

THE ENVIRONMENT IN BRAZILIAN MINERAL LEGISLATION FROM 1988 TO 2017

O MEIO AMBIENTE NA LEGISLAÇÃO MINERAL BRASILEIRA DE 1988 A 2017

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Resumo:

O modelo metodológico utilizado neste trabalho foi a realização de uma pesquisa bibliográfica na legislação mineral brasileira na esfera Federal, elencando Leis, Decretos, regulamentos, portarias e resoluções desde 1988, até 2017, com o objetivo de demonstrar de que forma ocorreu a evolução da legislação mineral brasileira no sentido de proteger o meio ambiente neste período. A partir da promulgação da Constituição Federal Brasileira (CF) de 1988 a preservação do meio ambiente assume um papel de elevada importância na legislação brasileira, sendo o principal exemplo o artigo 225, onde este conceito está explícito. Pode-se destacar, os trechos que responsabilizam o explorador de recursos minerais pela reparação dos danos ambientais gerados em decorrência de suas atividades, estando pessoa física e jurídica sujeitas à sanções tanto administrativas quanto penais. A Portaria nº 231, do Departamento Nacional de Produção Mineral – DNPM, publicada em 1998, regulamentou o Código de Águas Minerais, e descreve, de forma detalhada, os critérios para o estabelecimento do perímetro de proteção das fontes de água mineral, termal ou potável de mesa, devendo ser mapeados e identificados as possíveis fontes de contaminação da água, afim de se estabelecer um grau de vulnerabilidade para aquela jazida. Em 2001 o DNPM publicou a Portaria nº 237, que estabelece as Normas Reguladoras da Mineração. Estas normas versam, entre outras coisas, sobre os procedimentos de recuperação ambiental que devem ser praticados nos casos de Suspensão, Fechamento e Retomada, dos trabalhos de mineração. É regulamentado também o Plano de Fechamento de Mina (PFM). O PFM exige que, na área de influência da mina, sejam realizados monitoramentos da poluição, e também que sejam levantados os impactos causados pela mina no entorno desta. Esta portaria também regulamenta o encerramento das atividades de lavra, exigindo que seja feita a reabilitação topográfica e paisagística da área, com estabilização de taludes e redução dos impactos visuais, além de reflorestamento, e levantamento das aptidões de uso futuro do local. Estas exigências são extensíveis às áreas utilizadas para pesquisas e levantamentos geológicos, e também às que tenham sofrido algum tipo de impacto das atividades de mineração. No ano de 2017, o então DNPM foi extinto, sendo elevado à categoria de Agência Nacional de Mineração (ANM). Ao subir na hierarquia administrativa do País, o órgão ganhou também mais autonomia e poder de fiscalização. Com este levantamento é possível perceber que nesse período ocorreram vários avanços importantes na legislação mineral visando à proteção ambiental no Brasil.

Palavras Chave: Mineração no Brasil; Meio Ambiente; Legislação Mineral Brasileira, Recuperação Ambiental.

Abstract:

The methodological model used in this work was to carry out bibliographical research on the Brazilian mineral legislation in the Federal sphere, listing Laws, Decrees, regulations, ordinances and in force from 1988, until 2017, with the aim of demonstrating how Brazilian mineral legislation evolved in order to protect the environment during this period. Since the enactment of the Brazilian Federal Constitution (CF) of 1988, the preservation of the environment assumes a role of high importance in Brazilian legislation, the main example being Article 225, where this concept is explicit. It can be highlighted, the excerpts that blame the mineral resource explorer for understanding the environmental damage generated as a result of their activities, remain individuals and legal entities subject to both administrative and penal compliance.

Ordinance No. 231, of the National Department of Mineral Production – DNPM, published in 1998, regulated the Mineral Water Code, and describes, in detail, the criteria for establishing the protocol for the protection of mineral, thermal, or mineral water sources. table, and must be mapped and identified as possible sources of water contamination, to establish a degree of vulnerability for that deposit.

