



Global Industry Standard on Tailings Management

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## **GISTM tailings facility disclosure for Richards Bay Minerals (RBM) – Discard Sands**

5 August 2025

Guidance on interpretation of this GISTM tailings facility disclosure:

*The following provides the information required under Requirement 15.1.B of the GISTM.*

*The information provided in this Global Industry Standard on Tailings Management (GISTM) tailings facility disclosure should be read in conjunction with the information relating to Rio Tinto's approach to tailings management that is available on the Rio Tinto website, and the Group-level tailings management information supporting the GISTM tailings facility disclosures that is included in the Appendix to this document.*

*Where Rio Tinto considers a Rio Tinto internal process, standard, procedure and/or plan gives rise to a materially similar outcome to a requirement of GISTM, Rio Tinto has adopted the relevant defined term from GISTM for the purpose of reporting under Requirement 15.1.B of GISTM, even though the relevant Rio Tinto process may have a different name or achieve a materially similar outcome by different methods.*

*The information provided in this disclosure contains forward-looking statements (within the meaning of the US Private Securities Litigation Reform Act of 1995) concerning the financial condition, operations and businesses of Rio Tinto. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements.*

*Readers should not place undue reliance on these forward-looking statements, including with regard to future investment decisions. This is because forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance of, or events affecting Rio Tinto, or the industry, to differ materially from those expressed or implied in these statements.*

*Refer to the end of this GISTM tailings facility disclosure for further information on the content of this document and on forward-looking statements.*

## **GISTM conformance status**

**Tailings facility name:** Richards Bay Minerals (RBM) – Discard Sands

**GISTM consequence classification:** Significant

**GISTM conformance status:** Full Conformance

**Tailings facility status:** Active

Richards Bay Minerals (RBM) – Discard Sands is managed under the Rio Tinto *Group Safety Standard for the Management of Tailings and Water Storage Facilities*, which is focused on ensuring safe operation of all our tailings facilities, and the Rio Tinto *Group Safety Standard for the Management of Slope Geotechnical Hazards*.

All relevant requirements of the GISTM have been implemented for RBM – Discard Sands.

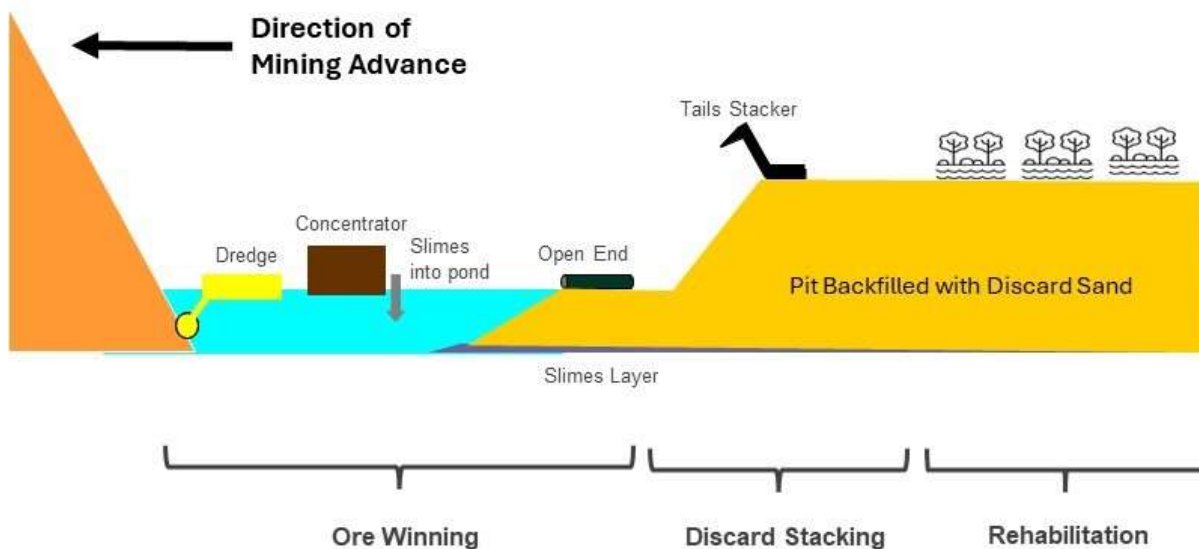
With safety and transparency being core principles for Rio Tinto and the GISTM, we have engaged with local representatives and emergency response groups and will continue to share relevant information and seek inputs as engagement continues. We have an Emergency Preparedness and Response Plan in place, developed with involvement from local responders and community stakeholders where relevant.

## 1. Description of the tailings facility

The GISTM definition of Tailings and Tailings Facilities is broader than many other international standards on Tailings Management and it encompasses the discarded sand produced at a Mineral Sands mining operations, such as the Richards Bay Minerals (RBM) mine.

The mineral sand mine is a continuous process. The in-situ ore is mechanically excavated by a dredger. The ore then undergoes washing and centrifugal separation to extract heavy mineral concentrate (HMC) from the non-mineralized sands. The discard non-mineralized sand is pumped to backfill the mined-out void, creating a landscape similar to the pre-mining landform of dunes and valleys. Some of this backfilled area is used temporarily for mining infrastructure, however, most of the backfilled area is rehabilitated with vegetation and actively managed. The mineral sand mining process does not create a conventional pit or waste dump, nor a typical tailings facility, yet it involves temporary mining slopes, processing, transporting of soils with water, and the deposited discard sand creates dunes and valleys.

The GISTM provides a framework for safe tailings management while allowing the operator flexibility as to how best to achieve this goal. RBM have used an international expert independent advisory panel to assure that the approach for safe tailings management suits the specific characteristics of this mining method used at RBM and meets the intent of the GISTM.



