

# THE AUSTRALIAN MINING REVIEW

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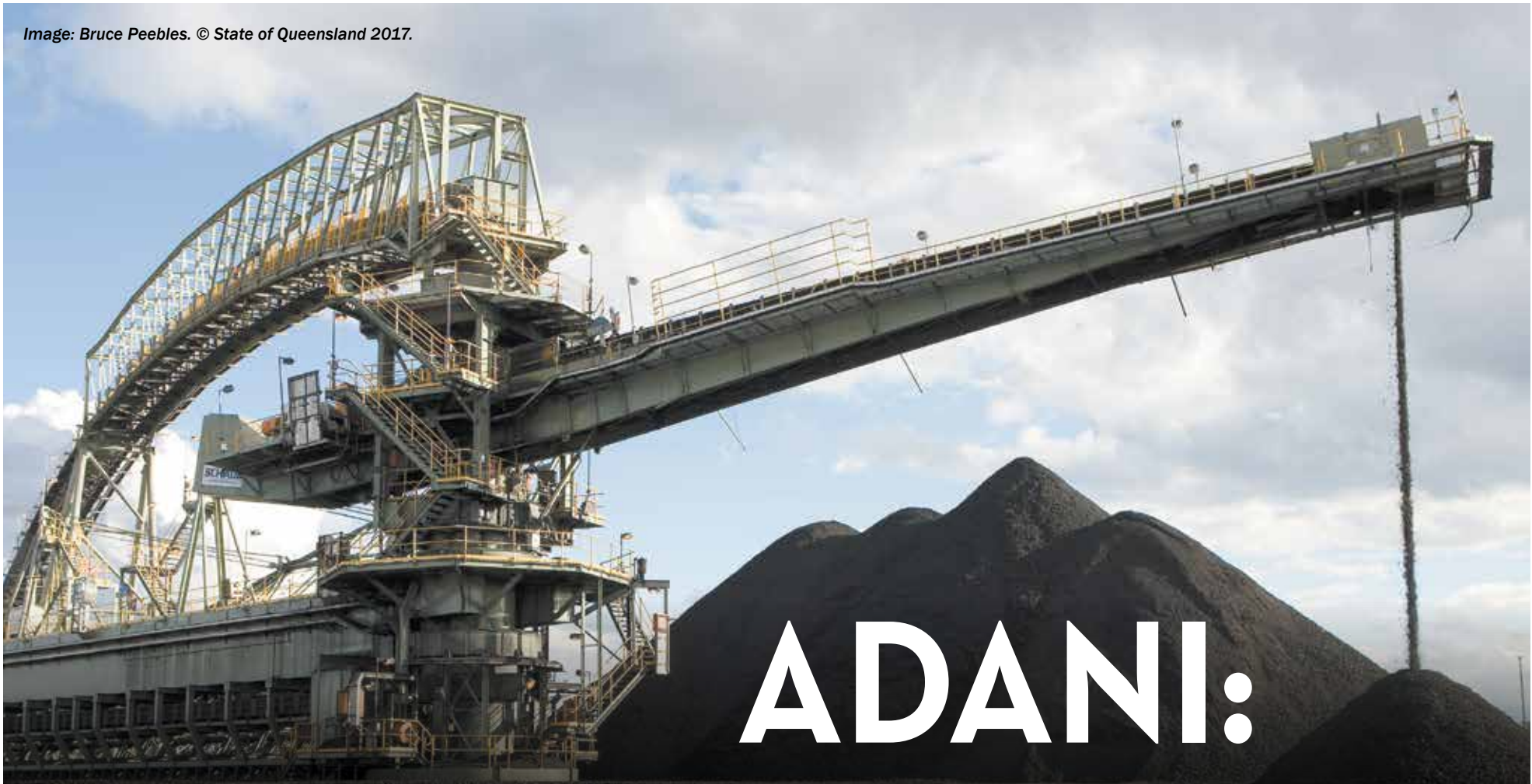
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NEWS: TECHNOLOGY & INNOVATION P10	MINING IN SOUTH AUSTRALIA P24	RECRUITMENT P75

Image: Bruce Peebles. © State of Queensland 2017.



## ADANI:

# Pushing for development

When Adani spectacularly deferred it's highly anticipated final investment decision announcement - just days before it was due - the future of its \$16.5 billion Carmichael project was cast into doubt. The story continues to evolve, but if the kinks associated with State royalty agreements and Federal NAIF loans can be ironed out, then this mega-project could be an economic windfall for the North Queensland region for decades to come.

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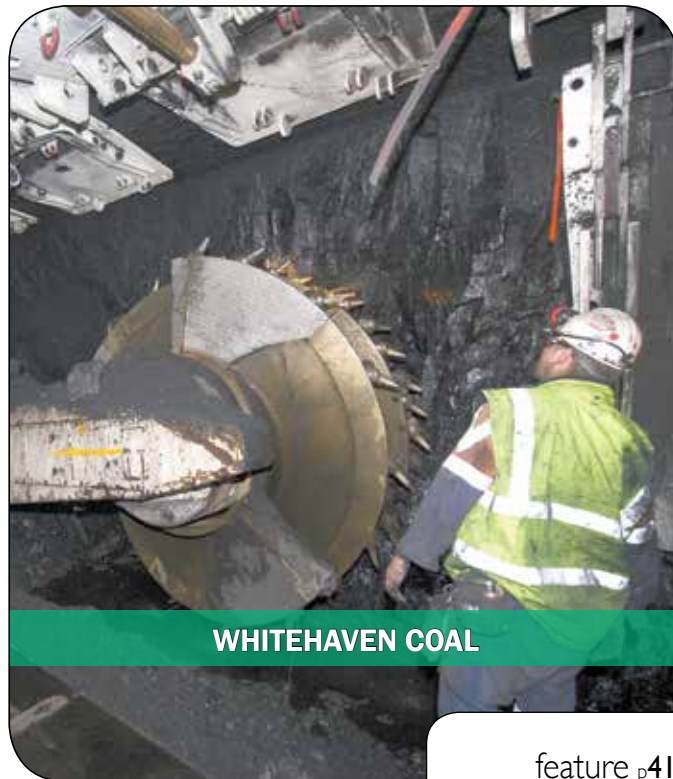


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FMG chief executive Nev Power.

## Australian miners win big at Platts awards

ELIZABETH FABRI

FORTESCUE Metals Group (FMG), Roy Hill, and MMG were awarded top honours at the 2017 Platts Global Metals Awards in May.

In its fifth year, the awards ceremony in London aimed to recognise the “best of the best” in the metals industry, with 15 awards winners chosen by an independent panel of judges.

Announced *Metals Company of the Year* for the second time since 2014, FMG also took home the *Industry Leadership Award - Raw Materials & Mining*.

“It is an honour to accept these prestigious awards which recognise the hard work and determination of everyone at Fortescue,” FMG chief executive Nev Power said.

“Our team has delivered outstanding results across all of our operations, including improved safety performance, consistent production, sustained productivity and efficiency gains and disciplined capital management.

“I am extremely proud of what Fortescue has achieved and of our commitment to ensuring the development and growth of our business benefits our local communities.”

Hancock Prospecting chairperson and director Gina Rinehart was presented the *Lifetime Achievement Award*, while her prized Roy Hill Holdings snapped up the *Rising Star Company Award*.

Ms Rinehart said she was delighted to be acknowledged for her dedication to the industry, most recently culminating in the delivery of the \$US10 billion Roy Hill project.

“The mining and resources industry with its many related industries is, I believe, a very important contributor to our country, and helps to maintain and improve living standards, so it means a lot to me to be recognised by my peers at these internationally renowned prestigious awards,” Ms Rinehart said.

MMG was also recognised for its contributions, and awarded the *Industry Leadership Award - Base & Specialty Metals*.

# A major rebrand for BHP



**“WE FUNDAMENTALLY BELIEVE THAT AS SOCIETY CHANGES IT IS UP TO US TO MAKE THE CASE – MORE CONFIDENTLY AND EFFECTIVELY – FOR THE POSITIVE ROLE THAT WELL-RUN AND RESPONSIBLE COMPANIES PLAY IN SOCIETY.”**

BHP chief executive Andrew Mackenzie has outlined a plan to grow company value by 50 per cent.

ELIZABETH FABRI

AUSTRALIA’S largest resources company BHP has undergone a rebrand as part of its biggest marketing campaign in more than three decades, dropping ‘Billiton’ from its name and adopting a new logo and slogan — ‘Think Big’.

BHP took on the double barrel name in 2001 when it merged with Anglo-Dutch company Billiton Plc, but decided it was time to return to its roots and pay homage to its 19th century start in the NSW mining town Broken Hill.

The company launched a \$10 million advertising campaign to promote the change, which included two television commercials and online promotion.

BHP chief external affairs officer Geoff Healy said the campaign focused on what people can and should expect of the company moving forward.

“In launching Think Big, we will take the opportunity to change our logo and move to a brand that Australians have known us by for generations – BHP,” Mr Healy said.

“This abbreviated simple expression of our organisation is used colloquially around the world.”

“We fundamentally believe that as society changes it is up to us to make the case – more confidently and effectively – for the positive role that well-run and responsible companies play in society.”

Days later, at the Bank of America Merrill Lynch Global Metals (BAML),

Mining and Steel Conference, BHP chief executive Andrew Mackenzie announced the company’s plan to grow its value by up to 50 per cent and almost double the return on capital through a new strategy focusing on cost reduction; major growth projects including Spence Growth, Olympic Dam and Jansen potash; and advances in the productivity of its shale assets.

“Our roadmap today contains an enhanced set of opportunities that will see us prosper and grow value per share throughout the cycle, and in multiple price scenarios,” Mr Mackenzie said.

“We’re confident of it because of our diversification across commodities and opportunities.

“There are many routes to go when you have that, and we will take the best one.”

## Redspear signs FMG contract

CAMERON DRUMMOND

FOLLOWING a competitive tender process, Aboriginal owned-and-operated mine supplier Redspear has won a contract to supply Fortescue Metals Group (FMG) with lifting and rigging equipment across its operational sites.

Owner and managing director Barry McGuire said the contract to provide business critical services was Redspear’s first of its kind with a major miner.

“This has given us confidence that we are able to compete with some of the largest names in lifting and rigging in Australia and beyond,” Mr McGuire said.

“We thank Fortescue for the opportunity to show our young people that with hard work, perseverance and support from the right partner, everything is possible.”

Redspear is the first Aboriginal-owned rigging and lifting business in Australia.

The company also received the opportunity to apply for 14-day payment terms, under a new business initiative announced this month to ease pressure on Aboriginal and Pilbara-based suppliers.

“Cash management is critical to the sustainability of any small business, and Fortescue’s reduced payment terms allows Redspear to invest more in its business,” Mr McGuire said.

Fortescue chief executive Nev Power



(From L to R:) Redspear managing director Barry McGuire, operations manager Liza McGuire, and general manager Francois Witbooi.

said initiatives such as the company’s Billion Opportunities program and new payment terms were providing encouragement to small businesses to build capability and capacity, while also offering practical solutions to cash flow management.

“By facilitating strong businesses we are creating more jobs and development

opportunities for Aboriginal Australians, which are in turn changing lives and helping to build stronger communities,” Mr Power said.

Since the inception of Billion Opportunities in 2011, 240 contracts and sub-contracts worth \$1.85 billion have been awarded to 103 Aboriginal-owned businesses and joint ventures.

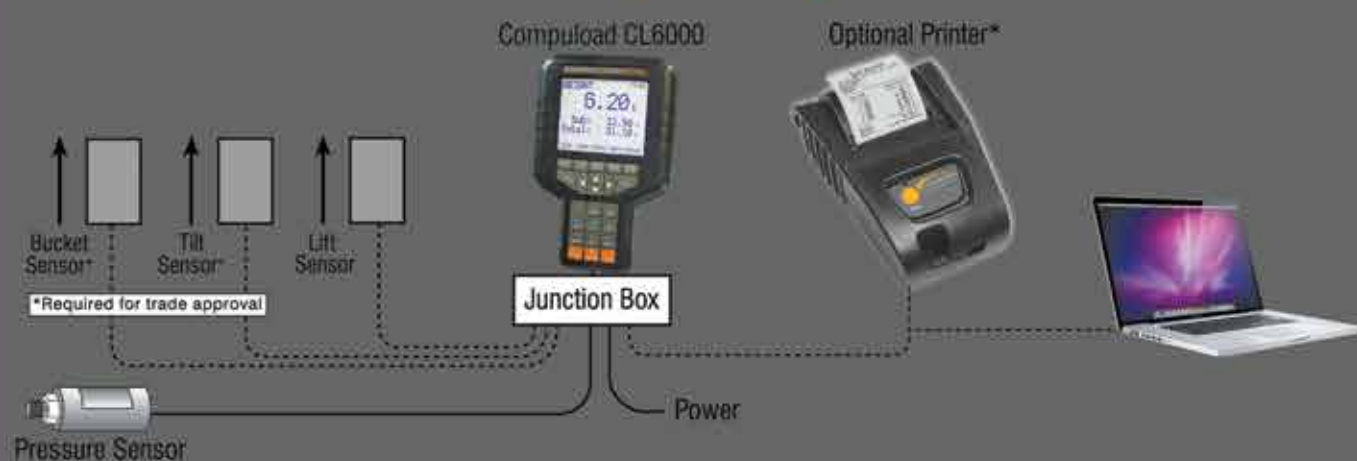


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## IN BRIEF

### BBIG to acquire Weelumurra mine

#### IRON ORE

BBI Group (BBIG) has signed an agreement with Mineral Resources subsidiary Polaris Metals to acquire its Weelumurra asset in the Central Pilbara.

Located just 15km from BBIG's proposed Centra Pilbara rail head and stock yard, Weelumurra contains an estimated 200 million tonnes of iron mineralisation and further exploration opportunities.

"BBIG continues to develop the Balla Balla Infrastructure Project as the next tier-one, low cost, large scale iron ore export infrastructure facility in the Pilbara," BBIG chief executive Nicholas Curtis said.

"Securing the Weelumurra iron ore asset is an important step in BBIG's efforts to progress the project to a final investment decision."

### Gold Fields increases stake in Gold Road

#### GOLD

SOUTH African miner Gold Fields has spent \$64.3 million to increase its holding in Gold Road Resources to 10 per cent, as the two companies progress their 50:50 Gruyere joint venture project.

Gold Fields acquired 74,824,070 Gold Road shares at 86 cents per share; a 27 per cent premium on its 18 May closing share price of 67.5 cents.

In December last year, Gold Fields paid \$350m for a 50 per cent stake in Gold Road's Gruyere project in the Goldfields region of WA.

### Rio to clear \$2.5bn in bond purchase plan

#### DEBT REDUCTION

MINING giant Rio Tinto said it would use its strong liquidity position to further reduce gross debt under a two tranche bond purchase plan for up to \$US2.5 billion.

The company issued a redemption notice for about \$1.72bn of its 2019 and 2020 US dollar-denominated notes and commenced cash tender offers to purchase up to \$US781 million of its five 2021, 2022 and 2025 US dollar-denominated notes.

The announcement follows the successful completion of a series of \$US7.5 billion US dollar-denominated note redemptions and repurchases in 2016.

# Heron awards \$107m EPC contract



**"THE EXECUTION OF THIS CONTRACT REPRESENTS ANOTHER IMPORTANT MILESTONE IN HERON'S PROGRESS TO BECOME AN IMPORTANT AUSTRALIAN ZINC PRODUCER."**

The Woodlawn zinc-copper project site near Tarago, NSW.

Image: Heron Resources.

#### CAMERON DRUMMOND

MULTI-commodity focused explorer Heron Resources has awarded a \$107m contract for the development of its Woodlawn zinc-copper project in NSW.

The engineering, procurement and construction contract (EPC) went to CIMIC Group subsidiary Sedgman for the development of a 1.5 million tonnes per annum mineral processing plant that would produce zinc, copper and lead concentrates.

The design also included a backfill plant

and supporting infrastructure at the project located near Tarago, 250km southwest of Sydney.

More than 250 personnel would be employed at the peak of construction.

Heron Resources managing director Wayne Taylor said the contract award followed the successful undertaking of a FEED program that included improvements on the earlier feasibility study work.

"The nature of the contract, which includes guaranteed maximum price and performance incentives, aligning Sedgman and Heron in delivering an under-budget and early result," Mr Taylor said.

"We are very pleased to be working with Sedgman as they have demonstrated their ability to provide a superior solution with technical and commercial advantages, having already delivered a reduction in projected capital expenditure.

"The execution of this contract represents another important milestone in Heron's progress to become an important Australian zinc producer."

Heron said project engineering was about 20 per cent complete, with onsite work scheduled to commence immediately following the completion of project financing.

# QCoal spruiks 900 jobs for Bowen Basin



Image: QCoal.

#### ELIZABETH FABRI

QCOAL will soon begin construction at its \$1.76 billion majority-owned Byerwen coal project in North East Queensland after receiving State Government approval to develop two of its tenements.

The joint venture project between QCoal (85 per cent) and JFE Steel Corporation (15 per cent) was set to generate 350 construction jobs at peak, and a further 545 jobs once operational.

The open-cut mine would produce up to 10 million tonnes of high-quality coking and thermal coal per annum, which would be railed to Abbot Point Coal Terminal for overseas export.

QLD Natural Resources and Mines minister Dr Anthony Lynham welcomed the investment in the State's resources sector.

"It's particularly good news for locals, as the proponent has previously committed to hiring from Glenden, Nebo, Moranbah and Collinsville and across the wider region," Dr Lynham said.

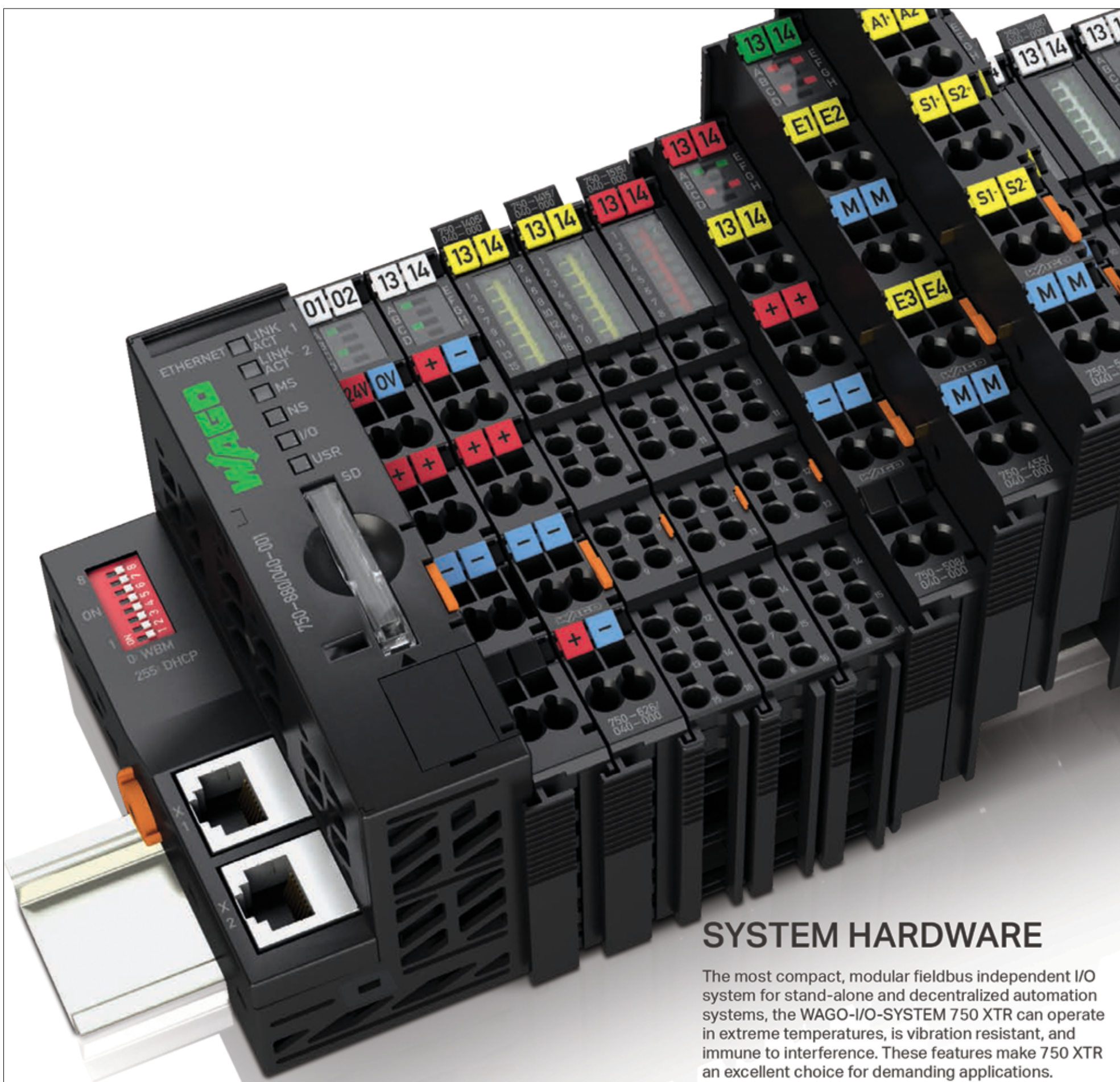
Queensland Resources Council deputy chief executive Judy Bertram said the announcement was a "huge shot in the arm" for central QLD.

"This is a big dose of export growth for Queensland's premium coking coal, which is why Japan's JFE Steel is investing in the project," Ms Bertram said.

"This mine will also be a significant economic contributor to local communities and the wider Queensland economy."

Byerwin coal mine was expected to begin shipping early 2018.





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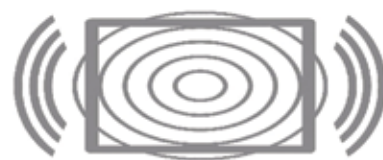
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Salt Lake Potash intends to become Australia's first producer of sulphate of potash.

## Salt Lake raises \$17.6m for pilot plant

CAMERON DRUMMOND

WA-based miner Salt Lake Potash has raised \$17.6 million for the development of a pilot plant at its Goldfields Salt Lakes project near Laverton, WA.

Commitments were made by UK and Australian investors to subscribe for 41 million ordinary shares at 43 cents per share, representing a 11.9 per cent discount to the 20-day weighted average price.

Salt Lake said the funds would be used for the planning and initial construction costs of the plant, as well as ongoing resource investigation, testwork, and other associated studies.

"We are very pleased to have successfully put in place the next stage of funding for our exciting sulphate of potash projects in Australia, where we are working very hard to become the first producer in a sector with outstanding potential," Salt Lake chief executive Matt Syme said.

"The excellent support we have received from our shareholders and advisers in the UK and Australia is a great help in our pursuit of that goal and we look forward to continued success together."

The pilot plant will have throughput of between 20,000 tonnes per annum (tpa) and 40,000tpa processing only brine feed drawn from the near surface.

Salt Lake has tenements totalling more than 4750 square kilometres across nine salt lakes in the Northern Goldfields region, including its flagship Lake Wells project.

# Rio progresses Koodaideri



**"THE KOODAIKERI DEVELOPMENT WILL REQUIRE AN EXPECTED 1600 CONSTRUCTION JOBS AND A FURTHER 600 OPERATIONAL STAFF IF APPROVED."**

ELIZABETH FABRI

RIO Tinto has poured \$30.9 million into a feasibility study of its Koodaideri greenfields iron ore deposit in WA, which could see construction begin in 2019 and first ore delivered by 2021.

The \$2.2 billion project, which had been in the planning pipeline for some time, was set to replace existing production in the Pilbara, with an estimated capacity of about 40 million tonnes per year.

Pre feasibility for the project released in November 2016 outlined development of a dry crushing and screening plant, non-process infrastructure, product stockyards, a rail loop and load out, and 170km rail link.

The 2017 feasibility study would focus on increasing Rio Tinto's knowledge of the orebody and a variety of timing, capital and scale options.

Rio Tinto Iron Ore chief executive Chris Salisbury said the company would be investing further in the Pilbara with local businesses and suppliers, and firms outside the State.



The Koodaideri deposit is located in the Hamersley Range, WA.

"The Koodaideri development will require an expected 1600 construction jobs and a further 600 operational staff if approved," Mr Salisbury said.

"We remain firmly focused on our value over volume strategy and maximising returns through enhanced productivity.

"We are examining the Koodaideri project as an option to help us maintain our low cost competitive position and assist in maintaining the Pilbara Blend product quality."

A final decision on the project will be made following the completion of the feasibility study and board review.

## New Bowen Basin land release

CAMERON DRUMMOND

MORE than 270 kilometres of land in Queensland's coal-rich Bowen Basin is up for grabs, after the State Government announced four tender blocks were on offer – the first land release in the region in four years.

Natural Resources and Mines minister Anthony Lynham said the exploration program concept delivered long-term planning certainty for explorers and early advice to the local traditional owners, landholders and councils.

"Resource developments which create jobs and attract economic investment to our regional communities must start with exploration," Dr Lynham said.

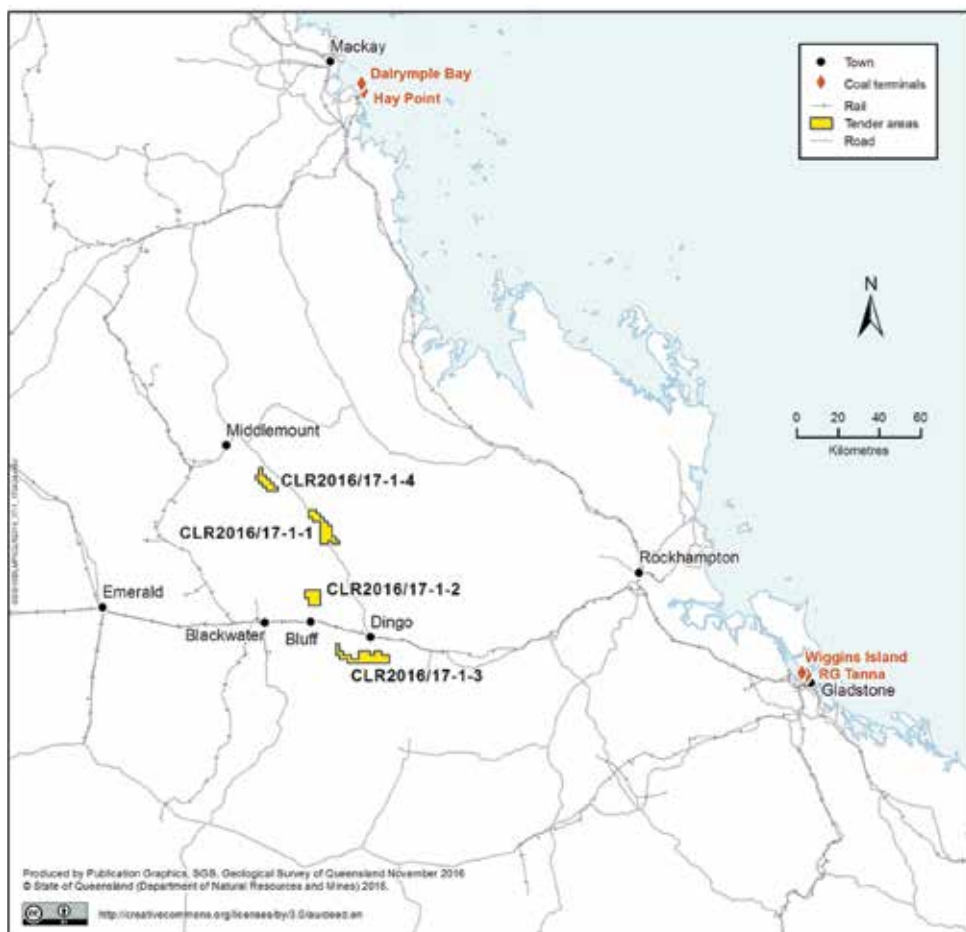
"This land release is a significant opportunity for explorers to gain access to land with the potential for thermal and metallurgical coal in a world-leading production region."

Since 2013, coal exploration licences have only been available in QLD via competitive tender.

The only tender under this process saw five permits awarded in the northern Bowen Basin in 2014.

The land on offer is surrounded by existing coal mines, from Middlemount in the north, to Cook and Blackwater to the south.

The area is also serviced by Aurizon's Goonyella and Blackwater coal rail networks, providing access to the coal export terminals of Hay Point and Dalrymple Bay to the north, and the Port of Gladstone to the south.



Four areas are up for tender in QLD's coal-laden Bowen Basin.

Image: QLD Government.

"Queensland's high standards of safety of environmental management, and a history of sustainable and innovative exploration and production practices, offer a safe, secure and attractive location for investment," Dr Lynham said.

Preferred tenders must meet environmental, native title and land access requirements before commencing on-ground exploration activity.

Tenders for the land were due to close on 24 August this year.



# What makes a construction materials supplier the right choice for the mining and energy sector?

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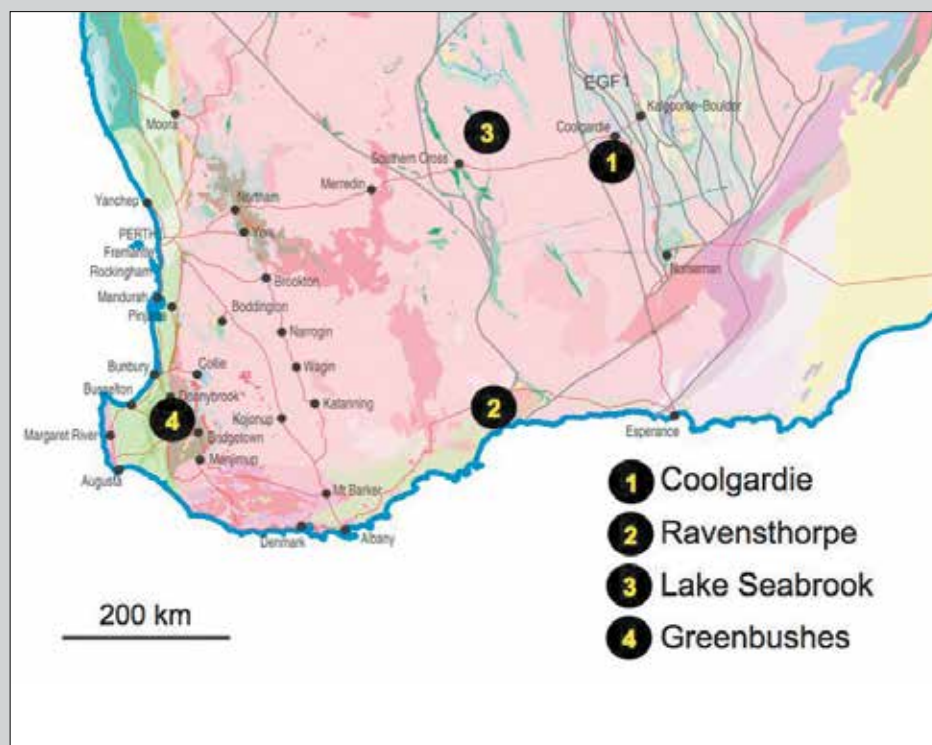
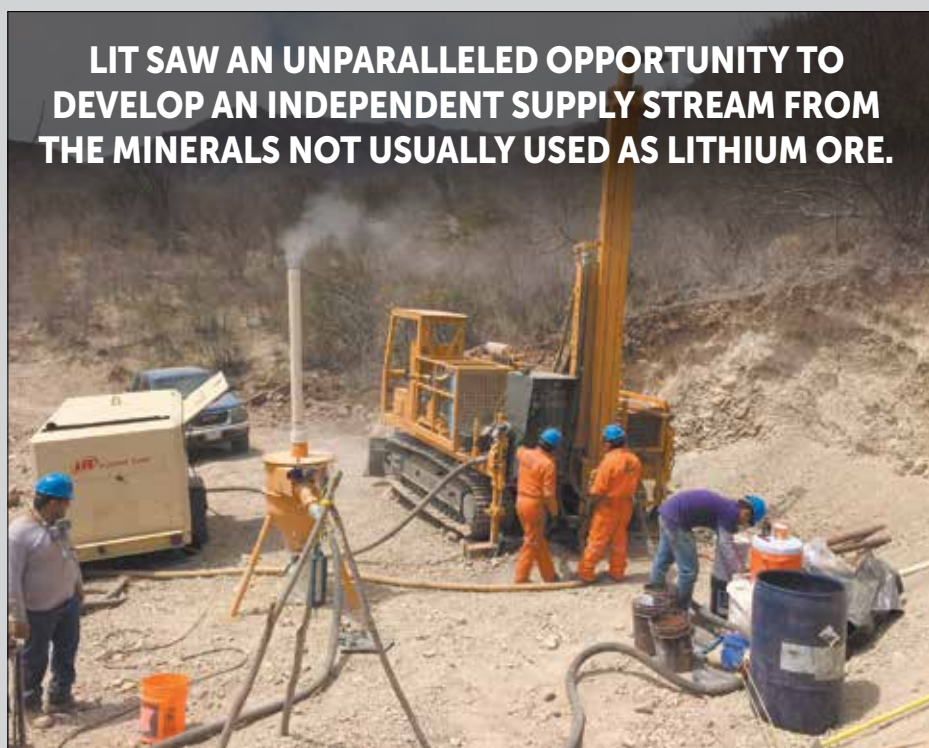
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# Transformative potential

ASX-listed **Lithium Australia** NL (LIT) has focused on developing disruptive lithium exploration and processing technologies in light of a broadening supply gap for the versatile metal.