In 2001, the DNPM published Ordinance No. 237, which establishes the Regulatory Norms for Mining. These norms deal, among other things, with the environmental recovery procedures that must be practiced in cases of Suspension, Closure, and Resumption of mining works. The Mine Closure Plan (PFM) is also regulated. The PFM requires that, in the area of influence of the mine, monitoring of pollution be carried out, and also that the impacts caused by the mine in its surroundings be surveyed. This ordinance also regulates the closure of mining activities, requiring topographical and landscaping rehabilitation of the area, with slope stabilization and reduction of visual impacts, in addition to reforestation, and survey of the potential for future use of the site. These requirements extend to areas used for research and geological surveys, and also to those that have suffered some type of impact from mining activities. In 2017, the then DNPM was extinguished, being elevated to the category of National Mining Agency (ANM). As it rose in the administrative hierarchy of the country, the body also gained more autonomy and supervisory power. With this survey it is possible to see that during this period there were several important advances in mineral legislation aimed at environmental protection in Brazil.

Keywords: Mining in Brazil; Environment; Brazilian Mineral Legislation, Environmental Recovery.

1 – Introduction

The methodological model used in this work was to carry out a bibliographical research on Brazilian mineral legislation at the Federal level, listing Laws, Decrees, regulations, ordinances and resolutions since 1988, until 2017. From this survey, a compilation was made of legislation that deals, in some way, with the protection of the environment and natural resources; as well as the promotion of mining activity in a sustainable manner. Thus, this work's main objective is to highlight the evolution of environmental concerns contained in Brazilian mineral legislation, demonstrating how these concepts were introduced into mineral legislation over time. It should be noted that, in line with the objectives of this work, no environmental legislation originating from Brazilian environmental agencies was included in this research.

In 1988, the current Brazilian Federal Constitution was promulgated, and came into effect, representing a significant milestone for environmental conservation in various sectors of the economy, including mining. This advancement particularly emphasized holding mining companies responsible for environmental damages caused by their activities.

In 2001, the National Department of Mineral Production (DNPM), now the National Mining Agency (ANM), published Ordinance No. 237, which established Regulatory Norms for Mining (NRM). These norms required mining activities to demonstrate concern for the environment, the surrounding population, and the physical and mental health of employees. Notably, these norms addressed the suspension and closure of mines, setting guidelines for enterprises to follow, including reports and closure plans that involved landscape adaptation. The requirement that investments for environmental recovery be included in the Economic Utilization Plan of the deposit reflects the commitment of mining managers to ensure that miners have the financial capacity to execute rehabilitation work.

In 2017, another significant legal milestone occurred for Brazilian mineral legislation when the DNPM was elevated from a department to the status of the National Mining Agency (ANM). This act not only raised the agency's administrative hierarchy but also granted it more autonomy and supervisory power.

2 - Brazilian Federal Constitution of 1988

With the promulgation of the Brazilian Federal Constitution in 1988, the importance of environmental preservation reached a new level in national legislation, explicitly stated in Article 225. This article significantly influenced mineral legislation, making environmental care not merely a consequence of conserving deposits and preserving neighboring water sources. From then on, reducing environmental damage became a fundamental requirement in mining activities.

Given that the Constitution is the country's *Magna Carta*, all existing legislation becomes subordinate to it, granting authority and jurisdiction to all mining sector norms to regulate mining activities. Paragraph 2 of Article 225 explicitly mentions "mineral resource explorers" and establishes their responsibility for rehabilitating degraded environments resulting from their activities...

"Art. 225. Everyone has the right to an ecologically balanced environment, essential for a healthy quality of life, and common to present and future generations.

[...]"

Paragraph three of Article 225 goes further, stipulating that repairing damages does not exempt offenders from responsibility for the impacts caused, regardless of whether they are individuals or legal entities. Thus, violators are subject to both criminal and administrative penalties, even if they later comply with legislation requirements.

3 - DNPM Ordinance n° 231, July 31, 1998

Ordinance DNPM 231 of 1998 regulates articles 12 to 18 of the 1945 Mineral Water Code. This regulation establishes guidelines for implementing the protection perimeter of mineral water sources. This perimeter was previously outlined in Article 46 of the Water Code but lacked specific demarcation guidelines. The level of detail in this regulation and the number of requirements represent a significant advancement in protecting mineral waters.

The considerations in this Ordinance recognize that water pollution is often an irreversible process, making the preservation of sources essential. It also acknowledges the risk associated with the location of most mineral water sources, often close to potential contamination sources like urban areas, industrial sites, agricultural areas, and landfills. The measures in this Ordinance aim to protect mineral water wealth through the delimitation of protection perimeters.

