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BACTECH Mining Corporation

TSX-V: BM

ENVIRONMENTAL SOLUTIONS FOR THE MINING INDUSTRY

BacTech Mining Corporation is a publicly traded Canadian company based in Toronto. The Company has developed a commercial biological reactor leaching process – BACOX – that can be applied to the remediation of sulphide-bearing mine tailings in an economical and beneficial manner. It is the Company's vision to apply bioleaching technology to mine remediation projects to remove harmful elements such as arsenic from the environment, where this can be assisted by a positive cash flow from the recovery of metals from the tailings.

Historically, conventional mineral extraction practices in most mining regions, including the silver and base metal projects in the Cobalt area of Northern Ontario, involved virtually unregulated processing of the ores, with no disposal control systems for the unwanted rock (i.e., mine tailings). Most tailings in the world contain sulphides, other toxic elements, and, where previous technology limitations existed, economically recoverable quantities of precious or other valuable base metals.

Sulphides readily react with the atmosphere over time to create an acidic solution referred to as acid mine drainage. This acidic solution is very efficient at dissolving certain heavy metals from mine tailings, resulting in contamination of the surrounding watersheds.

Cobalt inherited environmentally damaging mine tailings left behind by a silver rush in the early 1900's. Eighteen million tonnes of tailings were left in lakes, on shorelines and in open areas over a large region. These tailings contain high levels of arsenic that have been leaching into local lakes, streams and the drinking water.

Proposed pilot plant

BacTech has over 20 years of experience in the field of bacterial oxidation or "bioleaching". The Company has successfully designed, engineered, licensed and built bioleach plants for clients in the

gold industry. However, no such plants exist in the base metal industry. The Company is now poised to transfer its technology to environmental remediation applications that offer favourable economics through metal recovery. With the assistance of government grants, for which the Company has applied, BacTech intends to build and operate a demonstration plant capable of treating 200,000 tonnes of mine tailings per annum (tpa) in the Cobalt area that will effectively remove a source of arsenic pollution in the region. In addition, the process will recover cobalt, silver, and nickel for eventual sale to market.

usually in salaries and wages to employees

- Significant flow-on income to local business and suppliers
- Creation of jobs for young people with the ongoing relationship with the Haileybury School of Mines

A simplified flow diagram (page 2) outlines the envisaged process for tailings treatment at Cobalt. An important feature of the processing strategy is that over 90% of the arsenic is collected into a small concentrated mass of about 7% of the original tails volume before bioleaching treatment is applied. This results in



**Example of historical tailings dumped on shore and in lake—
Kerr Lake, Cobalt Camp**

Successful operation of the demonstration plant will lead to the construction of a plant capable of treating 1,000,000 tpa over 15 years or more. We believe there are a number of significant long term benefits to the community:

- Environmental clean-up
- 38 - 40 full time jobs may be created for operating the plant
- A large number of indirect jobs in the region - many millions of dollars an-

the tails material being stripped of most of the arsenic very early in the process and, effectively, 93% of the material will be deposited back on site with minimal effect to the environment.

The 7% remaining mass of concentrate, containing the arsenic and other valuable metals, will be transferred to the bioleach plant and fed into the bioreactors containing the natural bacteria. It is important to note that the bacteria used in bioleaching

are harmless, naturally occurring, and pose no threat to human health or the environment.

Bacterial metabolism then liberates arsenic and the other base metals into an acidic and oxidized solution. It is a continuous process and, after only five to six days in the bioleach tanks, a safe silver solid is removed for sale to market and the solution is treated with limestone to precipitate stable ferric arsenate. According to Ontario Regulation 558, ferric arsenate is classified as non-hazardous and can be sent to a landfill site. The remain-

traditional methods (i.e., roasting and smelting) would release noxious SO₂ and As₂O₃ emissions into the atmosphere.

Each tonne of tails contains 0.15% sulphur and the process will capture 85% of the sulphur produced. Therefore, the quantity of sulphur captured equals 1.28 kg of sulphur per tonne of tails. The equivalent amount of sulphur dioxide which is saved from harmful emission is then 2.55 kg per tonne of tails or 0.0025 tonnes sulphur dioxide per tonne of tails. At 200,000 tpa, the demo plant will save 509 kg sulphur dioxide emissions per

arsenic, 1.1 million kg per year cobalt, and 0.5 million kg per year nickel that will no longer be in the soils and be leached into the local watershed.