The Richards Bay Minerals (RBM) mine and smelter is located approximately 20 kilometres northeast of the city of Richards Bay in South Africa. RBM is an operational site that produces titania slag, pig iron, rutile and zircon.

RBM covers two lease areas, Tisand and Zulti North. The Tisand lease was operated on between 1976 and 2008 and has since been mined, backfilled and rehabilitated with vegetation. The rehabilitation is actively managed by RBM. The Zulti North lease is currently being mined and includes four dredge mining ponds. As each mining pond advances, the pit is backfilled with the tails (discard sands) and progressively rehabilitated. As of May 2025, RBM have backfilled 4,190 hectares across both leases.



## 2. Consequence classification

Credible failure modes for RBM – Discard Sands have been identified, and modelling has been undertaken. There are no credible flow failures on the mining lease that result in inundation outside of the mining lease. The dam failure consequence classification was assessed in accordance with the GISTM Consequence Classification Matrix. Incremental losses linked to potential population at risk and potential loss of life, environment, health, social, cultural, infrastructure and economic impacts were considered.

The overall GISTM consequence classification for RBM – Discard Sands is ‘Significant’, due to the potential impacts in the event of a failure to personnel and to the environment.

## 3. Risk assessment summary

Rio Tinto assesses risks in a manner consistent with the International Standards Organisation’s *Risk Management – Guidelines* (ISO 31000) using the Rio Tinto *Risk Management Standard*. Assessments of risks related to the construction, operation and closure of RBM – Discard Sands are undertaken by a multi-disciplinary team of specialists. Risks are evaluated in relation to potential consequences linked to a range of aspects including but not limited to health and safety, social, human rights, environment, infrastructure and local economics. The material risks that have been identified for RBM – Discard Sands and their associated mitigation measures are summarised in the table below.

Material risk	Control measure(s)	Status
Stack failure.	Richards Bay Minerals (RBM) utilises a 3-tier stacking methodology that ensures stability of each stacked unit. This is achieved by making sure that adequate foundations have been formed through use of an open end pipe, maintaining safe offset distances from the mining pond and between the successive tails stacks and maintaining correct heights to avoid potential failure of tails stacks.	Operational, and is monitored daily by the onsite team with monthly inspections by Engineer of Record.

<b>Material risk</b>	<b>Control measure(s)</b>	<b>Status</b>
Closure cost may be underestimated.	RBM's Rehabilitation, Decommissioning and Mine Closure Plan (RDMC) has been compiled in accordance with the requirements of the National Environmental Management Act (Act No 107 of 2008) GNR 1147, published on 20 November 2015, which outlines the requirements of the financial closure costing calculations. Cost estimates are informed by closure management measures and assumptions presented in the Closure Management Plan (2012) and updated survey data for mined and rehabilitated areas. Rio Tinto's Closure Standard requires comprehensive closure studies to be completed 10 years prior to final closure. These studies will inform an update to closure management measures, assumptions, and cost estimations.	The closure cost estimate is independently audited and closure cost estimates for the business are included in Rio Tinto's Annual Report.

Material risks are formally reviewed monthly, and all other risks are reviewed quarterly by an internal multidisciplinary risk management team. Risk assessments are reviewed by the Responsible Tailings Facility Engineer (RTFE) and Engineer of Record which are updated regularly to reflect an accurate current state of the risks and to ensure the controls for the risks remain relevant and effective.

A detailed study of tailings related risks and risk reduction measures has been conducted to ensure that the risks associated with RBM – Discard Sands are effectively managed to a level as low as reasonably practicable (ALARP), and to ensure that all reasonable steps have been taken to reduce both the probability and consequences of a tailings facility failure.

#### **4. Impact assessment summary**

An impact assessment has been undertaken for RBM – Discard Sands using credible failure scenarios. Since the credible failure scenarios are contained within the mining lease, human exposure and vulnerability were evaluated based on the presence and activities of mine personnel in the area during such events.

Acute environmental impacts are not anticipated, nor are adverse effects on water quality, ecosystems or conservation areas. Temporary ground water impacts are being monitored for long-term risk management and to ensure they do not affect local community.

Outcomes from the impact assessments have been provided to and discussed with relevant stakeholders, who have had input into the development of the Emergency Response Plan for the tailings facility that forms part of the overarching emergency preparedness and response for the site.

#### **5. Description of the tailings facility design**

The discard stacking is designed to achieve a final landform that is similar to the pre-mining landscape of the area, which is predominantly dunes and valleys. The landform is designed with a maximum slope angle of 26 degrees to avoid elevated ponding of water.

The mining and tailings management process for each of the dredge ponds comprises of three zones: Ore Winning, Discard Stacking, and Rehabilitation (as shown in Section 1).

The Ore Winning zone consists of the dredge pond, the dredger and the concentrator. The dredger mechanically excavates the ore at the mining face and pumps the ore to the concentrator. The height of the mining face can vary from 20 metres to 180 metres. The Concentrator separates the heavy mineral concentrate (HMC) from the non-mineralised sands. The fine (-45 micron) non mineralised sand is deposited

into the dredge pond where it settles to the bottom. The coarse discard sand is pumped to the Discard Stacking zone.

