KeyFlot.ca
Toronto & Viña del Mar

From Waste to Wealth: Transforming Mine Tailings and Creating a Sustainable Future

2023



What are Mine Tailings?

- Waste material left over after the extraction and processing of minerals from ore. They typically consist of rock, soil, and chemicals, **and fine and ultrafine minerals** left behind after the larger minerals have been separated from the ore.
- Mine tailings can contain toxic substances, such as heavy metals, that can be harmful on the environment and human health.
- There is an estimated 18,000 tailing dams around the world designed to prevent the tailings from leaching into the environment.
    - However, these facilities can fail, leading to environmental disasters, such as the recent tailings dam failures in Brazil and Canada.

The Problem

- Globally, there are over 340 billion tons (and counting) of mine tailings stored in roughly 18,000 dams - of which about 3500 are still in use.
- Mine tailings contain up to 30% of ultrafine particles such as **zinc, copper, gold, lithium, platinum, and rare earth elements**.
- There is no reliable technology available that can recover such ultrafine particles.

The Solution

- **KeyFlot** is **initially** focusing on extracting **zinc and copper** ultrafine particles from mine tailings (other metals to follow).
- **KeyFlot's plug-and-play** setup eliminates the need to modify or interfere with the mining operation.
- By significantly reducing the amount of heavy metals in water ecosystems, **KeyFlot is a clean technology** that improves profitability while benefiting the environment.

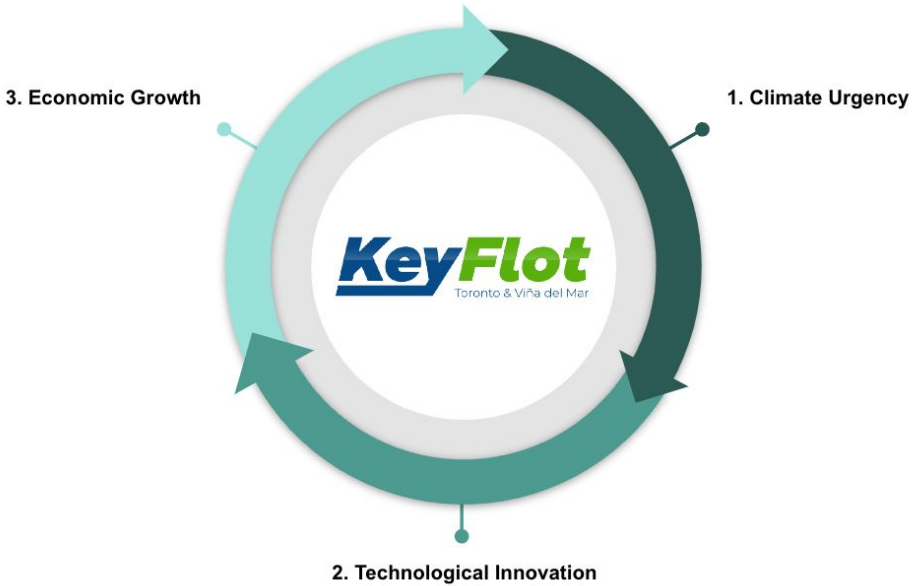
Why KeyFlot?

- **KeyFlot** effectively **recovers ultrafine minerals** that were previously unretrievable (≤20 microns). This is achieved through the use of a specially designed flotation cell that generates nano and micro bubbles through a highly selective physical-chemical process.
- In recovering metals such as copper, zinc, and rare earth minerals, **KeyFlot** is facilitating the shift towards a lower carbon world - e.g. batteries for electric vehicles.
- **KeyFlot's** technology will capture 1% of a US$ 188B (Global) mining waste market.
- **KeyFlot is a service**, not a product.
- The mining company receives a **percentage of the profits.**
- We are raising **US$1.6 M** to build a **5 - 20 ton/hour** recovery modular plant.

