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## Dear Reader,

*La Belle Province* is living a decisive period in its mining history. Having spent months throughout 2023 battling against the biggest wildfire in its history, Québec braces to supply the world's needs for future-facing commodities, while remaining a global hub for gold production. Indeed, despite the ongoing lithium "frenzy" in James Bay and elsewhere, the backbone of the industry remains gold production, with key producers, developers, and explorers leveraging a high gold price to advance their operations. At the federal and provincial levels, efforts are made toward making the province a North American leader in supplying the metals that will support the global green transition. Holding leading spots in Canada for gold, copper, graphite, and nickel shipment – and now lithium, and with development projects covering 30 commodities, what happens in Québec impacts the global mining world.

Yet, the road to reclaiming the top spots of the Fraser Institute index will remain rocky. Eager to feed the metals-starved capital market, Québec miners are having to dig south of the 49th parallel for resources, in areas in which the population is not as used to mining as their northern fellows. Coupled with incentives to boost the whole battery vehicle value chain in the province, Québec is the scene of a balancing act between the reality of capital markets and ambitious climate-related targets to decarbonize society.

To navigate those defining times, Québécois miners can count on a unique home advantage: one of the most globally recognized networks of engineers, consultancies, equipment providers, and innovators. The global need for increased mineral supply suggests that the know-how of Québécois engineers, geologists, drillers, air carriers, and AI-driven innovators, will have an ever-so-important role in making the green transition a success.

The time is now for Québec. Amid the wildfires, GBR's research team traveled throughout the province interviewing close to 80 industry leaders to present the most comprehensive analysis for stakeholders involved in the global mining value chain. We would like to thank these institutional representatives, executives, and leaders for their insights, along with the Ministry of Natural Resources and Forests, our association partners at QMA, AEMQ, and "THE Event". We hope you enjoy the read.



**Alfonso Tejerina**  
Director and General Manager  
GBR



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"The role of Québec will be extremely important in the energy transition as a major supplier of critical minerals to the North American vehicle industry."

**Jean-François Béland**  
Vice President  
Ressources Québec

# INTRODUCTION TO QUÉBEC

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# The Québec Mining Scene

## A jurisdiction fit to take on the energy transition

Image courtesy of Eldorado Gold

In the course of their history, some provinces will find themselves at turning points. Almost as if a complex web of circumstances (and elements across the periodic table) brought them to a particular moment that would make the balance tilt in their favor, providing generational-type opportunities. This is where Québec's mining industry stands in 2023. Québec is, of course, a regular contender for the top spots amongst the Fraser Institute's Annual Survey of Mining Companies, and the province remains one of the most attractive for investments in the world. In light of the green transition and the growing need for minerals, Québec's mining industry can step up to another level. NAICS, the Canadian statistics agency, stated: "Québec employs 10% of Canada's mining workforce (around 24,000 people) and looking at 2024, the employment outlook for the mining sector is stronger than for all industries in the province."

What has changed in recent months is a perfect storm of foreign investment (at levels unseen for a decade), strong commodity prices, and – perhaps one of the main stories going forward – public incentives to develop the industry's critical minerals value chain. First released in 2020, the "Québec Plan for the Development of Critical and Strategic Minerals" really started making strides in recent months, and along with the updated federal "Canadian Critical Minerals Strategy" of December 2022, shows government intent at both federal and provincial levels to make Québec a leader in sustainable, forward-looking mining. As put by Maité Blanchette Vézina, Minister of Natural Resources and Forests, Québec Government: "Québec is in the right place at the right time. Our

action plans are clear, and we are a key player on the international scene. People want ethical mining, and that is what Québec offers."

### All eyes on La Belle Province

Besides their food and French heritage, Québécois people take pride in their resilience. The latter has been tested since May 2023, when the biggest fire in the province's history broke out in the North. The blaze, which covered an area of more than a million hectares – the size of Jamaica – even forced the residents of Radisson in James Bay to evacuate in late July. Over the summer, the fires halted operations at Windfall, the JV between Gold Fields and Osisko Mining, along with Brunswick's exploration progress in James Bay, and even Hecla's Casa Berardi mine. Exogenous events impact, but do not change long-term dynamics.

Short-term setbacks have not deterred foreign investment into the industry. A predictable legal framework, an advantageous tax system, a skilled workforce, and a robust infrastructure all make for an enticing investment case for Québec. Amongst a flurry of Australian juniors, producers, and investors, 2022/2023 also marked the arrival of South African giant Gold Fields in the Abitibi, along with a US\$455 million investment by the Swiss Glencore into its Raglan mine. As put by Claude Bélanger, COO Copper North America and Philippines at Glencore: "We are making significant investments in our copper assets in Québec, and we look forward to increasing our recycling capabilities there."

The Québécois authorities and players however do not succumb to the delusions of grandeur. The province's exceptional resource potential must benefit the circular economy and the province, first. In an increasingly tense geopolitical environment, the government – in an apparent crackdown on Chinese foreign investment, particularly directed towards Canada's prized lithium – suggested in 2022 bolstering the Investment Canada Act to essentially allow ministers to block critical minerals investment if they believe such deals threaten national security. Pathing the way for foreign investment at Ressources Québec, Jean-François Béland, vice president, gave his take on the global climate: "Due to geopolitical reasons such as the Russia-Ukraine conflict and political turmoil with China, local and foreign companies are rather looking towards securing a supply chain in North America and Québec."

### Taking on the world's needs

Québec is ideally placed to serve the growing electrification needs of North America. Among Canadian provinces, Québec ranked first for iron, nickel, and graphite, second for gold, and third for copper, for a total of over C\$10 billion in shipment value. The province develops over 30 commodities, making it the most diverse resource base in Canada. Looking down the line, from the ground to the vehicle, Québec's role is better understood through concrete figures: "In terms of production capacity, it is forecasted that by 2030, 20 to 40% of EVs produced in North America will have a piece provided by Québec," according to Kirsty Liddicoat, COO of Northern Graphite – the only producer of graphite in North America through its Lac des Iles mine in Québec. "The province has shown itself to have the political will to champion the success of the energy transition," she continued.

The province has the resources to feed critical minerals-starved global markets, and 2023 is the year where all stakeholders determined a vision for Québec to be the epicenter of a whole value chain. Rather than relying on an extraction-based model, recent months saw critical minerals recycling, processing, and batter-making plants proposed. The reshoring of downstream capabilities was highlighted notably by General Motors' new US\$600 million electric-vehicle battery component plant financing in Bécancour, Québec. Desjardin, one of Canada's largest financial institutions, assisted with Sayona's North American Lithium operations and has a key responsibility in supporting the best upstream and downstream strategic projects. As shared by Carlo De Girolamo, managing director, head of private capital advisory and restructuring: "Québec is the epicenter of the future of the battery metals supply chain for the world."

This vision was shared by Louis-Nicolas Boulanger, partner at McCarthy Tétrault (and who acted as Sayona's legal council): "There is a strong desire to push North America as one of the main contributors of critical minerals in the

world, and issues such as political conflict with China and the Russia-Ukraine situation creates an extremely beneficial environment for Québec to contribute on the world-wide scene."

The ongoing lithium frenzy has, momentarily, relegated many of the province's exciting gold stories to the second row. With gold having stabilized at almost US\$2,000/oz since April 2023, players trading the king of commodities have felt let down by the market. Amidst decreasing gold production, the industry will likely be headed towards a virtuous cycle for investment, particularly given macroeconomic fundamentals. In conversations with developers such as Troilus Gold, O3 Mining, and Osisko Mining, the harsh outlook of a weakening dollar-centered economy justified the case for stronger gold demand, and the role of Québec in feeding the market – the Abitibi Greenstone Belt still contains over 300 million oz/Au including production, measured and indicated reserves and resources. José Vizquerra, president and CEO of O3 Mining shared: "Banks have limited amounts of cash, so the only way to push the economy is by reducing interest rates, and every time that happens, gold prices go up. Interest rates will come down. The question is when?"

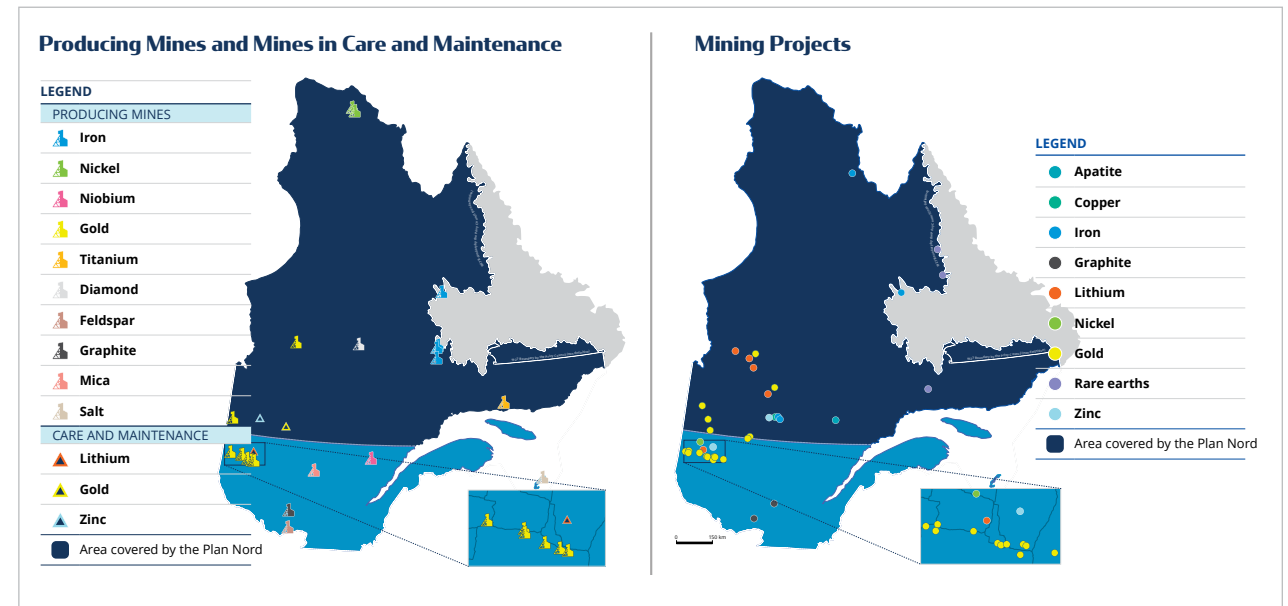
### Going South

Québec's mining story has, for almost 150 years, been written in the North. To this day, more than 90% of mining investments are made in the Nord-du-Québec, Abitibi-Témiscamingue, and Côte-Nord regions. Namely, the "La Grande Alliance" partnership between industries and the Cree First Nations, and the historical Plan Nord, all initiatives have contributed to the socio-economic prosperity of some of the most remote areas in the world north of the 49th parallel. As put by David Christie, president and CEO of Orford Mining, who holds multi-commodity exploration projects in Nunavik, above the 55th parallel: "Québec institutions tell you whom to contact as far as the local communities

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are concerned. They settled the land claims for the First Nations and Cree Nations a long time ago, and this significantly helped development in the Québec North.”

Yet, one of the main stories unfolding in Québec is the push south for the province’s potential economically viable critical minerals deposits and huge graphite reserves. In other words, the coming months are likely to resemble a balancing act, whereby the industry will try to convey the message – to a population that is not used to mining – that a claim is not a mine, and that one cannot choose where Mother Earth distributes minerals under its crust. As put by Fasken’s Frank Mariage, partner: “The green transition will come at a price, and we cannot pick and choose where deposits form. Sometimes they will be south of the 49th Parallel. There still is a NIMBY (not in my backyard) dilemma.”

Disputed land claims and uncertainty regarding protected areas were some of the main reasons behind Québec’s stumble from the fifth best

» Québec is the epicenter of the future of the battery metals supply chain for the world, and we have a front-row seat in seeing that transition unfold.



**Carlo De Girolamo,**  
Head of Private Capital Advisory and Restructuring,  
Desjardins

jurisdiction to the eighth in the Fraser Institute in 2022. The adoption of the Québec plan to develop critical minerals attracted juniors to the south of the province, leading to a drastic increase in claims in the area. Claims in the southern areas of Estrie, Bas Saint-Laurent, and Gaspésie increased by 100% in two years, particularly related to copper, zinc, gold, and graphite projects. Dialogue, to reassure all stakeholders – the local population, shareholders, and potential investors – will be the watchword as we head into 2024. In recent months, many local coalitions formed in Québec, exploring the idea of southern Québec

becoming “an open cast mine”. Yet, as reminded by Josée Méthot, president and CEO of the Québec Mining Association (QMA): “Last year, there were over 250,000 active claims in Québec, and less than 1% had real exploration works with heavy machinery.”

More mining will have to unfold for the green transition to happen to realize the ambitious net-zero targets in the coming decades. Society is left with a choice of leaving the job to neighboring countries, whose sustainable, social, and environmental practices are questionable, or to give itself tools to mine responsibly at home. The Québec Mineral Exploration Association assists early-stage developers in their quest for minerals, and chairman Olivier Grondin argued that there is no better place than Québec to find tomorrow’s resources: “Everybody wants electrification, and we need to convey that sustainable mining for critical minerals is the biggest part of this transition, and one of the best places in the world to do it is in Québec.”

The time is now for Québec. Across the mining value chain, across the periodic table, all elements align and point towards the province’s growing importance on the global mining scene. The following pages will analyze what makes Québec’s mining jurisdiction unique: from hosting the largest players in the gold space, boasting a new capital for lithium in North America, and critical minerals endowment, while paying special attention to the backbone of the industry, the service providers and equipment firms racking their brains to bolster innovation. In the words of Josée Méthot: “The mining industry is in a great spot now. Québec is in a great position to become a mining jurisdiction capable of producing the necessary minerals for decarbonization.” ■

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## Maité Blanchette Vézina

Minister of Natural Resources  
and Forests  
**GOVERNMENT OF QUÉBEC**

» If companies meet our high standards, we welcome foreign investment [...] People want ethical mining, and that is what Québec offers.

**Can you present the vision of the Québec government to support growth in the mining industry?**

Québec has well-documented potential to provide minerals for the battery sector as part of energy transition. We want to continue and even improve our excellent social responsibility and enhance it through better dialogue with local communities. My ministry emphasizes the importance of preserving our high operating standards: This is key to be in the vanguard of attracting foreign investment. These high standards and our best practices make us an attractive player and become a competitive asset in a global context.

To succeed, we have a development plan for critical and strategic minerals, as well as a research and development and recycling program to add value to the chain and create a circular economy for extracting and existing minerals. We think that for the next generations and to get better social acceptability, going through recycling and a circular economy is necessary. We’re working hard with our economic arm, Investissement Québec, to keep our business attractive and encourage companies to transform minerals here in Québec. We have strategic levers (Sidex, Ressources Québec, SOQUEM) that are unique to Québec.

**What makes Québec unique for mining investment?**

Our hallmark is socially acceptable practices, which we continue to improve. Our ESG standards are the best and our governance is stable. For many years now, we have had a geospatial database that provides free access to data to help our partners in their research. This helps save time and secure investments. Our economic levers are independent of government and are not influenced by the application of aid programs. We maintain a free-market economic environment. There is no interference, only a shared vision.

If companies meet our high standards, we welcome foreign investment. This capital is needed to carry out mining projects that will ensure the success of the energy transition, and that translate into a winning value chain for Québec society. We need local spin-offs, integrated into primary and secondary processing, with maximum circularity. National security is also key. We need to secure our resources for Québec society. The pandemic has prompted us to think about the supply chain; we have everything we need to make batteries, among other things, but now we need to capitalize on our resources and integrate them into Québec’s value chain to secure them.

**What impact will the proposed French language law have on foreign mining companies?**

We are the only French-speaking province in North America, and we need to protect this heritage. We continue to work with foreign companies to help them, but we ask them to work in French. We see our French heritage as a strength and as a comparative advantage, not as a constraint.

**How does the Ministry assist relations between mining companies and First Nations?**

The Société du Plan Nord works a lot with the First Nations, especially the Cree. It encourages dialogue. We have a whole government approval process for relations with Cree. The COMEX exercise is a government analysis done for the First Nations. Companies want to encourage hiring locally and involve the communities, and we facilitate that. We encourage mining companies to enter BSAs (benefit-sharing agreements) and finance the negotiation of these agreements.

**In terms of infrastructure and permitting processes, what actions have you taken recently to support the industry?**

We invested hundreds of millions of dollars on the southern portion of the Billy Diamond Highway – which runs north to Radisson – to secure this strategic route. This access is one of the keys to our success.

We are working on an office that will reduce permitting times by 40% for critical mineral development projects that meet our ESG criteria. Accelerating the authorization process is a priority for the government of Québec but accelerating does not mean lowering the criteria. This means more collaboration with other departments to achieve more efficiency in processing analyses for permitting.

**Do you have a final message for GBR’s audience?**

I am fortunate to be in a ministry at the heart of the world’s major decarbonization issues. Québec is in the right place at the right time. Our action plans are clear, and we are a key player on the international scene. People want ethical mining, and that is what Québec offers. ■



»» **We hope to gain the population's confidence and create the general understanding that it is better to mine here in Québec than in other lesser responsible jurisdictions.** ««

## Josée Méthot

President and CEO  
**QUÉBEC MINING ASSOCIATION (QMA/AMQ)**

### What are some of the key topics of discussion for the AMQ and its members so far in 2023?

There have been a lot of discussions in the media in Québec about the rise in the number of claims, and the increase in exploration projects in the southern part of Québec and north of the St-Lawrence River in regions where the population is unaccustomed to mining activities.

Since the last provincial elections, local groups opposed to mining in the south have asked our new Minister to modify the Mining Act and to change the claiming process. In response, the government has decided to launch public consultations on mining activities in Québec. Increasing the social acceptability of mining development in Québec being a priority of our Association and we welcomed the initiative.

We also took part in the consultation process organized by the Minister of Natural Resources and Forests, which will lead to changes – or not – to the Mining Act. The shift in exploration is leading to a lot of pressure right now.

### What does the passing of the new Federal budget mean for critical minerals exploration?

Both governments, provincial and federal, have put the accent on increasing the budget available to help the development of critical minerals. Measures to help and incentivize investments include R&D funds and the inclusion of a refundable tax credit equal to 30% of the cost of investments in new machinery and equipment to extract, treat or recycle the critical minerals that play an essential role in clean technology supply chains: lithium, cobalt, nickel, graphite, copper, and the rare earth minerals. Tax credits are higher if you explore for critical minerals.

But we must remember that critical minerals are not what has been paying the most in Québec. If you look at our economic benefits study, most benefits of our industry in Québec come from iron ore and gold. Looking at the map of projects in development, it is about 50% gold and iron ore, and 50% critical minerals.

### How can Québec remain an attractive province for mining investment in the near term?

From now on, the legal operating permit is no longer sufficient; social license, acquired through social acceptability resulting from dialogue,

better knowledge of stakeholders and consideration of concerns is necessary.

Even though municipalities and opposition parties are asking for a moratorium on claims, which would be very damaging for the future of our industry in Québec, the Québec government continues to promote Québec as an important player in the development of critical minerals and the EV battery value chain. The government is working hard to attract companies to come and process minerals in Québec and produce EV battery components. This has generated a lot of interest from investors and that is positive for our industry. We still do not know the conclusion of the consultations and what will be its impact on investors' interest for Québec, but we are hopeful because our government is working for more mining development.

Investments have increased in the last two years in exploration, mine construction, and development, and I hope the current talks will not hinder that positive cycle.

### What will be the main objectives for the QMA in 2023?

Making sure that we continue to develop great mines and that our industry is recognized as a big contributor to the decarbonation of the economy. We will work hard to better communicate our best practices and legal obligations. We hope to gain the population's confidence and create the general understanding that it is better to mine here in Québec than in other lesser responsible jurisdictions.

Remember that history shows that mining projects can develop with respect for local populations. Mining companies wish to remain partners of the communities in which they operate, and this is why they are in favour of this reconciliation of uses and actions are taken daily to adhere to it.

The mining companies active in Québec have made a commitment to the population to do things right, to be respectful and responsible. Combined with access to the territory, in compliance with the rules and processes in force, Québec is on the right track to remain among the best mining jurisdictions in the world. ■



»» **Everybody wants electrification, and we need to convey that sustainable mining for critical minerals is the biggest part of this transition, and one of the best places in the world to do it is in Québec.** ««

## Olivier Grondin

Chairman  
**QUÉBEC MINERAL EXPLORATION ASSOCIATION (QMEA/AEMQ)**

### In which areas has AEMQ been the busiest over the past year, and what is on the agenda for the association in 2023?

AEMQ's mission is to continue to promote sustainable and responsible exploration of mineral resources in Québec. We currently have a fantastic opportunity in the mineral industry with the energy transition as electrification will need more minerals such as copper, nickel, cobalt, graphite, and lithium, and Québec is one of the best places in the world to find these minerals.

We are used to mineral exploration and mining in the Abitibi and northern Québec, but some minerals required for electrification are located more in the southern part of the province. The population in southern Québec is not used to the mineral exploration industry and thus education is necessary to convey information about how exploration works and operates, and this is one of the main challenges at the moment.

AEMQ's role is especially important to explain facts about exploration and mining and how the mineral industry works to mitigate or eliminate their concerns. We need to get the message over that a claim is not a

mine. Due to the lack of knowledge of how the industry works, people are scared of these claims popping up on the maps, but an extremely small proportion of these claims are being worked on and it is less than 1% that will see impactful exploration, such as diamond drilling or trenching.

### What is at the top of AEMQ's agenda in the exploration space in Québec?

Again, it is ensuring that access to territory is available to the industry since large areas need to be explored to find the tiny anomaly that can become a mineral deposit. To do that, we need to make sure exploration is done the right way. AEMQ's mission is to promote responsible exploration and one of the tools the association put forward to achieve this is the ECOLOGO certification. This ensures that explorers, in whichever commodity, use the best practices while doing their field activities and it is all documented and independently auditable by UL Canada. The ECOLOGO certification can be reassuring to communities when companies move into areas that are less used to mineral exploration and this tool can be well leveraged in southern Québec.

### What are the benefits of exploring in Québec compared to other mature mining jurisdictions?

Québec is still a top 10 jurisdiction in the Fraser Institute ranking and is a prime destination for mineral exploration. Geologically, the province has potential for many commodities, including gold, base metals, and the critical minerals that North America and the Western world want to mine more locally. Québec also has access to hydro-power, which contributes to more sustainable mining and producing green products, and there are significant tax benefits and incentives in place for the mining of critical minerals required for electrification.

We are seeing a significant number of foreign explorers being attracted to Québec as a mining destination. We believe that outside funding spent in Québec is great for the industry as our locally-owned small businesses can provide services to these companies coming from abroad. AEMQ can accompany foreign companies to ensure they understand how our regulations work and that the job is done well. Money flow from abroad is welcomed and is the testimony of the good environmental and geological potential we have.

### How do you view deal-making and M&A in Québec in 2023?

A few years ago, companies were lacking funds due to cryptocurrencies and cannabis, but today, the money to fund juniors is lacking despite all the incentives being there. Juniors are currently hurting as there is limited funding available. This will force people to adapt to their reality and may allow for consolidation and the best projects to emerge.

### What are AEMQ's main objectives for the remainder of 2023 and looking into 2024?

AEMQ remains focused on looking after our members' interests. Communication is key in this environment where it is tough to control the narrative and we need to get our message through to the people, our regulators, and even the media. Everybody wants electrification, and we need to convey that sustainable mining for critical minerals is the biggest part of this transition, and one of the best places in the world to do it is in Québec. ■



"Our economic levers are independent of government and are not influenced by the application of aid programs. We maintain a free-market economic environment. There is no interference, only a shared vision."

**Maité Blanchette Vézina,**  
Minister of Natural Resources and Forests,  
Government of Québec

# FINANCIAL AND REGULATORY ENVIRONMENT

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# The Québec Investment Scene

**The province remains a top investment destination due to its institutional and fiscal incentives**

Image courtesy of Ressources Québec

During the opening speech of “THE Event” in Québec City in June 2023, in front of a crowd gathering Canada’s top mining executives, former Yamana Gold CEO Peter Maronne highlighted the capital markets’ role as the backbone of the mining industry in the country, citing Montreal as among the great financial hubs for the country. Highlighting the need for consolidation in the industry, he left with a word of wisdom for future mining investors, advising: “The way to create value is the balance between an open mind and critical due diligence.”

Québec’s welcoming investment environment, supportive institutions, and predictable regulatory landscape make the province an ideal candidate to receive capital. And with vast amounts of cash coming into the industry, the timing is ripe. Investment expenditures in Québec grew by 52% y-o-y in 2021 to US\$4,293 million. Preliminary expenditures in 2022 and investment intentions in 2023 showcase that these figures should be sustained, making the case for investment amounts unmatched for over a decade.

## Québec’s gold and lithium M&A picture

Mining M&A saw its strongest run in a decade in Q4 2022, and many high-value deals have sustained that trend so far into 2023, and 2024 is expected to herald yet further consolidations. In an environment dictated by lower grades, higher costs, and inflationary impacts, any consolidation will appear like a smart move. And indeed in 2022/2023, Québec witnessed that gold’s role as a hedge against inflation – coupled with a decade of underinvestment in new supply for the commodity – has renewed interest in gold M&As. On the critical minerals side, the green transition incentive for M&As.

The acquisition of Yamana Gold by Agnico Eagle Mines (overseen by Marrone) and Pan American Silver in a cash-for-shares transaction valued at US\$4.8 billion was one of the largest deals of 2022. More recently, the US\$19 billion acquisition of Newcrest by Newmont created the world’s biggest gold firm. In the gold space, the need for new resources should naturally lead to more partnerships, at least according to Pascal Hamelin, president and CEO of Abcourt Mines, a future gold producer in Matagami: “Majors have assets, but they are mining them, they are not doing much exploration. Eventually, these will phase out, so more exploration is needed, and growing for producers means talking to developers and juniors with assets close to their mills.”

Take a good look at Québec’s Eeyou Istchee James Bay territory, because it will more likely than not be unrecognizable in the next years. The battery-demand boom will supercharge M&A ac-

tivity in the lithium space, and James Bay already witnessed a deal that could give birth to the third-largest lithium producer globally by 2027: the US\$10.6 billion Allkem-Livent merger. That transaction will create a leading global lithium chemicals producer, with combined revenues of approximately US\$1.9 billion and an adjusted EBITDA of approximately US\$1.2 billion. This should pave the way for more deal-making in James Bay’s crowded lithium scene, where explorers virtually step over each other’s claims. After a record run on lithium prices last year, and with the correction in 2023 which rebalanced valuations, balance sheets across the major producers are solid and there is cash to deploy for growth through acquisitions.

## Competing for capital allocation

CEOs of precious metals, critical minerals, and base metals companies all compete intensively for capital allocation. In Québec, the wind seems however to have turned in favor of the “future-facing” commodities. With over US\$400 billion in assets under management, Desjardins is deeply involved in supporting Québec’s mining industry, and the majority of the province’s producers and explorers are likely clients of the bank. Maciej Pach, managing director, sees pools of capital being unlocked for future-facing commodities in the near term: “I think we will see good quality projects get financed but with more hype and interest around “future-facing” commodities.”

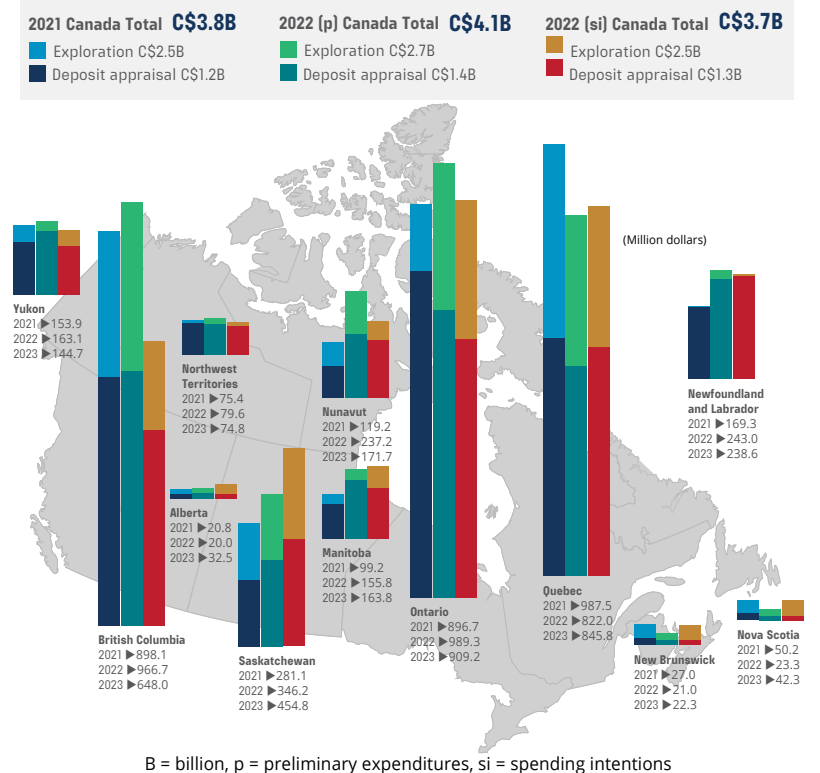
This forecast was seconded by Pach’s colleague and fellow managing director, Carlo De Girolamo, who pointed towards lithium as the commodity of choice for investors in Québec in the years ahead. With projects advanced beyond permitting and engineering, and with the province now holding the final pieces of the puzzle to create a complete battery value chain in North America (as shown by the arrival of two giants in Bécancour in recent months: GM and BASF), opportunities will be plenty: “We need to connect the chain between the electric vehicles and the rock. The ‘in-between’ is where capital investment opportunities lie in 2023-2024,” De Girolamo assessed.

On the other hand, Québec’s gold players have felt frustrated with the direction capital has taken in the past year. The inflationary environment, the cyclical nature of mining, and growing interest in battery metals prompted by the green transition seem to be the origin of their malaise, despite gold prices reaching high marks for most of 2023. Matthew Horner, president and CEO of Maple Gold Mines, shared his thoughts on the financing space: “The financial environment is currently extremely tough and even the best projects are having a hard time attracting investment. The inflationary environment has put a lot of pressure on investors with debt obligations.”

But geological facts and market fundamentals suggest the future will be shinier for gold players. With gold reserves

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## Expenditures, by province and territory, 2021-2023



Source: Natural Resources Canada, Institut de la statistique du Québec

CEO

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**Desjardins Business**



»»  
**Not only do we play a role in putting in place the industrial policy for critical mineral projects, but we also have the capacity to finance them in order to accelerate the de-risking and advancement of these projects.**  
 ««

## Jean-François Béland

Vice President  
**RESSOURCES QUÉBEC**

### What mining trends have you noticed so far in 2023?

The traditional mining sector is moving forward at a normal pace, but we have seen a boom in the battery materials and rare earth sectors, and everything related to critical minerals is moving rapidly. There are serious exploration projects on the map and many projects are moving quite fast with financing, environmental improvement, etc. We are seeing the shift of the economy away from a traditional mining sector to a more critical minerals mining sector, and copper is currently one of the top minerals for the new economy, as it was for the industrial economy. Ressources Québec currently has more focus on the critical mineral space, but we are not leaving aside the traditional mining sector. For example, under Ressources Québec, we have SOQUEM, which historically has been focused on traditional mining such as gold and copper, and discovered six major mines.

### Are you seeing increasing interest in Québec from foreign companies?

We are seeing increasingly more foreign companies move into Québec, with many doing so with local partners such as Osisko. Due to geopolitical reasons such as the Russia-Ukraine con-

flict and political turmoil with China, local and foreign companies are looking towards securing a supply chain in North America, and Québec is one of the top mining jurisdictions in the world. Québec has always been a close friend, ally and partner of the USA. Canada is also able to deliver cleaner products as we can make clean batteries with clean energy.

### How is Ressources Québec incentivizing and contributing to the new economic era of critical minerals that we are seeing in Québec?

Ressources Québec has a central role to play from an industrial policy point of view on the critical minerals, the battery strategy, and on new green energy.

We are in the middle of all these discussions and are the catalysts between private interests, the state public policy, and different investors. Not only do we play a role in putting in place the industrial policy for critical mineral projects, but we also have the capacity to finance them in order to accelerate the de-risking and advancement of these projects. We understand that financing is critical, but good policy and regulation will help projects move more rapidly, whereafter it will be easier to get the financing.

### Will Québec want to compete with Ontario as a hub for foreign investment?

Québec is growing as a mining investment hub, but rather than competing with Ontario, it is more of a complementary partnership between neighbors to attract foreign investment. There is complementarity between our different economic sectors; for example, looking at the automotive industry, Ontario has large OEMs that can source their materials for battery manufacturing from Québec. Significant investment is going into Québec not only due to the province's great mineral endowment but also the availability of clean energy through hydropower and clear policies from the government. We are proud of what we are doing at the battery level and Québec is being positioned in the battery field as one of the major hubs of the new economy of electrical vehicles.

### How important is Québec for the success of the green transition worldwide?

The role of Québec will be extremely important in the energy transition as a major supplier of critical minerals to the North American vehicle industry. In terms of production capacity, it is forecasted that by 2030, 20 to 40% of EVs produced in North America will have a piece provided by Québec, based on the 2019 production capacity. The province is extremely well-positioned to make a significant contribution to the green transition.

### What will be Ressources Québec's priorities in 2023 and moving into 2024?

Ressources Québec will remain focused on executing our mission of being a gateway for companies seeking to invest in Québec's energy and natural resources sectors. We will continue to support companies at every stage of their natural resource exploration, development, and processing projects. We also will continue to work and deliver on the battery strategy, the critical mineral strategy, and green energy. Ultimately, Ressources Québec will continue to be the center of excellence for political decision makers of Québec when it relates to industrial policy in the natural resources and energy sector. ■



## Paul Carmel

President and CEO  
**SIDEX**

»»  
**The majority of our portfolio is gold-related companies, but when a lithium, nickel, or copper player comes in, we give it special attention as we would like to increase the critical mineral component of our portfolio.**  
 ««

### Can you give an update on what has kept SIDEX busy over the past six months?

In terms of financing and deal flow, the markets have remained unusually slow over the past two to three years. The reason for this might just be cyclical and market malaise as, during this period, commodity prices have been good. There is an increased focus on lithium, but gold and base metal financing has been slower than usual.

Québec's mining industry is in tune with the energy transition, and SIDEX plays into this as well with having a great focus on battery metals, especially copper and nickel. The majority of our portfolio is gold-related companies, but when a lithium, nickel, or copper player comes in, we give it special attention as we would like to increase the critical mineral component of our portfolio.

### Are you expecting more activity in the lithium space in the coming years?

Interest in lithium in Québec continues to increase and we are not only seeing pure-play lithium companies positioning themselves in the province, but many of the companies in SIDEX's portfolio, which has originally been focused on other commodities, are now also starting to look at lithium opportunities on their properties, and these companies' stocks have moved up significantly because of that. Québec is extremely well endowed with lithium projects, and there are some serious plays, such as Patriot Battery Metals' world-class deposit and Nemaska Lithium's project starting to take shape and making significant headway.

It is encouraging to see increasingly more offtake agreements and the downstream of the value chain getting involved in projects to secure future supply. Off-takes are an extremely important step as it they are crucial to structuring financing, and the companies that are struggling to find offtakes will probably struggle to finance their projects. Australia is the biggest lithium producer in the world, and it is great to see many Australian companies positioning themselves in Québec for lithium exploration, bringing along their high level of expertise. Patriot Battery Metals and Sayona are great examples.

### Can you speak of SIDEX's investment criteria today?

Before ESG was a buzzword, we already had a requirement that when we invest in a company it needs to have a strong sustainability policy in place, and if not, we give them six months to put it in place. We have been focused on sustainability for over a decade and today continue to refine our investment criteria in terms of ESG. SIDEX is also very much interested in innovative approaches to exploration.

### What is your outlook for the junior financing environment in Québec moving into 2024?

I believe junior financing will pick up, especially as we are already seeing more M&A activity and deal flow. Maybe we are seeing a slow exploration financing environment due to the amount of M&A and joint venture deals currently being done that they have just not gotten to the phase of actually deploying funds to the exploration itself. Mining has an insatiable appetite for capital, and I believe exploration financing will come back shortly, maybe even stronger than it has ever been. Québec has a globally unique ecosystem to finance mining companies, and many funds and institutions have support and buy-in from the government, dedicated to financing mining activities at every level of the cycle, such as SIDEX, which is focused on grassroots exploration.

### How is SIDEX going to continue to help early-stage exploration companies in Québec?

I have every reason to believe that things are going to pick up, especially concerning lithium. We are increasingly seeing more companies coming to Québec looking for lithium, but SIDEX has over a dozen companies in our portfolio that are realizing that they have lithium prospects and which they are now starting to activate. We have recently seen one of the companies in our portfolio, Midland Exploration, and Rio Tinto signed a significant deal worth CAD\$64.5 million over the ground in Québec's James Bay lithium region, and with Rio Tinto footing the bill for a significant amount of the drilling, they might be knocking on our door. There is also still a lot of activity in the gold space, and with increased demand for critical minerals, next year will be busy for SIDEX. ■



FC



CD



MP

## François Carrier, Carlo De Girolamo and Maciej Pach

FC: MD, Head of Investment Banking and Co-Head of Capital Markets  
 CD: MD, Head of Private Capital Advisory and Restructuring  
 MP: MD, Investment Banking, Head of Global Mineral Resources and Mining  
**DESJARDINS**

### What is Desjardins' presence in the mining space in Québec?

FC: Québec is the province where we have the largest footprint. Not only do we get the benefit of deploying our strategy at the local level, but we also have direct relationships with many participants in the mining ecosystem. There is a high likelihood that companies engaged in mining exploration and production as well as their employees are Desjardins members and clients.

MP: Our mandate is to deliver the resources of Desjardins and to back reputable management teams who can unlock stakeholder value through the discovery, development, and operation of strategic and critical mineral assets responsibly and sustainably. We match our capabilities with clients' needs and serve groups that need access to capital markets to de-risk projects in jurisdictions with strong rule of law and track record of human rights. Québec is a de facto area of interest for us: looking at our mandate and Québec's mining ecosystem, there is a natural overlap with our capabilities:

we are focused on future-facing assets and projects that will have a net-positive economic and social impact on the province.

### Can you discuss an exciting future-facing project you are currently working on?

CD: One of our most important relationships is with Sayona Mining. The company is North America's first major producer of lithium, and is a prime example of the development of the battery supply chain in Québec and North America. We were closely aligned with them early on, advising them on the acquisitions and financing of North American Lithium and the Moblan project. We have also played prominent roles in multiple equity capital markets transactions that raised more than US\$500 million of equity capital for investment in Sayona's Québec assets.

