PROPOSED MINING RIGHT OVER A PORTION OF PORTION 3 OF THE FARM THE ORCHARDS NO 223, ALBANY MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

DEPARTMENTAL REFERENCE NUMBER:

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

MAY 2024

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EXECUTIVE SUMMARY

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

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory (off site) where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at a mobile crushing and screening plant to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers. All activities will be contained within the approved boundaries of the site.

Upon commencement, the proposed project will trigger listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment (EIA) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation.

Need and Desirability:

Makhanda has the largest known deposit of good quality clay in South Africa. Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and the Makana Brick Factory.

Considering this, and the lapse of the Makana Brick mining permit (on the same property) the Applicant saw a business opportunity to secure the significant clay resource and supply the desired clay to the Makana Brick Factory. Parts of the earmarked footprint have been mined for many years and have very little, if any, other (than mining) economic function left. The proposed development will generate income to the landowner (in the form of compensation) for the life of the mine. The small losses of agricultural land that will occur due to mining will be offset against much greater royalties received from mining compared to the income generated by the grazing of the earmarked footprint. In terms of the Social and Labour Plan (SLP), to be approved as part of this mining right application, the Applicant will contribute to Human Resource

Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

Alternatives Considered:

During the EIA phase the following alternatives were considered:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

The final project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3 and depicted in Figure 2. The mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose. The proposed footprint of the MR application was therefore based on the available geological information. The footprint was also chosen to include the areas that were previously altered by mining activities, which from an environmental perspective is the preferred option to prevent transformation of intact areas.

The Applicant intends to extract the clay from the mining area using opencast methods. The nature of the operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate). The Applicant will not establish any permanent infrastructure and/or buildings on site. The design and layout of the proposed footprint were based on the available clay resources and colour variants.

As mentioned earlier, experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. This project does not require complex technology to allow the winning of the intended minerals.

The operational aspects of the activity was based on the historic mining activities that have been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation.

Public Participation Process:

The relevant stakeholders and I&AP's were informed of the mining right application by means of an advertisement in the Daily Dispatch, and on-site notices that were placed at the entrance to the farm and the Makana Library. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 24 November 2023) was also sent to the landowner, neighbouring landowners, stakeholders, and I&AP that may be interested in the project. The comments received on the DSR were incorporated into the final Scoping Report (FSR) that was submitted to the DMRE on 24 November 2023 and approved on 09 February 2024.

The Draft Environmental Impact Assessment Report (DEIAR) was subsequently compiled and circulated for public comments over a 30-day period that extended until 15 May 2024. No additional comments were received on the draft EIA & EMPR that could be incorporated into the final EIA & EMPR to be submitted to the DMRE for decision making.

Environmental Impact Assessment Report:

The environmental impact assessment report identifies the potential positive and negative impacts that the proposed activity will have on the environment and the community as well as the aspects that may impact on the socio-economic conditions of directly affected persons and proposes possible mitigation measure that could be applied to modify / remedy / control / stop the identified impacts. The key finding of the environmental impact assessment regarding the proposed project entail the following:

Topography:

- The impact on the topography and geology is considered of low-medium significance if the depth of the exaction and extent of disturbance is considered and of low-medium significance if the cumulative impact is considered. Change in topography and geology of the mining area is unavoidable considering the nature of the project and will be irreversibly altered since a portion the land will be permanently removed. Through profiling the faces and stabilizing it with proper vegetation cover, the potential impact can be mitigated.

Visual Characteristics:

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

Air Quality and Noise Ambiance:

- The proposed operation will not trigger an application in terms of the NEM:AQA. Emissions to be generated at the mine will mainly consist of occasional dust. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). The expected impact on air quality and noise ambiance is low with mitigation.

Geology:

- During the operational phase, mining will result in permanent removal of clay and overburden, and the impact on the geology is unavoidable. Clay deposits are not regarded as a strategic mineral, and the study area is not a geo-site and therefore of less importance. Considering these factors, the impact is unavoidable but rated of low-moderate significance. The impact on soil properties is rated as low with mitigation.

Hydrology and Geohydrology:

- Mining will not alter the drainage patterns as water from the quarry will accumulate in the existing retention ponds. The Botha's River will not be impacted by mining since the mine boundary is more than 100 m away from the river bank. The mining activities will not have an impact on the groundwater since the mine floor will be restricted to 20 m and will therefore not undercut the groundwater table. No boreholes will be drilled and thus the impact on groundwater is rated as insignificant.

Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna:

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

- It is therefore the opinion of the specialists that the project may be favourably considered, provided that the proposed mitigation measures be implemented. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

Cultural and Heritage Environment:

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

Socio-economic Environment:

- Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

- The proposed development will also generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the SLP the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

Existing Infrastructure:

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

During the environmental impact assessment process, the feasibility of the proposed site was assessed to identify fatal flaws that are deemed as severe as to prevent the activity continuing or warrant a site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing.

Environmental Management Programme (EMPR)

The EMPR provides a description of the impact management outcomes and closure objectives. It presents the impacts to be mitigated in their respective phases as well as stipulates the mitigation measures to be applied on site.

The financial provision amount that will be necessary for the rehabilitation of the mining area, both at sudden closure during the normal operation of the project, and at final, planned closure is a sum of R 449 479.28.

LIST OF ACRONYMS

AIA	Archaeological Impact Assessment
AIP	Alien Invasive Plant
ASTM	American Society for Testing and Materials
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Areas
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and Environmental Affairs
DMRE	Department of Mineral Resources and Energy
DSLP	Draft Social and Labour Plan
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECNEO	Eastern Cape Nature and Environmental Ordinance 19 of 1974
ECPHRA	Eastern Cape Provincial Heritage Authority
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
ESA	Ecological Support Area
FEIAR	Final Environmental Impact Assessment Report
FEPA	Freshwater Ecosystem Priority Area
FSR	Final Scoping Report
GDP	Gross Domestic Product
GNR	Government Notice Number
GVA	Gross Value Added
HAS	Hazardous Substances Act, 1973 (Act No 15 of 1973)
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IBA	Important Bird and Biodiversity Areas
IDP	Integrated Development Plan
LC	Least Concern
LED	Local Economic Development
LN	Listing Notice
MHSA	Mine Health and Safety Act, 1996 (Act No 29 of 1996)
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)

MR	Mining Right
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NP	Not Protected
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act, 1996 (Act No 25 of 1996)
NWA	National Water Act, 1998 (Act No 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No 85 of 1993)
PAOI	Project Area of Influence
PCB's	Polychlorinated Biphenyls
PCO	Pest Control Officer
PIA	Palaeontological Impact Assessment
PPE	Personal Protection Equipment
PSM	Palaeontological Sensitivity Map
SAHRA	South African Heritage Resources Agency
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SAMBF	South African Mining and Biodiversity Forum
SAMRAD	South African Mining Mineral Resources Administration System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SEI	Site Ecological Importance
SCC	Species of Conservation Concern
SLP	Social and Labour Plan
SWMP	Stormwater Management Plan
SWSA	Strategic Water Source Area
TBCS	Terrestrial Biodiversity Compliance Statement
WMA	Water Management Area

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT:	Makhanda Mining (Pty) Ltd
TEL NO:	046 603 6300
FAX NO:	-
POSTAL ADDRESS:	243 Cemetery Road, Brakkefontein Farm, Makhanda, 6139
PHYSICAL ADDRESS:	Same as above
FILE REFERENCE NUMBER SAMRAD:	EC 30/5/1/2/2/10069 MR

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development act (Act 28 of 2002 as amended); the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorization can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation, or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulation, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has considered any minimum requirements applicable, or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorization for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as failure to meet the requirements of the Regulation and will lead to the Environmental Authorization being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the Applicant.

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process-

(a) determine the policy and legislative context within the activity is located and document how the proposed activity complies with and responds to the policy and legislative context,

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location,

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment,

(d) determine the –

(i) nature, significance, consequence, extent, duration, and probability of the impacts occurring to inform identified preferred alternatives, and

(ii) degree to which these impacts-

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed, or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts, and

(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of Greenmined Environmental

In terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) the proponent/applicant must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the Act. Makhanda Mining (Pty) Ltd (hereinafter the "Applicant") appointed Greenmined Environmental (Pty) Ltd (hereinafter "Greenmined") to undertake the study needed. Greenmined has no vested interest in Makhanda Mining (Pty) Ltd or the proposed project and hereby declares its independence as required by the EIA Regulations, 2014 (as amended).

i) Details of the EAP

Name of the Practitioner:	Ms Christine Fouché
Tel No:	021 850 8875 / 082 811 8514
Fax No:	086 546 0579
E-mail address:	christine.f@greenmined.co.za

ii) Expertise of the EAP

(1) The qualifications of the EAP
(With evidence).

Ms Fouché has a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology. Full cirriculum vitae with evidence is attached as Appendix P.

(2) Summary of the EAP's past experience.
(In carrying out the Environmental Impact Assessment Procedure)

Ms Fouché has nineteen years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. Ms Fouché is a registered Environmental Assessment Practitioner (registration no: 2019/1003) with EAPASA (Environmental Assessment Practitioners Association of South Africa) since 2019. See a list of past projects attached as Appendix P.

b) Description of the property

Table 1: Property description.

Farm Name:	Portion 3 of the farm The Orchards No 233
Application area (Ha)	43.4688 ha
Magisterial district:	Albany (Makana Local Municipality)
Distance and direction from nearest town	The property is located ±4 km northeast of the King Flats residents of Makhanda, between the N2 national road (south) and the Botha's River (north).
21-digit Surveyor General Code for each farm portion	C00200000000023300003

c) Locality map

(Show nearest town, scale not smaller than 1:250000)

The requested map is attached as Appendix B.

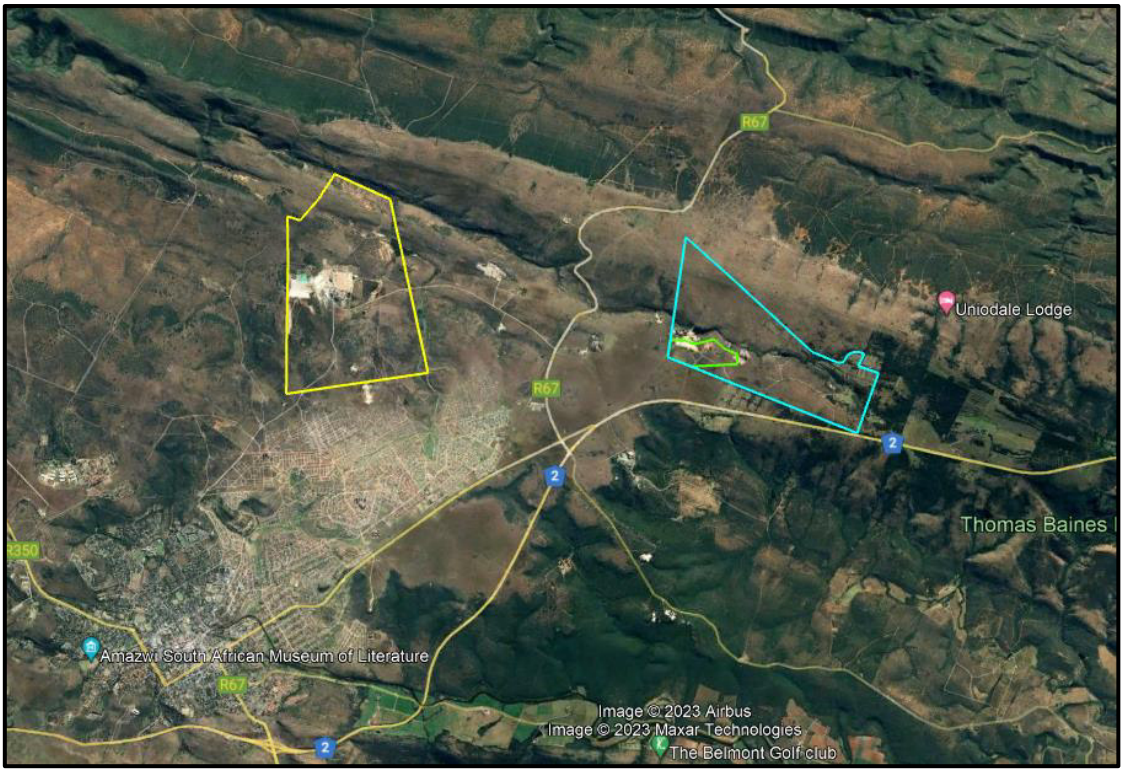

Figure 1: Locality of the proposed mining footprint (green polygon) in relation to the surrounding area, where the blue polygon indicates the farm boundary, and the yellow polygon shows the Makana Brick Factory and Mining area (Image obtained from Google Earth).

d) Description of the scope of the proposed overall activity

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site.

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

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory (off site) where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at a mobile crushing and screening plant to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers. All activities will be contained within the approved boundaries of the site.

The proposed project will therefore entail the following:

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

The proposed processing infrastructure will be of temporary and mobile nature, and only an ablution hut needs to be placed to allow the proposed project. The Applicant will make use of the existing roads, no electricity is needed as the crusher plant (when needed) will be powered with generators, and water will be obtained from Makana Brick and transported to site.

Upon commencement, the proposed project will trigger listed activities (see table below) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment (EIA) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation.

Mining will be >100 m from the adjacent Botha's River and associated dams and the project therefore does not trigger regulated activities in terms of the National Water Act, 1998.

See attached as Appendix C a copy of the site layout plan for the proposed mining activities.

i) Listed and specified activities

Table 2: Listed and specified activities triggered by the proposed application.

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	AERIAL EXTENT OF THE ACTIVITY Ha or m^2	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 OR GNR 546)/NOT LISTED
Demarcation of the site with visible beacons.	43.4688 ha	N/A	Not listed.
Introduction of mining equipment, stripping, and stockpiling of topsoil and overburden.	±43.5 ha (Progressively opened as mining proceed)	X	GNR 517 Listing Notice 2 Activity 17 (as amended)
Excavation of mining area.		X	
Screening and processing of aggregates (when needed).	±1 ha	X	
Stockpile of mined materials until it is transported to Makana Brick, alternatively collected by clients.		X	
Slope, landscape, and rehabilitate the affected areas upon closure of the mine.	43.5 ha	X	
NEMA: GNR 517 Listing Notice 2 Activity 17 (as amended): *Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.*			

ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

1. BACKGROUND INFORMATION

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

2023 and can no longer be renewed as the first, second and third renewals were already granted.

2. PROJECT PROPOSAL

The Applicant applied for environmental authorisation, and a mining right to win ball clay, clay (general), gravel, kaolin, and aggregate from the above mentioned property. The following table lists the GPS coordinates of the proposed mining area as shown on the Regulation 42 Mine Plan (Appendix A).

Table 3: GPS coordinates of the proposed mining area.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	33º15'51.67"	26º36'49.99"	-33.264353º	26.613886º
B	33º15'51.30"	26º36'57.95"	-33.264250º	26.616097º
C	33º15'53.55"	26º37'05.77"	-33.264875º	26.618269º
D	33º15'52.36"	26º37'11.89"	-33.264544º	26.619969º
E	33º15'50.94"	26º37'17.94"	-33.264150º	26.621650º
F	33º15'55.99"	26º37'24.40"	-33.265553°	26.623444º
G	33º15'59.15"	26º37'32.99"	-33.266431º	26.625831º
H	33º16'02.99"	26º37'40.21"	-33.267497º	26.627836º
J	33º16'05.79"	26º37'39.89"	-33.268275º	26.627747º
K	33º16'05.83"	26º37'03.56"	-33.268286º	26.617656º
L	33º16'00.72"	26º36'48.26"	-33.266867º	26.613406º

The following satellite image shows the location of the proposed mining area (green polygon) in relation to the surrounding landscape.

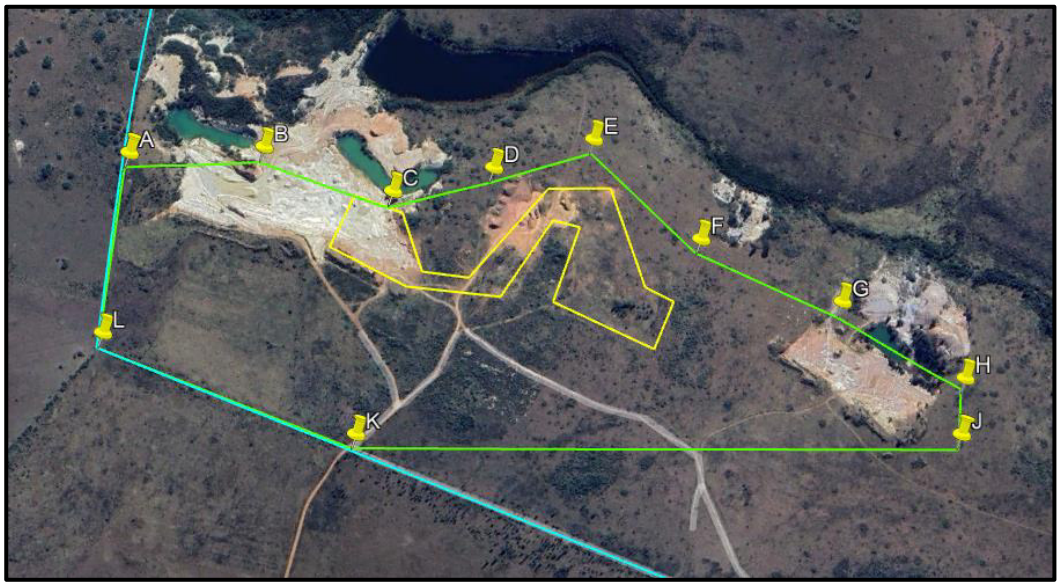

Figure 2: Satellite view showing the location of the proposed mining area (green polygon) in relation to the surrounding landscape where the yellow polygon indicates the old Makana Brick mining permit area,

and the blue lines show the boundary of Portion 3 of The Orchards No 233. (Image obtained from Google Earth)

Should the relevant authorisations be granted, and the proposed mining be allowed, the project will comprise of activities that can be divided into three key phases (discussed in more detail below) namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the site boundaries. Site establishment will further necessitate the clearing of vegetation, stripping and stockpiling of topsoil, and placement of the ablutions hut.

(2) *Operational phase* that will entail opencast mining. The clay will be excavated and loaded onto trucks that will transport it to the Makana Brick Factory (off-site) where it will be used to manufacture clay bricks. Unwanted overburden will be sold as aggregate. Minor processing/screening may be needed to reduce the aggregate to various sized stockpiles.

(3) *Decommissioning phase* which will involve the rehabilitation, sloping and rehabilitation of all affected areas, the replacement of topsoil, and the removal of all infrastructure no longer needed by the landowners. Due to the impracticality of importing large volumes of fill to restore the mined area to its original topography, the rehabilitation option is to develop the excavation into a minor landscape feature. This will entail creating a series of irregular benches along the faces thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate indigenous grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil. Once the full mining area is rehabilitated, the mining right holder will be required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

2.1 SITE ESTABLISHMENT PHASE

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

2.1.1 Demarcation of Mining Boundaries

Pursuant to receipt of an Environmental Authorisation (EA) and Mining Right (MR), and prior to mining, the boundary of the mining footprint will be demarcated. Project specific areas to be demarcated within the boundary of the mining footprint may include, but not be limited to, stockpile and processing areas, and the excavation. Additional thereto, the 100

m buffer from the Botha River will be demarcated and managed as a no-go area. A no-go area of 10 m around the Eskom power lines that traverse the mining footprint will also be demarcated.

2.1.2 Clearing of Vegetation

(Information extracted from the Terrestrial Biodiversity Compliance Statement attached as Appendix F)

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

As reported in the Terrestrial Biodiversity Compliance Statement (TBCS) (see Appendix F), the project area is predominantly comprised of modified, degraded habitat units attributed to the ongoing mining activities recorded. Although the project area falls within CBA 1 & CBA 2 ecosystems, and an ESA 1 ecosystem, ongoing disturbances and impacts associated with the activity will impede on the long-term recovery of the site to a more natural state. It is therefore the opinion of the specialists that the project may be favourably considered, provided that the mitigation measures and recommendations presented in the TBCS be implemented. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

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

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna.*

2.1.3 Topsoil Stripping and Stockpiling

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

2.1.4 Access Roads

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

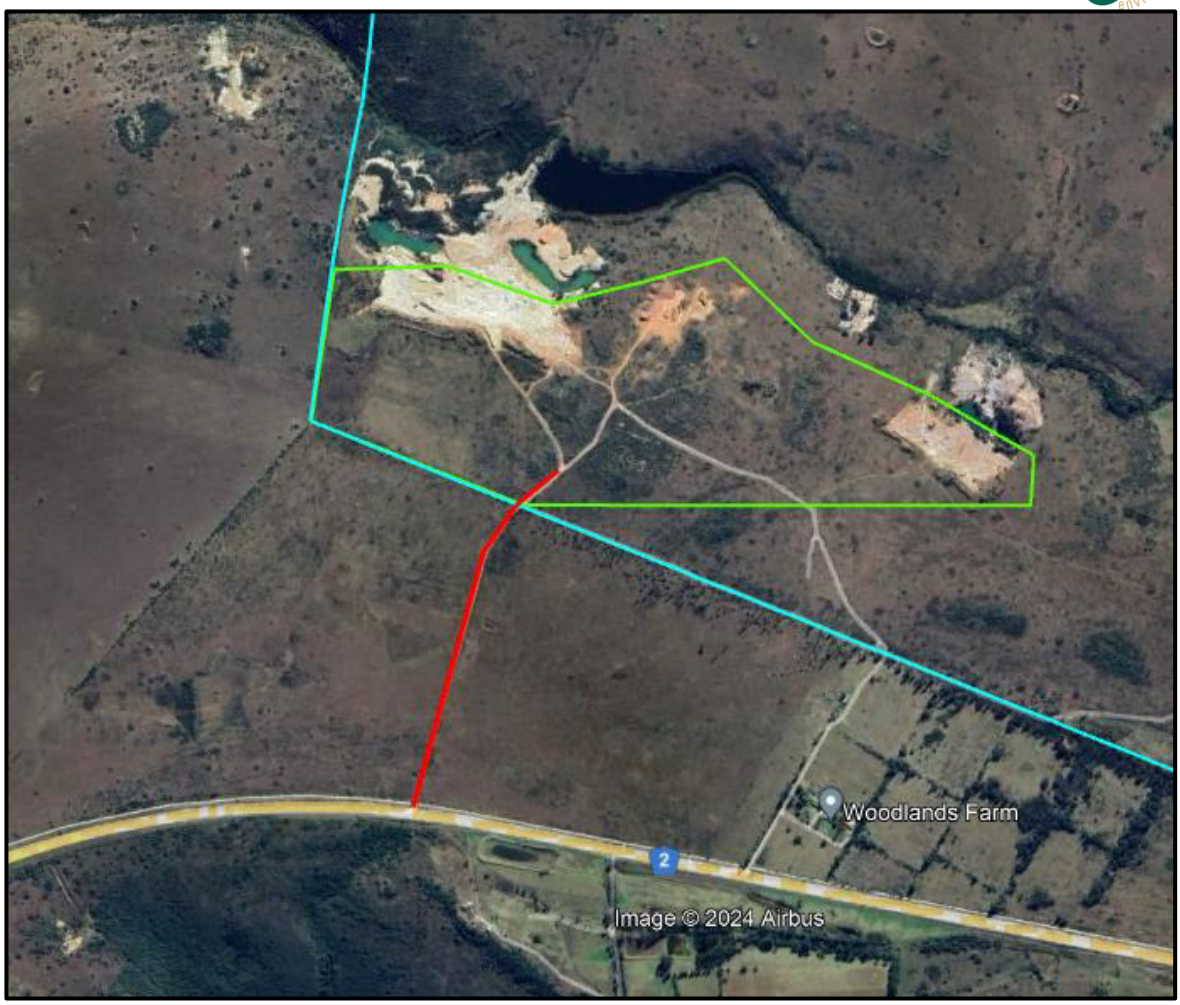

Figure 3: Satellite view of the existing farm road (red line) turning from the N2 national road to access the earmarked property (blue polygon). The green polygon indicates the proposed mining area. Also note the other internal roads within the earmarked mining area (image obtained from Google Earth).

2.1.5 Establishment of Site Infrastructure

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

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

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

2.1.6 Existing Infrastructure

Apart from the farm roads and power lines shown in the following figure, no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

Figure 4: Satellite view of the Eskom power lines where the dotted blue line indicates the low voltage power line crossing the proposed mining area, and the solid blue line refers to the high voltage power line (image obtained from Google Earth).

2.2 OPERATIONAL PHASE

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

2.2.1 Clay Mining

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

- Topsoil and overburden will be removed by bulldozer and stockpiled separately for future rehabilitation purposes.

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

Figure 5: Typical layout of the proposed mining area should this application be approved (Werth, B).

The mining activities are expected to entail the following:

- Site establishment;
- Clearing of vegetation;
- Stripping and stockpiling of topsoil of the operational areas;
- Excavation of clay;
- Transport of clay to the brick factory; and

- Replacing the topsoil and rehabilitation of the mined areas.

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

2.2.2 Aggregate Mining

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

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

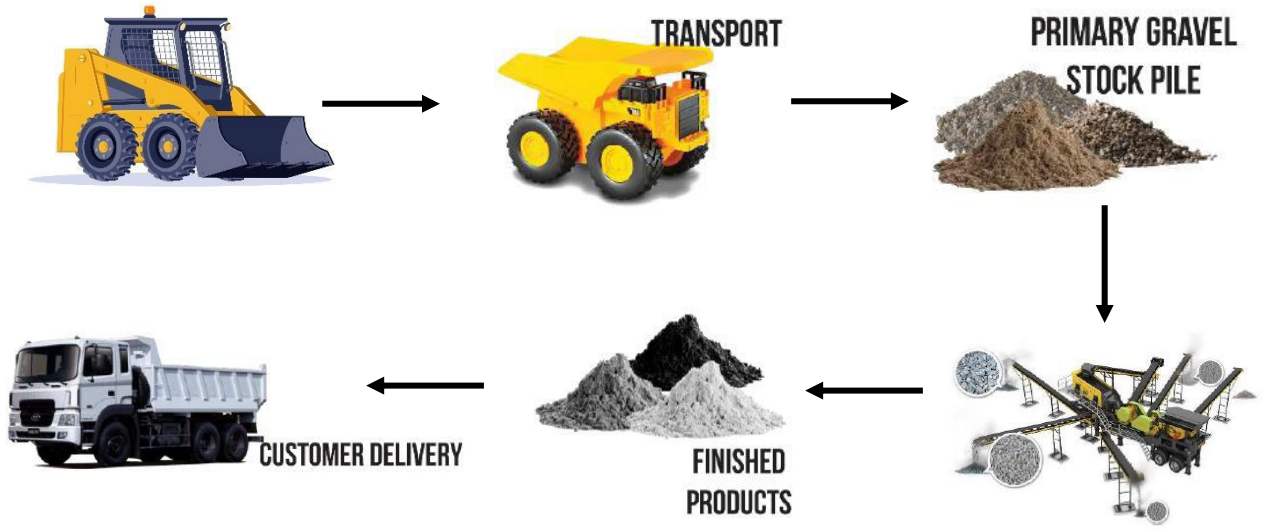

Figure 6: Schematic representation of the aggregate mining process to be followed on site.

2.2.3 Water Management

The Applicant will obtain water from the already authorised dam at Makana Brick (Brakkefontein No 243) and transport it in a water cart to the Orchards mining area when needed. Water will only be needed for dust suppression purposes, as the mining activities do not require washing/process water. Water sprayers will also be fitted to the crushing plant (when on site) to alleviate dust generation. If needed a JoJo tank will be established within the mining area where water will be stored for use on site. It is proposed that the operations will require an average of ±3 000 l/month.

(Also refer to Part B(1)(d)(vii) *Volumes and rate of water use required for the mining, trenching or bulk sampling operation*; Part B(1)(d)(viii) *Has a water use licence been applied for*).

2.2.4 Waste Management Programme

The general waste to be generated during the operational phase of the project will mainly consist of paper, plastic, and potentially tin that orginate from the lunch packs etc of employees. The general waste will be contained in a refuse bin with a lid that will be removed to a registered or formally accepted municipal landfill site site when the capacity of the containers is reached.

Hazardous waste will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will immediately (within first hour of the occurrence) be cleaned and the contaminated soil will be contained in a designated hazardous waste bin that will be kept at the stockpile area. The hazardous waste will be collected from the site by a registered hazardous waste handling contractor.

The Applicant will place an ablutions hut at the stockpile area that could be used by the employees. These ablutions will weekly be serviced by a registered sewerage handling contractor. No sewerage will be discharged onto the property.

2.2.5 Electricity

When needed the processing infrastructure (for the aggregates) will be powered by generators. The generator will have secondary containment to prevent spillages and subsequent contamination of the soil.

2.2.6 Servicing and Maintenance

Mining equipment will be serviced at the offsite workshop of Makana Brick or the mining sub-contractor. No regular maintenance will take place at the mining area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays will be used under the machinery and all waste will be contained and removed from the emergency service area to the workshop to ensure proper disposal.

2.3 DECOMMISSIONING PHASE

Rehabilitation will include activities to be divided into medium- and long-term categories. In the medium term, rehabilitation will entail the continuous shaping of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will

involve the shaping of the stockpiling/processing area by removing the stockpiled material and site infrastructure/equipment and landscaping the disturbed footprints, prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The MR holder will further be responsible for the seeding of all rehabilitated areas.

The decommissioning activities will consist of the following:

- Sloping and landscaping the excavations (to create an acceptable landscape feature);
- Removing all stockpiled material;
- Removing all mining machinery and equipment from site;
- Landscaping all other disturbed areas and replacing the topsoil;
- Vegetating the rehabilitated area; and
- Controlling/monitoring the invasive plant species.

Due to the impracticality of importing large volumes of fill to restore the mined area to its original topography, the rehabilitation option is to develop the excavation into a minor landscape feature. This will entail creating a series of irregular benches along the faces thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate indigenous grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil. The future land use of the rehabilitated mining footprint will be agriculture. Upon the replacement of the topsoil, the rehabilitated areas will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use. Final rehabilitation shall be completed within a period specified by the Regional Manager.

Once the entire mining area was rehabilitated the MR Holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"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".* The Closure Application will also be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

Also refer to Part B(1)(d)(i) *Determination of closure objectives* and Appendix M for the Closure Plan.

e) Policy and Legislative Context

Table 4: Policy and legislative context.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. in terms of the National Water Act: Water use license has/has not been applied for).
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970).	Part A(1)(g)(iv)(1)(b) Description of the current land uses. Part A(iv)(1)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Invasive Plant Species.*	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Eastern Cape Nature and Environmental Ordinance 19 of 1974 (as amended).	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Mining, Biodiversity Conservation Area, and Vegetation*.	The mitigation measures proposed for the site includes specifications of the ECNEO, 1974.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	Part A(1)(f) Need and desirability of the proposed activities.	The need and desirability of the project was assessed in accordance with these guidelines.
Hazardous Substances Act, 1973 (Act 15 of 1973)	Part A(iv)(1)(viii) The possible mitigation measures that could be applied on the level of risk – *Waste Management.*	The mitigation measures proposed for the site includes specifications of the HAS, 1973.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
Makana Municipality Final Integrated Development Plan (IDP) 2021-2022	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Socio-economic Environment.*	The description of the study area's socio-economic status is in accordance with that of the IDP.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Risks.*	The mitigation measures proposed for the site includes specifications of the MHSA, 1996.
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto.	Part A(1)(d) Description of the scope of the proposed overall activity.	Application for a mining right. Reference number: EC 30/5/1/2/2/10069 MR
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended): ❖ GNR 517 Listing Notice 2 Activity 17	Part A1(d)(i) Listing and specified activities.	Application for environmental authorisation. Reference number: EC 30/5/1/2/2/10069 MR
National Environmental Management: Air Quality Control Act, 39 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity – *Air Quality and Noise Ambiance.* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Air Quality and Noise Ambiance*.	The mitigation measures proposed for the site consider the NEM:AQA, 2004 and the National Dust Control Regulations.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A1(g)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(g)(viii) The possible mitigation	Should Final Layout Alternative be approved, and the proposed mitigation measures be implemented the potential impacts on the biodiversity of the area is deemed to be of low-medium significance.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
	measures that could be applied on the level of risk – *Mining, Biodiversity and Vegetation.*	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 9260).	Part A(ii) Description of the activities to be undertaken: 2.2.4 *Waste Management Programme* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Waste Management*.	The mitigation measures proposed for the site consider the NEM:WA, 2008.
National Heritage Resources Act No 25 of 1999.	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment.* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Cultural and Heritage Environment.*	ECPHRA commented that the development may proceed provided that the recommendations of the specialists are adhered to. The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Road Traffic Act, 1996 (Act No. 93 of 1996)	Part A(ii) Description of the activities to be undertaken: *2.1.4 Access Roads.* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Existing Infrastructure*.	The mitigation measures proposed for the project consider the NRTA, 1996.
National Water Act, 1998 (Act No. 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology, Geohydrology and*	The proposed project does not trigger an application in terms of the NWA as the development footprint will be >100 m from the Botha's River

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
Department of Water Affairs and Forestry Best Practice Guideline Series (2007).	*Groundcover (including wetlands).* Part B(1)(d)(viii) Has a water use licence been applied for?	The mitigation measures proposed for the site consider the NWA, 1998.
Public Participation Guideline in terms of the NEMA EIA Regulations.	Part A(1)(g)(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the public participation guidelines.
The South African Constitution.	Implied throughout the document.	To be upheld throughout the EIA assessment, planning-, construction-, operational- and decommissioning phases.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Makhanda has the largest known deposit of good quality clay in South Africa. Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and the Makana Brick Factory.

Considering this, and the lapse of the Makana Brick mining permit the Applicant saw a business opportunity to secure the significant clay resource and supply the desired clay to the Makana Brick Factory. The mining permit footprint of Makana Brick will be incorporated into the proposed mining right footprint, and Makana Brick and the Applicant has therefore entered into an agreement in this regard (see Appendix E2). Should the mining right be granted, the Applicant proposes to take over the rehabilitation liability of Makana Brick for the permit footprint, and therefore the mining right application was accompanied by a Transfer of Environmental Liabilities Application.

As mentioned earlier, parts of the earmarked footprint has been mined for many years and has very little, if any, other (than mining) economic function left. The proposed development will generate income to the landowner (in the form of compensation) for the life of the mine. The small losses of agriculture that will occur due to mining will be offset against much greater royalties received from mining compared to the income generated by the grazing of the earmarked footprint. In terms of the Social and Labour Plan (SLP), to be approved as part of the proposed mining right

application, the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

The need and desirability of the proposed operation was assessed in terms of the National Department of Environmental Affairs' Guideline on Need and Desirability (first version published in terms of section 24J of the NEMA in 2014, and second version in 2017). The following table shows the questions that were considered in this regard.

