest Transport, an industry leader and supplier of exceptional heavy transport equipment throughout Australia.

Established in WA in 1970, RoadWest Transport has experienced exceptional growth over the past 50 years, building itself a strong reputation for its high-quality transport equipment and its commitment to continually improve and develop products that are precision-built, cost effective and long lasting.

RoadWest Transport specialises in the design and manufacture of Side Tippers,

End Tippers, Low Loaders, Dollies, Water Tankers, Belly Dumpers and specialised equipment.

Faymonville Trailers to the MAX

As G&A Lombardi's newest partner, Faymonville Trailers to the MAX is headquartered in Luxembourg and builds semi-trailers such as the TeleMAX, WingMAX, MultiMAX, FloatMAX and PrefaMAX for the specialised haulage industry. Its brand portfolio includes transport solutions for 15 tonnes to 15,000 tonnes and beyond.

MaxiTRANS

MaxiTRANS is a Ballarat, Victoria-based industry leader partnered with G&A Lombardi since 2020. As a WA distributor for the brand, we carry the full range of MaxiTRANS brands which include Freighter, Maxi-CUBE, Lusty EMS, Hamelex White, Trout River and Schmitz Cargobull.

Tag-A-Long Trailers

Tag-A-Long Trailers, also located in Victoria, have been designing and constructing trailers for more than 35 years. Tag-A-Long Trailers manufactures a range of trailers, which include Tag Plant, Dog, Pig, and custom made trailers. G&A Lombardi are proud to be the sole distributor for Tag-A-Long Trailers in Western Australia.

G&A Lombardi is more than your average trailer provider. We are your solution to successfully keeping you on the road and hauling the heavy loads. As your one stop trailer shop, we supply everything needed to keep you moving.

FOR MORE INFO
www.lombardi.com.au

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YOUR ONE STOP TRAILER SHOP

QUALITY NEW TRAILERS · SPARE PARTS · SERVICE · REPAIRS



Backed with more than 50 years of heavy transportation experience, G&A Lombardi supplies premium heavy transport trailers for a wide range of industries.

- ✓ Mining
- ✓ General Freight
- ✓ Heavy Haulage
- ✓ Specialised Haulage
- ✓ Wind Power
- ✓ Agriculture
- ✓ Farming

Official partners with:

- RoadWest Transport
- Faymonville Trailers to the MAX
- MaxiTRANS
- Tag-A-Long Trailers

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MOVING TO THE CUSTOMER'S BEAT

Tranz Logistics provides both wet and dry hire of its fleet of transport equipment with a focus on high level client service.



Its fleet is used in mining, oil and gas, infrastructure, road construction and major civil projects across Australia and includes oversize and over-dimensional loads with its high capacity and high performance Palfinger cranes.

Tranz is committed to finding the best solutions to meet any industries specific requirements.

The company collaborates directly with its customers to ensure all equipment meets the required industry standards for the job including the provision of customised equipment to meet specialised conditions.

Always putting safety-first, all hire equipment includes advanced technology such as in-vehicle monitoring systems (IVMS), GPS tracking and fatigue management systems for high level safety performance.

All technology can be integrated where required for individualised job conditions.

Safety features include fire suppression systems, five-way camera and motion sensors on its fleet of crane trucks. The motion sensors detect objects and will halt the movement of the crane to prevent the possibility of damage. The Fire control system Fog Maker installed in tunnel vehicles to minimise injuries, along with the proximity detection device for collision avoidance.

We offer a specialist Tunnel Logistics service with customised supply chain solutions, a deep extensive knowledge requirement and needs built on long term partnerships with clients.

Tranz Logistics works together with projects to offer safe and reliable equipment and

operators to deliver the results customers rely on and expect from us.

Our considerable experience in tunnelling services includes the hire of all equipment as well as supplying operators should it be a requirement, which have the experience and expertise to work productively and safely in underground environments.

We have operated on major tunnelling projects across the eastern seaboard including North Connex and West Connex in Sydney, Melbourne Metro, West Gate Tunnel in Melbourne, Narrows crossing pipe tunnel and Brisbane and Airport Link in Queensland.

Tranz Logistics also offer a specialised service to manage chemical, dangerous goods, hard rock mining and other indus-

tries that deal in dangerous chemicals and toxic waste.

Our service focussed providers include Tranz Logistics, Tranz Renewables, Tranz Warehousing and Tranz Moves.

Tranz Renewables seeks to meet all the requirements for providing equipment in the construction and maintenance of hybrid renewable technologies, combining expertise in stevedoring, logistics and renewable solar handling, with an unequalled expertise in crane hire, heavy haulage, component transportation and logistics.

The company has been established in Australia Nationally for over 20 years and is now keen to expand into Southeast Asia, the Middle East and Europe. **AMR**

Service is our Success

We design and implement innovative supply chain solutions across the tunnelling, rail, road, civil, mining, renewable energy, infrastructure and oil & gas sectors.

We provide innovative, cost effective and high quality wet and dry hire transport solutions.



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- Lifting capacities from 590 – 730kg
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Maxilift Cranes

- Maxilift — Australia's favourite small crane
- Models from 0.5 to 5 tonne/metre

lifting capacity

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- Stellar tyre manipulators work with the largest off the road (OTR) tyres
- Imported from the USA with six models to choose from
- Truck mounted so they can be quickly moved between sites for the quickest response

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- Carrying capacity to take tyres to site (subject to vehicle capacity)
- Stellar TM4110-9000 tyre manipulator is our entry level model and can handle tyres from 740mm to 2790mm diameter, and 2080kg at 4.8mm for tractor and OTR rims
- The Stellar 16160-28000 tyre manipulator is heavy duty and handles the largest of tyres with lifting capacity of 7485kg and clamping capacity of 4000mm

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- Easy operation for stripping euro (safety hump rims) with no damage to polished wheels
- Heavyduty Tommygate tailgate loaders for quick loading/unloading 590kg or 730kg capacity's
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AMR



Maxilift Australia has an extensive distributor network allowing for the fast and efficient flow of sales and aftersales support for vehicle loading cranes.

Our team has more than 250+ years combined in the Vehicle Loading Crane industry.

We exclusively import and stock:

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- ✓ Maxilift Mono-Boom Cranes
- ✓ Unic Truck Mounted Cranes, Marine Canes and Mini Crawler Cranes
- ✓ Effer Knuckleboom Cranes
- ✓ Tommygate Hydraulic Liftgates



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POWERING THE INDUSTRY FOR 30 YEARS

ACE Electrical Australia has been supplying electrical installation and maintenance services to the oil and gas, mining and utility sectors since 1994, building itself an esteemed reputation for safety, quality and attention to detail.

Never compromising on providing the best solutions for its customers' construction and maintenance needs, we have years of proven experience that combines high-quality performance with delivering the most valuable results.

From operating digging equipment in open green fields trenching to exposing high value assets and operating large machinery, ACE Electrical will fulfill your short term or long term requirements.

Recent Projects

Our experience makes ACE Electrical the ideal choice for your project. We comply to the highest safety workplace regulations and ensure consistency to deliver premium work with effective communication, profound expertise and end-to-end solutions.

Recent projects we've completed include:

- Stage 1 HV Terminations onto new gas turbines to associated hazardous area switch gear and transformers (Santos)
- 3.3kv to 11kv system upgrade of flame proof switch gear and transformers on Varanus Island (Santos)
- Millstream cathodic protection solar power supply (WaterCorp)
- Fault finding on HV feeder cable between gas turbine powerhouse switch-room and integrated 3MVA solar array
- Stage 2 HV Terminations onto new gas turbines to associated hazardous area switch gear and transformers (Santos)
- Devil Creek gas plant HV switch gear and cooling pond transformer
- Mt Welcome aerial network undergrounding (Horizon Power)
- Burrup Train 2 1.2 MVA supply for construction and concrete batch plant (HV network connection)
- HV cabling jointing and testing (multiple Pilbara mine sites)
- Roebourne substation upgrade (HV jointing & earthing)
- 5MVA camp supply upgrade (Horizon Power)
- Deep drilled earths (multiple mine site in the Pilbara)

Our Services

At ACE Electrical Australia, we offer full project management solutions as well as operating plant and equipment for all required operations. Focused on strategic planning and a high culture of accountability, our professionals work tirelessly to ensure a safe working environment that delivers quality projects to clients.

High Voltage Installations

- HV feeder cables
- HV substation construction/ maintenance
- HV switching operators

Drilling and Earthing

- Deep drilled earths (DTH drills for hard rock)
- Substation earthing
- Lightning protection

Power generation

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- Battery backup
- Hybrid systems

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- Extensive experience HV jointing up to 132kv
- HV & LV jointing: CERT 3 cable jointers

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- 32Kv burn down units

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Trucks and Machinery

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- Loaders & skid steers
- Hiabs
- Beavertail trucks

ACE Electrical Australia provides expertise and in-depth knowledge when it comes to installation and maintenance services. And with more than 30 years in the industry, there's no one better you can trust.

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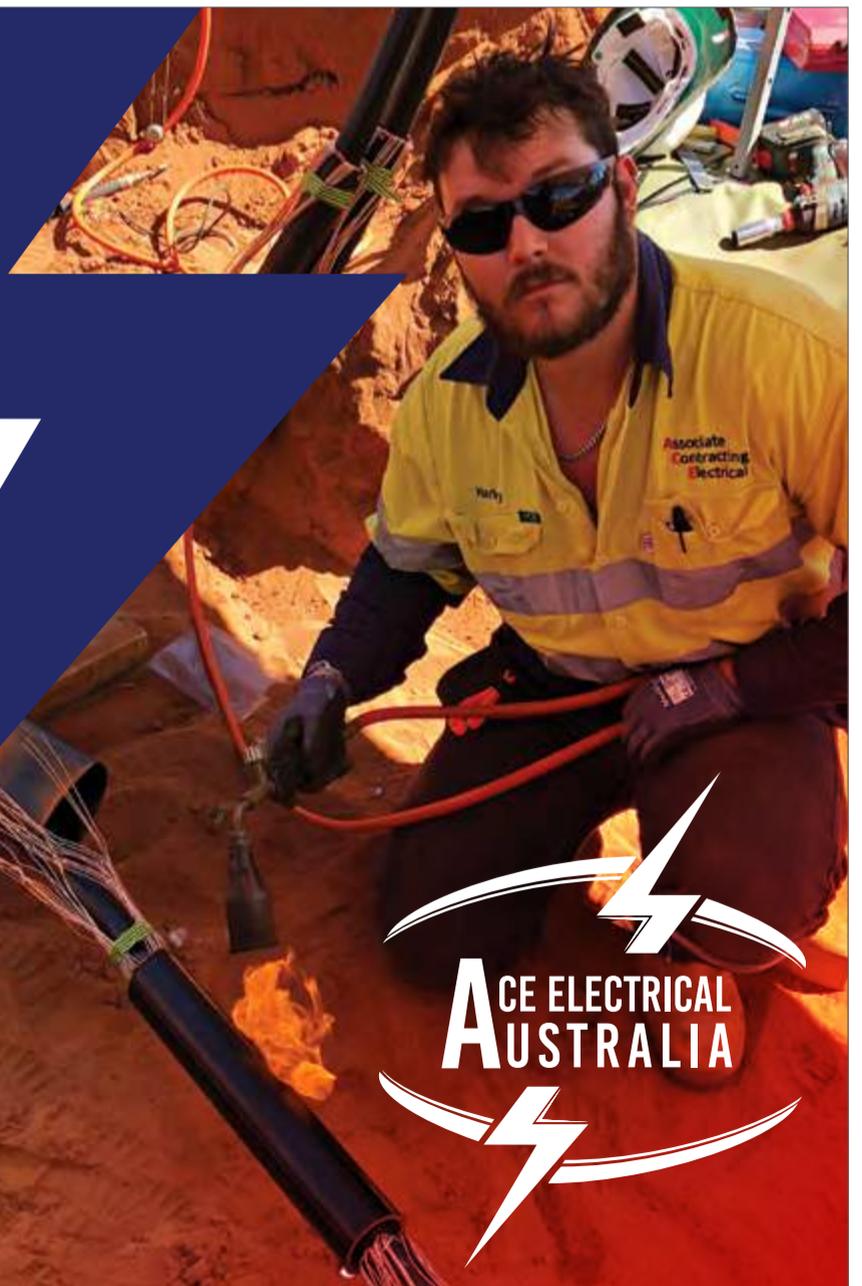
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Maximising equipment up-time is critical to shortening project completion times and increasing bottom line profits.

Removing equipment from the job site to a repair facility can delay project completion and put a damper on profits.

This is where Field Machine Tools can help. FMT has the on-site repair and maintenance machines that will minimise maintenance times and keep equipment working for companies and their customers.

Keeping equipment and plants in top operating condition is a constant challenge for today's mining, oil, gas and power generation contractors.

Our wide range of portable equipment

is available for rent or purchase, Australia-wide from our three branches, and include equipment for machining applications such as Portable Milling Machines, Portable Lathes, Clamshell Pipe Lathes, Flange Facers (OD and ID mount), Line Boring Machines, Vessel Grinding Machines and Pneumatic Magnetic Based Drills.

For welding applications, there are Bore Welding & Cladding Machines and Induction Heat Treatment Equipment.

For valves, there are Valve Test Equipment, Valve Repair Equipment and Portable Valve Actuators and, for heat exchanger, condenser and boiler manufacture, repair and maintenance there are Tube Pulling Systems, Tube Cleaning Systems, Heat Exchanger Tools, Torque Controlled Rolling Motors and Australia's largest stock range of Tube Expanders and consumables.

FMT is the Australian agent for major international brands including:

Climax Portable Machine Tools, an impressive range of highly-sought after industrial equipment designed by a market leading manufacturer for the rugged challenges facing Oil, Gas, Mining, Chemical & Power Generation Industries.

CLIMAX pioneered the portable machining revolution in 1966.

For more than 50 years they have been the innovators and technology leaders in the industry they invented.

They're #1 for a reason!

Modec Motors and Portable Valve Actuators and Modec vane air motors have been used for 30 years as an alternative to traditional electrical motors in many demanding applications.

They supply OEM replacement motors to a wide variety of industries and application-specific motors to customer specification.

This includes a versatile range of Portable Valve Actuators for preventative maintenance of valves, even in the most demanding of environments, and incorporates a reaction device designed to reduce the risk of strain injury to the operator.

Krais Tube & Pipe Tools has been delivering top quality tube tools for over 40 years.

Designed and manufactured by their engineers, the whole process from paper sketch to producing the tools is controlled in-house with one of the biggest and most modern machinery and production line in the EU.

There is a comprehensive range of Condenser, Boiler Tube Expanders, Tube Roll-

ing Motors, Tube Installation Tools, Tube Cutting and Removal Tools, Tube Pulling equipment and Accessories.

Goodway Technologies is a USA-based manufacturer of specialised industrial maintenance products for HVAC, Energy, Manufacturing, Food and Beverage Production markets.

Since 1966, facilities and plant maintenance personal have used their innovative products to maintain HVAC systems, plant machinery, hazardous material clean-up, surface cleaning and other critical maintenance needs.

Established in 1995, Field Machine Tools (FMT) is a privately owned Australian company that provides engineering solutions for field applications to minimise downtime.

The scope of operations is to provide the most complete product lines available to OEM equipment manufacturers, maintenance providers, field service companies, power stations, petro chemical plants, mining industry and other related industries.

Call Field Machine Tools on **1300 FMT FMT (1300 368 368)**, email **sales@fmt.com.au** or visit **www.fmt.com.au** for more information. **AMR**



Field Machine Tools has a range of end prep machines suitable for 12.7mm to 610mm bore mount to face, bevel or counter bore tube and pipe.



