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Tesla to eliminate cobalt from its electric vehicles

COBALT | Production of new type of battery cell has already begun



Tesla vehicle lineup at the company's Battery Day event in Freemont, California, Sept. 22, 2020. STEVE JURVETSON, FLICKR

BY CARL A. WILLIAMS
 cwilliams@northernminer.com

At Tesla's live-streamed Battery Technology Day on Sept. 22, CEO Elon Musk outlined the company's plans to build a US\$25,000 electric vehicle (EV) with a cheaper, more powerful battery that doesn't contain cobalt, and the construction of a new cathode plant.

The new battery technology, which the company plans to manufacture in-house, will lower the cost of its EVs and extend their range by 16% thanks to a six-fold increase in power.

Musk didn't provide details on the exact cost per kilowatt-hour (kWh), a key metric used to measure the performance of an EV's battery pack. However, changes to battery chemistry and how the battery pack is made, he said, will reduce the costs per kWh by 56%, suggesting a cost below the US\$100 per kWh threshold that is generally accepted for EVs to be price competitive with gasoline-powered cars.

Production of the new battery cell, called the "4680-cell" because of its 46 millimetre diameter and 80 millimetre height, has already commenced with ten gigawatt-hours (GWh) of annual capacity expected

before the end of 2021.

According to Wood Mackenzie, an energy research and consulting firm, the new design can cause thermal and rapid charging issues. However, Tesla claims to have overcome these issues by removing the tabs that act as the positive and negative connection points between the anode and cathode and the battery casing.

The tab-less design will reduce the cell's winding and increase production rates and could result in around 20% less copper and aluminum content in the cell, said analysts at BMO Capital Markets.

Consultants Wood Mackenzie noted that the tab-less design is yet to appear in any other commercialized EV battery cell.

Tesla also intends to eliminate cobalt in battery cathodes by switching to batteries that use less costly metals such as nickel and manganese.

In recent years, battery manufacturers have been focussed on cathode design, particularly the ratio of nickel, cobalt, and manganese used in cathodes. Manufacturers, including Tesla, are moving towards high-nickel cathodes with lower cobalt content.

But this has proved challenging

See **COBALT GOLD** / 8

License to operate still top concern for miners according to EY report

ESG | Geopolitical risks also expected to impact the sector

BY BRUNO VENDITTI
 Mining.com

License to operate (LTO) remains, for the third consecutive year, the number one issue for miners, according to a survey by Ernst & Young with over 250 executives, while a shifting balance of power among the world's largest economies has created a new geopolitical risk.

The annual EY Top 10 business risks and opportunities 2021 report shows 63% of executives view LTO as the biggest risk facing their business as stakeholder expectations evolve, up from 44% last year.

The departure of Rio Tinto's (NYSE: RIO; LSE: RIO) CEO Jean-Sebastien Jacques over the destruction of ancient Aboriginal heritage sites in Australia has put mining executives globally on notice, and EY says miners will need to work with governments and sector associations to help shape the messaging of the societal contribution and value derived from the mining sector.

"THERE IS A HUGE OPPORTUNITY TO REMOVE COMPLEXITY, OVERCOME HISTORICAL OBSTACLES TO CHANGE, AND ACCELERATE A TRANSFORMATION AGENDA."

PAUL MITCHELL, EY GLOBAL MINING AND METALS LEADER

"We expect the issue to become even more important as stakeholders broaden and develop a stronger voice," the report states. "Local communities will have greater expectations around how miners respect

See **ESG** / 8



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Industry, investors divided on proposed Ontario capital market reforms

REGULATORY ISSUES | Mining sector could be impacted

BY KELSEY ROLFE
SPECIAL TO THE NORTHERN MINER

Institutional investors, industry groups and experts are divided on a set of substantial capital markets reforms being proposed by Ontario's capital markets modernization taskforce.

The taskforce, set up in February by Ontario Finance Minister Rod Phillips, released a set of 47 proposed reforms over the summer that could impact mining issuers if they were implemented. The suggestions included introducing the option to move to semi-annual reporting from quarterly reporting; creating an alternative offering model for reporting issuers; introducing a well-known seasoned issuer model such as in the United States; and giving public companies greater flexibility to gauge investor interest in a prospectus offering. The three-month comment period concluded in September.

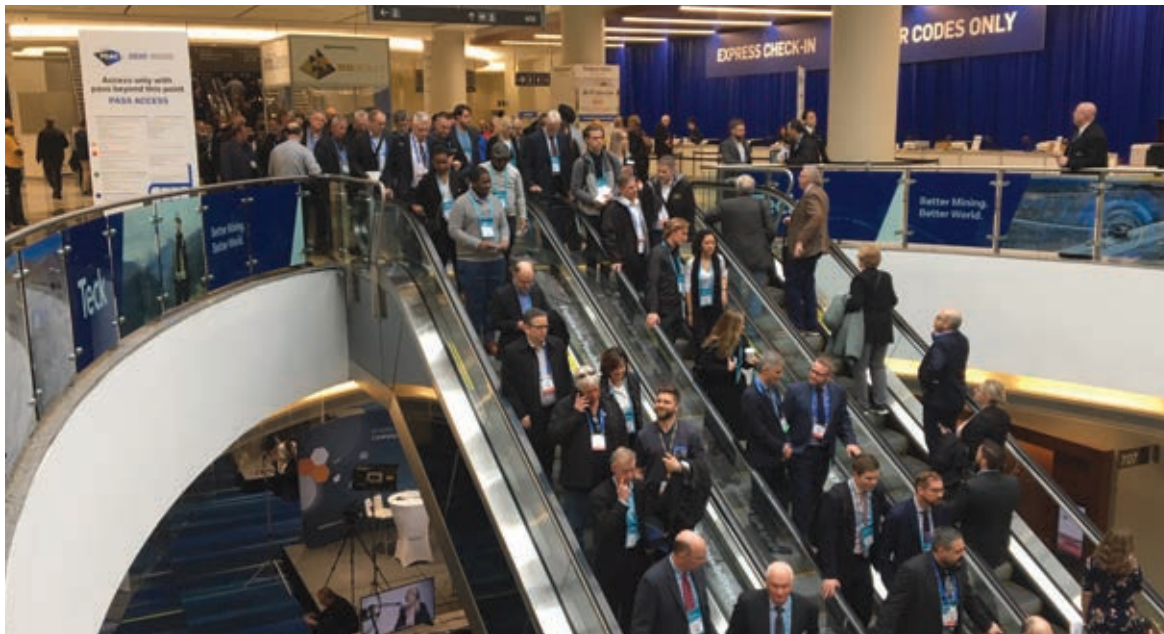
Commenting on the proposed changes, James Brown, a partner in Osler, Hoskin & Harcourt's corporate group and co-chair of the firm's mining group, said the impact will depend on the size of the mining issuer. "[For] larger issuers that are cross-border, some of the proposals are intended to make their lives easier."

Brown pointed to the proposal to incorporate a well-known seasoned issuer model for capital-raising. The model would give certain public companies a less burdensome registration process for a shelf prospectus — a short-form prospectus that companies can file on SEDAR for a public offering when they have no intention to immediately sell all of the qualified securities. Qualifying companies would need to be above a certain free float or have issued debt securities above a set amount in a specific time period, with a strong disclosure record. "[That's] a proposal we think is going to be helpful to reduce regulatory burden," Brown said in an interview.

However, he noted, many junior miners won't be able to take advantage of that system because they choose not to file annual information forms due to cost-constraints or other reasons, cutting them out of the short-form prospectus system.

In its submission to taskforce chair Walied Soliman, the Prospectors and Developers Association of Canada (PDAC) was supportive of several of the proposals that would seem to benefit junior mining companies, such as the suggestion to introduce an alternative offering model for reporting issuers.

While large public companies can absorb the cost of conducting a public offering, they present a barrier to small companies, the taskforce's report noted. The alternative model would allow smaller companies to raise capital based on a short offering document and their continuous disclosure record, rather than a full prospectus filing. Companies would need to be reporting issuers for 12 months and be up to date with continuous disclosure to participate.



Delegates at the 2020 PDAC convention in Toronto. CARL A. WILLIAMS/THE NORTHERN MINER

PDAC proposed a \$10-million maximum capital-raising limit within a 12-month period for smaller issuers, and more than that for larger issuers. It suggested the limit should be proportional to issuers' market capitalization so the alternative offering model couldn't be used to finance a material acquisition or change of business.

"One of the principle concerns PDAC has for its members is ensuring a smooth, effective access to capital, given the nature of their businesses, and something like this alternative offering model could certainly add a new flexible way for companies to reach markets," Jeff Killeen, the association's director of policy and programs, finance and taxation, securities, geoscience and health and safety, said in an interview with The Northern Miner.

Similar proposals have been entertained by the British Columbia Securities Commission and the Canadian Securities Administrators.

The Investment Industry Association of Canada, however, said such a model would "degrade the reputation of Canadian capital markets." It argued it would have a negative impact on continuous disclosure available to the secondary markets because of an absence of underwriter due diligence and regulatory review on such offerings, and expressed concern at the lack of proposals to protect retail investors if such a model were implemented.

PDAC expressed support for a proposal from the taskforce to move to semi-annual reporting. However, the association said such reporting should only apply to small issuers that reported no revenue from regular operations in the previous two years.

"For junior explorers, a move to semi-annual reporting could provide more time and resources for exploration, which is the principal way they provide value for their investors," Killeen said. As well, he noted, those companies are already required to disclose material changes to their business on a continuous basis through press releases.

On the investor side, the Pension Investment Association of Canada, which represents more than 130 of the largest pension plans in the country responsible for more than \$2 trillion in assets under management, said it supports semi-annual reporting from issuers, with caveats. "PIAC is of the belief that providing quarterly reporting and guidance may lead some issuers to focus on short-term thinking and to make decisions

"UNLESS THE CHANGES ARE HARMONIZED ACROSS THE COUNTRY, THERE IS LITTLE BENEFIT TO MAKING CHANGES IN ONTARIO."

JAMES BROWN, PARTNER, OSLER, HOSKIN & HARCOURT

that are short-term oriented to meet the demands of the market and lead to less than optimal outcomes for shareholders and the beneficiaries of the pension plans that PIAC represents," it said.

However, any move to semi-annual reporting should include timely disclosures of material changes to the issuers' business plans and activities to ensure transparency, it added.

The Investment Industry Association of Canada said it supports allowing semi-annual reporting for TSX Venture or Canadian Securities Exchange issuers, but not for larger

companies on the TSX. "Issuers benefit from the structured and frequent communication with investors that comes with the quarterly reporting cycle."

Australia and the United Kingdom have implemented such reporting, but other provincial regulators and the United States have not. Osler's submission to the taskforce pointed out that a move to semi-annual reporting, and other proposed changes, would put Ontario out of step.

"While many of the proposals present interesting ideas for Ontario's capital markets, simply making changes

in Ontario alone isn't helpful," Brown said. "Virtually all public companies in Canada report in more than one jurisdiction, so unless the changes are harmonized across the country, there is little benefit to making changes in Ontario to mining issuers, big or small, where they continue to have to comply with different standards in another province or territory."

Killeen said the PDAC is less concerned with harmonization with the United States. "Canada and Ontario are top destinations for raising capital for the mineral exploration industry, and we're certainly focused on maintaining that position," he said. "Alignment with the U.S. regulatory framework isn't always paramount. Ensuring our capital markets are nimble, streamlined and [have] strong investor protections, those are top priorities."

To encourage more public companies to use prospectus offerings for financings, rather than relying on private placements, the taskforce recommended greater flexibility for issuers and their advisors to gauge institutional investor interest in a potential prospectus.

"The Taskforce believes that a greater ability to communicate with potential investors to gauge the demand for a public offering would minimize the risk of failed transactions," it said, adding that such flexibility would need to be accompanied by increased monitoring and compliance examinations on the trading of investors that have advanced information about a potential prospectus.

This would bring Ontario up to speed with similar rules in the U.S., according to Brown. He said Ontario should attempt to more closely align its rules with the U.S., including those around testing the waters prior to a prospectus offering, as the U.S.

See **REGULATORY ISSUES** / 16

Mining's crucial contribution to the Sustainable Development Goals

COMMENTARY | A call to action

BY ANDREW CHEATLE
SPECIAL TO THE NORTHERN MINER

Fall is traditionally the start of conference season and networking for the mining industry. Events including Mines and Money, *The Northern Miner's* Global Mining Symposium, Precious Metals Summit, Denver Gold Forum, and 121 Mining Investment have moved seamlessly on-line, and back to back video meetings are now the 'new normal' for executives and investors alike.

The investments that flow from these meetings are the lifeblood of the mining sector, especially for junior miners, and also fundamentally important for growing our wealth, whether as personal portfolios or within pension plans. This year, Environmental, Social and Governance issues (ESG) have been front and center of many investment discussions, and are now widely incorporated into all company presentations, and real action on the ground is evident. At times, it might seem, ESG is the only subject of conversation at the table.

A new and important theme is developing: the United Nations Sustainable Development Goals (SDGs), and the mining industry's contributions to these goals are starting to feature at industry forums and in the media. This is a welcome breakthrough, which speaks to a higher purpose for our industry.

The Sustainable Development Goals are summa-

rized by the UN as "...a call for action by all countries — poor, rich and middle-income — to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection. More important than ever, the goals provide a critical framework for Covid-19 recovery." (The goals were adopted by 193 governments in September 2015 and comprise 17 individual, but connected goals, all of which seek to positively transform the world). Five years since their release, we have now entered the UN 'Decade of Action'.

ESG is now widely embraced, and the mining industry's role in achieving the SDGs is becoming more apparent and urgent.

We provide the needed metals and minerals for societal transformation to renewable energy, wealth generation (and preservation according to the gold bugs), new industrial applications, transportation and ever increasingly sophisticated communication platforms. As an industry, we are also successfully addressing our legacy by becoming trusted stewards of the natural environment where we operate, particularly with water management. We drive growth,

See **COMMENTARY** / 6

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Great Panther Mining focuses on stability, growth

C-SUITE PERSPECTIVE | Company shifts to becoming primarily a gold producer

BY TRISH SAYWELL
tsaywell@northernminer.com

Great Panther Silver changed its name to **Great Panther Mining** (TSX: GPR; NYSE-AM: GPL) last year after adding the Tucano gold mine in northern Brazil to its portfolio of two primary silver mines in Mexico and a silver-lead-zinc-copper project in Peru. Now gold makes up 80% of the company's revenue and silver the remaining 20%.

"It was a very transformational transaction," Great Panther's new president and CEO Rob Henderson says of the Tucano acquisition. "I wasn't there at the time but the company made a conscious decision to diversify into gold."

Last year, the company produced 147,000 oz. gold-equivalent, and its 2020 guidance is for 146,000-158,000 oz. gold-equivalent at all-in sustaining costs (AISCs) in the range of US\$1,150 to US\$1,250 per oz. gold sold.

Henderson joined Great Panther Mining in April, after heading up copper producer **Amerigo Resources** (TSX: ARG; US-OTC: ARREF) for seven years. Prior to Amerigo, Henderson spent eight years at **Kinross Gold** (TSX: K; NYSE: KGC), where he was senior vice president of technical services. He got his start at Rand Mines in Johannesburg where he worked as both a metallurgist and assistant plant superintendent.

"I saw this as an opportunity to join a company with very good assets in Brazil, Mexico and Peru," he says in an interview. "It's a growing company and well-diversified and has a

"IT'S A GREAT TIME TO BE IN THE INDUSTRY."

ROB HENDERSON
PRESIDENT AND CEO,
GREAT PANTHER MINING.

good balance of silver and gold, but, for me, it's going back to my roots as a gold miner."

For now, his priorities are to continue to build on cost and operating efficiencies at the Tucano mine and grow production and increase exploration at all three mines.

Great Panther owns two primary silver operations in Mexico – the Guanajuato mine complex and Topia – which have been churning out silver for the company since it was created in 2005. The Guanajuato mine complex is Great Panther's largest operation in Mexico and includes production from the Guanajuato and San Ignacio underground mines, which are situated on the outskirts of the capital city of Guanajuato. The Topia mine, in northwestern Mexico, is 235 km west of the city of Durango.

"Mexico is working well for us," Henderson says. "The mines have been producing continuously since 2005, they're in very good historic mining districts and at today's silver price they're producing free cash flow for us."

Henderson notes that when Bob Archer, the company's founder, purchased the Guanajuato mine fifteen years ago from a cooperative of Mexican workers who had been



Haul truck at Great Panther's Tucano gold mine in northern Brazil GREAT PANTHER MINING

operating it for 50 years, it had three years of resources on its books and that it still has 3 million oz. today. "We've been producing 1.5 million oz. of silver there every year for the last 15 years, which goes to show the exploration potential is enormous for us," he says. "One of the features of these Mexican silver mines is that you're always going to have a very small drilled inventory ahead of you, but the systems are huge, and I think we've demonstrated that at both Guanajuato and Topia."

The challenge with the two silver mines is that they are difficult to drill because they are high-grade narrow veins and you can only drill from

underground. "You start off with a couple of years of resources on the books and you drill every year to prove up enough material to mine for the next couple of years. That's how these Mexican silver mines go, so you have to have faith in the system and both of the mines have fabulous vein systems there which are extensive but you're never going to have much confirmed mine life ahead of you. They need to be drilled continuously."

By contrast, Great Panther's Tucano open-pit gold mine, the third-largest gold producer in Brazil, poses different challenges, he says. Last year, the company had to deal with

a pit wall stability issue. The pit's high walls got wet in the rain and there was a threat of material falling into the pit, so the company had to change the mine plan from a safety point of view, he explained.

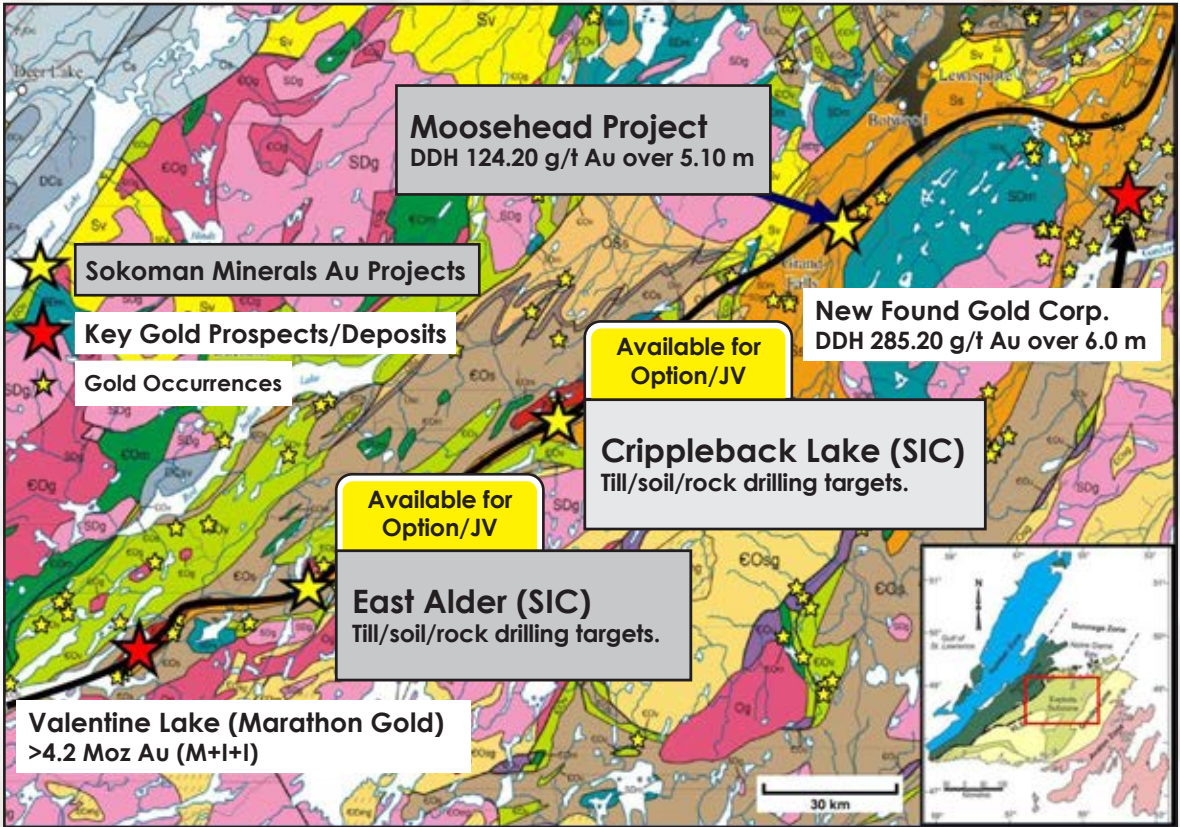
"We spent a lot of money on geotech drilling so now we understand the rock mechanics a lot better, but it was basically operating where we didn't have enough knowledge. So we need to know what we can and can't do and when we have that knowledge through drilling and studies, then we can get more stability in our production estimates."

See **C-SUITE PERSPECTIVE** / 7



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EDITORIAL

JPMorgan fined US\$920M
for market manipulation

MARKETS | Rogue trading, ill-gotten gains and the public interest



BY TRISH SAYWELL
tsaywell@northernminer.com

nearly eight years. The fine is the largest in the CFTC’s history, and with any luck, will discourage rogue trading behavior in the future.

According to the CFTC, from at least 2008 through 2016, traders on JPMorgan’s treasuries desk placed orders on one side of the market that they had no intention of ever executing in order to create the illusion of buy and sell orders to affect prices. The practice — called “spoofing” — has been prohibited since 2010 after it was banned under the Dodd-Frank financial reform law.

“JPM, through numerous traders on its precious metals and Treasuries trading desks, including the heads of both desks, placed hundreds of thousands of orders to buy or sell certain gold, silver, platinum, palladium, Treasury note, and Treasury bond futures contracts with the intent to cancel those orders prior to execution,” the CFTC stated in a Sept. 29 press release. “Through these spoof orders, the traders intentionally sent false signals of supply or demand designed to deceive market participants into executing against other orders they wanted filled. According to the order, in many instances, JPM traders acted with the intent to manipulate market prices and ultimately did cause artificial prices.”

The order also found that J.P. Morgan Securities LLC (JPMS), a registered futures commodities merchant, “failed to identify, investigate, and stop the misconduct” the CFTC stated, adding that “despite numerous red flags, including internal surveillance alerts, inquiries from CME and the CFTC, and internal allegations of misconduct from a JPM trader, JPMS failed to provide supervision to its employees sufficient to enable JPMS to identify, adequately investigate, and put a stop to the misconduct.”

The financial penalty is broken down into three parts. JPMorgan must pay US\$436.5 million in fines, US\$311.7 million in restitution and more than US\$172 million in disgorgement.

“Spoofing is illegal – pure and simple,” CFTC Chairman Heath Tarbert stated. “This record-setting enforcement action demonstrates the CFTC’s commitment to being tough on those who intentionally break the rules, no matter who they are.”

The derivatives regulator noted that the manipulative and deceptive conduct “involved hundreds of thousands of spoof orders in precious metals and U.S. Treasury futures contracts” on the Commodity Exchange, Inc., the New York Mercantile Exchange, and the Chicago Board of Trade.

“The order finds that JPM’s illegal trading significantly benefited JPM and harmed other market participants,” the CFTC said.

James McDonald, the director of CFTC’s Division of Enforcement, noted that the record monetary penalty “sends the important message that if you engage in manipulative and deceptive trade practices you will be caught, punished and forced to give up your ill-gotten gains.”

Some observers might argue that the bank’s response was less than apologetic.

“The conduct of the individuals referenced in today’s resolutions is unacceptable and they are no longer with the firm,” JPMorgan’s co-president Daniel Pinto said in a news release. “We appreciate that the considerable resources we’ve dedicated to internal controls was recognized by the DOJ (Department of Justice), including enhancements to compliance policies, surveillance systems and training programs.”

One of the harshest critics of the settlement, Better Markets, weighed in with a press release of its own. The Washington, D.C.-based non-profit organization, which was founded after the 2008 financial crisis “to promote the public interest in the financial markets, support the financial reform of Wall Street and make our financial system work for all Americans again,” said the “sweetheart settlement” was “little more than a slap-on-the wrist” and the fine amounted to “little more than 10% of what the bank made in the last three months of 2019 when it earned a total of \$36.4 billion.” TNM

COMPANY INDEX

Albemarle.....	8	Group Ten Metals.....	14,15
Alexco Resource Corp.....	15	Kinross Gold.....	3,14
Americas Gold and Silver.....	11	Kirkland Lake Gold.....	14
Amerigo Resources.....	3	Lundin Mining.....	8
Anglogold Ashanti.....	8	Metallic Minerals.....	15
Battle North Gold.....	7	Newmont.....	8
Endeavour Silver.....	11	Northern Star Resources.....	6
Equinox Gold.....	7	Palladium One Mining.....	10
Eskay Mining.....	11,14	Platinum Group Metals.....	9,15
Excellon Resources.....	14	Rio Tinto.....	1,8
First Cobalt.....	8	Saracen Mineral Holdings.....	6
First Majestic Silver.....	9	Sibanye-Stillwater.....	14,15
Freeport McMoRan.....	8	Sierra Metals.....	15
Glencore.....	8	Skeena Resources.....	14
GR Silver Mining.....	9	Solaris Resources.....	7
Great Panther Mining.....	3,7	Yancoal Australia.....	8



THE VIEW FROM ENGLAND

Lithium industry
has been ‘musked’
by Battery Day

COMMENTARY | Tesla recharges the global battery industry but simplistic presentation causes chaos



BY DR. CHRIS HINDE
Special to The Northern Miner

Battery-metal explorers and producers ought to coin a new (transitive) verb; “to Musk” is to confuse a science that is already complicated. Lithium developers, in particular, have been ‘musked’ since Tesla’s Battery Day on Sept. 22.

