

**PROPOSED GRAVEL MINE ON THE REMAINING EXTENT OF
THE FARM SYDENHAM 445, REGISTRATION DIVISION OF
BLOEMFONTEIN, FREE STATE PROVINCE**

REHABILITATION AND CLOSURE PLAN

**(IN ACCORDANCE TO GOVERNMENT NOTICE 940 OF THE NEMA, ACT NO 107 OF 1998 &
REGULATION 62 OF THE MPRDA, ACT NO 28 OF 2002)**



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1. INTRODUCTION

The objective of the final rehabilitation, decommissioning and mine closure plan is to identify a post-mining land use that is feasible through:

- a) providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- b) outlining the design principles for closure;
- c) explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- d) detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- e) committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- f) identifying knowledge gaps and how these will be addressed and filled;
- g) detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- h) outlining monitoring, auditing and reporting requirements.

(Financial Provision Regulations, 2015 Appendix 4)

In accordance to Appendix 5 of the NEMA EIA Regulations, 2014 a closure plan for the mining of gravel from a portion of the Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province was formulated.

2. DETAIL OF THE AUTHOR

The Applicant, Kenrau (Pty) Ltd appointed Greenmined Environmental to prepare the final rehabilitation, decommissioning and mine closure plan. Mrs. S Smit is the responsible consultant for the project and has fourteen years of experience in environmental legal compliance audits, (GIS) geographic information system, mining right and permit applications and applications for environmental authorisations & Water use applications. Please find full CV attached in Appendix L.

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3. LEGAL BACKGROUND AND BEST PRACTICE

There are a number of statutory legal requirements that are relevant to this Final Rehabilitation Plan. These include, but are not limited to, the following:

3.1 Constitution of South Africa (Act No. 108 of 1996)

This section provides an overview of the legislative requirements applicable to this project and it includes the Acts, guidelines and policies considered in the compilation of this report. The legislative motivation for this project is underpinned by the Constitution of South Africa, 1996 (Act No. 108 of 1996), which states that:

The State must, in compliance with Section 7(2) of the Constitution, respect, protect, promote and fulfil the rights enshrined in the Bill of Rights, which is the cornerstone of democracy in South Africa.

Section 24 of the Constitution:

24. Environment

-Everyone has the right-

(a) To an environment that is not harmful to their health or well-being; and

(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

(i) Prevent pollution and ecological degradation;

(ii) Promote conservation; and

(iii) Secure ecologically sustainable development and use of natural resources while promoting a justifiable economic and social development.

Section 24 of the Constitution of South Africa requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs or the relevant provincial Ministers to identify:

New activities that require approval;

Areas within which activities require approval; and

Existing activities that should be assessed and reported on.

Section 28(1) of the Constitution of South Africa states that:

“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”.

If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution or degradation; and
- Remedying the effects of the pollution or degradation

3.2 The Mineral and Petroleum Resources Act (Act No. 28 of 2002) (MRPDA)

Table 1: MRPDA applicable sections

Area Of Concern	Section	Legal Requirements
Environmental Management	Section 37	<i>Requires that the principles set out in section 2 of NEMA must apply to all prospecting and mining operations, and that the generally accepted principles of sustainable development must be applied by integrating social, economic and environmental factors during the planning and implementation phases of mining projects.</i>
	Section 38	<i>Requires the applicant to manage all environmental impacts in accordance with his or her environmental management plan (EMPR) or the approved environmental management program (EMPR).</i>
	Section 39	<i>Deals with the requirements of an EMP/EMPR, whichever is applicable.</i>
Financial Provision	Section 41	<i>Financial provision needs to be provided and annually assess the environmental liability.</i>
Closure Certificate	Section 43	<i>Holder of a mining right is responsible for all environmental liabilities as may be identified in the EMP, application needs to be made to the regional manager for the closure certificate.</i>
Removal of Infrastructure	Section 44	<i>When the mining operation comes to an end the mine may not remove buildings, structures or objects which may not be demolished or removed in terms of any other law</i>

3.2.1 Regulation 527 of the MRPDA

Government Notice No. R.527, as published in the Government Gazette, 23 April 2004 (GG No. 26275, Volume 466) of MRPDA stipulate that the following closure objectives must form part of the EMPR:

- Identify the key objectives for closure of the operation to guide the project design;
- Development and management of environmental impacts;
- Provide future land use objectives for the site; and
- Provide proposed closure costs.

