

# THE AUSTRALIAN MINING REVIEW

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## THE GRAPHENE REVOLUTION

TECHNOLOGY &  
INNOVATION **p12**



## EXCEEDING EXPECTATIONS

ANGLOGOLD  
ASHANTI **p24**



"a mad, infuriating  
and fun business."

ALTONA MINING  
MD ALISTAIR  
COWDEN **p71**



## MAJOR COMMODITIES SNAPSHOT **p4**

# THE THEORY OF EVOLUTION

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**FEATURE p28**

Image: Evolution Mining.

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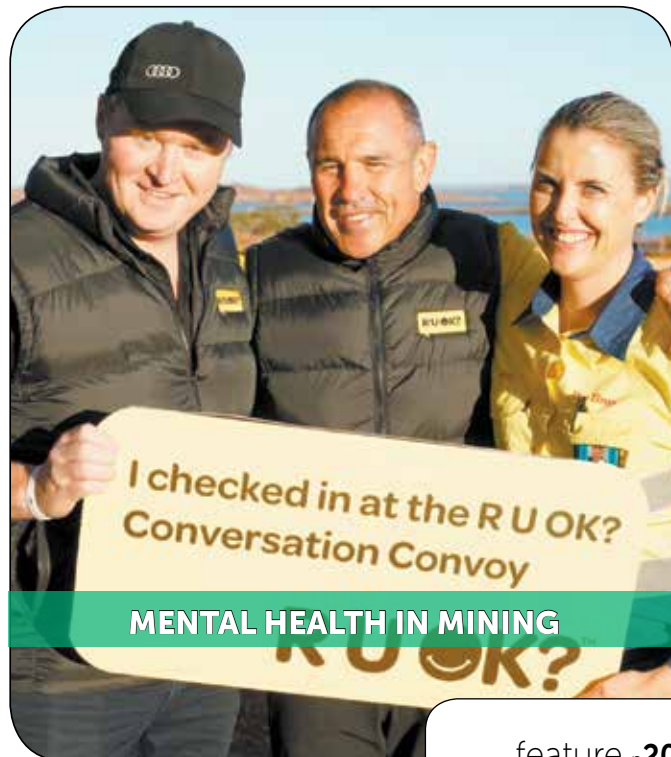
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**DR ALISTAIR COWDEN**  
ALTONA MINING MANAGING DIRECTOR

the interview p71

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# MAJOR COMMODITIES SNAPSHOT

## WATCHLIST Gold Juniors

### Spitfire Resources ASX:SPI

After its \$32m merger with Aphrodite Gold in August, the company's exploration and development portfolio now spans WA, NT and QLD, and includes the flagship Aphrodite gold project in the WA Goldfields.

### Dacian Gold ASX:DCN

The gold explorer's share price rose more than 11 per cent over the last month after it struck bonanza gold grades within the Cameron Well prospect at its flagship Mt Morgan gold project.

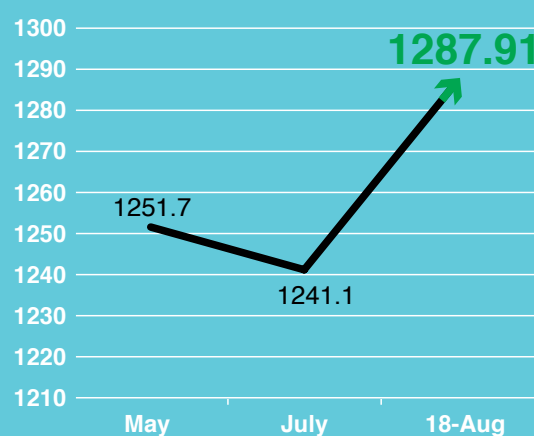
### Riversgold ASX:RGL

Led by former Doray Minerals managing director Allan Kelly, Riversgold lodged its prospectus with plans to raise up to \$8 million through an IPO for exploration projects in WA's Eastern Goldfields region, Alaska and Cambodia.

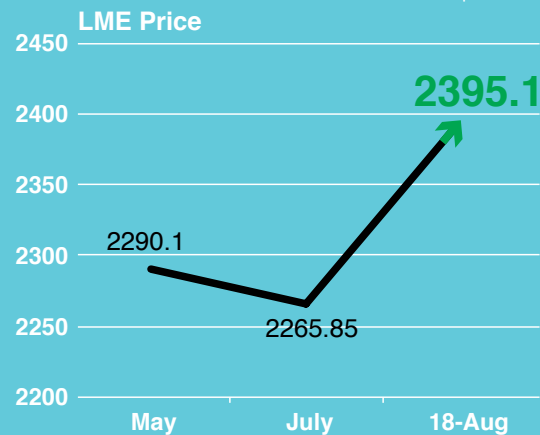
## COMMODITY FOCUS

➤ GOLD PG 16

### GOLD \$US/oz

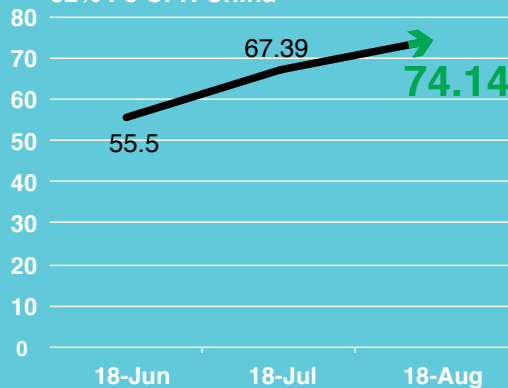


### LEAD \$US/t



### IRON ORE \$US/t

62% Fe CFR China



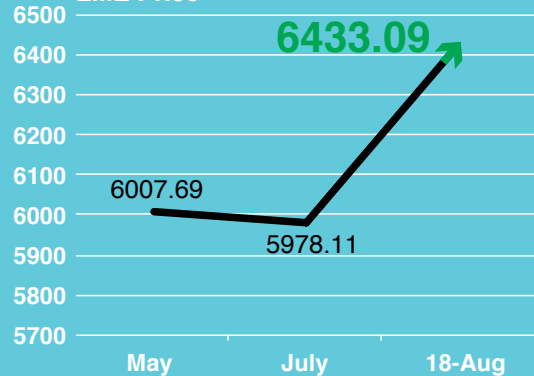
### NICKEL \$US/t

LME Price



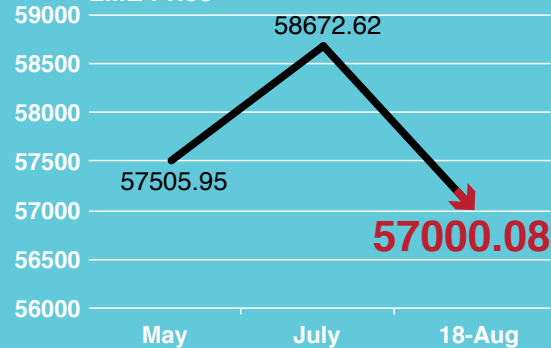
### COPPER \$US/t

LME Price



### COBALT \$US/t

LME Price



### ALUMINIUM \$US/t

LME Price



### ZINC \$US/t

LME Price



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## IN BRIEF

### Decmil wins South Flank contract

PILBARA

MINING services contractor Decmil has won a \$13m contract for initial works at BHP's South Flank project in the WA Pilbara.

It includes civil and enabling works for the expansion of the Mulla Mulla village required to support operations at Mining Area C and South Flank.

"The company currently has project teams at a number of major WA iron ore projects and this contract adds to Decmil's almost 40 years of experience as a contractor to the sector and a long relationship with BHP's Iron ore division," the company stated in an ASX announcement.

### \$15.5m raising for rare earths project

GASCOYNE

HASTINGS Technology Metals has raised \$15.5 million to progress its two major rare earths projects, Yangibana and Brockman in WA's north.

Funds will be used for infrastructure works prior to processing plant construction, including the Yangibana site access road, acquisition and commissioning of an accommodation camp, and preliminary engineering design work on the production plant.

The move follows a 1 August offtake agreement with China-based Batou Sky Rock.

"Further offtake agreements are expected to follow, which will reinforce the company's financing plan to fund the development of the mine and the construction of the processing plant," Hastings executive chairman Charles Lew said.

### Diggers and Dealers winners

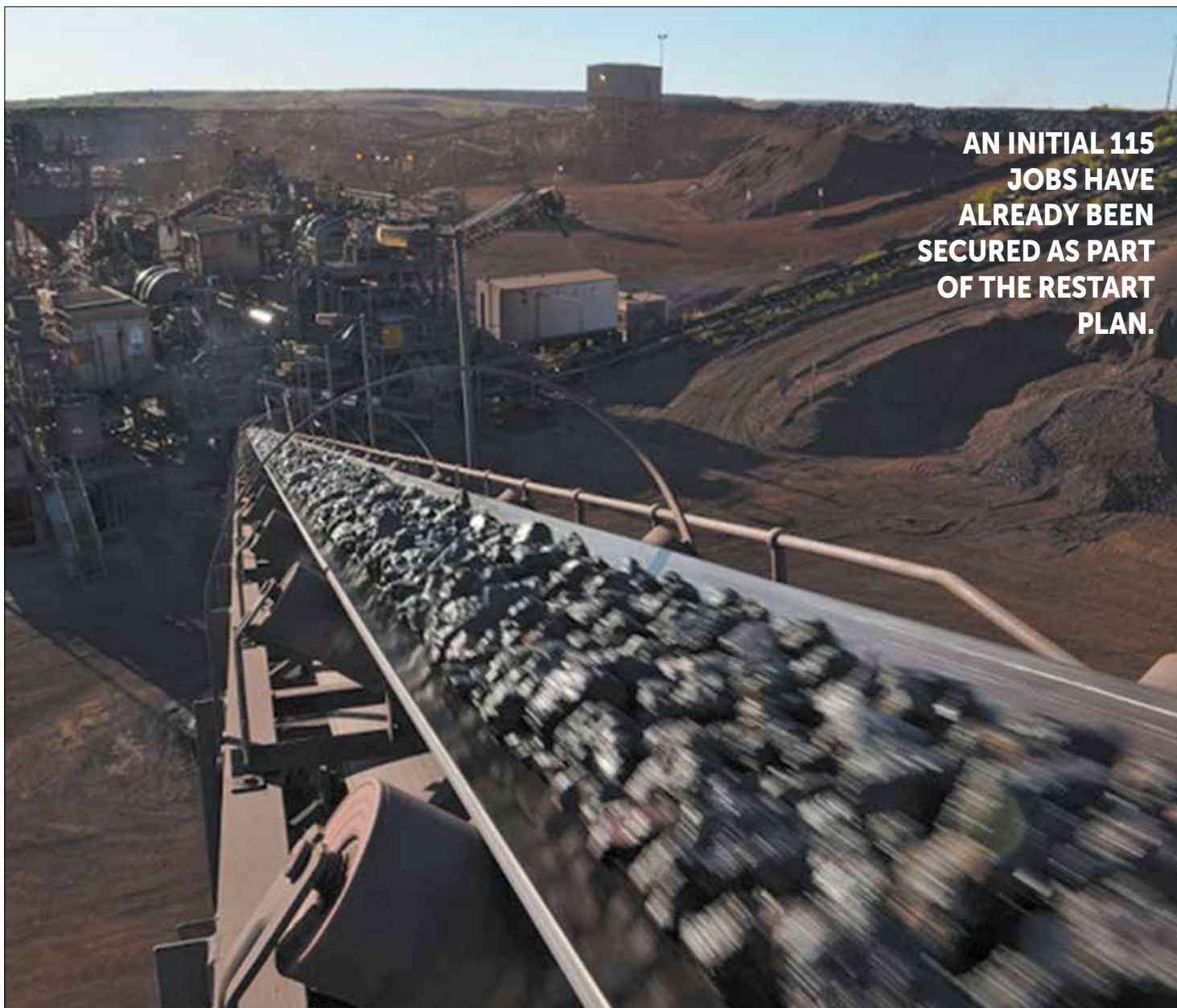
KALGOORLIE

THE 26TH annual Diggers and Dealers conference confirmed a watershed year for gold with three gold miners taking home prestigious awards.

St Barbara was named this year's *Digger of the Year* for its 'significant turnaround' of its operations over the last three years, while Gold Road Resources was named the *Dealer of the Year* for its decision to become a 50 per cent JV partner in the Gruyere Gold Project.

Kin Mining NL was named *Best Emerging Company*, and the *GJ Stokes Memorial Award* was presented to OceanGold and Syrah Resources chairman Jim Askew.

# \$30m Woodie Woodie restart



**AN INITIAL 115 JOBS HAVE ALREADY BEEN SECURED AS PART OF THE RESTART PLAN.**

Improved manganese prices have prompted Woodie Woodie's new owners to restart the operation.

CAMERON DRUMMOND

SKYROCKETING manganese prices have prompted a restart of the shuttered Woodie Woodie manganese operation 400km south of Port Hedland.

New Chinese owner Ningxia Tianyuan Manganese Industry Co (TMI) took control of the mine in May this year, after purchasing Consolidated Minerals (ConsMin) – including Woodie Woodie – from Russian billionaire Gennadiy Bogolyubov for an undisclosed sum.

TMI has flagged an initial investment of \$30 million to breathe life back into the mine and expected a full restart of operations by October.

ConsMin put the mine on care and maintenance in February last year due to depressed manganese prices.

ConsMin chief executive Oleg Sheyko said it was a tough decision to close Woodie Woodie but at the time it was simply unviable.

"We are now confident in the manganese market outlook and with an exploration investment can see Woodie Woodie continuing into the future," Mr Sheyko said.

"This is a great outcome for ConsMin, the Pilbara region and WA."

TMI chairman Tianjiang Jia said it had plans to make significant investments in exploration to underpin a long-term future for Woodie Woodie.

"This is a very exciting time for TMI," Mr Jia said.

"We were attracted to ConsMin because of the quality of its assets and we were always confident that there would be future opportunities for Woodie Woodie at some stage.

"ConsMin is an important part of TMI's international strategy to integrate our mining and production operations to further enhance our position as the world's biggest electrolytic manganese metal (EMM) producer."

An initial 115 jobs have already been secured as part of the restart plan.

ConsMin said it was targeting an annualised production of between 1.3 million tonnes (mt) and 1.5 mt, with first ore shipment from the mine planned for November.

# Steel drives WA rebound

ELIZABETH FABRI

THE WA economy is showing signs of improvement, with companies recording a 13 per cent increase in market capitalisation in FY17.

In a special edition of its *WA Index* report, Deloitte said FY17 had been a "period of rebalance" for the State following a turnaround for the index in 2016 when it grew by 1.8 per cent after an 11.6 per cent drop the year prior.

The increase in market capitalisation to \$152.6 billion was largely attributed to rising global steel prices brought on by Chinese and US Government commitments to increase infrastructure development expenditure, resulting in positive flow-on effects to the bulk commodity market.

**"IN OUR RESOURCES RICH STATE, DEMAND FOR MINING SERVICES OFTEN ACTS AS A LEAD-INDICATOR FOR THE OVERALL HEALTH OF THE ENERGY AND RESOURCES SECTOR."**

Deloitte national mining leader Nicki Ivory said despite some periodic turbulence, commodity markets demonstrated "strong growth" across the board.

"This year's performance more closely represents a rebalance of pricing as markets come to terms with uncertainty

and volatility representing a new normal. In particular, those who have been successful in unlocking value and leading from the front have started to see positive market response," Ms Ivory said.

"In our resources rich state, demand for mining services often acts as a lead-indicator for the overall health of the energy and resources sector.

"We should be hopeful this signals optimism for increased mining investment and activity over the coming year."

Top movers and shakers for the year included Monadelphous Group which increased its market cap by 88 per cent from \$699 million to \$1.31 billion; South32 which increased market cap by 71 per cent from \$8.19 billion to \$14 billion; and Fortescue Metals Group which increased its value by 49 per cent from \$10.8 billion to \$16.23 billion.



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# Ravensthorpe mine closes

ELIZABETH FABRI

CANADIAN mining giant First Quantum Minerals announced plans to suspend operations at its Ravensthorpe nickel mine which struggled to remain profitable during “depressed” nickel market conditions.

From early October the mine will be placed into full care and maintenance, resulting in up to 450 job losses.

WA Mines and Petroleum minister Bill Johnston told *The Australian Mining Review* the State Government had tried to offer assistance to First Quantum to prevent its decision but unfortunately market conditions for nickel were not favourable enough for it to remain open.

“The State Government reached out to First Quantum and offered assistance to prevent the decision, but we were told there was nothing we could do,” Mr Johnston said.

“The McGowan Government will be putting together a task force to assist displaced workers and the local community through this difficult time.”

Mr Johnston said Ravensthorpe was the highest cost producer of nickel in WA, and he had since spoken to other nickel miners in the State, which remained confident they were able to better weather the current market conditions.

“We will continue to monitor all operations,” he said.

The news of Ravensthorpe’s imminent closure came less than two weeks after First Quantum announced a \$US47 million loss for the first half of the year across its operations.

“This decision is disappointing to us, Ravensthorpe is an excellent operation with

**“THE MCGOWAN GOVERNMENT WILL BE PUTTING TOGETHER A TASK FORCE TO ASSIST DISPLACED WORKERS AND THE LOCAL COMMUNITY THROUGH THIS DIFFICULT TIME.”**



Ravensthorpe nickel mine in WA.

Image: First Quantum Minerals.

an outstanding workforce and supportive community but the continuing depressed nickel market conditions, over some years, leaves us no option,” First Quantum chairman and chief executive Philip Pascall said.

“Over the next few weeks we will work closely with our employees and key contractors to mitigate the impact and manage carefully the staged shutdown of operations.

“We will be offering assistance to employees

in seeking further employment opportunities.

“We extend our sincere thanks to our entire workforce, local community, all levels of Government and our partners in the mining sector who have assisted Ravensthorpe since its restart.”

The Ravensthorpe mine, previously owned by BHP, was first commissioned in 2008 but forced to close within months of opening as a result of the Global Financial Crisis.

First Quantum purchased the mine in December 2009 for \$US340 million, bringing it back to commercial production in December 2011.

First Quantum said the cost to suspend operations and enter care and maintenance was about \$10 million, with additional annual maintenance of about \$5 million.

Resuming operations would cost a further \$10 million.

## AMEC appoints new chief executive

REUBEN ADAMS

THE Association of Mining and Exploration Companies (AMEC) has appointed advocacy specialist Warren Pearce as its new chief.

Mr Pearce’s resources sector experience includes his stint as Manager at the North West & Pilbara Industry’s Community Council for the Chamber of Minerals and Energy of Western Australia (CME).

Mr Pearce has also worked at Western Australian Local Government Association (WALGA), as a Principal Policy Adviser for the WA Minister for Planning and Infrastructure, and most recently as chief executive for Local Government Professionals Australia WA (LGP).

“Warren is a high calibre individual with a track record of achieving outcomes for members,” AMEC President Will Robinson said.

“He has demonstrated his credentials with strong and successful advocacy, member engagement and in developing new and effective communication strategies.”

Mr Pearce will commence his role at AMEC in November 2017.

## Clough-AMEC wins plant contract



The Yara Pilbara ammonia plant produces explosives used in the mining industry.

Image: Orica.

CAMERON DRUMMOND

THE Clough and AMEC Foster Wheeler joint venture (JV) has won a \$100m maintenance services contract at WA-based ammonia facilities supplying fertilizer to domestic and international markets and explosives to the mining industry.

The five year contract involves a range of maintenance services at the Yara Pilbara Fertilisers (YPFPL) and Yara Pilbara Nitrates (YPNPL) facilities near Karratha.

It includes maintenance planning

support and routine maintenance services and shutdowns, as well as the supply of management, tools and systems to the facilities.

The 850,000tpa YPFPL is one of the world’s largest ammonia production facilities, with output sold in domestic and South East Asian markets.

Adjacent is the YPNPL, a technical ammonium nitrate facility opened last year that cost \$800m to build.

The plant produces ammonium nitrate used for explosives in the domestic mining market.

Clough-AMEC director Nigel Hudson said that since the JV was formed 13 years ago, the company had built an impressive track record for delivering operations, maintenance and shutdown success in the oil and gas sector in Australasia.

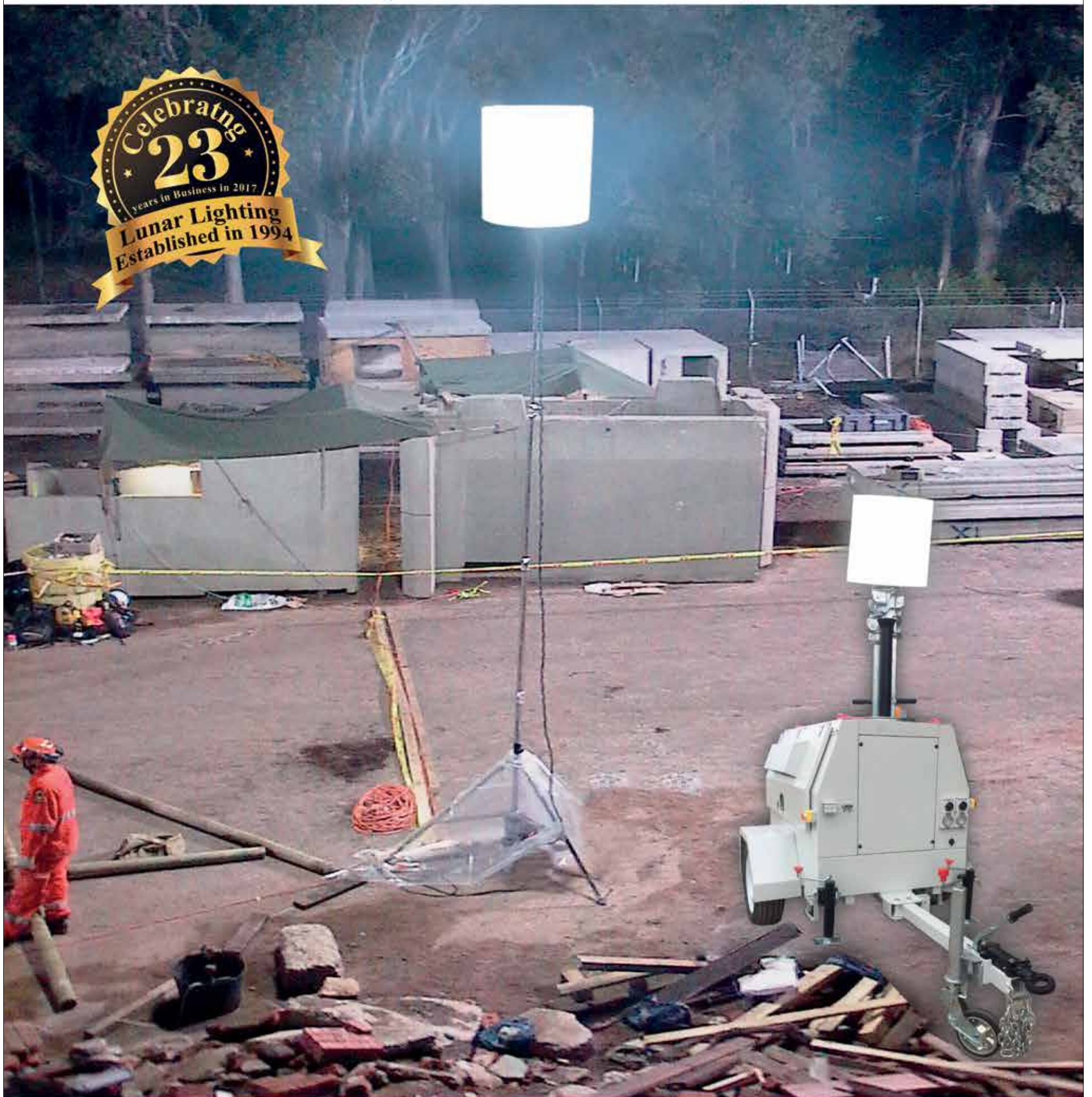
“This entry into the Australian petrochemicals sector recognises our success in delivering cost-effective solutions for our customers,” Mr Hudson said.

“It strengthens our position as the asset support services contractor of choice.”



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Northern Star will continue to organically grow its assets during FY18.  
Image: Northern Star Resources.

## Northern flags \$100m FY18 spend

CAMERON DRUMMOND

GOLD producer Northern Star Resources has flagged \$100m for exploration and expansion in FY18 after posting record financial year results.

The WA-based miner's profit after tax rose 42 per cent from FY16 to \$215.3m, which included a \$26.4m profit from the sale of its Plutonic mine.

The result came after Northern Star invested a whopping \$130m during the financial year to increase overall gold production to 600,000 ounces per annum (ozpa) in 2018.

The company also posted record earnings before interest, tax, depreciation and amortisation (EBITDA) of \$461.3m, up 16 per cent from the previous corresponding period; as well as an overall revenue of \$883.8m, in line with FY16 figures.

It also upped its final dividend payout 50 per cent to 6 cents per share, for a total FY17 payout of 9 cents per share.

Northern Star managing director Bill Beament said the results reflected an outstanding year for the company where it had again met or exceeded guidance figures and generated significant cashflow.

"A 42 per cent increase in net profit is exceptional in any circumstances," Mr Beament said.

"But this result is particularly satisfying because it has been driven predominantly by organic growth.

"Moreover, the lucrative benefits of this strategy are still unfolding, with further production increases forecast for this year and beyond.

"The ongoing production growth is underpinned by the substantial increase in our inventory which has resulted from the organic growth strategy."

Mr Beament said Northern Star had budgeted \$100m for exploration and expansionary capital in FY18 as a continuation of that strategy.

"We have substantial exploration upside and organic growth at all our operations," he said.

