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A tailings closure design origin story: from reactions to resilience

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Abstract

Tailings are a byproduct of mining, consisting of the uneconomic fraction of rock or soil left over at the end of processing. Risks and challenges associated with tailings storage facility operations and closure, as well as the potential for significant human and/or environmental incidents, such as the Baia Mare cyanide spill (Romania) and the Córrego do Feijão mine dam failure (Brumadinho, Brazil) are a focal point for the industry.

The Global Industry Standard on Tailings Management (GISTM) was developed following the 2019 Brumadinho disaster and provides an industry guideline for safe management of tailings and tailings storage facilities (TSFs) through their life cycle, from design and construction to post-closure. It provides a framework for safe TSF management to achieve zero harm, but flexibility for operators to best achieve this considering the varied TSF contexts (locations, jurisdictions and commodities).

This paper explores the origin and outcomes of TSF closure design development, including the evolution of purpose, drivers and processes in TSF closure design – from being 'reaction only' (e.g. regulatory alignment, changes to reserves and the need for understanding sudden closure costs) to an approach developing resilience in design. Reaction-only design can result in closure geometries that meet minimum requirements but may not prioritise longer-term sustainability, cost reductions and reduced residual risk, as well as social and interdisciplinary aspects.

This paper presents 4 case studies illustrating how tailings closure designs can evolve from a largely reactive, requirement-driven starting point to a more resilient, interdisciplinary approach. Rather than focusing solely on demonstrating conformance, the case studies highlight practical steps – building the knowledge base, testing options and applying risk- and data-informed decision tools – to improve confidence in closure outcomes, reduce residual risk and unnecessary conservatism, and better align closure designs with longer-term environmental, operational and community objectives.

Keywords: *tailings closure design, design drivers, closure design processes, closure design development*

1 Introduction

This paper presents a summary of the path by which 4 tailings storage facility (TSF) closure designs evolved, including the closure design origins (requirement context) and how the closure design was moved forward; by modifying a design, developed in reaction to specific requirements and adopting an approach to develop resilient closure designs, each TSF case study has a closure approach that is more well-rounded while being robust and adaptive.

A resilient design is one that considers the key closure planning elements, is risk-informed and is robust across the closure design period, from concept to execution. In contrast, a design developed in reaction to

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requirements may be less dynamic, with fewer opportunities or avenues to adapt to change as the TSF context evolves.

Good industry practice is to integrate closure planning into design through the life cycle of a TSF, extending beyond construction and operations into the post-closure period, aiming for long-term stability that is both physical and environmental. Examples of industry guidance documents include:

- Guidelines on Tailings Dams Planning, Design, Construction, Operation and Closure (Australian National Committee on Large Dams [ANCOLD] 2019), reprinted in 2020 with amendments
- The International Commission on Large Dams (ICOLD) 194 Bulletin, Version 1.0 (ICOLD 2022)
- A Guide to the Management of Tailings Facilities Version 3.2 (The Mining Association of Canada [MAC] 2021).

This documentation focuses on the tailings management process and design, construction, operations (including safety with monitoring and surveillance) and closure considerations as part of the full TSF life cycle. With the exception of the ICOLD 194 Bulletin, the authors find that the focus of this guidance is primarily on the operational dam safety engineering and geotechnical context as relevant to the tailings management process. This results in closure designs becoming reaction-driven, which can lead to conservative/generic outcomes and missed risk/opportunity integration.

Wider closure planning aspects are identified in documents such as the International Council on Mining and Metals (ICMM) Integrated Mine Closure Good Practice Guide (ICMM 2019), which speaks to broader closure planning considerations including social transition, closure land uses, objectives and completion criteria, amongst other closure planning elements. Exposure to, and incorporation of, these broader holistic aspects of TSF closure varies across TSF management professions. Therefore TSF management and closure benefit from a team composition inclusive of a wider set of skills and experience.

More recent industry guidance, like the Global Industry Standard on Tailings Management (GISTM) (ICMM 2019), and the United Nations Environment Programme (UNEP) and Principles for Responsible Investment (PRI) (2020), outline the integrated aspects relating to tailings management and closure. It is noted that an independent institution – the Global Tailings Management Institute (GTMI) – was formed with ICMM, UNEP and PRI as founding partners to oversee the implementation of, and conformance with, the GISTM.

