

**MINING RIGHT APPLICATION OVER A PORTION OF  
PORTION 3 OF THE FARM THE ORCHARDS NO 233,  
ALBANY MAGISTERIAL DISTRICT,  
EASTERN CAPE PROVINCE**

**CLOSURE PLAN**

**DEPARTMENTAL REFERENCE NUMBER:**

**EC 30/5/1/2/2/10069 MR**

**MAY 2024**

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## **EXECUTIVE SUMMARY**

Greenmined Environmental (Pty) Ltd is the consultants responsible for the mining right application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was accordingly drafted for the proposed mine.

The purpose of this document is to provide site management with an Annual Rehabilitation Plan as well as the Final Rehabilitation, Decommissioning and Closure Plan, compiled in terms of the NEMA Amendment Act, 2014 (Act No. 25 of 2014) read with the Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, November 2017 (GN 1228, Financial Provision Regulations 2017). The amendment of the closure plan entails a review of the following aspects:

1. Annual rehabilitation as reflected in the annual rehabilitation plan;
2. Final rehabilitation, decommissioning, and closure of the mining operations at the end of the life of operations as reflected in the final rehabilitation, decommissioning, and mine closure plan;
3. Remediation of latent or residual environmental impacts, which may become known in the future, as, reflected in the environmental risk assessment report.

### Annual Rehabilitation Plan:

Upon approval of the mining right application and receipt of the EA, the right holder will annually report on the planned rehabilitation actions.

### Rehabilitation, Decommissioning and Mine Closure Plan:

Rehabilitation will include activities to be divided into medium- and long term categories. In the medium term, rehabilitation will entail the continuous shaping and seeding of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve final landscaping of the site, the replacement of the topsoil on the final mined area and the shaping of the processing/stockpile area prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The MR holder will further be responsible for the seeding of all rehabilitated areas.

### Environmental Risk Assessment Report:

At this stage, no latent risks that will potentially arise during closure phase of the mining area were identified. By reason of the fact that no latent risks regarding the management of the mining area were identified no additional monitoring, auditing, or reporting requirements are required at this stage.

## LIST OF DEFINITIONS

**Abandonment:** The act of abandoning and relinquishment of a mining claim or intention to mine, a voluntary surrender of the claim or mine to the next party.

**Appropriately qualified:** A person who has training in the skills appropriate to the type of work to be done, and experience of the type of mine and of the size, complexity and safety classification of the deposit or the environmental conditions (or both) pertaining to the specific project.

**Closure Plan:** Annual Rehabilitation and Final Rehabilitation, Decommission and Closure Plan.

**Biodiversity:** Biodiversity is an abbreviation of "biological diversity". It means the variety of living things – the different plants, animals and microorganisms, the genes they contain and the ecosystems of which they are a part.

**Closure:** The act of reinstating a redundant mine which is acceptable for final mine closure.

**Context of an environmental impact:** The overall environmental setting in which an environmental impact occurs. It includes all "natural" components and characteristics (or both) and all "human and social" components and characteristics (or both). It has both spatial and time dimensions.

**Design:** The documented result of a systematic process during which all relevant factors and criteria are considered. The design includes the design report, the working drawings, and the operations manual.

**Environmental impact:** Any change in the state of a component of the environment, whether adverse or beneficial, that wholly or partially results from activities, projects, or developments.

**Environmental integrity:** The reliability of performance of the environmental impact management measures associated with the facility, with respect to the environmental performance objectives.

**Environmental management programme:** A programme contemplated in the Mineral and Petroleum Resources Development Act, 2002 submitted to and approved by the Regional Manager: DMRE and detailing the plan to be adopted and implemented by a mine for managing the environmental effects of the operations of the mine.

**Environmental objectives:** Those objectives that represent the desired state of environmental components that have been adopted for the mine.

**Intensity of an environmental impact:** The severity of the consequences of an environmental impact, as judged by suitably qualified persons.

**Manager of a mine (general manager):** Any competent person appointed in terms of the Mine Health and Safety Act, 1996 (Act 29 of 1996), to be responsible for the control, management, and direction of a mine.

**Rehabilitated land:** Is defined as land that has previously been mined through or areas, which have been disturbed by the mining process. These areas have been shaped, covered with topsoil, fertilized, seeded, and can support a sustained long-term vegetation cover.

**Redundant:** No longer required for mining operation.

**Reliability:** The probability that a specified event will not occur in a specified time (usually expressed as a ratio, when measured in quantitative terms).

**Risk:** The probability that a specified event, such as failure, will occur in a specified time.

**Scheduled closure:** Planned closure of the mine

**Significant environmental impact:** An impact in respect of which consultation (with the relevant authorities and other interested and affected parties) on the context and intensity of its effects provides reasonable grounds for mitigating measures to be included in the environmental management programme. Significance is determined by the integration of the context and intensity of the effects of the impact, and the likelihood that the impact will occur.

**Topsoil:** means the layer of soil covering the earth which –

- (a) provides a suitable environment for the germination of seed;
- (b) allows for penetration of water; and
- (c) Is a source of microorganisms, plant nutrients and in some cases seed.

**Unscheduled closure:** The closure cost associated with immediate closure and provision.

## **LIST OF ABBREVIATIONS**

DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Performance Assessment
EMPR	Environmental Management Program
I&AP's	Interested and Affected Parties
MPRDA	Mineral and Petroleum Resources Act, 2002 (Act No 28 of 2002)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
WCMR	Waste Classification and Management Regulations
WWF	World Wildlife Fund

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## 1. INTRODUCTION

The Applicant, Makhanda Mining (Pty) Ltd, applied for a mining right (MR), and environmental authorisation (EA) to mine ball clay, clay (general), gravel, kaolin, and aggregate from 43.4688 ha that extends over Portion 3 of the farm The Orchards No 233 in the Albany District of the Eastern Cape.

Greenmined Environmental (Pty) Ltd (“Greenmined”) is the consultants responsible for the mining right application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was accordingly drafted for the proposed mine. This report (the Closure Plan) stipulates the rehabilitation methods to be followed in the restoration of the earmarked mining footprint. The report was compiled in line with Government Notice 940 of the National Environmental Management Act, 1998 [NEMA] (Act No. 107 of 1998) together with Regulation 62 of the Minerals and Petroleum Resources Development Act, 2002 [MPRDA] (Act No. 28 of 2002). The information used in this report was sourced during the EIA process.

The purpose of this document is to provide site management with an Annual Rehabilitation Plan as well as the Final Rehabilitation, Decommissioning and Closure Plan, compiled in terms of the NEMA Amendment Act, 2014 (Act No. 25 of 2014) read with the Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, November 2017 (GN 1228, Financial Provision Regulations 2017).

### 1.1 BACKGROUND INFORMATION

Portion 3 of the farm The Orchards No 233 is within the jurisdiction of the Makana Local Municipality, ±4 km northeast of the King Flats residents of Makhanda, between the N2 national road (south) and the Botha’s River (north).

Grahamstown Brick (Pty) Ltd t/a Makana Brick (hereafter referred to as Makana Brick) held a mining permit with reference number EC 30/5/1/3/2/10397 MP over 4.95 ha of Portion 3 of the farm The Orchards No 233 in the Makhanda area. The mining permit allowed the mining of Ball Clay, Clay (General), Gravel and Kaolin from the approved area. This permit lapsed on 22 July 2023 and can no longer be renewed as the first, second and third renewals were already granted.

Considering this, the Applicant saw a business opportunity to secure the significant clay resource of the earmarked property and supply the desired clay to the Makana Brick Factory. The mining permit footprint of Makana Brick will be incorporated into the proposed mining right footprint, and Makana Brick and the Applicant has therefore entered into an agreement in this regard. Should the mining right be granted, the Applicant proposes to take over the rehabilitation liability of Makana Brick for the permit footprint, and therefore the mining right application was accompanied by a Transfer of Environmental Liabilities Application.

## **1.2 PROJECT PROPOSAL**

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks.

The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at a mobile crushing and screening plant to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers. All activities will be contained within the approved boundaries of the site.

