

property, among others, as provided for in the Constitution.⁵⁴⁸ Therefore, constitutionally, ‘state duty’ includes protecting ‘democratic values, social justice and fundamental human rights’.⁵⁴⁹

The correlation between section 27 and section 24 of the Constitution in regard to coal-mine water pollution is entrenched in the shared mandate to ensure access to clean and safe water resources while also ensuring that the environment is safe from pollution. Coal-mine water pollution, which can significantly affect water sources and the environment, falls within the purview of these constitutional provisions.

In the context of coal-mine water pollution, section 27 emphasises the right to access clean water, implying the duty of the mining companies to prevent contamination or degradation of water sources caused by coal-mining activities. Section 24 complements this by highlighting the broader obligation to maintain an environment that is not harmful to health and well-being, thereby encompassing measures to mitigate the detrimental effects of coal-mine water pollution on the environment and human health. Inasmuch as section 8(2) of the Constitution binds both natural and juristic persons, mining companies have an explicit⁵⁵⁰ legal obligation and duty to avoid the pollution⁵⁵¹ of water resources in a way that would disrupt people’s constitutional environmental rights.

Based on the above, one duty of the state is to ensure access to water. In this instance, the Constitution mandates the state to enact legislation and take necessary measures ‘within its available resources’ to ensure that the right to water is ‘progressively realised’.⁵⁵² The Constitution also includes other provisions with the potential to promote water protection, both directly and indirectly.⁵⁵³ The section below discusses the statutory framework for achieving water sustainability and people’s well-being in the coal-mining context.⁵⁵⁴

4.3 The statutory framework

A variety of statutes have been enacted to give effect to the constitutional obligation described above, including NEMA, which governs the protection of all environmental resources, including water. The Water Services Act (WSA)⁵⁵⁵ regulates access to potable water supply services, and NWA, safeguards the management, protection, and conservation of water resources.⁵⁵⁶ South

⁵⁴⁸ Preamble and s 3(2)(a) of the Constitution.

⁵⁴⁹ Preamble to the Constitution

⁵⁵⁰ Starck C 2003),

⁵⁵¹ Starck C (2003)m

⁵⁵² Section 27(2) of the Constitution.

⁵⁵³ Including provisions for environmental governance.

⁵⁵⁴ Section 27 of the Constitution.

⁵⁵⁵ Water Services Act 108 of 1997.

⁵⁵⁶ Feris L & Kotze LJ (2014) 17.

African legislation regulates mining, through MPRDA. Overall, the statutory framework provides for comprehensive prevention, minimisation, and remediation of pollution, which includes liability provisions.⁵⁵⁷ ‘Liability’ concerning coal-mining water pollution is defined by detailed legislative provisions varying framework to sectoral legislation relating to water resources and coal mining, and which would be applicable in terms of water pollution resulting from coal-mining practices.⁵⁵⁸ The following sections discuss the provisions of the legal framework that are relevant to coal-mine water pollution.

4.3.1 NEMA

NEMA is South Africa’s environmental law, and it applies in its entirety to the issue of water pollution resulting from coal-mining practices, especially so AMD. Moreover, it governs water resources because its governing capacity includes an extensively defined ‘environment’ that also includes the definition of water resources.⁵⁵⁹ According to section 2 of the Act, national environmental management principles apply to ‘actions of all organs of state that may significantly affect the environment’.⁵⁶⁰ These principles must ‘guide the interpretation, administration, and implementation of this Act (The NEMA), and any other law concerned with the protection or management of the environment’,⁵⁶¹ with ‘other law’ comprising NWA and MPRDA, among others. The principles are of paramount importance in that they function as mandatory rules concerning environmental governance efforts in the country. As the Constitutional Court noted in *Fuel Retailers*,

[t]he principles stipulate not only the common framework inside which environmental management and implementation decisions need to be structured, but, they also grant guidelines that should guide state organs in the exercise of their activities that may impact the environment. Possibly more importantly, these principles give guidance for the interpretation and implementation not only of NEMA but any other legislation that is concerned with the protection and management of the environment. These principles need to be observed as they are of considerable importance to the protection and management of the environment.⁵⁶²

NEMA’s principles are mandatory guidelines in that they have statutory power; because they are mandatory, they cannot simply be brushed to the side as immaterial irritations.⁵⁶³ However, the principles apply only to the actions of the government and not those of the private sector.⁵⁶⁴

⁵⁵⁷ Feris L & Kotze LJ (2014) 17.

⁵⁵⁸ Feris L & Kotzé LJ (2014).

⁵⁵⁹ Section 1 of the NEMA.

⁵⁶⁰ Section 2(1) of the NEMA.

⁵⁶¹ Section 2(1)(e) of the NEMA.

⁵⁶² *Fuel Retailers* para 67

⁵⁶³ Feris L & Kotze LJ (2014) 17

⁵⁶⁴ Feris L & Kotze LJ (2014) 17.

Nonetheless, in terms of section 37 of MPRDA, their application extends to the mining sector.⁵⁶⁵ Therefore, the principles bind the state and all its activities and decisions, including the activities and decisions of coal mines where these impact the environment. What are the principles that are applicable to coal mines in the context of water pollution?⁵⁶⁶

4.3.1.1 Relevant environmental management principles

4.3.1.1.1 The principle of sustainable development

Section 2(4)(a) of NEMA provides for the principle of sustainable development. The principle requires the consideration of all pertinent components for ensuring that the pollution and degradation of the environment are circumvented, or where they cannot be avoided, are reduced and remedied.⁵⁶⁷ Waste should be avoided, or where it cannot be avoided, be reduced and recycled where possible, or else disposed of responsibly.⁵⁶⁸

Sustainable development further requires that the use of non-renewable natural resources be accountable and reasonable, and take into consideration the concerns of the exhaustion of the resource, such that the development and utilisation of renewable resources and the ecosystems of which they are a part does not surpass the level above which the integrity of these resources is endangered.⁵⁶⁹ It is important that the risks are noted and a cautious approach is taken, considering the limitations of the available information concerning the consequences of decisions and activities. Moreover, negative effects on the environment and people's environmental rights are prohibited, and, when they cannot be prohibited altogether, reduced and remedied.⁵⁷⁰

These principles state 'no-harm' as the ideal scenario, but also note that justifiable socio-economic development will have environmental effects.⁵⁷¹ Where this is the situation, the effects must be reduced and remedied. Accordingly, when mining happens for the greater good of advancing justifiable socio-economic development, environmental damage arising from coal mining must be prohibited, reduced and remedied by the enforcement of reasonable measures by the agent of the mining activity.⁵⁷²

⁵⁶⁵ Section 37 of the MPRDA.

⁵⁶⁶ Feris L & Kotze (2014).

⁵⁶⁷ Feris L & Kotze (2014).

⁵⁶⁸ Feris L & Kotze (2014).

⁵⁶⁹ Feris L & Kotze (2014).

⁵⁷⁰ Section (4)(a) of the NEMA.

⁵⁷¹ This caveat corresponds to the condition provided in s 24 of the Constitution.

⁵⁷² Feris L & Kotze (2014).

4.3.1.1.2 No-harm principle

Section 2(4)(a) of NEMA provides for the no-harm rule. This principle is to minimise and remedy environmental impacts.⁵⁷³ Liability for environmental harm in the conventional manner is the key element of South African environmental governance, and is granted by the section 2 principles of NEMA. The provision on life-cycle liability requires that ‘responsibility for the environmental health and safety consequences of policy, programme, project, product, process, service or activity exists throughout its life cycle’.⁵⁷⁴ Life-cycle liability is strengthened by the polluter-pays principle, which holds polluters, and not the users, responsible for bearing the financial burden of their polluting actions.⁵⁷⁵

4.3.1.1.3 Principle of integration

Section 2(4)(b) of NEMA provides that environmental management must be integrated. It must acknowledge that all elements of the environment are interrelated, and must take into account the impact of decisions on all aspects of the environment, and all people in the environment, by pursuing the policy of the best practical environmental option (BPEO).⁵⁷⁶ The BPEO is the ‘option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well in the short term’.⁵⁷⁷ Any decisions pertinent to water pollution need to be made by the private or public sector or both, and must support the BPEO.⁵⁷⁸ The BPEO provides for ‘reasonable other measures’ to be enforced by those liable for the action that may result in coal-mine water pollution, for example.⁵⁷⁹

4.3.1.1.4 Precautionary principle

Under section 2(4)(b) of NEMA, it is explicitly provided that proactive measures must be taken to prevent or mitigate environmental harm. NEMA is the ultimate custodian of environmental resources. The state carries the responsibility for addressing coal-mine water pollution, through responsive strategies that address pollution caused by AMD from unowned and dilapidated mines. Another way is through practical strategies to ensure that present and future coal-mining activities do not go ahead without the enforcement of the necessary reasonable measures to prohibit water pollution resulting from coal-mining practices.⁵⁸⁰ This will prevent present and future mining

⁵⁷³ Section 2(4)(a) of the NEMA.

