

# THE AUSTRALIAN MINING REVIEW

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MARCH 2018

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COBALT

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FULL STEAM  
AHEAD

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HAWSON'S IRON  
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# STEEL THE SHOW

The Sanjeev Gupta-led GFG Alliance is spending big on its ambitious strategy to subvert Australia's dominant 'dig and deliver' approach.

FEATURE p20

Image: GFG Alliance.  
Photography: Sean Kelly



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UNDER THE SPOTLIGHT:  
HAWSONS

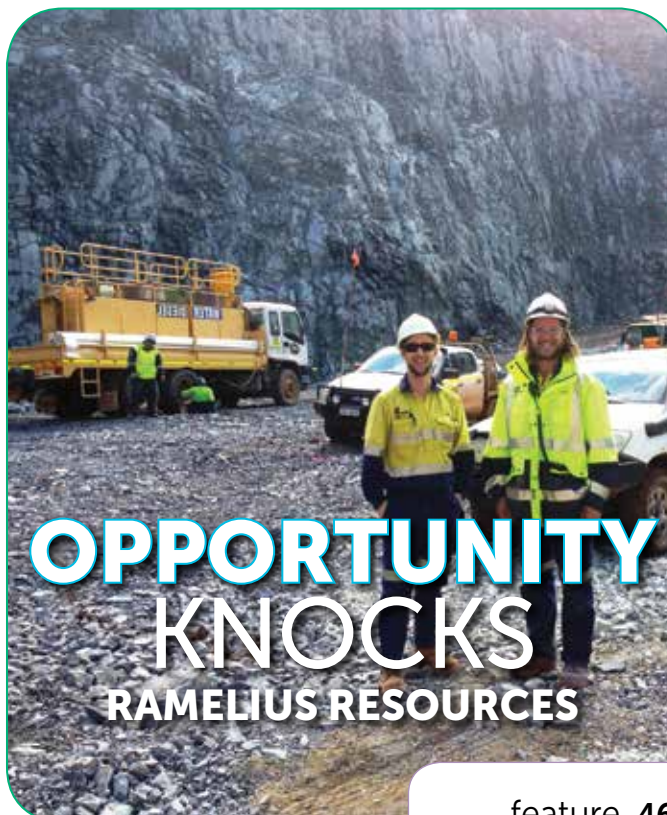
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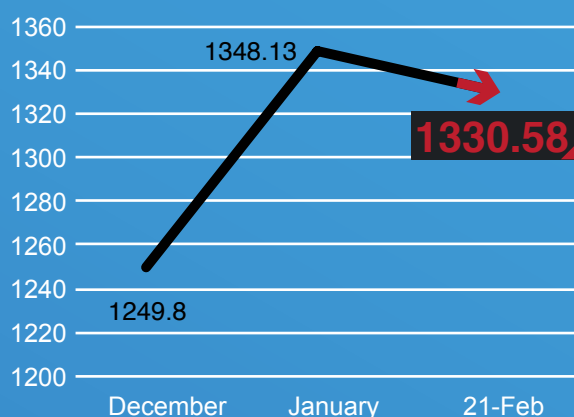
# MAJOR COMMODITIES

## SNAPSHOT

### GOLD

\$US/oz

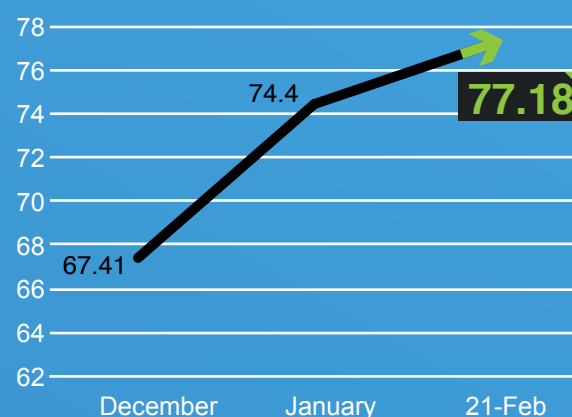
Gold lifted in February on the back of a weaker US dollar. Analysts believe that to breach the \$US1360 level retail investors will need to get on board in the coming months.



### IRON ORE

\$US/t  
62% Fe CFR China

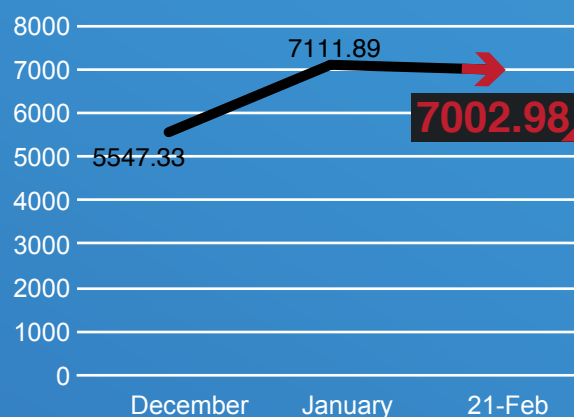
Iron ore is at six-month highs, reflected by bullish steel prices caused by ongoing Chinese production restrictions.



### COPPER

\$US/t  
LME Price

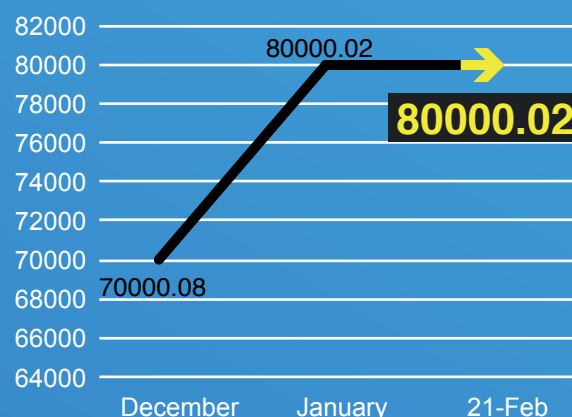
Copper rallied in early February, gaining 8%, however uncertainty over demand from China caused the commodity to fall back below January highs.



### COBALT

\$US/t  
LME Price

While cobalt has recently flattened, support for the commodity remains high for March.



### ALUMINIUM

\$US/t  
LME Price

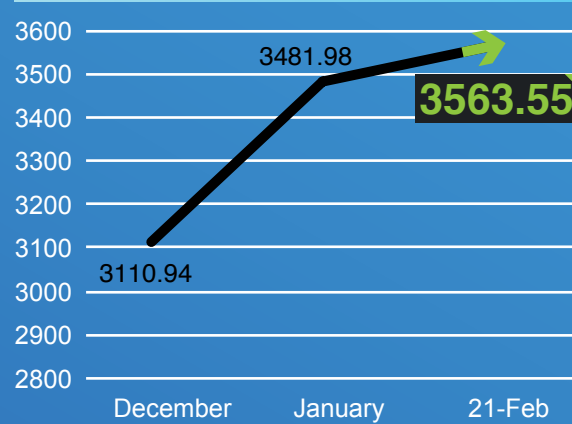
A rise in aluminium inventories has caused the base metal to drop over the past four weeks. Analysts have forecast Chinese aluminium manufacture to expand in the next few months.



### ZINC

\$US/t  
LME Price

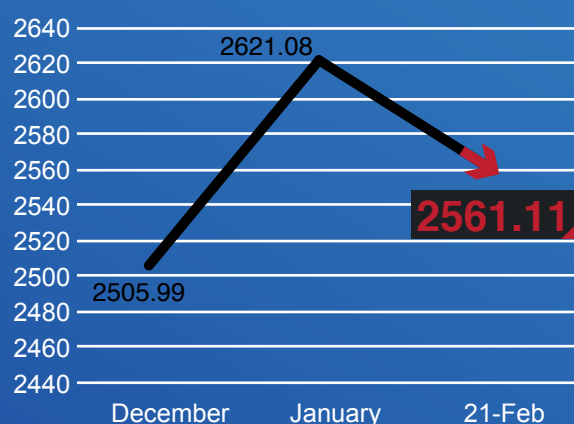
The base metal has started to flatten, with zinc inventories in China jumping 12% toward the end of last month.



### LEAD

\$US/t  
LME Price

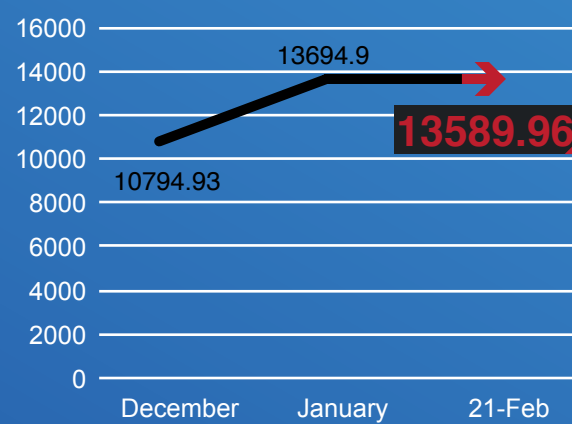
While overall lead demand is strengthening, fluctuating prices have caused week-to-week dips in prices.



### NICKEL

\$US/t  
LME Price

Nickel is expected to maintain its price, with strong support at \$US13,200 buffering a drop in prices.





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## IN BRIEF

### Nyrstar signs zinc offtake with New Century

QLD

GLOBAL metals business Nyrstar has settled a dispute over historic offtake agreements at the Century zinc mine in QLD.

Nyrstar had commenced arbitration proceedings against miner New Century in February relating to the validity of historical offtake agreements at the mine dating back to 2007, however the company said it had suspended the action based on the signing of a new agreement.

Nyrstar has agreed to a 5.5 year offtake agreement for 600,000 tonnes of zinc concentrate, which includes a variable tonnage allocation of 250,000t for the first 3.5 years, rising to 350,000t for the final two years of the agreement.

New Century said it remained on track for first zinc production from the project in Q3 this year.

### Gold Road secures \$150m in funding

WA

NEAR-term producer Gold Road Resources has signed a revolving \$100m finance facility and a \$50m dedicated working capital and gold hedging agreement for development and exploration activities.

The funds will be utilised for exploration at its Yamarna tenements and the development of its 50:50 Gruyere gold project joint venture in WA.

“These finance facilities are a prudent move as we transition the company from being an explorer with a development asset to an Australian mid-tier gold producer with significant exploration upside and the financial capability and flexibility to grow further,” Gold Road chief Ian Murray said.

### Another setback for New Acland

QLD

THE future of the New Acland coal mine expansion has been dealt a blow after the QLD Department of Environment and Science refused to accept the New Hope Group application to amend the Environmental Authority (EA).

“This very surprising decision handed down without any reasoning or explanation, puts at risk more than 700 jobs despite the project undergoing rigorous government assessment processes, including an examination by the Independent Expert Scientific Committee as part of the Federal Government’s approval,” Queensland Resources Council chief Ian Macfarlane said.

New Hope is preparing for a Judicial Review of the original Land Court decision – scheduled for 19 March – which could invalidate the Department’s decision.

# High-grade hits at Jundee

**“The 765g/t intersection from the seismic reflector at Zodiac is nothing short of spectacular, particularly when the huge potential along strike is considered.”**



Image: Northern Star Resources.

Northern Star has increased its exploration spend at Jundee mine by \$10 million.

**ELIZABETH FABRI**  
WA

AUSTRALIA’S third-largest gold producer Northern Star Resources will boost its exploration program after making multiple discoveries at and around its Jundee gold mine in WA.

As a result of the drilling success, Northern Star increased its FY18 exploration budget by \$10 million to \$45 million.

It plans to accelerate a number of drilling programs to bring the recent discoveries into

the Reserve category.

The discoveries included high-grade finds at the Zodiac discovery and the Armada trend, 400m and 800m from the Jundee mine, respectively.

Northern Star executive chairman Bill Beament said the results would change the way the 10 million ounce (moz) Jundee gold field was viewed.

“With production of 7moz over the past 22 years, Jundee has been an exceptional mine by any measure,” Mr Beament said.

“But these results show the Jundee gold field is now emerging as one of the greatest

gold fields in Australia.

“The Zodiac discovery is a game-changer of enormous proportions.

“The 765gpt intersection from the seismic reflector at Zodiac is nothing short of spectacular, particularly when the huge potential along strike is considered, and we are yet to intersect the second reflector.”

Mr Beament said the 2.5km long Armada trend also continued to grow.

“We are now very confident that we will grow Jundee’s 1.4moz Reserve base significantly, adding years to its mine life,” he said.

# Jobs growth highlights skills gap

**REUBEN ADAMS**  
WA

JANUARY SEEK data has revealed a 54 per cent jump in mining, resources and energy jobs as miners struggle with a ‘talent shortage’ due to an emerging skills gap, sluggish wages growth, and the rise of the ‘gig economy’.

SEEK ANZ managing director Kendra Banks said the employment website was seeing strong national demand for STEM skills – science, technology, engineering and mathematics – which reflected a global talent shortage.

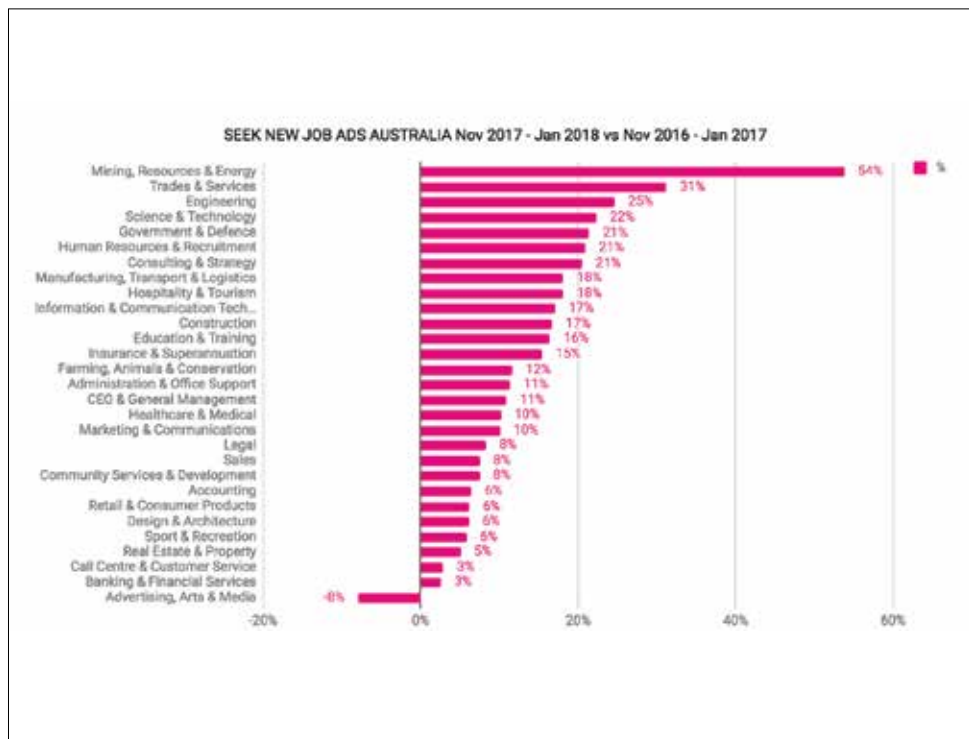
“This ‘talent shortage’ has been identified by Australian CEOs as one of their top business risk areas, but it also creates huge competitive job opportunities for Australians with engineering and IT skills,” Ms Banks said.

In a survey of Mineral Council of Australia (MCA) member companies, 70 per cent of respondents cited Research and Development and adoption of new technologies as important or very important to achieving future improvements in productivity.

But opportunities for Australia’s mining industry would only be fully realised by inspiring the next generation to pursue STEM disciplines, MCA Education and Training director Gavin Lind said.

“Australia’s world-class mining sector needs more highly-skilled STEM professionals – yet student participation and outcomes in STEM subjects have declined markedly over the last decade,” Mr Lind said.

In a February submission to a Senate inquiry into the future of the Australian workplace, MCA also warned that university enrolments in mining-focused programs had



Job ad growth across Australian industries on SEEK, November 2017 to January 2018, compared to the same period 12 months ago.

fallen to the lowest levels since 2000.

“The number of students commencing mining programs across Australia in 2017 show enrolments continue a drastic downward trend to levels below those last seen in 2000,” the submission stated.

But the mining sector is grappling with ongoing skills shortages across a range of roles.

Since the mining boom peaked in 2012 the sector has shed more than 50,000 jobs; many of these workers have moved on to different industries.

Now, the abolishment of the 457 visa,

increasingly casualised workforces, and sluggish wages growth in mining mean these roles are less attractive and harder to fill.

In February, outgoing Ausdrill founder and managing director Ron Sayers told *The Kalgoorlie Miner* that skills shortages were a massive challenge for the company, as local drillers who left the industry during the latest downturn have not returned.

“When the boom was on, we had a lot of people, and when the boom came off, people were made redundant and went into other fields of work,” Mr Sayers said.

“A lot of them haven’t wanted to go back.”



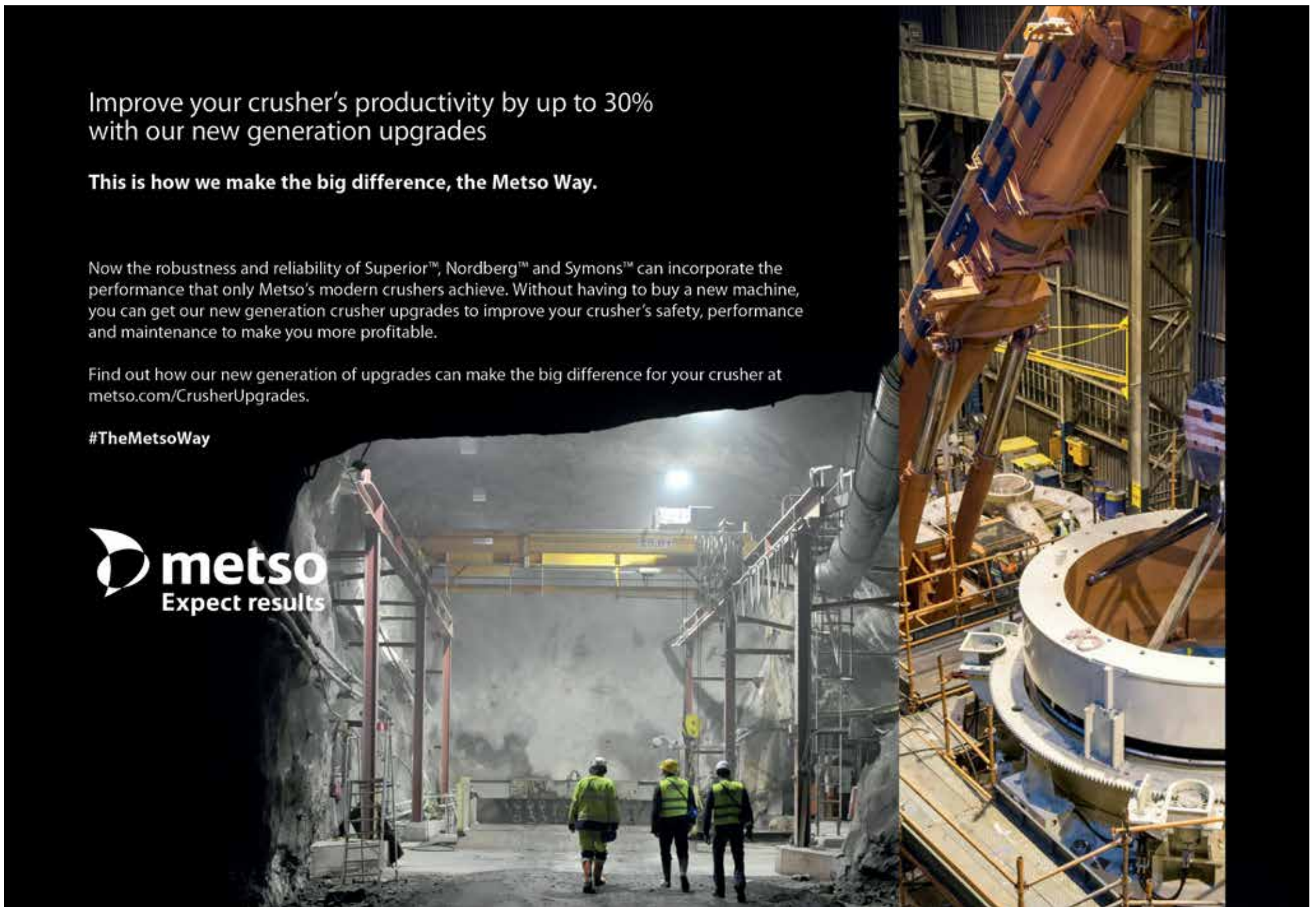
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# Roper Bar mine to reopen

**ELIZABETH FABRI**  
NORTHERN TERRITORY

THE mothballed Roper Bar mine in the Northern Territory has the green light to reopen after its mine management plan was approved.

The iron ore mine, formally owned by Western Desert Resources, was placed in care and maintenance in April 2015 when the company went into liquidation.

The project is now owned by international mining and shipping company British Marine subsidiary Britmar (Aust), who also has an interest in a bauxite operation in Weipa, QLD.

British Marine subsidiary Nathan River Resources is the owner of the iron ore mining assets, which includes the exclusive rights and licenses relating to the Roper Bar mine, haul road and the Bing Bong port.

"The Group now has in place all the relevant agreements and permissions to beginning the export of iron ore product, as well as the ownership of a variety of equipment including road trains, barges and loading equipment stationed on site," British Marine said in February 14 statement.

"It is expected that the project will start exports of iron ore product in earnest in Q2 2018."

Northern Territory Resources minister Ken Wovles said reviving Roper Bar indicated growing



**"It is expected that the project will start exports of iron ore product in earnest in Q2 2018."**

*Image: Western Desert Resources.*

Roper Bar is about 60km south of Ngukurr and 50km from the Gulf in the Northern Territory.

confidence in the sector.

"The resources industry contributes millions of dollars to the NT economy each year and creates thousands of jobs," Mr Wovles said.

"In 2016/17 the value of mineral production in the NT hit a new record of \$3.63 billion.

"Britmar has indicated they are keen to get things moving as quickly as possible, and it will

be great to see this mine up and running again."

Britmar has confirmed it will focus on local procurement and was planning to establish a head office in Darwin.

The news followed a series of wins for the Territory last year, including the opening of Edna Beryl mine, the first new gold mine in the region in 12 years; the reopening of Bootu Creek mine; and the opening of Gulkula, Australia's first

Aboriginal owned and operated mine.

"To see projects such as this come back on line means the Territory will finally realise results from the efforts of previous works, and for many years to come," Minerals Council of Australia NT executive director Drew Wagner said.

"This is proof of the shifting trend of growth and confidence in the sector once more."



*Image: Doray Minerals.*

Doray Minerals' flagship deflector mine.

## Doray raises \$25m

**CAMERON DRUMMOND**  
WA

GOLD producer Doray Minerals has tapped investors for \$25 million to reduce debt, accelerate exploration, and fast track underground development at the Deflector copper-gold project.

Doray will undertake resource definition drilling at Da Vinci north of the current Deflector mining operation. If successful, the company will have the funds to complete capital development for underground access to Da Vinci to boost total production.

At the end of 2017, Doray had \$47.5m in debt and \$23.9m in cash and metals.

The company will use \$14m from the placement, and \$4.5m in existing cash to reduce its gross debt balance to \$29m.

Doray managing director Leigh Junk said the company had worked tirelessly to turn the company around over the last 14 months, and was pleased with investor response to the capital raising.

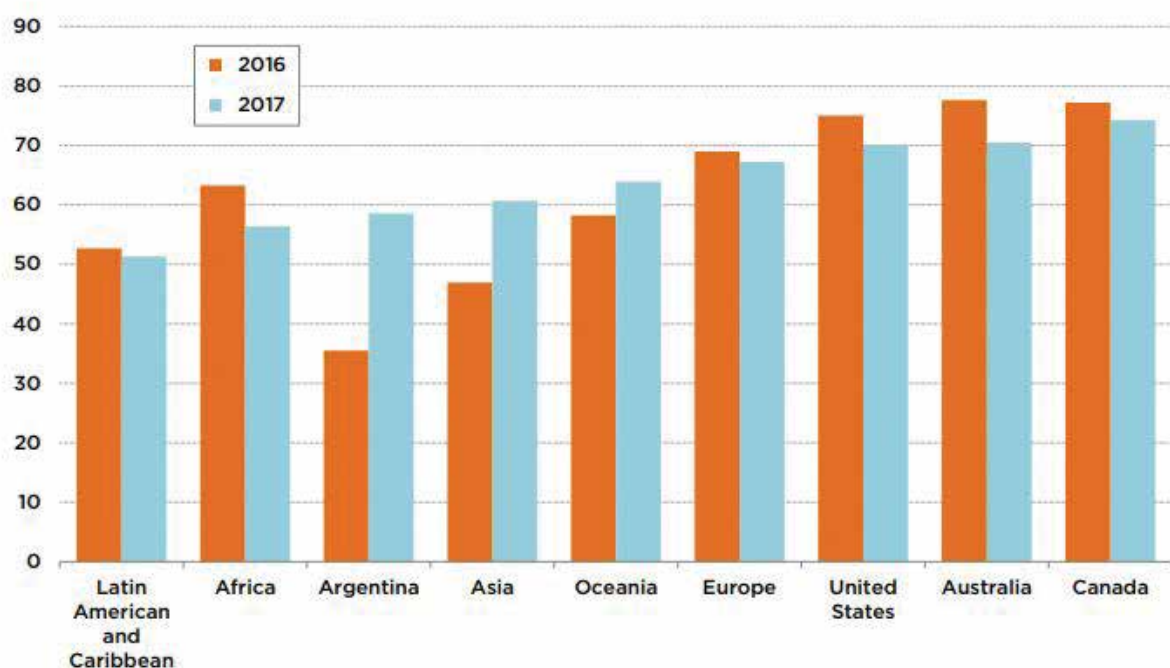
"We have been fortunate to have the support of some very loyal shareholders during this turnaround and we appreciate the contribution they have made to the company," Mr Junk said.

"The Deflector production ramp up is now complete and the operation is running at a steady state.

"The funds raised will provide a strengthened balance sheet giving us the flexibility to expedite our growth plans."

# Australia loses top spot

**Figure 13: Regional Median Investment Attractiveness Scores 2016 and 2017**



*Image: Fraser Institute.*

Australia has fallen to second place in the 2017 Fraser Institute's survey of the world's most attractive mining regions.

**ELIZABETH FABRI**  
NATIONAL

AUSTRALIA is no longer ranked the most attractive region for mining investment in the world after falling to second place in the 2017 Fraser Institute survey of mining and exploration companies.

According to the Fraser Institute, Canada was now ranked the most attractive region in the world for mining investment, with Finland rated the top jurisdiction.

WA was the only Australian jurisdiction to appear in the global top 10, however it fell for the third consecutive year, dropping from first place in 2015, to third in 2016 and now fifth place in 2017 out of the 91 jurisdictions.

