

The Implementation of the Global Industry Standard on Tailings Management (GISTM) in Hydro Bauxite and Alumina

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Abstract

The Global Industry Standard on Tailings Management (GISTM) endeavors to achieve “zero harm to people and the environment” [1]. The GISTM is a sturdy framework, underpinned by a plan-do-check-act approach to tailings management, developed to improve the safety and sustainability of tailings facilities in the industry.

It changed the mining industry's approach to accountability, transparency, and safeguarding the rights of project-affected people. The Standard was launched in August 2020 by the Principle for Responsible Investment (PRI) in partnership with the UNEP Finance Initiative and UN Global Compact, the United Nations Environmental Program (UNEP), and the International Council on Mining & Minerals (ICMM). The standard is framed into six topic areas, 15 principles, and 77 requirements. The project-affected people standards are addressed in Topic I. Topic II demands from the operators the development of knowledge about the social, environmental, and local economic context for a given tailings facility. Topic III deals with the standards for designing, constructing, operating, maintaining, monitoring, and closing tailings facilities. In addition, Topic IV focuses on management and governance on a continuous basis. Emergency preparedness and response plans (EPRP) are covered in Topic V, while Topic VI requires the operator to publicly disclose relevant information about tailings facilities to strengthen public accountability. Members of the ICMM committed to implementing GISTM by August 5th, 2023, at tailings facilities (TFs) with “extreme” and “very high” consequence classification and to its other TFs by August 5th, 2025. This paper will present Hydro Bauxite and Alumina’s pathway to successfully implement GISTM at all TFs located at the Alunorte alumina refinery and Paragominas bauxite mine in the Brazilian state of Pará. The Hydro B&A’s implementation process was based on the GISTM Conformance Protocols [2] and has been assessed and confirmed through a self-assessment. The self-assessment demonstrated that Hydro B&A is well-positioned to continuously pursue best practices, enhance tailings safety and environmental stewardship, and be committed to fostering sustainable industrial operations and building trust in practitioners, communities, and investors.

Keywords: Global Industry Standard on Tailings Management, Global Standard, Conformance, Implementation, Tailings.

1. Introduction

The Standard was launched in August 2020 by the United Nations Environmental Program (UNEP), the Principle for Responsible Investment (PRI), an investor initiative in partnership with the UNEP Finance Initiative and UN Global Compact, and the International Council on Mining & Minerals (ICMM). The tragedy that occurred at Vale’s Córrego do Feijão mine in Brumadinho on 25 January 2019 triggered the novel, decisive, and appropriate creation of a Global Standard that aims to enhance the safety of TFs across the globe by establishing clear expectations of safety and responsible performance.

The Standard was launched on 5 August 2020 with the ultimate goal of “zero harm to people and the environment” [1]. It sets a benchmark for achieving adequate technical, social, and environmental practices for tailings management.

The ICMM members have committed all “Extreme” and “Very High” consequence classification tailings facilities to be *in conformance* with the global standard by August 2023 and all other facilities by August 2025 [1]. The Standard structure comprises six Topic Areas, 15 principles, and 77 requirements. Topic I focuses on project-affected people. Topic II requires Operators to develop knowledge about the social, environmental, and local economic context of a tailing facility. Topic III raises standards for designing, constructing, operating, maintaining, monitoring, and closing tailings facilities. Topic IV focuses on ongoing management and governance. Topic V covers emergency preparedness and response plans, while topic VI requires public disclosure of information about tailings facilities to support public accountability. The facilities deemed to be in safe closure are exempt from the Standard.

The *conformance* status is achieved when the operator can demonstrate that systems and processes are in place to implement all applicable requirements of the Standard, not in conflict with the law. The operator can demonstrate its conformance through a self-assessment, where he confirms the systems and practices relating to implementation are in place, or through a third-party independent validation, which relies on a cross-check confirmation of the assertions made in self-assessments based on reasonable and authentic evidence [1].

The possible outcomes for an individual requirement assessment are ‘Meets’, ‘Partially Meets’, and ‘Does not Meet’. In specific situations, a requirement may be ‘Not Applicable’ (Table 1).

