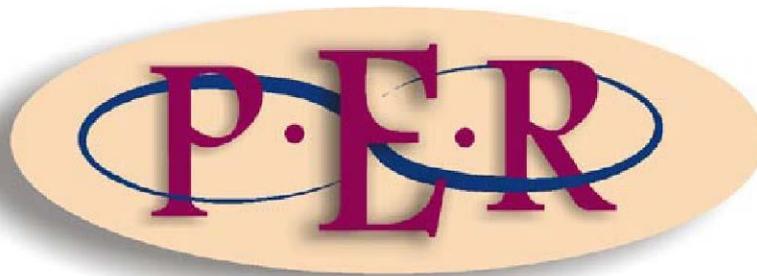


Authors: L Feris and LJ Kotze

**THE REGULATION OF ACID MINE DRAINAGE IN SOUTH
AFRICA: LAW AND GOVERNANCE PERSPECTIVES**

ISSN 1727-3781



2014 VOLUME 17 No 5

<http://dx.doi.org/10.4314/pelj.v17i5.07>

THE REGULATION OF ACID MINE DRAINAGE IN SOUTH AFRICA: LAW AND GOVERNANCE PERSPECTIVES

L Feris*

LJ Kotzé**

Acid drainage is one of the most serious and potentially enduring environmental problems for the mining industry. Left unchecked, it can result in such long-term water quality impacts that it could well be this industry's most harmful legacy.¹

1 Introduction

Acid mine drainage (AMD) has recently received wide coverage in the media, and as its potential impact on natural resources and human health and well-being become increasingly evident it is becoming a political issue.² The South African environment, including its water resources, soil and people, are now threatened by pollution stemming from AMD, which is a legacy left behind by abandoned, derelict and defunct mines, and a continuing by-product of existing mining activities. Mining has been central to economic development in South Africa, and whilst no longer the backbone of the economy it continues to contribute to the country's gross domestic product.³ Yet these economic benefits come at a high price, since mining, by its nature, adversely impacts on the environment. Not only does it lead to the depletion of the minerals that are being mined, but the process of extracting minerals also creates large-scale generation of waste and pollution. The grave challenges that South Africa currently experiences with respect to AMD are proof of the destructive

* Loretta Feris. BA Law LLB (US), LLM (Georgetown), LLD (US). Professor of Law, Institute of Marine and Environmental Law, University of Cape Town. Email: Loretta.Feris@uct.ac.za.

** Louis J Kotzé. BCom LLB LLM (PU for CHE), LLD (NWU). Professor of Law, Faculty of Law, North-West University, Potchefstroom Campus. Visiting Professor of Environmental Law, Lincoln University, United Kingdom. Email: louis.kotze@nwu.ac.za. The authors wish to extend their sincere thanks to Carin Bosman (Carin Bosman Sustainability Services) and Prof Tracy Humby (Wits) for their helpful comments on an earlier draft of this article. All errors remain our own. This research was made possible in part by generous funding from the Finnish Academy under the auspices of the Water Security Project (WATSEC).

¹ INAP date unknown <http://www.inap.com.au/>.

² For media coverage see, for instance, the extensive Special Report on AMD in Anon 2011 <http://mg.co.za/specialreport/acid-mine-drainage>. For scholarly debates on the issue, see Garland 2012 *Quest* 46-47; Funke, Nienaber and Gioia 2012 <http://researchspace.csir.co.za/dspace/handle/10204/5841>; and Tempelhoff and Winde "Acid Mine Drainage" 77.

³ Kotzé and Lubbe 2009 *SAJELP* 49-77.

consequences of unsustainable mining practices. Judge of Appeal Olivier in *Director: Mineral Development, Gauteng v Save the Vaal Environment*⁴ took judicial notice of the fact that mining is potentially damaging to the environment and potentially contrary to the ideal of sustainability when he stated that:

... the application of the [*audi alteram partem*] rule is indicated by virtue of the enormous damage mining can do to the environment and ecological systems. What has to be ensured when application is made for the issuing of a mining licence is that development which meets present needs will take place without compromising the ability of future generations to meet their own needs.⁵

Whilst AMD carries a potential threat to the environment as a whole, it poses a particular threat to the country's water resources which will have severe consequences for the health and well-being of people. South Africa is an arid country with an average rainfall below the world average.⁶ Water is also unevenly distributed across the country and "[w]ith just over 1200kl of available freshwater for each person each year ... [South Africa is] on the threshold of the international definition of 'water stress'".⁷ This situation is set to deteriorate further because of climate change, with current estimates indicating that the country has warmed by approximately one degree Celsius in the past 30 years and that annual rainfall is predicted to decrease by between 20 and 40 mm per annum by 2050.⁸ Not surprisingly, water scarcity features prominently in virtually every water policy document in South Africa, all of which emphasise that the country's fresh water resources are in short supply and disproportionately spread.⁹ But in addition to the impacts on water, as this article subsequently illustrates, AMD will also impact on all the parameters of sustainability, including ecological, social and economic concerns. In particular, AMD is set to affect infrastructure, displace people and affect their livelihoods, influence economic activity, impact on the resource extraction industry, and affect South Africa's policies and actions in relation to climate change and its

⁴ *Director: Mineral Development, Gauteng v Save the Vaal Environment* 1999 2 SA 719 (SCA).

⁵ *Director: Mineral Development, Gauteng v Save the Vaal Environment* 1999 2 SA 719 (SCA) para 719B-719C.

⁶ DWA *National Water Resource Strategy* 6.

⁷ DWAF *White Paper* 14. See, further, DEAT *State of Environment Report* Ch 6.2 *et seq*; King, Maree and Muir "Freshwater Systems" 435; and Day "Rivers and Wetlands" 842-844.

⁸ Government of the RSA *Background Information and Discussion Document* 4-5.

⁹ See for instance DWAF *National Water Resources Strategy*; DWAF *Management of the Water Resources*.

efforts to move towards a low carbon economy; and it will test the efficiency of regulatory interventions emanating from both the private and the public sector to the extreme. Clearly, AMD is an example of what Young¹⁰ calls the "great issues of our times in the realm of human-environment relations".

In this article we provide a survey of the AMD problem in South Africa through the law and governance lens. We commence by highlighting the various issues and challenges that result from AMD in the environmental context on the one hand, and the law and governance context on the other hand. We then describe the many provisions of the regulatory framework that we believe would be instrumental in responding to the threat. We conclude the article with brief remarks on what we believe are important considerations in the future regulation of AMD.

2 A devil with many faces

AMD is a multi-dimensional issue which is multi-scalar at the same time. It is also a temporal issue with past, present, and more worryingly, unknown future impacts that collectively lead to all sorts of challenges for law and governance interventions. According to McCarthy,¹¹ the impacts of AMD vary widely in South Africa, notably because they are dependent on specific local conditions such as population and infrastructure concentration and location, geomorphology, climatic conditions, and the extent and distribution of AMD-generating deposits. It is especially the large concentrations of gold and coal resources around critical river basins and rivers such as the Vaal River in the vicinity of the most densely populated and built-up areas in South Africa's economic heartland (Gauteng) that result in the prevalence of AMD in this area. As a result of mining in this part of the country (notably the Witwatersrand) AMD gives rise to a range of environmental problems that will have to be addressed by technological (which we do not reflect on in this article) and socio-institutional interventions embedded in law and governance (our focus). In order to determine the many challenges that law and governance face in this

¹⁰ Young 2011 *International Journal of the Commons* 66-67.

¹¹ McCarthy 2011 *SAJS* 1.

respect, we first need to understand some of the critical challenges associated with AMD.

2.1 Environmental challenges

AMD is a natural chemical reaction which occurs when iron pyrite is exposed to air and water.¹² The incidences of AMD are, however, greatly multiplied when land is disturbed and significantly more minerals are exposed to water and air:

...[m]ining increases the exposed surface area of sulphur-bearing rocks allowing for excess acid generation beyond natural buffering capabilities found in host rock and water resources.¹³

This result is generally associated with so-called hard rock mining, in other words the mining of ores that contain gold, coal and copper. In addition to minerals, the rock or ores contain significant concentrations of sulphide minerals, particularly pyrite (FeS_2).¹⁴ The excavation process during mining exposes sulphides in the walls of opencast and underground operations and disturbs the host rock and hydrological regime around mined out areas, thus allowing the ingress of water and oxygen.¹⁵ AMD is caused when rock containing sulphide minerals is exposed to air and water, either as a result of opencast or underground excavation, or from tailings disposal areas, resulting in the production of highly acidic water.¹⁶ The acidity of the water in effect mobilises and results in the increased solubility of heavy metals such as manganese, aluminium, iron, nickel, zinc, cobalt, copper, lead, radium, thorium and uranium.¹⁷ In contrast with water-rich mining regions, South Africa not only faces the high acidity and dissolved metal problems related to AMD, but also the limited

¹² Jennings, Neuman and Blicher 2008 http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf 1. See also Kleinman *Acid Mine Drainage*.

¹³ Jennings, Neuman and Blicher 2008 http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf 3.

¹⁴ Johnson and Hallberg 2005 *Science of the Total Environment* 3-14.

¹⁵ Expert Team *AMD Report (AMD Report)*.

¹⁶ Durand, Meeuwis and Fourie 2010 *Journal for Transdisciplinary Research in Southern Africa* 79.

¹⁷ Coetzee, Winde and Wade *Assessment of Sources*. See also Pinetown and Boer *Quantitative Evaluation of the Modal Distribution*.

dilution potential associated with low rainfall, which aggravates the salinisation of water resources.¹⁸

AMD has been noted for its serious ecological impacts and it is a particular threat for water resources.¹⁹ This is especially the case where large volumes of AMD are at issue. Notably, while contributing to bioaccumulation in living organisms, AMD also destroys aquatic life and seriously impacts on forms of terrestrial life that are dependent on the water resource.²⁰ Turton²¹ has noted that AMD is manageable in small quantities, but in South Africa the potential volume resulting from more than 100 years of mining is alarming. For example, the volume of acid mine water currently decanting in the West Rand Goldfield near Krugersdorp is sufficient to fill at least 10 Olympic-size swimming pools (2,500 m³ each) every day.²² A 2010 Inter-Ministerial Report on AMD identified the risks arising from the decant of AMD to the environment, which include serious adverse ecological impacts, regional impacts on major river systems, and localised flooding in low-lying areas.²³ AMD also raises additional concerns related to geotechnical impacts, namely, the flooding of underground infrastructure in areas where water rises close to urban areas, the dissolving of cement structures by acid water, and increased seismic activity, which could have an effect on property and infrastructure.²⁴ Most profoundly, the toxicity

¹⁸ Van Vuuren 2010 *Water Wheel* 30.

¹⁹ Durand, Meevis and Fourie 2010 *Journal for Transdisciplinary Research in Southern Africa* 79.

²⁰ See De Nicola and Stapleton 2002 *Environmental Pollution* 303-315; Gerhardt, Janssens de Bisthoven and Soares 2004 *Environmental Pollution*.

²¹ Turton 2009 *Journal for Transdisciplinary Research in Southern Africa* 14.

²² Hobbs *Parliamentary Briefing Paper*. See also recent estimates by the Trans Caledon Tunnel Authority (Trans Caledon Tunnel Authority 2011 <http://www.pmg.org.za/report/20110907-department-water-and-environmental-affairs-briefing-acid-mine-drainag>).

²³ *AMD Report* iv. Other countries face similar challenges with respect to AMD. For example, a recent study estimates that there are 20 000-50 000 mines in the United States which cause AMD. In Canada AMD has been identified as the "largest environmental liability facing the Canadian mining industry and is estimated at \$2 to \$5 billion dollars". Jennings, Neuman and Blicher 2008 http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf 4. However, in a separate report commissioned by the banking industry, the impact on water resources in the Witwatersrand Goldfields region was described as less severe. It states that "[d]ue to the fact that during mining pumped mine water was disposed of in nearby pans and rivers, it is suggested that the Central Basin mine void decant will, in the long term, not have a much greater impact on the river systems than was the case during active mining. In fact, if the water in the mine void stratifies, as observed elsewhere, cleaner water may decant on surface after the initial flush of highly polluted mine water [has] subsided". Mine Water Research Group *Desktop Assessment*.

²⁴ *AMD Report* iv.

of some of the heavy metals associated with AMD poses major health risks,²⁵ an aspect that is curiously absent from the Inter-Ministerial Report on AMD mentioned earlier. This is a grave concern, since poor people who are still dependent on natural water resources for drinking and washing are most vulnerable to the health impacts of AMD.

2.2 Challenges for law and governance

In addition to these geological and physical effects of AMD, the problems it poses are also temporal to the extent that AMD is a historical problem which is aggravated by present mining practices. It is also a future problem because AMD has the potential to occur in perpetuity, and its long-term socio-economic and environmental impacts will continue long after those mining activities that led to its creation have ceased. The long-term socio-economic and environmental harm caused by AMD may easily outweigh the short-term economic benefits of mining. This temporal conundrum is vividly illustrated in real terms by the substantial number of mines that have been left abandoned in South Africa after the completion of mining during a time when insufficient legislation and regulatory practices were in place to ensure their proper rehabilitation. The greater Johannesburg region, among others, is littered with these abandoned, derelict and defunct mines, which pose a real threat, as gradually rising water is flooding the mines. This in turn leads to the contamination of shallow groundwater and surface water resources that are essential for agriculture and human consumption.²⁶

The temporal challenges of AMD illustrated above, coupled with the fact that defunct mines are usually ownerless, furthermore create difficulties for law and liability regimes which aim to facilitate mining rehabilitation and environmental protection. Ownerless mines are problematic from a legal perspective because they lead to a situation which shifts liability to the government, and ultimately taxpayers, who were not responsible for the pollution and who benefited least from the profits of the

²⁵ See for instance Botha, Botha and Genthe 2012 <http://researchspace.csir.co.za/dspace/handle/10204/6258>. See also Oberholster *et al* 2012 *Ecotoxicology and Environmental Safety* 134.

