CRITICAL minerals REVIEW

2026

ISSUE 1

Greenland: From frontier to strategic anchor for western critical minerals

The future of aluminum starts in Saskatchewan

E3 Lithium advances Clearwater Project with Phase 2 of its Demonstration Facility in Alberta

www.criticalmineralsreview.com

In this issue

CRITICAL minerals REVIEW

DEL COMMUNICATIONS INC.
www.delcommunications.com

President & CEO
DAVID LANGSTAFF

Managing Editor
SHAYNA WIWIERSKI
shayna@delcommunications.com

Project Lead & Sales
MIC PATERSON
mic@delcommunications.com

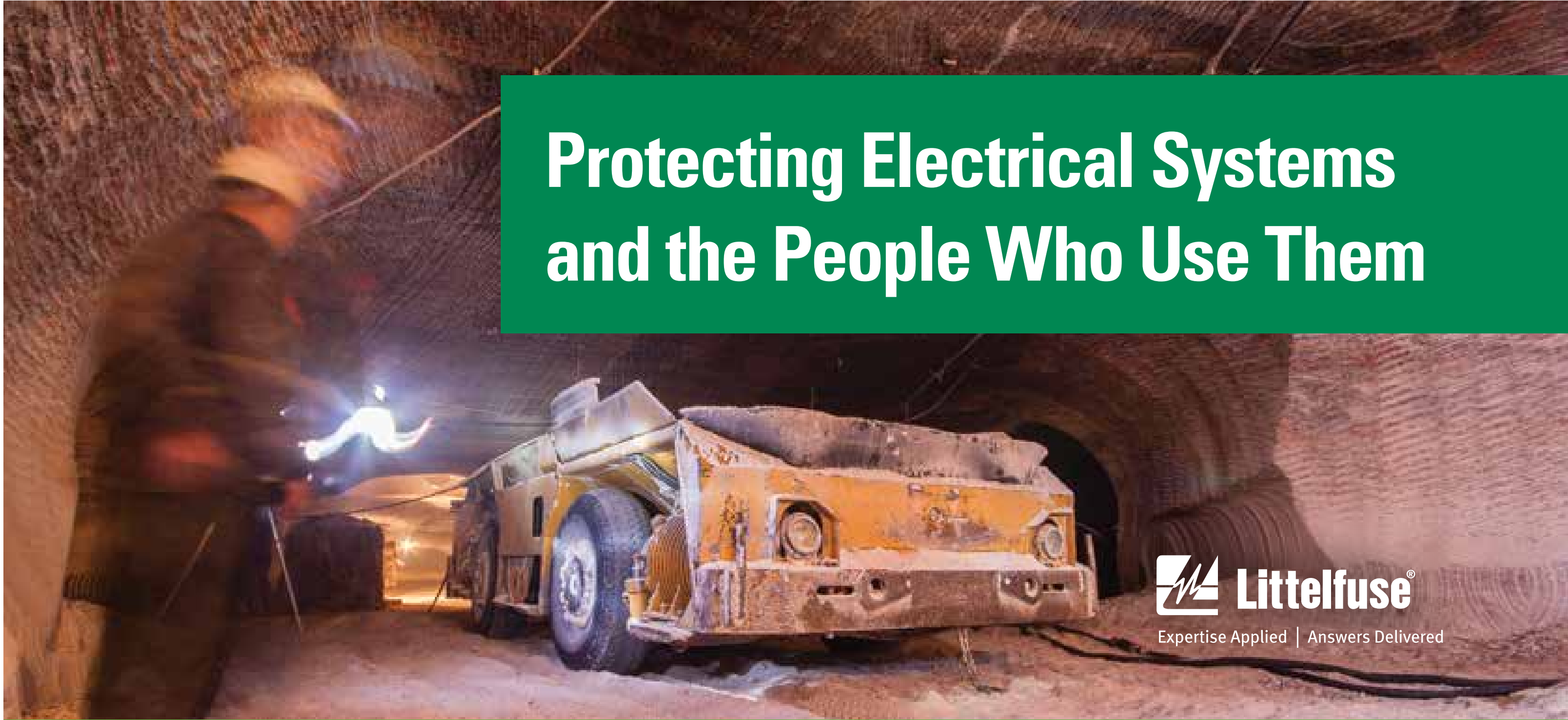
Creative Director / Design
KATHLEEN CABLE

Advertising Sales
BRENT ASTROPE
GARY SEAMANS

Contributing Writers
COMMANDER PHIL EHR
DR. LUCY HUNT
JOSHUA MAYFIELD
BO MØLLER STENSGAARD

DEL Communications Inc. is extremely grateful to our advertisers for their support in this publication.

CLICK HERE TO DOWNLOAD THE MEDIA KIT.



Visit Littelfuse.com/Mining

Our Expertise in Protection Runs Deep

Littelfuse products are engineered to withstand the harshest underground and surface mining environments to improve safety and reduce downtime.

Neutral-Grounding Resistors (NGRs) and Monitors

- Meet 2021 CE Code requirements
- Detect shorted NGR and monitor neutral-to-ground continuity

Ground-Fault Protection

- Advanced filtering eliminates nuisance tripping and detects ground faults early
- Reliable, sensitive ground-fault detection down to 0 Hz on systems with variable-frequency drives on resistance-grounded systems

Ground-Check Relays

- Combination ground-fault and ground-check monitoring to ensure proper equipment grounding
- Our relays protect equipment at the end of some of the longest mining cable runs in the world

Arc-Flash Protection

- Reduces arc-flash energy and risk of injury or equipment
- Redundant solid-state trip circuit provides fast and fail-safe operation even from black start

Motor and Pump Protection

- Extends motor life and reduces downtime
- Provides metering, datalogging, and fault diagnostics

Industrial and Power Semiconductor Fuses

- Extremely current-limiting
- Short circuit protection

Surge Protection

- Clamps and withstands high-energy transients to prevent equipment damage and downtime
- Thermal protection eliminates catastrophic failure

Industrial Shock Protection

- Human-level GFCI protection for equipment up to 600 V and 100 A
- Commonly used on submersible pumps, AC welders, and portable loads in wet areas and confined spaces

MESSAGE FROM THE EDITOR

Shayna Wiwierski

The world is in a race, and the finish line is a cleaner, more secure, and more resilient future. At the heart of that race lies something unglamorous but utterly essential: the minerals that power our batteries, harden our steel, and underpin the technologies reshaping economies and defence strategies alike.

With each issue of the *Critical Minerals* Review, we aim to track that race honestly, including the breakthroughs, the disruptions, and the complex policy environments that define this moment in history. This edition is no different.

Nowhere is the urgency of the energy transition more tangible than in the push to build a North American battery supply chain. In this issue, we highlight E3 Lithium, who is exploring a milestone that deserves far more attention than it has received: the launch of Phase 2 operations at their Clearwater Project demonstration facility in Alberta.

Located in the Bashaw District between Calgary and Edmonton, E3's project is advancing Direct Lithium Extraction technology toward commercial-scale production of battery-grade lithium carbonate. The numbers are striking. The Bashaw District resource represents Canada's largest lithium resource, with production potential of up to 150,000 tonnes of lithium carbonate per year, equivalent to roughly 10 per cent of global lithium supply in 2025. At a time when governments in Ottawa and Washington are scrambling to reduce dependence on offshore mineral sources, E3's progress offers a concrete and compelling answer. The commercialization of Clearwater would not simply be a corporate milestone; it would be a strategic one for the continent.

If lithium is the metal of the energy transition's promise, nickel is the metal of its complications. Our in-depth feature on the global nickel industry makes clear that this is a sector in genuine upheaval. Western governments and manufacturers are racing to establish reliable supply chains even as China tightens its grip on processing and refining capacity. Meanwhile, demand from stainless steel, EV batteries, and defence applications continues to accelerate, creating pressure on a market that is anything but stable. Layer onto that the European Union's Carbon Border Adjustment Mechanism and Canada's industrial carbon pricing regime, and the picture grows still more complex. Yet complexity, as we note in these pages, is not the same thing as paralysis.

Enter FPX Nickel and its Baptiste Nickel Project, the world's largest and most advanced deposit of awaruite, a naturally occurring nickel-iron alloy that could redefine how the industry operates. As the global leader in awaruite development, FPX has the potential not merely to participate in the nickel market's transformation, but to lead it. The Baptiste deposit's scale, combined with awaruite's distinctive processing characteristics, offers a genuinely differentiated path forward at a moment when differentiation matters enormously.

The critical minerals sector rewards patience, rigour, and a willingness to look past short-term noise. That is what we try to bring to every issue of this magazine, and what we hope you find in these pages.

If you want more critical minerals news year-round, make sure to visit criticalmineralsreview.com

Welcome back and we hope you enjoy this issue.

Shayna Wiwierski
Shayna@DELCommunications.com

HELP GROW THE MINING TALENT PIPELINE

Become a
Mining Needs You
Career Ambassador.

Learn more at:
miningneedsyou.ca

MIHR RHIM
MINING INDUSTRY HUMAN RESOURCES COUNCIL
CONSEIL DES RESSOURCES HUMAINES DE L'INDUSTRIE MINIÈRE

MINING NEEDS YOU

Canada's critical minerals advantage

Six minerals shaping the country's economic future and powering the global energy transition

As global demand for secure and sustainable supply chains continues to grow, Canada's critical minerals sector is becoming increasingly important to the future of clean technology, manufacturing, and economic development. From battery production and advanced electronics to agriculture and aerospace, critical minerals are essential to many of the industries driving the modern economy.

Canada's updated Critical Minerals List now includes 34 minerals and metals considered strategically important to the country's economic security and low-carbon future. Following last issue's spotlight ending at niobium, this edition continues the alphabetical series with the next six minerals on the list: phosphorus, platinum group metals, potash, rare earth elements, scandium and silicon metal.

Canada has a strong phosphate industry, particularly in Quebec.

Phosphorus

Added to Canada's updated Critical Minerals List in 2024, phosphorus is gaining attention for its growing importance in both food security and battery technology. While traditionally associated with fertilizers and agriculture, phosphorus is also increasingly used in lithium iron phosphate (LFP) batteries, which are becoming more common in electric vehicles and energy storage systems.

Canada already has a strong phosphate industry, particularly in Quebec, and the addition of phosphorus to the critical minerals list reflects the mineral's expanding strategic importance. As battery technologies evolve and demand for EVs rises globally, phosphorus is expected to play a larger role in North American battery supply chains.