Table 5: Need and desirability determination.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How were ecological integrity considerations considered? How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?	As discussed in this report the Mining and Biodiversity Map shows that the proposed mining footprint enter areas deemed to be of highest biodiversity importance. According to the DFFE Screening Tool Report the earmarked footprint extends across areas characterised as Critical Biodiversity Area (CBA) 1 & 2, Ecological Support Area 1 (ESA1), and a FEPA sub catchment. The vegetation type of the study area is known as Bisho Thornveld (SVs7) and Grahamstown Grassland Thicket (AT38) that are both characterised as Least Concern in terms of conservation status. The DFFE Screening Report for Environmental Authorisations as required by the 2014 EIA Regulations highlighted the following environmental sensitivities: ⁜ Agricultural Theme: Low & Medium ⁜ Animal Species Theme: Medium & High ⁜ Aquatic Biodiversity Theme: Low & Very High ⁜ Archaeological & Cultural Heritage Theme: Low & Very High ⁜ Civil Aviation Theme: High ⁜ Defence Theme: Low ⁜ Palaeontology Theme: Low & Very High ⁜ Plant Species Theme: Medium ⁜ Terrestrial Biodiversity Theme: Low & Very High The Biodiversity Company was appointed to undertake a terrestrial biodiversity baseline assessment of the earmarked mining area. The specialists concluded that the project area is predominantly comprised of modified, degraded habitat units attributed to the ongoing mining activities recorded. Although the project area falls within CBA 1 & CBA 2 ecosystems, and an ESA 1 ecosystem, ongoing disturbances and impacts associated with the activity will impede on the long-term recovery of the site to a more natural state. Completion of the terrestrial	Desirable based on the disturbed nature of the area.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The earmarked area was instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities. Refer to the following sections: ᛝ Part A(1)(d)(ii) *Description of the activities to be undertaken*; ᛝ Part A(1)(g)(i) *Details of the development footprint alternatives considered*; ᛝ Part A(1)(g)(iv) *The environmental attributes associated with the development footprint alternatives*; ᛝ Part A(1)(h) *Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity*; ᛝ Part A(1)(k) *Environmental impact statement*.	
How will this development pollute and/or degrade the biophysical environment?	Due to the small scale and nature of the proposed mining activities the pollution potential is of low significance. The mining method proposes progressive rehabilitation thereby keeping the impact on the receiving environment as low as possible. As mentioned earlier, due to the disturbed nature of the study area the potential of the proposed project impacting the biophysical environment is unlikely. Also refer to: ᛝ Part A(1)(d)(ii) *Description of the activities to be undertaken – 2.2.4 Waste Management Programme*; ᛝ Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk*.	Desirable
What waste will be generated by this development?	Due to the nature of the project, very little general waste is expected to be generated as a direct result of the mining activities. The general waste will mainly consist of paper, plastic, and potentially tin that will be contained in a	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	sealable refuse bin that will be removed to the Makhanda landfill site when the capacity of the containers is reached. Likewise, very little generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages/breakdowns, contaminated water from the wash bay, and hydrocarbon contaminated soil/items from the operations at the workshop. The hazardous waste to be generated will be kept in designated hazardous waste containers to be removed from the site by a registered hazardous waste handling contractor. Chemical ablution facilities will be available to the employees that will be serviced at least weekly by a registered sewerage handling contractor. No waste will be disposed of or treated on the mining area/farm.	
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	Makana Brick has been mining clay from Portion 3 of The Orchards No 233 for the past 5 years. Dr J Binneman wrote a letter for recommendation for exemption of a full phase 1 Archaeological Impact Assessment (AIA) in 2017 as part of the mining permit application (4.9 ha). Dr Binneman did not observe any sites/materials during his site assessment, and recommended exemption from an AIA as the area is of low cultural sensitivity and it is unlikely that any archaeological remains will be found on the property. Further to this, the DFFE screening tool shows most of the area is of low significance. Therefore, an AIA/HIA was not done as the project is unlikely to impact on any areas of cultural and/or archaeological importance. Dr Robert Gess was appointed to do a Palaeontological Heritage Impact Assessment (PIA) of the proposed mining area. Dr Gess concluded that almost the entire area is deeply underlain by strata of the Witpoort Formation, which are variably overlain by silcrete of the Grahamstown Formation. In places small outcrops of Witpoort Formation quartzite were observed to the south of historic diggings. Historic diggings in the north of the proposed mining right have targeted a thick bed of kaolin clay derived from an (originally black) mudstone layer. Due to its proximity to surface the shale was subsequently reduced to kaolin by deep leaching during and following the Cretaceous period	Highly desirable based on the disturbed nature of the area and the site specific geology.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	– the silica and metallic elements crystalised out near the surface to produce the silcrete capping. As a result of the kaolinization of the strata their probable original palaeontological interest has been destroyed. It remains possible, however, that as the fold dives down in a southerly direction it may, in places still be capped by southwardly dipping sheets of quartzitic strata. If this is the case, it may be that there are areas which have not been entirely kaolonised and where fossils may still be discernible in the strata. The specialist recommended that should more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess them for palaeontological potential. ECPHRA (Eastern Cape Provincial Heritage Authority) commented on 20 November 2023 that this project was tabled at the Archaeology, Palaeontology and Meteorites Committee meeting on 16 November 2023, and the outcome of the meeting was that the proposed development may proceed as proposed, provided that the recommendations of the heritage specialists are adhered to including the chance find protocol.	
How will this development use and/or impact on non-renewable natural resources?	The Applicant proposes to sell the clay mined from the earmarked footprint to the Makana Brick Factory, and the aggregate will be sold to the local market in and around the mine. Presently, it is believed that the proposed area may have a probable clay reserve of ±630 000 m³. Based on the proposed production rate, the clay resource shows a potential life of mine of ±79 years. The probable aggregate reserve of the area was estimated to be ±600 000 m³ with a life of mine of ±80 years. Considering this, the Applicant will responsibly consume the clay and aggregate resources of the study area.	Highly Desirable
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?	The proposed mine will make use of generators to power the site infrastructure and use water from the already authorised source (dam) at Makana Brick (off-site). Water will only be used for dust suppression purposes as the mining activities do not require any processing water.	Highly Desirable
How were a risk-averse and cautious approach applied in terms of ecological impacts?	The specialists (TBIA & PIA) proposed mitigation measures to be implemented by the proposed mine to lessen the impact of the proposed activities on the ecological aspects of the site. Both specialists concluded that should these mitigation measures be implemented the proposed project can be authorized.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	Refer to the following sections: ⁎ Part A(1)(d)(ii) *Description of the activities to be undertaken*; ⁎ Part A(1)(g)(i) *Details of the development footprint alternatives considered*; ⁎ Part A(1)(g)(iv) *The environmental attributes associated with the development footprint alternatives*; ⁎ Part A(1)(h) *Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity*; ⁎ Part A(1)(k) *Environmental impact statement*.	
How will the ecological impacts resulting from this development impact on people's environmental right?	The mine will be managed in accordance with the agricultural practices of the farm. As mentioned in Part A(1)(u)(i)(1) *Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. By nature, these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project. The study has however shown that should the proposed mitigation measures be implemented it is highly unlikely that the project will impact on the environmental right of people.	Acceptable
Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts.	The Applicant entered into a usage agreement with the landowner as well as Makana Brick that is a lawful occupier. Clay mining on this property is already well known in the surrounding community and to date no serious environmental or socio-economic impacts were identified. Further to this, the revenue to be generated by the mine will be an additional source of income (royalties) to the landowner. The mine will sub-contract the mining of the clay to a local contractor and contribute to the community as part of its SLP obligations. Also refer to: ⁎ Part A(1)(d)(ii) *Description of the activities to be undertaken – 2.2.4 Waste Management Programme*;	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	⁎ Part A(1)(g)(viii) The *possible mitigation measures that could be applied and the level of risk*; ⁎ Part A(1)(k) *Environmental impact statement*; ⁎ Part A(1)(u)(i)(1) *Impact on the socio-economic conditions of any directly affected person*.	
Based on all the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	The findings of the specialists did not identify any fatal flaw or red flag issue regarding the development of the proposed mine. As mentioned above, should the mitigation measures proposed by the specialists be implemented the proposed project can be authorised. The mine must be rehabilitated in accordance with the EMPR and Closure Plan, to be approved for this project, upon closure to shape all disturbed areas and minimise residual impacts. Also refer to: ❖ Part A(1)(g)(iv) *The environmental attributes associated with the development footprint*; ❖ Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected*; ❖ Part A(1)(k) *Environmental impact statement*.	Desirable
Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified, resulted in the selection of the "best practicable environmental option" in terms of ecological considerations	Kindly refer to the following sections of this report: ⁎ Part A(1)(g) *Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site*; ⁎ Part A(1)(g)(i) *Details of the development footprint alternatives considered*; ⁎ Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected*; ⁎ Part A(1)(g)(x) *Statement motivating the alternative development location within the overall site*.	Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What is the socio-economic context of the area?	Please refer to Part A(1)(g)(iv)(1)(a) *Type of environment affected by the proposed activity - Socio-economic Environment*.	Highly Desirable
Considering the socio-economic context, what will the socio-economic impacts be of the development, and specifically also on the socio-economic objectives of the area?	As mentioned in Part A(1)(u)(i)(1) *Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. If approved, the Orchards Mine proposes to be a highly regarded supplier of clay and/aggregate in the Makhanda community. The mine will further contribute directly to the greater society through the employment of a local mining contractor as well as the Local Economic Development (LED) commitments of the mine (stipulated in the SLP). Indirectly, the mine will contribute to local industry development (clay for brick making), and the spending of wages in the Makana area.	
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The mine intends to supply clay to the Makana Brick Factory and aggregate to the building industry in the Makana and greater Sarah Baartman District. In addition, the mine will be committed to Human Resources Development, Local Economic Development as prescribed in the SLP. Also refer to the discussion under Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.*	Highly Desirable
Will the development result in equitable impact distribution, in the short- and long-term?	The Orchards Mine intends to sub-contract the mining activities to a local contractor for the duration of the mining right (±30 years). This is of crucial importance in the MLM with an unemployment rate of 32.5%. Further to this, the mine will operate in accordance with the provisions of the Mining Charter, 2018 as well as the Employment Equity Act, 1998 giving preference to historically disadvantaged employees from within the local area in terms of employment.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
In terms of location, describe how the placement of the proposed development will contribute to the area.	The clay resource on Portion 3 of The Orchards No 233 has been mined since the 1980's, and the mine is a well-known clay supplier in the area. The proposed expansion of the mining activities from the mining permit footprint (4.9 ha) will increase the production capacity of the mine, as well as prolong the validity of mining on the property, extending it from the allowable 5 years (maximum) for a mining permit, to ±30 years allowed for a mining right. The landowner can also enjoy the continued benefits of a diversified property income from agriculture and small-scale mining.	Highly Desirable
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	The mitigation measures proposed in this report were compiled in consultation with the specialists to reduce the potential impact that the proposed activity may have on the receiving environment. Once approved, the management outcomes are legally binding to be implemented by site management for the duration of the site establishment-, operational- and decommissioning phases.	Highly Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	Should the management- and mitigation measures proposed in this document be implemented in conjunction with the conditions of the EA, no impacts could be identified that will impact on the people's environmental right.	Highly Desirable
Considering the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts?	The Applicant entered into a usage agreement with the landowner as well as Makana Brick that is a lawful occupier of Portion 3 of The Orchards No 233. Clay mining on this property is already well known in the surrounding community and to date no serious environmental or socio-economic impacts were identified. Further to this, the revenue to be generated by the mine will be an additional source of income (royalties) to the landowner. The mine will also sub-contract the clay mining to a local mining contractor and contribute to the community as part of its SLP obligations. . Also refer to: ⋉ Part A(1)(d)(ii) *Description of the activities to be undertaken – 2.2.4 Waste Management Programme*;	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
	⁎ Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk*; ⁎ Part A(1)(k) *Environmental impact statement*; ⁎ Part A(1)(u)(i)(1) *Impact on the socio-economic conditions of any directly affected person*.	
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations? What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons?	The findings of the specialists did not identify any fatal flaw or red flag issue regarding the development of the proposed mine. As mentioned above, should the mitigation measures proposed by the specialists be implemented the proposed project can be authorised. The mine must be rehabilitated in accordance with the EMPR and Closure Plan, to be approved for this project, upon closure to shape all disturbed areas and minimise residual impacts. Also refer to the discussion under: ❖ Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected*; ❖ Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk*.	Desirable
What measures were taken to pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination? What measures were taken to ensure that the responsibility for the environmental health and	The mine will operate in accordance with, amongst others, the following: ♦ CARA, 1983 – to ensure agriculture related compliance; ♦ Financial Provision Regulations, 2015 – to ensure compliance in terms of rehabilitation; ♦ Mine Health and Safety Act, 1996 (as amended) – to ensure employee safety; ♦ MPRDA, 2002 (as amended) – to ensure mining related compliance; ♦ NEM:AQA, 2004 – to ensure air quality related compliance; ♦ NEM:BA, 2004 – to ensure biodiversity related compliance; ♦ NEM:WA, 2008 – to ensure waste related compliance; ♦ NEMA, 1998 (as amended) – to ensure environmental related compliance;	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
safety consequences of the development has been addressed throughout the development's life cycle?	Should the proposed application be approved the mining area will also be subject to compliance with the above listed.	
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community that is consistent with the priority needs of the local area.	The mine intends to supply clay to the Makana Brick Factory and aggregate to the building industry in the Makana and greater Sarah Baartman District. In addition, the mine must meet the commitments of the SLP regarding Human Resources Development, Local Economic Development, and the process pertaining to management of downscaling and retrenchment.	Highly Desirable
What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected.	The mine must operate in accordance with the specifications of the Mine Health and Safety Act, 1996 (MHSA). Site management will have daily discussions with the staff regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the daily site meetings. The MHSA further requires the submission of quarterly occupational hygiene reports that record site specific occupational hygiene exposure assessments.	Highly Desirable
Describe how the development will impact on job creation in terms of, amongst other aspects?	The Applicant intends to sub-contract the mining of the clay to a local contractor. The employees of the sub-contractor will be sourced from the local community.	Highly Desirable
What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the	The proposed mine will operate under a valid environmental authorization and mining right to be issued by the DMRE-EC. Compliance of the site with the approved EMPR and EA conditions will be reported on as per departmental specification. Considering this, the proposed activity will take place in an environmentally sustainable manner with the least possible impact on the receiving environment.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
public interest, and that the environment will be protected as the people's common heritage.		
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left.	It is believed that the mitigation measures proposed in this document is realistic and can be implemented (when applicable) by the mine. Should the mined areas be rehabilitated successfully, no long-term management burden will be left behind.	Highly Desirable
What measures were taken to ensure that the costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for by those responsible for harming the environment.	In terms of Section 41 of the MPRDA, 2002 a mining right holder must submit a financial provision to the DMRE that is sufficient to rehabilitate or manage the negative environmental impacts related to the mining activity. Upon approval of this application, Makhanda Mining (Pty) Ltd will lodge a financial guarantee with the DMRE that will be deemed sufficient to cover the financial provision amount needed to rehabilitate the mining footprint. The environmental liability of the operation will annually be reviewed and if a shortfall is indicated, the guarantee will be accordingly adjusted.	Highly Desirable
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified, resulted in the selection of the best practicable environmental option in terms of socio-economic considerations	Kindly refer to the following sections of this report: ⋉ Part A(1)(g) *Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site*; ⋉ Part A(1)(g)(i) *Details of the development footprint alternatives considered*; ⋉ Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected*; ⋉ Part A(1)(g)(x) *Statement motivating the alternative development location within the overall site*.	Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and other planned developments in the area.	Refer to the discussion under Part A(1)(g)(vii) *The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected*.	

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

During the EIA phase, the potential impact of the proposed activities on the receiving environmental were assessed by, amongst others, the EAP, The Biodiversity Company, and the palaeontologist. The specialists considered the initial project proposal and accordingly submitted their respective recommendations. Following receipt of the specialist reports, the initial project proposal was refined to accommodate the findings. The following matters contributed to the identification of the preferred development option:

1. **Topography -** The impact on the topography and geology is considered of low-medium significance if depth of the exaction and extent of disturbance is considered and of low-medium significance if the cumulative impact is considered. Change in topography and geology of the mining area is unavoidable considering the nature of the project and will be irreversibly altered since a portion the land will be permanently removed. Through profiling the faces and stabilizing it with proper vegetation cover, the potential impact can be mitigated.

2. **Visual Characteristics –** Due to the topography of the area, the proposed footprint will mainly be visible from immediate surrounding areas. The visual impact of the earmarked footprint will be of low-medium significance after mitigation. The small scale of the proposed operation, and the proposed progressive rehabilitation, will however assist in mitigating the visual impact of the proposed development on the surrounding environment. No residual visual impact is expected upon closure of the mine.

3. **Air Quality and Noise Ambiance –** The proposed operation will not trigger an application in terms of the NEM:AQA. Emissions to be generated at the mine will mainly consist of occasional dust. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). The expected impact on air quality and noise ambiance is low with mitigation.

4. **Geology** – During the operational phase, mining will result in permanent removal of clay and overburden, and the impact on the geology is unavoidable. Clay deposits are not regarded as a strategic mineral, and the study area is not a geo-site and therefore of less importance. Considering these factors, the impact is unavoidable but rated of low-moderate significance. The impact on soil properties is rated as low with mitigation.

5. **Hydrology and Geohydrology** – Mining will not alter the drainage patterns as water from the quarry will accumulate in the existing retention ponds. The Botha's River will not be impacted by mining since the mine boundary is more than 100 m away from the stream bank. The mining activities will not have an impact on the groundwater since the mine floor will be restricted to 20 m and will therefore not undercut the groundwater table. No boreholes will be drilled and thus the impact on groundwater is rated as insignificant.

6. **Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna** – Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted. No fauna SCC were detected, and the ecologist rated the animal theme sensitivity of the area as Low.

   It is therefore the opinion of the specialists that the project may be favorably considered, provided that the proposed mitigation measures be implemented. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

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

8. **Socio-economic Environment** – Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the

region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

The proposed development will also generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the SLP the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

9. **Existing infrastructure** – Apart from the farm roads and power lines, no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

During the EIA phase the following alternatives were assessed upon receipt of the site-specific information, comments received from the public, and the results of the specialist studies.

1. THE PROPERTY ON WHICH, OR LOCATION WHERE, IT IS PROPOSED TO UNDERTAKE THE ACTIVITY.

The project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3 and depicted in Figure 2.

Applicants can only apply for mining rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the mining activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed mining operations is to exploit the economically viable clay deposits (and overburden

as aggregate) on the earmarked farm, an area known to contain these resources needs to be selected.

The earmarked property encompasses the Grahamstown Formation of the Cenozoic Deposits of the interior, immediately adjacent to the Witpoort Formation of the Witteberg Group of the Cape Supergroup. The Grahamstown Formation comprises of silcrete and kaolinite, with the former overlying the latter. A distinct variance in the colour of the clay/kaolin can be observed on site. The study area is located on the northern aspects of a slope decreasing in elevation towards the north, terminating in the Both's River, near the origin. The Botha's River marks the contact zone between the Grahamstown Formation and the Witpoort Formation. The presence of constant mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting.

The property and location of the proposed mining area were identified during the planning phase by the Applicant and project team, as the preferred site alternative based on the following:

- Various parts of the proposed footprint were previously mined, and the footprint is highly transformed. Thus the mining area will be situated within a disturbed area.
- The proposed mining right footprint is an extension of the Makana Brick mining permit area (4.9 ha) that has already proven the excellent quality and ample quantity of the clay resource. The proposed footprint was therefore placed over the most desirable part of the farm.
- The Applicant entered into an access agreement with the landowner, as well as Makana Brick (as lawful occupier of the property) who in principle support the proposed project;

Figure 7: Photograph showing the slope where mining took place on the earmarked farm.(Image obtained from Bryn Werth Consulting Services).

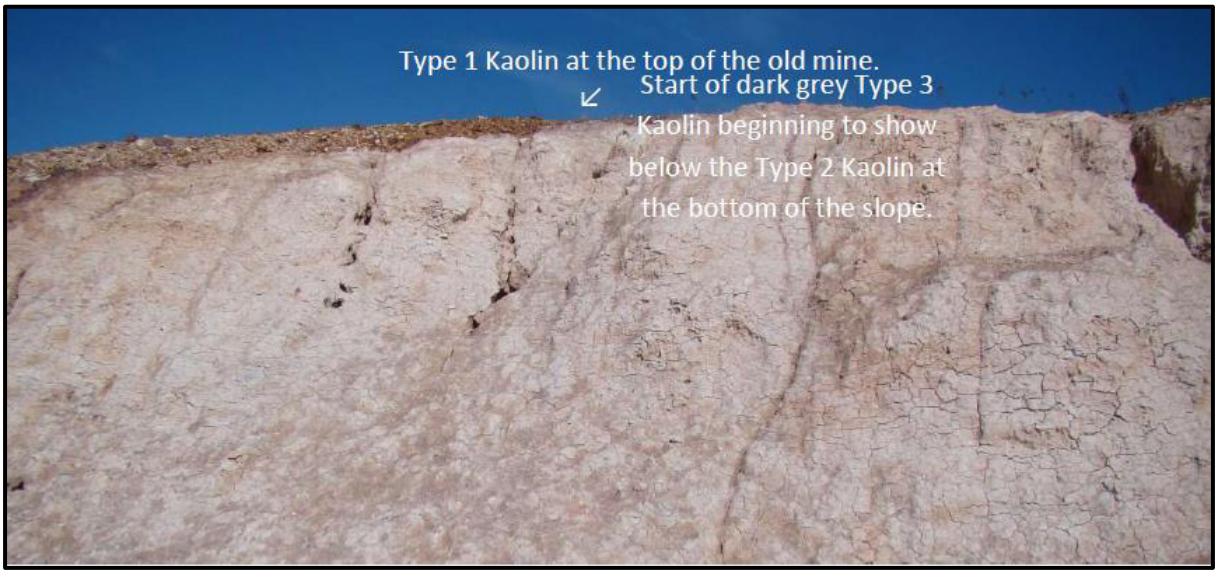

Figure 8: Photograph showing the various types of kaolin present at the earmarked farm.(Image obtained from Bryn Werth Consulting Services).

The proposed footprint of the MR application was based on the available geological information. No further location/site alternatives are considered in the Scoping and EIA process.

2. TYPE OF ACTIVITY TO BE UNDERTAKEN

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

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

Alternative land uses that could be considered is agriculture and conservation. Conservation is not a viable option, regardless of the CBA and ESA ecosystems shown by the DFFE screening tool. The ecologist confirmed that the PAOI (project area of influence) should rather have an overall Low sensitivity rating owing to the long-term, historical mining activities that has been conducted in the earmarked area. Considering this the severely transformed and degraded status of the application area and the transformation of surrounding land affords the earmarked area limited ecological function and the proposed activity will not lead to the loss of ecosystem connectivity, and therefore conservation is not deemed a viable option.

The degraded and transformed nature of the mined areas also renders those sections at least temporarily out of commission for grazing. The small losses of agriculture that will occur due to mining will be offset against much greater royalties received from mining compared to the income generated by the grazing of the earmarked footprint. Further to this, should the earmarked area be used for either conservation or agricultural purposes the clay resources will be sterilised, and the ensuing economic potential will be lost. Sterilisation of the mineral resource may also entail that the source must be sourced from another area that would most likely be within natural/undisturbed areas that will have a higher impact on conservation that the mining of the proposed partly transformed footprint.

In conclusion, unless the larger surrounding area is allocated to conservation, this proposal for an alternative land use will be completely unattainable. The earmarked parcel of land has little ecological function and the proposed mining will not lead to the loss of ecosystem connectivity. Regarding agriculture, it is recommended that the area be developed for mining, with the rehabilitation aimed at establishing a secondary grass cover and in the process profile the landscape properly and eradicate the invasive plant species.

Considering this, clay mining is deemed the most beneficial land use for this property, and the nature of the proposed operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate).

3. DESIGN AND LAYOUT OF THE ACTIVITY.

The Applicant will not establish any permanent infrastructure and/or buildings on site. The crushing plant and ablution hut will both be of temporary nature and can be moved as mining progress. Haul roads will also be developed as mining progress.

The Applicant requires the following materials from the proposed mine:

1. Kaolin clay;
2. Naartjie red clay;
3. Yellow clay; and
4. Aggregates.

The highest set kaolin is a cream coloured friable type of clay with a low grit content, not very plastic, most of which is still evident in the old mining area (mining permit) to the east near the top of the mine. The second kaolin is a light grey plastic, grit free clay. The third type of kaolin, the deepest of the three, is a dark grey clay which is very plastic (found just above dam level below the slope).

The Naartjie Red Clay, normally the first clay found beneath the overburden, has deposits which vary in depth between 1 m and 4 m. This high iron content clay provides the colour and unique reduction flashes to both Makana Brick's Ironspot and Cathcart Travertine bricks, which over the years have become synonymous with Makana Brick.

Although the seams of different clays in this mine are difficult to predict due to the undulating nature of their deposits, between 1 m and 5 m deep seams of Yellow Clay can normally be found below or sometimes adjacent to the Naartjie Red. This Yellow clay does sometimes reappear between seams of white Kaolin further down as experienced on the slope of the mining permit area, as well as a deep deposit below the Kaolin towards the base of the overall clay deposit. However, sometimes Naartjie Red goes straight into White Kaolin with no Yellow between, as found at the top of the slope in front of the silcrete capping.

Figure 9: Photograph of the colour variations present at the earmarked area. (Image obtained from Bryn Werth Consulting Services).

The design and layout of the proposed footprint were based on the available clay resources and colour variants as depicted in the following figure. Geological testing of the proposed footprint showed that Block C could be mined for Naartjie Red intense clay, as well as yellow clay and white kaolin. Historic test pits showed similar results to Block C in Blocks E and F. Block A will be mined for yellow and white kaolin on the slope as well as a bit of Naartjie Light at the top. Yellow kaolin is present in Block H.

Although the proposed footprint has been mined for decades, it still has material with a very high iron content as well as a deep deposit of solid Naartjie Red at the western point of the old mine available.

Figure 10: Plan showing the aggregate (silcrete) and clay sources within the earmarked area. Note white, and yellow kaolin in blocks A & H, and Naartjie Red Clay in blocks C & D.

Geological studies showed that most of the earmarked area seems to have between 500 mm to 1 m of overburden of which normally no more than 250 mm is topsoil. There are however areas especially around the old mine on the far eastern side, where the overburden does get to ±3 m thick. Considering that overburden is found over the entire proposed mining footprint the Applicant identified the need to sell the overburden as aggregate.

Figure 11: Photograph of the overburden present at the earmarked area. (Image obtained from Bryn Werth Consulting Services).

Considering the above no further design/layout alternatives are deemed viable for this application.

4. TECHNOLOGY TO BE USED IN THE ACTIVITY.

As mentioned earlier, experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. It has also been found that some layers have high levels of silica and result in extrusion problems, and therefore slope mining is proposed to counter these problems. During the winning process heavy earth–moving equipment will be used to extract clay from the quarry, as described in Part A(1)(d)(ii) *Description of the activities to be undertaken – Operational Phase*. Similarly, the aggregate will be recovered through direct stripping, processing (when needed) and loading.

The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. The processing infrastructure will be of temporary and mobile nature, moving to the stockpiled material as needed.

This project does not require complex technology to allow the winning of the intended minerals, and therefore no further technology alternatives are considered in the Scoping and EIA process.

5. OPERATIONAL ASPECTS OF THE ACTIVITY

The operational aspects of the activity was based on the historic mining activities that's been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The Applicant already holds water rights that can supply the project with water, no electricity connection is needed, no servicing of mining equipment will be required on site, and the mining sub-contractor will transport the material from the mine to Makana Brick along existing roads.

The water to be used on site will be transported from an already approved source and no additional abstraction/source is needed. All mining will be >100 m from the Botha's River, and runoff water (from the mining area) will be directed to the existing retention ponds. It is believed that the project proposal adequately considers the potential impact on the Botha's River and that all possible measures were implemented to protect the river against any adverse

effects. The project also consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation as listed in Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk.*

6. OPTION OF NOT IMPLEMENTING THE ACTIVITY (NO-GO ALTERNATIVE)

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. If the no-go alternative is implemented the land use of the earmarked footprint will remain that of agriculture amidst historically mined sections, with the remaining clay (and aggregate) resource sterilised/blocked.

The no-go option will further entail a loss of income to the landowner, employment opportunities, as well as socio-economic benefits and growth development opportunities. Given the high levels of unemployment and poverty in the Makana Magisterial Districts the loss of such opportunities is considered significant.

The positive implications of the no-go alternative are that there will be no impact on the bio- and geophysical environment of the earmarked area. However, geological investigations showed the significance of kaolin in the Makana/Grahamstown region, and the ecologist confirmed the low terrestrial biodiversity sensitivity of the area owing to the long-term, historical mining activities that have occurred.

Therefore, from an ecological perspective there is no reason why this area should not be mined. Nevertheless, care must always be taken to develop the mine to mitigate potential impacts, regardless of the low ecological and migratory status of the site.

Considering the above, the no-go option is not supported as a viable option.

7. FINAL PROJECT PROPOSAL

From the above, it is deduced that the Final Project Proposal entails:

- the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3;

- the opencast mining of the clay upon which it will be transported to the Makana Brick Factory where it will be used for clay bricks. The overburden may also be sold as aggregate;
- no permanent infrastructure and/or buildings will be established on site as the crushing plant and ablution hut will both be of temporary nature. Further to this, the design and layout of the proposed footprint were based on the available clay resources and colour variants;
- slope mining to improve blending across the sediment layers. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant; and
- the operational aspects of the activity were based on the historic mining activities that's been ongoing for several years. The Applicant already holds water rights that can supply the project with water, no electricity connection is needed, no servicing of mining equipment will be required on site, and the mining sub-contractor will transport the material from the mine to Makana Brick along existing roads.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attend public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land).

The relevant stakeholders and I&AP's were informed of the mining right application by means of an advertisement in the Daily Dispatch, and on-site notices that were placed at the entrance to the farm and the Makana Library. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 24 November 2023) was also sent to the landowner, neighbouring landowners, stakeholders, and I&AP that may be interested in the project.

The comments received on the DSR were incorporated into the final Scoping Report (FSR) that was submitted to the DMRE on 24 November 2023 for decision making. The following table provides a list of the I&AP's and stakeholders that were informed of the project. Comments were received from ECPHRA and the Commission on Restitution of Land Rights, and belatedly (for incorporation into the FSR) from DWS.

Table 6: List of the landowners, I&AP's and stakeholders that were informed of the project, and the availability of the DSR & DSLP.

LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: • Mr AM Moss Portion 3 of The Orchards No 233 **Surrounding Landowners and I&AP's:** • Amaraka Inv No 6 (Pty) Ltd The Orchards No 233 Orchards Lodge • Meadow View Trading 116 CC Farm No 599 • Mr AJ Diedericks Portion 4 of Grobbelers Kloof No 334 • Makana Municipality Erf No 4807 Portion 7 of Tempe No 240 Portion 11 of Tempe No 240 Portion 12 of Tempe No 240 • SANRAL Portion 2 of Grobbelers Kloof No 334	• Department of Economic Development, Environmental Affairs and Tourism – East London; • Department of Economic Development, Environmental Affairs and Tourism – Queenstown; • Department of Labour; • Department of Public Works; • Department of Rural Development and Agrarian Reform; • Department of Rural Development and Land Reform; • Department of Transport; • Department of Water and Sanitation; • Eastern Cape Provincial Heritage Resources Authority; • Eskom; • Makana Local Municipality – Ward 13; • SANRAL; • Sarah Baartman District Municipality.
COMMENTS RECEIVED ON THE DSR	
• ECPHRA, • Commission of Restitution of Land Right, and • DWS.	

Upon approval of the Final Scoping Report (09 February 2024) the Draft Environmental Impact Assessment Report was compiled and circulated for public comments over a 30-day period that extended until 15 May 2024. No additional comments were received on the draft EIA & EMPR that could be incorporated into the final EIA & EMPR. See attached as Appendix E2 proof that the I&AP's and stakeholders were contacted.

Refer to the following table for an explanation on how the public participation process of this project took the methods stipulated in Regulation 41 of the NEMA Regulations into account. Proof of the public participation process that was followed is attached as Appendix E to this document.

Table 7: Table comparing the required methods with the public participation process of this project.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
⁜ Regulation 41(2)(a): *Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of-* *(i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and* (ii) *Any alternative site.* ⁜ Regulation 41(3): *A notice, notice board or advertisement referred to in subregulation (2) must—* *(a) give details of the application or proposed application which is subjected to public participation; and* *(b) state—* *(i) whether basic assessment or S&EIR procedures are being applied to the application;* *(ii) the nature and location of the activity to which the application relates;* *(iii) where further information on the application or proposed application can be obtained; and* (iv) *the manner in which and the person to whom representations in respect of the application or proposed application may be made.* ⁜ Regulation 41(4): *A notice board referred to in subregulation (2) must—* *(a) be of a size of at least 60cm by 42cm; and* (b) *display the required information in lettering and in a format as may be determined by the competent authority.*	Notice boards were fixed at the following conspicuous and public accessible areas: ⁜ Entrance to the farm/site; and ⁜ Makana Public Library The notice boards that were placed complied with the requirements of Regulation 41(3) as presented in Appendix E2 attached to this document. The notices were printed on notice boards of 60 x 42 cm in Arial font of sufficient size.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
☒ Regulation 41(2)(b): *giving written notice, in any of the manners provided for in section 47D of the Act, to-* (i) *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;* (ii) *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;* (iii) *the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;* *(iv) the municipality which has jurisdiction in the area;* *(v) any organ of state having jurisdiction in respect of any aspect of the activity;* *(vi) any other party as required by the competent authority;*	(i) The Landowner signed a Landowner Consent Form regarding this project and were also invited to comment on the DSR and DEIAR. No additional comments were received. (ii) The surrounding landowner were invited to comment on the project, the DSR, and the DEIAR. (iii) The Ward Councillor Wards 13 was invited to comment on the project, DSR, and the DEIAR. (iv) Both the Makana Local Municipality and the Sarah Baartman District Municipality were invited to comment on the project, DSR, and the DEIAR. (v) As listed in Table 6 the relevant state departments and entities were invited to comment on the project, DSR, and the DEIAR. (vi) As listed in the FSR Acceptance Letter, ECPHRA, Department of Agriculture, Department of Forestry, Fisheries and the Environment, Department of Rural Development and Land Reform, DWS, DMRE and the Local Municipality were all invited to comment on the project, DSR, and the DEIAR.
☒ Regulation 41(2)(c): *Placing an advertisement in-* *(i) One local newspaper; or* *(ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations.*	The project and availability of the DSR was advertised in the Daily Dispatch on 25 October 2023.
☒ Regulation 41(2)(d): *Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken…*	Not applicable to this project as the proposed activity does not extend beyond the boundaries of the metropolitan or district municipality in which it will be undertaken.
☒ Regulation 41(2)(e): *Using reasonable alternative methods, as agreed to by the competent authority, in those instances where*	Not applicable to this project as no I&AP indicated that he/she was desirous but unable to participate in the public participation process.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
a person is desirous of but unable to participate in the process due to— *(i) illiteracy;* *(ii) disability; or* (iii) *any other disadvantage.*	
☒ Regulation 41(5): *Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d)…*	Not applicable to this application.
☒ Regulation 41(6): *When complying with this regulation, the person conducting the public participation process must ensure that—* *(a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and* (b) *participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.*	The DSR containing the first set of facts in respect of this application was available to potential I&AP's for perusal and commenting over a 30-days commenting period. The DSR was also available on the Greenmined website. I&AP's and stakeholders were invited to contact the EAP should additional information be required. Upon approval of the FSR, the DEIAR was compiled that was also available to I&AP's and stakeholders for their perusal.
☒ Regulation 41(7): *Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.*	Not applicable to this project.

iii) Summary of issues raised by I&AP's

(Complete the table summarizing comments and issues raised, and reaction to those responses)

Table 8: Summary of issues raised by I&AP's.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		**Date Comments Received**	**Issues Raised**	**EAPs response to issues as mandated by the Applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated**
AFFECTED PARTIES					
Landowner/s		-	-	-	-
Mr AM Moss ⁎ Portion 3 of The Orchards No 223 ⁎ Portion 3 of Grobbelers Kloof No 334	**X**	The landowner is aware of, and supports, the application in principle. Refer to Appendix E2 for a copy of the landowner agreement.			
Lawful occupiers/s of the land	-				
-	-				
Landowners or lawful occupiers on adjacent properties	**X**	**-**	**-**	**-**	**-**
Amaraka Inv No 6 (Pty) Ltd ⁎ The Orchards No 233 ⁎ Orchards Lodge	**X**	No comments were received.			

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Meadow View Trading 116 CC ⁒ Farm No 599	**X**	No comments were received.			
Mr AJ Diedericks ⁒ Portion 4 of Grobbelers Kloof No 334	**X**	No comments were received.			
Makana Municipality ⁒ Erf No 4807 ⁒ Portion 7 of Tempe No 240 ⁒ Portion 11 of Tempe No 240 ⁒ Portion 12 of Tempe No 240	**X**	No comments were received.			
SANRAL ⁒ Portion 2 of Grobbelers Kloof No 334	**X**	No comments were received.			
Municipal councillor Ward 13	**X**	No comments were received.			
Municipality Makana Local Municipality (MLM)	**X**	No comments were received.			
Organs of state (Responsible for infrastructure that may be	**X**	**-**	**-**	**-**	**-**

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
affected Roads Department, Eskom, Telkom, DWA, etc					
Department of Transport	**X**	No comments were received.			
Department of Water and Sanitation	**X**	05/12/2023	The DWS submitted the following comments on the DSR.	See Greenmined's response to the comments received from the DWS listed below.	See references listed below.

Comments received from DWS on the DSR:

"Reference is made to the above-mentioned document received. The Department of Water and Sanitation: Water Use Authorisation Directorate has the following comments with regards to the proposed development in terms of Section 21(c) and (i) i.e., "impeding or diverting the flow of water in a watercourse" and "altering the bed, banks, course or characteristics of a watercourse" respectively under the provisions of the National Water Act, 1998 (Act No. 36 of 1998), hereinafter referred to as the NWA.

1. Water Uses and Water Use Authorisations

The project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233. The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to obtain the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks. If needed, the aggregate will be processed at a mobile crushing and screening plant to reduce it to various sized stockpiles.

The proposed project will include the introduction of mining equipment onsite, stripping and stockpiling of topsoil and overburden, excavation of the mining area, screening and processing of aggregates, stockpile of mined minerals until it is transported to Makana Brick, and slope, landscape and rehabilitation of the affected areas upon closure of the mine.

Figure 9 on page 53 of the submitted draft scoping report indicates that there is the Botha River near the mine boundary. The applicant must note that should the any of proposed activities occur within the regulated area i.e., the outer edge of the 1:100 year floodline, delineated riparian habitat or within 100m from the edge of a watercourse where the edge of

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

the watercourse is the first identifiable annual bank fill flood bench (whichever is the greatest), the applicant will therefore be required to apply for a water use authorisation in terms of Section 21(c) and (i) with this Department, under the provisions of the National Water Act, 1998 (Act No. 36 of 1998), hereinafter referred to as the NWA.

Figure 9 on page 53 of the submitted report indicates that the study area falls within a NFEPA in terms of wetlands and/or rivers. If there are wetlands at the proposed location, the applicant will require authorisation from this Department for any activity within a wetland or a 500m radius from the delineated boundary (outer temporary zone) of a wetland or pan.

Flood line determination: The applicant must note that no activities should occur within a 1:100-year flood line, unless authorised by this department.

The Applicant shall conduct a preliminary legal assessment to identify all the water use activities associated with the proposed project that will require authorisation by the Department of Water and Sanitation (DWS) and the applicant is hereby referred to Section 22(1) of the National Water Act, 1998 (Act 36 of 1998).

Water use authorisation enquiry can be lodged through e-WULAAS online system for further processing.

The river, stream and associated buffers must be treated as no-go sensitive environment areas: caution must be exercised near the watercourses.

Applicant should identify alternatives with the aim of protecting water resource.

Please note that no person may use water unless permitted under the NWA. Should the applicant engage in any water use activity without the necessary water use authorisation, it will be regarded as an unlawful water use. The Applicant will thus be guilty of an offence and liable for a fine or imprisonment as stipulated in Section 151 of the NWA.

2. Solid Waste Management

Page 22 of the draft scoping report indicated that the general waste generated during the operational phase of the project will be removed from the site to a recognised waste handling facility, while the hazardous waste will be collected from the site by a registered hazardous waste handling contractor. The Applicant must note that should private contractors be used; all solid waste must be disposed of at a permitted landfill site and proof of this must be made available to this Department when required.

The requirements of this Department with respect to solid waste must be strictly enforced and complied with.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

The Applicant should note that contaminated soil or other hazardous material must be disposed of at a permitted hazardous landfill site that is authorized to accept the said material and proof of this must be made available to this Department when required.

The recycling of suitable material is encouraged by this Department, provided it is properly managed.

3. Sewage and Wastewater Management

Page 22 of the draft scoping report indicated that an ablutions hut will be placed at the mine that can be used by the employees and will be serviced weekly by a registered sewerage handling contractor. The Applicant must note that the use of any temporary, chemical toilet facilities must not cause any pollution to a water resource or pose a health hazard. In addition, these toilets must not be situated within 100m from a watercourse or within the 1:100-year flood line (whichever is the greatest). Furthermore, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the Applicant.

Washing, refuelling, maintaining of vehicles or the transfer of hazardous substances must be conducted within a bunded area. All drainage arising from the bunded area must be treated as a water containing waste and disposed of safely.

The following is applicable should small volumes of wastewater be generated during the site establishment and operational phase:

- Water containing waste must not be discharged into the natural environment,
- Measures to contain the water containing waste and safely dispose thereof must be implemented.

4. Stormwater Management

It is imperative that there is proper management of storm water at the project site. This Department requests a Stormwater Management Plan.

The Engineer or Contractor must ensure that only clean Stormwater runoff enters the environment.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any Stormwater discharge point(s). 5. Erosion Control Erosion control measures must be put in place to minimise erosion along the proposed mining areas. Extra precautions must be taken in areas where the soils are deemed highly erodible. Soil erosion onsite must be prevented at all times, i.e., pre-, during- and post-operational activities. Erosion control measures must be implemented in areas prone to erosion such as near water supply points, edges of slopes, etc. These measures could include the use of sandbags, hessian sheets, bidim, retention or replacement of vegetation. Where the land has been disturbed during site establishment or operational phase/excavation it must be re-habilitated and re-vegetated back to an acceptable state after such activities have been done. The applicant must ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. If and where possible, rehabilitation of disturbed areas should be done concurrently with the mining activities to avoid erosion of bare soil. It is recommended that the land clearing be done during dry seasons to avoid water runoff into the watercourse thus affecting the water quality. The Applicant must note that stockpiling of soil or any other materials during the operational phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface run-off. The Applicant must control and establish suitable mitigation measures to prevent the erosion of stockpiles. 6. Spillages Management There must be no unacceptable impact on the quality of both surface and groundwater in the area. If pollution of any surface or groundwater occurs, it must be immediately reported to this Department and the appropriate mitigation measures must be employed. In addition, should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity must be provided to the affected users.				

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

The Applicant must note that storage of material, chemicals, fuels etc. must not pose a risk to the surrounding environment, and this includes surface and groundwater. Temporary bunds must also be constructed around chemical or fuel storage areas to contain possible spillages.

Such storage areas must be located outside the 1:100-year flood-line of the water source and must be fenced to prevent unauthorized access into the area.

It is important that any significant spillage of chemicals, fuels, etc. during the construction phase and/or operational phase is reported to this Office and other relevant authorities. In the event of a spill, the following steps can be taken:

- Stop the source of the spill,
- Contain the spill,
- All significant spills must be reported to this Department and other relevant authorities,
- Remove the spilled product for treatment and authorised disposal,
- Determine if there is any soil, groundwater, or other environmental impact,
- If necessary, remedial action must be taken in consultation with this Department,
- Incident must be documented.

7. General

This Office reserves the right to inspect the site without prior notice in order to ensure that its requirements, as mentioned above, are adhered to. Should any problems be noted, measures must be undertaken immediately to rectify the situation.

This Department reserves the right to revise/withdraw these comments and request further information from the applicant should any other information that contradicts the above comes to light.

Notwithstanding the above, the responsibility rests with the Applicant to identify all sources or potential sources of pollution from his undertaking and to take appropriate measures to prevent any pollution of the environment. Failure to comply with the requirements of the NWA could lead to legal action being instituted against the Applicant."

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

Greenmined's response to the DWS comments received on the DSR:

"Thank you for taking part in the public participation process of the mining right applied for by Makhanda Mining (Pty) Ltd with reference number EC 30/5/1/2/2/10069 MR. Greenmined Environmental (Pty) Ltd, the environmental assessment practitioner for this project, herewith acknowledges receipt of your comments dated 05 December 2023.

Please note that the commenting period on the draft Scoping Report ended 24 November 2023 as the final Scoping Report had to be submitted to the DMRE by 29 November 2023. However, we do take note of your recommendations, and will forward it to the Department of Mineral Resources and Energy (DMRE). The comments will further be assessed, incorporated, and responded to in the draft Environmental Impact Assessment Report, upon approval of the Scoping Report by the DMRE."

