water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

MINE WATER MANAGEMENT

POLICY POSITION

DRAFT FOR INTERNAL CONSULTATUION AND DISCUSSION

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Contents **Page**

1. Introduction 3
2. Purpose 3
3. Scope of the Policy 3
4. Current Legislative Framework 3
5. Key Policy considerations 5
   5.1. Integrated approaches to mining closure 6
   5.2. Apportionment of liabilities 6
   5.3. Optimum use of appropriate /Best Available Technology 7
   5.4. Classification and differentiation of mines 7
   5.5. Promotion of sustainable mining development 8
   5.6. Duty of care 8
   5.7. Environmental Vigilance and Continuous Improvement 9
   5.8. Institutional arrangements on infrastructure management/ transfer after Mine closure 9
6. Way forward 10

Approval 10

1. Introduction

The National Water Act, 1998 (Act 36 of 1998) (NWA) provides a framework for the protection, use, development, conservation, management and control of water resources for the country as a whole. Chapter 2 of the NWA makes provision for the development of strategies in order to facilitate the proper management of resources. The National Water Resource Strategy-2 provides the overall framework for water resource management in the country. Acid mine drainage (AMD) and related mine water impacts have in the past decade evolved to become a major environmental challenge. Whilst the challenge is limited to the mining sector during operations, it eventually becomes externalised during mining downturn, and is especially pertinent post-mining closure, especially if mine closure does not proceed according to regulatory-approved recommendations. To deal with this challenge at a very high level, an Inter-Ministerial Committee (IMC) comprising the Ministers of Mineral Resources, Water and Environmental Affairs, Science and Technology, and the Minister in the Presidency: National Planning Commission was established. Mine water impacts, including AMD, are phenomena that plague all countries with rich mineral deposits. Depending on the geology/ mineralogy of a region, the terms acid rock drainage (ARD), acid mine drainage (AMD), neutral mine drainage (NMD), and saline drainage (SD) are the characteristic nomenclature for reporting different mine water types. Given the long history of mining in South Africa, and the mineral wealth still locked across various parts of South Africa, and the potential this deposit has for local economic development and attracting foreign investment, it is prudent that the Department of Water and Sanitation (DWS) formulates a policy principle to support its response to mine water challenges.

2. Purpose

The purpose of this policy document is to provide the position of the Department of Water and Sanitation (DWS) on mine water management, including AMD, and on long-term policy interventions by the DWS.

3. Scope of the Policy

The mine water management policy sets out the policy principles that strive to strengthen the protection of the water resources from mine water contamination for short and long term. The policy principles enshrined herein are informed by the current legislative framework on water resource management. It further proposes an integrated departmental approach to mine water management. Where legislative gap/s exist/s, this policy provides relevant and appropriate legislative remedy in order to strengthen a proactive mine water management approach.

4. Current Legislative Framework

White Paper National Water Policy 1997

With regard to environmental protection, the National Water Policy White Paper, amongst others, contemplates that, (i) it is the duty of Government to make sure that water pollution is prevented, (ii) that there is sufficient water to maintain the ecological integrity of our water resources, and (iii) that water conservation and sustainable, "justifiable economic and social development" are promoted. Essentially, it advocates for integrated goals of environment, social and economic development. It also takes cognisance that most water uses also impact on the environment, and the cost of this must be accounted for in assessing the economic benefits of alternative water uses

and developments. Ultimately, in order to sustain the established uses of water, the natural resource base must be suitably protected.

National Water Act, 1998 (Act 36 of 1998) (NWA)

Chapter 3 of the NWA, with specific reference to Sections 19 and 20, provides that the protection of water resources is fundamentally to their use, development, conservation, management and control. This chapter of the NWA further provides measures which are intended to ensure comprehensive protection of water resources, including measures to prevent pollution and remedy the effects of pollution of water resources.

The NWA in this regard is applied alongside all other appropriate and relevant state policies and legislation, including the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) as well as the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) in order to fulfil the State's responsibility to respect, protect, and promote social and economic rights in the Constitution.