Companies typically apply industry guidance based on membership (e.g. ICMM members have made a formal, binding commitment to implement and demonstrate conformance with the GISTM), previous commitments (e.g. environmental impact statements and other applications for approvals, financing requirements), regulatory requirements (e.g. guidance referenced in legislation, state guidelines, approvals, licence conditions) and/or preference based on internal organisational decisions considering risk.

2 Tailings closure requirements

TSF closure design evolution is often triggered by some kind of prompt. This may come in the form of aligning mergers and acquisitions with company standards, meeting regulatory and approval requirements and guidance, or considering good industry practices. Whatever prompts the development or upgrade of closure designs, TSF life cycle designs should marry the technical knowledge base with the key closure design requirements. With this in mind, TSF managers are also required to consider multiple guidance documents to support closure design development and bridge the gap between all of these documents; e.g. a TSF manager in Western Australia (WA) may advance a closure design to meet the GISTM while being required to consider Department of Mines, Petroleum and Energy [formerly the Department of Mines and Petroleum (DMP)] closure guidance for TSFs.

Some key tailings closure requirements across tailings closure guidance documents are identified in Table 1, including those modified from the ICMM Tailings Management: Good Practice Guide (ICMM 2025) closure planning element.

Table 1 Key closure design requirements across tailings closure guidance documents

Closure requirement	GISTM 1	ICOLD 194 2	ANCOLD3	MAC tailings guide 4	WA TSF guides / code 5, 6	Qld PRCP guideline 7
Integration of closure planning into design and life cycle	Y	Y	Y	Y	Y	Y
Governance and accountability for closure	Y	Y	Y	Y	Not explicit	Not explicit
Consideration of long-term stability	Y	Y	Y	Y	Y	Y
Risk identification and reduction (including as low as reasonably practicable where relevant)	Y	Y	Y	Y	Not explicit	Y
Management of geochemistry and water for closure and post closure	Y	Y	Y	Y	Y	Y
Define closure objectives and criteria	Y	Y	Y	Not explicit	Y	Y
Consider closure trials	No	Y	No	Not explicit	Y	Y
Stakeholder consideration (including engagement where relevant)	Y	Y	Y	Y	Y	Y
Cost estimation for closure design and implementation	Y	Y	Y	Y	No	No
Monitoring of closure performance	Y	Y	Y	Y	Y	Y

1. Global Industry Standard on Tailings Management (Global Tailings Review 2020)
2. Tailings Dam Safety (Bulletin No. 194, Version 1.0) (ICOLD 2022)
3. Guidelines on Tailings Dams Planning, Design, Construction, Operation and Closure (ANCOLD 2019)
4. A Guide to the Management of Tailings Facilities Version 3.2 (MAC 2021)
5. Code of Practice - Tailings Storage Facilities in Western Australia (DMP 2013)
6. Guide to Departmental Requirements for the Management and Closure of Tailings Storage Facilities (TSFs) (DMP 2015)
7. Statutory guideline Progressive Rehabilitation and Closure plan (Queensland Government 2024)

(Key: GISTM = Global Industry Standard on Tailings Management; ICOLD = International Commission on Large Dams; ANCOLD = Australian National Committee on Large Dams; MAC = Mining Association of Canada; PRCP = Progressive Rehabilitation and Closure Plan)

Closure design requires an interdisciplinary approach, which contrasts with previous TSF design and planning approaches that were often focused primarily on site selection and location-related design constraints, containment methods, disposal methods, storage capacity and water management. Current design practices are evolving to be more holistic, e.g. incorporating the future needs of the community in close proximity to the TSF. Former approaches to TSF design have focused on the critical geotechnical and engineering assessments and inputs, typically related to operations, and somewhat ‘in isolation’ from closure considerations. These previous approaches to closure considerations could be perceived as ‘reaction only’, however, ICOLD (2024), among a suite of international guidance, notes the importance of "design-for-closure" (ICOLD 2024), where closure considerations are integrated from inception (refer to Table 1).

