

THE AUSTRALIAN MINING REVIEW

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NEWS: TECHNOLOGY & INNOVATION

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AIMEX

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FORGED BY FIRE

Led by turnaround specialist Sanjeev Gupta, Arrium's new owner GFG Alliance has big plans for the South Australian steel maker.

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Image: GFG Alliance.



DIGGERS & DEALERS MINING FORUM

August 7 - 9, 2017 Goldfields Arts Centre Kalgoorlie, WA

Event Preview p29

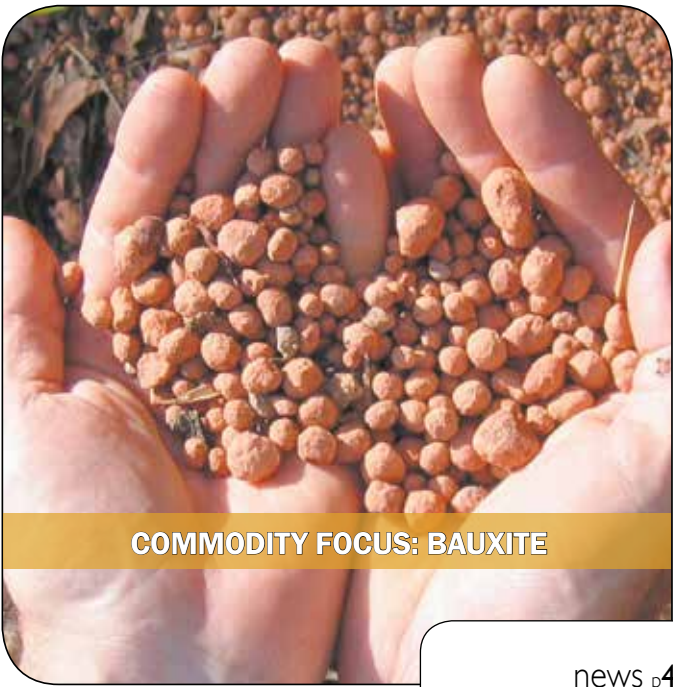
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MATTHEW PAINTER
ARDEA RESOURCES MANAGING DIRECTOR

the interview p78

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Unused Doosan DX225LC - 2 of 3



Unused Doosan DX140LC - Choice of 2



2013 Hitachi ZX135US-3



Unused CAT 308E2CR - Choice of 2



Unused Bobcat E85 - Choice of 2



Unused Hitachi ZX55U-5A - Choice of 3



2012 CAT D6T XL SU



2009 CAT 12H



14-15 Doosan DA40 - Choice of 2



2012 CAT 980K



2011 CAT 432E



Unused JCB 1CXTHFEC



2014 CAT TH417C - Choice of 2



14-15 CAT TH414C - Choice of 6



2013 Terex TA6S



Unused New Holland TD5.95 - 2 of 3



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Thinking inside the bauxite

It is one of the fastest growing bulk commodities of 2017, and as supply from China dries up Australian projects are poised to meet a surge in demand.

CAMERON DRUMMOND

DECLINING domestic bauxite quality in China and diminishing global reserves of high quality ore have compounded a supply side shortfall; on the upside, this creates significant opportunity for Australian miners.

Bauxite, the raw material to create aluminium has surged in the last few years, fuelled predominantly by exponential growth in Chinese demand.

In 2005 China imported just 2.2 million tonnes (mt) of bauxite.

By 2016, it was importing 52mt without signs of slowing down; by 2025 forecast estimates are a staggering 120 million tonnes each year.

Competition to fill this supply gap is growing, with miners based in Guinea, Malaysia, Indonesia and Australia all jostling for market share.

According to the Department of Industry, Innovation and Science, Australian bauxite exports may rise at an average of 36 per cent a year between FY18 and FY21 to meet a forecast 4 per cent per annum growth in aluminium demand.

A number of projects on QLD's bauxite-rich Cape York Peninsula are expected to be in production by 2019, notably Rio Tinto's Amrun, Metro Mining's Bauxite Hills, and Metallica Minerals' Urquhart projects near the township of Weipa.

Rio Tinto Aluminium chief executive Alf Barrios expected China's bauxite demand growth to be significant over the next 15 years.

"China has been expanding its aluminium smelting and alumina

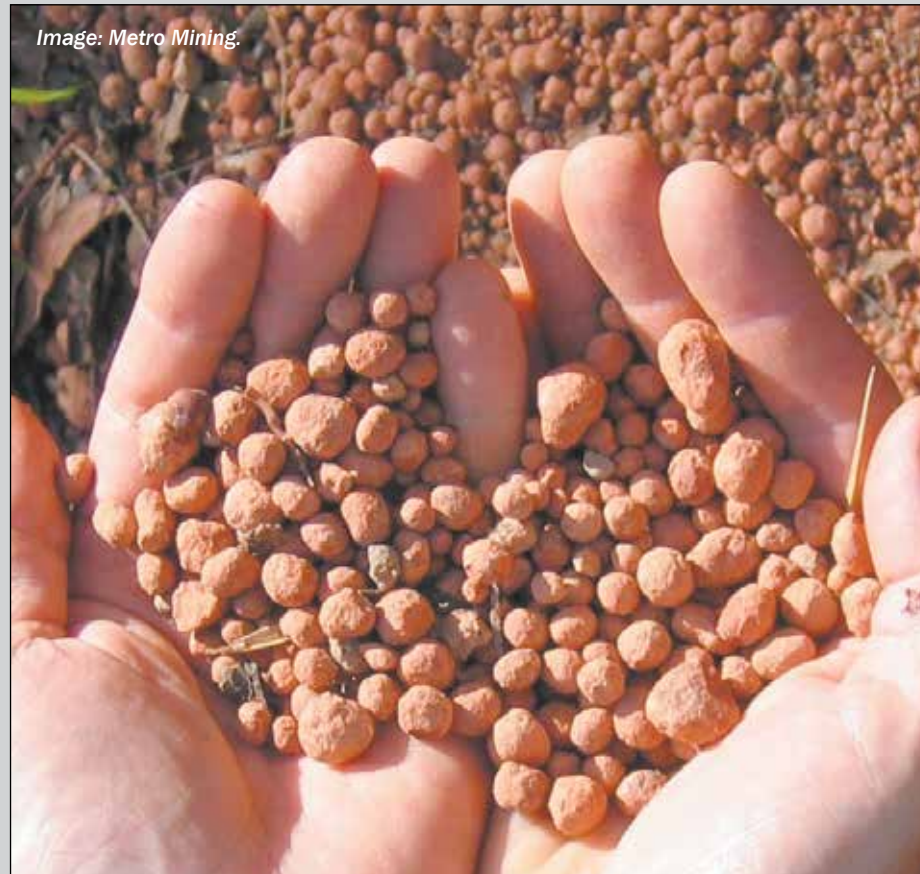


Image: Metro Mining.

"AUSTRALIAN BAUXITE EXPORTS MAY RISE AT AN AVERAGE OF 36 PER CENT A YEAR BETWEEN FY18 AND FY21 TO MEET A FORECAST 4 PER CENT PER ANNUM GROWTH IN ALUMINIUM DEMAND."

refinery capacity tremendously for the past ten to 15 years," Mr Barrios said.

"We're expecting that it will continue to aim for self-sufficiency in both products

and thus increase production to meet its internal demand growth.

"However, China's own bauxite resources are limited and the quality is

deteriorating, and so it is increasingly looking to import from sources that are sustainable and reliable in terms of quantity and quality.

"Rio Tinto has become the largest single player in that market, providing about a third of the country's imports."

Rio Tinto remains committed to the \$2.6bn Amrun mine expansion, and once completed will raise the company's total bauxite output by 10mtpa.

"We have the largest bauxite resources amongst the industry players and are geographically well positioned to supply China's significant future import needs, as well as the potential demand growth in other geographies," Mr Barrios said.

"Amrun was the first project we put on the table to execute this strategy.

"It is a Tier 1 opportunity with mining costs in the first quartile of the industry cost curve delivered to China.

"Amrun is a long-life, low-cost, expandable asset and we want to establish Cape York bauxite as the product of choice for the Chinese seaborne market."

Nearby mining juniors Metro Mining and Metallica Minerals have drawn large investments for the development of their respective bauxite operations.

On 19 July Metro successfully tapped investors for \$38m and immediately began development of its Bauxite Hills project with an aim to be in production by April 2018.

Similarly, Metallica's Urquhart project is due to commence production during the September quarter this year.

Once developed, Amrun is expected to have an annual output of 22.8mtpa, Bauxite Hills will produce 5mtpa over a 17 year mine life, and Urquhart will have a production rate of 1.9mtpa.

Construction begins at Bauxite Hills

CAMERON DRUMMOND

METRO Mining's project on the Cape York Peninsula is poised to become Australia's next bauxite mine, with construction underway after \$38 million was successfully raised for development.

Once completed, Bauxite Hills will have an annual production of 2 million tonnes per annum (mtpa), which was planned to increase to 6mtpa over its first four years.

Metro said it was committed to providing employment opportunities to the region and had already achieved its Indigenous employment goal of 25 per cent.

"I am particularly pleased with the high-level of Ankamuthi engagement on site already," Metro managing director Simon Finnis said.

"As construction works continue and production ultimately commences, we will strive to continue from this positive start.

"This is an exciting time for Metro and our shareholders.

"The company has entered the execution phase and we are committed to delivering the Bauxite Hills mine on time and on budget."



An aerial view of accommodation construction at the Bauxite Hills mine site.

Image: Metro Mining.

MAJOR COMMODITIES

SNAPSHOT

GOLD

\$US/oz



LEAD

\$US/t



IRON ORE

62% Fe CFR China

\$US/t



NICKEL

LME Price

\$US/t



COPPER

LME Price

\$US/t



COBALT

LME Price

\$US/t



ALUMINIUM

LME Price

\$US/t



THERMAL COAL

Newcastle Thermal

\$US/t



IN BRIEF

Wiluna project gets
Federal approval

URANIUM

TORO Energy's proposed Wiluna uranium project in WA has Federal Government approval to begin construction, subject to implementation conditions.

The project comprised the Centipede, Lake Way, Millipede and Lake Maitland deposits, and the construction of mine and processing related infrastructure, tailings storage facilities and transport to port.

The announcement followed a June State Government statement that it could not legally prevent the project's development, despite its anti-uranium mining stance.

Toro Energy said it would now progress a number of mining, metallurgical and process design and research initiatives to ensure the project is capable of being financed and brought into production when economic conditions justify development.

\$66.5m Dalgangara
contract for GR
Engineering

GOLD

GR Engineering has been awarded a \$66.5 million EPC contract for the design and construction of mineral processing facilities at Gascoyne Resources' Dalgangara gold project in the Murchison region of WA.

GR has already commenced the design and construction of a new 2.5 million tonnes per annum (mtpa) processing plant and associated infrastructure.

Site access is expected to be granted in August once preliminary earthworks have been sufficiently progressed.

First production is estimated for the second quarter of 2018.

Tas mining rebounds

**"...\$39.4 MILLION
WAS COLLECTED
IN MINING
ROYALTIES IN
2016-17; AN
IMPRESSIVE
INCREASE ON
THE \$15 MILLION
RECEIVED IN
2015-16."**



First gold pour at the reopened Henry gold mine, Tasmania.

Image: PYBAR.

ELIZABETH FABRI

TASMANIA's resources sector has bounced back from the sting of low commodity prices, with mining royalties more than doubling year-on-year in FY17 and new projects and mine reopenings signalling renewed confidence for the State.

State Resources minister Guy Barnett said the industry was "rebounding strongly" with mining and minerals processing accounting for 50 per cent of the value of the State's exports.

"I can also reveal as a further sign of growing confidence in the industry that \$39.4 million was collected in mining royalties in 2016-17; an impressive increase on the \$15 million received in 2015-16," Mr Barnett said.

The "raft of good news" was bolstered by the reopening of the Henty gold mine in 2016, the granting of a mining lease to Stellar Resources for its Heemskirk tin project, and the sale of MMG's shuttered Avebury nickel mine to Dundas Mining for \$25 million in July.

Avebury was placed in care and maintenance in 2009, and under the new ownership was expected to reopen soon.

"We have also seen the beginning of work on a number of projects at the Mt Lyell mine funded through a \$9.5 million investment by the Government aimed at helping to bring forward its potential restart," Mr Barnett said.

"The program will support innovation-focussed projects in partnership with the Tasmanian Minerals and Energy Council and the University of Tasmania's Centre of Excellence in Ore

Deposits."

In May, the State Government also committed \$1 million to a new Mining Sector Innovation Program that aimed to promote the development of technology within the sector.

"An increasingly high-tech sector of the economy, mining directly employs more than 2000 people across regional Tasmania, many in skilled occupations," Mr Barnett said at the time.

"The program will support the industry through innovative uses for geoscientific data using new technologies; investigation of innovative solutions for mine rehabilitation and remediation; development of best practice Acid Mine Drainage Management Guidelines; and improving our understanding of landslip reactivation and implications for future planning and emergency response."

Key offtake deals for Pilgangoora

CAMERON DRUMMOND

PILBARA lithium developer Altura Mining has signed two major binding offtake agreements (BOA) for 200,000 tonnes (t) of lithium production from its flagship Pilgangoora project.

Chinese battery manufacturer J&R Optimum Energy, Altura's largest shareholder, will receive a minimum 100,000t per annum of 6 per cent grade spodumene concentrate.

Altura's other offtake partner Lionergy will also receive 100,000tpa.

Floor and ceiling prices were part of the agreements, with Altura guaranteed a minimum price of \$US550/t, and a maximum price of \$US950/t for the first three years of the five year arrangements.

Annual pricing was to be agreed upon by Altura and the offtake partners via consideration of market pricing information.

The BOA's make up 90 per cent of Altura's 220,000tpa production; any additional spodumene concentrate would be available for purchase by J&R Optimum Energy, as well as any shortfall in sales to Lionergy.

At the request of both offtake partners, Altura approved the commencement of an initial Stage 2 expansion study of the project.



Image: Altura Mining.

Cimtec construction workers laying foundations at Pilgangoora.

"The scoping study will assist the company in determining the optimal mine output with the aim of increasing production to 450,000 tonnes annually in order to be aligned with offtake

partners' growth plans," Altura said in a statement.

Development of Pilgangoora remained on track for commissioning in Q1 2018.

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Northern Star breaks records

CAMERON DRUMMOND

GOLD producer Northern Star Resources expects a strong 2018 financial year as it capped off FY17 with record quarterly gold production.

Northern Star produced 154,116 ounces (oz) of gold in the June quarter to bring its FY17 total to 514,735oz; at the top end of guidance of between 485,000oz and 515,000oz.

Strong operational performance throughout the year at its Jundee and Kalgoorlie mines offset weaker results from the Paulsens mine.

Record production came despite the sale of its Plutonic mine in October last year, with the company on track to grow production substantially with an FY18 guidance of between 525,000oz and 575,000oz.

"The superb performance of the Jundee and Kalgoorlie operations is a direct result of the investment we have made in exploration and production growth at these tier-one assets," Northern Star managing director Bill Beament said.

"We are now reaping the rewards of this investment, as shown by the significant increase in our FY18 production guidance, and we will continue to do so for many years to come."

Mr Beament said the latest results provided an insight into the cash flow Northern Star would enjoy as production grew and expansionary capital fell away.

"We have invested \$180m over the past three years to grow our mineral inventory, [and] the outcome of this investment will be highlighted through the upcoming resources and reserves update that is due in early

"WE HAVE INVESTED \$180M OVER THE PAST THREE YEARS TO GROW OUR MINERAL INVENTORY, [AND] THE OUTCOME OF THIS INVESTMENT WILL BE HIGHLIGHTED THROUGH THE UPCOMING RESOURCES AND RESERVES UPDATE THAT IS DUE IN EARLY AUGUST."



Northern Star will look towards an FY18 gold production guidance of between 525,000oz and 575,000oz.

Image: Northern Star Resources.

August," Mr Beament said.

"This will fall to \$35m in FY18 as we believe the visibility across our tier-one assets has been achieved.

"It's been very pleasing to see the business grow organically and produce a

sector leading return on invested capital in what has arguably been the most capital intensive phase of the company's history."

The company said construction of its 50,000ozpa Millenium underground mine was well ahead of schedule and nearing

completion, and expected first ore production in September.

Development was also underway at Jundee's Armada deposit, with an \$18m mill expansion half-finished and set for full completion early in the December quarter.



FMG's Solomon iron ore production hub.

\$650m contract extension for Thiess

CAMERON DRUMMOND

CIMIC Group's global mining services provider Thiess has secured a \$650 million contract extension at Fortescue Metals Group's Solomon Hub in the WA Pilbara.

The contract extension involves the delivery of mining services at Solomon until 2020, including maintenance of mobile and ancillary plant, autonomy solutions and non-process infrastructure management.

Thiess managing director Michael Wright said the company was thrilled to be extending mining operations at Solomon Hub.

"Our partnership approach is what will enable mining operations at first quartile cash costs, with autonomous solutions and asset management services delivering asset utilisation that is world class," Mr Wright said.

"This contract is a testament to the team's passion and ability to transform improvement initiatives into innovative solutions that continue to drive long-term client value."

The Solomon Hub currently produces 72 million tonnes of iron ore annually from the Firetail and Kings Valley deposits.

Kidman forms Mt Holland JV

CAMERON DRUMMOND

A 50:50 joint venture (JV) with chemical producer Sociedad Quimica y Minera de Chile S.A. (SQM) will drive development of Kidman Resources' Mt Holland lithium project in WA.

Chilean-based SQM will pay Kidman \$US110 million for its 50 per cent stake, comprising \$US30m in cash and a staged payment of \$US80m.

SQM holds a 27 per cent global market share of the lithium chemicals industry, producing lithium hydroxide and lithium carbonate.

Kidman said funding would be committed to the completion of feasibility studies, design, construction and development of the Mt Holland project, as well as a downstream lithium refinery.

Mt Holland's monster Earl Grey lithium deposit had an estimated a mine life of more than 50 years, producing 40,000 tonnes of lithium carbonate annually from 2021 and generating employment for up to 180 personnel.

Kidman managing director Martin Donohue said Mt Holland's Earl Grey deposit had attracted significant interest globally.

"The decision to sign the binding letter agreement with SQM was justified by its unmatched expertise in the lithium business," Mr Donohue said.

"They are the world's largest producer, with a depth of technical and marketing expertise that will benefit the joint venture.

"We see the partnership with one of the world's leading lithium producers as compelling for shareholders.

"Their proposal to build an integrated lithium business here in Western Australia



Kidman Resources and SQM executive team in Perth, WA.

with a refinery plant drawing on SQM's technical capabilities has a lot of merit, for both our shareholders and for the economic development of WA," he said.

"We have also been very pleased with the in-principle support from stakeholders within the WA Government, who recognise the potential skills injection into the mining and processing sector from having a company with SQM's global chemical production credentials building and operating a large-scale industrial plant in the State in JV with Kidman."

SQM chief executive Patricio de Solminihac said that following the completion of his team's due diligence process it had become clear that combining Kidman's project and hard-rock mining experience in Australia with SQM's technical capabilities and expertise in the lithium business would form the

foundation of a new long-term, world-class lithium operation – in the shortest possible timeframe.

"SQM has engaged widely during the due diligence period, including meeting with key stakeholders within the Government of WA," Mr de Solminihac said.

"We are confident in our ability to form a long-term, successful partnership with Kidman and which will add significant value to the Mt Holland Project with our processing and chemical production expertise, and to the West Australian economy.

"We have been dealing with end customers of lithium chemicals for more than 20 years and we understand and closely monitor the evolving needs of battery manufacturers, as we are a fully integrated business that directly markets our products to customers."



Image supplied by RUOK?

Do you know what to do when someone isn't coping?

➤ **FACT:** Workers may be afraid to reach out for help, yet the majority of mental illnesses can be treated, allowing people to recover and remain productive at work.

➤ **FACT:** More awareness, attention and implementation of Mental Health First Aid in high stress work environments such as the resources sector can reduce the risk of **Psychological Injury**.

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REPORTING SEASON SNAPSHOT

BHP (ASX:BHP)

Achieved a broad increase in average realised prices for its commodities in FY17 from the year prior – the largest jump being hard coking coal which jumped 117 per cent year on year. Full year production guidance for iron ore, with annual production records at Western Australia Iron Ore (WAIO), Spence and two Queensland Coal mines. WAIO production is expected to increase to between 275mt and 280mt (100 per cent basis) in FY18.

Rio Tinto (ASX: RIO)

Record quarterly bauxite production of 12.9 million tonnes was seven per cent higher than the corresponding quarter of 2016, driven by strong production at Weipa and Gove.

Iron ore production was in line with last year, although iron ore shipments, mined copper, hard coking coal all fell in H117 compared with the same period in 2016.

Iron ore shipments guidance for 2017 is around 330 million tonnes (previously 330mt to 34mt).

South32 (ASX: S32)

While alumina, nickel and manganese operations finished the year on a strong note, bad weather and challenging conditions impacted South32's performance over FY17.

Cannington recorded a significant decrease in ore grades and metal production in FY17, while challenging ground conditions in the new Appin Area 9 longwall block and two extended outages at the Appin colliery led to a 15 per cent decrease in Illawarra Metallurgical Coal production in FY17.

Evolution Mining (ASX: EVN)

In its 6th consecutive year achieving cost and production guidance, Evolution broke a number of records.

Compared to the year prior, FY17 gold production was up 5 per cent to 844,124 ounces, and net cash flow up 8 per cent to \$A461.5m. AISC was down 11 per cent to \$US683/oz, with four of Evolution's seven operations achieving AISC below the bottom end of their respective FY17 guidance range – Cowal, Ernest Henry, Mt Carlton and Mt Rawdon.

\$350m Olympic Dam upgrade



"THERE WILL BE 1300 CONTRACTORS AT OLYMPIC DAM DURING THE PEAK OF CONSTRUCTION AS TEAMS WORK AROUND THE CLOCK TO DISMANTLE, REBUILD AND UPGRADE INTEGRAL COMPONENTS OF THE FACILITY."

The planned shutdown was the largest BHP has undertaken in South Australia.

Image: BHP.

CAMERON DRUMMOND

BHP has announced a \$350 million investment to upgrade its Olympic Dam copper smelting operation.

Olympic Dam asset president Jacqui McGill said the smelter maintenance campaign was the largest planned shutdown by BHP in South Australia.

The smelter campaign involves a combined investment in three key areas; a rebuild of the smelter flash furnace, demolition and construction of a new electric slag furnace and the removal and

replacement of the five-story high electro static precipitator.

BHP said it would also use the planned downtime to undertake further refinery asset maintenance.

"There will be 1300 contractors at Olympic Dam during the peak of construction as teams work around the clock to dismantle, rebuild and upgrade integral components of the facility," Ms McGill said.

"Work is underway on site with teams preparing to dismantle old infrastructure and starting to take delivery of more than 350 material loads to support the project.

"The rolling shutdown across the surface

operations starts in August with the maintenance campaign running for more than 100 days in total.

"As always, the safety of our people and our contractors is paramount as we focus on this demanding and complex project which will help underpin stability and growth at Olympic Dam for many years to come."

BHP said the improved operational performance would underpin an expected increase in copper production to about 215,000t in the 2019 financial year.

This would provide a stable base for the potential to increase capacity to 280,000t in the 2022 financial year.

QLD releases exploration strategy

CAMERON DRUMMOND

THE QLD Government has put in place a blueprint to drive the next wave of resources development in the State's North West Minerals Province.

QLD State Development minister Dr Anthony Lynham unveiled the blueprint on 19 July, which was created to stimulate exploration investment and identify new job-creating prospects.

"The blueprint represents the combined efforts of government, industry and business stakeholders from across North West Queensland to facilitate a strong and prosperous future for this important region," Dr Lynham said.

Underpinned by \$39m of funding from the recent State Budget, the blueprint is designed to build on existing measures such as the Resources Development (Royalties) Policy and its incentives for major resources projects in the Galilee and Surat Basins as well as in the North West Minerals Province.

Measures to support the resources sector include large-scale geological surveys to identify new commercial deposits; a four-year exploration program to support exploration in greenfield and high-risk areas; more international promotion to investors including an annual investor forum in Townsville; and red-tape reduction for explorers, including a hands-on team to help smaller miners get their projects over the investment line.

Dr Lynham said a blueprint



Image: MMG.

MMG's Dugald mine in QLD's North West Minerals Province.

implementation team would be set up in Mount Isa to coordinate the effort, including running a North West Futures Forum later this year to bring experts and locals together to implement the blueprint.

"This all helps secure the next generation of resource development in the State's north-west," Dr Lynham said.

Dr Lynham also announced that a tender to explore 102 square kilometres near Cloncurry had gone to Teck Australia, the regional subsidiary of Teck

– one of the largest producers of base metals, as well as specialty metals such as germanium, indium and cadmium.

Dr Lynham said resources activity in the region was showing green shoots of recovery with CuDeco's Rocklands copper project ramping up, with the expected creation of 200 jobs; Altona's Cloncurry copper project moving closer to development with nearly 600 construction and operational jobs; and MMG's Dugald River zinc project on track to create 400 jobs.

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IN BRIEF

Atlas Copco releases integration platform

DIGITAL

ATLAS Copco's new digital platform comes with the new concept '6th Sense' that connects all types of equipment together.

