ICMM
International Council on Mining & Metals

Dr Bruno Oberle
Chair
Global Tailings Review

23 December 2019

Dear Bruno

ICMM submission on the public consultation draft Global Tailings Standard – Cover Letter

The ICMM's members, as the builders and operators of tailings storage facilities, have the most critical vested interest of the three Co-Conveners in achieving our shared aim of the development of an international standard for the safer management of tailings facilities that is fit-for-purpose.

We offer our submission to the Global Tailings Review in support of that aim.

Firstly, we want to acknowledge the Chair and Expert Panel for the work undertaken to date. The process of developing the Standard and conducting in-person consultations in several languages and countries, as well as a global online consultation, has been a significant undertaking. We thank the Chair and Panel members for their efforts and commitment.

Secondly, our view is that there are some very substantive core issues to be addressed before ICMM will be able to endorse the final Standard. We strongly believe that the original objective of developing an international standard for the safe and secure management of mine tailings facilities to prevent catastrophic failures should remain central to the purpose and content of the Global Tailings Standard. This should be made clear in the standard for all requirements. In our view the draft document for consultation contains many requirements which are either only indirectly related to this objective or do not influence the stability, safety and management of tailings facilities. This is especially the case for broad-based requirements involving environmental, human rights, and social aspects.

It is from this position that we offer our comments on the draft Standard as part of the engagement process underway, and to which we remain committed. Furthermore, we consider it critical that the standard also includes sufficient reference and equivalency to the relevant existing principles, standards, practices and audits already in place, in order to avoid any possible confusion and repetition which might in any way detract from the specific objective of minimising the risk of catastrophic failures of tailing facilities.

Our feedback is intended to support the development of a final Standard that is implemented widely across the industry. To achieve this, and as provided in our comments, we still believe there are substantive points that need addressing before arriving at a viable standard which is both capable of being implemented and achieves the desired objective we are committed to: the safe and secure management of tailing facilities that prevents catastrophic failures.

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In preparing our comments, we considered a key question to be whether the draft supports the goal of understanding the risks of catastrophic failures, preventing them, or preparing to effectively respond in the unlikely event that failures occur. At the same time, we have asked ourselves whether the draft requirements are implementable by mining companies, and critically whether they might (albeit unintentionally) divert management attention or scarce resources and expertise away from focusing on the highest risk assets.

Our submission comprises two documents:

1. **A marked-up version of the draft Standard with suggested changes**. Some of these suggestions provide important points of clarification. Others are more substantive. We consider it to be imperative to address our comments to the introduction (specifically in the sections on the essential role of the state and implementation), and under principles 2, 3, 4, 6, 8, 10 and 17, as well as Annexes 2 and 3.

2. **A companion document that summarises the rationale for suggested changes.** In this document, the rationale for our suggested changes is outlined in the interests of transparency.

We ask the Chair and Expert Panel to consider both documents.

Lastly, there are some cross-cutting considerations that are not specific to individual requirements that we also feel deserve consideration:

The introduction and preamble to the Standard should describe the overall intent of the Standard, but not introduce additional requirements. In its current form, it raises issues that are not necessarily addressed in the text of the Standard.

- The balance between what is required rather than how to achieve it is not always adequate, such that in some areas the standard is overly prescriptive. The Standard should focus on ‘the what’, whereas ‘the how’ can be covered by guidance external to the Standard.

- We consider it critical that reference is made to consequence classification systems and external loading criteria already in place or under development but widely recognised, such as ICOLD. The Standard therefore should cross reference the connection to such requirements more clearly, as indicated in some of our specific comments. This is especially relevant to Annex 2, where we are suggesting that the Standard should refer to and align with the ICOLD 2019 draft consequence classification table (which is hereby attached for reference). Our understanding is that the ICOLD tailings committee member countries will be considering this draft for endorsement by end January 2020.

- A clearer distinction between the application of many requirements to operating, closed (active) and closed (passive) facilities is needed. These should be more clearly differentiated within the Standard.

- Throughout the Standard, there are numerous requirements that refer to consequence classifications. Our acceptance of the language in these requirements assumes that the final Standard will refer to ICOLD rather than the current consequence classification outlined in Annex 2.

- The wording of some of the principles reads more like specific requirements, rather than a principle beneath which many specific requirements are outlined.

- The Standard should identify and refer to leading practice.

In closing, we thank the Chair and Expert Panel. We are all mindful of the tragedies that have given rise to this Global Tailings Review, and we remain committed to developing a Standard that is robust and fit-for-purpose for the safer and secure management of tailings facilities. In so doing, we request you to consider both our comments and to ensure that the development of the standard remains centered and focused on its original purpose and intent. We hope that you will thereby avoid any creep in scope or content, which would render the Standard's implementation impractical or deviate from the key objective of achieving an improvement in the safety of tailings management.

Yours sincerely

Tom Butler
CEO
ICMM

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ICMM Council members

GlobalTailings Review.org

GLOBAL TAILINGS STANDARD

Draft for Public Consultation

November 2019

UN environment

ICMM International Council on Mining & Metals

PRI Principles for Responsible Investment

Contents

Acronyms

ALARP	As Low as Reasonably Practicable
CDIV	Construction vs Design Intent Verification
DBR	Design Basis Report
DSR	Dam Safety Review
EoR	Engineer of Record
~~EPRP~~	~~Emergency Preparedness and Response Plan~~
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
FPIC	Free prior and informed consent
GTR	Global Tailings Review
IAIA	International Association of Impact Assessment
ICMM	International Council on Mining and Metals
ICOLD	International Commission on Large Dams
IFC	International Finance Corporation
ILO	International Labor Organization
ITRB	Independent Tailings Review Board
MAC	Mining Association of Canada
OECD	Organization for Economic Cooperation and Development
OMS	Operations, Maintenance and Surveillance Manual
PAP	Project-affected People
PRI	Principles for Responsible Investment
~~RTFE~~RTP	Responsible Tailings ~~Facility Engineer~~Person
TARPs	Trigger action and response ~~actions~~ plans
TMS	Tailings Management System
UNDRIP	United Nations Declaration on Rights of Indigenous Peoples
UNEP	United Nations Environment Program
UNGP	United Nations Guiding Principles on Business and Human Rights

Foreword

Catastrophic tailings facility failures devastate the environment and destroy lives and livelihoods. The severity of recent failures spurred the United Nations Environment Program (UNEP), the Principles for Responsible Investment (PRI) and the International Council on Mining and Metals (ICMM) to co-convene the Global Tailings Review. In April 2019, I was invited to chair the Review and tasked with preparing a global standard for the safe and secure management of mine tailings facilities. There is an urgency associated with this task as the first anniversary of the Brumadinho tragedy approaches.

To prepare the Standard, I selected a team of seven experts to work with me, and I engaged a multi-stakeholder group to advise us. We have collaborated intensively over the past four months to prepare this draft for public consultation. The public consultation is an intermediate step to allow for critique, feedback and suggestions from others. It will be on the basis of this input that I will work with the Expert Panel and our Advisory Group to finalise this Standard, and submit it to the Co-conveners, along with an accompanying report. I hope that the Standard is accepted immediately by mining companies and endorsed by other stakeholders globally.

The problem that the Co-convenors asked me to address is clear. When a tailings facility fails, slurry and wet sand breach the containment structure, escape, and cause destruction. Finding a solution to this problem, however, is far more complex. I have learned that tailings facilities are in fact an intricate construction, realised over years and decades, managed by a cadre of specialists, influenced by the natural environment and subject to many socio-political and economic factors. These interactions form a dynamic, complex and interconnected system. An integrated approach is therefore needed – bringing together mine Operators, technical specialists, stakeholders, and technologies, all in the context of environmental conditions, and the lived experience of local populations. It is for this reason that I selected a multidisciplinary team of experts to work with me to prepare the Standard.

Our effort of synthesis and knowledge integration has been – and will continue to be – a challenge. We are still working towards balancing and streamlining certain requirements and ensuring that the Standard supports an integrated approach, across the lifecycle of a tailings facility. In addition, we are considering the level of detail that is appropriate for the scope of the Standard. We also acknowledge that there will be variations in the application of the Standard for new and existing facilities. I continue to work with the Expert Panel on these important matters.

Undoubtedly, ongoing work on the Standard will need to be grounded in stakeholder engagement, incorporating visits to mine sites and consultation with communities affected by tailings facilities. It will also require ongoing engagement with the three co-conveners – UNEP, ICMM and PRI – who have not endorsed the current consultation draft. It is vital that we continue to learn and understand what must be done to eliminate tailings facility failures. By continuing to integrate diverse insights and points of view, we will drive the change process forward.

There are many reasons for mining companies to welcome a global standard for the safe and secure management of tailings facilities. Leading companies will want to demonstrate to States, investors, insurers and local communities that they are committed to managing tailings facilities with integrity. Ultimately, Operators are required to strive towards zero

harm to people and the environment – with zero tolerance for any human fatality. The mining industry is encouraged to invest in new technologies and safer mining methods to achieve this goal.

. To create a step change, many other actors will need to be involved. Investors can insist that the Standard be embedded in corporate practice, and insurers can encourage adoption by linking implementation to the availability and cost of insurance. Consumers can choose to buy or use mining and metal products that are responsibly sourced, and local communities can demand that a company complies with the Standard. Finally, local, regional and central authorities of the State each have a critical role to play in embedding aspects of the Standard into their laws, their mining permits and other authorizations.

The online consultation for this draft is open for six weeks from November 15 to December 31. During this period, I will be visiting different countries and communities to ensure that local voices are heard and taken into consideration in the preparation of the Standard. All feedback will be carefully gathered, collated and provided to the team of experts for consideration and integration. I hope that this process will create awareness and trust in the Standard and help it to become influential. I invite you to read our draft, and to share your opinion. You can participate in the process by visiting ***www.globaltailingsreview.org*** *and completing a questionnaire, by commenting on specific requirements, or by freely expressing your views in a submitted statement. The consultation schedule is also available on the website.*

Every day, quality of life around the world is improving as more and more States commit to achieving the United Nations Sustainable Development Goals. The achievement of these goals needs a material basis and will be supported by the extraction and consumption of natural resources. Better technology will help us reduce consumption – but the overall needs of humanity will nonetheless continue to grow. To become safer, resource efficient, and contribute to sustainable development, we must better manage waste, including the residual material from mining, metal extraction and processing. This is not an option, but an obligation and I strongly believe this Standard can become a positive step in this direction.

Dr. Bruno Oberle
Chair of the Global Tailings Review

THE GLOBAL TAILINGS STANDARD

Introduction

The Global Tailings Standard (the 'Standard') aims to achieve the safe and secure management of mine tailings facilities globally. The Standard compels Operators[1] to ~~use specified measures~~ adopt recognized best management practices[2] and to apply rigorous technical controls to prevent the catastrophic failure of tailings facilities~~ and to implement best practices[3] in the planning, design, construction, operation, maintenance, monitoring, and closure of tailings facilities.~~ An independent Expert Panel is working to develop the Standard, taking into account multiple stakeholder perspectives, including those of local communities, civil society groups, regulators, investors, insurers, and the mining industry. Acknowledging these diverse perspectives requires a standard that extends beyond the facility itself to encompass the social, economic and environmental context, human rights, stakeholder engagement, corporate governance, and public disclosure.

The Standard makes clear that extreme consequences to people and the environment from catastrophic tailings facility failures are unacceptable. Operators must have zero tolerance for human fatalities and must strive for 'zero harm' to people and the environment due to catastrophic failure from the inception of project planning. ~~Operators are~~The industry is also expected to innovate, to develop and apply new technologies and mining methods that reduce risks and minimize consequences should problems arise.

Once a tailings facility moves from concept to reality, it becomes a hazard that must be managed to minimize risk. The Standard anticipates that individuals in the highest positions of authority within the organizational hierarchy will be accountable for the Operator's decisions and will insist on actions that reduce the risk of tailings facility failure to the extent reasonably practicable~~ to the fullest extent possible~~. ~~In addition, the Standard expects Operators to adopt best management practices and to apply rigorous technical controls. Zero harm is the goal at all stages of a tailings facility lifecycle.~~

Overview of the Standard

The Standard is organised around six Topic Areas, 17 Principles and 77 specific Requirements. This section provides a brief orientation to the Standard.

Topic Area 1 requires Operators to develop and maintain knowledge about the social, economic and environmental context of a proposed or existing tailings facility, and to conduct a detailed site characterization. Inundation studies build an understanding of inundation areas, associated impacts, and the identification of groups most at risk from tailings facility failures. A multi-disciplinary knowledge base developed and used by the Operator and key stakeholders, in an iterative way, will enable all parties to make informed

[1] ~~In this Standard, 'Operator' means any person, corporation, partnership, owner, affiliate, subsidiary, joint venture, or other entity, including any State agency, that operates, or controls a tailings facility~~.

[2] The Standard recognizes that there is no one "best practice" that can be viewed as applying to every tailing facility. Instead, there are a range of "best practices" that can apply to safely manage tailing facilities.

Commented [ICMM 21]: This introduction and overview, in particular Topic Area 3, will need to be aligned to the changes made in the Principles and Requirements.

Commented [ICMM 22]: The definition is already in glossary hence footnote should be deleted.

Commented [ICMM3]: BMP now referenced in first paragraph instead of the more nebulous 'specified measures'

decisions throughout the tailings facility lifecycle. These decisions will arise in the context of the alternatives analyses, the choice of technologies and facility designs, emergency response plans, and closure and post-closure plans, amongst others.

Topic Area 2 focuses on project-affected people. In order to appropriately respect human rights, a human rights due diligence process is required to identify and address those rights that are most at risk from potential failures of tailings facilities. Topic Area 2 also requires respect for individual rights and the collective rights of local, indigenous and tribal peoples who may own, occupy or use land or natural resources at or near a tailings facility site, or downstream areas that may be affected by a failure. To demonstrate this respect, project-affected people must be afforded opportunities for meaningful engagement ~~in decisions that affect them~~. The requirements outlined in Topic Area 2 are intended to be cross-cutting and ongoing throughout the tailings facility lifecycle.

Topic Area 3 aims to lift the performance bar for designing, constructing, operating, maintaining, monitoring, and closing tailings facilities. For new tailings facilities, the Standard requires designers to ~~presume an 'Extreme' consequence of~~use the 2019 draft ICOLD consequence classification information ~~failure classification~~. ~~Operators can rebut this presumption only when specific conditions are met.~~ Where upgrading an existing facility is not feasible, the Operator must reduce the ~~consequences of a potential failure to the greatest~~ risks to be as low as reasonably practicable (ALARP)~~extent possible~~. Recognizing that tailings facilities are dynamic engineered structures, Topic Area 3 requires the ongoing use of a~~n updated~~ knowledge base, consideration of alternative tailings technologies, robust designs, and well managed construction and operation processes to minimize the risk of failure. It also specifies the development and implementation of an Operations, Maintenance and Surveillance (OMS) Manual that supports effective risk management of the tailings facility. ~~A comprehensive monitoring system must support the full implementation of the Observational Method and the use of a performance-based approach for the design, construction and operation of tailings facilities.~~

Commented [ICMM 24]: These paragraphs will need to be brought in line to be consistent with the changes made in the Principles and Requirements, in particular Topic Area 3.

Topic Area 4 focuses on the ongoing management and governance of a tailings facility. This section elevates the accountability for tailings facilities that would result in 'Very High' or 'Extreme' consequences in the event of failure, to the upper level of an organization's hierarchy – the Board of Directors or a member of senior management (as appropriate to the Operator's organizational structure). It also provides for the designation and assignment of responsibility to key roles in tailings facility management, including an Accountable Executive, an Engineer of Record, and a Responsible Tailings ~~Facility Engineer~~Person. Further, it sets standards for critical systems and processes, such as the Tailings Management System and independent reviews, which are essential to upholding the integrity of a tailings facility during its entire lifecycle. Cross-functional collaboration and the development of a learning organizational culture that welcomes the identification of problems and protects whistleblowers are also included.

Topic Area 5 covers emergency preparedness and response in the event of a tailings facility failure. Operators must avoid complacency about the demands that would be placed on them and on public sector agencies in the event of a catastrophic failure. The Standard requires that Operators consider their own capacity, in conjunction with that of other

parties, and to plan ahead, build capacity, and work collaboratively with other parties to prepare for the unlikely case of a failure. Topic Area 5 also outlines the fundamental obligations of the Operator in supporting the re-establishment of ecosystems, and the long-term recovery of affected communities in the event of a failure.

Topic Area 6 requires public access to information about tailings facilities to fairly inform internal and external stakeholders about risks and potential impacts, management and mitigation plans, and performance monitoring. Operators must respond in a systematic and timely manner to all reasonable stakeholder requests for information. The Standard concludes by requiring that Operators commit to transparency, and participate in global initiatives to create standardized, independent, industry-wide and publicly accessible databases, inventories, and information about tailings facilities. This reflects the Co-convenors' commitment to increased public accountability.

A Systems Approach

The Standard is underpinned by a deep systems logic, reflecting and extending the well-established 'Plan, Do, Check, Act' cycle to enhance cross-functional collaboration. This does not mean, however, that the Standard seeks to build a single, overarching, management system. Instead, the Standard supports the effective interaction of multiple systems, each built on a strong disciplinary base. Some systems will sit within the organization. Others will cross the organizational boundary and interact with broader social, political, cultural, economic, environmental and climatic systems. This reflects the fact that a tailings facility is situated within a complex and dynamic local and global environment.

At the core of the Standard sits the tailings management system (TMS). This system is focused on the safe operation and management of the tailings facility itself. The TMS, and its various elements, must interact with other systems, such as the environmental and social management system (ESMS), the mine-wide management system, and the regulatory system. It is at the point of interface among these systems that data collection and accessibility, documentation, procedures, processes, resources and people must interact. This enables multidisciplinary teams to plan, implement, monitor and adapt to meet the requirements of this Standard. This systems interaction is fundamental to the effective implementation of the Standard.

The Essential Role of the State

The Standard guides the conduct of Operators but it also informs States about best practices for tailings facilities and it affords them a framework for designing rules for managing such facilities where required. This is a critical point because States are uniquely situated to provide independent oversight of the permitting, construction, operation, maintenance, monitoring, and closure of tailings facilities. They are likewise the most appropriate entity to set up an independent inspection and enforcement program capable of identifying problems early and making sure those problems are corrected promptly before they increase the risk of catastrophic failures. The Standard is not intended to displace or pre-empt any requirement of applicable law, the rules of a relevant stock exchange, or any established practice

of the industry based thereon, and where conflicting, applicable law or listing requirements shall prevail.[4]

Not all States currently have the capacity to carry out these tasks. Good oversight requires a comprehensive understanding of the planning and engineering necessary to build, operate, maintain, and ultimately close tailings facilities. Inspectors with the credibility and authority to issue citations and to mandate appropriate corrective actions must share an understanding of these issues and possess the capacity to identify solutions to reported problems. Moreover, developing a reliable and professional staff where one does not currently exist will require time and resources and these may be scarce. All States with tailings facilities should aspire to develop and implement an effective and well-staffed regulatory program.

The best standards in the world will not prevent catastrophic tailings facility failures unless those standards are scrupulously followed and unless an effective third-party enforcement program exists that mandates corrective action where an Operator falls short. Only States have a mandate to carry out oversight and enforcement. States should embrace this responsibility and use this Standard as a guide for building capacity and a regulatory framework that will ultimately fulfil a critical role in the safe management of tailings facilities.

The Role of Other Stakeholders

While an effective State regulatory and enforcement regime is an essential element for the long-term success of tailings facility management, other stakeholders such as investors, insurers, and communities also have important roles to play. Investors can limit their financial support to only those projects that follow strict technical and non-technical standards for tailings facility management such as the Standard proposed here. Investors can further demonstrate their commitment to strict standards by insisting on regular reporting, public disclosure of relevant documents, and third-party audits that ensure ~~compliance~~conformance.

Insurance companies that indemnify against damages to people and the environment from tailings facility failures will benefit by insisting that Operators minimize the risk of failure to the fullest extent possible. This would limit their exposure to significant claims, which can sometimes be in the billions of dollars. The risk of significant liability also incentivizes insurance companies to closely monitor tailings facilities and demand immediate correction of problems that are identified.

