

GRAVEL NORTH (PTY) LTD
PROPOSED MINING ON A PORTION OF PORTION 2 OF THE FARM
GLEN THORNE NO 2163, MANGAUNG DISTRICT,
FREE STATE PROVINCE

CLOSURE PLAN

DEPARTMENTAL REFERENCE NUMBER:

FS 30/5/1/3/2/10455 MP

NOVEMBER 2025

PREPARED FOR:

Gravel North (Pty) Ltd
28 Donald Murray Ave
Parkwest
Bloemfontein
9301
Contact Person: Mr GF Griesel
Cell: 071 315 6810
E-mail: animalfeeds@jsboerdery.co.za

PREPARED BY:

Greenmined Environmental (Pty) Ltd
Unit MO1, No 107 AECI Site
Baker Square, Paardevelei
De Beers Avenue
Somerset West
7130
Contact Person: Ms C Fouché
Tel: 021 851 2673
Cell: 082 811 8514
E-mail: Christine.f@greenmined.co.za



EXECUTIVE SUMMARY

Greenmined Environmental (Pty) Ltd is the consultants responsible for the mining permit application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (hereafter referred to as the “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 2015 (GN 1228, Financial Provision Regulations 2015 (as amended)). 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 permit application and receipt of the EA, the permit holder will annually report on the planned rehabilitation actions.

Rehabilitation, Decommissioning and Mine Closure Plan

The decommissioning phase will entail the reinstatement of the 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 borrow pit to its original topography, the rehabilitation option is to develop the excavation into a landscape feature. This will entail creating a series of irregular benches along the pit faces thereby reducing the overall face angle. The benches will be top-dressed with the available topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

Environmental Risk Assessment Report

At this stage, no latent risks that will potentially arise during the 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 Director: Mineral Development 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 levelled, 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

BAR	Basic Assessment Report
DMPR	Department of Mineral and Petroleum Resources
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
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

TABLE OF CONTENTS

1.	INTRODUCTION.....	9
1.1	PROJECT PROPOSAL.....	9
1.2	OBJECTIVE OF THE CLOSURE PLAN	10
2.	DETAILS OF THE AUTHOR.....	11
3.	LEGAL BACKGROUND AND BEST PRACTICES.....	12
3.1	THE CONSTITUTION OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996).....	12
3.2	THE MINERALS AND PETROLEUM RESOURCES ACT, 2002 (ACT NO. 28 OF 2002) [MPRDA] 13	
3.2.1	Regulation 527 of the MPRDA, 2002	13
3.3	THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) [NWA]	14
3.4	THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998) [NEMA] 15	
3.4.1	Regulation 1228 of NEMA, 1998	16
3.5	THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO 57 OF 2008) [NEM:WA].....	17
3.5.1	Waste Classification and Management Regulations, 2013 (GNR 634).....	17
3.6	FURTHER ACTS RELEVANT TO MINE REHABILITATION.....	19
3.7	BEST PRACTICE AND INTERNATIONAL GUIDELINES	19
4.	ENVIRONMENTAL AND PROJECT CONTEXT	20
4.1	PROJECT LOCATION	20
4.2	PROPOSED MINING OPERATION.....	21
4.2.1	Site Establishment Phase	21
4.3	OPERATIONAL PHASE.....	24
4.4	TOPOGRAPHY	24
4.5	VISUAL CHARACTERISTICS	24
4.6	AIR AND NOISE QUALITY	25
4.7	GEOLOGY	25
4.8	HYDROLOGY	27
4.9	TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER	27
4.10	CULTURAL AND HERITAGE ENVIRONMENT.....	28
4.11	EXISTING INFRASTRUCTURE	29
4.12	LAND CAPABILITY AND SURROUNDING LAND USE	29
5.	ANNUAL REHABILITATION PLAN	31
5.1	IMPLEMENTATION AND REVIEW OF TIMEFRAMES.....	31
5.2	MONITORING RESULTS	31
5.2.1	Control of Invasive Alien Vegetation.....	31
5.2.2	Noise Monitoring	31

5.2.3	Dust Monitoring	32
5.2.4	Waste Monitoring	32
5.3	SHORTCOMINGS IDENTIFIED	32
5.4	REHABILITATION ACTIVITIES FOR THE FORTHCOMING 12 MONTHS	32
5.5	REVIEW OF THE PREVIOUS YEAR'S REHABILITATION ACTIONS	33
5.6	COSTING	33
6.	REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN	34
6.1	CLOSURE STRATEGY GUIDED BY THE ENVIRONMENTAL RISK ASSESSMENT	35
6.2	DESIGN PRINCIPLES	35
6.2.1	Excavation	35
6.2.2	Processing Area	36
6.3	POST-MINING LAND USE	36
6.4	CLOSURE ACTIONS	37
6.4.1	Rehabilitation of the Excavated Area	37
6.4.2	Rehabilitation of Processing Area	37
6.4.3	Final rehabilitation	38
6.4.4	Revegetation of Rehabilitated Areas	39
6.4.5	Maintenance and Monitoring	39
6.4.6	Success Criteria and Monitoring	39
6.4.7	Impact Specific Procedures	40
6.5	CLOSURE SCHEDULE	43
6.6	IMPLEMENTATION AND RESPONSIBILITY OF CLOSURE PLAN	44
6.6.1	Site Management Responsibility List	44
6.6.2	Management of Information and Data	44
6.7	IDENTIFIED GAPS IN THE PLAN	44
6.8	RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES	45
6.9	CLOSURE COST ESTIMATE	45
6.10	MOTIVATION FOR AMENDMENTS MADE TO THE FINAL REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN	46
7.	MONITORING, AUDITING AND REPORTING	46
7.1	SCHEDULE FOR REPORTING REQUIREMENTS	48
8.	ENVIRONMENTAL RISK ASSESSMENT REPORT	49
8.1	ASSESSMENT PROCESS USED TO IDENTIFY AND QUANTIFY LATENT RISKS	49
8.1.1	Methodology	49
8.1.2	Description of Latent Risks	56
8.1.3	Results and Finding of Risk Assessment	56
8.1.4	Changes to the Risk Assessment Results	57
8.2	MANAGEMENT ACTIVITIES	57