The proposed project will therefore entail the following:

- ❖ Introduction of mining equipment, stripping, and stockpiling of topsoil and overburden;
- ❖ Excavation of the mining area;
- ❖ Screening and processing of aggregates (when needed);
- ❖ Stockpile of mined minerals until it is transported to Makana Brick, alternatively collected by clients;
- ❖ Slope, landscape, and rehabilitate the affected areas upon closure of the mine.

The proposed processing infrastructure will be of temporary and mobile nature, and only an ablution hut needs to be placed to allow the proposed project. The Applicant will make use of the existing roads, no electricity is needed as the crusher plant (when needed) will be powered with generators, and water will be obtained from Makana Brick and transported to site. Mining will be >100 m from the adjacent Botha's River and associated dams and the project therefore does not trigger regulated activities in terms of the National Water Act, 1998.

Mining machinery that will operate at the clay quarry consist of the following:

- ❖ Dumper trucks;
- ❖ Earthmoving machinery;
- ❖ Excavation equipment; and
- ❖ Water car/s.

### **1.3 OBJECTIVE OF THE CLOSURE PLAN**

The purpose of the Closure Plan is to describe the rehabilitation processes that need to take place to ensure that the mine reaches its full environmental potential upon closure.

The primary objective, at the end of the mine's life, is to obtain a closure certificate at minimum cost and in as short a period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) [MPRDA]. To realise this, the following main objectives must be achieved:

- ❖ Remove all temporary infrastructure and waste from the site as per the requirements of the EMPR and of the Provincial Department Mineral Resources and Energy.
- ❖ Shape and contour all disturbed areas in compliance with the EMPR.
- ❖ Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the damming of surface water.
- ❖ Make all excavations safe.
- ❖ Use the topsoil effectively to promote the re-establishment of vegetation.
- ❖ Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.
- ❖ Eradicate all weeds/invader plant species by intensive management of the mine site.

## **2. DETAILS OF THE AUTHOR**

Makhanda Mining (Pty) Ltd appointed Greenmined Environmental (Pty) Ltd to compile the Closure Plan of the mine. Ms Christine Fouché is the responsible consultant for the project and holds a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology with nineteen years' experience in doing environmental impact assessments and compliance monitoring in South Africa (see CV and proof of experience attached as Appendix O to the EIAR & EMPR).

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Declaration of Independence:

I, Christine Fouche, in my capacity as environmental assessment practitioner declare that–

- ❖ I act as independent environmental assessment practitioner in this matter;
- ❖ I will perform the work relating to this document in an objective manner;
- ❖ I have expertise in conducting environmental compliance audits, and -applications, including knowledge of the Act and regulations that have relevance to the activity;
- ❖ I will adhere to and comply with all responsibilities as indicated in the National Environmental Management Act and Environmental Impact Assessment Regulations.
- ❖ I do not have and will not have any vested interest in the activity other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014 (as amended).



Christine Fouché

Date: 22 March 2024

### 3. LEGAL BACKGROUND AND BEST PRACTICES

This section provides an overview of the legislative requirements applicable to the project, including the acts, guidelines and policies considered in the compilation of the Closure Plan.

#### 3.1 THE CONSTITUTION OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996)

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 MINERALS AND PETROLEUM RESOURCES ACT, 2002 (ACT NO. 28 OF 2002) [MPRDA]

The table below summarises the relevant sections in terms of the MPRDA, 2002.

*Table 1: Summary of the relevant rehabilitation sections of the MPRDA, 2002*

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 (EMP) or the approved 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 MPRDA, 2002

Government Notice No. R.527, as published in the Government Gazette, 23 April 2004 (GG No. 26275, Volume 466) of MPRDA 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&amp;AP's) in line with Section 24(a) of the National Constitution.</i>
Mine Closure	Regulation 43	<i>A closure plan contemplated in Section 43(3)(d) of the Act, forms part of the EMPR or EMP and must include – a summary of the results of progressive rehabilitation undertaken.</i>
Part III of R 527 deals with environmental regulations for mineral development, petroleum exploration and production.	Regulation 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 rehabilitated, 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, 1998 (ACT NO. 36 OF 1998) [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.

The following sections of the NWA, 1998 are relevant.

*Table 3: NWA, 1998 applicable sections*

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Prevention and remedying effects of pollution.	Section 19	<i>Any situation exists 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>
General principles: Water uses	Section 21	<i>The MR Holder has a valid General Authorisation issued by DWS in 2017.</i>

### **3.4 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (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, 1998 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 authorised by law or cannot reasonably be avoided or stopped, to minimise 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>
Environmental Management Plan.	Section 34	<p><i>A draft EMP must include –</i></p> <p><i>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 –</i></p> <p><i>(iv) rehabilitation of the environment;</i></p> <p><i>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></p>

### 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 a mining right must by no later than a date published in the Government Gazette comply with these regulations. Until such date is published, the right holder is regarded as complying with the provisions of these regulations if such holder complies with the provisions and arrangements regarding financial provisioning, approved as part of the the right issued in terms of the MPRDA.

As mentioned earlier the right 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 THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO 57 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 (GNR 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.

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 FURTHER ACTS 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 the mine has made an adequate provision for environmental rehabilitation in terms of Section 41 of the MPRDA.

### **3.7 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.

A guideline from the Government of Western Australia (GWA 2011) provides insight to the importance of mine closure. The guidelines (GWA 2011) 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 commence and should continue throughout the life of the mine until final closure and relinquishment. This approach enables better environmental outcomes. It is also good business practice, as it should avoid the need for costly remedial earthworks late in the project lifecycle.

## 4. ENVIRONMENTAL AND PROJECT CONTEXT

### 4.1 PROJECT LOCATION

The mining right application was lodged over 43.4688 ha of Portion 3 of the farm The Orchards No 233 in the Albany District. The table below lists the GPS coordinates of the proposed mining footprint.

*Table 5: GPS coordinates of the proposed mining footprint.*

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	33°15'51.67"	26°36'49.99"	-33.264353°	26.613886°
B	33°15'51.30"	26°36'57.95"	-33.264250°	26.616097°
C	33°15'53.55"	26°37'05.77"	-33.264875°	26.618269°
D	33°15'52.36"	26°37'11.89"	-33.264544°	26.619969°
E	33°15'50.94"	26°37'17.94"	-33.264150°	26.621650°
F	33°15'55.99"	26°37'24.40"	-33.265553°	26.623444°
G	33°15'59.15"	26°37'32.99"	-33.266431°	26.625831°
H	33°16'02.99"	26°37'40.21"	-33.267497°	26.627836°
J	33°16'05.79"	26°37'39.89"	-33.268275°	26.627747°
K	33°16'05.83"	26°37'03.56"	-33.268286°	26.617656°
L	33°16'00.72"	26°36'48.26"	-33.266867°	26.613406°