Additional response to the DWS comments:

<u>Water Uses and Water Use Authorisations</u>

1. The Applicant notes that should any of proposed activities occur within the regulated area i.e., the outer edge of the 1:100 year floodline, delineated riparian habitat or within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (whichever is the greatest), the applicant will be required to apply for a water use authorisation in terms of Section 21(c) and (i) with this Department, under the provisions of the NWA.

2. Although the study area falls within a NFEPA, the specialists did not identify any wetlands at the proposed location that would trigger the NWA.

3. The Applicant notes that no activities may occur within a 1:100 year floodline of the Botha's River.

4. Should this MR application be successful, the Applicant will conduct a preliminary legal assessment to identify the water use activities (if any) associated with the proposed project that may require authorisation by the DWS.

5. The river, stream and associated buffers will be treated as no-go sensitive environment areas, and caution will be exercised near the watercourses.

6. Kindly refer to Part A(1)(g)(i) *Details of the development footprint alternatives considered – 5. Operational Aspects of the Activity.*

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

7. The Applicant notes that no person may use water unless permitted under the NWA.

Solid Waste Management

1. The Applicant notes that should private contractors be used; all solid waste must be disposed of at a permitted landfill site and proof of this must be made available to this Department when required.

2. The Applicant further notes that contaminated soil or other hazardous material must be disposed of at a permitted hazardous landfill site that is authorized to accept the said material and proof of this must be made available to this Department when required.

Sewage and Wastewater Management

1. The Applicant notes that the use of any temporary, chemical toilet facilities may not cause pollution to a water resource or pose a health hazard. The ablutions will not be situated within 100 m from a watercourse or within the 1:100-year flood line (whichever is the greatest). Furthermore, no form of secondary pollution may arise from the disposal of refuse or sewage from the temporary, chemical toilets, and any pollution problems that may arising will be addressed immediately by the Applicant.

2. The Applicant confirms that washing, maintenance of vehicles and/or the transfer of hazardous substances will take place at the existing workshop of Makana Brick (off-site). Drip trays will be used when site machinery is refuelled. Presently, no need could be identified for a bunded area as no chemicals will be stored on site.

3. The Applicant notes that water containing waste may not be discharged into the natural environment, and that measures to contain the contaminated water and safely dispose thereof must be implemented.

Storm Water Management

1. The Applicant acknowledges the need for proper management of storm water at the project site, and a Stormwater Management Plan was appended to this document as Appendix I.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated

2. Care will be taken to only release clean storm water runoff into the environment.

3. The Applicant will control drainage to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm water discharge point(s).

Erosion Control

1. Erosion control measures will be put in place to minimise erosion along the proposed mining areas, and extra precautions will be taken (if needed) in areas where the soils are deemed highly erodible.

2. All disturbed areas will be rehabilitated and revegetated back to an acceptable state post mining. The Applicant does intent to implement progressive rehabilitation and mined areas will be shaped once the mineral has been extracted. When practical, land clearing will be done during the dry seasons to avoid water runoff into the watercourse that could affect the water quality.

3. The Applicant notes that stockpiling of soil or any other materials during the operational phase is not allowed on or near steep slopes, near a watercourse or water body.

Spillages Management

1. The Applicant undertakes to immediately report any pollution of any surface or groundwater to DWS, and to employ the appropriate mitigation measures. Should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity will be provided to the affected users.

2. The Applicant notes that the storage of material, chemicals, fuels etc. may not pose a risk to the surrounding environment, including surface and groundwater. As mentioned earlier, no bunded areas are envisaged for this project as no chemicals and/or fuel will be stored on site.

General

1. The Applicant notes that the DWS has the right to inspect the site without prior notice to ensure that its requirements are adhered to, and that the responsibility to identify all sources or potential sources of pollution from this undertaking rests with him.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Also refer to the following sections where the above matters where incorporated: ⁎ Part A(1)(g)(i) *Details of the development footprint alternatives considered*; ⁎ Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk*; ⁎ Part B(1)(g) – (k) *Mechanisms for monitoring compliance with and performance assessment of the environmental management programme and reporting thereon…*					
Department of Public Works	**X**	No comments were received.			
Eskom	**X**	No comments were received.			
SANRAL	**X**	No comments were received.			
Communities	N/A	No communities border the mining area or were identified within 100 m from the site.			
Dep. Land Affairs	**X**	23/10/2023	The Commission on Restitution of Land Rights responded that the Commission is not currently aware of a land claim registered on Portion 3 of the farm The Orchards No 233.		Refer to Appendix E for proof of the public participation process.
Traditional Leaders	N/A	No tradition leaders border the mining area or were identified within 100 m from the site.			
Dept. Environmental Affairs	**X**	-	-		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Department of Economic Development, Environmental Affairs, and Tourism (DEDEAT)	X	No comments were received.			
Other Competent Authorities affected	**-**	**-**	**-**	**-**	**-**
Department of Rural Development and Agrarian Reform (DRDAR)	X	No comments were received.			
Department of Rural Development and Land Reform (DRDLR)	X	No comments were received.			
Department of Labour	X	No comments were received.			
Sarah Baartman District Municipality	X	No comments were received.			
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	X	20/11/2023	ECPHRA provided the following final comments in terms of Section 38(4/8) of the NHRA, 1999:	The requirements of ECPHRA were incorporated into the EIAR and EMPR to be implemented upon approval.	Appendix E for the proof of public participation and Appendix G –

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the Applicant	Section and paragraph reference in this report where the issues and or response were incorporated
			"The matter was tabled at the Archaeology, Palaeontology and Meteorites Committee meeting held on 16 November 2023. The proposed development may proceed as proposed, provided that the recommendations by the heritage specialists are adhered to including the chance finds protocol. ECPHRA further requests: • Monitoring reports for this development, and • Details of the specialist to conduct training for the ECO."		Palaeontological Impact Assessment.
OTHER AFFECTED PARTIES		-	-	-	-
INTERESTED PARTIES		-	-	-	-

iv) The Environmental attributes associated with the development footprint alternatives.

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical, and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(Its current geographical, physical, biological socio-economic, and cultural character).

This section describes the general biophysical-, cultural- and socio-economic environment as well as baseline conditions that may be affected by the proposed project.

PHYSICAL ENVIRONMENT

CLIMATE

The following chart shows the maximum, minimum and average temperatures (21°C daytime, 15°C nighttime) of the Makhanda region. Makhanda experiences its highest temperatures during the summer months (December – February) with peaks of up to 27°C; thereafter the mercury drops to lows of 13°C during July/August.

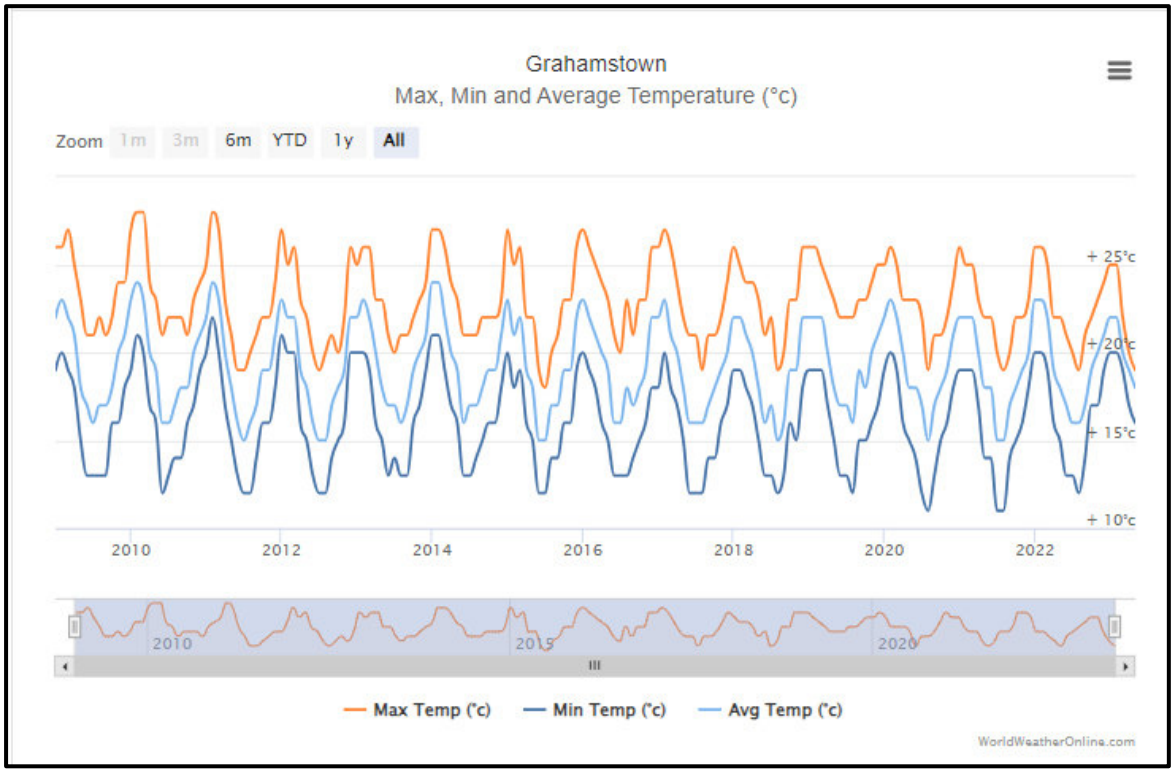

Figure 12: Chart showing the maximum, minimum, and average temperatures of the Makhanda region over a period of 12 years (chart obtained from http://www.worldweatheronline.com)

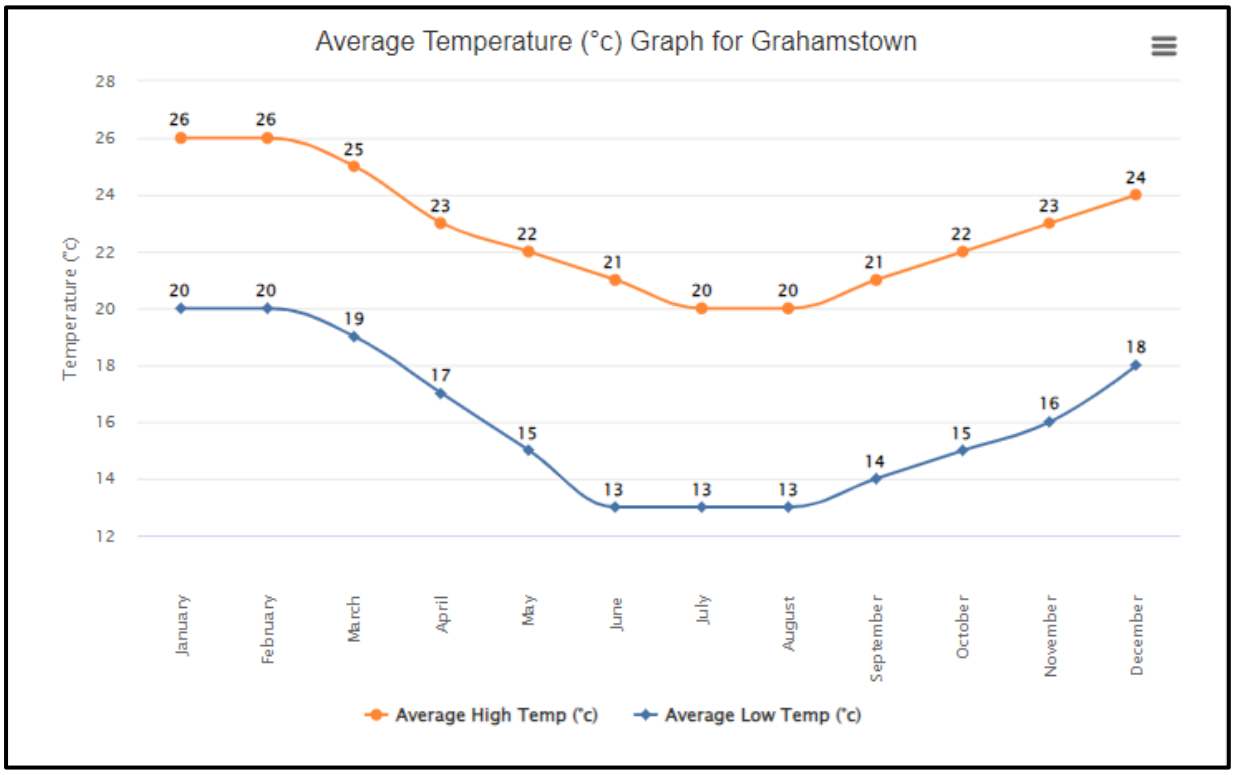

Figure 13: Chart showing the monthly average temperature of the Makhanda region (chart obtained from http://www.worldweatheronline.com)

According to Clima-Data.org the average rainfall of the Makhanda area is 590 mm/year. The following chart, obtained from World Weather Online, shows that the measured rainfall for the period May 2022 to May 2023 was ±477 mm, while the area received the lowest rainfall during March 2023 and the highest in May 2023.

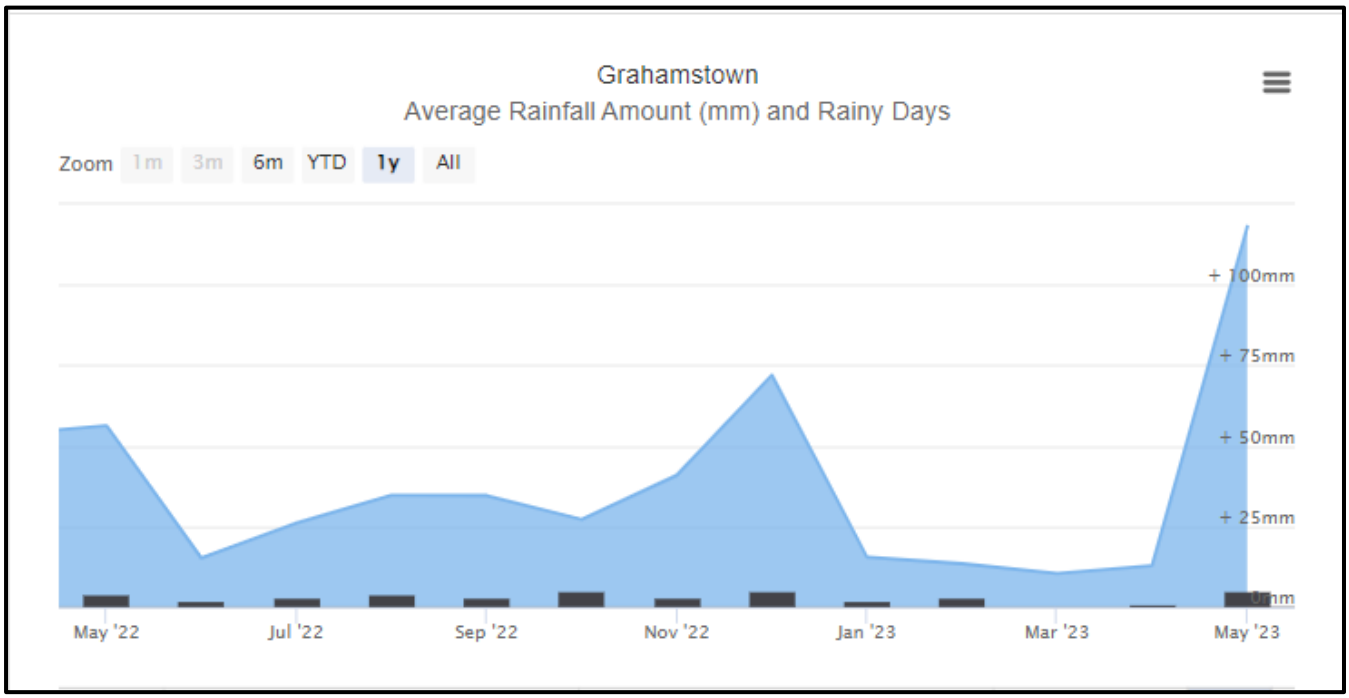

Figure 14: Chart showing the rainfall amount and rainy days for the Makhanda region (chart obtained from http://www.worldweatheronline.com)

The prevailing wind direction of the Makhanda region is in a north to south-westerly, direction with an average wind speed of ±10 knots (±18.52 km/h) as shown in the figure below.

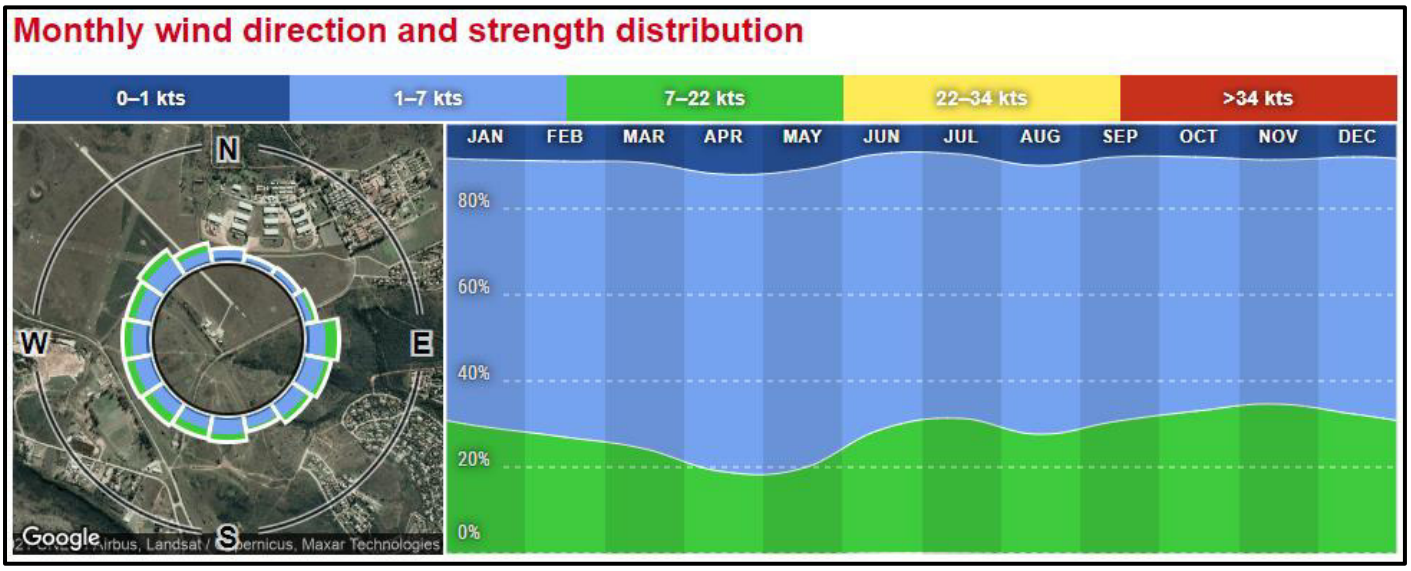

Figure 15: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Makhanda area (image obtained from http://www.windfinder.com/windstatistics/grahamstown).

TOPOGRAPHY

The topography of the greater study area is highly undulating as shown in the figure below. The area has elevations ranging between ±534 – ±663 mamsl. The study area is generally described as level plains with some relief, varying to open high hills or ridges (SES, 2017).

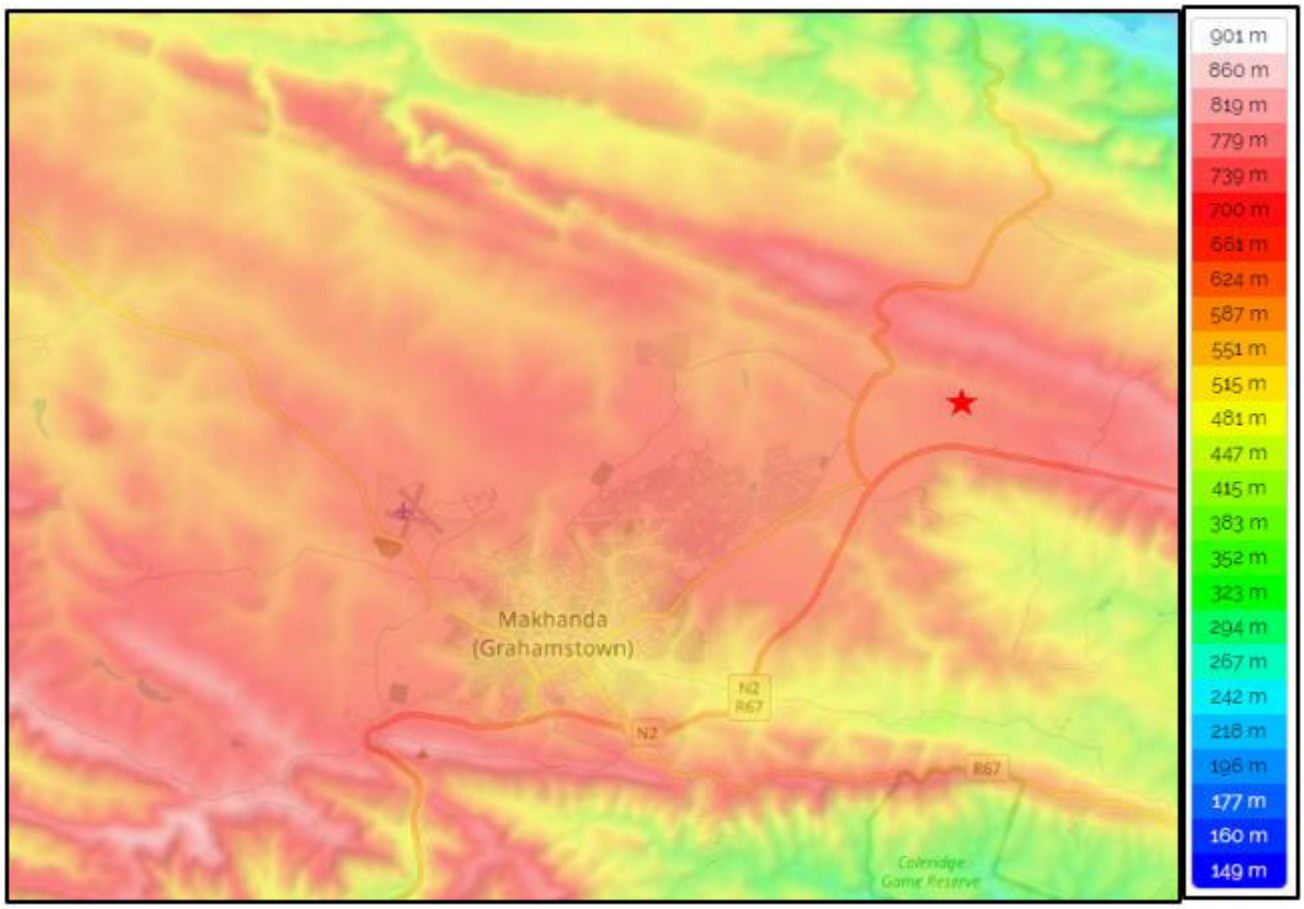

Figure 16: Map showing the topography of the greater Makhanda area (image obtained from http://www.en-za.topographic-map.com/maps/gwpq/South-Africa/).

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Topography.*

VISUAL CHARACTERISTICS

The aesthetic value of the study area is deemed to be of low-attractive and of moderate-low aesthetic value as the farm has been extensively mined over the years. The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by road- and electricity infrastructure, and transformed by township developments.

Owing to the elevation of the site, most of the farm is visible from the immediate surroundings. Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Visual Characteristics*.

AIR QUALITY AND NOISE AMBIANCE

The air and noise ambiance of the study area is representative of an agricultural environment in which farming equipment operates with occasional dust emissions from

denuded areas. The small scale mining at the permit area and surroundings contributes to the emissions (air & noise) to a slight degree through the movement of excavation- and earthmoving equipment, and delivery of clay to clients. Although the above mentioned developmental changes affect the ambiance of the receiving environment, the study area is still deemed representative of a rural landscape.

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Air Quality and Noise Ambiance.*

GEOLOGY AND SOIL

(Information extracted from the Geological Report for Grahamstown Brick (Pty) Ltd t/a Makana Brick situated on Portion 3 of the farm The Orchards 233, Division of Grahamstown, Eastern Cape Region, Stellenryck Environmental Solutions, 2017)

The study area is situated in a locality encompassing lithological units of the Grahamstown Formation of the interior Cenozoic Deposits. However, immediately north of the study area, lithological units of the Witteberg Group of the Cape Supergroup were also present and for this reason, the regional description of the geology of the immediate area, will include descriptions of both the Grahamstown Formation and Witteberg Group.

Witteberg Group

The total thickness of the strata of the Witteberg Group decreases from about 1 700 m to 1 200 m, from east to south-west, lessening swiftly towards the north along the western boundary of the basin. Generally micaceous mudrock and quartzitic sandstone are present in approximately equal quantities.

The Witteberg Group comprises of various Subgroups and Formations, which include the Weltevrede Formation, which becomes the Weltevrede Subgroup west of 21°E, the Witpoort Formation, the Lake Mentz Subgroup, and the Kommadagga Subgroup only found east of 23°E. The thickness of the various formations and subgroups varies significantly, with the Witpoort Formation and the Weltevrede Formation having the highest thickness of 850 m each.

Cenozoic Deposits of the Interior

In the Early Miocene an epeirogenic uplift of modest proportion took place, which is considered the earliest Cenozoic event which possess sufficient largely available evidence. The most significant amplitude is belived to have been in the woutheastern hinterland of southern Africa, while in the west it resulted in a rejuvenation of the slow-paced drainages extending across the African Surface, of which the net result was

renewed incisions along the previously created valleys. Minor uplift along some interior axis of warping may have occurred simultaneously. Studies focusing on the sizes of clast within coastal deposits suggests that this escarpment may have retreated by up to 100 km from the coast, by mid-Cretaceous.

Upliftment of about 700 – 900 mm took place along an axis approximately 80km from the coast in the south-east along a range between Port Elizabeth and Swaziland, between 3 – 5 Ma in the Pliocene. This resulted in the steepening of the Lebombo monocline, although the coastal plain to the east was left largely unaffected, where propagation persisted through the Late Neogene and subsequently produced successive rows of longshore dunes.

Surviving Africa Surface remnants are virtually universally capped by mature pedocretes (superficial materials that were originally weathering residues or sedimentary layers in soil profiles and have undergone cementation by minerals precipitated by groundwater), which primarily underlain by deeply kaolinized weathering profiles which may be up to 50 cm thick and formed during the Cretaceous climate. Silcretes dominates in the areas west of 29°E which has a drier climate, as well as in the Limpopo Valley, however Griqualand West where dolomitic rocks of the Transvaal Supergroup underlies, widespread calcrete duricrusts are present.

The silcretes of the Eastern Cape have been referred to as the Grahamstown Formation and displays a wide range of compositions, varying from cemented scree deposits to sand and pebbles cemented in hard, secondary siliceous matrix, all in which fossils are rarely present. In areas surrounding Grahamstown (Makhanda), the thickness of these deposits consists of multiple layered sequences, reflecting inconsistent soil moisture regimes, whereas the general thickness varies from a couple of centimetres up to 2 m or more.

Cape Fold Belt

The site is situated in the structural domain known as the Cape Fold Belt. This is an orogenic range that extends ±1 000 km east from the city of Cape Town, and about 100 km north from Cape Town. The deformation of the Cape Supergroup during the Cape Fold Belt orogeny was directly related to the deposition of parts of the Karoo Supergroup.

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Geology.*

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

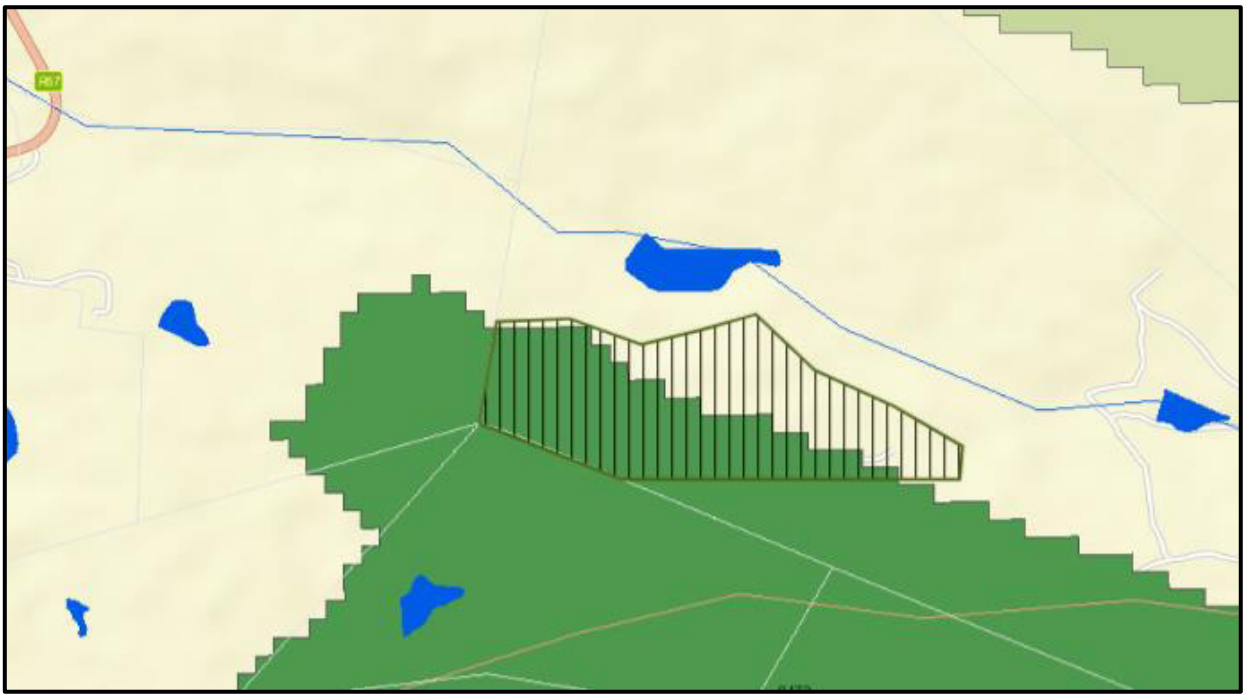

Figure 17: NFEPA BGIS Map Viewer showing the extent of the NFEPA (green shading) that the study area extends into. The blue line north of the proposed mining footprint (blue polygon) represents the Botha's River (image obtained from the BGIS Map Viewer – National Wetlands and NFEPA).

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

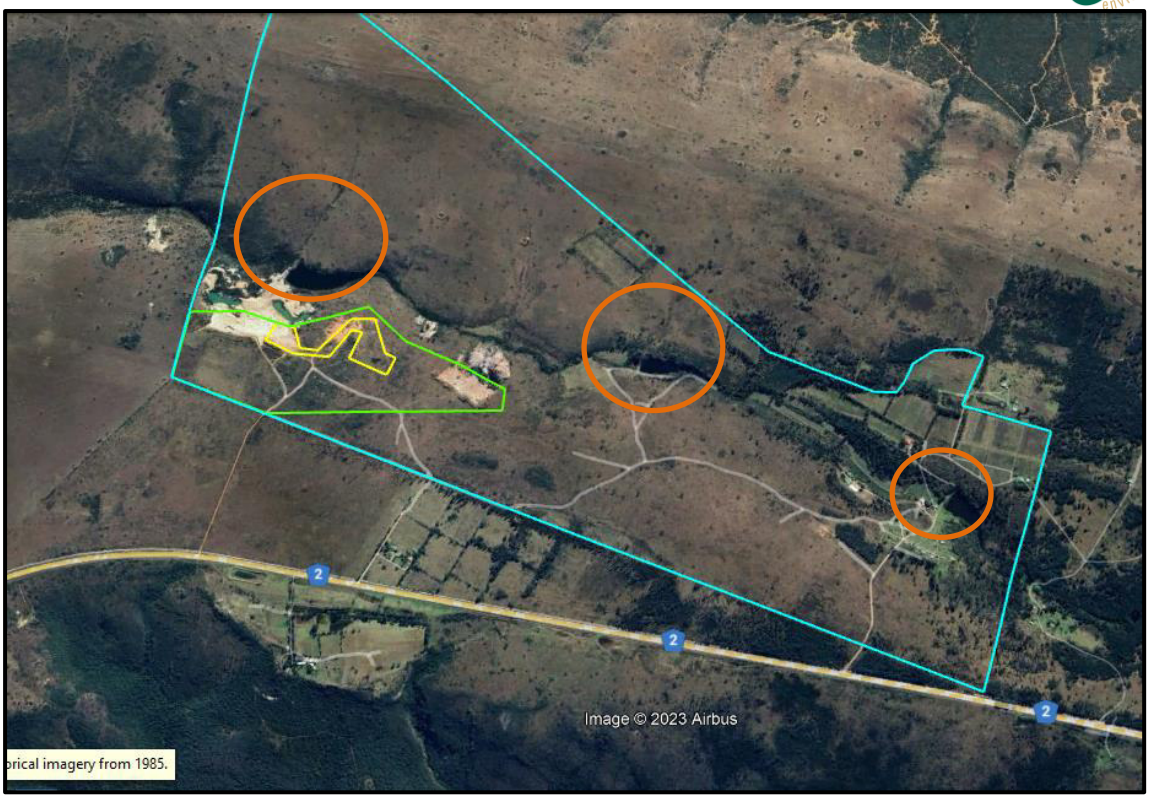

Figure 18: Satellite view of the Botha's River where the orange circles show the man-made dams/weirs. The green polygon shows the mining right application area, the yellow polygon indicates the mining permit area, and the blue polygon shows the farm boundary (image obtained from Google Earth).

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

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Hydrology, and Geohydrology*.

BIOLOGICAL ENVIRONMENT

MINING AND BIODIVERSITY

(Information extracted from the Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, 2013).

The Mining and Biodiversity Guideline, compiled by the South African Mining and Biodiversity Forum (SAMBF) provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into planning processes and managing biodiversity during the developmental and operational phases of a mine, from exploration through to closure.

When the position of the study area is placed on the Mining and Biodiversity Map, as shown in the figure below, almost the whole farm is classified as an area of highest biodiversity importance with highest risk for mining as shown in the following figure.

The Mining and Biodiversity Guideline's definition for areas of highest biodiversity importance stipulates that: "*these areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being*". An area of high biodiversity importance is defined as: "*important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for particular communities or the country as a whole*." The guidelines note that environmental screening, the EIA, and specialists should focus on confirming the presence and significance of biodiversity features and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

Figure 19: The Mining and Biodiversity importance map where the yellow polygon shows the farm boundary. Dark brown – highest biodiversity importance. (Image obtained from the BGIS Map Viewer: Mining Guidelines)

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna.*

BIODIVERSITY CONSERVATION AREAS

According to the DFFE Screening Tool the earmarked footprint extends across areas characterised as CBA1, CBA2, and ESA1 as shown in the following figure. The Lexicon of Biodiversity Planning in South Africa provides the following definition for a CBA and ESA:

- Critical Biodiversity Area (CBA): *"An area that must be maintained in a good ecological condition in order to meet biodiversity targets. CBA's collectively meet biodiversity targets for all ecosystem types as well as for species and ecological processes that depend on natural or near-natural habitat, that have not already been met in the protected area network."*

- Ecological Support Area (ESA): *"An area that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or not necessary to meet them in natural or near-natural areas."*

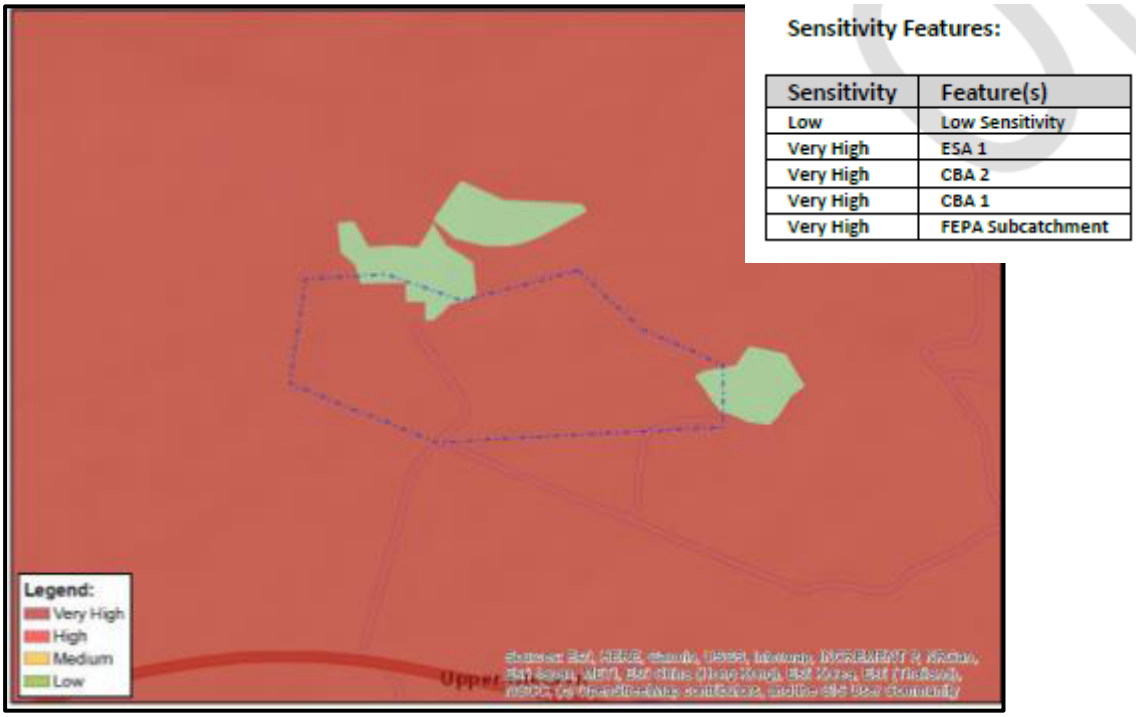

Figure 20: DFFE screening tool report showing the earmarked area (blue polygon), in relation to the CBA and ESA areas (red shading). (Image obtained from the DFFE Screening Tool Report).

GROUNDCOVER

According to Mucina and Rutherford (2012) the natural vegetation type of the greater study area is classified as Bisho Thornveld (SVs70) as shown in the following figure.

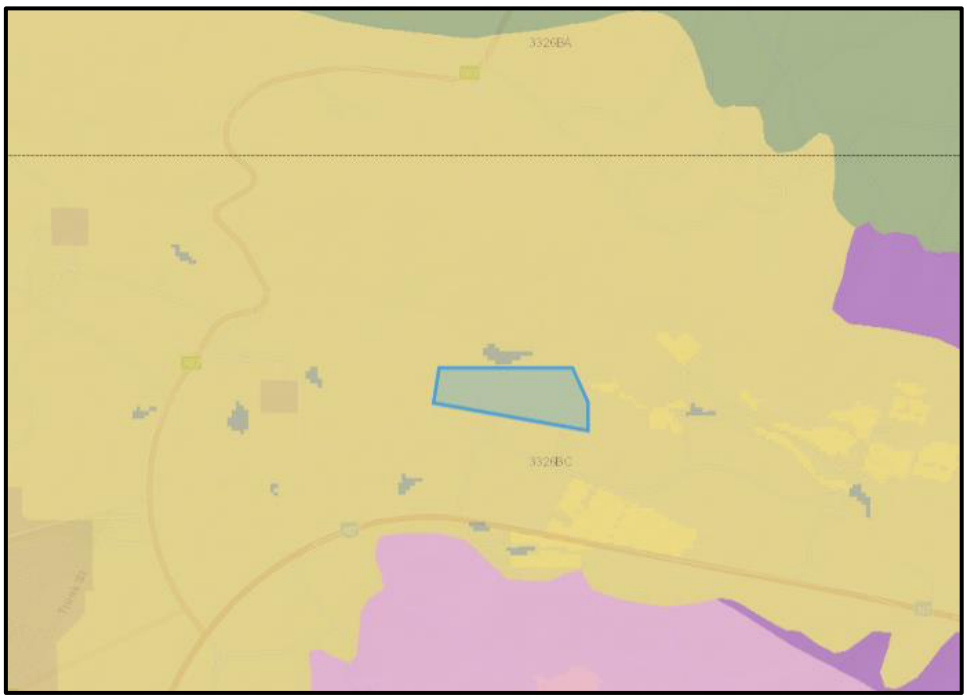

Figure 21: BGIS National Vegetation Map showing the vegetation type of the study area, where the brown shading indicates the Bisho Thornveld (SVs7). (Image obtained from the BGIS Map Viewers website).