²⁶ *AMD Report* iv.

polluter. As we note below, South African legislation now holds polluters liable for the rehabilitation and remediation of water pollution, including historic pollution. It is trite that an effective liability regime can operate only if its addressees are identifiable and actually still exist; that is, the polluters, but most of these mines have been abandoned and are now effectively ownerless. Tracking down past owners of mines and holding them responsible would be an almost impossible task, which places the problem of AMD squarely on the shoulders of the South African government, and consequently also further taxes the taxpaying public.

Other challenges stem from the fact that some of the proprietors of the mines that originally caused the AMD problem sold their mines to new companies, including companies established within the context of the Black Economic Empowerment (BEE) framework of government. In doing so, they have tried to walk away from their liabilities. This was illustrated in the case of Harmony Gold, which was ordered by the High Court in 2005 to comply with a directive issued by the Department of Water Affairs (DWA) to pump underground water containing AMD in an effort to avoid water pollution. The company sold the mine in 2007 to Pamodzi Gold Orkney (Pamodzi), a BEE company. After the land on which mining took place was transferred to Pamodzi, the company took the view that the directive was no longer applicable to it.²⁷

In addition, the fragmentation of environmental governance in South Africa is set to exacerbate the ineffectiveness of the statutory liability regime.²⁸ The regulation of mines is fragmented and the enforcement of environmental legislation is generally poor.²⁹ In this respect the Minister of Mineral Resources, who has the mandate of promoting mining and mineral resource development, has the power to approve the environmental management programme of a mine in terms of the *Mineral and*

²⁷ The Court did not agree and ruled that the directive remains valid until it has fully been complied with. See *Harmony Gold Mining Company Ltd v Regional Director: Free State Department of Water Affairs* 2012 ZAGPPHC 127 (29 June 2012) para 48.

²⁸ This fragmentation has been exacerbated by the recent appointment of separate Ministers for the environment and for water affairs.

²⁹ On the general issue of fragmented environmental governance in South Africa see, among others, Kotzé 2007 *SAPL* 34-60; Kotzé *et al* 2007 *SAJELP* 57-81; Kotzé "Environmental Governance" 103-125.

Petroleum Resources Development Act (MPRDA),³⁰ which approval is subject to consultation with the Minister of Water Affairs. In terms of the NWA, the Minister of Water Affairs has the power to license the use of water by a mine, which could include dewatering for the purposes of excavation, as well as the disposal of contaminated water and residue resulting from the mining activities. In addition, certain activities associated with mining, such as road construction, the construction of diesel storage tanks, *etcetera*. that could impact on the environment are governed by the Ministry responsible for water resources.³¹ The inevitable result is that the governance of mines in South Africa is primarily driven by a fragmented, and in the case of the Department of Mineral Resources (DMR), more economically ambitious agenda, which follows a distinctly separate track from environmental governance efforts, which instead should focus on environmental issues.³² There is also considerable overlap and conflict between these ministries because of their different mandates.³³

3 The regulatory framework

As the principal focus of this article, the following sections identify and then critically evaluate the primary constitutional and statutory provisions that would be applicable to regulating AMD.

3.1 The constitutional framework

The environment and the health and well-being of people are safeguarded under the *Constitution of the Republic of South Africa, 1996 (Constitution)* by way of section 24. The availability and supply of potable water are dealt with in section 27. Section

³⁰ *Mineral and Petroleum Resources Development Act* 28 of 2002.

³¹ *National Water Act* 36 of 1998 (NWA).

³² For example, in *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC), DMR argued that a land use authorisation in terms of the *Land Use Planning Ordinance* 15 of 1985 (LUPO) was unnecessary where a mining right or permit had been issued in terms of the MPRDA. They submitted that in the event of a conflict between these laws, the MPRDA prevailed because it regulated a functional area vested in the national sphere of government.

³³ It has been acknowledged specifically that with respect to the governance of mining and AMD: "... the delegation of powers between various 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 to remove ambiguity". Manders, Godfrey and Hobbs 2009 http://www.csir.co.za/nre/docs/BriefingNote2009_2_AMD_draft.pdf.

24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right.³⁴ Section 27 is delineated as a socio-economic right and not an environmental right. However, read with section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Notably, in the present constitutional order, water regulation in South Africa places a great emphasis on protecting the resource *and* on providing access to water to everyone. The two issues seem reciprocally intertwined.³⁵

3.1.1 An issue of local environmental governance

In terms of Part B of Schedule 4 of the *Constitution*, local government is responsible for water and sanitation services, including the potable water supply. This is reiterated in the *Water Services Act*³⁶ (WSA), which places a duty on water services authorities to supply water services in a sustainable manner. This would include ensuring that the water is not only conserved but is also suitable for use by consumers. As such, the provision of water of an acceptable quality is an important function of local government, and it will have to consider and address the impacts of AMD on its water services and sources and water infrastructure when fulfilling its tasks in this respect. That the ecological impacts of AMD could also have various socio-economic effects is vividly illustrated by the daily struggles of municipalities across South Africa to provide people with a sufficient quantity of potable water of an acceptable quality, and it is not immediately evident that local government is able

³⁴ S 27(2) of the *Constitution of the Republic of South Africa*, 1996.

³⁵ Kotzé 2010 *JHRE* 135-160; Kotzé and Bates 2012 *U Denv Water L Rev* 221-274.

³⁶ *Water Services Act* 108 of 1997. See s 1(xx), which includes local government as a water services authority, read with s 11.

to adequately fulfil its statutory and constitutional duties with respect to water provision. This was recently illustrated in *Federation for Sustainable Environment v Minister of Water Affairs*³⁷ (more popularly known as the *Carolina Case*). It was common cause in this matter that the water supply of the town Carolina and the township Sibolela was contaminated by AMD, and it was not appropriately treated, either by the mines that caused the AMD, or by the municipality which is responsible for the treatment of water for potable supply, causing the water supplied to the community to be unfit for consumption. The residents approached the Court for an urgent interdict to compel both national and local government to comply with the provisions of the WSA to supply a regular quantity of safe drinking water of an acceptable quality. The local municipality endeavoured to supply water, *inter alia* by bringing in water tanks from neighbouring towns. However, this was deemed inadequate by the Court as the tanks were not refilled and a number of residents had to walk long distances to access the potable water from the tanks. With reference to section 27 of the *Constitution*, the Court held that all respondents (national, provincial and local government) have a duty to progressively realise the right of access to water. It singled out local government, however, as the end provider of the service and argued that for national government to "interfere with administrative issues that resort in the sphere of local government, would negate the very separation of spheres created by the constitution [sic]".³⁸ The Court ordered the district municipality to provide access to water within 72 hours and to engage with the residents on how water should be made available.

With respect to the supply of water, whilst the duty of the end provider narrowly lies with local government, the Court acknowledged that national government has an overarching duty to provide regulatory control and support to local government. This includes not only funding³⁹ but arguably also ensuring that the necessary capacity

³⁷ *Federation for Sustainable Environment v Minister of Water Affairs* 2012 ZAGPPHC 128 (10 July 2012).

³⁸ *Federation for Sustainable Environment v Minister of Water Affairs* 2012 ZAGPPHC 128 (10 July 2012) para 20.

³⁹ In an application for leave to appeal the High Court decision the Court held that the National Minister and the MEC for Water Affairs must provide funding to resolve the matter, but that governance issues must be resolved at a political level. *Federation for Sustainable Environment v Minister of Water Affairs* 2012 ZAGPPHC 170 (15 August 2012).

exists within local government to comply with its constitutional duties described above. In this respect it has been argued that "the effective, efficient and economical municipal management of potable water supply entails the execution of highly complex hydrological, geo-hydrological and public management functions",⁴⁰ and that this "requires the municipal managers, leading officials as well as the committed political office bearers to be equipped with specific knowledge and information regarding the physical environment and utilise geographical mapping tools in order to improve their long-term planning skills".⁴¹ The duty to safeguard water supply thus lies with government as a whole, with specific functions and tasks afforded to different line functions situated in the different spheres. It is also a function which forms part of the custodial obligation on government as the public trustee of South Africa's water resources as constitutionally prescribed in sections 24 and 27 of the *Constitution* and the *National Water Act* 36 of 1998 (NWA).⁴² This decision undeniably represented a victory for the local residents, who required an immediate water supply. However, the underlying cause of the problem, namely contamination stemming from AMD, and the related issues of the liability of the surrounding mines responsible for the pollution remain unresolved.

3.1.2 The environmental right and sustainable development

Section 24(b) of the *Constitution* is of critical importance when considering the nature of the state's obligations related to environmental protection more generally, including its obligations to protect water resources. The right not only places an environmental governance obligation on the state, but it also demands from the state when exercising that obligation that it considers the imperatives of sustainable

⁴⁰ Nealer 2009 *Journal for Transdisciplinary Research in Southern Africa* 77.

⁴¹ Nealer 2009 *Journal for Transdisciplinary Research in Southern Africa* 77.

⁴² The relevant provisions in the NWA state: "3. (1) As the public trustee of the nation's water resources the National Government, acting through the Minister, must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate. (2) Without limiting subsection (1), the Minister is ultimately responsible to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values. (3) The National Government, acting through the Minister, has the power to regulate the use, flow and control of all water in the Republic." See, further, Van der Schyff and Viljoen 2008 *Journal for Transdisciplinary Research in Southern Africa* 339-353; Van der Schyff 2010 *PELJ* 122-159; Van der Schyff 2013 *SALJ* 369-389.

development. The wording of section 24 specifically suggests that sustainable development is an explicit constitutional objective to the extent that it is inherent in the environmental right. For South African purposes, sustainable development means "the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations".⁴³ This means that government must achieve, advance, respect, protect and promote the ideal of sustainable development as set out in the environmental right. The right clearly contains the inter- and intra-generational characteristics typically associated with sustainable development and it articulates the constitutional objective to create a balance between ecological, social and economic considerations through the implementation of reasonable legal and other measures that will, *inter alia*, prevent pollution and secure sustainable socio-economic development. This integrated approach to sustainability was highlighted in the landmark case of *Fuel Retailers Association of Southern Africa v Director General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province (Fuel Retailers)*.⁴⁴ In its interrogation of sustainable development, the Constitutional Court found that:⁴⁵

... development cannot subsist upon a deteriorating environmental base. Unlimited development is detrimental to the environment and the destruction of the environment is detrimental to development. Promotion of development requires the protection of the environment. Yet the environment cannot be protected if development does not pay attention to the costs of environmental destruction. The environment and development are thus inexorably linked.⁴⁶

Quoting from the Brundtland Commission Report, the Court acknowledged that "[e]conomy is not just about the production of wealth, and ecology is not just about the protection of nature; they are both equally relevant for improving the lot of humankind".⁴⁷ It added:

⁴³ S 1 of the *National Environmental Management Act* 107 of 1998.

⁴⁴ *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province* 2007 6 SA 4 (CC) (*Fuel Retailers*).

⁴⁵ *Fuel Retailers* 21 para C.

⁴⁶ *Fuel Retailers* 21 paras E-H. This view was reaffirmed by Judge Sachs in his dissenting judgment at *Fuel Retailers* 20 para I-45 paras A-B.

⁴⁷ *Fuel Retailers* 22 paras A-B; *Report of the World Commission on Environment and Development* (1987), Ch 1 in para 42.

The idea that development and environmental protection must be reconciled is central to the concept of sustainable development. At the core of this Principle [sic] is the principle of integration of environmental protection and socio-economic development ... The practical significance of the integration of the environmental and developmental considerations is that environmental considerations will now increasingly be a feature of economic and development policy.⁴⁸

Here the Court clearly recognises that socio-economic development cannot be divorced from ecological considerations. In this sense, sustainable development is not only a constitutional objective; it is also a "mediating principle" and an approach to resolve the conflict that inevitably arises between competing social, economic and ecological considerations. In the words of the court, the integration principle "implies the need to reconcile and accommodate these three pillars of sustainable development", and "[s]ustainable development provides a framework for reconciling socio-economic development and environmental protection".⁴⁹

Thus, despite the important economic contribution of mining to the economy (and the implication that society has to deal with the adverse effects of mining as a trade-off for socio-economic growth), the *Constitution* and the constitutionally entrenched principle of sustainable development demand a more integrated approach to governance⁵⁰ and require that environmental issues such as AMD are considered alongside aspects of the development process that traditionally have had more influence on economic and political decision-making.⁵¹ Importantly, these constitutional imperatives, as exemplified by the *Fuel Retailers* case, make it incumbent on government as the public trustee of natural resources to ensure that these resources are not polluted to the extent that human health and well-being are

⁴⁸ *Fuel Retailers* 24 paras A, F-G.

⁴⁹ *Fuel Retailers* 25 paras E-F.

⁵⁰ Principle 4 of the *Rio Declaration on Environment and Development* (1992) captures the integration principle and states: "[i]n order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it". It has been argued that the principle of integration is central to the attainment of sustainable development, and indeed it forms the backbone of sustainable development. See French *International Law* 54 quoting from UN Commission on Sustainable Development "Paper No 3".