Field Machine Tools has rugged and innovative portable flange facers for 19.1mm to 5054mm (0.75 to 199 inch) diameters. Several of the machines can be configured for facing, milling or both.



Field Machine Tools has OD mount flange facers suitable for 0mm to 3050mm (0 to 120 inch) diameters. Several models can handle flat face, raised face, RTJ, tongue and groove, lens ring, Grayloc and compact flanges.



Field Machine Tools has a range of Clamshell Lathes suitable from 33mm to 1676mm OD pipe preparation whether severing, bevelling or counter boring.

LEADING ENGINEERED MATERIALS AND SERVICES COMPANY

Founded in 1992 originally as Blucher Australia Pty Ltd, AusPress was the first company in Australia to introduce stainless-steel drainage and stainless-steel press-fit systems to the market.

Since then, AusPress was also the first company to introduce 168mm press-fit tube and fittings (in 2011) and 66.7mm press-fit tube and fittings (in 2024).

As part of the Tasma Group of Companies, AusPress is a market leader in the industrial piping market, specialising in the plumbing, mining, construction and marine sectors and has a proven reputation of providing highly technical solutions to their clients.

Having worked hard for more than 30

years, AusPress has introduced new and technically superior products which comply to relevant standards, codes and certifications such as Watermark, Activefire, DNV and HACCP, amongst many others.

"We don't consider ourselves as a product supplier but more of a solution provider," AusPress General Manager and CEO Jason Nelson said.

"Our core product has always been our stainless-steel press-fit system. An OEM branded system that has been in Australia since 1995 with more than \$100m worth of sales over the past 30 years.

"AusPress has a high commitment to ESG with certified policies for environment, anti-bribery and anti-corruption, modern

slavery and whistle-blower protection. We are also fully certified to ISO9001 and ISO45001.

"These commitments provide our clients with a high level of comfort around our governance and customer service."

AusPress' press-fit system remains the preferred system for hot and cold water, rising mains, fuels, fire sprinklers, hydrants, gases, dust suppression, steam, compressed air and various other applications.

"Our other products such as our stainless-steel drainage system and our KG2000 polypropylene trade waste system are capable of temperature in excess of 90 degrees," Mr Nelson said.

"Then we have our copper press-fit system and finally our range of tooling which allows us to offer complete solutions to our clients, giving them the ability to tie in a 'one warranty' system for vital projects."

Real World Use

An abattoir in Queensland using bore water could not find products that could carry the water at elevated temperatures. Using Duplex 2205 stainless steel tube and fittings, AusPress worked closely with the client and developed a press-fit system.

"Where 316 stainless steel was only lasting 3-4 weeks before suffering from corrosion, our Duplex 2205 press-fit tubes and fittings have now been in service for more than eight years and still going strong," Mr Nelson said.

"This solution actually led us to deciding to introduce annealed tube as standard which occurs post production and offers a far higher corrosion resistance than standard tube resulting in a longer service life and improved peace of mind."

Bright Future Ahead

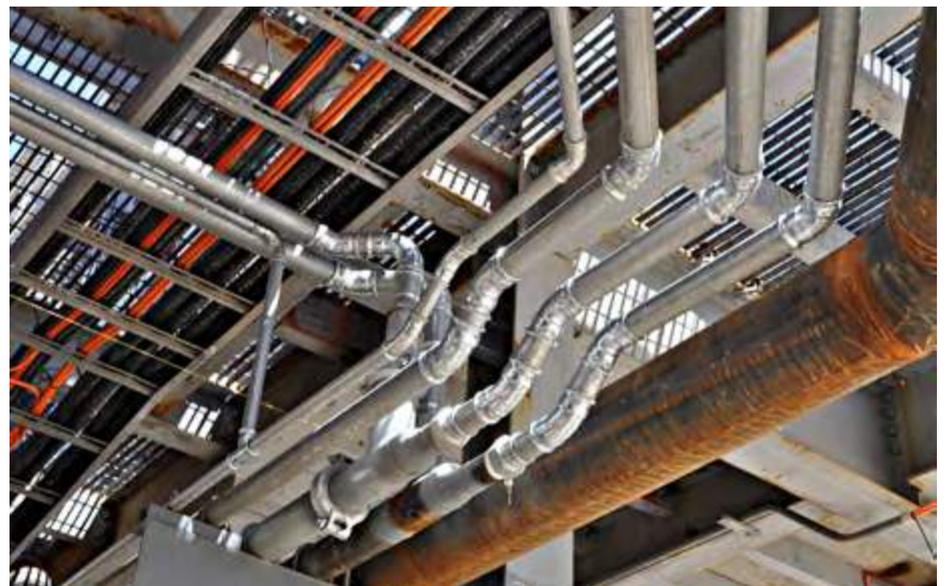
Under the ownership of Tasma Group, AusPress has seen exponential growth and expansion over the past five years with even more room to grow.

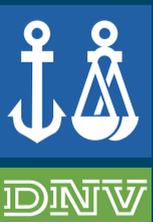
"We have introduced new technologies, new products and expanded our distribution which now includes warehousing in every Australian capital city as well as Auckland and Central Otago in New Zealand," Mr Nelson said.

"We remain focussed on research and development of new products and committed to the highest level of service to our clients.

"The future for AusPress is very bright."

AMR





- AusPress first stainless press-fit since 1995.
- AusPress first 168.3mm size in 2012.
- AusPress first 66.7mm size in 2024.

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HOW WE SUPPORT DECARBONISATION EFFORTS WITHIN THE MINING INDUSTRY

We provide power generation and weather forecasting solutions to the mining sector as companies transition to clean energy alternatives.

Weatherzone Business, a DTN company, has a long-standing relationship with the mining sector, supplying trusted weather and data solutions to support operational decision-making. We also offer specialised power generation and weather forecasting and irradiance data for on-site renewable energy projects as mining companies transition to clean energy alternatives.

The tide is gradually turning across the industry as the financial and environmental benefits of decarbonisation are realised. Companies focused on sustainability and mitigating climate risk have already implemented hybrid renewable energy solutions, and invested in battery electric vehicles and machinery across their fleet - reducing their scope 1 and 2 emissions. Changemakers, such as Fortescue, are investing significantly in the production of green ammonia and green hydrogen fuels to be used for shipping, extraction, and processing.¹ In-depth research into the financial viability of renewable energy and electrification projects has shown compelling evidence that the long-term gains far outweigh the initial investment.²

Renewable Energy Uptake

As mines continue to invest in renewable energy projects, it's often a hybrid solution paired with energy storage that provides a reliable and lower-cost supply.³ Wind and solar are mature technologies, but they're still advancing at a cracking pace, creating a downward trend in outlay costs. Battery storage is also moving through rapid advancements. For mining executives, this may make the use of 100% renewable energy sources on-site possible. And of course, the benefits flow beyond the company itself, often providing both energy to the power grids of surrounding communities, and much-needed employment. If a mine is nearing the end of its life, agreements may be reached so its solar and wind projects continue on, serving communities for years to come. There are also solar arrays designed to be portable, so they can be re-distributed as required.

Mining Operation Electrification

Many mining companies have been gradually replacing diesel trucks with electric vehicles. Research into the benefits of an electric fleet has outlined a marked decrease in underground heat generation and the obvious eradication of diesel particulate inhalation. Operators have stated that noise reduction decreases their fatigue at the end of each day, improving productivity and reducing the risk of long-term hearing degradation, and that the electric machines are articulate and precise in their movements.⁴ Battery swapping processes have been developed

approximately 4.4 million litres of diesel fuel per annum, and reduce emissions by 12,000 tons.⁵ Agnew Gold Mine in Western Australia runs a hybrid microgrid with 18MW wind turbine output and a 4MW solar array, with battery storage. This provides 50-60% of their power needs.⁶

When a mine establishes a wind farm, Weatherzone Business steps in to support these efforts to address climate risk. Weatherzone Business delivers industry-leading weather and power generation forecasting and real-time alerting to inform critical decision-making. Opticast™

- We offer specialised power generation and weather forecasting and irradiance data for on-site renewable energy projects.
- In-depth research into the financial viability of renewable energy and electrification projects has shown compelling evidence that the long-term gains far outweigh the initial investment.
- Opticast™ Renewable Wind provides 5-minute forecasting up to 72 hours and hourly forecasting out to 10 days.
- The mining sector has shown it responds with extraordinary innovation when sustainability and risk mitigation become the driver for future success.

that reduce the large-scale drain on power grids, and improve safety by removing the need for operators to exit their vehicles.

In-depth testing has shown that, overwhelmingly, the electrified fleet costs much less to operate and delivers improved cycle time and loaded up-ramp speeds. When these vehicles are recharged by energy produced by an on-site renewables plant, it's the perfect solution to significantly reduce scope 1 and scope 2 emissions, and fuel costs.

Wind Power Generation Forecasting

Wind power is already a well-established solution to reduce emissions for many mining operations across the world. Glencore in Canada installed two wind turbines in 2014 and 2018 that displace

Renewable Wind provides 5-minute forecasting up to 72 hours and hourly forecasting out to 10 days. This forms a framework for confident maintenance and operational planning. Customisable alerting covers lightning, severe weather, blade icing, high winds, and humidity: all set within the mine's unique operational thresholds.

Solar Data for Mine Sites

Weatherzone Business partners with Solcast, a DNV company, to deliver highly specialised solar data to solar plant operators. Low up-front CAPEX and powerful cloud-based information systems, underpin a complete suite of irradiance and weather data to enhance forecast accuracy and enhance site efficiency. Utilising Solcast's satellite

fleet, sky-imagers and the SCADA data collected from the solar plant, operators acquire not only forecasting capability but a precise picture of actual yield and PR. Weatherzone Business and Solcast provide monitoring and support, 24/7.

Working Hard to Decarbonise

There is still an entrenched reliance on fossil fuels within the industry, including the combustion of coal for electricity and utilising oil for fuel, but change is already occurring with each clean energy investment. The mining sector has shown it responds with extraordinary innovation when sustainability and risk mitigation become the drivers for future success. At a time when the impact of climate change is clearly articulated in unprecedented weather events that impact all industries, we look to the leaders within the mining and metals sector - working hard to reduce their GHG emissions - for guidance on how to embrace operational change and improve sustainability. As commodity demand for the mining industry intensifies, including for the raw materials needed to transition to renewable and electric solutions, it's time to push harder to close the gaps. Time to move beyond audits of what each company will gain or lose from decarbonization, and implement effective plans to significantly reduce scope 1, 2 and 3 emissions.

Weatherzone Business and DTN are here to support your renewable energy efforts with wind and solar data solutions tailored to your unique site and operations. From there, you get to observe how these efforts pay off over time.

Discover our comprehensive suite of mining solutions, tailored to your site and operational scope. **AMR**

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JB TOOLTECH - BOLTING EQUIPMENT SPECIALISTS

For almost 70 years, the team at JB Tooltech has been supporting their customers in industries such as Manufacturing, Mining and Power Generation. J&B Sales was formed in 1957, later in 2007 having its name changed to JB Tooltech, to better reflect the direction that the company was headed.

Originally the major focus of the business was to supply industrial power tools, and related products to the automotive assembly market. Today, JB Tooltech has a more diverse customer base that encompasses light to heavy industrial.

Being specialists in controlled bolting solutions, JB Tooltech has a large range of tooling options to suit most applications. The products include a range of pneumatic, hydraulic, electric, cordless and manual tools that can torque-fasten from 0.1Nm to 82,000Nm, as well as hydraulic and mechanical tensioning equipment for stretching studs and bolts.

As testament to their solution-based approach, JB Tooltech has won the safety improvement award from a major Australian energy producer, for custom tooling that they developed for field services. That tooling design eliminated the risk of repetitive strain injuries. On top of this, the first data acquisition system for power generation was introduced by JB Tooltech into the Australian market. This is now the benchmark of quality assurance in that field, as recognised by major OEM's operating in Australia.

In this portion of the AMR, we are going to look at a lesser-known solution for disassembly challenges in the mining industry, by finding out about the C.A.P. Srl Hydraulic Impact Wrench set-up, which is supplied and supported by JB Tooltech.

Hydraulic Impact Wrenches for Disassembly Applications

In the mining industry, the requirement for loosening bolted joints is a daily affair. Most commonly pneumatic and battery impact wrenches are the first option for disassembly due to convenience and speed of removal. As maintenance

workers are aware, the limitation of the impact wrench is the available torque. They just don't have the capacity to undo some bolts.

The requirement for larger torque capacity can be met by using torque multipliers (Battery, Pneumatic, Hydraulic). They have their place in the workshop for not only loosening, but also tightening of bolted joints, however there is another option available that is not so well-known.

The Hydraulic Impact Wrench from C.A.P. Srl Engineering is a great disassembly option, when an impact wrench is the preferred tool, but may not have the required torque available. Having the capacity of 3800lbf-ft for the C.A.P. 4KI wrench, and 5200lbf-ft for the 6KI wrench, they have a significant power-to-weight advantage over battery and pneumatic impact wrenches.

The tools are powered by a 3 phase hydraulic power unit, which differs from the 10,000psi torque pumps found in many workshops. It provides the Impact Wrenches with a consistent energy source, unlike air which can fluctuate as pressure and air flow drop during use. The power units are adjustable to the required pressure, which does allow some control over torque output. This can be useful for running bolts down before the final torque or angle is applied.

The C.A.P. Srl tools weigh approximately 8.2kg, and 9.5kg respectively, which means that they are lighter and deliver more torque than pneumatic wrenches of an equivalent size. Workshop fitters will have less exposure to vibration due to shorter cycle times, and less weight for the operator to bear with these hydraulic wrenches. They are also lighter than battery and pneumatic torque multipliers, of equivalent torque capacity.

It is commonplace to see operators struggling to undo a bolted joint with a pneumatic impact wrench. Due to the long cycle time as the tool is continually hammering, the air flow and pressure can

drop, therefore having the tool produce less torque, but still inducing noise and vibration for the operator. Because the C.A.P. Srl tools are hydraulically powered, there is no fluctuation in output due to the power-source.



1-1/2" Drive @ 16kg and 3000lbf-ft vs 1" Drive 4KI @ 8.2kg and 3800lbf-ft

The 4KI tool has more available torque than a No.3 square drive hydraulic tool, and the 6KI sits just shy of the capacity that can be delivered by a No.5 square drive head. If the C.A.P. Srl Hydraulic tool can fit into position, it can do the work of the No.3 and No.5 hydraulic torque multipliers. No reaction arm required, and much faster than any of the equivalent torque multiplier tools available.

Real World Application

Recently, an open cut mine in the Hunter Valley took part in a six-week trial of the impact wrenches on haul truck final drives, cutting edges and dozer master links on D11's. The Australian Mining Review interviewed Nathan, who is a Maintenance Supervisor in the Hunter Valley NSW to discuss the experience of using JB Tooltech's equipment.

"One of the main benefits was that there was no initial jolt or impact of the gun when using it and it was a lot lighter and less noisy than an air impact gun" "We used it on master link bolts...D11" he said.

When asked about the findings of the trial of the hydraulic impact wrenches, he said "Most people were impressed with using it in comparison to other wrenches as it was

very easy to use and there was no or very little vibration. We were very impressed with the torque specs it had and what it could undo for the size of it."

"That was one of the main things we were looking at and what its capability of torque spec it could undo was probably the biggest thing."

The C.A.P. Srl Hydraulic Impact Wrench can generate the amount of force a hydraulic wrench is capable of while having the speed of a pneumatic impact wrench. As the 4KI and 6KI wrenches don't require reaction arms, and work at lower maximum working pressures than hydraulic torque wrenches, the C.A.P. Srl Hydraulic Impact Wrench has some major advantages.