Beyond energy applications, phosphorus remains essential to global agriculture, supporting fertilizer production needed to maintain crop yields and food production worldwide. This dual importance positions Canada as a potentially significant supplier in both agricultural and clean technology markets.

Platinum Group Metals

Platinum group metals, commonly referred to as PGMs, include platinum, palladium, rhodium, and several related elements used in a variety of advanced

Platinum group metals are highly valued for their durability, conductivity and catalytic properties.

industrial applications. These metals are highly valued for their durability, conductivity and catalytic properties.

PGMs are critical to automotive manufacturing, particularly in catalytic converters that help reduce vehicle emissions. They are also increasingly important in hydrogen fuel cell technologies, electronics, medical devices, and aerospace applications.

Canada is already a notable producer of platinum and palladium, with much of its production tied to nickel mining operations in Ontario. As countries continue investing in hydrogen energy infrastructure and low-emission transportation technologies, demand for PGMs is expected to remain strong.

The strategic importance of these metals extends beyond clean energy. PGMs are also used in

Potash is primarily used as a fertilizer, making it essential to agricultural productivity and global food security.

defence technologies and advanced manufacturing processes, making secure and reliable supply chains increasingly important for western economies.

Potash

Canada has long been a global leader in potash production, with Saskatchewan home to some of the largest potash reserves in the world. Potash is primarily used as a fertilizer, making it essential to agricultural productivity and global food security.

As the world's population continues to grow, demand for efficient and sustainable agricultural production is expected to increase significantly. Potash plays a vital role in improving crop yields, enhancing plant health, and supporting large-scale food production systems.

In recent years, geopolitical uncertainty and supply chain disruptions have highlighted the importance of reliable fertilizer supplies. Canada's stable political environment and well-established mining sector have strengthened the country's position as a trusted global supplier.

While potash may not receive the same level of attention as battery minerals, its strategic importance to global agriculture and economic stability makes it a critical component of Canada's mineral portfolio.

Rare Earth Elements

Rare earths are relatively abundant in nature, but economically viable deposits and processing capabilities are much less common.

Rare earth elements, or REEs, are a group of 17 minerals essential to many modern technologies, including electric vehicles, wind turbines, smartphones, defence systems, and advanced electronics. Despite their name, rare earths are relatively abundant in nature, but economically viable deposits and processing capabilities are much less common.

Canada is working to expand its rare earth sector through exploration and project development in regions including the Northwest Territories, Saskatchewan, Quebec, and Newfoundland and Labrador. Governments and industry are also investing in domestic processing capabilities to help reduce dependence on foreign supply chains.

Rare earth elements are especially important in the production of permanent magnets used in EV motors and renewable energy systems. They are also critical to defence and aerospace technologies, making them strategically important to national security.

As demand for electrification and advanced technologies continues to accelerate, Canada's rare earth industry is expected to become an increasingly important part of North America's critical minerals supply chain.

Scandium

Scandium is one of the lesser-known critical minerals, but it offers significant potential in advanced manufacturing and clean technology applications. When added to aluminum, scandium creates lightweight, high-strength alloys used in aerospace, defence, and transportation industries.

These alloys are particularly attractive for applications where reducing weight can improve fuel efficiency and performance, including aircraft, electric vehicles, and advanced sporting equipment.

When added to aluminum, scandium creates lightweight, high-strength alloys used in aerospace, defence, and transportation industries.

Scandium is also used in solid oxide fuel cells, an emerging clean energy technology that can generate electricity efficiently with lower emissions. As industries continue seeking lighter and stronger materials, interest in scandium production is expected to grow.

Canada has several scandium exploration and development projects underway, particularly in Quebec and Ontario. Although global production remains relatively limited, growing demand for advanced materials could create significant opportunities for Canadian producers in the years ahead.

Silicon Metal

Another mineral added to Canada's critical minerals list in 2024, silicon metal is essential to semiconductor manufacturing, electronics, and solar energy technologies. It is used in computer chips, telecommunications equipment, solar panels, and a wide range of industrial applications.

As the global economy becomes increasingly digital, demand for semiconductors and electronic components continues to rise rapidly. Silicon metal is therefore becoming increasingly important to both economic competitiveness and national security.

Canada's access to clean electricity and strong industrial infrastructure could support future opportunities in silicon processing and advanced manufacturing. The mineral also plays an important role in solar photovoltaic technologies, further linking it to the global transition toward renewable energy.

Silicon metal is essential to semiconductor manufacturing, electronics, and solar energy technologies.

With governments around the world prioritizing domestic semiconductor production and resilient technology supply chains, silicon metal is expected to become an increasingly strategic resource. ✘

The future of aluminum starts in Saskatchewan

Located in east-central Saskatchewan, Canadian Energy Metals has identified North America's first major alumina discovery, the Thor Project.

Our future depends on a product we barely notice: aluminum. From power grids and transportation systems to consumer products and energy storage, our lives run on it.

At the same time, aluminum's supply quality is declining, and the product remains concentrated in a small number of regions far from North America. The world's electrified economy needs more of it, and the supply solution is closer than anyone expected. Offering a potential generational opportunity in the province of Saskatchewan.

Located in east-central Saskatchewan, Canadian Energy Metals has identified North America's first major alumina discovery, the Thor Project. A world-leading polymetallic black shale deposit that spans 1,111 square miles of flat prairie farmland. It's a multi-metal, multi-product, multi-generational asset with alumina as its primary resource and strategic advantage.

Thor's deposit stands out due to its geology, geography, and geopolitics.

Its geology has an immense scale with 16 billion tonnes of measured resource, 33 billion tonnes of indicated resource, and 87 billion tonnes of inferred resource. To date, there are 2.2 billion tonnes of measured alumina and 4.6 billion tonnes of indicated alumina.

Beyond its scale, the deposit's near-surface geology supports a more efficient extraction process compared to traditional bauxite mining methods. Outlined in the company's January 2026 Preliminary Economic Assessment, "the [CEM] process has significant technical and economic advantages over traditional processing methods." (Source: Hatch).

Unlike traditional alumina supply chains that have historically depended on long transoceanic shipping routes, the Thor Project geography places it in the heart of North America. The project is located near a network of established roads and rail with direct access to the U.S. Midwest and Canada's industrial heartland.

The Province of Saskatchewan offers the Thor Project its geopolitical advantage. Saskatchewan is consistently ranked among the world's premier mining jurisdictions. The 2025 Fraser Institute's Annual Survey of Mining Companies has recognized the province's supportive policy environment and regulatory clarity that

From power grids and transportation systems to consumer products and energy storage, our lives run on aluminum.

seeks to limit uncertainties plaguing other jurisdictions.

Premier Scott Moe praised the "prospect of a new alumina industry setting up shop in our province" following the release of the company's preliminary economic assessment in early 2026.

In the short term, CEM is looking at its prefeasibility study in 2026, including engineering the design of a commercial demonstration plant, and potential partnerships with both industry and financial investors.

With its scale, location, and resource potential, the Thor Project represents a generational opportunity for Saskatchewan

Premier Scott Moe praised the "prospect of a new alumina industry setting up shop in our province" following the release of the company's preliminary economic assessment in early 2026.

to seize a mine-to-metal strategy with multiple development options to secure North America's aluminum supply chain.

Cautionary note regarding forward-looking information

This publication contains forward-looking information within the meaning of applicable Canadian securities laws and forward-looking statements within the meaning of U.S. securities laws (collectively, forward-looking statements). Forward-looking statements in this publication include, but are not limited to, statements regarding the company's strategic initiatives, the anticipated role of its financial advisors, the evaluation of potential partnerships or monetization opportunities, and the advancement of the Thor Project.

Forward-looking statements are based on management's current expectations, estimates and assumptions as of the date of this publication, and are subject to a number of known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those expressed or implied by such statements. These factors include, among others, the company's ability to identify and complete strategic transactions, the availability of financing on acceptable terms, general economic and market conditions, and other risks inherent in the development of mineral projects.

There can be no assurance that such forward-looking statements will prove to be accurate, and actual results and future events could differ materially from those anticipated. Readers are cautioned not to place undue reliance on forward-looking statements. The company undertakes no obligation to update or revise any forward-looking statements except as required by applicable law. ✘

A North American phosphate supply chain matters

Agnico Eagle's acquisition in the Canadian phosphate space

By Joshua Mayfield

Phosphate production in Canada

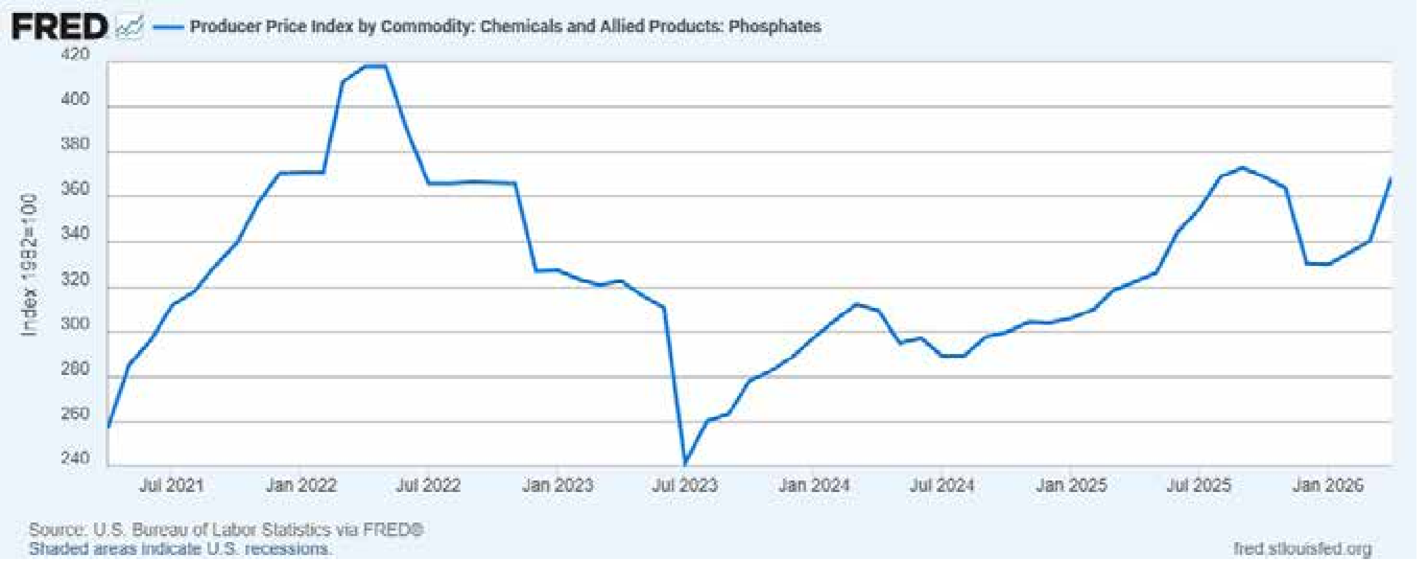
The reemergence of phosphate mining in Canada is nothing new and there are some advantageous political dynamics at play for Canadian phosphate projects. The Canadian government is keen to establish Ontario as a force in the phosphate mining sector and Ontario's Premier Doug Ford set out to create special economic zones (SEZs) that would suspend provincial and municipal laws for certain projects that will be important growth sectors for Canada's mining industry in the future, such as phosphate for fertilizer and lithium-iron phosphate (LFP) battery production.

