



# Dewatered Tailings Storage - Is it Inevitable?

MIT Global Summit on Mine Tailings Innovation  
September 19<sup>th</sup> 2024

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# Water is the key

Without water....

- Catastrophic tailings failure unlikely
- No seepage
- Our 'critical mineral' (water!) is conserved

Filters tick these boxes?

- ✓ Optimises water
- ✓ Mitigates catastrophic risks

But.....

X Capital and operating costs remain stubbornly high



The mining industry carries, and manages, the wet tailings storage risk

# Is there an alternative route to dewatered tailings?

- Uses existing infrastructure for >80% of tailings disposal
- Places robust filter of free-draining sand

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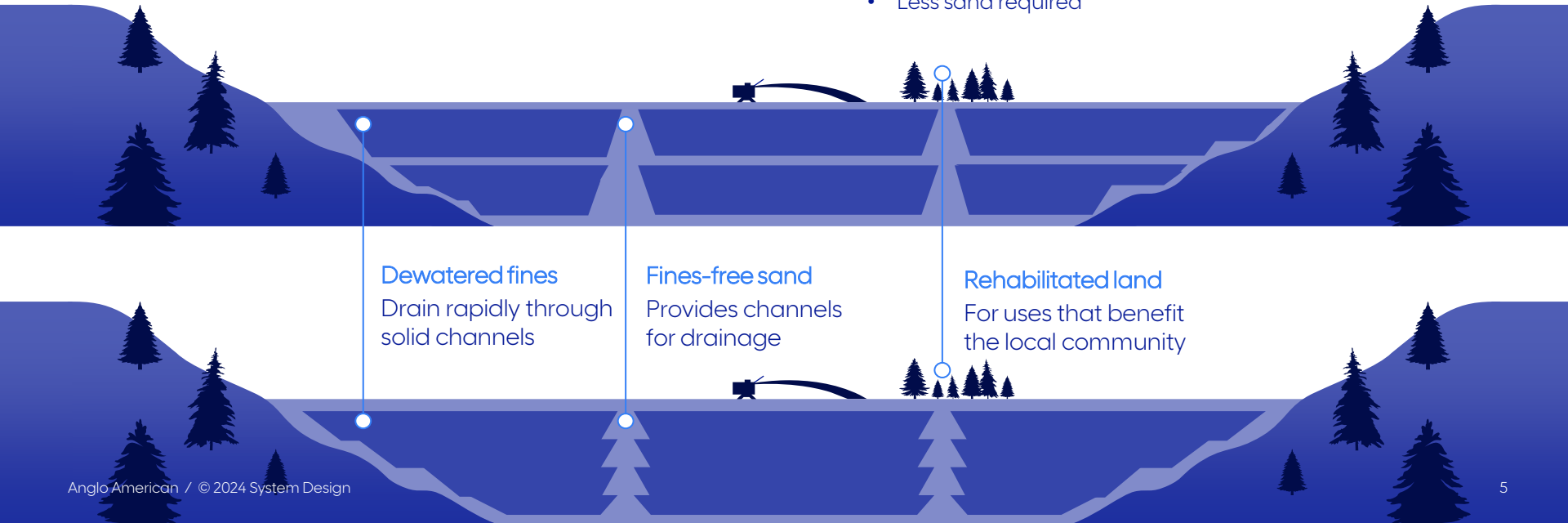
# Hydraulic Dewatered Stacking is a simple concept

## Sand Blanket Approach

- Sand blanket construction
- Operational constraints
- Water losses due HSF operation
- More sand required