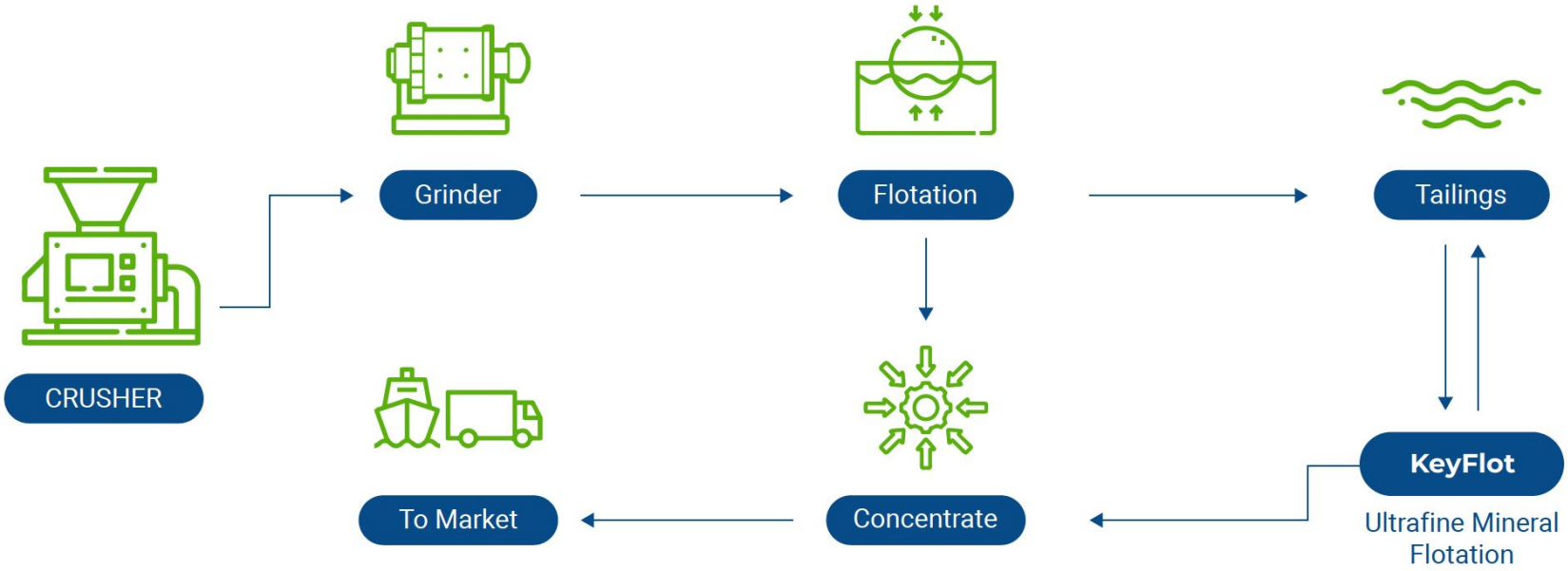
Why Now

Keyflot is:

1. A new way of thinking toward our **Climate Urgency.**
2. A **Technological Innovation** that will contribute to continued economic growth.
3. By providing continued **Economic Growth** that will help us take action and combat our climate urgency.



KeyFlot at work



Milestones

2018

Received US$20,000 from Chilean Government for development.

2019

Winner of Nexa Resources Mining Lab Challenge Innovation Competition (Brazil).

2020

$US 38,000 from Nexa Resources (Brazil) to carry-out pilot tests in lab

2021

First place - Perumin Hub International Innovation

2022

Scale to North America. Completed Foresight Canada Cleantech Accelerator.

2023

$US 200k (CORFO)

Alpha Program at Collision Conference

Business Model

% of Profits

We give back to the mining company a percentage of the profits obtained from KeyFlot’s process.