Table 2: Requirements of Government Notice 527

Area of concern	Regulation	Legal Requirements
The need to prevent and alleviate pollution arising from mining activities.	Regulation 42(1)	<i>Section 42(1) of the MPRDA stipulates that the closure process must start at the commencement of a mining operation and continue throughout the entire life of the mine. Furthermore, future closure and land use objectives must be included in the EMP. Section 42(1) d stipulates that any environmental damage or residual impacts that are identified during the Environmental Risk Assessment (ERA) phase must be acceptable to all Interested and Affected Parties (I&AP's) in line with Section 24(a) of the National Constitution (see Paragraphs 19.5.3 & 19.5.4 and Figures 6 & 7).</i>
	Regulation 43	<i>A closure plan contemplated in Section 43(3)(d) of the Act, forms part of the EMPR or EMP, as the case may be, and must include – a summary of the results of progressive rehabilitation undertaken</i>
Part III of R527 deals with environmental regulations for mineral development, petroleum exploration and production	Regulations 56	<i>In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that –The land is rehabilitates, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concepts of suitable development</i>

3.3 The National Water Act (Act No. 108 of 2008) (NWA)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways, which take into account:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations; and
- Managing floods and droughts.

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The following sections of the Act are relevant:

Table 3: NWA applicable sections

Area of concern	Section	Legal Requirements
Prevention and remedying effects of pollution.	Section 19	<i>Any situation exist or which may cause 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.</i>
Control of emergency incidents	Section 20	<i>Incidences of pollution needs to be reported the Department and the relevant catchment agency.</i>

3.4 National Environmental Management Act (Act No. 107 of 1998) (NEMA)

The National Environmental Management Act (NEMA) strives to regulate national environmental management policy and is focussed primarily on co-operative governance, public participation and sustainable development. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith.

The following sections are relevant:

Table 4: NEMA Applicable Sections

Area of concern	Section	Legal Requirements
Principles that may significantly affect the environment	Section 28	<i>General duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment to 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 authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.</i>
Control of emergency incidents	Section 30	<i>Incidences of pollution needs to be reported the Department.</i>
EMP	Section 34	<i>A draft EMP must include – information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of – (iv) rehabilitation of the environment; as far as 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 acceptable principle of sustainable development, including where appropriate, concurrent or progressive rehabilitation measures</i>

3.4.1 Regulation 1228 of NEMA, 1998

NEMA, GNR 1228 GG 41236, known as the NEMA Financial Provision Regulations, 2015 (amended 2017), was promulgated in November 2015, and in terms of these regulations holders of

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a mining right are allowed a transitional period of 39 months (19 February 2019) from the date of promulgation to comply.

As mentioned earlier the permit holder must annually update the annual rehabilitation, final rehabilitation and remediation of latent environmental impacts and ensure it is compliant with the Financial Provision Regulations of 2015. The reports need to be conducted in the format that was supplied in the regulations as per Appendix 5 and Appendix 6.

