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Mining looks to technology

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Minerals: Fredericton lab developing way to separate zinc, indium without foreign processing

B1 Christine Dobby
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A junior mining firm looking to get a Charlotte County project off the ground has high hopes a technology being developed in a Fredericton lab could preclude the need to send zinc concentrate across the world for processing - and make the mine economically viable in the process

 ENLARGE PHOTO



David Smith

Mitchell O'Donnell, left, test program manager; and Dean Thibault, principal and senior process design engineer at Thibault & Associates Inc., are seen at the company's Fredericton facility.

Errol Farr is the president and CEO of Adex Mining Inc. (TSX.V:ADE), which is working to develop a difficult ore body at its Mount Pleasant Mine property. He says Thibault & Associates Inc., a process chemical engineering firm based in the provincial capital, is testing a technique that could see Adex processing its ore on-site - producing zinc metal and indium sponge - instead of selling it to international buyers.

"The value increase is significant in that you're selling almost pure metal and at a much higher value. It's much more marketable - especially the indium," Farr says.

Dean Thibault, senior process engineer and owner of Thibault & Associates, says his firm has been working on processing indium, a mineral used in electronics such as LCD and plasma screens, since 1998. He says the purity of the indium produced is key, because the

electronics market demands it.

As with most occurrences of the mineral, indium is found along with zinc at the Mount Pleasant deposit. According to Farr, the heat-based smelting process typically used to separate zinc from ore bodies - known as pyrometallurgy - is energy-intensive and leaves sulphur dioxide streaming into the air. Plus, large zinc smelters are only found in a few places in the world, like China.

The hydrometallurgical approach being tested in a pilot operation at Thibault & Associates' lab takes a zinc-indium concentrate mined from the north zone of the Mount Pleasant property and dissolves it in a solution, Farr says. Waste materials are removed to obtain a pure zinc-indium mixture and then chemical reagents are used to extract the indium, which creates what is called an indium sponge - 95 to 99 per cent in purity. Finally, says Farr, electrolysis - applying an electric current to a solution - is used to obtain zinc metal.

"We end up bypassing that whole (smelting) process, maintaining control and selling into the final metal market," Farr says.

In addition to obtaining close-to-pure indium and zinc metal on-site, Thibault says shipping concentrate to China for processing "would probably kill the project" from an economic perspective.

And unlike with smelting, the sulphur byproduct produced with the hydrometallurgical process is elemental sulphur, which can be safely disposed of, he says.

All that's left now, after performing a smaller bench-scale study earlier this year with good results, is to prove through the current testing that the approach will work on the mine's ore. Once that challenge is met, a circuit at the mine site will be constructed to process the concentrate.

"We're fairly confident technically that the process will work," Thibault says, adding, "right now our objective is to prove the technical viability and ensure that we can do it in a cost-effective way."

The ore body at Mount Pleasant is complex and has lots of impurities, he says, and hydrometallurgy has not yet been tried as a means of processing.

"It's a novel approach and it's probably the best way to develop the Mount Pleasant deposit," Thibault says.

Adex purchased the property in 1995 and has yet to put it into production. However, after a financing agreement announced last week with Hong Kong-based Great Harvest Canadian Investment Co. Ltd., the prospect of an active zinc, tin and indium mine is closer than ever.

Thibault himself started his career at the property, working on the original design for a tungsten mine operated by Billiton Exploration Canada Ltd. for a few years in the early 1980s.

"I'm kind of tied to the deposit - there's a personal interest to see it going," Thibault says.

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