PROPOSED MINING ON A PORTION OF PORTION 0 (REMAINING EXTENT) OF THE FARM THANDISIZWE NO 16691, UMSHWATHI MUNICIPAL AREA, KWAZULU-NATAL PROVINCE

FINAL BASIC ASSESSMENT REPORT

JANUARY 2021

REFERENCE NUMBER: KZN 30/5/1/3/2/10724 MP

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EXECUTIVE SUMMARY

The Applicant, Inzalo Crushing and Aggregates (Pty) Ltd, applied for environmental authorisation to mine dolerite from a portion of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 in the uMgungundlovu Magisterial District of the KwaZulu-Natal Province.

The proposed mining footprint will be 4.9 ha and will be developed over a portion of the farm used for grazing. The proposed mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. The mining related activities will be contained within the approved mining permit boundaries.

The proposed project triggers listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended 2017) and therefore requires an environmental impact assessment (basic assessment process) 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. This report, the Final Basic Assessment Report, forms part of the departmental requirements, and presents the assessment report of the EIA (basic assessment) process.

Should the MP be issued and the mining of dolerite be allowed, the proposed project will comprise of activities that can be divided into three key phases namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the permitted mining area. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery and equipment

(2) *Operational phase* that will entail the mining of dolerite from the approved footprint area via conventional open cast mining methods. The mining method will make use of blasting in order to loosen the hard rock; upon which the loosened material will be transported to the crushing and screening processing plant where it will be screened to various sized stockpiles, before it is sold and transported from site to clients

(3) *Decommissioning phase* which entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining permit holder will be required to submit a closure

application to the DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

Preferred Site Alternative

Site Alternative 1, which entails development of the proposed dolerite quarry within the GPS coordinates as listed in Table 6, was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, as the preferred site alternative.

Although the position of Site Alternative 2 will still allow the development of the dolerite quarry on the property, it is believed that the impacts associated with this site alternative is of higher significance without the need or motivation justifying it.

No-go Alternative

The no-go alternative was not deemed to be the preferred alternative as:

- the Applicant will not be able to utilize the dolerite deposit available within the proposed mining area, or supply in the demand of the industry;
- the landowner will not receive compensation from Inzalo, and in so doing diversity the income generated from the property;
- the proposed job opportunities, associated with the development of the quarry, will be lost to the surrounding community;
- the degradation of the vegetation cover of the area will continue as a result of overgrazing, frequent veld fires, invasion by invader plant species, and harvesting of plant species for traditional purposes.

Public Participation Process

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent directly to the contact persons. An advertisement that was placed in the Ilanga News, and two on-site notices that were placed at conspicuous places. A 30-days commenting period was allowed which expired on 13 November 2020. In accordance with the timeframes stipulated in the EIA Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report was compiled and distributed for commenting and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 15 January 2021, that was extended until 22 January 2021, was allowed for perusal of the documentation and submission of comments. The comments/response received on the DBAR were

incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMRE.

Basic Assessment Report

The basic 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 entail the following:

Topography:

- Due to the impracticality of importing large volumes of fill material to restore the quarry area to its original topography, the rehabilitation option (upon closure) is to render the quarry safe and leave it as a minor landscape feature. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

Visual Characteristics:

- From the viewshed analyses, it is deduced that S1 will have a lower visual impact on the receiving environment than S2.

Air and Noise Quality:

- The proposed activity does not require an air emissions licence.
- Should the Applicant implement the proposed mitigation measures the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.
- Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low-medium significance.

Hydrology:

- Based on the results of the DWS risk assessment, a Water Use Licence (WUL) is required for the proposed dolerite quarry, as per Section 21 of the National Water Act No. 36 of 1998 and Notice 509 of 2016.

- Inzalo submitted a WUL application to the DWS on 24 November 2020 that is currently in progress. Should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

Terrestrial Biodiversity, Conservation Areas and Groundcover:

- The study area is located within Ecoregion 16: South Eastern Upland. Both S1 and S2 is situated over areas of highest biodiversity importance with a corresponding rating of highest risk for mining. The study area (S1 & S2) also extends into an area classified as CBA 3 Optimal and BSP 3 in terms of the KZN Biodiversity Sector Plan. The broad scale mapping of the uMDM-EMF shows the study area to be of high agricultural-, and water yield significance, very high biodiversity- and water quality significance, and low to moderate wetland sensitivity.

- One indigenous species (*Brachystelma franksiae*) of concern (Vulnerable) was found in the study area.

- The quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigatory measures are adhered to. Since the earmarked footprint (S1) is already degraded and ground-truthing confirmed that it is not rated as being of high conservation priority, it is the opinion of the specialist that the impacts on the vegetation do not constitute a fatal flaw to the proposed project and so there is no reason to block the project in that regard.

Cultural and Heritage Environment:

- No sites of archaeological or cultural importance were identified during the EIA. The SAHRA palaeontological sensitivity map shows the area to be of insignificant concern. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed insignificant.

Existing Infrastructure:

- No infrastructure exists in the 4.9 ha footprint of either S1 or S2.

- The mining activity will not impact the infrastructure of the clay brick factory due to it being ±400 m removed from S2 and ±750 m from S1. Should the mitigation measures proposed in this document be implemented the existing infrastructure on the farm will be safeguarded against mining related impacts.

Land Use:

- According to the landowner, the grazing value of the study area (S1) is of no significance and therefore he supports the proposed mining operation.

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 damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of R 381 917.81.

LIST OF ABBREVIATIONS

AMAFA	Heritage Kwazulu-Natal
ASTM	American Standard Test Method
BID	Background Information Document
BGIS	Biodiversity GIS
BSP	Biodiversity Sector Plan
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DMRE	Department of Mineral and Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EI	Ecological Importance
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended 2017)
EMPR	Environmental Management Programme
ES	Ecological Sensitivity
ESA	Ecological Support Areas
eWULAAS	Electronic Water Use Licence Application and Authorisation System
EZEMVELO	KZN Wildlife
FBAR	Final Basic Assessment Report
GDP	Gross Domestic Product
GNR	Government Notice
GPS	Global Positioning System
HDSA	Historically Disadvantaged South Africans
HSA	Hazardous Substances Act, 1973 (Act No. 15 of 1973)
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
MP	Mining Permit
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)

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:PAA	National Environmental Management: Protected Areas Amendment Act, 2014 (Act No. 21 of 2014)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFA	National Forest Act, 1998 (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
OHSAS	Occupational Health and Safety Management Systems
PCB's	Polychlorinated Biphenyl
PCO	Pest Control Officer
PES	Present Ecological State
PPE	Personal Protective Equipment
PSM	Palaeontological Sensitivity Map
S1	Site Alternative 1
S2	Site Alternative 2
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMBF	South African Mining and Biodiversity Forum
SANS	South African National Standards
SDS	Safety Data Sheet
uMDM	uMgungundlovu District Municipality
uMDM-EMF	uMgungundlovu District Municipality Environmental Management Framework
uMLM	uMshwathi Local Municipality
USBM	US Bureau of Mines
VARA	Vegetation, Aquatic and Risk Assessments
WMA	Water Management Area
WUL	Water Use Licence
WULA	Water Use Licence Application

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BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATION IN TERMS OF THE NATIONAL ENVIRONMENTAL 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).

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FAX NO:	086 612 8117
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PHYSICAL ADDRESS:	93&94 Maple Street, Pomona, Kempton Park
FILE REFERENCE NUMBER SAMRAD:	KZN 30/5/1/3/2/10724 MP

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 29 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 Authorisation 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 can 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 Regulations, 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 taken into account 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 authorisation 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 a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation 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 the 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 BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process–

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

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:

  (i) the nature, signification, consequence, extent, duration, and probability of the impacts occurring to; and

  (ii) the degree to which these impacts –

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to –

  (i) identify and motivate a preferred site, activity and technology alternative;

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

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

PART A

SCOPE OF ASSESSMENT AND BASIC 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 must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the aforementioned Act. Inzalo Crushing and Aggregates (Pty) Ltd (hereafter referred to as "Inzalo") appointed Greenmined Environmental (Pty) Ltd (hereafter referred to as "Greenmined") to undertake the study needed. Greenmined has no vested interest in Inzalo or the proposed project and declares its independence as required by the Environmental Impact Assessment Regulations, 2014 (as amended April 2017) (EIA Regulations).

i) Details of the EAP

Name of the Practitioner:	Ms Christine Fouché (Senior Environmental Specialist)
Tel No.:	021 851 2673
Fax No.:	086 546 0579
E-mail address:	christine.f@greenmined.co.za

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 M.

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

Ms Fouche has fifteen years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. See a list of past projects attached as Appendix M.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691
Application area (Ha)	4.9 ha
Magisterial district:	uMgungundlovu District FT
Distance and direction from the nearest town	±6 km north-east of Copesville on the outskirts of Pietermaritzburg. Using the R33 towards New Hanover, head north from Copesville for ±4.11 km. Take a right turn onto the farm road that will take you to the farm yard, from where the road continues to the mining area along the eastern rise of the hill.
21 digit Surveyor General Code for each farm portion	N0FT00000001669100000

c) Locality map

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

The requested map is attached as Appendix B.

Figure 1: Satellite view of the proposed mining permit area (white square) submitted by Inzalo Crushing and Aggregates (Pty) Ltd (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 aforesaid main and listed activities, and infrastructure to be placed on site

The Applicant, Inzalo Crushing and Aggregates (Pty) Ltd, applied for environmental authorisation to mine dolerite from a portion of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 in the uMgungundlovu Magisterial District of the KwaZulu-Natal Province.

The proposed mining footprint will be 4.9 ha and will be developed over a portion of the farm used for grazing. The proposed mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. The mining related activities will be contained within the approved mining permit boundaries.

The proposed MP project will therefor entail the:

- site establishment and infrastructure development;
- stripping and stockpiling of topsoil from the proposed mining footprint area;
- blasting and excavation of the mining area;
- crushing and screening of the loosened material at the processing plant; and
- stockpiling the product until sold and transported of site.

The proposed quarry will appoint ±11 employees (including management), and due to the small scale of the operation no permanent infrastructure will be built at the mining area. The Applicant plans to establish the following mobile/temporary infrastructure within the mining footprint:

- Chemical ablution facilities to be serviced by a registered contractor;
- Crushing and screening plant;
- Containers that will be used as site offices, workshops and storage rooms; and
- Temporary wash bay.

See attached as Appendix C a copy of the site activities map for the proposed project.

i) Listed and specified activities

Table 2: Listed and specified activities triggered by the associated mining activities

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – 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 324, GNR 325, GNR 326 OR GNR 327)
Demarcation of site with visible beacons.	4.9 ha	N/A	Not listed
Site establishment and infrastructure development.	±1 ha	X	GNR 324 LN 3 Activity 14

GNR 324 Listing Notice 3 Activity 14:

The development of—
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres; or
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs—
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —

excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

d. KwaZulu-Natal
i. In an estuarine functional zone;
ii. Community Conservation Areas;
iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;
iv. A protected are identified in terms of NEMPAA, excluding conservancies;
v. World Heritage Sites;
vi. Sites or areas identified in terms of an international convention;
vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
viii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
ix. Core areas in biosphere reserves;
x. Outside urban areas:

NAME OF ACTIVITY	Aerial extent of the activity	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
(aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or *(bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *xi. Inside urban areas:* *(aa) Areas zoned for use as public open space;* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or* *(cc) Areas seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined.*			
Stripping and stockpiling of topsoil and/or overburden.	±3.9 ha	X	GNR 327 LN 1 Activity 21, 27, 28 GNR 324 LN 3 Activity 12
GNR 327 Listing Notice 1 Activity 21: *Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002), including –* *a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or* *b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.*			
GNR 327 Listing Notice 1 Activity 27: *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*			
GNR 327 Listing Notice 1 Activity 28: *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*			
GNR 324 Listing Notice 3 Activity 12: *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *<u>d. KwaZulu-Natal</u>* *i. Trans-frontier protected areas managed under international conventions;* *ii. Community Conservation Areas;* *iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;*			

NAME OF ACTIVITY	Aerial extent of the activity	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; *v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *vi. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;* *vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;* *viii. A protected area identified in terms of NEMPAA, excluding conservancies;* *ix. World Heritage Sites;* *x. Sites or areas identified in terms of an international convention;* *xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;* *xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or* *xiii. In an estuarine functional zone.*			
Drilling and blasting.	±3.9 ha	X	GNR 327 LN 1 Activity 21
GNR 327 Listing Notice 1 Activity 21: *Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002), including –* *c) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or* *d) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.*			
Excavation, loading and hauling to processing area.	±3.9 ha	X	GNR 327 LN 1 Activity 21
GNR 327 Listing Notice 1 Activity 21: *Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002), including –* *e) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or* *f) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.*			
Processing, stockpiling and transporting of material.	±1 ha	X	GNR 327 LN 1 Activity 21

<table>
<tr><th>NAME OF ACTIVITY</th><th>Aerial extent of the activity</th><th>LISTED ACTIVITY</th><th>APPLICABLE LISTING NOTICE</th></tr>
<tr><td colspan="4">GNR 327 Listing Notice 1 Activity 21:

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002), including –
g) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or
h) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.

but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.</td></tr>
<tr><td>Sloping and landscaping upon closure of the mining area.</td><td>4.9 ha</td><td>X</td><td>GNR 327 LN 1 Activity 22</td></tr>
<tr><td colspan="4">GNR 327 Listing Notice 1 Activity 22:

The decommissioning of any activity requiring –
i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (act No. 28 of 2002); or
ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;

but excluding the decommissioning of an activity relating to the secondary processing of a –
(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or
(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –
in which case activity 31 in this Notice applies.</td></tr>
<tr><td>Replacing the topsoil and vegetating the disturbed area.</td><td>4.9 ha</td><td>X</td><td>GNR 327 LN 1 Activity 22</td></tr>
<tr><td colspan="4">GNR 327 Listing Notice 1 Activity 22:

The decommissioning of any activity requiring –
iii) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (act No. 28 of 2002); or
iv) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;

but excluding the decommissioning of an activity relating to the secondary processing of a –
(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or
(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –
in which case activity 31 in this Notice applies.</td></tr>
</table>

ii) Description of the activities to be undertaken

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

Background Information:

Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 lays within the jurisdiction of the uMshwathi local municipality just north of Copesville. The low agricultural potential of the property called for the extension of the land uses to include shale mining and the associated operation of a clay brick factory. The development of a filling station is also proposed (by a separate third party) in the northern corner of the property (bordering the R33 provincial road).

Upon identifying the dolerite resource on the property, Inzalo entered into a lease agreement with the landowner for the development of a hard rock quarry at the earmarked site (S1). Refer to Appendix F3 for a copy of the said agreement signed by the landowner and Inzalo. It must be noted that this mining permit application only applies to the establishment of the 4.9 ha dolerite quarry on the property. The development/operation of the shale mine, clay brick factory, and filling station (if approved) must be seen as separate projects (different entities) on the same property.

Project Proposal:

In light of the above, Inzalo applied for environmental authorisation and a mining permit over 4.9 ha of the above mentioned property. The following table lists the GPS coordinates of the proposed mining area as shown on the Regulation 2.2 Mine Plan attached as Appendix A.

Table 3: GPS Coordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29º31'32.606"	30º26'02.080"	-29.525724º	30.433911º
B	29º31'33.586"	30º26'09.553"	-29.525996º	30.435987º
C	29º31'41.639"	30º26'06.770"	-29.528233º	30.435214º
D	29º31'40.357"	30º25'59.801"	-29.527877º	30.433278º

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

Should the MP be issued and the mining of dolerite be allowed, the proposed 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 permitted mining area. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery and equipment.

(2) *Operational phase* that will entail the mining of dolerite from the approved footprint area via conventional open cast mining methods. The mining method will make use of blasting in order to loosen the hard rock; upon which the loosened material will be transported to the crushing and screening processing plant where it will be screened to various sized stockpiles, before it is sold and transported from site to clients.

(3) *Decommissioning phase* which entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is

rehabilitated, the mining permit holder will be required to submit a closure application to the DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

PHASES OF THE PROJECT

1. *Site Establishment Phase:*

Site establishment entails the demarcation of the mining boundaries, clearance of vegetation, and stripping and stockpiling of topsoil to access the mineral as detailed below:

- **Demarcation of Mining Boundaries:**

  Pursuant to receipt of the Environmental Authorisation (EA) and Mining Permit (MP), and prior to site establishment, the boundaries of the mining area will be demarcated with visible beacons.