8.3	COST ESTIMATE	57
8.4	MONITORING, AUDITING AND REPORTING REQUIREMENTS	57
9.	CONCLUSION	57
10.	SIGNATURE OF AUTHOR	57
11.	UNDERTAKING BY PERMIT HOLDER	58
12.	REFERENCES	59

LIST OF FIGURES

Figure 2: Satellite view showing the location of the MP application area (green polygon) in relation to the surrounding area (image obtained from Google Earth)	21
---	----

LIST OF TABLES

Table 1: Summary of the relevant rehabilitation sections of the MPRDA, 2002	13
Table 2: Requirements of Government Notice 527	14
Table 3: NWA, 1998 applicable sections	15
Table 4: NEMA, 1998 applicable sections	16
Table 5: GPS coordinates of the proposed mining footprint	20
Table 6: Summary of the impact specific procedures	41
Table 7: Closure schedule	43
Table 8: Relinquishment criteria	45
Table 9: Monitoring, auditing and reporting requirements	47
Table 10: Reporting requirements	48
Table 11: Monitoring Programmes	52
Table 12: Rating of duration used in the assessment of potential latent risks	53
Table 13: Rating of extent / spatial scale used in the assessment of potential latent risks	53
Table 14: Example of calculating overall consequence in the assessment of potential latent risks	53
Table 15: Rating of frequency used in the assessment of potential latent risks	54
Table 16: Rating of probability used in the assessment of potential latent risks	54
Table 17: Example of calculating overall likelihood in the assessment of potential latent risks	55
Table 18: Determination of overall significance in the assessment of potential latent risks	55
Table 19: Description of environmental significance and related action required in the assessment of potential latent risks	56

1. INTRODUCTION

The Applicant, Gravel North (Pty) Ltd, applied for environmental authorisation and a mining permit to mine gravel from 2.75 ha of Portion 2 of the farm Glen Thorne No 2163 in the Mangaung District of the Free State Province.

Greenmined Environmental (Pty) Ltd ("Greenmined") is the consultants responsible for the mining permit application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (hereafter referred to as the 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 2015 (GN 1228), Financial Provision Regulations 2015 (as amended).

1.1 PROJECT PROPOSAL

The Applicant, Gravel North (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit (MP) to mine gravel from 2.75 ha over Portion 2 of the farm Glen Thorne No 2163 in the Mangaung Metropolitan Metro (MMM) of the Free State.

The property has an existing borrow pit that was historically used for the extraction of gravel for private use on the farm. The proposed mining site of this application will serve as an extension of the existing pit. The mining method will involve direct excavation using earthmoving equipment. When necessary, a crusher and screening plant will be utilised to size the material, after which it will be stockpiled. Stockpiled material will be loaded onto client trucks for removal from the site.

The proposed MP project will therefor entail the:

- ❖ site establishment and infrastructure development;
- ❖ stripping and stockpiling of topsoil from the proposed mining footprint area;
- ❖ excavation of the mining area;

- ❖ crushing and screening of the loosened material at the processing plant (when needed); and
- ❖ stockpiling the product until sold to clients.

The existing access road to the farm, and borrow pit, will be used to access the mining area. If required, the farm road may need to be upgraded to accommodate truck movement. At present, no new road construction is anticipated.

The proposed mining operation will appoint ± 5 full time employees supported by ± 5 part time staff, and due to the temporary nature and small scale of the operation no permanent infrastructure in the form of offices or workshops will be established at the mining area. The expected infrastructure and equipment to be needed at the mine will include (non-exhaustive list):

- ❖ ADT trucks;
- ❖ Ablution facilities (either on-site or at the off-site auction pens);
- ❖ Crushing and screening plant;
- ❖ Earthmoving- and excavation equipment;
- ❖ Generators; and
- ❖ Water truck.

1.2 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 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 mine as per the requirements of the EMPR and of the Provincial Department Mineral and Petroleum Resources.
- ❖ 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 available 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 invader plant species by intensive management of the mine site.

2. DETAILS OF THE AUTHOR

Gravel North (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 twenty years' experience in doing environmental impact assessments and compliance monitoring in South Africa (see CV and proof of experience attached as Appendix K to the BAR & EMPR).