Local communities and civil society organizations have a strong interest in ensuring that tailings facilities are managed so as to protect public safety and the environment. These stakeholders can best protect this interest if they are given a meaningful role in key decisions that affect them as proposed in this Standard. They are also in a strong position to demand transparency from Operators regarding tailings facility plans, management plans, and other data and information relating to the tailings facility. Insisting on strict conformance~~compliance~~ with the Standard can also support positive relationships and help foster trust.

[4] Further, in those regions where laws address matters covered by the Standard, or where the Operator can credibly demonstrate that the regulatory authorities undertake key roles attributed to the Operator within this Standard, the Standard will not require the Operators to take measures beyond those required by law.

Implementation

Once the Standard has been approved by the three Co-conveners, a process will be needed for both implementation and ongoing development. The implementation process will require the following elements:

- a guarantee of independence;
- access to a multi-disciplinary team of experts to review implementation of the Standard;
- protocols for determining ~~compliance~~ conformance and non-~~compliance~~conformance with the Standard;
- procedures for seeking further information or agreeing an action plan should an Operator fail to meet requirements in the Standard;
- resources to conduct ~~compliance~~ conformance monitoring;
- a framework against which to assess the competency of reviewers;
- a process for approving or conditionally approving ~~assurance~~ conformance, where the requirements of the standard are met;
- ~~the power to revoke or suspend assurance where necessary;~~
- procedures for ensuring transparency and public reporting; and
- opportunities for meaningful public engagement in the process.

An accompanying report (the 'Report') will be issued along with the release of the Standard. In addition to proposing an implementation method, the Report will address matters relating to further refinement of the Standard, development of verification protocols, harmonization with existing assurance schemes, and good governance. Many activities referenced in this Standard may be found as part of a comprehensive mine-wide environmental and social management plan. Where credible systems for assuring these requirements are already in place (such as 3rd party audit or verification processes), the Standard should recognize these as equivalent to avoid duplication, to the extent reasonably practicable. Therefore, for Principles 2 and 3, adherence and assurance to best practice frameworks would satisfy these requirements of this Standard. The ITRB, independent senior technical reviewer or other tailings management professionals are not required to provide oversight of the environmental and social aspects of requirements 1.1, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1-3.4, 14.1-14.4, 15.2, 15.3, 16.1-16.5, 17.1-17.3.

Commented [ICMM5]: Not clear what is intended – delete as covered by expansion of previous bullet point.

Commented [ICMM6]: The ITRB or independent senior technical reviewer will normally not have the requisite skills to provide oversight of these requirements, which are subject to other oversight mechanisms.

GLOBAL TAILINGS STANDARD

Preamble

This Standard strives towards the prevention of catastrophic failures of tailings facilities. ~~ultimate goal of zero~~ and associated harm to people and the environment. ~~and zero tolerance for human fatality.~~ It requires Operators to take responsibility for the safe and secure management of their tailings facilities, through all phases of the project lifecycle, including closure and post-closure. For the purposes of this Standard, the term 'Operator' is broadly defined to encompass the people or organizations with responsibility for the tailings facility as set forth in Annex 1. Operators that are seeking to lead, innovate and pursue best practice will be well placed to meet the requirements set out henceforth.

All terms that appear in *italics* are defined in Annex 1: Glossary and Notes.

TOPIC I: KNOWLEDGE BASE

PRINCIPLE 1: Develop and maintain a ~~an updated~~ knowledge base to support safe tailings management across the *tailings facility lifecycle*.[5]

REQUIREMENT 1.1: Develop and ~~regularly~~ update knowledge about the social, economic and environmental context of a tailings facility, aligned with current international *best practice*.[6,7] e.g. at the start of a project and as material changes occur that may impact the context of the tailings facility (as per Requirement 2.4).

REQUIREMENT 1.2: Prepare and maintain ~~regularly update~~ detailed *site characterization* of the tailings facility site(s) that includes climate data, geomorphology, geology, geochemistry, hydrogeology, geotechnical, seismicity, ~~and~~ hydrology and hydraulics. The physical and chemical properties of the *tailings* shall be determined and regularly updated.

New REQUIREMENT 1.3: For all tailings facilities, undertake either a failure impact assessment or inundation evaluation to determine the potential consequences of failure for a tailings facility in accordance with Table 1.

REQUIREMENT 1.4: Where there is a potential for flow failure, conduct and regularly update an inundation evaluation for the tailings facility using a methodology that considers credible failure modes for both sunny day and rainy day conditions. The inundation evaluation should extend beyond the boundaries of the operation to an extent necessary to adequately define the potential impacts including informing the Emergency Preparedness and Response Plan. For 'Very High' and 'Extreme' consequence facilities a quantitative inundation evaluation should be undertaken to provide additional estimates of the inundation area, flow arrival

[5] ~~Updates should be carried out~~The knowledge base should be updated whenever there is a material change to the tailings facility, the social or environmental context or conditions, or at a minimum every 3 years for 'Very High' and 'Extreme' Consequence Classifications, and every 5 years for others.

[6] This knowledge should capture the uncertainties associated with variations due to climate change, with a focus on adaptive management and climate resilience.

[7] This information may already exist in whole-of-operations studies (e.g. baselines, impact assessments and specialist studies) and/or may subsequently be incorporated into other studies.

times, depth and velocities, duration of flooding, and depth of material deposition.

~~REQUIREMENT 1.3: Where there is a potential for flow failure, conduct and regularly update an *inundation zonestudy* for the *tailings facility* using a methodology that considers hypothetical events based on credible hypothetical failure modes, site conditions, *tailings facility* conditions, hydraulic routing models of the slurry, and the amount of *tailings* and downstream materials entrained in the outflow. The results of the study should include estimates of the inundation area, flow arrival times, depth and velocities, duration of flooding, and depth of material deposition.~~

REQUIREMENT 1.~~4~~5: If a facility has a credible failure mode/mechanism that can lead to an inundation flow event, ~~i~~identify stakeholders and how they are related to the *tailings facility* site, inundation area and impacted area[8]; collect land, livelihood and demographic data[9] for groups most at risk[10] from a *tailings facility* failure[11].

PRINCIPLE 2: Integrate the social, economic, environmental and technical information to select the site and the approaches~~technologies~~[12] to minimize the risk of tailings facility failure.

REQUIREMENT 2.1: ~~Undertake~~ For new tailings facilities, with the goal of minimizing risk to people and the environment, use the knowledge base to inform: a formal, multi-criteria *alternatives analysis* of all feasible sites and approaches ~~and technologies~~ for tailings management; ~~with the goal of minimizing risk to people and the environment~~. ~~Use the knowledge base to inform this analysis and~~ – for the preferred alternative – ~~to develop~~ facility designs; *inundation studies*; a monitoring program; *Emergency ~~Preparedness and~~ Response Plans* (E~~P~~RPs); and closure and post-closure plans. The ERPs and closure and post-closure plans will apply to the mine site overall.

REQUIREMENT 2.2: Engage an *Independent Tailings Review Board* (ITRB), in the case of 'Very High' and 'Extreme' consequence facilities, or an independent *senior technical reviewer* with no conflicts of interest to assess and review the *alternatives analysis* for site and technology selection. In the event of an actual or apparent conflict of interest, such a conflict will be managed pursuant to the ethical standards governing the conduct of engineers in the relevant jurisdictions.

[8] The area of potential impact may be larger than the inundation area.

[9] Data collection should include participatory processes, follow established ethical research protocols, and consider matters of privacy and data sovereignty. A comprehensive approach would include data and information relating to: the physical environment within which people live and work, natural resources and built infrastructure; social, economic, legal, cultural and political systems, norms and rules that govern how people interact with the environment and with each other; the population within the study area, demographic patterns and human activities or issues in the area; boundaries that demarcate rights over the ownership, and use of land and territory.

[10] Groups that are most at risk include people who risk loss of life in the event of a tailings facility failure and people who would experience significant impacts to livelihoods, cultural heritage, health or other aspects of their lives. Special attention must be given to gender, diversity and vulnerability when identifying groups at risk.

[11] It should be acknowledged that all tailings facilities have a credible failure scenario that results in an inundation area. In such circumstances, this requirement would not be applicable.

[12] The Standard does not ban any specific design technology or approach, such as upstream tailings facilities. Banning particular technologies was outside the Expert Panel's scope of work, available here: *https://globaltailingsreview.org/about/scope/*

REQUIREMENT 2.3: Use the knowledge base to assess the social, economic and environmental impacts of the tailings facility and its ~~potential~~ hypothetical failure impacts.[13] Where potentially significant impacts are predicted, ~~D~~develop impact mitigation and management plans[14], and *meaningfully engage* potentially affected communities in the process as part of the Environmental and Social Impact Assessment (ESIA) for the facility or operation.

REQUIREMENT 2.4: Update the assessment of the social, economic and environmental impact and update stakeholder identification and information for any material change to the *tailings facility*, the social or environmental context or conditions. If new data indicates that the impacts from the *tailings facility* differ from those assumed in the original assessments, the management of the facility shall be updated~~adjusted~~ to reflect the new data using *adaptive management best practices*.

REQUIREMENT 2.5: The amount of estimated costs for planned closure, early closure, and post-closure conditions shall be reviewed periodically to ensure adequate financial capacity is available for safe management of the tailings facility and its appurtenant structures.~~The amount of financial assurance shall be reviewed periodically and updated based on estimated closure and post-closure costs.~~

~~REQUIREMENT 2.6: Taking into account actions to mitigate risks, the Operator will consider obtaining appropriate insurance to the extent commercially reasonable or providing other forms of financial assurance if appropriate to address risks relating to the construction, operation, maintenance, and/or closure of a *tailings facility*~~

TOPIC II: AFFECTED COMMUNITIES

PRINCIPLE 3: Respect the rights[15] of project-affected people and *meaningfully engage* them at all stages of the *tailings facility lifecycle*.

[13] ~~12~~ Given the long-term nature of a tailings facility, the Operator is encouraged to address uncertainties around climate change and its potential impacts ~~on environmental and social conditions and trends.~~ on the facility, with a focus on adaptive management and resilience.

[14] This Requirement applies the mitigation hierarchy to consequences or impacts and where avoidance is not feasible, to ~~first minimize the impacts and then include measures to allow future compensation for remaining impacts to the extent they occur~~ minimize the impacts and, where residual impacts remain, provide compensation/offset, wherever technically and financially feasible. See International Finance Corporation's (IFC) 2012 Performance Standards on Environmental and Social Sustainability, Performance Standard 1 Assessment and Management of Environmental and Social Risks and Impacts (p.6), and Performance Standard 6 Biodiversity Conservation and the Sustainable Management of Living Natural Resources requirement 7.

[15] As defined in the United Nations Guiding Principles on Business and Human Rights (UNGP). Demonstrating respect for indigenous peoples rights may involve working to obtain~~ing~~ their 'free prior and informed consent' (FPIC), as outlined in the ICMM Indigenous Peoples and Mining Position Statement.

REQUIREMENT 3.1: Demonstrate *respect for human rights* by implementing the United Nations Guiding Principles on Business and Human Rights (UNGPs) and conducting *human rights due diligence*[16] for new tailings facilities to understand how a *tailings facility* failure may cause or contribute to adverse *human rights* impacts, including impacts on the individual and collective rights of indigenous peoples[17] and tribal peoples[~~18~~].

REQUIREMENT 3.2: *Meaningfully engage project-affected people* (PAP) throughout the *tailings facility lifecycle* regarding the matters that affect them.[19,20]

REQUIREMENT 3.3: ~~Where the risks of~~ In circumstances where an *Operator* ascertains the risks of a potential *tailings facility* failure that could result in loss of life or sudden *physical and/or economic displacement* of people which cannot reasonably be mitigated, the Operator shall consider working with relevant State authorities together with potentially impacted communities to assess implementation of additional measures, where reasonably practicable. ~~in good faith additional measures to minimize those risks or implement resettlement following~~ Additional measures may include, among others, the possibility of resettlement in the case of new facilities. The Operator shall follow international standards[21]~~.~~ for resettlement and ~~The Operator shall~~ communicate these decisions to those affected.

REQUIREMENT 3.4: Establish an effective operational-level, non-judicial *grievance mechanism* that addresses the concerns, complaints and grievances of *project-affected people* that relate to the *tailings facility*[22].

[16] While human rights due diligence should be conducted for all aspects of a mining business, this Standard requires a specific focus on the tailings facility. Human rights due diligence should be conducted for ~~potential~~ credible failure modes, and in the event of a failure. In many cases, human rights due diligence may occur during the State-mandated processes applicable to mining, including as part of the ESIA for the operation, rather than a separate process for just the tailings facility.

[17] The corporate responsibility to respect the rights and interests of indigenous peoples are covered by the UN Guiding Principles and reflected in the ICMM Indigenous Peoples and Mining Position Statement~~The Universal Declaration on the Rights of Indigenous Peoples (UNDRIP), 2007, delineates and defines the individual and collective rights of indigenous peoples~~.

[18] ~~The International Labor Organization (ILO) Convention 169, the Indigenous and Tribal Peoples Convention, 1989 is the major binding international instrument concerning indigenous peoples and tribal peoples and was a pre-cursor to UNDRIP.~~

[19] Operators shall also engage on those matters referred to in Requirements 1.3, 2.1, 2.3, 3.1, 3.3, 3.4, 5.6, 7.7, 7.8, 15.2, 15.4 and in case of a tailings facility failure, in Requirements 16.2-16.4. These activities may be documented in a mine-wide Stakeholder Engagement Plan.

[20] ~~Meaningful engagement, participation and consultation are related processes that are included in key instruments of the United Nations (UN); in the policy frameworks of international finance institutions, such as the IFC's Social and Environmental Performance Standards; and in performance expectations of industry associations, including the ICMM, and leading companies.~~

[21] International standards include the IFC's (2012) Environmental and Social Performance Standard (PS) 5 Land Acquisition and Involuntary Resettlement and IFC (PS) 7 Indigenous Peoples.

[22] This process may be part of an existing operational-level grievance mechanism, which may in turn form part of the mine-wide ESMS.

TOPIC III: DESIGN, CONSTRUCTION, OPERATION AND MONITORING OF THE TAILINGS FACILITY

PRINCIPLE 4: ~~Design, construct, operate and manage the *tailings facility* on the presumption that the consequence of failure classification is 'Extreme', unless this presumption can be rebutted.~~Understand the consequences of failure of a *tailings facility* and design, construct, operate and close the facility accordingly to manage the risk

REQUIREMENT 4.1: All new tailings facilities should be classified as per the agreed consequence classification matrix and designed, constructed, operated and managed accordingly. The consequence of failure classification is reviewed when appropriate, or sooner if there is a material change in any of the categories in the Consequence Classification Matrix, and the tailings facility would be expected to be reclassified within 3 years. This review cycle should proceed until the facility has been safely closed~~Presume the consequence of failure classification of all new tailings facilities as being 'Extreme' (see Annex 2, Table 1: Consequence Classification Matrix) and design, construct, operate and manage the facility accordingly. This presumption can be rebutted if the following three conditions are met:~~

~~The knowledge base demonstrates that a lower classification can be applied for the near future, including no potential for impactful flow failures; and~~

~~A design of the upgrade of the facility to meet the requirements of an 'Extreme' consequence of failure classification in the future, if required, is prepared and the upgrade is demonstrated to be feasible; and~~

~~The consequence of failure classification is reviewed every 3 years, or sooner if there is a material change in any of the categories in the Consequence Classification Matrix, and the *tailings facility* is upgraded to the new classification within 3 years. This review should proceed until the facility has been safely closed~~[23].

~~and achieved a confirmed 'landform' status or similar permanent non-credible flow failure state.~~

REQUIREMENT 4.2: The decision on classification and any reclassifications ~~decision to rebut the requirement to design for 'Extreme' Consequence Classification,~~ shall be documented and taken by the *Accountable Executive* or delegate,~~or the *Board of Directors* (the *'Board'*) or senior management (as appropriate based on the Operator's organizational structure),~~ with input from an independent *senior technical reviewer* or the *ITRB*. ~~The *Accountable Executive* or *Board* shall give written reasons for their decision.~~

REQUIREMENT 4.3: *Existing facilities* shall ~~comply~~ conform with Requirements 4.1 and 4.2. The timing for individual facilities will be determined on a risk-informed basis as soon as reasonably practicable, but will not be more than 3 years for 'Very High' or 'Extreme' consequence facilities after a company adopts the final Standard.

[23] Safe closure is achievement of a confirmed 'landform' status or similar status that also has a permanent non-credible flow failure state.

~~Where the required upgrade is not feasible, the *Board*, or senior management (as appropriate based on the Operator's organizational structure), with input from the *ITRB*, or independent *senior technical reviewer,* shall approve the implementation of measures to reduce the risks of a potential failure to the greatest extent reasonably practicableossible within an agreed timetable with the regulators and on a risk-informed basis.~~

PRINCIPLE 5: Develop a robust design for all new facilities and major expansions that integrates the knowledge base and minimizes the risk of credible failure for all stages of the *tailings facility lifecycle*.

REQUIREMENT 5.1: Consider implementation of alternative options, including but not limited to in-pit disposal and underground tailings placement, and application of the approaches~~technologies~~ selected according to Requirement 2.1~~,~~ to minimize the ~~amount~~ volume of tailings and water placed in external[24] tailings facilities.

Commented [ICMM7]: Suggest FN is moved to glossary.

REQUIREMENT 5.2: Develop, ~~and~~ implement and maintain a water balance and water management plans for the *tailings facility*, taking into account the knowledge base, upstream and downstream hydrological basins, the overall mine site, mine planning and operations and the integrity of the *tailings facility* for all stages of its lifecycle.

REQUIREMENT 5.3: Develop a *robust design* that considers the technical, social, economic and environmental context, the *tailings facility* Consequence Classification, site conditions, water management, mine plant operations, tailings operational issues, and the construction, operation and closure of the *tailings facility*.

REQUIREMENT 5.4: Address all credible failure modes of the structure, its foundation, abutments, reservoir (tailings deposit and pond), reservoir rim and appurtenant structures to minimize risk[25]. Risk assessments must be used to inform the design.

REQUIREMENT 5.5: Develop a design for all stages of the *tailings facility*, including but not limited to start-up, partial raises and interim configurations, final raise, and all closure stages. The design should be reviewed and updated as performance and site data become available and in response to material changes to the risk assessment.

REQUIREMENT 5.6: Design the closure stage in a manner that meets all the Requirements of the Standard with sufficient detail to demonstrate the feasibility of the closure scenario and allows immediate implementation of elements of the design, as required. The design should include, where possible, progressive closure and *reclamation* during operations.

[24] External or out-of-pit tailings facilities are tailings disposal areas that are not located in mined-out open pits or underground mine workings. 'Above ground facilities' are those contained by man-made structures.

[25] Measures to minimise risks should be subject to the As Low as Reasonably Practicable (ALARP) principle.

PRINCIPLE 6: Adopt design criteria that minimizes risk[26] ~~.~~to As Low as Reasonably Practicable (ALARP). In all cases, minimizing risk means minimizing risk to people, environment and the Operator.

REQUIREMENT 6.1: Select and clearly identify design criteria that are appropriate to ~~reduce~~ manage the risk for the adopted Consequence Classification for all stages of the *tailings facility lifecycle* and for all credible failure modes.

REQUIREMENT 6.2: Apply ~~factors of safety~~appropriate integrity analyses that considers the variability and uncertainty of geologic and construction materials, including brittle failure mechanisms (independent of trigger mechanisms), and of the data on their properties, the parameters selection approach, the mobilized shear strength with time and loading conditions, the sensitivity of the failure modes and the strain compatibility issues, and the quality of the implementation of risk management systems.

~~REQUIREMENT 6.3: Identify and address brittle failure mechanisms with conservative design criteria and factors of safetymeasures of integrity to minimize the likelihood of their occurrence, independent of trigger mechanisms.~~

REQUIREMENT 6.3~~4~~: The *EOR* or Designer of Record shall prepare and maintain a *Design Basis Report* (DBR) that details the design criteria, including operating constraints, and that provides the basis for the design of all stages of the *tailings facility lifecycle*. The *DBR* must be reviewed by the *ITRB* in the case of 'Very High' or 'Extreme' consequence facilities, or independent *senior ~~independent~~ technical reviewer*.