TSF closure design takes place all over the world, however, each jurisdiction approaches TSF closure with differing levels of concern and stringency, with some regulatory requirements dictating the levels of conservatism and overdesign in closure strategy, creating an environment of reactionary design. Reaction-only TSF closure design tends to be myopic in that it may be fit for purpose, e.g. meeting regulator requirements, but it may not integrate key closure considerations identified in international guidance alongside critical TSF design criteria. The critical design criteria serve a purpose in a complex system, however, they can be short-sighted. Altering the design based not only on performance but with a view to incorporating the full life cycle of the facility is a shift more likely to achieve closure outcomes of 'the many' considerations rather than 'the few'. The benefits of long-term planning and adaptive design by interdisciplinary teams include reduced closure costs, rework and rehandling. While often legitimate considerations, some examples of drivers that prompt reaction-only TSF design include:

- changes in ore quality
- water balance issues
- resource estimation changes
- regulatory changes
- drainage control and failures
- site limitations
- containment and disposal changes and constraints
- changes to mine plans, operational requirements and life of facility (LoF)
- sudden closure.

A reaction-only design without a risk-informed, interdisciplinary approach that includes key closure considerations has the potential to impact closure success. Potential impacts include increased costs for executing closure, the inability to achieve "safe closure" as defined by the GISTM (GTR 2020), and the inability to achieve completion criteria and relinquishment. "Safe closure" is defined as:

> *"A closed tailings facility that does not pose ongoing material risks to people or the environment which has been confirmed by an ITRB (Independent Tailings Review Board, or Independent Technical Review Board) or senior independent technical reviewer and signed off by the Accountable Executive."*

The GISTM defines "material" as:

> *"…important enough to merit attention, or having an effective influence or bearing on the determination in question. For the Standard, the criteria for what is material will be defined by Operator, subject to the provisions of local regulations, and evaluated as part of any audit or external independent assessment that may be conducted on implementation."*

Companies and TSF managers that are successfully practicing GISTM principles, or ANCOLD, ICOLD, CDA, etc. (i.e. good industry practice) will have a relatively robust and modern approach to using their data to ensure that their facility is meeting minimum requirements (environmental and stability); these practices feed the resilient, adaptive TSF closure design approaches.

3 Methodology and approach – from reaction to resilience

Like storytelling of myths and legends, or comic book heroes and villains, origin stories for tailings closure designs can sometimes communicate what drove the design, how it came about and why the design was selected. However, just like the evolution of a hero or villain, closure designs can end up being driven by circumstances. This means that the systematic review and development of closure design aspects may remain centred on the circumstances and areas of interest (internal or external) driving the need for a closure design. Typically this does not stimulate targeted investigation into key risks and opportunities or integration of considerations that are key drivers for the closure design to yield a tailored, risk-based design rather than a generic and potentially conservative design. TSF owner and manager options for tailings design may be restricted due to regulations and requirements from external stakeholders, which may also drive TSF design evolution.

Key steps to take in changing the approach of closure design origin stories from reactionary to resilient include:

1. Build the knowledge base considering risks for closure. For example
    a. TSF construction history, design evolution and decisions that led to the current, as-built construction
    b. obligations. TSFs may be able to remain as designated contaminated but non-polluting sites; associated residual risks require assessment and rehabilitation strategies can be confirmed
    c. geochemistry. Impacts of aging on tailings may be uncertain but quite relevant where materials are not benign
    d. geotechnical. Confirm early design and construction assumptions about foundations based on site investigations, history, etc.
2. Consider the ultimate LoF landform and storage capacity against key aspects. These include
    a. geotechnical. Consider battery limits for landform footprint and embankment design (review cutbacks as well as cut to fill and buttresses where it is feasible to reduce operational and ultimate volumes required), ponder whether volumes can potentially be moved with improved efficiencies if scheduled during operations), and overall closure costs need to reflect the work required to achieve stability
    b. water management and drainage strategies. Consider how water is decanted from and moved around the TSF, including flood capacity, erosion-resistant toes, catchment and flow management (including spillways), and final land use
3. Undertake technical studies to understand key closure behaviours and outcomes; for example, transient seepage modelling and cover design.
4. Consider optionality and alternatives for relevant aspects. For example
    a. cost and material availability (rehabilitation materials, clay performance and availability, landform preferences)
    b. water strategies (overall system and catchment impacts, capacity, sustainability, etc.)
    c. design life and sustainability (closure components, e.g. liners, slope angle, slope length, cover material and erosivity, impacts of geochemistry, climate and UV exposure, etc.)
    d. stakeholder expectations (residual risk, good industry practice, etc.) (Sanders & Fitzpatrick 2022)
5. Undertake a closure risk assessment. Consider the outcomes of site investigations, studies, modelling, etc., and controls related to design.