Global phosphate trade tensions

In 2025, phosphate was added to the USGS critical minerals list. The objective of this U.S. critical mineral push is to decrease dependence on imports for phosphate products. Morocco's phosphate exports were also hit with countervailing duties (CVDs) by the U.S. government. The case at the United States International Trade Court (USITC) is ongoing, even as the Mosaic Company announced its withdrawal from the case. Unfortunately for OCP North America, the duty rate on Morocco's phosphate imports into the U.S. was set at 16.81 per cent.

This CVDs case revolves around global phosphate market trends and foreign government subsidies; however, U.S. and Canadian farmers should also be concerned about how LFP battery demand will disrupt the supply and demand for phosphate fertilizers. For example, China's export restrictions on phosphate fertilizers disrupted the supply chain which led to higher prices. It's obvious that there had never been any expectations for China to exit this crucial phosphate market. In addition, the world is scrambling for phosphate fertilizer supplies due to Strait of Hormuz shipping disruptions.

Due to high fertilizer prices, several junior phosphate companies have emerged from the shadows, and not all of them are even trying to break into the phosphate fertilizer market. Volatile phosphate prices in the USD \$800-\$900 per ton range are a new reality in the MAP and DAP fertilizer markets. Higher raw material input costs from ammonia and sulphur found their way into higher prices for phosphate production. The Phosphate Producer Price Index (PPI) has risen over 100 points since bottoming out in July 2023.



Agnico: Going where eagles dare?

In recent years, new phosphate projects are getting a lot of attention in the capital markets. Even the battery-intensive companies with their LFP battery dreams in sight are getting noticed for the high phosphate fertilizer prices. In a very intriguing transaction, on May 25, 2026, it was announced that Agnico Eagle, via its subsidiary Avenir Minerals Ltd, was acquiring Fox River Resources (CSE:FOX) by way of a statutory plan of arrangement under the Canada Business Corporations Act.

The deal was unanimously approved by the directors of Fox. Fox River holds a 100 per cent interest in the Martison Phosphate Project near Hearst, Ont. This had been planned as a vertically integrated operation, to exploit a high-grade, large-scale igneous phosphate deposit "capable of providing a secure domestic supply of phosphate fertilizers, as well as PPA for the LFP battery industry". The project's Anomaly A deposit underpinned a PEA with an effective date of April 21, 2022. Shareholders of Fox River will receive CAD$1.10 per share, payable in cash, for an aggregate purchase price of approximately CAD$94.3 million on a fully-diluted basis.

Conclusion: A North American phosphate supply chain matters

This is a prescient move by a mining major to acquire a junior phosphate company in Canada. Current policy actions from the U.S. and Canda are positive for the phosphate mining sector. However, future policies will require more than just boosting domestic production in the U.S and Canada; there must be a complete rethink on the entire phosphate supply chain in North America because Morocco, China, and Algeria have some of the world's largest reserves of phosphate rock.

At the same time, domestic phosphate production should be reserved for fertilizer projects and national food security programs. The U.S. shouldn't even consider investments into LFP battery plants since Canada can provide LFP batteries with its extensive igneous rock reserves. It's clear that phosphate fertilizer prices are not the only cause for phosphate becoming a critical mineral in the U.S. and Canada. The North American LFP battery supply chain matters for the entire critical minerals landscape. ✘

E3 Lithium advances Clearwater Project with Phase 2 of its Demonstration Facility in Alberta

Located in the Bashaw District between Calgary and Edmonton, E3 Lithium's Clearwater Project will produce lithium from brine using Direct Lithium Extraction (DLE) technology.

As global demand for battery materials grows, Canadian lithium developer E3 Lithium is moving into the next stage of demonstrating commercial-scale lithium production in Alberta, Canada. The company recently began Phase 2 operations of its demonstration facility, one of the key milestones in advancing its Clearwater Project toward commercial production of battery-grade lithium carbonate. Located in the Bashaw District between Calgary and Edmonton, the company's Clearwater Project will produce lithium from brine using Direct Lithium Extraction (DLE) technology.

E3's Bashaw District resource represents Canada's largest lithium resource, with production potential of up to 150,000 tonnes of lithium carbonate per year, representing approximately 10 per cent of global lithium supply in 2025. As E3 nears commercialization of its Clearwater Project, the company aims to capitalize on rapidly growing lithium demand while securing a North American battery material supply chain.

Unlike conventional hard-rock mining, E3 Lithium's process targets lithium-rich brines found deep underground in Alberta's historic oil and gas reservoirs. The company's DLE process selectively removes lithium from the brine before returning the depleted brine to the aquifer, maintaining reservoir pressure and limiting impact on the subsurface geochemistry. E3's DLE process achieves higher recovery of lithium and has a drastically reduced physical footprint, fresh-water requirement, and environmental disturbance compared to conventional methods of lithium extraction. The company also benefits from Alberta's renowned energy industry, skilled workforce, and extensive subsurface expertise. Existing physical infrastructure and a well-established regulatory framework supports accelerated project development timelines, especially when compared to greenfield projects in remote regions.

Phase 2 of the demonstration facility focuses on collecting the final engineering and reservoir data E3 requires to complete the Clearwater Project's Feasibility Study, one of the final components the company needs prior to the final investment decision (FID) for its commercial project. Included in the demonstration facility's second phase is subsurface and surface engineering work that will finalize E3's reservoir development plan, central processing facility design, and well and pipeline network. The upcoming engineering work will build on E3's work-to-date over the last decade, making the company one of the most advanced and execution-

As E3 Lithium advances through the final stages of its demonstration facility, the company is positioned as a leader in sustainable lithium development with a globally significant resource, operating in a top-tier jurisdiction.

ready DLE project developers in North America.

E3's start-up of Phase 2 of its demonstration facility comes on the heels of an assessment published by the Alberta Geological Survey (AGS), which identified 82.5 million tonnes of lithium carbonate equivalent (LCE) resource, placing Alberta's lithium resource as the third largest globally. The AGS's independent assessment heightened international interest into lithium in Alberta and further supports E3's progression to commercial production of battery-grade lithium carbonate.

As E3 Lithium advances through the final stages of its demonstration facility, the company is positioned as a leader in sustainable lithium development with a globally significant resource, operating in a top-tier jurisdiction. By combining E3's expertise in DLE with the province's established energy infrastructure, the company aims to support resilient domestic supply chains at a time when critical minerals are at the forefront of national security interests. The Clearwater Project represents more than a resource development opportunity; it reflects Canada's broader ambition to build, to strengthen supply chain security, attract investment in clean technology, and establish a competitive presence in the global battery materials market. ✘

Awaruite: Changing the game for the global nickel industry

As the global leader in awaruite, a naturally occurring nickel-iron alloy and novel source of nickel, FPX Nickel has the unique opportunity to lead this transition and disrupt the nickel industry.

The nickel industry has entered an unprecedented time of upheaval and transition. Western governments and manufacturers are racing to secure reliable supplies of critical minerals to protect against the risks associated with China's growing dominance in the sector. This is taking place at the same time as demand for nickel is rising, driven by stainless-steel production and accelerating growth in electric vehicle batteries and various defence applications. Public policy initiatives such as the European Union's Carbon Boarder Adjustment Mechanism and Canada's own industrial carbon pricing regime further complicate these dynamics, yet also provide a policy signal that aligns to rising consumer expectations for lower carbon products.

As the global leader in awaruite, a naturally occurring nickel-iron alloy and novel source of nickel, FPX Nickel has the unique opportunity to lead this transition and disrupt the nickel industry. The company's wholly-owned Baptiste Nickel Project is the largest and most advanced awaruite deposit in the world and has the potential to redefine how nickel is mined, processed, and delivered to global markets.

Unlike conventional nickel sulphide and laterite deposits, awaruite offers a simplified processing pathway with the potential for significantly lower carbon intensity, lower operating costs, and reduced technical complexity. These advantages position the Baptiste Nickel Project as one of the most compelling critical mineral projects in Canada.

The Baptiste Nickel Project is located in central British Columbia and has strong economic fundamentals. According to FPX Nickel's 2023 pre-feasibility study, Baptiste has the potential to operate for 28 years while producing an average of 59,100 tonnes of nickel annually, ranking among the world's 10 largest nickel operations. The project also demonstrates robust economics, including an after-tax net present value of US$2.01 billion, and an after-tax internal rate of return of 18.6 per cent at today's global nickel spot price of US$8.75 per pound.

As a naturally magnetic nickel mineral, awaruite can be concentrated using magnetic separation instead of conventional flotation processes. This eliminates the need for several energy-intensive processing steps typically required for sulphide or laterite ores. In addition, Baptiste's concentrate grades of approximately 60 to 65 per cent nickel are substantially higher than many conventional sulphide concentrates, which typically contain only 10 to 15 per cent nickel.

These advantages result in improved project economics and strategic flexibility in how nickel produced at Baptiste can be marketed to downstream users. High-grade awaruite concentrate can be fed directly into stainless-steel production or further refined into battery-grade nickel sulphate or nickel metal without the intermediate smelting stages commonly required for conventional nickel products. This streamlined flowsheet reduces capital intensity, lowers energy consumption, and decreases transportation requirements across the value chain.

Equally important are the environmental benefits. Baptiste will be powered by British Columbia's hydroelectric grid, giving the project one of the lowest projected carbon intensities in the global nickel sector. FPX Nickel's pre-feasibility study estimates Baptiste's carbon intensity at approximately 1.2 tonnes of CO_2 equivalent per tonne

The Baptiste Nickel Project is one of the most compelling critical mineral projects in Canada.

As the world seeks cleaner and more secure supplies of critical minerals, awaruite offers a compelling alternative to conventional nickel production.

of nickel produced, which would be in the lowest decile of global nickel production.