**LIT SAW AN UNPARALLELED OPPORTUNITY TO DEVELOP AN INDEPENDENT SUPPLY STREAM FROM THE MINERALS NOT USUALLY USED AS LITHIUM ORE.**



LIT's Southern WA projects (excludes Pilbara and Gascoyne projects).

LIT has identified certain lithium minerals as an underdeveloped resource on a global scale.

The occurrence of such minerals and lack of available commercial processing technology to recover lithium from some of these materials was seen as an opportunity for LIT. The development of a more efficient process has the potential to transform some of the underdeveloped mineral occurrences into ore.

LIT focused on the development of processing technology to achieve that end, namely its wholly owned SiLeach™ and LieNa™ processes, which in turn led to examining a number of prospective deposits, and acquiring rights to lithium and rare metals deposits in Western Australia at Ravensthorpe, Coolgardie, and the Pilgangoora JV with Venus Metals; as well as Alix Resources' Electra project in Sonora, Mexico.

LIT is also entering into a joint venture to develop a tin/ lithium resource in Saxony Germany with Tin International AG.

Lithium is the lightest metal and is used in high-tech batteries that power computers, communication devices, consumer electronics and electric vehicles.

Its other uses include medical applications, colours in fireworks, ceramics, high-temperature glass, lubricants, air purification, fuel cells, catalysts, nuclear technology and batteries. In fact, lithium is often described as the most versatile metal on Earth.

Lithium demand is increasing at 11 per cent per annum, driven largely by the battery market, which is currently expanding at 20 per cent per annum and is likely to accelerate with the anticipated production of electric vehicles expanding from 160,000 units currently, to over 40 million units per annum by 2050.

LIT noticed an important change in the dynamics of lithium supply – a broadening supply gap and a potential shortage of available lithium. The dynamics on the supply side are complex and controlled by only a handful of producers. LIT saw an unparalleled opportunity to develop an independent supply stream from the minerals not usually used as lithium ore, provided a viable processing flowsheet – such as SiLeach™ – could be developed to commercially recover the lithium from those minerals.

SiLeach™ is Lithium Australia's core technology. It is a breakthrough in lithium extraction that has the potential to remove the significant cost barriers associated with Australia's hard-rock lithium industry, and achieve a globally cost-competitive, high-value lithium product.

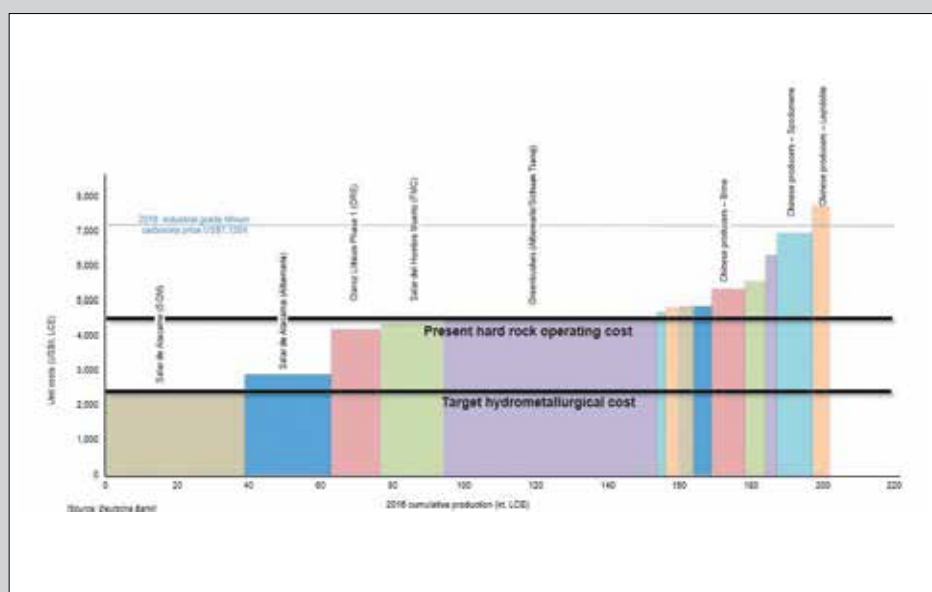
In addition to the development of novel and potentially revolutionary metallurgical processing technology, LIT also has a high quality portfolio of Australasian and international exploration and development projects.

Traditionally, lithium ore undergoes a roasting process at high temperature before being subjected to leaching.

Roasting is an energy-intensive activity and only economically viable to process high-grade ores such as spodumene, or petalite, a lithium-aluminium-phyllosilicate rock.

These lithium oxide ores can contain up to 6 per cent lithium with processing costs of between \$4000 and \$5000 per tonne of pure product. It is generally uneconomical to recover reserves with less than 5 per cent lithium oxide.

SiLeach™ has been developed as a hydrometallurgical process that can recover product from micas with a lithium content of between 2 and 4.5 per cent – such as lepidolite, a hydrous silica mica that is considered an abundant source of lithium.



World lithium production cost curve.

SiLeach™ is a halide accelerated sulphuric acid leaching process that is performed at atmospheric pressure (no autoclaves required) and at relatively low temperature (95 °C). This is in stark contrast to current conventional lithium extraction routes which require lithium minerals to be roasted at elevated temperatures (around 1000 °C) in energy intensive kilns to enable the contained lithium to be made available for subsequent acid leaching.

This elimination of the high temperature step and consequent energy reduction and cost saving is a key feature of the SiLeach™ process.

Recovery of a range of valuable by-products such as potassium, rubidium and cesium is also possible. The potential of SiLeach™ is in the production of lithium chemicals at the low end of the world production cost curve, where lithium is produced from hard-rock minerals but at the low cost of South American lithium brine

producers.

The possibility of recovering lithium using SiLeach™ from accessory minerals that are often disposed to tails also shows considerable promise; this would effectively mean production of lithium chemicals from mine waste and involving no mining cost, with mining already having taken place to source the primary mineral.

In alliance with a division of the Australian Nuclear Science and Technology Organisation, ANSTO Minerals, LIT has demonstrated the production of battery grade lithium carbonate using Lithium Australia's SiLeach™ hydrometallurgical process. The ore was produced from Lepidolite Hill in Western Australia. LIT and also conducted continuous SiLeach™ pilot plant operations on spodumene concentrates from Pilbara Minerals' Pilgangoora project demonstrating lithium extraction from this refractory mineral without the need for roasting.



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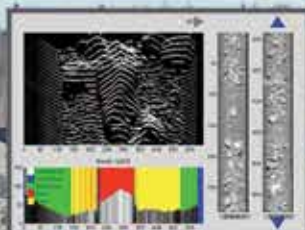
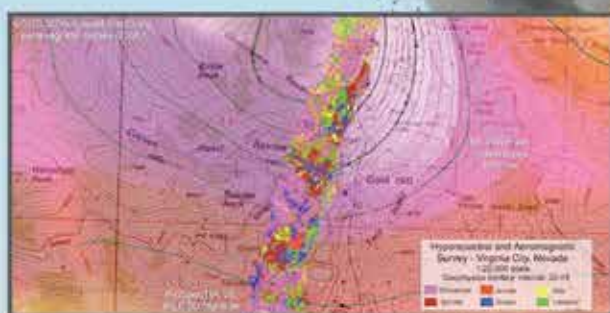
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## METS roadmap outlines growth areas

ELIZABETH FABRI

THE CSIRO has developed a new technology roadmap outlining potential growth areas for Australia's METS sector.

Developed in consultation with METS Ignited Growth Centre, researchers, and government, the 88-page report highlights the importance of METS to the nation's "innovation ecosystem" to meet future global mining challenges.

The report identified five areas for growth, which included new technologies to unlock deeper reserves; data driven mining for better and faster decision making; advanced extraction methods; improving social and environmental sustainability; and developing mining automation and robotics for safer and more efficient operations.

CSIRO chief executive Larry Marshall said the roadmap was a great example of its Strategy 2020's Customer First work, which aligned science to Australia's needs.

**"AS OUTLINED IN THIS INDUSTRY ROADMAP, THE INCREASING DEPENDENCIES ON TECHNOLOGIES AND THE SPECIALISED SKILL REQUIRED TO SUPPORT THEM ARE BOTH OPPORTUNITIES AND THREATS FOR OUR SECTOR."**

"In a sense we use science to anticipate the future and help us navigate to a better outcome," Dr Marshall said.

"METS is an important Australian sector and a global leader, but it can't rely on past successes in a rapidly changing global landscape.

"The sector must continue to innovate and take advantage of enabling technologies and new business models which are causing disruption across industries."

METS Ignited chief executive Roc Gros said the roadmap complemented the *METS Sector Competitiveness Plan* launched by METS Ignited and CSIRO in 2016, which laid strategic foundations for sector success over the next 10 years.

"The Australian METS sector needs scale and speed to stay abreast of global changes," Mr Gros said.

"As outlined in this Industry Roadmap, the increasing dependencies on technologies and the specialised skill required to support them are both opportunities and threats for our sector.

"The METS sector is technologically advanced but must develop faster Intellectual Property transfer and build better relationships within our helix of stakeholders to take industry capability to the next stage.

"The collective economic footprint of the METS and mining sector in Australia is significant."

## IFS and GIS: A powerful tool for enterprise asset management

By Patrick Zirnhelt

Vice President Enterprise Service & Asset Management IFS

GEOGRAPHIC information systems (GIS) are being used today in hundreds of thousands of organisations. In fact, the use of computer-based maps in organisations and across society in general is becoming pervasive.

Maps make it possible to view a wide variety of information in a geographic format. And that geographically displayed data empowers people and organisations to analyse information more precisely, make more informed decisions, and improve operations.

IFS has aligned itself closely with Esri and has developed a robust integration with the Esri GIS software. This integration enables geographic-based data visualisation and analysis for multiple diverse purposes.

Several industries that use IFS enterprise asset management solutions can leverage the integration with Esri to track, monitor and maintain physical assets – such as those found in the mining industry.

These organisations are realising significant benefits, including increased performance and lifecycle of their assets, improved regulatory compliance, reduced operational costs, and higher employee productivity.

### Mining applications

GIS integration with enterprise asset management solutions offers mining companies improved geological insight.

Mineral and ore deposit information can be displayed on an interactive map, allowing mining operators to plan new or expanded drilling and mining operations more accurately.

Mining operations are very asset-intensive. Mining companies use



complex machinery to extract, haul and process minerals and ore. Large, powerful equipment such as conveyors, dozers, drills, graders, haul trucks, loaders, longwall machines, roofbolters, scoops, underground rail and many other valuable assets must be tracked.

Integration between enterprise asset management and GIS gives mine operators the ability to visualise asset locations, asset bills of material, asset installation and movement history, asset service and maintenance history, and more.

### Mobility support

GIS integration with IFS EAM also facilitates gathering, updating, and

viewing asset information from the field.

Field technicians and surveyors can remotely record and update data regarding asset location planning, installations, configuration updates, problems, maintenance, and much more.

Smart phones, tablets, laptops, and ruggedised devices can be used remotely to gather and record mining and a broad range of other GIS-related data. All GIS and asset data can also be visualised on these remote devices.

### Dial before you dig

Asset management/GIS integration also provides information essential for infrastructure maintenance and planning. We're all familiar with the concept of "dial before you dig", the service that alerts construction and maintenance crews about underground assets, such as power lines, pipelines, sewers etc., that may be buried beneath the ground where they are about to dig.

Its integration of asset management data with GIS software that provides the data and digital map displays that make "call before you dig" services possible. IFS contains asset information such as work history, landowner information, repair and/or replacement data, supplier details and more, all of which are readily visible on the visual GIS map display.

This asset management information is just as useful for mining companies looking to perform maintenance work. Visualisation and analysis of mining equipment data empowers mine operators to plan and manage projects more effectively, increase the yield from mining operations, boost worker productivity, and grow the bottom line.

## Downer, Microsoft alliance for cloud tech

CAMERON DRUMMOND

DOWNER EDI (Downer) has entered into a strategic alliance with Microsoft to develop market cloud-based solutions and services that would digitally enhance their respective markets and allow for entry into new markets.

Under the alliance, Microsoft will invest resources and funding to help accelerate time-to-market for targeted Azure-based cloud services, while Downer will offer these solutions and services as an integral part of its current portfolio of solutions and services.

Downer chief executive Grant Fenn said the company was excited to be working with Microsoft.

"I believe the strategic alliance will provide Downer with unique capabilities to grow offerings in both new and existing markets," Mr Fenn said.

Microsoft Australia managing director Steven Worrall said the alliance would accelerate the pace at which Downer and Microsoft could innovate on their customers' behalf.

"We do not underestimate the value that this will unlock – our collaboration will deliver fresh perspectives and deep technical understanding to address the



Image: Downer Group.

specific challenges and opportunities facing the industries we serve," Mr Worrall said.

"Microsoft is pleased to collaborate with a respected business leader such as Downer – assured in the value that we can deliver as a result of this relationship."

Downer said the alliance between the companies was expected to deliver a continuous stream of new cloud-based solutions and service offerings over the next 18 months, with the first wave expected for a phased release during the second of half of 2017.



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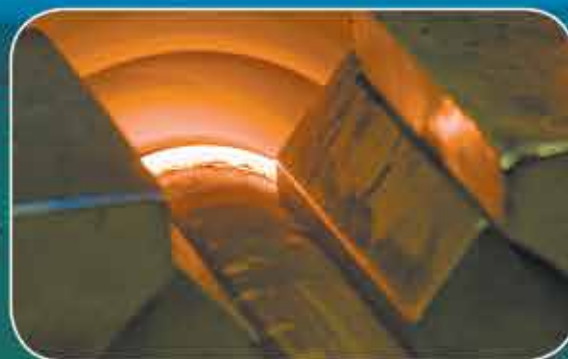






Image: First Quantum.

## First Quantum nears commissioning

CAMERON DRUMMOND

CANADIAN-based miner First Quantum Minerals said it was just months away from commissioning its massive \$US5.48 billion Cobre copper project in Panama.

First Quantum global exploration director Mike Christie said construction of the open cut mine – 120km west of Panama City – was about 50 per cent complete.

**“EVERYTHING ABOUT THIS MINE IS SUPER SCALE. ONCE FULLY OPERATIONAL THE PLANT WILL PROCESS AROUND 72 MILLION TONNES A YEAR AND EACH OF THE FIVE PITS HOSTS AROUND ONE BILLION TONNES IN COPPER INVENTORY.”**

“We are spending around \$US1 billion on the project this year to keep to our 2018 commissioning schedule for the entire operations,” Mr Christie said.

“All seven mills – the largest in the world – and their drives will be installed by mid this year and that’s a key outcome for us.”

First Quantum said it would be investing a further \$US830m next year and \$US110m in 2019.

“Everything about this mine is super scale,” Mr Christie said.

“Once fully operational the plant will process around 72 million tonnes a year and each of the five pits hosts around one billion tonnes in copper inventory.

“Cobre Panama in any view is a very large project with 3.7 billion tonnes of measured and indicated copper resources – more than enough to keep us going on site for 40 years.

“While the deposit is enormous, it is low grade but this project is all about scale and making this project work is helped by economic factors like an extremely low strip ratio and attractive tax regimes in Panama.”

The project is proving an economic boom for Panama, creating 7000 jobs during construction with 2500 employees for ongoing mining operations.

Mr Christie said the company expected Cobre to produce about 320,000 tonnes of copper concentrate per annum, equating to about \$US2bn worth of exports each year.

“That’s equivalent to around 4 per cent of Panama’s current GDP,” he said.

Once in full production, First Quantum was expected to emerge as the fifth or sixth largest copper producer in the world.

# Tanzania extends Acacia ban



Workers at Acacia’s Bulyanhulu underground gold mine.

Image: Acacia Mining.

CAMERON DRUMMOND

BARRICK Gold’s African subsidiary Acacia Mining said it was losing more than \$US1 million in revenue each day Tanzania extended its mineral export ban.

The ban was imposed in March after the value of concentrates in Acacia’s containers at Dar es Salaam port were found to be more than 10 times the amount declared by the company. Tanzania’s presidential committee has since decided to keep the export ban in place for declaring incorrect volumes.

Acacia rejected the committee’s claims that one month’s gold production from the

company’s Tanzanian mines was about 250,000oz; and believed there were significant discrepancies in the data provided.

“The committee’s findings imply that Bulyanhulu and Buzwagi each produce more than 1.5 million ounces of gold per year,” the company stated.

“This would mean they are the two largest gold producers in the world; that Acacia is the world’s third largest gold producer; and that Acacia produces more gold from just three mines than companies like AngloGold Ashanti produce from 19 mines, Goldcorp from 11 mines, and Kinross from their 9 mines.”

Barrick said the ban on Acacia represented

a drop of up to 6 per cent of its expected 2017 gold production guidance of between 5.3 million ounces (moz) and 5.6moz.

The Toronto-based miner’s current full-year forecast included a contribution of between 545,000oz and 575,000oz of gold (at a 63.9 per cent basis) from Acacia’s Bulyanhulu and Buzwagi mines.

“Barrick is offering Acacia its full support as Acacia works to resolve this matter with the government of Tanzania,” the company said in a statement.

“Barrick will evaluate any necessary adjustments to its full-year outlook should Acacia determine a revision to its own 2017 guidance is required.”

# Prospects in Latin America

ELIZABETH FABRI

AUSTRALIAN miners should diversify and consider Latin America for new opportunities, according to presenters at this year’s Latin America Down Under Conference.

Held 17 to 18 May, the sixth annual conference put a spotlight on mining prospects in countries such as Peru, Argentina, Brazil and Mexico for Australian junior and mid-tier explorers.

Day one speaker Governor General Peter Cosgrove said commerce between the regions had now exceeded \$10 billion, with 96 ASX-listed mining companies having established 465 projects across 16 countries.

“Last year I was fortunate enough to be the first serving Australian Governor-General to visit Latin America,” Mr Cosgrove said.

“In 17 days I made State visits to Mexico, Uruguay, Argentina and Chile; as well as an official visit to Brazil.

“There was desire to encourage more small and medium sized Australian mining companies to explore in South America, and there was an appetite for tapping into the mining engineering and technical services that are one of the great strengths of the Australian sector.”

Mr Cosgrove said momentum was building in the region, with more than \$2.5 billion total capital raised by ASX-listed companies for Latin America projects in the last five years.

“We are seeing WA-based FMG securing a 1400sqkm exploration lease in Ecuador, Galaxy Resources and Orocobre producing lithium in Argentina which is increasingly in demand for batteries, and Australian-managed First Quantum is developing a copper mine in Panama, the second biggest project in

**GOVERNOR GENERAL PETER COSGROVE SAID COMMERCE BETWEEN THE REGIONS HAD NOW EXCEEDED \$10 BILLION, WITH 96 ASX-LISTED MINING COMPANIES HAVING ESTABLISHED 465 PROJECTS ACROSS 16 COUNTRIES.**



that country after the world-famous Panama Canal,” he said.

The Council on Australia Latin America Relations (COALAR) chairman Chris Gale agreed, stating Australia was projected to invest \$US55 billion in Latin America mining between 2012 and 2031, with many of the countries ranking high on the Fraser Institute’s mining investment attractiveness ratings.

“One only has to look at Latam’s mining profile to reinforce why Australia should be paying the region far more attention and with a greater on ground presence,” Mr Gale said.

“This includes Brazil’s domination of the region with its iron ore mining.

“The region produced 45 per cent of global copper production in 2015, as well as 50

per cent of its silver output, 26 per cent of molybdenum production, and 21 per cent of zinc and 20 per cent of gold outputs.”

Mr Gale said Australia must move away from its reliance on Asia, and the scenario of “when China gets a cold, Australia now gets the flu”.

“Australian and Latin American countries have more in common with each other than with Asian countries and each has much to offer the other,” he said.

“Latin America looks to Australia for leadership and as a model to replicate its institutions.

“The increasing liberalisation of their markets on the Andean side presents many opportunities for two way trade and investment.”



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## IN BRIEF

Lithium  
Australia  
enters JV

## GERMANY

LITHIUM Australia has signed a joint venture agreement with Deutsche Rohstoff subsidiary Tin International to earn up to a 50 per cent interest in its Salisdorf project in Germany.

The terms of the agreement included an initial cash payment of EUR 50,000 and 1.7 million Lithium Australia shares, followed by a EUR 750,000 exploration spend by June 2018 for a 15 per cent share, and a further EUR 1.25 million payment by May 2020 for the remaining 35 per cent interest.

Lithium Australia managing director Adrian Griffin said developing a lithium project in Germany strengthened the company's European partnerships and added to its global lithium mica inventory.

Millie's  
Reward results  
high grade

## AFRICA

BASS Metals has completed technical due diligence at its high grade Millie's Reward project in Madagascar.

On 30 May, the Perth-based company said fieldwork confirmed outcropping pegmatites with significant spodumene mineralisation, including grades of 7.08 per cent lithium oxide.

Completing due diligence was one of the conditions of an agreement to acquire two adjoining mining permits and lithium mining rights for a third mining permit.

"The team at Bass Metals are excited by these results at Millie's Reward and look forward to the completion of commercial due diligence and finalising the transaction," Base Metals chief executive Tim McManus said.

Consolidated  
Zinc identifies  
new targets

## MEXICO

ASX-listed Consolidated Zinc (CZL) has identified new geophysical targets south east of its Plomosas Project in Mexico.

Recent analysis showed a deep magnetic body at a depth of between 700m and 1300m, which represented a heat source for a larger hydrothermal system.

"It's exciting to think that there are potentially significant extensions to the Plomosas mineralisation further along strike to the south and also the opportunity to review the prospectivity for copper and gold mineralisation within the project area," CZL managing director Will Dix said.

## 2017 Samarco restart unlikely



Reconstruction efforts at Samarco mine in January 2017.

Image: BHP.

## ELIZABETH FABRI

BHP and Vale are unlikely to resume operations at their ill-fated joint venture mine Samarco this year, despite earlier reports indicating a restart was 'technically feasible'.

The Brazilian mine, which has been offline since 5 November 2015 following the tragic Fundão tailings dam burst that killed 19 people, still had a number of regulatory hurdles to clear before it could recommence production.

Samarco Mineração SA chief executive Roberto de Carvalho said talks were continuing with the Brazil government to obtain necessary licenses.

"It is getting increasingly tight to resume operations this year," Mr Carvalho told *Reuters*.

"Each day that passes makes it tighter."

Mr Carvalho said with \$3.8 billion in outstanding debt obligations, the production halt had been harmful to negotiations aimed at a restructuring agreement with creditors.

"We have been in talks with banks and bondholders, but the basic condition is that the company resumes operations," he said.

Samarco produced about 30.5 million tonnes (mt) of iron ore per annum, and once reopened was expected to run at 60 per cent capacity, and deliver an annual rate of 18mt.

In December last year, BHP and 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.

## South32 buys Arizona Mining stake

## CAMERON DRUMMOND

SOUTH32 will pay \$C110 million (\$107m) for a 15 per cent stake in Canadian multi-commodity miner Arizona Mining.

Arizona Mining is focused on its Hermosa zinc-lead-silver project, which includes the Taylor deposit, located in Santa Cruz County, Arizona.

South32 chief executive Graham Kerr said Hermosa was a highly prospective project and was another step in the company's strategy to identify opportunities outside of its current portfolio.

"We look forward to working with Arizona Mining to progress this project through the feasibility and permitting stage to unlock the Hermosa Project's full potential."

Under the agreement, South32 will acquire 45,000,000 Arizona Mining shares at \$C2.45 per share.

South32 also has the right to nominate a director to the board of Arizona Mining providing it maintains a minimum 12.5 per cent interest.



Hermosa is a major zinc-lead project in the US.

Image: Arizona Mining.



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# Still a lady's best friend?

*While diamond mining in Africa can reap economic benefits for the region, companies need act with astute corporate social responsibility when operating in poorer nations, or more conflict diamonds could end up on our jewellery.*

## CAMERON DRUMMOND

SINCE DeBeers' highly successful 1948 'A Diamond is Forever' advertising campaigns kicked off, diamonds have been associated with the culture of romance and marriage.

The diamond industry in the US rose almost 100-fold in four decades, from sales of \$US23 million in 1929 to \$US2.1 billion by 1979.

In 2016, world diamond sales were reported to be more than \$US80 billion, of which the US currently makes up about 45 per cent.

Since the early 1990s 'blood diamonds' – those sold illegally to finance armed groups and civil wars in Africa – have remained at the forefront of controversy.

A three-year ban on diamond exports from the Central African Republic (CAR) lifted in 2016 had spurred renewed violence in the region, which led to the deaths of hundreds of civilians and six peacekeepers.

The ban was put in place to stop armed groups profiting off illegal diamond sales.

Ranked as the 10th largest diamond producer in 2012, CAR's diamond exports were banned in 2013 after the Kimberley Process – which puts checks and balances on the authenticity of the stones' origins – said there was no way to determine blood diamonds were not part of the country's exports.

Other African nations, however, have flourished off the back of revenue from diamond mines.

Botswana hosts the world's richest diamond mine – Jwaneng – which in



Image: ALROSA.

2016 produced \$2.35 billion worth of gems.

Nicknamed the "Prince of Mines", Jwaneng has been in operation 35 years and has helped the country go from one of the poorest nations in Africa, to one of its wealthiest.

Botswana also hosts the ninth largest diamond mine in the world, Orapa, which has been in production since 1971.

Both mines are owned in joint ventures between DeBeers and the Botswanan Government.

Other countries in Africa that benefit from the diamond trade include Angola, South Africa, Namibia and the Democratic Republic of Congo.

With its 11 primary and 16 alluvial deposits in northern Siberia,

Russian-owned ALROSA accounts for about one third of the world's diamonds, producing 37.4 million carats in 2016.

Its Yubileinaya operation is the world's second-largest diamond mine and has been in production since 1989.

Last month, ALROSA – the second biggest diamond miner in the world – partnered with Angola's national diamond company Endiama to develop Africa's largest kimberlite deposit, Luele, which has an estimated worth of more than \$US35 billion.

"If the resources are confirmed, it might be one of the biggest [discoveries] in the past 60 years worldwide," an ALROSA spokesperson said.

The miner said it was also looking into projects in Botswana.

A flurry of mining juniors were also set to step up exploration in Africa, including Diamcor Mining, Tsodilo Resources, Lucara and Australian-based Lucapa Diamonds.

On 1 May Foreign Minister Julie Bishop welcomed delegates to Perth for the Kimberley Process Intersessional meeting, the first of two meetings Australia will host as Chair of the Process in 2017.

During Australia's term as Chair, the focus would be on strengthening implementation of the process, including ways to enhance the security of rough diamond shipments and certificates.

"We will also lead a comprehensive review of the Kimberley Process to strengthen its integrity and ensure that the Process is well placed to lead international standard setting in the diamond trade into the future," Ms Bishop said.

Australia will also host two special forums during the Intersessional meeting. The first will explore cooperation between Indigenous communities and the mining sector in Australia.

The second will look at ways to address evolving consumer expectations, and ensure fairness and sustainability across the entire diamond value chain.

"Australia has a strong economic interest in a sustainable and resilient mining sector and will continue to work with all stakeholders to forge a stronger and more comprehensive process in relation to the diamond trade," Ms Bishop said.

# Lucapa records strong sales

## ELIZABETH FABRI

PERTH-based diamond company Lucapa's latest sale from its Lulo diamod mine in Angola included 1878 carats of alluvial diamonds at a cash price of \$US1.3 million.

The fourth sale for 2017, through partners Endiama and Rosas & Petalas, brought Lucapa's total sales revenue for the year to \$US14.5 million, at an average price per carat of \$US1747.

Lucapa managing director Stephen Wetherall said the majority of the diamonds were sourced from the new Mining Block 28, with diamonds weighing in at more than 10.8 carats at an average price of \$US695; a lower result than previous sale parcels.

Earlier in the year, the company recovered Angola's second largest diamond on record at 227 carats, along with other large stones that weighed 62, 65 and 92 carats.

In the March quarter the company also recorded a 33 per cent increase in diamond production to 4098 carats.

"With the Angolan wet season now over, Lucapa and its partners expect to resume alluvial mining operations at the high-value mining blocks later this month(May)," Mr Wetherall said.

**IN THE MARCH QUARTER  
THE COMPANY ALSO  
RECORDED A 33 PER CENT  
INCREASE IN DIAMOND  
PRODUCTION TO 4098  
CARATS.**



Image: Lucapa.





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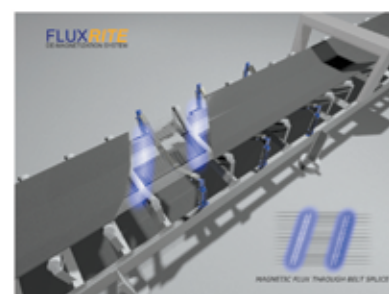
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Customer – Iron Ore – WA



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**"A LOT OF SUPPLIERS AND BUSINESSES HAVE BEEN HANGING ON FOR WHAT YOU WOULD CALL AN 'ECONOMY IN TRANSITION', AND IF THE PROJECT WERE TO NOT GO AHEAD IT WOULD INSTIL A LOT OF DOUBT AND REALLY SUBDUCE BUSINESS CONFIDENCE IN THE REGION."**

# The final hurdle

Development of Adani's \$16.5 billion Carmichael coal project is back on the table after the QLD Government made clear its position for the go ahead of the project. The Indian miner had dramatically suspended its final investment decision just days before its due date, blaming lack of clarity over royalty rates and the specifics of a \$900 million Federal loan through the North Australian Infrastructure facility (NAIF).

## CAMERON DRUMMOND

OVER the last two years, Adani has tenaciously pushed through the approval processes for the gigantic Carmichael mine and associated infrastructure which, if developed, had the potential to unlock widespread development in the Galilee Basin.

The proposed Carmichael coal, railway and port project includes building Australia's largest thermal coal mine in the north Galilee Basin, about 160km northwest of Clermont in Central QLD.

