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There is truly something special about the month of May. Here in the UK, and across much of the Northern Hemisphere, May marks the height of Spring and the start of Summer. A time for optimism and new beginnings.

To quote Nicholas Breton, poet and prose writer of the English Renaissance, "it is now May... It is the month wherein Nature hath her fill of mirth, and the senses are filled with delights. I conclude, it is from the Heavens a grace, and to Earth a gladness." Likewise, Edwin Way Teale, American naturalist, photographer and writer, once wrote: "The world's favourite season is the spring. All things seem possible in May."

This sentiment of optimism and endless possibilities can not only be found in the words of writers of times gone by, it can be seen in the world all around us, and especially in the mining industry, for which the year is off to a strong start.

With the gauntlet of fast-tracking the green transition, post-haste, laid down by the COP26 Climate Change Conference back in November 2021, battery materials demand continues to hit new highs – for example, McKinsey is projecting rapid growth in global demand for lithium alone between 2025 and 2030.¹ Furthermore, with the shadow and disruption of the COVID-19 pandemic seemingly starting to lift, projects around the world have begun resuming normal operations. Both of these trends have contributed significantly to a growing sense of sanguinity, which has been spreading across the mining industry.

I had the privilege of experiencing this optimism first-hand back in March, when I attended MINEXCHANGE 2022 SME Annual Conference & Expo in Salt Lake City, Utah. With over a greater-than-expected 5000 attendees in attendance, 480 exhibitors, and 430 presentations/papers delivered over 88 different technical sessions, the atmosphere was fantastic. Moreover, with all the new technologies on display and ideas being discussed, there was plenty to be excited about.

With trade-shows and exhibitions evidently back to business as near normal as possible, there is much for the mining industry to look forward to this Summer. Indeed, don't miss the chance to grab a print copy of this issue of *Global Mining Review* at Elko Mining Expo in Nevada (6 – 10 June), and upcoming our June issue at the PDAC 2022 Convention in Toronto (13 – 15 June in person, 28 – 29 June online).

In the meantime, make sure to check out the rest of this issue next. In particular, on pages 10 – 12, The World Gold Council provides our latest special report on gold; discussing the importance of addressing both the risks and positive ESG impacts of the gold mining sector. Likewise, don't miss the latest insights from this month's cover advertiser, Nokia, on pages 30 – 33, which include an evaluation of the benefits of private wireless networks as mines go deeper underground.

Optimism does by no means diminish the necessity of hard work, and there is certainly plenty of that in store for the mining industry, but it can make all the difference in sustaining efforts along the road to breakthroughs and eventual success.

This all being said, one cannot ignore the gravity of the events playing out before our eyes in Ukraine. Not only does the scale of the humanitarian crisis continue to grow, but the fallout of the Russian invasion has caused a ripple effect that continues to have significant implications for markets and industries all over the world, and not least the mining industry. As Reuters has reported, while on one hand mining companies have benefitted from soaring commodity prices, they are also faced with the threat of high inflation that could follow, with the potential for a significant blow to be struck to short-term demand and a slowdown in growth.²

To conclude, clearly there is a lot for the mining industry to feel good about this May, but, of course, it does not exist in isolation from the rest of the world. The impacts of the ongoing Ukraine-Russia conflict cannot be ignored, and will require us all to carefully re-assess our plans and expectations for the rest of the year. **GMR**

1. AZEVEDO, M., BACZYŃSKA, M., HOFFMAN, K., and KRAUZE, A., 'Lithium mining: How new production technologies could fuel the global EV revolution', *McKinsey & Company*, (12 April 2022).
2. DENINA, C., and MENON, P., 'Mining companies may pause growth plans amid Ukraine war, inflation', *Reuters*, (3 March 2022).

