



Mining and Biodiversity Guideline

Mainstreaming biodiversity into the mining sector



Environmental Affairs
Mineral Resources



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Mainstreaming biodiversity into the mining sector

The mining industry plays a vital role in the growth and development of South Africa and its economy. Since the earliest discoveries of minerals in the region, this rich endowment of mineral resources has been a key driver of South Africa's social and economic development. Mining continues to be one of the most significant sectors of our economy, providing jobs and growing our gross domestic product.

On par with this mineral wealth are exceptional endowments of biodiversity and ecosystems. South Africa is globally renowned as a megadiverse country that harbours an extraordinary number of species in relation to most other countries. This rich biodiversity and ecological infrastructure underpin and support our social and economic development in numerous direct and indirect ways. However, it is currently impacted upon by mining and other land uses in ways that are not sustainable. Sustaining the goods and services that flow from our biodiversity assets, and the benefits that these provide over the long term, will require limits in mining and other activities in certain areas. South Africa's Constitution and the laws stemming from it recognise the vital role of both ecological and mineral resources in a development path built upon the socially just, environmentally sustainable and economically efficient use of these resources. How then, can we develop both our mineral and ecological resources to grow our economy, create more jobs and improve human well-being – now and into the future? Taking stock of what we have and where, allows us to be proactive and make informed decisions about future land-use planning at various scales for South Africa's optimal growth path.



Guiding good decision-making in the mining sector

The Mining and Biodiversity Guideline provides a tool to facilitate the sustainable development of South Africa's mineral resources in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. It provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during all phases of the mining life cycle from exploration through to closure. The Guideline does not introduce new concepts or requirements but rather draws together all relevant information and presents it in a user-friendly format. From a business perspective, the Guideline explains the value for mining companies of adopting a risk-based approach to managing biodiversity. The early identification and assessment of mining impacts on biodiversity provides an opportunity to put in place environmental management plans and actions that reduce risks to biodiversity, people and business.

The Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. South Africa has some of the best biodiversity science in the world and is at the forefront of making information available in a useful context to policymakers, decision-makers and practitioners. Such biodiversity information and tools assist with laying the foundation for effective management and monitoring of biodiversity, and informing decisions on land-use planning to ensure an optimal development future.





The business case for integrating biodiversity into mining

Biodiversity considerations are relevant throughout the mining life cycle - from discovery or reconnaissance, to exploration or prospecting, development and production, and finally to decommissioning and closure. Authorisations are required at various stages of the exploration or exploitation of mineral resources.

From a business risk perspective, it is optimal to identify biodiversity constraints for project development early in the mining life cycle. The costs of fixing problems or retrofitting solutions during operational stages are inevitably greater than avoiding or preventing those problems through early detection.

Mining companies are generally aware of the possible obstacle that areas of high biodiversity value can pose to mining projects, but even in cases where direct biodiversity risks are assessed, there is often a failure to fully consider the interdependencies between mining, biodiversity and society in the assessment of impacts. This can result in a failure to identify significant risks associated with a proposed mining project because impacts on biodiversity affect a range of ecosystem services, which translate into implications for human well-being (livelihoods, safety, security and health).

The identification of these impacts at an early stage - based on proper consideration of biodiversity information - can streamline decisions about where, or where not, to develop mines, as well as about how to develop them. It is becoming good business practice to incorporate appropriate scientific methodologies that encompass all levels of assessment of impact on biodiversity and ecosystem services, stakeholder engagement, and comprehensive economic valuation of the affected areas into business decision-making. This is not least because early assessment of biodiversity impacts helps to:

- Reduce risk to biodiversity if appropriate mitigation action is taken.
- Avoid delay in authorisations, and reduce delays caused by appeals.
- Reduce risk to the company by avoiding reputational damage and unexpected costs, and/or difficulty in accessing finance.
- Obtain 'buy-in' from local communities (or a 'social licence to operate').
- Reduce risk to society of deteriorating ecosystem services and loss of biodiversity, from local to national scale, over the short, medium and long term.