⁵¹ French *International Law* 54.

affected, through the implementation of reasonable measures that will prevent pollution.⁵²

While the orthodox custodial duties alluded to above do not apply *prima facie* to private actors, section 24(a) of the environmental right, nevertheless, is couched in terms which suggest that it is capable of being horizontally construed. It has been noted that section 24 is unique in this sense, since it contains aspects of both vertical rights and horizontal rights.⁵³ If its scope of application also reaches to private parties, as we propose it does, then the duty to ensure sustainable development as a constitutional objective would arguably also extend to private parties; in this case the mining industry. In this regard consideration must be given to section 8 of the *Constitution*, the so-called "application clause", as it determines who is bound by the *Constitution*. Section 8(1) renders the *Constitution* applicable to the legislature, the executive, the judiciary and all organs of state. In this regard it adheres to the traditional view that a *Constitution* should protect citizens against unwarranted interference by the state. Section 8(2), however, deviates from this traditional view and provides that a provision of the Bill of Rights also binds natural and juristic persons "if, and to the extent that, it is applicable, taking into account the nature of the right and of any duty imposed by the right". We propose that, because the environment as the subject matter of the environmental right affects everyone and because everyone's actions could potentially affect the environment (in other words because of its all-encompassing nature), the nature of the environmental right and the duty imposed by it suggest that it is enforceable against everyone, including non-state parties such as mining companies. This would mean that the duties imposed by section 24, and more particularly the duty to ensure sustainable development lie not only on the shoulders of the state but equally on the shoulders of the private sector, including mines. This view is supported by Judge Davis, who declared in *McCarthy v Constantia Property Owners Association*.⁵⁴

⁵² There are similarities between the wording of the South African *Constitution* and the *Constitution of the State of Pennsylvania*, 1776 (a 1, s 27) in this respect. See further Ryan 2001 *Environmental Law* 477-499.

⁵³ Van Reenen 1997 *SAJELP* 270-273.

⁵⁴ *McCarthy v Constantia Property Owners Association* 1999 4 SA 847 (C).

Section 8(2) [of the Constitution] provides that the provision in the Bill of Rights binds all natural and juristic persons, if and to the extent, that it is applicable, taking into account the nature of the right and the nature of any duty imposed by the right. Whatever the interpretation of this opaque phrase, it is clear that its intention was to extend the scope of application of the Bill of Rights. In short, the Bill of Rights was not only designed to introduce the culture of justification in respect of public law but intended to ensure that the exercise of private power should similarly be justified. Accordingly the carefully constructed but artificial divide between public and private law which might have dominated our law prior to the constitutional enterprise can no longer be sustained in an uncritical fashion and hence unquestioned application.

Such an interpretation in our view suggests that section 24(a) implies that mines should shoulder some of the custodial duties vis-à-vis natural resources, pollution regulation and, more generally, the achievement of sustainable development. Apart from the general positive duties imposed on the private sector described above, this also means that where a mine commits an act that pollutes a natural resource such as water, a violation of section 24(a) could be alleged.⁵⁵ The effect of section 24(a) furthermore is that in the same way as we can hold the state liable for non-performance of the duties delineated in section 24(b),⁵⁶ mines could be held liable as well. This custodial duty arguably would include assigning some form of constitutionally mandated liability for damage stemming from AMD to those who caused and continue to contribute to the problem, and those who fail to take reasonable measures to prevent, minimise or remedy the effects of pollution caused by AMD.⁵⁷

Admittedly, while the state's custodial duty to manage human relations with respect to the environment and to protect natural resources is an all-encompassing one, the duties flowing from section 24(a) and resting on private actors may be of a slightly

⁵⁵ See *Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products* 2004 2 SA 393 (E), where the Court interpreted the duty of care as laid down in s 28 of the NEMA in the light of s 24(a) of the *Constitution*. The Court stated with regard to the emission of a substance by a tannery that created a nuisance to neighbouring businesses: "one should not be obliged to work in an environment of stench and, in my view, to be in an environment contaminated by H 2 S is adverse to one's 'well-being'. I am therefore satisfied that the activities of the first respondent have caused 'pollution' as defined in NEMA". See *Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products* 2004 2 SA 393 (E) 34.

⁵⁶ This can be done by way of the broadened standing provisions enshrined in s 38 of the *Constitution* and particularly s 38(d) in terms of which "anyone acting in the public interest" may approach the court. See also Feris "Human Rights and Locus Standi" 129-151.

⁵⁷ See s 28 of NEMA.

more moderate nature.⁵⁸ It is the duty of the state to implement "reasonable legislative measures" to secure the rights of section 24. However, it is the constitutional responsibility of private actors (alongside the state) to implement "reasonable other measures" to prevent, minimise and remedy the effects of pollution, as well as to comply with the provisions of state-enacted legislative measures. For private entities such as mines, at a minimum, it implies the observance and implementation of the duty of care principle, which is aptly captured in section 2(4)(ii) of the *National Environmental Management Act* 107 of 1998 (NEMA), namely that "pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied." The duty of care principle thus mandates the protection of natural resources by mines through the implementation of reasonable measures for the prevention, minimisation and remediation of pollution.⁵⁹ One practical way for a mining company to implement the duty of care principle in its operations as part of "reasonable other measures" is for it to adopt and implement an ISO 14001 Environmental Management System (EMS), by means of which it not only voluntarily undertakes to be a good corporate environmental citizen but also endeavours to comply with all relevant environmental and other legislation that regulates its activities.⁶⁰ In the next section we explore the statutory framework that currently regulates pollution caused by AMD with a view to determining if current South African laws provide sufficient measures to hold to account those responsible for pollution caused by AMD.

3.2 The statutory law framework

A range of statutes has been enacted to give effect to the constitutional objectives described above, including the NEMA, which regulates the protection of all environmental resources, including water; the WSA, which regulates access to potable water supply services; the NWA, which ensures the management, protection

⁵⁸ See Feris 2012 *Law Environment and Development* 1-22, arguing that the duty established by s 24(a) of the *Constitution* creates a shared responsibility, borne by private actors, for the management and conservation of natural resources in the public interest and beyond, in the interest of future generations.

⁵⁹ See also s 28 of the NEMA and the discussion below.

⁶⁰ For an analysis of ISO 14001, among other voluntary instruments in South Africa, see Nel and Wessels 2010 *PELJ* 48-79.

and conservation of water resources; and the *National Environmental Management: Waste Act* (NEM:WA),⁶¹ which provides for the management of waste. South African law also provides for the regulation of mining in the MPRDA. Collectively the statutory framework includes detailed pollution prevention, minimisation and remediation provisions as well as liability provisions. Liability in the context of AMD is demarcated by means of detailed statutory provisions ranging from framework to sectoral legislation which relates to mining and water resources, and which would be applicable to the issue of water and AMD. The following sections summarise and briefly discuss those provisions of the statutory framework that would be applicable to AMD.

3.2.1 Framework legislation: the NEMA

The NEMA is South Africa's environmental framework law and applies in its entirety to the issue of AMD. It also regulates water resources because its regulatory scope covers a widely-defined "environment", which by definition includes water resources.⁶² Section 2 of the Act sets out the national environmental management principles which apply to the "actions of all organs of state that may significantly affect the environment".⁶³ These principles must *inter alia* "guide the interpretation, administration and implementation of this Act [the NEMA], and any other law concerned with the protection or management of the environment",⁶⁴ including as a consequence the NWA, the NEM:WA and the MPRDA, among others. The principles are important insofar as they serve as binding guidelines with respect to the entire environmental governance effort in South Africa. As the Constitutional Court affirmed in *Fuel Retailers*:

[The principles] provide not only the general framework within which environmental management and implementation decisions must be formulated, but they also provide guidelines that should guide state organs in the exercise of their functions

⁶¹ *National Environmental Management: Waste Act* 59 of 2008.

⁶² S 1 of the NEMA defines "environment" as: "...the surroundings within which humans exist and that are made up of- (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being".

⁶³ S 2(1) of the NEMA.

⁶⁴ S 2(1)(e) of the NEMA.

that may affect the environment. Perhaps more importantly, these principles provide 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. It is therefore plain that these principles must be observed as they are of considerable importance to the protection and management of the environment.⁶⁵

Clearly they are binding guidelines because they have statutory force, and because they are binding they cannot simply be brushed aside as irrelevant irritations. Yet, as far as the NEMA is concerned, the principles curiously apply only to the actions of the state and not to those of the private sector. Section 37 of the MPRDA, however, explicitly extends their application to the mining industry.⁶⁶ The principles will therefore bind the state and all its actions and decisions, as well as the actions and decisions of mines where these affect the environment. What are the principles that apply to mines and the state in the context of AMD?

First, sustainable development requires the consideration of all relevant factors including, among others, that the pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied; that waste is avoided, or where it cannot be avoided, is minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner; that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource; that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and that negative impacts on the environment and on people's environmental rights are anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.⁶⁷ These principles clearly articulate "no-harm" as the ideal scenario, but simultaneously recognise that justifiable socio-economic development will inevitably lead to environmental

⁶⁵ *Fuel Retailers* para 67.

⁶⁶ S 37 of the MPRDA.

⁶⁷ S 2(4)(a) of the NEMA.

impacts.⁶⁸ Where this is the case, the impacts must be minimised and remedied. Accordingly, when mining occurs for the sake of promoting justifiable socio-economic development, as it inevitably does, environmental harm resulting from mining must be prevented, minimised and remedied by the implementation of reasonable measures by the proponent of the mining activity.

Second, liability for environmental damage in the traditional sense is a main feature of the South African environmental governance regime and is provided for by the principles. The provision on life-cycle liability requires that: "[r]esponsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle".⁶⁹ Life-cycle liability is reinforced by the polluter pays principle, which holds polluters, and not consumers or the state, liable for bearing the financial burden of their polluting activities. The polluter pays principle requires that "[t]he costs of remedying pollution, environmental degradation and consequent adverse health effects 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".⁷⁰ Collectively, this would suggest that mines must pay for the prevention, rehabilitation, and minimisation costs in this respect, and that this liability extends throughout the entire duration of mining operations, including the rehabilitation of the environmental damage caused by AMD. Unfortunately, the polluter pays principle can be wholly effective only in those instances where the polluter is known and where the polluter has the financial resources to contribute to the remediation costs. It has been estimated that with the many ownerless, derelict mines, all of which contribute to the AMD problem, the polluter cannot be identified any longer and the effectiveness of this principle is significantly diluted as a consequence.⁷¹

⁶⁸ This *caveat* corresponds with the condition articulated in the environmental right (s 24), namely that everyone has the right to have the environment protected through laws and other measures that aim among other things to "secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

⁶⁹ S 2(4)(e) of the NEMA.

⁷⁰ S 2(4)(p) of the NEMA.

⁷¹ WWF 2012 http://awsassets.wwf.org.za/downloads/summary_mining_report_8aug.pdf.

Third, flowing from the point above, decision-making in the environmental governance paradigm (the act refers to environmental "management") must always consider and reflect the best practicable environmental option (BPEO),⁷² which 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 as in the short term".⁷³ Any decisions related to AMD, be they made by the private or the public sector or both, must therefore espouse the BPEO. Harking back to the terminology employed by the environmental right (see the discussion above), the BPEO dictates the "reasonable other measures" to be implemented by those responsible for the action that may lead to pollution. For example, where it would be desirable for a mining company to implement and maintain an ISO 14001 EMS, it should do so as part of "reasonable measures", especially if the EMS would lead to better environmental outcomes, but with due consideration of the costs aspects associated with the EMS. In other words, to ensure an equation where unqualified environmental protection is balanced by "justifiable socio-economic development" and its associated environmental impacts, the environmental benefits and damage, or rather the costs of rehabilitating environmental damage or *not* using environmental resources at all must be acceptable to society; a typical cost-benefit analysis, in other words.⁷⁴ Because the term is not qualified in the context of the objectives of the act, "society" is arguably used here in a very wide sense so as also to include government, civil society, affected communities and private sector entities such as mines. The BPEO thus provides a measure of balance between

⁷² S 2(4)(b) of the NEMA.

⁷³ S 1 of the NEMA.

⁷⁴ The cost-benefit analysis approach to environmental governance is, however, increasingly being criticised for its lack of environmental ethics. For example, Kysar pointedly explains: "Its logic and conclusions have begun to appear so powerful that we have lost sight of a great deal of practical and moral wisdom that remains alive within our early 'excessive' efforts to conserve natural resources, reduce pollution, save species, and enhance human health and safety ... Soon enough, the language of instrumentalism that animates our talk of tradeoffs, efficiency, and welfare maximisation will become so dominant that we will lose facility altogether with these alternative and once-resonant languages. We will forget that we once talked of environmental rights, rather than of optimal risk tradeoffs; of the grave challenges posed by uncertainty regarding potentially disastrous or irreversible consequences of human action, rather than of risk aversion and the option value of delay; of the stewardship obligations we incur on behalf of future generations, rather than of discounted welfare maximization; and of the responsibility we hold to lead international cooperative endeavors to protect the global biosphere, rather than of competitiveness concerns arising from regulatory differentiation within the world economy." Kysar *Regulating from Nowhere* 2.

environmental protection on the one hand and costs related to this protection on the other, and the principle would make it incumbent on government and mines to address pollution as a result of AMD (because the prevention of pollution as a result of AMD undoubtedly is beneficial to the environment), but only to the extent that the costs are acceptable to government, the mines, affected communities and civil society. What would be regarded as "acceptable costs" for society to address AMD remains an open question. The costs of addressing pollution as a result of AMD from historic mining activities could include, among others, the cost of preventing, remediating and minimising pollution, the loss of infrastructure, the resettlement of people, and health-related costs. The cost is currently estimated to be around ZAR 30 billion.⁷⁵ Whether this is a cost acceptable to society or not is unclear. How the funds will be generated and by whom is even more problematic, as we indicate below. What is worrying is that the Minister of Finance has set aside only a paltry ZAR 150 million in the 2013/2014 budget to contribute to this cost.⁷⁶ Moreover, the fact that the South African taxpayer is footing the bill for these historic mining activities is probably contrary to the objectives, obligations and liability provisions of the constitutional and framework law discussed thus far, mostly because it shifts the constitutional and statutory liabilities to the tax paying public, who did not cause the pollution. It also emphasises the necessity of ensuring that all of the costs of implementing reasonable measures for the prevention of pollution as a result of AMD caused by current and future mining activities should be borne by the proponent of the activity and not by the next tax-paying generation. This would be in line with the obligation to ensure inter-generational environmental justice that is explicitly encapsulated in the environmental right and the constitutionally entrenched principle of sustainable development.