6. Develop closure design using site investigation test and analysis outcomes, monitoring data (for example, vibrating wire piezometers, settlement) and modelling outcomes (for example, groundwater recovery, cover design) to understand and manage risk, including selecting configurations that reduce cost.
7. Identify forward work and actions to address remaining gaps.

In comparison, reaction-only closure designs appear more likely to address known gaps and requirements along with the initial scopes provided (including the content of closure plans and approvals), whereas resilient closure designs address key risks and go further to identify, assess and select preferred options, leveraging data. Resilient closure designs consider data from site investigations and analysis or testing, monitoring and/or modelling, as well as cost data plus stakeholder perspectives. Tools such as multicriteria assessments (MCAs), with weighted scoring of differentiator aspects, are used to consider available information and analysis and arrive at a selected closure option. Options are assessed against the identified evaluation criteria – strategic objectives, or 'wants', of high importance – and are likely include technical, environmental, social and financial criteria. Weighting of evaluation criteria is a values-based function of the MCA team's perspective on the relative importance of each objective/indicator against each other and considers key risks. Sensitivity analyses may need to be undertaken to reflect the inferred 'must haves' of different stakeholder perspectives that may not be reflected within the MCA team.

MCAs can be valuable to developing resilient TSF designs, e.g. by providing an opportunity to consider short-term functionality, benefits of the location and performance related to potential TSF locations, alongside the context of longer-term closure outcomes and requirements like spillway design and final landform geometry. These interdisciplinary tools allow a wide range of stakeholders to be engaged and provide for a more balanced design.

Outcomes from developing resilient closure designs include:

- improved confidence and robustness in closure design that leverage, and can be validated by, data
- reduced conservatism due to additional investigations and options analysis considerations, including costs
- improved understanding of the residual risk profile, critical controls and design drivers. Actual key risks are addressed rather than just gaps and systemic review. Key risks are treated similarly in terms of priority and focus, allowing movement past compliance and reducing risks around costs and the environment
- an improved knowledge base considering investigations and technical studies
- stakeholder inputs and considerations within closure design, including risks and opportunities for engagement
- post-closure land use options and opportunities can be understood in the context of risk
- opportunities to prioritise sustainability (including vegetation) and the long-term stability of the landform, including erosion.

By using this approach to develop resilient closure designs it converts the process from being a 'tick box' exercise to an investment in design; not only meeting guidelines, approvals and other requirements but also adding value via understanding the closure risks and improving the knowledge base, among other aspects. This is helpful in progressing closure planning past the conceptual stage and for understanding and managing tailings, closure and financial risk. As noted in ANCOLD (2019):

> *"Key decisions must be based on all issues involved, particularly when using discounted cash flow methods that may minimalise the financial impacts associated with long-term risks issues. Decision-making should be based on the whole of life evaluation of the potential consequences (cost, health, safety, environmental and community)."*

A summary of the key steps of the reaction-only versus the resilient TSF closure design approach is shown in Figure 1.