⁵⁷⁴ Section 2(4)(a) of the NEMA.

⁵⁷⁵ Feris L & Kotze (2014).

⁵⁷⁶ Section 2(4)(b) of the NEMA.

⁵⁷⁷ Section 1 of the NEMA.

⁵⁷⁸ Feris L & Kotze (2014).

⁵⁷⁹ Feris L & Kotze (2014).

⁵⁸⁰ Feris L & Kotze (2014).

operations from becoming the liability of the government and taxpayers.⁵⁸¹ The precautionary principle prevents risk from occurring.⁵⁸²

4.3.1.1.5 Environmental management

In terms of section 2 of NEMA, environmental authorisation of mining operations would in the future fall under the ambit of NEMA.⁵⁸³ This would entail that the more severe environmental impact assessment administration outlined in NEMA would apply to mining and include the management and control of excess stockpiles both during the operative stage and at mine closure. This could result in stricter management of activities that may cause water pollution than under the environmental regime in MPRDA. Section 24N(3)(b) of NEMA provides that environmental management should

contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related activities which may occur inside and outside the boundaries of the prospecting or mining area in question.⁵⁸⁴

This provision requires coal-mining companies to address water pollution and have a management plan for AMD; the mine may not be issued with environmental authorisation except if it has addressed environmental impacts.⁵⁸⁵

4.3.1.1.6 Duty of care

Section 28 of NEMA is entitled ‘Duty of care and remediation of environmental damage’.⁵⁸⁶ It provides for the duty of care, as its name makes clear. According to this principle, it is required that mines have the responsibility to prevent pollution or degradation, to reduce pollution/degradation, and/or to rectify it.⁵⁸⁷ *Bereki v Gencor Ltd* focused on liability for pollution.⁵⁸⁸ However, since the amendment of NEMA, liability is now applicable retrospectively, that is, it applies to situations caused before the commencement of NEMA.⁵⁸⁹ Where a mine is incapable of taking reasonable measures to address water pollution, it might be ordered to do so by the applicable authority, and if

⁵⁸¹ Feris L & Kotze (2014).

⁵⁸² Kengni B (2018): 63.

⁵⁸³ Feris L & Kotze (2014).

⁵⁸⁴ Section 24N(3)(b) of the NEMA.?? why the space?

⁵⁸⁵ Section 24N(1) of the NEMA.

⁵⁸⁶ Section 28 of the NEMA.

⁵⁸⁷ Section 28 of the NEMA.

⁵⁸⁸ *Bereki v Gencor Ltd* 2006 1 SA 432 (T).

⁵⁸⁹ National Environmental Management Amendment Act 14 of 2009.

it does not comply with the directive, measures will be taken by the state on its behalf, but at the cost of the mine.⁵⁹⁰

In furtherance to this statutory-administrative liability, NEMA enforces criminal liability according to which the directors of a company that causes or has caused pollution could be vicariously liable and criminally accountable for an environmental offence created by the company. In terms of NEMA, it is explicitly provided that:

[a]ny person who is or was a director of a firm at the time of the commission by that firm of an offence ... shall himself or herself be guilty of the said offence ... if the offence in question resulted from the failure of the director to take all circumstances to prevent the commission of the offence.⁵⁹¹

This provision has a powerful dissuasion objective to ensure that directors of coal-mining companies prevent adverse environmental activities or appropriately focus on environmental harm, or else run the risk of criminal liability.⁵⁹² Although criminal liability is a significant factor in any environmental law regime, one of its biggest limitations is that it is incapable of addressing environmental remediation.⁵⁹³ However, the establishment of criminal liability could ‘persuade’ present and future directors of coal-mining companies to correctly concentrate on the water pollution crisis or else risk a fine and/or imprisonment.⁵⁹⁴

4.3.1.1.7 The polluter pays

Under section 2(4)(p) of NEMA, the polluter-pay principle entails that ‘the costs of remedying pollution, environmental degradation and consequent adverse health impacts and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment’.⁵⁹⁵ Liability in this regard extends throughout the entire period of mining, as well as to the rehabilitation of the environmental damage caused by AMD.⁵⁹⁶

4.3.2 NWA

The obligations under NWA are complementary to those of NEMA above, and they need to be taken into consideration because polluted coal mine water creates extreme difficulties in supplying clean water. NWA comprises a wide variety of regulations that are linked to water quality and the

⁵⁹⁰ Section 28(4), (7)-(8) of the NEMA.

⁵⁹¹ Section 34(7) of the NEMA.

⁵⁹² Feris L & Kotze LJ (2014) 18.

⁵⁹³ Criminal Measures 240-265.

⁵⁹⁴ Feris L & Kotze (2014) 18.

⁵⁹⁵ Feris L & Kotze (2014) 18.

⁵⁹⁶ Section 2(4)(p) of the NEMA.

preservation and management of water resources. In particular, it includes a host of liability provisions that could apply to water pollution caused by coal mines. Section 19, entitled ‘Prevention and remedying effects of pollution’, is certainly the most important, and provides as follows:

1. An owner of the land, a person in control of the land or a person who occupies or uses the land on which –
 - a) any activity or process is or was performed or undertaken; or
 - b) any other situation exists,

Which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing, or recurring.

At this point, one needs to observe that ‘pollution’ is defined as ‘the direct or indirect alteration of the physical, chemical or biological properties of a water resource make it –

- a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- b) harmful or potentially harmful-
 - (aa) to the welfare, health, or safety of human beings;
 - (bb) to any aquatic or non-aquatic organisms;
 - (cc) to the resource quality; or
 - (dd) to property.⁵⁹⁷

The definition of water pollution is extensive and includes not only harm (and therefore liability) to the aquatic environment and human beings, but also harm to property. Of importance is the observation of the risk that unrestrained water pollution causes to property, which suggests that the liability requirements of the NWA could be utilised not only in a conventional way that pertains to water *per se*, but to water organisation as far as water pollution in the coal-mining context is concerned. Section 19 carefully emulates section 18 of NEMA and imposes an extensive responsibility of care and liability on coal mines to address water pollution by ways of ‘reasonable measures’.⁵⁹⁸ According to section 28 of NEMA, these measures are not a closed list and may contain measures such ‘as to end, adjust or regulate any conduct or activities that cause water pollution; to observe any prearranged waste standard or management practice; to encompass or prohibit the drive of pollutants; to eradicate any cause of the pollution; to remedy the impacts of the

⁵⁹⁷ Section 1(xv) of the NWA.

⁵⁹⁸ Feris L & Kotze (2014).

pollution; and to remedy the impacts of any disturbance to the bed and banks of a watercourse.⁵⁹⁹ Where a coal mine does not take reasonable measures, it may be ordered to do so by way of an administrative directive. If it is unsuccessful in heeding the directive, the state will take measures on its behalf and recuperate the costs of these measures from the coal mine.⁶⁰⁰

Significantly, section 19 permits the state to hold coal-mining companies liable for pollution related to AMD, to prohibit such pollution from happening, to reduce pollution, and to remediate it. Confirming liability for environmental harm and pollution is part of the state's duties to control the assets of the trust, as it were, as far as the responsibilities of South Africa's public trustee of water resources are concerned.⁶⁰¹ It appears as if the South African courts are motivated to give sustenance to environmental governance departments in this regard. Such was the instance in the case of *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited*,⁶⁰² where the High Court decided as follows:

The object of the directives is to prohibit pollution of valuable water resources. To allow mining companies and their directors to flout environmental obligations is contrary to the Constitution, the Mineral Petroleum Development Act and the National Environmental Management Act. Unless courts are ready to help the government by providing suitable mechanisms for the enforcement of statutory obligations an impression will be created that mining companies are free to exploit the mineral resources of the country for profit above the lifetime of the mine, thereafter they may simply walk away from their environmental obligations. This simply cannot be allowed in a constitutional democracy which recognises the right of all its citizens to be protected from the impacts of pollution and degradation.⁶⁰³

Similarly, in *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry*,⁶⁰⁴ the Supreme Court of Appeal supported a directive dispensed by the Department of Water Affairs according to section 19(3) of NWA to take reasonable measures, as well as measures on land belonging to another, to prohibit pollution from contaminating water resources. The High Court in *Harmony* decided that Harmony Gold had an obligation to pump and treat acidic mine water, although it had served all lawful associations to the land on which the mining activities that produced pollution had occurred.⁶⁰⁵ According to the Court, 'if a member of

⁵⁹⁹ Section 19(2) of the NWA.