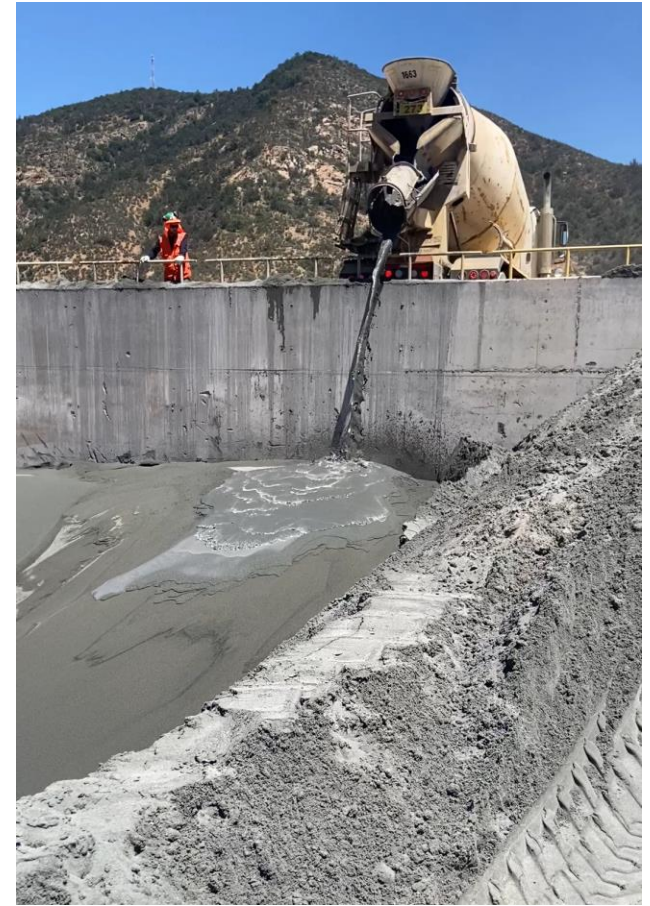
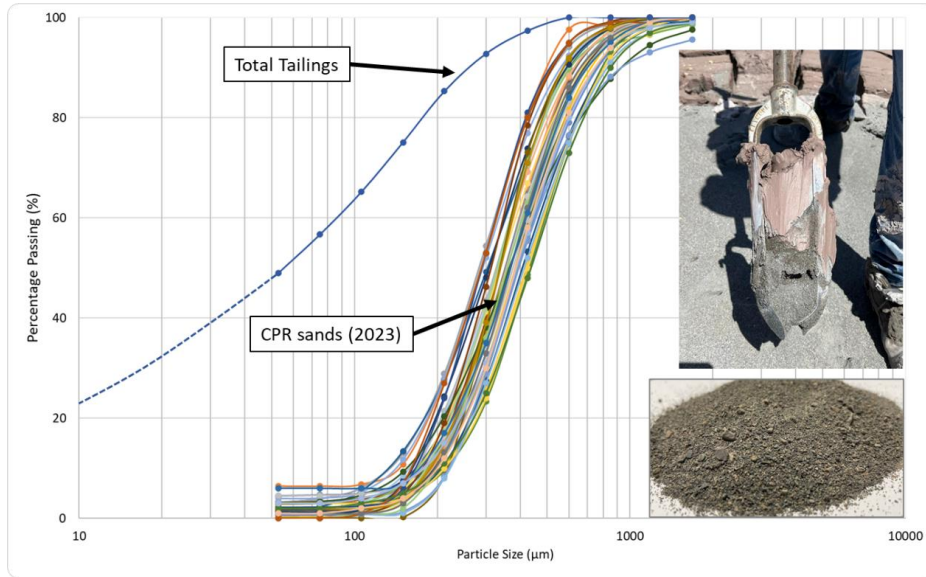
## Sand Channels Approach

- NO sand blanket required
- Easier operation, paddocks strategy
- Zone of Influence is key (ZOI) – distance between berms
- Less sand required



# How does it work?

Free-draining sand, with strong compatibility as a filter medium to the tailings from which it was derived, shortens drainage paths....



# Water recovery is strong



What about the water?

- Water recovery is fast
- Quality is good
- Geochemistry is similar
- Results have surprised (upside!)

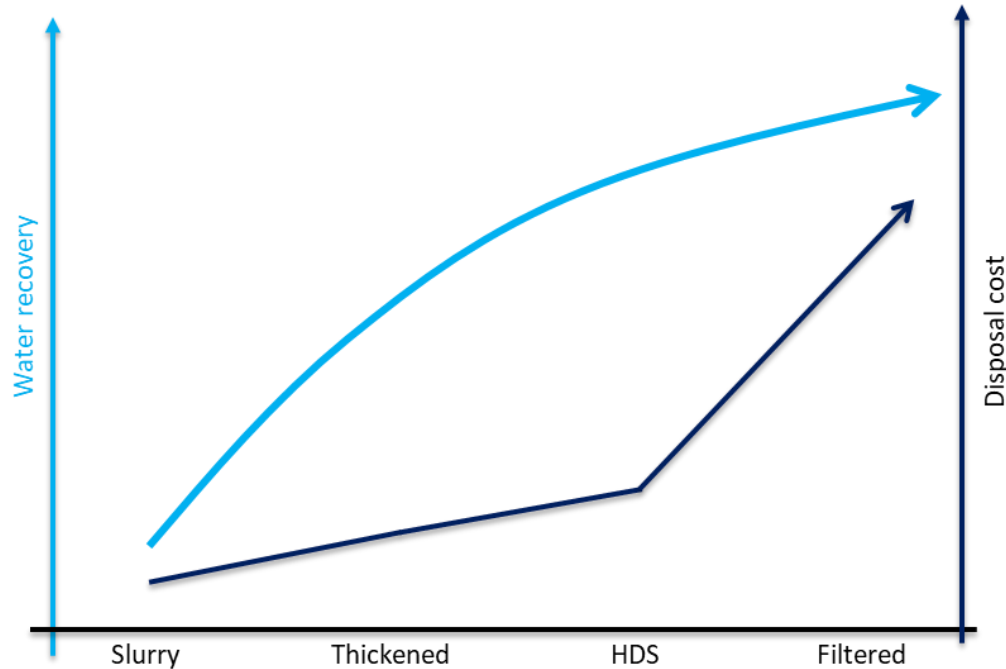
# 150,000m<sup>3</sup> demonstration facility