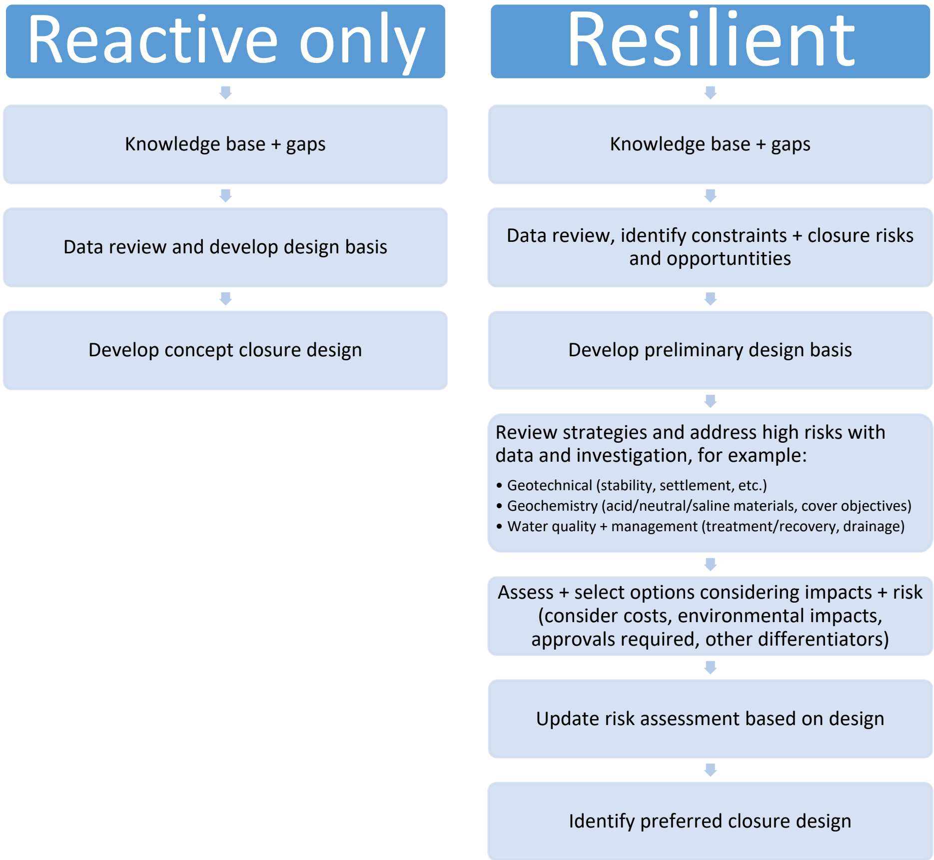

Figure 1 Summary of key steps to transform a tailings storage facility closure design from reaction only to resilient

Case studies have been used herein to demonstrate the transformation from reactive TSF closure design to the development of a more robust, resilient TSF closure design. Common changes are shown in Figure 2.

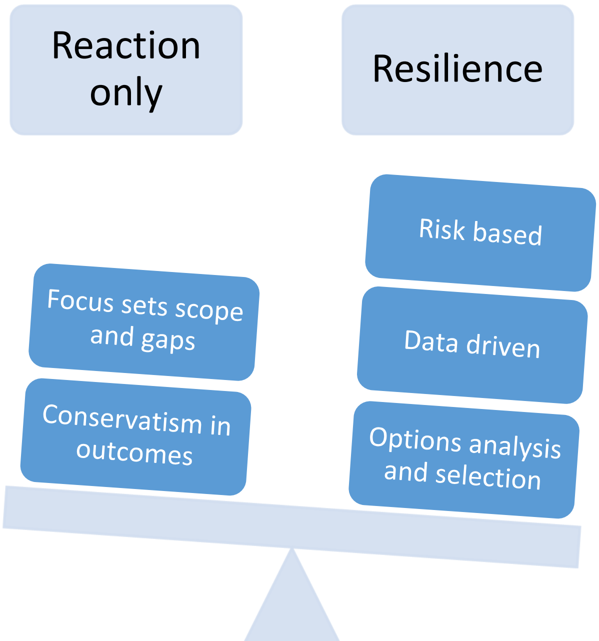

Figure 2 Relationship of tailings storage facility closure design origins from reaction only to resilience

4 Case studies and outcomes

The case studies considered for this paper are from 4 metalliferous mines.

An overview of each case study is provided, with a summary of key features and data for the 4 TSF case studies in Table 2. This includes the purpose and context around the origins of the closure design for each TSF.

Table 3 summarises some key closure design considerations used to develop a resilient closure design instead of a reactive closure design. The first two rows of Table 3 show the reaction-only closure design content and focus, where applicable. The remaining rows show additional considerations identified as part of developing a resilient closure design, with the key detail that was developed identified in the last row of the table. The additional detail and reduced conservatism are evident in the outcomes of the last row as compared to Row 2.