As already reported in *The Northern Miner*, there has been an incredibly diverse response to Elon Musk’s plans for the future.

Ironically, because of Tesla’s disappointing timelines and lack of detail, the electronic-car manufacturer was one of the biggest losers, with its value down on the day by over US\$60 billion — albeit barely 15% of the company’s market capitalization, and the shares have subsequently recovered half of their losses.

The biggest winner was a small, Perth-based, developer of a spodumene deposit in North Carolina, which is the target of a long-term sales agreement with Tesla. The share price of Piedmont Lithium Ltd. more than tripled on the Australian Securities Exchange in September (worryingly, the company’s equity had already risen by 60% ahead of trading being suspended prior to confirmation of the 10-year deal with Tesla).

The Tesla-Piedmont agreement highlights the importance of eliminating cobalt from batteries in favour of metals whose supply is more secure, and a move towards spodumene as feedstock for the lithium hydroxide required in high-nickel batteries.

Thereafter, the views of analysts diverge. London-based Benchmark Mineral Intelligence said the news should be positive for Australian spodumene producers as Tesla will likely need additional tonnages before 2022. The Verge technology-news website applauded Tesla’s plans to produce its own batteries, while Popular Mechanics magazine said Musk “is ready to recharge the battery industry” by taking on a more significant role in sustainable energy generation and storage.

Morgan Stanley said Elon Musk’s presentation as a “call to arms” for governments, suppliers and investors to “take it up a notch” by significantly accelerating policies and investment. The bank said Tesla has its sights set on reducing its dependency on outside battery-metal supply chains (by investing in mines and processing).

Controversially, Morgan Stanley argued, “the new technologies can reduce lithium usage and production costs,” and that this could negatively impact the lithium price.

The managing director at Battery Metals Review (BMR), Matt Fernley, described Morgan Stanley’s conclusions as “one-sided,” “ignorant of relevant data” and “third-rate.” Amongst other criticisms, he stressed the implied overall upside for lithium demand, and rubbished the view that recycling would replace mining. Fernley also noted that spodumene is a lithium mineral contained in pegmatite (hard rock) deposits, not lithium-clay deposits. Moreover, the latter also has high processing costs compared with lithium brine or hard-rock projects.

Battery-metal markets seem to have sided with the view of Battery Metals Review, rather than Morgan Stanley, which is good news for lithium developers everywhere, and it might lead to mining once more in Cornwall.

Cornish Lithium, which is seeking to develop the region’s lithium-rich brines, announced on Sept. 17 that it had found “globally significant” lithium reserves in hot springs within Cornwall’s historic mining area. The exploration company said that initial test results “suggest geothermal waters in south-west England contain some of the world’s highest grades of lithium, and best overall chemical qualities.”

Located at the southwest tip of England, mining began in Cornwall during the early Bronze Age (circa 2200 B.C.E.) and ended with closure in 1998 of the South Crofty tin mine (where production is documented back to 1592). The region’s tin and copper mining industries had started to decline in the 19th century, and it is estimated that most of the 250,000 Cornish who emigrated to the New World between 1861 and 1901 were miners. Indeed, it used to be said that “a mine is a hole anywhere in the world with at least one Cornishman at the bottom of it.”

Fingers crossed for the reemergence of one of Europe’s historic mining regions but, meanwhile, do not hold your breath for that cheap Tesla. TNM

— Dr. Chris Hinde is a mining engineer and the director of Pick and Pen Ltd., a U.K.-based consulting firm he set up in 2018 specializing in mining industry trends. He previously worked for S&P Global Market Intelligence’s Metals and Mining division.

DEPARTMENTS

Editorial.....	4	Professional Directory.....	17
Metal Prices.....	19	Stock Tables.....	18-23

Industry survey captures concerns about long-term impact of Covid-19

HEALTH & SAFETY | Economic downturn expected to continue for some time

BY CARL A. WILLIAMS
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In our second article examining the results of The Northern Miner and Canadian Mining Journal's reader survey on the industry's response to the Covid-19 pandemic, we look at respondents' concerns about the long-term impact of the coronavirus and what those polled think governments, banks, and financial institutions can do to help companies survive the economic downturn.

The reader survey was open in July and August, with 384 people from the sector responding to a combination of multiple-choice and open-ended questions. Respondents represented principally mining and exploration companies, suppliers to the industry, and consultants, with a few respondents who identified as investors, or as being part of financial institutions, government or NGOs.

Long-term impacts

Although the long-term impact of Covid-19 on the mining industry is still unknown, the economic downturn will continue to affect the industry for some time to come, many respondents said.

Over half (53.4%) of the respondents felt that the economic downturn would last more than a year, with 31.8% stating that it would last up to a year. A few respondents predicted that the downturn could last anywhere from two to 10 years, or until a vaccine was found.

The impact, according to a senior geologist at a consulting company, "will be the same as the other downturns: fewer jobs available; fewer students entering the industry and more students entering postgraduate programs; and slower investment interest."

Across the board, respondents indicated that the economic slowdown would reduce the demand for commodities and lower prices, leading to a decrease in mining and exploration activities.

"Lower demands on mineral resource commodities will reduce and/or eliminate new developments and reduce mining operations resulting in a major downturn in the industry," said a respondent who works for a mining/exploration company. "Majors may weather, but juniors and mid-tiers will be at much greater risk."

Another respondent was more optimistic, stating that while there would be diminished demand for some materials, "all industries need raw materials to function" and "after a period of adjustment, the mining industry should pick up."

One respondent noted that while the shortage in supply of metals may not be good for mining companies, it may benefit exploration companies and drive up prices.

A handful of respondents felt that gold projects would benefit from the downturn, but forecast that the market will remain soft for some commodities, like diamonds.

Another respondent, a supplier/service provider, predicted that while "business will adapt to new realities," it will take "at least 18 months to recover."

The same respondent also acknowledged the impact the pandemic has had on Indigenous communities. "Most Indigenous communities are very concerned about their health and safety and do not want outsiders visiting them," he wrote. "It will be necessary for companies and regula-

tors to come up with acceptable new engagement strategies."

A few respondents also commented on the impact on rural communities. "Rural communities that have been hard hit by Covid-19 may place undue pressure for help, assistance, and even profit sharing on regional mines," said a respondent. "The lack of exploration for one year can put an exploration company back between three and five years. This may affect the opening of new mines or the expansion of present mines."

There was consensus among the respondents that Covid-19 will continue to push the industry's digitization, with more of the workforce working remotely.

Supporting the industry

Across the board, respondents felt that governments and regulators at both the federal and provincial levels should continue to enforce social protocols to limit the spread of Covid-19, allowing businesses and mines to continue operating.

However, several felt that the federal government should provide a more consistent set of rules countrywide.

Asked what actions governments and their agencies could take to help the mining and exploration industry specifically, several respondents said that the sector's importance to the economy should be highlighted.

"Governments need to ensure clear



Covid-19 testing room at Baffinland's Mary River mine site in Nunavut. BAFFINLAND IRON MINES

and consistent messaging," said a respondent from a mining/exploration company. "They need to see that to help our economy. They need to back the resource sector – not try to cripple it with unattainable goals."

This view was echoed by another respondent, who felt that the government should "increase public awareness of the importance of mining's contribution, which will help balance poor public image problems."

One senior geologist working for

a major Canadian mining company said the industry has shown that it can safely operate during a pandemic and that the government should "keep mining an important business if there is a second wave that forces another shutdown."

Several respondents also called for governments to provide direct support to the industry with tax incentives or concessions, including a reduction in income tax, a loosening of travel restrictions (both

inter-provincial and international), increased employment subsidies, and more streamlined permitting processes.

One respondent from an exploration company based in Canada said the government should provide incentives to invest money on exploration, arguing: "Give exploration companies a reason to be here."

In general, there was considerable

See **REGULATORY ISSUES** / 16

Third-party litigation funding may provide 'best of both worlds' outcome in tax disputes

MARKETS | Companies on the list generated a market cap increase of \$221 billion

BY NATHALIE GOYETTE AND
JAMES TROUGAKOS
SPECIAL TO THE NORTHERN MINER

Covid-19 has affected the mining industry in unprecedented ways, ranging from forced mine shutdowns in some cases to profound fluctuations in supply and demand for various commodities. As the economy begins to reopen, preserving cash flow remains pertinent to the long-term health of mining companies, especially junior mining companies. Third-party litigation funding – that is, the financing of litigation by specialized parties that are not party to the litigation being funded – presents one opportunity to minimize expenditures and, by the same token, manage cash flow.

Beyond the usual disputes that are candidates for such arrangements, litigation funding presents an opportunity to manage the cost and risk of other disputes, such as those with tax authorities.

A litigation funding agreement typically provides that a litigation funder will agree to finance the cost of a litigation case, in full or in part, in exchange for an agreed share of the proceeds of the claim, if successful.

Traditionally, strict limits have been imposed on such arrangements. However, Canadian law has now evolved to allow greater scope and flexibility for these arrangements. Litigation funding has, as yet, mainly been relied upon in commercial litigation or arbitration cases, and appears never to have been used for tax disputes. However, the current context may be relevant to consider recourse to such an arrangement for tax disputes.

Disputes with Canadian tax authorities arise as a result of a myriad of events, only some of which involve the use of tax planning. More often, owing to the complex nature of tax laws, taxpayers and the government disagree on the

permitted scope of taxing provisions, thus making it necessary to seek resolution before a court.

Mining companies are not immune to these disputes. In fact, a number of recent high-profile tax disputes have taken place in the mining industry.

For instance, Wesdome Gold Mines Ltd. successfully appealed a provincial reassessment that denied that expenses qualified as exploration expenses, but with the company having to endure an appeal by the government all the way to the Supreme Court of Canada. The recently settled dispute concerning Champion Iron's Fermont facilities is an illustration of municipal governments putting into question the tax evaluation of mining facilities themselves. Finally, the federal government challenged Cameco's method of determining the transfer price of uranium products, assessing the company with approximately an additional \$160 million in taxes for 2003, 2005 and 2006.

Tax disputes can be notoriously complex to pursue, entailing high costs. Unlike conventional commercial disputes, tax disputes often have the added particularity that when a "large corporation" (one with total taxable capital employed in Canada at the end of the tax year of over \$10 million) seeks to challenge the government's position and the potential tax bill being disputed, it must prepay 50% of the disputed amount. Oftentimes, the entire amount is paid to avoid interest accumulation at exorbitant rates. Alternatively, if a corporation foresees that a dispute may arise, it will file its return accepting the government's position and prepaying any amount of taxes in order to avoid the possibility of being charged penalties, and then it will challenge the tax treatment.

The scenarios discussed above result in situations in which a taxpayer is burdened with the payment of, or part of, the amount in dispute without having begun the lengthy dispute reso-

lution process. In these circumstances, as well as those in which cash flow is an issue, litigation funding would allow a mining company to preserve and maintain cash flow that would otherwise be expended on the litigation process, without compromising effective legal representation or sacrificing necessary legal battles. This is particularly interesting considering that, in many cases, the outcome of a tax dispute for specific tax years has lasting consequences on the corporation's future income tax payable.

Third-party litigation funding in the context of tax disputes is akin to the funding of commercial disputes. For litigation funders, tax disputes also present certain unique advantages. Among other things, (a) the defendant's ability to pay is never at issue; (b) such litigation always leads to a monetary outcome; (c) tax litigation is less conducive to successful preliminary motions to dismiss, and no summary judgment rule exists; and (d) the Tax Court of Canada rules allow successful litigants to receive cost awards that can amount to a substantial portion of the litigation costs incurred.

As the government attempts to narrow the gap of the deficit generated by Canada's Covid-19 Economic Response Plan, audit activity is likely to increase, making the situations described above more prevalent. Directors deciding which disputes to pursue and which to forgo should properly consider their fiduciary duties and their duty to act in the corporation's best interests when making decisions to litigate. In certain contexts, third-party litigation funding may provide a perfect "best of both worlds" outcome, allowing even well-capitalized litigants to manage the cost and risk associated with tax disputes. *TNM*

— Nathalie Goyette and James Trougakos are lawyers in the Montreal office of law firm Davies Ward Phillips & Vineberg.

Northern Star, Saracen create US\$11.5B Australian gold giant

M & A | Merger expected to be completed in February

BY CECILIA JAMASMIE
Mining.com

Australia's **Northern Star Resources** (ASX: NST) is buying smaller peer **Saracen Mineral Holdings** (ASX: SAR) in a deal that will create an A\$16 billion (US\$11.5 billion) gold giant — the world's eighth-largest gold miner by market value.

The A\$5.76 billion (US\$4.14 billion) merger comes amid record high gold prices — above US\$2,000 per oz. for the first time in August — brought on by investors rushing to safe-haven assets in response to fears triggered by the coronavirus pandemic.

The combined company, with mines in Australia and Alaska, will produce 2 million oz. gold a year

from fiscal 2027. It is also expected to deliver as much as A\$2 billion in operational savings, the miners said in a news release.

Northern Star, Australia's second-largest gold miner, will own 64% of the combined entity, with Saracen holding the remaining 36% stake. A shareholder meeting to formally approve the proposal will be held in January 2021, the companies said.

Northern Star and Saracen already jointly run Australia's iconic Super Pit, which has an estimated reserve of 7.3 million ounces and has produced an average of 660,000 ounces a year over the last five years.

The combined Northern Star-Saracen, which aims to become the world's seventh gold miner by output, will focus on three produc-

tion centres.

One of them is Kalgoorlie, based around the super pit in central Australia. The second is Yandal, which will consolidate both companies' small mines and mills in the nearby desert region of Western Australia. The third centre, around Northern Star's Pogo mine in Alaska, is where the companies see major growth opportunities. Pogo, which the Perth-based miner bought in 2018 for US\$260 million, is expected to produce 180,000-220,000 ounces of gold in the 12 months to June 30 next year. The goal is for the mine to churn out 300,000 ounces a year by 2023.

BMO precious metals and minerals analyst, Brian Quast, estimates that the combined miner would have

over 19 million oz. of reserves and 49 million oz. of resources.

Management is currently predicting between A\$1.5 billion and A\$2 billion of synergies in the next ten years as operations management is rationalized.

"This is one of the most logical and strategic [mergers and acquisitions] transactions the mining industry has seen," Raleigh Finlayson, Saracen's managing director, stated in the news release. "The savings, the synergies and the growth opportunities it will generate make the transaction extremely compelling."

"Between both portfolios we've got so many growth options. We're not planning to divest anything and in fact we're growing our production," Northern Star's executive chairman, Bill Beament, noted on an investor call. "We've got plenty of feed to keep our expanded processing plants going for decades to come."

BMO's Quast said one of the key aspects of the merger was that the new senior gold producer has room to grow. "If current plans are maintained, our estimates would have the

merged company producing 2.1 million oz. in 2025," he wrote in a note to investors. "While a larger company may garner slightly higher multiples than the two smaller companies could have, a senior producer with significant organic growth would stand out in the space."

A single, unified company may also be able to optimize the Super Pit more efficiently than the current joint-venture arrangement, Quast added.

The boards of both companies have recommended the transaction, which is expected to be completed in February.

Northern Star's CEO, Stuart Tonkin, will remain in his post, with Finlayson to act as managing director for 12-to-18 months before taking on a corporate development role. Beament will remain in his position until July, when he'll become non-executive chairman. *TNM*

— This article first appeared in *MINING.com*, part of the *Glacier Resource Innovation Group*

REGULATORY ISSUES From 2

development and poverty reduction in developing countries. Similarly, we drive those same issues in the remote parts of developed nations such as Canada or Australia, and by World Bank estimates, the extractives industry plays a dominant economic, social and political role in the lives of 3.5 billion people living in 81 countries. Mining can, therefore, make a transformative economic and social difference to host countries, and on the lives of their citizens when managed in the context of being trusted development partners.

September also saw the publication of two impactful reports on mining and SDGs: firstly, *Mining and the SDGs: a 2020 Status Update* by the Responsible Mining Foundation and the Columbia Center on Sustainable Investment; and secondly, *Gold Mining's Contribution to the UN Sustainable Development Goals* by the World Gold Council. (The latter report also formed the basis of a keynote webinar at this year's Denver Gold Forum featuring CEOs from Newcrest and Golden Star Mining.)

The mining industry, especially the multinationals (e.g. AngloGold



The Sustainable Development Goals. UNITED NATIONS

Ashanti, Anglo American, Barrick Gold, BHP, Glencore, Endeavour Mining, Agnico Eagle Mines) are assessed as having made good progress on some SDGs. Mid-sized producers, such as Lucara Diamond, which in 2018 became a UN Global Compact participant contributing to

ten of the 17 UN SDGs, is an inspirational example of a company that places SDGs at the forefront of its business model, showing that SDGs are not the sole responsibility of multinationals, but for all businesses.

Here are a few examples of many good projects taken from the recent

reports and webinars, all of which illustrate the exceptional impact that mining can have in achieving the SDGs:

SDG 3 (Quality Education) involves focusing on developing local skills through skills transference, improving school facilities (for both genders),

scholarships and providing on-line degrees. Golden Star Mining, for example, noted that the depth of local homegrown talent has helped it manage through the Covid-19 pandemic. In another example, Endeavour Mining, with its 'Growing Local Talent' program, now has 75% of its general managers being West African, and 95% of the site workforce being nationals.

SDG 13 (Climate Action) is increasingly being addressed by our industry, through the provision of raw materials, such as lithium, cobalt and nickel, which are needed in a greener economy, and also in the measurement and reduction of greenhouse gas emissions. Canada is recognized as a world leader in electrification of its mines, such as at Newmont's Borden gold mine in Ontario, where low carbon energy technologies and smart ventilation technology have been integrated into the mine plan from feasibility and into production.

Mining companies are also acknowledged as being leaders in SDG 17 (Partnerships for the Goals) by working with local institutions, governments and society in areas of governance, reducing corruption and infrastructure development. Agnico Eagle Mines, for example, is building, at their cost, hundreds of kilometres of all-weather and paved roads in Canada's far north Nunavut Territory. These roads can be used by local communities to access previously difficult to reach areas.

Finally, an example of scale from SDG 6 (Clean Water and Sanitation) highlights Iamgold, which is collaboratively working with local partners in Burkina Faso to provide drinking water to over 100,000 people. All of these examples show the powerful positive impacts that mining can have on the world.

As we enter the UN Decade of Action on SDGs, we continue to see rapid societal change, greater transparency, more values driven investments by younger generations, the rise of Circular Economy principles, and an ongoing need for good investment opportunities that adhere to world class ESG principles. As an industry we need to continue driving forward on all 17 SDGs, in particular Gender Equality (SDG 5) and SDG 6 (Clean Water and Sanitation).

Why? The mining industry has a crucial contribution to make to our collective, better future. That is a higher purpose. *TNM*

— Andrew Cheatle is a mining executive/director and geoscientist. He is passionate about the mining industry's role in community and national development.

A GROWING DIVERSIFIED GOLD AND SILVER PRODUCER IN THE AMERICAS

Great Panther is a growing gold and silver producer focused on the Americas. The Company owns a diversified portfolio of assets in Brazil, Mexico and Peru that includes three operating gold and silver mines, four exploration projects, and an advanced development project. Great Panther is actively exploring large land packages in highly prospective districts and is pursuing acquisition opportunities to complement its existing portfolio.



GREAT PANTHER
MINING LIMITED

greatpanther.com | TSX: GPR NYSE: GPL



Battle North's Bateman project in northwestern Ontario's Red Lake mining district. BATTLE NORTH GOLD

Battle North reports 'high-grade intercepts' at Bateman project

GOLD | Drilling program targets two zones

BY CARL A. WILLIAMS
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Battle North Gold (TSXV: BNAU; US-OTC: NBAUF) has released assay results from drilling at the McFinley and Pen zones at the company's wholly owned Bateman gold project in northwestern Ontario's Red Lake mining district, 265 km northeast of Winnipeg.

The two zones, which are located at a depth of less than 300 metres, form part of the "string of pearls" exploration targets near the project's infrastructure, the company said.

Highlights from the McFinley zone include drill hole 84L-20-12, which intersected 1 metre grading 10.9 grams gold per tonne starting from 25 metres downhole.

Highlights from the Pen zone include drill hole 244L-20-05, which returned 1 metre grading 8.85 grams gold starting from a depth of 337 metres, including 1 metre grading 10.6 grams gold from 480 metres.

Other results from the Pen zone include drill hole 244L-20-02, which intersected 2 metres grading 34.01 grams gold starting from 172 metres downhole, including 1 metre grading 136 grams gold from 424 metres. Hole 244L-20-04 cut 3 metres grading 6.88 grams gold from 516 metres downhole, including 1 metre grading 24.1 grams from 518 metres.

"The high-grade intercepts encountered signal the upside potential of these zones, which remain open both across strike and at depth," president and CEO George Ogilvie said in a statement. "We continue to believe that both the McFinley and Pen Zones, which

are in close proximity to the Bateman gold project's infrastructure, exhibit the potential to provide future incremental mill feed to augment the project's anticipated production profile."

The company says it is on track to complete a resource estimate for the McFinley zone in the fourth quarter of 2020 and for the Pen zone in the first quarter of 2021.

The Bateman project contains indicated resources of 1.1 million tonnes grading 14.5 grams gold for 477,000 contained oz. gold. Inferred resources add 4.2 million tonnes grading 17 grams gold for 2.3 million oz. gold.

The company has now completed approximately 1,620 metres of drilling at McFinley at the 46 metre, 84 metre, and 122 metres levels, which targeted three distinct sub-zones of mineralization denoted as the B, C, and D zones.

Within these three zones multiple parallel zones have been identified through the drilling program and the reinterpretation of historical drilling, the company said.

About 2,600 metres of drilling have been conducted at the Pen zone from the 244 metre level to date. The drill program targeted high-titanium basaltic units that host gold mineralization and are also the host rock for gold mineralization at the Bateman gold project's F2 gold zone.

On the day the results were released the company's share price jumped 17% to close at \$1.78.

At press time in Toronto, Battle North was trading at \$1.76 per share within a 52-week trading range of 54¢ and \$2.25.

The company has 129 million common shares outstanding for a \$227-million market capitalization. TNM

Solaris reports long intercepts at Ecuador project

COPPER | Potential for open pit mine

BY CANADIAN MINING JOURNAL STAFF

Solaris Resources (TSXV: SLS) has reported assay results for the second and third drill holes completed as part of a 40,000-metre drill program at its Warintza project in southeastern Ecuador. The program is the first drill campaign in 20 years at the 268-sq.-km project.

Hole SLS-02 hit 660 metres of 0.97% copper-equivalent (0.79% copper, 0.03% molybdenum, and 0.1 gram gold per tonne) starting at surface, and confirmed an extension of the mineralization reported in August. August's hole returned 567 metres of 1% copper-equivalent (0.8% copper, 0.04% molybdenum and 0.1 gram gold).

Hole SLS-03 returned 1,010 metres of 0.71% copper-equivalent (0.59% copper, 0.02% molybdenum and 0.1 gram gold) from surface, and included a higher-grade section of 716 metres of 0.75% copper-equivalent (0.63% copper, 0.02% molybdenum and 0.1 gram gold). The intercept was completed down to the depth capacity of the drill rig and was collated approximately 426 metres east of the first two holes. The result "greatly improves upon the depth extent of known mineralization," the company said in a statement. Historical drilling was completed to an average depth of under 200 metres.

"The third hole stepped out over 400 metres to the east of the first drilling location within Warintza Central and provided further evidence of the depth extent of the system, which still remains open," Jorge Fierro, the company's vice-president of exploration, said in the statement.

The company's geological interpretation of the system at Warintza suggests that the mineralization drilled to date is from the outer halo of a porphyry system, with future drilling expected to vector toward the higher-grade core.

"Warintza Central continues to demonstrate the potential to become a large, high-grade open pit copper porphyry deposit, which is a rarity in the modern context of the industry," said Richard Warke, Solaris' executive chairman.

Warke added that drilling has only been completed at Warintza Central thus far, with a 5-km long trend at the property, which also includes the Warintza East, West and South areas – and all of these have a roughly equal footprint, with higher-grade soil and chip samples previously collected at the West and South zones.

The Warintza Central area features an existing pit-optimized inferred resource of 124 million tonnes grading 0.56% copper, 0.03% molybdenum and 0.1 gram gold (0.7% copper-equivalent), which is based on less than 7,000 metres of historic drilling. This resource is based on a 0.2% copper cutoff and remains open for expansion.

Warke joined Solaris as executive chairman in January, when the company joined the Augusta Group of companies, which he founded in 2005. Augusta has racked up more than \$4.5 billion in exit transactions since 2011, including the sale of Ventana Gold for \$1.6 billion in 2011; the sale of Augusta Resource for \$667 million in 2014; the co-founding of **Equinox Gold** (TSX: EQX; NYSE-AM: EQX) in 2017, now a mid-tier gold producer with a market cap of more than \$2.5 billion; and the sale of Arizona Mining for \$2.1 billion in 2018.

According to its latest corporate presentation, Equinox Gold owns 29% of Solaris and Warke owns 21%. Lukas Lundin owns 6%, Ross Beaty owns 5%, and David Lowell, the geologist who first discovered the 5 km trend of copper outcropping porphyry, owns 2%. TNM

— A version of this article first appeared in *The Canadian Mining Journal*, part of *Glacier Resource Innovation Group*.

C-SUITE PERSPECTIVE From 3

Henderson says his focus will be to bring "stability and predictability in our production and costs."