"But with the recent growth in our inventory, we will seek to unlock this potential which will require reduced expenditure from last years."

# Green light for \$7bn Wandoan

**"WE APPLIED FOR THESE LEASES IN 2007. THE PROJECT'S ENVIRONMENTAL IMPACT STATEMENT WAS APPROVED BY THE COORDINATOR-GENERAL IN NOVEMBER 2010 AND RECEIVED ENVIRONMENTAL APPROVAL FROM THE COMMONWEALTH GOVERNMENT IN MARCH 2011."**



Image: Glencore.

REUBEN ADAMS

IN a brief statement, QLD Mines minister Dr Anthony Lynham has finally granted mining leases for a \$7 billion coal development in the Surat Basin – a decade after Glencore applied for them.

Dr Lynham approved three 27-year leases over 30,000 hectares for Stage 1 of Glencore's proposed \$7 billion Wandoan thermal coal project near Roma, which could produce up to 22 million tonnes per annum when fully operational.

This would be the first major coal project of this scale in the Surat Basin, but still required a rail link to the Port of Gladstone for export, Dr Lynham

stated.

Glencore welcomed the decision but stated that it would need to review the details after placing the project on hold in 2013.

"We applied for these leases in 2007. The project's Environmental Impact Statement was approved by the Coordinator-General in November 2010 and received Environmental approval from the Commonwealth Government in March 2011," Glencore stated.

"We have been transparent with Governments and the community since 2013, when the project was placed on hold, that we will continue to assess the project's timing against the global coal market."

Glencore moved immediately to

temper enthusiasm over the project's development, stating that it would take a "responsible approach" to decision making.

"Adding significant new tonnes to the market at this time could adversely impact the profitability of existing thermal coal production, potentially putting jobs at risk as the market adjusts downwards as a result of oversupply," Glencore stated.

"The Wandoan Coal Project will require a multi-billion dollar capital investment for both the mine and related rail infrastructure.

"We maintain an open and regular engagement with the Wandoan community and provide updates of any developments or changes directly."

# Spitfire and Aphrodite to merge

ELIZABETH FABRI

ASX-listed junior gold companies Spitfire Materials and Aphrodite Gold have announced a decision to merge to form a new diversified Australian gold company.

The merger will create a leading gold exploration and development company with an advanced exploration portfolio in WA, Queensland and the Northern Territory, including a highly prospective greenfields opportunity at Alice River in QLD, Aphrodite Gold Project near Kalgoorlie, and discovery opportunity in Mulwarrie, WA.

Spitfire managing director John Young said the Aphrodite project offered "outstanding synergies" with Mulwarrie, with the gold projects just 65km apart.

"The combination of our WA assets at Aphrodite and Mulwarrie gives us the critical mass to pursue a near-term development strategy based on the potential establishment of a new production hub near the world-class mining centre of Kalgoorlie," Mr Young said.

"The large resource inventory at Aphrodite has exceptional exploration upside and growth potential, and offers significant synergies with our emerging discovery at Mulwarrie.

"At the same time, shareholders in the combined group will have exposure to a high-potential discovery opportunity at the Alice River Gold Project in North Queensland, where drilling is set to commence next month [September]."

Aphrodite executive chairman Peter Buttigieg, who will be joining the Spitfire

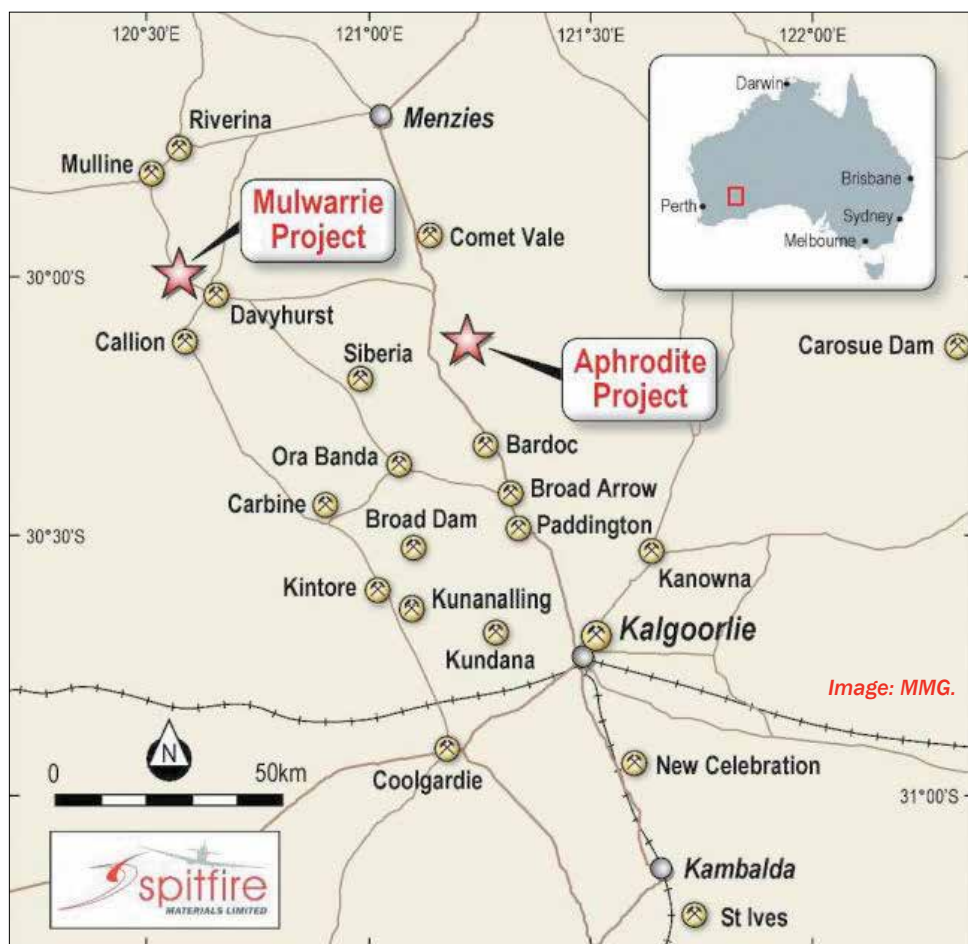


Image: MMG.

The Mulwarrie and Aphrodite projects were just 65km apart.

board, said the transaction realised a view held by the Aphrodite board for some time that "there was a potential and merit in a consolidation of projects around Kalgoorlie".

"The Board and management of Aphrodite have full confidence in the ability of the combined Spitfire and

Aphrodite team to drive the merged company's projects forward," Mr Buttigieg said.

"I am looking forward to working with the new board and management team, and continuing my involvement with the ongoing success of the Aphrodite Gold Project and the merged company."





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## IN BRIEF

## Innovation showcase returns

QLD

AUSTRALIAN research organisation Mining3 will be hosting its annual *Innovation Showcase* in Brisbane next month to provide mining professionals with a first-hand look at the latest technologies and innovations.

Mining3 and its research partners CSIRO, Curtin University, QUT and UQ will showcase technology step changes across the mining value chain, including automation developments, advanced extraction methods for underground mining and a demonstration of a progressing interoperability platform.

"It is an excellent opportunity for our members, partners and the mining industry to gather valuable insights into the latest research and technology advancements underway at Mining3," Mining3 stated.

Registrations are now open for the 19 October event at [www.mining3.com](http://www.mining3.com).

## Seabed mining: a new opportunity

INTERNATIONAL

In August, the New Zealand Environmental Protection Authority (EPA) granted Trans-Tasman Resources consent to mine iron sands off the South Taranaki Bight, with production to begin in 2020.

The landmark decision received strong opposition from environmental activists, however there were many companies currently working on new technologies to develop seabed resources with minimal impact.

Canadian company DeepGreen Resources was one of these, specialising in harvesting polymetallic nodules from the seafloor without intensive mining and waste.

"One of the objectives that we have is to contribute to the global knowledge of deepsea processes and to make sure that the field of science benefits from the work we're doing," Dr Samantha Smith of DeepGreen said.

## Leading the graphene revolution



Department of Industry, Innovation and Science minister Craig Laundy and AMGC managing director Dr Jens Goennemann announced the Centre's commitment at Imagine Intelligent Material's new plant in Geelong North, Victoria.

REUBEN ADAMS

A \$250,000 commitment from Advanced Manufacturing Growth Centre (AMGC) will help boost Australia's leadership position in the production of 'super material' graphene products at a commercial scale.

Department of Industry, Innovation and Science minister Craig Laundy and Advanced Manufacturing Growth Centre (AMGC) managing director Dr Jens Goennemann announced the Centre's commitment at the opening of Imagine Intelligent Material's new plant in Geelong North, Victoria.

The AMGC is part of the Federal Government's \$248 million Industry Growth Centres Initiative, an industry-led approach which invests in key industries to drive innovation, productivity and competitiveness.

It has established a collaboration hub for advanced fibre materials with Deakin University and CSIRO, as Australian manufacturers lead the way in the commercialisation of large scale applications that utilise graphene.

Graphene, the world's first 2-dimensional material, is stronger than steel, harder than diamond, and the most electrically and thermally conductive material discovered. However, it is currently "extraordinarily difficult" to manufacture at scale with predictability.

AMGC managing director Dr Jens Goennemann said the \$250,000 commitment was as a signal to Australian industry that this new generation of materials is where the country could boost global competitiveness.

"Smart graphene coated geotextiles that are used to line dams and report on leaks are



already being used in Australia," he said.

"These are the tip of the iceberg.

"Imagine how much more competitive the mining industry will be as these smart textiles become part of massive real-time sensing network, able to report on the structural integrity of a dam wall."

Other uses for graphene include its application in medical devices to accurately test blood levels for diabetes. It can be mixed into resins, inks, paints and fibres. Geotextiles that are coated with graphene are being developed to enable smart-roads that monitor traffic flows, and aircraft wings resistant to lightning strikes without the weight of conventional copper.

Imagine Intelligent Materials chief

executive Chris Gilbey said the funding commitment came at an appropriate time for Australian manufacturers.

"We are at an inflection point in the integration of graphene into manufacturing processes," he said. "Australia is leading from the front. We believe that graphene is a game changer for the mass take up of IoT solutions, allowing for 'dumb' products and materials to become 'smart'.

"It's integration into products leads to manufacturers generating larger top line revenues, improved margin contributions and higher return on capital invested.

"Better still, the IP is being created in Australia, by Australians, for a global market."

## Virtual gold app launched

ELIZABETH FABRI

WA-based not-for profit organisation Gold Industry Group is soon to launch a virtual gold 'discovery trail' app that will pay homage to the State's gold history.

The first-of-its-kind Heart of Gold app will use augmented reality, audio visuals and games to engage residents and tourists in Perth to learn the story of gold and how it changed the cityscape and secured an economic future for WA.

The trail begins at Elizabeth Quay and takes visitors to 12 locations of historical significance throughout the city, ending at Perth Mint.

On 7 October, Gold Industry Group and its sponsors will be hosting a launch event at Elizabeth Quay, with a number of prizes up for grabs, including real gold nuggets from Ramelius Resources.

Mining Education Australia and WA School of Mines will also give visitors the opportunity to see inside a gold mine using virtual reality.

"To mark the opening and the commencement of the trail, we will unveil a replica of the famous Golden Eagle nugget, which is one of the largest specimens found in WA," Gold Industry Group chairman and Perth Mint chief executive Richard Hayes.

Next year, the group will also launch a gold trail app in Kalgoorlie to mark the 125th anniversary since Paddy Hannan, Thomas Flanagan, and Dan O'Shea discovered gold at the base of Mt Charlotte.



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## IN BRIEF

### North Korea iron ore ban a drop in the ocean: report

#### IRON ORE

CHINA'S decision to suspend iron ore imports from North Korea will have little effect due to the small volumes involved, German investment bank Commerzbank said in a report.

China has implemented a UN resolution suspending imports from 5 September, including iron ore, lead ore and lead.

"While this is likely to hugely weaken the North Korean economy, as China is the main consumer of North Korean products, the step will hardly affect China itself at all," the report stated.

"China imported 1.34mt of iron ore from North Korea in the first half of 2017 (a good 220,000mt per month on average)."

"This constituted only 0.25% of total Chinese iron ore imports during this period."

### Rise in gem sales puts Mustang into drivers seat

#### GEMS

RUBY miner Mustang Resources said it was poised for rapid growth due to burgeoning gem sales fuelled by strong demand, especially from Asia.

The company is on track to bank first sales revenue from a 200,000 carat auction in October this year, and plans to utilise the revenue to expand its flagship Montepuez ruby project in Mozambique.

"Mustang's management team is confident of delivering a strong inaugural auction and continuing to advance towards our goal of establishing the company as a globally significant ruby supplier," Mustang managing director Christiaan Jordaan said.

### EY appointed BHP auditor from 2020

#### CONTRACTS

BHP has selected EY as the auditor of the dual-listed company from 2020.

This global appointment will see core EY teams in various offices across the world, including Australia and the UK.

According to the *Financial Review*, current BHP auditor KPMG earned US\$15.8 million for its audit work and another US\$1 million for non-audit work at the mining company in 2016.

# BHP flags \$2.46bn Spence upgrade

**WITH COPPER PRICES REACHING THEIR HIGHEST LEVELS SINCE 2014, BHP CHIEF EXECUTIVE ANDREW MACKENZIE SAID THE PROJECT SUPPORTED BHP'S STRATEGY TO DELIVER NEAR-TERM, VALUABLE COPPER PRODUCTION.**



Image: BHP.

The Spence copper mine, Chile.

#### CAMERON DRUMMOND

BHP will spend \$US2.46 billion to extend the life of its Spence open-cut copper mine in northern Chile by more than 50 years, creating up to 5000 jobs.

Under the Spencer Growth Option (SGO) project, incremental production of copper concentrate would be about 185,000 tonnes per annum (tpa) and 4000tpa of molybdenum, with first production expected during the 2021 financial year.

The project includes the design, engineering and construction of a

conventional large-scale sulphide concentrator for both copper and molybdenum with a 95,000 tonne per day nominal ore throughput capacity.

In addition, SGO will require a new 1000 litre per second desalination plant at Mejillones Bay, and a 154km water pipeline from the plant to the Spence mine site.

BHP said the SGO had an expected internal return rate of 16 per cent and an expected payback period of 4.5 years from first production.

With copper prices reaching their highest levels since 2014, BHP chief

executive Andrew Mackenzie said the project supported BHP's strategy to deliver near-term, valuable copper production.

"Execution of the Spence Growth Option will create long-term value for shareholders in one of our preferred commodities," Mr Mackenzie said.

"The project significantly extends the life of our Spence operation and unlocks the potential of the large, quality resource.

"SGO has been extensively studied and we have made significant improvements to project cost and design so that it is able to compete in our portfolio of attractive development options."

# Sandfire's Black Butte milestone

#### ELIZABETH FABRI

SANDFIRE Resources' high-grade Black Butte copper project in the US is a step closer to construction after achieving a key permitting milestone that will pave way for an environmental impact study (EIS) to begin.

On 15 August, the company's 78 per cent owned subsidiary Tintina Resources received notification its Mine Operating Permit (MOP) was "Complete and Compliant" with Montana State rules and regulations.

Sandfire will now move forward to a comprehensive EIS, which would take about 12 months to complete, and once finalised lead to a Final Record of Decision ahead of first construction.

The news came just two weeks after Sandfire increased its stake in North-American listed Tintina Resources by 16.9 per cent, lifting its shareholding in the project from 61.2 per cent to 78.1 per cent.

Sandfire had now invested \$31 million in Tintina since its original 36 per cent acquisition in the company in 2014.

The project's latest measured and indicated resources total 15.7 million tonnes grading 3.4 per cent copper for 533,600 tonnes of contained copper.

Sandfire managing director Karl Simich said the "Complete and Compliant" status was a significant milestone for the project.

"We are very much looking forward to the next and final stage of the approval process, the 12-month EIS process which is expected to kick off next month," Mr



**"FOLLOWING THAT WE WILL MOVE AS QUICKLY AS POSSIBLE INTO CONSTRUCTION AND DEVELOPMENT TO UNLOCK THE SIGNIFICANT ECONOMIC VALUE OF THE HIGH-GRADE COPPER RESOURCES."**

The Black Butte copper project is in central Montana, US.

Image: Sandfire Resources.

Simich said.

"Following that we will move as quickly as possible into construction and development to unlock the significant economic value of the high-grade copper

resources.

"This in turn will generate many positive benefits in terms of jobs, employment, business opportunities and investment."



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# Good as gold

The gold price reached a nine week high of between \$US1270 and \$US1280 per ounce in August, as miners – especially Australian miners, who benefit from the AU/US currency exchange rate – welcome the industry's continued renaissance.

ELIZABETH FABRI

WHILE the price had not yet returned to 2016 highs of \$US1357 per ounce, on 11 August the price recorded a two month high of \$US1289 – about \$A1620 – leaving many miners optimistic for the year ahead.

At last month's *Diggers and Dealers* conference, more than 2100 miners, investors and service companies touched down at one of Australia's oldest gold towns, Kalgoorlie, WA, to celebrate the industry across three days of informative sessions, networking events (and late night soirees).

While many commodities were covered across the forum, it was gold that dominated discussion with many conversations had on and off-site on the commodity's 'comeback' amid a weaker US dollar, and war of words between US President Donald Trump and North Korea.

Australia's second largest gold miner Evolution Mining's executive chairman Jake Klein was one of many to share their views on the gold's movement, dedicating a large portion of his speech to a "renaissance" that was occurring in the Australian gold industry.

"It's fair to say the last three years in the sector have been relatively good," Mr Klein said.

"The number of times the word 'record' was used in the recently released June quarterly reports of ASX listed gold miners was unprecedented.

"The Australian gold industry has had a much better time – we have benefited enormously from a falling Australian dollar and declining costs.

"It is a place I often refer to as God's gift to miners – a vast, highly mineralised, under populated, mining friendly country where the rule of law can be relied on."

According to the Gold Industry Group, Australia contained the largest share of known gold resources in the world (16.3 per cent), with gold mining contributing a massive \$13.4 billion to Australia's



## FACTS AND FIGURES:

- 66 gold mines in Australia
- In 2016 Australian gold mines produced more than 280 tonnes of gold (9 per cent of global production)
- Gold accounts for almost 50 per cent of Australian's exploration spend.
  - Australia contains 16.3 per cent of globally known gold resources
  - Directly employs about 26,000 Australians
  - Contributed \$13.4 billion to economy in FY17

Source: Gold Industry Group.

economy in FY17, and annual exports of \$16 billion in FY16.

Gold exploration was also increasing, with exploration expenditure rising by 30 per cent to \$653.5 million in the year to end March 2017, according to the Australian Bureau of Statistics.

Companies such as Gold Road Resources were ramping up exploration campaigns, with the company last month announcing

it would spend \$30 million on greenfield exploration this financial year.

Perth Mint's stats over the last financial year was another barometer of the sector's strength.

Perth Mint chief operating officer David Woodford said the quality of Australian gold and the certainty of supply had seen gold exports to China dramatically increase in recent years, with Chinese

investors buying more than 230 tonnes of gold bullion on the Shanghai Gold Exchange last year, worth \$11 billion.

"In 2014, The Perth Mint became the first foreign refinery accredited on the Shanghai Gold Exchange and we have worked steadily to establish this new market," Mr Woodford said.

"Today we are on track to achieve our goal of becoming the biggest source of imported gold in the Chinese market and that is great news for Australian gold producers and Australian mine workers."

Australian gold exports into China more than doubled from 110 tonnes in 2011, and in the last 12 months alone had grown more than 8 per cent.

"Our direct relationships with the banks have enabled us to lift our sales volumes and we are confident this market will continue to grow," he said.

However, Mr Klein said it was important for gold producers to err on the side of caution.

The seasoned executive said there were plenty of opportunities ahead for Australian gold producers, but unless companies demonstrate they have learnt the lessons from past cycles they will end up in the same place "relegated to the investor sinbin after destroying shareholder value".

"The harsh reality is that even in a benign US dollar gold price environment and a favourable Australian dollar gold price environment the gold industry, as a group, has had difficulty creating and delivering value consistently," Mr Klein said.

"Egizio Bianchini, the co-head of BMO Global Metals and Mining Group and friend of mine, cautioned the sector earlier this year when he was quoted as saying 'there is more capital than brains to deploy it. I hope that this time, the miners have found that out'.

"Let's take on the challenge of proving Egizio wrong.

"I believe the Australian gold sector has an outstanding opportunity in front of it."

# Red 5 swoops on Eastern Goldfields

CAMERON DRUMMOND

GOLD producer Red 5 has turned its attention to the Eastern Goldfields region of WA after suspending mining operations in the Philippines due to political uncertainty and rebel activity.

The company snapped up Gold Fields' Darlot mine and Saracen Minerals' King of the Hills project for a combined value of \$34.5 million.

Red 5 paid Gold Fields \$18.5m in cash and shares for Darlot, and Saracen will receive proceeds totalling \$16m for King of the Hills.

The move came after the company suspended operations at its Siana gold project on the island of Mindanao in April, due to uncertainty regarding mining regulation changes by the Filipino

Government.

In a double-blow to Siana, Filipino President Rodrigo Duterte declared martial law on Mindanao, stating rebel activity in the island's Marawi City had increased to threatening levels.

The miner said there had been no immediate impact to the Siana project, but it would continue to closely monitor the situation.

Red 5 managing director Mark Williams said its Goldfields' acquisitions laid the foundations for long term growth in one of Australia's most prolific gold districts.

"The cornerstone of this strategy is the proposed acquisition of the Darlot gold mine from Gold Fields – a transaction which allows the Red 5 Group to transition immediately back into gold production at a well-established gold mine in Australia where we can leverage our operational

experience and capabilities," Mr Williams said.

"In parallel with this, we will immediately begin work to examine development options for our second key project, the King of the Hills project, which we are acquiring from Saracen Minerals.

"This is a strategic asset which we believe can be enhanced due to its proximity to Darlot as a central processing hub, its grade, and the extensive studies and trial mining activities already completed by Saracen.

"Collectively, these acquisitions represent the cornerstone of a consolidation strategy which puts Red 5 in an ideal position to establish Darlot as a central processing facility capable of unlocking many undeveloped gold deposits within this region."



Underground at the King of the Hills gold project.



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The 2017 event will centre on the theme of 'Creating Value Through Collaboration', covering all aspects of mining; from exploration to investment, production to optimisation through to new technology, future energy as well as the brand new one day programme on mining infrastructure from pit to port; it truly is the one-stop event for the entire industry.

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This year the ride is aiming to raise \$4 million for cancer research.

# Ride to conquer cancer

One in two Australians will be diagnosed with cancer during their lifetime, but medical research means that survival rates for many cancers are improving. Harry Perkins Institute of Medical Research, based in Nedlands WA, is known as WA's premier adult medical research institute; but it relies heavily on donations. The Institute's annual MACA Ride to Conquer Cancer, running from 21-22 October this year, is a fun way for people to support the cause. **Elizabeth Fabri** spoke to Harry Perkins Institute director **Professor Peter Leedman** about the event and research programs currently underway.

**Q. How much has the charity ride raised for the Institute since the first event in 2012, and how much are you hoping to raise this year?**

Since 2012, thanks to the incredible commitment and dedication of thousands of riders, the MACA Ride to Conquer Cancer has raised more than \$23.5 million for the Harry Perkins Institute of Medical Research.

This year we're hoping to raise a further \$4 million for ground-breaking cancer research projects at the Perkins, but this will only be possible through strong community support.

**Q. How do the donations benefit Perkins and assist local cancer research?**

Donations from the MACA Ride to Conquer Cancer directly support Perkins researchers working at our world-class facilities at the QEII Medical Centre in Nedlands and the Fiona Stanley Hospital precinct in Murdoch. The funds raised support scientists and their teams, and enable the Institute to recruit new scientists and start new research projects.

The funds also help us to purchase advanced equipment that can help speed up the time it takes to transform a discovery into new a medicine for patients.

**Q. Can you tell us about some of your research programs?**

Several life-saving cancer research areas, including breast, prostate, melanoma, colon, head and neck and liver are being investigated at the Perkins as a result of Ride-funded dollars.

The purpose of these programs is to test new ideas for tackling cancer, promote new collaborations between cancer research teams and increase cross-fertilisation of ideas. Some of these exciting projects



Harry Perkins  
Institute director  
Professor Peter  
Leedman.

include a new way to treat breast cancer cells using nanoparticles; a new drug that improves blood flow to cancers increasing their response to chemotherapy; a new way to make liver cells from stem cells; and treating advanced melanoma with small RNA molecules – just to name a few.

**Q. Take us through the two day ride?**

The two-day, 200km cycling adventure begins with an inspiring opening ceremony in South Perth, where we remember those lost to cancer and honour those continuing the fight.

Every 25-30km, ride volunteers man pit stops with snacks, drinks and first aid (if you need it), and helpers are there to mend your bike if you have any difficulties.

At the end of day one, there is a fantastic camp, where riders can enjoy a cold beer, a hot shower and a massage before a fun evening of entertainment and socialising.

A local cancer expert and I speak at the camp and explain the incredible, life-saving research being conducted thanks to the hard-work and dedication of our riders and volunteers.

## Register to ride at

[www.conquercancer.org.au](http://www.conquercancer.org.au)

via email at

[perthguidesconquercancer.org.au](mailto:perthguidesconquercancer.org.au)

or by calling

**1300 99 7433.**

If you know someone riding, support their efforts by donating to their ride page; it's fully tax deductible and will help them reach their \$2500 fundraising minimum.

We also have crew members and volunteers who help ensure the event runs smoothly. There are plenty of ways to support this fantastic event.

**Q. How did the idea for the MACA Ride to Conquer Cancer originate?**

The ride is in its sixth year.