QLD fell from 10th to 12th place, South Australia from 13th to 14th place, the Northern Territory dropped seven places to 27th, and Victoria dropped 14 places to 71st.

NSW and Tasmania were the only Australian States which improved their ranking, rising to 46th and 50th place respectively.

Association of Mining and Exploration Companies (AMEC) chief executive Warren Pearce attributed the results to increased red tape, proposed royalty increases and regulatory uncertainty across the country.

"The geology has not changed, but Governments are damaging our investment attractiveness," Mr Pearce said.

"The report highlights that Australia's mining and mineral exploration industry is not

immune to the negative impact of regulatory and public policy uncertainty.

"Ultimately, if processes are duplicative, costly and slow, companies will invest in competing jurisdictions."

The report came days after Australia's ranking also fell in Transparency International's Corruption Perceptions Index.

Of the 180 countries studied, Australia still ranked 13th place, but its CPI score had decreased again for the sixth consecutive year.

"This suggests a loss of trust in the Australian public sector and the perception, at best, that corruption has gotten worse, in only a few short years," Transparency International Australia chief executive Serena Lillywhite said.



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WT Hydraulics managing director Kraige Cooper said each individual at the company played a part in it receiving the award, which boosted morale.

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## IN BRIEF

### Minotaur and OZ end alliance

#### SOUTH AUSTRALIA

OZ Minerals and Mintoaur Exploration have mutually ended a two year exploration partnership searching for copper resources around the Prominent Hill mine in South Australia.

Minotaur Exploration managing director Andrew Woskett said after various work programs, the teams concluded regional prospects for shallow copper mineralisation were limited.

“The Alliance effort and aims were nonetheless worthy as they provided a constructive model for mid-tier – junior explorer cooperation, on which to strengthen their working relationship,” Mr Woskett said.

“Minotaur appreciates OZ Minerals having provided the opportunity to explore OZL’s tenements.”

### Exploration impact at Silica Hill

#### NSW

JUNIOR explorer Impact Minerals has revealed high-grade silver hits at its Silica Hill prospect in NSW.

Assays from three drill holes have confirmed increasing grades at depth of high-grade gold and silver mineralisation.

Impact said the work to date indicated the prospect was very large and extended for at least half a kilometre down dip, with large areas still untested.

“The results are an exciting further breakthrough for us at Silica Hill as they indicate the mineralised system is getting better at depth and to the east,” Impact managing director Dr Mike Jones said.

### Silver City strikes at Copper Blow

#### NSW

Silver City Minerals has intersected excellent copper grades at its Copper Blow base and precious metals project near Broken Hill, NSW.

Broken Hill, which has historically hosted mainly lead, zinc, and silver, will add copper, gold and cobalt to its mining heritage if Silver City successfully proves up resources at the project.

The company will immediately commence drilling a Phase 2 program and test targets in zones between the two highest grade sections.

Silver City envisages between 4000m and 5000m of combined RC and diamond drilling would need to be conducted for an initial resource estimation.

# Pilbara gold JV gains momentum



Artemis Resources' Radio Hill plant south of Karratha, WA.

#### CAMERON DRUMMOND WA

ARTEMIS Resources and Canada-based Novo Resources are ramping up exploration efforts in and around their conglomerate gold project in the Pilbara, which set off a mini mining rush last year when unique watermelon shaped nuggets were discovered in shallow ground.

Artemis strengthened its balance sheet at the start of the month, after an additional \$2.5 million commitment from existing shareholder Deutsche Balaton AG lifted its January capital raising to \$9m.

On 12 February Artemis announced a

partnership with the CSIRO to investigate the origin of the unusual watermelon seed nuggets found in the conglomerates.

Artemis executive chairman David Lenigas said the company was actively seeking to understand the genesis of the unique type of gold in the Pilbara region.

“It is important that Artemis engage with independent leading industry specialists to seek a deeper understanding as to why the gold exists in the conglomerates south of Karratha, and indeed how these unique ‘watermelon’ seed nuggets were formed,” Mr Lenigas said.

“Gaining a better understanding of these key questions will enable refinement of our exploration and evaluation methods going

forward.”

On February 15 Artemis released high-grade gold hits from exploration conducted by Novo at the JV’s flagship Purdy’s Reward project, with bulk sampling grades of 87.7 grams per tonne (g/t), 46.1g/t, 17.7g/t and 10.6g/t.

Artemis executive director Ed Mead said the bulk sampling results from Novo were excellent and the 2018 exploration season had now started in earnest.

The JV was also granted a further four tenements around Pyramid Station, adding 178.8sqkm to the project area.

The tenements lie 50km east of the Radio Hill plant and 35km east of Purdy’s Reward.

# Liontown high-grade lithium hit

#### CAMERON DRUMMOND WA

EXPLORER Liontown Resources has recorded further zones of shallow, high-grade lithium mineralisation in the final batch of assays from an RC drilling campaign at its Kathleen Valley lithium project, 680km north-east of Perth, WA.

Liontown’s second round of drilling at the project covered 3000m to test along the strike identified in the maiden drilling program, returning thick zones grading at more than 2 per cent lithium oxide (Li<sub>2</sub>O).

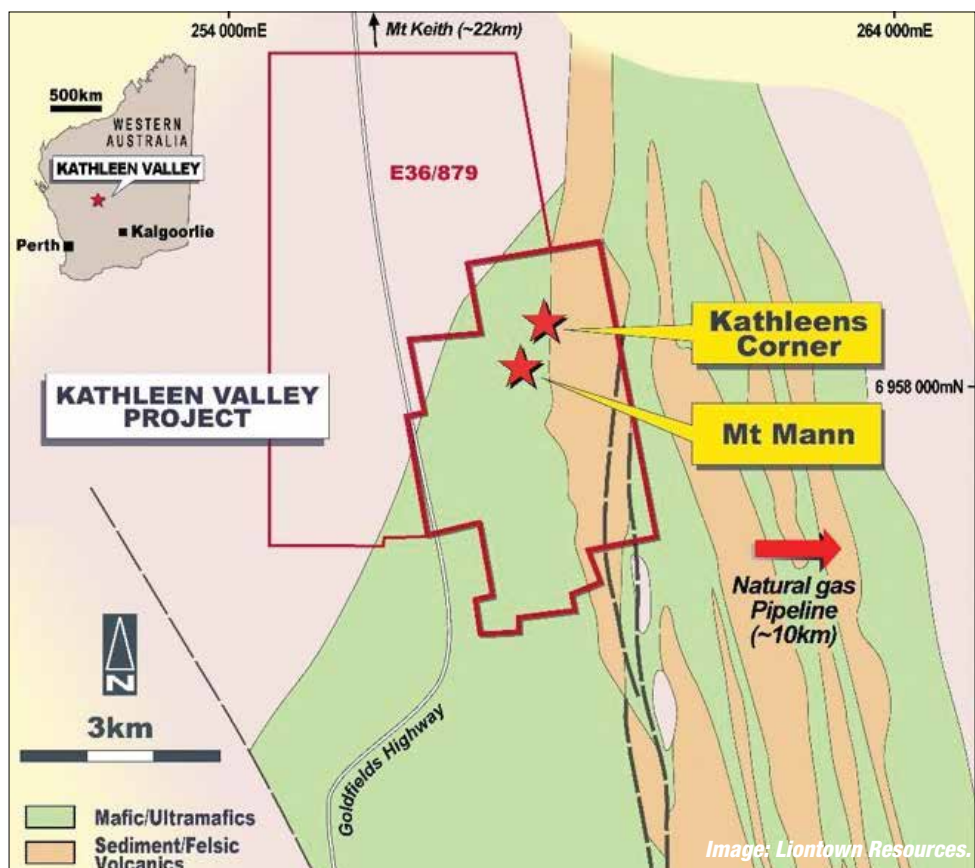
The latest assays include all the holes drilled into the Kathleen’s Corner prospect – located immediately north-east of the company’s Mt Mann prospect.

In contrast to Mt Mann, the mineralisation at Kathleen’s Corner is hosted by multiple stacked, flat-to-shallowly south-west dipping pegmatites.

The mineralised trend was intersected over more than 500m strike including to the north, where it is obscured by shallow transported cover.

Liontown said planning was underway for in-fill and extensional drilling over both prospects, including diamond core holes, and is scheduled to re-commence as soon as the current drilling program is completed at Buldania, the company’s second highly prospective lithium project in WA.

Liontown managing director David



Kathleen Valley is emerging as a highly prospective lithium deposit.

Richards said the latest results provided further evidence of the growing resource potential of Kathleen Valley as a high-grade lithium project.

“The presence of shallow pegmatites with

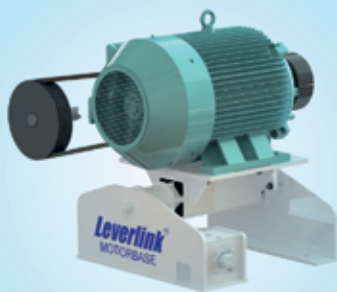
a relatively flat-lying geometry at Kathleen’s Corner is very encouraging and the company looks forward to moving ahead with our next phase of drilling at the project,” Mr Richards said.



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## IN BRIEF

### Macmahon acquires TMM

#### NATIONAL

MINING services contractor Macmahon has inked a deal to acquire Brisbane-based civil construction, operations and maintenance services provider TMM Group.

Macmahon said TMM would provide the company with additional civil capability for initial earthworks and construction mining contracts, as well as the ability to target site rehabilitation projects.

The news was followed by Macmahon's release of its six month results ending 31 December, which saw the company return to the black with net profit after tax of \$8.2 million.

### GBF wins Millennium deal

#### WA

MILLENNIUM Minerals has awarded GBF Underground Mining Company the underground contract for the new Bartons mine, which forms part of its Nullagine gold project in WA.

The three-year contract included the establishment of an underground portal at Bartons, all decline and level development, ore driving, stope production and two, 100 metre exploration drill drives.

"We are rapidly progressing towards the development of our first underground mine in Nullagine, and we're looking forward to working closely with GBF as they mobilise to site in the coming weeks," Millennium chief executive Peter Cash said.

### Century contracts announced

#### QLD

NEW Century Resources has named National Pump & Energy (NPE) and Paragon Tailings as the preferred contractors to complete hydraulic mining service works for its Century tailings deposit.

The company said hydraulic mining was determined the optimal method for extraction to allow efficient recovery of the ore and transport via existing site slurry piping infrastructure.

"The selection of NPE and Paragon as the company's hydraulic mining preferred contractors represents another key step in the restart of operations at Century," New Century chief operating officer Barry Harris said.

"We look forward to working with our new partners to ensure the safe, efficient and timely progression to production at the mine later this year."

# MND boosted by resources revival



**"Major construction prospects are improving, particularly in iron ore, and demand for maintenance services is expected to remain strong."**

Image: Monadelphous.

The engineering group has enjoyed a bumper first-half FY18.

#### CAMERON DRUMMOND WA

ENGINEERING services group Monadelphous has posted a 31.6 per cent hike in first-half profits on the back of rejuvenated mining sector earnings.

Net profit after tax was \$37.6 million, enhanced by a 39 per cent increase in sales revenue to \$874.1m on the previous corresponding period.

The strong performance was reflected by revenue increases in the company's core resources and energy markets in Australia from a high volume of contracts secured over the past 18 months.

Monadelphous managing director Rob Velletri said much of the new work and growth in the period was driven by its strong operational performance with longstanding customers.

Monadelphous has won \$385m worth of new work since the start of the financial year, including a 12 month extension of contract work at Rio Tinto's Pilbara operations and two packages of work at its Oyu Tolgoi underground operation in Mongolia.

The company's newly established engineering, procurement and construction (EPC) business Mondium was awarded its first contract for the design, construction and commissioning of a new feed system to existing plant at Talison Lithium's Greenbushes mine site.

Also during the period, Monadelphous carried out an upgrade to the water treatment plant at BHP's Mining Area C iron ore operation, as well as a flurry of structural and mechanical works at smelting and energy projects across Australia.

"Market conditions in our core resources market have improved, with solid demand expected to continue for sustaining and brownfield capital works," Mr Velletri said.

"Major construction prospects are improving, particularly in iron ore, and demand for maintenance services is expected to remain strong.

"The outlook for the company is positive, with full year revenue expected to be up around 30 per cent on the previous year."

# No dividend as NRW doubles revenue

#### CAMERON DRUMMOND NATIONAL

MINING services contractor NRW Holdings has decided against an interim dividend, despite the business continuing to "meet or exceed our expectations", securing contracts and contract extensions across all its businesses.

The company almost doubled its yearly revenue to \$345.3 million and increased profit from \$11.9m to \$15.3m.

Last year, the company acquired east coast mining services business Golding for \$85m, funded by a capital raising and debt facility.

Because of this, the company decided to retain its cash balances and not pay an interim dividend to ensure its debt was fully serviced.

It has not paid out to shareholders since a fully franked interim dividend of 4c per share in October 2014, when it posted an H1 FY14 profit of \$22.4m and had a net debt of \$39.8m.

NRW's activity in the six months to December 31 2017 included mining services at Middelmont, and contract mining at the Kogan Creek, Curragh, Isaac Plains and Pilgangoora projects.

The company said it had an order book of \$1.6 billion, with \$360m of work scheduled for delivery in the second half of the year.

NRW chief executive Jules Pemberton said the acquisition of Golding had been an outstanding success and largely contributed to the significant increase in revenue and earnings compared to the six months to December.

**"The pipeline of opportunities is currently valued at \$6 billion, of which approximately \$1.5 billion are active tenders."**

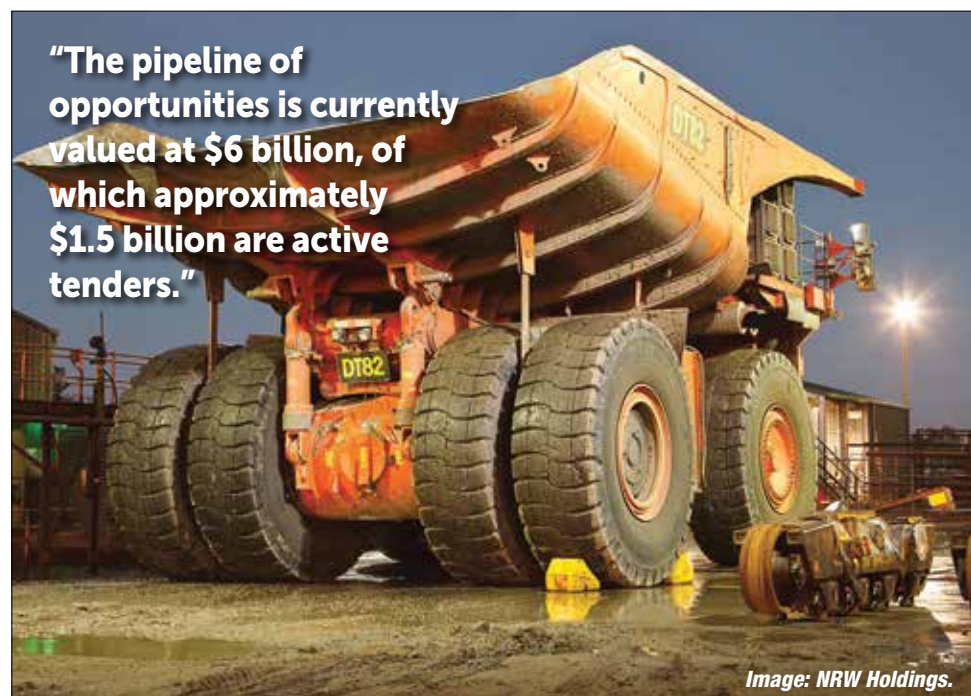


Image: NRW Holdings.

NRW said it had strong order book growth prospects.

"NRW's strong order book growth not only indicates the incremental work related to Golding but also a number of key contract awards in the six months to December 2017," Mr Pemberton said.

"Following the announcement of a \$111m early contractor involvement for OZ Minerals, we have now commenced the first stage of the work on site with the construction of the aerodrome at the Carrapateena project."

Mr Pemberton said the quality of prospects

continued to improve and "more closely aligns with our historic delivery capability and our enhanced capability as a result of the Golding acquisition".

"The pipeline of opportunities is currently valued at \$6 billion, of which approximately \$1.5 billion are active tenders," he said.

"These tenders are spread across the civil business in iron ore and public infrastructure and in mining in coal, lithium, nickel, gold and bauxite."





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## IN BRIEF

### India will import met coal long term

#### INDIA

IT IS likely the Indian steel industry will depend heavily on imported met coal for the next decade at least on the back of new infrastructure projects and weak domestic production.

Speakers at the Coaltrans India conference in Goa said demand would be boosted as India's steel output was forecast to increase from 100 million tonnes in FY17 to between 110mt to 112mt in FY18.

Arvind Rajgopalan from JSW Steel Limited said that the path towards 300mt of steel capacity by 2030, according to India's new steel policy formed in 2017, "seems on track".

### Newmont scoops another sustainability award

#### US

NEWMONT has been recognised for top performance in the mining sector in *The Sustainability Yearbook 2018*, published by investment company RobecoSAM.

It's the latest in a bag of awards for the global miner, which, in addition to being ranked as the world's leading miner in *FORTUNE* magazine's most admired companies list, was again confirmed as a constituent of the *FTSE4Good Index Series*, with an Environmental, Social and Governance (ESG) rating of 95 out of 100.

In December, Newmont was one of only two resources companies named in a Drucker Institute ranking of the top 250 best managed companies based on employee engagement and development, and social responsibility.

### \$US500m Obuasi redevelopment gets green light

#### GHANA

ANGLOGOLD Ashanti has got support from the Government of Ghana for a \$US500m redevelopment of its troubled Obuasi gold mine into a mechanised underground operation.

Production for the first 10 years will be focussed on the upper ore bodies and is expected to average between 350,000oz and 450,000oz at an average head grade of 8.1g/t.

"Obuasi now has the mine and labour plan, geological understanding and social model to match its world-class, high-grade ore body," AngloGold chief Srinivasan Venkatakrishnan said.

"The project metrics show a high-return, long-life project that not only brings ounces to account quickly and profitably, but also offers attractive returns on our investment."

# Newcrest spends big on Lundin



Fruta del Norte mine is currently under construction with first gold expected in late 2019.

#### ELIZABETH FABRI ECUADOR

NEWCREST will invest \$US250 million to acquire a 27.1 per cent interest in Canadian miner Lundin Gold, which is developing the Fruta del Norte gold project in South East Ecuador.

The 340,000 ounce per annum Fruta del Norte project, currently under construction, is aiming for first production by the end of 2019.

Under the deal, Newcrest has the right to appoint two directors to the Lundin Gold board, and one of its nominated directors to a project advisory committee that will oversee Fruta del Norte development.

The companies have also signed a binding Heads of Agreement to form a joint venture that will explore eight early stage concessions held by Lundin Gold.

Newcrest can earn up to a 50 per cent stake in the joint venture company by spending \$US20 million over a five year period, including a minimum of \$US4 million in the next two years.

Newcrest managing director and chief executive Sandeep Biswas said the equity investment and exploration farm-in partnership was consistent with its strategy of securing high potential orebodies.

"The Fruta del Norte epithermal orebody has many similarities with our Gosowong

operation and we look forward to sharing our experience with Lundin Gold to further develop this high-quality deposit," Mr Biswas said.

"This equity investment aligns with our aspiration of being exposed to five tier 1 orebodies by 2020."

Lundin Gold president and chief executive Ron Hochstein said the team could now focus on driving the development of Fruta del Norte.

"Newcrest has extensive experience building gold mines and bringing them into production," he said.

"As our strategic partner, their knowledge and expertise will be valuable as we develop Fruta del Norte into a large, high-grade gold mine."

# Norsk Hydro bids for Rio assets

#### ELIZABETH FABRI EUROPE

NORWEGIAN aluminium company Norsk Hydro has made a binding \$US345 million offer to purchase Rio Tinto's ISAL smelter in Iceland.

The binding offer would give Norsk Hydro full ownership of the ISAL smelter, a 50 per cent stake in Swedish plant Alufluor, and the remaining 53.3 per cent share in its Aluchemie project in the Netherlands.

ISAL currently produces 210,000 million tonnes of liquid primary aluminium per year and 230,000mt of extrusion ingot.

The plant has undergone significant upgrades in recent years, including a new gas treatment centre, pot relining and new casthouse, and runs on the same technology platform as Hydro's Husnes plant in Norway.

Through the acquisition of the three assets, Norsk Hydro said it will increase its annual aluminium production to 2.4mt in 2018.

"The offer demonstrates our strong belief in aluminium, which is seeing the strongest global demand growth among base metals," Norsk Hydro president Svein Richard Brandtzaeg said.

The company is currently running a technology pilot in Norway which aims to be the world's most energy-efficient and climate friendly aluminium production facility.

It said it planned to roll out these innovations to other projects such as ISAL.



The ISAL smelter in Iceland.

Rio Tinto Aluminium chief executive Alf Barrios said both parties expected to conclude the sale in the second quarter of this year.

"The binding offer for the sale of these assets provides further evidence of Rio Tinto's commitment to strengthen our business and deliver value by streamlining our portfolio," Mr Barrios said.

"Hydro has a solid track record in the aluminium industry and is a partner to Rio

Tinto in other ventures. ISAL, Aluchemie and Alufluor are a natural fit with Hydro's portfolio and this transaction should secure the long term future for the sites and continued economic benefit for the wider communities."

The news followed Rio's January announcement it would sell its Aluminium Dunkerque smelter in France to GFG Alliance for \$US500 million, and invest \$C250 million to extend operations at the Vaudreuil alumina refinery in Canada.





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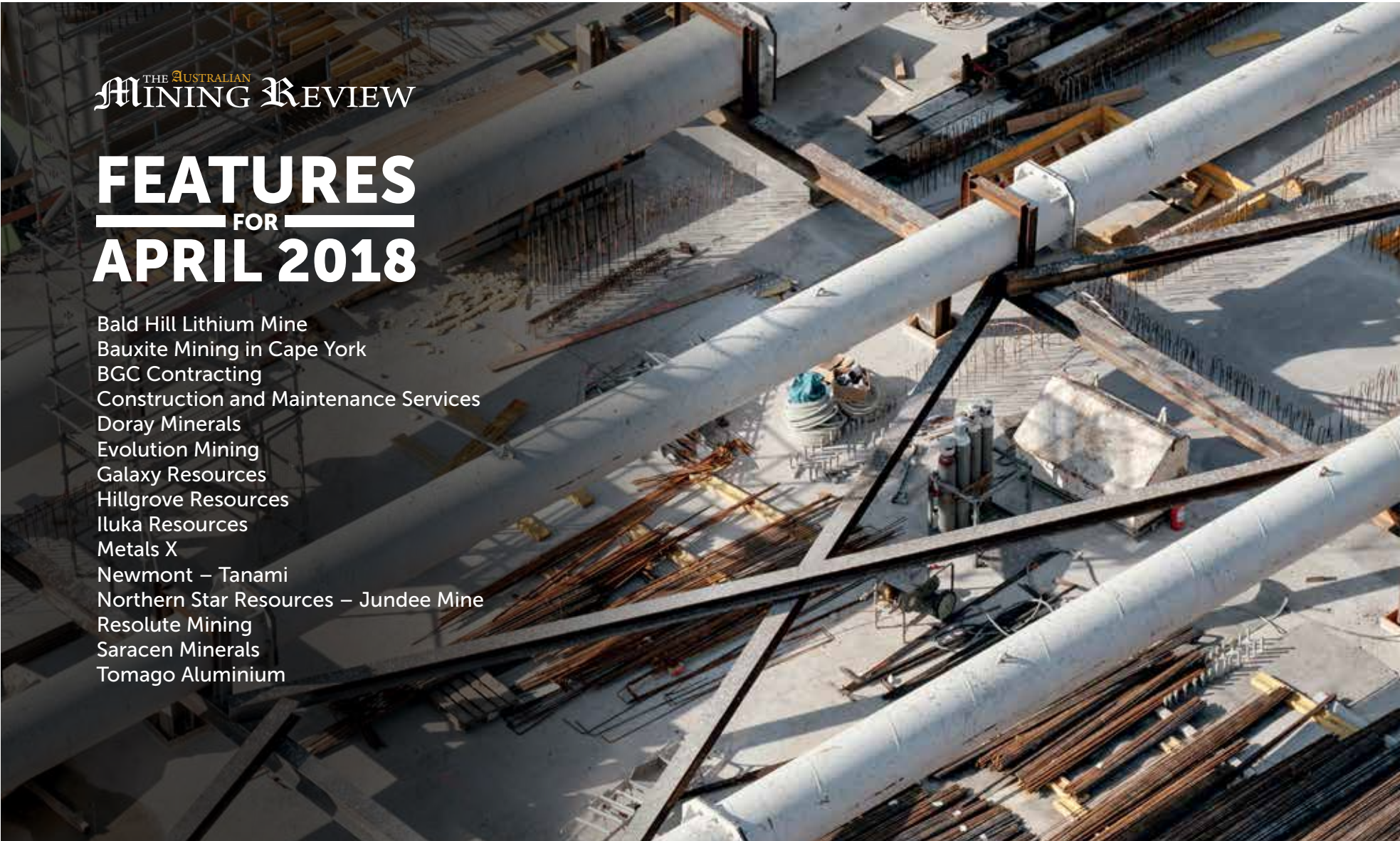
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- Bauxite Mining in Cape York
- BGC Contracting
- Construction and Maintenance Services
- Doray Minerals
- Evolution Mining
- Galaxy Resources
- Hillgrove Resources
- Iluka Resources
- Metals X
- Newmont – Tanami
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## IN BRIEF

EU tests  
underwater  
mining tech

## EUROPE

ACTIVELY mined over centuries, Europe's most easy-access deposits are either depleted or underwater.

The European Union is looking at ways to utilise underwater mining robots to access abandoned or flooded mine sites.

Its Viable Alternative Mine Operating System (VAMOS) project uses remote operation mining vehicles that are able to submerge themselves under water, lock on to an orebody and pump it up to the surface as slurry for processing.

The system was designed using cutting edge dredging technology to transport material out of the water body using a flexible piping system.

The VAMOS team are currently testing prototypes in flooded pit lakes in Bosnia and Herzegovina at depths of up to 120 metres below the water.

LIT to  
acquire  
battery  
developer

## QLD

LITHIUM Australia (LIT) has entered a binding agreement to purchase Brisbane-based battery cathode developer Very Small Particle Company (VSPC).

VSPC has developed world-leading cathode material production technology which can deliver a wide range of cathode materials for lithium-ion batteries (LIB).

LIT said the acquisition comprised VSPC's intellectual property and decommissioned pilot plant in Brisbane, designed to produce complex metal oxides/phosphate powders for the production of LIB.