- **Access Road:**

  The proposed mining area (S1) will be reached via an existing farm road that passes the site. Inzalo proposes to upgrade the road to allow comfortable movement of mining related equipment and vehicles. Haul roads into the excavation will be extended as mining progresses. The improvement of the access road, and establishment of haul roads will be below the threshold of the NEMA, 1998 EIA Regulations, 2017.

Figure 3: Satellite view showing the path of the existing access road (orange line) to the proposed mining area (white polygon).

❖ **Clearing of Vegetation:**

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

The vegetation type of the earmarked footprint is classified as Moist Coast Hinterland Grassland (Gs 20). The vegetation cover of the mining footprint (S1) is in a generally poor condition that can be attributed to over frequent veld burning and heavy grazing by livestock. The Vegetation, Aquatic and Risk Assessments (VARA) for the proposed dolerite quarry compiled by Alletson Ecological & Amanzi Aquatics (2020) (Appendix G) noted that although all of one type, the indigenous vegetation of the study area consists of two communities which are described as semi-open savannah and semi-closed savannah. The study identified 58 indigenous species and 19 alien species, and therefore the proposed activity will require the removal of indigenous vegetation during the site establishment- and operational phases to access the mineral. Of the ingenious species, only one (*Brachystelma franksiae*) was found to be listed as a species of concern. It is rated as “Vulnerable” due to habitat loss but is known to occur at seven or eight other localities.

In the circumstance, upon receipt of the EA and prior to site establishment/bush clearance, a qualified botanist will conduct a plant identification walkthrough with site management to identify any *Brachystelma franksiae* and/or other plants in need of a plant removal permit. The botanist will also advise the permit holder on the need for a license in terms of the National Forest Act, 1998 to allow the clearance of trees in areas that may be deemed "Natural Forest". Bush clearance will only commence upon receipt of the applicable plant permits. The environmental control officer (ECO) will assess the compliance of the permit holder with the conditions of said permits.

- **Topsoil Stripping:**

It is proposed that topsoil removal will be restricted to the exact footprint of areas required during the operational phase of the activity. The topsoil will be stockpiled at a designated signposted area within the mining boundary 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. The topsoil berm will measure a maximum of 1.5 m in height in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.

- **Introduction of Mining Machinery and Site Equipment:**

As mentioned earlier, Inzalo plans to establish mobile/temporary infrastructure within the mining footprint. It is proposed that the office/processing area (including offices, workshop, store rooms, wash bay, ablution, parking area and crushing infrastructure) will occupy ±1 ha of the proposed 4.9 ha area. As no permanent infrastructure will be established, the production rate will dictate the layout of the proposed footprint area.

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

- A temporary wash bay;
- ADT trucks;
- Chemical ablution facilities;
- Containers used as site offices, workshops and storage rooms;

- Crushing and screening plant;
- Drilling equipment;
- Earthmoving- and excavating equipment;
- Generators; and a
- Water truck.

2. *Operational Phase:*

Inzalo intends to loosen the hard rock of the quarry by blasting, upon which it will be mechanically recovered with drilling-, excavating- and earthmoving equipment. The rock will then be delivered to the crushing and screening plant where it will be reduced to various sized aggregate. The screened material will be delivered to various size category stockpiles. Transportation of the final product will be from the stockpile area to the end point by means of trucks. The proposed quarry will appoint ±11 employees (including management) that will be sourced from the surrounding area and daily be transported to site.

❖ **Water Use:**

Any water required for the implementation of the project will be bought and transported to the mining area (in a truck) where it will be stored in tanks until used. Presently, no washing of material is proposed and Inzalo will therefore mainly use water for dust suppression purposes on denuded areas, the processing plant, and access road (when needed).

Dust generation will, as far as possible, be managed through alternative dust suppression methods to restrict water use to the absolute minimum. These measures will include a combination of the following:

- The speed of all mining equipment/vehicles will be restricted to 40 km/h on the internal farm road to minimize dust generation;
- Site management will attempt to lessen denuded areas (dust source) to the absolute minimum;
- Strips of used conveyor belts can be attached to the drop end of the crusher plant where crushed material falls onto the stockpiles. This lessens the blowing of fines from the minerals;
- Compacted dust will weekly be cleaned of the crusher plant to eliminate it as a dust source.

Under very windy/dusty conditions the permit holder might have to substitute the above mentioned dust suppression methods with the spraying of water, in which case a water truck will moisten the problem areas, and sprayers at the processing plant will moisten the material to alleviate dust generation at the conveyor belts. The water truck driver will receive proper training to ensure effective use of the water on problem areas preventing water wastage. It is proposed that approximately 20 000 litres of water will be needed per day during the dry months (amount to decrease during the rainy season). At present no water is proposed to be drawn from dams or other surface water sources/courses.

- **Electricity Use:**

The proposed project will make use of diesel generators to power the mining infrastructure until a connection to the Eskom grid (if approved) can be secured. All generators will have secondary containment in the form of a bund wall/drip tray that can contain 110% of the generator's maximum fuel capacity.

- **Servicing and Maintenance:**

A temporary workshop and wash bay will be established on site where minor servicing and emergency repairs of mining related equipment/machinery will take place. The wash bay will have an impermeable floor and drain into an oil sump that will be serviced by a qualified contractor. No wash water will be allowed to drain into the surrounding environment. No bulk storing of fuel (>30 000 l) will take place on site, and any chemicals needed at the workshop will be stored in accordance with the product specific safety data sheet specifications in temporary containers/secured cages.

- **Waste Handling:**

Solid (general) waste, generated during the operational phase, will be contained in sealable refuse bins that will be placed at the office area until the waste is transported to a recognised general waste landfill site. A recognized contractor will service the chemical toilets that will serve as ablution facilities to the employees.

Due to the nature of the project very little generation of hazardous waste is expected, and will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and the contaminated soil will be contained in designated hazardous waste containers that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility.

Decommissioning Phase:

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature. This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form scree slopes on the benches below, thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil (see Appendix J for the Closure Plan).

The decommissioning activities will therefore consist of the following:

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

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

Inzalo will comply with the minimum closure objectives as prescribed by the DMRE and detailed below:

❖ Rehabilitation of the excavated area:

The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be dumped into the excavation.

No waste may be permitted to be deposited in the excavations.

Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from closure of the site.

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager 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 plant, office and service areas:

Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.

Stockpiles must be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.

On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

- Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.

- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager. _

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm 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.

❖ <u>Final rehabilitation:</u>

Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing.

All mining equipment, 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) will be eradicated from the site.

Final rehabilitation shall be completed within a period specified by the Regional Manager.

Once the mining area was rehabilitated the permit 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).

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**	**HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.** (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	Part A(1)(f) Need and desirability of the proposed activity.	The need and desirability of the proposed project was assessed in terms of this guideline.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk –	The mitigation measures proposed for the site includes specifications of the MHSA, 1996

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
and regulations thereto including relevant OHSA regulations.	*Management of Health and Safety Risks.*	
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ❖ Section 27	Part A(1)(d) Description of the scope of the proposed overall activity	Application for a mining permit submitted to DMRE-KZN. Ref No: KZN 30/5/1/3/2/10724 MP
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) ❖ GNR 327 Listing Notice 1 Activity 21 ❖ GNR 327 Listing Notice 1 Activity 22 ❖ GNR 327 Listing Notice 1 Activity 27 ❖ GNR 327 Listing Notice 1 Activity 28 ❖ GNR 324 Listing Notice 3 Activity 12 ❖ GNR 324 Listing Notice 3 Activity 14	Part A(1)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMRE-KZN. Ref No: KZN 30/5/1/3/2/10724 MP
National Environmental Management: Air Quality Control Act, 2004 (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)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Fugitive Dust Emission Mitigation Measures.*	The mitigation measures proposed for the site take into account 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 A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Vegetation Removal & Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
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 926)	Part A(1)(d)(ii) Description of the activities to be undertaken. Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Waste Management*.	The mitigation measures proposed for the site take into account the NEM:WA.
National Forest Act, 1998 (Act No 84 of 1998)	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Vegetation Removal.*	The mitigation measures proposed for the site includes specifications of the NFA, 1998.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Archaeological, Heritage and Palaeontological Aspects*.	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Potential Impact on the unnamed tributary and/or uMngeni River*. Part B(1)(d)(iii) Has a water use licence been applied for?	The mitigation measures proposed for the site includes specifications of the NWA, 1998. Based on the results of the DWS risk assessment, a Water Use Licence (WUL) is required for the proposed dolerite quarry, as per Section 21 of the National Water Act No. 36 of 1998 and Notice 509 of 2016. The application was submitted and is currently in Phase 1 in the e-WULAAS application process (see Figure 43).

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(1)(h)(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the guidelines published in terms of the NEMA EIA Regulations.
uMgungundlovu District Municipality – Environmental Management Framework Report.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of vegetation removal*.	The mitigation measures proposed for the site includes considerations of the uMDM-EMF, 2017.
uMshwati Municipality Integrated Development Plan (IDP)	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.

f) Need and desirability of the proposed activities.

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

As mentioned earlier, Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 has a very low agricultural potential and therefore the landowner has extended the use of the property to include alternative land uses such as small scale mining, brick-making and potential commercial uses. The dolerite intrusion of the earmarked area protrudes in some places above ground level, resulting in shallow soil depths with rocky soils that promote the low agricultural potential of the property. According to the landowner, the grazing value of the study area at the dolerite intrusion is of no significance and therefore he supports the proposed mining operation as it will contribute to the economic diversification of the property.

Inzalo identified the need for dolerite aggregate in the local industry and in the circumstance entered into a lease agreement with the landowner to develop the hard rock quarry on the proposed 4. 9 ha area (S1). The development of the quarry will create at least eight new job opportunities to local residents, and in doing so the proposed operation

will contribute to the local economy of the area, both directly and through the multiplier effect that its presence will create. Equipment and supplies will be purchased locally, and wages will be spent at local businesses, generating both jobs and income in the area.

The dolerite mined from the earmarked area will be sold to the building, construction and road maintenance industry in the vicinity of the property. The mining of the aggregate from the proposed site will benefit the general society in that it will contribute to the upgrading of road infrastructure of the region, thereby enabling road users to safely travel through the district. The upgrading and maintenance of roads is of high priority and contributes to the improvement of the infrastructure network of South Africa.

The need and desirability of the proposed project 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 taken into account? How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?	As discussed under Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity, the Mining and Biodiversity Map shows that the proposed footprint (Site Alternative 1 (S1)) extends over an area of highest biodiversity importance, with the footprint of Site Alternative 2 (S2) extending partially into the same area of highest biodiversity importance, and partially into an area of moderate biodiversity importance. According to the KZN Biodiversity Sector Plan the project area (S1 & S2 partially) is mapped as a Critical Biodiversity Area – specifically CBA 3 Optimal, with a corresponding rating of BSP 3 (Biodiversity Sector Plan). The VARA (Appendix G) verified that the vegetation type of the earmarked footprint is classified as Moist Coast Hinterland Grassland (Gs 20) classified as Endangered. Ground truthing, by the specialists, however confirmed that the vegetation of the study area (S1) is in a generally poor condition and concluded that the earmarked footprint (S1) is not of high conservation priority. The botanist deduced that the impacts on the vegetation do not constitute a fatal flaw to the proposed mining operation and so there is no reason to block the project in that regard. Also refer to: ❖ Part A(1)(d)(ii) Description of the activities to be undertaken – Clearing of Vegetation; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Mining and Biodiversity; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Biodiversity Conservation Areas; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Groundcover; ❖ Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas and Groundcover, ❖ Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk.	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**
How will this development pollute and/or degrade the biophysical environment?	Due of the nature of the proposed activity, it is inevitable that the present vegetation cover of the earmarked footprint (S1 or S2) will eventually be removed to allow access to the dolerite resource, only to be replaced (to some extend) during the rehabilitation phase. Further to this, the development of the proposed quarry (S1) will also extend across the nearby drainage line. Taking the above mentioned into consideration, the VARA concluded that the quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigation measures are adhered to. Therefore, should the permit holder adhere to the conditions of the WUL (to be issued by the DWS) as well as the mitigation measures proposed in this report it is believed that the impact on the biophysical environment is of acceptable significance.	Desirable
What waste will be generated by this development?	The general waste to be generated at the mine will mainly consist of paper, plastic, tin, and/or glass from the office, workshop and processing area. All general waste will be contained in sealable refuse bins that will be placed at the office area until it is transported to a recognised general waste landfill site. A recognized contractor will service the chemical toilets and be responsible for the removal of the sewerage to a registered sewerage handling facility. As mentioned earlier, hazardous waste may result from accidental spillages/breakdowns. Such contaminated areas will immediately (within two hours of occurrence) be cleaned and the contaminated soil will be contained in a designated hazardous waste container that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility. No waste will be disposed of, buried, burned or treated on the site.	Highly Desirable
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	The earmarked mining footprint extends across an area historically used for grazing purposes. If approved the proposed mining footprint will be in close proximity (±240 m) to an existing shale quarry. Prior to the development of the shale quarry, Mr Gavin Anderson undertook a Heritage Impact Assessment of the area (2018). Although Mr Anderson's study mainly focussed on the footprint of the proposed shale quarry, the report did not indicate any areas of concern within the immediate surroundings of the proposed mining area. Likewise, no national monuments, battlefields or cemeteries were identified in the proposed dolerite	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**
	quarry footprint. The Palaeontological Sensitivity Map (of SAHRA) identifies the study area as being of insignificant concern regarding the presence of fossils and does not require palaeontological studies. In light of this, it is believed that the proposed project will not disturb sites that constitute the nation's cultural heritage.	
How will this development use and/or impact on non-renewable natural resources?	If approved Inzalo will mine the dolerite resource identified on Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691. Presently, it is believed that the mineable area (4.9 ha) may have an inferred dolerite reserve of >1 750 000 m³. Based on the proposed production rate, the dolerite resource shows a potential life of mine of >55 years. In light of this, and the fact that the proposed 4.9 ha mining area only occupies ±8% of the identified dolerite intrusion, it is believed that the permit holder will responsibly consume the resource on the property.	Highly Desirable
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?	It is proposed that approximately 20 000 litres of water will be needed per day during the dry months (amount to decrease during the rainy season) to manage dust emissions from the proposed operation. As mentioned earlier, the contractor will strive to manage dust generation through alternative suppression methods to restrict water use to the absolute minimum. Presently, it is proposed that water will be bought and transported to site. The contractor will be encouraged to consider the use of non-potable water for mining related activities. The use of solar power should also be considered as an alternative power source to the offices and/or workshops.	Desirable
How were a risk-averse and cautious approach applied in terms of ecological impacts?	It is proposed that prior to site establishment/bush clearance, a qualified botanist will conduct a plant identification walkthrough with site management to identify any *Brachystelma franksiae* and/or other plants in need of a plant removal permit. The botanist will also advise the permit holder on the need for a license in terms of the National Forest Act, 1998 to allow the clearance of trees in areas that may be deemed "Natural Forest". Bush clearance will only commence upon receipt of the applicable plant permits. The environmental control officer (ECO) will assess the compliance of the permit holder with the conditions of said permits. The permit holder is also committed to adhere to the conditions of the WUL (to be issued by the DWS).	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**
How will the ecological impacts resulting from this development impact on people's environmental right?	The mine will be managed in accordance to the specifications of the lease agreement with the landowner, and should the mitigation measures proposed in this document be implemented the potential visual-, dust-, and noise impacts associated with the dolerite mining operation will be of low-medium significance. If the monitoring programs, proposed in this document, be implemented it is believed that no environmental rights of the surrounding residents/public will be affected by the ecological impacts associated with the proposed activity.	Highly Desirable
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.	If approved, the quarry will create at least eight new work opportunities to local residents, and will also contributed an additional source of income (compensation) to the landowner. It is proposed that the quarry will contribute to the local economy of the area, both directly and through the multiplier effect that its presence will create. Equipment and supplies will be purchased locally, and wages will be spent at local businesses, generating both jobs and income in the area. The mining of the dolerite from the proposed site will benefit the general society in that it will contribute to the upgrading of road infrastructure of the region, thereby enabling road users to safely travel through the district. The upgrading and maintenance of roads is of high priority and contributes to the improvement of the infrastructure network of South Africa.	Highly Desirable
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area? 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	If the mitigation measures proposed in this document are adhered to, S1 entails the mining of the 4.9 ha area without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA3/BSP3 area. Also refer to: ❖ Part A(1)(d)(ii) Description of the activities to be undertaken – Clearing of Vegetation; ❖ Part A(1)(h)(i) Details of the development footprint alternatives considered; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Mining and Biodiversity; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Biodiversity Conservation Areas; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Groundcover;	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**
environmental option" in terms of ecological considerations	❖ Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas and Groundcover.	