"We are now taking a big step on the digital path for systems integration in mining, quarrying and tunnelling," Atlas Copco Mining Technology vice president Olav Kvist said.

"With 6th Sense you are able to improve your operation in a completely new way."

Atlas Copco also announced partnerships for the product with Mobilis MCE, Dassault Systemes and IBM.

Drone tech trial underway

UAV

THE WA Department of Mines, Industry Regulation and Safety (DMIRS) has begun a six month drone trial to assess how remote piloted aircraft (RPA) technology can improve productivity across the department.

DMIRS deputy director general Phil Gorey said many government agencies were now embracing the technology and he hoped it would make operations safer for staff, and improve spatial awareness.

The Department Geological Survey WA (GSWA) division commenced the trial in July with a field excursion to geological sites in Kalgoorlie and Kambalda.

"The aim is to record 2700 million year old volcanic rock sequences that host both gold and nickel mineralisation," DMIRS stated.

Mining3 underground research

UNDERGROUND

AUSTRALIAN research body Mining3, in conjunction with MMG, Codeco, Geobruigg, DSI and the WA School of Mines, is researching new high energy dissipation schemes capable of withstanding the pressures of deep underground mining.

"With some of the deepest mines reaching four kilometres underground, global trends suggest incidents of rock bursts and tunnel failure are on the rise," Mining3 stated.

Mining3's study will look into blasting techniques, optimal excavation tunnel shape to tolerate higher stresses, reinforcement of the tunnel, mechanised installation, and optimal design and implementation of shotcrete, mesh and cable bolts.

"Mining3 are trialling the various dissipation schemes at the largest underground mine in the world, El Teniente Mine, in Chile with excellent results," it said.

Roadmap for METS success

"QUEENSLAND'S COMPANIES ARE ALREADY PROVIDING THE WORLD WITH THE KNOW-HOW THEY NEED, BUT WITH THE RIGHT GOVERNMENT SUPPORT, THERE'S SO MANY MORE OPPORTUNITIES WE CAN MAKE OURS."



Image: State of Queensland.

ELIZABETH FABRI

THE Queensland Government plans to create an additional 3000 jobs for the State's \$7 billion mining equipment, technology and services (METS) sector over the next 10 years, through a new roadmap outlining initiatives for growth.

Launched in July by State Development minister Anthony Lynham, *The Queensland METS 10-Year Roadmap and Action Plan* put forward a number of strategies to help QLD become a METS world-leader.

Recommendations included increasing collaboration between researchers,

miners and METS companies, making it easier for companies to turn ideas into commercial products through an accelerator program, and developing and promoting sector capabilities through training and a series of development frameworks and programs.

Dr Lynham said QLD METS already comprised more than 800 companies and 19,500 employees, and the roadmap would "lay the groundwork for the mining technology's sector's next wave of growth".

"Resources companies are under increasing pressure to provide the world with mineral and energy resources more cheaply and with better environmental outcomes," Dr Lynham said.

"Queensland's companies are already providing the world with the know-how they need, but with the right government support, there's so many more opportunities we can make ours."

The Government would also pilot an open innovation community in Mackay to address issues facing Bowen Basin based miners.

"Local miners will identify their challenges, and the researchers and mining technology companies will work together to develop Bowen Basin-specific solutions," Dr Lynham said.

"If the pilot works, we will apply it in other mining technology centres round the state."

Roy Hill partners with LiveHire

ELIZABETH FABRI

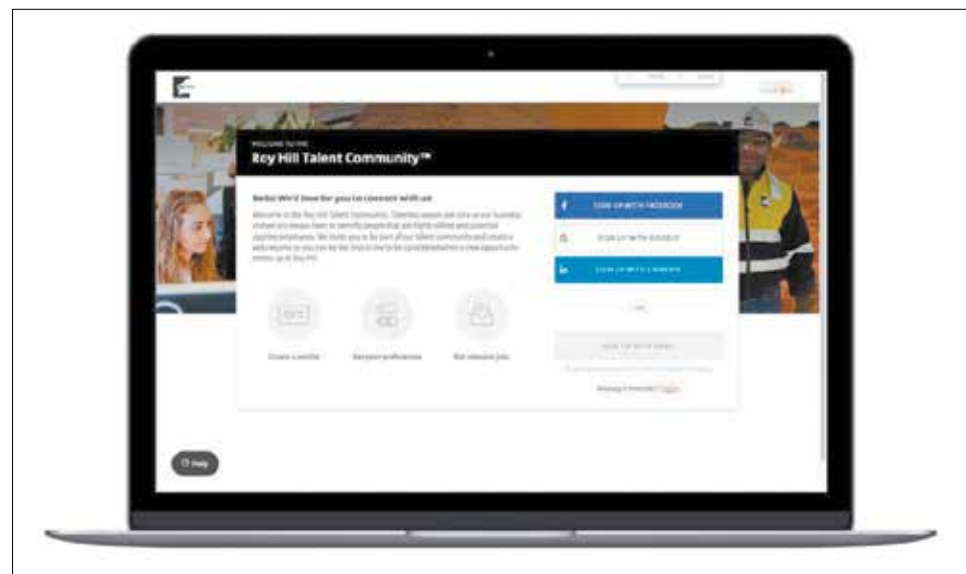
PILBARA miner Roy Hill has introduced innovative technology to recruit and manage its workforce through a partnership with Melbourne-based online recruitment platform LiveHire.

LiveHire would help Roy Hill grow its workforce by 300 over the next 12 months and integrate with the Roy Hill human resources technology to improve productivity.

"Roy Hill will use its Talent Community to invite and engage with current and future employees, as part of their strategic and proactive sourcing strategy to drive workforce agility, hiring productivity, reduced costs and optimal retention of high-quality, diverse talent," LiveHire co-founder and managing director Antonluigi Gozzi said.

The talent community launch was good news for entry level workers looking for a break in the industry, with Roy Hill previously stating it will hire 'green skins' as a cost-saving exercise for the operation.

Jobs seekers could now visit the talent



Roy Hill's new online employment platform.

community page and create a web resume on the site, which Roy Hill would then have access to.

"The breadth of roles, of which Roy Hill hires, includes mining operations, rail operations, port operations, digital, remote

operations and corporate services," Mr Gozzi said.

"This demonstrates the agnostic and powerful nature of LiveHire's Talent Community platform to deliver 100 per cent of hires across an organisation."



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IN BRIEF

Glencore buys into Brazilian copper producer

BRAZIL

SWISS-based mining giant Glencore has bought into Brazilian copper producer Paranapanema (PMA).

Under the agreement, Glencore will take a 5 per cent stake in Paranapanema for an investment of about \$US21 million.

PMA is a producer of refined copper products, with an installed capacity of 280 thousand metric tons of London Metal Exchange (LME) registered copper cathode per annum; supplying customers worldwide.

Glencore and PMA said they may cooperate further, which could include access to Glencore's expertise as well as the leveraging of each party's commercial network.

Rio signs MoU for Jadar project

SERBIA

RIO Tinto has signed a memorandum of understanding (MoU) with the Serbian Government for the development of the Jadar lithium-borate project.

The MoU will enable the formation of joint working groups between the government and Rio to progress through the study and permitting phases.

Rio Tinto Energy & Minerals chief executive Bold Baatar said the company saw Serbia as an attractive investment destination and Jadar was an important part of the company's growth.

"A project of this magnitude requires time and expertise to design and bring into operation," Mr Baatar said.

"We can only do this with the support of the Serbian government and local community."

Duterte issues ultimatum to miners

PHILIPPINES

PHILIPPINE president Rodrigo Duterte has threatened to tax miners "to death" if the "unbridled and irresponsible destruction of our watersheds, forests, and aquatic resources" persisted.

Mr Duterte's July State of the Nation address included an ultimatum to miners and contractors operating in the country.

"I sternly warn, I am warning all mining operations and contractors to refrain from the unbridled and irresponsible destruction of our watersheds, forests, and aquatic resources," he said.

"We shall [also] put a stop to the extraction and exportation of our mineral resources to foreign nations for processing abroad and importing them back to the Philippines in the form of consumer goods at prices twice or thrice the value of the original raw materials foreign corporations pay for them."

Sovereign risk

The Government of Tanzania has passed laws allowing it to tear up and renegotiate contracts with natural resources companies; causing widespread concern and uncertainty for the ASX-listed miners, exploration companies and service companies with interests in the East African nation. Australia-Africa Minerals & Energy Group (AAMEG) chief executive Doug Horak examines how the legislation impacts Australian miners moving forward.



Doug Horak.

Image: Nick Fraser.

ELIZABETH FABRI

Q. What do you make of the new laws passed by the Tanzanian Government?

Changes to the Tanzanian mining law in July have had a disruptive impact on the long-held view that the investment climate of Tanzania is an attractive one that is able to encourage foreign direct investment into its mining industry.

However, at the moment, it is unclear how these new laws are intended to be implemented, and that will only become apparent once the final regulations are in place.

Tanzania, like Australia, is a sovereign nation and therefore has every right to make changes to its legislation as they see best reflects its socio-economic requirements.

We have seen similar modifications to mining codes made across other mining destinations globally; some initial proposals are "wound back" to something more workable following a consultation period, while some are fully implemented.

AAMEG and its members look forward to working closely with the Tanzanian Government as it develops the implementing regulations in order to help ensure that the current uncertainty surrounding the changes is removed and to ensure that the new regulations provide the clarity and transparency required for the mining industry in Tanzania to continue to grow and prosper.

Q. Do you think the laws will damage Tanzania's foreign investment climate?

The Australian resource industry has a substantial interest and involvement in Tanzania.

As at July 2017, the Tanzanian Project Pipeline has 106 active projects of which 43 are active Australian company projects.

Of the Australian projects, only two are at the mine stage.

By working closely with industry, AAMEG hopes to gain a better understanding of the issues that could negatively impact the Tanzanian investment climate.

Our goal is to define and table the key issues of concern so that the final regulatory framework and its implementation will continue to promote the development of the resources industry and that Tanzania will continue to be viewed as an attractive destination for foreign investment in mining.

Q. I understand there is a clause in the legislation that would allow the Government to take a 16 per cent free-carried stake in mining companies as well as the option to acquire up to a 50 per cent stake?

While there are concerns, definition of the final legislative framework is still required.

Once we fully understand the details of the legislation changes, we will be in a better position to assess the impacts on a company by company basis.

At this point, there is some short-term uncertainty and lack of clarity and the full impact on long-term foreign investment remains unclear.

The legislation is just a few weeks old and the detail will only be settled over the coming weeks and maybe months.

It is important that we work collaboratively with the Tanzanian Government to ensure the mining industry in Tanzania continues to prosper and in turn, is able to continue contributing to the country's broader socio-economic development goals.

Q. How has AAMEG responded?

Our immediate focus is on gaining clarity on the legislative changes and establishing a line of communication with the Tanzanian Government at the highest

levels so that we may support a stable fiscal arrangement for current and future mining investment in Tanzania.

AAMEG and its Board are working extremely hard behind the scenes, engaging with members and non-members, Government representatives in both continents and other stakeholders.

Our role is to ensure the Australian response to this issue is well considered, collective, fact based and consistent – therefore we are taking an open-minded and collaborative approach, as we consult with all affected parties in order to build an informed view that will result in a positive outcome.

As a group we will seek to engage with the Tanzanian Government to gain clarity on the regulations and our goal is to end up with a positive working 'road map' for the way forward.

AAMEG has established a Tanzanian Working Group that consists of more than 20 affected parties who are currently aggregating, collating and disseminating information as it comes to light, and collectively working through each mining bill to develop a discussion paper that we hope will support the development of a sustainable regulatory framework in Tanzania.

Q. Do you have plans to meet with the Tanzanian Government?

AAMEG would welcome the opportunity, when appropriate, to discuss the details of the legislation with the Tanzanian Government so that we as an industry group can bring the considered views of the industry forward during the development of the implementing regulations for the legislative changes.

Our aim, and that of our members is to see Tanzania continue to develop its mining industry in a transparent and equitable manner and for the country to continue be viewed as an attractive investment destination.

IMPORTANT INFORMATION

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Clean energy to boost demand: World Bank



ELIZABETH FABRI

DEMAND for minerals and metals is expected to see significant growth in coming years as more renewable energy projects enter construction, a new World Bank report has found.

The *Growing Role of Minerals and Metals for a Low-Carbon Future* report looked at the types of minerals and metals expected to benefit from the development of low-carbon energy technologies, such as wind, solar, and energy storage batteries, as countries worked towards meeting their Paris Agreement targets.

Minerals and metals set for demand increases included aluminium, copper,

lead, lithium, manganese, nickel, silver, steel, and zinc and rare earth minerals such as indium, molybdenum, and neodymium.

The form in which metal demand would increase was dependent on inter-technology choices, such as the balance between wind, solar power and batteries.

"The most significant example is electric storage batteries, where demand for relevant metals: aluminium, cobalt, iron, lead, lithium, manganese, and nickel – could grow by more than 1000 percent if countries take the actions needed to keep global warming at or below 2 degrees Celsius," it stated.

World Bank senior director and head of the Energy and Extractive Industries

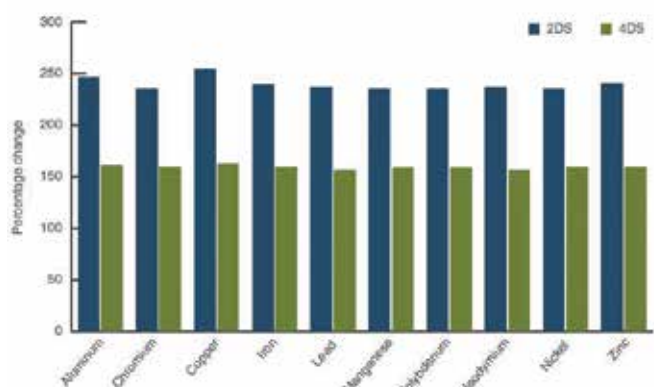
Global Practice Riccardo Puliti said with better planning, resources-rich countries, like Australia, could take advantage of the increased demand to foster growth and development.

"Countries with capacity and infrastructure to supply the minerals and metals required for cleaner technologies have a unique opportunity to grow their economies if they develop their mining sectors in a sustainable way," Mr Puliti said.

The report said based on current levels, Chile, Peru and potentially Bolivia would play a key role in supplying copper and lithium; Brazil would be a key bauxite and iron ore supplier, and India dominant in iron, steel and titanium.

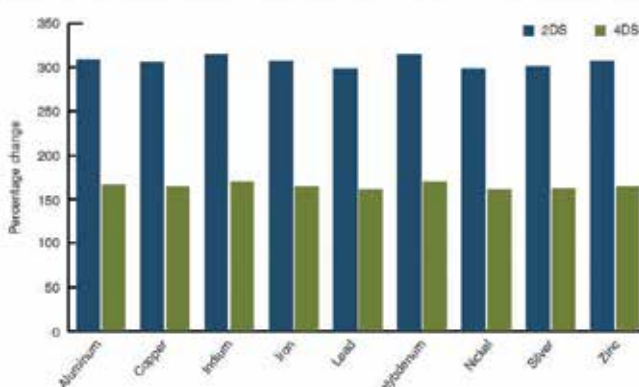
"DEMAND FOR RELEVANT METALS: ALUMINIUM, COBALT, IRON, LEAD, LITHIUM, MANGANESE, AND NICKEL – COULD GROW BY MORE THAN 1000 PERCENT IF COUNTRIES TAKE THE ACTIONS NEEDED TO KEEP GLOBAL WARMING AT OR BELOW 2 DEGREES CELSIUS."

FIGURE 2.3 Median Metals Demand Scenario for Supplying Wind Technologies through 2050



Note: 2DS = 2 degree scenario; 4DS = 4 degree scenario; 6DS = 6 degree scenario. Figure shows change in metal demand for wind technologies as compared with the 6DS.

FIGURE 2.7 Median Metals Demand Scenario for Supplying Solar Photovoltaics through 2050



Note: 2DS = 2 degree scenario; 4DS = 4 degree scenario; 6DS = 6 degree scenario. Figure shows change in metal demand for solar photovoltaic technologies as compared with the 6DS.



The Pilgangoora lithium project in the WA Pilbara.

Pilbara Minerals awards key contracts

ELIZABETH FABRI

PILBARA Minerals' 100 per cent-owned Pilgangoora lithium-tantalum project in WA's north is a step closer to production following the award of four 'milestone' contracts.

In late July, the company awarded RCR Tomlinson Stage 2 of the Engineering, Procurement and Construction (EPC) contract to build the 2 million tonnes per annum (2mtpa) processing plant, along with a site-wide bulk earthworks construction contract to NRW, a Camp Stage 2 expansion contract to Njamal Services and Pilbara Resource Group (NPJV), and camp services contract to Action Industrial Catering in a joint venture with Njamal Services.

Pilbara Minerals managing director Ken Brinsden said the \$234 million project remains on track to begin commissioning in March next year, and shipments in the second quarter of 2018.

"Following the final investment decision, we are now getting on with the job of delivering this world-class project as rapidly as possible, ensuring we can move quickly to deliver into the burgeoning lithium raw material demand growth we see from our existing customers and others, downstream in the lithium-ion battery supply chain," Mr Brinsden said.

"We are also very pleased with the cooperative relationships that have emerged between the Njamal Group and contract service providers at Pilgangoora, which has opened up significant opportunities for indigenous engagement and employment as part of the project's construction and ongoing operations."

THE AUSTRALIAN MINING REVIEW

SEPTEMBER 2017 EDITION

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Drones in Mining
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SPECIAL FEATURES

BHP IRON ORE

19

"WE MET GUIDANCE FOR THE YEAR AND POSTED THE 17TH CONSECUTIVE ANNUAL PRODUCTION RECORD IN WA IRON ORE, WHICH WAS THE RESULT OF OUR TEAMS STEPPING UP TO SUSTAINABLY INCREASE UTILISATION OF OUR INSTALLED CAPACITY."



All images BHP.

Rebuilding trust

The 2017 financial year was a game changer for BHP and its iron ore division. On top of a corporate rebrand and record production at West Australian Iron Ore (WAIO), plans for BHP's proposed South Flank project were advancing, with initial funding locked in for early construction.

ELIZABETH FABRI

BHP recently dumped the 'Billiton' name in a rebrand aimed at highlighting the company's Australian roots and rebuilding a dialogue with its stakeholders.

Iron ore has been a key pillar of BHP's operations for more than 67 years, with WA Iron Ore (WAIO) one of the company's largest and most successful assets.

"You're only as good as your last game. Notwithstanding this prosperous history, in the here and now we are facing a well-documented erosion of trust," Australia President Operations Mike Henry said during a 26 June presentation.

"Society quite justifiably expects companies like mine to not only operate within the law, but to ensure a sustainable quid pro quo in terms of ongoing investment, job creation, upskilling, support to ensure sustainable communities, and of course ongoing opportunities for local businesses to share in the wealth pie.

"Recently investment has slowed, commodity prices and therefore royalties have fallen, businesses like mine have sought to rapidly recalibrate to the new reality by becoming more productive, and that has seen flow on impacts to workers, local business and local communities.

"This has been tough and it's not surprising



BHP Australia President Operations Mike Henry.

that we've seen the beginnings of an erosion in support and trust in some quarters."

While big business does already engage with, and invest in people and communities in a big way, Mr Henry admitted that BHP had not "necessarily done a great job of making sure this is broadly known".

In the last five years, for example, BHP has

invested about \$1.6 billion into local Pilbara communities.

"We need to do what we can to engender trust on the part of our stakeholders by building their understanding of the industry and the benefits that already arise from our businesses," he said.

"And we also need to be willing to step up

and be heard on issues of mutual interest. But we need to do more than just get better about how we explain ourselves or how we advocate of how we advocate. We need to continue to lift our game in terms of the way we engage and the way we operate.

"We need to face outward and seek to build bridges just as leaders did at the start of this journey.

"For if we are able to strengthen the foundation of trust in the industry and amongst all stakeholders, then we can assure an industry, economy and communities that continue to advance and which are sustainable for many decades to come."

In the next few years, BHP plans to bring a new Pilbara mine into production, South Flank, as mining at BHP's largest iron ore mine Yandi winds down. Mr Henry said the funding would generate several hundred construction jobs and provide exciting opportunities for WA suppliers.

"If approved, the project will require investment of on the order of \$3-4bn, will create several thousand construction jobs, many hundreds of ongoing operational jobs, continued opportunities for local business big and small, and of course an ongoing stream of royalties for all West Australians," Mr Henry said.

(CONTINUED ON PAGE 26)

Fantastic benefits for Swans members



THINGS are hotting up at Swan Districts Football Club as the 2017 WAFL season approaches.

A highly successful recruitment campaign during the off season has seen many Swans players come through the Club's strong junior program, as well as returning after AFL careers.

The expectations are high, and there is no better time than now to jump on board and show support for the Mighty Black and Whites.

The club's Premium Plus membership

provides for the distinguished Swans supporter who wants to get amongst the Corporate and VIP action and the Presidents Luncheons at every Swans home game during the 2017 Season.

The Premium Plus membership also includes exclusive Sponsor's Lounge viewing and corporate networking.

Swan Districts also has Standard, Country/Interstate, and Junior Swan memberships, and the option of becoming a Judda Bee Member, tailored for businesses with some fantastic benefits.

Supporters can also add extra value to their Swans Membership by joining the Past Players and Officials Association; catching up with former players and officials and getting involved in the many different functions arranged by this dedicated group of Swannies.

Supporters may also consider joining the Club's Swansmen Association, a group of dedicated Swan Districts supporters who raise funds for the benefit of the football club. Their aim is to do this while enjoying camaraderie and fellowship at the same time.

Members and supporters can make a day of it at Steel Blue Oval and soak up the fantastic atmosphere on game days; booking a seat at the Club's President's Luncheon – which includes a superb buffet meal and drinks for a two hour period – is great value at only \$60 for members (valued at over \$95).

For information about signing up, interested parties can call Hannah or Jenny on 9279 8700, or jump on the website www.swandistrictsfc.com.au and join online.

A time for action

ALL businesses are striving to increase profits, to be a responsible and sustainable operation, and to provide greater shareholder returns.

Nevertheless, this can only be realised if a business truly understands its position, the risks it faces, with a plan that will keep it geared for success.

"Success can only be built on knowledge and the recent end of financial year provides a great catalyst for action, regardless of your organisation's performance," Altus Consulting principal consultant David Reynolds said.

"If you have experienced failings in these last 12 months, don't be despondent.

"Instead, view the experience gained as a valuable resource which can get you back on track.

"The same is true for your successes; they did not happen by accident, they occurred because the business made the right moves and the correct decisions."

Whatever situation a business finds itself in, a good consultant can work with the team to provide the next steps from a neutral perspective.

Understanding these factors and developing a strategic plan will stand a business in good stead for the future, however long term sustainable improvement is only achieved when implementation is correctly managed and with employees that are truly engaged. "Developing this type of perspective and having the available resources is often a challenge for many internal management environments," Mr Reynolds said.

"In today's global economy, too many advisors lose sight of a corporate operation as a unique and distinct business, one that has been built with blood sweat and tears."

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Enjoying a partnership with BHP Western Australia Iron Ore (WAIO) since 2004, Liebherr-Australia has focused on maintaining safety, high productivity and reliability.

These three facets are particularly important to Liebherr-Australia because, along with three other values, they form the Liebherr Mining Division's Six Pillars: the guiding values for product innovation, development, and support.

A clear example of this strategic focus is the recently established exchange module program, which includes such items as complete engine modules, hydraulic tank modules, and hydraulic cooler modules.

This method means that Liebherr-Australia is able to provide safe maintenance practices, reduced downtime at major shutdowns, and increased reliability.

Liebherr mining excavators like the R 9400, R 996 B, and R 9800 enable superior productivity and maximum uptime thanks to Liebherr-Australia's devoted personnel.

Liebherr offers BHP complete and personalised service and support, guaranteeing reliable and continued performance of the Liebherr fleet at its sites.

At the March Global Iron Ore & Steel Forecast Conference, held in Perth, WAIO asset president Edgar Basto



The EX7024 R 9400 excavator with bucket manufactured by Liebherr-Australia.



