



Corporate Environmental Responsibility at Every Stage of Mining Business According to *Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara*

Rama Wibawa

Universitas Brawijaya,
Indonesia

***Correspondent Author:**

Rama Wibawa, Universitas Brawijaya,
Indonesia. ✉r.wibawa0528@gmail.com

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Abstract

Background: Mining sector plays an important role in the Indonesian economy, it also poses significant risks to environmental sustainability. The main legal issue concerns the inadequacy of enforcement mechanisms under Law No. 4 of 2009 concerning Mineral and Coal Mining, which involves weaknesses in corporate liability for environmental obligations at every stage of mining activities, from exploration to post-mining reclamation.

Objective: This study aims to explain the importance of corporate responsibility in ensuring that mining business activities are carried out in accordance with environmental protection principles and relevant laws and regulations.

Methods: This study refers to the provisions of Law No. 4 of 2009 of the Republic of Indonesia concerning Mineral and Coal Mining, particularly those governing the stages of mining activities, including exploration, production operations, and post-mining activities. The study uses a normative legal approach.

Result: There is a gap in law enforcement under the Mineral and Coal Mining Law and its implementing regulations. Environmental assessment requirements remain largely formalistic, monitoring remains ineffective, approximately 40% of Mining Business Permit (*Izin Usaha Pertambangan* or IUP) holders do not comply with legal obligations, and criminal sanctions are rarely applied as a primary enforcement measure. The clear link between corporate environmental responsibility and criminal liability under the 2023 National Criminal Code has not been fully utilized.

Conclusion: To strengthen corporate environmental responsibility in mining, effective reforms of the Environmental Impact Assessment (*Analisis Mengenai Dampak Lingkungan* or AMDAL) system are needed to reduce chronic non-compliance, improve compliance with reclamation and post-mining safeguards.

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INTRODUCTION

In recent years, awareness of environmental responsibility has become a major concern in various industries, including mining. Mining is one of the most important sectors in the Indonesian economy (Gudio, 2025). Indonesia, with its abundant natural resources, has great potential for the development of this industry. The stages of mining activities involve not only technical processes but also an in-depth understanding of systems and best practices. A key element in the

implementation of Good Mining Practices (GMP) in the mining industry is the responsibility of mining companies to manage the environment through land reclamation, land restoration, and mine waste management to minimize negative impacts (Pottery et al., 2023). This responsibility extends from the exploration phase to the post-mining phase, aiming to prevent water and soil pollution and maintain the sustainability of environmental functions.

Law 23 of 1997 (PP No. 23 tahun, 1997) explains that the environment is a spatial unit that includes all objects, forces, conditions, living beings, humans, and their behavior, all of which affect the survival and welfare of humans and other living beings. At the same time, the scope of Indonesia's environment includes the territory of the Republic of Indonesia from the perspective of sovereignty, sovereign rights, and jurisdiction over the archipelago (Al Fariz et al., 2024; Borniwati et al., 2020).

Environmental management implemented by companies plays an important role in safeguarding the environment in relation to ongoing business activities. Inadequate environmental management by companies can negatively affect the environment in the areas where they operate. The same applies to mining companies, which are responsible for protecting the environment at every stage of their activities.

Mining companies are subject to strict legal and social responsibilities in environmental management, including land restoration and waste management, to minimize water degradation, air pollution, and ecosystem damage (Wieranti, 2025). All companies have an obligation to fulfill corporate social responsibility (CSR); however, many companies, especially in the nickel and coal sectors, tend to underestimate their environmental impacts, often causing air and water pollution and reducing the quality of life of residents living near mining areas. Despite law enforcement efforts, government oversight is still considered weak. Therefore, modern mining practices are inseparable from the commitment to balance the use of natural resources with responsible and long-term environmental protection efforts (Pardidi, 2018; Wieranti, 2025).

In this context, environmental obligations and post-mining recovery are important issues because the responsibility of mining companies does not end when mining activities are suspended or completed. The post-mining phase is an important step to ensure environmental recovery and the sustainability of social and environmental functions in affected areas. Failure to fulfill these obligations may result not only in long-term environmental damage but also in legal, social, and reputational risks. Therefore, operators in the mining sector must understand these obligations to comply with legal requirements, including the obligation to obtain environmental permits. Environmental permits ensure that companies are environmentally conscious and operate responsibly. These permits serve as the basic authorization required to conduct mining activities. In addition, environmental management includes the implementation of proper mining regulations and supervision of mineral and coal mining in accordance with Regulation of the Minister of Energy and Mineral Resources No. 26 of 2018.

From the perspective of environmental protection in mining activities, this study discusses the responsibility of mining companies to preserve the environment not only during exploration, production, and operational activities but also during post-mining activities. This responsibility is closely related to Law No. 4 of 2009 concerning Mineral and Coal Mining, also known as the Mineral and Coal Mining Law (Efendi et al., 2025; Undang-undang No. 4 tahun 2009, 2009).

METHOD

This research used a normative legal research method, also known as legal research, employing statutory and conceptual approaches. The statutory approach was applied by reviewing and analyzing various laws and regulations governing mining activities and environmental protection in Indonesia. These included (Efendi et al., 2025; Undang-undang No. 4 tahun 2009, 2009), in conjunction with Law No. 3 of 2020 (Pariawan & Dewi, 2025; Undang-undang no 3 tahun 2020, 2020), concerning Mineral and Coal Mining; Law No. 32 of 2009 concerning Environmental Protection and Management (Undang-Undang Republik Indonesia 32 Tahun 2009, 2009); Government Regulation No. 96 of 2021 (Dhahri, 2026; Peraturan Pemerintah Republik Indonesia & Nomor 96 Tahun 2021, 2021); and other relevant ministerial regulations. The conceptual approach was used to analyze legal principles related to corporate environmental responsibility, Good Mining Practices (GMP), sustainable development, and the polluter-pays principle, all of which have been developed in Indonesian and international environmental law literature.