Zinc - Market Analysis

Market Expectations: sales service of Zn recovery from tailings

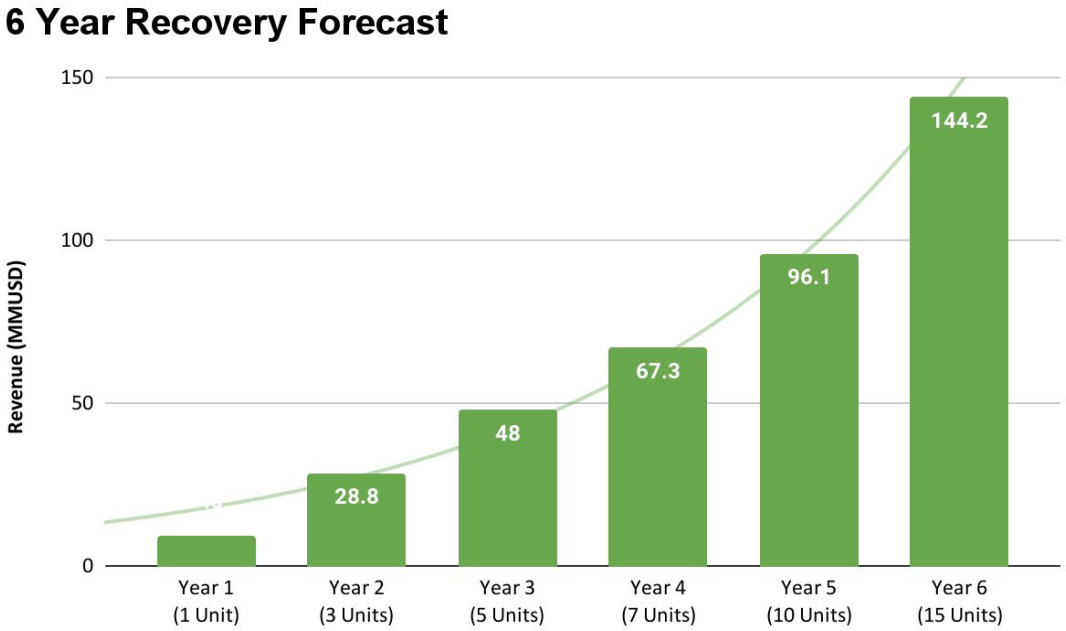
Measure	# of Units	X	Revenue Per Unit	=	Total Revenue
Total Market	**500**		**US$ 9.6 MM**		**US$ 4.8 B**
Total Addressable Market (TAM)	**15**		**US$ 9.6 MM**		**US$ 394.3 MM**
Year 1 Revenue	1				US$ 9.6 MM
Year 2 Revenue	3				US$ 28.8 MM
Year 3 Revenue	5				US$ 48.0 MM
Year 4 Revenue	7				US$ 67.3 MM
Year 5 Revenue	10				US$ 96.1 MM
Year 6 Revenue	15				US$ 144.2 MM
Cumulative Revenue - Years 1-6					US$ 394.3MM

Zinc Recovery - Financial Projections

Zn*

- Feed grade **2.75%**
- Mineral feed: **20 tons/h**
- Recovery **88%**
- Tons/day: **11.6**
- Tons/month: **348.4**
- Tons/year: **4,181.7**

- Service Revenue per unit: **US$ 800 K/month**
- Service revenue per unit: **US$ 9.6 M/year**
- Cumulative Revenue - Years 1-6: **US$ 394 M**