Mine to port would be linked by a new 388km standard gauge rail line to a new terminal at Abbot Point Port near Bowen.

Once developed, Carmichael would be one of the biggest coal mines on the planet, producing between 25 million tonnes per annum (mtpa) and 60mtpa of high quality thermal coal.

Over its 60 year life the major infrastructure would not only support Adani's operations, but the rail line and port facilities could facilitate development of other proposed mines in the Galilee Basin.

The combined mine, rail and port operations would provide more than 10,000 direct and indirect jobs and supply opportunities for the region, with operational hubs slated for Mackay, Townsville and Rockhampton.

The project benefits would be felt locally, regionally and across QLD, generating about \$22 billion in mining taxes and royalties in the first half of the project life.

This could assist in providing public funding to help deliver schools, hospitals, roads and other services and stimulate activity throughout the economy.

## Confusion & Clarification

On 22 May however, the Indian-based miner deferred its final investment decision



Adani Australia chief executive Jeyakumar Janakaraj.

on the Carmichael project – due to be made the following week – until it received clarity from the Queensland Government over lower or deferred royalties.

The news garnered a strong response from Federal Minister for Resources and Northern Australia Matt Canavan.

"How in hell can the Queensland Labor Government not even have the appropriate tax regime in place, two years after they've been in Government?," he said during a 23 May doorstep interview.

"This project's been assessed now for more than seven years, and the Queensland Labor Government is so chaotic, so wracked with indecision and in-fighting, that they can't even tell Adani what taxes they will pay if they make a decision to invest in the mine."

On 27 May Premier Annastacia Palaszczuk announced a new development policy under which the Adani Carmichael mine would "pay every cent of royalties in

full".

"My sole focus this week has been to lead negotiations that ensure Queenslanders get the best deal that will see more jobs and more money flowing into our state," Ms Palaszczuk said.

"This is the right policy that will provide certainty and deliver jobs, royalties and opportunities for years to come.

"It will unlock these resource areas so that projects can proceed and deliver thousands of new jobs for regional Queenslanders.

"The same approach will apply to all greenfield projects in these Basins and the North West Minerals Province such as the Adani Carmichael Coal project.

"Opening up these three regions for development has the potential to support thousands of new jobs that are needed in regional centres along the coast as well as in outback Queensland."

Deputy Premier Jackie Trad said that if royalties were deferred they would be paid

with interest and with security of payment in place.

"Consistent with our election commitments, cabinet has [also] determined that any NAIF funding needs to be between the Federal Government and Adani," she said.

The Northern Australia Infrastructure Facility (NAIF) is a Federal funding scheme to encourage and finance private sector investment in economic infrastructure that benefits northern Australia.

The NAIF was enacted in May 2016 and may approve a total of \$5 billion in loans to 30 June 2021. No projects had yet received NAIF funding.

QLD Treasurer Curtis Pitt said on 29 May the State continued to support the NAIF, to which Adani had applied.

"The NAIF is a concessional loans scheme," Mr Pitt said.

"NAIF was established by the Federal Government and any project financing approved by the independent NAIF board will flow between the Federal Government and a project proponent.

"We will not stand in the way of those arrangements [and] in the case of the Carmichael mine, any funds will pass directly from the Federal Government to Adani."

After an 11th-hour scramble the QLD Government made its position clear that royalties would be paid and they would not stand in the way of any NAIF funding approval Adani received.

On 30 May Adani said it had reached an agreement with the State Government on royalty payments for the Carmichael project.

"This shows a strong commitment by the State Government to the project and is a benchmark decision to take this project forward," Adani said in a statement.

The Adani parent company board said it would consider the final investment decision at its next board meeting.

(CONTINUED ON PAGE 22)



# Townsville strikes perfect work/life balance

TOWNSVILLE North Queensland has a well-established history as one of Australia’s premier fly-in fly-out (FIFO) hubs for mining personnel.

For decades, Townsville has been a major services and administrative centre for some of Australia’s most significant mining and industrial operations, including projects in the Bowen and Galilee Coal Basins and the North West Minerals Province.

Positioned on the doorstep of reef, rainforest and resources is a unique offering Townsville North Queensland can proudly boast.

Between the world heritage listed Great Barrier Reef and wet tropics rainforests, seamless direct air connectivity and one of Australia’s richest mineral provinces at arm’s reach, Townsville presents an enviable FIFO lifestyle.

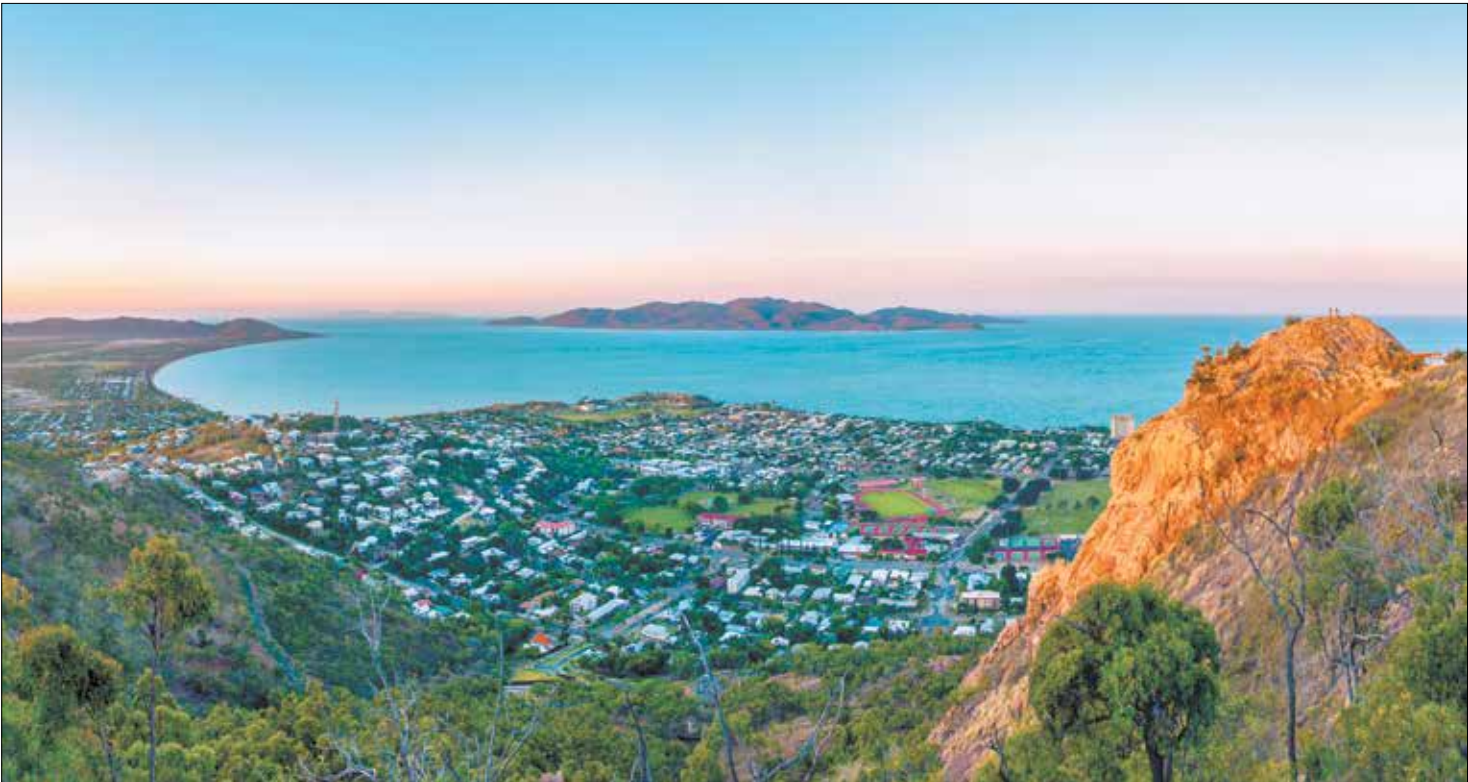
The city of Townsville is the proud custodian of one of the very first FIFO airports in Australia.

Between defence and resources sectors alone, Townsville was built to not only service the companies that rely on a stable FIFO workforce, but to support FIFO employees and, most importantly, support their families.

Townsville strikes the perfect FIFO work/life balance; it’s in the city’s DNA, and is supported by the services, infrastructure and culture of the region.

Townsville’s major strengths as a FIFO hub include size, quality, and availability of a regional skilled workforce; strong existing representation across the mining and construction sector; established air connectivity; strong projected population growth; affordable living costs and of course, a highly attractive lifestyle.

Several mining companies have already



View from Castle Hill, Townsville to Magnetic Island.

Image: Megan MacKinnon.

put the call out to Townsville to service their major projects in FIFO capacities.

BHP Billiton Mitsubishi Alliance (BMA) has called upon Townsville to supply more than 200 workers to its Peak Downs and Suraji mines.

Additional FIFO opportunities for Townsville have also recently been announced by global resources company MMG, confirming Townsville as the base of its FIFO operations for the Dugald River project.

It’s anticipated that up to 400 on-site staff will be employed when the mine is fully operational.

Such announcements are welcome news for jobs, business and overall confidence throughout Townsville.

Choosing Townsville as a FIFO base is a vote of confidence in the advantages the region offers the mining sector as a proven logistics base with a ready workforce.

These are exciting projects for Townsville and will supply the economic

boost the region needs.

A FIFO lifestyle out of Townsville provides an employment opportunity without the hassle of uprooting families and lives already established in a thriving city – a city that basks in more than 300 days of sunshine each year and is surrounded by a myriad of natural wonders. Townsville provides a lifestyle that is incredibly conducive to a FIFO workforce, supported by direct flight transfers that effortlessly take residents from home to mine and back again.

## Townsville North Queensland

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(CONTINUED FROM PAGE 20)

**"THE COMBINED MINE, RAIL AND PORT OPERATIONS WOULD PROVIDE MORE THAN 10,000 DIRECT AND INDIRECT JOBS AND SUPPLY OPPORTUNITIES FOR THE REGION, WITH OPERATIONAL HUBS SLATED FOR MACKAY, TOWNSVILLE AND ROCKHAMPTON."**



"I welcome the fact that belatedly, the Queensland Government has sorted out their internal ructions and divisions and are now fully behind the project, signing a deal... with Adani to proceed with the project on a royalties arrangement," Mr Canavan said.

"And the Queensland Government has confirmed that they will play their role in regards to any funding from the Northern Australia Infrastructure Facility."

### Benefits

The regional centres of Rockhampton, Mackay and Townsville are set to reap massive benefits if Carmichael clears these final hurdles.

Townsville Chamber of Commerce president Troy Popham said the project had been portrayed as moving forward for a number of years and has built momentum in a region that would have otherwise remained soft on the mining sector.

"A lot of suppliers and businesses have been hanging on for what you would call an 'economy in transition', and if the project were to not go ahead it would instil a lot of doubt and really subdue business confidence in the region," he said.

Adani has flagged Townsville as the project's regional headquarters.

Mr Popham said it was a great decision that would provide much needed downstream revenue to the region.

"There's also discussion as to whether Townsville would act as a fly-in fly-out (FIFO) base for the project," he said.

"From a risk management point of view it would make sense to base 3000 FIFO workers in more than just one location to mitigate travel delays from things like natural disasters."

In April last year Rockhampton was identified as a FIFO hub for the Carmichael project by Downer Mining, the project's prime contractor.

While that decision was not set in stone, Rockhampton Major Margaret Strelow said she was determined her town wouldn't miss out once the Galilee Basin was opened.

"We have been working very hard for the past two years with Adani and GVK



10,000 direct and indirect jobs would be created if the project was developed.

Hancock and I am very excited to know that Rockhampton will play a key role in supporting and delivering services as the Galilee Basin opens," she said.

Councillor Neil Fisher said discussions with stakeholders and contractors had commenced.

"The rapport we have built up with the resource industry during the last four years has now put Rockhampton at the forefront where we will become an integral part of the development of the Galilee Basin," he said.

"We are very fortunate to have the skill level within our community to assist in developing new projects in our region; we're excited to see that the development of Carmichael mine will draw on those skills in the coming years."

Some of the supply chain opportunities for the region include engineering, construction, maintenance, heavy

machinery, equipment, transport, camps, and labour hire.

Mackay is set to be the operational hub for the project – a base for suppliers to provide heavy equipment and engineering services for Carmichael.

Resource Industry Network (RIN) director Mick Crowe said the Mackay region was well-placed to service the project in an operational capacity.

"The operational hub is where the real work will happen and drive major job generation," Mr Crowe said.

"The Mackay industry sector has long supported Adani in its journey and this workshop is a great opportunity for potential suppliers to hear first-hand from key personnel as well as a means of building relationships and creating communications."

Mr Crowe said being named as an operational hub for Adani recognised the

expertise in Mackay.

He said it demonstrated that the Adani team understood where they could best access the world-class engineering and heavy industrial support they would need for the projects.

"Being an operational hub will mean the major Tier 1 contractors who will carry out the mining and support services will now likely be based here and would operate side by side with our services companies," he said.

"This means jobs for our region, both during construction and for the future life of the mine in a maintenance capacity."

"The flow-on effect of employment throughout our communities will be hugely beneficial for our economy."

"It will be the catalyst for other businesses to invest in our region when they see the investment by Adani and the boost in our regional economy."



# A driving force in QLD mining

NESTLED between Queensland's three major coal basins, the Bowen, Galilee and Surat, the Rockhampton Region is the provincial capital of Central QLD, acting as the principal service point for the resources sector.

With a rich mining and cultural fabric, the Rockhampton Region has transformed into a major economic and lifestyle hub, with more than \$5 billion gross regional product as of 30 June 2015.

Mining is a huge economic contributor to the region, with the historic Mt Morgan gold and copper mine alone drumming business in the area for more than a century between 1882 and 1992.

The region is favoured for its strong transport links; sitting in a prime location at the junction of major roads and rail networks, it features direct aviation links and freight routes connecting north, south, east and west.

Put simply, Rockhampton is the gateway to Central QLD and Northern Australia, and is the ideal location for Adani's FIFO hub; a sentiment that Rockhampton Regional Council agrees on.

Rockhampton Regional Council is 100 per cent committed to supporting Adani through the lifecycle of the Carmichael Mine and its associated infrastructure.

The council has put forward a strong bid to ensure the Rockhampton Region continues a proud history of servicing the resources sector, and a key part of this was the construction of an onsite airport (expected to cost around \$20 million), which would see all flights travel directly to Rockhampton and back for workers.

This bold move is part of a wider vision for Rockhampton to be a powerhouse for mining jobs.



Rockhampton Regional Council's 24-hour airport.

An average of 600,000 passengers a year pass through the Rockhampton Regional Council's 24-hour airport, which contains the third longest runway in the State.

Its current capacity and capability services major airlines with flexible schedules, international flight facilities and air-side infrastructure that supports all phases of aircraft up to the Airbus A380.

The region's road and rail infrastructure allows the region to act as the major logistics route for the Bowen Basin and future development in Galilee.

The road has been designated as a Type 1 road train route from Gracemere west, with a fully sealed road network and considerably flat gradient.

In addition, the Bruce Highway is the major north-south route that extends the length of the Queensland coast and forms an important part of the National Highway Network.

The highway recently underwent a \$225 million upgrade, which has significantly improved flood immunity and capacity.

Resources companies also make use of the region's North Coast Rail Line to transport ore, which comprises the North Coast Rail Line that runs in parallel to the Bruce Highway and branches onto the east-west Central Rail Line; along with Aurizon's road-rail intermodal facility that handles about 50,000 containers annually; Toll and NQX's intermodal facility on the Central Rail Line at Port Curtis; the Gracemere Queensland Rail tilt train servicing

facility; and driver change facility in Stanwell and Gracemere.

The Gracemere Industrial Area is also an excellent location for businesses seeking to provide goods and services to coal mining and coal seam gas operations in the Bowen, Galilee and Surat Basins as well as primary production throughout Central Queensland.

Located 10km west of Rockhampton, the facility recently received a \$10 million infrastructure investment by the council for an expansion.

This investment is complemented by the council's Economic Development Action Plan that will deliver more than 75 projects across 10 economic sectors to drive long-term economic growth beyond 2020.

ADVANCE

Rockhampton  
Region

Rockhampton is recognised globally as the **economic heart** of Central Queensland and the gateway to northern Australia.

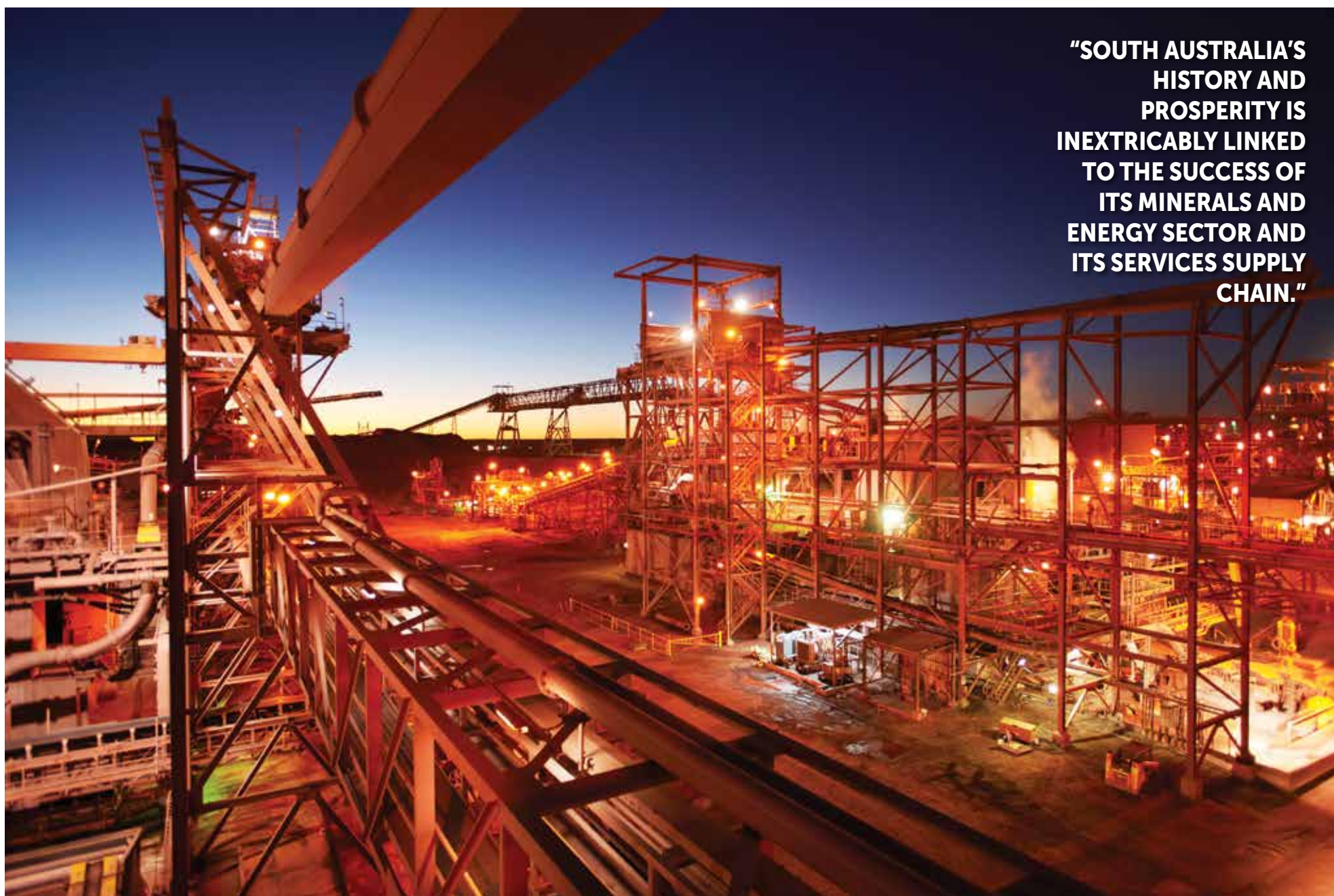
Acting as the **service centre** for more than 250,000 people, while also supporting the surrounding resource, health, agriculture and education sectors.

Rockhampton Regional Council is 100% committed to supporting **Adani** throughout the life cycle of the Carmichael Mine and its associated infrastructure.

Learn more about opportunities in the Rockhampton Region

ADVANCEROCKHAMPTON.COM.AU





**"SOUTH AUSTRALIA'S HISTORY AND PROSPERITY IS INEXTRICABLY LINKED TO THE SUCCESS OF ITS MINERALS AND ENERGY SECTOR AND ITS SERVICES SUPPLY CHAIN."**

Olympic Dam mine.

Image: BHP.

# Renewed optimism

With a history dating back to the 1800s, the South Australian resources sector is a continued force in Australian mining, boasting a portfolio of world-class projects and new exploration prospects for the next generation of mining.

## ELIZABETH FABRI

SOUTH Australia is a proud mining region, with many noteworthy accolades to its name.

To begin, the State is home to the world's largest known uranium deposit and Australia's largest underground mine, Olympic Dam.

It also hosts 68 per cent of the country's copper resources, 80 per cent of its uranium resources, 28 per cent of the economic gold resources, and more than 14 billion tonnes of iron ore.

In 2016, the region even ranked as the second most attractive investment destination for minerals exploration in Australia, behind WA, according to The Grant Thornton *Jumex Survey*, and was in the world's top 10 for overall mining investment, according to the Fraser Institute.

SACOME chief executive Rebecca Knol said upward movement in the sector through 2016 has continued into 2017, mustering a renewed optimism.

"South Australia's history and prosperity is inextricably linked to the success of its minerals and energy sector and its services supply chain," Ms Knol said.

"The sector contributes \$4 billion to the States' export revenue annually, delivering a further \$208 million to the State in



Prominent Hill mine.

Image: OZ Minerals.

royalties and directly employs 10,000 people while supporting a further 16,500 people in the Mining Equipment, Technology and Services (METS) sector.

"Continued development of sophisticated discovery and extraction technologies will strengthen the State's position as an exporter of copper, gold, uranium, iron, steel, nickel, mineral sands, oil and gas."

The region also maintained more than 700 exploration licenses and more than 20

advanced projects in exploration, feasibility and resource definition phases, signifying great promise for the future.

### Key projects to watch

South Australia's world-class projects include Olympic Dam, Prominent Hill and Kanmantoo, with many more scheduled to begin production in the next few years.

OZ Minerals' Carrapateena project is

one of the most anticipated projects in development with construction on the access decline now underway.

The feasibility study sees first commercial production in the second half of 2019.

In April, OZ Minerals announced it would be accelerating the involvement of major contractors at Carrapateena with requirements for local and Indigenous participation.

"The progression of Carrapateena copper-gold project is proceeding at pace and a brilliant example of the stimulus the PACE exploration initiative has made towards unlocking South Australia's precious resources, with the deposit discovered through a collaborative drilling grant in 2005," Ms Knol said.

Further details of the project are expected to be announced later this year.

"OZ Minerals is also looking at constructing a high-tech copper concentrate treatment plant (CTP)," Ms Knol said.

"The CTP creates a high grade copper concentrate that will be an attractive feed and blend stock for smelters."

Other projects in the planning pipeline included Iron Road's \$4.5 billion Central Eyre Iron Project, which was granted State Government approval in May.

(CONTINUED ON PAGE 29)



# More than a century of hydraulic solutions

PROVIDING custom solutions for Australia's most demanding industries, Southcott remains at the cutting edge of design and production of high performing hydraulic supplies.

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The company's focus is on delivering consistent high-quality products, and by manufacturing in Australia, Southcott can control the entire process, from raw material to finished product.

The company has successfully designed, installed and commissioned major projects throughout Australia.

Southcott products are highly regarded in all industries and used on various machinery and equipment for their quality and reliability.

The company is an innovative reputable solutions provider that understands the hydraulic industry; with a dynamic culture, expertise and a distribution network of 10 sales branches, three manufacturing facilities, electronics' division and more than 150 distributors across Australia.

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The company has successfully designed, installed and commissioned major projects throughout Australia.

hydraulic components ranging from pumps, valves, motors, cylinders, quick release couplings, child couplings, hydraulic gates hose and adaptors give Southcott the leading market advantage.

Southcott engineers work closely with clients every step of the process — from design, development and prototyping to fields testing — to develop a system solution. Southcott also analyses existing systems, offering ways to improve reliability efficiency or find cost savings.

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More information can be found at: [www.southcotthydraulics.com.au](http://www.southcotthydraulics.com.au).



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(CONTINUED FROM PAGE 24)



The Carrapateena project is one of the most anticipated projects in development.

Set to create nearly 2000 jobs during construction and 700 jobs over the 25 year life of the mine, the project will include construction of a new 145km rail link and deep-water port at Cape Hardy, near Tumby Bay.

The port will also be able to be used to export other goods from the region, such

as grain.

Iron Road is now looking to secure the remaining project financing by December 2017.

State Premier Jay Weatherill said if Iron Road met the approval conditions this project would create thousands of jobs and have a significant, lasting impact

on the South Australian economy.

“Connecting the Eyre Peninsula to the world’s markets through a modern rail link and deep-water port that can be used by other businesses will also enable this important region of our State to grow,” he said.

Established projects such as Prominent

Hill and Challenger were also performing well.

“The Prominent Hill copper-gold-silver mine, produced 116,882 tonnes of copper in 2016, meeting its annual copper guidance for the second consecutive year,” Ms Knol said.

In the 2016 financial year Olympic Dam achieved its highest production since 2006 and exceeded its forecast, delivering 203,000 tonnes.

Despite BHP’s operation facing a number of challenges during the current financial year, including the State-wide black outs in September and maintenance and investment in infrastructure to maintain underground material movement, the operation will soon produce first ore from the high-grade Southern Mine Area, which contained 70 per cent of the previously untouched orebody along with investing in critical infrastructure projects, including the smelter campaign.

While the smelter campaign will be delivered in a relatively short time-frame, the business has recently announced that it was recruiting 350 people for its ongoing operations.

In 2016, the State’s uranium mines also reported near-record production worth \$499 million from the sale of 5493 tonnes of uranium oxide, which represented about 75 per cent of Australia’s national output.

“Olympic Dam accounts for about two-thirds of the state’s uranium production with the remainder production from Four Mile owned by Quasar Resources and processed at the nearby Beverley plant by affiliate company Heathgate Resources,” Ms Knol said.

“Four Mile goes from strength to strength as more resource pockets are discovered and developed.”

Honeymoon uranium mine was also set to be brought back online after being on care and maintenance since 2014.

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“Under new owner Boss Resources, latest exploration across three project areas in the region point to the new Honeymoon project having some of the highest grade resources held by an ASX-listed uranium developer - with a combined total project resource of 28, 800 tonnes contained equivalent U3O8 across three project areas,” Ms Knol said.

“Technical studies into uranium processing options are underway and a feasibility study is planned to start this year into the commencement of production, and an expansion of operations.

“Latest results for the Jason’s prospect confirm its high prospectivity.”

Other projects included the proposed \$40 million Kookaburra Gully graphite mine on the lower Eyre Peninsula; and prospective mining projects in the Curnamona province and Yorke Peninsula.

Ms Knol said the Curnamona province had generally “flown under the radar” when it came to its copper-gold credentials, but times were changing.

“Proof of its prospectivity is the production from the State’s newest gold mine Portia and nearby identification of copper resource at North Portia, Kalkaroo (Havilah Resources) and Mutooroo,” she said.

Accelerating exploration

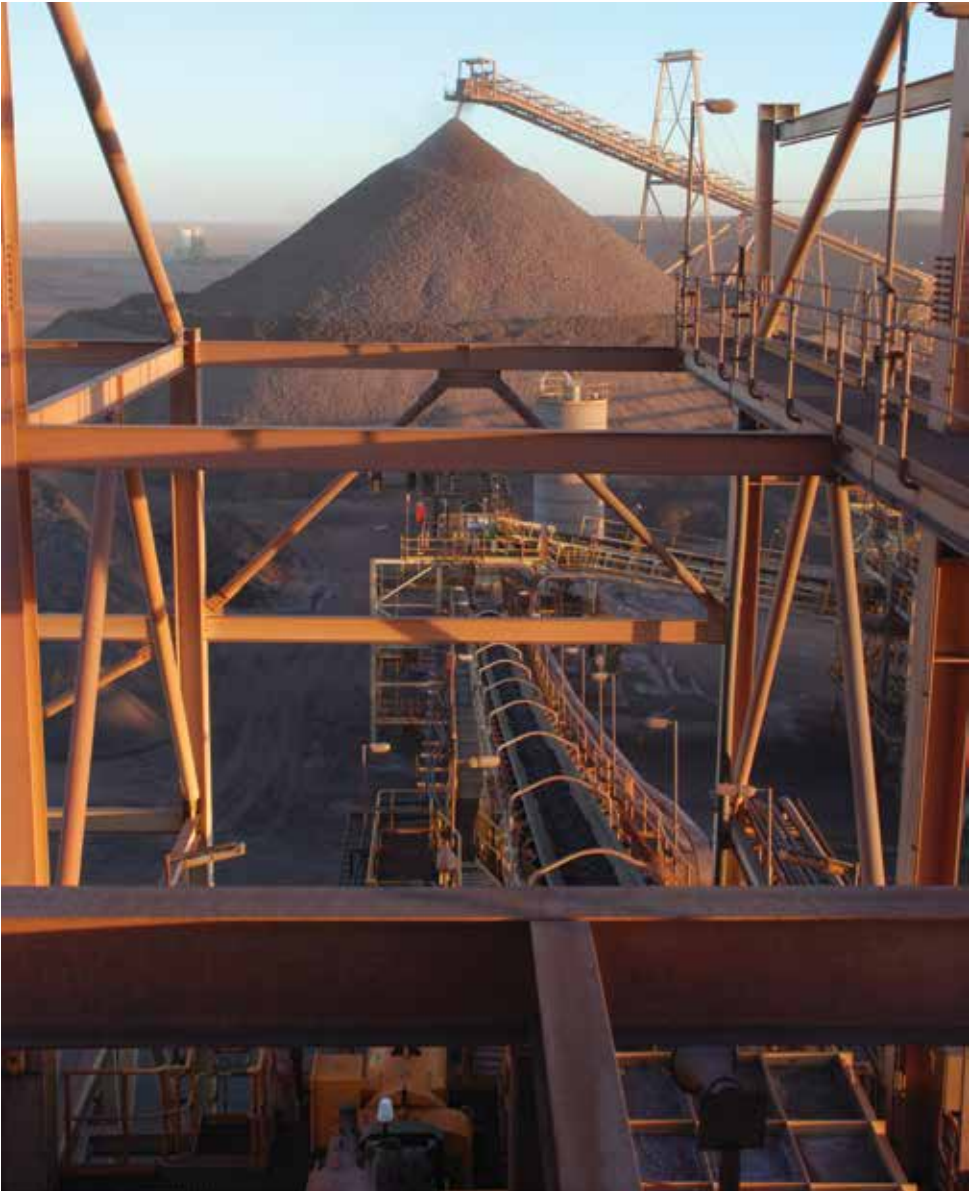
Over the last few years, the South Australian Government made significant contributions to promote mining sector growth.

On 30 November 2015, it introduced a two-year \$20m PACE Copper plan, which was coined the ‘rebirth’ of exploration in the Gawler Craton region.

The plan aimed to deliver the world’s largest high-resolution airborne geophysical and terrain imaging program; industry-government collaborative drilling on new targets; and world-class data and interpretation.

In February 2016, the Premier introduced a broader plan for the State’s copper industry with the launch of a dedicated Copper Strategy, which set out to triple copper production in the next 15 years and position Australia as the world’s third-largest copper producer.