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WORLD NEWS

AUSTRALIA Greatland Gold awarded a drilling grant for Paterson province exploration project

Greatland Gold plc, a mining development and exploration company with a focus on precious and base metals, has been awarded a grant from the Western Australian government to co-fund exploration drilling and mobilisation costs at its 100% owned Rudall licence in the Paterson province. The Rudall licence covers an area of approximately 65 km²

approximately 20 km south-southeast of Greatland's Haverton gold-copper resource.

The grant awarded is the result of a successful application under the exploration incentive scheme. Greatland is eligible to receive a grant up to AUS\$200 000 to co-fund drilling and mobilisation costs, within 12 months of the grant.

AUSTRALIA Omniflex and AMOG receives funding from METS Ignited

Omniflex and AMOG Consulting, who have collaboratively developed Industrial Internet of Things (IIoT) oversize detection instrumentation for the global mining industry, have received new funding from METS Ignited as part of an AUS\$2.5 million funding initiative. The funding is aimed at backing companies that have successfully commercialised technologies under previous METS Ignited funded projects in the mining equipment, technology, and services sector.

Mines often operate by blasting mine and pit faces with explosives, producing rubble of various shapes and sizes. This is then loaded onto large haul trucks and transported to an ore crusher. When oversized rubble reaches the crusher, it can block and damage it, halting production while blockages are removed, or parts are replaced.

Omniflex and AMOG have collaboratively developed IIoT instrumentation to boost oversize detection capabilities for the global mining industry. The system uses sensors to detect the size of ore rubble as it is loaded into haul trucks to be carried from the blast site to the crushing plant. This information is wirelessly communicated in real time to the driver, mine operations, and/or remote data storage for later analysis.

The initial technology creation was possible due to METS Ignited Collaborative Project funds. This new project aims to accelerate the scaling up of the business to meet global industry demand. This includes expanding production, testing capabilities, certification, enabling rapid adoption of this innovative digital technology.

USA Rio Tinto starts tellurium production at Kennecott

Rio Tinto has started producing tellurium at its Kennecott copper operation in Utah, becoming one of only two US producers of the critical mineral used in advanced thin film photovoltaic solar panels.

The tellurium will be refined in North America by 5N Plus, a leading global producer of specialty semiconductors and performance materials, under a commercial agreement between 5N Plus and Rio Tinto. The refined tellurium will primarily be supplied to First Solar, the only American company among the world's 10 largest solar manufacturers, under an existing supply contract between 5N Plus and First Solar. 5N Plus will also use the tellurium to manufacture ultra-high purity semiconductor materials at its facility

in St. George, Utah, to serve the security and medical imaging markets.

Approximately 20 tpy of tellurium will be produced through a new US\$2.9 million circuit built at the Kennecott refinery. This valuable material is recovered from by-product streams generated during the copper refining process, reducing the amount of waste that needs to be treated and discarded as mine tailings.

Tellurium is listed as a critical mineral by the US government due to its importance to the economy and energy security.

Tellurium is one of 10 metals and products recovered from ore extracted at Kennecott, which produces nearly 15% of US copper with the country's lowest carbon footprint.



WORLD NEWS

DIARY DATES

Elko Mining Expo 2022

06 – 10 June 2022

Elko, USA

<https://exploreelko.com/event/36th-annual-elko-mining-expo/2022-06-09/>

PDAC 2022 Convention

13 – 15 & 28 – 29 June 2022

Toronto, Canada & Online

www.pdac.ca/convention

Euro Mine Expo 2022

14 – 16 June 2022

Skellefteå, Sweden

www.euromineexpo.com

Electra Mining Africa

05 – 09 September 2022

Johannesburg, South Africa

www.electramining.co.za

International Fair EXPO KATOWICE 2022

06 – 09 September 2022

Katowice, Poland

www.expo-katowice.com

Mining Indonesia

14 – 17 September 2022

Jakarta, Indonesia

www.mining-indonesia.com

CONEXPO-CON/AGG 2023

14 – 18 March 2023

Las Vegas, USA

www.conexpoconagg.com/conexpo-conagg-construction-trade-show

To stay informed about the status of industry events and any potential cancellations of events due to COVID-19, visit Global Mining Review's events page: www.globalminingreview.com/events

CANADA Pacific Ridge acquires Chuchi porphyry copper-gold project

Pacific Ridge Exploration Ltd has entered into an agreement with AuRico Metals Inc., a wholly owned subsidiary of Centerra Gold Inc., to acquire up to a 75% interest in the Chuchi porphyry copper-gold project, located in the prolific Quesnel Trough, north-central British Columbia.