Fourth, like the NWA referred to above, there are indications that the NEMA makes the public trust doctrine part of the South African environmental law regime.⁷⁷ By virtue of its being the ultimate custodian of environmental resources, government

⁷⁵ WWF 2012 http://awsassets.wwf.org.za/downloads/summary_mining_report_8aug.pdf.

⁷⁶ South African Treasury 2013 <http://www.treasury.gov.za/documents/national%20budget/2013/review/FullReview.pdf> 99.

⁷⁷ See Feris 2012 *Law Environment and Development* 1-22.

carries the responsibility of addressing AMD, either through reactive strategies that address the pollution caused by AMD from ownerless and derelict mines, or through pro-active strategies that will ensure that current and future mining operations do not go ahead without the implementation of the necessary reasonable measures to prevent the pollution caused by AMD, so that these current and future mining activities do not become a liability for the state and its taxpayers. However, while the buck stops with government in this respect, it would have considerable leeway in its efforts to address AMD, and it could do so by means of "reasonable legislative and other measures"⁷⁸ which, for example, impose stricter obligations on the mining sector to prevent, minimise and remedy pollution.

Fifth, with the commencement of the *Mineral and Petroleum Resources Development Amendment Act*,⁷⁹ the environmental authorisation of mining activities would in future fall within the ambit of the NEMA.⁸⁰ In theory this would mean that the more strict environmental impact assessment regime as set out in the NEMA would apply to mining and would encompass the management and control of residue stock piles both during the operational phase and at mine closure. This could lead to tighter control over activities that may cause AMD when compared to the environmental regime under the MPRDA. Section 24N(3)(b) of the NEMA, for instance, requires that the environmental management programme must "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

⁷⁸ As per s 24 of the *Constitution*.

⁷⁹ *Mineral and Petroleum Resources Development Amendment Act* 49 of 2008.

⁸⁰ This long-delayed commencement arises from an agreement between the Minister of Environmental Affairs and the Minister of Mineral Resources to adopt a substantive integrated environmental management system so that the environmental authorisation process under NEMA will apply to mining activities under the competence of the DEA. This required amendments both to NEMA and the MPRDA. The amended provisions are, however, co-dependant and require the commencement of both Acts. While the *NEMA Amendment Act* came into effect in 2009, the *MPRDA Amendment Act* commenced only on 7 June 2013. However, the *MPRDA Amendment Act*, read with the *NEMA Amendment Act*, allows for a status quo for 18 months. The commencement of the amendments requiring environmental authorisations in terms of the NEMA will thus take effect on 7 December 2014 (the so-called first transitional period). Thereafter, the requirements for environmental authorisations will be implemented in accordance with NEMA, but under the authority of the Minister of Mineral Resource's competency (the second transitional period). Only after another three-year period has expired will further NEMA amendments become effective, requiring the environmental regulation of mineral activities under NEMA with the Minister of Environmental Affairs as the competent authority.

operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question". This provision will now require a mine to address and plan for the management of AMD, and the mine may not be issued an environmental authorisation unless it has addressed AMD (and other environmental impacts) in its environmental management programme.⁸¹ Once an environmental authorisation has been issued, the holder thereof bears responsibility "for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of his or her prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting or mining area to which such right or permit relates".⁸² This is a welcome amendment as it specifically ensures that the polluter maintains responsibility for threats to water resources. Because the provision applies geographically outside the boundaries of the mine, this provision could possibly force mines to consider their collective duties and liabilities with respect to hydrologically connected underground operations as well.⁸³ Importantly in this respect, the NEMA now explicitly provides that the responsible governmental authorities may identify areas where mines are interconnected or their impacts are integrated to such an extent that the interconnection results in a cumulative impact. In this case, the authorities may prescribe strategies in order to facilitate mine closure where mines that are interconnected have an integrated impact or pose a cumulative impact.⁸⁴ AMD by its very nature is an interconnected phenomenon which leads to cumulative impacts. This provision would enable government to address at least the occurrence of AMD in future, when mines close. Adequate consideration and remediation of AMD and its cumulative effects could, for example, be set as a requirement to be

⁸¹ S 24N(1) of the NEMA states that the competent authority may require the submission of an environmental management programme before considering an application for an environmental authorisation.

⁸² S 24N(7)(f) of the NEMA.

⁸³ On the issue of joint liability for hydrologically connected underground operations, see *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Co Ltd* 2006 5 SA 333 (W); *Kebble v Minister of Water Affairs* 2007 SCA 111; *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* 2006 SCA 65; and more recently, *Harmony Gold Mining Company Ltd v Regional Director: Free State Department of Water Affairs* 2012 ZAGPPHC 127 (29 June 2012). Also, for a discussion of these judgments, see Kotzé and Lubbe 2009 SAJELP 49-77; Humby 2013 *Journal of Energy and Natural Resources Law* 453-466.

⁸⁴ This provision has recently been incorporated into the NEMA by virtue of the *National Environmental Management Amendment Act* 62 of 2008. See ss 24R(4) and (5) of the NEMA.

fulfilled before a closure certificate is issued and, at least legally, the door is now wide open for government to request comprehensive action by interconnected mines to address their cumulative impacts, of which AMD is but one result.

Sixth, the NEMA's provisions on liability are supplemented by section 28, which is entitled: "Duty of care and remediation of environmental damage". This section provides detailed and comprehensive liability for mines, also with respect to AMD, and is worth quoting:

(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.

(1A) Subsection (1) also applies to a significant pollution or degradation that-

(a) occurred before the commencement of this Act;

(b) arises or is likely to arise at a different time from the actual activity that caused the contamination; or

(c) arises through an act or activity of a person that results in a change to pre-existing contamination.⁸⁵

Section 28 evidently sets out a wide duty of care and liability for mines not to cause pollution/degradation (no-harm); to minimise pollution/degradation; and/or to rectify it. As a result of litigation (*Bareki v Gencor Ltd*) that focused on the liability for historical pollution⁸⁶ the NEMA was amended and liability now applies retrospectively and therefore also to activities caused prior to the NEMA's commencement.⁸⁷ Where a mine fails to take reasonable measures to address AMD, it might be directed to do so by the relevant authority, and if it does not comply with the directive (an

⁸⁵ Own emphasis. Reasonable measures could be anything, and by virtue of s 28(3) of the Act, *may* include *inter alia* measures to investigate, assess and evaluate the impact on the environment; to cease, modify or control any act, activity or process causing the pollution or degradation; to contain or prevent the movement of pollutants or the causant of degradation; to eliminate any source of the pollution or degradation; or to remedy the effects of the pollution or degradation.

⁸⁶ *Bareki v Gencor Ltd* 2006 1 SA 432 (T). For a discussion of the judgment see Du Plessis and Kotzé 2007 *Stell LR* 161-193; Humby 2007 *SAJELP* 105-123.

⁸⁷ *National Environmental Management Amendment Act* 14 of 2009.

administrative enforcement instrument), measures will be taken by government on its behalf, but for the mine's cost.⁸⁸

Amendments to the NEMA⁸⁹ make any unlawful and intentional or negligent act which causes significant or is likely to cause significant pollution or degradation of the environment subject to criminal liability.⁹⁰ The NEMA also recognises the importance and value of economic or financial regulatory instruments as part of South Africa's environmental governance toolkit, especially with respect to the mining industry.⁹¹ It provides among other things that: "[a]n applicant for an environmental authorisation relating to prospecting, mining, exploration, production or related activities on a prospecting, mining, exploration or production area must make the prescribed financial provision for the rehabilitation, management and closure of environmental impacts, before the Minister of Mineral Resources issues the environmental authorisation".⁹²

In addition to this statutory-administrative liability, the NEMA imposes criminal liability in terms of which, among other things, the directors of an entity that causes or has caused pollution could be held criminally liable in their personal capacities for an environmental offence committed by the entity:

Any 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 reasonable steps that were necessary under the circumstances to prevent the commission of the offence.⁹³

This provision has a strong deterrence objective by way of which directors of mining companies should ensure prudent environmental practices to avoid or properly attend to environmental harm; otherwise they face the risk of criminal liability. While criminal liability is an important element in any environmental law regime, one of its

⁸⁸ Ss 28(4), 28(7)-(8) of the NEMA.

⁸⁹ *National Environmental Management Amendment Act 14 of 2009*.

⁹⁰ Ss 28(14)-(15) of the NEMA.

⁹¹ S 24P of the NEMA.

⁹² S 24P(1) of the NEMA.

⁹³ S 34(7) of the NEMA.

greatest weaknesses is that it is unable to address environmental remediation.⁹⁴ Nevertheless, the provision on criminal liability might "persuade" current and future directors of mining companies to properly attend to the AMD crisis, or otherwise risk a fine and/or imprisonment.

3.3 Water legislation

The provisions of the NWA are complementary to those of the NEMA and they must be considered, as AMD causes severe water pollution. The NWA contains various provisions related to water quality and the protection of water resources; specifically a host of liability provisions which would apply to mines in the context of AMD. Of these, section 19, which is entitled "Prevention and remedying effects of pollution", is arguably the most important. Section 19 states:

(1) An owner of land, a person in control of 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.

One should note here that pollution is defined as:

... the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to 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

⁹⁴ See generally Kidd "Criminal Measures" 240-265.

(dd) to property.⁹⁵

The definition of water pollution is wide and covers not only damage (and thus liability) to the aquatic environment and to people, but also damage to property. This is important in view of the threat that uncontrolled AMD poses to property, suggesting that the liability provisions of the NWA could be used not only in traditional guise to apply to water *per se*, but also to water infrastructure as far as AMD is concerned. Section 19 closely mirrors section 28 of the NEMA and it clearly imposes a very wide duty of care and liability on mines to address AMD by means of "reasonable measures". As with section 28 of the NEMA, these measures are not a closed list and *may* include measures such as to cease, modify or control any act or process causing the pollution; to comply with any prescribed waste standard or management practice; to contain or prevent the movement of pollutants; to eliminate any source of the pollution; to remedy the effects of the pollution; and to remedy the effects of any disturbance to the bed and banks of a watercourse.⁹⁶ Where a mine does not take reasonable measures, it may be directed to do so by means of an administrative directive. If it still fails to heed the directive, government will take the measures on its behalf and recover the costs of these measures from the mine.⁹⁷

Importantly, the provisions of section 19 allow government to hold mining companies liable for pollution related to AMD, to prevent such pollution from occurring, to minimise pollution and to remediate it. Ensuring liability for environmental damage and pollution forms part of the state's duty to manage the assets of the trust, as it were, as far as its duties as South Africa's public trustee over water resources are concerned.⁹⁸ It seems as if South African courts are inclined to support environmental governance departments in this respect. Such was

⁹⁵ S 1(xv) of the NWA.

⁹⁶ S 19(2) of the NWA.

⁹⁷ Ss 19(3)-(5) of the NWA.

⁹⁸ S 3 of the NWA. Also see the discussion above.

the case in *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited*,⁹⁹ where the High Court found:

The object of the directives is to prevent pollution of valuable water resources. To permit mining companies and their directors to flout environmental obligations is contrary to the Constitution, the Mineral Petroleum Development Act and to the National Environmental Management Act. Unless courts are prepared to assist the State 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 over the lifetime of the mine, thereafter they may simply walk away from their environmental obligations. This simply cannot be permitted in a constitutional democracy which recognises the right of all of its citizens to be protected from the effects of pollution and degradation.¹⁰⁰

Again, in *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry*¹⁰¹ the Supreme Court of Appeal upheld a directive issued by the Department of Water Affairs in terms of section 19(3) of the NWA to take reasonable measures, including measures on land belonging to another, to prevent pollution from contaminating water resources. More recently the High Court held Harmony Gold to its obligation to pump and treat acidic mine water, notwithstanding that it had severed all legal connections to the land on which the mining activities that generated the pollution had taken place.¹⁰² In the words of the Court: "if a member of 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".¹⁰³

Chapter 4 of the Act provides for the authorisation of water uses, which include activities associated with mining. There are four types of water use authorisations: water use authorised under Schedule 1 of the Act, generally authorised water use, activities that were lawfully undertaken between 1 October 1996 and 30 September

⁹⁹ *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited* 2006 ZAGPHC 47 (15 May 2006).

¹⁰⁰ *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited* 2006 ZAGPHC 47 (15 May 2006) para 16.9.

¹⁰¹ *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* 2006 SCA 65. See Kotzé and Lubbe 2009 *SAJELP* 49-77.

¹⁰² *Harmony Gold Mining Company Ltd v Regional Director: Free State Department of Water Affairs* 2012 ZAGPPHC 127 (29 June 2012). For a detailed case analysis, see Humby 2013 *Journal of Energy and Natural Resources Law* 453-466.

¹⁰³ *Harmony Gold Mining Company Ltd v Regional Director: Free State Department of Water Affairs* 2012 ZAGPPHC 127 (29 June 2012) para 39.