3.5 National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM: WA)

The rehabilitation measures must be aligned with the objections of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) which includes:

(a) To protect health, well-being and the environment by providing reasonable measures for—

- i.** Minimising the consumption of natural resources;
- ii.** Avoiding and minimising the generation of waste;
- iii.** Reducing, re-using, recycling and recovering waste;
- iv.** Treating and safely disposing of waste as a last resort;
- v.** Preventing pollution and ecological degradation;
- vi.** Securing ecologically sustainable development while promoting justifiable economic and social development;
- vii.** Promoting and ensuring the effective delivery of waste services;
- viii.** Remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
- ix.** Achieving integrated waste management reporting and planning;

(b) To ensure that people are aware of the impact of waste on their health, well-being and the environment;

(c) To provide for compliance with the measures; and

(d) Generally, to give effect to Section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

3.5.1 Waste Classification and Management Regulations, 2013 (Government Notice NR: 634):

Waste Classification and Management Regulations (WCMR) promulgated under the National Environmental Management: Waste Act, 2008 (NEM: WA) (effective 2013) provides mechanisms to:

- Facilitate the implementation of the waste hierarchy to move away from landfill;
- Reuse, recovery and treatment;
- Separate waste classification from the management of waste;
- Divert waste from landfill and into utilisation where possible; and
- Provide measures to monitor the progress.

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The Waste Classification and Management Regulations ultimately enables the improved and more efficient classification and management of waste; provide for safe and appropriate handling, storage, recovery, reuse, recycling, treatment and disposal of waste and will also enable accurate and relevant reporting on waste generation and management. All waste generators, excluding domestic generators, must ensure that the waste they generate is classified within 180 days of its generation.

All wastes that were classified in terms of the “Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste in terms of the Department of Water Affairs” (2nd Edition, 1998; Department of Water Affairs and Forestry) or alternative classifications that were approved prior to the WCMR taking effect, must be re-classified and assessed within three years from the commencement of these Regulations.

Reference is made to the NEM: WA, part 8 of Chapter 4 regarding contaminated land:

All owners of land that is significantly contaminated become obliged to report that contamination is occurring. Part 8 of Chapter 4 is concerned with the remediation of contaminated land. This new legal regime for identifying contaminated land, determining its status and the risk that it poses, and regulating the remediation process is introduced. This law imposes significant legal obligation on the owners of land and on those who cause contamination, with potentially serious financial consequences. Part 8 applies where the pollution only manifest sometime after the contamination occurred and also where the action of a person (for example, the excavation of land pursuant to a development) results in a change to pre-existing contamination. Along with the notice bringing Part 8 into effect, norms and standards for the remediation of contaminated land and soil quality (list certain contaminants and specify soil screening values for human health and environmental protection). This act also has several important implications for the sale of and, sellers who know that their lands is contaminated can no longer keep silent and this is classified as an offence.

3.6 National Heritage Resources Act, (Act No. 25 of 1999)

This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. The South African heritage is unique and precious and it cannot be renewed. It is imperative to define the country's cultural identity and therefore lies at the heart of all citizens spiritual well-being and has the power to build the nation. It has the potential to affirm the country's diverse cultures, and in so doing shape the country's national character. The South African heritage celebrates its achievements and contributes to redressing past inequities. It educates, it deepens our understanding of society and encourages us to empathise with the experience of others. It facilitates healing and material and symbolic restitution and it promotes new and previously neglected research into our rich oral traditions and customs.

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Due to the disturbed nature of the mining area no sites of heritage or cultural importance could be identified on the site.

3.7 Other Acts That Is Relevant to Mine Rehabilitation

The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

The South African Mineral Resource Committee (SAMREC) Code. Of particular importance in this regard is the determination of whether Sydenham Quarry has made an adequate provision for environmental rehabilitation in terms of Section 41 of the MPRDA.

3.8 Best Practice and International Guidelines

Mine closure is an international challenge. South Africa has produced various well known and reputable guidelines on matters directly linked and or associated with mine closure. Such was the need for guidelines to manage mine closure provisions in a consistent manner provided for by the DMRE (2005).

These guidelines are the only official mine closure guideline as contemplated in Regulation 54(1) in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Of particular importance is that this guideline document governs the closure cost assessment process in South Africa and is applied by the DMRE through its respective regional managers in each province.

The Chamber of Mines (CoM) (2007) issued a guideline for the rehabilitation of mined land. This document is a result of scientific knowledge experts. It is an on the ground reference document which provides written guidelines on the best rehabilitation techniques. Of value is how the document distinguishes between the financing, the planning and the licensing components of a typical mining program.

