THE AUSTRALIAN
MINING REVIEW

PP100007123

AUGUST 2019

australianminingreview.com.au

A product of Publications & Exhibitions Australia Pty Ltd

REPORTS FROM NOOSA MINING CONFERENCE
NEWS
p10-14

MAYUR LOOKS AT CONCRETE SOLUTIONS
MINING IN PAPUA NEW GUINEA
p27

LOVE IS IN THE AIR
TECHNICAL TALK
p68

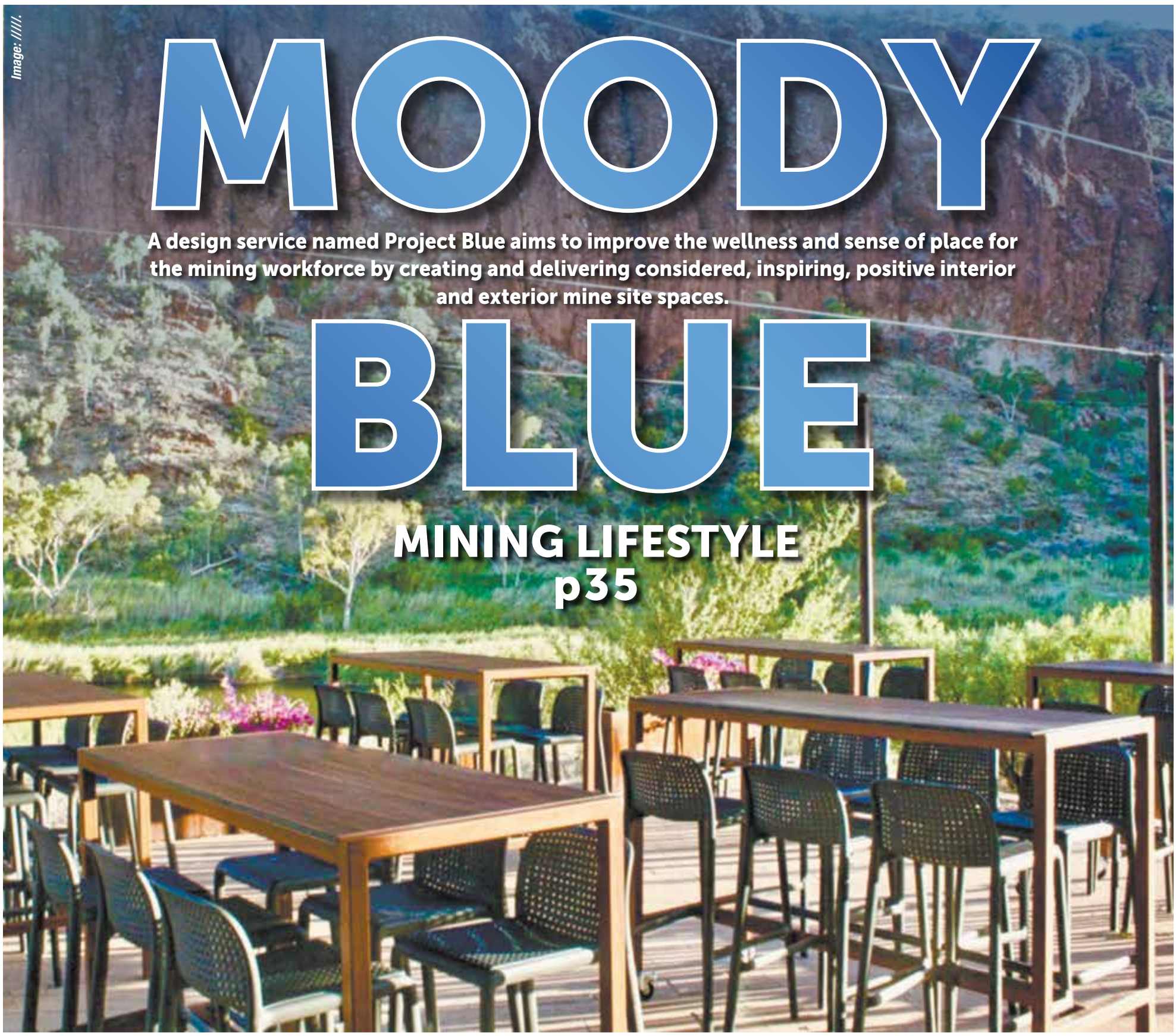


Image: /////.

MOODY BLUE

A design service named Project Blue aims to improve the wellness and sense of place for the mining workforce by creating and delivering considered, inspiring, positive interior and exterior mine site spaces.

MINING LIFESTYLE
p35

PICTOGRAPH PTY LTD

0410 568 485
rachel@pictograph-gis.com.au

Producing clear, concise maps & diagrams
Telling your story to the market!

GIS | CARTOGRAPHY | DATABASE MANAGEMENT
GRAPHIC DESIGN | BRANDING | PRINTING

NEWS

Commodities Snapshot	4
Noosa Conference	10
Technology & Innovation	16
Commodity Focus: Iron Ore	18

FEATURES

AIMEX 2019	20
Olympic Dam	25
Mining in PNG	28
Anglo American	30
Boonanarring	33

MINING LIFESTYLE

Project Blue	36
Drug use on rise	37

INDUSTRY FOCUS

Companies Gearing Up	38
Abrasive Blasting	41
Cables & Cabling	45
Equipment Hire	49
Filters & Filtration	50
Industrial Tanks	53
Mine Shutdowns	54
Motor Body Builders	56
Pumps & Pumping Solutions	60
Valves & Flanges	61
Vehicle Fitouts	62
Worksite Safety	63
XRD & XRF Testing	57

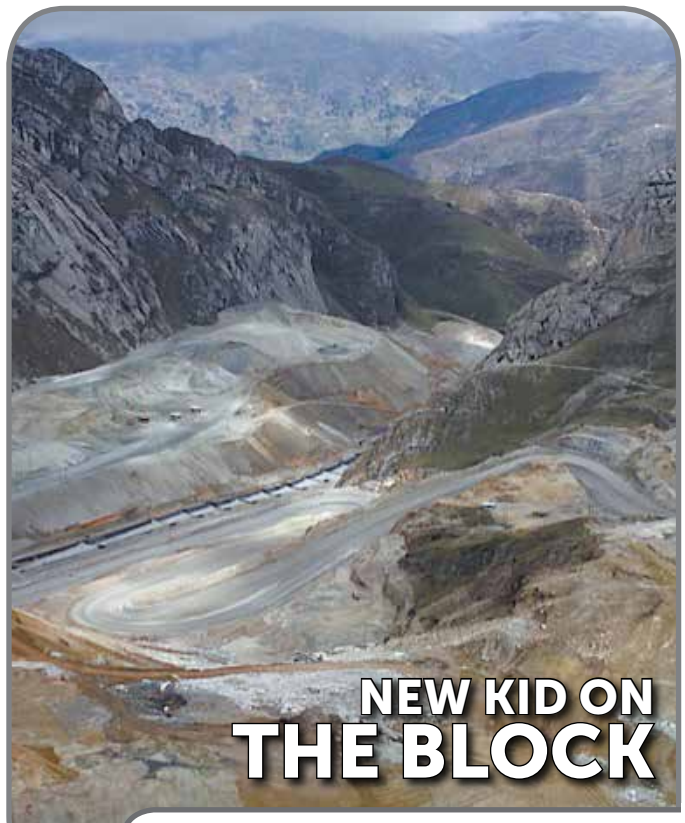
IN THE SPOTLIGHT:

OXYGEN RESOURCES CHIEF EXECUTIVE

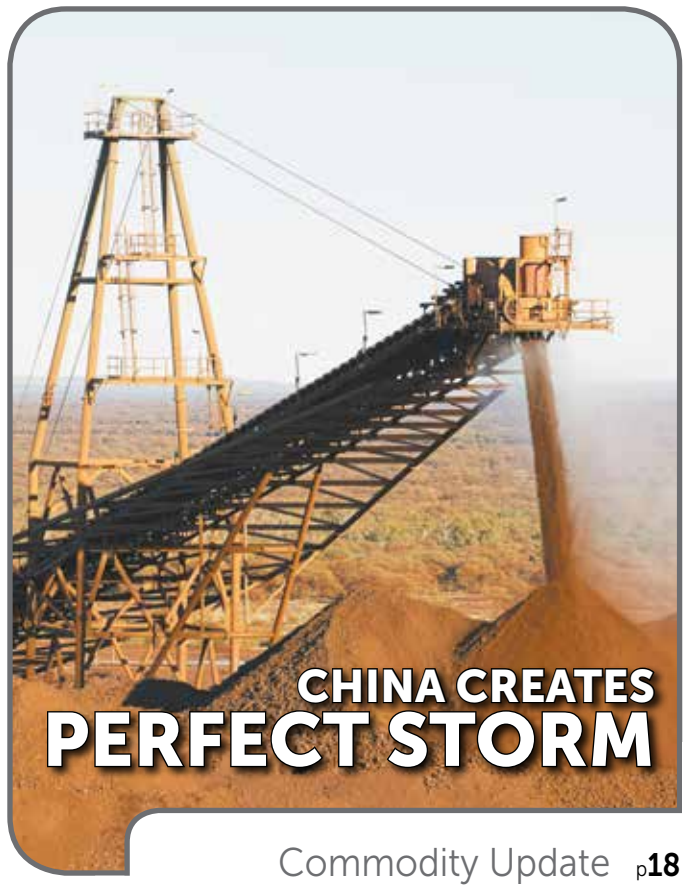
MARK O'DEA p94

TECHNICAL TALK

Drone Services	67
Minesite Power	72
Dump & Haul Trucks	78
Crushing Solutions	83
Minesite Lighting	92



Technology and Innovation p16



Commodity Update p18

PUBLISHED BY
ABN 28 112 572 433

A product of
Publications & Exhibitions Australia Pty Ltd

MANAGING DIRECTOR
Trevor Pickett
trevor@australianminingreview.com.au

MANAGING EDITOR
Ray Chan
ray@australianminingreview.com.au

JOURNALISTS
Emma Davies
emma@australianminingreview.com.au
Gerard McArtney
gerard@australianminingreview.com.au

GRAPHIC DESIGNER
Charlotte Lufino
charlotte@australianminingreview.com.au

RESEARCH
Jason Strydom
jason@australianminingreview.com.au

SALES EXECUTIVES
Trevor Pickett, Biliana Harman, John Carter

PRINTER
Rural Press

CONTACT US
P: (08) 6314 0300
F: (08) 9481 7322
160 Beaufort Street, Perth, WA 6000.
PO Box 8023, Perth BC, WA 6849.

E-mail the editor at
editorial@australianminingreview.com.au
For all other emails to staff, the standard convention is, first name (only) @australianminingreview.com.au

The Australian Mining Review is a free publication to all mine sites and mining companies in Australia. Its value is $11 an issue. (Includes GST, postage and handling).
The copyright is vested in the Proprietors of The Australian Mining Review; neither whole nor any part of this issue may be reproduced without permission.
The views expressed in this publication are not necessarily those of Publications & Exhibitions Australia Pty Ltd and its staff, but are those of the respective author who accepts sole responsibility and liability for them.

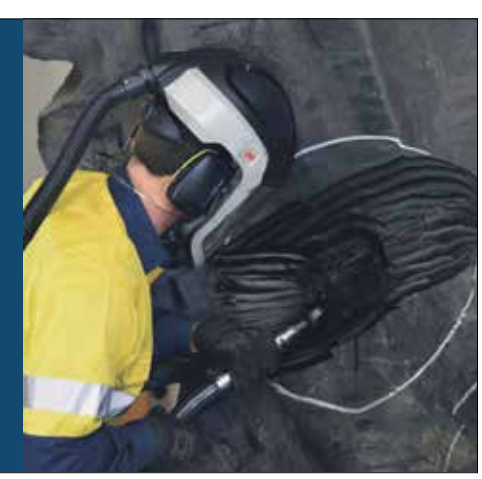
NOTICE TO ADVERTISERS:
The Trade Practices Act, 1974 came into force on the 1st October 1974. All advertisers and advertising agents are directed to carefully study the provisions of the Act, which contain strict regulations on advertising.
It can be an offence for anyone to engage, in trade or commerce, in conduct deemed "misleading or deceptive". Specifically s53 of the Act contains prohibitions from doing any of the following in connection with the promotion, by any means, of the supply or use of goods or services:
(a) falsely represent that goods are of a particular standard, quality, value, grade, composition, style or model or have had a particular history or particular previous use; (b) falsely represent that goods are new; (c) represent that goods or services have sponsorship, approval, performance characteristics, accessories, uses or benefits they do not have; (d) represent that the corporation has a sponsorship, approval or affiliation it does not have; (e) make a false or misleading representation with respect to the price of goods or services; (f) make a false or misleading representation concerning the need for any goods or services; or (g) make a false or misleading representation concerning the existence, exclusion or effect of any condition, warranty, guarantee, right or remedy.

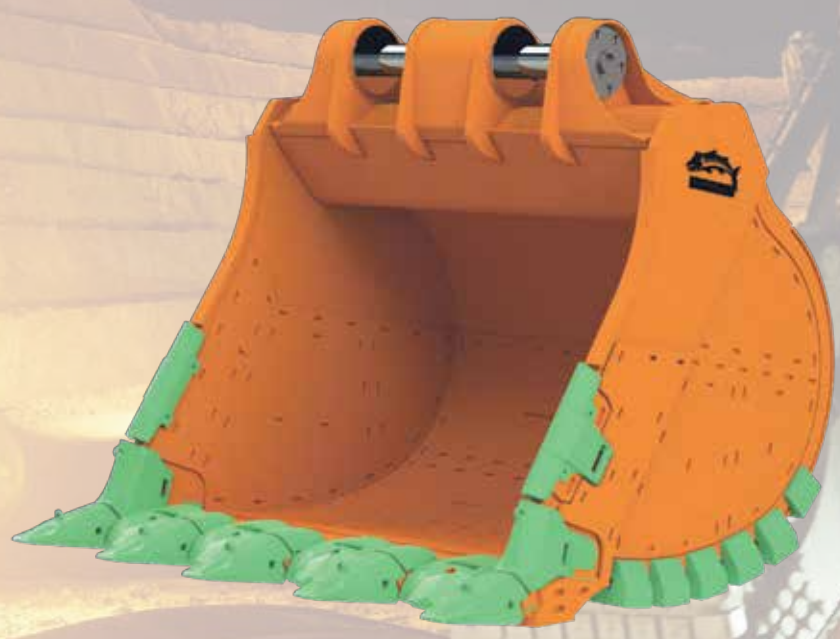
PENALTIES:
For an individual — $10,000 or six months imprisonment
For a corporation — $50,000. It is not possible for this company to ensure that advertisements published in this newspaper comply with the Act and the responsibility must, therefore, be on the person, company or advertising agency submitting the advertising for publication. In case of doubt, consult your lawyer.

SPECIALISTS IN OTR TYRE REPAIR FOR MINING SINCE 1986.
OPEN IN MACKAY FROM SEPTEMBER.

TYRE DOCTOR
WE'RE OTR. WHERE EXPERIENCE COUNTS.

meet **Shane Clark**
phone **1800 897 336**
search **tyredoctor.com.au**





BARRACUDA

HERCULES

BULLANT

ABOVE THE GROUND, BELOW THE GROUND OR IN THE GROUND

DT Australia has the engineering solutions to increase your payload capacity and lower your operational costs.

The technologically advanced range of Hercules and Bullant trays along with the new Barracuda range of mining buckets delivers real payload benefits to your mining operation.

These exceptional bottom line benefits include:

- Increased payload
- Improved productivity
- Reduced maintenance costs
- Reduced operating costs across the board

Our patented designs fit all major makes and models, extending the life of your equipment at a reduced cost.

Utilising our internal engineering experise we can customise our products to your specific requirements. This coupled with our engineering analysis software ensures that our solutions will go the distance.

If you demand real improvements to your operational bottom line, talk to our experienced team about how our range of lightweight and hard wearing equipment can improve your financial outcome.

WHEN RELIABILITY, DURABILITY AND EXPERTISE MATTERS TALK TO YOUR PARTNERS IN PAYLOAD

DT AUSTRALIA

HERCULES BULLANT BARRACUDA

schlam group

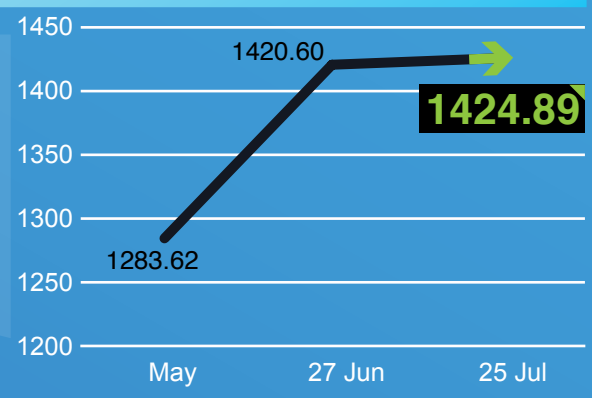
Ph: +61 (8) 6148 5555 Email info@dthiload.com www.dthiload.com

MAJOR COMMODITIES SNAPSHOT

GOLD

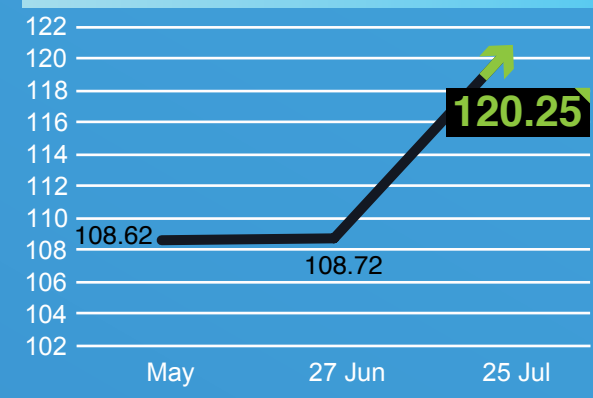
$US/oz

Gold has stayed strong amid global tension and unease, and has been bolstered by strong returns in the Australian market.



IRON ORE

$US/t
62% Fe CFR China

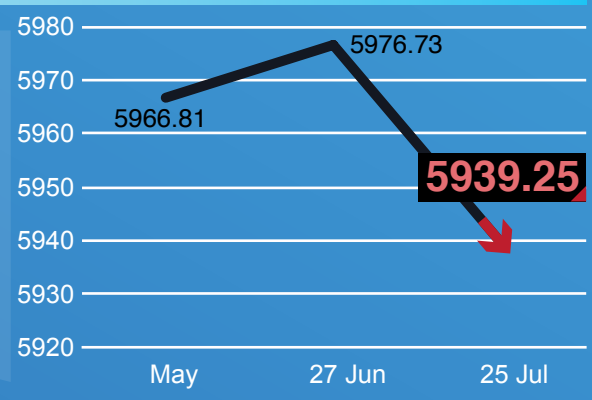


Iron ore remains at boom time highs for the second month in a row as Australian miners continue to reap the benefits of international supply deficit.

COPPER

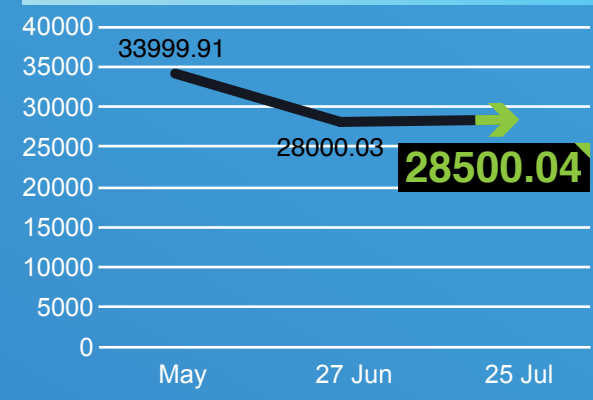
$US/t
LME Price

Copper prices fell sharply as investors remain skittish in the ongoing US China tensions as Donald Trump doubled tariff rates on US$2b of Chinese imports.



COBALT

$US/t
LME Price

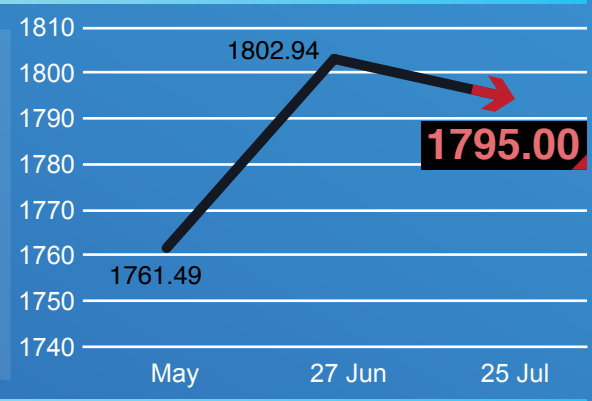


Cobalt continues to struggle as ethical questions around its origins in Democratic Republic of the Congo continue to put off automotive industries.

ALUMINIUM

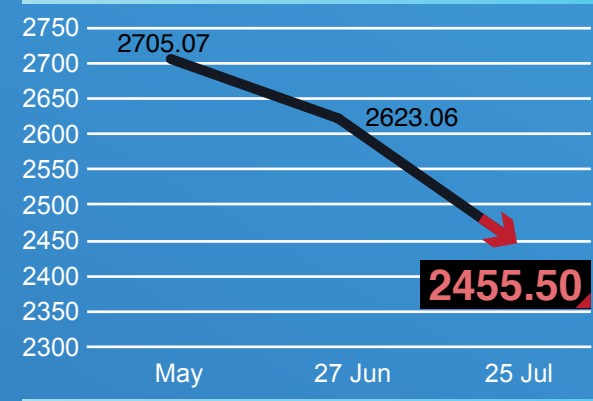
$US/t
LME Price

Aluminium prices remain under pressure due to low demand and continued high exports from China, along with concerns over a renewed Trump tariff threat on cars and car parts.



ZINC

$US/t
LME Price

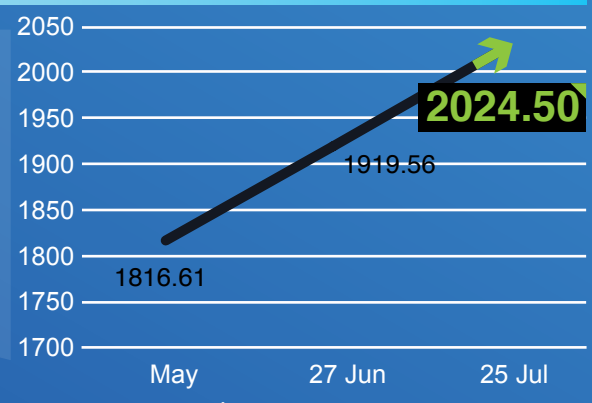


Zinc has continued its bearish run as the market reaches saturation and major Chinese smelters continue with maintenance.

LEAD

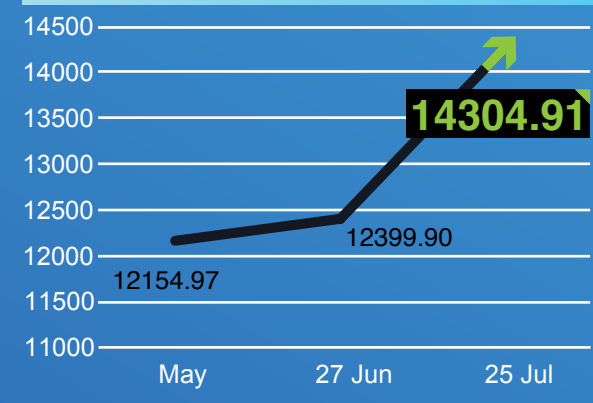
$US/t
LME Price

Low lead prices show no signs of rallying in the near future. Existing stockpiles meet supply deficits and have not sparked investor confidence.



NICKEL

$US/t
LME Price



Nickel has rallied through July adding some shine to an otherwise lacklustre financial year for industrial metals.

COMMODITY FOCUS > IRON ORE PG 18

ARMSTRONG
FLOW CONTROL
Efficient Systems Solutions™

Armstrong Flow Control are the Australian Representative for the Everlasting Valve.

Proven solution to difficult applications!

1300 136 486
sales@armstrongflow.com.au
www.armstrongflow.com.au

MINING

IT'S A DIRTY BUSINESS

New Aussie Blaster Blitz 5 coming

The cleaning bible of the Mining Industry

Reserve your copy today
Call or email .....

02 8865 3500

info@aussiepumps.com.au

Aussie Pumps

Australian Pump Industries

aussiepumps.com.au

Mining deaths prompt reviews

RAY CHAN
QLD

THE sixth mining fatality in Queensland within a year has prompted the Qld Government to expedite two expert independent reviews to identify changes needed to improve health and safety in the state's mines and quarries.

Qld Mines Minister Anthony Lynham announced plans for the reviews, to be held by the Government and Qld University, after meeting with mining industry representatives and the mining union in the wake of the incidents.

The scope of the Government review will include all coal, mineral mine and quarry incidents, and all fatal occurrences this year.

Mr Lynham said the review, led by forensic structural engineer Dr Sean Brady, would look at why mine workers have died over the past 20 years; how industry can improve; and how the mines inspectorate can work better. The fatalities prompted mining union CFMMEU to call for a 24-hour stoppage of production at all Queensland mines, and for mine CEOs to meet with workers to discuss safety protocols.

As the paper went to press, the Old Government announced that every miner in the state will berequired to attend a safety briefing on the fatal risks at their mine sites before the end of August.

Ranger clean-up costs covered

EMMA DAVIES
NT

RIO Tinto has agreed to partially fund the clean-up of its controversial Ranger uranium mine in the Northern Territory.

Owned by subsidiary Energy Resources of Australia (ERA), the mine will be closed by 2021 but the estimated costs to rehabilitate the site are a staggering $799m - which ERA is unable to cover on its own.

"ERA had total cash at bank of $349m at June 30, 2019, compared to $313m on December 31, 2018," ERA said in a statement.

"In addition to cash at bank, ERA had $76m of cash held by the Commonwealth Government as part of the Ranger Rehabilitation Trust Fund, bringing total cash resources to $425m."

In the first half of 2019, $48m was spent on rehabilitation activities at Ranger, and with $751m of costs remaining, the company is looking to its parent Rio to bridge the gap.

"Following extensive discussions regarding a number of potential funding options, Rio

Tinto has advised ERA that it is only willing to provide additional financial support to

ERA via a renounceable entitlement offer undertaken by ERA," ERA said.

"In that event, subject to the offer's terms, Rio Tinto has indicated it would subscribe for its 68.4pc entitlement of new shares."

ERA is also investigating whether there are other potential funding sources.

BHP tackles climate change

RAY CHAN
INTERNATIONAL

BHP has unveiled a five-year plan to spend US$400 million on measures to address climate change, while allying salaries for the group's executives closer to meeting environmental targets.

The Climate Investment Program will develop technologies to reduce emissions from BHP's own operations as well as those generated from the use of its resources.

Outlining the Big Australian's goals in London last week, group chief executive Andrew Mackenzie said the program, over the next five years, would scale up low carbon technologies critical to the decarbonisation of our operations.

"It will drive investment in nature-based solutions and encourage further collective action on scope three emissions," he said.

"Commercial success of these investments will breed ambition and create more innovative partnerships to respond collectively to the climate challenge."

Mr Mackenzie said BHP had to take a product stewardship role across its value chain and commit to work with shippers, processors and users of its products to reduce emissions.

Other measures announced include:

• Establishing a new medium-term, science-based target for scope one and two emissions in line with the Paris Agreement. This is in addition to BHP's short-term goal to cap 2022 emissions at 2017 levels, and long-term goal of net-zero emissions by mid-century.

BHP's program aims to reduce emissions from its operations.

• Developing a new climate portfolio analysis report in 2020, following on from BHP's 2015 two degree scenario analysis. This new report will evaluate the potential impacts of a broader range of scenarios and a transition to a 'well below' two degree world.

• Strengthening the link between emissions performance and executive remuneration. From 2021, this link will be clarified to further reinforce the strategic importance and responsibility of reducing emissions as a business.

Mr Mackenzie criticised environmentally conscious investors who pulled funds from miners and other resource companies, describing it as "simplistic", "fundamentally wrong" and potentially damaging.

"It may be uncomfortable for some, but many solutions to global warming — such as the increased electrification of transport — will require more mined resources rather than less," he said.

"Electric motors contain 80 per cent more copper than an internal combustion engine. That is why we must change the current storyline around easy, single solutions and acknowledge that there are many competing perspectives that must be taken into account."

His comments come as the miner prepares to extend the limits of its Pilbara iron ore operations, reporting recently that it would target production of between 273mt and 286mt this financial year, an increase from 2019 production figures of 270mt.

WA mining on centre stage

RAY CHAN
WA

THE key drivers pushing the WA mining industry will be examined at a new WA mining conference to be held in Perth from October 15-16.

The program will examine innovation across the entire value chain from early-stage exploration to scoping and feasibility, onto design and construction through operation and ultimately rehabilitation.

These in-depth sessions will provide operational and execution strategies of a mine's life cycle and discuss approaches to improve productivity, lower costs and optimise the end to end process.

The two-day conference hosts an impressive line-up of speakers that will feature mining decision-makers, technology experts and industry leaders.

Among them will be international mining expert and former BHP Billiton external affairs manager, Dr Osvaldo Urzua, who will discuss transiting to safe, smart, inclusive and sustainable mining.

"The world is rapidly heading to the automation era and mining can make automation work for all," Dr Urzua said.

"The WA Mining Conference gives me a chance to discuss how collective action is required, and technology suppliers must consider social and community impacts. This is a new factor to be considered in the assessment of companies bidding processes.

"Australia is an example of how mining has participated in technological revolutions. In the past Australian software has revolutionised mine planning processes. Today's METS sector is the new champion."

Swedish academic, technologist and strategic advisor to the Defence SA

Dr Osvaldo Urzua.

Professor Goran Ross.

Advisory Board, Professor Goran Ross, is also one of the key speakers.

Professor Ross will discuss collaboration strategies for the industry and what Australia can do to accelerate its innovations and capabilities.

WA Mining Director Brandon Ward said this inaugural WA conference will provide delegates with a conversational style platform that will address the role technology and people will play in the future of mining in the state.

"The WA Mining Conference agenda echoes the importance of collaboration, innovation and technology development in the WA mining sector and attendees will be given the chance to hear from leading experts who will share their insights about what is driving the sector forward while providing a unique opportunity to participate in this open and transparent dialogue," Mr Ward said.

"WA mining will be technology-centric but it will examine the vital role people will play with augmented human intelligence, machine learning, predictive analytics and how the industry ensures the human capital is available to take the sector through its next phase. No other event in WA offers this level of insight into the key drivers accelerating the WA mining sector to 2030."

Alongside the conference will be a targeted supplier showcase where delegates can source the latest products and services as well as a networking event on the first night to catch up with colleagues from across the state.

The WA Mining Conference will take place at the Perth Convention and Exhibition Centre, with doors opening at 9am on both days.

Early bird tickets are now available and they can be purchased by visiting waminingexpo.com.au.

Worldwide Auctioneers of Construction & Agricultural Equipment

Unused Doosan DX225LC

2018 Doosan DX340LC

2015 CAT D6T XL - choice

2013 John Deere 670G

2015 Komatsu HM300-3 - choice

Unused Komatsu WA380Z-6

Unused Doosan DL505

Unused Manitou MT932 EASY - choice

BRISBANE, AU

29th August @ 8:30am

www.euroauctions.com

Access a global audience like no other, consign today:

Craig Hart (QLD) +61 4179 27337
Paul Langan (QLD) +61 4887 45816
Paul Haynes (NSW) +61 4295 34493

161 Sandmere Road, Pinkenba, Brisbane QLD 4008 | +61 736 074 800

100% Unreserved Auction
Everything Sells To The Highest Bidder
Buyers Comission 2.5%

EURO AUCTIONS

Govt urged to maintain the momentum

NATIONAL

THE Australian Resources and Energy Group (AMMA) claims that record earnings for Australia's resources and energy exports, forecast by the nation's chief economist, highlights the opportunity for the Federal Government to implement policies of its National Resources Statement and help stimulate further industry growth.

Released in February, the NRS was built from recommendations of the government's Resources 2030 Taskforce, and contains a number of policy initiatives to continue developing Australia's world-leading industry and support its ongoing global competitiveness.

According to the latest Resources and Energy Quarterly report, export earnings surpassed the previous record of $227b in 2017-18, with a further spike likely to lift export earnings to $285b in 2019–20.

AMMA Head of Policy and Public Affairs Tom Reid said the record surge of more than 20pc showed Australia was now reaping the benefits of the huge levels of investment in major resources and energy projects over the past 15 years.

"To underpin further industry growth and even greater national contribution, it is critical that industry and government work together on implementing the NRS during this term of Parliament," he said.

However the report also warned of potential global economic headwinds, including weaker commodity prices, trade tensions and slowing production.

"Australia has little time to waste basking in the success of our resources earnings – we must focus on keeping up the momentum started by the Resources 2030 Taskforce," Mr Reid said.

"In particular, resources and energy employers are facing a number of future skills and labour mobility challenges that can be at least partially addressed by government and industry collaboration."

Mine workers need tax cuts

NATIONAL

THE Australasian Institute for Mining and Metallurgy (AusIMM), the peak body for resources professionals in Australia, has publicly supported all three stages of the Coalition Government's tax package, which it said would lead to significant tax relief to mining workers across the country.

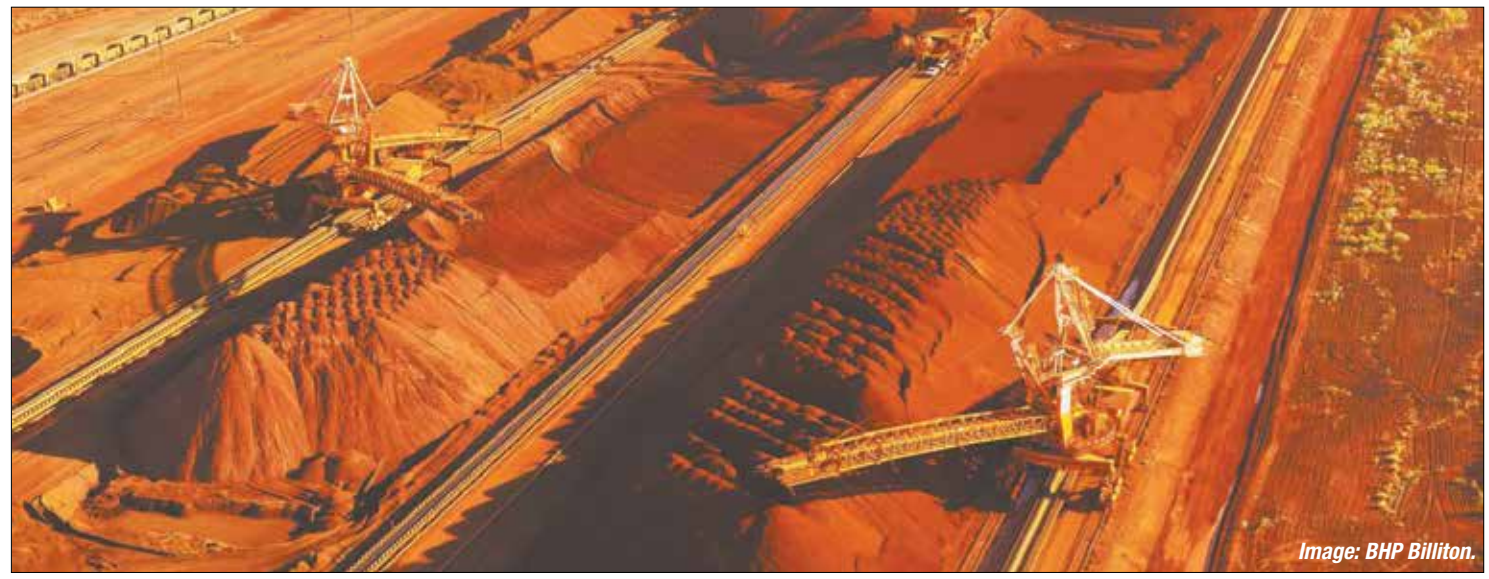
The resources industry, which employs more than 230,000 Australians, has traditionally had strong remuneration packages to attract the best talent to the industry, a fact which AusIMM believes should be celebrated and supported with tax cuts as the industry stabilises and grows.

AusIMM CEO Stephen Durkin said this was in part due to the in-demand skills of professionals and the sometimes-challenging nature of FIFO or remote work.

"Tax cuts provided could go a long way to assist in stimulating regional and rural communities, particularly those that are hit hardest during downturns, droughts, and rising unemployment," he said.

AusIMM's research showed 75pc of respondents who were under 30 and working full time, were earning between $100,000 and $250,000 per annum.

BHP agrees to $250m payback



BHP iron ore operations at Port Hedland.

RAY CHAN
WA

BHP and the WA Government have reached an agreement over the royalty deductions dispute, with the miner agreeing to cough up $250m in back payments.

The state government had earlier this year said it would seek royalty payments of up to $300m from BHP, which it believed was underpaid over a 12-year period.

Following an audit by the Department of Mines, Industry Regulation and Safety (DMIRS), the State Government had been engaged in negotiations with BHP in good faith, to resolve the matter in the best interests of WA.

The investigation came after the Australian Taxation Office reached a settlement agreement with BHP relating to its marketing operations in Singapore last year, in which the miner agreed to pay $529m in additional taxes for the years 2003 to 2018, without admission of tax avoidance.

This was in addition to the more than $75b in Australian taxes and royalties that has already been paid by BHP over that same period.

The WA settlement with BHP (and joint venture partners Mitsui and Itochu) marks the end of proceedings, and prevents taxpayers being exposed to lengthy and expensive legal proceedings.

Premier Mark McGowan said he was pleased at the "very positive outcome", with $250m now earmarked towards worthy projects.

"I am assured by BHP and its joint venture partners that they did not intentionally seek to minimise royalty payments, and I accept this advice, and thank BHP for working to resolve this dispute co-operatively with the State," Mr McGowan said.

"The State Government has a strong, long-running relationship with BHP that has benefited all Western Australians. We look forward to that relationship continuing long into the future.

"I commend DMIRS for its work in identifying the royalties dispute and the State Solicitor's Office for its efforts in achieving a good outcome on behalf of the WA taxpayers."

A BHP statement said the rift involved a technical interpretation of the law and that there was no assertion by the state that BHP, or its JVPs, had deliberately or knowingly sought to avoid or minimise the royalties payable to WA.

From the funds, the McGowan Government will allocate $230m towards the construction of a new women's and maternity hospital at the QEII site, replacing King Edward Memorial Hospital. This follows the $3.3m included in the Budget to begin planning for the new hospital.

A total of $15m will go towards much-needed upgrades and repairs at Hedland Senior High School, including upgrades to Hardie House, classrooms and specialist rooms, and covered recreational areas.

A further $5m will be directed to Newman Hospital for additional upgrades, including extra inpatient beds and an expanded procedure room. This is on top of the $48.7m already allocated for the new Newman Hospital.

Palmer fronts court over Qld Nickel

RAY CHAN
QLD

EMBATTLED businessman Clive Palmer is in the midst of a nine-week trial over the collapse of Queensland Nickel.

The mining magnate is fighting a Federal Government lawsuit against him and his nephew and former company managing director Clive Mensink over the liquidation of his Townsville nickel refinery, which left hundreds without a job.

Government-appointed liquidators of Qld Nickel brought the former federal MP to the Brisbane Supreme Court to recoup about $300m for creditors.

Mr Palmer had requested taxpayer-funded assistance from the Queensland Government in late 2015 to guarantee a loan of $35m for planned redundancies at the refinery, but the Government denied the request, citing the refusal of the company to share full details of its large donations to Palmer's Palmer United Party.

Despite its financial troubles, Qld Nickel donated more than $20m to the PAP in two years.

After terminating the employment of more than 230 employees in 2016, the company blamed poor nickel prices, which were at a 12-year low, and the refusal of the Qld Government to support industry and jobs in North Queensland.

Clive Palmer's collapsed nickel refinery in Queensland.

The liquidators' 280-page claim, first lodged in the court in June 2017, names 21 defendants, including Mr Mensink and a string of Mr Palmer's companies.

The liquidators' task includes trying to recover almost $70m in taxpayer funds used to cover unpaid entitlements to about 800 workers sacked from the refinery.

Mr Palmer, who at times represented himself during the trial, has fought stubbornly to have the claim dismissed over the past two years, having described it as baseless and a desperate politically motivated attack by the government.

In May, Mr Palmer had a win in court when WA's Court of Appeal unanimously denied the Chinese state-owned conglomerate CITIC's appeal of paying $14.50/t from its Sino Iron project to one of the tycoon's other companies, Mineralogy.

CITIC built the project on a land owned by Mineralogy, with both parties disputing the payment of royalties.

Mineralogy and CITIC originally agreed to base payments on the annual benchmark iron ore price, which was changed to base royalties on the iron ore spot price after a Supreme Court ruling in 2017, forcing CITIC to front up US$149.4 million in back-payments.

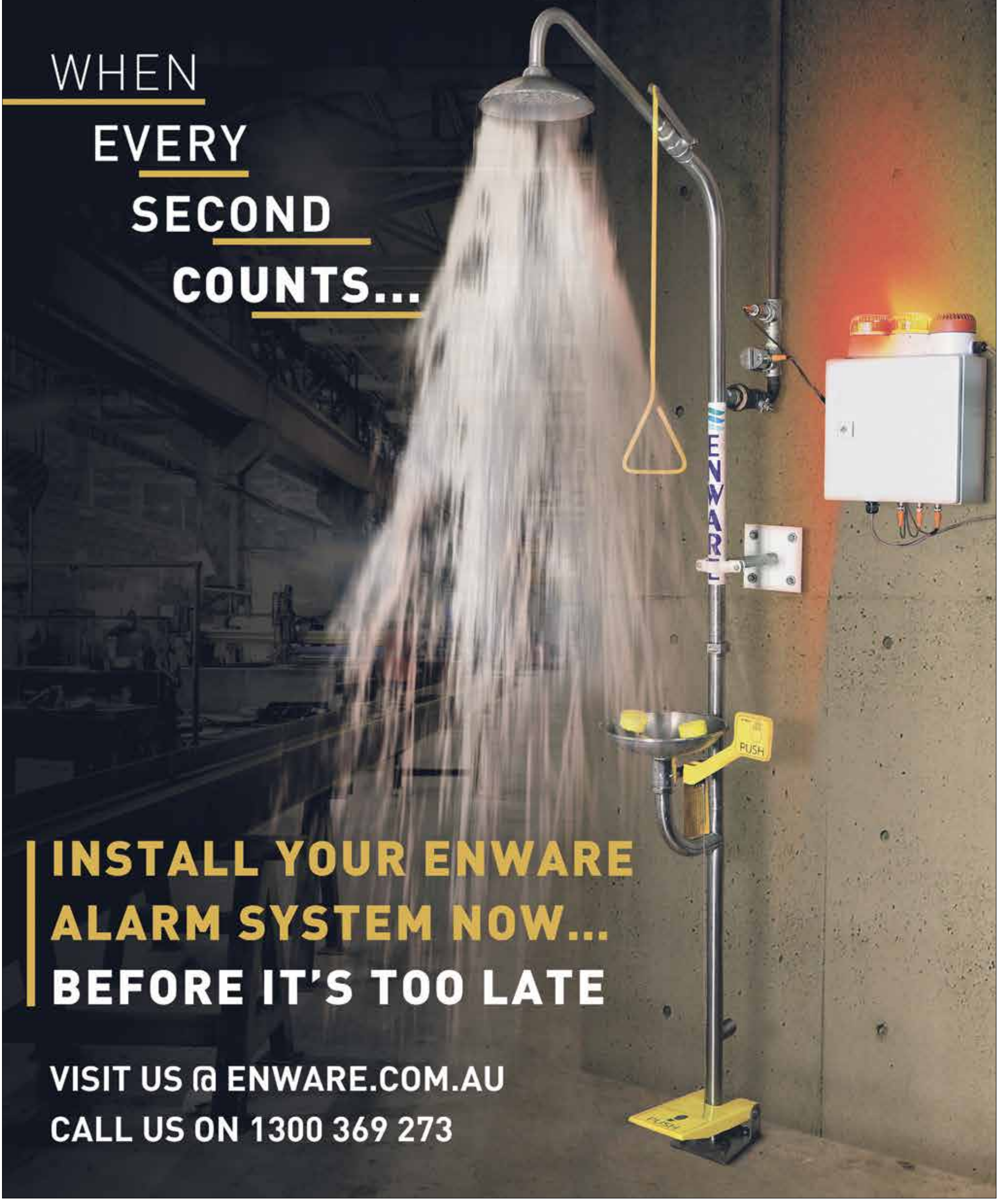
"During these five years, CITIC continually just took the ore. Those funds not paid at that time to Mineralogy would have been used to keep Queensland Nickel open and 3000 jobs in North Queensland would not have been lost," Mr Palmer said.

ENWARE

NEW

Workplace accidents happen without warning... often a timely first response can be the difference between a recoverable accident and a lifelong and debilitating injury.

WHEN
EVERY
SECOND
COUNTS...



INSTALL YOUR ENWARE
ALARM SYSTEM NOW...
BEFORE IT'S TOO LATE

VISIT US @ ENWARE.COM.AU
CALL US ON 1300 369 273

First in and best dressed

EMMA DAVIES
INTERNATIONAL

GRAPHENE is quickly gaining a reputation as an impressive nanomaterial, 200 times stronger than steel and the foremost electrical and thermal conductor, it promises to revolutionise the performance of any material it's added to.

That could be why First Graphene director Warwick Grigor is enthusiastic about the company's ability to supply high-performing graphene products.

"Our business strategy is to be the most reliable supplier of high quality graphene, fit for purpose for delivery to industry," Mr Grigor told investors at the recent Noosa Mining Conference in Queensland.