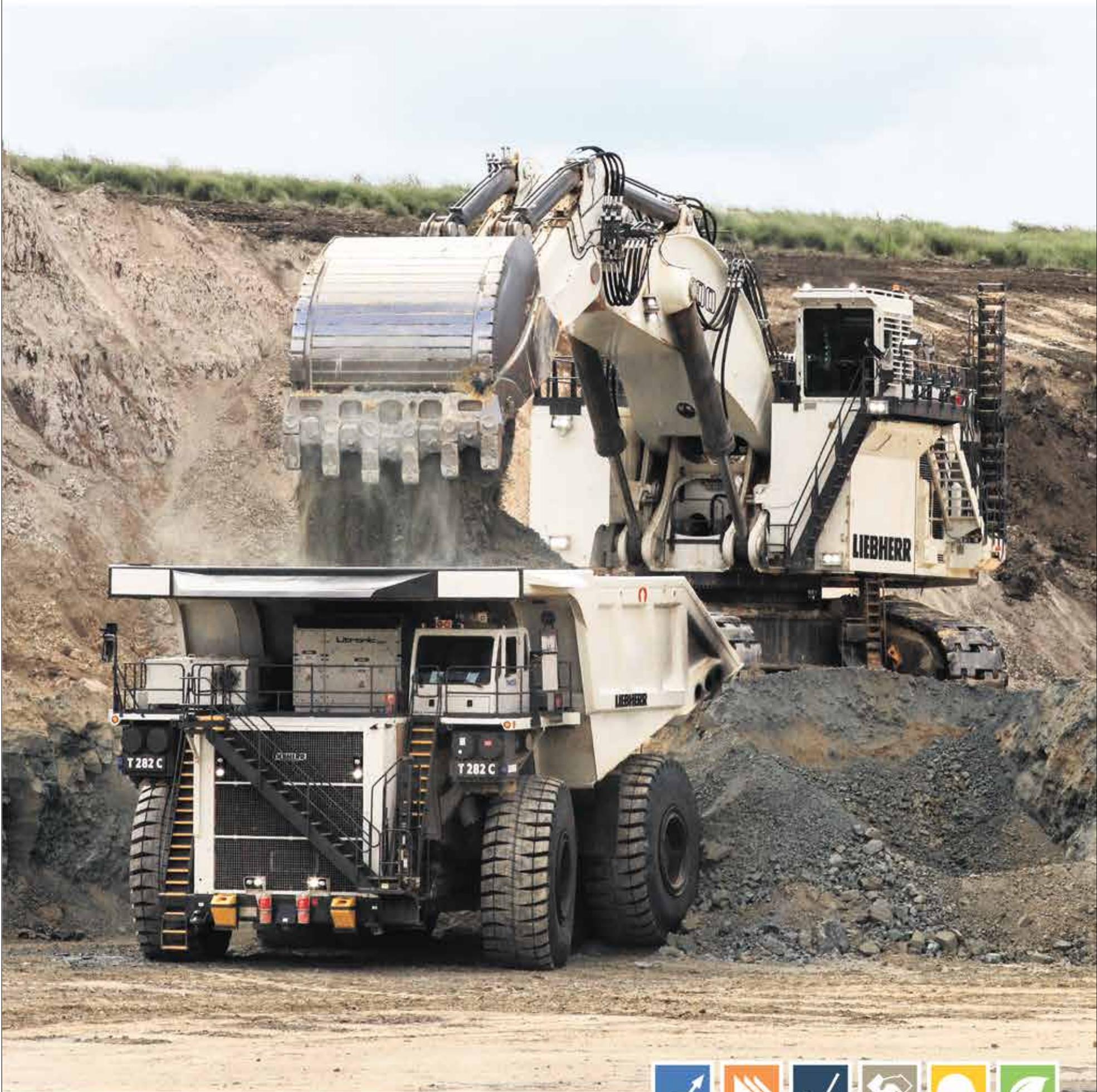
One of WAIO's R 996 B mining excavators, part of the exchange module program.

noted that "the time taken to complete a shutdown on a Liebherr Hydraulic excavator has fallen by almost 40 per cent, reducing the teams' risk exposure while allowing a faster return to service".

Celebrating more than a

decade of partnership with WAIO, Liebherr-Australia is proud to be associated with WAIO and other BHP assets to achieve world's best practices in safety, productivity and reliability, and looks forward to many more continued shared successes.

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ICE Engineering and Construction is a remote area electrical and instrumentation construction company that specialises in the development of greenfields and brownfields mining and oil and gas operations across Australia.

The company's core skills cover all of the electrical and instrumentation requirements of a site, from the installation, termination and testing of HV (33kV) power and distribution equipment, calibration and installation of field instruments to the installation of switch rooms and general lighting and power equipment.

Over the years, the company has invested heavily in its regional facilities; providing office, substantial workshop and warehouse facilities at Wingfield in Adelaide as well as Whyalla and Moomba in South Australia.

In 2011 the company also opened up an office in Perth, WA.

"We have the capability of a large organisation with the overhead of a small organisation and provide the highest quality of work and at a very competitive rate," ICE Engineering and Construction business development manager Richard De Nichilo said.

"Staff are qualified and licensed to perform their duties safely and effectively, being supervised by experienced heavy industrial supervisors while being managed by an experienced and focused management team."

Some of the projects the team has worked on include BHP's Yandi South, Jimblebar, Ore Body 24 and the Mooka OCRS in the Pilbara, WA, and additionally the Olympic Dam site in



ICE Engineering is a proud service provider to BHP.

South Australia.

The company is proud to hold a number of accreditations including AS4801, OHS/AS18001, ISO9001 & ISO14001, Achilles and CM3 and boasts more than 2 million hours LTI free with a TRIFR of 0.0 since October 2014.


"This is a significant achievement for an SME working in remote areas on heavy industrial and hazardous facilities," Mr De Nichilo said.

ICE is currently on site delivering the E&I component of the \$670 million Nyrstar Smelter Transformation Project

with more than 65 men working two shifts.

The company is also on site at Olympic Dam delivering the E&I component of the \$300m SCM17 Smelter shutdown with BHP.

More information on its services can be found by visiting www.iceengineering.net.au.



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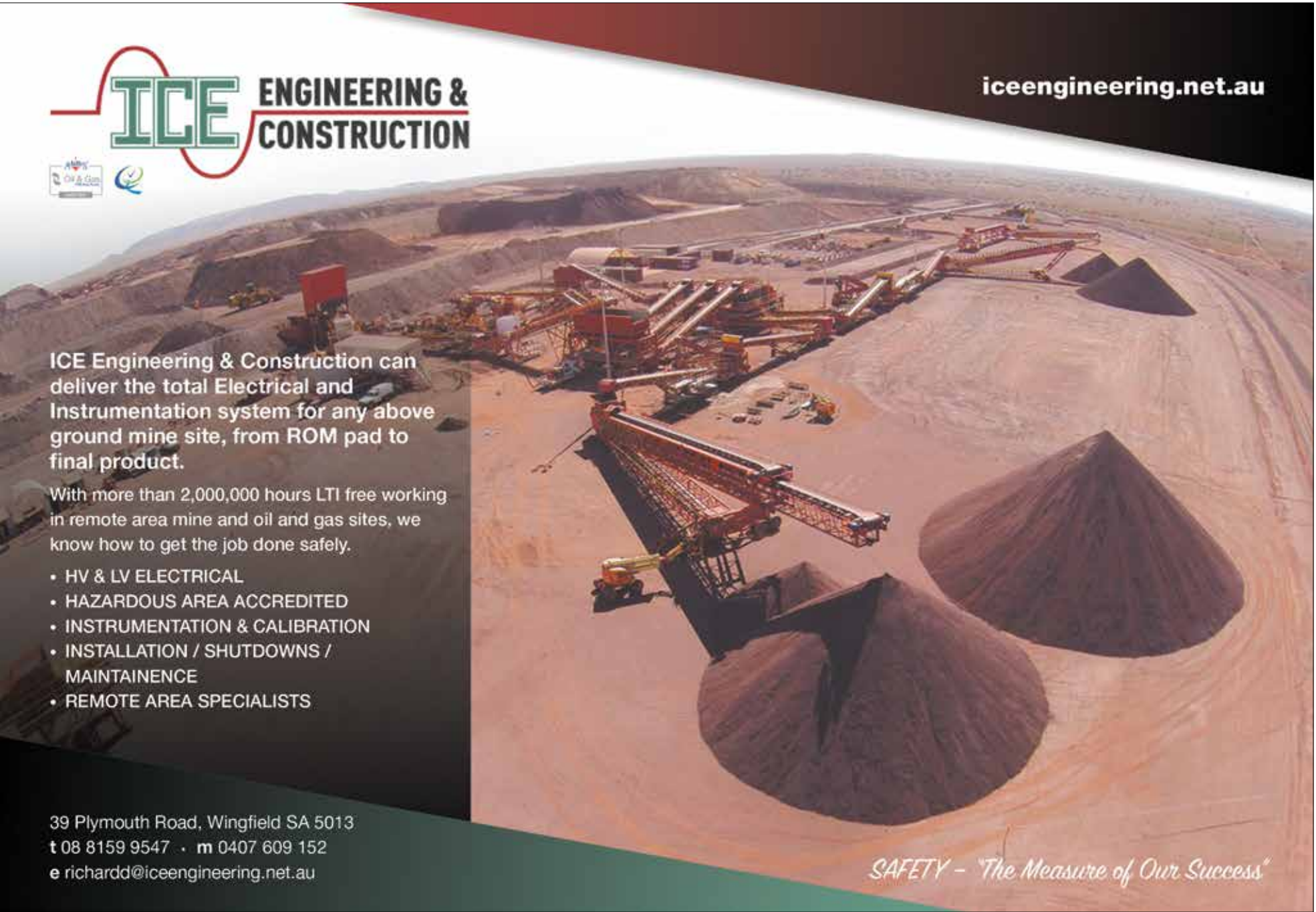
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Downer road to success

AUSTRALIA'S leading transport, rail, technology, engineering, construction, maintenance, and mining contractor Downer's success has been built around its positive relationships with customers.

From the initial feasibility studies into design, construction, operations, maintenance and eventual decommissioning, Downer has the unique capabilities to support customers' needs for the full life cycle of their assets.

The Engineering, Construction and Maintenance (EC&M) division has been a proud partner of BHP for more than two decades, delivering services across a large number of projects through its three business streams; Engineering and Technology, Operations, Maintenance and Services, and Construction.

"We've had a very long association with BHP; probably over 20 years if we talk about iron ore in particular," Downer EC&M construction executive general manager Adam Cook said.

"In the past decade, we've worked at BHP's Newman, Jimblebar, Yandi, Area C,

and Satellite Ore Bodies mines along the rail corridor in Port Hedland.

"We've done civil, mechanical and electrical works over that period on both their large capital expansions, and more recently on upgrade and sustaining works at the Port, as well as shutdown and maintenance works at several of the mines."

Mr Cook said that across Downer's divisions, it has the in-house capability to provide a full suite of services, from mine planning, design and construction of the process and non-process infrastructure, mining operations and maintenance of the infrastructure.

He elaborated further "Downer Mining offers contract mining services, whether that be surface mining or underground mining; it's truly an end to end service offering," he said.

"We tend to support the majority of the major producers in the bulk commodities sector and we're currently bidding several large EPC opportunities in the coal space."

The company recently made headlines after signing letters of award to provide

engineering and construction works for Adani's large-scale Carmichael coal project in Queensland.

"We'd hope to be able to tender for some of the upcoming works on BHP's South Flank project if the development is approved, but also the ongoing sustaining works that are required to support large mining operations," Mr Cook said.

"These sustaining projects provide an opportunity to support our customers as they look to sustain and improve the efficiency of their operations. It's really important for us to continue to provide services in that space and we'd like to think we're always talking to them in ways that we can do that."

Throughout its operations, Downer was committed to deploying the latest technologies and innovations to drive continuous improvement and efficiency.

"Technology and innovation is quite central to what we do," he said.

"We strive to be collaborative with our customers in this space; not for the sake of technology in its own right but we actually

improve the value of the service we provide."

In May, the company entered into a strategic alliance with Microsoft to develop market cloud-based solutions and services that would digitally enhance their respective markets, with first products expected in the second half of 2017.

Safety was also embedded in the company culture, through its commitment and belief of Zero Harm to its people, the environment and communities in which it operates.

"I think the quality of people you can attract, retain and develop within your organisation is what really sets you apart from competitors over the long term," Mr Cook said.

"We are always striving to provide a work environment that enables these talented and committed teams to be successful, enhance our customer relationships through performance and be supported by our safe systems of work."

"If you put those three together, collectively they underpin the sustainability of our business."



FUNCTION ROOMS

Located on the second level of the Swan Districts Football Club, looking out over Steel Blue Oval in Bassendean, our function rooms offer a great setting for your event.

Allow our friendly team to arrange your hassle free event in one of our large function rooms, accommodating for functions such as; **Wedding Receptions, Birthday Parties, Work Conferences, Seminars, Presentations** and many other events.

Choose from four of our function rooms catering for an intimate gathering for a minimum of 10 guests in our Past Players Room, or a larger event for up to 400 guests in our Main function room featuring U Shape bar located in the middle of the room and large dance floor.

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- Also available by request:**
- Lectern and Microphone
 - Electronic Whiteboard hire
 - Projector and screen hire

MEMBERS BAR: The Members Bar is a relaxed function area perfect for your small to midsize function. It is equipped with a large bar with beer on tap, large dance floor and balcony overlooking Steel Blue Oval. This area is ideal for cocktail parties and birthdays. **Capacity: Cocktail Function:** 150 guests

THE PAST PLAYERS ROOM: The Past Players Room is an intimate space ideal for smaller sit down dinners, seminars and meetings.

Capacity: Cocktail Function: 150 guests

Seated Dinner Style: 80 guests

Seated Theatre Style: 100 guests

Seminar Setting: 50 guests

This room features a large open space, with a wrap around bar located in the middle of the room, as well as a private balcony with views of Steel Blue Oval.

THE MAIN FUNCTION ROOM: The Presidents Suite is ideal for large events and features a stage, built in dance floor and can seat up to 250 people comfortably. With beers on tap, and great bar service making it quick and easy so you are able to enjoy

your event. This venue is great for birthdays, dinners, quiz nights, wedding receptions, seminars, work functions, presentation nights and many other special occasions.

Capacity: Cocktail Function: 400 guests

Seated Dinner Style: 250 guests

Seated Theatre Style: 200 guests

Seminar Setting: 100 guests

SPONSORS LOUNGE: The Sponsors Lounge is a serene and private function room with VIP seating overlooking Steel Blue Oval. The Sponsors Lounge boasts a Private Bar, Kitchen and bathroom facilities and as such is ideal for meetings, conferences, small cocktail parties and gatherings.

Capacity: Cocktail Function: 120 guests

Theatre Style: 100 guests

Seminar: 50 guests

If you choose to use outside catering for your function we have a fully equipped kitchen on site.

We would be delighted to meet with you to showcase our facilities and to discuss your requirements in detail.

(CONTINUED FROM PAGE 19)

“SHOULD SOUTH FLANK BE APPROVED BY THE BOARD, CONSTRUCTION WOULD BE EXPECTED TO START SOON AFTER AND TAKE SEVERAL YEARS TO COMPLETE.”

WAIO has undertaken a number of significant expansion projects during the past five years.

The \$US3.2bn project was expected to generate several thousand jobs during the construction phase, and hundreds of operational positions, which will provide significant flow-on benefits to the WA economy.

South Flank

Located 10km south of Area C operation, South Flank is BHP's preferred option to replace production from the 80mtpa Yandi mine when it reaches the end of its economic life.

On 26 June, BHP approved initial funding of \$US184 million for the project.

BHP WA Iron Ore asset president Edgar Basto said the Yandi mine would reach the end of its economic life in the early-to-mid 2020s.

“Should South Flank be approved by the board, construction would be expected to start soon after and take several years to complete,” Mr Basto said.

Mr Basto said the project was currently in the feasibility study phase, with first ore targeted in the 2021 calendar year.

“There would be a phased approach to ramping up production to capacity,” he said.

“We will determine the optimum ramp-up/ramp-down times for the transition as we continue to optimise the project, which includes the optimal schedule over which to ramp-down of Yandi and ramp-up of South Flank.”

Mr Basto said the capital cost for the project was expected to be in the range of between \$US30 and \$US40 per tonne.

“As we have said previously, this expenditure will fit within WAIO's long-term average sustaining capital expenditure of US\$4 per tonne,” he said.

“The use of existing processing, non-processing and logistics infrastructure at Mining Area C is a key component of the investment's competitive capital intensity.”

WAIO production

In FY17, BHP hit its annual iron ore production target of 231 million tonnes (mt); a four per cent increase from the year prior.

The year also saw record WAIO production of 268mt on a 100 per cent basis, which reflected productivity improvements across its supply chain, including a 12 per cent production in June from the March quarter, and additional capacity at Jimblebar.

“We met guidance for the year and posted the 17th consecutive annual production record in WA iron ore, which was the result of our teams stepping up to sustainably increase utilisation of our installed capacity,” Mr Basto said.

“Their ideas are not only contributing to reduce costs but also to sustainably increasing productivity in our supply chain.”

In FY17, BHP commissioned a new primary crusher and additional conveying capacity at its Jimblebar mine and processing hub to improve productivity.

A rail renewal and maintenance program was also completed in May 2017.

However, operations at BHP's Newman iron ore rail line came to an unexpected halt in June following a derailment, restarting at limited capacity.

A large fire at BHP's Mt Whaleback site near Newman also broke out in June; but this did not impact the company's full year guidance.

In the 2018 financial year, WAIO production was expected to increase to between 275mt and 280mt on a 100 per cent basis, as BHP continued its work with relevant authorities to increase system capacity to 290mtpa.

Samarco restart

In addition to its iron ore operations in the Pilbara, BHP holds a 50 per cent stake in Brazilian iron ore mine Samarco.

The ill-fated joint venture mine has been offline since November 2015 following the tragic Fundão tailings dam burst that resulted in 19 deaths.

In December last year, BHP and its joint venture partner Vale agreed to a non-binding term sheet that outlined a plan to use Vale's Timbopeba pit to deposit tailings upon Samarco's restart.

The companies were continuing talks with the Brazil Government to obtain necessary licenses to reopen, however recent reports indicate this was “unlikely” to occur in the 2017 calendar year.

“A restart of operations at Samarco is subject to obtaining separate regulatory approvals and will occur only if safe, economically viable and has the support of the community,” BHP said in a statement.

“Resuming operations would also require government approvals, the granting of licenses by state authorities and the restructure of Samarco's debt.

“Accordingly, operations at Samarco are unlikely to restart in CY2017.”

On 30 June, BHP approved \$US250 million in financial support for the Renova Foundation and Samarco Mineração S.A (Samarco) until 31 December 2017 to go towards remediation, compensation and stabilisation work.

Once the project comes back online, BHP's group iron ore production was expected to increase.

In FY15, the mine produced 29mt of iron ore (on a 100 per cent basis), and when reopened was expected to run at 60 per cent capacity, and deliver an annual rate of 18mt.

FY18 outlook

Over the next 12 months, BHP said it would continue its focus on improved productivity across its operations.

The company set an iron ore guidance of between 239mt and 243mt, and WAIO guidance (100 per cent basis) of between 275mt and 280mt, subject to regulatory approvals to increase capacity above 290mt.

“We are focused on continuing to improve productivity and safety,” Mr Basto said.

“Inclusion and diversity is also high on my agenda as a leader and delivers value in iron ore and across the company.”

“Our productivity drive is sustainable – in large part because it is underpinned by employee contribution.”

Mr Basto said the company often encouraged employees to contribute ideas to find better ways of doing things and in turn be recognised and rewarded for their work.

“This is what will truly deliver value for our people and our business,” he said.

“I am part of a new generation of leaders who, rather than working by the muscle delivery model, focuses on collaboration and getting input from all levels in the business. I realise I don't have all the answers.”

Mr Basto said ideas were generated at all levels, with groups meeting once a week to put forward recommendations.

In FY17, 1949 initiatives were established across WAIO, including 1035 on cost, 316 on culture, 349 on safety, and 249 on throughput.

“That is an increase on FY16 and the result of a focus by the mines to find new initiatives,” he said.

“In the past four years about 5830 ideas have been generated, and about 15 per cent of our employees have come up with initiatives.

“We believe that can increase.”

In the 2018 calendar year, the company said it would double its intake of apprentices in the Pilbara, taking on 200 new apprentices and trainees on top of the 300 already employed.

BHP's corporate “Think Big” campaign – part of its May rebrand – would also continue.

Mr Basto said planning began more than 15 months ago, and started with BHP asking communities where it operates what their understanding and perceptions of the company were.

“The research showed that while most people knew our name very few people knew what we did, what we stood for or what our commitment was to them and to the broader community but encouragingly, they also said they wanted to know, so we needed to address that,” he said.

“This is the first time since then we've come out with a significant national advertising campaign in more than 30 years.

“The purpose of the campaign, in short, is all about us telling our story - to reconnect with our communities.”

ContiTech 
The Future in Motion



Completed **early**, on budget and incident free **20 km overland conveyor belt changeout project**

Project Scope The ContiTech West Australian Service Team from Karratha had to set up and execute the replacement of a 20,548 m 1050 mm wide ST2786 9x5 DIN-X SLL overland conveyor belt in the Pilbara for a major iron ore miner.

Key Data • Motive force provided was from the ContiTech belt puller and 100 t belt winder. The belt winder was operating in tension/slave mode behind the belt puller. This combination provided an efficient and controlled means of belt movement and winding. The maximum diameter of the racetrack reels was 6.8 m. • 32 lengths of belt at 650 m were installed and reeled during the replacement work. The belt movement operations were completed continuously over 72 hours with an approximate belt speed of 17 m/min. • The belt flake length was 450 m. • The belt was guided safely and controllably onto the conveyor system from the flake through two ContiTech 90° turning frames. • Lower than expected pulling forces were recorded during the replacement operations. The recorded values indicated a DIN friction factor of around $f=0.010$

Summary An additional, unscheduled conveyor job was also carried out by the team while their specially developed equipment was nearby. This was also completed early and incident free. The client advised they were extremely happy with ContiTech's safety and performance, indicating they would like to continue the working relationship moving forward.

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GALLAGHER Group is a global leader in the innovation, manufacture and installation of security technology.

Formerly known as Cardax, Gallagher provides intelligent security, fatigue management and workforce safety access control systems to drive up productivity and cost efficiency across an organisation's operations.

More than 150 mining customers around the world rely on Gallagher security systems to meet OH&S and other regulatory requirements, and have been implemented at several major Australian mining organisations.

Gallagher Command Centre allows central configuration and management of access controls, intruder alarms, perimeter security, and worker compliance.

"We specifically design our products for the challenges the mining industry faces, such as keyless access control systems for individuals to operate vehicles, where the vehicle won't start unless that worker has met their relevant requirements," Gallagher security sales manager Paul Gordon said.

The Gallagher Alcolizer integration introduces proactive workforce management by identifying individuals who are intoxicated, reinforcing a company's 'duty of care' to all employees.

"Readings are registered and recorded against the user to help ensure the safety of all workers on a site," Mr Gordon said.

The Gallagher access system was installed at Xstrata Copper's (now Glencore) Mount Isa Mines, one of the largest underground operations in the world.

The site boasts Gallagher's world-leading Windows-based access management system to allow the movement of authorised



Gallagher's security technology is widely used across the resources sector.

personnel with minimum effort.

"The Gallagher access system as a tool, provides better control of access management health and safety systems and we wouldn't hesitate to recommend it," said

Xstrata Copper's emergency and protective services superintendent.

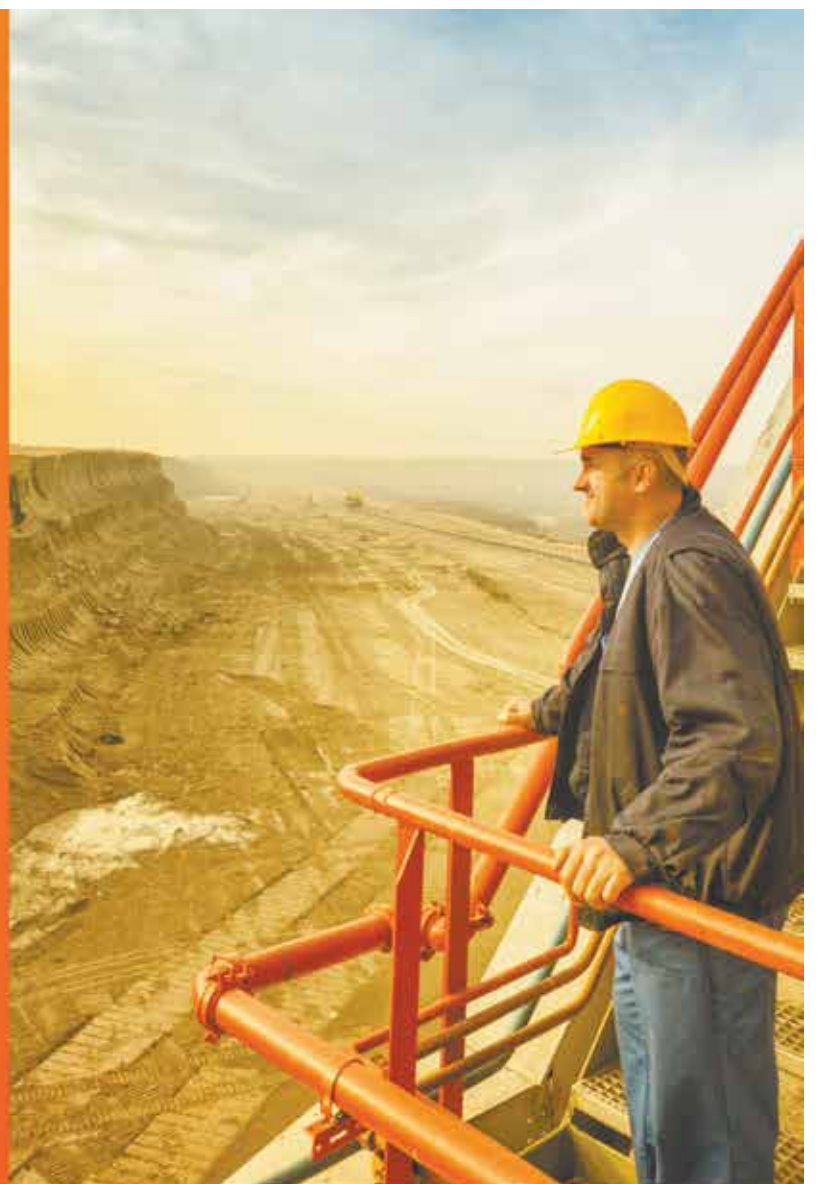
"The powerful software leads itself well to integration with other third party software applications to allow better management of

security, health safety, access control and contractor management."