"Considering that the vast majority of Mineral and Drinking Water Springs and Baths in operation in the country are located near urban centers, industrial districts, agricultural activities, landfills, and other polluting agents;

Considering that once mineral water is polluted, it loses its quality, and in most cases, the process is irreversible."

To define the protection perimeter, a survey of hydrological data from the aquifer is required to determine the areas of influence, contribution, and transport. The classification of these zones is defined by sub-item 3.3.

Sub-item 3.4 establishes additional characteristics that should be included in the surveys, which must be carried out by qualified professionals and must contain a wide range of data. These data include climatic characteristics of the region, lithological and structural aspects of the area in the context of regional geology, characterization of the type of aquifer, its hydraulic properties, and flow capacity. The location of springs and wells must also be surveyed.

Regarding pollution, sub-items 3.4.4 and 3.4.5 are of particular importance. Sub-item 3.4.4 addresses the determination of pollution sources based on land and water use, requiring identification of current and potential sources of contamination. This characterization involves creating maps distinguishing urban, industrial, agricultural, and livestock areas. Pollutants must be identified and characterized based on their origin and type, including liquid (effluent) and solid residues. Uses of both surface and groundwater must also be indicated.

Sub-item 3.4.5 demands information and technical work to determine potential pollution sources for water sources. This survey must consider land use, occupation, and use of groundwater in the region. Each potential contamination site must be indexed and classified based on its location, extension, magnitude, importance, and duration. The data obtained are used to establish the vulnerability of mineral waters in the area and the potential for reversing the impacts caused.

4 - Regulatory Norms for Mining – NRM, 2001

On August 18, 2001, the National Department of Mineral Production (DNPM) published through Ordinance 237 a set of rules known as the Regulatory Norms for Mining (NRM). In the first NRM 1.1.1 norm, the DNPM establishes its objectives.

Citing environmental protection and preservation, this Ordinance represents a significant advancement in Brazilian mineral legislation, emphasizing that it was formulated "Considering the minimization of environmental impacts resulting from mining activities." (DNPM, 2001)

With the DNPM's objectives in mind, it is possible to discuss the norms that aim to promote environmental protection and sustainable mining. Among the methods used to enforce these norms is the requirement that a series of plans and reports be submitted for analysis by the agency. There are 12 documents that every entrepreneur requesting a mining concession must present, established in NRM 1.5 - Mechanisms and Instruments of Information and Control, and must be prepared according to the detailed guidelines provided by the other NRMs.

From an environmental perspective, two reports of great importance are the Mine Closure, Suspension, and Resumption Plan, regulated by NRM 20, and the Mining Environmental Impact Control Plan - PCIAM, which should include, as defined by NRM 1.5.6, "all mitigating and control measures for environmental impacts resulting from mining activity, especially those related to monitoring and rehabilitation of the mined and impacted area." Additionally, NRM 21 addresses the rehabilitation of areas, whether they were researched, mined, or impacted by mining activities...

4.1 - NRM 20 - Suspension, Mine Closure, and Resumption of Mining Operations

NRM 20 provides guidelines for the suspension of mine operations, mine closure, and the resumption of mining operations. With this norm, the DNPM regulates what is provided in items XIV and XV of article 47 of the 1967 Code and creates a series of requirements for the concessionaire to take various environmental precautions, forbidding mere abandonment of activities, for example. It is essential to note that non-compliance with deadlines and guidelines for suspending work and abandoning the mine without observing closure rules are reasons for the forfeiture of the mining concession provided by Article 65 of the Mining Code.

The three themes covered by NRM 20 are classified as follows: NRM 20.3 - Suspension of mining operations; NRM 20.4 - Mine Closure; and NRM 20.6 - Resumption of Mining Operations.

4.1.1 - NRM 20.3 - Suspension of mining operations

Regarding the suspension of work, sub-item 20.3.1 establishes that it cannot be carried out without justification and the approval of the Minister of Mines and Energy. This norm acknowledges that pausing operations can cause damage to the environment, and therefore, it requires a report detailing all measures that will be taken to avoid such damage. This report must be submitted to the minister, who, after evaluation, will allow or deny the suspension of work.

Some highlights should be mentioned to outline the most important sections from a sustainability perspective:

Sub-items 20.3.1a, 20.3.1b, 20.3.1c, and 20.3.1d address the survey of the mine's general condition, topography, remaining and exploitable reserves, as well as the mine's map, showing the arrangement of organic soils, sterile materials, ores, accesses, and constructions.