The legal materials used consisted of legally binding provisions, such as the Constitution of the Republic of Indonesia of 1945, laws, including the Mineral and Coal Mining Law and the Environmental Protection and Management Law, government regulations, including Government Regulation No. 96 of 2021 (Dhahri, 2026; Peraturan Pemerintah Republik Indonesia & Nomor 96 Tahun 2021, 2021), Government Regulation No. 78 of 2010, and Government Regulation No. 22 of 2021 (PP Nomor 22 Tahun 2021, 2021; Triana & Matondang, 2025), as well as Regulation of the Minister of Energy and Mineral Resources No. 26 of 2018. Secondary legal materials included Indonesian mining law literature, corporate environmental responsibility, reclamation obligations, legal journals, doctrinal commentaries, and previous research.

Legal materials were collected through library research and document studies, including laws, government regulations, ministerial regulations, court rulings, policy documents, and academic literature. The analysis was conducted using legal interpretation techniques, such as grammatical, systematic, and teleological interpretation, to identify the legal framework, implementation gaps, and normative implications at each stage of the mining business life cycle.

RESULTS AND DISCUSSION

Results

Legal Basis of Corporate Environmental Responsibility

terms of terminology, a company or corporation refers to a business activity or project that aims to generate profit. Based on the definition of a company derived from the interpretation of the *Memorie van Toelichting* submitted by the Dutch government to parliament, a company refers to a series of actions carried out continuously and publicly for the benefit of individuals in a certain legal position. The word “corporation” comes from the English word “corporation,” which refers to an entity that is given legal personality or representation. Therefore, a company may be understood as the result of legal recognition and organizational action. This text serves as a theoretical or conceptual framework. Based on the linguistic interpretation of legal entities, as explained by Rahardjo (2025), a company may be concluded to be a legal entity established in accordance with the law. The created entity consists of a physical structure called the *corpus*, while the law introduces the element of *animus* and establishes the personality of the legal entity. Since a legal entity is a legal creation, its existence and termination are determined by law. Therefore, companies may take the form of limited liability companies, foundations, associations, cooperatives, state-owned enterprises, regional-owned enterprises, equivalent legal entities, corporate entities, limited partnership associations, similar forms, or legal entities or collective regulated assets (Prasetya & Ratnavati, 2023).

Law No. 1 of 2023 concerning the National Criminal Code (*Kitab Undang-Undang Hukum Pidana* or KUHP) has brought significant changes to the way corporations are recognized under criminal law. Article 45 of the 2023 Criminal Code clearly stipulates that corporations may be subjects of criminal acts. Furthermore, Article 46 provides that criminal acts committed by corporate executives, persons with functional positions, persons who control the corporation, beneficial owners, or other parties acting on behalf of the corporation may be attributed to the corporation. Therefore, Article 47 of the 2023 Criminal Code states that criminal acts committed in the interest of the corporation, within the scope of its business or activities, or through the corporation’s failure to take appropriate preventive measures, may result in corporate criminal liability. The types of penalties imposed on corporations are regulated under Articles 48 to 50 of the 2023 Criminal Code and include fines, business suspension, license revocation, and corporate dissolution (Amanda & Shergar, 2026).

A clear relationship emerges at the intersection of these two legal frameworks between corporate environmental responsibility and corporate criminal responsibility in the mining sector. First, the Mineral and Coal Law imposes sector-specific environmental obligations on IUP/IUPK holders. Second, the 2023 National Criminal Code, namely Law No. 1 of 2023, recognizes corporations as subjects of criminal law through Articles 45–50. If a mining company fails to meet its environmental obligations, such as by ignoring environmental assessment requirements, failing to carry out reclamation, or abandoning post-mining activities, the company may not only face administrative sanctions under the Mineral and Coal Law but may also be subject to criminal liability if the violation constitutes a criminal offense that benefits the corporation. This is

consistent with Article 47 of the 2023 Criminal Code. This framework reflects a multilayered system of corporate responsibility that covers administrative, civil, and criminal dimensions, thereby forming the legal basis for corporate environmental responsibility analyzed in this study.

One of the most prominent types of large-scale companies in Indonesia is found in the mining sector. Mining is the process of extracting materials from the earth to obtain mineral products (Rahmatullah and Hussain, 2018). In the context of mineral and coal research, management, and development, mining activities include general surveys, exploration, feasibility studies, construction, mining, processing and refining, transportation and sales, and post-mining activities (Hotabarat, 2020). Article 1 of ([Undang-undang No. 4 tahun 2009, 2009](#)) concerning Mineral and Coal Mining provides the legal definition of mining in Indonesia ([Efendi et al., 2025](#)).

All companies and organizations in the mining sector, as legal entities, have social and environmental responsibilities. This obligation is based on Government Regulation No. 47 of 2012 concerning the Social and Environmental Responsibility of Limited Liability Companies. Social and environmental responsibility is mandatory for companies engaged in natural resources and/or related business activities under Government Regulation No. 47 of 2012. Environmental responsibility is also clearly stated in Law No. 40 of 2007 concerning Limited Liability Companies, which stipulates that limited liability companies engaged in natural resources and related business activities must carry out social and environmental responsibility. Social and environmental responsibility means that a limited liability company must demonstrate a commitment to participate in sustainable economic development, improve the quality of life and the environment, and provide benefits to the company itself, local communities, and society as a whole. The budget and costs required to fulfill social and environmental responsibility must be allocated and calculated as company expenses, and their implementation must be based on compliance and fairness ([Susanty, 2022](#)).

In the mineral and coal mining industry, environmental protection is not merely an additional obligation but must be an integral part of the business process. However, environmental conditions in mining areas are often not ideal when compared with actual field expectations. Environmental aspects have consistently been among the most frequently discussed issues in mining practices. Therefore, all mining companies must comply with Law No. 3 of 2020 ([Undang-undang no 3 tahun 2020, 2020](#)), the latest amendment to the Mineral and Coal Law ([Pariawan & Dewi, 2025](#)). The Mineral and Coal Law, often referred to as the *Minerba* Law, emphasizes the need to protect the environment at every stage of mining activities, from exploration to post-mining. This supports the principle that mining activities, as part of the right to utilize and develop natural resources, must be carried out using sound, responsible, and environmentally conscious mining practices.