"First Graphene is the only company that can legally sell graphene in Australia according to federal regulations.

"There are about 22 companies and organisations who are offering graphene products but they are doing so illegally."

The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is the federal government agency that approves graphene sales, which First Graphene secured in May of this year, opening the door for its first commercial shipment on July 15.

With a range of applications in the mining industry, Mr Grigor said customers are already knocking on the doors.

"The first three customers that we picked up actually came through our doors saying we heard you can make graphene, can you show us how it works and can you give us assured supply? And we said yes we can."

"There was pent up demand. There was a frustrated industry out there wanting to get into business and we've solved their problems."

The company's first customer specialises in wear liners for mining industry, which go inside mining buckets and shovels, to protect the steal from abrasion and wear.

Mr Grigor said standard maintenance for RIO, BHP and Fortescue is to replace these every six months.

"What we've found with our test work is that the abrasion resistance improves between 100-500pc and the tensile strength improved by about 30-40pc.

"We're not too sure yet if this will extend maintenance to 9 months, 12 months, 24 months, but we know it's going to be a lot better."

Mr Grigor said the company has found graphene actually has some unexpected improvements for different applications, particularly fire retardancy.

"Over the past few years RIO, BHP and Fortescue have all had fires in their plants," he said.

"In the first quarter of this year RIO lost 40mt of production because of fires.

"When you add 1pc graphene to the polymer, the oxygen levels needed for the fire to propagate increases from 21pc (our atmospheric oxygen levels) to 31pc.

"RIO is pretty excited about this both for the fire retardancy factor and the wear resistance factor."

"We expect a lot of growth from that.

First Graphene uses its own proprietary single-step, high-yield electrochemical exfoliation process to produce graphene from graphite with an ore purity of over 90pc, which is extracted from the Sri Lankan mines owned by the company.

Lithium mines bypass China

With more than 1000 delegates attending over three days, the recent Noosa Mining Conference, held in Queensland from July 17-19, proved valuable information for investors and miners alike.
Designed to give investors, brokers and fund managers a better understanding of current investment opportunities in the mining, energy and exploration sectors, the Conference brought senior company executives and investors together and left delegates with a keen appreciation of how market events shape the sector.

Sayona Mining managing director Brett Lynch is confident Canada will be a key supplier to the US battery market.

EMMA DAVIES
CHINA

WITH the trade wars between the US and China, lithium developers are looking to circumvent the Asian superpower.

Sayona Mining managing director Brett Lynch said the company's flagship hard rock Authier lithium project in Québec, Canada, is strategically located close to US battery markets.

"It's a relatively low risk, straightforward mining project to deliver and execute on," Mr Lynch said.

"It really fits in to the strategies and opportunities in developing Québec as a source of downstream processed lithium for the US market."

Mr Lynch said a lot of hard rock supply coming out of Australia will go to China to get processed and then head back towards the USA.

"With the trade wars and everything, it's not the most sensible option long term, whereas Québec is ideally suited logistically," he said.

"The Pilbara is ideally suited to service China, there's no doubt about that, but I don't believe long term that China's going to be the energy source for the USA and that's where Canada comes in."

Other miners, like Lakes Resources, have hedged their bets on the 'Lithium Triangle' in South America.

Managing director Steve Promnitz said the reason the company went to Argentina is because half of the world's lithium comes from Northern Chile and Northern Argentinian lithium brines and it's also the lowest cost option long term.

"It wasn't rocket science to go there," Mr Promnitz said.

"The difference there is that we are at the lowest end of the cost curve.

"While it may take a bit longer to develop, and costs a bit more to get into production, once it's up and running we'll be producing for 20-30 years."

Mr Promnitz said while there is a lag in Australian electric vehicles, China and Europe are currently making them, and EVs have even been solidified in European legislation, so the supply demand is set to grow.

Another player with a foot in both hard rock and brine markets is Lithium Power International, which has projects in Chili and Argentina as well as hard projects in WA.

It remains to be seen how the trade wars will impact producers, but lithium players are confident that if they can hold on through the short term, they will reap the benefits in the long term as the EV market booms in China, Europe, and eventually Australia.

Paving the yellow brick road

EMMA DAVIES
NATIONAL

GOLD Road Resources has had a fantastic start to the year, with the first gold pour occurring from the Gruyere Project in the June quarter – just weeks after gold prices in Australia hit a high of $2050/oz.

The pour consisted of $2.2m worth of gold, which Gold Road business development and investor relations manager Duncan Hughes said was a testament to the company doing what it said it would do.

"We've built a project, we've paid for it and our balance sheet is still strong," Mr Hughes said.

Mr Hughes said that, with the support of 50:50 joint venture partner Gold Fields, the company's share price has risen from 5 cents in 2013 to $1.36 today on the back of production.

"There's no use putting a hole in the ground if you don't return something to shareholders," Mr Hughes said.

Gold Road Resources has reached the first significant milestone and poured gold at its 50:50 JV Gruyere project.

At the current gold price, Mr Hughes said that after paying to keep the lights on, paying for production and paying taxes and royalties, and paying for exploration, there's still 25 -35c to the dollar free cash flow.

"That's free cash flow value to shareholders that can be invested in growth," he said.

"We're not going to sit on our hands. We've got a great asset in Gruyere and we're going to optimise it."

The focus now turns to commissioning of the final components of the process plant, the ball mill, which is anticipated to be completed early in the September 2019 quarter.

Commencement of the operation of the ball mill will mark the start of an anticipated ramp-up period of six to seven months.

Gold Road forecasts that the JV should attain commercial production mid-way through the ramp-up period and anticipates 2019 production at between 75,000 and 100,000oz.

"We're set up to ramp up and deliver the cash flow we've promised," Mr Hughes said.

PROTOBLAST™
ENGINEERED BLASTING SYSTEMS

A leading Australian manufacturer of

ABRASIVE BLAST EQUIPMENT

Protoblast has been designing and manufacturing to suit customers' individuals needs since 1975.

ABRASIVE RECOVERY SYSTEM

AIRLESS BLAST MACHINES

SECTION BLAST MACHINES

DUST COLLECTORS

The best way to prepare a surface for a coating is by using the abrasive blasting process. Whether you need to blast earthmoving equipment, turbines, structural steel or railway lines...

We have successfully completed projects for Bechtel, BHP Billiton, ThyssenKrupp and BAE Systems just to mention a few.

Protoblast has the experience to design and supply equipment that is fast, efficient, improves your product and saves you money ... year after year

www.protoblast.com.au

PROTOBLAST™
ENGINEERED BLASTING SYSTEMS

P.O Box 157 Picton NSW 2571 // P. 1800 772 320 // International +61 2 4677 2320 // E. sales@protoblast.com.au

Uranium glows as market lifts

EMMA DAVIES
INTERNATIONAL

AUSTRALIAN uranium producers Paladin Energy was a favourite among investors at the recent Noosing Mining Conference in Queensland.

AMP Capital co-portfolio manager Matt Griffin said uranium was an exciting commodity.

"Over the next couple of years it looks like the most fundamentally solid market," Mr Griffin said.

"We've got China opening new reactors, so the demand side is growing fairly slowly — but it is growing."

With China's 'One Belt One Road' initiative, analysts expect the country could build as many as 30 reactors by 2030.

Japan's government has also adopted a new energy policy that suggests the country must rely on a larger share of nuclear and renewables to slash its carbon emissions and meet its target of a 26pc reduction by 2030.

Mr Griffin said it was only a matter of time before the uranium price really kicked up but that the spot price would have to hit around $40-50 to rebalance the market.

"At that kind of price we'd do very well in uranium equities," he said.

"While it hard for me to sit here and say over the next couple of months you're going to make a lot of money, the foundations are there, and the recent section 232 news was positive for the sector."

The section 232 announcement out of the United States centred on President Donald Trump declining issuing quotas for US domestic uranium production, and calling for a 25pc quota on uranium to limit imports in support of US producers – a welcome boon for producers like Paladin.

The company had put its Langer Heinrich mine in Namibia, and Kayelekera mine in Malawi, on care and maintenance due to the sustained low uranium spot price, but commenced feasibility studies in March of this year, aimed at re-positioning the Langer Heinrich operation for a restart when a suitable uranium incentive price is reached, and also to develop opportunities to reduce operating costs and potentially recover vanadium.

And the market is certainly looking up. Paladin chief executive officer Scott Sullivan welcomed Mr Trump's decision as good news non-US producers.

"Since the petition was lodged early last year, we have seen a reluctance by both US utilities and non-US utilities to enter into long-term off-take agreements with producers and instead they have drawn down their inventories, which has contributed to suppressed uranium prices," Mr Sullivan said.

The decision is expected to encourage additional buying activity and contribute to improved market conditions moving forward.

"Now that we have President Trump's decision on the petition and have finally removed the uncertainty that has prevailed in the market, we expect a normalisation of the term market to follow and strengthening prices moving forward."

Paladin continues its focus on Langer Heinrich with a rapid restart strategy expected to be completed in September 2019.

Nickel demand tipped to surge

Brent Cook from US-based Exploration Insights spoke at the conference about the US dollar on mining. Legend Mining managing director Mark Wilson said the nickel market was being affected by US President Donald trump's policies plus a host of other international factors.

EMMA DAVIES
INTERNATIONAL

LEGEND Mining managing director Mark Wilson is certain his company's Rockford project in WA's Fraser Range will see significant upside due to the expected increase in demand for nickel.

In 2015 the nickel stockpile sat at 900,000t, 12 months ago it was down to 260,000t and just weeks ago it slipped to 150,000t – which Mr Wilson said is due to political turmoil over the last year.

"All of this rhetoric about Trump and Xi Jin Ping and trade wars and tariffs have had an impact," Mr Wilson said.

"And don't underestimate the influence of Brexit, because many of you would be aware that the London market has been a massive source of capital for mining; most people will tell you the London market is paralysed by the uncertainty around Brexit.

"The negative sentiment from the Trump rhetoric, Xi Jin Ping, trade wars, tariffs and Brexit is totally dominating the fundamentals of a stockpile that's decreasing and a balance that's in deficit."

Essentially, there is more nickel being consumed today than is being produced, and Mr Wilson said if the stockpile drop from 900,000t to 150,000t isn't a fundamental demand qualification, he would be very surprised.

"The other thing that the nickel market's got going for it is the electric vehicle battery demand outlook.

"Nickel is the main component of these electric vehicle batteries," he said. "There are other more trendy metals like lithium and cobalt – and I don't wish to denigrate the importance of them – but nickel is the 8 in the 8:1:1 component of electric vehicle batteries."

There could be up to 5mt of nickel required in 2050. To put this in perspective, the current number today is 80,000t.

"When you read some of the reports coming out of Europe and China, and see the rate of conversion into electric vehicles, anyone who is saying it ain't coming is not looking far enough out their window," Mr Wilson said.

With the EV boom demand looming, it's no wonder Legend Mining is confident in the value of developing their Rockford Nickel project in WA.

Industry holds breath on boom

EMMA DAVIES
NATIONAL

A KEY question on the lips of attendees at the recent Noosa Mining Conference was whether or not the resources cycle really exists – and if so, where are we in the cycle?

But the jury is still out.

Exploration Insights analysist Brent Cook led a panel discussion on the question to determine what analysts really thought of the industry.

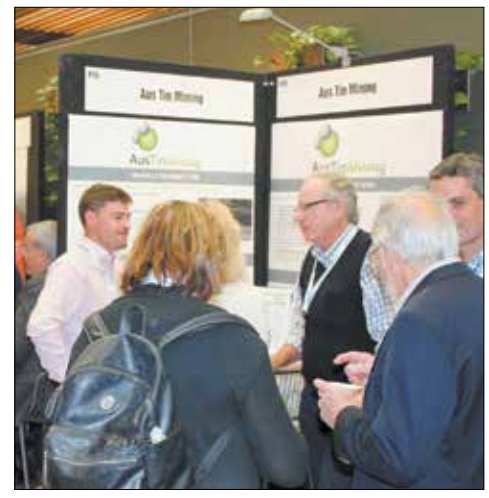
Lowell Resources Fund chief investment officer John Forwood was fairly certain that the industry was in a strong phase of the cycle, with high gold and iron ore prices remaining strong, along with a relatively solid copper price.

"The producers and mid-tiers such as Northern Star, Sandfire, and Regis etc. are attracting some pretty healthy valuations but at the other end of the scale, the explorers and grassroots explorers are largely ignored," Mr Forwood said.

"We are expecting to see a trickle-down effect at some point, we're expecting mergers and acquisitions (M&A) activity to pick up but at the moment there's a divergence from what we're seeing in the equity markets."

Mr Forwood drew comparisons to the 2000's dot com bubble burst and the current cannabis and tech booms.

"The bursting of the dot come bubble was possibly one of the causes for risk capital to come out of that sector and into the mining sector, in 2009-2010," he said.



The Noosa Mining Conference was attended by mining industry representatives from across Australia.

But that's just one element that could kick off a new mining boom.

Another hurdle is the gap between market capitalisation and the underlying Earnings Before Interest, Tax, Depreciation and Amortization (EBITDA) of the project and the market underlying belief as to whether or not a project is going to be financed.

"If the market thinks that finance will be available, then it will be available. If the market thinks that it won't then that share price will come down and companies will find it hard to raise funding," Mr Forwood said.

"The more the market sees that deserving projects can get finance then the market will believe that a project in the exploration or development phase will make it through to production and actually realising cash flow.

"The other thing that will trigger value in the junior exploration phase is M&A's like those we've seen it at the top of the gold sector — but it hasn't really trickled down to the juniors."

Essentially, the support of major players for minors could be the key to boosting investor confidence.

AMP Capital co-portfolio manager Matt Griffin agrees that M&A's are the best bet to get the sector back on track as miners look to acquire exploration and development assets.

"If there are good assets and good deposits, someone will see the value eventually, and whether that's an existing producer's cash or investors coming around to see the value, I think that will be realised eventually, it might just take a bit of time," he said.

Mr Griffin is adamant that a project needs to have the right team, the right location and good confidence on the commodity as a whole.

"If we don't like the commodity there's no point investing in the company unless there's something really special about it," he said.

"We will back management teams who've made money in the past and successfully delivered – that really counts for a lot."

Mining, quarrying & construction projects done safely and cost-effectively

with our integrated drill & blast services

IMPACT DRILL & BLAST

DRILL & BLAST

Integrated, safe, tailored drill & blast solutions to optimise outcomes in open cut mining and construction projects around Australia.

BLAST HOLE DRILLING

We own and operate drilling rigs across all areas of Australia. These are fully maintained and serviced to minimise downtime.

COMMERCIAL EXPLOSIVES

Commercial explosives for the mining, quarrying and construction industries - no matter the size or location of your project.

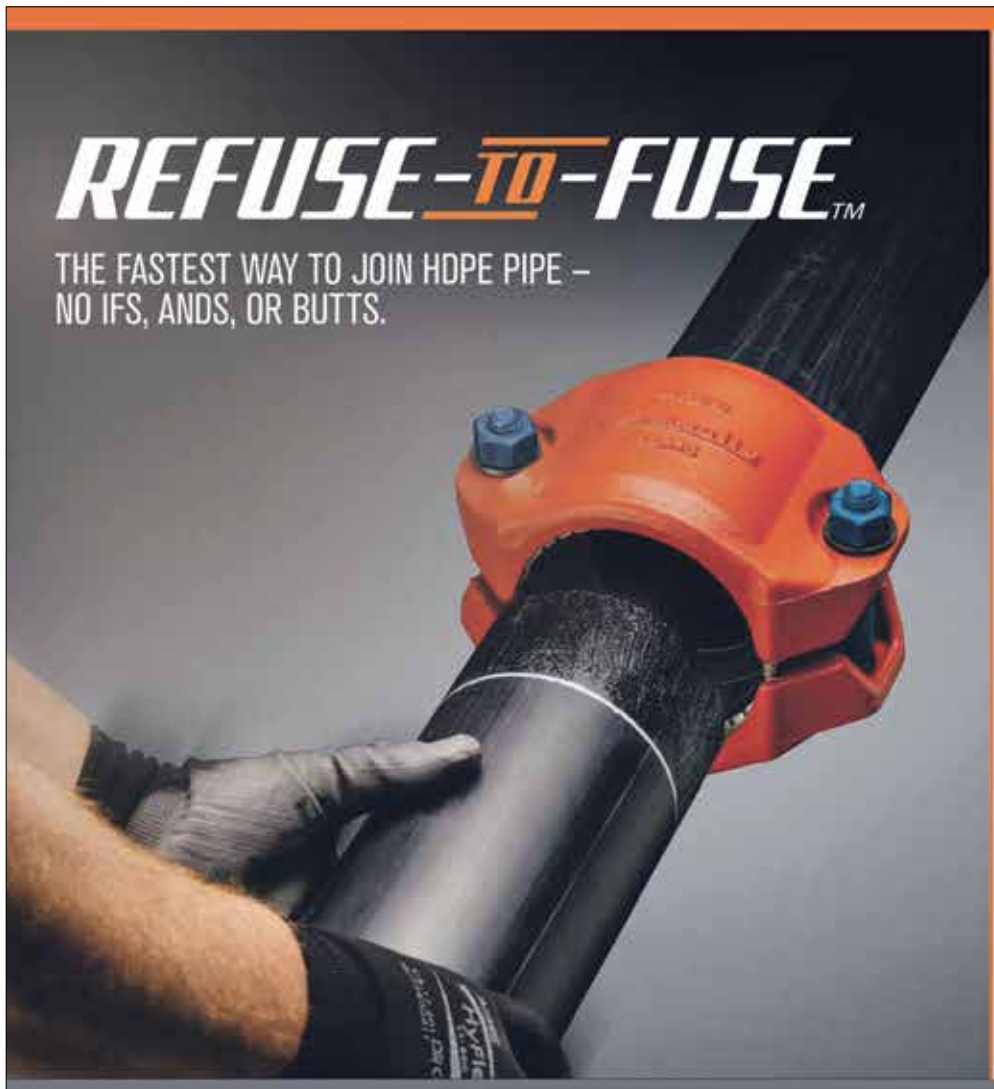
Partner with us if you're a quarrying, mining or construction company requiring professional, safe, cost effective, and prompt delivery on projects.

impactdrillblast.com

6/6 Quinns Hill Road East, Stapylton QLD 4207

1800 2 IMPACT

info@impactdrillblast.com



REFUSE-TO-FUSE™

THE FASTEST WAY TO JOIN HDPE PIPE – NO IFS, ANDS, OR BUTTS.

INSTALLS UP TO 10× FASTER

Join HDPE pipe in half the time it takes to fuse a joint. Forget the fusion equipment. Gone are the days of waiting for plastic to heat up just to cool down. Installing in tight or vertical spaces has never been easier; the *Refuse-to-Fuse* system goes where no fusion machine has gone before. That's time savings you've never seen before.

INSTALLATION IS WEATHER INDEPENDENT

Whether it's rain, shine, or just downright frigid and fierce, *Refuse-to-Fuse* products can be installed. No need to check the weather forecast and worry about protection for fusion equipment or project delays any longer.

MEETS OR EXCEEDS PRESSURE RATINGS OF HDPE PIPE

If you thought your fused joint was tough, check out *Refuse-to-Fuse* product performance. Small diameter solutions call for dual rows of razor-sharp teeth that sink into the O.D. of HDPE pipe, forming a sealed hold that never lets go. Bringing out the big guns? Large diameter solutions enlist a rugged double groove to seal the deal. Push it, pull it, and drag it to the max; treat it the same way you would treat fused pipe.

INSTALLS WITH SIMPLE TOOLS

No need to set up your fancy fusion machine because all you will need with the *Refuse-to-Fuse* system is a simple socket wrench. If you want to get crazy, a cordless impact driver will do the job, too!

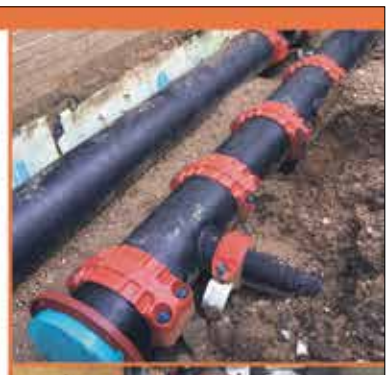
Don't worry about training certificates or learning how to use fusion equipment, just stick with the basics.

Refuse-to-Fuse™ Transition Coupling for HDPE Pipe

- Designed to provide a single transition from plain end HDPE pipe (SDR 7 – SDR 21) to grooved steel sized piping system components
- Sizes from 2 – 8" IPS HDPE to 2 – 8" DN50 – DN200 grooved steel
- Sizes from 63 – 225 mm ISO HDPE to 2 – 8" DN50 – DN200 grooved steel

Refuse-to-Fuse™ Fittings for HDPE Pipe

- Available in SDR 7, SDR 11, and SDR 17
- Sizes from 2 – 8" IPS and 63 – 225 mm ISO
- Full flow fittings
- Compatible for use with Style 905 and 907 HDPE couplings



FC MECHANICAL AND MINING SERVICES

firecorp.net.au

Adelaide
6 Myer Crt Beverley 5009
Ph: 08 8244 8748
E: sales@firecorp.net.au

Darwin
8 Willes Road Berrimah 0828
M: 0477 734 099
E: salesnt@firecorp.net.au

FIRECORP

Victaulic

Copper producers branch out

EMMA DAVIES
NATIONAL

COPPER producers Aeris Resources and Red River Resources appear to be set on expanding, merging and acquiring a diverse range of projects beyond their bread-and-butter metal.

Aeris Resources managing director Andre Labuschagne told investors that the company is ready to grow beyond its Tritton Copper mine in NSW.

"We've restructured the balance sheet, we've restructured the organisation and we now have a balance sheet where we're ready to look at growth opportunities," Mr Labuschagne said.

"We've always said we want to grow this business beyond Tritton.

"We're looking for more opportunities to bring into the business as we grow through mergers and acquisitions (M&A) and also looking at the ground around Tritton."

The company experienced a share price drop after announcing a pause in drilling at its joint venture (70:30) with Argonaut Resources on the Torrens project in South Australia, which Mr Labuschagne said has now stabilised.

"We want to show the market that the current value of the share price does not reflect the value of this business, especially as a copper producing company," he said.

The Tritton project is surrounded by high quality neighbours Aurelia Metals and CSA Copper and the Torrens project is near OZ Minerals Carrapateena project and BHP's Olympic Dam.

"There's a lot of upside and various exploration opportunities in and around our tenements," Mr Labuschagne said.

While recent attempts to acquire CSA Copper fell through, Aeris continues to explore merger and acquisition opportunities with a focus on base metals and gold – much like Red River Resources, which is also in the process of expanding beyond copper.

Copper producers are branching out into other commodities.

Red River Resources managing director Mel Palancian said the company is proud of its Thalanga copper project but excited to acquire the Hill Grove Gold-Antimony project in NSW.

"Hillgrove is pretty much Thalanga – just in a different commodity," Mr Palancian told conference delegates.

"There's over a million ounces of gold in the ground and that's averaging about five grams a tonne and about 1.5pc of antimony and about 100,000 tonnes of antimony metal in the ground.

"Antimony is really a cousin of lead, it's used in fire suppressant, in cladding in building materials, it's also used in batteries and in ammunition."

The Chinese Government considers antimony a critical raw mineral to be a protected and also controls mine production of antimony.

Current mining restrictions and increased smelting capacity have resulted in China's antimony concentrate exports increasing – which places Red River in prime position to meet demand.

"We're really excited about Hillgrove, I think it's going to be a great addition to our portfolio," Mr Palancian said.

Investors snubbing juniors

EMMA DAVIES
NATIONAL

WHILE the recent Noosa Mining Conference in Queensland was abuzz with investors considering their options, there was a notable difference in sentiment towards larger companies as opposed to juniors.

Keynote speaker Lion Selection executive director Hedley Widdup said investor sentiment had been low toward juniors since 2018.

"In 2018 something broke," Mr Widdup said.

"It is very difficult to raise money in the junior sector at the moment."

"Investors are not only not buying, they are also selling, so there has been a wholesale movement away from the junior space."

Mr Widdup puts this partially down to the fact that being pre-production means juniors are harder to value which makes them hard to price – so why wouldn't investors jump on something like BHP, a big company with a solid performance record.

"If you're not a miner, it's very difficult to value you, and you get priced according to a range of risks and this is where the breakdown starts to occur," he said.

"Because the business model of someone who is not a miner is to try and create value – and you're not creating it every day by digging up a tonne, putting it through a mill and then selling it for the money at the end – you are envisaging how that's going to take place.

"They [investors] don't like permitting, they don't really like commissioning but they particularly don't like funding because you can't see what's on the other side of that risk and the easiest way to manage that risk is by avoidance."

As to where investors are spending their money, the tech and cannabis market are to blame.

In 2009 there were around 20 unlisted companies with a market capitalisation of a billion dollars, but today, there are more than 150 – plus there is the legalised medicinal marijuana market in North America.

"On the Toronto Stock Exchange (TSX) and the TSX Venture Exchange (TSXV) in 2016, 2017, and 2018, the amount of money raised by miners went from about $9 billion to $8.5b to $6.4b," Mr Hedley said.

"The amount of money raised by pot companies on the same exchanges went from $1.3b to $3.5b to $9b - so it's captured that money that's been going into mining companies each year.

"But the interesting thing is that the miners that sit on the Canadian exchanges account for around 15pc of the market and pot stocks account for around 1-2pc, so it's a huge amount of money trying to push its way into a tiny space, and of course the equity returns are eye-watering, which only attracts more money."

While Mr Hedley doesn't advise miners go green or become pot companies, he does advise patience.

"There has not been a bubble in any industry on earth that hasn't eventually popped so I don't think these things will persevere for too long," he said.

"But of course it's very frustrating as the managing director of a junior company to sit and wait for that to happen."

Mr Hedley said gold could be the catalyst to bring the equity market to its senses, with some of the biggest gold deals happening during the last three years, such as Barrick Randgold and the Newmont Goldcorp merger.

"These big companies with big cash flows and balance sheets are not only looking at each other, they're also investing in juniors, they're spending money," Mr Hedley said.

"And this is the loudest and clearest signal that they could be sending to the market to say we want to grow, we see value here and we're putting money into these companies.

Image: vimeo.
Lion Selection executive director Hedley Widdup.

"From the point of view of investors, the red light is on, they're sitting there revving their engine, paying attention, looking for a change, but they're not doing anything and that's why it's hard to raise cash at the moment.

Mr Hedley said his gut was telling him that, with the industry buying and commodity trends, the signal could be about to go green.

Broons Group (08) 8268 1988 - info@broons.com - www.broons.com

Autohaul robot train project complete

An Autohaul train on the move.

RAY CHAN
WA

RIO Tinto recently celebrated the successful deployment of its AutoHaul project, the world's first automated heavy-haul long distance rail network.

The AutoHaul trains, which help deliver safety and productivity benefits for Rio Tinto's iron ore business, have also firmly positioned WA and its heavy-haul rail industry as a global leader in the joint development and application of rail technology.

Today, 2.4km-long trains, monitored remotely from an operations centre in Perth, travel across a vast network of 1700km of track, delivering iron ore from 16 mines to ports in Dampier and Cape Lambert.

These trains have now safely travelled more than 4.5m km autonomously since they were first deployed last year.

The world-first had been made possible by close collaboration with project partners from Japan, US and Australia, which included Hitachi Rail, Calibre, New York Air Brake, Wabtec and others, who provided the necessary expertise, innovation and software to make AutoHaul a success.

Several of these partners maintain a strong presence in WA and have committed to continuing to invest locally.

Rio Tinto iron ore managing director rail, port and core services, Ivan Vella, said the deployment of AutoHaul was a reflection of the pioneering spirit of the project team and its valued partners.

"I'd also like to commend our train driving workforce for their support and professionalism during the transition period," he said.

"This project has cemented WA as a leader in the heavy-haul rail industry and has attracted interest from around the world.

"The successful deployment of the world's first heavy-haul long distance rail network demonstrates the potential for significant further improvement in such operations with others around the world looking to replicate."

WA Mines and Petroleum Minister Bill Johnston said the AutoHaul project was an example of the strength of WA's resources industry, which continued to excel in technology and innovation.

"AutoHaul has brought the rail freight industry in this country into the 21st century and is rightfully the subject of global interest," he said.

"I'd also like to mention that the development of the world's biggest robot is such a success because of the contribution from WA's skilled engineers and innovative workers."

Early results from the deployment of AutoHaul have already highlighted the technology's potential to improve productivity, increase flexibility and reduce bottlenecks in Rio Tinto's iron ore system.

The $940m AutoHaul program involves about 200 locomotives on what is the largest privately-owned rail network in Australia.

Autonomous trains improve safety through reduced risk at level crossings and automated responses to speed restrictions and alarms. AutoHaul also removes the need for almost 1.5m km of road travel per year previously required to transport drivers to and from trains mid-journey.

The average return distance of these trains is about 800km with the average journey cycle, including loading and dumping, taking about 40 hours. Locomotives carrying AutoHaul software are fitted with on-board cameras allowing for constant monitoring from the Operations Centre in Perth.

All public rail crossings on the network are fitted with CCTV cameras and have been upgraded to the highest safety standards.

TAFE courses in automation

RAY CHAN
WA

TWO new automation courses will be available at South Metropolitan TAFE's Munster campus in WA from Semester 2, 2019.

This is the first achievement for the Resource Industry Collaboration between the McGowan Government, South Metropolitan TAFE and Rio Tinto, with Rio Tinto contributing $2 million towards the new training program.

The two new courses are:

- **Working Effectively in an Automation Workplace** — this micro-credential course offers a skill set that trade qualified workers and apprentices can use to improve or upgrade their skills in automation to meet future workforce and industry needs;
- **Certificate II in Autonomous Workplace Operations** — to be delivered as a pilot VET course for secondary students from Cecil Andrews College, Gilmore College, Baldivis Secondary College and Karratha Senior High School.

New kid on the Block

RAY CHAN
WA

WHEATON Precious Metals Corp, one of the world's largest precious metals streaming companies, is the latest customer of Blockhead Technologies' enterprise solutions.

Wheaton will be leveraging Blockhead's technology as part of the streamlining of its metal accounting processes.

With a market cap of about US$9.5b, Wheaton has streaming agreements relating to 19 operating mines and nine development projects, and produced more than 680,000 gold equivalent ounces in 2018.

Blockhead Technologies' CEO Greg Leach said the move was a testament to the expertise and vision of the Blockhead team.

"We look forward to delivering an outstanding outcome for Wheaton and delivering on our objective of building Blockhead into a market leader in our sector," he said.

Blockhead implements solutions ideal for simplifying the data management process and providing access to instant data analysis.

The platform allows companies to have greater control over their current data, as well as access and visualise historical data.

One of Wheaton Precious Metals' mines.

Blockhead data scientist James Allen said companies such as Wheaton stood to benefit from a streamlined data management process, along with greater assurance of data accuracy.

'It empowers them to better utilise their data to drive operational efficiencies and strategic outcomes," he said.

Blockhead Technologies leverages blockchain technology for multi-asset, secure digital record-keeping through the value chain, which extends to an organisation's accounting and auditing capabilities.

The company, established in 2017, has headquarters in Vancouver, Canada, as well as in Perth.

Blockhead's flagship platform STAMP aims to bring secure tracking and source certification into mining value chains.

V22 Dust Controller

FOR APPLICATIONS THAT DEMAND THE BEST

User-friendly Touch Panel

Compact size – height 220cm (undercarriage)

Low noise, high power energy efficient turbine

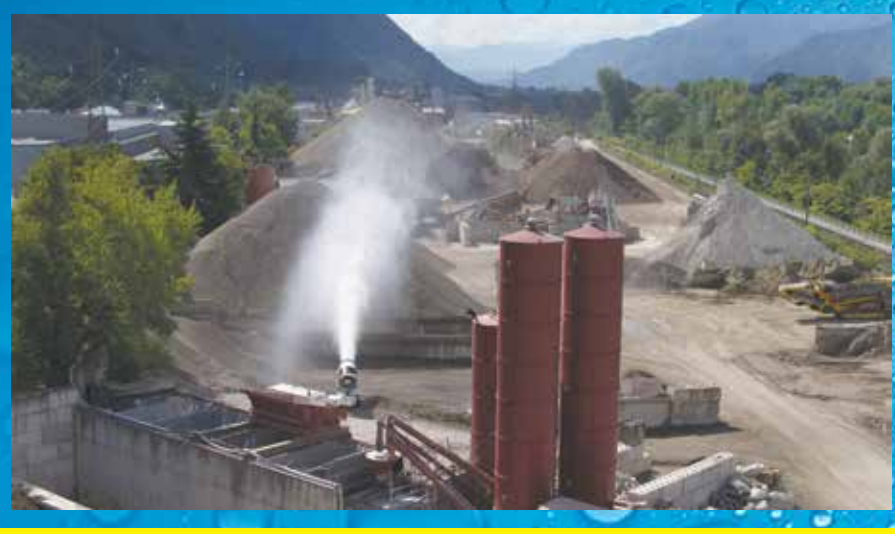
Internal nozzles providing greatest wind resistance

Low energy consumption 11kw pump (before: 15kW)

Bigger Tilt Angle: +40° to -18°

Turns twice as fast

Reduced weight (under carriage: -330kg; on fixed support: -250kg)



SEE IT AT AIMEX STAND R128

For all your dust suppression needs,
call **1800 832 776**,
or **sales@tecpro.com.au**

Tecpro AUSTRALIA

Technical Solutions You Can Rely On

www.tecpro.com.au

THE PERFECT STORM

If Australia once rode on the sheep's back, today a strong case could be made that it is Australia's ability to satiate China's insatiable appetite for iron ore which drives the economy.

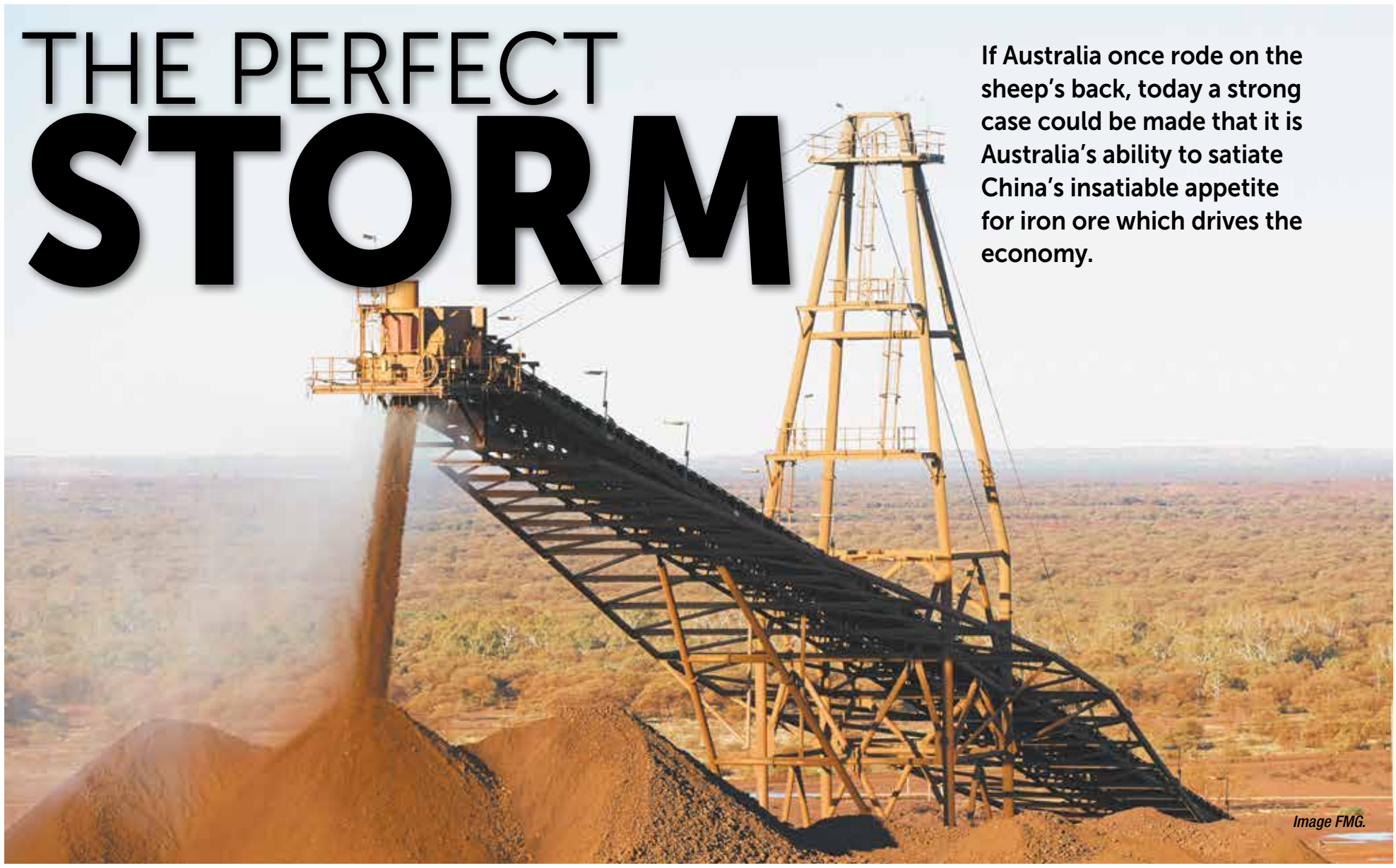


Image FMG.

Fortescue's Christmas Creek operation.

GERARD MCARTNEY

IN 2003, the appetite for iron ore crystallised in the 'once in a century' resources boom that lasted for nearly a decade and a half – an economic windfall not seen since the gold rush of the mid 1850's.

The boom's serendipitous timing kept the Australian economy out of the Global Financial Crisis, the worst recession since the great depression.

But in 2012, iron ore prices had begun tapering off, bottoming out at about US$40/t in 2016.

In 2018, Australia still held the lion's share of global exports at 53pc, equating to about $64b of exports in 2018, 81pc of which was sold to China.

Since 2016, iron ore prices ebbed and flowed, but they did not come close to the US$187/t highs of 2011 – until a mix of tragedy and circumstance early in 2019 began driving iron ore up to boom-time prices again.

The tailings dam collapse at Vale's Brumadinho mine in Brazil that killed more than 200 people also shut down the world's second largest iron ore exporter, leaving a massive 90mt hole in the supply chain.

Vale confirmed that it will take two to three years to return to the pre-rupture target of 400mt.

In Australia, Cyclone Veronica caused the Pilbara's three big players FMG, RIO and BHP to all significantly lower their iron ore guidance which further tightened the seaborne supply.

And as the Sino-US trade wars have continued to escalate, prices have continued to rise.

To combat US imposed tariffs, the Chinese government rolled out economic stimulus in the form of tax cuts, increased lending to smaller companies, and increased investment in infrastructure and construction projects which has kicked its steel making mega-machine into overdrive at precisely the time when Chinese iron ore stockpiles were at their lowest in recent times, down by 17pc year-on-year for May.

This caused prices to rally by more than 70pc, to over US$120, and has generated billions of dollars in revenue for mining companies and state and federal governments alike.

Experts and commentators have speculated that the iron ore windfall which filled the government's coffers was one of the deciding factors in Federal Labours shock defeat in the 2019 election.

Fortescue Metals Group chairman Andrew Forrest paid himself close to $1b in dividends, Rio Tinto said that every $10 price rise per tonne for iron ore generated about $1b in profit, and BHP looks set to de-throne Rio Tinto and take the crown as lowest-cost producer of iron ore in the Pilbara.

BHP has also been given the green light by the WA state government for its 50-100 year plan in the Pilbara which would see more than 12 new potential mines in the region and cut down environmental approvals times by up to 50pc, and South Flank is expected to reach 80mtpa by 2021.

Rio Tinto's Koodaideri will come online late in 2021 with an expected nameplate capacity of 43mt.

FMG will see its Elwina mine reach production in December 2020, and Iron Bridge will reach production by 2022.

FMG chief executive Elizabeth Gains told the *Australian Mining Review* that the wide product offering from the two mines would position the company to meet a range of segments from low to high iron content.

"Against a backdrop of an iron price of above US$120/t – which none of us would have predicted six months ago – China's steel industry continues to outperform expectations with growth in crude steel production in the first half of 2019 supporting predictions that annual steel production could reach 1bt this year," she said.

"The strength in the iron ore price is in part attributable to seaborne iron ore demand outpacing supply following the impact of the tragic event in Brazil earlier this year, as well as more recent weather-related events in the Pilbara."

Mr Forrest has also entered into talks with the ruling family of Dubai aimed at resuscitating a railway line linking Guinea to the Liberian port, Buchanan.

The re-establishment of the railway would pave the way for the possible reassessment of Guinea's Nzerekore region, long considered the world's next iron ore province, which hosts a series of very large and very high-grade iron ore deposits.

While the soaring price has been an unexpected windfall for Australian miners, understandably not everyone is happy.

Eight steel firms representing 30pc of China's steel output gathered at the China Iron and Steel Association (CISA) on June 27 to discuss strategies to cope with the crippling price of iron ore as the 69pc increase continued to frustrate the booming steel-making industry.

According to documents obtained by Reuters, in the meeting's minutes, the companies blamed poorly designed methodologies by price reporting agencies, speculators on the futures market, and poor trading mechanisms in the spot market.

"There are some non-market factors behind the price rally.

"Especially in recent months," the note said.

In another meeting, one attendee who wished not to be named told Reuters that "Government officials said they support industrial participants' assertion of their own rights and will resolutely sustain market order".

The June Resources and Energy Quarterly predicts that the price will return to an average of US$57/t by 2021 as Vale begins producing at full capacity and the Chinese government eases up on steel-reliant infrastructure spending.

The outlook to 2021 is quite positive, with prices expected to continue benefitting from the shortfall in global seaborne supply, however there are some factors that should be taken into consideration.

Firstly, China's iron ore imports declined by 4.9pc year-on-year in the last half of FY19, despite the record high steel production.

This can be attributed not only to the supply disruption from Brazil and Australia, but also to the increased domestic iron ore production and the rising use of scrap material that has displaced some of the need for iron ore.

Chinese steel makers are attempting to use lower-grade iron ore and more scrap metal to offset the high prices, which will reduce their reliance on imports and affect the price difference between high and low-grade iron ore.

Secondly, with a short-term demand increase from a single economy comes the increased risk of production oversupply once the demand dies down.

Iron ore is famously common.

It is everywhere.

But getting it out of the ground is expensive.

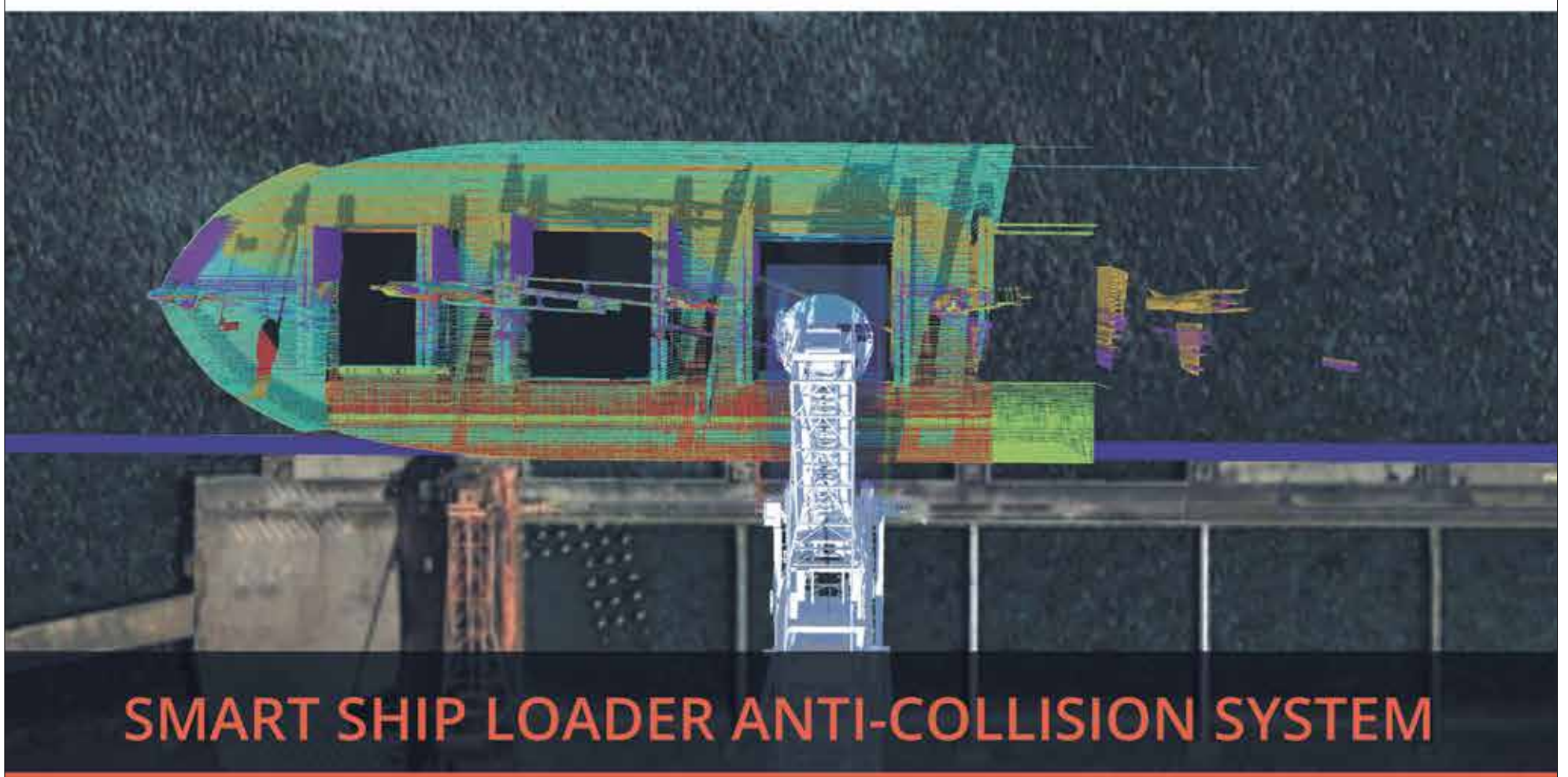
The infrastructure required to mine and process it is a massive investment.