Sub-item 20.3.1e demands details about which areas have already been rehabilitated and which ones will undergo future restoration.

Sub-item 20.3.1f deals with tasks that should be maintained even if the operations are suspended. These tasks include continuous monitoring of the water table levels, effluent control, observation of air and water pollution levels, and the drainage of accumulated waters, with this latter requirement already present in the 1967 Mining Code. These controls aim to reduce the impacts on three distinct fronts: biological, anthropic, and physical, not only on neighbors, as the previous Code had specified, but in a broader sense. There is also a requirement to present a plan for resuming operations.

Lastly, sub-item 20.3.1h demands the submission of a report that addresses all possible environmental consequences of halting mining activities. By requiring environmental impact studies, this regulation promotes an increase in environmental safety in the surrounding area.

4.1.2 - NRM 20.4 - Mine Closure

Until 2001, when Ordinance 237 was published, there were no clear rules dealing extensively with mine closure. NRM 20.4 aims to prevent the abandonment of facilities after the definitive closure of

operations, which can cause a series of consequences to the surrounding environment, affecting not only biological factors but also nearby populations.

The deactivation of the enterprise must demonstrate what will happen to the equipment and installations. A report must be presented detailing the work performed, and another indicating the remaining ore deposits. Additionally, the mine's topographical mapping must be updated (sub-items 20.4.1a, 20.4.1b, 20.4.1c, and 20.4.1d).

This topographical survey must include a complete mapping of the mine, indicating the points where waste is deposited, allowing an evaluation of these locations. It is also required to include all areas that must undergo future environmental rehabilitation, as well as those that have already been rehabilitated. The regulation distinguishes between mined and impacted areas, and both must be included in the report, broadly covering the locations located within the project's impact zone (sub-item 20.4.1e).

Sub-items 20.4.1f, 20.4.1g, and 20.4.1h establish the requirement for various control plans aimed at monitoring various environmental factors, with specifications of the parameters to be used. Some of the points that require monitoring are slopes, effluents, containment systems, and drainage systems, as well as air, water, soil, and groundwater pollution.

One of the sustainability highlights of this norm is sub-item 20.4.1j, which requires the development of a survey encompassing all possible environmental impacts within the mine's influence area, taking into account various factors, whether physical, biotic, or anthropic.

Regarding the area's rehabilitation, sub-item 20.4.1m demands interventions to adjust the mine's topography and landscape. These procedures help reduce visual impacts caused by mining and include interventions that prevent erosions. Sub-item 20.4.1l determines the demonstration of the area's suitability for future use.

Sub-item 20.4.1o requires the submission of a financial report detailing the execution of the work, preventing a company from claiming it lacks the financial capacity to implement the legislation's requirements. This is reinforced by item 20.4.2, which determines that enterprises that have not yet included the mine closure plan in the utilization plan must do so, and periodic updates are required...

4.1.3 - NRM 20.6 - Resumption of Mining Operations

Item 20.6 details the procedures to be taken in case of resumption of operations after a period of work suspension. This resumption must be carried out through the development of a project that includes an assessment of the mine's conservation and safety status, water management, a review of the economic utilization plan, and a reevaluation of environmental protection conditions. The reactivation of the enterprise can only be carried out after explicit approval from DNPM, which will be based on the information contained in the aforementioned project.

4.2 - NRM 21 - Rehabilitation of Researched, Mined, and Impacted Areas

Among all the norms contained in Ordinance 237, NRM 21 is undoubtedly one that converges the most towards promoting respect for the environment and environmental preservation. This norm aims to regulate the entire process of rehabilitating areas impacted by mining activity, covering issues from mineral research to mine operation, and even after its closure.

NRM 21 aligns with what is established in Article 225 of the Federal Constitution, detailing the requirements for the recovery of areas degraded by mining concessions. NRM 20 and 21 deal with related issues since the former establishes procedures for closing a mine, requiring area rehabilitation, while the latter focuses on the rehabilitation of areas, complementing and converging with each other.

One of the raised issues is that topography should also be restored, following a possible future use of the area, and visual impact should also be reduced. A comparison can be made with Article 34, section VI, of the 1940 Mining Code, which also predicted the maintenance of the mine to allow for future use but to allow the continued exploitation of the deposit. With NRM 21, this maintenance aims to mitigate environmental impacts, including visual impacts.

