

Extractive industries (CNAE B)

BRAZILIAN SUSTAINABLE TAXONOMY

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Extractive industries (CNAE B)

Sector overview

The metallic and non-metallic mineral extraction industry is a fundamental pillar of the Brazilian economy, contributing significantly (approximately 4% in 2021 (Leão and Rabelo, 2023) to its Gross Domestic Product (GDP) and generating around 200,000 direct jobs and 800,000 indirect jobs (EY and IBRAM, 2024). In that same year, the production of the eleven main metallic ores, including iron ore, bauxite, copper, and others, was valued at approximately BRL 312.9 billion, representing 89% of the total value of mineral production in the country (ANM, 2023). Iron ore alone accounts for roughly 80% of Brazil's total mineral production value, primarily originating from the states of Pará and Minas Gerais.

Certain minerals are essential components of many clean energy technologies required for a low-carbon economy, including batteries, wind turbines, photovoltaic panels, electrolyzers, electric vehicles, and electricity grids. According to projections by the International Energy Agency (IEA, 2024) under the Net Zero Emissions (NZE) by 2050 scenario, mineral demand for clean energy technologies is expected to almost double by 2030. Metals such as copper, nickel, lithium, and cobalt are likely to experience the largest increases in demand, creating significant growth opportunities for Brazil's mining sector.

Beyond production and exports, the mining sector also generates government revenue through *royalties* and taxes. In 2023, *royalties* from the main minerals totaled BRL 6.86 billion, with iron ore alone contributing almost 75% of total royalty revenue (ANM, 2025).

Given the economic importance of divisions 07 (extraction of metal ores) and 08 (extraction of non-metallic minerals) of the National Classification of Economic Activities (*Classificação Nacional de Atividades Econômicas*, CNAE), the recognized relevance of critical minerals for climate change mitigation (IEA, 2024), and the framework available for mining and associated value chains, the following minerals were selected for inclusion in the first edition of the Brazilian Sustainable Taxonomy (*Taxonomia Sustentável Brasileira*, TSB): lithium, nickel, copper, niobium, graphite, rare earths, quartz, iron, and bauxite.¹

Mineral extraction sits at the beginning of several value chains. By its nature, it has relatively low Scopes 1 and 2 greenhouse gas (GHG) emissions and high Scope 3 emissions. These Scope 3 emissions are linked to post-extraction processing and beneficiation (e.g., iron and steel production accounts for around 90% of GHG emissions in the iron ore value chain), or the direct use of minerals (e.g., combustion of fossil fuels) (CDP, 2024).

CNAE B covers activities involving the extraction of minerals in their natural state through underground mines, open-pit mines, or shafts. It also includes complementary activities, such as beneficiation associated with extraction, which are necessary to improve the quality of the product and facilitate marketing. However, the sector does not include processing activities that alter the physical or chemical characteristics of minerals, such as metallurgical processes (e.g., pyrometallurgy, chemical leaching, or electrolysis), which fall under CNAE C – Manufacturing Industries, division 24.

¹ Iron ore and bauxite ore included for their relevance to the national economy and the relevance of refining and processing activities for climate change mitigation.

Prioritization of activities

Objective 1 — Climate change mitigation: The prioritization of economic activities in the sectors was carried out through both quantitative and qualitative analysis, based on available data. The indicators used in this evaluation include a five-year historical series of the following indicators: 1) GDP, employment and the Economic Complexity Index, which measure the social and economic relevance of activities; 2) greenhouse gas (GHG) emissions and other climate indicators based on scenarios from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), which assess the potential for climate change mitigation; 3) the existence of economic activities in other taxonomies, which favors interoperability; and 4) an expert assessment, which considers climate priorities and sector regulations, reflecting the importance in the Brazilian context. The data was normalized and scored, with different weights according to sectoral importance, in order to prioritize activities according to a standardized system.