National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)

Section 28 of the NEMA dealing with the "duty of care and remediation of environmental damage", stipulates that:

(1) Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring or in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

(8) Subject to subsection (9), the Director-General or provincial head of department may recover all costs incurred as a result of it acting under subsection (7) from any or all of the following persons –

(a) any person who is or was responsible for or who directly or indirectly contributed to, the pollution or degradation or the potential pollution or degradation;

(b) the owner of the land at the time when the pollution or degradation or the potential for pollution or degradation occurred or that owner's successor in title;

(c) the in control of the land or any person who has or had a right to use the land at the time when –

(i) the activity or the process is or was performed or undertaken: or

(ii) the situation came about: or

(d) any person who negligently failed to prevent –

(i) the activity or the process being performed or undertaken: or

(ii) the situation from coming about:

Provided that such person failed to take the measures required of him or her under subsection (1)

Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA)

Section 45 of the MPRDA dealing with the Minister's power to recover costs in event of urgent remedial measures provides that:-

(1) If any prospecting, mining, reconnaissance or production operations cause or results in ecological degradation, pollution or environmental damage which may be harmful to the health or well-being of anyone and requires urgent remedial measures, the Minister may direct the holder of the relevant right, permit or permission to—

(a) investigate, evaluate, assess and report on the impact of any pollution or ecological degradation;
(b) take such measures as may be specified in such directive; and
(c) complete such measures before a date specified in the directive.

(2) (a) If the holder fails to comply with the directive, the Minister may take such measures as may be necessary to protect the health and well-being of any affected person or to remedy ecological degradation and to stop pollution of the environment.
(e) The Minister may recover an amount equal to the funds necessary to fully implement the measures from the holder concerned.

5. Key Policy Considerations

Within the context of the existing legislation, there are a number of policy considerations that needs to be taken into account. Amongst others, one needs to start by posing policy questions in order to fully understand the existing scenario. As such, they should consider the three different phases in the whole mining life cycle (commissioning, operation, decommissioning and mine closure, including post-closure mine water management).

Firstly, during commissioning, is it currently expected of new mining ventures to demonstrate that *long-term liabilities*, with explicit reference to mine water management (*i.e.* potential AMD formation), are not exceeding the long-term benefits of such mining ventures? Secondly, should long-term liabilities (with respect to AMD) exist, what is the risk of it reverting to the State and what is the extent of potential State exposure? These policy areas are crucial at the conception stage of any mining venture. An integrated strategy between Government and all other role playing institutions is key to the implementation of well-defined operational guidelines as well as final closure measures.

During operational stage of the mine, firstly, are legal liabilities with respect to mine water management being enforced? If so, does such enforcement yield the desired outcomes? If not, what should be improved? Secondly, the phenomena of *selling off marginal mines to smaller companies* during the end of the mine's life (as part of a closure strategy) remains a challenge. How can this matter be addressed through policy and legislation?

During decommissioning, and subsequently mine closure, one needs to consider these critical policy questions; firstly, are there entities that are legally liable for residual water pollution emanating from mines? If not, does the current policy and legal context sufficiently guide the execution of responsibilities to fall back onto the State? Secondly, if the entities can be identified, is such legal liability enforced? If not, why not? And could improvements be made to the current policy and legal context? Apportionment of liability is perceived to be cumbersome. How can this particular matter be dealt with and what is the legislative framework that allows for this to be invoked?

It is within the scope of this policy to bring about solutions or answers or interventions in relation to the above issues as far as mine water is concerned. These challenges will have to be dealt with in two phases, i.e. short to long term interventions.

5.1. Integrated Approaches to Mining Closure

Problem Statement
The delegation of powers between different government departments at the national, provincial and municipal levels is unclear. Institutional roles and responsibilities are fragmented, overlapping or vaguely defined. There is a need to rationalise and align national legislation, even our own NWA to remove ambiguity and address mine water directly.

Policy Principle
Government's responsibility with respect to the handling and management of mine water is ambiguous and as a result, roles and responsibilities require clarification which will have potential policy and law review implications. The consideration of a New Trilateral MoU that will include the three Departments i.e. Water and Sanitation, Mineral Resources and Environmental Affairs is advised.

The legislative amendments should be considered for incorporation into a National Mine Water Strategy, with the aim of enabling Government to have enhanced control and legal administration of the mine water challenges and issues and to further give more clarity on responsibilities and obligations. This should not only apply after mine closure but should also enable Government to apply regulatory provisions and mines to implement pro-active steps long before mine closure. Roles and responsibilities must be clear and specific agreements on the process of mine closure even prior to actual mining must be addressed.

5.2. Apportionment of Liabilities

Problem Statement
The MPRDA may play a leading role in the mining sector, but persons/companies/institutions still have to comply with other statutory duties under the NEMA and the NWA. Liability thus is based on a consistent and comprehensive application of the abovementioned (not limited to) legislations. This suggests that any person/company/institution that can be proven to fall within the ambit of Section 19 NWA, and/ or Section 28 NEMA, and/ or Section 38 MPRDA, can be held legally liable for damages and/ or negative impacts caused by mine water.