Name of the Practitioner: Ms Christine Fouché (Senior Environmental Specialist)

Tel No: 021 851 2673

Fax No: 086 546 0579

E-mail address: christine.f@greenmined.co.za

Declaration of Independence:

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

- ❖ I act as independent environmental officer in this matter;
- ❖ I will perform the work relating to this matter in an objective manner, even if the results and findings are not favourable to the holder of the authorisation;
- ❖ I have expertise in conducting environmental related projects, 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: 17 October 2025

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 permit 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&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>An application in this regard is pending with the DWS.</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	<i>A draft EMP must include –</i> <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> <i>(iv) rehabilitation of the environment;</i> <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>

3.4.1 Regulation 1228 of NEMA, 1998

NEMA, GNR 1228 GG 41236, known as the NEMA Financial Provision Regulations, 2015 (amended), was promulgated in November 2015, and in terms of these regulations holders of a mining permit are allowed a transitional period of 39 months (19 February 2019) from the date of promulgation to comply. The compliance date was extended to 19 September 2023.

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

3.5 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 DMPR (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 DMPR through its respective regional managers in each province.

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

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

Recently a released guideline from the Government of Western Australia (GWA 2011) provides insight to the importance of mine closure. The guidelines (GWA 2011) 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 permit application was lodged over 2.75 ha the farm Glen Thorne No 2163 in the Mungaung 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	28°57'39.27"	26°17'08.78"	-28.960909°	26.285773°
B	28°57'44.01"	26°17'08.41"	-28.962225°	26.285668°
C	28°57'45.82"	26°17'08.10"	-28.962729°	26.285583°
D	28°57'45.78"	26°17'10.01"	-28.962718°	26.286113°
E	28°57'44.96"	26°17'12.55"	-28.962488°	26.286819°
F	28°57'45.02"	26°17'13.94"	-28.962506°	26.287206°
G	28°57'40.00"	26°17'14.17"	-28.961110°	26.287268°
H	28°57'39.61"	26°17'13.27"	-28.961002°	26.287019°

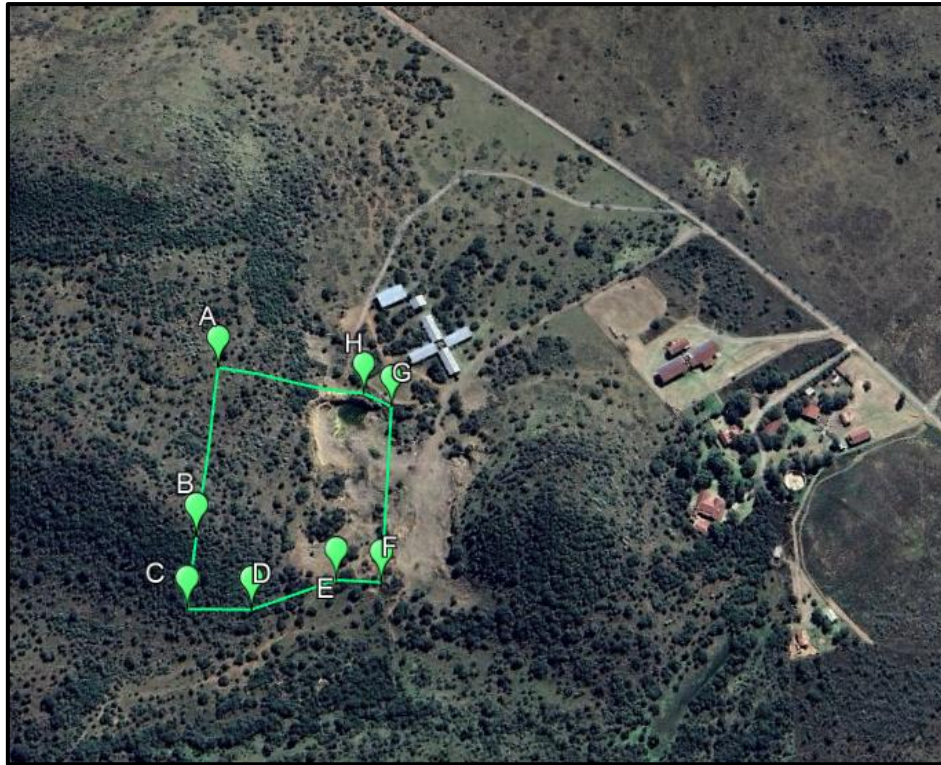


Figure 1: Satellite view showing the location of the MP application area (green polygon) in relation to the surrounding area (image obtained from Google Earth).

4.2 PROPOSED MINING OPERATION

4.2.1 Site Establishment Phase

Site establishment entails the demarcation of the mining boundaries and the removal/relocation of the identified protected plants, clearance of vegetation, and stripping and stockpiling of topsoil to access the mineral.

4.2.1.1 Demarcation of Mining Boundaries

Pursuant to receipt of the EA and MP, and prior to mining, the boundary of the mining area will be demarcated with visible beacons. Project specific areas to be demarcated within the boundary of the mining footprint may include, but not be limited to, the stockpile and processing areas, and the excavation.