Over 6100 ha. in size, the road accessible Chuchi is located 90 km north of Fort St. James and 35 km northwest of Centerra's Mount Milligan mine. The project is in the Quesnel terrane and is underlain by lower Jurassic volcanic and sedimentary rocks of the Takla Group (Chuchi Lake succession). Porphyry copper-gold mineralisation at the BP and Rio Algom Zones is associated with a cluster of early Jurassic monzodiorite to syenite porphyry intrusions, dated at 188.5 Ma ± 2.5 Ma. The main BP Zone is defined by 4 x 3 km halo of outer propylitic alteration surrounding a central 1.5 x 1.5 km area of copper-gold mineralisation, which is open to depth and potentially to the east across the north-south trending Valley Fault.

Chuchi has a long history of exploration by companies such as Noranda, BP, Rio Algom, Kiska Metals and AuRico, including 8886 m of drilling in 48 holes, of which 39 holes have targeted the main BP Zone. An additional 27 holes were drilled in 1991, but the records for this drilling have been lost. Most of the drilling was shallow, less than 150 m in depth, with many of the drill holes ending in mineralisation. Grades within the mineralised portion of the BP Zone range from 0.21 – 0.4% copper and from 0.21 – 0.44 g/t gold. Pacific Ridge believes that the core of the porphyry system has yet to be identified. The project also contains other targets that could represent porphyry centres.

Pacific Ridge is planning an airborne ZTEM resistivity survey and a surface exploration program consisting of mapping, sampling and core re-logging this summer, with the objective of defining drill targets for the 2023 field season.

GLOBAL Glencore and Li-Cycle announce partnership

Glencore has established a strategic partnership with Li-Cycle Holdings Corp., a leading lithium-ion battery recycler in North America. Glencore will subscribe for convertible debt in Li-Cycle and Li-Cycle will become a preferred partner for Glencore in the lithium-ion battery recycling sector.

With the addition of this strategic partnership with Li-Cycle, Glencore will seek to combine primary and recycled battery raw materials to produce battery grade end products. This will enable auto manufacturers to meet their EV ambitions, while also being able to meet key regulatory directives related to battery raw materials.

Subject to the satisfaction of customary conditions precedent and entry into the key commercial agreements, which is expected in 2Q22, Glencore will subscribe for US\$200 million of convertible debt in Li-Cycle. If Glencore elects to convert during the conversion option period, Glencore would hold an approximate 10% equity stake in Li-Cycle.

Upon closing, Glencore will have the right to nominate one board member to the Li-Cycle board. Kunal Sinha will be nominated by Glencore.



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SCREENING NEWS

MAJOR offers on-site technical services to maximise screening performance

MAJOR, a leading global manufacturer of high-performance wire screening media, works closely with its dealer network to offer complimentary on-site technical services for end users. Each programme is designed to help producers and contractors in the aggregates, mining, construction and recycling industries, to maximise uptime with their screen media and includes local screening performance assessments, technical assistance, training workshops, and more.

MAJOR certified dealers offer screening performance assessments to identify opportunities and offer solutions for improvement to increase plant uptime and screening efficiency. A MAJOR screening expert will visit the operation and collaborate with producers to collect data and operational parameters. Upon reviewing the data, the screening expert will provide a report that includes recommendations for improvement and outlines opportunities for growth.