### In which commodity-led project do you see capital flowing in 2023?

MP: The "green" and "future-facing" materials are getting more eyes on

them than ever, and this new interest has opened up new pools of capital. I think we will see good quality projects get financed but with more hype and interest around "future-facing" commodities.

CD: Lithium is going to be very interesting as there are projects advanced beyond permitting and engineering and ready for construction as far as investment is concerned. We also need to connect the chain between the electric vehicles and the rock, there is a lot in between, and the 'in-between' is where capital investment opportunities lie in 2023-2024. Capital is not just equity, so I think we will see a lot of equity and equity-linked structures and debt from foreign and domestic federal governments, the provinces, strategies, and asset management funds.

### How attractive is Québec for mining investment in comparison with other North American jurisdictions?

MP: Québec is extremely attractive for investment. The framework is very transparent and is one of the few advanced "Tier 1" jurisdictions that are generally pro-mining. The province understands the importance of mining and is sitting on a significant opportunity to be a global hub for the future of de-carbonization and electrification of critical minerals.

Permitting is at the top of the list of concerns for mining firms. But Québec recognizes its leading position and we see the province as a leader in the evolution of the permitting process.

### How important is a robust ESG strategy to attract investment?

FC: We have left behind the days of greenifying perceptions and reached the next stages where the action is required from all of us. As a financial institution, we already apply the lens of ESG to financing opportunities. We have taken a strong stance in the industry and wish to facilitate the transition towards a green economy through our actions in the market.

### How will Desjardins continue to support mining firms in Québec?

CD: Québec is the epicenter of the future of the battery metals supply chain for the world, and we have a front-row seat in seeing that transition unfold. ■

» We are at a point in the economy where the Fed will have a hard time controlling inflation while keeping the economy in good shape. The devaluation of the dollar will probably be the crux of gold starting to take off.



Tim Clark, CEO, Fury Gold Mines

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down 40% from their peak, shrinking production, and declining grades, long-term supply-demand fundamentals appear in favor of the commodity. Osisko Mining's president and CEO Mathieu Savard explained: "Financing has been challenging since the beginning of 2022. 2023 was harder for gold and base metals than for critical minerals, which are clearly in favor. But it does not change the fact that global resources are depleting and not being replaced."

### Enviéd institutional support

Québec is a province where the institutions and miners speak the same language – at least most of the time. In 2020, Québec adopted the Plan for the Development of Critical and Strategic Minerals 2020-2025, and the province keeps updating the plan to ensure it remains relevant to tomorrow's mineral needs. The plan is in synergy with new government actions, such as the Québec strategy for the development of the battery industry, the 2030 Sustainable Mobility Policy, and the 2030 Plan for a Green Economy.

In a context of collaboration among all stakeholders in the province, the Québec government's divisions aimed at attracting investment to the province and financing early-stage and high-risk exploration activity are unique tools. SIDEX, Le Fonds de solidarité (FTQ), Caisse de dépôt et placement du Québec (CDPQ) and Investissement Québec are not just institutions, but shareholders. In Québec, odds are that any explorer investor presentation will have at least one of these institutions among their key shareholders, if not all of them.

Investments in Québec's exploration projects from institutions and private actors are on a significant growth trajectory, with over US\$990 million spent in 2021, an 85% increase from 2020, according to the latest study from the Institute of Statistics of Québec. Jean-François Béland, VP of Ressources Québec, explained the support of Québec's institutions in today's mining environment: "Ressources Québec has a central role to play from an industrial policy point of view on the critical minerals, the battery strategy, and on new green energy. We are in the middle of all these discussions and are the catalysts between private interests, the state public policy, and different investors."

### Incentives to lead investment attractiveness

Québec's fiscal and tax regime remains a key incentive to encourage mineral exploration in the province. In 2022, a federal proposition was passed regarding a "super flow-

through" 30% critical mineral exploration tax credit (CMETC) to increase investment in 15 minerals. The taxation system's contribution to accelerating the mining industry was remarked on by many new Australian firms coming to explore the province's lithium and copper potential. Steven Turner, managing director of Pivotal Metals, an ASX-listed firm that in 2020 picked up the Midrim & Laforce exploration package in the Belleterre-Angliers Greenstone Belt (BAGB), explained: "Having a critical metal portfolio in Québec gives you the highest uplift you can get through your flow-through as the market sees it as two to one – every dollar you raise from investors effectively translates to two dollars you can invest in the ground."

Overall, what makes Québec's financial ecosystem so strong is the fact that one investor dollar seems to go further in *La Belle Province* than in other jurisdictions. In the competition to attract capital in the context of the green transition and an ever-so-capital-intensive industry, Québec keeps on adding to its already top-tier incentives. Toronto-based Troilus Gold, currently advancing the Troilus project towards production, recognized this advantage: "The Québec government actively participates in our ventures and provides financial incentives for exploration and development in the region. For every dollar spent, we receive a 36-cent refund, maximizing the effectiveness of our investment and accelerating project advancement" detailed CEO and director Justin Reid. ■

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ET



TB

## Elian Terner and Thomas Bachand

ET: Managing Director and Head, Global Mining & Metals Investment Banking

TB: Managing Director, Investment Banking  
**NATIONAL BANK**

### Can you give an overview of the work National Bank does in the mining space?

ET: National Bank offers a full suite of services to the mining and metals space, including lending, project financing, equity underwriting, and M&A services. Over the past year, we were involved in several transactions where we dealt with companies whose sole assets and management are outside of Canada. National Bank is one of the most aggressive lenders to the mining sector today in Canada. Our mining practices are based in three main offices – Toronto, Vancouver, and Montreal.

### Can you give a specific example of the work National Bank is doing with a mining client in Québec?

TB: The Osisko family of companies is one where we have had long-standing relationships across their whole family of businesses representing different projects in the province. National Bank recently advised on a three-way M&A transaction for Nomad Royalty, a company whose head office and management are based in Québec, but their assets are essentially outside of Québec. An example of a company we are working with which has its management and asset in Québec would be Champion Iron. National Bank also advised and underwrote the CAD\$1.3 billion financing for Nemaska Lithium a few years ago.

### How does National Bank select the firms that the bank will partner with?

ET: What is important to us is the management team, the project or idea that needs to be financed, and then the commodity. ESG is always part of the equation, and sometimes one or more of the ESG factors will be more important than the other, but it is a case-by-case situation. National Bank sees mining as a global business and we want to be part of the whole spectrum of the mining lifecycle, from exploration to development to construction, to production. What differentiates our practice is that we are not only targeting the most mature or the most junior companies in the sector, but we can add value across the chain.

### What makes Québec an attractive jurisdiction for investment?

TB: Québec has a long mining history which has fostered significant management quality in the region. There is huge untapped resource potential and the variety and quality of the deposits in the province is significant. There are also various complementary financial players in the province, including governmental institutions, which are actively supporting companies to move their projects forward.

### What is your outlook for M&A and deal-making particularly in the junior mining space?

TB: M&A and consolidation are inevitable in the junior space as many explorers are operating in the same commodity area coupled with limited sources of capital. It also takes one set of skills to explore and develop a project and a completely different set of skills to build and operate a mine. Increasingly more companies are also looking to vertically integrate and not only want to do the extraction of the mineral, but also want to add value through downstream processing, and this will lead to more M&A. With huge forecasted demands for critical minerals, I believe major players who are not playing in these commodity spaces already will start to turn their attention to these metals.

### Where do you see the biggest opportunities for investment in the mining industry?

ET: There is currently significant attention on battery metals, especially copper and nickel, which are commodities National Bank has been involved in for many years, and so we will continue to focus on these. We also focus on the trend of consolidation and earlier in 2023, we advised B2Gold on acquiring their first project in Canada under a corporate vehicle called Sabina Gold, and this was a well-received transaction by the market. National Bank has been involved with some of the most significant equity transactions to date. For example, we were the lead book runner recently on the sell-down by Orion of part of their Capstone Block, which was worth approximately CAD\$330 million, representing about 7% of Capstone, and that transaction, as of today, is the largest transaction on the TSX this year across all industries. National Bank will continue to offer a full suite of services to the mining industry. ■



## David Garofalo

CEO  
**GOLD ROYALTY CORP**

### Can you give an update on Gold Royalty Corp's activities over the past year?

Gold Royalty Corp continues to expand quickly and now has over 220 royalties in our portfolio, with a heavy concentration in Québec, Ontario, and Nevada. In 2021 we absorbed three of our peer companies – Abitibi Royalties, Golden Valley Mine & Royalties, and Ely Gold Royalties – and we have also been successful in acquiring third-party royalties as we did on IAMGOLD's Côté Gold project and Barrick and Newmont's Granite Creek project. The latter acquisition made Nevada Gold Mines (Barrick and Newmont's joint venture in Nevada) our second-biggest shareholder at 7% ownership. We also continue to generate royalties organically and have a small team in Val d'Or, Québec, and another in Reno, Nevada, who stake exploration claims around existing mines and deposits and then farm the properties out and take royalties in return.

### Can you discuss Gold Royalty Corp's involvement at the Canadian Malartic Complex?

Gold Royalty Corp has significant royalty coverage at Agnico Eagle's Canadian

Malartic complex, initially on the open pit to a limited basis, but now also on the underground expansion of the Odyssey mine where we have 3% NSR royalty coverage on a significant portion of the resource. As Agnico Eagle continues to ramp up production from underground, our royalty will ramp up accordingly. It is encouraging that Agnico Eagle has consolidated ownership which will realize significant cost synergies as a result of its takeover of Yamana Gold's former stake.

### How will Gold Royalty Corp fare in 2023 and beyond?

The industry has to reinvest back into exploration and mine development out of existential necessity as reserves have declined dramatically and we are well positioned to provide the capital to do that. Most importantly, we already have over 220 royalties in our portfolio that are fully bought and paid for and, by an analyst consensus estimate, we are poised to deliver over 60% compounded annual growth in revenue through the end of this decade. With little overhead, we are an excellent position to consider dividend increases over that period from the current 2% yield in our stock. ■



## David Cole

President and CEO  
**EMX ROYALTY CORP**

### Can you elaborate on EMX Royalty's portfolio, particularly in Québec?

EMX Royalty is a substantial global mineral rights holder, and we touch over 4 million acres / 1.6 million hectares of mineral rights across 14 countries including the US, Europe, Asia, Australia, North America, and South America, as well as one asset in Africa. In Eastern Canada, our portfolio is predominantly early-stage assets, and we believe that Québec is a great place to invest. The support for mining from the government and communities in the province is unsurpassed. Québec is also strongly incentivizing strategic mineral exploration.

### How is the royalty generation business model useful in the context of inflation?

The benefit of royalties is that once we sell an asset, the ever-increasing costs that it takes to advance it, whether it be exploration costs, development costs, or capex costs, is on the counterparty's shoulders and not on that of the royalty holder. This creates the concept of optionality, which is impor-

tant for the royalty company and its shareholders

Royalties are phenomenal financial instruments due to their embedded optionality.

### What are the key factors EMX Royalty considers before investing?

First and foremost is geological prospectiveness. Secondly, we will look at the probability of selling the asset, as it is not that hard to acquire mineral properties, but the trick is to get those sold and turned into a profitable royalty.

### What will be the key drivers for the mining industry in 2023 and beyond?

The energy transition agenda is driving significant demand for battery metals, but the real fundamental increase in demand is the fact that people in the poverty class are moving up to the lower class, and people that are lower class are moving up to the middle class. Every time there is a step change in class, there is a huge increase in consumption. ■

# Consolidation, a given

## As new players and capital flow into Québec’s mining industry, key players forecast M&A activity



“The environment is undoubtedly favorable for deal-making in 2023. Gold is above US\$2,000/oz. We see financings getting done now, and this will likely increase.”

**Frank Mariage, Partner, Fasken**

“M&A and consolidation are inevitable in the junior space as many explorers are operating in the same commodity area coupled with limited sources of capital. Increasingly more companies are also looking to vertically integrate and not only want to do the extraction of the mineral, but also want to add value through downstream processing, and this will lead to more M&A.”

**Thomas Bachand, Managing Director, Investment Banking, National Bank**



“There is a trend towards consolidation in the junior space and M&A activity has been strong over the past 18 months. With inflation and current economic conditions, investors might not be deploying capital as happily as they have done over the past 18 months, but I am still hopeful that the incredible demand for critical minerals will be more than enough to support M&A activity.”

**Louis-Nicolas Boulanger, Partner - Business Law Group, McCarthy Tétrault**



“To overcome the market challenges, I believe consolidation among companies in James Bay is necessary. Some major shareholders and Québec institutions share this view, which is leading to recent mergers in the region.”

**Normand Champigny, CEO, Quebec Precious Metals**



“Today, a significant number of junior explorers are fighting for limited funding, and due to this difficult environment, I believe we will see increasingly more M&A. As demands are also increasing, majors want to secure reserves and are thus looking for consolidation opportunities and viable projects they can add to their portfolios.”

**Mario Drolet, President, Mi3**



# The Regulatory Landscape

## Ambitious targets require faster processes

Image by Leonid Andronov at Adobe Stock

In Québec, governments come and go, but pro-mining attitudes remain. Like its North American neighbors, Québec’s mining code and legal framework offer investors and miners a stable environment that is (almost) free of geopolitical fluctuations. But like its neighbors, that legal framework often leads to extended permitting guidelines, and evermore stringent environmental regulations, two factors that can constitute investment barriers. And with the US leading the drive to overcome China’s dominance in the critical minerals space, leaders in Canada’s mining industry have called for federal and provincial measures resembling the Inflation Reduction Act for the country to accelerate mine-building timelines. As said by Claude Bélanger, COO copper North America and Philippines at Glencore, who operates the Raglan Mine in Québec: “It takes 10 years to bring a mine into production. Permitting has become a moving target, and for investors, predictability is key. Without predictability in the permitting process, it is hard to assess the costs of a project.”

### Permitting challenges and growing uncertainties

The federal government hopes to unveil a plan by the end of 2023 to streamline permitting for mining projects as the US and its allies push to accelerate the production of critical minerals in North America. Indeed, timescales for mining projects are long, too long compared with North America’s Asian counterparts, and are reducing the ability of the sector to respond to supply shortages and price fluctuations. In short, the success of the green transition will demand on government’s ability to shorten permitting processes, while maintaining high standards. Frank Mariage, partner at mining law firm Fasken, said: “If we want to succeed in the energy transition and address national security issues (being less dependent on Chinese minerals), we are going to have to make decisions to fast-track projects.”

Québec’s stumble from the fifth to the eighth spot on the Fraser Institute’s 2022 Annual Survey of Mining Companies was mostly due to growing uncertainties around the legal system. Throughout the province, miners expressed dismay over the lack of clarity regarding protected areas (in James Bay, the Cree and authorities discussed a memorandum of understanding to ensure the creation of a system of protected areas that will cover 30% of Cree territory by 2030) and changing environmental regulations notably.

The near-term will be defined by the ability of both the federal and Québec government and miners to work jointly to reduce the decade needed between exploration and production. In other words, streamlining the process will be

key, and Québec is making strides in that direction for firms willing to step up their ESG standards. The Québec government is currently developing a special office that will reduce permitting times by 40% for critical mineral development projects that meet such criteria. These new initiatives could be the answer to meet the world’s growing need for minerals while respecting the ESG standards that make Québec a world-class mining jurisdiction. Josianne Beaudry, partner at Lavery, shared: “What we hear in the industry is the difficulty at the permitting level to bring a mine into production. What could simplify things would be to centralize that process, for entrepreneurs both within and outside Québec.”

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**ADDED VALUE,**

*Signed,*  
**Lavery**



RB



JB

## René Branchaud and Josianne Beaudry

RB: Partner  
JB: Partner  
**LAVERY**

### What were the main highlights for Lavery in 2023?

RB: We have been active in the industry for over 50 years, and we represent several firms active in Québec and internationally. Our focus in recent months has been the arrival of international companies that want to find lithium in Québec.

JB: A lot of Australian companies are actively looking for new projects in Québec, and we are assisting exploration companies in that space.

### How do you assist foreign companies coming to invest in Québec?

RB: These firms are interested in learning about the tax consequences of their investments. They want to understand the Mining Act. This legislation is similar to what is found in mature any jurisdiction, and it is part of their due diligence before deciding if they will acquire companies in Québec.

JB: Australia is a mature mining jurisdiction, and operators have very developed rules regarding ESG, health, and safety for instance. The other area of interest is regulations regarding privacy and data collection policies.

### How does ESG and the road towards net-zero impact the work of law firms like Lavery?

JB: We are deeply involved with exploration firms whose environmental aims are different. There has been a lot of evolution in expectations in Québec for the past decade: if you want to develop a mining project, you need a restoration and closure plan to bring back the site in a way that it does not hurt the environment. Depending on the size of the project, there will be public audiences. For small explorers starting work early on, they will contact us for best practices. Companies operating below the 49th parallel, are faced with a lack of information for the public, who do not understand that the impact on the environment is minimal at the exploration stage.

### How is the current lithium “frenzy” impacting Lavery’s work?

RB: We still see significant investment in gold. Take Midland Exploration; they signed a very significant deal with Barrick who will invest millions in Québec in the next years. But the interest in critical minerals is growing.

JB: There is certainly a growing interest in lithium. In Québec, the government has made clear its position that it wants to increase our role in the development of green batteries. The resources are there in Québec, we just need to find them and bring projects into production.

### What is your outlook on the current regulatory environment in Québec?

RB: The recent legislation on the French language will be burdensome for foreign companies that will have to draft some of their agreements in French. Litigation and procedures will be in French, so this will be complicated for Australians and other foreigners. I have not yet seen problematic cases, but some provisions that started applying on June 1st this year will not help, to say the least.

JB: What we hear in the industry is the difficulty at the permitting level to bring a mine into production. There are lots of steps to provide all the documentation. What could simplify things would be to centralize that process, for entrepreneurs both within and outside of Québec. Québec is not that bad compared with other jurisdictions North America, but there is always room for improvement to streamline the process.

### Are you forecasting a consolidation period among juniors?

RB: There will certainly be more consolidation going ahead. There have been talks of consolidation in the battery metals and lithium space particularly before the end of the year and going into 2024. This will facilitate financing, as right now we have 12-15 firms owning claims in the same area. This will lead to a robust M&A environment.

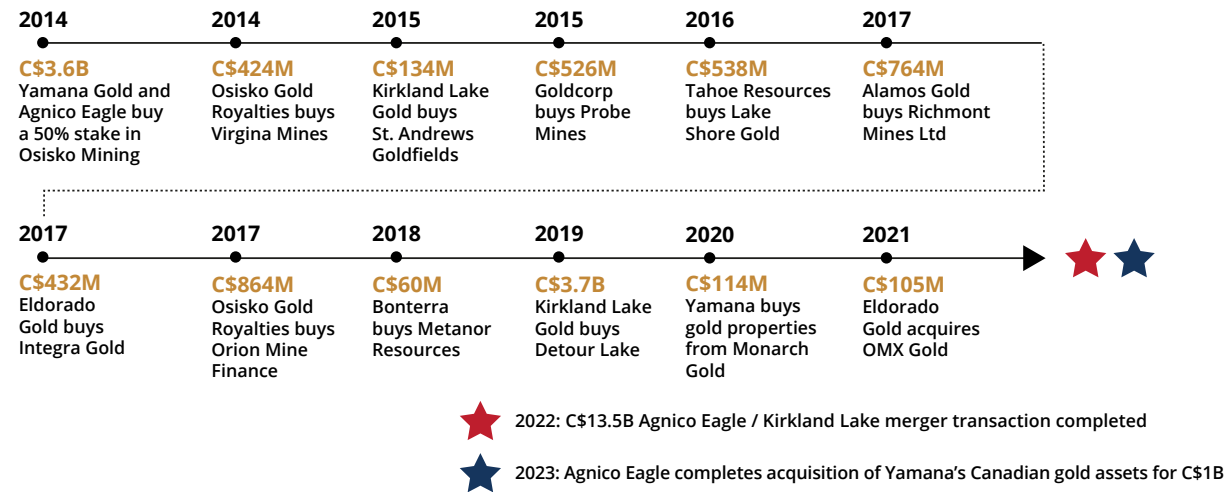
### What evolution have you seen in your practice in the past few years as it pertains to mining?

RB: We have seen more and more firms having royalties wanting to secure their rights. They are publishing hypothecs on mining claims, and this has been a significant increase in our mining practice. We have seen a significant increase in 2023 in lenders and investors who want to register and protect their rights immediately.

JB: As the industry got more sophisticated, we have seen a shift towards more title opinions. ■

## M&A Activity in the Abitibi

The Abitibi region has produced >C\$25B in M&A activity within the last decade.



Source: S&P Global Market Intelligence and Agnico Eagle

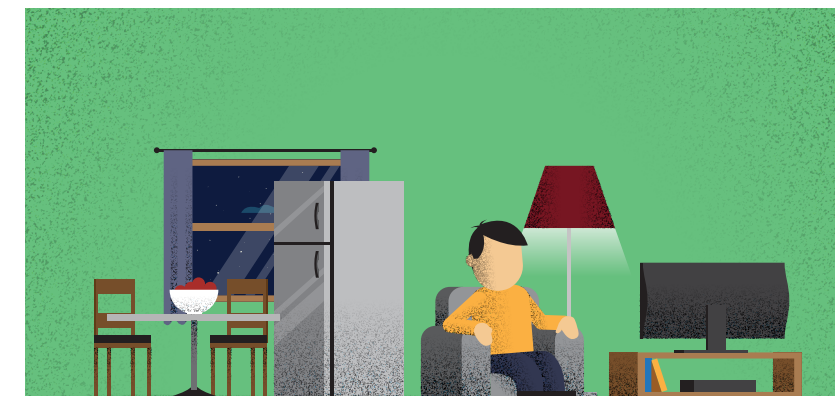
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### Preserving linguistic heritage

A year after the enactment of Québec's new French language law, it is safe to say that authorities have leaned towards helping with compliance, rather than firing fines. So far in 2023, legal industry experts have not noticed that Bill 96, "An Act respecting French, the official and common language of Québec", represented a threat to foreign investments in Québec, but recognize that with the unprecedented flow of foreign direct investment seen in late 2022/early 2023, the Bill could represent a challenge: "The recent legislation on the French language will be burdensome for foreign companies that will have to draft some of their agreements in French. This will be complicated for Australians and other foreigners" explained René Branchaud, partner at Lavery.

Could the language barrier for foreigners turn into an opportunity for Québec's mining industry? The province's linguistic heritage is certainly key to its touristic success, but for Maité Blanchette Vézina, Minister of Natural Resources and Forest, Québec Government, it could turn into an asset for the industry: "We are the only French-speaking province in North America. We continue to work with foreign companies to help them, but we ask them to work in French. We see our French heritage as a strength and as a comparative advantage, not as a constraint."

Québec remains one of the safest jurisdictions for miners to operate in, but is at a turning point. The direction that the federal and provincial governments will take to streamline permitting processes while keeping in consideration local stakeholders' demands will determine the province's ability to bring the commodities the world needs out of the ground, in time. ■



When you think about it, metals are everywhere. It's the same even when you don't think about it.



minesqc.com



»» Québec-based clients are concerned about the regulatory environment and delays. They also consider the capacity to finance their projects, the level of government support, and social acceptability issues. ««

## Frank Mariage

Partner  
FASKEN

### Fasken won the Natural Resources law firm of the Year in 2022. What was behind that success?

We are happy to be globally recognized as the top mining law firm in the world. We have professionals involved worldwide, we are boots-on-the-ground and follow our clients where they lead us. All the hype around critical minerals has been a key driver. There are still transactions made in gold, but critical minerals are driving the most interest these days.

### Have there been any shifts in your client base in Québec in the past year?

Juniors have been active recently: In the province of Québec, there has been a spike in exploration and development costs unseen since 2011, as exploration firms are the ones finding the deposits of tomorrow. Something new is working with Australian companies that are now investing in Canada to develop projects in the critical minerals space.

### To what extent does the green transition impact the work of law firms like Fasken?

ESG, net-zero, and green economy topics certainly affect investor confidence

and interest. From an exploration perspective, what is key is the community approach: How it is being handled, monitored, and dealt with? Juniors are the first on the ground. Big operators might end up paying for the mistakes made by juniors. The community approach is becoming a major factor, and it takes beyond legal services to understand it.

There is a disconnect between operators and communities. Bridging that gap will take a lot of work. The green transition will come at a price, and we cannot pick and choose where mineable deposits are located. Sometimes they will be south of the 49th Parallel. There still is a NIMBY (not in my backyard) dilemma. Some people still think that all exploration projects lead to mines: that is incorrect, not even one in 1,000 projects turns into a mine. It is about educating people, having discussions, and getting all stakeholders to the table.

### How do you assess the current regulatory environment in Québec?

Québec does not compare differently to other mature jurisdictions. The problem is still the burdensome regulatory process, meaning it still takes 12 to 15 years to take a mine into production. If

we want to succeed in the energy transition and address national security issues (being less dependent on Chinese minerals), we are going to have to make decisions to fast-track projects. This does not mean cutting corners: mining operators are responsible people. The environmental processes that are put in place are second to none. Mining is one of the most regulated industries in the world. Now it is a question of approving projects that are necessary for the green transition, for everyone's benefit. Overall, Québec-based clients are concerned about the regulatory environment and delays. They also consider the capacity to finance their projects, the level of government support, and social acceptability issues. First Nations issues are key, along with the communities nearby.

### Are we in a ripe environment for M&A and deal-making in the junior space?

The environment is undoubtedly favorable for deal-making in 2023. Gold is above US\$2,000/oz. If that were the case five years ago, it would be madness right now. We see financings getting done now, and this will likely increase. All the pricing about gold is not being reflected in gold projects. On the critical minerals front, I see more deals happening. We are also getting into the zone where M&As are becoming costly, which might put the brakes on a couple of things, but the amount and value of projects in that segment are still growing. Looking beyond juniors, the recently announced merger between Livent and Allkem is significant: by merging, they will become the third-largest lithium company in the world and the largest in Québec.

### What will be the growth strategy for Fasken in the mining space in the next 12 months?

We have had tremendous growth since the pandemic and are present in every major project. I would say growth will come from continuing to lead on our expertise in mining. A lot of emerging companies will become producers. We will accompany them and adapt our services to their needs. This will be key to our success. Legal services are more than writing contracts, it is also about being a strategic advisor and a partner. ■



## Sander Grieve

Partner  
BENNETT JONES

### Can you introduce Bennett Jones and discuss what prompted you to open a practice in Montreal?

Bennett Jones has 500 lawyers and business advisors, and we are proud to be expanding into Québec with our new office in Montréal. We help clients in the mining industry with the full range of services across issues that include capital markets and corporate matters, labor, international arbitration, regulatory, permitting and environmental issues, royalties, and other forms of secure financing.

### How do you assist the mining industry in Canada?

Explorers and developers are a big focus right now. These firms need the help most in terms of mobilizing talent, and financing to make material progress. There has been an underinvestment in the space for many years. The focus on actual exploration is a big game of catch-up, and it will be a key area of focus in the coming months.

### What will be the key trends in the mining space in 2023/2024?

We anticipate vertical integration, improvement in investment conditions, and infrastructure development. Integration leadership is being demonstrated through a variety of channels. The first is through direct investment and offtaking relationships between vehicle and vehicle parts makers and miners. We expect these and other commercial relationships will flourish throughout the supply chain from exploration, development, mining, processing, component making, servicing through to recycling and redeployment of materials. Governments are expressing a new interest in improving the conditions for capital attraction. This is giving rise to tax credits to encourage investment, and going all the way an increasing commitment to streamlining permitting processes. Infrastructure development is crucial across the mining and critical minerals sector, as much of the industry relies on remote operations. Investments are being made by provinces and the federal government to support access infrastructure. We anticipate this trend will and must continue to support the development of the next generation of assets to fuel the energy transition. ■



## Louis-Nicolas Boulanger

Partner - Business Law Group  
MCCARTHY TÉTRAULT

### Can you give an overview of McCarthy Tétrault?

McCarthy Tétrault is a national law firm based in all the major financial centers of Canada, including Vancouver, Calgary, Toronto, Montreal, and Québec, and we also have offices in London and New York. We are trusted advisers to many majors, mid-tier, and junior mining companies as well as streamers, lenders, private equity, strategic investors, traders, and SOEs which we support in areas such as M&A, streaming, strategic joint ventures, royalties, claims, and offtakes. What differentiates McCarthy Tétrault is the breadth and scope of our specialty areas, and we have a blend of top-tier lawyers with significant experience in mining, real estate, environment, and First Nations.

### Do you have a recent example of a project McCarthy Tétrault has been working on in Québec?

McCarthy Tétrault has a close relationship with the Australian lithium miner Sayona Mining and the work we have been doing for them ranges from the acquisition of initial assets, advising on project development, assisting with project finance, and First Nations work. This is an example where you get involved with a company for an acquisition, but then do the whole development spectrum of what is expected to be done to get the project to commercial operation.

### What is McCarthy Tétrault's view of the regulatory environment in Québec?

Québec has a sophisticated and structured approach compared to some other jurisdictions. For mining to be socially acceptable, you need to have safeguards, but at the same time, you need to balance that against the desire to accelerate the industry to increase output to meet our needs. We need to achieve a balance between promoting the industry, and doing it in such a way that the general population feels safe and that we are respectful of the environment. There is room to accelerate projects and remove some of the regulatory barriers that are a bit cumbersome from an industry perspective. ■

# A Multi-commodity Approach to Navigating Capital Markets

Because shareholders will not mind seeing returns in this environment

Image by Leonid Andronov at Adobe Stock

At the end of the day, it is the reality of capital markets that drives exploration efforts. Since the 1960s in Québec, explorers have mapped pegmatites and even walked over them, without markets showing economic interest. Despite James Bay's abnormal endowment for spodumene-bearing lithium deposits, up until a few years ago, the Canadian market only wanted gold, nickel, and copper. With over 70 lithium-bearing pegmatite outcrops identified to date, Patriot Battery Metals' Corvette property is one of the largest and highest-grade hard rock lithium projects in the world. But before the firm understood the size and grade of the pegmatites – and growing market interest in these – the project had been explored for gold. Today, Québec is the

scene of a growing phenomenon: companies that built their investment case exploring one commodity are leveraging the polymetallic potential of their properties to answer emerging market trends.

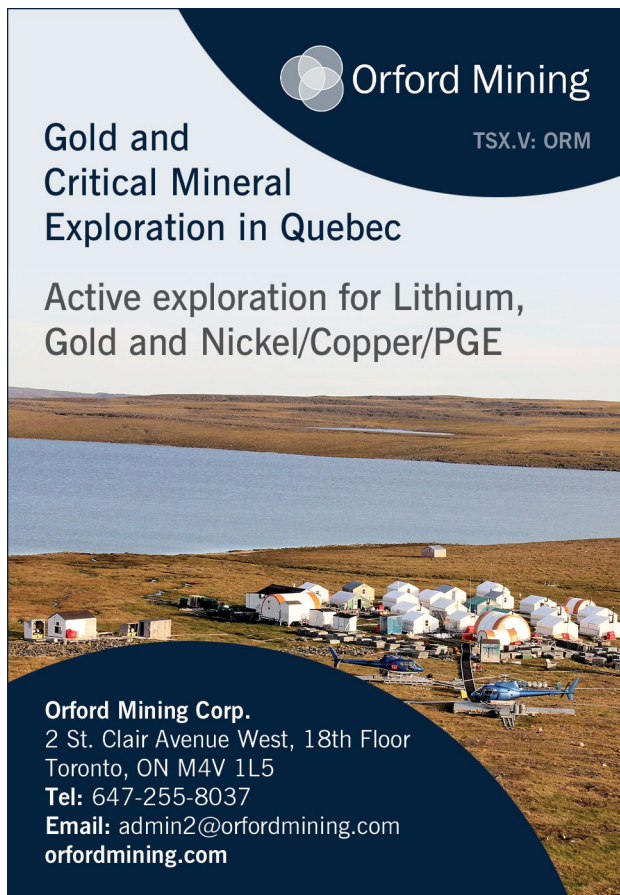
## Delivering immediate value to shareholders

With current markets being particularly difficult for junior explorers, shareholders certainly will not mind if management teams drive companies away from their initial focuses to pursue what the market wants. SIDEX, a government-supported investment fund that has the unique task of supporting high-risk early-stage projects in Québec, noticed a clear shift in companies that traditionally were focused on one commodity and had recently made a transition mostly towards lithium. Paul Carmel, president and CEO of SIDEX, detailed: "Many of the companies in SIDEX's portfolio which had originally been focused on other commodities are now starting to look at lithium opportunities on their properties, and these companies' stocks have moved up significantly because of that."

Harfang Exploration is one of the companies benefiting from Québec's unique institutional support, and that, in 2023, adapted its capital allocation strategy. Supported by FTQ, the Québec government, and SIDEX, Harfang Exploration is a pre-discovery firm that, up until 2022/2023, mostly focused on advancing its Serpent-Radisson flagship and Lake Ménarik gold properties. The company realized the potential of its Lemare lithium property in the Eeyou Istchee James Bay area, and as the summer field program progresses, CEO Ian Campbell touched upon the flexibility required as a junior to navigate capital markets, and how strategies change: "Our strategy has evolved from being mostly gold. We are probably spending 20% of capital on lithium, and that may rise to up to 50%. As a junior, you must adapt. We have solid institutional shareholders, and we know they are in favor of investment in lithium."

With commodity prices underpinned by sudden changes in global dynamics (wars, economic downturns, crypto bulls) there is one long-term trend that all analysts agree on: the growing demand, and the insufficient supply, of minerals needed for the green transition. And with the lithium market being in its infancy, as opposed to established markets like copper, any discoveries backed by strong geology will make

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**Orford Mining**  
TSX.V: ORM

**Gold and Critical Mineral Exploration in Quebec**

Active exploration for Lithium, Gold and Nickel/Copper/PGE

**Orford Mining Corp.**  
2 St. Clair Avenue West, 18th Floor  
Toronto, ON M4V 1L5  
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orfordmining.com



**If we are successful with the lithium project, at some time, we will look at making the story simpler and create a critical minerals company and gold company separate from each other.**



## David Christie

President and CEO  
ORFORD MINING

### Can you give an update on Orford Mining's activities over the past year?

Since last summer, Orford Mining has staked 455 km<sup>2</sup> of ground prospective for lithium, all in the Nunavik area of Northern Québec. We look at our assets in the Nunavik region as one project – consisting of our West Raglan nickel project, Qiqavik gold project, and our new lithium projects – as we have one camp, one airstrip, and we service all these projects from one place. The lithium project is exciting, and we had the first-mover advantage as we were the first people to stake claims for lithium in the area. To date, we have staked 19 individual properties and defined available government geochemical data with multi-spectral remote sensing data analysis to identify over 50 high-priority target areas that show compelling indicators for lithium-bearing pegmatites. We will start mapping and sampling in the next couple of weeks, and if we find a pegmatite that looks good, we will drill it this summer, as we have a drill at the Qiqavik project. It is greatly beneficial that our land package is located approximately 75 km from a

deep sea port at Deception Bay which operates year-round.

### How do you forecast 2023 to continue unfolding for Orford?

Orford is focused on pushing Nunavik Lithium forward as fast as possible, but all our projects are moving ahead. We are going to spend more money at Qiqavik than we will at Nunavik Lithium as the lithium project is at an earlier stage, but I believe our chances for discovery at the lithium projects are extremely good as the ground has never been explored, and it has known lithium anomalies.

At Qiqavik, we will be conducting a RAB drilling program, drilling the high-grade gold targets across the property. We got the best glacial expertise in the country to help us re-interpret our glacial and structural data, and he believes that there has been little movement in the boulders at the surface and that we should be drilling right underneath them. This is why we are using a RAB drill, as it is lightweight, can drill extremely fast at a hole a day, and will be able to test a significant number of targets.

### Can you present the capital structure of the company?

Orford currently has approximately 180 million shares outstanding, we have warrants and options, and the company has about US\$2.5 million in the bank. We are currently raising funds and recently closed the first round and will close the second round in the next couple of weeks. There maybe will be a third close as the market is currently tough. Alamos Gold is a 26% shareholder in Orford.

### Which commodity or project do you see taking the Orford story even further?

Orford recently completed a drill program at our Joutel Eagle project in the Abitibi region where we believe we have outlined a mineralized gold body in the South Gold Zone that is approximately 300 meters long and it has good continuity both at depth and along strike. We will conduct a drilling program next winter to define our findings better and hopefully get to a resource by mid-2024 to put value on the project.

Orford is also extremely excited about the Nunavik Lithium project as it is new, interesting, and it is virgin ground, and we believe the potential there is huge. If we are successful with the lithium project, at some time, we will look at making the story simpler and create a critical minerals company and gold company separate from each other.

### What role will Québec play in a successful energy transition?

Québec has always been pro-mining, more so than any other province. They have funds and systems in place to help you finance your company, stake your claim, and they tell you whom to contact as far as the local communities are concerned. They settled the land claims for the First Nations and Cree Nations a long time ago, and this significantly helped development in the Québec North. The hydro projects developed in Québec have helped the mining industry move forward in this province, with infrastructure already being in place. ■





## Ian Campbell

CEO  
HARFANG EXPLORATION

### Can you introduce Harfang Exploration and the firm's portfolio?

We are a pre-discovery company focused mostly in the Eeyou Istchee - James Bay region of Québec. In 2022, Harfang merged with another Junior explorer, LaSalle and so we also have some Northeastern Ontario gold projects near Timmins. While Serpent-Radisson has been our flagship, our Lake Ménarik property has numerous geological similarities to the Timmins Gold Camp so we are focusing our attention there this year. In the summer of 2022, we began reviewing lithium opportunities in James Bay which led to the staking of several properties later in the year and earlier this year.

### What will the current lithium frenzy mean for the future of James Bay?

James Bay is rapidly gaining attention as the center of gravity for a source of North American lithium deposits, based on the amounts of deposits delineated to date, and the exploration potential for more. Last month Midland brought in Rio Tinto on a CAD\$64 million dollar deal which was followed by a deal with Azimut. I believe the push into lithium is resetting James Bay, and as explorers in the area, we are in the right place at the right time.