The Discard Stacking zone is designed as a multi-tier system to mitigate the risk of the discard sand slumping into the back of the dredge pond. The different discard sand tiers are as follows:

- Open End Tier: The discard sand is deposited directly out of the pipe to form a shallow beach at the back of the dredge pond.
- Low Stack: The Open End Tier is given time for the water to drain and to consolidate by ensuring a minimum length of 200 m to the Low Stack. The Low Stack has a maximum height of 15 m. The coarse discard sand is deposited by means of a Tails Stacker. The discard sand is pumped to the Tail Stacker, where a hydro-cyclone recovers most of the water. The recovered water is returned to the dredge pond in pipes.
- Mid Stack: Coarse discard sand is deposited by the hydro-cyclone tail stacker to a maximum height of 20 metres and a minimum distance from the Low Stack of 100 metres.
- High Stack: Coarse discard sand is deposited by the hydro-cyclone tail stacker to a maximum height of 50 metres and a minimum distance from the Mid Stack of 200 metres.

The number of Tiers required depends on the height of the mining face. A valley is left on the side of the tailings stack to allow residual water to drain from the tails stack and return to the dredge pond.

As the dredge pond and discard stacking operations advance, the dunes created by tails stacking progressively enter the Rehabilitation zone. Wind erosion protection is installed, and vegetation is planted to support rehabilitation efforts and management.

## 6. Review findings summary

The material findings from the most recent independent operational review and their associated mitigation measures are summarised in the table below.

Material review finding	Mitigation measure(s)	Status
Understanding of the hydrogeological conditions.	Install additional piezometers.	Planned.

The review confirmed that RBM – Discard Sands is operated and constructed in accordance with the Rio Tinto *Group Safety Standard for Management of Slope Geotechnical Hazards*; this Standard provides a framework for the identification, assessment and management of slope geotechnical hazards and risks.

## 7. Environmental and social monitoring programmes

There are currently no material findings from the environmental and social monitoring programmes for RBM – Discard Sands.

Monitoring programmes form part of Rio Tinto's Health, Safety, Environment and Communities (HSEC) management system, that acts as the environmental social management system.

To support environmental monitoring, groundwater monitoring is conducted on a quarterly basis and includes static water levels and water chemistry. This involves the analysis of physical and chemical properties as determinants of potential pollution. Surface water monitoring takes place in the mine dredging ponds and streams nearby the operations monthly.

Data is analysed to determine potential impacts that may be caused by operations on water resources. The current groundwater chemistry shows water in the area to be mixing waters (i.e. a mix of fresh water and salt water), this is anticipated as the operation is near the coastline. When compared with the regional water

quality from the study conducted in the past, water quality at RBM is comparable, showing that RBM's influence in the regional water quality is minimal.

Dust monitoring is also conducted along the haulage roads and stockpiling areas. The monitoring points cover the mining area and residential areas. Dust emissions have been compliant with the dust fallout regulations, with rare instances of exceedances during windy months.

A monitoring programme for Sokhulu community was established following community concerns regarding RBM operations. The results are presented to the community quarterly since the inception of the monitoring programme towards the end of 2023. This helps to address the concerns early, in collaboration with the community to build relationships and in efforts to protect the environment.

## 8. Emergency preparedness and response

An Emergency Response Plan (ERP) has been developed for RBM – Discard Sands as part of Rio Tinto's Business Resilience and Recovery Programme. No credible failure modes were identified that could result in a flow failure event off the mining lease. Therefore, the ERP focuses on mitigating the consequences of the material risks present at RBM – Discard Sands, including the potential for slope failure, which could lead to equipment damage and pose a hazard to personnel.

The emergency preparedness and response planning includes:

- Equipment and personnel resources required to respond to an emergency;
- Roles and responsibilities of internal employees, responders and other relevant stakeholders;
- Personnel competencies and training need analysis;
- Training exercises;
- A graduated Trigger Action Response Plan, where actions are based on how imminent a failure may be, or where actions are based on a failure that has occurred;
- Communications during emergency (to employees, contractors, site visitors, Umfolozi Emergency Services, local community);
- Evacuation decision making, co-ordination, planning requirements; and
- Recovery from a tails stack failure at RBM – Discard Sands.

Relevant information has been provided to, and discussed with, the Local Disaster Management Group. This group includes the Umfolozi Emergency Services, Richards Bay Minerals Fire and Rescue Brigade (FARB), and community representatives. The group has had input into the development of the ERP for RBM – Discard Sands.

## 9. Independent review timing

The most recent independent operational review of RBM – Discard Sands was conducted in June 2023. The next review is scheduled for Q4 2025.

An annual independent inspection typically occurs in Q2 each year and is performed by the Engineer of Record.

The Engineer of Record also conducts an independent inspection each month of monitoring, and of geotechnical and operational performance.

## 10. Financial capacity for closure

RBM – Discard Sands is 74% owned by Rio Tinto. Joint Venture partners are responsible for their agreed share of closure and rehabilitation costs. Rio Tinto confirms it has adequate financial capacity to cover the agreed share of estimated costs of planned closure, early closure, reclamation, and post-closure monitoring and maintenance of RBM – Discard Sands.