PRINCIPLE 7: Build and operate the *tailings facility* to minimize risk.

REQUIREMENT 7.1: Build, ~~raise,~~ operate, monitor and close the *tailings facility* according to the design intent of all stages of the *tailings facility lifecycle*, using ~~qualified~~ capable personnel and appropriate methodology, equipment, procedures, data acquisition, the *TMS* and the overall *environmental and social management system (ESMS)*[27] for the mine and associated infrastructure.

REQUIREMENT 7.2: Manage the quality and adequacy of the construction and operation process by implementing *Quality Control, Quality Assurance* and *Construction vs Design Intent Verification (CDIV)*. *CDIV* shall be used to ensure that the design intent is implemented and is still being met if the site conditions vary from the design assumptions.

REQUIREMENT 7.3: Prepare a detailed *Construction Records Report* at least annually during construction or whenever there is any material change to the *tailings facility*, its infrastructure or its monitoring system. The *EOR* shall sign this report.

[26] ~~In all cases, minimizing risk means minimizing risk to people, environment and the Operator.~~

[27] Design and implement the ESMS to align decisions about the tailings facility with the changing environmental and social context, in accordance with the principles of *adaptive management*.

REQUIREMENT 7.4: Develop, implement, review (at least annually), ~~and~~ and ~~annually~~ update (as required) an *Operations, Maintenance and Surveillance (OMS) Manual* that supports effective risk management as part of the *TMS*. The *OMS Manual* should follow *best practices*, clearly provide the context and *critical controls* for safe operations, and be reviewed for effectiveness. The *EOR* and ~~*RTFE*~~*RTP* shall provide access to the *OMS Manual* and training to all personnel involved in the *TMS*.

Commented [ICMM8]: Under requirement 10.3 we recommend changing RTFE to RTP

REQUIREMENT 7.5: Implement a formal *change management system* that triggers the evaluation, review, approval and documentation of all material changes to design, construction, operation and monitoring during the *tailings facility lifecycle*. *The change management system* shall also include the requirement for a ~~periodic~~ *Deviance Accountability Report (DAR)*, prepared by the *EOR*~~,~~ that provides an assessment of the cumulative impact of the changes on the risk level of as-constructed facility. The *DAR* shall provide any resulting requirements for updates to the design, *DBR, OMS* and the monitoring program.

REQUIREMENT 7.6: ~~Refine the design, construction and operation throughout the *tailings facility lifecycle* by considering the lessons learned from ongoing work and the evolving knowledge base, and by using opportunities for the inclusion of new and emerging technologies and techniques.~~Include new and emerging technologies and techniques and the evolving knowledge base in the refinement of the design, construction and operation of the tailings facility.

~~REQUIREMENT 7.7: Ensure that the *ESMS* is designed and implemented to align decisions about the tailings facility with the changing environmental and social context as identified in the knowledge base, in accordance with the principles of *adaptive management*.~~

~~REQUIREMENT 7.8: Independent *senior technical reviewers*, with qualifications and expertise in social and environmental sciences and performance management, shall carry out a full review of the *ESMS* and monitoring results every 3 years, with annual summary reports provided to relevant stakeholders.~~

PRINCIPLE 8: Design, implement and operate monitoring systems.

REQUIREMENT 8.1: Design, implement and operate a comprehensive performance monitoring program for the *tailings facility* that ~~allows~~ incorporates full implementation of the *Observational Method* and covers credible ~~all potential~~ failure modes.

REQUIREMENT 8.2: Establish performance objectives, indicators, criteria, and performance parameters and include them in the design of a monitoring program that measures performance at all stages of the *tailings facility lifecycle*. Record, evaluate and ~~publish the results~~ provide the results to the appropriate regulatory authorities at appropriate frequencies, as required by law. Based on the data obtained, update the monitoring program throughout the *tailings facility lifecycle* to confirm that it remains effective.

REQUIREMENT 8.3: Analyze monitoring data at the frequency recommended by the *EOR*, and assess the performance of the facility, clearly identifying and presenting evidence on any deviations from the expected performance and any deterioration of the performance over time. Promptly submit evidence to the *EOR* for review and update the risk assessment and design, if required. Performance outside the expected ranges shall be addressed swiftly through ~~*critical controls or*~~ *trigger* *action and* *response* ~~*action*~~ *plans* (TARPs).

REQUIREMENT 8.4: Report the results of the monitoring program at the frequency required to meet company and/or~~,~~ regulatory requirements ~~and public disclosure requirements~~, and as a minimum on an annual ~~quarterly~~ basis. The ~~*RTFE*~~*RTP* and the *EOR* shall review and approve these reports.

TOPIC IV: MANAGEMENT AND GOVERNANCE

PRINCIPLE 9: Elevate decision-making responsibility for *tailings facilities* with a 'Very High' or 'Extreme' Consequence Classification[28].

REQUIREMENT 9.1: For a proposed *new facility* where a potential credible failure could have 'Very High' or 'Extreme' consequences, the *Board* or senior management (as appropriate based on the Operator's organizational structure) ~~–~~shall be responsible for approving the proposal, after deciding what additional steps shall be taken to minimize the consequences.

REQUIREMENT 9.2: For an *existing facility*, where a potential failure scenario based on a credible failure mode could have 'Very High' or 'Extreme' consequences, the ~~*Board* or senior management (as appropriate based on the Operator's organizational structure)~~*Accountable Executive* shall mandate additional steps to minimize the ~~consequences~~risks, using the As Low as Reasonably Practicable principle~~ and publish reasons for its decision~~. ~~This process is to be repeated at the time of every *Dam Safety Review* (DSR).~~

PRINCIPLE 10: Establish roles, functions, accountabilities and remuneration systems to support the integrity of the tailings facility.~~[29]~~

REQUIREMENT 10.1: The ~~*Board* of the *parent corporation*~~*Operator* shall adopt and publish a policy on or commitment to the safe management of tailings facilities, to emergency preparedness and response, and to recovery after failure that is mandatory for all its operations~~subsidiaries and joint ventures~~. The commitment shall require the Operator to establish a *Tailings Management System* (TMS), and a governance framework to assure the effective implementation and continuous improvement of the *TMS*.

REQUIREMENT 10.2: A member of the *Operator's* senior management shall be accountable for the safety of *tailings facilities* and for minimizing the social and environmental consequences of a *tailings facility* failure. This *Accountable Executive* will also be accountable for a program of tailings management training, for emergency preparedness and response, and for recovery after failure. The *Accountable Executive* or delegate must have regular scheduled communication with the *Engineer of Record* (EOR).~~[30]~~ For joint ventures, where a decision has been made to implement the standard, the *Operator* of any joint ventures~~s~~ will appoint an *Accountable Executive* who will inform the joint venture partners on tailings matters.

REQUIREMENT 10.3: Appoint a site-specific *Responsible* *Tailings Person*~~*Tailings Facility Engineer*~~ (RTP~~TFE~~) who is accountable for the integrity of one or more ~~the~~ *tailings facilities* ~~*(depending on size and complexity)*~~ who shall~~,~~ liaise~~s~~ with the *EOR,* the Operations and the Planning teams, and who ~~either~~ has clearly defined lines of communication and escalation

[28] See Annex 2, Table 1: Consequence Classification Matrix.

~~[29] See Annex 3: Outline of the Organizational Structure referred to in the Standard~~

~~[30] In the case of joint ventures, all venture partners shall appoint an Accountable Executive and it shall be the responsibility of the partners to jointly implement this Requirement.~~

~~reports directly~~ to the *Accountable Executive*~~, or via a reporting line that culminates with the *Accountable Executive*~~. ~~The *RTP*~~*TFE* will report ~~have a dotted reporting line to mine~~site~~e management to represent the delivery of~~ tailings management ~~services to the site.~~

~~REQUIREMENT 10.4: For employees who have a role in the *TMS*, consider implementing a performance incentive program to include a component linked to the integrity of *tailings facilities*.~~

REQUIREMENT 10.~~5~~4: Identify appropriate qualifications and experience requirements for all personnel who play safety-critical roles in the operation of a *tailings facility*, in particular, for the ITRB, ~~*RTFE*~~*RTP*, the *EOR* and the *Accountable Executive*. Ensure that occupants of these roles have the identified qualifications and experience~~,~~ and develop succession plans for these personnel.

PRINCIPLE 11: Establish and implement levels of review as part of a strong quality and risk management system for all stages of the *tailings facility lifecycle*.

REQUIREMENT 11.1: Conduct and regularly update risk assessments with a qualified multi-disciplinary team using best practice methodologies. Transmit risk assessments to the *ITRB (for 'Very High' or 'Extreme' consequence classifications) or* ~~senior~~ independent *senior technical reviewer* (as appropriate) for review, and address with urgency all tailings facility risks considered as unacceptable.

REQUIREMENT 11.2: Conduct internal audits to verify consistent implementation of company procedures, guidelines and corporate governance requirements consistent with the *TMS* and aspects of the *ESMS* developed to manage tailings facility risks.

REQUIREMENT 11.3: The EOR ~~or the a senior independent technical reviewer~~Designer of Record shall conduct annual tailings facility construction ~~and performance~~ reviews. The EOR or ~~senior~~ independent *senior technical reviewer* ~~(in the case of an internal EOR)~~ shall conduct annual performance reviews~~.~~.

REQUIREMENT 11.4: ~~A senior independent technical reviewer shall C~~conduct an independent *Dam Safety Review* (*DSR*) periodically (every 3 to 10 years, depending on performance and complexity, and the Consequence Classification of the tailings facility, or in accordance with regulatory requirements~~)~~. The *DSR* shall include technical, operational and governance aspects of the tailings facility and shall be done according to *best practices*. The *DSR* contractor cannot conduct ~~a~~ more than two ~~subsequent~~consecutive *DSR*s on the same facility.[31]

REQUIREMENT 11.5: For *tailings facilities* with 'Very High' or 'Extreme' Consequence Classification, the *ITRB*, reporting to the *Accountable Executive* (or qualified delegate reporting to the Accountable Executive) and/or the *Board*, shall provide ongoing senior independent review of the planning, siting, design, construction, operation, maintenance, monitoring, performance and risk management at appropriate intervals across all stages of

[31] Equivalency can be met through an ITRB or other senior technical reviews if any of these processes include independent review of physical stability, safety and performance of specific tailings facilities.

the *tailings facility lifecycle*. For facilities with other consequence classifications, the ongoing senior independent review can be done by a single person.

PRINCIPLE 12: Appoint and empower an *Engineer of Record*.

REQUIREMENT 12.1: Engage an engineering firm with relevant expertise and experience in design and construction of tailings facilities of comparable complexity to provide *EOR* services for operating facilities, and for 'Very High' or 'Extreme' consequence closed~~the~~ tailings facilities~~y~~. Require that the firm nominate ~~an individual~~a senior engineer to represent the firm as the *EOR*, in concurrence with the *Operator*, and verify that the individual has the necessary experience, skills and time to fulfil this role. Alternatively, the *Operator* may appoint an employee with expertise and experience in comparable facilities as the *EOR*. In this instance, the *EOR* may delegate the design to a ~~firm~~ design engineer ('*Designer of Record*') but shall remain thoroughly familiar with the design in executing their responsibilities as *EOR*. Whether the EOR or Designer of Record is internal or external, they must be competent and have experience commensurate with the consequence classification and complexity of the TSF.

REQUIREMENT 12.2: Empower the EOR through a written agreement that clearly describes their authority, role and responsibilities throughout the lifecycle of all facilities, including closed facilities, and during transfer of ownership of mining properties. The written agreement must clearly describe the obligations of the Operator to the EOR, to ensure that the EOR can execute his/her role effectively (i.e. provide all necessary data, design and as-built reports, performance history, etc).

REQUIREMENT 12.3: Establish and implement a system to manage the quality of all engineering work, the interactions between the *EOR,* the ~~*RTFE*~~*RTP* and the *Accountable Executive,* and their involvement in the *tailings facility lifecycle* as necessary to confirm that both the implementation of the design and the design intent are met in all cases.

REQUIREMENT 12.4: Given its potential impact on the risks associated with a *tailings facility*, the selection of the *EOR* shall be ~~decided~~ approved by the *Accountable Executive* (or qualified delegate reporting to the Accountable Executive) and not influenced or decided by procurement personnel.

REQUIREMENT 12.5: Where it becomes necessary to change the *EOR* (whether for a firm or internal employee), develop a detailed plan for the comprehensive transfer of data, information, knowledge and experience with the construction procedures and materials.

PRINCIPLE 13: Develop an organizational culture that promotes learning and early problem recognition.

REQUIREMENT 13.1: Educate personnel who have a role in the *TMS* and ERP about the reason for and importance of their job procedures for the prevention of a *tailings facility* failure.

REQUIREMENT 13.2: Incorporate workers' experience-based knowledge into planning for all stages of the *tailings facility lifecycle*.

REQUIREMENT 13.3: Establish mechanisms that promote *cross-functional* collaboration to ensure data and knowledge integration and communication across the *TMS* and the *ESMS*.

REQUIREMENT 13.4: Identify and implement lessons from internal incident investigations and relevant external accident reports, paying particular attention to human and organizational factors.[32]

REQUIREMENT 13.5: Develop procedures to recognize and ~~reward~~ encourage employees and contractors who speak up about problems or identify opportunities for improvement. Respond in a timely manner and communicate actions taken and their outcomes.

PRINCIPLE 14: Respond promptly to concerns, complaints and grievances.

REQUIREMENT 14.1: Establish a formal written complaint process that provides the *Operator* ~~and the appropriate regulatory authority~~ with information about possible permit violations or other conditions relating to the *tailings facility* that pose a risk to public health, safety, or the environment[33].

REQUIREMENT 14.2: Establish an effective pathway that guarantees anonymity for employees and contractors to express concerns about *tailings facility* safety.

REQUIREMENT 14.3: Initiate prompt investigations of all credible employee and stakeholder complaints and grievances, swiftly resolve concerns and complaints and provide remedy as required.

REQUIREMENT 14.4: In accordance with international *best practices* for *whistleblower* protection[34], the Operator shall not discharge, discriminate against, or otherwise retaliate in any way against a *whistleblower*, or any employee or person who, in good faith, has reported a possible violation or unsafe condition.

[32] International Association of Oil and Gas Producers, Demystifying human factors: Building Confidence in Human Factors Investigation, October 2018.

[33] This complaint process may be part of an existing one.

[34] See Study on Whistleblower Protection Frameworks, Compendium of best practices and Guiding Principles for Legislation, (OECD, 2010), available at, *https://www.oecd.org/g20/topics/anti-corruption/48972967.pdf*. Among other things, best practices require that the whistleblower be allowed to maintain their anonymity.

TOPIC V: EMERGENCY RESPONSE AND LONG-TERM RECOVERY

PRINCIPLE 15: Based on credible *tailings facility* failure scenarios and the assessment of potential consequences, ~~P~~prepare for emergency response to *tailings facility* failures and support local level emergency preparedness and response using *best practice* methodologies.

REQUIREMENT 15.1: Prepare[35] and implement a site-specific *Emergency Response Plan* (ERP)[36] based on credible *tailings facility* failure scenarios and the assessment of potential consequences[37], using the knowledge base. ~~Update regularly~~Review at the same interval as *DSRs* (see requirement 11.3), including during closure, and update as required.

REQUIREMENT 15.2: Based on credible *tailings facility* failure scenarios and the assessment of potential consequences, using the knowledge base, ~~M~~*meaningfully engage*[38] employees and/or employee representatives, site contractors, *public sector agencies*, first responders and at-risk communities to participate in emergency planning and implementation, including development of specific *ERPs* for at-risk communities[39].

REQUIREMENT 15.3: For a tailings facility, where the Operator's assessment of the risks of a potential failure scenario based on a credible failure mode indicate a potential of 'Extreme' consequences, the Operator shall ~~M~~*meaningfully* engage with *public sector agencies* and first responders, and other organizations involved in emergency response, ~~for the purpose of developing and implementing a site-specific *Emergency Preparedness and Response Plan* (EPRP). The plan shall assess the capacity and capability of emergency response services[40] and the Operator shall act accordingly~~in the development of an ERP.

REQUIREMENT 15.4: Based on credible *tailings facility* failure scenarios and the assessment of potential consequences, using the knowledge base, ~~Maintain~~ maintain a state of readiness at the mine site and within at-risk communities by taking reasonable steps to train~~ing all~~ appropriate personnel, engaging with *public sector agencies*, first responders and at-risk communities and by testing *emergency response plans* and procedures ~~with all involved stakeholders~~.[41]

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[35] ~~Both t~~The ERP ~~and the EPRP~~ should be developed by experts trained in emergency response planning.

[36] The ERP for the tailings facility may form part of the mine-wide ERP. The tailings facility ERP ~~is disclosed publicly and~~ forms the basis for the collaborative planning ~~of the EPRP~~ as well as developing ERPs for at-risk communities.

[37] The consequences to be addressed in the E~~P~~RP will be based on the findings of inundation studies and will include public and worker safety, health risks associated with the chemical composition of the tailings, and address how environmental damage and loss of infrastructure may influence emergency scenarios. The level of detail required by such inundation studies and runout analyses needs to be defined and informed by a screening level, simplified desktop analysis or review using charts or approximate methods.

[38] ~~ERPs and EPRPs for tailings facility emergencies require engagement and participation of stakeholders due to the risk of loss of life and to support the internal safety culture (see Principle 13).~~

[39] This and other requirements that involve engagement with public sector agencies do not require formal agreements to be established with public sector entities, and the Operator cannot be deemed responsible for the actions of public sector entities.

[40] ~~Where gaps remain in the capacity of public sector agencies to provide required emergency response services for credible failure scenarios, the Operator will provide them.~~

[41] The frequency of training and testing will be based on the regular assessment by a trained emergency response professional as to what is required to achieve and maintain readiness with the distinct stakeholders involved. Training and testing performance results will be ~~disclosed~~evaluated and documented.

PRINCIPLE 16: Prepare for long term recovery in the event of catastrophic failure.

REQUIREMENT 16.1 Based on credible *tailings facility* failure scenarios and the assessment of potential consequences, ~~M~~*meaningfully engage* with *public sector agencies* and other organizations that would participate in medium- and long-term social and environmental post-failure response strategies.

REQUIREMENT 16.2: In the event of *tailings facility disaster*, assess social, economic and environmental *disaster* impacts as soon as possible after people are safe and short-term survival needs have been met.[42]

REQUIREMENT 16.3: In the event of *tailings facility catastrophic failure*, ~~Work~~ work with *public sector agencies* and other stakeholders to facilitate the development of a *Reconstruction and Recovery Plan* that addresses medium- and long-term social, economic and environmental impacts of a *tailings facility disaster*.

REQUIREMENT 16.4: In the event of *tailings facility catastrophic failure*, ~~Enable~~ enable the participation of affected people in restoration, *disaster* recovery works and ongoing monitoring activities. Design and implement plans that take an integrated approach to *remediation, reclamation* and ~~the re-establishment of~~ post-recovery land-uses~~, which may include functional ecosystems~~.

REQUIREMENT 16.5: Facilitate the monitoring and public reporting of post-failure outcomes that are aligned with the thresholds and indicators outlined in the recovery plans and adapt recovery activities in response to findings and feedback.

[42] Disaster impact assessments ascertain the nature and extent of damages and losses, who has been affected and the support that they need, and the potential pathways to transition from emergency to recovery. Multiple aspects of human development should be considered, including the physical environment, economic, social, cultural, psychological, environmental, health, and gender, among others.