"In the past, Great Panther has seen too much variability in our production – it goes up and down – and costs go up and down, so for me as an operator I'd like to bring some stability to that and make sure we deliver what we say we're going to deliver and at the same time keep a continuing focus on cost."

Meanwhile, at the Coricancha project in Peru, which Great Panther acquired from Nyrstar in 2017, previous operators used a mining method that gave them a lot of tonnage but dropped the grade. Henderson, however, has engaged the company's Mexican engineers to see if they can employ more selective mining methods that will keep the grade up. The challenge, he says, will be to get enough tonnage to fill the mill. As a result, the company is now undertaking desk-top studies and hopes to make a production decision on Coricancha in the next 12 months.

"It's a past producer. It's very prospective on the exploration side. It's got all the infrastructure on-site,



Great Panther's president and CEO, Rob Henderson. GREAT PANTHER MINING

so the capital required for a restart there is low," he says. "But mining is tricky. We need to figure out what the appropriate mining method is."

Nyrstar used long-hole stoping and were running at a rate of about 500 tonnes a day, he says. "We're looking at cut and fill and the rate will be much lower than 500 tonnes per day but we don't know how much lower. But the grade will be higher so this would keep grades high but the chal-



Great Panther's Tucano gold mine in northern Brazil. GREAT PANTHER MINING

lenge is to find enough headings to keep the mill full."

As a long time operator and CEO, Henderson knows how hard it is to get everything right.

"In mining, there are always things that can go wrong— there are multiple reasons for things that can go sideways. You have to be on top of everything and can't keep your eye on one issue ... you've got to have your eye on all the balls that are moving

all the time."

Looking ahead, Henderson notes that while the company plans to continue exploration at all of its assets in the Americas, it is also focused on M&A in Mexico and Brazil, and points out that David Garofalo, the former CEO of Goldcorp, joined the board at the same time he became chief executive, "and has given us the mandate for growth."

"My vision is to grow the com-

pany," Henderson says. "It is growing through cash flow right now, and through drilling to increase our resources, and we are also looking to get bigger and become more relevant to institutional investors. A 150,000 oz. producer is on the small side to be of interest to institutional investors, so we want to grow the company to become a bigger producer. The timing is good — it's a great time to be in the industry." TNM

Top 10 mining property deals in the last five years

ANALYSIS | Large scale acquisitions peaked in 2016–2017

BY FRIK ELS
Executive Editor, Mining.com

Large scale property acquisitions peaked in 2016–2017 led by China Molybdenum’s purchase of the Tenke Fungurume mine in the Democratic Republic of the Congo. China Molybdenum bought Freeport-McMoRan’s (NYSE: FCX) 56% stake in the copper-cobalt mine in November 2016 and picked up Lundin Mining’s (TSX: LUN) 24% interest in April 2017 for a total consideration of US\$3.8 billion, based on data from Mining Intelligence.

The second-largest transaction since 2015 was Yancoal Australia’s (ASX: YAL) Warkworth purchase, while another large coal buy – Glencore’s (LSE: GLEN) Hunter Valley purchase from Rio Tinto (NYSE: RIO; LSE: RIO) – falls just outside the top 10.

Targets in the top 10 are all producing mines with the majority being copper operations. Battery metals make an appearance at no. 9, with U.S. lithium giant Albemarle (NYSE: ALB) closing on the Wodgina spodumene transaction in late 2019, only to put the Pilbara site on care and maintenance shortly after.

Newmont’s (TSX: NGT; NYSE: NEM) acquisition of AngloGold Ashanti’s (NYSE: AU) Cripple Creek and Victor complex in Colorado is the single gold mine transaction in the top 10, although with gold prices rallying to record highs the industry could well see a great number of large precious metals deals in the future. ^{TNM}

— This article first appeared in MINING.com, part of the Glacier Resource Innovation Group



Newmont’s Cripple Creek & Victor mine in Colorado. ^{NEWMONT MINING}

Company	Target	Country	Primary Commodity Acquired	Vendor	Closing Date	Interest (1%)	Acquisition Cost (\$m)
1 China Molybdenum	Tenke Fungurume	DRC	Copper Lundin Mining	Freeport McMoRan,	Nov 2016	80	3,786
2 Yancoal Australia	Warkworth	Australia	Coal	Rio Tinto	Sept 2017	100	2,450
3 Mosaic	Taquari - Vassouras	Brazil	Phosphate	Vale	Jan 2018	100	1,998
4 Antofagasta	Zaldívar	Chile	Copper	Barrick Gold	Dec 2015	50	1,005
5 Sumitomo Metal	Quebrada Blanca	Chile	Copper	Teck Resources	Apr 2019	23	1,000
6 Sumitomo Metal	Morenci	USA	Copper	Freeport McMoRan	May 2016	13	1,000
7 PTAMI	Batu Hijau	Indonesia	Copper	Newmont	Nov 2016	32	920
8 Newmont	Cripple Creek and Victor	USA	Gold	AngloGold Ashanti	Aug 2015	100	820
9 Albemarle	Wodgina	Australia	Lithium	Mineral Resources	Nov 2019	60	820
10 Newcrest Mining	Red Chris	Canada	Copper	Imperial Metals	Aug 2019	70	804

COBALT From 1

because cobalt stabilizes the battery during recharging, extending the battery’s life.

To get around this, Musk referred to the use of “novel coating and dopants,” but did not provide any further details. This lack of clarification, said Wood Mackenzie, would appear to suggest that the problem has not yet been solved.

Tesla also noted that the nickel-rich cathodes would be reserved for their high-performance and commercial EVs, while lithium-iron-phosphate batteries will be used in cheaper models.

The company aims to reach 100 GWh of in-house lithium-ion battery cell production capacity by 2022 and 3,000 GWh by 2030, which, Wood Mackenzie noted, is far greater than any other major battery manufacturer has announced.

Although the outlook for cobalt and nickel remains favourable, according to BMO, the switch to cathodes with higher nickel and lower cobalt content could lead to a minor short-term reduction in forecast cobalt demand, which becomes more noticeable further out as the technology is more widely adopted.

However, BMO believes that the cobalt market will tighten going into 2021 and forecasts a 2,000 tonne per day increase to 56,000 tonnes per day in nickel consumption for

2020, with a forecast consumption by 2025 of 351,000 tonnes nickel, up from 322,000 tonnes in its previous forecast.

Tesla’s determination to transition to a cobalt-free cathode appears primarily to be driven by reducing costs and ensuring that the raw materials in their EVs are ethically sourced.

The company’s current battery technology uses nickel-cobalt-aluminium cathode chemistry, which contains less than 3% cobalt (other battery manufacturers use nickel-cobalt-manganese blends that have around 10% cobalt).

Warnings about long-term shortages caused cobalt prices to spike in 2017 and 2018, prompting Tesla to try to reduce its reliance on the metal.

Tesla sources most of its cobalt from the Democratic Republic of the Congo (DRC), which has been beset by claims of illegal mining, human rights abuses and corruption.

However, the company’s stance on cobalt appears to be at odds with its plans (as reported by the Bloomberg news agency on June 16) to source 6,000 tonnes of cobalt over five years from a cobalt-copper mine in the DRC operated by Katanga Mining, a subsidiary of Glencore (LSE: GLEN), for its Gigafactories in Berlin and Shanghai.

The Environmental Justice Atlas, which documents and catalogues social conflict around environmental issues, has alleged that Katanga

has polluted local water sources, is linked to child labour, has engaged in tax evasion, and threatened human rights defenders.

“Around two years ago, Elon Musk put a statement out via Twitter that he was going to take cobalt out of their batteries,” Trent Mell, **First Cobalt**’s (TSXV: FCC; US-OTC: FTSSF) president and CEO, said in an interview. “While it’s important to note that it’s been an ambition of theirs for some time, it didn’t get much airtime and don’t think we heard anything on Tuesday by way of a commitment.”

The mining executive added that the shift away from cobalt appears to be achievable but will take many years and will only apply to a small segment of a large battery market.

“Tesla’s peers and competitors are not going that way because cobalt is such a minute cost element (at around US\$200 to US\$300 per battery) and that its benefits are perceived to outweigh its costs,” Mell noted.

Manufacturers instead have opted to reduce the amount of cobalt in the cathode to decrease the cost while preserving the battery’s integrity.

“Cobalt is a metal that many people want to hate,” Mell said. “The last time cobalt made headlines it was around the use of child labour and human rights violations in artisanal mines in the Congo, the reverberations of which would be extremely damaging for a company like Tesla.”

Mell noted that on Sept. 8, Tesla announced that it had joined the Fair Cobalt Alliance. The initiative aims to improve artisanal and small-scale mining operations in the DRC.

“As cobalt is the most expensive raw material input to batteries, lowering its levels will facilitate higher EV penetration rates, which, in turn, will drive EV adoption rates,” Mell said.

Although he believes that cobalt will continue to be an essential component in nickel-rich battery technologies, the cobalt amount will likely be reduced, making them cheaper.

Mell’s position appears to be supported by Benchmark Mineral Intelligence analysis, a leading authority on cobalt.

Benchmark has forecast demand for nickel-cobalt-manganese batteries to increase from approximately 20,000 tonnes in 2019 to over 730,000 tonnes in 2040, even after factoring in reductions in the use of cobalt.

First Cobalt is producing battery-grade cobalt sulphate at the company’s hydrometallurgical refinery in Ontario, 600 km from Canada’s border with the United States. It is the only fully permitted primary cobalt refinery in North America.

In a boost to the North American EV market, California’s governor, Gavin Newsom, signed an order on Sept. 23 that will ban the sale of new gasoline and diesel-powered passenger cars in the state by 2035. ^{TNM}

ESG From 1

Indigenous rights and native title. National communities may push for a return to resource nationalism, with increased debate around who miners sell to and for what purpose.”

Among the other risks mentioned by the mining executives interviewed were “high-impact risks,” which rose from fifth to second place in the ranking due to the impact on operations of Covid-19.

“During the Covid-19 pandemic, we’ve seen agile governance enable the rapid decision-making that has driven positive outcomes, such as continued production and the protection of workers’ health and safety,” EY said.

“Post-Covid-19, stakeholders will expect more from organizations,” EY added. “Leaders will need to shift from relying on subjective judgment toward adopting data-driven approaches — as multiple factors will need to be taken into account.”

“There is a huge opportunity to remove complexity, overcome historical obstacles to change, and accelerate a transformation agenda that will create long-term value for individual companies, the entire industry and communities,” said Paul Mitchell, EY’s global mining and metals leader.

Two new risks have emerged on the sector’s radar this year: geopolitics (5) and volatility (8).

According to the report, the top geopolitical issues that miners expect will impact their sector are the changing role of the United States in the international system; European Union stability and U.S.-China relations.

“A trend toward economic protectionism to favour domestic producers and ensure host countries receive their fair share of resource wealth will emerge in many jurisdictions,” the report stated.

The impact of Covid-19 has created near-term disruption to supply and uncertainty around demand for many commodities.

“While China’s swift economic rebound has kept up demand for iron ore, and gold and silver retain their status as safe havens, any future disruption could see this change fast,” EY said.

Productivity and rising costs jumped 10 positions to the number three threat to business, according to the survey.

“The impact of Covid-19 has been mixed, with some restrictions imposing new, unforeseen costs and other measures removing silos that hindered productivity,” the report noted.

“Over the longer term, we believe that tackling this issue effectively requires a true end-to-end focus on costs and productivity across the value chain.”

Workforce, and digital and data, the second and third biggest risks in 2019, still appear in the top 10, now sitting at 7 and 9, respectively.

“We believe their lower-ranking indicates that miners believe these issues are now better managed and, for some, business as usual,” noted EY. ^{TNM}

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SPECIAL FOCUS

SILVER & PGMs

Platinum and palladium could boost performance of lithium-ion batteries

PGMs | Companies seek to accelerate development of next-generation technology



Dr. Bilal El-Zahab in his lab at Florida International University in Miami, Florida

fully understand the paper's content, he reached out to El-Zahab for more information, and the two soon entered into a partnership.

In mid-September, Lion Battery Technologies announced that it had received a U.S. patent for its next-generation battery technology covering the use of PGMs inside carbon nanotubes at the cathode of the battery.

The patent ("Battery Cathodes for Improved Stability"), was issued to FIU, which has signed a sponsored agreement with the company covering research and patent applications. "Lion Batteries has 100% exclusive rights to the intellectual property of the technology, and the patent applies to the use of PGMs in any lithium battery, so it's a quite a broad-reaching patent," said Jones.

Under the US\$3 million, three-year agreement, the company is funding El-Zahab's research and patent agreements to unlock the potential of lithium-air and lithium-sulphur batteries by exploiting the catalytic properties of platinum and palladium.

"The granting of the first patent is a major milestone in developing the battery technology and driving up demand for PGMs at the same time," said Jones. "The trick-shot, to use a basketball analogy, is putting the palladium inside the carbon nanotubes at the cathode, which allows the chemical reaction to take place without destroying the electrolyte cell and is one of the key attributes

See PGMs / 15

"EVERYBODY APPEARS TO ACCEPT THAT WE ARE REACHING THE THEORETICAL LIMIT WITH LITHIUM-ION BATTERIES."

MICHAEL JONES
PRESIDENT AND CEO,
PLATINUM GROUP METALS

showed how PGMs could dramatically improve the performance of lithium-air and lithium-sulphide batteries.

"Everyone is aware that lithium-air and lithium-sulphide batteries can be extremely powerful but getting them to cycle and repeat is very difficult," Jones said. "Sure enough, his [El-Zahab] research paper was showing that PGMs were encouraging the reaction and improving the charge-discharge cycle."

According to Jones, lithium-air and lithium-sulphur batteries have a higher energy density, which allows them to perform orders of magnitude better than the best performing lithium-ion batteries currently available on the market or under development. They offer the promise of batteries with lower production costs and significant increases in the range and performance of battery electric vehicles (BEVs).

But they also suffer from short battery life due to the cathode's degradation during the battery's charge-discharge cycle. Also, lithium-sulphur batteries are prone to overheating.

El-Zahab's work, he said, shows that palladium and platinum catalysts in the cathode can improve lithium-air and lithium-sulphur batteries' charge-rate capability. This allows the battery to generate more power while reducing its charge overpotential, which can lead to metallic lithium being deposited on the carbon anode and reduce the performance, reliability, and safety of the battery. Although Jones said that he didn't

GR Silver discovers polymetallic mineralization at Plomosas in Mexico

SILVER | Resumption of large-scale mining possible



Level 775 RL room and pillar stopes at GR Silver's Plomosas mine in Mexico.

BY NORTHERN MINER STAFF

GR Silver Mining (TSXV: GRSL; US-OTC: GRSLF) has discovered high-grade polymetallic disseminated and massive sulphide-rich mineralization during initial underground channel sampling on the lower level of the historic Plomosas mine at its Plomosas silver project in Mexico's Sinaloa state.

GR Silver says assay results from one of the saw channel samples returned 16 metres of 90 grams silver per tonne and 2.5 grams gold per tonne (416 grams silver-equivalent per tonne).

Another channel sample cut 5 metres of 147 grams silver and 10 grams gold (1,313 grams silver-equivalent). This sample included one metre grading 288 grams silver and 37.5 grams gold (4,204 grams silver equivalent).

"These new high-grade polymetallic underground sampling results are extraordinary, indicating the potential to define substantial new mineralized zones," Marcio Fonseca, the company's president and CEO, said in a statement. "The geological setting of these samples

provides an opportunity to define large volumes of not only precious metals, but also base metals."

Fonseca noted that the presence of three styles of mineralization (disseminated or massive sulphide-style mineralization adjacent to structurally controlled lead-zinc-silver-gold hydrothermal breccia and high-grade gold and silver low sulphidation mineralization), "reinforces the potential for large-scale mining at Plomosas, in areas consisting of underground development completed by previous operators."

GR Silver acquired 100% of the project from **First Majestic Silver** (TSX: FR; NYSE: AG) in March and kicked off a 1,400-metre drill program in May.

First Majestic acquired the past-producing asset from Grupo México, which operated the underground silver-gold-lead-zinc mine from 1986 to 2001.

Over the last year, GR Silver's shares have traded in a range of 9¢-95¢ and at press time were changing hands at 54¢.

The company has 124 million common shares outstanding for an \$85-million market capitalization. **TNM**



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WHEN YOU NEED TO BE SURE

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Palladium One extends mineralization at Kaukua South

FINLAND | Exploration program resumed in August

BY CARL A. WILLIAMS
cwilliams@northernminer.com

Palladium One Mining (TSXV: PDM; US-OTC: NKORF) has extended the Kaukua South zone at its flagship Lantinen Koillismaa (LK) platinum-nickel-copper project in Finland, 190 km northeast of the port city of Oulu.

Visual interpretation of 11 discovery holes from its Phase I drill program has extended the strike length of Kaukua South from 600 metres to 4 km and is interpreted as the fault-displaced extension of the Kaukua deposit.

"This major discovery means that we potentially have an extensive mineralized system here that could give us a significant boost to the existing resources at the Kaukua open pit deposit, which has a one-kilometre strike length and adjoins Kaukua South," Derrick Weyrauch, the company's president and chief executive, said in an interview.

"Given that the new discovery has four times the strike length, we may have a resource that is multiples of the Kaukua open pit deposit," added Weyrauch. "Investors may have looked at us previously and said, 'it's great that you may have the highest investable palladium grade in a tier-one jurisdiction,' but now they can look at us and see that we have the potential for a large critical mass too."

The pit-constrained resource stands at 10.99 million indicated tonnes grading 0.81 gram palladium per tonne, 0.27 gram platinum per tonne, 0.09 gram gold per tonne (1.17 grams platinum group elements [PGE] per tonne), 0.15% copper, and 0.09% nickel for 635,600 palladium-equivalent ounces.

Inferred resources add 10.88 million tonnes grading 0.64 gram palladium, 0.20 gram platinum, 0.08 gram gold (0.92 gram PGE), 0.13% copper, and 0.08% nickel for 525,800 palladium-equivalent oz. for a pit-constrained cutoff grade of 0.3 gram palladium equivalent per tonne.

The resumed exploration drilling

"I THINK THAT IT'S VERY RARE WHERE YOU HAVE A 100% SUCCESS RATE ON A STEP-OUT DISCOVERY DRILLING PROGRAM."

NEIL PETTIGREW,
VICE PRESIDENT, EXPLORATION,
PALLADIUM ONE MINING



Left: Equipment at drill hole LK20-013, part of the recent exploration program at the Lantinen Koillismaa property in Finland. Right: Neil Pettigrew (r.), Palladium One's vice president of exploration, with consultant Markku Iljina at the LK project.

PALLADIUM ONE MINING

program comprised 14 holes totaling 2,566 metres, bringing the total Phase I exploration drill program to 26 holes (4,490 metres).

The holes were drilled on a previously identified Induced Polarisation (IP) chargeability anomaly in the Kaukua South zone. All holes intercepted magmatic sulphide mineralization.

"The aim of the Phase I drilling program was to define multiple drilling targets, and we knew that IP chargeability anomalies have proven to correlate very well with PGE-nickel-copper mineralization," said Weyrauch. "So, we undertook an extensive IP survey that covered

12 km of a 38 km basal contact and generated fantastic anomalies."

The drill program extended the known magmatic sulphide mineralization in Kaukua South more than 3 km east of a previous drill hole, LK20-006.

Drill hole LK20-006 intersected 63 metres grading 0.72 gram palladium, 0.26 gram platinum, and 0.08 gram gold (1.06 grams PGE), 0.14% nickel, and 0.013% copper starting from 95 metres downhole.

Historic drilling 600 metres west of LK20-006 returned 33 metres grading 1.9 grams palladium-equivalent from drill hole KAU-08-035, which, said Weyrauch, demonstrates a mineralized strike length of about 4 kilometres.

"When we first carried out the geophysics this past winter, no one had looked beyond the Kaukua deposit, and almost all of the existing drilling had been within the open pit shell," Neil Pettigrew, vice president

of exploration and a director with the company, said in the same interview. "It was one of those stories where no one had thought to look outside the area. So we extended the survey grid to the south even though there were no outcrops or any other indications that suggested that there was anything there. Low and behold, we discovered this beautiful chargeability anomaly."

The LK20-006 hole, he noted, was drilled in March before the restrictions imposed due to the Covid-19 pandemic stopped further exploration at Kaukua South. However, the drill hole results were very encouraging, so the company continued with further step-out drilling when the program resumed in August.

"We continued to step-out and hit mineralization, and the next thing we know, we'd drilled off three kilometres," said Pettigrew. "I think that it's very rare where you have a 100% success rate on a step-out discovery drilling program."

Pettigrew, a company director, said that the step-out drill program consisted of five sections with at least two holes per section and indicated that the mineralization at Kaukua South shallows and comes to surface along the three-kilometre extension.

The company is now planning a Phase II resource definition drill program, comprising a 100-metre spaced grid along the four kilometre mineralised extension of Kaukua South.

At press time in Toronto, Palladium One was trading at 14¢ per share within a 52-week trading range of 4.5¢ and 24¢. The company has 126 million common shares outstanding for a \$17.6-million market capitalization. TNM



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SILVER & PGMs SNAPSHOT: SEVEN COMPANIES TO WATCH

BY MAGDA GARDNER

mgardner@canadianminingjournal.com

With silver and platinum group metal (PGM) prices on the upswing on the back of a gold price rally, there is a renewed interest by investors in mining companies. Below, we provide an overview of seven industry players, from exploration, through to development and operations, with exposure to the metals.

■ AMERICAS GOLD AND SILVER

Americas Gold and Silver (TSX: USA, NYSE: USAS) is a gold and silver miner with assets in the U.S. and Mexico.

The company's operations include the Cosala operations in Mexico's Sinaloa state as well as the Galena silver-lead complex and Relief Canyon gold mine in Idaho and Nevada, respectively.

In September, Americas Gold and Silver provided details on the ramp-up of the Relief Canyon heap leach operation, where the open pit is expected to reach commercial production by year-end. In August, the company started stacking higher-grade ore and revised its operating practices. A month's worth of operating data suggests increased leach solution grades from the pad and recovery levels trending towards feasibility-level forecasts.

Relief Canyon poured its first gold in February. With a mine life forecast of six years, the 117-sq.-km site features proven and probable reserves of 24.8 million tonnes grading 0.77 gram gold per tonne for a total of 610,000 ounces. Based on a 2018 feasibility study, the company expects Relief Canyon to churn out approximately 90,000 oz. gold per year at all-in sustaining costs (AISCs) of US\$800 per ounce.

The wholly owned Cosala operations cover 194 square kilometres. The site includes the San Rafael, El Cajon and Nuestra Señora mines and has a central processing plant. After an illegal blockade at the site earlier this year and a Mexico-wide suspension of non-essential businesses due to the Covid-19 pandemic, the company expects to restart operations shortly. Last year, the site churned out 4.7 million oz. silver-equivalent at negative all-in sustaining costs of US\$10.90 per ounce.

At the company's 60%-owned Galena complex (40% is held by Eric Sprott), an 18-month recapitalization plan has been underway since October 2019. The property includes three shafts and two processing facilities. August's exploration results, which targeted three systems below known underground workings, returned high-grade intercepts, such as 4 metres of 739 grams silver and 1.6% copper and 2 metres of 2,381 grams silver and 1.7% copper.

Last year, the company produced a total of 1.2 million oz. silver, or 14,000 oz. gold-equivalent, at AISCs of US\$1,100 per oz. gold-equivalent. The gold output is expected to grow as Relief Canyon becomes a cornerstone asset for the company.

In September, Americas Gold



Pit at Americas Gold and Silver's Relief Canyon project in Nevada. AMERICAS GOLD AND SILVER



The team at Group Ten Metals' Stillwater West PGM-nickel-copper project in Montana, from left: Mike Ostenson, geologist; Justin Modroo, geophysicist; Michael Rowley, president and CEO; Greg Johnson, executive chair; Craig Bow, chief geologist. GROUP TEN METALS

and Silver closed a \$39.4-million bought deal financing. The proceeds are intended for exploration, development and ongoing improvements at its existing mines.

Americas Gold and Silver has a \$396.3-million market capitalization.

■ ENDEAVOUR SILVER

Endeavour Silver (TSX: EDR; NYSE: EXK) holds three underground gold-silver mines in Mexico: Guanacevi in Durango state, Bolanitos in Guanajuato state and El Compas in Zacatecas state.

Endeavour acquired the three-mine Guanacevi complex in 2004 and put the asset into production by 2005. While last year, the 1,200-tonne-per-day site operated below capacity due to operational issues, mill throughputs trended upwards, to 1,051 tonnes per day, by the second quarter of 2020, as turnaround efforts and mining of higher-grade orebodies positively impacted performance.

On April 2, Endeavour withdrew its 2020 production guidance after the Mexican government ordered

the closure of non-essential businesses, including mining. Last year, Guanacevi generated 2.7 million oz. silver-equivalent at AISCs of US\$22.86 per ounce.

Bolanitos, the company's lowest-cost operation, acquired in 2007, features a 1,600-tonne-per-day flotation plant and three underground mines. Last year, Endeavour deployed a revised mine plan for the site, added new equipment and fast-tracked development to improve ore access in an effort to ramp plant throughputs up towards 1,200 tonnes per day by year-end. In June, throughputs averaged 1,070 tonnes per day.

Last year, Bolanitos churned out 1.8 million oz. silver-equivalent at AISCs of US\$25.11 per ounce.

The high-grade El Compas mine features a 250-tonne-per-day leased flotation plant. The operation reached commercial production in March 2019, and also features ten untested vein targets within the existing holdings, in addition to further exploration potential at the recently acquired Calicanto and Veta Grande prop-

erties. In 2019, El Compas generated 710,537 oz. silver-equivalent at AISCs of US\$27.49 per ounce.