4.1 TSF A

TSF A belongs to a metalliferous operation in WA. Circumstances including a change to operations dictated the need for a revised TSF closure design that would achieve geotechnical stability and comply with the GISTM. The previous closure design was for the TSF ultimate geometry, which would no longer be achieved and did not optimise material volumes and balance or identify a water management approach for TSF closure. Constrained by the surrounding land uses, this TSF closure design underwent analysis to identify: key threats and opportunities, geotechnically stable geometry to meet post-seismic criteria, and a feasible integrated strategy that optimised remaining material movement and integrated water management and cover design without eliminating the opportunity for safe future land use.

4.2 TSF B

Located in Queensland, TSF B is proposed for a greenfield operation with constraints that include sensitive environmental areas and a semi-arid climate. To better support the approvals process with the regulators, the initial, conservative TSF closure design, with key requirements including lining the facility to achieve identified seepage rate criteria, was optimised by considering the site materials balance and confirming long-term performance predictions with an erosion-assessed landform and cover system modelled to optimise thickness. Erosion-resistant slopes options were compared using indicative costs to provide a landform achieving erosion criteria.

4.3 TSF C

The multicell TSF C is located in tropical Queensland. The scope of work required identification of feasible closure options for 2 conceptual ultimate TSF geometries ideally compliant with the GISTM and capable of achieving safe closure and compliance with internal standards. The TSF design constraints included site boundary and owned land as well as a commitment to limit the impact on offsite flows compared to pre-operations. An integrated approach was developed to identify the 2 proposed closure options considering the geotechnical stability of both configurations, long-term groundwater predictions and the design for surface water flows.

4.4 TSF D

TSF D is located in the Southwest Oceania region and faces topography, climate and seismicity constraints. The scope of works was to develop a feasibility study-level design. Geochemical assessments allowed for a refined cover design to maintain a phreatic surface over potential acid forming material and geotechnical stability for the TSF was assessed. An integrated closure design was developed, including a closure water management system using an MCA to choose a preferred TSF spillway alignment and stability modifications considering erosion, community downstream impacts, settlement, the schedule and economics, among other factors. Geotechnical stability options were considered to reduce materials balance requirements and foundational improvements were selected as the preferred option, with lower volumes of materials being required and longer-term retention of road access areas facilitated.

Table 2 Summary of key features of a case study for tailings storage facilities (TSF) and closure design requirements

Key features of the TSFs	TSF A	TSF B	TSF C	TSF D
Location	Western Australia	Queensland	Queensland	Southwest Oceania
Containment method	Constructed storage	Constructed storage	Constructed storage	Constructed storage
Construction type	Upstream	Downstream + centreline	Centreline	Downstream + centreline
Configuration	Multicell	Multicell	Multicell	Single cell
Disposal type	Spigotting and mechanical placement	Spigotting	Spigotting	Spigotting
Approximate projected remaining LoF 1 (years)	0	15–20	5–10	1–5
Purpose/origin of closure design	Sudden closure, develop a design for the existing TSF, which did not attain the ultimate landform geometry that meets GISTM closure requirements	Design a greenfield TSF including selection of the site, containment methods, disposal type and storage capacity, and provide closure information required to support obtaining approvals for the TSF	Develop conceptual closure designs for 2 ultimate TSF options being considered for the LoF and determine if safe closure can be achieved	Develop closure designs for TSF ultimate geometry to support submission of a regulatory closure plan
Closure design standard consideration	GISTM 2, regulatory guidance, obligations, company standards and requirements	ANCOLD 3, regulatory guidance and approvals requirements	GISTM, regulatory guidance, obligations, company standards and requirements	ANCOLD, regulatory guidance (including engagement), obligations

1. LoF = Life of Facility
2. GISTM = Global Industry Standard on Tailings Management
3. ANCOLD = Australian National Committee on Large Dams)

Table 3 Summary of key closure design considerations to transition from reactive design to resilient design in tailings storage facilities (TSF) case study