“The strategy, which has set a target



OZ Minerals’ Prominent Hill mine.

to triple copper output to 1mtpa by 2030, has gained momentum through its first year, as the sector unites to implement its action themes directed to accelerate exploration, discovery and information; develop innovative infrastructure, services and research; and engage to build industry and community capacity,” Ms Knol said.

“The forthcoming Copper to the World Conference (27 June) will throw the spotlight on the progression of this important initiative.

“Currently 125 companies are exploring or investigating opportunities for new copper mineral targets of the State, so there are plenty of opportunities to partner with them in the search for copper.”

Last year, the State also awarded \$3.5m in grants to 26 mineral exploration projects through its PACE Discovery Drilling program; which included grants of up to \$250,000 – an increase from the \$100,000 offered in previous rounds.

A magnetite strategy was also introduced

in May last year, as well as a The South Australian Geophysical Reference Model (SAGRM) to allow exploration companies to view the State’s geophysical data in 3D.

Community engagement

Ms Knol said two of the biggest challenges the State’s resources sector faced was community engagement and access to land.

“We are no longer in an era of unabated land access, limited environmental concerns and limited community interest in projects,” she said.

“The industry has changed dramatically. Communities are galvanised globally and leverage off social media to spread their message.

“At the same time, we must acknowledge that a lot of activities taking place in our sector are also impacting the agricultural sector and must ask ourselves whether we are engaging with this sector adequately.

“What are the issues we have in common and how can we work together?”

Ms Knol said communication was crucial in these areas, between Government, local communities, and the public.

She said a review of the State’s mining laws was underway to maintain its relevance to business and the community.

“This review has involved wide consultation and seeks to bring forward the economic and social benefits of the state’s mineral wealth for all,” Ms Knol said.

“While it will strengthen South Australia’s one stop shop model, it will also improve transparency in land access, engagement, negotiation and resolution processes.

“On this basis we will continue to attract leading, responsible miners that build strong relationships with the community.”

Ms Knol said the outlook for South Australia was positive and SACOME was well positioned to lead the mining and energy sector in South Australia as it transitioned to a digital future.

“New technology will help to guide us into a new era, but we must value the ingenuity of our skilled workforce to help deliver desirable outcomes,” she said.

“Our people are the lifeblood of our industry and their skills and creativity should be given the chance to flourish as this transition takes place.”



# Quality products drive productivity

PRODUCTION processes are becoming ever more complex, so it's important the measurement technology used to control and monitor these processes is all the more understandable and intuitive.

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VEGA employs more than 1200 people worldwide; 600 of whom work at its Schiltach headquarters in the Black Forest, Germany.

This is where – for more than 50 years – solutions to demanding measuring tasks have been conceived and brought to realisation for chemical and pharmaceutical plants, the food industry, drinking water supply systems, sewage treatment plants, landfills, environmental, mining, power generation, oil platforms, refineries, ships, and aircraft.

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Over this time, Lucas TCS has worked with some of Australia's leading mining and civil construction organisations.

Lucas TCS has been recognised for its expertise in the field of mining and civil contracting and has built and maintained long standing relationships with clients, consultants, suppliers and subcontractors both locally and nationally.

This strong relationship focus has assisted Lucas TCS to complete a broad range of construction, earthmoving and mining projects throughout Australia over the last four decades.

Lucas TCS has the capacity to develop new mining operations as well as supplement existing operations with capability to undertake overburden stripping, drill and blast, load and haul of ROM material, crushing, screening, bulk commodity haulage, waste and landfill management, surveying, plant maintenance and mobile camp operation.

A complete service from resource to process plant to ship can be offered, as well as individual parts of mining services.

An extensive and modern fleet of mining and construction equipment, supported by excellent maintenance and supply chain management, can be easily mobilised to a project and is also available for long or short term hire.

As a Federal Safety Accredited company, Lucas TCS views the safety and wellbeing of all personnel as its core value.

It is committed to instilling the highest level of safety standards on all projects and



More information can be found at [www.lucastcs.com.au](http://www.lucastcs.com.au).

providing a safe working environment for all personnel working on project sites.

With the head office based in Adelaide, the company has a core commitment to support local business while also supporting the regions it operates in across Australia.

Lucas TCS has been a key participant in some of the State's leading mining projects, including the OZ Minerals Prominent Hill mine, Arrium Whyalla operations, Iluka's Jacinth Ambrosia mine, White Dam gold mine and the Murray Zircon Mindarie 'C' mineral sands

mine.

Lucas TCS possesses the experience of managing tight and challenging construction programs to ensure its clients secure the outcome they set out to achieve – delivering a completed quality project, on time, on brief, and on budget.



Our Solutions.  
Your Success.



At Lucas TCS we're about the solution. We continually look for new and innovative ways to approach civil construction and mining, ensuring our clients have successful and cost effective outcomes.

For over four decades we've built our reputation working on a diverse range of projects with Australia's leading mining and civil construction organisations.

Our team of over 400 employees all follow the same cultural philosophy that is intrinsic throughout our company... **Our Solutions. Your Success.**





**"THE FREE TO ATTEND  
CONFERENCE, THE  
FUTURE OF MINING,  
OFFERED AS PART  
OF THE EXHIBITION  
HAS BEEN SHAPED BY  
LEADING INDUSTRY  
MINDS."**

# The Future of Mining

Registrations have well and truly opened for Australia's most extensive mining exhibition, the Asia-Pacific International Mining Exhibition (AIMEX), running from 29 to 31 August.

## REUBEN ADAMS

MINING companies, in general, are now in better financial health than at any time in the last two to three years, according to a *1Q17 trends and 2017 outlook* report from EY.

"Capital allocation remains key, and with diverging outlooks, we expect M&A drivers to continue to differ by commodity and geographical market," EY stated.

"In markets where growth is expected, such as copper and gold, we expect strategic activity to rebound while in weaker markets consolidation and restructuring activity will continue to drive deals.

"The lack of exploration spend as a result of limited access to capital, will inevitably contribute to a future supply deficit and may trigger a return to financing across the juniors towards the end of 2017."

The report stated that early signs of market bottom would encourage those who've successfully strengthened their balance sheets to start considering strategic acquisitions.

"Mid-tiers will be consolidating their positions through all-equity based



transactions, with a view of becoming major players in their respective commodities at the peak of the next cycle," it stated.

As one of the world premier mining conferences and exhibitions, AIMEX is the perfect place for businesses to seek out the latest technology and innovations in a strengthening market.

*The Future of Mining* is a world-class,

free to attend conference taking place at AIMEX in 2017.

The conference program will feature world-class keynote presentations, case studies and white paper discussing key themes, including mining's economic and political outlook; technology and innovation; advancements in drill and blast, processing, and bulk materials

handling; fleet performance; and health and safety.

NSW Mining chief Stephen Galilee, General Electric strategic account development manager Ian Larsen, and Mining3 chief Professor Paul Lever have already been confirmed as 2017 speakers, with the full conference program set to be revealed in the coming weeks.

The Mining Innovation conference stream will allow speakers to showcase cutting edge technologies and innovative practices to optimise productivity, heighten workplace safety, and maintain global competitiveness and sustainability.

The Underground Mining conference stream provides a platform to discuss and address critical topics in the underground mining sector such as monitoring productivity, maximising efficiency, maintaining competitiveness, skills development, and policies.

The Surface Mining conference delivers a combination of fundamental themes such as safety, equipment, systems, transport of materials and step-change solutions for mines moving forward.

**(CONTINUED ON PAGE 32)**



# ROSTA

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Malaga, Western Australia 6090  
✉ sales.aus@rosta.com  
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### Cost affective 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





(CONTINUED FROM PAGE 30)



**"THE ABILITY TO CONNECT FACE-TO-FACE IS STILL SO VITAL TO BUSINESS DEVELOPMENT, AND EVENTS LIKE AIMEX ENABLE YOU TO DO THIS IN A TIME EFFICIENT MANNER. BEING ABLE TO CONNECT AND INTERACT WITH COMPANIES AND THEIR PRODUCTS IS INVALUABLE."**



AIMEX 2017 will also feature 'The Breakthrough': a new platform showcasing emerging technologies that could be game changers in the mining sector.

This new-to-market technology has only been released in the last 18 months, and this feature will see these technologies launch on mass to the sector.

Close consultation with industry is key to the development of AIMEX 2017.

This has been spearheaded by the recently appointed AIMEX non-executive chairman David Moulton, who brings decades of global coal mining experience to the role, including stints as managing director and chief executive for Centennial Coal.

"The ability to connect face-to-face is still so vital to business development, and events like AIMEX enable you to do this in a time efficient manner. Being able to

connect and interact with companies and their products is invaluable," Mr Moulton said.

Event organiser Reed Exhibitions Australia has also announced a new partnership with Engineers Australia at AIMEX.

AIMEX event director Brandon Ward said the industry partnership was the first-of-its-kind, opening up new opportunities for collaboration between engineers from all fields of practice and AIMEX exhibitors.

"As the peak representative body for Australia's engineering professionals 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.

"Engineers Australia plays an important role in shaping the industry's future, and it is fantastic to have them involved as we continue planning for the 2017 event."

Engineers Australia chief operating officer Ron Watts said the partnership with AIMEX would help better connect members with the latest knowledge, expertise and experience.

"Through this new industry collaboration, Engineers Australia will be able to provide our members the opportunity to learn about the latest global developments in mining, network with industry peers and speak directly to suppliers showcasing cutting edge technology," Mr Watts said.

Mr Ward said the scale of AIMEX offered an unparalleled opportunity for the industry to upskill, network, and generate new business leads and opportunities.

"No other event in the region has the same offering for visitors to network, collaborate and learn from one another, interact with over 300 exhibitors and discover some of the latest products from leading suppliers," Mr Ward said.

"The free to attend conference, *The Future of Mining*, offered as part of the exhibition has been shaped by leading industry minds.

"This program features leading opinions on how people will work in the future, advances in new technologies and process improvements as well as taking a deeper focus on where the sector is heading."



# ROSTA: bigger and brighter than ever

THE widely known ROSTA range of rubber torsion element products have been providing solutions to the mining, oil and gas industries in fixed, modular and mobile plant — as well as a myriad of other industries — for 73 years.

The ROSTA Australia subsidiary in Malaga, WA, was established by ROSTA AG Switzerland in January 2015 to service the Australia and Asia Pacific region, following many decades of ROSTA product promotion by agents and distributors.

ROSTA Australia's vast stock holding is for the support of its distributor network, OEMs and end-users.

ROSTA Australia staff collectively has more than 50 years of experience with ROSTA products and have seen the development of many solutions from concept to reality.

## ROSTA's main product categories

**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     Single     Pivot     MB



ROSTA products have been a stalwart to the resources sector for decades.

**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 Tensioners** for chain drives range from 3/8" pitch upwards.

As well as the standard ROSTA SE type Tensioners, ROSTA produce custom Tensioners to suit just about any drive application.

**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 Rubber Suspension** units are modular components that ROSTA produces in a variety of designs which find their way into innovative engineering designs the world over. As well as its range of standard products, ROSTA's ability to design, analyse and produce custom rubber torsion elements is second to none.

The company is proud of its products, and quality validation is of the highest importance.

A well-equipped research and development department leaves nothing to chance; the materials tests that take place before and periodically during production are the guarantees for a comprehensive quality standard — so customers can be rest assured that a spare part element produced in 10 years' time will have the same characteristics as the one supplied today.

ROSTA is in its element providing customer support and assistance to find a possible solution, independent of the type of industry.

Information regarding contact details, brochures and CAD file downloads of ROSTA products can be found at: [www.rosta.com](http://www.rosta.com).



EnterpriseIS is a business improvement company with a long history working with the resources sector.

## Business improvement specialists

ENTERPRISE Improvement Solutions Australia (EnterpriseIS) is a business transformation company with a key focus on business excellence, asset management and education.

With a history of significant involvement in the mining industry, EnterpriseIS has worked with clients across the sector to deliver substantial improvements to operations.

Its team is comprised of experienced professionals who use recognised performance enhancement techniques to help clients identify, understand and capitalise on sustainable improvement opportunities.

At the core of EnterpriseIS is its Improvement Sustainability Model, which links the individuals in the teams to the capabilities, and the technical tools required to achieve success.

EnterpriseIS' core belief is that in order

to create sustainable improvements, the people, the capabilities and the tools must be integrated effectively.

Through understanding client needs and being part of the implementation of the solution, the company has been able to deliver significant returns on investment to businesses within the mining, manufacturing and infrastructure sectors.

EnterpriseIS has worked at a variety of mining operations, helping them to capitalise on improvement opportunities.

These include iron ore mines and port operations in WA, gold mines in South Africa, and coal terminals and cable manufacturers in NSW.

More information about how EnterpriseIS works with clients to improve business can be found by visiting them at AIMEX or through: [www.enterpriseIS.com.au](http://www.enterpriseIS.com.au).

# Why EnterpriseIS

We exist to help transform good companies into great companies. We are passionate about what we do; with a focus on innovation and making the complex, simple. We believe in only working with clients where we can make a meaningful contribution. Taking companies from anxious to excited about the future is what we do best, and working in close collaboration is how we make it happen.

At EnterpriseIS our philosophy is to drive sustainable business performance improvements through a focus on three key areas:

**EnterpriseIS**  
business excellence

business excellence  
EnterpriseIS

**Business Excellence**

- Organisational Design
- Strategic & Business Planning
- Data & Information Management
- Continuous Improvement methodologies

**EnterpriseIS**  
education

education  
EnterpriseIS

**Education**

- Learning & Development
- Capability Enhancement & Application

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# 3D printing tech on show

RENISHAW is a global company with core skills in measurement, motion control, healthcare, spectroscopy and manufacturing.

It is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement.

The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to mining and brain surgery.

The business is also a world-leader in the field of additive manufacturing (or metal 3D printing), where users are able to utilise technology to 'print' parts from metal powder.

This is increasingly becoming a preferred choice for miners and METS companies where precision and time efficiency is key.

The company is pleased to be able to attend this year's AIMEX exhibition at Stand 1414, where it will be showcasing systems from its Additive Manufacturing (AM) and Spatial Measurement Divisions (SMD).

SMD is particularly pleased to be able to highlight its new Void Scanner and Boretrak at the show.

Void Scanner is utilised for stope monitoring applications and enables users to collate three dimensional point clouds from a position of safety.

Boretrak enables users to measure and audit borehole deviation from proposed designs so that they can make informed decisions and optimise blasts.

"We are excited to be able to attend the AIMEX event. To be able to show our



More information can be found at [www.renishaw.com](http://www.renishaw.com).

systems at a platform like this will enable us to engage with potential customers and highlight the real cost benefits of what our niche products and technologies can

bring to mine and quarry sites," Renishaw product manager Alastair Delooze said.

"Our week will be focused on how our additive manufacturing and spatial

measurement systems can fit into mine sites both now and in the future, particularly with the ever growing potential of autonomous vehicles and remote working."

## The new Void Scanner

**Designed to produce fast, accurate 3D laser scans of underground voids where access is limited, dangerous or prohibited.**



[renishaw.com](http://renishaw.com)

Renishaw is a global company with core skills in measurement, motion control, healthcare, spectroscopy and manufacturing. It is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement. The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to mining and brain surgery. The business is also a world leader in the field of additive manufacturing (or metal 3D printing), where users are able to utilise our technology to 'print' parts from metal powder.

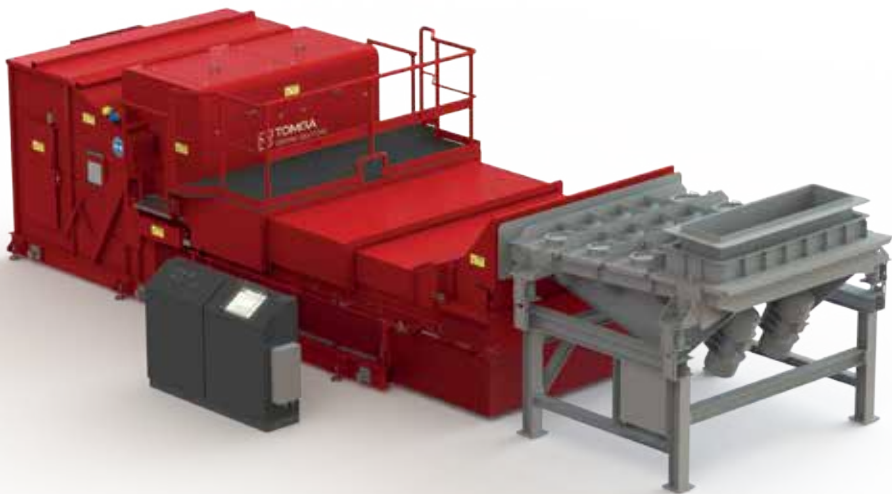
For more information about the new Void Scanner go to [www.renishaw.com/voidscanner](http://www.renishaw.com/voidscanner) or visit the team at its local Australian office in Melbourne.

You can also visit Renishaw at AIMEX in August at Stand 1414, to discuss more about how they can service your on-site needs.

**RENISHAW**   
apply innovation™

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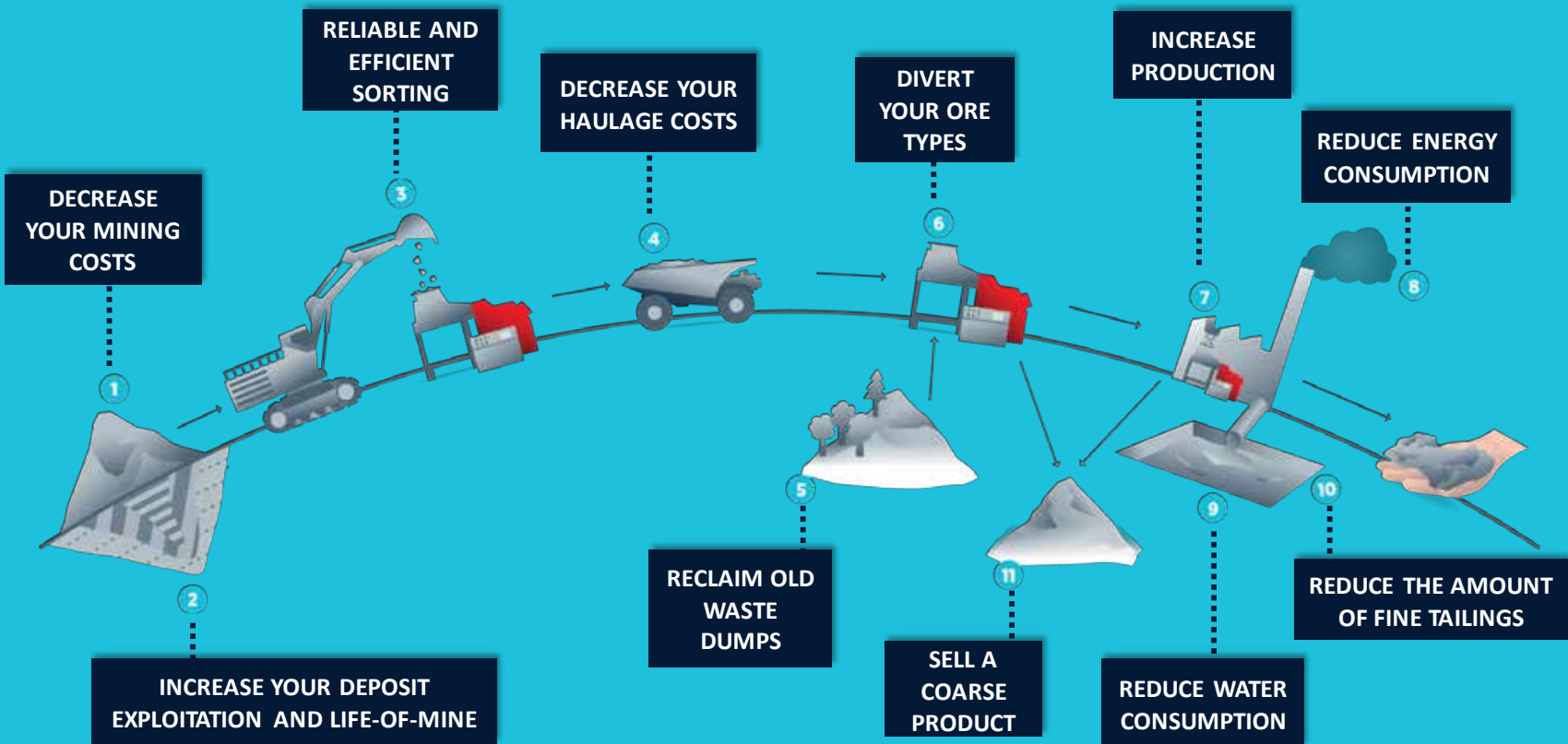
# World leader in sensor-based sorting technology

TOMRA sorting technology is able to reduce the mass by upto 90% by pre-concentrating mill feed, whilst retaining >95% of the target high grade ore before the traditional beneficiation process.

TOMRA range of highly advanced and automated sorting machines that utilise a number of different sensor technologies such as laser, x-ray, infra-red, electromagnetic and colour that are able to sort ore before entering a processing stream. This sorting process eliminates the waste material or barren material before it enters into the beneficiation circuit.

This in turn opens up additional processing capacity, reduces and often eliminates water consumption, equipment wear and dramatically reduces overall plant energy consumption whilst upgrading the ore before processing and increasing the life of mine and value of the deposit by now being able to process low grade ores.  
With the use of TOMRA ore sorting, plant size may be reduced, throughput increased and recoveries improved.

## SENSOR-BASED TECHNOLOGY CREATES VALUE IN VARIOUS PARTS OF THE MINING PROCESS



- HIGHER MILL THROUGHPUT
- IMPROVED PROCESSING EFFICIENCY
- BULK MINING INSTEAD OF SELECTIVE MINING
- INCREASED MINE PRODUCTIVITY

- HIGHER OVERALL RECOVERY
- COMPACT FOOTPRINT
- LESS ENERGY AND WATER CONSUMPTION
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## CONTACT US FOR YOUR FREE TEST WORK





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# Upgrades underway

Upgrades are under way at Pilbara Port Authority's ports to cater for the ramp up of LNG projects as well as a resurgence of the live export industry.

## CAMERON DRUMMOND

THE Pilbara region's gigantic iron ore export industry of is the primary driver making the Pilbara Ports Authority (PPA) the world's largest bulk export port authority, with the commodity accounting for about 95 per cent of total annual throughput.

Liquefied natural gas (LNG) and salt exports are the key exports rounding out the remaining 5 per cent.

PPA came into existence on 1 July 2014 through the amalgamation of the Port Hedland Port Authority and the Dampier Port Authority; stretching from the Port of Ashburton near Onslow in the south, to the Port of Port Hedland in the north, and includes the future Ports of Anketell, Balla Balla and Cape Preston East.

In the 2016 financial year PPA exported a record 630 million tonnes (mt) of cargo through its ports – Port Hedland alone accounting for its own record throughput of 460mt – returning the WA Government a \$100.5 million dividend.

Combined output across PPA's ports had steadily increased in the first few months of 2017 after dipping from an all-time monthly high of 60.6mt in December 2016 to 46.8mt in January this year.

By April, monthly throughput was back up to 55mt, an increase of 3 per cent over the same period in 2015.

PPA chief executive Roger Johnston said while iron ore remained the main focus of export by tonnage, other highly valuable commodities were also exported through the ports.

"We routinely talk about all the big stuff, but actually there are other important commodities that go through the port too," Mr Johnston said.

"We also have small tonnages between about 500,000t and 600,000t of copper concentrate goes out of Port Hedland which is worth about \$1 billion annually, and that's no small figure.

"There is also the expectation that lithium exports from projects out of the Pilbara will add high dollar value tonnage in the near future."

Mr Johnston acknowledged that this growth in export tonnages would start to cap off, however LNG would likely increase in the coming years, starting with the imminent commissioning of Chevron's Wheatstone project in the coming months.

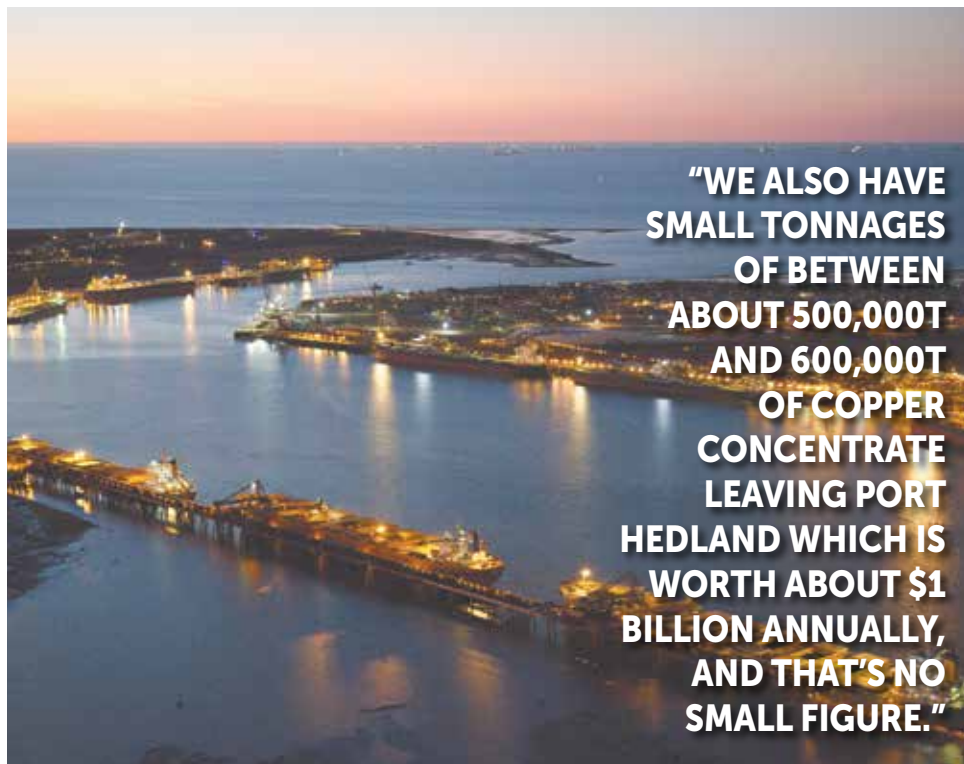
"What we will see in the forward years is LNG ramping up especially from Ashburton as iron ore export growth caps off after the commissioning of Roy Hill," Mr Johnston said.

"Any increase thereafter would be incremental."

## Projects

The Port of Port Hedland has recently developed a range of significant upgrades; the construction of a new integrated marine operations centre (IMOC), implementation of a new loading ramp for livestock exports; a new helicopter marine pilot transfer service; its Channel Risk Optimisation Project (CROP); and the replacement of channel markers.

The projects are funded by the Port Improvement Rate, a temporary levy charged on vessels entering and exiting the harbour, which funds capital improvements necessary to sustain the



The Port of Port Hedland at night.

Image: Pilbara Ports Authority.

long-term operation and development of the Port of Port Hedland.

## IMOC Update

PPA said it was progressing well with the development of its \$70.7m IMOC.

The IMOC will replace the existing, outdated Shipping Control Tower and be located adjacent to the existing Port Administration building.

The facility will control the marine operations of the port; including vessel movements in the inner harbour through the channel and offshore anchorage.

In February 2017, PPA awarded a contract to Australian Maritime Systems to design and install a Vessel Traffic Services (VTS) system at PPA's new shipping control tower in Port Hedland.

"The VTS system is a critical component of the new IMOC, which would help manage the safe and efficient movement of about 6000 vessel movements through the port each year," Mr Johnston said.

"The fit-for-purpose VTS system integrates radar, radio, CCTV and scheduling information to oversee the increasing number of vessels through the port."

Installation and commissioning of the new VTS system was expected to commence once the construction of the IMOC was completed in late 2018.

## Helicopter Transfer Service

A contract was awarded to Aviator Group to provide a new marine transfer pilot service at the Port of Port Hedland.

Two Eurocopter EC135 twin engine helicopters flew into Port Hedland on 25 March from QLD to improve PPA's marine pilot training program by allowing more passengers on each aircraft.

Each helicopter is capable of carrying seven passengers, and can reduce travel time by up to six minutes from the helipad to the end of the shipping channel and back.

The aircrafts were fitted with live tracking devices to assist the port's Shipping Control Tower in search and rescue situations.

The twin engine helicopters began

operations on 1 April, with 22 marine pilot transfers in the first 24 hours of operation.

"The two helicopters are here and they are terrific and they can carry greater numbers of people.

"Also, being twin engine gives them an in-built added safety feature over single engine helicopters if an engine should fail," Mr Johnston said.

## Livestock loading ramp

Due to international demand for Australian live exports PPA liaised with industry to raise awareness of Port Hedland's capability for live exports.

"We held a live export forum to see what we needed to do to help fire up the live export industry in the Pilbara," Mr Johnston said.

"The feedback was positive, so we then went to tender on getting new livestock loading facilities custom built."

PPA invested in the construction of a fit-for-purpose livestock loading ramp, benchmarked with similar systems at other ports.

The moveable ramp is to be commissioned this month, and will be able to be used on PPA's Berths 1, 2 and 3.

"Previously we were only able to load out from Berth 3 at Port Hedland, but have now expanded our ability to load livestock across all three loading berths at the port," Mr Johnston said.

Mr Johnston said the new ramp would ensure the safe and efficient loading of livestock onto vessels, in line with livestock industry requirements, and that there was a vision to the future to further expand PPA's ability to facilitate the export of livestock.

"In the future, the development of the Lumsden Point multi-user facility at Port Hedland will help support increased livestock exports from the Pilbara," Mr Johnston said.

"PPA will continue discussions with livestock exporters about development opportunities at Lumsden Point."

## CROP

In May 2016, PPA received State Government approvals to deliver a \$120m

Channel Risk and Optimisation Project (CROP), designed to reduce the risk of an obstruction in the Port of Port Hedland shipping channel and allow users to further optimise tonnages on their vessels.

It also involves the creation of a new emergency passing lane, extension of a deep water refuge zone, and the use of existing deeper depths along the tidally constrained 42km channel.

Together, these measures are aimed to optimise channel use for port users, by extending sailing windows and creating larger separations between departing vessels in a convoy. It would also potentially allow additional vessels to depart on the tidal window when necessary.

## Port of Dampier

Located on the West Pilbara's Burrup Peninsula, the Port of Dampier is a private port that facilitates the export of mainly iron ore (82 per cent in FY16) as well as LNG (12.5 per cent), salt and other general cargo; and mainly imports petroleum and diesel products for mining operations in the Pilbara region.

In FY16, Dampier exported a total 171.9mt of cargo, slightly down from 176.7mt in FY15.

Dampier VTS now carries out all functions of traffic within port waters, with new berthing protocols to facilitate passenger vessels that call at the port.

This will support boutique, smaller cruise vessels of less than 150m in length to berth at the Dampier Cargo Wharf.

The First LNG bunkering operation at Dampier was successfully completed earlier this year to test the viability of making it an option at the port.

Mr Johnston said opportunity was there to build the right infrastructure in place and or provide bunkering vessels that could operate out of the port.

"It could possibly be the green shoots of something new in terms of port traffic at Dampier."

## Port of Ashburton

PPA said it would take over the management of the Port of Ashburton around mid-2017, following the delivery of first gas from Chevron's \$29 billion Wheatstone LNG project.

The project includes two LNG trains with a combined capacity of 9.8 million tonnes per annum (mtpa) for a production lifespan of more than 30 years.

Mr Johnston said the multi-user port was ideally located to service international LNG markets, as well as open doors to future port users and create opportunities for growth.

"The port is operational and ready for first gas to be pumped out, however we also have to finish building the port authority infrastructure which includes buildings, security controls and the like, with our budget of \$32.5m," he said.

"Once completed, we will be in a position to see what other things we can facilitate.

"It has already been designed so that you can have two or even three LNG exporters using the channel in the future.