FMG gained its foothold as a major player in the industry only after the extended boom period afforded it the profit margins needed to establish itself.

While Australia can expect its export volumes to increase by 3.9pc with FMG's Elwina and Iron Bridge, Rio Tinto's Koodaideri and BHP's South Flank all expected to come online before 2022, they cannot fill the gap left by Brazil.

Should iron ore continue to command high prices for an extended period of time, the door could open for new players in Guinea, the Democratic Republic of Congo, and Canada to find a foothold which could lead to oversupply and affect price stability once Vale returns to nameplate capacity.

MRA
Electrical & Automation Engineering



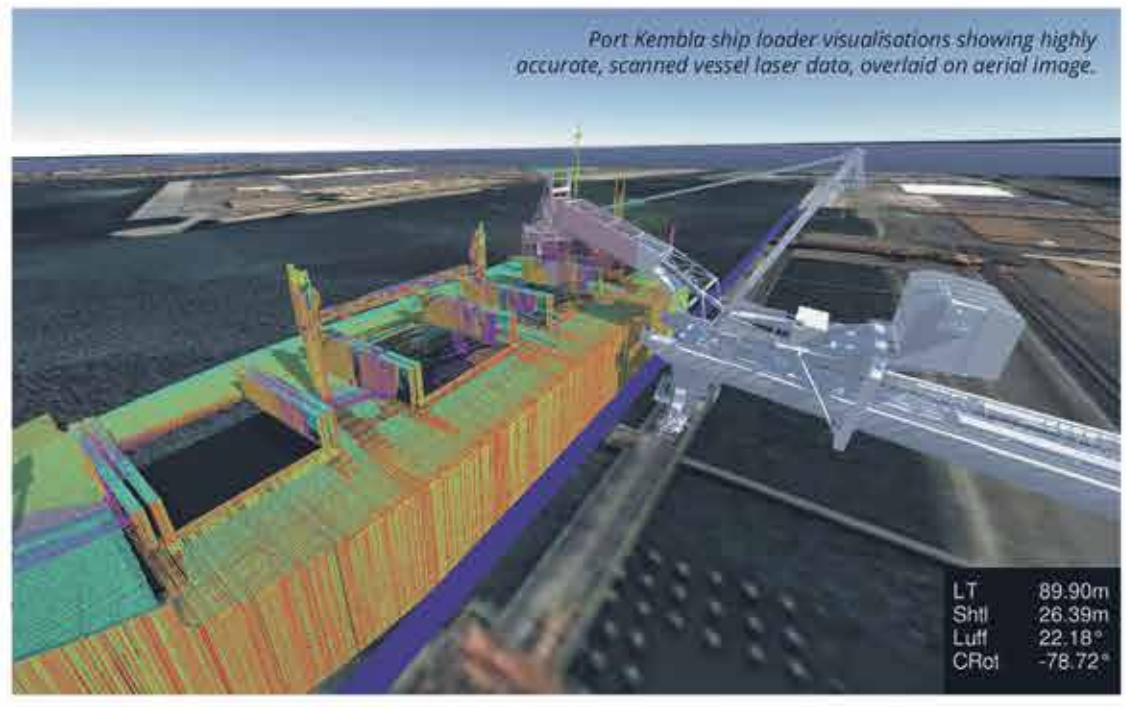
SMART SHIP LOADER ANTI-COLLISION SYSTEM

LASER ACCURACY MAKES FOR A SAFE & RELIABLE SHIP LOADING ENVIRONMENT

Our Smart Ship Loader Anti-Collision System (SLAC) uses laser data to establish a real-time protection zone surrounding the ship loader's boom and shuttle, its spout or spoon and operator cabin. During operations, any object entering or nearing this dynamically defined zone will trigger a collision warning.

The SLAC calculates highly accurate real-time and projected position information for the vessel including list, trim and draft, and its position along the wharf during loading.

Key separation distances to the ship loader are available in a 3D visualisation and for integration with the ship loader PLC for actioning including, alarm, slow down and inhibit.



Port Kembla ship loader visualisations showing highly accurate, scanned vessel laser data, overlaid on aerial image.

KEY BENEFITS

- Helps protect personnel and maximise operational availability.
- Supports all major vessel classes and hatch types.
- Suited to harbours and challenging open port environments.
- Uses relatively low-cost, long-life lasers that require minimal maintenance.
- Our off-site simulation environment allows for custom set up for each machine geometry, increasing accuracy and lowering the cost of setup and commissioning.
- Control aspects all performed in the PLC
- Zero collision incidents during 56 months of active operations.
  - Port Waratah Coal Terminal – two A-Frame ship loaders.
  - Port Kembla Coal Terminal – one Portal ship loader.

Keen to find out more?

You're welcome to contact our Engineering Manager Peter McPherson m 0403 453 250 e peter.mcpherson@mra.com.au w mra.com.au

MAJOR MINERS IN SPOTLIGHT

More than 500 leading companies from around the world will be represented at AIMEX.

NATIONAL

THE Asia-Pacific's International Mining Exhibition (AIMEX) is on track to deliver the largest showcase of supplier excellence when it returns to Sydney Olympic Park in August 27-29.

AIMEX is an internationally renowned exhibition and conference that will showcase more than 500 leading companies from around the world.

Joining these suppliers at AIMEX for the first time in the event's history will be leading mining companies who are exhibiting at the event as part of the AIMEX Mining Pavilion.

The Pavilion was created to provide mining companies with a platform to engage with the industry, promote their initiatives as well as drive recruitment.

This year the pavilion will feature Centennial, Glencore, Mach Energy, Whitehaven Coal and Yancoal Australia, companies which all contribute significantly to the mining industry, the Australian economy and the Australian workforce.

Centennial is an Australian coal mining company supplying thermal coal to the domestic and export markets.

With five underground mines and a workforce exceeding 1700, Centennial fuels about 40pc of NSW's coal-fired electricity.

Centennial will be exhibiting at stand N129 at the AIMEX Mining Pavilion.

Exhibiting alongside Centennial is Glencore Australia, one of Australia's largest mining companies operating in the country for more than 20 years.

Glencore has grown to become a leading commodity producer and provider operating 25 mines across NSW, Queensland, WA as well as the Northern Territory.

Glencore is also a major Australian employer with about 16,300 employees working across various commodities including coal, copper, nickel and many more.

Find Glencore Australia exhibiting at stand P128.

The AIMEX conferences are always well-attended.

Mach Energy develops and operates economical and efficient energy resources primarily for the international market.

It is responsible for operating the Mount Pleasant thermal coal project in the Hunter Valley region of NSW, which contains some of the most attractive coal resources in the area.

Mach Energy assists in facilitating the transition to a low emissions economy by supplying high quality coal to some of the world's most advanced and high efficient power plants.

Mach Energy can be seen exhibiting with other major mining companies at stand N133.

Whitehaven Coal will also be joining the Pavilion at stand P132.

Whitehaven Coal is Australia's largest independent coal producer and the leading coal producer in North West NSW.

The company operates a total of six mines in the Gunnedah Basin, producing a combination of thermal and metallurgical coal primarily exported to markets in North and South Asia.

Whitehaven Coal has a workforce that is 2000-strong, with 75pc living in the local communities around where its operations are based.

The fifth leading mining company participating in the AIMEX Mining Pavilion is Yancoal Australia, Australia's largest pure-play coal producer operating five mines and managing five others across NSW, Queensland and WA.

Yancoal Australia is a significant employer within the mining sector with a current workforce of more than 3000 people across its operations.

Yancoal Australia sources the majority of its employees and contractors from the local communities in which it operates.

Yancoal Australia will exhibit at stand N135.

AIMEX will not return until 2021, so don't miss this opportunity to access the largest free-to-attend exhibition and conference for the mining industry.

As the industry evolves, AIMEX provides the unique opportunity to source the latest products and hear insights from some of the industry's leading experts.

To review the complete supplier list, view the AIMEX Conference agenda, or secure your attendance at the most anticipated mining event of the year, please visit the event website aimex.com.au.

AIMEX 2019 AGENDA

Sponsored by Davey Bickford Enaex

TUESDAY, AUGUST 27, 2019

10:30am–10:35am: Davey Bickford Enaex company address

Davey Bickford of Enaex will be presenting a five-minute capability statement.

10.35am-10:40am: Welcome from AIMEX 2019

Brandon Ward, Exhibition Director welcome message.

"Seizing opportunities through new approaches and innovation"

10.40am–11:15am: Opening keynote: Transforming the relationship between the mining sector and regional communities

This session will explore the transformation of the relationship between the mining sector and regional communities.

11.15am–12:15pm: Panel on image of industry – How can the mining sector and the community work more collaboratively together in the future?

In this session we explore ways in which mining companies can engage more collaboratively in regional and rural areas.

12.15pm–12:50pm: Delivering autonomous vehicle maintenance - the challenges and opportunities

This session will discuss the challenges and opportunities of delivering autonomous vehicle maintenance which will be delivered by Enterprise Improvement Solutions.

12.50pm-1:50pm: Lunch break

1:50pm–2:25pm: Human-systems integration for the safe introduction of automation to mines and quarry

This session will explore the outcomes of automation, human systems integration and automated safety questions for consideration by mine and quarry operators.

2:25pm–3:00pm: Wash basin and maintenance innovation

This session will cover wash basin and maintenance innovation which will be delivered by Enviroconcepts International Pty Ltd.

3:00pm–3:35pm: Using Telepresence technologies for the safe deployment of wireless mesh networks and underground inspection robots in mines

This session examines the safe deployment of wireless mesh networks and the deployment of underground inspection robots in mines with no existing underground wireless network.

3:35pm–4:10pm: SafeWork NSW

This session will go through safe work practices to reduce work related fatalities, injuries and illnesses for better work practices.

4:10pm–4:45pm: Closing keynote: Global mining innovations and key takeaways the Australian mining industry can learn

The closing keynote will summarise the key takeaways from global mining innovations that the Australian mining industry can learn.

WEDNESDAY, AUGUST 28, 2019

10:20am–10:25am: Davey Bickford Enaex company address

Davey Bickford of Enaex will be presenting a five-minute capability statement.

"Attracting, developing and retaining talent"

10:25am–10:55am: Opening keynote and thought leadership session led by Davey Bickford, Enaex

Davey Bickford Enaex will be presenting the opening keynote as well as a thought leadership session to open day two of the AIMEX Conference.

10:55am–11:30am: Overcoming the safety challenges of the future worker

This session will explore why safety rules and checklists are no longer sufficient, the importance of problem solving and engagement to mitigate risk and the emerging impact of mental health and wellbeing.

11:30am–12:20pm: Panel on tomorrow's workforce – enabling and cultivating our future miners

This panel examines how the mining community can reinvent their approach to talent acquisition and retention for today's agile, digital, mobile, analytical, and technologically-driven workforce.

12:30pm–1:30pm: Lunch break

1:30pm–2:05pm: Using advanced welder training technology to reduce costs and increase outputs in mining industry

This presentation will explore how mining companies and their supply chain can reduce welder training costs and shore up workforce capability to meet by taking advantage of advanced training technology for welders.

2:05pm–2:40pm: Cross-industry learnings from the oil and gas industry: An introduction to HMI RMP - defining and mitigating HMI Risk with technology and analytics

This presentation describes the HMI RMP methodology and its application on the TCO Future Growth Project.

2:40pm–3:15pm: From air legs to iPads

This session will explore how enabling this technology has been delivered to the underground mining industry in a practical way to allow access to large amounts of data to manage the mining processes underground.

THURSDAY, AUGUST 29, 2019

10.25am-10:30am: Davey Bickford, Enaex company address

Davey Bickford of Enaex will be presenting a five-minute capability statement.

10.30am-11.15am: Ministerial Address

A State Government minister will open the third and final day of the AIMEX Conference.

11.15am-12.15pm: Panel on adapting to climate change and emissions – what does this look like for the mining sector?

This panel discussion will explore the projected impacts of climate change to mining and determine how reducing climate risk exposure can improve productivity.

12.15pm-1.00pm: Insights from Element 25 and TEC-C investments: Lower cost renewable energy solutions for a 25 year mine life manganese project in the Pilbara

Hear insights on the use of hybrid renewable generation and leach processing innovation to use cheaper, lower emission renewable energy for the electrolytic process to make metal.

— Program correct at time of printing.

Cameras for mining industry

NATIONAL

CROUSE-HINDS has been a world leader in hazardous and harsh environment electrical equipment for more than a century.

The Crouse Hinds Electric Company was founded by Huntington Beard Crouse in 1897, later shortening its name to Crouse Hinds Company.

Crouse Hinds began as a manufacturer of high grade electrical specialities.

Over the years it has continued to be at the forefront of development in all areas of hazardous and harsh environment electrical equipment.

The Eaton Crouse Hinds Series CCTV over-internet (otherwise known as IP) monitoring and control system is another part of the development of the Crouse Hinds product offering.

This high-quality offering is widely popular with mining and automation industries.

With more than an estimated 250,000 Eaton cameras now successfully installed across industry sectors, the new range of CCTV cameras are designed to enhance the offering.

The new range of Eaton Crouse-Hinds CCTV cameras is widely popular with mining and automation industries.

Industry desire for better quality monitoring systems, zoom capability and sharp images are gaining momentum.

The new range of Eaton Crouse Hinds cameras are meeting this demand.

Manufactured in the company's facilities using the same consistent manufacturing processes and procedures, they ensure a right first-time, on-time approach to quality.

The cameras are made from 316L stainless steel and designed specifically for use in hazardous areas and or harsh environmental conditions.

They are corrosion-resistant and suitable for a variety of applications, including the mining, oil and gas, marine, wind, chemical and many other industries in which quality and durability are a pre-requisite.

For a full overview of the Eaton Crouse Hinds CCTV offering, contact your local distributor to arrange a demonstration.

EATON
Powering Business Worldwide

Models to suite Industrial, Group 1 and Group 2 applications.
High Quality lowlight optics.
Exia , Exd, Exd/ib as well as IP68 Weatherproof.
Stainless Steel Enclosures. Open Protocols.

Contact your local Crouse Hinds distributor for a demonstration.

Eaton Crouse Hinds Division
10 Kent Road, Mascot NSW 2020
www.eatoncorp.com.au

Tel: 1300 332 866 (Option 3)
Email: crousehindsanz@eaton.com

Fire suppression solutions

NSW

FIRESTORM Fire Protection installs and maintains fire suppression systems across Australia and New Zealand.

More than 10,000 Fogmaker systems have been installed in Australia since 2009, and more than 180,000 systems installed internationally since 1995.

Firestorm branches are located across Australia, even servicing the most remote parts of the country.

The Fogmaker product provides original equipment manufacturers the great advantage of being compact, and can be installed at any angle.

Machines are becoming more compact and the large AFFF cylinders can no longer be installed without great cost and fabrication to support the weight.

As the Fogmaker system has a low centre of gravity, there are great operational cost savings due to the robust design.

The detection tube is liquid-filled, which stops any leaks, providing greater uptime.

The system is AS5062-2016 compliant with design and manufacturing of the alarm panels in Australia.

"There is no real estate for the big red AFFF cylinders anymore – Fogmaker replaces these without the need for specialised bracketing or reinforcing decks," Firestorm chief executive officer Kristian Bischoff said.

For more information visit: www.firestormgroup.com.au

Firestorm can protect your assets and premises with comprehensive fire protection solutions.

Dust suppression made easy

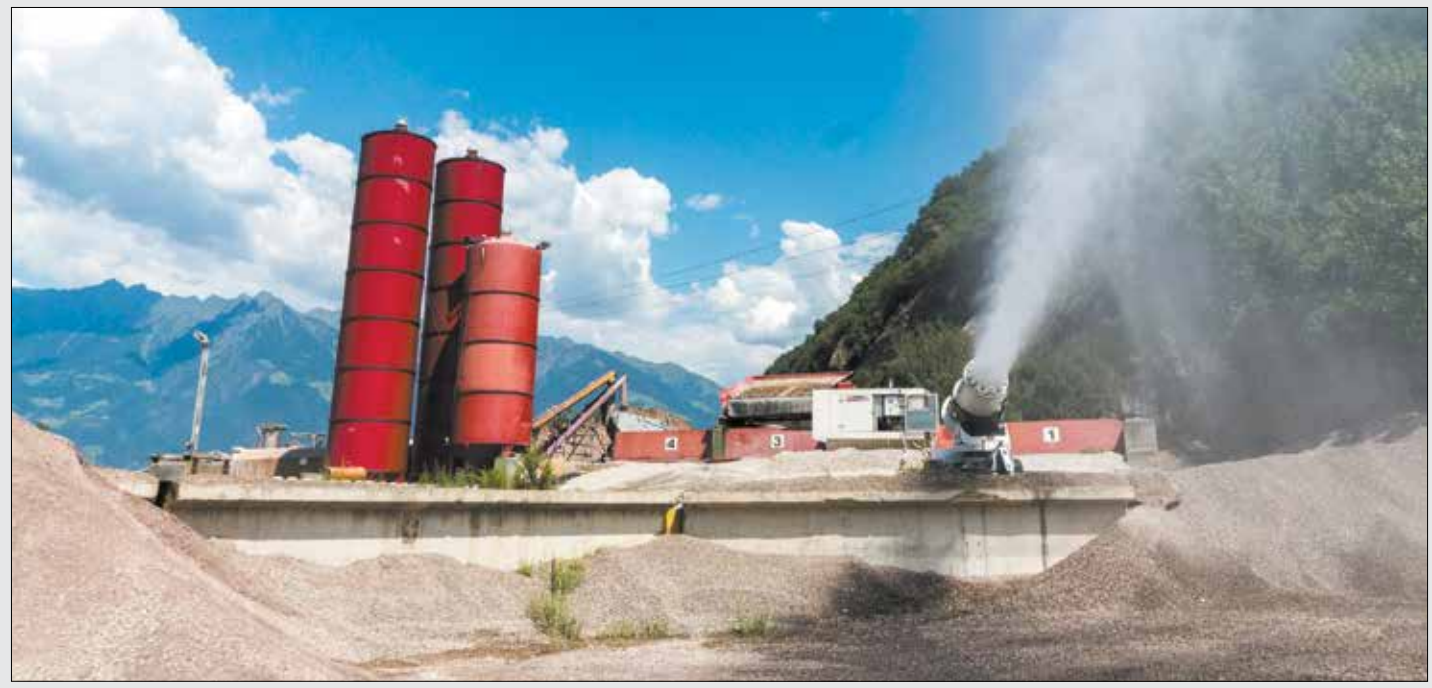
NATIONAL

WHEN it comes to dust suppression, there is no such thing as a one-size-fits-all solution.

The market has many choices available, and there are numerous deciding factors that require careful consideration, such as the type of dust, how it is being generated, and the available water supply.

With over 30 years' experience in the formulation and execution of effective dust suppression and dust control solutions, Tecpro has helped clients to significantly improve their workplace safety, reduce the wear and tear on equipment, and to improve community relations by eliminating or reducing dust in the vicinity of the project.

Tecpro will be showcasing two of its best-performing dust controllers, the recently upgraded V22 dust controller, and the recently upgraded V12s silent dust controller, along with its heavy duty hose reels and spray nozzles, at AIMEX 2019.



Tecpro is an Australian-owned and operated business that prides itself on its strong relationships with clients and customers.

V22 – for very large throwing distances

The new V22 is smaller and more compact than its predecessor.

Due to its ability to throw over 70m, the V22 is well-suited to open cut mines, recycling plants, ship loading facilities, materials storage and quarries.

The nozzle head and the externally mounted nozzle ring produce a fine water mist, which binds the dust particles and prevents them from spreading, without causing puddles.

The throwing distance of the inside nozzle head can be extended to a narrower range by switching off the turbine.

The angle of inclination can be adjusted from -18 degrees to + 40 degrees, and it can be set to a swing range of 350 degrees either by the user friendly remote, or it can be set automatically.

The V22 dust controller continues to be the only dust suppression unit that can use salt or saline water and it's exclusively available from Tecpro Australia.

V12s – the quietest dust controller in the world

Like the V22, the silent V12s model has been upgraded, and there are significant improvements on its predecessor.

The biggest difference is the size.

The much smaller V12s is easier to transport, easier to integrate into existing systems, and yet it has lost none of its stability and robustness in the face of difficult operating conditions.

The machine can be started and rotated much faster, the angles can be adjusted quicker, and there are three available water consumption speeds.

Due to its low noise levels, the V12s is ideal for city work, and other areas where noise levels must be taken into consideration.

It has applications in all types of quarries, warehouses, loading facilities and landfill, and can be installed on various mobile or fixed bodies.

Heavy duty hose reels

Some industries demand tough and durable equipment, but for some industries like mining, durable isn't enough – they need extra heavy duty.

Tecpro is the supplier of a range of Mine Spec hose reels that delivers just this.

The reels are suitable for a ¼ – 1½in diameter hose, and can accommodate hose lengths from 15m to 100m.

The reels are designed and manufactured in Europe and use 50pc thicker stainless steel than most standard hose reels.

Each reel includes a spring rewind mechanism that makes it easy for operators to retract the hose after use, and are designed to withstand the toughest conditions and the roughest operators.

As well as being available in AISI 304 stainless steel, the reels are also available in 316 stainless steel, powder coated steel and cataphoric treated steel.

The all new V22 in action.

Spray nozzles

Whether it is flat fan spray nozzles, full or hollow cone nozzles, air atomising nozzles and everything in between, Tecpro has 30 years experience in spray nozzle engineering, performance, specification and design to help its customers choose the right nozzle for the job.

Tecpro represents PNR, an Italian manufacturer of spray nozzles, and supplies nozzles of the highest quality to ensure the best performance and durability.

Tecpro was formed in 1982, and has built its business upon long term relationships with clients and suppliers.

The company offers a broad range of technical expertise and a comprehensive knowledge of the spray nozzle industry that allows it to solve challenging nozzle and dust suppression problems that its competitors cannot.

The V12 is now smaller and lighter than ever.

Tecpro's range of hose reels can withstand the toughest conditions and the roughest operators.

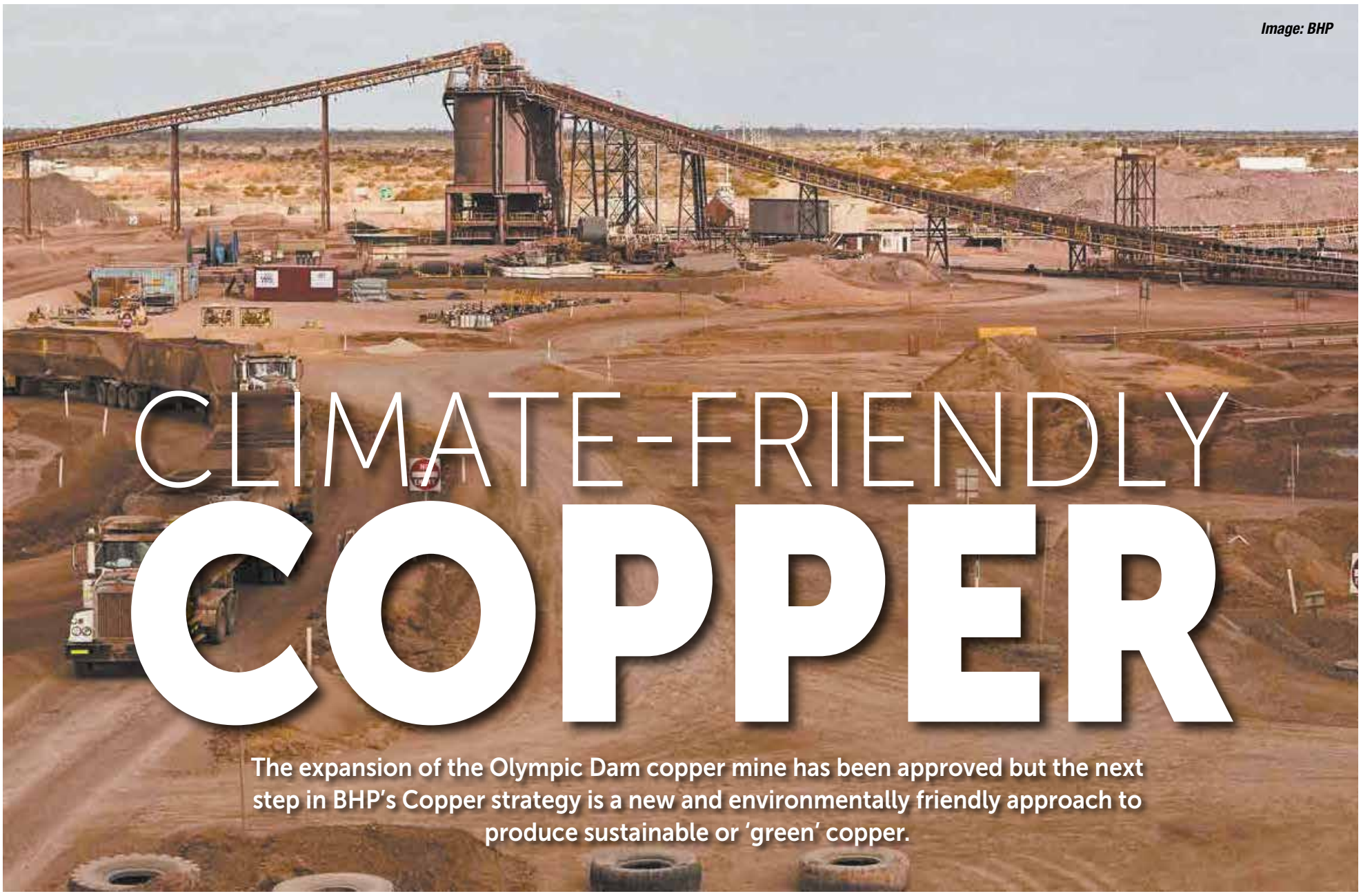


Image: BHP

CLIMATE-FRIENDLY COPPER

The expansion of the Olympic Dam copper mine has been approved but the next step in BHP's Copper strategy is a new and environmentally friendly approach to produce sustainable or 'green' copper.

Olympic Dam is one of the world's largest copper mines.

EMMA DAVIES

SOUTH Australia has a solid strategy in place for copper growth in the state.

Firstly, to accelerate exploration and discovery; secondly to develop innovative infrastructure, services and research; and thirdly, engage to build industry and community capacity.

BHP's Olympic Dam is certainly reaping the benefits of the first step, with South Australia approving its expansion plans in February of this year.

The $3b proposal would increase Olympic Dam's annual copper production from 200,000t to up to 350,000t and increase the level of gold, silver and uranium production.

SA Energy and Mining Minister Dan van Holst Pellekaan declared BHP's proposed expansion of Olympic Dam a major development as a key milestone in this important project.

"Olympic Dam is already the State's largest mining operation, providing jobs, investment and royalties for South Australia," he said.

"BHP's proposal could potentially create up to 1800 construction jobs with an additional 600 ongoing positions in operational roles."

There are a few stringent environmental and biodiversity hurdles to leap, but BHP said there would be a comprehensive state and federal process that would include assessment of the potential for social, economic and environmental impacts associated with an increase in mining and production at Olympic Dam.

Olympic Dam asset president Laura Tyler said that BHP was aiming to achieve stable operations and sustainable growth at Olympic Dam through a staged and capital-efficient long-term approach.

"Olympic Dam is a world-class resource with the potential to deliver value to BHP and South Australia for many decades to come, especially given our positive outlook for global copper demand," she said.

"We are pleased the South Australian Government has declared Olympic Dam's growth plans a major development, recognising our significance to the state.

"Our team continues to refine the scope for targeted underground development in the Southern Mine Area, strategic investment surface processing facilities, new technology and supporting infrastructure."

In its latest operational review, copper production at Olympic Dam increased by 17pc to 160kt as a result of the major smelter maintenance campaign in the prior period, which was partially offset by an unplanned acid plant outage in August 2018, and two minor production outages in May 2019 relating to the smelter and to the refinery crane.

Production is expected to increase to between 180kt and 205kt in the 2020 financial year, reflecting improved operational performance, partially offset by planned maintenance related to the replacement of the refinery crane (pre-work scheduled for the September 2019 quarter, and physical replacement and commissioning scheduled for the March 2020 quarter).

"We are confronted by a fast growing and copper hungry world."

"During the 2019 financial year, we successfully completed the heap leach research and development trial, confirming the viability of the technology to extract copper, uranium, gold and silver at Olympic Dam," the report stated.

Sustainable focus

Since early this year, BHP has been pushing its message of environmentally friendly operations to address climate change, and it's keen to show consumers that its copper operations like Olympic Dam can jump on the sustainability bandwagon.

At the International Wrought Copper Council in Chile in April, BHP president of operations – minerals Americas, Danny Malchuk, elaborated on the company's new strategy for sustainable copper operations.

"The case is clear: society demands a rapid transition to low emissions technologies to combat climate change," Mr Malchuk said.

"These facts are critical when it comes to the demand for copper.

"A battery powered electric vehicle contains four times as much copper as a conventional medium sized car.

"We are confronted by a fast growing and copper hungry world."

However, Mr Malchuk cautioned that high-quality copper is becoming harder to find and extract.

"As grades decrease, strip ratios rise and deposits get deeper, more water and energy is required for the same amount of output," he said.

"If the current trend continues, the OECD suggests that by 2060, copper will have a substantially worse environmental footprint, both compared to today and to many other metals, on a per tonne basis.

"A low carbon future is materially intensive in minerals like lithium, cobalt and copper.

"If these supply chains are not properly managed, it could seriously undermine the efforts of producing countries to meet their climate and related Sustainable Development Goals."

Mr Malchuk said BHP was always looking for ways to improve.

"If we are to follow other industries in to a more sustainable future, we must work together," he said.

"This will become even more important as we are confronted by new challenges shaping the sector.

"Consumers care and they speak with their wallets.

"Investors do the same and the rising influence of ESG investors ensures that our sectors' performance and transparency must keep up with their demands.

"And although sustainability should not be driven by profits, higher price premiums for sustainable commodities could be the wake-up call we need as an industry and provide an incentive to invest more on sustainable solutions."

Both the International Copper Association (ICA) and the LME have led initiatives to drive greater transparency and lift sustainable credentials across the copper value chain.

"A thorough solution will involve us all, but what I am calling for today is a new set of principles to guide the copper industry of the future," Mr Malchuk said.

"Firstly, we need an increased level of transparency across our value chains.

"The benefits of higher transparency will be clear as consumers can easily identify sustainable copper, just as they do with a 5-star energy rating on a kitchen appliance."

Collaboration was also mentioned across the entire value chain from end to end.

"Apple has been outstanding in sharing their standards with cobalt smelters," Mr Malchuk said.

"Whether you are an explorer, a miner, or a fabricator, we will be better if we confront it collaboratively."

Leading recruitment diversity

NATIONAL

FOR more than 20 years, the Australian mining industry has trusted the WorkPac Group with its contracted workforce needs.

Today, the company employs more than 10,000 workers across mine site operations and activities around the country.

Diversity and inclusion is at the core of WorkPac's values system, and staff work closely with clients to grow representation of both female and Aboriginal and Torres Strait Islander (ATSI) people in the Australian mining sector.

Organisations like BHP have gender diversity targets of 50/50 by 2025. WorkPac is proud to assist organisations reach these goals.

WorkPac Regional Manager for Southern Australia, Chris Coffey, said with so many of the company's 40-plus business centres based in regional and remote Australia, for example the Roxby Downs Business Centre in SA, there was a greater responsibility when it comes to providing employment, education and training opportunities for Indigenous Australians in the communities it operated in.

The company works closely with local language groups and Traditional Owners to ensure staff have a strong cultural awareness.

"One example of this is that the local Kokatha people's connection with the land means, they have a preference to work in surface operations," Roxby Downs Business Centre Manager Samantha Maywald said.

Through its specialised divisions, WorkPac provides whole-of-business solutions for clients who require multi-disciplined and experienced staff. Pictured are recruitment coordinator Melissa Haynes (left) and business centre manager Samantha Maywald.

"Our recruiters here in Roxby Downs know and respect this, it simply means when we work with Kokatha people we find work in above ground roles."

The company has a dedicated Indigenous recruitment team called JobTrail to cater for around 3pc of Australian's who identify as ATSI.

JobTrail has created a successful framework that has been rolled out across multiple clients throughout Australia.

The framework supports Aboriginal and Torres Strait people, provides qualified mentors, address challenges with work conditions and cultural pressures.

National JobTrail Manager Julian Genn said that since the original launch of WorkPac's Reconciliation Action Plan (RAP) two years ago, the company has been able to achieve its initial recruitment and RAP goals, targeting relationships, respect, opportunities, and tracking and progress.

"Through numerous trainee programs that we have run across Australia with several major companies, we have been able to increase our Indigenous workforce to represent 7pc of our employees," he said.

To find out more about how WorkPac can help your mine improve staff diversity and inclusion visit: www.workpacgroup.com.

SAFE. PRODUCTIVE. RELIABLE.
WE ARE YOUR LOCAL WORKFORCE SPECIALIST.

For over 20 years, the Australian mining industry has trusted the WorkPac Group with its contracted workforce needs. Today, the company employs over 9,000 workers across mine site operations and activities across the country.

We support the local workforce acquisition, performance and safety management objectives of Australia's predominant mining companies. Our close proximity to mining assets strengthens our positive contribution to the safety, production and financial performance targets of our world-class clients.

Diversity and inclusion is at the core of our values system, and we encourage female and Aboriginal Australians to apply to our employment and training opportunities.

We encourage the following professions to contact us:
Operations | Production | Trades | Maintenance | Engineering | Administration | Management

Contact us today to experience the WorkPac difference
1300 967 572 | workpac.com/find-us

WorkPac Group
A Smarter Alternative

Minesite innovation and vast experience

NATIONAL

From modest beginnings, Mine Tech has evolved into an industry-leading engineering and fabrication company.

MINE Tech Engineering and Construction Pty Ltd is an innovative engineering, fabrication and construction company with extensive experience in the mining industry.

The company has been servicing the mining industry for many years and has developed expertise in pipe fabrication, structural fabrication, coded welding, poly welding, civil works, mechanical, electrical, refrigeration and fitting and turning.

Mine Tech has the facilities and the technical know-how to manufacture and install pipework or structural components from supplied engineer's drawings and it also has the capacity to site measure and supply drawings on request for works across a variety of carbon steels, stainless steels, alloys and plastics.

Five years ago, Mine Tech started with an empty shed, some basic welding equipment, two boilermakers, a single vehicle and an unceasing desire to grow the business into something remarkable.

Today, the company employs more than 80 people, has over 20 light vehicles and more than 75 pieces of plant including loaders, backhoes, excavators, skid steers, trucks, trailers and poly welders.

The company has increased the size of its operation to include four additional blocks of land with an additional shed in the pipeline.

Based in Roxby Downs and servicing mines located in remote South Australia, Mine Tech has the capacity to deploy its operations teams and mobile equipment to almost any site across Australia.

Mine Tech has based its success on great customer service and a commitment to quality product and workmanship.

The company prides itself on effective communication and consultation with all stakeholders to ensure each project is smoothly run and delivered on time.

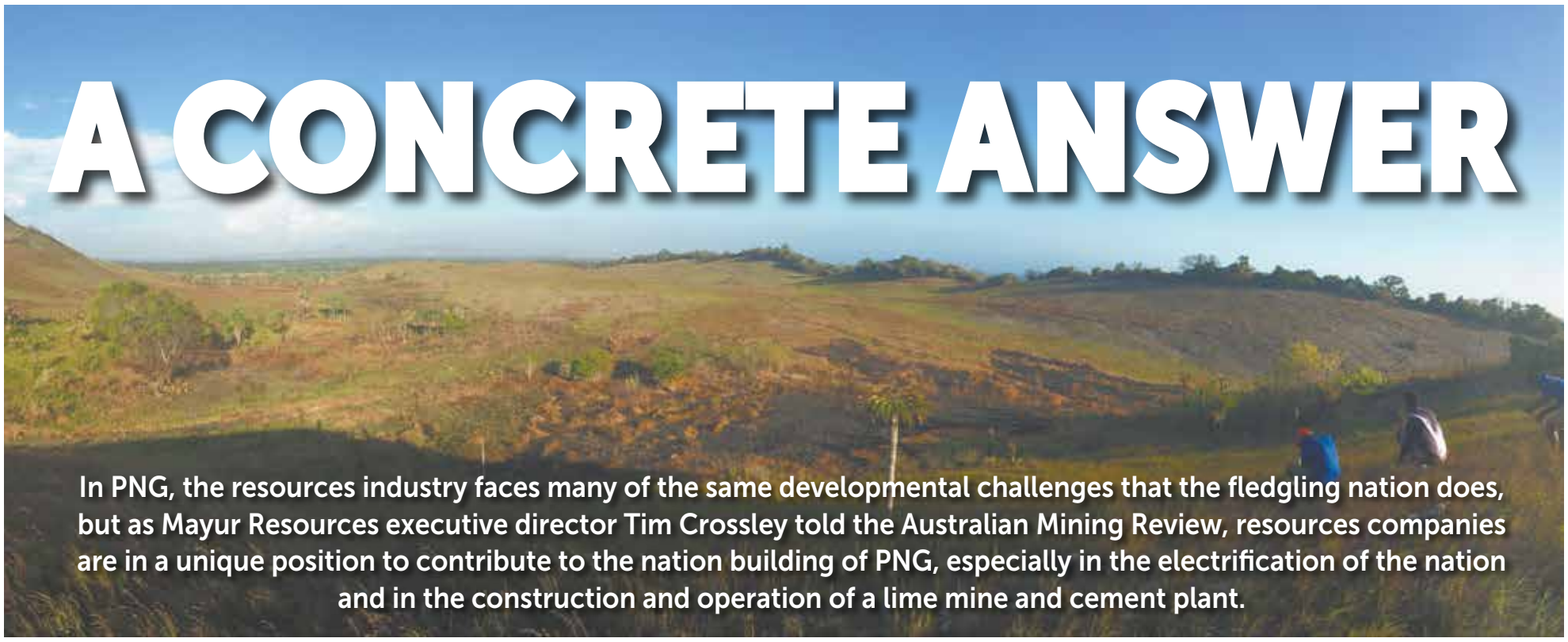
Mine Tech works in a systematic manner to ensure full project execution across all job fronts and is looking to future growth while maintaining its excellent safety record and strong commitment to continual improvement.

SITES AND CONDITIONS MAY CHANGE.
OUR COMMITMENT TO QUALITY DOESN'T.

MINETECH ENGINEERING

(08) 8671 2323
admin@mteng.com.au
mteng.com.au

A CONCRETE ANSWER



In PNG, the resources industry faces many of the same developmental challenges that the fledgling nation does, but as Mayur Resources executive director Tim Crossley told the Australian Mining Review, resources companies are in a unique position to contribute to the nation building of PNG, especially in the electrification of the nation and in the construction and operation of a lime mine and cement plant.

The development of a domestic cement plant in PNG has the potential to establish one of the foundational requirements of a modern nation.

GERARD MCARTNEY

IN 2018, the resources industries contributed to more than 25pc of Papua New Guinea's (PNG) GDP, and 80pc of its export revenue, and the industry employed about 20,000 people.

As a post-colonial nation, development in PNG has lagged behind the rest of Asia due to the wildness of the terrain, the challenges of remote locations, and lack of cheap, reliable electricity and infrastructure.

One of the biggest infrastructure hurdles has been the lack of a domestic concrete plant that would allow PNG to transition its infrastructure and construction projects from traditional, locally sourced building materials to modern methods using concrete.

Mayur Resources executive director Tim Crossley said that this transition had been well documented.

"If you look at the development of an emerging nation, there is a very clear line between GDP growth and electrification and there is a very clear line between GDP growth and cement demand or concrete demand," he said.

Because most of the mines in PNG, both existing and proposed, are located in very remote parts of the country where power and infrastructure are limited, security can be problematic, and logistics can be a nightmare, among other problems – meaning the cost of operations tend to be high.

"PNG is still very low on the development curve, GDP is in the low US$2000s per capita and hence there is often unavailability of the skills needed – the upscale skill sets," Mr Crossley said.

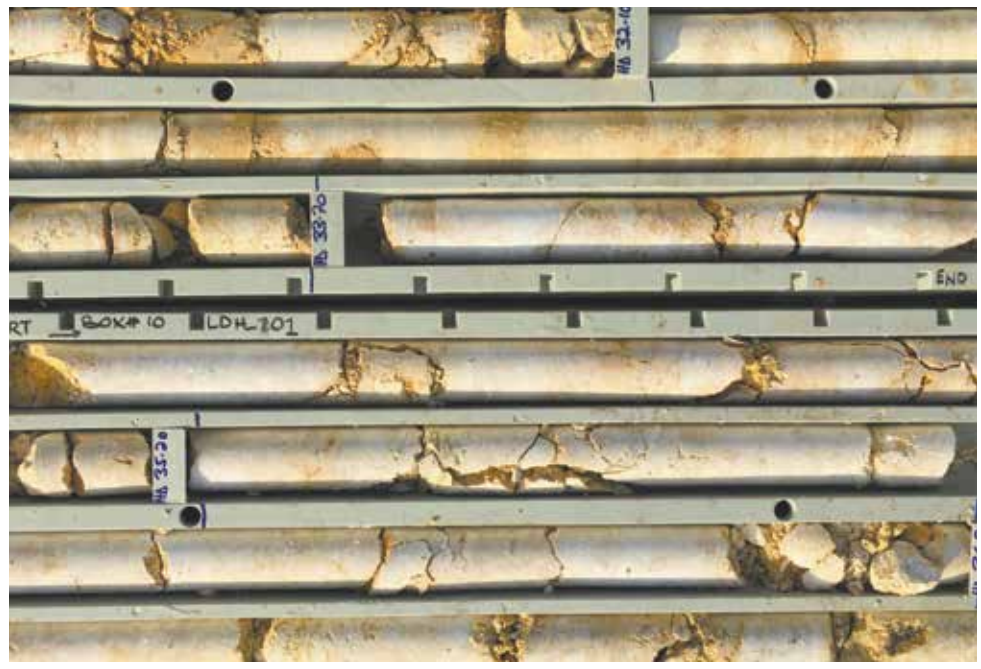
Another challenge was that land in PNG is often held under customary titles, which often required negotiations with many different groups, however when finesse was used, Mr Crossley said the process could be a lot easier.

"You have to go about it in the right way – in a respectful way and respect that it is their land – I think we have demonstrated that it can happen without project delays, I think we have demonstrated that it can happen quite quickly," he said.

But the biggest challenge comes from two of the stumbling blocks of nation building – reliable, cheap electricity and remoteness.

"For mining companies trying to develop projects in remote locations, that remoteness and lack of infrastructure are a huge challenge," he said.

"They are logistically challenged, infrastructure challenged and it is a high-cost to support them with helicopters and the like.



Drill samples from the Central Cement and Lime project.

"Primarily, and one of the key reasons that the Mayaur portfolio is on the coast or on islands, is because it is very costly to run these sorts of projects in the middle of the island, so we've made the decision to stay out of that.

"As the nation's GDP grows, and PNG is coming from a very low base, if you look globally where to where the opportunities for strong GDP growth, PNG is clearly one of those strong opportunities.

"It has lagged behind the rest of Asia, but PNG is entering a super cycle of robust growth that will take it above 6pc per annum of GDP per capita growth by 2024-2025."

Mayur Resources hopes that growth rate will in turn drive demand for cement as infrastructure projects shift from locally supplied materials, with construction projects moving away from traditionally sourced material and wood and people begin building houses using cement based construction techniques.

Currently, PNG is uses about 60kg of cement per capita, whereas the rest of the developing world is using they are using 250-600kg per capita.

This massive disparity is caused not only by a lack of cement in PNG, but also because of the prohibitively expensive prices involved in importing it.

On July 3, the company lodged its application with the Mineral Resource Authority for the Central Cement and Lime project in Central Province, where it hopes to establish PNG's first domestic concrete plant.

This represents one of the final hurdles for the company before it is granted the mining lease, and significantly de-risks the project.

Mr Crossley said that the reason a cement plant like CCL had not already been established in PNG was because of the high capital intensity required to start a project of such scale.

"I don't think anyone has looked at a project like this in the same way that we have," he said.

"If you look at trying to build a cement plant or a clinker plant like CCL you would find it very hard to justify that investment solely based on the PNG demand pool because the PNG market is 300,000-400,000t.

"To build a plant of that size, and to allow for growth, the capital intensity would pretty much kill it."

Mr Crossley said that the difference for Mayur Resources was that while it was fundamentally a project for import replacement in PNG, to justify that project and get it to a world-class scale, the company also allowed for about 1-1.2mt of exports.

"We're on the coast, next to deep water and the Australian market is next to us and has been increasing its imports for the last decade now," Mr Crossley said.

"That enables us to have the volume pull-through to justify the scale; now over time as the PNG market grows, we have two choices, we can slow down the exports as the PNG market grows, or we can replicate the plant and double capacity.

"Those are the options that are available to us in the future."

Mr Crossley said that the project was moving at a fast pace, and from a resources perspective was largely de-risked.

The company has completed nearly all of our landholder discussions.

"So long as we follow the necessary steps, there should be no risk in acquiring the mining lease, then it's really about financing," he said.

The difficulties attributed to working with the government and with local landholders was something that Mr Crossley was eager to dispel.

"The political process works – the great thing about PNG is that it is a former British colony, so it has British laws, it has a Westminster government and the spoken language is English, so it ticks a lot of boxes for companies like ours who're headquartered in Australia but have their interests in PNG," he said.