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)(h)(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?	If approved, the quarry will create at least eight new work opportunities to local residents, and will also contributed an additional source of income (compensation) to the landowner. It is proposed that the quarry will contribute to the local economy of the area, both directly and through the multiplier effect that its presence will create. Equipment and supplies will be purchased locally, and wages will be spent at local businesses, generating both jobs and income in the area. The mining of the dolerite from the proposed site will benefit the general society in that it will contribute to the upgrading of road infrastructure of the region, thereby enabling road users to safely travel through the district. The upgrading and maintenance of roads is of high priority and contributes to the improvement of the infrastructure network of South Africa.	
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?		

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
Will the development result in equitable impact distribution, in the short- and long-term?	The proposed mine will be operated in a socially and economically sustainable manner during both the short- and long term. Inzalo Crushing and Aggregates (Pty) Ltd is a predominantly black owned entity, with the focus on Historically Disadvantaged South Africans, especially women, empowerment. The procurement progression plan of Inzalo entails the support of local enterprises, of which preference will be given to HDSA & women owned local suppliers. Inzalo's employment equity is also in line with the provisions of the Mining Charter 2018, as well as the provisions of the Employment Equity Act, 1998 (as amended).	Highly Desirable
In terms of location, describe how the placement of the proposed development will contribute to the area.	Mining the dolerite source on the property will contribute to the area in that the landowner will receive compensation, the project will create employment opportunities, and the sales of the material will directly and indirectly promote the economy of the area as mentioned earlier.	Highly Desirable
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	No negative socio-economic impacts could, at this stage, be identified that cannot be managed through the implementation of mitigation measures included in this report.	Highly Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	As mentioned in Part A(1)(t)(i)(1) Impact on the socio-economic conditions of any directly affected person, the activity may have an impact on the visual characteristics of the surrounding environment, and may affect air quality and the noise ambiance of the study area. However, the mine will be managed in accordance to the specifications of the lease agreement with the landowner, and should the mitigation measures proposed in this document be implemented the potential visual-, dust-, and noise impacts associated with the dolerite mining operation will be of low-medium significance. If the monitoring programs, proposed in this document, be implemented it is believed that no environmental rights of the surrounding residents/public will be affected by the ecological impacts associated with the proposed activity.	Highly Desirable
Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and	If approved, the quarry will create at least eight new work opportunities to local residents, and will also contributed an additional source of income (compensation) to the landowner. It is proposed that the quarry will contribute to the local economy of the area, both directly and through the multiplier effect that its presence will create. Equipment and supplies will be purchased	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts?	locally, and wages will be spent at local businesses, generating both jobs and income in the area. The mining of the dolerite from the proposed site will benefit the general society in that it will contribute to the upgrading of road infrastructure of the region, thereby enabling road users to safely travel through the district. The upgrading and maintenance of roads is of high priority and contributes to the improvement of the infrastructure network of South Africa.	
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?	If the mitigation measures proposed in this document is adhered to, S1 entails the mining of the 4.9 ha area without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA3/BSP3 area. Should the permit application be approved, the project will directly contribute to the socio-economic status of the receiving environment through the employment of at least eight local residents, and support of the local economy. Also refer to: ❖ Part A(1)(h)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly 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?	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;	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	❖ NEM:WA, 2008 – to ensure waste related compliance; ❖ NEMA, 1998 (as amended) – to ensure environmental related compliance; As mentioned earlier, Inzalo is a predominantly black owned entity, with the focus on Historically Disadvantaged South Africans, especially women, empowerment. The procurement progression plan of Inzalo entails the support of local enterprises, of which preference will be given to HDSA & women owned local suppliers. Inzalo's employment equity is also in line with the provisions of the Mining Charter 2018, as well as the provisions of the Employment Equity Act, 1998 (as amended).	
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.	Presently, it is proposed that the mine will create a minimum of eight employment opportunities to local residents. In a municipal area with an unemployment rate of ±31.5%, new job opportunities are of high significance. Further to this, and as mentioned earlier, the procurement progression plan of Inzalo supports local enterprises, of which preferences are given to HDSA & women owned local suppliers (where possible).	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 will operate in accordance with the specifications of the Mine Health and Safety Act, 1996 as well as the Occupational Health and Safety Act, 1993. Site management will arrange regular toolbox talks with the site personnel regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the toolbox sessions and site meetings.	Highly Desirable
Describe how the development will impact on job creation in terms of, amongst other aspects?	As mentioned earlier, the proposed quarry will appoint ±11 employees (including management), of which at least eight will be from the surrounding area.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
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 public interest, and that the environment will be protected as the people's common heritage.	The proposed mine will operate under a valid environmental authorisation and mining permit to be issued by the DMRE-KZN as well as a water use licence to be issued by the DWS. Compliance of the site with the approved EMPR, EA- and WUL conditions will be reported on as per departmental specifications. In light of this, the proposed activity will take place in an environmental sustainable manner with the least possible impact on the receiving environment.	Highly Desirable
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. As mentioned earlier, due to the impracticality of importing large volumes of fill to restore the quarry pit to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature that will be rendered safe upon final site closure. The benches will be top-dressed with topsoil and vegetated with an appropriate grass mix and the area will be returned to agricultural use. If the disturbed areas are successfully rehabilitated 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 permit 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, Inzalo 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

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
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	If the mitigation measures proposed in this document are adhered to, S1 entails the mining of the 4.9 ha area without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA3/BSP3 area. Also refer to: ❖ Part A(1)(h)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
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.	The landscape around the proposed quarry site is already transformed, in a number of different ways. An existing shale quarry lies ±240 m to the east and extends northwards to a clay brick factory that is ±750 m away. Further north on the same ridge (different property) some further shale extraction is happening. A second brickworks with its own quarry lies to the north-east on the opposite side of the valley that is ±1.6 km away. South of the quarry site is the Copesville low income housing area while sugar cane fields lie to the west, south, and south-east. Thus, it is apparent that the ridge on which the proposed quarry would be situated lies in a moderately transformed landscape with large expanses of untransformed vegetation lying only to the north-west. The VARA concluded that the quarry will have relatively little impact on the area around it other than for the issue of dust on vegetation. It will not pollute any watercourses or wetlands and will not lead to the degradation of any mapped areas of conservation importance, and therefore it will have relatively little cumulative impact on the vegetation and fauna in its landscape.	Highly Desirable

g) Motivation for the overall preferred site, activities and technology alternative.

Site Alternative 1 (S1) entails the mining of dolerite within the proposed GPS coordinates (Table 6). As no permanent infrastructure will be established, the production rate will dictate the layout of the proposed footprint area.

The proposed site (S1) was identified as the preferred site alternative based on the following:

- The proposed mining footprint lays at the foot of the hill extending into it towards the west/north-west. Placing the quarry at the foot of the hill directly adjacent to the access road simplifies access into the mining area, access to the earmarked mineral, and transport of the material from the mining area.

- Based on the proposed mining method, the permit holder will gradually mine the earmarked area from the lowest point (south-eastern boundary) towards the higher laying north-western boundary. Ultimately, this should create a south-east facing excavation with more or less three faces that will be benched as the mining depth increases. Upon rehabilitation of the excavation, the permit holder will render the said benches safe and reinstate the footprint area to allow for future agricultural (grazing) use. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

- If S1 is approved, the mining area will be facing the surrounding area toward the south-east. This will mean that the mining footprint will be screened from traffic passing on the R33 provincial road (although it will be visible from ±3 km along the R614). As shown by the viewshed analysis the position of S1 will have a lower visual impact than that of S2.

- The proposed dolerite quarry will be ±240 m from the shale quarry on the property. Siting the dolerite quarry at the location of S1 will concentrate the mining activities on the farm to a central area, instead of spreading mining related impacts across the whole property.

- The VARA confirmed that there are already disturbed areas within the proposed footprint of S1, thereby reducing the magnitude of the impact that removal of vegetation, from the mining area, will have on the vegetation cover of the

ecosystem/farm. The protected species, identified by the botanist, can be relocated by a suitably qualified contractor upon receipt of a relocation plant permit.

- Although the proposed mining footprint will extend across the identified drainage line (upon approval of the WULA), it is proposed that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

During the environmental impact assessment process the feasibility of the proposed site alternative 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. In light of the above, the mining proposal was updated to incorporate the project related mitigation measures and monitoring programmes identified during the assessment process. The preferred development footprint was subsequently finalized and is depicted on the attached site activities plan (Appendix C).

h) Full description of the process followed to reach the proposed preferred alternatives within the 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.

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.

Site Alternative 1 (S1) (Preferred Site Alternative): Site Alternative 1 entails the development of the proposed dolerite quarry within the GPS coordinates as listed in the table below and depicted in Figure 2 above.

Table 6: GPS Coordinates of Site Alternative 1 (preferred site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29º31'32.606"	30º26'02.080"	-29.525724º	30.433911º
B	29º31'33.586"	30º26'09.553"	-29.525996º	30.435987º
C	29º31'41.639"	30º26'06.770"	-29.528233º	30.435214º
D	29º31'40.357"	30º25'59.801"	-29.527877º	30.433278º

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, as the **preferred site alternative** due to the following:

- The proposed mining footprint lays at the foot of the hill extending into it towards the west/north-west. Placing the quarry at the foot of the hill directly adjacent to the access road simplifies access into the mining area, access to the earmarked mineral, and transport of the material from the mining area.

- Based on the proposed mining method, the permit holder will gradually mine the earmarked area from the lowest point (south-eastern boundary) towards the higher laying north-western boundary. Ultimately, this should create a south-east facing excavation with more or less three faces that will be benched as the mining depth increases. Upon rehabilitation of the excavation, the permit holder will render the said benches safe and reinstate the footprint area to allow for future agricultural (grazing) use. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

- If S1 is approved, the mining area will be facing the surrounding area toward the south-east. This will mean that the mining footprint will be screened from traffic passing on the R33 provincial road (although it will be visible from ±3 km along the R614). As shown by the viewshed analysis the position of S1 will have a lower visual impact than that of S2.

- The proposed dolerite quarry will be ±240 m from the shale quarry on the property. Siting the dolerite quarry at the location of S1 will concentrate the mining activities on the farm to a central area, instead of spreading mining related impacts across the whole property.

- The VARA confirmed that there are already disturbed areas within the proposed footprint of S1, thereby reducing the magnitude of the impact that removal of vegetation, from the mining area, will have on the vegetation cover of the ecosystem/farm. The protected species, identified by the botanist, can be relocated by a suitably qualified contractor upon receipt of a relocation plant permit.

- Although the proposed mining footprint will extend across the identified drainage line (upon approval of the WULA), it is proposed that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

In light of the above mentioned, S1 is believed to be the most practical alternative as the topsoil and/or overburden layer of the footprint is relatively shallow, the dolerite is of good grade, access and rehabilitation is simplified, and the environmental related impacts are acceptable.

Site Alternative 2 (S2): Site Alternative 2 entails the development of the proposed dolerite quarry at the crest of the hill within the GPS coordinates as listed in the table and following figure.

Table 7: GPS Coordinates of Site Alternative 2

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29º31’10.86”	30º25’58.26”	-29.519684º	30.432851º
B	29º31’14.34”	30º26’05.02”	-29.520651º	30.434729º
C	29º31’21.65”	30º26’02.53”	-29.522680º	30.434035º
D	29º31’18.80”	30º25’55.81”	-29.521889º	30.432168º

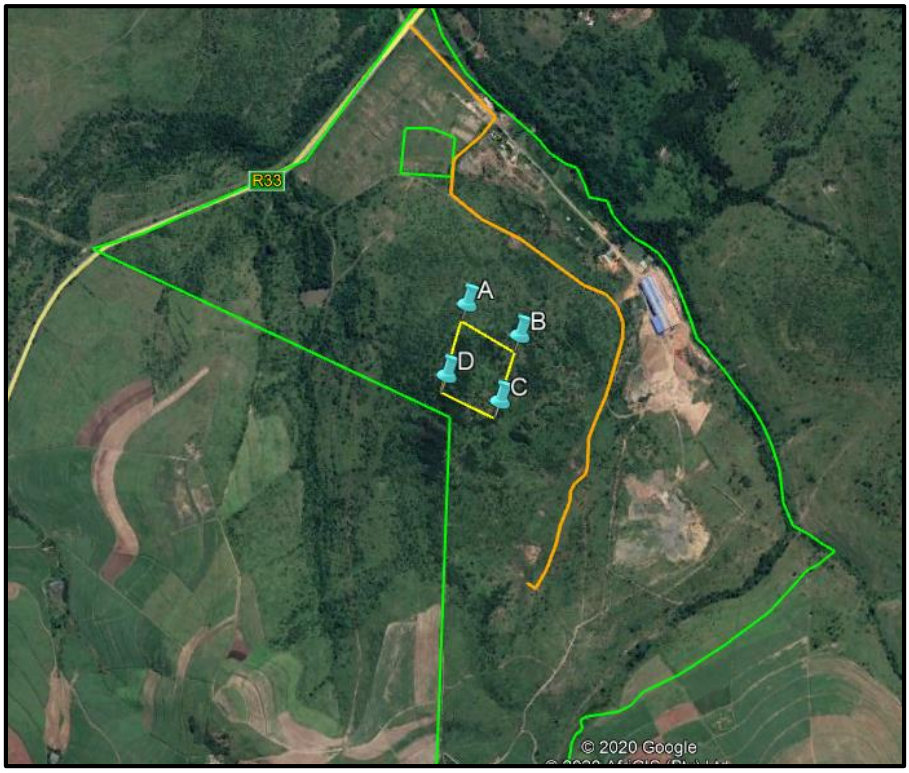


Figure 4: Satellite view showing the position of Site Alternative 2 (yellow polygon) in relation to the property boundaries (green polygons) and access road (orange line) (image obtained from Google Earth).

Site Alternative 2 was considered during the assessment phase of the environmental impact assessment, by the Applicant and project team, but were not deemed the **preferred site alternative** due to the following:

- Siting the mining area at the crest of the hill removes it from the existing access road; necessitating the construction of an access road of ±400 m.

- Should S2 be approved, the mining method will create an excavation (crate-like feature) with more or less four faces that will be benched as the mining depth increases. Upon rehabilitation of the excavation, the permit holder will have to render the said benches safe and reinstate the footprint area to allow for future agricultural (grazing) use. However, due to the topography and layout of the earmarked area the excavation will most likely create a crater-like feature that will have to be secured to prevent injury to humans and livestock. This entails additional cost and effort to achieve the end-use of an agricultural (grazing) suitable area.

- As shown by the viewshed analysis the position of S2 will have a higher visual impact than that of S1. The mining area will be visible from the R33, R614 as well as surrounding areas to the north/north-west.

- Should S2 be approved, the dolerite quarry will more or less be in the middle of the earmarked property, ±500 m from the existing shale mining operation. This will also move the mining area nearer (±400 m opposed to ±750 m for S1) to the infrastructure of the clay brick factory and sales office on the farm. As mentioned earlier, it would be best to centralise the mining related activities on the property (S1). The footprint of S2 will also raise the potential of the mining activity impacting on the infrastructure/operation of the clay brick factory.

- The VARA shows the vegetation community of the proposed footprint (S2) as semi-closed savannah / woodland. Developing the dolerite quarry in this plant community will necessitate the removal of numerous large trees and aloes that will not be necessary (to the same extent) should the quarry be developed at S1.

- The dolerite quarry will be developed (if S2 approved) on the opposite (south-western) side of the Eskom power line. This will mean that the power line will run between the quarry and the existing access road, and that the new access road (to the quarry) will pass underneath the power line. An Eskom servitude was registered on the property (see Figure 42), and the footprint of S2 will be within ±500 m thereof, opposed to the footprint of S1 that is ±1.2 km away. It is proposed that the potential impact of the mining activity affecting the nearby power line will be higher at S2 than at S1.

Although the position of S2 will still allow the development of the dolerite quarry on the property, it is believed that the impacts associated with this site alternative is of higher significance without the need or motivation justifying it.

No-go Alternative: The no-go alternative entails no change to the *status quo* and is therefore a real alternative that must be considered. The dolerite to be mined will be used for building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented the Applicant will not be able to exploit the mineral resource on the property.