"The ability to utilise mine waste, unconventional lithium minerals and waste batteries in the production of high-quality cathode materials is the ultimate test of sustainability," LIT managing director Adrian Griffin said.

"The integrated technologies available to LIT will allow for better resource utilisation, reduce the quantity of valuable materials going to landfill and enable the rebirth of many materials as new generation LIBs."

## RCT and RUC join forces



The signing of the partnership agreement between RCT and RUC.

ELIZABETH FABRI  
NATIONAL

GLOBAL smart technology company RCT will partner with underground mining contractor RUC Cementation Mining Contractors to trial new underground mining technologies across mines in Australia and overseas.

Trials will begin at Dacian Gold's Mt Morgans gold mine which is expected to commence production this month, where RUC has a three year contract to provide underground mining services.

RCT executive director and chief executive Brett White said the team were looking forward to seeing the partnership come to fruition in the coming months.

"We look forward to the rolling out of our new solutions and further enhancing our existing solutions with RUC Mining's assistance," Mr White said.

"What's exciting about this partnership is that we have the opportunity to collaborate directly and deeply with an innovative customer wanting to adopt our Smart Technology and make step changes in the industry.

"Having access to a mine to test is key to

RCT's Proof of Concept team (PoC Works)."

RUC Mining managing director Barry Upton said the contractor made the decision to partner with RCT because of its expertise in technical solutions innovation, particularly in loader automation.

"RCT provides flexibility across all OEM's fleet offerings, and in addition, the company extends itself to broader mine information management," Mr Upton said.

"This partnership aims to further build on this adaptability and realise an automated connected mine, unconstrained by the limitations of a single OEM supplier."

## Pre-pilot success for Hazer

CAMERON DRUMMOND  
WA

UNIVERSITY of Western Australia research spinoff Hazer Group is continuing to progress the development of a large-scale synthetic graphite production facility in WA with mining services group Mineral Resources (MinRes).

During Q4 2017, Hazer successfully demonstrated the on-line injection of iron ore catalyst in the pre-pilot plant, which it says was a "key development milestone" towards scale-up of the Hazer Process towards commercialisation and a significant step in de-risking the technology.

The groundbreaking process uses natural gas and unprocessed iron ore to create low-cost, low-emission "clean" hydrogen, as well as synthetic graphite – a key element in the manufacture of lithium-ion batteries.

A Stage 1 pilot plant facility will produce 1000 tonnes per annum (tpa) of high-grade synthetic graphite, with commissioning expected in Q3 this year.

Hazer said once the joint venture (JV) was satisfied with the production parameters of the pilot facility, MinRes would execute plans to

**A Stage 1 pilot plant facility will produce 1000 tonnes per annum (tpa) of high-grade synthetic graphite, with commissioning expected in Q3 this year.**



Image: Hazer Group.

The Hazer Process uses unprocessed iron ore to create synthetic graphite.

upgrade to a 10,000tpa-plus large-scale plant.

Hazer will receive revenue-based royalties from any production from the JV, and all intellectual property of its technology would be exclusively retained and licensed to MinRes over the course of the agreement.

It would also own any new IP or improvements that may arise from the project.

In October last year, Hazer signed a non-binding MOU with Primetals Technologies

to investigate the commercial and technical viability of the Hazer technology for the steel industry.

Hazer and Primetals – a JV between Mitsubishi Heavy Industries and Siemens – will work toward using hydrogen produced by the Hazer process for steel production with minimum carbon footprint. Hazer said that the graphite by-product could also be used as an alternative reductant or carburiser in the steel making process.





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**Helloworld Travel Limited and QBT have entered into a joint venture with In Travel Group to form Inspire Travel Management. The JV marks the first-in-market enterprise forming a majority Indigenous owned Travel Management Company in Australia.**

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## IN BRIEF

### Strong ASX debut for Accelerate

#### TAS

COBALT-focussed explorer Accelerate Resources successfully listed on the ASX in February following an oversubscribed \$5 million initial public offer (IPO).

The Company's initial focus will be the Mt Read cobalt project in Tasmania, where soil samples taken in October 2017 graded up to 7800ppm cobalt, 0.86 per cent copper, 2300ppm nickel, and 0.81 g/t gold.

"The company considers the Mt Read cobalt project to be its flagship project, and one that holds significant potential to increase shareholders value through a systematic and scientific exploration approach," AX8 said in a statement.

### Northern Cobalt locks in prospective ground

#### NT

NORTHERN Cobalt will acquire nine tenements in the Northern Territory's Arunta region after receiving final Government approvals in February.

The company will be pursuing mapping, soils, and rock chipping to work up drill targets over the coming months as it sees this project as complementary to its advanced Wologorang cobalt project to the north.

In January, Northern Cobalt increased its Wologorang project tenure by 341 percent to 4986sqkm with the granting of five new surrounding tenements on the NT-QLD border. An additional two tenements were applied for over prospective ground across the QLD border.

### High-grade results at Mt Cobalt

#### QLD

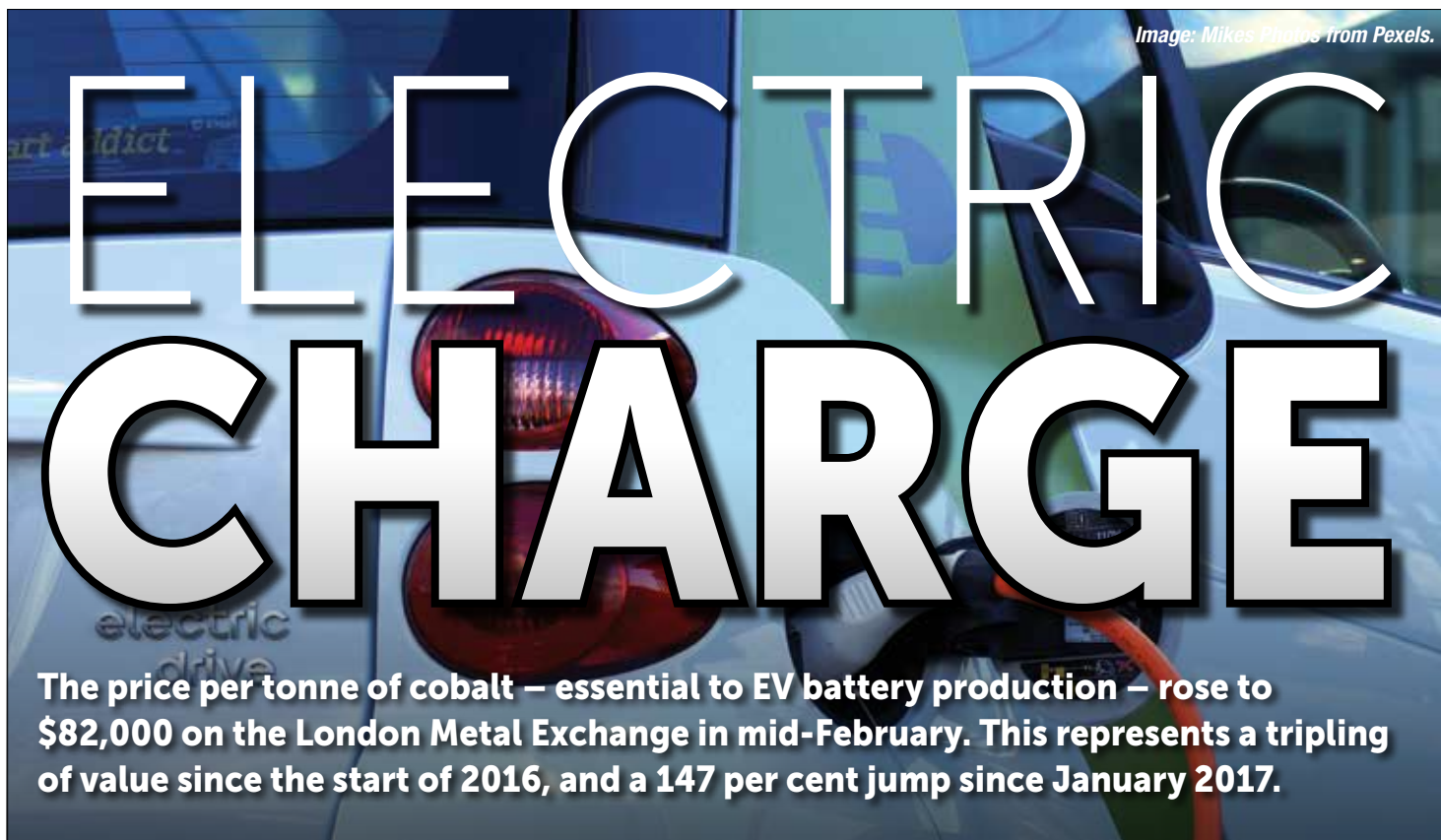
AUS Tin Mining has recorded further high-grade drilling results at its Mt Cobalt project near Gympie.

In January, Aus Tin completed the last three holes of a seven hole drill program to test potential extensions below and along strike from historic workings at Mt Cobalt.

Latest drilling confirmed high grade cobalt mineralisation close to surface with intervals including 1.1m at 1.2 per cent cobalt and 1.26 per cent nickel.

Chief executive Peter Williams said this last round of drilling enabled the company to establish a more defined target zone.

"Going forward the company will investigate the potential to extend the target zone through a combination of field reconnaissance, 3D modelling and drilling," he said.



**The price per tonne of cobalt – essential to EV battery production – rose to \$82,000 on the London Metal Exchange in mid-February. This represents a tripling of value since the start of 2016, and a 147 per cent jump since January 2017.**

#### REUBEN ADAMS

BURGEONING EV demand is already proving a disruptive force for both the mining industry and end users of metals such as lithium and cobalt.

In order to meet this increasing demand for EV batteries, cobalt supply will need to reach 180,000 tonnes (t) by 2026 – up from 48,000t in 2016, according to Benchmark Mineral Intelligence.

Platts expected a tripling in demand to more than 300,000tpa by 2030.

This surge in demand for battery metals could effectively slow the EV boom – with tightening cobalt supply the most likely offender, wrote Diana Kinch, editor at S&P Global Platts SBB Steel Markets Daily.

"Bottlenecks are already emerging in the EV supply chain," she said.

"Tesla motors fell behind in its production targets last October.

"The lag is persisting partly because Panasonic has been unable to supply batteries quickly enough, due to insufficient metals supply available at the right price, according to metals consultancy Roskill.

"Likewise, Volkswagen has reportedly been unsuccessful in striking a deal with any mining company after issuing a tender in September for a minimum of 5 years supply of cobalt for batteries at a fixed price."

Now, Apple is looking at buying cobalt in bulk direct from miners for at least the next five years, and BMW is close to signing a 10 year supply contract for both lithium and cobalt.

In response to demand, mining giant Glencore is set to increase its cobalt output in the Democratic Republic of Congo (DRC) at its Katanga mine, which will add 11,600 tonnes of cobalt to Glencore's total production in 2018.

But supply side issues are still exacerbated by the geopolitical risks and human right abuses associated with the industry in the DRC, which is currently responsible for two-thirds of global supply.

The DRC parliament has also proposed a hike in cobalt royalties from 2 per cent to 10 per cent to boost revenues as part of a long planned mining code revamp, which may deter further foreign investment.

This makes more production outside the politically-charged DRC essential to minimise the impacts of an impending cobalt supply deficit.

#### Australian Projects

Australia, home to the world's second-biggest cobalt reserves, is seeing a rush of interest in



**Glencore's Katanga mine in the DRC will boost cobalt production by 11,600 tonnes in 2018.**

*Image: Glencore.*

advanced local projects and cobalt-focused explorers.

In February, shares in of battery and technology metals developer Australian Mines surged after the company signed an off-take agreement with South Korean battery maker SK Innovation for nickel and cobalt from its flagship Sconi project in QLD.

The agreement is contingent on Australian Mines securing project financing by the end of 2018 and for mining to start before the end of 2020.

Clean TeQ is aiming to start production from its Sunrise project, one of the largest cobalt deposits outside Africa, in 2021.

In February, the NSW Department of Planning and Environment formally issued the mining leases (MLs) over the project area.

The company is currently preparing a mine operation plan (MOP) for approval, which will enable the commencement of site works and construction later in 2018.

#### Game Changers

But these project are years away from production and will not fill the supply gap in the short to medium term.

This has seen companies look for innovative alternatives.

A Samsung subsidiary plans to buy stakes in recycling tech companies to ensure long-term cobalt supply, *Bloomberg* reported earlier this year.

One of these recycling companies is Belgian-based Umicore, which had about 10,000 employees and a turnover of €11.1 billion in 2016.

Umicore chief executive Marc Grynberg told the *Financial Times* that recycling cobalt from used smartphones was an untapped market.

"We have billions of dismissed end-of-life smartphones ... that could be utilised to power millions of electric vehicles. Millions," Mr Grynberg said.

"If there is one thing that needs to be done ... starting now is to make sure there are mechanisms in place to motivate people to return their disused smartphones."

But recycling will not be enough on its own – projected annual cobalt production from old batteries is a drop in the ocean next to the increase in projected yearly demand.

Companies and researchers are also investigating alternatives; like minimising the amount of cobalt in EV batteries, or replacing it entirely.

Most recently, researchers at Northwestern University in Illinois have created a highly efficient, inexpensive lithium-iron-oxide battery that replaces cobalt with iron.

Professor Christopher Wolverton and his team of researchers, in collaboration with a team of researchers from Argonne National Laboratory, developed a rechargeable lithium-iron-oxide battery that can cycle more lithium ions than its common lithium-cobalt-oxide counterpart.

Professor Wolverton's team has improved upon the common lithium-cobalt-oxide battery by leveraging two strategies: replacing cobalt with iron, and forcing oxygen to participate in the reaction process.

"Four lithium ions for each metal — that would change everything," he said.

"That means that your phone could last eight times longer or your car could drive eight times farther.

"If battery-powered cars can compete with or exceed gasoline-powered cars in terms of range and cost – that will change the world."





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# A growing regional network

## NATIONAL

EIGHT years ago, the company today known as EMS Group was established in Dubbo as Eastern Mechanical Services.

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EMS Group director Tom Cavanagh said it's a continued growth story for EMS in 2018.

"As nationwide demand continues to grow, so too does our team, our facilities, and our capacity, with field servicing now available anywhere in Australia," Mr

Cavanagh said.  
"This year will see significant new EMS investment across Australia, with a new office just opened at Orange to complement our Dubbo headquarters and presence in Sydney and Perth.

"We've extended our state-of-the-art workshop at Dubbo where our skilled team completed 10 major rebuilds last year.

"Already this year the team has undertaken four major rebuilds.

"With 90 per cent of our growing team living in regional areas, we're looking forward to servicing Australia's vibrant, growing mining industry."




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# A STRONG VISION

**British billionaire Sanjeev Gupta's GFG Alliance is on an Australian spending spree. The new owner of Arrium's Whyalla has big plans to put Australia on the map as a global leader in vertically integrated steel and aluminium production — and the path to achieve this is nothing short of impressive.**

*All images: GFG Alliance.  
Photography: Sean Kelly.*



Sanjeev Gupta was named 'CEO of the Year' at the prestigious S&P Global Platts Global Metals Awards in London in 2017.

## ELIZABETH FABRI

GFG's landmark acquisition of Arrium's Whyalla steelworks in August 2017 was just the first step in Sanjeev Gupta's plan to transform Australia's steel and aluminium industry, and become one of the country's largest renewable energy producers.

Mr Gupta has already made a big name for himself and his \$14.5 billion business in the UK — and more recently the US and Europe — where he has rescued and revived a number of distressed metals, mining, engineering and power generation operations over the last three years.

His core business strategy is to own and manage as much of the supply chain as possible — adding value at each stage.

The GREENSTEEL model is designed to secure a competitive, low-carbon future for metal manufacture through recycling, use of renewable energy and vertical integration; defying common perceptions of metal manufacture as a dying industry.

In Australia, Mr Gupta plans to replicate this business model.

In April 2017, the group announced it had employed senior international metals and mining executive Michael Morley to spearhead the acquisition of the Arrium business.

But Arrium, the cornerstone of the Group's Australian strategy, wasn't always a 'done deal' for GFG Alliance.

The acquisition took months of back and forth and extensive research, Mr Gupta's right hand man, GFG Alliance chief investment officer and SIMEC Group energy and mining chief executive Jay Hambro said.

"It was very tiring, I commuted back and forth from Europe to Australia about 12 times last year, and never for more than about five days at a time," Mr Hambro told *The Australian Mining Review*.

"But doing that sort of travelling gives you plenty of time to think and contemplate your actions, and I think we set about that [acquisition] process very effectively.

"We did a huge amount of due diligence on all of the businesses, and we had a very good team analysing it which put us in a very strong position.

"We also enjoyed a strong relationship with the Government and got to know Malcolm Turnbull and Minister Sinodinos very well.

"They said 'look, we want companies like you in Australia, and we look forward to working with you to provide the environment you need to invest here'."

The acquisition was a two horse race, with a Korean consortium also vying for the Arrium assets.

However, Mr Hambro said it was always comforting knowing the Australian people and Government were in its corner.

"I think it was heart-warming whenever we were involved that people wanted us there," he said.

"We are a group that has a long history of industrial growth, a very strong history of industrial turnaround, and so we were always very welcomed by the management team because I think they saw us as a safe pair of hands to steward this business onwards.

(CONTINUED ON PAGE 22)



# Rising from adversity

NATIONAL

WHEN Arrium entered voluntary administration in 2016, Aquest Electrical had no idea what 2017 would hold for the company.

“It turned out to be a very adventurous year,” Aquest director Darren Hage said.

“We made the decision to knuckle down, adapt and survive.”

2017 began with a major fire on the Whyalla FOTB Barge, with Aquest working long hours, and enduring extreme temperatures to get the Barge back into operation for Arrium exports to get back on track.

Aquest then supervised Australian, Singaporean and Malaysian crews installing waterslides and Wi-Fi networks on the Pacific Dawn cruise ship located in Singapore Dry Dock.

“We also played the main role in the installation of the IPF for the Arrium/SIMEC mines,” Mr Hage said.

This was followed by the installation of an additional iron ore washing plant EVOwash at the OBP Baron for Mineral Technologies/ Downer Group, all while carrying out major electrical upgrades to the pump stations Katunga and PS3 for critical supply water management required to operate SIMEC Mining Operations.

Furthermore, Aquest completed a major electrical upgrade of #1 RAM at Liberty



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

Onesteel iron making.

On the Santos Port Bonython Jetty, Aquest completed the Capstan winch replacement in hazardous area and upgraded the cathodic protection to the entire jetty structure for the Department of Planning, Transport and Infrastructure.

“We completed all this and much more,

while looking after our long term customers Lucas, BIS, Olssons, Flinders Power, Liberty Onesteel and SIMEC; not forgetting BMFS - Department of Planning Transport and Infrastructure,” Mr Hage said.

Mr Hage added that Aquest management were extremely proud of their employees who put in massive efforts

for the customer.

“Most importantly, we completed these important and often high risk tasks without incident or injury,” he said.

“The future looks bright for those willing to have a go and Aquest looks forward to providing ongoing support for the industry in 2018 and beyond.”

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(CONTINUED FROM PAGE 20)



**"We are trying very hard to debunk the culture of 'dig and deliver' by generating more value within Australia."**

"There were a many moment where they [the Korean consortium] were beating us, and we were beating them, but I was also confident that we had the best proposition for the business and that's what we're delivering now."

#### A Turnaround Strategy

Through its Arrium takeover, GFG Alliance inherited the 1.2mtpa Whyalla steelworks and its 10mtpa iron ore mining operations in South Australia's Middleback Ranges; Whyalla port and rail; the OneSteel steel Scrap Recycling business; 4mtpa OneSteel secondary steelworks; Australian Tube Mills; and OneSteel Reinforcing, ARC and OneSteel metal centres.

The mining and port operations will be operated under GFG's SIMEC Mining and SIMEC Infrastructure business, while the steelworks and OneSteel assets will be operated under the umbrella of Liberty OneSteel.

SIMEC's new mines incorporated the Iron Baron, Iron Knob and South Middleback Ranges mine sites, which collectively produce hematite and magnetite iron ore that is respectively railed and piped to Whyalla.

Following the takeover, Liberty OneSteel embarked on a 100-day review of the business to finalise a transformation plan to ensure the long term sustainability of the Whyalla operations.

Mr Hambro said most of the mistakes that had been previously made were at a corporate level regarding the balance sheet.

"We didn't turn up on day one and say 'you're doing it wrong – you need to do it the GFG way'," Mr Hambro said.

"We set a 100 day program whereby we listened to and worked with [Arrium employees] to understand how they were [running the business], to understand their bright ideas for the future of the business, and also try to provoke a broader thought program to discover different ways they could do things," Mr Hambro said.

"We had a fundamental plan that we were recommending, but there is obviously no point when you buy a business to impose your plan on day one.

"You need to understand the business, and the people that understand it best are those that have worked there for many years."

## GFG ALLIANCE IN BRIEF

### Liberty

GFG Alliance's industrial and metals business Liberty is a large steel and aluminium producer and participant in high value add or 'advanced engineering' products. Headquartered in London with global hubs in Dubai, Singapore, Sydney and Hong Kong, the group has five divisions – Commodities, Recycling, Steel, Aluminium, and Engineering, and trades in more than 50 countries.

### SIMEC

An acronym for Shipping, Infrastructure, Mining, Energy and Commodities, SIMEC is a fully independent company owned by Sanjeev Gupta's father Parduman K. Gupta. In South Australia, its mining division (iron ore and coking coal) supplies the raw material for the Whyalla blast furnace and to third parties. On the energy front, SIMEC is the largest developer of renewable energy projects in the UK and specialises in trading energy and energy related commodities. It also owns commercial ports, railway stock, marine fleets, and storage facilities.

### Wyelands

The other pillar to GFG Alliance is its Wyelands financial services group which comprises an independent bank and financial advisory services business. The British bank is focused on global trade and was established to help industry grow and enable businesses to trade more easily around the world.

### Jahama

Jahama Estates is GFG Alliances' property business. It operates a wide portfolio of industrial, commercial, residential and agricultural properties across four continents with the majority in the UK. It is currently the fifth largest private land owner in the UK.

The 100 day program concluded in December, and later that month GFG announced its final concept plan for a \$1 billion transformation of the Whyalla operations.

The transformation investments included feed preconditioning and utilising latest technology to reduce ferrous feed costs for the steelworks; co-generation and the capture of process off-gases to improve steelworks energy efficiency; targeted modernisation and capacity upgrade investments across the steelworks and the rolling mill; and investments to increase production by about 50 per cent to 1.5mtpa.

The group was also looking to improve logistics around the transport of materials from the mine to Whyalla, as well as shipping.

"We brought in our global network to support that. Our shipping team based in Singapore spent a huge amount of time working with the Whyalla team to help them fit into our global [transport] network moving material around the world," Mr

Hambro said.

The group was now undertaking a detailed feasibility study on the transformation, of which \$50 million will be funded via a South Australian Government grant.

"We are moving it effectively from concept stage through to where you can press the button on a plan to construct, and that will begin to be enacted throughout this year," Mr Hambro said.

The next step in its master plan was an acquisition of Glencore's Tahmoor metallurgical coking coal mine in NSW in January.

Mr Gupta said the deal was a key element of GFG's transformation plan for the Liberty OneSteel Whyalla steelworks to optimise and expand production.

"Through this purchase we secure and de-risk an important feed for the Whyalla steelworks," Mr Gupta said.

"This, together with our iron ore mines in South Australia, now makes GFG the only fully-integrated Australian steel

producer, whether from iron ore and coking coal to primary steel, or from scrap metal and renewable energy to GREENSTEEL."

Mr Hambro added the Tahmoor coking coal was well known and regarded in the domestic and international markets for its grade and quality.

"It was a natural buy for us because it is a supplier for Whyalla," Mr Hambro said.


"At the moment it does about 5 per cent of its product to Whyalla, we have a view that we could take that up to 30 per cent."

Later in the month, SIMEC Mining also received approval for two mining leases to develop the Iron Sultan mine, which will provide 600,000 tonnes of 'cheap' iron ore to the steelworks, and the Iron Warrior mine, capable of exporting up to 1.5mtpa.


When asked when these could be brought into production, Mr Hambro said it was not immediate, but would be "within the next few years".

(CONTINUED ON PAGE 24)





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(CONTINUED FROM PAGE 22)

### Renewables Focus

In early February, GFG Alliance's SIMEC committed \$1.7 million towards pre-feasibility studies for its Middleback Pumped Hydro project.

Middleback is a key plank in the Group's plan to establish 1 Gigawatt of additional dispatchable renewable energy generation in South Australia for the Whyalla steelworks and other industrial and commercial users.

The pumped hydro project would use exhausted mining pits from the SIMEC Mining division as reservoirs for storing hydro power.

Study costs will be partially supported by a \$500,000 grant from the State Government.

Mr Hambro said role of Tesla's recently installed battery array in South Australia for power storage was widely misunderstood.

"If you fully used those batteries they would last for four minutes at 100MW," he said.

"Our pumped hydro is 100MW but would last for four hours.

"The battery array serves an important purpose, but I don't think it serves the purpose that people think. It does something called frequency response and it deals with short term blips in demand and supply, whereas pumped hydro is a hard work course of generation."

Mr Hambro encouraged more mining and energy companies to collaborate to utilise legacy mining projects for future renewable energy generation.

"Australia has a huge amount of scope to establish this type of generation," he said.

"The Prime Minister says he doesn't want to see projects that are just solar or just wind; they've got to have some storage component to them as well, which is very sensible.

"If you can create a storage site like we're doing at Middleback, it absolutely fulfils what the country, and particularly South Australia, needs."



### The Next Phase

Mr Hambro did not rule out diversification into other industries when it came to future acquisitions.

"We have an opportunistic view on life," he said.

"I have big business development team who spend their life pouring over projects and if we see a role for us in a different metal or a different commodity, we will jump on that."

Electric vehicle manufacture could be a new market for GFG. In February, rumours circled that the group had approached General Motors to buy assets from the closed former Holden factory; a proposal that was reportedly rejected by the car giant.

However, Mr Gupta has floated plans to build a modern electric 'people's car' similar to the VW Beetle, which would cost much less than the Tesla S model.

Mr Hambro said the company "definitely has an interest in electric vehicles", but

couldn't comment on the specific situation in South Australia.

He added overall the vision for GFG in Australia was creating an integrated end-to-end business.

"Australia has a history of what mining companies call 'dig and deliver'," Mr Hambro said.

"You will dig up a product and ship it offshore – it's the same in various sectors.

"Malcolm Turnbull said to me 'Jay, we have a long history of producing wool, sending it overseas and buying Italian suits'.

"There is not enough focus in the country on adding value, and that's what we're doing.

"We will not just produce the steel in Australia. We will use what we now have – which is 150 distribution centres across Australia – and create a higher value-add product for the Australian domestic market and export.

"We are trying very hard to debunk the culture of 'dig and deliver' by generating more value within Australia."