"A case in point for the success of the PNG political process would have to be the success of the last election with the change from the O'Neill Government to the Marape Government.

"In the lead-up to the election there was some uncertainty, but the political process worked perfectly.

"We don't see the sovereign risk or the potential of the project to be nationalised.

"There is no evidence that that will happen in PNG – the tenure security in PNG the government is very supportive of development of new companies, we get excellent support and I don't see a lot of the challenges that others seem to talk about."

Looking forward, 2019 is shaping up to be an exciting year for Mayur resources.

The cement plant is scheduled to be operational by the end of 2019, and the company's power plant has the potential to greatly benefit the electrification of the country as it moves toward the 70pc electrification by 2030 goal.

"If you look at the portfolio of projects that we're doing, we are fundamentally a first mover in two sectors: one being energy and one being building materials with CCL," Mr Crossley said.

"Both of those commodities are important elements to any developing nation that is going through industrialisation."

Able Instruments Sales & Service
COMMERCIAL | INDUSTRIAL | AUTO | MARINE

SERIES 30

HPC40

ASC400

XP2I

GAUGECALHP

CRYSTAL
engineering corporation

Innovative, Portable, Accurate, Reliable Pressure Measurement Equipment and Software.

ABLE Distributors for:
- *VDO Australia*
- *Tecsis*
- *Wema Instruments*
- *Rhomberg Gauges*

Solutions to:
Measure, Calibrate, Systemize, Configure, Record, Generate, and Connect.

Intrinsically Safe
Reference Pressure Recorder!

CONTACT US ON:
07 3801 1232

Unit 6, 10-12 Babdoyle Street
Loganholme QLD 4129
info@ableinstrument.com

RETURN TO FORM

On the back of the best half results since 2011, Anglo American has renewed its confidence and commitment to Australian coking coal, taking Aquila off the shelf, and will launch a $1b share buyback program.

Anglo American's share buyback will deliver $1b to shareholders executed in two tranches.

GERARD MCARTNEY

AUSTRALIA'S second largest coal producer, South African miner Anglo American, has reaped the benefits of the high price of coking coal as China's steel industry continues to boom.

The company has announced that, after 10 years on the shelf, it would revive the Aquila project, reconfirming its commitment to coal in Australia, and extending the life of the Capcoal operations out to at least 2028.

Anglo American has also announced a $1b share buyback program after posting its best first half results since 2011.

Internationally, the board has seen two new additions to its non-executive team, and Nolitha Fakude has moved into the executive role of Anglo American chairman of South Africa's management board.

Aquila

Anglo American announced it will revive and expand its operations in Central Queensland at the Aquila project, which would extend the life of Anglo American's existing Capcoal underground operations by six years out to 2028, expanding the Capcoal complex.

The complex consists of the Capcoal open cut mine, the Grasstree underground operation and infrastructure, and is a joint venture with Mitsui & Co Ltd (70:30 respectively).

More than 10 years after it was suspended because of concerns around the global financial crisis, the JV partners would invest a total of about $400m.

Anglo American's share is expected to come in at US$226m, and development work is expected to begin in September of 2019, with first longwall production predicted for 2022.

Anglo American's Metallurgical Coal chief executive Tyler Mitchelson said that Aquila was an important growth project for the business, and would provide ongoing employment opportunities for the company's Grasstree workforce as the mine reaches its end of life.

"Aquila will have a total average annual saleable production of around 5mt of premium quality hard coking coal, used in steel production for critical building and infrastructure around the world," Mr Mitchelson said.

"The mine will also continue to adopt Anglo American's FutureSmart Mining program, which applies innovative thinking and technological advances to address mining's major operational and sustainability challenges.

"Anglo American has been at the forefront of embracing innovation to drive the next level of mine safety and performance, and our Aquila Mine will be developed as one of the most technologically advanced underground mines in the world.

"The accelerating pace of technological innovation, particularly in the digitalisation, automation and artificial intelligence areas, are opening up opportunities for the mining sector to be safer, more productive and sustainable."

The project is subject to substantial approval by Mitsui.

Chief executive of bulk commodities, Seamus French, said that the project would benefit from low capital intensity and the use of existing infrastructure and systems from the Grasstree mine.

"Aquila offers us a high margin six-year life extension to our Grasstree mine, with an average annual saleable production of 3.5mt (attributable) of premium quality hard coking coal at a real, post-tax IRR of more than 30pc, and an EBITDA margin of 40pc at consensus long term prices," he said.

A hard time for thermal

FOB thermal coal prices were down to 88/t from $104/t, and exporting at $88/t down from $99/t in 2018.

The company said that thermal coal prices fell sharply as lower gas and higher carbon prices significantly affected the European coal demand, while coal demand in Japan was muted by an increase in gas fired power generation and improved nuclear availability in South Korea.

Prices were further impacted by Indonesian and Russian product that led to a higher global inventory, as the supply of lower quality coal and delays to customs clearances at Chinese ports widened the discounts between low and medium quality coals.

US$1B share buyback

Anglo American announced that it would return up to $1b to its shareholders through an on-market irrevocable and non-discretionary share buyback program.

It will be executed in two tranches of up to $500m each, and Anglo American has given instructions to Morgan Stanley International in relation to the first tranche.

Anglo American had previously shied away from this sort of shareholder return because of its focus on organic growth, but since Anglo American chief executive Mark Cutifani took the reins six years ago, the company had streamlined its operations, slashed costs and improved productivity.

Mr Cutifani said that it was appropriate to share the improvements with shareholders.

"We have a disciplined and value-focused approach to capital allocation that is designed to fund the sustainability of our existing business and our base cash dividend for shareholders," he said.

"With a strong balance sheet in place, we then consider the appropriate balance of options for any discretionary capital, in terms of growth investments and additional returns.

"The share buyback program demonstrates our applied discipline and the Board's confidence in the business."

Updates to the board

Hixonia Nyasulu and Nonkululeko Nyembezi will join the Anglo American board as non-executive directors from November 1, 2019, and January 1, 2020 respectively as Nolitha Fakude moves into the executive role of Anglo American chairman of South Africa's management board.

Anglo American chair Stuart Chambers said Ms Nyasulu had exceptional and highly relevant global board experience drawn from the natural resources, financial services and consumer industries.

"Her entrepreneurial spirit and passion for education and economic development will add richness to our board discussions," he said.

"Equally, Ms Nyembezi's engineering background and extensive experience spanning mining, steel, financial services and technology in South African and global organisations offers us great breadth of insights, both technical and strategic.

"We will continue to ensure that the non-executive directors on the board represent the full breadth of Anglo American's business."

NMC
Neil Mansell CONCRETE
BUILT ON STRENGTH

MACKAY OPERATIONS
104 Spiller Avenue
MACKAY QLD 4740
T. 07 4955 0455
F. 07 4955 0499

MORANBAH OPERATIONS
Lot 31 Goonyella Road
MORANBAH QLD 4744
T. 07 4941 8555
F. 07 4941 6641

BOWEN OPERATIONS
35 Don Street
BOWEN QLD 4805
T. 07 4786 4377
F. 07 4955 0499

NEIL MANSELL CONCRETE IS PROUD TO BE ASSOCIATED WITH ANGLO AMERICAN FOR THE SUPPLY OF CONCRETE TO ITS MINES IN THE BOWEN BASIN

A Member of the Neil Mansell Group of Companies

Black Thunder Photography

CENTURION

Providing supply chain solutions to the mining, energy, construction and retail sectors

With 50 years' experience in logistics, warehousing and specialised transport services you can rely on Centurion for the safe and reliable movement of your goods and equipment.

- Heavy Haulage
- Warehousing
- Line Haul Freight
- Refrigerated Freight
- General Freight
- Back-freight
- Produce
- Oil and Gas
- Local Deliveries

THINK SAFE ACT SAFE

centurion.net.au

The perfect partnership

QLD

CENTURION is one of Australia's largest independently owned and operated logistics (3PL) and transport companies delivering world-class logistics services and solutions.

Its vision is to be the leading logistics partner for all stakeholders in the commodity-rich communities of Australia.

Operating now for nearly 50 years, Centurion continues to be an agile, innovative customer-focussed organisation that works with its clients to develop sustainable relationships and optimise outcomes across the supply chain.

Operating across Australia, its vehicles travel more than 60m km each year, providing essential goods and services to a number of industries and regions including WA, Northern Territory, and Queensland.

It has significant mobile, land and infrastructure assets nationwide, including 14 distribution centres and a fleet of more than 1600 vehicles.

This ensures Centurion provides flexible and reliable supply chain solutions for all its customers.

Centurion offers a broad range of logistics services including full end-to-end solutions, lead logistics and off-site receiving for the energy and resource sectors.

It also offers general freight, warehousing, refrigerated services, retail distribution, logistic support, over-dimensional transport, bulk transport, heavy haulage, specialised projects and time-critical services.

Centurion partnered with Anglo American Coal to provide general transport services for all five of its coal mines throughout the Bowen Basin.

Centurion attracts and retains the best people in the business building on local expertise.

All employees across the business, whatever the job title, live its values of respect, integrity, passion, perseverance and accountability.

These values underpin everything Centurion does and helps to forge a positive team that works for the customer's benefit.

The business is built on safety.

It is the bedrock of the company's culture, and fundamental to every activity it performs.

The expectation is that the team, clients, suppliers and anyone else it interacts with, will go home to their families without injury, every day.

It also believes that no piece of equipment, facility or area of the environment within its control should be harmed.

The ability to deliver diverse solutions, combined with commitment to safe and environmentally-friendly operations, will continue to ensure Centurion remains at the forefront of the industry, now and in to the future.

Anglo American coal partnership

With a long and extensive history of providing safe and reliable supply chain solutions to customers operating in the mining industry, Centurion partnered with Anglo American Coal in mid-2018, providing general transport services for all five of its coal mines throughout the Bowen Basin.

Centurion operates major freight consolidation facilities in Emerald, Brisbane, Mackay and Rockhampton along with direct linehaul services to Anglo American sites.

Centurion runs daily services out of the consolidation hubs and provide the backbone for the Anglo American supply chain.

The addition of mobile cranes ranging from 25t – 230t at the Emerald location sees a significant leap forward in capacity and efficiency.

Centurion is able to offer a very well-developed mining support solution which has safety at the core and provides visibility tools tailored to client requirements that enable logistics management to be performed in a controlled manner throughout the entire process.

Frontline Planning and
Short Interval Control
Software

We have helped customers **reduce variability,** significantly **increase production** and improve **safety performance** for some of the world's largest mining companies.

WWW.COMMIT.WORKS

COMMIT.WORKS

Camilo Vargas
Marketing and Social Media
m. +61 414 461 044 | **p.** 1300 33 99 46
s. Camilo.vargas246 (Skype) | **w.** www.commit.works
e. camilo.vargas@commit.works

A BRIGHTER IMAGE

Over the initial five and a half year mine life, Image Resources Boonanarring mine is expected to produce 240,000t of Heavy Mineral Concentrate (HMC), including 60,000t of zircon, 130,000t, 6000t rutile and 4000 leucoxene.

Image: Image Resources.

First Boonanarring Heavy Mineral Concentrate (HMC) being loaded for transport to storage near Bunbury Port.

EMMA DAVIES

IMAGE Resources managing director Patrick Mutz said the ramp-up to full-scale production at the miner's Boonanarring project was achieved in only two months (as opposed to six months) after operations started in February, partially due to higher grade ore than expected based on the ore reserve.

"It was equally due to three very important contributors," he said.

"This was a high quality deposit with coarse grained mineralisation and high heavy mineral (HM) grade; the proper matching of plant and equipment with the deposit; and a very experienced workforce.

"The rapid ramp-up was beneficial as it contributed to higher than forecast production and revenue," Mr Mutz said.

At the recent Noosa Mining Conference in Queensland, Mr Mutz told investors the company underestimated the head grade.

"We found that we missed a high grade core that was just thin enough that it was just between the 20m spaced holes," he said.

"We had to go back and re-drill this deposit on 5m spacings to understand the complexity of the deposit and how rich it really is."

While a welcome bump, the ramp-up meant that the sale and shipping of three months of HMC production inventory in only six weeks was a real challenge.

"Every new mining operation has its challenges during the early stages of transitioning to an active mining company; Image's challenge was not adequately planning for its own success of realising much higher ore grades and production than expected based on the Ore Reserve," Mr Mutz said.

"We ramped up to full production in the second month of operation which is very rare."

Photography: Nathan Sixsmith Photography.

Thee months of HMC inventory was shipped in just six weeks.

"Consequently, our off-take partners were not prepared to take as much HMC product as we produced so quickly.

"When you're successful and you don't plan for that success, sometimes your own offtakers get caught short."

Luckily the company's off-take partners put their hands up to quickly acquire the excess product inventory.

"The way we accomplished this was due to our solid relationships with our trucking and shipping contractors, and careful planning and organising the transfer and loading of this significant amount of material in a very compressed period of time," Mr Mutz said.

"The credit for accomplishing this task goes to all parties involved — this is the mark of a successful company."

Image has off-take agreements for 100pc of its production for the life of the mine, and the off-takers have quickly adjusted to the company's higher than planned production levels.

"We expect that will continue for the remainder of 2019 and beyond, despite the fact that it remains to be determined whether Image will increase its guidance for 2019, and if so, to what level," Mr Mutz said.

(CONTINUED OVER)

(CONTINUED FROM PAGE 33)

"We have to wait until the second quarter results have been published, however if results from the first quarter are similar, it is clear production is well ahead of the current guidance."

Drilling and analysis is underway to update Image's mineral resources and ore reserves and Mr Mutz expects drilling to be completed, and the mineral resources and ore reserve updated in late September.

"Based on the first quarter results, the HM ore grade could increase substantially," he said.

"However it is not possible to estimate just how much the ore grade may increase until the new ore reserve estimate is completed."

Mr Mutz said the company had gone from a $50m market cap to $270m in less than a year – which is just the beginning for the company.

"There's still room to grow," he said.

"We're a company that delivers on what we said we were going to do, on time and on budget.

"We ramped up to full production in the second month of operation which is very rare."

Image Resources is set to increase production guidance for 2019 in its second quarter results.

Over the long-term

With the long term outlook of zircon anticipated to be one of tightening supply out until 2022, Image has placed itself well to leverage the sudden increase in production.

"Image launched the Boonanarring project at the bottom of the mineral sands commodity market (mid-2016)," Mr Mutz said.

"However Image's plan was to position the company to be in production and therefore in a position to benefit from a recovery of commodity prices.

"In hindsight, it appears Image chose wisely, as the zircon market in particular has increase substantially since mid-2016, and now that Image is an active mining company (since December 2018), we learn of a fundamental shortage of supply of zircon that currently is estimated to continue to at least the end of 2022."

This bodes well for Image, with predictions of strong zircon prices at current levels (or higher) for the foreseeable future and the company currently supplying up to 7pc of global supply into the market - with zircon representing up to 84pc of total revenue in the first quarter.

"A general shortage of supply of zircon will almost certainly keep upward pressure on zircon prices through this period," Mr Mutz said.

Reflecting on the newly found head grade, Mr Mutz said the zircon it contained was richer than anticipated by about 30 pc, which could see some exciting developments for the company in the second quarter and beyond.

"That's an anomaly," he said. "That's a value-adding quality."

"What we are learning now is that we underestimated the grade, we underestimated the zircon content so it's going to get better as we get a new ore reserve sometime in September."

ONLY ONE WAY TO MARKET AND THAT'S IN A STRAIGHT LINE.

MINE ROAD RAIL STORAGE PORT SHIP

Qube is proud to have assisted in the successful delivery of the Boonanarring project from mine to market.

> DESKTOP
> FEASIBILITY
> SOLUTION DEVELOPMENT
> SUPPLY CHAIN OPTIMISATION

QUBE

CALL +61 8 6141 1900 | EMAIL bulk@qube.com.au | WEB www.qube.com.au

Add value to your project

NATIONAL

FOR project management, engineering, construction management, design, and study work, ProjX add value to mining and resources projects.

A key example is Image Resources' Boonanarring project where ProjX were engaged to fill the pivotal role as the Owner's Project Execution Management Team.

ProjX provided the complete project and construction management team, carrying out detailed execution phase engineering and design, as well as managing the project commissioning efforts.

"Notably, the Boonanarring project was an empty paddock when we took it on, and seven months later, we were commissioning a complex mining and processing facility." ProjX director Clint Macri said.

"We are still closely involved with Image Resources and the Boonanarring site, with several design and execute projects currently underway."

Mr Macri said the company's extensive experience in mineral sands has resulted in numerous successful projects for key mineral sands players like Iluka Resources, VRX Silica, MZI Resources, and others.

Beyond mineral sands, the company also has extensive experience in bulk materials handling plant and infrastructure design and construction, servicing clients across multiple resource markets such as gold, salt, iron ore, nickel and coal.

For more information about how ProjX can add value to your project visit: www.projxco.com

"We currently work for a number of other mining and resources companies, both in exploration and operation, notably salt producers Shark Bay Resources, who we have worked with for more than 10 years with great success, and we have a number of current study and design projects underway with them," Mr Macri said.

"We have also provided project and construction management services and resources to a number of Tier 1 contracting companies within the country with great outcomes and lasting relationships."

With extensive in-house capabilities, and access to the very best sub-consultants and contractors in the industry, ProjX offers clients absolute peace of mind that their project is resourced and managed seamlessly by a specialised team of industry professionals.

BLUE SKY MINING

Project Blue offers a holistic approach to FIFO accommodation, focusing on design, spatial layout, urban design and mine site camp lifestyle.

NATIONAL

IT could be the calming sensation you feel when you walk in the front door of your home and kick off your shoes, or sense of camaraderie you feel at your local sport club, or any attachment you feel to a place that reflects your identity – a sense of place can mean many things.

It is something that architects and interior designers try to incorporate into their designs, and there is extensive research that shows not only how a positive attachment to the place where we live is important to identity, but that the absence of this connection can be devastating to mental health.

A sense of place is not something normally associated with the clinical, sterile accommodation of Australia's FIFO sector, but one WA collective is hoping to change that.

Project Blue was formed by interior design firm Seven Willows, commercial furniture manufacturer the Robinson Group and construction company Grounded Construction, after a meeting with a mining client who raised concerns about just how bad the accommodation on site could be.

Sharon Wiley from Seven Willows said that the focus had been to make a conceptual shift toward the way mining companies think about the accommodation they provide.

"We want to make a difference, and to improve mental health on the mine site by focussing on certain attributes, speaking to the right people, and by designing projects with mental health in mind," she said.

Project Blue can fit out or retrofit FIFO accommodation from concept and design through to manufacture and installation.

"FIFO workers are on-site 12 hours per day; when they come off shift they need to feel human, not like a wheel or a cog in a machine, they are a part of a wider community and they are making a difference," Ms Wiley said.

"They spend a large part of their lives away from loved ones and they need to feel a home environment."

Project Blue has social interaction at its core, and by creating common areas outside of the pub or the wet mess, Ms Wiley hopes to encourage social interaction and promote wellness.

And with more reading spaces and leisure areas, she hopes the design of the camps themselves can draw people out of their rooms to interact with one another.

"It's that third space, it's about the things that can help to stimulate you in calm and restful ways," she said.

"Everyone feels valued when they are a part of a community and they are not so isolated.

"That's the kind of message we want to send, and it's the kind of message we want mining companies to send."

Project Blue is officially launching on August 22 at the Laminex showroom in Perth, WA.

Meth, ice pose mines risk

RAY CHAN

THE use of illicit drugs such as methamphetamine and ice is unfortunately still rampant in WA, with WA Police recently estimating that West Australians now consume more than $27m worth of meth alone every week.

In fact, regional WA continued to have the highest rate of meth use nationally relative to population, with most of the substance coming into Australia from places such as China.

And mine sites are no exception. While regular testing of FIFO workers is commonplace, managers are now being urged to be aware that employees who use drugs may be developing strategies to hide their use of meth and ice.

According to two Perth clinical psychologists, Kerryn Ashford-Hatherly and Michael Tunnecliffe, who specialise in treating drug and alcohol addiction, some mine workers are now timing their drug use to avoid detection.

Ms Ashford-Hatherly and Mr Tunnecliffe are calling for better understanding of meth and ice addiction within the workplace, especially when it comes to safety critical environments.

They say many people fail to understand the pervasive brain-changing impact those drugs have on an individual, which often remain unseen until there's a crisis.

Generally, drug users will return to site having timed their last use so any testing regime will return a negative result.

The researchers warn that having the drug out of their system does not mean employees are fit for work.

"Five to seven days after drug use, the worker will go through a detox period where it is common for them to feel high levels of fatigue, nausea, headaches, cold and flu symptoms as well as difficulty in concentration and focus," they said.

"To manage their return to work, they will usually self-medicate these symptoms with either over-the-counter cold and flu medications, pain relief and excessive caffeine.

Actual Matrix group members showing their days of abstinence from drug use.

Kerryn Ashford-Hatherly and Michael Tunnecliffe of Ashcliffe Psychology.

"Sometimes, they will use prescription meds given to them from a third party. In other words, it is not their prescription medication, it is someone else's."

Ms Ashford-Hatherly and Mr Tunnecliffe spent seven years working with mining companies providing counselling, training, fitness for work and return to work assessments for employees.

They say their experience of the FIFO culture has equipped them with the knowledge and expertise to assist leaders and workers to understand drug use and treatment.

Mr Tunnecliffe said even when workers were mandated into treatment by their employer, there were misconceptions regarding the reduction of risk in the workplace.

"We have found in our treatment program that while some employees attend an initial information session, take away all the forms and use these to indicate to their employer they are getting treatment, they don't actually engage in the program," he said.

Employers also need to be aware the treatment of meth and ice can take up to two years before relapse potential decreases significantly and sleep patterns have stabilised.

Consequently, meth and ice users may be a fatigue risk.

They will have periods of wakefulness while using and this can be for periods up to two weeks at a time.

When they are "coming down" from the drug, the level of fatigue may be so significant some people can sleep for five days, only getting up to drink water and go to the toilet. Absenteeism is often high with meth and ice users.

"Meth and ice are very deceptive drugs. A person might only use meth or ice every few months and don't believe they have an addiction until they try to stop," Mr Tunnecliffe said.

"It can then become a vicious cycle of drug-taking and recovery in an ever-diminishing spiral that inevitably leads to family dysfunction, job loss, relationship break-ups and severe medical problems."

Ms Ashford-Hatherly and Mr Tunnecliffe believe a treatment program developed by the Matrix Institute in the USA offers a positive, neuroscience-based approach to assist people in recovery from addiction.

Both psychologists studied with the Matrix Institute in California and have adapted the US model to offer treatment in WA.

Ms Ashford-Hatherly said the Matrix Program is an intensive outpatient group treatment with four to eight participants at each session.

When FIFO workers are on shifts off, they attend the sessions in the Perth office. When on site, or if they live remotely, they can participate in the program via video link-up sessions.

Pretty in pink

RAY CHAN
WA

The six hero diamonds offered in the Tender collection.

RIO Tinto has unveiled its annual showcase of the world's rarest pink and red diamonds in an exclusive preview at the Argyle mine site in the east Kimberley region of WA.

The 64-diamond collection, including three Fancy Red diamonds and weighing 56.28 carats in total, make up the 2019 Argyle Pink Diamonds Tender.

Rio Tinto Copper and Diamonds chief executive Arnaud Soirat said the diamonds, each "a natural treasure", were a testament to the enormous range and depth of offering from the Argyle ore body, nearly four decades from when production commenced.

"Rio Tinto's Argyle mine is the first and only ongoing source of rare pink diamonds in history," he said.

"With the life cycle of this extraordinary mine approaching its end, we have seen, and continue to see, unstoppable demand for these truly limited-edition diamonds and strong value appreciation."

Mr Soirat also paid tribute to "the bold and innovative spirit of employees, communities, customers and suppliers and all those who have contributed to one of the great diamond mines of the world".

The 2019 Argyle Pink Diamonds Tender collection, titled "The Quest for the Absolute" comprises six hero diamonds:

Lot 1: Argyle Enigma, 1.75 carat modified radiant Fancy Red diamond

Lot 2: Argyle Amari, 1.48 carat heart shaped Fancy Vivid Purplish Pink diamond

Lot 3: Argyle Elysian, 1.20 carat modified cushion shaped Fancy Vivid Pink diamond

Lot 4: Argyle Verity, 1.37 carat oval shaped Fancy Vivid Purplish Pink diamond

Lot 5: Argyle Opus, 2.01 carat round shaped Fancy Intense Pink diamond

Lot 6: Argyle Avenoir, 1.07 carat oval shaped Fancy Red diamond

The 2019 Argyle Pink Diamonds Tender is being showcased in Perth, Hong Kong and New York, with bids closing on October 9, 2019.

Envelop products have mines covered

NATIONAL

CORROSION control is a major cost factor in mine maintenance with valuable equipment subject to adverse weather conditions and environmental degradation.

A revolutionary product, Envelop protective covers, were originally developed by NAVSEA for the US Navy and are now available for mine equipment.

Australian Pump Industries (Aussie Pumps), authorised distributors for Envelop covers, offers a complete cover solution that will protect these key assets from moisture, dust, UV light and heat.

The result is a massive reduction in maintenance hours spent cleaning and "rust busting".

Aussie Pumps chief engineer John Hales said traditional waterproof tarps and plastic covers often trap moisture with devastating results.

"The Envelop covers' unique design creates a micro-climate that slows corrosion, reducing maintenance and improving equipment readiness," he said.

Aussie Pumps has started supplying Envelop covers to big iron ore mines in the WA Pilbara, where monsoonal rain and frequent dust storms contribute to the corrosion of key assets.

Aussie Pumps also supplies Envelop protective covers to the Royal Australian Navy, leading to huge maintenance cost reductions on Australian ships including FFGs, Anzacs and Mine Hunters.

The company points out that there are big savings to be made on commercial assets, even those held in long term storage, where corrosion can be an issue.

Envelop covers use a unique and patented system that literally absorbs moisture from under the cover by "wicking" damp into absorbent layers which then sweat the water droplets through the outside cover.

Envelop covers have started rolling out to big iron ore projects in the Pilbara.

The outside layer is waterproof and acts as a rain shield, resulting in a controlled environment that keeps the asset dry and corrosion free.

That same technology has been applied to covers for the offshore drill rigs in the Gulf of Mexico, with substantial cost savings made.

Covers have been created for electrical control boxes, engines, hydraulic motors and pumps.

These high cost assets, critical for automated control and monitoring, are susceptible to corrosion caused by water intrusion, either from the elements or from periodic wash cycles required by adjacent power equipment.

Envelop covers shield equipment from the elements, keeping it dry, corrosion free, and eliminating the moisture build-up underneath the cover.

"Laboratory testing and field evaluations have resulted in up to 90 per cent reduction in corrosion", Mr Hales said.

"Field tests also showed substantial gains in protection of electrical components, optics and delicate navigation aids."

More information on Envelop covers and Aussie Pumps' range of products can be found at: www.aussiepumps.com.au.

Hands-on testing and sorting

NATIONAL

TOMRA is the leading ore sorting provider in the country, offering the only full-scale, indoor test centre for prospective customers to get hands-on with ore sorting and learn about TOMRA's unique technology and sensors.

In the past few years TOMRA's XRT technology has evolved from being able to just scan rocks down to an incredibly small detail of just 0.8mm, when just a few years ago 4mm was considered an impressive feat for the technology.

Ore soring is an increasingly prominent way for mine sites to maximise recovery and improve their processes.

In recent years a wide array of sensor technologies has emerged, each tailored to a different mineral or sorting application.

TOMRA has a range of highly advanced and automated sorting machines that utilise a number of different sensor technologies such as LASER, x-ray, infra-red, electromagnetic and colour that are able to sort ore before entering a processing stream.

TOMRA offers full-scale, indoor testing.

TOMRA's LASER and XRT technologies are able to achieve higher and higher resolutions of material as it goes through the machine at higher and higher speeds.

These and other technologies are at the forefront of mineral separation technology.

XRT scanning, possibly the most common type of ore scanning technology in mining applications, scans the internal mineralogy of the rock in minute detail, with X-ray penetration with the unique ability to show the makeup of particles within the rock.

LASER scanning is another popular method, particularly for the identification and subsequent grading of quartz or gold-bearing quartz via the diffusion, dispersion and diffraction of the LASER light through the material.

When implemented and operated correctly, ore sorting machines can greatly improve plant efficiency, reducing downstream crushing requirements and costs, and resulting in much improved grades.

It can even benefit the operator's carbon footprint since waste is rejected at an early stage, which in turn reduces the need to tailings treatment.

Tsurumi slurry pumps clears silted dams

NATIONAL

TSURUMI'S KRS slurry pumps, designed for the toughest slurry applications, are being applied at Australian mine sites to de-silt tailing dams.

The submersibles feature built-in high chromium agitators which stir up silt so it can be pumped out without the need to drain the pit.

Due to demand from mines, quarries and batch plants, the KRS series is now carried in stock by Tsurumi's distributor, Australian Pump Industries (Aussie Pumps).

Aussie Pumps product manager Neil Bennett said Tsurumi's KRS pumps are being used to remove the concentrated slurry from tailing dams in WA gold mines.

"The high chromium agitator stirs the silt that then passes through the pump so the dams don't need to be drained to be cleared," he said.

Tsurumi's KRS slurry pumps are powered by four pole 1450 rpm slow speed motors from 9.5kW to 34kW.

Available in 80mm to 200mm bore diameters, the pumps can deliver flows up to 4000 lpm and heads to 31m.

The pump bodies are manufactured from high-grade cast iron with a high chromium impeller and agitator for wear resistance.

The pumps feature all of Tsurumi's standard longevity attributes.

These include a unique anti-wicking cable entry that prevents water incursion due to capillary wicking should the power cable be damaged or the end submerged.

The cable entry is absolutely watertight.

The dual, double silicon carbide mechanical seal is completely enclosed in the oil chamber.

The seal is therefore always protected, cooled and lubricated by oil, thus eliminating spring failure caused by corrosion or abrasion.

And if that wasn't enough, Tsurumi added an oil lifter.

The oil lifter is a patented guide vane inside the oil chamber that ensures the mechanical seal is lubricated even if the oil level falls or the pump is installed at an angle.

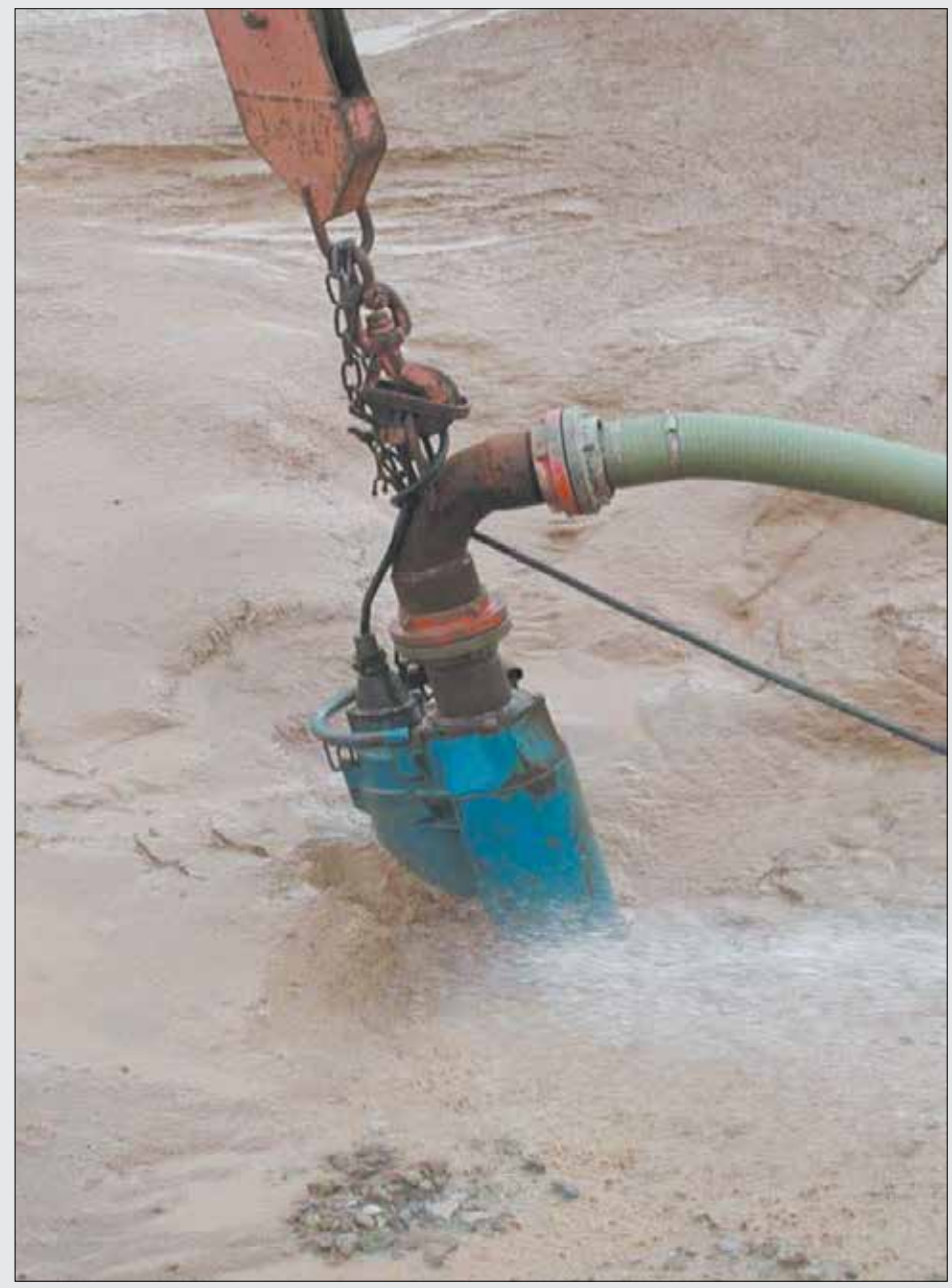
The top discharge design means that the liquid passes through the pump casing and cools the motor.

This means the pump doesn't have to be fully submerged or even installed vertically.

"Tsurumi's KRS series can link its heritage back to major projects of land reclamation carried out in Japan over the last 50 years," Mr Bennett said.

"The pumps are built with Tsurumi's fanatical approach to quality and shows their passion for products that won't quit."

Further information on the Aussie Pump Tsurumi series is readily available from Aussie Pumps, Aussie Pump mining partners throughout Australia, or www.aussiepumps.com.au.



Tsurumi's KRS pumps remove the concentrated slurry from tailing dams.

Solid wheels, solid reputation

NATIONAL

BIG Tyre has been manufacturing mining wheels in Australia for more than 20 years and has built a reputation as solid as its tyres.

According to Big Tyre chief executive officer, Dan Louden, what sets the company apart are its quality, reliability, custom design and problem-solving capabilities.

"We use the highest quality rubber we can buy to create a long-lasting product," he said.

"We have the capability to design according to the load specifications and other desired features to suit bespoke applications. "Plus, we are problem solvers. "

"We will meet the customers' needs for their particular site, whether that's unusual load and size requirements or solving issues like preventing a poorly fitted chain from slipping off the wheel and damaging the brake line."

Big Tyre has watched with interest as its competitors have copied some of its innovative modifications such as protective side wall plates that significantly improve the wheel's longevity.

Big Tyre chief executive officer Dan Louden.

One innovative solution the Big Tyre team is proud of, is adding a stainless-steel centre to the naive plate to prevent the wheel from seizing onto the hub in particularly corrosive environments.

"Before we provided this solution to one of our mining clients, their wheels sometimes had to be removed by cutting them off the hub with an oxy," Mr Louden said.

Big Tyre's solid wheels have a range of benefits for mining applications, most importantly safety (no risk of tyre blow-out) and reliability, which means they are cost-effective with a long tread life compared to pneumatics.

"We've got the quality, warranty and the reputation that stands by our product," Mr Louden said.

"That's why we're the preferred supplier to multiple global original equipment manufacturers and mining equipment hire companies and have our products used in over 50 countries around the world."

More information about Big Tyre can be found at: www.bigtyre.com.au.

Restructure strengthens Titan

NATIONAL

LEADING tyre and wheel specialist Titan Australia has recently restructured its operations in Australia, resulting in changes to certain aspects of the business focused on aligning the company's core strengths to meet the needs of their customers across Australia.

Titan Australia has transferred all operations in NSW to its Muswellbrook facility in the Hunter Valley, where its off-the-road wheel and tyre management services provide support to a wide range of customers in the region.

This move is designed to bring Titan closer to its customers, reduce turnaround times, and to streamline the supply chain and logistics.

In the Northwest and Goldfields regions of WA, Titan Australia will no longer maintain a physical presence in Kalgoorlie, Karratha or Port Hedland.

A Titan spokesman said that while doors were closed at these branches with a heavy heart, these locations had evolved as mainly retail outlets, which is not core business for Titan Australia.

Titan reinforces to customers in the Northwest and Goldfields that it remains heavily invested in servicing these areas with a dedicated customer management team, supported by a state-of-the-art warehousing and logistics distribution hub in Perth, and a nominated third party tyre-fitting provider.

ITM Mining Pty Ltd (ITM Mining) has been established as a separate legal entity to fully exploit the growth opportunities in the Australian market for ITM undercarriage products and services.

Titan remains heavily invested in servicing areas with a dedicated customer management team and a nominated third party tyre-fitting provider.

From a day-to-day perspective, it will be business as usual, with current services continuing to be provided from existing Titan Australia facilities.

The changes strengthen Titan Australia's core business, allowing it to focus on its main manufacturing and service hubs in Mildura, Brisbane, Emerald, Newcastle and Perth.

As a proudly Australia company, producing Australian products for Australian conditions using Australian steel, Titan Australia looks forward to continuing to provide customers with the products and services they need to support their businesses for many years to come.

MRA laser precision to stop ship collision

NATIONAL

CONCERNS for personnel safety and the cost of damage to valuable equipment and operational downtimes were the key drivers for Port Waratah to work with MRA on an automated, ship loader anti-collision system.

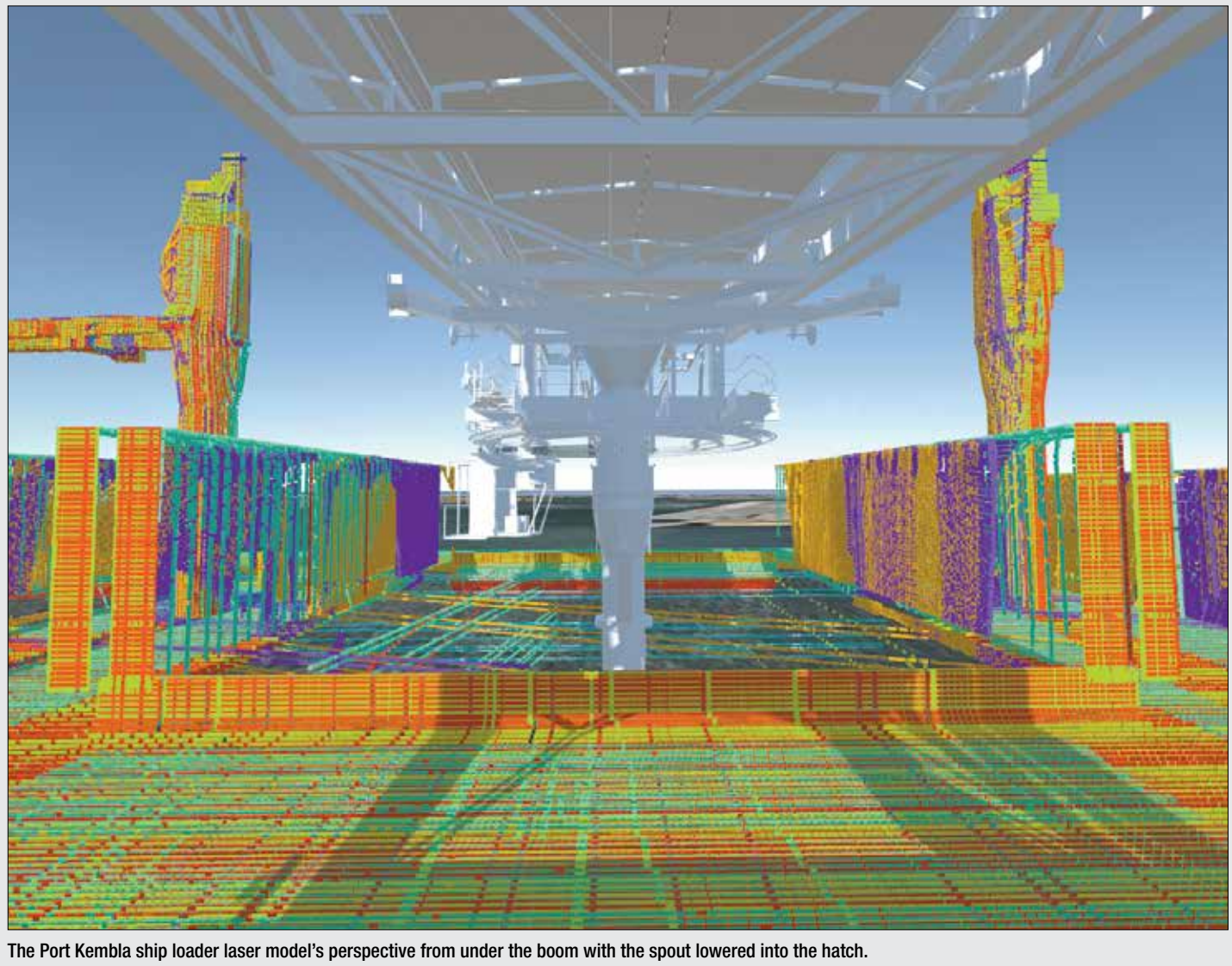
Installed in 2018, MRA's Smart Ship Loader Anti-Collision System (SLAC) uses laser technology and smart analytics to build a real-time protection zone surrounding the ship loader's boom and shuttle, its spout or spoon and operator cabin.

MRA engineering manager Peter McPherson said data from seven lasers is used to create a highly-accurate, real-time model of the vessel and ship loader.

"Rather than just knowing that some object broke a laser beam, the SLAC provides situational awareness," he said.

"Any object entering or nearing this dynamically defined zone can be identified and as appropriate, trigger warnings and action within the PLC."

The SLAC works with all major vessel classes, bridge configurations and hatch types, including butterfly and horizontal; and accounts for any deck gear such as cranes, hoists and light poles.


The Port Kembla ship loader laser model's perspective from under the boom with the spout lowered into the hatch.

A valuable feature is the 3D Visualisation Playback that enables a site to review past activity.

MRA general manager Rod Devetak said the company was investing significant resources into enhancing SLAC, and plans to support automatic hatch relocation.

"In 58 months of active operations across Port Waratah and Port Kembla, there has been zero collision incidents," he said.

"We see the automation of operations at the ship loader as the next frontier in materials handling."

McElligotts the master blasters

NATIONAL

ESTABLISHED by John and Jim McElligott in 1954, McElligotts has been operating in the remedial construction and protective coatings industries for more than 65 years.

The McElligotts team is qualified in abrasive blasting and protective coating applications and will ensure clients assets have the required preparation and end protection to ensure a quality product with a suitable life expectancy.

The company offers on-site and off-site abrasive blasting, and its equipment allows it to clean and prepare nearly any material in any texture desired.

Removing corrosion and contaminants correctly is vital before abrasive painting or protective coating can be applied.

McElligotts' team of certified abrasive blasters and painters have taken on all levels of corrosion across a wide array of industrial equipment and infrastructure.

Depending on the environment, scale of damage and type of metal/alloy, the company will identify the right blasting media that adequately removes rust, maintains durability, and doesn't harm the environment.

The company has robotic systems for selected abrasive blasting purposes and can source a multitude of different blasting media suited to various applications.

McElligotts can conduct abrasive blasting on-site or at its specialised facilities.

Plus, the company has extensive experience in transporting larger items requiring off-site abrasive blasting, and can organise transport for everything from mining conveyor belts through to wind turbine components.

McElligotts can also assist with abrasive painting, whether it is the removal of any rough edges, or to vary the grit level to get the exact surface texture desired before adding a high-quality colour of your choice.