MACA has been associated all of that time and has been a fantastic supporter of the event, introducing a large number of riders.

Since 2013, MACA has continued to raise more than \$1 million each year. Their key support of the event, as the title sponsor, has been instrumental in ensuring its continued success. MACA is a company that has a real commitment to the community.

Its leadership as the title sponsor of the Ride is an expression of how important they see medical research as a key driver in improving cancer survival rates.

**Q. How can people get involved?**

Obtaining dependable funds to support pioneering cancer research at the Harry Perkins Institute of Medical Research is absolutely crucial.

It's vital that Perkins has the capacity to support our passionate, hard-working researchers so that they can remain in WA and deliver breakthroughs to benefit our community. Events like the MACA Ride to Conquer Cancer offer a wonderful opportunity to support the incredible work of local medical researchers and their innovative research projects. This event isn't just for athletes or cycling enthusiasts – it's an opportunity for us to come together as a community and support the lifesaving medical research that will one day benefit our friends and family.

After an overnight campout in Mandurah, it's back on the road, with the beautiful scenery of the WA coastline providing a perfect backdrop for this epic journey.

On day two, riders make their way back to Perth for a high energy celebration of their efforts and the amazing impact they've made in the quest to conquer cancer.

**Q. Can people of all fitness levels and ages participate?**

Absolutely! The ride is not a race, all you need is a bike, a helmet and a passion to make a difference for people facing cancer.

We have participants ranging in age from 16-70 and every fitness level in between. I would absolutely recommend this ride to anyone; just remember to do a bit of training before the big day!

**Q. How many participants attend each year?**

Last year we had 905 incredible riders, who trained and fundraised in support of the Perkins.



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# SPECIAL FEATURES

## MENTAL HEALTH IN MINING



**"THE TRUTH IS, JUST SHOWING SOMEONE THAT YOU CARE ENOUGH TO HAVE NOTICED THAT THEY'RE NOT THEMSELVES CAN HELP THEM FEEL LESS ALONE."**

# Asking the question

In August, the R U OK? Conversation Convoy initiative began its six week journey around Australia. This 14,000km, 20 community tour aims to give more people confidence to support those who are struggling, while raising awareness of support services across the country. R U OK? chief executive **Brendan Maher** explains.

### CAMERON DRUMMOND

#### **Q.** How has RUOK?'s The Conversation Convoy been tracking?

It's been going really well. As of 16 August we've travelled over 8000km and held events in Yulara (NT), Katherine (NT), Beagle Bay (WA), Wickham (WA), Dampier (WA), Perth and Kalgoorlie (WA).

Our Wickham and Dampier events were hosted by Rio Tinto and our morning event in Kalgoorlie was hosted at the Frog's Leg mine site with Evolution Mining.

The communities we have visited have been highly receptive to our message and focus of reinforcing the 4-steps to having a conversation with someone who might be struggling with life.

#### **Q.** Working conditions in the mining industry (FIFO, remote locations) can create situations where the mental health of employees could be at risk. What warning signs can employers look for, and what preventative measures can be put in place?

Of course, and this is true of any workplace.

Many people we work alongside have issues going on in their lives that we know nothing about. It could be relationship issues, parenting issues, illness, addiction, grief, mental illness, loneliness, and stress – any number of things.

Our personal resilience and ability to get through these challenges is very different. What might be a small speed bump for one person could be a major crisis for another.

As an employer or colleague, noticing a change in a workmates behaviour might be

**A recent national omnibus survey conducted by Colmar Brunton revealed one in three people don't feel comfortable asking the question, "Are you ok?"**

#### **Leading reasons included:**

- "I don't know what to say."*
- "I wouldn't want to make it worse."*
- "I'm worried they might get angry."*
- "I'm not an expert."*
- "It's none of my business."*

an indication that someone isn't doing so well:

Maybe they're running late all of a sudden when normally they're a very punctual person.

Maybe the quality or care for their work has declined.

Maybe they're more tired than usual. Maybe they're quick to anger or have a stronger emotional reaction than a situation deserves.

Maybe they're eating more or less than usual.

Maybe it's not obvious, but they're just not themselves.

Of course we acknowledge that the nature of FIFO work has its unique challenges.

Long periods away from home, long hours, isolation, loneliness can all add to the stressors.

As employers, taking a genuine interest

in your staff, creating a workplace where it's ok to stick your hand up if you're struggling, building a strong narrative about emotional well-being into workplace communications and reinforcing help seeking pathways such as EAP services can be really helpful in strengthening resilience.

#### **Q.** As a largely male-dominated industry, does the perceived 'bravado' of the mining industry create unique challenges to helping people in need?

For sure. We've come a long way over the last decade but helping others is still held hostage by stigma, fear of saying the wrong thing, a concern that 'It's none of my business'.

The truth is, just showing someone that you care enough to have noticed that they're not themselves can help them feel less alone, and perhaps be a turning point for helping to improve their situation.

#### **Q.** How do high-stress work environments affecting a person's mental health impact on other areas of their life?

A little bit of stress can be healthy. It can keep us productive, on time and focused.

It's when stress becomes prolonged or chronic that it can have a really negative impact on us.

Loss of sleep, increased consumption of alcohol and or drugs, eating more or less, smoking more, poor diet, lack of exercise because 'too busy', not being present in relationships, working too many hours or switching off.

All of this can have an impact on our emotional wellbeing and mental health.

The good news is, we can do things to better manage our stress.

Speaking up if we're getting overwhelmed. Regular exercise. Less alcohol, no smoking, healthier diet and exercise. Seeking help. Visiting a GP if you're experiencing loss of sleep other symptoms.

#### **Q.** What can we as a society do to get the conversation about mental health to the forefront?

I think we're getting there but perhaps we could better bring the conversation out of the shadows by being more honest with each other about where we're really at, and being more compassionate with people who are doing it tough.

I think as a society, we could all do better at not labelling people who are experiencing mental illness; after all, its nothing to be ashamed of, nor afraid of if you're supporting or caring for someone.





# Seeing who's struggling isn't always obvious.

Chances are one of your three mates needs to talk. One simple question could change their life. **Just ask R U OK?**

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Afield campaign materials  
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# What is the Conversation Convoy?



The four yellow SUV's represent each of the conversation steps.

THE Conversation Convoy is building on the question “are you ok?” by reinforcing the 4 Steps to a conversation – asking, listening, encouraging action, and checking in.

A series of community-based events

and activities will help people of any age learn the steps in a fun and interactive way.

High profile ambassadors will be joining different legs of the trip including Ben Lee, Khan Porter, Commando

Steve, Daniel Conn, Steven Oliver, Travis Collins and Jodhi Meares.

Psychologist and R U OK? advisor Rachel Clements said that the barriers to asking are normal fears.

“We know that some conversations

can be really tough. But in reality, you don't have to be an expert to start a conversation – asking shows someone you care about them and that can make a really positive difference in their life,” Ms Clements said.



R U OK?'s Conversation Convoy rolled into the Pilbara mining districts of Wickham and Dampier to encourage the Rio Tinto workforce to check in with work mates.



# UON programs to support mental health



The University of Newcastle (UON) is working to provide assistance for miners struggling with mental health issues.

MENTAL health issues are a widespread and growing concern across Australia, with one in five Australians aged 16-85 having experienced a mental disorder in the last 12 months.

This is equivalent to almost 3.2 million people nationwide, every year.

There is less published empirical evidence of the extent and impact of mental health problems specific to the Australian mining industry.

Given mining is chiefly a male-dominated industry, the patterns of mental health problems are likely to reflect those of males of working age in the general population.

However, workplace and employment characteristics such as trends towards longer shifts, working in remote settings, and its impact on access to health care and social networks, may play a role in the specific mental health problems experienced by mining employees.

Researchers from the Centre for Resources Health and Safety at the University of Newcastle (UON) have been investigating these issues in both coal and metalliferous mining employees across Australia.

In a survey of more than 1450 employees across eight mine sites in NSW and QLD, survey respondents reported significantly higher levels of psychological distress, high risk for mental illness, and higher levels of alcohol use, relative to the general community.

More than 55 per cent of those in high-risk categories for mental illness had not consulted a health professional, highlighting a need to increase access to appropriate and early advice.

More than 40 per cent of the mining sample reported current hazardous levels of alcohol use, but only 17 per cent had consulted a health professional in the past 12 months.

Importantly, those who had sought professional health for these concerns reported significantly lower stress levels.

Across many industries there is an increasing focus on the important role of the workplace in promoting health, supporting a person with mental illness and improving access to both physical and mental health care.

Investing in strategies to support mental health in the workplace has been associated with a range of benefits to industry such

as cost benefits, improved employee performance, job satisfaction, morale and safety, as well as broader social benefits to employees, their families and the community.

Importantly, the Australian mining industry is committed to helping its employees with these issues through key partnerships with the UON.

Achieving such gains for industry requires timely and early access to effective options for providing health in a form that is tailored to the target population and the industry more broadly.

Health-e Mines is one such project, which is seeking to develop and test an online and app-based platform that provides a direct, real-time link between coal mining employees and the latest evidence-based online screening, early intervention and treatment programs for mental and physical health problems (including alcohol/other drug use and chronic disease risk factor prevention).

When launched, the Health-e Mines portal will provide the mining communities with anonymous, confidential, and private access to these programs at any time of the day or night.

A key innovation for this project is the active engagement of the mining workforce to design the portal, to provide advice on how, when, and where the portal and programs are best accessed, and what security and privacy checks need to be in place to increase a miner's comfort and readiness to use the platform.

In general, participants surveyed to date report a high willingness to access online programs to support mental health and wellbeing, particularly if they could do so anonymously, at home, on their smartphone or tablet and outside of work hours.

As a direct response to industry need, researchers at the UON have also developed short courses for supervisors to provide an introduction and overview of the issues relevant to managing staff experiencing mental health problems and to build skills in responding to these issues.

The training provides background information on mental health and mental illness using different scenarios that aim to build the supervisor's skills and capacity to address mental health problems in the staff they supervise.

More specifically, the course aims to help supervisors develop an understanding of the difference between mental health problems

and mental illness; recognise the signs that someone is experiencing difficulties in the workplace; identify support that can be recommended to a person experiencing mental health problems; demonstrate how to conduct a discussion with a team member about mental health problems at work; and provide

knowledge of legislative responsibilities and organisational policies relevant to mental health management in the workplace.

The centre for resources health and safety at the UON can be contacted for further information, or to share an opinion with the research team on these issues.

## Do you care about mental health in the workplace?




Researchers at the University of Newcastle are seeking feedback from mine employees and supervisors around workplace mental health in two key ways:





**Health-e Mines** – an online portal for Australian coal miners to access confidential online treatments for mental health, alcohol/other drug use and other health concerns. Tell us what you need and don't need by going to <https://www.research.net/r/FQZMVYN>.

**Supervisor training in mental health** – A short course for mine supervisors which aims to build supervisors' skills and capacity to address mental health problems in the staff they supervise, and recognise the signs that someone is experiencing difficulties in the workplace.

Please contact the Centre for Resources Health and Safety: [crhs@newcastle.edu.au](mailto:crhs@newcastle.edu.au)

Penny Chapman | Centre of Resources Health and Safety  
t. +61 2 4033 9249 | e. [penny.chapman@newcastle.edu.au](mailto:penny.chapman@newcastle.edu.au)  
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All images: Independence Group.

# Exceeding expectations

In February, AngloGold chief executive Srinivasan Venkatakrishnan told Mining Indaba delegates that the company would look inwards to expand its operations, rather than growth through mergers and acquisitions. In Australia, the third-largest gold miner in the world is focused on increasing production and extending the life of its optimised Tropicana and Sunrise dam assets.

## REUBEN ADAMS

ANGLOGOLD's embattled South African assets dragged half year results into the red to the tune of \$93 million, compared with a \$93 million profit for in the respective period in 2016.

AngloGold set aside \$47 million for massive job cuts as it restructures its loss-making South African operations, and also included \$46 million for the possible settlement of a lung disease court case brought by former employees.

Then there's Tanzania, where new legislation affecting mine development agreements are a concern for its tier one asset, Geita.

This turmoil didn't touch Australia, where it's Tropicana and Sunrise assets are performing well and undergoing upgrade and optimisation initiatives. The WA gold sector, in particular, has been resurgent over the past 18 months as prices for the precious metal retain a healthy glow.

A key part of AngloGold's global portfolio, Sunrise Dam and Tropicana (Anglo 70 per cent) are responsible for about 522,000 ounces per annum, or 15 per cent of portfolio production.

For the 6 months ending June, production totalled 255,000oz at a total cash cost of \$775/oz, which compared favourably to 251,000oz at a total cash cost of \$806/oz in the same period last year.

Production was slightly higher due to an increase in gold output at Tropicana, which more than offset a 5 per cent drop in production at the aging Sunrise Dam. The higher production at Tropicana also contributed to lower total cash costs.

At the annual Diggers & Dealers conference in Kalgoorlie, AngloGold underlined the economic contribution that these operations, which boasted a full time workforce of more than 500, as well as about 1000 contractors, had made in the region. Between 2013 and 2017, \$103.4 million has been paid in royalties to the WA Government. The company's average annual spend was \$203 million in the Eastern Goldfields, and a further \$521 million in WA.

### Sunrise Dam

55km south of Laverton in WA, Sunrise celebrated its 20th anniversary this year – and with a long track record of consistently



growing reserves and resources the company sees a long future ahead.

After more than 17 years of operation, the open pit was completed in 2013 to a depth of 490m below surface. In 2014 the underground mine became the primary source of mill feed, but lower grades meant that all-in sustaining costs have continued to creep higher.

Production for the June half was 107,000oz at a total cash cost of \$977/oz, compared to 113,000oz at a total cash cost of \$858/oz in the same period last year.

Total cash costs – a measure that has been replaced by the more realistic all in sustaining costs by many gold producers – were higher due to lower gold production and higher underground mining costs, with a 17 per cent increase in ore tonnes mined compared to the six months ended 30 June 2016.

A plan is in place to accelerate development and grade control drilling in the Vogue and Cosmo work areas to lift the mined grade.

Concurrently, a strategy is underway to lift recovered grade at the Sunrise Dam Processing Plant – the Recovery Enhancement Project – by an average of 8 per cent.

In June, GR Engineering Services was awarded a \$31.3 million engineering, procurement and construction (EPC) contract to undertake the design and construction of a brownfields upgrade to Sunrise processing facilities.

Under the contract, GR Engineering

would design and construct a new flotation and ultra-fine grind processing facility with associated services upgrades to operate within the existing processing infrastructure currently in operation.

Work is scheduled for completion in June 2018.

### Tropicana

"On to a very good new story that is developing at Tropicana; we've continued to exceed our initial planning assumptions," AngloGold senior vice president Ludwig Eybers said in the Q2 earnings call.

"We've now accelerated mining rate to 90 million tonnes per annum with the introduction of a 600 tonne face shovel.

"The accelerated mining rate has brought productivity improvements to lower mining unit cost by 37 per cent over the past two years."

For the half, Tropicana production was 148,000oz at a total cash cost of \$575/oz, compared to 137,000oz at \$704/oz in the same period last year.

The higher production was due to a 12 per cent increase in mill throughput to 7.5mtpa from original 5.8mtpa nameplate capacity, following completion of a processing plant optimisation and expansion project late in 2016.

There is potential to increase mill throughput rate even further to between

7.6mtpa and 7.7mtpa by the end of CY17 with completion of plant improvements. The increase in production contributed to lower total cash costs.

### Long Island Study

Work continued during the six months ended 30 June 2017 on the Long Island Study which aims to extend Tropicana Life of Mine through to 2027-2030.

Mr Eybers said the study gave the company "optionality".

"Long Island comprises eight stages and there are three major decision points, which is great, because it gives us the flexibility to tailor our approach at each decision point depending on the market conditions," he said.

Studies are investigating cutback options to the Boston Shaker, Havana and Havana South open pits utilising short-haul open pit options.

The completed Tropicana pit – due to be mined out in the second half of 2018 – would be used as a void into which waste will be backfilled, reducing haulage costs. The study is expected to be completed in the fourth quarter of 2017.

Long Island technical studies have already de-risked a strip mining approach and the associated in pit dumping. Elevated mining rates of about 90mtpa in 2017 have also derisked the increase to the Long Island mining rate of between 100mtpa and 110mtpa.

Minimal capital spend would be about \$18 million, primarily for camp and heavy vehicle workshop infrastructure expansions, with completed studies and approvals expected in the upcoming December quarter.

Pre-Feasibility is also nearing completion on the \$20 million addition of a second ball mill, designed to boost throughput to between 8mtpa and 8.2mtpa and improve recovery from about 89 per cent to 92 per cent.

AngloGold stated that drilling beneath Long Island final pit shells continued to confirm the underground potential – a current resource of 3moz which could contribute supplementary high grade production from 2020 – with additional drilling planned beneath Boston Shaker in the September quarter.

Regional exploration was also focused on the mineralised corridor as the potential source of additional mill feed from 2020 onwards.



# Global mineral processing solutions



GR Engineering has assisted AngloGold Ashanti in the development of its Sunrise Dam project.

GR Engineering Services (GRES) is an ASX-listed process design and engineering design company providing fixed price EPC engineering design and construction and EPCM services to the mineral processing industry.

GRES is currently delivering the Sunrise Dam Gold Recovery Enhancement Project (GREP) for AngloGold Ashanti Australia (AngloGold) and completed the feasibility study work which established the viable

pathway to development for the project.

GRES has an established track record in the provision of high quality technical and feasibility study work for a broad range of clients.

The innovative engineering solutions developed by GRES enable its clients to achieve project funding and move into development with confidence that the outcomes from the study will be achieved from the project.

GRES is proud to be assisting AngloGold

in the development of the GREP at Sunrise Dam, where sulphide mineral recovery and ultra-fine grinding unit processes will be added to the process plant to consistently increase gold recovery.

GRES has successfully completed the process and engineering designs and construction for projects of various scale and covering a diverse range of mineral commodities.

It has delivered processing facilities and

infrastructure for gold, base metals, mineral sands, tin, tungsten and iron ore projects for a range of clients in Australia and internationally.

GRES also has a presence in the hydrocarbons industry via its wholly owned subsidiary, Upstream Production Solutions, which is a leading provider of operations, maintenance and well management services to the oil and gas industry in Australian and South East Asia.

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AUSTRALIAN Gold Reagents' (AGR) is committed to contributing to the success of its customers with an uncompromising focus on people, safety, the environment and reputation.

As a founding signatory of the International Cyanide Management Institute (ICMI), AGR is a trusted supplier to the gold mining industry with more than 25 years' experience, supplying sodium cyanide in both solution and solid forms to operations in Australia, South East Asia, Africa, the Americas and the Middle East.

AGR's production facilities in Kwinana, WA, have the capacity to produce up to 78,000 tonnes (t) of sodium cyanide solution and up to 45,000t of solid sodium cyanide each year – offering reliable supply to its global client base.

As a ready-to-use product, AGR's sodium cyanide solution uses a closed circuit, eliminating product handling by mine site personnel, and the need to dissolve solid sodium cyanide on site.


AGR's proximity to WA's gold producing regions translates to shorter delivery times, and by managing its customers' stock levels and site storage facilities, AGR provides reliable supply and working capital cost benefits.

AGR can also assist customers in the design and construction of storage tanks and delivery processes to ensure the safe storage and management of sodium cyanide, as well as providing sodium cyanide awareness, handling and emergency response training.

The company couples its manufacturing capability with best practice packaging and distribution, allowing it to confidently market and distribute product domestically and internationally, with a reputation for low cost, safe and reliable supply.



The AGR plant facility in Kwinana, WA.




A founding signatory of the ICMI, and with more than 25 years of experience supplying sodium cyanide globally.

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# A dynamic mid-tier



All images: Evolution Mining.

The rise of Australia's second largest gold miner Evolution Mining over the last seven years has been no fluke. The mid-tier miner's core strategy – or 'religion' as it puts it – is to incessantly improve its portfolio by strategically buying and selling assets, building a business that can prosper through all stages of the cycle.

ELIZABETH FABRI

SINCE its founding in 2011 through the merger of Catalpa Resources and Conquest Mining, Evolution Mining has grown a \$50 million business into a \$3.7 billion heavyweight.

"We started the journey some seven years ago – at that time we were a six-person company with no production," Evolution Mining executive chairman Jake Klein said.

"Our only mineral asset was the Mt Carlton deposit in Queensland and a feasibility study had just concluded that development of the project would be uneconomic."

Today, Evolution sports a portfolio of seven operating assets, comprising Cowal, Mungari, Mt Carlton, Mt Rawdon, Cracow, Edna May, and a 30 per cent stake in the world-class Ernest Henry mine.

The company has been making moves within the gold mining industry, capping off the last six financial years with record results, including 844,000 ounces of production in FY17 at an All in Sustaining Cost (AISC) of \$905 per ounce and \$325 million worth of debt repayments.

Speaking on the side-lines of the *Diggers and Dealers* conference in August, Mr Klein said the secret to building a business that could thrive through the cycle was continuing to assess the value of its portfolio.

"We're now amongst the lowest cost gold producers in the world," Mr Klein said.

"When we think of quality we think mainly of two metrics – cost of production and mine life – both of which I am pleased to say we have been able to significantly improve in the past two to three years.

"And whilst our portfolio of assets now has an average reserve life of more than eight years, we would like to get to a point where each of our assets has at least an eight to 10 year mine life in front of it."

Between six and eight projects was the "ideal number" of assets to have according to Mr Klein, and with seven operating assets to its name, an acquisition or divestment was no doubt on the horizon.

"We think about that all the time; we think about acquisitions, investments, divestments, M&A joint ventures and partnerships all the time," he said.

**"WE THINK ABOUT ACQUISITIONS, INVESTMENTS, DIVESTMENTS, M&A JOINT VENTURES AND PARTNERSHIPS ALL THE TIME."**



Evolution Mining executive chairman Jake Klein.

Recent media speculation has pegged Edna May as the next project on the block.

"I'm not going to comment specifically on that, other than to say, we continue to improve the quality of the portfolio and we sold an asset last year [Pajingo], we acquired the interest in Ernest Henry; we're a dynamic business," Mr Klein said.

## Projects in focus

### Ernest Henry

Evolution's \$880 million economic interest in the Glencore Ernest Henry operation has been dubbed one of its most strategic acquisitions.

Completed in November 2016, the deal involved Evolution securing a 30 per cent stake in the Queensland mine, and receiving 30 per cent of copper and silver payable, and 100 per cent of gold payable production.

"It's been one of the best- it's turned out superbly," Mr Klein said.

"Last quarter we had a net mine

cash flow of almost \$48 million (on an annualised basis; that's \$150-160 million a year)."

In the June quarter, Evolution's interest in the project was 24,000oz.

"I think we'd love all deals to be that good," Mr Klein said.

"A key driver to all our business development is to seek out situations where our interests with the counterparty we are engaging with are complementary rather than competing.

"In Glencore, we found such a counterparty when it was seeking to deleverage.

"Gold was not considered a core commodity for Glencore and we were seeking to add long life, low cost ounces to our portfolio."

### Cowal

Cowal was the other jewel in Evolution's crown, acquired in May 2015 from Barrick Gold for \$US550 million.

Within 50km of Sydney, the project

was the "cornerstone asset" anchoring Evolution's portfolio.

"A few weeks before we submitted the final, binding offer I asked a senior lawyer acting for Barrick what our chances were of securing this coveted asset," Mr Klein said.

"Bearing in mind that during the sale process Evolution's market capitalisation was below Barrick's asking price for the asset; it was a pretty fair assessment when he responded by saying 'Jake, if you secure this asset you will be the Steven Bradbury of gold mining'.

"So, in the tradition of Steven Bradbury, who became the proud owner of a Winter Olympics gold medal when all the leading competitors fell over before him with the finish line in sight, so too is Evolution now the proud owner of the Cowal gold mine."

In the 24 months the company has owned Cowal, the project has performed exceptionally well, producing 501,000oz and generating \$322 million of net mine cashflow, or 47 per cent of the purchase price.

An investment of more than \$22 million in resource definition drilling has also doubled reserves from 1.6moz to 3.2moz at a drilling cost of only \$14/oz.

In February, Evolution received approval from the NSW Department of Planning and Environment to extend operations out to 2032, after receiving 65 submissions of support.

The project now had a 15-year mine life ahead with strong possibility to expand further.

"Cowal is in a superbly well-endowed belt, and now has a 15 year mine life ahead of us," Mr Klein said.

"The next phase of opportunity is going to be about drilling out some of the satellite areas and seeing whether those can be brought into the mine life."

### Mungari

Evolution snared the WA mine and 1.7mtpa processing facility from La Mancha Resources in April 2015, and has undertaken an aggressive exploration campaign on site since.