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“An important service we provide is to assist clients in understanding the true value of their product when it lands at their door here in Australia,” PFS director Rebecca Young said.

“Knowing the landed cost of the goods you are importing (the total price of a product including the original price, all transportation fees, customs, duties, taxes, insurance, currency conversion, crating, handling and payment) is vital to be able to gain an understanding on the viability of it in a retail market.

“The cost of importing goods can equal if not exceed the actual purchase price of your goods, so we ensure all our clients are making viable decisions on the products they are either selling or using.”

With extensive experience moving freight into and out of Australia, PFS has developed a strong footing in the resources industry.

In the last few years alone, the company has coordinated multiple shipping container and breakbulk shipments, bringing together shipping lines, customs brokers, international



Personalised Freight Solutions services a wide range of clients in the mining sector, including GFG Alliance.

trade, excise consultants and trucking companies, to ensure all shipments are moved through borders and to site in the set time frame.

One of its recent projects included coordinating 200 container shipments from Ireland to GFG Alliance’s Iron Knob and Iron Barron mines in South Australia.

The containers were shipped from Belfast to Adelaide, and then trucked from the wharf to the global giant’s operations near Whyalla.

“The key element to this project was the communication given to our customer throughout the project,” Ms Young said. PFS are currently completing two

separate projects in the energy sector.

Shipping more than 200 containers over a three month period, Shanghai to Sydney and Melbourne, these moves see PFS servicing two of Australia’s leading infrastructure companies.

More information on PFS services can be found at: [www.personalisedfreightsolutions.com](http://www.personalisedfreightsolutions.com).



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Image: Lighthouse Minerals.

# REJUVENATION

**Initiatives by the Queensland Government to boost exploration and support employment diversification aim to attract investment and protect employment in the region from the cyclical nature of the resources sector. However some feel that addressing high energy prices as a priority may do more to lift North West QLD's economy.**

## CAMERON DRUMMOND

COVERING 10 local government areas, the 375,000sqkm North West Minerals Province (NWMP) contains major copper, lead, zinc, silver and phosphate deposits and well defined rare earths potential.

The NWMP is home to about 34,500 residents, mostly based in Mt Isa, with 60 per cent of jobs that directly or indirectly support the mining industry.

The significance of the mining industry and the remoteness of the region has meant the NWMP has traditionally been exposed to fluctuating commodity markets.

The Province recently went through some tough economic challenges, as end-of-life or uneconomic operations closed their doors and investment into the resources sector dried up.

These challenges prompted the QLD Government to establish the North West Minerals Province Taskforce in November 2015 to identify issues affecting the mining industry and plan a way forward.

The taskforce identified the need for more efficient uses of existing infrastructure, improved exploration and mining approvals processes, greater exploration success, and strategies to attract fresh investment capital.

Those recommendations helped structure the QLD Government's *Strategic Blueprint for Queensland's North West Minerals Province*, a \$39m funding package released in mid-2017 aimed at building on existing economic and community strengths in collaboration with industry, business, and community leaders in the Mt Isa and Cloncurry regions.



MMG's Dugald River zinc mine near Cloncurry, QLD.

Image: MMG.

It facilitates continued resources sector development, and the cutting of red tape to help get projects off the ground.

QLD Natural Resources and Mines minister Dr Anthony Lynham said the blueprint also had a second objective; a stronger economy through diversification.

The State Government would collaborate with other levels of Government, business and industry groups, and communities to support a more diversified and sustainable economy by leveraging existing economic and community strengths.

## Strategic Resources Exploration Program

In support of the NWMP blueprint, QLD's Department of Natural Resources, Mines and Energy will spend \$27m over four years to boost exploration and support new mine developments.

Led by the University of Queensland (UQ), the Strategic Resources Exploration Program will focus on providing the tools, datasets and knowledge needed by explorers in North West QLD to drive a new wave of

mineral discoveries.

The initiatives include \$4.3m for mineral geophysics to pinpoint the locations of potential new mineral prospects over wide areas; \$1.45m for mineral geochemistry programs; \$5m for mineral synthesis; and nearly \$1m for national research into advanced discovery techniques.

Professor Rick Valenta of UQ's Sustainable Minerals Institute (SMI) and the WH Bryan Mining and Geology Research Centre said this new compilation and data collection collaboration would take a more holistic approach to the way the industry tackles challenges.

"The North West Queensland region has one of the most highly endowed belts of copper, zinc, lead and silver in the world, and yet less than a third of the region has been effectively explored," Professor Valenta said.

"The challenge of exploration under sedimentary cover has meant that industry has not been able to maintain the required rate of discovery, and mineral explorers need the best possible data and knowledge to be able to improve success rates in that environment.

"There is an untapped resource of geological information available from public and industry sources, and our objective is to put this information into a form which maximises its usefulness for exploration, and applies best practice analytical techniques to extract full value from it.

"We aim to carry out new studies which will help explorers to target and drill new orebodies in the region."

(CONTINUED OVER)



## (CONTINUED FROM PAGE 27)

Other participants in the program include the Geological Survey of QLD, Geoscience Australia, James Cook University, University of Tasmania, University of Western Australia, University of Adelaide, and the CSIRO.

Mount Isa Mayor Joyce McCulloch said her council was pleased with the early engagement with the program.

"We are very pleased to see the North West Minerals Province at the forefront of the excellent work of Geoscience Australia, mapping mineral resources in our region and sharing the data with prospective investors," Mayor McCulloch said.

"There is no doubt over time this will pay dividends for the Mount Isa economy and generate jobs in our community."

\$3.6m will fund the QLD Government's Collaborative Exploration Initiative (CEI), designed to stimulate investment in under-explored parts of North West QLD, and test innovative exploration using a broad range of techniques.

The CEI encompasses drilling and non-drilling activities including seismic, airborne and ground geophysics, and geochemical surveys.

Eligible activities added to drilling include mobilisation, pad preparation, and selected downhole analysis.

The first round of CEI grant funding (\$1.13 million) was awarded in December 2017 to 9 companies, including Capricorn Copper and Minotaur Resources.

### Missing the Mark

While the funding is a welcome injection into North West QLD – and buoyant commodity prices have spurred a rejuvenation of some projects – miners and community representatives in the region have cited energy prices as a major factor deterring investment.

State member for Mt Isa Robbie Katter said the blueprint was a step in the right direction, but \$39m would not address the immediate issues facing the economy in QLD's North West.

"The costs and handling of energy, transport and water supply are the main issues holding back investment," Mr Katter said.

"If I had to choose one issue that causes the biggest problem its energy, both gas and electricity.

"Since 2012 I've been speaking in parliament about the negative impacts the LNG industry could have on the domestic economy.

"Unfortunately we have exceeded even the worst expert forecasts of how high local gas prices could get.

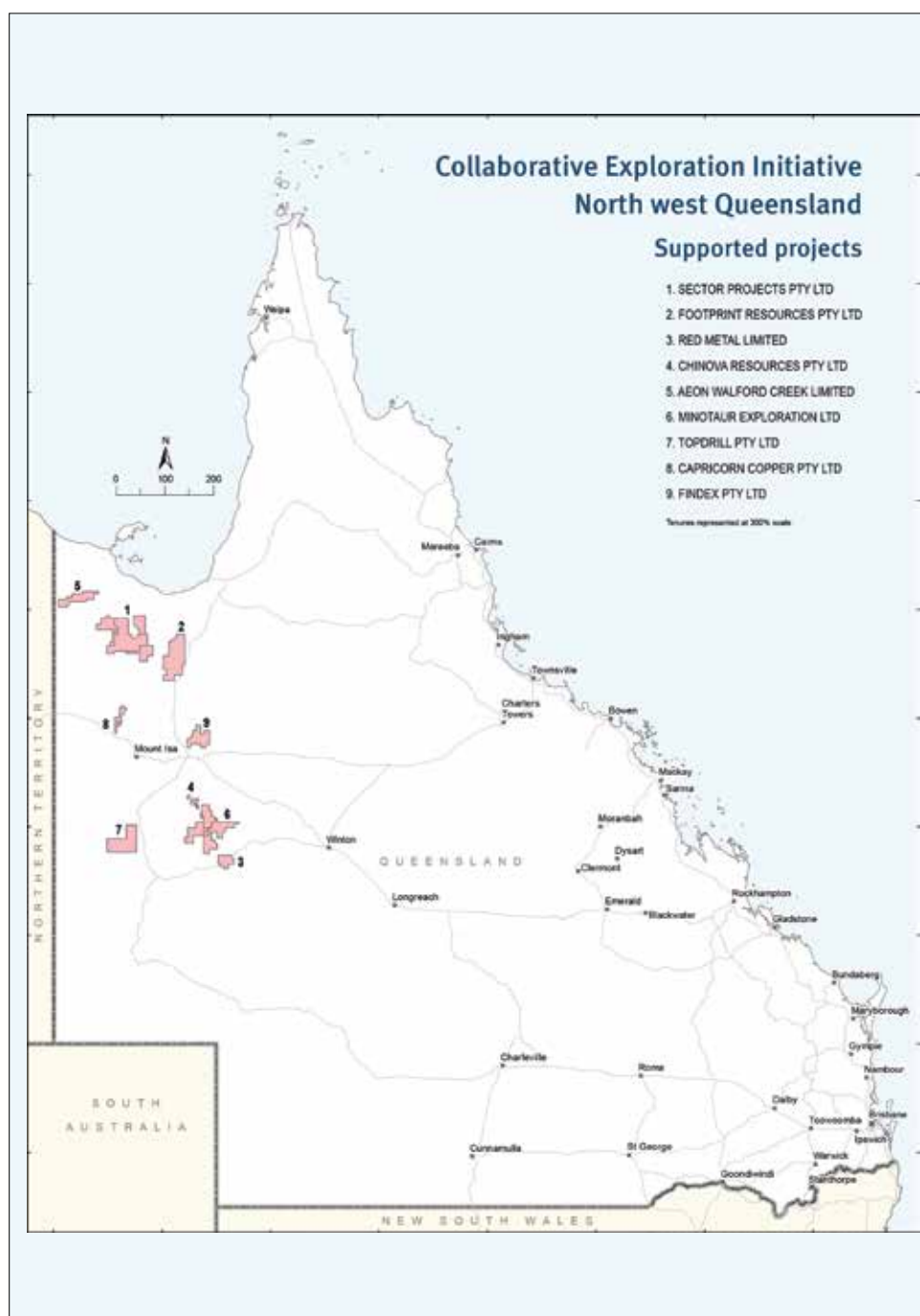
"It's not uncommon to hear of companies who were paying \$4-\$6/GJ to be offered up to \$20/GJ for new contracts."

Glencore, which employs about 2000 personnel at its mining and smelting operations in Mt Isa, stated in mid-2017 that the high cost of energy could force it to shut down its operations.

In a May 2017 letter to the Federal and QLD governments, Glencore's former copper director Aristotelis Mistakidis warned that the miner couldn't guarantee the long-term future of its copper plants if electricity prices continued to rise.

"If electricity prices continue to rise, Glencore will be forced to consider the future of our copper processing assets across north QLD, as well as future investment in energy-intensive operations," Mr Mistakidis said.

"Given the current electricity prices add uncertainty around future supply, we need to consider options for shutting our smelter



## EMPLOYMENT REVIVAL

### • MMG's Dugald River Zinc Project

Employment: 400

Status: Operational

### • Capricorn Copper JV Copper Project

Employment: 220

Status: Operational

### • Glencore's Lady Loretta Zinc Project

Employment: 250

Status: Restarting

### • CuDeco's Rocklands Copper Project

Employment: 200

Status: Operational

### • New Century Resources' Century Zinc Project

Employment: 200-300

Status: Restarting

### • Altona's Cloncurry Copper Project

Employment: 200

Status: Near Completion



Dugald River's main decline.

and refinery and ship copper anodes direct to market and/or refine at one of our other plants offshore.

"While our business acknowledges the efforts of the QLD Government to consider options for maintaining and extending our smelting and mining operations, the investment environment in Australia has materially changed."

The price of copper has trended up quite substantially since that time, but the Federal and QLD governments have begun implementing measures to increase domestic gas supply to lower prices; including domestic supply agreements with major gas producers and construction of the \$800m Northern Gas Pipeline.

In February, Santos signed a \$100m agreement to supply natural gas to New

Century Resources' Century zinc mine near Mt Isa.

"The gas sales agreement we've reached is innovative in both its flexibility and pricing, making it commercially attractive for both parties," Santos marketing and trading executive vice president Phil Byrne said.

Securing gas in the currently tight Australian east coast domestic market was identified early by New Century management as a key risk to the successful development of the project.

The entry into this gas supply agreement allows the company access to gas fired power generation for the operations, as opposed to more expensive on site diesel generation.

"After a highly competitive tender process for the supply of gas, we are thrilled to have entered into a long term contract with our

partners at Santos and look forward to a strong working relationship as we transition into full operations at Century," New Century utilities manager Michael Pitt said.

Mayor McCulloch said Mount Isa was also eager to become part of the solution to shortfalls in gas supply and help attract industry back to the region.

"We believe there is a lot of upside to the gas industry in our region," Mayor McCulloch said.

"We'd like to see more thinking from Government and industry about how to leverage these developments to help position Mount Isa as a substantial national gas hub and attract new gas exploration and production companies to the North West QLD region."



# Jewel in the crown

## QLD

THE world's richest deposit of minerals including copper, silver, lead, zinc, gold, uranium and rare earths such as vanadium, cobalt and molybdenum lie below the ground in QLD's North West around Mount Isa and Cloncurry.

With more than a hundred years of mining activity and billions in production and export income for Australia, the region has considerable infrastructure to facilitate the next generation of mines.

The MITEZ corridor has a thousand kilometres of rail line connecting the mining region to one of Australia's major ports at Townsville with shipping connections to other countries.

Power is generated at two power stations at Mount Isa and a number of transmission lines to provide energy to mines and processing plants.

Water storages and pipelines are in place to provide new projects with water



MMG's recently opened Dugald River mine in QLD.

for mine and urban use.

Transport infrastructure such as road, rail and airports are well developed with plans for new common-user infrastructure

such as rail loading facilities to cater for future customers.

North West QLD is considered the 'jewel in the crown' of Australia's mining regions

with its excellent prospectivity, established infrastructure, community amenities and natural environment that offer a great lifestyle for workers and families.

*Come, explore, invest and develop*

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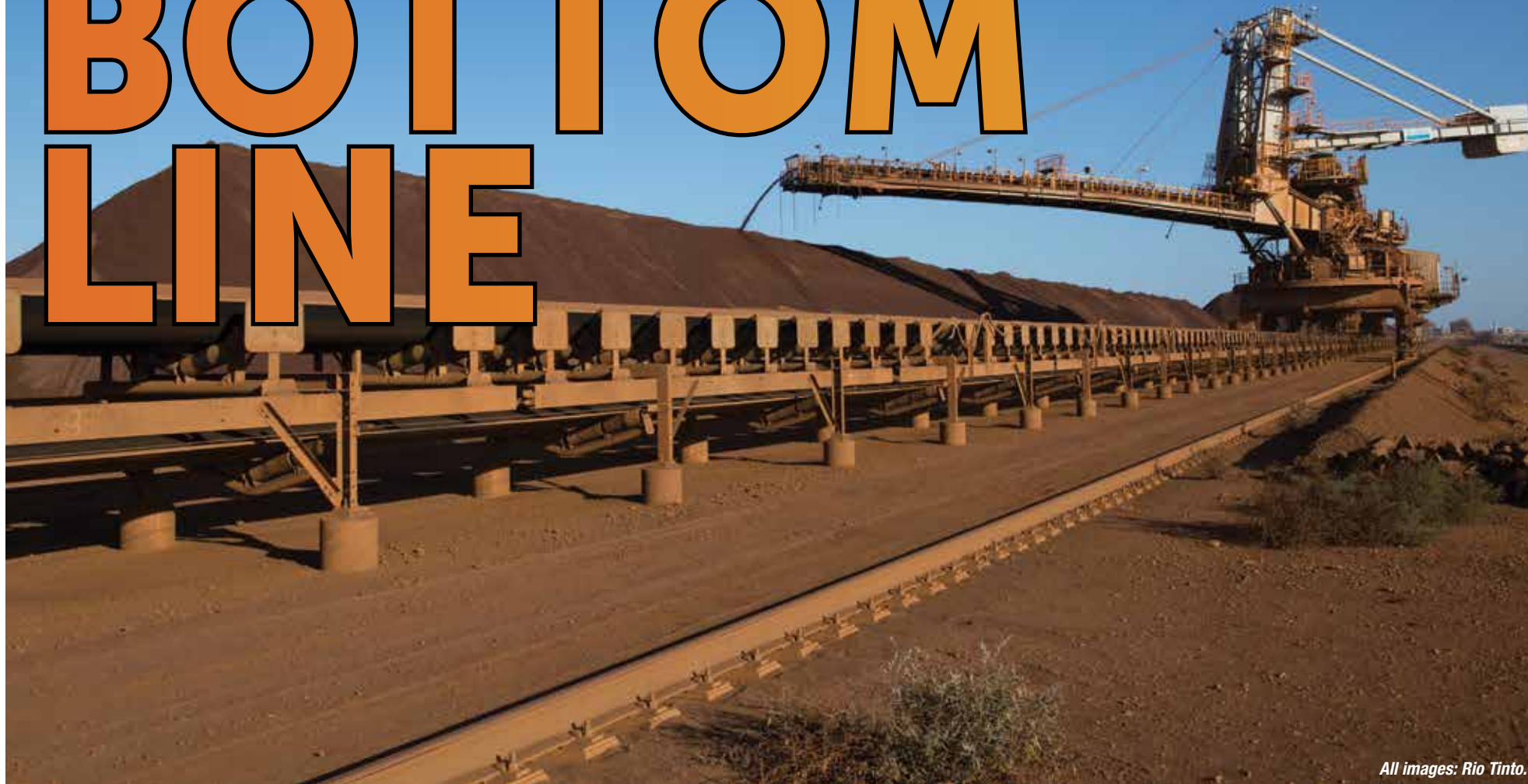
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# THE BOTTOM LINE

It capped off a strong 2017 calendar year with \$US8.8 billion in profit, but Rio Tinto is increasingly focussed on reputation and its social license to operate, both here and abroad.



All images: Rio Tinto.

## ELIZABETH FABRI

RIO Tinto is riding high on the back a 90 per cent increase in net profit compared to 2016.

It was a successful year on many fronts, with Rio Tinto's flagship iron ore division celebrating the opening of the \$US338 million Silvergrass mine.

Iron ore prices were also working in its favour, as China's increased appetite for higher grade ore continues following the nation's winter steel curtailment policy.

However, like many of its peers, the company's global 'social license to operate' has been put under a microscope.

Last October, the US Securities and Exchange Commission (SEC) charged former Rio chief executive Tom Albanese and former chief financial officer Guy Elliott with covering up multi-billion dollar losses on Mozambique coal assets.

And while Rio has vowed to defend the charges, this is just one of a few issues the company has not quite shaken off.

Rio is also facing pressure in Mongolia over alleged lack of transparency at its Oyu Tolgoi project, recently receiving an additional \$US155m bill from the Mongolian Government after an audit of taxes paid between 2013 and 2015.

Weeks later, the Dutch Centre for Research on Multinational Corporations (SOMO) and Oyu Tolgoi Watch published a report claiming Rio Tinto and Turquoise Hill Resources' Oyu Tolgoi mine led to nearly \$700m in tax losses for the Canadian and Mongolian governments.

In a letter to SOMO, Turquoise Hill chief financial officer Luke Colton said Oyu Tolgoi and its investors were "committed to tax transparency" and that their tax practices were "not only compliant with local laws,

international standards and voluntary commitments, but that the OT operation is substantially contributing to Mongolia's economy and long term development".

In WA, ahead of the 2017 State election, the WA Nationals proposed a \$5 per tonne iron ore royalty if they were elected, which would have stripped more than \$1.5 billion a year from Rio Tinto's pre-tax earnings.

At the time, WA's iron ore miners stated that the royalty increase would put jobs and local businesses in jeopardy.

WA Nationals leader Brendon Grylls may have lost his seat after the mining lobby successfully campaigned against his

proposal, but new Premier Mark McGowan said the Nationals had tapped into rising anti-mining sentiment.

"During the last election campaign there was a rich vein of hostility that was mined by Brendan Grylls," Mr McGowan said in April last year, via the ABC.

"I think the mining industry needs to be very aware of that and make sure they avoid the problems occurring again."

Rio Tinto iron ore has since ramped up its emphasis on local procurement, apprenticeships and fairer supplier payment terms as part of a wider campaign to highlight and boost its reputation as a

contributor to society.

## Social License

In May 2017 Rio Tinto reduced payment terms for its Australian suppliers to 30 days, after extensions to payment terms a year prior from 45 days to 90 days caused backlash.

Rio also pledged WA and Pilbara Aboriginal businesses would be given greater opportunities to bid for contracts for its Pilbara iron ore mines.

(CONTINUED ON PAGE 32)

## 2017 HIGHLIGHTS

- Pilbara production **329.8mt** (Rio Tinto share 271.3mt) compared to 329.5mt in 2016.
- The Iron Ore group's **underlying EBITDA of \$11.52 billion** and **underlying earnings of \$6.692 billion** in 2017 were 35 per cent and 45 per cent higher, respectively, than 2016.
- The **Silvergrass mine** and conveyor system was commissioned in August and processed about 2mt by the end of 2017.
- More than 60 per cent of train kilometres have been completed in autonomous mode as part of **AutoHaul**.
- The **Koodaideri project feasibility** was approved in May 2017.



# Ethical e-procurement systems

NATIONAL

IT'S difficult to imagine a modern competitive business thriving without robust e-procurement procedures, despite the technology being just over a decade old.

Procurement of most products and services via the internet on a macro level is now customary.

Face to face purchases consume time, money, labour and resources.

Online procurement is an immutable element of successful industry and mining and will be into the future.

The commercial challenge for 2020 and beyond is companies handpicking a strategic partner for e-procurement.

Partnership choice based on expediency is fraught with risk and the industry is besieged with firms that over promise and under deliver.

Online Procurement Services, a leading Australian-owned and operated e-procurement specialist, has amassed hours of supplier negotiation combined with leading edge systems development, then distilled it into a user-friendly procurement and payment process with inbuilt supplier onboarding, P2P and three-way invoice matching process.

Throughout the bid, delivery and closeout stages, regardless of the range of goods and services needed, Online Procurement Services procedures eliminate risk to the organisation.

The Online Procurement Services



Online Procurement Services' clients range from SMEs to major blue chip companies.

management team are all renowned specialists who have forged revolutionary advances in e-procurement.

They share a combined passion to help organisations such as Rio Tinto and others, and partner with local businesses for the benefit of entire communities through local procurement programs.

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is as endless as the range of service level outcomes.

The choice of firms with a personal interest in a client's procurement needs aligned with ethical standards is far scarcer.

Online Procurement Services has simple but robust procedures, tailored cloud based and mobility compatible

systems supported by thorough onboarding standards.

For a client's own peace of mind, they can request a free demonstration by visiting Online Procurement Services' website [www.onlineprocurement.com.au](http://www.onlineprocurement.com.au).

It costs nothing to ask, and the company's solutions can save clients more than just money.

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# Identify local suppliers by category and demographic

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"Rio Tinto's Pilbara iron ore business has more than 1200 WA suppliers and we make a large contribution to the State economy through local procurement, taxes and royalties," Rio Tinto Iron Ore chief executive Chris Salisbury said at the time.

"Providing more opportunities for WA businesses to secure contracts will further boost the Pilbara and state economy."

In July, the company took this a step further, introducing an online procurement portal to enable businesses to register their interest and view job opportunities more easily.

It is also working with the WA Government and South Metropolitan TAFE to pioneer a new curriculum that will prepare students for the mining industry jobs of the future, and has also teamed up with Murdoch University on a STEM roadshow for regional students.

The biggest news was Rio Tinto's plan to follow in the footsteps of rival miner BHP by launching a brand campaign to reshape its image.

Rio Tinto chief executive Jean-Sebastien Jacques recently told *The Australian Financial Review*, it was planning a series of "local, smart and relevant" advertising campaigns this year in Australia, Canada and Mongolia that would "win hearts and minds".

"Rio and the whole mining industry needs to have a much more compelling narrative about its contribution to society," Mr Jacques said.

"We are seen as part of the problem and not part of the solution.

"Our contribution to society is and always has been significant. We need to tell the story in a better way.

"We are pretty often on the back foot. But we are doing so much good stuff."

(CONTINUED FROM PAGE 30)



**"Providing more opportunities for WA businesses to secure contracts will further boost the Pilbara and state economy."**

# Doing business differently

## NATIONAL

AS one of the largest iron ore employers in WA, WorkPac Group has evolved its approach to be like a mining contractor.

"Having more than 2000 employees in iron ore has required us to evolve into thinking and acting like a mining contractor," WorkPac Group general manager Hamish Griffin said.

WorkPac Group was founded in Perth more than 20 years ago as a specialist provider of workforces to the local mining industry.

The company now employs more than 11,000 workers across a range of industry sectors throughout Australia.

This year, the company will accelerate past the \$1 billion turnover mark and remains privately owned.

"Our private ownership structure provides the agility and responsiveness necessary to innovate and invest in becoming a great deal more than our traditional services provided," Mr Griffin said.

"With such a significant contribution to the sector's productivity, safety and commercial outcomes we are increasing our levels of involvement within the sector and our host clients."

This includes more focus on areas such as collaborative planning, data efficiency, cost inputs and control, quality, reliability, training and health and safety.

"So, what is the difference between



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

a recognised mining contractor and the WorkPac Group then?" Mr Griffin said.

"At its simplest level, it's plant and equipment.

"Aside from this supply, our services are increasingly similar as long as we are afforded greater accountability towards human capital investments and

management.

"On this, we now consider ourselves very much within the iron ore sector, as opposed to an external supplier."

Not all WorkPac Group's clients share this approach however.

"We fully understand that this level of acceptance and contribution takes time, and

a great deal of evaluation, consideration and resources on our clients' behalf," he said.

"Our role is to be successful, capture the evidence and continue to understand and promote where the benefits realisations exist.

"At this point in time we remain extremely positive about this future direction."



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

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## ELIZABETH FABRI

IN the fourth quarter of 2017 the Rio Tinto achieved an annualised production rate of 360 million tonnes of iron ore; a result of new production from the Silvergrass mine and its continued automation drive.

Rio's current iron ore production guidance for the year was between 330mt and 340mt.

When asked in its annual results conference call in February whether guidance could be upgraded to 360mtpa once Autohaul was completed, Mr Jacques said he was not going to "increase tonnage for the sake of it".

"We want to have significant capacity around the railway, so that gives us the flexibility to go up and down depending on the market conditions; that is the value over volume," Mr Jacques said.

"We look at it saying, 'well, if we increase volume what is going to be the impact on prices?'"

