Global Industry Standard on Tailings Management (GISTM)

We recognize the relevance and value of GISTM to the industry. Peñoles is currently developing and implementing a TMS based on the state-of-the-art guidance from the Mining Association of Canada (MAC) and the International Council of Mining and Metals (ICMM), as well as documents from the Canadian Dam Association (CDA).

These technical resources will enable us to align with many GISTM principles. Although we do not currently plan to adopt GISTM formally, we are actively monitoring our progress and industry developments and remain open to evaluating future adoption.

Impact, risk, and opportunity management

Our goal is zero harm to people and the environment. We manage impacts, risks, and opportunities by applying best governance and engineering practices to design, construction, operation, closure, and post closure of TSF, guided by a comprehensive Tailings Management System (TMS).

Maintaining the highest safety and environmental protection standards for TSF is an ongoing process that requires constant evaluation throughout the facility's life cycle. Standards for design, construction, monitoring, maintenance, and external review specify the protection of human health and the environment and establish parameters for closure of mining operations.

We apply the following basic principles to achieve a culture of safe tailings management throughout our facilities' life cycle:

i. **Accountability, Responsibility, and Competence:** Defined responsibilities and competencies to identify and manage facility risks

ii. **Planning and resourcing:** Ensuring necessary financial and human resources for the continuous management and governance throughout the facility's life cycle

iii. **Risk management:** Identifying risks, establishing control systems, and verifying performance targets. We apply a "critical controls" approach (see Safety section)

iv. **Change management:** Evaluating, controlling, and communicating risks related to changes that could impact facilities' safety

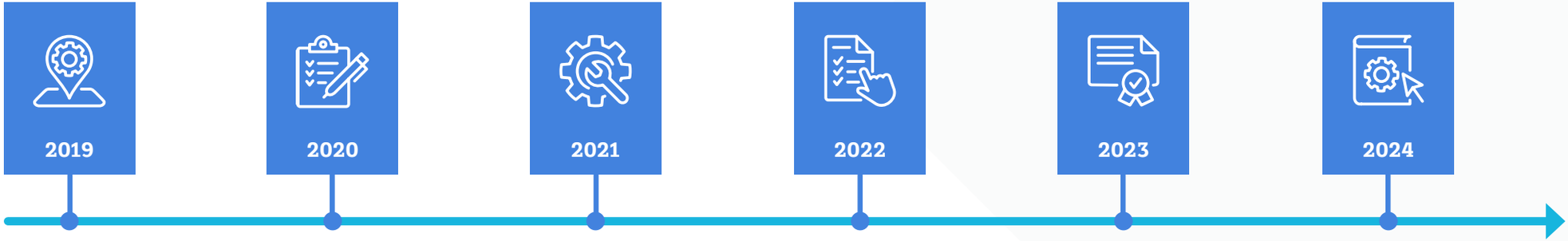
v. **Emergency preparedness and response:** Recognizing and responding to imminent failures and mitigating the impacts of a catastrophic failure

vi. **Review and assurance:** Internal and external reviews to evaluate and continuously improve risk controls

vii. **Meaningful community involvement:** Engaging communities to address questions and concerns, and plan visits to the facilities to learn about these infrastructures and responsible operating practices.

Tailings Management System

Our TMS provides a robust framework for the governance and application of engineering best practices. The TMS plays a key role in effective communication to address risks and to ensure sound decision-making. This system is aligned with our Tailings Policy and is applied throughout the life cycle of a Tailings Storage Facility.



Starting ITRP
- DSR
- Future EoR
- External reviews

TRC established
- Investigations
- Instrumentation
- Reinforcements
- New tailings storages

Tailings Policy (Definition)
- Governance
- External reviews
- Annual DSI by EoR
- TMS

First formal EoR
- Tailing guidelines definition
- World-class multi-disciplinary team
- Trade-off studies for new facilities
- First formal EoR, from design
- Baseline information
- External reviews
- Closure design
- Stability safety factors

Tailings policy and guidelines, workshop CDA and TMS Internal audit
- National and international standards
- Facility lifecycle
- Risk management
- External reviews
- Governance documents
- Connection to existing systems (ISO)
- BAP and BAT

Alignment with capital project management
- Governance update
- TMS update
- Emergency Preparedness and Response Monitoring
- Closure and Post-Closure Monitoring

ITRP: Independent Tailings Review Panel
DSR: Dam Safety Review
EoR: Engineer of Record
TRC: Tailings Review Committee
DSI: Dam Safety Inspection
CDA: Canadian Dam Association
TMS: Tailings Management System
BAP: Best applicable practices
BAT: Best available technology

We continue to develop the risk management elements of the TMS. The Fresnillo, Saucito, Juanicipio, and Velardeña facilities completed their risk assessments using the Potential Failure Mode Analysis (PFMA) methodology. Herradura, Sabinas, and San Julián developed their Dam Breach Analyses (DBA), including simulations to confirm classification based on consequences. Ciénega and Sabinas issued their Operation, Maintenance, and Surveillance (OMS) Manuals, along with the definition of their Triggered Action Response Plans (TARPs), which correspond to the critical controls implemented when the facility's normal operating parameters are exceeded.

In new projects, we use multi-criteria analysis, also known as multi-account analysis, to assess social, environmental, technical, technological, and economic aspects when evaluating potential sites for the construction of mining and metallurgical waste storage infrastructure.

Surveillance, inspections, and geotechnical investigations

We continuously monitor our sites using complementary systems such as piezometers, inclinometers, topographic controls, drones, InSAR, and other technologies to monitor water and the embankment integrity. The RTFE performs regular inspections to the facilities, and the EoR conduct periodic Dam Safety Inspections (DSI). Furthermore, we conduct site investigations that include the use of CPT tests to characterize tailings.

