The Dean's List – Part 5: Which manganese companies could benefit from Canada's commitment to critical minerals?

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It's time for Part 5 in our series that looks at Canadian companies in the mining sector that could be impacted by the many announcements with respect to critical materials, supply chain, EV battery manufacturing, etc. As a reminder the province of Ontario first announced in March its strategy for 'critical minerals' followed shortly by a C$4.9 billion electric vehicle battery plant in Windsor, Ontario, and then in mid-July, a new C$1.5 billion battery materials facility was announced for eastern Ontario. In April the Federal Government got on board with its Budget 2022 proposing up to C$3.8 billion in support over eight years to implement Canada's first Critical Minerals Strategy followed in late June with a House of Commons Standing Committee on Industry and Technology report entitled: Positioning Canada as a Leader in the Supply and Processing of Critical Minerals.

On top of all this, there was some big news out of the U.S. last week that could also have a trickle-down effect on Canadian miners – the passing of the Inflation Reduction Act, a Bill that includes requirements for domestic manufacturing of EVs and their battery components to qualify for tax credits. It requires that 40% of battery components be sourced from factories in the U.S. or its free trade agreement partners (like Canada). It also

states that Chinese components and minerals be phased out beginning in 2024. It seems logical to continue our critical minerals focus on battery materials for now given all the recent announcements, so we'll keep our focus on this particular aspect of the great energy transition.

We have so far discussed lithium & rare earths, nickel, graphite, and copper which leads us to today's material – manganese. The cells in the average battery with a 60 kilowatt-hour (kWh) capacity—the same size that's used in a Chevy Bolt—contained roughly 185 kilograms of minerals. NMC batteries, which accounted for 72% of batteries used in EVs in 2020 (excluding China), have a cathode composed of nickel, manganese, and cobalt along with lithium. Here's how the mineral contents differ for various battery chemistries with a 60kWh capacity:



Source: Mining.com

You might look at this and think "What's the big deal?", manganese is pretty much the smallest component. However, the devil is in the details. Guess how many manganese mines there are currently in North America? If you guessed anything more than zero, you'd be wrong. Not only that, High Purity Manganese Sulphate Monohydrate (HPMSM) is the highest purity "battery grade" manganese sulphate and is the manganese chemical used in a NMC cathode of a lithium-ion battery. There is currently no western hemisphere producer, and in particular no North American producer, of HPMSM. As you can probably guess, approximately 90% of current production of HPMSM is based in China. I think my decade old Christmas wish for an Aston Martin One-77 is more realistic than some of the commodities on the critical minerals list, but I digress.

But what if there were two companies that had the potential to

be the first (and thus only) manganese producers in North America. That's right, today is a bonus edition with two companies for the price of one given their assets are literally beside each other. I suspect they'd be pretty popular with all the EV battery plant manufacturers noted above, as well as any politician that could somehow attach their name to the support of one or both companies.

The first is Canadian Manganese Company Inc. (NEO: CDMN), who is focused on the exploration and development of its wholly owned manganese project located in Woodstock, New Brunswick, Canada ("Woodstock Project"). The Woodstock Project contains the largest, highest grade manganese carbonate deposit for development in North America. It is strategically located adjacent to the U.S. border, and within close proximity to both the St. Lawrence Seaway and Atlantic Ocean, ideally positioned to support the domestic lithium-ion battery supply chain for generations.

The second, Manganese X Energy Corp. (TSXV: MN | OTCQB: MNXXF) is advancing its Battery Hill manganese project, directly North of the Woodstock Project. It encompasses all or parts of five manganese-iron zones including Iron Ore Hill, Moody Hill, Sharpe Farm, Maple Hill and Wakefield.

In his Master's Thesis on the Woodstock area manganese occurrences, Brian Way (2012) reports that the area "hosts a series of banded iron formations that collectively constitute one of the largest manganese resources in North America, approximately 194,000,000 tonnes". It appears that someone from both these companies read this Master's Thesis. Perhaps several EV battery plant companies will also search out this document as well.

As for who is in the driver's seat of the two, Manganese X has

recently reported a PEA on the Battery Hill project with highlights including: after-tax NPV_{10} of US$486 million; CAPEX of US$350 million with a payback of 2.8 years and life of mine operating cost of US$122/t material processed. While Canadian Manganese is only at the PFS stage. To date, both companies have comparable total tonnage, albeit Canadian Manganese is only inferred while Manganese X has a measured plus indicated number due to the extra work done to complete the PEA. Canadian Manganese appears to have better grades of Mn at approximately 10.0% versus 6.4% for Manganese X.

Both have roughly C$4 million of cash at present with market caps of C$25 million for Canadian Manganese and C$36 million for Manganese X. So if you want exposure to the manganese component of the North American critical minerals supply chain your choices appear to be somewhat limited, because it's a pretty small field.

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The Dean's List – Part 1: What rare earths company will benefit from Canada's commitment to critical minerals?