IMPORTANT NOTICEContent of document

*This document includes figures, classifications, assessments and other information regarding tailings and Rio Tinto's systems. Some of the information provided relies upon judgment based on internal or external reviews of information. Unless otherwise stated the information in the document is based on data available as at the date of this document, and judgments or assessments in the document may be based on data which predates the date of this document. The information and views may change based on new or different information, circumstances or events and should not be relied upon as a forecast or recommendation.*

Forward looking statements

*The information presented contains forward-looking statements (within the meaning of the US Private Securities Litigation Reform Act of 1995) concerning the financial condition, operations and businesses of Rio Tinto. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements.*

*Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance of, or events affecting Rio Tinto, or the industry, to differ materially from those expressed or implied in these statements. Such forward-looking statements involve subjective judgements and determinations based on available geological, technical, contractual and economic information. These could change because of new information from production or mining activities, or changes in economic factors, including changes in market prices and operating costs, changes in the regulatory policies of host governments, or other events. The statements could also be altered by acquisitions and divestments, new discoveries, and extensions or closure of existing mines, as well as the application of improved recovery and tailings techniques. Published statements could also be subject to correction due to errors in the application of internal assurance or published rules or guidance, and changes in that assurance, rules or guidance. Please also refer to further factors and risks as identified in Rio Tinto's most recent Annual Report and Accounts in Australia and the United Kingdom and the most recent Annual Report on Form 2-0-F filed with the United States Securities and Exchange Commission ("SEC") or Forms 6-K furnished to, or filed with, the SEC.*

*As such, readers should not place undue reliance on these forward-looking statements, including with regard to future investment decisions.*

*Rio Tinto undertakes no obligation to publicly update, or revise, any information in the document, including forward-looking statements, as a result of new information, future events or other information.*



### **Appendix A: Group-level tailings management information supporting the GISTM tailings facility disclosures**

5 August 2025

Guidance on interpretation of this Appendix to the GISTM tailings facility disclosures:

*The following provides Rio Tinto Group-level information relating to tailings management that supports the GISTM tailings facility disclosures. The processes implemented at individual sites may differ slightly from those described here.*

*The information provided in this Appendix to the Global Industry Standard on Tailings Management (GISTM) tailings facility disclosures should be read in conjunction with the information relating to Rio Tinto's approach to tailings management that is available on the Rio Tinto website.*

*Where Rio Tinto considers a Rio Tinto internal process, standard, procedure and/or plan gives rise to a materially similar outcome to a requirement of GISTM, Rio Tinto has adopted the relevant defined term from GISTM for the purpose of reporting under Requirement 15.1.B of GISTM, even though the relevant Rio Tinto process may have a different name or achieve a materially similar outcome by different methods.*

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*Refer to the end of this Appendix to the GISTM tailings facility disclosures for further information on the content of this document and on forward-looking statements.*

## **Appendix A: Group-level tailings management information supporting the GISTM tailings facility disclosures**

### **A.1. Rio Tinto's tailings facilities**

#### *Key points:*

- *Information for the tailings facilities that Rio Tinto operates are included in our interactive tailings disclosure map.*
- *New tailings facilities at our operations are in various stages of studies and construction; these will be added to the interactive tailings disclosure map over time.*
- *Rio Tinto also has an interest in tailings facilities at non-managed and non-operated sites.*

Rio Tinto operates a diverse portfolio of tailings facilities at various stages of the tailings facility lifecycle, including tailings contained within engineered earthen embankments and tailings deposited into previously mined open pits. Some tailings facilities consist of embankments constructed in a single phase; others have been raised several times over their active life to increase tailings storage capacity.

For each of our tailings facilities with 'Very High' and 'Extreme' GISTM consequence classifications, we have published a tailings facility disclosure statement under Principle 15 of the GISTM that provides information on implementation status. In addition, the tailings information published in response to the request for public disclosure on tailings by the Investor Mining and Tailings Safety Initiative (IMTSI) is available for these facilities. For the remaining tailings facilities with 'Low', 'Significant' and 'High' GISTM consequence classifications, we have published information in the IMTSI disclosure; disclosure statements under Principle 15 of GISTM will be available for all Rio Tinto operated tailings facilities from August 2025.

We periodically update the list of tailings facilities to reflect operational and ownership changes, including changes relating to closure or remediation obligations for legacy assets and reclassification of tailing facilities as these develop over the life of operations.

Rio Tinto also has an interest in other mining operations through joint ventures and other business entities, and through our connection to legacy assets. Sites with tailings facilities in which Rio Tinto has an interest include: Alumar, Blackbird, Escondida, Gladstone Power Station, Mineração Rio do Norte, Olette, Ranger, and Saint Cyr. Refer to the operator or owner for further information on these tailings facilities.

### **A.2. Consequence classification**

#### *Key points:*

- *Each tailings facility has been assessed against the five potential loss categories defined in the GISTM and assigned a dam failure consequence classification based on the highest consequence classification across the five categories.*
- *Consequence classifications for Rio Tinto's tailings facilities are a result of assessment by qualified and experienced multi-disciplinary teams following consideration of credible failure modes and impact assessments.*
- *Consequence classifications can change over time.*

Annex 2 of the GISTM includes the Consequence Classification Matrix, as shown below. Using this matrix, potential failures of a tailings facility are assessed against five potential loss categories and assigned a dam failure consequence classification. The overall GISTM consequence classification for a tailings facility is the highest classification across the five categories.

It is important to note that consequence classifications are not ratings of the safety condition of a tailings facility or the likelihood of failure; instead, they rate the potential consequence if the tailings facility were to fail.

Dam Failure Consequence Classification	Incremental Losses				
	Potential Population at Risk	Potential Loss of Life	Environment	Health, Social and 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 <sup>2</sup> – 20 km <sup>2</sup> . 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	100-1,000	Likely (10 – 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 <sup>2</sup> . 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.
Extreme	> 1,000	Many (> 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 <sup>2</sup> . 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 assets 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. >US\$1B.

Rio Tinto has assigned a GISTM consequence classification to each tailings facility that we operate following assessment of credible failure modes, impact assessments and consideration of downstream conditions. These assessments are conducted by multi-disciplinary teams and use in-house and external expertise. The current GISTM consequence classification for each tailings facility is shown in our interactive tailings disclosure map and in our IMTSI tailings disclosure.