No.3 Square Drive Hydraulic Torque Wrench

- Slow rotation
- Maximum torque of around 3300lbf-ft
- Operating at near maximum of 10,000psi
- Usually a two person operation
- Reaction arms usually required - pinch point hazard
- 4kg - 5kg tool weight

Pneumatic Impact Wrench - 1" Drive Impact Wrench (well-known brand)

- Fast no-load speed and quick disassembly
- Maximum available torque of 2800lbf-ft
- One person operation
- No reaction arms — no pinch points
- 9.6kg tool weight

Hydraulic Impact Wrench - 1" Drive C.A.P. SRL - 4KI

- Fast no-load speed and quick disassembly
- Maximum torque 3800lbf-ft
- One person operation
- No reaction arms - no pinch points
- 8.2kg tool weight

For more information or to request a quote call 1300 303 818 or email sales@jbtooltech.com.au.

AMR



Providing Complete Solutions Across the Mining, Manufacturing and Power Generation Industries

Specialists in controlled bolting solutions, JB Tooltech has a large range of tooling options to suit most applications across the mining, power generation and manufacturing sectors.

Products include a range of pneumatic, hydraulic, electric, cordless and manual tools, plus hydraulic and mechanical tensioning equipment.

JB Tooltech is collectively developing technology and innovation to be the leading solution providers to the industrial sector.

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Controlled Bolting Specialists

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PRAMAC-GENERAC AUSTRALIA: THE TRUSTED SUPPORT IN THE MOBILE INDUSTRY

PRAMAC-GENERAC is committed to delivering clean and efficient energy solutions, offering an extensive range of mobile solutions with a focus on environmental sustainability. The company offers customers a variety of products such as lighting towers, dust suppression systems, and a wide range of generating sets with power nodes from 15kW up to over a MegaWatt.

In 2021, after the acquisition of the UK-based manufacturing company Off Grid, the group added to its portfolio a range of battery energy storage systems (BESS), mobile silent power banks that in a stand-alone mode do not emit polluting gases.

The PRAMAC-GENERAC AUSTRALIA PTY LTD branch, strategically located in Sydney and Perth, plays a pivotal role in establishing a robust presence in the country. This dual-location setup ensures strong support for the mining and rental sectors, providing a comprehensive solution to industry needs.

In addition to the historical Sydney office, where is located Luke Gibson, Mobile Sales Manager for Australia and New Zealand, the newly inaugurated Perth location features both offices and a spacious 1000 sqm warehouse, to enhance service capabilities for the industry. Led by Aftersales Director Andy Smith and WA BDM Justin Taylor, the dedicated team is well-equipped to cater to diverse requirements. Luke, Andy and Justin bring a wealth of knowledge and support for all customers and all users of mobile equipment including the BESS system, giving them great support and backup within Australia.

Among the wide range of mobile products, PRAMAC-GENERAC AUSTRALIA's fleet

includes the comprehensive range of mobile battery energy storage systems.

The units, now manufactured in UK and Italian Pramac branches, allow the storage of energy from multiple sources: generator, solar, or the grid. Energy can be redistributed, later, to a site that needs power. When a battery energy storage system is deployed onto the site, it is possible to have a clean, green solution that can power the site during those periods of low energy demand, such as overnight or during the weekend. This allows customers to utilise reliable, green, clean energy in almost any application.

The advantages of these innovative products lie in offering reduced noise emissions and fuel consumption, as well as maximising cost savings thanks to their remote monitoring feature.

The current BESS range includes the SX PLUS SERIES (starting from 5kVA), MX Series, and LX Series. To extend the range, Pramac has recently added the LX LFP Series, powered by Lithium Iron Phosphate advanced battery technology that has a lifespan among the best in its category and is characterised by a high level of safety. The superior thermal stability and lower environmental impact in comparison with other Li-ion technologies, elevate the product to a higher level.

These versatile mobile power banks find applications in mining, construction, events, utilities, remote off-grid settings for commercial or domestic use, and E.V. charging.

These units can operate in two modes: in hybrid mode, the BESS is coupled with any diesel genset. In any demanding

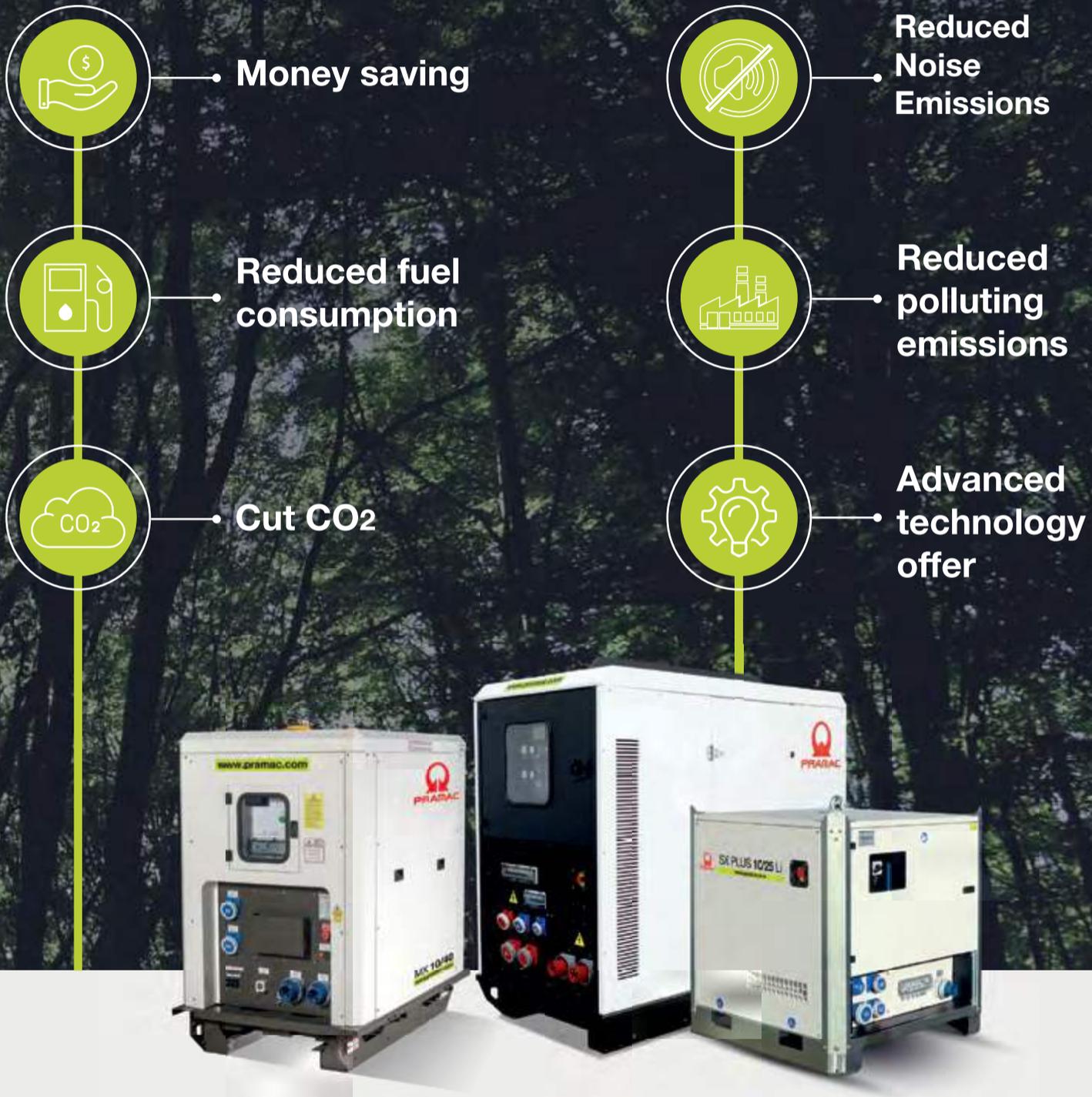
application like mining and construction sites, where low loads or peaks can be a problem for the generator, the hybrid solution is ideal for improving the overall performance of the site, also allowing reducing noise and pollutant emissions. In stand-alone mode, the BESS becomes an independent power solution and an ideal choice for addressing the needs of noise-sensitive environments or with zero-emission requirements, including night operations, job sites in city centres, remote telecom applications, and overcoming low-load challenges.

Looking ahead to the rest of 2024, PRAMAC-GENERAC plans to introduce new LFP models to complete the range, ranging from smaller units to 'extra-large' ones tailored for energy-intensive sectors like mining and large construction sites.

AMR



BATTERY ENERGY STORAGE SOLUTIONS



Pramac provides the widest range of hybrid and environmentally friendly power solutions, including a comprehensive range of **Battery Energy Storage Solutions.**

Pramac Battery Energy Storage Series allow the storage of energy from multiple sources: generator, solar or the grid. Energy can be redistributed, at a later time, to a site that needs power. When a battery energy storage system is deployed onto that site it is possible to have a clean, green solution that can power the site during those periods of low energy demand, such as overnight or during the weekend. **This allows customers to utilise reliable, green, clean energy in almost any application.**



STRATA WORLDWIDE WHERE SAFETY IS SUCCESS

Product development company Strata Worldwide has an extensive history of providing safety technology for use in mining, and tunnelling operations across the globe.

With its years of research and development experience as well as working closely with operation managers and personnel, Strata Worldwide offers two advanced accident prevention systems — HazardAVERT and HazardAI — to optimise safety across operations.

HazardAVERT

HazardAVERT is an electromagnetic proximity detection system and collision avoidance system designed to increase worker safety and safety awareness while working in and around mobile machinery. It has been designed for use in industrial environments such as mining, construction and tunnelling to prevent accidents involving machinery.

Warning Zone

Outer Zone. A breach triggers audible and visual warnings on individual PADs (personal alarm devices) and vehicle display screens simultaneously. Vehicles with level nine interfacing will automatically slow / crawl without operator intervention.

Hazard Zone

Inner Zone. A breach triggers

audible and visual alerts on individual PADs and vehicle display screens simultaneously. Vehicles with level nine interfacing will automatically stop without operator intervention.

Silent Zone

The exclusion area within the hazard zone enables operators to work on machinery without triggering the system. As soon as the operator exists the silent zone, the hazard zone will be triggered.

Perimeter Guard

The perimeter guard proximity detection uses a cable to generate linear electromagnetic fields and create invisible fencing around restricted areas and work zones, or safety barriers along beams and around equipment.

Custom sized warning and hazard zones along the cable are detected by HazardAVERT receivers worn by personnel (PADs) and installed on vehicles (VADs – Vehicle Alarm Device). These provide proximity warning alerts or initiate automatic intervention controls to stop moving equipment in an emergency.

Monitoring and Reporting

All system events are logged and recorded with the data able to be downloaded for analysis and reporting. In underground applications, the data can be transmitted over standard wi-fi or StrataConnect 900MHz wireless mesh.

HazardAI

HazardAI is an artificially intelligence machine vision solution designed to keep workers out of harm's way when working around machinery.

Powered by the Strata SafeSITE AI platform and state-of-the-art embedded edge computing sensors from their HazardAI range, the solution corrects for human oversight and incursion into high-risk zones by detecting, analysing and responding to event data and notifications in real-time.

The solution detects and differentiates between people, vehicles and objects in close proximity using stereoscopic vision to measure distance and advanced algorithms to analyse the potential for collision. Automated alarms warn the machine operator and workers when necessary.

Strata's HazardAI sensors give staff confidence that workers and machinery will be kept at a safe distance while affecting long lasting safety.

Strata works closely with customers to fully understand individual project needs and its on-site and remote service capabilities provide ongoing support and troubleshooting to help ensure system integrity. **AMR**

For more information visit
www.strataworldwide.com/mining
or email
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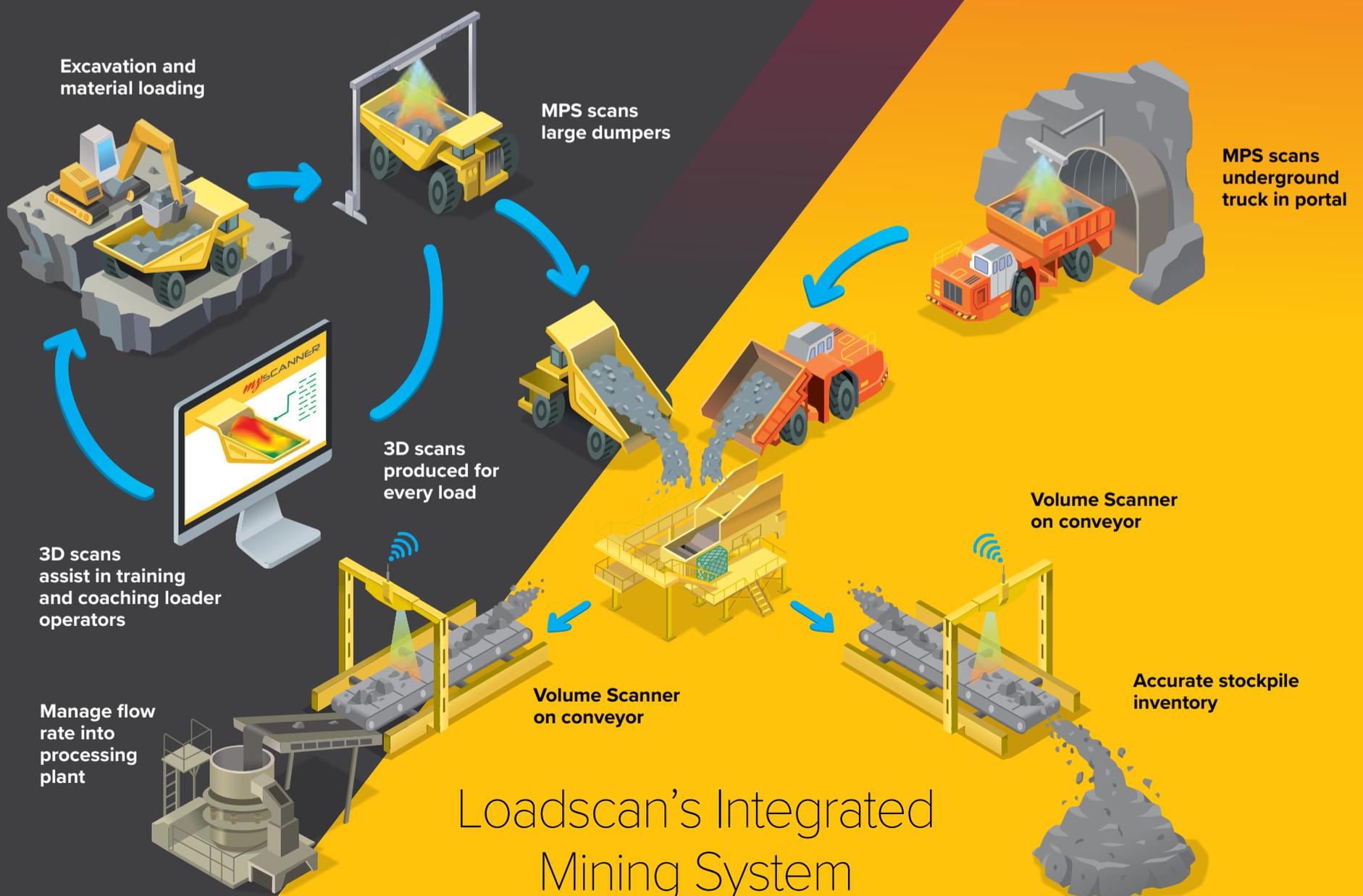
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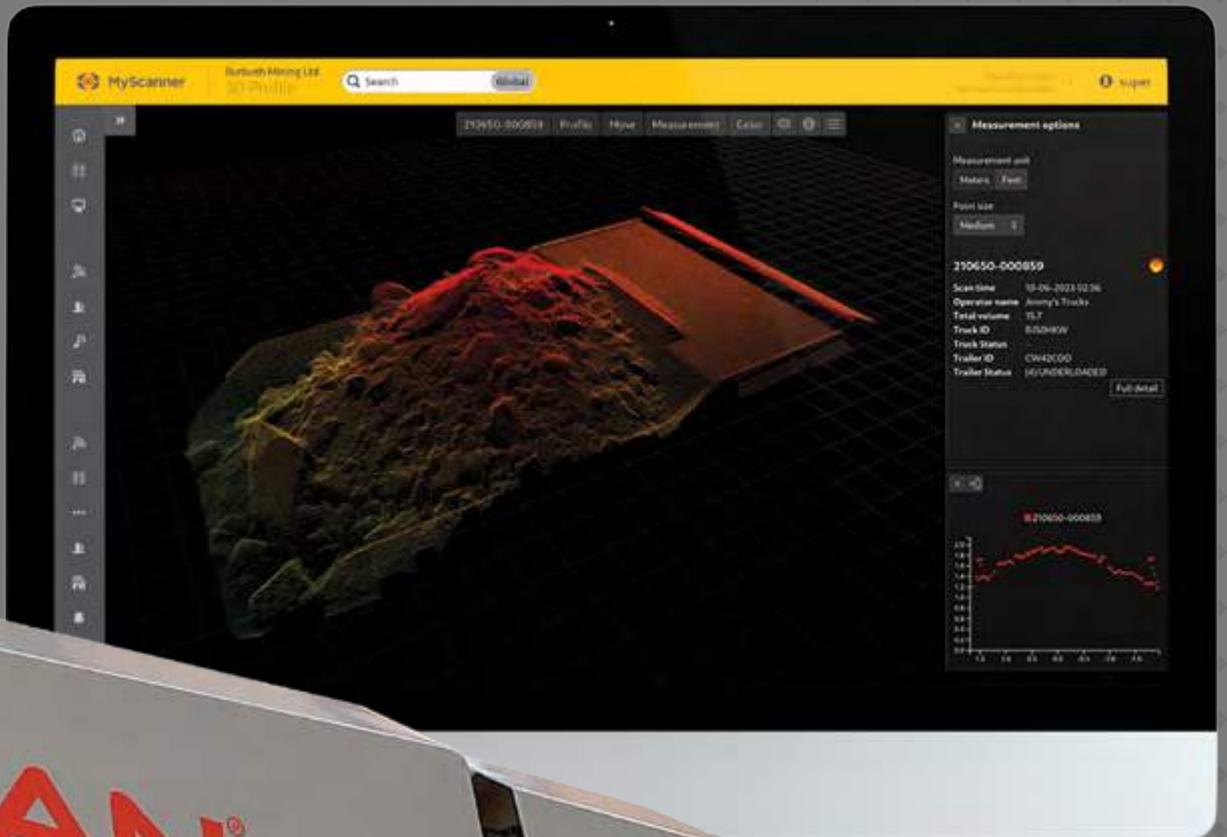
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- ▶ Reduces carryback