⁶⁰⁰ Sections 19(3)-(5) of the NWA.

⁶⁰¹ Section 3 of the NWA.

⁶⁰² *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited* 2006 ZAGPHC 47.

⁶⁰³ *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited* 2006 ZAGPHC 47: para 16.9

⁶⁰⁴ *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* 2006 SCA 65.

⁶⁰⁵ *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* 2006 SCA 65

the class of persons had, while still a landholder, failed to comply with the duty, his failure does not become erased by him merely “walking away” from the affected land without fulfilling the outstanding obligations’.⁶⁰⁶

Chapter 4 of the NWA regulates the authorisation of water uses, which comprise activities linked to mining. There are four different types of water use authorisations under the Act. These are water use authorised under Schedule 1 of the Act; commonly authorised water use; actions that were legally assumed between 1 October 1996 and 30 September 1998 that can be considered as present legal water use; and actions that need a water use licence. In common cases, a new or present mine needs to apply for a water use licence to be able to manage its fundamental activity of mining.⁶⁰⁷ The issuing of authority might assign wide situations to these licenses, and any breach of these situations may give rise to criminal and/or administrative sanctions.⁶⁰⁸ An extensive capacity of problems concerned⁶⁰⁹ with coal-mine water pollution and AMD would be governed in the water use authorisation, such as recommending which reasonable measures must be executed at the exact mine; these conditions apply in conjunction with additional protective measures, the duty of care, and statutory liability provisions governed by the NWA and other legislation.⁶¹⁰

4.4 MPRDA

MPRDA seeks fundamentally to control access to, the beneficial exploitation of, and the use of mineral resources. It also seeks to ‘give effect to section 24 of the Constitution by ensuring that the country’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development’.⁶¹¹ Although its focus is on the promotion of mineral resources development, the Act encourages mining activities and links socio-economic development inside permissible ecological restraints, even though this ecological intention is a sole competitor for consideration among other many expansions concerned with the goals of this Act.⁶¹²

As indicated above, MPRDA applies the sustainability principles of NEMA directly to mines. Moreover, it contains liability provisions that apply to water pollution. Section 38(1) states that a mine must ‘as far as it is reasonably practicable, rehabilitate the environment impacted by the prospecting or mining activities to its natural or predetermined state or to a land use which

⁶⁰⁶ *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* 2006 SCA 65: para 39.

⁶⁰⁷ Sections 21-55 of the NWA.

⁶⁰⁸ Section 29 of the NWA.

⁶⁰⁹ Feris L & Kotze (2014).

⁶¹⁰ Feris L & Kotze (2014).

⁶¹¹ Section 2(h) of the MPRDA.

⁶¹² Feris L & Kotze (2014).

conforms to the generally accepted principle of sustainable development'.⁶¹³ Furthermore, a mine is 'responsible for any environmental damage, pollution or ecological degradation as a result of his/her [sic] reconnaissance, prospecting or mining activities and which occur inside and outside the boundaries of the area to which such right, permit or permission relates'.⁶¹⁴ Provisions such as section 28 of NEMA and section 19 of NWA establish a duty of care, and the liabilities it enforces will endure until a closure certificate has been granted to the mine.⁶¹⁵ Of importance, it continues to be unclear whether the governing closure envisioned in the MPRDA also dismisses the duties outlined in the NWA and NEMA.⁶¹⁶

The extensively outlined liability of mines is also extended to directors (director liability), in that

the directors of a company or members of a close corporation are jointly and severally liable for any acceptable negative impact on the environment, including damage, degradation, or pollution advertently or inadvertently caused by the company or close corporation which they represent or represented.⁶¹⁷

These provisions cast an inclusive liability net which is applicable in conjunction with the similar provisions of NEMA and NWA mentioned above. However, these provisions mention the 'holder' of the right or permit, and retrospective liability will not be applicable in cases of coal-mining water pollution where the holder is not present and does not exist anymore. However, this must be fixed after the amendments to NEMA and MPRDA come into effect⁶¹⁸ because section 28(1A) of NEMA provides for historical pollution and liability for environmental damage arising from coal-mining practices that will be governed by NEMA and not MPRDA. The necessity to enforce liability retrospectively on mining is important.⁶¹⁹ Without it, the constitutional, environmental law, and governance effort that applies to mines would be deemed null and void. After all, it is coal mining that is accountable for the largest incidence and most dangerous forms of South Africa's long-standing coal-mining pollution.⁶²⁰

However, it is worth noting that, even though the provisions may apply retrospectively to include historical pollution, the fact remains that where the polluter is no longer present, the liability provisions cannot be imposed.⁶²¹ Coal mining companies' environmental responsibilities and activities to recognise their responsibilities should be outlined carefully in an environmental

⁶¹³ Section 38(1) of the MPRDA.

⁶¹⁴ Section 38(1)(e) of the MPRDA.

⁶¹⁵ Section 43(1) of the MPRDA.

⁶¹⁶ Feris L & Kotze (2014).

⁶¹⁷ Section 38(2) of the MPRDA.

⁶¹⁸ Feris L & Kotze (2014).

⁶¹⁹ Feris L & Kotze (2014).

⁶²⁰ Feris L & Kotze (2014).

⁶²¹ Feris L & Kotze (2014).

management plan and environmental management programme.⁶²² The granting of permission to mine or prospect is provisional on, inter alia, the submission of this programme and plan to the applicable government authority and its acceptance by that authority.⁶²³ Moreover, section 40(1) necessitates that when the DMR reflects on an environmental management plan or environmental management programme, it must discuss it with any government department that manages any law on matters impacting the environment.⁶²⁴ The programme or plan is dependent on the financial provision for the rehabilitation or management of negative environmental effects.⁶²⁵ If the mine is incapable or fails to rehabilitate or control any effect on the environment, or is incapable of assuming such rehabilitation or controlling such effect, the state might use the money to achieve the environmental duties of the mine on its behalf. The prerequisite to sustain and keep this financial endowment stays in force until the state releases the mine with a closure certificate.⁶²⁶ Most importantly, no closure certificate may be released unless the Chief Director of Mines and the Department of Water and Sanitation has approved in writing that the provisions relating to health and safety and the management of possible pollution to water resources have been addressed.⁶²⁷ It is worth noting that the state may keep such part of the financial provision as may be needed to rehabilitate the closed mining or prospecting operation about latent or residual environmental effects.⁶²⁸

The usefulness of this provision regarding harm or pollution caused by AMD is restricted. This is because some of South Africa's present AMD woes are a result of the archaic mining practices of a period when governance was wholly inadequate (for instance, before NEMA and other post-1996 environmental laws).⁶²⁹ There were no financial provisions that were made to address coal-mining water pollution, as there are today. The financial provision is bound together with the current applications for coal-mining authorisations and will therefore be applicable solely where coal mines have lately required a mining right, or where they will do so in the future.⁶³⁰ Furthermore, the accomplishment of the financial provisions in addressing water pollution will frequently rely on a variety of components being adequately measured, comprising, for instance, appropriate and recurrent appraisal of the provision and its competence, change of the provision about new

⁶²² Section 39 of the MPRDA.

⁶²³ Section 5(4) of the MPRDA.

⁶²⁴ Section 40(1) of the MPRDA.

⁶²⁵ Section 41(1) of the MPRDA.

⁶²⁶ Section 41(2) of the MPRDA.

⁶²⁷ Section 43 (5) of the MPRDA.

⁶²⁸ Section 43(6) of the MPRDA.

⁶²⁹ Feris L & Kotze (2014).

⁶³⁰ Feris L & Kotze (2014).

scientific knowledge that arises on water pollution, and appropriate, comprehensive discussion with all interested and negatively impacted parties.⁶³¹

According to section 43(2), the Minister has the decision to allocate environmental liabilities and duties to an appropriately capable person.⁶³² Whether this individual comprises the state, an environmental rehabilitation company, or a new owner is uncertain. It is also uncertain what the prerequisite 'appropriately capable' is envisioned to convey or require. Would the government be regarded as appropriately capable in an instance where it has no human and financial resources to deal with water pollution?⁶³³

Nonetheless, what this section adds to the present on the end of liability will not need to stop and simply fall away.⁶³⁴ Environmental responsibility (and, arguably, liability) at a minimum will always alternatively refer back to the government where liability stops by way of statutory mechanisms (the closure certificate), or where the mine is incapable of achieving the environmental obligations stemming from liability.⁶³⁵ Therefore, where the mine is pardoned from liability by the closure certificate, or the liability is not conveyed to an 'appropriately capable' individual, the state needs to take liability for water pollution.