The World Wildlife Fund (WWF) in 2012 published a discussion document named the "Financial provision for the rehabilitation and closure in South African Mining: Discussion Document on Challenges and recommended improvements". The document focuses on the adequacy of financial provisions and pulls a very strong link between insufficient financial allocations and that of derelict and abandoned mines in South Africa. The document further emphasizes the importance of establishing a dependency between the EMPR/EMP and financial provision which is updated and adequate

Recently a released guideline from the Government of Western Australia (GWA 2011) provides insight to the importance of mine closure. The guidelines (GWA 2011) in particular state that planning for mine closure is a critical component of environmental management in the mining industry. Notably is that this industry leading practice also requires that planning for mine closure should start before mining commences and should continue throughout the life of the mine until final closure and relinquishment. This approach enables better environmental outcomes. It is also

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good business practice as it should avoid the need for costly remedial earthworks late in the project lifecycle.

4. PROJECT CONTEXT

Kenrau (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine gravel from a section of the farm that was previously used as an existing quarry on a portion of the Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province. The proposed mining site will be an extension of the existing quarry pit previously mined for gravel. The mining method will make use of excavation by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 5 ha in extent and the applicant, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for construction industry in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Bloemfontein area.

The proposed MP project will entail the:

- Stripping and stockpiling of topsoil;
- Excavating;
- Crushing;
- Stockpiling, at the stockpile area, until sold and transporting to clients;
- Sloping and landscaping upon closure of the site and
- Replacing the topsoil and vegetation the disturbed area.

Should the MP be issued and the mining of gravel be allowed, the proposed project will comprise of activities that can be divided into 3 key phases (discussed in more detail below) namely the:

- (1) *Site establishment/construction phase* which will involve the demarcation of the permitted mining area. Site establishment may necessitate the clearing of vegetation (that established through succession) from the mining area, the stripping and stockpiling of topsoil at the mining area (if applicable), and the introduction of the mining machinery and equipment.
- (2) *Operational phase* that is presently expected to entail the removal of the gravel with an excavator from the approved footprint area, crushing and screening (if needed) of the gravel, stockpiling and hauling of the material to clients.
- (3) *Decommissioning phase* which entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources (DMRE). The

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permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining permit holder will be required to submit a closure application to the DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

In light of this, the table below shows the areas to be disturbed by mining that will be in need of rehabilitation upon closure of the site.

Table 1: Areas that will be in need of rehabilitation during the decommissioning phase.

DECOMMISSIONING PHASE		
NO	DESCRIPTION	QUANTITY
6	Opencast Rehabilitation	4 ha
14	2 to 3 years of maintenance and aftercare	5 ha

5. CLOSURE STRATEGY GUIDED BY ENVIRONMENTAL RISK ASSESSMENT

A very important factor affecting the success of rehabilitation, and consequently the significance of all direct impacts, is the level of care that is taken to rehabilitate effectively. This is dependent on the level of environmental management of all mining activities that can impact on rehabilitation, both during the mining process and during the rehabilitation phase.

As mentioned earlier the Applicant will not establish any permanent infrastructure in the footprint area. Upon closure of the mining area all equipment will be removed from the footprint area. The area will be landscaped in order to rehabilitate the disturbance and will subsequently revert back to dormant agricultural use. Due to the impracticality of importing large volumes of fill material to restore the excavation to its original topography, the rehabilitation option is to render the quarry safe and leave it as a minor landscape feature. This will entail sloping of the perimeter walls, to form scree slopes, thereby reducing the overall face angle. Fill and topsoil will be placed over the screes to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance.

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6. DESIGN PRINCIPLES

Upon closure of the quarry the mining permit holder will commence with the rehabilitation of the disturbed area. The decommissioning activities will be directed by the closure objectives proposed in the EMPr, as stipulated below:

Excavation Area:

- Deposit overburden, rocks and coarse material into the excavation;
- Sloping of the perimeter walls at 1:3 to the pit floor;
- Replacing the topsoil;
- Seeding the reinstated area.