Public consultation updates and considerations for future editions

The preliminary proposals for the first edition of the TSB were submitted for public consultation between November 16, 2024 and March 31, 2025, structured in two disclosures stages. The first stage of the consultation included the introductory taxonomy documents, while the second stage provided technical and thematic chapters, with technical criteria for mitigation and adaptation, minimum safeguards, and adjustments to economic activities. Interested stakeholders from civil society were able to contribute freely throughout the process.

This technical chapter incorporates the contributions received during the public consultation and the adjustments made. Below are specific considerations for future updates:

- Potential inclusion of manganese, cobalt, vanadium, and platinum group metal ores, with adjustments as needed to reflect differences in extraction processes;
- Potential prioritization of uranium ore extraction, ensuring alignment with technical criteria for nuclear power generation. It is important to highlight the need to revise do no significant harm and minimum safeguards criteria, given the specific characteristics and risks associated with this ore;
- Potential inclusion of a new activity and specific technical criteria of substantial contribution and do no significant harm (DNSH) to climate change mitigation related to pelletizing, sintering, and other forms of beneficiation of mineral activities, seeking alignment with similar activities in the CNAE C - Manufacturing Industries technical chapter;
- Potential development of specific technical criteria for substantial contribution and DNSH to other TSB objectives for the following activities:
 - Application of alternative use techniques for waste rock and residues from the mineral extraction process (circular economy contribution);
 - Implementation of monitoring measures (climate change adaptation) and decommissioning of tailings dams (protection and restoration of biodiversity and ecosystems);
 - Re-mining and reuse of decommissioned mines with the potential to support biodiversity recovery or to extract minerals contributing to climate change mitigation; and
 - Extraction of agrominerals with the potential to contribute to social objectives and the sustainable use and management of soil and forests.

Objective 1 — Climate change mitigation

Categories of eligible activities

- B1: Iron ore mining
- B2: Aluminum ore mining
- B3: Niobium ore extraction
- B4: Nickel ore extraction
- B5: Lithium ore extraction
- B6: Copper ore extraction
- B7: Rare earth ore extraction
- B8: Graphite extraction and beneficiation (associated with extraction)
- B9: Quartz extraction and beneficiation (associated with extraction)
- B10: Research, development, and innovation activities for the sector

Sector-specific activities

B1: Iron ore mining

CNAEs:

- 07.10-3/01: Extraction of iron ore
- 07.10-3/02: Pelletizing, sintering, and other beneficiation of iron ore

Description:

Extraction of iron ore; beneficiation of iron ore associated with or following extraction (concentration, crushing, etc.).

Out-of-scope activities:

- Extraction of pyrite;
- Support activities for the extraction of iron ore carried out under contract.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants using energy generation sources and technologies included in the CNAE D technical chapter — Electricity and Gas, through self-generation, Power Purchase Agreements in the Free Contracting Environment (ACL) or in the short-term market of the National Interconnected System (*Sistema Interligado Nacional*, SIN), or through the purchase of energy in the regulated market, directly from distributors.²

² Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

- B. Scope 1 and 2 emissions per ton of run-of-mine (ROM) related to extraction and continuous beneficiation not involving sintering and pelletizing must be less than or equal to 0.008 tCO₂e/t of ore.³
- C. Demonstration of alignment of ore sales with value chains that result in economic activities that contribute substantially to climate change mitigation:
 - Iron — demonstration that ore sales are aligned with economic activities of iron and steel production (CNAE C, Groups 24.1 and 24.2) under technical criteria established in the TSB or international taxonomies for climate change mitigation.

B2: Aluminum ore mining

CNAEs:

- 07.21-9/01: Extraction of aluminum ore
- 07.21-9/02: Beneficiation of aluminum ore

Description:

Extraction of aluminum ore (bauxite) and beneficiation associated with or following extraction.