"And today as we are having this conversation we are very comfortable with the 330mt to 340mt guidance for this year."

Mr Jacques said Rio Tinto would produce 360mtpa eventually, but would focus on optimising iron ore production to make sure cash flow was maximised; acknowledging that when it adds tonnage, it can have an impact on price.

Further on the automation front, Rio was expanding its autonomous fleet from the current 86 trucks to 140 trucks by 2019 after signing agreements to retrofit existing trucks with autonomous systems.

It is anticipated the retrofit program will help the iron ore business deliver another \$500 million of free cash flow annually from 2021.

Rio was also focused on ramp up of the 10mtpa Silvergrass mine after opening the

project in August, along with its next big development; the \$2.2 billion Koodaideri iron mine.

In May last year, the miner approved investment of \$30.9 million to complete a feasibility study of the Koodaideri project, which – all going well – could begin construction as early as 2019 with first ore delivered in 2021.

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

## Outlook

Mr Jacques said the company was "in good shape" as it navigated its way through the 2018 year, particularly in regards to its world-class Pilbara iron ore blend.

"We don't control the market but we are trying to position ourselves in the best possible way and today the Pilbara brand is a reference product in China," he said.

"It is a reference product and everybody wants more of it."

And with growing speculation the changes to China's emissions policies will be structural, premiums for Rio Tinto's high grade ore could continue.

"All the indications are moving in the right direction; the environmental policies, the fact that they [China] are making money, they are trying to produce more with a reduced capacity and therefore the need for higher quality product," Mr Jacques said.

"Our sense is we are moving closer to a structural change but we are always very cautious.

"What it means for Rio Tinto is very simple – as long as we have the right product in terms of cost, in terms of grade and the right relationship with our customer, then we are very well placed."



# Quality conveyor solutions

## NATIONAL

CONVEYOR Products and Solutions (CPS) has a proven track record delivering sustainable value to customers for their existing operations, as well as greenfield and brownfield expansion projects.

CPS recently delivered high accuracy, light weight, low noise, low rolling resistance idlers for overland conveyors to the Rio Tinto Silvergrass project and the BHP Jimblebar expansion project, exceeding both technical and commercial performance KPIs.

CPS is also supplying high-quality Australian components internationally for the First Quantum Minerals Cobre Panama copper project and other mine expansions in Asia and Africa.

The CPS team work with customers to optimise conveyor components for durability, quality, ease of installation and operational performance for both its construction and operations customers, thus ensuring the overall effectiveness of the conveyor systems.

For the Silvergrass project, CPS worked with the construction contractor and their engineers, using FEA tools to design idlers that met the loading requirements while being high precision, cost effective, easy



Construction of the Jimblebar overland conveyor manufactured by CPS.

to maintain, and simple to install into conveyor modules.

With the addition of pulleys, distributed drive systems, and other technologies to

the CPS product offerings, CPS is now able to offer a complete conveyor component supply solution to a project or operation.

CPS's head office and manufacturing

facilities are located in Perth with additional branches and staff across Australia, and supply hubs in the Eastern States.



## Silvergrass Overland CV2122

CPS is Australia's leading manufacturer and provider of conveyor equipment and solutions. We are proud to have been part of the Silvergrass overland conveyor project team.

9860 Man Hours Injury Free  
5550 Frames  
15700 Rollers  
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Roundel's on-site manufactured steel pipes in the WA Pilbara.

# Leader in corrugated steel

## NATIONAL

THE WA Pilbara is going through a renaissance since the recent mining downturn, with iron ore, lithium, and now a fledgling gold rush providing a plethora of project developments in the region.

As Australia's leading manufacturer of corrugated steel pipes and bolted, corrugated

steel structures, Roundel Civil Products has been supplying to mines in the Pilbara for more than 15 years, through its on-site manufacturing operations and its Tom Price factory.

Recent projects include Rio Tinto's Yandi Oxbow and Yandi Pocket, where the team has manufactured 1100 tonnes of steel culverts on-site for NRW.

Roundel has also worked at Fortescue Metals Group's Cloudbreak mine, which required 150 tonnes of large-diameter culverts delivered from Tom Price.

The company has also been involved in the new lithium mines at Pilgangoora, supplying both steel culverts and stockpile tunnels.

On the East Coast, Roundel's on-site expertise was engaged at Rio Tinto's

Weipa bauxite project in Northern QLD, manufacturing more than 400 tonnes of steel culverts for the project.

The company has also supplied corrugated steel box culverts to local Shires in far-north QLD; the Shires valuing the cost-effective designs, and the speed of installation, offered by steel structures, compared to traditional concrete.



**Australia's leading supplier of corrugated metal pipes and corrugated plate structures for use in road and rail infrastructure projects, as:**

- Drainage culverts and stormwater systems
- Bridge-spans and underpasses
- Conveyor, personnel and stockpile tunnels
- Mine portals and decline tunnels

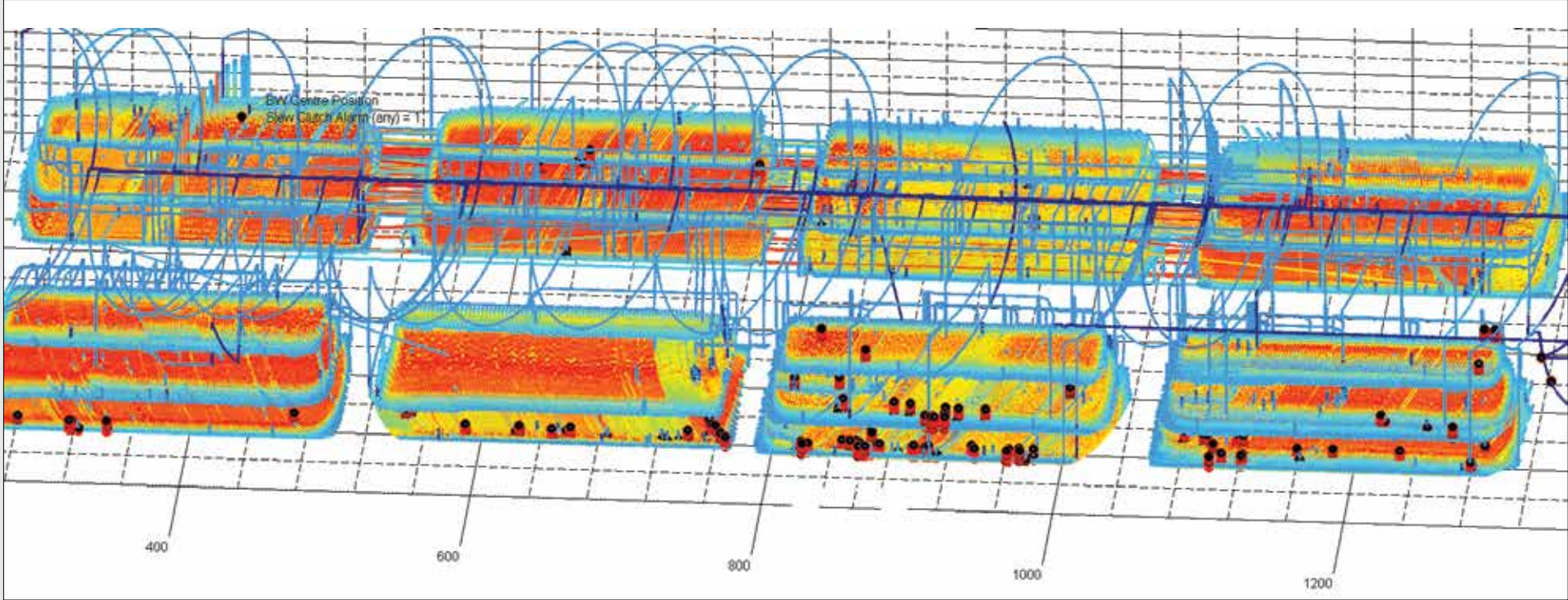
### Manufacturing locations:

Perth, WA	Tom Price, WA	Townsville, QLD
Capella, QLD	Blayney, NSW	

All supplemented by our state-of-the-art mobile mills for on-site manufacture where our experience, and safety record, is unrivalled.



# Servicing brownfields projects



ASPEC provides specialist engineering for ports, mines and infrastructure.

**NATIONAL**

ASPEC Engineering is a consultancy focused on solving brownfield structural and mechanical engineering problems at mines and ports.

The company was established in 2003 and has built a successful business offering personalised service to site engineers, superintendents and managers at mining companies in Australia and internationally.

ASPEC offers value and saves money for its clients by providing solutions to complex equipment failures in the mining industry.

It can also boost their productivity of machinery via control optimisation and incremental upgrades; and improve safety by pragmatically upgrading older equipment to meet modern safety standards.

ASPEC's experienced engineers reduce operational risks with site inspections and

repairs, while also extending the life of existing plant and machinery using an engineering and evidence-based approach to their work.

The company recently conducted refurbishment and replacement studies for 40-plus year old stackers, and developed technical specifications for the owners of new machines.

Further work has included structural fatigue studies and strain gauging of car

dumpers, mobile conveyors and reclaimers, as well as designing lifting systems and slew bearing jacking points for heavy maintenance and analysis of SCADA data for the causes of bucketwheel reclaimer overload stoppages.

ASPEC is a specialist firm with a national footprint, with locations in Brisbane, Newcastle, Perth and Wollongong, long term experienced staff and a large database of corporate knowledge.



ASPEC provides technical engineering support to mines and ports

ASPEC is an engineering consulting firm focusing on large bulk materials handling machinery such as stackers, reclaimers, shiploaders, car dumpers, car positioners, conveyors and surge bins.

ASPEC provides services for many of the major iron ore, coal, manganese, alumina and bauxite producers in Australia.

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## TRICON



# FULL STEAM AHEAD

There's a lot to like about the rapid development of Dacian Gold's Mt Morgans gold project. The miner has set a vigorous pace on the road to production, already coming in under its initial project cost by \$23 million.



All image: Dacian Gold.

## CAMERON DRUMMOND

PRODUCTION from Dacian Gold's flagship \$197 million Mt Morgans project near Laverton, WA is expected to start this month, less than three years after the Dacian board approved its development.

The fast-tracked gold project has been Dacian's sole focus since its \$20m initial public offering (IPO) onto the ASX in 2012.

At that time, Mt Morgans had a resource base of 840,000 ounces (oz) of gold.

In the years that followed, exploration work uncovered a further two, 1 million-plus ounce (moz) gold deposits at Westralia and Jupiter.

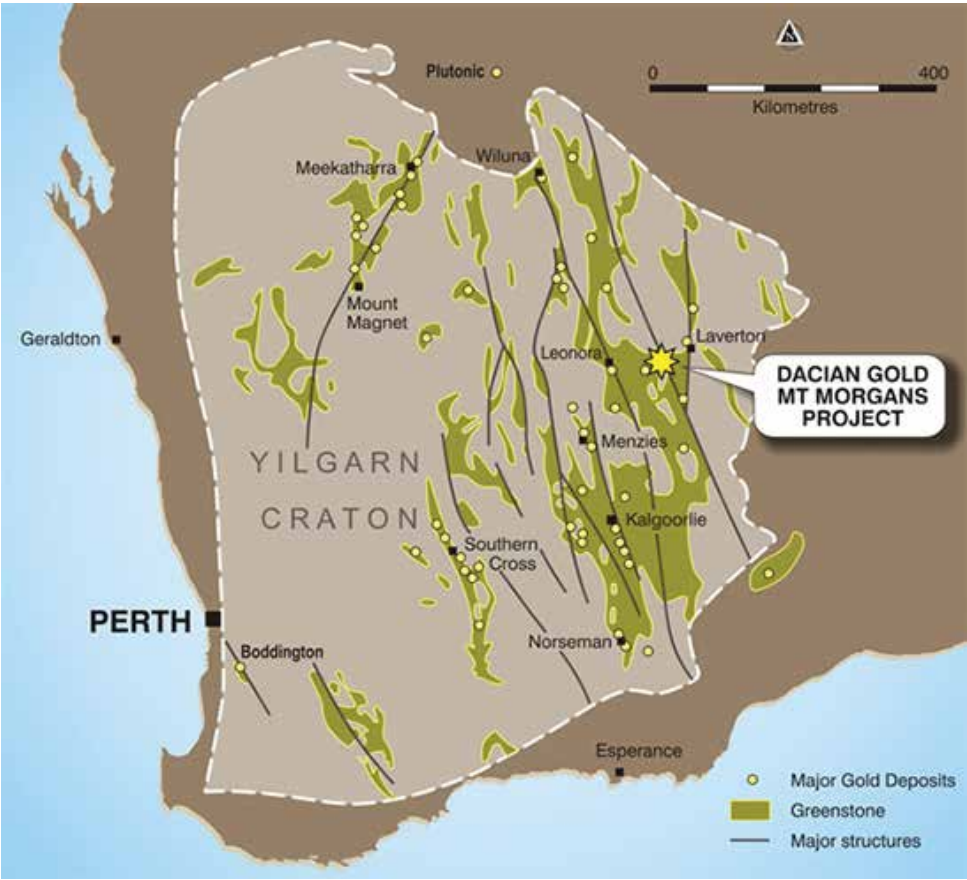
Mt Morgans now has a total mineral resource base of 3.3moz to produce 200,000oz a year across an initial eight-year mine life.

The project's estimated all-in sustaining costs (AISC) of \$1039/oz includes two new underground mines (Beresford and Allanson) beneath the historically mined Westralia pit, which are expected to deliver 492,000oz at a low AISC of \$837/oz over an initial four year mine life.

The large open pit at Jupiter contains 643,000oz at an expected AISC average of \$1193/oz over an eight year period.

Dacian has enjoyed lower than expected infrastructure costs, reduced from \$172m to \$149m.

That infrastructure includes a new 2.5 million tonne per annum (mtpa) CIL



Mt Morgans lies in the eastern edge of the Yilgarn Craton.

treatment plant and tailings storage facility; 400 person accommodation village, mine service facilities at Westralia and other related mine infrastructure.

Dacian executive chairman Rohan Williams said the development and construction of Mt Morgans was

proceeding exactly to plan.

"Thanks to the outstanding work by our staff and contractors, Dacian has achieved what we said we would do," Mr Williams said.

"We remain on time and on budget, which means the project is being de-risked by the day and we are getting

closer to production and cash-flow by the day.

"It's an exciting time for the company as we continue our transformation from developer to gold producer."

**"This exciting discovery comes on the eve of Dacian Gold's transformation into Australia's next significant mid-tier gold producer."**

## Exploration and Expansion

To help bring down the Mt Morgans AISC, Dacian has been concentrating on proving up further resources at Westralia, as Beresford and Allanson are expected to be two of Australia's lowest cost-per-ounce deposits.

Dacian said it would be prioritising the deposits as early production and expansion sources to maximise the cash-margin from the early stage mining at Mt Morgans.

"It remains a core focus for Dacian to extend the Westralia mine area ore reserve life beyond 2021, and the 3.5mt at 6.5 grams per tonne (g/t) for 715,000oz of inferred mineral resource that lies directly along strike and beneath provides the company with the potential to extend the mine life at both Beresford and Allanson," the company stated.

(CONTINUED OVER)



(CONTINUED FROM PAGE 39)

**"We remain on time and on budget, which means the project is being de-risked and we are getting closer to production and cash-flow by the day."**



Dacian said that the first underground stope was fired in late January, and mine development was 873m ahead of its feasibility schedule.

Also underneath Westralia's previously mined underground mine lies the Transvaal deposit, which has an ore reserve of 0.5mt at 3.9g/t for a further 65,000oz and is scheduled for mining in 2020.

Mr Williams said the exploration front was also starting to bear fruit, with RC drilling results released in February confirming the Cameron Well prospect as Dacian's third major discovery.

"RC drilling has now intersected good widths and grades of shallow oxide mineralisation over an area of 1.5km by up to 1km, confirming the mineralisation seen in our original aircore drilling programs laying the foundations for a maiden oxide Mineral Resource," he said.

"This is a very exciting development given the vast extent of anomalism and mineralisation seen in previous drilling over an area of 6km<sup>2</sup>.

"We have commenced a 16,000m RC program targeting a maiden oxide Mineral Resource at Cameron Well.

"In parallel, we have started collecting Feasibility Study data to be used in assessing the potential for oxide Ore Reserves at Cameron Well with the target of announcing a maiden ore reserve by the middle of the year.

"With the additional discovery of at least four bedrock structures below the extensive oxide gold mineralisation, we are confident that Cameron Well has the potential to become the company's third significant mining complex at Mt Morgans.

"With our first gold pour now just seven weeks away, this exciting discovery comes on the eve of Dacian Gold's transformation to become Australia's next significant mid-tier gold producer."

**Project cost: \$197m**  
**Mineral Resources: 3.3moz**  
**Production: 200,000ozpa**  
**Initial 8-year mine life**  
**First gold pour: March**



Cameron Well is emerging as the project's third significant discovery.



Mt Morgans lies in the eastern edge of the Yilgarn Craton.



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GRES develops innovative engineering solutions to a range of major mining projects across Australia.

# Providing global mineral processing solutions

## NATIONAL

GR Engineering Services (GRES) is a market leading ASX-listed process design, engineering and construction company providing safe, quality, cost competitive and timely engineering solutions to the global mineral processing industry.

GRES is currently delivering the Mt Morgans gold project for Dacian Gold and

the construction for the 2.5mtpa plant has commenced.

The Mt Morgans gold project is scheduled for completion in Q1 of 2018 and GRES is proud to have been selected by Dacian to construct its flagship project.

The innovative engineering solutions developed by GRES enable its clients to achieve project success at the earliest opportunity.

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

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

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.





RUC is proud to provide its services to Dacian Gold's Mt Morgans project.

# Underground mining experts

## INTERNATIONAL

OPERATORS face several challenges as they strive to exploit more complex orebodies. Improved development and production rates must be achieved, while ensuring that the quest for an incident-free safety record is not compromised.

For this reason, mine owners are increasingly turning to reputable mining

contractors, such as RUC Mining, who are bringing certainty to underground mining.

RUC Mining is an underground mining and construction expert with capabilities across the full scope of underground mining services, all under one roof.

This means that owners can benefit from improved productivity, cost, safety enhancements and increased efficiency of modern technologically advanced equipment

that only a turnkey mining contractor with all the answers underground, can provide.

RUC Mining are currently the underground mining contractor for Dacian Gold, at its Mt Morgans project – which is on budget, and on time.

RUC Mining has introduced the Epiroc S2 Jumbo into the Australian market and southern hemisphere, which comes with Measure While Drilling (MWD) technology

and full automation capability and recently undertook trials with electronic detonators for development blasting.

As the only manufacturer of raise drills in Australia, RUC Mining has designed and manufactured a custom Strata 80 Boxhole rig specifically for its Mount Morgans contract.

RUC Mining was also the first to fund and implement full fleet real time tracking in 3D in an underground mine.



RUC Mining is a diversified underground mining contractor with an extensive portfolio of completed projects throughout Australia and the Asia-Pacific.

With an extensive fleet of modern equipment and an experienced team of mining professionals, RUC Mining has a reputation for successfully tackling the most complex assignments.

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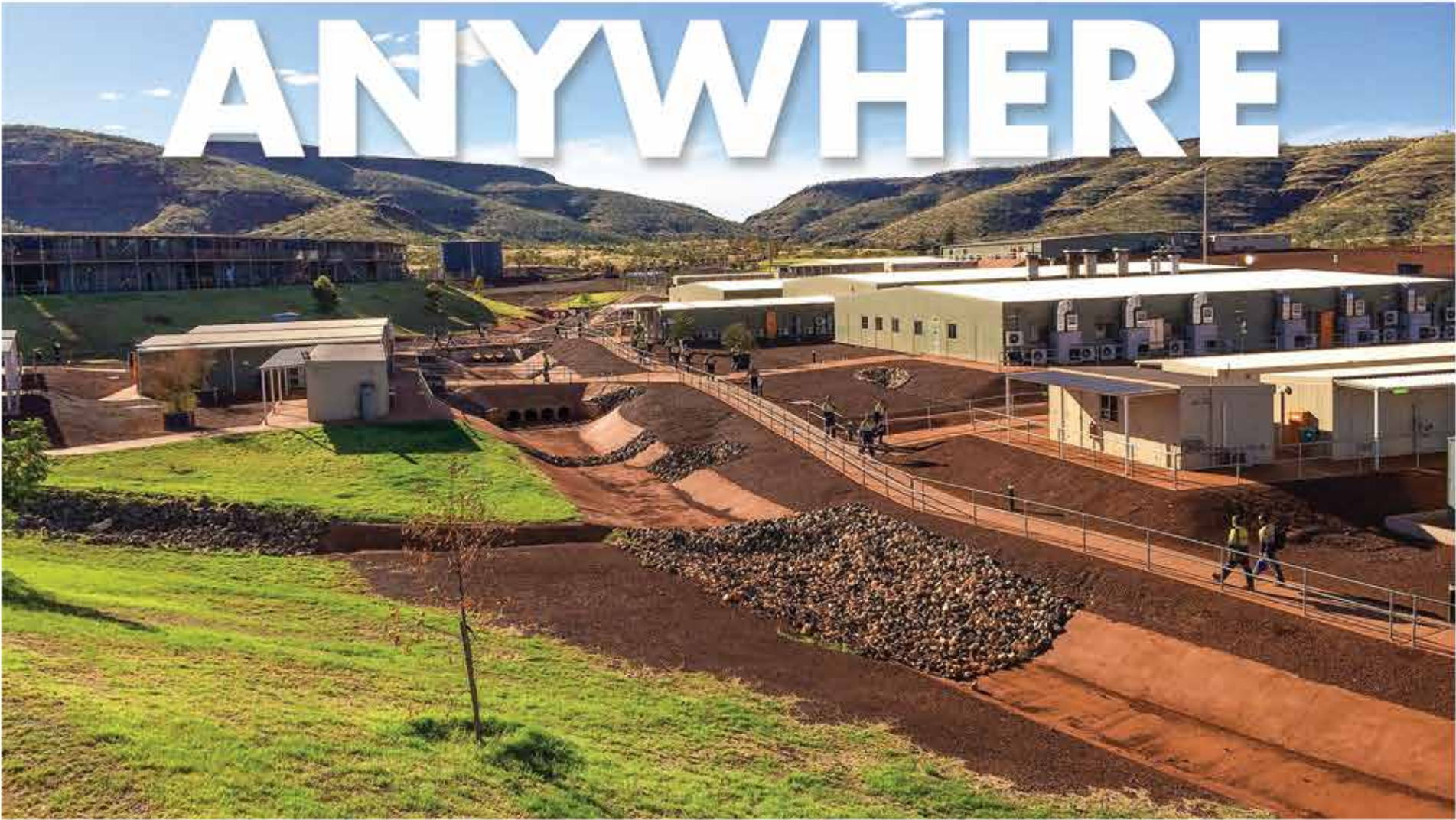
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# HEAVY EXPECTATIONS

Northern Minerals' Browns Range heavy rare earth (HRE) project is underway, with a Stage 1 pilot plant near completion amidst big plans to meet the growing demand for dysprosium.

All images: Northern Minerals.

## CAMERON DRUMMOND

160KM south east of Halls Creek in northern WA, Browns Range represents an opportunity for Australia to become a leading producer of dysprosium outside China.

The little-read-about element is crucial to the manufacture of permanent magnets and a fundamental ingredient in high-torque motors used in wind turbines as well as electric vehicles, which use about 100 grams of the HRE.

Dysprosium makes magnets last longer and retain efficiency at extremely high temperatures.

It also makes up part of the control rods used in nuclear power generation and has a range of military technology applications.

Since Molycorp – a large producer of rare earths (RE) and HRE, including dysprosium – filed for bankruptcy in 2015, China lifted its production to meet global supply.

However, with degradation of its rare-earth containing clays due to years of over mining beginning to show, a significant portion of Chinese mining is thought to be occurring illegally.

Now, increased regulation on mining and manufacturing to stem volatility has triggered the search for overseas suppliers.

"Supplies of HREs from China are likely to become scarcer, with market commentators forecasting China's HRE resources will be exhausted in 10-20 years at current rates of exploitation," Northern Minerals said in a statement.

"Furthermore, the Chinese Government

continues to consolidate the industry into six rare earth producers to promote domestic downstream value added production and assist in curbing illegal mining and processing."

This, says Northern Minerals' executive chairman Colin McCavana, puts the company

in the box seat to meet the expected growth in dysprosium demand.

"The development of the Browns Range project sets Northern Minerals up as the only producer of dysprosium outside of China, positioning us as strategic from a global supply perspective," Mr McCavana said.

## BROWNS RANGE: 4 STAGE APPROACH

### STAGE 1 – Test Pilot Plant

- **10% of full capacity**
- **Production Start: July 2018**
- **72ktpa capacity plant**

### STAGE 3 – Build Full Scale

- **585,000tpa operation**
- **1,500,000kg premium TREO product**
- **Initial 11-year mine life**

### STAGE 2 – Refine Project

- **Reduce mining cost**
- **Boost production**
- **Funding plan to progress initiatives**

### STAGE 4 – Downstream

- **Separation of heavy rare earth elements**
- **Production of dysprosium oxide and terbium oxide**
- **Wider potential customer base**

## Development

"The UK and Europe have both signalled there will only be new electric vehicles sold in those markets post 2040.

"China has also signalled that it will be moving towards 100 per cent electric vehicles and we believe that this move, from a volume perspective, will become the dominant theme."

Following a review in February 2016, Northern Minerals developed a new business plan to support Browns Range's pathway to production.