Baptiste also offers generational economic benefits for Canada and central British Columbia, a region hard hit by the downturn in the forestry sector. The project has the potential to create 3,000 direct jobs during the three-year construction phase and 4,200 direct and indirect jobs over the 28-year life of the mine. The project is expected to contribute $45 billion to Canada's GDP over the same time period. Baptiste also offers significant benefits for area Indigenous communities through improved transportation and electrical transmission infrastructure and economic development. For example, approximately 80 per cent of the spend associated with FPX's 2025 exploration field work was directed to local and Indigenous businesses.

The Government of British Columbia recently identified Baptiste as a major priority project under the province's Look West economic development strategy, recognizing its strategic importance to Canada's critical mineral supply chain. In 2023, Baptiste was also the first project to enter the province's Critical Minerals Office, a concierge service designed to ensure robust preparedness for permitting processes in advance of an eventual final investment decision.

As the world seeks cleaner and more secure supplies of critical minerals, awaruite offers a compelling alternative to conventional nickel production. Through the Baptiste Nickel Project, FPX Nickel is advancing a made-in-Canada solution capable of supplying low-carbon nickel to stainless steel, defence, and battery markets while helping position British Columbia as a global leader in responsible critical mineral development.✘

Kodiak Copper: Advancing a district-scale copper opportunity in British Columbia

Copper has become one of the world's most strategically important critical minerals.

As the global economy accelerates toward electrification, renewable energy expansion, and modern infrastructure development, copper has become one of the world's most strategically important critical minerals. From electric vehicles and battery storage systems to transmission grids and data centres, copper is essential to the technologies driving the energy transition. Against this backdrop, Kodiak Copper Corp. is advancing one of British Columbia's promising emerging copper-gold exploration projects — the MPD Project.

Located in southern British Columbia, between the producing Highland Valley and Copper Mountain mines, the MPD Project sits within one of Canada's most established mining jurisdictions. The project covers a large, district-scale land package with excellent infrastructure access, including nearby highways, power, rail, and skilled labour. This strategic location positions MPD within a prolific belt known for hosting major porphyry copper deposits.

A major milestone for Kodiak Copper came in December 2025 with the release of the company's maiden mineral resource estimate for the MPD Project. The initial resource demonstrated the size and scale potential of the district, validating years of systematic exploration work, and confirming MPD as an emerging copper-gold asset within British Columbia's prolific porphyry belt.

The maiden resource incorporated several known mineralized zones while highlighting substantial growth potential across the property. Importantly, the deposits included in the resource estimate remain open for expansion in multiple directions, reinforcing the opportunity for continued resource growth through additional drilling and exploration.

Beyond the current resource areas, MPD remains significantly underexplored at the district scale. Kodiak has identified 36 additional targets across the property that have yet to be fully tested. Many of these targets display geological, geophysical, and geochemical characteristics associated with porphyry copper systems, creating the potential for new discoveries that could materially enhance the overall scale and long-term prospects of the project.

This combination of an established maiden resource and a large pipeline of untested targets positions Kodiak Copper for another significant year in

Kodiak Copper Corp. is advancing one of British Columbia's promising emerging copper-gold exploration projects — the MPD Project.

Kodiak's technical approach combines modern exploration techniques with a strong understanding of the region's geological setting.

2026. Continued exploration success, resource expansion, and potential new discoveries across the project could further strengthen MPD's role as an emerging copper development opportunity in Canada.

The company has continued to advance the project through systematic exploration, including drilling, geophysical surveys, geochemistry, and data integration programs designed to refine targets and better understand the scale of mineralization across the district. Kodiak's technical approach combines modern exploration techniques with a strong understanding of the region's geological setting.

The importance of projects such as MPD extends beyond exploration success alone. Copper demand is expected to rise significantly over the coming decades as countries invest in electrification and decarbonization initiatives. Electric vehicles require substantially more copper than conventional vehicles, while renewable power systems, transmission infrastructure, and energy storage technologies are all highly copper-intensive.

At the same time, many analysts and industry participants have raised concerns about future copper supply shortages. Existing mines are aging, grades are declining in several major producing regions, and relatively few large-scale copper discoveries have been developed in recent years. This has increased attention on exploration projects located in politically stable jurisdictions with strong infrastructure and responsible development standards.

Canada is well positioned to play a larger role in meeting future critical mineral demand, particularly as governments and industry continue to prioritize secure and reliable supply chains. British Columbia remains one of North America's most important copper-producing regions, and projects like MPD highlight the ongoing exploration potential within the province.

Kodiak Copper's work at MPD reflects a broader trend within the mining industry: the search for the next generation of copper deposits capable of supporting long-term supply needs. By advancing exploration in an established mining district with strong infrastructure and year-round accessibility, the company is focused on advancing the MPD project with the goal to add it to the development pipeline needed to support future resource demand.

As exploration progresses, the MPD Project continues to demonstrate the characteristics that make porphyry copper systems attractive from both a geological and strategic perspective — scale potential, long mine-life characteristics, and exposure to a metal increasingly viewed as fundamental to the global economy.

With copper expected to remain central to electrification, infrastructure modernization, and economic growth, projects like MPD represent an important part of Canada's evolving critical minerals landscape. Kodiak Copper's continued advancement of the project positions the company within a sector that is expected to play an increasingly significant role in the years ahead.✘

Potash seam exposure at the working face.

Conventional potash mining: Key underground processes, engineering challenges, and risk considerations

Conventional underground potash mining presents a distinct set of engineering challenges that strongly influence mine design, execution strategy, operating reliability, and long-term asset performance. These challenges are not peripheral—they sit at the centre of how a potash mine is planned, built, and sustained over time.

Potash is one of the mineral commodities most closely tied to global food production. Around 95 per cent of potash output is used in fertilizer manufacture, where potassium remains an essential nutrient for crop yield, plant health, and water-use efficiency. For that reason, potash is increasingly being treated as a strategic or critical mineral in a growing number of national resource frameworks, particularly where supply security and long-term availability are seen as matters of economic and geopolitical importance.

Globally, potash is produced by two main methods: conventional underground mining and solution (brine) mining. Although solution mining has expanded in some basins, conventional underground mining still accounts for more than 75 per cent of global output. This remains the dominant approach in the major producing regions—Canada, Russia, Belarus, Germany, Spain, and the United Kingdom—where thick, laterally extensive evaporite sequences are best developed through shaft-based underground operations. In the United Kingdom, underground mining has recently shifted toward polyhalite extraction, supplying a multi-nutrient sulfate fertilizer containing potassium, magnesium, calcium, and sulfur. At the same time, a potash industry has emerged in Laos, where large evaporite basins are now being developed by conventional underground methods. Conventional potash mining is also expected to resume in the Republic of the Congo after a nearly 50-year interruption following the flooding of the Holle mine in 1977.

A conventional underground potash mine functions as a tightly linked system in which production mining, panel development, mine infrastructure, ventilation, ore handling, shaft hoisting, underground power distribution, drainage, ground control, rehabilitation, maintenance, automation, and safety all depend on one another. In practice, these systems must be designed and operated as a single framework.

Underground potash mining is characterized by a set of technical requirements and challenges that are largely specific to evaporite deposits and distinguish it from other underground mining of any other commodities. Shaft sinking represents a particularly critical activity, as shafts must safely cross water-bearing formations and be permanently isolated from the mining level through specialized sealing and lining systems. The long-term performance of such chemical water barriers (CWB) is fundamental to mine safety and viability. The time dependent deformation of salt rocks requires continuous ground control and long-term excavation rehabilitation, while the high solubility of potash minerals makes strict water control essential throughout the mine life. In this context, particular attention must be given to rock mechanical behaviour and the integrity of natural water protective barriers separating the mining level from overlying water-bearing horizons, as any degradation of these barriers may lead to rapid and irreversible flooding of underground workings.

In addition, exploration drill holes penetrating this protective stratum require the leaving of safety pillars and exclusion zones in mine plan to prevent water ingress along potential leakage paths. Each exploration hole therefore leads to partial sterilization of resources and introduces additional

Typical pillar deterioration in a potash mine.

Underground Potash Mining – Process Structure
Process-Based Structure (Conventional Underground)
Production mining *(extraction / stoping)*
Panel development & outfitting
Major development / mine infrastructure
Mine ventilation (incl. heating / cooling, gas monitoring)
Underground ore handling & conveying
Shaft hoisting
Personnel & materials transport (separate from ore)
Dewatering & drainage (incl. brines)
Underground power distribution
Equipment maintenance & workshops (UG)
Ground control & excavation rehabilitation
Underground geology, surveying & exploration
Automation, control & monitoring (UG OT / SCADA / tracking)
Mine safety, fire protection & personal protection
Backfilling (if applicable / mandatory)

Figure 1: Underground potash mining – process structure.

Under the geological conditions typical of potash deposits, shaft sinking and the long-term sealing of shafts across water-bearing horizons remain among the most critical, time-consuming, and risk-intensive parts of mine development.

constraints on mine layout and sequencing, increasing the complexity of long-term mine planning.

As mining depth increases, operating conditions become more demanding. Ventilation loads rise, heat management becomes more difficult, and monitoring requirements become more stringent. At the same time, shafts and major underground infrastructure must remain serviceable over very long operating lives, often measured in decades. Modern potash mines also rely on extensive material handling systems, electrification, automation, and process monitoring, which makes dependable power supply, maintenance capability, and safety management even more important. For that reason, understanding the geological and operational specifics of potash mining is not simply a technical advantage; it is a prerequisite for stable and durable mine performance.

Figure 1 presents a generalized framework of the main underground processes in a conventional potash mine.

Under the geological conditions typical of potash deposits, shaft sinking and the long-term sealing of shafts across water-bearing horizons remain among the most critical, time-consuming, and risk-intensive parts of mine development. Equally important is disciplined geotechnical and rock-mechanical control during panel preparation and extraction, particularly where the integrity of protective strata must be preserved to prevent water ingress. In potash mining, small failures can escalate quickly once salt rocks come into contact with undersaturated brine or mine water. These challenges underline the necessity for experienced and competent engineering consultants, and mining contractors capable of designing and constructing such complex underground systems. As new potash deposits are developed and existing districts expand into new mining fields, the reliable execution of these core underground processes will remain fundamental to long-term supply security.✘

Greenland: *From frontier to strategic anchor for western critical minerals*

By Bo Møller Stensgaard, Ph.D., president of Greenland Mines Ltd.

Sarfartoq is dominated by NdPr mineralisation and has the potential to evolve into a cornerstone feedstock for western permanent magnet manufacturing.