Technical assistance is also available through MAJOR's dealer network. This involves a personalised plant visit where a local screening expert can address issues and make recommendations on optimal screening solutions. Each plant visit will include a vibration analysis test with MAJOR's signature FLEX-MAT Sensor. The app-controlled vibration analysis sensor enables readings of screen box vibrations within seconds and generates a report, allowing MAJOR certified technicians to review results and fine tune an operation's screen box without shutting down the equipment.

Additionally, MAJOR and its dealer network offer aggregate and mining producers on-site training opportunities to optimise efficiency. The seminars educate plant managers, operators, and maintenance crews on best practices for screen media usage and how to prevent inefficiencies. Operations can also request custom training sessions focused on specific challenges or applications.

FLSMIDTH supplies full equipment flowsheet to Sabina Gold & Silver

FLSmidth has been chosen to supply the full equipment and processing flowsheet for Sabina Gold & Silver Corp.'s Goose gold mine in the West Kitikmeot region of Nunavut, Canada.

The order is valued at approximately DKK 270 million and was booked in 2Q22. The equipment is due to be delivered in the middle of 2023, ahead of the mine start-up date in 1Q25.

FLSmidth will supply the jaw crusher, Raptor® Cone Crushers, ball mill, VXP-Stirred Mill (secondary grinding) and KREBS® cyclones, pumps as well as screens, feeders, and Knelson™ gravity concentrators. The order also includes equipment for pre-oxidation and leaching; carbon in pulp extraction; absorption, desorption, and refining; and detoxification.

ANDRITZ develops new screen roll centrifuge

ANDRITZ has developed a new screen scroll centrifuge with innovative features that reduce wear, enable the rapid exchange of parts, and increase maintainability.

The new ANDRITZ screen scroll centrifuge HX can process bulk chemicals, minerals, agrochemicals and food, even under difficult feeding conditions. It is designed for improved product quality and maintainability. New features include a Gentle Feeder™ feeding system, a modular scroll, and a rotating assembly that can be removed and replaced in one piece (express cartridge).

The express cartridge design enables the entire rotating assembly to be replaced without dismantling any process piping, reducing downtime to less than 8 hrs, even for major maintenance

work. Minor maintenance work can be done without removing the cartridge as the scroll and screens are easily accessible and removable. The scroll itself is a modular unit designed specifically for cost efficiency and rapid repairs – worn parts can be replaced separately using standard tools. These new features minimise maintenance costs and maximise uptime.

The screen scroll centrifuge HX is also equipped with ANDRITZ's proven Gentle Feeder feeding system. It gently accelerates the solids, thus reducing particle breakage and screen wear. An automated cleaning-in-place system, a cake washing feature and optional additional wear protection round off this innovative solution.

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A close-up photograph of several gold nuggets of various sizes and shapes resting on a dark, textured wooden surface. The background is a soft-focus field of more gold nuggets, creating a sense of abundance. The lighting is warm, highlighting the metallic sheen of the gold.

GOLD MINING AND THE EVOLVING ESG



Terry Heymann, World Gold Council, UK, discusses the importance of addressing both the risks and positive ESG impacts of the gold mining sector.

Over recent years, investors have increasingly been considering how to integrate environmental, social, and governance (ESG) considerations into their investment decision processes. Similarly, consumers have become more mindful of the need to ensure the gold they purchase has been responsibly sourced. This has implications for the whole gold supply chain, but it often starts with an examination of the nature of mining operations and need to validate whether companies and the wider sector can demonstrate responsible and sustainable business practices.

And, as for all sectors, investor, regulatory, and societal expectations are broadening. Business leaders are increasingly asked to look beyond the objective of creating shareholder value, and exhibit an understanding of the wider social and environmental impacts of their companies and products.

Recently, Blackrock's Evy Hambro, a leading mining-focused fund manager, publicly stressed the importance of miners being able to explain the positive impact they have on the economies and communities in their host countries. He noted that the majority of miners' ESG reports focus primarily on the negatives – the downside risks – rather than the opportunities.