(CONTINUED ON PAGE 30)





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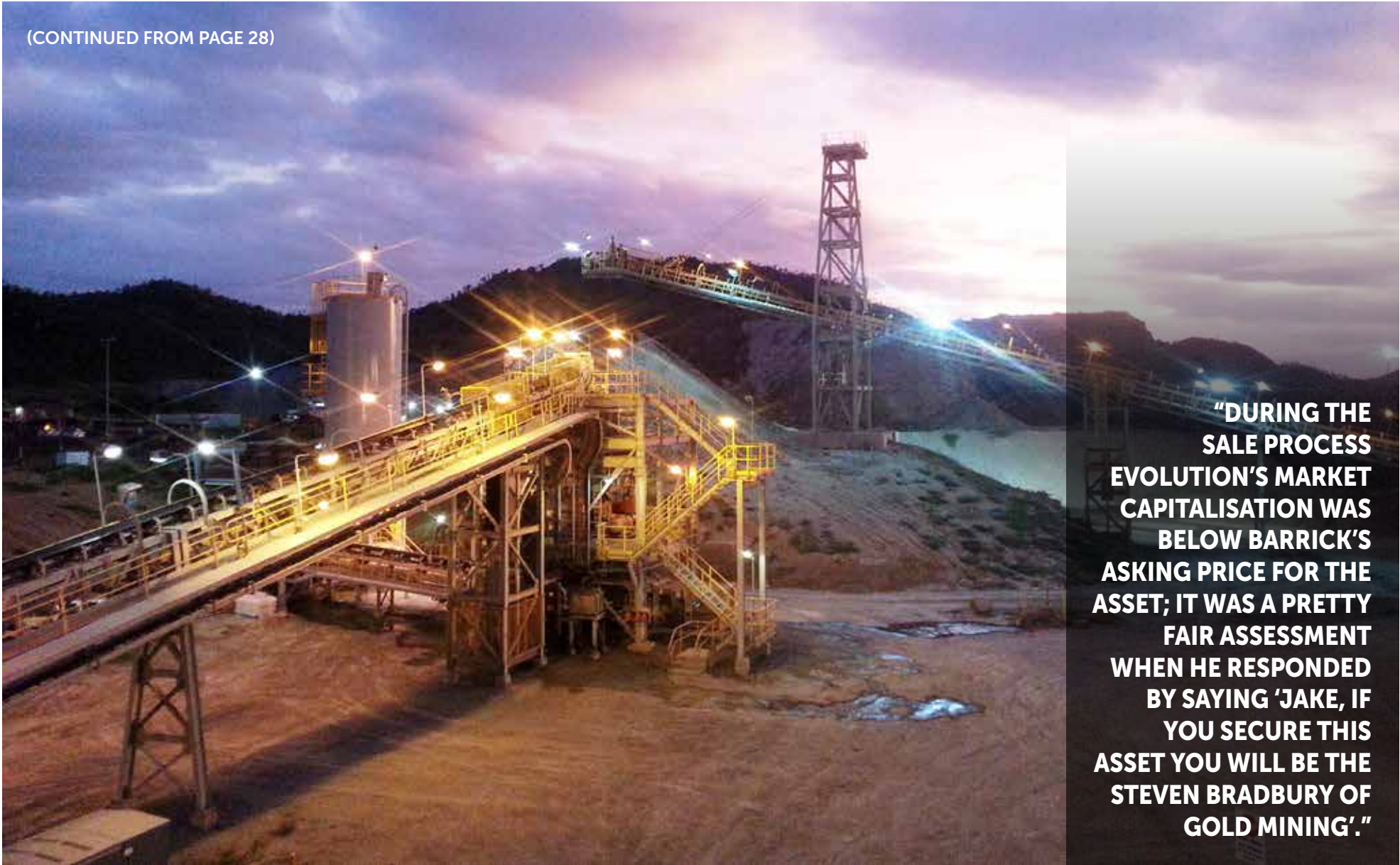
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(CONTINUED FROM PAGE 28)

**“DURING THE SALE PROCESS EVOLUTION’S MARKET CAPITALISATION WAS BELOW BARRICK’S ASKING PRICE FOR THE ASSET; IT WAS A PRETTY FAIR ASSESSMENT WHEN HE RESPONDED BY SAYING ‘JAKE, IF YOU SECURE THIS ASSET YOU WILL BE THE STEVEN BRADBURY OF GOLD MINING.’”**

In FY17, the project, 20km west of Kalgoorlie, received Evolution’s highest exploration spend, with similar expenditure expected to flow into FY18.

“It’s a great success, there’s some really encouraging results, and we’re very happy with the investment,” Mr Klein said.

In the June quarter, drilling at Emu and Burgundy extended high-grade mineralisation outside of the existing resources, while reverse circulation drilling extended mineralisation northwest of the historic Bent Tree mine.

Aircore drilling south of Blue Funnel mine had also identified a 600 metre long, 120m wide, northwest-trending gold anomaly adjacent to the Zuleika Shear Zone.

On day two of *Diggers and Dealers*, Evolution Mining Kalgoorlie general manager Simon Jessop took a group to the site to promote the recent exploration finds.

Mr Jessop said Evolution’s improved understanding of the tenement was beginning to “yield results”, and in FY18 the focus would be on Zuleika North (Blue Funnel), Frogs Leg South and Ora Banda.

EVOLUTION FY17 GOLD PRODUCTION	
Cowal, NSW	263,015oz
Mungari, WA	143,820oz
Mt Carlton, QLD	105,024oz
Mt Rawdon, QLD	101,331oz
Cracow, QLD	89,496oz
Edna May, WA	70,188oz
Ernest Henry, QLD	60,259oz (8 months)

Looking forward

While Evolution continues to search for its next Cowal or Ernest Henry, Mr Klein believed the team was unlikely to find the motivated sellers they have had in recent years.

“We recognise that the biggest opportunity for value creation is likely going to come from our existing asset base,” he said.

“However, all options must be on the table.”

One of its most exciting prospects was a \$2.5 million investment in the upcoming initial public offering (IPO) of gold explorer Riversgold, and recently announced earn-in joint venture agreement with Terramin Australia over the South Gawler gold-copper project in South Australia.

On 22 June, Evolution entered an agreement with Terramin to provide \$4 million in exploration spending over four years for a potential 70 per cent stake in the

South Gawler project.

Terramin may then elect to contribute, otherwise Evolution can earn an additional 10 per cent (total 80 per cent) by spending a further \$2 million over two years.

“Our geological team has a very favourable view of the geology,” Mr Klein said.

The primary target for the project was an iron oxide copper gold breccia deposit beneath shallow to deep cover.

In terms of a production timeline, Mr Klein wasn’t sure at this stage but remained optimistic.

“In defining our strategy for discovery, we are very clear on what it is we want to find – principally, we are looking for orogenic or epithermal style deposits,” he said.

“We also recognise that partnering with groups who may have superior geological knowledge of a specific area may be mutually beneficial, so we are definitely open for business in this area as reflected in our recent joint venture with Terramin in South Australia’s Gawler Craton and our cornerstone investment in the upcoming Riversgold IPO.”



Cowal E42 pit.



# MAXAM wins new blasting contracts



More information can be found at [www.maxamaustralia.net](http://www.maxamaustralia.net).

MAXAM Australia has secured two new highly sought-after contracts at Evolution Mining's Edna May and Mt Rawdon gold mines.

Headquartered in Brisbane, the Australian subsidiary of the global industrial and services group has enjoyed a long and rewarding working relationship with Evolution Mining.

MAXAM has provided blasting solutions to the open cut operations at Edna May since March 2015, and is currently the sole blasting solutions and services supplier for another two of Evolution Mining's gold mine operations in Australia; Mt Carlton and Cowal.

The company recently commenced the supply of blasting products to Edna May underground operations, and was also awarded the sole provider of blasting solutions to the Mt Rawdon open pit gold mine.

Mt Rawdon, 75km south west of Bundaberg in Queensland, has been in operation since 2001, while Edna May has been operated by Evolution since 2009.

Within 350km east of Perth, Edna May's mineralisation, near the northern

end of the Westonia Greenstone Belt, consists of high-grade reef structures in which mining has been done through open pit until now.

Its underground development commenced last June, and first exploitation results are expected by next September.

MAXAM's expansion into underground operations at Edna May sees the introduction of its flagship RIOFLEX RAPID bulk watergel explosive.

The technology, developed and proven in global underground mining operations, is proving its potential to lower total operating costs for both mine owners and mining contractors.

MAXAM Australia marketing manager Daniel Stewart said RIOFLEX RAPID was "the only underground bulk watergel explosive in the Australian market" with superior properties that make it well suited to all conditions.

"The unique cross linking properties of RIOFLEX turn the explosive into a semisolid mass in the hole within 20 minutes, reducing the potential for dispersion in broken ground and degradation from

water," Mr Stewart said.

The flexibility made possible by these explosives is mirrored by the site-specific "value-in-use" service the company offers customers.

## Custom-tailored products and services

First launched in 1998, RIOFLEX is MAXAM's flagship explosive, developed with the company's own in-house R&D – key to MAXAM's technological independence.

Thanks to its versatility and high energy, RIOFLEX has consistently delivered exceptional results for MAXAM's clients worldwide.

"Its high energy, fully water resistant, wider range of densities, clean burning and non-explosive base (can be stored on-site as an oxidizer) are some of its great advantages," Mr Stewart said.

"It's effective in both cartridge and bulk formats, can be used in extreme dry or wet conditions and has the proven ability to be deployed across an extreme temperature range, as it is currently used

in climates with temperatures ranging from 40 degrees Celsius in sub-Saharan Africa to -40 degrees Celsius in Siberia, Central Asia and Canada."

## MAXAM: integrated blasting solutions provider

MAXAM is an integrated provider of blasting solutions, focusing on all-round energy optimisation systems – a structured process approach tailored to customer requirements in various markets.

MAXAM's proven experience carrying out similar projects within Australia and around the world – Worsley Alumina (Western Australia), Kanmantoo (South Australia), Hidden Valley (PNG), Tasiast (Mauritania), Oyu Tolgoi (Mongolia) or Polyus (Russia) – makes it a natural fit for Evolution Mining's operations.

With production plants located on all five continents, the MAXAM global logistics system strengthens the company's ability to supply state-of-the-art products to meet a wide variety of challenges, while its in-house developed technology ensures conditions that are both safe and efficient.



All images: BHP.

# Major overhaul

As it prepares to mine the “body of the guitar” at Olympic Dam – representing an incredible 70 per cent of the resource footprint – BHP is forging ahead with \$600 million of expansions and upgrades.

## CAMERON DRUMMOND

UNDETERRED by an 18 per cent decrease in annual copper output due to state-wide power outages during September and October last year, BHP's Olympic Dam is undergoing its biggest expansion and maintenance program since the ‘Big Aussie’ purchased the mine from Western Mining Corporation in 2005.

In 2011, BHP released a supplementary Environmental Impact Statement into a gigantic open pit expansion at Olympic Dam.

Operating simultaneously with the existing underground mine, the planned open pit specs were truly immense; by 2050 the size of the pit would grow to be 4.1 kilometres long, 3.5 kilometres wide and 1 kilometre deep.

Exposing the upper surface of the orebody would take about six years of mining to remove the 350m thick layer of overburden, which would be relocated to an area eventually covering about 6,720 hectares.

The required infrastructure was similarly impressive. BHP had mapped out plans for a 200 megalitre per day coastal desalination plant and a 320km pipeline; a 270km electricity transmission line; a 105km rail line to connect Olympic Dam with the national rail network near Pimba; additional port facilities at Outer Harbor in South Australia and the Port of Darwin in the Northern Territory; and a new airport at Olympic Dam to cater for large commercial jets and the increase in passengers and air traffic.

The benefits to the State economy were expected to be substantial.

Then, the bad news. On August 2012 BHP put a pin in the open pit expansion, announcing that it would be investigating an alternative, “less capital intensive design” to improve the economics of the project.

Former BHP chief Marius Kloppers said market conditions, including subdued commodity prices and higher capital costs, had influenced the decision.

This resulted in impairments and other charges of \$US346m before tax in FY2012.

“There is no doubt this is a major disappointment for South Australia and the nation, especially for those workers and businesses who had set themselves to work on the expansion project,” South Australian Premier Jay Weatherill said in an August 2012 statement.

“What I want to say to South Australians is that these resources are world class. They are still there.

They belong to us, and they will be developed.”



## Then to now

In the last 4 years BHP has quietly spent \$250m developing the high grade Southern Mining Area (SMA), the location of the proposed open pit shelved by the company in 2012 and the key to Olympic Dams future prosperity.

BHP began work on a SMA underground expansion in FY15, accelerating development in the last 12 months with a dedicated team of around 180.

BHP Olympic Dam general manager Troy Wilson has called SMA the future of the mine, or “the body of the guitar, given the shape of the orebody”.

“Incredibly, since 1988 only the Northern area of Olympic Dam has been mined – or the neck of the guitar – which means a massive 70 per cent of the resource footprint is still available to be mined,” he told Copper to the World conference delegates in June.

“After nearly 12 months of development preparation, Olympic Dam looks forward to celebrating the first production ore from the SMA very soon.”

## Upgrades

A major \$350m smelter maintenance campaign from August to November this year will include a rebuild of the electric slag furnace, the flash furnace and the electro static precipitator.

The resulting shutdown would be lower copper volumes of 150,000 tonnes (t) in FY18, but the medium to long term result would be a substantial boost to output.

BHP announced this \$350m upgrade

to Olympic Dam's copper smelter in July, however the miner decided to up that figure to \$600m and include a total of 49 projects at the site.

Speaking at the American Chamber of Commerce event in Adelaide on 4 August, BHP Olympic Dam asset president Jacqui McGill said the decision represented the most significant investment BHP had ever made into South Australian operations.

“...these investments – in our underground infrastructure and above ground processing operations – will help us build the foundations for long term, safe, stable and sustainable growth at Olympic Dam,” Ms McGill said.

“The investment will ensure the operation is more modern, reliable and can support processing of additional tonnes in coming financial years.”

Ms McGill highlighted Olympic Dam had more programs of work in execution this financial year than any other BHP operation in Australia.

“Forty of these projects are being supported by BHP's new functional-regional model, which means Olympic Dam can draw on the incredible expertise within BHP's Minerals Australia projects team,” she said.

The capital investment was to be apportioned over three key areas at the project.

About 20 per cent of the investment would support the underground expansion into the high-grade Southern Mine Area; including additional fleet, telecommunications, raise bores, power and other services.

Nearly 40 per cent would underpin further underground development in the existing Northern Mine Area footprint.

Finally, more than 40 per cent would be directed to a wide range of infrastructure and other programs onsite; including the major \$350m smelter construction campaign.

The smelter campaign involves a combined investment in three key areas: a rebuild of the smelter flash furnace, demolition and construction of a new electric slag furnace; and the removal and replacement of the five-story high electro static precipitator.

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

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

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

“The rolling shutdown across the surface operations starts in August with the maintenance campaign running for more than 100 days in total.”

Once all work is completed, the improved operational performance would underpin an expected increase in copper production to about 215,000t in the 2019 financial year.

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

On top of personnel required for the smelter campaign, Ms McGill said the company would require a further 250 personnel at any one time and was recruiting to make sure the best people were working with the team.

“In addition to leveraging the expertise of our BHP colleagues internally, we're also boosting numbers in our Olympic Dam squad, so that we have a more diverse workforce that is representative of the communities in which we operate in,” she said.

“I'm proud that in the last 12 months, our recruitment of new female employees to join our team has increased by 20 per cent.

“And our recent efforts to renew our focus on effective contractor relationships has also been a success – through our Industry Capability Network Gateway online, we had a total of 226 submissions and 70 per cent of registrations new to Olympic Dam and more than 30 per cent were from South Australia.

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



# Proudly supporting the community

FOUNDED in 1959, Chandler Macleod Group is one of the largest and most comprehensive providers of HR services in Australasia.

Safety, diversity, inclusion and community focus underpins everything Chandler Macleod does.

The company believes that safety starts with the individual, and employees — through thoughts and actions — can make a difference to reduce harm.

Recently embarking on the largest ever e-mental health study in conjunction with 'All of Me', Chandler Macleod is squarely putting mental health on similar footing to its physical OHS focus.

The All of Me program recently garnered the recognition of BHP's WA iron ore operations, resulting in winning the *Contractors' Health Safety, Environment and Community Award* in Newman, WA.

The organisation employs more than 12,000 personnel, with more than one third of its workforce employed within the mining, mining services and construction industries across the country.

Chandler Macleod is passionate about building diverse workforces and supporting its clients with leading inclusion, diversity recruitment and retention practices, and is proud to be represented by 736 Indigenous workers who were employed over the last 12 months.

It also works closely with Women In Mining and Women In Construction promoting the employment of women in non-traditional role types, and TradeUp Australia, an organisation focused on encouraging schoolgirls to stay in STEM and for women to consider skilled trades as viable career options.



AFL legend Peter Burgoyne, and the company's 2017 *Contractors' Health Safety, Environment and Community Award*.

AFL legend and Indigenous Team of the Century's Peter Burgoyne heads up Chandler Macleod Indigenous team in South Australia.

Chandler Macleod leans on its strength in recruitment by improving and providing employment skills, knowledge, training and confidence to disadvantaged Australians as part of its support to a wide range of

community initiatives.

They also support a range of causes of personal relevance to their employees and their families.

Some of the causes Chandler Macleod supports include Sirens of Silence, WA Mental Health Week, St Vinnie's Sleepout, Cancer Council, MS Research Australia,

Police Legacy, Claremont WAWFL Club, Dress for Success, St Mary's Football Club, Shooting Stars Netball, Pride, Telethon and Roxby Districts Sporting Club (netball and football).

Further information can be found by visiting: [www.chandlermacleod.com](http://www.chandlermacleod.com), or [unleashing.chandlermacleod.com](mailto:unleashing.chandlermacleod.com).



“ Chandler Macleod - proud partner of the Australian Mining industry for over 45 years... ...and proud sponsor of Black Dog on a Lead ”

CHANDLER MACLEOD  
UNLEASHING POTENTIAL

[www.chandlermacleod.com](http://www.chandlermacleod.com)



[www.facebook.com/blackdogonalead](https://www.facebook.com/blackdogonalead)





**"OUR COST BASE IS  
\$US220/TONNE. TODAY  
THAT PRODUCT IS  
SELLING FOR A MINIMUM  
OF \$US820/T."**

All images: Pilbara Minerals.

# Picking up pace

The western world "grossly underestimated" the speed at which the lithium ion supply chain has to grow to meet demand, Pilbara Minerals chief executive Ken Brinsden has said. Addressing delegates at last month's *Diggers and Dealers* Mining Forum, the man behind the world-class Pilgangoora project has made it his mission to convert those still on the fence about lithium's long-term future.

## ELIZABETH FABRI

LITHIUM ion is set to become the battery of choice as new technologies such as electric vehicles hit the mainstream market.

"Lithium ion in essence is the 'go to' rechargeable battery," Mr Brinsden said.

"The technology has been developed over 30 years and commercialised in the last decade and now starting to generate some serious scale.

The reason that it has become the preferred platform for battery technology is because of its light weight, its high power; it is relatively green and going to become a very low cost technology."

Based on conservative electric car uptake of 8 per cent, modelling from metal consultancy firm Roskill estimated the market would see a ten-fold increase in lithium raw material consumption between now and 2026, from 100 gigawatt hours to 1000 gigawatt hours.

"To put that in context, that's five million Tesla vehicles," Mr Brinsden said.

"Every year 90 million cars are sold, so for this technology there is massive potential for there to be requirements for a lot more lithium. It's a pretty amazing story," he said.

Acknowledging Tesla was the "poster child" for lifting lithium's profile, referencing the electric vehicle manufacturer precisely 20 times in his speech, Mr Brinsden said this was far from the only story.

"The lithium ion batteries are finding their way into lots of new technologies; drones are being powered by lithium ion batteries, electric lawnmowers and mobile phones," he said.

"For those that are sceptical, it's happening right now."

As one of the WA companies bringing new lithium projects online over the next few years, Pilbara Minerals' Pilgangoora lithium-tantalum project will begin production at an opportune time as demand from China skyrockets.

The \$234 million project will be developed over two stages with concentrate already sold out for the first phase.



The Pilgangoora project in the Pilbara.

Image: Pilbara Minerals.

"We've got people knocking our door down saying: 'can we secure more supply?' Unfortunately you can't, we're sold out in Stage 1, but we'd love to talk to you about Stage 2 of our project," Mr Brinsden said.

## Meeting demand

A lot more lithium was required to catch up with global demand.

Pilgangoora was an important part of the supply solution, with an estimated ore reserve of 1 million tonnes of lithium oxide and 22 million pounds of tantalum pentoxide, with a mine life of about 40 years based on a 2 million tonne per annum (mtpa) operation.

Mr Brinsden said the project, scheduled to begin first concentrate shipments in the second quarter of 2018, was "absolutely fit for the times we're in".

"China is going to dominate lithium raw material purchasing and ultimately the lithium ion supply chain; the battery factories," he said.

"It's already happening; between 2015 and 2016, raw material supply consumption grew

by 30 per cent in China and the same thing is happening today in 2017.

"Unfortunately for the Chinese they don't have any natural competitive advantage, they don't have any high grade (in mass) spodumene.

"They have been very heavy reliant on imported sources of supply and especially spodumene.

"Spodumene is almost becoming the preferred source of lithium units, because it immediately upgrades to battery-grade carbonate or battery-grade hydroxide."

Mr Brinsden said the lithium supply chain had moved a lot faster than the industry had anticipated.

"I think everybody will continue to be surprised to the upside," Mr Brinsden said.

"China has a history of outperforming in the commodities that it chooses to invest – solar for example.

"We think that same phenomenon is happening now and expanding much faster than the western world is currently assuming."

Pilbara Minerals has already executed

a number of offtake agreements, including an agreement with General Lithium for the supply of 140,000tpa of 6 per cent chemical-grade spodumene concentrate from the first quarter of 2018 for an initial six year period with the option to extend for another four years.

It has also secured an agreement with Chinese lithium producer Jiangxi Ganfeng Lithium and its subsidiary Ganfeng Lithium for 30,000tpa for Stage 1, with a further off-take agreement for future production from the proposed expanded Stage 2 operation.

## Countdown to production

In June, the company's received the green light to commence major site works after announcing a final investment decision, and in July awarded four key construction contracts.

Speaking on the sidelines of the Kalgoorlie conference, Mr Brinsden said the company was well and truly into the commencement of site works.

"We've finished all of the final environmental approvals, we've raised all the money to develop the mine, and we're now flat out in construction," he said.

"Some reasonably major contracts have already been let, RCR Tomlinson is the designer and constructor of the processing plant and that contract is worth \$140million/\$150million.

"We've also done the civil earthworks package for the commencement of the site infrastructure, which was won by NRW."

A Camp Stage 2 expansion contract was also awarded to Njamal Services and Pilbara Resource Group (NPJV), and camp services contract to Action Industrial Catering in a joint venture with Njamal Services.

"We are taking the first stage of the camp from 60 persons to 300," Mr Brinsden said.

"Civil works have begun and concrete will be poured in the next couple of weeks, so we're really very much into it now.

"It is very exciting, a lot of hard yards to get a project to that point, it's not easy but we have a great team at Pilgangoora, and a really supportive board and the market of course has been pleasing."

(CONTINUED ON PAGE 36)



# Job done at world-class lithium project

SINCE 1986, Como Engineers has established itself as a world leader in engineering services and specialist products to the mining and resources sector.

Como specialises in fit for purpose cost effective solutions utilising new, refurbished, modular and transportable equipment in its plant designs.

The company recently worked closely with lithium developer Pilbara Minerals to complete the initial scoping, pre-feasibility, definitive feasibility and expansion studies for the Pilgangoora lithium-tantalite project prior to the commencement of early contractor involvement work during the tender phase of the project.

Como was able to deliver a seamless stream of successful study outcomes for Pilbara that has allowed it to further develop the project.

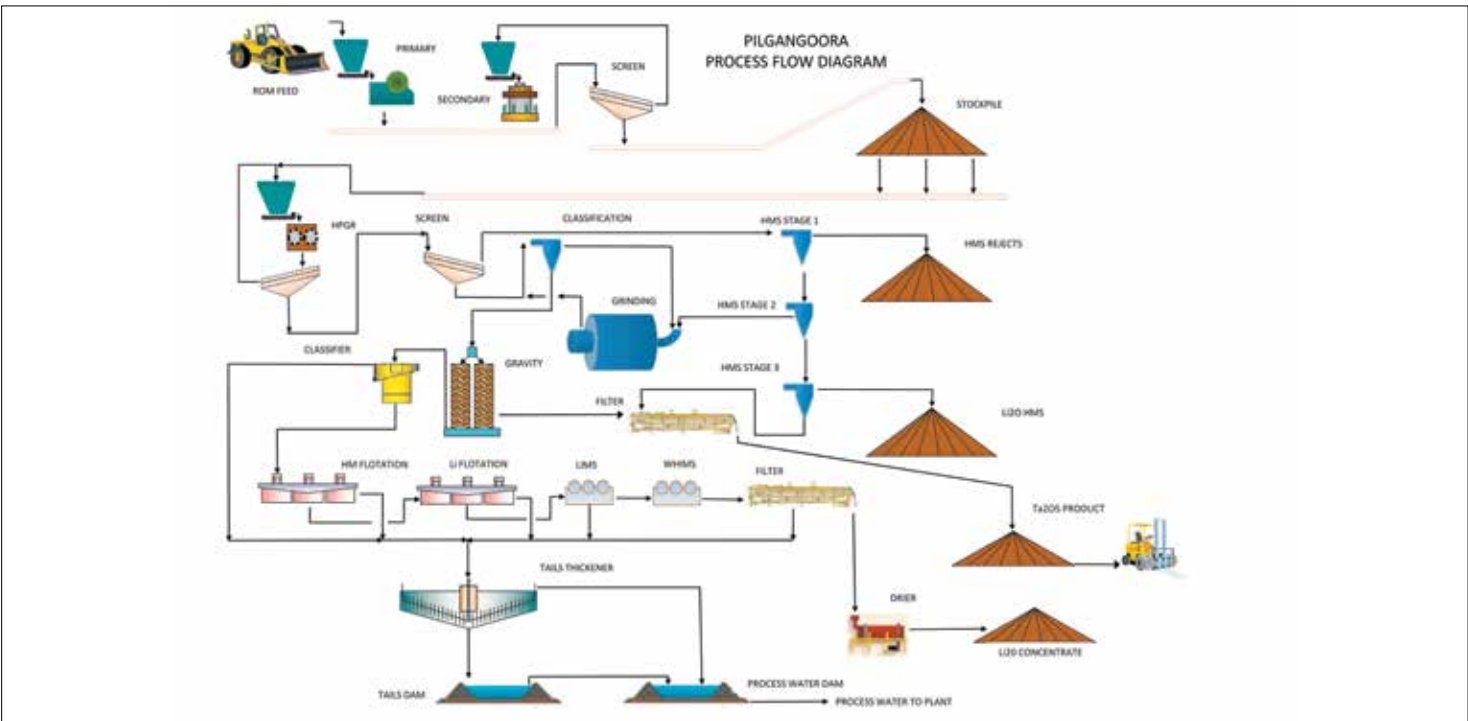
The Pilgangoora Project, 120km south of Port Hedland in the Pilbara region, is the second largest spodumene-tantalite resource in the world.