1998 that can be regarded as existing lawful water use, and activities which require a water use licence. In most cases a new or existing mine will have to apply for a water use licence to be able to conduct its primary activity of mining.¹⁰⁴ The issuing authority may attach various conditions to these licences and any breach of these conditions will give rise to criminal and/or administrative sanctions.¹⁰⁵ A wide scope of issues related to AMD and water could therefore be regulated in the water use authorisation, such as prescribing which reasonable measures should be implemented at a specific mine, and these conditions will function alongside the additional protective measures, duty of care and statutory liability provisions provided by the NWA and other legislation. The NWA also provides water authorities with the possibility, if it is necessary for the protection of a water resource or property, to require the applicant to give security in respect of any obligation or potential obligation arising from an authorisation issued in terms of the act. This financial security may include any of the following: a letter of credit from a bank; a surety or a bank guarantee; a bond; an insurance policy; or any other appropriate form of security.¹⁰⁶ The financial security is clearly intended to supplement similar provisions in the NEMA (see above) and the MPRDA (discussed below), and whereas the financial security in the latter two laws could be used for a wide array of rehabilitation purposes, the provision in terms of the NWA will specifically apply to water resources, including their rehabilitation in the AMD context.

The NWA significantly expands its repertoire of financial environmental governance mechanisms by also providing for a pricing strategy for water use charges.¹⁰⁷ These charges are also relevant for AMD since they may include, among others, charges for funding water resource management, including the related costs of gathering information; monitoring water resources and their use; controlling water resources; water resource protection, including the discharge of waste and the protection of the reserve; and water conservation.¹⁰⁸ Over and above all of the foregoing monetary contributions and financial securities, mines could thus be required to contribute an

¹⁰⁴ Ss 21-55 of the NWA.

¹⁰⁵ S 29 of the NWA.

¹⁰⁶ S 30(1)-(2) of the NWA.

¹⁰⁷ S 56 of the NWA.

¹⁰⁸ S 56(2) of the NWA.

additional amount of money to fund the general water resource management effort which, no doubt, will also have to address AMD. This could be an important source of funding to address legacy issues such as instances where the remediation of AMD caused by ownerless or derelict mines needs to be funded, and instead of being funded by the taxpayer, the primary beneficiaries of South Africa's mineral resources would be funding these interventions.

As with the NEMA, the NWA includes comprehensive provisions regulating criminal liability.¹⁰⁹ More specifically, criminal liability arises where a mine for instance uses water otherwise than as authorised under the NWA; fails to comply with any condition attached to an NWA authorisation; fails to comply with a directive issued under the act; fails or refuses to give data or information, or gives false or misleading data or information when required to give information under the Act; intentionally refuses to perform a duty or obstruct any other person in the exercise of any power or performance of any of that person's duties in terms of the NWA; unlawfully and intentionally or negligently commits any act or omission which pollutes or is likely to pollute a water resource; and unlawfully and intentionally or negligently commits any act or omission which detrimentally affects or is likely to affect a water resource.¹¹⁰ These prohibitions are so broadly formulated that it is highly probable that many mines could in fact already be held criminally liable for the pollution caused by AMD. Yet, as with the criminal liability provisions in the NEMA, these are valuable only to the extent that they will be able to successfully deter existing and future users of water from polluting water resources. They may neither be used to minimise or remedy pollution caused by AMD, nor are they applicable to situations where the transgressor (the owner of the mine) no longer exists. Moreover, the effectiveness of criminal liability depends almost exclusively on the willingness, competence and ability of the state to prosecute perpetrators. Where there is little political will or a lack of the resources and human capacity to do so, even the most comprehensive and severe set of provisions on criminal liability will remain a toothless dog. These are also prevailing concerns in South Africa, as

¹⁰⁹ Ss 151-155 of the NWA.

¹¹⁰ S 151(1) of the NWA.

commentators have highlighted.¹¹¹ To date, the jury is still out on whether or not there is appropriate intervention by government in this respect.

Considering the grave impact of mining on water resources, it is not surprising that the NWA provides for further detailed regulation of mining activities vis-à-vis water resources in a comprehensive set of regulations under the act. Section 22(2)(c) of the NWA provides that a person who uses water for the purposes of the discharge or disposal of waste or water containing waste (as defined in sections 21(f), (g), (h), and (j)), must comply with any applicable waste standards or management practices prescribed in regulations made under sections 26(1)(h) and (i), unless the conditions of the relevant water use authorisation provide otherwise. Regulations have been promulgated in GN R704 (currently under revision)¹¹² in terms of sections 26(1)(b)(g) and (i) of the NWA, which specify reasonable measures that must be complied with to protect water resources from the impacts of mining activities. This is also evident from the title of the regulations: "Regulations on Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources".¹¹³ In terms of the regulations, "[n]o person in control of a mine or [mining] activity may place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation".¹¹⁴ This prohibitive provision is supplemented by an array of provisions which specifically aim to protect water resources from mining. These provisions state that every person in control of a mine or mining activity must take all reasonable measures *inter alia* to:

- prevent water containing waste or any substance which causes or is likely to cause pollution of a water resource from entering any water resource;

¹¹¹ Burns and Kidd "Administrative Law" 243-257.

¹¹² GN R 704 in GG 20119 of 4 June 1999 (Regulations in terms of section 26 of the National Water Act on the Use of Water for Mining and Related Activities aimed at the Protection of Water Resources). It could be said that this provision is actually counter-productive to the extent that it might be read as preventing backfilling as one of the remedial measures for the prevention of AMD.

¹¹³ GN R 704 in GG 20119 of 4 June 1999 (Regulations in terms of section 26 of the National Water Act on the Use of Water for Mining and Related Activities aimed at the Protection of Water Resources).

¹¹⁴ Reg 4(c) of GN R 704 in GG 20119 of 4 June 1999.

-
- design, modify, locate, construct and maintain all water systems including residue deposits in any area so as to prevent the pollution of any water resource through the operation or use thereof and to restrict the possibility of damage to the riparian or in-stream habitat;
 - cause effective measures to be taken to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns;
 - prevent the erosion or leaching of materials from any residue deposit or stockpile from any area; and
 - ensure that water used in any process at a mine or activity is recycled as far as practicable, and any facility, sump, pumping installation, catchment dam or other impoundment used for recycling water, is of adequate design and capacity to prevent the spillage, seepage or release of water containing waste at any time.¹¹⁵

These provisions, to a greater or lesser extent, all relate to AMD and specifically the protection of water resources in the context of pollution as a result of AMD. They clearly set out comprehensive and far-reaching obligations on mines as far as their water resource protection activities are concerned, and add to and further expand the wide liability net covering mines with respect to pollution as a result of AMD.¹¹⁶ Unfortunately, in accordance with sub-regulation 3 of GN704, application can be made for an exemption from the requirements of sub-regulations 4-8, 10 or 11, subject to such conditions as the Minister may determine. Such an application for exemption should be submitted together with a water use licence application. This implies that a mining company does not have to comply with these regulations if it is exempted. The continued existence of this possibility for exemption seems to be unjustified, considering the disproportionately grave threat of AMD (and other forms of mining pollution) today and the need to enforce proper provisions now to avoid the future occurrence of this problem.

¹¹⁵ Reg 7 of GN R 704 in GG 20119 of 4 June 1999.

¹¹⁶ It is also a criminal offence to contravene the provisions of the regulations (Reg 14 of GN R 704 in GG 20119 of 4 June 1999).

3.4 Mining legislation

While the MPRDA primarily aims to regulate access to and the beneficial exploitation and use of mineral resources, it also aims to "give effect to section 24 of the *Constitution* by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development".¹¹⁷ Thus, despite its focus on the promotion of mineral resources development, the Act should promote mining activities and associated socio-economic development within allowable ecological constraints; although this ecological objective is a lone contender for attention among the many other development-oriented objectives of the Act. In doing so, as was indicated above, the MPRDA explicitly applies the sustainability principles of the NEMA directly to mines. The MPRDA also contains liability provisions which are relevant in the AMD context. Section 38(1)(d) determines that a mine must "as far as it is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development". A mine is also "responsible for any environmental damage, pollution or ecological degradation as a result of his or her [*sic*] reconnaissance prospecting or mining operations and which may occur inside and outside the boundaries of the area to which such right, permit or permission relates".¹¹⁸ These provisions, like section 28 of the NEMA and section 19 of the NWA, create a duty of care, and the liabilities it imposes will continue until a closure certificate is issued to the mine.¹¹⁹ Importantly though, as Humby¹²⁰ points out, it remains uncertain whether or not the regulatory closure envisaged in the MPRDA also terminates the obligations set out in the NWA and NEMA. In our view there is nothing to suggest that a portion of a mine's

¹¹⁷ S 2(h) of the MPRDA.

¹¹⁸ S 38(1)(e) of the MPRDA.

¹¹⁹ S 43(1) of the MPRDA provides: "[t]he holder of a prospecting right, mining right, retention permit or mining permit remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate to the holder concerned". Note, however, that once the provisions of the MPRDA *Amendment Act* come into effect, the rehabilitation of mining areas will be regulated in terms of s 28 of the NEMA.

¹²⁰ Humby 2013 *Journal of Energy and Natural Resources Law* 458.

environmental liabilities will not continue under the NWA and NEMA, even when some of these liabilities cease in terms of the MPRDA by means of the closure certificate. Moreover, in terms of the liability and financial burden that it will ultimately have to carry once the closure certificate is issued, it would be in the state's best interest not to usurp all liabilities for future environmental damage, but rather to have some of the liabilities continue through other statutory means.

This widely framed liability of the mine is specifically extended to its directors (director liability), in that "the directors of a company or members of a close corporation are jointly and severally liable for any unacceptable 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".¹²¹ Generally considered, these provisions provide for a comprehensive liability net which applies alongside the similar NEMA and NWA provisions discussed above. Yet, as these provisions refer simply to the "holder" of the right or permit, retrospective liability will not apply in the many AMD instances where the holder does not exist any longer. However, this should be rectified once the amendments to the NEMA and the MPRDA come into effect,¹²² because section 28(1A) of the NEMA caters for historic pollution and liability for environmental damage stemming from mining activities that will be regulated by the NEMA and not the MPRDA. The need to apply liability retrospectively to mining is vital. Without it, the constitutional and environmental law and governance effort applying to mines would be rendered null and void. It is, after all, mining that is responsible for the highest incidence and most severe forms of South Africa's historical mining pollution stemming from AMD.

¹²¹ S 38(2) of the MPRDA. See also s 34(7) of the NEMA, which provides for the criminal liability of directors of mines, in that: "(7) Any person who is or was a director of a firm at the time of the commission by that firm of an offence under any provision listed in Schedule 3 shall himself or herself be guilty of the said offence and liable on conviction to the penalty specified in the relevant law, including an order under subsection (2), (3) and (4), if the offence in question resulted from the failure of the director to take all reasonable steps that were necessary under the circumstances to prevent the commission of the offence: Provided that proof of the said offence by the firm shall constitute *prima facie* evidence that the director is guilty under this subsection. (8) Any such manager, agent, employee or director may be so convicted and sentenced in addition to the employer or firm." The NWA is specifically listed in Schedule 3. If a director therefore commits an offence in terms of the NWA (see the discussion below), in addition to the general liability of the mine, the director will also be liable by virtue of s 34 of the NEMA.

¹²² See the discussion above.

Importantly, though, while the provisions may apply retrospectively to cover historical pollution in a comprehensive way, the fact remains that where the polluter does not exist any more, the liability provisions cannot be enforced.

Mining companies' environmental obligations and undertakings to realise their obligations must be set out comprehensively in an environmental management programme and environmental management plan.¹²³ The granting of permission to mine or prospect is conditional, among other matters, on the submission of this programme and plan to the relevant government authority, and its acceptance by that authority.¹²⁴ In addition, section 40(1) requires that when the DMR considers an environmental management plan or environmental management programme it must consult with any State department that administers any law relating to matters affecting the environment. The programme or plan is furthermore subject to financial provision for the rehabilitation or management of negative environmental impacts.¹²⁵ If the mine fails or is unable to rehabilitate or to manage any impact on the environment, or is unable to undertake such rehabilitation or to manage such an impact, government may use this money to fulfil the environmental obligations of the mine on its behalf.¹²⁶ The requirement to maintain and retain this financial provision remains in force until government issues the mine with a closure certificate.¹²⁷ Importantly, no closure certificate may be issued unless the Chief Inspector of Mines and the Department of Water Affairs have confirmed in writing that the provisions pertaining to health and safety and the management of potential pollution to water resources have been addressed.¹²⁸ It is noteworthy that government may retain such a portion of the financial provision as may be required

¹²³ S 39 of the MPRDA. This will be regulated in terms of s 24N of the NEMA once the amendments to the MPRDA and the NEMA come into effect.

¹²⁴ According to s 5(4) of the MPRDA: "No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without an approved environmental management programme or approved environmental management plan."

¹²⁵ S 41(1) of the MPRDA. This will be regulated in terms of s 24P of the NEMA once the amendments to the MPRDA and the NEMA come into effect.

¹²⁶ S 41(2) of the MPRDA.

¹²⁷ S 43 of the MPRDA: "[T]he holder of a prospecting right, mining right, retention permit or mining permit remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate."