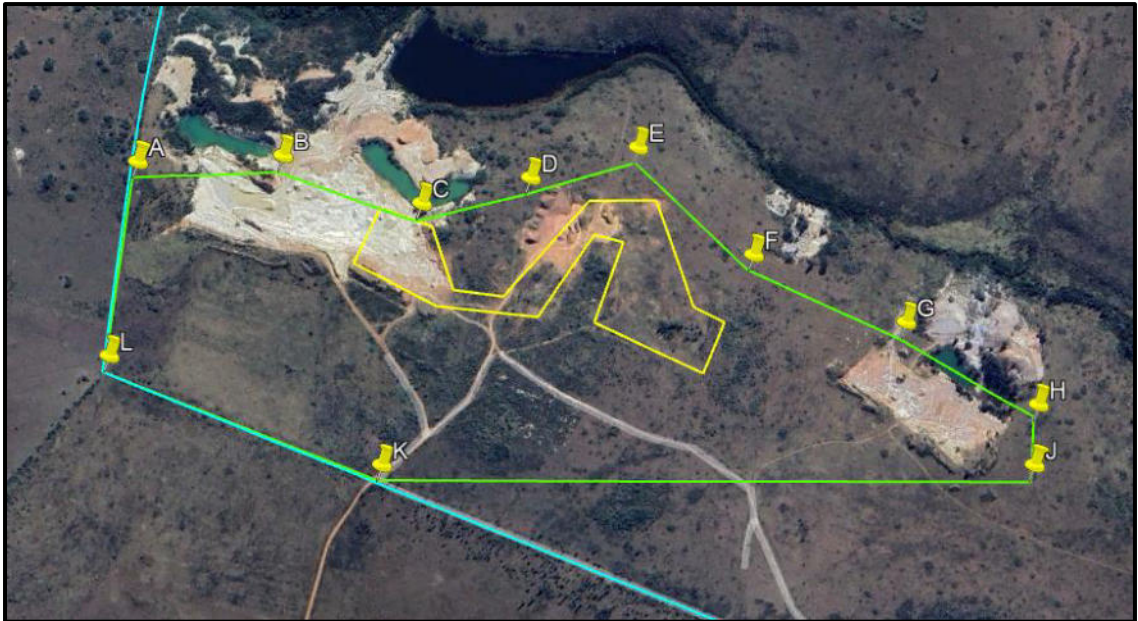


Figure 1: Satellite view showing the location of the proposed mining area (green polygon) in relation to the surrounding landscape where the yellow polygon indicates the old Makana Brick mining permit area, and the blue lines show the boundary of Portion 3 of The Orchards No 233. (Image obtained from Google Earth)

## 4.2 PROPOSED MINING OPERATION

### 4.2.1 Site Establishment Phase

Site establishment will entail the demarcation of the mining boundaries, clearance of vegetation (where necessary), and the stripping and stockpiling of topsoil and overburden to allow access to the clay.

#### 4.2.1.1 Demarcation of Mining Boundaries

Pursuant to receipt of an Environmental Authorisation (EA) and Mining Right (MR), and prior to mining, the boundary of the mining footprint will be demarcated. Project specific areas to be demarcated within the boundary of the mining footprint may include, but not be limited to, stockpile and processing areas, and the excavation. Additional thereto, the 100 m buffer from the Botha River will be demarcated and managed as a no-go area. A no-go area of 10 m around the Eskom power line that traverse the mining footprint will also be demarcated.

#### **4.2.1.2 Clearing of Vegetation**

The proposed mining area extends across remnants of the Bisho Thornveld (SVs70) and Grahamstown Grassland Thicket (AT38). Approximately 8 ha of the earmarked footprint has been altered by clay mining. Most of the earmarked area consists of Grahamstown Grassland Thicket that has a mixture of grassland and more woody Albany thicket vegetation types. In this circumstance the removal of vegetation will be necessary to expand the mining footprint and access the resource. The intention is to minimize the removal of natural vegetation, and to in the end restore the footprint area (through re-seeding) to secondary grassland suitable for grazing upon closure, and ultimately the lapse of the mining right.

It will be important to consider that undeveloped portions of land can still contribute to land management objectives and protection targets to some degree. An AIP (alien invasives plant) management plan must be implemented as a priority to prevent the further spread and proliferation of AIP species to the surrounding natural areas.

#### **4.2.1.3 Topsoil Stripping and Stockpiling**

It is proposed that topsoil removal will be restricted to the exact footprint of areas to be mined during the operational phase of the activity. The topsoil will be stockpiled at a designated signposted area to be replaced during the rehabilitation of the area. It will be part of the obligations of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon (the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped.

#### **4.2.1.4 Access Road**

The Applicant will use the existing gravel farm road to access the mining area. This road turns off the N2 national road via a formal access. Haul roads will be extended into the mining area as mining progresses. Should haul roads be needed where no farm roads exist the footprint of the haul roads will be contained to the approved mining area, specifically to areas where mining still needs to be done. No haul roads will be allowed over rehabilitated areas and upon closure of the site all haul roads will be ripped and rehabilitated if no longer needed by the landowners.

#### **4.2.1.5 Establishment of Site Infrastructure**

Mining of the clay does not require any permanent plant or infrastructure other than an ablutions hut. A temporary crushing and screening plant may (from time to time) be needed to reduce the overburden to the desired aggregate sizes of the clients. The processing infrastructure will be mobile, moving to the stockpiled material as needed. The plant will be powered by generators. No other infrastructure is needed as the Applicant will make use of the existing buildings, storerooms, and workshops at Makana Brick (off-site) when needed.

#### **4.2.1.6 Existing Infrastructure**

Apart from the farm roads and low voltage power line that traverse the application area no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

### **4.3 Operational Phase**

The Applicant intends to extract the clay from the mining area using opencast methods and applied to sell the unwanted overburden removed from the clay mining area as aggregate. Mining will be conducted during normal working hours (07:00 – 17:00) from Monday to Saturday. No mining or processing will take place on Sundays or after sunset.



#### 4.3.1 Clay Mining

Experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. It has also been found that some layers have high levels of silica and result in extrusion problems, and therefore slope mining is proposed to counter these problems. During the winning process heavy earth-moving equipment will be used to extract clay from the quarry, as follows:

- ❖ Topsoil and overburden will be removed by bulldozer and stockpiled separately for future rehabilitation purposes.
- ❖ A bulldozer will be used to move clay material along the benches or down the slopes at an incline of between 15 and 22°.
- ❖ Faces will be benched and cut at 5 m, creating a 5 m high bottom bench and 8 m high top bench with a ±3 m horizontal platform between. The horizontal platform will have a gentle slope to no more than 1% gradient forwards to ensure that stormwater drain freely off the platforms.
- ❖ Generally boundary sides lower than 5 m will be profiled to 1:2 gradient and those higher to 1:2.5 or 3 gradient.
- ❖ The average depth of the excavation will vary between 5-20 m.
- ❖ The quarry floor will have a slight slope of 2% and will be free draining to the existing retention ponds on the farm and therefore no additional stormwater structures are envisaged at present.
- ❖ Mechanical shovels i.e., front-end-loaders load the stockpiled clay onto dump trucks that transport it to the Makana Brick Factory (off-site) where it is stockpiled.
- ❖ The clay brick factory collects the clay with front-end-loaders and utilizes it in the brickmaking process.

Due to the Eskom power line, there is a portion of the mining footprint that will not be mined and will become an elevated “island” once mining is completed.

### **4.3.2 Aggregate Mining**

A bulldozer will be used to strip the overburden from the clay layer. The overburden will then be loaded onto dumper trucks that will transport it to the stockpile area. It may be necessary (from time to time) to make use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. The processing infrastructure will be of temporary and mobile nature, moving to the stockpiled material as needed.

At the primary crusher the aggregate will be fed through a grizzly into the crusher. From the primary crusher the material will be conveyed to the respective secondary processing plants for size separation before moving on conveyor belts to the various stockpiles. Deliveries will be made from the stockpiles.

## **4.4 TOPOGRAPHY**

The proposed mining area is situated on a fairly flat slope with a gradient decreasing from south to north, towards the Botha's River and very slight upslope from west to east. Further north the topography rises more prominently from Botha's Ridge and further south are more defined ridges and valleys.

The proposed mining area extends across three mined areas, to the west is the mining area of the landowner Mr Moss, and to the east the old mining permit areas of Makana Brick and Collingham Mining.

## **4.5 VISUAL CHARACTERISTICS**

Due to the topography of the area, the proposed footprint will mainly be visible from immediate surrounding areas. The small scale of the proposed operation, and the proposed progressive rehabilitation, will assist in mitigating the visual impact of the proposed development on the surrounding environment. No residual visual impact is expected upon closure of the mine.

#### **4.6 AIR QUALITY AND NOISE AMBIANCE**

Emissions to be generated at the mine will mainly consist of occasional dust due to the displacement of soil, screening (aggregate), and transport of the material from the farm. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). Noise and dust generation will resemble that of the current mining activities on site.

#### **4.7 GEOLOGY**

The site encompasses the Grahamstown Formation of the Cenozoic Deposits of the interior, immediately adjacent to the Witpoort Formation of the Witteberg Group of the Cape Supergroup. The Grahamstown Formation comprises of silcrete and kaolinite, with the former overlying the latter.