7. POST-MINING LAND USE

The future land use of the proposed area will be dormant agriculture of an existing quarry. Upon the replacement of the topsoil, the area around the excavation will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

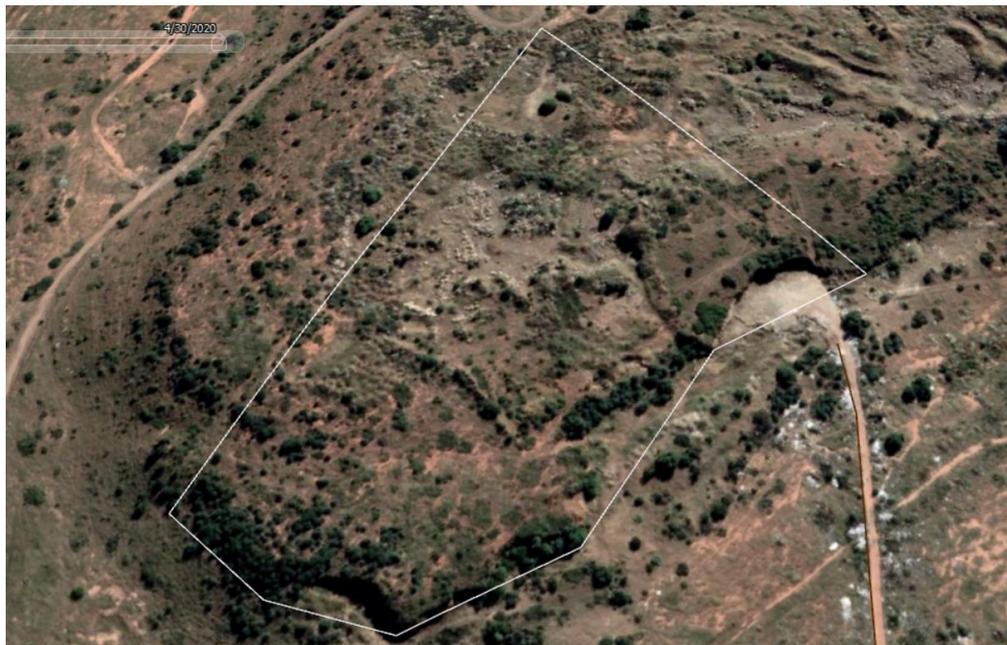


Figure 1: Satellite image (2020) of the mining area (white polygon) that will revert back to dormant agricultural use with existing gravel quarry upon rehabilitation).

8. CLOSURE ACTIONS

The following closure actions was stipulated in the Environmental Management Programme Report (EMPr) in order to successfully rehabilitate the mining area.

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The perimeter walls of the opencast pit will be sloped at 1:3 to the pit floor, to prevent soil erosion. The applicant will comply with the minimum closure objectives as prescribed by DMRE and detailed below:

Rehabilitation of the excavated area:

- The excavated area must serve as a final depositing area for the placement of overburden.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste may be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
- The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from closure of the site.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager (DMRE) may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

Final rehabilitation:

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), maintenance, and clearing of invasive plant species.
- All equipment, plant, and other items used during the mining period must be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- The management of invasive plant species must be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) need to be eradicated from the site.
- Final rehabilitation must be completed within a period specified by the Regional Manager (DMRE).

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Control of invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area. Site management must implement an invasive plant species management plan during the 12 months' aftercare period to address germination of problem plants in the area.

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9. CLOSURE SCHEDULE

At this stage it is proposed that the rehabilitation of the mining area will take approximately four months to complete. Rehabilitation will, however, not be considered complete until the first cover crop is well established and therefore the rehabilitation phase will extend over at least a six-month period.

Control of invasive plant species is an important aspect after topsoil replacement and seeding has been completed in an area. Site management will implement an invasive plant species management plan (see Appendix I of the BAR & EMPR) during the 12-month aftercare period to address germination of problem plants in the area. Final rehabilitation shall be completed within a period specified by the Regional Manager.