### What makes Québec a unique jurisdiction for junior mining?

Québec is the best jurisdiction in which I have operated, period. The whole mining ecosystem is strongly supported, from the grassroots level to development, and the geology for literally any type of hard rock deposit is as good as anywhere else in Canada. The Québec institutional funds provide excellent support as they understand the benefits of success. They are at the grassroots level, the highest risk point, and not just the mining level. This separates Québec from other jurisdictions not only in Canada but globally. Having worked in most Canadian provinces, it is easy to pinpoint Québec as an excellent place to do business. ■

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firms' share price spike in this environment. In June, Orford Mining's shares rose by 14% after the firm announced it had identified over 50 high-priority targets with pegmatite potential across its properties. Similarly, VIOR, another traditionally gold-focused explorer, saw a good market response after it expanded its Belleterre lithium project in February: "VIOR saw a nice increase in its share price after we announced the consolidation of the Belleterre lithium project" recalled Mark Fedosiewich, president and CEO.

### Capital and structural shifts ahead?

As Québec companies increase their lithium land packages, questions will arise regarding best management practices for multi-commodity exploration in a single region. Without diving into the complex web of dealmaking options that may or may not take place in James Bay, where lithium contenders are almost stepping over each other's claims, it appears clear that companies will have to make calls organically to determine if it is worth splitting entities, letting projects go, or continuing the multi-commodity approach. The years ahead could therefore see the emergence of new pure-play lithium firms that sprouted out of existing gold-focused companies.

Splitting companies into separate entities as they expand their portfolio toward new commodities is not new for mining firms. Gold remains a key part of the Orford story, with the firm having outlined a mineralized gold body in the South Gold Zone at its Joutel Eagle project. But in the rush to ad-

vance its Nunavik lithium project quickly to meet market expectations, and seeing the project's potential, David Christie, president and CEO, is considering a split: "If we are successful with the lithium project, at some time, we will look at making the story simpler and create a critical minerals company and gold company separate from each other."

Since the summer of 2022, Orford Mining has staked 455 km2 of ground prospective for lithium, all in the Nunavik area of Northern Québec. The company has a huge first-mover competitive advantage: while foreign and domestic companies continue to rush towards the pegmatite bonanza of James Bay, Orford mobilized its teams in Nunavik, ultimately now covering the most prospective lithium pegmatite targets in the region.

The next months will be key for multi-commodity companies to determine how to allocate cash. In a market preventing capital-expenditure blowouts, strong balance sheets and capital discipline are on the agenda. Diversifying portfolios with lithium assets will also allow these firms to decide if the shareholder value generated ought to be used to support more advanced gold exploration efforts, as many industry leaders expect a gold bull market around the corner.

Starting with gold production, development, and exploration, followed by an analysis of trends shaping supply-demand fundamentals for battery and base metals, the following pages make a compelling investment case for Québec's mining industry. ■



## Normand Champigny

CEO  
QUEBEC PRECIOUS METALS (QPM)

### What has Quebec Precious Metals (QPM) focused on in recent months?

The key focus of QPM this year have been on our flagship Sakami project, where we have been drilling since 2018 to find significant resources. We are planning to continue drilling this summer after making a promising discovery in 2020 and 2021. The second project, Kipawa, is a heavy rare earth elements (REEs) project in which we hold a 68% stake. Moreover, we have identified significant lithium potential in James Bay. We are evaluating our projects and working with ALS Goldspot Discoveries for a lithium potential study, with results expected in the summer of 2023. We also sold the Blanche and Charles project to Champion Electric Metals, hold about 6% of their shares with a royalty retainer, and are collaborating closely for mutual success. In the coming months, I believe these endeavors will not only bring attention to James Bay but also generate shareholder value.

### What prompted QPM to shift its focus from gold to exploring rare earths and lithium?

As a junior exploration company, we adapt to market trends and explore opportunities with the lowest costs possible. While our gold assets are substantial, we also recognize the changing landscape of commodity prices, particularly for rare earths and the emerging boom in lithium in James Bay.

### Will the current high gold price will be reflected through increased interest in gold projects?

In the mining sector, producers are facing significant cost inflation, making gold production expensive. Major companies seek reserves and resources through partnerships or acquiring junior companies with promising projects. As juniors, it is challenging to attract attention from retail investors and others due to our smaller size. Meanwhile, Australia has thrived in the mining industry. Australian companies have made substantial investments in James Bay's lithium projects, contributing to a significant wave of investment in the region. ■



## Mark Fedosiewich and Laurent Eustache

MF: President and CEO  
LE: Executive VP  
VIOR

### Can you give an update on VIOR's activities and plans for the coming year?

MF: VIOR has plans for a very busy 2023 as we rapidly advance three district-scale projects in Québec: Belleterre Gold, Belleterre Lithium, and Skyfall Nickel. Currently, the Belleterre gold project is the most advanced. Our Skyfall Nickel Project is still in its early stages but is extremely prospective. VIOR is advancing this project with its partner, SOQUEM Inc., a well-financed subsidiary of Investissement Québec, with whom we signed an option agreement in March 2023.

Our newly developed Belleterre lithium project is situated within the Sayona Abitibi lithium hub. In May we began an initial field exploration program and identified several pegmatite swarms on the property as well as some strong mineral indicators for lithium potential.

### Do you believe we will see more consolidation in the junior space in the coming year?

LE: There are a substantial number of juniors operating in the Québec market and competing for a limited pool of capital. Still, on a broader scale, I do not believe that there is a shortage of investors. The primary issue at the moment for many junior companies is that they are too small in market value to be eligible to access most institutional investors and funds. I think that this may lead to potential consolidations as a way for juniors to grow and attract the attention of investors. Finally, to consolidate, positive synergies that create value for shareholders will have to be properly demonstrated and executed.

### Why is VIOR going to be a great story for investors?

MF: VIOR is rapidly advancing three district-scale projects in Québec. Each has the potential for discovery and to be a game changer in the industry, and each distinct project offers exposure to a different highly sought-after metal, representing tremendous opportunity for the province and for our shareholders. ■



# GOLD

"Abitibi has a long history of gold mining, and there is still a lot of potential to develop other mines in this region."

**Daniel Paré**  
Vice President – Québec  
Agnico Eagle

GBR SERIES • QUÉBEC MINING 2023

Image courtesy of Newmont



# Gold Production

## Gold, the heavyweight of Québec's mining industry

Image courtesy of Ressources Québec

With a production value close to US\$14 billion, gold is Canada's most valuable commodity. Québec accounted for 25% of the country's production in 2021, with close to 1,696,000 oz/Au. New developments and extended mine lives at existing operations in Québec and Ontario are the main factors driving the expected expansion of Canadian gold mining production at a CAGR of 18.7% up until 2026, according to GlobalData. Despite high inflation, decreasing reserves globally, and market interest in battery metals, 2023 was a strong year for Québec's producers. A high commodity price (with gold teasing the US\$2,000/oz mark), central banks buying large amounts of gold, coupled with the new developments, announce the promise of a vibrant production scene in the coming year.

### Operational updates

Leading the gold production charge in Québec is Agnico Eagle. The firm produced over 827,000 oz/Au from its three main assets in 2023; the Canadian Malartic complex, the

LaRonde complex, and the Goldex complex. With innovation and discoveries bringing all three assets' mine lives beyond 2030, the future looks bright for the firm, which is particularly intent on leveraging its new underground plan at Odyssey. Having completed the preliminary mining of the Canadian Malartic pit this year, the firm processed the first ore from development and started production in March at Odyssey. The asset has the potential to be the biggest underground mine in Canada.

For gold producers, Québec's hydroelectric competitive advantage is best illustrated at Newmont's Éléonore mine. Located north of Montréal, in the territory of the Cree Nation of Wemindji, the underground operation is fully powered by hydroelectricity. Compared to 2022, Éléonore achieved 43% higher gold production in the first quarter of 2023. While the ore is currently processed onsite, Newmont began the development of a fifth mining horizon and a production shaft, both of which will bring Éléonore closer to its full production capacity.

Near Val d'Or city, Eldorado Gold is focusing on the completion of in-fill at Lamaque's Ormaque deposit, to deliver a maiden reserve in 2024. By the end of 2023, Lamaque is expected to mine and process around 870,000 t of ore. The increase from US\$670/oz to US\$770/oz in operating cost per reflects the struggles majors have been facing in the past 24 months: cost inflation, a competitive labor recruitment market, and optimizing zones. Hecla Mining, the larger silver producer in the US, generates about 35% of its revenue from *La Belle Province*. Operating the Casa Berardi mine, the firm's sole gold asset shut down for several weeks due to wildfires in the province. The operation is still on track to produce at least 110,000 oz/Au by the end of 2023.

### Strengthening the gold scene

Agnico Eagle chose both acquisitions and organic growth routes to strengthen its leading gold-producing position in the Abitibi gold belt. In 2022, the firm merged with Kirkland Lake Gold, and in 2023 it acquired the Canadian assets of Yamana Gold, making Agnico Eagle the largest gold producer in Canada, and the third gold producer in the world. Speaking about the firm's consolidation strategy in the Abitibi, Daniel Paré, VP Québec, explained: "We also have a JV with Maple Gold Mines there, located next to our former Joutel mine. We are always keeping an eye on the radar for potential opportunities."

In the months to come, majors will be eyeing developers' and juniors' positions, with extra milling capacity to be filled. For logistical reasons, many neighbors in Val d'Or or the Abitibi are keen on processing ore through the region's existing mills, which boast industry-high recovery rates. Indeed, with global reserves shrinking, high capex operations, and growing opex costs, feeding producers' mills will be one of the main stories to follow in 2024 and beyond. As explained by Daniel Paré: "Once we completely transition to underground mining at Odyssey, it will be processing 19,000 t per day, which will unlock 40,000 t per day in excess milling capacity."

This stance was seconded by Sylvain Lehoux, VP Canada at Eldorado Gold,

whose Sigma mill reached an attractive 97% recovery rate in 2023: "We are seeing significant interest from junior miners in using our Sigma mill to process their ore, as the Lamaque operation is surrounded by many neighbors who have made some good discoveries."

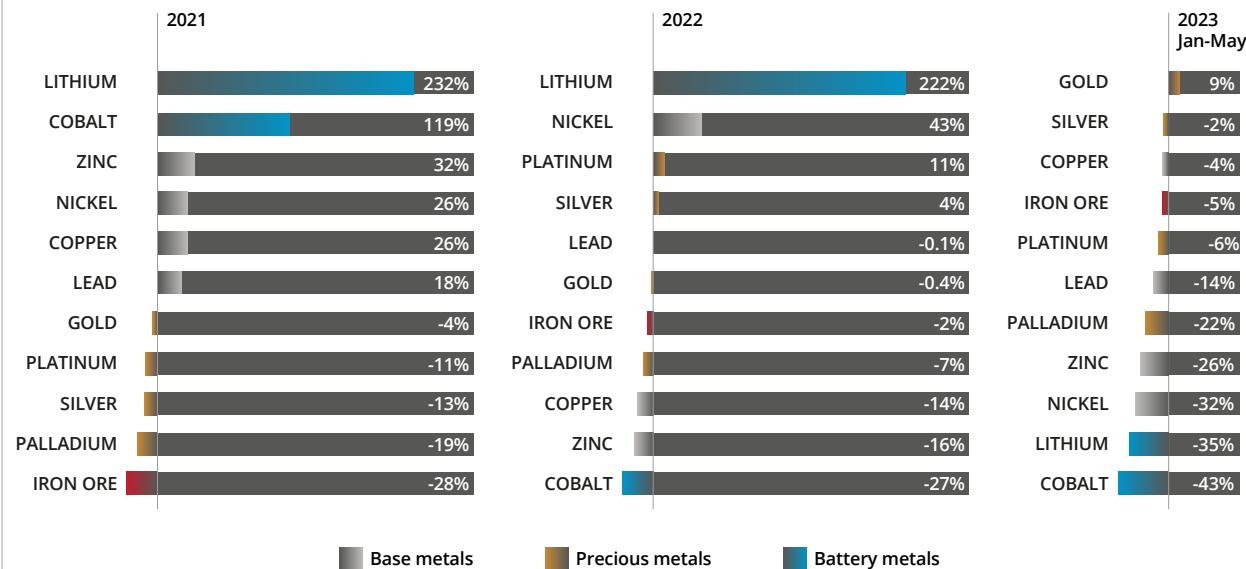
An example of a successful marriage would be that of Gold Fields and Osisko Mining. The former, the top South-African producer, announced its arrival in Québec in style through a JV with a firm part of the province's finest mining entrepreneurial story, Osisko Mining. In May 2023, Osisko Mining and Gold Fields put pen to paper, and Gold Fields acquired a 50% interest in the Partnership at Windfall in exchange for payments of C\$600 million in cash plus C\$75 million for the exploration properties. Boasting intercepts of 65 g/t over 6 meters, Windfall is currently scheduled to produce gold towards 2026. Martin Preece, interim CEO of Gold Fields, who will overall spend over C\$1 billion in Québec and announced a long-term commitment to the province, explained

the marriage terms: "We have been collaborating with the Osisko team for the better part of the year, providing technical input, particularly on the processing side. The partnership is a great marriage where Gold Fields and Osisko's skill sets greatly complement each other."

Newmont acquired Goldcorp and Newcrest in the space of four years (with the latter being a US\$19 billion transaction) and, like Barrick for instance, sees diversification as a key reason for acquisitions. Bernard Wessels, Newmont's regional SVP, North America, highlighted the strategy: "Newmont recently entered into a definitive agreement to acquire Newcrest, providing a strong example of the factors that make a good target for Newmont. Adding the gold and copper operations from the acquisition of Newcrest to our portfolio will increase our exposure to copper."

On Hecla's side, geology is the first factor making a potential acquisition a good target. CEO Phil Baker shared: "As part of Hecla's growth strategy, we are

### Evolution of metal prices



Source: PDAC

# Awakening the Giant

Abcourt is rapidly advancing its 100% owned, and fully permitted, Sleeping Giant Gold Project in Abitibi, Québec.

[www.abcourt.com](http://www.abcourt.com)  
**Contact:** Pascal Hamelin,  
 President & CEO,  
[phamelin@abcourt.com](mailto:phamelin@abcourt.com)

looking at M&A and deal-making opportunities, especially projects that are close to Casa Berardi. Hecla first looks at geology as, at the end of the day, it fundamentally starts with the reserves, resources, and exploration opportunities.”

With a pool of great mining stories, shrinking reserves, and input cost inflation, consolidation will most likely remain the best strategy for gold producers in Val d’Or, Chibougamau, and the Abitibi. As put by David Garofalo, CEO of Gold Royalty Corp, which has over 220 royalties in its portfolio and notably a 3% net-smelter royalty (NSM) at the Odyssey mine: “Producers will continue to consolidate with each other to replace their depleting reserves and maintain scale and relevance in the capital markets.”

#### **Innovation for sustainability: investing early**

In an industry that has often been considered as conservative, Québec’s producers are showing that investment in new technologies is an effective strategy to optimize their processes while decreasing their carbon footprint – this, despite the capital risks associated with early-stage technology investment. Leveraging its culture of thinking outside of the box, Agnico Eagle was the first company to implement an LTE 4G network underground at the LaRonde complex and is currently testing battery electric vehicles (BEVs) at the Odyssey mine. Touching upon electrification initiatives, Daniel Paré explained the strategy: “We need to invest now, despite the technology not being fully ready, if we want to remain ahead of the curve.”

The use of electric battery vehicles underground will only get more popular in the future as an obvious means to decarbonize mining operations. For the last six years, Hecla Mining has been using automated trucks at the Casa Berardi mine for haulage of approximately 1.7 km. Eldorado’s capital expenditure of up to US\$42 million highlights producers’ push in that direction: “We look forward to incorporating more BEVs into our fleets as part of our efforts to continuously improve sustainable mining practices at our operations and project,” said Sylvain Lehoux, VP Canada at Eldorado Gold.

At Éléonore, Newmont already made big strides in the battery space, with sustainability driving operating expenditures. The firm’s Full Potential Program includes the implementation of Sandvik DD422i jumbo bolters at Éléonore and for David Gaudreau, GM of the mine: “Replacing diesel trucks (which currently represent more than two-thirds of the GHG emissions at Éléonore) with battery electric vehicles represents the greatest opportunity for emissions reductions on site.”

Despite the frenzy around mining the metals of the future, gold will most likely remain the lifeline of Québec’s mining economy in the coming years. Over the past century, gold mining’s instrumental role in the socioeconomic development of the province has been unparalleled. Every year, Agnico Eagle injects around US\$375 million into the regional economy through employee wages and benefits and paid over US\$700 million in mining duties to the Government of Québec in the past decade. Over the same period, Éléonore invested more than US\$1 billion to support Cree businesses. ■

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## Daniel Paré

Vice President – Québec  
AGNICO EAGLE



**We now own the five largest gold mines in Canada, with three of them being in the Abitibi gold belt.**



#### **What are the latest operational updates from Agnico Eagle’s Québec operations?**

Going back to 2005, Agnico Eagle was a single-asset producer with LaRonde in the Abitibi region of Québec. Between 2005 and 2012, Agnico built five mines, and in 2014, we acquired Osisko with Yamana and created the Canadian Malartic partnership, of which we owned 50%, to manage and operate the Canadian Malartic. In 2022, we merged with Kirkland Lake Gold. In 2023, we acquired the Canadian assets of Yamana Gold, including the other half of Canadian Malartic, which today makes Agnico Eagle the largest gold producer in Canada, and the third gold producer in the world. Looking at our key operational highlights in Québec in 2022, gold production was around 827,000 oz/Au coming from three main assets: the Canadian Malartic complex, the LaRonde complex, and the Goldex complex.

Canadian Malartic produced over 657,000 oz/Au (on 100% basis) and has a mine life that will bring us up until 2029. If we include the underground portion (the Odyssey mine), this will extend to 2039. In 2022, we achieved 7 million oz at the complex. The mining of the first open pit, the Canadian Malartic pit, has been completed in 2023, and we are now mining the Barnat pit. This will allow us to transition to in-pit deposition for tailings in the first half of 2024. At Odyssey, in Q4 2022, we processed the first ore from development and started production in March 2023. We anticipate producing 50,000 oz/Au from the ramp this year. We have the permits, mill, and infrastructure there. Odyssey will be the biggest underground mine in Canada.

At the LaRonde complex, we produced 356,000 oz/Au in 2022, which is remarkable. LaRonde will reach its 35th year of production in 2023 and it still has a mine life that will bring us beyond 2030. LaRonde is the deepest mine in the Americas, and we are now mining at 3 km deep. We have implemented a lot of innovations there to overcome the challenge of mining at depth, and there is still a lot of potential.

At Goldex, we produced 141,000 oz/Au in 2022, and its current mine life will bring us beyond 2030. In 2022, we approved the construction of the Akasaba West project, which is an open-pit operation located 30km away from Goldex. We expect production from there to start in Q1 2024.

#### **Can you expand on Agnico Eagle’s consolidation strategy in the Abitibi region?**

Agnico Eagle became the sole owner of the Canadian Malartic Complex in 2023. We own the whole production from the pit and the production that will come out of Odyssey. That latest transaction also added the Wasamac Project to our portfolio (which was 100% owned by Yamana). That transaction solidifies our position in the Abitibi gold belt in Québec and into Ontario with over 31 million oz/Au in reserves. We now own the five largest gold mines in Canada, with three of them being in the Abitibi gold belt. We also have a JV with Maple Gold Mines in that area, located next to our former Joutel mine. We are always keeping an eye on the radar for potential opportunities.

#### **How does Agnico Eagle leverage innovation at its Québec operations?**

Agnico Eagle always had a long-term vision of the way we operate our mines. We foster “outside-the-box” thinking to improve safety, efficiency and reduce our environmental footprint. For example, we work with the government of Québec to rehabilitate an abandoned legacy site (Manitou), using non-acid-generating tailings from Goldex to cover the old tailings, cutting off their contact with oxygen and preventing them from generating acid. In terms of technology, at the LaRonde Complex, Agnico Eagle was the first company to implement a LTE 4G network in an underground mine. We are also testing battery-powered vehicles at Odyssey, as we want to build the mine of the future. We need to invest now, despite the technology not being fully ready, if we want to remain ahead of the curve. ■



BW



DG

## Bernard Wessels and David Gaudreau

BW: Regional Senior Vice President, North America

DG: General Manager, Éléonore Mine

**NEWMONT**

### How have the Éléonore mine and Newmont's other North American operations performed recently?

BW: Newmont's Éléonore mine is a state-of-the-art facility that is among the largest gold mines in Québec and is powered exclusively by hydroelectricity. It is a remote fly-in, fly-out underground mine located on the traditional territory of the Cree Nation of Wemindji, about 800 km north of Montreal. Newmont added Éléonore and two other Canadian sites – Porcupine and Musselwhite – to our portfolio through the acquisition of Goldcorp, and we are beginning to see the positive impacts of the proven Newmont operating model implemented at the site.

Compared to the first quarter of 2022, Éléonore achieved 43% higher gold production in the first quarter of 2023, while recording a significant increase in underground development meters and the amount of ore mined and processed – without losing our critical focus on safety. We made similar improvements across our North America portfolio, achieving 28% higher gold production overall in the region – a success story that Newmont hopes to continue building on as we solidify our position in Canada with the acquisition of Newcrest. Newmont hopes

to continue adding resources and reserves to meaningfully extend mine life at Éléonore.

### Can you expand on some decarbonization and ESG initiatives at Éléonore?

DG: As a company, Newmont has implemented a Climate and Energy Strategy since 2015 and has committed to greenhouse gas (GHG) emissions targets of a reduction of 32% for Scope 1 and 2 emissions (2018 baseline year) and a reduction of 30% for Scope 3 emissions (2019 baseline year) by 2030. Vision Zero, our strategic alliance with Caterpillar announced in 2021, will develop and bring zero-emission and battery-electric autonomous haul systems to our sites.

Éléonore is world-class in terms of carbon intensity and the lowest emitting mine in the Newmont portfolio, producing less than 10,000 t/CO<sub>2</sub>e per year. This is mostly because Éléonore is a small-throughput underground mine connected to the zero-carbon Hydro Québec provincial grid. Although ongoing site-level energy efficiency projects are an important focus area for reducing emissions, replacing diesel trucks (which currently represent more than two-thirds of the GHG

emissions at Éléonore) with battery electric vehicles represents the greatest opportunity for emissions reductions on site.

Since 2015, Éléonore has supported a Cree-led socioeconomic assessment, invested more than C\$1 billion to support Cree businesses, contributed more than C\$500,000 to provide access to traditional food during the Covid-19 pandemic, and provided training and employment opportunities to Cree community members – among many other initiatives.

### What is Newmont's M&A strategy in North America?

BW: Newmont recently entered into a definitive agreement to acquire Newcrest. The acquisition of Newcrest will add two operations to our Canadian portfolio: The Brucejack gold mine and the Red Chris copper-gold mine are both located in Northwestern British Columbia in the highly prospective region known as the Golden Triangle. Adding the gold and copper operations from the acquisition of Newcrest to our portfolio will also increase our exposure to copper.

### What are some interesting ways in which Newmont is leveraging technology to improve operational efficiency?

DG: Newmont's Full Potential program, designed to boost productivity and reduce costs, has enabled Newmont to rapidly replicate and deploy leading practices and technologies consistently across our operations. The program is predicated on all Newmont-managed operations having a set of improvement projects that include decarbonization initiatives and has delivered more than US\$4 billion of value since it was put in place eight years ago. Over 75% of the synergy value generated from our Goldcorp acquisition in 2019 was a result of this successful program.

An example is the implementation of Sandvik DD422i jumbo bolters at our Canadian operations, including Éléonore. The new bolters are equipped with an intelligent control system that provides the operator with real-time feedback regarding the machine's performance and health, along with tools for drill planning, reporting, and analysis to ensure quality and consistency hole-to-hole. These automated bolters improve operator safety by removing the need to work from heights and reducing operator exposure to noise and airborne contaminants while improving productivity. ■



## Phil Baker

CEO  
HECLA MINING



**Geologically, Québec is extremely well endowed. Hecla continues to look for growth opportunities along the Casa Berardi Fault, as well as the Cadillac-Larder Lake Fault, where our advanced-stage Heva-Hosco exploration property is located.**



### Can you give an update on Hecla Mining's Casa Berardi operation?

Hecla Mining is subject to the fires raging through Québec, but fortunately, we have not had any incidents at our Casa Berardi site. They now have control over the fires, however, there is concern about another heatwave, new fires, and then being able to manage resources, and thus mining operations in Québec have been shut down again. We are fortunate that when they are ready to lift the shutdown, our site will be in front of the queue as we are on an isolated forest road that is 60 feet wide, we have water trucks to water down the road if necessary, and there is no significant vegetation around the mine itself. Unfortunately, the shutdown does put a damper on our production for this quarter of the year, and it will have a big impact on us. We will update production at Casa Berardi with the Q2 release in August, and the impact of the shutdown is still to be seen. Regarding Québec, our capital allocation and focus will remain on Casa Berardi for 2023.

### How important is Québec overall for Hecla's footprint in North America?

Québec represents approximately 35% of our revenue. Our operations in Québec are in the gold space, whereas all other operations are in silver and base metals, in some cases a bit of gold. Hecla is primarily a silver company, but having gold production in Québec gives us diversification.

### How does Hecla plan on becoming Canada's number one silver producer?

Hecla is developing the Keno Hill silver mine in Yukon, which will go into production in Q3 2023. We expect to produce approximately 2.5 million oz in 2023, ramping up to 4 million or maybe even 5 million oz/y in 2024. As a result, we will be producing approximately 40% of all the silver produced in Canada.

### What makes Québec a unique mining jurisdiction in North America?

Mining is an important industry for Québec and there is significant government and community support. Geologically, Québec is extremely well endowed. Hecla continues to look for growth opportunities along the Casa Berardi Fault, as well as the Cadillac-Larder Lake Fault, where our advanced-stage Heva-Hosco exploration property is located.

### What are the factors Hecla takes into consideration when looking at acquiring juniors?

As part of Hecla's growth strategy, we are looking at M&A and deal-making opportunities, especially projects that are close to Casa Berardi in particular. Hecla first looks at geology as, at the end of the day, it fundamentally starts with the reserves, resources, and exploration opportunities. Secondly, we will look at the land package and how much space they have. Thirdly, we will start to figure out how economical the geology is.

### Is Hecla leveraging any new technologies to optimize operations at Casa Berardi?

For the last six years, Hecla has been using automated trucks at the Casa Berardi mine for haulage. An operator at the surface pushes a button, and the material is loaded into the truck. The truck then drives much faster than a person could drive it as it is more consistent in the small passageway, and unloads the material, which then gets automatically hoisted to the surface.

### How do you see silver and gold performing in the near term?

It is extremely hard to predict the prices of commodities, particularly commodities like gold that do not have a fundamental industrial demand. Silver, however, has many industrial uses, and it is an energy transition metal, for example, in solar panels, wind turbines, and EVs. The bushings on wind turbines are silver, and EVs have approximately 50% more silver in them than conventional cars. The silver market today is approximately 1.2 billion oz/y. In light of the energy transition, the demand for silver for the EV market has grown to approximately 50 million oz/y and for the solar market, it is approximately 140 million oz/y, with a compound annual growth rate of 11% over the past 5 years. It is forecasted that over the next few decades, the demand for silver from the solar market will increase to approximately 0.5 billion oz/y. ■



Sylvain Lehoux

VP Canada  
ELDORADO GOLD



We are in many discussions on how we could potentially partner or collaborate to continue building a safe, sustainable, and high-quality gold mining sector in Québec.



**Can you give an overview of Eldorado Gold and highlight the company’s recent activities and milestones achieved?**

Eldorado Gold has a diversified portfolio of assets across Canada, Greece, and Turkey, with a strong pipeline of strategic growth projects. In addition to gold, we have silver, lead, and zinc as byproducts, and will be adding copper to our portfolio with our Skouries project in Greece.

We continue to advance the assets in our portfolio and are particularly excited about developments at the Skouries project, where we have raised the capital to complete the construction of this transformational asset.

In Canada, we have great upside potential at the Lamaque mine in Québec, where we started commercial production in April 2019. For the remainder of 2023, we are focusing on the completion of detailed in-fill drilling at the Ormaque deposit at Lamaque, with the expectation of announcing a maiden reserve in 2024.

**What is Eldorado’s growth strategy moving forward?**

While the Skouries project is our major focus internationally, we’re excited about the potential we’re seeing in Canada and Québec as well. The new results at the Ormaque deposit continues to demonstrate the potential to increase resources, supporting future development plans in Québec. We are also seeing significant interest from junior miners in using our Sigma mill to process their ore, as the Lamaque operation is surrounded by many neighbors who have made some good discoveries. We currently have a recovery rate of more than 97%, which is quite attractive to juniors. We are in many discussions on how we could potentially partner or collaborate to continue building a safe, sustainable, and high-quality gold mining sector in Québec.

**Can you elaborate on Eldorado’s approach to sustainability and the company’s relationship with the First Nations in Val-d’Or?**

I’m pleased to say that since Eldorado started production at Lamaque in 2019, we have been able to build solid relationships with stakeholders, First Nations, and authorities in Québec. We recognize we have a responsibility to meaningfully consult First Nations and communities, and provide equitable access to employment, training and educational opportunities.

We have set a target to mitigate our Scope 1 and Scope 2 GHG emissions company-wide by 30% from 2020 levels by 2030, which is equal to approximately 65,000 tonnes of carbon dioxide equivalent. The Sandvik electric vehicles are the next step in working towards that goal, and we look forward to incorporating more BEVs into our fleets.

**How do you see underground mining trends shaping in the coming years?**

To achieve better grades, mines continue to go deeper underground. We are excited about what we continue to see at depth at Lamaque, and Eldorado has invested CAD\$24 million in a declining project, connecting the Sigma mill and the 405 m level of the Triangle mine. This decline eliminates surface re-handling of ore and does away with an approximate 26 km roundtrip to haul ore from the Triangle mine to the Sigma mill. This improves both energy efficiency and productivity. We have also conducted alternative materials handling trade-off studies at a PEA level which indicate a potential for reducing costs, equipment, and ventilation requirements, while at the same time reducing greenhouse gas emissions.

**What makes Québec unique as a mining jurisdiction?**

Québec is a mature mining jurisdiction that offers great expertise. There is a great supplier base, including the likes of Sandvik and Caterpillar, and there is excellent government support in recognition of the economic benefits of the mining sector. Sustainable mining practices are made easier by the availability of hydropower in Québec. There is also the opportunity to empower communities and continue building a strong workforce through engaging and collaborating with the First Nations.

**What are Eldorado’s key objectives in Québec in 2023 and heading into 2024?**

As Québec is a favorable mining jurisdiction, many companies are competing for limited talent. Eldorado is focused on not only retaining the great talent we have but also developing this talent so people can step up in the organization. We will hire graduates and train them so that they can grow within the company. ■



Gold Development and Exploration  
New mines being built and high exploration investments

Image courtesy of O3 Mining

It is impossible to predict when the market will start rewarding exploration activity in Québec through higher valuations, but in the meantime, the developers and explorers keep drilling, assaying, and investing in the province, which saw a strong increase in exploration investment expenditures since 2021. Gold remained the most sought-after commodity, accounting for 71% of the US\$990 million total expenditures in Québec in 2021. A strong gold price almost constantly north of US\$1,900/oz in 2023 ensured decent profitability for miners. Touching upon gold market fundamentals, Troilus Gold CEO and director Justin Reid assessed: “The US Dollar is losing its status as a haven, and inflationary pressures persist despite attempts to mitigate them. In this context, gold continues to be sought after as a store of value. Central banks around the world have been purchasing more gold than ever before.”

The World Gold Council forecasting high demand for the commodity given the macro-environment, along with Québec’s tradition of valuable discoveries, means the province is well-positioned to remain a hotbed for exploration.

Discoveries made in regions mined for centuries suggest that some areas of Québec are still abundant with mineral potential. The latest investment figures do not lie: Côte-Nord (US\$1,421 million), Nord-du-Québec (US\$1,341 million), and Abitibi-Témiscamingue (US\$1,334 million) received 95.4% of the around US\$4 billion invested in exploration in Québec in 2021. The discovery pipeline in Québec’s major mining camps – Malartic, Rouyn-Noranda, Val d’Or, Matagami, Casa Berardi, and Chibougamau – suggests a busy exploration and deal-making scene in 2024, with, hopefully, shareholders seeing firms’ achievements finally being rewarded by a stubborn market.

**Eyeing the big league**

By mid-decade, the historic gold production scene in Québec will have welcomed several newcomers. Abcourt Mines owns the past-producing Sleeping Giant mine and mill located between Amos and Matagami and should (normally) become the next producer in Québec, as early as 2024 - an unusual sight for a company with a C\$26 million market cap. But the firm doubled the existing resource with a new estimate in December 2022, and the June 2023 PEA detailed an NPV of C\$54 million and an IRR of 33%. Abcourt president and CEO Pascal Hamelin believes his firm can grow the existing

resource to over a million ounces, and expanding on plans: “We are headed towards pre-feasibility, construction financing (for underground development to access the new zones). We could be pouring gold as quickly as the fall of 2024.”

Another company breathing new life into a past-producing mine is Toronto-based Troilus Gold. Five years after going public, Troilus Gold is now poised to become one of Québec’s largest gold and copper producers and has on short notice conducted an extensive drilling program, (over 340,000 m), leading to the discovery of the high-grade X22 zone. Throughout 2023, the firm continued to extend X22, as the target keeps revealing high-grade intercepts, most recently

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## José Vizquerra

President and CEO  
O3 MINING



**We are still on track for production by 2027. One of the main objectives is to unlock synergies with neighboring producers to be able to process the ore, which will allow us to move fast.**



### What are the main updates from O3 Mining so far in 2023?

The most important objective this year is to advance our Marban Alliance project intelligently. The key element will be capital allocation: we want to explore options to process our ore. This will allow us to focus on improving the economics of our project by finding more ore.

With this in mind, we recently announced a maiden resource at Malartic H located between the northwestern extensions of the Marbenite and Norbenite shears, which host most of the mineral resource estimate on the Marban Alliance project described in the Pre-feasibility Study back in October 2022. In summary, we will continue to highlight the potential in the area where we operate. We are still on track for production by 2027. One of the main objectives is to unlock synergies with neighboring producers to be able to process the ore, which will allow us to move fast.

### Can you touch upon the latest news at the Alpha Property?

Alpha and Marban are both within the Cadillac break, which is a zone that separates metasedimentary rocks of the Pontiac Group on the south side from predominantly volcanic rocks in the north. The beauty of Alpha is that it has been demonstrated that at approximately every kilometer there is potential for a deposit to be found, demonstrated by a repetition (called periodicity) in terms of the nature of mineralizing fluids. Our focus in the coming months will be drilling the Bulldog and Akasaba targets.

### How important is sustainability for O3 Mining?

Sustainability is extremely important to us. We believe in ESG, and most importantly, we believe there are better advancements by having diverse groups working together. That diversity is a huge strength: as an organization, we were not pushed for it, and it worked out in a very organic way. With Myrzah Bello, our VP of Sustainability, we have someone that has been ahead of the curve in her field, and this has helped us to move ESG in a better way. There is alignment and commitment from the top down.

### What is your assessment of the funding and regulatory environment for Québec explorers?

With the demand for critical minerals, the increase in claims is not surprising. There has been a higher demand for lithium, and cobalt and people will be staking for those elements. One of the most important advantages of Québec is to access flow-through shares. There have been a lot of comments about this continuing, and I hope the government understands that the only way to develop Québec is through investments. Cutting flow-through shares financing would ultimately damage investment coming into the province.

### How do you forecast the supply-demand fundamentals for gold in the short term?

Statistically, every time that there has been an economic downturn bringing inflation and a sense of economic depression where interest rates have gone up, (like the 1930s, the 1970s, the end of the 90s, and post-Covid), you push the market to the limit in an inflationary environment where it is too expensive to buy things. Money is now more expensive, and rates to borrow at about 7%. Banks have limited amounts of cash, so the only way to push the economy is by reducing interest rates, and every time that happens, gold prices go up. Interest rates will come down. The question is when? Gold has not been accounted for inflation yet. If you do so, gold could be at around US\$ 2,300 /oz.

### What are the key targets for O3 Mining in the coming months?

I would like to pass on the message that O3 Mining is part of the solution to make the Val-d'Or camp a sustainable area and we will continue to develop the Marban Alliance project by focusing on win-win opportunities for our partners, host communities, and shareholders. Our goal remains to be in production by early 2027, and we will be taking the steps necessary to get us to that goal in the most sustainable way possible. ■



## Pascal Hamelin

President and CEO  
ABCOURT MINES



**There is a lot of talent here, people are proud miners, mining is perceived well, and people understand the wealth it generates.**



### What is your vision as the new CEO of Abcourt Mines?

Abcourt is a gold development company. We own the Sleeping Giant mine and mill located north of the 49th parallel near Matagami. Abcourt has been listed on the TSX under ABI for decades, it was a small producer for a long time. The board approached me in the winter of 2022 to turn the company around: we needed to unleash the value of the Sleeping Giant mine. It is a high-grade deposit that historically produced over a million oz at 10.3 g/t, with a recovery of over 96%. The geologists that were there in the early 2000s told me that the full potential has not been discovered yet, and they just scratched the surface. As of last year, the mine did not even have a 3D model! So, we started there using modern techniques and just released a resource estimate in December 2022 where we more than doubled the resource.

### What are some of the main highlights of the PEA?

The PEA we released in June shows lots of upside potential. The NPV of the project, as it stands, is over C\$55 million dollars after tax, and the IR is over 33%. After the PEA, we announced we will tackle the next phase, which is drilling to convert inferred resources into indicated. We can grow this resource to over a million ounces in short order. We will tackle the underground drill program in Q3 2023, which will lead to a PFS. The mine is fully permitted.

### How do you allocate capital and manage the transition from developer to producer?

Most of the capital will continue to be spent on Sleeping Giant. We are going to invest some funds into satellite deposits next to the mill, like Discovery, Flordin, and Pershing-Manitou. Those three deposits are trucking distance from the mill. We will look at assets around our mill down the line, as our goal is to be a producer, increase the number of ounces, and grow organically that way.

### Do you think we will see more consolidation among gold players in Québec?

Consolidation must happen. I believe that the growth of the province is through exploration, JVs, and partnerships. Majors have assets, but they are mining them, they are doing some exploration. Eventually, these will phase out, so more exploration is needed, and growing for producers means talking to developers and juniors with assets close to their mills. We have properties near the Cadillac fault, and other explorers near the Sleeping Giant mill will have to go through permitting, build a mill...or choose our mill. There will be consolidation, it is just a matter of time with how the capital markets are right now. The more aggressive mid-tier producer will win. The market wants consolidation. Investors do not want to pay G&A for 50 different juniors, they want the money to be in the drill bit. They are sending clear signals to explorers, you are going to merge or vanish.