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SPARTEL

REVOLUTIONISING SUSTAINABILITY IN THE MINING INDUSTRY

In an era of increasing environmental consciousness and regulation, the mining industry faces the pressing need for sustainable waste management solutions. Recognising this need, Spartel Pty Ltd emerges as a leading provider of innovative technologies and services tailored specifically for the mining industry. In business since 1996, Spartel has over 25 years of experience in the industry as experts in waste management and pollution control.

With a commitment to environmental responsibility, Spartel offers a comprehensive range of relevant solutions to address waste management challenges and promote sustainable practices.

On-Site Organic Waste Composting Technology

One of the key technologies offered by Spartel is their state-of-the-art on-site organic waste composting technology. Designed to handle various organic waste streams, including food waste, green waste, and overburden, this ground-breaking technology enables mining operations to effectively manage their organic waste on-site. The composting technology comes with a remote access wireless process control system with a range of 2 km.

By implementing this composting system, mining companies can eliminate organic waste disposal to landfill, elimi-

nate vermin and odour, produce a richer product for mine site rehabilitation and prolong the life of the landfill leading to significant cost savings promote resource recovery, and contribute to a circular economy.

Glass Bottle Crushers and Recycling Services

Spartel understands the significant volume of glass waste generated in the mining industry. To tackle this challenge, they provide innovative onsite glass bottle crushers that can achieve an impressive 80% volume reduction. These crushers are designed to efficiently process glass bottles, transforming them into manageable cullet for recycling.

Spartel also offers mine site glass recycling services, ensuring that the recovered glass is properly recycled and diverted from landfill, thereby minimising the environmental impact.

Plastic Bottle/Container Shredders

In addition to glass waste, plastic bottles and containers pose a significant challenge for the mining industry. Spartel addresses this issue by offering advanced plastic bottle/container shredders, achieving volume reduction of an amazing 96%, making the plastics recycling process more efficient and cost effective. By implementing these shredders, mining operations can effec-



tively manage their plastic waste, promote recycling, contribute to a cleaner environment and achieve cost savings.

Certified Organic Fertiliser

Spartel revolutionised the fertiliser industry in 2006 with FABFert, an organic fertiliser designed for vegetable farms and mine site rehabilitation and landscaping. It combines high nutrient levels, low odour, and minimal environmental impact.

FABFert contains valuable nutrients free of chemicals. Spartel ensures product quality control.

Odour Control Technologies and Products

Spartel provides advanced odour control technologies and tailored products for the mining industry, creating a pleasant working environment while demonstrating environmental stewardship. They offer a wide range of innovative solutions to address waste management challenges, helping mining companies comply with regulations and enhance their reputation as responsible corporate citizens. Spartel leads in environmental innovation, delivering efficient solutions for a greener, sustainable future in the evolving mining industry. **AMR**



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On-Site Organic Waste Composting:

Efficiently manage food waste, green waste, and overburden through Spartel's advanced composting technology. We also provide complete organic waste collection and compost Plant operation services.

www.FAB-COM.com.au

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An Australian owned and operated company since 1984, Challenger Valves is a leading supplier, manufacturer and distributor of valves and actuation. It provides products and solutions across the water, mining, power generation, irrigation and general industries sectors.

Challenger Valves stock consists of a wide range of products including butterfly,

gate, knife gate and check valves, all of which come in various materials to handle a wide range of industrial processes and applications.

**Cla-Val Control Valves:
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Curated for Australian industries, the Cla-Val series features top-of-the-line Cla-Val control valves that are globally renowned

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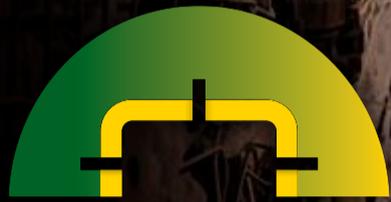
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JETCRETE AUSTRALIA'S LARGEST SHOTCRETE PROVIDER

By providing unparalleled ground support services across the country, Jetcrete has earned the trust of mining professionals and related industries.

With over 40 years of experience, Jetcrete's knowledge lies in shotcreting — the application of specially adapted materials using cutting-edge techniques.

In an industry that can be both physically and mentally taxing, Jetcrete knows the importance of supporting people, suppliers and clients to help them thrive, as well as provide complete support at every stage of the project.

Shotcreting

Jetcrete is the largest shotcrete provider in Australia, delivering underground and fibrecrete ground support for both the development and rehabilitation of underground mines. In collaboration with key industry suppliers, they have developed several major advances in shotcrete technology to complete difficult shotcreting tasks efficiently and safely.

The first development are the robotic shotcrete units. Up until 30 years ago, shotcrete was applied by hand only and in 1993, Jetcrete attached a shotcrete system to a drilling jumbo rig, enabling a remote-control shotcrete application to undertake overhead shotcrete work safely — thus creating the first robotic arm shotcrete application.

The second development of hydrosaling removed the need for a jumbo rig for scaling to improve mining development in-cycle efficiency.

Jetcrete and Byrnegut introduced this process in the early 2000s and it has since become an integral part of any efficient mining cycle.

The final development of 3D laser scanners improves QAQC thickness verification without the need for additional resources.

Concrete Manufacturing

Jetcrete has been at the forefront of concrete manufacturing since 2003. They own 16 batch plants, enabling mining sites to access 24-hour concrete, CAF and shotcrete manufacturing. This results in increased production, reduced costs and with experienced technical support, a better quality assurance on the manufacturing and delivery process.

Their active involvement with major suppliers helps them develop specialise mixes onsite to meet the requirements of the soft and hard rock mines.

Cable Bolting, Laser Scanning & Resin Injection

Recently, Jetcrete expanded its scope of services to include cable bolting and with a

growing number of projects, has installed an average of 350,000 metres of cables per year.

Jetcrete uses the latest laser scanning technology to measure application thickness of the shotcrete at the site.

This enables the accurate detection of safety concerns with Jetcrete then able to use only the necessary amount of concrete to support the ground, improving safety and efficiency.

An alternative rock support system for underground mining, resin injection provides additional support for encapsulation of TG cable bolts and ground consolidation.

This stabilises rock, coal, sand, gravel, concrete and caved materials, stops water ingress and supports the injection of any cable bolt.

Remote Shaft Lining

Over the past 20 years, Jetcrete has developed a tele-remote system that has eliminated the need for people to enter the shaft during the entire process. They were the first company to introduce an EX-d – Group 1 compliant shaft liner, enabling safe operations in zone 1 hazardous environments.

A remote shotcrete application can work in vertical shafts from 1m to 6m in diameter and up to a maximum depth of 400m.

Ready Jet Drum Blasting

Jetcrete's latest addition — Ready Jet Drum Blasting — is designed to remove hardened concrete from agitator drums in a safer and more efficient method.

The remote-controlled, high-pressure cleaning system eliminates the need for workers to enter the concrete mixer drum where they are exposed to confined spaces, loud noise, falling debris and respiratory dangers.

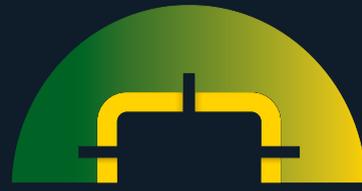
Cleaning is controlled from outside of the drum using a remote control, resulting in significantly reduced health and safety hazards. Not only does this mark a safer way of cleaning the drum, but this method is also faster and only one worker is needed for the cleaning services.

With its comprehensive range of services, which includes shotcreting, concrete manufacturing, remote shaft lining, cable bolting, laser scanning, resin injection and civil construction, Jetcrete has the capacity to support projects of any scale and difficulty. When it comes to ground support work, Jetcrete is the name to trust.

For more information, visit
www.jetcrete.com.au

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JETCRETE

Complete support from the ground up

As Australia's leading ground support specialist to the mining industry, Jetcrete uses the latest techniques and specially adapted placement materials to provide a shotcreting service for clients across the country.

With more than 40 years in the industry, Jetcrete has extensive experience in all aspects of concrete spraying. We are capable of providing a complete service for all stages of underground shotcreting service including onsite concrete, shotcrete and CAF manufacture, delivery and application.

Jetcrete is also capable of delivering specialist ground support services including shaft lining, cable bolting and resin injection.

Find out more about our services and careers, visit:

[jetcrete.com.au](https://www.jetcrete.com.au)



INDIGENOUS COMPANY ENRICHING COMMUNITIES & CLIENTS

Eastern Guruma is a highly regarded Australian independent Indigenous Company, enriching the communities and clients it serves through growth, sustainability and diversity. Eastern Guruma has been in operation for 15 years as a successful and respected Aboriginal owned business, providing services in civil & mining, construction, landscaping, drilling, facilities management, traffic management and more.

A full list of past and current projects can be found on Eastern Guruma's website.

Eastern Guruma is 100% owned by members of the Traditional Owner group Eastern Guruma, the lands of which surround Tom Price in the Pilbara region of WA. The team has delivered services to Australia's largest mining companies, Rio Tinto, BHP, and Fortescue Metals Group. Our Indigenous Training and Employment Policy outlines our commitment to Indigenous development within our business.

Samantha Connors and Tania Stevens

are the owners and directors of Eastern Guruma. Ms Stevens has been the company's owner since its foundation in 2004, she is an Eastern Guruma Traditional Custodian of the Mundulgorra, Guruma in the Pilbara of Western Australia.

Facility Management

Eastern Guruma's Facilities Management (EGFM) kicked off in April 2017 with only forty staff on a 5+5 year Contract with Rio Tinto. The Contract fuelled jobs and growth in the Pilbara region while keeping the site's mine site facilities clean and sanitised.

The EGFM contract operates to undertake cleaning and gardening services for Rio Tinto across Western Turner, Paraburdoo, Marandoo and Tom Price mine sites. General scope of the contract includes maintaining grounds and gardens and cleaning all site facilities including offices, crib rooms and toilets. Successes of the Rio Tinto contract have included improved cleaning standards and integration of EGFM processes and procedures

with an exceptional safety record. The contract has just been renewed for a further 10 years and will grow in terms of geography, staffing and scope of work.

Campgrounds Maintenance & Landscaping Agreement

Eastern Guruma recently had its Contract with Fortescue for the Solomon Kangi Campgrounds Maintenance & Landscaping renewed for a further five (5) years. This included transitioning all our mechanical Plant & Equipment and Light Vehicles to electric as part of Andrew "Twiggy" Forrest mission to meet the net zero targets by 2026 and 2030. Eastern Guruma, as a long term, committed contractor to Fortescue are at the forefront of the net zero initiative which can only be advantageous.

New Fleet Acquisitions

Eastern Guruma made a significant addition to its fleet with the acquisition of the Cat D9 Dozer! With customisable blade options, efficient boosters, integrated

components, advanced technology and cost-effective performance this little beauty empowers the team to deliver results that exceed client expectations. With this powerful tool at our disposal, the team is ready to achieve new heights in the industry!

New Light Vehicle Acquisitions

Our Facilities Management (FM) arm recently acquired 27 Mitsubishi, Triton Light Vehicles (LV's) across the operations in the Pilbara. Features include, Driver Safety System (DSS) enabling driver fatigue management and Vehicle Monitoring System (IVMS) enabling speed control, communication and tracking. LV's support the new Rio Tinto FM Contract entered into July 2023.

For more information or to apply for current vacant and future positions please see below email address or visit the Eastern Guruma web site
<https://www.easternguruma.com.au/hr@easternguruma.com.au>

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We're a civil and mining contractor, run solely by traditional landowners from the region. We proudly partner with Indigenous groups to work on specific mining and civil projects and create career opportunities for Indigenous Australians.

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McLernons Business Base: Empowering the Australian Mining Industry with Tailored Solutions

Western Australian Excellence in Office and Operational Support

In the dynamic and demanding world of mining, the need for robust, reliable, and efficient workplace solutions is paramount. McLernons Business Base, a proud Western Australian owned and operated company, has been at the forefront of providing such solutions for over 30 years. Specializing in office furniture and fitouts, shelving, racking, storage solutions, business machines, and Covid-safe products, McLernons is not just a supplier; it is a cornerstone in the operational success of the mining sector.

Office Furniture and Fitouts: Engineered for the Mining Sector

Understanding the unique demands of the mining industry, McLernons offers a range of office furniture designed for comfort, durability, and functionality. Our ergonomic chairs, desks, and workstations are specifically crafted to ensure that your administrative staff can work efficiently and comfortably, which is crucial in high-stress environments. Our fitout services go beyond mere aesthetics, focusing on creating spaces that reflect your operational needs and corporate ethos, thus boosting productivity and employee satisfaction.

Shelving, Racking, and Storage: Organized Efficiency and Safety

Efficient management of resources and equipment is critical in mining operations. McLernons' shelving and racking solutions are not only robust and versatile but are also designed with safety as a top priority. Our solutions ensure optimal organization, easy accessibility, and maximum safety, keeping your operation running smoothly and securely.