In July, the company released the results of an updated prefeasibility study on its Terronera development project in Jalisco state. According to Bradford Cooke, the company's CEO, Terronera "represents our next core asset and, once built, should become our largest and lowest-cost mine."

The study outlines a 1,600-tonne-per-day, ten-year underground operation, producing an average of 3 million oz. silver and 32,800 oz. gold annually (5.9 million oz. silver-equivalent) at AISCs of US\$8.96 per silver ounce. With an initial capital cost of US\$99.1 million, the after-tax net present value estimate for Ter-

ronera is US\$137 million, at a 5% discount rate, with a 30% internal rate of return, based on US\$15.97 per oz. silver and US\$1,419 per oz. gold. Over the next nine to 12 months, Endeavour plans to complete a feasibility study for the asset and has awarded the study to an international engineering firm.

Endeavour Silver has a \$709.9-million market capitalization.

■ ESKAY MINING

Eskay Mining (TSXV: ESK) is focused on exploration within the polymetallic Eskay Rift belt in B.C.'s Golden Triangle, 70 km northwest of Stewart, where it holds 526 sq. km of ground.

The company's 330-sq.-km Sib

See **SNAPSHOT / 14**



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- ✓ **Experienced Management Team** Proven track record with exploration, development and operational expertise
- ✓ **Compelling Organic Growth** Building new mines to increase production and reduce costs
- ✓ **Pure Silver/Gold Leverage** No base metals, no hedging & strong beta to silver price (60/40 silver gold producer)
- ✓ **Strong Balance Sheet** \$44.6 million working capital, no debt (as at 6/30/2020)

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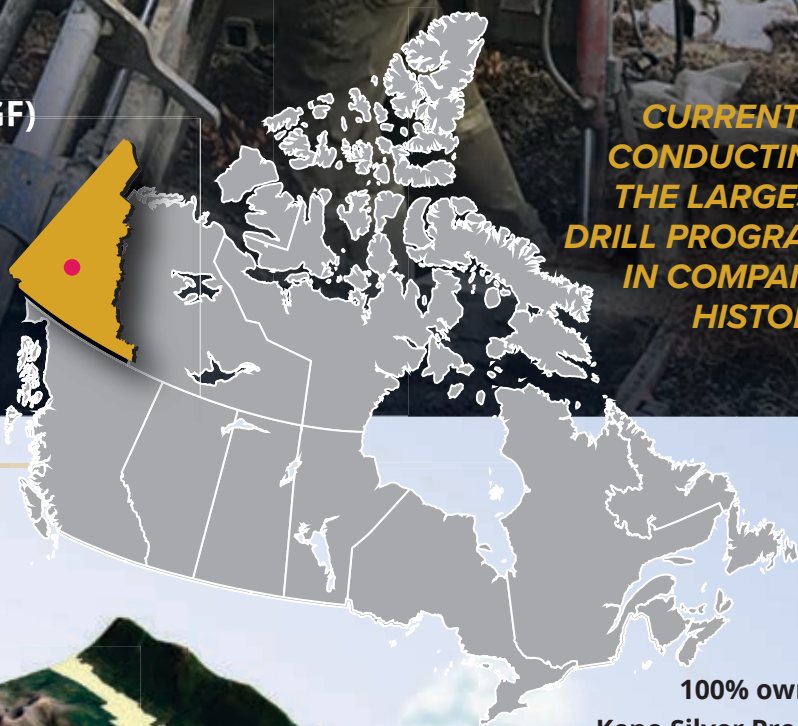
TSX-V: MMG

OTC: MMNGF

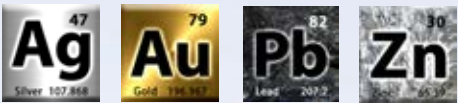
SILVER AND GOLD IN HIGH-GRADE DISTRICTS

Metallic Minerals Corp. (TSX-V: MMG / US OTC: MMNGF)
is a growth stage exploration company focused on
high-grade silver and gold in the Keno Hill and La Plata
mining districts of Canada and USA

**CURRENTLY
CONDUCTING
THE LARGEST
DRILL PROGRAM
IN COMPANY
HISTORY**



KENO SILVER



Metallic has consolidated the
second largest land position in
the Keno Hill silver district
including 8 high-grade past
producing mines adjacent to
Alexco Resource Corp.
Operations

Metallic Minerals

Keno Mill Complex

Alexco Resource Corp.

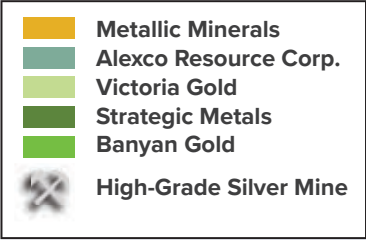
Keno City

**100% owned
Keno Silver Project
located in Canada's
mining-friendly Yukon
Territory**

- Over 220 million ozs of historic silver production along with 74 Moz current M&I mineral resources on the adjoining Alexco property
- Potential to rapidly develop mineral resources at the most advanced target areas based on historic and current drilling

Excellent access and power infrastructure in place

- Existing road and grid power access from nearby hydro facility
- Access by highway to year-round deep seaport facilities
- Regional mill facility in Keno City





TSX-V: **PGE:**

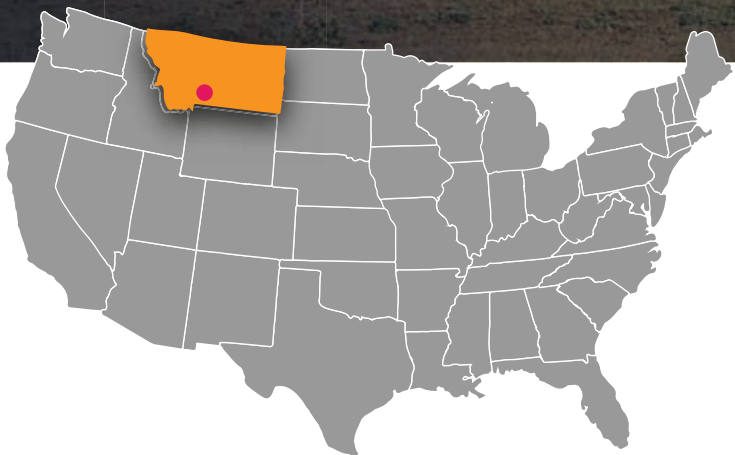
OTCQB: **PGEZF**

Drilling Currently Underway

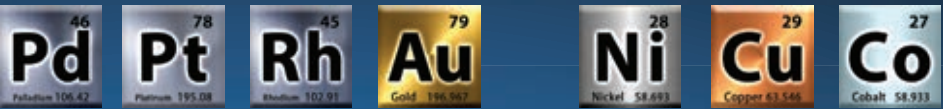
PLATINUM GROUP & BATTERY METALS

IN A PREMIER US MINING DISTRICT

Group Ten Metals (TSX.V: PGE / OTCQB: PGEZF) is focused on advancing our district-scale Stillwater West PGE-Ni-Cu-Co + Au project in Montana’s prolific Stillwater mining district with the objective of becoming a primary US-based source of battery and precious metals



HIGH-DEMAND COMMODITIES



Primary PGE demand driven by rising emissions standards

Growing platinum demand from hydrogen fuel cells

Majority of PGE supply from high-risk countries

Surging demand for nickel sulphide from energy storage uses, especially electric vehicles

Nickel, PGEs and cobalt listed as ‘critical’ in the American Mineral Security Act, with the intent of advancing US supplies

STILLWATER WEST PGE-Ni-Cu-Co + Au PROJECT

Adjoins the producing J-M Reef PGE deposit operated by Sibanye-Stillwater¹

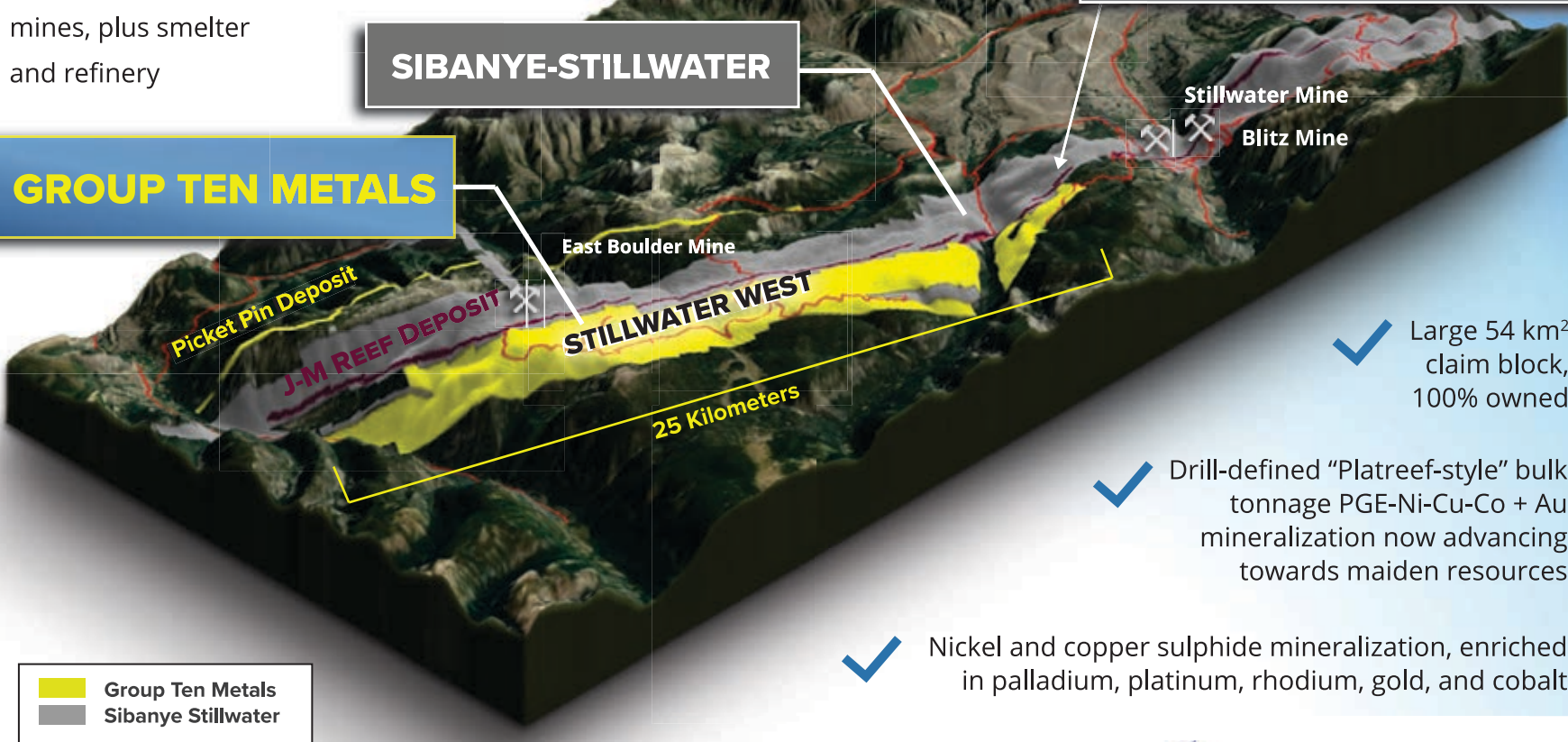
Hosts the highest-grade major PGE deposit in the world, and the largest outside of South Africa and Russia, with three producing mines, plus smelter and refinery

Smelter & Refinery Complex
Columbus, MT (60 km)

J-M Reef Deposit (Sibanye-Stillwater)
Past Production: Over 14 Moz combined Pd+Pt²

SIBANYE-STILLWATER

GROUP TEN METALS



1: References to adjoining properties are for illustrative purposes only and are not necessarily indicative of the exploration potential, extent or nature of mineralization or potential future results of Group Ten’s projects
2: Based on publicly disclosed production statistics of Sibanye-Stillwater including most recent CPR.



SNAPSHOT From 11

property is next to the past-producing Eskay Creek volcanogenic massive sulphide (VMS) deposit, which is held by **Skeena Resources** (TSX: SKE). The junior has an 80% interest in Sib and is the project operator; the remaining 20% is held by **Kirkland Lake Gold** (TSX: KLG; NYSE: KL).

The Eskay graben extends southward from Skeena's grounds onto Eskay Mining grounds. Approximately 85% of the belt lies within Eskay's tenure.

Drilling completed in 2018 at the Lulu prospect within Sib hit high-grade stockwork feeder-style mineralization, returning 1 metre of 61.9 grams gold. Lulu is on strike with the Eskay Creek deposit.

Eskay Mining has now developed a new targeting strategy for the zone after determining that gold is hosted in the contact mudstone. The company is now looking at the alteration and internal structure of VMS systems and has completed three-dimensional modelling to better understand local structures.

Eskay has retained a geological team, led by Quinton Hennigh, to analyze the available data for Sib. The team has determined that the west-dipping Coulter Creek Thrust fault (CCTF) was previously misinterpreted, and that the prospective Hazleton group of rocks is its footwall. According to the company, the new theory projects that the seafloor mudstone, which hosts the Eskay Creek deposit, continues on the western side of the Lulu zone.

Based on an updated geological framework, the company is considering an extensive program targeting mineralization west of Lulu.

In September, the junior also reported assay results for a drill hole completed at the TV target within the Corey property, also from Kirkland Lake Gold joint-venture grounds. The hole returned 11 metres of volcanogenic massive sulphide (VMS) mineralization, grading 210 grams silver and 1.23 gram gold (4.11 grams gold-equivalent), starting at 194 metres. This section included higher-grade intervals, such as 1.2 metres of 182 grams silver and 5.46 grams gold (7.99 grams gold-equivalent).

The results appear to complement a recent geophysical survey, which defined several near-surface conductive targets within a two-kilometre corridor, centred on the TV and Jeff targets. According to a press release, the early-stage drilling suggests "a significant precious-metals bearing VMS system at [the] TV and Jeff [targets]."

There are a total of 14 prospects at Corey, with various mineralization and alteration styles.

In August, Eskay Mining closed a \$3.4-million private placement. A 3,000-metre diamond drill program also started in August; most of the holes are allocated towards TV and Jeff.

Eskay Mining has a \$102.7-million market capitalization.



The portal at Excellon Resources' Platosa silver-lead-zinc mine in Mexico. EXCELLON RESOURCES



Underground at Sierra Metals' Bolivar copper-silver-gold mine in Mexico

SIERRA METALS

■ EXCELLON RESOURCES

Excellon Resources (TSX: EXN; NYSE: EXN) holds the producing 110-sq.-km Platosa silver-zinc-lead project in Mexico's Durango state, as well as the Kilgore gold project in Idaho, which it acquired in February.

The wholly owned underground Platosa mine is, according to Excellon, one of the highest-grade silver mines in Mexico. The operation extracts massive sulphide carbonate replacement deposits (CRDs)

within a Mexican CRD belt. Production at Platosa was impacted in the second quarter of the year by government-mandated Covid-19 suspensions, but resumed by June.

Last year, Platosa generated 1.8 million oz. silver-equivalent at AISCs of US\$23.57 per oz. silver-equivalent.

The Kilgore project in Idaho is a potential open-pit, heap leach operation with indicated resources of 44.6 million tonnes grading 0.58 gram gold for a total of 825,000 oz.

and additional inferred resources of 9.4 million tonnes at 0.45 gram gold for a further 136,000 ounces.

A 2019 preliminary economic assessment for Kilgore outlined an operation producing an average of 112,000 oz. gold annually over a five-year mine life, at an initial capital cost of US\$81 million, with an associated US\$110 million net present value estimate, at a 5% discount rate, and a 34% internal rate of return, based on US\$1,300 per oz. gold.

There are additional geophysical anomalies at the Kilgore property, outside of the current resource area, and according to Excellon, this deposit is analogous to **Kinross Gold's** (TSX: K; NYSE: KGC) Round Mountain mine.

Excellon also holds the past-producing, 450-sq.-km Evolucion property, 220 km south of Platosa, host to an 800-tonne-per-day flotation facility, which processes ore from the Platosa mine. Resources at Evolucion, updated in September, stand at 6.4 million indicated tonnes, grading 64 grams silver, 0.09 gram gold, 1% lead and 1.14% zinc (170 grams silver-equivalent), for a total of 35.1 million oz. silver-equivalent. There are an additional 15 million inferred tonnes, at 39 grams silver, 0.1 gram gold, 0.75% lead and 1.15% zinc (135 grams silver-equivalent), for a further 64.8

million oz. silver-equivalent.

In Europe, Excellon holds the option to earn a 100% interest in the Silver City project in Germany. The 164-sq.-km project lies within an epithermal province, with a 750-year production history.

In June, the company announced that its drilling operation plan for Silver City received approval from the Mining Authority of Saxony. By July, Excellon had started an initial, 15-hole, 2,500-metre drill program.

In August, Excellon closed a \$17.9-million private placement financing of convertible debentures.

Excellon Resources has a \$129.5-million market capitalization.

■ GROUP TEN METALS

Group Ten Metals (TSXV: PGE) is an explorer focused on advancing its Stillwater West platinum group element-nickel-copper project, next to three of **Sibanye-Stillwater's** (JSE: SSW) palladium-platinum mines in Montana.

The wholly owned, 54-sq.-km Stillwater West property, covers 25 km of strike and is next to Sibanye's producing J-M reef PGE deposit.

Group Ten suggests similarities between the Stillwater and Bushveld complexes (the latter is a platinum group element-bearing layered intrusion in South Africa). The comparison is based on comparable stratigraphy (both are layered magmatic intrusions) and similar emplacement patterns of platinum group elements.

There are a total of eight 'platreef-style' target areas and six 'reef-type' targets, within a dipping layered magmatic complex that is 8 km thick at Stillwater West. Platreef-style deposits are stratigraphically lower in the magmatic complex and are usually 100 metres to 200 metres thick. The nickel-copper mineralization is typically enriched in PGEs and amendable to bulk mining. Reef-type deposits occur higher in the sequence, and are typically 0.5 metre to 2 metres thick and very high grade (at 3 grams to 17 grams PGEs within nickel-copper sulphide mineralization).

Stillwater West also features 21 km of anomalous precious and

See **SNAPSHOT / 15**



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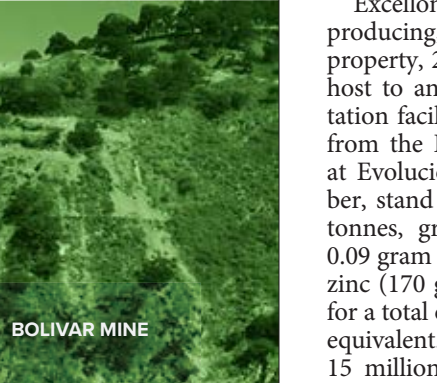
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SNAPSHOT From 14

base metal values over the lower Stillwater stratigraphy, with good correlation to geophysical conductors. Geophysical imaging results from Stillwater West suggest magmatic targets over 15 km of strike, which appear to continue below the existing mineralized zones.

The three most advanced targets at the site are the Discovery (Chrome Mountain) area, as well as the HGR (Iron Mountain) and Camp targets. According to Group Ten, last year's drilling confirmed 'platreef-style' mineralization in these areas, and this year's program is aimed at defining initial resources within the zones. Drill highlights include 272 meters of 1.9 grams total platinum-equivalent from HGR, drilled last year, and 118 metres of 2.15 grams total platinum-equivalent from Discovery, drilled in 2007.

Priority targets also include the Crescent Target area, a 250-metre by 500-metre zone, and the Pine (Wild West) target, where high-grade gold has been traced over 150 metres of strike, and down to a depth of 90 metres.

In July, the company closed a \$4.5-million private placement financing.

Group Ten Metals has a \$45.1-million market capitalization.

METALLIC MINERALS
Metallic Minerals (TSXV: MMG) is a silver explorer focused on the Yukon. The company's flagship property is the wholly owned, 166-sq.-km Keno silver project, which lies within the Keno Hill silver district, and is adjacent to and on strike with **Alexco Resource's** (TSX: AXU; NYSE-AM: AXU) Keno Hill Silver District property, which is expected to start producing silver concentrate later this year.

The greater Keno Hill silver district has produced over 200 million oz. silver over the last 100 years. Metallic's holdings are within the under-explored eastern part of the district. Eight of the 12 known mineralized trends at Keno Hill continue through to the company's eastern grounds. The Keno silver project includes eight high-grade historic silver mines.

Drilling, trenching and sampling has, to date, defined three high-grade, Keno-style silver targets at Keno, within the known trends, which are now being defined with step-out drilling. An additional six known areas are undergoing first-phase drilling. Exploration work has also defined 12 km-scale targets.

The Keno-style high-grade silver veins typically occur along parallel structural trends, and form mineralized shoots, which are 1-5 metres wide and can grade over 500 grams silver, with additional



Underground at Sierra Metals' Bolivar copper-silver-gold mine in Mexico. SIERRA METALS



Left: Core samples at Endeavour's Bolañitos mine in Guanajuato state, Mexico.
Right: Underground operations at Endeavour's Guanaceví mine in Mexico. ENDEAVOUR SILVER



lead and zinc sulphides.

In July, Metallic announced that it had launched an exploration field program at Keno. The first phase of the program will focus on drill testing multi-kilometre anomalies, discovered last year, at the East Keno target area. The second phase would then aim to expand known areas of mineralization, in the west and central parts of the property, at more advanced targets as Metallic looks to establish an initial resource estimate.

At the end of May, the company also announced exploration results from the West Keno targets at the project. Underground channel samples from the Formo area suggest three high-grade shoots, at over 1,000 grams silver-equivalent, which remain open. On surface, the company also defined

two new, untested zones along the Formo structure. Modelling at the Silver Queen target has also defined two additional priority targets for drill testing. At the Duncan Creek area, Metallic discovered two new multi-kilometre soil anomalies, on trend with interpreted structural corridors.

Also in the Yukon, Metallic holds the 44 sq. km McKay Hill project, 50 km north of Keno Silver. It sits within a silver-lead-zinc rich belt running from Alaska to southern Yukon and includes the Keno Hill silver district. In addition, the junior wholly owns 43.5 sq. km of creek and bench mining rights along a tributary in the Klondike gold district. Metallic has entered into a production royalty agreement with an alluvial mining operator on a 2.8-sq.-km portion of the property, providing them min-

ing rights in exchange for a 12% royalty on the gold produced.

The company has also entered into an option agreement to acquire 100% of the La Plata silver-gold-copper property in Colorado. The property features a porphyry system rich in precious metals, with silver and gold epithermal prospects.

In August, the company closed an \$8-million bought deal financing.

Metallic Minerals has a \$83.7-million market capitalization.

SIERRA METALS
Sierra Metals (TSX: SMT; NYSE: SMTS) is a South American-focused zinc, copper, gold, lead and silver producer with mines in Mexico and Peru.

The company's largest production contributor is the 82%-owned Yauricocha underground mine in Peru's Yauyos province, with additional output from the wholly owned Bolivar and Cusi mines in Mexico's Chihuahua state.

After accounting for coronavirus-related government-mandated mine suspensions earlier this year (Yauricocha and Bolivar restarted in June, and Cusi started back up in July), Sierra issued revised production guidance in August. This year, the miner expects to generate 110 million to 122.3 million lb. copper-equivalent, or 287-319 million lb. zinc-equivalent.

In the first six months of the year, Yauricocha produced 34.5 million lb. copper-equivalent, while Bolivar generated 17.5 million lb. copper-equivalent, and Cusi added 286,000 oz. silver-equivalent, for a total of 54 million lb. copper-equivalent in the first half of 2020.

The 3,150 tonne-per-day Yauricocha mine has been operating since 1948 and lies within a 180-sq.-km land package. Explo-

See PGMs / 9

of the technology.”

Although the technology is in its early development stage, Jones said that by using carbon nanotubes infused with only 10 grams to 12 grams of PGMs at the cathode could dramatically improve lithium-air and lithium-sulphur batteries' performance and offer a significant power-to-weight advantage at reduced costs per kilowatt-hour (kWh) compared with traditional lithium-ion batteries.

The company's target weight, he said, is 144 kg for its lithium-air battery and 188 kg for its lithium-sulphur battery at a cost of US\$63 per kWh for the lithium-air and US\$71 per kWh for the lithium-sulphur battery.

In comparison, the Tesla Model 3 battery weighs 371 kg and has a cost of US\$150 per kilowatt-hour.

“Everybody appears to accept

that we are reaching the theoretical limit with lithium-ion batteries, and there aren't many more incremental changes we can tease out of that chemistry,” Jones said.

“What's exciting about lithium-air and lithium-sulphide is that it's a stair-step change that has the potential for a three to ten times improvement in the power-to-weight ratio, and PGMs are the key to unlocking this potential.”

While the use of PGMs will likely increase the cost of the battery, he continued, the price would be partly offset by the battery's greater efficiency. He also said he believes that the market will rebalance in terms of demand as increased use of BEVs reduce the need for PGMs used in conventional, gas-powered cars.

The research at FIU, Jones said, has advanced far quicker than anticipated with additional patent applications

pending that cover other roles that PGMs could play in improving the battery's performance. (He did not elaborate on what these roles are.)

The company is now looking to partner with a battery engineering firm, he noted, which they didn't think they'd be in the position to do until at least three years into the project.

“We feel that now is a good time to bring some engineering influence back into our science to understand the practical aspects of making a commercial battery,” he said. “We've already started that dialogue with several major participants in the battery field.”