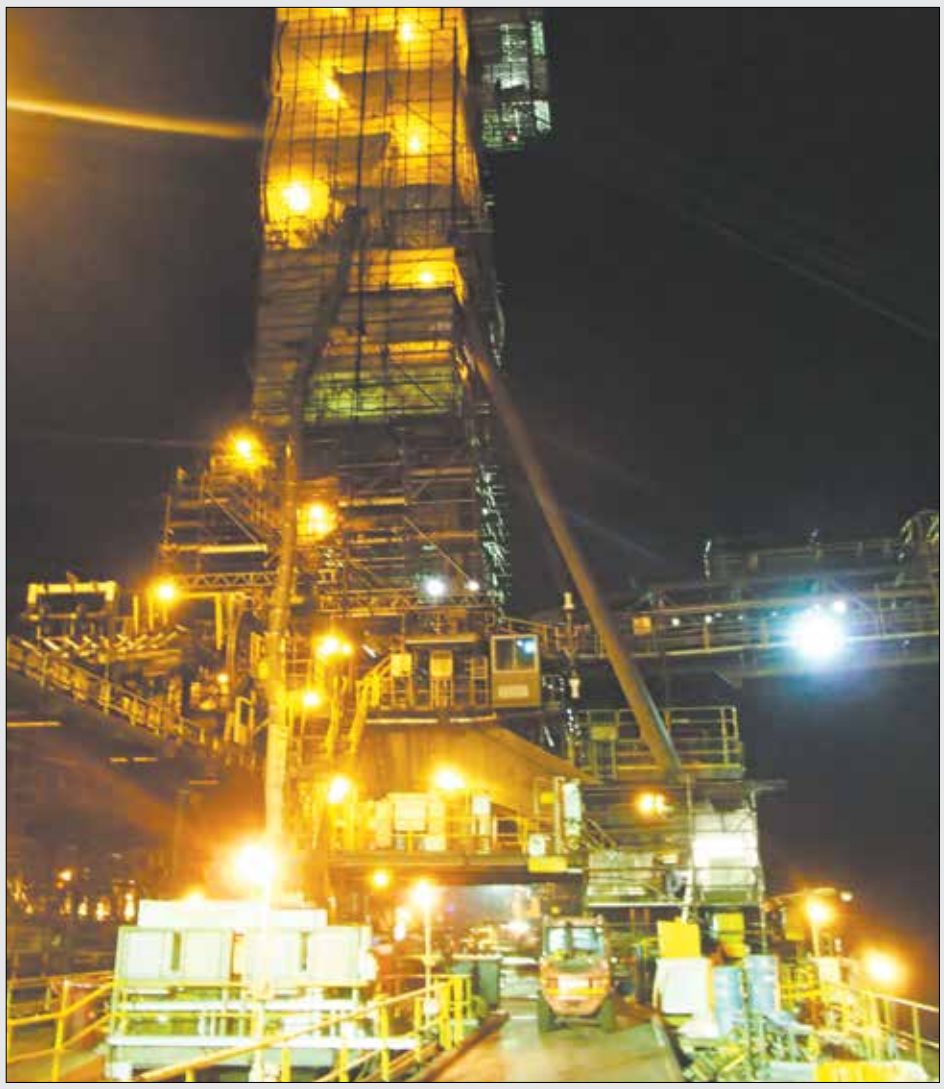
Once the new coloured coats are applied, the company can complete the job with additional protective coatings designed to extend the life further.

McElligotts' team have obtained the highest levels of certification in surface preparation and protective coatings, and are trained in a range of specialised protective coating products.

This allows it to identify the right coating product for your structure and equipment in your intended environment.

McElligotts have operating facilities in Queensland, Tasmania, Victoria and New South Wales.

If you require abrasive blasting, sandblasting or protective painting for your structure and equipment, please get in touch with the company today.



McElligotts provides comprehensive abrasive painting, sandblasting and abrasive blasting services across Australia.

Innovative engineering solutions

NATIONAL

W Granowski's heritage is engineering, and its philosophy is to innovate.

FOR three generations, W Granowski has been one of Australia's foremost experts in surface preparation technologies, supplying abrasive blast and degreasing equipment, consumables, and replacement parts to suit a wide range of industrial applications.

It fabricates both wet and dry air blast machines and airless wheel blast and peening machines to clean and prepare product – whatever the size, shape, or condition.

W Granowski managing director Caitlin Granowski said while the company's heritage is engineering, its philosophy is to innovate.

"We create innovative engineering solutions," she said.

"Our ability to implement them in projects and further develop them based on operational requirements benefits a variety of industries."

"Our advanced engineering services, including digital manufacturing, optimization analysis and design for manufacture, are meticulous in detail and provide efficient solutions and sustainable results.

"We also believe it is the quality of advice that makes us different – whether that advice is around the type of abrasive needed for a particular application, or a task-specific engineering solution, we have both contemporary experience and 90 years of data to draw upon."

W Granowski's experience sets it apart, having manufactured and serviced thousands of machines across all industry segments, in both the domestic and overseas markets.

"Our machines are designed and manufactured in our Melbourne facility and comply with all Australian design and safety standards," Ms Granowski said.

"With 95pc of our customers providing repeat business, we pride ourselves on partnering with local industry.

Whether the environment is high volume mass production or low volume jobbing-shop, we work with each customer to identify the blast solution to suit their application."

Ms Granowski says the company specialises in custom-built equipment.

"We can adapt or remodel a standard machine – such as a wet blast cabinet with a custom designed loading mechanism" she said, "but what we excel at, and most enjoy, is to design and manufacture for special purpose – such as providing a progressive blast solution for carbon fibre."

No job is too big or too small, no component is too difficult to process or application impossible to achieve: the Granowski team strives to get the finish needed.

"Our trademark robust build and machine reliability is key to our success," Ms Granowski said.

For more information on W Grabowski visit: www.granowski.com.au.

LEADERS IN BLAST TECHNOLOGY FOR 90 YEARS

GRANOWSKI

W Granowski is expert in surface preparation technologies, producing both peening / abrasive blast and degreasing equipment to suit a wide range of industrial applications.

Whether it's advice around the type of abrasive needed for your project or an engineered solution to a task-specific problem - we will partner with you to project's end.

+61 3 9729 4333
wgmailbox@granowski.com.au
www.granowski.com.au

Protoblast is an Australian-owned and run family business, operating since 1974.

The whole package with Protoblast

NATIONAL

THE Protoblast story starts in 1974, when it was part of a large, well-known surface preparation and coating industry based in Sydney where John Gillies was a leading engineer.

Mr Gillies saw the potential and purchased the name and rights to the product and the company has been moving forward ever since.

Protoblast is now being guided by the third generation, with the same values and passion with which it was started.

All equipment is manufactured in-house in Picton, NSW, and supplied all through Australia, New Zealand and PNG, and the company has equipment operating in the USA and UAE.

It has established itself as a market leader in the abrasive blasting and surface preparation industry, as well as in the manufacture of abrasive blast chambers, abrasive recovery and recycling systems and customised airless blasting machines.

The Protoblast advantage comes from its end-to-end custom design and build ability.

The company can work with customers from the start through design, customisation, manufacturing, delivery, installation and maintenance.

The advantage doesn't stop there, with the Protoblast system delivering the best return on investment through lower operating costs and superior reliability.

This lower operating cost and reliability is made possible through the use of the Protoblast Oscillating Conveyor and Bucket Elevator/Abrasive Classifier system.

In comparison to other abrasive recycling systems available, the Protoblast method delivers savings every day of operation.

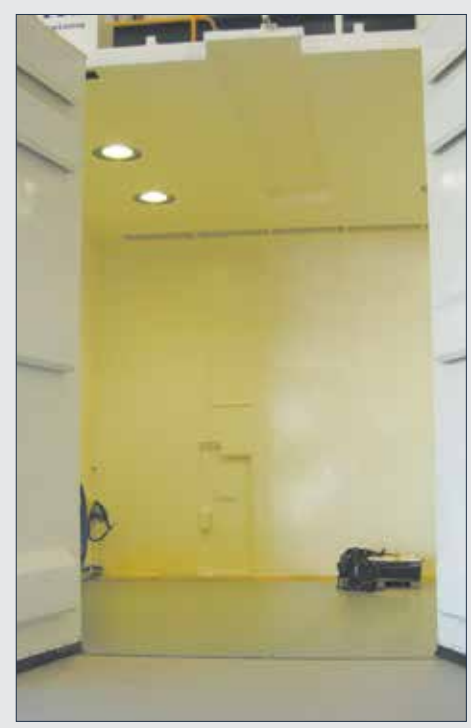
For three generations, the company has been known for its ability to see customers' need or issues, and come up with a solution that provides the best return on investment.

Protoblast machinery is designed and built to provide low cost operation for more than 20 years, with some of its original machines still on operation.

With Protoblast, clients get the whole package – from the personal service of a family-owned company, through to the maintenance and backup support of an industry leader.

Protoblast has built machines to blast many products such as building screws, surfboards, railway lines, structural steel, large carbon anodes for aluminium smelters, truck bodies, large curved plates and many more.

For more information call: (02) 4677 2320.



HARTECH
PTY LTD

ONE STOP
CORROSION
SHOP

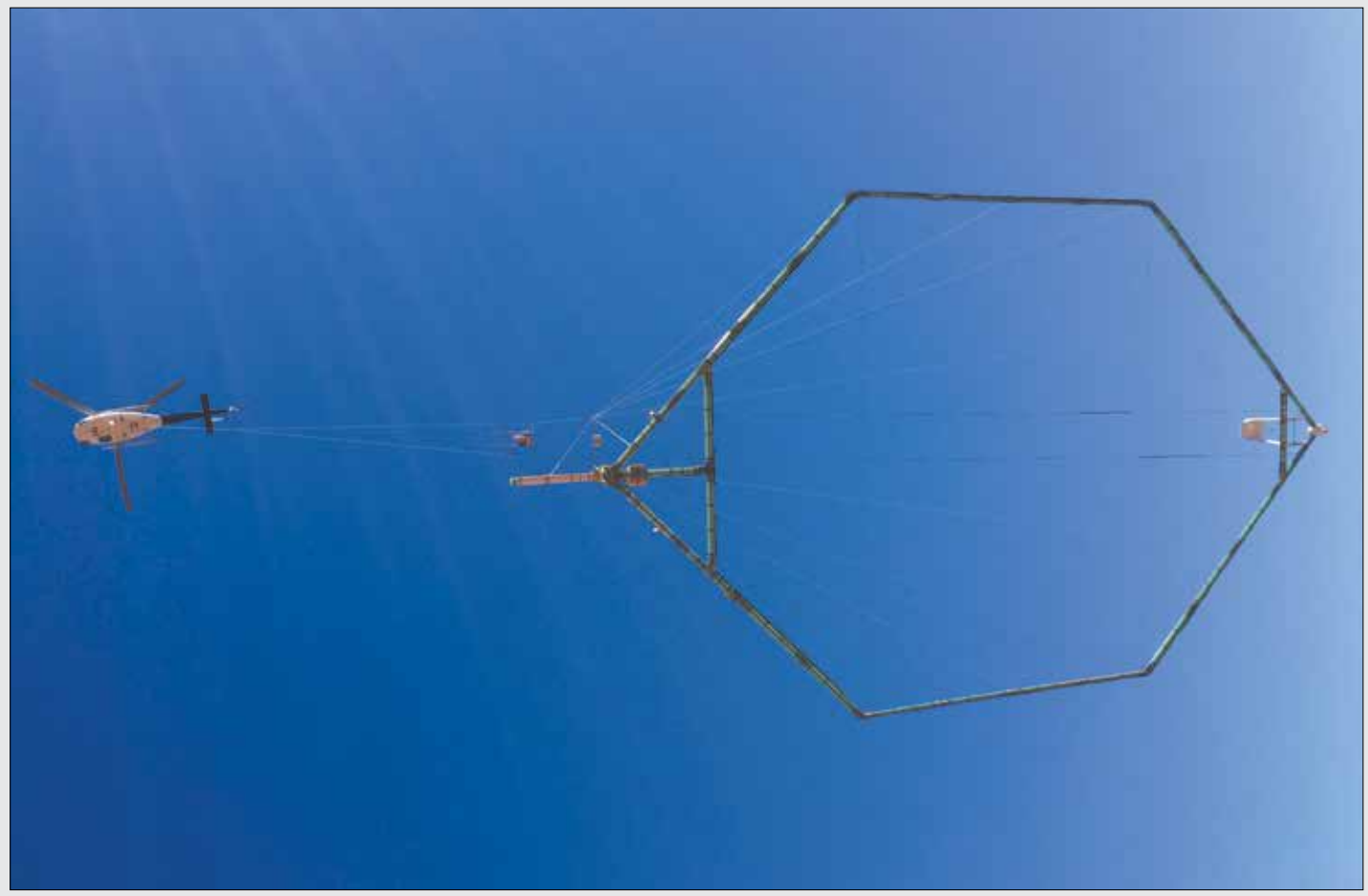
ABRASIVE BLASTING
*
INDUSTRIAL COATINGS
*
POWDER COATING
*
GALVANISING SERVICE
*
CORROSION CONTROL
*
ONSITE WORKS

08 8340 3477
P. 08 8340 3477
E. hartech@bigpond.com
M. 0409 695 469
hartechptyltd.com.au

Unit 7, 34 Adam St, Hindmarsh SA 5007
PO Box 193 Willaston SA 5118

The trusted helicopter company

NATIONAL



United Aero Helicopters is one of the preferred helicopter service providers for low level airborne geophysical surveys in Australia.

UNITED Aero Helicopters has long been synonymous with airborne geophysical surveys and the helicopter provider of choice for most survey companies currently exploring in Australia and the region.

Being one of the most experienced aerial work providers in Australia with a large modern fleet of helicopters ensures the company can continuously meet and exceed customers' expectations.

From the beginning, low level airborne surveys have been an integral part of United Aero Helicopters' core competencies, which is why it has a reputation for providing the best low level survey pilots in the industry.

The range of services offered by United Aero Helicopters includes remote area operations, geological mapping and heritage surveys, seismic, camp resupply and cargo relocation, aerial construction, gas and utility inspections, emergency services contracts including medevac and firefighting, using winch-equipped search and rescue helicopters as well as VIP IFR charter operations.

Complementing these services is United Aero Helicopters' in-house Part 141 flight training school, as well as its maintenance organisation, Aerofix, with engineers who travel to remote areas when required and diligently perform complex maintenance tasks to ensure aircraft are continuously airworthy – minimising downtime.

Pilot training is also a key factor in United Aero Helicopters' consistent success in providing quality airborne survey flying.

Having experienced survey pilots will not only significantly improve data quality and improve production by reducing costly re-flights, but will also greatly enhance safety performance and offer additional redundancies in controlling risk.

It is a formula which is hard to emulate as it takes years to build up this expertise and experience.

United Aero Helicopters, with bases in Sydney, Melbourne, Brisbane, Adelaide and Perth, further expanded its WA operations in 2018 by opening an operational base in Newman to service its existing and new customers in the Pilbara and northern WA.

An AS350 B3 Squirrel is permanently based at Newman, with multiple further helicopters based throughout WA.

Helicopters can be reconfigured to suit clients' needs, be it with an external cargo basket, water bucket for firefighting, or medical stretcher kit.

Other aircraft types available at short notice from any of its bases include the ambulance-equipped IFR twin engine BK117-C1.

Aerial work specialist with remote area helicopter and fixed-wing operations across Australia and the Asia Pacific region

united aero helicopters

MINING / EXPLORATION SUPPORT • AERIAL SURVEY / INSPECTION • MEDEVAC / RESCUE / DISASTER RELIEF • HELICOPTER MAINTENANCE • BARS GOLD ACCREDITATION • IAGSA MEMBER

(02) 4655 3040 info@unitedaero.com.au unitedaero.com.au

PERTH | NEWMAN | SYDNEY | MELBOURNE | ADELAIDE | BRISBANE

Andromeda a shining star

NATIONAL

ANDROMEDA Industries has established itself as an innovator in the wire rope industry in Australia and was a finalist in the Tamworth 2019 Quality Business Awards, in two categories, Excellence in Innovation and Excellence in Customer Service in Manufacturing/Construction and Rural division.

Andromeda general manager Annette Williams said she believes the company was a finalist because it is at the forefront of manufacturing Superflex cables, and has been the only manufacturer of this type of cable worldwide.

"Its special field is the design and manufacture of plaited and woven steel cables for rigging gear and terminal systems for these cables," Mrs Williams said.

"The base products were originally invented by Andromeda in the 1970's for specific municipal council requirements in the electrical field.

"These products have been adapted, improved and product range increased over time to today, from that first product to now, they have always been well received by the market as they minimise risk to construction workers lives and last longer compared to other products. "These factors alone outweigh the added cost for quality."

Mrs Williams said innovation has always been key to the company's growth and development, with the original design and manufacture of Superflex cable being the catalyst for a multitude of products.

Superflex cables are known for its flexibility, impeccable quality and strength for mining applications.

"The goal is now to adapting Superflex to competing in an entirely new age where some slings are now made from high tech ultra-light weight fibres," she said.

"Andromeda has adapted Superflex to this new age by increasing the cable size and capacity enabling supply of slings capable of lifting upwards of 300t.

"Andromeda is proud of its products contributing to added safety to building sites, mines and offshore oil and gas rigs around the world.

"This also contributes high benchmark standards in the rigging industry to ensure lower quality and less safe products are not considered by companies doing the work onsite.

"As rigging work is very repetitive with riggers using the slings up to several hundred times a day depending upon the job, they are sensitive to the way the slings perform. Our products are easily handled leading to higher safety and efficiency of their work."

For more information on Superflex cables visit: www.andromedaindustries.com.au.

RJE's track record is proven with some of the biggest names in mining.

Underground cabling specialists

NATIONAL

FOR more than 15 years, RJE Global has been a market leader in the supply and installation of trenched cables solutions.

Having pioneered cabling handling and installation techniques using purpose-built mobile equipment (primarily to service the renewable energy sector), RJE Global has taken smarter cable installation solutions underground.

In recent years the company has installed thousands of kilometers of trenched medium and high voltage cable.

The efficiencies RJE has been able to achieve now make many trenched cable solutions cost-competitive when compared with overhead cable installations.

RJE Global's resources division has a strong presence nationally and significant operations in Mongolia (through RJE Mongolia).

RJE Global is familiar with the challenges of working in underground mines, having undertaken many major underground projects.

Utilising its surface cable management techniques, RJE has been able to comfortably install in excess of 500m per shift of large multicore armored high voltage cable along underground drives.

In addition to efficient cable install, RJE Global provides complete turnkey solutions for electrical and control system works from engineering and design, through to site installation and commissioning.

RJE Gobal is able to self-deliver the supply and installation of substations (including large transportable switch/control rooms up to 132kV) as well as an extensive array of transportable modular equipment including diesel fuels systems.

If an overhead cable install is the answer, RJE Global can also self-deliver power line design and installations of to 132kV.

RJE offers unparalleled expertise in the supply and installation of cables for the mining industry.

With more than 350 dedicated employees, a seven-acre manufacturing facility located central to its national customer base in South Australia, and a 25-year history of delivering large heavy industry projects, RJE Global is the complete design and construction electrical solution.

RJE's point of different and core strength as an engineering and construction company is evident in its expertise and proven track record in the mining, energy and renewables sectors.

RJE's drive for innovative solutions led the company to implementing IEC standards on an unprecedented scale for major power infrastructure, well before Australian companies seriously considered these ground breaking solutions.

RJE is always looking to implement progressive solutions to give its projects and, ultimately, its customers, a distinct advantage in an ever changing industry.

RJE understands the challenges of dealing in isolated, remote areas, which has filtered through all levels of its designs, and led RJE to develop significant modular products which cut site-build costs, and minimise project start-up capital.

Providing innovative solutions and risk-averse, turn-key deliverables is RJE's point of difference and has led to its success and diversification, and the company's ability to deliver all elements throughout large, remote projects for multinational "world's best" resource companies, is proven.

RJE provides everything from initial project ideas to full operations, both within Australia and internationally.

Strong values underpin everything at RJE, and the company credits these values as the cornerstone of its success.

RJE has earned a proud reputation for building collaborative partnerships with its clients through open communication and transparency, along with an emphasis on responsiveness and agility to meet the needs and objectives of every project.

Ultimately, it has enabled the company to gain clients' trust and confidence in the delivery of outstanding results.

No problem is too large, small or difficult for the RJE team. It constantly strives to solve clients' challenges, and delivers smarter engineering solutions in a pragmatic and uncomplicated manner.

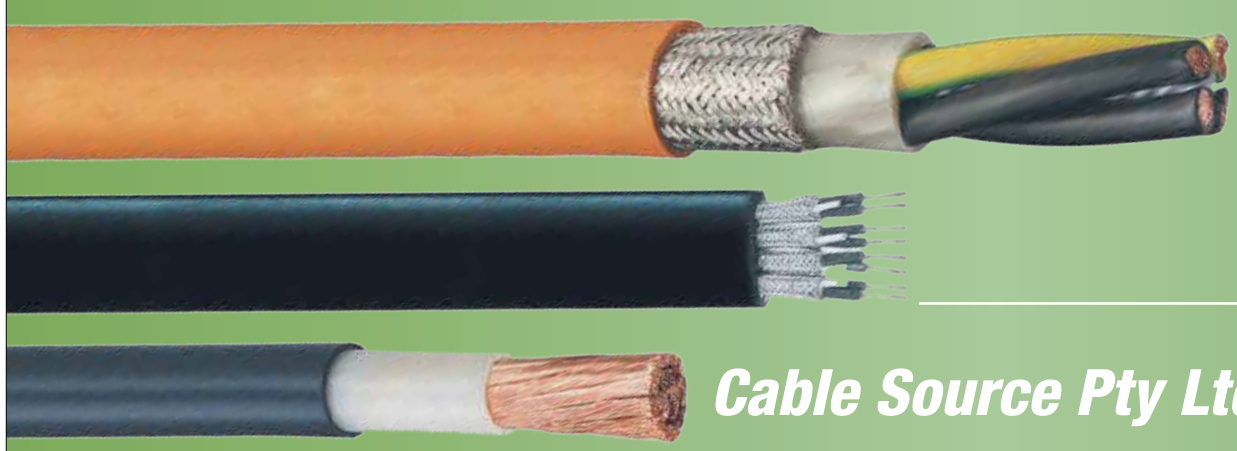
RJE

Smarter
Engineering

Designed smarter
Built smarter
Delivered smarter
Commissioned smarter

RJE Global provide multi-discipline engineering and construction services to complex projects worldwide.

rjeglobal.com



Cable Source Pty Ltd

Cable Source Pty Ltd

Cable Source is a manufacturer and distributer of Heavy Duty Flexible Rubber and Control Cables, EMC Cables, SWA Instrumentation, HDPE Underground Cables, Fire Rated, LSZH and Fibre Optic Cables.

If any special cables are required to be manufactured, we can offer low minimum quantities and extremely fast production times.

Cable Source Pty Ltd

Cable Source now has a range of outdoor cabinets to house sophisticated electronic equipment, such as computers and servers, fibre optic devices, routers, switches, UPS units and surveillance devices.

In an ever changing technological world, this range of cabinets ensures any sensitive equipment is safeguarded from the harshest conditions.

www.cablesource.com.au | sales@cablesource.com.au +61 1300 099 989

BE AT THE FINGERTIPS OF EVERY MINESITE OPERATOR AUSTRALIA WIDE

Join **Mine Suppliers Online** and be seen by mine operators all over the country.

Our comprehensive directory is the one stop when looking for services on the go.

- List your company details, logo and services
- Boost your own website SEO and expand your presence
- Be contacted directly via our instant messaging system
- Expand your online presence

Get a listing today!

Mine Suppliers Online CALL 0407 271 600 neil@australianminingreview.com.au www.minesuppliersonline.com.au

MAK Water's extensive fleet hire can service all water needs for short to medium term projects.

Water treatment plants for hire

NATIONAL

SHORT to medium term water needs can be met effectively by hiring water filtration and treatment plants.

MAK Water's versatile filtration plants can suit applications from 10cum per day to several thousand per day.

Typically, MAK Water's filtration plants are used for drinking water in compliance with the Australian Drinking Water Guidelines, and include pre-filtration and disinfection.

They can also be modified for other applications such as de-watering and the provision of process water.

The plants are generally containerised, which means that all they need is a feed water supply and power, and so they can be set up within a matter of hours.

MAK Water also operates a hire fleet of modular sewage/wastewater treatment plants that are designed for the versatile applications of mining treating from 10 to 200cum per day of standard strength sewage.

A temporary water treatment plant can be used for construction projects, plant commissioning, planned outages, equipment replacement, equipment failure, extra capacity and many more applications.

MAK Water understands the often urgent nature of hire projects and moves fast to review client water quality data and to enable the rapid deployment of the best possible equipment solution.

Typically, MAK Water offers short term usage solutions of up to 18 months, however longer-term arrangements can be accommodated.

The company can supply within two weeks from receipt of firm commitment, depending on availability at the time of the order.

Home to the most efficient, innovative water treatment solutions in Australia

mak water
The Smart Water People
water | wastewater | sewage

Products and Equipment

- Desalination / Reverse Osmosis
- Filtration
- Wastewater Treatment

Typical uses

- Temporary drinking water supply
- Construction water for projects that will require additional water during construction, but not be required for ongoing operations
- Site dewatering
- Safe environmental discharge of a contaminated source
- To cover system outages for planned and emergency outages
- Disaster and emergency relief to supply safe drinking water and sewage treatment following natural disasters and emergencies

(08) 9249 8007
www.makwater.com.au

MAK Water's Industrial Water Hire Solutions for short-term or long-term lease are available. Our hire fleet may be the solution to your temporary water treatment needs.

Superior customer service is KPL's primary focus.

Complete filtration solutions

NATIONAL

KPL Filtration is an Australian-owned and based company offering full-service filtration and comprehensive technical support, keeping clients' lubricants clean and ensuring the improved and prolonged performance of its clients' equipment, with a focus on revival, rather than replacement.

With superior customer service at the heart of what they do, the team at KPL strives for continued growth in the AUS/Asia Pacific oil, gas and mining industry, and prioritises environmental practices through its ISO accreditation.

As such, KPL understands that each client's needs are different, and works to provide tailored solutions specific to the needs of each client.

During its 40 years in the industry, KPL has partnered with businesses of all sizes, and has assisted them to reduce their overall maintenance costs by incorporating preventative maintenance and technical support programs to future-proof their lubricant and fuel requirements.

Any business that utilises lubricants and fuel in their equipment will benefit from the products and services that KPL offer.

With tailored options for any business, KPL is as customer-centric as it gets.

Orange Filters supplies filters and all other consumables necessary.

Fully tailored filter service

NATIONAL

FILTERS are an essential part of most services executed on fixed and mobile equipment, and can range from standard filter replacements to change-outs of entire filtration systems.

Orange Filters is a one-stop shop supplying individual filters, complete filter kits and all other consumables necessary, offering a fully tailored service.

Whatever the requirement – large or small – Orange Filters consistently deliver to clients fit-for-purpose solutions to the highest possible standard.

The company can source, supply or build specifically to client needs using OEM or aftermarket filters.

Orange Filters stocks air filters, fuel filters, oil filters, cab filters, transmission filters, hydraulic filters and more.

With the company's state-of-the-art cross-referencing tool, Orange Filters can locate any current part number and provide customers the most cost effective alternative.

With a large range of stock held in Perth, Orange Filters can process both stock and emergency orders.

Even if you're not sure what parts you need, Orange Filters can still help.

Simply provide your asset details and it will help you find them.

Contact the team today on 1300 202 400 or help@orangefilters.com.au

Customised filtration systems

NATIONAL

DIX Engineering's experienced team has an international reputation for excellence in the field of engineering, completing projects in Australia, Asia, North and South America and Europe.

The company is constantly evolving the business to meet customer and market conditions and offers specialised filtration systems for the mining industry.

Dix's stainless-steel screen filters are manufactured from high-strength 304-grade stainless steel as standard, and 316 on request, which ensures exceptional corrosion and wear resistance, providing many years of reliable service for the cleaning of process and waste water.

The eight standard screen filters in Dix's range caterer for flows from 375l per minute to as high as 10,000lpm, and can be manifolded together for higher flow rates.

All screen filters are fitted with manual or automatically operated brushes for flushing.

Every filter is hydrostatically tested to twice its normal operating pressures before leaving the factory.

10,000lpm manifolded filters.

Dix Engineering also has a range of media filters.

Filtration is achieved by forcing water through a media bed of sand or gravel, with filtration rates as low as 20 microns or less achievable depending on media used.

These stainless-steel tanks are available in sizes ranging from 230mm to 1200mm diameters and can come in modular form to meet customer specifications.

Dix Engineering store and sales manager Steve Watson said the range of Azud filtration systems is also distributed, extending the range of screen and media filtration systems, "with automatic disc filtration systems and Azud Luxson suction scanner filters available".

The company offers an extensive range of 316 stainless steel repair bands and cast irrigation fittings, at competitive prices around the country.

Special fittings can also be designed and manufactured to order, either fabricated or cast in the Renmark foundry.

Dix Engineering also provides fabrication and installation services and has recently purchased a state-of-the-art fully computerised plasma cutter capable of cutting mild steel and stainless steel with high definition, precision and accuracy.

More information can be found at www.dixrenmark.com.au.

SERVING AUSTRALIA
FOR MORE THAN 90 YEARS.

FILTRATION SYSTEMS, SCREEN, DISC, SUCTION SCANNER, MEDIA TANKS, HYDRO CYCLONES, LINE BORING, DESIGN, FABRICATION, S/S REPAIR BANDS, S/S TAPPING BANDS, FOOT VALVES, CAST TAPPING SADDLES, STAINLESS STEEL AND MILD STEEL FABRICATION.

CALL US FOR ALL YOUR ENGINEERING REQUIREMENTS.

08 85861500
dix@dixrenmark.com.au
dixrenmark.com.au

DIX Engineering

CERTIFIED UNDER AS/NZS ISO 9001

Tanks West is WA's premier manufacturer of moulded fibreglass (FRP) tanks.

The liquid storage experts

NATIONAL

SUPPLYING the WA mining industry for more than 20 years, Tank West makes tanks which are designed to requirement for a variety of mining and industrial applications.

The company works closely with its clients to determine exact project specifications, supplying tanks with capacities from 450 litres to 65KL for aggressive and non-aggressive liquids.

While standard tanks are designed for potable water, a wide range of effluents, flocculents and reagents can also be accommodated.

Tanks West is WA's premier manufacturer of moulded fibreglass (FRP) tanks, providing the best solutions for liquid storage and handling.

The company can assist with project designs, consult on chemical compatibility and area-specific hazards related to temperature and UV exposure.

The tanks can be hydrostatically tested on completion and QA inspections prior to despatch can be arranged.

A restraint system certified for Region D Cyclonic wind loadings can be supplied for tanks if required.

Fitting sizes up to 900mm in a variety of materials (FRP, brass, stainless and polypropylene) can be factory-fitted using threaded or flanged connections to suit, reducing the need for onsite labour.

Whether it's water storage, break tanks, chemical storage, dust suppression or process applications, Tanks West will deliver a quality product with exceptional service.

Profitability, safety not mutually exclusive

NATIONAL

PUTTING profits before safety is only a short term gain when compared to the cost (both emotionally and financially) of serious injuries and deaths.

It is well documented that physical fatigue plays a large part in elevating the risk of workplace accidents and incidents.

Fatigued employees often have lessened alertness resulting in slower reactions, decreased motor skills and poor judgement.

This increases the risk to their own safety, and to the safety of workmates.

Not only do the effects of fatigue reduce the safety of those relying on the work, but can be seen in the quality and efficiency of the work being done, which in turn impacts profits.

Nivek Industries designs tooling for the mining and earthmoving maintenance industry specifically to improve fitters' safety and their quality of life; and efficiency gains are an added bonus.

Having a mechanical aide taking the weight of heavy tools and parts during countless maintenance operations not only reduces the risk of crush injuries, muscle strains and sprains, but can dramatically reduce physical fatigue in fitters.

Of the fitters interviewed on various Hunter Valley mine sites this year, every single one of them listed 'reduced manual handling' as one of the main safety benefits of having a tracked elevating device (TED).

When asked, "What would you say to a site that doesn't use a TED yet?" Mick, a contract fitter in the Hunter Valley responded "What price is safety worth?"

The tracked elevating device (TED) reduces manual handling and dramatically improves safety on site.

"Working on dozers, without TED, you're lifting heavy components on everything. When you go home, you're stuffed from it and then you go back and have to do it all again the next day.

"TED is just so much of an easier way; you can work more efficiently when you're not sore and exhausted."

TED was initially designed to take the weight out of belly plates, and being remote-controlled, keep fitters out of the line of fire.

These days, an ever-evolving range of smart attachments allows TED to take the weight and crush hazards out of a huge range of maintenance jobs, including the removal and replacement of cutting edges, ball caps, spindles, steer cylinders, steering idlers, tie rods, Y-links, sound suppression, sumps, and pumps – just about anything up to 800kg that needs to be accessed under dozers, graders, loaders and dump trucks.

The latest game-changing attachment to TED is a tooling manipulator arm, the Lift Assist 40 (LA40), which can take the weight of rattle guns and torque wrenches up to 40kg.

TED's your best mate for plant maintenance....

With an increasing range of versatile attachments, TED can help remove and fit most mechanical components from a wide range of plant machinery. With a SWL of up to 800kg, TED can help take the weight of:

Belly Plates • Steer Cylinders • Cutting Edges • Y-Links • Sumps • Pumps • Sound Suppresion • Sole Plates • Load Rollers • Stands • Tie Rods • Spindle Caps • Bucket Teeth

Let TED and the LA-40 lift your safety standards

www.nivekindustries.com.au

• Remote Controlled
• Self Propelled
• Hydraulic Power
• All - Terrain
• Safe
• Efficient
• Versatile
• Durable
• Reduced manual handling
• Australian Made

@TrackedElevating Device
@Nivekindustries
(02) 6571 3703
0418 517 359

NIVEK INDUSTRIES

This allows the operator to almost weightlessly manoeuvre the tooling into position to get the job done quickly, safely and easily.

Naturally, with the LA40 arm taking the weight, operator fatigue is reduced substantially.

Jess, a fitter from the first mine to embrace the new technology, has become a huge advocate of the LA40.

"The LA40 takes all the effort out of your body and most of the vibration out of it too, rather than taking all that through your arms and shoulders," she said.

"Prior to having the LA40 arm on site we found that frequently we'd have to stop or have a rest, whereas with the LA40, you could just keep going."

When asked, "What difference did you feel using the LA40?" Adam, a trainer replied, "It was a combination of having no vibration and no load on your muscles; the impact on my arms was less and I wasn't physically exhausted holding the gun".

"You can put the gun onto the nut or bolt and remove your hand and it'll stay there.

"A lot of the impact is absorbed by the LA40's spring design.

"The fatigue management of the LA40 is just awesome.

"Doing cutting edges with TED, the GET attachment and the LA40 together is ideal, as you can do the whole process, removing the cutting edge, cleaning it and reattaching it with next to no manual handling."

Jess offered her thoughts on long term health and work practices: "It's about protecting people, and working smarter not harder."

"The LA40 is good for everyone, regardless of their size or strength," she said.

"Why make something harder than it has to be? It's not about battle scars, it's about getting out of it with no scars."

This positive feedback from actual fitters using TED, the LA40 arm and a variety of Nivek Industries' specialised attachments demonstrates that improving worker safety and implementing the right tools to minimise their fatigue, improves productivity on a daily basis.

That translates directly into better quality work completed in less time resulting in reduced equipment downtime, therefore increasing profits.

Worker safety and increased profitability are not mutually exclusive – as long as TED is involved.

The TED is remote controlled – keeping fitters out of harm's way.

Attachments are available to remove hazards from a range of maintenance jobs.

Inspections minimise downtime

NATIONAL

WITH ever-growing pressures on mining operations, companies are extending the life of their equipment by leveraging Eriez' service capabilities.

Its technicians can inspect equipment on-site, or customers can deliver their equipment in-factory for a strip and inspect.

Eriez provides a detailed report outlining the best courses of action.

This may mean preventative maintenance or replacing minor components, updating electronics, or carrying out a complete rebuild to original OEM specifications.

All repairs and refurbishments are covered by an Eriez warranty.

Most importantly, Eriez understands the dangers associated with handling permanent magnets.

Its personnel are specially trained and follow specific job safety procedures to properly handle high-strength magnetic elements.

Eriez inspections and performance audits improve equipment availability by avoiding unscheduled downtime.

Its technicians have an unparalleled level of skill and knowledge, understanding the application and limits of magnetic equipment.

Advancements in technologies and innovations are often implemented as upgrades during rebuild processes.

As good as new – suspended electromagnetic repair.

One of Eriez' early innovations was the external oil expansion tank developed for its suspended electromagnets (SE).

This ensures that the magnet coils always stay completely submerged, thus preventing moisture infiltration and coil burn-outs.

The company has also retrofitted expansion tanks to competitor SE's to boost performance.

Eriez can improve the magnetic power of wet drum magnetic separators with enhanced circuit design and better-quality magnets.

The performance of vibratory feeders is improved with new energy saving components; metal detectors are improved with software updates; and smart phone technology can feedback real time data to enhance maintenance and operating processes.

Process equipment represents a significant capital investment, and annual inspections are mandatory to maintain them in peak working order, to identify any looming issues and for the possibility of process improvements.

Regular equipment checks, process audits and in-plant certifications by Eriez will help maximise life.

Eriez has the complete in-house capability necessary to service, repair and refurbish damaged equipment quickly, accurately, and safely.

Parts&Panels

Genuine and Parallel After Market Parts & Panels
- Bonnets
- Fenders
- Bumpers & Grilles
- Radiators & Fans/Shrouds
- Rad Supports & Reinforcements
- Headlights, Corner Lamps, Indicators & Tail Lamps
- Doors, Handles, Mirrors & Window Regulators

Automotive Glass - all makes/models
- Windscreens - Front & Rear
- Machinery Glass
- Van & 4WD Windows
- Side & Rear Windows
- Genuine & After Market

Also available:
Huge range of Second Hand Parts
Incl. Tailgates, Wellbodies and Turrets

CAPRICORN PREFERRED SUPPLIER

For expert advise and a fast friendly service call:
9458 5733

atlas parts & panels specialists

www.atlasparts.com.au
Freecall: 1800 640 039 for Rural and National/Country callers

Fit-outs fit for mining

NATIONAL

WESBAR Vanquip specialises in modifications and comprehensive fit-outs of mine site compliance vehicles to optimise personnel safety, deployment and space, as well as provide ease-of-access, customising vehicle fleets to meet specific mining site requirements.

Consultative in its approach, Wesbar designs solutions that take account of the mandatory safety requirements, compliant with five-star ANCAP ratings.

With products designed to deliver a safe, compliant and clean workplace environment, Wesbar delivers solutions focused on user safety and high level utilisation.

A mine site fit-out typically includes:

- Air-conditioning
- Battery isolators, power invertors
- Bullbars, towbars and cargo barriers
- Reversing cameras, sensors and alarms
- Heavy duty canvas seat covers and replacement seating
- Safety kits including fire extinguisher, first aid, and road triangles
- Two-way radios
- Reflectives, chokes, roll bars, spotlights
- Protective lining
- Refrigerated lunch vans and customised 4WD fleets are also supplied.

A full three-year warranty is guaranteed on all product installations, extended to five years on some manufacturer guarantees, with all necessary documentation, warranty and engineer's report supplied.

Wesbar Vanquip also recently partnered with EROAD Australia, an in-vehicle telematics (IVMS) company which has more than 100,000 of its units installed globally, about 70,000 of those in Australasia.

EROAD's in-vehicle telematics solution (EHUBO) collects data from the vehicle which is then transmitted via a secure cellular link and appears in a cloud-based web portal for customer access and easy reporting.

EROAD's technology is focused heavily on driver safety and driver integrity, with health and safety at its core.

The accuracy and security required of a telematics solution originally developed for regulatory compliance, has ensured EROAD's products and services can be relied on and why government agencies and auditors accept reports generated through the EROAD system.

About Wesbar Vanquip

Wesbar has a network of technical expertise, installation specialists and distribution facilities nationally to meet local market requirements.

Sister company Atlas Parts supplies genuine and parallel replacement parts to maintain fleets, freighted direct to mine sites or service areas.

More information: sales@wesbarvanquip.com.au, +61 08 9458 9177.

Engineering strength and safety focus

NATIONAL

DT HiLoad specialises in the design and manufacture of dump truck bodies and mining buckets for the resources sector, but beyond buckets and bodies, the company can cater for a range of engineering requirements.

General manager Glenn Brearey said the company knows the importance of safety in product design.

"One of our strengths is our ability to custom manufacture our product to suit the specific mine requirements," Mr Brearey said.

"It's not a one size fits all – we understand that," he said.

"Innovation is at our core and safety is a priority.

"We use our engineering skills to make sure that our products are manufactured to the highest standards, are site-specific, and also adaptable the varying safety regulations."

The company's engineering capabilities include using Finite Element Analysis (FEA) software to analyse how the products will react in real world forces.

In addition, DT HiLoad also use Discrete Element Method (DEM) to determine the behaviour of geomaterials such as iron ore and coal.

This method is used to analyse the flow behaviour and related wear characteristics

Engineering manager Tom Smith said the engineering team frequently noticed areas where safety improvement could be made, including in kits for wear management.

"As bodies wear from the repeated dumping of product you need to install a wear solution to ensure that the tray thickness is maintained." Mr Smith said.

"Often this would be plate liners which are heavy steel plates which often need rolling or bending, which leads to all sorts of issues with manual handling and stored energy risks.

"Our solution to this is our patented Hex Tile technology as wear protection which dramatically increases safety on site.

"They are up to 60pc lighter than traditional steel plate liners when installed."

There's also no chance of stored energy issues.

Often wear plates have potential energy or residual energy when they are welded or forced down, so when those welds are cut the plates can potentially spring back which is a real risk to the maintenance teams working on the tray.

"The hex tiles are smaller, they basically sit in the palm of your hand," Mr Smith said,

"That's just one example of how we engineer safe and efficient product designs – it's at the heart of what we do."

Mr Brearey said that being part of the wider Schlam Group played a positive influence into the design and engineering component of our payload solutions.

Using the patented Hex Tile Wear Technology, clients can rest assured their wear management program will maintain the body's light weight and the floor thickness above 15mm throughout its operating life.

"We are in a unique position, where we as part of the Schlam Group are involved in the whole life cycle of the asset from design, manufacture, installation, maintenance, removal and refurbishment," Mr Brearey said.

"The learnings from our groups' exposure goes back into product development of the payload solutions that we manufacture.

"There are not many businesses that have this unique exposure to capitalise on.

"The Schlam Group will continue to position itself as a market leader in all things payload and provide engineering, manufacturing, refurbishment and site service solutions to our clients.

"What we offer to our clients is more than just a product, it is an ongoing partnership," Mr Brearey said.

For more information on DT HiLoad's payload solution capabilities visit: www.dthiload.com.

Omnibus cut above the rest

NATIONAL

OMNIBUS has been in the business of bus manufacture, servicing, repairs and upgrades for over 60 years.

While its core business focused on large-scale bus building and bus fleet maintenance, the imports of fully assembled busses from overseas has forced the company to innovate and show a robustness in the face of a changing market.

The company found its niche custom building fully customised, highly sought-after 4WD busses for tourism operators and mining contractors – an area that has proved difficult for mass producers to crack.

Following a fatal accident in Central Queensland, the safety recommendations around 4WD busses were changed.

These included stronger seatbelt use and monitoring, revised design and construction of roads, adequate roll-over protection, vehicle stability, driver competence and authorisation, suitability of speed limits and speed monitoring, and a preference for all-in-one (driver/passenger layout) transporters in favour of the pod/module bus where possible.

Omnibus has taken a practical approach to the design and modification of the chassis into seamless bus bodies – either in integrated body or pod style – and all are all manufactured in Australia to federal Australian design regulations.

With its all-in-one cabin design and industry benchmark construction, Omnibus' Hino 817 4WD bus is the first choice for mining operators.

For the all-in-one design, the Hino 817 300 4WD was chosen for a number of reasons: firstly, it was tried and tested in the Australian outback for many years prior to commercial release, and it is also backed by an Australia-wide Hino distributor network, and is the only 4WD truck in its class to feature Vehicle Stability Control (VSC).

Modifying the truck, Omnibus kept the driveline (engine, gearbox, transfer case, differential, axle, steering, front windscreen, wipers, mirrors and doors) all original, as fitted by Hino.

The company then structurally mated the cab to the body, and manufactured maintenance hatches between the driver and front passenger seats.

With the functional side taken care of, Omnibus then installed a comfortable, and seamless interior trim that matches any factory specs, and it fixed a powerful Thermoking X-500 roof-mounted air-con that makes the cabin as comfortable as the seats.

The Omnibus 4x4 bus range can be configured to meet client specifications and expectations to fit up to 32 seats, the Hino 817 300 4x4 in particular seating capacity starts at 16 seats or at 20 seats still giving more leg room for longer journeys and mining operations.

OMNIBUS PERSONNEL TRANSPORT
— MINING SERIES —

The proven difference in 4x4 transportation

Proudly Made in Australia for Australian conditions

- Vehicle stability control as standard
- Coach styled passenger module
- Coach air conditioning
- Full-size access between driver and passengers
- Vinyl and laminex interior trimming for long life and easier cleaning
- Rear boot
- 4x4 and low range
- Cruise control
- Anti-lock brake system (ABS)
- Ventilated disk brakes
- Internal air system to inflate tyres after lowering tyre pressure for 4x4 application

With the unique ALL-IN-ONE cabin design, large side storage bins combined with the robust and reliable Hino 817 300 4x4 system is the first choice for mining and tourism bus operators. The bus is built to relevant federal office standards & ADR's that apply, with an Australia-wide warranty coverage your Hino 4x4 bus can be serviced in every state or territory in Australia. The Hino 4WD bus range is available from 16 - 32 seat capacity, so call us today to discuss your operational requirements.

Tough enough for mining, comfortable enough for touring.

T. (08) 9256 3211 | **E.** dave@accessibletransit.com.au | www.omnibusservices.com.au

omnibus services

Quality custom builds

QLD

MRF Motor Bodies specialises in the manufacture of steel framed trays, light commercial truck bodies, custom builds and more.

With experience in customising brands such as Hino, Isuzu, Mitzubishi Busses and Toyota Buses, MRF's dedicated team can deliver quality manufacturing to meet your exact requirements and specifications while staying with industry regulations.

Custom fabrication is available for tippers (including hydraulic), steel heavy duty trays, service and speciality bodies (up to 10 tonnes), transfer vehicles, Pantec, water and fire vehicles.

The company also offers sheet metal fabrication, steel fabrication, design and development, and computer design and drafting.

The team at MRF is dedicated to design a custom solution for mining operations and service providers, and that dedication to quality workmanship has allowed MRF to participate in and win several industry awards.

To find out more visit: www.mrf.net.au.

The team at MRF is dedicated to design a custom solution for mining operations and service providers.

CUSTOM BUILT TRUCK BODIES AND TRAILERS

PROUD AUSTRALIAN MANUFACTURING

MRF Motor Bodies is a proudly known and owned Australian company based in Queensland. Specialising in the manufacturing of custom built trailers and truck bodies.

Over the past 20 years, we have dedicated ourselves to provide Australian businesses with quality manufacturing practices to deliver high end custom trailers and truck bodies.