An aerial photograph of a large-scale industrial water treatment facility. The facility consists of several large, rectangular tanks and a central processing area. The tanks are filled with water of varying colors, including a large pinkish-red tank at the top, a large green tank at the bottom, and several smaller grey and blue tanks. The surrounding area is a mix of dirt, gravel, and some industrial structures. The overall scene is a complex of large-scale water management infrastructure.

Located at El Soldado Mine in Chile, it has attracted >100 visitors including two Chilean Mines' Ministers and the mining regulator.

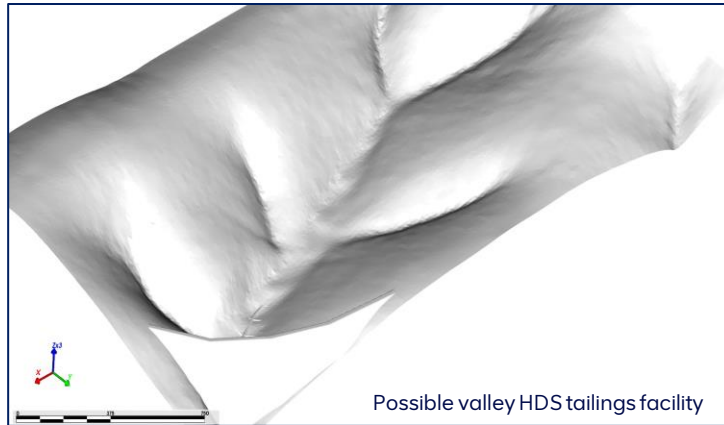
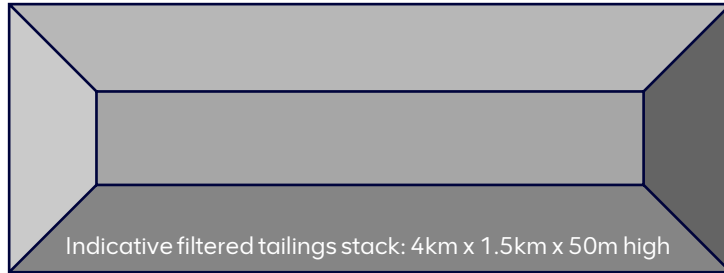


# Seeking clarity on costs for HDS vs Filtered Tailings



- HDS costs more than conventional
  - Delivers water
  - Reduces closure costs
  - Mitigates against failure
- HDS costs less than filtered
  - By how much?
  - What water do we 'miss'?
  - Closure impacts?

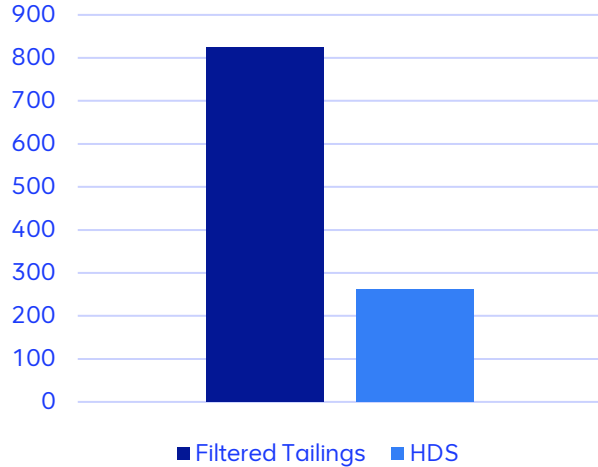
# Developing a case study



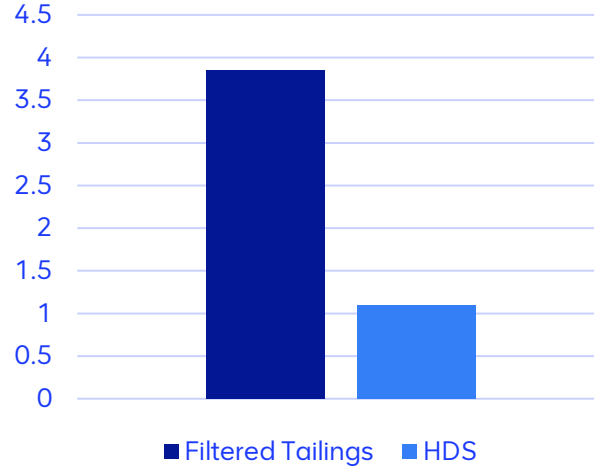
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# HDS Benefits (~22Mtpa Cu operation<sup>1</sup>)