TOPIC VI: PUBLIC DISCLOSURE AND ACCESS TO INFORMATION

PRINCIPLE 17: Provide public access to information on *tailings facility* decisions, risks and impacts, management and mitigation plans, and performance monitoring through the appropriate authorities (as required), in a reasonable and proportionate manner consistent with the purpose of this Standard as set out in the Preamble, and subject to the rights of companies to protect their intellectual property and other commercially sensitive information, which are not affected by this Principle.[43]

REQUIREMENT 17.1: ~~Publicly disclose[44]~~ Publish at least annually relevant ~~data and~~ information[45] ~~about the~~related to the safety and integrity of *tailings facilities*~~, and its consequence classification in order to fairly inform interested stakeholders~~including information related to conformance with this Standard and the Operator's determination of the consequence classification of its tailings facilities.[46]

REQUIREMENT 17.2: Respond in a systematic and timely manner to all reasonable stakeholder requests for information about the the safety and integrity of a *tailings facility*, to the ~~fullest~~ extent ~~possible~~ reasonably practicable, consistent with commercial confidentiality, and to fairly inform the interested party making the request.[38]

REQUIREMENT 17.3: Commit to ~~transparency and participate~~ cooperate in reasonable credible global transparency initiatives led by qualified independent organizations to create standardized, independent, industry-wide and publicly accessible databases, inventories or other information repositories related to the safety and integrity of ~~about~~ *tailings facilities*.

[43] ~~Disclosure activities relevant to the tailings facility may be included in a site-wide Communication Plan or Stakeholder Engagement Plan.~~

[44] ~~A fundamental principle that underlies the Standard is that the public is entitled to timely access to information relating to the tailings facility. This information must be made available at no charge, as soon as possible, and in one or more languages as necessary to afford adequate access to interested stakeholders.~~

[45] ~~Relevant information to be disclosed shall at a minimum include those items referred to in Requirements 1.3, 2.3, 2.4, 3.1, 4.2, 4.3, 5.5, 5.6, 7.8, 8.2, 8.4, 9.1, 9.2, 10.1, 10.2, 11.1, 11.4, 11.5, 12.1, 13.5, 14.3, 15.1, 15.3, 15.4, 16.1, and in case of a tailings failure 16.2 16.5, provided that such disclosure: (i) is permitted by subject to applicable law; (ii) may be complied with through relevant regulatory agencies in accordance with applicable legal requirements; and (iii) will in some cases be subject to the consent of external parties (for example where third-party reports and external stakeholder information are involved).~~

[46] Public disclosure should exclude confidential financial and business information or where disclosure would present a risk to operational or physical security. Where relevant information is reported to and made publicly available to or by State authorities, such information may be incorporated by reference into the annual report.

Annex 1: Glossary and Notes

Terms shown throughout the Standard appear in *italics* and are explained below.

Accountable Executive	An appropriately designated person who may be a Director, an Officer, Executive, or Senior Manager, according to Owner's organizational structure ~~A member of senior management~~ who is accountable for the safety of tailings facilities and for minimizing the social and environmental consequences of a tailings facility failure.
Adaptive Management	A systematic (robust and iterative) process for continually improving management policies, practices and decision-making for environmental and social management, by learning from the outcomes of previously employed policies, practices and decisions based on experience and actual changes. *Adapted from: from IPBES (Global Assessment on Biodiversity and Ecosystem Services 2019) and Encyclopaedia of the Anthropocene 2018 citing Stankey et al., 2005, available at, https://www.sciencedirect.com/science/article/pii/B9780128096659093654#bib0310l)*
As Low as Reasonably Practicable (ALARP)	A term used in many jurisdictions and national / international guidelines to refer to the As Low as Reasonably Practicable Principle, which is included with the intent of the Operator's meeting the spirit of ALARP through the use of various risk assessment processes and acting upon results (if needed).
Alternatives Analysis	An analysis that should objectively and rigorously consider all available options and sites for mine waste disposal. It should assess all aspects of each mine waste disposal alternative throughout the project life cycle (i.e. from construction through operation, closure and ultimately long-term monitoring and maintenance). The alternatives assessment should also include all aspects of the project, direct or indirect, that may contribute to the predicted impacts associated with each potential alternative. *https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/guidelines-alternatives-mine-waste-disposal/chapter-2.html*
Best Practices	A procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption. *Merriam-Webster Unabridged Dictionary, available at, https://www.merriam-webster.com/dictionary/best%20practice*
Board of Directors	The ultimate governing body of the Operator typically elected by the shareholders of the Operator firm. The Board is the entity with the final decision-making authority for the Operator and holds the authority to, among other things, set the firm's policies, objectives, and overall direction oversee firm's executives. Where the State serves as the Operator, the Board of Directors shall be understood to mean the government official with ultimate direct responsibility for the final decisions of the Operator.

Change Management System	Changes in projects are inevitable even if there had been detailed studies during the design development, and prior to the construction stage. The changes need to be managed to reduce the negative impacts to quality and stability. The impact and consequences of changes vary according to the type and nature of changes, but most importantly according to how they are managed. Managing changes effectively is crucial to the success of a project. A change management system has the objective of disciplining and coordinating the process, and should include an evaluation of the change, a review and formal approval of the change followed by detailed documentation including drawings, and in some cases changes to equipment, process, flow, information, cost, schedule or personnel.
Critical Controls	A control that is crucial to preventing the event or mitigating the consequences of ~~the~~ an unwanted event taking place. The absence or failure of a critical control would significantly increase the risk despite the existence of the other controls. In addition, a control that prevents more than one unwanted event or mitigates more than one consequence is normally classified as critical. See: ICMM Health and Safety Critical Control Management Good Practice Guide.
Cross-functional	A system or a practice whereby people from different areas of an organization share information and work together effectively as a team.
Construction Records Report	Describes all aspects of the 'as-built' product, including all geometrical information, materials, laboratory and field test results, construction equipment and procedures, changes, non-conformances and their resolution, and construction photographs, amongst others.
Design Basis Report (DBR)	A report that provides the basis for the design, operation, construction monitoring and risk management of a tailings facility.
Designer of Record	Another professional engineer designated by the Engineer of Record to design the tailings facility where the Engineer of Record is an internal professional. Designer of Record is interchangeable with Design Engineer, or Designer.
Deviance Accountability Report (DAR)	A report that provides an assessment of the cumulative impact of changes to the tailings facility on the risk level of the achieved product and that defines the potential requirement for updates to the design, DBR, OMS or the monitoring program

Disaster	A serious disruption to the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts. The effect of the disaster can be immediate and localized, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or those at the national or international levels. See: UN Office for Disaster Risk Reduction terminology: *https://www.unisdr.org/we/inform/terminology*. In this Standard, the word 'catastrophic' is used interchangeably with the word 'disaster'.
Displacement (physical and economic)	'Physical displacement' of people refers to the loss of dwellings or other assets resulting from project-related land acquisitions and/or land uses that require affected persons to move to another location. 'Economic displacement' refers to loss of assets or access to assets and the resulting loss of income sources or other means of a livelihood as a result of project-related land acquisition or land use.
~~Emergency Preparedness and Response Plan (EPRP)~~	~~A community-focused tool for strategizing with relevant stakeholders in the context of emergency preparedness and disaster risk management. It includes measures to identify hazards faced by stakeholders and communities from different sources, assess capacity and capability of public sector agencies and first responders, identify gaps in preparedness and strategies to close the gaps. It includes measures to help at-risk communities to safeguard lives and assets by improving knowledge of hazards, how to respond, and to strengthen local response and remediation capacities. Adapted from APELL *Awareness and Preparedness for Emergencies at Local Level* (2015) and ICMM/UNEP *Good Practice emergency preparedness and response (2005).*~~
Emergency Response Plan (ERP)	According to State requirements and/or various national and international guidelines, a site-specific plan developed to identify hazards, assess and prepare for an emergency and to respond if it occurs. ERPs are tools to prepare for onsite response to identified hazards and a range of credible emergencies. Such plans also identify any necessary coordination with off-site emergency responders and communities and state agencies should consequences extend off the mine property. The tailings facility ERP may be part of the mine-wide ERP. The ERP may also include a community-focused tool for strategizing with relevant stakeholders in the context of emergency preparedness and disaster risk management. It may include measures to help at-risk communities to safeguard lives and assets by improving knowledge of hazards, how to respond, and to strengthen local response and remediation capacities.

	~~A detailed, site-specific plan developed to identify hazards, assess and prepare for an emergency and to respond if it occurs. Best practice mine ERPs are internal plans to prepare for onsite response to identified hazards across the entire mine operation and to prepare detailed response activities for a range of credible emergencies. Such plans also identify any necessary coordination with off-site emergency responders and communities and state agencies should consequences extend off the mine property. The tailings facility ERP may be part of the mine-wide ERP.~~
Engineer of Record (EOR)	The qualified engineer who is responsible for confirming that the tailings facility is designed, constructed, operated, and decommissioned with appropriate concern for health, safety and the environment, and that it aligns with and meets applicable regulations, statutes, guidelines, codes, and standards (*after Site Characterization for Dam Foundations in BC, EGBC, 2016*). Qualification does not refer to certification, per se, but means that the individual possesses relevant experience. In some highly regulated jurisdictions, notably Japan, the role of EOR is undertaken by the responsible regulatory authorities. For more information, please refer to PRINCIPLE 12: Appoint and empower an Engineer of Record.
Environmental and Social Management System (ESMS)	Scaled to the nature and size of an operation, an ESMS helps companies integrate the rules and objectives for the management and mitigation of environmental and social impacts into core business operations, through a set of clearly defined, repeatable processes. An effective ESMS is a dynamic and continuous process initiated and supported by management, and involves engagement between the Operator, its employees and contractors, project affected people and, where appropriate, other stakeholders.
Existing Facility	A mine tailings facility that meets any of the following criteria: (1) the facility is accepting new mine tailings on the date that the Standard takes effect; (2) the facility is closed or is not currently accepting new mine tailings but is still being actively managed by an Operator on the date that the Standard takes effect; or (3) a facility has been proposed for construction as evidenced by the filing of a complete application for a license or permit to build the facility before the date that the Standard takes effect. For an application to be deemed 'complete' under this definition, the Operator must have completed all necessary processes for site selection and technology design and the application must contain all of the information necessary for the approving agency to make a final decision on the application without significant amendments.
Grievance Mechanism	A non-judicial grievance mechanism is 'effective' when it is: legitimate; accessible; predictable; equitable; transparent; rights compatible and a continuous source of learning. In addition, operational-level mechanisms should be based on engagement and dialogue. See:

	https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf A grievance is a perceived injustice evoking an individual's or a group's sense of entitlement, which may be based on law, contract, explicit or implicit promises, customary practice, or general notions of fairness of aggrieved communities.
Hazard	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. It may be a natural or a technological (human built) hazard. Adapted from UNEP program *APELL*.
Human Rights Due Diligence	Involves an ongoing management process that a reasonable and prudent Operator would undertake to meet its responsibility to respect human rights under the UN Guiding Principles on Business and Human Rights. This process should identify, prevent, mitigate and account for how the Operator addresses their impacts on human rights. See: *https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf*
Impact Assessment	A decision-making support instrument which aims to identify, predict, evaluate and mitigate social, biophysical and other relevant environmental effects of development proposals, prior to major decisions and throughout the lifecycle of a project. Assessments should consider impacts that are chronic and cumulative, and those that are sudden and acute. While studies typically focus on a single project, impact assessments can be scoped at the landscape level, and consider strategic environmental, economic and social matters. Depending on the context, the circumstances, and the issues at hand, impact assessment studies can be stand-alone, or may be conducted as an integrated set of studies. This Standard encourages two types of impact assessment: (i) regular and scheduled impact assessments; and (ii) impact assessments that are triggered by a change to either the facility or the external context. In addition to describing the overall aims and objectives, agreed principles for the application of impact assessments are defined by the International Association of Impact Assessment (IAIA). See: *www.iaia.org* and see also *https://www.ipbes.net/glossary.*
Incremental Loss	This is the loss over and above that which would be caused by the hypothesised flood or earthquake where no tailings facility exists. For a more detailed discussion of the meaning of incremental loss, see *British Columbia Ministry of Forests, Lands and Natural Resource Operations, Downstream Consequence of Failure Classification Interpretation Guideline, March 2017* *https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/dam-safety/con_class_guidelines_for_owners-2017.pdf* *NSW Dam Safety Committee, Consequence Categories For Dams, June 2010, updated November 2015* *https://www.damsafety.nsw.gov.au/DSC/Download/Info_Sheets_PDF/Dam/DSC3A.pdf* *The preceding references are free of charge. See also guidelines*

	produced by ICOLD, https://www.icold-cigb.org/, ANCOLD, https://www.ancold.org.au/, and CDA, https://www.cda.ca/
Independent Tailings Review Board (ITRB)	Provides high-level, independent technical review of the design, construction, operation and closure of tailings facilities. The expertise of the ITRB members relates to the specific technical aspects of the tailings facility site, material and design characteristics. In some highly regulated jurisdictions, notably Japan, the role of ITRB is undertaken by the responsible regulatory authorities.
Inundation Study	A study that assumes a hypothetical failure of the tailings facility and estimates the inundation area, flow arrival times, depth and velocities, duration of flooding, and depth of material deposition. It is based on hypothetical and credible scenarios not connected to probability of occurrence. It is primarily used to inform the emergency preparedness and response planning and the dam classification. The dam classification is then used to inform the design criteria. Refinements are ongoing to make these more realistic and applicable to tailings facilities.
Major Hazard Risk	Safety can be divided into two types: occupational safety and safety with respect to major hazards. Major hazards in the mining industry include tailings facility failure, pit wall failure and underground coal mine explosion amongst others. The indicators of how well major hazard risk is managed are necessarily quite different from the indicators used for occupational safety. Major hazard risk management focuses on low probability, high consequence events.
Meaningful Engagement	Described by the United Nations (UN), The World Bank, the International Finance Corporation (IFC), the Organization for Economic Cooperation and Development (OECD), the Inter-American Bank, amongst other international and multilateral organizations and agencies, as a process whereby project proponents not only have an obligation to consult and listen to stakeholder perspectives, but also have an obligation to take their perspectives into account. Meaningful engagement involves understanding and addressing structural and practical barriers to the active participation of diverse groups of people, for example: women, ethnic minorities, people who live in remote areas, and/or different language groups. ~~Access to relevant information that can be reasonably understood by the external party is a precondition of meaningful engagement.~~
New Facility	A mine tailings facility proposed for construction by an Operator who has not yet filed a complete application for a license or permit to build the facility before the date that the Standard takes effect.
Observational Method	A continuous, managed, integrated, process of design, construction control, monitoring and review that enables previously defined modifications to be incorporated during or after construction as appropriate. All of these aspects must be demonstrably robust. The objective is to achieve greater overall safety. See *Peck, R.B. (1969) 'Advantages and Limitations of the Observational Method in Applied Soil Mechanics' Ninth Rankine Lecture, Geotechnique, Vol.19, No.2, 171-187.*

Operator	Any person, corporation, partnership, ~~owner, affiliate, subsidiary,~~ joint venture, or other entity, including any State agency, that operates ~~or controls~~ a tailings facility.
Parent Corporation	The ultimate owning company usually listed on a stock exchange. Where the ultimate owner is an arm of government or a government-owned entity, the reference is to that arm or entity.
Project-affected People	For the purposes of this Standard, project-affected people are those people experiencing impacts of any kind, either positive or negative, directly from a tailings facility ~~either directly or indirectly~~. Impacts may include economic and/or physical displacement, disruption of ecosystem services, changes to cultural or social well-being, or a decline in the determinants of mental or physical health, amongst others. People affected by a tailings facility may include, for example, people who live nearby; people who hear, smell or see the project; or people who might own, reside on, or use the land on which the project is to be located or may potentially inundate. International standards require developers to identify the inherent and potential vulnerability of different PAPs, as this can influence a person or group's experience of impacts and corresponding responses. See: *IFC Environmental and Social Performance Standard 1 Assessment and Management of Environmental and Social Risks and Impacts.*
Public Sector Agencies	Refers to all governmental agencies at the State, regional, and/or local level with some responsibility or authority for regulating mining activities that occur within or impact their jurisdictions.
Reclamation	Refers to the process of restoring land to a useable state. Further measures are required to restore land to the state prior to exploitation including the restoration of functional ecosystems.
Remediation	Refers to the immediate approach to neutralize hazards after a tailings failure incident (of any scale).
Respect for Human Rights	The business responsibility to 'respect' human rights is a global standard of expected conduct, defined by the UN Guiding Principles on Business and Human Rights. Respect means that businesses should avoid infringing on the human rights of others and address adverse human rights impacts with which they are involved. The Guiding Principles make clear that efforts to promote or support human rights cannot be used to offset negative human rights impacts elsewhere in a company's operations. See: *https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf*
Responsible Tailings ~~Facility Engineer~~Person (~~RTFE~~RTP)	An ~~engineer~~ person appointed by the Operator to be responsible for the tailings facility. The ~~RTFE~~RTP must be ~~available~~ involved at all times during construction, operations and closure. The ~~RTFE~~RTP has clearly defined, delegated responsibility for management of the tailings facility and has appropriate qualifications compatible with the level of complexity of the tailings facility. The ~~RTFE~~RTP is responsible for the scope of work and budget requirements for the tailings facility, including risk management. The ~~RTFE~~RTP may delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel.
Robust Design	The robustness of a tailings facility depends on each particular situation and it may be associated with various aspects, for example, the

	factor of safety against each of the potential failure modes, the presence or absence of materials with brittle behaviour, the degree of brittleness of these materials, the degree of variability of the materials, the potential for thresholds of deformation that significantly affect the facility performance. The degree of robustness is related to the facility maintaining its overall integrity despite less than ideal performance of one or more of its components.
Risk	The risk of a tailings facility failure is the product of consequence and likelihood of failure.
Senior Technical Reviewer	A professional with in-depth knowledge and at least 15 years' experience in the specific area of the review requirements, e.g. tailings design, operations and closure; environmental and social aspects or any other specific topic of concern. In some highly regulated jurisdictions, notably Japan, the role of Senior Technical Reviewer is undertaken by the responsible regulatory authorities.
State	A term used broadly in the context of this Standard to encompass all relevant public sector agencies
Tailings	A by-product of mining, consisting of the processed rock or soil left over from the separation of the commodities of value from the rock or soil within which they occur.
Tailings Facility	A facility that is designed and managed to contain the tailings produced by the mine. Tailings can be placed in mined-out underground mines, in open pit mines and on external surface facilities. Tailings can be produced and managed as slurry-based (a mixture of solids and water) at various moisture contents ranging in appearance from a watery mixture to a less watery mixture to paste and to a dryer material that has been filtered. Tailings slurry in a surface facility is contained by dams constructed of borrow materials including soil and rock as well as tailings. Dryer materials, like filtered tailings, can be contained by rock piles. Facilities that have been safely closed and principally require monitoring and limited maintenance to ensure effective closure measures, and that have achieved a "landform" status or similar non-flowable conditions as determined by the EoR, with review by the independent senior technical reviewer or ITRB, are not subject to the Standard.
Tailings Facility Lifecycle	The succession of phases in the life of a facility consisting of: • project conception, planning and design • initial construction • operation and ongoing construction • closure (including temporary closure, care & maintenance) • post-closure (including reclamation, relinquishment, reprocessing, relocation, removal) *Adapted from MAC Guide to the Management of Tailings Facilities 2017 Mining Association of Canada*).
Tailings Management System (TMS)	An overarching system to support the safe operation and management of a tailings facility throughout its lifecycle to meet the Requirements of the Standard. The TMS should follow the well-established Deming cycle (Plan, Do, Check and Act). Each Operator should develop a TMS that best

	suits their organization and tailings facilities. A TMS includes elements such as: establishing policies, planning, designing and establishing performance objectives, managing change, identifying and securing adequate resources (qualified personnel, equipment, scheduling, data, documentation and financial resources), conducting performance evaluations and risk assessments, establishing and implementing controls for risk management, auditing and reviewing for continual improvement, implementing a management system with clear accountabilities and responsibilities, preparing and Implementing OMS, EPP, and ERP. Components of the TMS may overlap or link with site-wide management systems. In this case, these systems should be integrated.
Trigger Action & Response Plan (TARP)	A planning tool used for managing or responding to critical situations caused by specific events.

Annex 2: Consequence Classification

Commented [ICMM9]: This section should be directly aligned with ICOLD 2019 draft (see cover letter to submission) and the language adjusted accordingly.

