

TECHNICAL AND ECONOMIC CONSIDERATIONS FOR THE DEVELOPMENT OF A NEW POTASH SOLUTION MINE IN SASKATCHEWAN

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Abstract

The rich sylvinitic deposits in Saskatchewan were initially developed during the period from the mid 1950's to the early 1970's. Solution mining was demonstrated to be the most viable method of extraction for deposits in one region of the province and the operating parameters were established in the 1960's. A successful solution mine was developed in this period and has run ever since. Despite its success, it remains as the only one out of the ten potash operations in the province which was designed as a solution mine from its inception. One other "accidental" operation was converted from a conventional mine.

This paper discusses the economic and technical considerations which have militated against the development of another solution mine over the last thirty years and demonstrates the reasons why the next new potash mine in Saskatchewan may very well be a solution mine. The generally accepted advantage over a conventional underground mine in initial capital cost will be quantified and incorporated into a model showing the effect of offsetting operating and sustaining capital costs. Risks and opportunities presented by market pricing and demand movement will be discussed.

The extraction technique proposed for most solution mining targets is similar to the one currently in use at the existing operation. This paper will examine possible advancements and will suggest considerations for adaptation to newly identified sources.

A large potash resource is known to be present in the zone between the area currently targeted for conventional mining and the one suitable for solution mining using current techniques. The paper will discuss the parameters which may suggest alternative techniques which may be used in the future for extraction from this middle zone.

Key words: Solution Mining, Potash, Canada, Saskatchewan