Bisho Thornveld (SVs7):

The vegetation and landscape features of the Bisho Thornveld (SVs7) vegetation type is characterised by undulating to moderately steep slopes, sometimes in shallow incised drainage valleys. Open savanna characterized by small trees of *Acacia natalitia* with a short to medium, dense, sour grassy understorey, usually dominated by *Themeda triandra* when in good condition. A diversity of other woody species also occurs, often increasing under conditions of overgrazing (Mucina & Rutherford, 2012).

Some of the important taxa found in this vegetation type include (amongst others) the following *Acacia natalitia*. Tall Shrub: *Tephrosia capensis*. Low Shrubs: *Anthospermum rigidum* subsp. *pumilum*, *Chrysocoma ciliata*, *Felicia muricata*. Graminoids: *Eragrostis plana*, *Heteropogon contortus*, *Hyparrhenia hirta*, *Sporobolus africanus*, *Themeda triandra*, *Aristida junciformis* subsp. *junciformis*, *Bulbostylis humilis*, *Cynodon dactylon*, *Digitaria diagonalis* Herbs*: Centella asiatica, Commelina africana, Gazania linearis, Gerbera ambigua, Helichrysum miconiifolium, H. nudifolium var. pilosellum, H. rugulosum, Senecio retrorsus, Spermacoce natalensis,*

Wahlenbergia stellarioides, Zornia capensis. Geophytic Herbs*: Hypoxis argentea, Moraea polystachya, Pellaea calomelanos.*

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) only 0.2% of the unit is statutorily conserved in the Doubledrift and Thomas Baines Nature Reserves. About 2% is conserved in private reserves. Approximately 20% of the vegetation type has already undergone transformation for cultivation, urban development, or plantations. A conservation target of 25% was set for the vegetation type.

2018 SANBI Vegetation Map:

According to the latest vegetation map provided for South Africa (SANBI, 2018), the project site is situated within the Grahamstown Grassland Thicket (see following figure). Within the new SANBI map, the Bisho Thornveld (SVs7) was split into the Grahamstown Grassland Thicket, and the Saltaire Karroid Thicket. As no formal description exist for the 2018 SANBI vegetation types, the description provided by Mucina and Rutherford (2012) was used in this report to describe the characteristics of the applicable vegetation types.

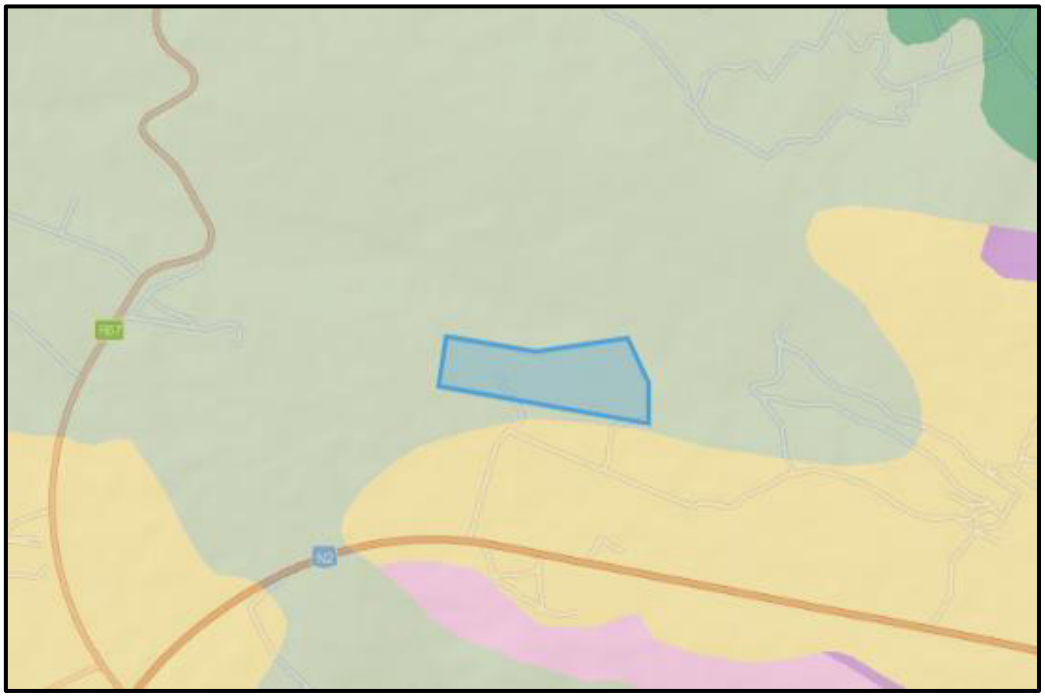

Figure 22: BGIS 2018 National Vegetation Map showing the vegetation type extending into the study area, where the grey shading indicates the Grahamstown Grassland Thicket. (Image obtained from the BGIS Map Viewers website).

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna*.

FAUNA

The 2017 EMPR of Makana Brick notes that a few large mammals do still occur in the region, along with small and medium sized animals. Reptiles and amphibians occurring in the area include many species of frogs, tortoises and terrapins, lizards, and snakes. According to the EMPR (2017) important species occurring in the study area may include the following:

- Albany Dwarf Adder (*Bitisal banica*) (EN);
- Leopard or Mountain Tortoise (*Geochelone pardalis*);
- Parrot-beaked Tortoise (*Homopus areolatus*);
- Yellow-bellied House Snake (*Lamprophis fuscus*);
- Black-footed Cat (*Felis nigripes*);
- Duthie's Golden Mole (*Chlorotalpa duthie*);
- Straw-coloured Fruit Bat (*Eidolon helvum*);
- Schreiber's Long-fingered Bat (*Miniopterus schreibersi*);
- Mountain Zebra (*Equus zebra*);
- Mountain Leopard (*Panthera pardus*)

Also refer to Part A(1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna*.

HUMAN ENVIRONMENT

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Letter of recommendation for the exemption of full phase 1 archaeological impact assessment for the proposed mining of gravel on Portion 3 of the farm The Orchards No 233 in the district of Grahamstown, Makana Local Municipality, of the Eastern Cape province, Binneman, May 2017)

In 2017, Dr Binneman was appointed for a Phase 1 Archaeological Impact Assessment (AIA) for the mining permit application of Makana Brick. No archaeological sites, -materials, graves, or buildings of more than 60 years were observed and the report recommended that the development (4.9 ha) may proceed.

The 2017 EMPR of the Makana Brick mining permit application notes that fossils and trace fossils found in the Witteberg Group include marine invertebrates (such as molluscs, trilobites, and brachiopods), *Zoophycos, Spirophyton* and *Skolithos*, as well as plant fragments such as psilophyte and lycopod stems. The most important fossils and trace fossils from the Witteberg Group is Lycopods from the Witpoort Formation, *Zoophycus* (Spirophyton) feeding traces in the Wagen Drift Formation of the

Weltevrede Subgroup and the Mentzichthys jubbi (palaeo-fish species) from the Lake Mentz Subgroup.

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening palaeontologically sensitive areas at the onset of a project. When the footprint of the proposed mining area is placed on the PSM, it shows the study area to extend over areas of Low (blue) and Very High (red) concern as presented in the figure below. Considering this, a palaeontological field assessment and study is required.

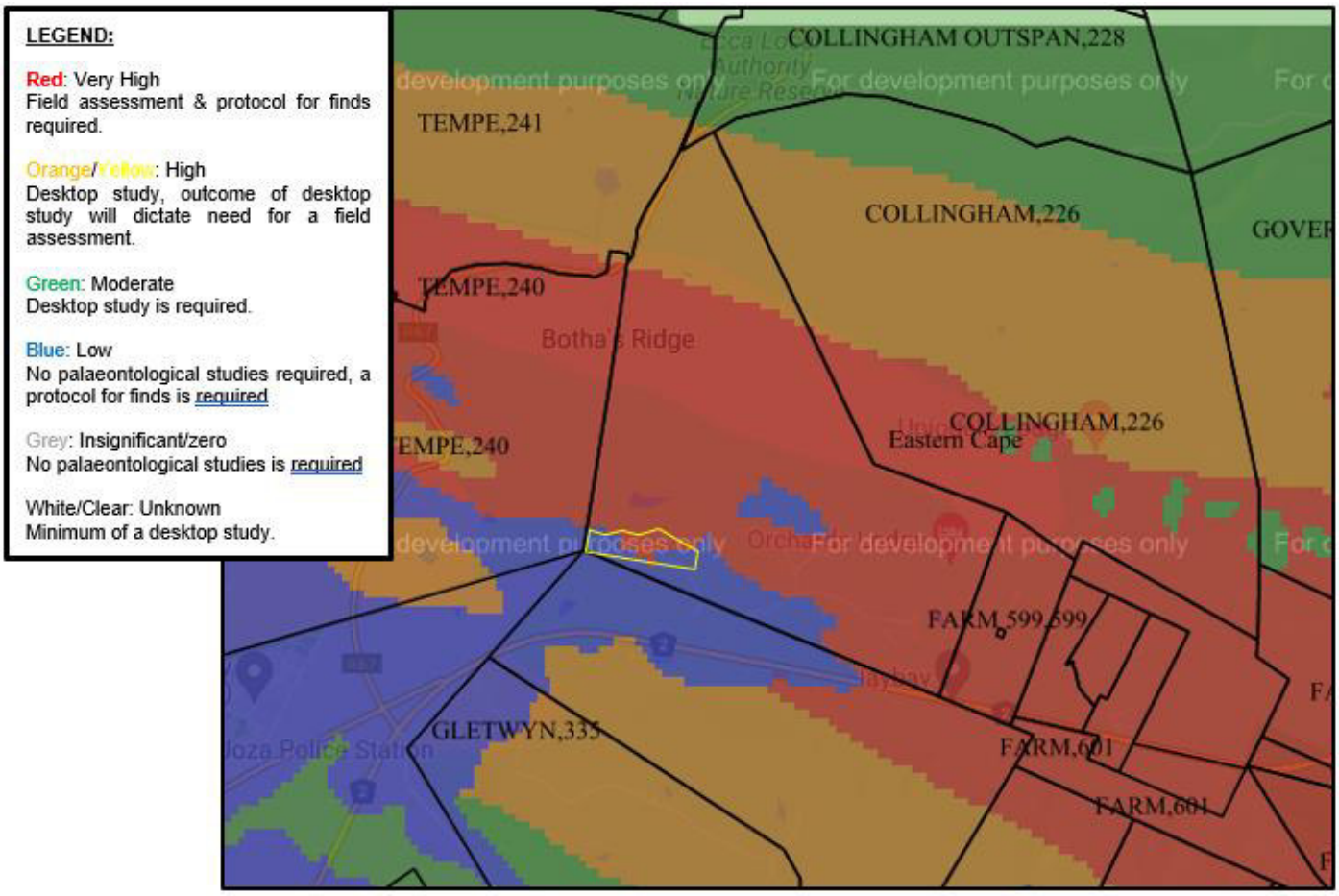

Figure 23: The SAHRA palaeontological sensitivity map shows that the proposed mining footprint (yellow line) extends over an area of medium concern (green) (image obtained from the PalaeoSensitivity Map on SAHRIS).

Subsequently, Dr Robert Gess was appointed to investigate the cultural/heritage sensitivity of the study area as discussed in more detail under Part A (1)(g)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Cultural and Heritage Environment*.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Social and Labour Plan of Makhanda Mining (Pty) Ltd, 2023 attached as Appendix J)

Portion 3 of the farm The Orchards No 233 is situated within the Makana Local Municipality (MLM) that forms part of the Sarah Baartman District. The MLM is a category B Municipality approximately halfway between East London and Gqeberha that forms part of the seven local municipalities of the Sarah Baartman (formerly Cacadu) District Municipality in the Eastern Cape Province. The following section provides a summarised look at the demographics of the municipal area.

Total Population:

The Makana Municipality had a population size of 86 068 people in 2016. The total population for the Sarah Baartman Municipality is estimated to increase to 98 356 by 2026, growing at an average annual rate of 0.39%.

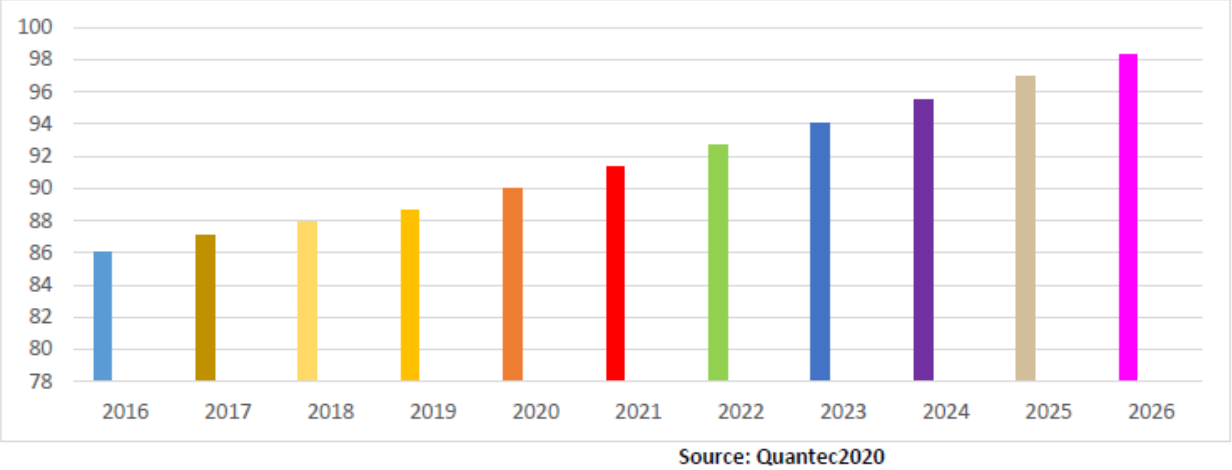

Figure 24: Makana Population 2016 – 2026 (image obtained from the SLP).

Population Profile:

Based on the present age-gender structure and the present fertility, mortality, and migration rates, Makana's population is projected to grow at an average annual rate of 1.0% from 91 400 in 2020 to 96 000 in 2025.

Table 9: Population projections – Makana, Sarah Baartman, Eastern Cape, and National Total 2020 – 2025 (information obtained from the SLP).

Year	Makana	Sarah Baartman	Eastern Cape	National Total	Makana as % of District	Makana as % of Province	Makana as % of National
2021	91,200	536,000	7,400,000	60,300,000	*17.0%*	*1.23%*	*0.15%*
2022	92,100	543,000	7,470,000	61,100,000	*17.0%*	*1.23%*	*0.15%*
2023	93,100	549,000	7,550,000	61,900,000	*17.0%*	*1.23%*	*0.15%*
2024	94,200	556,000	7,630,000	62,700,000	*16.9%*	*1.24%*	*0.15%*
2025	95,400	563,000	7,710,000	63,500,000	*17.0%*	*1.24%*	*0.15%*
2026	96,600	570,000	7,780,000	64,300,000	*17.0%*	*1.24%*	*0.15%*
AVERAGE ANNUAL GROWTH							
2021-2026	***1.17%***	***1.21%***	***1.02%***	***1.29%***			

The population projection of Makana Local Municipality shows an estimated average annual growth rate of 1.2% between 2021 and 2026. The average annual growth rate in the population over the projection period for Sarah Baartman District Municipality, Eastern Cape Province and South Africa is 1.2%, 1.0% and 1.3% respectively. The Eastern Cape Province is estimated to have an average growth rate of 1.0% which is very similar than that of the Makana Local Municipality. The South Africa as a whole is estimated to have an average annual growth rate of 1.3% which is very similar than that of Makana's projected growth rate.

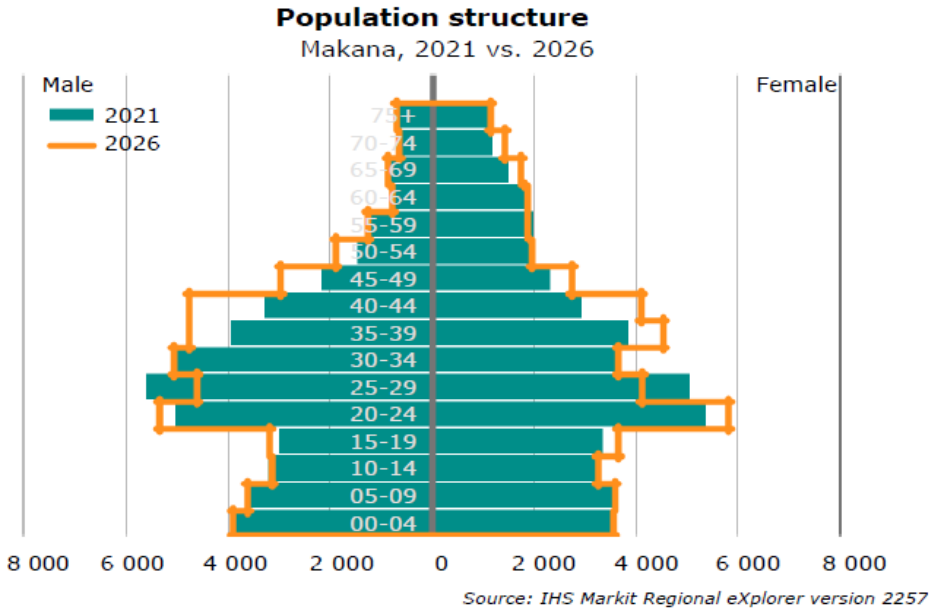

Figure 25: Population pyramid – Makana Local Municipality, 2020 vs. 2025 (image obtained from the SLP).

The population pyramid reflects a projected change in the structure of the population from 2021 and 2026. The differences can be explained as follows:

- In 2021, there is a significantly larger share of young working age people between 20 and 34 (32.7%), compared to what is estimated in 2026 (29.6%). This age category of young working age population will decrease over time.
- The fertility rate in 2026 is estimated to be slightly higher compared to that experienced in 2021.
- The share of children between the ages of 0 to 14 years is projected to be significant smaller (21.8%) in 2026 when compared to 2021 (23.2%).

In 2021, the female population for the 20 to 34 years age group amounts to 15.6% of the total female population while the male population group for the same age amounts to 17.2% of the total male population. In 2026, the male working age population at 15.5% still exceeds that of the female population working age population at 14.1%, although both are at a lower level compared to 2021.

Economic Profile:

The Makana Local Municipality does not function in isolation from Sarah Baartman, Eastern Cape Province, South Africa, and the world and now, more than ever, it is crucial to have reliable information on its economy for effective planning. Information is needed that will empower the municipality to plan and implement policies that will encourage the social development and economic growth of the people and industries in the municipality respectively.

The Gross Domestic Product (GDP), an important indicator of economic performance, is used to compare economies and economic states. GDP-R can be measured using either current or constant prices, where the current prices measure the economy in actual Rand, and constant prices measures the economy by removing the effect of inflation, and therefore captures the real growth in volumes, as if prices were fixed in a given base year.

With a GDP of R 8.52 billion in 2021 (up from R 4.59 billion in 2011), the Makana Local Municipality contributed 17.57% to the Sarah Baartman District Municipality GDP of R 48.5 billion in 2021 increasing in the share of the Sarah Baartman from 17.84% in 2011. The Makana Local Municipality contributes 1.80% to the GDP of Eastern Cape Province and 0.14% the GDP of South Africa which had a total GDP of R 6.23 trillion in 2021 (as measured in nominal or current prices). It's contribution to the national

economy stayed similar in importance from 2011 when it contributed 0.14% to South Africa, but it is lower than the peak of 0.14% in 2015.

In 2021, the Makana Local Municipality achieved an annual growth rate of 5.13% which is a significant lower GDP growth than the Eastern Cape Province's 5.79%, but is higher than that of South Africa, where the 2021 GDP growth rate was 4.91%. Contrary to the short-term growth rate of 2021, the longer-term average growth rate for Makana (0.85%) is very similar than that of South Africa (0.95%).

The construction sector is expected to grow fastest at an average of 2.92% annually from R 129 million in Makana Local Municipality to R 149 million in 2026. The community services sector is estimated to be the largest sector within the Makana Local Municipality in 2026, with a total share of 44.8% of the total GVA (as measured in current prices), growing at an average annual rate of 0.7%. The sector that is estimated to grow the slowest is the mining sector with an average annual growth rate of -3.16%. The Primary sector is expected to grow at an average annual rate of 0.69% between 2021 and 2026, with the Secondary sector growing at 2.02% on average annually. The Tertiary sector is expected to grow at an average annual rate of 1.34% for the same period.

Employment Profile:

There are 28 494 economically active (employed or unemployed but looking for work) people, and of these 32.5% are unemployed. Of the 7 777 economically active youth (15–34 years) in the area, 42.2% are unemployed.

The majority household income is between R 19 601 to R 38 200 at 20.5%, followed by 19.5% at R 9 601 to R 19 600. 12.7% of the population has no income. The minority of the economically active population falls within the higher income bracket, with 0.3% earning more than R 2 457 601, with 0.4% earning between R 1 228 801 – R 2 457 600.

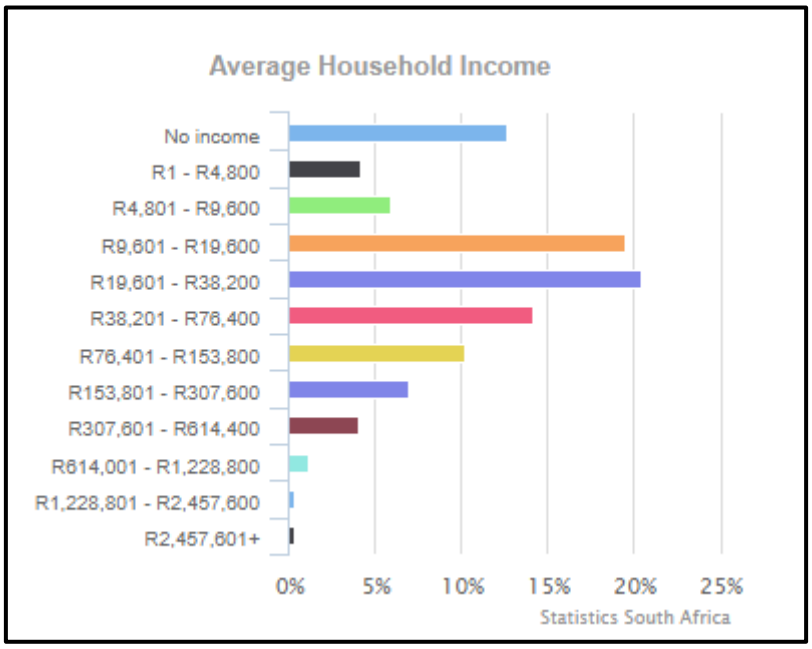

Figure 26: Average household income of the MLM (image obtained from the Statistics South Africa).

(b) Description of the current land uses

Portion 3 of the farm The Orchards No 233 is situated in a rural setting within proximity to the N2 national road. Municipal land borders the property to the west and the nearest housing development is that of Extension 7 ±2.9 km to the south-west. The farm is mainly used for grazing and clay mining, with the surrounding farms mainly grazed. The land capability and grazing potential of the mined areas are classified as an area that is non-arable with low to moderate potential for grazing. The Botha's River borders the property to the north.

The DFFE Screening Report classifies the Agricultural Theme Sensitivity of the area as depicted in the following figure, where the green areas represent land of low capability, while the yellow areas show land of low-moderate to moderate capability. Sections of the earmarked footprint has been mined for many years and the Applicant entered into land use agreement with the landowner regarding this application.

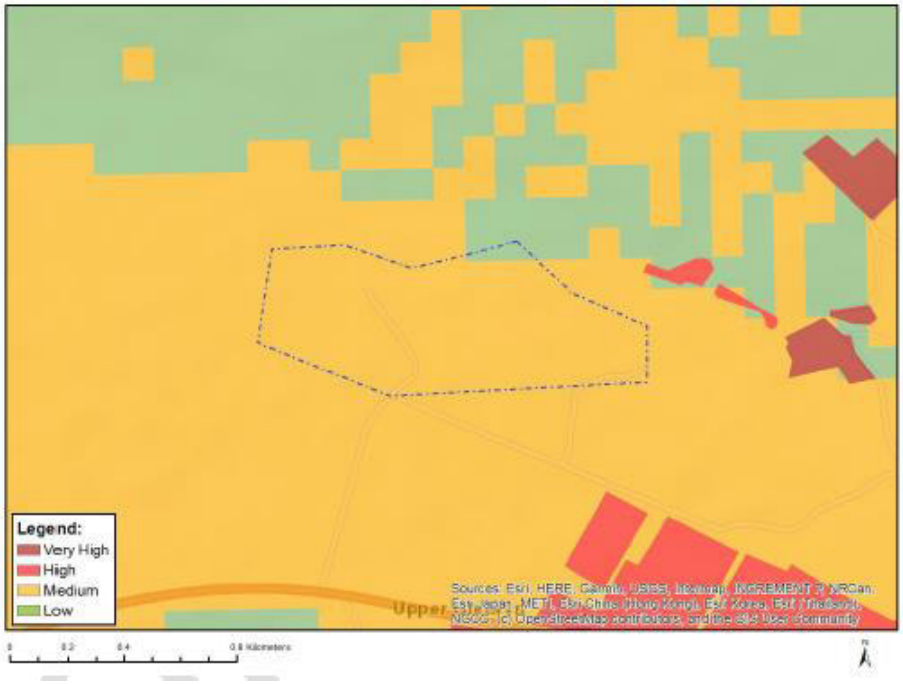

Figure 27: Agricultural theme sensitivity according to the DFFE screening report (2023).

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the study area:

Table 10: Land uses and/or prominent features that occur within 500 m radius of the study area.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The proposed footprint is surrounded by natural areas used for agricultural purposes.
Low density residential	-	**NO**	-
Medium density residential	-	**NO**	-
High density residential	-	**NO**	-
Informal residential	-	**NO**	-
Retail commercial & warehousing	-	**NO**	-
Light industrial	-	**NO**	-
Medium industrial	-	**NO**	-
Heavy industrial	-	**NO**	-
Power station	-	**NO**	-
High voltage power line	**YES**	-	A low voltage and high voltage power line cross the mining footprint but will not be affected by the proposed activity.
Office/consulting room	-	**NO**	-
Military or police base / station / compound	-	**NO**	-
Spoil heap or slimes dam	-	**NO**	-

LAND USE CHARACTER	YES	NO	DESCRIPTION
Quarry, sand or borrow pit	**YES**	-	The proposed footprint extends across the 4.9 ha Makana Brick mining permit area.
Dam or reservoir	**YES**	-	Three man-made dams border the mining area to the north as well as the existing retention ponds on the property.
Hospital/medical centre	-	**NO**	-
School/ crèche	-	**NO**	-
Tertiary education facility	-	**NO**	-
Church	-	**NO**	-
Old age home	-	**NO**	-
Sewage treatment plant	-	**NO**	-
Train station or shunting yard	-	**NO**	-
Railway line	-	**NO**	-
Major road (4 lanes or more)	-	**NO**	-
Airport	-	**NO**	-
Harbour	-	**NO**	-
Sport facilities	-	**NO**	-
Golf course	-	**NO**	-
Polo fields	-	**NO**	-
Filling station	-	**NO**	-
Landfill or waste treatment site	-	**NO**	-
Plantation	-	**NO**	-
Agriculture	**YES**	-	The earmarked property is used for agricultural purposes.
River, stream, or wetland	**YES**	-	The Botha's River borders the mining area to the north. The mining footprint was kept >100 m from the river.
Nature conservation area	-	**NO**	-
Mountain, hill, or ridge	**YES**	-	Botha's Ridge borders the study area to the north opposite the Botha's River.
Museum	-	**NO**	-
Historical building	-	**NO**	-
Protected Area	-	**NO**	-
Graveyard	**-**	**NO**	-
Archaeological site	-	**NO**	-
Other land uses (describe)	-	**NO**	-

(c) Description of specific environmental features and infrastructure on the site.

SITE SPECIFIC TOPOGRAPHY

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

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

Figure 28: Pictures showing the impact of mined areas on the topography of the study area.

The proposed mine is situated on an area with an average slope of 3.9% (-4.8%), and a max slope of 25.4% (-42.0%) over 1.6 km as presented in the following image.

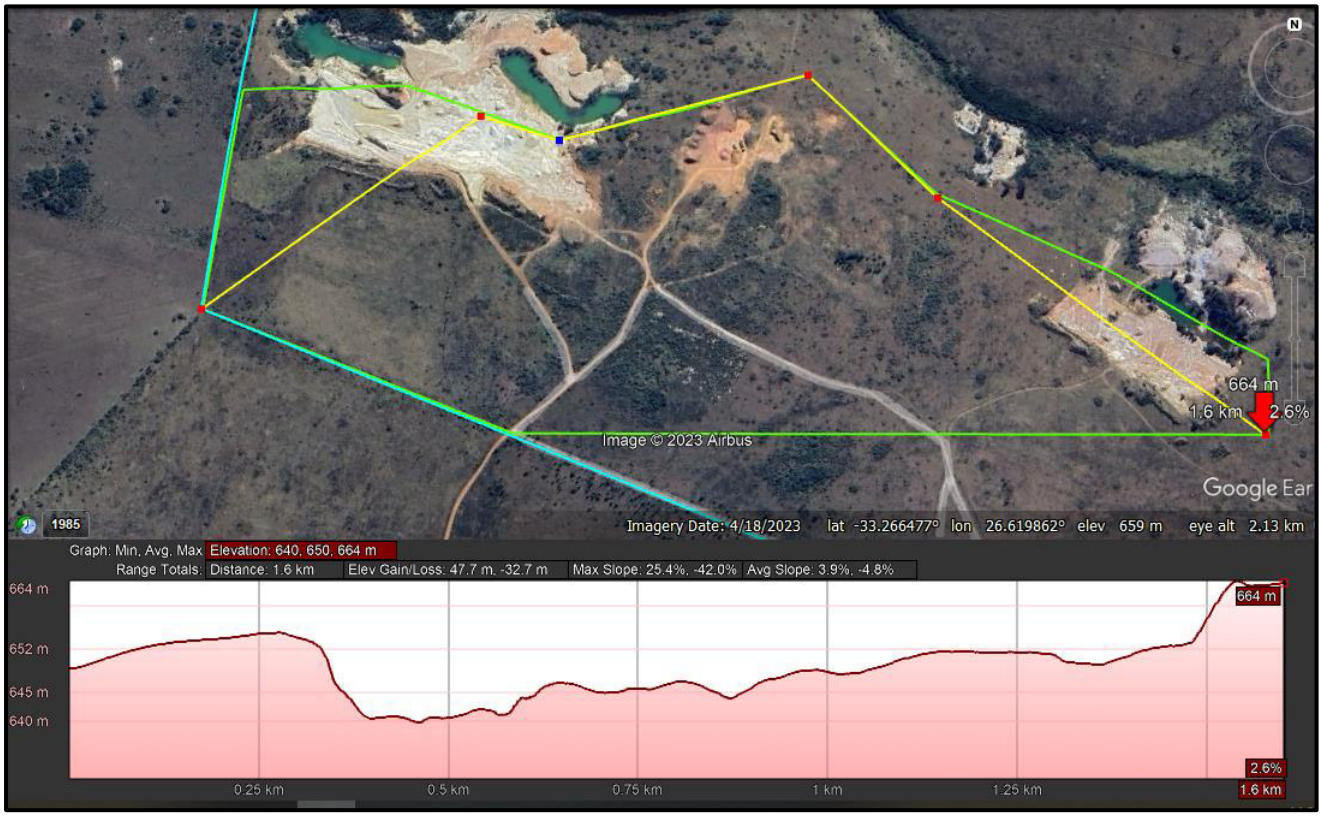

Figure 29: Elevation profile of the proposed mining area (Image obtained from Google Earth).

The impact on the topography and geology is considered of low-medium significance if depth of the exaction and extent of disturbance is considered and of low-medium significance if the cumulative impact is considered. Change in topography and geology of the mining area is unavoidable considering the nature of the project and will be irreversibly altered since a portion the land will be permanently removed. Through profiling the faces and stabilizing it with proper vegetation cover, the potential impact can be mitigated.

Also refer to Part B(1)(d)(i) *Determination of closure objectives* as well as the Closure Plan attached as Appendix M.

SITE SPECIFIC VISUAL CHARACTERISTICS

Due to the topography of the area, the proposed footprint will mainly be visible from immediate surrounding areas. The figure below shows the viewshed analysis for the proposed footprint within a ±10 km radius. The green shaded areas show the positions from where the mining area will be visible. From this analysis it is shown that the visual impact of the earmarked footprint will be of medium significance without mitigation, and low-medium after mitigation. The small scale of the proposed operation, and the proposed progressive rehabilitation, will however assist in mitigating the visual impact

of the proposed development on the surrounding environment. No residual visual impact is expected upon closure of the mine.

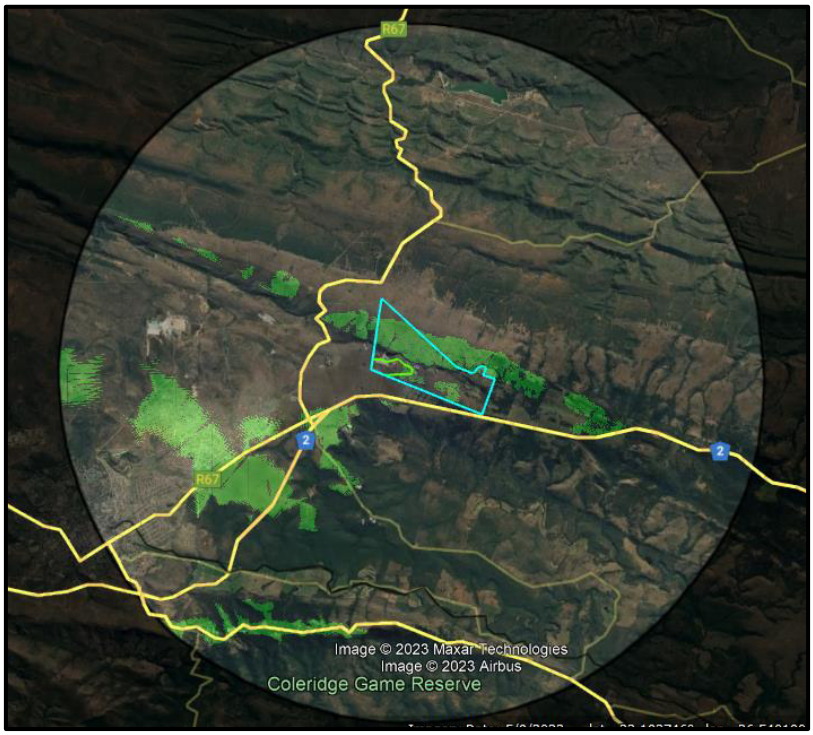

Figure 30: Viewshed analysis of the proposed footprint where the green shaded areas show the positions from where the highest part of the mine will be visible (within 10 km radius) (image obtained from Google Earth).

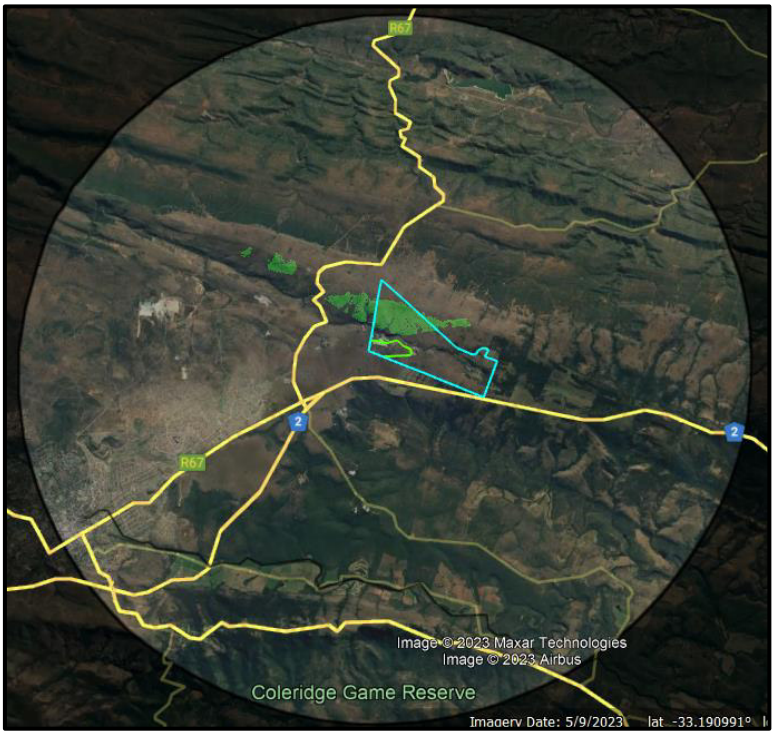

Figure 31: Viewshed analysis of the proposed footprint where the green shaded areas show the positions from where the lowest part of the mine will be visible (within 10 km radius) (image obtained from Google Earth).

SITE SPECIFIC AIR QUALITY AND NOISE AMBIANCE

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The proposed operation will not trigger an application in terms of the said act. Emissions to be generated at the mine will mainly consist of occasional dust due to the displacement of soil, screening (aggregate), and transport of the material from the farm. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). Noise and dust generation will resemble that of the current mining activities on site.

The figure below shows the position of the nearest residences (non-exhaustive list) to the proposed mining area:

- Number 1: ±2.1 km Botha's Ridge Farm
- Number 2: ±3.3 km Uniondale Lodge
- Number 3: ±2.0 km Orchards Lodge
- Number 4: ±2.5 km Farmyard
- Number 5: ±2.4 km Collingham Methodist Church and Cemetery
- Number 6: ±1.6 km Farmyard
- Number 7: ±1.7 km Farmyard
- Number 8: ±1.4 km Farmyard
- Number 9: ±1.6 km Farm Structures
- Number 10: ±2.3 km Farmyard
- Number 11: ±764 m Woodlands Farm
- Number 12: ±1.3 km Upper Gletwyn Farm
- Number 13: ±1.1 km Farmyard

Figure 32: Satellite view showing the position of the nearest residences to the proposed mining area (yellow polygon) where the green and red polygons indicate the farm boundaries. (Image obtained from Google Earth)

Large stockpile areas act as dust generating sources especially during windy conditions. Site management intends to keep the stockpile area to the smallest possible footprint to reduce this impact. Site management will further implement the use of a permanent water truck/s to moisten the denuded areas during dry periods/windy spells.

Also refer to Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk – Air Quality and Noise Ambiance*.

Noise Quality:

The rural setting of the area causes the ambient noise levels to be low. However, traffic and especially trucks on the N2 do intermittently increase noise levels to ±70dB along the road. Farming activities and neighbouring mines also cause constant background noise levels. Therefore the tranquillity of the area has largely been affected by increased non-farming related business activities such as mining.

Actions such as earthmoving equipment stripping topsoil and overburden and excavation as well as occasional processing of aggregate will take place during the operational phase. The mining noise will generally be low-pitched if operating

equipment is well maintained. Reverse sirens which produce a high pitched noise will be an exception to the low-pitched sounds that could affect the nearest residences. However, since the fitting of the sirens is a requirement of the Mine Health & Safety Act as well as the OHS Act, there is no mitigation possibility except for restricting mining operations to normal work hours.

As mentioned earlier, the closest residents are ±764 m south of the mining area, and the second nearest ±1.1 km west of the proposed mine. To prevent excessive disturbance it is proposed that noise levels be kept below 60 dB during the day. The impact is determined based on the distances to receptors and generally rule that noise levels will abate with 6 dB every time the distance from the source is doubled, without taking into consideration screening effects, wind direction and amplifying aspects. Considering the distance of the receptors, the noise levels at the nearby residence will therefore be below 30 dB, which is less than the ambient noise levels and will therefore not contribute to a nuisance factor and will be insignificant.