4.2.1.2 Access Road

The farm is accessed via a public gravel road that turns off the R30 provincial road. The gravel road then links up with an existing internal farm road that provides access to the proposed mining area as shown in the following figure. If required, the internal farm road of ± 0.40 km may need to be upgraded to accommodate the mining related truck movement. At present, no new road construction is anticipated.

4.2.1.3 Clearing of Vegetation

The vegetation type of the earmarked footprint falls within the Winburg Grassy Shrubland (Gh7) that has a conservation status of Least Threatened. This application entails the expansion of an existing borrow pit where the natural vegetation has previously been removed to allow access to the gravel. Approximately 41% of the 2.75 ha application area has already been distributed and has none to very little vegetation left.

The vegetation composition of the western part of the proposed mining footprint, that extends up the hill, is mainly intact Winburg Grassy Shrubland dominated by False Olive (*Buddleja saligna*), and Sour Karee (*Searsia ciliata*). The grass layer is sparse but shrubs/small trees such as the Blue Guarri (*Euclea crispa*), Lightning Bush (*Clutia pulchella*), Karoo Kunibush (*Searsia burchelli*), Broom Karee (*S. erosa*), Bluebush (*Diospyros lycioides*), Camphor bush (*Tarchonanthus camphoratus*) and Fine-leaved Felicia (*Felicia filifolia*) abound in the area.

Various Wild Olive trees (*Olea europaea* subsp. *africana*) also occur in the area. The Wild Olive tree is a protected species in terms of the National Forests Act, 1998 (Act No 84 of 1998) as well as the Free State Nature Conservation Ordinance 8 of 1969 and may therefore not be destructed, disturbed and/or removed prior to approval by the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTE).

Consequently the removal of vegetation from especially the western part of the mining area will be necessary to access the resources. Where the development will affect the protected Wild Olive trees the Applicant will, prior to bush clearance, apply for destruction permits from DESTE.

4.2.1.4 Topsoil Stripping

Although the proposed mining area has very little/shallow topsoil, it is proposed that the available topsoil will be removed, with the vegetation layer, from the areas required 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 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. The topsoil berm will measure a maximum of 2 m in height to preserve micro-organisms within the topsoil, which can be lost due to compaction.

4.2.1.5 Introduction of Mining Machinery and Site Equipment

As mentioned earlier, the Applicant plans to establish very little infrastructure within the mining footprint. It is proposed that the processing area will occupy ± 0.30 ha of the proposed 2.75 ha area and include the crushing and screening plant with ablutions for employee use. Due to the proposed mining method, the production rate will dictate the layout of the proposed footprint area. The existing offices, storerooms and workshops of the farm (off-site) will be used and therefore no new structures need to be developed at the mining area.

Presently, the mining equipment/infrastructure is expected to consist of at least:

- ❖ ADT trucks;
- ❖ Ablution facilities (either on-site or at the off-site auction pens);
- ❖ Crushing and screening plant;
- ❖ Earthmoving- and excavating equipment;
- ❖ Generators / solar energy connection; and
- ❖ Water truck.

4.3 OPERATIONAL PHASE

The gravel will be mechanically recovered with excavating- and earthmoving equipment. The rock will then be delivered to the crushing and screening plant where it will be reduced to various sized gravels (if needed). The screened material will be delivered to various size category stockpiles until it is sold and transported from site.

The proposed mine will appoint ± 5 full time employees that will be sourced from the local municipal area and daily be transported to site. Mining will take place between 05:00 and 20:00 Monday – Saturday. No work will be done on Sundays.

4.4 TOPOGRAPHY

The Preferred Layout Option extends onto the eastern slope of a hill. Approximately 40% of the proposed development footprint is situated on relatively level terrain, beyond which the topography transitions into a steep incline up the hillside. The average elevation of the study area is $\pm 1\,336$ masl with the northern corner being the highest at $1\,359$ masl. From the highest point the elevation drops in an eastern direction, with the north-eastern corner being the lowest point of the site ($1\,321$ masl).

Mining the proposed borrow pit into the eastern face of the hill should create an excavation with more or less two faces that will be benched as the mining depth increases. The rehabilitation proposal is therefore (upon closure) to render the borrow pit safe and leave it as a landscape feature.

4.5 VISUAL CHARACTERISTICS

The viewshed analysis shows that the proposed visual impact will be of low-medium significance as the mining area will mainly be visible from the northern to south-eastern adjacent areas. The terrain layout will screen the proposed development from most of the north-western to southern areas. It must also be borne in mind that as the distance between the development and the observer increases the visual impact will decrease and perception of the 2.75 ha excavation will diminish to negligible at the periphery of 10 km.

4.6 AIR AND NOISE QUALITY

The auction pens and farm buildings of Portion 2 of the farm Glen Thorne No 2163 are the nearest structures to the proposed mining (within 500 m). The surrounding farm yards occur within ± 820 m north-west (Farm Yard 1), and ± 960 m south (Farm Yard 2) of the study site. The prevalent wind direction of the study area is in a north-western direction for most of the year. Currently the air quality of the study area is mainly impacted on by traffic along the gravel roads, and agricultural practices in the area. Traffic along the R30 provincial- and N1 national roads influences the ambient sound levels and air quality within the greater study area.