¹²⁸ S 43(5) of the MPRDA.

to rehabilitate the closed mining or prospecting operation in respect of latent or residual environmental impacts.¹²⁹

The value of this provision for damage or pollution caused by AMD is limited, however. This is because much of South Africa's current AMD woes are a result of historical mining practices which occurred at a time when regulation was wholly insufficient (ie; prior to the NEMA and other post-1996 environmental laws). No financial provisions were made then to address AMD today. The financial provision is coupled with present applications for mining authorisations and will thus apply only where mines have recently sought a mining right, or where they will do so in future. Moreover, the success of the financial provisions in addressing AMD will mostly depend on a range of factors being sufficiently considered, including, for example, proper and frequent review of the provision and its adequacy, adjustment of the provision in relation to inflation, adjustment of the provision in relation to new scientific knowledge that emerges on AMD, and proper, broad-based consultation with all interested and affected parties. It is worrying, then, that the World Wildlife Fund (WWF) recently estimated that:

There are indications that a number of mines are not making adequate financial provision for closure (uncertainty with regard to the adequacy of financial provisions appears to be the greatest challenge in relation to providing for adequate post closure water treatment and management). This is supported by targets set in the two most recent strategic plans of the DMR, which explicitly recognise that more needs to be done to ensure greater compliance with financial provision requirements.¹³⁰

In terms of section 43(2) the Minister has discretion to transfer environmental liabilities and responsibilities to a suitably qualified person. Whether this person includes the state, an environmental rehabilitation company, or a new owner is unclear, however. It is also unclear what the requirement "suitably qualified" is intended to convey or require. Would the state be considered suitably qualified where it has no human and financial resources to deal with AMD, for example? Nevertheless, what this section adds to the current provisions on the termination of liability by means of the closure certificate is that environmental liability will not

¹²⁹ S 43(6) of the MPRDA.

¹³⁰ WWF 2012 http://awsassets.wwf.org.za/downloads/summary_mining_report_8aug.pdf.

necessarily cease and simply fall away. Environmental responsibility (and arguably liability) at a minimum will always resort back to the state where liability ceases by means of statutory mechanisms (the closure certificate); or where the mine is unable to fulfil the environmental obligations arising from its liability. Thus, where the mine is absolved from liability by the closure certificate, or the liability is not transferred to a "suitably qualified" person, the state must assume liability for AMD. However, where the liability for AMD does resort back to the state it is quite possible that the polluter pays principle will be contravened, since government, and thus the public, would be required to foot the bill for environmental remediation. In this instance, the polluter would clearly not be paying for remedying AMD, but rather the tax-paying public. This raises potentially contentious questions regarding the self-defeating and manifestly contradictory provisions in South Africa's suite of laws that deal with the environmental liability of mines insofar as AMD is concerned.

In addition to the broader liability provisions above, section 45 of the MPRDA provides "[i]f 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 well-being of anyone and require urgent remedial measures", the relevant authority may direct the mine to undertake these measures. Section 45 is the MPRDA's version of the administrative directive that is also provided by section 28 of the NEMA and section 19 of the NWA. The provisions of these laws do not conflict and could be used simultaneously; in fact, section 45 extends the use of administrative directives to include "urgent remedial measures", and not only more general circumstances and measures as under the NEMA and the NWA. The threat to the environment and human health and well-being posed by AMD is such that it arguably might require "urgent remedial measures". If the mine fails to take these measures, the relevant authority will do so on its behalf and then recover the costs incurred in this respect from the mine.¹³¹ Where the mine fails to compensate the authority, the latter is empowered to seize and sell the mine's property to recover the costs.¹³² The mine will thus in effect, even if it chooses to

¹³¹ S 45(2)(a) of the MPRDA.

¹³² S 45(2)(c) of the MPRDA.

ignore government directives relating to the rehabilitation of AMD, remain at least financially liable for the costs incurred as a result of actions undertaken in terms of the directive.

In many instances, however, the mine does not exist any more, the current owner cannot be identified or located, or the mine has been liquidated. In these instances it would be impossible to provide for and/or recover the costs of rehabilitation. In many instances this is the case with AMD in South Africa, as has been argued throughout this article. In this event, section 46 of the MPRDA grants the Minister the power to instruct the relevant Regional Manager (a government functionary)¹³³ to take the necessary measures to prevent further pollution or degradation or "to make the area safe". These measures must be funded from the financial security provision made by the mine, or if there is no such provision or if it is inadequate, from money appropriated by Parliament for that purpose.¹³⁴ Importantly, then, section 46 provides the possibility for government to respond to AMD where the mine is unable to do so. Government is further even entitled to additional and extraordinary funding from Parliament where this proves to be necessary, and as long as AMD could be described as requiring "urgent remedial measures". The way is now paved for heavy public-sector investment and concomitant measures to address AMD where mines do not exist any longer or are unable to pay for the rehabilitation of AMD. Yet, as has been illustrated, the money for this public sector investment will necessarily come from the taxpayer. On the positive side, this funding may be used and is being used by government for the development of infrastructure to address AMD in the Witwatersrand area.¹³⁵

In addition to these liabilities, in most instances it is a criminal offence to contravene the provisions of the MPRDA, including those described above.¹³⁶ Criminal liability

¹³³ In terms of s 8 of the MPRDA, the Director-General must designate an officer in the service of the Department as regional manager for each region contemplated, who must perform the functions delegated or assigned to him or her in terms of the MPRDA or any other law.

¹³⁴ S 46(2) of the MPRDA.

¹³⁵ See, for example, the work of the Trans Caledon Tunnel Authority (Trans Caledon Tunnel Authority 2008 <http://www.pmg.org.za/report/20081024-department-trans-caledon-tunnel-authority-water-research-commission-a>).

¹³⁶ Ss 98 and 99 of the NEM:WA.

therefore remains a viable alternative to hold mines liable for AMD, but only insofar as it serves as a deterrent to present and future perpetrators. Again, criminal liability does not solve the historical aspects of the AMD crisis. Criminal measures and liability, as we have argued above, remain viable and often very effective environmental governance mechanisms, but they are restricted by their very nature in that they can punish and deter, not rehabilitate and restore. And as we have argued above, the success of criminal measures, because these are state-driven measures, will depend almost solely on the willingness and competency of the state to institute them.

3.5 Waste legislation

The NEM:WA contains a number of provisions that would apply to mines in the AMD context, especially in so far as their waste-related activities affect water resources and either cause and/or exacerbate the AMD problem. Section 1 of the Act defines waste as including:

... *any* substance, whether or not that substance can be reduced, re-used, recycled and recovered—

(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;

(b) which the generator has no further use of for (he purposes of production;

(c) that must be treated or disposed of; or

(d) that is identified as a waste by the Minister by notice in the *Gazette*, and includes waste generated by the *mining*, medical or other sector.¹³⁷

The definition specifically includes waste generated by the mining sector, but by virtue of its own exclusions,¹³⁸ the NEM:WA explicitly does not apply to residue deposits and stock piles of mines under the MPRDA, thereby excluding a significant amount of waste disposed of on land annually in South Africa, which is also a significant contributor to AMD. This, however, is the only type of mining waste that

¹³⁷ S 1 of the NEM:WA. Own emphasis.

¹³⁸ S 4(1)(b) of the NEM:WA.

is specifically excluded from the Act's application and, for the rest, it would apply to all other types of mining waste and waste-related activities.¹³⁹

Of particular importance for the potential impacts resulting from AMD formation are the Act's provisions that set out general duties with respect to waste management. AMD is not "residue deposits", but can be generated as a result of leachate from such deposits, and the facilities within which such AMD is captured will be regarded as waste management facilities under the Act. Section 16 states that a holder of waste, including a mine, must take all reasonable measures to avoid the generation of waste and, where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; and manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts.¹⁴⁰ It is also prohibited to dispose of waste, or knowingly or negligently cause or permit waste to be disposed of, in or on any land, water body or at any facility unless disposal is authorised by law, or to dispose of waste in a manner that is likely to cause environmental pollution or harm health and well-being.¹⁴¹

Furthermore, the treatment of water containing AMD is provided for by way of the requirement for waste management licences for listed activities as set out in sections 19 and 20.¹⁴² Section 26 also prohibits the unauthorised disposal of waste in or on land or in a water resource or at any facility. The prohibition includes disposal in a manner that is likely to cause environmental pollution or harm to health and well-being. These prohibitions and obligations are broadly reflective of the duty of care and virtually similar to the wide duty of care and liabilities established in terms of the MPRDA, NWA and NEMA. They clearly lay down very explicit obligations with respect

¹³⁹ The inclusion of all other mining waste is confirmed by the Act's widely defined notion of "waste", which includes "any substance". Own emphasis.

¹⁴⁰ S 16 of the NEM:WA.

¹⁴¹ S 26 of the NEM:WA.

¹⁴² Read with GN 779 in GG 32368 of 9 July 2009. Non-compliance is a criminal offence in terms of s 67(1)(a) of the NEM:WA.

to mining waste and could be used very effectively insofar as mining waste pollutes water resources and contributes to the formation of AMD.

Sections 35-41 of the Act, which recently came into effect¹⁴³, relate to contaminated land and extensively provide for measures to identify, investigate and remediate contaminated areas in South Africa. "Contaminated" is defined by the Act as "the presence in or under any land, site, buildings or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which substance or micro-organism directly or indirectly affects or may affect the quality of soil or the environment adversely".¹⁴⁴ A plain reading of this definition leaves little doubt that AMD formation could lead to "contaminated" land and/or that AMD formation could cause land to become contaminated. As a consequence, areas affected by AMD will be subject to the Act's provisions related to contaminated land. The provisions on contaminated land would apply also to existing AMD, even if the activities that led to the current AMD situation occurred before the commencement of the NEM:WA, or if the contamination arises or is likely to arise at a "different time from the actual activity that caused it"; a particular temporal characteristic of AMD.¹⁴⁵ The obligations and liabilities arising from the Act's provisions on contaminated land are explicitly retrospective and would also apply to historical activities and activities that not necessarily have occurred at the same time as the present contamination. More particularly, the Act provides that areas suspected of being contaminated may be identified by government and then investigated.¹⁴⁶ As part of the investigation, the mine may be directed to conduct an independent site assessment at its own cost.¹⁴⁷ On receipt of the assessment, government may declare the site to be contaminated and to be a remediation site and make "such a remediation order as may be necessary to neutralise that risk".¹⁴⁸ The order will be directed to the mine, which will bear the cost of carrying out the steps in the order. Apart from posing the useful possibility of creating additional statutory avenues to

¹⁴³ GN 331 in GG 37603 of 2 May 2014.

¹⁴⁴ S 1 of the NEM:WA.

¹⁴⁵ S 35 of the NEM:WA.

¹⁴⁶ S 36 of the NEM:WA.

¹⁴⁷ S 37 of the NEM:WA.

¹⁴⁸ S 38(2) of the NEM:WA.

force mines to address AMD, the provisions on contaminated land are important for another reason. Section 40 of the NEM:WA prohibits the transfer of contaminated land without informing the person to whom that land is to be transferred that the land is contaminated and, in the case of a remediation site, without notifying government or complying with any instructions from government to this extent. This provision would therefore make it very difficult for mining sites that are contaminated with AMD to be transferred to new owners without their having been remediated first.

4 A critique

At first glance it may seem that the environmental impacts of mining, including the impacts on water resources, are relatively well regulated and that the regulatory system could be used to address AMD. One would certainly come to this conclusion, especially in the light of the generous liability provisions encountered in the NEMA, the NWA, the NEM:WA and even the MPRDA. These provisions even go so far as to provide for liability for historic pollution; a particularly novel statutory innovation in the AMD context. These statutes also impose criminal liability, including the ability to hold the directors of mining companies responsible in their personal capacity, and financial provisions which aim to ensure that money is made available to remedy the effects of significant pollution stemming from AMD.

A more critical evaluation, however, reveals the significant problems in the regulatory (and political) net. The first and most obvious failure is that the liability framework, even though it operates retrospectively and despite its comprehensiveness, cannot hold the private sector to account for any damages caused by AMD if the owners of the mines do not exist any more. AMD is largely caused by defunct mines which are ownerless and no legal provision, however it is designed, can remedy this situation. What the law can do is to provide a comprehensive liability regime today and applicable to the future so that the current AMD disaster is not repeated many years from now. As for the existing cases of damage caused by AMD in the event of unidentifiable or non-existent liability addressees, it will be up to government and the taxpayer to foot the bill for now,

even though this militates against the very core of environmental governance principles such as life-cycle liability, polluter pays, and the duty of care.

Second, the relationship between the environmental regulatory regime set out in the main law governing mines (MPRDA) and "pure" environmental legislation (such as the NEMA, the NWA and the NEM:WA) has at best been uncomfortable and at worst strained. This is illustrated by the continuing inability of government to align or reconcile mining and environmental legislation despite amendments to these laws that seek to achieve greater alignment and reconciliation. For example, while the amendments to the NEMA and the MPRDA designed to bring the environmental regulation of mines into the fold of the Ministry designated with responsibility for and oversight of environmental governance have now commenced, proposed further amendments to the MPRDA by way of the *Mineral and Petroleum Resources Development Amendment Bill, 2013*, which was introduced into Parliament on 21 June 2013, may lead to greater fragmentation.¹⁴⁹ These proposed amendments seem to attempt to retain the Minister of DMR as the competent authority for environmental authorisations for mines, a move which is at odds with the recent amendments to the NEMA and the MPRDA. As long as the evident tension between the two statutory regimes exists, there will be little hope for proper invasive strategies that are sufficiently preventive and remediative as far as AMD is concerned, and a strong, consolidated response from government will remain elusive.