During extraction one or two trucks will enter or exit the mine at any given time within a 20 – 40 minute period, and the impact is rated as very low. Impacts related to the use of the bulldozer will be limited as it will be used during the extraction of material or when profiling the sides of the quarry and as indicated will not be heard by the closest residents. The processing plant may increase the noise levels when operational, however the plant will generate a low-pitched noise that will only be applicable for short periods when the overburden needs to be reduced to appropriate sized aggregates. The use of the processing plant will most likely not be heard by the surrounding residents. The expected impact rating on noise is rated as low with mitigation.

Also refer to Part A(1)(g)(viii) *The possible mitigation measures that could be applied and the level of risk – Air Quality and Noise Ambiance*.

SITE SPECIFIC GEOLOGY

The site encompasses the Grahamstown Formation of the Cenozoic Deposits of the interior, immediately adjacent to the Witpoort Formation of the Witteberg Group of the Cape Supergroup.

The Grahamstown Formation comprises of silcrete and kaolinite, with the former overlying the latter. Kaolinite is a common clay mineral formed by the weathering of hydrothermal alteration of feldspar and other aluminous silicate minerals.

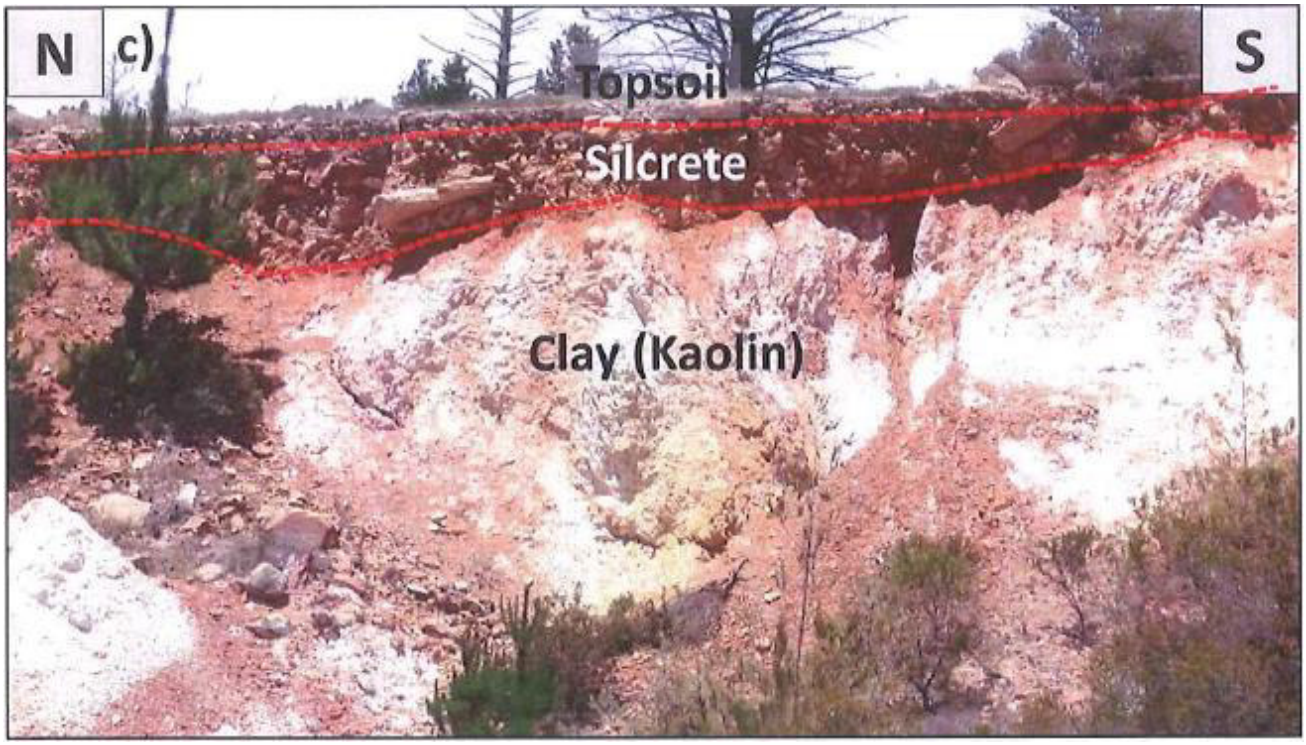

Figure 33: Lithologies observed in the existing excavations. (Image obtained from SES Geology Report, 2017)

Although Grahamstown (Makhanda) is well-known for its surrounding kaolin deposits, kaolin is not the single alteration produce present in the Grahamstown (Makhanda) area, as many other clays are also present. Clay refers to a naturally occurring material comprising predominantly of fine-grained minerals, which is generally plastic at suitable water contents and will harden when dried or fired. Silicates are the main constituent of clay and is generally less than 2 microns in size.

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

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

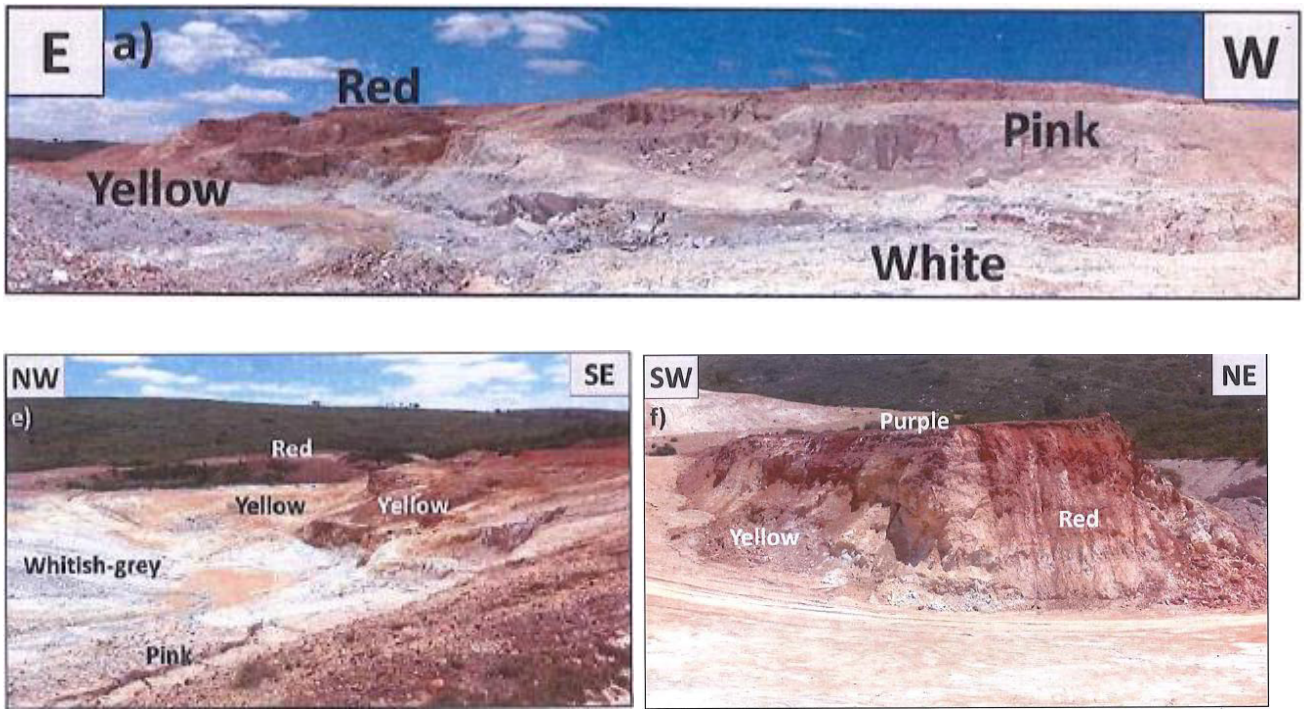

Figure 34: Pictures showing the colour variations in the existing western excavation. (Image obtained from SES Geology Report, 2017)

Additionally, the kaolin comprises of a very fine-grained material, which becomes apparent on closer inspection. The fine-grained kaolin has a very characteristic chalky feel to it. The shale-derived clay consists of a visibly more coarse-grained composition, as well as a colour difference as discussed above.

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

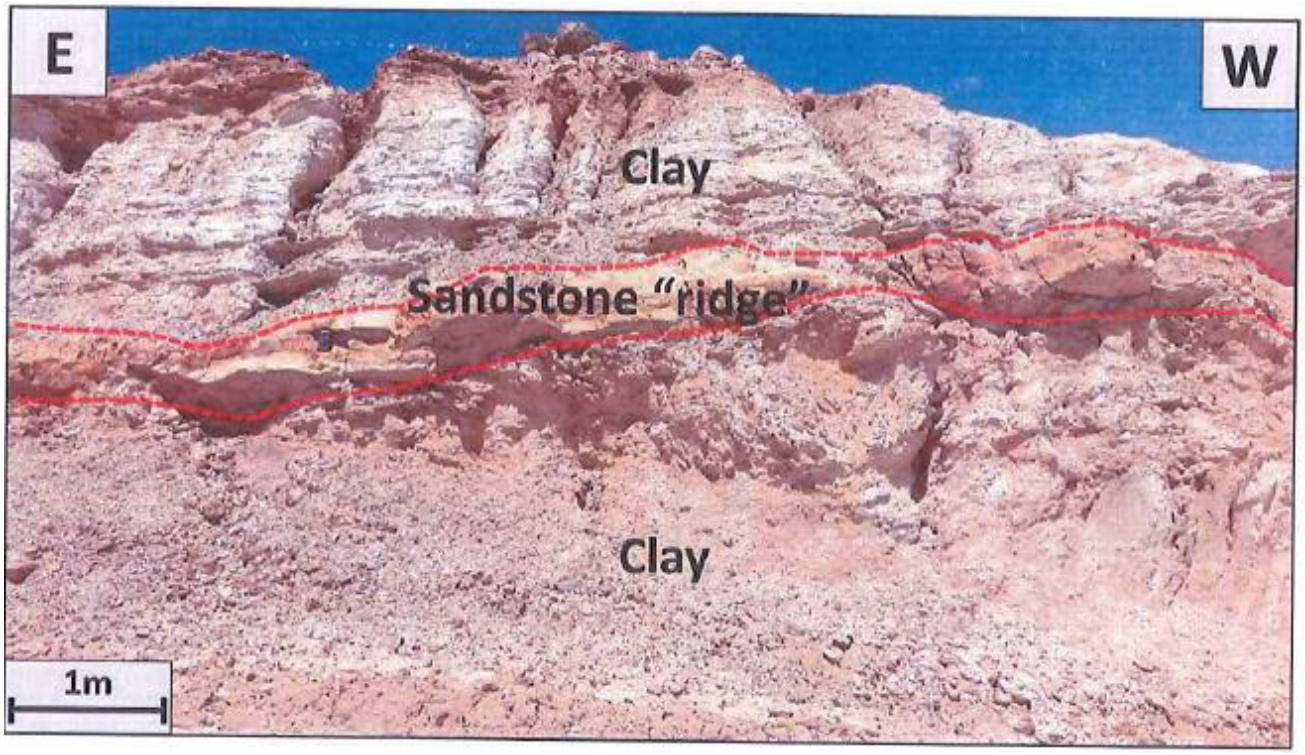

Figure 35: Sandstone layer observed in the existing excavation. (Image obtained from SES Geology Report, 2017)

The study area is located on the northern aspects of a slope decreasing in elevation towards the north, terminating in the Both's River, near the origin. North of the Botha's River, there is a significant hill, comprising of quartzitic sandstone of the Witpoort Formation of the Witteberg Group. Outcrops of the quarzitic sandstone are clearly visible. The Botha's River marks the contact zone between the Grahamstown Formation and the Witpoort Formation. The presence of constant mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting.

As mentioned earlier, the clay generally occurs under a silcrete cover but is found close to the surface on the slopes below the peneplain. Generally, the overburden consists of unwanted material such as smectite, silcrete, lime and contaminated clay that the Applicant desires to process and sell as aggregate for commercial purposes.

During the operational phase, mining will result in permanent removal of clay and overburden up to 20 m deep. Considering the nature of the development the impact on the geology is unavoidable. The impact on the geology is site specific and permanent. Clay deposits are however not regarded as a strategic mineral. The study

area is not a geo-site and therefore of less importance. Considering these factors, the impact is unavoidable and rated of low-moderate significance.

Soil Erodibility:

Soil erodibility is an estimate of the ability of soils to resist erosion, based on the physical characterises of each soil. Generally, soils with faster infiltration rates, higher levels of organic matter and improved soil structure have a greater resistance to water erosion. Certain clay textured soils tend to be less erodible than silt. On average, soils within the mine area will be able to withstand significant rain events in its natural state. However, when disturbed or shaped, rainfall erosivity will increase, especially on the slopes of mine areas where limited gulley erosion could establish.

Further to this, soils containing higher concentrations of clay are heavier, better structured, and hence more resistant to wind erosion. As a result of the strongly dominant loamy sands topsoil matrix, the wind erosion index of the proposed mining area is moderate and soil stability of reinstated soils or freshly established topsoil heaps could be affected during windy periods. Considering the frequent strong winds this area experiences wind could therefore influence the proposed revegetation strategy and eventually a sustainable land-use, since the stability of newly introduced topsoil will be poor and the sandy soil will be subject to wind erosion that could result in deflated areas to develop should this impact not be mitigated, monitored, and managed.

It will be imperative to manage and upgrade the soil quality correctly to achieve the correct tilth in the soil to assist with rehabilitation. Therefore, stockpiling of topsoil is important and must be correctly stored. Since concurrent rehabilitation is proposed the storing of topsoil will be of short term, and the impact on the soil properties is rated very low.

To prevent erosion the clay will be compacted well, and any crack, channel or root cavity will be scarified and then compacted to prevent possible future tunnel erosion. Once the clay was compacted, the top 5 cm of the clay will be scarified, parallel with the contours. Overburden will be spread prior to the placing of topsoil. The topsoil will be spread over the overburden. Once the soil has been prepared the area will be seeded immediately and irrigated on and off over a period.

The impact on soil properties is rated as low with mitigation.

Mining will not alter the drainage patterns. During the operational phase, there is always the risk that water quality can be affected through an increase in suspended and dissolved solids since cay material could potentially release a high sediment load during sheet wash. However, water from the quarry will accumulate in the existing retention ponds and this water will not drain into the surroundings. The Botha's River will not be impacted by mining since the mine boundary is more than 100 m away from the stream bank. The farm already has three retention ponds (following figure) along the northern boundary of the proposed mining footprint where runoff water can be directed to. The retention ponds trap silt loaded storm water whereafter the water can be used for irrigation by the MR Holder and/or landowner. It will be the responsibility of the MR Holder to constantly monitor the capacity of the retention ponds to prevent run-off water spilling into the environment. As mentioned earlier, the retention ponds will remain post mining to be used by the landowner.

Figure 36: Satellite view of the retention ponds along the northern boundary of the proposed mining footprint (green polygon) (image obtained from Google Earth).

The mining activities will not have an impact on the groundwater since the mine floor will be restricted to 20 m and will therefore not undercut the groundwater table. No boreholes will be drilled and thus the impact on groundwater is rated as insignificant.

SITE SPECIFIC TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA

(Information extracted from the Terrestrial Biodiversity Compliance Statement for the proposed Makhanda Mining Project attached as Appendix F)

As mentioned earlier, when the footprint of the farm is layered over the Mining and Biodiversity Map, it extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining. The DFFE screening tool notes that there are CBA1, CBA2 and an ESA1 recorded over the property and in terms of this earmarked area is of Very High terrestrial biodiversity sensitivity as depicted in the following figure.

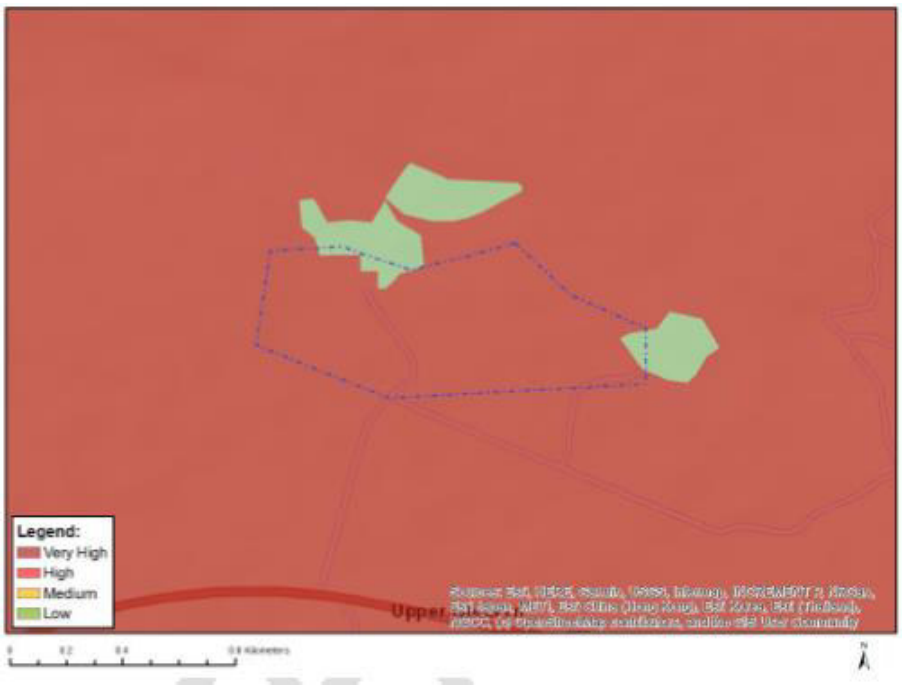

Figure 37: Terrestrial biodiversity theme sensitivity according to the DFFE screening report (2023).

The DFFE Screening Report notes that the Plant Species Theme of the area is of Medium sensitivity as depicted in the following figure.

Figure 38: Plant species theme sensitivity according to the DFFE screening report (2023).

The DFFE screening report classifies the Animal Species Theme Sensitivity of the area as depicted in the following figure.

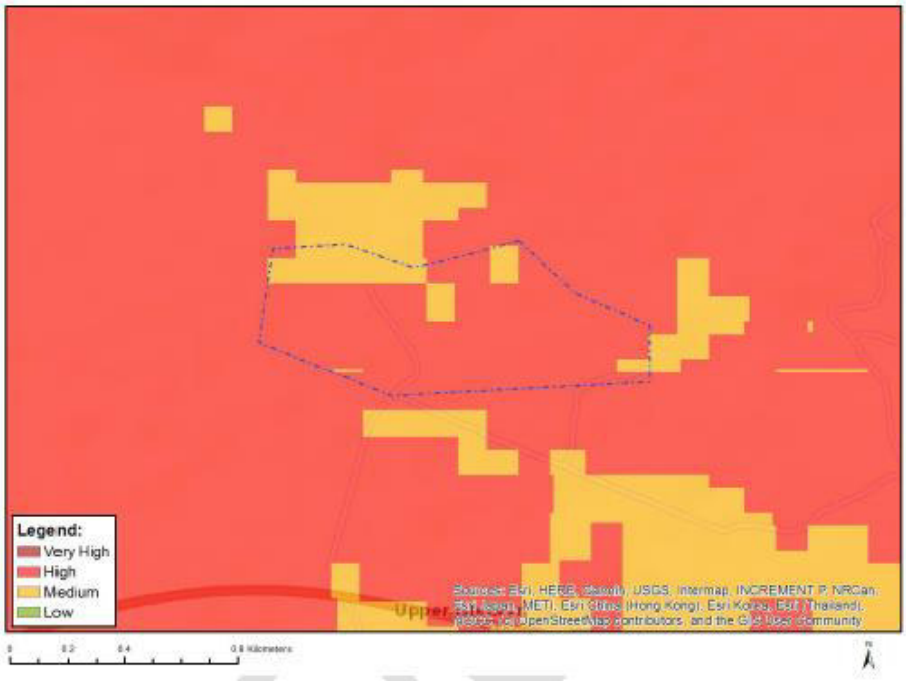

Figure 39: Animal species theme sensitivity according to the DFFE screening report (2023).

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental

Management Act, 1998, when applying for Environmental Authorisation" – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however;
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey (by The Biodiversity Company), confirmed that the proposed footprint area is of a 'Low' sensitivity. Therefore, a Terrestrial Biodiversity Compliance Statement (TBCS) was compiled (see Appendix F).

Terrestrial Site Ecological Importance:

The ecologist identified and delineated the different habitat types within the project area based on observations made during the field survey, and information from available satellite imagery. These habitat types were then assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes. The finds are presented in the following table.

Table 11: Summary of the spatial relevance of the PAOI to local ecologically important landscape features (information obtained from the TBCS).

Desktop Information Considered	Relevant/Irrelevant	Reasoning
Eastern Cape Biodiversity Conservation Plan (ECBCP)	Relevant	PAOI overlaps with CBA 1 & 2, and ESA 1 ecosystems.
NBA 2018: Ecosystem Threat Status	Relevant	PAOI is situated within a 'Least Concern (LC)' ecosystem.
NBA 2018: Ecosystem Protection Level	Relevant	PAOI overlaps with 'Poorly Protected (PP)' and 'Not Protected (NP)' ecosystems.
Red List of Ecosystems (2021)	Relevant	PAOI is situated within a 'Least Concern (LC)' ecosystem.
Protected and Conservation Areas (SAPAD & SACAD)	Irrelevant	The nearest protected area (Ecca Nature Reserve) is located ~3.3 km north of PAOI.
National Protected Areas Expansion Strategy (NPAES)	Irrelevant	PAOI does not overlap with any Protected Areas (PAs).
Important Bird and Biodiversity Areas (IBA)	Irrelevant	PAOI does not overlap with an IBAs.
Strategic Water Source Areas (SWSA)	Irrelevant	PAOI does not overlap with any SWSAs.
National Freshwater Ecosystem Priority Areas (NFEPA)	Relevant	PAOI buffer overlaps with an NFEPA river.
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Irrelevant	PAOI does not overlap with any SAIIAE wetlands.

The following table discuss the results from the specialist's field survey (also presented in the TBCS as Table 3-2).

Table 12: Sensitivity summary of the habitat types delineated within the PAOI (information obtained from the TBCS).

Habitat	Description	SEI
Bhisho Thornveldt	This habitat unit spans a very small portion (~6.47ha) of the total surface area of the PAOI footprint (~43.5ha). This vegetation type is confined to the Eastern Cape of South Africa, with a conservation target of approximately ~25%, and is still considered Least Concern. Dominant species in the area were grasses including *Themeda triandra*, *Heteropogon contortus*, *Eragrostis curvula*, and *Cympogon plurinoides*. Individuals of Vachellia karroo were scattered through the habitat unit at a low density. Cliffortia species are also widely distributed through the site, with these species being a least conservation concern. Other smaller shrubs present include *Chrysocoma ciliata*, *Felicia muricata*, *Helichrysum odoratissimum*, *Osteospermum monoliferum*, *Pelargonium reniiforme* and *Selago corymbosa*. Smaller succulents *included Drosanthemum hispidum*, *Crassula muscosa* and *Bulbine abyssinica*. No species of high conservation concern were found to be present.	**Low**

Grahamstown Grassland Thicket	The majority of the PAOI consists of the Grahamstown Grassland Thicket habitat unit (~25.58ha). This habitat is widespread in the PAOI and surrounding area and consists of a mixture of grassland and more woody Albany thicket vegetation types. Thicket typically forms patches dispersed within a more grass- and shrub-dominated vegetation. There are few, if any, diagnostic species within this habitat type, however the pattern of thicket patches dispersed within shorter grassland and grassy fynbos mixtures is what characterizes it. The specific composition of the vegetation type also varies depending on the surrounding land management (pers. Obs.). This vegetation pattern is likely caused by a complex underlying geology which favors the coexistence of these two vegetation forms. The conservation target is 19% and approximately 36% has already been transformed. The grassland and grassy fynbos part of this vegetation is dominated by common grasses such as *Themeda triandra*, *Eragrostis curvula*, *E. capensis*, *Cymbopogon plurinoides* and *Digitaria eriantha*. The shrub layer is dominated by large shrubs, particularly *Osteospermum moniliferum* (prev. *Chrysanthemoides monilifera*) an abundant and widespread species. Other common shrub species are scattered throughout the grassland and occur in densities differing from single individuals to larger more expansive and dense aggregations. These shrubs include species such as *Searsia lucida* and *Searsia pentheri*, *S. longispina*, *Putterlickia pyracantha*, *Burchellia bubalina*, *Scutia myrtina*. Smaller shrubs, herbs and forbs present include common species such as *Chrysocoma ciliata, Passerina rigida, Pelargonium reniiforme*, several *Helichrysum* species such as *Helichrysum odoratissimum, H. cymosum, H. rugulosum,* and *H. teretifolium*. Other common species include *Stoebe capitata, Felicia muricata, Dicerothamnus rhinocerotus* and *Passerina rigida*. Occasional fynbos species such as *Erica demissa* and an unidentified species of *Restio*. Widespread low growing creepers such as *Rhynchosia caribaea* and geophytes such as *Eriospermum* spp. Two clumps of Albany thicket were present on the site, forming part of this habitat type. Thicket patches contained a typical collection of thicket species including *Cussonia spicata, Burchellia bubalina, Sideroxylon inerme, Mytroxylon aethiopicum, Diaspyros scabrida*, *Grewia occidentalis*, *Portulacaria afra*, *Carissa bispinosa*, and *Gymnosporea buxifolia*. There were no species of conservation found present on the site dominated by Grahamstown Grassland thicket.	**Low**
Modified – Mining	This habitat unit includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified the area's primary ecological functions and species composition. This habitat unit no longer maintains its functional integrity and does not contribute significantly to ecosystem services. This habitat unit is characterised by areas used for mining related activities. No fauna or flora SCC were recorded or are expected to occur in this habitat unit.	**Low**

The allocated sensitivities for each of the relevant themes were either disputed or validated for the overall PAOI in Table 3-3 of the TBCS, also presented in the following table. The specialist-assigned sensitivity ratings are based largely on the SEI process (as previously explained), and consideration is given to any observed or likely presence of SCC or protected species.

Table 13: Summary of the screening tool vs. specialist assigned sensitivities (information obtained from the TBCS).

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	Low	Disputed – Large portions of the PAOI are degraded owing to historical habitat modifications linked to mining. No fauna SCC were detected during the terrestrial field survey. This, however, does not negate the possibility of fauna SCC occurring within the PAOI in the future.
Plant Theme	Medium	Low	Disputed – Habitat is largely degraded with no SCCs having been recorded during the terrestrial field survey.
Terrestrial Theme	Very High	Low	Disputed – Despite overlapping with CBA 1, CBA 2 and ESA 1 ecosystems, the habitat is degraded - within proximity to mining activities - and does not represent CBA 1, CBA 2, and ESA 1 ecosystems anymore.

The findings are presented in the following figure.

Figure 40: Map depicting the specialist assigned sensitivity ratings of habitats within the PAOI. (Image obtained from the TBCS).

Table 4-1 of the TBCS presents mitigation measures (incorporated under *Part A(1)(g)(viii) The possible mitigation measures that could be applied and the level of*

risk as well as Part B Environmental Management Programme Report) to reduce the significance of the likely impacts associated with the development, and thereby:

- Prevent the further loss and fragmentation of vegetation communities within the CBA and ESA ecosystems within and around the PAOI;
- Reduce the negative fragmentation effects of the development and facilitate the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance (SEI) ratings assigned to the project area.

Animal Theme:

Generally most of the rare animal's habitats are associated with riverine environments. The Botha's River environment is an obvious niche for a whole range of animal species such as fish, amphibians, avian species, reptiles, rodents, insects, and a few antelope. However, the Botha's River falls outside the proposed mining area and will not be disturbed by this activity. Further hereto, any runoff from the mine will be contained in the retention ponds and no sediment will be transported to the Botha's River that could affect the faunal component.

The Terrestrial Biodiversity Compliance Statement notes that the PAOI are degraded owing to historical habitat modifications linked to mining. No fauna SCC were detected during the terrestrial field survey, and although this does not negate the possibility of fauna SCC occurring within the PAOI in future the ecologist rated the animal theme sensitivity of the area as Low.

Considering this, and the adaptability shown by animals to changes in their environment, it is proposed that the faunal component of the area would be able to adapt to the changes. Fragmentation of the natural habitats could negatively affect the larger species, and therefore it is proposed that the mining activities be demarcated with beacons rather than being fenced off, as this will allow free movement of roaming species in and out of the work areas. To minimise the impact on the faunal component it is proposed that all operations are restricted to normal working hours, and daily inspected for trapped and/or injured species in need of assistance. Any such species must then be assisted/relocated to a safe area by a competent person.

No threatened bird species are known to occur within the study area. The known species are all Least Concern in terms of conservation status and has been co-existing with the clay mining activities since commencement. The bird species are all highly mobile and can readily move away from disturbance. As mentioned earlier, the historic mining activities have co-existed well with the fauna in the area, and this is also true for the avifaunal component of the farm. It is suggested that the rehabilitated areas are not only seeded with grass, but that fast-growing trees/bushes be planted where possible to replace the lost of bush used by birds as shelter, perching and nesting.

Although the reptile, and insect component of the area were not assessed, the same conditions (as discussed earlier) apply, in that the mining areas must be kept to the smallest possible footprint, retaining the vegetation component for as long as possible. Reptiles, such as snakes and tortoises, that do enter or get trapped in the operational areas, must be safely relocated away from the mine by a competent person. No species that enter the mining area may be caught, played with, killed, or sold.

All operations must be restricted to daylight hours, to afford nocturnal animals the leeway of free movement. No excessive lighting may be placed at the mining area that could affect the habitual activities of species such as bats, owls, moths, frogs etc.

In conclusion, mining in the study area will not result in the extinction of any species or decrease in species numbers and the impact on the faunal diversity of the site is rated as Low.

Conclusion:

The TBCS concludes that the project area is predominantly comprised of modified, degraded habitat units attributed to the ongoing mining activities recorded. Although the project area falls within CBA 1 & CBA 2 ecosystems, and an ESA 1 ecosystem, ongoing disturbances and impacts associated with the activity will impede on the long-term recovery of the site to a more natural state.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted.

It is therefore the opinion of the specialists that the project may be favourably considered, provided that the proposed mitigation measures be implemented correctly, along with the specialist recommendations. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Palaeontological Heritage Impact Assessment for Quarry Extension at the Orchards, East of Makhanda/Grahamstown attached as Appendix G)

The DFFE Screening Report notes the Archaeological and Cultural Heritage sensitivity of the area as Low with only the eastern side extending into a Very High sensitivity, while the northern half of the application area extends into a Very High Palaeontological sensitive area.

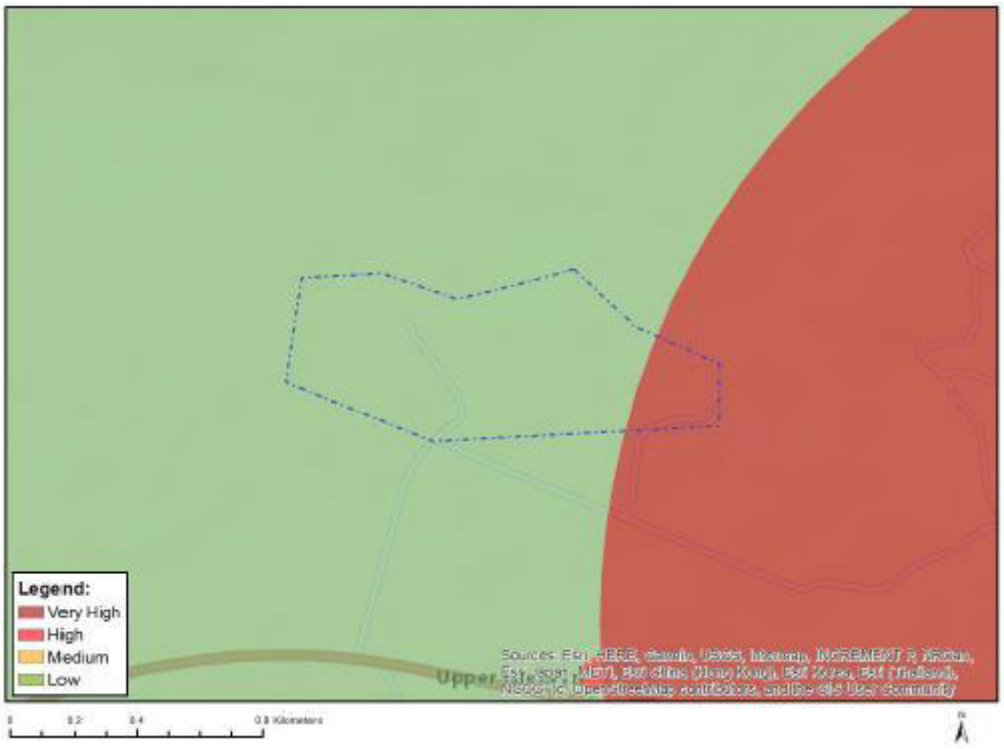

Figure 41: Archaeological theme sensitivity of the proposed area according to the DFFE screening report (2023).

Figure 42: Palaeontological theme sensitivity of the proposed area according to the DFFE screening report (2023).

Dr Robert Gess was appointed to do a Palaeontological Heritage Impact Assessment (PIA) of the proposed mining area.

Geological Overview and Palaeontology of Affected Strata:

The PIA notes that the Witpoort Formation is Famennian (uppermost Devonian) in age. That is approximately 359 to 372 million years old. It is a largely quatzitic unit representing mature sandy strata deposited along a linear barrier island type coast. The lower portion of the Witpoort Formation tends to have a brownish weathering character, whereas the upper portion (sometimes referred to as the Perdepoort Member) tends to comprise much cleaner whiter weathering quartzites. Particularly around Makhanda/Grahamstown black shale lenses are interbedded within the Witpoort Formation quartzites. These are interpreted as estuarine deposits preserved during brief transgressive events and have proven remarkably fossiliferous.

A series of lenses at Waterloo Farm, to the south of Grahamstown, have provided southern Africa's most important Late Devonian locality, representing an entire coastal estuarine ecosystem and adjacent terrestrial environment. It has yielded fragmentary remains of Africa's earliest known four legged animals, the aquatic tetrapods, *Tutusius umlambo* and *Umzantsia amazana* and at least 20 taxa of fossil fish (including jawless fish (Agnatha), armoured fish (Placodermi), spiny sharks (Acanthodii), sharks

(Chondrichthyes), ray finned fish (Actinopterygii) and lobe finned fishes (Sarcopterygii) including Coelacanths (Actinistia), lungfish (Dipnoi) and Tristichopterids. Of these nine have as yet been described including the world's oldest lamprey fossil, *Priscomyzon riniensis*, and Africa's earliest coelacanth from the world's oldest known coelacanth nursery, *Serenichthys kowiensis*. Seaweeds, brack-water charophytes and fresh to brack-water bivalves have been described and a giant Eurypterid identified. The terrestrial realm is represented by the remains of a scorpion, *Gondwanascorpio emzantsiensis*, the oldest known terrestrial animal from the supercontinent Gondwana, Dozens of land plant taxa have been revealed, including zosterophylls, lycopods (eg. *Kowieria alveofolis, Colpodexylon pullumpedes* and *Leptophloem rhombicum*), iridopteralian-like plants (*Flabellopteris lococannensis*), sphenophytes (eg *Rinistachya hilleri*) and early progymnosperms, such as *Archaeopteris notosaria*, southern Africa's earliest known fossil tree.

Abundant trace fossils have also been collected. Witpoort Formation quartzites have yielded a range of plant stem taxa and trace fossils. Lag deposits of bone have not, yet, been discovered, but may be expected.

Fossil black shales (commonly fossiliferous) are interbedded with quartzites all along the ridge though these are generally reduced to soil or clay near surface. They are normally revealed where quarrying or roadworks cut into the land surface, for example in the hardrock quarry 3.2 kilometres north northwest of the orchards site (along the same horizon). Black shales here were protected from leaching by overlying quartzitic strata which have been penetrated by quarrying. Preliminary investigation revealed these to contain silvery white plant fossil fragments.

The top of the Witpoort Formation coincides with the end of the Devonian and is similar in age to the end-Devonian extinction event. It is overlain by rocks of the early Carboniferous aged Lake Mentz Subgroup. The End Devonian Mass Extinction Event completely changed diversity patterns of life on Earth, wiping out all placoderm (armoured fish) as well as most acanthodians (spiny finned fish) and lobe finned fish groups. Thereafter, ray-finned fish and sharks dominated the waters, and tetrapods (animals with four legs) went on to populate the land. Although there are as yet no tetrapods known from South Africa's early Carboniferous rocks, there are a number of fish fossil sites that well illustrate this change in fish diversity. Most famous of these is the 'Lake Mentz' site from near the Darlington Dam in the Addo National Park. Here several layers of rock covered in fossil fish of many species have been discovered. In strong contrast to the fish of the Waterloo Farm site, the fish from near Darlington Dam are all ray-finned fish, the group of fish that dominates our seas, lakes and rivers today.

Some shark and acanthodian remains have also been recovered from the Lake Mentz Subgroup. These fish rich layers are generally associated with the middle portion of the Lake Mentz subgroup (the Waaipoort Formation) which will not be impacted by the quarry.

In the later part of the Carboniferous and early part of the Permian period, during the breakup of Gondwana, the Agulhas Sea floor was folded up into a chain of high mountains that separated the Karoo Basin from the Sea. The area thereafter became an erosional environment and largely ceased to accumulate sediments. Around 200 million years later, during the Cretaceous and early Tertiary Periods much of Africa was weathered down to a number of level horizons collectively known as the African Surface. The area in the vicinity of Grahamstown was reduced to a flat plain close to sea level, remnants of which are referred to as the Grahamstown Peneplane.

During the Tertiary, mudstones and shales were leached to considerable depth, transforming them into soft white kaolin clay. Silica, iron and magnesium from these rocks was carried in solution by groundwater and deposited near the ground surface due to steady evaporation of mineral rich waters. This led to the formation of a hard mineralised capping layer, often consisting of silicified soil. Resultant silcretes are referred to as the Grahamstown Formation. Though occasional occurrences of root and stem impressions have been recorded from the Grahamstown Formation it is generally considered unfossiliferous.

Site Specific Findings:

The specialist surveyed the earmarked area in July 2023, and found most of the area to be undisturbed and eroded to a flat surface, with virtually no visible outcrop of strata. Small outcrops of southerly dipping Witpoort Formation quartzites (following figure) were however observed in places, and in piles where they had been cleared off underlying clay.

Figure 43: Photographs of Witpoort Formation quartzite (Images obtained from the PIA).

Within the former excavation a profile illustrates leached shale with small interbedded sandstone lenses and purer clay strata, at depth, towards the heart of the former quarry, though still retaining original bedding.

Figure 44: Thin sandstone layer bedded within clay (formerly shale) of the Witpoort Formation (Images obtained from the PIA).

In the far east of the proposed mining right cleaner kaolin is observable near to surface. This is covered by silcrete, either in a layer of soil bound nodules or in massive layers.

Figure 45: Profile showing cleaner kaolinite close to the surface in the east of the area, looking south (Images obtained from the PIA).

Conclusion and Recommendations:

The PIA concludes that almost the entire area is deeply underlain by strata of the Witpoort Formation, which are variably overlain by silcrete of the Grahamstown Formation. In places small outcrops of Witpoort Formation quartzite were observed to the south of historic diggings.

Historic diggings in the north of the proposed mining right have targeted a thick bed of kaolin clay derived from an (originally black) mudstone layer. Due to its proximity to surface the shale was subsequently reduced to kaolin by deep leaching during and following the Cretaceous period – the silica and metallic elements having crystalised out near surface to produce the silcrete capping. As a result of the kaolinization of the strata their probable original palaeontological interest has been destroyed.

It remains possible, however, that as the fold dives down in a southerly direction it may, in places still be capped by southwardly dipping sheets of quartzitic strata. If this is the case, it may be that there are areas which have not been entirely kaolonised and where fossils may still be discernible in the strata.