The feasibility studies confirmed robust project economics based on an initial production of ore throughput of 2 million tonnes per annum, producing three product streams.

The company delivers projects to a wide range of styles and specialise in fixed cost projects to agreed quality and time constraints.

**Multi-disciplined**

Como Engineers works closely with clients to fully understand their needs and independently deliver to their requirements



The Pilgangoora project process flow diagram.

using all the expertise and facilities at its disposal.

It employs a team of experienced engineers across all disciplines; including metallurgists, process, mechanical, civil, structural, electrical engineers, construction supervisors and drafts-people, which enables Como to offer a complete self-delivered process and engineering service.

The company has vast experience in scoping, pre-feasibility, bankable and definitive feasibility studies.

Because of its strong knowledge across many metals and minerals, more than 30 years of resources industry experience and the diverse technical background of our engineers, metallurgists and geologist, studies are the backbone of its business.

Whether it is designing, constructing and acting as the project manager for a brand new plant or operation; or second hand, upgraded components into a plant, Como's team of experienced engineers and drafts-people work together toward clients' needs.

With a very low staff turnover and long term service of its team, Como has an extensive history and catalogue of projects it has successfully completed.

Other projects Como has provided its services to include the IMERYS Talc project, Barrick Gold's Lawler's mine, Independence Group's Jaguar copper-zinc plant, and Metso Minerals' mines in Sweden and Finland.

More information on Como's broad range of engineering services can be found at: [www.comoeng.com.au](http://www.comoeng.com.au).

# CONCEPT TO COMPLETION

## CLIENT SATISFACTION IS OUR SUCCESS

Established in 1986, Como Engineers' provide engineering services and specialist products to the Mining and Resources sector. We are committed to working collaboratively with our clients to deliver mineral processing and engineering projects on time and on budget.



### CORE SERVICES

Conceptual, Scoping, Pre-Feasibility & Feasibility Studies	Engineering Design and Construction	Relocations, Refurbishments and Upgrades	Modular Plants and Equipment
--	-------------------------------------	--	------------------------------

**COMO ENGINEERS**  
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# COMO

## ENGINEERS

MECHANICAL & MINERAL PROCESS ENGINEERS



All going well, the project will begin commissioning in March and shipments in the second quarter of 2018.

"We will be ramping up the overall mine capacity from late 2019 and it looks like it will be a really good opportunity because it's got some very strong economics and the market is just ready for it," he said.

"We're getting to the expansion as soon as we can."

The expansion would involve doubling production capacity to 4mtpa, however based on the strength of the increased ore reserve, studies were now underway to evaluate increased capacity to 5mtpa.

Pilbara Minerals was hoping to finish a definitive feasibility study on the expansion to 5mtpa in the first half of next year.

Under the current pre-feasibility for a 4mtpa expansion, average annual production was about 564,000tpa of 6 per cent spodumene concentrates inclusive of technical grade product, and 579,000 pounds of tantalite in concentrate.

Once in production, the project was set to deliver lucrative cash flow for Pilbara Minerals.

"Our location in the Pilbara so close to Port Hedland and quality of product all translates to a very low cost operation," Mr Brinsden said.

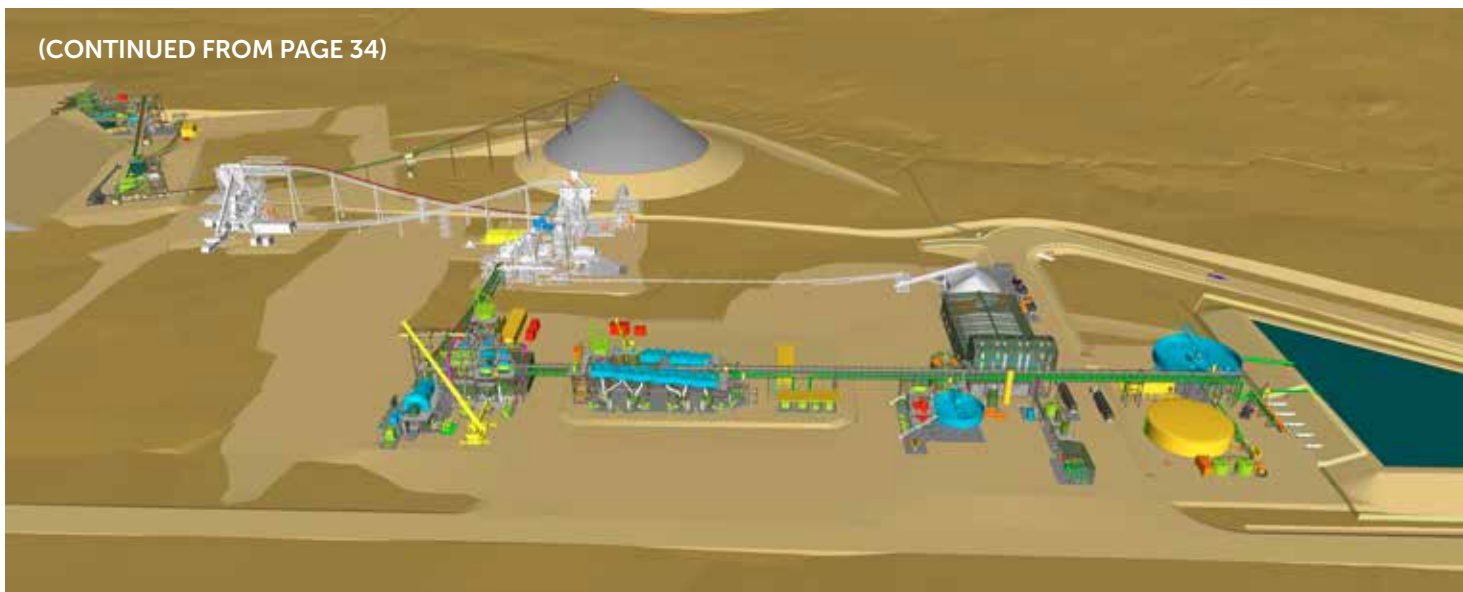
"Our cost base is \$US220/tonne. Today that product is selling for a minimum of \$US820/t.

"If you're making a cash margin of \$US600/t over 350t sold, that's a serious cash flow, and we're not that far away from producing it from the second quarter of 2018."

#### Future prospects

While Pilgangoora was Pilbara Minerals' primary focus over the next few years, the company also had its sights on its newly acquired Mt Francisco project.

(CONTINUED FROM PAGE 34)



The Pilgangoora mine was now under construction.

**"WE'VE GOT PEOPLE KNOCKING OUR DOOR DOWN ASKING: 'CAN WE SECURE MORE SUPPLY?', AND UNFORTUNATELY YOU CAN'T. WE'RE SOLD OUT IN STAGE 1, BUT WE'D LOVE TO TALK TO YOU ABOUT STAGE 2 OF OUR PROJECT."**

On 29 March, the company inked an agreement with Atlas Iron to acquire an initial 51 per cent interest in the lithium, tantalum and tin mineral rights for Mt Francisco project, just 50km from Pilgangoora.

As part of the deal, Pilbara Minerals can earn up to 80 per cent of Mt Francisco in stages by funding \$1 million worth of

exploration and completing a definitive feasibility study until a decision to mine.

"We're really looking to getting into Mt Francisco, because we've obviously learnt so much about Pilgangoora," Mr Brinsden said.

"We're really optimistic there's going to be a lot of spodumene there too; of course it has got to be proven, we've got to get in there and drill, which will be begin before the end of the year, so we're looking forward to that, and hopefully our shareholders have got something to look forward to there to."

The deal followed the company's December 2016 purchase of the high-grade Lynas Find project from Dakota to further bolster its pipeline of exploration targets in the North Pilbara region.

Mr Brinsden said while his focus would be on developing Pilgangoora and later Mt Francisco, he didn't rule out any future acquisitions.

"It's hard to look past your own

backyard; it's such a good place to work in, but that doesn't stop us from keeping an eye out in the industry as a whole and what's happening elsewhere," he said.

"We're so lucky with Pilgangoora, and now Mt Francisco, so that's a really good position to work from to see the company continue to grow.

"We like the idea of being able to participate a bit more downstream as well in the refining piece, so that's a future initiative that we're continuing to chip away."

He added it should not be underestimated "how important" WA was for lithium mining.

"The natural endowment of lithium raw materials – it's absolutely amazing," he said.

"Some of the quality of those resources is just phenomenal.

"WA will do well, Australia will do well as a whole, and I think we're an incredibly lucky country."

# NRW expands east coast operations

AFTER securing a site bulk earthworks construction contract at Pilbara Minerals' Pilgangoora project in July, NRW Holdings has made another landmark deal, recently acquiring one of QLD's largest civil construction, urban development and mining services contractors, Golding.

Golding is a leading civil construction and mining services company with a highly successful project delivery record.

NRW chief executive Jules Pemberton said the acquisition has the potential to deliver growth across the business and its east coast operations.

"Golding is a business with strong market positions across its operating divisions, underpinned by longstanding tier one client relationships and an experienced management team," Mr Pemberton said.

"The business is highly complementary to NRW and with a well-recognised brand, represents an attractive platform for our company's further expansion into the growing east coast civil and infrastructure markets and coal and metalliferous mining sectors."

This acquisition increased NRW Holdings' employees to 2000 and raised the number of projects to 40, across a variety of sectors including iron ore, lithium, gold, coking coal and thermal coal.

This positions NRW to offer a diverse range of services and project solutions to clients across the infrastructure, resources and urban sectors.

With the acquisition, the company now has more than 100 years of experience with combined civil expertise in bulk earthworks, concrete installation, project rehabilitation, rail formations, tailings dams, airstrips,



NRW continues to implement its growth strategy for its east coast operations.

processing plants, power stations and jetty's, among other capabilities.

NRW has proven capacity to safely deliver mining projects in Australia that meet timeframes and budgets.

The group has the resources to offer a full range of mining services spanning the mine development and operations, including mine planning, load and haul,

pit development, clearing a grubbing, production haulage and rehabilitation.

Extensive experience in these capabilities allows NRW to continuously improve methodologies to provide the best value for its clients.

The Golding acquisition followed last year's takeover of Hughes Drilling East Coast business to compliment NRW

Holdings' subsidiary Action Drill & Blast.

The prospect of leveraging the additional capabilities and regional strengths across the combined group, give NRW the ability to further capitalise on its strong market position to deliver large and complex projects across the country.

It seems there are exciting times ahead for the expanded NRW.





## YOU IMAGINE. **WE DELIVER.**

NRW is experiencing unprecedented growth. Our solid reputation delivering world class projects for Australia's leading resource companies, backed-up by our dedicated team of 2000 industry-experienced personnel, has made NRW the preferred partner in project delivery.

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PROJECT DELIVERY**

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**"IT TOOK US TWO YEARS TO FIND OUR FOUNDATION, AND WE WERE FREQUENTLY TOLD THAT REDSPEAR WOULD NEVER HAPPEN, THAT IT WOULD FAIL, BUT OUR PERSISTENCE AND OUR BUSINESS MODEL PROVED PEOPLE WRONG AND HERE WE ARE NOW, A SUCCESSFUL, PROUD ABORIGINAL BUSINESS SERVICING AUSTRALIA'S LARGEST SECTOR."**



Redspear founder Barry Maguire, speaking at CEDA's Indigenous Business Leader's August event in Perth.

Image: CEDA.

# Indigenous contractors build momentum

Indigenous mining contractors are thriving from a push by the WA Government and private industry to provide local jobs to projects in regional areas.

## CAMERON DRUMMOND

WITH footprints in remote locations across Australia, it makes sense that locally based indigenous businesses are given increased opportunities to competitively tender for work in a sector that creates job prospects in their own backyard.

The recently elected WA Labor Government has taken the lead in linking regional contracts with local suppliers, complementing Fortescue Metals Group and Rio Tinto initiatives to award contracts to Aboriginal-owned and local supply companies.

In the past six months, Rio and Fortescue have awarded a plethora of contract work to Aboriginal-owned companies, including Redspear Safety, Pindari, Eastern Guruma and Yindjibarndi Aboriginal Corporation.

At the end of the 2016 financial year, Fortescue announced \$100 million worth of new contracts to Aboriginal businesses or joint ventures (JV), including \$65m worth of partnerships with Pilbara-based Yindjibarndi-owned businesses.

That announcement brought the total value of work awarded through Fortescue's 'Billion Opportunities' program – an initiative to promote business opportunities for Aboriginal people – to \$1.95 billion at the time.

At FMG's Solomon Hub, site-wide waste management would be provided by PTK Environmental Services, with civil and earth moving services supplied by the NRW – Eastern Guruma WMYE JV.

"The flow on effects of our work with Fortescue has huge benefits for the community by providing real opportunities for people to get a job and support their family," Palyku traditional owner and PTK



Image: Rio Tinto.

(L-R) Rio Tinto Communities and Communications general manager Linda Dawson, Rio Tinto Yandicoogina general manager Matt Holcz, Rio Tinto Indigenous Business Development and Support principal advisor Bernadette Harris and Pindari director David Pidek.

director Tammy O'Connor said.

Fortescue chief executive Nev Power said the continued growth of the Billion Opportunities program was fundamental to the company's long-standing relationships with Aboriginal communities.

"These works will provide employment and business opportunities for our traditional owner and native title groups in the Pilbara, as we continue to ensure our communities benefit from the growth and development of Fortescue," Mr Power said.

"We are particularly proud of our ongoing partnerships with Yindjibarndi People through the Wiru-murra Yindjibarndi Aboriginal Corporation, as they work toward a better future for their community by embracing training, jobs and business opportunities."

Since the inception of Billion Opportunities in 2011, Fortescue has awarded 244 contracts, sub-contracts and works to 105 Aboriginal-owned businesses and JVs.

In May, Redspear Safety was awarded a contract by Fortescue for lifting and rigging services across its operations, its first contract with a mining major.

Speaking at the Committee for Economic Development of Australia's (CEDA) Indigenous Business Leadership event held in Perth on 10 August, Redspear founder Barry McGuire said that despite the company struggling to get off the ground in the first two years, he led Redspear into critical contracts with companies such as Fortescue.

"It took us two years to find our foundation, and we were frequently told that Redspear

would never happen, that it would fail, but our persistence and our business model proved people wrong and here we are now, a successful, proud Aboriginal business servicing Australia's largest sector," Mr McGuire said.

Mr McGuire said the contract reflected grassroots changes in attitude towards the competency of Indigenous businesses.

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

Meanwhile, Pindari doubled its workforce after being awarded a five-year contract by Rio to provide facilities maintenance services across nine of its WA mines.

Pindari executive director Natalie Venosi said the long-term contract with Rio was the culmination of 20 years of Pindari delivering high quality, commercially competitive solutions to the mining and offshore oil and gas sectors.

"Pindari has provided services to Rio Tinto since 2008, starting out with a handful of tradespeople in infrastructure maintenance to winning multiple accommodation refurbishment contracts, landscaping and building projects," Ms Venosi said.

"We have proven our capability over the years and helped pioneer a relationship with Rio that led to an exciting Aboriginal business engagement initiative, now resulting in Pindari's first long term contract opportunity," she said.

Elsewhere in WA, Yagahong Alliance was awarded an \$8.2m contract for the development of Sandfire Resources and Talisman Mining's Monty copper-gold JV; and Guma Indigenous Construction Resources Group secured a contract to carry out port sump installation at Hancock Prospecting's Roy Hill.



# Turnkey contract solutions for mining



Mallard Contracting was awarded an *Indigenous Business* award at the Rising Stars 2016 awards.

WITH more than 30 years’ experience in remote construction, Mallard Contracting is a well-respected force in the WA mining industry.

The Aboriginal-owned contracting company specialises in all areas of construction, from hydraulics, installations, concrete and civil, communications, to electrical services including high voltage, along with a long list of maintenance services from site upgrades to housing maintenance.

“We have grown to become an approved

contractor with the capability and the experience to tender for, and undertake major works, with a safety training and track record demonstrating our commitment to delivering projects on time without compromising safety,” Mallard Contracting general manager Chad Duckrell said.

“We currently employ about 20 full time core personnel with access to a highly skilled team of tradespeople from project managers, engineers, HSE personnel, and administrative staff to trade assistants.”

## MALLARD CONTRACTING

IS PROUDLY A 100% ABORIGINAL OWNED CONTRACTING COMPANY

Mallard Contracting has a strong commitment to helping improve the lives of Aboriginal people and their communities, focusing on using the company to mentor through employment, traineeships, and apprenticeships. The company constantly delivers high-quality projects on time and on budget, demonstrating a commitment to delivering those projects without compromising safety.

*Mallard Contracting pay their respect for the Traditional Owners, past and present, of the lands upon which they operate.*

Robby Mallard 0409 088 103  
Chad Duckrell 0409 253 625  
chad@mallardcontracting.com.au

# Community focus in regional WA



Maramara has access to an extensive equipment range.

WA based business Maramara has the capabilities, staffing, and management system of a tier one company packaged into an Indigenous company with the flexibility and family feel to offer a real solution to Indigenous contracting services.

The name Maramara (meaning ‘Two Hands’), captures the spirit and intent of the business with its logo depicting the two principle parties coming together to grow and enhance Aboriginal involvement and participation in the WA economy.

Maramara provides a range of professional services within the civil infrastructure, construction and mining fields, with access to an extensive range of equipment.

Being Certified in ISO 9001:2008 Quality Management and AS/NZS 4801:2001 Occupational Health and Safety ISO 14001:2004 Environment, its clients can be assured of a quality service being delivered in a safe and timely manner.

## THE MARAMARA DIFFERENCE

Maramara provide a range of professional services within the civil infrastructure, construction and mining fields.

We always deliver the best possible outcome for our clients, by ensuring flexibility and recognising our client's needs.

- Road Maintenance / Road Construction
  - Rail maintenance
  - Camp installation earth works
  - Dust suppression
- General Mine Site Civil Works and upkeep
- Haul Road / Rail Formation construction,
  - Bulk handling,
- Land rehabilitation / Mine Site Rehabilitation
  - Waste management,
  - Culvert & drainage construction
  - Dam construction

**MARAMARA**  
TOGETHER WE GROW

08 9172 2018

maramara.com.au



# PROFIT FOR PURPOSE

**KARLAYURA GROUP (KG)** is a proudly 100% Aboriginal-owned "profit-for-purpose" business. Founder and Director, Brian Tucker, or BT as he is known in the Pilbara is a respected entrepreneur and businessperson.

As a profit for purpose business, Karlayura Group injects a percentage of earnings into Aboriginal Community Programs. Karlayura Groups primary purpose is to assist 'family' get back on Country, maintain cultural lore and traditions, as well as building strong relationships towards self-sustaining communities.

KG has business interest in the mining services, civil construction, waste management and tourism sectors. Most recently, Karlayura Group undertook a civil project for FMG in Newman, and have been actively engaged to provide Aboriginal and Torres Strait Islander candidates, for labour hire and permanent placement with a wide ranging client base.



## LABOUR HIRE

In response to the market, we have more recently extended our business offerings to include Labour hire and direct permanent recruitment services.

We understand the challenges of finding and retaining eligible candidates for your business needs.

Karlayura Group offers candidates for contracts and/or permanent placement.

Nothing is too difficult – if you need candidates from certain Aboriginal Language groups we can definitely assist in that regard. Just call and give us the details.

What differentiates us from our competition is that we only offer 100% Aboriginal and Torres Strait Islander candidates to enable you to meet your contractual obligations under effective Aboriginal Engagement.

In addition, unlike other Labour hire service providers, we offer mentoring and support in the first three months to any candidate's placed to ensure a smooth transition into the workplace.

Our database has candidates ready and willing to help your business make a difference and give you the competitive edge.

Let's work together to deliver great outcomes for your client.

To know more about how Karlayura Group can assist you, call us today!

## KARLAYURA TOURS

In relation to tourism, Karlayura Group, through Karlayura Tours offers Corporate Cultural Immersion and On Country Tours.

Some of BT's traditional country is the world famous Karijini National Park. All Karlayura Tours are bespoke, consisting of a minimum of 12 participants required for any tour. The offerings include a Welcome to Country, Smoking Ceremony and an unforgettable cultural evening with BT and other members of his community on Country sharing stories of creation, dance and songs. This program offers more than providing non-aboriginal people with a greater insight to aboriginal histories and stories but also employment. Your participation on these programs provide the opportunity for employment and cultural practices for local members of BT's family/community.

For more information, please contact  
Regina Glover, Operations Manager

☎ 08 9414 1882

✉ [employment@karlayura.com.au](mailto:employment@karlayura.com.au)

🌐 [www.karlayura.com.au](http://www.karlayura.com.au)

**KARLAYURA  
GROUP**

100% Aboriginal Owned



# Experienced and reliable contracting



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

WITH a family history that spans more than 100 years in Cloncurry, Queensland, K&R Contracting's owners prides themselves on offering clients the "local touch".

The 100 per cent Aboriginal family-owned civil construction business has delivered fully accredited and quality mining, civil and construction services to the heart of North West Queensland for more than 20 years, taking care of all

road construction, maintenance and mine operation needs; including exploration earthworks, sub-divisions, excavation, rehabilitation, stockpile re-handle, crushing and screening, ROM management and crusher feed, load, haul and dump operations.

Through the teams' in-depth knowledge and experience, they have established a proven track record of reliability, timeliness and performance in delivering projects in

full and on time, while maintaining a safe work environment.

"We have a fleet of civil and mine-ready mobile equipment along with highly skilled operators and qualified tradesmen available for all your onsite requirements," proprietor Kevin Wehrman said.

"We also deliver nationally accredited and recognised training in a number of areas including business, civil construction, surface extraction, underground and work

readiness, and also provide opportunities to local Indigenous youth through quality training and mentoring leading to full time employment."

Some of its clients include Xstrata/ Glencore, BHP, Pasminco, Bectel Services, WMC, Incitec Pivot, Copper Chem, McMahon's Holdings, South 32, MMG, Zinfra, Roadtek, Department of Transport and Main Roads, and Cloncurry Shire Council.

# CONTRACTING DONE RIGHT

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Austrorads National Prequalification System for Civil (Road and Bridge) Construction Contracts (National Prequalification) (TMR). Road construction, Road maintenance, Exploration earthworks, Sub divisions, installation of services.

## EMPLOYMENT & TRAINING

Nationally Accredited and Recognized training certificates, Work readiness training (course design & delivery), and Training scope includes Business, Civil Construction, Surface Extraction, Rockbreaking and Underground Services.

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## EARTHWORKS & PLANT HIRE

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## LOCAL FOCUS

K&R Contracting owners Kevin and Rita Wehrman are both aboriginal, born and raised in Cloncurry and have more than 100 years of family history in the Cloncurry and North-West districts. The team work tirelessly to improve the community by the continuing support of local sporting and community groups in the Cloncurry district.

[krcontracting.com.au](http://krcontracting.com.au)

# K&R CONTRACTING

(07) 4742 0376  
[admin@krcontracting.com.au](mailto:admin@krcontracting.com.au)



# Indigenous-owned NT training centre opens

CAMERON DRUMMOND

AN Indigenous-owned bauxite mining operation and training centre has opened in Northeast Arnhem Land in the Northern Territory with an aim to deliver sustainable economic benefits for local Yolgnu people.

Owned by the Gumatj clan, the Gulkula Regional Training Centre – adjacent to the small-scale Gulkula bauxite mining operation – will deliver on-the-job training for participants.

The training centre was established with \$2.4 million in funding from Rio Tinto, with Gumatj Corporation, Territory and Federal Governments also contributing to the project.

Rio has also committed to purchase all bauxite produced from the mine.

Gumatj Corporation chief executive Klaus Helms said it was a significant day for local Yolgnu people and Indigenous communities far and wide.

“The commencement of a 100 per cent Indigenous-owned training centre and mining operation is a testament to what Indigenous people can achieve working in partnership with business and government – this a major step forward in building a sustainable future for our local people,” Mr Helms said.

“With Rio Tinto’s support, Yolgnu people can now receive on-the-job training through Gumatj mining operations.

“The skills they develop will open up opportunities for them to build careers in the mining industry in the Northern Territory and beyond.

“The bauxite sales agreement we signed with Rio Tinto today also signifies their commitment to ensuring the success of our new mine. We are very excited to begin production later this year and start generating economic benefits for our local region.”



An aerial view of the Gulkula Regional Training Centre accommodation facility.

Image: Rio Tinto.



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Our ultimate goal is to empower indigenous Australians to pursue a professional career in the Spatial Sciences sector.