More information on Gallagher's access control systems can be found at: security.gallagher.com.

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BACK AGAIN,
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THROUGH
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NICKEL OR
THROUGH
OTHER BASE
METALS."**

A proud tradition

Momentum is building for this year's Diggers and Dealers Mining Forum, with more than 2000 mining professionals expected to set foot on Kalgoorlie's iconic red soil this August for another action-packed event.

ELIZABETH FABRI

THE Kalgoorlie and Goldfields province has a rich mining history that dates back to September 1892, when prospectors Arthur Bayley and William Ford first discovered gold in Coolgardie.

Gold and nickel mining dominated the first half of the 20th century, and the region's industry has since evolved to encompass a number of iron ore, copper, zinc, silver, and lithium projects.

"This year, gold mining in Kalgoorlie celebrated its 60th million ounce of action, which is a remarkable achievement," Diggers and Dealer's Forum chairman Nick Giorgetta said.

"I actually live in Kalgoorlie myself, and I've seen a lot of ups and downs, but Kalgoorlie always comes back again, whether through gold or nickel or through other base metals.

"The history of mining continues on very successfully; it's a very rich area."

There is no other event that can truly match the buzz experienced at WA's iconic Diggers and Dealers conference.

For the last 26 years, mining companies have travelled great distances to attend the annual conference founded by Geoff Stokes, and today marked in the diaries of miners, METS companies, and investors from across the country.

"It started pretty small; in the first year they had about 92 people attending and as the years went on it became a much bigger conference," Mr Giorgetta said.



"In 2012 it went up to a maximum of 2400 delegates, and now we're consistently close to 2000, and this year we will get about 2100/2200 attending."

WA's unofficial gold capital Kalgoorlie has hosted the conference since its inception, and continues to remain a significant contributor to the event's appeal; with miner's looking forward to attending each year to celebrate with industry peers in a relaxed setting.

A smart-casual dress code and generous networking drinks portion alone set the scene for an enjoyable three days filled with learning opportunities, collaboration

through the many exhibitor stands, and of course, socialising.

But with operations at the event venue, Goldfields Arts Centre, up in the air, questions arise on Diggers and Dealers place in the region in future years.

In June, the State Government announced the city's event's hub, Goldfields Arts Centre would be forced into care and maintenance from 30 June 2017, as a result of an ongoing dispute between the City and State Government.

Existing bookings for the next 12 months would be honoured, so this had no effect on the

running of the 2017 event to be held between 7-9 August.

In July, Diggers and Dealers announced the WA Minister for Training had confirmed the centre would be available for Diggers and Dealers for the 2018 conference.

"We have addressed this uncertainty with the Minister for Training with respect to the 2018 Diggers and Dealers Mining Forum as we know that people attending Diggers and Dealers in August this year will be wanting to reconfirm accommodation for the following as has been done for many years," Mr Giorgetta said.

Mr Giorgetta hoped the Government's would allow the conference to continue in Kalgoorlie beyond 2018, as the destination aspect was a key drawcard.

"I have been to many conferences in the city [Perth] myself and you just go there, listen to the information and come five o'clock everyone goes in different directions," Mr Giorgetta said.

"Most people go home or to their hotels, so all the interaction following the conference doesn't exist.

"However in Kalgoorlie everyone stays on; Diggers and Dealers puts on a couple of hours of free drinks for delegates so they can mingle and discuss things.

"After that they seem to make their own arrangements; go into town to the pub, or whatever they want to do.

"In a way people have to stay together because there really isn't any other place to go, and this works wonderfully well."

(CONTINUED ON PAGE 32)

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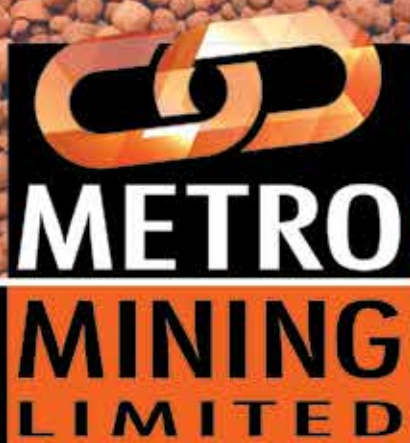
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Conference attractions

The 2017 conference program is shaping up to be one of Diggers and Dealers best yet.

Following Mr Giorgetta's opening speech, delegates will be treated to a keynote address from Robert Zoellick, who served in President George W Bush's cabinet as US Trade Representative between 2001 and 2005, as US Deputy Secretary of State from 2005-2006, and as World Bank Group president between 2007 and 2012.

Mr Giorgetta said Mr Zoellick was uniquely qualified to provide an educated overview of recent global political and economic changes and what they will mean for the Australian resources sector.

"We believe that this year with all the events taking place worldwide (political events such as Brexit, Trump's election, the France election), it will be very interesting to see what Robert's perspective is on the world we live in and we're looking forward to his presentation," Mr Giorgetta said.

"He [Robert] is quite outspoken which is good to see."

The conference will also include presentations from Anglo American technical director Tony O'Neill, Fortescue Metals Group chief executive Nev Power, Roy Hill Holdings chief executive Barry Fitzgerald, Pilbara Minerals chief executive and managing director Ken Brinsden, AngloGold Ashanti vice president corporate affairs Andrea Maxey, Evolution Mining executive chairman Jake Klein, and many more.

On top of this, the conference will be complemented by an exhibitor hall filled with between 140 and 150 stands exhibiting their services and the latest technologies.

"It's a good mix of about 60-70 per cent



presenters and mining companies, and then some from the service industry; so it's a very comprehensive exhibition, and everyone there will find somebody to talk to," Mr Giorgetta said.

The annual Diggers and Dealers awards, presented at the WesTrac Gala dinner on 9 August recognises the outstanding players in the industry.

Last year's recipients included Fortescue Metals Group, which was awarded the *Digger* award, and Evolution Mining, which took home the *Dealer* award.

The road ahead

The Diggers and Dealers conference will continue to be run in Kalgoorlie for as long

as it's feasible, Mr Giorgetta said.

"Kalgoorlie is the perfect location for the conference; its unique in the sense that all delegates arrive in Kalgoorlie and stay there for the full three days and meet together, communicate with each other, and most do some visits to mine sites around the Goldfields so the miners arrange for them to fly to the mine sites," he said.

"It wouldn't make any sense to shift the conference from Kalgoorlie, unless of course, we are forced to."

Mr Giorgetta said the organisers were currently awaiting confirmation whether the conference would be held at the venue beyond 2018.

"Discussions between the Council and

the Department of Training are ongoing and we are confident that the long term ownership and operations of the Goldfields Art Centre will be resolved in due course," he said.

"Honestly, we are quietly confident this will be resolved within the Government and the town of Kalgoorlie, because apart from the Diggers and Dealers, Kalgoorlie needs the arts centre or something similar to that.

"If they close it the whole population will suffer... I'm sure that between the town, the shire and the Government they will come to a resolution; at least I'm hopeful for that."

Once the 2017 conference has finished, planning will begin shortly after for next year's event.

"It's a very complex conference to organise because of the logistics to get the people to Kalgoorlie, to make sure there is accommodation available, and to make sure there is flights available for people," Mr Giorgetta said.

"It takes nearly the whole year to organise so by the time this conference is finished, two months later the management team start working on the next conference, and to make sure it was a little bit better next year than it was this year."

Mr Giorgetta said while there had been previous years where the mining industry was not performing well, the conference remained a highly informative and positive networking experience for delegates.

"It's a cyclic industry, so we always see the ups and downs but by large I am very encouraged," he said.

"I'm quite optimistic I think it is continuing on very well."

More information can be found at www.diggersndealers.com.au.

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All images: AIMEX

Big ideas

With just weeks left on the clock, final preparations are underway for the 2017 Asia-Pacific International Mining Exhibition at Sydney Showgrounds.

ELIZABETH FABRI

THE biennial Asia-Pacific International Mining Exhibition (AIMEX) is world renowned; and this year, the exhibition and conference will be free to attend for the first time in its history.

Built around the theme 'Future of Mining' the three-day conference will feature three key streams; Mining Innovation, Surface Mining and Underground Mining.

The industry's leading minds will offer the 6000 registered visitors world-class key note presentations, white paper discussions, case study sessions, exhibits and technology demonstrations.

"Event attendees will have direct access to engage with industry specialists via the conference program, with CSIRO research director for Hard Rock Mining Dr Ewan Sellers and NSW Mining chief executive Stephen Galilee already confirmed as 2017 speakers," AIMEX event director Brandon Ward said.

"AIMEX is an unrivalled mining event in the region and offers visitors the chance to interact face-to-face with exhibitors, collaborate and share knowledge with one another and hear about the latest products from leading suppliers."

The 2017 conference will also mark the beginning of a partnership between AIMEX and the peak representative body for Australia's engineering professionals, Engineers Australia.

"With more than 100,000 members, Engineers Australia is a powerful global



voice to have on board for AIMEX 2017," Mr Ward said.

"This collaboration will only strengthen the event's reach to engage with highly talented and qualified engineering professionals, exchange ideas and share industry insights with likeminded peers."

Conference sessions

On top of the key note speakers Mr Ward listed, AIMEX will feature presentations and panel discussions from Bloomfield Group chairman John Richards, World Coal Association chairman Mick Buffier, Austmine chief executive Christine Gibbs

Steward, METS Ignited Ric Gros and Centennial Coal executive general manager Steve Burgess, followed by targeted sessions from industry leaders on specific case studies.

Creating trust, commitment and sustainable operational and safety results.

Presented by Fewzion co-founder and growth director Paul Moynagh on day one, this session will look at shift planning and short interval control systems developed at the Oaky Creek and Moranbah North coal mines in Central Queensland.

The session explores the industry's need for flexible and effective planning systems so that everyone can work as a coordinated team to complete work planned for the shift.

Case studies will be presented to explore how Oaky Creek improved monthly metres by 34 per cent in two months, exceeding its monthly target each month since, as well as Anglo's Moranbah North – winner of the 'Coal Mine of the Year' two out of the past three years.

How Digital Transformation is driving to an increasing efficiency mining operation.

Due to the current volatility of global mineral commodity prices, mining plants are facing challenges around the need to increase efficiency, minimise downtime, and decrease direct costs.

Also held on day one and presented by General Electric strategic account development manager Ian Larsen, this session will look at what strategies are available within underground surface mining and mining innovation to address concerns around energy efficiency, automation, exploration, and safety.

Mr Larsen will discuss a number of case studies on tried and tested underground mining applications both in Australia and South America, and how these solutions can effectively reduce the number of accidents of pedestrians in close proximity with heavy mobile equipment.

(CONTINUED OVER)

The influence of mine haul road design and maintenance on tyre performance.

On day two, Kal Tire operations support specialist Ian Campbell will provide mine operators heavily focused on production with an insight into tyre management, and the importance of tyre performance in the decision-making process when it comes to mine haul road design, construction, and maintenance.

Mr Campbell will explore the effect haul road design and maintenance decisions contribute to tyre performance and therefore overall mine operating costs.

Advanced cloud based maintenance systems and its application at mine sites.

Modular Mining Systems maintenance product manager Simon Van Wegan will explore how contract miners can benefit from cloud-based maintenance systems, specifically in regards to capital expenditure and infrastructure requirements.

Speaking at day three, Mr Van Wegan will discuss how integrating cloud technology with a maintenance management system will assist contract miners in obtaining superior data processing and storage capabilities, without having to own and maintain an expensive infrastructure.

New products on the exhibition floor

Between conference sessions, attendees are encouraged to visit the exhibition floor featuring more than 300 exhibitors showcasing the industry's latest technologies, innovations, products and services.

Some of the latest technologies to be showcased this year, such as systems from global company Renishaw from its additive manufacturing and spatial measurement



divisions, including a new Void Scanner designed to produce fast, accurate 3D laser scans of underground voids, as well as its Boretrak, which enables users to measure and audit borehole deviation from proposed designs to enable informed decisions to optimise blasts.

TOMRA Sorting Mining will be launching its brand new multi-channel laser sorting technology, which will unlock new opportunities for quartz and gold processing and sorting.

Davies Wear Plate Systems will also

be launching its new wear side only attachment system.

In addition, Global Pumps will have the Verderflex VF Series peristaltic hose pump on show, and Hedweld Engineering will showcase its Trilift range of component handling equipment and Safe-Away range of Ladder and Stair Access Systems.

Relationship building

AIMEX 2017 is also the perfect platform for networking, and offered many opportunities

for businesses to get together to look at ways to boost productivity through collaboration.

At the end of day one, the conference will put on a networking event from 4.30pm at the exhibition floor that is free for all AIMEX exhibitors and visitors.

The METS Ignited sponsored event will include refreshments and entertainment, and is looked forward to by all attendees.

Visitors are also encouraged to network throughout the duration of the conference to build relationships face-to-face and generate sales leads.

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TOMRA sensor tech on show

LEADING sensor-based sorting systems manufacturer TOMRA Sorting Mining will be among the many companies exhibiting at next month's AIMEX conference; this year launching its brand new multi-channel laser sorting technology set to revolutionise the business.

Designed and manufactured by TOMRA, the state-of-the-art technology will unlock new opportunities for quartz and gold processing, assisting miners in achieving higher recoveries, and better quality and more consistent sorting than other sensor devices on the market.

The technology is unique in its ability to identify and separate minerals that cannot be differentiated with existing technologies, such as X-ray transmission, near-infrared sensors or colour-sorting.

"The new ore sorting technology enables the user to define and apply a greater number of sorting criteria, and thus sort with much greater precision," TOMRA managing director Anthony Sacca said.

"The laser identification technology consists of a multi-channel laser scanning system with high-resolution imaging, and cutting-edge colour and textural selectivity.

"Multiple material characteristics such as brightness, colour, size, shape and surface texture are processed simultaneously."

Mr Sacca said the technology had potential to address some of the industry's biggest challenges; from declining ore grades, production costs, and water shortages, to increasing red tape.

The global company already contributes to increased productivity in mining



TOMRA laser technology.

operations, extending mine life and overall value of deposits.

"Our new laser sorting solution is unlocking untapped opportunities for

quartz and gold processes offering an innovative and cost-efficient solution, which increases the lifespan of their deposits," Mr Sacca said.

The TOMRA team of specialists can be visited at stand 1420 at AIMEX 2017.

More information can be found at: www.tomra.com/mining.



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Vis it us at
AIMEX 2017
Sydney Showground
Stand 1420

Layher: free scaffolding

HUGH MACDONALD
MANAGING DIRECTOR,
LAYHER AUSTRALIA

THE delegates at the worldwide Layher conference remained silent for what seemed like quite a long period of time.

I thought I had presented a simple enough question, but evidently not.

There were a couple of chuckles then one of the managing directors said, "I think you must be mistaken, surely no industry would operate like that".

I had been seeking peer group input to an Australian conundrum: we know that Layher's Allround scaffolding system is the lightest modular steel scaffolding in the world. Additionally, we know that it has a well-deserved reputation for safety and high productivity.

The problem is that the widely established Australian industrial tendering model is designed to reward low levels of productivity and to favour the heaviest and least efficient scaffolding systems.

This model is known by various names, but in essence it comprises a rate for labour per man-hour and a weekly hire-rate per tonne of scaffolding material.

In discussion with senior personnel in mining enterprises and main contractor businesses, I have raised this subject.

The logic appears to me to be relatively straightforward.

I start by acknowledging the usual requirement for scaffolding contractors to prequalify. Thereafter, the successful bidder invariably will be the contractor that submits the most competitive rates for a man-hour of labour and for the weekly hire for a tonne of scaffolding material.

I pause to gain confirmation that I am on track with the logic thus far.

I then develop the theme further: with a wafer-thin profit margin available per man-hour at the tendered rates, the single factor that will serve to generate a worthwhile commercial outcome for the successful bidder is the number of man-hours that can be invoiced – the more the better.

So much for the labour component.

Moving on to the scaffolding material, we see a scaffolding contractor thinking through the best way to generate an acceptable return on his investment at a weekly hire-rate per tonne that is painfully tight.

"BY COMBINING THE LAYHER ALLROUND SCAFFOLDING PRODUCT WITH EFFECTIVE DESIGN AND SKILLED LABOUR, THIS CRITICAL-PATH SCAFFOLD PROJECT, THAT HISTORICALLY HAD TAKEN 18 HOURS, WAS REDUCED TO ONE HOUR AND 15 MINUTES."

The inevitable conclusion is that the cheapest possible scaffolding system is of great appeal. The cheapest scaffolding systems are also the heaviest systems, and this latter factor serves to provide a dual benefit.

The weekly hire-rate per tonne can be invoiced for fewer scaffolding components, and the weight of the equipment will slow down the scaffolders and increase the number

of billable man-hours. Result!

Having provided the above summary, I then acknowledge that I may not be acquainted with all the pertinent facts.

I may be ignorant of various clever reasons why this tendering model works to the commercial benefit of the mining business or main contractor.

I ask for enlightenment, but to date cannot report any worthwhile feedback.

By this point in these discussions, I frequently find that I am speaking to someone gazing at his feet, with pursed lips and folded arms.

The response I gained from the worldwide Layher conference gave me hope.

It is clear that the rest of the industrial scaffolding world works very differently when compared to the Australian *modus operandi*.

All those at the conference confirmed that man-hour/tonnage pricing is used widely, but in particular circumstances.

Various alternative models are in place that, with no loss of focus on safety, enable efficiency and productivity to flourish.

During 2016, an engineering student employed at Layher's head office in Germany brought to a conclusion her university thesis.

The title of this work is 'Theoretical analysis and development of a practical guideline of billing methods for industrial system scaffolding services'.

At this point, those operating outside the world of scaffolding are entitled to yawn and zone out.

However, those involved in industrial scaffolding, particularly in Australia, may wish to hear more concerning the models detailed within the thesis: they offer up very practical, realistic and well explained options for the combination of cost reductions plus productivity improvements.

Heard it all before?

Well, how about the following short summary to describe what Layher and a scaffolding contractor achieved on a WA iron ore site shutdown during 2016.

The mission was to produce a scaffolding structure to access a conveyor system.

By combining the Layher Allround scaffolding product with effective design and skilled labour, this critical-path scaffold project, that historically had taken 18 hours, was reduced to one hour and 15 minutes.

When offline, the loss of revenue from that conveyor ran at approximately \$1m per hour. You can draw your own conclusions about the level of enthusiasm generated within the mining business when this result was achieved.

For those with the imagination to embrace change, there *are* alternatives to the status quo. Particularly during times of depressed commodity prices, efficiency improvements hold special appeal for mining and main contractor businesses.

Indifferent scaffolding contractors may benefit from working with the current pricing model, but imaginative and intelligent scaffolding contractors will welcome the opportunities offered by a real focus on productivity.

Allow us the opportunity to present to you the conclusions and recommendations detailed in our thesis.

We believe there is no doubt that they will offer your business more possibilities for the future.

When you have experienced the cost-savings illustrated by the above example, you just took on your Layher Allround scaffolding for free.

Free scaffolding! How good is that?

Contact us for more information by calling 1300 136 026, visiting us at AIMEX 2017 – Booth 2014 (German pavilion), or at www.layher.com.au



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Solutions for Mining & Aggregate

Cost effective Pre-tensioning ROSTA MB Motorbases for belt drives

ROSTA Single Pivot MB Motorbases are used for maintaining belt tension on V Belt drives, such as those used on crushers, feeders, screens, fans, pumps and just about any application which utilises V belts. Sizes range from 0.75kW to more than 550kW.

ROSTA ATEX Single Pivot MB Motorbases are suitable for applications in hazardous areas according to the ATEX 94/9/EC Directive.

ROSTA Superior Lift Motorbases are used in overhead drive applications, and are especially suited to pump drives. These motorbases eliminate the often-used vertical jacking bolt system and makes belt changes safer, quicker and easier as the V belt drive alignment is maintained throughout the motor movement range. As with the company's whole MB ROSTA Motorbase range, there is a noticeable improvement in pulley and V belt life as belt tension is maintained for a longer period when compared to a fixed system.

ROSTA Oscillating Mountings offer a broad range of units including AB mounts which are used for screen and feeder suspension for fixed, modular and mobile plant applications in the mining and quarrying industries to replace coil springs, rubber block and airbag systems.



The AB mounts have proven to be reliable and long lasting, even in hostile environments which has endeared them to end users and OEMs alike.

ROSTA Anti-Vibration Mounts are used for isolation of vibration and impact from surrounding structures. These are especially useful for absorbing high impact loads on conveyor transfer point applications.



ROSTA MB 50 motorbase for Screen Drives



ROSTA MB 70 Motorbase for Screen & Crusher Drives



ROSTA MBSL 70 Motorbase for Vertical Pump



ROSTA MB 100 Motorbases for Crusher Drives



The HiDrive difference

BISON Group is an Australian owned ISO9001 certified private company with its own vertically integrated manufacturing operations providing reliable mobile workspace solutions for light commercial vehicles in the mining, civil and construction industries.

Servicing all States across Australia, the company understands that all businesses operate in a competitive environment, and the stakes on safety, efficiency, and cost constraints are high.

"Our guarantee is to meet and exceed your designated outcomes with realistic solutions," Bison Group business development team manager Doug Elford said.

The Bison solution is simple: its trademark HiDrive Service Bodies are engineered and manufactured to minimise weight for maximum safety, reliability and payload.

Since its launch, HiDrive has delivered a quantum leap forward in reliability, safety, and accessibility for Australian miners, and garnered strong support and loyalty from satisfied clients nationally.

The state-of-the-art product's aluminium fuselage incorporates an accessory track system making accessory installation easy and versatile, and creating a tough yet lightweight, engineered modular system



Bison Group gives businesses a quantum leap forward with HiDrive.

with a 36 month warranty.

"Our easy to use Gullwing doors also feature an internal Dual-Action hinge system for optimum security, and positive sealing from dust and water, also creating a 'Door Open Seal' to channel the water away when the door is open in wet weather," Mr Elford said.

HiDrive service bodies are finished in a colour coded 2K automotive paint system, including optional metallic colours to

match a client's vehicle choice.

"Building on our robust and modular system, our experienced designers and engineers ensure that your vehicle and workspace configuration are safe, functional, fit for purpose and compliant," he said.

"We strive to remain at the forefront of the fleet trades and services industry, with the team continuously developing engineered reductions in service body weight, with increased vehicle payloads through our

advanced silyl modified polymer panel bonding system."

In addition, Bison Group offers FleetAssist; a cloud-based fleet project management portal to enable management of a company's new vehicle rollout.

More information on HiDrive can be found at www.hidrive.com.au or by visiting the Bison Group at stand #1630 at this month's AIMEX conference and exhibition.

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PUT AN END TO BLACK LUNG DISEASE

- Caused by prolonged exposure to respirable coal dust
- Causes scarring to lung tissue which can significantly reduce lung function

This disease cannot be cured - preventing exposure to airborne coal dust is the only way of stopping black lung disease.

The Dust Control Systems from Spraying Systems Co. are designed to effectively prevent and suppress airborne coal dust, resulting in improved health and safety practices for everyone at your mine site.

Stop by AIMEX stand 3520 for more information



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Experts in Spray Technology

www.spray.com.au

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Stopping Black Lung disease

DUST in underground coal mining is an inevitable problem.

Not only is dust one of the most invasive and irritating impacts of mining, it has the potential to severely affect the health of underground mine workers.

Black lung disease in Australia is a very serious issue that coal miners face daily, particularly in Queensland.

The disease is caused by prolonged exposure to respirable coal dust which often leads to irreversible damage of the lungs.

Black lung disease symptoms include chronic coughing (often coughing up black mucus), shortness of breath and high blood pressure.

There is no cure for this disease, however preventative measures can be taken.

Dust control and dust suppression systems designed to prevent the occurrence of airborne coal dust have been shown to improve worker safety and reduce the prevalence of this disease.

This is where the experienced engineers and dust control specialists at Spraying Systems Co. have a wealth of knowledge and experience that separates them from their competitors.

In order to stop underground mine dust at the source, applying a precise amount of water to the problem area with the correct spray pattern and spray angle is crucial.

Selecting the appropriate spray nozzles is just as important.

The spray solutions specialists at Spraying Systems Co. have the knowledge and the expertise to guide you in selecting the correct spray nozzles to suppress dust in your underground mine.



Spraying Systems Co. has a wealth of knowledge of dust control in mining.

Various types of nozzles produce different drop sizes.

For example, air atomising nozzles utilise compressed air to atomise the water, and therefore produce the smallest drop sizes.

This is followed by fine spray, hollow cone, flat fan and full cone nozzles.

High pressure nozzles will yield smaller droplets while low pressure nozzles will yield larger droplets.

With so many different spray nozzle options out there, it can be easy to select the incorrect product which can negatively impact a mine site and workers.

The most important part of effective dust

control is ensuring the size of the dust particle matches that of the water droplet so that the dust particle is weighed down thus adequately suppressing the dust.

If the dust particle size is larger or smaller than the droplet size, dust control will be severely reduced.

Further, dust particle size in coal mining can range anywhere between 1 and 100 microns.

Large size particles are not necessarily health threatening, but particles below 30 microns are not visible to the human eye and can be readily inhaled into the lungs and even permanently lodge there.