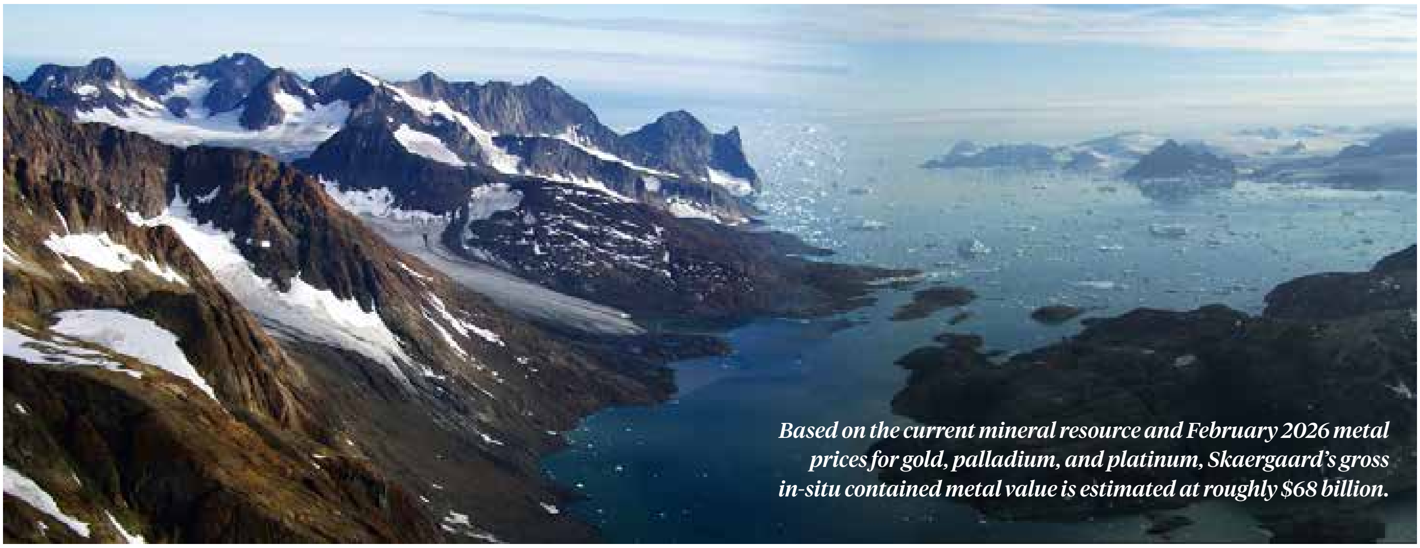
Greenland is no longer a remote frontier on the margins of western strategy; it is becoming one of its anchors. As Western allies in the United States and European Union race to de-risk and de-Sino-fy critical mineral supply chains, they are seeking jurisdictions that combine scale, geological diversity, and strong governance inside allied legal frameworks. Greenland fits that brief in a way very few regions can: it hosts a broad suite of critical minerals and sits physically and politically within a North Atlantic corridor that connects directly into western industrial ecosystems.

Greenland hosts a broad suite of critical minerals and sits physically and politically within a North Atlantic corridor that connects directly into western industrial ecosystems.

For policymakers in Washington, Brussels, Copenhagen, and Nuuk, that combination is compelling. It offers a path to reduce reliance on concentrated sourcing, processing, and single-point geopolitical risks without compromising on environmental standards or community engagement. The debate has shifted from whether Greenland can participate in global supply chains, to how quickly it can be integrated as a strategic pillar of western mineral sovereignty and a source of industrial-base and defence resilience.

Sarfartoq: Building a rare earths pillar

The strategic case for Greenland is perhaps most obvious in neodymium and praseodymium (NdPr), which are central to the green transition and enable everything from electric vehicles and high-efficiency industrial



Based on the current mineral resource and February 2026 metal prices for gold, palladium, and platinum, Skaergaard's gross in-situ contained metal value is estimated at roughly $68 billion.

systems to robotics, advanced high-tech applications, and modern defence capabilities. U.S. and EU strategies on critical raw materials explicitly call out REE as a vulnerability: supply is concentrated, processing is geographically narrow, and the mid-stream is dominated by a small group of actors.

Greenland Mines' definitive agreement to acquire the Sarfartoq REE project in southwestern Greenland is designed to speak directly to that policy agenda. Sarfartoq is dominated by NdPr mineralisation and has the potential to evolve into a cornerstone feedstock for western permanent magnet manufacturing. Importantly, the REE at Sarfartoq occur in conventional mineral species that are already processed elsewhere in the global REE industry, and the project benefits from a historic NI 43-101 resource and a positive preliminary economic assessment, providing a strong technical and economic baseline for further work. Unlike many legacy REE assets, it sits in a democratic jurisdiction within the Kingdom of Denmark, with rule of law, alignment with EU and NATO partners, and direct maritime access to both European and North American industrial bases.

The continued offtake rights of up to 60 per cent held by the project's previous owner, Neo Performance Materials – which is now focusing its strategy on the mid- and downstream part of the REE magnet value chain, best exemplified by its magnet plant in Estonia – further underlines Sarfartoq's fit within existing western processing and manufacturing ecosystems. Strategically, Sarfartoq is being positioned as more than a single-metal project. By combining rare earth magnet metals from Sarfartoq with palladium, platinum, gold, and potential co-products from Skaergaard, Greenland Mines aims to offer policymakers and downstream manufacturers a more complete platform: multiple classes of large, advanced critical mineral projects, anchored in a single region and advanced under transparent environmental and social standards. For governments trying to move from discussion of "friend-shoring" to the reality of long-term offtake, that kind of integrated footprint matters.

Skaergaard: Tier-1 scale in precious and strategic metals

Balancing Sarfartoq on the REE side is the Skaergaard project in Southeast Greenland, one of the world's largest undeveloped palladium-gold-platinum systems. Based on the current mineral resource and February 2026 metal prices for gold, palladium, and platinum, Skaergaard's gross in-situ contained metal value is estimated at roughly $68 billion. This figure reflects contained metal only, excludes all mining, processing, capital, and other costs, and does not represent net present value, cash flow, or any form of economic analysis of the project. Even with those caveats, the scale of the in-situ endowment is significant.

That Tier-1 scale is material in a policy context: it offers a route for Western economies to diversify away from heavily sanctioned or operationally fragile platinum group metal producers, while still meeting the metal intensity of the energy transition. A 2026 metal-price sensitivity study sharpened that picture. Holding the geological model, costs, and recoveries constant from the 2022 mineral resource estimate, the analysis tested higher gold and platinum price assumptions to calculate updated palladium-equivalent grades. Under the illustrative high-price case, Indicated PdEq grades increased significantly and Inferred PdEq grades rose even more. This is not an economic study, but it underscores a point important to policymakers: when large polymetallic systems sit inside allied jurisdictions, market-driven price shifts can unlock substantial "hidden" metal inventory without new discoveries.

Technically, Skaergaard is now moving from the "what" to the "how", in line with Western calls for investable, near-development projects. The fully funded 2026 field campaign is a substantial, multi-disciplinary program: drilling and geotechnical work to support both open-pit and underground scenarios, bulk sampling for pilot-scale metallurgical work, and environmental baseline studies that underpin future permitting. In parallel, an integrated program with GTK Mintec, a leading Finnish mineral processing and pilot-plant facility run by the Geological Survey of Finland, is advancing flowsheet concepts across gold, palladium, platinum, and potential Fe-Ti-V-Ga products, with the goal of maximizing metal recovery per tonne and creating optionality around future by-product streams that feature prominently on western critical raw materials lists.

The North Atlantic Critical Minerals Corridor

The North Atlantic Critical Minerals Corridor vision by Greenland Mines is what transforms Sarfartoq and Skaergaard from project-level successes into a system-level response to western supply-chain risk. In a world where a significant share of global palladium originates in Russia, and China controls key refining and mid-stream capabilities for REE and specialty metals, simply granting new mining licences is no longer enough. The centre of gravity in policy discussions has moved toward complete value chains: from source and extraction through to separation, refining, and the production of semi-finished products inside trusted jurisdictions.

The corridor concept addresses this by anchoring extraction in Greenland and connecting it to processing and manufacturing within a network of allied North Atlantic locations. For Skaergaard in East Greenland, that naturally points toward Iceland: deep, sheltered fjords provide direct access to open sea lanes, while Iceland contributes established heavy-industry platforms, deep-water ports, high-capacity grids, and abundant renewable baseload power from hydropower and geothermal resources. For Sarfartoq in Southwest Greenland, the same corridor logic can support multiple western pathways, including direct shipment to allied processing partners, as well as future use of regional hydropower potential in Southwest Greenland itself as domestic or joint-venture processing concepts mature.

Rather than relying on precise price points, the policy logic is clear: industrial power sourced from renewables in the North Atlantic—whether in Iceland or, over time, in Southwest Greenland—can be secured at levels that are materially lower than diesel-based Arctic processing. Applied to a continuous, large-scale processing load, that gap translates into substantial operating-cost savings and a far lower embedded-carbon profile for critical mineral products entering western markets. Those gains sit alongside other strategic benefits: all-season open water, shorter shipping distances, the ability to repurpose or co-locate within existing industrial parks, and regulatory environments that are fully interoperable with U.S. and EU climate, ESG, and security objectives.

Equally important, the corridor is conceived as a governance and security asset. Greenland and Iceland, together with key North Atlantic partners, are embedded in western political and security architectures, including the North Atlantic and GIUK Gap. That alignment allows Greenland Mines to outline a development path in which NdPr from Sarfartoq and platinum group and precious metals from Skaergaard—and, over time, potential co-product streams—can move from resource to refined product without transiting higher-risk jurisdictions or opaque mid-stream chokepoints. For U.S. and EU decision-makers seeking to move from dependency to genuine mineral sovereignty, that is the essence of resilience.

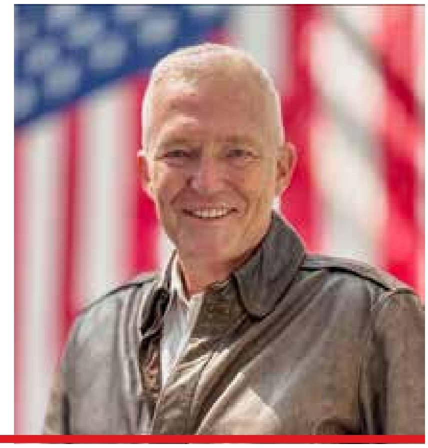
Towards western mineral sovereignty

Taken together, Sarfartoq's emerging NdPr potential, Skaergaard's Tier-1 scale in palladium, platinum, and gold, the fully funded 2026 technical programs, and the North Atlantic Critical Minerals Corridor vision show why Greenland is rapidly moving from frontier to strategic necessity in western thinking. Greenland, Greenland Mines, and its projects align with the direction of U.S. and EU critical mineral initiatives that prioritize diversification, allied sourcing, and low-carbon transparent supply chains over purely lowest-price sourcing.