Out-of-scope activities:

- Manufacturing of alumina (aluminum oxide).
- Beneficiation of aluminum associated with or following extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.⁴
- B. Scope 1 and 2 emissions per ton of ROM ore must be less than or equal to 0.023 tCO₂e/t ore.⁵
- C. Demonstration of alignment of the sale of ore with value chains that lead to economic activities that contribute substantially to climate change mitigation:
 - Aluminum — demonstration that ore sales are aligned with economic activities of aluminum production (CNAE C, Group 24.4, Class 24.41-5) under technical criteria established in the TSB or international taxonomies for climate change mitigation.

B3: Niobium ore extraction

CNAEs:

- 07.29-4/01: Extraction of niobium and titanium ores
- Description: Extraction of niobium ore;
- Beneficiation of niobium ore associated with or following extraction.

³ To calculate Scope 1 emissions for extractive industries, emissions related to land-use change should be disregarded.

⁴ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

⁵ To calculate Scope 1 emissions for extractive industries, emissions related to land-use change should be disregarded.

Out-of-scope activities:

- Support activities for the extraction of niobium carried out under contract.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.⁶
- B. Submission of annual reports quantifying Scope 1 and 2 emissions for ROM extracted ore, following the criteria established in the Brazilian Association of Technical Standards (*Associação Brasileira de Normas Técnicas*, ABNT) Brazilian Regulatory Standards (*Normas Brasileiras Regulamentadoras*, NBR) International Organization for Standardization (*Organização Internacional para Padronização*, ISO) 14064-1:2020 standard.
 - Within a maximum of five years after the publication of the TSB, or earlier if a baseline can be established, this component of the criterion must be updated with maximum emission limits for Scope 1 and 2.
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of batteries, energy accumulators, and similar equipment, or metal alloys, which demonstrably contribute substantially to climate change mitigation.

B4: Nickel ore extraction**CNAEs:**

- 07.29-4/03: Extraction of nickel ore

Description:

- Extraction of nickel ore;
- Beneficiation of nickel ore associated with or following extraction.

Out-of-scope activities:

- Support activities for the extraction of nickel ore carried out under contract;
- Production of nickel mattes.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.⁷

⁶ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

⁷ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter

- B. Scope 1 and 2 emissions per ton of ROM ore must be less than or equal to 0.007 tCO₂e/t of ore.⁸
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of batteries, energy accumulators and similar equipment, which demonstrably contribute substantially to climate change mitigation.

B5: Lithium ore extraction

CNAEs:

- 07.29-4/04: Extraction of copper, lead, zinc and other non-ferrous metal minerals not previously specified
- 07.29-4/05: Beneficiation of copper, lead, zinc and other non-ferrous metallic minerals not previously specified

Description:

- Extraction of lithium ore;
- Beneficiation associated with or following the extraction of lithium ore.

Out-of-scope activities:

- Beneficiation of lithium metal minerals associated with or following extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.⁹
- B. Scope 1 and 2 emissions per ton of ROM ore must be less than or equal to 0.017 tCO₂e/t of ore.¹⁰
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of batteries, energy accumulators and similar equipment, which demonstrably contribute substantially to climate change mitigation.

⁸ To calculate Scope 1 emissions for extractive industries, emissions related to land-use change should be disregarded.

⁹ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

¹⁰ To calculate Scope 1 emissions for extractive industries, emissions related to land-use change should be disregarded.

B6: Copper ore extraction

CNAEs:

- 07.29-4/04: Extraction of copper, lead, zinc and other non-ferrous metal minerals not previously specified
- 07.29-4/05: Beneficiation of copper, lead, zinc and other non-ferrous metallic minerals not previously specified

Description:

- Extraction of copper ore;
- Beneficiation associated with or following the extraction of copper ore.

Out-of-scope activities:

- Beneficiation of metallic copper minerals associated with or following extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.¹¹
- B. Scope 1 and 2 emissions per ton of ROM ore must be less than or equal to 0.005 tCO₂e/t ore.¹²
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of cables, wires, and conductive elements necessary for the generation, transmission and distribution of electricity or that contribute to the electrification of economic activities, which demonstrably contribute substantially to climate change mitigation.