Trace quantities of mercury are also present, and we envisage removing approximately 3 tpa from the soils. While the nature of any reclamation results in some disturbance, these are of a temporary nature and are far outweighed by the long term environmental benefits to the region, as the bioleach process results in removal of contaminants from the tailings, not just long term treatment of the problem once it occurs.

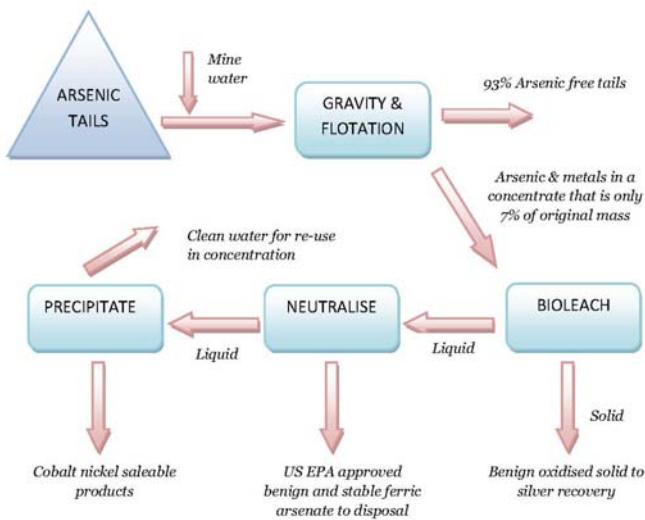
Blackstone tailings

In April, BacTech signed an agreement with Blackstone Development Inc. of Cobalt, granting the Company access to Blackstone's considerable tailings inventory in the Cobalt camp. BacTech will undertake a field program this year to determine the grades of the various tailings deposits to identify suitable production candidates.

The Blackstone tails cover the majority of the Cobalt camp and the claim package includes more than 50 past-producing mines and their related tailings. Blackstone estimates that as much as 8 to 10 million tonnes of tailings are situated on their land package.

Update on Castle Mine tailings

Testwork was conducted by BacTech on samples collected last summer from the Castle Mine tailings located near Gowganda. The area was thought to contain mineral concentrations similar to those reported in 2008 by Gold Bullion Development Corp. at the Castle Mine tailings. However, BacTech was unable to duplicate the results. The Company will therefore focus on the Blackstone tailings going forward, with no further work planned at this time for the Gowganda area tailings.



Simplified flow diagram of tailings treatment at Cobalt, Ontario

ing pregnant liquor undergoes treatment to precipitate nickel and cobalt which will be sold directly, or electrowinning can be used to produce cobalt metal.

Concentrate will be produced at the tailings site and then trucked to a plant near Cobalt for bioleaching. Given the small mass of concentrate that is produced from the tails, it is anticipated that only 2 – 3 trucks per day will be needed to transport the material to the bioleach plant.

Benefits to the region

There will be numerous clean air, soil, water and employment benefits to the environment and economy in the Cobalt area with the operation of a demonstration and full scale tailings processing plant. If BacTech's technology were not used for treatment of the concentrate,

year. A 1 million tpa commercial plant will save 2,547 kg of sulphur dioxide per year.

Other clean air benefits are as follows. The Cobalt tails contain quantities of arsenic at 0.42% and trace quantities of mercury at 4 grams per tonne. Such pollutants are common for many types of tailings materials. These elements would normally report to flue gases in smelting, which for a 1 million tpa operation equates to 4,200 tpa of arsenic (equivalent to 11,089 tpa of arsenic trioxide in flue gas) and 4 tpa of mercury, if normal smelting processes were used.

For soil and water benefits (assuming a 1,000,000 tpa plant), each tonne of tails contains 0.42% arsenic, 0.13% cobalt, 0.06% nickel. An acceptable recovery of 85% arsenic and 80% for the other metals would equate to 3.6 million kg per year



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