In that sense, Greenland Mines is not only building a corporate portfolio; it is helping to demonstrate what a next-generation western critical minerals platform can look like: diversified across commodities, integrated from mine to mid-stream, and rooted in jurisdictions whose geology, geography, and governance can underpin the energy transition and technological innovation for decades to come.✘

Copper, conflict, and national security

Why critical minerals are the backbone of America's future



By Commander Phil Ehr (Ret), NovaRed Mining Executive

In the early 1980s, as a young enlisted sailor aboard the USS Leahy (CG-16), I worked as a fire control technician maintaining the Phalanx Close-In Weapon System. That weapon system—designed to intercept incoming cruise missiles in the final seconds before impact—relied on advanced electronics, precision components, and specialized munitions. Even then, we understood something fundamental: modern warfare runs on materials as much as it runs on strategy.

Today, four decades later, that lesson is more urgent than ever.

The technologies that define national security—from missile defense and aircraft carriers to satellites and artificial intelligence—depend on a foundation of critical minerals. And among them, copper is perhaps the most indispensable.

Often overlooked in public debates about energy or defense, copper is the connective tissue of modern civilization. It powers the electrical systems inside fighter jets, the wiring inside naval vessels, the circuitry of satellites, and the infrastructure of the global digital economy.

Put simply: without copper and other critical minerals, modern defence capability collapses.

Global demand for critical minerals is rising at historic speed. According to projections from the International Energy Agency (IEA), demand for key minerals such as lithium, cobalt, and nickel could triple by 2030 as electric vehicles, renewable energy systems, and advanced technologies expand worldwide.

Copper demand is also surging. The World Bank estimates that global copper demand could double by 2040 as nations electrify transportation, build renewable power grids, and expand digital infrastructure.

At the same time, the geopolitical environment surrounding these materials has become more complex. China dominates significant portions of global mineral processing and supply chains. In rare earth refining, for example, China controls roughly 90 per cent of global capacity. That concentration has raised alarms across Washington and allied capitals.

Supply chains that underpin national security cannot depend on geopolitical rivals.

This is why critical minerals are no longer merely an economic issue. They are a national security imperative.

During my career as a naval officer and later as a mission commander aboard the Lockheed EP-3E Aries II, I witnessed firsthand the accelerating pace of military technology.

Early in my career, signal analysis was largely analog. Technicians studied waveforms and matched them against known radar or weapons signatures. Over time, digital systems, automated processing, and advanced electronic intelligence dramatically expanded our capabilities.

But every leap in technology carried a common denominator: more electronics, more power, and more materials.

Copper became even more central to military systems because of its unmatched ability to conduct electricity efficiently while remaining durable under extreme conditions. Whether operating in the corrosive environment of the open ocean, the vacuum of space, or the vibration of combat aircraft, copper remains the backbone of electrical infrastructure.

It is no exaggeration to say that copper is second only to steel in the physical architecture of modern military power.

Let's also be clear, the nature of warfare is also evolving.

Today's battlefields are increasingly defined by drones, cyber systems, electronic warfare, and artificial intelligence. Conflicts like the war in Ukraine have demonstrated how quickly innovation can reshape the battlefield. Small, inexpensive drones can destroy armored vehicles that once symbolized overwhelming military power.

These systems require vast networks of sensors, communications systems, batteries, and computing infrastructure. Each of those systems relies on copper wiring, circuit boards, and electrical components.

Energy itself has also become a strategic target. Military planners have long understood that striking energy infrastructure can paralyze an adversary. That vulnerability is pushing nations to explore more resilient energy systems, including distributed generation, smart grids, and renewable power.

Ironically, building these resilient energy networks requires even more copper.

Expanding mineral production is not without challenges. Large-scale mining projects can have significant environmental footprints and often face opposition from local communities.

These concerns are legitimate and must be addressed with transparency, modern technology, and respect for local stakeholders. Responsible mining practices, improved environmental standards, and meaningful engagement with Indigenous and regional communities are essential.

But avoiding the issue entirely is not an option.

If democratic nations fail to develop their own mineral resources, the world will simply rely more heavily on supply chains controlled by countries with far weaker environmental and labour standards.

The choice is not between mining and environmental responsibility. The real choice is between responsible mining at home and irresponsible extraction elsewhere.

One of the most significant obstacles to developing new mineral projects in North America is the length and complexity of permitting processes. In some cases, it can take more than a decade to approve a new mine.

While environmental review is essential, excessive delays can undermine national security and economic competitiveness.

Governments should provide clearer forecasts of future mineral demand and streamline regulatory processes without weakening environmental protections. At the same time, companies must maintain the highest ethical standards, ensuring transparency, environmental stewardship, and community engagement.

Public trust is critical. Without it, no mining project can succeed.

In recent years, I have traveled to Ukraine delivering humanitarian assistance and observing the realities of modern conflict firsthand. The determination of Ukrainian soldiers defending their homeland is extraordinary.

Their fight underscores a truth that Americans sometimes forget – national security ultimately rests on preparation.

Preparation means technological innovation. It means resilient energy systems. It means secure supply chains for the materials that power everything from satellites to submarines.

And increasingly, it means securing the critical minerals that underpin the modern world.

Copper may not capture headlines the way missiles or fighter jets do. But without it, none of those systems function.

In the 21st century, the race for critical minerals is not simply about economics. It is about national survival.

The Defence Dividend: *How military demand is reshaping the future of critical minerals*

For Canada's mining sector, the defence shift presents a rare alignment of geopolitical priorities, industrial policy and market demand.

Rising defence spending, NATO rearmament targets, and growing geopolitical tensions are transforming critical minerals from cyclical commodities into national security assets. For mining companies, the shift is creating new demand signals, as well as government-backed financing and long-term procurement opportunities.

For decades, critical minerals were largely treated as inputs to commercial industries – electronics, infrastructure, manufacturing, and more recently, energy transition technologies. Today, they are viewed as key to sovereignty.

"We live in an era of economic nationalism around the world," notes Anton Sestritsyn, principal at lobbying and communications firm Vosavis. "Therefore, we're seeing a lot of the strategies that are being released by various governments in the U.S., Canada, and the EU that emphasize the need to treat critical minerals as national security issues."

The shift has been driven by a convergence of factors, including rising geopolitical tensions and a growing recognition that global supply chains for key minerals are heavily concentrated in a handful of countries, particularly China.

According to Christopher Hernandez-Roy, deputy director and senior fellow at the Center for Strategic and International Studies, the strategic significance of minerals has moved to the centre of western defence thinking.

"National security is not just about how many guns, boats, planes, troops you have," he said. "It's about the resilience of your economy... and the ability to not be pinched off by foreign adversaries who may control your supply chains."

China's long-term strategy to dominate critical mineral supply chains has played a major role in accelerating that shift. Over the past two decades, Beijing has built a near-monopoly in processing and refining several key minerals, while also demonstrating its willingness to restrict exports of strategic materials during geopolitical disputes.

At the same time, western militaries are rapidly expanding production of weapons systems and replenishing depleted stockpiles.

"The control of critical materials by China, along with the need to rearm, has created a sort of perfect storm," Hernandez-Roy said. "Suddenly, the United States has to look around the world and find reliable sources of critical minerals."

For resource-rich allies such as Canada, the implications are profound.

Defence demand becomes structural

For many in the mining industry, the key question is whether defence demand represents a short-term surge or a structural shift. For Bill Hawkins, head of trade and investment at Sussex Strategy Group, the answer is increasingly clear.

"Yes, defence demand is now a structural driver," Hawkins said. "It's embedded in long-term force structure, stockpiling mandates, and industrial capacity building, creating durable, government-backed offtake that endures market cycles rather than episodic spikes."

NATO production targets and rearmament programs are turning mineral supply into a matter of military readiness.

"Governments now ask not just whether supply is resilient, but whether it's assured at scale, under stress, and from trusted allies," Hawkins added.

According to the team at Sussex Strategy, the strongest new signals emerge from aerospace modernization, precision munitions replenishment/surge capacity, advanced electronics/electronic warfare, and autonomous systems. And offtakers are willing to be flexible for allied supply.

"Defence primes and OEMs are responding by extending qualification timelines for allied (including Canadian) sources, locking in long-term supply agreements with price floors, favouring predictable allied-origin materials even at higher upfront costs, and embedding domestic content to meet evolving procurement rules – turning supply-chain security into a core board-level priority," added David Timm, partner and energy practice lead.

Which minerals matter most for defence?

Modern defence systems rely on a wide range of critical minerals, from structural metals to specialized electronic materials.

Among the most important are tungsten for armour-piercing munitions and defence systems, gallium and germanium for semiconductors and electronic warfare systems, graphite and aluminum for aerospace and munitions, and titanium and rare earth elements for advanced defence technologies.

These materials are often used deep within defence supply chains, particularly in tier-two and tier-three manufacturing, where vulnerabilities can remain hidden until crises emerge.

"Defence prioritizes materials where failure is not an option," Hawkins said, noting that combat systems require materials capable of operating under extreme conditions.

Military systems require performance, reliability, and supply assurance – even if that means paying more for allied-origin materials.

Canada's strategic advantage

Canada holds a strong position in this emerging geopolitical landscape. The country produces many of the minerals considered critical to defence supply chains, including nickel, cobalt, and copper.

That resource base is increasingly being recognized as a strategic asset. The federal government's new Industrial Defence Strategy aims to position the country not simply as a supplier of raw materials, but as a partner in allied defence production.

For mining firms, the strategy could help de-risk projects thanks to long-term government-backed offtake agreements, and significantly reduce price volatility.

"By encouraging our Canadian companies, first and foremost, to use home-produced critical minerals, we are actually taking price volatility out of the equation. The prices are still guided by the market – there's no doubt about that. But at the same time, I think

Modern defence systems rely on a wide range of critical minerals, from structural metals to specialized electronic materials.

there's a lot more predictability with having a domestic supply chain. What we've seen in the Industrial Defence Strategy is a 70 per cent Canadian content goal," explains Sestritsyn. "So, I think what we're going to see increasingly in the next couple of years is a lot of B2B activity between defence companies and critical minerals."