B7: Rare earth ore extraction

CNAEs:

- 07.29-4/04: Extraction of copper, lead, zinc and other non-ferrous metal minerals not previously specified
- 07.29-4/05: Beneficiation of copper, lead, zinc and other non-ferrous metallic minerals not previously specified

Description:

- Extraction of rare earth ore;
- Beneficiation associated with or following the extraction of rare earth ore.

¹¹ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

¹² To calculate Scope 1 emissions for extractive industries, emissions related to land-use change should be disregarded.

Out-of-scope activities:

- Beneficiation of rare earth metallic minerals associated with or following extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.¹³
- B. Submission of annual reports quantifying Scope 1 and 2 emissions for ROM extracted ore, following the criteria established in the ABNT NBR ISO 14064-1:2020 standard.
 - Within a maximum of five years after the publication of the TSB, or earlier if a baseline can be established, this component of the criterion must be updated with maximum emission limits for Scope 1 and 2.
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of batteries, energy accumulators and similar equipment, the manufacture of electricity generation equipment or sustainable molecules, which demonstrably contribute substantially to climate change mitigation.

B8: Graphite extraction and beneficiation (associated with extraction)**CNAEs:**

- 08.99-1/01: Extraction of graphite

Description:

Extraction of graphite and its beneficiation following extraction.

Out-of-scope activities:

- Support activities for extraction of graphite carried out under contract;
- Beneficiation of graphite not associated with extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.¹⁴
- B. Submission of annual reports quantifying Scope 1 and 2 emissions for ROM extracted ore, following the criteria established in the ABNT NBR ISO 14064-1:2020 standard.

¹³ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

¹⁴ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

- Within a maximum of five years after the publication of the TSB, or earlier if a baseline can be established, this component of the criterion must be updated with maximum emission limits for Scope 1 and 2.
- C. Demonstration of alignment of ore sales with value chains that result in economic activities related to the manufacture of batteries, energy accumulators and similar equipment, which demonstrably contribute substantially to climate change mitigation.

B9: Quartz extraction and beneficiation (associated with extraction)

CNAEs:

- 08.99-1/02: Extraction of quartz

Description:

Extraction of quartz in its various forms (rock crystal, citrine, smoky, milky rose, etc.) and its beneficiation following extraction.

Out-of-scope activities:

- Support activities for extraction of quartz carried out under contract;
- Beneficiation of quartz not associated with extraction.

Substantial contribution to Objective 1 — Climate change mitigation

Activities must demonstrate alignment with criteria A, B and C:

- A. Electricity used must come from power plants that use energy generation sources and technologies included in CNAE D — Electricity and Gas technical chapter, through self-generation, Power Purchase ACL or in the short-term market of the National Interconnected System (SIN), or through the purchase of energy in the regulated market, directly from distributors.¹⁵
- B. Submission of annual reports quantifying Scope 1 and 2 emissions for ROM extracted ore, following the criteria established in the ABNT NBR ISO 14064-1:2020 standard.
 - Within a maximum of five years after the publication of the TSB, or earlier if a baseline can be established, this component of the criterion must be updated with maximum emission limits for Scope 1 and 2.
- C. Demonstration that ore sales are aligned with the production of silicon metal using fossil carbon-free processes (substituting with biogenic carbon) and intended for the manufacture of photovoltaic equipment.

B10: Research, development, and innovation activities for the sector

CNAEs:

- 71.2: Technical tests and analysis 72.10-0: Research and experimental development in physical and natural sciences

¹⁵ Brazil's electricity matrix has a high level of renewability, with more than 90% of its electricity coming from renewable sources. See General Overview of the Sector in CNAE D — Electricity and Gas technical chapter.

Description:

This category covers research, development and implementation of innovative solutions, processes, technologies and business models aimed at reducing, eliminating or preventing emissions in the CNAE B sector. It also includes individual measures and professional services needed to ensure that economic activities comply with TSB objectives.