The study area hosts a relatively limited topsoil layer of  $\pm 10 - 15$  cm thick. The ancient pedogenic horizon which form across the peneplain surface, comprising of a broad slight concave folded rock sequence, is clearly visible in the form of the characteristic silcrete layer overlying the kaolin deposit on site. The silcrete overlying the kaolin acted as a weathering resistant capping, which protected the kaolin against erosion.

A distinct variance in the colour of the clay/kaolin can be observed on site. This colour variance is observed in a horizontal and vertical expanse of mere single meters. The change in colour may be due to a mineralogical difference attributed to dissimilarities throughout the corresponding extent of the parent material – e.g. Dwyka tillite (kaolin) or shale (clay).

The kaolin and clay found in the Grahamstown (Makhanda) area and surrounds are alteration/weathering products of parent material such as tillite and shale respectively. As part of the Cape Supergroup sequence of strata, sandstone, and shale/mudstone are generally present in alternating layers throughout the stratigraphy. Due to the chemical composition and physical properties of shale and mudstone, these lithologies are significantly more susceptible to alteration/weathering when compared to , for instance, sandstone.

#### **4.8 HYDROLOGY AND GEOHYDROLOGY**

The study area is situated in the Fish sub-water management area that forms part of the Fish to Tsitsikama Water Management Area (ID 16). According to the National Freshwater Ecosystem Priority Areas (NFEPA) map, the study area falls within a NFEPA in terms of wetlands and/or rivers. The proposed mining footprint does not extend into any strategic water management area.

The study area falls within the Botha's River catchment area and this small river is more than 100 m away from the mine boundary. The Botha's River is a tributary of the Great Fish River and feeds two large man-made dams, which together with several smaller dams and numerous seasonal pans provide important water sources to animals (SES, 2017). The 2017 EMPR of Makana Brick notes that the Botha's River ecological status is classified as AB condition, which is considered intact and able to contribute towards river ecosystem biodiversity targets. SES reported in 2017 that an assessment of the Botha's River revealed three man-made dams/weirs within 2.5 km from each other, alien vegetation along the riverbanks and cultivation lands on the riverbanks. The AB classification for the river might be applicable to the lower reaches of the river, but not for the upper reach.

The Albany Coast south and east of Grahamstown (Makhanda) has an elevated borehole concentration, with most boreholes situated in the fractured Witteberg Aquifer, and to a lesser degree, within the primary intergranular Algoa Aquifer and coastal dune belt. Groundwater is under-utilized in the Albany Coastal sub-area. Groundwater depth also varies in this area between 70 -120 m (SES, 2017).

#### **4.9 TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA**

When the footprint of the farm is layered over the Mining and Biodiversity Map, it extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining. The DFFE screening tool notes that there are CBA1, CBA2 and an ESA1 recorded over the property.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI (project area of influence) was instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted. No fauna SCC were detected, and the ecologist rated the animal theme sensitivity of the area as Low.

#### **4.10 CULTURAL AND HERITAGE ENVIRONMENT**

No areas of cultural, heritage or palaeontological concern were identified within the proposed site. The specialist recommended that should more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess it for palaeontological potential.

#### **4.11 EXISTING INFRASTRUCTURE**

Apart from the farm roads and low voltage power line, no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

## **5. ANNUAL REHABILITATION PLAN**

Appendix 3 to the Financial Provision Regulations, 2015 states that the objectives of the annual rehabilitation plan are to:

- a) Review concurrent rehabilitation and remediation activities already implemented;
- b) Establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months, which contribute to the gradual achievement of the post-mining land use, closure vision and objectives identified in the holder's final rehabilitation, decommissioning, and mine closure plan;
- c) Establish a plan, schedule, and budget for rehabilitation for the forthcoming 12 months;
- d) Identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
- e) Evaluate and update the cost of rehabilitation for the 12-month period and for closure, for purposes of supplementing the financial provision guarantee or other financial provision instrument.

### **5.1 IMPLEMENTATION AND REVIEW OF TIMEFRAMES**

The annual rehabilitation plan will be applicable for a 12-month period commencing from the date of approval thereof by the Department of Mineral Resources and Energy. The document will be reviewed during the 11<sup>th</sup> month of the operative period to ensure the timely submission of the subsequent annual review.

### **5.2 MONITORING RESULTS**

#### **5.2.1 Control of Invasive Alien Vegetation**

The right holder will continuously monitor the mining footprint for the invasion of alien vegetation in accordance with the Invader Plant Species Management Plan of the site (Appendix K of the EIAR & EMPR). This practice will continue through-out the site establishment-, operational-, and decommissioning phases of the project.

#### **5.2.2 Noise Monitoring**

A qualified occupational hygienist will quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring will be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.

Silencers will be fitted to all project related vehicles, and vehicles will be in a road worthy condition as stipulated in terms of the National Road Traffic Act, 1996. The type, duration and timing of each blast will be planned with due cognizance of other land users and structures in the vicinity.

### **5.2.3 Dust Monitoring**

The above mentioned occupational hygienist will also report on the gravimetric dust levels of the site. Site management must ensure that the dust generating activities at the site comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). Dust levels will be controlled through the management processes stipulated in the EIAR & EMPR.

### **5.2.4 Waste Monitoring**

Site management will be responsible to monitor the generation of all types of waste at the mining area, including general-, hazardous- and liquid waste. Solid (general) waste, generated during the operational phase, will be contained in sealable refuse bins that will be placed at the office area until the waste is transported to a recognised general waste landfill site.

Hazardous waste (such as spills) will be cleaned up immediately (within two hours of the occurrence) and the contaminated soil will be contained in designated hazardous waste containers that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility.

## **5.3 SHORTCOMINGS IDENTIFIED**

This report is the first Annual Rehabilitation Plan in terms of the Financial Provision Regulations, 2015 that was compiled for the proposed mine. No shortcomings have therefore been identified.

#### **5.4 REHABILITATION ACTIVITIES FOR THE FORTHCOMING 12 MONTHS**

Not yet applicable as mining has not yet commenced. Upon approval of the mining right application and receipt of the EA, the right holder will annually report on the planned rehabilitation actions.

#### **5.5 REVIEW OF THE PREVIOUS YEAR'S REHABILITATION ACTIONS**

This report is the first Annual Rehabilitation Plan in terms of the Financial Provision Regulations, 2015 that was compiled for the proposed mine. In this circumstance no annual rehabilitation activities have been identified that can be reviewed.

#### **5.6 COSTING**

To be determined once the annual rehabilitation objectives were established.



## 6. REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN

The objective of the final rehabilitation, decommissioning, and mine closure plan (According to MPRDA) 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 (as described above);
- 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; and
- h) Outlining monitoring, auditing, and reporting requirements.

*(Financial provision regulations, 2015 appendix 4)*

The following objectives are leading closure indicators, which need to be applied across all the domains, and read in conjunction with the principles, which embody the strategic objectives. The closure plan must address all the areas associated with closing the operations, of which rehabilitation and re-vegetation forms part of a component. The first step in developing the overall mine closure strategy is to identify potential post mining land use options and establish key objectives for closure to be incorporated in the project design.

The preferred post mining land use for the proposed mine is to restore the natural vegetation (where possible) and return the area to agricultural use (grazing). In this context, the primary objectives for the closure of the mining operations are:

- ❖ Remove all infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources and Energy.
- ❖ Shape and contour disturbed areas in compliance with the EMPR.
- ❖ Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the damming of surface water.
- ❖ Make all excavations safe.
- ❖ Use the topsoil effectively to promote the re-establishment of vegetation.
- ❖ Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.

- ❖ Eradicate all weeds/invaser plant species by intensive management of the mine site.

## **6.1 CLOSURE STRATEGY GUIDED BY THE ENVIRONMENTAL RISK ASSESSMENT**

The overall objective of the closure plan is to minimize adverse environmental impacts associated with the mining activity whilst maximising the future utilisation of the property. The idea, therefore, is to leave the mined areas in a condition that reduces all negative impacts associated with the activity. Significant aspects to be borne in mind in this regard is visibility of the mining scar, re-vegetation of the mining footprint, stability, and environmental risk in an old mine environment. The rehabilitated and immediate surroundings must also be free of weeds and alien vegetation.