Table 2: Closure schedule.

CLOSURE SCHEDULE	
REHABILITATION / DECOMMISSIONING ACTION	TIMEFRAME
EXCAVATION	
Quarry Pit: <ul style="list-style-type: none"> ❖ Deposit overburden, rocks and coarse material into excavation; ❖ Slope perimeter walls according to design principles; ❖ Backfill overburden into the quarry floor; ❖ Cover the final floor of the quarry and the top of the benches with topsoil; ❖ Seed the reinstated area. 	Month 1 – 4
MAINTENANCE AND AFTER CARE	
<ul style="list-style-type: none"> ❖ Erosion Monitoring ❖ Invasive Plant Species Control 	Monthly monitoring for 12 months after final rehabilitation of the mining area

10. IMPLEMENTATION AND RESPONSIBILITY OF CLOSURE PLAN

Implementation of the closure plan is ultimately the responsibility of the mining permit holder. Upon commencement of the closure phase daily compliance monitoring will be the responsibility of the site manager. The site manager will be responsible for ensuring compliance with the guidelines as stipulated in the EMPR as well as the prevention and/or rectification of environmental incidents. The applicant will appoint an Environmental Control Officer to oversee compliance of the rehabilitation/closure activities.

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11. IDENTIFIED GAPS IN THE PLAN

The assumptions made in this plan, which relate to the closure objectives and associated impact on the receiving environment, stem from site specific information gathered by the project team. No gaps in the Rehabilitation, Decommissioning and Mine Closure Plan could be identified.

12. RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES

The specific rehabilitation outcomes against which the effectiveness of completed rehabilitation must be measured are:

1. that the topography has been sufficiently sloped without steep excavation edges that pose a safety risk;
2. that topsoil has been spread on the reinstated areas;
3. that there is no visible erosion across the area, or down-slope of it as a result of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
4. that a successful cover crop has been established across the entire area.

In addition to the above, the following relinquishment criteria is proposed for the closure activities of the mining area:

Table 3: Relinquishment criteria for closure activities

RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES			
CATEGORY	RELINQUISHMENT CRITERIA	INDICATORS	REPORTING REQUIREMENTS
Slope stability and safety.	The site is safe for use by humans and animals for the foreseeable future.	Close-out inspection by the Mine Health and Safety officer.	Appropriate control measures are in place that will continue to meet agreed requirements.
Decommissioning of all mining equipment.	No visible man-made equipment may remain.	Close-out inspection by site management upon end of decommissioning phase.	Photographic evidence that equipment has been removed.
Soil erosion	Implementation of erosion control measures or the establishment of vegetation in denuded areas.	Engineered structures to control water flow	Proof in final closure report that required structures are in place and functional.
Vegetation	Seeding of a cover crop after topsoiling.	Biodiversity monitoring	Monitoring report

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RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES			
CATEGORY	RELINQUISHMENT CRITERIA	INDICATORS	REPORTING REQUIREMENTS
Invader plant management	Continuous management of invader plants until the establishment of the first cover crop.	Biodiversity monitoring	Monitoring report
Land Use	Land capability and productivity similar to, or better than that which existed prior to mining.	Land capability and productivity	Comparison to equivalent areas.

13. MONITORING, AUDITING AND REPORTING

In compliance with applicable legislation the mining permit holder will conduct monitoring of the mining activities for the duration of the operational- and decommissioning phases. The compliance of the site will be audited and reporting will be done to the relevant authorities. The table below stipulates the actions to be followed in this regard.

Table 4: Monitoring, auditing and reporting requirements

MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	RESPONSIBLE PERSON	FREQUENCY OF AUDIT	CLOSE OUT APPROACH
LEGISLATED AUDITING AND REPORTING			
Environmental Auditing	<u>Internal Review</u>		
	Site manager to ensure compliance with Environmental Authorization, Environmental Management Programme and Closure Plan.	Daily compliance monitoring.	Any non-conformance must immediately be addressed by site management and weekly reported on.
	<u>External Auditing</u>		
	Independent Consultant	Annual auditing and reporting to the Department of Mineral Resources	Depending on the significance of the findings site management has a maximum of four weeks to address and close out auditing results.