Our dedicated team specialises in taking customers concepts and through CAD design software and our highly organised factory turning them into a reality that can withstand the test of the harsh Australian conditions.

We have extensive experience with steel and aluminium service truck bodies. Rear and side tipping bodies. Hydraulic installs including cranes. Custom size firefighting equipment to suit various vehicles. Air conditioning and refrigerated transport. Communication and mobile work stations. Off-road trailer manufacturing. Road safety lighting and message boards. Rollover Protection Structures.

Quality Guaranteed

07 3888 9244
info@mrf.net.au
mrf.net.au

MRF MOTOR BODIES

5/62 McPhail Rd Narangba QLD 4504

Ultima body in good shape

NATIONAL

A UNIQUE 'V' profile floor, designed to actively channel the load to the centre of the tray, is one of the standout design features of the new Austin Ultima dump body.

Designed and manufactured by Austin Engineering, the new body also features improved structural integrity and payload advantages.

Based on the company's industry-proven Westech, JEC and JEC-LD series of bodies, the new tray is lighter and stronger than current OEM bodies, which translates to a 10-15pc weight saving without sacrificing payload.

Described by Austin as the next generation in mining dump bodies, the Ultima will carry a greater payload, meet all OEM dump body specifications and deliver the industry's lowest cost per tonne.

By channeling the payload to the centre line of the tray, the V-floor, with its lower centre of gravity, improves machine stability and safety and reduces overall tray wear.

The floor design also reduces dump cycle times (empty is achieved at 3/4 tipping).

The new body also features large radius transitions to assist in the reduction of material carry-back.

It also provides superior impact resistance and substantially extend operating life.

The Austin JEC-LD.

Overall, the optimised shape of the Ultima body means better material distribution within the structure while maintaining the payload / weight advantage.

The new body's increased structural integrity gives superior impact and wear resistance, extends fatigue life and lowers maintenance costs.

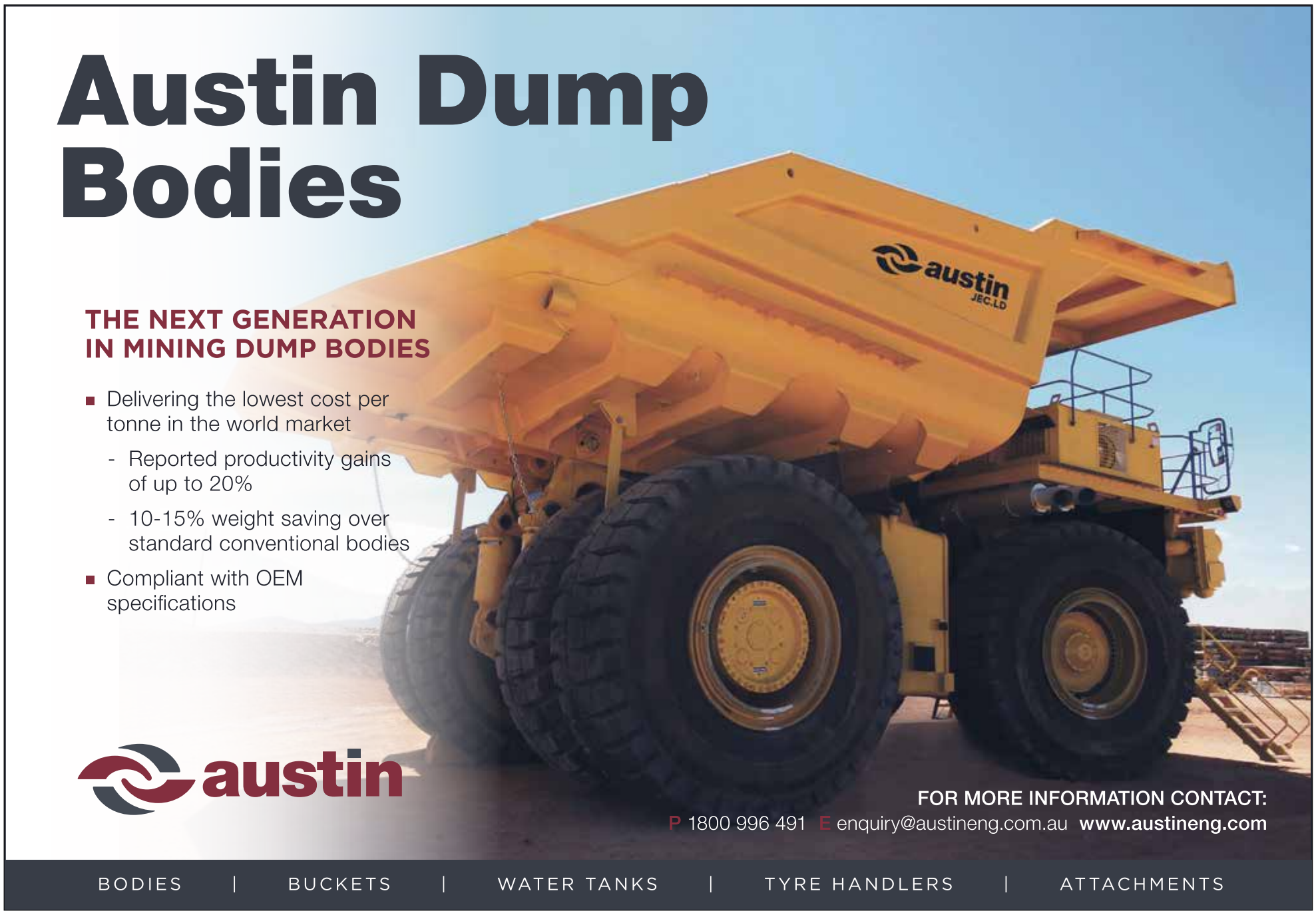
Tapered sides run the full length of the body to minimise wear, assist in carry-back reduction and reduce side spillage in the dumping cycle.

A low-profile rear floor shape combined with a reduced height bolster provide additional ground clearance when dumping.

Available in both "straight floor" or "flow control combo" designs to cater for fixed or varying SG values, the new Ultima body is designed to operate as a liner-less configuration.

It can be adapted to suit any mine specific application, is suitable for any current OEM dump truck chassis, and is designed to comply with all OEM haul truck operating limitations.

For further information on Austin Engineering, Australia, phone 1800 996 491, email enquiry@austineng.com.au or visit the website www.autineng.com.



Reduce downtime, boost profit

NATIONAL

THE mining industry is known for its harsh and unforgiving environments, and demands reliable, high-quality equipment to ensure safety and efficiency.

It is vital for the hoses and valves used in mining to be thoroughly tested to meet pressure standards and provide consistently reliable performance to ensure safety of operations and individuals in extreme environments.

Although today's hydraulic hoses perform better than ever, a lack of maintenance, equipment abuse, or unforeseen circumstances can lead to failure.

Hose pressure testing not only provides peace of mind to clients, but can ensure minimum maintenance costs and downtime of their equipment.

Pressure testing compiles valuable information such as cracking, leakage, and distortions/deformities.

This process also provides an identification number for easy traceability and replacement when the hydraulic or pneumatic hose has reached the end of its service life or has been damaged.

As pressure testing needs to be done regularly, clients need reliable and cost-effective testing equipment.

ProTech Pumps, with more than 50 years of hydraulic and pneumatic engineering experience, has a complete range of high-performance air driven liquid pumps, gas boosters, air amplifiers and high pressure system components.

ProTech Pumps has a complete range of high-performance air driven liquid pumps, gas boosters, air amplifiers and high pressure system components.

ProTech Pumps recognises that the application and selection of air driven liquid pumps no longer requires highly specialised, factory-trained technical staff, so they have removed the costly middlemen and passed on the savings to customers.

With full workshop facilities located at its Brisbane factory, the company can be called on for customised systems, repairs and maintenance of all makes of liquid pump, gas boosters and air amplifiers.

Additionally, its pumps are used as reliable and competitive replacements for other brands in existing systems.

The protechpumps.com webstore makes it easy to view, compare, select and buy online.

Plus get free shipping Australia-wide. Visit www.protechpumps.com or call on (07) 3103 5190.

Caman Engineering stocks an extensive range of pipeline products in both its Perth and Sydney facilities.

State-of-the-art pipe flanges

WA & NSW

CAMAN Engineering is Australia's largest independent stockist and manufacturer of pipeline flanges.

With recently expanded facilities, Caman specialises in tube plates, spectacle blinds, orifice plates, hydro-test blanks forged nozzles, long weld necks and associated products for the petrochemical, oil, mining and gas industries.

An extensive range of these pipeline products are held in stock in both its Perth and Sydney facilities.

Caman Engineering is now the leading independent flange and tube plate manufacturer in Australia

To complement its range of flanges, it now stocks an extensive valve (Brook Valves) range including ball, butterfly, gate, globe, check and knife gate.

This valve expertise also extends to automated and actuated valves.

The company has one of Australia's most complete ranges of valving products; no matter what the application, it has the solution, tailored by one of the most experienced valve sales teams in the country.

Caman also offers a state-of-the-art CNC machining service with a machining capacity of up to 2200mm in diameter; this means if the company does not have a certain specialised or custom flange in stock, it can be manufactured promptly.

Caman is 100 per cent Australian-owned by the same family that has been involved in the daily running of the company since its inception in 1954.

More recently in 2017, Caman Engineering WA completed a purpose-built 3600sqm facility in Perth, demonstrating its long standing commitment to providing the WA market with an excellent level of "stock on hand" and customer service.

Caman is an approved manufacturer and supplier of pipeline flanges, heat exchanger and pressure vessel components to oil, gas, mining and petrochemical companies operating in Australia; is accredited to comply with Quality Assurance Standard ISO 9001; and is an approved P.E.D material supplier, certified by Lloyds Register Quality Assurance.

CAMAN

Australia's largest independent stockist and manufacturer of pipeline flanges since 1954.

- Pipeline flanges
- Valves
- 24 hours breakdown machining and supplies
- Orifice plates and flanges
- Spec blinds, spades, spacers
- Hydro-test blinds
- Nozzles and long weld necks
- Tubesheets and baffles
- Heat exchangers
- Machining of specials up to 2,200mm diameter
- Full CNC machining

Celebrating 65 years
Supplying quality products to mining, oil and gas industries

Perth — New Larger Premises
6 Brewer Road Canning Vale WA 6155
Tel. 08 9277 5666
Email. camanwa@camaneng.com.au

Sydney
4 Clerke Place Kurnell NSW 2231
Tel. 02 9540 2355
Email. sales@camaneng.com.au

VISIT OUR ONLINE CATALOGUE AT WWW.CAMANENG.COM.AU

Making safety a reality

INTERNATIONAL

MOTOR accidents in commercial vehicles are an unfortunate reality for any mine operator.

While sound safety policy can drastically minimise the possibility of vehicle roll over, it can never stamp it out completely.

A 5-Star ANCAP rating is very effective if a vehicle is impacted from the front or from the side, with airbags designed to minimise injury from collisions.

However, airbags are ineffective in the case of vehicle rollovers.

Airbags will not stop the cabin from collapsing and crushing the occupants, and they will rapidly deflate if punctured.

Roy McEwen from vehicle modifiers Jaram Australia says that this message is something that has been driven home time and again.

"Every time that I hear about a motor vehicle accident, especially involving a roll-over that has ended in a serious injury, or even worse, a fatality; it sends a shudder down my spine," he said.

"Not every serious accident ends in fatality, people do walk away unscathed, but the odds aren't in your favour.

"This is not meant to be scare-mongering, it is simply a fact of life.

"After all, we should always consider duty of care.

"Of course the ANCAP Rating of vehicles is important and the corresponding increase in safety and design has contributed to saving lives, but where an accidents involves a single or multiple roll over, there has been negligible improvement."

Statistically speaking, commercial vehicles – 4WDs, vans, busses, trucks and SUVs – tend to be at a higher risk of roll-over due to a higher centre of gravity.

The installation of an Internal Roll-Over Protection System (ROPS) can be customised for each vehicle and is certified and tested to conform to the relevant Australian standards VSB14-LK9/10 or ECE324R29 Add28

While a ROPS is not a 100pc guarantee of a safe outcome in an accident, it does give the occupants of a vehicle a fighting chance should the worst happen.

"Jaram offers the addition of a steel rollover system to complement the factory safety equipment," Mr McEwen said.

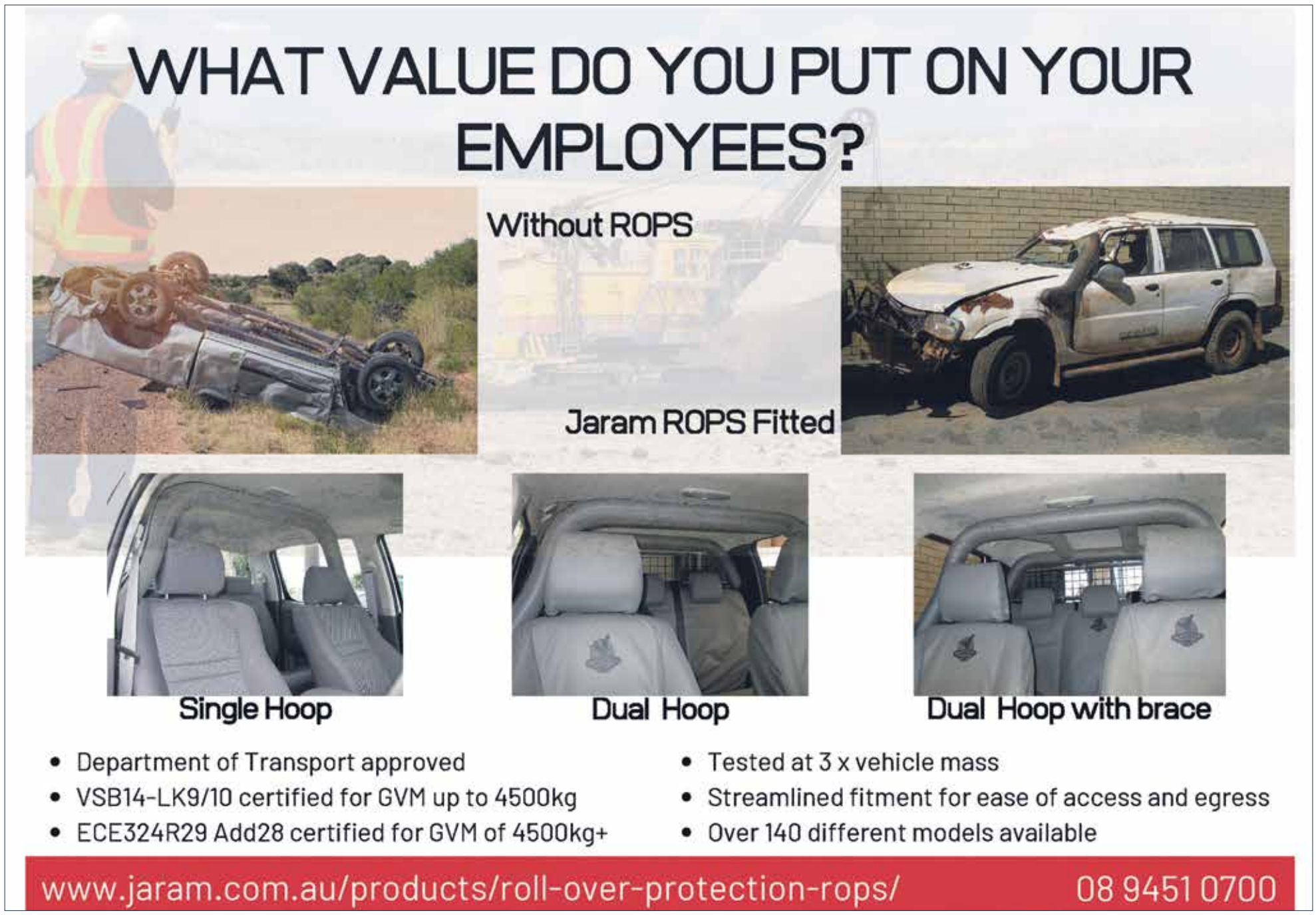
"Each and every internal ROPS design is engineer certified and where required, registered by the Department of Transport for your vehicle."

Jaram Australia Pty Ltd is licensed by the Department of Transport as an authorised and approved vehicle modification facility.

As an alternative, the company also offers a supply-only service and you can have the ROPS fitted by a qualified mechanic.

A vehicle fitted with Jaram rollbar.

A vehicle without roll protection.



Mechanical shoulder support

NATIONAL

For more information visit www.safetymits.com.

SAFETY MITS specialises in innovative products and maintenance equipment for the aerospace, construction, engineering, service, health, mining and earth-moving industries.

From humble beginnings in a shed located in Newcastle, Safety MITS has taken off since its launch in 2010, and now services major earthmoving and mining companies in Australia and internationally. "Now we are considered to be the leader in exoskeletal technologies in Australia, New Zealand and South East Asia," Safety MITS director Tony Brooks said.

Having worked in a range of maintenance tasks in the industry, the Safety MITS team created the business around a culture of eliminating risks and reducing injuries and fatalities by providing innovative safe technologies.

All of Safety MITS' products have been developed in compliance with Australian and New Zealand industry standards, which are some of the strictest in the world.

"Safe and innovative products fit for industry are our passion," Mr Brooks said. A prime example is the Eksovest, which was developed to protect workers who sustain injuries due to keeping their arms raised and outstretched, often using tools or lifting objects for prolonged periods of time.

The Ekso Works EksoVest is an upper body exoskeleton that elevates and supports a worker's arms to assist them with tasks ranging from chest to overhead.

It's lightweight and low profile, making it comfortable to wear in all conditions while enabling freedom of motions.

"Using the EksoVest means workers experience fewer on-site injuries and tasks are completed faster and with high quality results," Mr Brooks said.

"Workers stay healthier and experience increased stamina, and companies gain greater productivity as a result."

Safety MITS also provides aluminium work platforms and high density plastic cribbing and blocking blocks, plus other bespoke engineered products for industry.

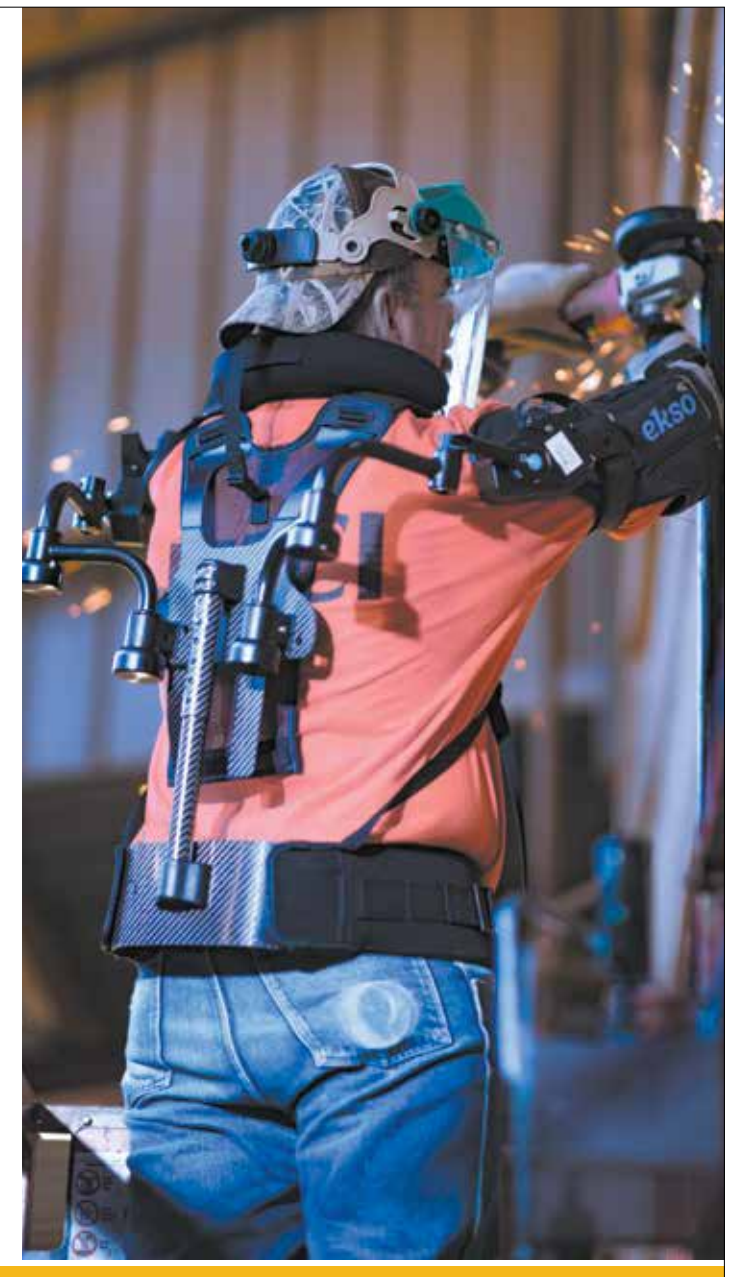
MITS
Mining Industrial Trade Suppliers
Committed to Innovation for Industry

Enhance human mobility, strength, and endurance with eksoworks from Safety MITS.

Exoskeleton technology for mining, construction and engineering industries.

REDUCE FATIGUE
•
IMPROVE QUALITY
•
REDUCE WORKPLACE INJURIES

ekso BIONICS



02 9838 8887 | info@safetymits.com
www.youtube.com/user/safetymits | www.safetymits.com

DROPPED OBJECT PREVENTION SYSTEM

Sadly being hit by a falling object is still a major killer in many Australian work places.

Pro3 Safety's certified system can be retro-fitted to your existing handrails, stairs and platforms, providing a permanent lifesaving solution and the best protection for your employees and contractors against the risk of injuries and falls.

Cost effectively improve the safety in your workplace and become a DROPS free site.

DESIGN BENEFITS & SPECIFICATIONS

- Minimises Dropped Object Hazards
- Prevent personnel leaning through or standing on rails
- Install with little or no interruption to production
- Install from within the existing safety barriers
- Low Cost
- Quick Installation, saving on Labour Costs
- Fits to Existing Walkways
- Certified for Wind Loadings AS1170.2 / AS4100
- Various Materials and Finishes to Suit Your Environment
- No Drafting Required
- No Welding Required

Our 3 products give you comprehensive DROPS coverage on handrails, stairs, and flooring.

Simon: 0421 635 518
Andrew: 0400 446 167
sales@pro3safety.com.au
www.pro3safety.com.au

Pro3 Safety
Filling the gaps in Safely

SHIPPING INTERNATIONALLY

microanalysis australia

X-ray Diffraction (XRD) is a technique that is utilised to identify crystalline phases present in a given sample.

For powder diffraction, a micronized sample is pressed into a specialised holder and placed into the X-ray Diffractometer. The instrument bombards the powdered sample with X-rays at varying angles. As the X-rays come into contact with the particulate material, they are diffracted by the crystal structure of the phase or phases that are being analysed. The scan results in a diffraction pattern which contains numerous peaks or humps.

The resulting peaks or humps are similar to a fingerprint, as they can be matched to specific mineral or crystalline phases. The interpretation of the diffraction pattern is a comparative method where the data is matched to an exhaustive list of reference patterns. By using this interpretation technique, it is possible to identify well over ten different minerals or crystalline phases within an unknown sample, as long as they are present in concentrations that exceed ~1%.

Note that elemental composition is not determined by XRD, but can be inferred from the phases identified. Confidence in matching the phases can vary depending on how closely the standardised database pattern match the minerals present in the sample, the number and type of other phases present in the sample, crystallinity, concentration of the individual phases and the quality of the diffraction pattern as well as the grinding/micronizing process itself.

Other information that can be gleaned from a diffraction pattern includes the degree of weathering or alteration, crystallite size, elemental substitution, the degree of disorder, and the amorphous content.

The use of elemental assay information (say from XRF), sample history and geology/location information and complimentary techniques all assist by strengthening confidence in making phase identification more accurate.

Quantification XRD techniques vary from qualitative (what is present) to semi quantitative (what and relative abundance of what is present) through to fully Quantitative Rietveld analysis.

One of the most challenging areas for phase identification is clay speciation. Due to the poor crystallinity and irregular ordering of some clay groups, identification may require additional sample preparation methods including glycolation, heat (dehydration) and other techniques.

At Microanalysis we have several automated powder X-ray Diffractometers. Utilising a number of diffraction databases including the latest 2019 complete International Centre for Diffraction Database (ICDD) to assist in the accurate analysis of unknown samples. We have a myriad of different holding mounts to assist in the analysis of the samples including our standard holders that utilise approximately one cubic centimetre of powdered sample, holders that take milligram quantities of sample, holders that can present filter cloth, flat ceramic or metallic plates and holders that can accommodate some sample irregularity.

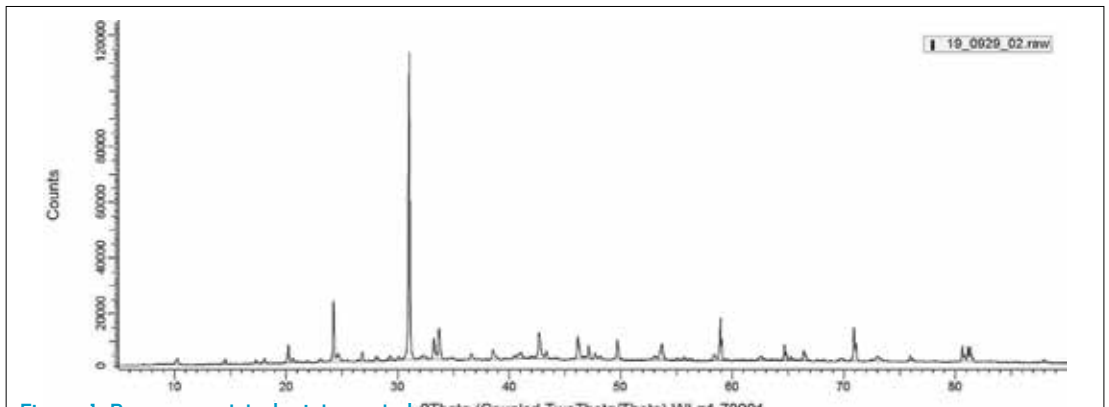


Figure 1: Raw scan yet to be interpreted.

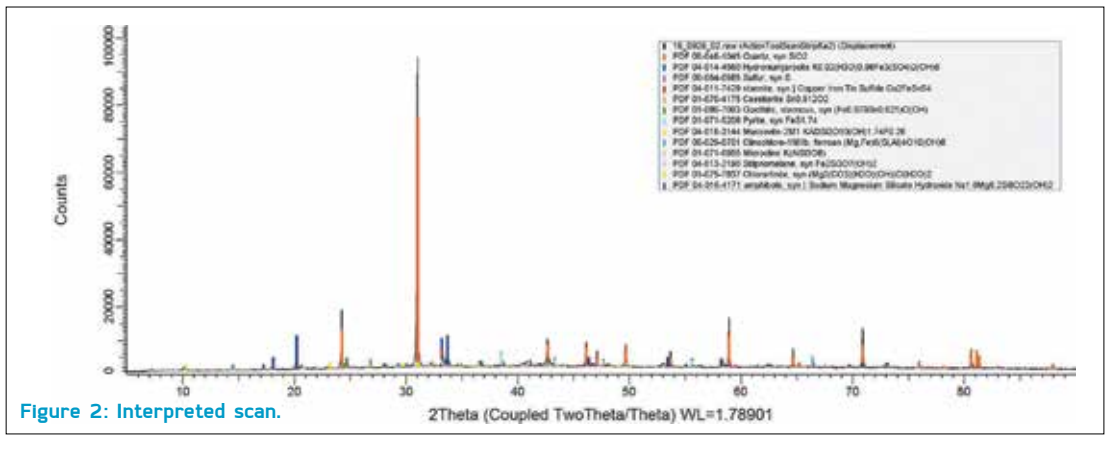


Figure 2: Interpreted scan.

The techniques we frequently utilise are:

- Qualitative XRD where the phase identification is conducted and the minerals are classified as major, minor and trace;
- Semi-quantitative in which the phase identification includes a concentration which is calculated using the normalized reference intensity ratio method where the intensity of the 100% (highest) peak divided by the published correction factor for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. An estimation of the total amorphous content can also be given. The mineral concentrations are reported as percentages, with the total being normalised to 100%. XRF assay data can be used to infer absolute phase concentration;
- Spiked semi-quantitative is similar to a standard semi-quantitative analysis with a higher confidence in the concentration values and a more accurate measurement of the amorphous content;
- Quantitative XRD analysis using an internal standard, with full Rietveld analysis to give the highest confidence possible in the concentration of phases and amorphous content determined. This technique considers preferred orientation, crystallite size, and strain within the crystal lattice;
- Crystalline silica determinations for alpha quartz, cristobalite and tridymite utilise a full phase identification to check for overlaps that may be present from the phases present. A specific peak scan is then performed with this result compared against a five point calibration curve to produce a value of each crystalline silica phase present;
- Clay speciation utilising a semi-quantitative analysis followed by gylcolation and heating to identify specific clay groups;
- Respirable free silica (crystalline) determination in which a semi-quantitative analysis is performed on the bulk or respirable (PM4/PM2.5) fraction and is combined with particle size determination and the respirable particulates/aggregates checked using scanning electron microscopy;
- Comparative XRD is utilised if there is no entry in the databases for the compound being examined but a suitable reference pattern can be constructed computationally or has been provided;
- Specific mineral semi-quantitative analysis utilises solvent washing, heavy liquid separation, magnetic separation and other specific techniques to concentrate the phases of interest and provide increased confidence in the identification of minerals and to enhance XRD features; and
- Certain polymers, organics and highly disordered compounds still exhibit short range order than can diffract to give a 'fingerprint' unique to the intrinsic bond structure. Non-traditional materials (other than minerals) may still be amenable to XRD analysis and confirmation of composition.

Microanalysis Australia is always pleased to customise XRD techniques to accommodation specific client requirements and achieve the highest quality results.

www.microanalysis.com.au

The FASTest data in Australia

NATIONAL

DURING exploration, resource definition and production, getting analytical data quickly is vital for making accurate, timely decisions.

SGS Australia's field analytical services and testing (FAST) approach to exploration, mining and processing gives accurate and supported analytical data to its clients within 24-48 hours from the sampling event by using its new portable technologies.

This timely response can help field geologists to quickly identify resource drill patterns as part of exploration or pre-feasibility studies, this technology allows for real-time changes to drill positioning and minimisation of drill and laboratory analysis spend.

SGS and Minalyze working together now provide FAST XRF core scanning services.

This generates objective and consistent data using patented technology which produces both elemental quantification along with hi-resolution sample imaging with a throughput in excess of 80m per day.

Furthermore, by taking micro samples and analysing using quantitative Fourier Transform Infra-Red analysis (FTIR) it is possible to provide detailed mineralogical as well as elemental logs.

The data can then be used to either update existing geological models or, using machine learning, the Geostat team can produce new predictive models.

SGS FAST enables businesses to make faster decisions during active exploration, optimising the exploration spend, and realising an earlier return on exploration investments and development activities.

SGS FAST is cloud-based, meaning that physical distance and time zone restrictions will not hinder operations.

SGS FAST enables businesses to make faster decisions during active exploration, optimising the exploration spend, and realising an earlier return on exploration investments and development activities.

This ensures rapid project development, maintains consistent plant performance and minimises downtime, which ultimately creates a more attractive company profile for investors.

For more information please contact John Woods at john.woods@sgs.com.

INTRODUCING FAST
TRANSFORMING THE WAY YOU EXPLORE & PRODUCE YOUR PRODUCT

Field Analytical Services and Testing takes instruments into the field, even the most remote areas, provides data in 24 to 48 hours, enabling you to make decisions quicker than ever before.
We call that FAST.

INNOVATION & EXPERTISE DELIVERS SUCCESS.
MINERALS@SGS.COM

+61 8 9373 3616 +61 459 863 999
john.woods@sgs.com sgs.com

SGS

Detailed drone surveys

NATIONAL

C.R. Kennedy is a nationwide organisation which employs more than 250 people within various significant divisions.

The largest of these divisions is the 'survey division' which distributes land surveying, construction, laser scanning, machine control, laser levelling and laser distance measuring equipment throughout the country.

CR Kennedy's major distribution partnership for the survey division is with Leica-Geosystems, a Swiss organisation with more than 200 years of history.

The Leica Aibot sits quite significant within this UAV product offering.

Drones

Unmanned aerial vehicles (UAVs), remotely piloted aircraft (RPA), or perhaps even the remotely piloted vehicle (RPV), are here to stay, and CR Kennedy has a range of multi rotor and fixed wing solutions for mapping, aerial photography, aerial inspections, mine mapping, LIDAR and real-time surveillance.

Combined with the various software packages, these solutions can produce high quality digital terrain models (DTMs), 3D models, point clouds, and orthographic photographs.

Laser scanning, LIDAR, is becoming more and more a viable option in the UAV world and CR Kennedy can offer various options if this level of detail, accuracy and delivery speed are required.

CR Kennedy's UAV related product basket extends to such significant brands as Geocue PPK and LIDAR systems, Dji drones, Riegl LIDAR, Wingtra VTOL drone, Hovermap (SLAM) LIDAR, Pix4d software, Parazero recovery systems, Blue Vigil tethers and, as mentioned, the Leica Aibot.

It is the case that today, CR Kennedy is by far the largest distributor of drones in Australia.

Through the various brands, including DJI, it currently delivers more than 1000 drones throughout Australia on a monthly basis – a number that is quite illuminating in regard to drone usage in Australia today.

UAV options

A Dji Phantom 4 RTK or Matrice 200 package, teamed with software and training, is often the starting place for many entering the UAV industry.

Considering the breadth of the DJI range, many required tasks can be completed by the various options within this family.

Things move very quickly in the UAV world and processes such as PPK (post processing Kinematic) are now commonplace.

These PPK systems are added to the drone in order to boost the accuracy potential and vastly reduce the reliance on multiple ground control points being needed in order to achieve acceptable accuracy.

The Leica Aibot SX high precision UAV.

An M600 Hovermap 100 V5.

Another excellent option is the Leica Aibot multi rotor system.

This PPK system utilises a high-end Sony camera and Ronin gimbal, combined with Leica GNSS technology and Leica Infinity software to provide a 100pc Leica work flow.

Moving beyond photogrammetry, CR Kennedy can also offer various LIDAR solutions.

These include the SLAM-based Hovermap, the Geocue Trueview 410 or the Riegl Vux Mini LIDAR system.

These three options would all pair with the industry leading DJI M600 drone for a formidable solution.

Software

Pix4D software, exclusively distributed by CR Kennedy, generates high-end, survey-grade accurate orthomosaics, DSMs and Point clouds in a few clicks only, and with a fully automatic worfklow.

Quickly becoming the go-to software package, CR Kennedy can package Pix 4d into your UAV purchase or supply licensing as required.

Hexagon Geosystems and Leica also provide Infinity and 3D Reshaper software.

This is becoming more and more relevant with Infinity supporting the entire photogrammetry process through use of the Leica Aibot and, considering the Lidar options provided by CR Kennedy, 3D Reshaper is an excellent option for working with these point clouds.

Training and CASA qualifications

CR Kennedy partners with a variety of training providers around the country who can assist with licensing requirements.

All partners work closely with CASA and do work efficiently through the various processes to get organisations flying in as short a time frame as possible.

As with software, training can also be included in a UAV package.

CR Kennedy is very involved in providing CASA based training through its partnering with such industry leading companies as UAS Pacific and Aviassist.

MORE INFORMATION: C.R. Kennedy Pty. Ltd. | 07 3862 6210 | www.survey.crkennedy.com.au/categories/_products/uav

WingtraOne

Aerial Data for Professional Mapping and Surveying

The Vertical Take-Off and Landing (VTOL) capability allows the WingtraOne to ascend and move like a helicopter. For the mapping mission it transitions into forward cruise flight and matches the endurance and speed of fixed-wing airplanes. In order to land, the WingtraOne switches back to hover flight and descends vertically.

- **Vertical take-off and landing** allows use in a far greater variety of situations, guarantees safety for the operator and offers much reduced wear and tear on the drone.
- **State of the art PPK system** allows for mapping with down to 1 cm absolute accuracy without using ground control points.
- The WingtraOne PPK system with **42 MP camera** produces brilliant resolution images with down to 0.7 cm/px GSD.

C.R.Kennedy | SURVEY SOLUTIONS |

Call **07 3862 6210** for more information
survey.crkennedy.com.au

Seeing the bigger picture

UAV Magnetics have refined their processes and developed a system that allows it to collect accurate data efficiently and cost-effectively.

NATIONAL

UAV Magnetics is at the forefront of drone surveying in Australia, and has refined its technology and method to create a system that is fast, efficient and produces high-quality, high-resolution magnetic data for exploration tenements and mine sites.

The system is the culmination of decades of expertise, and in conjunction with the custom magnetometer, is ideally suited for high-resolution magnetic surveys that are less than 2000 line km in size.

The custom-built hexacopter can fly autonomously at a range of 2km from the ground operator, and solves the significant safety risks associated with operating manned helicopters and fixed-wing aircraft at low altitudes.

The system can help to locate changes in rock types, and fault structures in the ground which provide critical information for mine operations and mine planning, such as dykes and coal operations.

Traditionally, collecting magnetic data over mine sites and exploration tenements involved two methods: a walking survey where the surveyor carries the magnetometer, or airborne surveys in a fixed wing aircraft or helicopter in a grid pattern.

Both of these methods have significant disadvantages associated with them, but these can be improved upon significantly with the use of unmanned aerial vehicles (UAVs).

Walked surveys are obviously quite slow.

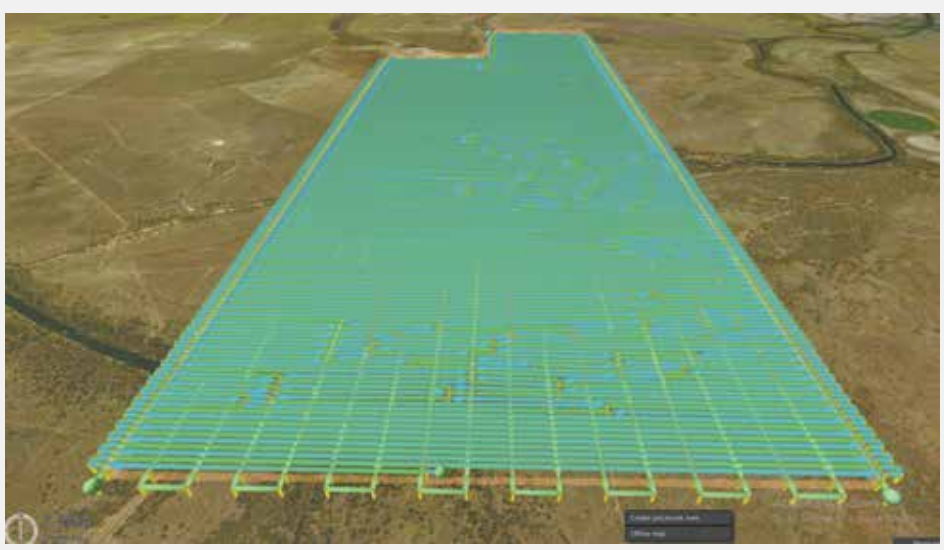
The gear is heavy and cumbersome, and the terrain, temperature, accessibility and weather can all be prohibitively difficult for operators, amplified through the cost imposed by modern work, health and safety regulations which demand two operators working together on any one survey.

Helicopter and fixed wing aircraft do not have these problems; but they are far more expensive, and are limited to 40m above the ground for safety reasons.

This can be a severe impediment to the quality of data, as a magnetometer's accuracy is dependent on its proximity to the ground.

UAVs provide the cost-effective, accurate, efficient solution to the problems of traditional magnetic surveys.

The UAV's proximity to the ground allows it to collect much more accurate data than a manned aircraft.



UAV Magnetics digital flight plan.

UAVs don't have the same WHS operational requirements, and where a walked survey can cover about 15-20km per day, a UAV can cover 150-180km.

Where a helicopter cannot fly below 40m, UAVs can skim the ground at 10-15m with none of the operator hazards associated with manned aircraft.

This proximity to the ground gives the magnetometer a much larger amplitude and better responses than from a helicopter at 40m.

According to UAV Magnetics chief remote pilot Kyle Gardner, from a technical perspective, there are a number of advancements and factors that have led to the availability of high quality UAV surveys.

The first is that the UAV technology has advanced significantly in the past two years, with much of the technology filtering down from the military.

"Today, we operate large hybrid petrol-electric UAVs that have a payload capacity of up to 5kg, and an endurance of 90 minutes," Mr Gardner said.

"These performance figures, together with advancements in the flight control, flight planning and data link technology, have only recently become available to the UAV industry.

"This means we can cover significant amounts of ground each flight, and our turnaround time is about 20 mins to refuel and upload a new flight plan.

"It's quick and we're not continually charging batteries."

With a 25kg take-off weight and a hybrid petrol-electric setup, Mr Gardner is confident that UAV Magnetics' custom hexacopter is competitive with, if not better than, most operational systems in the country.

With the petrol motor charging the batteries in-flight, the airborne insurance is extended to 90 minutes – significantly longer than a battery-powered drone.

Mr Gardner said that while it is new technology, it has been proven to be effective, and it is exponentially more efficient than both of the previous methods.

"We are proven against fixed wings and ground surveys," he said.

"We are much more efficient at small to medium sized surveys, we fit nicely between the two and can provide very accurate data.

"We had only been flying flying for five minutes, and we had a supervisor with us and he said, 'what you guys have done in five minutes would have taken me two hours'."

The custom-built hexacopter and magnetometer.

UAV Magnetics chief geophysicist Anton Rada said that the second component in the survey, the magnetometer, had been refined and customised by UAV Magnetics through the data acquisition system (DAS).

The company's specialised proprietary miniaturised acquisition system and sensor has been specifically designed for use with UAV's.

"The traditional magnetometers are very heavy and bulky," he said.

"Over the past four years we have continued to stay ahead of the curve, to stay in front of the new emerging technologies, and we have become a world leader in UAV magnetic surveys.

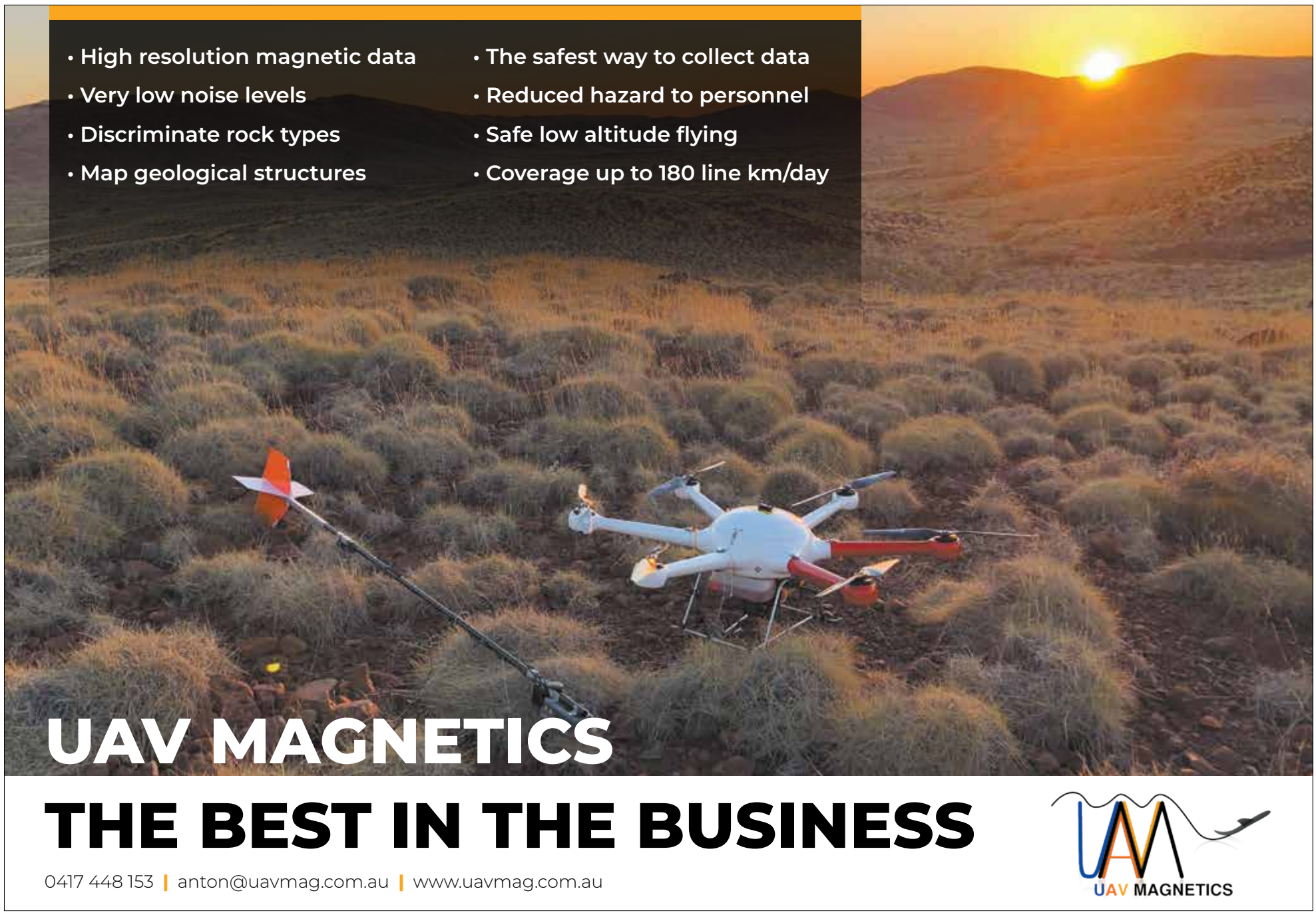
"UAV Magnetics is focused on providing the best data quality to ensure the client gets the best information and results, and I am yet to find an operator who can provide data that competes with ours."

