

SASKATCHEWAN: A GROWING CRITICAL MINERALS HUB

Major projects presented at the Rare Earth Summit in Saskatoon this past September highlighted Saskatchewan's emerging leadership in rare earth elements (REE) production, research, and education. The Saskatchewan Research Council (SRC) introduced its \$55 million vertically integrated Rare Earth Processing Facility in north Saskatoon. A first-of-its-kind in North America, the facility will include processing, separation, and metal



BASTNAESITE



URANIUM

The second major announcement of the summit came from Vital Metals Limited, Canada's first rare earths producer. Vital Metals unveiled phase one of its multi-



LITHIUM

million-dollar rare earth extraction facility, also located in the city's north industrial area adjacent to SRC. The unveiling was attended by key stakeholders including representatives from all four levels of government as well as Indigenous and Métis leaders and international

guests representing the company's rare earth supply chain. The facility has already begun processing beneficiated ore from its Nechalacho rare earth mine. Located in the Northwest Territories,

Nechalacho is Canada's first, and so far, only operational rare earth mine.

In Saskatoon, the ore will be processed to a high purity, mixed rare earth carbonate. This product is then exported to Norway



COPPER

stages. Already a global leader in uranium and potash production, Saskatchewan is emerging as a producer of helium, lithium, copper, zinc, and now rare earths. The world needs what Saskatchewan has to offer.

The SRC Rare Earth Processing Facility is establishing a REE technology hub in Saskatchewan, creating an industry model for future commercial REE initiatives and supply chain development. Prior to its official unveiling in September, the facility announced a major step forward in August, when the first REE metal ingots ever produced in Canada were processed during a successful test run of the facility's metals smelting unit. The unit was made possible by an additional \$20 million in funding from the provincial government and expands the facility's participation in

the REE value chain, as the metal ingots are used in the manufacture of magnets which in turn are used in electric vehicles, wind turbines and various electronics.

"With its world-leading REE expertise, SRC is already working with industrial partners to develop company-specific REE concentration facilities in Saskatchewan, which is the precursor process to full REE processing. This facility will allow for an environmentally sustainable, reliable, and strategic supply of REEs to be produced outside of China," says Mike Crabtree, SRC President and CEO.



POTASH

- JIM REITER,
MINISTER OF ENERGY AND RESOURCES
GOVERNMENT OF SASKATCHEWAN

and the United States for separation into individual magnetic rare earth metals. From there, it travels to Europe, where it will be used in the manufacture of electric vehicle motors.

Vital Metals hopes to double the plant's capacity by 2025. Speaking at the summit, David Connelly, Vice President of Strategy and Corporate Affairs for Cheetah Resources, a subsidiary of Vital Metals said, "The world is watching us. We are Canada's first rare earths miner and producer. Our teams at the Nechalacho rare earth project in the Northwest Territories and here at Vital Metals' Rare Earth Extraction Facility in Saskatoon are the cornerstones of an independent mine-to-motor supply chain."

Pam Schwann, president of the Saskatchewan Mining Association (SMA), sees the SRC Rare Earth Processing Facility and Vital Metals Rare Earth Extraction Facility positioning Saskatchewan as a North American leader in critical minerals processing. "Without those processing facilities, Canada misses out on a key component of the value chain," Schwann says. "I see this as an area that can be carved out for Saskatchewan really developing that global centre of expertise, where countries ship their rare earth element concentrates to Saskatchewan to be processed."

WHY CRITICAL MINERALS ARE ... CRITICAL

Critical minerals are essential to our modern, digitized economy. They are used in the production of everything from electric vehicle motors to agricultural crops and from wind turbines to smartphones. Agriculture, energy, communication, transportation, health care—every sector of our economy depends on a reliable supply of critical minerals. Surging global demand combined with supply chain disruptions caused by the pandemic prompted the creation of Canada's Critical Minerals List.

The Critical Minerals List was developed by the federal government in collaboration with provincial and territorial governments and other stakeholders, including the SMA. The list identifies 31 minerals, each considered essential to Canada's economic security and our transition to a low-carbon economy as well as necessary for Canada to become a sustainable source of critical minerals for our partners.

In addition to REEs, Saskatchewan has a major role to play in the supply and processing of other critical minerals, notably potash, uranium, helium, lithium, and copper.



CANADA'S FIRST RARE EARTH PRODUCER

Congratulations Saskatchewan!

as Canada's emerging
RARE EARTH HUB
for processing, education and research

We're proud to be the first private sector partner in this exciting success story!