Jones believes that the market for cheaper, lighter, and more powerful lithium batteries will grow on the increasing adoption of BEVs and their use in a range of applications beyond transport, including laptops, mobile devices, and other electronics. TNM

ration at this flagship operation is focused on near-mine targets as well as on district-scale open pit and underground opportunities. Sierra is looking to obtain the permits required to increase Yauricocha throughputs to 3,600 tonnes per day next year.

The 5,000-tonne-per-day Bolivar mine in Mexico's Chihuahua state derives the majority of its revenues from copper and sits within a 152-sq.-km landholding, with Sierra exploring and developing additional targets at the property. Additional development and infrastructure improvement work is planned for this year to increase throughputs by asset-end.

The company's wholly owned 1,200-tonne-per-day Cusi mine, also in Chihuahua state, has been producing silver, gold, zinc and lead since 2013. Exploration work within the 117-sq.-km site is focused on the Cusi fault and on the Santa Rosa de Lima vein complex. Ongoing mine development is expected to provide access to higher-grade ore for the mill. Additional drilling is also planned to define the extension of one of the mineralized zones at depth and to the northeast. Sierra also intends to start studies on a potential expansion of Cusi and begin working on a new tailings dam nearby the Mal Paso mill. Sierra Metals has a \$314.2-million market capitalization. TNM

U.S. grabs stake in battery metals miner to fight Chinese control

FINANCING | Government aims to reduce reliance on Chinese supply chains

BY CECILIA JAMASMIE
Mining.com

The U.S. government is taking a US\$25 million equity stake in Dublin-based battery metals miner TechMet, as part of a push by President Donald Trump to reduce the country's reliance on supply chains dominated by China.

The backing from the US\$60 billion U.S. International Development Finance Corporation (DFC) will help TechMet develop a nickel and cobalt mine in Brazil. Both metals are key in the production of the batteries that power electric cars and cell phones.

TechMet's Brazilian nickel project, in the northeastern state of Piauí, is estimated to hold as much as 72 million tonnes of ore containing 1% nickel and 0.05% cobalt.

"Investments in critical materials for advanced technology support development and advance U.S. foreign policy," Adam Boehler, CEO of the government agency, said in a statement.

The move follows an executive order signed Sept. 30 declaring a "state



TechMet's Brazilian nickel project in the northeastern state of Piauí. BRAZILIAN NICKEL PLC

of emergency" in the U.S. mining industry. The directive, which seeks to advance a domestic battery metals industry, also called for a report evaluating possible measures such as tariffs, quotas, or other trade restrictions targeting China and "other non-market foreign adversaries."

Washington has expressed concern that China's control of rare earths supply could be used as a tactic against U.S. companies that depend on those elements.

China produces roughly two thirds of the world's lithium-ion batteries and has taken steps to secure criti-

cal metals for them, particularly in Africa and Latin America.

The U.S. is trying to fight back, with the Pentagon promising to fund domestic mining of the essential materials, while also investing in projects abroad.

Washington has also created the

DFC to provide an alternative to Chinese overseas finance in Asia, Africa and Latin America.

The backing to TechMet marks the first time the U.S. government has invested directly in a metals and mining company, the company's chief executive, Brian Menell, said.

Menell, a South African mining veteran, founded TechMet in 2017. Menell previously worked at Anglovaal and De Beers.

The company has a tin and tungsten mine in Rwanda, a rare earths mine in Burundi, and a lithium-ion battery project in Canada. It also produces vanadium, a crucial metal for manufacturing nuclear reactors and military aircraft.

The U.S. is not alone in its quest to reduce reliance on foreign producers. In September, the European Union stepped up its efforts to become less dependent on imported raw materials, including rare earths and, for the first time, lithium. **TNM**

— This article first appeared in MINING.com, part of the Glacier Resource Innovation Group

HEALTH & SAFETY From 5

support among the respondents for government wage-subsidy programs like the Canada Emergency Response Benefit (CERB), which provides \$500 per week for four weeks for Canadians whose jobs have been impacted by the pandemic.

One senior executive from a major Canadian gold mining company said the federal government "can include pre-revenue companies (companies without revenue) in their Covid-19 wage subsidy program."

That view was not shared by all. One respondent from a supplier/service provider felt that the government should "stop giving money to people not to work," and that their company had "many spots available, but CERB [was] making people not work."

One executive from an exploration company focused on the Northwest Territories said that the government should change the legislation relating to Canada Pension Plan (CPP) contributions to ensure that "employees are not penalized if they are



Above: Clean room at the Covid-19 testing lab at Baffinland's Mary River mine site in Nunavut. Right: Lab technicians preparing to extract RNA for Covid-19 testing at Baffinland's Mary River mine. BAFFINLAND IRON MINES



working for greatly reduced amounts or relying on wage subsidies during the pandemic, where lower incomes year(s) do not count and thus will not have a negative effect on the long-term CPP benefits payable."

A few respondents also felt that the government and regulators, like the TMX Group, should reduce

business costs. "We are trying to stay viable, and yet we have to pay thousands of dollars to all of them for sustaining fees, listing fees and filing fees," one person said.

Some respondents saw the current crisis as an opportunity to improve the industry's environmental sustainability, with one board member of a junior company noting that the government could "provide incentives to develop our own domestic supplies of critical minerals needed to move towards more sustainable and low carbon-producing energy."

Other respondents said that banks and other financial institutions could help mining companies weather the downturn and felt that credit lines should be extended and that interest rates should be lowered to reduce the cost of capital.

A few respondents also asked for flexibility in the lending terms offered by banks and other creditors, with the option of deferring payments for those companies.

One respondent from a consulting firm asked that they "be available and understand the needs of a capital-intensive industry. Be cognizant that this is a short-term challenge with benefits in addition to risks."

Doing business in 2020

Although companies in the mining industry appear to have generally coped well with Covid-19, many expressed concern about the pandemic's future impact on business. Their biggest

worry was the long-term shuttering of mines, which polled at 30.3%.

Of those polled, 27.4% voiced a broad range of concerns, which included travel restrictions hampering access to sites and the ability to consult with communities; the health and safety of employees, contractors and communities; lack of or loss of business/client interest; trade nationalism; supply chain disruptions; and mining companies failing to adapt.

The loss of staff/skilled workforce was also an issue, with 24.2% of respondents ranking it as their primary concern.

According to many of those polled, the impact on the workforce was significant. They felt that skilled workers would migrate to other sectors, and finding workers willing to operate in confined spaces and close to other people would be a challenge.

A few of the respondents reflected on how the industry's ageing demographic would push many older workers into retirement.

"I think skilled labour who are on the brink of retirement will retire," said a respondent from a supplier/service provider to the industry. "Because mining has an ageing workforce, this will have long term impacts on the industry."

A geoscientist from a consulting firm also felt that Covid-19 could see "senior members retire with no knowledge transfer" to their previous companies.

Concern over the loss of skilled

workers wasn't confined to older workers or those close to retirement.

"It will push a lot of contract workers and smaller consulting companies out of the industry," said a respondent from a supplier/service provider to the industry. "Especially the younger contractors that don't have enough savings to get through a year or more of slow times — they will move on to other jobs in other industries and not return."

Nearly two-thirds (66%) of respondents noted that their companies had reduced staffing levels by less than 10%, with 11.2% reporting headcount reductions of more than 50%.

Respondents employed by companies that had laid off or furloughed workers amounted to 5.5%, while 11.4% reported that their company had introduced reduced hours/job sharing.

Demand destruction was the primary concern of 22.8% of the respondents. About one-fifth of respondents (20.3%) reported that they were concerned about their company's ability to raise money, with one respondent from a mining/exploration company observing that, "it would be nice to be able to raise money again."

Only 12.5% of respondents ranked commodity prices as their primary concern.

In response to the economic downturn, 58.7% of respondents said that their organization had reduced capital spending, with 18.9% reducing capex by more than 50%, 21.8% between 25% and 49%, 23.3% between 10% and 24%, and 28.6% by less than 10%.

"Exploration, capital expenditures are on hold, and [we're] reassessing development plans due to reduced ability to raise capital," said an advisor for a supplier/service provider.

Respondents reported a wide range of areas where companies had sought to reduce expenditure. These included exploration activities, business travel, marketing (tradeshows, events, advertising), office supplies, new equipment purchases, engineering and feasibility work, and hiring.

One respondent from an exploration company in B.C. said that the company had "increased capital expenditure, headcount, and salaries, [and is] pushing ahead on all fronts simultaneously." **TNM**

REGULATORY ISSUES From 2

markets provide a major source of capital for Canadian issuers. "We don't want Canadian companies to decide, 'I'm not going to bother with Canada because [it's] too difficult, I'm only going to go public in the U.S. All that does is it prejudices Canadian investors.'"

The taskforce also proposed prohibiting short selling in connection with prospectus offerings and private placements, by preventing market participants and investors that have previously short sold the same type of securities as offered under a prospectus or private placement from acquiring securities under those deals. It noted stakeholders have said short-selling around prospectus offerings has made the pricing and execution of those offerings more difficult, because they're generally priced at a discount to market price.

"Market participants and inves-

tors who expect to purchase under the offering may seek to profit through aggressive short selling prior to the offering to depress the price of the offering," it said, further noting that pre-arranged bought deals with hedge funds that are shorting the stock prior to the announcement are "rife in the Canadian markets and particularly targeting capital intensive industries."

PDAC called for more research into short selling before any changes are implemented. "[We don't] think there's a proper understanding of the impacts of short selling in the marketplace right now," Killeen said. "We certainly hear anecdotal comments about short selling in the marketplace around offerings and otherwise, but without that quantitative understanding of what the real dynamic looks like, we're reticent to recommend regulatory changes that may not address the issues that are out there." **TNM**

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MARKET NEWS

TORONTO STOCK EXCHANGE / SEPTEMBER 28 – OCTOBER 2

The S&P/TSX Composite Index rose 0.83% to 16,199.25 during the Sept. 28-Oct. 2 trading week. The S&P/TSX Global Mining Index increased 0.14% to 96.25, and the S&P/TSX Global Base Metals Index climbed 0.78% to 103.67. Spot gold jumped US\$37.60 per oz., or 2.02%, to US\$1,898.80 per oz., and the S&P/TSX Global Gold Index rose 0.78% to 361.57.

Agnico Eagle Mines increased \$1.36 to \$105.99 per share. The company has formed a 50:50 joint venture (JV) with Newmont to explore the Anza gold project and to seek other prospective gold targets of district-scale potential in Colombia. Anza comprises exploration contracts and applications totalling about 200 sq. km in the Mid-Cauca belt, about 50 km west of Medellin and 60 km south of Zijin Mining’s Buritica operation. In 2018, Newmont reached an exploration agreement with Orosur Mining, in which it was granted the right to earn up to a 75% stake in the Anza project. Under the agreement with Newmont, Agnico will solely fund the JV until it equals Newmont’s previous investment of around \$2.9 million in Anza, after which the parties will continue funding exploration activities on a 50:50 basis.

Kinross Gold’s shares rose 12¢ to \$11.84. The company said it plans to strengthen its medium-term production and cash flow profile

with the US\$93.7 million acquisition of the Peak gold project in Alaska, 400 km southeast of its Fort Knox mine. The open-pit project, which is expected to start production in 2024, will be a “low-risk ‘tuck in” to leverage the company’s existing mill and infrastructure at its Fort Knox operation, Kinross said, and is forecast to produce a total of 1 million gold-equivalent oz. over four and a half years at mining grades of 6 grams per tonne. The company intends to blend the project’s higher grade ore with the lower grade ore at Fort Knox to reduce its average life-of-mine all-in sustaining costs by about US\$70 per gold-equivalent ounce. The project is currently owned by Royal Alaska LLC (40%), a subsidiary of Royal Gold, and Core Alaska (60%), a subsidiary of Contango.

TSX MOST ACTIVE ISSUES						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Suncor Energy	SU	40998	17.52	14.81	15.95	- 0.68
Kinross Gold	K	25944	12.21	11.53	11.84	+ 0.12
Lundin Mng	LUN	25493	7.70	6.68	7.41	- 0.29
Alacer Gold	ASR	22959	9.84	9.42	9.47	unch 0.00
Barrick Gold	ABX	20782	38.15	36.73	37.11	+ 0.03
OceanaGold	OGC	15290	2.33	1.99	2.03	- 0.15
B2Gold Corp	BTO	14621	8.97	8.45	8.69	+ 0.19
First Quantum	FM	13033	12.14	11.40	11.57	- 0.07
NextSource Mat	NEXT	12053	0.06	0.03	0.05	+ 0.02
Orosur Mng	OMI	10962	0.35	0.09	0.25	+ 0.15

Shares of **Victoria Gold** fell 53¢ to \$14.69. The company closed a previously announced bought deal secondary offering of common shares with Orion Mine Finance and a syndicate of underwriters. The offering consisted of 3.38 million common shares at a price of \$17 per common share for gross proceeds of \$57.52 million.

Lundin Mining’s shares dropped 29¢, finishing the trading week at \$7.41 per share. The

company reported on Sept. 27 that a power outage at its Chapada copper and gold mine in Brazil had damaged all four of the operation’s SAG and ball mill motors. In an update on Sept. 29, Lundin said that it expects to resume partial processing within one week, with a return to full capacity within 60 days. Operations were also suspended at is Neves-Corvo mine in Portugal following a fatality at the mine on Sept. 25. TNM

TSX GREATEST PERCENTAGE CHANGE						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Orosur Mng	OMI	10962	0.35	0.09	0.25	+150.0
Lithium Amer	LAC	9102	20.34	12.59	19.60	+ 72.1
NextSource Mat	NEXT	12053	0.06	0.03	0.05	+ 42.9
SolGold plc	SOLG	475	0.59	0.43	0.59	+ 31.1
Xanadu Mines	XAM	49	0.05	0.00	0.05	+ 25.0
Karnalyte Res	KRN	109	0.29	0.25	0.28	+ 21.7
Anglo Pac Grp	APY	73	2.43	0.00	2.43	+ 21.5
Condor Gold	COG	13	0.88	0.83	0.88	+ 17.3
Josemaria Res	JOSE	1951	0.91	0.76	0.85	+ 13.3
Serabi Gold	SBI	12	1.90	1.71	1.85	+ 12.8
General Moly	GMO	893	0.16	0.04	0.04	- 73.3
Goldgroup Mng	GGA	2826	0.06	0.04	0.05	- 25.0
Centamin	CEE	233	3.52	2.70	2.80	- 18.4
EurOmax Res	EOX	16	0.04	0.04	0.04	- 12.5
Black Iron	BKI	2017	0.14	0.11	0.12	- 11.5
INV Metals	INV	375	0.44	0.38	0.39	- 11.4
Potash Ridge	SOP	5777	0.05	0.04	0.04	- 11.1
Eastern Platin	ELR	74	0.42	0.35	0.37	- 11.0
Freegold Vent	FVL	4872	1.14	0.95	0.99	- 10.8
Atalaya Mining	AYM	6	2.76	2.50	2.50	- 10.7

TSX GREATEST VALUE CHANGE			
		VOLUME	WEEK
		(000s)	CLOSE
Lithium Amer	LAC	9102	19.60 + 8.21
Pan Am Silver	PAAS	2975	44.01 + 2.18
MAG Silver	MAG	1052	22.34 + 1.66
Agnico Eagle	AEM	2565	105.99 + 1.36
Ero Copper	ERO	782	19.37 + 0.87
Newmont Corp	NGT	383	82.98 + 0.84
Teranga Gold	TGZ	1481	14.31 + 0.65
Dundee Prec Mt	DPM	4147	9.61 + 0.62
Lundin Gold	LUG	1475	12.43 + 0.61
PolyMet Mng	POM	57	5.14 + 0.55
Nutrien	NTR	8979	51.48 - 1.69
Aura Minerals	ORA	45	14.48 - 1.37
Suncor Energy	SU	40998	15.95 - 0.68
Centamin	CEE	233	2.80 - 0.63
Victoria Gold	VG CX	893	14.69 - 0.53
Cameco Corp	CCO	4041	12.96 - 0.45
Kirkland Lake	KL	5760	64.60 - 0.40
NovaGold Res	NG	2913	14.79 - 0.39
Atalaya Mining	AYM	6	2.50 - 0.30
Lundin Mng	LUN	25493	7.41 - 0.29

TSX VENTURE EXCHANGE / SEPTEMBER 28 – OCTOBER 2

The S&P/TSX Venture Composite Index climbed 1.92% to finish the Sept. 28-Oct. 2 trading week at 708.60. Spot gold rose US\$37.60 per oz., or 2.02%, to US\$1,898.80 per ounce.

New Found Gold jumped 72¢ to \$2.68. The company announced results from its first drill hole targeting the Lotto zone at its 100%-owned Queensway gold project, in Newfoundland. The company recently started a 100,000 metre drill program, and reported two separate near-surface intervals of quartz veining “with significant sulfide and visible gold,” that returned 41.2 grams gold over 4.75 metres starting at 35 metres downhole and 25.4 grams gold over 5.15 metres starting at 57 metres down hole. The Lotto zone is situated along a secondary structure occurring along the east side of the Appleton fault about 2 km north of the high-grade Keats zone, the site of New Found’s initial high-grade gold discovery at Queensway.

Surge Copper saw its shares surge 134.5% to 34¢. The company announced on Sept. 23 that a 3D induced polarization (IP) survey identified a large and previously unidentified geophysical anomaly on the east side of its Seel trend at its Ootsa project in British Columbia. The project contains the East Seel, West Seel and Ox porphyry deposits, adjacent

to the open-pit Huckleberry copper mine. A 3D induced polarization geophysical survey conducted over the Seel trend identified the anomaly contains chargeability, resistivity and magnet values that are similar to the East Seel deposit over an area extending 800 metres long by 500 metres wide.

Shares of **Palladium One Mining** jumped 77.8% to 16¢. The company announced that it has extended the Kaukua South zone at its Lantinen Koillismaa (LK) platinum-nickel-copper project in Finland. Visual interpretation of 11 discovery holes from its Phase I drill program extended the strike length of Kaukua South from 600 metres to 4 km and is interpreted as the fault-displaced extension

TSX-V MOST ACTIVE ISSUES						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Palladium One	PDM	18520	0.18	0.09	0.16	+ 0.07
Manganese X	MN	9089	0.65	0.35	0.48	+ 0.15
Uragold Bay Rs	HPQ	8649	0.54	0.41	0.50	+ 0.09
Fuse Cobalt	FUSE	8171	0.04	0.03	0.04	unch 0.00
Klondike Silv	KS	7892	0.08	0.07	0.07	unch 0.00
Benchmark Met	BNCH	6371	1.36	1.16	1.23	- 0.01
Giga Metals	GIGA	5957	1.03	0.67	0.85	+ 0.20
NuLegacy Gold	NUG	5884	0.16	0.13	0.15	- 0.02
Rio Silver	RYO	5541	0.10	0.07	0.09	+ 0.02
Neo Lithium	NLC	5367	1.23	0.70	1.08	+ 0.40

of the Kaukua deposit. The company reported that the 11 holes each contained magmatic sulphide mineralization and said they confirm the Kaukua South Induced Polarization (IP) chargeability anomaly is the result of magmatic sulfides. Rush assays are pending.

Nevada Energy Metals increased 60% to 12¢. The junior closed a non-brokered private placement of 20 million units at 5¢ for gross

TSX-V GREATEST PERCENTAGE CHANGE						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Tisdale Res	TRC	27	0.63	0.00	0.63	+800.0
Colombia Crest	ATX	373	0.34	0.14	0.34	+139.3
Surge Copper	SURG	4742	0.34	0.16	0.34	+134.5
Baselode Egy	FIND	389	0.69	0.35	0.60	+ 87.5
Rock Tech Lith	RCK	54	1.13	0.00	1.05	+ 84.2
Palladium One	PDM	18520	0.18	0.09	0.16	+ 77.8
Rochester Res	RCT	640	0.09	0.05	0.09	+ 70.0
E3 Metals	ETMC	1732	0.66	0.38	0.66	+ 65.0
Nevada Energy	BFF	255	0.12	0.08	0.12	+ 60.0
Neo Lithium	NLC	5367	1.23	0.70	1.08	+ 58.8
Tri Origin Exp	TOE	330	0.30	0.17	0.19	- 39.3
Paleo Resource	PRE	2484	0.02	0.01	0.01	- 33.3
Vision Lithium	VLI	653	0.03	0.02	0.02	- 33.3
Kings Bay Res	KBG.H	623	0.02	0.00	0.01	- 33.3
Sun Metals	SUNM	3893	0.17	0.12	0.12	- 32.4
Standard Uran	STND	1564	0.27	0.16	0.17	- 32.0
Damarra Gold	DMR	381	0.07	0.06	0.06	- 31.3
Megastar Dev	MDV	186	0.18	0.12	0.13	- 30.6
Rainy Mtn Royl	RMO	86	0.11	0.10	0.10	- 29.6
Silver Spruce	SSE	1190	0.07	0.05	0.05	- 28.6

TSX-V GREATEST VALUE CHANGE			
		VOLUME	WEEK
		(000s)	CLOSE
Rupert Res	RUP	1342	5.06 + 1.02
New Found Gold	NFG	2268	2.68 + 0.72
Tisdale Res	TRC	27	0.63 + 0.56
Rock Tech Lith	RCK	54	1.05 + 0.48
Solaris Res	SLS	1071	4.32 + 0.47
Bear Creek Mng	BCM	465	3.12 + 0.46
Los Andes	LA	121	4.50 + 0.45
Standard Lith	SLL	3392	1.90 + 0.41
Neo Lithium	NLC	5367	1.08 + 0.40
Starr Peak Exp	STE	771	1.97 + 0.35
Auraria Res	ARU	452	4.43 - 0.62
Great Bear Res	GBR	445	14.77 - 0.43
Abitibi Royal	RZZ	11	25.58 - 0.42
Caldas Gold	CGC	459	2.42 - 0.38
Metalla Rylty	MTA	152	10.26 - 0.28
Artemis Gold	ARTG	346	6.08 - 0.26
Callinex Mines	CNX	74	2.50 - 0.24
Universal Vent	MCLD	340	2.27 - 0.24
Gold Reserve	GRZ	65	2.25 - 0.20
Discovery Met	DSV	3564	1.73 - 0.19

U.S. MARKETS / SEPTEMBER 28 – OCTOBER 2

The Dow Jones Industrial Average rose 1.87% to finish the week at 27,682.81 and the S&P 500 Index climbed 1.52% to 3,348.44. Spot gold increased US\$37.60 per oz., or 2.02%, to US\$1,898.80 per ounce.

Shares of **Cleveland-Cliffs** rose US\$1.15 to US\$7.03 per share. Cleveland-Cliffs is buying “substantially all” of Luxembourg-based ArcelorMittal’s operations in the United States in a US\$1.4 billion deal that will make it North America’s largest flat-rolled steel producer. Under the transaction, Cleveland-Cliffs will pay about US\$505 million in cash and US\$873 million in common and non-voting preferred shares. The boards of both companies support the deal and Cleveland-Cliffs expects the transaction will close in the fourth quarter of this year. “Once completed, Cleveland-Cliffs will be the largest flat-rolled steel producer in North America, number two in overall steel-making in North America (behind Nucor), with combined shipments of approximately 17 million tons in 2019, and the largest iron ore pellet producer in North America, with 28 million tonnes of annual pellet capacity,” David Gagliano of BMO Capital Markets said in a research note.

Treco Resources rose 55¢ to US\$6.59 per share. The company completed the sale of its shares in Al Masane Al Kobra Mining Co., a Saudi Arabian joint stock company, for gross proceeds of US\$70.5 million. According to Treco, the funds will be used to pay down debt and enable the company to achieve its target leverage ratio of 1.5 to 2 times adjusted earnings before interest, taxes, depreciation, and amortization (EBITDA) from continuing operations, while building significant liquidity for future deployment. “With the completion of this transaction, we have simplified our company’s structure to pure speciality chemicals and positioned ourselves to generate growth,”

U.S. MOST ACTIVE ISSUES						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Vale*	VALE	139302	10.92	10.29	10.39	- 0.35
Freeport McMoR*	FCX	104001	16.06	15.22	15.94+	
Cleveland-Clif*	CLF	84149	7.11	6.16	7.03	+ 1.15
Lithium Amer*	LAC	78903	15.30	9.41	14.70	+ 6.16
Barrick Gold*	GOLD	60003	28.55	27.45	27.89	+ 0.19
Yamana Gold*	AUY	59695	5.84	5.56	5.77	+ 0.16
Chevron Corp*	CVX	58563	74.76	68.82	71.19	- 0.64
Kinross Gold*	KGC	51352	9.19	8.61	8.89	+ 0.14
Suncor Energy*	SU	51121	13.09	11.11	12.01	- 0.42
United States S*	X	47468	7.73	7.25	7.65	+ 0.54

the company’s president and CEO, Pat Quarles, stated in a press release.