Key closure considerations	TSF A	TSF B	TSF C	TSF D
Knowledge base including key gaps	Cover design objectives and performance, final landform post-seismic stability, landform water management, water recovery and treatment timeline	Cover design and objectives, erosion and long-term stability	Impacts of landform selection on performance and design, landform water management, water recovery and treatment timeline	Cover design performance, water quality impacts, final landform post-seismic stability, TSF residual risk profile
Reactive-only design	Geotechnical stability achieved via conservative design (buttress only), remediated groundwater, approved land use, conservative cover system, run-off management	Conservative cover design, conservative long-term slopes	Geotechnical stability, conservative long-term slopes, drainage location reflecting pre-operations footprint	Conservative cover design, buttress only considered for stability, significant volumes of landform material lost to settlement, alternative designs
Identify key constraints to closure design	Constrained footprint, sensitive areas, flat topography, limited proximal borrow options, operations completed	Constrained footprint, sensitive areas, availability of materials with characteristics required in cover, long-term drainage stability	Potential changes to TSF deposition and landform, regulator-driven accelerated rehabilitation timing, drainage discharge locations	Constrained footprint, proximity to drainage, tailings to be retained wet to reduce risk of oxidation
Identify key risks to closure design	Long-term water treatment, groundwater remediation (including recovery), geochemistry, materials availability	Materials availability, landform water management, erosion and long-term stability	Materials availability, groundwater remediation (including recovery), geochemistry, management of landform flows and adverse impacts to the receiving environment, erosion and long-term stability	Modified ultimate geometry, geochemistry, geotechnical characteristics (settlement), management of upstream catchment and flows, water quality potential impacts to communities
Consider key drivers for optionality if any	Geotechnical stability, materials deficit, cover system performance and cost, drainage strategies and design, cost	Materials balance, post-mining land use, cover system long-term performance, long-term slopes and erosion stability, cost	Geotechnical stability, materials balance, drainage design, selection of LoF 1 deposition/ storage/geometry, cost	Geotechnical stability, cover system performance and cost, drainage strategies and design, cost
Resilient design	Cover design selection considering mainly economic and geochemistry criteria, geotechnical stability and drainage requirements combined to develop final landform with reduced materials balance deficit, gravity drainage designed to reduce slope and offsite rip rap materials requirements and cost	Analysed cover design with reduced thickness achieving infiltration rates, long-term slopes meeting acceptable annual erosion rates but not the highest materials volumes, cost of analysed options, spillway located to reduce risk	Re-sloping of embankments, buttressing as required, spillway location and drainage based on analysis of flows, ability to achieve safe closure assessed	Cover thickness based on oxidation and oxygen gas depths, subsurface geotechnical enhancements for stability instead of buttress, spillway located to avoid erosion-prone areas

1. LoF = Life of Facility

5 Conclusion

Just like the evolution of a hero or villain, closure designs can end up being driven by circumstances, resulting in generic and potentially conservative 'reaction-only' design. Resilience in closure design can be developed by modifying the closure design process, from focusing on what initially necessitated the design, providing the required content and addressing known gaps, to utilising a tailored, risk-based, adaptive and data-driven approach. By integrating closure considerations in an interdisciplinary approach, resilient, more economic and less conservative tailings storage facility (TSF) closure designs can be developed. Global Industry Standard on Tailings Management, International Council on Mining and Metals Good Practice Guide, Australian National Committee on Large Dams Guidelines and other design standards requirements utilised to address the purpose of TSF closure designs can be used to meet minimum requirements without achieving designs resilient for the longer term, including future land use and social considerations, and/or realising opportunities to reduce conservatism in closure design and materials balance volumes required.

Resilient closure designs use data from site investigations and analysis or testing, monitoring and/or modelling, as well as cost data and stakeholder perspectives. TSF management methods applying closure considerations as a reaction-only approach may not achieve the economy and success in performance compared to methods where integrated design considerations are employed early in TSF and/or closure design for long-term sustainable, resilient TSFs. Tools such as multicriteria assessments should be used to consider available information and analysis and select preferred options for a more integrated closure design and favourable outcomes using appropriately weighted criteria.

Outcomes from developing resilient closure designs include:

- improved confidence and robustness in closure design leveraging data
- reduced conservatism due to additional investigations and options analysis considerations, which can include costs
- improved understanding of the residual risk profile, critical controls and design drivers. Actual key risks are addressed, rather than just treating the gaps and undertaking a systemic review; key risks are treated in terms of priority, with the focus on reducing residual risks, including costs and environmental implications.

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Use of artificial intelligence disclosure statement

In the preparation of this work the authors used M365 Copilot (Version 20260604.51.2) to assist in identifying common themes and comparing guidance documentation. The authors have reviewed the content, verified validity by viewing the original source in the guidance documentation and edited it where required, and take full responsibility for said content.

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