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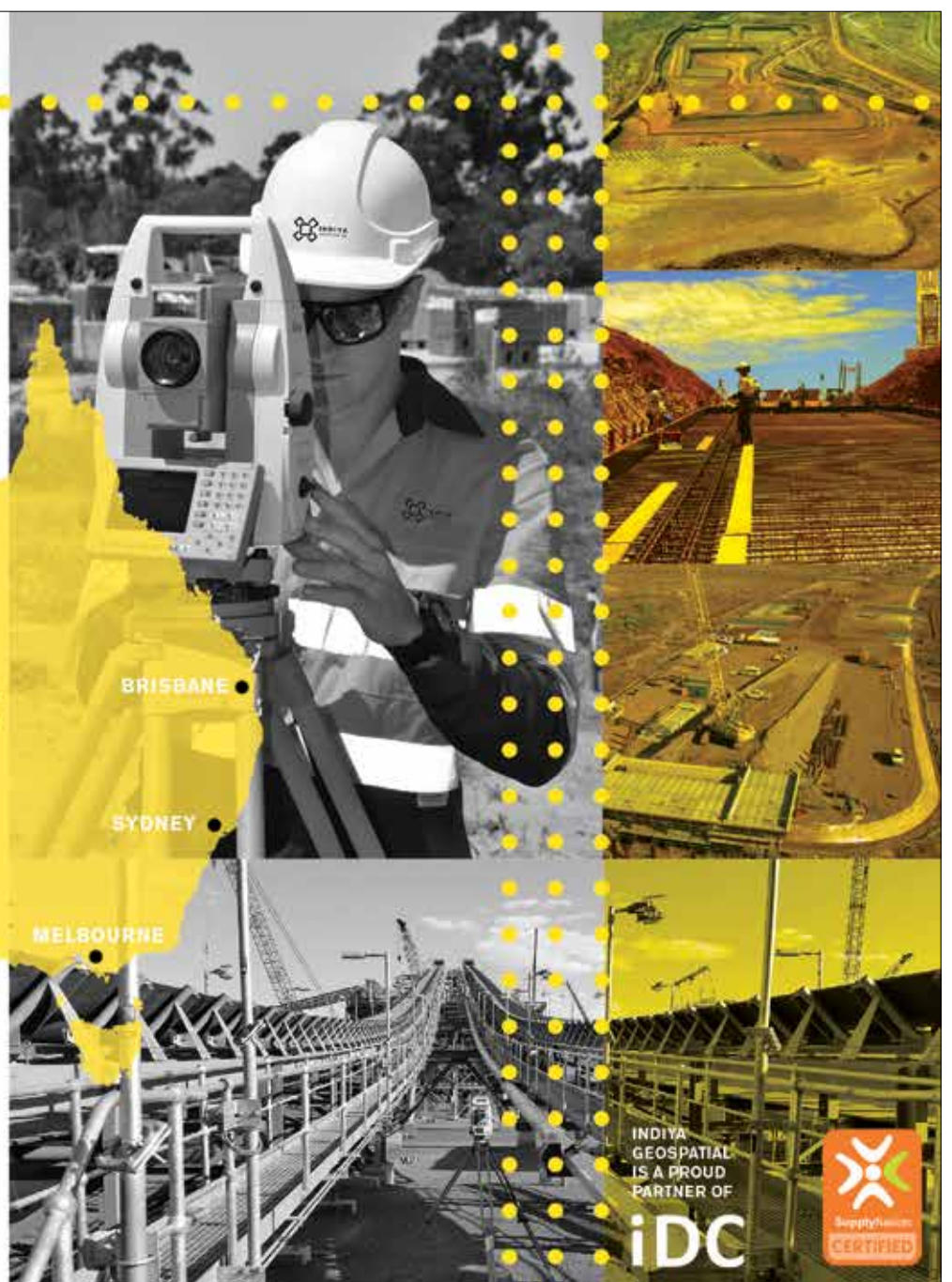
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All Images: Mount Gibson.

# Restart on the horizon

After securing insurance payouts of more than \$150 million, Mount Gibson Iron Ore is in a well improved cash position to restart its Koolan Island mining operation, ramping up production at Iron Hill and resume paying dividends to its shareholders.

## CAMERON DRUMMOND

SINCE a seawall collapse in October 2014 halted operations at Mount Gibson's Koolan Island iron ore mine, the company had patiently awaited insurance settlements over the disaster before making a decision on restarting the shuttered mine.

By June 2016, the company had secured \$86m for damages caused to property at the mine, and in July this year was paid a further \$64.3m for business interruption costs.

Mount Gibson said that 92.5 per cent of the business interruption costs were now paid, and negotiations with one insurer over the remaining 7.5 per cent were underway.

"This settlement, which takes combined insurance proceeds for property damage and business interruption at Koolan Island to just over \$150m, is well timed with construction of the starter embankment for the new Main Pit seawall and related activities progressing in line with the project restart schedule," Mr Beyer said.

The company had previously stated the total redevelopment cost of Koolan Island would need to be less than \$90m, with sufficient ore reserves to produce at least 15mt of hematite ore over a period of 3 to 4 years (above 62 per cent Fe).

However with insurance proceeds and improved overall iron ore prices, a new redevelopment cost of \$97m was approved by the Mount Gibson board in April this year.

After further investigation, the project's Stage 1 Main Pit was found to contain high grade hematite ore reserves of 12.8mt at 66 per cent Fe with an initial mine life of 3.5 years.

The company said further geotechnical work would be conducted for a potential Stage 2 pit extension at the east end of the Main Pit as it progressed the mine's redevelopment.

Material works commenced in June to rebuild the Main Pit seawall, dewater the pit and prepare the site for commencement of commercial production, with initial ore sales anticipated in early 2019.

By the end of August, the company had sealed the seawall breach and commenced drilling for instrumentation installation.

Seepage barrier construction was on track to commence in September, with dewatering



The Extension Hill crushing plant where ore from Iron Hill is processed.

scheduled for 2018.

"We are extremely excited to now be proceeding with the restart of our very high grade Koolan Island mine, having confirmed a safe and viable seawall design and compelling economics," Mr Beyer said.

## Iron Hill

3km from the now depleted Extension Hill mine, Iron Hill has an annual production rate of between 5.5mwmt and 6mwmt, and is to be mined until depletion by the end of 2018.

Iron Hill represents a low cost operation for Mount Gibson.

It was developed at a cost of under \$3m, and the project has a relatively low production cost of between \$US46/wmt and \$US48/wmt.

The primary focus of activity during the June quarter was on ramping up production and commencing sales from the new Iron Hill pit.

After mining commenced late in the prior quarter, production of high grade ore from Iron Hill totalled 640,000t in the June quarter.

The commencement of Iron Hill sales was significant for Mount Gibson, given the higher

average grade of Iron Hill product relative to material produced in the final stages of mining at Extension Hill. The average grade of Iron Hill lump sold during the quarter was 61.6 per cent Fe, while average grades of Iron Hill fines produced during the period increased to about 59 per cent Fe.

However, development of Iron Hill was not without its hiccups.

During the year, Mount Gibson terminated two offtake agreements relating to Iron Hill production, after Chinese customers failed to comply with a fundamental term of their respective offtake agreements. In mid-June it terminated an offtake agreement with Xinyu Iron and Steel Group for one quarter of the total production from its Iron Hill project.

Xinyu was one of three customers that Mount Gibson had entered into agreements with, each for a quarter of the project's production.

A month later it terminated a similar agreement with Sinogiant Steel.

The company said it would pursue the companies for any resulting losses.

"Mount Gibson continues to sell Iron Hill material into the market and expects to place

all production from Iron Hill with customers as it becomes available," Mr Beyer said.

## Moving forward

Mr Beyer said the June quarter marked an important point in the ongoing evolution of Mount Gibson, most notably with the commencement of site works at Koolan Island, and initial sales from Iron Hill.

Total ore sales during the period amounted to 603,000wmt at \$US63/t, down from 782,000wmt at \$US86/t during the previous quarter.

"As foreshadowed, the June quarter was soft in terms of sales and revenue reflecting the transitional nature of this period and renewed volatility in market conditions," Mr Beyer said.

"However, we look forward to an improved product mix as high grade Iron Hill ore replaces sales of low grade material from our depleted Extension Hill mine and work progresses to bring Koolan Island back into production and commence sales by early 2019.

"The high quality of ore from Koolan Island will set us apart in a market that is increasingly geared to premium quality products.

"Significantly, right after the end of the quarter we also concluded a \$64.3m cash settlement for the business interruption insurance claim resulting from the 2014 failure of the Koolan Island seawall.

"The settlement proceeds have now been received, taking the total insurance proceeds for the seawall failure to over \$150m, further building our strong cash reserves to over \$500m.

"Mount Gibson remains in a very solid position as we progress our Iron Hill and Koolan Island projects and seek new high quality resources investment opportunities. We enter the new financial year with confidence."

After posting a \$26.3m profit for FY17 a final dividend of 2 cents per share was paid to shareholders, marking the first time the miner had paid investors since 2014.

This was lower than FY16 profit of \$86.3m, however nearly all of that amount came from an insurance payout related to the seawall collapse at Koolan Island.



# Quality service safely

HAGSTROM Drilling is a privately owned company, recognised for its proven professionalism and expertise in the supply of drilling solutions both nationally and internationally.

Hagstrom has been in operation for 25 years specialising in Aircore, Air and Mud Rotary, Diamond, Auger, Direct Push Probe and Cone Penetration Testing (CPT); with extensive experience on land and over water.

Hagstrom provides these services with an end-to-end service capability; from feasibility, exploration and construction, to monitoring and site remediation.

With its head office in Canning Vale, WA and representation in NT, NSW and Victoria, Hagstrom has the capability to service the industry, internationally and Australia wide.

In conjunction with its experienced personnel and extensive range of Drill Rigs and equipment, Hagstrom can provide specialised services that include service locating, sampling and waste management; its operations are a complete package for the ever expanding business.

Irrespective of challenges Hagstrom face, its team strives to ensure that the environmental impact is minimised in line with company and client policies.

Hagstrom values the environment, eco-sensitive and cultural sites and respects the rights of landowners.

In 2012, the company was awarded the *WA Business News Rising Stars* and the *Australian Business Award for Enterprise*.

Receiving the awards confirmed the strategic and operational focus of the organisations' effectiveness.



Hagstrom provides nation-wide drilling services to the resources sector.

Hagstrom's vision is to achieve the highest level practicable with safety and health of all employees, contractors and visitors.

Its warehouses are stocked with a comprehensive inventory of spares and consumables for necessary repairs, fabrication, maintenance and rebuilds of all plant and equipment; giving Hagstrom the ability to fully support its equipment in the

field in order to minimise any unplanned down time.

All Hagstrom safe work procedures are rig specific and incorporate a high level of national competency, as all staff are required to understand and exercise all company policies together with ISO 4801 compliance, safety management plan and visions.

With a comprehensive training matrix covering each role to industry competencies,

best practice, internal procedures, policies and standards, Hagstrom's focus on staff training and development is an asset to the business and industry as a whole.

Hagstrom continues to provide highly efficient and accurate drilling solutions, whilst remaining true to its 'quality service safely' motto.

Additional information can be found at: [www.hagstromdrilling.com](http://www.hagstromdrilling.com).

## YOUR PEOPLE. OUR SOLUTIONS.

SHR has proudly supported Mount Gibson Iron over a number of years with our consulting and services expertise covering Employee Relations, Industrial Relations, Human Resources, Business Migration and our dedicated team that delivers Outsourced Human Resources Management and Payroll Processing.

SHR welcomes Mount Gibson Iron's announcement to reopen their Koolan Island operation and congratulates CEO Jim Beyer and Directors on their decision – helping to further stimulate WA's economic rebound.

At SHR we have over 21 years of broad strategic and operational experience providing services to clients, like Mount Gibson Iron, within Australia and throughout the Asia Pacific region. SHR is an independent consulting practice and our core competencies include:

- Strategic HR & IR planning
- HR management consulting
- Industrial & employee relations consulting
- Due Diligence, mergers & acquisition
- Strategic workforce planning
- Professional HR contractors
- HR managed services
- Talent sourcing & management
- Organisational development
- Business migration services
- Major projects HR & IR consulting





# Silver lining

After divesting its shuttered Murchison operations in July, Silver Lake Resources is now free to pour its capital into the flagship Mount Monger operation. Over the next 12 months, the gold producer will be ramping up exploration to unlock new longer life ore sources.

ELIZABETH FABRI

SINCE its IPO in 2007, WA gold producer Silver Lake Resources' strategy was to operate multiple projects feeding multiple mills, instead of relying on one single asset.

In 2012, the company became one of Australia's largest gold miners following its \$426 million takeover of Integra Mining; adding to its portfolio of tenements in the Mount Monger and Murchison goldfields.

Five years later, Silver Lake Resources has changed its strategy, choosing to divest its non-core assets to focus solely on its Mount Monger operation in the Eastern Goldfields in efforts to maximise cash flow and maintain a strong balance sheet.

Selling the mothballed Murchison operations, as well as the Great Southern project in 2016, has increased cash-on-hand for continued development and exploration at Mount Monger.

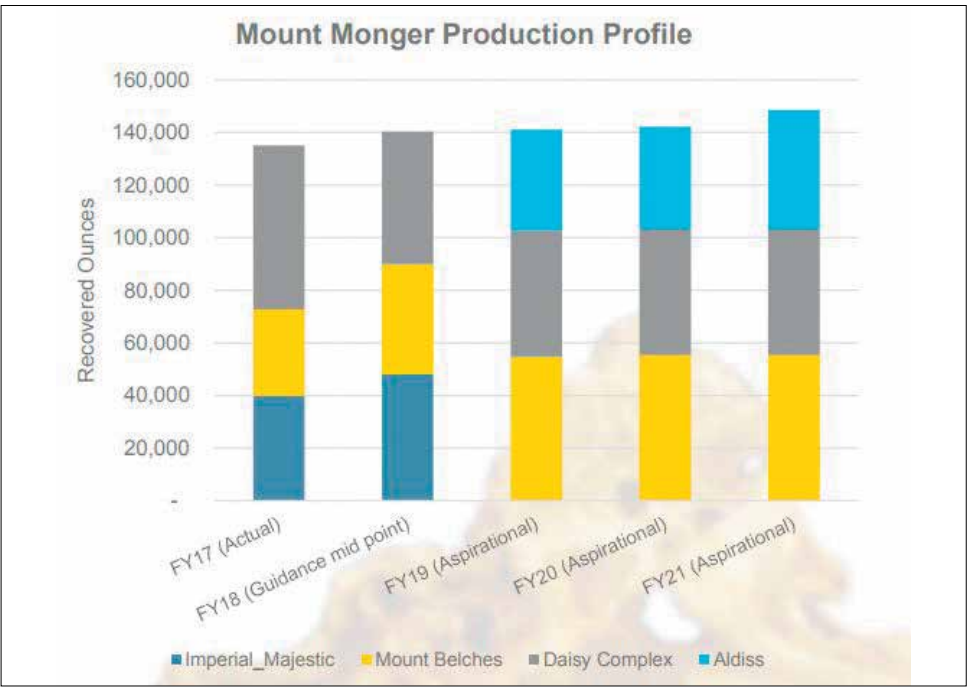
In the June quarter, the project delivered strong production across its three operating mines – Daisy underground, Maxwells underground, and Majestic open pit – which contributed to full year gold sales of 137,000 ounces.

In July, the company also restarted mining at the project's Cock-eyed Bob underground mine, which will represent a new production stream for the year ahead.

Commenting on the company's recent movements, Silver Lake managing director Luke Tonkin said he was focused on delivering, developing and discovering higher margin ounces.

"Silver Lake has had a successful year in FY17 meeting guidance, defining new lower cost production sources and further strengthening the balance sheet," Mr Tonkin said.

"Looking forward to FY18, Silver Lake will take the next steps of transitioning the Mount Monger camp towards longer life ore sources with increased visibility."



The Aldiss centre will be Mount Monger's next production source.

### Divestments

600km northeast of Perth, the Murchison project has been out of action for several years after it was placed into care and maintenance amid unfavourable market conditions in June 2014; just one year into its production life.

On 23 June, the company announced it would sell Murchison to a subsidiary of Westgold Resources for \$10 million, including the Tuckabianna gold processing facility and underlying mining tenure, along with Silver Lake's 40 per cent interest in the Cue Joint Venture.

However, the sale of the Cue interest was reliant on the other JV partner, Musgrave Minerals, not exercising its pre-emptive right to purchase the JV interest on equivalent terms.

On 18 July, Musgrave announced it

would exercise this right and purchase the remaining interest on equivalent terms to those agreed upon with Westgold; a deal that has since been completed.

In July last year the company also sold its Great Southern project to ACH Minerals for \$5 million.

ACH entered a farm-in to acquire the project from Silver Lake back in December 2015 to acquire up to an 80 per cent stake in the project by spending \$6 million over six years.

ACH was also granted the option to wholly acquire the project for a cash consideration of \$5 million, which it chose to elect.

"This is a further step in our strategy to realise value from our non-core assets and minimise our financial and management commitments outside of our core Mount Monger operations," Mr Tonkin said at the time.

### Mount Monger

Now that the Great Southern and Murchison transactions had been completed, Silver Lake has shifted its full attention to Mount Monger.

Mount Monger has been flagged as Silver Lake's cornerstone asset from the beginning due to its highly endowed gold camp, with multiple mines and a history of replacing reserve life.

Since FY08, Silver Lake has produced about 1 million ounces from the project, while never having more than a three to four year reserve backed life of mine (LOM).

While there are many mines within the tenement, current operating projects at the mine include the underground Daisy Complex, Cock-eyed Bob underground, Majestic open pit, and Maxwells underground, with ore processing undertaken at the nearby 1.2 million tonnes per annum Randalls Processing Facility.

Cock-eyed Bob was the company's latest development, with mining recommencing in July following a successful drilling campaign, which saw a 30 per cent increase in resources to 266,000 ounces at a higher grade of 5.8 grams per tonne of gold.

Mr Tonkin said the significant increase in the tenor of gold mineralisation was "highly encouraging".

"Resource development drilling is ongoing and is focussed on converting Inferred Resources to Indicated Resources," Mr Tonkin said.

"CEB is expected to make a significant contribution to Silver Lake's key objective of delivering new ore sources that sustain and enhance margins to drive shareholder returns."

The mine is expected to contribute about 10,000oz in FY18, increasing to 24,000oz in FY19, with future mine life extensions looking likely.

(CONTINUED OVER)



(CONTINUED FROM PAGE 45)



The sale of Silver Lake's Murchison project is now complete.

Mining also began at Maxwells underground in early FY17, after the open pit was depleted in June 2014.

In FY17, production from Maxwells increased 142 per cent, contributing 8945oz.

Open pit mine production would also soon begin at the new Aldiss mining centre, once mining had been completed at the Majestic and Imperial mines.

The Aldiss centre will comprise multiple open pit mines that will feed into the Randalls mill in FY19, FY20 and FY21, recovering a total gold amount of between 130,000oz and 150,000oz.

Multiple ore sources have already been targeted including; Harry's Hill, French Kiss, Karonie South, Spice, Tank, Atriedes, Main Zone, with Harry's Hill scheduled to begin construction this December and ore processing from the first quarter of FY19.

#### Growth opportunities

Looking forward, Mr Tonkin said the company would place a high focus on exploration to unlock new opportunities.

In the June quarter, the company made "significant progress" across five



Mine portal at Mount Monger.

high-priority exploration targets, including strong drilling results from Daisy Complex which showed potential for extensions and repetitions of the existing underground loads.

Mr Tonkin said the \$11.8 million exploration budget for FY18 will be targeting both sustaining and growth prospects within the Daisy Complex, Mount Belches (Maxwells and Cock-eyed Bob), and new Aldiss areas to leverage off existing mine development and infrastructure.

"The Mount Belches area will become

an increasingly important part of the Mount Monger camp with the two shallow, high-grade underground Maxwells and Cock-eyed Bob mines remaining open along strike and at depth," Mr Tonkin said.

"The combination of Daisy Complex and Mount Belches has the Mount Monger camp well positioned to be a strong cashflow generator for years to come as Silver Lake pursues future growth opportunities."

In FY18, the company hopes to sell between 135,000oz and 145,000oz, and would hedge 43 per cent of its production at a confirmed price of \$1670/oz.



## Transportable Camps

NT Link specialises in turnkey camp solutions, customised to meet the requirements of your project and ensure a fully operational camp. We work with you from the start to finish providing all relevant services in-house; from manufacturing, transport, install and project management.

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# INDUSTRY PROFILES

## COMPANIES GEARING UP

# Nationwide pipe supplier

OILFIELD Traders Australia (OTA) specialises in the procurement and supply of new and used steel pipes to many industries, including mining.

Its broad range of products includes large diameter heavy wall steel pipe, drill pipe, casing ideally suited for dewatering – slotted or plain.

The company has been expertly refurbishing all sizes of steel pipe and casing for many years, building a reputation as a go-to nationwide service provider.

OTA's linishing, coating and complete refurbishing capabilities provides clients with an excellent way of maintaining pipe integrity, while also offering alternatives to purchasing new stock.

Many clients engage OTA in order to prepare their tubing or casing requirements to ensure all elements are fit-for-purpose. This results in projects being completed more efficiently and to budget.

The refurbishing service also includes data collation capabilities to assist in the loading and transport manifests.

The company's onsite fleet includes all the necessary equipment to safely and efficiently complete all unloading and reloading works; and can provide transport options if required.

OTA also provides a range of project support services to the drilling, marine and mining industries, supported by its 30,000sqm general industrial zoned block in Perth, WA.

It has fully qualified, in-house boilermakers with the capacity to professionally and efficiently complete any fabrication works at competitive prices.

Whether it's third party logistics,



OTA provides new and refurbished piping and casing for use in the resources sector.

refurbishing or boilermaking/fabrication, OTA's expert team will have the job completed on-time and to specification.

OTA has grown its professional network through providing mutually beneficial solutions with clients, while maintaining

superior service quality.

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

## Best choice for quality and experience

PRECISION Hydrographic Services (PHS) has established itself as a leading hydrographic survey services company, dedicated to providing the highest quality hydrographic services worldwide.

The global economy is changing, and with it the demands on ports are changing too.

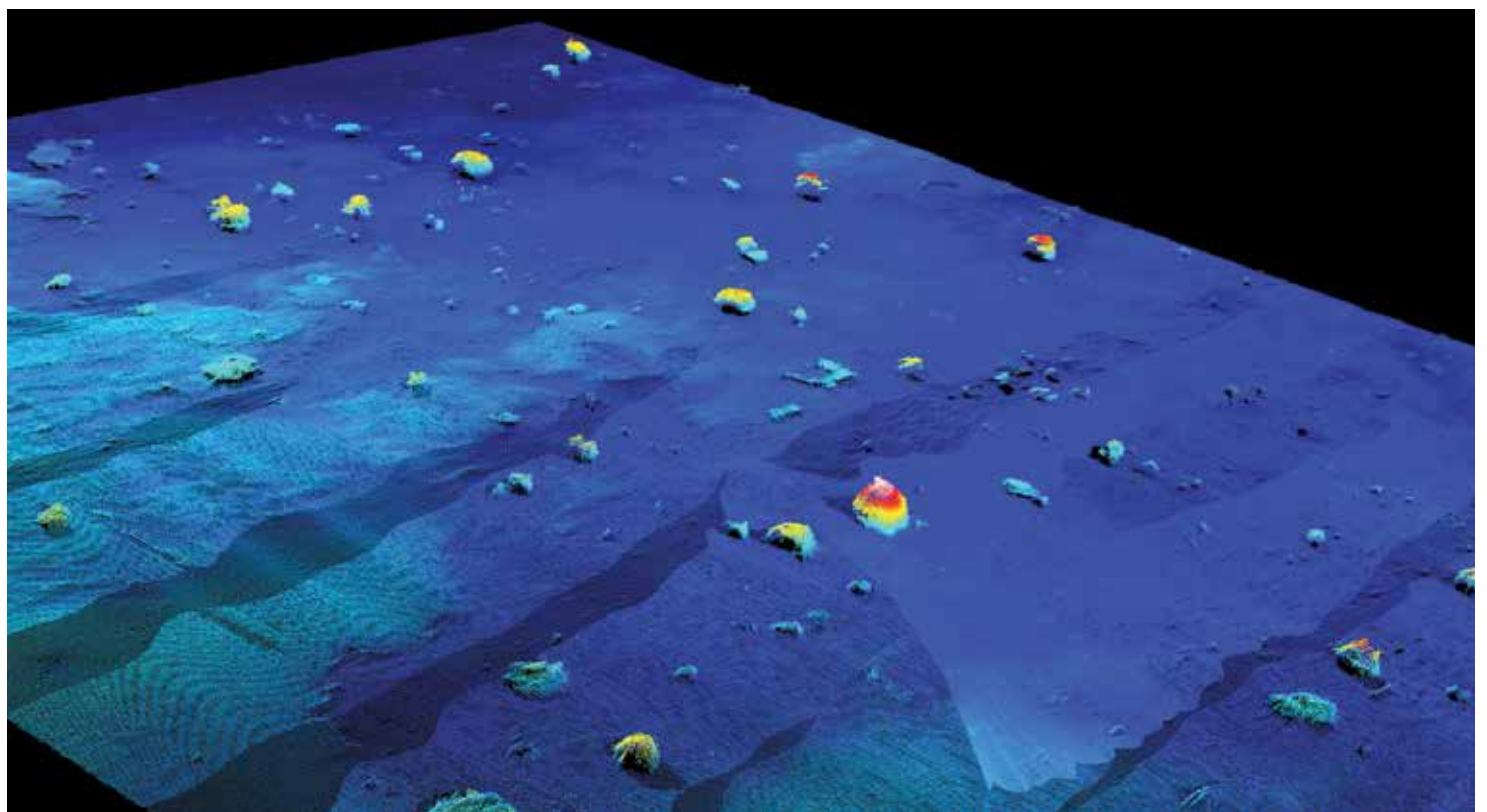
To meet the increasing demands for volume and efficiency, ships are becoming larger and with maximum loading, under keel clearances are diminishing.