Table 1. Description of conformance levels [2].

Conformance Level	Description of outcome
Meets	Systems and/or practices related to the Requirement have been implemented, and there is sufficient evidence to demonstrate that the Requirement is being met.
Partially meets	Systems and/or practices related to meeting the Requirement have been only partially implemented. Gaps or weaknesses persist that may contribute to an inability to meet the Requirement, or insufficient verifiable evidence has been provided to demonstrate that the activity is aligned to the Requirement.
Does not meet	Systems and/or practices required to support implementation of the Requirement are not in place, or are not being implemented, or cannot be evidenced.
Not applicable	The specific Requirement is not applicable to the context of the asset.

3.4 The Public Disclosure

Principle 15 of GISTM sets requirements on public disclosure and access to information about tailings facilities to support public accountability. Requirement 15.1 asks Operators “to publish and regularly update information on their commitment to safe tailings facility management, implementation of its tailings governance framework, its organization-wide policies, standards or approaches to the design, construction, monitoring, and closure of tailings facilities” [1].

Hydro B&A publicly disclosed a report [3] summarizing the individual description of the tailings facilities, the consequence classification, the summary of the risk assessment findings relevant to the tailings facilities, the impact assessment, and the human exposure and vulnerabilities to tailings credible failure scenarios, a description of the design for all phases of the facility lifecycle including current and final height, the summary of the annual performance reviews and dam safety reviews, including the mitigation actions to attend the ALARP criteria (as low as reasonably practicable), a summary of the relevant findings of the social and environmental monitoring program and the summary of the Emergency Preparedness Response Plan including the credible flow failure scenarios from the breach analysis, and the emergency measures that applies to project affected people. It also included the dates of the most recent and following independent reviews and the confirmation of the adequate financial capacity to cover estimated costs for the tailings facilities closure and reclamation.

4. Conclusions

As described in this paper, Hydro Bauxite & Alumina has successfully implemented GISTM by August 5th, 2023, to all “very high” consequence classification facilities, as committed as ICMM member.

The paper demonstrated the pathway to successfully implement GISTM at all tailings facilities at the Alunorte alumina refinery and Paragominas bauxite mine in the Brazilian state of Pará. The process comprised the creation and nurturing of multidisciplinary working groups for Interpretation, gap assessment, check and Balance, cross-check audit, and final sign-off.

This paper focused on governance improvements, including the creation of the Independent Tailings Review Committee, the Engineering of Records, the Responsible Tailings Facility Engineers roles, the TMS, and the global tailings management policy addressing governance, management, and competency, environment, safety, and community, engagement, training, and transparency.

The implementation has been assessed and confirmed through a self-assessment in line with the GISTM Conformance Protocol. It was demonstrated that Hydro B&A is well positioned to continuously pursue best practices, enhance tailings safety and environmental stewardship, being committed to fostering sustainable industrial operations and building trust in practitioners, communities, and investors.

5. References

1. International Council on Mining & Metals (ICMM), Global industry standard on tailings management, *ICMM Website*, https://globaltailingsreview.org/wp-content/uploads/2020/08/global-industry-standard_EN.pdf (accessed on 19 March 2024).
2. International Council on Mining & Metals (ICMM), Global conformance protocols: global standards on tailings management, *ICMM Website*, <https://www.icmm.com/website/publications/pdfs/environmental->

- [stewardship/2021/tailings_conformance-protocols.pdf?cb=21097](https://www.hydro.com/globalassets/04-sustainability/stewardship/2021/tailings_conformance-protocols.pdf?cb=21097) (accessed on 19 March 2024).
3. Hydro, Global industry standard on tailings management (GISTM) public disclosure report, *HYDRO Global Site*, <https://www.hydro.com/globalassets/04-sustainability/gistm-public-disclosure-pdf.pdf> (accessed on 19 March 2024).
 4. Hydro, Tailings management policy, *HYDRO Global Site*, https://www.hydro.com/globalassets/08-about-hydro/corporate-governance/tailings-management-policy_publication.pdf (accessed on 19 March 2024).