The proposed mining and rehabilitation procedures was formulated to optimise the extraction of the raw material while creating a stable mining area that will not present an unreasonable safety risk once the mine is closed. Rehabilitation will include activities to be divided into medium- and long-term categories. In the medium term, rehabilitation will entail the continuous shaping of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve the shaping of the stockpiling/processing area by removing the stockpiled material and site infrastructure/equipment and landscaping the disturbed footprints.

Due to the impracticality of importing large volumes of fill to restore the mined area to its original topography, the rehabilitation option is to develop the excavation into a minor landscape feature. This will entail creating a series of irregular benches along the faces thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate indigenous grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

The decommissioning activities will therefore consist of the following:

- ❖ Sloping and landscaping the excavations;
- ❖ Removing all stockpiled material;
- ❖ Removing all mining machinery and equipment from site;
- ❖ Landscaping all disturbed areas and replacing the topsoil;
- ❖ Vegetating the rehabilitated area; and
- ❖ Controlling/monitoring the invasive plant species.

## **6.2 DESIGN PRINCIPLES**

The Applicant proposes the following for rehabilitation of the mined areas:

- ❖ The mine plan will be such that topsoil is stockpiled for the minimum possible time through implementing progressive rehabilitation as mining continues.
- ❖ After mining, steep slopes at the edges of excavations will be reduced to a minimum and profiled to blend with the surrounding topography.
- ❖ The stockpiled topsoil will then be evenly spread over the disturbed mining area, so that there is a depth of 300 mm of sandy topsoil above the underlying layer. The depth will be monitored during spreading to ensure that coverage is adequate and even.
- ❖ The Applicant will strive to (when possible) spread topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, is minimized.
- ❖ A cover crop (indigenous vegetation) that ties in with the proposed land use will be planted immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop will be fertilised for optimum biomass production.
- ❖ The rehabilitated area as well as the land down slope of it will monthly be monitored for erosion, and appropriately stabilized if any erosion occurs.
- ❖ The Applicant will ensure monthly monitoring of weeds/invaser plants that may germinated within the rehabilitated area. The invasive plant species management plan will continually be implemented on site.
- ❖ The 100 m buffer between the mining area and the river as well as the 10 m buffer between the mine and the power line will be kept intact for the duration of the mining activities and the decommissioning phase.
- ❖ The retention ponds will remain at the property to be used by the landowner.

Final rehabilitation will entail the shaping of the final mined areas (as listed above), as well as the processing/stockpiling area. This will entail the removal of all manmade structures and mining related equipment no longer needed by the landowner, the dumping of coarse natural material used for the construction of ramps into the excavations, removal of all stockpiles, and the ripping and topsoiling of all compacted and disturbed areas.

### **6.3 POST-MINING LAND USE**

As mentioned earlier, the preferred post mining land use for the proposed mine is to restore the natural vegetation (where possible) and return the area to agricultural use (grazing).

## **6.4 CLOSURE ACTIONS**

The closure goals and objectives are to ensure that post-use rehabilitation achieves a stable and functioning landform consistent with the environmental values and agreed land use.

As mentioned earlier, the mined areas will not be refilled however, rehabilitation will largely fall within two categories namely, those that will occur within the medium term when an area has been mined, and those that will occur in the long term upon final closure of the site.

### **6.4.1 Medium Term Rehabilitation**

In the medium term, progressive rehabilitation of mined areas will be done and will include the following closure objectives:

- ❖ Reduce any steep slopes at the edges of excavations to a minimum and profile it to blend with the surrounding topography (follow parameters as listed under 6.4.2 Long Term / Final Rehabilitation);
- ❖ Replace the stockpiled topsoil evenly over the mined area to a depth of 300 mm;
- ❖ Maintain the stormwater measures proposed in the Stormwater Management Plan (SWMP) to prevent erosion of newly rehabilitated areas;
- ❖ Seed the rehabilitated area with a seed mix of commercial- and native seeds including annuals and perennials to diversify rooting depths;
- ❖ Control invasive plant species for at least one growth season;
- ❖ Monitor the area for erosion until vegetation established.

### **6.4.2 Long Term / Final Rehabilitation**

Upon closure of the mine, the Right Holder will commence with the rehabilitation of the final mined area/s (as listed above) and the processing area. As mentioned previously, the design of the excavations will take place with the rehabilitation end goal in mind. The clay will be removed along the benches or down the slopes at an incline of between 15 and 22°. Faces will be benched and cut at 5 m, creating a 5 m high bottom bench and 8 m high top bench with a ±3 m horizontal platform between. The horizontal platform will have a gentle slope to no more than 1% gradient forwards to ensure that stormwater drain freely off the platforms. This will be important for rehabilitation, due to the properties of clay that may hinder rehabilitation if the stormwater is retained on the platforms.

Generally boundary sides lower than 5 m will be profiled to 1:2 gradient and those higher to a 1:2.5 or 3 gradient with the top edge rounded off to create a flowing landscape. Faces will be profiled in such a manner that soft lines are created and sharp corners are prevented to blend the quarry the landscape. The quarry floor will have a slight slope of 2% and will be free draining to the existing retention ponds. The retention ponds will be retained as a water source for cattle post mining.

Excess material and overburden will be used to profile the production faces. Topsoil will be spread to a depth of at least 200 mm over the floor and scarified lightly to key it in with the sub-layer. The mine will be rehabilitated to sustainable secondary grassland, allowing natural succession for thicket to establish. Alien and invader plant species will continually be cleaned from rehabilitated areas until the Right Holder obtained a closure certificate.

The right holder will also comply with the minimum closure objectives as prescribed by DMRE and detailed below:

**Rehabilitation of the Excavation:**

- ❖ The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material (if any) removed from the excavation must be dumped into the excavation.
- ❖ No waste may be deposited in the excavations.
- ❖ Once overburden 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 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 may require that the soil be analysed 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.

### **Rehabilitation of Processing/Stockpiling Area:**

- ❖ Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- ❖ Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.
- ❖ On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
  - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- ❖ Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.
- ❖ On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- ❖ The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the DMRE Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a 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).

#### **6.4.3 Revegetation of Rehabilitated Areas**

When an area was mined, progressive rehabilitation must occur wherein a stable vegetation cover is established with a grass layer. It is imperative that any mined areas are re-vegetated as soon as possible. The goal of re-vegetation is:

- ❖ Preventing erosion and avoiding further soil loss;
- ❖ Restoring the affected area to the best possible condition compared to the original state or equivalent benchmark/pristine areas;
- ❖ Reduce, or ideally prevent, surface runoff and the carrying away of topsoil so that the sedimentation into rivers and/or wetlands is reduced;
- ❖ Restore a best possible ecosystem functioning, via plant succession, so that the local biodiversity can return, preferably to conditions as close to the original state as possible.

A suitable layer of topsoil, of the same type and quality as that of an equivalent benchmark site to that of the mined area, should immediately be applied to an area after it has been fully mined, and before revegetation of that area commences. The recommended depth of soil is 300 mm. The use of a commercial seed mix is recommended, and for dryland areas, the seed mix should be less than half the standard sowing rate and include annuals (e.g. wheat or rye) and perennials e.g. Couch Grass (*Cynodon dactylon*). The seed mix can be augmented with the following species:

- ❖ Love Grass (*Eragrostis curvula*)
- ❖ Foxtain Buffalo Grass (*Cenchrus ciliaris*)
- ❖ Curfy Leaf (*Eragrostis chloromelas*)
- ❖ Tough Dropseed (*Sporobolus africanus*)
- ❖ Purple Finger Grass (*Digitaria tricholaenoides*)
- ❖ Guinea Grass (*Panicum maximum*)
- ❖ Rhodes Grass (*Chloris gayana*) (soil stabiliser)
- ❖ Red Grass (*Themeda triandra*) (fire resistant)
- ❖ Thatch Grass (*Hyparrhenia hirta*) (less palatable, drought resistant, protects and stabilise soil)
- ❖ Giant Spear Grass (*Trachypogon spicatus*) (protection against soil erosion)

None of these grasses poses any threat of proliferation. Seeding would take place when the phases are rehabilitated or in the spring from August to October and in autumn from March to middle April at an application rate of 5 kg/ha each of the species mentioned. If the seeding application was unsuccessful the area must be treated with additional seed applications during the rainy season.