However, where their liability for water pollution does not refer to the government, the polluter-pays principle will be infringed, since the state and the public would be required to foot the bill for environmental remediation. In this case, the polluter would be openly not paying for remedying water pollution, but rather the tax-paying public.⁶³⁶ This raises possible questions about the self-defeating and noticeably inconsistent provisions in South Africa's suite of laws that focus on the environmental liability of mines as far as coal-mining water pollution is concerned.⁶³⁷

Furthermore, under the broader liability provisions above, section 45 of the MPRDA states that 'if any prospecting, mining, reconnaissance, or production operations cause or result in ecological degradation, pollution or environmental damage which may be harmful to the health or wellbeing of anyone and require urgent remedial measures',⁶³⁸ the appropriate authority may order the mine to assume these measures. Section 45's version of the administrative directive is also regulated by section 28 of NEMA and section 19 of the NWA. These provisions do not conflict with each other

⁶³¹ Feris L & Kotze (2014).

⁶³² Section 32(2) of the MPRDA.

⁶³³ Feris L & Kotze (2014).

⁶³⁴ Feris L & Kotze (2014).

⁶³⁵ Feris L & Kotze (2014).

⁶³⁶ Feris L & Kotze (2014).

⁶³⁷ Feris L & Kotze (2014).

⁶³⁸ Section 45 of the MPRDA.

and could be used simultaneously.⁶³⁹ Section 45 refers to the practice of administrative directives as encompassing ‘urgent remedial measures’ and not only more common situations and measures, as under NEMA and the NWA. The risk to the environment and human health and well-being posed by water pollution is such that it certainly needs ‘urgent remedial measures’. If the mine is incapable of taking these measures, the applicable authority will do so on its behalf and then claim the costs acquired in this regard from the mine.⁶⁴⁰ Where the mine cannot reimburse the authority, the latter is authorised to appropriate and sell the mine’s property to recover the costs.⁶⁴¹ Therefore, even if it decides to disregard government directives about the rehabilitation of water pollution, the mine in effect remains at least financially responsible for the costs acquired if actions are taken according in terms of the directives.⁶⁴²

In cases where the mine does not exist, the current owner cannot be recognised or located, or the mine has been liquidated, it would be difficult to provide for and/or claim the costs of rehabilitation. In many instances, this is the case with coal-mine water pollution in South Africa.⁶⁴³ In this situation, section 46 of the MPRDA empowers the minister to order the applicable regional manager (a government functionary)⁶⁴⁴ to take necessary measures to prohibit further pollution or degradation, or ‘to make the area safe’. These measures should be funded from the financial security provision made by the mine, or if there is no provision like this, or if it is insufficient, from money appropriated by Parliament for that purpose.⁶⁴⁵

Importantly, section 46 states that the potential of the state to respond to water pollution where the mine fails to do so.⁶⁴⁶ The state is further subjected to additional and extraordinary funding from Parliament where this proves to be required if water pollution can be explained as needing ‘urgent remedial measures’.⁶⁴⁷ The way is now paved for heavy public-sector investment and commitment measures to address water pollution where mines no longer exist or are incapable of paying for the rehabilitation of water resources. However, as it has been highlighted, the money for the public sector investment will necessarily come from the taxpayer. On the bright side, this funding may be utilised by the state for the development of infrastructure to address AMD in the Witwatersrand area.⁶⁴⁸

⁶³⁹ Feris L & Kotze (2014).

⁶⁴⁰ Section 45(2)(a) of the MPRDA.

⁶⁴¹ Section 45(2)(c) of the MPRDA.

⁶⁴² Feris L & Kotze (2014).

⁶⁴³ Feris L & Kotze (2014).

⁶⁴⁴ Section 8 of the MPRDA.

⁶⁴⁵ Section 46(2) of the MPRDA.

⁶⁴⁶ Section 26 of the MPRDA.

⁶⁴⁷ Section 46 of the MPRDA.

⁶⁴⁸ Trans Caledon Tunnel Authority 2008.

Furthermore, concerning these liabilities, in various cases, it is a criminal offence to violate the provisions of the MPRDA illustrated above.⁶⁴⁹ Therefore, criminal liability continues to be a feasible alternative for holding mines accountable for water pollution resulting from coal-mining practices, but to an extent as it serves as a preventive mechanism as regards current and future wrongdoers.⁶⁵⁰ Moreover, criminal liability does not resolve the past aspects of the water pollution crisis. Criminal measures and liability continue to be feasible, and often very applicable, environmental governance instruments; however, they are limited by their very condition in that they can only punish and dissuade, not rehabilitate, and reinstate. The achievement of these state-driven measures will depend entirely on the inclination and capability of the government to institute them.⁶⁵¹

4.5 Mining Charter POLICY

In addition to the aforementioned legal instruments, the Mining Charter⁶⁵² also aligns with South Africa's environmental and constitutional obligations.⁶⁵³ The Charter states that a minimum of 5 per cent of the leviable amount must be allocated to 'essential skills development'.⁶⁵⁴ This 5 per cent is earmarked to support research and development initiatives within the mining industry.⁶⁵⁵ The goal is to finance projects that address critical issues such as water usage and environmental protection in the mining industry.⁶⁵⁶

The following discussion centres on how the MPRDA, NEMA, and the NWA facilitate environmental protection. This analysis delves into how these legal frameworks promote water sustainability, seek to prohibit, or mitigate issues such as water pollution, and aim to address and rectify damages caused by mining operations.⁶⁵⁷

4.4.1 Environmental authorisation

To mitigate the adverse environmental impacts of mining in South Africa, a robust legal framework mandates environmental authorisations for proposed mining projects.⁶⁵⁸ As discussed in Chapter 3,

⁶⁴⁹ Sections 98 and 99 of the NEM: WA.

⁶⁵⁰ Feris L & Kotze (2014).

⁶⁵¹ Feris L & Kotze (2014).

⁶⁵² Broad-Based Socio-Economic Empowerment Charter for the mining and Mineral Industry, 2018.

⁶⁵³ Section 2(3)(1) of the Mining Charter of 2018.

⁶⁵⁴ In terms of section 3(4) of Skills Development Levies Act 9 of 1999, a leviable amount is 'the total amount of remuneration, paid or payable, or deemed to be paid or payable, by an employer to its employees in terms of schedule 4 of the Income Tax Act'.

⁶⁵⁵ Section 2(3) of the Mining Charter of 2018.

⁶⁵⁶ Section 2(3)(1) of the Mining Charter of 2018.

⁶⁵⁷ Blignaut J & Van Heerden J, 'The Impact of water scarcity on economic development initiatives' (2009) 35 Water SA 415 415.

⁶⁵⁸ Kengni B (2018).

a notable case, *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others*,⁶⁵⁹ highlights the importance of considering climate change effects before authorising projects such as coal-fired power stations. These requirements specifically pertain to mining-rights applicants.⁶⁶⁰

According to NEMA, any activity with potentially adverse environmental or water resource impacts requires environmental authorisation.⁶⁶¹ This means that mining operations can only commence if authorised by the Minister of Mineral Resources and Energy as environmentally compliant.⁶⁶² The court emphasised this in the *Mining and Environmental Justice Community Network of South Africa and Others* case, stating that mining in protected areas without proper environmental impact assessment is unacceptable.⁶⁶³ In the context of mining, ‘listed activities’ are identified by the Minister of Environmental Affairs under NEMA, signifying activities that require environmental authorisation before commencement.⁶⁶⁴ The court’s decision in *Joint Owner of Remainder ERF 5216 Hartenbos v MEC of Local Government and others* reiterated that environmental authorisation for listed activities is non-negotiable.⁶⁶⁵ Mining operations are inherently a continuous environmental threat and can lead to water pollution, making such authorisation indispensable.⁶⁶⁶

The usefulness of environmental authorisations depends on various processes that provide measures to accomplish specific goals to prevent environmental degradation in the coal-mining industry.⁶⁶⁷

4.4.2 Environmental impact assessment (EIA)

EIA is an important component of South African regulations, authorised by the MPRDA and NEMA, for mining permit applicants.⁶⁶⁸ It requires a thorough analysis of environmental impacts to formulate an environmental management plan (EMP) ensuring the protection of the environment, present and future.⁶⁶⁹ Furthermore, these regulations make it evident that consultation processes with affected parties and local communities are a prerequisite for granting mining permits. These processes involve the preparation of various environmental documents and seek to compel mining

⁶⁵⁹ *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others* (2017) ZAGPPHC 58, para 2, s 24 of NEMA.

