

# The Potash Journey

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**PotashCorp**  
Helping Nature Provide

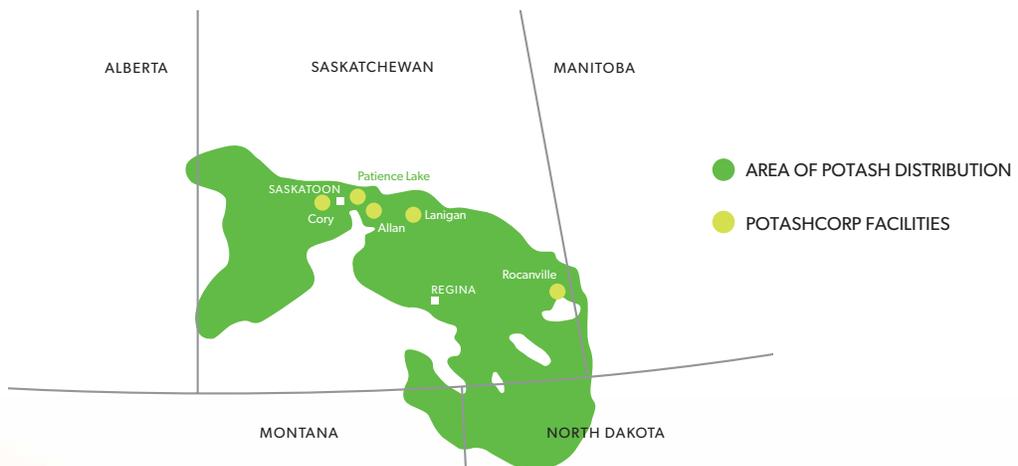
# POTASH PROFILE

PotashCorp is the world's largest potash producer by capacity with six low-cost mines in Saskatchewan and New Brunswick.

## Saskatchewan Potash Development

Nearly 400 million years ago a vast sea covered most of Saskatchewan. Over time, a massive reef slowly grew across the northern part of the sea and blocked it from the open ocean in the north. That reef prevented water from coming in from the ocean, and the warm dry air climate eventually evaporated the water producing a bed of mineral salts known today as the Prairie Evaporate Formation. This formation contains the world's largest known reserve of potash. The province of Saskatchewan alone accounts for almost half of world potash reserves.

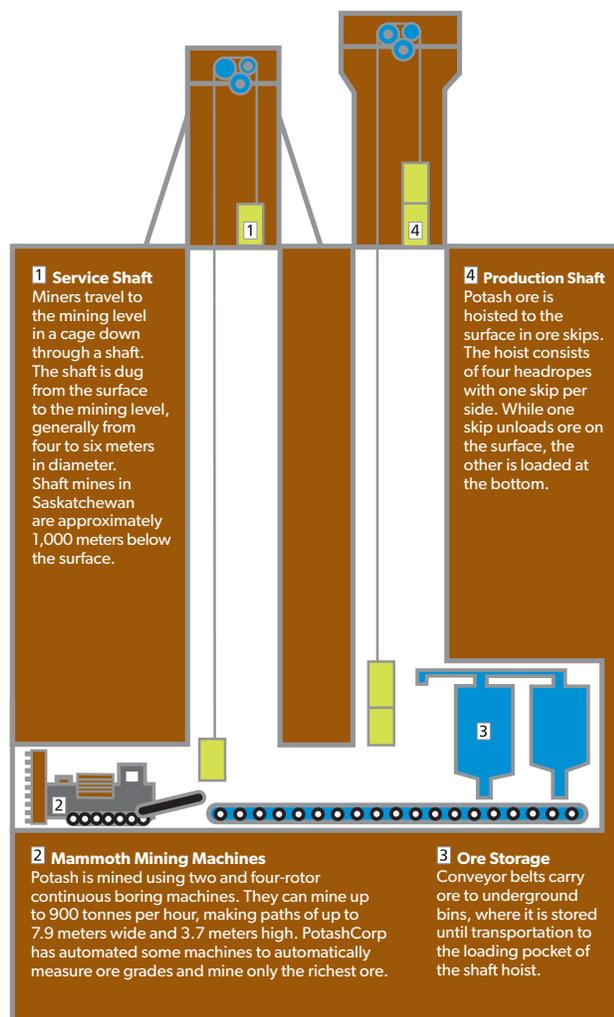
Potash deposits in Saskatchewan are located about 1,000-3,000 meters below the surface and are relatively flat-lying and undisturbed over very large areas. Potash ore is composed of approximately 55 percent sodium chloride, 40 percent potassium chloride and 5 percent clay and other insolubles. It also contains small amounts of iron oxide which gives the finished product a pink or red color.