It is recommended that some tree species be planted on the benches in the excavation during the rehabilitation process. Individual tree species can be planted with distance no less than 5 – 10 m apart. As far as possible the trees from the bush clumps should be transplanted and used in the rehabilitation. The following species are known to occur in the bush clumps:

- ❖ Camphor Bush (*Tarchonanthus camphorates*)
- ❖ Candle/Cherriewood (*Pterocelastrus tricuspidatus*)
- ❖ Cabbage Tree (*Cussonia spicata*)
- ❖ Numnum (*Carissa bispinosa*)
- ❖ Star Apple (*Diospyros dichrophylla*)
- ❖ White Cape Beech (*Pittisporium viridiflorum*)

For every tree/bush a hole (0.5 x 0.5 x 0.5 m) must be prepared by digging out some of the soil and filling it with a 75:25 mixture of good topsoil and compost and very light application of 2:3:2. Before the plant is introduced the soil mixture must be watered well. Once planted, and the remainder of the soil introduced the trees must be watered again and be repeated at least every week for two months.



If water should collect in the excavation area and conditions are not conducive to planting thicket bush clumps on the excavation floor, a wetland habitat can be created. Alternatively the silt ponds can be rehabilitated by planting wetland species. The following species can be planted in the top dressed quarry floor, silt ponds to facilitate the formation of an artificial wetland habitat:

- ❖ Bulrush (*Typha capensis*) (if water is already present)
- ❖ Cyperus (*Cyperus textilis*)
- ❖ Blue Water Lily (*Nymphaea nouchali*) (if water is already present)

#### **6.4.4 Maintenance and Monitoring**

Rehabilitated areas need to be monitored and managed after the initial rehabilitation. The proposed mine's primary tool for maintenance of the rehabilitated area will be monitoring of the shaped areas until the closure certificate is issued. The following aspects must closely and regularly be monitored:

- ❖ Topsoil Depth: it is crucial that a proper topsoil depth is maintained to 300 mm;
- ❖ Soil Erosion Status: any existing erosion must be controlled, and any new erosion that arises must be corrected immediately;
- ❖ Vegetation cover and Species Diversity: vegetation must regularly be assessed to determine whether target species have established and whether a sufficient vegetation cover has been obtained.

If areas are identified that are considered unsatisfactory then maintenance may include, but not be limited to:

- ❖ Replanting failed or unsatisfactory areas;
- ❖ Repairing any erosion problems; and
- ❖ Pest and weed control.

#### **6.4.5 Success Criteria and Monitoring**

To assess when the rehabilitation and re-vegetation process is complete, the mine will develop a set of completion criteria. These criteria will be reviewed by senior management before being submitted to the regulatory authorities (DMRE) for approval and sign off.

The approved set of completion criteria will be used as a basis for assessing the closure of the mining operations, with the mine required to comply with the specified criteria before the land management can be relinquished. The completion criteria

will be reviewed every two years with the closure plan and updated to include findings of the mine rehabilitation research and development program as well as additional requirements of the regulatory authorities.

When selecting completion criteria, consideration must be given to the climatic conditions in the area. Using simple percentage species and percentage cover may not be appropriate, as this is dependent on when the samples are taken. If the baseline was established during a wet year and the assessment undertaken during drought, the criteria will not be met. The rehabilitated and re-vegetated areas will be monitored to determine the progress of the programme. Monitoring is likely to be a combination of methods and may include photographic monitoring, transects and standard plot areas.

#### **6.4.6 Impact Specific Procedures**

The table below provides a summary of the impact specific procedures associated with the closure of the mine.

Table 6: Summary of the impact specific procedures

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
<b>SOCIO-ECONOMIC</b>		
<ul style="list-style-type: none"> <li>❖ The retrenchment process will be followed as per requirements of the applicable legal process; and</li> <li>❖ All existing social investments will be phased out over an agreed period with beneficiaries.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Progressive rehabilitation must be implemented as mining progress.</li> </ul>	<ul style="list-style-type: none"> <li>❖ The Social and Labour Plan (SLP) must be audited on an annual basis;</li> <li>❖ Any commitments made to I&amp;AP'S will be attended to the relevant I&amp;AP's satisfaction as agreed upon between the I&amp;AP'S and the mine.</li> </ul>
<b>TOPOGRAPHY AND EROSION CONTROL</b>		
<ul style="list-style-type: none"> <li>❖ The area will have contours constructed to prevent soil erosion.</li> </ul>	<ul style="list-style-type: none"> <li>❖ All slopes which may incur erosion will be profiled in such a way that a preferential down drain can be installed;</li> <li>❖ Erosion control measures such as contour banks and cut off berms must be constructed, and soil vegetated in rehabilitated areas. On gentle slopes, water will be encouraged to flow off the rehabilitated surface as surface flow, as quickly as possible without causing erosion.</li> <li>❖ The specifications of the SWMP must be implemented on site.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Should it be noted that designs are not being followed, rehabilitation activities will cease, and corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary;</li> <li>❖ Any erosion will also be addressed utilising contour berms, gabion structures if necessary or a specialist will be consulted if necessary. Any eroded soils will be lifted and returned to the affected area;</li> <li>❖ Any deficiencies will be corrected by placing material in these areas as per the closure plan;</li> <li>❖ Any compacted soils will be ripped or disked and re-vegetated with indigenous flora. Vegetation will then be monitored in these areas;</li> <li>❖ All recommendations made by the specialists will be implemented where deemed appropriate;</li> <li>❖ An alien invasive management program will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised will be used responsibly. Where required DWS will be consulted with regards to the use of certain chemicals</li> </ul>

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
<b>ECOLOGY</b>		
<ul style="list-style-type: none"> <li>❖ The rehabilitated area will be protected from surface disturbance to allow vegetation to establish and stabilise.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems;</li> <li>❖ The rehabilitated ecosystem will have equivalent functions and resilience as the target ecosystem;</li> <li>❖ Soil properties will be appropriate to support the target ecosystem;</li> <li>❖ The rehabilitated areas will provide appropriate habitat for fauna.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Should it be noted that designs are not being followed, rehabilitation activities will be amended to ensure corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary;</li> <li>❖ An alien invasive management programme will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised must be used responsibly.</li> </ul>
<b>LAND USE</b>		
<ul style="list-style-type: none"> <li>❖ To ensure that rehabilitation is done to such an extent that land use potential is regained for agricultural use and associated zoning.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Only after the rehabilitated areas have been inspected and approved by the Mine Manager/Site Manager will topsoil be placed to a depth of 300 mm. The topsoil layer must be as even as possible, i.e. it must be smooth, and the depth must remain consistent throughout;</li> <li>❖ Once the topsoil has been replaced, vehicle movement must be restricted to prevent compaction of the topsoil;</li> <li>❖ Rehabilitated areas will be vegetated within the same growing season (at the end of the rainy season). A suitable seedbed will be prepared to enhance the penetration and absorption of water, thereby giving the seed the best possible chance to germinate. The seeding depth should be very shallow to provide better germination. For most grass species seeding depth is approximately 5-15 mm;</li> <li>❖ Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible; and</li> <li>❖ Once the seed mixture has been sown, the land must be rolled to ensure consolidation around the seeds and effective moisture retention.</li> </ul>	<ul style="list-style-type: none"> <li>❖ N/A</li> </ul>

## 6.5 CLOSURE SCHEDULE

As explained earlier the Mining Right holder intends progressive rehabilitation of each mined areas, thereby minimizing denuded areas that stem from mining.

At this stage it is proposed that the final 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 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.