"Planning for future growth is a key principle for PPA, and we strive to ensure that any port development in the Pilbara stimulates investments, supports trade activities and contributes to the long-term growth of the Pilbara region," he said.





# PRINTING IN THE PILBARA

*Print, photocopy and document management technology is a necessity for the day-to-day running of all businesses, including Australia's resources sector which often requires offices in the country's most remote locations. Recognising the need for reliable printer servicing outside the metro area, SCOPE Business Imaging has created the ultimate printing service solution for businesses in the Pilbara, establishing a network of offices in regional WA to provide local on-ground support, an industry leading two-hour service response time, and 'First Time Fix' quality assurance.*

"WE started the business back in 1986 as we saw a gap in the market for quality, prompt and reliable service to support businesses that relied heavily on printers and photocopiers to produce valuable documents," SCOPE Business Imaging founder and managing director Dennis Bartulovic said.

"The rationale was to give a very quick two-hour or better response to a fault call, which would be measured from the customer call to when the technician walked through the door, and deliver greater efficiency, increased workflow, and reduced costs across their operations.

"That back in the day, and even today, was highly impressive; people just don't do it."

The standard response time in the industry generally averaged at between four and six hours in the city's surrounding areas, and a matter of days for regional locations.

Mr Bartulovic said in the metro area the SCOPE team averaged at about an hour and a half, and up to two hours up north within a 60km radius, and a next morning service if beyond this.

"When we went up north in the Pilbara this was just 'gold' for them, it was unique; they never had this, they used to wait days," he said.

The other drawback was in each of its locations in

Perth, Bunbury, Port Hedland and Karratha; each office had a substantial amount of warehouse capacity for spare parts and consumables; so the team never ran out.

"In Northern WA in particular, where the roads get cut off by flooding, we've overcome all of that," he said.

"In Port Hedland and Karratha we have ample stocks of everything that our clients need to keep their machines operational.

"That's been a huge bonus for us and we are the only company that operates in WA where it's a seamless situation; where if you order a product from us in Perth and you have branches in the regions and you have offices in the regions as well, we can deal with you here and deal with you in the regional centres through one organisation.

"Others have to go through different channels to get the work dispatched in the Pilbara, or even in Bunbury for that matter."

Service calls are also handled locally so customers can take comfort knowing they are talking to a person in their locality, with an understanding of where they are and what the conditions are like to get there quickly.

"It's not a call centre from over east which is how many other businesses operate," Mr Bartulovic said.

SCOPE Business Imaging's offering involved a comprehensive service contract, which included the hire

of the machine, and an all inclusive servicing, which took care of printer parts, consumables, labour, faults, and preventative maintenance.

Everything is handled as part of this service contract, which runs for the same amount of time as the renting portion.

Mr Bartulovic said while people could purchase the printing equipment, most people saw the benefits of renting to keep abreast with the latest technology.

"It's a fully tax deductible expense, where customers get a brand new machines about every three years," he said.

"During that three year cycle the machines get a facelift and an update, so customers get a refresh, and then they have a brand new model."

The company also takes this one step further, with a vested interest training employees up in how to get the most out of their machines.

"It's not just about walking in and fixing the machine and walking away; we take the time to see whether the staff have any issues, if we can help them with a specific task or even tailor one-touch soft settings on the machines to their environment," he said.

"It's going that little bit extra to understand what is it that they need to make their day easier and more effective working with the equipment."





### PILBARA PRESENCE:

Scope Business Imaging has an extensive and vast operation in the Pilbara. Its professional and state-of-the-art offices in Karratha (LIA) and Port Hedland (Wedgefield) comprise sales, sales support, service technicians and logistics – all contained locally. Its service vehicles are also fully mine site compliant and off-road specified, which allows the team to travel to remote office locations and onsite at mining premises. Having established two locations in this region means that businesses can experience service and support that is second-to-none. Scope Business Imaging offers a guaranteed two-hour service response time for local businesses, but average considerably less, with an 85 minute response time during April 2017. At each location, the team carry stock of the machines and components, to ensure a quick turnaround time and first time fix for faults.

### SOFTWARE SOLUTIONS:

Scope Business Imaging offer clients software solutions that are completely customisable and bespoke to their business needs. The products hinge around traditionally what is 'scan print copy' Konica Minolta devices with software to help manage document workflows that can be integrated through apps on the machine. The team pride themselves on remaining at the forefront of the latest technologies at the most competitive price.

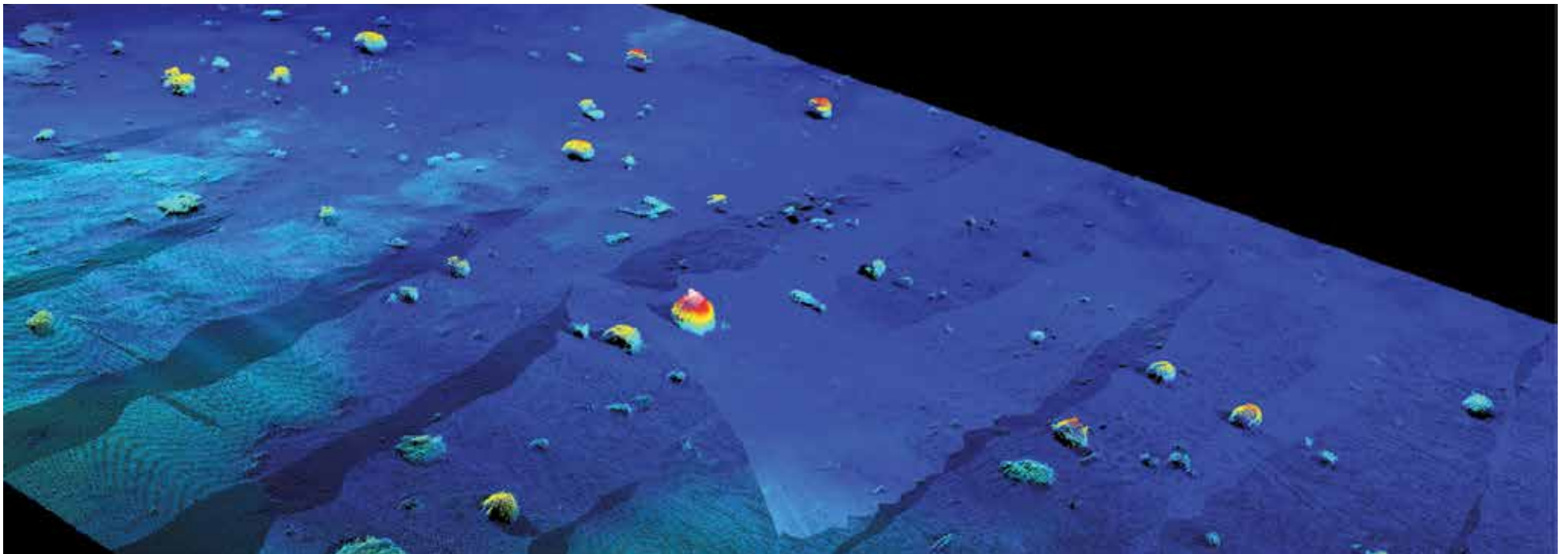
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issues affecting the industry, meaning its clients benefit from cost-effective solutions in an industry facing ever changing regulatory and financial issues.

PHS can be contacted when planning a coastal or marine infrastructure project; this enables clients to make informed decisions in areas of hydrography, minimising the potential outlays due to lack of information in that area of a project.

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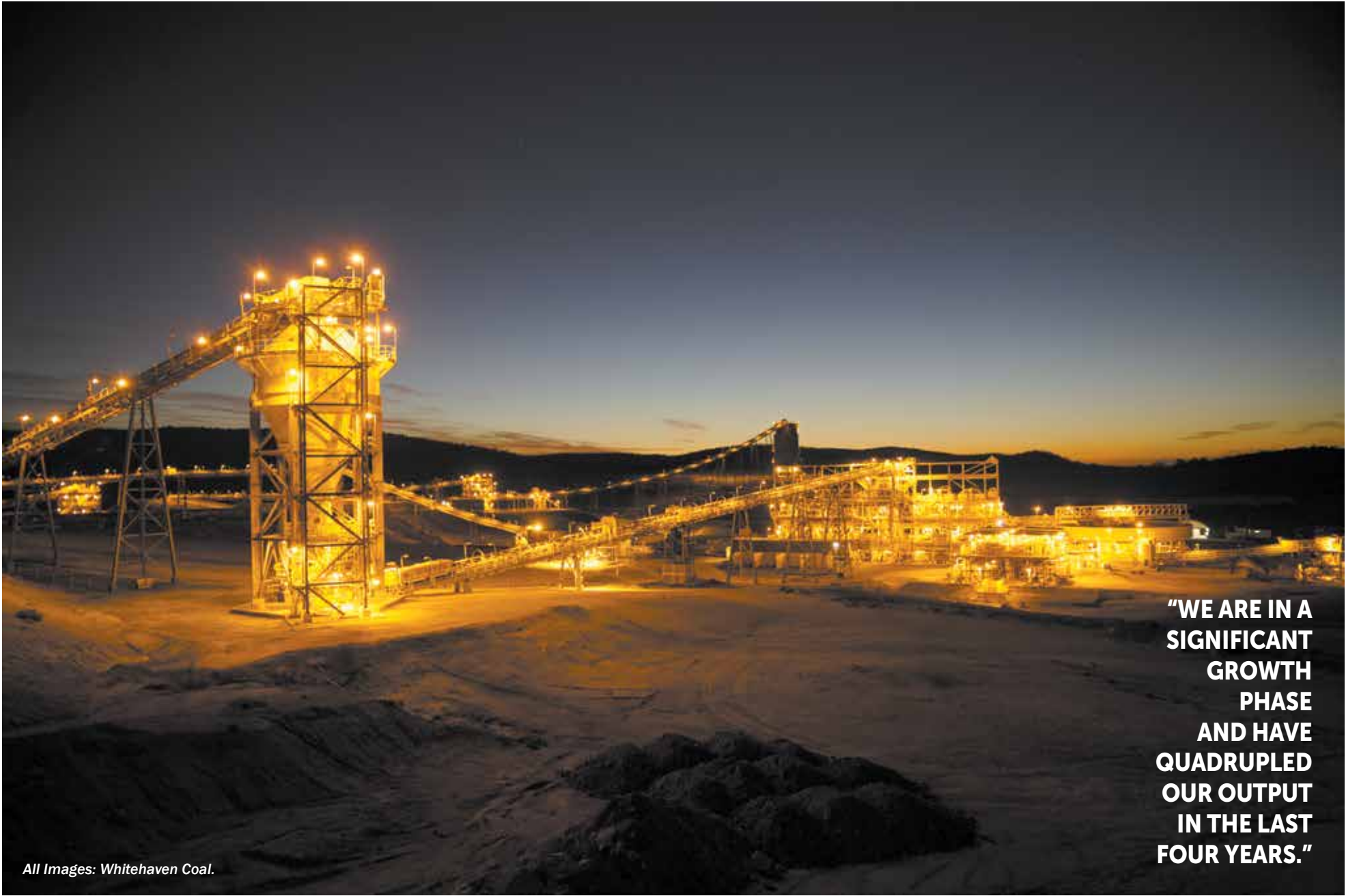


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**"WE ARE IN A  
SIGNIFICANT  
GROWTH  
PHASE  
AND HAVE  
QUADRUPLED  
OUR OUTPUT  
IN THE LAST  
FOUR YEARS."**

All Images: Whitehaven Coal.

# Growth spurt

On the back of increased seaborne coal prices, Whitehaven banked record revenue during the first half of the 2017 financial year which enabled the company to pay down more than \$300 million of debt.

CAMERON DRUMMOND

WHITEHAVEN Coal is Australia's largest independent coal producer, with five operating mines in North West NSW. The operations have a combined annual output of 20.1 million tonnes per annum (mtpa); however Whitehaven is undertaking expansion works at its flagship Maules Creek operation to increase its saleable coal output to 23mtpa by the 2019 financial year. Thermal and metallurgical coal is produced from one underground mine, Narrabri, and four open cut mines at Maules Creek, Tarrawonga, Werri Creek and Rocglen in the coal-rich Gunnedah Basin. Coal is transported by rail to the Port of Newcastle and shipped to customers mainly in Japan, Korea, Taiwan and India. The company employs more than 1400 personnel, with about 75 per cent from the local communities near its operations, and has injected more than \$850 million to the region since 2012. Record revenue in H1 FY17 of \$823.5m turned Whitehaven a net profit after tax of \$157.5 million, a bumper margin when compared to H2 FY16's profit of \$12.7m and \$7.8m in H1 FY16. In H1 FY17 Whitehaven sold 7.8mt of coal at \$97 per tonne (t), at an average cost



Underground at Narrabri.

of \$56/t – an incredible \$41/t in earnings before interest, tax, depreciation and amortisation (EBITDA). To put this in perspective, the company made a \$14/t EBITDA margin on sales in both halves of FY16. The strong rise in coal prices in the last September quarter was the driving force

behind the improved margin for the half. Average received thermal and metallurgical coal prices for the H1 FY17 were \$US78/t and \$US90/t respectively, and in the December quarter had risen to \$US92/t and \$US104/t. Whitehaven used the funds to reduce net debt by \$231.1m and a further \$105m of its senior bank facility debt was repaid.

Maules Creek

The \$701m Maules Creek open cut mine, 55km northwest of Gunnedah in northern NSW, contains coal resources of 660 million tonnes (mt), with 510mt of reserves for a mine life of more than 30 years. It commenced operation on 1 July 2015, and in FY16 the mine produced 7.8mt of run of mine (ROM) coal, more than guidance of between 7.1mt and 7.3mt. Following a production ramp up, by the end of the March 2017 quarter Maules Creek was operating at a rate of 10.5mtpa and was on target to achieve its FY17 guidance of between 9.5mt and 9.8mt. Whitehaven chief executive Paul Flynn expected Maules Creek to ramp up to its full production rate of 13mtpa by 2019. "Maules Creek has been a big step up for the company, and is a forty year asset that was brought on fairly cheaply relative to other greenfields projects in the last five to ten years," he said. "There's one more fleet that is required to come online to reach nameplate capacity, which will arrive in about 12 months time." Mr Flynn said the cost of Maules Creek would be repaid within the first two years of its operation.

(CONTINUED ON PAGE 42)



(CONTINUED FROM PAGE 41)



More than \$800m worth of economic benefits have poured through the region in the past four years.

### Narrabri

Whitehaven's only underground operation, the Narrabri coal mine is 17km south of its namesake town and commenced operation in 2012.

It contains resources of 720mt and reserves of 216mt with a mine life of more than 22 years.

In December 2015 the NSW Department of Planning and Environment granted approval to increase Narrabri's annual production limit from 8mtpa to 11mtpa.

In FY16 the mine produced 6.9mt of ROM coal, an 11 per cent decrease on FY15 due to two longwall changeouts during the period.

Whitehaven said it was on track to meet its FY17 guidance of between 8mt and 8.3mt.

During the March 2017 quarter, coal production was constrained in order to undertake another longwall changeout from LW106 to LW107.

It was completed by mid-April, and reflected a lower production rate of 1.33mt for the quarter.

Whitehaven said Narrabri's next changeout was scheduled for March 2018, with the development of LW108 advancing on schedule.

### Gunnedah open cuts

Whitehaven's three open cut mines near the town of Gunnedah – Rocglen, Tarrawonga and Werris Creek – performed well during FY16, producing 5.8mt of ROM coal.

Mr Flynn said the mines had produced enough cashflow for Whitehaven to focus on developing its larger projects.

"Gunnedah open cuts have done a fantastic job at underpinning our business while we have been in our construction phase."

Mr Flynn said Whitehaven had made a decision to re-open one of its shuttered open cut mines at Gunnedah due to favourable market conditions.

"We have a small open cut mine called Sunnyside and have decided to move back into the mine as we see a good opportunity to finish the remaining 1mt of coal, complete the rehabilitation and close the operation for good."

Sunnyside had been on care and maintenance since 2012 following a strategic review of operations due to lower realised coal prices.

Gunnedah's operations were forecast to produce a total of between 5.2mt and 5.5mt ROM coal during FY17.

### Rocglen

Located 28km north of Gunnedah, Rocglen commenced production in November 2008,



The Gunnedah CHPP will be moved from the outskirts of its namesake town to Whitehaven's upcoming Vickery project site.

and produces about 1.2mtpa of thermal coal from 10mt of resources and 4mt of reserves.

The mine produced a record 0.58mt of ROM coal in the March quarter compared to 0.36mt in the previous corresponding period.

Rocglen, nearing completion, had been flagged to move into a rehabilitation phase in two years time after coal was exhausted.

### Werris Creek

Located 4km south of its namesake town, the Werris Creek open cut mine produces up to 2mtpa of thermal coal and employs about 70 personnel.

It has coal resources of 18mt and reserves of 14mt, with a mine life of about three years.

Whitehaven said production in the March 2017 quarter was expected to be significantly higher than earlier in FY17 as the mining sequence entered the bottom seams of the open cut.

### Tarrawonga

Located 16km east of Boggabri, Tarrawonga commenced production in 2006 and produces a mix of thermal and coking coal for export.

Coal resources of 76mt and reserves of 39mt support a mine life of more than 15 years at a rate of up to 3mtpa.

The mine produced 0.653mt of ROM coal in the March quarter compared to 0.576mt in the previous corresponding period.

### Vickery project

Whitehaven's Vickery project is a mixed underground and open cut coal mining operation with resources of 505mt and reserves of 230mt.

Whitehaven said a number of discussions were taking place regarding the formation of

a joint venture to develop the project, with the company hoping to sell a 30 per cent stake to a high quality offtake partner.

"Now that we are a much bigger company we are less driven by the investment itself but are more driven by inviting high quality counterparts to join us in our investments," Mr Flynn said.

Construction was flagged for the second half of 2019 at an estimated capital expenditure of between \$600m and \$700m across a two year period.

The NSW Government had approved Vickery as a 4.5mtpa open cut metallurgical and thermal coal operation, however Whitehaven was seeking to expand the scope of the project and increase its nameplate capacity up to 10mtpa.

Work on the project's Environmental Impact Statement (EIS) for the expanded 10mtpa mine had progressed during the March quarter and was due to be lodged before the end of the June this year.

Mr Flynn said the company was looking forward to gaining approval for the expansion as it would not only ramp up production, but also benefit the community.

"This is a significant high quality resource that we think economically improves the quality of the project by scaling it up to 10mtpa."

"Part of the expansion plan is to also decommission the current prep plant near Gunnedah and construct a dedicated washing facility up on the Vickery site itself."

Preparing coal on site at Vickery would remove the need for road haulage and give Whitehaven's Tarrawonga mine rail access to the wash facility.

"This provides two big bonuses for the community by removing truck haulage from the roads completely and removing the prep plant near Gunnedah to allow further

growth of the town."

The company said it would also wait until Maules Creek had ramped up to its nameplate capacity before commencing works at Vickery.

"The timing for start up of the Vickery project remains market dependent, but will likely occur once Maules Creek has been fully ramped up to its 13mtpa capacity," the company said.

### Community development

Over the past four years Whitehaven injected more than \$800m into the North West NSW region in the way of local employment, community projects, and support for local businesses.

Mr Flynn said Whitehaven's focus was that the whole community would benefit from the company's presence.

In 2016, Whitehaven opened a regional office in the centre of Gunnedah to improve communication between the company and the surrounding community that made up 75 per cent of Whitehaven's workforce.

"Using an annual feedback survey with the local community we found that people were after more information about our operations as we are the largest employer in the region," Mr Flynn said.

"We addressed this by putting a regional office in the mains street of Gunnedah where people can come in and communicate with our business and address any issues or concerns."

"We believe it essential to demonstrate to the community that the region is benefitting by having our operations in the area."

In 2016, Maules Creek picked up the NSW Minerals Council award for *Community Excellence in Aboriginal Employment and Enterprise Development* for its commitment to employing a minimum 10 per cent Indigenous workforce.

"We set ourselves a target of 10 per cent Indigenous employment within five years and are well over that target already," he said.

During FY16 Whitehaven supported 81 community projects via donations to local charities, as well as \$6.4m in voluntary planning agreement payments to local councils to supply improved services to local residents.

At Narrabri, Whitehaven has pledged more than \$20.6m in payments to the local council for community projects.

This included \$5m to upgrade the Narrabri Airport, \$2m towards the Baan Baa town water project, \$1.5m for the redevelopment of the Narrabri swimming pool and \$1.5m for upgrades to Narrabri's central business district.



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# Drilling success at Whitehaven

AN associated entity of the GDS group of companies, Australian Drilling Systems (ADS) designs and manufactures directional drilling systems and delivers contract underground in-seam directional drilling services.

ADS has supplied drilling systems and training to various clients globally and domestically, having multiple systems in operation in the Hunter Valley in NSW, the Bowen Basin region in Queensland, and Shanxi province in China.

ADS specialises in directional drilling for gas and water drainage, exploration, barrier proving and compliance coring, and is equipped with the latest survey systems and experienced staff to prepare all flight plans, process and validate recorded data and produce end of hole reports.

The company draws on the collective experience of individuals involved with the development of underground directional drilling and the underground mining industry in general for the past 20 years.

The team remains committed to providing the safest, most accurate and efficient drilling service to the underground coal mining industry.

Supplying drilling services to Whitehaven's Narrabri coal operations since early 2012, ADS has met Whitehaven's drilling programs requirements.

Gas drainage, compliance coring (out to 1000m), and exploratory drilling have been the core services provided during this time.

"The company is proud to be given the opportunity to contribute to Whitehaven's



ADS has been supplying to Whitehaven Coal's projects since 2012.

success and is committed to continuing our strong association into the future," ADS chief executive Troy Vitnell said.


"Our aim is to remain at the forefront of

the underground directional drilling sector both domestically and internationally.

"We structure our project teams to address the client's specific priorities, to control risk

and deliver on time and on budget.


"We have created a culture that demands of people to actively seek opportunities for improvement in performance."



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**"GREENBUSHES IS ONE OF THE BEST LITHIUM RESOURCES CURRENTLY AVAILABLE ON EARTH AND THE RECENTLY ANNOUNCED EXPANSION TO DOUBLE ITS CURRENT CAPACITY IS A KEY COMPONENT OF ALBEMARLE'S STRATEGY TO DELIVER RELIABLE PRODUCTION."**

# A jobs bonanza

It's an exciting time for the WA lithium sector. On top of the emerging spodumene projects shooting up across the State, construction at Tianqi Australia's \$400 million Kwinana Lithium Plant is now underway, and an expansion to double production at Talison's Greenbushes mine has received the green light.

**ELIZABETH FABRI**

WITH lithium demand forecast to skyrocket over the next few years, news of Tianqi Lithium Australia's plan to develop a large-scale lithium plant in Kwinana, south of Perth, received a warm response across the country.

The project will process spodumene concentrate from Talison Lithium's Greenbushes mine, with capacity to produce

up to 24,000 tonnes per annum (tpa) of lithium hydroxide.

It will also create up to 500 construction jobs at peak and more than 115 full time positions once operational.

Construction on the plant was moving fast, and expected to be complete at the end of 2018, with production ramping up in 2019.

In March, rumours of an expansion at Talison's Greenbushes mine (a joint venture between Albemarle and Tianqi Lithium, the parent company of Tianqi Lithium

Australia) were also confirmed, which would see the mine double its LCE capacity from 80,000mtpa to more than 160,000mtpa.

**Kwinana construction**

In October 2016 after a five year development phase, earthworks began at the Kwinana Lithium Plant site, with Tianqi now moving on to the next phase of construction.

"Civil/concrete works have now commenced and are well underway with first

large concrete foundation pours completed," Tianqi Australia managing director Phil Thick said.

"This work will continue through to August/September.

"Work has just commenced on the NPI (Non-Process Infrastructure – main office building, control room, training centre, laboratory, warehouses) and will continue for 12 months."

(CONTINUED ON PAGE 46)



Construction at the Kwinana Lithium Plant was now underway.

Images: Tianqi Australia.



(CONTINUED FROM PAGE 48)

**"EVERYONE IN WA SEEMS TO BE DELIGHTED THAT WE ARE BUILDING SOMETHING OF THIS SCALE IN THE MIDDLE OF THE DOWNTURN, AND CREATING MUCH NEEDED EMPLOYMENT IN PERTH."**



The Greenbushes mine produced more than 30 per cent of the world's lithium.

Image: Talison.

Mr Thick said major pieces of equipment, such as the mill, calciners and crystallisers, were ordered last year and would be delivered towards the end of 2017.

"Major contracts for structural steel, piping and mechanical are about to be let," he said.

"Approximately \$134m has been committed to date."

West Perth-based MSP Engineering was awarded head contractor for the project and would subcontract work to local businesses including Georgiou Group, which was handed a \$17 million contract in April.

Georgiou Group would build Tianqi's new southern hemisphere headquarters; the third contract it had secured on the project.

Mr Thick said he was pleased to have received strong support from the local community and State Government.

"Everyone in WA seems to be delighted that we are building something of this scale in the middle of the downturn, and creating much needed employment in Perth and particularly the Kwinana area," he said.

"Also universal support for a new 'value adding' industry in the renewal energy space will position WA at the top of the world in the booming lithium industry."

#### Greenbushes expansion

Talison is breathing new life into its Greenbushes mine with its biggest expansion to date.

With a mine life of about 40 years, the Greenbushes mine was estimated to contain the world's largest known reserves of lithium spodumene minerals with unique properties.

The mine currently produced 65,000 tonnes of lithium carbonate equivalent a year, which was forecast to more than double under the new expansion.

"Our operational excellence, engineering capability and our talent set



The Kwinana Lithium Plant design.

us up for a successful expansion of the Greenbushes mine," Albemarle Lithium and Advanced Materials president John Mitchell said.

"Greenbushes is one of the best lithium resources currently available on earth and the recently announced expansion to double its current capacity is a key component of Albemarle's strategy to deliver reliable production for our long-term partners."

The historic mine, 250km south of Perth and about 90km south east of the Port of Bunbury, had produced lithium for

more than 25 years and tantalum since the 1940s.

Today the mine produced more than 30 per cent of the world's lithium.

An estimated 200 jobs would be created in peak construction and between 40 and 60 operational positions at the new production plant and crushing plant worth about \$320m.

Commissioning of the expansion was expected to begin in the second quarter of 2019.

Production at the project was going strong and meeting all of the joint venture's requirements, Mr Thick said.

#### Future growth

Mr Thick said once the Kwinana Lithium Plant and the Greenbushes expansion were up and running a further expansion at Kwinana could be on the cards.

"The mine will have the capacity to feed a further expansion," he said.

"The Kwinana plant is designed to be expanded easily in the future, though no decisions have yet been taken on any expansion."

The Kwinana plant would also play host to a number of industry research and development activities as Tianqi planned to further its Research and Development (R&D) activity both in China and WA through partnerships with WA universities.

"We are in discussions with a number of WA universities and have had a number of detailed meetings with UWA," he said.

"We are looking at a long term plan that potentially includes research, scholarships, exchanges and general collaboration."

"This is work in progress."

Globally, Tianqi forecast demand for lithium, particular lithium hydroxide, to be very strong and said currently short term supply was not meeting the need.

"The Greenbushes expansion and Kwinana production will be critical to meet global demand," Mr Thick said.

"We see a short term gap over the next two years."

"Views differ on what happens after that as there are clearly going to be a number of new projects coming on stream over the next five years to increase supply significantly."

Mr Thick said Tianqi remained committed to bringing its new production on as soon as possible and that quality and reliability would be key to the future.

"This is why the Kwinana plant is targeting to produce the highest quality lithium hydroxide in the world," he said.

"This will continue to be demanded by top end customers and will command a premium price."



# GEA supplies key technology for Kwinana lithium plant

It's been an eventful period for German based technology group GEA.

In December last year, the leading engineering firm was awarded a lucrative contract by MSP Engineering to equip the new ultra-modern Kwinana Lithium Plant for Tianqi Lithium Australia.

The contract was to design, manufacture, supply and commission the evaporation, crystallisation and drying technology for the plant, and further works on site if Tianqi followed through with a future expansion.

The Tianqi Lithium Corporation, which controls a majority stake in the Talison Greenbushes mine – the world's premier producer of lithium concentrate from spodumene – was building the downstream processing plant for lithium hydroxide.

Once constructed, the plant would convert around 161,000 tonnes per year of spodumene concentrate into 24,000 tonnes of lithium hydroxide, for use in the growing global market for lithium ion batteries.

"Lithium is the lightest metal known to man," GEA stated.

"This third element in the Periodic table is powering the modern world, with today's lithium batteries keeping our medical, consumer and industrial electronic devices switched on, and storing energy generated by electricity grids.

"But it is the use of lithium-ion batteries in the next generation of electric and hybrid vehicles that will make the biggest impact on the global lithium market."

With this in mind, it came as no surprise GEA was delighted to win a leading role in the development of Tianqi's mega lithium project.

The project involved a number of parts; extensive test work at GEA facilities in Europe; followed by engineering design, fabrication, testing and commissioning of the key process equipment to produce a pure lithium hydroxide monohydrate ( $\text{LiOH} \cdot \text{H}_2\text{O}$ ), including packaging, with a by-product of dried sodium sulphate.

GEA Australia Commercial and Regional area sales manager Gary Wheatley said the supply package started with the PLS Evaporator unit.

"This is a falling film evaporator complete with shell and tube heat exchangers and single stage MVR (Mechanical Vapour Recompression)," Mr Wheatley said.

"There, the vapours are compressed to a higher pressure and therefore temperature level which enables them to be re-used as heating steam within the same system.

"Appearing condensates are collected and pumped to the glauber's salt melter in order to be partly used as dissolving water."

In addition, GEA's glauber's salt cooling crystallisation used draft tube crystallisation in a flash cooling step using deep vacuum.

"The material is transferred level controlled into the second glauber's salt crystallizer, the FC (Forced Circulation) type crystallizer is a surface cooling crystallizer using chilled water/glycol mixture to

reach the final cooling temperature," he said.

"While further cooling down the solution, additional glauber's salt is crystallizing.

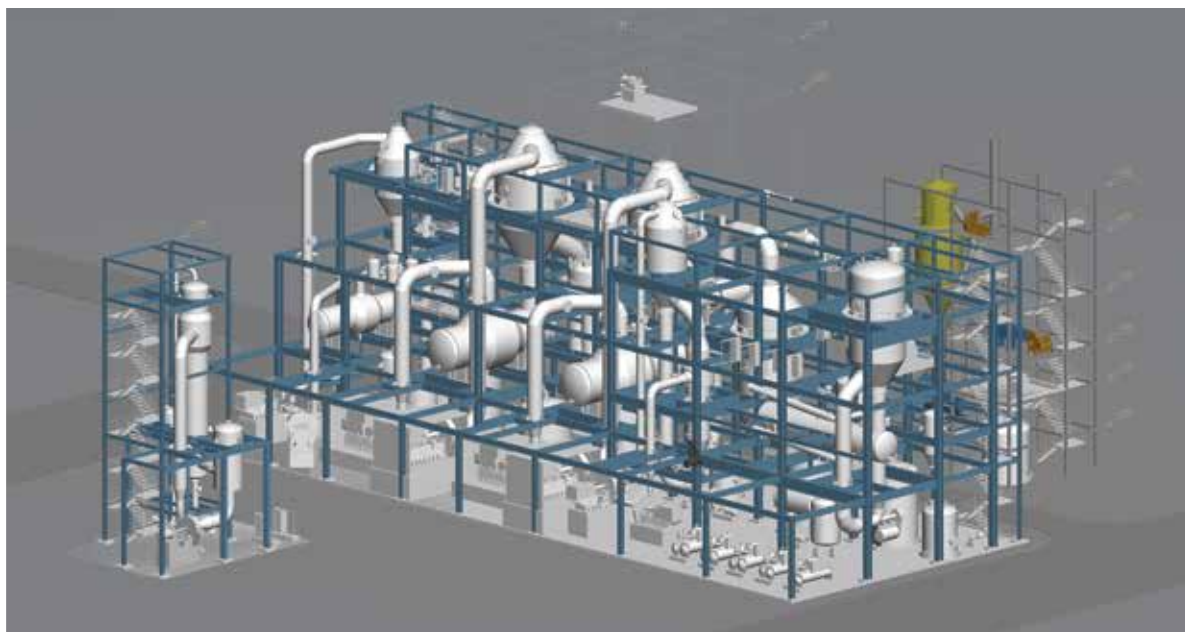
"The overall loop has a highly sophisticated design in order to minimize incrustations at the cold surfaces of the heat exchanger which has the highest supersaturations for the glauber's salt. "The glauber salt slurry is fed directly into a centrifuge then onto a polishing filter before it starts the sodium sulphate crystallisation leg using forced circulation heated by MVR and onto another filtration process.