Out-of-scope activities:

Activities linked to the improvement of technologies and processes for the use of fossil fuels, except those linked to the reduction of greenhouse gases.

Substantial contribution to Objective 1 — Climate change mitigation

Creating intangible assets and carrying out research, development and innovation activities explicitly aimed at facilitating compliance with TSB's substantial contribution criteria and reaching the limits established for the CNAE B sector.

Do no significant harm (general for any activity in the sector)

The do no significant harm criteria applicable to activities are based on the adoption of complementary criteria to the substantial contribution criteria, ensuring that their implementation does not cause adverse impacts on TSB's other climate, environmental, or socio-economic objectives.

For a practice, or an investment in such practice, to be considered in line with TSB, in addition to the other requirements already mentioned, there must be documented evidence demonstrating that measures, such as those exemplified below, are effectively implemented on the property where the qualified practice will be carried out.

Do no significant harm (to any of the following objectives)

Climate change adaptation	<ul style="list-style-type: none"> • The economic activity has implemented structural and procedural solutions that substantially reduce the most important physical and material climate risks of this activity. • If a) heat, cold and water stress; b) damage from floods, storms, mass movement and wildfires; c) changes in marine conditions; and d) multiple risk. For these classes, a robust climate risk and vulnerability assessment should be carried out with the following steps: <ul style="list-style-type: none"> ○ Screening of the activity to identify which of the physical climate risks listed above could affect the performance of the economic activity during its expected useful life; ○ Where the activity is assessed as being at risk from one or more of the listed climate risks, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity; ○ An assessment of adaptation solutions that may reduce the identified physical climate risk. • The assessment of climate risk and vulnerability is proportional to the scale of the activity and its expected useful life, so that: <ul style="list-style-type: none"> ○ For activities with an expected useful life of less than 10 years, the assessment is carried out at least using climate projections on the smallest appropriate scale; ○ For all other activities, the assessment is carried out using the highest resolution available, state-of-the-art climate projections covering the full range of future scenarios consistent with the expected lifetime of the
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Do no significant harm (to any of the following objectives)

	<p>activity, including at least climate projection scenarios for 10 to 30 years for major investments.</p> <ul style="list-style-type: none"> • Climate projections and the assessment of climate impacts are based on the best available practices and guidelines and take into account state-of-the-art science for vulnerability and risk analysis and related methodologies, in line with the latest reports from the Intergovernmental Panel on Climate Change, peer-reviewed scientific publications, and open-source or proprietary climate models. • The adaptation solutions implemented must: <ul style="list-style-type: none"> ○ Not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, nature, cultural heritage, assets, or other economic activities; ○ Favor nature-based solutions or rely on blue or green infrastructure as much as possible; ○ Be consistent with local, sectoral, regional or national adaptation plans and strategies; ○ Be monitored and measured against predefined indicators, and corrective actions are considered when these indicators are not met; ○ When the implemented solution is physical and consists of an activity for which technical selection criteria have been specified in this chapter, the solution complies with the DNSH criteria of that activity.
<p>Protection and restoration of biodiversity and ecosystems</p>	<ul style="list-style-type: none"> • The assessment of the conditions in which an extractive activity significantly harms biodiversity and ecosystems must take into account the basic and specific criteria listed below: <ul style="list-style-type: none"> ○ Basic criterion for mineral extraction activities (including continuous beneficiation) that are already in operation. The activity will be considered as not causing significant harm if: <ul style="list-style-type: none"> ▪ The environmental licensing process and respective environmental studies and associated monitoring determine that: <ul style="list-style-type: none"> • In the area of direct influence of the project, there is no loss of biodiversity value and of ecosystems considered irreplaceable at the regional and national level; • In the area of indirect influence of the activity, there are no negative or non-mitigable impacts on protected areas or areas relevant to biodiversity. For the purposes of this criterion: <ul style="list-style-type: none"> • Protected areas are defined as all categories of areas included by the Brazilian Government in the World Database on Protected Areas (WDPA), maintained and operated by the United Nations Environment Programme; • Areas relevant to biodiversity are defined as priority conservation areas, as defined in the acts of the Ministry of the Environment, Ecological Economic Zoning instruments, or other international instruments to which Brazil is a signatory, and offer additional protection to territories not yet included in other protected areas. ▪ The activity does not cause environmental damage or degradation, as defined by the National Environmental Policy (Law No. 6938/1991) and the Environmental Crimes Law (Law No. 9605/1998).