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MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	RESPONSIBLE PERSON	FREQUENCY OF AUDIT	CLOSE OUT APPROACH
LEGISLATED AUDITING AND REPORTING			
Financial Provision Review	<p><u>Financial Provision Review</u> Independent Consultant</p> <p><u>Independent Auditor</u> Independent financial consultant</p>	Annual review of the financial provision, and reporting of the findings to the Department of Mineral Resources and Energy	Should the review of the financial provision indicate a shortfall the holder of the permit will increase the financial provision to meet the audited financial provision within 90 days from the date of the signature on the auditor's report.
Health and Safety Auditing	Health and Safety Manager	<p>Monthly auditing of health and safety aspects on-site.</p> <p>Monthly reporting to the Mine Health and Safety division of the Department of Mineral Resources and Energy.</p>	Depending on the significance of the findings site management has a maximum of 48 hours to address and close out auditing results.
MONITORING			
Dust Monitoring	<p>Site Management.</p> <p>Compliance checked by Independent Consultant.</p>	Monthly Dust Monitoring	Site management has a maximum of two weeks to improve the dust management measures should the dust level of the site to be excessive.
Invader Plant Monitoring	<p>Site Management.</p> <p>Compliance checked by Independent Consultant.</p>	Monthly Monitoring	Site management has a maximum of two weeks to eradicate Category 1a and b plants in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) that germinate on-site.
Storm Water Monitoring	<p>Site Management.</p> <p>Compliance checked by Independent Consultant.</p>	Monthly Monitoring	Site management has a maximum of two weeks to improve the storm water control measures on site should signs of erosion occur.

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13.1 Schedule of reporting requirements providing an outline of internal and external reporting including disclosure of updates of the plan to stakeholders

The following table stipulates the reporting requirements and how document updating will be handled:

Table 4: Reporting requirements

REPORTING REQUIREMENTS			
AUDIT	LEGISLATION	REPORTING REQUIREMENTS	UPDATE DISCLOSURE
Environmental Auditing	NEMA; EIA Regulations, 2014 (as amended 2017)	Annual reporting on the environmental compliance of the mining area will be in accordance with Regulation 34 of the NEMA EIA Regulations, 2014 (as amended 2017). The environmental audit report will contain the information set out in Appendix 7 of the said Regulation.	The environmental audit report will indicate the ability of the EMPr and Closure Plan to adequately manage the activity. Should the reports not be sufficient, amendment will be proposed.
Financial Provision Review	NEMA Amendment Act, 2014 (Act No 25 of 2014) Financial Provision Regulations, 2015	Annual reporting on the financial provision for closure of the mining area will be in accordance with Section 24P of the NEMA Amendment Act, 2014 (Act No 25 of 2014) read with the Financial Provision Regulations 2015.	The auditor will report on the adequacy of the financial provision and any adjustments that need to be made to the financial provision.
Health and Safety Auditing	Occupational Health and Safety Act, 1993 Mine Health and Safety Act, 1996	Reporting on the health and safety compliance of the mining area will be in accordance with the Mine Health and Safety Act, 1996.	The safety manager will quarterly report on the safety aspects at the mine, and annually update the Code of Practices applicable to the site.