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POTASH

Some might be surprised to see potash included on Canada's list of critical minerals, but it is there for good reason—global food security. Whether due to climate change or geopolitical issues, food security is a growing concern. This has led to growing demand for potash, and Saskatchewan's potash sector is responding by ramping up production.

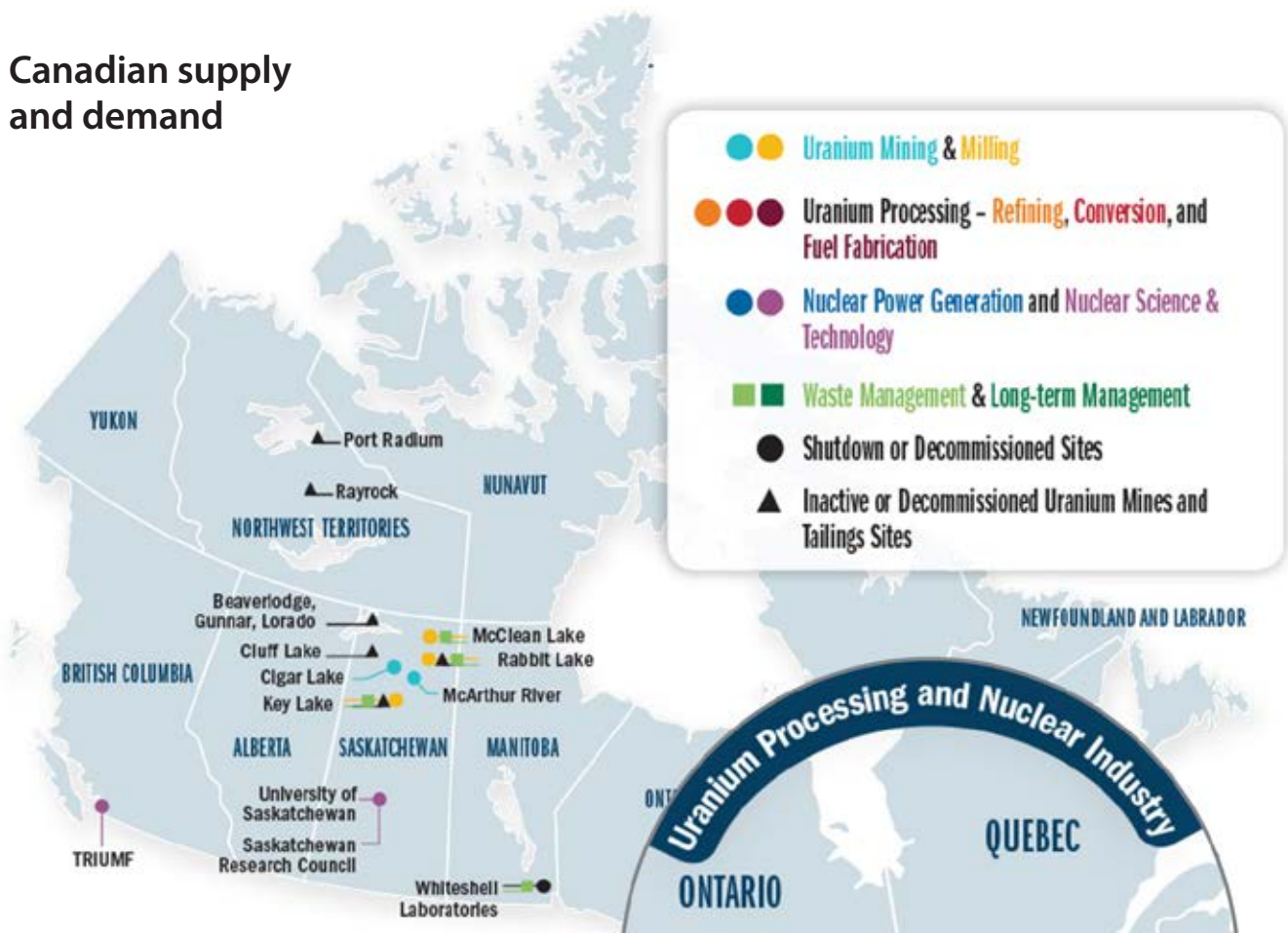
"Global interest in Saskatchewan is at an all-time high as countries look to us as an ethical and reliable producer for their resource needs. We are proud of our world-class potash sector for stepping up to meet growing global demand for decades to come," says Minister Jim Reiter.