The specialist recommended that should more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess them for palaeontological potential. During disturbance of quartzitic strata, notice should also be taken in case impressions of plant stems or bony plates of fish are disturbed. Should the possibility of any such material be suspected a palaeontologist should be contacted to assess the possible fossils.

SITE SPECIFIC SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Social and Labour Plan of Makhanda Mining (Pty) Ltd attached as Appendix J)

A Social and Labour Plan (SLP) (Appendix J) was submitted as part of the MR application. The SLP forms the basis for the implementation of programmes and projects as key activity drivers of the development and operation of the mining activity in the Makana area. It offers the building blocks for future economic development and growth of the local area. The scope of the document offers the Applicant a platform to engage in the development of the local economy and community through a basis of human resource development, economic delivery, business development and community participation. The nature of the document is therefore aimed at the widest possible comprehension and stimulation for inputs.

The SLP notes that the Orchards Mine will appoint a local sub-contractor to conduct the proposed mining. Since all the employees will reside within the Makana area, it is fair to presume that most monthly earned salaries will be spend in the local area. Indirectly, through the payment for services and suppliers, the mine also supports employment of the procurement partners.

As mentioned earlier, kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

The proposed development will generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the Social and Labour Plan (SLP), to be approved as part of the proposed mining right application, the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

SITE SPECIFIC EXISTING INFRASTRUCTURE

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

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

The environmental and current land use maps are attached as Appendix B.

v) Impacts and risks identified including the nature, significance consequence, extent, duration and probability of the impacts, including the degree to which these impacts.

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

The following potential impacts were identified of each main activity in each phase of the proposed project. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

SITE ESTABLISHMENT

Loss of grazing for duration of mining.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	5	1	2.3	5	5	5	**11.5**

Visual intrusion because of site establishment.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	5	2	3	5	5	5	**15**

Direct loss and disturbance of floral species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	5	1	2.3	5	3	4	**9.2**

Loss of topsoil and fertility during site establishment.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	1	3	4	2	3	**9**

Infestation of the topsoil heaps and mining area with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	4	4	4	2	3	**12**

Dust nuisance because of the site establishment activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	4	2	2.6	3	3	3	**7.8**

Noise nuisance because of the site establishment activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	4	2	2.6	1	5	3	**7.8**

Work opportunities due to continued mining **(Positive Impact)**

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High (+)			**Final Project Proposal**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**

EXCAVATION OF MINING AREA

Potential soil contamination from hydrocarbon spills.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	4	4	3	4	3	3.5	**10.5**

Noise nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	4	2	2.7	3	4	3.5	**9.5**

Potential impact on areas of palaeontological concern.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	5	5	4.6	2	1	1.5	**6.9**

Direct loss and disturbance of fauna species and communities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	4	4	2	1	1.5	**6**

Runoff from mining area having a potential impact on the Botha's River.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	3	4	3.6	2	1	1.5	**5.4**

Potential damage to the Eskom power lines.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	3	5	4	2	1	1.5	**6**

PROCESSING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE

Loss of stockpiled material due to ineffective stormwater control.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	4	1	2.6	3	2	2.5	**6.5**

Dust nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	4	2	3	4	5	4.5	**13.5**

Noise nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	4	2	2.6	2	5	3.5	**9.1**

Potential impact associated with littering and hydrocarbon spills.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	4	2	3	4	4	4	**12**

Infestation of denuded areas with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	4	2	3	5	2	3.5	**10.5**

Deterioration of the access road to the mining area.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	4	2	2.6	3	2	3.5	**9.1**

Overloading of trucks having an impact on the public roads.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	4	5	4.3	3	3	3	**12.9**

SLOPING AND LANDSCAPING (MEDIUM & LONG TERM)

Erosion of returned topsoil after rehabilitation.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	2	3	**9.9**

Infestation of the rehabilitated area with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	4	2	3	5	2	3.5	**10.5**

Noise nuisance because of the decommissioning activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	1	2	1.3	1	5	3	**3.9**

Potential impact associated with litter/hydrocarbon spills left at the mining area.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	4	4	**13.2**

Return of the mined areas to grazing **(Positive Impact)**

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High (+)			**Final Project Proposal**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**

CUMULATIVE IMPACTS

Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	4	5	4.7	2	1	1.5	**7.1**

Fragmentation of ecosystems affecting safe movement of fauna species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
4	4	4	4	2	1	1.5	**6**

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined to decide the extent to which the initial site layout needs revision).

Methodology for the assessment of the potential environmental, social and cultural impacts.

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 recognized from the various interpretations:

- Environmental significance is a value judgment.
- The degree of environmental significance depends on the nature of the impact.
- 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 impact magnitude and impact significance. Impact magnitude is the measurable change (i.e., intensity, duration, and likelihood). Impact significance is the value placed on the change by different affected parties (i.e., level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

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

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will 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 impact on the biophysical and socio-economic environment. Table 14 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 14: Table to be used to obtain an overall rating of severity, taking into consideration the various criteria.

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 15: Criteria for the rating of duration.

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 16: Criteria for the rating of extent / spatial scale.

RATING	DESCRIPTION
1	Immediate, fully contained area
2	Surrounding area
3	Within Business Unit area of responsibility
4	Within the farm/neighbouring 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 17: Example of calculating overall consequence.

CONSEQUENCE	RATING
Severity	Example 4
Duration	Example 2
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 18: Criteria for the rating of frequency.

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

RATING	DESCRIPTION
5	Daily

Determination of Probability

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

Table 19: Criteria for the rating of probability.

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

Overall Likelihood

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

Table 20: Example of calculating overall likelihood.

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 environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH,** or **HIGH**, as shown in the table below.

Table 21: Determination of overall environmental significance.

SIGNIFICANCE OR RISK	LOW	LOW-MEDIUM	MEDIUM	MEDIUM-HIGH	HIGH
Overall Consequence x Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

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 prioritizations and decision-making process associated with this event, aspect, or impact.

Table 22: Description of environmental significance and related action required.

SIGNIFICANCE	LOW	LOW-MEDIUM	MEDIUM	MEDIUM-HIGH	HIGH
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 potentially substantial in relation to other impacts. Can pose a risk to company	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
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	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

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

High — Of the highest order possible within the bounds of impacts, which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

Medium-High — Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.

Medium — Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and easily possible. In case of positive

impacts; other means of achieving these benefits would be about equal in time, cost, and effort.

Low-Medium	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or several ways, than this means of achieving the benefit.
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

LIST OF POSITIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL:

- Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region,
- The red/orange clay is a localized occurrence that is highly sought after in the brick making industry, to be exploited by this mine,
- Work opportunities due to continued mining,
- The landowner will generate income from the mining footprint in the form of compensation,
- The Applicant will contribute to Human Resources Development and LED projects that will support the development of the local socio-economic environment,
- Return of the mined areas to agricultural use post mining.

LIST OF NEGATIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL:

The following table lists the potential negative impacts associated with the present project proposal:

Table 23: List of potential negative impacts associated with the preferred project proposal.

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION	SIGNIFICANCE (AFTER MITIGATION)
⁜ Site establishment.	⁜ Loss of grazing for duration of mining.	⁜ Medium	⁜ Low-Medium
⁜ Site establishment.	⁜ Visual intrusion because of site establishment.	⁜ Medium-High	⁜ Low-Medium
⁜ Site establishment. ⁜ Cumulative Impact	⁜ Direct loss and disturbance of floral species. ⁜ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	⁜ Low-Medium ⁜ Low-Medium	⁜ Low-Medium ⁜ Low
⁜ Site establishment	⁜ Loss of topsoil and fertility during site establishment.	⁜ Low-Medium	⁜ Low
⁜ Site establishment ⁜ Processing, stockpiling and transporting of material from site. ⁜ Sloping and landscaping.	⁜ Infestation of the topsiol heaps and mining area with invader plant species. ⁜ Infestation of denuded areas with invader plant species. ⁜ Infestation of the rehabilitated area with invader plant species.	⁜ Medium ⁜ Medium ⁜ Medium	⁜ Low ⁜ Low ⁜ Low
⁜ Site establishment ⁜ Processing, stockpiling and transporting of material from site.	⁜ Dust nuisance because of site establishment activities. ⁜ Dust nuisance because of the mining activities.	⁜ Low-Medium ⁜ Medium	⁜ Low ⁜ Low
⁜ Site establishment ⁜ Excavation of mining area ⁜ Processing, stockpiling and transporting of material from site. ⁜ Sloping and landscaping.	⁜ Noise nuisance because of the site establishment activities. ⁜ Noise nuisance because of mining activities. ⁜ Noise nuisance because of mining activities. ⁜ Noise nuisance because of the decommissioning activities.	⁜ Low-Medium ⁜ Low-Medium ⁜ Low-Medium ⁜ Low	⁜ Low ⁜ Low ⁜ Low ⁜ Low
⁜ Excavation of mining area ⁜ Processing, stockpiling and transporting of material from site.	⁜ Potential soil contamination from hydrocarbon spills. ⁜ Potential impact associated with littering and hydrocarbon spills.	⁜ Medium ⁜ Medium ⁜ Medium	⁜ Low ⁜ Low ⁜ Low

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION	SIGNIFICANCE (AFTER MITIGATION)
⁎ Sloping and landscaping.	⁎ Potential impact assocaited with litter/hydrocarbon spills left at the mining area.		
⁎ Excavation of mining area	⁎ Potential impact on areas of palaeo concern.	⁎ Low-Medium	⁎ Low-Medium
⁎ Excavation of mining area ⁎ Cumulative Impact	⁎ Direct loss and disturbance of fauna species and communities. ⁎ Fragmentation of ecosystems affecting safe movement of fauna species.	⁎ Low-Medium ⁎ Low-Medium	⁎ Low ⁎ Low
⁎ Excavation of mining area	⁎ Runoff from mining area having a potential impact on the Botha's River.	⁎ Low-Medium	⁎ Low
⁎ Excavation of mining area	⁎ Potential damage to the Eskom power lines.	⁎ Low-Medium	⁎ Low
⁎ Processing, stockpiling and transporting of material from site. ⁎ Sloping and landscaping.	⁎ Loss of stockpiled material due to ineffective stormwater control. ⁎ Erosion of returned topsoil after rehabilitation.	⁎ Low-Medium ⁎ Low-Medium	⁎ Low ⁎ Low
⁎ Processing, stockpiling and transporting of material from site.	⁎ Deterioration of the access road to the mining area. ⁎ Overloading of trucks having an impact on the public roads.	⁎ Low-Medium ⁎ Medium	⁎ Low ⁎ Low

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment / discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

The following mitigation measures are proposed to address/minimize the potential impacts that the proposed activity may have on the surrounding environment.

VISUAL CHARACTERISTICS

<u>Visual Mitigation:</u>

- The site must have a neat appearance and be always kept in good condition.
- Mining equipment must be stored neatly in a dedicated area with a sealed drip tray underneath when not in use.

- Concurrent rehabilitation must be done as mining progress to limit the visual impact on the aesthetic value of the area.
- The MR holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area.
- Upon closure the faces must be profiled and stabilised with proper vegetation cover to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.

GEOLOGY AND SOIL

Topsoil Management:

- The upper 300 mm of soil must be stripped and stockpiled before mining.
- Topsoil is a valuable and essential resource for rehabilitation, and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The mining plan must be such that topsoil is stockpiled for the minimum possible time.
- The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.
- Topsoil stockpiles must be protected against losses by water- and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.
- Topsoil heaps may not exceed 2 meters.
- The temporary topsoil stockpiles must be kept free of invasive plant species.
- Storm- and runoff water must be diverted around the stockpile area to prevent erosion.
- Before topsoil or overburden is replaced, the clay sub-layer must be prepared:
  - All cracks, channels and root cavities must be properly scarified and filled in, if necessary.
  - Thereafter, the whole slope and platform area must be compacted.
  - Once compacted, only the top 5 cm of the clay layer must be ripped lightly along the contour before overburden is replaced.
  - Once the overburden layer is replaced, the area can be top dressed with topsoil.
- The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. The topsoil must be keyed-in slightly with lower horizons by ripping it lightly along the contour and fertilised if necessary.
- The Applicant must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by

both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.

- A cover crop must be planted, irrigated, and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil (if deemed necessary). It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- Water from the retention pond, alternatively from the Makana Brick dam (already authorised) can be utilized to irrigate the cover crop to help fast track re-vegetation.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after closure.

HYDROLOGY

Mitigating the potential impact on the Botha's River and Downstream Users:

- No activities may take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan.
- All mining activities must be contained in the approved footprint, and the vegetation layer between the river and the northern boundary of the mine must be preserved.
- The 100 m between the river and the mine must be treated as a no-go area and all employees must be educated accordingly.
- Adequate storm water management measures must be implemented and must include diverting storm- and floodwater around the stockpile and excavation areas and preventing sediment and silt from entering the river.
- Necessary precautions must be taken to ensure that floodwaters are diverted around the processing/stockpile- and excavation areas by means of berms.

Erosion Mitigation / Storm Water Control:

- The Stormwater Management Plan, appended to this document, must be implemented on site.
- Removal of vegetation ahead of the production faces must be limited.
- The applicant must ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. It is recommended that the land

clearing be done during dry seasons to avoid water runoff into the watercourse thus affecting the water quality.

- Storm water must be diverted around the topsoil heaps and mining areas to prevent erosion.
- Drainage must be controlled to ensure that runoff from the mining area does not culminate in off-site pollution, flooding or result in any damage to properties downstream or any storm water discharge points.
- Erosion control measures must be put in place to minimise erosion along the proposed mining areas. Extra precautions must be taken in areas where the soils are deemed highly erodible. These measures could include the use of sandbags, hessian sheets, bidim, retention or replacement of vegetation.
- Silt traps must be used where there is a danger of topsoil or material stockpiles eroding and entering the river and other sensitive areas.
- Stockpiling of soil or any other materials during the operational phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface run-off. The Applicant must control and establish suitable mitigation measures to prevent the erosion of stockpiles.
- Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
  - Clean water (e.g., rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
  - Dirty water must be collected and contained in a system separate from the clean water system.
  - Dirty water must be prevented from spilling or seeping into clean water systems.
  - A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
  - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.
- To reduce runoff, reinstated soil must be vegetated as soon as possible to restore soil properties. If erosion occurs on the slopes, it should be curbed by infill material obtained from the active mining area.
- If and where possible, rehabilitation of disturbed areas should be done concurrently with the mining activities to avoid erosion of bare soil.

Fugitive Dust Emission Mitigation:

- The liberation of dust into the surrounding environment must be effectively controlled using, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g., DAS products).
- The site manager must ensure continuous assessment of the dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust.
- Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining.
- Loads must be flattened to prevent spillage of clay and/or aggregate during transportation, also minimising windblown dust.
- Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts.
- All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).
- Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the clay and/or aggregates from site to minimize potential dust impacts.
- Dust allaying structures such as water sprayers must be fitted to the crushing plant.
- The processing equipment must daily be cleaned of excess material and dust.

Noise Handling:

- The Applicant must ensure that the employees and visitors to the site conduct themselves in an acceptable manner while on site.
- No loud music may be permitted at the mining area.
- All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).
- Best practice measures shall be implemented to minimize potential noise impacts.
- A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.

TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA

Impacts on floral species, and fragmentation of vegetation communities within the CBA and ESA ecosystems:

- The mining boundaries must be clearly demarcated, and all operations must be contained to the approved mining area.
- The area outside the mining boundaries must be declared a no-go area, and all employees must be educated accordingly.
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further.
- Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and should take up the smallest footprint possible.
- All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles.
- The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas.
- It must be made an offence for any staff member to take any indigenous plant species out of any portion of the Project area, or to bring any alien plant species into any portion of the Project area except for rehabilitation purposes. This is to prevent the spread of exotic or invasive species or the illegal collection of plants.
- A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.
- An invasive plant species management plan must be implemented on site to control weeds and invasive plants on denuded areas, topsoil heaps and rehabilitated areas.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.
- Final rehabilitation must consist of profiling, spreading of available overburden and stockpiled topsoil and upgrading of the topsoil and seeding with a prescribed grass seed mix (refer to Closure Plan) during the period March to October.

Management of Invasive Plant Species:

- The invasive plant species management plan (attached as Appendix K to this document) must be implemented at the site to ensure the management and control of all 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). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.
- All stockpiles must be kept free of invasive plant species.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - The plants can be uprooted, felled, or cut off and can be destroyed completely.
  - The plants can be treated chemically by a registered pest control officer (PCO) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Impacts on faunal species, and fragmentation of ecosystems affecting safe movement of species:

- A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.
- Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, to provide an easy escape route for all small mammals and herpetofauna.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- The mining activities must be demarcated with beacons rather than being fenced off to allow free movement of roaming species. If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed,

the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.

- The site manager must ensure no fauna is caught, killed, harmed, sold, or played with. Signs must be put up to enforce this.
- All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Workers must be instructed to report any animals that may be trapped in the working area.
- No snares may be set, or nests raided for eggs or young.
- Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight it must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling.
- All vehicles must adhere to a low-speed limit (40 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises.
- Any dangerous fauna (snakes, scorpions, etc.) and/or other animals to be affected that are encountered must not be handled or antagonised by the construction staff. A suitably qualified person(s) must be contacted to remove the animals to safety.
- No litter, food or other foreign material must be thrown or left around the site and must be placed in demarcated rubbish and litter areas that are animal proof.
- Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.
- Use environmentally friendly cleaning and dust suppressant products.
- The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.
- A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- All mining must be confined to the development footprint area.
- Should, during extension of the quarry, more shaly material of a grey to black colour be encountered to the south, a palaeontologist must be contacted to assess them for palaeontological potential.

- During disturbance of quartzitic strata, notice must also be taken in case impressions of plant stems or bony plates of fish are disturbed. Should the possibility of any such material be suspected a palaeontologist must be contacted to assess the possible fossils.
- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA.
- Work may only continue once the go-ahead was issued by SAHRA.
- Implement the Fossil Chance Find Procedure, proposed in this document, should fossils be uncovered.
- Monitoring reports for this activity, as well as the details of the specialist that will train the ECO must be submitted to ECPHRA.

LAND USE

Loss of grazing for duration of mining:

- The temporary loss of agricultural land for the duration of the mining period is acceptable to the landowner. If needed, mined/rehabilitated areas will revert to agricultural use once the cover crop stabilised.

EXISTING INFRASTRUCTURE

Access Road Mitigation:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access roads and crisscrossing of tracks through undisturbed areas must be prohibited.
- Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the Applicant.
- Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes.

- Heavy vehicle signs must be erected on both sides of the N2 junction of the farm road, to increase safety standards.
- Truck drivers must be sensitised towards displaying proper road etiquette, and regular toolbox talks must be held with truck drivers and sub-contractors to address reckless driving and speeding.

Power Line Management:

- An adequate no-go buffer (minimum 10 m) must be maintained around the power lines as per Eskom standard.
- Should the line be damaged, Eskom must immediately (within the first hour of occurrence) be informed.

GENERAL

Waste Management:

- Vehicle maintenance, repairs and services may only take place at the off-site workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal.
- Ablution facilities must be provided to all employees. The toilet must be placed outside the 1:100-year floodline of the river or further than 100 m from the watercourse (whichever is greatest).
- The ablution facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage. Any pollution problems arising from the above are to be addressed immediately by the Applicant.
- If a diesel bowser is used on site, it must be always equipped with a drip tray. Drip trays must be used during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- An emergency spill kit must always be available on site.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.

- Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed to the hazardous waste storage area of the workshop, either for resale or for appropriate disposal at a recognized facility. Proof must be filed.
- A waste management plan (inclusive of a hydrocarbon spill management plan) must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA.
- General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to a recognised general waste landfill site.
- No waste may be buried or burned on the site.
- It is important that the occurrence of any significant chemicals, fuels etc. spill and/or pollution of any surface or groundwater during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities. In addition, should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity must be provided to the affected users.
- Should small volumes of wastewater be generated during the site establishment and operational phase:
  - Water containing waste may not be discharged into the natural environment,
  - Measures to contain the water containing waste and safely dispose thereof must be implemented.
- In the event of a spill the following steps must be:
  - Stop the source of the spill,
  - Contain the spill,
  - All significant spills must be reported to DWS and other relevant authorities,
  - Remove the spilled product for treatment and authorised disposal,
  - Determine if there is any soil, groundwater, or other environmental impact,
  - If necessary, remedial action must be taken in consultation with DWS,
  - Incident must be documented.

Management of Health and Safety Risks:

- Adequate ablution facilities and water for human consumption must daily be available on site.
- Worker(s) must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).

ix) Motivation where no alternative sites were considered.

Refer to Part A(1)(g) *Motivation for the preferred development footprint within the approved site*…., and Part A(1)(g)(x) *Statement motivating the alternative development location within the overall site.*

x) Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

The final project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3 and depicted in Figure 2. The mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting. The proposed footprint of the MR application was therefore based on the available geological information. The footprint was also chosen to include the areas that were previously altered by mining activities, which from an environmental perspective is the preferred option to prevent transformation of intact areas.

The Applicant intends to extract the clay from the mining area using opencast methods. The nature of the operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate).

The Applicant will not establish any permanent infrastructure and/or buildings on site. The design and layout of the proposed footprint were based on the available clay resources and colour variants.

As mentioned earlier, experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. This project does not require complex technology to allow the winning of the intended minerals.

The operational aspects of the activity was based on the historic mining activities that has been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation.

Also refer to Part A(1)(g) *Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed*

development footprint within the approved site; as well as Part A(1)(g)(i) *Details of the development footprint alternatives considered* for a discussion regarding the matters that were considered when determining the preferred development option within the overall site.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures).

During the impact assessment process, the following potential impacts were identified of each main activity in each phase. An initial significance rating (listed under *v) Impacts and Risks Identified*) was determined for each potential impact should the mitigation measures proposed in this document not be implemented on-site.

The impact assessment process then continued in identifying mitigation measures to address the impact that the proposed mining activity may have on the surrounding environment. The significance rating was again determined for each impact associated with the identified alternatives using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact ratings listed below was determined for each impact **after** bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

SITE ESTABLISHMENT

Loss of grazing for duration of mining.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	4	1	2	4	5	4.5	**9**

Visual intrusion because of site establishment.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	4	1	2	4	5	4.5	**9**

Direct loss and disturbance of floral species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
1	3	1	1.6	5	3	4	**6.4**

Loss of topsoil and fertility during site establishment.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	2	1	1.6	2	1	1.5	**2.4**

Infestation of the topsoil heaps and mining area with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	2	1	1.6	3	2	2.5	**4**

Dust nuisance because of the site establishment activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
1	1	1	1	3	3	3	**3**

Noise nuisance because of the site establishment activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	1	2	1.3	1	5	3	**3.9**

Work opportunities due to continued mining. **(Positive Impact)**

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High (+)			**Final Project Proposal**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**

EXCAVATION OF MINING AREA

Potential soil contamination from hydrocarbon spills.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	2	1	1.6	3	2	2.5	**4**

Noise nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	4	2	2.3	2	2	2	**4.6**

Potential impact on areas of palaeontological concern.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Final Project Proposal**			**Degree of Mitigation: Full**	
3	5	5	4.3	2	1	1.5	**6.4**

Direct loss and disturbance of fauna species and communities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	3	1	2	3	1	2	**4**

Runoff from mining area having a potential impact on the Botha's River.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	3	2	2.3	2	1	1.5	**3.4**

Potential damage to the Eskom power lines.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	2	5	3	2	1	1.5	**4.5**

PROCESSING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE

Loss of stockpiled material due to ineffective stormwater control

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
2	2	1	1.6	3	2	2.5	**4**

Dust nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	2	1.6	2	2	2	**3.2**

Noise nuisance because of the mining activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	4	1	2	1	3	2	**4**

Potential impact associated with littering and hydrocarbon spills.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	1	1.3	2	2	2	**2.6**

Infestation of denuded areas with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	2	1	1.6	2	2	2	**3.2**

Deterioration of the access road to the mining area.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	3	2	2.3	2	1	1.5	**3.5**

Overloading of trucks having an impact on the public roads.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	5	2.6	2	1	1.5	**3.9**

SLOPING AND LANDSCAPING (MEDIUM- & LONG TERM)

Erosion of returned topsoil after rehabilitation.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	1	1.3	2	2	2	**2.6**

Infestation of the rehabilitated area with invader plant species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	1	1.3	2	2	2	**2.6**

Noise nuisance because of the decommissioning activities.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
1	1	2	1.3	1	4	2.5	**3.3**

Potential impact associated with litter/hydrocarbon spills left at the mining area.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Full**	
2	1	1	1.3	2	1	1.5	**2**

Return of the mined areas to grazing. **(Positive Impact)**

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High (+)			**Final Project Proposal**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**

CUMULATIVE IMPACTS

Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
3	3	2	2.6	2	1	1.5	**3.9**

Fragmentation of ecosystems affecting safe movement of fauna species.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Final Project Proposal**			**Degree of Mitigation: Partial**	
3	3	2	2.6	2	1	1.5	**3.9**

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table 24: Assessment of each identified potentially significant impact and risk.

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If mitigated.
⁜ Demarcation of the mining area with visible beacons.	⁜ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	N/A	<u>Control:</u> Implementation of proper housekeeping and site management.	N/A
⁜ Site establishment	⁜ Loss of grazing for duration of mining.	The impact may affect the agricultural operations of the property.	Site Establishment- & Operational Phase	⁜ Medium	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area, only to be	⁜ Low-Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					reversed upon the closure of the mine. The impact could be controlled through progressive rehabilitation.	
⁜ Site establishment	⁜ Visual intrusion because of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment- & Operational Phase	⁜ Medium-High	Control: Proper housekeeping and implementation of progressive rehabilitation.	⁜ Low-Medium
⁜ Site establishment ⁜ Cumulative impacts	⁜ Direct loss and disturbance of floral species. ⁜ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	Denuded areas can lead to erosion and sedimentation of the river. Loss of vegetation may also affect the biodiversity of the area.	Site Establishment- & Operational Phase	⁜ Low-Medium ⁜ Low-Medium	Control: Implementing the proposed mitigation measures and preventing blanket clearing of vegetation.	⁜ Low-Medium ⁜ Low
⁜ Site establishment ⁜ Sloping and landscaping (medium- & long term).	⁜ Loss of topsoil and fertility during site establishment. ⁜ Erosion of returned topsoil after rehabilitation.	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment- & Operational- & Decommissioning Phase	⁜ Low-Medium ⁜ Low-Medium	Control & Remedy: Proper housekeeping and storm water management.	⁜ Low ⁜ Low
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site.	⁜ Infestation of the topsoil heaps and mining area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational-, and Decommissioning Phase	⁜ Medium ⁜ Medium ⁜ Medium	Control: Implementing soil- and invader plant control/management.	⁜ Low ⁜ Low ⁜ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
⁜ Sloping and landscaping (medium- & long term).	⁜ Infestation of the denuded areas with invader plant species. ⁜ Infestation of the rehabilitated area with invader plant species.					
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site.	⁜ Dust nuisance because of the site establishment activities. ⁜ Dust nuisance because of the mining activities.	Increased dust will impact on the air quality of the receiving environment.	Site Establishment- & Operational Phase	⁜ Low-Medium ⁜ Medium	<u>Control:</u> Dust suppression methods and proper housekeeping.	⁜ Low ⁜ Low
⁜ Site establishment. ⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscaping (medium- & long term).	⁜ Noise nuisance because of the site establishment activities. ⁜ Noise nuisance because of the mining activities. ⁜ Noise nuisance because of the mining activities. ⁜ Noise nuisance because of the decommissioning activities.	Should the noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment- and Operational Phase	⁜ Low-Medium ⁜ Low-Medium ⁜ Low-Medium ⁜ Low	<u>Control:</u> Noise suppression methods and proper housekeeping.	⁜ Low ⁜ Low ⁜ Low ⁜ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscapting (medium- & long terrm).	⁜ Potential soil contamination from hydrocarbon- and other spills. ⁜ Potential impact associated with littering and hydrocarbon spills. ⁜ Potential impact associated with litter/hydrocarbon spills left at the mining area.	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the MR Holder.	Operational-, and Decommissioning Phase	⁜ Medium ⁜ Medium ⁜ Medium	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	⁜ Low ⁜ Low ⁜ Low
⁜ Excavation of mining area.	⁜ Potential impact on areas of palaeontological concern.	The impact could affect the cultural sense and/or artefacts of the area.	Site Establishment- and Operational Phase	⁜ Low-Medium	Control & Stop: Implementation of a chance-find procedure.	⁜ Low-Medium
⁜ Excavation of mining area. ⁜ Cumulative impacts	⁜ Direct loss and disturbance of fauna species and communities. ⁜ Fragmentation of ecosystems affecting safe movement of fauna species.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	⁜ Low-Medium ⁜ Low-Medium	Control & Stop: Implementing good management practices and the proposed mitigation measures.	⁜ Low ⁜ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
⁜ Excavation of mining area.	⁜ Runoff from mining area having a potential impact on the Botha's River.	Increased sedimentation of the river could have a negative impact on unique bedrock communities, as well as a decrease in instream and marginal macrophytes and aquatic communities.	Operational Phase	⁜ Low-Medium	Control & Stop: Through the proposed mitigation measures.	⁜ Low
⁜ Excavation of mining area.	⁜ Potential damage to the Eskom power lines.	Damage to the power lines will affect the power supply of the recipients.	Operational Phase	⁜ Low-Medium	Control & Stop: Through the proposed mitigation measures.	⁜ Low
⁜ Processing, stockpiling and transporting material from site.	⁜ Loss of stockpiled material due to ineffective stormwater control.	This impact could result in financial losses to the mine as well as sedimentation of the river.	Operational Phase	⁜ Low-Medium	Control: Implementing the proposed mitigation measures.	⁜ Low
⁜ Processing, stockpiling and transporting material from site.	⁜ Deterioration of the access road to the mining area. ⁜ Overloading of trucks having an impact on the public roads.	Impacting the condition of public roads may incur public complaints and additional costs to the MR Holder.	Operational Phase	⁜ Low-Medium ⁜ Medium	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	⁜ Low ⁜ Low

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked Appendix L.

j) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):

The following table provides a summary of the specialist studies that were applicable to this project. Also refer to Appendix H for a copy of the DFFE screening tool report and accompanying cover letter that provides reasons why the other specialist studies (proposed by the DFFE report) were deemed immaterial.

Table 25: Summary of specialist reports.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Palaeontological Heritage Impact Assessment for Quarry Extension at The Orchards, East of Makhanda/Grahamstown. July 2023 *(See Appendix G for a full copy of the document)*	**<u>Conclusion and Recommendations:</u>** Almost the entire area is deeply underlain by strata of the Witpoort Formation, which are variably overlain by silcrete of the Grahamstown Formation. These form part of the northern limits of the Grahamstown peneplain - a flat plain, eroded adjacent to the then coastline during the Cretaceous Period. In places small outcrops of Witpoort Formation quartzite were observed to the south of historic diggings. The lateral extent of the quartzites was not, however, apparent due to cover of soil and vegetation. Historic diggings in the north of the proposed mining right have targeted a thick bed of kaolin clay derived from an (originally black) mudstone layer. This was folded up in an east-west oriented anticlinal fold - the top of which was truncated during formation of the peneplain. Due to its proximity to surface the shale was subsequently reduced to kaolin by deep leaching during and following the	All the recommendations of the specialist were incorporated into this document.	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity: Cultural and Heritage Environment. Part A(1)(g)(iv)(1)(c) Description of specific environmental features and infrastructure on the site: Site Specific Cultural and Heritage Environment. Part A(1)(g)(viii) The possible mitigation measures that could be applied and the level of risk: Cultural and Heritage Environment. Part A(1)(h) Full description of the process undertaken to

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
	Cretaceous period – the silica and metallic elements having crystalised out near surface to produce the silcrete capping. As a result of the kaolinization of the strata their probable original palaeontological interest has been destroyed. It remains possible, however, that as the fold dives down in a southerly direction it may, in places still be capped by southwardly dipping sheets of quartzitic strata. If this is the case it may be that there are areas which have not been entirely kaolonised and where fossils may still be discernible in the strata. Should therefore, during extension of the quarry, more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess them for palaeontological potential. During disturbance of quartzitic strata, notice should also be taken in case impressions of plant stems or bony plates of fish are disturbed. Should the possibility of any such material be suspected a palaeontologist should be contacted to assess the possible fossils.		identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity. Part B(1) Mechanisms for monitoring compliance with and performance assessment the environmental management programme and reporting thereon, including g) monitoring of impact management actions, h) monitoring and reporting frequency, i) responsible persons, j) time for implementing impact management actions, k) mechanisms for monitoring compliance.
Terrestrial Biodiversity Compliance Statement for the Proposed Makhanda Mining Project.	**<u>Specialist Recommendations:</u>** It is important to consider that undeveloped portions of land can still contribute to land management objectives and protection targets to some degree. It is recommended	All the recommendations of the specialist were incorporated into this document apart from those referring to the construction of	Part A(1)(d)(ii) Description of the activities to be undertaken – 2.1.2 Clearing of Vegetation.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
September 2023 *(See Appendix F for a full copy of the statement)*.	that care be taken during construction to adhere to mitigation measures (see pg. 21 – 26 of Appendix F). An AIP management plan must be implemented as a priority to prevent the further spread and proliferation of AIP species to the surrounding natural areas. Installation of leak warning and detection systems on all pipelines must also be made a priority to prevent damage caused by pipe leaks on the surrounding natural areas, particularly near to water resources.	buildings/structures as these are not applicable to this application.	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity: Biodiversity Conservation Areas, Groundcover, and Fauna. Part A(1)(g)(iv)(1)(c) Description of specific environmental features and infrastructure on the site: Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna. Part A(1)(g)(viii) The possible mitigation measures that could be applied and the level of risk: Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna. Part A(1)(h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
			Part B(1) Mechanisms for monitoring compliance with and performance assessment the environmental management programme and reporting thereon, including: g) monitoring of impact management actions, h) monitoring and reporting frequency, i) responsible persons, j) time for implementing impact management actions, k) mechanisms for monitoring compliance.

k) Environmental impact statement

i) Summary of the key findings of the environmental impact assessment.

The key findings of the environmental impact assessment regarding the proposed mining operation entail the following:

Project Proposal:

Makhanda Mining (Pty) Ltd applied for environmental authorisation and a mining right application to win ball clay, clay (general), gravel, kaolin, and aggregate from 43.4688 ha of Portion 3 of the farm The Orchards No 233 in the Makhanda Area. The clay will be excavated and loaded onto trucks that will transport it to the Makana Brick Factory (off-site) where it will be used to manufacture clay bricks. Unwanted overburden will be sold as aggregate. Minor processing/screening may be needed to reduce the aggregate to various sized stockpiles.

Topography:

The impact on the topography and geology is considered of low-medium significance if the depth of the exaction and extent of disturbance is considered and of low-medium significance if the cumulative impact is considered. Change in topography and geology of the mining area is unavoidable considering the nature of the project and will be irreversibly altered since a portion the land will be permanently removed. Through profiling the faces and stabilizing it with proper vegetation cover, the potential impact can be mitigated.

Visual Characteristics:

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

Air Quality and Noise Ambiance:

The proposed operation will not trigger an application in terms of the NEM:AQA. Emissions to be generated at the mine will mainly consist of occasional dust. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). The expected impact on air quality and noise ambiance is Low with mitigation.

Geology:

During the operational phase, mining will result in permanent removal of clay and overburden, and the impact on the geology is unavoidable. Clay deposits are not regarded as a strategic mineral, and the study area is not a geo-site and therefore of less importance. Considering these factors, the impact is unavoidable but rated of low-moderate significance. The impact on soil properties is rated as low with mitigation.

Hydrology and Geohydrology:

Mining will not alter the drainage patterns as water from the quarry will accumulate in the existing retention ponds. The Botha's River will not be impacted by mining since the mine boundary is more than 100 m away from the stream bank. The mining activities will not have an impact on the groundwater since the mine floor will be restricted to 20 m and will therefore not undercut the groundwater table. No boreholes will be drilled and thus the impact on groundwater is rated as insignificant.

Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna:

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

It is therefore the opinion of the specialists that the project may be favourably considered, provided that the proposed mitigation measures be implemented. The location, state and size of the ecosystem means that it is unlikely that any

functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

Cultural and Heritage Environment:

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

Socio-economic Environment:

Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

The proposed development will also generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the SLP the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

Existing Infrastructure:

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

ii) Finale Site Map

Provide a map at an appropriate scale, which superimposes the proposed overall activity and its associated structure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers Attach as **Appendix**

See the map showing the site activities attached as Appendix C.

iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives.

The positive impacts associated with the proposed mining activity include the following:

- Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region,
- The red/orange clay is a localized occurrence that is highly sought after in the brick making industry, to be exploited by this mine,
- Work opportunities due to continued mining,
- The landowner will generate income from the mining footprint in the form of compensation,
- The Applicant will contribute to Human Resources Development and LED projects that will support the development of the local socio-economic environment,
- Return of the mined areas to agricultural use post mining.

The following table shows the potential negative impacts associated with the proposed activity that were deemed to have a Low-Medium or higher significance/risk:

Table 26: List of potential impacts deemed to have a low-medium or higher significance/risk.

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION	SIGNIFICANCE (AFTER MITIGATION)
Site establishment	Loss of grazing for duration of mining.	Medium	Low-Medium
Site establishment	Visual intrusion because of site establishment	Mediuim-High	Low-Medium
Site establishment	Direct loss and disturbance of floral species.	Low-Medium	Low-Medium
Excavation of mining area.	Potential impact on areas of palaeontological concern.	Low-Medium	Low-Medium

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPR as well as for inclusion as conditions of authorization.