There are other consequence classification schemes in use for tailings facilities, and Rio Tinto has previously published the consequence classifications for our tailings facilities based on the relevant local or international scheme. There may be differences in classification ratings between schemes, depending on the criteria used to assign the classifications.

The consequence classification of a tailings facility can change over time for various reasons, including changes to the operational status of the tailings facility, additional construction that changes the configuration of the tailings facility, the completion of engineering works or implementation of other controls that reduce the potential consequences, or when new information is obtained about the tailings facility, or about the social, environmental and local economic context where the tailings facility is situated.

Consequently, Rio Tinto may, from time to time, amend the consequence classification of a tailings facility. Given the nature of the work required to assess if an amendment to a consequence classification is required, there may be a delay between the change in circumstances that leads to the assessment and amending the consequence classification in our GISTM and IMTSI disclosures and in our interactive tailings disclosure map.

### A.3. Risk assessments

#### Key points:

- *Rio Tinto's Risk Management Standard describes our approach to identifying, assessing, managing and mitigating risk.*
- *Tailings risk assessments consider risk scenarios based on credible failure modes.*
- *Risk assessments are conducted by qualified and experienced multi-disciplinary teams.*
- *Identified risks are managed using the 'three lines of defence' model.*

All of Rio Tinto's tailings facilities have undergone a detailed risk assessment in alignment with Rio Tinto's *Risk Management Standard* and, where relevant, following our internal guidance on risk analysis for dam safety. Using these processes, potential risk scenarios are listed, risk controls and their effectiveness are assessed, and additional controls are identified. The outcome of these risk assessments is a risk classification using Rio Tinto's internal risk classification scheme which determines the materiality of the risks and the approach to mitigating them.

For tailings facilities, the risk analysis is based on credible failure modes. While credible failure modes are possible ways that a tailings facility could fail, the GISTM notes that "*credible catastrophic failure modes do not exist for all tailings facilities*" and "*the term 'credible failure mode' is not associated with a probability of this event occurring and having credible failure modes is not a reflection of facility safety*".

Credible failure modes can vary over the lifecycle of a tailings facility as the operating conditions change; the risk assessment process takes into account these changes, and risk assessments can be done at different stages in the life cycle (for example, a risk assessment will occur for the operating phase of the tailings facility and will subsequently be reviewed and updated when the tailings facility moves into the closure phase).

Tailings facility risk assessments are conducted by multi-disciplinary teams to consider the potential causes and impacts of a tailings facility failure including to communities and the environment. Rio Tinto has qualified and experienced personnel who participate in these risk assessments, and we also use the expertise and knowledge of external consultants at various times to contribute to and review the outcomes.

We have a structured approach to managing risks associated with tailings facilities, underpinned by our *Group Safety Standard for the Management of Tailings and Water Storage Facilities*. We apply the 'three lines of defence' model to assurance activities to ensure risks are appropriately managed, through:

- First line assurance, facilitated at the site level, with the purpose of assuring effective tailings facility design, comprehensive operational controls and regular independent reviews;
- Second line assurance through technical reviews and risk reviews; and
- Third line assurance that is independent and is commissioned by the Executive and Board to ensure that our systems for risk management, internal control and governance are adequate and effective.

#### **A.4. Impact assessment, and human exposure and vulnerability**

##### *Key points:*

- *Impact assessments have been used to inform and identify potential environmental impacts, and potential human exposure and vulnerability to a tailings facility failure.*
- *Human exposure and vulnerability assessments are used to inform the social impact assessments and other social studies that consider social, environmental and local economic contexts relevant to the tailings facility.*
- *A human rights risk self-assessment is used to identify, assess, manage and mitigate any potential impacts to project-affected people's salient human rights, in alignment with the United Nations Guiding Principles on Business and Human Rights and Rio Tinto's Human Rights Policy.*

Rio Tinto's environment Group Standards outline the minimum performance requirements for the management of water quality, air quality, mineral waste (including tailings), land disturbance and rehabilitation, hazardous materials and non-mineral waste as well as biodiversity and natural resource management. Our Health, Safety, Environment and Communities management system ensures that our environment standards are considered collectively with health, safety, and social performance standards as part of the hazard identification and risk management process to identify and control risks associated with business activities.

Regulations in the jurisdictions where we operate require Rio Tinto to conduct environmental impact assessments (EIAs) or social and environmental impact assessments (SEIAs) as part of any new mine development and, where required, expansions to existing operations. Additionally, risk assessments are required to be undertaken that consider climate change, water management and any hazards associated with physiochemical properties and biogeochemistry of tailings. To understand the potential risks associated with climate change affecting the stability of tailings facilities, assessments have been undertaken in line with

Rio Tinto's approach to climate risk and resilience assessment for new, operating and closed tailings facilities.

Environmental baseline information and supporting monitoring information for each tailings facility has been incorporated into the integrated knowledge base. Additional environmental assessments have been undertaken as required to supplement the knowledge base to support tailings management risk mitigation approaches.

Rio Tinto's *Communities and Social Performance Standard* defines minimum, mandatory performance and management criteria to manage social and human rights risks and opportunities associated with our business activities that could materially impact host communities, other stakeholders with whom we interact, or the Rio Tinto Group.

