Filtered Tailings as an Enabler of Sustainable Tailings Management

Summary

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Abstract

Filtered tailings provide a pathway to more sustainable tailings management by improving water recovery, reducing land disturbance, and supporting safer, more responsible closure. Their value extends beyond operational performance to the reduction of long-term environmental, financial, and social liabilities. When assessed across the full mine life cycle, filtration becomes a strategic investment in resilience, water security, and enduring risk reduction.



Reframing Tailings Management Decisions

Risk | Water | Closure | Scale

Drivers

- Historically major issues with water heavy impoundments
- ESG-driven investor pressure implementation of the Global Industry Standard on Tailings Management (GISTM)
- Social License To Operate
  - Catastrophic failures
  - Water Scarcity
  - Community Impact





Benefits

- True reflection of future costs and liabilities
- Significant water recovery benefits
- Smaller footprint and progressive closure capability
- Increased social acceptance
- Reduced Geotechnical and environmental risks

Feasibility: commercial, social and risk agreements



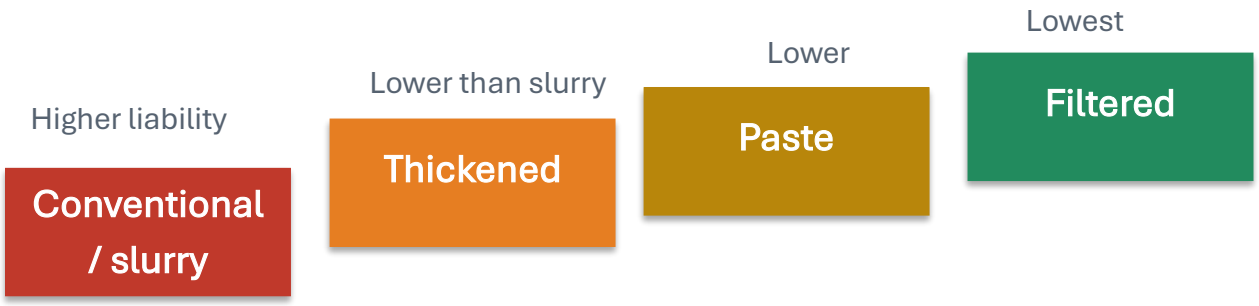
The costs are always there – Someone will pay

- Environment
- Community
- Future investors

Filtered tailings changes the storage philosophy, not just the water content.

- CAPEX – Infrastructure and Equipment
- OPEX – Labour; Consumables; Water, Power; Containment Maintenance
- Closure – Monitoring liabilities in perpetuity
- Risk of failure – Financial; reputational; civil and criminal

Tailings options and what we're really choosing -TSF & Equipment



Closure is often undervalued in early alternatives studies.

Progressive rehabilitation is a defining advantage of filtered tailings.

Lower long-term water management and reduced reliance on dam raising improve resilience.

Filtered options become stronger when closure and residual liabilities are fully costed.

Different tailings options distribute costs very differently over the life of mine.

The strongest filtered-tailings economics often appear at closure, not

Dewatering – Fit for purpose

- **TSF**
  - Footprint; Volume
  - Geography – Climate, Seismic, Communities;
  - Bulk material handling and stacking logistics



- **Equipment**
  - Can the equipment reliably deliver material to specifications
  - Can the thickener achieve UF?
  - The filtered cake achieve stackable moisture
  - Filtrate is ok for process - % of solids?
  - Equipment availability – 20 vs 24hr operation



Technology is closing the gap

High-throughput filters

New pressure filters can handle much larger capacities than before.

Modular plants

Standardized modules reduce schedule and construction risk.

Automation

Better control of cycle times, moisture and reliability reduces variability.

Better handling systems

Conveyors, stackers and pilot methods are improving operability at scale.

In Conclusion

1. Evaluate filtered tailings early, while alternatives are still open.
2. Integrate water strategy and tailings strategy in the same decision frame.
3. Use life-cycle cost, not just base-case CAPEX/OPEX.
4. Design for scale from day one — do not treat scale as an afterthought.

Best fit conditions for filtered tailings:

- Water-constrained regions
- High-consequence / high-scrutiny settings
- Projects with significant closure liabilities
- New projects or major expansions
- Whole Lice Cycle Scenarios