The no-go alternative was not deemed to be the preferred alternative as:

- the Applicant will not be able to utilize the dolerite deposit available within the proposed mining area, or supply in the demand of the industry;
- the landowner will not receive compensation from Inzalo, and in doing so diversity the income generated from the property;

- ❖ the proposed job opportunities, associated with the development of the quarry, will be lost to the surrounding community;
- ❖ the degradation of the vegetation cover of the area will continue as a result of overgrazing, frequent veld fires, invasion by invader plant species, and harvesting of plant species for traditional purposes.

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 attended 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.

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent directly to the contact persons. A 30-days commenting period was allowed which expired on 13 November 2020. The following I&AP's and stakeholders were informed of the project:

Table 8: List of the I&AP's and stakeholders that were notified of the Inzalo mining permit application.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: ❖ Rookhiya Bee Bee Moosa Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691. **Surrounding landowners & lawful occupiers:** ❖ Nurden Oliver Wyndham Portion 17 of the farm Retief No 884; ❖ Skhuma Skins of Africa CC Portion 23 of the farm Retief No 884 ❖ Nanxing Bricks & Tiles (Pty) Ltd Portion 1 (Remaining Extent) of the farm Alida Mount No 1347 ❖ Alzura Inv CC Portion 2 of the farm Thandisizwe No 16691 ❖ Greenville Trading 6 CC Portion 0 of the farm Whispers No 17478 & Portion 10 of Lot 37 No 1294 ❖ Department of Land Affairs Portion 9 of Lot 37 No 1294 ❖ Sansha Investments CC Portion 0 of the farm Thornridge No 17217 ❖ Nirmala Singh	❖ AMAFA / Heritage KZN; ❖ Department of Agriculture and Rural Development; ❖ Department of Agriculture, Land Reform and Rural Development (National); ❖ Department of Economic Development Tourism and Environmental Affairs; ❖ Department of Human Settlements, Water and Sanitation; ❖ Department of Labour; ❖ Department of Transport; ❖ Eskom Ltd; ❖ Ezemvelo / KZN Wildlife; ❖ South African Heritage Resources Agency. ❖ uMgungundlovu District Municipality, ❖ uMshwathi Local Municipal Ward Councillor (Ward 10); and ❖ uMshwathi Local Municipality.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Portion 9 of the farm Zeekoegat No 17216 ❖ Tom Lam Lawful occupier of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691	
I&AP'S AND STAKEHOLDERS THAT REGISTERED DURING THE INITIAL NOTIFICATION PERIOD	
❖ Department of Economic Development, Tourism and Environmental Affairs – KZN; ❖ Mr Tom Lam care of Mr Magnus van Rooyen.	

An advertisement was placed in the Ilanga News on 12 October 2020 and on-site notices were placed on 01 October 2020 at the entrance to the farm, and the intersection of the R33 and the D173 road turnoff towards the Karkloof Safari Spa. The advertisement, background information document (BID) and on-site notices invited the recipients to register/comment on the project on/before 13 November 2020.

In accordance with the timeframes stipulated in the EIA Regulations of December 2014 (amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report (DBAR) was compiled and distributed for comment and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 15 January 2021, that was extended until 22 January 2021, was allowed for perusal of the documentation and submission of comments. The following table provides a list of the I&AP's and stakeholders that were invited to comment on the project:

Table 9: List of the I&AP's and stakeholders that were invited to comment on the DBAR.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: ❖ Rookhiya Bee Bee Moosa Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691. **Surrounding landowners & lawful occupiers:** ❖ Nurden Oliver Wyndham Portion 17 of the farm Retief No 884; ❖ Skhuma Skins of Africa CC Portion 23 of the farm Retief No 884 ❖ Nanxing Bricks & Tiles (Pty) Ltd	❖ AMAFA / Heritage KZN; ❖ Department of Agriculture and Rural Development; ❖ Department of Agriculture, Land Reform and Rural Development (National); ❖ Department of Economic Development Tourism and Environmental Affairs; ❖ Department of Human Settlements, Water and Sanitation; ❖ Department of Labour; ❖ Department of Transport; ❖ Eskom Ltd; ❖ Ezemvelo / KZN Wildlife; ❖ South African Heritage Resources Agency. ❖ uMgungundlovu District Municipality, ❖ uMshwathi Local Municipal Ward Councillor (Ward 10); and

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Portion 1 (Remaining Extent) of the farm Alida Mount No 1347 ❖ Alzura Inv CC Portion 2 of the farm Thandisizwe No 16691 ❖ Greenville Trading 6 CC Portion 0 of the farm Whispers No 17478 & Portion 10 of Lot 37 No 1294 ❖ Department of Public Works Portion 9 of Lot 37 No 1294 ❖ Sansha Investments CC Portion 0 of the farm Thornridge No 17217 ❖ Nirmala Singh Portion 9 of the farm Zeekoegat No 17216 ❖ Tom Lam Lawful occupier of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691	❖ uMshwathi Local Municipality.
I&AP'S AND STAKEHOLDERS THAT COMMENTED/RESPONDED ON THE DBAR/NOTIFICATION	
❖ Department of Economic Development, Tourism and Environmental Affairs – KZN; ❖ Ezemvelo / KZN Wildlife.	

The comments received on the DBAR was incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMRE.

See attached as Appendix F1 & F2 proof that the I&AP's and stakeholders were contacted.

iii) Summary of issues raised by I&APs

(Compile the table summarising comments and issues raised, and reaction to those responses)

Table 10: Summary of issues raised by IAPs

Interested and Affected Parties **List the name 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	**X**				
Landowner/s					
Rookhiya Bee Bee Moosa ❖ Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691.	X	Inzalo Crushing and Aggregates (Pty) Ltd entered into a lease agreement with Mr Moosa who supports the application. See Appendix F3 for a copy of the signed lease agreement.			
Lawful occupier/s of the land					
Mr Tom Lam care of Mr Magnus van Rooyen ❖ Lawful occupier of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691.	X	10 November 2020	Mr Van Rooyen registered Mr Lam as an interested and affected party on the project.	Greenmined acknowledged receipt of the registration on 11 November 2020 and will provide Mr Van Rooyen and Mr Lam with an opportunity to comment on the DBAR.	Appendix F – Proof of Public Participation Process
Additional comments received from Mr Van Rooyen on 10 November 2020: *"As a first query from our side, can you please confirm if any blasting will take place during the mining operations associated with the Mining Permit and if so, what mitigation measures will be put in place to monitor/prevent/repair any potential structural damage to my client's factory and associated buildings. Similarly, is an upgrade planned for the intersection between the access road from the Mining Permit Area and the Greytown Road?".*					
Greenmined responded as follows on 16 November 2020:					

Interested and Affected Parties List the name 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.
"1. The proposed mining method does include blasting. The mitigation measures will be elaborated on in the draft basic assessment report that will follow shortly, and that will be available for your perusal and commenting, but thus far I can confirm that: *• Before blasting, the structural integrity of the infrastructure near the proposed mining footprint will be determined;* *• Blasting will be done in accordance with the USBM standards and measures will be implemented to limit flyrock;* *• During a blast, vibration measuring equipment (seismograph) will be placed at the brick factory to measure the ground vibrations that extents from the quarry. Should the vibration testing indicated excessively high readings the blasting at the quarry will be amended to lower the impact. Any structural damage, that resulted as a direct cause of the mining at the quarry, will be repaired at the cost of the Applicant.* *• Mr Lam will be notified in advance of each blasting.* *2.The permit holder will maintain the access (gravel) road to the quarry that turns onto the farm from the Greyton road (R33). Upon closure of the quarry the road will be left in a condition that will at least represent the pre-mining status."*				
Landowners or lawful occupiers on adjacent properties	**X**			
Nurden Oliver Wyndham ❖ Portion 17 of the farm Retief No 884	X	No comments recevied	N/A	N/A	N/A
Skhuma Skins of Africa CC ❖ Portion 23 of the farm Retief No 884	X	No comments recevied	N/A	N/A	N/A
Nanxing Bricks & Tiles (Pty) Ltd ❖ Portion 1 (Remaining Extent) of the farm Alida Mount No 1347	X	No comments recevied	N/A	N/A	N/A
Alzura Inv CC ❖ Portion 2 of the farm Thandisizwe No 16691	X	No comments recevied	N/A	N/A	N/A

Interested and Affected Parties **List the name 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.**
Greenville Trading 6 CC ❖ Portion 0 of the farm Whispers No 17478 ❖ Portion 10 of Lot 37 No 1294	X	No comments recevied	N/A	N/A	N/A
Department of Land Affairs ❖ Portion 9 of Lot 37 No 1294	X	No comments recevied	N/A	N/A	N/A
Sansha Investments CC ❖ Portion 0 of the farm Thornridge No 17217	X	No comments recevied	N/A	N/A	N/A
Nirmala Singh ❖ Portion 9 of the farm Zeekoegat No 17216	X	No comments recevied	N/A	N/A	N/A
Municipal councillor					
Cllr. Zuma Dube (Ward 10)	X	No comments recevied	N/A	N/A	N/A
Municipality					
uMshwathi Local Municipality	X	To date no comments were received from the municipality.			
Organs of state (Responsible for infrastructure that may be affected					

Interested and Affected Parties List the name 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.
Roads Department, Eskom, Telkom, DWA e					
Department of Transport	X	No comments received	N/A	N/A	N/A
Eskom Ltd	X	Although Eskom was informed of the availabilty of the DBAR and invited to comment no comments were received from them to date. The Applicant also contacted Eskom regarding the possible supply of electricity, but to date no feedback was received that could be added to this FBAR.			
Communities	No communities were identified within the study area.				
Dept. Land Affairs	X	08 October 2020	The office of the Regional Land Claims Commissioner: KZN advised that their records indicated that no claim for restitution in terms of the provision of the Restituion of Land Rights Act, 22 of 1994 (as amened) has been lodged in respect of the property in question.	N/A	Appendix F – Proof of Public Participation Process.
Traditional Leaders	N/A				
Dept. Environmental Affairs					
Department of Economic Development, Tourism and Environmental Affairs (DEDTEA)	X	28 October 2020	The DEDTEA registered on the project with the following comments that was sent to the Inzalo contact person Mr Weideman.	Mr Weideman acknowledged receipt of the comments on 28 October 2020, and Greenmined registered the DEDTEA as a commenting authority. The comment	See references listed below.

Interested and Affected Parties List the name 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.
				received from the DEDTEA were incorporated into the DBAR.	

Comments received from the DEDTEA during the initial public participation period:

"1. The Background Information Document (BID) submitted in respect of the above-mentioned project, received by the Department on 23 October 2020, refers.
2. This Department has reviewed the BID and requires that the following issues be addressed in the Final FBAR.
3. The BID must include a detailed project description; proposed footprint, structure sizes for the offices; workshops; storage rooms; and temporary wash bay; ablution, parking; etc.
4. A filling station is also to be included to the proposed development and the FBAR need to include the cubic capacity on the dangerous good storage (underground storage and above – ground storage) as well as the listed activities for the petrol filling station (GNR 327 activity 4, and GNR 324 activity 10) in the FBAR.
5. Kindly note that in you BID document makes reference to "the proposed mining footprint extends over an undisturbed section of the property that is occasionally used for gazing". Agriculture land is prime and used for agricultural purposes (food security). Therefore, the applicant is required to explore all types of alternatives according to chapter one of the EIA regulations 2017.
6. Kindly include the zonation for the site.
7. The BID states that water will be bought and where will it be stored after being after being purchased. Water is also the main source to undertake mining operations and what quantity of water will be purchased. Will water be sourced from any other dams/watercourses?
8. The BID makes reference to generators to supply power to the mining infrastructure. Kindly specify the type of generators that will be used (i.e. petrol or diesel) as generators are loud and include mitigation measures to address the noise impact.
9. A letter from Eskom must be included in the FBAR for the supply of electricity.
10. Comments are to be included of potential Interested and Affected Parties; state departments (DHWS, DARD, DUCT); District and Local Municipality; DoT; landowners, farmers associations, neighbours; and local farmers.
11. The uMgungundlovu District Environmental Management Framework (EMF) Status Report must be obtained and be to be included in the FBAR to identify sensitive areas of the site.
12. Kindly indicate how waste will be managed on site.
13. An Air Emission Licence may be required and must be obtained from the Umgungundlovu District Municipality. The contact person is Mr Brendon Rajoo, Cell Number: 079 491 2148.
14. Building plan must be submitted and approved by the Umgungundlovu District Municipality.
15. A copy of the facility illustrations Layout Plan is to be incorporated into the FBAR.

Interested and Affected Parties List the name 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.
16. All specialist studies should be ground truth and meet the requirements of Appendix 6 of the EIA regulations 2014 (as amended).				

Response to the comments received from the DEDTEA:

3. The detailed project description is discussed in this document under Part A(1)(d) Description of the scope of the proposed overall activity.

4. As mentioned under Part A(1)(d)(ii) Description of the activities to be undertaken, the low agricultural potential of the property called for the extension of the land uses to include shale mining, a clay brick factory, and the development of a filling station (by a separate third party). The development/operation of the shale mine, clay brick factory, and filling station (if approved) must be seen as separate projects (different entities) on the same property. The filling station development does not form part of the Inzalo Crushing and Aggregates (Pty) Ltd mining permit application and therefor does not apply to this EIA process.

5. Refer to Part A(1)(h)(i) Details of the development footprint alternatives considered.

6. The property is zoned as Commercial Agricultural.

7. Refer to Part A(1)(d)(ii) Description of the activities to be undertaken – 2. Operational Phase: Water Use.

8. Refer to Part A(1)(d)(ii) Description of the activities to be undertaken – 2. Operational Phase: Electricity Use; and
   Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk – Noise Handling.

9. Eskom will be contacted regarding the possible supply of electricity. Any correspondence received from them will be incorporated into the FBAR.

10. Refer to Part A(1)(h)(ii) Details of the Public Participation Process Followed; and
    Appendix F – Comments and Response Report & Proof of Public Participation Process.

11. Refer to Part A(1)(e) Policy and Legislative Context; and
    Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Biodiversity Conservation Areas.

12. Refer to Part A(1)(d)(ii) Description of the activities to be undertaken – 2. Operational Phase: Waste Handling.

Interested and Affected Parties List the name 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.
13. The proposed mining activity does not trigger an application for an air emissions licence. Refer to Part A(1)(h)(iv)(c) Description of specific environmental features and infrastructure on the site - Site Specific Air and Noise Quality. 14. The permit holder will make use of temporary infrastructure for the duration of the mining activity. However, should the uMgungundlovu District Municipality request the submission of building plans, the permit holder will comply. 15. Refer to Appendix C for a copy of the Site Activities Map. 16. Alletson Ecological & Amanzi Aquatics (Pty) Ltd were contracted to do a Vegetation, Aquatic and Risk Assessment (VARA) for the proposed dolerite quarry on the earmarked property. The specialists visited the site in September/October 2020 to assess the actual ecological state and current land-use in the area, and the VARA (Appendix G) was compiled in accordance with the requirements of Appendix 6 of the EIA Regulations, 2014 (as amended).				
Comments received from DEDTEA on the DBAR (21 January 2021): *"1. This Department has reviewed the Draft BAR and requires that the following issues be addressed in the Final BAR:* *2. The Department has reviewed the relevant spatial datasets and has established that the proposed development falls within areas that have been identified as being sensitive in terms of the uMgungundlovu District Environmental Management Framework (i.e. High agricultural, biodiversity, water quality constraints and is within a 500 m buffer of a wetland). Kindly consider other specified activities in terms of the sensitivity of the proposed site.* *3. Letters from all relevant service providers must be included in the Final BAR with their contact details in respect to the collection and disposal of waste. All hazardous waste must be disposed at a suitably licenced landfill site.* *4. A copy of the Water Use Licence must be included in the FBAR.* *5. The DBar states that "the proposed mining site area (S1) will be reached via an existing farm road that passes the site and Inzalo proposes to upgrade the road". Should the road be upgraded, widened or lengthened, then kindly consider Listing Notice 1 Activity 56 in the FBAR.*				

Interested and Affected Parties List the name 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.
6. A suitably qualified botanist must be appointed to identify and relocate sensitive plant species prior to any site works and must ensure a Plant Rescue Plan be included in the FBAR. Permits must be obtained from KZN Wildlife for the relocation of plants. *7. All concerns raised by Interested and Affected Parties, must be addressed adequately in the FBAR.* *8. The Final BAR must meet the requirements of Appendix 1 of the EIA Regulations, 2014 (as amended), the final Environmental Management Programme must comply with Section 24N of NEMA and Appendix 4 of the EIA regulations, 2014 (as amended) and all specialist studies compiled must be prepared in terms of Appendix 6 of the EIA Regulations, 2014 (as amended)."*				
Response to the DBAR comments received from DEDTEA: *2. The Department has reviewed the relevant spatial datasets and has established that the proposed development falls within areas that have been identified as being sensitive in terms of the uMgungundlovu District Environmental Management Framework (i.e. High agricultural, biodiversity, water quality constraints and is within a 500 m buffer of a wetland). Kindly consider other specified activities in terms of the sensitivity of the proposed site.* Agriculture: As mentioned earlier, the dolerite intrusion at the earmarked footprint area results in shallow topsoil with low vegetation cover, that highly reduces the agricultural potential of the specific study area. Therefore, even though the framework indicates the region to be of high agricultural importance, the site specific conditions do not support this classification and therefore an alternative use (mining) is proposed. No listed activities, other than Listing Notice 1 Activity 28, is deemed applicable to this application. Biodiversity: Ground-truthing (VARA) confirmed that the landscape around the proposed quarry site is already transformed by (amongst others) shale mining, brickworks, nearby low income housing (Copesville) and sugar cane farming. The groundcover of the site specific study area (S1) was found to be in a generally poor condition due to frequent veld burning and overgrazing. The VARA notes that the quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigatory measures put forward (in this report) are adhered to. Since the earmarked footprint (S1) is already degraded and ground-truthing confirmed that it is not rated as being of high conservation priority, it is the opinion of the specialist that the impacts on the vegetation do not constitute a fatal flaw to the proposed project and so there is no reason to block the project in that regard. No listed activities, other than Listing Notice 1 Activity 27 and Listing Notice 3 Activity 12, is deemed applicable to this application.				