Shares of **Turquoise Hill Resources** fell by 2¢, finishing the trading week at 81¢ per share. The company announced plans to consolidate its issued and outstanding common shares by a ratio of one post-consolidation share for every ten pre-consolidation shares. The consolidation will be effective from Oct. 23 and was approved

U.S. GREATEST PERCENTAGE CHANGE						
		VOLUME	WEEK			
		(000s)	HIGH	LOW	CLOSE	CHANGE
Lithium Amer*	LAC	78903	15.30	9.41	14.70	+ 72.1
Cleveland-Clif*	CLF	84149	7.11	6.16	7.03	+ 19.6
Treco Res*	TREC	295	6.70	5.97	6.59	+ 9.1
United States X	X	47468	7.73	7.25	7.65	+ 7.6
McEwen Mng*	MUX	12926	1.12	0.98	1.06	+ 7.2
MartinMarietta*	MLM	3122244.79	227.24	240.55	+ 6.4	
Sibanye-Stillv*	SBSW	10973	11.37	10.71	11.03	+ 5.9
HudBay Min*	HBM	4025	4.28	3.99	4.18	+ 5.6
Nexa Resources*	NEXA	419	6.00	5.13	5.94	+ 4.6
Freeport McMoR*	FCX	104001	16.06	15.22	15.94	+ 4.2
Peabody Enrgy*	BTU	17226	3.31	2.10	2.39	- 21.6
CONSOL Energy*	CNX	30412	10.49	9.03	9.30	- 10.4
CONSOL Coal Rs*	CCR	143	3.43	3.13	3.24	- 4.4
Arch Coal*	ARCH	2022	47.64	41.04	44.79	- 3.8
Suncor Energy*	SU	51121	13.09	11.11	12.01	- 3.4
Vale*	VALE	139302	10.92	10.29	10.39	- 3.3
Cameco Corp*	CCJ	10030	10.30	9.54	9.75	- 2.8
Nutrien*	NTR	5646	40.79	37.51	38.65	- 2.7
Turquoise Hill*	TRQ	8933	0.85	0.80	0.81	- 2.5
Natural Res Pt*	NRP	34	12.31	11.54	12.04	- 1.7

by the company’s shareholders as part of a special resolution on July 24 at its annual and special meeting of shareholders. The principal reason for the consolidation is to ensure its common shares remain eligible for continued listing on the New York Stock Exchange, the company says. This will reduce the number of issued and outstanding shares from about 2.01 billion shares to 2.01 million shares. TNM

U.S. GREATEST VALUE CHANGE			
		VOLUME	WEEK
		(000s)	CLOSE
			CHANGE
MartinMarietta*	MLM	3122	240.55 + 14.48
Lithium Amer*	LAC	78903	14.70 + 6.16
Black Hills*	BKH	1926	55.34 + 2.03
Agnico Eagle*	AEM	5333	79.58 + 1.44
Southern Copp*	SCCO	4736	45.63 + 1.15
Cleveland-Clif*	CLF	84149	7.03 + 1.15
Franco-Nevada*	FNV	2631	139.69 + 1.02
Newmont Corp*	NEM	27811	62.29 + 0.87
Freeport McMor*	FCX	104001	15.94 + 0.64
Wheaton Prec M*	WPM	7811	48.97 + 0.63
Arch Coal*	ARCH	2022	44.79 - 1.75
CONSOL Energy*	CNX	30412	9.30 - 1.08
Nutrien*	NTR	5646	38.65 - 1.08
Peabody Energy*	BTU	17226	2.39 - 0.66
Chevron Corp*	CVX	58563	71.19 - 0.64
Suncor Energy*	SU	51121	12.01 - 0.42
Vale*	VALE	139302	10.39 - 0.35
Mosaic*	MOS	17410	18.31 - 0.28
Cameco Corp*	CCJ	10030	9.75 - 0.28
Natural Res Pt*	NRP	34	12.04 - 0.21

METALS, MINING AND MONEY MARKETS

LME WAREHOUSE LEVELS		
Metal stocks (in tonnes) held in London Metal Exchange warehouses at opening, Oct 01 2020 (change from Sep 24, 2020 in brackets):		
Aluminium Alloy	5780	(-100)
Aluminium	1450950	(-31275)
Copper	163125	(+86800)
Lead	137000	(+1600)
Nickel	236148	(-498)
Tin	5550	(+45)
Zinc	212575	(-8725)

PRODUCER AND DEALER PRICES	
Coal: Central Appalachia, 12,500 Btu, 1.2 S02-R,W: US\$59.50	
Coal: Powder River Basin, 8,800 Btu, 0.8 S02-R, W: US\$11.70	
Cobalt: US\$14.97/lb.	
Copper: US\$3.00/lb.	
Copper: CME Group Futures November 2020: US\$2.95/lb.; December 2020: US\$2.94/lb	
Iridium: NY Dealer Mid-mkt US\$1,645.00/tr oz.	
Iron Ore 62% Fe CFR China-S: US\$123.20	
Lead: US\$0.82/lb.	
Phosphate Rock: US\$86.00/tonne	
Potash: US\$226.00/tonne	
Rhodium: Mid-mkt US\$14,000.00 tr. oz.	
Ruthenium: Mid-mkt US\$270.00/tr. oz.	
Silver: Handy & Harman Base: US\$23.83 per oz.; Handy & Harman Fabricated: US\$29.78 per oz.	
Tin: US\$7.94/lb.	
Uranium: U3O8, Trade Tech spot price: US\$30.00 per lb. U3O8	
Zinc: US\$1.07/lb.	
Prices current Oct. 5, 2020	

TSX SHORT POSITIONS				
Short positions outstanding as of Sept. 15, 2020 (with changes from Aug. 31, 2020)				
Largest short positions				
Barrick Gold	ABX	17864974	7710773	8/31/2020
New Gold	NGD	16526896	697504	8/31/2020
Kinross Gold	K	16328492	1165220	8/31/2020
Suncor Energy	SU	14262520	2489806	8/31/2020
Nexgen Energy	NXE	12870566	-178128	8/31/2020
Yamana Gold	YRI	12331510	607611	8/31/2020
Ivanhoe Mines	IVN	10432425	-877680	8/31/2020
Premier Gold M	PG	9927453	-1431980	8/31/2020
Wheaton Prec M	WPM	9662085	608671	8/31/2020
Teck Res	TECK.B	9501004	-297730	8/31/2020
Fortuna Silvr	FVI	9474779	-1101872	8/31/2020
First Quantum	FM	9104800	924802	8/31/2020
Wallbridge Mng	WM	8134417	3137516	8/31/2020
Equinox Gold	EQX	7747000	951457	8/31/2020
Sandstorm Gold	SSL	7141048	349319	8/31/2020
Largest increase in short position				
Barrick Gold	ABX	17864974	7710773	8/31/2020
Wallbridge Mng	WM	8134417	3137516	8/31/2020
Suncor Energy	SU	14262520	2489806	8/31/2020
Kinross Gold	K	16328492	1165220	8/31/2020
Equinox Gold	EQX	7747000	951457	8/31/2020
Largest decrease in short position				
Silver Eleph	ELEF	2116036	-4358613	8/31/2020
Lundin Mng	LUN	6275404	-2901872	8/31/2020
Premier Gold M	PG	9927453	-1431980	8/31/2020
OceanaGold	OGC	3332109	-1311329	8/31/2020
Americas Silvr	USA	1417434	-1257335	8/31/2020

TSX VENTURE SHORT POSITIONS				
Short positions outstanding as of Sept. 15, 2020 (with changes from Aug. 31, 2020)				
Largest short positions				
Discovery Met	DSV	5645071	-9262	8/31/2020
Mako Mining	MKO	5550572	61835	8/31/2020
AbraPlata Res	ABRA	5249684	313649	8/31/2020
Novo Res	NVO	5214971	317173	8/31/2020
Dolly Vard Sil	DV	4446247	-247386	8/31/2020
Conic Metals	NKL	4171023	4107316	8/31/2020
K92 Mining	KNT	3044704	766005	8/31/2020
Minaurum Gold	MGG	2585849	7685	8/31/2020
Teslin Rvr Res	SIM	2575006	2433630	8/31/2020
Ely Gold Royal	ELY	2462209	270850	8/31/2020
Lion One Mtls	LIO	2115713	-956886	8/31/2020
IMPACT Silver	IPT	2039918	-277647	8/31/2020
Monarca Mnrls	MMN	1930745	1831461	8/31/2020
Rokmaster Res	RRK	1685302	1402514	8/31/2020
Great Bear Res	GBR	1523055	72615	8/31/2020
Largest increase in short position				
Conic Metals	NKL	4171023	4107316	8/31/2020
Teslin Rvr Res	SIM	2575006	2433630	8/31/2020
Monarca Mnrls	MMN	1930745	1831461	8/31/2020
Rokmaster Res	RRK	1685302	1402514	8/31/2020
Granada Gold	GGM	1378354	1339847	8/31/2020
Largest decrease in short position				
Portofino Res	POR	829316	-3021144	8/31/2020
Arcturus Vent	MILE	81448	-1547382	8/31/2020
Alianza Min	ANZ	48535	-1254750	8/31/2020
Sailfish Rylty	FISH	184809	-1240110	8/31/2020
C3 Metals	CCCM	704	-1154210	8/31/2020

DAILY METAL PRICES					
Date	Oct 02	Oct 01	Sep 30	Sep 29	Sep 28
BASE METALS (London Metal Exchange -- Midday official cash/3-month prices, US\$ per tonne)					
Al Alloy	1500/1550	1490/1510.50	1500/1521.50	1578/1600	1517.50/1540
Aluminum	1705/1740	1716/1754	1737/1770.50	1746/1780	1737/1772
Copper	6409.50/6418.50	6614/6628	6610/6612	6546/6558	6571.50/6584.50
Lead	1763/1783.50	1809.50/1832.50	1801/1821.50	1821/1845	1805/1826.50
Nickel	14271/14305	14430/14479	14385/14423	14470/14512	14416/14460
Tin	17545/17530	17506/17529	17463/17494	17350/17395	17219/17276
Zinc	2302/2317.50	2365/2383	2413/2426.50	2418/2429.50	2394/2407.50

PRECIOUS METAL PRICES (London fix, LBMA silver price, US\$ per troy oz.)				
Gold AM	1906.40	1895.55	1883.40	1882.40
Gold PM	1903.05	1902.00	1886.90	1883.95
Silver	23.87	23.62	23.73	23.84
Platinum	891.00	898.00	884.00	880.00
Palladium	2312.00	2334.00	2335.00	2275.00

EXCHANGE RATES					
Date	Oct 02	Oct 01	Sep 30	Sep 29	Sep 28
US\$ in C\$	1.3287	1.3287	1.3308	1.3385	1.3358
C\$ in US\$	0.7526	0.7526	0.7514	0.7471	0.7486

Exchange rates (Quote Media, October 02, 2020)					
C\$ to AUS	C\$ to EURO	C\$ to YEN	C\$ to Mex Peso	C\$ to SA Rand	
1.0481	0.6409	79.4385	16.4428	12.4899	
C\$ to UK Pound	C\$ to China Yuan	C\$ to India Rupee	C\$ to Swiss Franc	C\$ to S. Korea Won	
0.5841	5.1113	55.1207	0.6917	875.1209	
US to AUS	US to EURO	US to YEN	US to Mex Peso	US to SA Rand	
1.3926	0.8515	105.5505	21.8479	16.5944	
US to UK Pound	US to China Yuan	US to India Rupee	US to Swiss Franc	US to S. Korea Won	
0.7761	6.7904	73.4600	0.9190	1162.9800	

NORTH AMERICAN STOCK EXCHANGE INDICES							
IndexName	Oct 02	Oct 01	Sep 30	Sep 29	Sep 28	52-week	
						High	Low
S&P/TSX Composite	16199.25	16184.54	16121.38	16211.52	16242.81	17970.51	11172.73
S&P/TSXV Composite	708.60	717.92	706.51	712.54	708.83	761.84	330.65
S&P/TSX 60	971.32	969.49	967.27	973.77	976.60	1070.48	683.81
S&P/TSX Global Gold	361.57	365.99	364.29	367.02	360.88	416.84	173.42
DJ Precious Metals	314.69	314.69	312.01	312.57	307.72	359.81	140.55

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Contact: **moliveira@northernminer.com** or **416-510-6768**

TSX WARRANTS	
Warrant to purchase one common share of the Issuer at \$0.50 until expiry.	
Liberty Gold Corp. Wt (LGD.WT) - One Warrant to purchase one common share of the Issuer at \$0.90 until expiry may 16, 2019	
Lithium Americas Corp (LAC.WT) - One Warrant to purchase one common share of the Issuer at \$0.90 until expiry	
Lydian International Limited (LYD.WT) - One Warrant to purchase one additional ordinary share of the Issuer at \$0.36 per share until expiry	
Nevada Copper Corp. (NCU.WT) - One Warrant to purchase one common share of the Issuer at \$0.20 until expiry	
Northern Dynasty Minerals Ltd. J (NDM.WT.B) - Wt buys sh @ \$0.55 to Jun 10/21	
Northern Dynasty Minerals Ltd. J (NDM.WT.B) - Wt buys sh @ \$0.55 to Jun 10/21	
Osisko Gold Royalties (OR.WT) - Wt buys sh @ \$36.5 to Feb 18/22	

TSX VENTURE WARRANTS	
ABE Resources Inc. (ABE.WT) - One warrant to purchase one common share at \$0.15 per share.	
American Cumo Mining Corp. (MLY.RT) - 2 rights and \$0.07 are required to purchase one share	
Antioquia Gold Inc. (AGD.RT) - One (1) Right and \$0.042 are required to purchase one share.	
Aurania Resources Ltd. (ARU.RT) - Fourteen (14) Rights exercisable for one common share at \$2.70 per common share.	
Avidian Gold Corp. (AVG.RT) - Three rights and \$0.11 are required to purchase one Share.	
Boreal Metals Corp. (BMX.WT) - One warrant to purchase one common share at \$0.50 per share.	
Boreal Metals Corp. (BMX.WT) - One warrant to purchase one common share at \$0.30 per share.	
Cordoba Minerals Corp (CDB.WT) - One warrant to purchase one common share at \$1.08 per share.	
Cordoba Minerals Corp (CDB.WT) - One warrant to purchase one common share at \$1.08 per share.	
Cordoba Minerals Corp. (CDB.RT) - One (1) Right exercisable for One (1) Rights Share at \$0.05 per Share.	
Equinox Gold (EQX.WT) - One warrant to purchase one common share at \$3.00 per share.	
Eros Resources Corp. (ERC.WT) - One (1) Right exercisable for (1) Unit at \$0.05 per Unit.	
Falco Resources Ltd. (FPC.WT) - One warrant to purchase one common share at \$1.70 per share.	
Firefox Gold Corp. (FFOX.WT) - One warrant to purchase one common share at \$3.00 per share.	
Goldstar Minerals (GDM.RT) - One Right to purchase one common share at \$0.03 per share.	
Goldstar Minerals Inc. (GDM.RT) - One (1) Right and \$0.05 are required to purchase one common share.	
JDL Gold Corp. (JDL.WT) - Wt buy sh @ \$3.00 to Oct 06/21	
Kootenay Silver Inc. (KTN.WT) - Wt buys sh @ \$0.55 to Apr 21/21	
LaSalle Exploration Corp. (LSX.WT) - One warrant to purchase one common share at \$0.15 per share.	
LSC Lithium Corporation (LSC.RT) - One (1) right exercisable for One (1) Unit at \$0.40 per Unit.	
Mako Mining Corp. (MKO.RT) - Rights exercisable for One (1) share at \$0.10 per share.	
Maple Gold Mines Ltd. (MGM.WT) - One	
warrant to purchase one common share at \$0.40 per share	
Maple Gold Mines Ltd. (MGM.WT) - One warrant to purchase one common share at \$0.40 per share	
Mexican Gold Corp. (MEX.WT) - One warrant to purchase one common share at \$0.12 per share.	
Millennial Lithium Corp. (ML.WT) - One warrant to purchase one common share at \$4.25 per share.	
Orezone Gold Corporation (ORE.WT) - One warrant to purchase one common share at \$0.80 per share.	
Sandfire Resources America Inc. (SFR.RT) - Eight (8) Rights exercisable for One (1) share at \$0.06 per unit.	
Tintina Resources Inc. (TAU.RT) - Nine(9) Rights exercisable for one share at \$0.06 per share.	
Trek Mining (TREK.WT) - Wt buy sh @ \$3.00 to Oct 06/21	
Ucore Rare Metals Inc. (UCU.RT) - One (1) right exercisable for one share at \$4.00 per share.	
Vision Lithium Inc. (VLI.WT) - One warrant to purchase one common share at \$0.15 per share.	
Yellowhead Mining Inc. (YMI.RT) - One (1) Right and \$0.12 are required to prchase one Share	

NEW 52-WEEK HIGHS AND LOWS SEPT. 28-OCT. 2, 2020					
120 New Highs	E3 Metals*	Kestrel Gold	Oroco Res*	Sonoro Gold*	Amerigo Res*
Abitibi Royal	Elysee Dev	Kings Bay Res*	Orosur Mng	Stakeholdr Gld*	Arcturus Vent
Abitibi Royal*	Elysee Dev *	Kodiak Copper*	Pacific Rim*	Standard Lith	Arcwest Explor
Altamira Gold	Endurance Gold	Latin Metals*	Pan Global Res	Stratabd Mnr*	Arcwest Explor*
Altamira Gold*	Endurance Gold*	Lithium Amer	Pan Global Res*	Surge Copper	Arizona Metals*
Aton Resources*	FireFox Gold*	Lithium Amer*	PepinNini Lith*	Surge Copper *	Ashanti Sanko*
Aurania Res	Firestone Vent	Los Andes	Pivit Explor	Tamino Mnrls*	CONSOL Coal Rs*
Aurania Res*	Fireweeed Zinc	Los Andes*	Puma Expl*	Tanqueray Expl	Core Assets
Auxico Res	Fireweed Zinc*	MDN Inc*	Questex Gold	Tarachi Gold*	Cortus Metals
Baselode Egy	Focus Minerals*	Melkior Res*	Rambler Metals*	Telson Res	Entree Res*
Bessor Min*	Four Nines*	Meryllion Res	Riley Gold	Timberline Res	Evergold
BMEX Gold	Full Metal Mnl*	Mojave Gold	Rio Silver	Tisdale Res	Excellon Res*
Cabral Gold	Gambier Gold*	Navy Res	Rochester Res	Tyhee Gold*	Goldblock Cap
Cabral Gold*	Generic Gold	Neo Lithium	Rock Tech Lith	Valley High Mg*	Hanstone Gold
Candelaria Mg	GGL Res*	New Found Gold	Rock Tech Lith*	Warrior Gold*	Major Precious
Chalice Gold M*	Giyani Gold*	New Milln Iron*	RT Minerals*	Western Troy C*	Montego Res
Clarity Gold	Global Energy*	New Stratus	Rupert Res	Westhaven Vent*	Orea Mining
Colombia Crest	Goldstar Mnls*	NGEx Minerals	Sassy Res	Xtra-Gold Res	Palayan Res*
Cons Wodjam	Guyana Goldstr	NGEx Minerals*	Sentinel Res	Xtra-Gold Res*	Peabody Enrgy*
Cyon Explor	Hanna Capital*	Noble Metal *	Sentinel Res*	ZEN Graphene*	PUF Vent Inc *
Cypress Dev	Josemaria Res	Norra Metals	Serengeti Res	Zenith Explor	27 New Lows
Cypress Dev*	Jourdan Res	Norse Gold	Silver Dollar*	Falcon Gold*	Sierra Madre*
Diamond Disc*	K2 Gold	O3 Mining	Solaris Res	Steppe Gold*	Trio Resources*
Ditem Explor*	Kapuskasing Gd	O3 Mining*	Solaris Res*	Alliance Res*	United States A*
E3 Metals	Kapuskasing Gd*	Oroco Res	SolGold plc*		

CANADIAN GOLD MUTUAL FUNDS							
FundName	Oct 02 (\$)	Sep 25 (\$)	Change (\$)	Change (%)	YTDChange (%)	MER (%)	TotalAssets (M)
BMO Prec Mtls Fd A	31.11	30.91	0.20	0.64	43.28	2.41	69.39
BMO ZGD	84.72	83.74	0.98	1.17	44.57	0.61	272.72
BMO ZIG	82.27	81.36	0.91	1.12	39.03	0.60	139.83
CIBC Prec Metal Fd A	17.57	17.46	0.10	0.58	48.09	2.43	77.79
Dyn Prec Metls Fd A	13.66	13.45	0.21	1.60	62.54	2.73	730.80
Evolve GLC		17.22	0.34	1.95	26.31		23.48
Harvest HGGG		36.16	0.85	2.36	54.48	0.94	9.54
Horizons HEP		37.24	0.80	2.14	36.18	0.83	
IG MacGblPreMetCl A	16.90	16.67	0.23	1.40	56.00	2.66	48.02
iShares XGD		22.40	0.40	1.77	46.85	0.61	1605.64
Mac Prec Met Cl A	81.78	80.63	1.15	1.42	57.88	2.52	90.56
NBI PrecMetFd Inv		23.19	0.55	2.37	48.53	2.46	44.66
NPT Go&PrMinFd A	62.00	60.97	1.03	1.69	64.31	3.19	
NPT SilverEquCl A	10.18	10.15	0.03	0.30	78.42	2.98	
RBC GblPreMetFd A		65.70	1.69	2.58	58.40	2.10	615.07
RBC GblPreMetFd Adv		66.16	1.70	2.58	58.38	2.09	3.58
Sentry Pre Met Fd A		60.38	0.92	1.53	63.50	2.32	476.67
TD Prec Mtl Fd Inv	59.01	58.53	0.48	0.82	45.23	2.27	187.55