The proposed mining activity does not trigger an application in terms of the National Environmental Management: Air Quality Act, 2004, and emissions to be generated is expected to mainly entail dust due to the displacement of soil, crushing and screening, and the transport of material on gravel roads.

The noise to be generated at the proposed borrow pit will contribute to the daily noise levels of the receiving environment through excavation, crushing/screening and transporting of material. As mentioned earlier, mining will take place from Monday – Saturdays between 05:00 to 20:00 and no work will be done on Sundays. It is expected that the mine will be visited by approximately two trucks per day.

4.7 GEOLOGY

The project lies in the central part of the main Karoo Basin where the Beaufort Group sediments of the Karoo Supergroup are exposed. They are unconformably overlain by fluvial sands and alluvium that were deposited during the Quaternary period.

The Karoo Supergroup rocks cover a very large proportion of South Africa and extend from the northeast (east of Pretoria) to the southwest and across to almost the KwaZulu Natal south coast. It is bounded along the southern margin by the Cape Fold Belt and along the northern margin by the much older Transvaal Supergroup rocks. Representing some 120 million years (300 – 183 Ma), the Karoo Supergroup rocks have preserved a diversity of fossil plants, insects, vertebrates and invertebrates.

Overlying the basal Dwyka Group glaciogene rocks are rocks of the Ecca Group that are Early Permian in age. There are eleven formations recognised in this group, but they do not all extend throughout the Karoo Basin. In the central and eastern part are the following formations, from base upwards: Pietermaritzburg, Vryheid and Volksrust Formations. All of

these sediments have varying proportions of sandstones, mudstones, shales and siltstones and represent shallow to deep water settings, deltas, rivers, streams and overbank depositional environments.

Overlying the Eccca Group are the rocks of the Beaufort Group that has been divided into the lower Adelaide Subgroup for the Upper Permian strata, and the Tarkastad Subgroup for the Early to Middle Triassic strata. As with the older Karoo sediments, the formations vary across the Karoo Basin.

In this part of the basin, east of 24°E, three formations are recognised in the Adelaide Subgroup, the basal Volksrust Formation that is also included in the Eccca Group, and the upper Normandien Formation. The latter has been divided into five members only where exposures are good. In the Free State the Adelaide Subgroup is difficult to subdivide.

Large exposures of Jurassic dolerite dykes occur throughout the area. These intruded through the Karoo sediments around 183 million years ago at about the same time as the Drakensberg basaltic eruption.

There were two large basins dominating southern Africa during the Cenozoic, with the Kalahari Basin to the west and the Bushveld basin to the east. Both basins are bounded along their southern extent by the more or less west-east trending Griqualand-Transvaal Axis (Partridge et al., 2006).

Quaternary Kalahari sands cover large parts of the rocks in this region, especially to the west. This is the largest and most extensive palaeo-erg in the world (Partridge et al., 2006) and is composed of extensive aeolian and fluvial sands, sand dunes, calcrete, scree and colluvium. Periods of aridity have overprinted the sands, and calcrete and silcrete are common. Most geological maps indicate these sands simply descriptively (aeolian sand, gravelly sand, calcrete) or they are lumped together as the Gordonia Formation because the detailed regional lithostratigraphic work has not been done. Nonetheless, these sands have eroded from the interior and have been transported by wind or water to fill the basin. Reworking of the sands or stabilisation by vegetation has occurred. Probable ages of dune formation are around 100 kya (thousand years), 60 kya, 27-23 kya and 17-10 kya (in Botha, 2021).

This application is for the direct mining of the weathered gravel source on the farm that will be sold to the construction industry.

4.8 HYDROLOGY

According to the SANBI BGIS National Wetlands and NFPA Mapviewer the project area is not within any Strategic Water Source Area (SWSA) or National Freshwater Ecosystem Priority Area (NFEPA).

As previously mentioned, approximately 40% of the proposed mining footprint is situated on terrain that is relatively level, primarily due to historical gravel extraction. However, despite its general flatness, this area remains uneven, allowing surface water to periodically accumulate in some of the historic depressions. These temporary pools result from runoff descending from the nearby hillside. Importantly, these features are short-lived and do not constitute formal wetlands, streams, or drainage lines within the proposed footprint.

An ephemeral drainage line passes the proposed mining to the south but is more than 100 m from the study site and mining activities is not expected to have an impact on this feature.

4.9 TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUND COVER

This application entails the expansion of an existing borrow pit where the natural vegetation has previously been removed to allow access to the gravel. Approximately 41% of the 2.75 ha application area has already been distributed and has none to very little vegetation left.

The vegetation composition of the western part of the proposed mining footprint, that extends up the hill, is mainly intact Winburg Grassy Shrubland dominated by False Olive (*Buddleja saligna*), and Sour Karee (*Searsia ciliata*). The grass layer is sparse but shrubs/small trees such as the Blue Guarri (*Euclea crispa*), Lightning Bush (*Clutia pulchella*), Karoo Kunibush (*Searsia burchelli*), Broom Karee (*S. erosa*), Bluebush (*Diospyros lycioides*), Camphor bush (*Tarchonanthus camphoratus*) and Fine-leaved Felicia (*Felicia filifolia*) abound in the area.