Capital Cost (\$M)



Operating Cost (\$/t)



High level criteria:

- 22Mtpa copper operation
- Located at altitude in extremely water scarce region
- CPF is used, delivering ~20% fines free sand
- Tailings psd: P80 = 180u
- Distance to TSF location ~2km

<sup>1</sup> Technical paper prepared for [Gecamin 24](#)

# Data rich demonstration = opportunities

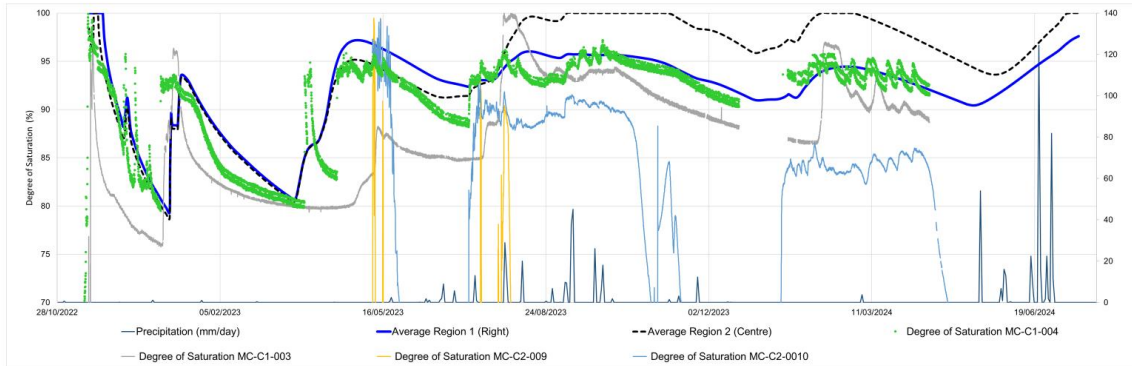
Digital twin modelling

Opportunities to test unsaturated soil mechanics models



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## HDS 2D MODELLING OF STAGE 2 – CELL A



- Blue line – model output (vs green data)
- Stage 3 modelling will predict results and then be compared with extensive site investigation planned of Oct/Nov.



# As closure looms, is there buyers remorse?

Are tailings facilities designed for closure?



Closing wet tailings facilities is difficult

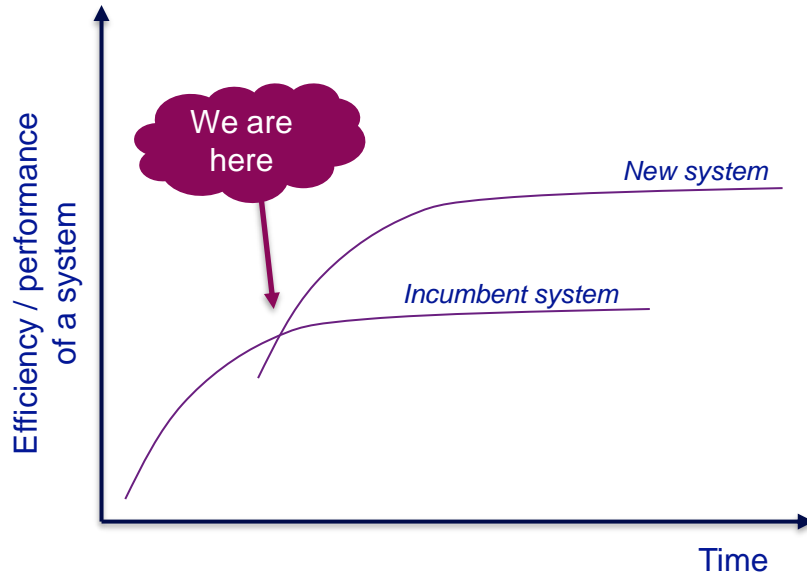
Closure cost inflation is under-estimated

Stabilising tailings - easier with access

In-situ dewatering ideas need to be worked on collaboratively to deliver better outcomes for closure / expansion

# Building on success – accelerating change

We are climbing a steep learning curve



Strong performance at El Soldado

Testing regime and modelling delivers pathway to defensible design and performance criteria

Good visibility of the engineering challenges

Strong industry engagement and development agreements expected in 2025

# Thank-you



**Scientific hypothesis appears to hold**  
**Water recovery is fast**  
**The techno-economics are strong**

**Scaling – new machine under development**  
**Partners needed to accelerate commercial app**