MINING STOCKS listed on
CANADIAN and U.S. EXCHANGES
TRADING: SEPTEMBER 28-OCTOBER 02, 2020

STOCK TABLES

Stock	Exc	(100s)	Week				12-month	
			High	Low	Last	Change	High	Low
A								
1911 Gold	O	260	0.90	0.52	0.54	+	0.03	1.22 0.15
1911 Gold	V	331	0.80	0.71	0.71	+	0.01	0.98 0.22
79 Resources	C	280	0.12	0.11	0.11	-	0.01	0.15 0.10
79North	C	173	0.14	0.14	0.14	+	0.02	0.25 0.13
Abacus Mining*	O	258	0.15	0.13	0.14	-	0.00	0.21 0.03
Abacus Mining	V	220	0.21	0.18	0.21	+	0.04	0.29 0.05
About Mines	V	1718	0.23	0.21	0.22	+	0.01	0.24 0.04
About Mines*	O	449	0.17	0.15	0.16	+	0.00	0.18 0.03
Aben Resources*	O	817	0.08	0.06	0.07	+	0.00	0.12 0.03
Aben Resources	V	568	0.10	0.09	0.09	-	0.01	0.16 0.05
Abitibi Royal*	O	3	19.70	0.00	19.20	-	0.08	19.70 7.68
Abitibi Royal	V	11	26.50	25.53	25.58	-	0.42	26.50 11.10
AbráPlata Res*	O	1379	0.24	0.21	0.23	+	0.00	0.36 0.03
AbráPlata Res	V	1880	0.31	0.29	0.31	+	0.01	0.48 0.04
Academy Metals*	O	13	0.09	0.09	0.09	unch	0.00	0.14 0.09
Academy Metals	V	17	0.11	0.00	0.10	-	0.01	0.27 0.10
Adamera Min*	O	117	0.07	0.05	0.06	-	0.01	0.12 0.01
Adamera Min	V	99	0.09	0.00	0.08	-	0.01	0.16 0.02
Adex Mining	V	257	0.01	0.01	0.01	unch	0.00	0.01 0.01
Advantage Gold	V	255	0.13	0.11	0.12	-	0.01	0.29 0.03
Adventus	V	228	1.10	1.02	1.02	-	0.03	1.60 0.52
Adventus*	O	52	0.81	0.00	0.81	-	0.00	1.18 0.36
AEX Gold	V	45	0.80	0.77	0.80	+	0.01	1.20 0.31
Affinity Metal*	O	25	0.21	0.00	0.18	+	0.00	0.37 0.06
African Gold	V	2445	0.24	0.21	0.23	+	0.01	0.46 0.10
African Gold*	O	138	0.17	0.15	0.16	-	0.00	0.34 0.07
African Min*	O	1449	0.00	0.00	0.00	-	0.00	0.01 0.00
Aftermath Silv*	O	976	0.64	0.58	0.61	-	0.01	0.83 0.06
Agnico Eagle*	N	5333	81.95	77.74	79.58	+	1.44	89.23 31.00
Agnico Eagle	T	2565	108.81	104.05	105.99	+	1.36	117.35 43.25
AgriMinco*	O	465	0.00	0.00	0.00	-	0.00	0.00 0.00
Aguila Amer Gd	V	30	0.38	0.38	0.38	unch	0.00	0.50 0.12
AJN Resources	C	36	0.29	0.26	0.29	-	0.01	1.34 0.17
Alacer Gold	T	22959	9.84	9.42	9.47	unch	0.00	10.82 3.50
Alamos Gold	T	4719	12.06	11.60	11.68	-	0.04	15.52 4.43
Alamos Gold*	N	9135	9.05	8.70	8.76	-	0.01	11.58 3.34
Alaska Pac Egy*	O	39197	0.00	0.00	0.00	-	0.00	0.00 0.00
Alcoa*	N	27483	12.33	10.98	11.82	+	0.27	23.47 5.16
Aldebaran Res	V	34	0.50	0.44	0.44	-	0.06	0.74 0.16
Aldebaran Res*	O	34	0.42	0.32	0.32	-	0.06	0.52 0.17
Alderon Iron*	O	37	0.03	0.00	0.02	-	0.01	0.17 0.00
Aldever Res	V	3731	0.14	0.12	0.13	+	0.02	0.22 0.05
Aldever Res*	O	5	0.11	0.10	0.10	-	0.00	0.16 0.01
Alexandra Cap*	O	491	0.21	0.18	0.19	-	0.01	0.60 0.06
Alexco Res*	X	4648	2.77	2.56	2.61	+	0.03	3.50 0.72
Alexco Res	T	1119	3.68	3.44	3.45	-	0.04	4.65 1.00
Alianza Min*	O	128	0.11	0.09	0.10	+	0.00	0.16 0.03
Alianza Min	V	476	0.14	0.13	0.13	unch	0.00	0.21 0.03
Alien Metals*	O	1006	0.01	0.01	0.01	+	0.00	0.02 0.00
Allegiant Gold	V	578	0.47	0.40	0.44	+	0.05	0.71 0.07
Allegiant Gold*	O	446	0.34	0.30	0.34	+	0.05	0.56 0.05
Alliance Mng	V	210	0.02	0.02	0.02	unch	0.00	0.03 0.01
Alliance Res*	D	2898	2.97	2.63	2.86	-	0.01	14.88 2.63
Almaden Min*	X	1959	0.89	0.77	0.81	-	0.05	1.09 0.21
Almaden Min	T	212	1.20	1.03	1.05	-	0.11	1.43 0.31
Almadex Min*	O	426	0.29	0.19	0.23	+	0.02	0.29 0.05
Almadex Min	V	267	0.33	0.26	0.29	-	0.04	0.36 0.12
Almonty Ind *	O	45	0.56	0.49	0.56	+	0.07	0.61 0.24
Almonty Ind	T	113	0.75	0.70	0.75	+	0.06	0.81 0.28
Aloro Mining*	O	12	0.06	0.05	0.05	-	0.00	0.19 0.01
Aloro Mining	V	30	0.08	0.07	0.07	-	0.01	0.12 0.03
Alpha Lithium	V	1357	0.60	0.52	0.58	+	0.05	1.45 0.21
Alpha Lithium*	O	2441	0.45	0.36	0.43	+	0.04	1.13 0.19
Alphamin Res *	O	125	0.19	0.16	0.16	-	0.02	0.24 0.09
Alphamin Res	V	560	0.25	0.21	0.22	-	0.02	0.30 0.12
Altai Resource	V	938	0.10	0.09	0.09	unch	0.00	0.14 0.03
Altair Res Inc	V	96	0.03	0.03	0.03	unch	0.00	0.04 0.01
Altamira Gold	V	2078	0.19	0.12	0.15	+	0.03	0.19 0.04
Altamira Gold*	O	199	0.14	0.09	0.11	+	0.02	0.12 0.02
Altan Nevada	V	46	0.02	0.02	0.02	unch	0.00	0.05 0.01
Altan Rio Min	V	312	0.10	0.00	0.09	unch	0.00	0.13 0.03
Altiplano Met	V	293	0.22	0.19	0.22	+	0.02	0.23 0.02
Altiplano Met*	O	5	0.15	0.15	0.15	unch	0.00	0.15 0.05
Altius Mnrfs *	O	137	7.64	7.16	7.61	+	0.02	9.38 4.33
Altius Mnrfs	T	297	10.20	9.63	10.14	-	0.10	12.32 6.29
Alto Ventures	V	343	0.16	0.14	0.15	-	0.01	0.24 0.08
Alto Ventures*	O	8	0.10	0.10	0.10	unch	0.00	0.18 0.04
Altura Mining*	O	59	0.08	0.08	0.08	+	0.02	0.12 0.01
Altus Strat	V	138	1.10	0.97	1.05	+	0.07	1.36 0.30
Altus Strat*	O	0	0.00	0.00	0.87	unch	0.00	21.22 0.35
Alumina Ltd*	O	280	4.09	3.83	3.88	-	0.07	6.75 3.09
ALX Resources	V	299	0.08	0.07	0.07	unch	0.00	0.10 0.02
ALX Resources*	V	462	0.06	0.05	0.06	+	0.00	0.07 0.01
AM Resources	V	385	0.04	0.04	0.04	unch	0.00	0.12 0.03
Amani Gold*	O	498	0.00	0.00	0.00	+	0.00	0.05 0.00
Amanita Res*	O	0	0.00	0.00	0.00	unch	0.00	0.00 0.00
Amarc Res*	O	19	0.04	0.00	0.04	+	0.01	0.07 0.02
Amarc Res	V	472	0.06	0.05	0.06	+	0.02	0.08 0.02
Amarillo Gold	V	1709	0.36	0.32	0.33	-	0.01	0.42 0.10
Amarillo Gold*	O	253	0.27	0.24	0.24	-	0.01	0.31 0.08
Amer Intl Vent*	O	43	0.01	0.01	0.01	+	0.00	0.02 0.00
American Creek*	O	925	0.25	0.21	0.22	-	0.00	0.38 0.02
American Creek	V	2226	0.34	0.27	0.29	-	0.01	0.50 0.04
American Cuko*	O	1880	0.05	0.02	0.05	-	0.00	0.09 0.00
American Lith	V	4518	1.28	0.98	1.25	+	0.31	2.98 0.09
American Lith*	O	5815	0.98	0.73	0.92	+	0.22	1.19 0.06
American Mang*	O	1325	0.18	0.13	0.16	+	0.01	0.21 0.07
American Mang	V	816	0.23	0.18	0.21	+	0.01	0.28 0.10
American Pac	C	1164	0.23	0.19	0.22	+	0.03	0.62 0.06
AmericasSierra*	O	1	0.03	0.00	0.03	+	0.00	0.05 0.01
Americas Silv*	X	2769	2.70	2.53	2.57	-	0.02	3.90 1.00
Americas Silv*	T	1965	3.60	3.37	3.40	-	0.06	5.12 1.39
Amorigo Res*	O	601	0.60	0.52	0.57	+	0.03	0.80 0.12
Amorigo Res*	O	343	0.44	0.00	0.39	+	0.00	0.61 0.08
Amex Expl*	O	98	2.32	2.18	2.22	+	0.03	2.98 0.64
Amex Expl	V	266	3.09	2.90	2.94	-	0.04	3.98 0.86
Amliot Capital	V	27	0.05	0.05	0.05	unch	0.00	0.06 0.01
Amseco Expl	V	92	0.05	0.04	0.04	-	0.01	0.08 0.02
AMV Capital	V	3	0.15	0.15	0.15	-	0.05	0.20 0.07
Anaconda Mng*	O	306	0.39	0.35	0.36	-	0.03	0.59 0.07
Anaconda Mng	T	802	0.53	0.46	0.47	-	0.04	0.78 0.10
Andes Gold*	O	64	0.01	0.00	0.01	+	0.00	0.02 0.00
Andover Mng*	O	6	0.00	0.00	0.00	unch	0.00	0.00 0.00
Anfield Energy	O	826	0.05	0.04	0.04	-	0.01	0.12 0.03
Anfield Energy*	V	2074	0.07	0.05	0.06	-	0.01	0.16 0.04
Angel Gold*	O	28	0.03	0.02	0.03	-	0.00	0.05 0.00
Angel Gold	V	240	0.04	0.03	0.03	-	0.01	0.07 0.01
Angkor Gold*	O	70	0.08	0.07	0.07	-	0.00	0.09 0.02
Angkor Res	V	43	0.10	0.09	0.09	-	0.01	0.12 0.01
Anglo American*	O	11	24.90	0.00	24.85	+	1.11	29.51 12.56
Anglo American*	O	544	12.22	11.88	12.08	+	0.37	14.81 5.91
Anglo Gold Ash*	O	73	2.43	0.00	2.43	+	0.43	3.20 0.27
AngloGold Ash*	O	0	0.00	0.00	26.70	unch	0.00	38.94 15.44
AngloGold Ash*	N	9979	26.72	25.56	26.01	-	0.38	38.50 12.66
Angus Gold*	O	28	1.12	0.78	0.85	-	0.04	1.16 0.53
Angus Gold	V	63	1.51	1.10	1.47	+	0.27	1.51 0.14
Antioquia Gold	O	47	0.05	0.04	0.04	-	0.01	0.07 0.01
Antioquia Gold*	V	285	0.06	0.06	0.06	-	0.01	0.09 0.02
Antler Gold *	O	0	0.00	0.00	0.27	unch	0.00	0.38 0.01
Antler Gold	V	109	0.32	0.28	0.32	+	0.03	0.49 0.02
Antofagasta*	O	7	13.19	13.19	13.19	unch	0.00	15.00 7.30
Apex Res *	O	15	0.09	0.08	0.08	+	0.00	0.31 0.04
Apex Res	V	162	0.11	0.10	0.11	unch	0.00	0.43 0.04
Apollo Gold	V	924	0.84	0.56	0.76	+	0.17	1.68 0.04
Apollo Gold*	O	36	0.57	0.42	0.57	+	0.13	0.91 0.39
Appia Energy*	O	769	0.30	0.25	0.27	-	0.01	0.43 0.07
Appia Energy	C	1086	0.40	0.34	0.35	-	0.03	0.57 0.10
Applied Min*	O	778	0.01	0.01	0.01	+	0.00	0.03 0.00
Aquila Res*	O	647	0.12	0.11	0.12			

Stock	Exc	(100s)				Week				12-month			
		Volume	High	Low	Last	Change	High	Low	Change	High	Low	Change	High
Engold Mines	V	277	0.05	0.05	0.05	+	0.01	0.09	0.02				
Engold Mines	O	38	0.04	0.04	0.04	+	0.00	0.06	0.02				
Ensurg	O	145	0.04	0.03	0.03	unch	0.00	0.06	0.01				
Entree Res*	O	44	0.32	0.00	0.32	+	0.01	0.40	0.16				
Entree Res	T	54	0.43	0.41	0.41	+	0.01	0.53	0.22				
Equinox Gold	X	4111	12.06	11.43	11.85	+	0.22	13.66	4.63				
Equinox Gold	T	2872	16.00	15.29	15.74	+	0.18	17.99	6.80				
Equitorial Ex	V	264	0.23	0.13	0.23	+	0.09	0.35	0.05				
Equity Metals*	O	88	0.13	0.10	0.11	+	0.01	0.15	0.03				
Equity Metals	V	250	0.17	0.15	0.16	+	0.01	0.20	0.04				
Erdene Res Dev*	O	111	0.36	0.33	0.35	+	0.02	0.55	0.09				
Erdene Res Dev	T	654	0.48	0.45	0.48	+	0.03	0.71	0.13				
Erin Ventures*	O	169	0.04	0.03	0.04	+	0.00	0.05	0.02				
Erin Ventures	V	805	0.05	0.04	0.04	unch	0.00	0.08	0.03				
Ero Copper	T	782	20.02	17.95	19.37	+	0.87	23.93	8.40				
Ero Copper*	O	70	14.60	0.00	14.51	+	0.87	18.22	5.92				
Eros Res Corp*	O	20	0.08	0.06	0.08	+	0.00	0.11	0.04				
Eros Res Corp	V	524	0.10	0.09	0.09	-	0.01	0.17	0.06				
Eros Res Corp	V	524	0.10	0.09	0.09	-	0.01	0.17	0.06				
EsKay Ming*	O	406	0.60	0.49	0.51	-	0.09	0.70	0.06				
EsKay Ming	V	338	0.79	0.66	0.69	-	0.09	0.95	0.09				
Essex Minerals	V	763	0.75	0.49	0.51	-	0.10	0.92	0.10				
Ethos Gold*	O	452	0.21	0.18	0.20	+	0.02	0.28	0.05				
Ethos Gold	V	286	0.28	0.24	0.26	+	0.03	0.37	0.08				
Etruscus Res*	O	84	0.32	0.28	0.30	-	0.04	0.34	0.25				
Etruscus Res	C	323	0.45	0.40	0.41	-	0.01	0.48	0.12				
Euro Manganese	V	1577	0.22	0.16	0.20	+	0.02	0.24	0.05				
Euro Sun Mg	T	961	0.44	0.39	0.44	+	0.05	0.63	0.14				
Euro Sun Mg*	O	252	0.36	0.30	0.32	+	0.02	0.49	0.02				
EuroMax Res*	O	30	0.04	0.00	0.02	-	0.01	0.05	0.01				
EuroMax Res*	T	16	0.04	0.04	0.04	-	0.01	0.07	0.02				
European Elect	V	134	0.46	0.47	0.48	-	0.01	0.60	0.05				
Eurmin	V	0	0.00	0.00	0.02	unch	0.00	0.04	0.01				
Evergold	V	161	0.37	0.00	0.35	-	0.01	0.95	0.17				
Evergold*	O	11	0.28	0.00	0.26	-	0.01	0.71	0.15				
EVMI Global Grp	C	358	0.23	0.05	0.09	+	0.03	0.63	0.05				
Evolving Gold	C	77	0.07	0.07	0.07	+	0.01	0.14	0.01				
Evolving Gold*	O	4	0.05	0.05	0.05	+	0.00	0.11	0.01				
Evrim Res	V	541	0.36	0.32	0.33	unch	0.00	0.62	0.19				
Excelsior Res	T	320	4.05	3.66	3.80	-	0.22	6.15	1.55				
Excelsior Res*	X	237	3.06	2.47	2.87	-	0.16	3.36	2.47				
Excelsior Mng*	O	140	0.54	0.48	0.51	-	0.00	0.94	0.30				
Excelsior Mng	T	136	0.70	0.66	0.68	unch	0.00	1.23	0.42				
ExGen Res Inc	V	1462	0.02	0.01	0.02	unch	0.00	0.02	0.01				
ExGen Res Inc*	O	75	0.01	0.01	0.01	unch	0.00	0.01	0.00				
Explores Res	C	4	6.20	5.30	6.20	+	0.90	6.75	3.49				
Explores Res*	O	6	3.85	3.85	3.85	unch	0.00	4.27	0.00				
Fairmont Res*	O	23	0.30	0.28	0.29	+	0.01	0.63	0.27				
Falco Res	V	475	0.45	0.41	0.42	+	0.01	0.60	0.17				
Falco Res *	O	175	0.34	0.25	0.31	+	0.01	0.72	0.11				
Falcon Gold	V	993	0.17	0.14	0.16	+	0.01	0.25	0.03				
Falcon Gold*	O	515	0.13	0.09	0.12	+	0.00	0.19	0.10				
Falcon Expl	V	960	0.09	0.07	0.09	+	0.02	0.09	0.03				
Far Res*	O	49	0.05	0.04	0.05	+	0.00	0.08	0.01				
Far Res	C	1534	0.07	0.06	0.07	unch	0.00	0.12	0.02				
FenixOro Gold	C	723	0.60	0.46	0.55	+	0.09	0.63	0.10				
FenixOro Gold*	O	638	0.42	0.34	0.40	+	0.06	0.56	0.08				
Fidelity Min	V	556	0.07	0.06	0.06	-	0.02	0.13	0.02				
Fidelity Min*	O	2	0.06	0.04	0.04	-	0.02	0.09	0.02				
Filo Mg Corp*	O	4	1.39	0.00	1.36	-	0.12	1.83	0.77				
Filo Mg Corp	V	131	1.95	1.80	1.85	+	0.05	2.50	1.00				
Finlay Mining	V	49	0.08	0.00	0.08	+	0.01	0.10	0.02				
Flow Gold*	O	305	1.26	1.10	1.19	+	0.10	1.38	0.12				
Flow Gold	V	732	1.65	1.49	1.58	+	0.12	1.75	0.27				
Fire River Gold*	O	0	0.02	0.00	0.02	unch	0.00	0.90	0.00				
FireFox Gold	V	1215	0.21	0.15	0.20	+	0.04	0.25	0.04				
FireFox Gold*	O	171	0.16	0.12	0.15	+	0.03	0.13	0.10				
Firestone Vent	V	57	0.24	0.00	0.22	+	0.07	0.24	0.03				
Fireweed Zinc	V	862	1.31	1.07	1.14	+	0.04	1.31	0.31				
Fireweed Zinc*	O	14	0.97	0.81	0.82	-	0.04	0.97	0.21				
Firma Holdings*	O	595	0.01	0.00	0.01	+	0.00	0.04	0.00				
First Cobalt *	O	858	0.12	0.10	0.11	+	0.00	0.13	0.05				
First Cobalt	V	1714	0.15	0.14	0.14	-	0.01	0.18	0.08				
First Energy*	O	131	0.17	0.12	0.15	+	0.01	0.21	0.02				
First Energy	C	106	0.21	0.17	0.20	+	0.04	0.30	0.04				
First Majestic	T	6547	13.23	12.48	12.84	+	0.10	14.41	5.30				
First Majestic*	N	29247	9.90	9.33	9.65	+	0.13	14.57	4.17				
First Mg Fin *	O	2575	0.37	0.33	0.35	+	0.02	0.47	0.09				
First Mg Fin	T	6000	0.49	0.45	0.47	+	0.02	0.60	0.12				
First Point*	O	179	0.52	0.45	0.45	-	0.03	0.64	0.08				
First Quantum	T	13033	12.14	11.40	11.57	+	0.07	14.85	4.71				
First Vanadium	V	270	0.40	0.34	0.38	+	0.01	0.48	0.13				
First Vanadium*	O	278	0.30	0.25	0.30	+	0.02	0.36	0.08				
Fission 3.0*	V	263	0.08	0.00	0.07	unch	0.00	0.11	0.03				
Fission 3.0*	O	111	0.06	0.04	0.06	+	0.00	0.08	0.02				
Fission Uran*	O	780	0.28	0.24	0.24	-	0.03	0.38	0.07				
Fission Uran	T	1488	0.36	0.31	0.31	-	0.03	0.49	0.10				
Five Star Diam	V	877	0.05	0.04	0.05	+	0.01	0.06	0.01				
Five Star Diam*	O	4	0.04	0.04	0.04	unch	0.00	0.04	0.02				
Fjordland Exp*	O	12	0.08	0.06	0.08	+	0.02	0.08	0.02				
Fjordland Exp	V	91	0.10	0.09	0.09	+	0.01	0.12	0.03				
Flow Metals	C	113	0.07	0.06	0.06	-	0.01	0.20	0.06				
Flowers Gold*	O	9	0.07	0.00	0.07	-	0.01	0.51	0.05				
Focus Graphite*	O	763	0.02	0.01	0.02	unch	0.00	0.03	0.01				
Focus Graphite	V	818	0.03	0.02	0.02	-	0.01	0.03	0.01				
Focus Minerals*	O	126	0.25	0.00	0.25	+	0.10	0.19	0.13				
Focus Mining	V	1364	0.33	0.28	0.30	-	0.01	0.43	0.04				
Foran Mng	V	24	0.19	0.00	0.18	-	0.01	0.29	0.08				
Forsys Metals	T	48	0.17	0.16	0.16	unch	0.00	0.22	0.06				
Fort St J Nick	V	1	0.00	0.00	0.16	unch	0.00	0.16	0.09				
Fortescue Met*	O	21	12.08	11.18	11.55	+	0.58	14.12	5.16				
Fortuna Silr	T	3598	8.87	8.29	8.49	+	0.13	10.47	2.05				
Fortuna Silr*	N	16646	6.63	6.19	6.37	+	0.13	7.95	1.47				
Fortune Bay	V	82	1.20	1.00	1.18	+	0.21	1.56	0.22				
Fortune Bay*	O	4	0.89	0.00	0.89	+	0.17	1.21	0.14				
Fortune Mnrs*	O	133	0.06	0.05	0.06	+	0.00	0.07	0.03				
Fortune Mnrs	T	736	0.08	0.07	0.07	-	0.01	0.10	0.04				
Forum Energy	V	838	0.13	0.12	0.13	unch	0.00	0.17	0.05				
Forum Energy*	O	424	0.11	0.08	0.10	+	0.00	0.14	0.03				
Forsterville	V	661	3.34	2.96	3.06	+	0.11	5.34	0.91				
Four Nines	C	16	0.32	0.25	0.32	+	0.07	0.39	0.10				
Four Nines*	O	36	0.24	0.15	0.24	+	0.09	0.24	0.15				
Fox River Res	C	21	0.08	0.00	0.08	unch	0.00	0.12	0.04				
FPX Nickel	V	406	0.69	0.60	0.60	-	0.04	0.84	0.11				
Franco-Nevada*	N	2631	143.29	136.99	139.69	+	1.02	166.11	77.18				
Franco-Nevada	T	1413	190.50	183.54	186.10	+	3.37	222.15	105.93				
Franklin Mng*	O	623	0.01	0.00	0.01	+	0.00	0.10	0.00				
Freegold Vent	T	4872	1.14	0.95	0.99	-	0.12	1.95	0.04				
Freeman Gold	C	821	0.59	0.49	0.57	+	0.04	0.84	0.11				
Freeman Gold*	O	85	0.50	0.37	0.43	+	0.03	0					