The existing frameworks place Government and DWS specifically in the position of having limited powers in terms of imposing sanctions. The legislation needs to be strengthened, to give the DWS a strong legislative basis to impose sanctions and apportion of liabilities. The best funding models to deal with historic pollution should be identified. Abandoned mines need to be rehabilitated by DWS in cases where water security is at risk.Within the context of MW, and given the magnitude of this challenge, it remains prudent that possible apportionment of liabilities be considered within the existing legislative frameworks. This will provide a legal basis for holding parties potentially liable for negative effects and damages of mine water related pollution and/or any other negative impacts that can be related to mine water.

Policy Principle
In terms of liability, the polluter pays principle should be applied to mine water in all its forms. This term, mine water, includes ARD, AMD, NMD, SD, and metallurgical process waters of concern is

not formally defined in South African legislation; however international norms and definitions should be considered as multi-national mining houses recognise them, and have also incorporated them in their legal frameworks elsewhere in the world. Where subcontracting exists, the mine remains responsible. A provision on mine water management dealing with all potential mine water hazards is needed. The provision should deal with them holistically in terms of the classification and categorisation of mines.

5.3. Optimum use of Appropriate /Best Available Technology (BAT)

Problem Statement

The DWS recently completed a Feasibility Study to identify the best plan of action for a long term solution that uses a proven acid mine water treatment technology and produces useable water. Options for passive, biological, chemical and physical treatment were assessed. The only technologies which are proven for treatment of the expected volumes to the required standard, and which constitute the Reference Project are:

- High Density Sludge (HDS) for neutralisation and metal removal (Chemical Treatment), as per the Short Term Intervention (STI), currently being implemented in the Witwatersrand.
- Reverse Osmosis (RO) for desalination (Physical Treatment); and
- Ion Exchange (IX) for uranium removal (Physical-Chemical Treatment) if required

Policy Principle

The selected technology should be situational based. It should be sustainable, clean (with minimal residuals and/or easily manageable residues) and economical. A regulatory framework should be established to facilitate technology assessment and demonstration, ensure skills and capacity for managing, operating and maintaining the technology, as well as exploiting local human capital development.

5.4. Classification and Differentiation of Mines

Problem statement

The current legal and policy context does not draw a clear distinction between the handling and regulation of (1) new, (2) active and (3) historic mines (including abandoned mines). The current legal and policy context does not impose special and/ or stricter measures in the case of mines with a significant adverse impact potential. Specific conditions should be imposed on mines that have an acid generation potential.

Policy Principle

The regulatory environment on mine water management applying to new mines will be different (probably, in many respects, stricter), if compared to that applying to active and/ or historic mines. The Best Practicable Environmental Option (BPEO) to deal with mine water drainages should be implemented by existing mines. Historic mines should be maintained. Although current policy does differentiate between the different categories of mines, such policy should be strengthened. Legislation should support policy and may potentially require review.

Category A Mines: All gold and coal mines; Any mine with any kind of extractive metallurgical process, including heap leaching; and any mines where pyrite could occur in the mineral deposits.

Category B Mines: Mines with a low risk for water quality impacts; and Mines with a potential significant and/ or permanent impact on the yield/ availability of water, dynamics of the river, riparian rights, etc.
Category C Mines: Big mines with no significant impact on water where Resources Quality Objectives for ideal conditions will be realised; and small low impacting mines. Depending on the change in mine operation, mine might be re-categorised.

5.5. Promotion of Sustainable Mining Development

Problem statement
There is a perception that mining is often authorised, irrespective of whether the long-term *"benefit"* outweighs the long-term *"cost"*, including the costs for managing mine water. More investigation is required on the possibility to use the green approach in mining. This will involve investigations on green technologies, sustainable mining methods, etc. and the evaluation of socio-economic sustainability.

Policy Principle
New mining ventures should prove, beforehand, that the cost to deal with the residual impacts associated with mining (*e.g.* AMD) is catered for. A Cost-Benefit-Analysis (CBA) should be demonstrated.

The investigation of the long term benefits, including sustainability and the benefits of green technology should be prioritised. Monitoring and Evaluation tools should be in place to address the ongoing impact in all stages of minimise from initial planning through development and operation, and to closure and rehabilitation. Leading Practice (LP) to mine water management should be considered for sustainable mine development. Where necessary a levy should be imposed in conjunction with water resource protection guidelines for the purposes of optimum water protection.

5.6. Duty of Care

Problem statement
Apportioning liability remains problematic. The NWA has gaps with regards to *"retrospective liability"*. The impacts caused by mine water drainages e.g. AMD is often externalised by the mining sector, whether during active mining or subsequent to mine closure. Financial Provision predominantly applies to surface rehabilitation.

