The PotashCorp Letter

This issue of The PotashCorp Letter discusses the challenges related to bringing on new potash capacity or debottlenecking existing production.

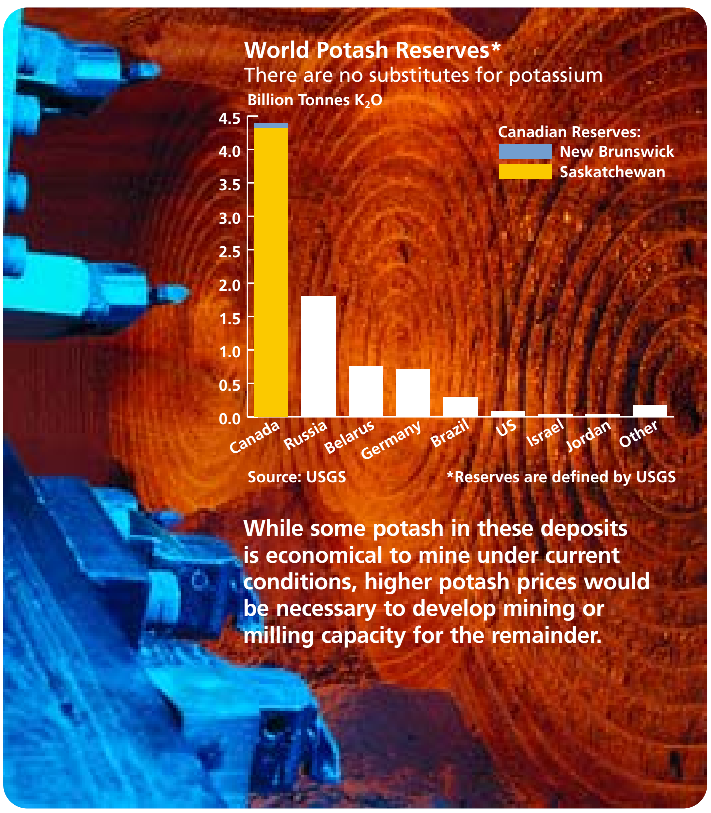
PotashCorp

POTASH PHOSPHATE NITROGEN

SUMMER 2005

RARE EARTH

It takes hundreds of millions of years and a complex series of geological processes to form an economically viable potash deposit.



With global potash demand growing and many producers operating at or near their capacity, the quest for new production is under way. There are, however, a number of natural obstacles that make expanding production, finding viable deposits or building new capacity daunting challenges.

The sources of supply are few, as the Earth's geological evolution has provided only a limited number of large accessible deposits scattered across a small number of geographic regions. That is a product of the extraordinary circumstances necessary for the development of a potash ore body.

At their outset, these deposits started as large inland seas that were isolated from the world's oceans many millions of years ago. As the water bodies began to evaporate, they deposited limestone, dolomite and rock salt. In some areas the remaining water, with its precious contents, flowed to low spots and, with further evaporation, left a thick layer of concentrated minerals that would become potassium salts.

These potassium salts, however, can be easily dissolved or separated into small, uneconomical deposits by contact with water. Only in regions where the salts were covered by a layer of clay, which provided protection through many tens of millions of years, did the deposits remain.

Even those buried treasures were not certain to become workable deposits. As the earth shifted, some beds developed fault lines or folded, moving different parts of the potash beds to varying levels, making them difficult and expensive to access and mine. In other areas, the hazardous gases or excessive temperatures found in the formations make the deposits uneconomical.

As a result, flat, thick, nutrient-rich potash deposits are rare – and a long-awaited gift of nature.

For more information, visit The PotashCorp Letter Online at www.potashcorp.com

WHERE THERE'S A MILL...

Where there's a mill, there's often a way to increase capacity. But the many stages of milling are interconnected, making debottlenecking a challenging task. While improved technology and additional or larger equipment can speed certain processes, changes to any one step place new demands on other stages of production.

Surface Ore Storage: Surface ore storage capacity can be increased to allow the mill to continue operating during ore hoisting interruptions such as routine hoist maintenance.

Ore Size Reduction: Crushers, rod mills and screens are used to reduce the size of the ore delivered from the mine to physically separate the KCl from the NaCl and clay.

Clay Removal: This process separates the small clay particles in the ore from the larger NaCl and KCl crystals, using equipment such as wet screens, hydrocyclones, and hydroseparators.

Flotation: Banks of flotation cells are used to separate the KCl (which becomes the concentrate) from the NaCl (which becomes the tailings).