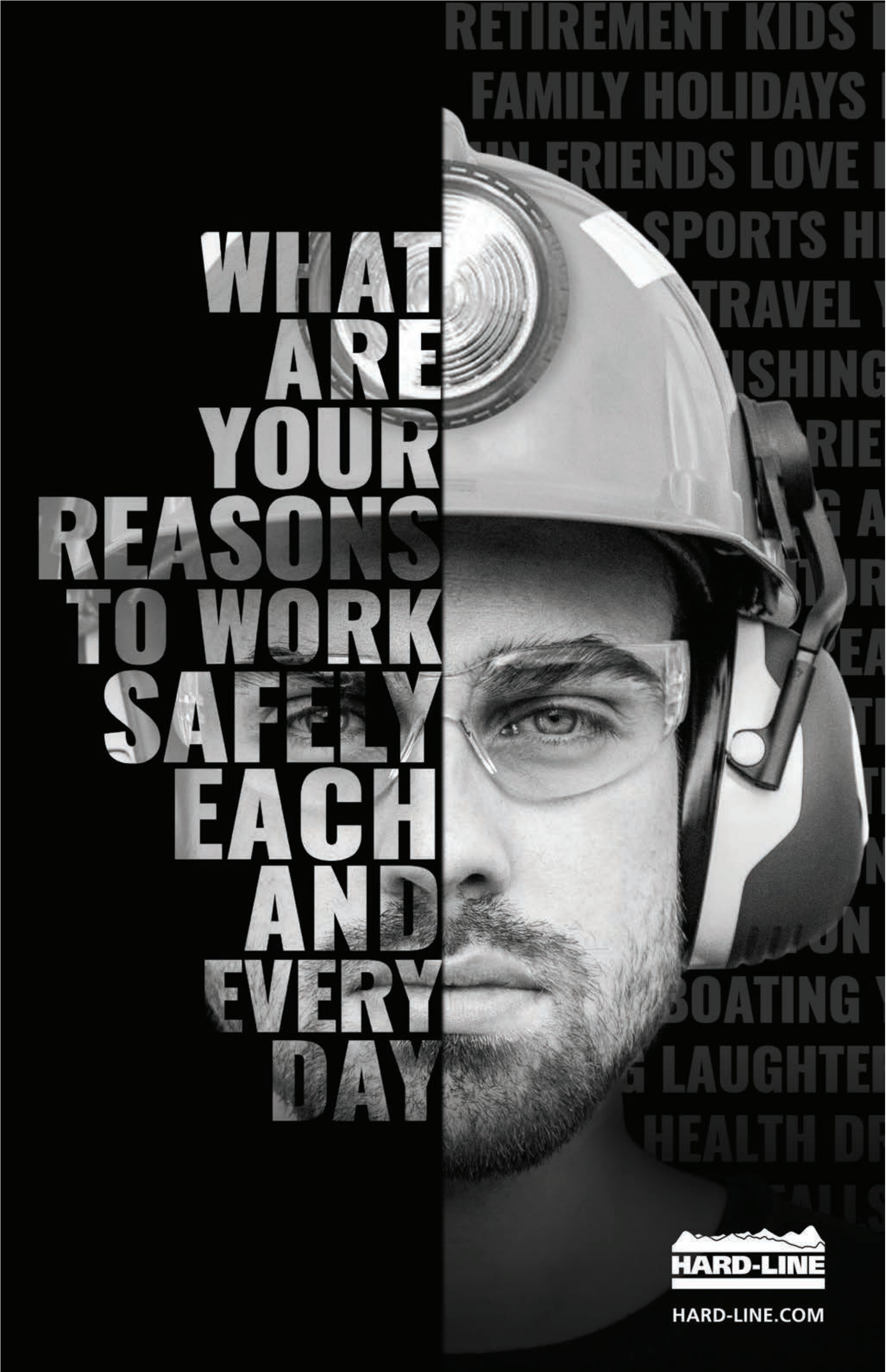
STOCK TABLES

Stock	Exc	(100s)			Week				12-month	
		Volume	High	Low	Last	Change	High	Low	High	Low
MGX Minerals*	O	650	0.07	0.05	0.05	+	0.00	0.15	0.02	
MGX Minerals	C	784	0.08	0.07	0.07	unch	0.00	0.20	0.04	
Mil Resources	C	73	0.30	0.26	0.29	+	0.03	0.50	0.10	
Midas Gold	T	1495	1.51	1.35	1.48	+	0.12	2.04	0.24	
Midas Gold*	O	2042	1.15	1.01	1.12	+	0.10	1.55	0.16	
Midasco Cap	V	175	0.08	0.07	0.08	unch	0.00	0.15	0.07	
Midland Expl	V	55	1.00	0.93	0.94	+	0.02	1.13	0.46	
Midnight Star	C	434	0.16	0.00	0.15	+	0.01	0.35	0.10	
Midnight Sun*	O	25	0.21	0.17	0.17	-	0.04	0.21	0.04	
Midnight Sun	V	42	0.27	0.21	0.22	-	0.05	0.28	0.03	
Millennial Lit	O	40	1.06	0.90	1.05	+	0.05	1.24	0.38	
Millennial Lit*	V	49	1.43	1.28	1.40	+	0.06	1.66	0.61	
Millrock Res*	O	2139	0.13	0.09	0.11	-	0.01	0.23	0.06	
Millrock Res	V	2370	0.18	0.13	0.14	-	0.03	0.32	0.08	
Milner Con Srv	V	40	0.11	0.11	0.11	unch	0.00	0.20	0.02	
Minaurum Gold	V	453	0.68	0.58	0.59	unch	0.00	0.85	0.22	
Minaurum Gold*	O	615	0.51	0.43	0.44	+	0.01	0.67	0.16	
Minco Silver*	O	40	0.37	0.35	0.35	-	0.01	0.63	0.14	
Minco Silver	T	108	0.50	0.48	0.48	+	0.01	0.84	0.20	
Minera Alamos*	O	891	0.54	0.49	0.51	+	0.01	0.60	0.11	
Minera Alamos	V	1376	0.70	0.66	0.66	-	0.03	0.78	0.17	
Minera IRL*	O	71	0.14	0.12	0.12	-	0.02	0.18	0.06	
Minera IRL	C	269	0.18	0.14	0.18	+	0.01	0.24	0.05	
Mineral Mtn*	O	64	0.24	0.21	0.22	+	0.00	0.43	0.12	
Mineral Mtn	V	1345	0.33	0.28	0.30	-	0.01	0.53	0.16	
Minerallite*	O	1932	0.00	0.00	0.00	-	0.00	0.00	0.00	
Mineworx Tech	V	745	0.06	0.06	0.06	unch	0.00	0.20	0.06	
Mineworx Tech*	O	68	0.05	0.04	0.05	+	0.00	0.16	0.04	
Minifocus Expl	V	91	0.08	0.00	0.08	+	0.01	0.09	0.02	
Minifocus Expl*	O	1	0.05	0.05	0.05	-	0.01	5.00	0.01	
Mining Global*	O	1190	0.00	0.00	0.00	unch	0.00	0.00	0.00	
Minnova Corp	V	22	0.41	0.00	0.38	-	0.05	0.60	0.05	
Minsud Res	V	75	0.08	0.06	0.06	unch	0.00	0.15	0.01	
Mirasol Res	V	720	0.49	0.43	0.48	+	0.03	0.62	0.29	
Mirador River	C	852	0.25	0.22	0.22	+	0.01	0.35	0.02	
Mikango Res	V	34	0.11	0.11	0.11	unch	0.00	0.16	0.05	
ML Gold*	O	1	0.07	0.00	0.07	-	0.01	0.16	0.06	
ML Gold Corp	V	71	0.10	0.10	0.10	unch	0.00	0.18	0.08	
Mojave Gold	C	945	0.45	0.27	0.39	+	0.11	0.45	0.03	
Monarca Mtns	O	283	0.11	0.09	0.11	+	0.02	0.14	0.01	
Monarca Mtns*	V	341	0.16	0.14	0.15	+	0.02	0.19	0.02	
Monarch Gold	T	2052	0.51	0.47	0.48	+	0.01	0.59	0.11	
Monarch Gold*	O	746	0.40	0.35	0.37	+	0.01	0.45	0.07	
Moneta Porcup*	O	557	0.12	0.11	0.12	-	0.00	0.16	0.04	
Moneta Porcup	T	1178	0.16	0.15	0.15	-	0.01	0.22	0.06	
Monitor Vent*	O	1	0.13	0.00	0.13	+	0.01	0.33	0.08	
Monitor Vent	V	3	0.18	0.00	0.18	unch	0.00	0.45	0.12	
Montego Res	C	40	0.01	0.00	0.01	unch	0.00	0.06	0.01	
Monterey Min	C	942	0.07	0.06	0.07	unch	0.00	0.10	0.02	
Monterey Mgt&E*	O	9	0.14	0.14	0.14	unch	0.00	0.17	0.02	
Monterey Mgt&E	V	38	0.17	0.15	0.15	-	0.02	0.20	0.01	
Monument Mng	V	368	0.10	0.08	0.08	-	0.01	0.12	0.04	
Monument Mng*	O	6	0.07	0.07	0.07	+	0.00	0.09	0.02	
Morien Res*	O	50	0.11	0.11	0.11	+	0.01	0.50	0.06	
Morien Res	V	194	0.16	0.14	0.16	+	0.02	0.65	0.08	
Mosaic	N	17410	19.29	17.30	18.31	+	0.21	22.50	6.50	
Mountain Boy	V	84	0.07	0.06	0.07	+	0.03	0.69	0.14	
Mountain Boy*	O	205	0.34	0.28	0.32	+	0.01	0.52	0.09	
Mountain Prov	O	6	0.32	0.00	0.31	-	0.01	0.86	0.17	
Mountain Prov*	T	296	0.42	0.41	0.41	-	0.03	1.44	0.25	
Mundoro Cap*	O	20	0.11	0.11	0.11	unch	0.00	0.14	0.06	
Mundoro Cap	V	185	0.16	0.16	0.16	+	0.01	0.21	0.09	
Murchison Min	V	8	0.10	0.10	0.10	unch	0.00	0.18	0.04	
Musgrave Min*	O	11	0.42	0.39	0.42	+	0.03	0.60	0.32	

N-O

NA Frac Sand*	O	72043	0.01	0.00	0.00	-	0.00	0.03	0.00
NACOD Int	N	57	19.13	18.03	18.36	+	0.41	66.40	17.95
Namibia Crit	V	187	0.26	0.23	0.23	-	0.02	0.37	0.08
Namibia Crit*	O	239	0.20	0.14	0.17	-	0.01	0.29	0.06
Napier Vent	V	17	0.07	0.07	0.07	unch	0.00	0.19	0.04
Natural Res Pt*	N	34	12.31	11.54	12.04	-	0.21	27.70	8.50
Nautilus Mtns*	O	1173	0.00	0.00	0.00	+	0.00	0.03	0.00
Navis Res Corp*	O	7	3.15	0.00	2.17	+	0.44	3.44	0.92
Navy Res	V	121	0.48	0.41	0.47	+	0.06	0.48	0.12
Neo Lithium	V	5367	1.23	0.70	1.08	+	0.40	1.23	0.38
Nemetals*	O	35	0.16	0.12	0.12	-	0.17	0.40	0.08
Network Expl*	O	92	0.20	0.17	0.17	-	0.02	0.35	0.06
Network Expl	V	145	0.27	0.23	0.23	-	0.03	0.41	0.08
Nevada Canyon*	O	128	0.12	0.08	0.12	+	0.02	0.40	0.03
Nevada Copper	T	2568	0.13	0.12	0.12	unch	0.00	0.38	0.12
Nevada Energy*	O	230	0.09	0.06	0.08	+	0.02	0.11	0.02
Nevada Energy	V	255	0.12	0.08	0.12	+	0.05	0.16	0.04
Nevada Expl *	O	140	0.14	0.12	0.12	-	0.00	0.30	0.08
Nevada Expl	V	312	0.19	0.16	0.17	+	0.01	0.39	0.12
Nevada Sunrise*	O	789	0.20	0.15	0.19	+	0.00	0.25	0.01
Nevada Sunrise	V	157	0.26	0.22	0.26	+	0.02	0.31	0.01
Nevada Zinc	V	84	0.07	0.00	0.07	+	0.01	0.08	0.03
Nevado Res	V	40	0.12	0.12	0.12	-	0.02	0.15	0.07
New Age Metals	V	1451	0.07	0.06	0.06	unch	0.00	0.15	0.03
New Age Metals*	O	449	0.05	0.04	0.05	-	0.00	0.11	0.02
New Carolin Gld	O	463	0.04	0.04	0.04	+	0.01	0.11	0.02
New Carolin Gld	V	699	0.06	0.05	0.06	unch	0.00	0.15	0.03
New Destiny Mng	V	165	0.05	0.00	0.05	unch	0.00	0.09	0.02
New Destiny Mng*	O	150	0.04	0.04	0.04	unch	0.00	0.04	0.03
New Dimen Res	V	681	0.09	0.08	0.08	unch	0.00	0.10	0.02
New Dimen Res*	O	19	0.06	0.06	0.06	-	0.01	0.08	0.02
New Egm Min*	O	2	0.01	0.01	0.01	unch	0.00	0.10	0.01
New Energy Met*	O	0	0.00	0.00	0.05	unch	0.00	0.20	0.00
New Energy Met	V	2347	0.09	0.00	0.07	+	0.01	0.15	0.02
New Found Gold	V	2268	2.68	1.96	2.68	+	0.72	2.68	1.24
New Gold*	X	23750	1.81	1.62	1.74	+	0.08	2.06	0.39
New Gold	T	10236	2.41	2.18	2.31	+	0.08	2.71	0.55
New Guinea Gld*	O	201	0.00	0.00	0.00	-	0.00	0.13	0.00
New Jersey Mng*	O	632	0.35	0.28	0.32	+	0.04	0.39	0.12
New Millin Iron*	O	325	0.06	0.06	0.06	+	0.01	0.06	0.03
New Millin Iron	T	2339	0.09	0.08	0.08	unch	0.00	0.09	0.04
New Oroperu	V	40	2.39	2.10	2.27	-	0.17	2.95	0.45
New Pac Metals*	O	510	5.20	4.65	4.91	+	0.16	5.60	1.68
New Pac Metals	T	537	6.96	6.21	6.54	+	0.16	7.23	2.34
New Placer*	O	193	0.26	0.19	0.21	-	0.06	0.80	0.05
New Placer	V	2695	0.36	0.27	0.28	-	0.06	0.95	0.25
New Stratus	V	770	0.35	0.28	0.33	+	0.05	0.35	0.03
New Tech Min*	O	11	0.10	0.09	0.09	-	0.02	0.10	0.10
New Tech Min	C	404	0.13	0.11	0.12	+	0.01	0.15	0.02
New World Res*	O	3	1.54	1.54	1.54	unch	0.00	1.90	0.36
Newworld Gold	V	282	0.75	0.68	0.71	unch	0.00	0.92	0.14
Newworld Gold*	O	35	0.51	0.51	0.51	unch	0.00	0.67	0.09
Nexcor Gold	C	1777	0.13	0.10	0.11	-	0.02	0.19	0.03
Nexmac Res	V	20	0.06	0.06	0.06	unch	0.00	0.09	0.03
Newmont Corp	T	383	85.28	82.07	82.98	+	0.84	96.45	44.00
Newmont Corp*	N	27811	64.10	61.31	62.29	+	0.87	72.22	33.00
Newport Expl	V	5	0.43	0.00	0.40	unch	0.00	0.45	0.25
Newport Gold*	O	1510	0.00	0.00	0.00	+	0.00	0.01	0.00
NewRange Gold*	O	546	0.09	0.08	0.09	unch	0.00	0.31	0.05
NewRange Gold	V	1121	0.13	0.12	0.12	-	0.01	0.43	0.07
Nexa Resources	T	9	7.83	6.78	7.71	+	0.10	14.33	3.94
Nexa Resources*	N	419	6.00	5.13	5.94	+	0.26	10.98	2.57
Nexco Res	C	760	0.14	0.13	0.13	unch	0.00	0.16	0.06
Nexgen Energy	T	1874	2.37	2.18	2.27	-	0.02	2.64	0.76
Nexgen Energy*	X	1852	1.78	1.64	1.71	-	0.01	2.04	0.50
NextSource Mat	T	12053	0.06	0.03	0.05	+	0.02	0.07	0.02
Nexus Gold	O	408	0.06	0.05	0.06	+	0.00	0.12	0.01
Nexus Gold	V	3856	0.09	0.07	0.08	-	0.01	0.14	0.03
NGEX Minerals	V	268	0.69	0.61	0.65	+	0.05	0.69	0.24
NGEX Minerals*	O	33	0.50	0.47	0.50	+	0.15	0.41	0.16
Nickel Creek	T	639	0.19	0.15	0.16	+	0.01	0.22	0.02
Nickel Creek*	O	404	0.14	0.11	0.12	+	0.01	0.16	0.02
Nickel North	V	232	0.05	0.04	0.04	+	0.01	0.10	0.01
Nicola Mng Inc	V	986	0.16	0.13	0.13	+	0.02	0.21	0.04
Nicola Mng Inc*	O	42	0.12	0.00	0.10	-	0.02	0.14	0.04
Nighthawk Gold*	O	51	1.05	0.95	0.97	-	0.02	2.20	0.50
Nighthawk Gold	T	308	1.41	1.26	1.29	-	0.04	2.90	0.97
Niobay Metals	V	171	0.80	0.72	0.75	-	0.04	0.81	0.20
Niobium Inc	V	4	0.16	0.00	0.16	+	0.02	0.28	0.10
Niocom Dev	T	330	0.83	0.77	0.78	-	0.03	1.02	0.53
Niocom Dev*	O	553	0.84	0.58	0.58	-	0.02	0.59	0.27
Nippon Dragon	V	471	0.07	0.05	0.06	+	0.01	0.09	0.01
Nippon Dragon*	O	126	0.04	0.03	0.04	+	0.00	0.06	0.01
Noble Met*	O	5180	0.00	0.00	0.00	unch	0.00	0.00	0.00
Noble Met	V	74	0.01	0.01	0.01	unch	0.00	0.03	0.01
Noble Mineral*	O	101	0.08	0.00	0.05	-	0.01	0.10	0.02
Noble Mineral	V	275	0.09	0.00	0.08	+	0.02	0.14	0.03
Noram Vent	V	4159	0.23	0.18	0.18	-	0.02	0.27	0.05
Noram Vent*	O	155	0.17	0.13	0.15	-	0.01	0.17	0.04
Noranda Alum*	O	1	0.02	0.01	0.01	+	0.00	0.05	0.00
Noront Nickel*	O	408	24.31	23.50	23.95	-	0.19	35.52	18.62
Noront Res*	O	5	0.13	0.13	0.13	+	0.01	0.17	0.08
Noront Res	V	599	0.18	0.16	0.18	+	0.01	0.23	0.12
Norra Metals	V	2549	0.18	0.12	0.18	+	0.06	0.18	0.02
Norse Gold	V	650	0.17	0.00	0.10	+	0.01	0.17	0.02
Norseman Silv	V	232	0.26	0.21	0.23	+	0.03	0.30	0.04
Norsemont Cap*	O	1599	1.85	1.13	1.26	-	0.44	2.21	0.20
Norsemont Cap	C	2808	2.30	1.50	1.65	-	0.61	2.79	0.25
Nortec Mtns*	O	1	0.02	0.02	0.02	-	0.00	0.03	0.00
Nortec Mtns	V	377	0.04	0.02	0.03	-	0.01	0.05	0.01
North Am Nickl	V	414	0.19	0.14	0.17	-	0.02	0.30	0.06
North Am Nickl*	O	288	0.18	0.10	0.12	-	0.02	0.33	0.02
North Arrow Mn*	O	18	0.04	0.04	0.04	unch	0.00	0.06	0.02
North Arrow Mn	V	111	0.07	0.06	0.07	-	0.01	0.08	0.03
North Bay Res *	O	2840	0.00	0.00	0.00	unch	0.00	0.00	0.00
North Peak Res	O	34	0.40	0.00	0.39	-	0.01	3.00	0.14

(100s)										Week										12-month			(100s)										Week										12-month		
Stock	Exc	Volume	High	Low	Last	Change	High	Low		Stock	Exc	Volume	High	Low	Last	Change	High	Low		Stock	Exc	Volume	High	Low	Last	Change	High	Low		Stock	Exc	Volume	High	Low	Last	Change	High	Low							
Strategic Res*	O	0	0.00	0.00	0.14	unch	0.00	0.39	0.14	Timberline Res	V	648	0.35	0.26	0.35	+	0.09	0.35	0.06		United Res Hdg*	O	235	0.03	0.02	0.02	-	0.02	0.07	0.02		Walker River	V	830	0.13	0.11	0.12	+	0.01	0.19	0.06				
Stria Lithium	V	30	0.02	0.02	0.02	unch	0.00	0.03	0.01	Timberline Res*	O	1024	0.27	0.18	0.26	+	0.07	0.27	0.02		United States A*	X	4580	0.32	0.22	0.26	-	0.04	0.59	0.22		Wallbridge Mng*	O	1509	0.88	0.70	0.76	-	0.05	1.01	0.23				
Strikepoint Gd*	V	1240	0.22	0.19	0.20	-	0.01	0.27	0.02	Timb Res	O	605	0.15	0.11	0.15	+	0.01	0.15	0.01		United States S*	N	47468	7.73	7.25	7.65	+	0.54	14.52	4.54		Wallbridge Mng	T	4662	1.08	1.01	1.02	-	0.02	1.35	0.32				
Strongbow Expl	V	418	0.11	0.08	0.08	-	0.01	0.21	0.01	Tinika Res	V	1134	0.20	0.18	0.19	unch	0.00	0.25	0.07		Universal Cop*	O	0	0.00	0.00	0.07	unch	0.00	0.07	0.01		Warrior Gold*	O	631	0.11	0.09	0.10	+	0.01	0.11	0.03				
Strongbow Expl*	O	25	0.07	0.00	0.07	-	0.02	0.10	0.01	Tintina Mines	V	1231	0.05	0.03	0.04	+	0.01	0.07	0.02		Universal Cop	V	324	0.09	0.07	0.09	+	0.02	0.21	0.03		Warrior Gold	V	2923	0.14	0.12	0.13	+	0.02	0.15	0.03				
Stroud Res	V	70	0.73	0.66	0.66	-	0.02	0.83	0.15	Tisdale Res*	O	0	0.00	0.00	0.04	unch	0.00	0.60	0.37		Universal Vent	V	340	2.60	2.17	2.27	-	0.24	5.05	2.07		Waseco Res	V	247	0.04	0.03	0.03	unch	0.00	0.07	0.02				
Stuhini Explor*	O	7	0.44	0.43	0.43	-	0.01	0.72	0.29	Tisdale Res	V	27	0.63	0.00	0.63	+	0.56	1.50	0.35		Upper Canyon	V	5	0.15	0.15	0.15	unch	0.00	0.50	0.05		Wealth Mnrls*	O	46	0.08	0.06	0.07	-	0.00	0.29	0.05				
Stuhini Explor	V	49	0.58	0.47	0.53	+	0.03	0.94	0.12	Titan Mining*	T	141	0.70	0.64	0.69	-	0.02	0.75	0.14		Ur-Energy	X	2035	0.52	0.45	0.46	-	0.04	0.72	0.27		Wealth Mnrls	V	78	0.10	0.09	0.09	-	0.01	0.38	0.07				
Sullidien Mng	T	219	0.07	0.00	0.07	unch	0.00	0.10	0.03	Titanium Corp	V	145	0.30	0.27	0.29	+	0.02	0.78	0.24		Ursgold Bay Rs	V	8649	0.54	0.41	0.50	+	0.03	0.72	0.05		Wescan Goldflds	V	21	0.08	0.00	0.08	unch	0.00	0.12	0.03				
Summa Silver*	O	901	1.29	0.95	1.06	+	0.14	2.20	0.89	TMAC Resource*	O	48	0.97	0.91	0.91	-	0.03	3.43	0.31		Uranium Energy*	X	4946	1.05	0.97	0.98	-	0.02	1.29	0.35		Wescome Gold	T	1714	13.19	12.18	12.66	+	0.33	15.00	5.85				
Summa Silver	C	3058	1.64	1.24	1.39	+	0.17	3.50	0.09	TMAC Resources	T	87	1.33	1.19	1.19	-	0.11	4.70	0.44		Uranium Hunter*	O	359	0.06	0.04	0.05	-	0.01	3.00	0.01		Wescome Gold*	O	188	9.85	9.14	9.66	+	0.37	11.37	4.10				
Sun Metals	V	3893	0.17	0.12	0.12	-	0.06	0.25	0.06	TNR Gold	V	1014	0.04	0.03	0.03	-	0.01	0.07	0.02		Uranium Res*	D	247396	5.62	1.52	4.42	+	2.93	9.25	0.25		West High Yld	V	121	0.30	0.19	0.20	-	0.05	0.30	0.07				
Sun Peak Metal	V	312	1.19	1.02	1.15	+	0.18	1.34	0.80	Tocvan Venture	C	528	0.48	0.43	0.44	-	0.01	0.50	0.10		Uranium Roylty	V	113	1.18	1.14	1.14	-	0.01	1.32	0.80		West Red Lake	C	2180	0.13	0.11	0.13	unch	0.00	0.21	0.04				
Suncor Energy	T	40998	17.52	14.81	15.95	-	0.68	45.12	14.02	TomaGold	V	1309	0.09	0.08	0.08	-	0.01	0.10	0.06		Uranium Roylty*	O	56	0.89	0.86	0.86	unch	0.00	0.99	0.56		West Red Lake*	O	242	0.10	0.08	0.10	+	0.01	0.17	0.02				
Suncor Energy*	N	51121	13.09	11.11	12.01	-	0.42	34.56	9.61	Tombstone Expl*	O	6	2.35	2.10	2.35	+	0.18	3.09	0.50		Uravan Mnrls*	O	60	0.02	0.02	0.02	unch	0.00	0.03	0.00		West Vault	V	165	1.80	1.65	1.71	+	0.01	1.94	0.45				
Superior Gold*	O	134	0.57	0.54	0.55	+	0.01	1.15	0.26	Tonagov Res*	O	951	0.40	0.38	0.39	+	0.01	0.55	0.15		Uravan Mnrls	V	26	0.03	0.03	0.02	unch	-	0.01	0.03	0.01		Western Areas*	O	106	1.60	1.48	1.51	-	0.06	2.17	1.15			
Superior Gold	V	2003	0.77	0.68	0.73	unch	0.00	1.53	0.33	Tonopah Div Mg*	O	1	0.10	0.10	0.10	-	0.34	0.50	0.00		UrbanGold Min	V	510	0.30	0.25	0.30	+	0.03	0.45	0.05		Western Atlas	V	495	0.15	0.13	0.14	-	0.02	0.19	0.04				
Supernova Met*	O	20	0.21	0.21	0.21	unch	0.00	0.24	0.03	Torex Gold*	O	135	15.33	13.81	14.54	+	0.03	19.45	6.19		USCorp*	O	1060	0.00	0.00	0.00	-	0.00	0.00	0.00		Western Atlas*	O	115	0.12	0.00	0.12	+	0.02	0.14	0.04				
Supernova Met	V	96	0.18	0.16	0.16	-	0.01	0.32	0.02	Torex Gold	T	1448	20.15	18.72	19.33	-	0.10	25.52	8.79		Usha Res	V	83	0.26	0.19	0.22	-	0.01	0.27	0.10		Western Copper*	T	223	1.67	1.48	1.48	-	0.14	1.95	0.44				
Surge Copper*	O	253	0.19	0.11	0.19	+	0.09	0.12	0.03	Torq Resources*	O	14	0.49	0.49	0.49	-	0.01	0.59	0.21		Val-d'Or Mlg	V	18	0.13	0.00	0.11	unch	0.00	0.20	0.03		Western Copper*	X	867	1.25	1.10	1.10	-	0.11	1.53	0.31				
Surge Copper	V	4742	0.34	0.16	0.34	+	0.20	0.34	0.02	Torq Resources	V	361	0.66	0.58	0.60	-	0.05	0.79	0.27		Val-d'Or Mlg*	O	43	0.10	0.08	0.10	-	0.01	0.15	0.04		Western Mag	V	376	0.14	0.13	0.14	+	0.01	0.24	0.09				
Surge Explor	V	34	0.08	0.08	0.08	+	0.01	0.55	0.05	Tower Res*	O	5	0.07	0.07	0.07	-	0.01	0.10	0.01		Vale*	N	139302	10.92	10.29	10.39	-	0.35	13.67	6.49		Western Mag*	O	218	0.10	0.09	0.10	+	0.01	0.20	0.07				
Sutter Gold*	O	500	0.00	0.00	0.00	-	0.00	0.05	0.00	Tower Res	V	156	0.11	0.10	0.10	-	0.01	0.14	0.02		Valley High Mlg*	O	108205	0.02	0.00	0.01	+	0.00	0.01	0.00		Western Polash	T	53	0.19	0.17	0.18	unch	0.00	0.39	0.13				
Syrah Res*	O	320	0.35	0.26	0.32	+	0.02	0.52	0.09	Transatlantic*	O	1	0.03	0.03	0.03	unch	0.00	0.03	0.01		ValeOre Metals	O	212	0.23	0.20	0.20	-	0.02	0.31	0.09		Western Res*	O	1	0.13	0.12	0.12	-	0.01	0.24	0.11				
										Transatlantic	V	278	0.06	0.00	0.05	-	0.01	0.07	0.02		ValOre Metals	V	535	0.30	0.28	0.28	-	0.02	0.41	0.14		Western Troy C*	O	0	0.10	0.10	0.10	unch	0.00	0.10	0.10				
										Transition Met	V	103	0.17	0.16	0.16	-	0.01	0.24	0.11		Valorem Res	C	364	0.19	0.14	0.19	+	0.04	0.64	0.06		Western Troy C	V	35	0.17	0.00	0.16	-	0.01	0.33	0.05				
										Transition Met*	O	1	0.12	0.12	0.12	unch	0.00	0.18	0.08		Valterra Res*	O	93	0.08	0.08	0.08	-	0.00	0.21	0.03		Western U&V	C	34	0.80	0.75	0.77	-	0.01	1.10	0.25				
										Valterra Metal	T	526	1.45	1.31	1.35	unch	0.00	1.98	0.45		Valterra Res	V	131	0.12	0.10	0.12	+	0.02	0.25	0.03		Western U&V*	O	33	0.63	0.55	0.58	+	0.01	0.84	0.15				
										Treasury Metal*	O	139	1.05	0.98	1.01	+	0.01	1.40	0.90		Vanadian Enrgy	V	74	0.07	0.07	0.07	unch	0.00	0.08	0.01		Westhaven Gold	V	873	1.24	1.10	1.15	+	0.05	1.25	0.35				
										Trecoara Res*	N	295	6.70	5.97	6.59	+																													



WHAT
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