Table 27: Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
TOPOGRAPHY Landscaping of Mining Area	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ Implement progressive rehabilitation as prescribed in the closure plan, appended to this document, through-out the operational- and decommissioning phases of the project.	⁜ Effectively restoring the mining area to prevent residual impacts and allow for the proposed agricultural end-use.
VISUAL CHARACTERISTICS Visual Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ Ensure that the site has a neat appearance and is always kept in good condition. ⁜ Store mining equipment neatly in a dedicated area with a sealed drip tray underneath when not in use. ⁜ Implement concurrent rehabilitation as mining progress to limit the visual impact on the aesthetic value of the area. ⁜ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ⁜ Rehabilitate and level the site upon closure to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	⁜ Minimise the impact of the mining operations on the visual characteristics of the receiving environment during the operational phase and minimise the residual impact after closure.
AIR QUALITY AND NOISE AMBIANCE Dust Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	⁜ Control the liberation of dust into the surrounding environment using; inter alia, water spraying and/or other dust-allaying agents.	⁜ Dust prevention measures are applied to minimise the generation of dust.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer. Occupational Hygienist to report on the air quality of the mine.	⁎ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ⁎ Limit speed on the access roads to 40 km/h to prevent the generation of excess dust. ⁎ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ⁎ Flatten loads to prevent spillage and windblown dust during transportation. ⁎ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods. ⁎ Ensure dust-generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). ⁎ Implement best practice measures during the stripping of topsoil, loading, and transporting of the mineral from the site to minimize potential dust impacts. ⁎ Fit dust allaying structures such as water sprayers to the crushing plant. ⁎ Daily clean the processing equipment of excess material and dust.	
AIR QUALITY AND NOISE AMBIANCE Noise Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁎ Ensure that employee and visitors to the site conduct themselves in an acceptable manner while on site. ⁎ Do not permit loud music at the mining area. ⁎ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996.	⁎ Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Occupational Hygienist to report on the noise levels of the mine.	⁎ Implement best practice measures to minimise potential noise impacts. ⁎ Appoint a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be done in accordance with the SANS10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	
GEOLOGY AND SOIL Topsoil Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁎ Strip and stockpile the upper 300 mm of the soil before mining. ⁎ Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. ⁎ Ensure topsoil stripping, stockpiling, and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. ⁎ Place the topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. ⁎ Protect topsoil stockpiles against losses by water- and wind erosion. Position stockpiles so as not to be vulnerable to erosion by wind and water. Establish plants (weeds or a cover crop) on the stockpiles to prevent erosion. ⁎ Ensure that topsoil heaps do not exceed 2 m. ⁎ Keep temporary topsoil stockpiles free of invasive plant species. ⁎ Divert storm- and runoff water around the stockpile area to prevent erosion. ⁎ Prepare the clay sub-layer before topsoil or overburden is replaced as listed below: ▪ All cracks, channels and root cavities must be properly scarified and filled in, if necessary.	⁎ Adequate fertile topsoil is available to rehabilitate the mining area.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		▪ Thereafter, the whole slope and platform area must be compacted. ▪ Once compacted, only the top 5 cm of the clay layer must be ripped lightly along the contour before overburden is replaced. ▪ Once the overburden layer is replaced, the area can be topsoiled. ᵡ Spread the topsoil evenly, to a depth of 300 m, over the rehabilitated area upon closure of the site. Slightly key the topsoil in with the lower horizons by ripping it lightly along the contour and fertilised if necessary. ᵡ Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. ᵡ Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established. ᵡ Use water from the retention pond, alternatively from the Makana Brick dam to irrigate the cover crop. ᵡ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after closure.	
HYDROLOGY	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	ᵡ Do not allow activities to take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan.	ᵡ Mining having no impact on the Botha's River and/or downstream users.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
Mitigating the potential impact on the Botha's River and Downstream Users.	Compliance to be monitored by the Environmental Control Officer.	⁎ Contain all mining activities in the approved footprint and preserve the vegetation layer between the river and the northern boundary of the mine. ⁎ Treat the 100 m between the river and the mine as a no-go area and educate all employees accordingly. ⁎ Implement adequate storm water management measures including diverting storm- and floodwater around the stockpile and excavation areas and preventing sediment and silt from entering the river. ⁎ Take necessary precautions to ensure that floodwaters are diverted around the processing/stockpile- and excavation areas by means of berms.	
HYDROLOGY Erosion Mitigation / Storm Water Control	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁎ Implement the Stormwater Management Plan, appended to this document. ⁎ Limit removal of vegetation ahead of the production faces. ⁎ Ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. Do land clearing during the dry seasons (if possible) to avoid water runoff into the watercourse thus affecting the water quality. ⁎ Divert storm water around the topsoil heaps and mining areas to prevent erosion. ⁎ Control all drainage from the project area to prevent off-site pollution, flooding, or damage to infrastructure downstream of any storm water discharge points. ⁎ Put erosion control measures in place to minimise erosion. Take extra precautions in areas where the soils are deemed highly erodible. These measures could include the use of	⁎ Impact to the environment caused by storm water discharge is avoided and erosion is managed.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		sandbags, hessian sheets, bidim, retention or replacement of vegetation. - Use silt traps where there is a danger of topsoil or material stockpiles eroding and entering the river and other sensitive areas. - Do not allow stockpiling of soil or any other materials during the operational phase on or near steep slopes, near a watercourse or water body. Control and establish suitable mitigation measures to prevent the erosion of stockpiles. - Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. - Revegetate reinstated soil as soon as possible to restore soil properties and reduce runoff. Curb erosion that occurs on the slopes, with infill material obtained from the active mining area. - Implement concurrent rehabilitation of disturbed areas if and where possible to avoid erosion of bare soil.	
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA Impacts on floral species, and fragmentation of vegetation communities within the CBA and ESA ecosystems.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	- Clearly demarcate the mining boundaries and contain all operations to the approved mining area. - Declare the area outside the mining boundaries a no-go area and educate all employees accordingly. - Prevent fragmentation and/or disturbance of indigenous vegetation, even secondary communities outside of the direct project footprint. - Limit laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) to already modified areas and the smallest footprint possible. - Use existing roads and walking paths.	- Vegetation clearing is restricted to the authorised development footprint of the mine.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		⁎ Minimise the clearing of vegetation where possible. Restrict all activities to within the authorised areas. ⁎ Inform staff members that it is an offence to take any indigenous plant species out of any portion of the Project area, or to bring any alien plant species into any portion of the Project area except for rehabilitation purposes. ⁎ Compile a fire management plan and implement it to restrict the impact fire would have on the surrounding areas. ⁎ Implement an invasive plant species management plan n site to control weeds and invasive plants on denuded areas, topsoil heaps and rehabilitated areas. ⁎ Revegetate areas that are denuded with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. Keep all grazing mammals out of the areas that have recently been re-planted. ⁎ Ensure final rehabilitation consists of profiling, spreading of available overburden and stockpiled topsoil and upgrading of the topsoil and seeding with a prescribed grass seed mix (refer to Closure Plan) during the period March to October.	
MINING, BIODIVERSITY AND GROUNDCOVER Management of Invasive Plant Species	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁎ Implement an invasive plant species management plan at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA, 2004. Do weed/alien removal on an ongoing basis throughout the life of the mining activities. ⁎ Keep all stockpiles free of invasive plant species. ⁎ Control declared invader or exotic species on the rehabilitated areas.	⁎ Mining area is kept free of invasive plant species.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
TERRESTRIAL FAUNA Impact on faunal species, and fragmentation of ecosystems affecting safe movement of species.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ Ensure there is a qualified ECO on site when activities begin. Consider a site walk through by a suitably qualified ecologist prior to commencement. In situations where SSC or protected species is noted these species must be removed, but only do so after the required permission/permits were obtained. In the abovementioned situation, develop and implement a search, rescue, and recovery program for the protection of these species. Should animals not move out of the area on their own, contact the relevant specialists to advise on how the species can be relocated. ⁜ Conduct clearing and disturbance activities in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, to provide an easy escape route for all small mammals and herpetofauna (frogs). ⁜ Demarcate the areas to be disturbed specifically and responsibly to prevent the movement of staff or any individual into the surrounding environments, and place signs to enforce this. ⁜ Demarcate the mining activities with beacons rather than fencing it off to allow free movement of roaming species. If fencing is required: use wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. ⁜ Ensure no fauna is caught, killed, harmed, sold, or played with. ⁜ Provide environmental induction to all personnel regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Instruct	⁜ Disturbance to fauna is minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		workers to report any animals that may be trapped in the working area. - Prevent the setting of snares or raiding of nests for eggs or young. - Dig any holes/deep excavations in a progressive manner and do not leave it open overnight. Should any holes remain open overnight it must be properly covered temporarily to ensure that no small fauna species fall in. Inspect holes subsequently for fauna prior to backfilling. - Restrict the speed of all vehicles (40 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. - Do not handle or antagonise any dangerous fauna (snakes, scorpions, etc.) and/or other animals that are encountered during construction. Contact a suitably qualified person(s) to remove the animals to safety. - Do not throw or leave litter, food, or other foreign material around the site. Place this in demarcated rubbish and litter areas that are animal proof. - Keep noise to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. - Use environmentally friendly cleaning and dust suppressant products. - Minimise the duration of the activities to as short a term as possible, to reduce the period of disturbance on fauna. - Put a pest control plan in place and do not use poisons to control pests.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
CULTURAL AND HERITAGE ENVIRONMENT Archaeological, Heritage and Palaeontological Aspects	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Archaeologist/Palaeontologist to comment should any features of importance be unearthed. Compliance to be monitored by the Environmental Control Officer.	⁜ Confine all mining to the development footprint area. ⁜ Contact a palaeontologist should, during extension of the quarry, more shaly material of a grey to black colour be encountered to the south. ⁜ Take note of impressions of plant stems or bony plates of fish during disturbance of quartzitic strata. Should the possibility of any such material be suspected contact a palaeontologist to assess the possible fossils. ⁜ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA. ⁜ Implement the Fossil Chance Find Procedure, proposed in this document, should fossils be uncovered.	⁜ Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		⁜ Submit monitoring reports for this activity, as well as the details of the specialist that will train the ECO to ECPHRA.	
SOCIO-ECONOMIC ENVIRONMENT / LAND USE Loss of grazing for duration of mining.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ If needed, sign mined/rehabilitated areas back to agricultural use once the cover crop stabilised.	⁜ Mining has the least possible impact on the operation of the property.
EXISTING INFRASTRUCTURE Access Road Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ Divert storm water around the access road to prevent erosion. ⁜ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ⁜ Repair rutting and erosion of the access road caused as a direct result of the mining activities. ⁜ Prevent the overloading of the truck and file proof of load weights for auditing purposes. ⁜ Erect heavy vehicle signs on both sides of the N2 junction of the farm road, to increase safety standards. ⁜ Sensitise truck drivers towards displaying proper road etiquette, and hold regular toolbox talks with truck drivers and sub-contractors to address reckless driving and speeding.	⁜ The access road remains accessible to the landowner during the operational phase, and upon closure, the road is returned in a better, or at least the same state as received by the right holder.
EXISTING INFRASTRUCTURE Power Line Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁜ Maintain an adequate no-go buffer (minimum 10 m) around the power lines as per Eskom standard. ⁜ Immediately (within the first hour of occurrence) inform Eskom should the line be damaged.	⁜ The power lines are not damaged by mining operations.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
GENERAL Waste Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	⁎ Ensure regular vehicle maintenance, repairs and services only take place at the off-site workshop and service area. Ensure drip trays are present if emergency repairs are needed on equipment not able to move to the workshop. Dispose all waste products in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. ⁎ Provide all employees with ablution facilities. Ensure that the toilet is placed outside the 1:100-year floodline of the river or further than 100 m from the watercourse (whichever is greatest). ⁎ Ensure that the ablution facilities does not cause pollution to water sources or pose a health hazard. In addition, prevent any form of secondary pollution from the disposal of refuse or sewage. Address any pollution problems arising from the above immediately. ⁎ If a diesel bowser is used on site, always equip it with a drip tray. Ensure that drip trays are used during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ⁎ Clean drip trays after use. Do not use dirty drip trays. ⁎ Ensure that an emergency spill kit is available on site. ⁎ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ⁎ Should spillage occur, such as oil or diesel leaking from a burst pipe, collect the contaminated soil, within the first hour of	⁎ Wastes are appropriately handled and safely disposed of at recognised waste facilities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES

		occurrence, in a suitable receptacle and remove it from the site, either for resale or for appropriate disposal at a recognized facility. File proof.
		- Compile a waste management plan (inclusive of a hydrocarbon spill management plan) that focus on the waste hierarchy of the NEM:WA and implement it on site.
		- Contain all general waste in marked, sealable, refuse bins placed at a designated area, to be removed when filled to a recognised general waste landfill site.
		- Prevent the burning or burying of waste on site.
		- Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the DWS and other relevant authorities. In addition, should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity must be provided to the affected users.
		- If small volumes of wastewater is generated during the site establishment and operational phase:
		  ▪ Do not discharge water containing waste into the natural environment,
		  ▪ Implement measures to contain the water containing waste and safely dispose thereof.
		- In the event of a spill the following steps must be:
		  ▪ Stop the source of the spill,
		  ▪ Contain the spill,
		  ▪ Report all significant spills to DWS and other relevant authorities,
		  ▪ Remove the spilled product for treatment and authorised disposal,	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		▪ Determine if there is any soil, groundwater, or other environmental impact, ▪ If necessary, take remedial action in consultation with DWS, ▪ Document the incident.	
GENERAL Management of Health and Safety Risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Health and safety representative to manage H&S aspects at the mine. Compliance to be monitored by the Environmental Control Officer.	⁜ Ensure adequate ablution facilities and water for human consumption is daily available on site. ⁜ Ensure that workers have access to the correct PPE as required by law. ⁜ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	⁜ Employees work in a healthy and safe environment.

m) Final proposed alternatives.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives, which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

The Final Project Proposal entails:

- the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3;
- the opencast mining of the clay upon which it will be transported to the Makana Brick Factory where it will be used for clay bricks. The overburden may also be sold as aggregate;
- no permanent infrastructure and/or buildings will be established on site as the crushing plant and ablution hut will both be of temporary nature. Further to this, the design and layout of the proposed footprint were based on the available clay resources and colour variants;
- slope mining to improve blending across the sediment layers. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant; and
- the operational aspects of the activity were based on the historic mining activities that's been ongoing for several years. The Applicant already holds water rights that can supply the project with water, no electricity connection is needed, no servicing of mining equipment will be required on site, and the mining sub-contractor will transport the material from the mine to Makana Brick along existing roads.

Also refer to Part A(1)(g) *Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site*; as well as Part A(1)(g)(i) *Details of the development footprint alternatives considered* for a discussion regarding the matters that were considered when determining the preferred development option within the overall site.

n) Aspects for inclusion as conditions of Authorization.

Any aspects which have not formed part of the EMPR that must be made conditions of the Environmental Authorization

The management objectives listed in this report under *Part A(1)(L) Proposed impact management objectives and the impact management outcomes for*

inclusion in the EMPR above should be considered for inclusion in the environmental authorisation.

o) Description of any assumptions, uncertainties, and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site-specific information gathered from the Applicant, site inspections, specialist- and desktop studies. No uncertainty regarding the proposed project or the receiving environment could be identified presently.

p) Reasoned opinion as to whether the proposed activity should or should not be authorized.

i) Reasons why the activity should be authorized or not.

The specialists agree that with mitigation management and monitoring the risk of the proposed activity on the receiving environment will be of acceptable significance. In light thereof, it is proposed that should the Applicant commit to the project proposal as presented in this report, the mitigation measures, and monitoring programmes, no fatal flaws could at this point and time be identified that were deemed as severe as to prevent the activity continuing.

ii) Conditions that must be included in the authorization.

(1) Specific conditions to be included into the compilation and approval of EMPR

The management objectives listed in this report under *Part A(1)(l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* must be included into the compilation and approval of the EMPR.

(2) Rehabilitation requirements

The rehabilitation- and closure objectives proposed in *Part B(d)(i) Determination of Closure Objectives* and the Closure Plan attached as Appendix M, to this report, must be included in the authorisation.

Once the mining area was rehabilitated the MR Holder is required to submit a closure application to the Department of Mineral Resources and Energy in

accordance with section 43(4) of the MPRDA, 2002 that states: *"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".* The Closure Application will also be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

q) Period for which the Environmental Authorization is required.

The MR Holder requested that the Environmental Authorisation be valid for the duration of the mining right.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme report.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

i) Explain how the aforesaid amount was derived.

The amount required to annually manage and rehabilitate the affected environment was estimated to be ±R 208 251.00. Please refer to Appendix N – *Financial and Technical Competence Report* for and explanation as to how this amount was arrived at.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

The mining operations will be self-funded through income generated by the activities. If necessary, bridging finance will be provided by Grahamstown Brick (Pty) Ltd towards this specific project.

t) Deviations from the approved scoping report and plan of study.

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

No deviation from the methodology used in determining the significance of potential environmental impacts and risks were necessary. The methodology described in the Scoping Report was also used in the Environmental Impact Assessment Report.

ii) Motivation for the deviation.

Not applicable.

u) Other Information required by the competent Authority.

i) Compliance with the provisions of sections 24 (4) (a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA report must include the:

(1) Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 219.1 and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein).

The following potential impacts were identified that may affect socio-economic conditions of directly affected persons:

- **Visual intrusion associated with the mining:**

  The removal of the vegetation cover to access the clay will impact on the visual character of the study area. It is however proposed that the visual impact of the earmarked footprint will be of low-medium significance after mitigation. The small scale of the proposed operation, and the proposed progressive rehabilitation, will assist in mitigating the visual impact of the proposed development on the surrounding environment. No residual visual impact is expected upon closure of the mine.

- **Impact on the air quality and noise ambiance of the study area:**
  The proposed operation will not trigger an application in terms of the NEM:AQA. Emissions to be generated at the mine will mainly consist of occasional dust. Due to the small scale of the operation the noise levels to be generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). The expected impact on air quality and noise ambiance is Low with mitigation.

- **Employment opportunities and socio-economic impact:**
  The operation will contribute to the local economy in the area, both directly and through the multiplier effect that its continued presence will create. Equipment and supplies will be purchased locally, and wages are spent at local businesses, generating both jobs and income in the area. Although the employees are not resident on the site, they will be from the surrounding community.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(*vi*) and (*vii*) of that Act, attach the investigation report as **Appendix 219.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

The specialist did not identify the presence of national estate as referred to in Section 3(2) of the NHRA, 1999 within the earmarked footprint of the study area.

v) Other matter required in terms of section 24(4)(a) and (b) of the Act.

(The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives as contemplated in sub-regulation 22(2)(h), exist the EAP must attach such motivation as **Appendix 4)**

The alternatives associated with the proposed activity, investigated during the impact assessment process, were done at the hand of information obtained during the site investigation, public participation process, specialist studies as well as desktop studies conducted of the study area. Refer to Part A(1)(m) *Final Proposed Alternatives*.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Draft environmental management programme.

a) Details of the EAP,

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details and expertise of Ms C Fouché of Greenmined Environmental (Pty) Ltd that acts as EAP on this project has been included in *Part A(1)(a) Details of Greenmined Environmental* as well as Appendix P as required.

b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

The aspects of the activity that are covered by the draft environmental management programme were described and included in *Part A(1)(h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity*.

c) Composite Map

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers)

As mentioned under *Part A(1)(k)(ii) Finale Site Map* the map was compiled and is attached as Appendix C.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

(Ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The primary objective, at the end of the mine's life, is to obtain a closure certificate at minimum cost and in as short a time 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 infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources and Energy.
- Shape and contour disturbed areas in compliance with the EMPR.
- Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the damming of surface water.
- Make all excavations safe.
- Use the topsoil effectively to promote the re-establishment of vegetation.
- Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.
- Eradicate all weeds/invader plant species by intensive management of the mining area.

The site-specific closure objectives are discussed in detail in the attached Closure Plan (Appendix M), however, a summary of the closure objectives for the proposed mine was included below.

As mentioned earlier, the rehabilitation will include activities to be divided into medium- and long-term categories. In the medium term, rehabilitation will entail the continuous shaping of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve the shaping of the stockpiling/processing area by removing the stockpiled material and site infrastructure/equipment and landscaping the disturbed footprints. The MR holder will further be responsible for the seeding of all rehabilitated areas.

The decommissioning activities will therefore consist of the following:

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

As mentioned previously, the design of the excavations will take place with the rehabilitation end goal in mind. The clay will be removed along the benches or down the slopes at an incline of between 15 and 22°. Faces will be benched and cut at 5 m, creating a 5 m high bottom bench and 8 m high top bench with a ±3 m

horizontal platform between. The horizontal platform will have a gentle slope to no more than 1% gradient forwards to ensure that stormwater drain freely off the platforms. This will be important for rehabilitation, due to the properties of clay that may hinder rehabilitation if the stormwater is retained on the platforms.

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

Excess material and overburden will be used to profile the production faces. The excavation will not be refilled. Topsoil will be spread to a depth of at least 200 mm over the floor and scarified lightly to key it in with the sub-layer. The mine will be rehabilitated to sustainable secondary grassland, allowing natural succession for thicket to establish. Alien and invader plant species will continually be cleaned from rehabilitated areas until the Right Holder obtained a closure certificate.

The future land use of the rehabilitated mining footprint will be agriculture. Upon replacement of the topsoil, the area will be available for grazing, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

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

Rehabilitation of the Excavation:

- The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material (if any) removed from the excavation must be dumped into the excavation.
- No waste may be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

- The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix 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.

Rehabilitation of Processing/Stockpile Area:

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

be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

Final Rehabilitation:

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

Once the mining area was rehabilitated the MR Holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"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".* The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

Due to the nature of the mining operation, it is believed that the risk of environmental damage or pollution is of low significance. If site management implement the mitigation measures as prescribed in this document, it is believed that the impact on the receiving environment can be adequately controlled.

iii) Potential risk of Acid Mine Drainage.

(Indicate whether or not the mining can result in acid mine drainage).

Not applicable.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

Not applicable.

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

Not applicable.

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

Not applicable.

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

As mentioned in *Part A(1)(d)(ii) Description of the activities to be undertaken – 2.2.3 Water Management* the Applicant intends to use water obtained from the Makana Brick dam on the farm Brakkefontein No 243 for dust suppression purposes on The Orchards No 233. It is proposed that the operations will require an average of ±3 000 l/month.

viii) Has a water use license been applied for?

The proposed project does not trigger an application in terms of the NWA as the development footprint will be >100 m from the Botha's River. Furthermore, the water to be used for dust suppression on site will be sourced from an already authorized dam at Makana Brick and transported in a water cart to the Orchards mining area when needed.

ix) Impacts to be mitigated in their respective phases.

Measures to rehabilitate the environment affected by the undertaking of any listed activity

Table 28: Impact to be mitigated in their respective phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
⁜ Demarcation of the mine with visible beacons.	Site Establishment phase	43.4688 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Mining is only allowed within the boundaries of the approved area. ⁜ MPRDA, 2002 ⁜ NEMA, 1998	Beacons need to be in place throughout the life of the mine.
⁜ Site establishment	Site Establishment, and Operational Phase	±43.5 ha	**<u>Loss of Grazing for Duration of Mining:</u>** ⁜ The temporary loss of agricultural land for the duration of the mining period is acceptable to the landowner. If needed,	Use of agricultural land must be managed in accordance with the: ⁜ CARA, 1983	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
		(Progressively opened as mining proceed)	mined/rehabilitated areas will revert back to agricultural use once the cover crop stabilised.	⁎ Closure Plan (Appendix M)	
⁎ Site establishment	Site Establishment- & Operational Phase	±43.5 ha (Progressively opened as mining proceed)	**<u>Visual Mitigation:</u>** ⁎ The site must have a neat appearance and be always kept in good condition. ⁎ Mining equipment must be stored neatly in a dedicated area with a sealed drip tray underneath when not in use. ⁎ Concurrent rehabilitation must be done as mining progress to limit the visual impact on the aesthetic value of the area. ⁎ The MR Holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area. ⁎ Upon closure the faces must be profiled and stabilised with proper vegetation cover to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	Management of the mining activities must be in accordance with the: ⁎ MPRDA, 2002 ⁎ NEMA, 1998	Throughout the site establishment- and operational phases.
⁎ Site establishment ⁎ Cumulative impacts	Site Establishment- & Operational Phase	±43.5 ha (Progressively opened as mining proceed)	**<u>Management of the impact on floral species, and fragmentation of vegetation communities within the CBA and ESA ecosystems:</u>**	Natural vegetated areas must be managed in accordance with the: ⁎ NEM:BA 2004	Throughout the site establishment- and operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁜ The mining boundaries must be clearly demarcated and all operations must be contained to the approved mining area. ⁜ The area outside the mining boundaries must be declared a no-go area, and all employees must be educated accordingly. ⁜ Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further. ⁜ Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and should take up the smallest footprint possible. ⁜ All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles. ⁜ The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas. ⁜ It must be made an offence for any staff member to take any indigenous plant species out of any portion of the Project area, or to bring any alien plant species into any portion of the Project area except for rehabilitation purposes. This is to prevent		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			the spread of exotic or invasive species or the illegal collection of plants. ⁜ A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas. ⁜ An invasive plant species management plan must be implement on site to control weeds and invasive plants on denuded areas, topsoil heaps and rehabilitated areas. ⁜ Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted. ⁜ Final rehabilitation must consist of profiling, spreading of available overburden and stockpiled topsoil and upgrading of the topsoil and seeding with a prescribed grass seed mix (refer to Closure Plan) during the period March to October.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
⁎ Site establishment ⁎ Sloping and landscaping (medium- & long term).	Site Establishment- and Operational Phase	±43.5 ha (Progressively opened as mining proceed)	**<u>Topsoil Management:</u>** ⁎ The upper 300 mm of soil must be stripped and stockpiled before mining. ⁎ Topsoil is a valuable and essential resource for rehabilitation, and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. ⁎ Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The mining plan must be such that topsoil is stockpiled for the minimum possible time. ⁎ The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. ⁎ Topsoil stockpiles must be protected against losses by water- and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. ⁎ Topsoil heaps may not exceed 2 meters. ⁎ The temporary topsoil stockpiles must be kept free of invasive plant species.	Topsoil stripping must be managed in accordance with the: ⁎ CARA, 1983 ⁎ Closure Plan (Appendix M) ⁎ MPRDA, 2002 ⁎ NEM:BA, 2004 ⁎ SWMP	Throughout the site establishment-, operational- and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁜ Storm- and runoff water must be diverted around the stockpile area to prevent erosion. ⁜ Before topsoil or overburden is replaced, the clay sub-layer must be prepared: ▪ All cracks, channels and root cavities must be properly scarified and filled in, if necessary. ▪ Thereafter, the whole slope and platform area must be compacted. ▪ Once compacted, only the top 5 cm of the clay layer must be ripped lightly along the contour before overburden is replaced. ▪ Once the overburden layer is replaced, the area can be top dressed with topsoil. ⁜ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. The topsoil must be keyed-in slightly with lower horizons by ripping it lightly along the contour and fertilised if necessary. ⁜ The Applicant must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. ⁜ A cover crop must be planted, irrigated, and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil (if deemed necessary). It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established. ⁜ Water from the retention pond, alternatively from the Makana Brick dam (already authorised) can be utilized to irrigate the cover crop to help fast track re-vegetation. ⁜ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after closure.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
⁜ Site establishment ⁜ Sloping and landscaping (medium- & long term).	Site Establishment- and Operational Phase	±43.5 ha	**Erosion Control and Stormwater Management:** ⁜ The Stormwater Management Plan, appended to this document, must be implemented on site. ⁜ Removal of vegetation ahead of the production faces must be limited. ⁜ The applicant must ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. It is recommended that the land clearing be done during dry seasons to avoid water runoff into the watercourse thus affecting the water quality. ⁜ Storm water must be diverted around the topsoil heaps and mining areas to prevent erosion. ⁜ Drainage must be controlled to ensure that runoff from the mining area does not culminate in off-site pollution, flooding or result in any damage to properties downstream or any storm water discharge points. ⁜ Erosion control measures must be put in place to minimise erosion along the proposed mining areas. Extra precautions must be taken in areas where the soils are deemed highly erodible. These measures	Soil must be managed in accordance with the: ⁜ CARA, 1983 ⁜ Closure Plan (Appendix M) ⁜ MPRDA, 2002 ⁜ NEM:BA, 2004 ⁜ NWA, 1998 ⁜ SWMP	Throughout the site establishment-, operational- and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			could include the use of sandbags, hessian sheets, bidim, retention or replacement of vegetation. ⁜ Silt traps must be used where there is a danger of topsoil or material stockpiles eroding and entering the river and other sensitive areas. ⁜ Stockpiling of soil or any other materials during the operational phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface run-off. The Applicant must control and establish suitable mitigation measures to prevent the erosion of stockpiles. ⁜ Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: ▪ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			▪ Dirty water must be collected and contained in a system separate from the clean water system. ▪ Dirty water must be prevented from spilling or seeping into clean water systems. ▪ A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns). ▪ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.		
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscaping (medium- & long term).	Site Establishment & Operational-, and Decommissioning Phase	±43.5 ha	**Management of Invasive Plant Species:** ⁜ An invasive plant species management plan (Appendix K) must be implemented at the site to ensure the management and control of all 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). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.	Invader plants must be managed in accordance with the: ⁜ CARA, 1983 ⁜ NEM:BA 2004 ⁜ Invasive Plant Species Management Plan (Appendix K)	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁜ All stockpiles must be kept free of invasive plant species. ⁜ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: ▪ The plants can be uprooted, felled or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.		
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site.	Site Establishment- and Operational Phase	±43.5 ha	**Fugitive Dust Emission Mitigation:** ⁜ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). ⁜ The site manager must ensure continuous assessment of the dust suppression equipment to confirm its effectiveness in addressing dust suppression.	Dust generation must be managed in accordance with the: ⁜ NEM:AQA. 2004 Regulation 6(1) ⁜ National Dust Control Regulations, GN No R827 ⁜ ASTM D1739 (SANS 1137:2012)	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁜ Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust. ⁜ Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining. ⁜ Loads must be flattened to prevent spillage of clay and/or aggregate during transportation, also minimising windblown dust. ⁜ Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. ⁜ All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012). ⁜ Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the clay and/or agreggates from site to minimize potential dust impacts. ⁜ Dust allaying structures such as water sprayers must be fitted to the crushing plant.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁎ The processing equipment must daily be cleaned of excess material and dust.		
⁎ Site establishment. ⁎ Excavation of mining area. ⁎ Processing, stockpiling and transporting material from site. ⁎ Sloping and landscaping (medium- & long term).	Site Establishment- & Operational Phase	±43.5 ha	**Noise Handling:** ⁎ The Applicant must ensure that the employee and visitors to the site conduct themselves in an acceptable manner while on site. ⁎ No loud music may be permitted at the mining area. ⁎ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996). ⁎ Best practice measures shall be implemented in order to minimize potential noise impacts. ⁎ A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	Noise generation must be managed in accordance with the: ⁎ NEM:AQA. 2004 Regulation 6(1) ⁎ NRTA, 1996	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscapting (medium- & long terrm).	Operational-, and Decommissioning Phase	±43.5 ha	**<u>Waste Management:</u>** ⁜ Vehicle maintenance, repairs and services may only take place at the off-site workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. ⁜ Ablution facilities must be provided to all employees. The toilet must be placed outside the 1:100-year floodline of the river or further than 100 m from the watercourse (whichever is greatest). ⁜ The ablution facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage. Any pollution problems arising from the above are to be addressed immediately by the Applicant. ⁜ If a diesel bowser is used on site, it must be always equipped with a drip tray. Drip trays must be used during each refuelling event. The nozzle of the bowser needs to	Mining related waste must be managed in accordance with the: ⁜ NWA, 1998 ⁜ NEM:WA, 2008 ⁜ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ⁜ NEMA, 1998 (Section 30)	Throughout the site establishment-, operational- and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			rest in a sleeve to prevent dripping after refuelling. ⁜ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. ⁜ An emergency spill kit must always be available on site. ⁜ Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ⁜ Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed to the hazardous waste storage area of the workshop, either for resale or for appropriate disposal at a recognized facility. Proof must be filed. ⁜ A waste management plan (inclusive of a hydrocarbon spill management plan) must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA. ⁜ General waste must be contained in marked, sealable, refuse bins placed at a		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION

			designated area, to be removed when filled to a recognised general waste landfill site.
			- No waste may be buried or burned on the site.
			- It is important that the occurrence of any significant chemicals, fuels etc. spill and/or pollution of any surface or groundwater during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities. In addition, should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity must be provided to the affected users.
			- Should small volumes of wastewater be generated during the site establishment and operational phase:
			  ▪ Water containing waste may not be discharged into the natural environment,
			  ▪ Measures to contain the water containing waste and safely dispose thereof must be implemented.
			- In the event of a spill the following steps must be:
			  ▪ Stop the source of the spill,
			  ▪ Contain the spill,		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			▪ All significant spills must be reported to DWS and other relevant authorities, ▪ Remove the spilled product for treatment and authorised disposal, ▪ Determine if there is any soil, groundwater, or other environmental impact, ▪ If necessary, remedial action must be taken in consultation with DWS, ▪ Incident must be documented.		
⁎ Excavation of mining area.	Site Establishment & Operational Phase	±43.5 ha (Progressively opened as mining proceed)	**Archaeological, Heritage and Palaeontological Aspects:** ⁎ All mining must be confined to the development footprint area. ⁎ Should, during extension of the quarry, more shaly material of a grey to black colour be encountered to the south, a palaeontologist must be contacted to assess them for palaeontological potential. ⁎ During disturbance of quartzitic strata, notice must also be taken in case impressions of plant stems or bony plates of fish are disturbed. Should the possibility of any such material be suspected a palaeontologist must be contacted to assess the possible fossils.	Cultural/heritage aspects must be managed in accordance with the: ⁎ NHRA, 1999	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁜ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ⁜ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ⁜ The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA. ⁜ Work may only continue once the go-ahead was issued by SAHRA. ⁜ Implement the Fossil Chance Find Procedure, proposed in this document, should fossils be uncovered. ⁜ Monitoring reports for this activity, as well as the details of the specialist that will train the ECO must be submitted to ECPHRA.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
⁎ Excavation of mining area. ⁎ Cumulative impacts	Site Establishment- & Operational Phase	±43.5 ha (Progressively opened as mining proceed)	**<u>Protection of Terrestrial Fauna:</u>** ⁎ A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. ⁎ Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, to provide an easy escape route for all small mammals and herpetofauna. ⁎ The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any	Fauna must be managed in accordance with the: ⁎ NEM:BA 2004	Throughout the site establishment- and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			individual into the surrounding environments, signs must be put up to enforce this. - The mining activities must be demarcated with beacons rather than being fenced off to allow free movement of roaming species. If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. - The site manager must ensure no fauna is caught, killed, harmed, sold, or played with. Signs must be put up to enforce this. - All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Workers must be instructed to report any animals that may be trapped in the working area. - No snares may be set, or nests raided for eggs or young. - Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight it must be properly		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling. - All vehicles must adhere to a low-speed limit (40 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. - Any dangerous fauna (snakes, scorpions, etc.) and/or other animals to be affected that are encountered must not be handled or antagonised by the construction staff. A suitably qualified person(s) must be contacted to remove the animals to safety. - No litter, food or other foreign material must be thrown or left around the site and must be placed in demarcated rubbish and litter areas that are animal proof. - Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. - Use environmentally friendly cleaning and dust suppressant products. - The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁎ A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.		
⁎ Excavation of mining area.	Operational Phase	±43.5 ha	**<u>Mitigating the potential impact on the Botha's River and downstream users:</u>** ⁎ No activities may take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan. ⁎ All mining activities must be contained in the approved footprint, and the vegetation layer between the river and the northern boundary of the mine must be preserved. ⁎ The 100 m between the river and the mine must be treated as a no-go area and all employees must be educated accordingly. ⁎ Adequate storm water management measures must be implemented and must include diverting storm- and floodwater around the stockpile and excavation areas and preventing sediment and silt from entering the river. ⁎ Necessary precautions must be taken to ensure that floodwaters are diverted around the processing/stockpile- and excavation areas by means of berms.	The Botha's River must be shielded in accordance with the: ⁎ NWA, 1998 ⁎ SWMP	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
⁎ Excavation of mining area.	Operational Phase		**Power Line Management:** ⁎ An adequate no-go buffer (minimum 10 m) must be maintained around the power lines as per Eskom standard. ⁎ Should the line be damaged, Eskom must immediately (within the first hour of occurrence) be informed.	The power lines must be managed in accordance with all Eskom servitudes and requirements.	Throughout the site establishment-, operational- and decommissioning phase.
⁎ Processing, stockpiling and transporting material from site.	Operational Phase	±0.7 km	**Access Road Mitigation and Traffic Accomodation:** ⁎ Storm water must be diverted around the access road to prevent erosion. ⁎ Vehicular movement must be restricted to the existing access roads and crisscrossing of tracks through undisturbed areas must be prohibited. ⁎ Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the Applicant. ⁎ Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes. ⁎ Heavy vehicle signs must be erected on both sides of the N2 junction of the farm road, to increase safety standards.	All mining related traffic must adhere to the requirements of the: ⁎ NRTA, 1996	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			⁎ Truck drivers must be sensitised towards displaying proper road etiquette, and regular toolbox talks must be held with truck drivers and sub-contractors to address reckless driving and speeding.		
⁎ Site establishment. ⁎ Excavation of mining area. ⁎ Processing, stockpiling and transporting material from site. ⁎ Sloping and landscaping (medium- & long term).	Operational Phase	±43.5 ha	**<u>Management of Health and Safety Risks:</u>** ⁎ Adequate ablution facilities and water for human consumption must daily be available on site. ⁎ Worker(s) must have access to the correct personal protection equipment (PPE) as required by law. ⁎ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	All mining activities must be in accordance with the: ⁎ MHSA, 1996 ⁎ OHSA, 1993	Throughout the operational-, and decommissioning phase.