This has the potential to cause respiratory illness and black lung disease.

Achieving the correct droplet size is paramount in not only optimising operations, but also preventing workplace health and safety concerns like black lung disease.

Spraying Systems Co. has been servicing the mining industry in Australia with the most effective dust control solutions for more than 50 years.

More information about the spray technology products and systems that Spraying Systems Co. has to offer can be found by calling 1300 877 431 or visiting www.spray.com.au.



Reliable mechanical components used in today's mining industry starts with a quality forging

At Overall Forge, we pride ourselves in producing high integrity forgings that meet the most demanding applications.

Manufactured locally in Australia Overall Forge produce a broad range of Open Die Forgings for use as shafts, gears, wheels, racks, rings, discs and many other shapes and sizes up to 24 tonne.

Our manufacturing process is seamless due to our totally integrated facility, which covers all facets of forging production in-house including:

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"THE TGO (TOMINGLEY GOLD OPERATION) BEING IN PRODUCTION SERVES ANOTHER IMPORTANT PURPOSE...WHEN WE ARE TALKING TO POTENTIAL OFF-TAKE PARTNERS AND FINANCIERS ON THE DUBBO PROJECT THEY CAN SEE THAT WE ARE PROVEN OPERATORS, AND NOT JUST EXPLORERS."



All images: Alkane Resources.

An open pit at the Tomingley gold project.

Development ready

Strategic metals-focused Alkane Resources is currently securing offtake partners and financing for the development of its flagship Dubbo Project.

CAMERON DRUMMOND

ALKANE Resources is looking to become a strategically important producer of a number of metals required for modern technologies.

Its flagship Dubbo Project, if developed, would become a major supply of zirconium, hafnium, niobium, yttrium and other rare earth metals outside of dominant supplier, China.

Alkane also produces gold from the nearby Tomingley gold operation, and has exploration-stage interests in the surrounding region.

Dubbo Project

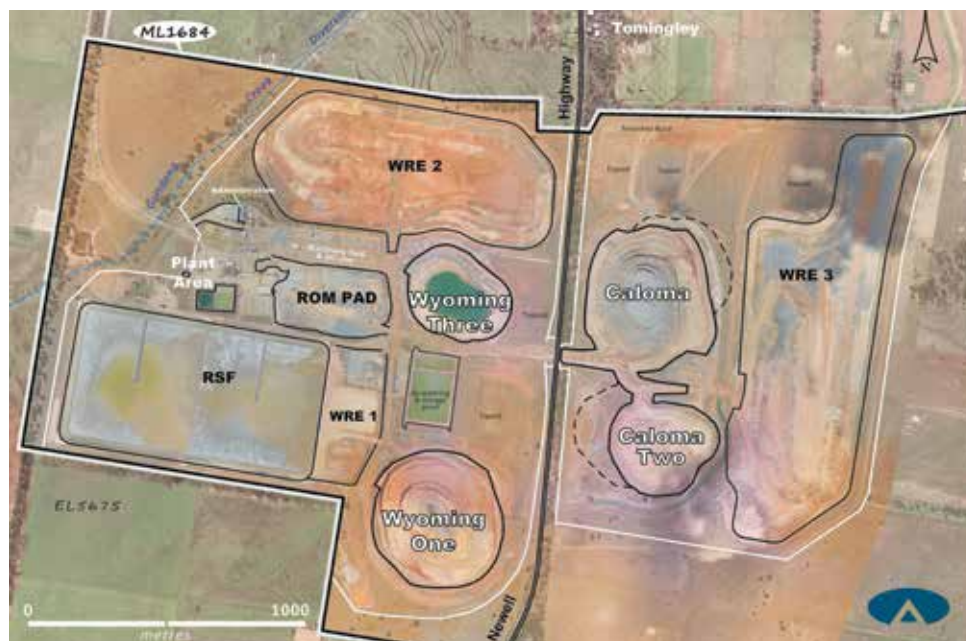
Near its namesake town in central NSW, the Dubbo rare earths project is a two stage modular design development.

Alkane managing director Ian Chalmers said the project was construction ready and awaiting financing, and was in a unique position to use cash flow from Tomingley to support project development.

"Unlike other companies looking to develop similar projects, Alkane has a profitable gold operation and maintains active exploration programs for copper and gold," Mr Chalmers said.

Alkane aimed to finish construction of Stage 1 of the project by 2019, at an estimated cost of \$US480 million, and would process 500,000 tonnes per annum for an annual revenue of up to \$US220m.

Construction of Stage 2 was planned to be completed by 2023, and would double ore processing to 1 million tonnes per annum



Overhead map of the Tomingley gold project.

at an estimated cost of \$US360m for a total projected turnover of between \$US400m and \$US440m.

The Dubbo Project would process a total of 25,200 tonnes per annum (tpa) of all products.

16,372tpa, or 42 per cent, of product would be zirconium, used in corrosion resistant cladding for nuclear fuel rods and jet engines.

The light and heavy rare earth metals of praseodymium, neodymium, dysprosium, terbium and samarium – used in magnets – would make up 25 per cent; while niobium – used to create super alloys – would make up 17 per cent.

10 per cent of product output would be hafnium, which has been linked with next generation ferro-electric micro-processing; and yttrium and other rare earths would account for the remaining 5 per cent.

"Diversity of output gives us a much stronger position in the market because we aren't reliant on just one or two metals to drive our revenue stream," Mr Chalmers said.

In April 2016 Alkane signed letter of intent (LOI) for Vietnam Rare Earth (VTRE) to process materials from the Dubbo Project.

An initial 2000tpa of high value

rare earths would be shipped to the Vietnamese facility for processing, including neodymium, praseodymium, didymium, dysprosium and terbium.

The offtake agreement would account for about 85 per cent of all Dubbo Project rare earths revenue.

Lanthanum-cerium and yttrium would be recovered; yttrium oxide to be sold directly from the site, with the separated lanthanum and cerium to be stored until markets improved.

The partnership guidelines gave Alkane an exclusive right for 12 months to complete due diligence and finalise the terms of the agreement, including an option to purchase equity in VTRE.

Alkane stated that VTRE's operating costs were similar to, or lower than, its Chinese competitors; ensuring production was market competitive.

The partnership was also an opportunity to participate in the downstream integrated rare earths processing to avoid potential market and financial risks.

Earlier this year the LOI was extended to October to allow satisfactory time to complete the toll treatment agreement and marketing agreement, and to agree on potential investment in VTRE.

Mr Chalmers said a decision to change the project model had made investment in the Dubbo Project more attractive.

"In October last year we came out with a modularised staged concept for the build of the project," Mr Chalmers said.

"The initial upfront capex was consequently reduced and we've since been strongly marketing our project and looking for offtake partners."



"WE ALREADY HAVE 6 LETTERS OF INTENT TO OFFTAKE THE DUBBO PROJECT'S ZIRCONIUM, WHICH SPEAKS FOR ABOUT 60 PER CENT OF STAGE 1 OUTPUT."

Core samples from the Dubbo project.

Alkane has a pilot plant for the Dubbo Project at ANSTO, near Sydney, which has provided the company with the ability to develop its suite of products to showcase to potential offtake partners.

"In the last two years our main driving force at the pilot plant has been to produce a high purity zirconium product, which we have done; and we are now concentrating on refining hafnium to a quality marketable product," Mr Chalmers said.

"We already have 6 letters of intent to offtake the project's zirconium, which speaks for about 60 per cent of Stage 1 output; and are in advanced discussions with potential partners for our rare earth products."

Alkane also signed an agreement with Siemens for product offtake and the procurement of equipment relating to the development of the project.

The company said its funding strategy had not changed with strategic investment, Export Credit Agency (ECA) finance and commercial debt remaining as the key components of the envisaged project funding suite.

"We see the ECA's an incredibly important part of our financing options," Mr Chalmers said.

"Strategic investment has always been a part of our strategy, and we welcome future investment into Alkane to bring the project into development."

Market Forces

A combination of higher raw materials prices and a Chinese-government led environmental clean-up of industry had



Alkane Resource's board reviewing rehabilitation at Tomingley.

resulted in prices for zirconium oxychloride (ZOC) increasing by more than 12 per cent since the end of last year.

ZOC, the base chemical for most downstream zirconium products finished the quarter at a price of \$US1700 per tonne (t); or between \$US5000 and \$US5500 on a 100 per cent zirconia basis.

"The main reasons for increased prices was a rise of processing reagent prices and a clear sign that zircon prices bottomed in the fourth quarter, which has coincided with tightness of supply in Q1 2017," Alkane

stated in its March 2017 activities report.

"Leading mineral sands producers increased the zircon prices by \$US50-60/t in Q1 2017, with similar price rises also accepted by customers in Q2 2017.

"The current outlook for Q3 2017 is for a more significant price increase of \$US100-200/t, underpinned by a small shortage of supply as planned new mines miss their commissioning dates."

Alkane said the hafnium market was also under supply pressure as Toshiba recently announced the bankruptcy of its subsidiary

Westinghouse Electric Corporation, which produces hafnium-free zirconium metal for nuclear fuel reactor assemblies.

"Combined with ongoing losses by Areva in France, the leading European supplier, it is easy to appreciate that hafnium supply has and will be constrained as it is a by-product from making hafnium free zirconium metal," the company stated.

Tomingley

After heavy rain had interrupted mining operations during the December 2016 quarter, quarterly gold production at Tomingley had picked up to levels close to meeting its FY17 guidance.

The March 2017 quarter saw Tomingley record a 59 per cent a quarter-on-quarter increase in gold production at an all-in sustaining cost (AISC) \$1201/oz.

A total of 18,721 ounces of gold were poured which exceeded the company's revised plans to recover from the weather impacted first half of the financial year.

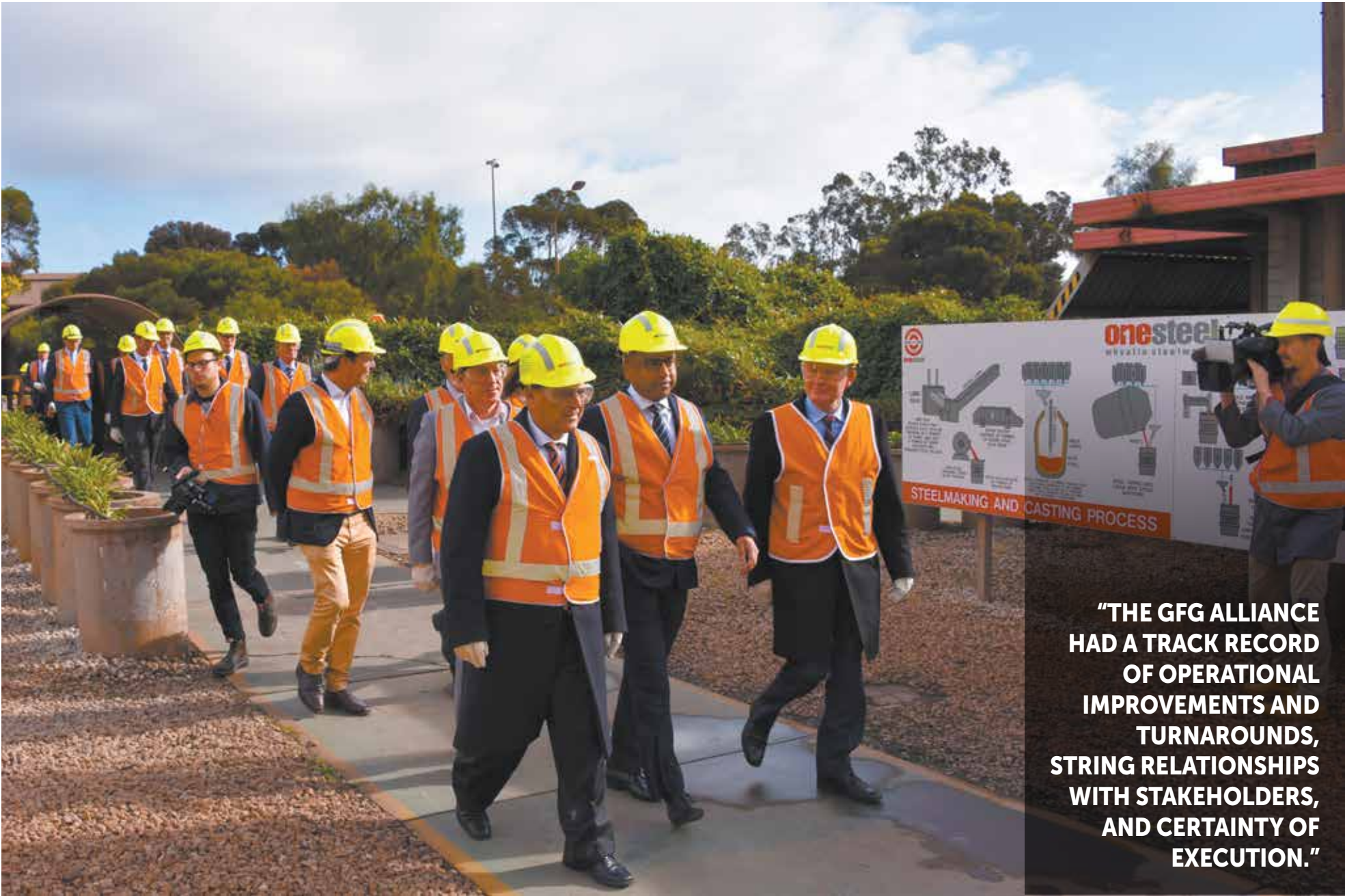
"The TGO is only a medium-sized gold mine, but it's very important to provide good cash flow to Alkane with the objective of getting the much larger, strategic DP into production," Mr Chalmers said.

"The TGO being in production serves another important purpose in that when we are talking to potential off-take partners and financiers on the DP they can see that we are proven operators and not just explorers."

Exploration work at the project was ongoing, as Alkane weighed up options for extending its mine life.



The Dubbo Project's pilot plant at ANSTO, west of Sydney.



**"THE GFG ALLIANCE
HAD A TRACK RECORD
OF OPERATIONAL
IMPROVEMENTS AND
TURNAROUNDS,
STRING RELATIONSHIPS
WITH STAKEHOLDERS,
AND CERTAINTY OF
EXECUTION."**

A steely resolve

Securing a buyer for the Whyalla-headquartered steel manufacturer is a victory for the 5500 jobs related to Arrium's operations, the Whyalla business community, and the State of South Australia.

REUBEN ADAMS

IN early April 2016 Arrium pleaded for a \$US927 million lifeline from its lenders. Australia's four banks, several global banks and US bondholders rejected the proposal, pushing the struggling Group into voluntary administration, owing its creditors more than \$2.8 billion.

Arrium employed about 5500 workers across its mining, steel and mining consumables business units, which included a 1.2 million tonnes per annum (mtpa) steel plant at Whyalla on South Australia's Eyre Peninsula, smaller plants in Melbourne and Sydney, and a 12mtpa iron ore mining operation in South Australia's Middleback Ranges.

The lengthy voluntary administration process meant the future of Arrium's direct employees was uncertain.

As Arrium is its largest employer, the city of Whyalla was particularly affected; of a population of about 22,000 people, 1600 were direct employees. Thousands more were contractors.

If Arrium failed, many believed Whyalla and – to a lesser degree – the State of South Australia would fall into economic and social crisis.

From an operational perspective it was business as usual for Arrium as the administrators moved forward selecting preferred bidders for the Group, and Local,



GFG Alliance chairman Sanjeev Gupta speaks with Arrium workers and management in July.

State and Federal Governments scrambled to coordinate a cohesive response.

In June 2016 the South Australian Government sweetened the deal of any prospective buyer, committing \$50m to support the new owner upgrade the Whyalla steelworks.

In Parliament, Premier Jay Weatherill called for a bipartisan commitment from

both major Federal parties to contribute \$100m towards the funding facility to give the Whyalla steelworks the best chances of a long-term future.

The \$10m Whyalla Small Business Loan Scheme was also launched to support small Arrium suppliers experiencing cash-flow challenges as a result of Arrium entering administration.

Marketing efforts for the Arrium Australia business kicked off during August 2016.

After much back and forth, on 30 March 2017 the Administrators shortlisted two unnamed bidders – both wanted the entire business – to progress to the next stage of the process.

The Korean consortium led by POSCO and UK-based GFG Alliance were soon revealed as the two short-listed bidders.

On 15 June, the administrators announced it had chosen the Korean consortium as the "preferred bidder".

The consortium, headed by Newlake Alliance Management and JB Asset Management, was supported by steelmaking giant POSCO, which had already attempted a \$1bn takeover for Arrium in 2012.

Back then, POSCO had proposed spending up big on new technology at the Whyalla steelworks to replicate the modern steelmaking process used at its Pohang steelworks in South Korea.

The Korean consortium was in the box seat, but then – a curveball.

GFG Alliance, led by Gupta Family Group executive chairman Sanjeev Gupta, submitted a modified offer on the night of Tuesday 4 July, after the exclusivity period granted to the South Korean consortium expired on the Friday prior with no deal reached.

(CONTINUED OVER)



**"THE BUSINESS IS
ENDOWED WITH AN
EXPERIENCED AND
SKILLED WORKFORCE,
WELL-RUN OPERATIONS,
STRONG BRANDS AND
LONG-ESTABLISHED
CUSTOMER
RELATIONSHIPS AND
WE LOOK FORWARD
TO EXPLORING
OPPORTUNITIES TO
GROW THE BUSINESS
FURTHER."**

A binding agreement was signed the following day, ending 15 months of uncertainty for the people of Whyalla.

"Taking all factors into consideration, including the timeframes required to complete a sale, the Administrators and sale advisers Morgan Stanley, decided the GFG Alliance offer was superior to the conditional offer of the Korean Consortium with whom we were negotiating," Deed Administrator Mark Mentha said in a statement.

The acquisition was expected to secure the jobs of more than 5500 Australian workers, and included the 10mtpa iron ore mining operations; Whyalla port and rail; the 1.2mtpa Whyalla Steelworks; the OneSteel steel Scrap Recycling business; 4mtpa

OneSteel Secondary Steelworks; Australian Tube Mills; and OneSteel Reinforcing, ARC and OneSteel Metal Centres.

A landmark acquisition

A key player in the transaction was accomplished Melbourne-based metals and mining executive Michael Morley, who was appointed to lead GFG Alliance's drive into Australia in April this year.

Mr Morley joined GFG as development director for Australia following a decade with Nyrstar, the Belgian-listed global mining and multi-metal processing leader, where he was senior vice-president for metals processing

The respected merger, acquisition and restructure specialist has a track record of securing and implementing high-profile deals for the industry across the globe, most running into hundreds of millions of dollars.

But his local experience was also crucial; he led the US\$500m flagship project to completely revitalise the ageing Port Pirie lead smelter in South Australia, and even played a key role in the \$US1.2 billion merger between the Smorgon Steel Group and OneSteel in 2007.

"I have a reasonably good sense of the importance of the Upper Spencer Gulf to South Australia and have been privileged to develop good relationships with many

people in Government.

"[This] has no doubt assisted our ability to develop a plan for Whyalla, progress discussions with both Governments and reaching agreement in relation to the acquisition of Arrium with the administrators," Mr Morley told The Australian Mining Review.

Mr Morley said he was always confident that the GFG Alliance proposal was the best solution for all stakeholders; including employees, employee representatives, the local community of Whyalla and both Federal and State Governments.

"We had developed a comprehensive, relatively low risk plan, to sustainably improve Whyalla performance," he said.



“The GFG Alliance had a track record of operational improvements and turnarounds, strong relationships with stakeholders, and certainty of execution.

“It was a journey, and our perseverance should be seen as proof of just how passionate and committed we are to creating an exciting future for the business.”

The deal represented a major step forward in the Group’s strategy to establish a market-leading business in Australia.

“We are thrilled, this is a landmark acquisition for the Group and one that we have been working on for quite some time,” Mr Morley said.

“It is perfectly aligned with our strategy and, looking forward, we continue to explore opportunities to further grow our presence in Australia in adjacent and complimentary industries, including renewable energy, metals and mining.”

A transformation specialist

GFG Alliance is an international group of businesses founded by the British Gupta Family.

The Arrium acquisition builds on GFG Alliance’s track record of distressed asset acquisitions and turnarounds in the UK, where it has become key player in the industrial, energy, property and financial sectors.

In the last 18 months the Group has spent up big on UK assets through its Liberty House (steel, aluminium and engineering), SIMEC (energy, infrastructure and resources), GFG Estates and Wyelands (banking, capital and advisory) businesses.

In 2016, Liberty bought Rio Tinto’s Lochaber business in Scotland for \$300 million GBP, allaying fears that there



would be job losses among the 150 staff and hundreds more contractors in the process.

In April this year, Liberty House acquired Tata Steel’s struggling speciality steel business for \$100 million GBP; not only safeguarding about 1700 jobs, but adding 300 more.

It’s a common story for GFG and the enigmatic Mr Gupta.

In May, Mr Gupta was recognised for his relentless drive to transform the steel industry in the UK and beyond, winning ‘CEO of the Year’ at the prestigious S&P Global Platts Global Metals Awards in London.

Chosen from a shortlist of ten top metals industry executives, the judges’ citation said they were “impressed by his track record of successful acquisitions and

his role as a motivator willing to swim against the tide of pessimism prevalent in the industry”.

Mr Gupta’s vision was to create a vertically integrated and sustainable industrial business encompassing mining, metal recycling, primary metal production, engineering and distribution and the use of renewable energy.

The Arrium business fit perfectly with this strategy.

Mr Morley said Arrium was well placed to play a significant role in the expected growth in infrastructure spending in Australia over the coming years.

“The business is endowed with an experienced and skilled workforce, well-run operations, strong brands and long-established customer relationships and we look forward to exploring

opportunities to grow the business further,” he said.

“Whilst the Whyalla Steelworks has faced well-publicised operational and financial challenges over recent years, we have developed a comprehensive plan to secure its long-term future and that of the local community.”

This plan focussed on reducing iron ore feed costs, modernisation investments, energy generation, expanding production and creating high value export opportunities.

“We are particularly excited by the opportunity for the Whyalla Steelworks to directly supply intermediate steel products to our UK rolling mills that are currently sourced from third parties,” Mr Morley said.

In mid-July Mr Gupta toured the Arrium assets.

Meeting steelworkers at the Whyalla integrated plant on 17 July, Mr Gupta praised the ‘patience and resilience’ of the Arrium workforce, and said the acquisition put an end to a period of prolonged uncertainty.

“It allows them to look more confidently to the future as they become a part of our large and multi-skilled alliance of international businesses,” he said.

The senior GFG team spent several hours at the Whyalla plant discussing strategies for the recovery of the business.

This included discussions on renewable energy generation – both for the steelworks itself and the South Australia grid.

“We have developed a comprehensive plan that we are confident will secure a long-term future for this operation and the community who depend on it,” Mr Gupta said.

(CONTINUED OVER)

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"WITH PLANS TO EXPAND THE BUSINESS IN THE SHORT TO MEDIUM TERM, MORE JOBS WILL LIKELY BE GENERATED."

The community

Whyalla Chamber of Commerce (WCCI) President Ron Hay has lived in Whyalla since 1963, where he worked for BHP and then Onesteel for almost 44 years.

He said mining and manufacturing businesses was a cornerstone support for the broader business community.

"The reason Arrium is important is that it brings other businesses and people to the community," he said.

"We would lose population if that business was not here, and with that population we would also lose a skill base.

"It also then means that it jeopardises other services within the community. It's difficult to attract those and other services back into the community once they are gone."

In a statement Whyalla Mayor Lyn Breuer called the last 18 months one of the most difficult periods in Whyalla's history – and Mr Hay agreed.

"It has been one of the most difficult times. 1800 people were made redundant in 1978 when the shipyards closed," he said.

"Some of those people were absorbed into the steelworks, others decided to leave town. Smaller businesses who supported the shipyard closed or downsized their operations.

With Arrium it was difficult because of the nature of the situation – with the business being in voluntary administration – for businesses, the people that live here, and the employees.

"It was a very, very difficult period of uncertainty."

Moving forward, GFG Alliance intends to spend an estimated \$1bn on the steel plant and associated infrastructure – including a power plant capable of feeding extra electricity into the South Australian grid. The certainty that came with the GFG agreement has injected a sense of confidence back into the community, Mr Hay said.

"Undoubtedly so. When we first

received the news [the buyer] was different to what we first thought; that was a bit unexpected considering what had been in the media and what we had been briefed on," he said.

"But the confirmation of the signing of a binding agreement has brought a level of confidence back into the community.

"People can now see some light at the end of the tunnel; they can see that we are moving forward on a new path for this community.

"More importantly, what it has shown is that over the 15 or so months, the community of Whyalla, the business community has done it tough, but they have taken it in their stride.

"The next step is as a chamber to engage with the new owner so that we understand their plans for moving forward. They have a vision; we need to understand that vision and how it is going to be a part of Whyalla."

GFG is currently focused on achieving completion by the end of August, and

putting robust plans in place so that it can "hit the ground running", Mr Morley said.

"With plans to expand the business in the short to medium term, more jobs will likely be generated," he said.

For Arrium, the future is promising. The Government's ramp up in infrastructure, including the Melbourne-to-Brisbane inland rail line, will boost demand for Arrium's products, while a contract to provide steel for Adani's Carmichael Coal Mine in Queensland is worth \$74m.

Mr Hay said there was now opportunity for fresh financial investment into the community.