Dewatering: Wet screens and centrifuges are used to remove the process brine from the KCl concentrate, leaving behind damp concentrate.

Drying: Gas-fired rotary kilns or fluid bed dryers are used to dry the damp concentrate.

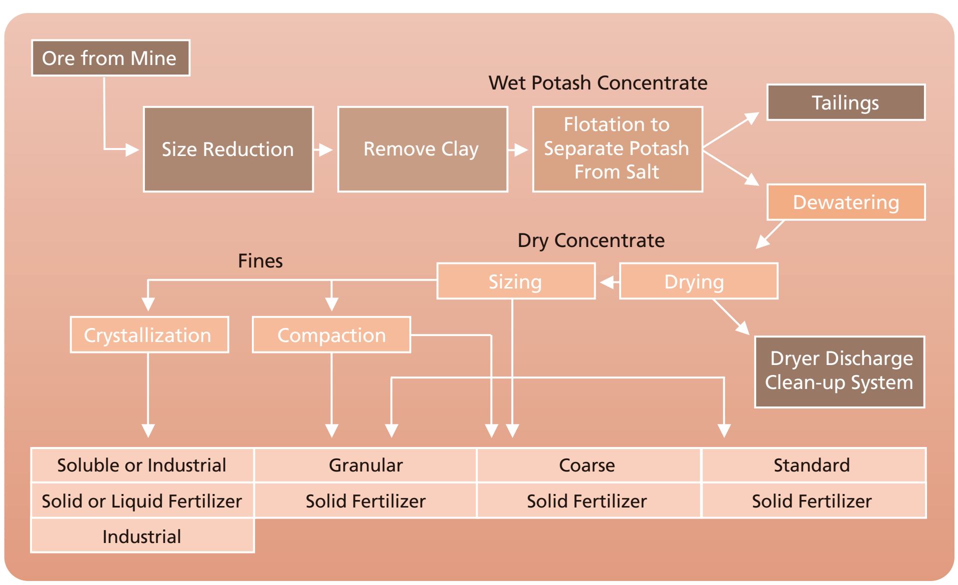
Product Sizing: Screens are used to separate the wide range of particle sizes in the dry concentrate to a narrower distribution of size ranges.

Compaction: Particles that are too small for inclusion in one of the marketable products are compressed and converted into larger granules.

Crystallization: As an alternate to being compacted, small particles may be dissolved in hot brine, which is then clarified to remove the minor amount of clay that gives the floated product its color. Next, the hot brine is cooled, resulting in white crystals, which are separated from the brine and dried to produce a white potash product.

Tailings Handling: Mill tailings, consisting of the sodium chloride and clay, are pumped by pipeline into a tailings management area designed to prevent these materials from entering adjacent surface land or aquifers.

Dry Discharge Clean-up Systems: Streams such as the hot moisture-laden air from product dryers are passed through cyclones and scrubbers to remove particulate matter so the discharge meets government standards.



WORLD OF POTASH

Not All Deposits Are Created Equal

A number of factors determine the viability and value of the world's potash deposits. Foremost among them are:

Size: a deposit must be large enough to justify an investment in the development of a mine, as it costs about US $1.2 billion for 2 million tonnes of new production.

K_2O content: the measure of potassium oxide in the rock. The higher the K_2O content, the more valuable the deposit.

Shape: thick, flat deposits are the most economical to mine. A flat ore body allows large continuous boring machines to mine a level path and increases the percentage of ore recovered from the potash bed. Deposits that are uneven or contain carnallite ($KCl.MgCl_2.6H_2O$) have higher mining costs.

Depth: the distance below the surface can have an impact on the cost and ability to recover potash deposits.

Geology: the presence of clay seams within the potash beds or water-bearing formations above or in close proximity below the beds can affect mining methods and costs.