Various Wild Olive trees (*Olea europaea* subsp. *africana*) also occur in the area. The Wild Olive tree is a protected species in terms of the National Forests Act, 1998 (Act No 84 of 1998) as well as the Free State Nature Conservation Ordinance 8 of 1969 and may therefore not be destructed, disturbed and/or removed prior to approval by the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA).

Consequently the removal of vegetation from especially the western part of the mining area will be necessary to access the resources. Where the development will affect the protected Wild Olive trees the Applicant must, prior to bush clearance, apply for destruction permits

from DESTEA. Bush clearance may only commence upon receipt of the applicable plant permit.

Though the majority of the site does not currently contain any significant weed or invasive plant infestations, problem plants such as Wild Tobacco (*Nicotiana glauca*) did establish in the previously mined areas. The proposed development will therefore have to implement a comprehensive monitoring and eradication programme to ensure that invasive plant species are removed from the area and prevented from re-establishing.

A site inspection confirmed that there is currently no resident fauna within the proposed mining footprint. Given the small size of the application area (2.75 ha) and the fact that the site has already been disturbed, the potential impact on local fauna is expected to be minimal. Mining activities will progress gradually, allowing any transient or mobile species sufficient time to vacate the area in response to increased human presence and noise. Furthermore, the project will not result in habitat fragmentation or the creation of barriers that could impede the movement of wildlife across the broader landscape. As such, the proposed activity is unlikely to have significant or lasting impacts on faunal populations in the area.

4.10 CULTURAL AND HERITAGE ENVIRONMENT

The broader region surrounding the proposed mining site is situated within the central interior of South Africa, an area known for its rich cultural and historical landscape. The Free State is home to a variety of heritage resources, including Stone Age and Iron Age archaeological sites, historical battlefields, mission stations, and colonial-era farmsteads. However, the specific project area is located within a previously disturbed borrow pit, and a site inspection has confirmed the absence of any visible heritage features, such as pottery shards, graves, or built structures of historical significance.

Given the small scale of the proposed activity (2.75 ha) and the disturbed nature of the site, the likelihood of encountering significant heritage or archaeological resources is considered low. Furthermore, the project is not expected to impact any formally declared heritage sites or cultural landscapes as defined under the National Heritage Resources Act (Act No. 25 of 1999).

Nonetheless, as a precautionary measure, the Applicant must adhere to the chance finds protocol (incorporated into the EMPR). Should any heritage artefacts or human remains be uncovered during site preparation or mining activities, work must cease immediately, and

the South African Heritage Resources Agency (SAHRA) and the Free State Provincial Heritage Resources Authority must be notified for further investigation and guidance.

The Palaeontology Impact Assessment notes that the palaeontological sensitivity of the area under consideration is mainly of Insignificant sensitivity while a small portion in the north-east is considered to have a Very High sensitivity rating.

Dolerite is an igneous rock that has intruded through the sedimentary layer along cracks and fissures, then cooled and solidified. The heat from the molten material often alters and damages the sediments through which it has intruded. Dolerite does not preserve fossils (Cowan, 1995; Briggs and McMahon, 2016). Therefore the correct palaeosensitivity for this area is insignificant to zero. The north-eastern portion of the borrow pit appears to be on the very highly sensitive Adelaide Subgroup but this is probably a result of the resolution of the mapping. It is more likely that the material to be mined is dolerite as it is much harder than shales or mudstones of the Adelaide Subgroup.

The geological structures suggest that the rocks to be mined are the wrong kind (dolerite) to contain fossils. Since there is a small chance that fossils from the adjacent Adelaide Subgroup may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the PIA concluded that the potential impact to fossil heritage resources is Low, and the project can therefore be authorised from a palaeontology point.

4.11 EXISTING INFRASTRUCTURE

No infrastructure exists in the proposed 2.75 ha footprint that could be affected by the proposed activity. The auction pens are the nearest infrastructure to the mining area, and the permit holder will need to implement the mitigation measures proposed in this report and the EMPR to minimise potential impacts to these structures. Furthermore, the internal access road will need to be maintained by the permit holder for the duration of the mining operations.

4.12 LAND CAPABILITY AND SURROUNDING LAND USE

Portion 2 of the farm Glen Thorne No 2163 is situated in a rural settling intersected by road and electricity infrastructure. The property is mainly used for game and livestock farming while the earmarked mining area entails the proposed expansion of an existing borrow pit that has been used for non-commercial purposes to date. The farm also has water use authorisation to irrigate fields from the Modder River.

The land use of the immediate surrounding properties is mainly for agricultural purposes with the bulk of the land being natural to semi-natural rangelands grazed by cattle. Dryland crop cultivation is extended to pivot irrigation along the Modder River.

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 and Petroleum Resources. The document will be reviewed during the 11th 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 permit 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 I of the BAR & EMPR). Care will be taken to prevent the establishment of species such as Wild Tobacco (*Nicotiana glauca*). This practice will continue throughout 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.

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 BAR & 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 processing area until the waste is transported to a registered general waste landfill site. Should a chemical toilet be established on site, a recognized contractor will service the toilet, and proof will be filed for auditing purposes.