Tailings facilities are classified according to the potential severity of the consequences of a worst-case failure assuming no mitigative measures are in place. This Standard adopts the Consequence Classification Matrix set out in Table 1 (below), which is a slightly modified version of a draft matrix proposed in 2019 by the International Commission on Large Dams (ICOLD). The Matrix involves five levels of severity (at the left side of Table), ranging from 'Low' to 'Extreme', and a number of loss categories (across the top): potential population at risk, loss of life, environment, health social and cultural, infrastructure and economics, and livelihoods. The Consequence Classification of a tailings facility is assigned based on the most severe consequence among these loss categories. For example, if the hypothesized failure could cause catastrophic loss of critical habitat or rare and endangered species, the consequence classification of the tailings facility will be 'Extreme', even though no loss of life was expected. The types of losses described above do not include the consideration of economic and reputational losses to the mining company itself.

The descriptions of potential loss in the Matrix do not mean acceptance of those losses. They are identified as impact levels that trigger specific or additional requirements for planning, design and implementation of remedial measures to reduce the likelihood of those losses to negligible.

This classification has at least ~~five~~ six uses:

- Assist tailings facility designers in establishing design criteria for new facilities, in particular the external loading applied by floods and earthquakes;
- Provide guidelines for the design, construction, management and monitoring of existing facilities; the Standard recognizes that the design criteria may not be practicable for existing facilities, and may be modified by the Accountable Executive, with input from the EoR and independent senior technical reviewer or ITRB;
- Trigger an escalation of decision-making to the *Board*;

- Define some of the *TMS* requirements;
- Allow comparison across a portfolio of facilities, either within an *Operator*'s inventory or within a given jurisdiction; and
- Communicate with the public and regulators about the potential *hazard* levels and support the development and implementation of realistic *EPRP*.

Where the consequence of failure includes loss of life, tailings facilities must be designed, built and operated so that there is a negligible likelihood of failure. Table 2 (below) sets the criteria for external loading, applied by floods and earthquakes. These criteria mean the tailings facility will be designed to withstand floods and earthquakes very much greater than any known previous flood or earthquake in the region where the tailings facility is or will be located, making the likelihood of failure due to floods and earthquakes negligible. The Standard also includes a number of requirements across all stages of the tailings facility lifecycle to achieve the goal of negligible likelihood of failure.

It is reasonable for designers to choose less restrictive designs for tailings facilities with a Consequence Classification of 'Low' or 'Significant'. These are the facilities where the potential consequences of a hypothetical failure do not include loss of life (or other loss categories, see Table 1). However, it is noted that the criteria set out in Table 2 for 'Low' or 'Significant' Consequence Classifications also involve designing to withstand floods and earthquakes very much greater than any known previous flood or earthquake in the region of the tailings facility. Moreover, the Standard also requires that any less rigorous tailings facility design allows for the possibly of a later upgrade to a more rigorous level, should the consequence level increase, for instance as a result of people settling in downstream areas.

The likelihood of a tailings facility failure cannot be rendered negligible by the use of stringent design criteria alone. This needs to be complemented by other measures such as the correct implementation of the design, quality construction and good management practices. In particular, inappropriate management decisions years or decades later (e.g., enlarging tailings facilities without following proper procedures) can dramatically increase the likelihood of failure in ways that are beyond the control of tailings facility designers. For this reason, the Standard endorses a number of other Requirements for reducing the likelihood of failure and it adds a further line of defence, which is to minimize the potential consequences of failure.

For new facilities pPossible ways to minimize consequences include: negotiating to resettle downstream populations, negotiating with local authorities to prevent future occupancy of land in the inundation area, changing the location of the tailings facilities, changing the technology used or the design to non-flowable facilities, or by some other means. Some of these measures may be beyond the authority of *Operators* and may require the participation of the State. The Consequence Classification can provide the trigger to escalate decisions about 'Very High' to 'Extreme' consequence tailings facilities to the *Board* so that it is aware of the material risks to which it is exposed and is able to take informed decisions. These include go/ no go decisions or approval of capital investments.

This Standard requires that tailings facilities be designed for the most severe level in the Consequence Classification Matrix, unless it can be demonstrated that a lower classification is appropriate. If this is demonstrated, it is also required that the design and construction be such that a future upgrade of the facility to a higher classification remains feasible. This approach recognizes that, given the longevity of tailings facilities, and the potential for population growth, in-migration and economic development downstream of a tailings facility, the consequences of a potential failure are likely to increase over time. Downstream development is not within the exclusive control of *Operators*, and in some cases is accelerated by the economic opportunities that the mine brings. The Standard addresses the fact that an adequate design and construction at one point in time may be rendered inappropriate and it could be difficult and/or costly to upgrade later if that is not considered during initial planning and design.

Commented [ICMM 210]: This paragraph will need to aligned to our changes to Principle 4

Finally, it is important that the Consequence Classification is not interpreted as a 'risk level'. Risk is a factor of both the consequences and the probability of the event occurring. By contrast, the consequence classification of a tailings facility is assessed independently of its probability of failure for the reasons discussed above. As noted earlier, the design of a tailings facility is intended to reduce the probability of failure to negligible levels.

Table 1: Consequence Classification Matrix

Dam Failure Consequence Classification	*Incremental Losses*					
	Potential Population at Risk	Potential Loss of Life	Environment	Health, Social & Cultural	Infrastructure & Economics	Livelihoods
Low	None	None expected	Minimal short-term loss or deterioration of habitat or rare and endangered species.	Minimal effects and disruption of business. No measurable effect on human health. No disruption of heritage, recreation, community or cultural assets.	Low economic losses; area contains limited infrastructure or services. <US$1M	Up to 10 household livelihood systems disrupted and recoverable in the short term. No long-term non-recoverable loss of livelihoods.
Significant	Temporary only	None expected	No significant loss or deterioration of habitat. Potential contamination of livestock/fauna water supply with no health effects. ~~Process water low potential toxicity. Tailings not potentially acid generating and have low neutral leaching potential.~~ Restoration possible within 1 to 5 years.	Significant disruption of business, service or social dislocation. Low likelihood of loss of regional heritage, recreation, community or cultural assets. Low likelihood of health effects.	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes. <US$10M	Up to 10 household livelihood systems disrupted and recoverable in the longer-term; or Up to 100 household livelihood systems disrupted and recoverable in the short-term. No long-term non-recovera of livelihoods
High	10-100	1 - 10	Significant loss or deterioration of critical habitat or rare and endangered species. Potential contamination of livestock/fauna water supply with no health effects. Process water moderately toxic. ~~Low potential for acid rock drainage or metal leaching effects of released tailings.~~ Potential area of impact 10 km^2 - 20 km^2. Restoration possible but difficult and could take > 5 years	500-1,000 people affected by disruption of business, services or social dislocation. Disruption of regional heritage, recreation, community or cultural assets. Potential for short term human health effects.	High economic losses affecting infrastructure, public transportation, and commercial facilities, or employment. Moderate relocation/compensation to communities. <US$100M	Up to 10 household livelihood syst and non-recoverable; or Up to 50 household livelihood disrupted and recoverable over the term; or Up to 200 household livelihood systems disrupted and recoverable in the short term.
Very High	100-1000	10 to 100	Major loss or deterioration of critical habitat or rare and endangered species. ~~Process water highly toxic. High potential for acid rock drainage or metal leaching effects from released tailings.~~ Potential area of impact >20 km^2. Restoration or compensation possible but very difficult and requires a long time (5 years to 20 years).	>1,000 people affected by disruption of business, services or social dislocation for more than one year. Significant loss of national heritage, community or cultural assets. Potential for significant longer-term human health effects.	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities, for dangerous substances), or employment. High relocation/compensation to communities. <US$1B	Up to 50 household livelihood systems lost and non-recoverable; or Up to 200 household livelihood systems disrupted and recoverable over the longer-term; or Up to 500 household livelihood systems disrupted and recoverable in the short term.
Extreme	> 1000	More than 100	Catastrophic loss of critical habitat or rare and endangered species. ~~Process water highly toxic. Very high potential for acid rock drainage or metal leaching effects from released tailings.~~ Potential area of impact > 20 km^2. Restoration or compensation in kind impossible or requires a very long time (>20 years).	>5,000 people affected by disruption of business, services or social dislocation for years. Significant national heritage or community facilities or cultural asset destroyed. Potential for severe and/or longer-term human health effects.	Extreme economic losses affecting critical infrastructure or services, (e.g., hospital, major industrial complex, major storage facilities for dangerous substances) or employment. Very high relocation/compensation to communities and very high social readjustment costs. >US1B	More than 50 household livelihood systems lost and non-recoverable; or More than 200 household livelihood systems disrupted and recoverable in the longer-term; or More than 500 household livelihood systems disrupted and recoverable in the short term.

Commented [ICMM11]: Recommend changing to align with ICOLD 2019 draft (see cover letter to submission).

Commented [ICMM12]: These are contributing factors that should be considered in the assessment of incremental loss, but not a measure of loss, so should be deleted to avoid confusion. They could be included in the forthcoming ICMM guidance document.

Table 2: External loading criteria required by the Standard

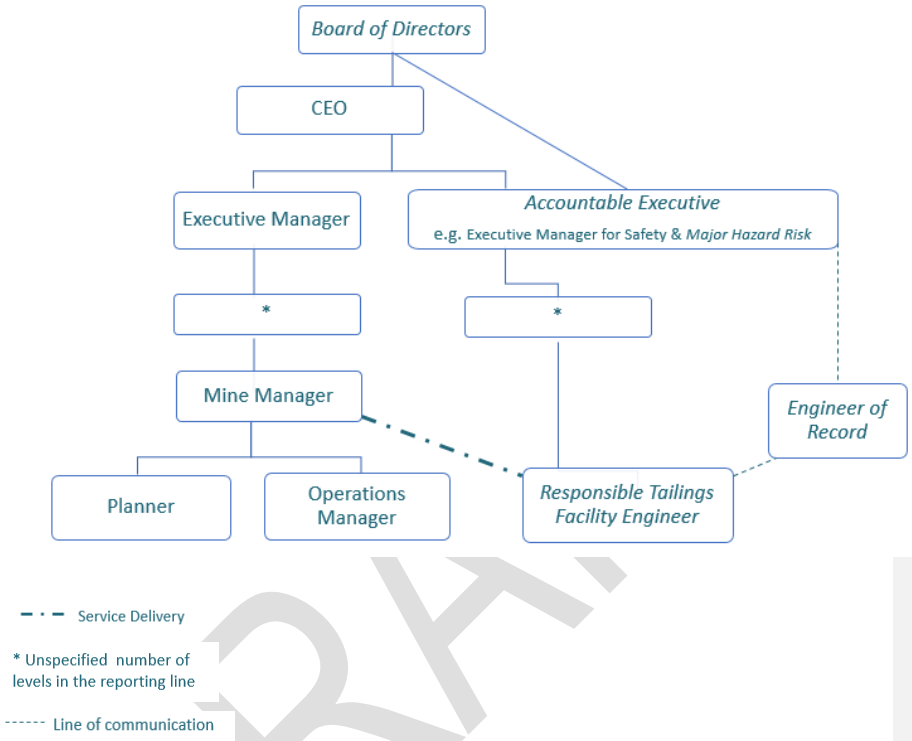
Dam Failure Consequence Classification	Design Flood Annual Exceedance Probability	Design Ground Motion Annual Exceedance Probability
Low	1/2500	1/2500
Significant		
High	1/5000	1/5000
Very High		
Extreme	1/10000 or PMF*	1/10000 or MCE**

* PMF Probable Maximum Flood
** MCE Maximum Credible Earthquake

Commented [ICMM13]: These should be changed to align with the requirements of ICOLD 2019 draft.

~~Annex 3: Outline of the Organizational Structure referred to in the Standard~~

Commented [ICMM14]: Delete the organisation chart in Annex 3 as it is flawed, prescriptive and not appropriate for inclusion in a standard.



Rationale for ICMM comments on the Consultation Draft of Global Tailings Standard

**Note1: Wherever mention is made of footnotes in the 'Rationale' column, the original numbering in the consultation draft of the standard is referenced.*

Topic/Principle/Requirement	Observation/rationale for suggested changes
Overview of Standard "To demonstrate this respect, project-affected people must be afforded opportunities for meaningful engagement in decisions that affect them."	The phrase "decisions that affect them" is potentially very far reaching and needs to be further qualified.
Overview/intro	Subject to the content of the standard being modified as a result of the consultation feedback, further changes will need to be made to this section to bring it into alignment. The term "specified measures" is very unclear, so we have proposed edits that anchors this to best practice. The statement "Operators are also expected to innovate and apply new technologies and mining methods that reduce risks and minimize consequences should problems arise", is at odds with the concept of best management practices (BMPs) outlined in the Standard. BMPs are generally accepted by the industry. Innovation implies developing new techniques and approaches which don't become BMPs until proven to be effective. The responsibility for innovation and advancement of new technology is better placed at an industry level – individual operators will be reluctant to develop and apply unproven techniques and approaches where risks may be uncertain. Our wording seeks to address this. The deletion of the sentence on the 'observational method' is due to concerns that it could lead to negligence in monitoring of other critical information not related to the observational method but which is required for design basis/intent verification.
The Essential Role of the State The Standard is not intended to displace or pre-empt any requirement of applicable law and where conflicting, applicable law shall prevail.	Request that the current wording should be strengthened is intended to reflect the concerns of Japanese members, where national legal requirements are especially stringent. Reference to applicable law should also refer to other requirements that are binding on companies such as stock exchange rules/requirements.
The role of other stakeholders	The International Commission on Large dams (ICOLD) and its national member bodies such as ANCOLD and CDA are also important stakeholders that should be mentioned. We recommend including them here as these bodies have a critical role to play and there is no mention of them to this point in the document.

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Implementation The implementation process will require the following elements: ▪ a process for approving or conditionally approving assurance ▪ the power to revoke or suspend assurance where necessary	These requirements are unclear as worded and assume the creation of an independent entity charged with determining compliance with the Standard. ICMM has not committed to the creation of such a body. ICMM members have credible 3rd party assurance/audit processes in place for a number of the requirements of the standard (e.g. linked to ICMM's Performance Expectations, ISO certification, Independent Tailings Review Boards (ITRBs) or related stewardship processes that include independent review etc.) yet there is no recognition of this. The suggested addition at the end of this section signals that where companies have processes in place to independently assure their EHSC management systems, or have credible independent oversight of aspects of the standard covered by IFC's performance standards, ICMM's performance expectations, RJC, IRMA, etc., this would suffice and avoid duplication.
Implementation – clarification about compliance vs conformance, and equivalency	Reference to compliance (which is usually used for legal requirements) should be switched to conformance (which is commonly applied to standards). The International Commission on Large dams (ICOLD) and its national member bodies such as ANCOLD and CDA are also important stakeholders that should be mentioned. They have developed a significant body of technical and operational information that needs to be referenced. They also provide existing procedures, approaches and systems that will support implementation.
Preamble This Standard strives towards the ultimate goal of zero harm to people and the environment and zero tolerance for human fatality.	"Zero harm" is potentially problematic as it is not auditable. Better to reference the agreed objective of the Global Tailings Review (i.e. the prevention of catastrophic failures of tailings facilities)
Overarching The use of the terms 'tailings facility', 'facility' and 'facilities' - and the definition of 'Existing facility	The terms 'tailings facility', 'facility' and 'facilities' are used frequently in the Standard, but the definition of "Existing facility", which imposes heightened requirements on such facilities, does not distinguish between new, existing, and closed facilities. The definition of "existing facility," should be remedied to address these concerns. Importantly, throughout the text, greater precision is needed to clarify whether requirements apply to new, existing, closed or all facilities.
References to climate change in footnotes to requirements 1.1 and 2.3	For climate change, the Standard acknowledges uncertainties but should also refer to adaptive management and climate resilience.

Topic/Principle/Requirement	Observation/rationale for suggested changes
References to best practices throughout the standard	The Standard must recognise that there is no one “best practice” that applies to every tailing facility. A range of good practices can provide safe and acceptable tailing facility management.
Topic I: KNOWLEDGE BASE	
Principle 1: Develop and maintain an updated knowledge base to support safe tailings management across the *tailings facility lifecycle*.	Use of term ‘updated’ redundant as already implied by ’maintain’. The term ‘knowledge base’ should be defined in the glossary.
1.1: Develop and regularly update knowledge about the social, economic and environmental context of a tailings facility, aligned with international *best practice*. FN4: This knowledge should capture the uncertainties associated with variations due to climate change.	Regularly update is ambiguous – we have applied the logic outlined in 2.4 to indicate when updates are required. For FN4, this should also reflect a focus on adaptive management and climate resilience.
1.2: Prepare and regularly update detailed site characterization of the tailings facility site(s) that includes geomorphology, geology, geochemistry, hydrogeology, geotechnical, seismicity and hydrology. The physical and chemical properties of the tailings shall be determined and regularly updated.	The terms site characterisation is unclear and should be defined in the glossary. Regularly update is ambiguous and some of this data is currently only collected during large scale projects or expansions. See previous comment under 1.1.
1.3: Where there is a potential for flow failure, conduct and regularly update an inundation study for the tailings facility using a methodology that considers credible hypothetical failure modes, site conditions, tailings facility conditions, hydraulic routing models of the slurry, and the amount of tailings and downstream materials entrained in the outflow. The results of the study should include estimates of the inundation area, flow arrival times, depth and velocities, duration of flooding, and depth of material deposition.	The requirement requires a full inundation study (quantitative dam breach assessment) to be completed for any facility, regardless of consequence, We suggest breaking the requirement into two as in the edited text. The terms ‘inundation zone’ should be defined in the glossary.
1.4: Identify stakeholders and how they are related to the tailings facility site, inundation area and impacted area; collect land, livelihood and demographic data for groups most at risk from a tailings facility failure.	Not all facilities have a credible failure mechanism that results in an inundation area. The focus and resources should be placed on those with credible failure modes.

Topic/Principle/Requirement	Observation/rationale for suggested changes
FN6: The area of potential impact may be larger than the inundation area. FN7: Data collection should include participatory processes, follow established ethical research protocols, and consider matters of privacy and data sovereignty. A comprehensive approach would include data and information relating to: the physical environment within which people live and work, natural resources and built infrastructure; social, economic, legal, cultural and political systems, norms and rules that govern how people interact with the environment and with each other; the population within the study area, demographic patterns and human activities or issues in the area; boundaries that demarcate rights over the ownership, and use of land and territory.	The term 'groups' at risk is introduced here, as well as 'project affected people' and other similar terms. It is important to either apply a limited number of terms consistently and to define these in the glossary. In many instances where these terms are used, it is also important to limit the definition to those that will be potentially directly impacted by a failure.
Principle 2: Integrate the social, economic, environmental and technical information to select the site and the technologies to minimize the risk of tailings facility failure FN9: The Standard does not ban any specific design technology, such as upstream tailings facilities. Banning particular technologies was outside the Expert Panel's scope of work, available here: https://globaltailingsreview.org/about/scope/	The term 'technology' implies you need equipment, whereas 'approaches' is more inclusive and therefore more appropriate.
2.1: Undertake a formal, multi-criteria alternatives analysis of all feasible sites and technologies for tailings management with the goal of minimizing risk to people and the environment. Use the knowledge base to inform this analysis and to develop facility designs, inundation studies, a monitoring program, Emergency Preparedness and Response Plans (EPRP), and closure and post-closure plans.	The term 'technologies' implies the use of equipment as opposed to management approaches. Current wording implies that significant work should be undertaken for all alternatives, rather than the preferred alternative. Need to clarify that this should apply to new facilities rather than existing facilities. We have also suggested re-wording the requirement to improve clarity. Later in the document we recommend streamlining *Emergency Response Plans* (ERPs) and *Emergency Preparedness and Response Plans* (EPRPs) into a single plan, as a better way is to maintain an overarching ERP for the entire site.
2.2: Engage an Independent Tailings Review Board (ITRB) or an independent senior technical reviewer with no conflicts of	The conflicts of interests clause is too restrictive. The Standard must acknowledge that many firms and engineers having the relevant technical qualifications will continue to work with mining companies, and that such engagements and relationships do not disqualify them from serving in an

Topic/Principle/Requirement	Observation/rationale for suggested changes
interest to assess and review the alternatives analysis for site and technology selection.	independent role at sites where they are not engaged by the Operator for other work. Excluding them from these roles would likely increase rather than decrease risks by preventing qualified individuals from performing them. There are insufficient global engineering resources to implement an ITRB for all tailings facilities, and the Standard could divert resources from facilities having the most significant risks to those with far lower risks unless it takes that issue into account.
2.3: Use the knowledge base to assess the social, economic and environmental impacts of the tailings facility and its potential failure. Develop impact mitigation and management plans, and meaningfully engage potentially affected communities in the process. FN10: Given the long-term nature of a tailings facility, the Operator is encouraged to address uncertainties around climate change and its potential impacts on environmental and social conditions and trends FN11: This Requirement applies the mitigation hierarchy to consequences or impacts and where avoidance is not feasible, to first minimize the impacts and then include measures to allow future compensation for remaining impacts to the extent they occur. See IFC 2012 Performance Standards on Environmental and Social Sustainability, PS1 Assessment and Management of Environmental and Social Risks and Impacts (p.6), and PS 6 Biodiversity Conservation and the Sustainable Management of Living Natural Resources requirement 7.	The impacts are hypothetical, and the standard should avoid possible interpretation that 'failure' is an eventual outcome – the vast majority of tailings facilities never fail. For new projects or major changes to existing projects, this is duplicative as it should be addressed in the Environment and Social Impact Assessment (ESIA) process. 'Potentially affected communities' should be defined in the glossary and limited to those directly impacted by a failure. FN10 is too broad and should be limited to the impact of climate change on the facility, not on environmental and social conditions and trends. FN11: The reference to "allow future compensation" should be aligned with the IFC performance standards listed to faithfully reflect the wording that they use.
2.4: Update the assessment of the social, economic and environmental impact and update stakeholder identification and information for any material change to the tailings facility, the social or environmental context or conditions. If new data indicates that the impacts from the tailings facility differ from those assumed in the original assessments, the management of the facility shall be adjusted to reflect the new data using adaptive management best practices.	Suggest we say "updated", rather than "adjusted", as there may be times where no adjustment is necessary. We are not sure that adaptive management is the correct term?