State-of-the-Art Business Machines: Streamlining Office Operations

Time is of the essence in the mining industry. McLernons understands this and provides a range of high-quality business machines, including advanced paper shredders, laminators, printers, scanners, and guillotines, ensuring that your office operates with maximum efficiency. Our machines are selected to handle the demanding needs of the mining industry, ensuring reliability and speed in all your office tasks.

Covid-Safe Products: Prioritizing Health in Challenging Times

The health and safety of your workforce are vital. McLernons offers a comprehensive range of Covid-safe products, ensuring that your operations continue smoothly and safely. From personal protective equipment to advanced sanitization solutions, we keep your workplace health-focused and compliant with the latest safety standards.

Why to choose McLernons Business Base?

- ✓ **Local Roots, Global Standards:** As a Western Australian owned and operated business, we bring local insights combined with global best practices. This unique blend ensures that our solutions are perfectly aligned with the specific requirements of the Australian mining industry.
- ✓ **30+ Years of Industry Experience:** Our deep understanding of the sector comes from over three decades of experience, during which we have continually evolved to meet the changing needs of the industry.
- ✓ **Diverse Industry Servicing:** While we specialize in mining, our experience spans various industries, enabling us to bring cross-industry innovations and solutions to your mining operations.
- ✓ **Local Products, Local Warranties:** We believe in supporting the local economy. Our products are sourced locally, ensuring quick delivery and reliable local warranties.
- ✓ **Exceptional Customer Support:** Our team of experts is always ready to assist you, from selecting the right products to after-sales support, ensuring a seamless and satisfying experience.

Contact McLernons Business Base

For tailored solutions that meet the specific needs of your mining operations, look no further than McLernons Business Base.

Email: sales@mclernons.com.au

Phone: 08 9358 5566

Website: www.mclernons.com.au



MOXI AND MARTEQ

Long experience, flexible training courses and relevant, practical teaching from skilled industry trainers are what set MOXI apart as the leading registered training organisation for the Oil and Gas, Mining, Minerals, Utilities and Infrastructure sectors.

Based in Australia, MOXI provides training courses and training services both nationally and internationally. In all training, the mission is to Reduce Risk, Demonstrate Competency and provide Training Management Solutions for all their industry clients, both large and small.

Industry Training Provider Meeting Demand

Stricter corporate governance and regulations for many industries has seen an increase in the demand for accredited competency-based training, technical and commercial due diligence, and independent verification services.

MOXI's trainers ensure that all courses deliver up-to-date training which complies with the latest industry standards and work place requirements.

This includes local, state and federal regulators, state authorities and agreed national competencies.

Continually Improving

As a leading industry training provider, MOXI is constantly developing new strategies, competency-based programs and training to better service potentially hazardous working environments such as in the Oil and Gas and Mining Industries.

Internet technology is also changing the method of delivering the best training,

where their new e-Learning facility which offers flexible training options for all clients, the world-over.

Customised Training

MOXI can customise training to meet your specific work place and industry requirements.

Offering diverse training options and flexible delivery based on best-practices.

We look at the broad scope of your company's strategic plan and goals, employees' job roles and potential career paths, while also factoring in practical things like your current work schedule, staff availability and workplace location.

World-class Training Material

Sourcing the best available training solutions from local and international industry training providers.

MOXI's Alliance Partners are established training providers with world-class material which can be adapted to suit local standards and industry regulations.

Professional Trainers and Assessors

MOXI's strong team of professional trainers have worked across a range of industries including, Oil and Gas, underground Coal Mining, Safety Management, Power Generation and Electrical Design.

From their own experience, they understand what you need to get the job done efficiently, while satisfying safety requirements and industry regulations.

Why not make MOXI your preferred registered training organisation for all your competency training requirements?

Don't sweat over compliance in industry, be proactive and train your staff well.

As an experienced industry training provider, MOXI will take you through, step-by-step, in the development of a complete training program for your company that meets both immediate and ongoing training needs.

The well-established company MOXI partnering with verified Indigenous supplier Company Marteq Energy Pty Ltd established within the Pilbara region have become sought-after within the domestic mineral resources sector for their auditing, inspection, classification, and design support capabilities, underscored by years of industry experience.

With locations in Australia, New Zealand and Asia, the company a globally recognised training course and professional services provider offering contemporary practical education for the mining, oil and gas, utilities and infrastructure sectors.

Marteq Energy is a leading Project Delivery and engineering consultancy company servicing the mining, power generation, oil & gas, industrial infrastructure sectors, Marine engineering, and Project management for onshore mining as well as subsea and offshore oil & gas industries.

MOXI is a customer service oriented Service company perpetually seeking to provide timely and quality solutions to meet the customer's requirements.

To provide the best possible solutions to our clients through their full spectrum of electrical design, power studies and modelling,

build and on-site services in the mining industry.

Marteq Energy are experienced in all stages of project delivery from conceptual Project Engineering, design and drafting through to site installation and commissioning of a range of plant and equipment.

Their project delivery capabilities and experience include and are not limited to; Project Execution Strategy and Management, Project Execution Strategy and Management, Site Construction and Commissioning Support – NPI Logistic Access and v Final Documentation, Project Handover, Lessons Learned and Close Out.

Marteq Energy has excellent vendor relationships with multiple technology partners in various industries, this has benefited their associations and expertise with ventilation, logistics, generators, pipes and consumables businesses.

The Procurement with Marteq Energy extends to Rental and Hire equipment, featuring; Air Compressor's, Earth Moving, Trailers & Welding, Site Accommodations /Cabin and plenty more.

MOXI and Marteq Energy have a new strategy to better serve their respective clients in WA and in particular the Newman area.

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EEHA DOSSIER

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REVOLUTIONISING PROCESS OPTIMISATION FOR TUMBLING MILLS: UNLEASHING HD TECHNOLOGY DATA FOR ENHANCED PRODUCTION EFFICIENCY

The paradigm shift towards sustainable and efficient industrial processes has fuelled innovations in data-driven technologies. SPM Instrument, a pioneer in condition monitoring, has uncovered the transformative potential of HD technology data not only in assessing the mechanical health of production-critical machines but also in gaining valuable insights into the very core of industrial processes.

"This breakthrough extends beyond traditional boundaries, leveraging advanced measurement technologies, smart algorithms, and hardware to optimise various facets of production," apt Group Managing Director Geoff Soper said.

Exploring Process Optimisation in Tumbling Mills: A notable stride in this direction is SPM Instrument's cutting-edge process optimisation solution for tumbling mills, currently under patent review. The focus here is on monitoring the charge toe position, a critical parameter in ensuring the mill operates at its maximum working capacity while mitigating the risk of fault modes such as overload, underload, and freewheeling. This innovative solution serves as a powerful tool for operators, offering insights into the ideal feed rate for optimal grinding conditions.

Key Objectives and Benefits: The primary goal of this optimisation solution is to enhance grinding efficiency, facilitating not only increased production but also the optimisation of particle size distribution.

What sets this solution apart is its holistic approach to monitoring various parameters crucial for mill performance, including wear-and-tear on liners and lifters, outlet blockage, density, and the occurrence of oversized rocks. The beauty of this approach lies in its simplicity and robustness, as it requires no equipment to be attached to the mill's rotating shell.

Toe Position Monitoring Unveiled: Traditional mills experience variations in toe position at the inlet and discharge ends. SPM Instrument's solution, however, breaks from convention by employing patented HD vibration measurement technology to measure vibrations at both ends. The absence of external equipment attached to the mill's rotating shell is a notable advantage, making the hardware installation straightforward. The gathered vibration data is then presented in a user-friendly, web-based dashboard in the control room. This empowers mill operators to optimise the toe position of the charge dynamically, thereby improving grinding efficiency, throughput, and raw material yields.

The Synergy of Process Optimisation and Condition Monitoring: The convergence of high-resolution process data with condition monitoring epitomises a winning strategy for industries grappling with high production costs. This novel application seamlessly integrates the benefits of condition-based maintenance with those derived from process optimisation. The outcomes are manifold, contributing to increased production speed, elevated

raw material yields, maximised equipment availability, enhanced overall plant condition, and improvements in health, safety, and environmental performance.

The Holistic Impact on Production Efficiency:

- 1. Increased Production Speed:** By continuously monitoring and optimising the charge toe position, mills can operate closer to their maximum working capacity. This translates to heightened production speeds, allowing industries to meet growing demands with efficiency.
- 2. Enhanced Raw Material Yields:** The optimisation of grinding conditions and particle size distribution directly impacts raw material yields. Fine-tuning the mill's performance through real-time adjustments optimises the utilisation of raw materials, reducing waste and maximising yield.
- 3. Maximised Availability:** The proactive approach enabled by condition monitoring and process optimisation ensures that mills operate within their optimal parameters. This, in turn, maximises equipment availability, minimising downtime and disruptions to the production process.
- 4. Improved Plant Condition:** The comprehensive monitoring of wear-and-tear, density, and other critical parameters contributes to maintaining the overall health of the mill and associated components. This not only extends the lifespan of equipment but

also ensures a consistently high level of operational performance.

- 5. Health, Safety and Environmental Improvements:** The reduction of faults such as overload and underload, along with the efficient use of raw materials, not only enhances operational safety but also leads to environmental benefits. A streamlined, optimised process consumes less energy and reduces the carbon footprint associated with industrial operations.

"SPM Instrument's foray into the realm of process optimisation without any equipment attached to the mill's rotating shell represents a groundbreaking leap in the pursuit of sustainable and efficient industrial practices," Mr Soper added.

"By seamlessly integrating high-resolution process data with condition monitoring, industries stand to gain substantial benefits, ranging from increased production speeds and enhanced raw material yields to maximised equipment availability and improved environmental performance.

"As technology continues to evolve, these innovations pave the way for a future where industrial processes are not only efficient but also environmentally conscious and economically sustainable."

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With the mantra “Breaking Boundaries, Redefining the Impossible” we continue to win contracts and supply major projects across various sectors, reinforcing our reputation for quality, adaptability, and exceptional service.

Enviro Pipes stands at the forefront of the Australian plastics manufacturing industry, with a legacy spanning over 50 years. Founded in Perth in 2008, our growth has led to expansions in Queensland and Victoria, reflecting our commitment to innovation and excellence.

Our facilities, equipped with the latest technology, enable us to produce a broad range of HDPE pipes and fittings from 25mm to 1600mm for pressure applications and 100mm to 4000mm for non-pressure uses. We pride ourselves on our ability to deliver custom solutions, including bespoke fittings and large bore thick-walled pipes, previously considered unachievable, tailored to our clients' unique requirements, while maintaining rigorous standards and certifications such as Watermark and ISO Type 5.

At Enviro Pipes, our mission extends beyond manufacturing excellence to include environmental stewardship and ethical practices. We are firmly against Modern Slavery and dedicated to reducing our environmental impact, underscored by our ISO14001:2015 certification and commitment to obtaining Environmental Product Declarations.

With the mantra “Breaking Boundaries, Redefining the Impossible,” we continue to win contracts and supply major projects across various sectors, reinforcing our reputation for quality, adaptability, and exceptional

service. Our presence in Perth, Brisbane, and Melbourne, along with our expansion plans, ensures we are well-placed to meet Australian and the international market demands.

Enviro Pipes invites you to explore how our pioneering plastics innovations can support your projects, embodying our dedication to quality, sustainability, and building lasting relationships.

Discover how Enviro Pipes can make the impossible possible for your next project. Join us in shaping a sustainable future in plastics manufacturing.

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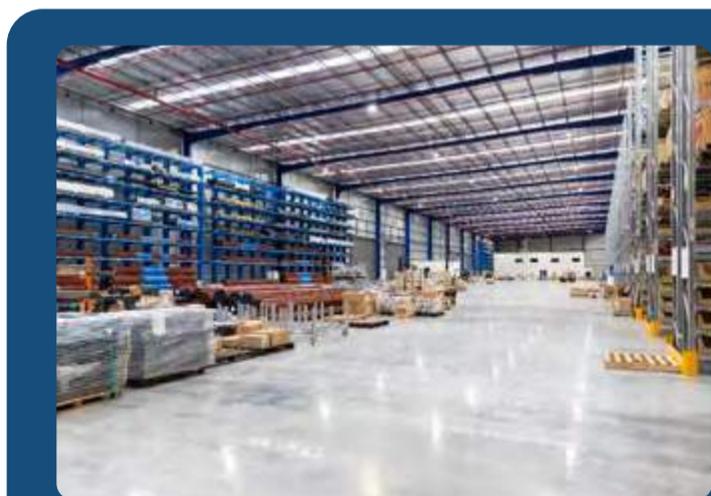
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Left: Enviro Pipes head office expansion, Perth, WA. Custom Fabrication, Thick wall Enviro pressure pipe, Enviro Pipes Corrugated HDPE pipe installation

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PIPELINE PERFECTION

PREMIUM PIPES, VALVES AND FITTINGS



Working in any industrial environment where the movement of gases and liquids is commonplace requires quality products and niche technical expertise. In mines, construction projects, and facilities like paper mills, water treatment and power generation plants, most applications rely heavily on pipes, valves and flanges to keep equipment and machinery running smoothly, without the fear of breakdown and unnecessary maintenance.

That's where Pipeline Supplies Australia (PSA) comes into play. Its rich history supporting major mining, commercial and infrastructure projects is backed by a team with more than 50 years of combined experience.

No matter the project size or complexity, PSA specialises in Heating, Ventilation and Air Conditioning (HVAC) solutions, fire protection and the industrial sector. It leverages the latest technology and software to manufacture compliant, high performance products and solutions fit for Australia's harsh conditions.

PSA regional business development lead Adrian Ryan, highlighted four core areas that lay the foundation for the company's extensive service offering.

"Firstly, we recognise our customers are at the heart of our success, so we take a customer first approach in everything we do. The PSA team ensures every interaction is driven by a commitment to delivering excep-

tional service and satisfaction. This enables us to cultivate long-term relationships for mutual success.

"The second being our advisory arm, which provides direct access to our technical specialists for all aspects of HVAC, fire protection, and plumbing. This is bolstered by our manufacturing capability, which helps customers with complicated designs and intelligent solutions for their specific project requirements."

The third area is PSA's own workforce, which is made up of an exceptional team with invaluable knowledge and technical expertise.

"They are the backbone of our operation, orchestrating seamless coordination between suppliers, buyers, and customers," says Adrian. "This dedication, commitment, and level of expertise takes efficiency to new levels in every job, all critical contributors to our success."

Finally, when it comes to supply, PSA stocks an extensive range of world-class brands. The company is always on the lookout for emerging trends, and strives to ensure the right products are stocked. This means essential products are delivered when and where they are needed, keeping projects moving forward.

More than just pipes
Owned by the Reece Group, PSA offers cus-

tomers access to a global network of product, procurement, and installation specialists. It also has a strong alliance with Victaulic, a leading global manufacturer of mechanical pipe joining, flow control and fire protection solutions for complex piping applications.

With more than 50,000 square metres of storage and warehousing facilities, which includes pipes up to 600mm diameter, and the supply of Trilaminate and FBE (fusion bonded epoxy) coated pipe, PSA offers solutions for every industry.

Adrian added that PSA can supply prefabricated pipes in either cut or grooved form, direct to site, anywhere across Australia. "Whether it is an industrial or oil and gas facility, energy plant, or water processing site, we provide technical consulting, custom design and engineering to meet specific project requirements." **AMR**



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TRANSFORM THE WAY YOU WORK WITH **ALLU**

Materials processing is a complex series of chemical, thermal and physical work that produces large quantities or batches of a product. Not only does using the right attachment make for a safer operation, but it also reduces downtime, lowers operating and lifetime costs, and helps reduce the cost per tonne of material moved.

ALLU's range of screening products are designed to screen and separate a wide range of materials, allowing for the removal of oversized or undersized particles. Products can be tailored to the needs of the application.