To assess potential human exposure, and vulnerability, together with social risks and impacts from a tailings facility failure, assessments have been conducted in alignment with international standards, guidelines and best practice approaches, linked to:

- Social knowledge base, community baselines, socio-economic data and local context considerations;
- Social risks resulting from a potential tailings facility failure being considered through the formal, multidisciplinary risk assessment process using Rio Tinto's risk evaluation framework to quantify the potential consequences to people, health and safety, human rights, license to operate, the environment, business integrity, and legal and regulatory compliance;
- Human exposure and vulnerability assessments conducted for each tailings facility to identify induced and inherent vulnerabilities from a failure scenario identified as part of the dam break study, and how this information is used to support emergency response preparedness;
- Social impact assessments being updated to reflect current social contexts, baselines, stakeholders, and dependencies in response to a tailings facility failure event; and
- In alignment with the United Nations *Guiding Principles on Business and Human Rights* and Rio Tinto's *Human Rights Policy*, a targeted human rights risk self-assessment tool is used to consider and manage salient human rights risks resulting from a tailings facility failure. The tool provides a framework for identifying, assessing, mitigating, managing and monitoring human rights risks in alignment with Rio Tinto's *Risk Management Standard* and *Communities and Social Performance Standard*.

## A.5. Tailings facility design

*Key points:*

- *The design of each tailings facility is unique, based on the type of tailings and the location in which the tailings facility is situated.*
- *Our tailings facilities are designed and reviewed by qualified and experienced consultants.*
- *Designs are undertaken to industry standards and leading practice guidance.*

Tailings storage is a substantial design decision when developing a mine, and there are many factors that need to be considered in selecting the site and construction method to safely contain the tailings. Site conditions such as topography, foundation conditions, rainfall, seismic activity, mineral characteristics and proximity to people and communities dictate appropriate siting of tailings facility locations, technology and storage solutions. As a result, each tailings facility is unique.

Depending on the environment and the chemical characteristics of the tailings, the tailings facility may be lined, using a variety of lining systems which are designed to prevent impacts to surface and groundwater systems. In other cases, lining may not be required and storage behind an engineered earthen embankment or within a mined-out open pit may be sufficient. Back-filling of mined-out pits may have advantages for overall risk reduction and will generally be considered as an option for tailings storage where practicable.

As the tailings slurry is collected in the tailings facility, the water separates from the heavier sand and silt particles and is collected at the surface. The water in the tailings facility may then be recycled back to the process plant for reuse to minimise the impacts to the environment.

In addition to the design requirements specified by the GISTM, our *Group Safety Standard for the Management of Tailings and Water Storage Facilities* has specific requirements relating to the design of tailings facilities. The design of our tailings facilities is carried out to industry accepted design standards and design criteria by qualified and experienced personnel employed by engineering consulting companies. The

designs are also reviewed by independent tailings facility specialists. For our 'Very High' or 'Extreme' consequence classification tailings facilities, oversight and review of the technical aspects of the design is within the remit of the Independent Tailings Review Board.

#### **A.6. Annual performance reviews and dam safety reviews**

*Key points:*

- *Annual performance reviews are undertaken by the Engineer of Record, and findings are reported back to Rio Tinto.*
- *Dam Safety Reviews comprise of independent reviews conducted in alignment with our Group Safety Standard for the Management of Tailings and Water Storage Facilities, together with reviews of our As Low As Reasonably Practicable (ALARP) risk assessments.*
- *ALARP demonstration is an ongoing process for the lifecycle of the tailings facility and is a driver for improvements to the management of our tailings facilities.*

Supporting the performance requirements specified by the GISTM, the Rio Tinto *Group Safety Standard for the Management of Tailings and Water Storage Facilities* has specific requirements relating to monitoring and design verification. The key requirements are:

- All personnel conducting monitoring, survey and other design verifications must be suitably trained and familiar with the tailings facility performance objectives;
- Reports must be prepared that outline tailings facility performance at specified intervals;
- The Engineer of Record must inspect the tailings facility at least annually and review the operational documentation to confirm that operation of the tailings facility conforms to the intent of the design; and
- Monitoring reports must be reviewed by the Engineer of Record and must confirm that the tailings facility is operating within the design constraints.

To meet these requirements, an annual performance review is undertaken by the Engineer of Record to assess performance of the operation to design, and a review report is then provided to Rio Tinto.

Rio Tinto addresses the GISTM requirements of a Dam Safety Review by undertaking independent reviews and risk analyses processes to demonstrate that risks have been reduced, including to an As Low As Reasonably Practicable (ALARP) level where required.

Design reviews are conducted at various stages of the design process. The independent design review includes detailed technical review of all aspects of the design with emphasis on the design basis analysis including site and material characterisations, water balance, and stability modelling.

The life-of-facility design is reviewed by an independent tailings facility specialist prior to the implementation of the design. Each detailed stage design, including final closure design, is also reviewed by an independent tailings facility specialist prior to start of construction. The independent specialist evaluates the technical aspects of the design including construction drawings and technical specifications and ensures that the stage designs align with the life-of-facility design.

Independent operational reviews are planned for and completed through the tailings facility lifecycle, including closure and post-closure phases, to identify physical hazards associated with geotechnical, hydrological, hydrogeological and performance aspects of the tailings facility. Reviews are conducted at a frequency of not less than once every two years. Following implementation of the GISTM for a tailings facility, the independent reviewer will make a statement on the safety of the tailings facility, in accordance with the requirements of the GISTM.

ALARP demonstration is undertaken predominantly through a formalised quantitative risk assessment process. ALARP demonstration activities are documented, including actions and timing for completion, and associated commentary is provided on the rationale behind the design decisions. We then subsequently confirm that all actions have been implemented to mitigate risks.

The Engineer of Record reviews the ALARP assessment results, followed by an additional review by the Independent Tailings Review Board or senior independent technical reviewer. The Accountable Executive may then take the decision to confirm that the tailings facility is at ALARP level, or direct further works to be undertaken to demonstrate ALARP.