### Is there still potential for big gold discoveries in the Abitibi Greenstone Belt?

We have only just scratched the surface of the Abitibi Greenstone Belt. The geologists have only been focusing on the Cadillac fault, and eight years ago, no one knew about the Windfall deposit. Canadian Malartic is an open pit on top of an old underground mine, everyone thought the mine was done. These are just recent examples of successes. Québec will be there for more decades at least, and that is just near Val d'Or. If you keep going north near the Sleeping Giant mill, there will be more big deposit discoveries. The talent around the camp is what makes Québec special. Agnico, Teck, Barrick...they began in the Abitibi decades ago. There is a lot of talent here, people are proud miners, mining is perceived well, and people understand the wealth it generates.

### Why will Abcourt be a great story for investors?

Managers and directors own over 35% of the company and are participating in almost every placement. Being in production a year from now, it is a no-brainer for any investor who would want to jump in. The company went from totally unknown to putting its name out there, and once people realize Abcourt's potential, we will not be at a C\$26 million market cap for long. ■



»» **The combination of a favorable jurisdiction, the scale of our project, a robust balance sheet, solid capitalization, and the support from the government provides a solid foundation for a highly successful project in the future.** ««

## Justin Reid

CEO and Director  
**TROILUS GOLD**

### What makes the Troilus Gold project special?

Troilus Gold is a relatively new company with a market capitalization of around CAD\$160 million. In late 2017, we acquired the Troilus past-producing open-pit mine, which operated from 1996 to 2010 under Inmet Mining Corporation. During its lifespan, the mine produced approximately 2 million oz of gold and 70,000 t of copper. However, it ceased due to economic factors. After acquiring the project, we went public in 2018. Since then, Troilus Gold has conducted an extensive drilling program, with over 340,000 m drilled, leading to the discovery of a higher-grade zone called X22. As of September 2020, the total resource stands at 8.1 million oz Au equivalent, with an additional 200,000 m of drilling to be included in a mineral resource update in the second half of this year. We aim to develop an open-pit gold mine with a mine life of 20 years or more, producing over 300,000 oz/y of gold, along with significant amounts of copper and silver. The feasibility study is currently underway, and we expect to obtain permits by the end of 2024, progressing toward mine construction.

### What was the decision-making behind the recent agreement to sell claims to Sayona Mining?

As we started adding ounces to Troilus, we realized that the belt had been incorrectly explored. To address this, we decided to acquire a couple of companies, which allowed us to acquire a large land position of about 50,100 square km. This was more land than most major companies would have in the area. Over the course of three years and with an investment of approximately CAD\$7 million, we assessed this regional work and successfully defined a core gold corridor spanning 500 square km. Around the same time, Sayona had recently acquired other companies and they needed land and air-ground to work around their deposit. Recognizing the opportunity, we struck a CAD\$40 million deal where we sold them the ground while retaining 2% NSR Royalty, an additional CAD\$5 million private placement investment, and ensuring our company remained funded in a non-diluted way. It was a win-win situation for both parties.

### How important is sustainability to Troilus Gold's local operations?

We are proud to be the first company in Québec to receive the ECOLOGO certification, a significant third-party verification awarded to companies for their environmental, social, and governance practices. Most recently, in 2022, we be-

came members of the United Nations Global Compact Initiative. We have remained committed to building long-lasting relationships with our communities and supporting them socially and economically to ensure lasting impacts beyond the life of the mine. Moreover, the Québec government is our largest shareholder through Investment Québec. These institutions have social mandates and place great importance on ESG initiatives.

### What is your outlook for the future gold price environment over the next six to twelve months?

I think everyone in the gold industry would be content if gold prices remained at their current level. Looking ahead, as the US debt ceiling negotiations approach and inflation remains unchecked, I anticipate gold prices could reach US\$2,000 to US\$2,600 per ounce within the next 12 months, based on bank forecasts.

### What are the main advantages and opportunities of operating in Québec?

Firstly, there is a strong acceptance and support for mining and extractive industries, which play a significant role in Québec's overall economic growth. As long as we adhere to responsible practices, there is generally a pro-development and pro-permitting attitude, minimizing pushback. Secondly, Québec offers access to abundant, low-cost, and environmentally friendly power. Most of the power generated in Québec comes from hydroelectric sources, allowing us to benefit from electricity costs as low as 3.2 cents per kilowatt-hour.

Additionally, Québec provides excellent infrastructure, including access to skilled labor professionals, and offers the security of tenure, meaning that once we acquire land, we have stable ownership without the risk of sudden reappraisals or complications. Finally, the Québec government actively participates in our ventures and provides financial incentives for exploration and development in the region. For every dollar spent, we receive a 36-cent refund, maximizing the effectiveness of our investment and accelerating project advancement.

For Troilus, the combination of a favorable jurisdiction, the scale of our project, a robust balance sheet, solid capitalization, and the support we receive from the government provides a solid foundation for a highly successful project in the future. ■

»» **We are seeing a significant number of foreign explorers being attracted to Québec. We believe that outside funding coming into and being spent in Québec is great for the industry as our locally-owned small businesses can provide services to these companies.**



### Olivier Grondin, Chairman, AEMQ

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some at 103.81 g/t AuEq over 1 m, and 18m at 1.34 g/t AuEq, including 2 m at 7.16 g/t AuEq. Expecting to obtain permits by the end of 2024, and recalling the advantages of operating in Québec, Troilus Gold's CEO and director, Justin Reid revealed his bullish stance: "The combination of a favorable jurisdiction, the scale of our project, a robust balance sheet, and the support we receive from the government provides a solid foundation for a highly successful project."

Climbing the few floors on Avenue des Canadiens de Montréal to Osisko Mining's office is worth the detour if only to witness some of the intercepts from the Windfall deposit. The firm's flagship property, since May 2023 a 50/50 JV with Gold Fields, returned rocks impregnated with gold veins and samples of 65 g/t. With 3.3 million oz/Au inferred and 12,287 million t at 8.4 g/t, the project has been deemed by some as the highest-grade discovery in Québec recently. What is unique is the deposit's potential to deliver in the future beyond Windfall. Discussing the inflow of capital from Gold Fields in the project, Osisko Mining's president, Mathieu Savard, expanded: "Windfall is probably one of many more discoveries in that district, and that capital will sustain exploration for the years to come."

A dozen kilometers away from the Canadian Malartic complex, O3 Mining's Marban Alliance project keeps advancing intelligently. The firm recently announced a maiden resource at Malartic H, located between the northwestern extensions of the Marbenite and Norbenite shears, and eyes production in 2027. Selling assets and deal-making to ensure a healthy balance sheet is a core component of president and CEO José Vizquerra's strategy. The firm sold its Garrison property to Moneta Resources, effectively becoming the largest shareholder in the company. "We repeated the same process with Cartier Resources. Now, the Chimo project with our East Cadillac project will be valued much more than separately. We now own 14.2% of Cartier after vending the asset."

Recent months saw significant consolidation in Québec's most prolific districts. Covering 19 km of favorable strike along the prolific Destor-Porcupine Fault Zone, First Mining Gold's Duparquet and adjacent properties collectively represent one of the top four largest undeveloped gold projects in Québec. Hoping to unlock a new wave of successful exploration, First Mining picked up Porcupine East from IAMGOLD, allowing the company to tighten its grip on the Duparquet district. CEO Dan Wilton explained the decision-making process behind the decision: "What we are most excited about is the drilling done at satellites around Duparquet. This will


allow us to follow the known mineralization and lead to a low-risk high-return exploration opportunity."

### Explorers with common goals and different strategies

In the current environmental and macroeconomic climate, the patience that an experienced management team brings is invaluable. Capital is rare, and drilling is expensive, making finding the perfect strategic balance vital. In April 2023, Cartier Resources released a PEA, but its summer 25,000-m drill program was cut short by the wildfires, with only 200 m remaining in the program. Seeing the glass half-full, president and CEO Philippe Cloutier assessed in June: "We would have preferred to continue drilling, but with US\$3 million in the bank, the forest fires raging, and the markets not paying attention, the situation is perfect for us right now."

Cartier Resources announced new intersections of up to 9.6 g/t at the Chimo mine and East Cadillac properties.

Creating value through successful drill holes is a strategy that will not displease any shareholders and one that Fury Gold Mines actively pursued in 2023. The firm hit one of its best drill holes at its Eau Claire flagship in James Bay at the end of 2022, and intercepted 13.5 m at 8.05 g/t Au. Such strikes are like breaths of fresh air in such a suffocating period for gold juniors. For Tim Clark, Fury's CEO: "Over the past few years, we have seen our share price pull back along with the rest of the industry. Fortunately, Fury Gold has been able to unlock value through positive drill results."



**NORTHERN SUPERIOR RESOURCES**

TSXV:SUP  
OTCQB:NSUPF

**Consolidating the Chibougamau Gold Camp in Quebec and Capitalizing on District Scale Exploration in Ontario**

By consolidating the most relevant gold deposits in the Chibougamau Gold Camp under one roof, Northern Superior is increasing the viability of the resources. The deposits are located within a small radius, which will eventually allow them to be combined into a single operational design, feeding a single mill.

We look at the camp as one project.

info@nsuperior.com  
www.nsuperior.com





Hunter or hunted? Having released a mineral resource estimate (MRE) at its Philibert property in August, Northern Superior Resources established the pillar it needed to further its consolidation strategy in the Chibougamau camp. With Philibert located adjacent to IAMGOLD's Nelligen and Monster Lake projects, and the MRE showcasing Philibert's high-grade compared with its neighbors, the coming months will determine the directions that the seemingly inevitable consolidation will take in Chibougamau. Touching upon what makes the camp's particularities unique, president and CEO of Northern Superior CEO Simon Marcotte detailed: "Lac Surprise is adjacent to Nelligen, which already has a resource of 2 million oz in the indicated category and 3.6 million oz inferred. Enlarging that radius to 17 km allows us to include Monster Lake, which has a resource carrying a grade of 12 g/t, and Chevrier, which has a sizable resource with enormous potential."

**Untapped potential in the Abitibi**

Having yielded over 200 million oz of gold, the Abitibi region will still be the mother of multiple future discoveries. This opinion is shared between Canada's finest gold mining executives, geologists, and financiers. Amex Exploration, one of the province's best success stories in Québec market capitalization-wise in recent years, keeps generating targets for its Perron project. The firm did its biggest-ever financing of close to C\$50 million in 2022 and is advancing the newly discovered Team Zone as both an underground

target, as well as a near-surface open pit type system. Speaking of the Abitibi Greenstone Belt, president and CEO Victor Cantore forecasted: "Amex has found gold in an area that has never seen gold before, and thus the answer is clearly and quantifiably that future discoveries will be made. I believe there is much more discovery potential across the entire Belt."

Numerous are those who assess that Québec's miners have only scratched the surface of the Abitibi Greenstone Belt. The Cadillac Fault is well understood, but considering that the Windfall deposit was not discovered until a few years back, the potential for untapped geological endowments remains enormous. Matthew Hornor, president and CEO of Maple Gold Mines, which recently released the first phase of deep drilling at the past-producing Telbel mine area of its 50/50 JV Joutel project (with Agnico Eagle), is of that opinion: "The Abitibi is well endowed, and I expect there will be gold mines producing new ounces here 100 years from now."

Great discoveries start with great explorers, and Québec proudly boasts another resource envied by the entire world: its talent. Producers, developers, and explorers alike praise the skilled labor in Québec. Recalling that firms like Agnico Eagle, Barrick, and Teck started their journey in the Abitibi decades ago, Pascal Hamelin summarized the pride of Québécois miners: "There is a lot of talent here, people are proud miners, mining is perceived well, and people understand the wealth it generates." ■

pushing towards 50% absolute emission reductions by 2030 and net zero by 2050. We have led the way in decarbonization across the mining industry globally.

The fifth ESG target is around tailings management and conformance to the global standard. We have two high-risk dams that we will be reporting on in August this year in terms of our conformance to the standard.

The last element of our ESG targets is water stewardship, where we are aiming to get 80% of our water recycled and have a 45% reduction in our freshwater intake.

**What technologies and tools are Gold Fields leveraging to make the company's operations more efficient?**

We are currently trailing an AI satellite-based exploration tool to help us improve target drilling at our Australian operation. We are also starting to deploy automated digital solutions at our operations. We have already implemented remote loading solutions at some of our operations to increase efficiency. ■

**Can you give an overview of the latest activities at Gold Field's Windfall project?**

For long, we wanted to expand into Canada, and the Windfall project was an exceptional opportunity as it is a great project run by a great team. We have been collaborating with the Osisko providing technical input, particularly on the processing side. The partnership is a great marriage where Gold Fields and Osisko's skill sets greatly complement each other.

**Can you elaborate on Gold Field's ESG initiatives?**

Gold Fields has set six targets in terms of ESG. The first is safety, wellness, and environment. Our second target is around gender diversity, and we are pushing to get to at least 30% female representation in our business by 2030.

Thirdly, we are focused on stakeholder value creation, ensuring that those around us benefit as well. We are aiming for 30% of the value we create to go to host communities.

Gold Fields' fourth ESG target is around decarbonization, and we are



**Martin Preece**

Interim CEO  
GOLD FIELDS



**Dan Wilton**

CEO  
FIRST MINING GOLD

**What are the latest updates at Duparquet and Springpole?**

At Springpole, we are significantly through the Environmental Assessment (EA) process and 80% through a feasibility study. We are looking to submit a final EA report in mid-2024, with approval in mid-2025. Overall, we are looking at being in production and pouring gold in 2028.

**What was the decision-making process behind the acquisition of Porcupine East?**

We picked up Porcupine East from IAMGOLD as the property ties the entire Duparquet district together. It follows the major controlling structures and almost doubles the exposure of the fault itself. There has been little exploration there, so we think that will unlock an exciting phase. We are most excited about the drilling done at satellites around Duparquet, which will allow us to follow the known mineralization and lead to a low-risk high-return exploration opportunity.

**Why is First Mining going to be a great story for investors near term?**

We have two of the biggest undeveloped projects in two tier-1 jurisdictions, with Springpole being one of the most advanced. When the moment of recognition comes two years down with the final EAs, we have the potential for multiple returns. ■



**Matthew Hornor**

President and CEO  
MAPLE GOLD MINES

**Can you present the latest highlights from Maple Gold Mines?**

We recently reported results from the first phase of deep drilling at the past-producing Telbel mine area of our Joutel project. Those results showed high-grade gold mineralization more than 500 m below the lowest level of historical mining. We also completed our first phase of deep drilling at our Douay project to start testing below the already defined 3-million-ooz gold resource. We are well positioned with cash, an established gold resource, a partnership with Canada's largest gold producer (Agnico Eagle) and aggressive drilling plans with a vision towards developing a future gold camp in the heart of the Abitibi.

**What is your overview of the financial environment for gold explorers in Québec?**

The financial environment is currently extremely tough and even the best projects are having a hard time attracting investment. The inflationary environment has put a lot of pressure on investors with debt obligations, while also providing interest-bearing investment alternatives that are attractive for cautious investors. The tax incentives and flow-through financing access for gold explorers in Québec provide a significant advantage. ■



**Mathieu Savard**

President  
OSISKO MINING

**What are the latest milestones achieved by Osisko Mining?**

In 2022 we completed the bulk sample at Windfall, for which we published results that captured a lot of attention: 65 g/t Au for 4,800 t. We published the results of the feasibility study in December 2022, and the report in January 2023, which showed a robust project with strong economics. We signed an agreement with Miyuu kaa Corp., a subsidiary of the Cree First Nation of Waswanipi, whereby they will finance, build and own a powerline to transport hydroelectric power to Windfall. We filed the Environment Impact Assessment report in late March, which triggered the permitting process for the project. Finally, we struck a deal with Gold Fields in May where Gold Fields acquired a 50% interest in the partnership at Windfall, in exchange for payments of C\$600 million in cash plus C\$75 million for the exploration properties. We are fully funded for our portion of the project and foresee production by the year-end of 2025 or the beginning of 2026.

**What will make Osisko Mining a great story for investors?**

Windfall has the potential to become a cornerstone asset for the corporation. The project has a lot of upsides. We are just at the beginning of what we believe will be a highly successful story. ■



»» Northern Superior Resources has an aggressive strategy of consolidation of the Chibougamau gold camp, where many gold projects are located close to one another. ««

## Simon Marcotte

President and CEO  
NORTHERN SUPERIOR RESOURCES

### Can you give an overview of Northern Superior Resources and the company's activities at the Chibougamau gold camp in Québec?

Northern Superior Resources has a unique and aggressive strategy of consolidation of the Chibougamau gold camp, where many gold projects are located close to one another. Putting them under one roof allows us to look at all those deposits as one project eventually feeding the same mill. This consolidation strategy is transforming unviable ounces into viable ounces.

Chibougamau started with the discovery of the Nelligan deposit, which was the discovery of the year in 2019 in Québec. This discovery made the surrounding projects more viable, but consolidation was required. Northern Superior was already in the Chibougamau gold camp with the Lac Surprise project as well as with the Croteau project and took the leadership role. We acquired Genesis Metals for the Chevrier project, followed by the transformative acquisition of Royal Fox Gold to bring the Philibert deposit under the tent. We believe that the Philibert deposit, which is located only 9 km from Nelligan, will attract

significant attention with an imminent 43-101 resource publication based on a total of 77,000 meters of drilling. We feel strongly that this resource calculation will establish Philibert as a pillar in the Chibougamau Camp.

Overall, the Chibougamau Camp is well solidified with all projects concentrated within a small radius. Envisioning a mill strategically positioned, we could have Nelligan, Philibert, and Lac Surprise all within a 5 km radius. The Lac Surprise is even adjacent to the Nelligan deposit, which already has a resource of 2 million ounces in the indicated category and 3.6 million ounces in the inferred category. Enlarging that radius to 17 km, allows us to include Monster Lake, which has a resource carrying a grade of 12 g/t, and Chevrier, which already has a sizable resource with enormous potential.

### Will the limited sources of financing lead to more deal-making and M&A in the junior space in 2023?

The junior and explorer market has become extremely cheap, and this devaluation will lead to more and M&A activity. In regards to the Chibougamau gold camp, let's keep in mind that the large gold companies do not want

to deal with a whole bunch of small companies. We have done the heavy lifting by handling everything that needs to be handled to consolidate small companies, and we are now getting to a size that moves the needle for larger companies.

### Can you discuss the experience of your management team and the financial structure of the company?

We are fortunate to have Victor Cantore, president and CEO of AMEX Exploration, as our executive chairman. Victor grew AMEX into one of the most successful gold exploration companies in the country. Also, our largest shareholder and director, Michael Gentile, was the mastermind behind the consolidation strategy of the Chibougamau gold camp and remains very involved. The company recently closed a financing of US\$5 million of hard dollars, with all of it being raised at market price without warrants.

### What are the main benefits of being an explorer in Québec?

Institutional support, government support, and a clear permitting process all contribute to making Québec a top-tier global jurisdiction. Québec has been able to put to work a defined, aggressive, and supporting structure from government entities which have spectacular repercussions in that other institutions and investors are then much more attracted to the province.

### How do you forecast the gold space to evolve in the coming months, and what makes Northern Superior a compelling investment story?

By consolidating projects and putting them all under one roof in the Chibougamau gold camp there is a substantial amount of money to be made. Gold acts well when money is being devalued. Money continues to be devalued in current market dynamics. For example, you can put money in the bank today and get 4% interest on it a year later, but you have lost 7% due to inflation. This dynamic of high inflation and weak growth is catnip for the gold price. I believe that within the next few years, we will be looking at a gold price significantly higher than where it stands currently. Northern Superior is on the cusp of becoming a top-tier exploration company in Canada. ■



VC



KM

## Victor Cantore and Kelly Malcolm

VC: President and CEO,  
KM: VP Exploration  
AMEX

### Can you give an update on Amex Exploration's activities and milestones achieved over the past year?

KM: 2022 was a great year for Amex and we did the company's biggest-ever financing raise of C\$49.6 million in February 2022, utilizing Québec's charity flow-through structure. We did significant drilling and made the Team Zone discovery at our Perron project, something we believe will be a significant part of the future of Amex.

### Can you elaborate on Amex's flagship Perron project and the key catalysts ahead for this project?

KM: Our goal is to get a resource out as soon as possible. We have been extremely lucky in that we have been continually finding new gold and base metal deposits on the project, but we are at the point now where we would like to quantify what is in the ground.

### Are you seeing investors jumping on the current lithium frenzy to the detriment of the gold industry?

VC: Amex experienced a great financing round in 2022, when the lithium frenzy had already started, and we were fortunate enough to have closed our financing early on in the year.

VC: Amex experienced a great financing round in 2022, when the lithium frenzy had already started, and we were fortunate enough to have closed our financing early on in the year.

### What makes Québec an ideal place for gold exploration?

VC: Québec is a great jurisdiction, it is geologically well endowed, there is access to capital, and the government tax incentives, such as the charity flow-through structures, which are advantageous for junior explorers.

### What is going to make Amex a great story for investors in the coming months?

VC: Amex is still one of the most active gold explorers in the industry, and we will continue delivering great results from our drilling and most likely make new discoveries. We will soon deliver a resource calculation along with an economic study, and the ounces at Perron should come in extremely favorable for this economic study. ■



## Philippe Cloutier

President and CEO  
CARTIER RESOURCES

### Can you give an update on Cartier Resources' activities over the past year?

Cartier Resources is a gold exploration company focused exclusively on the Québec Abitibi Greenstone belt, and specifically around Val d'Or. We have other assets in the Windfall project area, but we are currently focused on the Chimo Mine project, which is a past-producing gold mine that we bought from a bankruptcy sale in 2013. One of the recent successes for Cartier is the consolidation of the O3 Mining East Cadillac project with our Chimo Mine project.

### Can you speak to some highlights of the recent PEA?

We are looking at an underground operation on a standalone basis with a production profile of approximately 120,000 oz/y over an approximate 10-year mine life. The Capex is CAD\$341 million with a post-tax NPV of CAD\$388 million and IRR of 20.8%, at a long-term conservative gold price of US\$1,750/oz.

We have built a mine plan in and around the currently existing infrastructures, which biases our exploration plan, yet there is drill indicated exploration potential up to 15 kilometers

from the project east and west, and thus there are upside optionality and alternatives for Cartier moving forward. Our project being sub shovel ready, with underground infrastructure, having access to infrastructure, having a qualified workforce, in a proactive fiscal environment such as Québec, if the gold price continues to increase, the impact is much more beneficial than if we had a gold project in a remote jurisdiction in a country that is politically unstable.

### What will be key catalysts for Cartier in 2023?

In June due to region-wide forest fires we shut our drills down, but by that time, we had drilled 24,739 m of the 25,000 m drill program. We would have preferred to continue drilling as the project continues to show an extension of the mineralized zones east and west and at depth, but with still CAD\$3 million in the bank, the forest fires raging, and the markets not paying attention, the situation is perfect for us right now as we get to take the next month or two to reengineer our corporate development and expansion strategy on the project to continue building value and reward our shareholders. ■



"With provincial and federal support for critical minerals, Québec is the place to be in the lithium space."

**Guy Belleau,**  
CEO,  
Sayona

# BATTERY AND BASE METALS

GBR SERIES • QUÉBEC MINING 2023

Image courtesy of Glencore



# Battery Metals Production

**Building a local, secure and sustainable battery value chain**

Image courtesy of Sayona and Piedmont Lithium

The race to become the world's biggest producer of EVs, batteries, solar panels and wind turbines is on. Global financial markets are progressively factoring climate risk into investment choices, with intelligent investments shifting from assets incompatible with a shift to a net-zero environment towards more aligned opportunities.

The following chapter will try to assess Québec's role in producing materials to feed the ongoing battery metals frenzy worldwide, and how the province can – and must – leverage its mineral potential to set itself in pole position to ensure a successful green transition. The province's ground is rich in 30 commodities, among them almost all of those commonly called battery metals. This home advantage is key, particular-

ly considering the findings of the July 2023 Energy Transitions Commission (ETC) report that states: "Scaling supply rapidly enough to meet demand growth between now and 2030 will be challenging for lithium, copper, nickel, cobalt, graphite." In North America, Québec is either the sole producer or a developer of each of the four metals just cited.

North America is at a turning point in its regional critical minerals strategy. A study from a Chinese university – reviewed by the Financial Times – shows that Chinese investment in foreign mining projects topped US\$10 billion in H1 2023, more than the whole of 2022 combined. Fears over China's splurge have prompted many countries, including Canada, to review foreign direct investments emanating from Chinese entities, particularly in areas such as critical minerals. The Canadian Critical Minerals Strategy highlights the country's determination to bolster the production of minerals that are the building blocks for its green economy. From extraction to recycling, and particularly at the production stage, Québec has a unique opportunity to stand out, as the province is already a producer of three of the main battery metals.

## Lithium

A new producer emerged in the Canadian lithium scene in 2023. In March, Sayona and Piedmont Lithium announced the successful restart of production at the North American Lithium (NAL) complex at La Corne, Québec. In August, the leading producer of hard-rock lithium in North America delivered the first shipment of 20,500 t of lithium spodumene concentrate. Powered by renewable hydroelectricity, NAL is ideally located with close access to rail, highway, and port infrastructure. Summed up by Sayona's CEO, Guy Belleau: "Québec is the place to be in the lithium space, and Sayona has the potential to be a leader in North America with over 30% of total hard rock lithium resources on the continent."

Québec thus became home to the only major source of new spodumene concentrate expected in the continent in the years to come. NAL eyes a yearly production of 260,000 t of spodumene concentrate (SC6). Such figures are needed for society to successfully achieve the green transition, with the International Energy Agency forecasting that lithium demand will have to grow 26-fold to meet the 2050 net-zero targets.

In the future, the firm plans to grow beyond the production stage. Sayona intends to become fully integrated in the battery value chain, and use its lithium produced locally to



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feed Québec's ever-hungrier EV market. Sayona's partners, Piedmont Lithium, struck a deal with LG and Tesla to deliver lithium concentrate downstream. A preliminary study in June 2023 demonstrated the downstream potential at NAL, with Sayona now considering a separate carbonate processing plant as early as 2026.

With more lithium projects poised to enter production – such as Patriot Battery Metals' Corvette flagship in James Bay – Québec is likely to carve itself a bigger slice of the global lithium market in the years to come. Guy Belleau detailed the factors underpinning the region's potential to align itself with main producing jurisdictions in China, Chile, and Argentina: "I strongly believe that Québec could become one of the major lithium hubs in the world. We have clean energy with hydro-electricity, we have universities, talent, and power to become a world leader as a lithium producer."

Québec's status as the lithium capital of Canada means that the province will be instrumental in leading Canada's charge in solidifying its battery value chain in the months to come. Sayona's ambition to grow downstream highlights that balancing scale, size, and expertise will be the key to transforming lithium into a finished product after extraction within Québec. This dynamic also led to the US\$10 billion merger between Allkem and Livent, creating a new giant in James Bay: the former has the financial resources to develop a mine, and the latter the capabilities for secondary processing.

Overall, Québec is seeing unmatched activity in its lithium industry, sustained by the province's strong institutions, a unique operating environment, and the most compelling investment case for foreign investors wishing to see input capital in decarbonization-related opportunities.

**Nickel**

A Tesla battery requires about 50 kg of nickel, with the element boasting the property of being infinitely recyclable. Beyond those candid facts, a 2022 report by Australia's National Science Agency indicated that the world will need about five times as much nickel (48,006 kilotonnes) than it is currently producing to meet global demand by 2050. Pierre Barrette, Vice President of Raglan Mine, Québec's largest nickel producer, touched upon the fundamentals: "Nickel is a strategic metal for the future and the planet's decarbonization ambitions. Today, the battery business is taking a growing part of the nickel demand. The world demand sits at about 3 million t/y of nickel; we think it will grow to 5 million t/y by 2030, with most of the growth coming from the battery business."

Operated by Glencore, the fourth largest nickel producer in the world, Raglan has produced over 40,000 t/Ni p/y for the past five years, and is now looking towards the future. With less than 20% of the property having been explored at depth, Pierre Barrette and his teams are now moving towards the second phase of the mine (called the Sivumut project, meaning 'moving forward' in Inuktitut) to extend the operation's life beyond 2040. The project will leverage the existing infrastructures at Raglan, namely a concentrator, housing, port facilities at Deception Bay, air and land access, and will treat wastewater using Raglan Mine's existing system. Barrette updated: "These two phases represent an investment of about C\$600 million. This project kicked off in 2018, and we are now nearing completion as one of the zones should be in full production by early 2024."

With around 55,000 t/Ni annually, Québec accounted for 42% of Canada's total nickel production in 2021. Looking beyond 2023, despite the effects of the war between Russia (the third largest nickel producer) and Ukraine still being felt, resilient nickel prices and a robust demand outlook will likely boost investment in the best nickel operations and projects in the world.

**Graphite**

Graphite accounts for close to 50% of materials needed in batteries (by weight). With the lithium-ion battery market poised to grow at a CAGR of 19% up until 2030, North American policymakers and mining executives are acting to develop a local value chain capable of competing with China, which currently accounts for 70% of global graphite production.

Northern Graphite Corp will be the key player to watch in the coming months and holds the key to a North American graphite value chain. The firm acquired the Lac des Iles mine Graphite – the only significant graphite-producing operation in North America – in 2022, and kicked off a program to increase production, reserves, and mine life in May 2023. The operation produces 15,000 t/y of graphite concentrate.

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TSX.V: NGC | OTCQB: NGPHF



**North America's only Mine-to-Market Graphite Producer**

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- North America's Only Significant Natural Graphite Producer with well defined growth strategy** (Québec)
- Building 200,000 tpy Battery Anode Material Plant in Baie-Comeau** (Ontario)
- Near-term production growth with large projects in Ontario and Namibia** (Namibia)
- An opportunity to participate in the green energy revolution from mine to market** (Namibia)




PB



CB

**Pierre Barrette and Claude Bélanger**

PB: Vice President - Raglan Mine  
 CB: COO Copper North America and Philippines  
**GLENCORE**

**Can you give an overview of Glencore Canada's copper assets?**

CB: The Horne smelter started in the 1920s. The Canadian Copper Refinery (CRR) – where we take the copper anode from the smelter – has been operating since 1932. Today, we are the only copper smelter and refinery in operation in Canada. Looking to the future, we made a big announcement of a CA\$500 million investment which will allow us to improve our performance in terms of emissions at the Horne smelter. We have a big team working on that project (one of the largest projects in the province of Québec) and the leading one in terms of reducing environmental emissions.

**What are the latest operational updates at the Raglan mine?**

PB: Raglan mine is Québec's largest nickel producer, producing over 40,000 t/Ni p/y for the past five years. We were the first mining company in Canada to sign an impact and benefit agreement (IBA) with local communities in 1995, which is still regarded as

the reference in the Canadian mining business. We have been in operation for 25 years and have almost doubled production since 1997.

We are working on the second phase of the mine, which is referred to as the "Sivumut project", aimed at extending the life of the mine until 2040 and beyond, and which represents an investment of about CA\$600 million. This project kicked off in 2018, and we are now nearing completion as one of the zones should be in full production by early 2024.

**Are you leveraging any new technologies aiming at reducing the footprint of Raglan?**

PB: Raglan Mine is off-grid, so we had no alternatives but to produce our power with diesel generators. With the advancements in windmill technologies, we saw the opportunity to take a turn toward a greener industry. In 2014, we started that shift, with the installation of our first 3-megawatt windmill. We put a second one into operation in 2018. There is great wind potential at Raglan mine.

**What is your assessment of the fundamentals of nickel in the long term?**

PB: Nickel is a strategic metal for the future and the planet's decarbonization ambitions. The stainless-steel industry has been the main customer of the commodity in the past, as nickel is what you add to steel to give it its stainless properties. Today, the battery business is taking a growing part of the nickel demand. The world demand sits at about 3 million tons of nickel per year, we think it will grow to 5 million by 2030, with most of the growth coming from the battery business.

**What efforts must North American leaders make to incentivize mining to decarbonize the economy?**

CB: It takes 10 years to bring a mine into production. Permitting has become a moving target, and for investors, predictability is key. Without predictability in the permitting process, it is hard to assess the costs of a project.

PB: We need to find a way to promote mining better and spread the message that mining is one of the most regulated and disciplined industries in Canada. Some associations are already doing this, but the government should step up and reinforce the mining industry's ESG performance to counter the negative perceptions.

**What will be Glencore Canada's main objectives in 2023 and beyond?**

PB: Glencore wants to be a leader in providing the world with low-carbon key strategic metals. We want to be part of the solution to the supply-demand gap experts foresee in the future. Glencore sees Raglan mine as a strategic asset to support that growth. We have a bright future ahead of us. Less than 20% of our property has been explored at depth, so one can imagine the full potential of the property, hence why we are preparing an expansion of our exploration capabilities. We will help decarbonize the planet in an ever cleaner and greener way.

CB: We are making significant investments in our copper assets in Québec, and we look forward to increasing our recycling capabilities there. The goal is simple: providing the metals to decarbonize the planet. ■



## Guy Belleau

CEO  
SAYONA



**Sayona has the potential to be a leader in North America with over 30% of total hard rock lithium resources on the continent.**



### After having been recently appointed CEO, what is your vision to take the firm forward?

I joined Sayona in September 2022 and was President of the Abitibi Témiscamingue hub. I worked on the preparation of our North American Lithium (NAL) asset in Québec, and since January 1st, I have had the immense privilege to be the CEO of Sayona. I could not think of a better place to be in the world than Québec in terms of growth opportunities, and 2023 will be pivotal for us. Going forward, we will continue to grow resources in Abitibi and James Bay and unveil the potential of the Moblan world-class deposit. With provincial and federal support for critical minerals, Québec is the place to be in the lithium space, and Sayona has the potential to be a leader in North America with over 30% of total hard rock lithium resources on the continent. Going forward, we are going downstream. We currently have a study to produce carbonate, which is our long-term objective by 2026. We want to be fully vertically integrated and produce battery-grade material with lithium from here.

### What are the latest operational updates at NAL?

We successfully started the NAL operation in March and are currently in a ramp-up phase. We are aiming at producing 226,000 t/y of spodumene concentrate (SC6). It is going very well; our team has safely managed the procedure. We produced about 24,000 t already, so are ahead of expectations. Regarding spodumene, we are the major concentrate producer in North America, and the first shipment is scheduled to take place in July. Our partners Piedmont Lithium have secured an agreement with LG and Tesla. After the second transformation in Abitibi we will produce carbonate lithium; we will then be fully integrated from the mine to battery material right here in La Corne.

### Can you expand on your other exploration activities at Authier and Moblan?

We determined that Authier has the potential to be a C\$2 billion business and are currently deploying a huge exploration program right in the pit and outside. In the James Bay hub, at Moblan, we unveiled the first resources in April. We grew the resources from 14 to close to 50 million t. On top of that, we started a very aggressive diamond drilling exploration program there.

### What were the reasons behind your successful transition from a developer to a lithium producer?

We have been very successful to attract and retain talent in the Abitibi. 90% of our workforce is from local communities, and 30% of the workforce is female, so we are proud of our diverse workforce. Technology and ESG are at the heart of our actions. With the scarcity of labor, we need to find ways to remove workers from hazardous areas, which is where technology and automation became key.

We continue to fight climate change and are committed to ensuring our projects are a source of pride for host communities.

### Could Québec become a lithium hotspot globally?

I strongly believe that Québec could become one of the major lithium hubs in the world. Here, we have a unique combination of resources, a supportive regulatory environment, a talented workforce, and a great position within the North American market. We have clean energy with hydroelectricity, we have universities, talent, and power to become a world leader as a lithium producer. With hydropower, we can produce the lower carbon equivalent lithium on the planet, and this is something we can be proud of in Québec. Sayona will be a leader in the battery value chain for the years to come and committed to the province of Québec that NAL would go downstream.

### What makes Sayona a compelling investment story?

There is a world race for Québec's lithium. We own a solid base of the resource there, drawing the world's attention. This year's objectives are orientated to organic growth through aggressive exploration programs in both regions, James Bay, and Abitibi. We have the most expansive exploration program in the province, and the future is bright for Sayona in Québec. Looking ahead, speed to the market and tons of volume will set us apart. ■



## Kirsty Liddicoat

COO  
NORTHERN GRAPHITE CORP



**The headline is that Lac des Iles now has long-term potential, which is key to our strategy of being a sustainable player in the mine-to-battery market for graphite.**



### What are the main updates at the Lac des Iles mine?

The main takeaway on Lac des Iles is that it has moved from being a mine that was supposed to close in 2024 to becoming a cornerstone asset for the company. Let me take a step back, though. After acquiring Lac des Iles in April 2022, a mine with more than 20 years of operational history in the graphite market, we realized that, in essence, there had been a huge underinvestment in exploration on the property. We recently reviewed the historical drilling and MAG surveys that show high-potential targets and interesting intersections on the property. This is what led us to the drilling program we kicked off in May 2023. With this program, we are hoping to increase reserves, extend mine life, and expand production from the existing mine. Our recent acquisition at Mousseau – where we will be looking at a resource estimate in the short term – will support those expansion plans. The headline is that Lac des Iles now has long-term potential, which is exciting and key to our strategy of being a long-term, sustainable player in the mine-to-battery market for graphite. It's an integrated strategy that will see our graphite feed into a battery anode plant we plan to build at Baie-Comeau, which will supply 200,000 t/y in battery anode material (BAM) for the North American battery market. The BAM we produce at Baie-Comeau will be clean and green, powered by hydroelectric power in Québec.

### Can you touch upon Northern Graphite's approach to innovation?

Graphite mining and processing is an exercise in innovation itself. The final graphite product is specific to what the end user needs, so we need to process it in a way that can be used by our different customers. It is a little more complex than other minerals, so every day we are thinking about where the product will end in the market, as lubricants and battery anodes require different approaches, for instance.

### How do you view the supply-demand fundamentals for graphite?

Simply put, there is not going to be enough graphite production to support the green energy transition and reach net-zero targets for the planet. In North America, the deficit is even larger. The demand for battery anode materials due to the shift to EVs will in itself drive graphite demand up 1,000%. Graphite is 48% of the anode and conservative estimates suggest graphite production needs to grow threefold by 2030 to support that shift. We are the only producers in North America producing natural graphite, so we will be key in answering that challenge.

### What is Québec's role in a successful green transition?

Québec is a mining-friendly jurisdiction that is setting itself up to be a leader in the green transition. It has everything going for it. It has the mines, the resources, and clean, green, and affordable hydroelectric power. Just as importantly, it has shown itself to have the political will to champion the success of the energy transition. That is the reason why we are building what will be the biggest battery anode processing facility outside of China here in Québec. Securing our land there in June was key, as it is a key part of our mine-to-battery strategy.