"The filters mother liquor is then put through another crystallisation stage to produce raw Lithium hydroxide monohydrate using forced circulation crystallisation and again heated using MVR (two fans in series) running under vacuum through the surface condenser."

Mr Wheatley said a major factor contributing to GEA winning the contract was these state-of-the-art evaporation and crystallisation processes that proved more energy efficient than that of the competitor.

"Besides this economic advantage the test work was an important part of the GEA tender conducted by our engineering Laboratory team in Montigny, France and supported by our process engineers/experts in Duisburg and Milan," Mr Wheatley said.

"These factors and our close relationship with the client enabled us to obtain the award."



More information on GEA Engineering and its services can be found at [www.gea.com](http://www.gea.com), or by calling +61 8 9429 8829.



[gary.wheatley@gea.com](mailto:gary.wheatley@gea.com)



**"WE'RE NOW  
RESOURCED  
MORE  
APPROPRIATELY  
FOR KEY  
BUSINESS  
PRIORITIES OVER  
THE COMING  
YEARS, AND  
THERE WILL BE  
A CONTINUED  
FOCUS ON  
LOWERING THE  
COST BASE OF  
THE COMPANY."**



The Sierra Rutile acquisition was finalised in December 2016.

Image: Sierra Rutile.

# A company on the rise

After experiencing significant financial losses during 2016, international minerals sands company Iluka Resources is back on track with the Sierra Rutile acquisition now under its belt, and a handful of advanced production and exploration opportunities in progress to deliver future growth.

## ELIZABETH FABRI

ILUKA Resources is finally making a comeback.

At the end of 2016, the company reported an 11.4 per cent decline in revenue brought on by low market conditions from the minerals sands sector, which was partially responsible for a total reported loss of \$224 million after tax.

However, higher commodity prices this year have generated a substantial increase in revenue for the global miner.

In the March quarter, Iluka reported a 130 per cent increase in total zircon, rutile and synthetic rutile sales volumes relative to the same period in 2016, and a 118.5 per cent increase in zircon, rutile and synthetic rutile revenue.

During the quarter, Iluka also produced 154,000 tonnes (t) of heavy mineral concentrate and processed 366,000t.

"The 2017 financial year has commenced more favourably," managing director and chief executive Tom O'Leary said.

"Sales volumes and revenues have more than doubled by comparison to first quarter 2016; prices in the first quarter for both zircon and rutile were higher than average 2016 levels; and [Iluka] has generated strong free cash flows over the quarter, which have been applied to the repayment of debt, which has reduced from \$506 million at 31 December to \$403 million."

Mr O'Leary joined the company as chief executive in September last year with the aim of bringing the company's financials back to a healthy state.

One of his first decisions as head of the company was a review of the business; a result was 90 out of 440 support roles being made redundant.

"As a consequence of these changes, Iluka's 2017 non production cash costs



Hamilton plant operations will be suspended in October.

Image: Iluka Resources.

(excluding Sierra Rutile) are expected to be approximately \$20 million lower on a like-for-like basis compared to 2016," Mr O'Leary said.

"Just as importantly, we're now resourced more appropriately for key business priorities over the coming years, and there will be a continued focus on lowering the cost base of the company."

Operating since 1998, Iluka has a diverse portfolio, with an iron ore royalty asset, and projects in WA's Perth Basin, South Australia's Eucla Basin, Victoria's Murray Basin, and Sri Lanka.

In December, Iluka all-cash acquisition of London-listed company Sierra Rutile was also approved, marking its entrance into the African market.

## Sierra Rutile acquisition

At a total cost of \$389 million plus assumed \$80 million of net debt, the Sierra Rutile merger was an important milestone in reshaping Iluka.

The acquisition has effectively doubled Iluka's rutile resource base, with the Sierra Leone operations set to produce 150,000t in 2017, and expansion potential in future years up to 240,000tpa.

In the company's recent reserve and resource statement, it reported an inaugural rutile reserve of 3.9 million tonnes (mt) for Sierra Rutile, equating to a 15 year mine life.

It also confirmed potential to add to the resource and reserve based through further delineation drilling.

Mr O'Leary said Iluka's strategy for generating a satisfactory return from the mine was to invest in increasing its capacity.

"This increase will come at a capital expenditure cost estimated at ~ \$US220 million for the three mine expansion projects," he said.

"This is inclusive of the \$US60 million planned to be spent in 2017 and 2018 on improving safety and efficiency; and increased capacity at the mineral separation plant.

"We are confident we can achieve the reduction in unit cash costs Iluka has guided, with the prospect of robust margins and cash flows."

Since taking over the mine in December, Iluka has been incredibly busy at the project, and sent some of its most experienced technical and operational personnel to the ground.

Following a visit to the mine in March, Iluka chairman Greg Martin said he was impressed and encouraged by the local workforce and manner in which Iluka personnel had embraced the new requirements of operating effectively and safely in a new country.

"These activities have included developing key relationships at all levels of government, with local communities, including Paramount Chiefs, with non-governmental organisations as well as establishing initial links with international agencies that provide social and economic development support to the country," Mr Martin said.

However despite the positive feedback, production for the March quarter was lower than expected due to a reduced level of surface mobile equipment available prior to the commissioning of the new fleet which led to limited ore supply volumes.

In the March quarter, Sierra Rutile produced 35,700t of rutile, 11,600t of ilmenite and 300t of zircon.





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### Hamilton plant suspension

On 28 March, Iluka announced it would be suspending operations at its Hamilton mineral separation plant in Victoria from October in an effort to further streamline operational costs.

Over the last few years, the plant had been processing stockpiled ore from the Murray Basin mining operations that closed in 2015, and the Jacinth-Ambrosia operation in South Australia.

In March, Iluka announced the Jacinth-Ambrosia feed would now be processed at the Narngulu facility in WA, meaning the Hamilton plant would now only process the remaining heavy mineral concentrate from the Murray Basin, which was expected to be exhausted by October 2017.

Iluka chief operating officer Steve Wickham said the company intended to recommence processing operations at Hamilton once concentrate became available from the pending Balranald development.

"In light of the timing for that development, the decision to suspend operations at Hamilton once the Victorian stockpile has been exhausted is the most cost efficient configuration of the company's assets," Mr Wickham said.

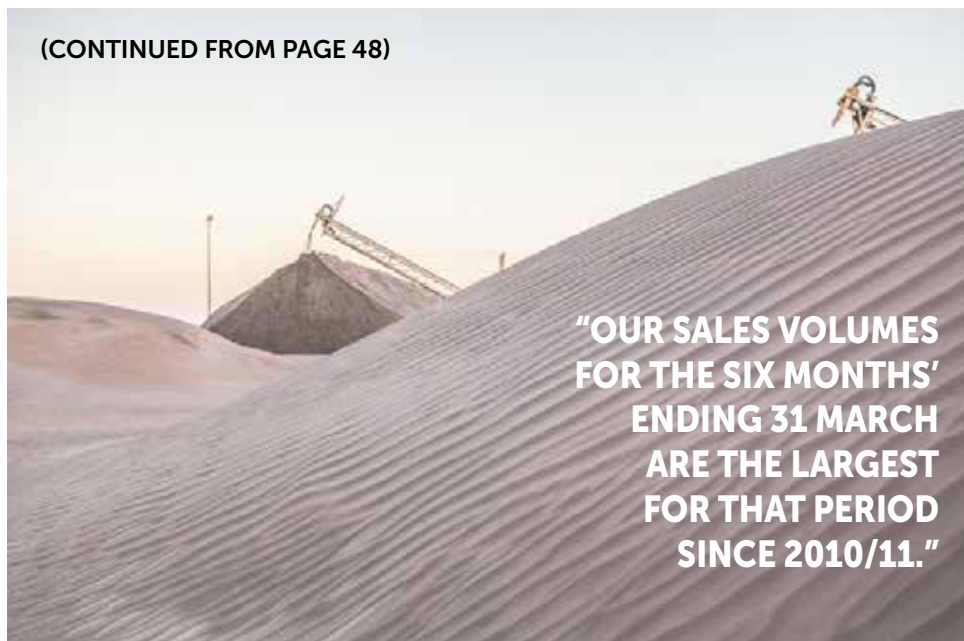
He confirmed that the suspension was in no way reflective of the economic conditions in Victoria, and was purely made from a commercial standpoint.

The suspension would result in 60 redundancies.

"The company acknowledges that this will be a difficult time for affected employees and will provide whatever assistance it can, including counselling, redeployment and employment placement support," Mr Wickham said.

"The company's rehabilitation of former mine sites in Victoria is not affected by the suspension of operations at Hamilton;

(CONTINUED FROM PAGE 48)



Heavy mineral concentrate stockpiles at Jacinth-Ambrosia.

Image: Iluka Resources.

**"OUR SALES VOLUMES  
FOR THE SIX MONTHS'  
ENDING 31 MARCH  
ARE THE LARGEST  
FOR THAT PERIOD  
SINCE 2010/11."**

and will continue in line with long-term planning arrangements."

### Planned new production

Over the next few years, Iluka has a huge task ahead to bring its next round of projects into production; Cataby, Balranald and Puttalam.

North of Perth in WA, Cataby is a chloride ilmenite deposit with associated zircon and rutile production and a mine life of about 8.5 years.

Iluka recently completed the definitive feasibility study for the project, and environmental approvals and amenity agreements continue on schedule.

Once the project received the green light, concentrate produced at the site would be processed at the Narngulu plant.

"Discussions with existing and potential customers are progressing," Mr O'Leary

said.

"In the 2017 capital expenditure guidance of approximately \$260 million, approximately \$150 million related to Cataby.

"While a proportion of this – approximately \$20 million – will be spent on detailed engineering work and land access arrangements in 2017, the expenditure of the remaining amount will depend on the timing of a development commitment."

Balranald was the next project in the development pipeline, which had now also completed a definitive feasibility study.

The project comprises two rutile mineral sands deposits in the northern Murray Basin, NSW.

In 2016, Iluka completed a field trial on an unconventional mining method to access the deposits, and further evaluative work was planned for this year.

Iluka was also looking at restarting mining at the Jacinth Ambrosia operation

which was suspended in May 2016.

The established project in the Eucla Basin, South Australia, was the largest known global source of zircon.

Mr O'Leary confirmed a decision to re-commence production was expected before the year's end.

Further afield, the Puttalam mineral sands deposit in Sri Lanka was being assessed, with a pre-feasibility study being undertaken, along with discussions with the Sri Lankan Government to secure a binding investment agreement.

In addition, the company also had a number of exploration projects in the works in Kazakhstan and Canada.

### 2017 outlook

Key areas of focus for the rest of the 2017 calendar year included the potential expansion of the Sierra Rutile operation, a sustainable business review to further reduce costs and improve productivity, and marketing contracts to underpin the Cataby development.

This year, non-production costs were already down \$70 million from 2016 through reduced exploration activity and research and development, and lower corporate overheads, while the zircon market was now in a sturdy position.

Mr O'Leary said the market was now stronger and demand was more robust than the company had seen in years.

"In zircon, we've had two consecutive quarters of strong sales, in an environment where prices have increased," he said.

"Our sales volumes for the six months' ending 31 March are the largest for that period since 2010/11.

"The US\$50 per tonne increase on contracted tonnes, effective mid-February, has been accepted by customers and provided support for spot sale prices materially higher."



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# Underpinning growth

With extension projects at Airly and Springvale in the works, Centennial Coal is in a comfortable position to further its NSW presence.

**Elizabeth Fabri** spoke to newly minted managing director and chief executive **Mick Cairney** about his focus for the company over the next few years.



**Q. You were appointed Centennial's new managing director and chief executive in May. How are you finding the role so far?**

I commenced in the role as managing director and chief executive of Centennial Coal on 1 May. I have been with the company for 15 years and during this time managed four of Centennial's mines and also headed up health, safety, environment and community across the group and, more recently, was Centennial's executive general manager operations.

It is a privilege to be able to serve in this role with our dedicated, professional and highly skilled teams. Also, working with our parent company Banpu PCL has given Centennial exposure to diversity of culture, systems and markets that have added value to Centennial.

My focus will be on operational excellence by using technological systems, solutions and innovations to achieve efficiencies and reach key business targets across the Group. I understand the value of maintaining our social license to operate and the importance of environmental excellence and compliance, and will be working to ensure we minimise our

environmental footprint.

We will be adding a stronger engineering approach to our health and safety and environmental improvement strategies.

The value of company-wide improvement strategies across critical business functions cannot be underestimated and we will be reviewing our current position and implementing reforms as required.

**Q. In December, Airly received approval for its mine extension project. What has Centennial been up to at the site since?**

Airly mine has been operating since 2010. Airly was granted renewal of its State consent in December last year and secured Federal approval this month (May).

These approvals represent another two decades of mining at Airly and provide security for the existing workforce.

Airly is currently only mining 800,000 tonnes annually and the consent provides for up to 1.8 million tonnes, therefore Centennial will look at opportunities to increase production and employment if we are confident the current market conditions will continue.

**Q. In April your Springvale project received approval to increase production. How important are these approvals and what are your plans for the Springvale Water Treatment Project?**

Springvale was recently granted an approval to increase manning, production and the coal stockpile capacity. Improvements made at Springvale necessitated increasing these elements in readiness for market opportunities and to account for employees redeployed from Angus Place mine after it was placed on care and maintenance in 2014.

When securing Springvale's planning consent (October 2015) Centennial committed to significantly improve the quality of water discharged and this commitment was incorporated into our conditions of consent.

To deliver on this commitment, Centennial and EnergyAustralia are proposing to build a water treatment facility which will enable

Springvale to improve upon the water quality compliance conditions required by the consent.

Importantly, the Springvale Water Treatment Project underpins the future operations of Springvale and Mt Piper Power Station, secures more than 600 local jobs and provides energy security for 15 per cent of NSW's energy needs.

The Department of Planning's Assessment report has recommended approval, with the appropriate conditions, and has referred the project to the Planning and Assessment Commission (PAC).

The PAC held a meeting in Lithgow on 17 May receiving huge support from the local community and we anticipate a PAC Determination by mid June.

**Q. How is the Centennial team working towards meeting guidance?**

The Centennial team pulled together to manage costs and lift productivity due to the long period of poor market conditions. We developed our own Step Change Productivity program and placed focus on process engineering.

Automation of certain parts of the production systems was also implemented. Centennial utilises a wide ranging portfolio of different mining systems so a great deal of work was undertaken to seek out short term gains, but also establish a medium term strategy of continuous improvement; we have some exciting new possibilities scheduled out to 2020.

I am pleased to say that our teams across all of our operating mines delivered records for production and productivity. Whether it is daily, weekly, monthly or annually, all sites have contributed.

**Q. How has Centennial responded to the Clarence Colliery environmental incident?**

Centennial Coal and Clarence Colliery deeply regret the 2 July, 2015 environmental incident and have apologised for its occurrence.

This environmental incident at our Clarence Colliery involved the overflow

of material from a holding cell in a reject emplacement area impacting the surrounding environment, and coal fines also entering the Wollangambe River within the Blue Mountains National Park.

From the day of the incident, Clarence engaged a specialist team to oversee an extensive clean-up operation that operated for 12 months in extremely rugged conditions and cost \$2 million.

Prior to this incident, Clarence had a clean record, with no conviction for any environmental offence.

As a result of this environmental incident both the EPA and OEH commenced prosecution proceedings (May 2016) in the Land and Environment Court (LEC) against Clarence, a subsidiary of Centennial Coal. At the earliest available opportunity Clarence entered a plea of guilty to the charges.

The sentence hearing was held in the LEC on 8 May and judgement has been reserved.

**Q. How has the global coal price impacted Centennial's performance this year?**

65 per cent of Centennial Coal's production is supplied to NSW power stations meeting more than 40 per cent of the States fuel needs. The balance is exported to established long-term customers in Korea, Japan and Taiwan.

We are quietly optimistic the global market has stabilised and as a result export prices will be maintained and domestic sales will be sustained by high electricity prices.

**Q. What is your outlook for Centennial for the second half of 2017, and beyond?**

Our operating mines are well poised to deliver on their commitments this year. We will be investigating and implementing responsible growth plans that are assessed as beneficial.

Centennial has good opportunity for organic growth that can now be underpinned by our new benchmarks of productivity and cost management that we have strived hard to achieve, and will continue to improve upon.



# REMA TIP TOP increases Australian footprint

IN the current market, mining suppliers and contractors are facing increasing difficulties meeting operational demands with greater budget constraints; however REMA TIP TOP is bucking that trend.

It was with a view of business sustainability, and long term strategic growth that REMA TIP TOP merged with ConvaTech in 2016.

What was born of that merger was the largest total conveyor maintenance solution provider in Australia.

REMA TIP TOP Industry Australia general manager Craig Philpotts said the organisation's continued focus on local expertise was vitally important.

"We are positioned across Australia in all the industry hotspots," Mr Philpotts said.

"This allows us to partner with the major mining houses across all their national operations.

"Strong, meaningful partnerships are one way of delivering increased savings and efficiencies to our customers, but it's a multi-pronged strategy.

"Our innovative approach to delivering product and service solutions specifically tailored to our customers' needs is how we set ourselves apart.

"From covering the conveyor maintenance and component supply for the entire coal loading facilities in the Port of Newcastle, to servicing more than 300km of conveyor systems in the Pilbara, we align our operations with the objectives of our customers to deliver increased asset availability and reduced costs over their lifetime."

REMA TIP TOP Asia Pacific chief executive Christian Grueterich said sustainability was a key factor in the



Rema Tip Top combines global strength with local experience.

merger.

"REMA TIP TOP, together with ConvaTech has accomplished a holistic geographical footprint in the Australian market," Mr Grueterich said.

"Our people, and our product manufacturing in Europe, Asia, America and Africa, paired with our local service offering will further differentiate us within the Australian market.

"Our ongoing strategy is to meet every need of our customer with innovative and high quality product and engineering solutions, and we are confident that this continues to be valued by our customers."



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**"THE EXPECTED IMPACT TO COAL VOLUMES WILL BE 12-14MT, REDUCING FY2017 TONNAGE GUIDANCE TO 190-200MT (FROM 200-212MT)."**

# Standing strong

Aurizon is experiencing a difficult few months as it deals with the structural and financial damage to its Central Queensland Coal Network caused by Cyclone Debbie, but under the new leadership of ex-Rio Tinto executive Andrew Harding, the company's strength cannot be questioned.

**ELIZABETH FABRI**

FORMER Rio Tinto Iron Ore chief executive Andrew Harding took over the Aurizon reins in December; and has since made a wave of advancements.

With close to 25 years experience as an executive in the resources industry, Mr Harding also brings a fresh and progressive approach to the role to further Aurizon's Australian presence.

"I joined Aurizon in December, moving from a wintry London to sub-tropical Brisbane," Mr Harding told Melbourne Mining Club delegates in April.

"After 24 years at Rio, it was a big change; a new location, a new organisation, and new ways of doing things."

His first major hurdle occurred in April, when storms associated with Cyclone Debbie caused significant structural damage to Aurizon's Central Queensland Coal Network.

"Our Central Queensland coal network bore the brunt of the storm," Mr Harding said.

"Yet what impressed me most in the incident management was the primacy of safety and welfare.

"Systematically, all employees were contacted and supported where needed."



Wiggins Island Rail Project.

The 2670km Central Queensland Coal Network which transported about 60 per cent of Australia's coal exports, comprised the Goonyella Rail Corridor, Moura Rail Corridor, Newlands Rail Corridor and Blackwater Rail Corridor; along with the

Hunter Valley corridor; and South-West Rail Corridor connecting coal mines in the Clarence-Moreton and Surat basins to the Port of Brisbane.

Each day, Aurizon moved more than 500,000 tonnes of freight bound for

markets in India, Taiwan, South Korea, Japan and China through its fleet of about 600 active locomotives, 15,000 wagons, extensive road network of vehicles, and 40 depots across the five mainland States.

The Central Queensland network has a nameplate throughput of 308 million tonnes (mt) per annum, and last financial year hauled 226mt.

Aurizon was also the country's largest haulier of iron ore for export outside of the Pilbara region.

In the March quarter, the company transported 48.4mt of coal; 2 per cent lower than the previous corresponding period, while iron ore volumes totalled 5.6mt; a 7 per cent drop attributed to operational issues from one of its customers.

"March Quarter 2017 Above Rail volumes were impacted by tropical cyclone Debbie and associated flooding affecting all commodities hauled in Queensland," Aurizon stated.

"The expected impact to coal volumes will be 12-14mt, reducing FY2017 tonnage guidance to 190-200mt (from 200-212mt)."

Freight volumes for the quarter also saw a slight 3 per cent decrease primarily due to the cessation of the Mt Isa freighter service in February.

(CONTINUED ON PAGE 55)

All images: Aurizon.



# Complete asset maintenance solutions

CUSTOM Fluidpower is one of the largest hydraulic, pneumatic, electronic, and instrumentation solution providers in Australia, supplying a wide range of products to suit all fluid power requirements.

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"We have access to all major brands of hydraulic, pneumatic and lubrication products with the bonus of national buying power."

Proudly customer focused, Custom Fluidpower provides national support and coverage across seven branches; three of which are based in Queensland.

The business has established a large network of clients at each of these branches, including a strong working relationship with rail freight operator Aurizon.

Over the years, Custom Fluidpower has developed an intimate knowledge of Aurizon's track laying and maintenance machinery, delivering on site servicing, on and off site repairs, breakdown repairs, system improvements and upgrades, and critical component support.

More information on Custom Fluidpower's services can be found at: [www.custom.com.au](http://www.custom.com.au).



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(CONTINUED FROM PAGE 53)

**"THE ADANI PROPOSAL WOULD COST MORE THAN \$1 BILLION THAN THE AURIZON OPTION OF TAPPING INTO AN INSTALLED AND EFFICIENT INFRASTRUCTURE ASSET."**



#### Cyclone Debbie impact

Aurizon was one of the companies hardest hit by Cyclone Debbie, with all four of its Central Queensland rail systems forced to temporarily close.

By 18 April, three out of the four railways had been reopened but were operating under rigid conditions with reduced capacity.

The Goonyella coal system suffered the worst damage and remained closed until 26 April.

"The storm killed at least 12 people in Queensland and New South Wales, primarily as a result of flooding," Mr Harding said.

"This makes Debbie the deadliest cyclone to hit Australia since Cyclone Tracy in Darwin in 1974.

"In locations west of Mackay, at the heart of Aurizon's operations, 48 hour rainfall totals exceeded 1000 millimetres or 39 inches in the old scale.

"In all, Cyclone Debbie touched communities covering around 4000 Aurizon employees."

Mr Harding said Aurizon's infrastructure teams scoped more than 520 pieces of recovery work, and estimated the repair bill to reach between \$40 million and \$50 million.

"A large part is being spent restoring track on landslips on Black Mountain, west of Mackay – the same spot that got a metre of rain in 48 hours," he said.

"I flew over that section after the cyclone and can assure you this has been a major civil engineering exercise.

"Our infrastructure crews have worked relentlessly on a disciplined and well-executed recovery plan."

He said the net impact on earnings would be between \$30 million and \$35 million (EBIT) when taking a three-year position that factored expected recoveries.

"That demonstrates a commercially and operationally resilient business in the face of Category Four cyclone that struck around 70 per cent of our asset base."

Aurizon expected its Above Rail coal tonnes for FY17 to reduce by between 12mt



The Moura Line in QLD.

and 14mt, worth \$100–115 million to the company; between \$70 million and \$80 million of this would be recovered through regulatory processes in future years.

#### Galilee Basin rail plan

Aurizon has pushed forward a rail link plan for Queensland to connect the Galilee Basin with Abbot Point; a plan which was competing with the more expensive, but far more publicised Adani proposal.

In March, the company submitted its proposal to the Northern Australia Infrastructure Facility (NAIF) for funding, competing with coal miner Adani which had put forward a similar plan last year.

When news of Aurizon's application for the rail project went public, the company experienced heavy backlash from environmental activists.

"Within hours of our application becoming public, social media was swamped with vitriol on Aurizon and demonising our potential role in the Galilee," Mr Harding said.

"Within days, we had protestors in our head office; I expect the anti-Aurizon campaign to continue while we are part of seeking a viable infrastructure solution for the Galilee.

"Our message won't change — we acknowledge that climate change is human-induced, that action needs to be taken to reduce carbon emissions, and that

a growing proportion of renewables will be part of that solution.

"However for the foreseeable future, the world's energy needs will be served through a baseload of coal and gas, supplemented with the intermittent power of renewables."

Construction costs for the project were estimated to be at least \$1 billion less than the Adani's plan by combining existing rail lines with new infrastructure.

"The Aurizon and proposed Adani corridors are so close that drivers could wave to each as trains crossed," he said.

"The Adani proposal would cost \$1 billion more than the Aurizon option of tapping into an installed and efficient infrastructure asset.

"I can only ponder the parallels with the massive investment in triplicate of LNG trains in Queensland, now under-utilised, and the source of angst for Australian gas consumers.

"Adani's proposal, through the NAIF process, also seeks Australian taxpayer funding.

"I've got to say that doesn't make a lot of sense to me."

#### Company outlook

While the Galilee rail link project was still up in the air, Aurizon had implemented a number of other changes across its organisation, primarily a new company

structure that will come into effect July.

On 23 March, the company announced it would soon transition from a functional-based organisational model to a business unit model designed around the core areas of the business; coal, diversified bulk freight and iron ore, intermodal and network, and central support and planning functions.

Mr Harding said the functional model had served Aurizon well after it came out of government ownership, but the time had now come to move to a business unit model to driver greater efficiencies, and improve customer service and productivity.

"It will provide greater accountability with each business unit being responsible for both operational and financial performance rather than the current model where it is shared across multiple functions," he said.

"The intent is for the new structure to be in place by 1 July this year and as we map out the detail we will keep our customers and employees updated, and consult where necessary."

Aurizon had also made some senior management changes, including appointing former Woodside Petroleum executive Tina Thomas to the position of Human Resources executive vice president.

With a month left of FY17, the company hoped to reach its revised EBIT guidance of between \$800m and \$850m and coal haulage volumes between of 190mt and 200mt.

Mr Harding said in the years ahead, he also hoped to "build heavily on this platform of performance in rail infrastructure and train operations."

"Here's a business that can deliver sustained, long-term improvement across key safety and operating metrics," he said.

"While much has been achieved, there's plenty of juice left in the tank.

"It's not inconceivable that in years to come, we could challenge the current business model for the Australian resources sector with Aurizon providing discrete, super-efficient rail and port services to resource companies and allowing them to focus on their core activities."



# Major contracts timeline:

8 March 2016

Founded in Weipa, construction firm Goodline wins \$25m contract to build a barge and ferry berths to transport personnel and materials across the Hey River from Weipa to the Amrun project site.

12 December 2016

Perth-based construction company Civmec awarded \$160m in contracts to build facilities and equipment. One contract is for the construction of the process facility, the other for the part-supply of a stacker, reclaimers and shiploader.

16 December 2016

WA-based marine services provider Baghwan Marine wins a contract to supply vessels and crew to support project construction. The contract includes a significant percentage of Baghwan's workforce to be local Indigenous employees.

28 December 2016

WA-based construction and engineering firm Decmil awarded \$50m contract to construct heavy mining equipment workshops, refuelling and wash stations, workshops and welding bays, waste transfer stations and administration buildings at Amrun.

16 January 2017

Townsville-based pipe and fittings provider Vinidex wins \$20m contract to manufacture more than 26km of high density pipes to connect water between the dam and mine processing infrastructure across the project.

19 January 2017

QLD-based Qbirt awarded \$70m bulk earthworks contract to develop critical mine infrastructure. It includes 40km of sealed access roads and the haul road network. It will also develop the mine stockpile zone, tailings and separation ponds and other critical site infrastructure.

13 February 2017

Sodexo wins \$22m contract to supply camp management services to the project. The contract includes an Indigenous employment target of 20 per cent within two years.

15 February 2017

Fulton Hogan's QLD arm awarded \$45m contract to build a 10.9 giga-litre dam to supply water to Amrun. The company will develop the impoundment area, embankment and intake infrastructure for the dam and other critical supporting infrastructure including the spillway, fishway and access corridor.

**"THE AMRUN PROJECT WILL ENSURE QLD BUSINESSES AND THEIR EMPLOYEES WILL CONTINUE TO REAP THE BENEFITS OF MANY DEVELOPMENT OPPORTUNITIES FOR YEARS TO COME."**

All images: Rio Tinto.

# Full steam ahead

Construction at Rio Tinto's tier one investment – the Amrun bauxite project – is well underway after the company recently awarded more than \$1.38 billion in contracts for the expansion of its Far North Queensland asset.

## CAMERON DRUMMOND

WITH first production expected in 2019, it's all hands on deck at Rio Tinto's \$2.6 billion Amrun bauxite expansion project in Far North QLD.

When completed, Amrun will extend mining activities on part of Rio Tinto's existing lease south of the Embley River, between Weipa and Aurukun on the Cape York Peninsula.

This includes the construction of a range of infrastructure required to support mining, including a processing plant and port near Boyd Bay; a dam, tailings storage facility, roads; and a ferry terminal on the Hey River to transport workers from Weipa to the mine.

Consisting of two mining operations – East Weipa and Andoom – the Amrun development will eventually replace the existing East Weipa mine centre and develop bauxite reserves south of the Weipa Peninsula toward Aurukun.

The project is expected to extend mine life by about 40 years at a production rate of about 22.8 million tonnes per annum (mtpa) and includes an option to boost production up to 50mtpa.

## Boost for Queensland

During the peak of construction the project had been tipped to employ about 1100 personnel, and when delivered would



contribute about \$1.3 billion annually to the QLD economy.

Rio said it had awarded more than \$900m in contracts to QLD suppliers, making up almost two-thirds of the \$1.38bn in contracts awarded to Australian suppliers as a whole.

509 QLD businesses had been engaged directly or indirectly to supply goods and services to the site.

QLD Premier Annastacia Palaszczuk

said Rio's significant investment in local and regional suppliers would provide a tremendous boost to the State's economy.

"The Amrun project will ensure QLD businesses and their employees will continue to reap the benefits of many development opportunities for years to come.

"It is a best practice example of encouraging local and Indigenous participation with substantial employment targets already agreed with many key suppliers."

Rio said more than 1600 people had been engaged by contractors as at the end of March this year, with 77 per cent from QLD.

Businesses bidding for contracts of more than \$1m must have completed a Local and Indigenous Participation Plan as part of the procurement process.

Once awarded, contractors must report on how they are performing against their commitment.

Rio Tinto chief executive Jean-Sébastien Jacques said the company was proud of the contribution Amrun would make in supporting QLD communities.