How to mitigate biodiversity risks related to mining

The primary purpose of the Guideline is to improve consistency in dealing with biodiversity issues. It gives direction on how to avoid important biodiversity completely, minimise impacts through careful design and operation, rehabilitate where feasible and/or offset significant residual mining impacts, as part of a thorough environmental impact assessment (EIA) and robust environmental management programme (EMP). Importantly, this is a guideline to aid the integration of biodiversity issues into the mining life cycle rather than a set of rules which can be applied unilaterally without interpretation or interrogation. The mitigation of negative impacts on biodiversity and ecosystem services is a legal requirement and should take on different forms depending on the significance of the impact and the area being affected. Mitigation requires proactive planning that is enabled by following the mitigation hierarchy, illustrated in Figure A. Its application is intended to avoid disturbance of ecosystems and loss of biodiversity, and where they cannot be avoided altogether, to minimise, rehabilitate, and then finally offset any significant residual negative impacts on biodiversity.



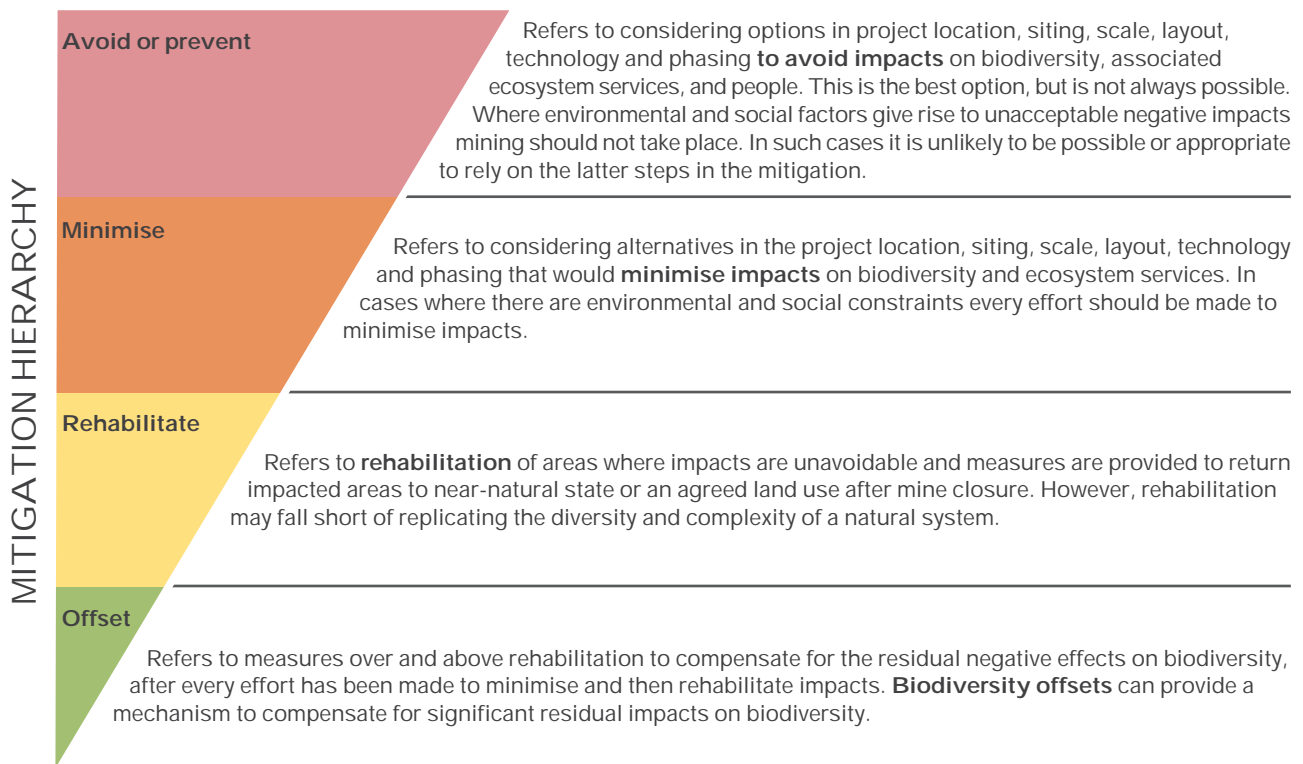


Figure A. Mitigation Hierarchy: Companies should first strive to avoid disturbance of ecosystems and loss of biodiversity, and where they cannot be avoided altogether, to minimise, rehabilitate or offset any residual negative impacts on biodiversity.