Hambro is right; the gold mining sector needs to better communicate the societal and environmental positive impacts it brings, as well as the steps it is taking to address risks. It is important to note that the gold industry has clear standards in place, across the supply chain, including the World Gold Council's Responsible Gold Mining Principles (RGMPs) and the LBMA's Responsible Gold Guidance. The RGMPs were developed to address all the material ESG risks associated with gold mining; and the Responsible Gold Guidance is followed by all LBMA-accredited refiners, in order to ensure that they have appropriate responsible sourcing procedures in place. These complementary frameworks should give all stakeholders confidence that the gold they invest in has been mined and processed in a responsible manner.

In addition, the industry also plays an important role in delivering wider positive impacts that help advance the UN Sustainable Development Goals (SDGs). Responsible gold mining supports sustained socio-economic development in many of the countries and communities where gold is mined. It creates well-paid jobs for local workers, stimulates local economies, provides valuable tax revenues for host governments, and generates sustained benefits for local

communities through infrastructure provision and supporting health and educational provision.

Furthermore, the gold mining sector has credible plans to decarbonise and, if the industry continues on its current path, its emissions reduction will broadly be in line with the climate targets set by the Paris Agreement. Looking downstream, at gold as an investment asset, it offers a number of benefits to investors which suggest it might play a positive role to play in reducing exposure to climate-related risks within a multi-asset portfolio.

Value distribution and wider socio-economic impacts

The World Gold Council's members, 32 of the world's leading gold mining companies, are committed to responsible and sustainable business and operational practices. In 2019, it launched the RGMPs – a framework that sets out clear expectations for consumers, investors, and industry stakeholders as to what constitutes responsible gold mining. Developed with its members, and through extensive stakeholder consultation, the RGMPs comprise 51 principles that address all material environmental, social, and governance issues for the sector. All of the World Gold Council's members are committed to implementing the RGMPs, which requires publicly-disclosed external assurance by a third-party. The hope is that the RGMPs will be adopted across the entire gold mining sector, and the council has seen a number of non-World Gold Council members commit to implementation.

In addition to committing to responsible mining, the members are also committed to supporting social and economic development in the countries and communities where they operate.

Gold mining is a major economic driver for many countries across the world. Well-managed, transparent, and accountable resource extraction can be a major contributor to economic growth, due to the creation of employment and business opportunities for local people. In 2021, the World Gold Council released a report – the Social and Economic Contribution of Gold Mining – which examined the value contributed by its members in the countries in which they operate. This report, covering 31 member companies, operating in 38 countries and producing 34.5 million of oz of gold, found that, collectively, these companies contributed close to US\$38 billion to the GDPs of host countries. This represented 63% of the total revenue they received from gold sales, and equates to almost US\$1100 in value added locally for every ounce of gold produced. It also highlighted the positive impacts on stimulating wider employment, including job creation beyond the mine site; for every job at a mine, a further six are supported in the broader economy. Furthermore, in contrast to historical trends, the vast majority of the mine's workers – over 95% – are employees from that country. Members also support their host communities by investing in infrastructure, providing education opportunities, and healthcare facilities and services, including, for example, COVID-19 relief and tackling malaria.

Gold and climate risk mitigation

The World Gold Council and its members recognise that climate change imposes very substantial risks to the global

economy and socio-economic development. Policy makers, industry participants, investors, and wider society are eager to develop a greater understanding of these risks and their potential consequences, and how they might be mitigated or managed in future. To contribute to a clearer, more consistent appreciation of how climate-related risks and opportunities might impact the future prospects of the gold industry and its many stakeholders, it has undertaken a programme of research, in collaboration with leading climate and sustainability experts.