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 at the off-site workshop 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 permit application and receipt of the EA, the permit 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 and 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 as 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 allow the use of the surrounding area for grazing. In this context, the primary objectives for the closure of the mining operations are:

- ❖ Remove all temporary infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Mineral and Petroleum Resources.
- ❖ 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 available 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 invasive 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 area 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 invasive plant species.

The proposed mining and rehabilitation procedures were formulated to optimise the extraction of the raw material while creating stable excavation sides that will not present an unreasonable safety risk once the mine was closed. Mining operations will be conducted in stages, corresponding to the creation of benches towards the base of the working. The decommissioning phase and closure of the mine will also involve removal of all debris and rehabilitation of areas not rehabilitated during the operational phases of the project. This will comprise the scarification of compacted areas, reshaping of areas, topsoiling and regeneration of all prepared surfaces. All temporary infrastructure/equipment will be dissembled, and all other infrastructural development such as haulage roads and stockpile areas will be rehabilitated.

6.2 DESIGN PRINCIPLES

6.2.1 Excavation

Upon closure of the mine, the Applicant will contract the expertise of a rock engineer (if needed) to guide the final design of the quarries. The rock engineer will be directed by the following:

- ❖ The borrow pit must be developed into a landscape feature, by creating a series of irregular benches along the pit, thereby reducing the overall face angle.
- ❖ Presently, it is proposed that the benches must be ± 12 m high x 3 m wide. However, site management must be directed by the rock engineer regarding the final layout of the benches.

- ❖ The benches must be top-dressed with the available topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

6.2.2 Processing Area

The processing area (including crusher, and ablutions) will be reinstated and the footprint landscaped as listed below.

- ❖ Coarse natural material used for the construction of ramps must be removed and dumped into the excavation.
- ❖ Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned 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.
 - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- ❖ Photographs of the processing area, 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 DMPR 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.

6.3 POST-MINING LAND USE

As mentioned earlier, the preferred post mining land use for the proposed mine is agriculture (grazing). Upon replacement of the available topsoil, the area around the excavation will once again be available for grazing purposes, and the planting of the grass layer (to protect the topsoil) will tie in with the proposed land use.

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 surrounding landscape, other environmental values and agreed land use.

The Applicant will comply with the minimum closure objectives as prescribed by the DMPR and detailed below:

6.4.1 Rehabilitation of the Excavated Area

- ❖ The excavated area must serve as a final depositing area for the placement of unwanted rocks and coarse material.
- ❖ No waste may be permitted to be deposited in the excavations.
- ❖ Once unwanted rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the available 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 six 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.

6.4.2 Rehabilitation of Processing 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 available 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.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- ❖ Photographs of the processing area, 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 DMPR 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 DMPR 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.

6.4.3 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 (DMPR).

6.4.4 Revegetation of Rehabilitated Areas

All reinstated areas must be revegetated to establish a stable grass layer that will tie-in with the end-use of the site. 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 by Love Grass (*Eragrostis curvula*) and Red Grass (*Themeda triandra*).

6.4.5 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 reinstated areas until the closure certificate is issued. 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.

6.4.6 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 (DMPR) 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.

6.4.7 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
SOCIO-ECONOMIC		
❖ The retrenchment process will be followed as per requirements of the applicable legal process; and ❖ All existing social investments will be phased out over an agreed period with beneficiaries.	❖ Progressive rehabilitation must be implemented if possible as mining progress.	❖ Any commitments made to I&AP'S will be attended to the relevant I&AP's satisfaction as agreed upon between the I&AP'S and the mine.
TOPOGRAPHY AND EROSION CONTROL		
❖ The area will have contours constructed to prevent soil erosion.	❖ All slopes which may incur erosion will be profiled in such a way that a preferential down drain will occur; ❖ Erosion control measures such as contour banks and cut off berms should 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.	❖ 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; ❖ Any pooling will be addressed by filling depression and / or grading areas and re-vegetating such sites; ❖ 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; ❖ Any deficiencies will be corrected by placing material in these areas as per the closure plan; ❖ Any compacted soils will be ripped or disked and re-vegetated with indigenous flora. Vegetation will then be monitored in these areas; ❖ All recommendations made by the specialists will be implemented where deemed appropriate; ❖ 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

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
ECOLOGY		
❖ The rehabilitated area will be protected from surface disturbance to allow vegetation to establish and stabilise.	❖ Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems; ❖ The rehabilitated ecosystem will have equivalent functions and resilience as the target ecosystem; ❖ Soil properties will be appropriate to support the target ecosystem; ❖ The rehabilitated areas will provide appropriate habitat for fauna.	❖ 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; ❖ 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.
LAND USE		
❖ To ensure that rehabilitation is done to such an extent that land use potential is regained for agricultural use and associated zoning.	❖ Only after the levelled areas have been inspected and approved by the Mine Manager/Site Manager will topsoil be placed. The topsoil layer must be as even as possible, i.e. it must be smooth, and the depth must remain consistent throughout; ❖ Once the topsoil has been replaced, vehicle movement will be restricted to prevent compaction of the topsoil; ❖ 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; ❖ Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible; and ❖ Once the seed mixture has been sown, the land must be rolled to ensure consolidation around the seeds and effective moisture retention.	❖ N/A