*Price per ton: US$ 2,300

Copper - Market Analysis

Market Expectations: sales service of Cu recovery from tailings

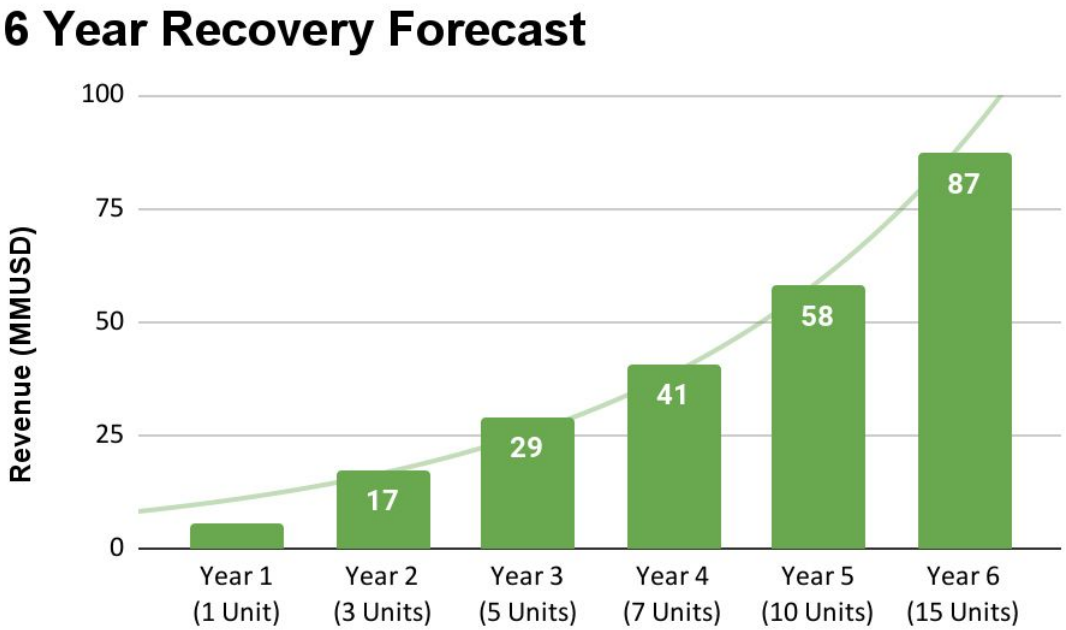
Measure	# of Units	X	Revenue Per Unit	=	Total Revenue
Total Market	**500**		**US$ 5.8 MM**		**US$ 2.9 B**
Total Addressable Market (TAM)	**15**		**US$ 5.8 MM**		**US$ 238.5 MM**
Year 1 Revenue	1				US$ 5.8 MM
Year 2 Revenue	3				US$ 17.4 MM
Year 3 Revenue	5				US$ 29.0 MM
Year 4 Revenue	7				US$ 40.7 MM
Year 5 Revenue	10				US$ 58.1 MM
Year 6 Revenue	15				US$ 87.2 MM
Cumulative Revenue - Years 1-6					US$ 238.2MM

Copper Recovery - Financial Projections

Cu*

- Feed grade **0.5%**
- Mineral feed: **20 tons/h**
- Recovery **85%**
- Tons/day: **2.04**
- Tons/month: **61.2**
- Tons/year: **734.4**

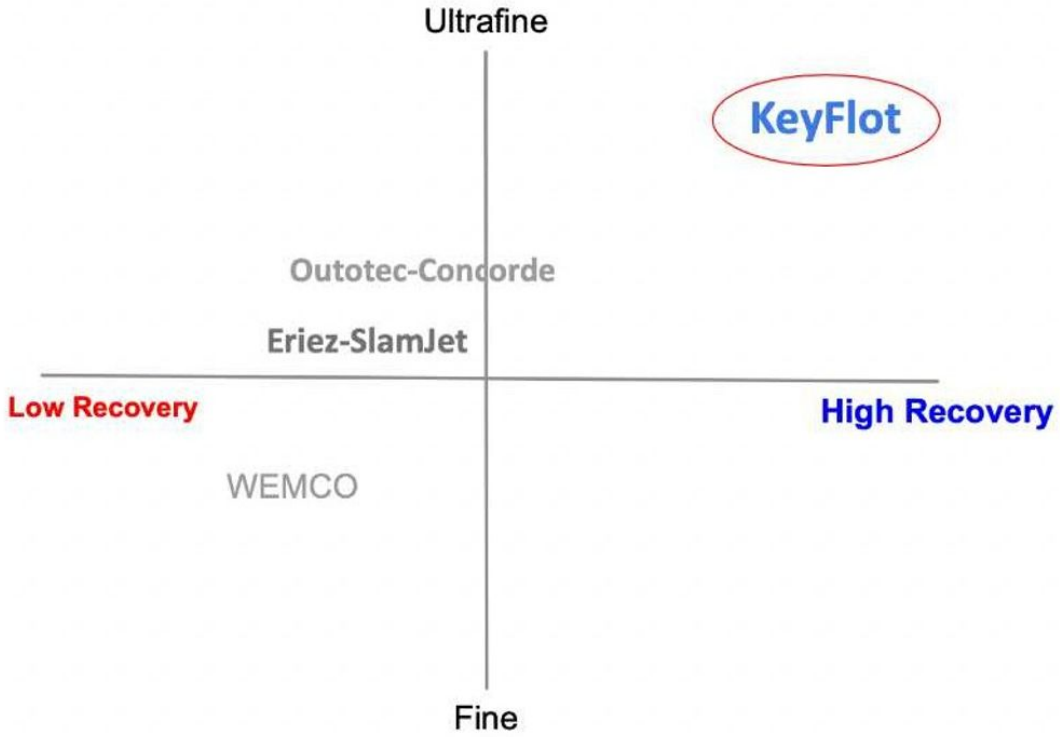
- Service Revenue per unit: **US$ 483 K/month**
- Service revenue per unit: **US$ 5.8 M/year**
- Cumulative Revenue - Years 1-6: **US$ 238.2 M**