ALARP demonstration is not a one-off event; it is an iterative process through the tailings facility lifecycle, including closure. The Rio Tinto processes listed above align with the GISTM ALARP requirements to:

- Conduct and update risk assessments with a qualified multi-disciplinary team using best practice methodologies at a minimum every three years and more frequently whenever there is a material change either to the tailings facility or to the social, environmental and local economic context; and
- Conduct a review of ALARP at the time of every Dam Safety Review or at least every five years for an existing tailings facility classified as 'High', 'Very High' or 'Extreme'.

## A.7. Environmental and social monitoring

*Key points:*

- *Effective and integrated management of the tailings facility is governed through our Environmental and Social Management System (ESMS).*
- *The business monitors local communities, in terms of social contexts, impacts, dependencies, public perceptions, trust and acceptance, feedback, complaints and grievances through the collection and analysis of data to inform decision making.*
- *Social monitoring programs are maturing as local communities become more aware and engaged in the management of tailings facilities. Engagement plans are in place to support ongoing local engagement throughout the tailings facility lifecycle and to raise awareness and maintain a shared state of preparedness in the event of tailings facility failure.*
- *There are opportunities for local communities to become more involved in environmental monitoring activities linked to tailings management.*

Rio Tinto's Health, Safety, Environment and Communities (HSEC) management system is reflective of the 'plan, do, check, act' concept that integrates procedures and objectives to manage environmental and social risks and impacts in a structured and meaningful way. The HSEC system meets the requirements of the environmental social management system (ESMS) under GISTM, in that it supports sustainable environmental and social performance, reflects clearly defined and repeatable processes, is dynamic, promotes continuous improvements and is integrated with other management systems, including the tailings management system.

Environmental and social monitoring activities are in place to support the management system. Environmental monitoring programs are established based on environmental impact assessments to determine actual and potential impacts from mining projects, which are compared against predicted or modelled impacts as part of the assessment process.

As part of the environmental impact assessment process, Rio Tinto is also required to undertake monitoring of impacts to the receiving environment to satisfy conditions and commitments outlined in statutory approvals and to conform to the requirements of our environment standards.

Monitoring can include, but is not limited to, assessment of impacts of the tailings facility to local and/or regional groundwater quality, surface water quality and local air quality. In most jurisdictions, reporting of environmental performance is through provision of monitoring results to the local regulators, as well as nominated affected stakeholders, and is required on at least an annual basis for the life of the tailings facility, including the closure and post-closure phases.

Our approach to social monitoring involves the collection and monitoring of data linked to socio-economic contexts of local communities, risk and impact assessments, stakeholder feedback, community perception surveys, complaints and grievances, and requests for information. The information gathered is used to manage social risks and impacts, measure performance against targets, and to inform decision making.

Engagement with local communities is used to increase awareness of each tailings facility and our approach to safe tailings management, to build an integrated knowledge base for each tailings facility and local surroundings, collectively develop plans to monitor performance, and to support a maintained shared state of preparedness in the event of a tailings facility failure. A variety of engagement tools and resources have been developed to support local engagement activities.

With safety and transparency being core principles for Rio Tinto and the GISTM, we have engaged with local communities about the 'Very High' and 'Extreme' consequence tailings facilities located in the areas where we operate and we will continue to share relevant information, seek input and ensure communities are prepared in the unlikely event of a failure.

Community grievances are managed through a mechanism that outlines processes for obtaining, handling, responding to, and remedying complaints and grievances. Our *Communities and Social Performance Standard* requires that each site has a mechanism that has been designed in consultation with communities and stakeholders, is publicly available, easily accessible, and allows for an appeal process for resolution of complex complaints or grievances.

To date, there have been a small number of reported complaints and requests for additional information in relation to tailings management from local communities across our global footprint. The complaints have been managed in accordance with our internal standards and procedures and responses provided to stakeholders as appropriate. As engagement continues, local communities will have more opportunity to raise questions, seek clarification, express concerns and request information.

#### **A.8. Emergency preparedness and response**

##### *Key points:*

- *Rio Tinto has a well-established Business Resilience and Recovery Programme, which applies to all emergency situations including tailings-related events.*
- *Immediate emergency response is provided by our emergency response teams, in collaboration with local emergency response groups as required.*
- *We engage with local communities and agencies on emergency response planning and considerations for longer-term recovery.*

Principles 13 and 14 of the GISTM include the requirement for a site-specific tailings facility Emergency Preparedness and Response Plan which includes specific actions to both prepare for and manage an escalating event, and deliver long-term business, social and environmental recovery following a catastrophic failure.

The Business Resilience and Recovery Programme (BRRP) is Rio Tinto's emergency and crisis management framework, ensuring enterprise-wide preparedness to respond to actual and potential incidents and/or events that may impact local communities, the environment, or our business objectives.

Our sites leverage the BRRP framework to address the GISTM requirements. Each site has an emergency response team that acts as first responders to any emergency on site. These teams are trained in rescue, medical aid and evacuations, and regularly practice emergency response scenarios. The role of the public sector or civil emergency response would be significant in the event of a catastrophic tailings facility failure, with their role likely to extend to the assumption of overall incident command in accordance with legislative requirements. In this situation, the site will comply with the directions of the lead response agency and cooperate with their response efforts.

In alignment with the BRRP and to meet the requirements of the GISTM for an Emergency Preparedness and Response Plan, a Tailings Response Plan has been prepared for each tailings facility as part of the overall emergency preparedness and response planning for local communities. The Tailings Response Plan is based on credible flow failure scenarios and the assessment of potential consequences. The plan includes details on roles and responsibilities, chain of command, training competencies, action responses, evacuation procedures and considerations for recovery.