Producer/Location	Depth (metres)	Annual Capacity (in million tonnes)	K_2O Content	Mining Method/ Extraction Ratio	Capital Expenditures/Key Considerations
Legend Deposits with greater capacity, higher ore grade and simpler mining processes provide the greatest economic return.		> 1.0	> 22%	Conventional	
				Surface brine	
		.75-1.0	15-22%	Solution	
				Cut-and-fill	
		< .75	< 15%	Drill-and-blast	
PotashCorp					
Allan, SK	900-1000	1.9	24-26%	Conventional (30-32%)	• Restarting mothballed capacity will increase production at Lanigan to 3.8 million tonnes by late 2007 and Allan to 2.0 million tonnes by April 2006.
Cory, SK	900-1000	1.3	24-25%	Conventional (30-32%)	
Lanigan, SK	900-1000	3.8	19-22%	Conventional (30-32%)	
Rocanville, SK	900-1000	2.7	22-25%	Conventional (33%)	
Patience Lake, SK	900-1000	1.0	22-25%	Solution mining	
New Brunswick, NB	460-700	0.8	22-25%	Cut-and-fill	
Esterhazy, SK	900-1000	1.0	22-25%	Conventional	

WORLD OF POTASH (continued)

Producer/Location	Depth (metres)	Annual Capacity (in million tonnes)	K_2O Content	Mining Method/ Extraction Ratio	Capital Expenditures/Key Considerations
Agrium					
Vanscoy, SK	900-1000	1.7	22-25%		• Announced expansion will increase capacity by 310,000 tonnes by late 2006.
Mosaic					
Belle Plaine, SK	1600	2.5	22-25%	Solution	
Esterhazy, SK	900-1000	2.8	22-25%	Conventional	• Announced expansion will increase capacity by 360,000 tonnes by the fourth quarter of 2006.
Colonsay, SK		1.7			• Debottlenecking projects "under review".
Carlsbad, NM	250-500	0.3	15%	Hard langbeinite ore requires drill and-blast method to extract ore.	• Low-grade, deteriorating reserves.
Hersey, MI		0.2		Solution	• Small operation with limited potential.
Intrepid					
Carlsbad, NM	250-500	1.0	15%	Drill-and-blast	• Deteriorating reserves with limited potential.
Cane Creek, UT		0.1		After conventional mining proved unsuccessful, switched to solution mining.	• Ore body is badly folded. • Moving some KCl production to potassium magnesium sulfate.
Wendover, UT		0.1			
Kali und Salz (Germany)					
- Hattorf	600-1000	0.5	10-15%	Drill-and-blast	• Depleting reserves, low ore grade and limited potential.
- Unterbreizbach	600-1000	0.5	10-15%	Drill-and-blast	• High-cost production
- Wintershall	600-1000	0.5	10-15%	Drill-and-blast	• Spent € 40 million on a 30 km tunnel to transfer 250,000 tonnes of ore from an older mine
- Zielitz	600-1000	2.3	10-15%	Drill-and-blast	

WORLD OF POTASH (continued)

Producer/Location	Depth (metres)	Annual Capacity (in million tonnes)	K_2O Content	Mining Method/ Extraction Ratio	Capital Expenditures/Key Considerations
QSLIG					
China	Just below surface	1.5		Surface brine	• Brine is pumped to evaporation ponds.
Mahai					
China	Just below surface	0.15		Surface brine	
Hanhei Enterprise					
China	Just below surface	0.2		Surface brine	
Other Minor Chinese Producers					
Various		0.02		Surface brine	• Numerous small producers with capacity of 20,000 tonnes or less.
Lop-Nur		0.02		Surface brine	• Potential SOP production from natural brines in Xinjiang Province in western China. Current pilot operation of 20,000 tonnes/year. Planned increase to 1.2 million tonnes/year by 2010
Silvinit (Russia)					
- Solikamsk 1	270-420	0.6	15-19%	Conventional	• Older operations in need of capital.
- Solikamsk 2	270-420	1.7	15-19%	Conventional	• Limited expansion potential.
- Solikamsk 3	270-420	1.7	15-19%	Conventional	• Recently received a US $30 million loan to finance operations.
Uralkali (Russia)					
- Berezniki 1	270-420	1.3	15-19%	Conventional	• Older operations in need of capital.
- Berezniki 2	270-420	1.4	15-19%	Conventional	• Production costs increasing as they adjust to market-value input costs.
- Berezniki 3	270-420	1.2	15-19%	Conventional	• Have rights to new ore body.
- Berezniki 4	270-420	1.1	15-19%	Conventional	• Investing in new compactors to increase granular production.
					• Expansion projects "under review".