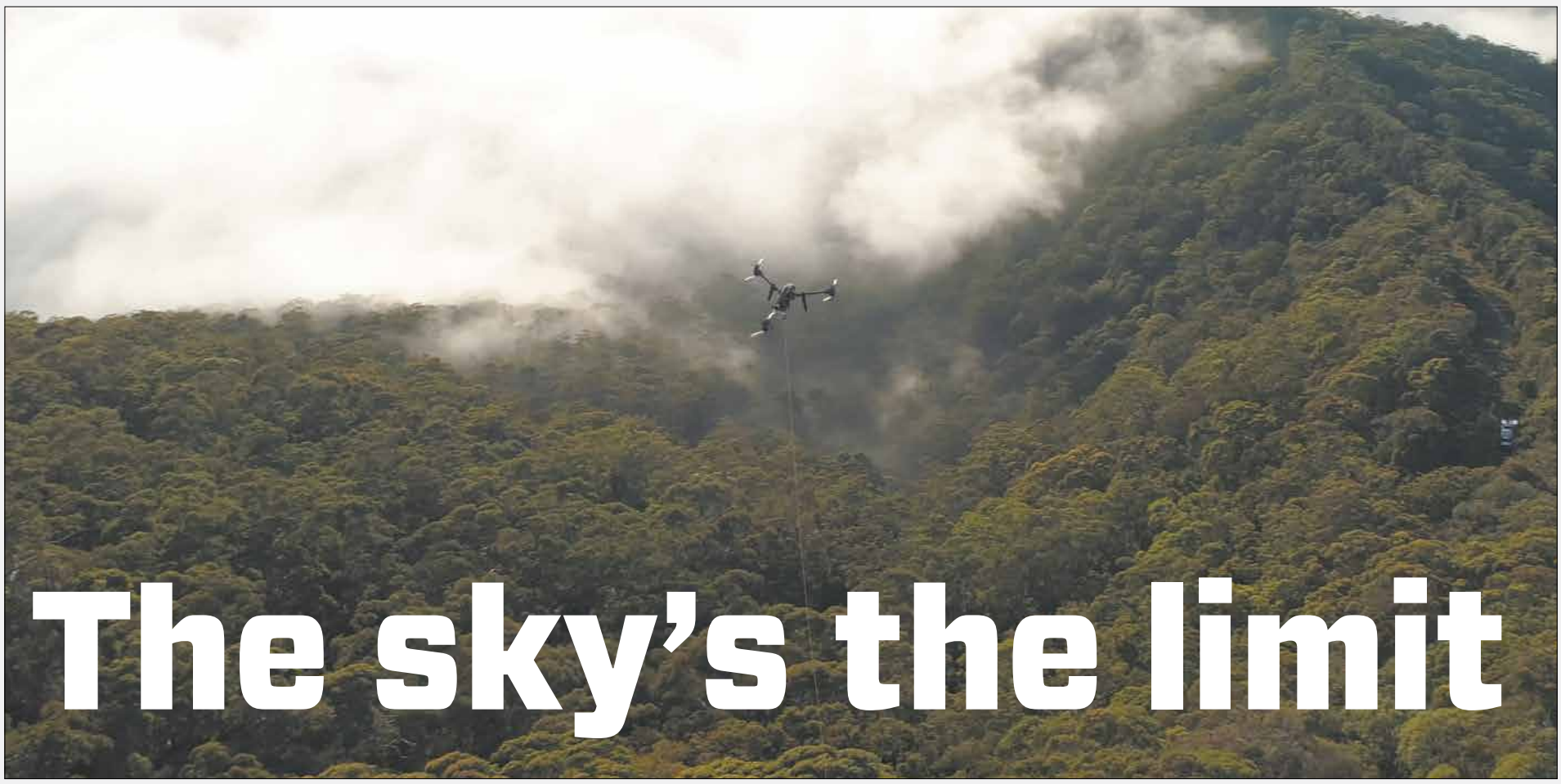
The data collected is used to determine the sub-surface structures, and to discriminate between the various rock types and geology beneath the surface.

Mr Rada said that this system has been the point of difference for the company, and that it had been overlooked by new players in the industry.

"We've seen a few guys coming into the market, and they have been developing their own systems, but we haven't seen any of their data," he said.

MORE INFORMATION: Aerial Vision | 0417 448 153 | anton@uavmag.com.au | www.uavmag.com.au





The sky's the limit

Skyhawke is customisable, upgradable, agile, and proven in the field to do what its competitors can't.

NATIONAL

WHEN designing a multirotor drone platform, ease of operation, price point and maintenance cost must all be factored in, as should the scalability and ease of customisation.

It is rare that a single platform can do everything.

Skyline UAV has developed Skyhawke, a Y6 coaxial tricopter, as a solution to some of the problems it had found with its existing fleet of single rotor machines.

The software, much of which was produced in Europe, lacked certain features and controls such as the ability to create survey patterns and automated payload controls, and the aftersales support could take weeks or even months for a machine to be returned, which was costly not just for the price of repairs, but also in lost downtime.

Skyline UAV has taken its firsthand experience with these problems and built a fully customisable solution right here in Australia – Skyhawke.

Skyhawke MR6

SYSTEM SPECIFICATIONS

- Aircraft size (excluding props): 826x902x303mm
- Aircraft size (folded): 335x902x303mm
- Propeller size: 458x140mm (18x5.5 inch) 2-blade
- Max take-off weight: 10kg
- Max useful payload: 3kg
- Flight battery: 22.2v (6S) 16000 LiPo
- Endurance: 20 minutes depending on battery and payload configuration
- Max wind gusts: 10m/s (20kts) any direction
- Max range: Variable depending on C2 link used

The Skyhawke MR6 is currently fitted with the FLIR DUO Pro R camera package for thermal/visual animal surveillance.

The build

Skyline UAV used its extensive knowledge of, and many years working with, UAV technology to design and build Skyhawke 100pc in-house.

The process began with several known parameters and was then fleshed out in CAD.

A smaller prototype aircraft was built from low cost materials in order to test the concepts and to identify any weaknesses or potential improvements.

After testing, the final CAD files were prepared for a full carbon frame construction.

The multi-rotor frame was chosen because if offers several advantages over single-rotor helicopters.

Firstly, they are cost-effective.

Single rotor helicopters require complex control and drive systems which makes them very expensive to produce, and to operate.

Secondly, the multi-rotor aircraft have much fewer moving parts and so they are much more accessible, easier to maintain, and less likely to suffer from control failures due to fatigue and improper setup.

Thirdly, multi-rotor aircraft have a certain level of motor redundancy built in, which improves flight safety and makes them safer for use in high-risk environments.

Last, but certainly not least, multi-rotors were selected for ease of operation and the ability to hover and to move equally well in any direction, regardless of which direction the nose is facing – which makes them particularly useful for survey and inspection tasks.

Electric motors were chosen over fossil fuel motors for two reasons.

Firstly, they have no internal moving parts – this makes them virtually maintenance-free for their service life.

Secondly, they can operate in areas where the use of fossil fuel combustion engines is not viable – whether that is because it is too noisy, too remote, or too dangerous.

Endurance is always the trade-off with electric motors.

Skyline UAV's chief remote pilot, Mike Walters, says that most of the figures quoted by UAV companies are unrealistic, as they are based on zero payload, and using 100pc battery capacity in perfect operating conditions.

"Weight, temperature, wind, humidity, elevation, battery condition, etc, will all impact endurance," he said.

"As such, we have tried to obtain realistic data for the Skyhawke and continue to update our information over time.

"Skyhawke, with a moderate payload under normal operating conditions can stay aloft for 20-30 minutes.

"This is comparable with the real-world performance of other aircraft in its class.

"However, by using off-the-shelf lithium polymer batteries we can use multiple configurations to achieve different performance."

Skyhawke can also be built to full custom specifications, due to the in-house capabilities of the Skyline team.

Whether it is as simple as integrating different payloads into the build, or as complex as completely re-sizing the aircraft for different power systems and performance, Skyline has CNC and 3D printing machines on site that can quickly prototype and manufacture new components for any number of applications.

To resolve the software incompatibility problems, Skyline opted for the Pixhawk flight controller, which runs open source software.

This means that Skyline has access to the massive community of developers who are constantly updating and innovating, as well as providing timely support and a lively product development cycle.

For Skyline, the main purpose of the smaller Skyhawke MR6 was as a survey platform that was fitted with a FLIR Duo Pro R camera package.

The larger Skyhawke XL has been used as a precision lifting platform, and has also been configured to carry Skyline's Infernus aerial incendiary unit.

Put to the test

Skyline UAV was recently engaged to assist with the replacement of a power cable between two electricity pylons in a remote, densely forested area.

The pylons were 300m apart, with 120m of vertical separation between them – you can see the image in Skyline's advertisement on this page.

Skyline elected to use the Skyhawke XL as it was easily capable of lifting the cable leader and could be transported to site in a 4wd with minimal ground support equipment.

The lift was carried out at first light in cold and windier conditions than expected, however the aircraft was still able to complete the job with an impressive level of precision and stability.

The cable was placed with great accuracy and the client was able to achieve a successful outcome as a result, and with considerably less risk and cost than if a manned aircraft had been used.

Due to the heavy tree canopy and steep slope, the company did encounter some difficulty with visibility and data telemetry.

As a result, it has identified a need to always place the ground station at the lowest elevation, and will be working with Helicopter Lifting Services (another Skyline company) to identify how full-size procedures can be adapted to UAV with regards to ground crew and communication.

Skyhawke XL

SYSTEM SPECIFICATIONS

- Aircraft size (excluding props): 1289x1403x429mm
- Aircraft size (folded): 447x1403x429mm
- Propeller size: 762x266mm (30x10 inch) 2-blade
- Max take-off weight: 36kg
- Max useful payload: 14-16kg (depending on batteries)
- Flight battery: 44.4v (12S) 22000-44000mah LiPo
- Avionics battery: 11.1v (3S) 1000mah LiPo dual pack
- Endurance: 30 minutes depending on battery/payload configuration
- Max wind gusts: 10m/s (20kts) any direction
- Max range: Variable depending on C2 link used

MORE INFORMATION: Skyline UAV | (02) 4945 1491 | skyhawke@skylineaviation.com.au | www.skylineuav.com.au

Portable, flexible solar option

NATIONAL

RENEWABLE energy is an essential end goal for any responsible corporate citizen but until recently alternate energy systems have struggled to fully replace grid or diesel/LNG generated electricity.

The SolarGEM system from Sequentia Services, in Queensland, provides a proven and reliable solution for remote power generation, delivering flexible and relocatable renewable energy from a hybrid power station.

Containment policy

The foundation of the SolarGEM system is the container-mounted integrated photovoltaic (PV) system, which includes an inverter, an AC distribution board, communications and fire protection.

A total of 200 PV panels, mounted on 40 hinged frames, concertina into a single 20-foot container.

When the side doors of the container are opened a pair of tracks are withdrawn and set up on a foundation system designed to cater for the site's contours.

The frames are then deployed with the aid of a telehandler or similar machine.

Once fully extended, the row of solar panels is 90m long. Each container has the capability to produce 74kWp (60kVA) of power and an almost unlimited number of containers can be daisy-chained to produce any desired total output level.

Using a string inverter, each container is capable of outputting 60kW of AC power in either three-phase or single-phase.

At 400V, the inverter has a constant current delivery of 86.7A up to a maximum of 95.3A.

A recent project study for a mining client proved this scalability by linking 136 individual units at a single location to produce 10MW of power.

Once fully extended, the row of solar panels is 90m long, and an almost unlimited number of containers can be daisy-chained to produce any desired total output level.

Once the panels are extended and the tracks are secured to the foundations, the side doors of each container can be closed and locked to safely enclose key electrical elements and to prevent weather ingress or unwanted entry.

An E-Stop is fitted to the outside of each container as an integral safety feature.

In addition to the SolarGEM's ability to link dozens of units together, the system has excellent ground density, with only 1m required between each row of panels.

This creates a smaller footprint and economies with cabling and wiring setup time.

Because the SolarGEMs are portable, they can also be set up in satellite locations on a mine site.

This is ideal for powering the pumps at a tailings dam for example, as it eliminates the need for remote diesel deliveries.

Exploration companies also find this portability invaluable as they are able to set up in a particular location and then move to the next with minimum downtime, all while reducing diesel generator use and associated maintenance hassles.

Battery technology

Along with the SolarGEM providing 74kW in one 20-ft container, Sequentia Services couple their scalable PV array with a battery system, which is also containerised.

Output ranges from about 100kWh to 1MWh in each container.

Similar to the SolarGEM, the StorageGEM is scalable to allow an almost unlimited number of units to be combined to meet a specific requirement.

The battery system's design is flexible to accommodate varying site load profiles, be it for energy shifting, power control or a mix of both.

Being lithium-ion, providing grid stability services for a grid-connected or micro-grid setup is not an issue.

With blackstart capabilities, the reliability of the site's electrical system is secured, even catering for the massive increases in load when heavy processing equipment commences operation.

What sets this system apart is the way it smoothly integrates solar power with battery storage and diesel supplementation, using smart management software that optimises the balance of all three inputs to minimise power costs while delivering an uninterrupted power supply.

Sequentia Services couple its scalable PV array with a battery system, which is also containerised. The battery system's design is flexible to accommodate varying site load profiles, be it for energy shifting, power control or a mix of both.

Control is key

Hybrid power is now feasible with near 100pc renewable energy penetration, maintained by as little as 5pc diesel power to periodically charge and maintain the storage batteries.

For each hybrid system, a cost benefit analysis is carried out to provide the most optimum mix of technologies more commonly used in mining.

This typically results in a 50-70pc renewable energy penetration with diesel generation providing support at 100pc efficiency.

The seamless switching and transition between each power source is managed and controlled by Akuo Industries' highly advanced control software.

This French company has been in the renewables industry for more than 10 years and has developed their own energy management system (EMS) to manage the changing power requirements of their clients' operations at various times throughout the day and night.

The end result of their exhaustive R&D program is smooth, reliable power.

An added advantage of such powerful management hardware and software is the ability to effectively test a complete system 'on the test bench' offsite, before it is deployed to a remote location.

Technical staff, including the client's technical representatives, can put the installation through its paces before shipping.

This allows adjustments to be made under factory conditions so that when the EMS hardware and software are installed on site, final commissioning time is drastically reduced and a major project risk is significantly mitigated.

Full redundancy

Depending on the solar PV and battery sizing, the EMS is able to cycle the diesel power to act only as an emergency back-up or once or twice a week to maintain the storage batteries.

Additionally, Sequentia designs their systems with full N+1 redundancy, so that if the site requires 5MW to operate then there are enough diesel generators to meet that 5MW demand for a period of time, if necessary.

So, the Sequentia hybrid systems effectively offer more power reliability while providing operational cost savings.

Grid locked

Utilising the battery system and the EMS, Sequentia can configure a fully operational power station 'behind the meter' and only use grid power to periodically charge the batteries at off-peak times to further reduce costs.

Alternatively, a larger hybrid power plant can be built to actually assist the grid in a remote or under-supplied area by feeding power and stability services back into the grid – effectively turning a cost centre into a profit centre.

This has become an increasingly topical conversation with remote grid operators who are grappling with the increased introduction of distributed energy sources, changing load profiles and increasing maintenance costs.

Initiatives like this can help companies fulfil part of their social responsibilities in remote areas as it provides a win for local remote communities who receive more stable, and hopefully cheaper, power.

Capex or Opex?

There are a number of options available to structure the implementation and operation of a hybrid power station.

Instead of outright capital purchase, some junior miners are opting to lease the system over five or 10 years with monthly payments.

Managed services can also be provided if required.

Another alternative is for Sequentia Services to supply, commission, operate and manage the power station — providing a usage charge per KW/hour.

This allows miners to shift what is usually a large Capex cost into an Opex line item, once production is underway.

According Sequentia Services director Matt Doyle, the paradigm is changing.

"With portable and flexible renewable energy options, hybrid power is now a viable solution," he said.

"With tested technology to efficiently manage the power blend, potential income streams and both Capex and Opex options available to adopt the technology, the time has never been better to implement a renewable energy system."

MORE INFORMATION: Sequentia Services | 07 4243 4420
www.sequentiaservices.com.au

Serious power and reliability

NATIONAL

POWER reliability is vital for mining operations and with a wide range of compact generators available, Kubota has a solution for almost every application.

From 5.5kVA through to 30kVA, Kubota GL and SQ series diesel generators are powered by genuine Kubota engines and renowned worldwide for their superior reliability and long service life.

The Kubota GL and SQ series diesel generators are built to withstand Australia's tough conditions, easy to transport and maintain, and are safer and quieter to use – which is ideal for the mining industry.

With back-up power you can trust for off-grid energy mining operations, Kubota can be relied upon when unexpected power outages hit or the off-grid solar system lets you down.

The GL series generators also offer easy single side maintenance and servicing, a compact design, plus exceptional fuel economy combined with Kubota diesel generators' generous fuel tanks to extend operating periods between refuelling.

The SQ series, on the other hand, are super quiet generators, with noise absorbing duct, oversized muffler, extra-long air cleaner hose and low-noise cooling fan – and have incredible power output.

The GL and SQ series diesel generators keep sites operational even in the event of unexpected power outages.

The perfect partner for off-grid systems with lean battery storage, these heavy-duty, four-pole generators will help you weather any storm.

When you need exceptional performance, excellent fuel efficiency and reduced emissions that won't blink twice at Australia's harshest conditions, the SQ Series is the premium choice.

GL9000 and GL6000 diesel generators

The Kubota GL9000 and GL6000 are two-pole, silent-type, direct-coupled, single-phase diesel generators.

While the Kubota GL9000 generator has a capacity of 8.8kVA at 3000RPM, suppling 33.3A at 240V and the Kubota GL6000 has a capacity of 6kVA at 3000RPM, suppling 22.9A at 240V, both models include a digital model featuring a remote 2-wire auto start for solar back-ups.

The Kubota GL9000 diesel generator is powered by Kubota D722 engines, renowned worldwide for their high performance and reliability and a running a range time of 8.5 hours at full load, while the Kubota GL6000 diesel generator is powered by the Kubota Z482 engine, with ease of use and accessibility making it ideal for moveability purposes and running a range time of 12 hours at full load.

Both the GL6000 and GL9000 are perfect solutions to off-grid back-up power.

SQ3300 and SQ3200 diesel generators

The Kubota SQ3300 and the SQ3200 are compact three-phase, four-pole diesel generators with a 30kVA at 1500RPM capacity.

Both the Kubota SQ-3300B-AU-B and the SQ-3200B-AU-B diesel generator are fully sound attenuated for super quiet operation.

The SQ3300 has a run time of 24 hours powered by the extra reliable Kubota V3300 diesel engine, which can work under a single phase 240V and run a current of 27.1A or a three-phase 415V and a run a current of 41.7A per phase.

While the SQ-3300B-AU-B has a V2203 diesel engine on board to power through even the toughest jobs, it is also available to work under a single phase 240V and run a current of 18.1A or a three-phase 415V and a run a current of 27.8A per phase.

Both models run a digital model, which features a two-wire auto start for solar applications fitted as standard, as well as being fully bunted to guard against fuel leaks for added peace of mind.

Coupled with long running times (25 hours), these generators are ready and able to get to work at any time – the SQ can even be used as the primary power source because it plugs straight into the meter box for fast, quiet, reliable efficiency that's kind to the environment with fewer emissions.

Also in the SQ Range are two single-phase, four-pole, compact diesel generators, the Kubota SQ1120 and the 1150B-AU-B.

Both fully sound attenuation for super quiet operation, high fuel efficiency and low emissions, they are premium choice for a wide range of applications, including tradespeople, and the mining and construction industries.

MORE INFORMATION: Kubota | 1300 582 582 | www.kubota.com.au

Speed the key for power stations

NATIONAL

ENERGY Power Systems Australia (EPSA) undertakes the fast mobilisation, set-up and commissioning of power stations across Australia.

Business development manager Terry Knott said rapid deployment was important because it reduces risk of delays or shutdowns, therefore decreasing the potential costs involved in lost operational days.

EPSA is the trusted advisor for multi-megawatt rapid deployment power stations.

They combine all internal capabilities to ensure mines stay fully operational.

The services EPSA provide include electrical engineering, onsite technicians, logistics support and operations.

EPSA's deployment capability has resulted in responsive deployment of power stations around Australia.

Mr Knott said that in November 2017, a mining customer suffered a mechanical tap changer fault that caused one of its main transformers to explode.

The loss of the transformer put a large amount of pressure on its back-up generator, which also suffered slight damage due to its proximity to the explosion and fire.

With the lead-time for ordering a new transformer around five months, the client identified an unused 20MVA 11kV to 33kV transformer in an unused switchyard on their mining lease.

ESPA is Australia's specialist Cat engine dealer.

Energising the spare transformer would reduce the pressure and high risk of failure on the back-up transformer.

"This is where EPSA stepped in with a full turnkey temporary power solution," Mr Knott said.

"Our team combined all internal capabilities – from electrical engineering and technicians to logistics and operations to ensure our client remained fully operational."

EPSA was awarded the project to supply 16 x 1500kVA generator 415v to 11kV for a period of 90 days to maintain the power station in full operation from late-January 2018.

"EPSA's rapid deployment capability has resulted in responsive deployment of power stations around Australia by our rental team," Mr Knott said.

EPSA is a leader in rapid deployment of multi MW power stations.

The company partners with businesses to find the best through-life cost benefit solution.

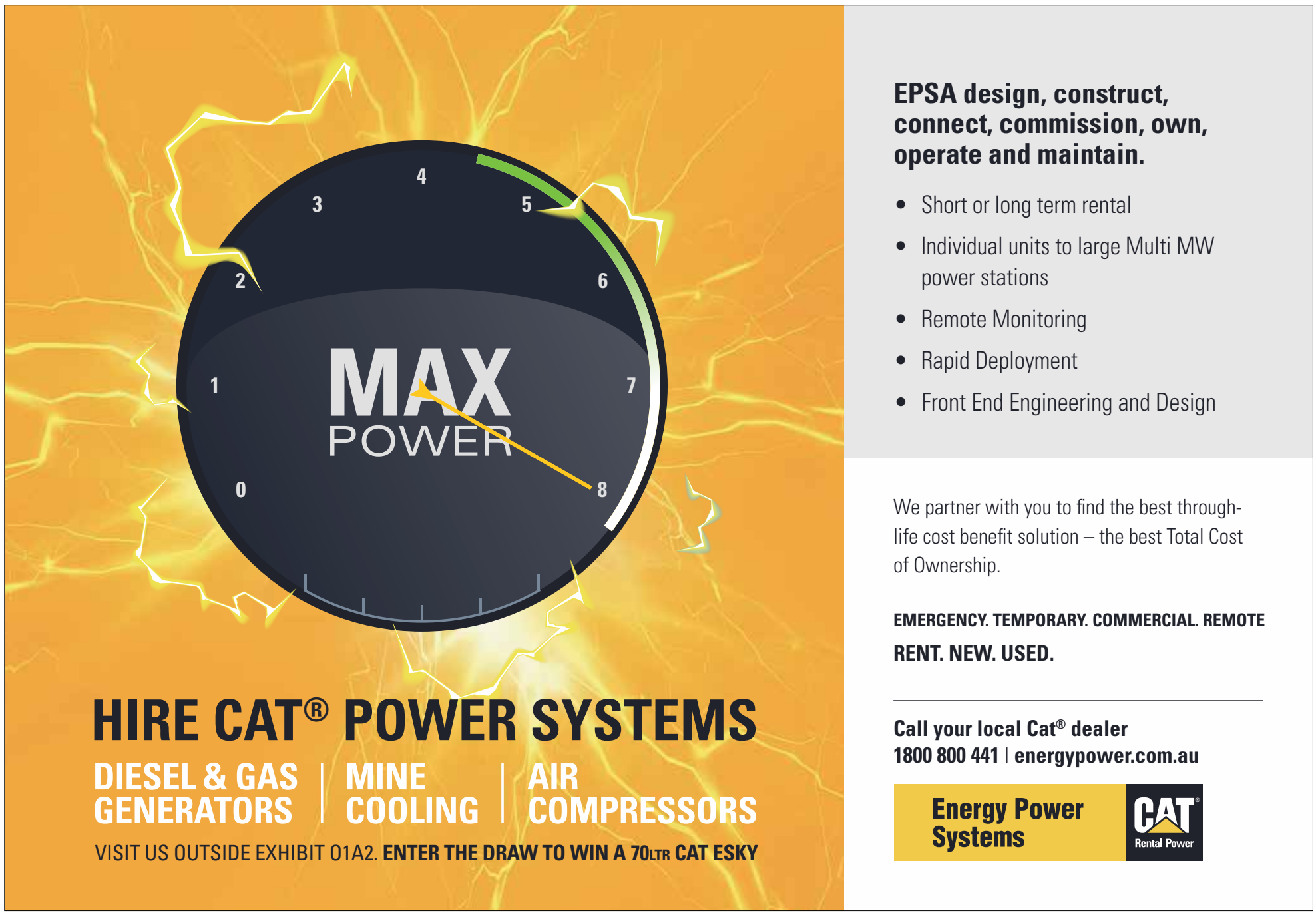
EPSA began in 1992 with the amalgamation of Cat power systems from the regional Australian Cat dealers into one single national Cat engine company.

The company can cater for every power generation requirement: continuous power, prime power, standby power, cogeneration, trigeneration, peaking power and a range of bio-fuel applications from land fill gas to coal seam gas to waste gas EPSA also provides the new Cat Hybrid Microgrid System and Energy Storage solution that integrates traditional energy sources with wind, solar and biogas.

As the authorised Caterpillar supplier, EPSA has the options to rent or buy new or used Cat power systems anywhere around Australia, Papua New Guinea and the Solomon Islands.

EPSA delivers technically superior Cat engines with unmatched engineering support, technical advice and after-sales support through the Cat network.

MORE INFORMATION: Energy Power | 1800 800 441 | epsa@energypower.com.au | www.energypower.com.au



Synchronicity

Container-mounted generators are portable and can be linked to deliver reliable and economical power.

NATIONAL

THE days of running a single, large genset to power an entire camp or processing plant are long gone.

Using clever controllers to manage and synchronise a number of smaller generators saves not only upfront capital costs but also ongoing operating costs.

The fuel savings alone, enjoyed by adopters of this technology, have been between $1-2m per year.

Genset Hire and Sales Australia (GHASA) is a WA company with more than 40 years' experience in remote power generation.

In that time, it has been instrumental in developing power installations that do away with a single large generator, instead utilising several smaller generators with the same total output.

The benefits of this system are manifold and impact directly on the client's bottom line.

A large generator, for example 1000kVA, may only be producing at full capacity for a short time each day, when power demand is high.

For the rest of the time, the large diesel engine is running with very light load and producing far less than 100pc of its capacity but still burning a significant volume of fuel.

Diesel engines running for extended periods under light or no load are susceptible to cylinder wetting and that can result in a costly rebuild.

GHASA Australia general manager Mark Kindred said the alternative is both economically and environmentally sound.

"In most cases, an electrical engineer will give us the specifications for the mine camp or process plant's power requirements," he said.

"It might require a total of 1000kVA.

"We examine the load profiles of that specific application and may recommend a combination of three or four 300kVA generators to supply the total required power.

"However, our design process and controllers allow us to seamlessly introduce or remove individual generators at any time to balance output with the site's demand as it varies throughout the day.

"We encourage a similar sized unit as the spare. This allows for complete +1 redundancy in the event of a mechanical failure.

"By utilising ComAp controllers, and with some custom engineering, we can meet all the company's energy requirements but also save them money on initial capital costs and ongoing maintenance using our synchronised genset installation.

"This system can have a significant cost saving on diesel consumption per annum.

"Diesel is the biggest cost in power generation alone."

Clever camps

ComAp are the industry leaders in synchroniser controllers and its use has also allowed GHASA to go one step further for construction and small fly camps.

By teaming up with transportable building companies, GHASA has successfully designed and built modular camp configurations that are literally plug and play.

All electrical connections from the gensets to the buildings have plugs and sockets, so there is no need for a gaggle of electricians to wire up the site before it is commissioned.

Full bore

GHASA also supports many mining companies to power the pumps in their bore fields – the source of their water supply.

These gensets are typically sized between 20 and 50kVA and run for days at a time, often unsupervised due to their remote locations.

However, reliability and fuel efficiency and long range fuel tanks are paramount in this application as water is critical to the continuous operation of a mine.

GHASA pioneered the use of telemetry and onsite remote controllers to not only ensure that these generators operate faultlessly but also load switch according to water pump demand, to minimise fuel usage.

Hardcore hardware

GHASA's gensets are powered by quality engines that are known for their reliability and longevity and have readily available service parts.

Skid-mounted generators feature high quality Kubota and Isuzu engines for reliable running – especially in remote locations.

Larger generator units are powered by world renowned Perkins and Cummins engines. Parts are readily available anywhere in the world.

The ComAp controller and management system allows synchronisation of multiple generators on site, to bring in power only as it is needed. This leads to significant fuel savings each year.

For generators up to 30kVA, Kubota engines are used.

These are not only reliable but have excellent resistance to cylinder wetting (bore glazing) when operating under light loads.

For units up to 50kVA, GHASA specifies Isuzu engines.

For applications 45kVA and above, Perkins or Cummins power plants are put into service.

Coupled to these highly renowned engines are quality gensets from Powerlink and Shindaiwa.

Once again, these units have proven themselves over the decades and have delivered thousands of trouble-free hours of service in the harshest environments in Australia and are proven in GHASA's rental fleet.

As expected, the complete generators are fully mine-spec and feature locking battery isolators, bunded fuel tanks, internal control panels, outlets and external fuel valves.

GHASA's units also include high capacity fuel tanks that permit true 24-hour operation between refills.

It takes experience, knowledge and technology to deliver uninterrupted power in remote locations but it takes a little extra know-how to do it for less up front capital and also save millions of dollars-worth of diesel. Synchronicity at its best.

MORE INFORMATION: Genset Hire and Sales Australia | 08 9359 1988 | www.ghasa.com.au

Power generators that meet your needs where & when you need it!

Sizes From 20kVA to 1250kVA

Using only high quality Kubota, Isuzu, Perkins and Cummins Engines

Synchronised generator specialists.

Our synchronised minesite systems use industry leading ComAp Controllers to link a series of generators with load switching to deliver capital savings & significants dielsel savings.

GENSET
hire and sales australia

- Hire and sales to full mine specs (BHP and RIO compliant)
- Generators - 20kVA to Multi Megawatt
- Loadbanks hire and sales - 1000L to multiple 110kL bunded
- Distribution boards, siteboards and MCCB's
- Fuel tanks and tank farms supply - AS1940 and AS1962 compliant from 1000L to 110,000L double skinned (self bunded)

www.ghasa.com.au

08 9359 1988

Heavy metal

Excavator repairs form a large portion of EMS's weekly duties. In this case the bucket is being repaired and fitted with new wear plates. EMS have also done everything from track repairs to complete slew bearing replacements on machines up to 800-tonnes.

EMS also has experienced HV electricians for electric drive mining equipment repairs and component replacement.

NATIONAL

WHEN it comes to maintaining and repairing heavy earth moving equipment, it takes knowledge and experience to carry out the work to the highest standard and in the least amount of time.

Elphinstone Mechanical Services (EMS) is a family-owned WA-based company that has grown to service clients across Australia and South Africa.

Keeping a minesite up and running 24 hours a day is no mean feat and it takes a diversely skilled team to manage everything from unexpected repairs to scheduled maintenance and rebuilds.

EMS has grown to cater to the demands made by modern mining companies to keep production processes in motion – particularly in the area of large haul and dump trucks and the huge excavators they serve in an endless procession.

The 50 field service technicians and more than 30 site-based staff include HV electricians to deal with electric drive trucks and earthmoving equipment, auto electricians to handle repairs on mobile plant running 48V or less, boiler makers to take care of repairs to truck trays, chassis and pins, and heavy duty mechanics to make sure that the mechanically driven haul fleet is always operational.

EMS mechanics replacing an engine in large excavator.

EMS regularly carries out tray repairs on site for faster turnarounds.

Mining companies and contractors need a service company that can handle any problem as quickly as possible to minimise downtime, and when that company has a range of specialists to make that happen, a great deal of comfort is created.

EMS tackles the big jobs on a regular basis – complete machine overhauls, component rebuilds, day to day scheduled maintenance, breakdown repairs, on site welding and line boring services, auto electrical and high voltage mining equipment repairs.

Due to the company's diversity, EMS now manages the scheduled service and maintenance of heavy duty mobile plant for a number of customers around the world, while others also require scheduled rebuilds where the crew strips the machine back to a bare chassis and re-assembles it with any and all repairs, refurbishments and replacements carried out before it returns to service.

EMS boilermakers repairing tray pivot points.

MORE INFORMATION: Elphinstone Mechanical Services (EMS) | 08) 6222 6621 | www.emsgroup.net.au

• Labour Hire / site support
• Field Service
• On site and off site welding repairs
• Spare Parts Sourcing
• Component rebuilds
• Complete Machine overhauls

Our team of talented and skilled technicians are ready to provide practical mechanical solutions for your project.

EMS
ELPHINSTONE MECHANICAL SERVICES
08 6222 6621
fieldsupport@emsgroup.net.au | emsgroup.net.au

Australian long-haul legend

NATIONAL

DESIGNED and manufactured in Tasmania, the Elphinstone Haulmax 3900 extended distance haul truck range is the culmination of 20 years of experience and research into mine haulage applications.

Elphinstone developed the purpose-built range of trucks to fill the industry-acknowledged void between traditional mining dump trucks and conventional on-highway trucks.

Designed to operate on cycles of about 50km, the narrow width design of the 3900 allows it to work effectively on roads of 15 metres width.

Simply put, narrower roads cost considerably less to build, construct and maintain, so the longer the distance, the larger the cost-saving.

Emphasis on reducing the cost per tonne (CPT) has been at the forefront of the design and constant improvements.

The Haulmax design is based around tyre performance indicies, maximising vehicle payloads over longer haulage distances.

As an authorised Caterpillar Original Equipment Manufacturer, Elphinstone worked closely with Caterpillar to ensure matched power train components optimise longevity, reliability and mechanical availability, resulting in improved productivity and reduced operating costs.

After-sales service and product support is made available through the worldwide Caterpillar dealer network.

Other value-add features include excellent traction and stability, operator comfort and safety, serviceability, sustainability and an assured increase in productivity.

These features and more contribute markedly to a reduction in CPT and Total Cost of Ownership (TCO) for the customer.

The first two of eight Haulmax 3900 long haul trucks are ready for dispatch from Elphinstone's world class manufacturing facility in Burnie, Tasmania.

The spacious, ergonomically designed two-person ROPS / FOPS certified operators cabin offers a comfortable working space to minimise operator fatigue.

Stairs accessing the operator's cabin and the maintenance platform are bordered with safety rails allowing three points of contact.

Traction and stability

The 3900 Series offers excellent traction and stability in soft and slippery operations.

The combination of the truck's narrow width, long chassis and dual axle eight-wheel drive configuration provides safe and superior operator control.

Brake systems include hydraulically controlled dry front, and rear oil-cooled multiple disc brakes and engine retard system, all of which combine for superior fade-resistant performance in all mine site conditions.

Parking and secondary brakes are spring applied and hydraulically released.

This combination ensures braking in the event of complete hydraulic failure.

The 3900 chassis is a deep box-section construction incorporating castings in high-stress areas with full penetration wraparound welds designed for a minimum life of 60,000 hours.

By using castings in critical high stress areas, welded joints are moved to lower stress areas.

Serviceability and maintenance

Easy access to daily service points from ground level increases safety and reduces time spent on regular maintenance procedures.

Retracting stairs provide safe access to the maintenance platform where engine, air filters, radiator, hydraulics and steering can be reached safely.

Engine shutdown and battery disconnect can also be accessed from one point at ground level, making machine lockout simple and safe.

On-board diagnostic systems enable fast diagnosis of engine conditions and effective maintenance and repairs.

An optional fluid evacuation system and automatic lubrication system reduces labour time by up to 50pc.

The lubrication system automatically delivers lubricant to clustered injector banks which distribute the correct amount of grease to service points.

Operator comfort and safety

The independent front suspension and 'A-frame' rear axle assemblies provide unrivalled levels of stability, safety and comfort.

The spacious, ergonomically designed two-person ROPS/FOPS certified operators cabin offers a comfortable working space with fully adjustable lumbar support and air suspension seats for both the operator, trainer or trainee.

All controls, levers, switches and gauges are positioned ergonomically to maximise productivity and minimise operator fatigue.

Customer characteristics

Typical Haulmax 3900 customers are those operators with haulage requirements which are outside the range of traditional haul trucks; require sustained downhill braking; are governed by haul road width restrictions; or require superior gradeability, traction or other special trailer configurations.

Elphinstone's focus has always been to deliver customers a total haulage solution based on their specific haul requirements.

Thus the 3900 can be optioned with different truck bodies to account for a variety of material applications.

The recent sale of eight Haulmax 3900 long haul dump trucks in Suriname, South America, exemplifies the fit-for-purpose characteristics of the 3900 range.

Prior to 2016, Surmac, an authorised dealer of Elphinstone machines in Suriname, identified a need for an extended distance haul solution at a local mine site.

Due to lessening gold provisions close to the site, ore would have to be hauled 35km or more, beyond the application of a normal mining dump truck.

In January 2019, Elphinstone signed a dealer agreement with Surmac in Australia and Elphinstone shipped the Haulmax 3900 trucks soon after and these are now operating for the first time in Suriname.

Elphinstone has now sold more than 100 Haulmax 3900 trucks for dump truck, water tank, service module and low loader applications worldwide.

MORE INFORMATION: Elphinstone | 03 6442 7777 | www.elphinstone.com

ELPHINSTONE

HAULMAX
IN IT FOR THE LONG HAUL

80 TONNE NOMINAL PAYLOAD CAPABILITIES
The 3900 Series Truck was developed to operate on cycles of approximately 50km (30 miles).

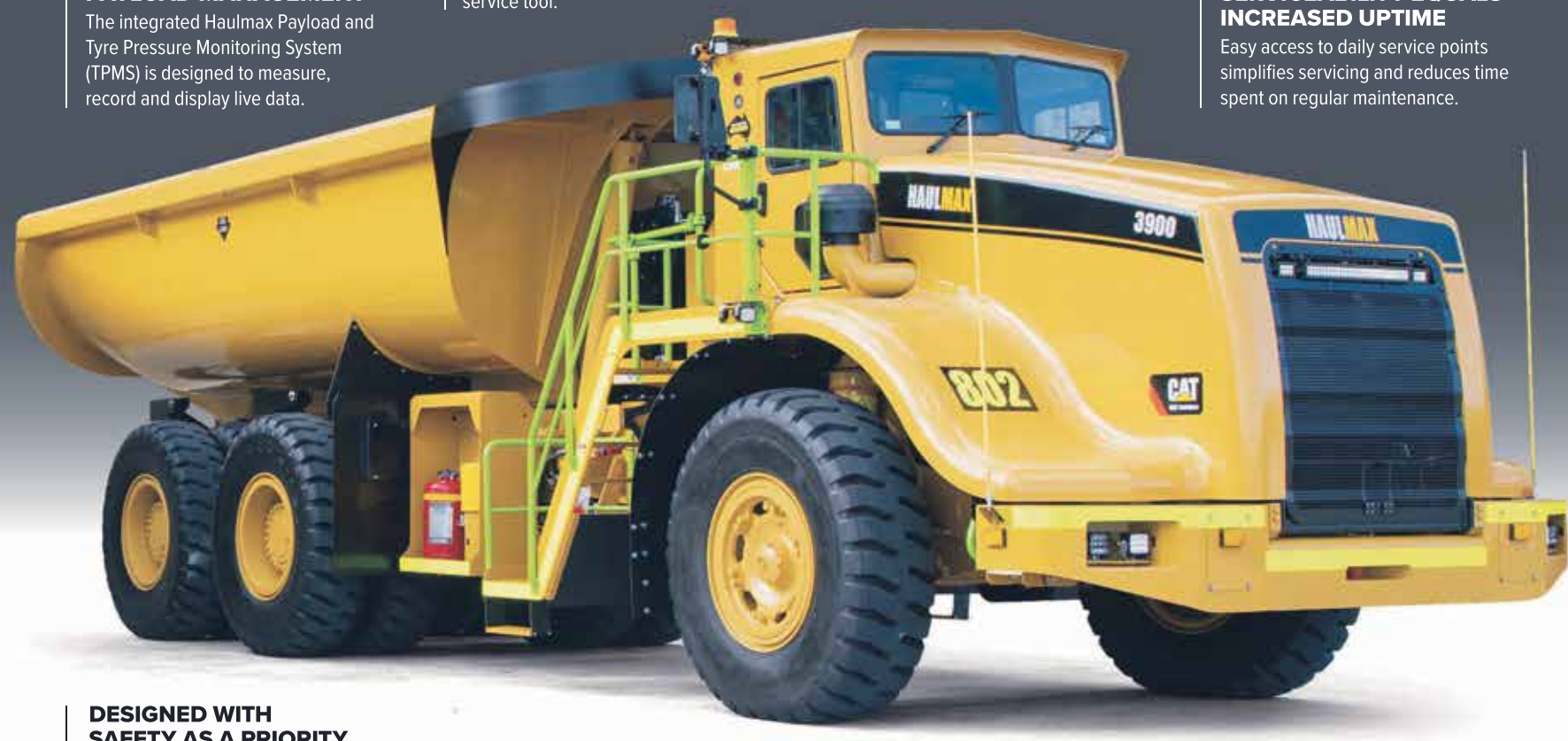
PAYLOAD MANAGEMENT
The integrated Haulmax Payload and Tyre Pressure Monitoring System (TPMS) is designed to measure, record and display live data.

ON-BOARD DIAGNOSTIC SYSTEMS
Electronic control system enables quick diagnosis of engine conditions and effective maintenance and repairs using the Electronic Technician (Cat ET) service tool.

OPERATOR COMFORT AND CONFIDENCE
Ride and comfort assured with a spacious two-person ROPS / FOPS certified cabin, air suspension seats and ergonomic layout.

ENGINE PERFORMANCE AND PRODUCTIVITY
Cat C27 Engine with ACERT™ Technology. Meets US EPA Tier 2 and European Union Stage II standards.

SERVICEABILITY EQUALS INCREASED UPTIME
Easy access to daily service points simplifies servicing and reduces time spent on regular maintenance.



DESIGNED WITH SAFETY AS A PRIORITY
Oil cooled disc brakes, access ladders, fire prevention and optional WAVS camera at the rear and high intensity HID lights.

ENGINE SHUTOFF SWITCH
A secondary engine shutoff switch is located at ground level along with a hood tilt switch and other electrical isolators.

MAINTENANCE PLATFORM
Easy stairway access to engine, air filters and radiator. Platform access for hydraulics and steering.

BOX-SECTION DESIGN
Incorporating castings in high-stress areas with full penetration wrap around welds.

APPLICATION SPECIFIC TRANSMISSION
The Cat mechanical drive power train and power shift transmission provides unmatched operating efficiency and control on steep grades in poor underfoot conditions and on haul roads with high rolling resistance.

STABILITY, SUSPENSION AND TRACTION
Designed to handle mine site conditions enhancing a longer frame and service module life plus a more comfortable ride. Six independent self-contained, oil pneumatic, variable rebound suspension cylinders are designed to absorb shocks in the most severe applications.

Ground level access and serviceability keeps your wheels and productivity on track.

Easy access to daily service points simplifies servicing and reduces time spent on regular maintenance procedures. Enhanced serviceability and extended 500-hour engine service intervals are designed to increase machine availability and productivity. The maintenance platform provides easy stairway access to engine, air filters and radiator. Platform access for hydraulics and steering. Ground level and filter access allows convenient servicing to tanks, filters, evacuation points, battery disconnect and engine shutdown. Oil change labour time is reduced as much as 50% with this optional engine and system fluid evacuation system.

+61 3 6442 7777 | elphinstone.com

ELPHINSTONE

SMS a big company for small business

SMS Mining Services has a hands-on, solutions mindset that delivers effective outcomes for clients.

NATIONAL

SMS employs more than 500 people, and is led by an experienced and hands-on leadership team that has accountability and approachability built into its culture.

The company prides itself on its unparalleled reputation in the industry for equipment reliability and service.

SMS is a big company with a small company feel.

The company works with its clients and will generate ideas on cost reduction, as it sees value delivery as one of its key responsibilities.

Founded in 2000 as Sweeney's Mechanical Services, SMS began its life providing maintenance, refurbishment, sales and service support for heavy duty earthmoving.

In 2007, rental hire services were added to the portfolio and the company's name changed to SMS Rental, before evolving to SMS Innovative Mining Solutions.

In 2016, the contract mining division was formed to deliver an end-to-end service offering.

To reflect this, it evolved to SMS Mining Services.

In 2018, SMS Mining Services merged with the Rivet Group, an Australian provider of specialised transport and logistics solutions, to become part of a much larger and stronger group of companies.

The company has one of the largest rental fleets in Australia which includes dozers, loaders, excavators, graders, dump trucks, water trucks, on-highway vehicles, light vehicles and ancillary equipment.