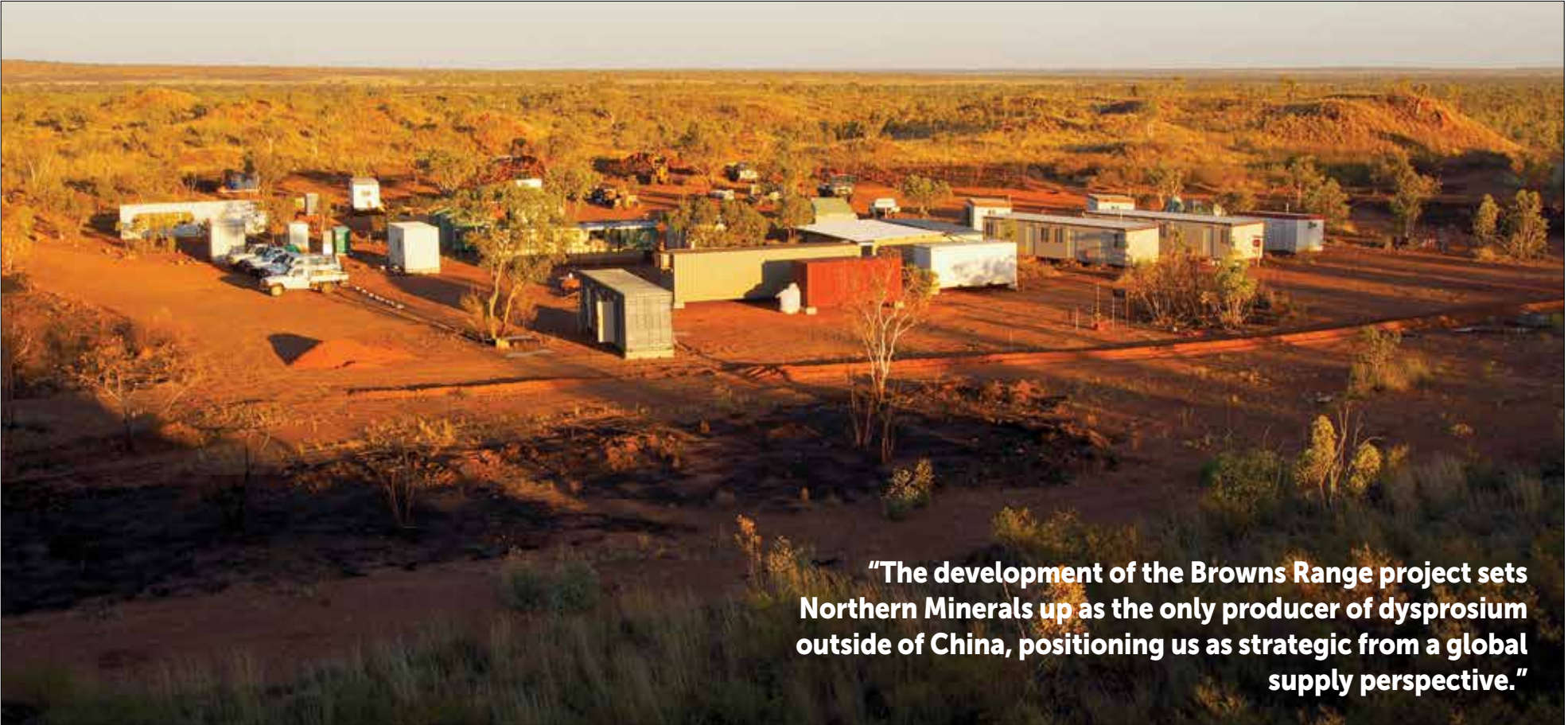
The project will be split into four development stages, allowing Northern Minerals to test the process and market the mixed RE carbonate product with a pilot plant, then develop Browns Range to a bankable feasibility study (BFS) level, build the full-scale operation, and ultimately develop heavy rare earths separation capacity.

In 2017, the Northern Minerals board approved the construction of the \$56m first stage, three-year research and development pilot plant at Browns Range that will run at 10 per cent of the overall project output.

The company said the plant would provide an opportunity to gain production experience, surety of supply for its offtake partners, and assess the economic and technical feasibility of the larger full-scale development.

Northern Minerals managing director George Bauk said mining for the pilot plant during 2017 stockpiled 180,000t of ore to be drawn down over the first stage of the project.





“The development of the Browns Range project sets Northern Minerals up as the only producer of dysprosium outside of China, positioning us as strategic from a global supply perspective.”

The mineralisation at Browns Range has high percentages of the much sought after HRE dysprosium.

“[Annually] we will produce 573,000kg of mixed RE carbonate, containing 49,400kg of dysprosium as well as terbium, lutetium, neodymium and praseodymium,” Mr Bauk said.

“All of the mixed rare earth carbonate will be purchased by Lianyugang Zeyu New Materials Sales Co.

“The mixed RE carbonate will be processed in Lianyugang, China, into its various components for use in the energy metals sector.”

The pilot plant is expected to be completed by June 30 this year.

Browns Range reserves have a rare earth oxide content of about 6600 parts per million, of which 8.9 per cent is dysprosium.

At full scale operation, Browns Range would produce about 585,000 tonnes per annum for 1,500,000kg of total RE oxide, making it a globally significant dysprosium producer.

As well as expanding to a full-sized plant, Northern Minerals also has plans to develop

its own separation capacity, a move which would allow downstream processing of HRE’s into a higher value product.

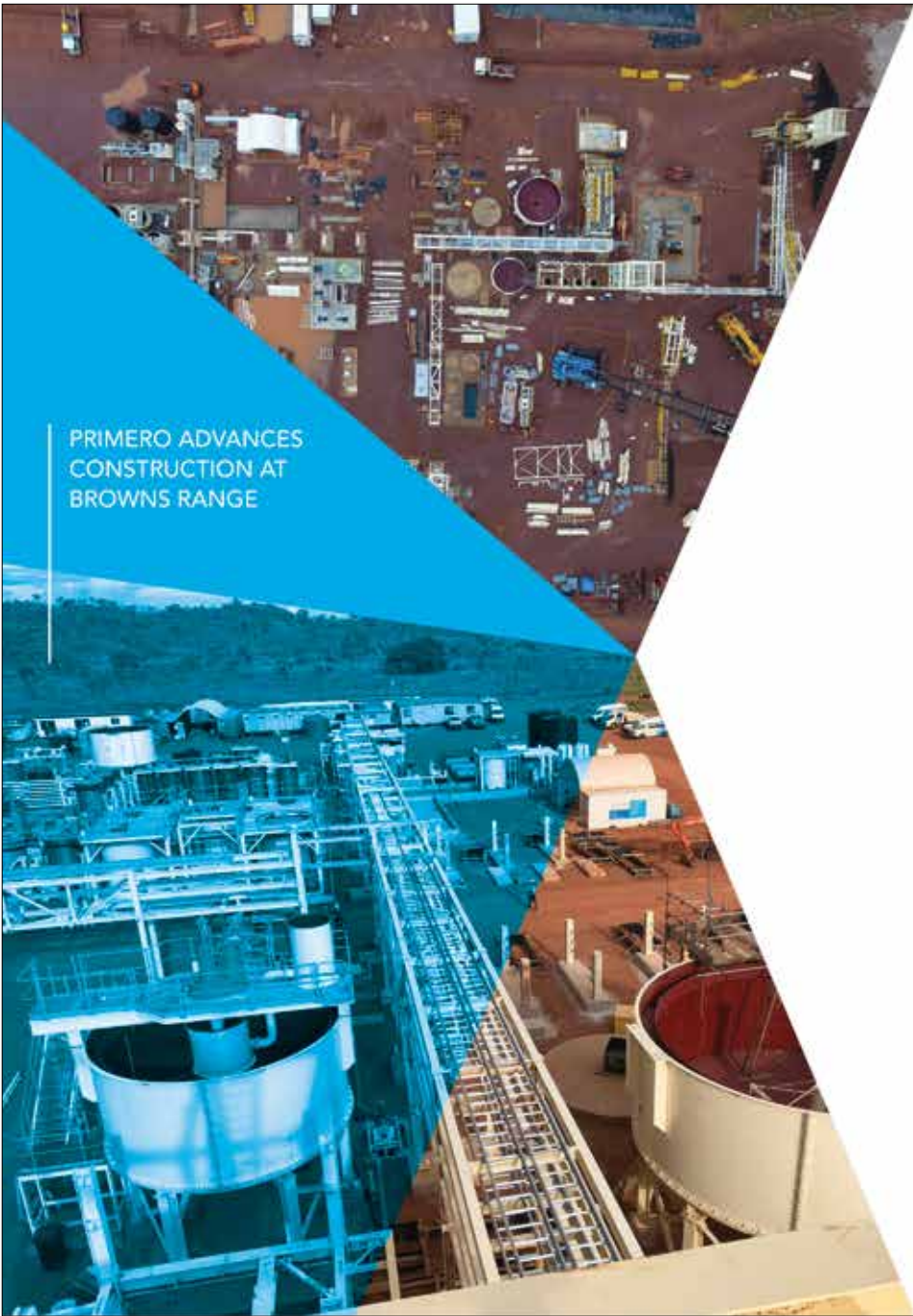
Dysprosium oxide and terbium oxide would be produced, exposing the company to a wide customer base.

In tandem with Stage 1 development, the company recently raised \$15m in a share purchase plan for exploration work to expand on Browns Range’s mineral resource.

“Recent regional sampling has returned grades up to 10 times higher than the

average Brown Range deposits, these grades are similar to what was found at our Wolverine site, which is one of the largest heavy rare earth deposits in the world,” Mr Bauk said.

“The additional funds raised will allow Northern Minerals to accelerate our exploration, get drilling rigs back on the ground in the June quarter, and implement ore processing to help us become the first significant supplier outside of China.”



PRIMERO ADVANCES CONSTRUCTION AT BROWNS RANGE

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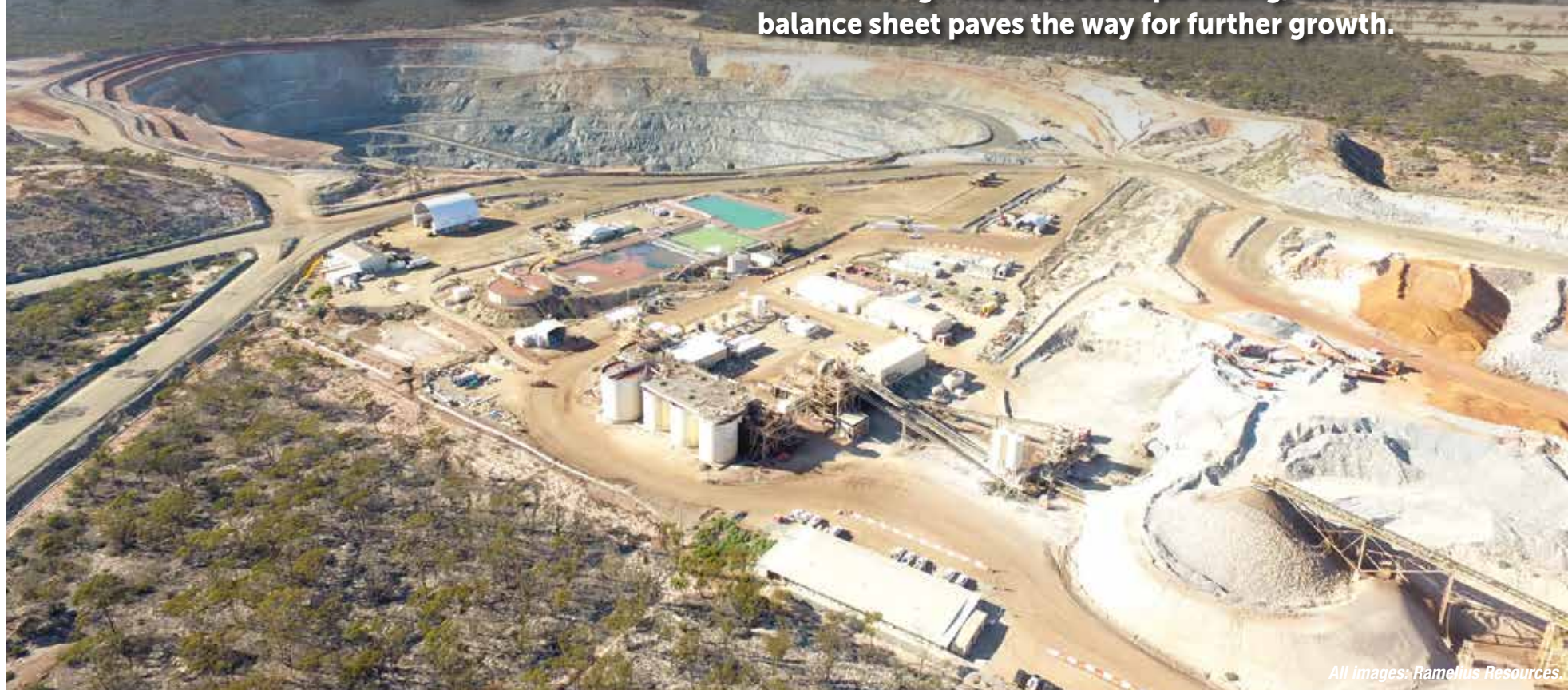
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# OPPORTUNITY KNOCKS

The acquisition of Edna May in late 2017 represents a step change for Ramelius Resources. The estimated 54 per cent uplift in annual gold production pushes the gold miner through the 200,000ozpa ceiling, while a rock-solid balance sheet paves the way for further growth.



All images: Ramelius Resources.

Aerial view of Edna May.



Ramelius Resources chief executive Mark Zeptner.

## REUBEN ADAMS

RAMELIUS Resources chief executive Mark Zeptner presented at the Denver Gold Forum in September last year, just after a complex \$90 million agreement to acquire Evolution Mining's Edna May gold mine in WA was locked in.

The deal represented the next step in the company's strategy to build on the strength of its existing WA operations at Mt Magnet and Vivien and establish itself as a profitable and sustainable mid-tier.

"Over the last six years at Mt Magnet we proved that we can run that operation profitably," he told delegates.

"Now we are in the acquisition phase, putting the \$90m and no debt – essentially a very solid balance sheet – to work."

The Edna May open pit gold operation near Westonia in WA has produced more than 1 million ounces over its life, with more than 500,000oz produced since 2011 under Evolution ownership.

One of Ramelius' challenges has been reducing expenditures at the traditionally high cost operation.

Prior to the sale, Edna May had produced 70,188oz at an average cash cost of \$1309/oz and AISC of \$1440/oz for FY17.

Evolution stated that low material movement and a lack of available ore at periods during the year resulted in full year production lower than guidance of 80,000oz – 85,000oz.

This had resulted in higher costs relative to guidance of \$1020 – \$1100/oz and AISC of \$1140 – \$1220/oz.

Since acquisition, Ramelius has moved quickly to put in place an effective improvement program for the operation which is aimed to both increase

productivities and reduce costs.

## Hit the Ground Running

Ramelius boosted its December half revenue 36 per cent on the back of record production, the result of the Edna May acquisition and improved production from Mt Magnet and Vivien.

Production of 91,162oz was up 35 per cent on the 67,546oz in H1 FY17.

Profit after tax was a solid \$13.6m, 5 per cent increase on the \$12.9m in H1 FY17.

Importantly, Ramelius remains debt free, with net cash and bullion of \$61.8m.

FY18 production is expected to be between 200,000ozpa to 210,000ozpa at a comfortable AISC of between \$1100 and \$1200/oz.

Aided by a formal three month transition process, Mr Zeptner said the incorporation of Edna May into the Ramelius business had gone as smoothly as could be expected.

"We signed the Sale Purchase Agreement on the 18th September and settlement occurred on the 3rd October so there was very little time for preparation before the 'real thing'," he said.

"Given production achieved in the December 2017 Quarter was very similar to Evolution Mining's previous quarter, but at lower costs, is a testament to how quickly we have transitioned the asset."

Since completion of the acquisition, Ramelius has moved quickly to put in place an improvement program for the operation.

Initiatives include streamlining the organisational structure and changing employment policies; review of truck haul distances and tailings dam earthworks; and assessment of blasting practices.





The bottom of Percy Pit at Mt Magnet.

“All of the initiatives have reduced costs by varying amounts – some immediately by reducing the number of direct reports to the General Manager, and some will take more time, like improving blasting practices and reducing haul distances where possible,” Mr Zeptner said.

Further improvement initiatives are currently being considered and will be designed to secure a lower cost operation leading into the decision on Stage 3 open pit versus Stage 2 underground, expected by mid-2018.

Open Pit v Underground

A decision by Ramelius to develop either of the project’s two main growth options – a major pit cut back and/or continued underground development – will trigger up to \$50m in additional, production based payments to Evolution on top of the initial \$40m payment.

According to a September research note from Hartley, a large scale cutback is most likely, potentially adding about 500,000oz to the open pit mine plan.

Ramelius plans to spend up to \$3m drilling the extensions from surface and from a newly established underground access point in the December 2017 and March 2018 quarters, prior to making a decision on the cut back by June 2018.

“I have stated that my opinion is that a large Stage 3 cut-back is the best future option, but we will be guided by the both the geology, post-drilling of approximately 13,000 metres from both surface and underground, and the project economics,” Mr Zeptner said.

“The drilling program will be finished by the end of the current March 2018 quarter, with an updated resource model and mining studies to be carried out in

the June 2018 quarter, with the aim to be at a decision point by mid-2018.”

**Outlook**

Ramelius’ target for FY18 is building cash towards \$100m and maintaining nil corporate debt.

This strong balance sheet enables Ramelius to take advantage of any potential acquisitions as they become available.

“We are constantly assessing potential opportunities – this is what you have to do in a space that is highly competitive – but there are a lot of projects that don’t make the grade,” he said.

“Not surprisingly, we like Australia, NZ, and Nevada in the US but also would consider certain parts of the Asia for the right project as it ticks travel and time zone challenges when based in Perth.”

Mr Zeptner said that FY18 group AISC of between \$1100/oz to \$1200/oz was achievable as costs at Edna May fell.

“We have actually averaged between \$1150/oz and \$1200/oz for the last two financial years which has been surprisingly consistent, and whilst everyone would like lower costs it is not always realistic,” Mr Zeptner said.

“This range is very competitive compared to our peer group producers and provides a healthy operating margin at current gold prices.

“We are looking forward to a very strong second half of FY2018 with increased production and lower costs, combined with reduced capital expenditure when compared to the first half.

“Ramelius is very well positioned heading into some key decision points in the middle of the year that will hopefully provide a longer life profile for the company.”





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# INDUSTRY SPOTLIGHT

## COMPANIES GEARING UP

# Family values, global reach

### NATIONAL

TRU-FLO Pumping Systems is one of the world leaders in supplying dewatering pump and pontoon package solutions.

The family-owned and operated business entered the pumping industry as Bathurst Irrigation during the winery boom of the 1990s.

Originally focused in agriculture, the company has grown to service global mining, oil and gas, civil and food markets.

Tru-Flo shows particular leadership in underground and open-cut mining as its equipment is manufactured to withstand harsh Australian and international environments.

The company's unique Run-Dry pump delivers one of the fastest priming capabilities on the market with industry-leading efficiencies.

Tru-Flo's pump range is fully customisable, built to the highest quality and performance standards and can be configured to suit a range of applications, including tailings return, dewatering, leachate and CHPP supply water pumps; as well as to underground or fire water supply and water evaporation projects.

The range is capable of pumping against high head situations, large quantities of



Tru-Flo water pumps can meet any industry challenge.

solids, and slurries; often encountered in mine dewatering.

During Tru-Flo's manufacturing process, safety and quality assurance are always top of mind.

Now with more than 70 personnel, Tru-Flo has become a dominating force in the industry.

However, the same family owned business qualities exist, with the desire to

give something different.

With offices strategically placed around the world, Tru-Flo will continue to be one of the market leaders in dewatering pumps and equipment for the mining industry.

## TUFF TOOL BAGS GIVE AWAY



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As a tradesman, it has become apparent that there has been a lack of choice in the current market for industrial, reliable heavy duty electricians' tool bags. When Tuff Tool Bags inventor Tony Nankervis started traveling interstate to and from various mining sites and other project sites, he found that a 'good old' canvas tool bag or expensive electrician bags just wouldn't do.

Tuff Tool Bags has developed an easier way than lugging around a heavy toolbox or doubling back and forward to the truck for tools needed for a job. Some people think that to get the best of anything, you have to pay a lot – but Tuff Tool Bags has designed its Shoulder Bag to be as functional, heavy duty, affordable and safe to use as could possibly be. Its easy access compartments help tradesmen become more organised, and thus more productive on the tools.

It's a fact: Mine workers need a serious tool bag. The Shoulder Bag is it. Take it to jobs large or small – it is safe and reliable, with the durability to handle any weather conditions.

### Made with the best:

- ▶ Fire-retardant materials
- ▶ Rip/tear-resistant
- ▶ UV protection incl. double-reinforced base and ends
- ▶ Heavy-duty shoulder strap

### Giving you fast external access & visibility:

- ▶ Velcro lids on all pockets
- ▶ Straps & plastic clip buckles on lid
- ▶ Reflective lid strip
- ▶ Blue & silver highlights for high visibility
- ▶ Giving you easy internal access:
  - Internal pockets (1)
  - Document pocket (1)
  - External pockets (4)
  - Internal tool loops (28)
- ▶ With an extraordinary load capacity of 60kg.

### Dimensions: Size is important, but we've kept it realistic!

Internal storage area (mm): 500W x 140D x 260H  
Total external size incl. pockets (mm): 650W x 250D x 260H

Inside plan sleeve (mm): 460W x 240H



**TUFF TOOL BAGS**

For more information on the Shoulder Bag and other Tuff Tool Bags products, visit our website

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# Safety: from marathon to easy win



Self-serve automation strengthens adherence to mine safety regulation and increases productivity.

## NATIONAL

PPE compliance – a safety manager’s constant concern – can feel like a never-ending race.

Ensuring the right materials are available at all times, and recording this activity for regulatory requirements, is of critical importance.

A single misstep managing and distributing these supplies can impact employee well-being and business performance.

Self-serve, automated vending devices from Apex Supply Chain Technologies® transform this process to make a safety manager’s ongoing race an easy one to win.

The technology virtually eliminates stock

outs while automatically creating a digital audit trail to ensure 100 per cent compliance and increase productivity.

### Automating PPE Management Processes

Apex industrial vending devices rely on the Apex Trajectory Cloud® to help automate PPE supply management.

When supplies reach a predetermined level, a distributor is automatically notified to ensure replenishment.

Trajectory handles all automation rules which can be customised to grant access to PPE based on employee or job function, and by tracking each device transaction in real-time, trajectory creates a digital audit trail.

With 24/7 time-stamped documentation, this is an accurate record of PPE availability, including who used what, when, and where.

Now mine safety managers can easily prove every employee takes the correct type and size of PPE across every shift, and this data is available across the company through a web browser or mobile device.

### Increasing Employee Productivity

Management may be initially surprised at the significant impact self-serve automation has on this process.

But consider the time it frees up for each employee and by applying this to every employee across every shift, these minutes add

up quickly.

Now safety managers can focus on more valuable tasks and mine workers get shifts started faster, confident they have the right equipment needed to do their job.

The end result makes it easy for a mine safety manager to win the race they face each day.

To learn how Apex Supply Chain Technologies improves PPE distribution for mining companies, including Yancoal, Barminto and BHP, more information can be found online at [www.apexsupplychain.com/au/mining](http://www.apexsupplychain.com/au/mining), emailing [infoau@apexsupplychain.com](mailto:infoau@apexsupplychain.com), or calling +61 (02) 9450 0866.

# Heavy hitting haul road solution

## NATIONAL

WITHOUT a doubt, poorly maintained haul roads are a primary cause of damage to truck suspension, reduced tyre life and low productivity in a company’s fleet.

Often passed off as simply a cost to operations, in many cases these “hidden costs” can be reduced or even eliminated entirely with some simple haul road house-keeping.

Adelaide-based compaction specialist Broons has the answer to haul road failures with its massive Square Impact Roller.

Although visible at the surface, subgrade problems often occur as a result of poorly compacted materials buried deep down – this is where the Square Impact Roller far surpasses alternatives.

Often, time is spent re-sheeting or constantly grading haul roads when in fact the problem is deeper and requires a specialist compactor to fix the issue.

Vibrating rollers run out of efficiency at around 300mm below the surface.

A Broons Square Impact Roller achieves results beyond one metre to build a strong dense layer that supports the weight of those huge trucks.

Towed at around 10km per hour, Broons’ big hitting Impact Roller can improve the



Broons’ Impact Roller reduces the wear and tear on a company’s fleet.

insitu density of most materials with 20-30 passes capable of treating 600-900sqm per hour.

Nothing on the market comes even close to that output and the improvement is happening deep down where it counts, not just at the surface.

There are minimal delays as Broons’

Impact Roller works comfortably with operating truck fleets, so there is no need to close the road for maintenance.

Forget capex approval, Broons operates an Australia-wide fleet of its proven Square Impact Rollers with machines available in almost every region.

All units are MDG15 compliant for use

on mine sites.

For quantifiable savings, businesses need to look a little deeper and be sure the density of their infrastructure can support the load the fleet is transporting.

Broons’ in-field team of compaction specialists can be contacted on (08) 8268 1988 or [info@broons.com](mailto:info@broons.com).



# Mine-spec winch hire makes impact

## NATIONAL

WINCH Hire Australia provides lift and shift gear and the largest range of cable hauling equipment available for hire in Australia.

The company's winches range from 200kg to 60 tonne capacity with lengths of wire rope fitted from 50m to 6000m, and its chain hoists range from 200kg to 30 tonne capacity.

Brett Williamson started the company in 1996 when he recognised industry demand for the hire of highly specialised, up-to-the-minute equipment on a project-by-project basis.

"Today, 22 years later, Winch Hire Australia remains the market leader because we have the big jobs covered with machines that can lift and pull from 200kg to 60 tonnes, as well as the experience, servicing skills, and commitment to safety," Mr Williamson said.

Winch Hire has a highly experienced team of qualified tradesmen deliver reliable mine-spec equipment with efficiency, and hire controllers who are adept at problem solving solutions which save time and money onsite.

The company regularly hires out fully mine site compliant winches for maintenance in existing mines and cable handling equipment for installation of power and data cables in new mines.

Its vast equipment range is adaptable to a variety of mining applications – no job is too big or too small.

This includes maintenance of mine machinery including drag chain feeders and



Winch Hire Australia is a leading supplier of winches and associated products to the resources sector.

pulverisers, conveyor belt replacement and mine machinery repairs on drag lines at open cut mines.

Winch Hire's scheduled maintenance program ensures winches, hoists, cable hauling winches, cable stands, cable drum

trailers and associated equipment are 'ready to rent' at all times in preparation to meet the demand of a resurgent mining industry.

## LIFT AND SHIFT SPECIALISTS

Supplying Minespec Lift and Shift equipment, Cable Handling equipment Nationwide



Our *Lift and Shift* range includes 200 KG winches right up to winches with 40 Tonne capacity. Our chain hoists range from 200 KG up right up to 30 Tonne.

We stock Australia's largest range of Cable Hauling equipment and accessories available for hire.

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# Driving productivity

## NATIONAL

AUSTIN Engineering is the world's leading truck body designer and manufacturer that continues to deliver customised solutions that result in higher profitability for mining operations around the world.

Austin's JEC-LD truck body is a proven engineering success delivering substantial payload increases on mine sites in South America and Australasia, with some reported productivity gains of up to 20 per cent.

The JEC-LD truck body evolved from merging the design characteristics of the highly successful JEC and Westech models, which together, have accumulated years of operational experience.

Benefits of the JEC-LD include low body weight, high payload ratio design, and full support structure interface to the truck chassis (as per OEM requirements), anti-carryback with large rolled transitions, low rear profile to prevent berm drag damage and sidewall protection.

Also a bespoke body, the JEC-LD is designed to suit the individual characteristics and requirements of each site adopting advanced Discrete Element Modelling and Finite Element Analysis engineering software designed to optimise payload, reduce body weight, improve structural integrity and limit fatigue resistance.



Austin Engineering's JEC-LD truck body.