According to the MPRDA Section 43 (4) refers to the issues of a closure certificate and stipulates the following:

**“Section 43(4) Issuing of a closure certificate -**

*(4) An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment, or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report.*

Table 7: Closure schedule

CLOSURE SCHEDULE	
DECOMMISSIONING / CLOSURE ACTION	TIMEFRAME
<b>EXCAVATION (OPERATIONAL- &amp; DECOMMISSIONING PHASE)</b>	
<ul style="list-style-type: none"> <li>❖ Create irregular benches along the mined faces (at an include of between 15 - 22°);</li> <li>❖ Bench cut faces at 5 m, creating a 5 m high bottom bench and 8 m high top bench with a ±3 m horizontal platform between;</li> <li>❖ Ensure the horizontal platform has a gentle slop of no more than 1% gradient forwards;</li> <li>❖ Profile boundary sides lower than 5 m to a 1:2 gradient, and those that are higher to a 1:2.5 or 3 gradient with the top edge rounded off;</li> <li>❖ Ensure the quarry floor has a slight slope of 2% to make it free draining to the retention ponds;</li> <li>❖ Use excess material and overburden to profile production faces;</li> </ul>	<p>Once an area is mined, and at the end of the mine's life. Seeding to be done in spring from August – October, or in autumn from March – April.</p>

<b>CLOSURE SCHEDULE</b>	
<b>DECOMMISSIONING / CLOSURE ACTION</b>	<b>TIMEFRAME</b>
<ul style="list-style-type: none"> <li>❖ Spread topsoil to a depth of at least 200 mm over the floor and scarify it lightly to key it in with the sub-layer;</li> <li>❖ Dispose all waste off-site;</li> <li>❖ Seed rehabilitated area or arrange for planting of relevant cover crop;</li> <li>❖ Retain the stormwater control measures for as long as needed.</li> </ul>	
<b>PROCESSING / STOCKPILE AREA</b>	
<ul style="list-style-type: none"> <li>❖ Dump coarse natural material used for ramps into the excavations;</li> <li>❖ Remove all product stockpiles;</li> <li>❖ Remove all structures/equipment from the footprint;</li> <li>❖ Rip any compacted area;</li> <li>❖ Landscape and level the area to prevent any depressions and allow for grazing (after the vegetation re-established);</li> <li>❖ Replace the stockpiled topsoil over the rehabilitated and landscaped area;</li> <li>❖ Seed rehabilitated area or arrange for planting of relevant cover crop;</li> <li>❖ Retain the stormwater control measures for as long as needed.</li> </ul>	Week 1 - 12
<b>MAINTENANCE AND AFTER CARE</b>	
<ul style="list-style-type: none"> <li>❖ Erosion Monitoring</li> <li>❖ Weeds and Invader Plant Control</li> </ul>	12 months duration after final closure of the mining area.

## **6.6 IMPLEMENTATION AND RESPONSIBILITY OF CLOSURE PLAN**

Implementation of the closure plan is ultimately the responsibility of Makhanda Mining (Pty) Ltd. 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 right holder will appoint an Environmental Control Officer to oversee compliance of the rehabilitation/closure activities.

### **6.6.1 Site Management Responsibility List**

- ❖ Inspect area for erosion, and/or compaction;
- ❖ Floral surveys need to be conducted to monitor cover abundance, plant succession and community structure;
- ❖ Monitor any ecologically sensitive species should it be observed on site.

### **6.6.2 Management of Information and Data**

The Closure Plan must include a description of the management strategies, and all information and data relevant to mine closures. These records are valuable during all phases of mining to provide:

- ❖ A history of closure and implementation at the site;
- ❖ A history of past developments;
- ❖ Information for incorporation into state and national natural resource databases;  
and
- ❖ The potential for improved future land use planning and/or site development.

## **6.7 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.

## **6.8 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 shaped without steep excavation edges;
2. that topsoil has been spread on the surface;

3. that there is a potential rooting depth of at least 300 mm, of non-compacted soil material, which is suitable for root growth, across the mining area;
4. that there is no visible erosion across the area, or down-slope of it because of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
5. that a successful cover crop has been established across the area.

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

*Table 8: Relinquishment criteria*

<b>RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES</b>			
<b>CATEGORY</b>	<b>RELINQUISHMENT CRITERIA</b>	<b>INDICATORS</b>	<b>REPORTING REQUIREMENTS</b>
Removal of all equipment.	No visible man-made structures (no longer needed by the landowner) should remain.	Closeout inspection by site management upon end of decommissioning phase.	Photographic evidence that infrastructure 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
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 like that is acceptable to the landowner.	Land capability and productivity	Comparison to equivalently rehabilitated areas.

## **6.9 CLOSURE COST ESTIMATE**

Financial provision (Regulation 54 of the MPRDA, 2002) is the amount needed for the rehabilitation of damage caused by the operation, both at sudden closure during the normal operation of the project and at final, planned closure. This amount reflects what it will cost the Department to rehabilitate the area disturbed in case of liquidation or abscondence. Financial provision for environmental rehabilitation and closure requirements of mining operations forms an integral part of the MPRDA. Section 41 of the MPRDA and Regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

Based on the extent of the current disturbance and by utilising the Department of Mineral Resources and Energy guideline document for calculating financial provision the proposed mine needs to provide a financial provision value of R 800 139.43 (calculated March 2024).



Refer to *Part B(1)(f)(i)(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline of the 2024 EIAR & EMPR for an explanation as to how the financial provision amount was calculated.*

#### **6.10 MOTIVATION FOR AMENDMENTS MADE TO THE FINAL REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN.**

Not applicable as no amendments were made to the Final Rehabilitation, Decommissioning and Mine Closure Plan.

### **7. MONITORING, AUDITING AND REPORTING**

In compliance with applicable legislation, the mining right holder will conduct monitoring of the mining activities for the duration of the decommissioning and closure phase. 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. Monitoring, auditing, and reporting needs to be conducted until mine closure has been approved by the DMRE and the closing certificate obtained.

Table 9: Monitoring, auditing, and reporting requirements

<b>MONITORING, AUDITING AND REPORTING REQUIREMENTS</b>			
<b>AUDIT</b>	<b>RESPONSIBLE PERSON</b>	<b>FREQUENCY OF AUDIT</b>	<b>CLOSE OUT APPROACH</b>
<b>LEGISLATED AUDITING AND REPORTING</b>			
<b>Environmental Auditing</b>	<b><u>Internal Review</u></b>		
	Site manager to ensure compliance with Environmental Management Programme and Closure Plan.	Daily compliance monitoring.	Any non-conformance must immediately be addressed by site management and weekly reported on.
	<b><u>External Auditing</u></b>		
	External Environmental Consultant	Annual auditing and reporting to the Department of Mineral Resources and Energy.	Depending on the significance of the findings, site management has a maximum of four weeks to address and close out auditing results.
<b>Financial Provision Review</b>	Financial Provision Review	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 right would increase the financial provision to meet the audited financial provision within 90 days from the date of the signature.
<b>MONITORING</b>			
<b>Dust Monitoring</b>	Dust Monitoring Specialist	Quarterly Gravimetric Dust Monitoring	Site management has a maximum of two weeks to develop and implement a dust management plan should the dust levels increase, and such a plan is required by DMRE or the municipality.
<b>Noise Monitoring</b>	Noise Monitoring Specialist	Quarterly Noise Monitoring	Site management has a maximum of one week to designate additional noise zone where applicable. Hearing protection equipment must be always available to employees.
<b>Invader Plant Monitoring</b>	Site Management	Annual Monitoring	Site management has a maximum of two weeks to review and implement the invader plant control plan should Category 1a & b plants in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 15 of 1973) and the

MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	RESPONSIBLE PERSON	FREQUENCY OF AUDIT	CLOSE OUT APPROACH
			Alien and Invasive Species Regulations, 2014 (amended 2016) germinate on-site.