"With ALLU the operators can transform their excavator, wheel loader, and skid steer into a multifunctional tool that will screen, mix, aerate and load all in a one-step operation," says Adam Leece, Technical Sales Representative at Total Rockbreaking Solutions.

"By using ALLU companies can reduce costs as there is less materials to landfills and processed materials can be re-used onsite," Adam adds.

Real World Application

Due to their old-current method being very time consuming and consisting of many steps, a company operating in the Kalgoorlie region hired an ALLU DH 3-23 with X75 blades to process stockpiles of gold ore for gold production.

Old-Current Method

The stockpiles of gold ore on the ground were loaded into a dump truck and were then transported 30km to 40km and tipped to the ground to make another pile. A loader would then come to pick up material and tip it into a static grizzly to separate the larger lumps-product from the small product.

From grizzly, the old-small product was taken to be processed in the mill for gold production and the larger lumps-products were then transported to a crusher to be crushed to a smaller, more useable product.

New Method with ALLU DH3-23 with X75 blades attached to a Komatsu PC490

The ALLU DH3-23 attached to a Komatsu PC490 goes next to the stockpiles on the ground and starts processing the material into two separate piles.

The processed fines pile is then taken to the mill for gold production while the oversize rock pile is taken to a crusher that will crush the oversize into a smaller and useable product.

With this method, the process of loading and transporting the material to the grizzly and the use of the grizzly is completely

avoided, saving time, money and equipment.

This method took the operator 19 minutes and 48 seconds to screen, calculating to an average of 211.88 tonnes per hour.

"It is not only the time savings but also saving on maintenance and labour cost as with the Allu DH3-23 bucket there is one less wheel loader and operator needed in this application," says Adam.

ALLU Series

Designed for large-scale material processing and screening applications, the ALLU M Series bucket is compatible with large excavators and wheel loaders.

It's suitable for a wide range of applications in multiple industries including mining and quarrying, and it can be used for screening, crushing, mixing and loading

materials, amongst other tasks. Using an ALLU M series bucket can eliminate the need for material processing equipment, and it reduces the need for material double handling.

The ALLU M bucket contributes to environmental sustainability by reducing the need for transportation and separate processing of materials. Furthermore, the on-site screening and processing minimises waste and optimises resource utilisation.

By integrating screening and loading into one attachment, operations are streamlined, reducing the need for additional equipment and manual labour.

The bucket is designed for user-friendly operation, ensuring ease of use and efficient material processing.

Excavator Models

ALLU M series bucket mounted on excavators are recommended because of work speed and reach, resulting in almost double the processing capacity compared to a wheel loader as a carrier.

The carrier ranges from 50 to 160 tonnes, volume ranges from 2,82 to 8,67 cubic metres, weight ranges from 7000 to 14,000 kilograms, oil flow ranges between 300 to 440 litres per minute and there's a peak max pressure of 350 bar.

Wheel Loader Models

ALLU M series buckets mounted on wheel loaders are recommended when equipment mobility is one of the main criteria on the job. Operations at harbours, power plants and other bulk material storage areas will benefit from this machine.

Across the two models, the carrier rangers from 30 to 70 tonnes, volume ranges between 4,00 to 4,60 cubic metres, weight ranges from 8000 to 13,500 kilograms and capacity ranges between 250 to 350 tonnes per hour while there's a max pressure of 350 bar and peak oil flow of 400 litres per minute across both models.

ALLU Series

The ALLU Transformer Screener Crusher D Series is a versatile attachment designed for material processing, screening and recycling across the construction, excavation, recycling, agriculture and landscaping industries. The attachment is compatible with excavators and wheel loaders, offering a wide range of benefits and functionalities.

It enables efficient screening of material into different particle sizes, and it can screen and separate various materials such as various soil types, sand, gravel, topsoil, compost, biomass and demolition waste, producing end products of different functions.

The ALLU D Series adapts and transforms according to the application, with interchangeable blades and segments able to meet the different requirements of the application. It's designed for high efficiency and productivity, eliminating the need for separate screening and processing equipment thus streamlining operations, saving time and costs.

The on-site screening and processing reduce the need for external transportation and minimises environmental impact.

AMR

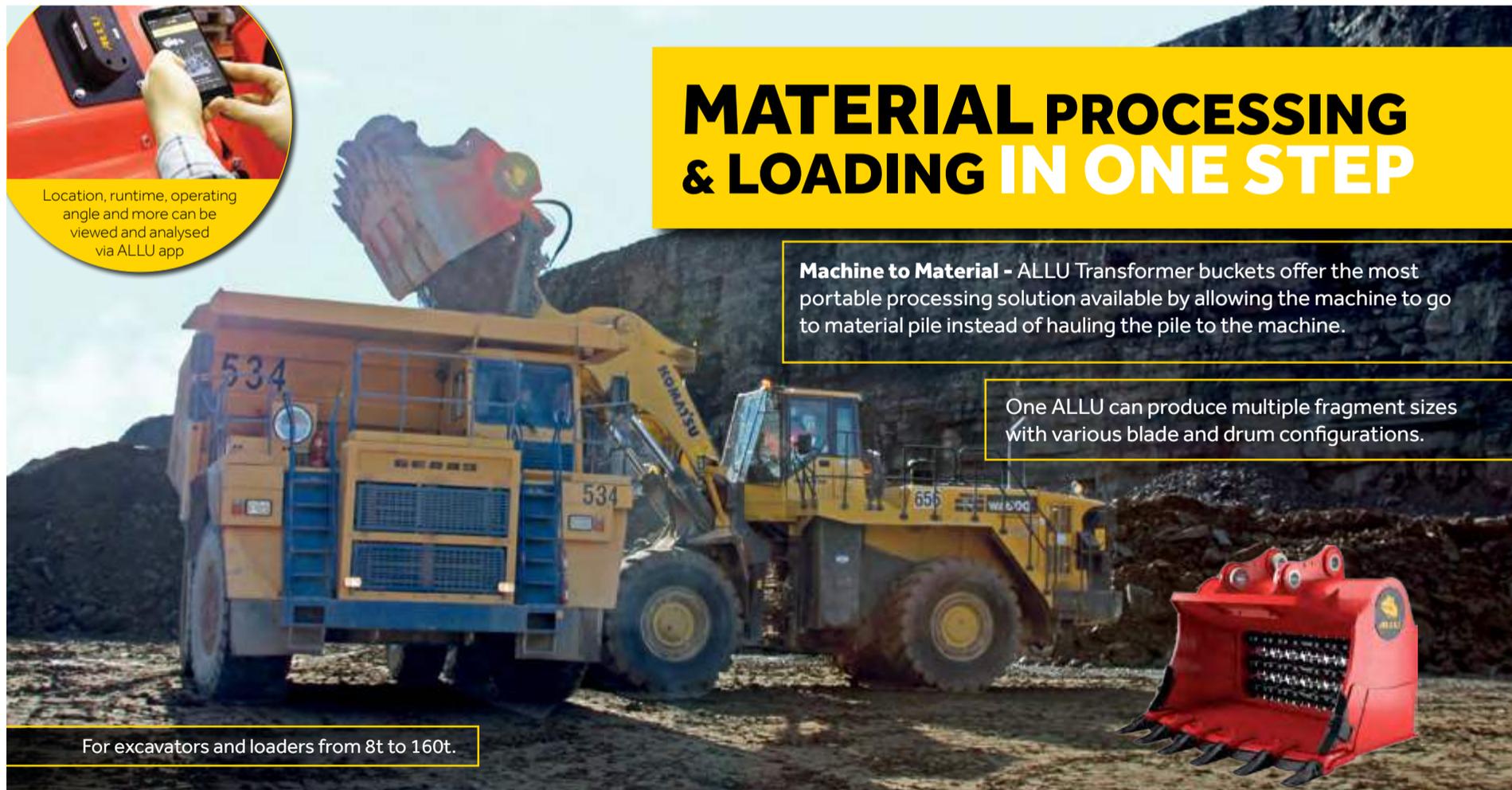


Location, runtime, operating angle and more can be viewed and analysed via ALLU app

MATERIAL PROCESSING & LOADING IN ONE STEP

Machine to Material - ALLU Transformer buckets offer the most portable processing solution available by allowing the machine to go to material pile instead of hauling the pile to the machine.

One ALLU can produce multiple fragment sizes with various blade and drum configurations.



For excavators and loaders from 8t to 160t.



Scan for ALLU dealer locations in Australia: QLD | NSW | VIC | SA | WA or visit attachmentspecialists.com.au/allu



MINING & WATER

TOO MUCH OR TOO LITTLE?



Warwick Lorenz
Managing Director,
Australian Pumps Industries.

*This story is contributed by Warwick Lorenz,
Managing Director of Australian Pump Industries.*

The Aussie Pumps brand is famous throughout the Mining Industry as is the company, for its innovation and dedication to building products that are inspired by the people who use them.

All mining operations are dependent on water in some sense.

Imagine Kalgoorlie without the pipeline, or Broken Hill without Menindee Lakes.

Despite all of that, it's obvious, that water resources consistently run into extremes. By that we mean, too much or too little.

Australia's Mining Industry is by far our biggest earner, although not the biggest employer. The efficiencies and skills of the industry are a testament to their huge contribution to the national economy.

And yet, the Industry still finds itself having to compete with farmers, towns and cities for water when things get tough and there simply isn't enough.

The Mining Industry could argue that it has the highest justified demand, because it generates the most income for the country. Of course, that may not work for politicians.

Mind you, they depend on mining to

balance the budgets from the various income streams available from Australia's dynamic Mining Industry!

WATER AND CLIMATE

Most of us have noticed that Climate Change is very real.

The erratic nature of the weather, scorching days, interspersed with major downpours, or cyclones for that matter, are becoming something that we're all getting used to. Yes, it's extremely inconvenient to find that even the Bureau Of Meteorology can't accurately predict what is going to happen anymore.

In the meantime, the Mining Industry must be geared for not only the pressure of reducing the carbon footprint but also, to find ways of securing sufficient water to stay in business during what looks like more frequent droughts than we are used to.

FLOODS AND DROUGHTS

Many of us remember floods when Central Queensland's coal mines all went under.

As a pump manufacturer at the time, we couldn't keep up. There simply weren't enough pumps in the country, or even pump manufacturers for that matter to be

able to deal with the demand.

We're not sure how many months they were out of action for but, it was a mighty effort to empty those mines, and to make sure that the water that was pumped into the river systems wasn't completely toxic.

The Mining Industry, as usual, got on with it and was back in business within a relatively short time considering the extent of the problem.

The Northern mines, North Queensland, Gove, Kakadu, and right along the west coast are likely to be plagued with deteriorating climate stability over the coming years. Again, we always come back to either too much, or too little water.

HERE'S SOME UNORIGINAL IDEAS

Ian Idriess, famous and prolific Australian author of the 1930's to 1960's was in on the establishment of Broken Hill. He had been a prospector as well as a fighter in the Light Horse Brigade during the First World War in Palestine, (after having already been wounded in Gallipoli). He then came back to Australia, worked in mining, and with cattle and eventually started writing about it. Some of his most famous books were "Cattle King" about Sidney Kidman, the man who owned an extent of real estate between Darwin and

Adelaide, that was bigger than the entire United Kingdom. It's a fascinating account of how one 14 year old boy leaving home can turn his intelligence to building a huge empire (that's another story).

Since mining started in Australia, there has always been the issue of water and for that matter, water security.

But then there's the Ord Dam

Wow, what a piece of engineering! We read that the Ord dumps millions of litres of water into the Arafura Sea. This happens daily, because the Governments, either State or Federal don't have the imagination to be able to build the pipeline or channels to take that water to somewhere where it could do some good.

Yes, we hear that companies are investing in channels to get water from the Ord dam into grazing country, with plans to convert it into cropping land.

The problem seems that most of them aren't Australian companies.

For mining this may seem irrelevant.

However, we come back to Mining Industries and their local towns, sometimes being so short of water that the priorities go back to the local town or



Ord dam.

farmers, rather than to the mine that is producing the income.

DEALING WITH TOO MUCH

We are seeing frequent floods in North Queensland, right through the Eastern coast and even in Adelaide and Kimberley Region in Western Australia.

Will there be more? Absolutely!

So, we get back to what to do about it.

Infrastructure can be built to deal with floods. Dams can be built in appropriate places (the Todd River in Alice Springs) or in any of those rivers feeding the Gulf every year with huge amounts of water.

Infrastructure can direct water to where it needs to be, but it needs imagination, funding of course, and most of all the will to do it!

Floods can be dealt with by channelling the excess water to a location somewhere it may be useful, such as, local dams. Pump stations can move the surplus away, to someplace where it might be useful for either farming or storage.

Mobile heavy duty diesel drive pumps can and are being used to divert water, like Australian Pump did in Sudan in

2022. That story has been told 100 times now. It shows what can happen with the motivation and support of a body like the United Nations. We got pumps by air to South Sudan to save the capital city of Juba before it actually flooded.

Yes, they had warning. The Sud, has vast papyrus marsh that acts as blotting paper when the river floods. Apparently this stalled the flood water to give time to air freight the big Aussie 6" pumps.

Imagine how twenty 6" pumps, pushing out 6000 lpm, over a period of six weeks can move an awful lot of water.

We guess it probably wound up in the Nile Delta in Egypt, where we're told that with that amount of water they can grow 3-4 crops per year.

Those same pumps are working on mine and construction sites all around Australia and Papua New Guinea. Even Tonga uses our big Aussie 6" trash pumps as part of their emergency services program.

These robust, self priming trash pumps can pass large solids in suspension. They self prime! That means no compressors or vacuum pumps are needed to prime the pump. It's just a simple process of filling the casing with liquid, through a priming port built into the casing, and starting the engine.



Megator Sliding Shoe Pump, mounted in a mobile configuration.

Provided there's no air leaks on the suction side, the pump will draw up huge amounts of water and pump to where you need it through 6" outlets!

Yes, 20 of them can do 120,000 litres per minute!

MINE FLOOD MITIGATION

Enlightened coal companies rent machines like this but, as we learnt in the Queensland floods, when the chips are down there simply isn't enough product like this to go round.

Mining companies should be exploring the possibilities of being able to have these pumps in reserve, to provide a mobile and flexible response in the event of major flood issues!

TOO LITTLE WATER

We all know what happens when you run out of water in mining and processing. It becomes a massive issue.

Yes, 60,000 litre tankers can truck water in, but it is expensive, and you may have to get in line, bearing in mind the conditions and severity of drought.

We've seen mines having to compete with Local Government, or farmers for water in extreme droughts.

It's a tough gig because you can't help but feel sorry for the farmers, who produce the food that we all eat. Without them we'd all be in big trouble, and yet, the city people are largely oblivious to the issues of a farmer's life when their livestock is dying in front of them, or their crops are withering.

Sound familiar? Yes, that's what it's like with mining as well.

What's the answer? Obviously, it is Government infrastructure to retain water and

hold it in reserve for those tough times.

You'll read a lot about the Murray Darling River exercise and the huge amounts of money spent on discussions that seem to go nowhere particular in terms of preserving water.

The scale of 'drought proofing' the country seems to intimidate politicians and bureaucrats alike.

Even the Australian Water Association, of which we are members, shy away from the subject whenever it is raised.

And yet, the great Artesian Basin is a natural system that is drawn upon by Australia's vibrant drilling industry to tap water for agriculture and general water supply.

I have had the privilege of being the manager for Pacific Pump for many years. We made deep well submersible pumps, even winding motors up to 300hp to drive them. That was in the days of Australian manufacturing!

We supplied the pumps for almost all the coal mines, manufacturing under a licence of a company called Pleuger from Hamburg.

They were more advanced than any other manufacturer at the time, and it was an honour to work with them.

Yes, we put the submersible pumps into Alice Springs, Tennant Creek and even supplied pumps to Free Port Indonesian Gold mines.