Sub-item 21.2.1 establishes the obligation to also recover research areas, including those outside the mine's limits. It is essential to note that even areas whose research reports have not been approved must go through the rehabilitation process. This determination prevents any miner from using the lack of approval as an argument not to proceed with the area's recovery.

In characterizing impacted areas, sub-item 21.2.3 provides a broad definition, going beyond concerns about life forms and including abiotic factors that may have been affected in any way due to mining activities, requiring them to go through rehabilitation as well.

Sub-items 21.2.4 and 21.2.5 define what should be understood as topographic and landscape adequacy, as the DNPM was concerned with creating regulations that even minimize visual impacts caused by mining. This determination is also present in item "m" of NRM 20.4, but the regulatory body reaffirms this obligation, aiming, in addition to topographic stabilization, to reduce or eliminate the visual impacts of the mine. Sub-item 21.2.6 characterizes the future use of the mine, evaluating its potential suitability.

In item 21.3, DNPM assumes its regulatory responsibility and requires all rehabilitation projects to be carried out by qualified professionals and submitted for approval by DNPM.

Sub-item 21.5 establishes what should be included in the rehabilitation project, explicitly requiring the submission of a financial report proving the concessionaire's capacity to bear the costs of area rehabilitation. Another detailed issue is the need for reforestation of the area, as well as the obligation to conduct a survey of any type of impact, including indirect ones. Topographic reconfiguration must also be in line with possible future use of the area, requiring landscape adaptation as well.

The last sub-item of this norm, 21.6, determines the presentation of the area rehabilitation project together with PCIAM, which, as previously mentioned, must include all measures to control the environmental impacts caused by the mine's activity, thus conducting a comprehensive survey of all potential environmental consequences that may occur during the operation of the enterprise, as well as the respective prevention and correction measures.

5 - Creation of the National Mining Agency – ANM, 2017

Law No. 13,575, of December 26, 2017, creates the National Mining Agency - ANM, which inherits the functions of the former DNPM and is subordinated to the Ministry of Mines and Energy. This law establishes, among other things, the purpose of creating the agency: "to promote the management of the Union's mineral resources, as well as the regulation and oversight of activities for the use of mineral resources in the country." Therefore, the oversight of mining activities is no longer carried out by a "Department" but rather by an "Agency."

It is worth highlighting Article 2, which describes the Agency's competencies, and item XXII, which establishes the function of overseeing mining companies' treatment of the environment, which must be done complementarily and jointly with environmental agencies. This Law demonstrates the need for environmental and mineral agencies to cooperate to ensure compliance with regulations that protect the environment, both through mineral and environmental legislation.

6 – Conclusion

Since the entry into force of the current Federal Constitution (1988), which, for the first time, mentions the ideals of sustainability and environmental protection, the protection of the environment in mining activities has gained significant attention. Among the articles of the Federal Constitution that address environmental protection, there is one that holds the entrepreneur and mining companies responsible for environmental damage resulting from their activities, relieving the Federal Government of the role of repairing damages but placing it as a manager and overseer.

In 2001, Ordinance DNPM No. 237, which institutes the Regulatory Norms of Mining, took the most critical step in mineral legislation for environmental protection until then. Several plans were created that must be prepared and submitted by mining enterprises to protect the environment and repair environmental damages caused by the enterprises. Miners are required to conduct an environmental impact assessment of their activities and take measures to mitigate these impacts, including in the case of temporary or permanent suspension of activities. Another important advancement is the Mine Closure Plan - PFM, whether due to depletion or any other reason. Additionally, guidelines for mine decommissioning have been established, including the obligation to present the type of future use that will be given to the area, with the requirement to perform topographic stabilization, reforestation, and landscape works. In certain cases, continuous monitoring of water and air pollution is required.

The creation of ANM in 2017, which assumes responsibilities previously attributed to DNPM, also allows for better management of mining activity oversight. This action not only raised the agency's status in the government's administrative hierarchy but also, consequently, granted greater autonomy and regulatory power.

With this survey it is possible to see that several important advances towards environmental protection occurred in mineral legislation during this period in Brazil.

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²⁵ Federal Official Gazette

²⁶ Federal Official Gazette

²⁷ National Mining Agency

²⁸ National Department of Mineral Production

²⁹ Constitution of the Federative Republic of Brazil