### Can you expand on the conversations you are having with the downstream segment of the industry?

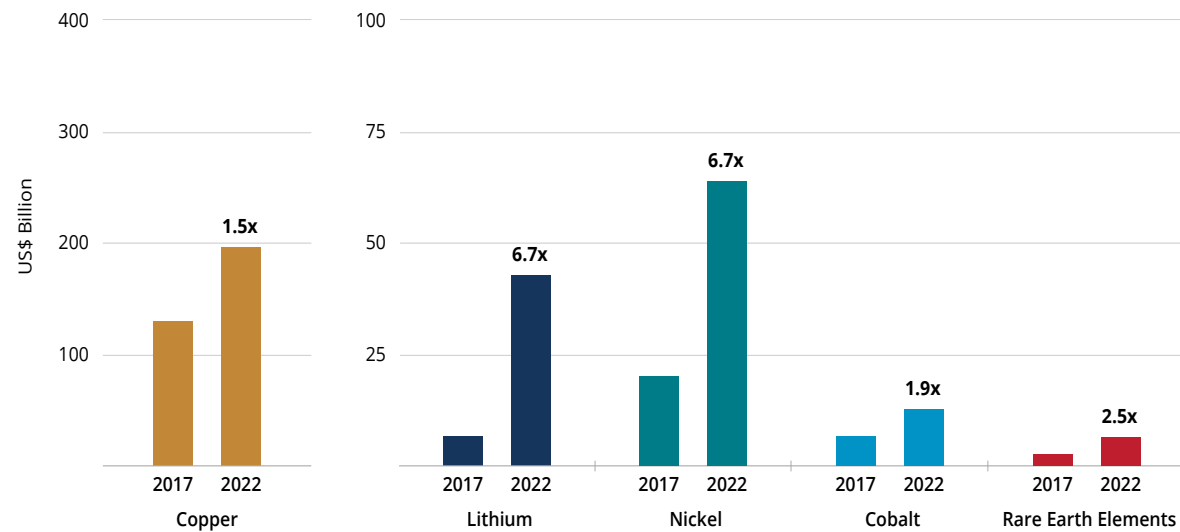
With the energy transition, we are seeing a change in how the downstream segment is looking to buy products. Car manufacturers are excited to come to secure the product upstream. As more is going into the battery market, the demand in the traditional market will also skyrocket. This will lead to natural organic growth. Our thought process on expansion at all our plants is modular, so we can increase our production as the demand increases, as opposed to building a large capacity plant now and not being able to sell the product, or underutilizing the plant.

### What will drive growth for Northern Graphite?

Building our resources and extending the mine life at Lac des Iles, understanding the Mousseau deposit, and most importantly, starting to work on Baie-Comeau. We have secured the land, and the next stage is commencing our PEA. ■

### Market size for key energy transition minerals

Thanks to heightened demand and rising prices, the market size for energy transition minerals doubled over the past five years, reaching US\$ 320 billion in 2022



Source: IEA

>> 56

Beyond production, the firm's integrated strategy aims to feed the graphite from Lac des Iles (and other miners) into its proposed battery anode material plant in Baie-Comeau, scheduled to supply 200,000 t/y in battery anode material (BAM) for the North American battery market.

With battery raw material demand poised to grow at least fivefold to feed all the mega factories being built to support the green transition, no battery mineral requires a larger production increase than graphite. With surging EV sales and graphite prices and valuations remaining relatively low, Kirsty Liddicoat, Northern Graphite's COO, touched upon market fundamentals: "Simply put, there is not going to be enough graphite production to support the green energy transition and reach net-zero targets for the planet. In North America, the deficit is even larger. The demand for battery anode materials due to the shift to EVs will in itself drive graphite demand up 1,000%. Graphite is 48% of the anode and conservative estimates suggest graphite production needs to grow threefold by 2030 to support that shift."

The strategy put in place in Québec a few years back to develop a fully integrated battery vehicle chain is start-

ing to materialize. In 2023, Northern Graphite multiplied talks with car manufacturers looking to secure supply, and Nouveau Monde Graphite entered a commercial framework with Panasonic. NMG, also received a US\$50 million investment from Mitsubishi, Pallinghurst, and Investissement Québec, once again highlighting the role the province's institutions play in the success of its mining strategy. Kirsty Liddicoat expanded on Québec's role in decarbonizing the world: "Québec has shown itself to have the political will to champion the success of the energy transition. That is the reason why we are building what will be the biggest battery anode processing facility outside of China here."

Adding downstream capabilities to production efforts will remain the way forward for Québec's battery metals producers. As the market for nickel, lithium, and graphite doubled between 2017 and 2022, to surge to US\$320 billion today (according to the IEA), Québec's producers are intent on on-shoring upstream and downstream capabilities to offset the impacts of volatile prices, supply chain bottlenecks, and geopolitical turmoil. ■

» "Electrification will require a significant amount of copper. We are seeing never-unseen price forecasts of between US\$ 6 to US\$ 8,, which will make it economical to start mining materials that were left behind in low-grade stockpiles.



**Kiril Mugerman,**  
President and CEO, Kintavar Exploration

» First Nations are business-oriented, notably the Crees communities of the Eeyou-Istchee James Bay region, and that fosters constructive relationships between the First Nations and the mining community.

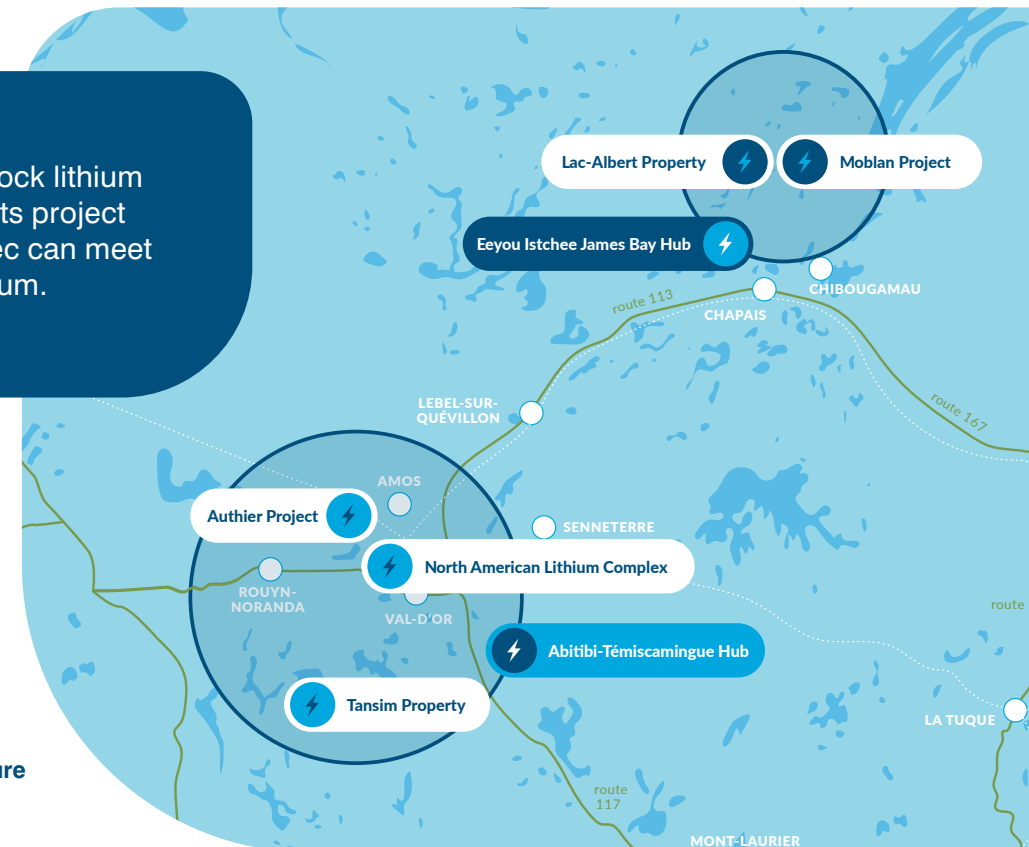


« **Carl Caumartin,**  
General Manager - Canada, Winsome Resources



Sayona's actions contribute to transport electrification and the fight against climate change.

Sayona is the leading hard rock lithium producer in North America. Its project portfolio ensures that Quebec can meet the growing demand for lithium.



Learn more about us by taking a look at our corporate brochure

[sayona.ca](http://sayona.ca)



# Battery Metals Development and Exploration

## Welcoming new players and investment

Image courtesy of Brunswick Exploration

Discoveries are needed to meet battery metals demand and leave the fossil-fuel economy in the past. Incentives are key in attracting foreign investment in exploration, and it is safe to say that Québec excels in that area. Leveraging the Federal Bill C-32, providing the new and non-refundable 30% Critical Mineral Exploration Tax Credit (30% CMETC), the province's institutions have also shifted their focus towards supporting the most promising critical minerals projects.

### James Bay takes on an Aussie accent

Australia's reputation in lithium mining is well-established. The country is the largest producer of spodumene and

mines more than 50% of the world's lithium supply. Armed with that experience – and deep pockets for lithium projects – ASX-listed firms and Australia-HQed companies have started developing projects and staking an unprecedented amount of claims in Québec's Eeyou Istchee James Bay region, and these include Allkem, Patriot Battery Metals, Sayona, and Winsome Resources, to name a few. Frank Marriage, partner at Fasken, noticed the shift: "Something new is working with Australian companies that are now implementing themselves in Canada to develop projects in the critical minerals space. Australians are used to working in a safe, mature jurisdiction, and Québec is one of the best mining jurisdictions in the world."

The lithium potential in James Bay is attracting major interest from the world's biggest mining companies. The market's darling Patriot Battery Metals made a splash when it listed back on the ASX in December 2022, and the firm's ascent is just starting. At its Corvette property, Patriot released in August a maiden inferred MRE of 109.2 million t at 1.42% Li<sub>2</sub>O and 160 ppm Ta<sub>2</sub>O<sub>5</sub> (at a cut-off of 0.40% Li<sub>2</sub>O), ranking it as the largest lithium pegmatite resource in the Americas and the 8th worldwide. Those figures convinced lithium giant Albemarle, which subsequently invested over C\$109 million for a 5% stake in Patriot.

Rio Tinto made a similar move, acquiring 10 of Midland's lithium properties in James Bay. Speaking to the future and metallurgy of Corvette, Patriot CEO Blair Way detailed: "We are aiming to permit a production scenario at CV5 which will propose scheduled construction in 2027 and commissioned and production by 2028. We are optimistic about this timeline because our metallurgy is very straightforward. We do not require flotation, which means our tailings will not contain chemicals or reagents, making tailings management very straightforward."

The relative youth of the lithium exploration and development scene in Québec offers the perfect hunting ground for experienced Australian companies. Winsome Resources saw its share price multiply over sevenfold after it hit constant pegmatite mineralization at its Adina project. As the firm prepares for an initial resource by Q4 2023, Winsome's general manager Carl Caumartin shared his take on what attracted his firm to Québec: "The lithium market, while growing and inciting interest, is perhaps less well understood than the precious and base metals markets, which

the TSX and venture exchanges have traditionally catered for. Winsome has been able to easily raise the venture capital needed from Australia to advance its projects."

### Leading the exploration charge

Dotted around Patriot, Sayona, and Allkem's existing resources are a plethora of juniors and developers intent on turning James Bay into a global lithium hub. Brunswick Exploration holds the largest grassroots exploration portfolio in Canada, and its CEO Killian Charles recognizes in James Bay a world-class lithium potential. Surrounded by Allkem, the firm's Anatacau West project returned a great intercept with 26 m at 1.51%, giving Brunswick the confidence to put more drills in the area. In the long term, Charles is bullish on the region's potential to unlock value: "Give it 10 more years, and like Australia, we will have generated over US\$25 billion of value creation just in the lithium space. Our geological potential is just as good as Australia's. We need discoveries in Québec to feed North America, but also to feed Europe" he forecasted.

Lithium was not always the flavor of the day for financial markets. Now looking more like the flavor of the decade, cherry-picking previously explored properties might become a growing trend in James Bay. Having acquired the Mia lithium project in November 2022, Q2 Metals (which also owns a project in Australia) will be looking to replicate the Patriot success story, namely picking up properties that have been explored several years ago, but not for lithium. Up until five years ago, the Canadian market was avid for gold and copper mostly, explaining how most of the region's geological potential remains untapped. Q2 will be the first company to carry out an extensive lithium-focused exploration program at Mia. With good funding and potential north of Mia at its blue-sky Stellar Lithium property, Q2 will hope to leverage institutional support to advance its projects rapidly. CEO Alicia Milne explained: "It is greatly beneficial to have the government as well as end users involved in exploration projects as it will push timelines forward significantly faster."

### Restarting past copper-producing mines

In August 2023, the US added copper to its critical elements list. Already deemed a critical mineral in Canada, the move further strengthened North America's ambitions to bolster its red metal reserves in light of the green transition. And despite huge investments in exploration, there has not been a significant discovery in North America in a decade. Faced with that reality and growing copper demand, developers in Québec opted for the pathway of restarting past-producing mines. In July 2023, Osisko Metals acquired the past-producing Gaspé mine from Glencore. The resource currently stands at about 456 million t grading at about 0.31% copper, and Osisko Metals currently envisages a life of mine of 25 years that could be the same size as Canadian Malartic. Expanding on the decision-making process behind the transaction, CEO Robert Wares shared: "I believe that we will see a growing trend of restarting past-producing mines to meet the growing copper demand. The curve has just flattened out, and the few discoveries made are not in easy jurisdictions. So, the entire copper supply chain is at threat."

Osisko Metals plans to launch a feasibility study in 2024 and be in production around 2028. Wares discussed the timeline: "It is ambitious, but relative to the rest of the planet, Québec is the place where it will be possible to get a permit in that timeframe."

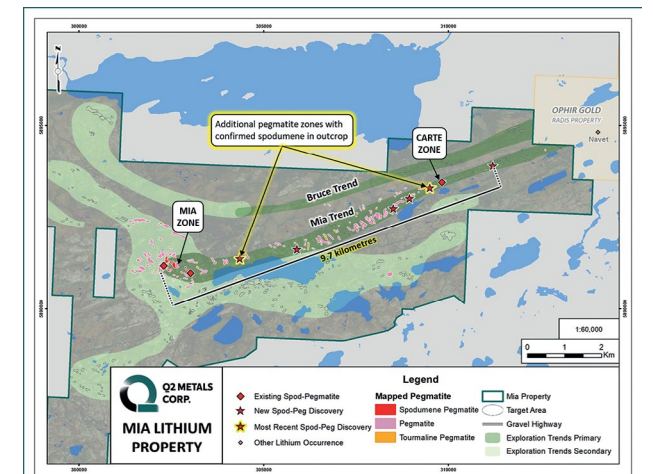
In any case, developers, permitting agencies, and authorities must act quickly. Eliminating greenhouse emissions by 2035 and reaching net zero targets by 2050 will require the world to double its copper output in a short timeframe. Wares warned: "There is a disconnect between the supply and demand fundamentals for the red metal. The reality of capital markets and political stability is another story compared with climate forecasts."

Beyond Gaspé and the Troilus mine (which produced around 70,000 t/y of copper between 1996 and 2010), a limited number of projects – those of Doré Copper, QC Copper & Gold, and Kintavar Exploration – are aiming at increasing the province's copper output in the long term. In July, the latter filed a NI 43-101 report for the maiden copper MRE at the Sherlock zone of its Mitchi project. Expected to be done by mid-2023, a PEA will assess the hub-and-spoke model of Mitchi. Speaking of the fundamentals, Kintavar's president and CEO Kiril Mugerma explained: "We are seeing unprecedented price forecasts of between US\$6 to US\$8, which will make it economical for existing mines to start mining materials that were left behind in low-grade stockpiles."

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**A Leader in Canadian Lithium Exploration**

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**ACCELERATING CANADA'S FUTURE BY  
ADVANCING THE MIA LITHIUM PROJECT  
IN THE EYYOU ISTCHEE JAMES BAY  
TERRITORY OF QUEBEC, CANADA**

**Q2 METALS CORP.**  
TSXV: QTWO, OTCQB: QUEXF, FSE: 458

**CONTACT:**  
Jason McBride  
Jason@Q2Metals.com





## Blair Way

CEO  
PATRIOT BATTERY  
METALS

### Can you give an introduction to Patriot Battery Metals and the company's portfolio?

Patriot Battery Metals is a hard rock lithium exploration company focused on advancing its district-scale 100%-owned Corvette property in the James Bay region. But we also have several other assets in our portfolio, including lithium assets in Québec and the Northwest Territories, and a gold and copper property in Idaho. The Corvette property is one of the largest and highest-grade hard rock lithium projects being explored today. It is host to the CV5 Spodumene Pegmatite with a maiden inferred mineral resource estimate of 109.2 million t at 1.42% Li<sub>2</sub>O and 160 ppm Ta<sub>2</sub>O<sub>5</sub> (at a cut-off of 0.40% Li<sub>2</sub>O), ranking it as the largest lithium pegmatite resource in the Americas and one of the top 10 largest lithium pegmatite resources in the world.

### Can you elaborate on what makes Corvette a fascinating asset?

So far we have concentrated our efforts on only a small portion of the property; roughly 25 km have been evaluated to date with more than 25 km yet to be explored. We have dis-

covered more than 70 lithium pegmatite outcrops over roughly 20 km of trend evaluated to date, which form multiple distinct clusters throughout the property.

The CV5 Spodumene Pegmatite has been traced by drilling over a strike length of 3.7 km and remains open along the strike at both ends and to depth along a significant portion of its length. We also intend to complete a maiden mineral resource estimate for the CV13 Spodumene Pegmatite Cluster in the first half of 2024. The CV13 Spodumene Pegmatite Cluster, where we have identified more than 20 spodumene pegmatite outcrops, is located approximately 3.8 km along the geological trend of the CV5 Spodumene Pegmatite and some 1.9 km along the trend from the CV8 Spodumene Pegmatite Cluster.

In summary, we are moving forward with field exploration on the unexplored areas of the property to discover additional lithium pegmatite.

### Do you think it is the lithium market maturity that is sparking Australian companies to come to Québec?

A big part of it is that most of the discoveries that were made in the last lithium cycle were not that great. They were closer to roads, which made them more accessible, but they were not of the same scale as we see in Western Australia. There has been much more exploration in Western Australia compared to Québec, but the prospectivity for Québec and the Canadian Shield is quite high with the Greenstone belts and a similar geological environment to host these larger deposits. In October 2021, Patriot Battery Metals was one of the few companies actively exploring lithium, as there was little or no interest in lithium in Canada. Our significant initial drill results caught the attention of Australian investors, and we financed our next few drill programs with all-Australian money. The Canadian market is getting up to speed, but it is just more reticent. The Australians are more informed and aware of what needs to be found, so it makes sense that they are here in Québec exploring. ■

### Looking ahead

There will be several hurdles to overcome before seeing new producers in the critical minerals space in Québec. Two of the province's most advanced developers highlighted pressure points brought about by the reality of capital markets before making it to the big stage. Few are those that boast more exploration experience than Robert Wares in the province, and for him, the issues lie in the cycle/waning of investor interest in the Lasso Curve after firms announce their resource: "As you enter the feasibility study and permitting stages, you become less interesting to investors, and your retail market dries up. Some resource funds used to be long and supportive, but they have disappeared at the expense of retail investors. So, developers are in a tough space, and you cannot do debt financing to a reasonable level as you do not have your permits."

The time between a firm's PEA and the PFS is where the real cash crunch lies. Gordana Slepcev, Lomiko's COO, noted that despite support for flow-through financing and increased tax reductions for critical mineral exploration, investments to complete the engineering and design lack before the FS. Osisko Metals' decision to do a JV with Appian at its zinc-lead Pine Point project in Northwestern Territories is a lesson on how to navigate the current environment as a critical minerals developer. Simply put: "It is better to have a 40% interest in a permitted project than to sit at 100% ownership with no clear path forward toward production," said Robert Wares, CEO.

With more projects planned to enter production in the next five years, Québec is well poised to supply the North American market with vertically integrated battery materials. With discoveries just starting to materialize in James Bay, it appears that the region will shortly be known as a global lithium hub, and will continue attracting ambitious explorers from all continents looking for "white oil". ■



## Robert Wares

CEO  
OSISKO METALS



**We want to get into production in five years. It is ambitious, but relative to the rest of the planet, Québec is the place where it will be possible to get a permit in that timeframe.**



### What are the latest updates at the Gaspé Copper project?

Gaspé Copper is a past-producing asset that we acquired from Glencore in July 2023, after we decided to diversify into the copper space beyond our Pine Point zinc and lead project in the Northwest Territories. The old mine site closed in 1999 after 45 years of production.

To acquire the site, Osisko Metals issued Glencore a US\$25 million secured convertible note that can be converted at a later date for a 21.8% stake in the company. Glencore retains a 1% NSR on the historical Mount Copper open pit and a 3% NSR on all other minerals extracted from Gaspé Copper. Osisko Metals has committed to spending CAD\$55 million over four years to bring the project to shovel-ready status. Osisko Metals will pay Glencore US\$20 million when commercial production begins. The deal also includes an off-take agreement whereby Glencore will purchase 100% of the concentrates produced at Gaspé Copper. There is as much copper left in the ground as in the past 45 years of production, so we envisage a mine of 25 years that could be the same size as Canadian Malartic.

The resource currently stands at about 456 million tons grading at about 0.31% copper. We are advancing the project through drilling to validate that resource. We drilled 28,000 m in the summer of 2022, and by year-end, the bulk of the resource should be in the measured and indicated status, allowing us to launch a feasibility study in 2024. We also went ahead with the Phase 1 Environmental Baseline Study. We want to get into production in five years. It is ambitious, but relative to the rest of the planet, Québec is the place where it will be possible to get a permit in that timeframe.

### Taking Pine Point for example, why is the JV model interesting for developers?

Pine Point is a past-producing zinc and lead mine in the Northwest Territories. Markets are notoriously tough on small-cap companies in the development space. Once you have announced your resource, you enter the down cycle/waning of investor interest in the Lasso Curve. And as you enter the feasibility study and permitting stages, you become less interesting to investors, and your retail market dries up. Some resource

funds used to be long and supportive, but they have disappeared at the expense of retail investors. So, developers are in a tough space, and you cannot do debt financing to a reasonable level as you do not have your permits. Capital markets are not structured to support that stage of development.

The best way to advance projects is to JV. This is what we did at Pine Point: it is better to have a 40% interest in a permitted project than to sit at 100% ownership with no clear path forward toward production. Acquiring assets and advancing them to drilling requires partnerships for most junior explorers now. This is the best solution for most developers in this environment.

### What is Osisko Metals' approach to sustainability?

Social acceptability is essential today, most governments will never approve a project without it. In the case of Gaspé Copper, the mining town of Murdochville is the first impacted community. When this mine goes ahead, it will bring jobs and more money invested into the town. We have started the process with the town council, made a presentation last fall, and kept an open communication to keep residents informed. People have concerns about a new smelter, despite my reassurance that there will not be a new one. We will ship the concentrate to Europe, mostly. I attended a meeting with First Nations in June to address their concerns and discuss business arrangements. Communication starts at the exploration level.

### How will Osisko Metals fare in 2023?

One cannot believe in the energy transition without believing in copper. Grid systems, renewable energies, EVs, all these technologies require copper. If you believe in the energy transition, you should be investing in copper projects, and we believe we have in our hands a fantastic project that has an almost guaranteed chance of being permitted in a reasonable timeframe.

At the same time, we are moving swiftly this year to advance the Pine Point project in the NWT toward production. ■



## Killian Charles

CEO  
BRUNSWICK EXPLORATION



**We like to talk about the lithium triangle in South America, but there is nothing preventing the same kind of potential region in Québec.**



### What are the latest updates from Brunswick in 2022 and so far in 2023?

2022 for us was a year of a compilation of growth and laying the foundations for grassroots lithium exploration. 2023 is the execution year. We hold the largest land package in Canada, and our portfolio is still growing, but this is the year that we are putting teams in the field and looking at the targets we want to hold. This will be the focus for the rest of the year. In the second half of 2023, we will move into drilling the high-priority targets.

### What do you feel your Québec properties, such as James Bay, hold in terms of lithium potential?

Québec is a core component of our work, and James Bay is an incredibly enticing area for lithium discoveries. We like to talk about the lithium triangle in South America, but there is nothing preventing the same kind of potential region in Québec. Brunswick, with our portfolio, is at the forefront of making materially significant discoveries in that space.

### Can you touch upon your latest high-grade intersects at the Anatacau West Project?

We went directly to the ground to drill that opportunity and got a great intercept with 26 meters at 1.51% Li<sub>2</sub>O. We will go back and drill it later this year. On the main Anatacau block, we have spodumenes cropping there and are extremely excited. We will make announcements soon, and I am convinced we will be there drilling in the second half of the year.

### How can North America meet the lithium demand?

Today, we see an upheaval in the Canadian lithium market. We are for the first time building refining capacities in North America. We have not built a copper refinery in 70 years on the continent, but we are building lithium refining capacity. It now makes sense to have a local source of lithium. Canada is set to lead the charge in terms of lithium exploration, and we are just getting started. We need discoveries in Québec to feed North America, but also to feed Europe.

### Is lithium-focused investment going more toward the production or the downstream value chain?

A downstream facility is just a chemical plant. It is a lot easier on the permitting side. When it comes to exploration, there are many more risk factors. This is why there has been a focus on the downstream. On the upstream side, investment is nowhere near as high as it needs to be. We are in a unique scenario now where we are building plants without the asset base supply to feed them. That puts pressure on the price: those facilities are going to get hungry. Decarbonization is not just the flavor of the month; without lithium and other critical minerals, we are stuck in an oil and gas economy. Decarbonization will affect every single one of us, and to achieve our goals for decarbonization we are going to need companies like Brunswick Exploration to find the necessary lithium.

### What is Québec's role in decarbonizing the world?

Québec has the potential to be a world-class supplier of lithium. When people think of oil and gas, they think of the Middle East, and soon they will think of Québec in the same way as a source of lithium. We need to get all stakeholders to realize that potential. The need is now, we need to push and make sure that everyone is involved to get this done as efficiently and sustainably as possible.

### What will set Brunswick apart in the months ahead?

Our growth strategy is flexible. We are always on the hunt for future opportunities, whether it is staking new pegmatites in new regions, or through partnerships. We are open to transactions that allow us to make new lithium discoveries. With Brunswick operating on such a large scale, we can have multiple strategies.

The coming months will be about absolutely executing our exploration strategy. As we define these spodumene targets across our portfolio and start drilling them, that will take us to another level. I want us to find one and continue from there. ■



## Alicia Milne

President and CEO  
Q2 METALS



**Q2 has confirmed mineralization on our Mia Lithium project and we are well funded for our upcoming exploration program.**



### Can you introduce Q2 Metals and the company's portfolio?

Q2 Metals was a small mineral exploration company with zinc projects in British Columbia and Newfoundland. These projects were not progressing and so my fellow director, Jody Bellefleur, and I took over the company. An exploration program on the Australia gold project was completed and, although we had some encouraging results, it was a challenging time to raise further funds for a gold project. We started looking at projects in different commodities and were introduced to a prospector in northern Québec who had a project available, the Mia Lithium project, and we acquired it in November 2022. The market reacted very well. In January 2023, we started trading on the TSX as Q2 Metals, with the new name to reflect the company's focus on our two primary assets, the Mia Lithium project in Québec and the Big Hill Gold project in Queensland.

### Can you elaborate on the highlights of the 2023 exploration program at the Mia Lithium project?

The Mia Lithium project is located near the Cree community of Wemindji in Eeyou Istchee James Bay. There is confirmed mineralization on the project from sampling that was done by the government in the mid-90s, but it has historically been explored for gold and base metals. Q2 will be the first company to execute a substantial exploration program focused on lithium.

We acquired the Mia project in November 2022, and the project was under snow up until May. We did as much data compilation, satellite imagery, IP surveying, and anything else we could do to get us prepared for our inaugural drill program this summer. We had a team on the ground on June 1st, 2023, who completed several days' worth of mapping and sampling.

The initial exploration program will consist of mapping and sampling concentrated on mineralized outcrops and a 7 km strike of pegmatite that has never been sampled. Due to the forest fires, we and other companies in the region are still not allowed back into the area, but hopefully, weather permitting, we will get back on site in the coming weeks. The plan is to drill 8,000 to 10,000 m as soon as we are allowed to resume operations.

When we first acquired Mia, we completed a financing round where we raised US\$1.25 million. In February 2023, we did another financing round as we were approached by groups that wanted to invest, and we were fortunate to raise another US\$10.25 million. We are well funded, with US\$7.5 million of the funds raised being flow-through dollars that must be allocated to exploration work on the property.

### What are the advantages of exploring lithium in Québec, and overall, the potential of James Bay?

The potential in Québec and James Bay is tremendous. Patriot Battery Metals is the darling of the James Bay region with a world-class discovery, and the provincial government is extremely supportive and often participates in financing projects in the region. It is greatly beneficial to have the government as well as end users involved in exploration projects as it will push timelines forward significantly faster. Canada can become a major hub for lithium.

### What must be done at the industry level to attract more diverse talent at the top management position of mining companies?

It has been a slow process of creating diversity in the industry and I hope it is only a matter of time before it is no longer an issue. It's going to take those wanting management positions to put themselves forward as well as those who are already in top management positions to recognize this, mentor, and bring in the next generation – not only in management but in the industry as a whole.

### Why is Q2 going to be a great story for investors in the coming months?

Q2 has confirmed mineralization on our Mia Lithium project and we are well funded for our upcoming exploration program. Our objective is to execute our strategy and hopefully make additional discoveries. As well, just north of Mia, we have the Stellar Lithium project, which is a blue sky project that has never been explored and sits on a greenstone belt. We are excited about not only the Mia project but also what the Stellar project might hold. ■



## Gordana Slepcev

COO  
LOMIKO METALS INC

### Can you give an overview of Lomiko Metals' activities over the past year?

In 2022, we completed a 13,000 m, 79-hole, infill drill program at La Loutre to upgrade the inferred resources to the indicated category. There has been a 184% increase in tonnage in the indicated resources and we are now reporting an estimate of 64.7 million t averaging 4.59% carbon pt for 3.0 million t of graphite in the indicated category. As a result of the infill drill program, there is also the addition of 17.5 million t of inferred resources averaging 3.51% carbon pt for 0.65 million t of contained graphite. The MRE assumes a US\$1,098.07/t graphite price and a cut-off grade of 1.50%Cg (graphitic carbon).

In February 2023, Lomiko completed PFS-level metallurgical testing and completed a flowsheet optimization.

Lomiko also has six other graphite properties in the Grenville sedimentary belt where we identified 55 targets in 2022. In May 2023, we started with a field program where to field prove these targets.

### What milestones will Lomiko try to achieve at the Bourier lithium project?

We are currently doing geochemical studies at the Bourier project to identify the LCT pegmatites containing spodumene which we will target during the field program. ■



## John Passalacqua

CEO  
FIRST PHOSPHATE

### Can you introduce First Phosphate?

We plan to take a vertically integrated approach from the mine source to the development of LFP cathode active material with some of the world's largest partners. The company holds over 1,500 sq. km of royalty-free district-scale land claims in the Saguenay-Lac-St-Jean Region of Québec.

Our properties consist of rare anorthosite igneous phosphate rock that generally yields high-purity phosphate material devoid of high concentrations of harmful elements. Anorthosite igneous phosphate rock represents 1% of the world's phosphate reserves, and it is by far the purest. 90% of this rock type can be made into purified phosphoric acid using our partner Prayon Technologies' process.

### What are the key milestones First Phosphate is looking forward to achieving in 2023 and 2024?

A huge milestone in 2023 was to commission our phosphate concentration pilot plant. We are also working on our PEA at Lac à l'Original, which we expect to complete by the end of 2023 if not earlier, to move into the feasibility study stage by 2024. At Bégin-Lamarche, we recently completed 4000 m of drilling and will conduct further drilling next year to eventually publish a 43-101 report on the property. ■



## Martin Kepman

CEO  
MANGANESE X

### Can you give an update on Manganese X's activities over the past year?

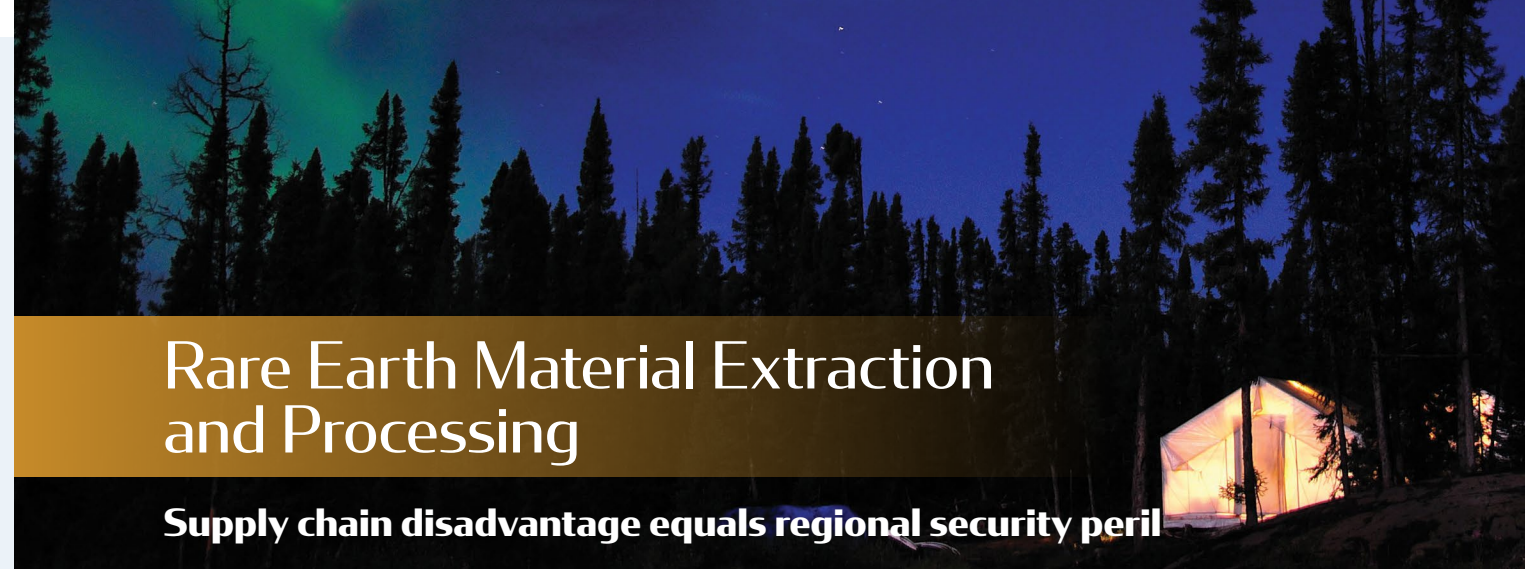
Manganese X achieved many great milestones including updating our resource, completing a robust PEA, affiliating ourselves with the consulting engineering company Wood Canada, along with continually working with Kemetco Research, and then moving into our pilot plant project. We are in the final phases of completing the pilot plant which will demonstrate and validate Manganese X's innovative patent-pending process to produce high-purity manganese sulfate monohydrate (HPMSM) EV-compliant materials suitable for cathode manufacturing.

### Can you elaborate on Manganese X's key catalysts after the pre-feasibility study?

Our current key objective is producing and pre-approving the samples. Manganese X has done a PEA, the highlights of which are US\$486 million NPV, 25% IRR, a 47-year mine life, and producing an average of approximately 75,000 t/y.

### What is Manganese X's strategy to become the first publicly traded mining firm in Canada to commercialize high-purity EV-compliant manganese?

EV revolution is underway and innovative battery chemistry will be the catalyst that moves us into an interesting future. We believe that manganese will have a big influence on EV batteries, and this will position Manganese X to take advantage. ■



# Rare Earth Material Extraction and Processing

## Supply chain disadvantage equals regional security peril

Image courtesy of Commerce Resources

A growing consensus among policymakers in Beijing to further reinforce the export bans and restrictions on rare earths imposed on the West since April 2023 is by no means a slight security concern. China seemingly seems intent on pursuing a strategy of weaponizing minerals like gallium and germanium, and North America has much to do regarding its ability to produce and refine rare earths needed for the green transition. The global demand for rare earth elements doubled to 300,000 t/y in the past decade (and was measured at barely 40,000 tons at the dawn of the century). "REEs are by far the rarest commodities needed for the green transition," stated Commerce Resources' president, Christopher Grove.

Turning rocks into magnet components is no easy task, particularly when processing plants, refineries, and recycling facilities are thousands of kilometers away. Figures from the International Energy Agency show that China controls a staggering 87% of global rare earths refining capacity. With this precarious geopolitical context in mind, the advances made over the last two years should enable Québec to establish itself as a well-needed North American leader in the entire rare metals value chain.

### The terbium and dysprosium potential

The world can expect more samples and production to come from Québec's northern territories in the year to come. Having added 15,000 m of drilling in 2023, Commerce Resources sees the potential for Ashram, one of the world's largest RE deposits, to grow even bigger. Christopher Grove and his team keep developing the project and see growing interest for the firm's mixed rare earth carbonate, with La Rochelle-based Solvay notably requesting more samples a decade after Christopher originally toured their facility in Western France. And in July 2022, Commerce Resources shipped its first sample of marketable mixed rare earth carbonate – Neodymium and Praseodymium – to a major rare earth producer. Grove explained: "Anybody with solvent extraction (SX) processing is looking for a new source of feedstock. The interest of anyone in magnet manufacturing would be in Commerce Resources because of our heavy percentage of the four key REEs for magnet manufacturing."

Nunavik is poised to see socio-economic growth in parallel with the development of its rare earth industry. Financiers also understand the importance of building a rare earth supply chain outside of China. In November 2022, Torngat

Metals secured a US\$50 million investment from Cerberus Capital Management for its Strange Lake RE project in Nunavik. To date, this represents the biggest single investment in rare earths in Canada. Strange Lake is one of the largest rare earth deposits containing both light and heavy REs. That investment has unlocked the potential for Torngat to move towards a PFS and a BFS, with a path to the production of high-purity, rare-earth oxides in a few years after the BFS.

With the rapid acceleration in the production of EVs, dysprosium, and terbium have risen to the top of the criticality list. As put by Christine Burow, chief marketing officer, Torngat Metals: "To build a complete domestic North American supply chain there needs to be the certainty that rare earth oxides are going to be available domestically. To make manufacturing investments, these companies need certainty that they will have long-term supply security of responsibly produced rare earth from outside of China."