We thought we were doing good quality work, for a worthwhile task. We built these for farmers for flood irrigation and putting them in as river pumps or down wells.

Some of the pumps were 12" in diameter. It was an exciting project.

See over next page



Aussie self-priming Mine Boss pumps available in 2"- 4" configuration.

The point is, that when it rains and particularly the monsoon season in Capricornia, the Great Artesian Basin is refreshed. At least it is in those sections closest to the North.

Located around the fringe of the Artesian Basin, the level can drop to the point that the pumps no longer operates.

When that happens farmers and townships are in trouble.

Is there a solution? The Artesian Basin could be refreshed simply by turning back those rivers that dump millions of litres of water into the ocean, right in front of our eyes.

AUSTRALIA'S VIBRANT PUMP INDUSTRY

We have a great pump industry in Australia. The problem is that it is no longer inhabited by manufacturers, but rather multi-nationals importing low cost product built overseas.

Of course, that's a matter of economies of scale, but 'Australian Pump Industries' is a classic example of what an innovative Australian manufacturer can do by listening to the market.

Work we've done into developing products for the mining industry has been gratifying. We build a range of heavy duty Mine Boss trash pumps that are equipped just for Australia's miners.

Yes, they're built like tanks. We were inspired by Caterpillar and built them with safety in mind as well as performance.

Our Chief Engineer, John Hales, has a slogan up in his office, "We design and build equipment as if we are going to use them ourselves!"

He means it.

APR2024 AMR

Our information is from the field, and we are guided and inspired by it.

Aussie Pumps was the first to build big extreme heavy duty high pressure water blasters involved in mining. Those big machines up to 500bar, are built in heavy duty, hot dipped galvanised steel frames and powered by Yanmar water cooled diesel engines.

Called the 'Aussie Extreme' range, these hydro blasters are picked up by other companies around the world and particularly through the South Pacific, often used in shipyards!

Coming back to Australian Pump Industries, it saddens us is to see great companies from Europe, supplying their product in Australia, but getting them made in China or some other third world country.

At Australian Pump Industries, we focus on using components from first world countries, with serious qualifications and a heritage of reliable performance. It works for us, and it works for the Australian mining industry too.

DEALING WITH CORROSION

Everybody that has had something to do with pumping in the mining industry, whether it is process, filtrate or even just simple dewatering, knows how abrasive, corrosive and toxic liquids can be.

We've been working with mines all over the country to deal with this issue and noted that some of them just deal with it by replacing pumps more often than they normally would.

At Aussie we introduced a range of cast 316 stainless steel pumps, that start at 2" ports, available as both diesel engine drive or electric motor drive in those configurations.

At this stage the biggest machine we've built is a big self priming 4" pump that produces 2,200 lpm.

That may not seem like much but, a battery of these units running off 15kw motors can not only produce high flow, but also quite acceptable pressure performance as well.

3" pumps with heads as high as 50m are already available in 316 stainless steel.

Yes, mines can prolong pump life by selecting the right material ie. 316 stainless steel or even Duplex or Super Duplex.

WHY DID WE GO SELF PRIMING

Self priming makes life easier on the site, whether you're a farmer, miner or even a plumber. Dewatering a site or drawing water from where it is to where you want it to go, (concrete batch plants are a classic example) having a self primer is just so much more convenient and easier for the user.

We've built, step by step over the last 30 years, a range of self priming centrifugal pumps that lend themselves to multiple applications. Our Mine Boss versions include fire pumps both single and twin impellers, decked out just for the mining industry, as well as dirty water and clean water pumps.

Our Aussie 'Smart Pumps,' originally designed for seawater applications on patrol boats, tugs and similar, have been successfully applied on salt mines.

The nice thing about 30% glass filled polyester is, it doesn't rust!

Working with companies like Carver Krogh range of filtrate pumps, or Megator with their sliding shoe pump

are indications of just how open we are to unique technology designed for specific tasks.

We are quite entrepreneurial in that sense.

CLIMATE CHANGE

Yes, we are all going to have to deal with this and that probably means electrification of equipment wherever possible.

Even so, somethings got to generate that power. We can only hope that in the years to come great innovators dealing with this subject will figure it out and provide us with the power we need without choking the planet in the process.

I'm optimistic about that!

SUMMARY

Australian Pump Industries have been around the for a long time and have recently moved into a much larger factory unit in Sydney's Norwest business district. We are clearly focused on the key industries of this wonderful country, which are of course, agriculture and mining. Our job is to support these industries and, we see that Idriess' vision of a drought proofed inner Australia, with dams and water storage, most of it Artesian, would really help to develop this country.

It would also spread the population from the four big cities!

For further information on the complete Aussie Pumps Mine Boss product package don't hesitate to contact us on 02 8865 3500 or online www.aussiepumps.com.au.

AMR

Hammersley Reel System with 200m of layflat hose compactly stored.



Crusader Hose managing director Francois Steverlynck on-site for training and technical support.

DEWATERING INNOVATION – RESHAPING THE FUTURE

Layflat hose and reel systems are reshaping the future of mine dewatering. Crusader Hose offers a reliable alternative to fibreglass, steel and HDPE piping. The challenge of running pipelines up high pit walls is a thing of the past when using layflat hose.

The Australian Mining Review speaks with Francois Steverlynck, Managing Director of Crusader Hose, about this.

AMR: As Australia's only manufacturer of large-diameter layflat hose and reel systems, what does Crusader Hose offer?

FS: Our layflat hose and reel systems offer a proven and reliable alternative to rigid pipe. Laying pipelines of HDPE is time-consuming and costly compared to the time it takes to install our flexible system. Handling rigid pipe is much more cumbersome than layflat. Layflat comes rolled compactly onto reels. Connecting 200m segments with our high-tech Boa clamps can be done easily on-site without the need for special equipment.

AMR: How is Crusader Hose reshaping the mine dewatering space?

FS: We are an innovative company. We are a company that thinks outside the box, so to speak. We have pioneered incredible achievements in Australian manufacturing with our layflat hose systems supporting the mining industry where efficiency and safety are key. For example, the 152mm Crusader Hose Waterlord® mine dewatering hose has a burst pressure of 9,000kPa (900m head), which ensures a high safety factor when connecting to a helical rotor or centrifugal pump. This Crusader hose is only 4mm thick. Layflat pipelines not only withstand high volume and high pressure, regarding installation,

it takes only a fraction of the time when comparing it to poly.

We've been manufacturing layflat hose for over 38 years and, during that time, have been involved in many mine dewatering projects. Two years ago, I had the eureka moment when speaking with some mining engineers about their pain points in the dewatering space. Installing pipelines up high pit walls with our layflat hose, we believe, is the solution many engineers have been looking for.

AMR: Why is innovation important?

FS: Innovation is important because, as we all know, it drives progress and growth, which leads to advancements in manufacturing processes, technology and the economy. At Crusader Hose, the spirit of innovation and continuous improvement fosters creativity, solves problems and ultimately improves our products to support industry.

AMR: Tell us about your innovative dewatering solution.

FS: The Crusader Layflat Hose System is particularly suited to pump water out of deep pits or under high pressures. This innovative system is supplied on reels, and the hose unwinds from the top of the pit wall. The reel is placed at the top

of the pit, and a rope is tethered to one end. Drones are typically used to connect the tether rope into the pit. Once the rope is attached to a vehicle, the pipeline can be deployed by gently driving along and dragging it into position. There is no need for anchoring the layflat hose at each bench as the flexible nature of layflat allows the pipeline to adapt to and follow the contours of the pit wall. At contact points between the hose and the pit wall, the layflat hose 'grips' the wall and does not slide down unless pulled. We know this unique frictional contact makes the installation of a layflat pipeline down a high pit wall a safer and less risky process compared to HDPE poly pipe or steel.

Therefore, the lightweight yet super-strong layflat hose is the system of choice for ease of handling and high-pressure pumping.



Layflat adapts to contours of pit wall, no complex anchoring required.

AMR: How does that system differ from using HDPE?

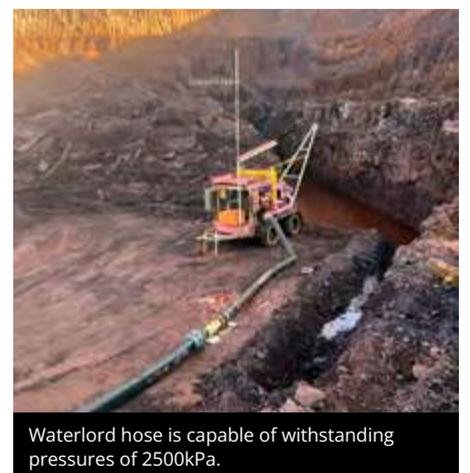
FS: HDPE adds complexity to the project. Engineers need to calculate overall weight, the distance between bench heights, potential creep, and complex anchoring requirements in addition to maintaining safety standards for the installers and welders. This is more time-consuming and expensive compared to planning and installing layflat hose. With our layflat hose system, there is no temperature derating compared to the risk of the poly welds pulling apart.

AMR: I know you've been knocking on many doors to get a foot in. Why do you think it's taking time for more mines to embrace your layflat system?

FS: Many mining operations have long-standing traditions and established methods. There may be resistance to change among workers and management who are accustomed to traditional practices. Uncertainty and risk may also contribute. It requires a paradigm shift in thinking. It takes someone to consider the potential benefits, trust and try the solution. We are confident we will convert.

AMR: Do you offer support if a mine needs technical support in installing your high pit wall system?

FS: By all means! Crusader Hose has the technical support and offers training to assist mines in installing our layflat hose system. Our technical expert can spend one or two days on-site anywhere in Australia to ensure a safe and rapid installation. **AMR**



Waterlord hose is capable of withstanding pressures of 2500kPa.

UNDERGROUND MINE DEWATERING SPECIALISTS

NPE underground mining pumps specialist Desiree Pozzi.



New 90kW Pumps being prepared for shipment to an underground mining operation in Western Australia.

National Pump & Energy (NPE) provides a full range of dewatering services to the civil, construction and mining industries.

As a trusted partner in the mining industry, NPE offers reliable and innovative solutions for any dewatering projects.

Underground Powerhouse

NPE has been at the forefront of surface dewatering in Australia for some time and, now, they are proving to be a powerhouse in the underground dewatering space.

With the ability to provide solutions tailored to their client's needs – whether it be rental units, new pump sales, spare parts or offsite repairs – NPE are being recognised as the “one stop shop” for all underground pumping needs.

Aside from having “seen it all”, NPE's underground mining team are driven to think outside the box and provide alternative options for any underground dewatering issues.

NPE tailors solutions for every client as they understand that the one-size-fits-all approach does not work with a multitude of variables in mining.

The Best In The Business

NPE prides itself on having a “best in the business” team.

With decades of experience and a thorough understanding of the underground mining conditions in Australia, they love what they do and are passionate about underground mining.

The dewatering requirements of each site differ due to a number of factors and the NPE team aim to provide a tailored approach to their clients' needs.

Their ability to listen to what their clients are aiming to achieve and to “think outside the box” when providing solutions has seen them become the ‘go to provider’ in an industry that is ever evolving.

NPE's success has been underpinned by its ability to deliver what they promise.

The company's branch network throughout Australia provides support to underground operations in each state.

It has an extensive rental fleet of underground submersible pumps (5kW -90kW) along with underground ancillary equipment (hopper tanks, float modules).

Its “super service centres” also provide offsite repairs to clients.

NPE's Female Specialist In Underground Mining Pumps

NPE's underground mining pumps specialist Desiree Pozzi lives and works locally in Kalgoorlie-Boulder, in the heart of the Goldfields, WA.

Working as part of the NPE Kalgoorlie team that services the entire region, Desiree is solely focused on the dewatering solutions in the region's underground market.

“Living and working in the Goldfields, I understand that mining is a 24/7 game,” she said.

“I am committed to ensuring my clients are supported – no matter when, no matter where.

“Our NPE team on the ground here have open communication, so we are always

across-the-board with client expectations and always making sure these are met.”

Desiree's presence is a breath of fresh air in a male-dominated industry and her commitment to her mining clients are unwavering.

“Working within a male dominated industry it could be perceived that being a female may at times be tough,” she said.

“I can honestly say, I have been extremely supported by both my clients and colleagues.

“The continual positive feedback from clients regarding our commitment to delivering what we promise has been welcomed.

“I am so lucky to be a part of a team that possesses the same passion for underground mining as I do.

“While technology plays a huge part in mining, with continual improvements in the dewatering space being made – we believe that service provided should not suffer.

“We pride ourselves on our high level of service and are regularly praised by our customers for this.

“Our aim is always to ensure that we are working with clients to optimise pump life and we believe we are able to provide

tools aside from our products that can ensure this happens.”

Quality Service Australia-Wide

Clients are assured that OEM-trained technicians are on the job when NPE is engaged for offsite repairs.

The company's exclusive distributorship agreement with Minetuff Dewatering Pumps gives them access to comprehensive spare parts which are available to purchase, should a client wish to repair their own units on site.

NPE provides ongoing support to its clients, whether they purchase spares and pumps, repair offsite or rent.

Through follow ups and open communication with the end users of the product they ensure they are the first call that is made for the next order.

Leading Expert in Pump Fleet Management

NPE's dedicated and experienced team can assist with all aspects of a project, from site inspection through to system design, project costing, equipment selection, in-house construction – assembly, testing, installation, commissioning, maintenance, operation and/or complete project management, where required.

The detailed on-site (or remote if required) inspection and assessment will ensure that the designed solution will produce the most effective and reliable outcome whilst reducing potential delays and bottom line impacts.

NPE maintains a large inventory of genuine replacement parts, which allows for quick delivery.

The company's routine maintenance ensures all equipment is cleaned, inspected and tested for performance and safety prior to dispatch.

NPE has the experience, capacity and most importantly, commitment, to assist clients with any project anywhere in Australia. **AMR**



A range of underground mining sump pumps for hire at the NPE Kalgoorlie branch.

AUSTRALIA'S LEADING PROVIDER OF UNDERGROUND MINING DEWATERING SOLUTIONS



OUR EXPERTISE AND INNOVATION HAVE
MADE US A POWERHOUSE IN THE INDUSTRY



SUBMERSIBLE PUMPS FOR UNDERGROUND
MINING APPLICATIONS

We specialise in providing top-of-the-line pumping solutions for the industrial Australian mining sector. Our extensive range of pumping equipment is engineered using the latest technology and mechanics to ensure high quality and reliability. As a trusted partner to the mining industry, we offer innovative and customised solutions that are tailored to the specific requirements of each project.

With our expertise and commitment to quality, you can trust that our solutions will deliver the performance and efficiency you need to succeed.



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COERCO CRITICAL FOR MAJOR CLEAN ENERGY AND ECO-FRIENDLY WATER MANAGEMENT PROJECTS

The Kidston Hydro Project is a clear example of how government led incentives programmes have helped to drive investment towards cleaner energy projects.

The 250MW Kidston Pumped Storage Hydro Project in Queensland's north received support from the Northern Australia Infrastructure Facility (NAIF) in a loan worth up to \$610 million, in addition to a \$47 million grant from the Australian Renewable Energy Arena (ARENA).

The funds helped Genex Power Limited build the first pumped storage hydro project in Australia since 1984 and the first to be used solely for energy storage and generation rather than water management.

A key part of the project involved the dewatering of an abandoned gold mine, about 400km inland from Townsville, a

challenge taken on by West Australian based COERCO.

COERCO, widely known for manufacturing industry-leading poly tanks, has successfully expanded its capabilities since it was founded more than 30 years ago.

Its broad range of solutions can now be divided into three main divisions: contain; float; and, move.

The remoteness of the location coupled with difficulties accessing the site required COERCO to draw upon its experience and expertise to solve numerous problems.

