

**APPLICATION FOR SUSPENSION IN TERMS OF SECTION 96(2) OF THE
MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002
("MPRDA")**

CENTRE FOR ENVIRONMENTAL RIGHTS NPC

Applicant

IN RE:

MINISTER OF MINERAL RESOURCES AND ENERGY

Decision-Maker

**DIRECTOR-GENERAL: DEPARTMENT OF MINERAL
RESOURCES AND ENERGY**

Decision-Maker

MINERAL SANDS RESOURCES (PTY) LTD

Right Holder

TORMIN MINERAL SANDS (PTY) LTD

Right Holder


EXPERT AFFIDAVIT OF PETER CARRICK

I, the undersigned

PETER CARRICK

state under oath that:

- 1 I am the Director and Founder of Nurture Restore Innovate (NRI) at: H3 Peers Village, Genoa Avenue, Fish Hoek. I have been the Director of NRI for 12 years.
- 2 I am an ecological scientist with the following qualifications: a Bachelor of Science (with Honours) in Botany (with Distinction) obtained at the University of Cape Town, and a PhD obtained at the University of Cambridge where my dissertation focused on *Shrub community dynamics in a South African semi-desert.*

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- 3 I have 26 years' experience in my field of specialisation. My key areas of expertise include ecological restoration, functioning and management of semi-arid landscapes.
- 4 I am currently an Honorary Research Fellow at the University of Cape Town's Plant Conservation Unit, and have authored more than 20 scientific papers, mostly concerning semi-arid ecosystem functioning and ecological restoration.
- 5 My work and research have been focused on the West Coast, Namaqualand and Succulent Karoo region since 1997. I have founded and run both the Nurture Restore Innovate (NRI) and the Namaqualand Restoration Initiative whose primary focus has been the ecological restoration of the Namaqualand and west coast regions of South Africa.

5.1 NRI is an initiative which provides long-term ecological research, development and mentoring to projects or practices that affect landscapes at larger scales. Some major achievements of the initiative include: researching and designing restoration systems for semi-arid rangelands that have been degraded by centuries of ploughing or constant grazing, and for arid savannas degraded by recent gold mining; developing and conducting biodiversity and restoration training programs for people in the regions (non-specialists); biodiversity and land management systems and guidelines that aim to enhance biodiversity conservation concomitant with current land-uses; assessing and costing large-scale environmental damage and its associated restoration costs



across various biomes; specialist mine closure plans. A current focus of the initiative is on understanding restoration systems in different countries, socio-economic contexts and environmental conditions, and developing universal metrics for measuring restoration success and end-points.

5.2 From 2005 to 2009, I was the Founder and Director of the Namaqualand Restoration Initiative at the University of Cape Town, a research, advocacy and implementation program, conceived as a five-year project focused on the Namaqualand region. The initiative advocated for ecological restoration by mining operators through a variety of national and international fora. This together with developing mine-site based restoration solutions that were integrated into the mining business, resulted in the large-scale implementation of biodiversity restoration. The principle achievements of the initiative have been the development of methods and systems for the restoration of the pre-existing landscapes and biodiversity on areas degraded by mining and by other land-uses.

6 In 2012, I was the winner of the National Science and Technology Foundation Award for an outstanding contribution to science, engineering and technology through research leading to innovation in an NGO, CBO or NPO organisation. I received this award for my work on the ecological restoration of the West Coast region following mining.




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- 7 I have authored or co-authored more than one hundred professional reports. I have reviewed papers for various scientific journals, including: Journal of Arid Environments; Journal of Applied Ecology; South African Journal of Botany; Plant Ecology; African Journal of Range & Forage Science; Ecological Restoration. More than thirty popular journalistic articles, five radio interviews and two television documentaries feature my work.
- 8 My professional work is international (including Namibia, Botswana, Australia and the USA) and I have 25 years' of professional membership with the British Ecological Society and 10 years' of professional membership with the international Society for Ecological Restoration.
- 9 The facts set out in this affidavit fall within my personal knowledge and belief, except where the context indicates otherwise, and are true and correct.
- 10 The Right Holder, Mineral Sands Resources (Pty) Ltd ("MSR") operates the heavy mineral sands Tormin Mine on the West Coast of South Africa.
- 11 MSR has recently commenced further mining pursuant to obtaining an Integrated Environmental Authorisation and an amendment of MSR's mining right in terms of section 102 of the Mineral and Petroleum Resources Development Act, 28 of 2002 which allows it to significantly expand its Tormin Mine operations on the West Coast.
- 12 The expansion entails extending the mine by an additional 188.7 hectares to mine an additional strip of coastline north of the current operations (a further ten beaches), to conduct inland "strand line" mining on the Farm Geelwal Karoo 262