Interested and Affected Parties List the name 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.

Water Quality Constraints: The proposed activity will not make use of water from natural sources at the property, and therefore the water quality of the property is not of significance to this project. However, as mentioned in this report, the Applicant will be encouraged to make use of non-potable water for dust suppression purposes. The activity will further have to comply with the conditions of the WUL once approved.

Wetland: The VARA confirmed that no wetlands occur within the project area. An unnamed tributary was identified on/near the application area for which the Applicant has submitted a WUL application to the DWS. The EIA proposes that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated. No listed activities, other than Listing Notice 3 Activity 14, is deemed applicable to this application.

3. Letters from all relevant service providers must be included in the Final BAR with their contact details in respect to the collection and disposal of waste. All hazardous waste must be disposed at a suitably licenced landfill site.

As this is a greenfield development, the Applicant cannot appoint service providers until the environmental impact assessment and mining permit application have been concluded resulting in a positive outcome. Once the EA and MP were received (and prior to commencement), the Applicant will contract the services of appropriately qualified waste handling service providers. Copies of the agreements with the service providers will be placed on record at the environmental site file for auditing purposes. Presently it is proposed that the services of the following companies will be considered:

- Chemical Toilet Hire & Sewerage Disposal:
  - Sanitech (033 386 1023)
  - Jus Loos (033 390 1567)
  - Aqua Technical Services (082 932 2001
- General and Hazardous Waste Removal:
  - The Waste Group (031 563 4228)
  - Spill Tech (031 206 0919)
  - Enviroserv (087 086 8401)
  - Skipgo (076 318 5996)

4. A copy of the Water Use Licence must be included in the FBAR.

Interested and Affected Parties List the name 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.
As mentioned earlier, an application for a WUL was submitted to DWS on 24 November 2020 (refer to Figure 43). The application is still in process at the DWS and therefore a copy of the WUL cannot be appended to this report the FBAR. The Applicant will, upon receipt of the WUL, place a copy of the document in the environmental site file for auditing purposes. *5. The DBar states that "the proposed mining site area (S1) will be reached via an existing farm road that passes the site and Inzalo proposes to upgrade the road". Should the road be upgraded, widened or lengthened, then kindly consider Listing Notice 1 Activity 56 in the FBAR.* The improvement of the access road, and establishment of haul roads will be below the threshold of the NEMA, 1998 EIA Regulations, 2017 in particular Listing Notice 1 Activity 56, as the road will not be widened by more than 6 meters, or lengthened by more than 1 km. *6. A suitably qualified botanist must be appointed to identify and relocate sensitive plant species prior to any site works and must ensure a Plant Rescue Plan be included in the FBAR. Permits must be obtained from KZN Wildlife for the relocation of plants.* The Applicant will upon receipt of the MP appoint a suitably qualified botanist to identify and relocate sensitive plant species that may be present within the footprint of the approved mining area. The appointment of the botanist, associated pre-commencement walk-through, and securing of plant removal permits, were added as a mitigation measure to this FBAR & EMPR (refer to *Part A(1)(h)(viii) The possible mitigation measure that could be applied and the level of risk – Management of vegetation removal*). It is proposed that the Plant Rescue Plan be compiled, subsequent to the said site investigation, to ensure its relevance to the site specific conditions and the plants to be identified. The compilation of the Plant Rescue Plan was added as a mitigation measure to this report and the EMPR.				
Other Competent Authorities affected				
AMAFA / Heritage KZN	X	13 October 2020	Me Bernadet Pawandiwa confirmed receipt of the BID and requested the submission of their Form J as per guidelines on the attached form.	Thus far, Greenmined had the following correspondence with AMAFA regarding this project.	Appendix F – Proof of Public Participation Process.
❖ 30 September 2020 – Greenmined submitted a Needs and Desirability application (hard copy) to AMAFA for their consideration; ❖ 13 October 2020 – Greenmined sent the BID and application Map to AMAFA for their perusal; ❖ 13 October 2020 – AMAFA request the submission of Form J;				

Interested and Affected Parties List the name 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.
❖ 16 October 2020 – Greenmined uploaded the second application (including Form J) onto the SAHRIS website and informed AMAFA of its availability; ❖ 02 November 2020 – AMAFA acknowledge receipt of the application, and requested additional payment; ❖ 02 November 2020 – Greenmined noted that the correct amount was already paid and supplied AMAFA with proof of payment. AMAFA acknowledge receipt of the proof of payment. ❖ To date no feedback has been received from AMAFA.					
Department of Agriculture and Rural Development	X	No comments received	N/A	N/A	N/A
Department of Agriculture, Land Reform and Rural Development (National)	X	No comments received	N/A	N/A	N/A
Department of Human Settlements, Water and Sanitation	X	No comments received	N/A	N/A	N/A
Department of Labour	X	No comments received	N/A	N/A	N/A
Ezemvelo / KZN Wildlife	X	01 December 2020	Me Pillay responded that Ezemvelo only consider applications once the hard/electronic copies of the relevant reports have been submitted.	Greenmined provided Ezemvelo with an electronic copy of the DBAR on 01 December 2020. To date no further response was received from Ezemvelo.	See Appendix F1 & F2.
uMgungundlovu District Municipality	X	No comments received	N/A	N/A	N/A
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A

Interested and Affected Parties **List the name 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.**
OTHER AFFECTED PARTIES				
N/A				
INTERESTED PARTIES				
N/A				

iv) The Environmental attributes associated with the alternatives.

(The environmental attributes 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 biophysical, cultural and socio-economic environment that may be affected and the baseline conditions, which are likely to be affected by the proposed mining activity.

PHYSICAL ENVIRONMENT

CLIMATE

The following chart shows the maximum, minimum and average temperatures (21°C daytime, 15°C night time) of the Pietermaritzburg region. Pietermaritzburg experiences its highest temperatures during the summer months from September – March with peaks of up to 28°C; thereafter the mercury drops to lows of 10°C during June/July.

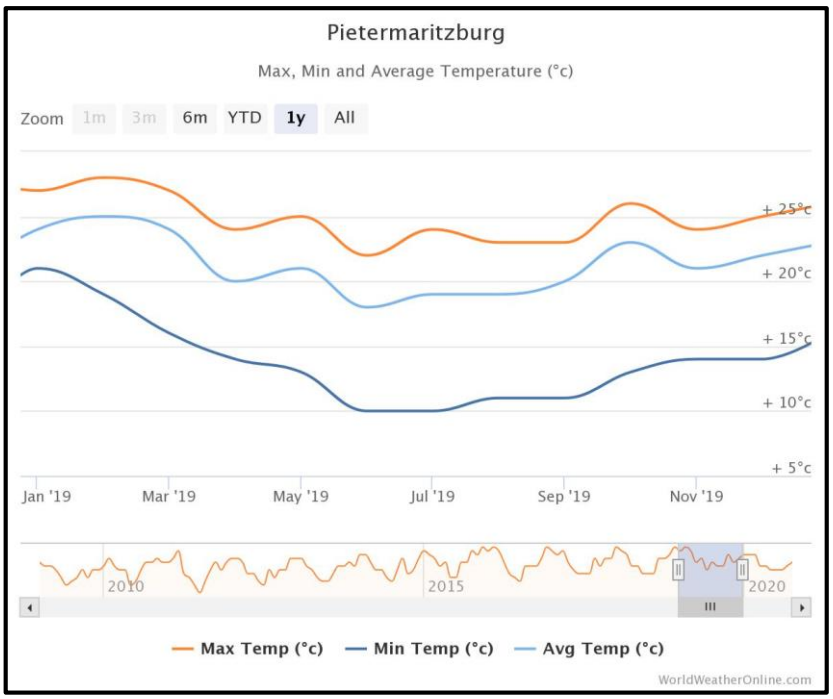


Figure 5: Maximum, minimum, and average temperature of the Pietermaritzburg region (chart obtained from http://www.worldweatheronline.com)

According to Weather-atlas the average rainfall of the Pietermaritzburg area is 832 mm/year. The following chart obtained from World Weather Online shows that the measured rainfall average for 2019 was ±1 4707 mm, while the area received the

lowest rainfall during the winter months (May – August) and the highest in the summer (November - March).

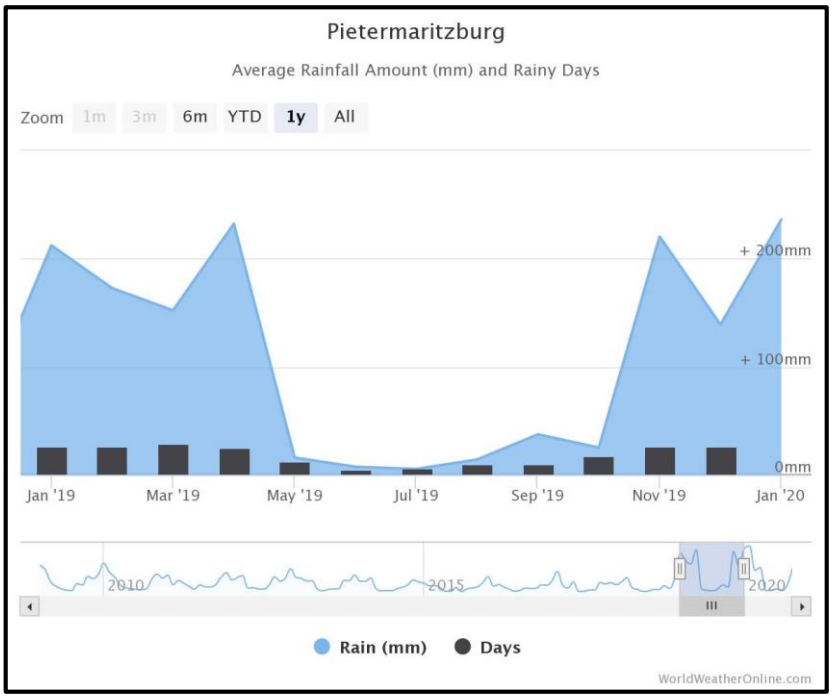


Figure 6: Average rainfall amount and rainy days count for the Pietermaritzburg region (chart obtained from http://www.worldweatheronline.com)

The dominant wind direction of the Pietermaritzburg region is fairly constant in a western direction (eastern wind), with the average wind speed being ±4 knots (±7.83 km/h) as shown in the figure below (measured at the Pietermaritzburg Airport).

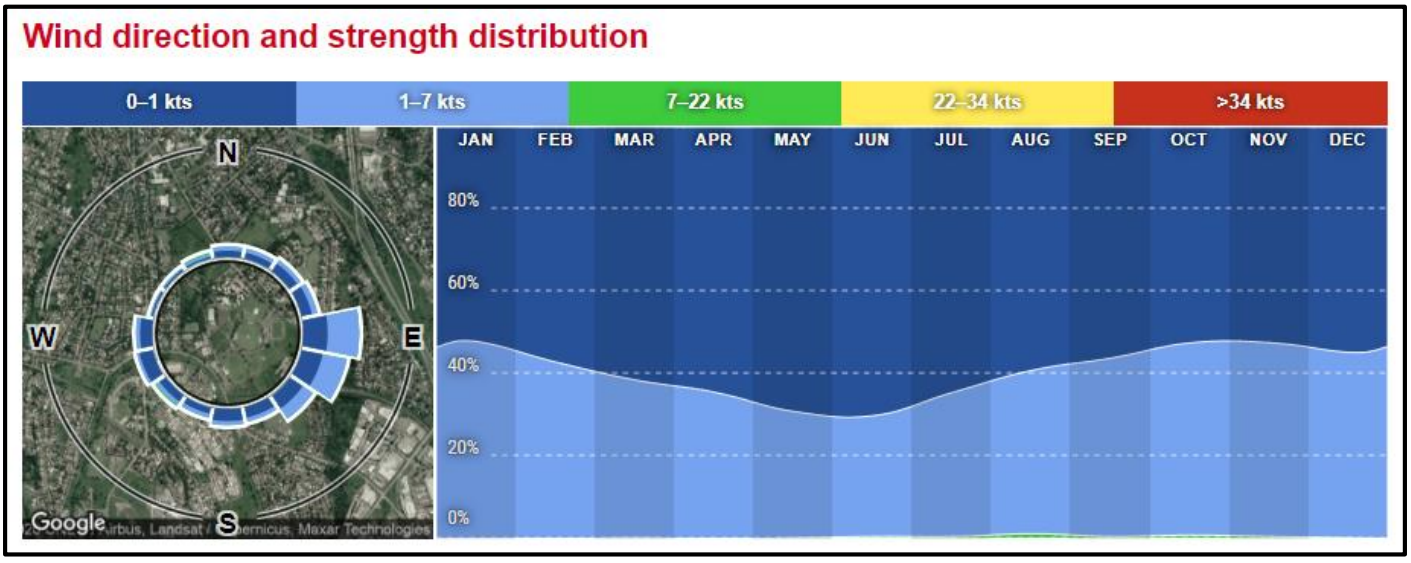


Figure 7: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Pietermaritzburg area (image obtained from http://www.windfinder.com/windstatistics/pietermaritzburg).

TOPOGRAPHY

The topography of the greater study area is shown in the figure below. The area has elevations generally ranging between 710 – 860 mamsl.