As the principal legal instrument governing the mining industry, Law No. 3 of 2020 ([Pariawan & Dewi, 2025](#); [Undang-undang no 3 tahun 2020, 2020](#)) amends Law No. 4 of 2009 concerning Mineral and Coal Mining ([Efendi et al., 2025](#); [Undang-undang No. 4 tahun 2009, 2009](#)). These laws are grounded in Article 33 paragraph (3) of the 1945 Constitution of the Republic of Indonesia, which affirms that land, water, and natural resources are controlled by the state and used for the greatest prosperity of the people. Accordingly, mineral and coal mining management must comply with Indonesian environmental standards. Article 2 of Law No. 4 of 2009 ([Undang-undang No. 4 tahun 2009, 2009](#)), as amended by Law No. 3 of 2020, stipulates that mineral and coal mining management must be carried out based on the following principles: benefit, justice, and balance; orientation toward national interests; participation, transparency, and accountability; and sustainability and environmental awareness ([Efendi et al., 2025](#)).

The principles of sustainability and environmental awareness require the systematic integration of economic, environmental, social, and cultural aspects into all mineral and coal mining operations to ensure the well-being of both present and future generations. The mining sector is not only intended to generate economic benefits but also to ensure environmental sustainability through responsible mining practices. This includes transforming the value of nonrenewable resources into long-term benefits for surrounding communities and future development. Therefore, environmental protection and legal compliance are fundamental responsibilities of mining operators, including corporations engaged in the mining industry.

Discussion

Mining Phase

Initial Stage (Mining Business License Stage)

Mining operations begin with the acquisition of permits at an early stage. Article 35 of the Minerba Law states that business actors intending to conduct mining operations must fulfill the requirements for obtaining a business license. Mining business permits are regulated under Article 1, Clause 10 of the Mineral and Coal Mining Law, which states, "A Mining Business License, hereinafter referred to as an IUP, is a permit to carry out mining business activities." This provision emphasizes the importance of corporate responsibility in ensuring that mining business activities are carried out in accordance with environmental protection principles and relevant laws and regulations.

However, important legal issues arise. Is the IUP licensing system effective in ensuring environmental protection? Evidence indicates significant gaps in regulatory implementation. The granting of an IUP does not necessarily guarantee that environmental standards will be maintained throughout the entire mining process. Central and local control mechanisms remain fragmented, and the integration of environmental compliance into IUP renewals and expansions is inconsistent. RKAB approval mechanisms regularly determine operational and management targets, but they do not always lead to real-time environmental monitoring. This institutional weakness undermines the preventive function of the IUP, particularly when rent-seeking practices persist and regulatory enforcement is weak at the local level.

On the other hand, Article 38 of the Mineral and Coal Mining Law stipulates that parties entitled to obtain an IUP include business entities, cooperatives, and individual businesses. Article 40(1) of the Minerba Law further states that an IUP is granted only for one type of mineral or coal mining activity.

Therefore, if a business actor intends to conduct two different mining operations, the actor must obtain a separate IUP for each mining activity. This provision allows IUP holders to possess more than one IUP, provided that each permit corresponds to a distinct mining commodity or activity as regulated under the Minerba Law.

Mining operators may obtain an IUP if they satisfy the administrative, technical, environmental, and financial requirements specified in Article 31 of Government Regulation No. 96 of 2021 ([Dhahri, 2026](#); [Peraturan Pemerintah Republik Indonesia & Nomor 96 Tahun 2021, 2021](#)).

Administrative Requirements

Article 32 Paragraph (1) of Government Regulation No. 96 of 2021 provides that the administrative requirements include:

- 1) An application;
- 2) A Business Identification Number at the time of data updating; and
- 3) The composition of management, a list of shareholders, and information on the business entity, cooperative, or beneficial owner of the company at the time of data updating.

The administrative requirements above apply to IUP applications for metallic minerals, non-metallic minerals, rocks, and coal commodities.

All the above administrative requirements are implemented through an electronic system in accordance with Article 32 Paragraph (1) of Government Regulation No. 96 of 2021. The electronic system referred to here is the Online Single Submission Risk-Based Approach, or OSS-RBA. Its implementation in relation to risk-based business licensing is regulated under Government Regulation No. 5 of 2021. Mining companies are classified as high-risk business activities because they involve various aspects, including safety, health, environmental protection, and natural resource management.

Technical Requirements

Article 33 of Government Regulation No. 96 of 2021 stipulates the technical requirements for obtaining an IUP, including the following:

- a) For mineral and/or coal commodities, a statement from a mineralogist and/or geologist with at least three years of experience is required (Article 33A of Government Regulation No. 96 of 2021).

- b) For nonmetallic minerals, certain nonmetallic minerals, or shale assets, a statement from a mining expert and/or geologist with at least one year of experience is required (Government Regulation No. 96 of 2021, Article 33(b)).

Environmental Requirements

Article 34 of Government Regulation No. 96 of 2021 establishes environmental requirements and requires business actors to submit a statement declaring their willingness to comply with laws and regulations in the field of environmental protection and management.

Financial Requirements

Article 31 of Government Regulation No. 96 of 2021 stipulates that operators must meet several requirements, including:

- a) Installation certification, which ensures that exploration activities are carried out seriously and responsibly;
- b) Proof of payment for a WIUP for mineral or coal mining based on the value offered for metallic minerals, non-metallic minerals, or coal commodities;
- c) For non-metallic minerals, certain types of non-metallic minerals, and rock commodities, an IUP is required. Operators must pay the regional reserve fee and provide proof of a WIUP map for non-metallic minerals, a WIUP map for certain non-metallic minerals, or a printed WIUP map for rock commodities in the relevant area; and
- d) Tax clearance certificates obtained in accordance with laws and regulations in the field of taxation.

