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Lithium in Manitoba: Production and Exploration Potential

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Lithium continues to be in the spotlight due to the continue demand for batteries in tandem with the advent of decarbonization of our economy and the fossil fuel transition. Lithium has other important physical and chemical properties that are suited to a wide range of applications including pharmaceuticals, glass and ceramics, and aerospace technologies. In addition, lithium is considered a critical element by the governments of Canada, the United States, and the European Union.

The Canadian province of Manitoba has a long and rich history of lithium exploration and mining associated with granitic pegmatites. Granitic pegmatites contain the largest known resources of lithium in Manitoba. The most prolific region is the Winnipeg River-Cat Lake pegmatite field, which hosts the world-class Tanco lithium cesium-tantalum deposit, along with numerous other pegmatite occurrences. The Tanco mine was until very recently the sole producer of spodumene concentrate in Canada. The Winnipeg River-Cat Lake pegmatite field is Archean in age and is part of the Superior province. Elsewhere in the Archean Superior province of Manitoba, lithium-bearing pegmatites occur at Red Sucker Lake, Gods Lake, Cross Lake, Red Cross Lake, and McLaughlin Lake.

A second prolific lithium-hosting region in Manitoba is the Wekusko Lake pegmatite field, located just east of the town of Snow Lake. The Snow Lake area in Manitoba is well known for the world-class Flin-Flon-Snow Lake mining camp and its production of gold, copper, zinc, and nickel. The Wekusko Lake pegmatite field is of Paleoproterozoic age (ca. 1800 Ma). The main lithium-bearing pegmatite mineral found in the Wekusko Lake field is spodumene. However, more recently, highly fractionated pegmatite dikes with lepidolite were reported, making this area even more attractive for pegmatite exploration projects.