⁶⁶⁰ Section 24(1a) of NEMA.

⁶⁶¹ Section 24(1).

⁶⁶² Section 24M of NEMA.

⁶⁶³ *Mining and Environmental Justice Community Network of South Africa and Others v Minister of Environmental Affairs and Others* (CC82/2017) [2019] ZAGPPHC 86, PARA 129.

⁶⁶⁴ Section 24(2) of NEMA.

⁶⁶⁵ *Joint Owner of Remainder ERF 5216 Hartenbos v MEC of Local Government, Environmental Affairs and Development Planning, Western Cape Province and Another* (23635/20090 [2010] zagpphc 86, paras 117 &130.

⁶⁶⁶ Kengni B (2018).

⁶⁶⁷ Kengni B (2018).

⁶⁶⁸ Manamela DMS (2019).

⁶⁶⁹ Manamela DMS (2019).

permit applicants to engage with impacted communities, in the process jointly identifying the positive and negative effects of the proposed mining activities.⁶⁷⁰

EIAs need to be undertaken to show the possible risks that planned activities hold for the environment, including water resources.⁶⁷¹ The goal of an EIA report is to show that the applicant of an environmental authorisation has carefully considered the environmental impacts of a planned mining project as well as how such impacts, including outcomes that may arise upon closure, will be avoided.⁶⁷² As such, the report needs to show how the planned activity complies with existing policies and legislation.⁶⁷³ It is also important to identify the place where the project will take place and highlight the significance of that project.⁶⁷⁴ The section below shows that, over and above the need for the EIA report, an environmental management programme may also be needed for obtaining environmental authorisation.

4.4.3 Environmental management programme

While an EIA is needed before making decisions on environmental authorisation, the suitable authority may request an environmental management programme report (EMPr).⁶⁷⁵ This report gives specific details on proposed measures to address the environmental impacts identified in the EIA; it must also include information about the experts who prepared the EMPr.⁶⁷⁶ The EMPr outlines the impacts and risks that must be avoided, managed, and mitigated throughout the project.⁶⁷⁷ It further explains how these measures will be managed, implemented, and monitored.⁶⁷⁸ It specifies timeframes for implementing impact management and designates responsible individuals.⁶⁷⁹

After the submission of the EIA and EMPr, the Minister of Mineral Resources and Energy reviews the environmental authorisation request.⁶⁸⁰ These processes play a vital role in ensuring that the environmental impacts of mining are adequately addressed and mitigated, particularly concerning the prevention or reduction of environmental degradation, including water pollution.⁶⁸¹

⁶⁷⁰ Manamela DMS (2019).

⁶⁷¹ Section 24(4) & (5)(iii).

⁶⁷² Point 1(2), Appendix 1 of EIA Regulations of 2014.

⁶⁷³ Point 2(a).

⁶⁷⁴ Point 2(b).

⁶⁷⁵ Section 24N (1A) of NEMA.

⁶⁷⁶ Environmental Assessment Practitioner.

⁶⁷⁷ Identified through the EIA.

⁶⁷⁸ Point 1 (h).

⁶⁷⁹ Point 1 (j).

⁶⁸⁰ Alberts A et al., 'Complexities with extractive industries regulation on the African continent: what has 'best practice legislation delivered in South Africa?' (2017) 4 *The Extractives Industries and Society* 267 273.

⁶⁸¹ Kengni B (2018).

The pertinent provisions of the relevant legislation related to coal mining and the obligations of coal mines are summarised in Table 2 below.

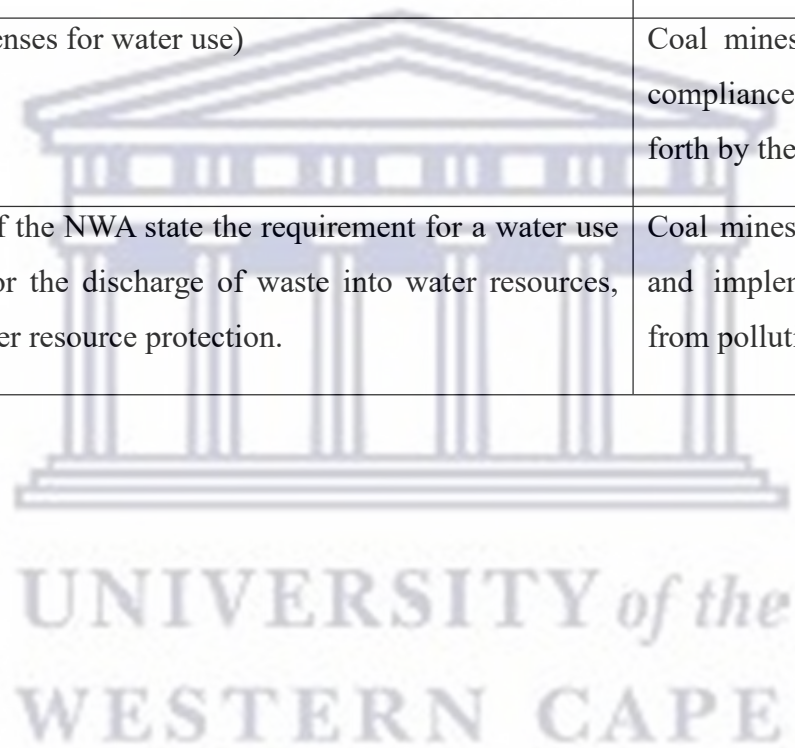


Table 1: Relevant provisions on water issues

| Relevant laws | Relevant provisions on water issues | Obligations imposed on coal mines |
|--|---|--|
| Constitution of the Republic of South Africa | Section 24 provides the right to an environment not harmful to health or well-being. | Ensures that coal mines operate in a manner that does not harm water sources or the environment, aligning activities with the right to a healthy environment. |
| NEMA | Section 2(1)(e) (principles of cooperative governance) | Requires cooperation among governmental bodies, including coal mines, to manage water resources effectively and sustainably. |
| | Section 21 of NEMA obliges obtaining a water use license for coal-mining operations to ensure compliance with water quality standards. EIA must be done concerning water usage. ⁶⁸² | Coal mines are obliged to apply for and adhere to water use licenses, implement measures to sustain water-quality standards, and undergo EIAs to assess water-related impacts. |
| | Section 28 (duty of care and remediation of environmental damage) | Imposes a duty on coal mines to prevent water pollution or environmental degradation arising from mining activities. |
| MPRDA | Section 23 of MPRDA entails that mining activities need to prevent water pollution and reduce adverse effects on water resources. It also requires that a water management programme (WMP) manage water | Coal mines need to avoid water pollution, mitigate effects on water resources, and implement a WMP to ensure sustainable water usage in mining activities. |

⁶⁸² Section 24 of NEMA.

| | | |
|-----|--|---|
| | usage sustainably. ⁶⁸³ | |
| NWA | Section 2 (general duty to use water reasonably and beneficially) | Requires coal mines to use water resources responsibly and for beneficial purposes, preventing wastage or overuse. |
| | Section 19 (water licenses for water use) | Coal mines must obtain water use licenses, ensuring compliance with permissible water usage regulations set forth by the licensing process. |
| | Sections 20 and 21 of the NWA state the requirement for a water use license, conditions for the discharge of waste into water resources, and measures for water resource protection. | Coal mines must adhere to strict discharge regulations and implement measures to protect water resources from pollution or depletion. |



⁶⁸³ Section 39 of the MPRDA.

The above discussion highlights that the problem of environmental degradation and water pollution is taken seriously in South African legislation. It highlights that water pollution can be managed in the South African coal-mining industry to a certain extent.⁶⁸⁴

4.5 Conclusion

This chapter has examined how the legal framework in South Africa promotes the sustainability of water resources within the coal-mining sector. In the context of water, the discussion has revealed that the Constitution places a clear obligation on the state to work towards achieving water sustainability in coal-mining. This commitment can be realised through policy and legislative development, as well as through the interpretation of legal principles. The state's execution of this mandate involves administrative actions aimed at enforcing and implementing the relevant laws.