*Price per ton: US$ 7,921

Competition

- **KeyFlot** efficiently recovers ultrafine mineral particles with low energy consumption and optimized reagent dose.
- **KeyFlot**'s unique design is specific for nano and microbubble dispersion to catch ultrafine particles, increase productivity and recover water for the process.
- **KeyFlot** uses non-conventional renewable energies, therefore it has low operating costs and a low impact on ecosystems.



The Next 18 Months

Q1

Prospect and work with mining clients to test rare earth elements, platinum, gold, silver, copper in KeyFlot prototype.

Q2

Validate technology with mining client's in the lab and with KeyFlot prototype.

Q3

Engineering and design of a 20 ton/hr KeyFlot modular plant.

Q4

Develop specifications and manufacturing of KeyFlot modular plant.

Q5

Build a 20 ton/hr modular plant.

Q6

Place KeyFlot modular plant for client's mine for testing and evaluation. Begin scaling to mines.

The Team

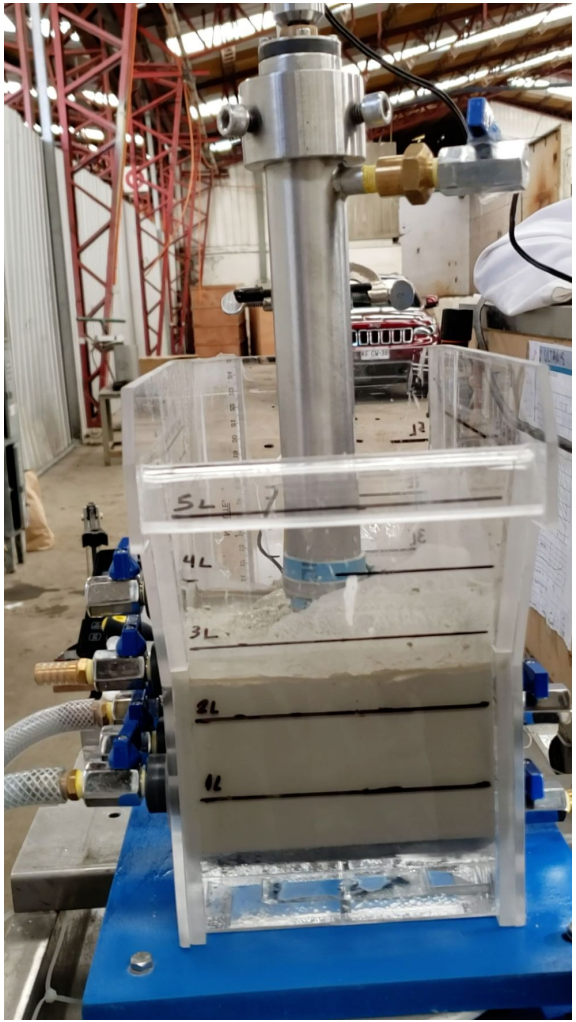
Cristhian Mercado, MSc.
Industrial Engineer
Co-founder & CEO

Marcela Paz Bastías, MSc.
Biochemical Engineer.
Co-founder & CTO

Arturo Ruiz, MBA
Mechanical Engineer
Co-founder & CFO

Felipe Rubio, PhD
International Relations
Co-founder & COO

KeyFlot at work



Thank you

info@keyflot.ca

Toronto | Viña del Mar
2023