Six principles for getting it right

Six principles for integrating biodiversity into mining-related decisions are described in the Mining and Biodiversity Guideline. Considerations with respect to the six principles are described for each stage of the mining life cycle (reconnaissance, prospecting, mining or production, and decommissioning and closure), including the implications for mining companies and decision makers. The potential impacts of mining on biodiversity, the administrative requirements, the principles that should underpin consideration of biodiversity at each stage, and the biodiversity tools available to limit impacts and reduce risk to biodiversity are discussed for each stage. A range of tools and guidelines exist to support the application of these six principles.

1. Apply the law (as a minimum)

South Africa has sound environmental legislation aimed at achieving sustainable development, including laws that support public participation, impact assessment and environmental management. A network of legislation exists in South Africa that is geared towards sustainable development and the conservation and management of our country's rich biodiversity. Part of this fabric is the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA), which is the main piece of legislation governing all stages of the mining and petroleum production process in South Africa.

The Minister of Mineral Resources, responsible for implementing the MPRDA, is specifically tasked to “ensure the sustainable development of South Africa’s mineral and petroleum resources within a framework of national environmental policy, norms and standards while promoting economic and social development”. To ensure this, the MPRDA stipulates that the principles of the National Environmental Management Act (No. 107 of 1998) (NEMA) apply to all mining, and serve as guidelines for the interpretation, administration and implementation of the environmental requirements of the MPRDA.





As a consequence, a holder of a mining permission/right/permit:

- o Must consider, investigate, assess and communicate the impact of their activities on the environment comprehensively.
- o Must, as far as is reasonably practicable, rehabilitate the environment to its natural or predetermined state, or to a land use which conforms to the generally accepted principle of sustainable development.
- o Is responsible for environmental damage, pollution or ecological degradation as a result of reconnaissance, prospecting or mining operations which may occur inside and outside the boundaries of the areas to which such right, permission or permit relates.
- o Must ensure that it will take place within the framework of national environmental management policies, norms and standards.

To ensure this, the MPRDA includes some key legal and regulatory mechanisms such as the Environmental Management Plan (EMP; explained further in principle 5), the MPRDA Pollution Control and Waste Management Regulations (which ensures that water management, soil erosion and pollution control comply with applicable legislative requirements) and Section 49 of the MPRDA (through which the Minister of Mineral Resources may prohibit or restrict the granting of any permission/permit/right in specific areas, including certain areas of critical biodiversity, heritage and hydrological importance).

In addition to the MPRDA, mining companies also need to comply with a range of other laws which regulate mining impacts on the environment. The Constitution of the Republic of South Africa enshrines the right 'to an environment that is not harmful to their health or well-being'.

NEMA sets out environmental management principles that support this, and other Specific Environmental Management Acts (SEMAs) that should guide decision-making throughout the mining life cycle. Disturbance of ecosystems, loss of biodiversity, pollution or degradation of the environment, as well as sites that constitute the nation's cultural heritage, should be avoided, minimised, rehabilitated, or as a last option offset. This is supported by the Biodiversity Act as it relates to loss of biodiversity and by the Environmental Impact Assessment Regulations (GN No. R. 543) published in terms of NEMA; which guide the identification, assessment and evaluation of impacts, and the determination of appropriate mitigation measures required for various listed activities.



Water Use Authorisations under the National Water Act (No. 36 of 1998) are required by most mining operations. In addition, mine-water regulations (Government Notice (GN) No. R. 704) are aimed at ensuring the protection of water resources. Finally the National Environmental Management Protected Areas Act (No. 57 of 2003) prohibits mining and prospecting in protected areas. In addition, other legislation such as the National Heritage Resources Act (No. 25 of 1999) and various land use planning ordinances and zoning schemes may apply. It is a legal requirement that this stage commences only once all of the required authorisations have been approved, including the water use license and any environmental authorisations for associated activities.