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- and to construct additional processing plants, stockpile areas, industrial yards, parking and laydown areas.
- 13 The Applicant, the Centre for Environmental Rights (*“the CER”*), has brought an application for judicial review brought in the Western Cape High Court under case number 13446/2020 seeking to set aside (i) the decision of the Third Respondent to dismiss the Applicant’s appeal in terms of section 43(1A) of the National Environment Management Act, 107 of 1998 against the decision of the DMR to grant the Integrated Environmental Authorisation and (ii) the DMR’s to grant the Integrated Environmental Authorisation.
 - 14 The CER has also lodged an internal appeal in terms of section 96(1) of the MPRDA against the DMR’s decision in terms of the MPRDA to amend MSR’s mining right in terms of section 102 of the MPRDA and an application in terms of section 96(2) of the MPRDA for the suspension of the decision made in terms of section 102(1) of the MPRDA, pending the outcome of the internal appeal.
 - 15 I have been requested by the CER to furnish it with an expert affidavit for the purposes of the CER’s application for suspension of the decision made in terms of section 102(1) of the MPRDA, pending the outcome of the internal appeal.
 - 16 I have reviewed the Terrestrial Ecology Specialist Study (Appendix 11F of the EIAR).
 - 17 I have read the comments by CapeNature dated 14 May 2018 on the Scoping Report for the Right Holder’s EIAR, and I concur with the contents of paragraphs 3 and 5 thereof with regard to the Right Holder’s ability (and track record) to

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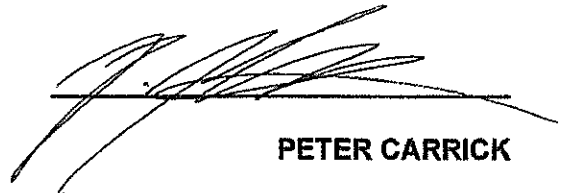
minimise and mitigate potential impacts¹, which should be a key consideration to any approval being granted.

- 18 I have also read the supporting affidavit of Susan Brownlie and I strongly concur with the contents of paragraphs 33 – 41 and 52 thereof with regard to the Right Holder's reliance on the proposed rehabilitation measures to remedy negative impacts and the avoidance of search and rescue options for conserving Species of Conservation Concern.
- 19 My comments on the Terrestrial Ecology Specialist Study are contained in a report prepared for the CER, titled *Comments on the Terrestrial Ecology Specialist (Todd 2018), Appendix 11F to the EIAR for SRK and MSR, extension of Tomlin Mine, West Coast, South Africa*, annexed as "PC 1". I confirm that I authored this report.
- 20 In summary, it is my view that mitigation of impacts of the proposed section 102 mining extension, including rehabilitation and restoration, is key to containing the impacts to the local scale and not dramatically impacting the CBA, biodiversity, ecological integrity or function of the greater area. The Right Holder's EIAR and EMPr proposes a number of recommendations for rehabilitation, restoration and mitigation which are problematic. The EIAR and EMPr contain a number of generalist (often incorrect) statements on rehabilitation plans, but evidence of specialist management/knowledge, infrastructure, protocols or goals for

¹ In particular, with regards to rehabilitation methods for the impacted Namaqualand Strandveld terrestrial vegetation and the sea cliffs and foredunes.

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restoration is lacking. A detailed rehabilitation and revegetation plan needs to be provided. My attached report sets out these issues in detail.



PETER CARRICK

I CERTIFY THAT:

1. The Deponent acknowledged to me that:
 - 1.1. He knows and understands the contents of this declaration;
 - 1.2. He has no objection to taking the prescribed oath;
 - 1.3. He considers the prescribed oath to be binding on his conscience.
2. The Deponent thereafter uttered the words, "I swear that the contents of this declaration are true, so help me God."
3. The Deponent signed this declaration in my presence at **CAPE TOWN** on this 30 day of **OCTOBER 2020**.