Do no significant harm (to any of the following objectives)

- To determine environmental damage or degradation, administrative or judicial acts capable of producing effects on the organization or mining project will be considered.
- Operators and controlling entities must estimate the costs necessary to fulfill the obligations related to mine closure and impact remediation, including the necessary environmental recovery measures, *vis-à-vis* the measures defined in the Basic Environmental Projects. Any adjustments to environmental conditions and requirements must be complied with, documented and communicated to the appropriate regulatory agent. Operators and controlling entities must provide resources to fulfill these obligations.
- The mine closure plan must follow the minimum technical criteria established in the environmental licensing process and associated studies and plans, as well as follow Resolution No. 68 of 30/Apr/2021 of the National Mining Agency (*Agência Nacional de Mineração*, ANM) and the ISO 24419-1:2023 technical standard.
- The Degraded Area Recovery Plan must follow the technical criteria established in the environmental licensing acts and associated studies and plans.
- Specific criteria for opening new mines and expanding existing mines that require a new environmental licensing process:
 - In the event of overlap with protected areas, the activity will be considered as not significantly harming if the conversion of habitats in protected areas complies with the following criteria:
 - Forests (National, State, Municipal) — checking that the mining activity complies with the legal framework that established the protected area (legislation and decree) and that it is in line with the Management Plan;
 - Environmental Protection Area and Area of Relevant Ecological Interest — check if the act establishing the area specifically addresses mining activities and, if there is a Management Plan, check alignment;
 - Indigenous Lands — check whether there is authorization from the National Congress for the initiation and operation of mining activities.
 - For the purposes of applying the criterion, Indigenous Lands that have been delimited or homologated shall be recognized;
 - Other categories of Conservation Units (*vis-à-vis* Law No. 9985/2000 of the National System of Conservation Units) — mining activity is considered incompatible and, therefore, significantly harmful.
 - Opening of new mines or expansion of existing mines in areas relevant to biodiversity. The activity will be considered as not causing significant harm if the conversion of habitats and the associated environmental impact have been assessed in the permitting process and associated environmental studies, and all the necessary mitigation and impact reduction measures have been adopted to ensure that the loss of biodiversity value and ecosystems considered irreplaceable at the regional and national level will not occur.

Do no significant harm (to any of the following objectives)

- The opening of new mines that is preceded by a process of declassification or change in category of protected areas incompatible with mining activity (strictly protected Conservation Units, Extractive Reserves, Sustainable Development Reserves and Private Natural Heritage Reserves) will be considered to cause significant harm to biodiversity.
- Exceptions are considered in cases in which the declassification or change of category was motivated by irremediable loss of biodiversity and ecosystem value, caused by actions unrelated to the mining process.
- Specific criterion for mine operations and beneficiation operations:
 - The activity will be considered as not causing significant harm if:
 - Toxic metals and materials are not detected at levels above regulatory limits outside the controlled environment of the mine and in its area of indirect influence, provided that these levels are due to the mining activity and not a specific characteristic of the area where the mine is located, as indicated by the background studies;
 - The operator adequately implements the operational plans and programs determined in the environmental licensing process, as attested to in regular reports required in the environmental licensing process and routine investigations carried out by the permitting bodies;
 - The operator proactively updates operational plans and programs determined in the environmental licensing process when necessary and submits these modifications and updates to the regulatory authority and interested parties, ensuring maximum possible transparency for the public.
- Criterion for deep-sea mining:
 - Deep-sea water is defined as regions below 200 meters above sea level;
 - Deep-sea mining activities and the beneficiation of ore extracted from deep-sea water will be considered as causing significant harm until technical studies on the activity clarify the operational limits and potential environmental impact of the activity.
- Criterion relating to tailings dams will be considered as not causing significant harm if:
 - The dams are classified as A or AA in operational management, according to ANM Resolution No. 95/2022; and
 - The tailings dams are not classified as a high-Risk Category (CRI);
 - The operator is implementing projects or works to decommission inactive tailings dams;
 - Regarding biodiversity issues, the operator incorporates all the principles of the 2020 Global Industry Standard for Tailings Management (GISTM).
 - The location of new tailings dams upstream of protected areas must consider the dam break areas and projected flood areas to minimize the risk of environmental impact in the event of a catastrophic event and demonstrate that Strictly Protected Conservation Units, Extractive Reserves, Sustainable Development Reserves, Private Natural Heritage