To prepare for long term recovery in the event of a tailings facility failure, we will engage with public sector agencies and other organisations to consider social and environmental response strategies that may be relevant to reconstruction, restoration and recovery activities, tailored to the failure scenario and local context. In the event of a failure, a long-term recovery plan would then be developed and implemented in partnership with all relevant stakeholders supporting the recovery efforts.



### A.9. Frequency of independent reviews

*Key points:*

- *Independent reviews of tailings facility designs are conducted at key stages of the design phase for each of our tailings facilities.*
- *Independent reviews of tailings facility operation are conducted at a frequency of not less than once every two years.*
- *Rio Tinto has a process for appointing Independent Tailings Review Boards for tailings facilities with 'Very High' and 'Extreme' consequence classifications.*

As detailed in Section A.6, the independent reviews undertaken by Rio Tinto include reviews of tailings facility designs, and reviews of tailings facility operation. Independent design reviews will be conducted as required at multiple stages of the design process as it progresses and typically occur at each project stage through pre-feasibility, feasibility, and other check points of the detailed design phase. Independent operational reviews, where an assessment on the performance of the tailings facility is conducted, are conducted at a frequency of not less than once every two years.

In addition to these independent reviews, Rio Tinto undertakes Independent Tailings Review Board reviews for tailings facilities with a GISTM consequence classification of 'Very High' and 'Extreme'. The Independent Tailings Review Board's role is to provide the Accountable Executive and senior management with independent, objective, expert advice in identifying, understanding, and managing the risks and opportunities associated with the relevant tailings facility. The Independent Tailings Review Board procedures require:

- A minimum of three members to constitute the Board;
- Additional members to be appointed depending upon the risks associated with, and the complexity of, the tailings facility; and
- A minimum of two internationally recognised expert board members who are independent and external to the business.

### A.10. Financial capacity for closure

*Key points:*

- *Rio Tinto has processes in place for estimating closure costs.*
- *Closure provisions for close-down, restoration and environmental obligations are included in the financial statements described in Rio Tinto's Annual Report.*
- *Rio Tinto's financial statements are audited by an independent auditor.*

The financial provisions and estimated closure costs for sites are included in Rio Tinto's consolidated financial statements in Rio Tinto's *Annual Report*. A copy of the latest *Annual Report* can be downloaded from Rio Tinto's website.

The financial provisions for close-down and restoration costs include the dismantling and demolition of infrastructure, the removal of residual materials, and the remediation of disturbed areas for mines and refineries and smelters. The provision excludes the impact of future disturbance which is planned to occur during the life of mine, so that it represents only incurred disturbance as at the balance sheet date.

Close-down and restoration costs are a normal consequence of mining or production, and the majority of close-down and restoration expenditure is incurred in the years following closure of the mine, refinery or smelter. Although the ultimate cost to be incurred is uncertain, the Group's businesses estimate their costs using current restoration standards, techniques and expected climate conditions. The costs are estimated on the basis of a closure plan and are reviewed at each reporting period during the life of the operation to reflect known developments. The estimates are also subject to formal review, with appropriate external support, at regular intervals.

We use our judgment and experience to determine the potential scope of closure rehabilitation work required to meet the Group's legal, statutory and constructive obligations, and any other commitments made to stakeholders, and the options and techniques available to meet those obligations and estimate the associated costs and the likely timing of those costs. Further details can be found under the heading 'Provision for closure costs' in the Financial Review section of the *Annual Report*.

The financial statements included in the Annual Report are audited by an independent auditor who provides an opinion that the financial statements give a true and fair view of the state of Rio Tinto's affairs, and that the statements have been properly prepared in accordance with international accounting standards. Evaluation of specific provisions for close-down, restoration and environmental obligations ('closure provisions') at certain sites is a recurring Key Audit Matter (KAM) noted in the independent auditors' report. For further information, refer to the Independent Auditor's Reports section of the *Annual Report*.

IMPORTANT NOTICEContent of document

*This document includes figures, classifications, assessments and other information regarding tailings and Rio Tinto's systems. Some of the information provided relies upon judgment based on internal or external reviews of information. Unless otherwise stated the information in the document is based on data available as at the date of this document, and judgments or assessments in the document may be based on data which predates the date of this document. The information and views may change based on new or different information, circumstances or events and should not be relied upon as a forecast or recommendation.*

Forward looking statements

*The information presented contains forward-looking statements (within the meaning of the US Private Securities Litigation Reform Act of 1995) concerning the financial condition, operations and businesses of Rio Tinto. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements.*

*Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance of, or events affecting Rio Tinto, or the industry, to differ materially from those expressed or implied in these statements. Such forward-looking statements involve subjective judgements and determinations based on available geological, technical, contractual and economic information. These could change because of new information from production or mining activities, or changes in economic factors, including changes in market prices and operating costs, changes in the regulatory policies of host governments, or other events. The statements could also be altered by acquisitions and divestments, new discoveries, and extensions or closure of existing mines, as well as the application of improved recovery and tailings techniques. Published statements could also be subject to correction due to errors in the application of internal assurance or published rules or guidance, and changes in that assurance, rules or guidance. Please also refer to further factors and risks as identified in Rio Tinto's most recent Annual Report and Accounts in Australia and the United Kingdom and the most recent Annual Report on Form 2-0-F filed with the United States Securities and Exchange Commission ("SEC") or Forms 6-K furnished to, or filed with, the SEC.*

*As such, readers should not place undue reliance on these forward-looking statements, including with regard to future investment decisions.*

*Rio Tinto undertakes no obligation to publicly update, or revise, any information in the document, including forward-looking statements, as a result of new information, future events or other information.*