COMMISSIONER OF OATHS

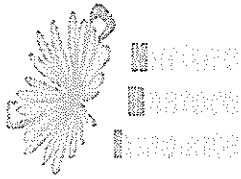
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Comments on the Terrestrial Ecology Specialist (Todd 2018), Appendix 11 F to the EIAR and EMPr for the extension of Tormin Mine, West Coast, South Africa.

1. I am an ecological scientist specialising in the ecological restoration, functioning and management of semi-arid landscapes. My work and research have been focused on the west coast, Namaqualand and Succulent Karoo region since 1997. I have founded and run both the Namaqualand Restoration Initiative and Nurture Restore Innovate whose primary focus has been the ecological restoration of the Namaqualand and west coast regions of South Africa.
2. I have reviewed the Terrestrial Ecology Specialist Study (Todd 2018) Appendix 11 F to the EIAR For SRK and MSR.

Overarching concerns

3. The mitigation, including rehabilitation and restoration, of impacts of the proposed mine expansion are key to containing the impacts to the local scale and not dramatically impacting the CBA, biodiversity, ecological integrity or function of the greater area, and have been identified as such in Todd (2018), e.g. p. 37: *"Thus the long-term impact of the inland mining on landscape connectivity hinges largely on the extent to which appropriate rehabilitation and remedial action is applied to ensure adequate vegetation recovery."* However, there are some shortcomings in this report that do not direct good practice of land management in these aspects, and will not result in adequate ecological rehabilitation of these local impacts.

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4. More than 20 academic theses and scientific papers have been published specifically on the biodiversity impact of mining in this area in the last 20 years, covering key aspects of biological function for ecological management, rehabilitation and the monitoring and goal-setting for rehabilitation and ecological management. A similar number of professional reports on these subjects have been commissioned by the Namakwa Sands mining operation at Brand-se-Baai alone, in addition to further applicable professional reports and scientific studies by other mining operations in the region. Although some of these are cited, very few appear to have informed the specialist report (Todd 2018).
5. Section 24N(2)(f) and (g) of the National Environmental Management Act, 107 of 1998 ("NEMA") states that the environmental management programme must contain —
- (f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and*
- (g) a description of the manner in which it intends to—*
- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;*
 - (ii) remedy the cause of pollution or degradation and migration of pollutants; and*
 - (iii) comply with any prescribed environmental management standards or practices.*

With our current knowledge it is not possible to restore the full species diversity of ecosystems in this region following the impacts of mining. Todd (2018) has emphasised the restoration of ecological function but does not outline how this is achieved or what aspects should be monitored in order to gauge progress.

The mitigation of unavoidable mining impacts is predicated on the ecological rehabilitation of the sites after mining. This starts by developing a clear rehabilitation goal, and specific measurable targets by which to direct a rehabilitation plan. The rehabilitation goals set out in Todd (2018) are neither context nor site specific. They simply echo the global rehabilitation objectives provided by the Society for Ecological Restoration. The only rehabilitation targets set out in Todd (2018) concern vegetation cover, and it is unclear what informed the setting of these targets. Reference sites are needed for each vegetation sub-type impacted, and these should be analysed to set explicit targets. Targets for vegetation composition may then include abundance and/or cover metrics, site-scale diversity and area-scale diversity (these should concern species in reference systems rather than simply the number of species). Numerous targets for

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vegetation structure and/or function can be developed. These targets should be relevant to the context and the key environmental processes and functions that need to be restored.

Specific concerns

6. There are a number of specific shortcomings in the rehabilitation and revegetation plan (Appendix 6) provided by Todd (2018), the most salient of which are set out below:
- Topsoil management: Todd (2018) directs either that 500 mm (p. 85) or 300 mm (p. 10 for the inland) of topsoil is removed and used for rehabilitation. The use of up to 500 mm of surface soil for rehabilitation is very good practice in these ecosystems. However, the failure to recognize this depth of surface soils as two components will result in crucial dilution of the true topsoil, the burial of most of the seedbank and a significant failure of rehabilitation.

The key components of topsoil: soil nutrients, soil biota (including mycorrhizae and other symbionts that make nutrients available to plants) and most importantly, the soil seedbank, are concentrated in the top 50 mm of topsoil, and have been well studied, e.g. de Villiers *et al.* (2004). The upper 50 mm of topsoil should not be mixed with any other soil layers. Good practice implemented by the Namaqua Diamond Company, in exactly the same area as the proposed mine expansion, involved the stripping of the upper 50 mm of topsoil (together with surface plant material), and the remaining 500 mm of subsoil separately. These layers are then stored separately and replaced in reverse order during rehabilitation.