The next chapter draws conclusions and makes recommendations.



⁶⁸⁴ Alberts et al. (2017) 270.

Chapter 5:

Conclusions and Recommendations

5.1 Introduction

The goal of this research has been to evaluate whether the South African environmental legislative framework facilitates SWM in the context of coal mining. The focus has been to analyse the potential impact of coal mining operations on water resources and explore strategies for sustainable water management that can be implemented to mitigate water pollution and ensure environmental sustainability on the coal-fired power station in Lephalale and how water pollution stemming from its operations may be limited. The research questions were whether SWM and the legal framework can be enhanced to guarantee access to safe drinking water and clean water resources by communities that are susceptible to coal-mining practices and the impacts of water pollution.⁶⁸⁵

5.2 Summary of findings and chapters

5.2.1 Research findings

The study identified the dominant issues of Lephalale. Limpopo province faces severe water pollution concerns connected to coal-mining activities. The construction of another coal mine poses the risk of further negative effects on water resources. The contamination of water resources threatens the health and well-being of the people of Lephalale, exacerbating an already perilous situation.

The findings of this study show that there is a need for SWM in Limpopo. The existence of comprehensive legal provisions regulating water management in coal-mining operations serves as a foundational framework for SWM. These provisions include water management guidelines, treatment standards, the prohibition of water pollution, the regulation of water usage, and the protection of water resources. They provide the basis for a systematic approach to managing water in the coal-mining sector. Effective enforcement and implementation of these provisions are crucial for the successful realisation of SWM.

However, another step is re-evaluating and reinforcing the current legal framework regulating water practices and coal-mining operations in Lephalale. This would entail amendments or the inclusion of other provisions that focus explicitly on reducing water pollution.

⁶⁸⁵ Winkler *The Human Right to Water*: 6.

Achieving SWM in Lephalale amid current and potential coal-mining expansions necessitates immediate action. South Africa must protect and preserve its already scarce water resources by ensuring that the impact of coal mining on them is reduced. Below is a summary of the chapters.

5.2.2 Chapter summaries

Chapter 1 provided an overview of the study, its significance, and its methodology. The study used a desktop literature review to answer the main research question, which is to identify to what extent South Africa's mining laws and regulations promote SWM in the coal-mining context.

In Chapter 2, the study provided a historical contextualisation of Lephalale and Eskom, elucidating their backgrounds. It presented the prevailing issues, particularly around the Lephalale coal mine, which has sparked contention among local community members in Lephalale. Furthermore, the chapter delved into the coal-mining project, focusing on the Lephalale court case, and presenting as well as analysing the reasoning of the court.

Chapter 3 explained the concept of sustainability. The latter is primarily concerned with the protection of the environment and natural resources as well as water, for the benefit of both the present and future generations. This highlights the importance of SWM in the mission to ensure that water resources are uncontaminated by South Africa's coal-mining industry. Consequently, this research concludes that to protect water resources, it is important to adopt sustainable practices, as expounded in Chapter 3. Such measures can ensure that water is used as a natural resource without compromising the needs of present and future generations.⁶⁸⁶

As shown in Chapter 3, the South African legal framework needs to include provisions that perpetuate consistent access to clean water resources, especially in the context of coal mining. SWM is accomplished through the implementation of a legal framework that seeks to ensure the well-being of society and the environment. This is vital since people depend on the environment and water for their sustenance.

Chapter 4 examined the South African legal framework and its regulations for the realisation of water sustainability within the coal-mining sector. The Constitution outlines the main obligations, consisting of governmental responsibilities to accomplish water sustainability in the coal-mining sector. This obligation is fulfilled through processes such as legislation and policy formulation, legal interpretation, and administrative actions to ensure legal enforcement and execution.

⁶⁸⁶ Fisher DE 'A jurisprudential model for sustainable water resources governance' in *Water and the law: Towards Sustainability* 141.

The findings indicate that while the legal framework does include provisions aimed at promoting sustainable water management (SWM) in the coal mining sector, there are significant gaps and challenges in its implementation. Key legislation, such as the National Water Act and the National Environmental Management Act, along with the Mineral and Petroleum Resources Development Act, provides a basis for regulating water use and protecting water resources. However, the effectiveness of these regulations is often undermined by issues such as inadequate enforcement, lack of resources, and insufficient coordination among government agencies.

Overall, the legal framework has the potential to promote sustainable water management in the coal mining sector, but its success largely depends on improved implementation and enforcement of existing laws, as well as the continuous development of policies that address emerging challenges in water sustainability.

Chapter 5 presents the key findings, conclusions, and recommendations of the study. Based on the conclusions, section 5.3 presents research limitations, while section 5.4 makes some actionable recommendations for relevant stakeholders desirous of adopting the SWM approach.

5.3 Research limitations

This study, while it seeks to offer a thorough understanding of the concept of SWM in the context of coal mines, confronted limitations that need acknowledgement. The limitations, although acknowledged, do not detract from the study's rationality but rather serve to contextualise its scope and findings.

The data collection method used, specifically the doctrine method, might have certain limitations in capturing the intricate distinctions of coal-mine water pollution. Doctrine research relies heavily on pre-existing legal literature, case law, statutes, and academic opinions. This method may confine the findings to existing perspectives rather than fostering insights that could come from primary data collection methods. Despite these limitations, doctrine research is the foundational pillar for understanding legal principles and their existence.

Access to specific legal documents or databases was another limitation. The inability to access certain crucial resources deterred a more comprehensive evaluation of SWM within the legal framework under investigation.

It is important to note that while these limitations exist, efforts were made to address and mitigate their impact. The insights and conclusions drawn in this dissertation are based on the available data and context within the confines of the abovementioned limitations.

The legal framework includes various provisions that relate to the environmental concerns within the coal-mining sector and can adopt SWM techniques. The advancement of SWM is more likely to happen if these provisions adhere to the principles of fairness, morality, and justice, joined with the efficient execution and implementation of the legal system. These provisions can be accomplished when properly implemented.

5.4. Recommendations

This section offers comprehensive recommendations. They are practical and pertinent, as they account for the specified responsibilities of diverse stakeholders and the associated resource considerations, including capacity and socio-economic factors. They aim to mitigate the identified coal-mine water pollution as highlighted in the study. Ultimately, these recommendations are intended to aid the government in effectively tackling coal-mine pollution and making a substantial stride toward the realisation of SWM. The following sub-section presents these recommendations in detail.

5.4.1. The MPRDA

The mining industry, especially coal mining, plays an important role in the economy by offering important energy resources. Yet the removal of coal frequently has significant environmental and social consequences, one of the most critical issues being water management. The MPRDA, which is necessary for regulating mining activities, has several shortcomings in addressing SWM in coal mines:

- **Limited water resource protection:** The MPRDA does not provide adequate guidance or regulations for water management in mining operations. It is recommended that the MPRDA be amended to include specific provisions that relate to water management in mining operations, particularly in coal mining. This needs to outline requirements for water use, protection, conservation, and quality standards, in this way adequately reinforcing the regulation of the impact of coal mines on water quality.
- **Inadequate monitoring:** The Act lacks specific requirements for consistent monitoring of water quality and quantity in mining areas. This omission makes it challenging to detect and address potential water pollution or depletion matters promptly.
- **Insufficient EIAs:** While EIAs are necessary, the Act may not require comprehensive EIAs, particularly for mining operations, which can end up in the inadequate evaluation of potential water-related impacts. Therefore, it is recommended that there be mandatory EIAs for all coal-mining projects. These assessments should pay particular attention to the

potential impact on local water resources, comprising groundwater and surface water. The impact assessment will help advance the ‘contribution of the mining sector to sustainable development, and to provide governments with a forum in which to discuss the opportunities and challenges of the sector’.⁶⁸⁷

- Lack of integration with other legislation: Effective water management requires coordination with other laws, such as NWA and NEMA. MPRDA might not facilitate this integration effectively enough, resulting in fragmentations as well as regulatory gaps and conflicts. It is recommended that an integrated regulatory approach be adopted to promote better coordination between MPRDA, NEMA, and NWA. This would ensure that there are no regulatory gaps or conflicts in water management.
- Climate change considerations: The Act does not sufficiently address the effect of climate change on water resources in mining areas. Climate change’s long-term impacts on water availability and quality are increasingly important for SWM. Climate change adaptation should include consideration of the impacts of climate change on water resources; in this regard, mining companies need to be encouraged to plan for changing climate conditions and their impacts on water resources.