The inclusion of environmental requirements is an important indicator that all businesses related to natural resources must prioritize environmental protection. To meet these requirements, companies and mining operators must first secure an IUP during the initial exploration stage, which is generally divided into three main phases: exploration, production, and mine reclamation. Meanwhile, according to Article 28 of Government Regulation No. 96 of 2021, mining activities are classified into two types: exploration activities and production operation activities.

Exploration Phase

Article 36 Paragraph (1) of the Regulation of the Minister of Energy and Mineral Resources No. 7 of 2020 states that business entities may conduct mineral and coal mining operations only after obtaining a business license. Therefore, administratively, during the exploration stage, a company is subject to Government Regulation No. 96 of 2021. As stated in the regulation, all administrative, technical, environmental, and financial requirements must first be fulfilled by the holder of the *IUP*. The exploration phase is the process of identifying locations that contain mineral and coal potential with economic value. These activities include geological surveys, surface mapping, exploration surveys, and the clarification of the depth, size, and distribution of mineral deposits. The results of exploration serve as the basis for mining feasibility assessments and long-term planning. The accuracy of the data obtained at this stage greatly affects the efficiency and sustainability of future mining operations. According to Article 1 Number 15 of the Mineral and Coal Mining Law, exploration activities are stages of mining operations intended to obtain accurate and detailed information concerning the location, form, dimensions, distribution, quality, measured resources, and social and environmental conditions of mineral or coal deposits.

During the general survey and exploration stages, mining companies continue to bear environmental obligations. Although the scale of activity at this stage is relatively limited, the potential for environmental damage (particularly to soil structure, water sources, and biodiversity) remains present. Therefore, exploration activities must consider the carrying capacity and environmental capacity of the surrounding area and must avoid permanent damage that could complicate future restoration efforts. This precautionary principle forms the basis for establishing a sustainable environmental management plan throughout the production and operational stages.

The validity period of exploration activities under an *IUP* is regulated in Article 42 of Government Regulation No. 96 of 2021. The exploration period is eight years for metal minerals, three years for non-metallic minerals, seven years for certain types of non-metallic minerals, three years for rocks, and seven years for coal. Strict compliance with these regulatory periods is part of a company's commitment to responsible mining operations.

A company's environmental responsibility requires the submission of an Environmental Impact Assessment, or *AMDAL*, or other relevant environmental documents. Companies whose activities have significant environmental impacts are required to obtain environmental approval based on an impact analysis. Indonesia's current regulation concerning environmental impact analysis is Government Regulation No. 22 of 2021 ([PP Nomor 22 Tahun 2021, 2021](#)) concerning the Implementation of Environmental Protection and Management ([Triana & Matondang, 2025](#)), which was issued as an implementing regulation of the Job Creation Law. In addition, according to Article 1 Number 25 of the Mineral and Coal Mining Law, *AMDAL* refers to an environmental analysis that examines the significant impacts of a planned business and/or activity and serves as an important basis for decision-making regarding whether the business and/or activity may be implemented. Furthermore, the implementation of *AMDAL* serves as a prerequisite for business licensing and approvals issued by the central or regional government. Therefore, before conducting production or operational activities, every mining company must conduct a comprehensive environmental impact assessment to determine the scope and significance of potential environmental impacts.

This assessment is not merely an administrative formality; it must be conducted properly and monitored continuously. It encourages mining companies to adopt sustainable and environmentally responsible natural resource management practices. In this context, corporate responsibility is essential to ensure that mining business activities are carried out in accordance with environmental protection principles and applicable laws and regulations.

However, the practical effectiveness of initial environmental assessments is still widely questioned. Research shows that environmental assessment documents in the mining sector often function more as administrative requirements than as instruments for preventing actual environmental harm. Several structural weaknesses undermine the effectiveness of Environmental Impact Assessments. First, *AMDAL* committees may consist of evaluators with limited independence in assessing project proposals. Second, monitoring and enforcement of *AMDAL* commitments after license issuance remain weak, particularly because there is no mandatory real-time reporting mechanism. Third, public participation in the assessment process is often formal rather than substantive. Fourth, the integration of *AMDAL* into the *OSS-RBA* licensing system may reduce procedural rigor in favor of accelerating investment processes. This gap indicates that current environmental assessments have not fully fulfilled their role as an essential environmental protection instrument in the mining sector.

The exploration stage must be conducted in accordance with the *AMDAL* and *UKL-UPL* systems, namely Environmental Management Efforts and Environmental Monitoring Efforts. If these relevant environmental documents are ignored or not properly implemented, such actions constitute a violation of Law No. 32 of 2009 ([Undang-Undang Republik Indonesia 32 Tahun 2009, 2009](#)) and Government Regulation No. 22 of 2021 ([PP Nomor 22 Tahun 2021, 2021](#); [Triana & Matondang, 2025](#)). The most common sanctions are administrative sanctions under Article 508 Paragraph (1) of Government Regulation No. 22 of 2021 ([PP Nomor 22 Tahun 2021, 2021](#)), including written warnings, government coercive measures, suspension of business licenses, and revocation of business licenses ([Triana & Matondang, 2025](#)). The most serious risks include imprisonment and fines amounting to billions of rupiah.

Companies that operate without proper environmental assessments, approvals, or documentation may be considered to be conducting illegal activities and may also be classified as engaging in illegal mining. Companies that carry out mining exploration activities without an Exploration Mining Business License, or *IUP Eksplorasi*, are classified as conducting *PETI* activities and may face severe sanctions and fines. Under the applicable regulations, *PETI* constitutes a violation in the mineral and coal mining sector. According to Article 158 of the Mineral and Coal Mining Law, any person who conducts mining without a permit may be subject to imprisonment for up to five years and a fine of up to Rp100 billion. In addition, holders of an *IUP* at the exploration stage who conduct production or operational activities without the appropriate permit may also be subject to criminal sanctions under Article 160 of the Mineral and Coal Mining Law.