2. Use the best available biodiversity information

South Africa, unlike many other countries, generally has very good quality biodiversity information, and this provides a sound basis for decision-making with due consideration for biodiversity. Spatial biodiversity planning has supported the identification of biodiversity priority areas that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services.

Biodiversity priority areas are the areas - or assets - in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. These ecosystem services are vital to people and economic activities downstream of ecosystem service flows. Their loss would be difficult or in some cases impossible to compensate or offset; there are no cost-effective substitutes for many of the services they deliver. These biodiversity assets are mapped on Figure B.

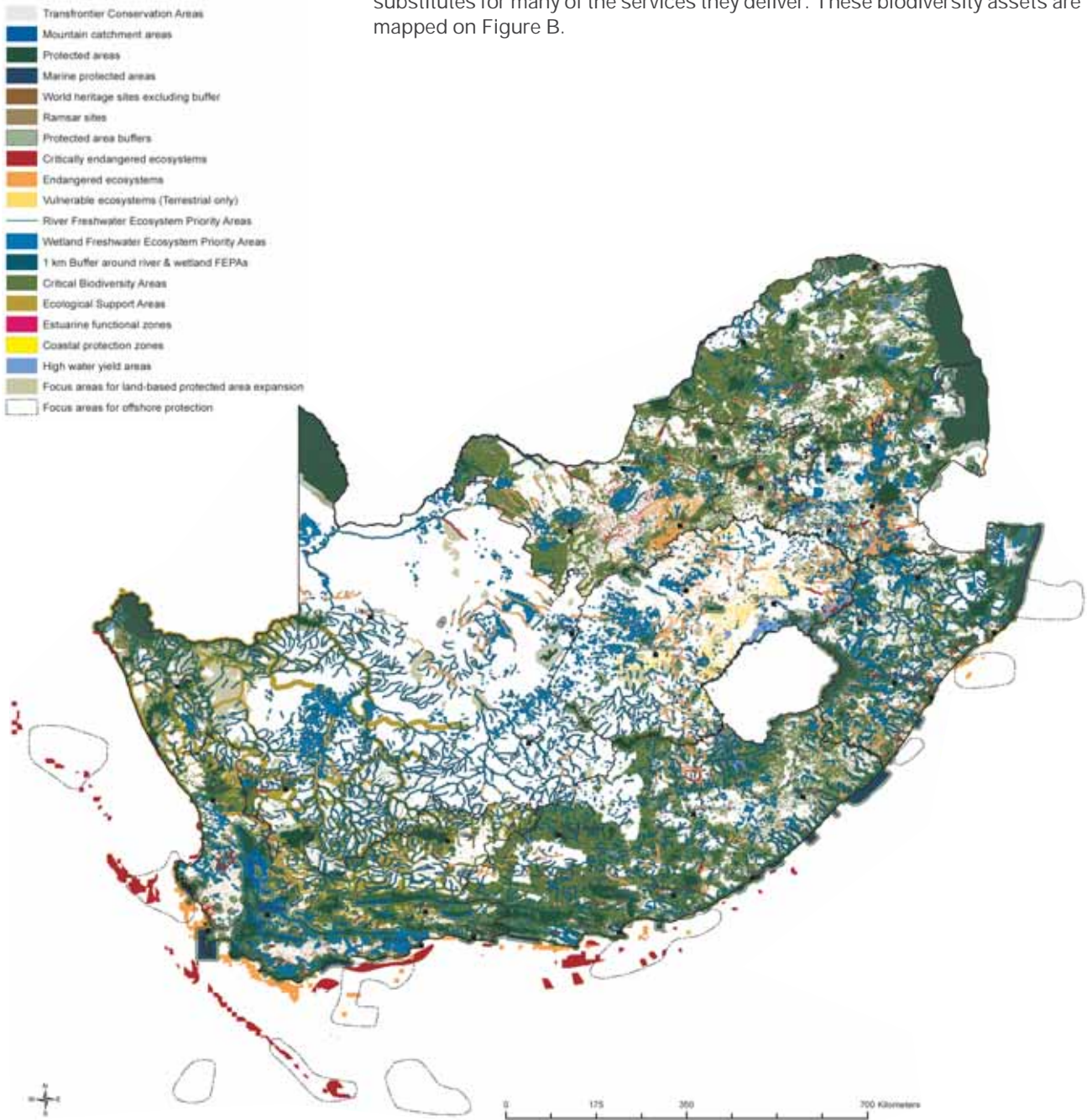


Figure B: Biodiversity priority areas are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services.