Additional benefits include ease of maintenance and required life span, which are taken into consideration during the design phase to ensure greater profitability over the life of the tray.

Austin has a program of continual

improvement with considerable investment in R&D and quality testing of premium steels and weld consumables to ensure its bodies are built using the highest quality materials.

The result is specific 'Austin' steel grades that are purpose designed to deliver

high-strength, and superior fatigue and abrasion resistance when operating in harsh unforgiving environments.

More information on Austin, its solutions and global locations can be found at: [www.austineng.com.au](http://www.austineng.com.au) or (07) 3723 8600.

# Extreme cleaning pays off

## NATIONAL

IN a major breakthrough in mine site cleaning, Australian Pump (Aussie Pumps) has announced an expansion of its Aussie Mine Spec Extreme series.

The range of continuous duty hydro-blasters now includes the big Aussie 4300 psi Python with a huge 31 lpm that delivers a real cleaning whack.

The combination of high flow at high pressure ensures that mine plant or equipment caked in mud can be cleaned significantly faster.

This delivers major savings in downtime and maintenance costs.

"It's really tough to shift dried mud from a crawler dozer or dump truck fast," Aussie Pumps operations manager Hamish Lorenz said.

"You can't fix it until you clean it, so that's where machines with a great pressure/flow combination really deliver.

"We've designed this kit to not only handle the rigours of mine life, but to run all day every day in the busiest of wash bays."

The heart of the new machine is a 'Big Bertie' RAS series heavy duty triplex piston pump, powered by a reliable Yanmar 3TV88 20kW diesel engine with

integrated control panel.

The compact, water cooled engine delivers cleaner and lower exhaust emissions thanks to improved flow-mixing and injector nozzle design, and is governed to a maximum speed of 2400 rpm for long life.

A PE Manual engine protection kit is fitted, featuring a tachometer, hour meter, battery monitoring, timer and low oil pressure protection.

A 50 litre stainless steel fuel tank enables the engine to run continuously for up to 10 hours.

The Python Extreme is mounted in a heavy duty hot dip galvanised steel frame with skid base that incorporates large forklift tyne slots accessible from all sides.

A weather-proof cover protects the engine and pump without inhibiting air flow around the radiator.

The mine spec frame includes reflective markers and flashing operating light for safety and a fire extinguisher and banded tray are fitted as standard.

"This first unit is heading for an open cut coal mine, so it had to be both robust and mobile," Mr Lorenz said.

"The Python weighs up to 565kg so we integrated multiple forklift points into the skid base for ease of lifting."



Aussie's Hamish Lorenz checks out the engine protection kit supplied on the new Aussie Python Extreme Yanmar powered hydro-blaster.

The unit features a 60 litre stainless steel "break tank" with float valve and low water cut out for pump protection.

An emergency stop and battery isolator are fitted as standard on Aussie Mine Spec equipment.

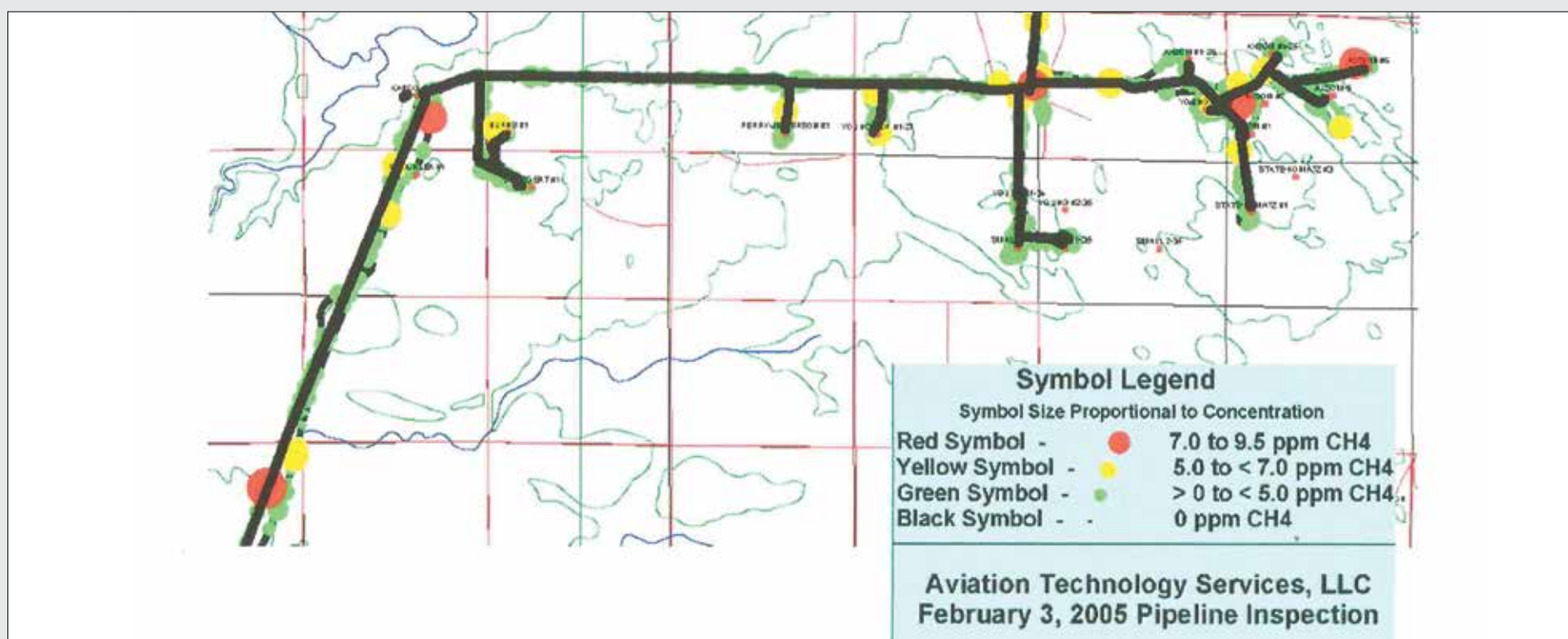
The industrial 5000 psi stainless steel hose reel with friction brake is loaded with

30m of 5800 psi rated hose.

This facilitates cleaning large plant, making it safer and is more convenient for the operator.

More information on the Python Extreme hydro-blaster can be found by calling 02 8865 3500 or via [www.aussiepumps.com.au](http://www.aussiepumps.com.au).





A pipeline inspection from the Boreal UAV Laser Analyser.

# Advanced detection capabilities

## NATIONAL

THE effects of processed gas emissions is wide and varied, and can present unforeseen challenges in today's high standard resources sector.

Australian Dynamic Technologies (ADT) has taken on some of these difficulties by offering different methods of procuring real time data in two areas.

Pipeline gas detection involves getting close to the potential leakage sources while covering vast lengths of gas pipeline and reporting gas liberations.

In this instance, the Boreal UAV Laser Analyser is the ultimate answer, with parts per million detection, no cross sensitivities, high speed and integral automatic calibration – surely the engineers' best friend.

The same technique can be used for

fence line monitoring, where large areas need to be monitored with full wireless communications.

On the other hand, stack emissions are met with another drone equipped gas analyser with a Scentroid DR1000 carrying up to six sensors – part of a list of 22 different sensors – to feed back concentrations of stack plumes with full drone control.

The system can also carry a camera to inspect remote locations and report back

potential problems before they occur.

In another application, bund pond liquid collections are a valuable addition to the ability of the Scentroid DR1000.

Operators would know how difficult this procedure is.

ADT offers specialist focus upon the design and production of gas analysis systems with follow up contract servicing and maintenance.

## Aerial Gas Detection

*The answer for inaccessible locations.*

**SCENTROID**  
 Future of Sensory Technology

### Drone Mounted Gas Analyser DR1000

- Designed for Process Air Quality, Stack Emissions, Fence Line Monitoring, Flare Plume Conditions, Pond Fluid Collections and Pipeline Monitoring
- Can use Thermal Imaging Camera
- Fixed Wing or Rotary Wing
- Capacity for 22 Gas Species down to ppm's, VOC's and Particulates to 1 micron
- Data Storage and Direct
- Communications



### BOREAL UAV Mounted Laser Gas Analyser GF-2UAV

- Gas Pipeline detection of CO<sub>2</sub>, HF, NH<sub>3</sub> and CH<sub>4</sub>
- Long Term Integral Calibration
- No interference
- Wireless Communications with stored data and GPS Dongle
- High Speed flight to 185 km/h
- Height above ground to 65 metres
- Fixed Wing or Rotary Blade



Further information

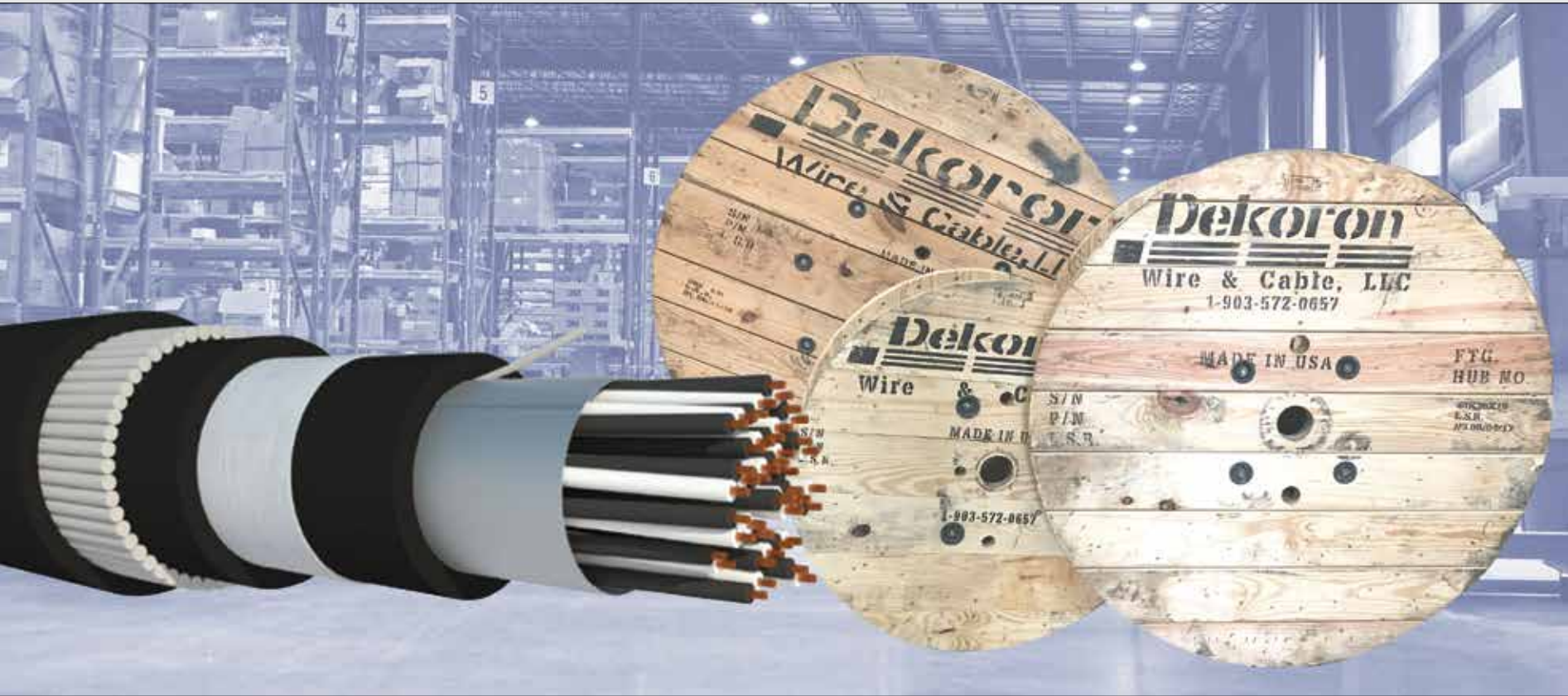
**adt**  
 australian dynamic technologies

Aust. Dynamic Technologies Co Pty Ltd  
 5 Aspinall Place, Mulgrave NSW 2756  
 Tel: +61 2 4577 9347 | Fax: +61 2 4587 7786  
 Email: sales@austdynatech.com.au

[www.austdynatech.com.au](http://www.austdynatech.com.au)



# Dekoron Cable. A brand, not a type



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

## NATIONAL

FOR more than 50 years, Dekoron® Wire & Cable has led the way in industrial signal transmission.

Manufactured in the US, Dekoron's range of instrumentation cables were developed specifically to meet the needs of the mining,

refining and petrochemical industries.

Specialty products including Fieldbus, Circuit Integrity, Dekabon® (lead free) armoured and thermocouple cables have been added to the range to provide a complete solution for any application.

Dekoron's state-of-the-art facility in Mt Pleasant, Texas, is home to manufacturing, customer service, quality assurance and

engineering personnel.

To ensure unmatched quality, all Dekoron® products are subject to electrical inspection by trained QA technicians after twist, cabling, jacketing and armouring.

Additional in-process testing is built into the manufacturing line with extensive use of spark testers and real-time dimensional monitoring.

Celebrating its 10th year as the exclusive Dekoron® distributor (AU/NZ), Maser Communications is committed to offering products of the highest quality to its customers.

The company strives to partner with leading manufacturers, not generic brands.

This is why Maser chooses Dekoron®: the manufacturer, the product, the quality.

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**Wire & Cable LLC**

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*Only available at*  
**[www.maser.com.au](http://www.maser.com.au)**



# Commitment to excellence

## NATIONAL

WARD Operations is a specialist high voltage cable jointing company that has serviced Central Queensland mining and heavy industry for more than 29 years.

With extensive experience under its belt, Ward Operations has earned a reputation for delivering outstanding results across a range of projects spanning the mining, industrial, commercial, military, liquefied natural gas (LNG) and Government sectors in Australia and overseas.

Its primary area of expertise is high voltage cable jointing with both paper insulated and cross linked polyethylene (XPLE) up to 132KV.

The company's latest venture has seen it acquire a new Cable Nitrogen Purging machine, which can be applied to cables that have been effected by water and have an ingress of moisture or water into the conductors/screens, leaving them free from moisture prolonging the high voltage cable life.

It's high voltage cable jointing services also includes mining cable terminations (ethylene propylene rubber)solar farms, draglines, ship loaders, shovels and stackers, and reclaimer reeling cables with fibre optics component into slip rings compartments, along with many other capabilities.

A further additional unique service offered by Ward Operations is submarine cable repairs and VLF Testing.



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

"All our work is completed by fully trained and competent workforces who are committed to quality workmanship," Ward Operations owner Jeff Ward said.

"We use reliable and proven brands and components in accordance with best practice and Australian standards as well

as being a certified TE Jointing company, all our services include scoping, planning, procurement, progress reports and quality assurance."

Ward Operations also has a fleet of equipment available for hire including VLF Tester, shipping/site containers, jack stands,

cable socks, hydraulic capstan winch, cable hauling equipment, and more.

"Some of our long term major clients include the likes of Rio Tinto, BHP, Anglo American, Glencore, Downer EDI, UGL, Thiess, Decmil Group, Stanwell Corporation and more," Mr Ward said.

## HIGH VOLTAGE CABLE JOINTING



Ward Operations specialise in installation, termination and jointing, testing and repair of all types of High Voltage cables up to 132KV.

We service mining, industrial, commercial, military, LNG and Government industries throughout Australia and overseas.

- High Voltage Cable jointing and termination
- Cable Nitrogen purging
- Submarine cable joints and repairs
- VLF Testing
- Equipment hire

All services include scoping, planning, procurement, progress reports and quality assurance.



# One stop shop for cable needs

## NATIONAL

CABLE Connect at Auslec has on-hand cable inventory to support the vast majority of its customers' application requirements.

Its Welshpool location has cables and wires for site distribution services, switchboard construction, conveyors, pumps, control and instrumentation, as well as general light and power.

Also included are screened cables for EMC applications, orange circulars and SWA in both power and control construction.

The numbered core stockholding ranges from 2-core to 30-core covering the majority of industrial needs.

The new range of ex-stock cables include flexibles in high temperature single cores, multi-core control and super flexible for switchboard construction and mobile plant battery systems.

With the ability to custom-cut up to 400mm XLPE single core, Cable Connect has what customers need, when they need it.

For other products, including highly flexible, water resistant or high temperature building wire, Auslec Welshpool is well equipped.



Cable Connect at Auslec has a large range of cables and wires suited for mining.

Together, Auslec and Cable Connect's flexibility to offer the right products and custom processes ensure customers can rely on them for the total package.

With its own 6-tonne forklift and long-bed delivery truck, Auslec is able to capably manage the most exacting customer requirements for cable solutions.

Its warehouse regularly ships to all parts of WA, dealing with major logistics providers as well as direct-to-site.

The team is also able to help customers keep their projects on time and on budget.

The knowledgeable management and staff have extensive experience in the mining, oil and gas, and infrastructure project sectors.

Auslec's centralised mining and projects support group leverages experience, ingenuity and connections to give client's the solutions they need, when they need them.

Most of its employees are long-term, offering reliable support to thousands of customers each day.

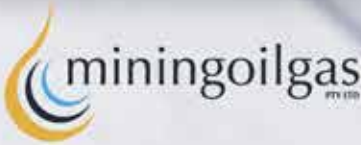
Auslec, with its associate company L&H, has a national reach which brings customer advantages as it leverages not just manufacturer but also an extensive branch network.

More information can be found by emailing [mining.wa@auslec.com.au](mailto:mining.wa@auslec.com.au) or calling 1300AUSLEC.



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- Fire Control & Security
- Multi-Core Instrumental
- Heavy Duty Rubber
- Trailing & Reeling
- Underground Steel Wire Armour
- Solar, Digital, LAN and Fibre



### FLEXIBILITY

We are able to cut up to 400mm XLPE and deliver to your site wherever and whenever you need it.



### BRANDS

We have full access to and stock all major cable brands

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# Corporate TEAM BUILDING



A team of 50 from South 32 - with 265 meals for charity



## Take on some corporate team building *with a difference!*

Food has the unique ability to unite people in a relaxed atmosphere and there is a special bond between people who eat together. Taste Budds Cooking Studio team building programs were developed with that point in mind. Suitable for inter-department team bonding, top management team building, client-relations, regional meeting gatherings, or as an ice-breaker prior to a workshop...we incorporate organisational objectives through the way we structure critical components within the programme.

The team building session is in the format of a fun cooking competition; where although it is not a formal activity, the program has been designed to include successful elements of team building throughout.

Assured participants will have an extremely enjoyable and memorable experience with endless opportunities to interact, communicate and coordinate with other members of the group.

*We have four packages to choose from:*



### FOOD RESCUE MYSTERY BOX CHALLENGE

Competition style where staff engage in 2-hour cooking class creating meals from food rescue produce.

Teams are judged and prizes are given at the end.

Sit down meal and drink (BYO) at end of class.

All extra food gets tubbed up and taken to a local charity.

**\$160 a head plus GST**  
(\$20 per person donated to Food Rescue)

**4 hours total**



### MYSTERY BOX CHALLENGE

Competition style where staff engage in 2-hour cooking class creating meals from fresh produce.

Teams are judged and prizes are given at the end.

Sit down meal and drink (BYO) at end of class.

**\$150 ahead plus GST**

**4 hours total**



### FOOD RESCUE MYSTERY BOX PIE COMPETITION

Competition style where staff engage in cooking class creating pies from food rescue produce.

Teams are judged and prizes are given at the end of the night.

Teams eat some of the pies and have a drink (BYO) at end.

The rest of the pies are taken to a local charity.

**\$100 ahead plus GST**  
(\$10 per person donated to Food Rescue)

**2.5 hours total**



### COOKING CLASS

Teams are assisted to learn cooking skills and cook recipes from fresh produce.

Teams have sit down meal and enjoy the meals they created, (BYO) alcohol.

Choose from ... Italian, Indian, Greek, Bush Tucker, Spanish, French, Thai, Japanese, and many more.

**\$150 ahead plus GST**

**4 hours total**

Depending on your group size we run our team building from three venues:

**Taste Budds Cooking Studio**  
10 – 30 x pax  
305 Lord St  
Highgate WA 6003

**City Farm**  
30-100 x pax  
1 City Farm Place  
East Perth WA 6004

305 Lord St Highgate WA 6003 | 0415 365 395 | [cook@tastebudds.com.au](mailto:cook@tastebudds.com.au)

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





Particles emitted from diesel engines contain harmful carcinogens.

# Real-time diesel particulate analyser

## NATIONAL

THE latest locally designed and manufactured diesel particulate analyser technology on the market alleviates potential health concerns amongst vehicle maintenance workers.

Alerts from the World Health Organisation (WHO) have focused on the public awareness of dangers to human health from the microscopic carbon-based particles emitted in the exhaust of diesel engines.

As a Class 1 carcinogen (the most dangerous category) the WHO estimates that these particles are responsible for hundreds of thousands of deaths around the world each year.

Given the dominance of diesel power sources in underground mining, the industry has clear responsibilities to minimise worker exposure to this most dangerous pollutant.

A capability to effectively monitor and control tailpipe particle emissions is a key component of these responsibilities.

To enhance this capability, Pacific Data Systems Australia (PDSA) has recently launched the latest, and possibly most advanced, tool for this task – the dPM-RT Real-time Diesel Particulate Analyser.

PDSA general manager Paul Gapes outlined some advances embedded in the new instrument.

“The measuring chamber – the heart of the instrument – is a radical new design, with enhanced measurement stability and sensitivity,” Mr Gapes said.

“Upgraded photo-electronics and improved laser beam control now generate more stable, noise-free output.

“Traditionally, tailpipe particle emission levels were measured by passing a portion of the exhaust stream through a pre-weighed filter, then weighing the filter to determine the mass of particulates deposited.

“This was a slow, laborious, specialised and expensive task that needed to be outsourced to appropriately equipped laboratories, with a turnaround time that

could run into weeks.”

But a new genre of real-time measurement instrumentation, born around 12 years ago, established a capability for the monitoring to be done quickly, in-house.

Over the years, developments led to simpler operation and improved sensitivity/accuracy.

This progressive chain of instruments was all designed, developed and manufactured right here in Australia (though some overseas licensed manufacturing did occur).

Continuing this trend, the dPM-RT now enters the market; representing the 4th generation of these highly respected and widely used instruments.

At a glance the new instrument projects strong visual echoes to its immediate predecessor, though dimensions and weight have been significantly reduced.

“The dPM-RT’s performance has been independently validated through extensive back-to-back testing and correlation against a NIOSH 5040-certified and calibrated reference test rig,” Mr Gapes said.

“With one-button operation and a fully processed result delivered on completion of a one-minute test, the dPM-RT Real-time Diesel Particulate Analyser appears to justify its claim to be a tool that both management and workshop staff need to reliably identify high DPM emitters, and to validate the effectiveness of emissions-related maintenance.”

Founded in 1984, Pacific Data Systems Australia (PDSA) is a leader in smart monitoring and control systems.

The company has provided robust devices and solutions for data collection, monitoring and control across a wide range of industries and applications.

Across Australia and the globe, clients spanning mining, exploration, defence, resource distribution, engineering, manufacturing, environmental monitoring, scientific research and engineering go to PDSA for the solutions and services they need.

## DIESEL PARTICULATE MEASUREMENT



### dPM-RT REAL-TIME DIESEL PARTICULATE ANALYSER

The dPM-RT is the tool that mechanical and workshop staff need in order to reliably identify high DPM emitters, and to validate the effectiveness of emissions-related maintenance.

- Real-time measurement of fine particulate levels in diesel exhaust
- Easy to use, on-screen prompts, minimal (<10min) training required
- Designed to handle the rugged demands of mining sites
- Auto-generates & displays Stall or Free Acceleration test results

The World Health Organisation has declared the black carbon particles emitted by diesel engines to be a Class 1 carcinogen (the highest risk level). Contributing towards achieving a healthy workplace, Pacific Data Systems Australia now introduces the dPM-RT - a rugged, no-frills tool designed to help minimise worker exposure to these dangerous particles.

Controlled using the dPM-RT’s single operating button, a simple, one-minute workshop test can immediately identify high emitters, and verify the effectiveness of emissions-related maintenance. Developed here in Australia, the instrument’s internal workings literally do the task of a laboratory, but in a simple shoebox sized case!

For more information visit  
[www.pacdatasys.com.au](http://www.pacdatasys.com.au)  
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THE AUSTRALIAN  
MINING REVIEW



# A proud history

## NATIONAL

ESTABLISHED in 1923 by George Dix to provide engineering services, solutions and products to clients in the mining, construction, automotive and agricultural industries, Dix Engineering has developed strong ties within South Australia in its 95 year history.

Over the years the company has built an international reputation for excellence in the field of engineering with a record of achievements, completing projects in Australia, Asia, North and South America, and Europe.

At a local level, the company is engaged with mining companies and suppliers to meet their specific requirements, including supplying filtration products such as stainless steel screen filters, media filters, and Azud Luxson Suction Scanner Filters and Disc Filtration Systems.

Its range of stainless steel filters are manufactured at the company premises in Renmark and have proved extremely popular with irrigators and irrigation system installers and designers.

Sintered mesh screens are available in 50 mesh, 80 mesh, 120 mesh and 150 mesh (number of holes per square inch) to cater for all requirements.

Dix Engineering also undertakes various infrastructure projects, and can help clients meet their design and performance requirements through its expert selection of welding material and welding processing.



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

"Welding can be a cost-effective solution as no tooling cost is required (jigs and fixtures are often used for production efficiency and dimensional uniformity)," Dix Engineering director Alan Selfe said.

Dix Engineering also supplies a wide range

of CNC machined parts from its own workshop, and a variety of machining, milling and turning precision, and foundry services.

The company's capabilities are a result of investing in resources, rewarding and training personnel appropriately, committing to project

time lines and completing tasks to a high standard at all times.

"We believe that our customer experience starts well before the customer has engaged our company to complete their project," Mr Selfe said.



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**DIX**  
Engineering



# Protecting the environment

## NATIONAL

NEDERMAN MikroPul is a leading provider of environmental impact reduction systems for the mining industry, offering solutions that reduce air pollution caused by industrial activities.

Based in Australia, the company provides world-class engineered solutions to all parts of the world.

Its high-efficiency dust collector cyclones are the most cost-effective option for separating dry particulate (five microns or larger) from gas streams.

The cyclone dust collectors, named for their vortex motion similar to that of cyclones and tornados, are large, funnel-shaped tubes.

Dust and debris is pulled into the tangential inlet at a high velocity, forcing material against the walls in a cyclonic motion.

Larger particles slide down into the hopper while smaller or fine dust exits out the other side.

The company's inertial separators, can also be used to reduce the volume of particles from the mass flow of an air stream or as a pre-separator or pre-filter for collectors handling greater efficiencies.

In addition, the company also specialises in bag filters, and is a worldwide pioneer in pulse jet dust collectors, and providing wet scrubbers to solve air pollution control problems.