"Sustainability is crucial to this project and strict guidelines are in place for all suppliers," he said.

"They must demonstrate they are commercially competitive, technically competent and most importantly, align with the safety standards of our Group.





The East Weipa mine centre will be replaced with the development at Amrun.

“Rio Tinto is a substantial contributor to the QLD economy, paying \$1.3bn in State taxes and royalties over the past five years.”  
QLD Natural Resources and Mines minister Dr Anthony Lynham said the government had worked closely with Rio to create jobs and strengthen the state’s economy.

“The independent Coordinator General declared the Amrun project a significant project (now coordinated project) more than eight years ago,” Dr Lynham said.  
“The Coordinator-General continues to work closely with Rio to progress this important project for the region, the local community and the state’s economy overall.”



Goodline has built a reputation for quality project delivery.

# An industry leading reputation

GOODLINE is an Australian owned company specialising in the construction, maintenance and operational requirements of the mining, marine, energy and construction industries.

The company offers creative and innovative solutions to maximise the full lifecycle of assets.

The Goodline culture is driven by open and honest relationships with its clients and suppliers, as it seeks continuous improvement to provide cost effective solutions.

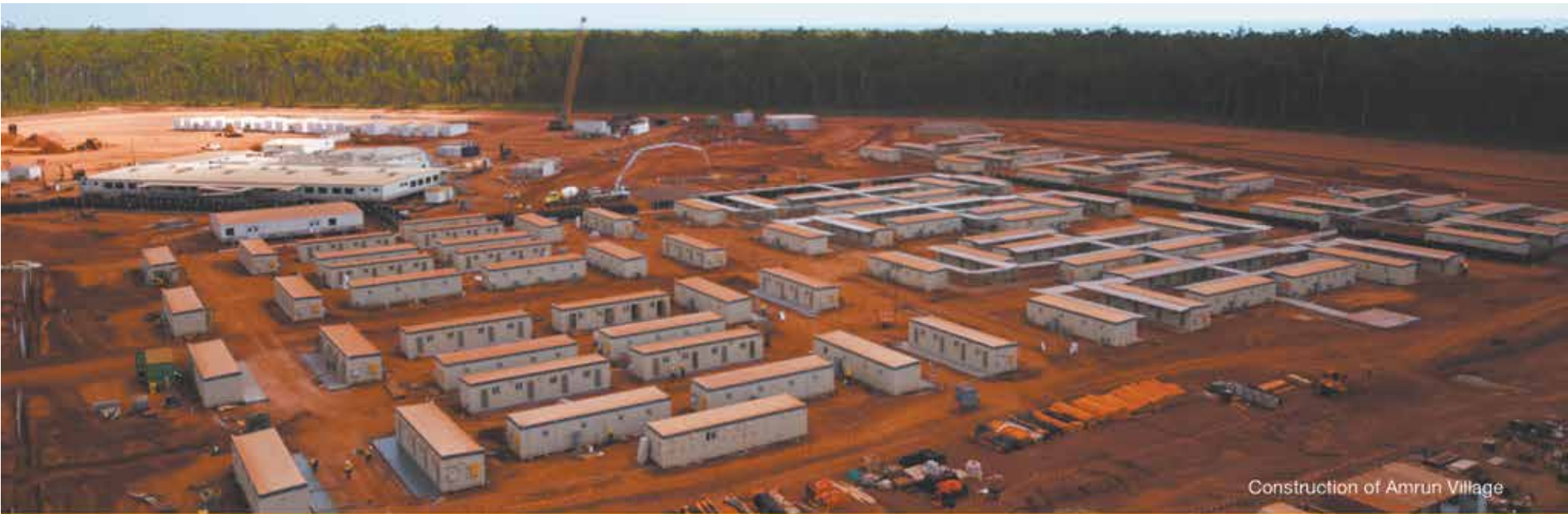
The company’s business functions are supported by internationally accredited HSE and Quality Management Systems.

With a proud and ongoing association with Australia’s leading resources companies for more than 18 years, Goodline’s success and reputation is built upon a “can do” attitude and a commitment to excellence in providing safe and efficient project delivery.

Goodline offers a full turnkey approach to construction and maintenance.

As a true multidiscipline contractor, Goodline has the capacity and experience to complete civil, structural, mechanical, hydraulic, electrical and instrumentation installations and maintenance.

With a proud track record of exceeding all safety and performance targets as well as a history of delivering projects within deadlines, its reputation is supported by key industry leaders throughout Australia that provide widespread endorsement of its services.



Construction of Amrun Village

## Proudly supporting Rio Tinto and the Amrun Project

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CuDeco's new chief executive Mark Gregory.



All images: CuDeco.

# A change for the better

After a rocky start to 2017, when a failed safety audit halted operations at its flagship Rocklands project, copper producer CuDeco is back in business with fresh investment and a new leadership team.

## CAMERON DRUMMOND

OFFICIALLY opened in October 2016 – 10 years after its original discovery – CuDeco's Rocklands copper project lies 17km west of Cloncurry, QLD, and employs about 225 personnel.

Producing primarily copper, Rocklands also has significant cobalt and gold deposits, and was in the process of ramping up to its nameplate capacity of about three million tonnes per annum (mtpa) for a minimum mine life of 10 years.

### Early year hurdles

On 16 February the Queensland Department of Natural Resources and Mines (DNRM) suspended operations at Rocklands after the mine failed a routine safety audit.

The DNRM concluded that a desktop audit on CuDeco's Safety and Health Management System did not support its current activities, personnel and processes associated with the site, and therefore did not meet the requirements under the Mining and Quarrying Safety and Health Act 1999.

The inspectors also reviewed the site's risk assessment and determined that the site had not sufficiently reviewed the risks associated with the mine's activities and was out of date.

CuDeco took swift action, submitting an updated safety and health management system relevant to its current operations at Rocklands.

Under the DNRM directive, the company was permitted to continue loading concentrate that was stockpiled at site, and operate plant and equipment to keep the site safe.

The suspension was lifted eight days later on 24 February after the DNRM deemed the company's updated safety system was satisfactory for operations to resume.

The suspension resulted in managing director Dr Dianmin Chen, chairman Noel



CuDeco's Rocklands copper mine.

White and operations manager Mark Roberts all resigning from their positions.

Dr Chen – who was due to resign on 30 April – had his resignation brought forward to 21 February as a result of the DNRM directive, with Peter Hutchison appointed to the position of interim chairman five days earlier.

CuDeco's share price was also affected, dropping from 52 cents at the start of the year to 29 cents at the time of suspension.

Mark Gregory, former chief executive of construction company Waltz Group which helped build the Rocklands processing plant, was appointed CuDeco chief executive shortly after the suspension.

Mr Gregory said he was thrilled to have been appointed as chief executive at a critical time of the Rocklands project.

"Rocklands is on the verge of realising

the dreams of its founders, and it will be incumbent on me to guide it through the last critical stages necessary to achieve this goal," he said.

Mining at the project recommenced on 15 March after planned shutdowns, maintenance and procedural updates had been completed.

### Recent activities

On 3 April CuDeco announced it had entered an agreement to raise \$US15 million through a convertible note to a subsidiary of Valuestone Fund.

The funds were used solely to pay down company debt to China's Minsheng Bank, to which it owed \$US60m payable in four quarterly payments of \$US15m.

Mr Gregory said CuDeco would not tap

investors for the upcoming debt repayments.

"We have another repayment due as of 30 June, and if failing to generate sufficient cashflow from mining operations we are looking at other funding options to make the payment to Minsheng on time."

"It's not our intention to do a capital raising between now and then to make the repayment to Minsheng."

CuDeco said production had ramped up to acceptable rates by late March after lower than anticipated rates in January and February, largely due to the eight day shutdown of operations.

Total quarterly ore throughput was 316,708 dry metric tonnes (dmt), producing 2796 tonnes (t) of copper metal.

CuDeco continued to work up to full production since recommencement in March, with the mine supplying ore direct to the processing plant.

Plant throughput continued to improve, processing 146,327dmt of ore in March, which accounted for almost half the total throughput for the quarter.

The company said the crushing plant was now capable of achieving design rates with the inclusion of the mobile crushing plant, and ore processed through the plant during April was at nameplate rates.

Interim chairman Peter Hutchison said the company was finally heading into a period of robust performance.

"Corporate distractions have dominated shareholder perspectives for too long [and] I am pleased to say this is almost behind us now," he said.

"Recent changes at the company and Rocklands are having a positive impact."

On 4 May CuDeco accepted the resignation of its chief financial officer David Wrigley due to business model changes at the company.

He was originally employed by previous managing director Dr Chen to fulfil a Perth-based role.



“David joined the company at the very critical commissioning phase of Rocklands, managing the finances of the business with a very high level of professionalism and commitment,” Mr Gregory said.

“It is unfortunate that our strong focus on developing the Rocklands asset does not support a business model where our head of finance is based in Perth.”

Mr Gregory said he was pleased with the management changes and that CuDeco was well placed for long term success.

“I’m really happy with the management team we have in place and we have strong support from the board,” he said.

“We have some short term challenges; however our fundamentals place the business in good stead to get through these short term hurdles and become successful in the long term.”

“Our process plant is beginning to show signs of what is achievable under appropriate management, with nameplate throughput rates being achieved on a regular basis.”

“We have even seen periods well above nameplate being achieved sporadically which is wonderful news for all concerned.”

“We expect that we will continue to increase capacity over the [coming] months and by July, achieve consistent nameplate capacity.”

Mr Gregory noted that valuable input and direction from key personnel had the driven project-wide improvements.

“We are all working very hard to maintain the new momentum which has been created,” he said.

“Rocklands is performing well and achieving important milestones, but we know it can perform better still and we will continue to pursue a program of ongoing improvement.”

“I am none the less very pleased with efforts to date, and the measurable achievements that have been made over a relatively short period of time.”

# End-to-end supply chain management

ESTABLISHED in 2009, Townsville Bulk Storage and Handling (TBSH) began as a local storage facility for bagged fertiliser at the Port of Townsville.

As a result of its commitment to unrivalled personal and tailored service, TBSH expanded its customer base across the globe; adding stevedoring, transport, customs, quarantine and warehousing solutions to its portfolio.

TBSH is now the largest privately owned stevedoring company in North Queensland.

TBSH offers tailored end-to-end supply chain management services which extend to every corner of Australia.

Its reputation as one of North Queensland’s most trusted providers has been built on its strong relationships with customers.

As part of that mandate, TBSH strives to provide exceptional service to its customers by making a point of understanding their unique needs, and proving it by delivering, transporting and storing shipments on time, safely and within budget.

The company employs a team that is determined to provide the best service in the industry, so clients can enjoy



The TBSH complex at the Port of Townsville.

peace of mind that their product is being handled with the same care and attention they would expect from their own staff.

They are highly experienced in transporting, managing and storing

a diverse array of cargo, and offer a seamless end-to-end solution regardless of timing, size or nature of the client requirements.

More information can be found at: [www.tbsh.com.au](http://www.tbsh.com.au).





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# Industry changing

*Metso's revolutionary new cone crusher technology arrives in Australia.*

THE product of 100 years of cone crusher evolution, Metso's new MX seems poised to redefine the way we think about cone crusher performance with claims of previously unimagined efficiency, wear part utilisation, safety and automation.

The company unveiled the new machine along with a number of other world first innovations at this year's CONEXPO-CON/AGG global trade show in Las Vegas.

Metso has just announced the launch of MX4, the first model of its innovative new MX cone crusher series, on the Australian and New Zealand markets.

According to Metso, MX is the first 'Multi-Action' cone crusher on the market. It combines the very high reduction ratios of the most demanding mining applications with superb end-product shape and consistency critical in aggregate applications.

The machine's engineering team says that the MX cone crusher was designed with one objective in mind - making the machine owner's business more profitable than ever before. The company states that the MX reduces total-cost-of-ownership whilst supercharging productivity.

### Patented 'Multi-Action' Technology

Peter Newfield – Metso Australia's Head of Marketing & Communications, says that the company's patented 'Multi-Action' technology is a revolutionary way to automatically optimise crusher operation.

The MX is able to simultaneously adjust its setting with a rotating bowl above its cavity and a hydraulic piston inside the machine's fixed shaft. Dynamic setting adjustments can be made when the crusher is operating under full load conditions without the need to stop production. Both rotating bowl and piston adjustments are fully automated, so no human intervention is required.

The MX also provides a maximised tramp release distance, delivering high levels of protection against uncrushable objects and overloading. Protection is optimised under all conditions, even with completely new wear parts.

### More uptime and lower operating costs

According to Mr Newfield, the MX with its Multi-Action technology is the most cost-efficient crusher on the market. It enables operational cost savings of 10 per cent or more compared with traditional cone crushers.

Savings in wear components coupled with an effective and continuous crushing action, provide an unbeatable starting point to bring down the cost per ton in any quarry or mining application.

The new machine's uptime is significantly better than traditional cone crushers.

The MX's Multi-Action design allows dynamic setting adjustment and wear composition with its hydraulic piston, minimising interruptions to production. It also provides rapid, fully automated



protection via its rotating bowl. The combination of rotating bowl and piston adjustment enables optimised wear part utilisation.

The MX features a very robust design that is based on Metso's experience over the years with its Nordberg MP, HP and GP Series cone crushers. The new crusher is designed for the most challenging operating conditions with very hard and abrasive feed material. From the start, the MX was engineered to minimise downtime and allow 24/7 crushing in the harshest applications.

One of the big advantages of the MX is its quick and easy wear component change-outs. All the wear parts are accessible from the top of the machine, allowing a complete change-out in just two to three hours.

### Up to 70 per cent wear part utilisation

Metso says that the MX delivers record breaking wear parts utilisation rates. The crusher can use up to 70 per cent of the mass of new wear parts. Optimal

cavity design, stroke direction and an effectively distributed crushing action are combined to provide a highly optimised rock-on-rock crushing motion.

Together with the machine's Multi-Action technology, this results in extended intervals between maintenance and higher production rates. Quality characteristics of all sized end product fractions stay consistent throughout the lifetime of wear parts.

### Selective production

Mr Newfield says that the smart optimisation of Metso Multi-Action technology is the key to reaching desired end-product shape and particle size distribution while eliminating waste. End products can be measured as often as 10 times per second and shown directly on the crusher's automation display. Operators can easily control and automate parameters such as material cavity level, crusher speed, power setting and piston pressure.

Crushing quality can be monitored via Metso's 'VisioRock' which measures real-time production through a photo particle size analyser that is connected to the crusher's automation system. VisioRock is compact in design and easy to install. Its Modbus interface enables quick access to particle size distribution from cameras that are mounted above the crusher's output conveyor.

### Designed with operator safety and the environment in mind

Less human machine interactions for adjustment and maintenance naturally means a safer working environment for machine operators and maintenance staff. Combined with purpose made lifting components and wear part tightening tools, the MX is said to be a big win for operator safety. The machines have also been designed with the environment in mind. There is no lead used in the MX's counterweight design and no backing is required to set the liners. The machine's lubrication system has been optimised to use up to 3 times less oil than previous models. Machines can be equipped with Metso's offline filtration system which keeps oil clean for extended periods.

### Technology proven in the 'real world'

As part of its MX development program, Metso included a pre-launch field testing period. Machines were secretly tested in four different countries. By the time of the global launch in Las Vegas, the test machines had completed a combined operational time of more than 10,000 hours.

"Our prospective customers can be confident that our new machines already have a proven track record in some really challenging applications," Mr Newfield said.



# 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”.



Blueprint Wealth financial advisor Brad Martin presenting at the Kanowna Belle mine site in Kalgoorlie, WA.

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.*

## Tsurumi first choice for iron ore mine

EUROPEAN submersible pumps have traditionally played a large role in keeping Australian mines dry and safe.

Most European products are designed around much the same principles and of course are, as you would expect, designed to compete with one another.

The world’s biggest pump manufacturer – Japanese-based Tsurumi – is changing the way miners and the construction industry think about submersibles.

The latest example of Aussie Pump Industries’ (Aussie Pump) success was to supply a major Australian iron ore mine a 90 kilowatt Tsurumi LH690 pump.

The LH690 has a 150 metre head and a 2500 litres per minute maximum flow capacity.

Like all Tsurumi’s LH series, it looks very different to its European counterparts.

At only 592cm in diameter, the big LH690 pump is slender, designed to enable the pump to be used in bores and wells.

Its top discharge means that the waters flows through the pump casing, thus keeping the motor cool even in high temperature underground applications, with a central discharge flange designed so that it is balanced for lifting.

The pump achieves its extraordinary performance by two high chrome iron closed impellers that act as a two stage system.

It includes Tsurumi’s special features, developed to allow pumps to operate for longer with less maintenance than other brands.

These include a unique anti-wicking cable entry that prevents water incursion

due to capillary wicking should the power cable be damaged or the end submerged; and an absolutely watertight cable entry.

The mechanical seal is a dual, double mechanical seal as opposed to conventional submersible pump arrangements.

Tsurumi use a double silicon carbide seal that is completely enclosed in the oil chamber; therefore always protected by oil thus eliminating spring failure caused by corrosion or abrasion, keeping all four surfaces of the mechanical seal lubricated and cool.

Is if that wasn’t enough, Tsurumi added an oil lifter.

The oil lifter is a patented guide vane inside the chamber that ensures the mechanical seal is lubricated even if the oil level falls, increasing the time between routine pump maintenance.

The pumps are robust with the big LH690 weighing a whopping 1100kgs.

“The LH series will be available soon in 316 stainless steel configuration, something many corrosive mines have been hanging out for,” Aussie Pumps product manager Neil Bennett said.

Some of the most corrosive copper mines in Australia are using Tsurumi 316 stainless steel SFQ series pumps because they are the only product that seems to be able to stand up to the level of corrosion found in applications.

Further information and a free catalogue on Tsurumi submersible pumps can be found by contacting Australian Pump Industries’ Neil Bennett on (02) 8865 3500, Aussie Pump industrial dealers throughout Australia, or at: [www.aussiepumps.com.au](http://www.aussiepumps.com.au).



Tsurumi’s LH series are a slender design that produces pressure from a compact profile.



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Watson provides turnkey drilling services across Australia.

## Advanced drilling service provider

WATSON Drilling is a leading, innovative resource and water drilling organisation deploying a modern universal fleet of drilling rigs and support equipment in Australia.

Established in Maryborough, VIC in the 1930s, Watson Drilling is currently run by fourth generation family members Dave and Rex Watson, who hold 68-plus years of experience between them.

The company is a leading, innovative resource and water drilling organisation holding some of the most modern and technically advanced fleet of drilling rigs and support equipment in Australia.

Its fleet comprises of 11 multi-purpose all terrain drill rigs, backed by a huge inventory of support equipment.

This includes, water trucks, front end loaders, excavators, generators, lighting

towers, auxiliary mud-pumps, high pressure air compressors and mobile camps.

Watson Drilling has staff and equipment for turnkey drilling operations throughout Australia.

The company is proud to employ a very experienced team of licensed drillers, offsidors, and maintenance staff; whose skills and knowledge ensure safe, efficient and productive field operations.

The company has licensed drillers able to drill in the Great Artesian Basin, with endorsements for Mud-Rotary, Diamond Coring, DHH and RC drilling, specialising in large diameter bores.

It is also an industry leader in groundwater investigation and development, for irrigation, exploration and dewatering.

## World leading construction supplier



Holcim has a global footprint spanning 80 countries.

WITH access to global and local-scale know-how, Holcim is a unique part of Australia's building and construction materials industry.

The energy and mining sector demands flexibility, technical excellence, and scale from its suppliers.

Yet finding one with a local focus combined with global business resources is rare; that's why Holcim Australia is unique in being able to offer the best of both these worlds.

Holcim has operated in Australia for more than 150 years, supplying construction materials to many of Australia's biggest mining and energy projects through a national fixed plant network, and mobile plant options for those hard to reach, out of the way places.

Notable projects which Holcim has

been a part of include the Gorgon LNG plant, the Sydney Metro rail tunnels, and the Argyle Diamond Mine.

Holcim is part of LafargeHolcim, the world's leading building and construction materials firm with more than 90,000 employees and 1400 plants in 80 countries.

Holcim's products benefit from access to the LafargeHolcim Research Centre – the world's largest concrete research and development facility, which employs 120 PhD-qualified researchers.

At its core, Holcim is an Australian business that draws on global innovation and resources.

More information on how Holcim can support projects can be found by calling 13 11 88, or visiting [www.holcim.com.au/RightFromTheStart](http://www.holcim.com.au/RightFromTheStart) to receive the company's new credentials brochure.



# Flexibility has a name: WAGO

WAGO has designed its I/O-SYSTEM 750 in such a way that the same platforms are used in the Ex-proof and non-Ex-proof areas.

Based on design details, the system is extremely versatile, while still adhering to its higher ranking standard.

Featuring more than 500 different modules, it offers the opportunity to directly integrate different sensors in the field and transmit multiple different forms of analog and digital signals bundled through TCP/IP to the control room.

In addition, the WAGO- I/O-SYSTEM makes it possible to remotely record failure messages or fill levels of rain overflow basins and in doing so, control the inflow into the wastewater treatment plant in a targeted manner.

In addition to the general field-bus dependency and the standard availability of open interfaces for the instrumentation, as well as the integration of entire system parts, the HART communication is also offered by WAGO.

Finally, this communication compatibility also permits it to easily permit a system expansion in the future.

### Less effort for planners and operators

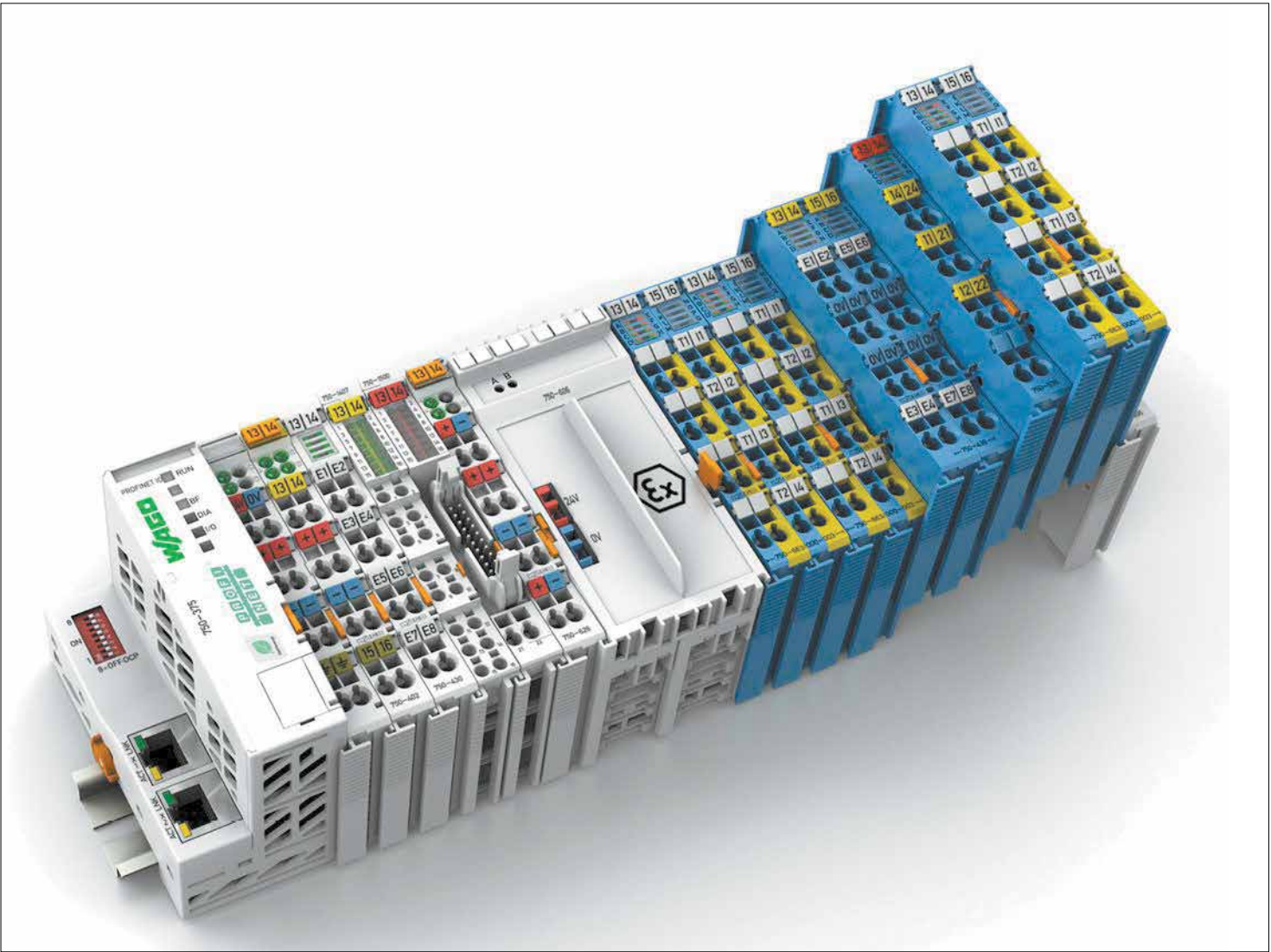
WAGO's modular design principle enables planners to equip applications in the Ex-proof and non-Ex-proof areas economically and efficiently without extensive programming.

Operators can also implement special solutions, such as a partial energy measurement, including the storage of all process data, with the components of an automation system.

This makes it possible to establish a targeted monitoring management system that displays historic values.

The functional benefits that WAGO's system provides for the process engineer are completed for the programmer by offering function libraries free of charge.

WAGO's- I/O-SYSTEM 750 comprises of more than 500 I/O modules, 60 controllers



WAGO's PFC200 Ex controller.

and 40 fieldbus connections.

That is WAGO-I/O-SYSTEM 750 – making no other automation system more flexible.

The company offers so many variants and can be adapted individually to any project – even in extreme operating conditions.

The WAGO-I/O-SYSTEM includes the established ship building approvals

for offshore use, such as DNV\*GL or ABS and can also be used in hazardous environments (dust, gas and mining).

With the intrinsically safe IO the WAGO-I/O-SYSTEM has reliably served in oil and gas mines for years.

In addition to two ethernet interfaces, the WAGO controller offers a variety of additional interfaces.

The WAGO-I/O-SYSTEM 750 can

easily integrate with CAN RS-232-485 Profibus, Profinet, Ethernet/IP and MODBUS, among many others.

Additionally the IO system can be incorporated into a VPN infrastructure with openVPN and IPsec protocols directly.

The variety of options with the WAGO system means it is flexible and scalable to customers' requirements.

# Reducing the cost of pump ownership

THE initial purchase price of a pump is only a fraction of the total cost of ownership. Maintenance, energy, operational and downtime costs are real concerns — year after year — over the life of the equipment.

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Building on more than 160 years of Goulds Pumps experience, ITT has been providing an array of repairs and upgrades services to extend equipment life.

PRO Services helps customers develop effective maintenance and asset management programs to lower maintenance costs, improve uptime, reduce inventory costs and extend equipment life.

Industry players know that “up-time” yields money and is paramount to businesses.

ITT's Goulds Pumps products are engineered to maximise up-time, by offering customers the best and most complete solutions.

The company's experienced and knowledgeable team further complements its portfolio of mineral processing solutions.

The Goulds Pumps Model XHD is the result of 100 years of slurry pumping experience.

The XHD incorporates the latest technology including CFD analysis to provide the next generation in severe-duty slurry pumping.

Extensive 'voice of the customer' input was utilised to ensure customers' most important needs were met.

This included high efficiency with extended wear life, along with maximum reliability and ease of maintenance.

The XHD is designed to keep a process running.

With offices, packaging and service centres located across Australia, ITT Goulds Pumps provides the coverage needed to serve all types of customers, whether small or multi-national companies located in any region.

More information on ITT's pump products can be found by calling 1300 333 488 or by visiting: [www.itt.com](http://www.itt.com).



ITT supplies the well-known Goulds Pumps products.



# Sky high service

BEGINNING operations in 1990 in Melbourne, Flight Data Systems (FDS) is now a specialist company providing aviation products and services to more than 250 commercial and military customers worldwide.

FDS is an Australian provider that designs, develops, produces and supports a range of Remotely Piloted Aircraft Systems (RPAS) services.

Its experienced team offer a range of solutions, including a full turnkey service with fully licensed CASA RPAS operators and RPA systems for different commercial applications.

FDS is a delegated authority of CASA, which means it can process applications for a Remotely Piloted Aircraft Operator's Certificate (ReOC), formerly referred to as a UAV Operator's Certificate (UOC).

The company's aim is to reduce the wait-time and cost to industry.

FDS is a CASA approved training organisation offering end-to-end basic and type training packages for both fixed wing and multirotor RPAS.

FDS is also ASQA approved to deliver the Certificate III in Aviation - Remotely Piloted Aircraft Course.



More information can be found at [www.flightdatasystems.com.au](http://www.flightdatasystems.com.au).



## CERTIFICATION

Flight Data Systems is a Delegated Authority of CASA, which means we can process your application for a Remotely Piloted Aircraft Operator's Certificate (ReOC, previously UOC). Our aim is to reduce the wait-time and cost to industry.



## SERVICES

FDS can design, develop, produce and support a range of Remotely Piloted Aircraft Systems (RPAS) services. We also offer a range of solutions, including a full turnkey service for many different commercial applications.



## TRAINING

FDS offers both a Certificate III in Aviation course as well as CASA-approved RPAS Training. These training courses are nationally recognised and fully accredited courses which include classroom, online, and in-field practical training.

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**accura**



"Seam Surveys have been involved with the Accura boat project for almost two year now. We have helped work through various Beta upgrades and alterations and are pleased to say that for the last 6 months, despite lots of use, our package has been virtually bullet proof. We feel that it is a superior package to the other options available and have now taken on a second Accura. We are ecstatic with our Accura CEE Hydrosystems package." **Mick Harris, Seam Surveys.**



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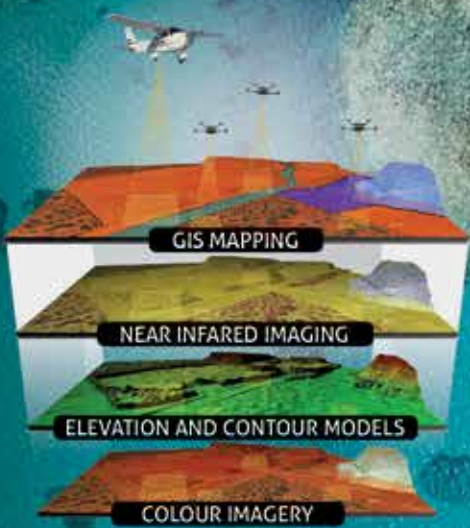
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– Senior Data Manager, Victoria Government







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# Eriez® suspended electromagnet: less bucks for better bang

WITH higher throughputs and larger capacities of today's processing plants, the need to remove damaging tramp metal prior to key unit operations is paramount.

It only takes a small amount of downtime to eradicate any savings gained by installing sub-standard equipment.

Eriez, now celebrating 75 years, has been proud to be the high-quality industry standard when it comes to protecting customers' operations.

The workhorse that keeps customers and their equipment safe is Eriez' suspended electromagnet. These separators can be designed to capture tramp metal from both shallow and deep burden depths and are ideal for almost any application – wet, dry, fine, or coarse.

As plants continue to increase in size to take advantage of economies of scale, Eriez' electromagnets have followed suit.

The largest magnets available from Eriez exceed 74 tonnes (t) and measure 3600mm square.