Biodiversity priority areas should inform and influence spatial land use policies and plans, including policies and plans for mineral development. The biodiversity features in these biodiversity priority areas are likely to be vulnerable to the impacts of mining activities. Hence such activities may be prohibited by law or will be subject to scrutiny and potentially limited because of biodiversity considerations.

This Guideline identifies four categories of biodiversity priority areas in relation to their importance from a biodiversity point of view and the business risk this presents to mining companies. These are listed in Table A and illustrated in Figure C.

This guides the appropriate identification, assessment, evaluation and management of potential biodiversity impacts. For mining companies the table and map can be used to assess the level of risk for investment in new mining projects, implications for current mining operations, and to inform the application of the mitigation hierarchy to reduce impacts on biodiversity in these areas. For regulatory authorities this table should be used to apply the law in areas where mining is prohibited (Category A) and to ensure that in other categories there is rigorous evaluation of the biodiversity content of applications and that the mitigation hierarchy is appropriately applied to reduce impacts on biodiversity in these areas. The full explanations of each biodiversity priority area, including their legal standing and/or recognized importance are given in Chapter 3.2. of the Guidelines. Importantly, these data should be confirmed by site level investigation and supplemented with additional information on features such as red listed species.

Proponents of a mining activity in a biodiversity priority areas, especially in those areas of higher biodiversity importance, should demonstrate that:

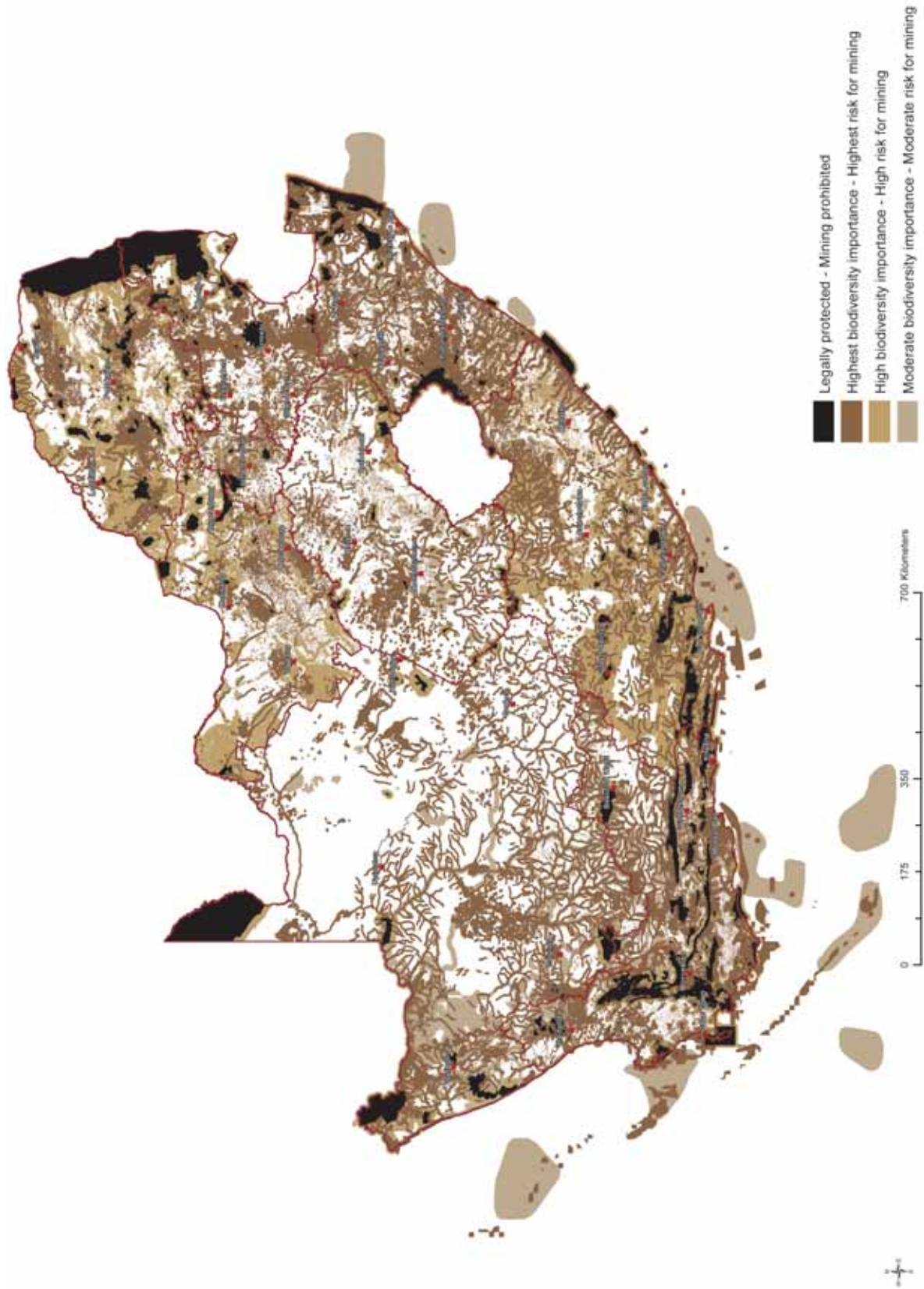
- There is significant cause to mine in these areas, that it is in the national interest, and that viable alternatives outside biodiversity priority areas are not available.
- Biodiversity impacts have been comprehensively assessed.
- The mitigation hierarchy has been systematically applied and alternatives rigorously considered.
- Mitigation measures have been incorporated into a robust EMP; and good practice environmental management is followed, and monitoring and compliance enforcement is ensured.



Table A. Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

Category	Biodiversity priority areas	Risk for mining	Implications for mining
A. Legally protected	<ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) 	Mining prohibited	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it. In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>
B. Highest biodiversity importance	<ul style="list-style-type: none"> Critically Endangered and Endangered ecosystems Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs Ramsar Sites 	Highest risk for mining	<p>Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being. An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully take into account the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts, and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
C. High biodiversity importance	<ul style="list-style-type: none"> Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) Other identified priorities from provincial spatial biodiversity plans High water yield areas Coastal Protection Zone Estuarine functional zone <p>*Note that the status of buffer areas of World Heritage Site is subject to a current intra-governmental process.</p>	High risk for mining	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, for maintaining important ecosystem services for particular communities or the country as a whole. An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. Mining options may be limited in these areas, and limitations for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
D. Moderate biodiversity importance	<ul style="list-style-type: none"> Ecological support areas Vulnerable ecosystems Focus areas for protected area expansion (land-based and offshore protection) 	Moderate risk for mining	<p>These areas of moderate biodiversity value. EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>

Figure C. Biodiversity priority areas vulnerable to the impacts of mining categorised into four categories. More detailed, higher resolution maps and underlying data will be made available on the South African National Biodiversity Institute's B-GIS website. (<http://bgis.sanbi.org>)





3. Engage relevant stakeholders thoroughly

Engaging thoroughly with appropriate stakeholders is the third principle of good biodiversity decision-making. Stakeholder engagement on biodiversity issues is central to the integration of biodiversity and ecosystem services into the impact assessment process and should begin early on, particularly when biodiversity priority areas are affected. Note that many of these processes are part of, and embedded in, existing legal processes and requirements such as EIAs and EMPs.