Most ports and harbours have dredged channels, berths and anchorages; however, these suffer from siltation, thereby reducing the depth of water available to shipping.

Consequently, a burden of responsibility is placed on port authorities to ensure that hydrographic surveys are undertaken to monitor charted depths, ensure depth accuracy is maintained, and underwater hazards are identified and avoided.

PHS specialise in the acquisition, interpretation and reporting of seabed information.

The PHS team are skilled certified



PHS provides high-quality hydrographics services for coastal and marine infrastructure.

hydrographic surveying professionals providing Level 1 Certified Hydrographic Services to international and local standards for accuracy and object detection.

PHS operate under a rigorous and evolving quality control process to ensure consistent quality of deliverables and continued improvement of processes.

For the past three years, PHS has worked closely with the Pilbara Ports Authority

(PPA) to maximise the export capability and increase safety by conducting high accuracy, high resolution surveys to measure the depth and identify any dangers to navigation in the Port Hedland port.

PHS has a vast understanding of the 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.

For more information, PHS can be contacted on 08 8351 1203 or through its website: [www.precisionhydrographic.com.au](http://www.precisionhydrographic.com.au).



# Safe mine clean-up

PRESSURE cleaning of mining equipment is an integral part of preventative maintenance.

In today's world, the industry has made huge progress in moving to highly efficient, high pressure cleaning equipment in either a depot (wash bay) or in-field capabilities.

Australia's leading manufacturer of pressure cleaners, Aussie Pumps Industries (Aussie Pumps), is conscious of the impact of Australia's new safety standards on mining and quarry Industries.

The new standard (AS-NZ4233.1.2013) covers safe operation and maintenance of pressure cleaners.

The document clearly separates Class A and Class B machines.

Class B machines are any unit that has a capability greater than 5600 bar lpm. To turn that into layman's terms, it starts at around 4300 psi (300 bar) and 20 lpm. All 5000 psi and above machines are generally deemed to be Class B.

Aussie Pumps understands the dilemma facing operators of big plants and realise that the pressure cleaners of today have become a vital part of the 'Preventative Maintenance Program'.

"We understand that one ounce of prevention can shortcut a tonne of trouble," Aussie Pumps chief engineer John Hales said.

According to the new standards, the Class A operators need to be trained in danger awareness, site safety set up, machinery stop



Safety standards for operators of high pressure cleaners are driving development of new triplex pumps that maximise performance for A-class machines.

controls, hose and equipment inspection, and personal protective equipment.

The Class B operators are required to be certified by a RTO in a wide range of procedures, maintenance, PPE procedures and to be able to

present 'Verification of Competency'.

Operators not certified according to the above classification are in jeopardy of being in breach of the standards, putting their employers at risk of litigation in the event of

an incident.

Aussie Pumps has introduced a program to replace Class B pumps on pressure cleaners with Class A units.

"We've seen a rush of orders for replacement pump kits for both electric and engine drive machines," Mr Hales said.

The program involves the substitution of the gearbox and pump drive to a model that delivers 4000 psi (275 bar and 20 lpm flow). That equates to 5500 bar litres per minute, thus it falls outside of the Class B range.

New pumps have developed by Bertolini just for this application. It should be noted that the standard specifically forbids the reduction in performance by manipulation of an unloader as a way of getting Class A certifications.

"The standard is quite specific, and any tampering with the unloader to reduce pressure still leaves the operator with the option to increase the pressure at their discretion," Mr Hales said.

Aussie Pumps has also developed a new range of heavy-duty diesel drive pressure cleaners and engine drive steam cleaners that are within the Class A classification.

These machines deliver great performance, are built like tanks, reasonably priced and fulfil the requirements of the Class A units as specified by the new safety standards.

Further information is available from the Aussie Pumps website or by calling them on 02 8865 3500.

# Keep the good times rolling



The Broons BH-14 Grid Roller.

WITH commodity prices seemingly recovering, now is not the time to dismiss post boom efficiencies that kept the proverbial wolves from the mineshaft entrance.

Smart tyre management through use of the Broons BH-14 Grid Roller is a prime profitability measure worthy of consolidation.

Available for long term hire or outright

ownership, the 14 tonne towed Grid Roller is highly efficient at cleaning up haul roads, pit floors and tip heads to reduce the dangers of sharp jagged rocks.

Mine operators can expect a significant increase in tyre life by preventing premature failure caused by a poor running surface.

At speeds approaching 15 kilometres per hour, the Broons Grid Roller is able to

be readily deployed to problem areas and can improve surface conditions in a very short period of time.

Towed by a suitable 4WD tractor, the heavy-duty roller is highly durable and low on maintenance with no complicated motors, hydraulics or electronics.

The Broons Grid Roller ticks all boxes for effective, reliable and proven performance.

Training can be carried out at any

location no matter how remote and should any parts be required to maintain the roller, Broons renowned backup will be back up and rolling with a minimum of delay and downtime.

For further information on the GH-14 Grid Roller, Broons technical staff can be contacted on (08) 8268 1988 or via email at [info@broons.com](mailto:info@broons.com). Download a brochure here at: [www.broons.com](http://www.broons.com).



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508.00mm O.D X  
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API 5L GRADE  
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406.40mm O.D X  
12.70mm WALL



API 5L GRADE  
X80M-PSL2  
210 X 12m LENGTHS  
508.00mm O.D X  
20.60mm WALL



API 5L GRADE X56  
API 2-W-50  
5.5 X 11.50m LENGTHS  
813.0mm X 25.40mm  
WALL



API 5L GRADE  
X56 PSL1 (SAWL)  
10 X 11.5m LENGTHS  
762.00mm O.D X  
25.40mm WALL



API 5L GRADE  
L80-PSL2  
800x12m LENGTHS  
240.00mm O.D X  
13.84mm WALL



API 5L GRADE  
L80-PSL2  
600x12m LENGTHS  
339.00mm O.D X  
12.19mm WALL



API 5L GRADE  
X56-PSL1  
2 x 914mm O.D X  
25.40mm WALL  
8 x 914mm O.D X  
38.10mm WALL  
DNV-450 IFD (SAWL)  
6 x 914mm O.D X  
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## Completed **early**, on budget and incident free **20 km overland conveyor belt changeout project**

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

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

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

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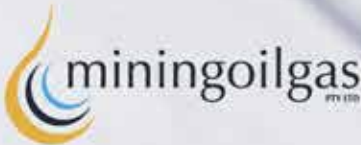
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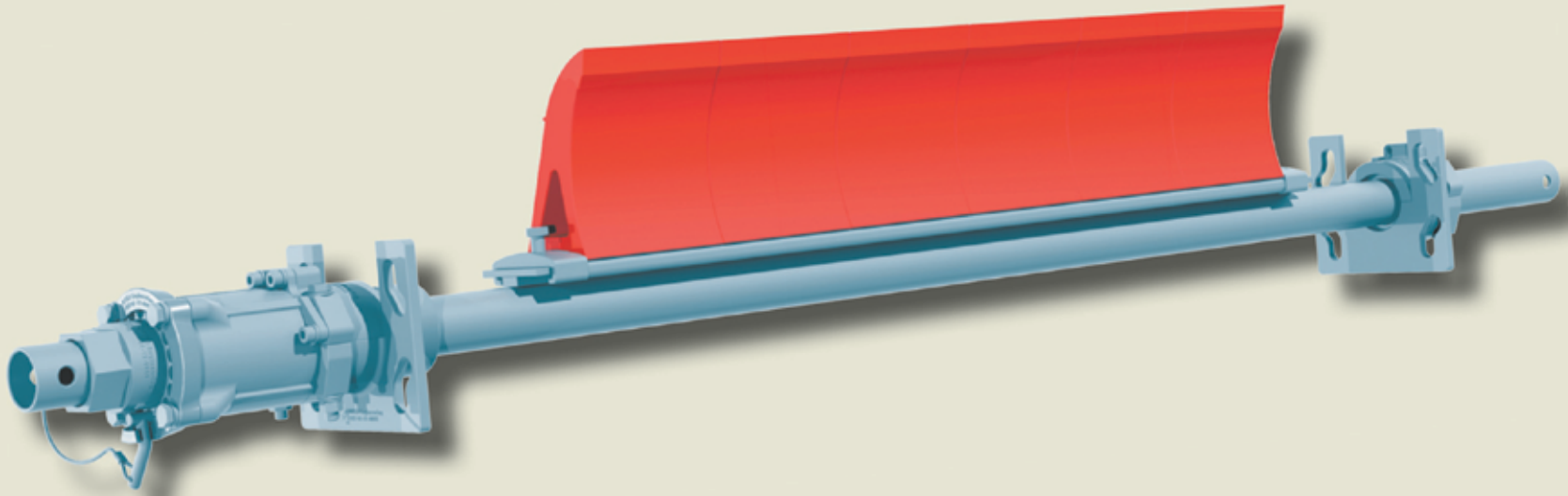
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ERIEZ Magnetic Mill Liner (MML) is a wear-resistant steel-encased magnet that combines the best qualities of traditional steel and magnetic liners.

The MML is specifically designed to accommodate the customer's specific mill to achieve optimum performance.

Each MML segment works together as a system and facilitates the creation of a protective coating made up of the ball chips and magnetic minerals already contained within the mill.

This autogenous, self-replenishing layer safeguards the MML components and the mill.

The small ball chips contained in the mill generally provide no benefit and only

end up increasing power consumption.

However, the MML exploits the magnetic properties of the minerals and, more importantly, the scats giving them a useful purpose – protecting the MML and the mill shell.

The MML segments consist of permanent magnets embedded in a high chromium alloy moulding. High-quality magnet material is carefully selected for superior holding power.

Once in place, the face of the liners is magnetised and accumulates ball chips and ferromagnetic material to create a protective layer approaching 40mm thick.

Thickness of the MML with the protection layer is less than that of a

conventional liner, resulting in a greater working volume and improved efficiency.

There are a number of benefits associated with utilising the MML, the first being that little maintenance is required.

Compared to traditional steel liners, the safety and ease of installing the MML is remarkable due to the size of each light-weight component (less than 20 kilograms).

Users of the MML have noted a significant drop in energy consumption and a longer service life with up to six times the life of a manganese steel liner and up to three times the life of most bolt-type liners.

MMLs can increase mill throughput, eliminate mill leakage and improve the working environment.

Eriez' MML has been installed in more than 600 applications throughout the mining industry worldwide.

Installation of the MML is easier, faster and safer than conventional steel liners; and the results of the operation have shown increases in efficiency and profitability.

Eriez is recognised as the world authority in advanced separation technology for magnetic, vibratory and inspection applications.

More information can be found by calling (03) 8401 7400, emailing sales.au@eriez.com or at: [www.eriez.com](http://www.eriez.com).

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The new FLIR GFx320 gas camera.

# FLIR optical gas imaging camera

YOU can't see it and you can't smell it but you know it might be leaking gas; but from where?

The new FLIR GFx320 intrinsically safe gas camera visualises hydrocarbon gases quickly and easily from a safe distance and shows exactly where the leak is coming from.

The GFx320 is specifically tuned to visualise fugitive emissions that are impossible to see with the human eye, so surveyors don't waste time inspecting leak

free components on their sites.

The FLIR gas camera can detect and visualise around 40 different hydrocarbon gases and even the smallest concentration of volatile organic compounds (VOCs) can be detected.

With a sensitivity to detect gases leaking at just 0.4 grams per hour, surveyors can find leaks up to nine times faster than with traditional gas sniffer methods and is verified to meet sensitivity standards defined in the US EPA's OOOOa methane rule.

The gas leak shows up on the camera's LCD screen or viewfinder looking like black or white smoke or steam coming from the leaking component.

The camera then stores the video of the leak in thermal and visible in MPEG4 format to a standard SD memory card in the camera.

The playback feature allows the user to view the leak in the field on the camera, so they can show colleagues where it's coming from and download it on their PC for reporting.

The FLIR GFx320 is also a dual purpose product, so normal IR thermography for predictive maintenance can also be carried out using the same camera.

The camera to date is used widely on offshore platforms, LNG plants, oil refineries, FPSOs, CSG well heads and compressor stations, to name but a few.

More information about the gas camera can be found at: [www.flir.com.au/ogi](http://www.flir.com.au/ogi) or by calling 1300 729 987 to talk to an expert.



## Dr Alistair Cowden

Altona Mining managing director

**"THE PROJECT NOW HAS ALL ITS PERMITS, GRANTED MINING LEASES AND NATIVE TITLE AGREEMENTS IN PLACE. THE MISSING INGREDIENT IS MONEY."**

*The Interview, page 71*



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# Hose reels that hold fast

HOLDFAST has quickly become one of Western Australia's most knowledgeable providers of hydraulic hose supply, install and maintenance.

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At the core of all mining, oil and gas operations is a dependence on thousands of flexible hydraulic hoses and fittings systems.

With hydraulic component failures a leading factor in costly downtime, the experienced team at Holdfast Fluid Power can help avoid component failure and improve profitability.

Its qualified technicians aim to reduce downtime and costs associated with hydraulic system failure using fast and effective solutions.

With a fleet of mobile emergency breakdown vehicles and extensive workshops located in Perth and the northwest, Holdfast technicians can quickly provide a tailored supply, install and maintenance solution for all unique hydraulic requirements.

Built on a foundation of quality customer service and knowledgeable staff, Holdfast prides itself on providing quality workmanship, innovative solutions and exceeding safety standards.

It has experience in delivering tailored solutions and ongoing support for businesses across mining, oil and gas, marine, industrial, civil and construction industries.



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# Rapid deploy hose reels

FOR more than 35 years Crusader Hose has pioneered Australian-made layflat hoses and associated equipment to a variety of industries, including the specific needs of the resources sector.

The company has developed an outstanding reputation as a leading manufacturer and supplier of layflat hose and is highly responsive to the needs of its clients, with the ability to adapt to produce tailored hose solutions to specific requirements.

In mining, large diameter layflat hoses are often required for rapid volume purposes such as emergency mine de-watering, saving a company lost time and income.

Cyclonic activity, particularly in Northern Australia, brings with it sustained rainfall and gale-force winds which can be a significant threat to mining operations.

Crusader Hose has directly addressed this issue when manufacturing its layflat hoses and reels.

It is an Australian manufacturer and supplier of efficient, rapid deployment layflat hoses specific to the needs of the mining industry.

The Crusader Waterlord hose is a tough, yet compact layflat hose which can be easily and rapidly deployed to get emergency



Crusader's layflat hoses and reels are ideal for emergency de-watering purposes.

de-watering underway within hours.

With coil lengths of up to 200 metres, they can be quickly transported to the flooded area and joined together using couplings or bolt on flanges.

Crusader's hoses are made from heavy

duty polyurethane, and can be laid across rough terrain without the fear of damage.

In this way, it can be used right up the mine wall and laid along the most direct route as required.

The Waterlord is an ideal answer to

de-water cyclone-affected mine sites; its hose reel system takes up minimal space and can easily pump water directly from site to neighbouring land, ensuring mine functions can return to normal with minimal time lapse.

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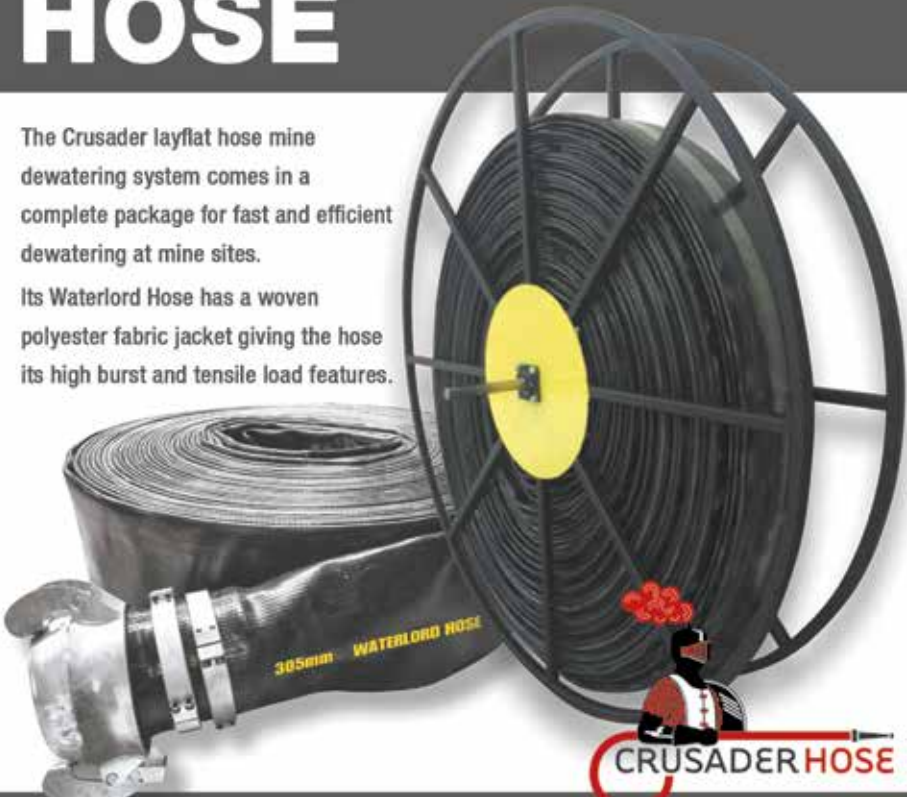
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**MINING REVIEW**

# RAPID DEPLOY DEWATERING HOSE

The Crusader layflat hose mine dewatering system comes in a complete package for fast and efficient dewatering at mine sites.

Its Waterlord Hose has a woven polyester fabric jacket giving the hose its high burst and tensile load features.



**CRUSADER HOSE**

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# Phase-out of toxic catalysts

POLYURETHANE is one of the most versatile polymers available today, and comes in many forms.

It is used as flexible foam for application in the furniture bedding and automotive industries; rigid foams for insulation, structural, buoyancy and sound deadening applications; as well as moisture curing single component adhesives, coatings and elastomers for crack sealing and water stopping applications.

There are also two pack elastomers for high abrasion resistance, rollers, wheels and castors.

Sprayable elastomers are similar to cast elastomers in key physical properties, but with a significantly faster reaction for abrasion resistant coatings, waterproofing and corrosion protection.

Mercury, or more specifically phenyl mercury neodecanoate, has been the mainstay catalyst for polyurethane elastomers and coatings for more than 50 years.

However, Phenylmercury compounds are degraded in the environment to give hazardous degradation products such as inorganic mercury and elemental mercury, which can be transformed to methylmercury.

Mercury and its compounds are highly toxic to humans, ecosystems and wildlife, and can cause irreversible, adverse neurotoxic and neurodevelopmental conditions.

It is believed that mercury-based polyurethane catalysts are responsible for about 4 per cent of all mercury that is released into the environment in Europe.

Its unique ability to give a long pot life but fast cure, and its selectivity to avoid foaming in the elastomer, means that there



Pacific Urethanes provide environmentally friendly, mercury-free elastomers.

is no simple substitute of this chemical in all formulations, and has been a significant challenge for the polyurethane industry to overcome.

## Commitment to the Environment

There are a number of new generation catalysts based on different metal complexes, such as zinc and bismuth, but these alternatives are not as forgiving, particularly with long pot life elastomers, where achieving

an acceptable surface cure on the elastomer has been a significant weakness.

A team of polyurethane formulation specialists at Pacific Urethanes has been working on providing mercury free elastomer solutions for more than five years now.

When the company achieved ISO14001 environmental accreditation in 2014, Pacific Urethanes made the decision to phase out mercury catalysts from all elastomer formulations, becoming the first polyurethane systems organisation in Australia to make

this commitment.

Pacific Urethanes has been providing customised polyurethane chemicals to all types of industries and applications for more than 9 years.

It partners with customers to satisfy their individual application, process and economic requirements.

The company's specialists also have the application experience to ensure its products perform in production and not just in the laboratory.



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# Multotec: A trusted supplier

**SPECIALIST** equipment supplier Multotec has built a strong reputation as a trusted provider of hard wearing and high performance screen media, wear liners and process equipment to Australian mining customers.

Multotec's approach to engineer and order products using a range of polyurethane and rubber materials ensures consistent reliability.

The company's latest product, the ClipTec sytem, compliments its range of patented innovative bolt free lining solutions.

In addition to the WS 2.10 magnetic lining system, the ClipTec range features zip tie fastening and allows additional freedom to attach hard wearing polyurethane liners to beam and chute structures without the need for bolts.

"This significantly reduces maintenance downtime and improves safety as all work can be done without hotworks, and inside the chutes," Multotec managing director Nigel Kriel said.

In May 2017 Multotec also completed a new 5000 square metre manufacturing facility in Brisbane, with brand-new state of the art processing machinery.

The extra capacity allows quicker delivery, higher quality and improved efficiency in delivering custom solutions to the mining and quarry industries.



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

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# Downtime minimisation with Polylok

**POLYLOK** Products services the resources sector with a complete range of quality products, application advice and technical assistance.

The company helps its customers to improve productivity, increase efficiency and minimise downtime in their mining, quarrying and manufacturing operations.

Established more than 30 years ago as a general polyurethane screen manufacturer, Polylok continues to produce a complete range of quality screening systems and general polyurethane castings, high tensile wire screencloths, wire mesh, perforated plate, stainless steel wedge wire and rubber products to the mining, quarrying and manufacturing industries.

The company offers a complete range of products and manufacture our products internally at its factory in Newcastle, NSW.

Polylok's goal is to develop, manufacture and recommend innovative products based on a thorough understanding of customers' current and future needs.

The company pride itself on the quality of the products it makes, and recommends and produces the best solution to its customers' issues with no bias towards one type or grade of material – what is best for the client, is best for Polylok.



Polylok has more than 30 years of experience in providing polyurethane products to the mining industry.

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We provide a wide range of polyurethane products and application advice for

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# Mining jobs available again

*FOR many it's been a long time coming, but finally vacancy activity is increasing across Australia's mining industry.*



DATA from SEEK shows jobs advertised in the mining, resources and energy industry are up 70 per cent year-on-year, no doubt thanks to renewed optimism, stability in commodity prices and increases in iron ore and coal.

There's even green shoots when it comes to the next wave of development.

But mass redundancies and the uncertainty of previous years have taken their toll and driven much of the blue collar workforce into alternative industries closer to home, where many remain satisfied to trade reduced wages for improved lifestyles.

This is particularly evident in locations such as North Queensland where many workers were expected to work on DIDO rosters, and it may be challenging to entice them back.

As a result, some mining companies are hiring candidates from other related sectors with no specific mining experience to supplement the experienced workers that they are hiring through their preferred agency partners.

The theory behind this is that they bring different ideas from other industries and should help to dilute what remains of the elevated earning expectations of those who only ever knew the boom times.

Some Queensland employers will also

reconsider the use of FIFO candidates to increase their options.

An increasing number of temporary and contract roles are also on offer as employers supplement new mining industry entrants with flexible and experienced contractors. Longer-term, as the available candidate pool drains more of these workers will be converted into permanent headcount.

Another recent trend is the focus on diversity when recruiting. Most major miners are focused on diversifying their workforce to include a greater proportion of female and Indigenous employees, which will improve their social license and widen their candidate pool.

In another trend, improved technology around automation and a continual push towards greater mine efficiency and maximising production will increase engineering roles and eventually reduce repetitive high-risk tasks.

## Skills in demand

Vacancy activity differs by location. Looking firstly at Western Australia, Geologists are increasingly sought, with gold the major driver as exploration budgets are increased.

In turn, this is seeing more vacancies for Metallurgists and Drill and Blast Specialists.

Essentially employers want cross-discipline candidates and underground candidates in all roles are highly sought after.

Turning to Queensland, Dragline Operators, Diesel Fitters and Drill and Blast specialists are in short supply. With stronger coal prices, a huge number of jobs are being created within the Bowen Basin and so demand will continue.

Mechanical, electrical and heavy diesel Fitters are needed in the Northern Territory. Vacancy activity extends to supervisory and engineering roles.

Rubber Liners and Belt Splicers continue to be in high demand in South Australia thanks to the increasing amount of work that is being outsourced to subcontractors for shutdowns.

This work is adhoc and these organisations typically do not have a large headcount for this very reason. Instead, they utilise temporary employees.

Demand is so high that Belt Splicers and Rubber Liners are now being flown in from around Australia to complete contracts and can command a strong rate.

In New South Wales and Victoria we are seeing marked demand for Boilermakers as many have transitioned into the manufacturing

industry, leaving a shortage of suitable candidates for current vacancies.

Victoria also needs Mechanical Fitters; again most of these people secured work in the manufacturing industry and very few are interested in the remote location of mining roles. This is especially true within the quarry sector, which also requires Operators in response to project demand and the remote location of work.

## Salary trends

Unsurprisingly, salaries remain sedate across the industry. While wage erosion has abated as skill shortages begin to emerge, salaries remain flat.

In their next review, 50 per cent of Australia's mining employers will give their staff a pay rise of up to 3 per cent. But 35 per cent will not increase salaries at all.

Our 2017 Hays Salary Guide also shows that a small 12 per cent of employers intend to award a salary increase of between 3 and 6 per cent. An even smaller 3 per cent of employers will increase salaries at the higher level of more than 6 per cent.

For more information, see the Hays Quarterly Report at [www.hays.com.au/report](http://www.hays.com.au/report) or *Hays Salary Guide* at [www.hays.com.au/salary](http://www.hays.com.au/salary).





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### Ambrosini's footprint

In just 16 years, Caroline Ambrosini has built up a successful boutique recruitment company with a global reach.