While certain aspects of water management are addressed in legislation such as NEMA and possibly NWA, there remains a necessity for specific amendments and enhancements within the MPRDA to comprehensively regulate water management in coal mining operations.

It is further recommended that the MPRDA concentrate on water management within coal-mining activities, such as:

- Improved monitoring: Monitoring is a ‘process that means determining how the public policies implemented reach their intended targets. It implies that public policy monitoring is the radar that guides and shapes the implementation processes for the pre-set objectives to be achieved’.⁶⁸⁸ There is a need for ‘ongoing research to improve and strengthen the measures, standards, and practices applied to managing the impacts on the environment and to control pollution’.⁶⁸⁹ The MPRDA needs to enforce regular monitoring of water quality and quantity. Mining companies should be obligated to provide transparent and constant

⁶⁸⁷ Crawford (2015) 1.

⁶⁸⁸ Mbelu (2011) 27.

⁶⁸⁹ Manamela DMS 175.

reports on their water management practices, including potential contamination and depletion.

- The MPRDA should require water recycling and reuse systems within the mining operations. This can help to reduce water consumption and reduce the discharge of polluted water.
- Pollution control measures: Develop strict guidelines for the treatment and disposal of wastewater to prohibit water pollution. Sufficient measures need to be in place to ensure that contaminants do not negatively affect local water resources.
- Community engagement should be undertaken to include local communities and stakeholders in the decision-making process regarding water management in mining operations. This can help to ensure that the concerns and needs of impacted communities are taken into consideration. Currently, communities cannot object to mining development that is taking place on their lands.

By incorporating these recommendations, MPRDA could better address SWM in coal mines, reducing environmental impact and protecting local water resources while still allowing for responsible mining operations.

It is recommended that coal-mining companies respect human rights, both before and after their activities. As such, coal-mining activities need to be compliant with local, national, and international laws, entailing specific attention to the connection between water and the environment. This should translate into the implementation of compliance action plans and human rights impact assessments that include consideration of how coal-mine water pollution impacts the right to safe drinking water.

Coal mining companies need to capitalise on developing efficient water technologies and solutions within their supply chain and focus on minimising or reducing water pollution caused by their operations. A specific target needs to be implemented to track progress towards these technologies and solutions.

It is further recommended that for Lephalale Local Municipality (LLM) to address coal-mining water pollution in the region, it should enforce stringent measures to mitigate water pollution risks and safeguard the fundamental right to clean and safe water for its residents. Furthermore, LLM must empower community members who are affected by adverse mine impacts. This includes providing them for voicing their concerns, actively involving them in the decision-making process, and ensuring access to accurate information concerning water quality and safety.

The national government, together with LLM, should develop policies and practices to protect the interests of future generations.

6. Concluding Remarks

Water sustainability can be accomplished by coal mines through the integrated SWM model advocated in this study. Sustainability can be enhanced by means of the present legal framework. However, it (the framework) needs to be amended, especially so the MPRDA, to include water protection provisions. Furthermore, participation by host communities is important in helping to ensure that coal-mining companies develop specific measures to protect community members from the impacts of mining.



Bibliography

Legislation

Constitution of the Republic of South Africa of 1996

Mining Charter of 2018

Mineral and Petroleum Resources Development Act 28 of 2002

Mineral and Petroleum Development Amendment Act 49 of 2008

National Environmental Management Act 107 of 1998

National Environmental Management Amendment Act 14 of 2009.

National Water Act 36 of 1998

Caselaw

Bareki v Gencor Ltd 2006 1 SA 432 (T)

Director: Mineral Development, Gauteng v Save the Vaal Environment 1999 2 SA 719 (SCA)

Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others (65662/16) [2017] All SA 519 (GP)

Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry 2006 SCA 65

Joint Owner of Remainder ERF 5216 Hartenbos v MEC of Local Government, Environmental Affairs and Development Planning, Western Cape Province and Another (23635/20090 [2010] ZAGPPHC 86

Mazibuko and Others v City of Johannesburg and others (CCT 39/09) (2009) ZACC 28.

Minister of Water Affairs and Forestry v Stilfontein Gold Mining Co Ltd 2006 5 SA 333 (W)

Mining and Environmental Justice Community Network of South Africa and Others v Minister of Environmental Affairs and Others (CC82/2017) [2019] ZAGPPHC 86

Government Documents, Policies and Report

DEAT General Guide to the Environmental Impact Assessment Regulations, 2006 (2006)

DWA The Annual National State of Water Resources Report October 2011 to September 2012 (2012)

The White Paper on the National Water Policy for South Africa 1995

The National Water Resource Strategy 2nd Edition for an Equitable and Sustainable Future 2013

International Instrument

Paris Agreement

Declaration of the United Nations Conference on the Human Environment, Stockholm 1972

Rio Declaration on the Environment and Development of 1992

Books

Currie I, De Waal J & Law Society of South Africa the Bill of Rights Handbook 6th ed (2013) 517

Journal Articles

Alberts A et al, 'Complexities with extractive industries regulation on the African continent: what has 'best practice legislation delivered in South Africa?' (2017) 4 The Extractives Industries and Society 267 273

Akinlabi et al. (2019) 'Evaluating the Impacts of Coal Mining in South African environment: a step to actualizing society 4.0'

Axelrad et al 'Dose-Response Relationship of Prenatal Mercury Exposure and IQ: An Integrative Analysis of Epidemiologic Data' (2017) Environmental Health Perspectives, 115 (4)

Ashton PJ & Dabrowski JM 'An overview of the surface Water Quality in the Olifants River Catchment. Report No. KV 293/11. Water Research Commission (2011)

Baillie & Inglesi-Lotz 'Estimating the employment impacts of a low-carbon transition in South Africa' (2019) Energy Economics. 83: 444-457

Bohlman, H.R, J.M Horridge, R. Inglesi-Lotz, E.L. Ross and L. Stander. 'Regional Economic Effects of Changes in South Africa's Electricity Generation Mix' (2018).

Chen et al 'Different Air under One Sky' (2022) The Quality Research. Greenpeace

Blignaut J & Van Heerden J, 'The Impact of water scarcity on economic development initiatives' (2009) 35 Water SA 415 415.

Dabrowski J, Oberhosler PJ, and Dabrowski JM, 'Water Quality of Flag Boshielo Dam, Olifants River, South Africa: Historically trends and the Impact of drought. Water SA (2014), 39(2) 345-358

Di et al 'Air pollution and Mortality in the Medicare Population' (2017) *New England Journal of Medicine*, 376: 2513-2522

DEA 'National Environmental Management: Air Quality Act, 2004'. National Ambient Air Quality Standards for Particulate Matter with Aerodynamic Diameter less than 2.5 Micron Meters (PM_{2.5}) (2012) Government Gazette No. 33463, 29 June 2012 & WHO 2021

DEA 'National Environmental Management: Air Quality Act, 2004 Waterberg Bojanala Priority Area Air Quality Management Plan (2015) Government Gazette No. 39489

Department of Energy 'Draft Integrated Energy plan'. Final Draft_22/0/2018 for Public Input (2016) Pretoria: South Africa. Government Printers:

Delloite & Touche 'African construction trends report 2014'. Member of Deloitte Touche Tohmatsu Limited (2015) Johannesburg. Creative Solutions: Deloitte

Du Plessis A, 'South Africa's constitutional environmental right (generously) interpreted: What is in it for poverty?' (2011) 27 SAJHR 279 301.

Eberhard & Godinho 'Eskom inquiry reference book- a resource for parliament's public enterprise inquiry civil society, journalists and engaged citizens; a part of the state capacity research project' (2017) University of Stellenbosch, Witwatersrand, Cape Town and Johannesburg: 3

Fischer et al 'Air pollution and Development in Africa: Impacts on health, economy, and human capital' (2021) *Lancet Planet Health*. 5(10): E681- E688

Flyvbjerg 'What you should know about Megaprojects and why: An overview' (2014) *Project Management Journal*, 45 (2), pp. 6-19

Hering JG & Ingold KM, 'Water resources management: what should be integrated?' (2012) 336 *Science* 1234 1234.

Howard J 'Coal mining and the ongoing water crisis: economics, finance & risk' (2016) 9 *inside mining*.

Howlett et al 'Studying public policy: policy cycles and subsystems (2009) 3rd Edition. Canada: Oxford University Press.

Humbly TL 'One Environmental System: Aligning the laws on the environmental management of mining in South Africa' (2015) 33 *JERL* 110

Humbly T-L, 'Environmental justice and human rights on the mining wastelands of the Witwatersrand gold fields' (2013) 43 *Revue Générale de Droit* 67 74.