6.5 CLOSURE SCHEDULE

At this stage it is proposed that the final rehabilitation of the mining area will take approximately three 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
EXCAVATION	
❖ Create irregular benches along the pit faces; ❖ Dump excess rocks and coarse material into the excavation; ❖ Shape the benches; ❖ Bench plant the faces; ❖ Dispose all waste off-site.	Week 1 - 6
PROCESSING AREA	
❖ Dump coarse natural material used for ramps into the excavations; ❖ Remove all product stockpiles; ❖ Remove all temporary structures/equipment from the footprint; ❖ Rip any compacted area; ❖ Landscape and level the area to prevent any depressions and allow for agricultural activities; ❖ Replace the stockpiled topsoil over the mined-out area;	Week 6 - 12

CLOSURE SCHEDULE	
DECOMMISSIONING / CLOSURE ACTION	TIMEFRAME
❖ Seed reinstated area or arrange for planting of relevant cover crop.	
MAINTENANCE AND AFTER CARE	
❖ Erosion Monitoring ❖ Weeds and Invader Plant Control	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 Gravel North (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 permit 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, pooling 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 rehabilitated without unsafe excavation edges;
2. that topsoil has been spread on the surface;
3. that there is a potential rooting depth, 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 as a result 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

RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES			
CATEGORY	RELINQUISHMENT CRITERIA	INDICATORS	REPORTING REQUIREMENTS
Removal of all equipment.	No visible man-made structures 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, which existed prior to mining.	Land capability and productivity	Comparison to equivalent 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 and Petroleum Resources guideline document for calculating financial provision the proposed mine needs to provide a financial provision value of R 120 670.88 (calculated October 2025). 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 2025 BAR & 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 permit 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 DMPR and the closing certificate obtained.

Table 9: Monitoring, auditing and reporting requirements

MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	RESPONSIBLE PERSON	FREQUENCY OF AUDIT	CLOSE OUT APPROACH
LEGISLATED AUDITING AND REPORTING			
Environmental Auditing	<u>Internal Review</u>		
	Site manager to ensure compliance with Environmental Management Programme and Closure Plan.	Daily compliance monitoring.	Any non-conformance must immediately be addressed by site management and weekly reported on.
	<u>External Auditing</u>		
	External Environmental Consultant	Annual auditing and reporting to the DMPR.	Depending on the significance of the findings, site management has a maximum of four weeks to address and close out auditing results.
Financial Provision Review	Financial Provision Review	Annual review of the financial provision, and reporting of the findings to the DMPR.	Should the review of the financial provision indicate a shortfall the holder of the permit would increase the financial provision to meet the audited financial provision within 90 days from the date of the signature.
MONITORING			
Dust Monitoring	Site Management	Daily 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 DMPR or the municipality.
Invader Plant Monitoring	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 Alien and Invasive Species Regulations, 2014 (amended 2016) germinate on-site.
Noise Monitoring	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 always be available to employees.

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
Environmental Auditing	NEMA; EIA Regulations, 2014 (as amended)	Reporting on the environmental compliance of the mining area will be in accordance with Regulation 34 of the NEMA EIA Regulations, 2014. The environmental audit report will contain the information set out in Appendix 7 of the said Regulation.	The environmental audit report will indicate the ability of the EMPR and Closure Plan to adequately manage the activity. Should the reports not be sufficient, amendment will be proposed.
Financial Provision Review	NEMA Amendment Act, 2014 (Act No 25 of 2014) Financial Provision Regulations, 2015	Reporting on the financial provision for closure of the mining area will be in accordance with Section 24P of the NEMA Amendment Act, 2014 (Act No 25 of 2014) read with the Financial Provision Regulations 2015.	The auditor will report on the adequacy of the financial provision and any adjustments that need to be made to the financial provision.
Health and Safety Auditing	Occupational Health and Safety Act, 1993 Mine Health and Safety Act, 1996	Reporting on the health and safety compliance of the mining area will be in accordance with the Mine Health and Safety Act, 1996.	The safety manager will 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 a given 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

Rating	Description
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

Rating	Description
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

Consequence	Rating
Severity	Example 4
Duration	Example 2

Consequence	Rating
Extent	Example 4
SUBTOTAL	10
TOTAL CONSEQUENCE: (Subtotal divided by 3)	3.3

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

Rating	Description
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
SUBTOTAL	6
TOTAL LIKELIHOOD (Subtotal divided by 2)	3

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 together 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.

Gravel North (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 Fouché	<i>Christine Fouché</i>	04 November 2025

11. UNDERTAKING BY PERMIT HOLDER

I,, the undersigned and duly authorised thereto by that Gravel North (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 on thisday of2025.....

FINAL DOCUMENT TO BE SIGNED

Name:

Designation:

12. REFERENCES

- ❖ Chamber of Mines of South Africa, 1981. Guidelines for the rehabilitation of land disturbed by surface product mining in South Africa, Johannesburg
- ❖ Department of Water Affairs and Forestry, 2003. Draft: A practical procedure for the identification and delineation of wetlands and riparian areas, Pretoria
- ❖ Department of Environmental Affairs and Tourism: Integrated Environmental Management Information Series: Impacts Significance
- ❖ Department of Water Affairs and Forestry (DWAF) (2007b) Best Practice Guideline A4: Pollution control dams. The Government Printer, Pretoria