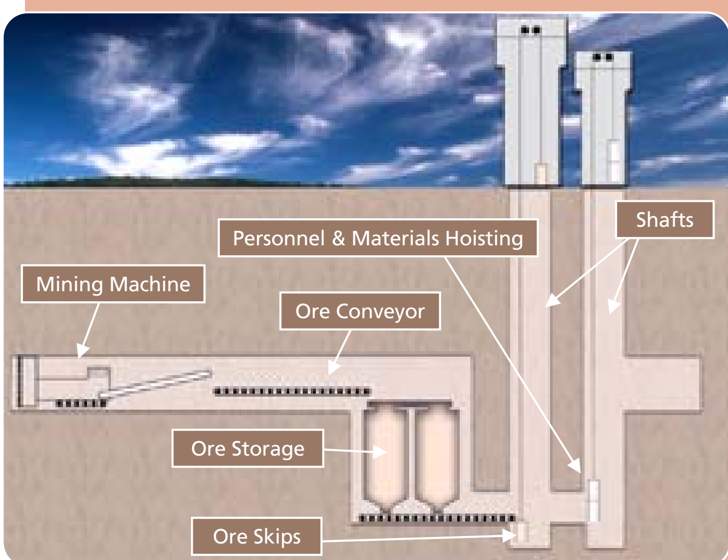
WORLD OF POTASH (continued)

Producer/Location	Depth (metres)	Annual Capacity (in million tonnes)	K_2O Content Content	Mining Method/ Extraction Ratio	Capital Expenditures/Key Considerations
Belaruskali (Belarus)					
- Soligorsk 1	430-900	1.6	16%	Conventional	• New shaft being sunk to replace depleted ore body at Soligorsk 1. Completion is planned between 2006-2009. • State-owned and operated. • Low cost with non-market economy inputs. • Needs capital infusion.
- Soligorsk 2	430-900	2.1	16%	Conventional	
- Soligorsk 3	430-900	2.1	16%	Conventional	
- Soligorsk 4	430-900	2.1	16%	Conventional	
Israel Chemicals (ICL)					
Dead Sea Works, Israel	Pumped from the Dead Sea	3.3		Surface brine	• Low-cost operation. • Limited area for pond expansion.
Cleveland Potash, England	1100	1.0	21%	Conventional	• Poor mining conditions and depleting ore bodies.
Iberpotasas, Spain	500-800	1.1	16%	Conventional	• Poor ore bodies with difficult conditions for mining.
Arab Potash Company (APC)					
Safi, Jordan	Pumped from the Dead Sea	2.1		Surface brine	• Low-cost producer. • Potential 200,000 tonnes from debottlenecking. • Engineering under way for a 500,000 tonne expansion, with potential for an additional 500,000 tonnes to follow.
SQM					
Chile		0.7		Solution	• Limited potential for expansion. • Majority of production is used in KNO_3, a specialty potash product.
CVRD					
Brazil		0.7		Conventional	• Difficult conditions and high production costs. • Spent US $67 million on 200,000 tonne expansion to come on stream by 2006. • Limited future expansion potential.

Your Way or Mine?

Mining companies have developed a number of different approaches to extract potash from different types of deposits.

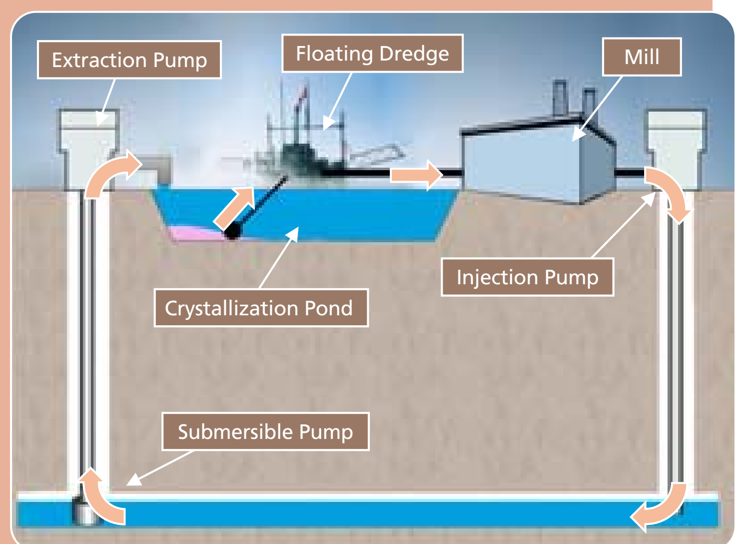
Conventional Room-and-Pillar: This is the simplest and most efficient method of potash mining. In flat-lying potash formations, ore is mined from areas called "rooms". Walls of ore are left between rooms to act as "pillars", supporting the overlying formation. A mining area containing a series of rooms and pillars is called a "panel". Continuous boring machines extract ore, which travels by conveyor to the shaft. This allows about 40-60 percent of the ore to be removed from a panel. The overall extraction ratio using this method is lower due to the need to maintain long-term access roads and wide pillars between panels, as well as large pillars around exploration wells and brine-injection wells.