"The economic opportunity that will be created over the next 6 to 18 months puts a lot of focus on Whyalla," he said.


"It creates wealth within the community. It doesn't matter what business you are running, there is the potential for money being spent across a range of businesses.

"The future of Whyalla looks a lot brighter."



Whyalla Mayor Lyn Breuer with Mr Gupta.





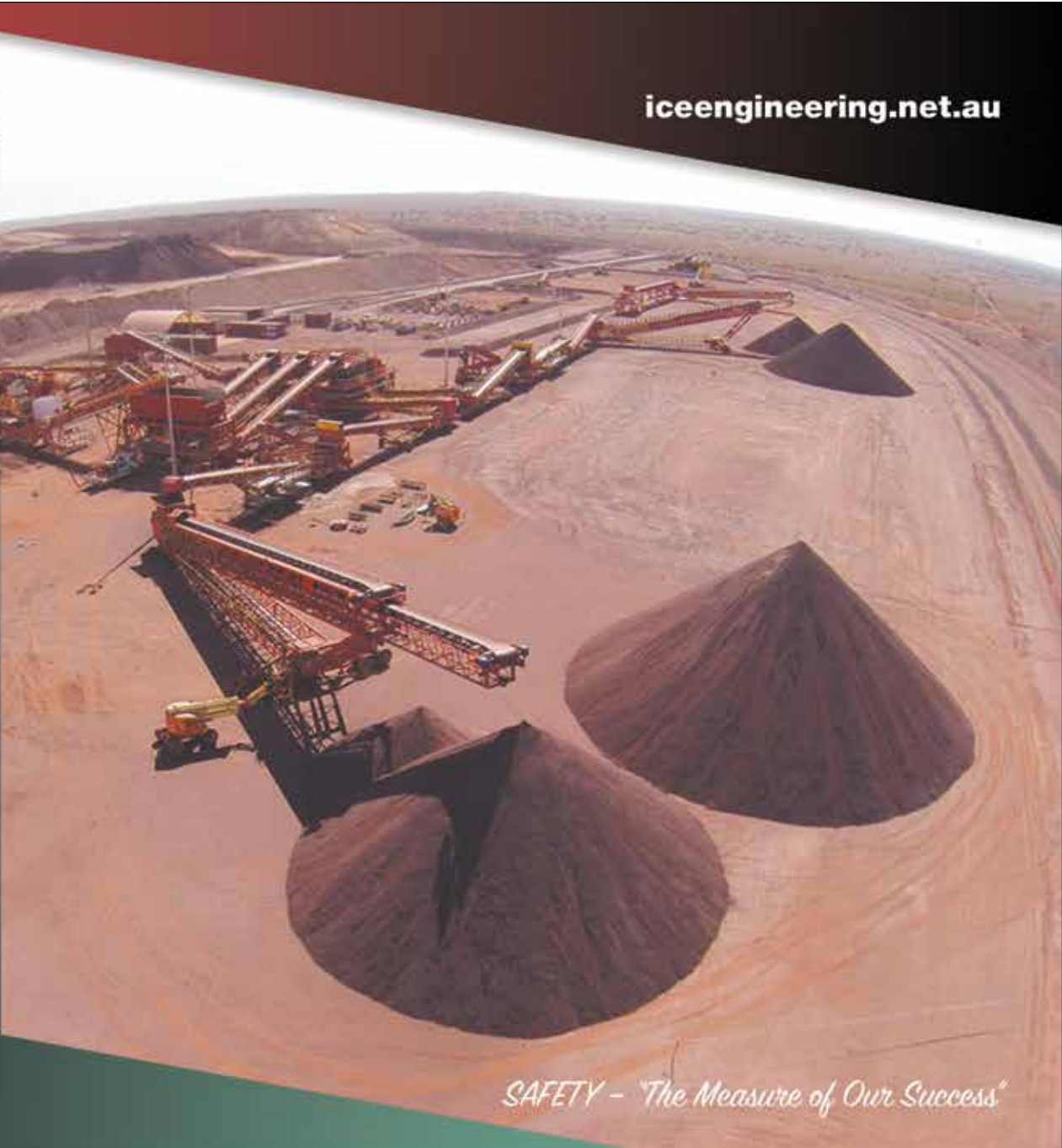
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"AN ONGOING LEGAL BATTLE BETWEEN CITIC AND CLIVE PALMER'S MINERALOGY OVER ROYALTY AGREEMENTS SET IN 2006 WAS STILL UNRESOLVED, AND WAS HEARD BY THE WA SUPREME COURT IN JUNE."



All Images: CITIC Pacific Mining

Next phase production

A legal stoush between Mineralogy and CITIC over royalty payments from the Sino Iron project is awaiting decision by the WA Supreme Court, and could affect up to 2600 workers currently involved with the operation.

CAMERON DRUMMOND

ALTHOUGH beleaguered by mounting costs, court battles and a volatile iron ore price, CITIC Pacific Mining remains confident its Sino Iron project in the Pilbara will become a stalwart of the WA mining scene, contributing 24 million tonnes per year (mtpa) of magnetite ore to its steelwork counterparts in China.

Headquartered in Perth, CITIC Pacific Mining (CPM) was established to manage the construction and operation of the Sino Iron project; an integrated mining, processing and port operation that CPM believed would secure a long term stable supply for Chinese steel mills owned by its parent company, CITIC Limited (CITIC).

Hong Kong-listed CITIC is China's largest conglomerate, comprising financial services, resources and energy, manufacturing, real estate and infrastructure, engineering contracting, and other businesses in China and overseas.

In 2006, CITIC reached a deal with Clive Palmer's Mineralogy to mine 2 billion tonnes of magnetite iron ore at Cape Preston, 100km southwest of Karratha in WA's Pilbara region.

Sino Iron is the largest magnetite mining and processing project in Australia and has a mine life of more than 25 years.

It includes Pilbara's first greenfields port development in 40 years, a 51 gegalitre desalination plant, 450 megawatt (MW) combined cycle gas-fired power station, and a 30km slurry pipeline.

At full production, Sino Iron was expected to have an output of 24mtpa.



A drone image of the Sino Iron project.

Dispute

An ongoing legal battle between CITIC and Mineralogy over royalty agreements was heard by the WA Supreme Court in June.

The dispute goes back to mid-March 2006, when CITIC and Mineralogy discussed a deal that would see the Chinese group take an 80 per cent interest in the Sino Iron project.

After weeks of negotiations – where Mr Palmer had once apparently “stormed out” of meetings over the deal – CITIC paid Mineralogy \$US415m up front to mine 2 billion tonnes of ore from the project, and a consideration of two ongoing royalties linked to production value from the project.

After years of battling red tape and a

blown-out development cost of more than \$US10bn – four times its initial project cost – production began in 2013.

Three years later Mineralogy launched a claim against CITIC for alleged unpaid royalties.

The Brisbane Supreme Court dismissed the allegations made by Mineralogy in March last year, however Mr Palmer then brought the claim to the WA Supreme Court, with proceedings concluding in late June this year.

The legal stoush is related to Royalty B, a value-linked charge CITIC stated relied on a now-defunct annual benchmark pricing system that was disbanded in 2010.

The Chinese industrialist argued the original Royalty B agreement should be

struck from the deal and replaced by a “fair and reasonable” royalty based on the project's profitability, rather than a dollar price per tonne.

Royalty A, a 30 per cent per tonne payment, currently sees Mineralogy collect about \$10 million a year from CITIC.

However that payment itself could be under threat, as CITIC revealed the Sino Iron project had recorded a further \$US1 billion loss in the 2016 calendar year, and had mounting pressure to develop the project into a more viable operation.

In a sworn affidavit, Sino Iron head of sustainability and planning Malcolm Northey told the court Sino Iron would be suspended at the end of 2017 if the mine's financial position didn't improve. He also stated that Mr Palmer had delayed approvals needed for a critical expansion of the mine's tailings dam.

The three-week trial concluded on 30 June, with WA Supreme Court judge Kenneth Martin to decide on the matter in the coming weeks; a decision that could have major consequences for not only CITIC and Mineralogy, but also Sino Iron's 2600 strong workforce.

Mining Activities

In May 2016, Sino Iron achieved a significant milestone when lines five and six joined the other four lines in producing premium magnetite concentrate.

CITIC Limited chairman Chang Zhenming said focus would turn to ramping up production and maximising efficiencies across all lines.

“There's still a lot of work to do [and] it will take time to optimise line performance but we're headed in the right direction,” Mr Zhenming said.

(CONTINUED ON PAGE 52)

Asset tracking software delivers

WITH more than 15 years' experience in asset and tool tracking solutions to the mining and oil and gas industries, Asset Track Australia is now a leading distributor of the global specialist fixed asset software, Hardcat Asset Management.

Asset Track successfully implemented its tool store and equipment management solution for CITIC Pacific in 2012 utilising the Hardcat software, just as production operations began to come online.

The integrated solution incorporated tracking of equipment at four site based maintenance tool stores, IT and communications equipment, portable buildings and GPS tracking of mobile lighting plant.

The process has enabled CITIC Pacific to have visibility and control of its equipment from the start, seamlessly handling the growth in numbers as the site expanded in that time.

Asset Track consultants have prior experience with some of Australia's principal equipment hire companies, and an intimate knowledge of the equipment management issues encountered by mining and industrial clients.

The company uses Hardcat's specialised fixed asset management software as part of its suite of services to undertake physical asset stock-taking, barcode and RFID labelling, data capture, planning and configuration, and comprehensive training and support for all implemented solutions.

Asset Track has also assisted other clients such as Pilbara Iron, BHP Billiton, Woodside Energy, Rio Tinto, INPEX, Metso Minerals, Laing O'Rourke and Synergy to overcome the challenges of managing volumes of



Asset Track undertakes data capture of equipment using the Hardcat mobility tool.

small equipment within the confines of large enterprise resource planning (ERP) systems, such as SAP.

Large ERPs will not automatically provide the granular levels of asset control and information that maintenance and asset system managers require.

The Hardcat process provides an improved

level of visibility and control to a client's operations through server, web and mobility interfaces.

It assists in the issue and return of tooling from a maintenance workshop, control of IT and communications equipment, or the efficient management of equipment problems and repairs in both construction and

production environments.

Asset Track's end-to-end services reduce asset control costs, ensuring accurate asset data while introducing an improved level of accountability and efficiency to a client's equipment control processes.

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(CONTINUED FROM PAGE 50)



"THIS TYPE OF PRODUCTION WILL BE THE WAY OF THE FUTURE AND UNDERPIN WA'S LONG-TERM COMPETITIVENESS AS A PREMIER IRON ORE PROVINCE."

Construction of port infrastructure at the Sino Iron project.

"This project represents the realisation of the next phase of iron ore production in WA.

"We have shown it is possible to produce steel from resources in WA that have been considered low value until now.

"This type of production will be the way of the future and underpin WA's long-term competitiveness as a premier iron ore province."

From January 2016 to the end of February 2017, more than 13 million wet metric tonnes (wmt) of premium magnetite concentrate had been delivered to CITIC steel plants and other steel mills in China.

CPM has requested approvals from its landlord Mineralogy, which include increasing Sino Iron's tailings and waste-drop storage capacity, as well as increases to the capacity of its existing

stockpiles and infrastructure at the Cape Preston export facility.

"In the year ahead, Sino Iron will continue to optimise its production capabilities by increasing production, maximising efficiency and lowering operating costs as it seeks to achieve the appropriate economies of scale," the company said in a statement.

Fundraising

CPM chief executive Chen Zeng recently visited the facility for WA in Jandakot, presenting Royal Flying Doctor Service (RFDS) chief executive Grahame Marshall with a \$50,000 cheque on behalf of staff for its medical transportation services to isolated areas of Western Australia.

It was also an opportunity for Mr Zeng to update Mr Marshall on construction of the

new aerodrome at the Sino Iron project.

For the past three years, CPM said it had focused fundraising efforts on a not-for-profit organisation. In 2016, the RFDS was identified as a worthy recipient, and funds were raised dollar-for-dollar between staff and contractors, and CPM.

Mr Zeng said there were strong synergies between the work of the RFDS and Sino Iron.

"We're a relatively isolated mining, processing and export operation, with 2600 direct and indirect employees," Mr Zeng explained.

"We understand that fast, reliable and high-quality emergency response capability is critical for the best possible health and safety outcomes.

"It's a big part of why we're investing in a new aerodrome – cutting travel time

between site and city medical facilities, where every minute can be vital.

"Our staff really appreciate the good work RFDS does for regional communities [and] we had no hesitation making the service the focus of our fundraising efforts."

Mr Marshall thanked CPM and staff for their support.

"The fact that staff right across CPM gave so generously demonstrates just how important the Flying Doctor is in giving people peace of mind, no matter where they are throughout our vast State," Mr Marshall said.

"This money will allow us to continue to provide the finest medical care and life saving outcomes to 65,000 Western Australians every year, ensuring we can be there whenever they need us, wherever they are."



CITIC is looking to ramp up production to 24mtpa.



An ongoing legal dispute is stalling expansion activities.



Fuelling demand

On the back of resurgent coal prices, mining giant Glencore has boosted output and is looking at expanding its Australian portfolio.

CAMERON DRUMMOND

ONE of the world's largest global diversified natural resource companies, Glencore is a major producer of Australian coal, with 12 active mining operations across NSW and QLD employing about 7000 personnel.

Its QLD operations employ more than 2900 personnel across five projects in the Bowen Basin – Clermont, Rolleston, Oak Creek, Newlands and Collinsville.

In NSW, 4750 personnel are employed across four coalfields – Hunter Valley, Newcastle, Western Districts and Southern Districts.

During 2016, the Swiss-based miner produced 67.6 million tonnes (mt) of coal in Australia, up from 65.6mt in 2015.

Thermal coal production of 62.3mt was 4 per cent higher than 2015, mainly as a result of planned increases at its Mangoola, Rolleston and Ravensworth North operations, along with improved production at South Blakefield following geological challenges in 2015.

Rising coal prices during the second half of 2016 caused prompted Glencore to reverse its strategy, implemented the year before when revenues from coal were bottoming out, of reducing its Australian coal output by 15mt when revenues from coal were bottoming out.

Instead, it made the decision to reopen its Collinsville and Integra mines towards



the end of 2016 to meet renewed demand and take advantage of the higher saleable commodity price.

Glencore acquired Integra (formerly Glennies Creek) in 2015 from Brazilian miner Vale with the mine already on care and maintenance since July 2014.

Integra was expected to produce 1.3mt of coal from the mine during 2017, and

Glencore had already begun expansion work to extend the life of the mine.

"We have begun work to add an additional longwall block to current mine plans, which will extend the current mine life by up to 12 months," Integra operations manager Peter Ostermann said.

"In addition, we will require a second development crew which will add up to 30

extra positions to nearly 200 people working on site at present."

Glencore said the decision was a reflection of the current market conditions, improvements to the existing infrastructure and initial development performance meeting targets.

Asset restructure

On 9 May, Glencore kicked off the sale process for its Tahmoor underground mine in the NSW Southern Highlands.

This followed an August 2016 announcement that the company would discontinue mining beyond 2018 because ongoing operations did not meet its internal investment criteria.

However, with a recent market increase in coking coal prices, Glencore recommenced development for additional longwalls blocks in the North West area of the mine.

"We believe the asset has a number of development options for the future and presents a potential buyer with the opportunity to establish or increase a strategic position in the Australian coking coal industry," Glencore said in a statement.

Tahmoor has 57mt of reserves and a 650mt total resource, and produces about 1.8mt of saleable coal each year.

Glencore said it would continue business as usual at the mine until a sale was agreed.

(CONTINUED ON PAGE 55)



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to deliver cost effect high speed quality balanced idlers suitable for today's heavy mining practices that include large tonnage and high speed conveyors.

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Reliable Conveyor Belt is regarded by many in the industry as a leader in the field of conveyor belt installation, maintenance and repair as well as preventative maintenance strategies and has the largest footprint of any conveyor company in NSW.

It has a group supply agreement with Glencore for various sites across NSW and Queensland.

This is a three-year agreement in which it supplies Fabric reinforced (AS1332) and Steel Cord reinforced (AS1333) belting as well as Underground Approved Solid Woven and Ply belt belting (AS4606).



Asset bid

In January 2017, Rio Tinto announced it would sell off its Coal & Allied assets to Yancoal Australia, a subsidiary of China-based Yanzhou Coal Mining Company in a deal worth \$US2.45 billion.

Coal & Allied comprises of Rio's thermal coal business in the Hunter Valley region of NSW, which includes its 67.6 interest in the Hunter Valley Operations mine, Mount Thorley (80 per cent), Warkworth (55.6 per cent) and a 36.5 per cent interest in Port Waratah Coal Services.

Before the deal was finalised, Glencore also offered to buy Coal & Allied, trumping Yancoal's bid with an offer of \$US2.675bn.

On top of the offer, Glencore would then purchase Mitsubishi Corporation's 32.4 per cent share of the Hunter Valley Operations mine and 28.9 per cent interest in Warkworth for an additional \$520m.

However, Yancoal hit back on 25 June with a revised offer of \$US2.69bn which Rio agreed to a day later, stating that Yancoal would be able to complete the transaction by September.

"Any transaction with Glencore is unlikely to complete until the first half of 2018 at the earliest, [and] given the uncertainty of receipt of certain cash flows under Glencore's revised terms, the Yancoal offer presents greater net present value," Rio said.

Recent activities

Production of 15.4mt was 1.1mt (8 per cent) higher than the comparable period, reflecting planned ramp ups at Rolleston and Mangoola, and Glencore's increased ownership of the Newlands and Collinsville mines.

It was however 1.4mt (8 per cent) below Q4 2016 as a result of adverse weather in NSW and dragline maintenance at Rolleston in QLD.

Cyclone Debbie had minimal impact on mine production across the portfolio, with stoppages limited to a few days, however

railings to port were disrupted following the cyclone.

Glencore recently received certification for a 73 hectares area of rehabilitation at Newlands open cut operations, 33km northwest of Glenden, in the northern part of QLD's Bowen Basin.

It was a first for the coal mining history of the region for a coal complex to receive a certification for the rehabilitation of overburden spoil.

"Although this is the third area in history to be certified in QLD, it is the first time that rehabilitation of coal mine overburden spoil has ever been certified," Glencore Coal Queensland Environment & Community manager Pieter Swart said.

"We maintain a very strong focus on progressive rehabilitation across all our coal mining operations, with each site required to achieve annual targets that go beyond regulatory requirements.

"As an example, last year alone Newlands mine completed over 270 hectares of rehabilitation and in 2017 the mine has set itself an even higher target of 285 hectares of rehabilitation."

Mr Swart said certification had been achieved after Glencore worked collaboratively with Government, the Queensland Resources Council and other resource industry members to develop a formal process that properly evaluates rehabilitation against agreed standards for a project.

"This is an important step not only for Glencore, but for the wider industry," he said.

"The Newlands work is the first of several areas in our Queensland mining operations that we will be submitting for possible certification, including additional areas at Newlands, Collinsville, Oaky Creek and Rolleston coal mines."

Mr Swart said in the past five years, 53 per cent of land disturbed by Glencore's coal operations in QLD over that period had been rehabilitated, with a 2017 target to rehabilitate more land than the mines will disturb.



Glencore was outbid for Rio Tinto's Coal & Allied business by Yancoal.



Image: Jellinbah Group.

Quiet achiever

On the back of an expansion at its Lake Vermont mine, Jellinbah Group recently awarded a fresh set of contracts for the next wave of infrastructure.

ELIZABETH FABRI

QUEENSLAND'S third largest producer and exporter of metallurgical coal, Jellinbah Group, has been a key player in the Bowen Basin for almost 30 years.

In 1989, mining began at its namesake Jellinbah mine, and in 2009 production commenced at Lake Vermont mine.

Together, the projects produced 14 million tonnes of hard coking coal, low volatile pulverised coal injection (PCI) coal, and semi-soft coking coal in the 2015/16 financial year.

While a production figure for the last 12 months was still yet to be announced, a few operational hiccups throughout the year indicate a potential drop in production.

In early April, the miner declared 'force majeure' on shipments as a result of railway logistical issues in the aftermath of Cyclone Debbie.

The disruption was believed to have effected a few shipments from both the Jellinbah and Lake Vermont projects.

Lake Vermont

Lake Vermont, near Dysart, produces about 9 million tonnes of coal per annum (mtpa) for export.

The mine is owned and operated by Jellinbah (70 per cent), with the remaining interest held by Marubeni Coal (10 per cent), Sojitz Coal (10 per cent) and AMCI (10 per cent).

In February 2009 the mine began first shipment, and production has been on an upwards trajectory since.

In FY16, the mine exported a record 9.11mt; a sizeable increase from the 4.56mt exported in FY13.

The increase was driven by an expansion of the mine in 2013, which enabled Lake Vermont to effectively double its production.

In 2012, mining contractor Thiess, who had operated the site since 2008, was awarded a \$2.3 billion contract to expand mine capacity from 4mtpa to 8mtpa.

In December 2015, Thiess was awarded a \$1.3bn three-year extension to deliver mining operations at the project until December 2021.

The good news continued in August last year, when Thiess was awarded a \$30



Lake Vermont project.

Image: Thiess.

million contract extension to design and build an additional processing module at the coal handling and preparation.

CIMIC Group (Thiess' parent company) subsidiary Sedgman was currently undertaking the engineering, procurement, construction and commissioning portion, which it expected to complete towards the end of this year, and Thiess will continue to operate and maintain the facility for the balance of its current contract term.

"THE PROPOSED PROJECT INCLUDES THREE NEW OPEN CUT PITS AND IS PREDICTED TO EXTRACT 64 MILLION TONNES OF COAL WITH MINING EXPECTED TO CEASE IN 32 YEARS."

"The Lake Vermont expansion combines the expertise of both Thiess and Sedgman to deliver a solution that will improve resource recovery and generate greater value from the mine for our client Jellinbah Group," Thiess managing director Michael Wright said at the time.

An additional expansion of the mine was also on the cards.

In November 2016, the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development released a report on a proposed northern extension.

"The proposed project includes three new open cut pits and is predicted to extract 64 million tonnes of coal with mining expected to cease in 32 years," the report stated.

"The proposed project will utilise the existing coal handling preparation plant (CHHP) and existing train loading facilities associated with the currently operating Lake Vermont Mine."

Lake Vermont was currently the second most widely traded low ash coal in the international spot market, accounting for 23 per of trades, according to S&P Global Platts analysis in 2016.

Jellinbah

South of Lake Vermont near Bluff, Jellinbah mine is the company's oldest operating asset.

The project is led by Jellinbah Group (70 per cent) with remaining interests held by Marubeni Coal (15 per cent), and

Sojitz Coal (15 per cent).

It produces a low volatile bituminous coal with high-specific energy, low ash and sulphur, ideally suited to pulverised coal injection, blending for coke making and special coal boilers.

Once prepared for shipping, the coal is hauled by rail about 300km to the Port of Gladstone.

In FY16, the open cut mine exported 5.19mt, compared to 4.51mt in FY15, according to the Department of Natural Resources and Mines.

Of the FY16 exports, 527,801t went to Brazil, 1.1mt to China, 1.8mt to India, 930,127t to Japan, 22,000t to Malaysia, 187,408t to Taiwan, and 22,000 to Vietnam.

In the last 12 months, operations at the mine has been steady state, with the mine recruiting additional trainee operators back in February.

Commitment to safety

Above production, Jellinbah Group's fundamental objective was to protect the health and safety of its personnel.

"Jellinbah Mine have been running an Employee Health Program for the past 20 years, which is the longest running program in the industry in Queensland," the company stated.

"We were also very proud when Jellinbah Mine was the recipient of the Queensland Government Healthy Queensland Corporate award in 2009.

"This award recognised the culture at Jellinbah Mine, and was based on a program which involved up to 12 initiatives over the past 20 years."

The current program included nutritional advice for employees, a QUIT smoking program, voluntary health assessments, gym assistance, physiotherapy support, and more.

The company was also committed to working with local communities.

"We have agreements with a number of local aboriginal groups to ensure cultural heritage is identified and preserved," it said.

"We have a clear understanding of the importance of working closely with the relevant local aboriginal people to inform all mine workers of the importance of preserving this culture."

Logistics centre enhances efficiencies

THE Jellinbah Group has a highly successful and enduring relationship with TransCoal for the management of all logistics functions for the Lake Vermont and Jellinbah mines.

TransCoal has managed all aspects of the Jellinbah Group's stockpile management, train ordering and port and shipping coordination for the past 18 years.

It has made some big strides forward in recent months with the establishment of a Coal Logistics Centre – a one-of-a-kind operating centre that builds upon industry best practice for visualisation, specifically for the logistics function.

What makes the TransCoal platform even more unique is the full line-of-sight capability it has developed for being able to view all variations right across the chain; from the mine plan through to ship nominations and arrivals.

The improved operating tools of the Coal Logistics Centre capture all opportunities for additional Jellinbah coal export capacity, and ensure changes to the plan are minimised or reacted to quickly enough to mitigate demurrage.

The Coal Logistics Centre also enhances working relationships between rail and port operators, who equally see the benefit of minimising plan changes.

Dove-tailing into the great efforts of rail and port operators to utilise technology platforms for managing their 'live-run' and 'day of operation' planning brings the whole supply chain closer to the 'holy grail' of increasing capacity and utilisation for the benefit all stakeholders.

