

Potash

Manitoba is home to world-class deposits and high mineral potential in extensive underexplored terrains.
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Potash in Manitoba

Canada is the world leader in **POTASH** (sylvite, potassium chloride and KCl) production and export, and has the world's second largest potash reserves. The production of potash in Canada is based on the extraction of potassium-bearing evaporite minerals using underground mining methods, including conventional room and pillar mining, and solution mining. The majority (approximately 95 per cent) of potash production is used as an agricultural fertilizer. Secondary uses have chemical and industrial applications, including detergents, ceramics, pharmaceuticals, water conditioners and de-icing substitutes.

Potassium, obtained from potash, is an essential plant nutrient for the healthy development of a range of

agricultural crops. It is also an important element of the human and animal diet.

IN MANITOBA, potash deposits occur in the Devonian-aged Prairie Evaporite of the Williston Basin. This formation is a thick, evaporitic sequence, consisting dominantly of halite and anhydrite and other accessory minerals, with localized potash occurrences. The Russell-McAuley deposit is the eastern extension of the prolific deposits mined in Saskatchewan and has an extensive exploration history.

The **MANITOBA GEOLOGICAL SURVEY** conducts basin-wide geoscience studies and mapping at the deposit and basin scale to improve the understanding of potash occurrence and distribution in the province.