Due to the difficulties involved with entrance to the water body in the former mining pit, there were major safety in design considerations to ensure that most importantly the personnel, but also the equipment involved with this scope were safeguarded.

COERCO head of projects Warren Classen says the logistical challenges continued, as COERCO was required to transport large equipment over difficult terrain and long distances.

"One major factor we needed to take into account was transportability to get it to site, the assembly of the system, and then launching it into the dam," Mr Classen said.

The Kidston Hydro Project, led by construction contractor McConnell Dowell - John Holland (MDJH JV), would ultimately involve moving 30 gigalitres of water from the Eldridge Pit into the new Wises Dam.

COERCO designed and assembled a modular system that consisted of 6 pumps with 850kw motors, allowing a flow rate of 200 litres per second, per pump, or 1200 litres per second for the system.

Will Hefferan, surface works area manager for the project, said COERCO responded well to the challenges.

"It's been really easy working with COERCO," Mr Hefferan said.

"Whenever I need some information from them, they're easily accessible to call or chat with or send an email through and receive the information.

"If I had a job requiring a similar solution, I'd like to seek a solution from them.

"It's been very enjoyable working with COERCO, and as you can see with the solution we've got there, it all came to fruition pretty well," Mr Hefferan said.

COERCO has had extensive experience working on major dewatering projects and

the company has developed fruitful and long-lasting industry partnerships along the way.

Aqua Energy Group design, supply, install, commission and maintain water and slurry packaged pump systems and electrical equipment for major mines in Australia.

Aqua Energy Group has earned a reputation within the mining industry for dealing with the most complex and challenging projects, particularly when it comes to integrated pump systems.

Daniel Thompson, project director at Aqua Energy Group, is well aware of the many complexities that exist when it comes to liquid management in the mining industry.

"When faced with a complex project, many considerations are at play, including the liquids and site applications involved, the type of pontoon selected, and of course the pumping system required to effectively manage different liquids," Mr Thompson said.

"Add to this a multitude of other factors and complexities within a project, and it's no surprise that it takes a unique set of skills to deliver a practical, cost-effective solution.

"We have completed a significant number of projects over the years, from small pumpstations to large turnkey projects such as containerised fire pumps and pontoon pump stations, dewatering operations and waste water treatment plants.

"Our pumping and electrical solutions are on show across multiple industries including mining, fire, civil, renewable, and tunnelling, with projects including mine sites, municipal projects, renewable hydro power plants, and industrial sites."

It is difficult to discount the value of a collaborative partnership.

This is particularly evident in projects that face time pressures on designs that require integration of liquid management products, or unique expertise from





different industries as a single point of contact, to facilitate a holistic approach to the project.

As the industry's liquid control specialists, COERCO understand the mutual benefits a collaborative approach and long-term partnership with industry experts such as Aqua Energy Group can provide.

With COERCO designing and supplying floating pontoons and Aqua Energy Group building pumping systems for projects all around the country, the alliance has successfully completed numerous challenging projects.

Mining and water infrastructure industries utilise pontoons and floating walkways to support heavy pumping equipment or machinery during floating applications.

Flotation on liquid, specifically industrial pump pontoons, is a specialised area where COERCO excel.

"Knowing COERCO's extensive experience in pontoon design, and our capability from a pump system perspective, we leverage mutual expertise and resources that are second to none," Mr Thompson said.

Controlling liquids with fit-for-purpose pontoons

Dewatering is performed regularly in most open-pit and underground mining operations that are prone to flooding as a result of a shifting landscape and heavy rainfall.

As well as reducing flood risk and helping operations avoid shutdown, preventing toxic substances from leaking into nearby water or local ecosystems is a core function of pump pontoons which are used to drain excess water from mine tailings dams.

A floating pontoon equipped with heavy pumping equipment is an ideal solution for miners when de-sludging and pumping effluent water from holding ponds.

It's also suitable for reclaiming and cleaning shallow bodies of water or pits without heavy excavation and drainage.

Mine sites commonly use floating pontoons to provide a reliable platform when dredging pumps in high solid industrial pumping applications. They can also serve as stable access walkways for mining, or industrial floating operations in remote areas during floods.

COERCO have been building floating walkways and pontoons for decades. With many different styles, sizes and materials available, the type of pontoon depends upon the site requirements and type of environment in which liquids are being managed.

"When we work on a specific project with COERCO, we ensure the pontoon configuration and our pump system will function from a design point of view," Mr Thompson said.

"Whether it's a heavy-duty, lightweight poly, or modular setup, the type of pontoon makes a big difference to how we integrate the required pump system.

"The heavy-duty pontoons work really well for clients needing a robust, safe and stable platform capable of handling large pump setups and heavy loads of up to 25 tonnes.

"You've also got lightweight and versatile poly pontoons, ideal for tight spaces and temporary setups. These are manufactured using high-quality polyethylene materials, and are UV stabilised and resistant to corrosion and harmful chemicals.

"Then there's the modular pontoons, which easily adapt and change your pontoon's shape and size as your project requirements change. These can support a maximum load of 5 tonnes and are simple to assemble and reassemble as required."

Coerco and Aqua Energy Group have partnered on a number of major mining projects, delivering solutions that aim to solve the most complex problems in liquid management.

They have leveraged their shared capabilities to achieve success in the areas



of liquid containment, flotation on liquid, and liquid movement.

Two mine infrastructure projects the companies have worked on are based in the Moranbah region of Queensland, both of which were complex tailings management projects requiring a high-spec engineered solution.

"The first project was for tailings storage management, which involved the design, supply and installation of all electrical and mechanical requirements," according to Mr Thompson.

"We had two dual electric pontoons and custom walkways, two kiosk substations, and mine spec control panels, instrumentation, and electrical and pipework manifolds that were commissioned and integrated.

"The second complex tailings infrastructure project came off the back of a successful tender win for a flagship mining company. It involved a full turnkey solution from design to commission, and required a huge collaborative effort between ourselves and COERCO."

COERCO is continuing to expand its network and involvement in the mining industry and will be attending the International Mining and Resources Conference (IMARC) in Sydney later this year.

The theme for the 2024 conference is: "Accelerating the Critical and Responsible Pathway to Net Zero".

COERCO will join others in the industry to learn more about strategies, expertise, and

collaboration that will lead the industry toward a more sustainable future, at the Sydney International Convention Centre

The event will be held from 29-31 October and is expected to be the biggest IMARC event yet, with record delegates, speakers, exhibitors, sponsors.

IMARC serves as a platform for industry, government, and community leaders from around the globe to engage in crucial discussions that will shape a sustainable and clean energy future.

"We take great pride in taking part in this significant event in the heart of Australia's thriving metropolis, providing insights into the future of mining," a COERCO spokesperson said.

"You can discover more of our efficient Mining Pontoon solutions and hear strategic ideas that will help lead to a more sustainable and greener energy future. "With this, we hope to add value to your future projects.

"Coerco invites you to book a meeting with us ahead of time for an opportunity to have a productive discussion with our experienced team of Mining Pontoon specialists, as well as get fit-for-purpose solutions to suit your needs." **AMR**





The MEPS Dual Unit is driven by a 1000v, 55kw motor to deliver up to 20lps at 18bar.

MINE DEWATERING – THE MURRAY ENGINEERING CONSULTATIVE APPROACH

Underground mining operations present a raft of health and safety risks, from plant and equipment, toxic chemicals and flammable liquids, to airborne particles and other hazardous substances. However, excess mine wastewater and slurry build-up during mineral extraction or flooding events, is one risk that can threaten worker safety and blow out project costs if not managed effectively.

Underground wastewater comes from a variety of sources such as drilling operations, aquifer interceptions, and external weather events. For operations tasked with moving fluids from one location to another, the process of dewatering is a familiar one. It requires specialised pump systems designed for specific applications and hydraulic duties, which means selecting the right pump is critical to productivity and profitability. There's also the time

that businesses spend chasing down multiple suppliers to fulfil the demands of a single project.

This is where Murray Engineering steps in. Headquartered in Pinjarra WA and supported by branches in Kalgoorlie, Newcastle, Sydney and Mongolia, the company has built an excellent reputation for maintenance, refurbishment, automation, manufacture, and assembly of mechanical

and electrical equipment, for both local and international markets.

From a fleet of underground trucks, loaders and drills, to award winning safety systems, the company is a genuine solutions provider. But it's the company's dewatering capability that is changing the way companies manage their fluid transfer jobs.

One of Murray Engineering's underground mine dewatering specialists, Tony Kersten, says their turnkey dewatering, industrial and wastewater pumping solutions are designed for the harshest mining environments.

"Our dewatering pump sets have a competitive advantage in terms of performance, maintenance and longevity," he said. "Designed specifically for mine dewatering and backed by an experienced team, we manufacture pump sets in both metallic and non-metallic configurations. Our pumps can handle a diverse range of mining and wastewater applications."

"To keep mining operations reliably dewatered, many factors need to be determined and carefully considered, including the total flowrate required, solids type and chemistry, temperature, static elevation, pipe sizing and friction analysis among many other elements."

This information enables us to calculate the Total Dynamic Head (m), and then the ideal pumping equipment can be selected



Single MEPS Netzsch unit.

for the specific hydraulic duty point, to ensure a successful outcome for our clients."

Pumps that keep fluids flowing

With access to major OEM pump brands plus a comprehensive in-house pump manufacturing capability, there's no fluid transfer job out of reach. Murray Engineering offers solutions for all applications – skid mounting of helical rotor pumps, dewatering, submersible, slurry, dosing, gear, vane, multistage, ring section, axial lift, and vertical turbines coupled with diesel or electric driven motors, valves, hoppers, control panels and pump starters, plus auditing and testing services.

Murray Engineering Pumping Systems (MEPS) are available in both abrasion-resistant centrifugal and positive displacement progressive cavity arrangements. The company's NETZSCH Helical rotor pumps are built for heavy-duty mine dewatering applications and offer the lowest cost per litre pumped on the market. A base MEPS unit houses a tank, progressing cavity pump, inspection ladder and walkway, valves, and piping all mounted on a galvanized or painted steel skid. The unit may also include a starter panel, and an integrated instrumentation panel that automatically operates the pump system.

Unlike other pump sets on the market, NETZSCH helical rotor pumps have a unique design that incorporates a slurry agitation chamber to keep solids in suspension. This provides a uniform feed into the stator and prevents solids accumulation in the mechanical seal mitigating premature wear and inadequate lubrication on the seal.

With a seven percent larger cavity volume than other brands, the helical rotor pump



The MEPS Modular Unit is capable of having the hoppers connected to increase overall capacity.

can run slower with the same flow. This significantly increases the run life of the rotor and stator.

The larger cavity provides a longer sealing line between the rotor and stator, and increases longevity in these components, further reducing the maintenance required over the life of the pump. Additionally, the ratio between the length and height of the pitch has been engineered for optimal performance.

NETZSCH Australia managing director Rafael Navarrete, highlighted the importance of efficiency and how their pumps help achieve higher torque for increased pump flow.

"The drive structure of the rotor and stator assembly, which includes a solid stainless-steel coupling rod and joints, transmits the required torque from the pump drive through to the rotor with minimal losses resulting in improved efficiency.

"Each pump uses an individual drivetrain design that delivers higher efficiency. The bearing housing (each pump size has its own) is built to handle the radial and axial forces within the pump aligned to the maximum duties the pump is rated to. Another feature that supports higher pump performance includes the conical-shaped stator entrance that improves fluid flow and reduces NPSHr. The NETZSCH Helical Rotor range has an industry-

leading capability of up to 150 litres per second and 110 bar or 1100m metres total dynamic head. There is a pump to suit every application."

With pumping specialist teams located in Pinjarra, Kalgoorlie, Newcastle, and Sydney you can be assured your pumping requirements are covered Australia-wide. You will also benefit from access to an in-house team of Electricians, HD Fitters and Boilermakers coupled with world-class ISO and CC3 certified service facilities, and fully equipped service vehicles for all onsite and offsite pumping needs. **AMR**

For more information, visit www.murrayengineering.com.au

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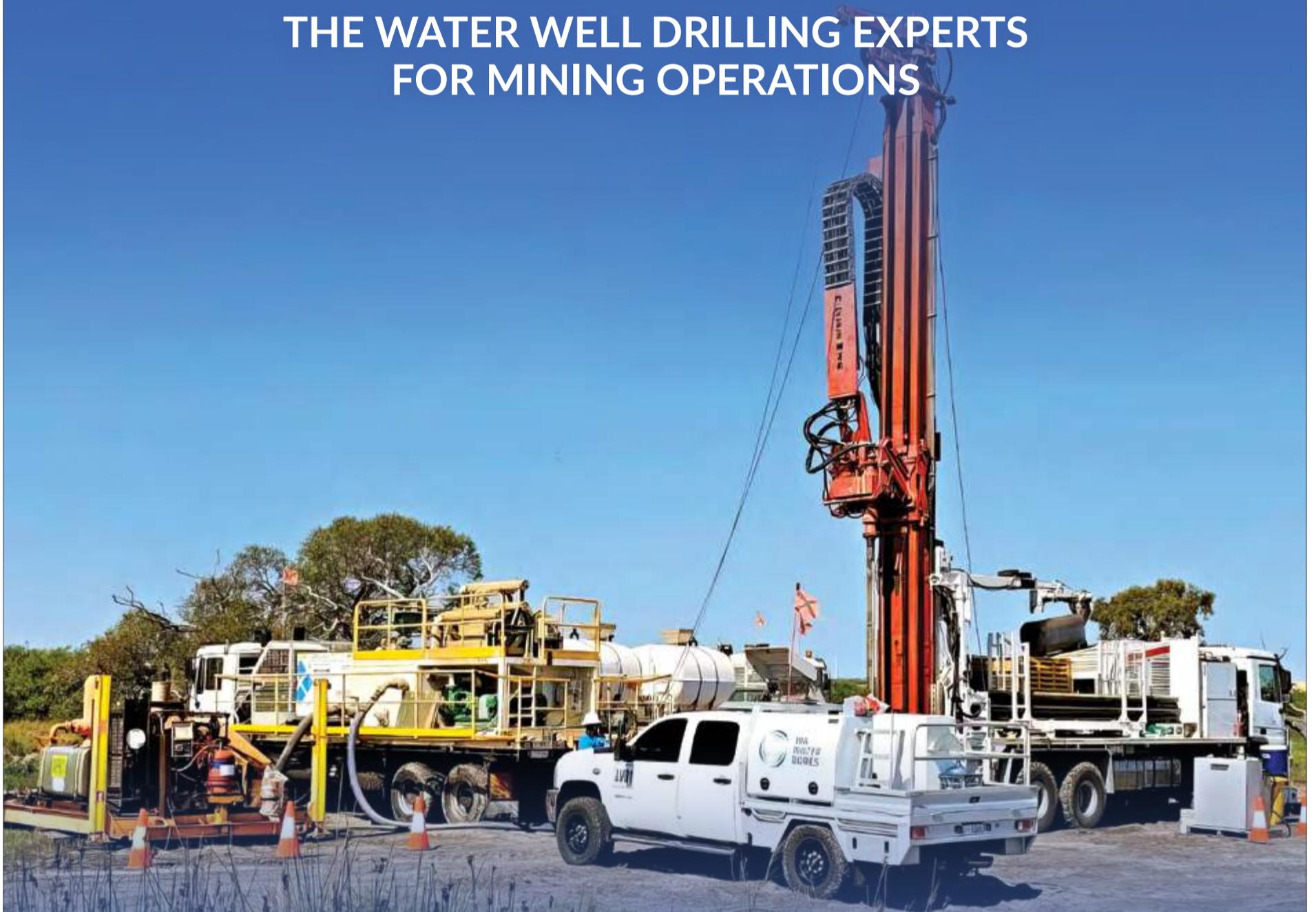
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