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13.2 Monitoring Plan and Compliance Assessment

The following list presents the monitoring programs to be implemented on site for the duration of the decommissioning phase:

Table 5: Monitoring programme

MONITORING PROGRAMME	
MONITORING UNIT	FREQUENCY
DUST MONITORING	
<p>Dust Monitoring:</p> <p>Dust control through the implementation of good housekeeping and site management is the key method of controlling dust emissions. It is proposed that monthly fallout dust monitoring be implemented at the mining area in order to record the dust conditions of the site. The dust monitoring must be conducted by a qualified specialist and dust results must monthly be populated and filed in the environmental site file and be available for auditing purposes. The environmental control officer must inspect the fallout dust results during the environmental performance audit. Should the ECO find that the dust levels of the mining area are excessive and impacting on the surrounding land use, the dust management plan of the Applicant must be amended and additional dust control measures must be instigated.</p>	<p>Monthly until final closure of the site</p>
<p>Gravimetric Dust Monitoring:</p> <p>Gravimetric sampling of dust is the internationally acceptable method to determine respirable dust concentrations of a site. This monitoring is implemented to determine the level of exposure employees are subjected to during each shift as prolonged exposure to atmospheric dust can give rise to a number of lung disorders or diseases. Personal and/or static monitoring is done by a qualified Occupational Hygienist in accordance with the guidelines for gravimetric sampling published under the auspices of the Department of Mineral Resources – Guidelines for the Compilation of a Mandatory Code of Practice – No. 1 Personal Exposure to Airborne Pollutants.</p>	<p>Quarterly until final closure of the site</p>
NOISE MONITORING	
<p>Personal Noise Monitoring:</p> <p>Personal noise exposure monitoring is done to determine the noise levels employees are exposed to during an eight-hour shift. Excessive noise exposure can lead to hearing loss and therefore continuous monitoring and demarcation of noise zones are of the utmost importance. This monitoring is conducted by a qualified Occupational Hygienist who has to submit his findings on</p>	<p>Quarterly until final closure of the site</p>

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MONITORING PROGRAMME	
MONITORING UNIT	FREQUENCY
Form 21.9(2)(e) prescribed by the Department of Mineral Resources in terms of the National Environmental Management: Air Quality Act, 2004 (Act No 39. of 2004).	
SOIL EROSION MONITORING	
<p>Soil Erosion:</p> <p>The definition for erosion is defined in the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) as the loss of soil through the action of water, wind, ice or other agents including the subsidence of soil. Soil erosion monitoring has to be implemented by site management to prevent the loss of exposed soil as a result of the mining activities. If the replaced topsoil stay exposed it is especially vulnerable to soil erosion. It is therefore proposed that a cover crop be planted on reinstated topsoil and topsoil heaps to be stored for more than six months.</p>	<p>Weekly monitoring for the first 6 months or until the first cover crop has established, where after the mining areas must be monitored monthly through at least one wet and one dry season.</p>
INVASIVE PLANT SPECIES MONITORING	
<p>Management of Invasive Plant Species:</p> <p>All species listed in terms of the Alien and Invader Species (AIS) regulations published in terms of section 97(1) of NEM:BA as amended 2016, are deemed to be declared invasive species, and should be managed accordingly. When identifying invasive plant species that need to be eradicated from the site the plants listed in the AIS regulations are used as guideline. Control of invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area. Site management must implement an invasive plant species management plan (attached as Appendix J to the BAR & EMPR) during the 12 months aftercare period to address germination of problem plants in the area.</p>	<p>Monthly monitoring for the duration of the decommissioning phase and a 12-months aftercare period.</p>
STORM WATER MONITORING	
<p>Storm Water Monitoring:</p> <p>The risk of erosion or loss of topsoil due to uncontrolled storm water flowing through the decommissioning area can be reduced through proper monitoring and implementation of effective storm water infrastructure. Site management must implement a storm water management plan for the duration of the operational- and decommissioning phases. Monitoring needs to continue during the 12 months aftercare period.</p>	<p>Monthly monitoring for the duration of the decommissioning phase and a 12-months aftercare period.</p>

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MONITORING PROGRAMME	
MONITORING UNIT	FREQUENCY
HEALTH AND SAFETY MONITORING	
Management of Health and Safety Risks All operations must comply with the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) as well as the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Daily monitoring for the duration of the decommissioning phase.

14. MOTIVATION FOR AMENDMENTS MADE TO FINAL REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN

Not yet applicable.



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