



BacTech Environmental Unveils Intellectual Property for ‘Zero-Waste’ Metals Recovery & Fertilizer Production

Files Patent Application for Industry’s First-ever, Zero-Waste Bioleach Process Using Green Technology for Metals Recovery and Fertilizer and Steel Production from Sulphide Minerals

Key Highlights:

- Company files expanded Provisional Patent Application for **zero-waste** bioleach process Intellectual Property (IP).
- Engineered for eco-friendly nickel, copper, and cobalt recovery from pyrrhotite and pyrite tailings, new zero-waste IP introduces novel methods for transforming remaining waste compounds into valuable, alternative green commodities.
- Zero-waste IP now optimized to convert soluble iron into iron metal (produced on-site or as a feedstock to green steel making) and to create ammonium sulphate fertilizer from bioleach acid (sold as organic fertilizer).
- Independent estimates suggest approximately 80 to 100 million tonnes of pyrrhotite tailings in the Sudbury, Ontario region alone (pyrrhotite and pyrite waste is common to many mining operations).
- Testing and Collaboration with MIRARCO (Mining Innovation, Rehabilitation, and Applied Research Corporation) continues for pilot-scale bioleach circuit testing in Sudbury.

TORONTO, ON – April 5, 2024 – [BacTech Environmental Corporation](#) (“**BacTech**” or the “**Company**”) (CSE: **BAC**, OTC: **BCCEF**, FSE: **0BT1**), a well-established environmental technology company specializing in environmentally friendly bioleaching and remediation solutions for the recovery of precious metals and critical minerals, today announces it has filed an expanded provisional patent application introducing new Intellectual Property (IP) and methods capitalizing on the inherent mechanisms of bioleaching. This process, aside from effectively extracting valuable metals like nickel, copper, and cobalt from pyrrhotite or pyrite tailings, uses eco-friendly technology and sustainable power sources to eliminate all waste during tailings reprocessing operations, delivering a first-ever zero-waste, low-carbon liberation, and extraction approach for valuable metals recovery.

“BacTech’s IP development path specifically aligns with broader trends across mining and steel industry operations, consistent with continued public and policymaker calls to shift processes and reduce carbon emissions,” said Ross Orr, President, and CEO of BacTech. *“Furthermore, it is appropriate to the commercial interests of non-ferrous metal production, steel making and fertilizer production which are all traditionally siloed as separate industries. We believe our **zero-***

waste metals recovery IP will emerge as a defining solution. By diversifying the range of products derived from these projects, BacTech aims to reduce dependence on long-term metal prices as the primary drivers for investment in remediation efforts while treating pyrrhotite and pyrite waste streams from current operations. BacTech plans to capitalize on fostering both sustainability and profitability in the industry by creating land value previously occupied by a legacy of mining industry waste.”

Making Steel, Fertilizer and Recovering Metals Using Green Technology

Pyrrhotite is an iron sulphide mineral containing low levels of nickel, cobalt, and copper — typically dismissed and discarded as an uneconomical waste by-product by mining operations that continues to perpetuate an environmental tailings legacy in need of remediation.

The Company’s updated Intellectual Property (IP) retains its original bioleaching approach to recovering metal values and producing multiple commodities from low grade mine wastes, but now introduces novel innovation to selectively convert soluble iron into iron metal for green steel making and produce ammonium sulphate fertilizer from the sulphur which is converted to acid during bioleaching.

While the patent application update offers two iron product options, BacTech will first explore direct electrowinning of iron from the bioleach solution for on-site iron metal production, potentially bypassing the need for manufacturing an iron feedstock for conventional iron/steel production and likely proving to be more environmentally sustainable and cost-effective. Further, following the sequential precipitation of copper, nickel, and cobalt from the solution, the soluble ammonium sulphate, produced during the process, will be crystallized and packaged for sale at a premium as an organic fertilizer. Any residual water will be returned to the process, effectively leaving **zero-waste**.

Applicable to the treatment of existing pyrrhotite or pyrite tailings or streams from current operations, the primary products delivered through the new **zero-waste**, low-carbon bioleach processes specifically include:

- Mixed nickel/cobalt precipitate.
- Copper precipitate.
- On-site iron metal production via electrowinning or iron pellets for off-site conventional iron manufacturing or green steel making.
- Ammonium sulphate fertilizer.
- Additional minor by-products such as magnetite powder and geopolymers silica for construction material or mine backfill.

The technology can also be adapted to recover precious metals and platinum group elements present in low grade pyrite feedstocks.

Close Collaboration with MIRARCO

BacTech continues its close collaboration with MIRARCO (Mining Innovation, Rehabilitation, and Applied Research Corporation), an organization renowned for providing innovative solutions

to challenges in the mining industry since its establishment in 1998. MIRARCO have set up a pilot-scale bioleach circuit in Sudbury to conduct test work on BacTech's technology, aimed at breaking down pyrrhotite sulphide minerals into individual elements. Independent estimates suggest that there are approximately 80 to 100 million tonnes of pyrrhotite tailings in the Sudbury basin, containing 60% iron, 30-35% sulphur, 0.85% nickel, 0.03% cobalt, and copper, accumulated over a century of mining activity.

Drawing on past experience (Radio Hill, Australia) with bioleaching pyrrhotite material for nickel recovery, BacTech is confident in replicating previous results while the new IP enhances project value by enabling the production of multiple products previously unattainable through conventional bioleach processing. Zero or minimal waste from remediation operations also converts previously unusable land into valued assets.

About BacTech Environmental Corporation

BacTech Environmental Corporation is a company that specializes in environmental technology. We use a process called bioleaching to recover metals like gold, silver, cobalt, nickel, and copper, while also safely removing harmful contaminants like arsenic. This process is eco-friendly and uses naturally occurring bacteria that are safe for both humans and the environment. By using our proprietary method of bioleaching, we can neutralize toxic concentrates and tailings while also creating profitable opportunities. The company is publicly traded on several stock exchanges, including the CSE, OTCQB, and Frankfurt Stock Exchange.

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This news release contains "forward-looking information", which may include, but is not limited to, statements with respect to future tailings sites, sampling or other investigations of tailing sites, the Company's ability to make use of infrastructure around tailings sites or operating performance of the Company and its projects. Often, but not always, forward-looking statements can be identified using words such as "plans", "expects", "is expected", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates", or believes" or variations (including negative variations) of such words and phrases, or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors

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