Topic/Principle/Requirement	Observation/rationale for suggested changes
2.5: The amount of financial assurance shall be reviewed periodically and updated based on estimated closure and post-closure costs.	Current wording is very general, and glossary doesn't specify what financial assurance is. Many smaller mining companies will not be able to provide financial assurance and will not accept the standard. States are the principal authorities in a position to require and hold financial assurance and are the only legal stakeholder to set and apply such requirements. Further, where States do not have existing requirements for financial assurance for tailing facilities covered by the Standard, there may not be a party with the authority, expertise, and interest in holding financial assurance. Our suggested edits attempt to ensure adequate financial capacity to address closure and post-closure, while balancing the need to address the concerns mentioned above.
2.6: Taking into account actions to mitigate risks, the Operator will consider obtaining appropriate insurance to the extent commercially reasonable or providing other forms of financial assurance if appropriate to address risks relating to the construction, operation, maintenance, and/or closure of a tailings facility	There is no clarity on what the insurance would have to cover and for how many tailings facilities in a company portfolio? It is not realistic to have cumulative insurance coverage for all tailings facilities in the company. Also the term "commercially reasonable" is unclear. As it reads, this clause is not auditable and is unrelated to the prevention of catastrophic failure of TSFs. We suggest deleting it.
Topic II: AFFECTED COMMUNITIES	
PRINCIPLE 3: Respect the rights of project-affected people and meaningfully engage them at all stages of the tailings facility lifecycle. FN12: As defined in the UN Guiding Principles on Business and Human Rights (UNGP). Demonstrating respect for indigenous peoples rights may involve obtaining their 'free prior and informed consent' (FPIC), as outlined in the ICMM Indigenous Peoples and Mining Position Statement.	'Meaningfully engage' needs clarification in definitions. As written, it assumes constructively engaged parties, but does not account for situations where one or more parties are hostile. It is also difficult to audit. Realistically, not all "project-affected people" can be meaningfully engaged on technical decisions for which they would not have adequate knowledge. The definition in the glossary and FN18 need to be aligned. Wording of FN12 references ICMM's position statement but is not aligned in one important respect: our suggested edits correct this.
3.1: Demonstrate respect for human rights by conducting human rights due diligence to understand how a tailings facility failure may cause or contribute to adverse human rights impacts, including impacts on the individual and collective rights of indigenous peoples and tribal peoples. FN12: As defined in the United Nations Guiding Principles on Business and Human Rights (UNGP). Demonstrating respect for indigenous peoples rights may involve obtaining their 'free	The UN Guiding Principles should be clearly recognized as equivalent. These cover indigenous peoples, which we suggest be footnoted, so separate references to indigenous peoples are unnecessary. Further, the Standard should acknowledge that human rights due diligence is covered by other State processes that regularly occur. Concern that the reference to "free, prior and informed consent (FPIC)" in FN12 should not be interpreted as requiring FPIC for the planning, design and construction of a TSF separate from that required for a new mining project, unless a TSF is added as part of a major expansion. The wording should also be changed to faithfully align with ICMM's position statement on Indigenous Peoples and

Topic/Principle/Requirement	Observation/rationale for suggested changes
prior and informed consent' (FPIC), as outlined in the ICMM Indigenous Peoples and Mining Position Statement. FN13: While human rights due diligence should be conducted for all aspects of a mining business, this Standard requires a specific focus on the tailings facility. Human rights due diligence should be conducted for potential failure modes, and in the event of a failure FN14: The Universal Declaration on the Rights of Indigenous Peoples (UNDRIP), 2007, delineates and defines the individual and collective rights of indigenous peoples.	mining that is referenced in the standard, which requires that companies work to obtain consent, but does not mandate consent. Add the following to FN13 to reflect the fact the human rights due diligence may be a part of other state-mandated processes: "In many cases, human rights due diligence may occur during the State-mandated processes applicable to mining, including as part of the ESIA for the operation, rather than a separate process for just the tailings facility." Replace FN14 with "The corporate responsibility to respect the rights and interests of indigenous peoples are covered by the UN Guiding Principles and reflected in the ICMM Indigenous Peoples and Mining Position Statement" in line with comments above on this requirement and delete FN15.
3.2: Meaningfully engage project-affected people (PAP) throughout the tailings facility lifecycle regarding the matters that affect them.	We agree that it is important to engage with affected stakeholders regarding issues related to the safety and integrity of a tailings facility. Meaningful engagement with project-affected people "regarding the matters that affect them" is vague and too broad and could be interpreted to include people who are slightly or indirectly impacted, as well as operational or commercial issues. See related comment on requirement 1.4 – in this context, "project-affected people" should be limited to those directly impacted. The standard includes too many non-essential footnotes, that can either be dropped or included in the glossary. For example, FN18 on 'meaningful engagement' needs to be dropped and included within a single definition of meaningful engagement in the glossary.
3.3: Where the risks of a potential tailings facility failure could result in loss of life or sudden physical and/or economic displacement of people, the Operator shall consider in good faith additional measures to minimize those risks or implement resettlement following international standards. The Operator shall communicate these decisions to those affected.	We agree with the intent of this requirement. However, as currently worded it could be interpreted that resettlement is the default position. This sets the risk of an incorrect expectation by communities. Resettlement may be extremely difficult or impossible for existing facilities – and may not be feasible for new facilities. It remains a last resort option but does not need to be mentioned explicitly given all the other alternatives available. Accordingly, resettlement should be a decision of the Operator, triggered by a unique set of facts and circumstances. We also need to get across that there are other actions besides resettlement that could be implemented too.
3.4: Establish an effective operational-level, non-judicial grievance mechanism that addresses the concerns, complaints and grievances of project-affected people that relate to the tailings facility.	Requires that project affected people is defined as those directly impacted by the project.

Topic/Principle/Requirement	Observation/rationale for suggested changes
Topic III: **DESIGN, CONSTRUCTION, OPERATION AND MONITORING OF THE TAILINGS FACILITY**	
PRINCIPLE 4: Design, construct, operate and manage the tailings facility on the presumption that the consequence of failure classification is 'Extreme', unless this presumption can be rebutted.	This Principle is confusing as the introduction indicates this designation of Extreme hazard applies to new facilities as does requirement 4.1 below. However, 4.3 which applies to Existing facilities requires compliance with 4.1 and 4.2 implying that all facilities would start with an Extreme classification. As this is the first mention of design, the standard should recognise that certain design standards may not be achievable for existing facilities. In accordance with good practice, the default position should be to assess the consequence of all dams. We also believe the wording is a requirement not a principle. We have reworded the requirement to reflect this.
4.1: Presume the consequence of failure classification of all new tailings facilities as being 'Extreme' (see Annex 2, Table 1: Consequence Classification Matrix) and design, construct, operate and manage the facility accordingly. This presumption can be rebutted if the following three conditions are met: a) The knowledge base demonstrates that a lower classification can be applied for the near future, including no potential for impactful flow failures; and b) A design of the upgrade of the facility to meet the requirements of an 'Extreme' consequence of failure classification in the future, if required, is prepared and the upgrade is demonstrated to be feasible; and c) The consequence of failure classification is reviewed every 3 years, or sooner if there is a material change in any of the categories in the Consequence Classification Matrix, and the tailings facility is upgraded to the new classification within 3 years. This review should proceed until the facility has been safely closed and achieved a confirmed 'landform' status or similar permanent non-credible flow failure state.	This requires that TSF's are presumed to be extreme classification unless all three rebuttal conditions are met. It is understood that the requirement aims to: 1. Put the burden of proof onto the dam owner to demonstrate that the facility is of lower consequence (defaulting to extreme where this cannot be done). 2. Cater for classification creep over time by ensuring that the facility can be upgraded to extreme if required. 3. Mandate a periodic review to ensure that any change in classification is detected and acted upon. However, the approach is problematic for a number of reasons. Firstly, conforming with condition (a) also relies on demonstrating that there is no potential for impactful flow failures. This term is not defined and not linked to the consequence classification matrix and its inclusion could lead to facilities with lower true consequence potential being required to be classified as extreme due to the presence of impactful flow failures (even though the consequence of the impact could be low). Secondly, the requirement is problematic when implementing across existing dams where due to their inherent characteristics (such as small size or remote location) will constitute a very low potential consequence both in the near and long term. Additionally, it may be difficult to apply the ability to upgrade the facility to accommodate Extreme design requirements retrospectively in all situations and in many cases it will never actually be required. There is likely a significant number of such facilities, the rebuttal of which will consume a significant amount of specialist engineering resources without delivering any real risk reduction thereby meeting the core objective of the Standard. Both these points highlight this requirement is not aligned with a risk-based approach which could lead to the misrepresentation of the consequence potential profile and dilution of effort away from truly higher consequence potential facilities.

Topic/Principle/Requirement	Observation/rationale for suggested changes
	This will be confusing and problematic not just for Operators, but for insurers, shareholders, and other stakeholders. Accordingly, we have reworded the requirement.
4.2: The decision to rebut the requirement to design for 'Extreme' Consequence Classification, shall be taken by the Accountable Executive or the Board of Directors (the 'Board'), with input from an independent senior technical reviewer or the ITRB. The Accountable Executive or Board shall give written reasons for their decision.	The wording should be changed to reflect changes to 4.1. The requirement to provide written reasons is impractical and it is unclear who the intended audience is.
4.3: Existing facilities shall comply with Requirements 4.1 and 4.2. Where the required upgrade is not feasible, the Board, or senior management (as appropriate based on the Operator's organizational structure), with input from the ITRB, shall approve the implementation of measures to reduce the risks of a potential failure to the greatest extent possible.	The wording should be changed to reflect changes to 4.1. In addition, we have also proposed language around the timing for implementation for Very High and Extreme consequence facilities after companies adopt the final Standard, as this is an important consideration.
PRINCIPLE 5: Develop a robust design that integrates the knowledge base and minimizes the risk of failure for all stages of the tailings facility lifecycle.	This does not differentiate between new and existing facilities and ought to. It also should also qualify 'failures' as credible
5.1: Consider implementation of alternative options, including but not limited to in-pit disposal and underground tailings placement, and application of the technologies selected according to Requirement 2.1, to minimize the amount of tailings and water placed in external tailings facilities. FN21: External or out-of-pit tailings facilities are tailings disposal areas that are not located in mined-out open pits or under-ground mine workings	No change. Note that there are also hydrogeological challenges with in-pit disposal and underground disposal my require separation of stronger fraction from weaker slimes that still require surface disposal.
5.2: Develop and implement water balance and water management plans for the tailings facility, taking into account the knowledge base, upstream and downstream hydrological basins, the overall mine site, mine planning and operations and the integrity of the tailings facility for all stages of its lifecycle.	Important to recognise that water balances are maintained rather than a one-off exercise. Also, this won't be applicable to dry-stack or closed facilities not designed to store water.

Topic/Principle/Requirement	Observation/rationale for suggested changes
5.3: Develop a robust design that considers the social, economic and environmental context, the tailings facility Consequence Classification, site conditions, water management, mine plant operations, tailings operational issues, and the construction, operation and closure of the tailings facility.	Technical factors should also be considered.
5.4: Address all credible failure modes of the structure, its foundation, abutments, reservoir (tailings deposit and pond), reservoir rim and appurtenant structures to minimize risk. Risk assessments must be used to inform the design. FN20: Safe closure is achievement of a confirmed 'landform' status or similar status that also has a permanent non-credible flow failure state	FN20 implies a non-credible determination may apply only to landform or pit disposal, which is not correct. Otherwise the requirement presumes a buttress or other measure required to be assessed under the Standard may never remove a credible failure mode. Relatedly, the Standard requires Operators to minimize risk of failure, but that does not appear to include a qualifier for financial or logistical practicality.
5.5: Develop a design for all stages of the facility, including but not limited to start-up, partial raises and interim configurations, final raise, and all closure stages. The design should be reviewed and updated as performance and site data become available and in response to material changes to the risk assessment.	Should clarify that 'facility' refers to 'tailings facility'
5.6: Design the closure stage in a manner that meets all the Requirements of the Standard with sufficient detail to demonstrate the feasibility of the closure scenario and allows immediate implementation of elements of the design, as required. The design should include, where possible, progressive closure and reclamation during operations.	Some jurisdictions may impose legally enforceable closure requirements that differ from the Standard. In such instances, compliance with those legal requirements should constitute compliance with the Standard. This should be footnoted.
PRINCIPLE 6: Adopt design criteria that minimize risk. FN22: In all cases, minimizing risk means minimizing risk to people, environment and the Operator	For 6.1-6.3: The standard does not define minimum requirements around design acceptability for credible failure modes. In its current form these could be open to misinterpretation. To be effective and to avoid ambiguity, the GTS should identify and refer to leading practice (e.g. international guidelines such as ICOLD, CDA, ANCOLD), as otherwise there is a risk of TSF design and management deferring to local regulation, which may be weaker or outdated. The reference to 'minimising risk' risk should be qualified by the ALARP principle. FN22 should be folded into the principle.

Topic/Principle/Requirement	Observation/rationale for suggested changes
6.1: Select and clearly identify design criteria that are appropriate to reduce risk for the adopted Consequence Classification for all stages of the *tailings facility lifecycle* and for all credible failure modes.	We cannot always reduce risk of a particular tailings facility but we can manage risk. See also comments on 6.1-6.3 for this and next two requirements.
6.2: Apply factors of safety that consider the variability and uncertainty of geologic and construction materials and of the data on their properties, the parameters selection approach, the mobilized shear strength with time and loading conditions, the sensitivity of the failure modes and the strain compatibility issues, and the quality of the implementation of risk management systems.	The concept of “factors of safety” is not applicable to many TSFs. This becomes increasingly less relevant as we move to alternative tailings management and the corresponding facilities.
6.3: Identify and address brittle failure mechanisms with conservative design criteria and factors of safety to minimize the likelihood of their occurrence, independent of trigger mechanisms.	Brittle failure mechanisms are better addressed as an integral part of requirement 6.2 rather than in isolation. We suggest deleting 6.3 as key concepts are now included under 6.2. If the requirement is retained, change ‘factors of safety’ to ‘measures of structural integrity’
6.4: The EOR shall prepare a Design Basis Report (DBR) that details the design criteria, including operating constraints, and that provides the basis for the design of all stages of the tailings facility lifecycle. The DBR must be reviewed by the ITRB or senior independent technical reviewer.	The DBR could also be prepared by the Designer of Record, so this option should not be precluded. Define Designer of Record in the glossary. The term “senior independent technical reviewer” is referred to elsewhere in the standard as “independent senior technical reviewer”. Consistent with other references in the standard, the ITRB should be constituted for very high and extreme consequence facilities.
PRINCIPLE 7: Build and operate the tailings facility to minimize risk.	No change.
7.1: Build, raise, operate, monitor and close the *tailings facility* according to the design intent of all stages of the *tailings facility lifecycle*, using qualified personnel and appropriate methodology, equipment, procedures, data acquisition, the *TMS* and the *environmental and social management system (ESMS).*	The term “qualified” may imply certification, which does not currently exist. As an alternative we suggest ‘capable’. Wording could be interpreted to require a stand-alone ESMS for the TSF, so our edits are intended to clarify this.
7.2: Manage the quality and adequacy of the construction and operation process by implementing Quality Control, Quality Assurance and Construction vs Design Intent Verification (CDIV). CDIV shall be used to ensure that the design intent is	No change.

Topic/Principle/Requirement	Observation/rationale for suggested changes
implemented and is still being met if the site conditions vary from the design assumptions.	
7.3: Prepare a detailed Construction Records Report at least annually or whenever there is any change to the tailings facility, its infrastructure or its monitoring system. The EOR shall sign this report.	Implies an ongoing need to prepare a detailed construction records report irrespective of circumstances. Our edits are intended to address this. As good practice, construction records should be constantly maintained. The EOR should also produce an annual report on the dam (in addition see requirement 7.5). How are inactive facilities that have no construction record covered relative to this requirement? Include a footnote to address legacy sites that are closed.
7.4: Develop, implement and annually update an Operations, Maintenance and Surveillance (OMS) Manual that supports effective risk management as part of the TMS. The OMS Manual should follow best practices, clearly provide the context and critical controls for safe operations, and be reviewed for effectiveness. The EOR and RTFE shall provide access to the OMS Manual and training to all personnel involved in the TMS.	Implies an ongoing need to update the OMS, whereas this may not always be the case.
7.5: Implement a formal change management system that triggers the evaluation, review, approval and documentation of all changes to design, construction, operation and monitoring during the tailings facility lifecycle. The change management system shall also include the requirement for a periodic Deviance Accountability Report (DAR), prepared by the EOR, that provides an assessment of the cumulative impact of the changes on the risk level of as-constructed facility. The DAR shall provide any resulting requirements for updates to the design, DBR, OMS and the monitoring program.	The requirement to document all changes should be qualified to refer to material changes, as it is otherwise too onerous. The qualifier of 'periodic' before the Deviance Accountability report is unnecessary. In the requirement or definition, address whether the Deviance Accountability Report (DAR) can be part of existing reports. The EOR will likely be reviewing data on a regular basis and could include this information in those reports.
7.6: Refine the design, construction and operation throughout the tailings facility lifecycle by considering the lessons learned from ongoing work and the evolving knowledge base, and by using opportunities for the inclusion of new and emerging technologies and techniques.	Poorly worded and hard to understand. Our suggested alternative is intended to address this.
7.7: Ensure that the ESMS is designed and implemented to align decisions about the tailings facility with the changing environmental and social context as identified in the knowledge	Not applicable to Topic III or Principle 7. Covered in general terms in 7.1. Put Requirement 7.7 as a footnote to 7.1.