Mines can often obtain a wealth of input from biodiversity stakeholders, and should consider them as important sources of information, stewards and potential partners integral to the assessment and management of impacts on biodiversity. Where mining is likely to affect biodiversity priority areas, there may be a greater number of stakeholders who are concerned with the proposal or activity and its consequences, as well as more local and downstream users of ecosystem goods and services who might be affected. Failure to tackle stakeholder engagement properly in such areas would pose an almost certain risk to the mining company and its proposal or activity. Early and effective stakeholder engagement should enable mining companies to:

- Clarify objectives of a proposed mining activity in terms of community needs and concerns and company commitments to biodiversity.
- Identify potential conservation partners in addressing biodiversity issues.
- Distil the main issues and concerns of interested and affected parties in relation to the proposed activities.
- Gather local traditional/indigenous knowledge of the area, and identify local values and levels of dependence on ecosystem services.
- Identify and evaluate feasible alternatives.
- Identify, evaluate and implement potential biodiversity offset sites (if relevant).



4. Use best practice in environmental impact assessment to identify, assess and evaluate impacts on biodiversity

There is substantial guidance on and regulation of EIAs, which is the process of evaluating the likely impacts of a proposed project or development on the environment, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

The fundamental components of an EIA involve several stages that broadly correspond with the scoping and EIA requirements set out in the MPRDA and NEMA EIA Regulations, although the time frames for the respective processes are different. This Guideline provides guidance on the integration of biodiversity information into an EIA and in the development of the EMP, with particular attention paid to the mitigation of impacts on the environment.

The approach emphasizes the robust implementation of the mitigation hierarchy at each stage of the mining life cycle to:

- Avoid or prevent loss to biodiversity and ecosystem services.
- Minimise impacts on biodiversity and ecosystem services.
- Rehabilitate concurrently or progressively with the proposed activity, and/or on cessation of the activity.
- Offset significant residual negative impacts on biodiversity or ecosystem services.



5. Apply the mitigation hierarchy when planning any mining-related activities and develop robust environmental management programmes

The primary tools for managing impacts on biodiversity and ecosystem services are the measures contained in the EMP required of the MPRDA, the water use licence and the EMP required in terms of the NEMA EIA regulations. The EMP must therefore meet good practice standards especially in terms of robust application of mitigation hierarchy, and fully satisfy legal requirements. The EMP, once accepted by the relevant authorities, becomes an enforceable blueprint for managing impact on the environment. The Guideline provides an overview of the generic requirements of the EMP and discusses the required financial provision for monitoring, mitigation and enhancement, and closure management. Robust EMPs require taking a risk-averse and cautious approach to identifying residual negative impacts, gauging the effectiveness of proposed rehabilitation measures, and making provision for biodiversity offsets where required.

6. Ensure effective implementation of environmental management programmes, including adaptive management

The final principle in making good decisions regarding mining and biodiversity is to ensure effective implementation of the EMP, which includes adaptive management. To be effective with regard to managing biodiversity and ecosystem services, it is legally required that the EMP must be rigorously implemented by the rights holder, and enforced by the competent authorities. It is often that the scale and/or significance of impacts of mining only become evident once construction or operation begins. To this end, it is important that measurable performance indicators are used and clear management targets and timeframes are specified in the EMP. Monitoring and reporting against the EMP by the rights holder and compliance enforcement by the regulator is key.

Where an EMP Performance Assessment finds measures to manage impacts to be ineffective or insufficient to achieve the stated outcomes, then the EMP must be updated and additional or different actions incorporated to rectify these shortcomings. The adaptive management of the EMP can ensure that the most effective and efficient approach to management is implemented. Through regular monitoring and assessments, the company can respond swiftly, and cost effectively, to any areas where performance needs to be addressed.



In conclusion

South Africa's mineral endowment implies that mining and the environment will continue to interact and need to walk a path together to achieve prosperity and sustainability. We need to be mindful of the fact that without the integrity of our biodiversity assets and natural systems, there will be no sustained long-term economic growth. In pursuit of South Africa's developmental pathway, a shared vision of sustainability has emerged as a strong driver of industry values and societal behaviour. The Guideline can help to ensure that mineral resource development, as an integral component of South Africa's development future, takes place in a way that supports an optimal growth path for South Africa.