Drill-and-Blast Mining: When the hardness of potash mineralization exceeds the cutting ability of a continuous mining machine, drill-and-blast mining is used to break ore from the mine walls. This is less efficient than conventional continuous mining.

Cut-and-Fill Mining: The ore is cut with a boom miner in successive horizontal lifts. A transfeeder and conveyor system takes the broken ore to bins feeding the skips. The void created by removing the ore is partially backfilled with mill tailings.

Solution Mining: In areas where conventional mining is not practical because of excessive depth, high formation temperatures, folded potash beds or hazardous gases, solution mining provides an alternate method of extraction. Heated brine is pumped into the deposit to dissolve the potassium salts. The brine is then pumped to evaporation or cooling ponds on the surface where potassium-containing salts crystallize. The cost of the natural gas used for brine heating has skyrocketed in many regions, making the economics of this option less favorable than conventional mining.



Surface Brine Mining: In a limited number of locations, brines at or near the surface can be economically recovered and the potash extracted through solar pond crystallization. This method is used for brines from the Dead Sea and in China's Qinghai and Xinjiang provinces.

Pond Crystallization: Facilities that rely on solution mining use pond crystallization to convert brine to potash crystals. At operations such as PotashCorp's Patience Lake Division, warm potash-bearing brine is pumped from the underground formation to surface ponds, where the heat is released, resulting in potash crystals forming in the brine and settling to the pond bottom. A dredge with a boom and cutting head harvests the crystals, which are then pumped through a pipeline to the mill for further processing into finished products. At other locations, such as ICL in Israel and APC in Jordan, solar evaporation is the key to crystallization.

HELP WANTED

With finite potash capacity being pushed by global demand, many producers are looking for ways to increase production from existing operations. But even those trying to debottleneck their facilities face a number of challenges.

While opportunities to build capacity exist, many producers have already pushed their operations to the limit. To expand capacity further will be more complicated, time-consuming and expensive. Even if these producers take steps to increase capacity, the cost per tonne will be much higher than existing operations.

The challenge is made greater by a strong global economy that has tightened the labor supply and created shortages of key inputs. That means companies looking to expand their workforce or install new equipment often need a longer lead time.

The current buoyant economic conditions have driven up demand for construction materials, limiting their availability and pushing up prices. Steel, for example, has risen 40 percent in the past two years. Following the announcement of PotashCorp's expansions at Lanigan and Allan, all steel fabricators in Western Canada were fully booked, leaving later projects to turn to more distant suppliers in search of materials and installers. That will add time and expense to future projects.

This has increased the importance of planning, as delivery times for many items have grown. It can take as long as 12-16 months for the delivery of new compactors.

In addition, facility expansions have to be conducted while existing operations continue to function. New equipment is connected to the process during planned shutdowns, which requires close coordination between contractors and plant personnel to ensure that tasks such as lifting new equipment are performed safely.

Even as expansions near completion, new challenges are created. Expanded production capacity requires additional product loading and shipping capabilities, and may necessitate more track space to store loaded railcars. Maintenance also becomes an issue, as extended operating hours reduce the amount of time available for maintenance.

In essence, the low-hanging fruit has already been picked. Further production increases will be challenged by issues of cost, coordination and expanded timelines. This means any significant expansion of capacity through debottlenecking is unlikely in the near future.

Working It Out

Producers explore a variety of means to build capacity - all with advantages and limitations.

In a conventional mine, producers can put additional boring machines underground or utilize new technology with greater automation to reduce downtime. This, however, requires wider conveyer systems to carry more ore and expanded underground ore surge capacity to be effective.

In mine shafts, increasing the horsepower driving the hoist and the size of the ore-carrying skips, together with installing hoist ropes with a larger diameter, shortening the hoisting cycle time and strengthening the hoisting structure, allow more ore to be brought to the surface. To be effective, more ore and milling capacity must be available.

A solution mine can increase its production capability by installing more wells and higher-capacity pumps. Solution mines may require increased steam production capacity and additional brine heat exchange capacity to heat the greater brine flow.

For pond crystallization, increasing capacity requires construction of new ponds or enlarging existing ones, purchasing additional crystal harvesters or building bigger systems to transfer slurry to the mill.

GREENFIELD DREAMS

Although longstanding projects to evaluate new greenfield development continue, the world will have to depend on existing deposits for the next several years.