## 7.1 SCHEDULE FOR REPORTING REQUIREMENTS

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

Table 10: Reporting requirements

REPORTING REQUIREMENTS			
AUDIT	LEGISLATION	REPORTING REQUIREMENTS	UPDATE DISCLOSURE
<b>Environmental Auditing</b>	NEMA; EIA Regulations, 2014	Reporting on the environmental compliance of the mining area will be in accordance with Regulation 34 of the NEMA EIA Regulations, 2014 (as amended). 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.
<b>Financial Provision Review</b>	NEMA Amendment Act, 2014 (Act No 25 of 2014)  Financial Provision Regulations, 2015	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.
<b>Health and Safety Auditing</b>	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 annually update the Code of Practices applicable to the site.

## 8. ENVIRONMENTAL RISK ASSESSMENT REPORT

The objective of the environmental risk assessment report is to:

- a) ensure timeous risk reduction through appropriate interventions;
- b) identify and quantify the potential latent environmental risks related to post closure;
- c) detail the approach to managing the risks;
- d) quantify the potential liabilities associated with the management of the risks; and
- e) outline monitoring, auditing, and reporting requirements.

*(Financial Provision Regulations, 2015 Appendix 4)*

### 8.1 ASSESSMENT PROCESS USED TO IDENTIFY AND QUANTIFY LATENT RISKS

#### 8.1.1 Methodology

The methodology for the assessment of the potential latent risks entailed the use of the following:

#### **DEFINITIONS AND CONCEPTS**

##### **Environmental significance:**

The concept of significance is at the core of impact identification, evaluation, and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- ❖ Environmental significance is a value judgement.
- ❖ The degree of environmental significance depends on the nature of the risk.
- ❖ The importance is rated in terms of both biophysical and socio-economic values.
- ❖ Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into risk magnitude and risk significance. Risk magnitude is the measurable change (i.e. intensity, duration, and likelihood). Risk significance is the value placed on the change by different affected parties (i.e. level of acceptability)

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of consequences being realised (Environment Australia (1999) Environmental Risk Management).

**Impact:**

The positive or negative effects on human well-being and / or the environment.

**Consequence:**

The intermediate or outcome of an event or situation OR it is the result, on the environment, of an event.

**Likelihood:**

A qualitative term covering both probability and frequency.

**Frequency:**

The number of occurrences of a defined event in each time or rate.

**Probability:**

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

**Environment:**

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation (ISO 14004, 1996).

**Methodology to be used:**

The environmental significance assessment methodology is based on the following determination:

**Environmental Significance = Overall Consequence x Overall Likelihood**

**Determination of Overall Consequence:**

Consequence analysis is a mixture of quantitative and qualitative information, and the outcome can be positive or negative. Several factors can be used to determine consequence. For determining the environmental significance in terms of consequence, the following factors were chosen Severity/Intensity, Duration and Extent/Spatial Scale. Each factor is assigned a rating of 1 to 5, as described in the tables below.

***Determination of Severity / Intensity:***

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects affect the biophysical and socio-economic environment.

The following table will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 11: Monitoring Programmes

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous / Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

### **Determination of Duration**

Duration refers to the amount of time that the environment will be affected by the event, risk, or impact, if no intervention e.g. remedial action takes place.

*Table 12: Rating of duration used in the assessment of potential latent risks*

<b>Rating</b>	<b>Description</b>
1	Up to ONE MONTH
2	ONE MONTH to THREE MONTHS (QUARTER)
3	THREE MONTHS to ONE YEAR
4	ONE to TEN YEARS
5	Beyond TEN YEARS

### **Determination of Extent/Spatial Scale**

Extent or spatial scale is the area affected by the event, aspect, or impact.

*Table 13: Rating of extent / spatial scale used in the assessment of potential latent risks*

<b>Rating</b>	<b>Description</b>
1	Immediate, fully contained area
2	Surrounding area
3	Within Business Unit area of responsibility
4	Within the farm/neighboring farm area
5	Regional, National, International

### **Determination of Overall Consequence**

Overall consequence is determined by adding the factors determined above and summarized below, and then dividing the sum by 3.

*Table 14: Example of calculating overall consequence in the assessment of potential latent risks*

<b>Consequence</b>	<b>Rating</b>
Severity	Example 4
Duration	Example 2
Extent	Example 4



Consequence	Rating
<b>SUBTOTAL</b>	<b>10</b>
<b>TOTAL CONSEQUENCE:</b> (Subtotal divided by 3)	<b>3.3</b>

***Determination of Likelihood:***

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

***Determination of Frequency***

Frequency refers to how often the specific activity, related to the event, aspect, or impact, is undertaken.

*Table 15: Rating of frequency used in the assessment of potential latent risks*

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

***Determination of Probability***

Probability refers to how often the activity or aspect has an impact on the environment.

*Table 16: Rating of probability used in the assessment of potential latent risks*

Rating	Description
1	Almost never / almost impossible
2	Very seldom / highly unlikely
3	Infrequent / unlikely / seldom
4	Often / regularly / likely / possible
5	Daily / highly likely / definitely

### Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Table 17: Example of calculating overall likelihood in the assessment of potential latent risks

Consequence	Rating
Frequency	Example 4
Probability	Example 2
<b>SUBTOTAL</b>	<b>6</b>
<b>TOTAL LIKELIHOOD</b> (Subtotal divided by 2)	<b>3</b>

### Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the significance of the risk, which is a number that will then fall into a range of **insignificant risk**, **uncertain risk**, or **Significant Risk**, as shown in the table below.

Table 18: Determination of overall significance in the assessment of potential latent risks

Significance or Risk	Insignificant risk (cc)	Uncertain risk (bb)	Potential significant risk (aa)
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 – 19.9

### Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision-making process associated with this event, aspect, or impact.

Table 19: Description of environmental significance and related action required in the assessment of potential latent risks

Significance	An insignificant risk (cc)	A uncertain risk (bb)	A potential significant risk (aa)
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect.  Acceptable.	Impact is of low order and therefore likely to have little real effect.  Acceptable.	Impact is real and substantial in relation to other impacts. Pose a risk to the company.  Unacceptable
Action Required	Maintain current management measures.  Where possible improve.	Maintain current management measures.  Implement monitoring and evaluate to determine potential increase in risk.  Where possible improve	Improve management measures to reduce risk.

Based on the above, the significance rating scale has been determined as follows:

- A potential Risk (aa) Risks of a substantial order. Mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these.
- An uncertain risk (bb) Risk would be negligible. Almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple.
- An insignificant risk (cc) There would be very small to no risk.

### 8.1.2 Description of Latent Risks

At this stage, no latent risks that will potentially arise during closure phase of the mining area were identified.

### 8.1.3 Results and Finding of Risk Assessment

Not applicable as no latent risks were identified.

### 8.1.4 Changes to the Risk Assessment Results

N/A

## 8.2 MANAGEMENT ACTIVITIES

No additional management activities are necessary as no latent risks were identified.

## 8.3 COST ESTIMATE

Not applicable as no latent risks were identified.

## 8.4 MONITORING, AUDITING AND REPORTING REQUIREMENTS


By reason of the fact that no latent risks regarding the management of the mine were identified, no additional monitoring, auditing, or reporting requirements are required at this stage.

## 9. CONCLUSION

This Closure Plan needs to be followed in union with the EMPR and its amendments when it is decided that the end of mining has been reached. This document gives the necessary information when planning the rehabilitation of the mine together with the cost associated with the rehabilitation.

Makhanda Mining (Pty) Ltd commits itself to providing all the necessary resources to ensure that the rehabilitation of the mine is done in such a way that will be acceptable to all parties involved.

## 10. SIGNATURE OF AUTHOR


NAME	SIGNATURE	DATE
Christine Fouche		22 March 2024

**11. UNDERTAKING BY RIGHT HOLDER**

I, JOHN COLIN MEYER, the undersigned and duly authorised thereto by MAKHANDA MINING that Makhanda Mining (Pty) Ltd will comply with the provisions of the MPRDA and its Regulations as set out in Government Gazette no. 26275 (23 April 2004), as well as NEMA.

I have studied and understand the contents of this document and duly undertake to adhere to the conditions as set out therein, unless specifically or otherwise agreed to in writing.

Signed at ...Makhanda... on this ...17...day of ...May... 2024.....

  
Name: JC MEYER  
Designation: CEO / DIRECTOR

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## 12. REFERENCES

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