Third, as was explained above, provisions relating to mine closure do not effectively address scenarios where the effects of pollution may become apparent only some time after a closure certificate has already been issued. The financial remedies must be sufficient to address concerns of (future) temporal scale and at present they are not, both in terms of their quantum and the future time frame they apply to. Although this financial provision has to be revised on an annual basis, the calculation of the quantum of financial provision is determined by a departmental guideline that makes provision for three years of post-closure maintenance, which is wholly

¹⁴⁹ *Mineral and Petroleum Resources Development Amendment Bill* [B15-2013].

insufficient considering the pervasive pollution and damage-causing characteristics of AMD.¹⁵⁰ Also, as Humby¹⁵¹ correctly points out:

... the lack of any sort of fund or system of financial security to cover costs where a responsible party does not exist, is unable or refuses to pay is a fundamental stumbling block. Although the state is legally authorised to act, funds for this purpose would need to be appropriated by parliament on a case-by-case basis subject to the application of the strict laws governing public finance. The availability of funds for the ongoing treatment of AMD (and all other forms of pollution and environmental degradation) thus needs to compete with all the other pressing needs of a developing, and increasingly fragile, state. The result is a stalemate on remedial action.

One therefore requires a correction of the disproportionate pollution-remediation correlation in a financial sense, or at least a proper appreciation of the polluter pays principle in determining the extent of, and continuously revising, the financial provisions paid by mines for possible future pollution. The legislator will be well advised to amend existing legislation as soon as possible to address this concern, and it could consider providing for taxation-based measures to ensure greater financial guarantees in this respect.

Fourth, while the regulation of water use under the NWA is part and parcel of the custodial duty of the state, several mines seemingly operate without such licences. In a written reply to a question posed to her in the National Assembly asking her to indicate the number of mines operating without an appropriate licence, the Minister of Environmental and Water Affairs in October 2011 indicated this number to be approximately 70.¹⁵² This means that the Department of Water Affairs has effectively no control over water use at such mines and is unable to ensure compliance with the pollution prevention and remediation requirements of the NWA. Any action by such mines that may lead, contribute to, or exacerbate AMD therefore remains largely unregulated. Unless it is set on flouting its statutory and constitutional custodial duties, what is clearly required is a dedicated intervention by the government, and the Department of Water Affairs in particular, to undertake all necessary measures to correct this failure.

¹⁵⁰ Humby 2013 *Journal of Energy and Natural Resources Law* 458.

¹⁵¹ Humby 2013 *Journal of Energy and Natural Resources Law* 465.

¹⁵² Minister of Water and Environmental Affairs 2011 http://www.benchmarks.org.za/publications/mines_operating_without_water_use_licenses.pdf.

Fifth, while the NEM:WA was recently enacted to manage waste and regulate detrimental environmental degradation and pollution stemming from waste, residue deposits at mines that actually leach AMD are largely left outside of its purview. By virtue of its own exclusions,¹⁵³ the NEM:WA explicitly does not apply to residue deposits and stockpiles of mines under the MPRDA. This has the effect that mine tailings that leach ADM are not regulated by the Act, although the leached AMD falls within its purview. The legislature would be well advised to consider amending the NEM:WA to bring residue and stock piles within its regulatory scope if the NEM:WA is to make any meaningful contribution to regulating AMD.

Sixth, in 2010 government put together a task team, the Inter-Ministerial Committee (IMC) on AMD, comprising the Ministers of Mineral Resources, Water Affairs and Science and Technology, and the Minister in the Presidency: National Planning Commission. The IMC also commissioned a team of experts to assess and reappraise "the situation with respect to acid mine drainage, focusing on the Witwatersrand Gold Fields".¹⁵⁴ Their recommendations include:¹⁵⁵

- Water must be pumped from the three priority basins to maintain water levels at least below the relevant environmental critical levels or, by agreement with stakeholders, the lowest level of underground activity within the basin.
- Steps must be implemented to reduce the ingress of water into the underground workings as far as possible. This will reduce the volumes of water which need to be pumped and treated to more acceptable levels and consequently reduce the operational costs of AMD management.
- The water that will be pumped will not be of a suitable quality for productive use or discharge to river systems and will therefore need to be treated. In the short term, it is proposed that water be neutralised in a process that will address the low pH, high acidity and high iron and other metal content. In the medium- to

¹⁵³ S 4(1)(b) of the NEM:WA.

¹⁵⁴ *AMD Report* iv.

¹⁵⁵ *AMD Report* viii.

long term consideration should be given to steps that will reduce the mine water contribution to the salinity of major river systems.

- Improved monitoring of mine water, groundwater, surface water, seismicity, subsidence and other geotechnical impacts of mine flooding and related targeted research is required. It is recommended that a multi-institution monitoring committee be established to facilitate the implementation of the required monitoring and the necessary assessment programmes.
- The flooded mine voids are not the only sources of AMD in the Witwatersrand. Other sources, particularly mine residues, need to be monitored and appropriately remediated to reduce AMD impacts on the environment.
- The feasibility needs to be investigated of implementing a further environmental levy to be paid by operating mines in order to cover the costs of the legacies of past mining.¹⁵⁶
- The problems posed by AMD will have implications far into the future, with impacts likely to continue for many years. The process of management of these impacts will therefore need to continue, with on-going assessments and adaptation as conditions change.

The report focused on only one area in the country that is currently at risk. In essence what is required is that water-accumulating mines be continuously pumped and that the water be treated. While pumping and treating contaminated water are necessary technological interventions, some are of the opinion that this intervention "will have no impact on water quality in the Vaal River system, but will merely return the situation to what it was when the mines were still pumping, treating and releasing water from the mine void".¹⁵⁷ Nevertheless, while government will inevitably have to foot the bill for these costs, some responsibility will have to be borne by the mining sector as well.

¹⁵⁶ Whilst it is not clear how such a levy would operate, we believe that it would be in line with a number of principles included in environmental legislation and discussed in this chapter, including the polluter pays principle, the principle of life-cycle liability, and the BPEO.

¹⁵⁷ McCarthy 2011 *SAJS* 6.

Seventh, while technological interventions will play a critical role in addressing AMD, one must be cognisant of the realities of politics and socio-economic progress that go hand in hand with legal and governance processes, and specifically of the tremendous positive effects that prudent political and developmental decisions might have on the AMD crisis. McCarthy,¹⁵⁸ for example, notes the disturbing proliferation of applications for new mining permits in the Upper Vaal River Catchment, where much of South Africa's gold and coal deposits are located. Despite policy commitments to the contrary,¹⁵⁹ South Africa seems determined to proceed along the tracks of a carbon-intensive economy. Notably, it has recently commissioned two new coal-fired power stations which will only increase the country's appetite for fossil fuels. In addition to the evident environmental impacts of this increased demand, further mining in an area which is already plagued by AMD will only exacerbate this crisis.

Finally, comprehensive as it may be, the current statutory liability regime in South Africa is not necessarily a panacea for all AMD related impacts. Its effectiveness will necessarily depend on unwavering political will, sufficient human and financial resources and dedicated interventions from all relevant government departments, in close cooperation with the private sector, to find suitable solutions for the AMD crisis in South Africa - a crisis which is set to test the South African environmental governance effort to its very limits.

¹⁵⁸ McCarthy 2011 *SAJS* 5.

¹⁵⁹ Department of Economic Development 2011 <http://www.info.gov.za/view/DownloadFileAction?id=159756>; Government of the Republic of South Africa 2011 http://www.environment.gov.za/PolLeg/WhitePapers/national_climatechange_response_whitepaper.pdf.

BIBLIOGRAPHY***Literature***

Burns and Kidd "Administrative Law"

Burns Y and Kidd M "Administrative Law and Implementation of Environmental Law" in Strydom HA and King ND (eds) *Fuggle and Rabie's Environmental Management in South Africa* 2nd ed (Juta Cape Town 2009) 243-257

Coetzee, Winde and Wade *Assessment of Sources*

Coetzee H, Winde F and Wade PW *An Assessment of Sources, Pathways, Mechanisms and Risks of Current and Potential Future Pollution of Water and Sediments in Gold-mining Areas of the Wonderfonteinspruit Catchment* (Water Research Commission Pretoria 2006)

Day "Rivers and Wetlands"

Day JA "Rivers and Wetlands" in Strydom HA and King ND (eds) *Fuggle and Rabie's Environmental Management in South Africa* 2nd ed (Juta Cape Town 2009) 842-867

DEAT *State of Environment Report*

Department of Environmental Affairs and Tourism *State of Environment Report* (The Department Pretoria 2006)

De Nicola and Stapleton 2002 *Environmental Pollution*

De Nicola D and Stapleton M "Impact of Acid Mine Drainage on Benthic Communities in Streams: The Relative Roles of Substratum vs. Aqueous Effects" 2002 *Environmental Pollution* 303-315

Du Plessis and Kotzé 2007 *Stell LR*

Du Plessis W and Kotzé LJ "Absolving Historical Polluters from Liability through Restrictive Judicial Interpretation: Some Thoughts on Bareki No v Gencor Ltd" 2007 *Stell LR* 161-193

Durand, Meeuis and Fourie 2010 *Journal for Transdisciplinary Research in Southern Africa*

Durand J, Meeuis J and Fourie M "The Threat of Mine Effluent to the UNESCO Status of the Cradle of Humankind World Heritage Site" 2010 *Journal for Transdisciplinary Research in Southern Africa* 73-92

DWA *National Water Resource Strategy*

Department of Water Affairs *National Water Resources Strategy* 2nd ed (The Department Pretoria 2013)

DWAF *Management of the Water Resources*

Department of Water Affairs and Forestry *Management of the Water Resources of the Republic of South Africa* (The Department Pretoria 1986)

DWAF *National Water Resources Strategy*

Department of Water Affairs and Forestry *National Water Resources Strategy* (The Department Pretoria 2004)

DWAF *White Paper*

Department of Water Affairs and Forestry *White Paper on a National Water Policy for South Africa* (The Department Pretoria 1997)

Expert Team *AMD Report*

Expert Team of the Inter-Ministerial Committee under the Coordination of the Council for Geoscience *Report to the Inter-ministerial Committee on Acid Mine Drainage: Mine Water Management in the Witwatersrand Goldfields with Special Emphasis on Acid Mine Drainage* (The Committee Pretoria 2010)

Feris "Human Rights and Locus Standi"

Feris L "Human Rights and Locus Standi" in Kotzé L and Paterson A *Compliance and Enforcement in Environmental Law* (Juta Cape Town 2009) 129-151

Feris 2012 *Law, Environment and Development*

Feris L "The Public Trust Doctrine and Liability for Historic Water Pollution in South Africa" 2012 *Law, Environment and Development* 1-22

French *International Law*

French D *International Law and Policy of Sustainable Development* (Juris Manchester 2005)

Garland 2012 *Quest*

Garland R "Acid Mine Drainage: Can it Affect Human Health?" 2012 7(4) *Quest* 46-47

Gerhardt, Janssens de Bisthoven and Soares 2004 *Environmental Pollution*

Gerhardt A, Janssens de Bisthoven L and Soares AMVM "Macroinvertebrate Response to Acid Mine Drainage: Community Metrics and On-line Behavioural Toxicity Bioassay" 2004 *Environmental Pollution* 263-274

Government of the RSA *Background Information and Discussion Document*

Government of the Republic of South Africa *Background Information and Discussion Document to Facilitate the Climate Change Policy Engagement* (GCIS Pretoria 2010)

Hobbs *Parliamentary Briefing Paper*

Hobbs P *Parliamentary Briefing Paper on Acid Mine Drainage: Annexure 'B' of CSIR Report No. CSIR/NRE/WR/IR/2008/0079/C* (CSIR Pretoria 2008)

Humby 2007 *SAJELP*

Humby T "Letting Polluters Off the Hook? The Impact of *Bareki no v Gencor Ltd* 2006 (1) SA 432 (T) on the Reach of s 28 of the National Environmental Management Act 107 of 1998" 2007 *SAJELP* 105-123

Humby 2013 *Journal of Energy and Natural Resources Law*

Humby T "The Spectre of Perpetuity Liability for Treating Acid Water on South Africa's Goldfields: Decision in *Harmony II*" 2013 *Journal of Energy and Natural Resources Law* 453-466

Johnson and Hallberg 2005 *Science of the Total Environment*

Johnson D and Hallberg K "Acid Mine Drainage Options: A Review" 2005
Science of the Total Environment 3-14

Kidd "Criminal Measures"

Kidd M "Criminal Measures" in Paterson A and Kotzé LJ *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta Cape Town 2009) 240-265

King, Maree and Muir "Freshwater Systems"

King NA, Maree G and Muir A "Freshwater Systems" in Strydom HA and King ND (eds) *Fuggle and Rabie's Environmental Management in South Africa* 2nd ed (Juta Cape Town 2009) 425-454

Kleinman *Acid Mine Drainage*

Kleinman R *Acid Mine Drainage: US Bureau of Mines Researches Control Methods for Coal and Metal Mines* (US Bureau of Mines Washington DC 1989)

Kotzé 2007 *SAPL*

Kotzé LJ "Revisiting the South African Integrated Pollution Prevention and Control (IPPC) Regime: A Critical Survey of Recent Developments" 2007 *SAPL* 34-60

Kotzé "Environmental Governance"

Kotzé LJ "Environmental Governance" in Paterson AR and Kotzé LJ (eds) *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta Cape Town 2009) 103-125

Kotzé 2010 *JHRE*

Kotzé LJ "Phiri, the Plight of the Poor and the Perils of Climate Change: Time to Rethink Environmental and Socio-economic Rights in South Africa?" 2010 *JHRE* 135-160

Kotzé *et al* 2007 *SAJELP*

Kotzé LJ *et al* "Strategies to Integrate Environmental Policy at the Operational Level: Towards an Integrated Framework for Environmental Authorisations" 2007 *SAJELP* 57-81

Kotzé and Bates 2012 *U Denv Water L Rev*

Kotzé LJ and Bates R "Similar but Different: Comparative Perspectives on Access to Water in Australia and South Africa" 2012 *U Denv Water L Rev* 221-274