"We are able to work more closely with mine planners, shippers, rail operators and port operators than any other entity and



The TransCoal logistics team.

our clients are therefore getting the very best practice for coal logistics management," TransCoal said.

TransCoal is also enhancing its services with the roll out of a Coal Chain Logistics App which allows its clients to monitor their coal deliveries via mobile devices.

In addition, recent personnel appointments are underpinning a robust 24

hour coverage for all operations.

TransCoal exports more than 27 million tonnes per annum for its clients out of eight operating mines and through three coal loading ports across the Central QLD coal network.

Throughout TransCoal's 18 years in operation it has supported numerous greenfields projects through to the

establishment of operating mines by taking uncertainty away from the logistic functions required to get the final product to the customer.

TransCoal also processes laytime calculations and manages the despatch/demurrage requirements of importers and exporters across multiple commodities throughout the world.



DRIVING SUPPLY CHAIN EFFICIENCY TO UNLOCK LATENT SYSTEM CAPACITY

A whole corridor approach for the mining industry. We can manage the entire logistics function or offer a customised service, providing:

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- EXPERIENCE ON ALL AUSTRALIAN COAL CORRIDORS
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"WE BELIEVE THIS GOES A LONG WAY TO ANSWER ANY QUERIES INVESTORS HAD WITH ABOUT OUR MINE LIFE."



All images: Ramellius Resources

Pushing forward

Solid production from Ramellius Resources for the 2017 financial year was tempered when the gold miner fell shy of group guidance by a mere few hundred ounces. Yet the company was well placed with production up 13 per cent from the year prior, and an updated mine of life for its Mt Magnet and Vivien projects provided assurance for shareholders.

ELIZABETH FABRI

RAMELIUS gold production for FY17 came to 125,488 ounces (oz); just short of set guidance of between 126,000oz and 130,000oz which was attributed to lower production over the last six months.

"Our June 2017 quarter was improved over the March 2017 quarter although we were fractionally short of guidance with 29,859 ounces produced versus guidance of 30,000-34,000 ounces," Ramellius Resources managing director Mark Zeptner said.

"Ramellius is well placed heading into the new financial year, with Water Tank Hill now developed and ready for production, Titan performing well and Blackmans open pit completed at Mt Magnet, while Vivien has now settled close to its steady-state production level."

Ramellius' historical Mt Magnet project in WA comprised a network of deposits including Water Tank Hill, Morning Star, Milky Way, Galaxy, Titan, and the recently completed Blackmans and Perseverance pits.

Further east, the company operated the Vivien gold mine 15km west of Leinster in WA and processing operations in the Murchison and Goldfields regions, along with exploration tenements in the Tanami desert in the Northern Territory as part of a joint venture with Tychean Resources (Ramellius 85 per cent).

In May, following a series of ore reserve upgrades, Ramellius announced a new Life of Mine (LoM) plan across its operating projects, which included new open pit mineral resources at Morning Star.

The company reported upgrades to 545,000oz at the Mt Magnet and Vivien operations, representing a four year mine life before underground extensions were required.

"This is an important update for Ramellius to announce a new four-year life of mine with underground extensions possible, when mine life is a challenge for many Australian gold producers," Mr Zeptner said.

"We believe this goes a long way to answer any queries investors had about our mine life."

The miner was also gearing towards an additional upgrade in the next six months, with deeper exploration drilling currently



Mount Magnet's Saturn pit with Titan to the west.

underway, which was hoped to bolster results.

Mt Magnet

Located in the Murchison region of WA, Mt Magnet was Ramellius' top performing project in the June quarter, delivering 18,504oz of gold.

The 225sqkm project area was acquired from Harmony Gold in 2010 for \$40 million and operations restarted late 2011.

In FY16, Ramellius completed open pit mining at Galaxy's Saturn and Mars deposits, and earlier this year concluded

operations at the Perseverance and Blackmans open pits.

Mining was now underway at the Water Tank Hill and Titan open pit, with further projects to be brought online in coming months.

"Titan open pit is going very well and expected to continue until the end of September 2017," Mr Zeptner said.

In June, the company awarded a \$100 million contract to MACA Limited to undertake open pit mining services at the Milky Way, Stellar, Stellar West, Brown Hill, Vegas and Shannon satellite pits over the next 32 months.

"Work has already commenced with fleet mobilization kicking off on the 26 June 2017," Mr Zeptner said.

"There will effectively be a three month overlap period where we transition from our incumbent surface mining contractor – Watpac, over to MACA."

Vivien gold mine

Vivien gold mine produced 11,355oz of gold in the June quarter, bringing its total FY17 contribution to 46,144oz.

Mr Zeptner said the company hoped to increase production to more than 50,000oz in FY18.

The underground mine in the Northern Goldfields region, was purchased from Agnew Gold Mining for \$4 million in 2014.

Mined ore is trucked 300km to the company's 1.7 million tonnes per annum (mtpa) Checkers processing facility at Mt Magnet.

Total resources at the mine were now 854,000 tonnes at 7.2 grams per tonne for 198,000oz of gold, and probable ore reserves of 525,000t at 7.3 g/t for 123,000oz.

Exploration

Over the last 12 months, exploration was a large focus for the miner.

"We ended up spending approximately \$16m in FY17 on exploration and this will be reduced back to \$10M in FY18, which is still much greater than what Ramellius has spent historically," Mr Zeptner said.

Of this amount, Ramellius spent \$6.2m in the June quarter towards the deeper drilling program at Vivien, Morning Star Deeps, and Shannon.

"There is once again a heavy focus on brownfields exploration at Mt Magnet and Vivien with only around 10 per cent allocated to greenfields projects," he said.

"Deeper diamond drilling has been underway at Vivien since May 2017 and we will be completing this program in July 2017 and releasing results once all assays are received," he said.

At Mt Magnet, Morning Star Deeps drilling was almost complete with all but one hole from the current program.

"We expect final batches of exploration results to come through shortly ready for release and currently forecasting to produce 130,000oz in the FY18."

INDUSTRY PROFILES

COMPANIES GEARING UP

Case Study: Linwood Quarry

An investment in next generation crushing technology boosts plant safety and efficiency.

DAVID LEROY

LOCATED in the Adelaide suburb of Seacliff Park, Boral's Linwood quarry is positioned within one of South Australia's most important sources of hard rock.

Quarrying started here over 130 years ago, when in 1882 the quarry was first operated to supply limestone to the nearby Brighton Cement works. Boral, Australia's largest building and construction materials supplier, acquired the quarry in 1994. Today Linwood's operations are focused on providing high quality aggregate, critical in the production of composite materials such as concrete and asphalt.

Linwood is currently the largest capacity quarry servicing the Adelaide metropolitan area. In recent years, the region has seen a flurry of large construction projects such as Adelaide's Desalination Plant, the city's Northern and Southern Expressways and the Royal Adelaide Hospital.

As a consequence of these important projects, the demand for aggregate products has progressively increased, challenging the quarry's production capabilities.

In 2013, site management identified the need to upgrade their crushing and screening plant with the latest technology in order to meet this growing demand.

Improving primary crusher throughput

The requirement for new equipment first became evident in the quarry's primary crushing section.

The plant's 30-year-old primary jaw crusher was struggling to keep up with production demands. The machine's reliability and downtime were affecting overall plant performance. Maintenance costs had risen sharply and the availability of spares had become an ongoing problem.

After considering the cost of refurbishing the existing crusher, Linwood's management decided that investing in a new machine was their best option. Following a detailed analysis of the quarry's requirements, the team selected Metso's C140 jaw crusher.

"Minimising the need to modify our existing civils was a key prerequisite for the new machine," Quarry Manager Andy Baker said.

"Essentially we needed a modern like-for-like crusher that would fit into the existing footprint, increase throughput and be easy to maintain – Metso's C140 met all these criteria," he said.

While improving throughput and reliability was a priority, Linwood's management also recognised the upgrade as an opportunity to improve site safety. As part of the crusher installation, new walkways and access platforms were designed to improve access to the quarry's primary crushing station.

Once the C140 was installed, the crusher's performance and reliability significantly improved product quality and throughput.

The new machine's ability to deliver more consistent output also immediately reduced the load and wear rates in other key areas of the plant. Where personnel previously needed to constantly monitor the crusher to ensure a consistent product output size, this was now an automated process.



Boral has invested in new crushing equipment to better service market demands in the South Australian region.



The HP3's touch screen has simplified the adjustment of crusher parameters.

"Now we can simply program the gap setting and be confident about what product we are going to get," Andy Baker said.

"The C140's hydraulic adjustment provides a massive advantage for us in terms of overall efficiency and safety. It eliminates manual adjustments and associated hazards. This saves us time and keeps our production rates up."

The plant's primary crusher upgrade represented a big change for quarry staff, as it brought the latest technology to the primary crushing process in the form of advanced automation and safety.

Metso's Area Manager Andy Gough says that post-commissioning support was very important to ensure a smooth transition period.

"The new machine offered many benefits, however it was a significant change for the site. We worked hard to maintain a presence at the quarry post commissioning, offering a comprehensive range of support services during this critical period," he said.

A win in tertiary crushing quality and efficiency

Shortly after the new crusher was installed in 2014, its increased production capacity shifted the site's bottleneck to the tertiary crushing circuit. Tertiary crushing involves further reducing aggregate in size while shaping it into final end products.

While it's important to keep up with upstream feed rates, high precision is required to ensure the right product shape. Linwood had two cone crushers responsible for this task that were nearing the end of their effective service life.

By weight and volume, cubically shaped aggregate is characteristically much stronger than flatter, elongated material. A problem with the existing crushers was their inability to reliably produce aggregate that met the required index of elongation and flakiness. To get the right shape, operators had to recirculate the output product through the crushers, and/or channel it for

additional screening and polishing.

Recirculation required additional processing time, which could have been utilised producing new feed material.

Another method employed by the quarry's team to improve shape was to set the crushers with tighter closed-side settings. This increased downstream plant load causing the screens and conveyors to use more energy or become overloaded. Running the crushers longer also increased machine wear, energy consumption and reduced overall production rates.

With output quality so heavily dependent on operator intervention, another problem was the constant risk of end-product stock piles being contaminated with inferior product. The combination of these inefficiencies meant there was also less yield per unit of feed.

Site management considered replacing their tertiary cone crushers with units from Boral's extensive install base.

Eventually, the team decided that the installation of two new machines would provide the best solution. After an exhaustive selection process which took into account all of the quarry's requirements, in 2015 Metso was awarded with a contract to supply two HP3 cone crushers.

Selecting the latest crusher technology

When Linwood first compared Metso HP3's specifications with their existing crushers, it was a challenge to reconcile their performance and operating requirements. One of the first things that the team noticed was how different the crusher's size, power and capacity were. The HP3's design was physically smaller than the old crushers, yet Metso claimed that the machines had a 20 per cent higher throughput capacity and could produce a higher precision product with one-pass production.

(CONTINUED OVER)



Boral Project Manager Santanu Ghosal oversees cable installation for the new crushers.

According to Peter Small, Metso's Capital Sales Manager, there are a number of factors that allow the HP3 to outperform similar sized machines. He says that while automation with integrated control is an important factor, it is the efficiency of the crushing process that makes the biggest difference.

"The HP3's efficiency is derived from a design that increases the concentration of aggregate inside the crusher," he said.

"It applies more crushing force and relies on a greater degree of inter-particle crushing. Getting these elements to work relies on complex calculations and detailed analysis of process variables, feed material characteristics and final product specification."

Peter says that an essential part of Metso's crushing solution is BRUNO, the company's Crushing and Screening simulation software tool. BRUNO calculates and tests process models based on empirical crushing and screening expertise.

"Being able to demonstrate the capabilities of alternate configurations and designs gives our customers great confidence in the equipment and the designs we propose," he said.

Sailing into uncharted waters

When Linwood needed to select its new crushers, the HP3 had just been released. There weren't any of these machines operating in Australia, which meant Linwood's decision makers couldn't call upon the experiences of their usual references within Boral or the broader quarrying community. The availability of spares for the first and only units in Australia was also a concern.

Linwood recognised that the next generation HP3 offered many benefits.

The technology would future proof the site's tertiary circuit and enable the wider integration of automation across the entire plant.

Santanu Ghosal, Linwood's Project manager, elaborates.

"The benefits were clear to us, but choosing the HP3s was still a leap of faith. Ultimately I think it was the confidence and expertise of Metso's people that gave us the assurance we needed. We had access to a very responsive team of local and international experts; and had enjoyed great post-sales support with our C140 primary crusher."

Andy Baker says that Metso's local and global support network was a significant factor in Linwood's decision making process.

"The support we received helped us to fully explore and understand the options and benefits the HP3s could offer, specific to our situation," he said.

"For me, a key differentiating factor was the integrated control and automated operation of the HP3s - we knew this was the single biggest technology step towards improving our product quality and efficiency."

Overcoming installation challenges

Replacing the old crushers with the new HP3s was always going to be a challenge while maintaining aggregate production rates at the quarry.

From an electrical point of view, the HP3's larger motor required new mounting and cabling arrangements from the crusher through to the switch room.

The mechanical work included installing new cooling units and a bigger standalone lubrication system. A redesign of the feeder to a new location was also required. Alongside this work were the site's safety improvements, which included extended platforms and improved working areas.

The team estimated that the electrical and mechanical upgrades would take the tertiary crushing station offline for at least 17 days.

This made the timing of the installation a critical consideration. Linwood's management originally considered performing the installation over Christmas, but were concerned about the availability of personnel, parts, and materials during this period.

While management planned to stockpile product in preparation for the installation, at the same time they had major projects to supply and knew their reserves wouldn't last 17 days.

In order to help mitigate the loss of production, a trailer mounted cone crusher and screen was refurbished to supplement supply while the main plant was offline.

Performance and efficiency were not optimal, but the mobile station closed the gap in production whilst installation and commissioning was in progress.

A leap forward in site productivity and safety

During the selection process, a high degree of automation was a requirement for the site. Once the new HP3s had been installed, feedback from the quarry's operators has been particularly centred on this aspect.

The HP3's touch-screen interface allows

operators to have quick and easy access to troubleshooting, throughput and motor current information. Mechanical settings, which previously had to be manually adjusted, are now performed in a matter of seconds via the machine's touch screen.

The productivity benefits and the elimination of safety risks involved in manual adjustments have made these features very popular with site operational staff.

Stray metallic objects, called tramp iron, that enter the crusher can stall and even damage the machine. The HP3's innovative tramp release system with dual-acting hydraulic cylinders and fixed return point lets the crusher easily eject tramp iron.

If the crusher stops under load, the dual-acting hydraulic cylinders provide a powerful stroke that clears the crushing cavity. In both instances the crusher's settings are instantaneously restored without the need for operator intervention.

The HP3's liner fastening system doesn't require the backing material that is common with other crushers. When liners are changed or reconfigured, hydraulic motors rotate the bowl completely out of the adjustment ring threads. These two innovations save a lot of time and labour.

Technology upgrade – making the big difference

The upgrades to Linwood's crushing circuit have improved the site's production capabilities and modernised its crushing process.

Commenting on these outcomes, Andy Baker believes the site is now capable of producing more, while maintaining high product quality and improving safety.

"The throughput we are getting has surpassed our expectations. Our ongoing maintenance costs have come down, while the automation and access platform upgrades have improved plant safety. Overall, we can now more reliably meet market demands for our key-specification products," he said.

Commenting on Linwood's successful application of new crushing technology, Metso's Vice President for Aggregates - Shaun Fanning highlights the importance of the project.

"We are extremely happy to support Boral's long-term growth plans through such an important project for the Linwood site. We strive to make the big difference by offering quality equipment and supporting our customers with an extensive program of post commissioning services to ensure many years of machine reliability," he said.



Linwood's Quarry Manager Andy Baker.



Metso's Vice President - Aggregates Shaun Fanning.



Linwood's Project manager Santanu Ghosal.



Metso's Capital Sales Manager for Aggregates, Peter Small.

Aussie mine fire protection

AUSTRALIAN Pump Industries has announced the launch of a new twin impeller, high pressure portable fire pump for the mining industry.

Based on the Aussie's Mr T portable firefighting pump, the new version has been upgraded to include additional safety features.

"Our Aussie Mr T has an established reputation for performance and quality," Aussie Pump chief engineer John Hales said.

"We up spec'd this pump with features to add safety for use in high risk environments like mine sites.

"For example we've incorporated a centre mounted balanced lifting bar into the frame that make these 100 kilogram pumps easy to move on site."

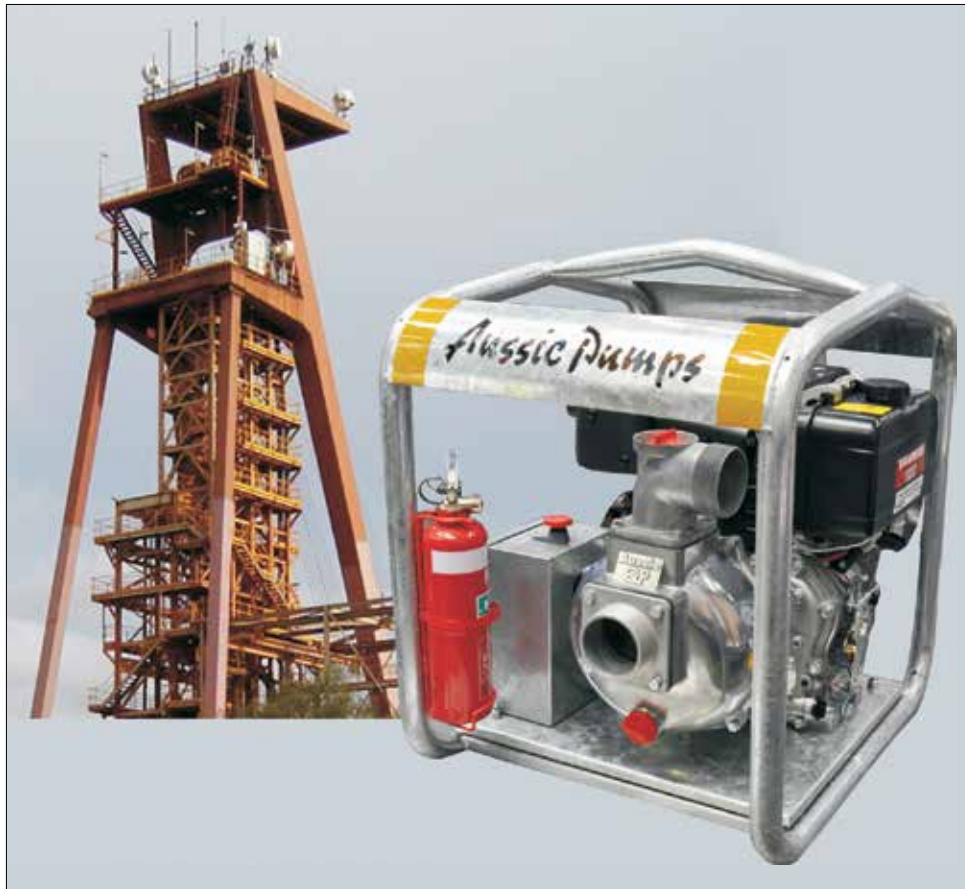
The unique Aussie Pump Mr T in Mine Boss configuration includes not only a super heavy duty, hot dipped gal, steel frame but a galvanised base plate with anti-vibration mounts.

That floating base plate provides a sturdy platform for the pump and diesel engine, reducing wear on components.

The Mine Boss configuration also includes battery isolation in a lockable galvanised steel cabinet with emergency stop a standard feature.

A top quality fire extinguisher is fitted to the frame to comply with industry and company standards.

The Aussie fire pump produces a maximum head of 90 metres and 450 litres per minute max flow.



The Mr T portable fire fighting pump.

Power is supplied by a single cylinder Yanmar 10hp air cooled electric start diesel engine.

"We chose Yanmar diesels for this kit because they are regarded as the finest lightweight, portable diesel engine on the

market," Mr Hales said.

"They reliable, powerful engines that are backed with a two year warranty with support from a national Yanmar service centre network."

The Yanmar engine can also be supplied with an optional spark arrestor for gaseous environments and the pump has been engineered with twin single piece impellers and volutes that are perfectly matched to the engine capacity.

This means the engine holds its rpm even under full load conditions.

The pump features a flanged three way outlet for fire system installations which can be replaced with a two inch or three inch outlet port.

The standard two inch flanged suction port is fitted with a robust check valve designed to allow the pump to prime fast, first time, every time.

The pumps integrated priming tank, incorporated in the sculpted body, means fast priming through a vertical lift of 7.6 metres.

"Recently this pump was successfully integrated into a specialised trailer mounted fire protection system, supplied into a coal mine," Mr Hales said.

"It passed all the site safety and performance checks and the customer was very pleased with our timing commitment and delivery capability."

Further information is available from Australian Pump Gold Distributors around the country or online at: www.aussiepumps.com.au.

Highly skilled, highly motivated

MINING contractor Point Break Mining has more than 10 years of experience providing mining services to resources companies across Australia.

Founder and director Steve Mincher has more than 29 years of hands-on expertise in the mining industry, specialising in narrow vein air leg mining.

As a company, Point Break prides itself on the quality and range of services it offers to its clients.

Point Break offers cost effective and competitive rates in level and sublevel development, ladder and Alimak rising, stoping, ground support and shaft sinking, as well as manway installation, fabrication and shaft refurbishment.

It provides experienced personnel in every field; operating well maintained plant and equipment in an environment of communication and cooperation.

While being competent and capable of doing all forms of mechanised mining, Point Break's most outstanding skills lie in its airleg and timbering abilities.

The company has some of the most competent rise and stope miners in Australia, specialising in jobs where the ability to use initiative to work through difficult tasks make its personnel a great asset to a mining team.

As a result, its quality of work is of a high standard, and its obligation to health, safety and the environment is of the utmost importance.

It has completed thousands of mars ladder rising without incident.

Point Break has provided its services to well-known miners and contractors such as Glencore, Newcrest, Oceana Gold, Mandalay Resources, Barminco, Byrnecut and Pybar; both in Australia and overseas.

More information can be found at: www.pointbreakmining.com.



Point Break Mining provides a highly skilled team for underground mining work.



Blueprint Wealth financial advisor Brad Martin presenting at the Kanowna Belle mine site in Kalgoorlie, WA.

A blueprint for wealth generation

THE mining industry has experienced a slowdown for the past couple of years, and as wages and jobs become tighter many people in mining have used this period as an opportunity to make sure they are getting ahead financially.

Many people seeking advice from Blueprint Wealth complain that they do not feel like they are making the most of their current income.

They feel as though their time spent in mining earning high wages should have them in a better position than they currently are.

The team at Blueprint Wealth are big believers in not being able to change the past, but learning from it.

“Working in the mining industry can be lucrative and we see many high income earners establish large amounts of investments; these people work hard and don’t have a lot of time to spend in this area so they use a company like ours that specialises in building wealth,” Blueprint Wealth director David Baruffi said.

Financial planning is about looking at an individuals’ current situation, working out what is best for them, then helping that person put that best practice into place.

Every good financial plan needs to be regularly reviewed. Situations change – it could be a person’s job, income, house upgrades or having another child. All of these impact the original plan put in place.

Blueprint Wealth can assist people to make the most of their incomes and help them feel like they are getting ahead financially and not just “spinning their wheels”.

The company sits down with clients and puts plans in place to get them on track to maximising their financial position.

Over time, Blueprint Wealth can show people the benefit and reward of sticking to their tailored strategy.

Blueprint Planning Pty Ltd (ABN 78 097 264 554), trading as Blueprint Wealth, is an Authorised Representative and Credit Representative of AMP Financial Planning Pty Ltd, Australian Financial Services Licensee and Australian Credit Licensee.

This article contains information that is general in nature and does not take into account your objectives, financial situation or needs. Therefore, before making any decision, you should consider the appropriateness of the advice in regards to those matters.

The tried and tested L-MUVA



ADiT Engineering's L-MUVA vehicle in action.

ESTABLISHED in 1991, ADiT Engineering is an Australian mechanical engineering and repair business for the mining, road transport, heavy haulage and earth moving industries.

The company was initially operated under underground mining contractors Farnsway-Famenco to manufacture a utility vehicle developed by the group in the late 1980s.

Several vehicles were in service until the sale of the contracting business to Downer in 1999.

The Low-Maintenance Utility Vehicle by ADiT (L-MUVA) has proven to be extremely economic; offering a stable platform for a multitude of mining roles, including the installation of mine services, grouting, charging faces, and more.

ADiT continues to service the agricultural, construction, defence, transport, waste management and mining industries. It has redeveloped the L-MUVA over the last three years; and fitted and tested the latest hydraulic and electronics from Parker and a low emission diesel engine from Penske.

The L-MUVA is an intrinsically safe, low-maintenance, highly manoeuvrable model, with a long life (ecologically responsible), high payload capacity, and a multi-functional tractor unit.

From a safety perspective the vehicle has a single joystick operation, fail-safe hydrostatic and enclosed wet-disc braking, and a low centre of gravity.

The vehicle comprises a non-turbo 87kW Tier 3 Deutz engine with optional

fire-suppression, and has easy access to drive-line components, semi-solid tyres and elimination of CV joints, universals, steering linkages, conventional suspension components, gear box, transfer case and differentials.

It is also capable of manoeuvring a 180 degree turn within a 4.5 metre width, and its durable chassis, trunnions and swing arms are warranted for five years, with a life expectancy in excess of 10 years.