Once in production, Torngat Metals' Strange Lake project will be essential to the development of a complete North American supply chain for the EV market, as the firm should become the largest producer of dysprosium outside of China. That feat, critical for the electrification value chain, will be accomplished with the help of a Finnish firm with a global presence, Metso. The latter will pilot test the beneficiation of ore extracted from the Torngat Metals Strange Lake project, with the production of RE concentrate expected by the end of 2023. In the words of Giuseppe Campanelli, Metso's president of North and Central America: "Metso has a pilot plant in place that will process ore from the Torngat Metals Strange Lake project. This project is a critical driver for the manufacturing of permanent magnets for electric motors, wind turbines, and other low-carbon technologies. The next stage will be to supply them with the engineering to showcase the scalability of their production."

» There is great government support to make a North American EV supply chain a reality, and they are thus investing in projects and companies that can contribute to this goal.



Kiril Mugerman,  
President and CEO, Geomega Resources



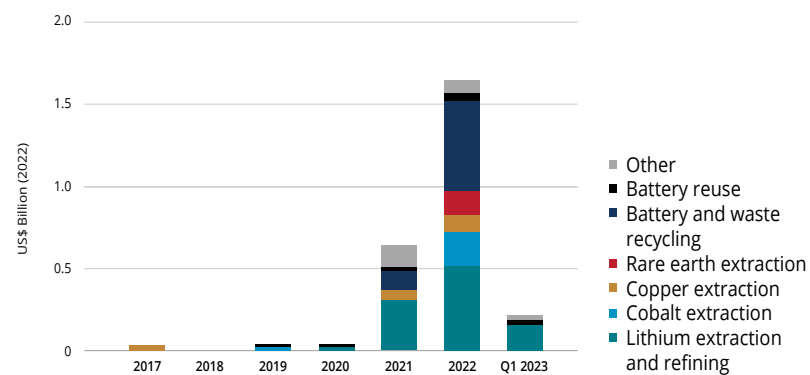
**Life after mine**

While Québec is en route to enhancing its rare earth production by mid-decade, calls have emerged in recent years for the province and its North American neighbors to develop downstream capabilities. This would allow REEs produced in the continent to be processed locally, rather than having to travel to China (most probably), significantly impacting their overall carbon footprint, and Canada and the US' ability to control the destiny of their minerals from mine to end product. Christopher Grove commented: "There is a lot of activity in terms of governments and industries looking at creating those nascent industries right now."

This is illustrated by the joint government and Rio Tinto push to invest C\$737 million to cut carbon emissions at the Rio Tinto Fer et Titane facility, which currently processes titanium dioxide and scandium oxide in Sorel-Tracy.

**Rocky financial markets, but investor favoritism**

**Despite headwinds in the wider venture capital sector, critical minerals start-ups raised a record US\$ 1.6 billion in 2022**



Source: IEA

While there is no need to debunk the inaccurate prejudices that producing rare earth is dirtier than the production of any other minerals, there are also debates to be had regarding our capacity to recycle them in North America. Indeed, the end spectrum of the value is what sets the region

apart from its Asian counterpart, at least from the sustainability angle. Geomega is building the world's first sustainable rare earths recycling facility in Saint-Bruno-de-Montarville capable of processing 4.5 t of magnet waste per day, leveraging two Québecois competitive advantages: unique innovative technology and hydro-power. Expecting the plant to be commissioned in 2024, president and CEO Kiril Mugerma detailed the global economics behind the project: "When it comes to recycling rare earths, you are looking at small volumes of magnets, and thus we have no choice but to look at the global supply of magnet scrap. If you were to depend only on one country's supply, it would be extremely hard to build an economical, large-volume operation."

Projects that are at the peak of their development, such as Strange Lake and Ashram, showcase how Québec's rare earth industry is reaching maturity. Actors in the province have the ambition to play key roles at the production, processing, and recycling levels, and have paved the way for the next years to be pivotal in Québec's rare earths story.

From development to recycling, including processing plants, a future complete value chain of rare earths is a plausible scenario in Québec. And with that ambition, it is realistic to expect more investment in that segment of the industry; a true magnetic attraction. ■

**Unleash the Power of Rare Earths**  
Strange Lake, Nunavik, Quebec

**MÉTAUX TORNGAT METALS**

- **Globally significant:** strategic asset positioning Québec and North America as a powerhouse in the permanent magnet supply chain for electrification and low-carbon economy transition
- **Unique geology:** full suite of light and, notably, heavy rare earths that are essential for permanent magnets, and not typically found in sufficient quantities in a single project
- **Fully funded to Bankable Feasibility Study:** backed by US\$50 million from cornerstone investor Cerberus Capital
- **Values-based partnerships:** committed to mutually beneficial partnerships with local communities, honouring the spirit of the people and the land, and delivering excellence in responsible mining

www.torngatmetals.com  
information@torngatmetals.com



**Christine Burow**

Chief Marketing Officer  
**TORNGAT METALS**

» We believe in the goal of growing a rare earth industry in Canada, which means multiple projects need to get into production here within the next few years. «

**What have been the main milestones achieved by Torngat Metals over the past year?**

Torngat Metals has secured a new strategic partner, Cerberus Capital Management, that has committed US\$50 million to the Strange Lake rare earths project, allowing us to proceed on all fronts. Torngat is now a foundational company in their Supply Chain and Strategic Opportunities Fund, focused on strengthening the critical supply chains of the US and its allies, especially Canada.

**Can you elaborate on Torngat's timeline on the pathway to production?**

During the first half of 2023, Torngat has been focused on building and executing a comprehensive plan, and we are in the process of refining our schedule. We are happy to have already started the environmental impact assessments as there are multiple jurisdictions that we must comply with, including Canada, Québec, the Kativik Regional Government (KRG), and the Newfoundland and Labrador, and Nunatsiavut governments.

We have a large engineering effort underway. Torngat aims to complete our pre-feasibility and feasibility studies by the end of 2025. We will then go straight into obtaining permits and

raising construction financing, moving steadily towards construction and ultimately production.

**How do you plan on feeding the growing rare earth market once Strange Lake goes into production?**

To meet demand there needs to be a significant increase in supply. We believe in the goal of growing a rare earth industry in Canada, which means multiple projects need to get into production here within the next few years. For our part, Torngat continues to improve the efficiency of our processing to have the most cost-effective production of rare earths while mining in a socially and environmentally responsible manner.

Unlike most other rare earth projects, the Strange Lake deposit contains the full suite of critical light—neodymium and praseodymium, and heavy rare earths—dysprosium and terbium. Most projects are lacking in these two heavy rare earths critical for the production of permanent magnets that enable high-efficiency motors for electric vehicles (EV), wind energy, robotics, drones, and other leading-edge technologies. Fortunately, Torngat Metals will be in a position to address the dysprosium and terbium supply gap and will be the largest producer of dysprosium outside of China.

**What is the state of the rare earth supply chain in North America, and how can it improve?**

The permanent magnet supply chain starts from high purity separated rare earth oxides, conversion to their metal form, production of magnet alloys, production of magnets, and finally assembly into finished products. To build a complete domestic North American supply chain there needs to be the certainty that rare earth oxides are going to be available domestically. There have been several announcements from companies considering and planning to make permanent magnets again in North America, but to make those manufacturing investments, these companies need certainty that they will have long-term supply security of responsibly produced rare earth from outside of China. This is a difficult supply chain to build— how do you line up all of the investments for each required supply chain step at the same time when they are dependent on each other for making big capital decisions? This is where governments play a key role and it's been exciting to see the release of the Québec government's Critical and Strategic Minerals Strategy and the Canadian and US governments' new critical minerals strategies, policies, and acts being implemented. It proves that there is support for developing a North American supply chain, and this is extremely important for securing investment across every supply chain step.

**What is the importance of Québec for the future of the green transition?**

Québec is leading the way, not only due to the significant geological endowment but also because the province has a long history of successful mining and is continuing to improve how it does mining in terms of Indigenous partnerships, and environmental, social, and governance standards.

**What will be Torngat's key priorities in the next year?**

We are expanding and building the team and advancing strategic partnerships. This includes partnering with Indigenous communities who are the experts on their land. Another key focus is executing the environmental impact assessment processes, since these vital processes require significant time and effort. ■



»» **What we need is the downstream industries to be created, for the REEs produced in North America to be used to manufacture products domestically.** ««

## Christopher Grove

President  
**COMMERCE RESOURCES**

### What are the latest updates at the Ashram deposit?

We completed another excellent drilling program in 2022, and when the drilling results came in February, a lot of people were astounded. This included an intersection that was close to 400 m at 2% rare earth oxide. The Ashram deposit extends 700 m north to south, and 300 m east to west, and we have drilled it with constant mineralization from the surface down to below 600 m.

We are also producing another 1.5 kg of the mixed rare earth carbonate we have been producing for the past year. We have much industry interest waiting for samples of this, and we will have to be parsimonious in that regard. This material has one of the highest percentage of the four rare earth elements essential for the manufacture of permanent magnets. The mixed REE carbonates we have been producing are the most valuable produced and are fully radioactive-free.

### What is the pathway toward production at Ashram?

We continue to be pushing ahead on all programs for the completion of the PFS, which we expect to complete by Q1 2024. Publishing it will allow us to

start the 18-month process of data collection for the Environmental and Social Impact Assessment. During that period, we also want to finish the bankable FS. We will then be able to apply for a mining permit. In 2027, we should be in production.

### How can North America reduce its dependence on China for REEs?

It is essential that more production and downstream manufacturing are initiated in North America. MP Materials could become the single largest magnet manufacturer in the West, with its 200,000 sqft facility in Fort Worth. What we need is the downstream industries to be created, for the REEs produced in North America to be used to manufacture products domestically. There is a lot of activity in terms of governments and industries looking at creating those nascent industries right now.

### How do you assess the regulatory environment and permitting process in Québec?

The Prime Minister and Jonathan Wilkinson, the Minister of Natural Resources, have both spoken about streamlining the permitting process. Québec currently sits at a healthy

number 6 on the Fraser Institute, but several years ago, there was a new by-law passed in the southern two-thirds of Québec, which lowered Québec from one of the top spots. This additional requirement for another EIAS from the community that is closest to the mineral project is not applicable in Nunavik, where Ashram is. If the Fraser Institute looked at the difference between Nunavik and Québec, Nunavik might be number 1. Nunavik is the most streamlined jurisdiction in North America to advance a mineral project.

### How important are REEs for a successful green transition?

REEs are by far the rarest commodities needed for the green transition. Back in March, Tesla made an announcement on investor day about how they would transition away from REE permanent drive motors, because of the mining and processing of REE being environmentally damaging. That was simply incorrect; For example, Mountain Pass, the only operating REE mine in North America, is running right on the other side of the state from Tesla, and the Sierra Club is not picketing their operations. The idea that REE mining and processing is damaging comes most specifically from the historical operations run by China.

### Why will Commerce Resources be a great story for investors in the near term?

The Ashram project has the most attractive of the most standard commercialized fundamentals for an REE project. It is the largest monazite-dominant defined resource of the REEs hosted by a carbonatite. We have added ~15,000 m of drilling to the original resource, and we are excited to release the new resource in the PFS. The Ashram deposit will arguably be a little bigger and much more defined. Overall, we have not tapped into the totality of the resource, as we have only drilled from the surface to below 600 m. How many other REE resources does one need when one sits on a resource that has generations of production? Because of this resource and its inherent very high distribution of the magnet fee REEs, we have more expressions of interest from industry majors than ever before. ■

# World Race for Lithium

## Players in James Bay give their take on the potential for the region to become a North American lithium capital



“Going forward, we will continue to grow resources in Abitibi and James Bay and unveil the potential of the Moblan world-class deposit. With provincial and federal support for critical minerals, Québec is the place to be in the lithium space. I strongly believe that Québec could become one of the major lithium hubs in the world.”

**Guy Belleau, CEO, Sayona**

“Patriot Battery Metals now has the largest lithium pegmatite mineral resource in the Americas and the eighth largest globally. There has been much more exploration in Western Australia compared to Québec, but the prospectivity for Québec and the Canadian Shield is quite high with the Greenstone belts and a similar geological environment to host these larger deposits.”



**Blair Way, CEO, Patriot Battery Metals**



“James Bay is an incredibly enticing area for lithium discoveries. We like to talk about the lithium triangle in South America, but there is nothing preventing the same kind of potential region in Québec, which will be known as a lithium hub globally. The James Bay region will be known for lithium.”

**Killian Charles, CEO, Brunswick Exploration**

“James Bay, claims are almost overlapping with each other, with flurries of announcements of newcomers entering the area almost every week. We have been courting other juniors that do not have our exposure and are considering further acquisition and taking interest in lithium players.”

**Carl Caumartin, General Manager - Canada, Winsome Resources**



“James Bay is a center of gravity for North America just based on the amounts of deposits that are there already, and more are going to be discovered. For lithium explorers in the area, we are in the right place at the right time.”

**Ian Campbell, CEO, Harfang Exploration**



"There is a noticeable change taking place in Québec's mining sector, with an increased interest in exploring new technologies and fostering innovative thinking."

**Nadine Veillette,**  
**President,**  
**Abitibi Geophysics**

# INFRASTRUCTURE, EQUIPMENT AND INNOVATION

GBR SERIES • QUÉBEC MINING 2023

Image courtesy of IOS Services Géoscientifiques



# Decarbonization: the Home Advantage

## Electrifying Québec mines slowly, but surely

Image by Andrei Orlov at Adobe Stock

While there are no doubts that the electrification of the mining industry is underway, a thorough analysis of the components at play for mines to reach net-zero targets is needed. Selecting the right electrical technologies and products, their dimensioning, compatibility with existing infrastructure, and compliance with environmental standards is by no means a rapid (or cheap) undertaking. Having been around for decades, Québec miners and service providers are ideally placed to have the necessary hindsight to understand what the electricity transformation of off-grid mining to battery energy storage and renewables will require.

Mining is currently responsible for 4 to 7% of greenhouse gas (GHG) emissions globally, according to a McKinsey study. The 2022 GMG Mine Operator Roundtables – an independent coalition of mining executives across the value chain, from operators, and OEMs to academics – identified widespread electrification as a main priority to decarbonize the industry. Engineering firms like AtkinsRéalis or G Mining Services shared the joint assessment that electrification was a top priority for their clients.

Québec is in a unique setting to go electric, being the mining jurisdiction that benefits the most from its hydroelectricity potential. Eldorado's Lamaque mine, one of the lowest GHG-emitting gold mines in the world, notably due to being powered by hydroelectricity, is an example.

Rouyn-Noranda-based Adria Power Systems is dedicated to decarbonizing mines, and in October 2022 launched a new generation of high-power chargers. President Jean-François Couillard acknowledged that Québec was ideally

placed to lead the industry shift towards battery-powered machines: "The electrical infrastructure is the main challenge that a lot of industries will face. In Québec, mining firms have a strong service entrance, with a lot of power available."

### Provincial competitive advantage

Energy generation will be a key component of the green transition's success or failure. A leading supplier and manufacturer of hydroelectric energy, Hydro Québec is one of the largest hydropower producers in the world, with a system of over 60 hydroelectric generating stations connected to a robust grid with close to 260,000 km of transmission and distribution lines. Michel Frenette, business development and large industries lead at Hydro Québec, recalled Québec's unique advantage: "Electrification is only truly sustainable if the energy is generated from renewable sources, and therefore, mining operations in Québec have a great advantage as there is the availability of hydropower."

In Québec, the hydro-economics of mining will only grow more relevant. Hydroelectricity being relatively affordable and local, actors see operational expenditure advantages as opposed to the use of traditional diesel-powered operations. DGSC (Distributed Gas Solutions Canada) keeps innovation at the core of its offering to supply Québec with liquified and compressed natural gas to reduce GHG emissions. The firm's VP business development and marketing, Andrew Wilkins, touched upon the expenditure advantages of hydroelectricity for mines: "Québec is blessed with relatively inexpensive hydroelectricity with a very low carbon intensity, which results in lower OPEX and carbon footprint as compared to virtually all other provinces."

Over the past years, Québec has differentiated itself through its investments in infrastructure. Today, those capital moves pay off, as even the most remote parts of the province are connected through strategic routes. Minister Maité Blanchette Vézina explained: "We invested hundreds of millions of dollars on the southern portion of the Billy Diamond Highway – which runs north to Radisson – to secure this strategic route."

Such investments are critical to the success of a clean-powered industry in the long term. Sander Grieve, partner at Bennett Jones, forecasted infrastructure development to be a key trend in the coming years for the mining industry.

Touching upon Québec's case, he developed: "One of the key barriers to the industry across the country is infrastructure, and Québec, among others, has made material inroads to support mines."

### New offerings loading

On a mine site, the concept of electrification starts most often at the level of decarbonizing heavy-duty vehicles without impacting performance. In that sense, in-vehicle energy storage, fast charging, and even microgrid solutions are starting to crop up on the Québec mining landscape. As OEMs receive pressure from end-users onsite, opportunities for equipment providers to see widespread adoption of their technologies will follow. As firms like Adria expect aggressive growth on the charging infrastructure side, another of Québec's finest firms, Meglab, keeps making waves in the charging space. In 2022, the Québec government granted C\$350,000 in financial assistance to Meglab to demonstrate and market its MegaCharge electric charging station, which will be in use in September 2023. Kim Valade, general manager, said: "Electrification solutions are increasingly being adopted in mines as companies are striving to increase their, productivity, sustainability, and safety goals."

Electrification improvements lay the ground for automation discussions, and in the long term, it appears inevitable that we will witness AI in the driver's seat of mining operations. In Québec, AI is already used for the predictive maintenance of mobile mining equipment. Kevin Urbanski, co-founder and COO of Rithmik Solutions, noticed a shift in recent years from mining customers regarding the penetration rate of AI-driven solutions. The company closed a first C\$1 million+ investment round to commercialize its Rithmik Asset Health Analyzer – which offers uptime increases for mines – in 2021, and is now looking to raise another C\$3 million to take its offering a step further and benefit Canada's mines.

### Bottlenecks down the (power) line?

Electrifying, automating, and digitalizing mines comes with its share of capital and technical challenges. When

choosing contractors, operators must determine if the macro-environment is auspicious for important capex investments that bring returns down the line rather than immediate ROI. With clients like Eldorado Gold, Wesdome, and IAMGOLD, Procon is a trusted partner. Christian Bourcier, VP Eastern Canada for Procon, noticed that directing capex towards efficiency and safety was still the priority, rather than immediate electricity pushes: "Operators have big plans to go electric, but on the contractor side, what matters is cost, efficiency, and safety. Going electric will be a priority eventually, but it is not an immediate requirement for our clients."

Besides capital allocation, what is less talked about when it comes to electrification is the grid's capability to support several mines going electric. Charging machines, supplying power, and supporting underground vehicles must be done diligently and with the right balance. Indeed, going electric means the grid needs to be increasingly intelligent and capable of storing information.

Will Québec's world-class infrastructure and electric grid be sufficient for all new projects cropping up with the demand for new minerals? This question might well determine the province's capability to supply the world's green transition ambitions. Hydro Québec's grid capacity is 40,000 megawatts, and the utility firm saw demand for 23,000 megawatts from new projects in 2023 only. Michel Frenette explained: "We have seen a significant increase in demand from new industrial projects coming online, and it will be a great challenge to connect all these projects as there is only as much availability."

Through acts and bills, the Québec government is working on determining the future-facing projects that ought to benefit from hydropower. For mining firms, going electric represents the first hurdle of capex requirements, infrastructure improvements, and charging rates. But down the line, operational expenditure gains and CO2 emissions abatement justify being early adopters of future mining modus operandi. ■

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»» **For more than a century, industrial and mining development in Québec has been stimulated by the abundance of hydroelectric resources.** ««

## Michel Frenette

Business Development and Large Industries Lead  
**HYDRO QUÉBEC**

### Can you give an introduction to Hydro Québec and the services you provide to mining companies in the province?

Hydro Québec is a public utility that manages the generation, transmission, and distribution of electricity across Québec, including the Abitibi, James Bay, and Northern regions, as well as the export of power to portions of the Northeastern US. We work with several companies in the mining sector, mainly working with gold and iron mines, but we have a few strategic metal projects, such as lithium, nickel, and graphite, in our servicing portfolio as well. For more than a century, industrial and mining development in Québec has been stimulated by the abundance of hydroelectric resources.

Hydro Québec is one of the largest hydropower producers in the world, and approximately 99% of our energy production is from renewable hydro sources. Our hydropower system is vast, with over 60 hydroelectric generating stations connected to a robust grid with close to 260,000 km of transmission and distribution lines. We are proud that we can be part of the solution to the major challenges facing North America by reducing GHG emis-

sions and ensuring a secure supply of electricity in support of the clean energy transition, continuing to connect increasingly more customers to the grid with clean energy.

### Will the push towards electrification mean more growth for Hydro Québec?

Electrification is only truly sustainable if the energy is generated from renewable sources, and therefore, mining operations in Québec have a great advantage as there is the availability of hydropower. Mining operations are often located in extremely remote areas, and we are seeing increased demand for building transmission lines into the remote areas of Québec with mining projects wanting to connect to the grid to make use of this low-cost, environmentally friendly power source for their operations. Hydro Québec will have to look into building these transmission lines in remote areas to serve the mining operation located there, but currently, it is not a pressing issue and is probably more of a 10 to 15-year plan.

There are already many mines connected to Hydro Québec's grid. Demand in all sectors is going to grow significantly over the next few years.

Hydro Québec will have to increase production to even adequately serve the urban areas, but at the same time, we will work on energy efficiency to reduce demand where it is possible to do so.

### What role can Québec play in being a leader in the green electric transition in the coming years?

In addition to clean energy required for the fast-growing EV market, it has become extremely important to decarbonize industrial processes, and increasingly more companies are looking to access clean energy to be able to have greener operations. Over the past two years, we have seen a significant increase in demand from new industrial projects coming online, and it will be a great challenge to connect all these projects as there is only as much availability. Our grid has a capacity of approximately 40,000 MW, but over the last few months, we have seen demand for 23,000 MW from new projects. To address this challenge of demand exceeding supply, the government is putting policies in place to evaluate projects, and the most promising for the economy of Québec will be favored. Bill No. 2 specifies, amongst other things, that given the significant demand for electricity to be expected in the coming years, the Act respecting the Régie de l'énergie (chapter R-6.01) is amended to better regulate Hydro Québec's obligation to distribute electricity. In the past, we were obligated to supply electricity to any industrial project under 50 MW, but the government will now be in a position to choose the most promising industrial projects for Québec and focus on specific sectors. If there are mining projects selected as favorable, we will work with these mining companies on the construction of new grids if necessary, as well as the design of their plants to be as energy efficient as possible to reduce demand.

### What will be the key priorities for Hydro Québec as pertains to the mining industry in 2023 and beyond?

Hydro Québec will work with our industrial customers to optimize their projects in terms of energy efficiency to reduce their energy demands, allowing us to serve more projects. ■



»» **We are the first company in the world to produce a mine-duty battery charger that is designed for underground mining, and that was done more than 10 years ago.** ««

## Jean-François Couillard

President  
**ADRIA POWER SYSTEMS**

### What has driven demand for Adria Power Systems' (Adria) services in the past months?

In 2012, we started to supply charging infrastructure for battery-powered equipment and have continued our journey on that path ever since. During the IMARC Convention in Australia in October 2022, we launched our new generation of high-power chargers. This advanced, new-generation system has more features for the customers. Since then, we started having orders from a Canadian and a US-based OEMs. We are in contact with 95% of mining machinery and OEM players that are going towards electrification. There is a big shift in the mining industry to go into electrification and battery-powered machinery. We are the first company in the world to produce a mine-duty battery charger that is designed for underground mining, and that was done more than 10 years ago! We were avant-guardian in that regard and have developed our technology since.

### Where do you view the main opportunities for your chargers?

The opportunities are limitless. Our main paths to the market are through

OEMs currently, as well as directly with mining companies. Overall, we were able to foresee what were going to be the challenges in the industry, which put us in a very strong position with major OEMs. A lot of OEMs started working with commercial charging systems, then shifted to our solutions, as they understand that reliability and robustness are key in the long term. Customers now understand the difference between price and value: yes, a commercial charger is cheaper, but how much does it cost to replace it every year? How this cost affects the availability of the mining machinery? How the machine availability affects the production cost of a mine? This is where the value and reliability of our system shine.

### With more underground mining required to meet green transition goals, how do you expect demand to evolve?

We expect aggressive growth on the charging infrastructure side. That will also push the first core business, electrical equipment for underground mines. If you have more charging infrastructure, you put pressure on the electrical infrastructure of the mine, which brings a necessity

for robust electrical deployment at the mine site. In parallel, there are other sectors we are starting to work with. Many face the same challenges in terms of equipment reliability and movement. Mining remains a more mature market in terms of industrial and electrification aspects, but we are looking at other sectors: defense and construction mostly. There is a gain in social license associated with it by cutting GHG emissions. It shows the community that the mining industry is willing to do its part.

### How robust is the electrical infrastructure serving mines in Québec?

The electrical infrastructure is the main challenge that a lot of industries will face. No one can say that they have the grid to support their work. But this will spark innovation and will bring smart ways to use the existing tools. In Québec, the advantage is clean energy. We have a lot of power available, a utility company that is state-owned and innovating in how it manages its infrastructure. Mining firms have a strong service entrance, with a lot of power available. The grid challenge can be solved by having management systems to control which charging infrastructure will get power to prevent any peak. We are also working on bringing innovations to cope with those challenges. Québec is known for its innovation. A lot of underground mines are in the North, which pushed the industry to develop its ways and tools for centuries, as they did not have the same access and solutions as highly populated areas. They had to be handy, this pushed innovation a lot. This has been embedded in the culture of mining in Québec for centuries.

### What will be the targets for Adria in 2023?

2023 will be a key year for us. I think we will secure more orders with a wider variety of OEMs. We have a lot of testing planned in the summer and fall, so I am expecting a good market penetration at the end of the year. OEMs that have proprietary charging technologies are being pressured by the end user to move into a more standardized solution, which would be a driver for the mine site to adopt our technology. ■





KV



ED

## Kim Valade and Eric Dessureault

KV: General Manager  
ED: VP Operations  
**MEGLAB**

### Can you give an update on Meglab's activities and main milestones achieved over the past year?

KV: Our great motivation is to push boundaries to lead and inspire the energy and technology transition for a better, safer, and zero-emission mine. This is the dream that led us to Epiroc. Together, we work in a collaborative way to embrace change and accelerate transformation. After a two-year integration process, Meglab is now working closely with Epiroc to provide electric, connected, digital, and automated solutions helping to shape the sustainable mining industry's future.

### At what stage of mining projects do you see the most demand coming from?

KV: Many projects at the feasibility stage are looking into electrical fleets to reduce carbon emissions and meet sustainability goals. Having been involved in the first electric projects, we can support our customers in every stage of this transition. For example, when Newmont Borden decided to go fully electric, our team was involved from the beginning of the project permitting and developing this specific

electric mine. Agnico Eagle has decided to go fully electric at their Odessey mine, and Epiroc has won a large order for equipment. Meglab currently has people on site to support their battery-electric machines and automation solutions. Today, we also have an ongoing BEV training program where we support a mine in their electric transition.

### How important is Québec for the company's overall operations?

KV: Québec continues to be our home and an important market, where our excellent reputation in the province has allowed us to expand our footprint across Canada, as well as to countries around the world where our clients have operations.

### Can you speak to some of Meglab's flagship solutions and products?

ED: Over the past year, Meglab has been working on our charging solutions as well as energy storage systems. We produced our first MegaCharge this year, a multi-channel charging solution that will reshape the usability of electric-powered equipment, and the system will be tested within a mine in September.

KV: Today, everything is connected. To deploy an electric mine, we need reliable technology and information. Eric talks about our charging solutions, which are transforming a whole range of processes, including the way we work. Technology will make this possible. One example is our IMAGINE system and the way it evolves. Modular applications, which include tracking, ventilation automation, cycle counting, access control, and proximity detection, are evolving and will continue to support the electric transition by bringing more intelligence to manage the entire energy infrastructure and processes.

### Do you see the mining industry in Québec being a leader in adopting digital and automation solutions?

ED: Digitization, electrification, and automation solutions are increasingly being adopted in mines as mining companies are striving to increase their efficiency, productivity, and safety and want to meet their sustainability goals. Canada is no exception.

### How far are we from a zero-emission mine?

KV: For years we have been working to improve the footprint and the solutions deployed are showing convincing results. For example, the use of automated ventilation makes better use of energy, providing quality air only where and when it's needed. We have demonstrated a 50% reduction in ventilation-related energy consumption. In Québec, we are fortunate to have access to hydropower, but this is not the case everywhere. Renewable energy infrastructure still needs to be developed, and there is still room for improvement in mining processes and operations to ultimately get to a zero-emission mine.

### What will be Meglab's key priorities over the next 12 months?

KV: Meglab will continue to connect with Epiroc and all acquisitions so that we have an integrated and global offer to add value to customers' operations and accelerate the electrification. The partnership approach will remain very important as the implementation of automation and electrification involves many changes on both sides. As we've mentioned, people are key, and trusting relationships will always be a priority. ■



## Giuseppe Campanelli

President - North and Central America  
**METSO**

### Can you give an update on Metso's activities and milestones achieved over the past year?

Metso has focused heavily on sustainability and our Planet Positive portfolio. In 2022, demand for Planet Positive solutions exceeding expectations, with sales growing by a remarkable 51%. We continue to introduce new elements to the portfolio, and we launched approximately 30 new Planet Positive technologies in 2022.

Metso also continues to invest in the digital space, recently acquiring the digital field services company Global Physical Asset Management. Lastly, we're also very proud of our new in-house mill reline team in Canada. With more boots on the ground, we can be more responsive and flexible to customer needs. Building this team is part of our bigger plan to expand our service footprint and capabilities in Canada.

### Can you speak to Metso's relationship with Torngat Metals?

Metso will build a large-volume pilot-scale plant that will process ore from Torngat's Strange Lake REE project in northeastern Québec. This project is a critical driver for the electrification val-

ue chain, specifically the manufacturing of permanent magnets for electric motors, wind turbines, and other low carbon technologies.

Metso can now offer complete processes for battery minerals production from minerals extraction to refined battery chemicals and end-of-life battery black mass recycling. The supply chain in North America is developing quickly, and we are currently working with several lithium processing and battery recycling projects that are in the study, piloting, engineering, or delivery phases.

### How do you rate the penetration rate of digital technologies in the Québec mining industry?

EfDigitalization plays a key role in increasing accuracy, availability, sustainability, and safety, so it is no surprise that operators are interested in solutions to make their plants smarter, and more data-driven. Metso has four main areas that we deliver value to customers through digitalization: customer engagement and experience, connectivity, analytics, remote support, equipment and process optimization, and digital efficiency. ■



## Andrew Wilkins

VP Business Development and Marketing  
**DGSC**

### Can you give an overview of DGSC's activities in the mining space over the past year?

Specifically in the mining space, DGSC is actively engaged with end-users in the Saguenay-Lac-Saint-Jean region, where companies are utilizing higher carbon fuels, either for industrial processes or for heating applications, seeking ways to maintain operational reliability, lower their carbon footprint, fuel costs, and commodity volatility risk. This is exactly what compressed natural gas and compressed renewable natural gas offer to mining end users. We are advanced with one end user in particular having proceeded through phase 1 of the Québec government's ÉcoPerformance program, which provides financial assistance for feasibility studies and implementation of industrial and mining end users to convert their equipment from diesel or propane to natural gas operation. We are now moving towards phase 2, which will be the implementation to convert equipment to be able to receive compressed natural gas that

DGSC and partners will be delivering to them. In terms of our client base, we have to make choices of where we focus our resources and our efforts, and as a company, we have decided to focus on existing operations with a mine life that is still quite significant.

### How achievable is carbon fuel neutrality for the mining industry in the coming decades?

Fuel lifecycle carbon neutrality is achievable for most mining operations over the next two to three decades. Natural gas and RNG will play a very important role in the energy transition between petroleum-based fuels and electrification/hydrogen. Our key priority in the near term is to execute end-user agreements to maximize the production capacity of our existing CNG station in Chicoutimi, as well as the daughter CNG station we are also planning for in the region. We are also excited about offering compression and virtual pipeline solutions for RNG project developers in eastern Canada. ■



**Mines have been collecting data for approximately 20 years, but it has not been fully exploited and there is so much both low-hanging and higher-hanging fruit embedded in that data.**



## Kevin Urbanski

Co-Founder and COO  
**RITHMIK SOLUTIONS**

### What has shift towards the adoption of AI solutions meant for Rithmik Solutions (Rithmik) in recent months?

We have noticed a shift in the markets overall where mining companies are getting serious about addressing their fuel consumption and greenhouse gas emissions. These topics have been in discussions for years, but companies are now starting to take action. There also seems to be a shift in adopting AI-driven solutions such as Rithmik offers. In the past, there has been some resistance against AI for numerous reasons, but in experiencing what is possible with AI, the level of excitement and acceptance is rapidly gaining momentum.

Due to the current open-mindedness and excitement about AI, we have had a barrage of conversations from mining companies and OEMs that want to partner with Rithmik as we are doing something very specific that no one else is currently doing. We are right now talking to three new clients to do a value assessment project with them to demonstrate what we can do with their data.

### Can you touch upon Rithmik's growth plans?

After the closing of the US\$1.2 investment round in 2021 to commercialize our Asset Health Analyzer (AHA), we are now looking to raise US\$3 million. We plan to hire talent, grow the company, and increase our scalability to be able to serve more clients.

### Are you seeing the market moving from the need for increased efficiency and the decrease of downtime to more sustainability-focused concerns?

There are still people on both sides of the fence. Some companies are directly transitioning to electrification and alternative energy sources, but some companies are not able to do that or that is not in their game plan, and they are wanting to lessen the fuel consumption and GHG emissions from the fleet that they have. The challenge is that companies have the information on their fuel consumption, but do not have the solution to lessening this consumption. Rithmik can offer analytic solutions to draw circles around opportunities in the

mechanical space, operator behavior, and road condition information to deliver actionable insights.

### What is the role of new technologies in the success of the green transition?

Mines have been collecting data for approximately 20 years, but it has not been fully exploited and there is so much both low-hanging and higher-hanging fruit embedded in that data. As there is so much information, it can be difficult to uncover the value, but AI is an extremely powerful tool for looking at these substantial amounts of data, finding correlations and relationships, and extracting the value. Moving forward, AI will be important in the data collection and analysis space and the autonomous space.

### Are mining firms in Québec ready to put AI in the driver's seat?

A future of full automation is possible, but I believe it will take longer than what people are saying. The mining industry has many different challenges that you do not see, for example, in manufacturing plant environments. The solutions there are built in at the engineering level whereas, within mining, there are so many variables that make it difficult to adjust at that engineering level and the technology is currently getting applied from the top down. Mining is significantly complex, which is one of the main reasons why the mining industry is a bit behind in technology. To get to full automation, a lot of change management and open-mindedness will be required as we need to change some of the processes that are currently being used, not just within maintenance and operations, but the entire mining process.

### What key milestones does Rithmik want to achieve in 2023?

Rithmik will be focused on further emphasizing and quantifying the capacity of our product to reduce fuel burn and mitigate GHG emissions. We will also be expanding our team and scaling up to serve more clients, having our solutions in more mines around the world. ■



## Innovation in Geology

### New targets, new tools

Image courtesy of IOS Services Géoscientifiques

With many of Québec's leading geophysics companies having been in business for more than 25 years, the maturity of that segment offers a reliable entry point for foreign firms into the province's exploration market. IOS' CEO and GM Réjean Girard has witnessed the "lithium frenzy" that led to an order book filled with Australian names in 2023 (particularly Cygnus Metals) and noted the competitive advantage experienced Québec-based firms have considering current geopolitical fluctuations: "We act as an entry door for the province for foreign firms, providing target generation. The geopolitical landscape is changing the whole perspective on mineral exploration. This is bringing a lot of attention to Canadian resources, and we have a century-style opportunity to grasp here."

The next months will determine if Québec manages to leverage its unique ecosystem to grasp that century-style opportunity. The province seems ideally equipped to do so. Through a solid network of academia, associations, and government actors, Québec supports mining firms with research centers and free tools such as maps of Québec's mineral potential, common-earth 3D models, and geoscientific databases. An example is the SIGÉOM2 (Québec geomining information system) database, gathering over a century of geological information.

### Commodity switch

Perhaps the best summary of the state of the geology scene came from Abitibi Geophysics's president, Nadine Veillette: "In 2022 and 2023, we experienced a notable shift toward work related to critical minerals exploration."

Abitibi Geophysics has seen significant growth in the past months, and its culture of fostering innovative thinking – as seen with the firm's OreVision 2D & 3D IP (induced polarization), a technique utilizing the distributed array system used mostly for gold projects – allowed the firm to adapt swiftly to changing market needs: "Companies that traditionally focused on gold are now turning their attention to lithium, as well as other critical metals like copper and nickel. This change has influenced our geophysical methods."

Celebrating its 25th anniversary, Val d'Or-based Géophysique TMC noticed a similarly abrupt shift in demand from its traditional customer base, despite a strong gold price. Gabriel McCrory, co-owner, recalled: "We are experiencing low demand from the gold sector, which is surprising as gold

price is still high on the markets and there are plenty of territories that still need to be explored, but most investments are currently going into critical minerals."

As IP resistivity remains a preferred choice for gold projects, electromagnetics has been more frequently used for critical minerals. Looking for lithium pegmatites is different than digging for gold. Different mineral signatures cropping up in a province that has built its fame on gold call for adaptation, learning, and innovating for geology companies to continue attracting new projects. As put by IOS' Réjean Girard: "All (future-facing) metals occur in a wide spectrum of deposit types that have diverse signatures that require a bunch of new techniques: there are no geophysics techniques to



Image courtesy of Corem

detect lithium, so you need geochemistry and satellite images. It is a total change in modus operandi here, and this is a whole learning curve for the industry.”

**Nurturing the reality of AI-powered discoveries**

Leveraging some of the best mining programs in the world at McGill or UQAT, the private-academia relationship, one that too often saw the latter being constrained to the ivory towers of Montréal and Abitibi-Témiscamingue, is a growing factor in Québec’s growing innovation successes. Corem is a non-profit company assisting mining firms in their R&D efforts,

and president and CEO Francis Fournier detailed: “Research is a tool to develop and deliver innovation, and academia and research institutions have to partner with industry to de-risk technologies and validate performance.”

Nadine Veillette seconded those comments: “Collaboration with educational institutions allows us to integrate artificial intelligence into our processing, further enhancing our capabilities.”

Across the value chain, a million-ounce gold producer, a geologist, or an investment banker will tell you the same: Québec leads Canada in technology adoption in the geophysics and geoscientific realms.