Reviews

The Independent Tailings Review Panel (ITRP) regularly reviews the design, operation, maintenance, surveillance, and governance of our Tailings Storage Facilities and provides input on the EoR performance. In addition, independent experts conduct periodically Dam Safety Reviews (DSR). All findings are submitted to the TRC.

Emergency preparation and response

TMS require our sites to regularly update the OMS with the definition of their TARPs and Emergency Response Plans. We consider the Potential Failure Mode Analysis (PFMA) and DBA methodologies to plan for the emergency response of extremely unlikely events. We conduct emergency response drills and engage with communities and authorities to communicate our approach to safe management of tailings and foster collaborate on emergency response.

Training

Training is key to safe tailing facilities management. We focused our efforts on increasing awareness of our tailings policy and management system guidelines, as well as other related topics, including engineering, governance, and environmental protection. In 2025, we'll concentrate our training efforts in circular economy strategies and technological innovation.

MIT Global Summit on Mine Tailings Innovation

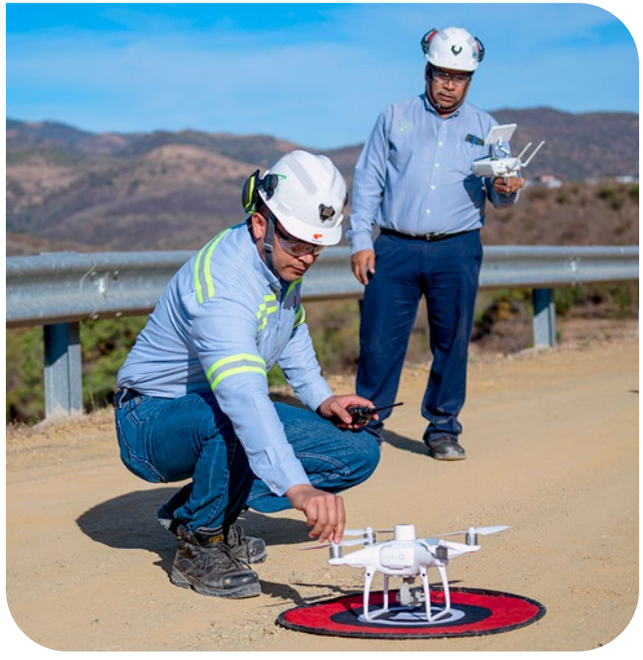
The summit showcased innovative approaches to tailings management, including reuse and repurposing of tailings for alternative applications, strategies to reduce the volume of tailings generated, and the potential for their complete elimination.

Staff from Corporate Tailings Management, along with the Engineers Responsible for the Ciénega and San Julián tailings deposits, attended the event virtually on September 19–20, 2024. Key takeaways from the summit were shared with other areas of the organization.

Filtered Tailings and Mine Backfill Workshop

Paterson & Cooke conducted a workshop on filtered tailings and mine backfilling on September 9–10, 2024, in Torreón, Coahuila. The event brought together 25 participants from Peñoles and Fresnillo mining operations, as well as representatives from Projects and Construction, the Center for Research and Technological Development, and the Health, Safety, and Environment departments.

On September 12, Paterson & Cooke also held an executive session on the same topics for members of the Tailings Review Committee.



Technology and innovation

Our approach to technology and innovation is guided by the strategic priorities and maturity level of each technology. We focus on three key strategic lines:

i. **Enhancing Safety:** Implementing surveillance, monitoring, and alert systems (e.g., InSAR, drones, data analytics)
ii. **Improving Operational Efficiency:** Advancing downstream processing technologies, such as paste and filtered tailings
iii. **Reducing Environmental Risks and Footprint:** Developing upstream processing technologies aimed at selective processing, and reducing water and energy consumption.

Case Study – Natural tailings drying in Velardeña

A new tailings storage facility (TSF) is planned to support the remaining life of mine (LOM) at Velardeña. Tailings will be stored with low moisture content—just enough to achieve optimal compaction—enabling the development of a dry stack TSF. This approach enhances safety and stability, results in a more compact structure, and reduces the facility's overall footprint compared to conventional tailings storage methods.

Although the evaluation of tailings filtration indicated it was not economically viable, Velardeña's favorable climate supports natural tailings drying. The current TSF is divided into multiple cells, allowing tailings to be deposited as pulp in the first cell, dried in the second, and excavated from the third for transport and placement in the dry stack.

Permitting for the new facility is currently underway, with construction expected to begin before the end of 2025. The projected capacity of the facility is 27 million tons of tailings.

Case Study – Extended capacity and reuse tailings in Sabinas

In recent years, Sabinas has made significant investments to enhance the safety factor of Tailings Dam 4. With this objective achieved, the site proceeded with the construction of a new embankment raise to extend storage capacity and support two additional years of operation.

The current raise is being constructed using tailings generated by the processing plant. Through hydrocyclone separation, coarser particles are selected for embankment construction, with strict control over layer thickness and compaction. A total of 180,000 m^3 of tailings will be reused in this process, promoting circularity, reducing the need for additional tailings storage, and eliminating the use of borrow materials.

Case Study – Fresnillo and Saucito storage tailings extended

Both units have faced significant challenges in developing new tailings storage facilities, primarily due to land acquisition and permitting constraints. Despite this complex context, cost-effective short- and medium-term solutions have been identified.

Drawing on the robust data and insights gathered from studies and research conducted over the past three years, the design of the existing facilities has been optimized. These expansions align with the stability and safety standards established in our Tailings Management System.

As a result, the San Carlos Tailings Facility in Fresnillo has extended its capacity through the second half of 2026, while the Saucito Facility will now support operations through the second half of 2028.