Policy Principle
The sale of a mine to another company should not exonerate the selling company from their environmental obligations, unless the purchasing company can prove financial provisions to address any environmental liabilities associated with the mine they are purchasing. The application of retrospective liability should be considered. Financial provisioning made by mines should be sufficient to deal with the mitigation of all mine water management related impacts, including impacts due to current and/ or future decants. The cost to address mine water drainages e.g. AMD should be internalised by the mining industry. This policy position is notably also aim at protecting poor and vulnerable communities.

5.7. Environmental Vigilance and Continuous Improvement

Problem statement

From a mine water management perspective, there often appears to be a mismatch between environmental planning and the actual interventions earmarked for implementation. The DMR mandate, *i.e.* to promote minerals development, appears to be incompatible with DWS's mandate, *i.e.* to protect and use water resources sustainably. Mining authorisations often appear to be granted for mines that are to mine in water sensitive areas. From a mining sector perspective – significant impacts due to AMD are often attended to on a case-by-case basis. From a regulatory perspective – an *"Integrated Master Plan"* is currently required for the regulation of future mining developments. Mining authorisations appear to be granted on an *ad hoc* basis without the necessary consultations amongst the relevant Government Departments (DMR, DWS and DEA). It is hoped that the recently-adopted one environmental permitting system will address this gap.

Policy Principle

Continuous environmental risk appraisal is required and is to be linked to appropriate actions taken when necessary. Mines should be compelled to do impact prediction to improve environmental preparedness. Regular internal and external auditing is necessary with corresponding reporting. Self-regulation promotes legal compliance. Prohibition of mining in water sensitive areas in order to comply with the Class, RQOs and the Reserve should be promoted. Planning for mining should take cognizance of vulnerable water resource areas, and where necessary such areas should be demarcated as "no go" areas. It is especially pertinent that the ultimate socio-economic benefit of mining be quantified against potential long-term water resource impacts and that outcome guide the decision on whether to authorise mining activity in sensitive areas.

In some instances, regional cooperation and minerals development planning amongst mining companies may yield better economies of scale and more affordable solutions. Mines should be compelled to collaborate with respect to certain matters, based on the regional *"Master Plan"* from the regulator for minerals development.

Regional *"Master Plans"* for minerals development should be considered to regulate the regional consequences of new and active mining in a catchment context. Regional closure planning will ensure a regional perspective on mine closure.

With reference to the ecosystems protection guidelines, all vulnerable water resource areas should be mapped.

5.8. Institutional Arrangements on Infrastructure management/ Transfer after Mine closure

Problem statement

The Mining Charter provides that mines are expected to design and plan all operations so that adequate resources are available to meet the closure requirements of all operations. Section 28(2)(c) of the MPRDA contemplates that mines should report on their compliance to the Mining Charter on annual basis. However in instances where a mine is declared insolvent and subsequently closes, the responsibility is inherited by the State who then has to ensure the continuous rehabilitation of derelict and ownerless mines. Technically, the mine escapes liability and the rehabilitation fund provided prior by the mine is often not sufficient for continuous infrastructure

management and rehabilitation. As a result, mine water is left unmanaged if transfer has not taken place which then typically becomes a State liability.

Police Principles
In the interest of optimum water resource protection, a legislative provision on institutional arrangements of infrastructure management/ transfer post mine closure is needed for proper infrastructure/ assets transfer. Mines should provide infrastructural management plans for prior, during and post mine closure. Relevant institution/s should be in place to oversee and regulate this process.

6. Way forward

In the current legislation(s): NEMA, MPRDA and NWA, it is worth noting that mine water management is not formally defined and this may continue to hinder process of dealing with mine water management decisively. These policy principles may require legislative review or policy alignment. The existing frameworks place the government in the position of having to be reactive rather than proactive as far as mine water management is concerned.

The formalisation of a Mine Water Management Unit in the Department will accomplish an integrated and composite approach ensuring efficient coordination of all mine water management related initiatives and activities within the Department and amongst all other Departments and Institutions. The functions of the Unit will be aligned with the objectives of the Department's Annual Performance Plan for the period 2015-2019.

Parallel to the formulation and development of the policy position, emergency interventions are currently underway to address mine water challenges in the gold fields of the Witwatersrand mining region. Additionally, tandem activities such work streams dealing with finance and regulatory matters, mine water monitoring, research to support future decision-making, pilot testing of emerging mine water treatment technologies, ingress control, and the potential applications of cost recovery and/ or an environmental levy in the mining sector (as plausible revenue streams for mine water management) are ongoing These activities remain to be optimised as guided by the final policy position.

The mine water problem is not going to be solved by a single intervention, but will require the integrated implementation of a range of measures which should be lead by pragmatic and progressive polices and legislations.

Approval

This policy position is approved by

Ms Margaret-Ann Diedricks **DATE:**
DIRECTOR-GENERAL