Quebec Precious Metals (QPM) is an example of a company using ALS GoldSpot’s AI tools to enhance exploration efforts: using AI to analyze information and identify target areas led to the discovery of two new areas at the Elmer East project. Mira Geoscience has been working on finding lithium targets in James Bay and recently developed the Geoscience ANALYST platform for the exploration community. The firm has been pushing for the use of the software at the university level, the solution being the only free data-science, AI-enabling geoscientific platform, with powerful visualization, open-source data structure, and open-source Python API. Jean-Philippe Paiement, director of global consulting, shared his vision: “We want to enable the next generation of geoscientists to have access to the latest technology. In Québec, technology adoption has been better than in other jurisdictions in Canada. There is a great deal of education involved.”

In conclusion, the forecast is encouraging for Québec’s geologists, geochemists, and geoscientists. The push toward critical minerals is redefining geological approaches and techniques, and driving exponential growth for that segment of the industry. But geologists in Québec know from decades of experience that in mining, nothing is certain, nor do bull markets last forever. Undoubtedly, the potential for sodium-ion batteries to challenge lithium-made ones will be on these firms’ radars in the next months. Abitibi Geophysics’ Nadine Veillette explained: “Maintaining diversification is crucial in the mining industry due to its cyclical nature. While lithium may currently be in high demand, we cannot predict what will happen in the next five to 10 years.” ■



**Jean-Philippe Paiement**

Director, Global Consulting  
**MIRA GEOSCIENCE**

**What has the market reaction been so far to Geoscience ANALYST?**

Geoscience ANALYST is growing as we facilitate access to this software solution among the geoscience community. Providing access to a wide range of inversion codes enables geophysicists to test results from different sources and different technologies in one single 3D environment, empowering them to make better decisions.

Ample research and development are happening in academia, but oftentimes these codes get lost as the person graduates. With our open-source data structure, GEOH5, and its connection to the Python ecosystem through GEOH5Py, we can integrate the latest inversion codes built through university research into our software. For example, all the SimPEG inversion codes that we have integrated over the past year have been performing well. So we continue to drive the usage of Geoscience ANALYST in universities, and being the only free data-science, AI-enabling geoscientific platform, with powerful visualization, open-source data structure, and open-source Python API, it gives people no reason not to use the software.

**Can you explain what is Magnetic vector inversion (MVI) modeling?**

Magnetic vector amplitude inversion takes care of one of the big issues encountered with magnetic data, which is remanence. When ferromagnetic minerals are formed, they align with the magnetic field of the Earth before cooling down and capturing that orientation. This recorded remanent magnetization may or may not align with Earth’s magnetic field as geologic time passes. For a mineral formed when magnetic poles were reversed, its magnetic anomaly, as we observe it today, is distorted by its remanence. The associated anomaly may look like a magnetic low instead of a high. Standard inversion codes assume magnetic remanence is non-existent, thus producing unrealistic models. We are inverting the magnetic intensity data for the magnetization vector distribution, representing both the amplitude and orientation of subsurface magnetic domains. This can accommodate the remanence issues and allows for a better representation of the subsurface environment. ■



**Francis Fournier**

President and CEO  
**COREM**

**Can you give an overview of Corem’s major milestones achieved over the past year?**

Corem has been working closely with our members, large mining companies in Canada and abroad, on issues related to environmental impact, and the reduction of GHG emissions is increasingly becoming a focus in our pre-competitive research programs. In terms of the gold industry, one of our focuses is on the replacement of chemical products with bio products, for example in the flotation process, and we are currently piloting a cyanide recycling technology at Agnico Eagle’s LaRonde mine to derisk it and demonstrate its value in decreasing the use of cyanide in the gold leaching process.

Corem is also piloting an ore sorting system where detection sensors in the sorter use optical properties of reflection, brightness, and transparency to locate mineralization and increase extraction.

**Can you elaborate on Corem’s business model?**

Corem has a pre-competitive research program where companies collaborate to develop knowledge and innovative processes and technologies for the mining industry. Our members thus invest in R&D and we are focused on generating the most value for their investments. Corem leverages this industry funding, but also has great experience in working in partnership with government as well as research partners, such as universities, that contribute to our research programs.

**What excites you about the Québec mining industry in 2023 and beyond?**

Québec has a strong and diversified mining sector. Québec is also one of the few places globally where high-purity iron ore is produced, playing an important role in improving the chemistry of steel mill iron ore blends and thus blast furnace productivity and efficiency. It is also exciting to see the role Québec can play in the supply and demand dynamics of critical minerals, especially in light of the energy transition. ■



## Réjean Girard

CEO and General Manager  
IOS SERVICES  
GÉOSCIENTIFIQUES

### Can you present the work you are currently doing with majors and juniors?

Lots of things have happened since last year. We keep putting efforts into offering specialty services to global exploration companies. But, in parallel, we ride the frenzy for lithium exploration, so we have been contracted by many Australian firms in Canada. We act as an entry door and a one-stop shop for the province for them, providing target generation, drilling programs, and permitting services.

### What innovations are you bringing to market to accelerate the speed of exploration projects?

Assay laboratories are slow this year, which is bringing drawbacks to many projects in Québec. The causes are multiple and not easy to solve, and putting pressure on the labs is not the solution. So we are currently implementing a technical solution to circumvent the bottleneck. This will not be sufficient for press releases or a resource estimate, but will be accurate enough to get the decisional process going while keeping drilling. This is key, as firms without assay results cannot plan subsequent holes, and when this takes months, they are in trouble.

### Can you expand on IOS' unique approach to mineralogy and geochemistry?

Mines do not produce metals but mineral concentrates, so your "geochemical" approaches shall be driven by the presence of minerals, not metals. We commercialized techniques to detect those 4500 different minerals exclusive to mineral deposits, and this has great advantages compared with geochemistry, particularly the signal-to-noise ratio. We can detect deposits from much dimmer signals and much further away than geochemistry, meaning you can reduce the cost and improve the reliability of the surveys. This technique still needs to gain acceptance by juniors, but majors did understand right away the advantages.

### What does the shift in focus toward critical minerals mean for geoscientific firms?

All these metals occur in a wide spectrum of deposit types that have diverse signatures that require a bunch of new techniques: if you look for lithium, there are no geophysics techniques to detect it, so you need geochemistry to detect it, and satellite images. It is a total change in modus operandi here, and this is a whole learning curve for the industry. ■

### Are there any geographical areas that are driving more demand than others these days?

We are seeing significant demand from Northern Québec due to the current focus on critical minerals. We are experiencing low demand from the gold sector, which is surprising as the gold price is still high and there are plenty of territories that still need to be explored.

### Can you expand on Géophysique TMC's latest work in Abitibi?

Géophysique TMC completed a magnetotellurics survey, located northwest of Val d'Or, Québec. In 2022, we completed surveys in Eastern Ontario and Newfoundland, and this year, we wanted to push for the Abitibi region. We now have results from the surface down to 2,000 m identifying resistivity sections. We have also done a test survey on another project in Northern Abitibi and got the same great results, helping the client to better understand the geological system they are working with.

### What differentiates Québec as a mining jurisdiction?

Québec has a great mineral endowment and there is still significant oppor-

tunity for exploration which will require geophysical services. There is also great collaboration between mining service providers in the province.

### How has Géophysique TMC's goal to become a one-stop shop for geophysical surveys unfolded over the past months?

Both Simon and I like to be hands-on and involved in each project and therefore we have decided to continue our specialized approach in ground geophysics rather than being a one-stop shop at this stage. We have more ground geophysical services to our list with the acquisition of MT, gravity and GPS instruments.

### What will be Géophysique TMC's main priorities in 2023 and beyond?

Géophysique TMC is rooted in Québec and Mexico but has a global footprint servicing our clients, on request, on projects across Northern America, and for example, Eritrea in Africa, as well as in Greenland. Géophysique TMC aims to stay on top of technological trends which would allow us to offer the best services to our clients, especially within the critical mineral sectors. ■



## Gabriel McCrory

Co-Owner  
GÉOPHYSIQUE TMC



## Nadine Veillette

President  
ABITIBI GEOPHYSICS



There is a noticeable change taking place in Québec's mining sector, with an increased interest in exploring new technologies and fostering innovative thinking.



### What areas currently drive the most interest for Abitibi Geophysics' services?

In 2022 and 2023, we experienced significant activity and a notable shift toward work related to critical minerals exploration. Companies that traditionally focused on gold are now turning their attention to lithium, as well as other critical metals like copper and nickel. This change has influenced our geophysical methods. Electromagnetics, particularly for base metals like copper, nickel, and zinc deposits, has been in high demand, while induced polarization has been commonly used for disseminated deposits like gold. We have also witnessed an increased demand for microgravity surveys and airborne drone magnetics.

### How does Abitibi Geophysics determine the best approach to tackle projects?

We transitioned to Aerovision around 2015. Nowadays, we primarily focus on OreVision 2D & 3D IP and DasVision, which is a technique utilizing the distributed array system for a real 3D acquisition. This method has gained increasing popularity, especially in gold properties. Another popular technique is InfiniTEM, a loop configuration used in Time domain Electromagnetics methods, which are effective depending on the survey's geometry and con-

figuration. For each project, we carefully consider the orientation and deposit type to determine the best approach. There is a noticeable change taking place in Québec's mining sector, with an increased interest in exploring new technologies and fostering innovative thinking.

### Why do so many innovative solutions burgeon in Québec?

The rich geological history and abundance of mineral resources have been driving factors for the prominence of mining in the region. The Abitibi region, with its century-old gold mines, has established a strong mining heritage. The availability of skilled personnel for exploration and mining has been a result of this historical foundation. Additionally, Québec has a favorable jurisdiction and has made efforts to attract foreign investors, leading to an active presence of mining claims. The government has also invested in surveys and mapping projects, with organizations like SOQUEM contributing valuable data. The accessibility of public information through government platforms further enhances Québec's appeal as a hub for technical expertise. Recognizing the importance of community engagement, we actively participate in initiatives to connect with local communities and schools, not only in Québec but also in Thunder Bay where we have

an office. Ensuring community awareness and involvement has become increasingly vital, and we actively promote the mining sector while engaging with diverse local stakeholders.

### Will Abitibi Geophysics prioritize a specific direction to maintain a balance among different commodities?

Maintaining diversification is crucial in the mining industry due to its cyclical nature. While lithium may currently be in high demand, we cannot predict what will happen in the next 5 to 10 years if a new alternative for batteries emerges, potentially causing a significant drop in lithium demand. Therefore, it is essential for us to adapt and stay updated with evolving technologies while not neglecting other methods. We prioritize diversifying our offerings to ensure that we can provide clients with the best available method. Similarly, the volatile nature of commodity prices emphasizes the importance of flexibility and being prepared for uncertain market conditions in the future.

### What are the key milestones and objectives that you aim to achieve within the next 12 months?

In the near term, one of our significant upcoming developments is working on our borehole TDEM offering. Based on the development of the ground ARMIT probe, we have developed a Borehole ARMIT probe for Time-Domain EM (TDEM) that simultaneously measures the B-field and dB/dt, setting it apart from existing market offerings that typically employ separate sensors for each. This innovation allows for improved measurements where the conductivity is variable from very good conductor to poor conductor. Additionally, the sensor's noise level has proven to be significantly lower than what is currently available on the market. This sensor marks the culmination of a three-year research program and will soon be available to our clients.

Simultaneously, we are engaged in a research project focused on enhancing our Induced Polarization (IP) methods. This involves rethinking all aspects, including more efficient injection techniques, developing a greener battery-operated transmitter, and improving inversion processes to deliver more accurate results. Collaboration with educational institutions allows us to integrate artificial intelligence into our processing, further enhancing our capabilities. We continually strive to push the boundaries of research and innovation. ■



"Clients are increasingly concerned about the risks that widespread technology adoption carries."

**Claude Sarrazin,**  
President,  
Groupe SIRCO

# SERVICES

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Image courtesy of GCM Consultants



# Engineering Québec's Future

## Navigating the pathways of engineering excellence

Image courtesy of Metso Outotec

The uptick in mining activity seen in Québec in recent years was only possible thanks to the province's exceptional engineers, and that segment might well be the key to unlocking the province's full mining potential. Looking ahead, Québec engineers will continue to leverage their versatility to take on projects that financiers (and society) want and need to pursue at short notice, as the switch from a gold-dominated order to one with critical mineral diversification.

AtkinsRéalis leveraged its unmatched firepower and experience on the mining engineering scene to do such a strategic repositioning in Québec in 2022, and in April 2023, the firm was contracted by lithium giant Sayona to complete the environmental and social impact assessment for the Sayona Moblan lithium project. Notably, AtkinsRéalis will provide design and engineering services for the site's tailings storage facility, water management, and site infrastructure. Dominic Tremblay, VP

Québec - mining and metallurgy, who is actively involved in the project, added: "We are leveraging our strengths in mining sustainability to minimize all the potential environmental and social impacts of the project."

Pushed by the need for more critical minerals, detailed engineering services are likely to be even more in demand in the coming years. G Mining Services is a reference for Canada's top mining operators, taking on large-scale projects spanning several commodities. Currently involved in Equinox's Greenstone project, which should become the biggest gold mine built in Canada since Canadian Malartic, the firm also assisted Allkem with its PFS at the James Bay Lithium project and plans to start construction by the end of 2024. A game changer for the James Bay region, the 2021 Feasibility Study and Maiden Ore Reserve detailed average annual production of 321,000 t/y of 5.6% Li<sub>2</sub>O spodumene concentrate with an approximate 19-year mine life. For Michael Gignac, VP finance at G Mining Services, the societal push to move away from fossil fuels mean such projects are only the start for the firm: "As there is a need to reduce our reliance on oil, the world will need more minerals and there will be a need to build more mines. This explains the demand for our detailed engineering and construction services, and why the future is bright for us."

### Decarbonization through innovation

Innovation is necessary to accelerate decarbonization. With investors carrying out meticulous due diligence into operators' carbon footprints, en-

gineers are having to rethink the way they can maximize project value while lowering scope 1,2, and 3 emissions. In Québec, AtkinsRéalis' pit-to-port solution allows operators to maximize value across the mining lifecycle, and in the era of digital transition, AtkinsRéalis now uses digital and remote technologies to optimize efficiency while integrating mine design with geotechnical and environmental constraints. According to Dominic Tremblay: "We are seeing the mining industry become less conservative, implementing advanced technologies and solutions to improve their operations."

Beyond AI-driven processes and digital twins, AtkinsRéalis adapted its trademarked Decarbonomics platform (launched in 2022) to expand into the mining sector in mid-2023. This data-driven approach aims at decarbonizing assets and processes through a program-optimized net-zero strategy. Dominic Tremblay explained: "The software can track mining assets' emissions from pit to port, identifying areas

where improvements can be made to reduce carbon emissions."

Widespread software, machine-learning, and cloud-based adoption however come with its sets of risks. SIRCO offers investigation and cybersecurity protection services, and its president Claude Sarrazin noted the growing concerns among his clients when it came to hostile actors trying to obtain mining operators' valuable information: "With digital systems, you are looking at high levels of risk that administrators were not exposed to in the past, and this becomes worrisome. The good news is that in Québec, the government has funded a new Minister for Cybersecurity."

Finally, coupling innovation with power source management is key to successful decarbonization. Québec has the advantage of having a low-carbon generating grid that makes the jurisdiction ideally placed for ESG-focused projects and investments. G Mining Services' clients have a clear agenda, as explained by Michael Gignac: "Sus-

tainability is a key focus for our clients. Social acceptability is everything when you want to build a mine, and investors are closely looking at ESG. Managing the power sourcing and optimizing it is the real key."

These thoughts were seconded by Riad Faour, CEO of Progesys, a project management firm delivering industrial mining projects. "A factor key to the Québec operating environment is ESG. Business decisions and investments nowadays are driven by ESG objectives, focusing on the environment, decarbonization, and net zero emissions" he unveiled.

Québec's engineering scene is busier than ever. Beyond local impacts, with firms growing figures in terms of headcounts, turnover, and large-scale projects, Québécois engineers distinguish themselves with their global footprint. In 2023, G Mining Services leveraged lessons learned from its TZ project in Brazil, while being involved in projects throughout Canada, Ecuador, Burkina Faso, the US, and Guyana. ■

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»» **Decarbonomics will provide clients with a complete picture of carbon presence across their entire value chain through easy-to-use interactive dashboards.** ««

## Dominic Tremblay

VP and General Manager, Québec - Mining and Metallurgy, **ATKINSRÉALIS**

### Can you give an update on AtkinsRéalis' activities and milestones achieved over the past year?

2022 was a year of transition for AtkinsRéalis as we repositioned ourselves in the Québec mining market to assist with key critical mineral projects. We consolidated all the expertise we provide to the industry to create a hub in the province.

### What is AtkinsRéalis' role in advancing the Sayona Moblan lithium project?

AtkinsRéalis is actively working on completing an Environmental and Social Impact Assessment at Sayona's Moblan project where we are leveraging our strengths in mining sustainability to minimize all the potential environmental and social impacts.

AtkinsRéalis will provide design and engineering services for a tailing storage facility, water management, and site and plant infrastructure, incorporating sustainable mining solutions from the earliest stage to mine closure. We will also collaborate with InnovExplo and Primero on several aspects of the pre-feasibility and feasibility studies.

### Which of AtkinsRéalis' services are most in demand in Québec?

Everything related to mining sustain-

ability, waste management, and the environment is in extremely high demand. We are seeing the mining industry become less conservative, implementing advanced technologies and solutions to improve their operations, namely in waste management by extracting resources from old waste that could not be extracted in the past. Our focus is to help our clients mine more while reducing their impacts, especially considering the amount of mining and resources that will be necessary to keep up with the demands of the energy transition. AtkinsRéalis is differentiated in the market in that we offer a pit-to-port solution, optimizing all the ESG components in the value chain for our clients.

### What is AtkinsRéalis' approach to growing the Company's presence in Québec?

AtkinsRéalis is focused on bringing our clients the best value and we leverage our global expertise and knowledge to do so. We will also partner with peer companies that complement our work as we are all working for the same clients. Collaboration with external and internal stakeholders is a key value for us and has served us well in our work.

We are also leveraging new technologies that can be used to mine more ore bodies more cleanly and reduce the

waste generated. Implementing more sustainable mining technologies will be necessary to address the energy transition; forecasts show that during the next 30 years, we will have to mine twice the volume of copper that has been mined since humankind began mining the critical mineral. The energy transition requires mining and advanced technologies will have to be implemented to create a balance between critical mineral demand and optimization for more sustainable mining. AtkinsRéalis is excited to be part of this digitization, optimization, and sustainable mining journey with our clients.

### What is AtkinsRéalis' role in helping to decarbonize the mining industry?

AtkinsRéalis has launched the Decarbonomics platform, a data-driven solution that captures a project's carbon emissions and can cost-effectively decarbonize the built environment. The software can track mining assets' emissions from pit to port, identifying areas where improvements can be made to reduce carbon emissions. Decarbonomics will provide clients with a complete picture of carbon presence across their entire value chain through accessible and easy-to-use interactive dashboards and will enable companies to accelerate their net zero plans into delivery in the most cost-effective way.

If we want to accelerate decarbonization, we must continue to innovate. We are very proud of how we are leading the way by focusing on ensuring that innovations and technologies, such as modeling, digital twins, and AI are part of all our projects, which optimize processes and lower carbon emissions.

### What are AtkinsRéalis' key objectives for 2023 and beyond?

The mining industry is an essential enabler of the energy transition and a net zero future. If there is no mining, there is no energy transition. AtkinsRéalis is focused on providing our clients with technologies and solutions to enable better ways of mining for the increased demands of critical minerals needed for the energy transition. We have extensive expertise and knowledge and want to continue bringing value to clients and the mining industry of the future. We will also continue to be at the forefront of sustainable mining, and we are leveraging advanced digital technologies to improve the industry and its impact on the environment as we work towards electrification. ■



»» **We see growth in the areas of detailed engineering, construction, and due diligence for financiers determining whether to invest in projects.** ««

## Michael Gignac

VP Finance  
**G MINING SERVICES**

### Can you touch upon some of the milestones achieved in 2022 and so far in 2023, particularly the work being done with Allkem?

2022 was a very busy year for us. We increased our headcount to about 240 and continued working on large multi-year projects. G Mining Services finished detailed engineering on Equinox Gold's Greenstone project in 2022, and now the team is focused on construction management and support of the project. Greenstone was at around 73% completion as of the end of March 2023, and things are trending well. We are very grateful to Equinox for trusting us with this multi-million-ounce project which should become the biggest gold mine built in Canada since Canadian Malartic. We are also advancing the detailed engineering on the Tocantinzinho (TZ) project for G Mining Ventures. As for Allkem, we are progressing with the detailed engineering, and the project is awaiting permits. The plan is to receive them and start construction ideally by the end of 2023.

### Are there any geographic areas and particular services that you forecast will drive growth beyond 2023?

The work we do here involves project management, as well as geology, mining, and metallurgy services used by early-stage projects in the province. Right now, we are learning a lot from our TZ experience in Brazil. It is a huge country with a good market, and we think there could be a potential for us to have an office there soon. But we do not want to grow too fast: it is about matching contracts with resources. We are also involved in projects throughout Canada, Ecuador, Burkina Faso, the United States, and Guyana.

On the services side, we see growth in the areas of detailed engineering, construction, and due diligence for financiers determining whether to invest in projects. Our due diligence services are well-trusted.

### Are you seeing customers increase their focus on automation and sustainability approaches?

Sustainability is a key focus for our clients. People want more battery-powered equipment, and the best way to get close to net zero would be to connect operations to a low-carbon generating grid as we have in Québec. If you can power your mill that way

and have the mobile equipment run on batteries, it would be easier for Québec mining companies to get closer to net zero compared with other jurisdictions that rely on natural gas, for example. Social acceptability is everything when you want to build a mine, and investors are closely looking at ESG.

Digital technologies will not take you to net zero. One thing that mines can do is implement solar panels and wind turbines, with the issue being that this energy is intermittent. We have heard of mines that had very large battery capacities to store energy as well. Managing the power sourcing and optimizing it is the real key.

### What are the main advantages of operating in Québec?

Québec is a stable jurisdiction where the rules do not change, and there are lower permitting risks. In South America, governments change the rules almost every year, which increases risks for mine developers trying to forecast cash flows. In Québec, there are lots of good inputs and providers as it is a mature jurisdiction. The government benefits a lot from the mining industry, so it is a win-win situation.

### What makes the work culture at G Mining Services unique?

Attracting and retaining talent is about treating people the way you want to be treated: communicating well, being kind, and taking care of them so they take care of clients. We allow them to be the best they can be and to reach their full potential. Two of our core values are family and respect, and that is reflected in the work we do. We try to build a sense of community in the company.

### How do you plan on maintaining your success record in the coming years?

Our big objectives are to ensure the Greenstone, TZ, and Allkem projects are built safely, on time, and within budget. We want to continue expanding the business geographically and in headcount. We want to continue supporting G Mining Ventures with their planned growth and we are changing our head office location to a brand-new building this year. ■



## Christian Bourcier

VP Eastern Canada  
PROCON

### What are the main updates from Procon in Eastern Canada?

Business has been very good in recent months. The pressure on the workforce has eased down as some projects were halted due to the wildfires. This brought freedom back to the labor market. We have steady clients like Eldorado, Wesdome, and IAMGOLD which bring us a steady flow of business. We won a new contract a few months ago with Wesdome to install ventilation logistics and were recently able to expand in Ontario with Alamos Gold's project.

### Can you expand on the work you are doing at Eldorado's Lamaque operation?

Eldorado hired us to build a new ramp to access their new zone, so we excavated this access, and are waiting for their green light to go nearer to the ore body.

### Have conversations around sustainability and automation increased in Québec?

Everybody is talking about sustainability, but the bottom line of a capital project is the cost. Operators have big plans to go electric, but on the contractor side, what matters is cost, efficiency, and safety. Going electric is not a priority right now. It will be eventually, but it is not an immediate requirement for our clients.

Automation-wise, we are on the right path in Québec. Every week I hear about new technologies being developed and I'm very impressed with remote operations. As we go deeper, it is getting warmer, and it is very good to have operators removed from the line of fire. Companies are using AI to automate ground support, and this is the area where we are the most exposed, so this is very interesting.

### What will be your key priority in the coming months?

We will focus our efforts on the Abitibi region. Nunavut and Nunavik are other areas of interest, but they require more logistics. There is a lot of action in Québec that will keep us busy! ■



## Riad Faour

CEO  
PROGESYS

### Can you give introduce Progesys and how the company serves the mining industry?

Progesys was founded in 2003 as a project management firm, delivering industrial projects in the mining, metals, and oil and gas industries. We look at capital projects through the eyes of the owners and our unique solutions, tailored to the size and condition of every project, are helping project owners worldwide drive their projects to their fullest potential from project management and build to operations. Our services include looking at contractual strategies and planning for the development phase, and we continue our support throughout the lifecycle of the project with a focus on construction management and commissioning of plants and infrastructures. We assist project owners in their two major risks: making the right choices regarding project management and putting the right stakeholders around the table for execution. After that follows excellent construction management and commissioning that allows for optimal operation of the plant.

### Are you seeing more automated solutions being adopted by the mining industry?

For any project, and especially 4.0 technology projects, what makes or breaks it is how well it is managed and optimized in terms of startup and ramp-up. Automation in the mining industry is rapidly gaining momentum and Progesys has been involved in many projects where the transition to an autonomous fleet was part of the scope.

### What are the key areas driving growth for Progesys in 2023 and beyond?

There are still many opportunities for Progesys in the regions we are already operating in, including Canada, Latin America, Malaysia, Indonesia, and the Middle East. Progesys' culture of being integrated with the project owner teams and our focus on supporting these owners from project management to the transition into operation has allowed us to attract the interest of many new clients. Currently, we are consolidating our activities in the regions where we are already operating. The objective of maintaining high quality and standards for the delivery of the projects we take on will continue to drive our growth-related decision-making. ■



## Water Management Strategies for responsible mining

Image courtesy of Brunswick Exploration

Future mining will be about decreasing existing water-related challenges, and will require better ways to manage wastewater from the extraction of lower-grade orebodies needed for the green transition to be successful. Québec illustrates how water engineering, water management, and environmental dynamics are at the forefront of stakeholders' agenda today. While, globally, innovations like Zero Liquid Discharge (ZLD) Systems – used to minimize the discharge of wastewater – or water monitoring analytics have gained in popularity, Québec continues to be the scene of advancements in water management at every stage of the mining life cycle.

### Innovation tailor-made for Québec

The remoteness and harsh conditions of Québec's northern mines requires constant upgrades and innovation from service providers offering water treatment solutions in the province. Saint-Laurent-based Veolia Water Technologies is spearheading the water treatment for Canada's mines. Beyond delivering over EUR7 billion in revenue in 2022 for Veolia, the Veolia-Suez merger at the end of 2022 made Veolia Water Technologies and Suez Water Technologies & Solutions sister firms, bringing the firms unparalleled firepower to assist mines.

One key trend in water treatment in Québec is mobility, namely adding mobile assets to existing infrastructure in remote mines. Veolia's Actiflo technology requires no introduction and remains an ideal solution for Québec miners given their operating environment. The remote aspect of Québec mines, coupled with the necessary speed for deployment, make the technology an ideal partner for the province's producers. Leveraged notably at IAMGOLD's Niobec mine in Saguenay, Actiflo is used to treat toxins and remove organic matter. It is well-suited for the removal of

suspended solids, heavy metals, and other constituents of concern to ensure safe and compliant water supplies. Moreover, it is mobile. David Oliphant, the firm's VP business development, said: "When companies are looking to drive project schedules, they cannot wait 18 months to have a permanent wastewater treatment facility put in place."

With over 11.4 billion liters of contaminated water treated, Québec's ALTRA | SANEXEN remains a preferred partner for mines to keep adding innovative solutions in terms of their water solutions. In particular, the ALTRA 3D technology can address the diverse aspects of mine closure and reclamation while reducing hazards and environmental liabilities and controlling costs. This innovation is purpose-



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» The last element of our ESG targets is water stewardship, where we are aiming to get 80% of our water recycled and have a 45% reduction in our freshwater intake.



Martin Preece,  
Interim CEO, Gold Fields





built for Québec, as detailed by Marie-Chantal Savoy, VP strategy and communications: "Our woven lay flat hose can easily cope with the drastic environmental and climatic challenges and changes typically found in mining applications in Northern Québec. The ALTRA 3D solutions can be installed quickly, easily and most of all safely."

**Critical projects driving demand**

Much like any service providers across the value chain in Québec, the lithium frenzy has led to expansive growth for actors in the water space. GCM Consultants, for instance, recently assisted a lithium-focused player with its water requirements on-site and the permitting of the water and wastewater treatment system. Karine Gauthier-Héту, environmental director, detailed: "We have seen tremendous growth in our water treatment segment over the past few months. The lithium space has recently been extremely active, and we have seen tremendous growth in demand there."

Service providers in the water space will have a key responsibility in helping mines with their zero wastewater targets, and with many projects due to switch from development to production in the next few years, firms like Veolia will likely keep seeing growing demand. Veolia recently helped a rare earth mine to achieve zero wastewater discharge with its OPUS technology, a reverse osmosis process operated at an elevated pH to maximize water recovery.

» The government's C\$ 90 million Critical and Strategic Minerals plan (2020-2025) further supports the production of materials essential for low-carbon energy technologies.



Marc Roy, CEO, Focus Graphite

David Oliphant noticed the progress made in rare earths: "The amount of activity we are seeing in the Québec mining industry today, specifically the rare earths space, is tremendous compared to 10 years ago."

**The importance of dialogue**

In today's mining, the way operators manage, treat, and discharge their water determines whether operators will have the community's green light – effectively determining the mines' success or failure. Before putting shovels to the ground, mining firms in Québec must think about the guidelines for preparing mine closure plans. In the past months, several instances in the province highlighted the importance of taking the community into account and being a leader through good environmental practices.

A couple of phenomena are likely to drive water-related topics in Québec in the coming months: mediation and remediation. For the former, the drive for more critical minerals taking explorers and operators to greenfield lands in areas unused to mining will necessitate unprecedented levels of communication among all stakeholders. In June 2022, concerned citizens began an independent environmental monitoring of Nouveau Monde Graphite's Matawinie project, representing the first instance of citizens taking charge of their own sampling of the quality of water at a mine site in Québec. For the latter, the removal of toxic and polluting substances from existing sites will only grow given today's high environmental standards. ALTRA | SANEXEN won the bid for the environmental remediation project of the former Aleris plant site in Trois-Rivières, Québec, to provide continuous full-scale remediation of PFAS (a group of chemicals) from landfill leachate and wastewaters for one of the country's largest waste haulers. "We will see more and more large-scale site remediation projects in North America," Marie-Chantal Savoy forecasted.

Frequent regulatory reforms, declining ore grades, and engineering complexities can make miners' lives harder. Thankfully, Québec operators can rely on a strong web of consultancies to help them navigate the rough seas of water management. This means that, ultimately, the future will look bright for engineering consultancies and players involved in wastewater management, according to sector leaders like GCM Consultants' Karine Gauthier-Héту: "I believe mining companies will rely increasingly more on consultancies, especially in a world where the availability of specialized resources is getting scarce. Companies such as GCM will play a critical role in supporting mining companies with major challenges, such as technical issues, environmental issues, and sustainability." ■



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**David Oliphant**

VP Business Development  
VEOLIA WATER TECHNOLOGIES CANADA

» Québec's mining industry is very active, and when companies try to drive project schedules, they cannot wait 18 months to have a permanent wastewater treatment facility put in place. «

**Can you give an overview of Veolia Water Technologies (Veolia) and the milestones achieved over the past years?**

For the past 75 years, Veolia Water Technologies has been serving clients across Canada in various industrial applications, with a strong focus on mining. We continue to develop technologies and services to anticipate regulatory requirements and meet our client's needs. Our expertise covers the entire water cycle — a crucial component of a mine's daily operations. We provide a full range of water solutions for mining, including preliminary and detailed engineering, provision of standard and custom equipment, project management and maintenance services, as well as long-term operation, temporary mobile water solutions and water treatment chemicals. As part of Veolia's mission to lead ecological transformation, our main focus is discharge to the environment with an emphasis on toxicity to aquatic life as is showcased by our numerous references across the country.

In 2021, Veolia acquired Suez, and consequently, Veolia Water Technologies and Suez Water Technologies & Solutions (now Veolia Water Technologies & Solutions) are sister companies.

The merger contributes to our efforts in creating a global champion of ecological transformation, allowing us to bring a full suite of services and capital equipment portfolio to our clients. From a revenue standpoint, 2022 was a record year for the company.

**What services and solutions have Veolia brought mining firms in Québec?**

Our mobile water services assets are very active in the mining space, and one of the top five global mining companies has recently extended its mobile contract from a two-year to a five-year application. Working with global mining companies, we are seeing a trend of long-term mobile contracts related to various mine water applications. Our Actiflo® high-rate clarification technologies are big in the mining space but we are also able to bring in membrane-based and ion exchange-based processes to offer a full suite of services to our clients.

The mining industry in Québec is currently very active, and when companies are looking to try and drive project schedules, they cannot wait 18 months to have a permanent wastewater treatment facility put in place. Veolia can install mobile assets for our

clients to start treating water in just a few weeks compared to months or even years. We see the speed of delivery as a key decision factor for many of our mining clients. We are also seeing more long-term requirements for these solutions versus the short-term or emergency requirements we used to have in the past.

**Can you discuss some of the technologies, such as Actiflo® and HPD®, Veolia is putting into the market?**

Although Actiflo is quite a mature technology within Veolia, we continue to develop new process enhancements and applications to solve some of the most pressing water treatment issues faced by our mining clients. This small-footprint, high-rate clarification system is used to treat toxins and remove organic matter and is particularly well-suited for the removal of suspended solids, heavy metals, and other constituents of concern to ensure safe and compliant water supplies.

As far as HPD processes, they are positioned well in the mining sector as it relates to battery materials (Li, Ni, Co, Mn) from primary sources and recycling — all of which require concentration, purification, and ultimately, crystallization. These plants often have waste streams from which byproducts (sodium sulfate for example) and water can be recovered — often through thermal crystallization or zero liquid waste systems. Especially in the battery material market, the associated mining companies are increasingly focused on extracting these materials with the lowest possible carbon, water, and waste footprint.

**How do you assess digitalization trends in the mining space?**

We are seeing more interest from the mining industry to optimize and digitize their water management solutions. Digitization is also a key focus for Veolia, and we have created the Hubgrade platform allowing clients to view, evaluate, and remotely optimize their management of energy, water, and waste. This platform creates a continuous link with our customers, giving them access to information that is easy to understand and use. As mines are becoming more remote, digitization of services and operations is becoming key. ■



KG



JG

## Karine Gauthier-Hétu and Jean-Sébastien Grenier

KG: Environmental Director  
JG: Team Leader Water Treatment  
**GCM CONSULTANTS**

### Can you give an update on GCM Consultant's activities over the past year as it pertains to the mining space?

KG: 2023 has been quite a busy year for GCM, and our environmental department has seen significant growth over the last few years, especially in the water treatment segment. Water treatment has been an evolving sector for GCM, with increasingly more mining companies having issues with water quality and requiring specialized solutions to solve their problems, and also new projects coming online looking for options to effectively manage their water and wastewater treatments. The company has also recently hired a new manager responsible for our innovative services and solutions related to greenhouse gas (GHG) reduction and energy transition aspects. Legal requirements are becoming more stringent and have kept mining companies busy. GCM is helping our clients handle the new system for them to get their projects approved on schedule.

JG: Our environmental department has people committed to the permitting process, which can assist our clients in an efficient and timely fashion regard-

ing compliance with regulations and completing the required forms.

### Can you give an example of a mining firm in Québec GCM is providing services to?

KG: GCM is working with many major gold and lithium companies in Québec, assisting them with permitting requirements for their projects to stay on schedule. We have also worked with companies to develop their construction procedures to ensure that the regulations and mitigation measures linked to the environmental impact assessment (EIA) and the permits are followed.

JG: GCM also assists mining companies in Québec with everything related to water and wastewater treatment and management. We not only offer industrial water treatment and management solutions but also drinking water solutions for mining camps.

### Has GCM noticed more demand coming from the lithium space?

KG: There is definitely more demand for our services coming from the lithium space at all project levels, from exploration to operation. At the exploration level, we are involved in the baseline

studies, wetland characterization, and supporting companies in engagements with the land users and local indigenous communities, and we are working with our clients on the permitting process as well as the engineering process. The lithium space has recently been extremely active, and we have seen tremendous growth in demand for our services coming from this sector.

### How important is the role of consultancies going to be in the future to tackle water, environmental, and sustainability challenges for mining?

KG: I believe mining companies will rely increasingly on consultancies, especially in a world where the availability of specialized resources is getting scarce. Companies such as GCM will play a critical role in supporting mining companies with major challenges, such as technical issues, environmental issues, sustainability, as well as with their workforce. We are already seeing growing demand for support in identifying practical solutions for projects, whether it be technical or environmental. We have the knowledge and experience to not only support our clients at the conceptual and technical levels but also to assist with operational issues at mines, particularly at the water treatment level, but also with aspects such as an energy transition or mitigation measures, ensuring that what we suggest in the environmental authorization requests is practically feasible at an operating level. The consultant plays a critical advisory role in sustainable development, assisting in the optimization of systems as we work towards a greener future.

### What are the areas that will drive growth for GCM in the coming months?

KG: We have seen tremendous growth in our water treatment segment over the past few months. We certainly want to pursue even further growth in this area as we have a specialized unit with great expertise in this regard on the technical level, but also with a good comprehension of the operational issues. We have also been supporting clients in terms of the energy transition, and we believe we will see significantly increased demand for our services in this space over the coming months. We will manage our growth in respect of our values, ensuring that we maintain a high level of quality and continue to provide the best possible service to our clients. ■



## Marie-Chantal Savoy

VP Strategy and Communications  
**ALTRA | SANEXEN**

»  
**Supporting our customers' ESG goals and addressing climate change, our team is accelerating the deployment of our environmental technologies, especially ALTRA 3D.**  
«

### What are the main highlights for ALTRA so far in 2023?

2023 has been a very productive year so far. We rebranded LOGISTEC Environment to ALTRA and launched a new website: ALTRAGroup.com. At the beginning of the year, we were awarded the major environmental remediation project of the former Rayrock mine in Northern Canada. This project will allow the indigenous Tlicho people to return to the land. Our team is in charge of the extensive cleanup of the former Rayrock uranium mine and its surroundings, which includes lakes and beautiful natural habitats.