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ()):

Table 29: Impact Management Outcomes

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
⁜ Demarcation of the mining area with visible beacons.	⁜ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	<u>Control:</u> Implementation of proper housekeeping and site management.	Mining is only allowed within the boundaries of the approved area. ⁜ MPRDA, 2002 ⁜ NEMA, 1998
⁜ Site establishment	⁜ Loss of grazing for duration of mining.	The impact may affect the agricultural operations of the property.	Site Establishment- & Operational Phase	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine. The impact could be controlled through progressive rehabilitation.	Use of agricultural land must be managed in accordance with the: ⁜ CARA, 1983 ⁜ Closure Plan (Appendix M)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
⁜ Site establishment	⁜ Visual intrusion because of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment- & Operational Phase	Control: Proper housekeeping and implementation of progressive rehabilitation.	Management of the mining activities must be in accordance with the: ⁜ MPRDA, 2002 ⁜ NEMA, 1998
⁜ Site establishment ⁜ Cumulative impacts	⁜ Direct loss and disturbance of floral species. ⁜ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	Denuded areas can lead to erosion and sedimentation of the river. Loss of vegetation may also affect the biodiversity of the area.	Site Establishment- & Operational Phase	Control: Implementing the proposed mitigation measures and preventing blanket clearing of vegetation.	Natural vegetated areas must be managed in accordance with the: ⁜ NEM:BA 2004
⁜ Site establishment ⁜ Sloping and landscaping (medium- & long term).	⁜ Loss of topsoil and fertility during site establishment. ⁜ Erosion of returned topsoil after rehabilitation.	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment- & Operational Phase	Control & Remedy: Proper housekeeping and storm water management.	Topsoil stripping must be managed in accordance with the: ⁜ CARA, 1983 ⁜ Closure Plan (Appendix M) ⁜ MPRDA, 2002 ⁜ NEM:BA, 2004 ⁜ SWMP

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscaping (medium- & long term).	⁜ Infestation of the topsoil heaps and mining area with invader plant species. ⁜ Infestation of the denuded areas with invader plant species. ⁜ Infestation of the rehabilitated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational-, and Decommissioning Phase	Control: Implementing soil- and invader plant control/management.	Invader plants must be managed in accordance with the: ⁜ CARA, 1983 ⁜ NEM:BA 2004 ⁜ Invasive Plant Species Management Plan (Appendix K)
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site.	⁜ Dust nuisance because of the site establishment activities. ⁜ Dust nuisance because of the mining activities.	Increased dust will impact on the air quality of the receiving environment.	Site Establishment- & Operational Phase	Control: Dust suppression methods and proper housekeeping.	Dust generation must be managed in accordance with the: ⁜ NEM:AQA. 2004 Regulation 6(1) ⁜ National Dust Control Regulations, GN No R827 ⁜ ASTM D1739 (SANS 1137:2012)
⁜ Site establishment. ⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site.	⁜ Noise nuisance because of the site establishment activities.	Should the noise levels become excessive it may have an impact on the noise ambiance	Site Establishment- and Operational Phase	Control: Noise suppression methods and proper housekeeping.	Noise generation must be managed in accordance with the: ⁜ NEM:AQA. 2004 Regulation 6(1)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
⁜ Sloping and landscaping (medium- & long term).	⁜ Noise nuisance because of the mining activities. ⁜ Noise nuisance because of the mining activities. ⁜ Noise nuisance because of the decommissioning activities.	of the receiving environment.			⁜ NRTA, 1996
⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscapting (medium- & long terrm).	⁜ Potential soil contamination from hydrocarbon- and other spills. ⁜ Potential impact associated with littering and hydrocarbon spills. ⁜ Potential impact associated with litter/hydrocarbon spills left at the mining area.	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the MR Holder.	Operational-, and Decommissioning Phase	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	Mining related waste must be managed in accordance with the: ⁜ NWA, 1998 ⁜ NEM:WA, 2008 ⁜ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ⁜ NEMA, 1998 (Section 30)
⁜ Excavation of mining area.	⁜ Potential impact on areas of palaeontological concern.	The impact could affect the cultural sense and/or artefacts of the area.	Site Establishment- and Operational Phase	<u>Control & Stop:</u> Implementation of a chance-find procedure.	Cultural/heritage aspects must be managed in accordance with the: ⁜ NHRA, 1999

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
⁜ Excavation of mining area. ⁜ Cumulative impacts	⁜ Direct loss and disturbance of fauna species and communities. ⁜ Fragmentation of ecosystems affecting safe movement of fauna species.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	Control & Stop: Implementing good management practices and the proposed mitigation measures.	Fauna must be managed in accordance with the: ⁜ NEM:BA 2004
⁜ Excavation of mining area.	⁜ Runoff from mining area having a potential impact on the Botha's River.	Increased sedimentation of the river could have a negative impact on unique bedrock communities, as well as a decrease in instream and marginal macrophytes and aquatic communities.	Operational Phase	Control & Stop: Through the proposed mitigation measures.	The Botha's River must be shielded in accordance with the: ⁜ NWA, 1998 ⁜ SWMP
⁜ Excavation of mining area.	⁜ Potential damage to the Eskom power lines.	Damage to the power lines will affect the power supply of the recipients.	Operational Phase	Control & Stop: Through the proposed mitigation measures.	The power lines must be managed in accordance with all Eskom servitudes and requirements.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
⁜ Processing, stockpiling and transporting material from site.	⁜ Loss of stockpiled material due to ineffective stormwater control.	This impact could result in financial losses to the mine as well as sedimentation of the river.	Operational Phase	Control: Implementing the proposed mitigation measures.	Soil must be managed in accordance with the: ⁜ CARA, 1983 ⁜ Closure Plan (Appendix M) ⁜ MPRDA, 2002 ⁜ NEM:BA, 2004 ⁜ NWA, 1998 ⁜ SWMP
⁜ Processing, stockpiling and transporting material from site.	⁜ Deterioration of the access road to the mining area. ⁜ Overloading of trucks having an impact on the public roads.	Impacting the condition of public roads may incur public complaints and additional costs to the MR Holder.	Operational Phase	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	All mining related traffic must adhere to the requirements of the: ⁜ NRTA, 1996

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

Table 30: Impact Management Actions

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or . Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
⁎ Demarcation of the mining area with visible beacons.	⁎ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Control: Implementation of proper housekeeping and site management.	Beacons need to be in place throughout the life of the mine.	Mining is only allowed within the boundaries of the approved area. ⁎ MPRDA, 2002 ⁎ NEMA, 1998
⁎ Site establishment	⁎ Loss of grazing for duration of mining.	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine. The impact could be	Site Establishment- & Operational Phase	Use of agricultural land must be managed in accordance with the: ⁎ CARA, 1983 ⁎ Closure Plan (Appendix M)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		controlled through progressive rehabilitation.		
⁎ Site establishment	⁎ Visual intrusion because of site establishment.	Control: Proper housekeeping and implementation of progressive rehabilitation.	Site Establishment- & Operational Phase	Management of the mining activities must be in accordance with the: ⁎ MPRDA, 2002 ⁎ NEMA, 1998
⁎ Site establishment ⁎ Cumulative impacts	⁎ Direct loss and disturbance of floral species. ⁎ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	Control: Implementing the proposed mitigation measures and preventing blanket clearing of vegetation.	Site Establishment- & Operational Phase	Natural vegetated areas must be managed in accordance with the: ⁎ NEM:BA 2004
⁎ Site establishment ⁎ Sloping and landscaping (medium- & long term).	⁎ Loss of topsoil and fertility during site establishment. ⁎ Erosion of returned topsoil after rehabilitation.	Control & Remedy: Proper housekeeping and storm water management.	Site Establishment- & Operational Phase	Topsoil stripping must be managed in accordance with the: ⁎ CARA, 1983 ⁎ Closure Plan (Appendix M) ⁎ MPRDA, 2002 ⁎ NEM:BA, 2004 ⁎ SWMP
⁎ Site establishment.	⁎ Infestation of the topsoil heaps and mining area with invader plant species.	Control: Implementing soil- and invader plant control/management.	Site Establishment, Operational-, and Decommissioning Phase	Invader plants must be managed in accordance with the:

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
⁎ Processing, stockpiling and transporting material from site. ⁎ Sloping and landscaping (medium- & long term).	⁎ Infestation of the denuded areas with invader plant species. ⁎ Infestation of the rehailitated area with invader plant species.			⁎ CARA, 1983 ⁎ NEM:BA 2004 ⁎ Invasive Plant Species Management Plan (Appendix K)
⁎ Site establishment. ⁎ Processing, stockpiling and transporting material from site.	⁎ Dust nuisance because of the site establishment activities. ⁎ Dust nuisance because of the mining activities.	Control: Dust suppression methods and proper housekeeping.	Site Establishment- & Operational Phase	Dust generation must be managed in accordance with the: ⁎ NEM:AQA. 2004 Regulation 6(1) ⁎ National Dust Control Regulations, GN No R827 ⁎ ASTM D1739 (SANS 1137:2012)
⁎ Site establishment. ⁎ Excavation of mining area. ⁎ Processing, stockpiling and transporting material from site. ⁎ Sloping and landscaping (medium- & long term).	⁎ Noise nuisance because of the site establishment activities. ⁎ Noise nuisance because of the mining activities. ⁎ Noise nuisance because of the mining activities. ⁎ Noise nuisance because of the decommissioning activities.	Control: Noise suppression methods and proper housekeeping.	Site Establishment- and Operational Phase	Noise generation must be managed in accordance with the: ⁎ NEM:AQA. 2004 Regulation 6(1) ⁎ NRTA, 1996
⁎ Excavation of mining area.	⁎ Potential soil contamination from	Control & Remedy: Proper housekeeping and implementation	Site Establishment- & Operational Phase	Mining related waste must be managed in accordance with the:

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
⁎ Processing, stockpiling and transporting material from site. ⁎ Sloping and landscapting (medium- & long terrm).	hydrocarbon- and other spills. ⁎ Potential impact associated with littering and hydrocarbon spills. ⁎ Potential impact associated with litter/hydrocarbon spills left at the mining area.	of an emergency response plan and waste management plan.		⁎ NWA, 1998 ⁎ NEM:WA, 2008 ⁎ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ⁎ NEMA, 1998 (Section 30)
⁎ Excavation of mining area.	⁎ Potential impact on areas of palaeontological concern.	Control & Stop: Implementation of a chance-find procedure.	Site Establishment- and Operational Phase	Cultural/heritage aspects must be managed in accordance with the: NHRA, 1999
⁎ Excavation of mining area. ⁎ Cumulative impacts	⁎ Direct loss and disturbance of fauna species and communities. ⁎ Fragmentation of ecosystems affecting safe movement of fauna species.	Control & Stop: Implementing good management practices and the proposed mitigation measures.	Site Establishment- and Operational Phase	Fauna must be managed in accordance with the: ⁎ NEM:BA 2004
⁎ Excavation of mining area.	⁎ Runoff from mining area having a potential impact on the Botha's River.	Control & Stop: Through the proposed mitigation measures.	Operational Phase	The Botha's River must be shielded in accordance with the: ⁎ NWA, 1998 ⁎ SWMP

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
⁎ Excavation of mining area.	⁎ Potential damage to the Eskom power lines.	Control & Stop: Through the proposed mitigation measures.	Operational Phase	The power lines must be managed in accordance with all Eskom servitudes and requirements.
⁎ Processing, stockpiling and transporting material from site.	⁎ Loss of stockpiled material due to ineffective stormwater control.	Control: Implementing the proposed mitigation measures.	Operational Phase	Soil must be managed in accordance with the: ⁎ CARA, 1983 ⁎ Closure Plan (Appendix M) ⁎ MPRDA, 2002 ⁎ NEM:BA, 2004 ⁎ NWA, 1998 ⁎ SWMP
⁎ Processing, stockpiling and transporting material from site.	⁎ Deterioration of the access road to the mining area. ⁎ Overloading of trucks having an impact on the public roads.	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	Operational Phase	All mining related traffic must adhere to the requirements of the: ⁎ NRTA, 1996

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

The decommissioning phase will entail the rehabilitation of the processing/stockpiling 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 excavated areas to its original topography, the rehabilitation option is to create a series of irregular benches thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate grass mix (indigenous species) if vegetation does not naturally establish in the area within six months of the replacement of the topsoil. The applicant will comply with the minimum closure objectives as prescribed by DMRE.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The draft EIAR & EMPR, contained the environmental objectives in relation to closure and were available for perusal by the landowner, I&AP's and stakeholders over a 30-days commenting period. No additional comments were received on the draft EIAR that could be incorporated into the Final EIAR & EMPR.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation plan is attached as Appendix D.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The decommissioning phase will entail the final rehabilitation of the proposed mining footprint. Final landscaping, levelling and top dressing will be done on all areas to be rehabilitated. The rehabilitation of the mining area as indicated on the rehabilitation map attached as Appendix D will comply with the minimum closure objectives as prescribed by DMRE and detailed below, and therefore is deemed compatible:

Rehabilitation of the Excavation:

- The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material (if any) removed from the excavation must be dumped into the excavation.
- No waste may be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
- The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix 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.

Rehabilitation of Processing/Stockpiling Area:

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.

- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the DMRE Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

Final Rehabilitation:

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

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14

Mine type	Aggregate Ball Clay Clay (General) Gravel Kaolin
Saleable mineral by-product	None

Risk ranking.

According to Tables B.12, B.13 and B.14

Primary risk ranking (either Table B.12 or B.13	C (Low risk)
Revised risk ranking (B.14)	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Low

Level of information

According to Step 4.2:

Level of information available	Extensive

Identify closure components.

According to Table B.5 and site-specific conditions

COMPONENT NO.	MAIN DESCRIPTION	APPLICABILITY OF CLOSURE COMPONENTS (CIRCLE YES OR NO)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	NO
2(A)	Demolition of steel buildings and structures	-	NO
2(B)	Demolition of reinforced concrete buildings and structures	-	NO
3	Rehabilitation of access roads	-	NO
4(A)	Demolition and rehabilitation of electrified railway lines	-	NO
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	NO
5	Demolition of housing and facilities	-	NO
6	Opencast rehabilitation including final voids and ramps	YES	-
7	Sealing of shafts, adits and inclines	-	NO
8(A)	Rehabilitation of overburden and spoils	-	NO
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	NO
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	NO
9	Rehabilitation of subsided areas	-	NO
10	General surface rehabilitation, including grassing of all denuded areas	YES	-
11	River diversions	-	NO
12	Fencing	-	NO
13	Water management (Separating clean and dirty water, managing polluted water, and managing the impact on groundwater)	-	NO
14	2 to 3 years of maintenance and aftercare	-	NO

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components. The master rates were based on the DMRE guideline, inflating the rates with the CPI % to account for escalation since January 2005. The FP calculation further applied a multiplication factor depending on the risk of ranking and the environmental sensitivity as determined in the above sections.

COMPONENT NO.	MAIN DESCRIPTION	MASTER RATE	MULTIPLICATION FACTOR
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
2(A)	Demolition of steel buildings and structures	-	-
2(B)	Demolition of reinforced concrete buildings and structures	-	-
3	Rehabilitation of access roads	-	-
4(A)	Demolition and rehabilitation of electrified railway lines	-	-
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	-
5	Demolition of housing and facilities	-	-
6	Opencast rehabilitation including final voids and ramps	273 265	0.04
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils	-	-
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	-
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	-
9	Rehabilitation of subsided areas	-	-
10	General surface rehabilitation, including grassing of all denuded areas	73 468	1.00
11	River diversions	-	-
12	Fencing	-	-
13	Water management (Separating clean and dirty water, managing polluted water, and managing the impact on groundwater)	-	-
14	2 to 3 years of maintenance and aftercare	1 955	1.00

Determine weighting factors.

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.10 (Undulating)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05 (Peri-Urban)

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision.

Table 31: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	**Orchards Kaolin Mine**			**Location:**	**Makana / Grahamstown**		
Evaluators:	**C Fouché**			**Date:**	**05 March 2024**		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (rands)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m^3	0	-	1.00	1.10	R 0.00
2(A)	Demolition of steel buildings and structures	m^2	0	-	1.00	1.10	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m^2	0	-	1.00	1.10	R 0.00
3	Rehabilitation of access roads	m^2	0	-	1.00	1.10	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	-	1.00	1.10	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	-	1.00	1.10	R 0.00
5	Demolition of housing and/or administration facilities	m^2	0	-	1.00	1.10	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	18	273 265	0.04	1.10	R 216 425.88
7	Sealing of shaft, audits, and inclines	m^3	0	-	1.00	1.10	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	-	1.00	1.10	R 0.00

8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	-	1.00	1.10	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	-	0.51	1.10	R 0.00
9	Rehabilitation of subsided areas	ha	0	-	1.00	1.10	R 0.00
10	General surface rehabilitation	ha	1	73 468	1.00	1.10	R 80 814.80
11	River diversions	ha	0	-	1.00	1.10	R 0.00
12	Fencing	m	0	-	1.00	1.10	R 0.00
13	Water Management	ha	0	-	0.17	1.10	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	11	1 955	1.00	1.10	R 23 655.50
15(A)	Specialists study	Sum	0				R 0.00
15(B)	Specialists study	Sum	0				R 0.00
						Sum of items 1 to 15 above	R 320 896.18
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 320 896.18		**Sub Total 1**	R 336 940.99

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 20 216.46
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 33 694.10
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 390 851.55
		Vat (15%)	R 58 627.73
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 449 479.28**

According to the above calculations, the amount that will be necessary for the rehabilitation of damages caused by the operation, both at sudden closure during the normal operation of the project and at final, planned closure gives a sum of R 449 479.28.

(f) Confirm that the financial provision will be provided as determined.

Herewith I, the person, whose name is stated below confirm that I am the person authorised to act as representative of the right holder in terms of the resolution submitted with the application. I herewith confirm that the company will provide the amount that will be determined by the Regional Manager in accordance with the prescribed guidelines.

Mechanisms for monitoring compliance with and performance assessment the environmental management programme and reporting thereon, including,

g) Monitoring of Impact Management Actions,
h) Monitoring and reporting frequency,
i) Responsible persons,
j) Time period for implementing impact management actions,
k) Mechanism for monitoring compliance.

Table 32: Mechanisms for monitoring compliance with and performance assessment against the EMPR and reporting thereon.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
⁜ Demarcation of site with visible beacons.	⁜ Maintenance of beacons	⁜ Visible beacons need to be established at the corners of the mining area. ⁜ A 10 m buffer must be demarcated	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout site establishment-, operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		around the power lines. • The 100 m buffer between the Botha's River and the mining area must be demarcated.	Responsibility: • Ensure beacons are in place throughout the life of the mine.	• Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment	Land Use: • Loss of grazing for duration of mining.	• Mining schedule.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • If needed, sign mined/rehabilitated areas back to agricultural use once the cover crop stabilised.	Applicable throughout site establishment- and operational phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment	Visual Characteristics • Visual intrusion as a result of site establishment.	• Parking areas for equipment. • Good housekeeping practices.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Responsibility: ⁜ Ensure that the site has a neat appearance and is always kept in good condition. ⁜ Store mining equipment neatly in a dedicated area with a sealed drip tray underneath when not in use. ⁜ Implement concurrent rehabilitation as mining progress to limit the visual impact on the aesthetic value of the area. ⁜ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ⁜ Rehabilitate and level the site upon closure to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	⁜ Annual compliance monitoring of site by an Environmental Control Officer.
⁜ Site establishment ⁜ Cumulative impacts	Terrestrial biodiversity, conservation areas, groundcover and fauna ⁜ Direct loss and disturbance of floral species. ⁜ Loss and fragmentation of vegetation communities within the CBA	⁜ Visible beacons indicating the boundary of the mineable areas. ⁜ Environmental awareness training material. ⁜ Fire management plan.	Role: ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ⁜ Clearly demarcate the mining boundaries and contain all operations to the approved mining area. ⁜ Declare the area outside the mining boundaries a no-go area and educate all employees accordingly.	Applicable throughout site establishment-, and operational phases. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	and ESA ecosystems.	⁜ Alien invasive species management plan. ⁜ Cover crop to seed rehabilitated areas.	⁜ Prevent fragmentation and/or disturbance of indigenous vegetation, even secondary communities outside of the direct project footprint. ⁜ Limit laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) to already modified areas and the smallest footprint possible. ⁜ Use existing roads and walking paths. ⁜ Minimise the clearing of vegetation where possible. Restrict all activities to within the authorised areas. ⁜ Inform staff members that it is an offence to take any indigenous plant species out of any portion of the Project area, or to bring any alien plant species into any portion of the Project area except for rehabilitation purposes. ⁜ Compile a fire management plan and implement it to restrict the impact fire would have on the surrounding areas. ⁜ Implement an invasive plant species management plan n site to control weeds and invasive plants on denuded areas, topsoil heaps and rehabilitated areas. ⁜ Revegetate areas that are denuded with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. Keep all grazing mammals out of the areas that have recently been re-planted. ⁜ Ensure final rehabilitation consists of profiling, spreading of available overburden and stockpiled topsoil and upgrading of the topsoil and seeding with a prescribed	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			grass seed mix (refer to Closure Plan) during the period March to October.	
⁜ Site establishment ⁜ Sloping and landscaping (medium- & long term).	<u>Geology and Soil:</u> ⁜ Loss of topsoil and fertility during site establishment. ⁜ Erosion of returned topsoil after rehabilitation.	⁜ Earthmoving equipment to strip, stockpile and spread the topsoil. ⁜ Stormwater control infrastructure. ⁜ Designated team to control weeds/invader plant species that may germinate on the topsoil heaps. ⁜ Cover crop to vegetate topsoil heaps (when needed) and reinstated soil.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Strip and stockpile the upper 300 mm of the soil before mining. ⁜ Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. ⁜ Ensure topsoil stripping, stockpiling, and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. ⁜ Place the topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. ⁜ Protect topsoil stockpiles against losses by water- and wind erosion. Position stockpiles so as not to be vulnerable to erosion by wind and water. Establish plants (weeds or a cover crop) on the stockpiles to prevent erosion. ⁜ Ensure that topsoil heaps do not exceed 2 m.	Applicable throughout site establishment-, and operational phases. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Keep temporary topsoil stockpiles free of invasive plant species. ⁜ Divert storm- and runoff water around the stockpile area to prevent erosion. ⁜ Prepare the clay sub-layer before topsoil or overburden is replaced as listed below: ▪ All cracks, channels and root cavities must be properly scarified and filled in, if necessary. ▪ Thereafter, the whole slope and platform area must be compacted. ▪ Once compacted, only the top 5 cm of the clay layer must be ripped lightly along the contour before overburden is replaced. ▪ Once the overburden layer is replaced, the area can be topsoiled. ⁜ Spread the topsoil evenly, to a depth of 300 m, over the rehabilitated area upon closure of the site. Slightly key the topsoil in with the lower horizons by ripping it lightly along the contour and fertilised if necessary. ⁜ Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. ⁜ Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established. ⁜ Use water from the retention pond, alternatively from the Makana Brick dam to irrigate the cover crop.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after closure.	
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscaping (medium- & long term).	<u>Mining, Biodiviersity and Groundcover:</u> ⁜ Infestation of the topsoil heaps and mining area with invader plant species. ⁜ Infestation of the denuded areas with invader plant species. ⁜ Infestation of the rehabilitated area with invader plant species.	⁜ Designated team to cut or pull-out invasive plant species that germinated on site.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Implement an invasive plant species management plan at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA, 2004. Do weed/alien clearing on an ongoing basis throughout the life of the mining activities. ⁜ Keep all stockpiles free of invasive plant species. ⁜ Control declared invader or exotic species on the rehabilitated areas.	Throughout the site establishment-, and operational phase. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.
⁜ Site establishment	<u>Terrestrial Fauna:</u> ⁜ Direct loss and disturbance of fauna species and communities.	⁜ Toolbox talks to educate employees how to handle fauna that enter the work areas.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout site establishment-, and operational phases. ⁜ Daily compliance monitoring by site management.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	⁎ Fragmentation of ecosystems affecting safe movement of fauna species.	⁎ Contact number of a snake catcher and/or other faunal specialists.	<u>Responsibility:</u> ⁎ Ensure there is a qualified ECO on site when activities begin. Consider a site walk through by a suitably qualified ecologist prior to commencement. In situations where SSC or protected species is noted these species must be removed, but only do so after the required permission/permits were obtained. In the abovementioned situation, develop and implement a search, rescue, and recovery program for the protection of these species. Should animals not move out of the area on their own, contact the relevant specialists to advise on how the species can be relocated. ⁎ Conduct clearing and disturbance activities in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, to provide an easy escape route for all small mammals and herpetofauna (frogs). ⁎ Demarcate the areas to be disturbed specifically and responsibly to prevent the movement of staff or any individual into the surrounding environments, and place signs to enforce this. ⁎ Demarcate the mining activities with beacons rather than fencing it off to allow free movement of roaming species. If fencing is required: use wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.	⁎ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Ensure no fauna is caught, killed, harmed, sold, or played with. ⁜ Provide environmental induction to all personnel regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Instruct workers to report any animals that may be trapped in the working area. ⁜ Prevent the setting of snares or raiding of nests for eggs or young. ⁜ Dig any holes/deep excavations in a progressive manner and do not leave it open overnight. Should any holes remain open overnight it must be properly covered temporarily to ensure that no small fauna species fall in. Inspect holes subsequently for fauna prior to backfilling. ⁜ Restrict the speed of all vehicles (40 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. ⁜ Do not handle or antagonise any dangerous fauna (snakes, scorpions, etc.) and/or other animals that are encountered during construction. Contact a suitably qualified person(s) to remove the animals to safety. ⁜ Do not throw or leave litter, food, or other foreign material around the site. Place this in demarcated rubbish and litter areas that are animal proof. ⁜ Keep noise to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Use environmentally friendly cleaning and dust suppressant products. ⁜ Minimise the duration of the activities to as short a term as possible, to reduce the period of disturbance on fauna. ⁜ Put a pest control plan in place and do not use poisons to control pests.	
⁜ Site establishment. ⁜ Processing, stockpiling and transporting material from site.	<u>Air Quality and Noise Ambiance:</u> ⁜ Dust nuisance as a result of the site establishment. ⁜ Dust nuisance as a result of the mining activities.	⁜ Dust suppression equipment such as a water car. ⁜ Signage that clearly reduce the speed on the access roads. ⁜ Cover crop to re-vegetate denuded areas.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Control the liberation of dust into the surrounding environment using; inter alia, water spraying and/or other dust-allaying agents. ⁜ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ⁜ Limit speed on the access roads to 40 km/h to prevent the generation of excess dust. ⁜ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining.	Applicable throughout site establishment-, operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management. ⁜ Monthly compliance monitoring by dust monitoring contractor. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Flatten loads to prevent spillage and windblown dust during transportation. ⁜ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods. ⁜ Ensure dust-generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). ⁜ Implement best practice measures during the stripping of topsoil, loading, and transporting of the mineral from the site to minimize potential dust impacts. ⁜ Fit dust allaying structures such as water sprayers to the crushing plant. ⁜ Daily clean the processing equipment of excess material and dust.	
⁜ Site establishment. ⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscaping	<u>Air Quality and Noise Ambiance:</u> ⁜ Noise nuisance because of the site establishment activities. ⁜ Noise nuisance because of the mining activities.	⁜ Silencers fitted to all project related vehicles, and the use of vehicles that are in road worthy condition in terms of the National Road Traffic Act, 1996.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Ensure that employee and visitors to the site conduct themselves in an acceptable manner while on site.	Applicable throughout site establishment-, operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management. ⁜ Quarterly reporting by a qualified occupation hygienist. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
(medium- & long term).	⁜ Noise nuisance because of the mining activities. ⁜ Noise nuisance because of the decommissioning activities.	⁜ Work schedule to adhere to allowable work hours.	⁜ Do not permit loud music at the mining area. ⁜ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. ⁜ Implement best practice measures to minimise potential noise impacts. ⁜ Appoint a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be done in accordance with the SANS10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	
⁜ Excavation of mining area.	<u>Hydrology</u> ⁜ Runoff from mining area having a potential impact on the Botha's River.	⁜ Stormwater Management Plan. ⁜ Stormwater management structures. ⁜ Beacons to demarcate the work areas.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Do not allow activities to take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan.	Applicable throughout site establishment-, operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Contain all mining activities in the approved footprint and preserve the vegetation layer between the river and the northern boundary of the mine. ⁜ Treat the 100 m between the river and the mine as a no-go area and educate all employees accordingly. ⁜ Implement adequate storm water management measures including diverting storm- and floodwater around the stockpile and excavation areas and preventing sediment and silt from entering the river. ⁜ Take necessary precautions to ensure that floodwaters are diverted around the processing/stockpile- and excavation areas by means of berms.	
⁜ Excavation of mining area. ⁜ Processing, stockpiling and transporting material from site. ⁜ Sloping and landscapting (medium- & long terrm).	<u>General</u> ⁜ Potential soil contamination from hydrocarbon- and other spills. ⁜ Potential impact associated with littering and hydrocarbon spills. ⁜ Potential impact associated with litter/hydrocarbon	⁜ Sealed drip trays. ⁜ Formal waste disposal system with waste registers. ⁜ Covered refuse bins. ⁜ Oil spill kit. ⁜ Chemical toilets. ⁜ Waste management plan.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Ensure regular vehicle maintenance, repairs and services only take place at the off-site workshop and service area. Ensure drip trays are present if emergency repairs are needed on equipment not able to move to the workshop. Dispose all waste products in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal.	Applicable throughout site establishment-, operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	spills left at the mining area.		⁎ Provide all employees with ablution facilities. Ensure that the toilet is placed outside the 1:100-year floodline of the river or further than 100 m from the watercourse (whichever is greatest). ⁎ Ensure that the ablution facilities does not cause pollution to water sources or pose a health hazard. In addition, prevent any form of secondary pollution from the disposal of refuse or sewage. Address any pollution problems arising from the above immediately. ⁎ If a diesel bowser is used on site, always equip it with a drip tray. Ensure that drip trays are used during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ⁎ Clean drip trays after use. Do not use dirty drip trays. ⁎ Ensure that an emergency spill kit is available on site. ⁎ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ⁎ Should spillage occur, such as oil or diesel leaking from a burst pipe, collect the contaminated soil, within the first hour of occurrence, in a suitable receptacle and remove it from the site, either for resale or for appropriate disposal at a recognized facility. File proof. ⁎ Compile a waste management plan (inclusive of a hydrocarbon spill management plan) that focus on the waste hierarchy of the NEM:WA and implement it on site. ⁎ Contain all general waste in marked, sealable, refuse bins placed at a designated area, to be removed when filled to a recognised general waste landfill site.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Prevent the burning or burying of waste on site. ⁜ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the DWS and other relevant authorities. In addition, should the proposed development impact on any groundwater and/or surface water users, then water of equal quality and quantity must be provided to the affected users. ⁜ If small volumes of wastewater is generated during the site establishment and operational phase: ▪ Do not discharge water containing waste into the natural environment, ▪ Implement measures to contain the water containing waste and safely dispose thereof. ⁜ In the event of a spill the following steps must be: ▪ Stop the source of the spill, ▪ Contain the spill, ▪ Report all significant spills to DWS and other relevant authorities, ▪ Remove the spilled product for treatment and authorised disposal, ▪ Determine if there is any soil, groundwater, or other environmental impact, ▪ If necessary, take remedial action in consultation with DWS, ▪ Document the incident.	
⁜ Excavation of mining area.	<u>Cultural and Heritage Environment:</u> ⁜ Potential impact on areas of	⁜ Contact number of an archaeologist & palaeontologist that can be contacted	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout site establishment-, operational-, and decommissioning phases.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	palaeontological concern.	when a discovery is made on site.	⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Confine all mining to the development footprint area. ⁜ Contact a palaeontologist should, during extension of the quarry, more shaly material of a grey to black colour be encountered to the south. ⁜ Take note of impressions of plant stems or bony plates of fish during disturbance of quartzitic strata. Should the possibility of any such material be suspected contact a palaeontologist to assess the possible fossils. ⁜ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations.	⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			The ECO will then contact a professional archaeologist for an assessment of the finds who will notify SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA. ⁜ Implement the Fossil Chance Find Procedure, proposed in this document, should fossils be uncovered. ⁜ Submit monitoring reports for this activity, as well as the details of the specialist that will train the ECO to ECPHRA.	
⁜ Excavation of mining area.	<u>Existing Infrastructure:</u> ⁜ Potential damage to the Eskom power lines.	⁜ Beacons to demarcate the 10 m buffer around the power lines.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Maintain an adequate no-go buffer (minimum 10 m) around the power lines as per Eskom standard. ⁜ Immediately (within the first hour of occurrence) inform Eskom should the line be damaged	Applicable throughout operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.
⁜ Processing, stockpiling and transporting material from site.	Loss of stockpiled material due to ineffective stormwater control.	⁜ Stormwater control structures.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout operational-, and decommissioning phases. ⁜ Daily compliance monitoring by site management.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁎ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁎ Implement the Stormwater Management Plan, appended to this document. ⁎ Limit removal of vegetation ahead of the production faces. ⁎ Ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. Do land clearing during the dry seasons (if possible) to avoid water runoff into the watercourse thus affecting the water quality. ⁎ Divert storm water around the topsoil heaps and mining areas to prevent erosion. ⁎ Control all drainage from the project area to prevent off-site pollution, flooding, or damage to infrastructure downstream of any storm water discharge points. ⁎ Put erosion control measures in place to minimise erosion. Take extra precautions in areas where the soils are deemed highly erodible. These measures could include the use of sandbags, hessian sheets, bidim, retention or replacement of vegetation. ⁎ Use silt traps where there is a danger of topsoil or material stockpiles eroding and entering the river and other sensitive areas. ⁎ Do not allow stockpiling of soil or any other materials during the operational phase on or near steep slopes,	⁎ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			near a watercourse or water body. Control and establish suitable mitigation measures to prevent the erosion of stockpiles. - Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. - Revegetate reinstated soil as soon as possible to restore soil properties and reduce runoff. Curb erosion that occurs on the slopes, with infill material obtained from the active mining area. - Implement concurrent rehabilitation of disturbed areas if and where possible to avoid erosion of bare soil.	
- Processing, stockpiling and transporting material from site.	<u>Existing Infrastructure:</u> - Deterioration of the access road to the mining area. - Overloading of trucks having an impact on the public roads.	- Earthmoving equipment to maintain the gravel pavement structure of the road. - Road signage to control traffic speed. - Proof of load weights to prevent overloading.	<u>Role:</u> - Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. - Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> - Divert storm water around the access road to prevent erosion. - Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. - Repair rutting and erosion of the access road caused as a direct result of the mining activities.	Applicable throughout operational-, and decommissioning phases. - Daily compliance monitoring by site management. - Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			⁜ Prevent the overloading of the truck and file proof of load weights for auditing purposes. ⁜ Erect heavy vehicle signs on both sides of the N2 junction of the farm road, to increase safety standards. ⁜ Sensitise truck drivers towards displaying proper road etiquette, and hold regular toolbox talks with truck drivers and sub-contractors to address reckless driving and speeding.	
⁜ Processing, stockpiling and transporting material from site.	<u>General:</u> ⁜ Management of health and safety aspects on site.	⁜ Stocked first aid box. ⁜ Level 1 certified first aider. ⁜ All appointments in terms of the Mine Health and Safety Act, 1996.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ⁜ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁜ Ensure adequate ablution facilities and water for human consumption is daily available on site. ⁜ Ensure that workers have access to the correct PPE as required by law. ⁜ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Applicable throughout decommissioning phase. ⁜ Daily compliance monitoring by site management. ⁜ Annual compliance monitoring of site by an Environmental Control Officer.
⁜ Sloping and landscaping (medium- & long term).	<u>Topography:</u>	⁜ Earthmoving equipment to rehabilitate mined areas.	<u>Role:</u> ⁜ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout site establishment-, operational-, and decommissioning phases.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	⁎ Landscaping of Mining Area		⁎ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ⁎ Implement progressive rehabilitation as prescribed in the closure plan, appended to this document, through-out the operational- and decommissioning phases of the project.	⁎ Daily compliance monitoring by site management. ⁎ Annual compliance monitoring of site by an Environmental Control Officer.

l) Indicate the frequency of the submission of the performance assessment report.

An Environmental Audit Report in accordance with Appendix 7 as prescribed in Regulation 34 of the EIA Regulations, 2014 (as amended) will annually be submitted to DMRE for compliance monitoring purposes or in accordance with the frequency stipulated by the Environmental Authorisation.

m) Environmental Awareness Plan

i) Manner in which the Applicant intends to inform his or her employees of any environmental risk which may result from their work.

Once the Applicant receives the mining right and may commence with the proposed activity, a copy of the Environmental Impact Assessment Report and Environmental Management Programme will be handed to the site manager for his perusal. An induction meeting will be held with the mining related employees (operator & management) to inform them of the Basic Rules of Conduct about the environment.

ii) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

The operations manager must ensure that he/she understands the EIAR & EMPR document and its requirement and commitments before any mining takes place.

An independent Environmental Control Officer must annually check compliance of the mining activity to the management programmes described in the EMPR. The management objectives listed in the EIAR under *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* must be always implemented.

The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst preforming their tasks.

- **<u>Site Management:</u>**
  - Stay within boundaries of site – do not enter adjacent properties.
  - Keep tools and material properly stored.
  - Smoke only in designated areas.
  - Use toilets provided – report full or leaking toilets.

- **Water Management and Erosion:**
  - Check that rainwater flows around work areas and are not contaminated.
  - Report any erosion.
  - Check that dirty water is kept from clean water.

- **Waste Management:**
  - Take care of your own waste.
  - Place waste in containers and always close lid.
  - Don't burn waste.
  - Pick-up any litter laying around.

- **Hazardous Waste Management (Petrol, Oil, Diesel, Grease)**
  - Never mix general waste with hazardous waste.
  - Use only sealed, non-leaking containers.
  - Keep all containers closed and store only in approved areas.
  - Always put drip trays under vehicles and machinery.
  - Empty drip trays after rain.
  - Stop leaks and spills, if safe.
    - ✓ Keep spilled liquids moving away.
    - ✓ Immediately report the spill to the site manager/supervision.
    - ✓ Locate spill kit/supplies and use to clean-up, if safe.
    - ✓ Place spill clean-up wastes in proper containers.
    - ✓ Label containers and move to approved storage area.

- **Discoveries:**
  - Stop work immediately.
  - Notify site manager/supervisor.
  - Includes – Archaeological finds, Cultural artefacts, Contaminated water, Pipes, Containers, Tanks and drums, Any buried structures.

- **Air Quality:**
  - Wear protection when working in very dusty areas.
  - Implement dust control measures:
    - ✓ Water all roads and work areas according to instructions.
    - ✓ Minimize handling of material.
    - ✓ Obey speed limit and cover trucks.

- **Driving and Noise:**
  - Use only approved access roads.
  - Respect speed limits.
  - Only use turn-around areas – no crisscrossing through undisturbed areas.
  - Avoid unnecessary loud noises.
  - Report or repair noisy vehicles.

- **Vegetation and Animal life:**
  - Do not remove any plants or trees without approval of the site manager.
  - Do not collect firewood.
  - Do not catch, kill, harm, sell or play with any animal, reptile, bird, or amphibian on site.
  - Report any animal trapped in the work area.
  - Do not set snares or raid nests for eggs or young.

- **Fire Management:**
  - Do not light any fires on site, unless contained in a drum at demarcated area.
  - Put cigarette butts in a rubbish bin.
  - Know the position of firefighting equipment.
  - Report all fires.
  - Don't burn waste or vegetation.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

The Applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMRE for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

2. UNDERTAKING

The EAP herewith confirms,

a) the correctness of the information provided in the reports ☒
b) the inclusion of comments and inputs from stakeholders and I&AP's; ☒
c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and
d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

17 May 2024

Date:

UNDERTAKING

I,.....*Colin Meyer*.....the undersigned and duly authorised thereto by.....*Makhanda Mining (Pty) Ltd*.....

Company / ~~Closed Corporation / Municipality or Council~~
(Delete whichever is not applicable)

hereby undertake to implement all the aspects contained in the ~~BAR and EMPR~~ / EIA and EMPR and accept full responsibility therefore.
(Delete whichever is not applicable)

SIGNED at ...**Makhanda**..... on this .....**17**..... day of ...**May**..... 2024

SIGNATURE

WITNESSES:

1.....

2.....

Official use

APPROVAL

Approved in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

SIGNED at ..... this ..... day 2024

REGIONAL MANAGER

EASTERN CAPE

Undertaking/eg

-END-

APPENDIX A

REGULATION 42 MINE PLAN

APPENDIX B

LAND USE AND LOCALITY MAP

APPENDIX C

SITE ACTIVITIES MAP

APPENDIX D

REHABILITATION MAP

APPENDIX E1

COMMENTS AND RESPONSE REPORT

APPENDIX E2

PROOF OF PUBLIC PARTICIPATION

APPENDIX F

TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT

APPENDIX G

PALAEONTOLOGICAL HERITAGE IMPACT ASSESSMENT

APPENDIX H

DFFE SCREENING TOOL REPORT AND COVER LETTER

APPENDIX I

STORMWATER MANAGEMENT PLAN

APPENDIX J

SOCIAL AND LABOUR PLAN

APPENDIX K

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX L

SUPPORTING IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, herewith please receive an environmental impact statement that summarises the impact that the proposed mine may have on the environment after the management and mitigation of impacts have been considered, with specific reference to types of impact, duration of impacts, likelihood of potential impacts occurring and the significance of impacts.

TYPE OF IMPACT	DURATION	LIKELIHOOD	SIGNIFICANCE
Site Establishment:	**Duration of site establishment phase**		
♦ Loss of grazing for duration of mining.	**(±1 month)**	**Definite**	**Low-Medium Concern**
♦ Visual intrusion because of site establishment.		**Possible**	**Low-Medium Concern**
♦ Direct loss and disturbance of floral species.		**Low Possibility**	**Low-Medium Concern**
♦ Loss of topsoil and fertility during site establishment.		**Low Possibility**	**Low Concern**
♦ Infestation of topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
♦ Dust nuisance because of the site establishment activities.		**Low Possibility**	**Low Concern**
♦ Noise nuisance because of the site establishment activities.		**Low Possibility**	**Low Concern**
♦ Work opportunities due to continued mining **(Positive Impact)**		**Definite**	**Medium-High (+)**
Excavation of Mining Area:	**Duration of operational phase**		
♦ Potential soil contamination from hydrocarbon spills.		**Low Possibility**	**Low Concern**
♦ Noise nuisance because of the mining activities.		**Low Possibility**	**Low Concern**
♦ Potential impact on areas/infrastructure of palaeontological concern.		**Low Possibility**	**Low-Medium Concern**
♦ Direct loss and disturbance of fauna species and communities.		**Low Possibility**	**Low Concern**
♦ Runoff from mining area have a potential impact on the Botha's River.		**Low Possibility**	**Low Concern**
♦ Potential damage to the Eskom power lines.		**Low Possibility**	**Low Concern**
Processing, Stockpiling and Transporting Material from Site:	**Duration of operational phase**		
♦ Loss of stockpiled material due to ineffective stormwater control.		**Low Possibility**	**Low Concern**
♦ Dust nuisance because of the mining activities.		**Low Possibility**	**Low Concern**
♦ Noise nuisance because of the mining activities.		**Low Possibility**	**Low Concern**
♦ Potential impact associated with littering and hydrocarbon spills.		**Low Possibility**	**Low Concern**
♦ Infestation of denuded areas with invader plant species.		**Low Possibility**	**Low Concern**

TYPE OF IMPACT	DURATION	LIKELIHOOD	SIGNIFICANCE
♦ Deterioration of the access road to the mining area. ♦ Overloading of trucks having an impact on the public roads.		**Low Possibility** **Low Possibility**	**Low Concern** **Low Concern**
Sloping and Landscaping (Medium- & Long Term): ♦ Erosion of returned topsoil after rehabilitation. ♦ Infestation of the rehabilitated area with invader plant species. ♦ Noise nuisance because of the decommissioning activities. ♦ Potential impact associated with litter/hydrocarbon spills let at the mining area. ♦ Return of the mined areas to agricultural use **(Positive Impact).**	**Duration of decommissioning phase**	**Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**
Cumulative Impacts: ♦ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems. ♦ Fragmentation of ecosystems affecting safe movement of fauna species.	**Duration of operational phase**	**Low Possibility** **Low Possibility**	**Low Concern** **Low Concern**

APPENDIX M

CLOSURE PLAN

APPENDIX N

FINANCIAL AND TECHNICAL COMPETENCE REPORT

APPENDIX O

PHOTOGRAHPS OF THE STUDY AREA

PHOTOGRAPHS OF THE PROPOSED MINING AREA THAT SHOWS THE HISTORIC MINED AREAS	
	
Photos showing the red Naartjie clay. View towards the north-north-east.	
	
Makana Brick old mining area, note the white clay. View towards the west.	
	
Photos of the adjacent retention pond. View towards the north.	

APPENDIX P

CV AND EXPERIENCE OF EAP