Starting as Ambrosini Professional Placements in 2001, Caroline's achievements were recognised four years later, winning Business News' **40under40** award in 2005.

Ambrosini grew rapidly to become one of WA's most respected boutique recruitment firms for white collar employees.

This year Caroline rebranded the company to Ambrosini Global Recruitment to reflect its global reach in recruiting mining finance executives for roles in Africa and Asia.

Ambrosini has gone from strength to strength over the years, developing a strong national brand and holding an enviable market share for a locally owned company.

Through economic cycles and many challenges from aggressive competitors, Ambrosini continues to successfully build its brand and contribute to industry.

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The organisation has consequently become a force to be reckoned with in recruitment circles.

Flexible Force is an Australian owned-and-operated technical

recruitment company that prides itself on providing exceptional labour solutions to companies within the resources sector.

The company specialises in short and long term project work where economical labour results are required throughout the duration of a project.

As an ICN Tier 2 rated supplier with the ability to recruit personnel into a broad range of positions, Flexible Force's diverse, experienced employment

consultants bring a skilled understanding to the recruitment process.

They have extensive industry knowledge and are a long standing representation of the company since its inception.

This, together with highly developed management methodologies and practices, provides employers with best-fit personnel into some of the most advanced roles the mining industry has to offer.

Specialised solutions, advanced technology and an individual approach and exceptional service are hallmarks of the company's ethos.

Flexible Force utilises high-end database software, designed to quickly match skillsets sought with registered candidates, including trades people, plant operators, and labourers.

**More information can be found at:**  
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# FAST, EFFICIENT WORKFORCE MOBILISATION

CONTRACT labour specialist PGC Resources has expanded its footprint, with new offices in QLD to service the Bowen Basin mining region and in Rockingham servicing South West WA & Kwinana to complement its established Perth and Pilbara locations.

Established in 2012, PGC is an Australian-owned business that provides specialist labour solutions to the crane hire, mining, oil and gas and construction industries.

It also provides shutdown, construction and maintenance workers to the resources sector, across six disciplines: crane and rigging, fixed plant mechanical, electrical, scaffolding, HSE and supervision.

As well as skilled labour, it provides supervised crews, site

containers and mine spec vehicles to site.

PGC's flexible employment and contractual arrangements provides clients with the ability to reduce administration overheads and labour costs through a workforce that is easily ramped up and down.

With an average of about 30,000 man hours per month and more than 350 people currently employed on its books in either a full time or casual capacity, PGC can mobilise medium to large-scale work crews quickly and efficiently for its clients.

PGC invests heavily in developing tailored training packages for different sites that its crews work on – this means they are more familiar with site regulations and the major

hazards on that site which again improves safety and performance.

Previous contracts have been located in the Pilbara, South West and Goldfields regions of WA, QLD and the Northern Territory.

At these sites, PGC has averaged a 90 per cent return rate for shutdowns – the highest amongst all contractor groups – proving that its teams come as crews, not individuals, that know and understand the sites they work on, therefore improving safety and productivity.

Providing a safe work environment for its employees, clients and other site personnel is at the core of the business.

PGC actively works on developing a strong safety

culture with both employees and clients, with the ultimate aim of providing zero harm to the health and well-being of all stakeholders.

More information on PGC's services can be found at: [www.pgcreources.com.au](http://www.pgcreources.com.au)



**PGC Resources can quickly mobilise teams to site for medium and large-scale projects.**



# PGC

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X-GLO has proven to increase safety and awareness, dramatically boost efficiency and increase performance.

## Lighting the way with xGlo

MINEGLOW is the proud Oceanic distributor of the xGlo range of LED strip lighting solutions, specifically designed to weather the harsh conditions of underground mining.

Able to run 24 hours a day, seven days a week and with an expected lifespan of 10 years, xGlo is the most cost-effective and reliable form of lighting available.

The xGlo LED strip lighting provides a complete uniform blanket of light, eliminating dark areas, which in turn improves safety in dangerous working environments.

The lighting solution also has a significant effect on miners' morale by making the workplace somewhat 'day-like' in appearance.

MineGlow sales manager David Peters said the company's recent lighting installations varied from substations, service pits and portal exit lighting in hard rock mines; to general drift and transitional lighting in coal mines with great success.

"We are constantly investing in R&D to develop complete package solutions," Mr Peters said.

"In conjunction with an IT company a pulsing evacuation system is now ready.

"This system triggers the strip to pulse in the direction that the miners are to proceed to in the event of a seismic shift, or when ventilation levels are not adequate.

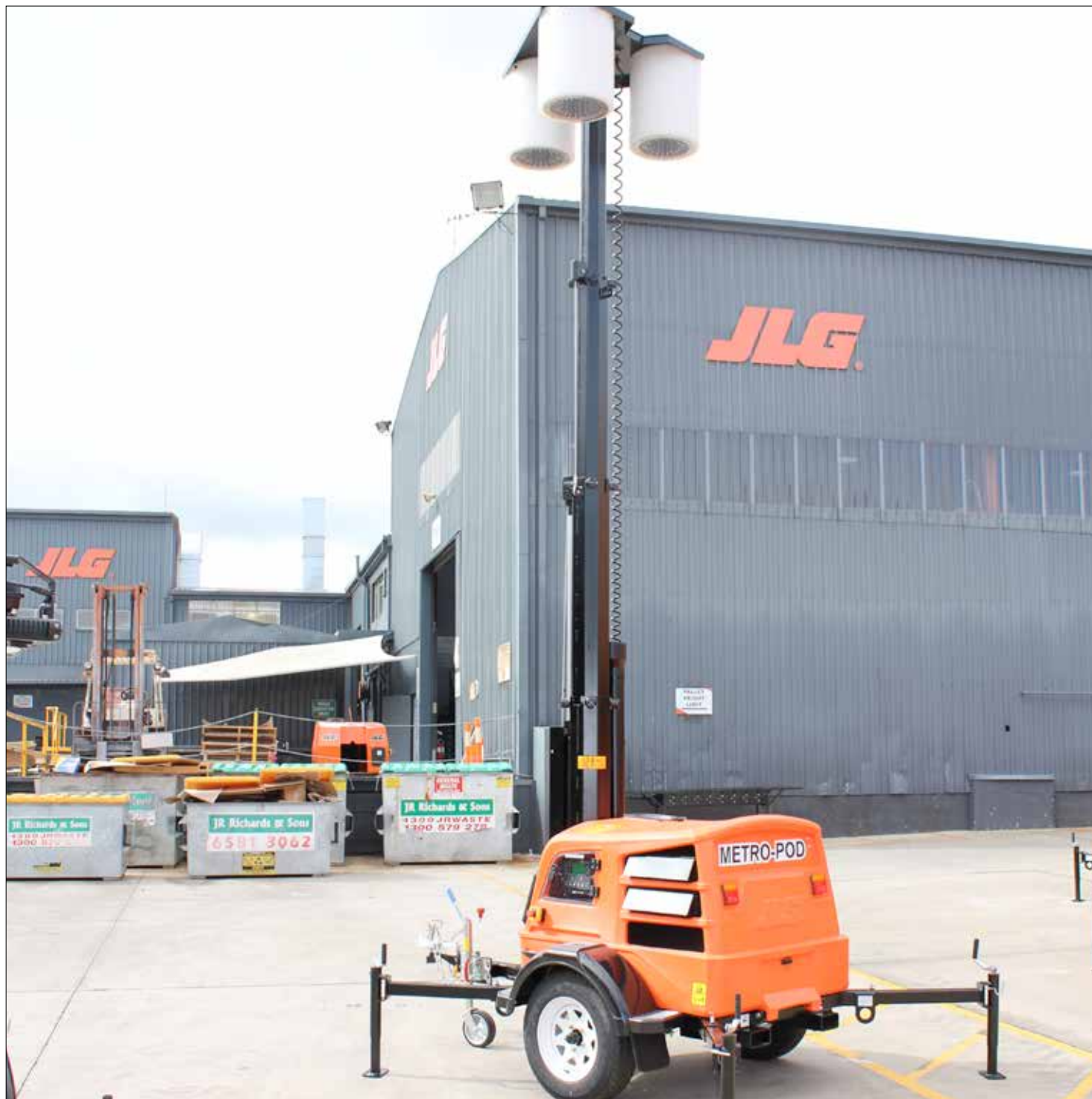
"We are getting closer to having the xGlo Led Strip Lighting certified as intrinsically safe for use right at the coal face."

A variety of colours are available including RGB (Red, Green and Blue), and RGW (Red, Green and White), with colour temperatures ranging between 2500K and 6500K.

MineGlow has installed its lighting solutions across some of the country's biggest mines; its client list includes companies such as AngloAmerican, Evolution Mining, Glencore, MMG, Newcrest Mining, Rio Tinto, Newmont, BHP, South32, Centennial Coal, Vale, Barrick and more.

More information on the xGlo lighting can be found at: [www.mineglow.com.au](http://www.mineglow.com.au).

# JLG secures certification for Metro-POD lighting towers



JLG's Metro-POD Lighting Tower.

JLG's recently-launched Metro-POD Lighting Tower – the newest addition to the company's popular 'Metro Series' – not only provides users with the latest in light tower technology, but the added peace of mind of knowing the model has been purpose-built in accordance with ISO 9001 standards.

ISO 9001 is the standard which specifies the requirements for a Quality Management System (QMS), and is designed to help companies ensure they meet the needs of customers and stakeholders, while adhering to statutory and regulatory requirements for their product or service.

Regulating the standard is the International Organisation for Standardisation (ISO), an independent, non-governmental group with a membership of 163 national standard bodies.

ISO regularly reviews standards to ensure they remain relevant in a changing business environment – the latest update to ISO 9001 to which the Metro-Pod Lighting Towers are certified, introduce a number of new changes requiring a higher focus on risk mitigation, and place a greater emphasis on customer satisfaction and continuous improvement.

JLG Industries Australia and New Zealand general manager Bob Mules said the latest certification demonstrates the robust management and quality systems at JLG, and the company's desire to remain at the forefront of this industry sector.

"An ISO 9001 certification is evidence of our commitment to quality and provides our customers with evidence of our internal discipline to achieve this quality," Mr Mules said.

"It also assists in building a culture of continuous improvement where customers can count on consistent, repeatable, high quality products.

"Beyond JLG's own internal processes, the certification also affects supplied components, guaranteeing a high standard to the overall product."

### ISO 9001 and JLG Metro-POD Lighting Towers

In meeting certification for its Metro-POD Lighting Towers and other lighting tower products, JLG's facility in Port Macquarie, NSW, where the towers are designed and manufactured, use an extensive QMS that is annually audited both internally and externally by an independent third party auditor.

The facility uses an array of cutting-edge, lean and six sigma tools to produce the products, with the goal of delighting customers with their superior performance.

As an additional measure to ensure JLG lighting towers meet the company's stringent internal and ISO 9001 requirements, five

quality inspection points occur through the course of manufacturing before the product is shipped to customers.

These are: a fabrication final inspection, paint final inspection, final assembly final inspection, run-up inspection and a final pass quality audit.

Gaining ISO 9001 was not only good for customers, but would also widely benefit JLG Industries, Mr Mules said.

"Of course the benefits are clear for our customers in that they will receive a product that is of superior quality that will be extremely well supported by us," he said.

"JLG first achieved ISO certification in 2001, and by meeting the most recent ISO 9001 requirements we'll ensure that our customers' high expectations continue to be met.

"Having more satisfied customers of course leads to repeat purchases and great word of mouth which will attract new clientele to our brand.

"Furthermore, this certification will improve our processes and further build efficiencies in our business – it's a win-win situation."

More information about the Australian designed and developed JLG Metro Lighting Tower Pod can be found at [www.jlg.com.au](http://www.jlg.com.au), or by calling JLG Australia on 131 554 or JLG New Zealand on +64 9276 1278.



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REACHING OUT | Lighting Towers



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Metro-MH

Metro-POD

Metro-LED

The bright new idea in lighting, JLG's Metro Series Lighting Towers offer a host of benefits to make light work of night projects. The Metro Series has reduced noise levels thanks to the new hood design coupled with better engine and exhaust system technologies. Customers can expect a brighter output of 3 x 610 W LED lights on the Metro-Pod and 340 W LED lights on the Metro-LED, while the Metro-MH boasts 1000 W Metal Halide light heads. Auto start/stop controllers and fuel efficient engines mean fuel consumption is greatly reduced and the units run longer between refuelling. Designed for side-by-side loading on trucks, transport is made easy and once onsite they are easily positioned and setup by one person, making for further savings in time and labour. And best of all, the Metro Series is designed and built in Australia with ISO9001 certification and is backed by JLG's industry-leading Ground Support network.



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[www.jlg.com/en-au/equipment/lighting-towers/metro-lighting-towers](http://www.jlg.com/en-au/equipment/lighting-towers/metro-lighting-towers)

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# 2400W LED Lunar Lite®

GLARE FREE\* • 220 Lm/W • 528,000 Lumens



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# 2400W LED Lunar Lite®

GLARE FREE\* • 220 Lm/W • 528,000 Lumens

## Features\*\*

- CRI 70
- Dimmable
- Flicker Free
- Power 90V to 305VAC
- LEDS rated for 50,000Hrs
- Area lit approximately 10,000m<sup>2</sup>
- Even and Uniform 360° Lighting
- Operating Temp range -40°C to 85°C
- Polymer Diffuser - Durable & Tough
- Daylight color temperature 6000°Kelvin
- Adjustable from Visible light to Infrared light (Optional)
- Light head Dimensions: 56 cm H x 43 cm D Weight: 14kg
- Adjustable Wattages 480W – 960W – 1440W – 1920W – 2400W
- LED efficacy is 220lm/W. 2400W LED efficacy is 528,000 lumens
- Lunar Lighting Tower Version available. Solar Powered Version Optional
- HEAVY Duty Impact Resistant road-case for transportation and storage
- State of the Art LEDs which have Extreme Stability and high Thermal ability.
- Directional lighting options: FIVE independent segments of 72° per segment.
- Innovative LED Thermal Management System with PURE Aluminum heat sink
- Typical Amperage draw is 12.25Amps @ 230V for 2400W; 2.45 Amps for 480W
- Can be Retrofitted to conventional lighting towers, poles, plant and machinery

\*\* Features and Figures may be subject to change at any time without notice © Lunar Lighting Pty Ltd 2017

\* Glare free properties are dependent upon distance from light source.



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# Save time and money with Roshtek

WITH hundreds of employees and contractors on the books, mining operations can often fall behind when it comes to keeping track of their workforce and assets, often spending valuable time trying to locate misplaced equipment, keep track of time sheets and the dreaded task of payroll.

Luckily, Perth-based software company Roshtek (the brand name of Existco) has a solution; a suite of attendance, asset and inventory management software that allow companies to regain control of their operations with ease.

Roshtek Software Solutions specialise in vertical markets such as asset management, inventory control, time and attendance, and office productivity solutions (messaging and quotation systems), with a broad range of automatic data capture products, electronic and software engineering services for the local and interstate industry.

"We dynamically utilise the latest proven technologies, bringing them to everyday businesses and allowing a more effective and efficient result," Roshtek director and senior design engineer Eli Abitbol said.

"We maintain and strengthen alliances with technology partners, such as Honeywell and Zebra, and continue constant education and training to further develop our knowledge and skills."

Roshtek's Asset Manager is an industry-leading asset tracking solution for small to medium-sized businesses.

The product keeps the location of company's valuable assets at their fingertips, preventing them from having



More information on Roshtek's software solutions can be found at [www.roshtek.com.au](http://www.roshtek.com.au).

to search for misplaced, unreturned, or lost assets.

In addition, detailed information on each asset, including what site, location

and even department it is currently in, who checked it in or out, the cost of the asset, when the warranty period expires, and even when maintenance is due on the asset,

is all captured by the system.

Roshtek Asset Manager also stores the transaction history of an asset, so companies know where it has been, how many times it has been broken or serviced, and who was the last person to check it out, and for how long.

Roshtek Inventory Manager is also capable of meeting the high demands of a business, preventing staff from having to search for inventory levels, ordering information, or performing stock takes too often.

The system captures detailed information on each inventory, including cost, multiple sell value, location, serialisation, and even department it is currently in, order on suppliers based on reorder information, update inventory levels when goods arrive, issue inventory to jobs, and perform stock takes is all part of the system.

In addition Roshtek's Attendance Manager is an industry-leading time and attendance solution that saves businesses time to reconcile timesheets and calculate entitlements.

Detailed information on each employees' job times are recorded via a touch screen based time system, which gives businesses the best user interface.

All of Roshtek's solutions use the latest technologies, including Barcoding, Passive RfID, Active RfID, Satellite tracking, 'Internet of Things' and incorporate mobility (rugged mobile computers), and labelling using thermal transfer technology.

They can also be easily integrated to customers' existing ERP, accounting system, and in house line of business solutions.



## Streamline your business with Roshtek Software Solutions

- Are you tired of losing track of your company assets & searching for lost equipment?
- Do you want to know exactly what assets you have, where they are located and who they are checked out to?
- Wouldn't it be great to be able to perform data collection in the field with a small light user friendly handheld device, and save time and money?
- Do you want to know exactly what hours, breaks, and entitlements each employee has in an immediate live system?
- Do you want to take control of your Time Sheets, Payroll, and Entitlements today?



### THE ROSHTEK SOLUTION:

**Roshtek Asset Manager** | Managing tool store and consumables on premises or on the cloud, with a kiosk mode for fast changeover of shifts and return of tools.

**Roshtek Attendance Manager** | Managing hours on jobs, electronic time sheets, award interpreter, interface to accounting system / ERP systems / biometrics login option.

**Roshtek Inventory Manager** | A warehouse management solution capable of tracking by serial number, batch no / pallet etc.

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*Paul Bullock, D Crew Relief Asset Health Advisor,  
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# Dr Alistair Cowden

## Altona Mining managing director

While finishing his tertiary education in his homeland Scotland **Dr Cowden** moved to Australia as a young man and never left. He spoke with **Cameron Drummond** about his wealth of experience in exploration and development and his company's flagship Cloncurry Copper project.



**"IN EXPLORATION  
IN PARTICULAR,  
YOU NEED A BIT OF  
CHUTZPAH...YOU GO  
AND DO IT ALL AGAIN  
UNTIL ONE DAY, YOU  
FIND SOMETHING. A  
MAD, INFURIATING  
AND FUN BUSINESS."**

with 17,000ozpa by-product gold. As a gold equivalent that's 220,000 ounces! The comparison is even more surprising as the 1.65 million tonnes of copper and 400,000 ounces of gold equate to about 8.8 million ounces.

We had a heads of agreement to build the project with a Chinese party until recently, when the Chinese party failed to complete the transaction.

During that time we perfected the Definitive Feasibility Study. The project now has all its permits, granted mining leases and native title agreements in place. The missing ingredient is money.

We have been quietly building our exploration portfolio and now have 3800sqkm of granted tenure and applications. We have developed our own approach to exploration, including a concerted effort to mine data from old reports that are not easy to find or access. We have generated scores of targets, many with excellent first pass drilling results.

### **Q. What other developments are on the horizon for Altona?**

The project has been 'off the market' for the last year or two during the time of Chinese exclusivity. We are now out seeking to get value for our shareholders.

We are open to partnerships, asset sales or corporate deals, whichever generates the best return to our shareholders.

We will also be drilling a few of our favourite targets at Cloncurry that were unable to be tackled during the Chinese deal.

### **Q. What is the best piece of advice you have been given in your career?**

I remember Western Mining's Roy Woodall talking about persistence, but wise, informed persistence. What Roy meant was you need confidence and self-belief without self-deception. Hopefully our persistence at Cloncurry will pay off.

In exploration in particular, you need a bit of chutzpah – after all it's about making predictions about what you don't know, and spending other people's money to most likely find out you are wrong. Then you go and do it all again until one day, you find something. A mad, infuriating and fun business.

### **Q. What is your opinion on the future outlook for copper?**

Copper is simple; it's a proxy for the world economy. It's in everything electrical and at the moment everything to do with electricity is very trendy! The world market is some 26 million tonnes of copper per annum with 22 million of that being new production. Demand increases by about 500,000 tonnes per annum. That's a mine such as Las Bambas to be brought on to meet annual demand growth, never mind what's required to replace aging mines.

So supply is a struggle and demand is strong and likely to get stronger. Copper is also a large liquid and fragmented market, it is not a minor metal where one big producer can kill prices and control a market.

### **Q. What is your educational and professional history?**

I first came to Australia from the UK in 1980 to do fieldwork for my PhD on Kambalda nickel. I never left and finished my PhD while working at Kambalda. It was a great time with the discovery and first development of what is now Gold Fields' St Ives project, 15 operating underground and open pit mines, and a culture of excellence. It was a great place for a young Scot to learn about mining and the bush.

After a brief spell as an academic in New Zealand, I joined Delta Gold. A fantastic experience; at one stage we were drilling at Hartley Platinum in Zimbabwe with

BHP developing the mine, drilling out the Kanowna Belle discovery and drilling the first RC holes into what was to become Sunrise Dam.

Delta eventually sponsored my first company, Archaean Gold, which discovered the Nimbus Silver deposit.

Archaean shareholders benefited from a cash takeover in 1996. I was subsequently involved in founding a number of juniors over the years, notably Magnetic Resources which discovered the Dongara mineral sands deposits and Rox Resources.

### **Q. Tell us about your current role.**

With Michael Blakiston and Brett Dickson, I founded Vulcan Resources in 2003

and Vulcan acquired and developed the Outokumpu copper mine in Finland.

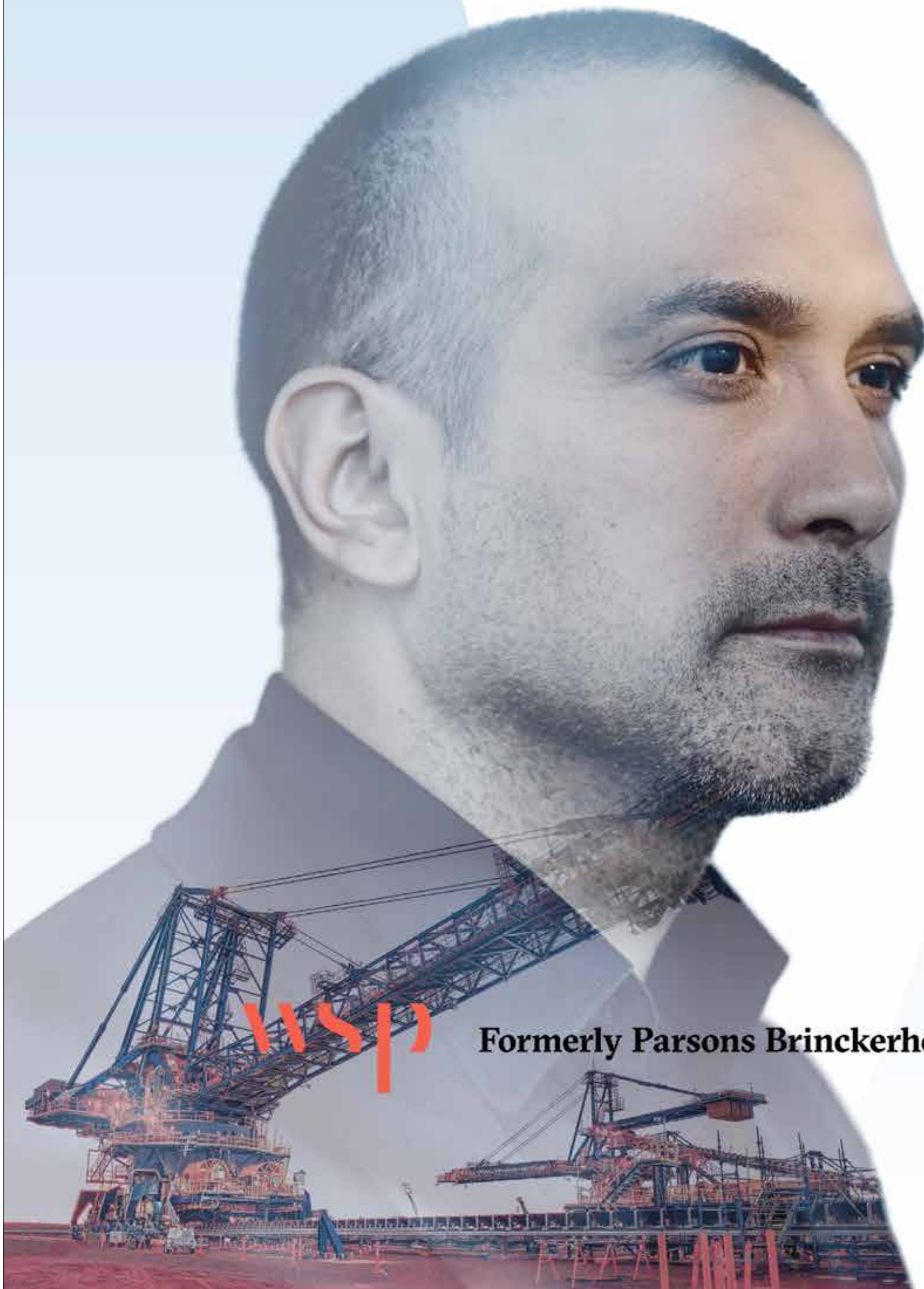
Vulcan then took over Universal Resources in 2010 which included the Cloncurry Copper Project, and sold the Outokumpu mine in 2015 for \$112 million and returned 15 cents a share to shareholders. Vulcan then changed its name to Altona Mining. I have been its managing director since inception.

### **Q. How has the Cloncurry Copper project been tracking?**

It's a terrific project. If discovered from scratch today, Altona would be a market darling. The project is a ready to build 39,000tpa copper open pit mine and mill



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