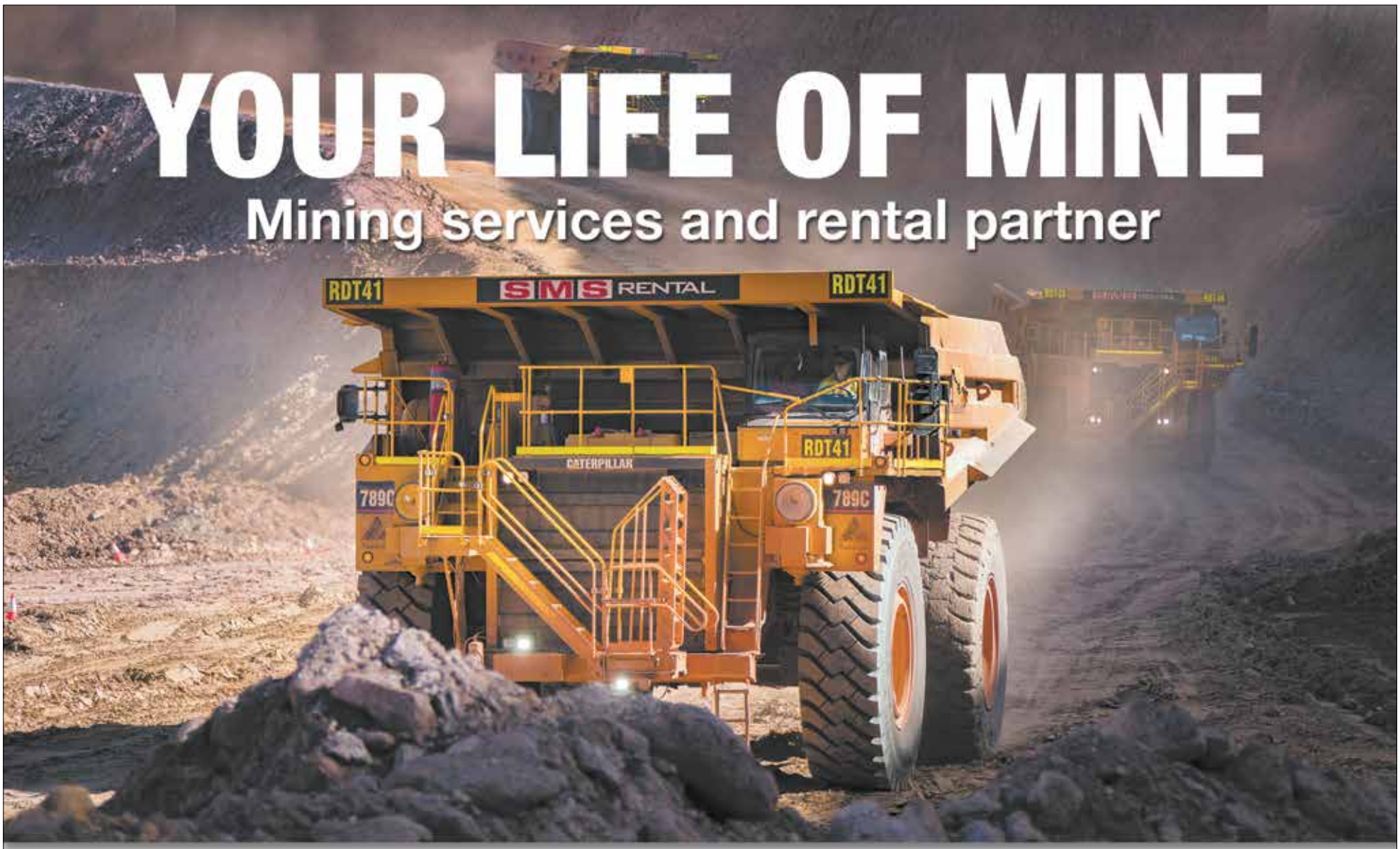
Saracen general manager Lee Stephens said that as a company to work with, SMS Mining Services is adaptable and flexible, and that the company would embrace any challenge to come up with a working solution.

"SMS offers a unique service with its ability to leverage experience and relationships to assist in the acquisition of appropriate equipment on behalf of the company," he said.

"It is highly responsive helping us gear up with equipment when a project needs it.

"We have a strong relationship with the company, with the ability to talk directly with the owners when needed."

MORE INFORMATION: SMS Mining Services | (08) 9277 5177 | admin@smsmining.com.au | www.smsmining.com.au



08 9277 5177 www.smsmining.com.au
96 Ewing Street, Welshpool WA 6106 | Po Box 272 Bentley WA 6982
SMS MINING SERVICES

Axis Mineral Services has all crushing, screening and sorting needs covered.

Screening services sorted

NATIONAL

AXIS Mineral Services runs a modern fleet of crushing and screening equipment from Terex Finlay and McCloskey.

Whether clients need equipment to sort mill feed, in-pit or remote crushing and screening, oversize rock breaking, or ROM Pad management, Axis has the right equipment for any mining operation.

Axis operations director Mark Thompson said the company enhances the performance of its customers in crushing, production and mining requirements by understanding their needs, and providing cost effective crushing and mining services within a safe and innovative environment.

"We can screen aggregates to all specifications. If you need concrete, road, sand, filter rock or armour rock crushing and screening – we can help," he said.

With extensive experience in the industry, Mr Thompson said Axis is the provider of choice.

"We are a recognised as a market leader in delivering technical solutions and best value service to industry," he said.

"Our business is built around continuously providing superior customer service and working with our clients, partners and suppliers in long term mutually beneficial relationship."

Axis Minerals understands customers' expectations around innovation and cost effective solutions.

"We pride ourselves on our ability to provide crushing for all mining requirements and to adapt and change to our customers' needs because we understand the importance of efficiency to our customer's bottom line," Mr Thompson said.

For more information about crushing and screening services visit: www.axisminerals.com.au

MORE INFORMATION: Axis Minerals | 08 6155 8916 | www.axisminerals.com.au

08 6155 8916
mark.thompson@axisminerals.com.au
axisminerals.com.au

AXIS MINERAL SERVICES

CRUSHING? SCREENING?
SORTED

CRUSHING & SCREENING, ORE SORTING AND CIVIL SERVICES FOR AUSTRALIA'S MINING AND CIVIL INDUSTRY.

Ground breaking

Premier Rock Machinery is the new owner of MISU, the original screening bucket of choice.

NATIONAL

SORTING quality earth from rubble, rock and rubbish has long been driven by an innovative Australian product — the Mobile Integrated Screening Unit (MISU).

The MISU combines simplicity and speed to deliver piles of clean fill in the most efficient way possible.

MISU is the original screening bucket, which many subsequent designs around the world were originally based on.

The patent originated in Albury, Australia and since 1999 over 700 buckets have been sold and supported around the world.

MISU was recently purchased by Queensland company Premier Rock Machinery, which is renowned for its innovative and diverse excavator-mounted attachments, representing quality brands such as Montabert Rock Breakers and Drills and Movax Piling attachments.

Premier Rock Machinery was also recently recognised for its innovative safety solutions being developed for the Thiess group on elevated work platforms, and has a dedicated engineering department focused on control system innovation and mobile equipment safety.

One of the biggest challenges with re-using dug-up earth is that it is often lumpy and packed with tree roots, chunks of old concrete, building materials and rocks.

Traditional methods of removing this debris from soil has been the use of stationary giant 'sieves' which are bulky and time consuming.

PRM PREMIER ROCK MACHINERY
MISU MOBILE INTEGRATED SCREENING UNIT

ATTACH YOURSELF TO THE BEST.

MISU – The original Screening Bucket of Choice – Australian icon

- Pipeline Back Filling
- Mine Paste Plants
- Mine Tailings
- Lump screening out of Nitrogen fertiliser
- Many more applications
- Over 700 units sold since 1999.

CONTACT

07 3711 2779
prm@premrock.com.au
premrock.com.au

SPECIALIST ATTACHMENTS HYDRAULIC INSTALLATIONS ENGINEERING SOLUTIONS

By using a patented multiple-spinning, inter-meshing rotor system which allows particles of earth to filter through, chunks of larger debris are held in the bucket to be discarded.

These rotors also crush and mix softer materials — making the most of each load.

The rotors spin two ways from a 'floating' position and allow free release of debris to prevent them from becoming stuck.

This floating motion allows the MISU to screen wet and muddy earth without issue.

The 'tailing pile' — the pile of sifted earth — is much cleaner after using a MISU and there is no need to repeat the process.

Powered by a carrier unit's hydraulic system, a MISU bucket must be matched correctly to its carrier unit.

This ensures the weight of the bucket and carrier are properly balanced and that the horsepower of the carrier is sufficient.

MISU models vary in size, weight and function, with some of the heavier units weighing up to four tonnes and carrying four cubic meters of earth at a time.

Suitable carrier units range from a mini excavator to a 50t excavator.

Depending on the type of bucket, the size of screened material ranges from 20mm through to 80mm — allowing flexibility for the operator's requirements.

This versatility makes the MISU the perfect companion for mining applications.

Few environments subject equipment to such a brutal range of elements as the mining industry.

MISU is adaptable for a range of mining applications.

The robust MISU copes well with mud, clay, rock and slurry providing the perfection companion in mining, though it is often used in civil and construction where back-filling of pipelines requires clean fill.

Australian-made, all spare parts can be purchased locally — reducing downtime by eliminating wait times on overseas parts or repairs.

Premier Rock Machinery sees the future growth of the MISU as being largely related to component evolution and streamlining of manufacture.

With a focus on Australian-made quality and easy access to parts and service, the MISU looks set to remain a constant fixture in the Australian mining industry.

MORE INFORMATION: Premier Rock Machinery | 07 3711 2779 | www.premierrockmachinery.com.au

Visit Us
AIMEX
#G140

Global Design, Built Aussie Tough

The Eriez SE-7000 has been adopted by industry around the globe and now it's built right here in Australia

The SE-7000 Series Suspended Electromagnet will remove damaging tramp metal such as rock bolts, star pickets and sections of rail tracks from coal, limestone, sand, gravel, other ores and almost any conveyed bulk material.

Features and Benefits:

- Oil expansion tank prevents condensation and protects against hot spots to extend coil life
- Coil design uses Nomex insulation with fiberglass spacers to prevent shorts
- Adjustable oil expansion tank designed for any installation angle
- Lift lugs include two side-by-side holes to allow simultaneous hoisting
- 23 magnet sizes, 69 standard models and fully engineered designs available
- Maximise the magnets life with Eriez equipment check-ups, process audits and in-plant certifications
- For hazardous applications, our experts can recommend the best advice for your specific needs

Eriez is recognised as World Authority in Separation Technologies

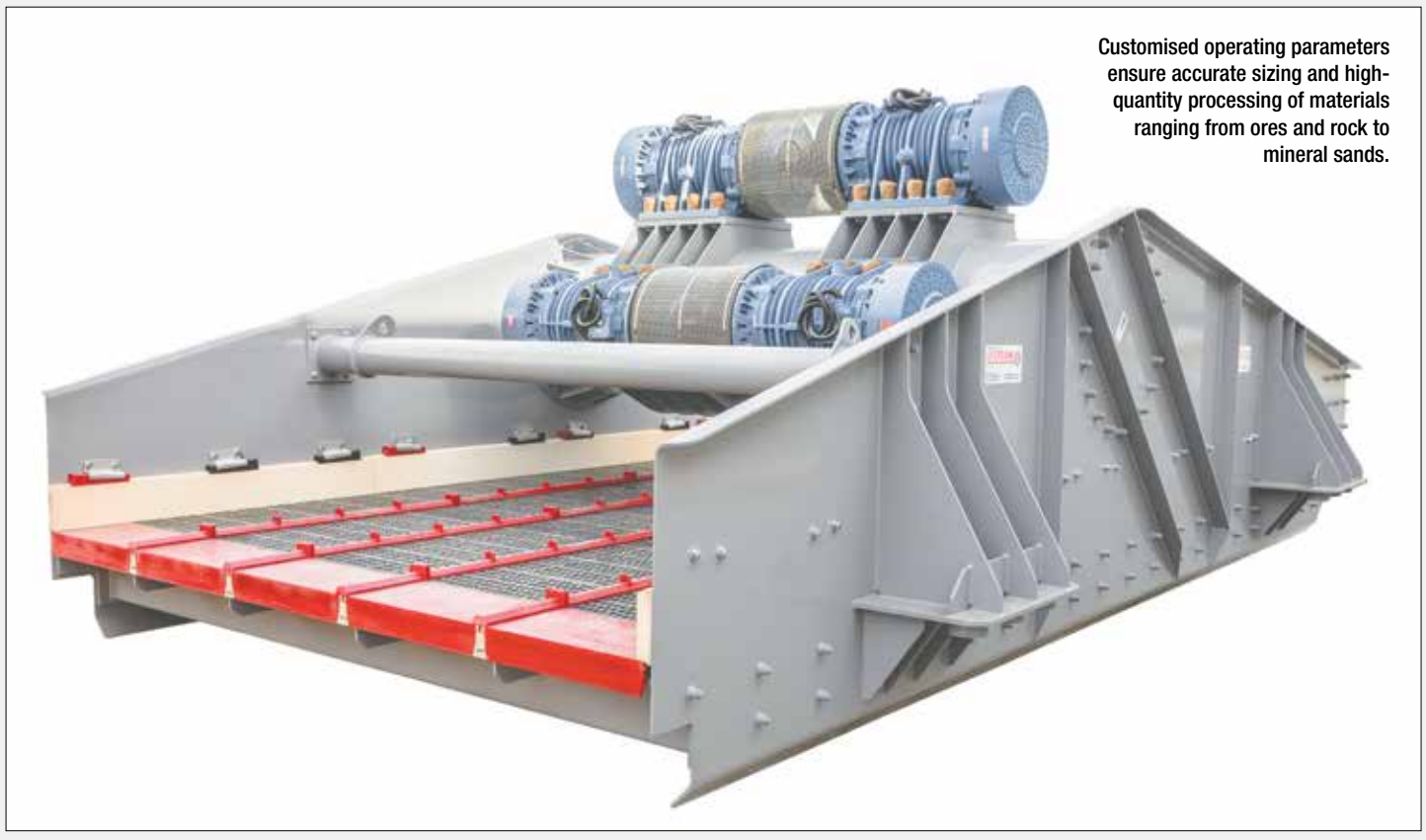
ERIEZ

Call: 613 8401 7400 Email: sales.au@eriez.com Web: Eriez.com.au

Punching above its weight

From humble beginnings, Oreflow has evolved to encompass and service all areas of mineral processing systems and bulk materials handling from design, installation, maintenance and repair.

Oreflow supply quality capital equipment both in Australia and abroad, specialising in bulk materials handling and processing plant design and manufacture.



Customised operating parameters ensure accurate sizing and high-quantity processing of materials ranging from ores and rock to mineral sands.

Oreflow products are designed to be fit for purpose, capable of operating effectively and able to be integrated into new or existing plant.

INTERNATIONAL

OREFLOW is the culmination of more than 50 years' experience in the Australian mining industry, and is still a proudly Australian-owned and family-operated business.

While the company offers a wide range of services, from bulk material handling to air cannons and magnets, it specialises in the design and construction of ore screens, and has been selling them throughout Australia and to all corners of the globe since Mel King expanded Minspec to form OreFlow in 2013.

With a team of 16 on board, OreFlow has the capacity to do the big jobs, and the agility of a small team of experts to create a tailored, personal experience.

The team is small enough to be nimble, but big enough to do the heavy lifting and get the job done.

OreFlow Technical Specialist Mel King said that "we quote it, we draft it, we build it to a certain stage, and then if it gets too big, we sub contract it to an engineering company, but we will do QA from start to finish".

"Everything is drawn in-house, it's engineered in-house, our springs are made locally, we are an Australian company and our customers love that about us," he said.

Whether a customer needs a Trommel screen for waste processing, or a vibrating screen for materials separation, Oreflow can provide the right screen type, and the right screen size, to achieve the outcomes and aims required.

The company understands that to get it right when it comes to material size, conforming to a rigid specification relies heavily on using the appropriate screen size.

Different materials have different separation rates, and this is why it is important that the correct screen size is used, as it will maximise the efficacy and efficiency of the screen.

For this reason, OreFlow's engineering team optimises the design of all its equipment using JKTech simulation software.

Oreflow works with local Australian providers who continue to offer the highest quality components at competitive prices, along with the face-to-face relationships that are at the core of its success.

All Oreflow products and services meet Australian quality, safety and environmental standards.

"We have established relationships that are very strong and provide us first class service," he said.

"We get approached everyday by people who want us to use their products, but we don't need to when what we've got works so well."

"Our providers are loyal, consistent and we always get good pricing so why would we want to change that."

Oreflow's timely well-built machines have been used across Australia and all over the world, and Mr King said that there was a lot of international interest around OreFlow's products.

"We are Australian and we work for Australians and we are Australian-owned and operated, but we export worldwide," he said.

"We have sent screens to Africa, to Asia – Indonesia and PNG – and we have a lot of interest from Europe".

Oreflow's strength comes from its business model which is centred around the customers it serves and the close relationships it builds with suppliers.

"We do anything to do with moving material from one point to another," Mr King said.

"We operate small because we want to stay nimble, lean and effective – it works for us."

Oreflow is the Australian master distributor for the Brelko range of spillage control products, which have quickly gained acceptance in the Australian market place.

It is a major supplier of skirting systems, belt scrapers, air cannons and impact beds both locally and overseas.

The company's conveyor, belt and apron feeder design and manufacture are becoming internationally renowned.

Oreflow also imports its own range of conveyor idlers and frames, which are readily interchangeable with Australian manufactured products without modification.

The company has exported crushers, screens, feeders, belt scrapers and idlers overseas to various countries including Ghana, Senegal, Burkina Faso, Mali, Tanzania, Indonesia, Philippines, Saudi Arabia and Zambia as well as many local iron ore, gold, nickel and mineral sands projects.

The Oreflow service team are also multi-skilled in elevated work platforms, Franna cranes and rigging, thus reducing waiting time on jobs.

MORE INFORMATION: Oreflow | 08 9472 0800 | sales@oreflow.com.au | www.oreflow.com.au

OREFLOW
AUSTRALIA PTY LTD

AUSTRALIAN OWNED & OPERATED MINING EQUIPMENT & PARTS SUPPLIER

Oreflow Australia service all areas of mineral processing systems and bulk materials handling; from designing, installing and supplying quality equipment to Australia and abroad as well as providing maintenance, repairs & spare parts.

- IDLERS & FRAMES
- CAPITAL EQUIPMENT
- SPILLAGE CONTROL
- BRELKO CONVEYOR PRODUCTS DISTRIBUTOR
- CRUSHING EQUIPMENT & SPARE PARTS
- EQUIPMENT DESIGN & ENGINEERING

Contact us now for a quote
08 9472 0800
sales@oreflow.com.au
www.oreflow.com.au

Transformer buckets

An ALLU M-Series processing bucket fitted to a Komatsu wheel loader.

NATIONAL

CRUSHING and screening is at the heart of any mining operation and any improvements made in this area reflect positively on the bottom line.

ALLU Transformer D and M-Series attachment buckets are entirely driven by the hydraulics of the carrier machine and were designed to deliver a one-step screening and loading solution capable of handling all materials from wet soils to coal and rock.

The M series was developed specifically for the mining industry and has attachments to suit 50-160 tonne excavators and 30-90 tonne wheel loaders.

The D-series was designed for use in soft rock quarries, handling of sand and gravel aggregates, material loading at ports, de-clumping of hardened materials and processing of green waste and compost materials.

When looking at ALLU case study projects with an holistic approach — given multiple equipment mobilisations — fuel costs and the cost to process in low margin return ore or reclaiming projects have shown savings between $1.50-$2.50/t in running costs, in comparison to multiple unit processing configurations.

Custom configuration

The buckets can be fitted to either excavators or wheel loaders and instantly converts them into a mobile primary screening and loading plant.

Depending on the model, each bucket is fitted with three or four shafts, which are chain-driven by the on-board, 1400cc heavy-duty, hydraulic motor – powered by the carrier's hydraulic pressure. These shafts either feature a hammer mill profile for impact crushing and screening or a cam lobe design for screening.

A range of blade and drum sizes are available to provide fragment sizes of 50mm, 75mm, 100mm and 150mm.

The revolutionary ALLU Transformer bucket allows material to be crushed and screened while directly loading haul trucks. This unique system brings the processing plant to the material for greater flexibility and substantial cost savings.

An M-Series attachment bucket to suit a wheel loader.

One of ALLU's M-Series attachment buckets to suit an excavator.

Each application is different, so by interchanging drums, the bucket can be configured for optimal undersize and oversize to meet the needs of a particular site.

Built tough to suit these harsh environments, the frame of each Transformer bucket is made from 100pc wear-resistant steel and utilises genuine CAT ground engagement tools, ensuring that replacement teeth can be sourced anywhere in the world. All blades, hammers and bars are hard-metal coated for added durability.

Single step operation

As the Transformer bucket begins processing, the undersize material falls through the bottom screen and can be tipped directly into a truck or processing plant.

The oversize remains in the bucket and can be tipped onto a stock pile or conveyor.

In terms of crushing power, the ALLU buckets can process material rated between 1 and 4 on the Mohs scale.

This typically includes coal, gypsum, dolomite, limestone, sandstone, shale and talc. An added bonus is the bucket's ability to handle wet material without clogging, which is often a serious challenge in clay-bound areas.

Machine to material

Apart from their diversity, Transformer buckets offer the most portable processing solution available – they allow the machine to go to the pile, the pile no longer needs to be hauled to the machine. This creates significant transport cost savings as haul trucks are not required to bring material to the processing plant and there is no need for an additional excavator to load the hauled material into a fixed crusher.

Such mobility also permits a machine fitted with the Transformer attachment to be quickly and easily transported via low-loader to a satellite location, or even a different site, where it can be put into production immediately.

Again, this eliminates the necessity for a separate remote plant and associated wiring and infrastructure.

Data acquisition

Processing data is of huge value to production and financial personnel and the M-Series buckets tick that box too.

Using ALLU's proprietary ALLU-DARE data recording system, information such as processed tonnes, bucket count, processing time, total working time, down time, cycle time and even hydraulic temperature can be recorded and viewed via the web app.

This allows the actual throughput of the attachment to be monitored, recorded and included in production schedules, new project quotes and when estimating project finish times, just as it would be from a fixed plant.

Australia-wide

ALLU Transformer buckets are distributed to more than 30 countries around the world and are now available across Australia.

RD Williams is the Australian importer of the ALLU buckets, and has partnered with an experienced network of successful businesses which ensures that all sales, parts and servicing of the Transformer attachments is taken care of by a dedicated dealer in each state.

The network includes:

- Walkers Hammers (Victoria)
- Groundtec (NSW)
- QLD Rock Breakers (QRB) (Qld and NT)
- Total Rockbreaking Solutions (TRS) (WA)
- RAM Equipment (SA); and DLM Machinery (Tasmania).

ALLU's Transformer attachments provide processing and handling solutions for a number of industries.

Nick Angus from QRB said their unique design delivers increased efficiency and productivity on site, capex savings by eliminating the need for remote processing plants, transport savings with only a low-loader required to move the carrier from location to location and reduced operating expenses from the 'one operator, one machine, one attachment' philosophy.

The new ALLU Dare system.

AT A GLANCE:

- M & D Series ALLU Transformer Series Buckets
- Converts a base machine into a mobile processing plant
- Six bucket styles and sizes available – three for excavators, three for wheel loaders
- M-Series buckets range from 3.5-6.2cum
- Able to crush and load directly into a truck or processing plant
- Waste and oversize can be tipped on site
- Hydraulic attachment bucket offers reduced cost and total mobility
- Can eliminate requirement for an additional fixed plant
- Ideal for satellite operations
- High productivity from crushing and screening in a single operation
- M-Series buckets have optional data recording system

MORE INFORMATION: QLD Rock Breakers | 07 3715 0800 | www.rdw.com.au

Crushing the competition

The Terex Finlay I140RS impact crusher is adjustable to suit smaller materials and different size requirements.

NATIONAL

CRUSHING and screening material is a key component of any mining activity – and custom crushers to process your feed is what makes the difference in tonnage and productivity.

Finlay Screening and Crushing Systems offers a range of jaw crushers, impact crushers and cone crushers to suit a range of mining applications, from coal to gold, and everything in between.

The Terex Finlay J-1480 jaw crusher

Jaw crushers effectively break down materials such as granite, limestone, concrete and asphalt, and Finlay's machines include a powerful combination of performance, simplicity and versatility combined to suit almost any application.

The J-1480 single toggle Jaw Crusher is fitted with a Terex Jaques 1370mm x 762mm (54" x 30") single toggle jaw crusher chamber and a heavy-duty undercarriage for exceptional on-site mobility.

The hydrostatic drive, independent hydraulic pre-screen, heavy duty vibrating feeder, with automatic control to regulate the feed into the crusher, ensures that the machine delivers maximum performance and efficiency, reducing down time whatever the application.

Selectable discharge of fines materials to either the by-pass or main conveyor and reversible operation for clearing blockages are features of this machine.

Finlay Screening and Crushing Systems manager Ronnie Bustard said the J1480 enabled a coal mine to maximise throughput on their plant to about 400 tonnes per hour.

"This machine can actually ramp up to 750 tonnes per hour depending on the size its crushing and the feed size going into it," he said.

"On this particular site it's a bit slower because the coal being crushed is quite large, however the J-1480 is more than capable of taking the bigger feed size and, unlike smaller crushers, is less likely to become blocked as a result."

Operators can also choose to collect product via the bypass conveyor, or discharge the product via the main conveyor and the integrated pre-screen system removes fines and sizes before entering the jaw chamber, reducing packing and wear on the jaw liners.

The Terex Finlay J-1480 single toggle jaw crusher is perfect for larger, tougher materials like coal, granite and limestone.

"The customer didn't want to generate fines, so the bypass feature with the pre-screen helps and you can generate less fines than you would with an impactor or cone crusher," Mr Bustard said.

The I140RS impact crusher

Finlay stocks a range of high quality mobile impact crushers that use a combination of unique crushing variations to provide low wear costs, superior materials and high reduction ratios.

The Terex Finlay I-140RS shapes the future through innovation, with advanced technological design resulting in improved material flow and production capabilities in quarrying, mining, demolition and recycling applications.

Incorporating the Terex CR032 impact chamber with direct drive and an advanced electronic control system, the machine provides operators with high material reduction ratios and produces a consistent product shape.

A key component of the machine is the on-board innovative quick detach 4.8m x 1.5m (16' x 5') single deck screen.

For applications not requiring recirculation of materials for further processing or stockpiling, the complete screening and recirculating system can be quickly detached from the machine.

The high productivity, ease of maintenance and operation makes the machine an ideal solution for large scale producers and contract crushing operators.

Mr Bustard said the I-140RS had a range of features, including the ease of material flow through the machine being greatly improved with each component increasing in width as the material moves through the machine; fully hydraulic assisted apron setting features, making adjustment of the aprons convenient; and efficient and a heavy duty vibrating grizzly feeder (VGF) with integral pre-screen, removing dirt fines and sizes bypass material for reprocessing.

"Throughput on this machine is around 450 tonnes per hour," he said.

"As opposed to our jaw crushers, the impactor means you can crush down to smaller sizes as it's adjustable to suit different requirements.

"For our coal client we ran the machines with independent pre-screens - again bypassing a lot of the inspec material, which does two things; one, cuts down the load on your rotor which increases throughput, and two, it means you're not crushing inspec material."

The I-140 RS also has a quick on-board detachable recirculating system, including large 4.8m x 1.5m (16' x 5') single deck screen as well as a recirculating conveyor which can be rotated from closed loop configuration or utilised for stockpiling making an additional oversized product.

"The variable speed of the rotor also determines how hard you hit the coal and that again determines how much plus the recirculating conveyor on this machine can be slewed out to stockpile position for coal with high ash contamination," Mr Bustard said.

"You will lose a little coal by stockpiling that material rather than putting it back into the chamber but your ash content comes down and that's worth doing.

"Like in the gold process, it's worth sacrificing a little bit than putting it back in and wasting time, contaminating it and bring it down to a low value."

C1550 P and C1540 cone crushers

Terex Finlay cone crushers are ideal for the aggregate and mineral processing industries.

These cone crushers have been effectively designed to only break down the materials that need to be crushed, in order to increase the capacity of the machine and greatly reduce running costs.

Finlay's cone crushing equipment includes innovative features such as hydrostatic drive, rapid set up time, chamber clearing, high reductions ratio, high output capacity and advanced electronic control systems.

The Terex Finlay C-1550P leads the way, incorporating the proven Terex 1300 cone crusher driven through direct drive.

The machine features a patent pending optional pre-screen module with a single deck 2.45m x 1.52m (8' x 5') screen for removal or bypass of fines from the feed material.

The integrated chute system, below the pre-screen, allows the fines material to be discharged from the machine using the optional by-pass conveyor or reintroduced onto the main product conveyor.

Both methods improve the overall plant throughput capacity, product flexibility and liner wear reduction.

The cone features variable speed drive, hydraulic tramp relief system and ability to change closed side setting while crushing.

The large hopper/feeder has an automated metal detection and a purge system to protect the cone and reduce downtime by removing metal contaminants via the purge chute.

The hydraulically adjustable feed conveyor allows the machine to be operated using either the innovative pre-screen system, or, if required, by feeding directly into the cone.

Comparatively, the C-1540 cone crushing equipment features a number of major benefits including hydrostatic drive, rapid set-up time, high reduction ratio, high output capacity and advanced electronic control system with an integrated pre-screen feature.

By only crushing the products that need to be crushed, the capacity of the machine is increased and wear costs reduced.

The metal detector on the hopper with self-clearing facility is also another notable feature.

With an automatic tramp metal relief, hydraulically adjustable closed side settings, ease of maintenance and direct hydrostatic drive, the Cone chamber is already well established in the marketplace.

Mr Bustard said the use of the J-1480 Jaw Crusher, along with both the C-1550P and C-1540 cone crushers, is an effective combination for gold miners.

"With a client making a 14mm minus for their ball mill (which is an extremely hard and abrasive material), we put it through the J-1480 jaw crusher, then into the C-1550P cone crusher with a pre-screen of 14mm to bypass the inspect material from the chamber," he said.

The Terex Finlay C-1550P and C1540 cone crushers are ideal for the aggregate and mineral processing industries.

"Oversize plus 14mm passed through the chamber, and crushed down to approximately 35mm minus, which then goes on to a screening plant.

"The oversize (+14mm -35mm) from the screening plant goes out into a C1540 cone crusher which is smaller (the C1550P is a 1300mm cone and the C1540 is a 1000 mm cone in comparison) is fed back onto the screen so that all inspect material 14mm minus on the ground goes straight to the ball mill."

Any application

As market leaders in mobile crushing and screening equipment, Finlay can find reliable equipment for all demanding mining and construction environments.

With versatile, mobile impact crushers and a comprehensive range of optional additional equipment available, trust Finlay to match the right products to the demands of your specific application.

MORE INFORMATION: Finlay Screening | 1800 777 300 | info@finlay.com.au | www.finlay.com.au

FINLAY
SCREENING & CRUSHING
sales@finlay.com.au | www.finlay.com.au | CALL TODAY 1800 777 300

More light, less expense

NATIONAL

LUNAR Lighting is a unique Research and Development-focused lighting company with worldwide patents and trademarks.

With a history spanning over 24 years, Lunar Lighting has made significant achievements in the growth and development of its unique range of glare-free lighting solutions and to date remains unchallenged in the world lighting market.

The extraordinary engineering design and manufacture of our glare-free lighting solutions is delivering exceptional safety and performance for our customers around the world.

"Our latest development is the 5440W LED Lunar Lighting Tower with an LED efficacy of approximately 1,185,920 lumens, with only a 22Amp power draw," Lunar Lighting Director George Ossolinski said.

The mining, resources and energy sector is where Lunar Lights really shine.

For 25 years, the company has left its competitors in the dark with superior LED lights which have illuminated major projects across some of the most challenging environments across Australia and the world.

Mr Ossolinski said the company's LED lighting products have revolutionised the industry.

"Our patented LED lighting technology delivers more light using less energy than any other lighting system on the world market," Mr Ossolinski said.

"The highest lumen output per watt is a massive 218lm/W and our lights are the brightest meaning you can illuminate a wider area with fewer lights.

"Our LED Lunar Lights are also the most energy-efficient, saving money on fuel and transport, and the most compact, with a compact 14kg light head compared to the typical 4x LED light tower banks at approximately 60kgs."

Lunar Lighting prides itself on a unique research and development focus with worldwide patents and trademarks on its products.

"The LED lighting products reflect years of development, customer feedback and constant upgrading of technology," Mr Ossolinski said.

"The extraordinary engineering design and manufacture of our glare-free lighting solutions is delivering exceptional safety and performance for our customers around the world.

"With a history spanning over 25 years, Lunar Lighting has made significant achievements in the growth and development of our unique range of glare-free lighting solutions and to date remains unchallenged in the world lighting market."

Lunar Lighting's superior LED solutions are available in portable tripod units, trolley mounted or light towers.

The 48V DC 2550W LED Lunar Lights trolley-mounted version has an LED Efficacy of 218lm/W and a total LED efficacy of 555,900 lumens.

"The 2550W LED Lunar Light incorporates rigid polymer diffusers and is available in a combination of either or all of visible light/ infrared light," Mr Ossolinski said.

"We have a range of input voltage options available, from 24V DC to 48V DC and 90V AC to 305V AC.

A conventional light tower produces about 100,000 lumens. The single 12000W globe inside the Lunar lighting tower is rated at 1,200,000 lumen output.

"The 48VDC light head is more compact, more energy efficient, more powerful and can be supplied on a compact tripod, as a lighting tower or even retrofitted to existing lighting towers, poles, plant and machinery."

A 24V DC to 48V DC or 240V AC 2550W LED Lunar lighting tower version is available as well as a 24V DC to 48V DC or 240V AC 1710W tripod mounted version.

"Our latest development is the 5440W LED Lunar Lighting Tower with an LED efficacy of about 1,185,920 lumens," Mr Ossolinski said.

"That's the highest lumens per watt LED tower available on the world market."

Lunar Lighting has a range of superior solutions, LED towers and portable lighting systems that outperform conventional LED lighting in several key areas, reducing costs while providing greater flexibility and enabling measurable productivity gains.

The 90V or 305V AC 2550W LED lunar lighting tower and 90V or 305V AC 2550W trolley-mounted LED Lunar Light specifications:

- Dimmable
- Flicker-free
- LEDs rated for 50,000 hours
- Even and uniform 360 degree lighting
- Operating temperature range from -40 degrees to 85 degrees Celsius
- Polymer diffuser – durable and tough
- Daylight colour temperature 5400 degrees Kelvin (6000 degrees Kelvin for the trolley-mounted LED tower)
- Adjustable from visible light to infrared light
- Light head dimensions: 57cm H x 43cm D at a weight of 14kgs
- Adjustable wattages: 510W – 1020W – 1026W – 1530W – 2550W
- Area lit about 9161 square meters at 5m height and min lux of 1
- LED efficacy of 218lm/W. 2550W LED efficacy is 555,900 lumens
- Input voltage options: 12VDC, 24VDC, 48VDC and 90VAC to 305VAC
- Heavy duty impact resistant road-case for transportation and storage
- Total luminous flux of 335,836 lumens after diffuser and driver reductions
- Typical amperage draw is 10 Amps @ 240V for 2550W; 2 Amps for 510W
- State-of-the-art LEDs which have extreme stability and high thermal ability
- Innovative LED thermal management system with pure aluminium heat sink
- Can be retrofitted to conventional lighting towers, poles, plant and machinery

The 48V DC 2550W LED Lunar Light trolley-mounted version has an LED efficacy of 218lm/W and a total LED efficacy of 555,900 lumens.

MORE INFORMATION: Lunar Lighting | 1300 586 271 | lunar@lunarlighting.com.au | www.lunarlighting.com.au

2550W LED Lunar Lite®

Total LED Efficacy of 555,900 Lumens

NATO OTAN

LUNAR LIGHTING

DEFENCE RECOGNISED SUPPLIER
Department of Defence

U.S. DEPARTMENT OF HOMELAND SECURITY

- Fuel usage: 0.8L/Hr
- Current draw: 10.81A

www.LunarLighting.com.au

OXYGEN CAPITAL CHAIRMAN MARK O'DEA

Amid a struggling junior resources sector, Oxygen Capital, has found its niche with an innovative 'incubator model'. Founder and chairman Mark O'Dea spoke with Gerard McArtney about his time in Australia and the shared merits between the two countries, the incubator concept and the destabilising effects of the marijuana boom.

Oxygen Capital founder and chairman Mark O'Dea.

Over the past 20 years, Oxygen Capital has built nine companies, and today there are four companies in the group.

Q. Can you tell us more about your time spent in Australia with Monash University and your field work at Mt Isa?

I lived there from 1992 to 1997 while I did my PhD.

I chose to study the extensional history and architecture of the western part of the Mount Isa Inlier.

It was very field-based, so I ended up spending two to three months every year camped in the outback mapping and figuring out the structural history of some fairly big, complicated areas.

That PhD work led to a post doctorate, which wrapped up in 1997.

I decided at that time to step away from academia and get into industry and mineral exploration and that has been my focus ever since.

My time at Monash was absolutely invaluable and unique.

Q. Why is Canada such an attractive option for Australian miners?

Having lived and worked on projects in both countries, three reasons come immediately to mind: the similar geology, geopolitical stability and security of tenure; essentially they share the same merits.

Both countries were founded on mining and continue to have world-class miners and Tier-1 mining camps.

Second, Canada was founded with the same political/legal system as Australia.

Every mining jurisdiction has its challenges, but miners can enjoy security of tenure and work through a legal system if there is an issue.

Finally, Canadian gold companies, like Australian companies have a foreign-currency exchange advantage.

Gold breached $2000 per ounce in Australian dollars and gold is trading at $1845 per ounce in Canadian dollars. That's pretty attractive.

Q. Can you please tell me a bit about the Oxygen Capital business model? What is the incubator concept about?

The Oxygen Capital team is a private mining house that I put together with two business partners — Donald McInnes and Sean Tetzlaff.

Essentially, we create and structure new mining companies based on exploration and development opportunities that we identify.

We put our own equity to work, take these companies public and build independent management teams and boards around each one.

Over the past 19 years, we have built nine companies along with an incredible multidisciplinary team of experts in exploration, discovery, resource estimation, finance, mine development, operations and CSR.

We have built all of our companies around the mantra of "good projects in good places" and generally focus on brownfield data rich projects in good jurisdictions where a lot of the exploration risk has been removed, or minimised.

We like projects that have a lot of historical data that we can reinterpret, and focus on finding the prize that is often left behind.

Frequently, that prize is huge.

We have been able to have repeated success with this business model and scientific approach to data analysis and discovery.

There are currently four companies in the Oxygen Group: Liberty Gold, Pure Gold Mining, Discovery Metals and Sun Metals.

Each is run by a dedicated management team, and independent board. Importantly, they are focused on Tier 1 jurisdictions in places like Red Lake, Ontario; the Great Basin in Nevada, Idaho, Utah; north central British Columbia; and northern Mexico.

Q. How has Oxygen Capital maintained relevance in Canada's struggling junior mining sector?

In this business, like in any cyclical business, if you get the timing right the results can be spectacular and beautiful. If you get it wrong, things can turn bad quickly.

And getting the timing right isn't just a matter of luck (although that helps), it is a matter of discipline and endurance and a commitment to building the best pipeline you can in a bear market when things are cheap.

Since 2013 we've been in a bear market.

That seems to have turned now thankfully, but during this period, we stuck to our knitting.

We have been focused on buying, exploring and advancing great projects in great places.

The past four years have been a gestation period for our projects and companies and we are now ready to start serving up a pipeline to the world at a time when our industry desperately needs new projects and new production.

Q. I understand that brown fields projects are generating the best returns in Canada right now, why is that?

You're quite right, brownfield discoveries have been the story.

Kirkland Lake Gold, for example, epitomizes that theme today.

It is a real life example of an asset that was tired and difficult and got completely rejuvenated by exploration success and the discovery of massive upside and resource and grade expansion.

The same story underpinned the history of Goldcorp.

The Red Lake mine went from producing 53,000oz at 8 g/t in 1995 to producing 552,000oz at 77 g/t in 2004 after the discovery of the High Grade Zone.

We see a similar theme, for example, at our Madsen project owned by Pure Gold. Madsen was a past producing mine in Red Lake Ontario, just down the road from the Red Lake mine.

We acquired it in 2014 for under C$10m, drilled off 2.5moz of gold at about 9 g/t, and have transformed it into the highest grade gold development project in Canada today.

It is on the cusp of production.

It is very exciting.

Q. What effect has the cannabis industry had on Canadian mining?

In Canada, for the past few years, a huge percentage of risk capital has flowed into the cannabis industry, which has had a really negative impact on capital available to the junior mining sector.

The numbers are stark: in 2018, cannabis companies raised $4b, versus $217m raised for junior mining.

I think we are seeing this trend starting to change.

Especially as gold prices are now beginning to rally and North American investors are wanting to get positioned in an industry that they correctly see as deeply undervalued.

I feel that over time, as cannabis companies mature and become real operating businesses, the bloom will come off the rose, so to speak.

Reality will set in and investors looking for better returns will turn to other sectors, like mining.

Q. Can we expect another round of mergers and acquisitions from Australian companies any time soon?

I think it is quite possible.

Although I do think that window may be closing soon if North American investors start getting seriously positioned in the space.

With gold breaking through US$1400, we are seeing a lot of renewed interest out there and the value gap between Australian and North American mining companies is beginning to narrow.

But there is still a ways to go.

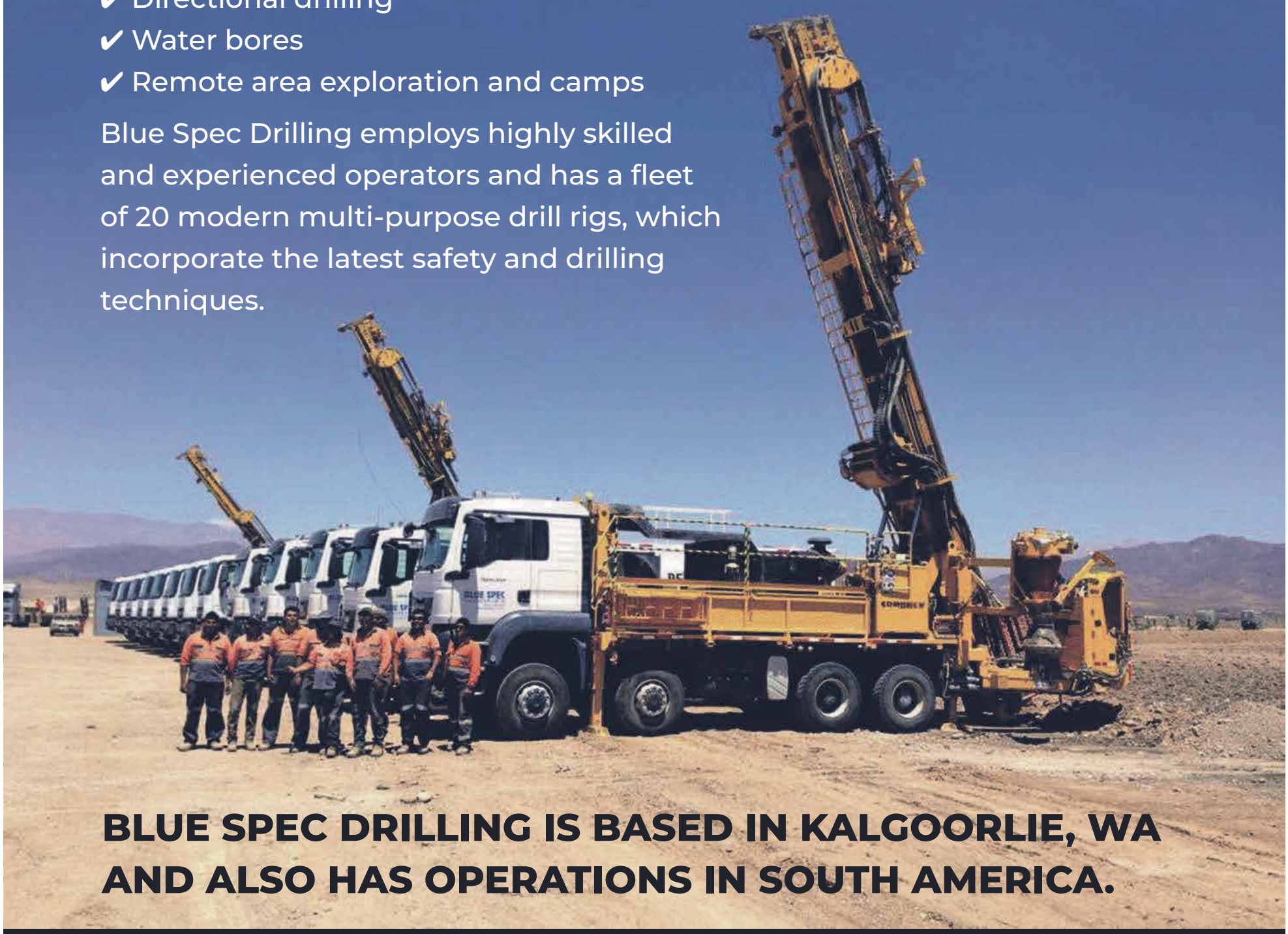
Between the geopolitical stability, value and security of tenure we just discussed, this is one of the most attractive and profitable gold mining countries in the world.

BLUE SPEC
DRILLING PTY LTD

Blue Spec Drilling Pty Ltd provides a variety of drilling services including:

- ✔ Reverse circulation
- ✔ Surface diamond drilling
- ✔ Directional drilling
- ✔ Water bores
- ✔ Remote area exploration and camps

Blue Spec Drilling employs highly skilled and experienced operators and has a fleet of 20 modern multi-purpose drill rigs, which incorporate the latest safety and drilling techniques.



BLUE SPEC DRILLING IS BASED IN KALGOORLIE, WA AND ALSO HAS OPERATIONS IN SOUTH AMERICA.

CONTACT MURRAY BLACK

M. 0417 973 394 **P.** 08 9021 3033

E. murray@bluespec.net.au **W.** www.bluespec.net.au

Dulux® PROTECTIVE COATINGS

Protection you can count on.

duluxprotectivecoatings.com.au