We won the bid for the environmental remediation project of the former Aleris plant site in Trois-Rivières, Québec. This large-scale project will be completed for the Québec Ministère de l'Environnement et de la Lutte contre les Changements Climatiques, de la Faune et des Parcs, in order to give this vast land back to the community. Our team of experts will completely decontaminate the site to give a second life to this huge industrial wasteland with an area equivalent to 14 soccer fields. We will see more and more large-scale site remediation projects in North America, and we are very proud to be a trusted partner for cities and governments. This June, at the Water Canada Summit, our Innovation team received

Water Canada's prestigious award for Best New Technology. This award underlines ALTRA's strength in delivering water technologies that are impactful, complex, and transformative.

### Can you give an overview of ALTRA's most demanded environment services?

ALTRA has the most comprehensive "on the ground" environmental offering for the mining industry. For years, we have helped mining companies with many important aspects of mine development and actual closure. Our professionals have extensive expertise in water treatment, fluid transfer, and infrastructure solutions, including our latest ALTRA 3D technology. We have been involved in the closure and decommissioning of hundreds of industrial facilities. Our team takes an integrated approach to the management of contaminated soil, water treatment, and innovative site revegetation.

### How can new technologies like ALTRA3D help answer environmental challenges for mines in Québec?

The unique properties of ALTRA 3D make it the best-performing solution for transporting minerals, water, slurry, chemicals, and other fluids in challenging mining environments. Due to the flexibility of ALTRA 3D, our woven lay

flat hose can easily cope with the drastic environmental and climatic challenges typically found in mining applications in Northern Québec. The ALTRA 3D solutions are engineered to resist abrasion from solids as well as corrosion from fluids that are transported in mining applications. This means that the ALTRA 3D solutions last much longer than alternatives.

### Can you expand on ALTRA's approach to ESG and the firm's relationship with its First Nations partners?

Our mission is to deliver a positive and long-lasting impact on the communities where we work. As an example, last February, we were awarded the large-scale environmental remediation project located on the Couchiching First Nation land, near Fort Frances, in Southwestern Ontario. This important phase marks the beginning of a multi-phase project to return Couchiching First Nations land, once used for heavy industrial purposes, to clean and safe land for use by the community. The Company currently has six successful Indigenous business partnerships in Québec, Nunavut, the Northwest Territories, and New Brunswick. Furthermore, we have worked with the Weenusk, Attawapiskat, and Fort Severn First Nation communities in northern Ontario for the past 10 years. Through these collaborations, ALTRA has led several key soil remediation and site clean-up projects on traditional lands, which aligns with their mission to deliver sustainable solutions that have a positive and long-lasting impact on the communities where they work.

### What will Québec's role be as a leading mining jurisdiction through its high environmental standards and sustainable practices?

Strong environmental practices are crucial to the health of the mining ecosystem and they will increasingly determine the future of the sector. Under the leadership of the Ministry of Economy and Innovation and combined with the leadership of Investissement Québec, Québec is making its voice heard and enjoying the recognition of leading international partners.

### What will be ALTRA's key priorities in the months ahead?

Supporting our customers' ESG goals and addressing climate change, our team is accelerating the deployment of our environmental technologies, especially ALTRA 3D. ■



# Drilling

## Adapting to shifting demand

Image courtesy of Diafor

The cyclical nature of commodities spares no one, nor do exogenous events like wildfires, which halted much of the province's drilling activity for several weeks between May and June. Fortunately, the poly-commodity potential of Québec, along with the flexibility given by the regional and global footprint of the province's main drillers, allow for the sector to continue thriving, with no signs of stoppage in sight. Exploration waves supported by strong commodity prices and supply-demand fundamentals are good for business, and the world's growing appetite for lithium notably will most certainly keep Québec's drillers busy in the coming year.

### Constantly adapting

The volume of foreign direct investment (FDI) seen in 2022/2023 in Québec, at a level unprecedented for a decade, had a trickle-down effect across all segments of the value chain. Drillers, traditionally contracted by established local operators, saw demand coming from newcomers. In the winter of 2022/2023, five of RJLL's 12 customers were Australian companies exploring *La Belle Province's* lithium. FDIs were mostly directed toward lithium projects, and this will likely remain the case in the short term, given Australian miners' experience in the area, compared with Québec's relative virginity. In the words of David Bradley, the co-owner of RJLL: "The current lithium frenzy is a positive game changer for us. I believe we will see significant demand coming from the lithium sector over the next five years."

Compensating for a slowdown in gold exploration in a province like Québec, which built its reputation on

the precious metal for centuries, is by no means an easy task. Drillers in the province have traditionally generated most of their revenues from Val d'Or's golden land. The world race for lithium currently unfolding in Québec thrown a lifeline for the drilling segment. Celebrating the second anniversary of the merger with Versadrill, MBI Global CEO Daniel Misiano, stated: "A slowdown in gold and other metals has been compensated by an increase in demand for lithium."

Originating from Rouyn-Noranda, MBI Global is a superb example of a contractor with a global presence and at the forefront of innovation. Indeed, visitors at PDAC in Toronto in March 2023 may have witnessed the firm's first underground autonomous drill, currently in use at Agnico Eagle's Goldex mine. Speaking to the advantage of automation and AI for operators, Daniel Misiano explained "We can give information that has an impact on drill planning and setting of automatic parameters and, in the end, can aspire to improved productivity per shift as well as overall cost savings on drill maintenance."

These benefits were seconded by Diafor's Mathieu Donne: "Real-time data collection and live communication with drill rigs will be a big improvement in terms of monitoring drill specifications to define areas where we can decrease energy and fuel consumption."

### Getting some height

With environmental norms becoming more stringent, drillers' ability to stand out with efficient, safe, and sustainable offerings will remain key in the long term. Coupled with the remoteness of

mine sites in Québec, part of this story will be written through the advent of heli-portable drills. Mathieu Donne, president of Diafor, doubled the size of the business since 2022. Having had consecration at the explorer stage, the firm is actively trying to tap into the major market. Part of its competitive offering is the firm's capability to deploy a heli-portable drill, that ticks boxes for operators on the environmental, efficiency, and remoteness aspects. He detailed: "In the summer and winter of 2023, the heli-portable drill will be the star of the show, especially regarding environmental impact and access to land factors."

Look up, and you might catch one of RJLL's seven drill rigs flown by helicopter over Québec's Arctic region, James Bay, or Val d'Or. Among them, the Mancore 900 drills stand out: capable of drilling down to 1,000 m below surface, these drills can be disassembled and then built on-site, allowing easy aerial transportation in the province's most remote sites. According to David Bradley: "I believe that the remote operating environment of many exploration projects in Canada will lead to increasingly more demand for heli-portable drilling services."

### Promising incentives

Québec's ambition to become a hub for global electrification will have to be supported by reliable infrastructure. And as processing plants, construction sites, and facilities crop in the province, a well-tailored network of roads, ports, and power lines is also key to benefit the province's drillers. MBI Global was able to leverage the growing infrastructure in North America to bolster its order book. Seeing upswings on the geotechnical drilling side notably, Daniel Misiano shared: "We are benefiting from announcements of the rehabilitation of infrastructure or decisions related to new construction." This trend is unlikely to wane anytime soon, particularly with a clear strategy at the governmental level: "The Government of Québec has announced significant investments to facilitate mining exploration and further construction impacting geotechnical drilling", he concluded. ■



» **Automation is a new technology, acceptance is thus key. The newcomers in drilling have been a great influence on the more mature drillers in accepting and benefiting from this new technology.** «

## Daniel Misiano

President  
MBI GLOBAL

### What synergies did the merger with Versadrill unlock for MBI Global?

This boosted our capabilities by adding a mix of exploration core and geotechnical drills. The integration has been extremely successful and has kept us very busy over the past years. It made MBI Global a much better company when we present ourselves to potential and existing customers around the world.

### What is demand looking like for your exploration and your geotechnical drills?

On the exploration side, we have a good order book. The geopolitical and macroeconomic environment has made exploration activities complicated since July 2022. But since our footprint spans over 30 countries, we have the flexibility to keep busy; if one market is slower, other areas of the world are picking up. We have seen a lot of upswings on the geotechnical drilling side. Demand is very strong due to all the infrastructure work being made in North America.

### How is MBI Global adapting R&D expenditures to prepare for upcoming work in the lithium space?

We were ahead of the curve in that aspect, as our preparations have been

ongoing since 2017. We have been seeing a consistent decline in available resources, meaning that the basis for exploration drilling is looking good. Likewise, and as mentioned before, the North American demand for geotechnical drilling is also strong thanks to very high investments made for construction and rehabilitation. The bulk of our R&D has been on the equipment side of the drills using automation and information gathering.

At PDAC in March 2023, we revealed the first underground autonomous drill, and now we want to take that technology up to the surface. Our first underground autonomous drill was deployed in the Abitibi region. Within the next 12-18 months, MBI Global will be able to offer automated drills on all of our surface drills, which will assist the industry in areas to address the ongoing lack of human resources and for geologists to help them with improved data collection thus assisting them for quicker decision making.

Looking at the autonomous drill, one key element is that various mining departments will have access to various data for their planning (ie: geologists, rock mechanics, and mine planning). We will be blending rod and inner tube handling with the automated drill to respond to increased

safety legislation where workers, in some countries, cannot manipulate the rod or its components. The safety legislation and the fact that automation offers access to another pool of labor give us a great base. We are very pleased to see more women joining the industry as expert drillers. Automation is a new technology, acceptance is thus key. The newcomers in drilling have been a great influence on the more mature drillers in accepting and benefiting from this new technology. Managing rod handling takes away that extra physical aspect. We like to say that our workers can go to the gym after their shift!

### Is the industry opening up to fully automated solutions?

Absolutely. We have our first automated drills at Agnico Eagle (Goldex mine). Now, whenever we have a quarterly meeting, we have the benefit of having several mine departments for their input relevant to the added data made available. We can collect various data from the drill and using AI we can give information that has an impact on drill planning, and setting of automatic parameters to improve productivity per shift as well as overall cost savings on drill maintenance and use of drilling consumables. We now can also drill between shift changes.

### What makes Québec special for drillers?

Québec is and will continue to be an important territory for drillers given all the work that will come in from existing well-known minerals found as well as that for the push for metals required for the electrification push. The Government of Québec has announced significant investments to facilitate mining exploration and further construction impacting geotechnical drilling.

### What will top MBI Global's agenda in 2024?

Being proactive through continuous R&D, automation, and safety advancements. Our relationship with our customers is our strongest value. We pride ourselves on understanding them and asking the right questions. This creates an environment of confidence between us and them. ■



»» **What has prompted our aggressive growth strategy is the demand we see in the market for underground drilling services, as increasingly more of our clients are going underground.** ««

## David Bradley

Co-Owner  
RJLL

### Can you provide an update on RJLL's activities and performance over the past year?

2023 is a year to consolidate the growth that RJLL has experienced over the past four years. We have grown to 21 drills, and we need to buy another to keep up with demands. We are consolidating and improving efficiencies in our shipping department, inventory, purchasing, etc., to get ready for our next phase of growth.

On the surface, RJLL offers deep hole drilling, shallow drilling, heli-portable drilling, and barge drilling. The company is now diversifying into underground drilling services, either deep hole drilling or shallow drilling, and we will now start acquiring underground drill rigs to have at least 10 by 2026. What has prompted this aggressive growth strategy is the demand we see in the market for underground drilling services, as increasingly more of our clients are going underground.

### Is the company looking to potentially expand outside of Québec?

RJLL is focused on Québec and Ontario. However, we are also looking outside of Québec and will potentially have an underground drilling contract in Saskatchewan in 2024/2025. Historically, the company had operations

in Asia, and due to client demand, we are looking to again expand into this region. The overseas client demanding our services is one of the largest mines with both surface and underground operations. RJLL would also like to expand our services into the US.

### Can you present RJLL's heli-portable drill service and the demand you are seeing for it?

RJLL has seven heli-portable rigs running this summer, two in the Québec Arctic region, four in the James Bay region, and one in the Val d'Or region. The Mancore 900 multifunctional drills can drill down to 1000 meters, and these modular machines can be disassembled into multiple segments allowing easy transportation by helicopter to the most difficult locations around the world. I believe that the remote operating environment of many exploration projects in Canada will lead to increasingly more demand for heli-portable drilling services.

### From what commodity spaces does RJLL see the most demand coming?

This past winter, five out of our 12 customers were Australian companies drilling for lithium in Québec and Ontario. I believe we will see significant demand coming from the lithium sec-

tor over the next five years as more companies, particularly Australian companies that have the expertise and knowledge, come to explore Québec's virgin territory for the commodity.

### Can you touch upon the work RJLL is doing with its First Nation partners?

RJLL has developed partnerships with indigenous communities to generate positive consequences for our work and to share our profits with each community we operate in. These partnerships are mainly based on knowledge sharing and a complete training plan to teach them the profession of drilling to be able to integrate them into the workforce and thus contribute to the economic development of the First Nations. RJLL currently has three joint venture partnerships contributing to the economic development and empowerment of First Nation communities. RJLL/Nuvumiut is a collaboration that will allow us to extend our territory of activities to Nunavik in partnership with the Inuit community. We are also in partnership with Assibi Industries, where we aim to create a link between the world of drilling and the Anishnabe Nation of Lac Simon so that they can take part in drilling activities in their territory. In partnership with the Spencer family from the community of Eastmain, the Nouchimi RJLL entity was created to contribute to the economic development of Cree communities in the James Bay sector.

### Are you seeing the drilling industry deploying electric drills to meet sustainability goals?

The number of batteries needed to run a drill is still large, and there is also a high risk of flammability. The bottleneck is the batteries, and further development is still needed to address these challenges. RJLL is working with companies from Canada and abroad to identify a starting point for the R&D process for electric drills.

### What are RJLL's main objectives for 2023 and beyond?

Due to the forest fires raging through Québec, our drilling activities have been stopped for over 20 days, and it is going to be a challenge to catch up on drilling meters lost during this time. Moving forward, RJLL will focus on consolidation and setting up the company in such a way that we are ready to expand. ■



»» **The heli-portable drill will be the star of the show, especially regarding environmental impact and access to land factors.** ««

## Mathieu Dionne

President  
DIAFOR

### Can you give an overview of Diafor's activities and achievements over the past year?

Over the past year, we doubled the size of our business. The company is now ready to answer heli-portable drilling needs. We see an increase in demand from battery metal projects such as lithium and graphite. During the past year, we also developed a turnkey drilling water treatment system and deployed it successfully on two projects already. Diafor was also able to significantly reduce our greenhouse gas emissions as part of our sustainability efforts.

### How is Diafor positioning itself to work with both majors and explorers?

We assess that Diafor has an unmatched level of customer satisfaction with junior explorers, but will also be the best supplier for majors. So far, majors seem to prefer to have an upside potential in terms of drill availability from their larger drill supplier and they assume a smaller company such as Diafor will not have the capacity to take on their request. I want to put the message out that we do! We are often invited to bid on programs, which is a sign that the major companies are

considering us as a potential supplier. Larger drilling companies are very competitive in winning contracts and they lower their prices to a point that is very close to their breakeven point. We respect our value and ask for the price we deserve for our services, but sometimes, this results in a 10% to 20% price gap. Clients that have worked with us before know that there is value in that price gap and that it is worth working with Diafor. Currently, we are actively seeking and welcoming First Nations partnerships.

### How do you forecast demand for Diafor's heli-portable drill capabilities to unfold in 2023?

The heli-portable drill will be the star of the show, especially regarding environmental impact and access to land factors. As environmental regulations are becoming more stringent, we cannot pull a drill on skids on wetlands 99% of the time, and using a heli-portable drill significantly reduces the impact on the environment. In the James Bay region, access infrastructure to lands is not as developed as in mid and southern parts of Québec where they have a large forestry industry or are closer to agglomerations, and it is then greatly beneficial to be able to

fly the drill to the property where it is required. To date, the adoption rate of heli-portable drills has not been what it should have and many companies that have utilized it do not have the level of expertise required to make the programs successful. Demand and adoption interest however continues to develop and more companies like Diafor are adopting this method, especially with the drilling industry being extremely competitive and we have to incorporate more services into our portfolio to maintain our added value.

### Can you elaborate on Diafor's ESG commitments to the region?

ESG is key for Diafor, and we continue to invest in the local communities where we are based as well as where we operate. For example, in Malartic, we are focused on investing in sports activities and athletes, which is beneficial from a health point of view but are also continuously looking for social initiatives we can encourage and invest in. We also invest in suicide prevention activities.

In terms of our green commitments, we continue to develop technologies for water drilling fluid treatment to make it more efficient and respectful of the environment. We are also focused on reducing our carbon emissions, and through testing two different arrangements of power units on our drills, we found a combination that allows us to save 40 tons of greenhouse gas emission per drill per year based on lower fuel consumption. Diafor is proud to maintain our ECOLOGO certification.

### What technological advancements do you think will be increasingly adopted in the coming years?

Real-time data collection and live communication with drill rigs will be a big improvement in terms of monitoring drill specifications and analyzing the data from all the drill parameters to define areas where we can decrease fuel consumption and optimize our operations. We can also determine workforce productivity through data analyses and identify where certain employees might need more training. Predictive and planned maintenance will also be improved, allowing for less downtime and more productive drilling. ■

# Aerial Logistics

Essential, timelessly



Image courtesy of OCTANT Aviation

The aviation segment may well be the lifeline of the mining industry in Québec. Before even considering an aviators' vital role in taking miners in the province's most remote areas – where most of its critical minerals are located – one must appreciate the colossal effort made by airlines, charter, and cargo to ensure the safety of people endangered by the 2023 wildfires.

The aviation segment plays a crucial role in supporting the mining industry in Québec's remote areas by facilitating

efficient transportation of personnel, equipment, and supplies, ensuring the continued exploration and extraction of valuable resources in otherwise inaccessible parts of the North.

With operations strategically spread across the province to access bush areas affected by the fires – in Natashquan, Havre St-Pierre, Manic 5, Caniapiscau, Sept-Îles, and Schefferville – Air Tunilik assisted all stakeholders when the largest fires in the province's history quickly spread in May. "Air Tunilik's fleet com-

prises six-seat Beaver DHC-2 and nine-seat Turbo Otter DHC-3T, cementing our status as a premier bush plane operator in Québec and one of the largest in North America," detailed Simon Contant, the firm's president.

Reactivity, flexibility, and adaptability will undoubtedly remain keywords for the aviation segment in the coming months. Mining operations come with a set of hazards for personnel, and the guarantee of a quick response from an aerial firm is a key differentiating factor for miners when selecting a service provider. Out of Laval, OCTANT Aviation is a consulting firm established to support air carriers, airports, as well as public and private organizations for their aviation projects. Beyond being a strategic partner for mining firms, assisting with performance studies notably, Nathalie Tousignant, the firm's president, also takes pride in her "SWAT team". She detailed: "We operate a 24/7 operations center composed of dispatchers, reservations agents, and flight coordinators. If a worker needs to be evacuated for sickness or accident, we mobilize a specialized aircraft with medical staff to be there within a few hours."

### Unlocking opportunities through the air

The first of the many challenges that define mining supply chain logistics is access to exploration targets, deposits, and operations. Going thousands of kilometers north of the Abitibi, in James Bay, Radisson, and Nunavik, places that are rich in minerals coveted for electric vehicles, is by no means an easy task. With the critical minerals space providing opportunities across the value chain, the size of the freight, cargo, and

charter market will most likely increase in the coming years, meaning more business for Québec's air carriers.

Among the industry, Nolinor needs no introduction. Not just because the firm boasts the largest fleet of Boeings' 737-200 in the world or its status as the official carrier of Agnico Eagle, but also because the firm is as present online as it is in the air: having reached a million followers on TikTok in 2023, only Ryanair has a larger social presence than the Montréal-based airline. The firm's president, Marco Prud'Homme, touched upon the fundamentals behind the role of aviation going ahead: "If you look at any satellite picture of the earth at night, you will see that the only place that remains without lights is northern Canada. For the next 20 years, there will be lots of exploration and development in a region where there are few roads and limited sea access."

Despite robust infrastructure, road, and sea networks, the distance between most mine sites in Québec continues to remain a challenge for operators to attract – and retain – personnel. Chrono Aviation, perhaps the fastest-growing airline in the history of Canada, noted that challenge. Having Glencore, Canadian Royalties, and ArcelorMittal as notable clients, Chrono virtually serves the full spectrum of the mining industry in Québec, particularly through its Boeing 737-200, Pilatus, and Beechcraft 1900D aircraft that are available for ad-hoc charter. Speaking to the importance of aviation as an answer to the talent crunch, president Vincent Gagnon detailed: "Employees would be discouraged if they had to commute to the mine by road. Québec's aviation industry is therefore vital, allowing mines to use fly-in fly-out services to support their operations and attract new talent."

The fly-in fly-out model being that of choice for operators, it will not be surprising to see a workforce from the Montréal areas sent up North to take part in the rush for Québec's critical minerals. Attracting rare talent will come at a

» Importantly, climate risks like extreme weather have the potential to disproportionately impact remote communities like those that host our fly-in, fly-out operations



David Gaudreau, General Manager, Éléonore Mine, Newmont

cost. In the short-term, mining operators will have to balance exploration upsides with these new untraditional logistics expenditures. As put by Nathalie Tousignant: "The shortage of human resources has become a serious challenge for the mining industry. As such, mining organizations must gather personnel from several locations to bring them to the mine site. This situation makes fly-in fly-out logistics more complex and more expensive."

Whether by responding to short-term crises or through long-term fly-in fly-out commitments, Québec's aviation firms have shown the mining industry that they are a crucial partner to their operations. Most importantly, that they are here to stay. ■



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## Vincent Gagnon

President  
CHRONO AVIATION



Québec's aviation industry is vital, allowing mines to use fly-in and fly-out services to support their operations and attract new talent.



### Can you introduce Chrono Aviation and the firm's history?

Chrono Aviation has been providing air charter services since 2012. In the beginning, my business partner Dany and I discussed starting an air charter company using the Pilatus PC-12. Within a year and a half, we added three more aircraft, and within seven years, we acquired Boeings! It is perhaps the fastest-growing airline in the history of Canada. Our expansion began with Wabush mines and Québec Northern Construction, then we moved into Nunavut to service even more mines and construction firms.

Our Boeing 737-200, equipped with a gravel runway, as well as Pilatus and Beechcraft 1900D aircraft, are available for ad-hoc charter, serving clients like Glencore, Canadian Royalties, Arcelor, and others. I can say that there is virtually no Québec mining firm we do not work with.

February 2022 marked the introduction of our first Boeing 737-800 cargo plane. We use the Boeing 737-800 cargo twice a week to transport food to Nunavut and service clients throughout the United States, Canada, the Caribbean, Central America, and South America.

### How important is the Québec mining industry for your operation?

We have bases in Winnipeg, Montréal, and Québec City, so we are very versatile across the country. Although we serve a diverse range of clients, mining makes up a large portion of our business, and Québec mining is a particularly important part of it. We estimate that Québec mining accounts for about 15% of our business. No matter what the need is, we provide fly-ins, fly-outs, or cargo flights for mining companies throughout the country.

### How has Chrono Aviation responded to the Covid-19 pandemic?

We have faced many challenges due to the pandemic. At the beginning of the outbreak, traffic was virtually shut down in the North. Additionally, we were building a large facility in St-Hubert at the time of the pandemic, which negatively affected our capital. We were also denied government assistance despite operating in the North and delivering 100,000 pounds of food weekly to Iqaluit (Nunavut).

### With Québec operations being remote, how important is the aviation segment for mining firms?

Québec's road network offers more access to mining sites than in Nunavut. However, employees would be discouraged if they had to commute to the mine by road. Québec's aviation industry is therefore vital, allowing mines to use fly-in and fly-out services to support their operations and attract new talent. I believe that the aviation industry, particularly charter airlines, is of significant importance for mining. The mining industry needs to have companies like ours assist them when mining companies need to send 50 employees to Wabush for weekend shutdown work.

Whether it is just flights or logistics assistance, we do everything we can to make sure our clients receive the best service possible. Our team at Chrono is committed to working together with clients and advising them on cost-saving flying solutions they've never considered before.

### What are going to be the key objectives for Chrono Aviation in the coming months?

In short, the Boeing 737-200 is getting old, and it will soon need to be replaced. It is necessary to replace the current aircraft with a more fuel efficient and reliable one to better serve the mining industry. In spite of the high capital expenditures in aviation, we are working on developing a solution that will allow for the acquisition of new aircraft. This is why 2023 will be a pivotal year for us. By focusing on our growth strategy, we hope to raise the necessary capital and attract new investors to enable us to obtain better aircraft. ■

# CHRONOAVIATION

## 737-800SF

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## 737-200





# Marco Prud'Homme

President  
NOLINOR AVIATION



**For the next 20 years, there will be lots of exploration and development in a region where there are few roads and limited sea access. So, aviation will play a crucial role in the green transition.**



## How has Nolinor Aviation (Nolinor) adapted to the needs of the mining industry in 2023?

Most of our requests from the mining industry right now are related to the Boeing 737-200, the only certified jet by Boeing that can land on gravel. We have the largest fleet of 737-200 in the world and recently received a confirmation from Boeing that they would continue supporting the aircraft. We are also bringing back two Boeings that were removed from the fleet at the beginning of the pandemic. One aircraft should be ready before the end of June, and the other at the beginning of 2024.

## Did you notice a shift in demand from majors and juniors for Nolinor's services?

Increasingly, mining firms want us to take care of larger logistics in the aviation field. Some operators may request oversized cargo to bring to their mine, so firms will ask us to take cargo from Europe to North America. We are handling those services, and we are also branching into smaller aircraft: we have a division that has a small fleet of PC-12 aircrafts, and a small fleet of Beach 1900. These are needed to transport workers from the local communities to the mining sites. We want to push those added services to the coming years, so we can offer mining firms turnkey air solutions. We added a 737-800 recently, and if you have a fair amount of people to move, this is key. Adding 400s and 800s to the fleet adds flexibility, and we want to be seen on the market as an airline that brings 360-degree solutions.

There is a change in the market. Five years ago, people looked for cheap prices. We stuck to our philosophy, which is bringing value to mining companies, and you need an important fleet to do so. This comes to a price.

## What will the growing need for critical minerals mean for the aviation segment in Québec?

For the next 20 years, there will be lots of exploration and development in a region where there are few roads and limited sea access. So, aviation will play a crucial role in the green transition.

## Can you touch upon some of Nolinor's investments in new technologies and sustainability practices?

We added younger aircrafts to our fleet, which is our way of adapting, and we use the 400 and 800 for charter requests only. In the coming years, we might have to enroll in specific environmental programs, and we welcome the idea with an open mind. In November 2022, we started working on AI solutions for our safety management system (SMS). We created an API and used ChatGPT to manage part of the report. Simply put, the AI will summarize a 3-page report in a paragraph. At the end of the process, we asked ChatGPT to act as an airline safety specialist and provide a draft of safety measures. This was a 3-month project that we deployed in mid-April, and so far the result is so good we are thinking of developing a commercial version of it. At Nolinor, we love innovating.

## How are you leveraging social media as a recruitment and public outreach tool?

We are second on TikTok in the aviation industry, having reached 1 million followers recently. Social media completely redefined our approach to HR. We now receive resumés every week, and in 30 years, we have never seen such a level of fandom from folks online. I receive personal emails every week about youngsters writing that their dream job is to work at Nolinor. They follow our account, dream about going up North, flying with our aircrafts, etc. One kid built a LEGO of a 737-200 with thousands of parts and submitted his design to LEGO, and people still vote for it to be reproduced. We spend around C\$200,000 per year on social media. The return we get from it is visibility, candidates, leads, and public outreach. Only Ryanair is before us on TikTok, which is crazy!

## What are the key milestones for Nolinor in 2023-2024?

We want to create more volume and capacity with the 737-200 for the mining industry. As those aircrafts will be flying for the next two decades, we have been looking for their alternative, as I doubt people are going to pave all the roads in Nunavut. Aviation will stay relevant for mining companies in Québec in the decades ahead. ■



# A Forward Outlook for the Aviation Industry

## The 737-200, a balancing act

Image courtesy of IOS Services Géoscientifiques

One of the industry's most mythic aircraft has not sung its Swan Song. First flown in 1967, the Boeing 737-200, one of the only jets capable of taking off and landing on gravel runways, with a capacity of over 100 passengers and 30,000 tons of cargo, is still showing its resilience. With years of flying ahead, the industry is still planning, but in the short term will most certainly rely on the one aircraft able to bring cargo and passengers up North, where most of the tracks are not tarmacked. People at mine sites in James Bay or Nunavut might see hydrogen, battery, or sustainable aviation fuel (SAF) powered aircraft in the next two decades, but in the foreseeable future, they will most likely see smaller aircrafts, 737-200s, 737-400s, and 737-800s.

### The way to the North

Despite growing headwinds, the 737-200 will likely remain the default solution for air carriers to serve the mining industry in the short term. The aircraft built its reputation over its reliability, its versatility, and its unique landing capabilities, despite a less glamorous carbon footprint. Nolinor recently got a confirmation from Boeing that the group would continue supporting the aircraft. "This comes at a time when most of our requests from the mining industry right now are for the Boeing 737-200" explained president Marco Prud'Homme.

Deemed the "Spirit of Yellowknife" by Canadian North, the 737-200 can be equipped with gravel deflectors behind the landing gear. This reinforces protection around sensitive equipment and modifies the engines to help keep gravel out. In Yellowknife and in the North, the reality of the terrain means that, at least in the coming years ahead, miners will certainly have to rely on the 737-200 to access the part rich in critical minerals. Nathalie Tousignant, president of OCTANT Aviation, explained: "The fleets of our carriers are composed mainly of De Havilland Dash-8s, as short airstrips are standard in the North. Most runways are gravel and very few types of aircraft can land on these surfaces. On longer runways, the Boeing 737-200 is still the most suitable aircraft."

### Complimentary offerings

While the 737-200 still has good years ahead of it, the industry's main players are looking at ways to complement their offering to answer efficiency, sustainability, and forward-looking challenges. Despite holding the largest fleet of 737-200s there is, Nolinor added a 737-800 – and 737-400s – aircraft

capability, key to transporting more passengers, and uses its 400s and 800s for charter only to adapt. Chrono Aviation uses its 737-800 to serve customers throughout the Americas. The next two years will be pivotal for the firm in its quest to unlock capital and engineer solutions to provide the industry with new flying ways. As put by Vincent Gagnon, its president: "In short, the Boeing 737-200 is getting old. It is necessary to replace the current aircraft with a more fuel efficient and reliable one to better serve the mining industry."

### Sustainability focuses

Unsurprisingly, sustainability-related topics will keep aviation executives busy in the coming years. In the age of social media and public transparency, the industry has often been the target – often unfairly – of environmental and civil society groups regarding the fuel consumption and carbon footprint of aircraft. While the challenge is global, Québec has (of course) its own twist to it: adapting gravel runways. The industry must invest for different types of jets to be able to take off and land from Québec's most remote areas, and this is one of the contributions OCTANT could make in the future: "We are working to find a stabilizer product for gravel runways that will allow the use of more recent-generation aircraft that have less jet-fuel consumption. This type of product could potentially reduce the frequency of runway maintenance. That would be a game-changer for the industry," expressed Nathalie Tousignant.

Could battery-powered fleets be a new norm in the future? The first battery-powered commercial aircraft took off from Washington in 2022, with the capacity to carry nine passengers and 250-mile autonomy. Québec is known for its innovative minds and ingenious entrepreneurs. Simon Constant, Air Tunilik's president, shared his vision of an electrified horizon: "We have made significant strides in reducing our carbon footprint by transitioning from piston engines to turbine engines. This transition also involves shifting a gasoline-based fuel to jet fuel, a cleaner alternative. Looking ahead, we envision a future where battery-powered aircraft become an integral part of our fleet."

With the world looking at Québec's minerals, aviation service providers will be protagonists in making the generational opportunity a reality in the province. And this, according to Québec's highest operating standards: safety, efficiency, and sustainability. ■



» Projects can range from planning the construction of a runway, organizing transportation logistics, selecting appropriate air carriers, or even just supporting on-site operations on a regular basis. «

## Nathalie Tousignant

President  
OCTANT AVIATION

### Can you present OCTANT Aviation?

OCTANT Aviation is a consulting firm established to support air carriers, airports, as well as public and private organizations for their aviation projects. We help our clients put in place structured and sustainable projects for their operations. Our great strength resides primarily in our detailed knowledge of the technical, logistical, and regulatory aspects involved in aerial operations as well as airport operations.

Projects can range from planning the construction of a runway, organizing transportation logistics, selecting appropriate air carriers, or even just supporting on-site operations on a regular basis. Let me give you an example. OCTANT Aviation was mandated by the Nunatsiavut government to plan the relocation of the Nain airstrip in Labrador. Its relocation has become necessary to ensure reliable and safe service to the community. Construction work is scheduled to begin in 2026. Ultimately, this new fully equipped 6,000 ft runway will be an extraordinary opportunity for the mining industry.

### How do mining companies leverage your services?

Mining companies use OCTANT Aviation's services to plan the construction of a runway or to optimize existing in-

frastructure. We cater to all aspects of the development process concerning site selection, engineering, construction, and the complete commissioning of the site.

The shortage of human resources has become a serious challenge for the mining industry. As such, mining organizations must gather personnel from several locations to bring them to the mine site. This situation makes "fly-in fly-out" logistics more complex and more expensive. This is why we also work on the organization of logistics and the management of their flights. Our job is to negotiate agreements with air carriers, optimize routes, and manage flights on a daily basis. We operate a 24/7 operations center composed of dispatchers, reservations agents, and flight coordinators. If a worker needs to be evacuated for sickness or accident, we mobilize a specialized aircraft with medical staff to be there within few hours.

Finally, our "SWAT" team can be deployed at anytime, anywhere, when the situation requires it. This very versatile team is composed of airport controllers, base managers, ground handlers, and trainers.

### How are fleets adapted to the specific conditions in the North?

The fleets of our carriers are composed mainly of De Havilland Dash-8s, as short airstrips are standard in the North. Most runways are gravel and very few types of aircraft can land on these surfaces. On longer runways, the Boeing 737-200 is still the most suitable aircraft, with a tremendous weight capacity and being the only jet capable of operating on gravel runways. Fleet is a key factor to consider when operating in the North. Unfortunately, most of the aircraft used are old and the Boeing 737-200, in particular, has a very short remaining lifespan.

### What optimization approaches have you used to improve your sustainability?

Besides managing day-to-day flights very carefully to reduce environmental impact, we are working to find a stabilizer product for gravel runways that will allow the use of more recent-generation aircraft that have less jet-fuel consumption. This type of product could potentially reduce the frequency of runway maintenance. That would be a game-changer for the industry. On another front, we also worked with one of the air carriers serving many of the remote communities in the North. OCTANT Aviation optimized its flight paths at each airport by designing more straight-in approaches in line with the carrier's itinerary. These improvements resulted in significantly diminished fuel consumption.

### What will be the priority for OCTANT Aviation in the months ahead?

Mining companies are very keen on workers' safety, and this is no exception when it comes to aviation operations. There are a few companies that still do not treat aviation with the same emphasis as their principal mining operation, mainly because their expertise is mining and not aviation, thorough management of aviation (runway and carriers) is likewise a key component of workers' safety.

Fifteen years ago, Transport Canada issued federal regulations requiring both air carriers and airports to operate a Safety Management System (SMS) within their organizations to manage their own risk. It was a complete culture shift. To facilitate the process, we developed a software to manage the SMS and help organizations comply with regulations. It was a big achievement for OCTANT, but more importantly, it eases the life of our clients. ■



## Simon Contant

President  
AIR TUNILIK

» Our operations are strategically spread, with seaplane bases in as Natashquan, Havre St-Pierre, Caniapiscou, Sept-Îles, and Schefferville, extending into Wabush in Newfoundland and Labrador. «

### Can you give an overview of Air Tunilik and the company's services to Québec's mining industry?

Air Tunilik is a renowned aviation company based in Québec, boasting more than 20 years of industry experience. Our reputation as the leading bush aviation company in Québec stems from our unwavering commitment to serving mining companies in northern Québec. We offer comprehensive transportation solutions for both personnel and cargo, including essential supplies such as fuel, drill equipment, food, machine components, and other materials required for mining camp operations.

Our operations are strategically spread across Québec, with seaplane bases located in key areas such as Natashquan, Havre St-Pierre, Manic 5, Caniapiscou, Sept-Îles, and Schefferville, and extending into Wabush in Newfoundland and Labrador. In our continuous pursuit for efficiency, we acquired an airport three years ago north of Wabush and west of Schefferville, featuring a 6000-foot runway capable of accommodating a Boeing 737.

### Can you elaborate on Airlink Tunilik's fleet?

Air Tunilik operates an extensive fleet of over 10 seaplanes, each capable of carrying cargo loads of up to 3,000 pounds, a capacity that exceeds most helicopter models. We also deploy ski planes during winter to ensure uninterrupted service for the mining industry. Our fleet comprises six-seat Beaver DHC-2 and nine-seat Turbo Otter DHC-3T, cementing our status as a premier bush plane operator in Québec and one of the largest in North America. Our DHC-3T Turbo Otter can transport up to 2,500 pounds of cargo and demonstrates exceptional versatility, capable of landing on skis, water, or wheels. In addition, we operate Cessna Caravan planes, modern aircraft designed for passenger/cargo transport on wheels and floats, and can carry up to 3,400 pounds on wheels.

### How will the increased demand for critical minerals impact the aviation segment?

Mining sites are often located in remote areas where air travel is more feasible than road access. For mining operations located over 50 miles away from roadways, our services become indispensable for personnel and cargo transportation. Our Cessna Caravan aircraft are also capable of conducting airborne surveys, in partnership with specialist companies, making them an invaluable tool in the mining sector.

### What is Air Tunilik's approach to sustainability and reducing greenhouse gas?

Sustainability is a priority for Air Tunilik. We have made significant strides in reducing our carbon footprint by transitioning from piston engines to turbine engines, significantly lowering our carbon emissions. This transition also involves shifting from avgas, a gasoline-based fuel, to jet fuel, a cleaner alternative. Looking ahead, we envision a future where battery-powered aircraft become an integral part of our fleet. Though currently still under development and testing, we are optimistic about incorporating this technology into our operations within the next decade.

### What are Air Tunilik's main priorities in 2023 and 2024?

As we navigate through 2023 and 2024, our strategic focus will be threefold. First, we aim to consistently deliver superior services to our clients, backed by our uncompromising commitment to safety and reliability. Second, we intend to expand our fleet with the acquisition of more advanced aircraft to improve our cargo and personnel transportation capabilities. This will not only enhance our service offerings but will also contribute to increased operational efficiency. Lastly, we will continue to explore innovative technologies and eco-friendly practices that align with our sustainability goals, ensuring that our growth does not compromise our responsibility towards the environment. We look forward to these exciting advancements in our services and operational capabilities. ■





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