In response to a sharp increase in global demand for potash resulting from Russia's invasion of Ukraine, Nutrien, The Mosaic Company and K+S Potash Canada have all announced planned potash production increases at their Saskatchewan facilities. BHP, which announced in 2021 that it was completing the Jansen potash mine—at \$12 billion, the single largest economic investment in Saskatchewan's history - is also accelerating its first potash production from 2027 to 2026.

K+S Potash Canada announced a long-term plan to increase potash production at its Bethune mine, growing continuously over the next several decades to effectively double the current production output. Mosaic announced plans to increase potash production capability by a further 1.5 million tonnes by the second half of 2023 at their Esterhazy K3 and Colonsay operations. And Nutrien is ramping up its annual production capacity to 18 million tonnes by 2025, which will

COVER

Canadian supply and demand



Source: <https://www.nrcan.gc.ca/our-natural-resources/minerals-mining/minerals-metals-facts/uranium-and-nuclear-power-facts/20070>

lead to approximately 350 new jobs in the province.

“One of the objectives identified in Saskatchewan’s Growth Plan is to increase the annual value of potash sales to \$9 billion,” says Minister Reiter. “With the strong performance of the sector, I am pleased to say that Saskatchewan’s potash companies have reached this goal this year.”

URANIUM

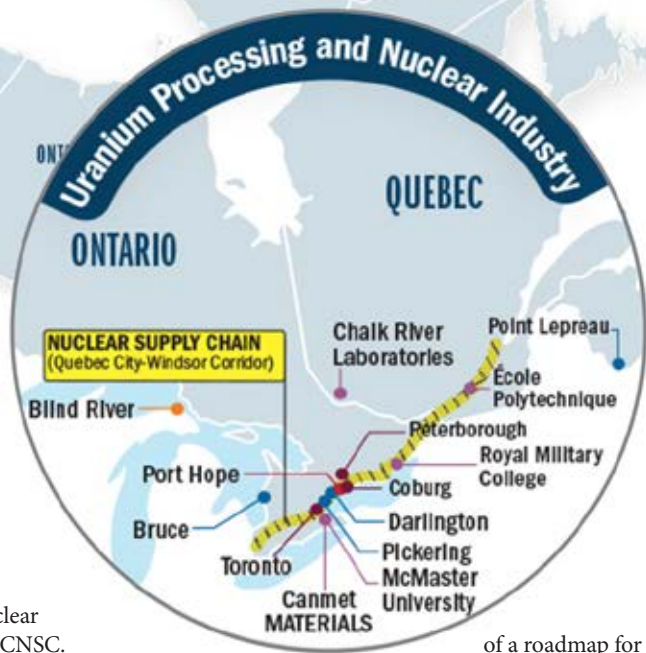
Saskatchewan is home to the world’s highest grade uranium mines. In 2019, Saskatchewan-produced uranium was used around the world to generate approximately 306 billion kilowatt hours of clean electricity, the equivalent of powering approximately 28 million homes for an entire year. The Pan-Canadian nuclear energy industry includes uranium mining and milling in Saskatchewan, refining, conversion, and fuel fabrication in Ontario; nuclear power stations operating in Ontario and New Brunswick, and a strong nuclear science and technology presence across Canada, including the production of isotopes for

medical and industrial applications. Canada also has a globally respected and experienced nuclear regulator in the CNSC.

With world demand for non-emitting power on the rise, Natural Resources Canada engaged interested provinces, territories, power utilities and stakeholders on the creation



Nuclear fuel bundle.



of a roadmap for the possible development and deployment of Small Modular Reactors (SMR) in Canada. Ontario, Saskatchewan, New Brunswick and Alberta have since partnered on the advancement of SMR’s to provide a source of clean electricity, and in some cases generate heat, which would help meet the goal of Net-Zero GHG emissions by 2050, by displacing power generated from fossil fuels. According to SaskPower, although a decision on whether to build a SMR in Saskatchewan won’t be made until 2029, planning is happening now. As the utility seeks to reduce emissions and fill the gap left by the legislated retirement of conventional coal-fired power plants by 2030, there is now a potential to add SMR’s into the energy supply mix.