ADiT Engineering currently has three new models under development, including an 8000kg payload unit; a Tier 4 diesel powered unit; and an electric powered unit, the latter of which is expected to provide huge benefits to the mining industry.

More information can be found at: www.l-muva.com.

Mental Health First Aid fills knowledge gap

RAISED in an isolated mining town, Stephen Dowling, managing director of Delivering Safe Production and Safe Services™ (DSPSS) saw first-hand the impact of workplace psychological injury and illness.

Stephen and his DSPSS team of specialists have worked with some of the worlds’ biggest and most hazardous companies in corporate, regional, rural, remote, and international settings, to develop systems of work that enable all to deliver safe services and safe production.

As a community ambassador for the RU OK? Foundation and a Mental Health First Aid instructor, Stephen Dowling has increased his focus on psychological injury and mental health first aid.

He has helped a number of organisations in corporate, regional, remote and fly-in-fly-out (FIFO) workplace settings to develop practical, sustainable mental health and wellness strategies.

Stephen believes that a lack of knowledge and stigmatising attitudes about psychological injury may prevent some people from seeking help early, and limit the ability of co-workers and managers to provide mental health first aid to their workmates until appropriate professional treatment can be sought.

DSPSS draws on lessons learnt by evidence-based research, the RU OK? Foundation, Mental Health First Aid Australia, and practical organisational issues to translate health and wellness strategies to action, including:



Delivering Safe Production and Safe Services is looking out for the mental health of all personnel in the resources sector.

- Evaluating mental health first aid and wellness strategies to reduce the risk of mental health problems in FIFO workplace

- Moving from a stand-up-and-cope culture to a Mental Health First Aid program that delivers care

- Enabling workers, co-workers and managers to gain and use evidence-based skills to recognise warning signs and intervene

- Utilising Mental Health First Aid to

mitigate adverse impacts of mental health problems in the workplace

- Achieving successful return to work following depression, anxiety, substance use, and related mental health problems.

- Sustaining cost-effective mental health first aid programs that deliver benefit and demonstrate ROI.

More information on Delivering Safe Production and Safe Services™ can be found at: www.deliveringsafeproduction.com.au.

Workplace first aid ready specialist

THE St John Safe Program assesses an organisation's current first aid set-up and details recommendations needed to be undertaken in order to be prepared for any first aid emergency.

The program is a way of identifying and communicating to staff, clients and visitors that a business has the right first aid training, equipment and systems in place to deal with an emergency situation.

It is recognition that a workplace has met its first aid obligations, and is peace of mind for employers, employees and visitors knowing that they are in safe Matsa Resources is leading the way with workplace safety, and recently approached St John to assess its set-up and put forward recommendations for a new project it was undertaking.

Using the St John Safe assessment, the company's first aid specialist was able to

make recommendations on training and equipment requirements in order to be 'First Aid Ready'.

A St John representative personally visited key decision makers at Matsa Resources to discuss the pricing behind the recommendations to provide clarity and confidence.

Matsa Resources agreed to all recommendations and is now First Aid Ready

for its new project.

St John has been providing first aid training in WA for more than 125 years.

This experience allows St John to provide businesses with the right first aid training, first aid kits and supplies.

More information, or to book a St John Safe assessment can be found at: www.stjohnambulance.com.au or by calling (08) 9334 1233.

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THE INTERVIEW: MATTHEW PAINTER

EXPLORER ARDEA RESOURCES IS SITTING ON ONE OF THE LARGEST UNDEVELOPED COBALT DEPOSITS IN THE WORLD.

page 78

Heavy haulage transportation covered

DOOLANS Heavy Haulage is an Australian owned family business specialising in heavy haulage and over dimensional transport to all sectors, including infrastructure, mining, construction, wharf clearance specialists, and oil and gas.

Doolans commenced in Melbourne (Moorabbin) in 1980 and rapidly expanded its offices to Perth (Maddington) and Port Hedland (Wedgefield).

The business is an accredited Quality Endorsed Company, complying with the requirements of the ISO Quality Management System and ensuring every job is completed safely and on time.

Doolans operates a wide range of fleet and equipment services to ensure it meets the requirements of today's increasing market, and is constantly improving its services through professional reviews and adopting new and innovative approaches.

Doolans range of heavy haulage fleet specialise in over-size and over-mass freight; with a general fleet of low loaders, extendable trailers, platform trailers, dollies, vessel, beam trailers, pilot vehicles, and Gantry jacking systems to 1000 tonnes to guarantee the company can perform every job to the highest standards.

All vehicles have tracking technology



Doolans has been providing heavy transportation solutions for more than 36 years.

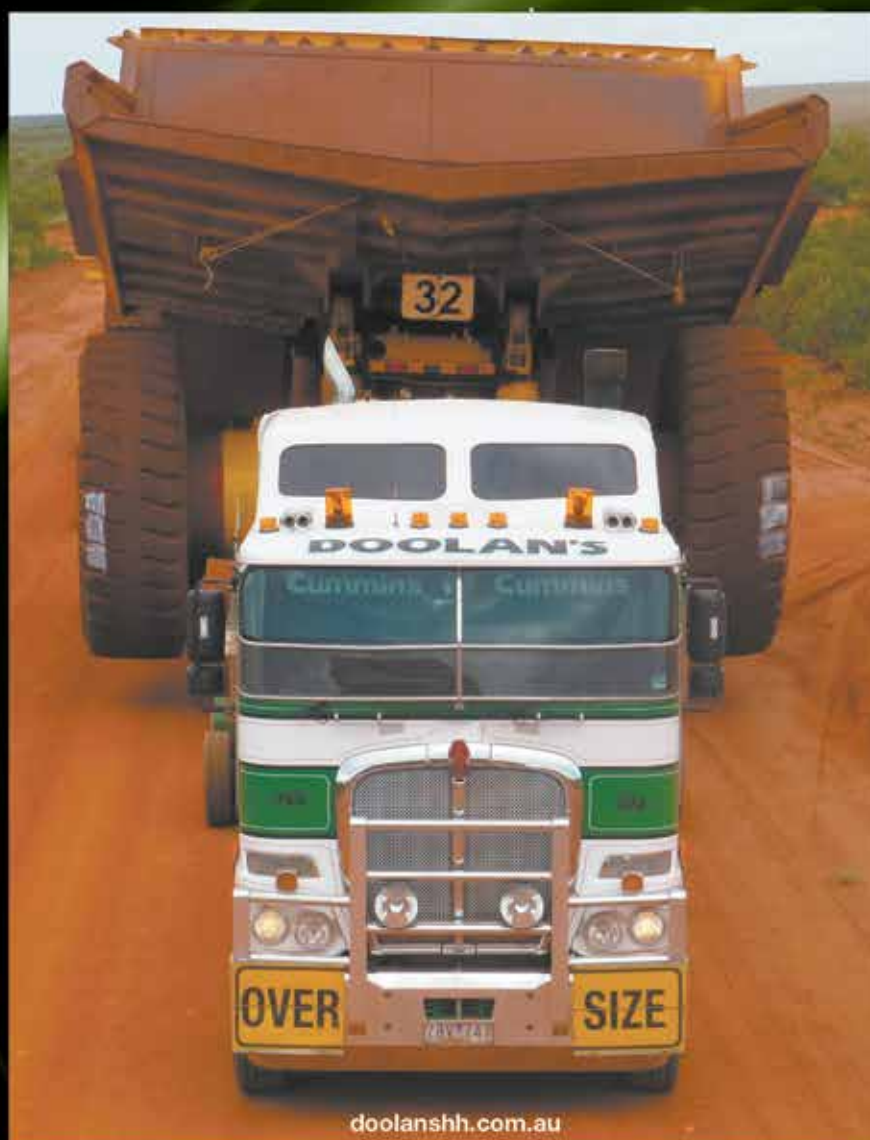
devices enabling Doolans to locate exactly where deliveries are at all times.

Doolans has been involved in major projects, including the Mumbida Wind

Farm in 2013, Gateway Project Stage 1 & 2 in 2014, and the BHP Rail project from 2013 – 2016.

With a number of upcoming projects,

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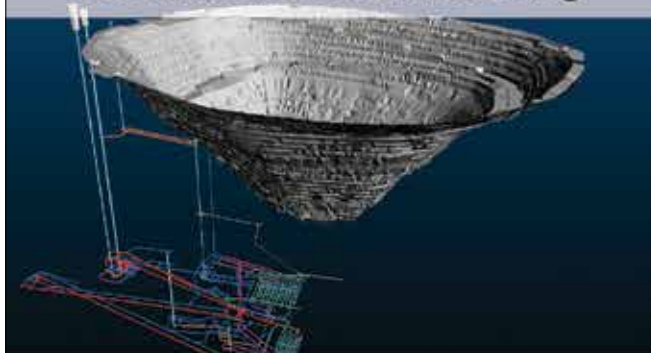
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A global leader in industrial fans



AirEng Hurricane Mine Auxiliary Fan.

AIRENG is one of Australia's leading manufacturers of high-quality industrial fans and blowers.

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Designing and building fans for challenging applications is AirEng's specialty and inspires its workforce.

Variations manufactured include temperatures of between minus 40 degrees Celsius and more than 900 degrees Celsius, below sea level to 3500 metres above sea level (mASL), low noise environments, hyper saline environments, mobile equipment and shaft powers to 7300 kilowatts (kW).

The mining fan specialist has more than 300 fans installed in the global mining sector.

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primary air and auxiliary fans, booster fans, dragline coolers and pulverisers, gas drainage and coal loader baghouse fans as well as a wide range of mineral processing fans.

AirEng has the in-house expertise and experience to manage full turnkey mine ventilation projects, including all engineering, mechanical, civil and electrical works.

By managing full turnkey projects, AirEng works towards eliminating risk

for all stakeholders.

As one of the leading industrial fan companies in the region, AirEng continues to expand its well-earned reputation by continually providing excellent quality backed with life of asset support and the highest level of product reliability.

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Eriez' case for coarse flotation

THE Eriez Flotation Division (EFD) provides advanced engineering, metallurgical testing and innovative flotation technology for the mining and minerals processing industries.

Most recently, EFD has concentrated on improving flotation efficiency, especially in areas where conventional technology comes up short.

Eriez is currently working with industrial partners to quantify the benefit of applying their coarse fluidised-bed flotation technology, the HydroFloat Separator, to base metals and sulphides.

Eriez HydroFloat has the potential to revolutionise concentrator design.

This technology synergistically combines fluidised-bed separation with flotation to achieve a level of recovery that cannot be attained using conventional technologies alone. As a result, valuable minerals can now be recovered at a size approaching and exceeding 850 microns.

This ability has a direct positive impact on concentrator capacity and profitability.

In the time-tested traditional approach, minerals are very finely ground until nearly complete liberation is achieved to facilitate recovery in conventional flotation cells.

In comparison, the HydroFloat operates treating particles at a size an order of magnitude larger.

It has the ability to recover both liberated and composite particles with minimal mineral surface expression. The resultant increase in grind size has the direct benefit of lowering grinding costs, while simultaneously increasing plant capacity.

Multiple large-scale industrial pilot plants have been installed and have shown that the HydroFloat technology is able to produce a reject that is essentially devoid of value, or contains so little value that further grinding is uneconomical.

This scavenging ability is a result of the higher flotation rates derived from the synergistic effect of combining flotation with fluidised-bed separation.

As a result, only the particles recovered by the HydroFloat need further grinding and the coarse tail can be discarded – leaving more room for additional feed.

University data show that when the HydroFloat technology is implemented directly in the grinding circuit of a typical concentrator, there is the potential to increase capacity by up to 25 per cent depending on the liberation and hardness characteristics of the ore.

The pilot plant studies have also shown there is clear benefit when using this technology to scavenge the final tail from existing concentrators to recover coarse values that are typically missed by conventional mechanical cells.

This revolutionary technology from Eriez is expected to lead to a paradigm shift in how concentrators are designed.

The direct benefits are clear with an increase in plant capacity and simultaneous reductions in grinding costs for energy and media consumption.

The indirect benefits of producing a coarse tail may be even greater in terms of improved water recovery and the resultant reduction in carbon footprint.

EFD provides advanced engineering, metallurgical testing and innovative flotation technology for the mining and minerals processing industries.

Strengths in process engineering, equipment design and fabrication position EFD as a leader in minerals flotation systems around the world.

Eriez manufactures and markets these products through 12 international facilities located on six continents.

More information can be found by calling (03) 8401 7400, emailing efdau@eriez.com or visiting www.eriezflotation.com.



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WEBTRACK has provided cost-effective and cutting edge GPS solutions to individuals, and small to medium sized businesses throughout Australia since 1992.

GPS systems are incredibly valuable as the tracking technology offers a range of applications.

The devices can be attached to a single car or an entire fleet of commercial vehicles

to track all movements.

Regardless of a client's tracking specifications, WebTrack can deliver a solution to meet all individual requirements.

Its systems are designed to be user friendly, and the devices provide detailed information which can be accessed via a smartphone or other specialised software.

Location data and other vital information

are useful in commercial applications from fleet management to asset tracking.

WebTrack GPS systems drive down unnecessary spending on fuel, wages, and maintenance repairs, and increase productivity by holding the workforce accountable for their hours.

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devices offer a wide range of options.

They can be tailored to exact specifications and according to individual needs, and the company offer professional installation services which are backed by a lifetime warranty.

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Radar sensor tech brings benefits



Excellent resistance to weather conditions makes VEGAPULS WL S 61 the ideal level sensor for water-supply and sewage applications.

VEGA Australia has launched a new radar level sensor that has been strategically designed for all simple applications in the water-supply and sewage sectors.

Featuring a wide range of mounting options, the VEGAPULS WL S 61 is an especially cost-effective radar solution, and can be readily integrated into existing infrastructure.

Just as with the VEGAPULS WL 61, which has been available for several years with a large installed base, the new VEGAPULS WL S 61 offers a design optimised for use in the water-supply and sewage sectors.

Radar technology offers numerous advantages compared with ultrasonic sensors, which used to be standard in this sector; radar is independent of weather influences, strong sun, wind, fog or rain.

In addition, no compensation is needed for variations in the signal transmission time due to air temperature fluctuations.

With an accuracy of +/- 5mm, the VEGAPULS WL S 61 covers a wide range of applications.

This sensor is particularly suitable for level and flow measurement in water treatment plants.

Its excellent focusing enables its use in

pumping stations and rainwater overflow basins, for flow measurement in open channels, and for level monitoring.

The sensor's robust housing is wear and maintenance free, and its high degree of protection – IP 68 (2 bar) – also makes it suitable for applications where the sensor may be temporarily submerged.

The unit complies with the latest LPR standard (Level Probing Radar), and is approved for open-air use without restrictions or special attachments.

VEGA drew on its many years of experience in its development of this new sensor for simple measurement tasks.

Today, about 40,000 VEGAPULS WL 61 sensors are being successfully used worldwide in the water-supply sector.

An entirely new feature is Bluetooth wireless operation from a smartphone or tablet (and/or a PC with PACTware) when combined with a Bluetooth USB adapter; this makes commissioning and diagnosis even simpler.

Corresponding display and signal processing units enable the display of measurements and provide the relay outputs needed, for example, to control a pump.

More information can be found at: www.vega.com/wls61.

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High-quality poly welding

GORDON'S Welding Service (GWS) is a proud local business with a 15-year track record providing welding, fabrication and maintenance services to the mining industry.

From its workshop base in Collinsville, QLD, GWS offers a wide range of welding and fabrication services, including a full mobile plant for onsite repairs to heavy earth moving machinery, draglines, buckets, blades and truck bodies; fabrication of chutes, covers and guards over moving parts; steel and stainless pipework; cutting of wear plate; and installation and repairs to structural beams.

"We have a range of highly qualified tradesman available for onsite work, including boilermakers, diesel fitters, electricians, trades assistants, Level 1 crane operators, riggers, dogman, and supervisors (S1, S2, & S3)," GWS owners Graham and Sheryl Gordon said.

"We specialise in poly welding and all of our tradesmen are trained in poly welding."

The company's equipment suite includes a large 350 Butt Welding machine, a 250 Butt Welding machine, an Electro Fusion Machine, and a mobile sandblasting unit for onsite blast and painting.

It also stocks a large range of the poly spare parts in all sizes at its workshop.

The team also supplies all gas and BOC equipment, electrodes, mig wires, oxy and acetylene products, along with structural steel, rod, bar, pipe, alloy products, RHS and plates.

Being a locally-based company with a 90 per cent local workforce, GWS is able to respond on site within 20 minutes, when required, for a break down or supplementary labour/maintenance service.



More information can be found at: www.gordonswelding.com.au.

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GORDON'S
WELDING SERVICE

Matthew Painter

Ardea Resources managing director

Recently spinning off from WA-based miner Heron Resources, explorer Ardea Resources is sitting on one of the largest undeveloped cobalt deposits in the world. **Cameron Drummond** spoke to Mr Painter about his vision and what it means to be an 'ethical' mining company.

"WE HAVE, IN THIS COUNTRY, THE ABILITY TO BECOME MAJOR PLAYERS IN THE BATTERY MINERALS SECTOR, AND I INTEND ARDEA TO BE LEADING THAT CHARGE."



Q. What is your professional history?

I'm a geologist by trade, working globally on a wide variety of commodities. I've been fortunate to work on most continents, always on deposits and mines, and often in exploration around active mine sites.

Since receiving a PhD in Economic Geology (ore deposit geology) from the University of Queensland, I've worked in the Western Australian geological survey, consultancies, junior exploration companies and major mining houses.

For the last decade or so, a lot of these projects have been based in Africa. I love it over there, but it's great to be focused now on projects in Australia that, through diligence and hard work, have the potential to become mines in the near future.

Q. Describe your current role.

It's a great time to be Managing Director of Ardea Resources. Since listing in February, our focus on the KNP Cobalt Zone has been justified as the cobalt price climbs in response to a number of important global factors.

Drilling has exceeded our expectations, and the pre-feasibility study of the KNP Cobalt Zone is progressing very well.

This must all be balanced with our other projects, where the prefeasibility study of the Lewis Ponds zinc-gold-silver deposit in NSW is underway, and exploration of our portfolio of precious and base metal projects is gathering pace.

Between our technical progress and logistical considerations like setting up a new head office and establishing regional offices in Kalgoorlie and Orange, I've been fortunate to be surrounded by a small but dedicated and

highly skilled team of people without whom none of this could have happened.

It's exciting to be steering a company with such huge potential on so many fronts.

Q. What led to the decision to spinoff from Heron Resources?

I wasn't involved with those decisions.

I understand that, with their focus on developing the Woodlawn base metal mine, their board saw an opportunity to realise value for shareholders in their other projects by placing these into a new company. I'm glad they did.

Q. What new developments are on the horizon?

There's a lot coming up for us. First and foremost, the KNP Cobalt Zone prefeasibility study is progressing very well and will be completed in the first quarter of 2018.

We expect a positive outcome so plan to move directly onto a definitive feasibility study straight away.

All of this is aimed at bringing the KNP Cobalt Zone into production as soon as we possibly can, so we're investigating various means to accelerate that.

Simultaneously, we'll complete a prefeasibility project for bulk mining at the Lewis Ponds zinc-gold-silver deposit in NSW.

Previous exploration at Lewis Ponds was aimed to mine high-grade mineralisation at depth.

We see an enormous opportunity to initially bulk mine the lower grade material near to surface by open pit. Test work to date is exceeding our expectations, but it is early

days. Later this year we expect to progress on to more advanced studies to bring Lewis Ponds toward production.

Our exploration projects are some of the highest quality I have come across for some time.

I'm very much looking forward to getting on the ground at Mt Zephyr in WA where we will apply new thinking to historical mines and prospects. With similarities to several nearby developing projects, there is a lot of potential here. Similarly for some of the long-forgotten prospects and historical workings in NSW at Wiseman's Creek, Yeoval, and Ophir.

Q. What makes Ardea Resources an 'ethical' mining company?

Everyone nowadays wants to know where the produce they're purchasing comes from. Is your chicken free range, are your eggs cage-free, is your fish line-caught, and where did they come from? Provenance is vital. This goes for our commodities also.

Around two-thirds of the world's cobalt is sourced from the Democratic Republic of Congo (DRC), and a sizeable portion of that cobalt goes into the batteries that power our phones, our computers and increasingly our houses and our cars.

Amnesty International recently raised serious concerns about a significant proportion of DRC cobalt being sourced from sites with unsafe to dangerous work practices, and child labour is commonly an issue.

With the KNP Cobalt Zone being located just outside of Kalgoorlie, we can guarantee that all of our products will be sourced from locations with legislated fair work

practices, stringent safety protocols, and high environmental standards.

Several phone manufacturers have already put controls on who supplies their battery metals to avoid the stigma of child labour in particular in their supply line.

I can only see demand for ethically-sourced cobalt increasing.

Q. What are your thoughts on the future of Australia's resources sector?

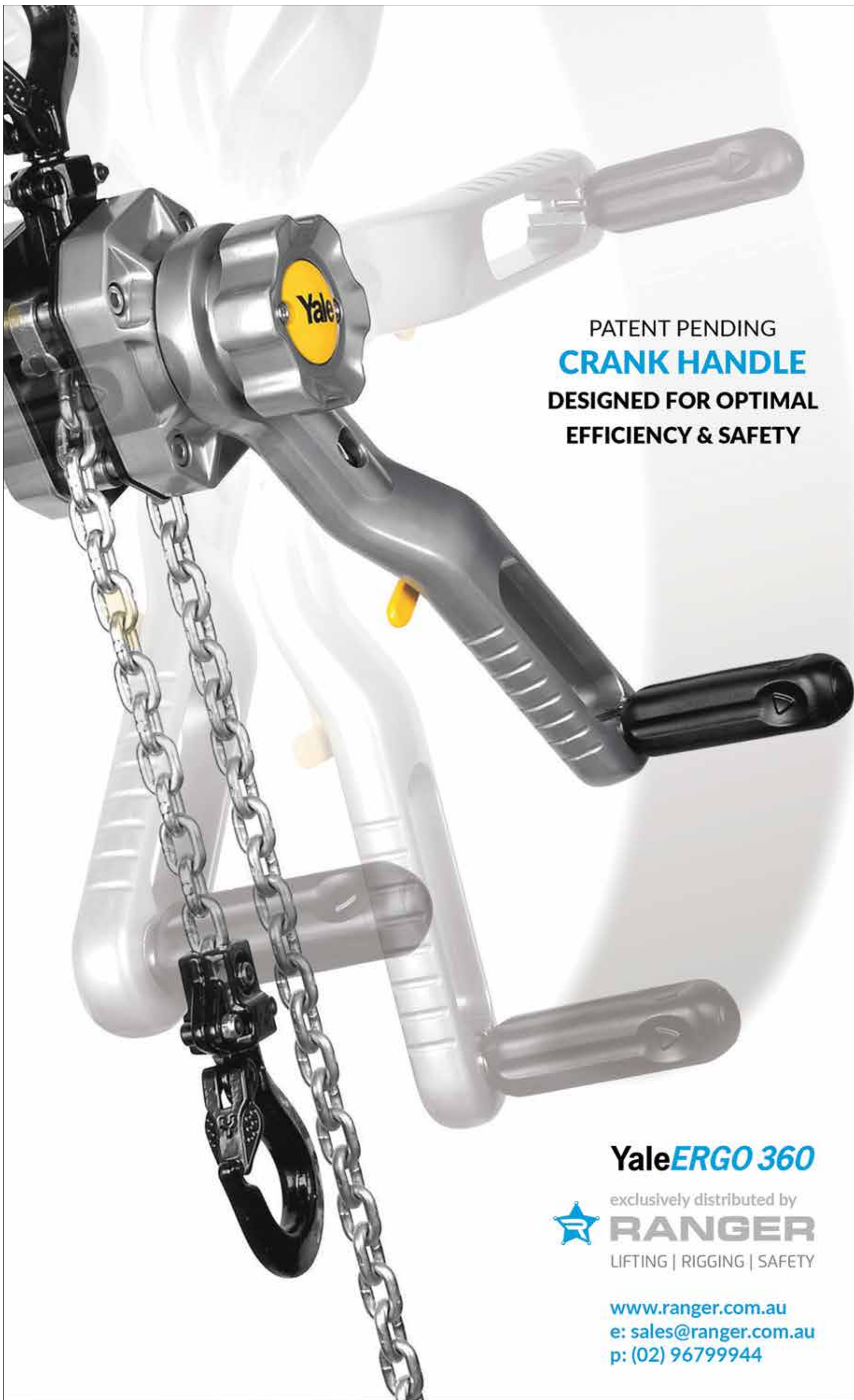
The resources sector in Australia has a massive future. We'll continue to be world leaders in the production of iron ore and gold.

The increasing importance of the battery metals sector will be a boon to this country. We have some of the largest reserves of hard-rock lithium, and there are enormous volumes of bulk tonnage cobalt, as at the KNP Cobalt Zone and the greater KNP (the largest cobalt resource in the developed world).

Small high-grade cobalt deposits make wonderful headlines but these will not impact upon global cobalt production. It is, in large part, the lateritic cobalt and nickel deposits that have the potential to meet much of the anticipated demand. Fortunately, Australia has many such deposits.

With lateritic cobalt and nickel deposits forming under past or current tropical conditions, most of these deposits are located within 30 degrees of the equator.

As such, Australia is one of the few developed nations to host a significant number of these deposits. We have, in this country, the ability to become major players in the battery minerals sector, and I intend Ardea to be leading that charge.



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