Market demand still matters

Despite the growing role of defence procurement, industry leaders caution that military demand should not be viewed in isolation. According to Jeff Gaulin, vice-president of corporate affairs at Vale Base Metals, defence is an important but secondary driver for many metals.

"Growth of defence spending will drive increased demand for some critical minerals – some more than others – but strategic economic growth will always be a larger driver of demand for these commodities," he notes.

In fact, a recent study by S&P Global found that while defence modernization will contribute to rising demand for minerals such as copper, growth in electrification, artificial intelligence infrastructure, and electricity grids will have an even larger impact.

Critical minerals that can be used in a range of applications beyond defence will most likely benefit the most from Canada and other countries' rearmament strategies: de-risking projects thanks to military demand, but selling to a diverse range of sectors to hedge against volatility.

Nickel, for example, plays a role across multiple strategic sectors.

"Nickel… is a triple-use critical mineral," Gaulin said, noting its importance in advanced machinery, renewable energy and batteries.

Governments step into the market

Historically, western countries have relied largely on market forces to secure mineral supply, but defence needs are changing that approach.

"Market forces alone in the west are not going to necessarily be sufficient to get new projects off the ground," Hernandez-Roy said.

As a result, governments are increasingly stepping in with financing tools traditionally associated with strategic infrastructure.

These include long-term offtake agreements, loan guarantees, equity investments, stockpiling programs, and procurement frameworks linked to defence production.

Hawkins says these instruments are already improving the financial outlook for projects.

"Defence demand significantly improves bankability for Canadian critical minerals projects by reducing demand uncertainty and geopolitical risk."

Long-term procurement signals from defence ministries and allied governments provide revenue visibility that lenders and investors typically require. And while it is still early days to notice the market impact of this government involvement, Sestritsyn believes "we're going to see a lot more interest and a lot more ink on paper with venture funds coming to Canada and investing in our mines here, understanding how crucial these supply chains are in today's world".

In addition, Gaulin notes that blended capital and new pricing mechanisms could emerge to support investment.

"There is opportunity for new mine development – both brownfield and greenfield – potentially underpinned by new pricing mechanisms, such as long-term offtakes tied to defence procurement that could include price floors or minimum-volume commitments," said Gaulin.

Such structures could help de-risk projects that produce relatively small volumes of specialized minerals but serve strategic applications.

Processing: The strategic choke point

But mining is only part of the supply chain challenge. Much of the world's refining and processing capacity remains concentrated in China, creating vulnerabilities even for countries with abundant mineral resources.

Hernandez-Roy describes refining as "one of the most important bottlenecks that needs to be addressed".

"The U.S. has belatedly realized that it needs to do more processing, and most of the money is not in the processing, unfortunately," added Hernandez-Roy, adding that one of the biggest issues with processing, in his view, is the environmental impacts associated with it, but new projects in Canada could help create a cleaner supply chain for critical minerals.

He cites Rio Tinto's scandium oxide plant in Quebec and the Saskatchewan Research Council's rare earths processing facility as examples of "clean, home-grown Canadian technology" that could be licensed to companies and allied governments to create a more integrated, cleaner critical minerals market.

For Gaulin at Vale Base Metals, there's an understanding in allied nations that processing and refining are "strategic choke points".

"While Vale Base Metals has a vertically integrated operating model, with processing, refining, and smelting facilities here in Canada, we are the exception. With Canada prioritizing self-reliance, there is opportunity to expand mining, processing, refining, and other measures to enhance our industry's global competitiveness," said Gaulin. "This is a unique and consequential moment for mining. Canada has an unparalleled endowment of critical minerals, mining expertise, and experience."

While Canada's Industrial Defence Strategy does mention processing as a priority, the sector will have to wait until the second quarter of 2026 for more detailed information as part of another strategy document specifically for defence critical minerals.

Opportunity and responsibility

For Canada's mining sector, the defence shift presents a rare alignment of geopolitical priorities, industrial policy and market demand. Yet the opportunity comes with new expectations.

Defence customers are increasingly demanding traceable supply chains, reliable delivery, and processing capacity within allied jurisdictions. Meeting those requirements will require collaboration across the mining ecosystem – from exploration and extraction to refining and manufacturing.

Governments, meanwhile, appear prepared to play a larger role in shaping the sector's future.

For an industry accustomed to operating largely within market cycles, that represents a fundamental change. As defence spending rises and geopolitical competition intensifies, critical minerals are no longer global commodities. ✘

Potash at depth: Solution mining and supply security in Utah's Paradox Basin

Every crop that feeds America needs potash. Without it, yields fall and fields fail. There is no substitute and no way to manufacture it. The United States imports 92 per cent to 94 per cent of what it needs.

"Some critical minerals are everyday things like potash that we use as a fertilizer. We need it to sustain our economic viability in our country, but we import a large percentage of it," says Susan Patton, principal consultant with RESPEC.

On November 7, 2025, the U.S. Geological Survey (USGS) added potash to the 2025 Federal Critical Minerals List. The supply numbers drove that decision. Canada supplies 79 per cent of U.S. imports, Russia another 12 per cent. Belarus, which operates within Russia's political and economic orbit, ranks among the world's largest producers [USGS Mineral Commodity Summaries, February 2026].

New Mexico, Utah, and Michigan are the country's three potash-producing regions. RESPEC has worked in all three, bringing solution mining knowledge and geotechnical proficiency to some of the most demanding deposits in the country.

The Paradox Basin in southeastern Utah is among the most significant, with approximately two-billion tons of potash across multiple horizons. Developing the basin gives western farmers a domestic supply source and cuts transportation costs on every ton of imported product.

"Mining from the Paradox Basin directly reduces U.S. dependence on foreign potash imports," says Camilo Rojas, project geologist with RESPEC.

The deposits sit deeper than 7,000 feet in places, which rules out conventional mining. Solution mining is the only practical method. The process injects hot water into the potash bed, dissolves the target minerals, and pumps the resulting brine to the surface for recovery. In the water-constrained west, a closed-loop mechanical evaporation system reuses water rather than losing it through solar evaporation ponds, reducing the surface footprint and water draw.

The problem is what happens underground after the cavern forms.

RESPEC's cavern group has spent decades solving exactly this problem.

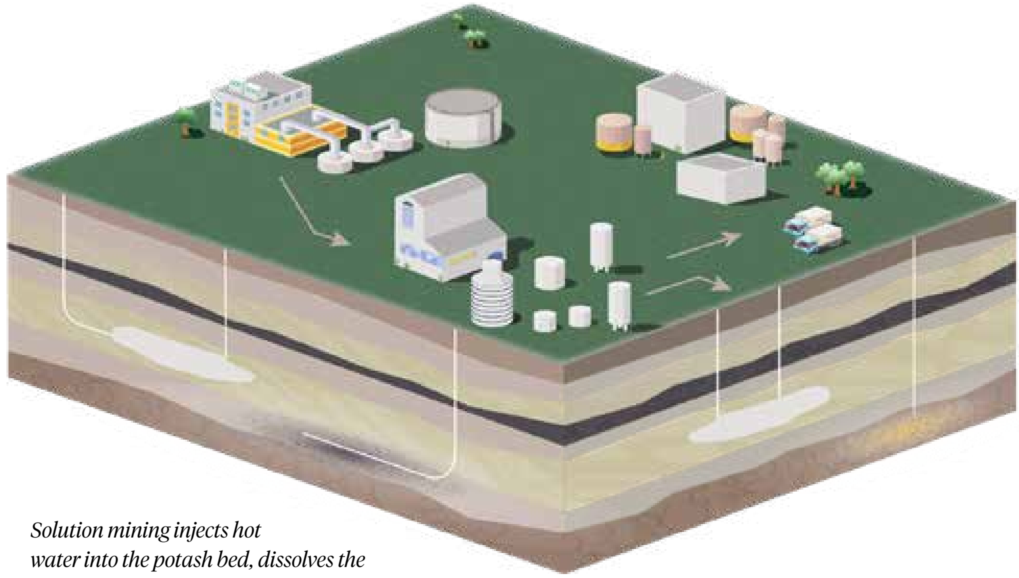
The team's geomechanical modeling spans solution mining, hydrogen storage, and deep salt cavern design across North America, including projects where cavern depths and salt behaviour pushed well beyond industry norms.

Salt is not static. It creeps under pressure and reshapes over time. A cavern that appears stable at excavation can slowly close or fail, taking the investment with it. Modeling that behaviour requires geomechanical analysis of cavern stability, subsidence potential, and failure risk.

"The potash knowledge and the geotechnical need to be married together to make it happen," says Patton.

That combination is rare. Major potash projects have absorbed billions and never reached production. The Paradox Basin presents depths that exceed most operators' direct experience, where margins for error are smaller and consequences larger.

"We've led and managed exploration campaigns, analytical work, and technical reporting for potash operations in the Paradox Basin for two decades," says Erik Hemstad, manager of RESPEC's Grand Junction office.



Solution mining injects hot water into the potash bed, dissolves the target minerals, and pumps the resulting brine to the surface for recovery.

"The basin rewards operators who understand what they're dealing with before they start drilling."

In January 2026, Governor Spencer Cox unveiled Mission Critical, a mine-to-market strategy targeting permitting timelines of 18 months or less on state lands, aiming to make Utah the nation's top destination for critical mineral extraction and processing [Deseret News, January 20, 2026].

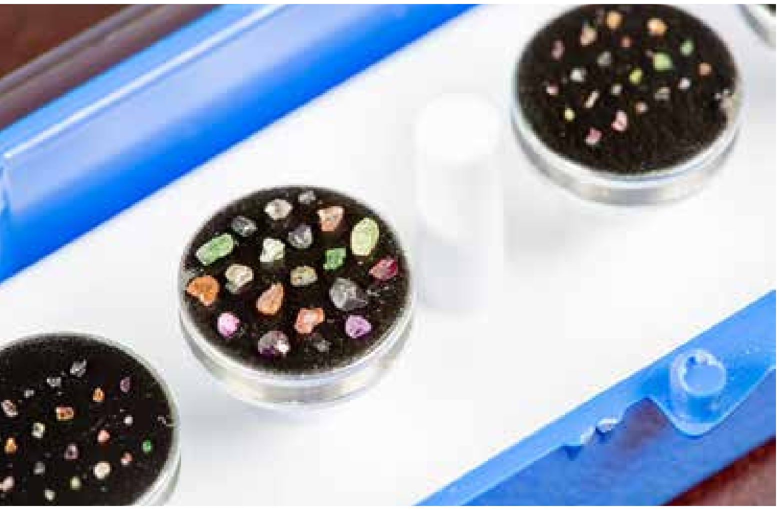
The national case for domestic potash production has not been stronger. The Paradox Basin has the resource, and Utah has the will to develop it.