Do no significant harm (to any of the following objectives)

	Reserves, and Indigenous Lands will not be affected in case of a catastrophic event.
Conservation and sustainable management and use of soil and forests	<ul style="list-style-type: none"> • The assessment of the conditions in which extractive activity significantly impairs the sustainable use of land, and the conservation, management and sustainable use of forests must take into account the basic and specific criteria indicated below: <ul style="list-style-type: none"> ○ They are not considered to cause significant harm: <ul style="list-style-type: none"> ▪ Areas in operation where vegetation suppression and soil removal have already been carried out; ▪ Expansion of an existing mine or opening of a new mine that does not require the vegetation suppression or removal of soil; and ▪ The activity directly affects areas with forest cover and soils that are considered highly degraded. ○ For all other cases, the activity will be considered as not causing significant harm if: <ul style="list-style-type: none"> ▪ Vegetation suppression prioritizes higher value-added uses for the biomass and forest resources extracted during the vegetation suppression phase; ▪ The organization forms a germplasm bank for use in the restoration of areas during the operation of the mine or upon its closure; and ▪ The organization adopts techniques for the extraction and storage of soil to be used in the restoration of areas during the mine operation or upon its closure.

Do no significant harm (to any of the following objectives)

Sustainable use and protection of water and marine resources

- Extractive activities that meet the following conditions will not be considered as causing significant harm to water and marine resources:
 - Have transparent, auditable reports published annually demonstrating compliance with all the conditions established in the specific environmental licensing process for each mine;
 - The reports must present data on effluent emissions or leaching profiles, indicating compliance with the conditions and standards established in National Environmental Council (*Conselho Nacional do Meio Ambiente*, CONAMA) Resolution No. 430/2011.

In regions of high-water stress (as defined in the National Water Agency's mapping, or in areas of high or extremely high-water stress indicated in the Water Risk Atlas published by the World Resources Institute – Kuzma et al, 2023), adopt closed water cycle technologies with at least 80% efficiency for continuous extraction and beneficiation operations;

 - Guarantee that the discharge of effluents does not affect special class waters, and in other cases, does not lead to a downgrade in class according to the definitions stipulated in CONAMA Resolutions No. 357/2005, No. 397/2008, No. 410/2009, and No. 430/2011;
 - Do not cause environmental damage or degradation, as defined by the National Environmental Policy (Law No. 6938/1991) and the Environmental Crimes Law (Law No. 9605/1998).
 - To determine environmental damage or degradation, administrative or judicial acts capable of producing effects on the organization or mining project will be considered.
 - Have operators and controlling entities that estimate the costs necessary to fulfill the obligations related to mine closure and impact remediation, including water resources management and protection measures, *vis-à-vis* the measures defined in the Basic Environmental Projects.
 - Any adjustments to environmental conditions and requirements must be complied with, documented and communicated to the appropriate regulatory agent. Operators and controlling entities must provide resources to fulfill these obligations.
 - Are covered by a mine closure plan that follows the minimum technical criteria established in the environmental licensing process and associated studies and plans, as well as following Resolution No. 68 of 30/Apr/2021 of the National Mining Agency (ANM) and the ISO 24419-1:2023 technical standard, to ensure the maintenance and stability of water resources in the region.