Article 161 states that any person who stores, uses, processes, refines, develops, utilizes, transports, or sells minerals and/or coal that are not obtained from an *IUP*, *IUPK*, *IPR*, *SIPB*, or other authorized permit may be subject to imprisonment and fines.

In addition to the penalties mentioned above, perpetrators may face additional sanctions under Article 164 of Law No. 3 of 2020. In addition to the provisions referred to in Articles 158, 159, 160, 161, 161A, 161B, and 162, perpetrators of criminal acts may be subject to additional sanctions in the form of confiscation of goods used in criminal activities, confiscation of profits obtained from criminal activities, and/or an obligation to pay costs arising from the criminal acts.

If a corporation or mining company commits a criminal act, then, in addition to imprisonment or fines imposed on its management, the fine imposed on the corporation may be increased by one-third of the maximum fine. In addition to fines, companies may also face additional penalties, including revocation of business licenses and/or revocation of legal entity status.

If a company conducts sampling activities before obtaining an Exploration *IUP*, it may face the penalties described above. This is because, before submitting samples, the company must first carry out legally permitted stages such as sampling, management, analysis, and sample storage. These activities must be conducted within the framework of an authorized mining permit.

Therefore, all mining actors, particularly mining companies, must strictly comply with *IUP* requirements for both exploration and production activities. Such compliance ensures that mineral resource governance is carried out in accordance with applicable regulations and environmental protection principles. This is essential for safeguarding the rights of local communities, protecting the environment, and preserving national interests.

Productive work phase

Once construction and production operations begin, environmental protection obligations become more complex and require significant technological investment. Government Regulation No. 96 of 2021 clearly requires holders of mining business licenses at the production operation stage to fulfill technical and environmental requirements as part of their business activities. These obligations include the management of mining waste, the control of pollution and environmental damage, and the gradual implementation of reclamation during production activities.

The production operation stage is a critical phase in which physical mining activities are carried out intensively. At this stage, mining companies bear direct responsibility for protecting the environment and minimizing damage. To prevent environmental degradation caused by mining activities, companies must adhere to the principles of Good Mining Practice (GMP). The implementation of GMP is based on Law No. 3 of 2020 concerning Mineral and Coal Mining, which amended Law No. 4 of 2009. Under this amendment, holders of Mining Business Licenses (*Izin Usaha Pertambangan/IUP*) and Special Mining Business Licenses (*Izin Usaha Pertambangan Khusus/IUPK*) are required to apply sound, responsible, and technically appropriate mining principles. The implementation procedures are further regulated in Regulation of the Minister of Energy and Mineral Resources No. 26 of 2018. Principles related to responsible and sustainable mining practices are widely applied internationally. Therefore, the implementation of GMP represents a concrete form of corporate responsibility in environmental protection.

In addition, the responsibilities of mining companies include fulfilling reclamation guarantees and post-mining guarantees to ensure that environmental obligations remain enforceable in the event of operational failure, business disruption, or company closure. Government Regulation No. 96 of 2021 also requires environmental commitments to be incorporated into the annual Work Plan and Budget (*Rencana Kerja dan Anggaran Biaya/RKAB*). The *RKAB* must include an environmental management plan, a reclamation plan, and the allocation of guarantee funds as a condition for the continuity of the mining business license. Through this mechanism, the government can conduct routine administrative assessments of company compliance with environmental commitments.

Furthermore, reclamation and post-mining obligations are major concerns of the Indonesian government, which has established mining environmental management regulations to supervise the preservation and control of environmental impacts arising from mining activities. One of the regulations governing the implementation of good mining practices is Regulation of the Minister of Energy and Mineral Resources No. 26 of 2018. Under this regulation, one of the obligations of holders of *IUP* and *IUPK* is to provide reclamation and post-mining guarantees.

Before calculating reclamation guarantee deposits, holders of *IUP* and *IUPK* must first prepare reclamation plans based on the approved mining plan. The reclamation plan should include land preparation, reclamation programs, success criteria for reclamation activities, and estimated

reclamation costs. The amount of reclamation guarantee is calculated for a five-year period, with detailed costs recorded annually. In addition, mining license holders must submit revisions to reclamation plans and budgets when required.

If the reclamation plan document does not meet the requirements for the production operation stage, it must be amended or revised. Holders of production operation IUP and IUPK must provide reclamation guarantees in the amount determined by the competent authority.

According to Government Regulation No. 96 of 2021, reclamation guarantees for the production operation stage are determined once every five years, while annual or periodic disbursement options are evaluated based on performance. The main argument is that this financial guarantee mechanism serves as an important instrument for ensuring that environmental obligations are fulfilled, even in the event of bankruptcy or company closure. However, the effectiveness of this preventive mechanism depends on the adequacy of the guarantee amount and the rigor of government supervision, which in practice may reveal institutional weaknesses.

If violations occur during the production operation stage, companies may face serious consequences, including administrative, civil, and criminal sanctions. Under Indonesia's mining regulations, particularly Law No. 3 of 2020, which amended Law No. 4 of 2009 concerning Mineral and Coal Mining, violations of environmental, reclamation, and post-mining obligations may result in legal consequences and sanctions.

To ensure that mining companies comply with reclamation and post-mining obligations and reduce environmental impacts, the government imposes administrative and criminal sanctions for violations of these obligations. If a license holder fails to fulfill reclamation or post-mining obligations, or violates relevant statutory provisions, administrative sanctions may be imposed. Administrative sanctions are clearly regulated in Article 151 of the Mineral and Coal Mining Law (Undang-Undang Mineral dan Batubara/UU Minerba). Article 151 provides that administrative sanctions may include written warnings, fines, suspension of part or all exploration or production operation activities, and/or revocation of IUP, IUPK, Community Mining Licenses (Izin Pertambangan Rakyat/IPR), Rock Mining Permits (Surat Izin Penambangan Batuan/SIPB), or other relevant mining permits.