Provision for topsoil storage is also crucial as topsoil is the primary driver of successful rehabilitation. The major threat to topsoil stores/dumps in the west coast environment is wind erosion. Steps to limit the degradation or loss of topsoil are not adequately set out for this mining operation. Best practice involves storing topsoil in piles no greater than 1 m high and for not longer than one month. Todd (2018) p.90 recommends piles no greater than 1 m high and for not longer than six months, and the EIA and EMPr (SRK 2018) recommends stockpiles no greater than 4 m high and for not longer than six

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months. Following the latter guidelines will result in the loss of the majority of ecological value of the topsoil.

Due to cost implications it is most unusual for topsoil to be trucked offsite to a dedicated storage area as indicated by Todd (2018). Wherever topsoil is stored, its management should be guided by the environmental dynamics of the region and not guidelines borrowed from other global operations.

- **Netting to limit wind erosion:** Netting is crucial for any successful rehabilitation along the west coast and should be implemented immediately following the replacement of the final topsoil layer. Todd (2018) has highlighted much of the necessary wind erosion management, however the distance between nets of 5-10 m prescribed by Todd (2018) p. 89 is incorrect and may result in significant rehabilitation failure. The use of shade-netting to limit wind erosion was pioneered by the Namakwa Sands mining operation at Brand-se-Baal, has proved effective, and is well established, e.g. Halbich 2003. If such nets are placed further than 6 m apart soil erosion will result in most cases before plants can establish.

- **Reseeding:** The emphasis given by Todd (2018) to the use of indigenous seed from the immediate area and understanding of functional groups of plants to inform the seeds used is good management practice, however, the recommendation that reseeded be done using "an agricultural methods (i.e. tractor and planter or spreader and roller)" p. 88, is wholly unfeasible. It is simply not possible to collect sufficient quantities of seed for such methods. Reseeding methods need to be implemented in order to best manage the scarcity of seeds. It is also unclear why Todd (2018) p. 87 recommends the use of only 3-4 species for reseeded. In most cases this is inadequate for the restoration of even the key functional groups, and around 20 species are usually used to achieve this target.

- **Search and rescue:** As a means of restoring populations of plants that are rare or have specific habitat requirements, search and rescue is often unsuccessful. No reliance for the restoration of biodiversity should be placed on this practice. Furthermore, suitable management guidelines for such operations are lacking from Todd (2018).

- **Overburden storage:** Due to cost implications it is most unusual for overburden to be trucked offsite to a dedicated storage area as indicated by

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Todd (2018) p. 85, when mining commences at new mining sites. If this practice is not followed and overburden is stored/dumped adjacent to the mine cutting (as is the usual the practice), it will result in an additional degraded area after return of the overburden to a mining void and an increased footprint of mining impact (not accounted for in Todd, 2018). If this process is followed and overburden is located in the Infrastructure / plant expansion area, protocols and provisions should be provided for its management (i.e. Is the area large enough? How is erosion and soil and slope movement to be managed?), and are not.

- New mining and haul roads: No details are provided of the nature of the new roads, including the 15 m wide haul road. If these roads are to be compacted or treated in any way, e.g. clay, calcrete, hardpan or saltwater used for stabilisation and dust suppression, specific rehabilitation will be required. No provision or guidelines are provided for specific mining impacts and too few for the specific environmental dynamics of this region.

Literature Cited

7. Literature Cited:

- de Villiers A.J., van Rooyen M.W. and Theron G.K. 2004. The restoration of Strandveld Succulent Karoo degraded by mining: and enumeration of topsoil seed banks. South African Journal of Botany 70: 717-725.
- Halbich T.F.J. (2003). Mine rehabilitation in the arid Succulent Karoo vegetation zone on the South African West Coast, Namakwa Sands - case study. Heavy minerals p. 113-118, Institute of Mining and Metallurgy. Johannesburg, South Africa.
- SRK 2018. Extension of Tormin Mine, West Coast, South Africa. Environmental Impact Assessment Report and Environmental Management Programme. Report prepared for Mineral Sands Resources (Pty) Ltd. Final EIAR and EMPr. November 2018.

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