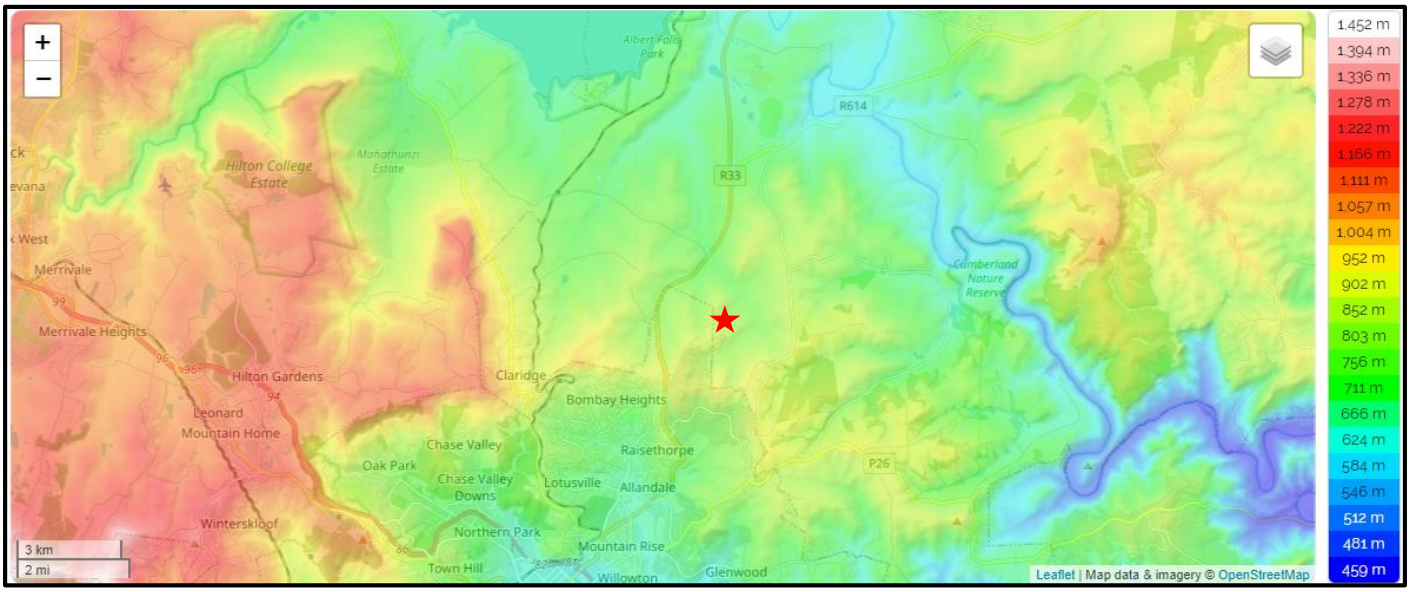


Figure 8: Map showing the topography of the greater Pietermaritzburg area (image obtained from http://www.en-za.topographic-map.com/maps/gwpq/South-Af).

A complex range of terrain morphological classes occur in this region including: plains with a moderate relief, lowlands with a low relief, lowlands with a high relief, open hills with low relief, open hills with high relief, closed hills with a moderate relief and low mountains with a high relief.

The earmarked farm has an undulating topography that gradually rises from the lower laying uMngeni River valley (eastern boundary), up the hill that is more or less in the centre of the property. The highest point of the hill is at 867 mamsl as shown in the figure below.

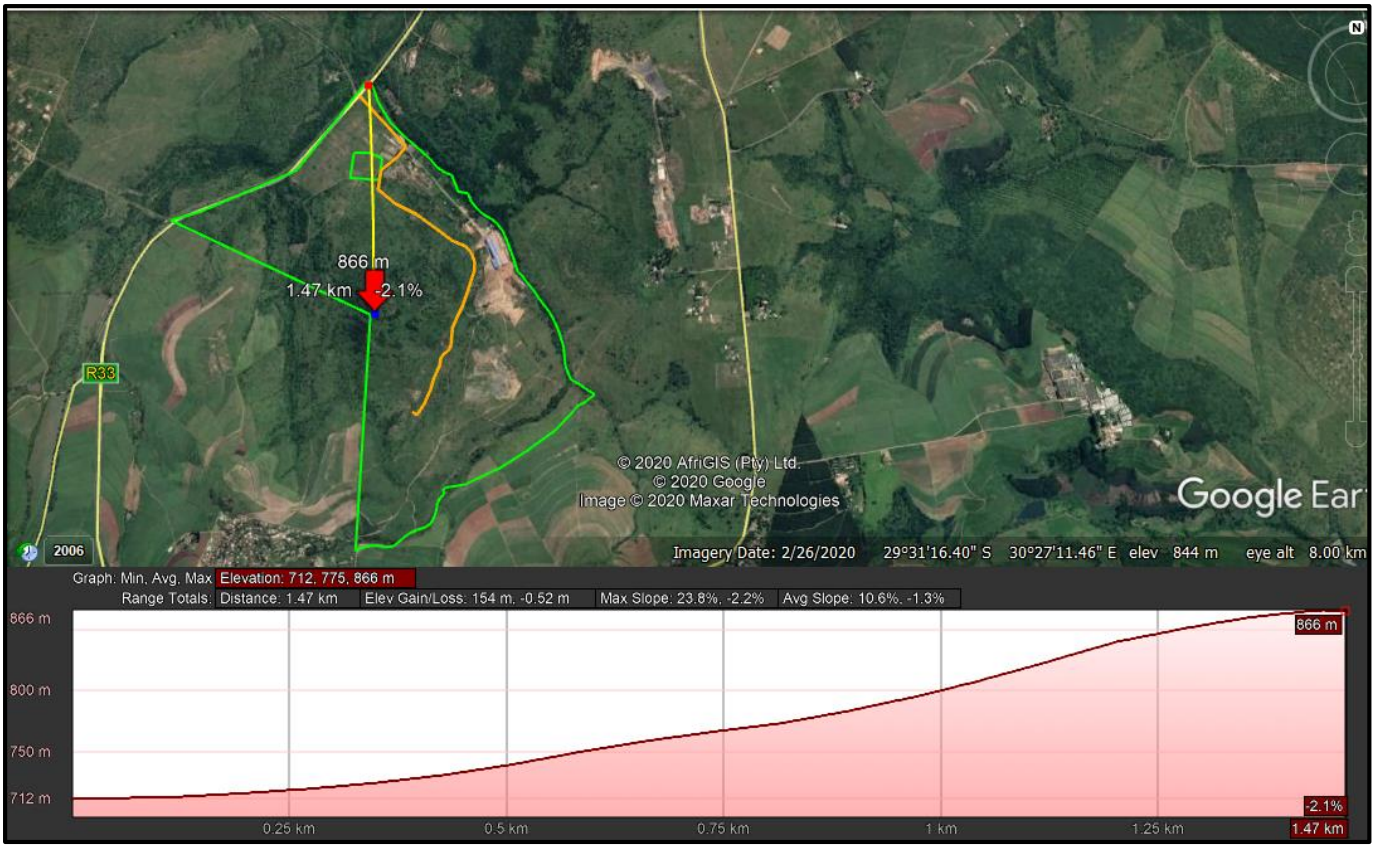


Figure 9: Satellite view of the earmarked property that shows the rise in altitude from the northern boundary/uMngeni River towards the western boundary (image obtained from Google Earth).

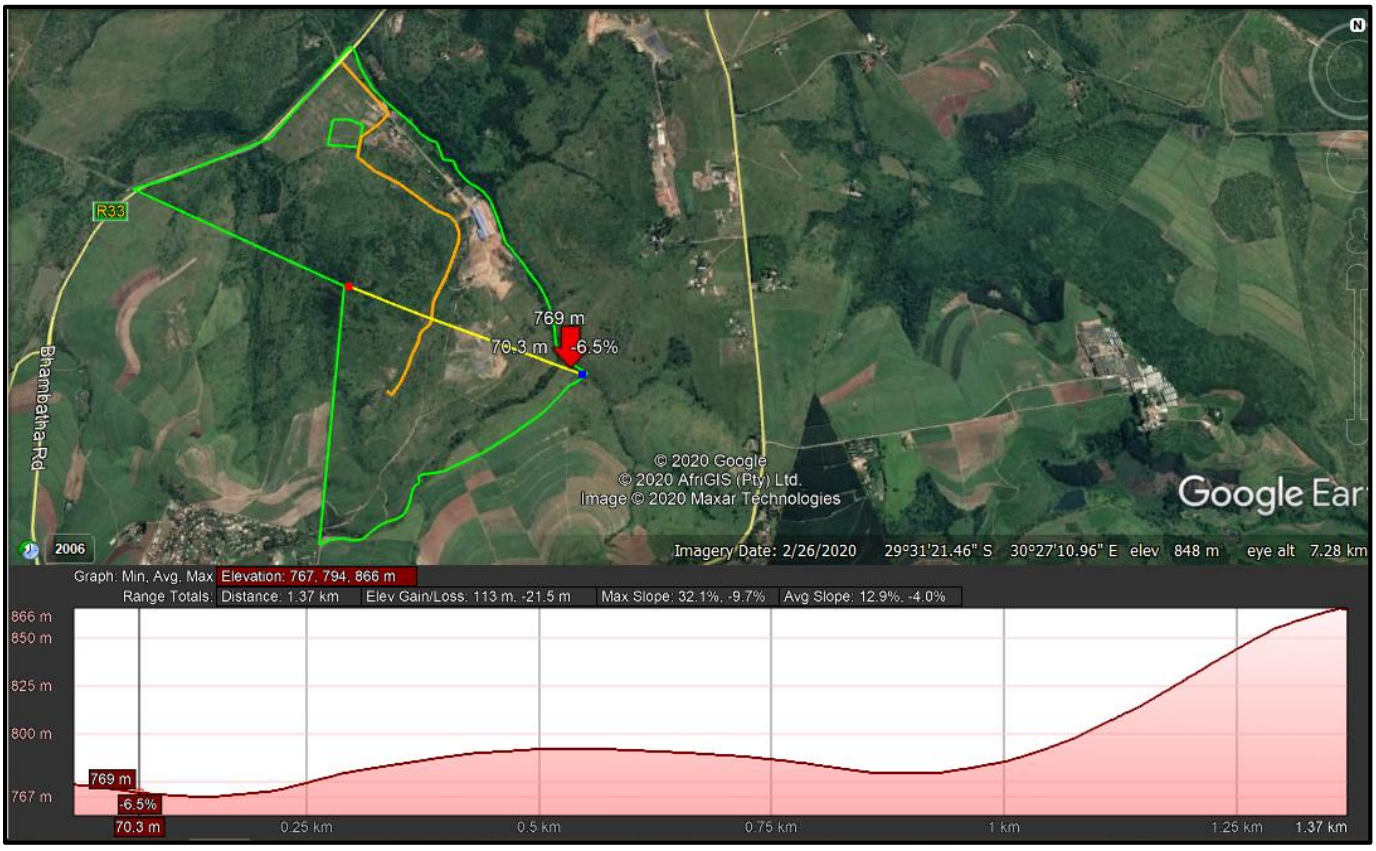


Figure 10: Satellite view of the earmarked property that shows the rise in altitude from the south-eastern boundary towards the western boundary (image obtained from Google Earth).

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

VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by road- and electricity infrastructure, and transformed by the nearby Copesville residential area (south of the farm).

The land use of the surrounding properties was also extended to include small scale mining. Due to the topography of the area, Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 is mainly visible from the north to south-eastern side of the farm as the rise in elevation screens the farm to the western side.

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Visual Characteristics.

AIR AND NOISE QUALITY

The air quality and noise ambiance of the study area was historically representative of an agricultural environment in which farming equipment operated with occasional high dust emissions from denuded areas and smoke pollution due to the burning of sugar cane fields. The surrounding area has since been transformed with the construction of the R33 and R614 provincial roads, the development of open cast mines on the farm and surrounding properties, and the development of the Copesville residential area. Although these factors all contribute air and noise emissions to the study area the air quality and noise ambiance of the area is still regarded as rural and of relatively good quality for most of the year.

GEOLOGY AND SOIL

According to Mucina and Rutherford (2012) the geology of the study area comprise of acid, leached heavy soils derived from the Karoo Supergroup sediments (including significant Dwyka tillites) and intrusive Karoo dolerites. Shallow sandy soils are derived from Natal Group Sandstone that are freely drained and structureless with a high erodibility and typically low fertility. The geological map for the Council of Geoscience (figure below) shows the study area within the Namaqua and Natal Metamorphic Provinces (pink shaded area), within close proximity to the Cape Supergroup and Natal Group (blue shaded area).

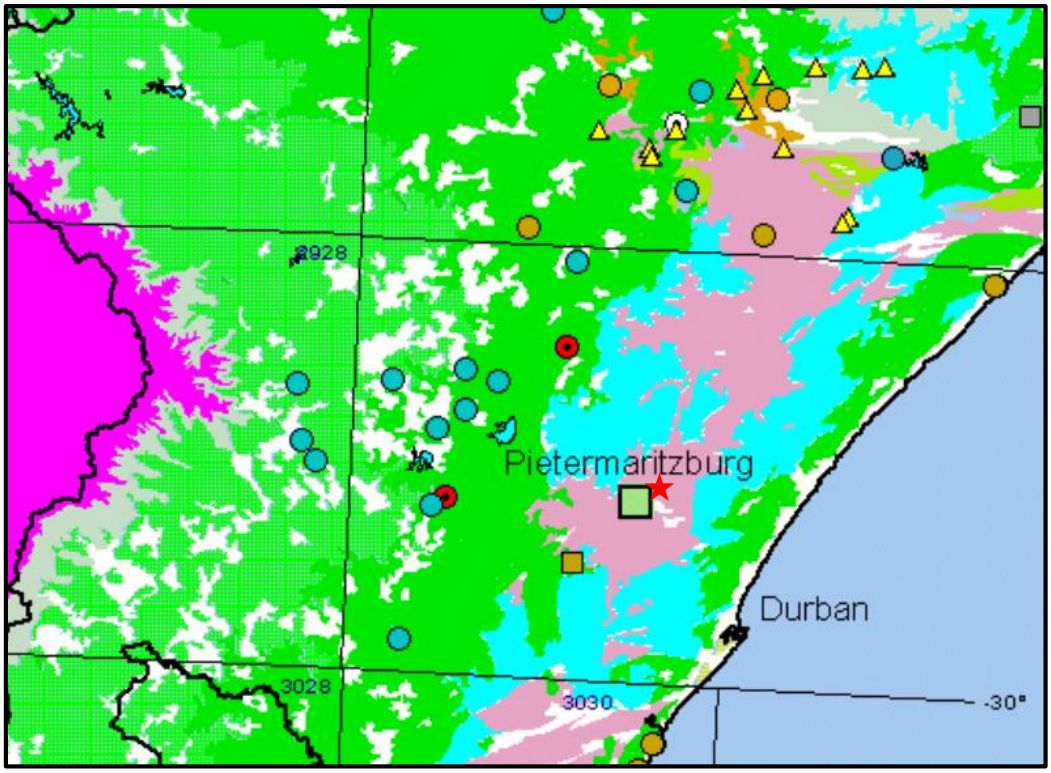


Figure 11: Indication of the simplified geology of the study area, where pink represents Namaqua and Natal Metamorphic Provinces, blue shows Cape Supergroup and Natal Group, green the Dwyka and Ecca Groups (part of the Karoo Supergroup), and white the dolerite intrusions. The proposed mining area is indicated by the red star. (Image obtained from the Council for Geoscience)

HYDROLOGY

(Information extracted from the Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg area, Mshwati Municipality, KwaZulu-Natal, 2020)

The proposed mining area is situated in the Mgeni sub-water management area that forms part of the greater Pongola-Mtamvuna Water Management Area (ID 4), and Quaternary Catchment U20G. An unnamed tributary (light blue in following figure) originates in the south-west of the study area, flows in a north-easterly direction and joins the upper reaches of the uMngeni River ±1 km downstream. The uMngeni River forms the eastern border of the property.

Figure 12: Satellite view showing the watercourses in the study area, where the unnamed tributary is shown in light blue and the proposed mining footprint (S1) shown in red (image obtained from the Vegetation, Aquatic and Risk Assessments, 2020).

Based on a study by the DWS (2014), the Present Ecological State (PES) of the uMngeni River is Moderately Modified (C Category) which means that a moderate loss and change of natural habitat and biota have occurred. The VARA (Appendix G) summarised the Eco-status and impacts of the uMngeni River's as listed in the following figure. The Ecological Importance (EI) of the river is high whilst the Ecological Sensitivity (ES) of the uMngeni River is very high due to the possible presence of endangered and/or near threatened species as listed in Table 3-5 of the VARA.

Quaternary Catchment	Water Resource	Present Ecological State (PES)	Ecological Importance (EI)	Ecological Sensitivity (ES)
U20G	uMngeni River	C Moderately Modified	High	Very High
Current Impacts				
Flow hydrograph reversed, feedlot, crocodile farm, chicken farms, cultivation, high nutrients, mines and dams in tributary.				

Figure 13: Summary of the uMngeni River's Eco-status and impacts (image obtained from the Vegetation, Aquatic and Risk Assessments, 2020).

According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, the proposed mining area (S1 and/or S2) does not fall within a NFEPA in terms of wetlands and/or rivers.