Substantive research has looked in detail at the gold industry's carbon footprint and led to the conclusion that there is a credible way for the entire supply chain to reach net-zero by 2050. The research also evaluates the impacts of reducing gold mining's power emissions by 2030 to assess what would be required to be consistent with the Paris-aligned climate targets. Based on the industry's current status and known plans, coupled with analysts' estimations of future trends, the World Gold Council calculates the primary cause of sectoral emissions – the carbon intensity of power used in gold production – is estimated to fall by approximately 35% by 2030. This reduction is based on the growing decarbonisation of grid-sourced electricity, and gold mining company actions to replace direct site-generated electricity from fossil fuels with the increased use of renewable energy sources, alongside substantially reduced production from higher emission mines.

Furthermore, as gold miners decarbonise their energy sources at mine sites, they can also bring cleaner power to local communities and, in some locations, will be a key factor in bringing low carbon electricity to the region, with potential development benefits well beyond the mine.

Building on a better understanding of gold's carbon profile and potential decarbonisation pathway, the World Gold Council's latest research on gold and climate change examines the implications of holding physical gold (or a gold-backed asset) on the climate-related risk and performance profile of diversified portfolios.

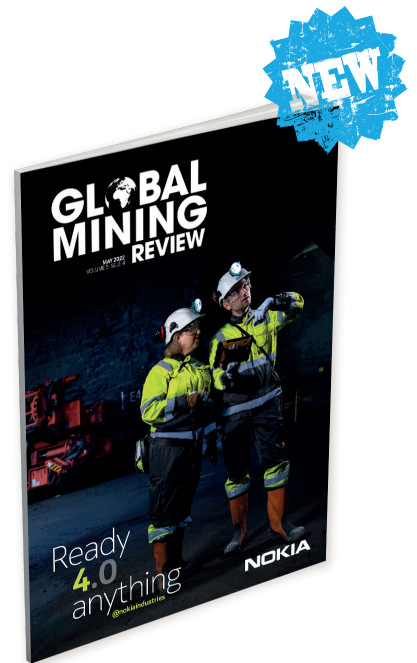
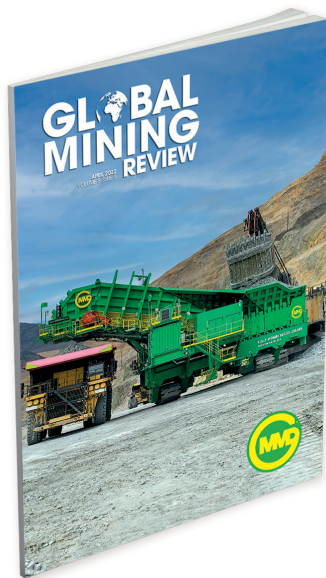
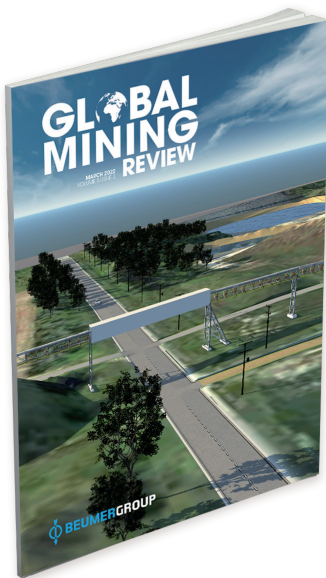
Its analysis, conducted in collaboration with financial climate risk experts at Urgentem, found that including gold as part of a portfolio of equities and bonds can increase the portfolio's alignment to climate targets while reducing the portfolio's overall carbon footprint, and reduce the vulnerability of the portfolios to climate transition risks and shocks, such as the imposition of carbon taxes and the rising cost of carbon more generally.

Carving out a path for future progress

From implementing the RGMPs to, more recently, committing to reporting their positions and progress on climate-related risks in line with the recommendations of the Taskforce for Climate-related Financial Disclosures (TCFD), companies have shown they are committed to taking action and creating real change. While there is still a great deal of work to do and further progress to be made, a vibrant gold sector, with responsible mining at its heart, can make substantial contributions to advancing sustainable development and to supporting the transition to a decarbonised economy. **GMR**

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MAY 2022



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