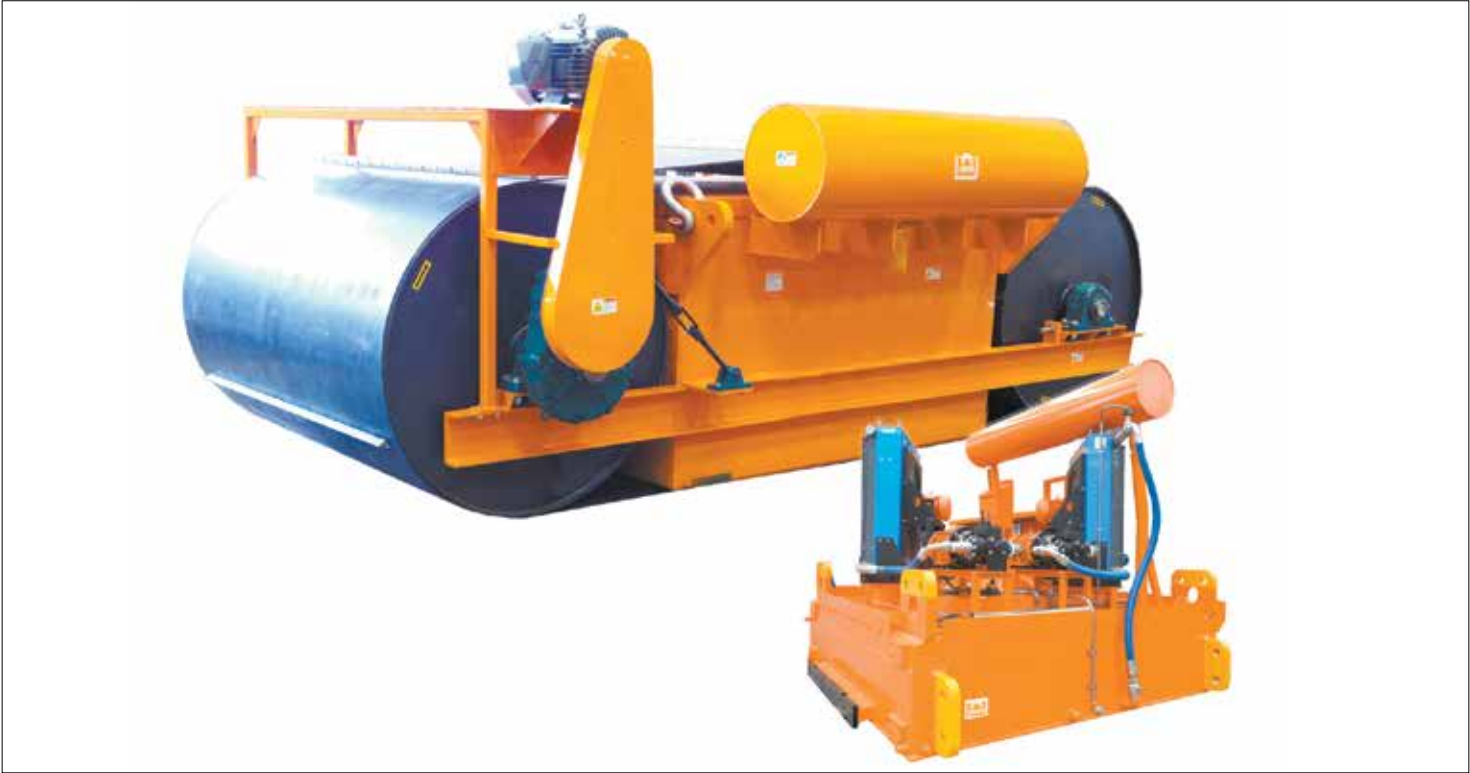
The size of these magnets is a direct result of the passive heat dissipation used to keep these separators cool and required to maintain their strength.

Recently, Eriez has worked closely with several customers to provide significantly smaller sized compact "force-cooled" magnets that are able to provide the same strength as the company's biggest magnets.

The key is in using a light-weight active cooling system which can be fully integrated or located remotely.

These units are preferred when the existing support structure does not have sufficient load capacity for a traditional suspended electromagnet.

They are also nominated for installation in new plants due to the resulting lower



Eriez' compact "force-cooled" magnets provide the same strength as its largest magnets on offer.

overall capital cost stemming from the significant weight and size reduction which translates to a smaller superstructure and reduced foundation load.

As an example, a force-cooled magnet (Eriez SE65k) was chosen over a traditional unit (SE10863) that measured 2800mm square and weighed 32t.

In contrast, the force-cooled magnet measured 2000mm square and weighed only 10t, which led to significant savings on installation.

Additionally, because the force-cooled magnet operated at a lower temperature,

it provided a stronger field and better overall protection for the customer.

While some customers will prefer the "plug and play, set and forget" approach afforded by traditional suspended electromagnets, the force-cooled approach provides Eriez' clients the option to take advantage of size and weight reductions leading to overall cost savings, while maintaining the best tramp metal protection offered by industry and proven over 75 years in the business.

Eriez is recognised as the world authority in advanced separation

technologies for magnetic, vibratory and inspection applications.

The company's magnetic separation, metal detection, materials feeding, screening, conveying and controlling equipment have application in the process, mining, aggregate, plastics, metalworking, packaging, recycling and textile industries.

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 sales.au@eriez.com or at: www.eriez.com.

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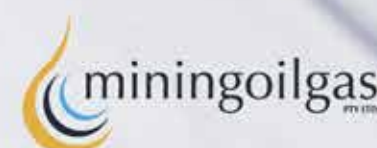
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# Proudly Australian owned

IN the commercial and industrial market, it is essential for business operations to know the correct weight of the materials they are handling.

Instant Weighing supplies weighing equipment and support to industries such as mining, quarrying, transport, industrial and farming.

Instant Weighing is a licensed scale company with National Measurement Institute (NMI) accreditation and is the WA distributor of the COMPULOAD series of front end loader trade and non trade approved scales, COBO excavator scales, as well as the seven various PROLEC Safety Limiters (made to Australian Standards) for excavators.

The company is also a major tester of all types of scales for the new SOLAS/AMSA export sea container weighing laws introduced 1 July last year.

COMPULOAD product development is an ongoing exercise with the recent release of the new COMPULOAD 6000 (with data storage including a built in USB data downloader) and the COMPULOAD 5000 scales for front end loaders and forklifts that includes fine tuning to improve weighing accuracy.

The COMPULOAD range has weighing software for both loading road trains and batching.

A recent example showing the accuracy of the COMPULOAD series of front end loader scales included a client that used front end loaders fitted with trade approved COMPULOAD 4000 scales.

The client used the 4000 model to load four trailer road trains at mine sites and haul the ore back to Port Hedland for shipment.

The COMPULOAD scale indicated that 18,800 tonnes of ore was transported to the port for a specific shipment, and once loaded onto the ship the Port Authority indicated that the difference between their total weight and the COMPULOAD scale's total weight was just 37t.

That's an error of just 0.2 of 1 per cent.

On 1 July 2016, new international laws



Providing product support and calibration services throughout WA is paramount to Instant Weighing.

were introduced through the Australian Maritime Safety Authority (AMSA) regarding the testing of scales used to determine the Verified Gross Mass (VGM) of an export sea container.

In summary, the new laws stated that any scale can be used to weigh an export sea container, but before the scale can be used it must be tested and pass NMI standards of testing for that type and capacity of scale, and that this testing must continue on an annual basis.

The laws also stated that Certified Test Masses must be used for the testing.

The variety of different scales affected by the new laws include small to very large platform scales; weighbridges; scales on small to very large forklifts using either forks or spreader bars; scales on front-end loaders fitted with forks; scales on reach stackers, and trucks with side lifters; and scales used at wharves on cranes or container straddlers.

Instant Weighing technicians hold the NMI testing licenses for testing the trade approved front end loader and forklift scales and also for general scales, including general scales exceeding 3t in capacity,

which included weighbridges.

In the last 12 months throughout all of WA, this AMSA scale testing has generated extra work for Instant Weighing staff because of the unique range of NMI testing licenses its technicians hold.

The number of different types of industries involved in weighing export sea containers to determine its VGM included large companies in both the mining and oil and gas industries.

More information on scales and onsite calibration requirements can be found at: [www.instantweighing.com.au](http://www.instantweighing.com.au).

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# State-of-the-art pipe flanges

CAMAN Engineering is Australia's largest independent stockist and manufacturer of pipeline flanges.

An extensive range of pipeline products are held in stock in both its Perth and Sydney facilities, including orifice plates and flanges, spec blind spades and spacers, hydro-test blinds, nozzles and long weld necks, tube sheets and baffles for heat exchangers.

Caman also offers a state-of-the-art CNC machining service with a machining capacity of up to 2200mm in diameter; this means if the company does not have a certain specialised or custom flange in stock, it can be manufactured promptly.

The company has one of Australia's most complete ranges of valving products; no matter what the application, it has the solution, tailored by one of the most experienced valve sales teams in the country.

Caman is 100 per cent Australian owned by the same family that has been involved in the daily running of the company since its inception in 1954.

More recently in 2017, Caman Engineering WA completed a purpose built 3600sqm facility in Perth, demonstrating its long standing commitment to providing the WA market with an excellent level of "stock on hand" and customer service.

Caman is an approved manufacturer and supplier of pipeline flanges, heat exchanger and pressure vessel components to oil, gas, mining and petrochemical companies operating in Australia; is accredited to comply with Quality Assurance Standard ISO 9001 and is an approved P.E.D material supplier, certified by Lloyds Register Quality Assurance.



Caman Engineering's new state-of-the-art facility in Perth.

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GR Engineering provides fully equipped plant services to the mining sector.

GR Engineering Services Limited (GRES) is an ASX-listed (ASX:GNG) process design and engineering contractor providing fixed price EPC engineering design and construction and EPCM services to the mineral processing industry.

GRES is currently delivering the Mungana project for Auctus Minerals, Mt Morgans gold project for Dacian Gold and the Dalgarranga gold project for Gascoyne Resources.

GRES has successfully refurbished plant and infrastructure at sites which have been shutdown or on care and maintenance for extended periods with the most recent projects of this nature being the Davyhurst gold project for Eastern Goldfields, Mt Magnet gold project for Ramelius Resources and Gold Ridge for St Barbara.

GRES has undertaken new project development based on the use of existing and

relocated plant.

The Randalls project for Integra Mining (now Silver Lake Resources) utilised the New Celebration plant and the Edna May gold project for Catalpa Resources (now Evolution Mining) used the Big Bell gold plant.

Both these projects proved successful for the respective owners and remain in operation.

GRES' team of highly experienced professional engineers and construction trades persons

are well equipped to provide brownfields expansion work, project support, operations support and improvement consulting and asset management services.

GRES has a presence in the hydrocarbons industry via its wholly owned subsidiary, Upstream Production Solutions, a leading provider of operations and maintenance management services to the oil and gas industry in Australia and South East Asia.



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# HARRYBILT ENGINEERING



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**Harrybilt Engineering is an Australian based, family owned manufacturing business, established in 1985.**

Harrybilt Engineering pride themselves on having the ability to design and develop new equipment to customer requirements. Equipment is manufactured for Australian conditions, and to the highest standard.

Harrybilt Engineering is completely customer orientated, manufacturing equipment to suit specific customer needs as well as meeting delivery requirements. By listening to customer feedback, they are always improving and increasing their product range.

Their team consists of a Mechanical engineer, Boilermakers, Fitters and a Hydraulics Technician and their tradespeople are fully qualified and experienced.

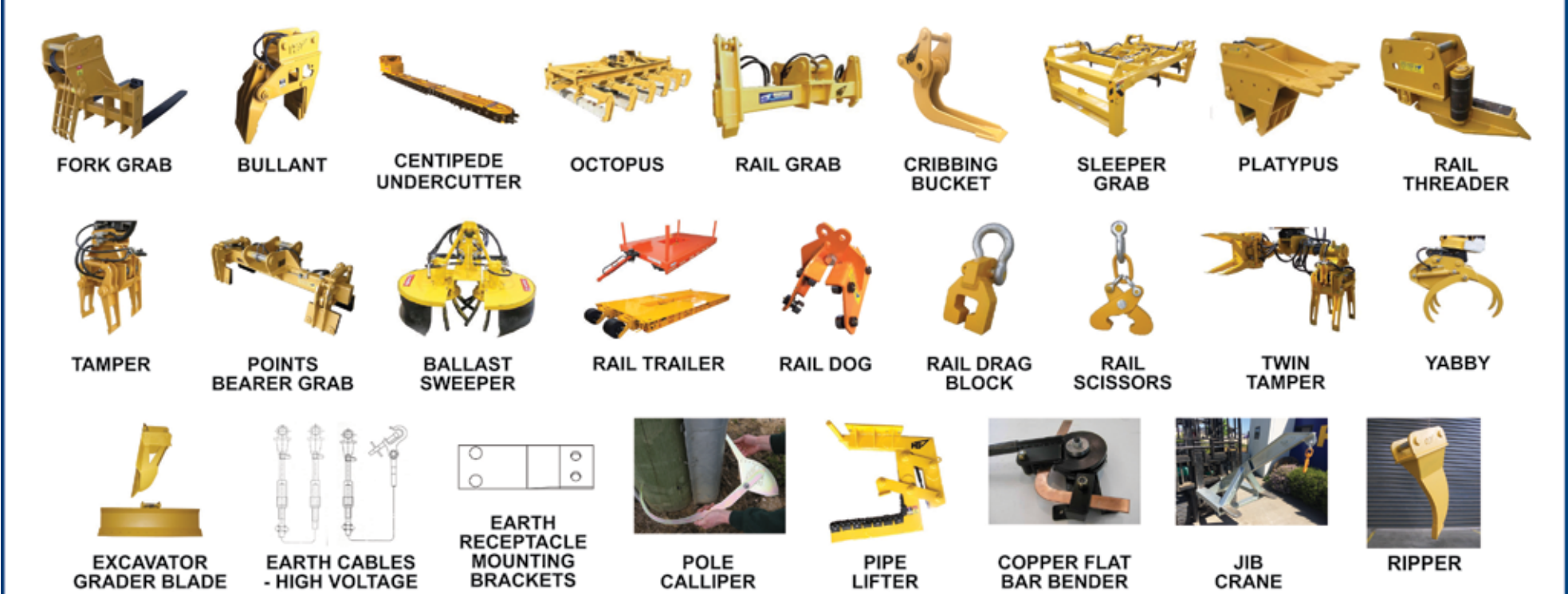
For nearly 20 years, Harrybilt Engineering has specialised in the design, development and manufacture of specialist equipment for Rail Infrastructure Networks across Australia. This equipment ranges from Hi Rail and Rail Guidance Systems for excavators (wheel and track) trucks and backhoes, rail maintenance equipment, as well as rail and sleeper handling attachments.

All equipment is manufactured in a modern purpose built engineering factory constructed in 2008, and with two five tonne overhead cranes, can handle most engineering projects. A further expansion in 2011 incorporated a large warehouse to provide immediate delivery of spare parts to their customers.



Harrybilt Engineering look forward to meeting with new and existing customers, with new ideas and new products.

## Products - View the products & specifications in detail at [www.harrybilt.com.au](http://www.harrybilt.com.au)





# Global signalling services for rail projects

JMD Railtech (JMDR) is an experienced rail engineering Australian company (registered in 2005) that provides signalling services across a broad engineering spectrum.

The company employs a wide range of experienced, competent and licensed engineers, who possess the required knowledge of standards, procedures and processes of various railways in Australia, United Kingdom, Malaysia, Thailand, Singapore, Indonesia, Taiwan and India.

JMDR provides total signalling solutions in signal design, wiring works, construction, site works, testing and commissioning, and competency management.

With more than 31 years of experience in the rail and engineering industry, JMDR Managing Director Dilip Goyal has led a team that has delivered a large number of signalling projects from concept to handover.

It is a preferred supplier of signalling services, with many Framework & Panel agreements across a large number of transport organisations across the globe. These agreements were awarded on the grounds of the competency of JMDR's staff and sub-consultants, the quality of its services, consistency and agreed rates over an extended period of time, as well as providing value for money.

JMDR provides critical signalling resources and offers management services (as design, testing, commissioning and project signalling management).

JMDR has been carrying out Competency Assessments for ARTC since 2010.

"In September 2014, JMDR became an IRSE Approved Assessing Agency and subsequently authorised to undertake both Workplace and Competence Assessments on behalf of the internationally accredited and globally recognised IRSE Licensing Scheme," Mr Goyal said.

"With first-hand knowledge of the IRSE Scheme, JMDR promise to provide an assessment service that is professional, efficient and timely."

JMDR has more than 120 dedicated staff with offices in Sydney, Ingleburn, Perth, York, Birmingham, Noida, New Delhi, Bangalore, Mumbai and Singapore.



JMDR is an accredited ISRE agency.

JMDR said it was also considering opening another office in Melbourne in the near future.

JMDR's values are accountability,

customer focus, teamwork, value for money and people; and JMDR's all staff and sub-consultants are 100 per cent committed to deliver the signalling

works with passion, accountability and commitment to high standards compliant with client specifications in a timely manner.

## Rail maintenance equipment specialists

ESTABLISHED in 1985, Harrybilt Engineering is an Australian, family owned manufacturing business that prides itself in having the ability to design and develop new equipment to suit specific customer needs and utilising a range of modern machinery.

Its qualified and experienced team consists of a mechanical engineer, boilermakers, fitters, a hydraulics technician, and tradesmen.

For almost 20 years, Harrybilt Engineering has specialised in the design, development and manufacture of specialist equipment for rail infrastructure networks across Australia.

This equipment ranges from hi-rail and rail guidance systems for excavators (wheel and track), trucks and backhoes, rail maintenance equipment and sleeper handling attachments.

Harrybilt Engineering is completely customer orientated, manufacturing

equipment to suit specific customer needs, as well as meeting delivery requirements.

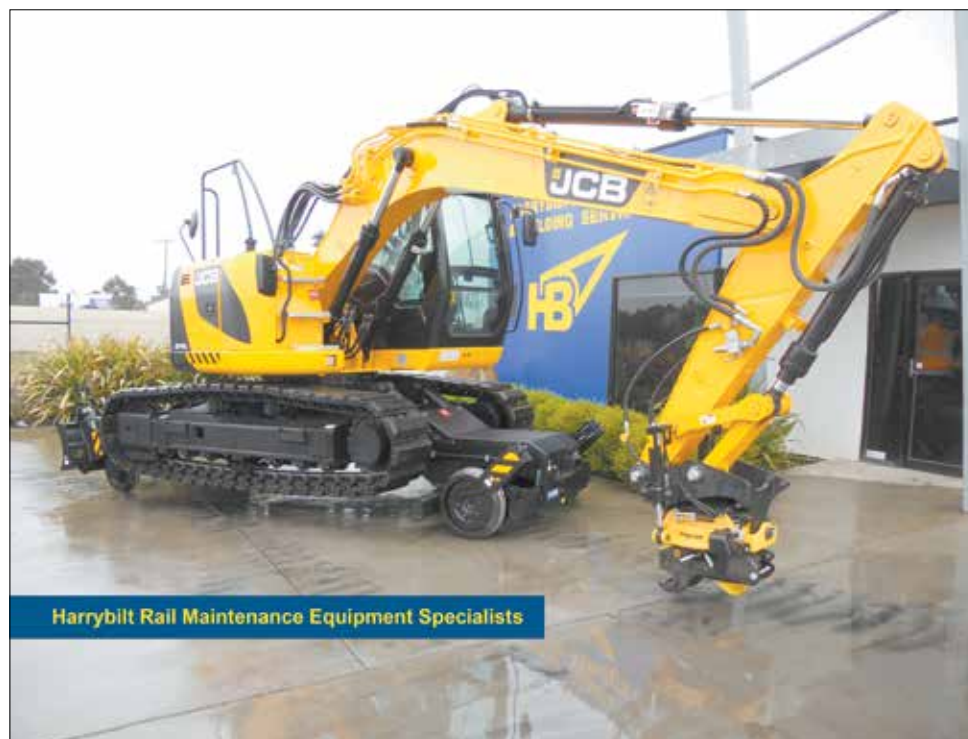
All equipment is designed for Australian conditions to the highest quality and standards, and is supplied Australia wide.

With an in house engineer, Harrybilt Engineering has the ability to design and develop new equipment to suit the requirements of each individual customer and is always designing and developing the product range to keep pace with this specialised industry.

In 2013 an onsite testing facility was established to conduct compliance testing for network registration.

Harrybilt Engineering is continually improving and increasing its product range.

The company has an extensive range of spare parts available for immediate delivery and also specialises in the design and fabrication of individual products for general, commercial and private



Harrybilt Engineering specialises in the manufacture of rail maintenance equipment, fabrication and steelwork for commercial and mining applications.

applications to suit specific customer needs.

The team at Harrybilt Engineering

look forward to meeting with new and existing customers, with new ideas and new products.



**HAYS** Recruiting experts  
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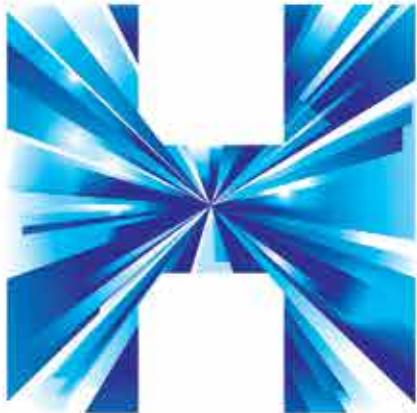
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# Skill shortages emerge again in WA

AUSTRALIA'S resources sector continues to show recent signs of improvement.

In WA, the stable commodity price and the decision of gold producers to increase their exploration budgets have lead to demand once more for Geologists with gold experience.

Hays has also seen an increase in the need for Mine and Exploration Geologists.

Underground (UG) Drill and Blast Engineers are in high demand too.

Employers want good quality candidates who have been in continuous work for the last four years.

UG Geotechnical Engineers are also needed, however many candidates left the industry when teams were cut.

As the market improves, there is a severe lack of quality candidates remaining.

This last point is a trend emerging across the industry. Over recent years many people moved into other industries, such as manufacturing and operations, in order to secure employment.

They enjoy being away from FIFO or DIDO rosters and with salaries lower than they once were there is little to entice them back.

In other trends, employers continue to prefer recruiting on a temporary basis, although with demand rising this could change. The first sign of a change will be employers offering their strong temporary candidates permanent roles.

An interesting trend is the increased focus in mining companies on creating a diverse workforce. Consequently, candidates who can strengthen diversity within an organisation are in rising demand.

In other parts of the country, Hays is seeing demand for Fitters and Operators as well as Lead Study/Managers in Queensland.



Data from Hays has shown an increased demand for skilled workers in the resources sector.

In New South Wales it is Mechanical Fitters, Boilermakers and Diesel Mechanics that are in demand as mines take advantage of the increase in coal prices and carry out maintenance on their equipment.

Victoria needs Mechanical Fitters, Boiler Makers/Welders and Diesel Mechanics with quarry experience, while the Northern

Territory needs Mechanical and Electrical Fitters and HD Fitters.

When looking for their next role, jobseekers are very flexible in the roles they will accept although they continue to favour higher pay rates and longer-term opportunities.

They are also more willing to relocate for

regional roles and increase their skills with additional tickets and qualifications.

Our 2017 Hays Salary Guide launches on 1 June 2017. An insight into the typical salaries and trends being offered across the resources & mining sector can be found by contacting Hay's Perth office or at: [www.hays.com.au/salary](http://www.hays.com.au/salary).

## Signs of recovery



Constructive Recruitment principal consultant Emanuel Gherardi.

THE mining downturn has left the industry suffering from a collective state of anxiety, but there's good news, Constructive Recruitment principal consultant Emanuel Gherardi said.

"What we're hearing from our clients and candidates at present is that conditions are becoming much more favourable and that there is definitely opportunity in the market," Mr Gherardi said.

"The banks are investing; and even more tellingly, lending to the Australian mining industry again, big miners have exploration

budgets again, the mid-tier miners and contractors are dipping their toes in the water (truth be told, they're out there swimming)."

Most importantly, Mr Gherardi said they are creating jobs and bringing highly skilled people back into the industry and have witnessed a year-on-year increase in job adverts of more than 90 per cent in NSW, WA and QLD, albeit from a low base.

"So is it safe to go outside?" he said.

"My answer is 'open the door and take a look, I think you'll like what you see'."

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If you are seeking new employees or considering a career move either in Australia or overseas, please contact Emanuel Gherardi for a confidential discussion:

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# Managing large-scale workforces

ONE Key Resources is a specialist provider of managed workforce services and labour hire to the mining, oil and gas and infrastructure industries nationally.

A subsidiary of the global Fircroft Group, the company supplies total workforce management solutions to clients including the recruitment, employment, mobilisation and ongoing management of large-scale blue collar workforces across all areas of open-cut and underground mining, oil and gas, and infrastructure projects.

“We currently work on nearly 100 projects throughout Australia,” One Key Resources managing director Grant Wechsel said.

“Our services allow clients to attract and retain a specialist workforce for their projects with our skills in recruitment, human resources, industrial relations and employee relations allowing the client to focus on their core activities as well as achieving positive outcomes in productivity and profitability.”

For its employees, One Key Resources offers a variety of permanent, fixed term contract, and casual employment opportunities in every commodity in the resources industry as well as supporting infrastructure projects at all levels of the organisations.

“If you are an experienced employee looking for your next opportunity in



More information can be found at: [www.onekeyresources.com.au](http://www.onekeyresources.com.au).

the resources or major infrastructure industries, One Key Resources and the broader Fircroft Group offer great opportunities,” Mr Wechsel said.

“We are currently rapidly expanding our workforce in gold, copper and iron ore mining across Western Australia and South Australia, while also offering maintenance

and operations roles within oil and gas and major infrastructure projects.

“We also continue to expand our footprint across coal mining projects in QLD and NSW where we have traditionally held a lot of our work.”

One Key Resources has proven its ability to provide whole of mine site managed

workforce services.

The company’s ability to take full employment responsibility, provide on-site management or support teams and overlay business intelligence data options allows it to work closely with clients in engaging and managing a productive and safe workforce for a project.



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# Dr Craig Stegman

## Rio Tinto Copper and Diamonds Operational and Technical Support vice president

With more than 30 years of experience in the mine life cycle, **Dr Stegman's** recent focus has been on establishing technical and innovation capabilities within copper and diamond products. He spoke with **Cameron Drummond** about the importance of innovation and collaboration in the mining industry.

### Q. What is your professional history?

I began my career as an exploration geologist with CRA Exploration (precursor to Rio Tinto Exploration) and Battle Mountain (which became part of Barrick) exploring in PNG, New Zealand, Northern Australia, Solomon Islands and Fiji.

After about 10 years, I moved to Peak Gold Mines in Cobar where I managed a near-mine exploration program and the mine geology.

As we identified additional resources, discovery of Perseverance and resource extensions in the Cobar Goldfield, I became involved in project studies and project execution (building of several new satellite underground and open cut mines). Ultimately, I became the site manager at Peak.

After eight and a half years, I moved to Northparkes Mines and worked in several operational roles, including surface mining manager, processing manager and underground mine manager.

I obtained my NSW above ground and underground mine manager tickets during this time. I then became the E48 Project general manager, managing completion of the feasibility study and then construction of E48 Mine, before becoming the mine general manager and then managing director. During this time, I gained significant experience in the design, construction and operation of block cave mines.

In 2012, I moved to SLC to manage the Resolution (USA) and La Granja (Peru) major projects for Rio Tinto's Copper Group.

This role evolved into managing Growth and Innovation within Copper and Coal, including the Oyu Tolgoi Underground Project studies and then operational and technical support for our Copper and Diamonds assets (Kennecott, Argyle, Diavik, Resolution, Escondida, Grasberg and OT). I will be moving back to Australia in my current role in July 2017.

### Q. Tell us about your role(s) at Rio Tinto.

My current role is focused on the delivery of technical capability across Rio Tinto's Copper and Diamonds portfolio. I lead an integrated technical team of more than 250 people that support the operation of mines and projects, including joint ventures.

We are heavily focused on managing risk, improving the productivity and long-term value of our assets through short-range and medium-term initiatives in the areas of value chain optimisation, innovation and growth projects.

We are heavily focused around the technical disciplines of orebody knowledge, surface mining, underground (block cave) mining and processing, including smelting. My team works hand-in-hand with Rio Tinto's central Growth and Innovation group.



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### Q. What is Rio's attitude towards digital innovation and how can METS firms first take advantage?

I don't think you would be surprised that there isn't a single view on the role of digital innovation in the mining industry. I think we are all very excited about the possibilities, but we understand that innovation without a purpose does not create value.

I think it is very important that METS firms understand the problems we are trying to solve in our business.

Not surprisingly, if we are focused on a particular problem, it is because it is probably critical for our business and a necessity.

[There are of course, some] problems that we are trying to solve in Rio Tinto Copper & Diamonds. In the case of digital innovation, I tend to think of this as an enabler for solutions to our problems – like being able to monitor ore quality in real time or manage mobile equipment and personnel interactions in an underground mining environment. Clearly, the development of new sensing, communications and analytics

technologies allow us to solve problems that we previously couldn't.

### Q. How important to mining is collaboration with other industries?

One of the key learnings from my time living in the United States is opportunity to borrow and learn from other industries – in part, the opportunity derives from the sheer size of the non-mining industries (like automotive, energy, IT, biomedical, etc.) in the United States relative to the mining industry and their respective investments in research and development.

These industries operate in very dynamic and fast-moving markets. They constantly need to innovate to remain competitive. My perspective is that much of the R&D done in the non-mining sector has some form of applicability to the mining industry that the original developer is unaware of – that is our opportunity and an opportunity for METS firms. But, to go back to my previous point, the point of the collaboration is to find solutions to real problems.

### Q. What other trends in the resources sector are you most excited about?

There are several trends I am very excited about at the moment. The work we are doing to support the Mine of the Future in large-scale underground mining is challenging and future-defining.

We have some unique problems we are trying to solve. No one is offering the complete solution, and I am very excited about the way my team is systematically working to pull together and integrate a disparate range of technologies from around the world with multiple suppliers to achieve a step change in block cave mining.

There are a number of trends that coalesce around processing – options to reduce energy and water consumption during the liberation of valuable minerals and the conversion of those minerals into metals.

Finally, the concept of integrated operations built upon real-time data analytics breaking down the siloes across the value chain appeals to me. There are clearly organisational design and employee cultural aspects as well.





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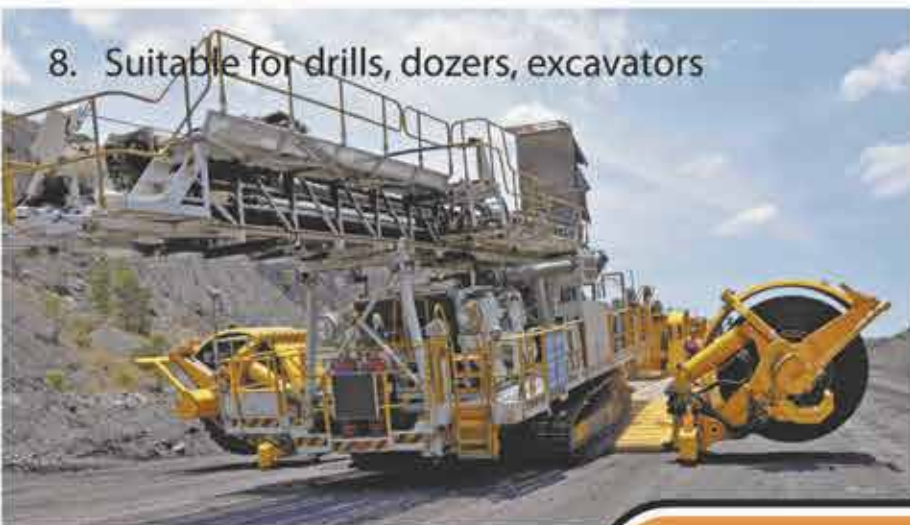
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