Do no significant harm (to any of the following objectives)

Transition to a circular economy	<ul style="list-style-type: none"> • The sale of ore to value chains in regions where the following conditions apply will be considered as causing significant harm to the circular economy: <ul style="list-style-type: none"> ○ There is the technical and socio-economic viability of meeting industrial demand with perfect recycled substitutes; ○ The sale of ore to specific value chains compromises the use of recycled substitutes. • The application of the criterion is subject to the availability of national or regional assessments or diagnoses on the circularity of value chains and the technical and socio-economic viability of perfect recycled substitutes.
Pollution prevention and control	<ul style="list-style-type: none"> • Extractive activities that meet the following conditions will not be considered as causing significant harm to water and marine resources: <ul style="list-style-type: none"> ○ Publish transparent, auditable reports annually demonstrating compliance with all the conditions established in the specific environmental licensing process for each mine; ○ In regions subject to prolonged periods of drought or for operations that emit a high volume of particulate matter, evaluate and adopt necessary measures to eliminate or minimize the emission of particulate matter into the air. ○ Do not use or release into the soil and air substances restricted or classified as hazardous due to: <ul style="list-style-type: none"> ▪ Persistence and environment toxicity; ▪ Bioaccumulation and environmental toxicity; ▪ Persistence, bioaccumulation and environmental toxicity; ▪ Carcinogenicity, mutagenicity, or reproductive toxicity; ▪ Characteristics of endocrine disruptors, based on scientific evidence. ○ Do not cause environmental damage or degradation, as defined by the National Environmental Policy (Law No. 6938/1991) and the Environmental Crimes Law (Law No. 9605/1998). <ul style="list-style-type: none"> ▪ To determine environmental damage or degradation, administrative or judicial acts capable of producing effects on the organization or mining project will be considered. ○ Have operators and controlling entities that estimate the costs necessary to comply with the obligations relating to mine closure and impact remediation, including containment measures, stabilization, or decontamination of areas used, <i>vis-à-vis</i> the measures defined in the Basic Environmental Projects. <ul style="list-style-type: none"> ▪ Any adjustments to environmental conditions and requirements must be complied with, documented and communicated to the appropriate regulatory agent. Operators and controlling entities must provide resources to fulfill these obligations. ○ Are covered by a mine closure plan that follows the minimum technical criteria established in the environmental licensing process and associated studies and plans, as well as follows Resolution No. 68 of 30/Apr/2021 of the National Mining Agency (ANM) and the ISO 24419-1:2023 technical

Do no significant harm (to any of the following objectives)

	<p>standard, to ensure the containment, stabilization or decontamination of the affected areas.</p>
<p>Reduction of socio-economic inequalities, considering racial and gender aspects</p>	<ul style="list-style-type: none"> • Annex A1: Do no significant harm criteria for socio-economic Objective 9. <p>An organization or project will not be considered to cause significant harm if:</p> <ul style="list-style-type: none"> • Provides documentation demonstrating dialogue with the people affected, ensuring that compensation measures are agreed upon in a fair and legitimate manner, in accordance with the National Policy on the Rights of Populations Affected by Dams (PNAB), established by Law No. 14755/2023 and its regulations, where applicable. • Makes publicly available the mortality and fatality indicators among its own employees and those of contracted companies, through publication on its official website, in an annual report, or both, ensuring broad public access to the information. • Maintains and adequately discloses, including to trade union representatives, a formal occupational risk management program, prepared by a qualified technical team and implemented under the organization's responsibility, including prevention measures and specific plans compatible with the risks inherent in its activities, in accordance with current regulatory standards.

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