Kotzé and Lubbe 2009 *SAJELP*

Kotzé LJ and Lubbe N "How (Not) to Silence a Spring: The Stilfontein Saga in Three Parts" 2009 *SAJELP* 49-77

Kysar *Regulating from Nowhere*

Kysar D *Regulating from Nowhere: Environmental Law and the Search for Objectivity* (Yale University Press Yale 2010)

McCarthy 2011 *SAJS*

McCarthy TS "The Impact of Acid Mine Drainage in South Africa" 2011 107(5/6) *SAJS* 1-7

Mine Water Research Group *Desktop Assessment*

Mine Water Research Group, North-West University *Desktop Assessment of the Risk for Basement Structures of Buildings of Standard Bank and ABSA in Central Johannesburg to be affected by Rising Mine Water Levels in the Central Basin* [confidential report on file with the authors]

Nealer 2009 *Journal for Transdisciplinary Research in Southern Africa*

Nealer E "Municipal Governance and Environmental Crises: Threats and Thoughts" 2009 *Journal for Transdisciplinary Research in Southern Africa* 73-85

Nel and Wessels 2010 *PELJ*

Nel J and Wessels J "How to Use Voluntary, Self-Regulatory and Alternative Environmental Compliance Tools: Some Lessons Learnt" 2010 *PELJ* 48-79

Oberholster *et al* 2012 *Ecotoxicology and Environmental Safety*

Oberholster P *et al* "Bioaccumulation of Aluminium and Iron in the Food Chain of Lake Loskop, South Africa" 2012 *Ecotoxicology and Environmental Safety* 134-141

Pinetown and Boer *Quantitative Evaluation of the Modal Distribution*

Pinetown K and Boer R *A Quantitative Evaluation of the Modal Distribution of Minerals in Coal Deposits in the Highveld Area and the Associated Impact on the Generation of Acid and Neutral Mine Drainage* (Water Research Commission Pretoria 2006)

Ryan 2001 *Environmental Law*

Ryan E "Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resource Management" 2001 *Environmental Law* 477-499

Tempelhoff and Winde "Acid Mine Drainage"

Tempelhoff J and Winde F "Acid Mine Drainage in South Africa: Policy, Economic Issues and Public Concerns" in Katko P, Juuti P and Schwartz K (eds) *Water Services Management and Governance: Past Lessons for a Sustainable Future* (IWA London 2013) 77-88

Turton 2009 *Journal for Transdisciplinary Research in Southern Africa*

Turton A "The Role of Science in Deepening Democracy: The Case for Water in Post-Apartheid South Africa" 2009 *Journal for Transdisciplinary Research in Southern Africa* 9-28

UN Commission on Sustainable Development "Paper No 3"

UN Commission on Sustainable Development "Paper No 3" in the *Report of the Expert Group Meeting on Identification of Principles of International Law for Sustainable Development* (26-28 September 1995 Geneva)

Van der Schyff 2010 *PELJ*

Van der Schyff E "Unpacking the Public Trust Doctrine: A Journey into Foreign Territory" 2010 *PELJ* 122-159

Van der Schyff 2013 *SALJ*

Van der Schyff E "Stewardship Doctrines of Public Trust: Has the Eagle of Public Trust Landed on South African Soil?" 2013 *SALJ* 369-389

Van der Schyff and Viljoen 2008 *Journal for Transdisciplinary Research in Southern Africa*

Van der Schyff E and Viljoen G "Water and the Public Trust Doctrine: The South African Perspective" 2008 *Journal for Transdisciplinary Research in Southern Africa* 339-353

Van Reenen 1997 *SAJELP*

Van Reenen TP "Constitutional Protection of the Environment: Fundamental (Human) Right or Principle of State Policy?" 1997 *SAJELP* 270-273

Van Vuuren 2010 *Water Wheel*

Van Vuuren L "AMD: Local Solutions for Local Challenges" 2010 Sep/Oct *The Water Wheel* 28-30

Young 2011 *International Journal of the Commons*

Young OR "Land Use, Environmental Change, and Sustainable Development: The Role of Institutional Diagnostics" 2011 *International Journal of the Commons* 66-85

Case law

Bareki v Gencor Ltd 2006 1 SA 432 (T)

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

Federation for Sustainable Environment v Minister of Water Affairs 2012 ZAGPPHC 128 (10 July 2012)

Federation for Sustainable Environment v Minister of Water Affairs 2012 ZAGPPHC 170 (15 August 2012)

Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province 2007 6 SA 4 (CC)

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

Harmony Gold Mining Company Ltd v Regional Director: Free State Department of Water Affairs 2012 ZAGPPHC 127 (29 June 2012)

Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products 2004 2 SA 393 (E)

Kebble v Minister of Water Affairs 2007 SCA 111

Maccsand (Pty) Ltd v City of Cape Town 2012 4 SA 181 (CC)

McCarthy v Constantia Property Owners' Association 1999 4 SA 847 (C)

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

Minister of Water Affairs and Forestry v Stilfontein Gold Mining Company Limited 2006 ZAGPHC 47 (15 May 2006)

Legislation

Constitution of the Republic of South Africa, 1996

Constitution of the State of Pennsylvania, 1776

Land Use Planning Ordinance 15 of 1985

Mineral and Petroleum Resources Development Act 28 of 2002

Mineral and Petroleum Resources Development Amendment Act 49 of 2008

National Environmental Management Act 107 of 1998 (NEMA)

National Environmental Management Amendment Act 62 of 2008

National Environmental Management Amendment Act 14 of 2009

National Environmental Management: Waste Act 59 of 2008

National Water Act 36 of 1998 (NWA)

Water Services Act 108 of 1997 (WSA)

International instruments

Report of the World Commission on Environment and Development (1987)

Rio Declaration on Environment and Development (1992)

Government publications

GN R 704 in GG 20119 of 4 June 1999 (Regulations in terms of section 26 of the National Water Act on the Use of Water for Mining and Related Activities aimed at the Protection of Water Resources)

GN 779 in GG 32368 of 9 July 2009

GN 331 in GG *Gazette* 37603 of 2 May 2014 (National Norms and Standards for the Remediation of Contaminated Land and Soil Quality in the Republic of South Africa)

Mineral and Petroleum Resources Development Amendment Bill [B15-2013]

Internet sources

Anon 2011 <http://mg.co.za/specialreport/acid-mine-drainage>

Anon 2011 *Special Report: Acid Mine Drainage*
<http://mg.co.za/specialreport/acid-mine-drainage> accessed 18 May 2014

Botha, Botha and Genthe 2012 <http://researchspace.csir.co.za/dspace/handle/10204/6258>

Botha S, Botha A and Genthe B 2012 *An In-vitro Assessment of the Genotoxic Impacts of Acid Mine Drainage in the Human MCF7 Cell Line*
<http://researchspace.csir.co.za/dspace/handle/10204/6258> accessed 8 May 2014

Department of Economic Development 2011 <http://www.info.gov.za/view/DownloadFileAction?id=159756>

Department of Economic Development 2011 *Green Economy Accord Signed at COP17 Durban* <http://www.info.gov.za/view/DownloadFileAction?id=159756> accessed 5 May 2013

Funke, Nienaber and Gioia 2012 <http://researchspace.csir.co.za/dspace/handle/10204/5841>

Funke N, Nienaber S and Gioia C 2012 *An Interest Group at Work: Environmental Activism and the Case of Acid Mine Drainage on Johannesburg's West Rand* <http://researchspace.csir.co.za/dspace/handle/10204/5841> accessed 8 May 2014

Government of the RSA 2011 http://www.environment.gov.za/PolLeg/WhitePapers/national_climatechange_response_whitepaper.pdf

Government of the Republic of South Africa 2011 *National Climate Change Response White Paper* http://www.environment.gov.za/PolLeg/WhitePapers/national_climatechange_response_whitepaper.pdf accessed 15 May 2013

INAP date unknown <http://www.inap.com.au/>

International Network for Acid Prevention date unknown *INAP: Addressing a Global Need* <http://www.inap.com.au/> accessed 8 May 2014

Jennings, Neuman and Blicker 2008 http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf

Jennings SR, Neuman DR and Blicker PS 2008 *Acid Mine Drainage and Effects on Fish Health and Ecology: A Review* http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf accessed 8 May 2014

Manders, Godfrey and Hobbs 2009 http://www.csir.co.za/nre/docs/BriefingNote2009_2_AMD_draft.pdf

Manders P, Godfrey L and Hobbs P 2009 *Acid Mine Drainage in South Africa: Briefing Note 2009/02* http://www.csir.co.za/nre/docs/BriefingNote2009_2_AMD_draft.pdf accessed 21 October 2011

Minister of Water and Environmental Affairs 2011 http://www.benchmarks.org.za/publications/mines_operating_without_water_use_licenses.pdf

Minister of Water and Environmental Affairs 2011 *National Assembly: Question 3327 for Written Reply* http://www.benchmarks.org.za/publications/mines_operating_without_water_use_licenses.pdf

marks.org.za/publications/mines_operating_without_water_use_licenses.pdf
accessed 19 May 2013

South African Treasury 2013 <http://www.treasury.gov.za/documents/national%20budget/2013/review/FullReview.pdf>

South African Treasury 2013 *Budget Review 2013*
<http://www.treasury.gov.za/documents/national%20budget/2013/review/FullReview.pdf> accessed 19 May 2013

Trans Caledon Tunnel Authority 2008 <http://www.pmg.org.za/report/20081024-department-trans-caledon-tunnel-authority-water-research-commission-a>
Trans Caledon Tunnel Authority 2008 *Department, Trans-Caledon Tunnel Authority and Water Research Commission: Annual Report, Presentations and Implementation Review of National Water Act* <http://www.pmg.org.za/report/20081024-department-trans-caledon-tunnel-authority-water-research-commission-a> accessed 3 December 2013

Trans Caledon Tunnel Authority 2011 <http://www.pmg.org.za/report/20110907-department-water-and-environmental-affairs-briefing-acid-mine-drainag>
Trans Caledon Tunnel Authority 2011 *Acid Mine Drainage Progress Reports: Department, Trans Caledon Tunnel Authority, and Mintek*
<http://www.pmg.org.za/report/20110907-department-water-and-environmental-affairs-briefing-acid-mine-drainag> accessed 3 December 2013

WWF 2012 http://awsassets.wwf.org.za/downloads/summary_mining_report_8aug.pdf
World Wildlife Fund 2012 *Financial Provisions for Rehabilitation and Closure in South African Mining: Discussion Document on Challenges and Recommended Improvements* http://awsassets.wwf.org.za/downloads/summary_mining_report_8aug.pdf accessed 19 May 2013

LIST OF ABBREVIATIONS

AMD	Acid mine drainage
BEE	Black Economic Empowerment
BPEO	Best practicable environmental option
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
EMS	Environmental Management System
IMC	Inter-Ministerial Committee
JHRE	Journal of Human Rights and the Environment
LUPO	Land Use Planning Ordinance
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEM:WA	National Environmental Management: Waste Act
NWA	National Water Act
PELJ	Potchefstroom Electronic Law Journal
SAJELP	South African Journal of Environmental Law and Policy
SAJS	South African Journal of Science
SALJ	South African Law Journal
SAPL	SA Public Law
Stell LR	Stellenbosch Law Review
U Denv Water L Rev	University of Denver Water Law Review
UN	United Nations
WSA	Water Services Act
WWF	World Wildlife Fund

THE REGULATION OF ACID MINE DRAINAGE IN SOUTH AFRICA: LAW AND GOVERNANCE PERSPECTIVES**L Feris*****LJ Kotzé******SUMMARY**

Acid mine drainage (AMD) is arguably one of the most serious environmental concerns in South Africa. AMD is a legacy left behind by abandoned, derelict and defunct mines, and is a continuing by-product of existing mining activities. In addition to its environmental impacts, AMD will also impact on all the parameters of sustainability, including ecological, social and economic concerns. In particular, AMD is set to affect infrastructure, displace people and affect their livelihoods, influence economic activity, impact on the resource extraction industry, and affect South Africa's policies and actions in relation to climate change and its efforts to move towards a low carbon economy; and it will test the efficiency of regulatory interventions emanating from both the private and the public sector to the extreme. Given these pervasive challenges, in this article we provide a survey of the AMD problem in South Africa through the law and governance lens. We commence by highlighting the various issues and challenges that result from AMD in the environmental context on the one hand, and the law and governance context on the other hand. We then describe the many provisions of the regulatory framework that we believe would be instrumental in responding to the threat. We conclude the article with brief remarks on what we believe are important considerations in the future regulation of AMD.

* Loretta Feris. BA Law LLB (US), LLM (Georgetown), LLD (US). Professor of Law, Institute of Marine and Environmental Law, University of Cape Town. Email: Loretta.Feris@uct.ac.za.

** Louis J Kotzé. BCom LLB LLM (PU for CHE), LLD (NWU). Professor of Law, Faculty of Law, North-West University, Potchefstroom Campus. Visiting Professor of Environmental Law, Lincoln University, United Kingdom. Email: louis.kotze@nwu.ac.za. The authors wish to extend their sincere thanks to Carin Bosman (Carin Bosman Sustainability Services) and Prof Tracy Humby (Wits) for their helpful comments on an earlier draft of this article. All errors remain our own. This research was made possible in part by generous funding from the Finnish Academy under the auspices of the Water Security Project (WATSEC).

KEYWORDS: acid mine drainage; environment; mining; environmental law; environmental governance; water pollution; environmental right; sustainable development; *Constitution; National Water Act; National Environmental Management Act; National Environmental Management: Waste Act.*