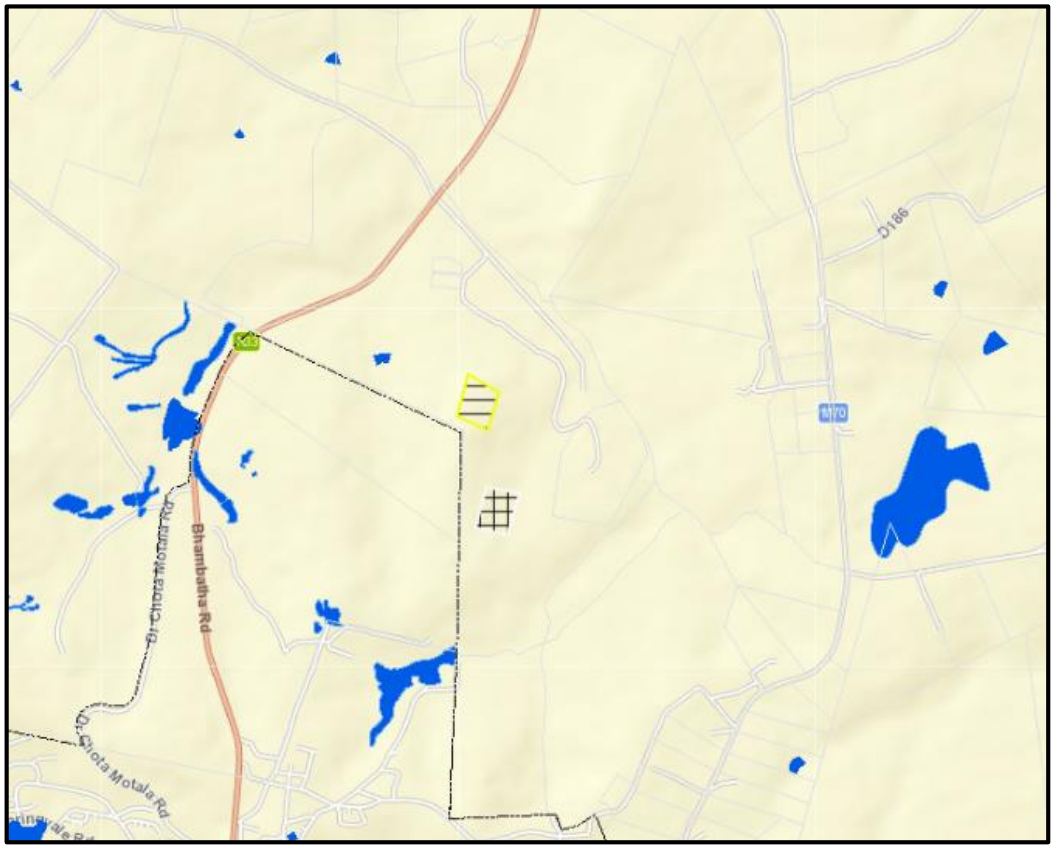


Figure 14: According to the National Wetlands and NFEPA BGIS Map Viewer no watercourses or NFEPA areas are within the vicinity of the study areas (S1 – white crossed polygon & S2 – yellow striped polygon) (image obtained from the BGIS Map Viewer – National Wetlands and NFEPA).

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

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 potential mining footprints (S1 & S2) are layered over the Mining and Biodiversity Map (following figure), S1 falls in an area of highest biodiversity importance (dark brown) with a corresponding rating of highest risk for mining. The footprint of S2 falls partly in the same biodiversity importance area of highest concern, as well as an area deemed to be of moderate biodiversity importance (sand colour) with a corresponding rating of moderate risk.

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 moderate biodiversity importance is defined as: "*areas of moderate biodiversity value*." 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.

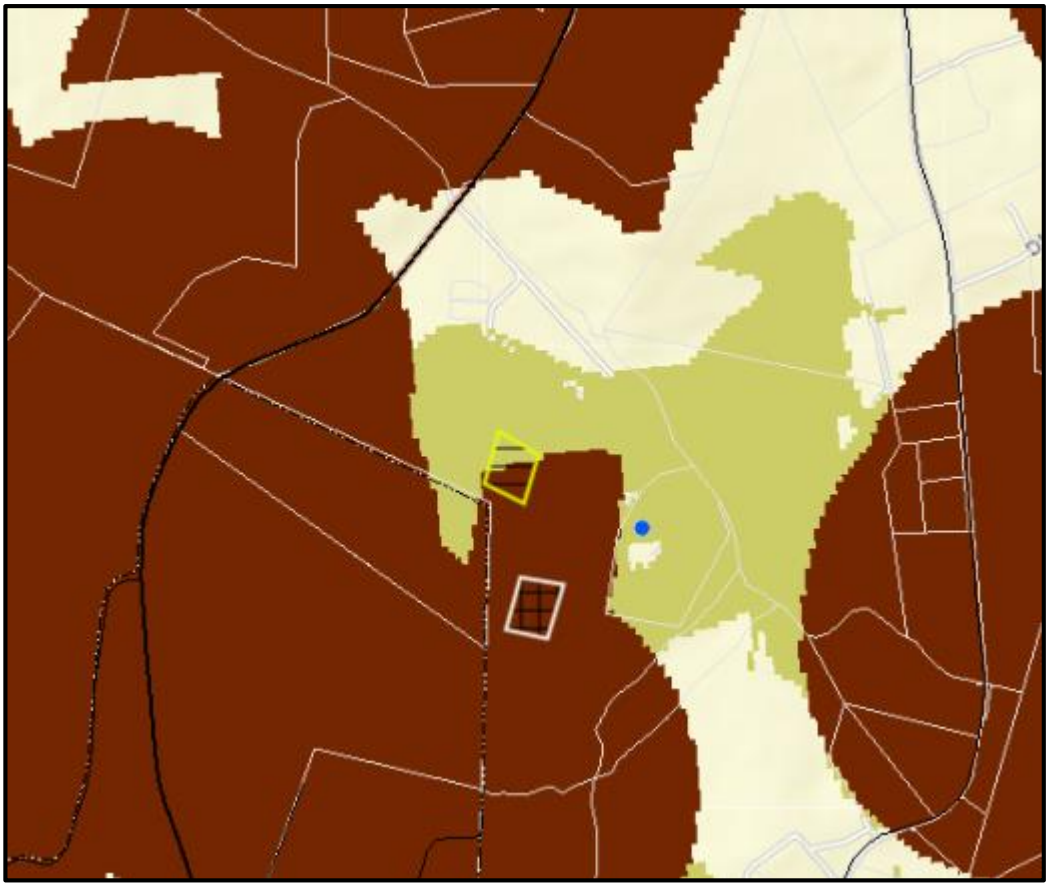


Figure 15: The Mining Guidelines map shows that S1 (white crossed polygon) and a portion of S2 (yellow striped polygon) falls within an area of highest biodiversity importance with a highest risk for mining (dark brown). The sand colour indicates the area of moderate biodiversity importance with a moderate risk for mining. The blue dot indicates a nearby existing quarry.

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

BIODIVERSITY CONSERVATION AREAS

(Information extracted from the Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg area, Mshwati Municipality, KwaZulu-Natal, 2020 and the Environmental Management Framework for the uMgungundlovu District Municipality: Environmental Management Framework Report, 2017)

The KZN Biodiversity Sector Plan shows that a Critical Biodiversity Area (CBA), specifically CBA 3 Optimal, extends across the central-southern part of the earmarked property within which S1 and a part of S2 is situated. The VARA notes that the CBA Optimal classification refers to areas that is the most optimal to meet the biodiversity conservation targets while avoiding high cost areas as much as possible. The closest CBA 1 site is the Ferncliffe Forests above Pietermaritzburg that is ±3.5 km away from the project area.

Correspondingly, the project site is mapped as a BSP 3 (biodiversity sector plan), which means it does occur in a CBA, but not within an ESA (ecological support area) or conservation-related corridors.

The project site is more than 5 km from any NEM:PAA listed private game or nature reserve, or other conservation areas. It is however within 3 km of the Highthorn Private Game Reserve (north-east of the earmarked property). The vegetation in that reserve is most unlikely to be influenced by the proposed dolerite quarry since the intervening area includes existing shale quarries and a brick factory.

Figure 16: 2014 KZN Biodiversity Sector Plan showing the position of the CBA3 Optimal (grey area) in relation to the footprint of S1 (white crossed polygon) and S2 (yellow striped polygon) (image obtained from BGIS Map Viewer – 2014 KZN Biodiversity Sector Plan).

The study area does not fall within any of the Key Focus Areas (KFA's) identified in terms of the uMgungundlovu District Municipality Environmental Management Framework (uMDM-EMF).

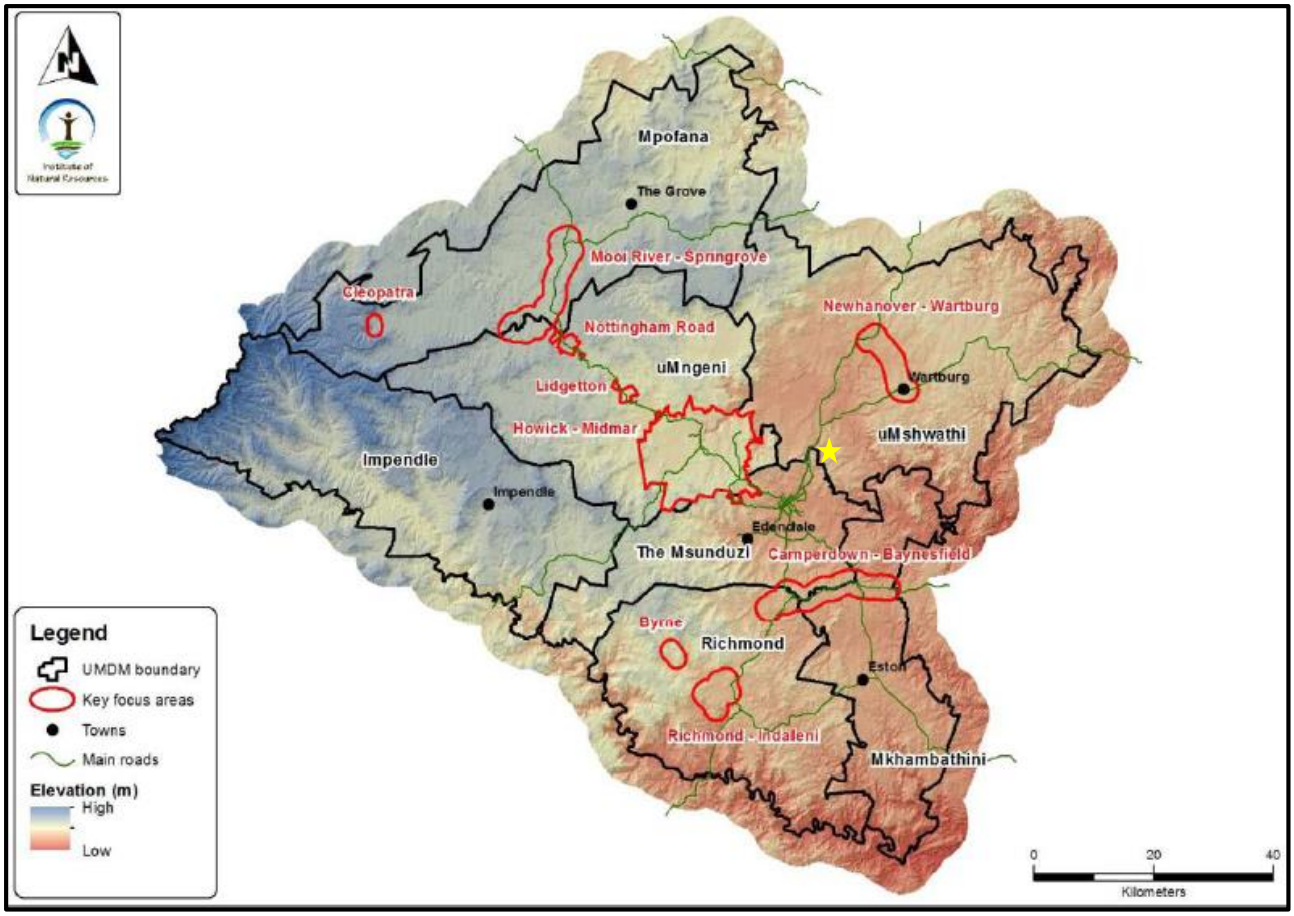


Figure 17: Map showing the key focus areas (red boundaries) as identified in the uMgungundlovu Local Municipality EMF, where the yellow star indicates the mining area (image obtained from the uMLM-EMF, 2017).

Although the uMDM-EMF Decision Support Tool was not available at the time of compilation of this document, the following information was obtained from the broad scale maps of the uMDM-EMF. The said maps show the following sensitivity ratings for the study area:

- Agricultural sensitivity – High (Environmental Screening Tool: Medium-Low);
- Biodiversity sensitivity – Very High;
- Water Yield Area – High;
- Water Quality Sensitivity – Very High; and
- Wetland Sensitivity – Low to Moderate.

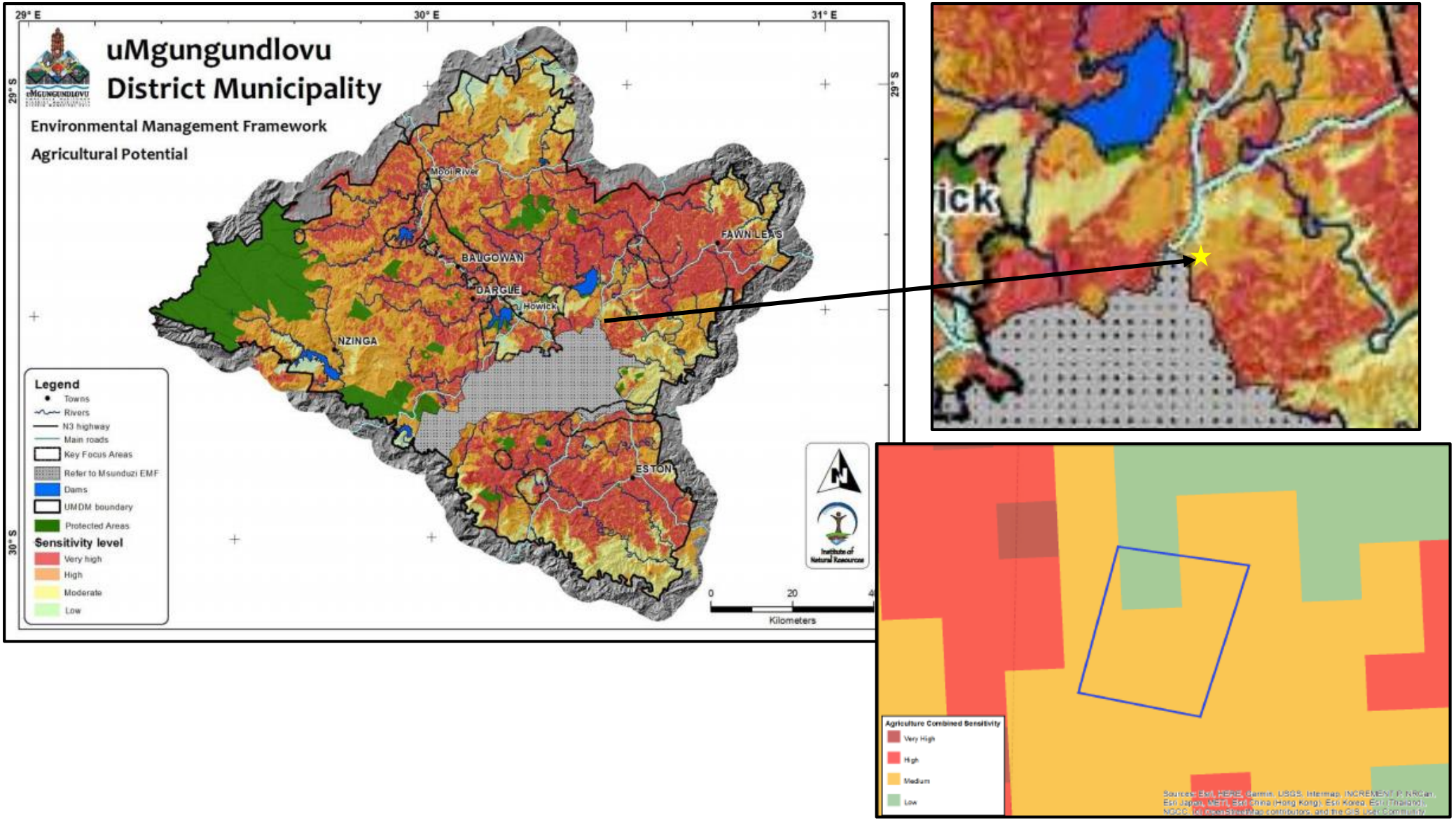


Figure 18: Agricultural sensitivity of the uMDM. The larger map (left) and extract shows the study area (yellow star) with a high sensitivity rating, while the map of the screening report (lower right) shows a medium-low sensitivity rating (images obtained from the uMDM-EMF and the Environmental Screening Tool/Report).