On the other hand, Article 158 regulates criminal sanctions for parties conducting mining activities without the required permits. Articles 159, 160, 161A, and 161B of the UU Minerba also regulate criminal offenses related to violations of mining obligations. Criminal sanctions for violations of reclamation and post-mining obligations may include imprisonment or fines when the violation contains criminal elements. In the enforcement of reclamation and post-mining obligations, criminal law should be regarded as a last resort, or *ultimum remedium*, particularly when administrative sanctions are insufficient to resolve the violation.

In addition to the UU Minerba, Government Regulation No. 78 of 2010 concerning Reclamation and Post-Mining also provides enforcement rules for mining companies that fail to carry out reclamation and post-mining activities. The sanctions under this regulation are primarily administrative. If the relevant provisions are violated, administrative sanctions may be imposed, including written warnings, suspension of activities, and/or revocation of IUP, IUPK, or IPR. The regulation also emphasizes that holders of IUP, IUPK, or IPR are not released from responsibility for reclamation and post-mining activities even if they receive administrative sanctions in the form of license revocation.

Through the Directorate General of Mineral and Coal, the Ministry of Energy and Mineral Resources is responsible for supervising the post-operation environmental management of mining institutions. Regulation of the Minister of Energy and Mineral Resources No. 26 of 2018 requires all IUP and IUPK holders to manage and monitor the mining environment based on approved environmental documents. This regulatory framework demonstrates the importance of corporate responsibility in ensuring that mining business activities are conducted in accordance with environmental protection principles and relevant laws and regulations.

Post-mining regeneration phase

This stage is the sole responsibility of the mining company. All mining organizations holding a Mining Business License (*Izin Usaha Pertambangan* or IUP) or a Special Mining Business License (*Izin Usaha Pertambangan Khusus* or IUPK) must conduct environmental management at the

mining site after operations. This obligation is one of the key factors supporting the successful implementation of Good Mining Practices (GMP) in the mining industry.

Law No. 4 of 2009 on Mineral and Coal Mining stipulates that “reclamation is an activity carried out throughout the stages of mining business to organize, restore, and improve the quality of the environment and ecosystem so that they can function again in accordance with their intended use.” Reclamation is therefore an essential instrument for restoring land affected by mining activities. Restoration efforts may include revegetation, tree planting, land contouring, and the creation of green spaces on post-mining land. Mining companies are responsible for rehabilitating environmental damage caused by mining activities and ensuring that the land can be reused in the future. Meanwhile, Article 1 point 27 defines post-mining activities as planned, systematic, and continuous activities carried out after all mining business activities have ended, with the aim of restoring environmental and social functions in accordance with local conditions throughout the mining area.

When mining activities are partially or completely suspended, the company’s environmental responsibility reaches its highest point. Government Regulation No. 96 of 2021 clearly emphasizes that reclamation and post-mining activities are legal obligations and must be carried out until full success is achieved. This provision is reflected in Article 118 paragraph (3) of Government Regulation No. 96 of 2021, which requires IUP and IUPK holders to conduct reclamation and/or post-mining activities in accordance with statutory provisions until a 100% success rate is achieved, including the fulfillment of reclamation and post-mining guarantees during the process.

Article 96 of the Mineral and Coal Mining Law applies not only to mining safety but also to the environmental obligations of Mining Business License (IUP) and Special Mining Business License (IUPK) holders as part of their commitment to maintaining Good Mining Practices. These obligations include managing and monitoring the mining environment, including reclamation and post-mining activities.

Government Regulation No. 78 of 2010 concerning Reclamation and Post-Mining regulates the obligations of IUP and IUPK holders. Article 2 paragraphs (1), (2), (3), and (4) provide that: (1) reclamation must be carried out by holders of Exploration IUPs and Exploration IUPKs; (2) holders of Production Operation IUPs and Production Operation IUPKs are required to conduct reclamation and post-mining activities; (3) reclamation must be carried out on disturbed land during exploration activities; and (4) reclamation and post-mining activities must be conducted on disturbed land used for mining activities, including open-pit mining.

In addition, based on Government Regulation No. 78 of 2010, mining companies must submit reclamation and post-mining plans to the relevant authorities as part of licensing requirements and operational implementation. This provision emphasizes that reclamation is not merely an administrative requirement but an integral part of a comprehensive environmental protection strategy.

In addition to technical obligations, mining companies must provide reclamation and/or post-mining guarantee funds. This provision ensures that companies have the financial capacity to carry out environmental recovery activities as planned (Harris et al., 2024). The minister or authorized official may appoint a third party to use the guarantee fund to implement reclamation and post-mining activities if the company is negligent. However, if the guarantee fund is insufficient, the government may require the company to provide additional funds to complete the reclamation work. In many cases, reclamation failures are linked to a lack of transparency in the management of reclamation guarantee funds. Some mining companies fail to deposit sufficient funds or provide guarantees below the required amount. This is especially risky if a company goes bankrupt or ceases operations, as environmental recovery may not be fully implemented.

As part of corporate environmental responsibility in the mining sector, post-mining restoration is a legal obligation. Government regulations on reclamation and post-mining require companies to restore post-mining land so that it can be reused in accordance with its designated function. Law No. 3 of 2020 concerning amendments to the Mineral and Coal Mining Law further strengthens this obligation. This commitment is an important step in ensuring that mining operations do not cause permanent environmental damage. However, the implementation of reclamation in Indonesia still faces many challenges. According to 2020 data from the Ministry of Energy and Mineral Resources, of approximately 3,500 Mining Business Licenses issued, around

40% failed to meet reclamation standards. This indicates that many mining companies still neglect due diligence in fulfilling their legal obligations.