J de Waal 'Constitutional Law' in CG Van der Merwe, R Zimmermann & JE Du Plessis (eds) introduction to the law of South Africa (2004) 55-87.

Ashukem, JCN 'Setting the Scene for Climate Change Litigation in South Africa: EarthLife Africa Johannesburg v Minister of Environmental Affairs JCN and Others [2017] ZAGPPHC 58 (2017) 65662/16' 13/1 Law, Environmental and Development Journal (2017), p 35. available at <http://www.lead-journal.org/content/17035.pdf>

Kruger R 'The Silent Right: Environmental Rights in the Constitutional Court of South Africa' (2019) 9 Constitutional Court Review 473-496

Marais et al 'Air quality and Health Impact of Future Fossil Fuel Use for Electricity Generation and Transport in Africa' (2019) Environmental Science and Technology, 53 (22): 13542-13534

Merven B et al 'Assessment of new coal generation capacity targets in South Africa's 2019 Integrated Resource Plan for Electricity' (2020) ESRG. University of Cape Town

Merven et al 'Comments for the National Energy Regulator of South African the Ministerial Determination on the procurement of 2500 MW new generation capacity from nuclear'. (2021) Energy Research Centre, University of Cape Town, Cape Town.

Mhlongo s, Mativenga PT & Marnewick 'Quality in a mining and water-stressed region' (2018) 171 Journal of Cleaner Production 446-452

McCarthy TS 'The impact of Acid Mine Drainage in South Africa. South African Journal of Sciences. (2011)107 (5/6) 1-7

Muswaka L 'An analysis of the Legislative framework concerning Sustainable Mining in South Africa' (2017) 31 SPECJU 7

Myllyvirta & Kelly 'Air quality, health and economic impacts of a new coal mine and power plant in Lephalale' (2023) Centre for Research on Energy and Clean Air.

Oliveira D 'Limpopo coal mining operations threaten environment' (2013)

Pacyna et al 'Global anthropogenic mercury emission inventory for 2000' (2006) Atmospheric Environment, 30(22): 4048-4063

Pahl-Wostl C et al, 'Environmental flows and water governance: managing sustainable water uses' (2013) 5 Current Opinion in Environmental Sustainability 341-342.

Pirrone et al 'Global Mercury Emissions to the Atmosphere from Anthropogenic and Natural Sources' (2010) Atmospheric Chemistry and Physics.

Potgieter et al 'Standard Encyclopaedia of Southern Africa' (1974) Library of Congress Catalogue Number: 79-113594. Vol 4.

Polit DF & Hungler BP nursing Research: Principle and Method (Lippincott Williams & Wilkins: United States of America 2000) 23.

Rosenthal E 'Encyclopaedia of Southern Africa' (1978) 7th edition. Cape Town. Juta.

Stevens CI 'South Africa' in A Falach (ed) The International Comparative Guide to Mining Laws 2015: A Practical Cross-border Insight into Environment and Climate Change Law 2nd ed (2015).

Schreiner B 'Viewpoint- Why has the South African National Water Act been so difficult to implement' (2013) b Water alternatives.

Wilkinson MJ, Magagula TK, Hassan RM 'Piloting a method to evaluate the implementation of integrated Water Resource Management in the Inkomati River Basin' (2015) 41 Water SA

Internet Sources

Carbon Brief 'The Carbon Brief Profile: South Africa '. 15 October 2018, available at <https://doi.org/10.1073/pnas.1803222115> (accessed on 23 August 2023)

Dunmade I, Madushele N, Adedeji P.A, and Akinlabi E.T. 'A streamlined life cycle assessment of a coal-fired power plant- The South African case study.' Environmental Science & Pollution Research (2018) Chamber of Mines of South Africa, Facts and Figures. http://www.bullion.org.za/documents/F_F_2012Final_Web.pdf (Accessed on 5 May 2023).

Eskom (2014) Eskom development foundation national planning commission report. Available at www.eskom.co.za/csi (accessed on 23 August 2023)

IEA 'Net Zero 2050: A roadmap for the global Energy Sector'. International Energy Agency, available at <https://www.iea.org/reports/net-zero0by-2050> (Accessed on 26 August 2023).

International Energy Agency (IEA) 'World Energy Outlook 2020' International Energy Agency, Paris, available at <https://www.iea.org/reports/world-energy-outlook-2020> (Accessed on 26 August 2023)

IEA 'Market Series Report: Renewables 2017 Analysis and Forecasts to 2022. International Energy Agency, Paris, available at <https://www.iea.org/reports/renewables-2017> (Accessed on 26 August 2023).

IET 'Future skills and job creation through renewable energy in South Africa. Assessing the co-benefits of decarbonising the power sector'. Potsdam/Pretoria: IASS/CSIR/IET, available at

<https://www.cobenefits.info/resources/cobenefits-south-africa-jobs-skills/> (Accessed on 27 August 2023)

IRENA 'From Baseload to Peak: Renewable Provide a Reliable Solution'. International Renewable Energy Agency, Abu Dhabi, available at

https://www.irena.org/media/files/IRENA/Agency/Publication/2015/IRENA_Baseload_to_Peak_2015.pdf (Accessed on 26 August 2023)

IEA 'Global Energy and CO2 Status Report: The latest trends in energy and emissions in 2018'. International Energy Agency, Paris, available at <https://www.iea.org/reports/global-energy-co2-status-report-2019/emissions> (Accessed on 26 August 2023).

Merven et al 'Improved representation of coal supply for the power sector for South Africa'. Southern Africa- Towards Inclusive Economic Development, available at

https://sawea.wider.unu.edu/sites/default/files/pdf/SATIED_WP84_Merven_Hartley_McCall_Burt_on_Schers_October_2019.pdf (Accessed on 26 August 2023)

Natali Cowling (2023) 'Mining Sector's value added to GDP in South Africa 2016-22' <https://www.statista.com/statistics/1121214/mining-sectors-value-added-to-gdp-insouth-africa/> (Accessed on 26 August 2023)

Tyler & Steyn 'An overview of the Employment implications of South Africa Power Sector Transition. South African Wind Energy Association, available at <https://sawea.org.za/wp-content/uploads/2018/08/SAWEA-Employment-in-SA-Power-Sector-July-2018-EMAIL-VERSION.pdf> (Accessed on 26 August 2023)

Smith T 'Reskilling coal industry workers to start at Mpumalanga Training centre', available at <https://www.esi-africa.com/renewable-energy/reskilling-coal-industry-workers-to-start-at-mpumalanga-training-centre/> (Accessed on 27 August 2023)

Statistics South Africa 'General Household survey 2016'. Embargoed until 31 May 2017. Pretoria: Statistics South Africa. available at www.statssa.gov.za (accessed on 23 August 2023)

Worthington 'Analysis: Out of the light and into the dark'. Mail and Guardian. Available at <https://mg.co.za/article/2008-01-29-out-of-the-light--and-into-dark> (accessed on 23 August 2023).

Theses

Faul K 'Sustainable water usage in the mining sector through the optimisation of collaborative implementation' (Unpublished LLM Thesis, University of Pretoria, 2017)

Gaurav Kumar Impact of Coal Mining on Water Quality (Unpublished LLM Thesis, National Institute of Technology 2015).

Kegni B 'Strengthening Decision-making processes to promote water Sustainability in the South African mining context: The role of good environmental governance and the law' (Unpublished LLD thesis, University of Cape Town, 2019)

Manamela DMS 'The impact of mining on Indigenous African communities in Limpopo [South Africa]' (Unpublished LLM Thesis, North West University, 2019)

Monaledi MHA 'The relationship between community participation and sustainability of CSR projects: The case of the Grootegeluk Coal Mine in Lephalale Local Municipality (Unpublished LLM Thesis, North West University, 2015)

Nyembe T 'The Socio-economic impacts of Medupi Power Station on Lephalale' (Unpublished LLM thesis, University of Witwatersrand, 2018)

Ratombo AP 'Determination of coal mine impacts on surface water bodies (Olifants River)' (Unpublished LLM thesis, North West University, 2019)

Shongwe BN 'The Impact of Coal Mining on the Environment and Community Quality of life: A case study Investigation of the Impacts and Conflicts Associated with Coal Mining in the Mpumalanga Province, South Africa (Unpublished Masters, University of Cape Town, 2018)

Steinschaden J 'Developing a business model for sustainable water management in South Africa' (Unpublished LLM thesis, North West University 2018)