Mining Insights

How Dundee Sustainable Technologies' eco-friendly advances boost ESG credentials

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Dundee Sustainable Technologies (CSE: DST) has developed two innovative metallurgical processes that offer significant environmental benefits for the mining industry.

The recent tailings dam breach in the Yukon is a case in point where cyanide-laced material used to extract gold contaminated nearby waterways. But green technologies and sustainability-focused projects are helping the industry address risks earlier and build longer lasting community ties.

Earlier this year, Jean-Philippe Mai, President & CEO of DST, sat down with MINING.com's Devan Murugan to discuss how DST's technology can provide miners with safer and more efficient alternatives to traditional mining practices.

DST's CLEVR gold extraction plant in Canada.
DUNDEE SUSTAINABLE TECHNOLOGIES

> **"We wanted to develop an efficient gold extraction and gold recovery processes which provided a safe, efficient and a viable alternative to cyanidation."**
>
> — JEAN-PHILIPPE MAI

DM: It's been about 10 years since your first demonstration plant went up. That was back in 2014. What gap were you hoping to fill in the market back then? Take us through those beginnings.

JPM: We've been focused on developing and commercializing our process for numerous years. Starting with bench scale concepts, we moved to pilot scale in 2009-2011, then built our first industrial demonstration plant in 2015. Our objective was to provide an efficient gold extraction and recovery process as a safe, efficient alternative to cyanidation. We wanted to not only replace cyanide completely but also provide added efficiency compared to standard processes.

DM: From an elementary perspective, what miners do is extract gold using cyanide, which comes with risks. How does Dundee's process provide an alternative?

JPM: We use a chlorination-based approach with sodium hypochlorite and a catalytic amount of sodium hypobromide. We leverage the fast kinetics of bromide to rapidly solubilize gold using essentially a diluted household bleach solution operating at ambient temperature and pressure. This novel chemical approach provides a very efficient way of solubilizing gold without the toxicity concerns of elemental chlorine.

DM: It's interesting because this method not only eliminates cyanide but also reduces leaching time and waste. That's a major benefit for mining companies, isn't it?

JPM: Absolutely. Typical processes take 24-48 hours to solubilize gold. Our approach achieves this within 1-2 hours, providing huge benefits in throughput and plant size for equivalent capacity. We also handle contaminants like sulphur and arsenic efficiently, removing them before transferring to the CLEVR process. The CLEVR process operates in a closed loop, regenerating all effluents and generating dry stackable tailings, eliminating ponds and reducing liability and footprint.

DM: And I suppose on the other side of the spectrum, the other process that you do, the GlassLock process, is aimed at similar efficiency, isn't it?

JPM: When developing CLEVR, we worked with refractory arsenopyrite gold ores. After decomposing arsenic compounds, we needed to stabilize the arsenic product. This led us to develop GlassLock, an arsenic stabilization process using vitrification that incorporates arsenic within a glass matrix for long-term stability. This increases efficiency in permanent stabilization while reducing associated costs of handling and stabilizing arsenic.

DM: Let's talk about investor appeal. You're in a space where environmental, social and governance (ESG) standards matter. What's your investor experience been on that front?

JPM: We're offering tools to address project challenges differently. Investors and the industry seek the right solutions for given projects. Having processes that efficiently recover gold and properly handle contaminants like arsenic, combined with our use of proven equipment at larger scales, provides alternatives. Our novelty is in chemistry. Understanding processes like ours offers routes that can be welcomed by investors, miners, and communities.

DM: From an investor point of view, at the end of the day, it's really about industry adoption, isn't it? Is there momentum there?

JPM: Our industry is conservative but keen to learn about processes like ours. We've seen significant recent interest and ask mining companies to be curious and try us. Adoption requires proper understanding through development, test work, and engineering designs that provide data for sound decision making. Once you generate supporting technical data, both operators and investors will support it as the right thing to do.

Visit: dundeetechnologies.com for more information.