Topic/Principle/Requirement	Observation/rationale for suggested changes
base, in accordance with the principles of adaptive management.	
7.8: Independent senior technical reviewers, with qualifications and expertise in social and environmental sciences and performance management, shall carry out a full review of the ESMS and monitoring results every 3 years, with annual summary reports provided to relevant stakeholders.	Not applicable to Topic III or Principle 7. It is not relevant to tailings management and strays into other operating practices.
PRINCIPLE 8: Design, implement and operate monitoring systems.	No change.
8.1: Design, implement and operate a comprehensive performance monitoring program for the tailings facility that allows full implementation of the Observational Method and covers all potential failure modes.	MUST change – needs to refer to credible failure modes as monitoring for “all potential failure modes” is unreasonable. The “Observation Method” is not applicable to all potential failure modes (see Peck, 1969 referenced in Glossary) and is especially limited around static liquefaction. Peck discusses presence of brittle elements, (see also Jefferies and Been, 2016). For static liquefaction failure can be detected and emergency response implemented but the observational method is supposed to allow for changes in the design to stop things from failing. For new structures and some existing structures this can be designed out, but there may be limitation on some existing structures that do not allow for that. We suggest that a footnote is included to indicate the limitations of the “Observation Method”.
8.2: Establish performance objectives, indicators, criteria, and performance parameters and include them in the design a monitoring program that measures performance at all stages of the tailings facility lifecycle. Record, evaluate and publish the results at appropriate frequencies. Based on the data obtained, update the monitoring program throughout the tailings facility lifecycle to confirm that it remains effective.	In place of publishing data, we recommend providing the data to the responsible regulatory authorities.
8.3: Analyze monitoring data at the frequency recommended by the EOR, and assess the performance of the facility, clearly identifying and presenting evidence on any deviations from the expected performance and any deterioration of the performance over time. Promptly submit evidence to the EOR for review and update the risk assessment and design, if required. Performance outside the expected ranges shall be	The words preceding the acronym TARPs are in the wrong order.

Topic/Principle/Requirement	Observation/rationale for suggested changes
addressed swiftly through critical controls or trigger response action plans (TARPs).	
8.4: Report the results of the monitoring program at the frequency required to meet company, regulatory and public disclosure requirements, and as a minimum on a quarterly basis. The RTFE and the EOR shall review and approve these reports.	Quarterly review of every facility is prohibitive. It should be risk-based (e.g. downstream raise rockfill dams with relatively low production rates/rates of rise will not require quarterly review). There should be a distinction between Dam Safety Inspection report vs. merely reporting on Critical Controls. Agree with minimum quarterly internal re-porting on Critical Controls but not necessarily production of a "report". The term 'public disclosure requirements' is too open-ended, and we suggest it is deleted.
TOPIC IV: MANAGEMENT AND GOVERNANCE	
PRINCIPLE 9: Elevate decision-making responsibility for *tailings facilities* with a 'Very High' or 'Extreme' Consequence Classification.	No change.
9.1: For a proposed new facility where a potential credible failure could have 'Very High' or 'Extreme' consequences, the Board or senior management (as appropriate based on the Operator's organizational structure) shall be responsible for approving the proposal, after deciding what additional steps shall be taken to minimize the consequences.	Unclear if "additional steps" referred to in last clause apply to all consequence categories or only "Population at Risk" and "Potential Loss of Life", as it may not be feasible to minimize consequences in other areas (e.g. environment). Please clarify in the wording of the requirement.
9.2: For an existing facility, where a potential credible failure could have 'Very High' or 'Extreme' consequences, the Board or senior management (as appropriate based on the Operator's organizational structure) shall mandate additional steps to minimize the consequences and publish reasons for its decision. This process is to be repeated at the time of every Dam Safety Review (DSR).	Should clarify that 'potential credible failure' refers to 'potential failure scenario based on a credible failure mode'. Accountable Executive, as defined, provides flexibility to an Operator's unique organizational structure while requiring a senior-level individual be named as accountable. The requirements to 'publish reasons for its decision' and 'repeat at the time of every DSR' are not appropriate. Important to apply the ALARP is a principle to this requirement. Note: Other related changes will be needed, including a definition of "Accountable Executive."

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PRINCIPLE 10: Establish roles, functions, accountabilities and remuneration systems to support the integrity of the tailings facility. FN24: See Annex 3: Outline of the Organizational Structure referred to in the Standard	In Annex 3, the requirements for key roles such as EOR and Responsible Tailings Person to report to the Accountable Executive are problematic, as the transfer of the reporting lines of these key roles away from the operations could lead to ambiguity and diminished line accountability for the safe management of TSFs. The standard should enable governance arrangements that ensure the independence of key roles such as EOR etc. through the 2nd line governance functions, without loss of day to day control from operations. The Standard needs to recognise the burden of responsibility on the Accountable Executive role within a large organisation and provide for the ability to delegate in line with the intent. Organisational structures will also vary between companies. For all these reasons, we suggest Annex 3 is deleted.
10.1: The Board of the parent corporation shall adopt and publish a policy on or commitment to the safe management of tailings facilities, to emergency preparedness and response, and to recovery after failure that is mandatory for all its subsidiaries and joint ventures. The commitment shall require the Operator to establish a Tailings Management System (TMS), and a governance framework to assure the effective implementation and continuous improvement of the TMS.	A company that has adopted the Standard will not have the legal authority to compel their joint venture partner(s) to follow it unless it has a controlling interest. The Standard must assign the responsibility for compliance to the entities with actual operational control of the tailings facility; it will be impossible for some companies to adopt the Standard without this change. It is also unworkable for joint ventures because the parent corporation of each JV party will have a separate policy and there is no means by which a joint venture could resolve inconsistencies. Our suggested changes address this. The reference to the Board is unnecessary as a company acts through its Board. It is not acceptable to make the members of the Board personally liable.
10.2: A member of senior management shall be accountable for the safety of *tailings facilities* and for minimizing the social and environmental consequences of a *tailings facility* failure. This *Accountable Executive* will also be accountable for a program of tailings management training, for emergency preparedness and response, and for recovery after failure. The *Accountable Executive* or delegate must have regular scheduled communication with the *Engineer of Record* (EOR). FN25: In the case of joint ventures, all venture partners shall appoint an Accountable Executive and it shall be the responsibility of the partners to jointly implement this Requirement.	See concerns in 10.1 relating to joint ventures. These are amplified by FN25 which requires all JV partners to appoint an Accountable Executive. For JVs, the requirement for ongoing interaction with the EOR is not practical given multiple JV partners. The standard should only impose obligation on those entities with operational control over a tailings facility. Removing direct line accountability for the tailings dams from the site adds a level of complexity that will introduce additional risk to the operation by adding conflicting priorities and diluting accountability. Suggest FN25 is deleted as suggested changes supersede this.

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10.3: Appoint a site-specific Responsible Tailings Facility Engineer (RTFE) who is accountable for the integrity of the tailings facility, liaises with the EOR, the Operations and the Planning teams and who either reports directly to the Accountable Executive, or via a reporting line that culminates with the Accountable Executive. The RTFE will have a dotted reporting line to mine management to represent the delivery of services to the site.	The responsible person does not have to be an engineer, and so we suggest re-naming this to Responsible Tailings Person (RTP). In addition, the responsibility for TSFs should reside with site management. However, there should be clearly defined lines of communication and escalation to the Accountable Executive, but the Standard is not the place to determine prescriptive reporting lines. The draft Standard is ambiguous regarding the use of the term “Accountable Executive” and how that relates to the undefined term “senior management.” The key roles in 10.3 should be defined in glossary of the revised draft. For example, making the Accountable Executive responsible for setting standards, and governance against those standards plus providing technical support is more realistic. Emphasize the need to put controls in place to protect the role from undue influence and conflict of loyalty.
10.4: For employees who have a role in the TMS, consider implementing a performance incentive program to include a component linked to the integrity of tailings facilities.	The Standard must refrain from setting requirements for remuneration, compensation, or bonuses for various personnel. Such requirements will make it more difficult to retain qualified people, potentially increasing risk. It could also inadvertently create counterproductive incentives (i.e., deter candid reporting). We suggest 10.4 is deleted. The concept could be reflected in the “Recommendations Report” - however we advise caution as incentives must be linked to a leading indicator, not a lagging indicator, otherwise it incentivizes hiding problems.
10.5: Identify appropriate qualifications and experience requirements for all personnel who play safety-critical roles in the operation of a tailings facility, in particular, for the RTFE, the EOR and the Accountable Executive. Ensure that occupants of these roles have the identified qualifications and experience, and develop succession plans for these personnel.	The responsible person does not have to be an engineer, replace RTFE with Responsible Tailings Person (RTP) -See 10.3. Should there be mechanisms to enable exceptions in a resource constrained environment with limited access to qualified persons? Should also refer to ITRB
PRINCIPLE 11: Establish and implement levels of review as part of a strong quality and risk management system for all stages of the tailings facility lifecycle.	No change.
11.1: Conduct and regularly update risk assessments with a qualified multi-disciplinary team using best practice methodologies. Transmit risk assessments to the ITRB for review, and address with urgency all risks considered as unacceptable	Current wording implies that all facilities should have an ITRB which is neither reasonable not practicable given the insufficient global engineering resources to implement an ITRB for all tailings facilities. It could also divert resources from facilities having the most significant risks to those with far lower risks. The frequency associated with ‘regularly’ is unclear.

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11.2: Conduct internal audits to verify consistent implementation of company procedures, guidelines and corporate governance requirements consistent with the TMS and the ESMS developed to manage risks.	The expectations of the ESMS to manage tailings risk needs to be defined to focus audit activity.
11.3: The EOR or a senior independent technical reviewer shall conduct annual tailings facility construction and performance reviews.	The responsibility for conducting annual construction reviews and annual performance reviews should be differentiated. The former should be undertaken by the Designer of Record. Also, not every facility has construction each year – the performance review occurs with or without construction activity, but the proposed revision makes sure any construction is captured in the annual review. Elsewhere the term 'independent senior technical reviewer' is used, rather than 'senior independent technical reviewer'
11.4: A senior independent technical reviewer shall conduct an independent DSR periodically (every 3 to 10 years, depending on performance and complexity, and the Consequence Classification of the tailings facility). The DSR shall include technical, operational and governance aspects of the tailings facility and shall be done according to best practices. The DSR contractor cannot conduct a subsequent DSR on the same facility.	It is unclear what is meant by the term Dam Safety Review (DSR), so please define in the glossary. It should not have to be a senior independent technical reviewer who conducts the DSR. The requirement that a DSR contractor not be allowed to conduct a "subsequent" DSR on the same facility is overly restrictive given the limited number of qualified technical firms or personnel. Natural succession planning and attrition of reviewers in Stewardship and ITRBs/Senior Technical Reviewers can also provide an equivalency regarding consecutive reviews that include new perspectives. There should be flexibility to retain the same firm/contractor for two consecutive DSRs if the individuals are different.
11.5: For tailings facilities with 'Very High' or 'Extreme' Consequence Classification, the ITRB, reporting to the Accountable Executive and/or the Board, shall provide ongoing senior independent review of the planning, siting, design, construction, operation, maintenance, monitoring, performance and risk management at appropriate intervals across all stages of the tailings facility lifecycle. For facilities with other consequence classifications, the ongoing senior independent review can be done by a single person.	Depending on the size of the company, it may be impractical for the Accountable Executive to have direct reporting of all ITRBs at tailings facilities classified as Very High and Extreme consequence. So provision should be included for delegated responsibility reporting to the Accountable Executive.
PRINCIPLE 12: Appoint and empower an Engineer of Record.	
12.1: Engage an engineering firm with expertise and experience in design and construction of tailings facilities of comparable complexity to provide EOR services for the tailings	The wording also implies that and EOR is required for all closed facilities which is impractical. Similar to CDA, the closed sites must be classified into different categories and each category will have different requirements (for example passive closed sites do not require EOR or DSR).

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facility. Require that the firm nominate an individual to represent the firm as the EOR, in concurrence with the Operator, and verify that the individual has the necessary experience, skills and time to fulfil this role. Alternatively, the Operator may appoint an employee with expertise and experience in comparable facilities as the EOR. In this instance, the EOR may delegate the design to a firm ('Designer of Record') but shall remain thoroughly familiar with the design in executing their responsibilities as EOR.	The reference to an engineering firm is confusing, especially as the requirement later provides the alternative of allowing the EOR to be appointed internally. The wording also implies that designs cannot be conducted internally, and by implication this will drive all designs to be conducted externally.
12.2: Empower the EOR through a written agreement that clearly describes their authority, role and responsibilities throughout the lifecycle of all facilities, including closed facilities, and during transfer of ownership of mining properties.	It would be useful for the written agreement to clearly describe the obligations of the Operator to the EOR, to ensure that the EOR can execute his/her role effectively. The EOR cannot be effective if they don't have the relevant information they need.
12.3: Establish and implement a system to manage the quality of all engineering work, the interactions between the EOR, the RTFE and the Accountable Executive, and their involvement in the tailings facility lifecycle as necessary to confirm that both the implementation of the design and the design intent are met in all cases.	The responsible person does not have to be an engineer, replace RTFE with Responsible Tailings Person. See 10.3
12.4: Given its potential impact on the risks associated with a tailings facility, the selection of the EOR shall be decided by the Accountable Executive and not influenced or decided by procurement personnel.	To reasonably limit the responsibilities of the Accountable Executive, enable delegation of the selection process (still independent of procurement); but the Accountable Executive could 'approve'. This only applies where the EOR is being externally contracted.
12.5: Where it becomes necessary to change the EOR firm, develop a detailed plan for the comprehensive transfer of data, information, knowledge and experience with the construction procedures and materials.	Only deals with situations where the EOR is a firm rather than internal employee – should acknowledge the possibility of the latter.
PRINCIPLE 13: Develop an organizational culture that promotes learning and early problem recognition.	While the concept of employee/worker engagement and collaboration should be pursued, making it a part of a standard (which will be audited) is not practical.
13.1: Educate personnel who have a role in the TMS about the reason for and importance of their job procedures for the prevention of a tailings facility failure.	Assume that operational personnel and emergency response personnel are included in the TMS.

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13.2: Incorporate workers' experience-based knowledge into planning for all stages of the tailings facility lifecycle.	Not clear how this would be audited beyond the earlier requirements for design and operation, and not sure how this would be translated into practice. Either clarify or consider deleting.
13.3: Establish mechanisms that promote cross-functional collaboration to ensure data and knowledge integration and communication across the TMS and the ESMS.	Unclear how this could be 'measurable'? Either clarify or consider deleting.
13.4: Identify and implement lessons from internal incident investigations and relevant external accident reports, paying particular attention to human and organizational factors.	No change.
13.5: Develop procedures to recognize and reward employees and contractors who speak up about problems or identify opportunities for improvement. Respond in a timely manner and communicate actions taken and their outcomes.	Unsure how "recognise and reward" would be assessed. There is potential for behavioural issues associated with this 'incentive' arrangement. 'Reward' could create perverse incentives that are best avoided. As this is already covered by 14.4, consider deleting.
PRINCIPLE 14: Respond promptly to concerns, complaints and grievances.	Looks very duplicative of 3.4.
14.1: Establish a formal written complaint process that provides the Operator and the appropriate regulatory authority with information about possible permit violations or other conditions relating to the tailings facility that pose a risk to public health, safety, or the environment.	Looks very duplicative of 3.4. Consider deleting. A standard cannot impose a process on a regulatory authority. The standard should NOT require the operator to share their grievance system with the regulator. If a permit violation is observed this should be reported to the regulator, either directly by the public or by the operator. A grievance system deals with the relationships between the operator and the community – not with the regulator.
14.2: Establish an effective pathway that guarantees anonymity for employees and contractors to express concerns about tailings facility safety.	Looks very duplicative of 3.4. Consider deleting.
14.3: Initiate prompt investigations of all credible employee and stakeholder complaints and grievances, swiftly resolve concerns and complaints and provide remedy as required.	Looks very duplicative of 3.4. Consider deleting.
14.4: In accordance with international *best practices* for *whistleblower* protection, the Operator shall not discharge, discriminate against, or otherwise retaliate in any way against	No change.

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a *whistleblower*, or any employee or person who, in good faith, has reported a possible violation or unsafe condition. FN27: See Study on Whistleblower Protection Frameworks, Compendium of best practices and Guiding Principles for Legislation, (OECD, 2010), available at, https://www.oecd.org/g20/topics/anti-corruption/48972967.pdf. Among other things, best practices require that the whistleblower be allowed to maintain their anonymity.	This study is 10 years old and there have been significant developments over that time. Also, much of this study is focused on public sector whistleblowing. We don't think it should be included as illustrating best practice.
TOPIC V: EMERGENCY RESPONSE AND LONG-TERM RECOVERY	
PRINCIPLE 15: Prepare for emergency response to tailings facility failures and support local level emergency preparedness and response using best practice methodologies.	An important qualifier in 15.1 should be reflected in principle 15 and all related requirements, i.e. based on credible tailings facility failure scenarios. There are some operating and many legacy tailings facilities where there is no credible failure mode/mechanism that could lead to an inundation flow event and so the requirement would be excessive. Focus and resources should be placed on those with credible failure modes. Many companies incorporate the dam emergency plan into their overall emergency plan as a section in the plan. The areas that overlap, such as emergency personal, communications, chain of command, etc is common to all areas and there is no wish to have duplication in the system.
15.1: Prepare and implement a site-specific *Emergency Response Plan* (ERP) based on credible *tailings facility* failure scenarios and the assessment of potential consequences, using the knowledge base. Update regularly, including during closure. FN29: The ERP for the tailings facility may form part of the mine-wide ERP. The tailings facility ERP is disclosed publicly and forms the basis for the collaborative planning of the EPRP as well as ERPs for at-risk communities.	To avoid the risk that ERPs get put on a shelf and not revisited, we think it is worth being more explicit on how often these should be revisited or reviewed (e.g. reviewed during DSRs and updated accordingly). FN29 requires the ERP to be publicly disclosed in its entirety which is impractical for a number of reasons. The requirements of 15.2 will involve disclosure of relevant components to interested and affected parties.
FN30: The consequences to be addressed in the EPRP will be based on the findings of inundation studies or runout analyses , and will include public and worker safety, health risks associated with the chemical composition of the tailings, and address how environmental damage and loss of infrastructure may influence emergency scenarios.	Important to add some further clarifying language around inundation studies to provide guidance on the degree of detail required.