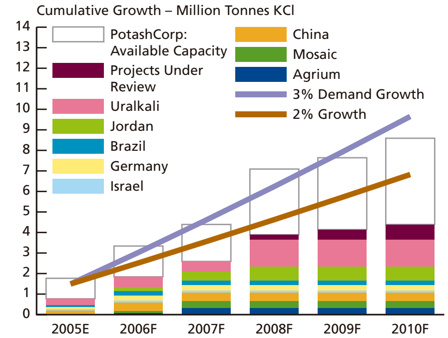
Speculation about greenfield development has been building as potash consumption rises and prices reach record levels. In reality, the three most prominent projects under discussion appear unlikely to ease the tight supply in the foreseeable future.

It is not expected that any of these projects could be operational prior to 2010. If additional capacity from these projects does come on stream, the market is expected to ease for a brief period before returning to tight supply/demand balance. Market growth between 2010 and 2012 is expected to absorb any new capacity contributed by these projects, leading to tight market conditions again after 2012.

Thailand - ASEAN: In 1993, the ASEAN Potash Mining Company was established, with participation from the governments of Thailand (20 percent), India (13 percent) and Malaysia (13 percent). An early test shaft, however, reportedly found a relatively low ore grade of 10 percent K_2O. In addition, the ore is carnallite, a mineral that contains magnesium and has less structural strength, which could make mining difficult. The presence of magnesium, which tends to absorb moisture from the air, could also adversely affect the milling process and product quality, as potash breaks down and cakes in the presence of moisture. Thailand's government has withdrawn from the project, which is currently inactive.

Thailand - Asia Pacific Potash Corporation: APPC began an exploration program in 1993, launched a pre-feasibility study in 1995 and carried out a full feasibility study in 1998. Its primary ore body, Udon South, is located about 50 kilometers from the Thailand/Laos border and reportedly contains 300 million tonnes of ore. Extracting the ore suitable for mining from this deposit gives it a life span of 22 years.

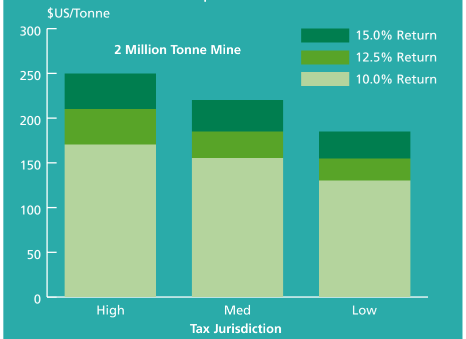
Potash Demand Growth vs Capacity:
Assumes Half of Projects Un der Review" Completed



Source: Fertecon, PotashCorp

A secondary deposit, Udon North, contains a reported 665 million tonnes, with an estimated life of 25 years. Although the center of the deposit contains 30 million tonnes of ore graded at 27 percent K_2O, the presence of carnallite and a high-humidity climate impact mining, milling and product quality and could make production in Thailand difficult. The project plan calls for 1 million tonnes of initial capacity, followed by a second 1 million tonnes at a later date. APPC, however, is reported to have been unable to locate a suitable underground formation for injection of excess brine and it is examining the feasibility of evaporating brine, which is a costly process. It submitted an application for a mining license to the government of Thailand in 1993, but had not received approval as of mid-2005.

Greenfield Potash Operation Sensitivities
FOB Mine Price Required for Desired Return



Source: PotashCorp

The percentage return on the investment (ROI) in a new greenfield potash operation depends largely on two key variables: the tax rate and the price per tonne of potash. The accompanying graph provides the price required to achieve an ROI of 10 percent, 12.5 percent and 15 percent in tax jurisdictions with low, medium and high tax rates. For example, in a high tax rate jurisdiction, a price of $250 per tonne is required to achieve an ROI of 15 percent.

Argentina - Rio Tinto: Although Rio Tinto has reported recoverable resources of 35 million tonnes, infrastructure challenges may present a problem at this deposit. The company is currently performing a pre-feasability study, exploring the potential for solution mining at this site. The pre-feasability study will determine whether this deposit merits the expense of performing a full feasibility study. If both stages of feasibility studies justify further work, substantial time will be required to develop a well-field capable of recovering a high-volume, potash-laden brine. Finding an environmentally acceptable pond system for processing that brine to produce potash crystals, along with the development of infrastructure like roads and railways to support shipping, will take as long to construct as a conventional mine and mill. As with all solution mining operations, the project economics depend on natural gas, which may be in short supply and expensive.

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