For operators working in the Paradox Basin, the question is not whether the resource is there but whether the engineering behind the project is strong enough to reach it. That is exactly the problem RESPEC was built to solve.

RESPEC is an employee-owned engineering and consulting company founded in 1969, with offices across the United States and Canada. The company's Mining and Energy group provides full life-cycle services for solution mining, underground storage, and critical minerals projects, from exploration and resource estimation through mine design, cavern modeling, and operational support. For more information, visit respec.com. ✘

Beyond the microscope: High-throughput automated indicator mineral analysis

By Dr. Lucy Hunt, Senior Technical Supervisor, Saskatchewan Research Council



Diamond indicator minerals that have been isolated from kimberlite. (Copyright SRC).

SRC's "robot arm" increases sample preparation efficiency and consistency to achieve accurate analysis. (Copyright SRC).

Today's exploration landscape is changing quickly. Demand for critical minerals is increasing, budgets are more complex, and decisions need to be made earlier and with greater confidence. As a result, the way exploration data is generated and used is becoming increasingly important.

Indicator mineral analysis has long been a key tool in supporting exploration decision-making, but these changing pressures highlight the need for not just faster analysis, but a different way of working with mineralogical data. Within the broader exploration toolkit, indicator mineral analysis complements methods such as geological mapping, geophysical surveys, drilling and core logging, and bulk geochemical analysis.

Regional-scale methods, such as geochemical surveys and indicator mineral analysis, are used to screen large areas and identify zones of interest, while geophysical surveys and drilling are used to refine targets and confirm mineralization. Without effective regional screening, exploration becomes increasingly reliant on expensive, lower-probability targeting.

Indicator minerals are naturally occurring mineral grains with specific chemical compositions that are directly linked to particular types of mineralization. They can offer more diagnostic insight into source characteristics and processes, even where geochemical signals are weak or ambiguous.

By identifying and analyzing these grains, geologists can then trace them back to their source and infer the presence of mineralization. They have long been central to mineral exploration, particularly in regions where access to bedrock is limited.

Expanding the exploration toolkit with automated workflows

For decades, this work has relied on careful visual observation of processed heavy mineral concentrates under a microscope by highly trained specialists. While effective, this approach can be slow, subjective, and typically focused on one commodity at a time.

To address these challenges, the Saskatchewan Research Council (SRC) has been developing a high-throughput automated indicator mineral workflow – the sequence of steps used to prepare, analyze, and interpret samples – in collaboration with industry. By combining advanced instrumentation, robotics, and machine learning-driven analytics, this approach is designed to deliver standardized mineralogical datasets at a scale and level of detail not previously achievable.

Rather than relying on sub-sampling and selectively identifying a limited suite of known indicator minerals, the workflow generates complete mineralogical, chemical, and spatial datasets within timeframes that support active exploration decision-making. This shift from selective, experience-driven observation to comprehensive, quantitative analysis provides a more representative understanding of each sample, allowing companies to adapt programs within the same season and optimize drilling strategies.

SRC's fully integrated workflow combines automated sample preparation, advanced instrumentation, and data analytics. The system can analyze every grain in a heavy mineral concentrate, providing more quantitative information faster and more accurately than traditional approaches.

From single-commodity results to multicommodity insight

One of the most significant implications of SRC's workflow is the ability to move beyond single-commodity analysis. With every grain being imaged and chemically characterized, the same dataset can support exploration for multiple commodities simultaneously, while preserving this information for future programs.

The approach also enables the reanalysis of archived samples that were originally processed with a single target commodity in mind; revisiting them using automated mineralogy can reveal new information without additional sampling, reducing time and cost.

Implications for exploration programs

Automating preparation and analysis reduces turnaround times while maintaining consistency and quality. Analyzing all grains in a sample minimizes the risk of missing rare but significant minerals, supporting more confident target selection and reducing unnecessary drilling.

SRC brings decades of experience in indicator mineral processing to this initiative, ensuring accuracy and repeatability remain central as new technologies are integrated.

High-throughput automated indicator mineral analysis represents a shift from selective observation toward comprehensive, reusable mineralogical datasets. By combining automation, advanced instrumentation and data analytics, SRC's approach enables exploration teams to work with greater clarity, adapt strategies earlier, and make decisions based on complete datasets rather than partial snapshots. In a sector where uncertainty is costly, this change in workflow may prove as significant as the technology itself.

This is a shorter version of a feature article available on SRC's website: src.nu/amworkflow. ✘

Helping grow the mining talent pipeline

In 2026, Mining Needs You will offer 75 $200 honorariums for each approved speaking engagement, with up to two honorariums available per ambassador.

Ask young people what comes to mind when they think about mining and the answers are often similar: hard hats, physical labour, and remote locations. Yet, that only tells part of the story. Canada's mining sector has advanced in many important ways, but that reality is not always reaching students and young professionals as they make career decisions. That is the gap the Mining Needs You Career Ambassador Program is working to close.

National polling of 3,000 youth aged 15 to 24 conducted by Abacus Data on behalf of the Mining Industry Human Resources Council (MiHR) in 2026 suggests there is a strong foundation to build on. Many young Canadians understand mining's importance to the economy and recognize its role in supporting renewable energy and new technologies. Interest in mining careers is also growing. About 40 per cent of youth surveyed said they would consider working in the sector, up from 32 per cent in 2023.

However, a large group is still undecided. They're not opposed to mining, but they don't feel informed enough to choose it as a career path. Only about a third of those surveyed said they're familiar with mining careers. Many still associate the industry with safety concerns, physically demanding work, and limited flexibility. There's also a common assumption that most jobs are site-based and traditional, even though many roles today are tied to technology, environmental management, and modern operations.

This is where career ambassadors can make a real impact. Hearing directly from professionals working in the industry helps make mining careers more tangible and relatable. It gives elementary and high school students a clearer sense of what modern mining looks like and shows them that people like them work in the industry. Career ambassadors visit schools, attend events, and share their personal experiences. They talk about their day-to-day work, what surprised them about the industry, and what they wish they had known earlier. Just as importantly, they answer questions honestly, including topics like safety, environmental responsibility, and work-life balance.

Those conversations matter. Industry is changing quickly and many young

Many young Canadians understand mining's importance to the economy and recognize its role in supporting renewable energy and new technologies.

people expect transparency. Job stability and pay remain top priorities when choosing a career, and mining can offer both. The challenge is helping people connect those priorities with what the industry offers.

There's also a growing conversation around mining's role in producing the materials needed for clean energy, advanced technologies, and infrastructure. At the same time, the industry is making progress in areas like community partnerships and reconciliation. Awareness of this work is increasing, but there's still more to do to help young Canadians see the full picture.

What makes the Career Ambassador Program effective is its focus on reality. It's not only about polished presentations but creating honest conversations about what it is really like to work in mining. The strongest ambassadors are people who can speak openly about their experiences and connect with others in a genuine way.

There are benefits for ambassadors as well. In 2026, Mining Needs You will offer 75 $200 honorariums for each approved speaking engagement, with up to two honorariums available per ambassador. This recognizes the time and effort involved and helps cover any related expenses. It also gives participants a chance to build confidence, strengthen communication skills, and expand their professional networks.

Youth interest is rising and perceptions are improving, but many young people are still undecided about their careers. Reaching them won't happen through reports alone. It will happen through real conversations with people who can speak honestly about their experiences and help others understand what modern mining truly looks like. The Mining Needs You Career Ambassador Program is looking for people who are ready to be part of those conversations.

If you're interested in becoming a career ambassador or would like an ambassador to speak to your students, contact info@mihr.ca or visit MiningNeedsYou.ca to apply. ✘

PDAC 2026 reflects growing global momentum for mineral exploration and development

PDAC 2026 welcomed 32,155 participants from around the world, the highest participation in the event's history.

Over four days, PDAC 2026 facilitated networking, investment discussions, and deal-making.

The Prospectors & Developers Association of Canada (PDAC) Convention brought together the global mineral exploration and mining community the first week of March, continuing a 94-year tradition of connecting industry, governments, investors, Indigenous communities, and students.

PDAC 2026 welcomed 32,155 participants from around the world, the highest participation in the event's history.

"There was a clear sense of energy throughout the convention," said PDAC president Karen Rees. "Strong commodity markets are contributing to optimism across the sector. At the same time, governments and the public are recognizing more clearly how essential minerals are to economic growth, electrification, defence, and modern technologies."

The convention also set a record with more than 1,300 exhibitors, delivering the largest trade show footprint in PDAC's history and filling the Metro Toronto Convention Centre across both the North and South buildings. Over four days, PDAC 2026 facilitated networking, investment discussions, and deal-making. The convention's programming featured hundreds of expert presenters examining the key opportunities and challenges shaping mineral exploration, project development, and financing.

PDAC 2026 also welcomed participation from governments around the world, alongside Canadian policymakers and leaders from municipal, provincial, and federal levels. Their presence reflects the growing global focus on mineral supply, investment, and the policies needed to support responsible development.

"Government policy choices play a critical role in supporting the mineral sector and ensuring Canada remains a global leader in mineral exploration and development," Rees said. "Proven, made-in-Canada exploration tax

While the convention is an important moment for the association, PDAC advocates throughout the year on behalf of its members and the broader sector.

credits and greater regulatory predictability are essential to maintaining Canada's competitiveness and investor confidence."

While the convention is an important moment for the association, PDAC advocates throughout the year on behalf of its members and the broader sector.

"In a more complex global environment, a strong mineral sector is fundamental to Canada's economic prosperity, supply-chain security, and sovereignty," Rees said.

PDAC thanks its volunteers, speakers, sponsors, exhibitors, and participants for contributing to a successful convention and looks forward to welcoming the global mineral exploration and mining community back to Toronto for PDAC 2027 from March 7–10, 2027.

About PDAC

The Prospectors & Developers Association of Canada (PDAC) is the leading voice of the mineral exploration and development community, an industry that employs more than 724,000, and contributed $156 billion to Canada's GDP in 2024 (Natural Resources Canada, February 2025). Representing more than 8,200 members worldwide, PDAC works to support a competitive, responsible, and sustainable mineral sector. Visit pdac.ca for more information. ✘

> "Government policy choices play a critical role in supporting the mineral sector and ensuring Canada remains a global leader in mineral exploration and development," Rees said.