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15.2: *Meaningfully engage* employees and/or employee representatives, site contractors, *public sector agencies*, first responders and at-risk communities to participate in emergency planning and implementation, including development of specific *ERPs* for at-risk communities. FN31: ERPs and EPRPs for tailings facility emergencies require engagement and participation of stakeholders due to the risk of loss of life and to support the internal safety culture (see Principle 13).	An important qualifier in 15.1 should be reflected in principle 15 and all related requirements The Standard must eliminate any requirement for agreements with public sector entities, and the Operator cannot be deemed responsible for actions of public sector entities. “Using the knowledge base” as in 15.1 is an important component and should be reiterated throughout all requirements under this principle. FN31 adds nothing of value to the requirement. Suggest it is deleted.
15.3: Meaningfully engage with *public sector agencies* and first responders, and other organizations involved in emergency response for the purpose of developing and implementing a site-specific *Emergency Preparedness and Response Plan* (EPRP). The plan shall assess the capacity and capability of emergency response services and the Operator shall act accordingly. FN32: Where gaps remain in the capacity of public sector agencies to provide required emergency response services for credible failure scenarios, the Operator will provide them. FN33: The frequency of training and testing will be based on the regular assessment by a trained emergency response professional as to what is required to achieve and maintain readiness with the distinct stakeholders involved. Training and testing performance results will be disclosed.	The requirement to engage with emergency responders is principally applicable to Extreme consequence facilities considering the resources involved for public agencies and multiple stakeholders. Multiple guidance documents and States use specific terminology about emergency plans, which may be equivalent. As such, a single term such as ERP should be used to describe a plan that addresses response and preparedness while accounting for variability of State requirements. The Operator cannot be responsible for the capacity of the public sector agencies. It is important that the standard does not specify “hard-edged requirements” to enter into agreements with emergency responders and public sector agencies as this will not always be possible or practicable.
15.4: Maintain a state of readiness at the mine site and within at-risk communities by training all appropriate personnel, *public sector agencies*, first responders and at-risk communities and by testing *emergency response plans* and procedures with all involved stakeholders.	An important qualifier in 15.1 should be reflected in principle 15 and all related requirements. It is important to add a ‘reasonableness’ qualifier to the provisions for training. In many jurisdictions, companies will not have the role or mandate to engage with public sector entities – and the responsibility for testing emergency response plans will reside with the public authorities. For this reason, we can’t be as prescriptive as the current wording in the guidance.
PRINCIPLE 16: Prepare for long term recovery in the event of catastrophic failure.	No change

Topic/Principle/Requirement	Observation/rationale for suggested changes
16.1: Meaningfully engage with public sector agencies and other organizations that would participate in medium- and long-term social and environmental post-failure response strategies.	An important qualifier in 15.1 should also be reflected in 16.1, i.e. 'Based on credible tailings facility failure scenarios and the assessment of potential consequences…'.
16.2: In the event of *tailings facility disaster*, assess social, economic and environmental *disaster* impacts as soon as possible after people are safe and short-term survival needs have been met. FN34: Disaster impact assessments ascertain the nature and extent of damages and losses, who has been affected and the support that they need, and the potential pathways to transition from emergency to recovery. Multiple aspects of human development should be considered, including the physical environment, economic, social, cultural, psychological, environmental, health, and gender, among others.	
16.3: Work with public sector agencies and other stakeholders to facilitate the development of a Reconstruction and Recovery Plan that addresses medium- and long-term social, economic and environmental impacts of a tailings facility disaster.	An important qualifier should be included at the beginning of the requirement. The Standard must avoid any requirement for formal agreements with public sector entities, and the Operator cannot be deemed responsible for actions of public sector entities. 'Reconstruction and recovery plan' should be defined in the glossary.
16.4: Enable the participation of affected people in restoration, *disaster* recovery works and ongoing monitoring activities. Design and implement plans that take an integrated approach to *remediation, reclamation* and the re-establishment of functional ecosystems.	Include the suggested important qualifier at the beginning. Requiring "re-establishment of functional ecosystems" could lead to increase in the recovery scope and conflict with the desired post-recovery land uses of stakeholders.
16.5: Facilitate the monitoring and public reporting of post-failure outcomes that are aligned with the thresholds and indicators outlined in the plans and adapt recovery activities in response to findings and feedback.	No change.
TOPIC VI: PUBLIC DISCLOSURE AND ACCESS TO INFORMATION	
PRINCIPLE 17: Provide public access to information on *tailings facility* decisions, risks and impacts, management and mitigation plans, and performance monitoring.	Suggest adding important language onto the end of the principle as follows: '..through the appropriate authorities (as required), in a reasonable and proportionate manner consistent with the purpose of this Standard as set out in the Preamble, and subject to the rights of

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	companies have to protect their intellectual property and other commercially sensitive information, which are not affected by this Principle'
17.1: Publicly disclose relevant data and information about the *tailings facility* and its consequence classification in order to fairly inform interested stakeholders. FN36: A fundamental principle that underlies the Standard is that the public is entitled to timely access to information relating to the tailings facility. This information must be made available at no charge, as soon as possible, and in one or more languages as necessary to afford adequate access to interested stakeholders. FN37: Relevant information to be disclosed shall at a minimum include those items referred to in Requirements 1.3, 2.3, 2.4, 3.1, 4.2, 4.3, 5.5, 5.6, 7.8, 8.2, 8.4, 9.1, 9.2, 10.1, 10.2, 11.1, 11.4, 11.5, 12.1, 13.5, 14.3, 15.1, 15.3, 15.4, 16.1, and in case of a tailings failure 16.2-16.5, provided that such disclosure: (i) is subject to applicable law; (ii) may be complied with through relevant regulatory agencies in accordance with applicable legal requirements; and (iii) will in some cases be subject to the consent of external parties (for example where third party reports and external stakeholder information are involved).	The nature and extent of disclosures required by the draft Standard are overly broad and go beyond what is needed to demonstrate compliance with the Standard. In the spirit of the draft GTS, proposed language provides for transparent summaries to inform stakeholders of safety information to demonstrate compliance with the Standard, while providing flexibility to Operators' efforts within constraints of State requirements. FN36 establishes unrealistic requirements for disclosure that has the potential to allow vexatious requests for information to be submitted that would require significant re-sources to address – which are better directed to the effective management of TSFs. In line with comments noted above, suggest that FN37 is deleted.
17.2: Respond in a systematic and timely manner to all reasonable stakeholder requests for information about the *tailings facility*, to the fullest extent possible and to fairly inform the interested party making the request. FN35: Disclosure activities relevant to the tailings facility may be included in a site-wide Communication Plan or Stakeholder Engagement Plan. FN36: A fundamental principle that underlies the Standard is that the public is entitled to timely access to information relating to the tailings facility. This information must be made available at no charge, as soon as possible, and in one or	The fullest extent possible has the potential to problematic and should be replaced by 'to the extent reasonably practical'. As drafted this provision is very broad and open to abuse; it exposes operators to the possibility of vexatious requests and a significant administrative burden that will divert essential resources away from the management of TSFs. We suggest deleting FN35, as it is not clear how it fits in with the requirements for public disclosure in 17.1. The deletion of FN36 is important for this requirement to be workable.

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more languages as necessary to afford adequate access to interested stakeholders.	
17.3: Commit to transparency and participate in credible global initiatives led by qualified independent organizations to create standardized, independent, industry-wide and publicly accessible databases, inventories or other information repositories about *tailings facilities*.	Need a definition for what would be considered a "credible global initiative", as otherwise this could become onerous, especially if the expectation is to participate in any such initiatives that might be established.
Annex 1: Glossary	The glossary and Annex 2 use legal or regulatory terms in certain jurisdictions – such as "endangered species" – that are often used to establish prescriptive regulatory requirements unrelated to the actual presence of such resources in an area potentially affected by a hypothetical tailings failure. The final Standard must make clear that it does not use these terms in this manner.
Accountable Executive	What are the requirements for this person in terms of qualifications and relevant experience?
Board of Directors	Not sure this is correct in the context of tailings management. Merriam-Webster says: *A board of directors is a team of people elected by a corporation's shareholders to represent the shareholders' interests and ensure that the company's management acts on their behalf.* The Board as a decision-making body is incorrect; this overrides the accountability of management and confuses the accountability of governance of the Board.
Critical controls	First sentence is unclear.
Designer of Record	It seems more confusing than useful to substitute the established name "Designer" by the proposed name "Designer of Record". It is not the function nor the responsibility of the EOR to designate the Designer. It is the responsibility of the Responsible Tailings Person (RTP).
Disaster	Should be redefined as 'tailings facility catastrophic failure' (consistent with earlier comments) to include, as an example, an event which has a significant adverse impact on people or the environment.
Engineer of Record	Some important suggested changes to the definition.
ERP and EPRP	Combine and define in line with suggested edits.

Topic/Principle/Requirement	Observation/rationale for suggested changes
Inundation study	Dam breach assessments need to be undertaken to inform the consequence classification. This requirement to understand flow arrival times, depth and velocities from a numerical model needs to be risk based. We suggest the differentiation to conduct a numerical vs. a semi-quantitative model based on the dam consequence classification.
ITRB	Some concerns highlighted with current wording.
Meaningful engagement	Definition needs to be revisited to address concerns raised under specific requirements. For example, FN18 (which we suggest deleting) also refers to meaningful engagement. Principle 3 refers to meaningful engagement at all stages of the tailings facility lifecycle – which is very broad and encompasses technical aspects where engagement is practically very difficult. Requirement 3.2 refers to meaningful engagement with project affected people on matters that affect them which is very broad and ambiguous. Access to information provision is duplicative of principle 17.
Observation method	Specific concerns raised on this in the main text. Provide more thorough definition of the "Observational Method" in this document. One suggestion is to present the Eurocode 7 definition and to stress the importance of the due attention to be given to the "time factor" for its success.
Operator	This definition is unnecessarily broad. "Any person, corporation, partnership, joint venture, or other entity" already captures all of the different types of entities that could operate tailings facilities. "Owner, affiliate or subsidiary" appears to extend this definition beyond the actual operator to other companies in the operator's corporate group. The wording "or controls" creates significant uncertainty as to which entity or entities in a corporate group would be subject to the Standard (beyond the actual operating company).
Project Affected People	In the context of tailings facilities, its important and appropriate to focus on direct impacts.
Responsible Tailings Facility Engineer	Must provide allowance for RTFE / Responsible Tailings Person to assign a delegate for leave of absence and transition purposes and must recognize that the role may be divided among more than one individual. The RTP must be '**involved**' (rather than 'available') at all times during construction, operations and closure
Risk	Important to add definition.

Topic/Principle/Requirement	Observation/rationale for suggested changes
Senior technical reviewer	Add clause to reflect concerns relating to countries like Japan.
Tailings facility	Concern that post-closure tailings facilities that no longer present risks may be subject to the standard.
Tailings facility Lifecycle	Reclamation not mentioned
Tailings management System	Most non-English-speaking countries have the same word to translate “accountable” and to translate “responsible” because the culture in the countries does not distinguish between these two concepts. To be “accountable” and to be “responsible” is the same thing, and this is the case in Portuguese, which means that only one of the two concepts, that is “responsible” should be used in this document.
Annex 2: Table 1, Consequence Classification Matrix	Departures from the ICOLD version of consequence table are very problematic. The language before and within the table should be adjusted to directly align with ICOLD. We also recommend changes to the uses of the classification approach that precedes the table.
Annex 2: Table 2, External Loading Criteria	The values shown in table 2 are very significant for areas with limited seismic and hydrological information. The specification of design loading criteria has been significantly elevated from leading industry guidelines for “low” and “significant” consequence dams without any rationale for change. This is not in accordance with good risk management as it dilutes prioritization of resource; further, it will have significant impacts on existing facilities across the industry, which we do not consider practical without further justification. These should be changed to align with the requirements of ICOLD and CDA.
Annex 3: Outline organisational structure	The standard must allow for range of governance, management, and communications structures, such as a second line governance function to Accountable Executive / Senior Management, without loss of Operations’ day to day control. Given the range of management approaches and company sizes and structures across the globe, it is too prescriptive to include a ‘one-size-fits-all’ organisational chart and we recommend deleting it.

December 4Dam Classification

The purpose of assigning a dam failure consequence classification is to assist in communicating the potential consequence of a dam failure and to guide the design and governance requirements for the dam. A dam failure may have significant consequences to communities, environment and infrastructure beyond the mining company's property boundaries, as well as significant consequences to the Owner. The consequence classification is determined by assessing these consequences in the event of an assumed dam breach, regardless of the likelihood of the event. This means that the dam consequence category is not indicative of risk, but rather an indicator of the level of design and governance inputs required to ensure that the risk of the breach occurring is appropriately low as discussed in Section **Error! Reference source not found.** of this Bulletin.

Table 1-1 presents a dam classification based on potential effects to the environment, infrastructure and population at risk, which are considered impacts to society. The potential financial losses to the Owner are not directly considered in the dam classification. As noted in Section 5, the potential losses to the Owner may be captured in setting the design criteria. Other dam classifications in the jurisdictions where the TSF is located may need to be considered depending on the applicable country regulatory requirements.

The consequence classification is used to guide the selection of design criteria and operational controls for the TSF as further discussed in Section **Error! Reference source not found.** and Section **Error! Reference source not found.**.

An initial qualitative or semi-quantitative (refer to Section **Error! Reference source not found.** of this Bulletin) consequences assessment may be completed without a detailed inundation mapping and may be applicable when the magnitude of the severity and loss is obvious, and the dam classification can be readily discerned. The initial consequence assessment, without a detailed flood mapping, may also be adequate for the selection of the preliminary consequence category in the early stages of a design of a new TSF facility.

A detailed consequence assessment supported with a detailed flood inundation and "mud flow" mapping should be undertaken for High, Very High and Extreme consequence dams as described in Section **Error! Reference source not found.** of this Bulletin.

The following discussion provides details in support of Table 1-1.

Population at Risk and Loss of Life:

Environment:

Environmental values include aquatic and terrestrial habitat, including rare and endangered species. Water quality effects include groundwater and groundwater use, as well as surface water quality

effects on aquatic habitat and livestock and fauna use. The geochemistry of the tailings may influence surface water quality in cases where potentially acid generating tailings or tailings with neutral metal leaching are deposited within the inundation zone and have longer term effects on water quality and terrestrial habitat. The toxicity of the released process water may also have short term effects on the environment. The scales of the impacts are assessed on short-term or long-term effects and on the ability for the environment to recover.

Health, Social and Cultural:

Health, social and cultural values include disruptions or losses to local businesses, services, or social dislocation of people and workers. Potential losses to local and regional recreational, heritage and cultural assets that may be affected by the dam failure or destroyed. Potential effects on human health may be influenced by the toxicity of the tailings process water and leaching of released tailings.

Infrastructure and Economics:

Infrastructure losses can include bridges, highways, power stations, commercial and residential/properties etc. Loss of infrastructure that may contain hazardous substances can exacerbate the consequence. Loss of employment and the economic requirements to compensate persons and property are considered.

The consequence assessment may be developed to various level of details depending on the purpose of the consequence assessment (TSF classification, Emergency Panning, Risk Assessment), the stage of the TSF project and the magnitude of the potential losses.

FORWARD REFERENCE TO SECTION 7 ON DAM BREACH

INDICATE THE TWO CLASSIFICATIONS (FAIRWEATHER AND FLOOD)

Table 1-1 Tailings Dam Classification

Dam Failure Consequence Classification	Incremental Losses				
	Potential Population at Risk	Potential Loss of Life	Environment	Health, Social & Cultural	Infrastructure and Economics
Low	None	None expected	Minimal short-term loss or deterioration of habitat or rare and endangered species.	Minimal effects and disruption of business and livelihoods. No measurable effect on human health. No disruption of heritage, recreation, community or cultural assets.	Low economic losses; area contains limited infrastructure or services. <US$1M
Significant	1-10	Unspecified	No significant loss or deterioration of habitat. Potential contamination of livestock/fauna water supply with no health effects. Process water low potential toxicity. Tailings not potentially acid generating and have low neutral leaching potential. Restoration possible within 1 to 5 years.	Significant disruption of business, service or social dislocation. Low likelihood of loss of regional heritage, recreation, community, or cultural assets. Low likelihood of health effects.	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes. <US$10M
High	10-100	possible (1 - 10)	Significant loss or deterioration of critical habitat or rare and endangered species. Potential contamination of livestock/fauna water supply with no health effects. Process water moderately toxic. Low potential for acid rock drainage or metal leaching effects of released tailings. Potential area of impact 10 km^2 – 20 km^2. Restoration possible but difficult and could take > 5 years.	500-1,000 people affected by disruption of business, services or social dislocation. Disruption of regional heritage, recreation, community or cultural assets. Potential for short term human health effects.	High economic losses affecting infrastructure, public transportation, and commercial facilities, or employment. Moderate relocation/compensation to communities. <US$100M
Very High	100-1000	likely (10 to 100)	Major loss or deterioration of critical habitat or rare and endangered species. Process water highly toxic. High potential for acid rock drainage or metal leaching effects from released tailings. Potential area of impact >20 km^2. Restoration or compensation possible but very difficult and requires a long time (5 years to 20 years).	>1,000 people affected by disruption of business, services or social dislocation for more than one year. Significant loss of national heritage, community or cultural assets. Potential for significant long-term human health effects.	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities, for dangerous substances), or employment. High relocation/compensation to communities. <US$1B

Dam Failure Consequence Classification	Incremental Losses				
	Potential Population at Risk	Potential Loss of Life	Environment	Health, Social & Cultural	Infrastructure and Economics
Extreme	> 1000	many (more than 100)	Catastrophic loss of critical habitat or rare and endangered species. Process water highly toxic. Very high potential for acid rock drainage or metal leaching effects from released tailings. Potential area of impact > 20 km2. Restoration or compensation in kind impossible or requires a very long time (>20 years).	>5,000 people affected by disruption of business, services or social dislocation for years. Significant National heritage or community facilities or cultural asset destroyed. Potential for severe and/or long- term human health effects.	Extreme economic losses affecting critical infrastructure or services, (e.g., hospital, major industrial complex, major storage facilities for dangerous substances) or employment. Very high relocation/compensation to communities and very high social readjustment costs. >US1B

Notes: Population at Risk: Temporary includes people who may within the inundation zone on a short intermittent basis (e.g. seasonal or recreational visitors, temporary travelers or workers)

Loss of Life: Unspecified considers the number of persons who may temporarily be in the inundation zone, their exposure time and other conditions.

Habitat: Includes critically endangered, endemic, or migratory species, and ecosystem integrity and/or ecosystem services

Infrastructure and economics: Includes indirect and tangible losses. Costs are indicative only

1 SITE AND TAILINGS CHARACTERIZATION

1.1 Flood and Seismic Design Criteria

The design criteria for floods and seismic loading conditions are established by considering the dam classification and the potential losses to the Owner. The higher the consequences, the more stringent are the design criteria.

Table 5-1 provides the criteria corresponding to the consequence classification. Criteria for closure recognizes that the TSF will, in most cases, need to be safe for into perpetuity. Designs that reduce the consequence of failure on closure with, for example, removing the ability to store water, or draining down the level of saturation to a point where liquefaction is unlikely, may allow a reduction in the consequence classification.

The potential losses to the Owner may result in the Owner establishing more stringent criteria than those shown in Table 5-1. For example, a tailings dam may be classified as Significant because it is not a large structure and a failure would be fully contained on the mine lease, but such a failure could have major impacts to the Owner (as per Table XX), hence the Owner may elect to select design criteria that are consistent with a Very High classification. The classification of the dam would not change, but the design criteria would be more stringent.

For PBRISD design criteria can be determined by consideration of tolerable risks for the various failure modes. Societal tolerable risks have been determined in some jurisdictions such as Hong Kong, USA, and Australia with the concept of As Low as Reasonably Practical (ALARP) being used to drive risks down. The Australian National Committee on Large Dams (ANCOLD) Risk Assessment Guidelines (2003a) state that tolerable risk is 'A risk within a range that society can live with so as to secure certain net benefits. It is a range of risk that we do not regard as negligible or as something we might ignore, but rather as something we need to keep under review and reduce it still further if and as we can.' The ANCOLD Risk Assessment Guidelines (ANCOLD, 2003a) are consistent with the Australian/New Zealand Risk Management Standard AS/NZS ISO 31000:2009 (AS/NZS, 2009).

Table 1-1 Flood Design Criteria

Consequence Classification	Flood Criteria -- Annual Exceedance Probability	
	Operations and Active Care Closure	Passive Care Closure
Low	1/200 ANCOLD 1:100	1/1,000 ANCOLD PMF
Significant	1/1,000 ANCOLD 1:1000	1/2,475 ANCOLD PMF
High	1/1,2475 ANCOLD 1:10,000 or PMF	1/5,000 ANCOLD PMF
Very High	1/5,000 ANCOLD 1:10,000 or PMF	1/10,000 or PMFANCOLD PMF
Extreme	1/10,000 or PMF ANCOLD 1:10,000 or PMF	1/10,000 or PMF/ANCOLD 1:10,000 or PMF

Table 1-2 Seismic Design Criteria

Consequence Classification	Seismic Criteria - Safety Evaluation Earthquake-- Annual Exceedance Probability	
	Operations and Active Care Closure	Passive Care Closure
Low	1/200 ANCOLD 1:1000	1/1,000 ANCOLD 1:10,000 or MCE
Significant	1/1,000	1/2,475 ANCOLD 1:10,000 or MCE
High	1/1,2475 ANCOLD 1:2000	1/5,000 ANCOLD 1:10,000 or MCE
Very High	1/5,000 ANCOLD 1:5000	1/10,000 or MCE ANCOLD 1:10,000 or MCE
Extreme	1/10,000 or MCE	1/10,000 or MCE ANCOLD 1:10,000 or MCE

Note: The determination of a Maximum Credible Earthquake (MCE) is difficult in regions of relatively low earthquake activity such as Australia, North America and Brazil. In these areas the use of probabilistic methods to estimate the SEE is preferred. However, in regions where the extent of active faults can lead to the assessment of a realistic MCE, this value could be used as an upper limit of the SEE.