



Objective: Establish guidelines, commitments from Vale for the management of mining and metallurgical waste, in order to manage them sustainably throughout the entire production chain.

Scope:

This Policy applies to Vale and its subsidiaries 100% and must be reproduced by its direct and indirect subsidiaries, in Brazil and in other countries, always respecting the constitutive documents and the applicable legislation. Its adoption is encouraged in other entities in which Vale has a shareholding interest, in Brazil and in other countries.

References:

- POL-0001-G – Code of Conduct.
- POL-0009-G – Risk Management Policy.
- POL-0016-G – Anti-corruption Policy.
- POL-0005-G – Human Rights Policy.
- POL 0012-G – Climate Change Policy.
- POL-0019-G – Sustainability Policy.
- POL-0037-G – Policy for Dam safety and geotechnical mining structures.
- NRM 18 - Treatment (Brazilian Mining Standards).
- NRM 19 – Disposal of wasterock, tailing and products (Brazilian Mining Standards).
- ABNT NBR 13028:2017 - Mining - Preparation and presentation of design of tailings, sediments and/or water dams – Requirements.
- ABNT NBR 13.029/2017 Mining - Elaboration and presentation of a mining waste disposal design
- Lei nº 12.305/10 - Brazilian Wastes Policy.
- Lei nº 12.334/10 – Brazilian National Dam Safety Policy.
- Portaria ANM nº 70.389/17 - Integrated Mining Dam Safety Management System.
- ABNT NBR ISO 31000 (2009) – Risk management – Guidelines.
- IFC Environmental, Health and Safety Guidelines for Mining
- ICMM Mining Principles.
- DIRECTIVA 2006/21/CE, on the management of waste from extractive industries
- Development of a guidance document on best practices in the extractive waste management plans – European commission.
- Environmental Code of Practice Canadian Environmental Protection ACT, 1999.

Concepts:

Mining wastes¹: those generated by the activities of research, extraction or ores treatment, including tailings.

Tailings²: the waste solids or slurries that remain after the treatment of minerals by separation processes (e.g. crushing, grinding, size-sorting, flotation and other physico-chemical techniques) to remove the valuable minerals from the less valuable rock.

Circular economy³: In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value.

Industrial wastes: rubbers, plastics, glass, paper, oil, wood, metal scraps, food waste, and others.

¹ Lei nº 12.305/10 - Brazilian national solid waste policy.

² DIRECTIVE 2006/21/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 March 2006.

³ European Community.



Slag⁴: A molten layer formed on top of a bath of liquid metal or matte when iron and other impurities in the charge oxidize and mix with the flow.

Context:

This policy sets out principles and commitments to give more transparency to Vale's management of wastes from extractive and metallurgical activities, considering extractive activities residues - tailings and wasterocks, and residues from metallurgical processes, slags.

Considering conditions, scale of waste generation, specific regulations/standards, management and disposal methodologies for mining and metallurgical wastes, Vale establish a specific guidelines for these types of waste.

They are directly linked to the treatment of ores and metallurgical process, which sustainable management is a major challenge of the sector, due to the large generation of these materials.

This guideline encourages the transition to an innovative circular economy, in order to maximize the efficient use of waste materials through the promotion of new technologies and other value chain usages, that subsequently minimizes environmental and social disposal risks, mainly those related to piles and dams disposal. It is important to note, however, that aspects related to dam safety are recommended in specific policies and procedures of the Geotechnical Area.

Transition towards a sustainable economic system is a strategic element for Vale.

Guidelines to industrial residues management, like rubbers, plastics, oils, wood, scrap metal and food residues, among others, are not considered on this policy, due to its minor criticality, being established in a specific norm.

Action guidelines:

In order to contribute to the reduction and reuse of waste, as well as reducing environmental and social disposal risks, Vale adopts the following guidelines:

- Prioritize across all phases of the mining project's life cycle (exploration, design, operation and closure phases), the best practices available for the optimization of mineral extraction and processing, internal use of residues plus the reduction of the risks associated with metals solubilization to drainages from the waste disposal;
- Encourage the development of technologies and implement equipment and controls for mineral extraction, to improve recovery and efficiency to ultimately reduce waste generation;
- Invest in R&D and technologies to enable treatment optimization and new supply chain usages of tailings, wasterocks and slags;
- Prioritize natural moisture ores treatment;
- Consider, from the conception to the reclaiming phase, geochemical processes characterization of ores and residues, in order to implement controls actions to prevent metals solubilization to drainages;
- Waste piles will be located accordingly, considering economic feasibility, in areas that have a low socio-environmental impact and will be properly managed;
- Situations in which dry processing or thickening operations are not applicable, mineral waste will be preferably disposed on closed pits, based on technological feasibility studies and avoiding exploitation restrictions of mineral resources. In the absence of a viable alternative, dam tailings will be implemented, following all of the governance and safety procedures established in a specific policy – POL-0037-G;
- Mine closure will consider the option of using disposed wastes available to meet closure objectives.

⁴ Environmental Code of Practice Canadian Environmental Protection ACT, 1999).



Commitments and KPIs:

Vale's actions are guided by the following commitments:

- Encourages the transition to an innovative circular economy of mineral and metallurgical wastes investing in technologies aiming to increase treatment efficiency and mineral-metallurgical waste utilization.
- Migrate to dry processing model (natural moisture) in production of iron ore, considering geological conditions and technical feasibility.
- Monthly analysis of data on the generation, disposal and reuse of mining and metallurgical waste, providing adequate reporting, both internally and externally.

General provisions:

- Guidelines related to safe and risk management of dams and geotechnical mining structures are addressed at a specific policy and it's not scope of this document.
- This policy shall be periodically revised, at least 1 (once) every 3 (three) years or on demand.