Wet scrubbers currently available



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

include; Mikro-Vane Scrubber, a basic wet scrubber for high inlet dust loadings; Dynamic Scrubber with integral wetted fan, for all industrial and mining applications; High Efficiency Venturi Scrubber, designed to suit any process gas requiring particulate removal; Multi-Venturi Scrubber, which uses a

venturi-rod deck consisting of a series of rods arranged to create the venturi effect between each rod; and Absorption Tower, a packed tower arrangement that can be applied as gas absorbers, coolers, humidifiers or condensers.

Nederman MikroPul has also developed high pressure vacuum systems for mining

and heavy industry, which can fill the void in localised clean-up and product transfer.

On top of its vast product offering, the company prides itself on a full range of after-market services, including supplying spare parts, planned and preventative maintenance work, as well as an emergency breakdown service.



## Global leader in air filtration

**Nederman MikroPul** is the world leading supplier of dust and fume pollution control systems. Global presence with state of the art engineered solutions designed right here in Australia.

Founded in 1944 and operating continuously in Australia since 1972.

With experience in pollution control within the heavy industrial sector for over 45 years, our team will provide you a comprehensive solution to your specific site and project requirements. Our engineered solutions have proven themselves to last the test of time in the harsh Australian mining environment.

All our engineered solutions are supported by a comprehensive 24/7 national aftermarket team for spare parts and maintenance services.

+61 3 8720 3700 [sales@mikropul.com.au](mailto:sales@mikropul.com.au)

Nederman MikroPul Australia offers solutions using the latest advancements in:

- Dust collectors
- Wet scrubbers
- Inertia separators
- High pressure vacuum systems

We offer a comprehensive after sales service providing technical support, retrofits, spare parts and servicing for remote sites all serviced from our offices in Perth, Melbourne and Sydney. [Let us help you with your site dust and fume requirements.](#)

**MIKROPUL**  
**Nederman**



# Vacuum filtration and degasification

## NATIONAL

AVT Services is Australia's foremost vacuum equipment and service provider; for just about anything vacuum, it can deliver.

With its head office located in Sydney, and branch offices in Brisbane, Melbourne and Perth, AVT is well placed to provide sales, service, and advice to all vacuum oil filtration and degasification users in Australia.

The company is committed to providing vacuum oil filtration solutions via this nationwide network, with extensive knowledge and unparalleled support.

AVT Services delivers the most advanced coverage of technology in vacuum oil filtration equipment and is the Australian distributor of highly acclaimed Enervac Corporation vacuum oil filter and purification systems that service a range of industries, including chemistry, mining, and power.

AVT's consultants offer expert advice



The Enervac Vacuum Oil Degasser.

to tailor the right, cutting-edge technology products for customers.

AVT Services aims to be a "one stop shop", where customers can find support for all vacuum filtration needs, be it in the supply of equipment, the design of equipment, the management of vacuum processes or the maintenance of vacuum equipment and systems.



## AVT SERVICES

VACUUM & CRYOGENIC SPECIALISTS

AIR & GAS DRYERS • SF6 GAS SERVICING EQUIPMENT • INDUSTRIAL OIL & GAS FILTERS  
INSULATING FLUID PURIFICATION EQUIPMENT • OIL FILTRATION PURIFICATION EQUIPMENT



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THE AUSTRALIAN  
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RE-USE | RE-CYCLE | SAVE

A new era in Filter Cleaning

As our major resource companies and contractors continually look to drive down operational and maintenance costs without any compromise to company assets, personnel health and safety and the environment, cleaning air filters by a reputable and accredited air filter cleaning company is certainly a prudent method. This would deliver significant savings with the added benefit of creating environmental awareness and contribution.

Air filter cleaning companies have been servicing the WA industrial and resource sectors for more than 40 years. The previous misconception of not cleaning filters is a thing of the past and is now seen as a beneficial service in more ways than one.

Air filter cleaning is now an integral part of a maintenance process and purchase plan when it comes to financial and environmental planning and awareness. The reduction in filter consumables, added to the financial and environmental benefits, make it a very attractive service for maintenance and purchasing officers.

Combining the experience and expertise of three long standing Western Australian air filter cleaning companies, Managing Director David Solomons explains the rationale behind the acquisitions & amalgamation of Vibra Air Filter Cleaning, Pure Air Filters and Air Filter Dry Clean Systems WA.

"We have a purpose built facility in Perth with ISO9001 accredited dry cleaning and wet cleaning processes, where we offer our clients the appropriate cleaning and testing method for their filters, not just a single method. Some filters may require a combination of cleaning and testing processes in order for us to achieve the optimum results."

We cater for open cut / underground mining operations, gas pipeline filtration, exploration and heavy duty earthmoving industries.



SAVINGS EXAMPLE:

EXAMPLE: Cost saving after 5 Cleans per filter\*

NEW FILTERS		CLEANED FILTERS	
New Filter	\$160	New Filter	\$160
New Filter	\$160	1 <sup>st</sup> Filter Clean	\$25
New Filter	\$160	2 <sup>nd</sup> Filter Clean	\$25
New Filter	\$160	3 <sup>rd</sup> Filter Clean	\$25
New Filter	\$160	4 <sup>th</sup> Filter Clean	\$25
New Filter	\$160	5 <sup>th</sup> Filter Clean	\$25
TOTAL COST	\$960	TOTAL COST	\$285

TOTAL SAVINGS: \$675 = 70%

The more times you clean your filters, the greater the cost saving becomes!

\* cleaning prices may vary depending on the size of the filter.

Each business brings its unique method of cleaning & testing. Most importantly, we are privileged to have a workforce with a combined industry experience of over 100 years, which allows us to provide superior work standards and exceptional customer service. When filters arrive for cleaning, our staff can determine the cleaning process that is best suited for each filter and clients needs. Harnessing the appropriate cleaning method allows us to achieve maximum results and optimum performance from the cleaned filters. This contributes to significant financial savings and environmental benefits for our clients.

As all customers specific requirements vary, we are able to customise a solution to meet their particular need. When customers operations are located in remote areas throughout the Pilbara, Goldfields and Mid West regions, we set up a container rotation for them. We offer complimentary use of our containers for filter transportation purposes between site and our facility. This ensures there are always sufficient cleaned filters on site whilst others are in transit or being cleaned. This creates an efficient and effective supply of cleaned filters in order to meet our clients work demands.

Please feel free to contact one of our companies listed below to discuss your requirements and we will gladly be of assistance to meet your specific needs."

Ph. (08) 9408 9500  
www.vibrafilters.com.au



Ph. (08) 9408 9599  
www.pureairfilters.com.au



Ph. (08) 9408 9550  
www.airfilterdryclean.com.au







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850 microns

### HydroFloat Separator



EFD's **HydroFloat™** Separator radically improves the traditional sulfide processing circuit through Coarse Particle Flotation. Unlike conventional flotation, the HydroFloat Separator recovers particles as large as 800 microns with as little as 1% mineral surface expression. By rejecting the balance as "coarse" tailings, much of the recirculating load is eliminated, thus greatly increasing mill capacity... with NO loss in mineral recovery!

Coarse Particle Flotation using EFD's HydroFloat Separator can:

- Increase mill throughput by as much as 15-20%
- Reduce energy & media consumption
- Produce a coarse tailing stream



For more details download  
these White Papers at  
[www.EriezFlotation.com](http://www.EriezFlotation.com)

**ERIEZ**  
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# WANT AN ALL-IN-ONE APPLICATION FOR DUST SUPPRESSION, EROSION CONTROL AND LONG TERM GRASS COVER?

**Valley Hydramulch & Revegetation** uses Agricultural Materials proven in service over many decades. We do not use any by-products from materials processing, promoted by commission-based salespersons relying on outrageous claims, backed up by dubious scientific information and no historical records beyond initial germination.



Coal Haul Road Embankment and Bridge over Local Main Road - Embankment in ROM Material without Topsoil Cover  
Compost Blanket Application Jan 2016



Long Term Grasses Established with Full Cover

## QUALITY TOPSOIL NOT AVAILABLE?

- Site Soil Testing Identifies Soil Deficiencies • Application is then Site Specific to Suit Existing Soils
- All ingredients absorbed into the soil surface • No maintenance watering required



Our Compost Blanket application has erosion control capabilities, resulting here in full ground cover. The works were completed on March 25th 2015, achieving full cover after 4 weeks.

✉ [mail@vhr.net.au](mailto:mail@vhr.net.au)

☎ 0249 886111 📱 0412 598392

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







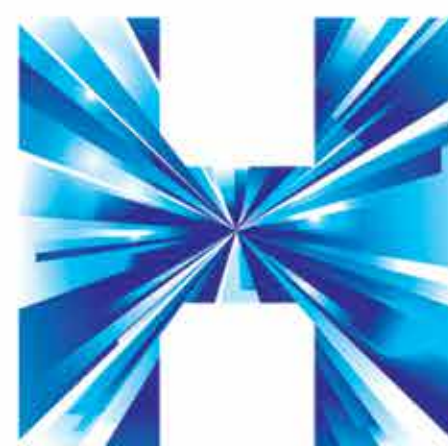
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# Safety around moving vehicles

NATIONAL

ACCIDENTS involving moving vehicles and pedestrians are costly in terms of physical harm to staff and their families as well as business bottom line and reputation.

Drivers affected by poor visibility (dust, smoke and blind spots) can find it almost impossible to see pedestrians nearby.

Even in regular conditions, drivers can struggle to see what's near them.

Vehicles and pedestrians working closely together increase the chance of an accident dramatically.

Physical barriers and exclusion zones help, but they depend on worker compliance and "human-factors" (inattention, distractions or poor judgment).

Staff may be instructed to keep safe distances, but this relies on their judgment.

"BodyGuard ensures no one gets hurt and can go home at the end of each day, our BodyGuard i-Tag is the perfect solution for safety around vehicles at work," BodyGuard chief executive David Huisman said:

"It's a pedestrian safety warning system that prevents vehicle operators and pedestrians colliding.

"This system does not rely on pedestrian compliance or judgment, removing the human-factor and challenges associated with poor visibility."

The system has three components; a personal "Tag" worn by pedestrians, "Sensor" unit attached to the vehicle, and "Cab Alert" unit which speaks to the driver.



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

"When a pedestrian gets too close (breaches safety exclusion zone), the system informs the driver," Mr Huisman said.

"The cab alert unit warns the driver, using an unmistakable high impact siren and human voice ("Look out! Person near you!") to get the driver's attention and avoid an accident.

"The clear warning sticks out above other buzzers and beepers at the site. It is like having a buddy looking out for pedestrians. The system is designed to perform a single task well (detect people within the safety exclusion zone around the vehicle). It is easy to install, setup and operate."

BodyGuard Safety Solutions have also introduced a new system for improving safety in workshops where tyre-handlers and similar machines pose risk to pedestrians.

"This system operates remotely located warning devices whenever the tyre-handler machine is operating," Mr Huisman said.

## Need to improve separation between your people and mobile plant?

Our leading edge technology is the answer you've been looking for to protect staff from the danger of moving vehicles.



### BODYGUARD I-TAG® PEDESTRIAN WARNING SYSTEM

- Reduces the risk of on-site collisions and promotes a stronger safety culture.
- Uses our Enhanced Detection Technology (EDT™) to overcome the challenges of driver inattention, poor visibility and worker non-compliance with exclusion areas.
- The system is made up of three components:
  - Personal tag- worn by pedestrians
  - Sensor unit- attached to the vehicle
  - Cab alert unit- which speaks to the driver
- 360 degree safety exclusion zone around sensor, adjustable up to 9m.
- Quick and easy to install, simple to use.
- Loud alert system with human voice.
- Keeps your people and mobile plant separated.



Ensure your staff go home to their families and friends after work.



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bodyguardsafety.com.au





# Dropped object prevention

## NATIONAL

DROPPED and falling objects are major causes of fatalities and Lost Time Injuries (LTIs) in the mining industry globally.

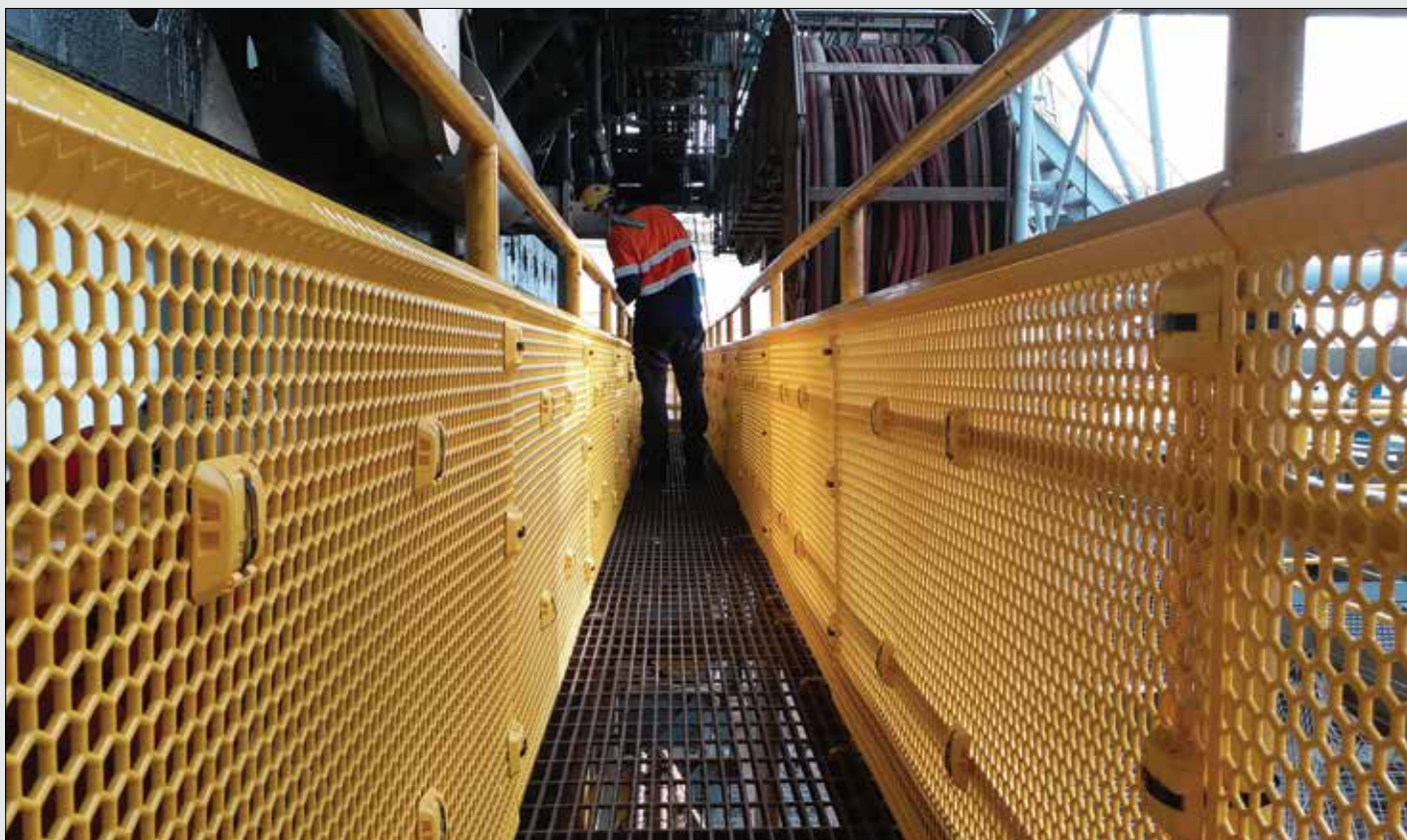
Fixtures (lights, CCTV cameras, and speakers), handheld devices, unsecured tools, loose items, and structural components are all recognised hazards.

For 10 years, industry safety provider Dropsafe has delivered innovative and patented mesh-security and mesh-safety solutions for the mining, oil and gas, industrial and marine industries.

The global company has a whole host of products that eliminate risks on site, including the Dropsafe Barrier, a new state-of-the-art barrier panel system that prevents items such as tools, water bottles, hard hats, two way radios, shackles and maintenance equipment from falling through open guard railing, stairways and elevated work platforms that could potentially create a dropped object and LTI.

The Dropsafe Barrier, now launched in the Australian market, has been cleverly designed to attach easily along the inside of the guard railing of walkways, stairways, conveyor's and access ways of permanent and temporary structures such as scaffolding, gangways, utilising a universal attaching system.

The Dropsafe Barrier has also been through extreme wind tests, impact tests and accelerated weather testing so it can be installed in any harsh environment to protect people from potential dropped and



The Dropsafe Barrier is now available in the Australian market.

falling objects.

"The impact resistance, coupled with the small honeycomb apertures of the barrier panels prevent loose items from falling from height where the barrier is installed," Dropsafe Australia operations manager Gareth Warne said.

Dropsafe also specialise in 316 stainless steel safety nets that retain CCTV cameras, anodes, pipe clamps, and also pouches to securely enclose and tether handheld items such as gas detectors, two-way radios, multi-meters and an assortment of other accessories designed for 'dropped object

prevention' including four-part safety shackles, lanyards, securing cables and carabiners.

More information on Dropsafe's patented technologies can be found at [www.dropsafe.com](http://www.dropsafe.com) or by emailing [gwarne@dropsafe.com](mailto:gwarne@dropsafe.com).

Global Leader in Drops Prevention

## Protecting Your People

**Dropsafe®**  
Drops Prevention Technology



High impact resistance



Designed for high winds



Suitable for harsh environments



Small mesh aperture  
(19.8mm / 0.78inch)

[www.dropsafe.com/contact-us](http://www.dropsafe.com/contact-us)



# UNDER THE MICROSCOPE: Hawsons

**With discounts for lower quality iron ore increasing, Carpentaria Resources' Hawsons project – the highest grade undeveloped iron ore project in the world – is ready to capitalise on growing demand from Chinese steelmakers for high grade product. Cameron Drummond spoke with Carpentaria managing director Quentin Hill about the project's Supergrade® product and his outlook on the future of the iron ore market.**



Hawsons managing director Quentin Hill.

## **Q. How is Carpentaria's Hawsons iron ore project progressing?**

We drilled the first hole in 2009, and released Hawsons first resource in 2010.

It is a \$US1.4 billion development cost over an 18-month period, and will produce an initial 10 million tonnes per annum (mtpa) of 70 per cent Fe Supergrade ore for projected annual revenue of \$900m.

GHD performed an independent analysis of Hawsons and on a 62 per cent Fe basis, all-in sustaining costs are \$23 per tonne, which puts us in the first quartile of the global cost curve.

Our plan is to be in production by 2021, subject to funding.

We released our pre-feasibility results in July 2017. Since then, we have been focused on keeping the project to schedule, which includes EIS works and talking to equity markets and customers about raising between \$25m and \$30m for our bankable feasibility study, of which we are making great progress on.

We have been on several international trips and customers have been looking through the data and responses have been good.

While this has been happening, we have been tightening up our bankable feasibility program and schedule. We are running workshops where we've got a team with vast experience to help us to get the right organisational structure and implementation strategies to take us through construction and into operation.

## **Q. What makes the Hawsons product attractive?**

The key point is that the deposit and the ore is very different to other magnetites. The softness of the ore means the processing costs per tonne of product are well below any other

magnetite project.

We are in a different geological domain to what's in the west. It's the secret of the deposit that makes Hawsons the world's leading undeveloped, high-quality iron ore project.

The ore itself is super soft, grinds super easy and has a very low amount of impurities.

This gives us the Hawsons Supergrade product. The physical properties – because it's so fine – means it's perfect for pelletising.

Iron ore pellets are the most efficient thing you can feed a blast furnace, and pellets are the preferred feed for a direct reduction (DR) furnace.

It terms of the iron ore market it's quite sophisticated. When people talk about high-grade, they talk about pellets, which according to CRU Global has the highest growth rate in the iron ore market.

There isn't enough feed out there and that's where we come in.

The demand for DR specification material is incredibly tight, and the growth is supply constrained.

This is why we have oversold 12 million tonnes of our 10mtpa ore in our initial offtake agreements.

## **Q. Why the structural market shift towards higher grade ore?**

It goes back to the Chinese industry restructure, which started when the iron ore price crashed. They wanted to close a lot of old, polluting steel making facilities – which they have done.

What this means is that capacity utilisation has gone from a low 60 per cent up to 80 per cent. Economics tells you that the margins are going to be high. If you have these high margins you want to produce as much as you can.

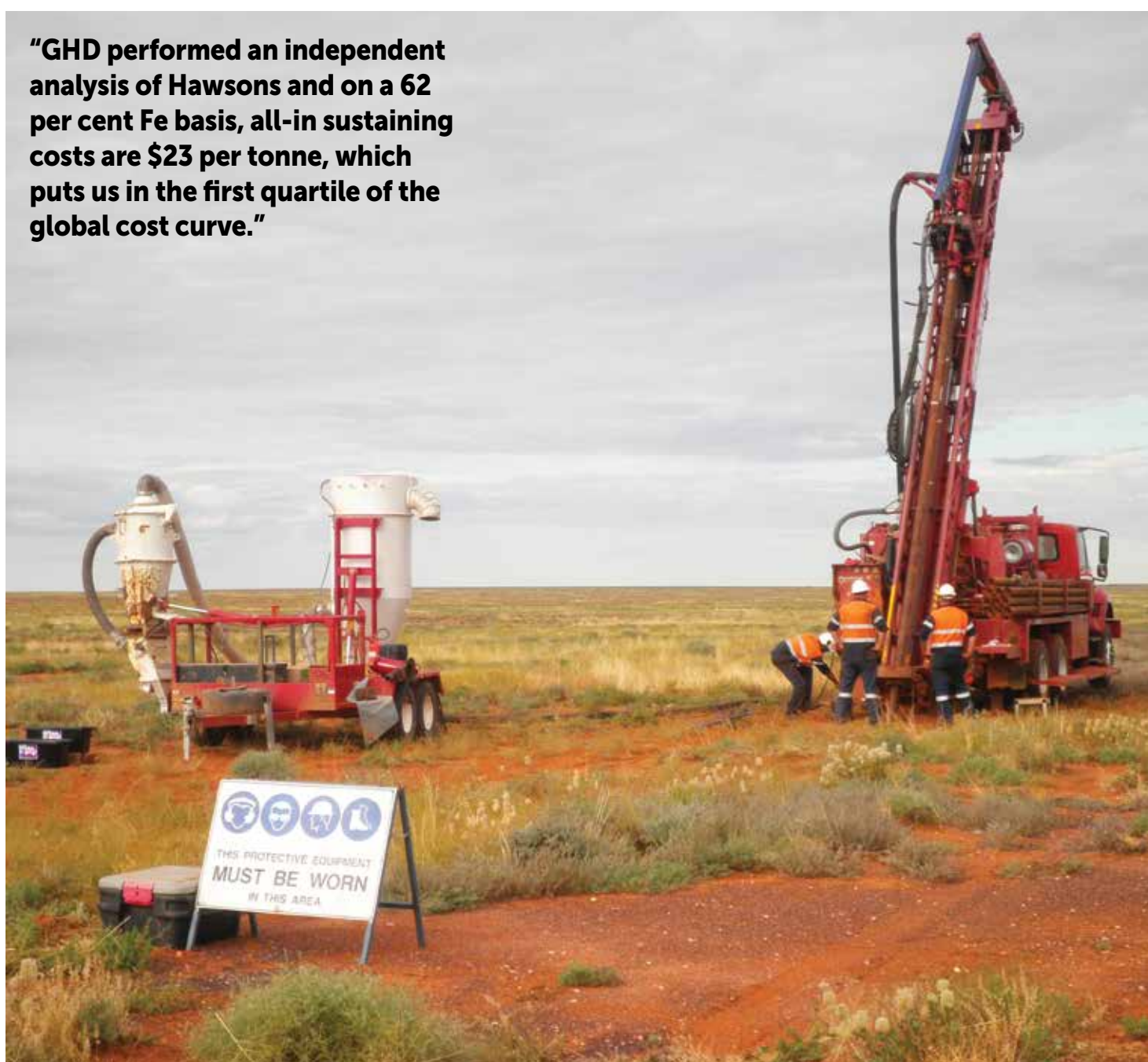
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**"GHD performed an independent analysis of Hawsons and on a 62 per cent Fe basis, all-in sustaining costs are \$23 per tonne, which puts us in the first quartile of the global cost curve."**



If you are feeding 58 per cent Fe against 70 per cent Fe – using the higher grade means you can produce more steel at lower costs and exploit those margins. That's what people are paying for now.

Pollution is another factor. If you are running at an ore efficient level – you are burning less coal per tonne of steel.

Due to increasing costs of pollution in China, steelmakers are looking to reduce that pollution – this again is why high grade ore is now more sought after.

China is also shutting capacity down in the winter due to pollution, which means the rest of the steel market has to make up for that loss, and how do they up productivity? Again, higher grade ore.

One more key point. To make the blast furnace most efficient, you increase the use of iron ore pellets. This allows better gas flow and super-efficient use of the blast furnace.

We are not just benefiting from the need for higher grade iron ore, we are picking the eyes out of the high grade market by targeting its highest growth sectors – the pellet feed market, as well as the tight supply DR specification market.

These markets will drive the development of our project.

#### **Q. What factors are critical for iron ore juniors in Australia to be successful?**

You need rail transport to lower costs, and you need a high quality product. If you have a product that the customers want, they will fund your development.

In terms of direct shipping ore, it appears the best deposits have already been captured by the big four. That makes it hard for a junior unless iron ore prices are very high.

Most of the past juniors started at that those high iron ore prices. The magnetite projects find it difficult too due to the logistics chain and the high energy costs being prohibitive to their profit margins.

It's also important to have good partners. Generally speaking, to get projects banked you need a project with excellent returns, and excellent customers whom the banks are prepared to lend against.

In terms of Hawsons our customers combined have more than \$130 billion of revenue and the ability to underwrite the revenue side of the contracts, and that makes our project attractive to lenders.

In terms of magnetite projects and what you need – the logistics chain and infrastructure is always very important for bulk commodities, and that's why it's very difficult to compete against the majors because they have such sophisticated logistics chains.

For Hawsons we are very fortunate. Because of our location, it is unlike any other undeveloped iron ore project in Australia.

It's right next to a power line, we have identified a water source, and are adjacent to a rail line that goes to two ports – Port Pirie and Whyalla.

There is also a nearby ready workforce that we can tap into from the well-known mining town of Broken Hill.

So that logistics chain is in place, we just need to negotiate access and contracts.

On top of our super soft, super fine, super grade benefits, we also have those infrastructure benefits which lowers the overall capital expenditure for our project.

The market has warmed up a bit. Lenders are still scarred from the downturn, but people are investing at the junior end of the market a little bit more because they see that the cycle has turned and that there's good times ahead.

We still see that the investment community in Australia is perhaps not ready for another magnetite project – but the customers are.

Our job now is to link investors to demand.



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