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Core sample from Cameco McArthur River mine

The increased interest in clean energy is encouraging news for Cameco Corporation and ORANO Canada, the province's two largest uranium producers. Earlier this year in response to growing demand, improving commodity prices and increased interest in nuclear power around the world as part of the solution to combat climate change and to meet energy security needs, Cameco and Orano announced the gradual return to production of their McArthur River mine and Key Lake mill after a four-year hiatus

In October, Cameco announced a strategic partnership with Brookfield Renewable Partners, a leader in the clean-energy space, to acquire Westinghouse Electric Company, one of the world's largest nuclear services businesses. Brookfield Renewable, with its institutional partners, will own a 51% interest in Westinghouse and Cameco will own 49%.

"We're witnessing some of the best market fundamentals we've ever seen in the nuclear energy sector," Tim Gitzel,

President and CEO of Cameco says. "As one of the few forms of electricity generation capable of safely, reliably and affordably producing emissions-free, baseload power, nuclear energy is becoming increasingly important in a world that prioritizes electrification, decarbonization and energy security."

Gitzel says the partnership will create a platform for growth across the nuclear value chain. "Coupled with our more than 30-year proven track record of providing secure and reliable fuel supplies to a global customer base, this transaction fits perfectly within Cameco's strategy and is expected to increase our ability to meet the growing needs of existing and new customers at a time when origin and security of supply is of significant concern. At the same time, we expect the recurring demand for Westinghouse's operating plant services and nuclear fuel will generate a strong revenue stream and add stable cash flow to complement Cameco's existing uranium and fuel services business."

LITHIUM

In southern Saskatchewan, Prairie Lithium is establishing itself as a

COVER

A Key Driver of Saskatchewan's Economy

Representing 12% of Saskatchewan's gross domestic product (total value of goods and services produced), the mining sector generated \$8.6 billion in sales in 2021, the second-highest level on record. Last year alone Saskatchewan mining companies purchased more than \$2.2 billion of their total goods and services from Saskatchewan suppliers, including over \$368 million from Indigenous-owned businesses. And these mining operations made over \$20.2 million in social and community contributions. The Saskatchewan mining industry provides over 26,000 direct jobs, paying more than \$1.1 billion to employees in 2021. For every direct job there are at least two indirect jobs in the mining supply and services sectors. The mining industry is a key economic driver across the province.

12%
of SK GDP

The SK mining sector represents **12%** of the province's Gross Domestic Product (total value of goods and services produced).



Payroll
>\$1.1 BILLION

From exploration through operations and export, SK companies **support jobs** in every part of the province.



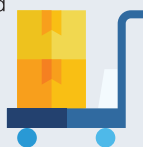
SK mining operations paid more than **\$1.1 billion** to employees in 2021.

"Mining companies operating in Saskatchewan are global leaders in safe, sustainable and socially responsible production," says Pam Schwann, president of the Saskatchewan Mining Association.

"Local and global communities benefit when more minerals are produced from Saskatchewan mines."

Procurement
> \$2.2 BILLION

In 2021 SK mining companies purchased **\$2.2 billion** of their total goods and services from Saskatchewan suppliers.



leader in lithium brine development. That is important because, right now, North America imports the large majority of its lithium from producers in South America, Australia, and China.



The company is using a proprietary extraction process to access untapped lithium resources trapped in the oil-rich Williston Basin," says Zach Maurer, Prairie Lithium President and CEO. "Our technology directly extracts the lithium from the brine and puts the brine back underground in hours."

Early results from the company's September 2021 drilling program at its Discovery #1 lithium well in Southeast Saskatchewan indicated some of the highest known lithium brine concentrations in Canada. "I always believed that the best was yet to come in terms of finding higher lithium concentrations in Saskatchewan," Maurer says. "To find the highest repeated lithium brine concentrations in Canada to date, on the first well drilled for lithium brine in the country, is the result of a targeted exploration program with an A-class team of industry experts."



Core sample from Foran Mining.

COPPER

In northern Saskatchewan, Foran Mining is developing the world's first carbon neutral copper development project.

The McIlvenna Bay mine, which is aiming to be the first new copper mine in the province in decades, is being designed to take advantage of the latest technological advances to reduce its emissions and make it safer and more efficient.

As part of its commitment to carbon neutrality, the company has secured a fleet of battery electric underground equipment such as drills, trucks, and loaders that will be used for the mine's development and production activities. "Utilizing battery electric equipment with semi and fully autonomous capabilities can help us achieve our carbon neutral targets and provide a safe working environment, which is part of our Net Positive Business strategy as we look to deliver critical metals essential for global decarbonization in a responsible and social-empowering way," comments Dave Bernier, Chief Operating Officer of Foran Mining. 🏆