# MINING METHODS

## 1. Conventional Underground Mining

Conventional underground mining is the most common mining method accounting for almost 80 percent of global potash capacity. Of the six mines PotashCorp owns and operates in Canada, five are conventional underground mines. Each mine has at least two shafts: a service shaft that transports people and materials and a production shaft for hoisting potash ore. Potash is mined using massive mining machines that weigh approximately 200 tonnes. The mined ore is transported underground by conveyors and brought to the surface to be milled.

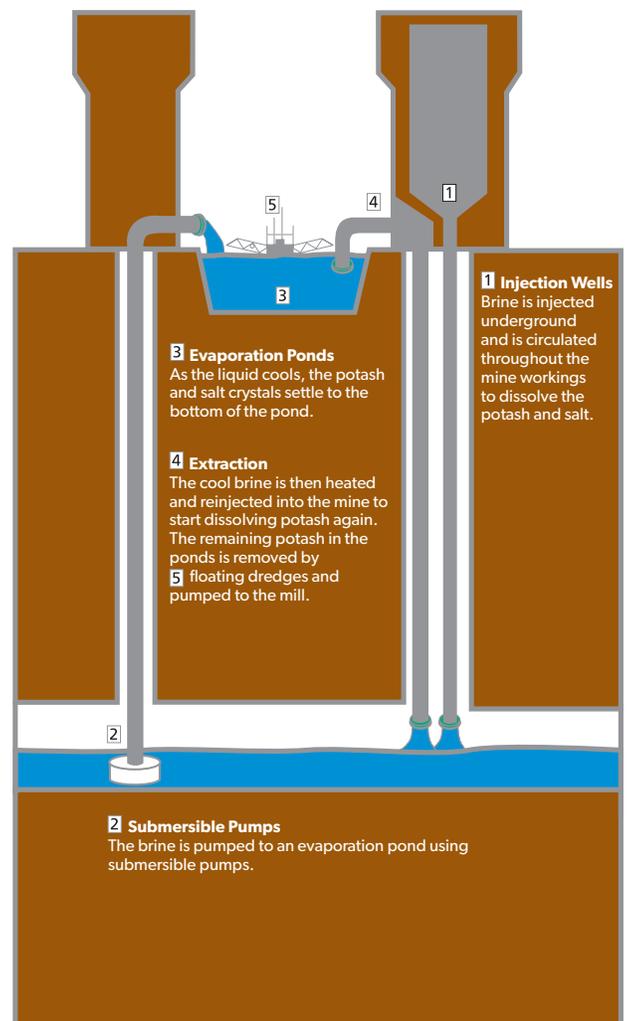


# 1000m

Depth equipment and personnel are lowered in the service shaft to reach the mining level.

## 2. Solution Mining

Solution mining involves the injection of heated brine (a salt and water solution) to extract potash from the underground ore bodies. The resulting potash-rich brine is pumped to surface ponds or crystallizers where the potash is extracted. PotashCorp's Patience Lake operation was originally a conventional mine but has been converted to a solution mine.



# 27°C

Approximate underground temperature at our Saskatchewan potash mines.

# THE MILLING PROCESS

## The Mill

Once potash ore is extracted, PotashCorp mines essentially follow the same milling process at the surface.

### Crushing and Grinding; Desliming

Ore hoisted from the mine is crushed into small pieces, which releases the crystals of potash and salt in the ore. Clay particles are separated from the crystals using agitation machines. The clay particles are much smaller than the potash and salt crystals and are removed using size separators.

### Flotation

Process reagents added to the potash, salt and brine mixture attach only to the potash crystals. These reagents enable potash to attach to fine air bubbles that are introduced into the bottom of flotation machines. The potash particles rise to the surface for collection and the salt remains on the bottom, where it is discarded.

### Drying and Sizing

Potash particles and brine are transferred to centrifuges (similar to a washing machine spin cycle), which separates potash from the brine. The potash is moved to dryers, which heat the product to about 200 degrees Celsius. The resulting dry mixture contains various sizes that are separated by huge mesh screens into standard, granular and suspension grade product.

### Compaction and Crystallization

A portion of the finer product stream is fused under high pressure between two rolls. The resulting solid "board" is broken into pieces and sized to form additional granular potash.

In some mills, finer product is dissolved in hot brine to release small quantities of impurities. The brine is then cooled in vessels to produce a high purity white product suitable for use in soluble fertilizer and in industrial markets.

### Storage and Loadout

Finished product is transferred to onsite warehouses that have the capability to store several grades of potash. The majority of our potash is loaded onto railcars for delivery to customers around the world. Modern facilities have the capability to load more than 100 rail cars per day.



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and tour a mine online at:

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