The high rate of non-compliance, with approximately 40% of IUP holders failing to meet reclamation requirements, reflects several structural weaknesses. First, law enforcement remains weak. Criminal sanctions under the Mineral and Coal Mining Law are rarely applied as an enforcement measure, while administrative sanctions, such as written warnings or temporary suspensions, are often insufficient to deter economically powerful companies. Second, conflicting economic incentives remain a major problem. Reclamation costs often exceed the value of the reclamation guarantee fund, creating incentives for companies to avoid their obligations and accept administrative penalties instead. Third, the oversight system remains inadequate. Fragmented supervision among the Ministry of Energy and Mineral Resources, local governments, and environmental agencies creates accountability gaps, especially in relation to abandoned mines. Fourth, regulatory capture at the local level may occur, as close relationships between local authorities and mining operators have historically hindered independent enforcement. Addressing the root causes of this problem requires not only higher fines but also stronger regulatory reform and institutional capacity.

Mining companies that fail to conduct reclamation face serious legal consequences under Indonesia's mining legal framework. These sanctions are intended to hold mining companies legally and financially accountable for environmental damage caused by mining activities and to prevent further environmental degradation. Depending on the severity and impact of the negligence, sanctions may be administrative, civil, or criminal.

Administrative sanctions

Government Regulation No. 78 of 2010 on Reclamation and Post-Mining, Article 50(1), stipulates as follows: If the holder of an IUP, IUPK, or IPR violates Article 2, Article 3 paragraph (1), Article 21, Article 22, Article 25 paragraph (3), Article 26 paragraph (1), Article 29 paragraph (1), Article 41, Article 45 paragraph (2), Article 47 paragraph (1), or Article 48, administrative sanctions shall be imposed. Article 50(2) further states that the administrative sanctions referred to in paragraph (1) may include: a. written warnings; b. suspension of activities; and/or c. revocation of the IUP, IUPK, or IPR.

In addition, mining companies that fail to fulfill their reclamation and post-mining obligations may be subject to sanctions under Law No. 32 of 2009 on Environmental Protection and Management. Depending on the nature and severity of the violation, fines may be imposed. These fines are generally applied when a company fails to commence or complete reclamation within the period specified in the approved reclamation plan. Fines may take the form of fixed payments intended to compensate for environmental losses incurred. The amount of the fine depends on the extent of environmental damage and the seriousness of the violation. However, in practice, these fines are often considered ineffective. Many companies view the cost of fines as lower than the cost of proper reclamation, making it more economical to pay administrative penalties than to fulfill their environmental responsibilities. This highlights the need to strengthen the penalty mechanism to provide a stronger deterrent effect for violating companies.

Civil penalties

Mining companies that neglect restoration work may face civil lawsuits filed by parties affected by environmental damage. For example, communities affected by reclamation failures, such as water pollution or damage to agricultural land, may file civil lawsuits seeking compensation. Such claims are usually based on the principle of strict liability, under which the company may be held liable for damages without the need to prove negligence. In some cases, Indonesian courts have upheld community claims and ordered mining companies to pay compensation. However, because these legal procedures are often lengthy and complex, many affected communities may be reluctant or unable to pursue legal action.

Criminal penalties

If a company is found to have deliberately neglected its reclamation and post-mining responsibilities and caused extensive and irreversible environmental damage, the company may

face criminal penalties. The *Minerba* Law contains clear criminal provisions regarding violations of reclamation and post-mining obligations. Article 161B of the *Minerba* Law provides that every holder of a Mining Business Permit (*IUP*) or Special Mining Business Permit (*IUPK*) whose permit has been revoked or has expired and who fails to carry out reclamation and/or post-mining activities, or fails to place reclamation and/or post-mining guarantee funds, may be punished with a maximum imprisonment of five years and a maximum fine of Rp100,000,000,000. In addition to the penalties referred to in paragraph (1), former *IUP* or *IUPK*holders may also be subject to additional sanctions in the form of obligations to fulfill post-mining responsibilities.

Law No. 4 of 2009 concerning Mineral and Coal Mining previously did not provide sufficiently specific criminal penalties for mining companies, *IUP* holders, or *IUPK*holders who avoided their post-mining recovery responsibilities. This created a regulatory weakness because the law regulated reclamation and post-mining obligations under Articles 99 and 100, but its criminal provisions were incomplete. As a result, enforcing criminal law against companies that neglected reclamation or post-mining obligations became difficult. The strengthening of sanctions under subsequent amendments to the *Minerba* Law therefore reflects the importance of corporate responsibility in ensuring that mining business activities are carried out in accordance with environmental protection principles and applicable laws and regulations.

In addition, mining companies that cause environmental damage may also be subject to criminal penalties under Law No. 32 of 2009 concerning Environmental Protection and Management. Article 98 paragraph (1) provides that any person who intentionally commits an act resulting in the exceedance of ambient air quality standards, water quality standards, seawater quality standards, or environmental damage criteria may be sentenced to imprisonment for a minimum of three years and a maximum of ten years, and fined at least Rp3,000,000,000 and at most Rp10,000,000,000.

Article 98 paragraph (2) further provides that if the act referred to in paragraph (1) causes injury to a person and/or endangers human health, the offender may be sentenced to imprisonment for a minimum of four years and a maximum of twelve years, and fined at least Rp4,000,000,000 and at most Rp12,000,000,000. If the act results in serious injury or death, Article 98 paragraph (3) provides that the offender may be sentenced to imprisonment for a minimum of five years and a maximum of fifteen years, and fined at least Rp5,000,000,000 and at most Rp15,000,000,000.

Article 99 paragraph (1) also regulates criminal liability for negligence. It provides that any person whose negligence results in the exceedance of ambient air quality standards, water quality standards, seawater quality standards, or environmental damage criteria may be sentenced to imprisonment for a minimum of one year and a maximum of three years, and fined at least Rp1,000,000,000 and at most Rp3,000,000,000. If the negligent act causes injury to a person and/or endangers human health, Article 99 paragraph (2) provides for imprisonment of a minimum of two years and a maximum of six years, and a fine of at least Rp2,000,000,000 and at most Rp6,000,000,000. If the act results in serious injury or death, Article 99 paragraph (3) provides that the offender may be sentenced to imprisonment for a minimum of three years and a maximum of nine years, and fined at least Rp3,000,000,000 and at most Rp9,000,000,000.