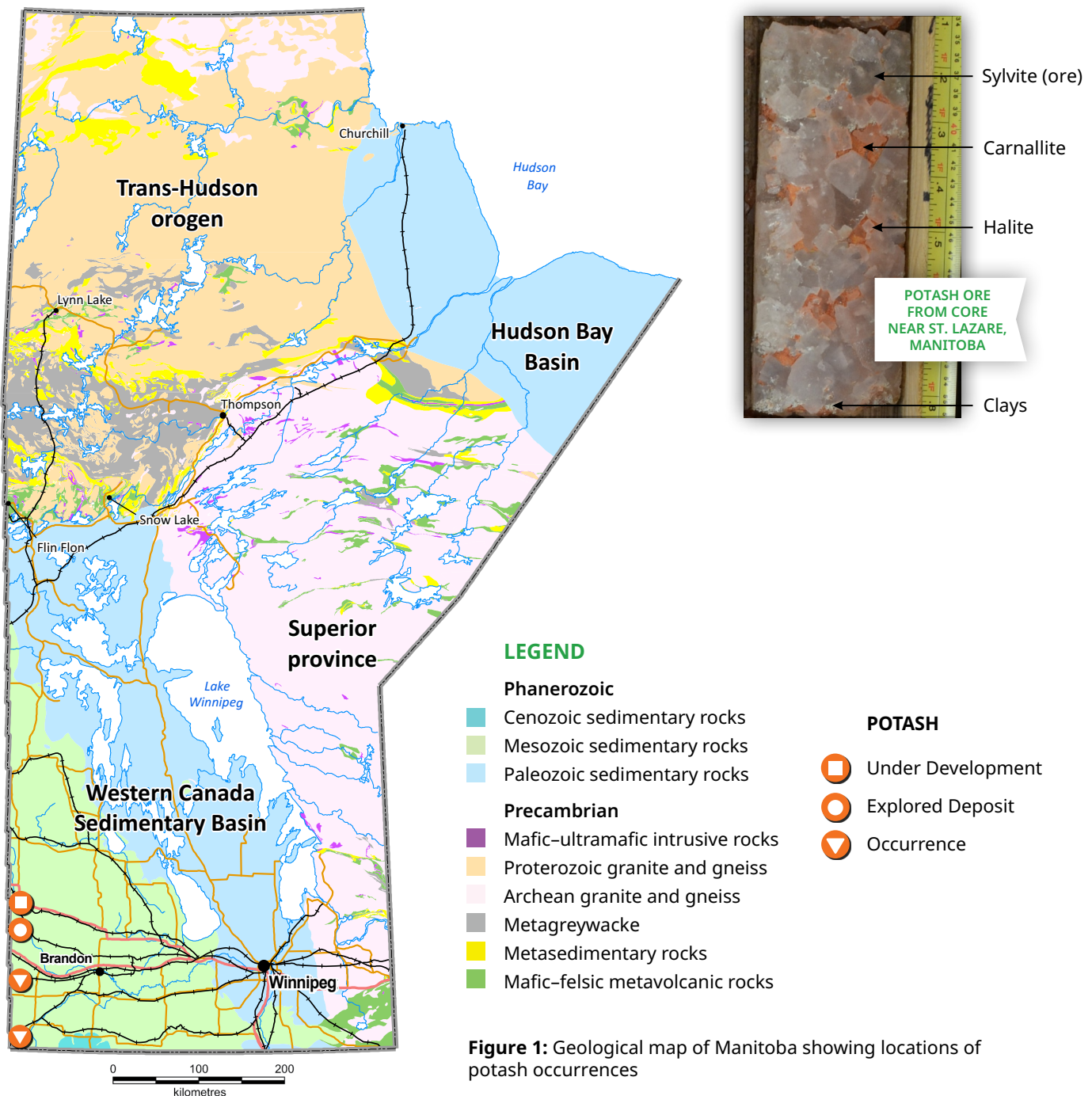


Figure 1: Geological map of Manitoba showing locations of potash occurrences

Prairie Evaporite, Esterhazy Member

Underlying the Dawson Bay Formation and overlying the Winnipegosis formation carbonates, the Prairie Evaporite contains four potash-bearing members:

- Esterhazy
- Belle Plaine
- White Bear
- Patience Lake

Of these four members, three of them—Belle Plaine, Esterhazy and White Bear—extend into Manitoba from the west (Figure 2). Esterhazy is the only potash bed in Manitoba with sufficient thickness and grade to potentially sustain economic mining, especially solution mining, and is the target of Manitoba’s first potash development. The ore grade and tonnages measured in this member in Manitoba are comparable to nearby, active, long-lived potash mines in Saskatchewan, including:

- Nutrien’s Rocanville mine
- The Mosaic Company’s Esterhazy K1 and K2 mines

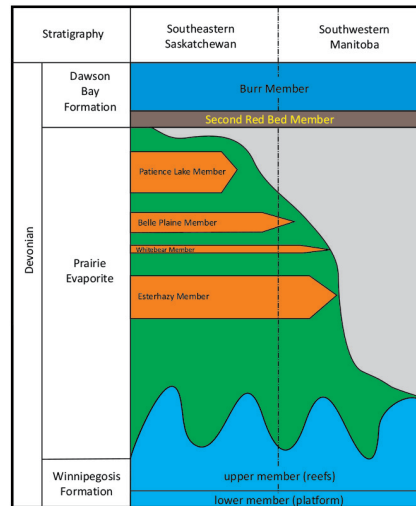


Figure 2:

Stratigraphic column of the middle Devonian formations showing correlations between the prolific potash beds in Saskatchewan and those occurring in Manitoba

Potash Occurrences

The known area of potash occurrences in Manitoba can be subdivided into four areas, each separated by barren or underexplored expanses (Figure 3):

- 1) Roblin–Russell area, covering townships 19 to 25, ranges 27 to 29W1
- 2) St. Lazare–McAuley area, covering townships 14 to 18, ranges 27 to 29W1
- 3) Daly–Sinclair area, covering townships 5 to 11, ranges 27 to 29W1
- 4) Pierson area, occurring in township 1, range 28W1

These areas total approximately 2,879 km² of potentially mineable potash occurrences.

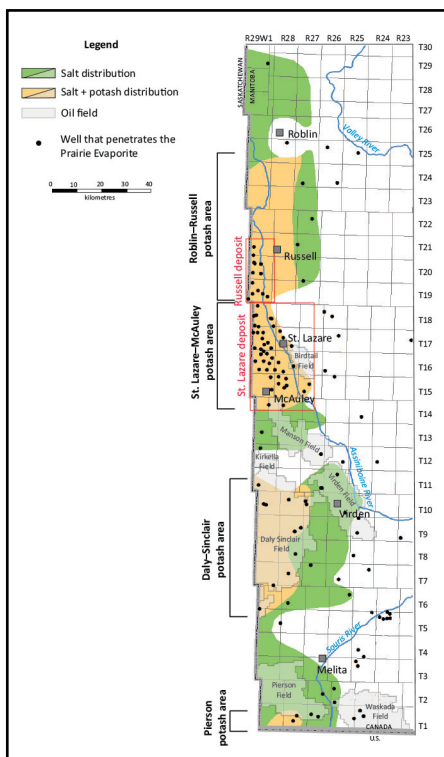


Figure 3:

Distribution of the salt, salt + potash, oil fields, and wells that penetrate the Prairie Evaporite in southwestern Manitoba. The four areas with potash occurrences are shown, as are the northern (Russell deposit) and southern (St. Lazare deposit) blocks of the Russell–McAuley area. The salt dissolution edge is equivalent to the eastern limit of the salt and salt + potash distribution areas

Russell–McAuley Potash Deposits

Located between the communities of Russell and McAuley, Manitoba, these are the only potash deposits with an exploration history. This potash resource has been historically subdivided into two blocks (Figure 4):

- a northern block, referred to as the Russell deposit
- a southern block, referred to as the St. Lazare deposit

Both deposits are continuous into one another. The distinction between the two blocks simply reflects the extent of two long-standing potash dispositions held in the past by competing companies. Both deposits are reefs good candidates for solution mining.

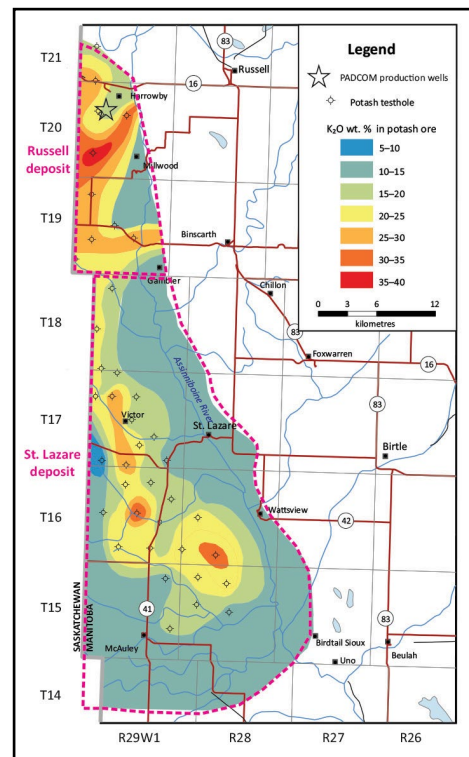


Figure 4:

Potash distribution and K₂O wt. % in potash ore (sylvinite) of the Russell and St. Lazare deposits, southwestern Manitoba

Potash Resource

In 2009, a formal mineral resource estimate was prepared for the Russell deposit. A historical resource estimate for the St. Lazare deposit was prepared in 1983. The following table summarizes the estimated resources for both the Russell and St. Lazare deposits. These estimates were determined assuming a conventional underground mining operation. Resources estimates for the deposits for a solution mining operation are expected to be higher, but have never been calculated.

Potash Resource Estimates for the Russell–McAuley Areas in Southwestern Manitoba for a Conventional Underground Mine		
Potash deposit	Million tonnes*	Average grade (K ₂ O wt. %)
Russell deposit	392	22.5
St. Lazare deposit	650	20.9

* Resources are historical and pre-date NI 43-101; users should verify critical information

Potash Exploration History

The discovery of potash in Manitoba is from an oil well drilled in 1951, which led to a potash rush and exploration programs by several companies. Since that time, sporadic exploration has occurred, including the development of a feasibility study for the Russell deposit, and the drilling and coring of a pilot hole for an underground mine shaft in the 1980s. The last round of active exploration ended in 2013. In 2022, new geological mapping of potash distribution north of Russell has identified up to 840 km² of unexplored potash potential areas.

Manitoba's first potash solution mining operation is being developed by PADCOM within the Russell deposit and is located south of the community of Harrowby (Figure 4). In 2021, PADCOM drilled two production wells; this mine went into production in 2023.

Going forward, Manitoba is looking to embrace new technologies and flexibility for future potash development to maximize the economic benefit and diversification of its mineral resources.

Mining, Oil and Gas Industry Overview

- \$3.4 billion in estimated value of production, a 45% increase since 2021
- \$1.7 billion in real value added, accounting for approximately 2.6 per cent of the province's real GDP and 4.3 per cent of all domestic merchandise exports
- Direct employment of approximately 3480 people, with an additional 2035 individuals employed by sector support activities
- 2023 estimated mineral exploration and deposit appraisal spending intentions at \$163.8 million
- 225 new wells drilled in 2022

Source: Natural Resources Canada



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