Ultimately, all mining operators must comply with legal requirements by implementing environmental obligations at every stage of mining activity, from planning and operation to closure and post-mining management. In principle, legal compliance and actual mining practices must ensure that mining operations not only generate direct economic benefits but also preserve long-term environmental sustainability.

Mine Waste Management Regulations

Mining is one of the industries that supports national economic growth. However, despite its economic benefits, mining activities have significant negative impacts on the environment and public health, mainly due to inadequate waste management. Mine waste may contain heavy metals and hazardous materials, including mercury and cyanide, as well as solids, liquids, gases, and hazardous and toxic substances (*Bahan Berbahaya dan Beracun/B3*), which can pollute water, soil, and air around mining areas (Rahardjo & Herman, 2025; Suryaningsi, 2017).

Despite the broad regulatory framework governing mine waste management, significant legal gaps remain. This means that there is no unified or operationally mandatory standard for mine waste management that is tailored to each type of mining product and production volume. The

current multilayered regulatory structure, including Law No. 32 of 2009, Government Regulation No. 101 of 2014 on B3 waste management, and Government Regulation No. 22 of 2021 (PP Nomor 22 Tahun 2021, 2021), creates overlapping yet scattered obligations, making it difficult for small and medium-sized business operators to comply comprehensively (Triana & Matondang, 2025). In addition, the transition from the traditional environmental permit system to the environmental approval system under the Job Creation Law has significantly reduced the pre-screening process for waste management plans. These normative gaps, limited monitoring capacity, and inconsistent sanctions continue to sustain B3 waste pollution, especially in coal and nickel mining areas (Darajah et al., 2026; Maroji et al., 2025).

Waste refers to residue generated by a company or activity. Therefore, emissions and waste produced through mining companies' production processes or activities are referred to as mining waste. If their quantity or concentration exceeds environmental quality standards, they are classified as industrial waste that can have negative impacts on the environment. Today, industrial waste has become one of the most serious environmental challenges, particularly in relation to waste management. The management and disposal of mine waste must therefore be carried out properly to prevent environmental damage.

After mining activities end, mining companies have significant environmental obligations that must be fulfilled as an important form of corporate responsibility. These obligations are intended to restore environmental and ecosystem functions affected by mining activities. Therefore, as part of their responsibility during and after mining operations, mining companies must understand and comply with various environmental protection regulations related to mining activities.

Indonesia's mining waste management regulations have evolved significantly over the past decade (Hasna et al., 2025). The main legal framework is set out in several layers, ranging from statutory law to operational technical regulations. Law No. 32 of 2009 concerning Environmental Protection and Management (*Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup*) serves as the primary legal framework governing the basic principles of environmental management, including in the mining sector. Law No. 32 of 2009 covers various matters, including pollution prevention, environmental damage control, B3 waste, Strategic Environmental Assessment (*Kajian Lingkungan Hidup Strategis/KLHS*), carrying capacity, and environmental capacity. This law regulates key legal aspects related to environmental protection and management.

In addition, Law No. 32 of 2009 regulates legal sanctions for environmental violations, including environmental destruction. These sanctions may include civil liability, administrative sanctions, and criminal penalties, including imprisonment.

Several implementing provisions have emerged from this law, especially government regulations (Peraturan Pemerintah/PP). These include Government Regulation No. 27 of 2012 concerning Environmental Permits, Government Regulation No. 101 of 2014 concerning the Management of Hazardous and Toxic Waste, and other ministerial regulations concerning environmental management, reporting, and environmental audits. These regulations were further strengthened by Government Regulation No. 22 of 2021 (PP Nomor 22 Tahun 2021, 2021) concerning the Implementation of Environmental Protection and Management, which provides more detailed technical guidance (Triana & Matondang, 2025).

Environmental protection and management constitute integrated and systematic efforts to maintain environmental functions and prevent environmental damage and pollution through planning, utilization, control, supervision, maintenance, and law enforcement. Therefore, business stakeholders and various types of companies are expected to become more environmentally conscious and responsible, a concept commonly referred to as environmental responsibility. Furthermore, each legal provision serves as a reference for both the government and the private sector in supporting the achievement of environmental protection goals.

CONCLUSION

This study reveals that corporate environmental responsibility under Indonesian mining law operates through a hierarchical legal framework based on the Mineral and Coal Mining Law, namely Law No. 4 of 2009 as amended by Law No. 3 of 2020. Normatively, this framework is

comprehensive; however, in practice, it faces three main weaknesses. First, weak post-licensing monitoring reduces the effectiveness of initial environmental impact assessments. Second, the reclamation guarantee mechanism remains insufficient to ensure full compliance, as indicated by an estimated non-compliance rate of approximately 40%. Third, criminal liability provisions under the Mineral and Coal Mining Law and the 2023 National Criminal Code have not been sufficiently applied as a deterrent against companies that neglect environmental obligations.

Based on these findings, this study recommends several policy reforms. First, integrating real-time environmental monitoring data into the RKAB approval process should be mandated to enable dynamic compliance assessment rather than routine administrative review. Second, the full reallocation of the Reclamation Guarantee Fund should reflect the actual cost of reclamation, including reserves for ecosystem damage. Third, corporate criminal liability provisions should be systematically implemented for chronic non-compliance with reclamation obligations under Article 47 of the 2023 National Criminal Code, serving as a foundational enforcement measure in addition to administrative sanctions. Fourth, regulatory oversight of mine waste management should be integrated into a single inter-ministerial institutional framework to eliminate fragmentation among law enforcement authorities. Fifth, a mandatory environmental performance disclosure mechanism should be developed as a market-based accountability instrument for IUP holders.

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AUTHOR CONTRIBUTION STATEMENT

Rama Wibawa is the sole author responsible for the conceptualization, legal analysis, literature review, data interpretation, and preparation of the original manuscript. The author developed the research framework, conducted the analysis, revised the manuscript, and approved the final version of the article.

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