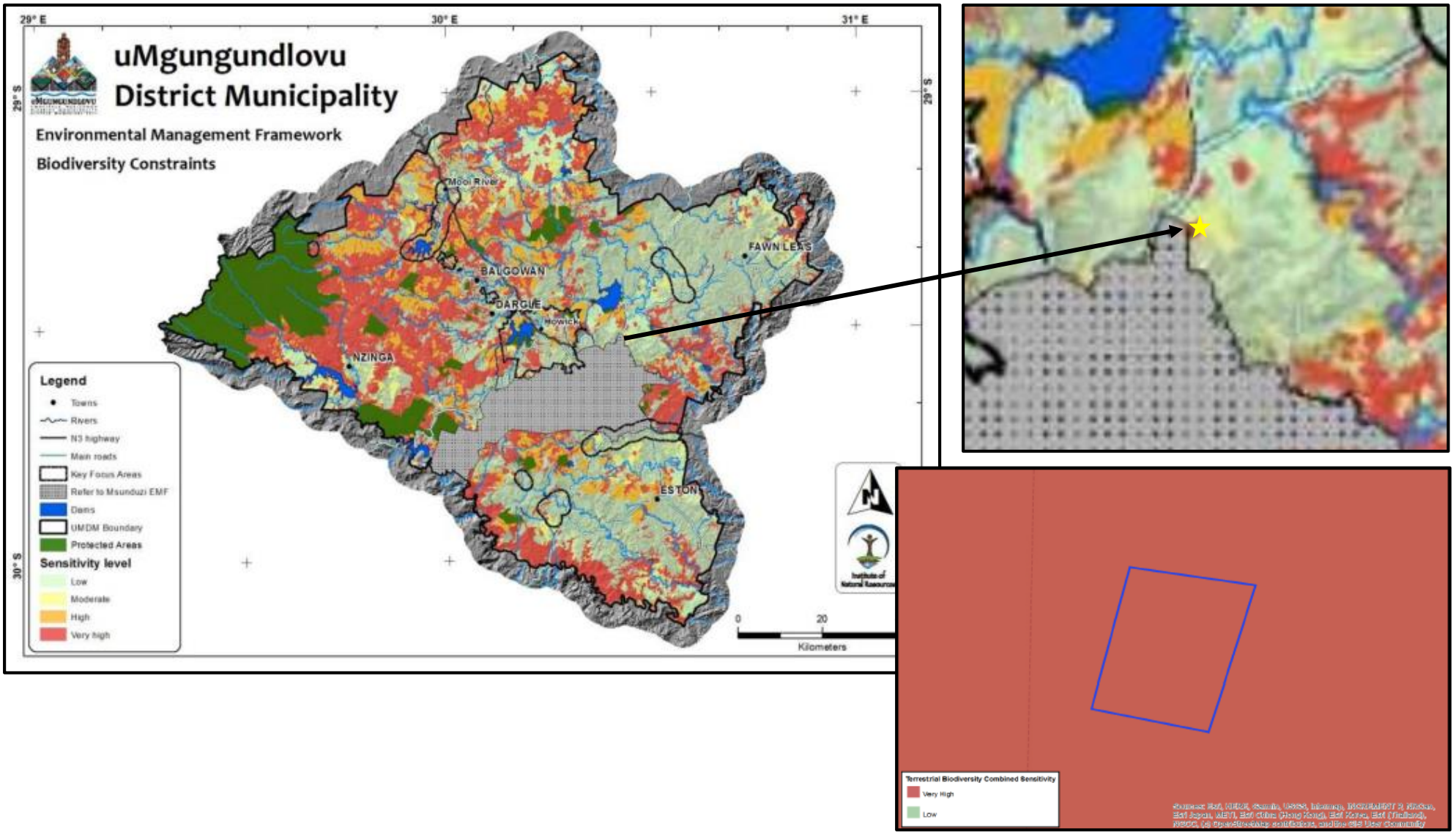


Figure 19: Biodiversity Sensitivity of the uMDM. The larger map (left) and extract shows the study area (yellow star) with a high sensitivity rating, while the Terrestrial Biodiversity map of the screening report (lower right) shows a very high sensitivity rating (images obtained from the uMDM-EMF and the Environmental Screening Tool/Report).

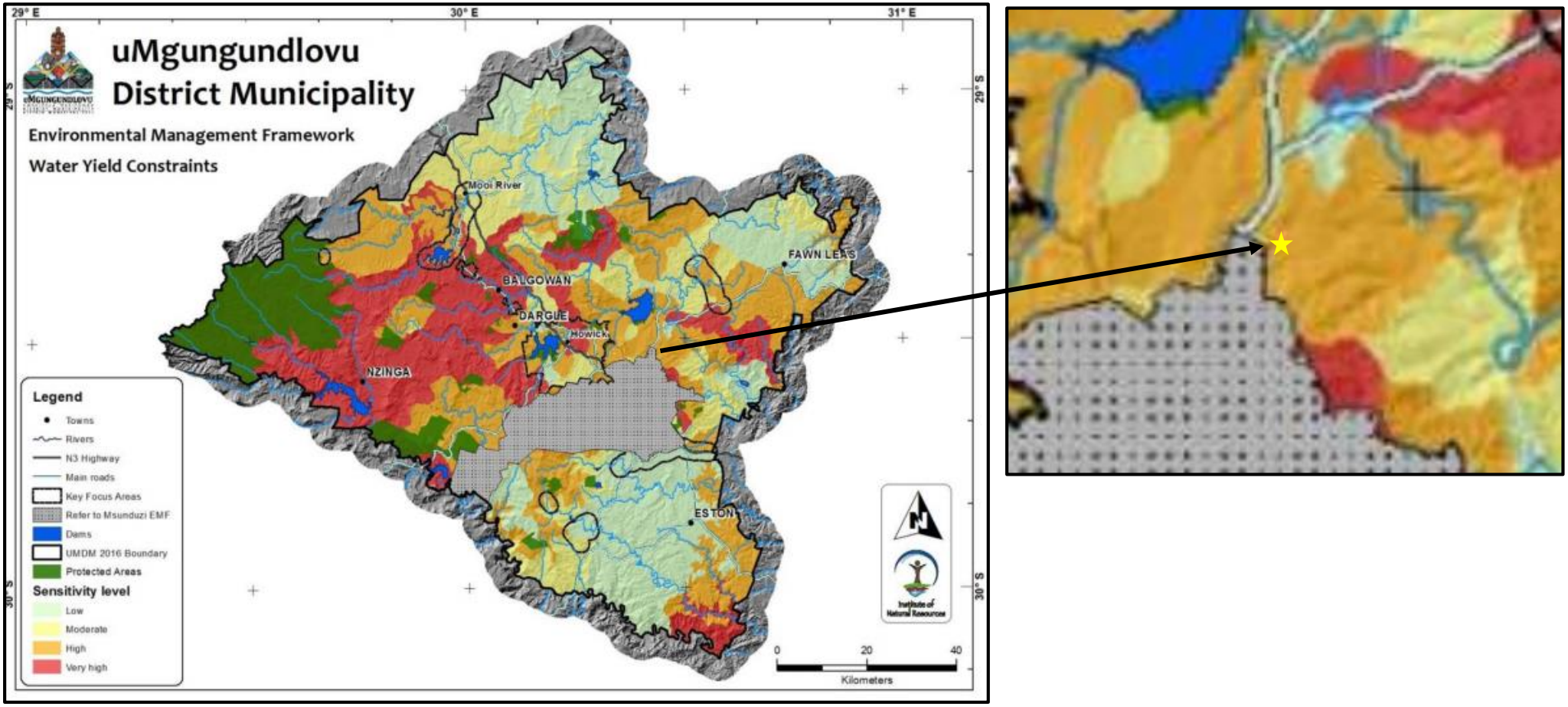


Figure 20: Water Yield Areas in the uMDM. The map shows the study area (yellow star) within an area of high sensitivity (image obtained from the uMDM-EMF, 2017).

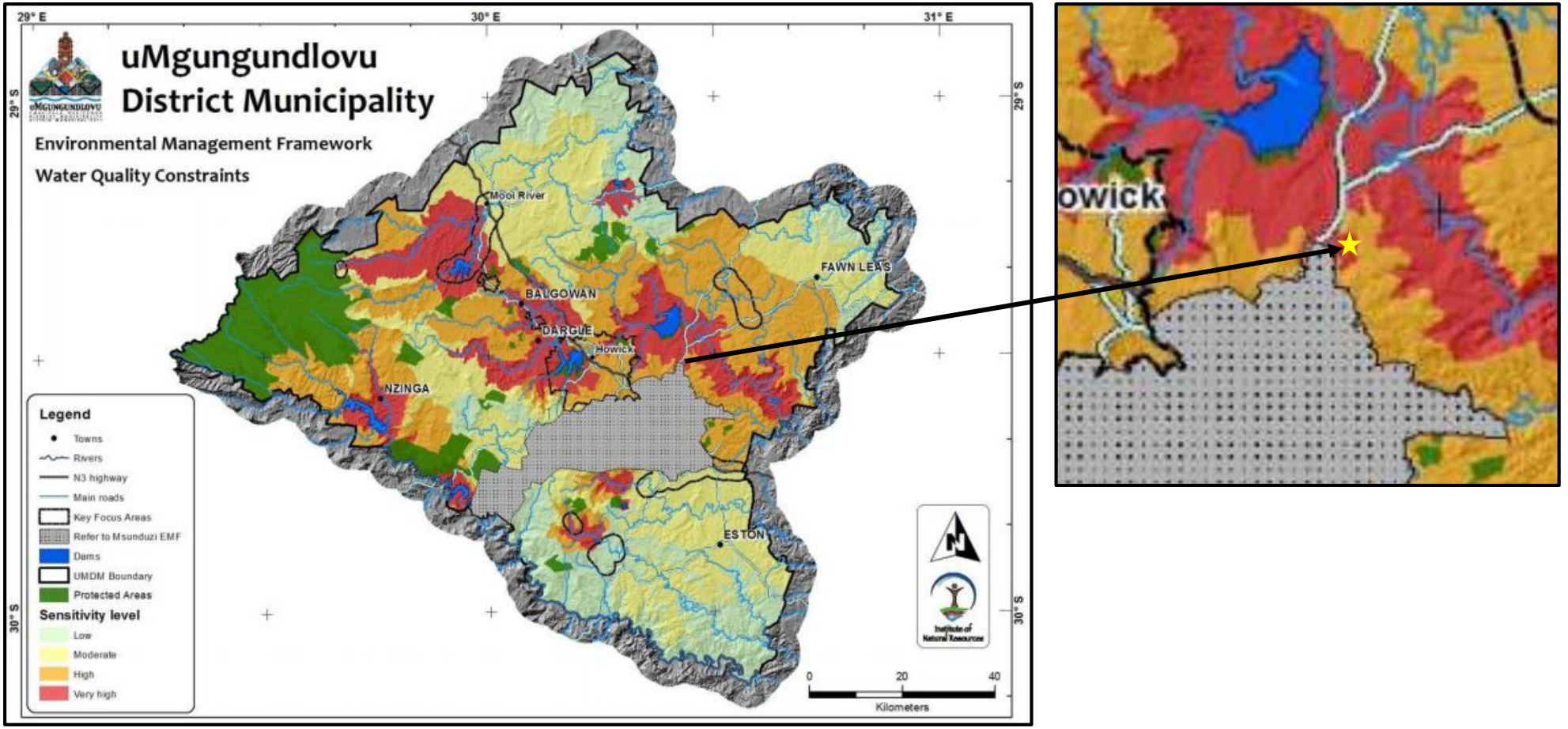


Figure 21: Water Quality Sensitivity in the uMDM. The map shows the study area (yellow star) within an area of very high sensitivity (image obtained from the uMDM-EMF, 2017).

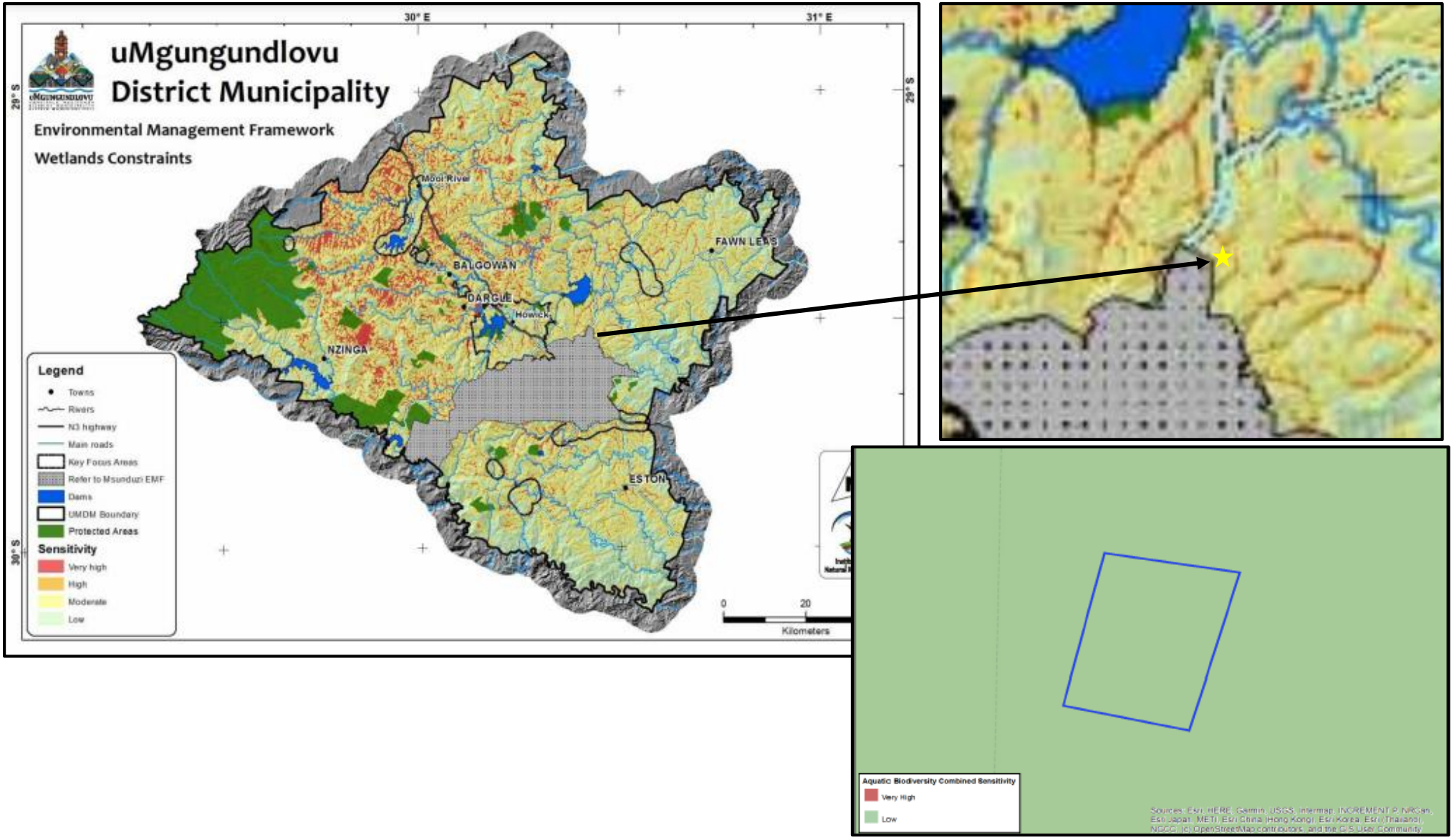


Figure 22: Wetland Sensitivity in the uMDM. The larger map (left) and extract shows the study area (yellow star) with a low-moderate sensitivity rating, while the Aquatic Biodiversity map of the screening report (lower right) shows a low sensitivity rating (images obtained from the uMDM-EMF and the Environmental Screening Tool/Report).

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

GROUNDCOVER

(Information extracted from the Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg area, Mshwati Municipality, KwaZulu-Natal, 2020)

According to Mucina and Rutherford (2012) the natural vegetation type of the study area is classified as Moist Coast Hinterland Grassland (Gs 20). The type was formerly known (Mucina & Rutherford, 2006) as KwaZulu-Natal Hinterland Thornveld (SVs 3).

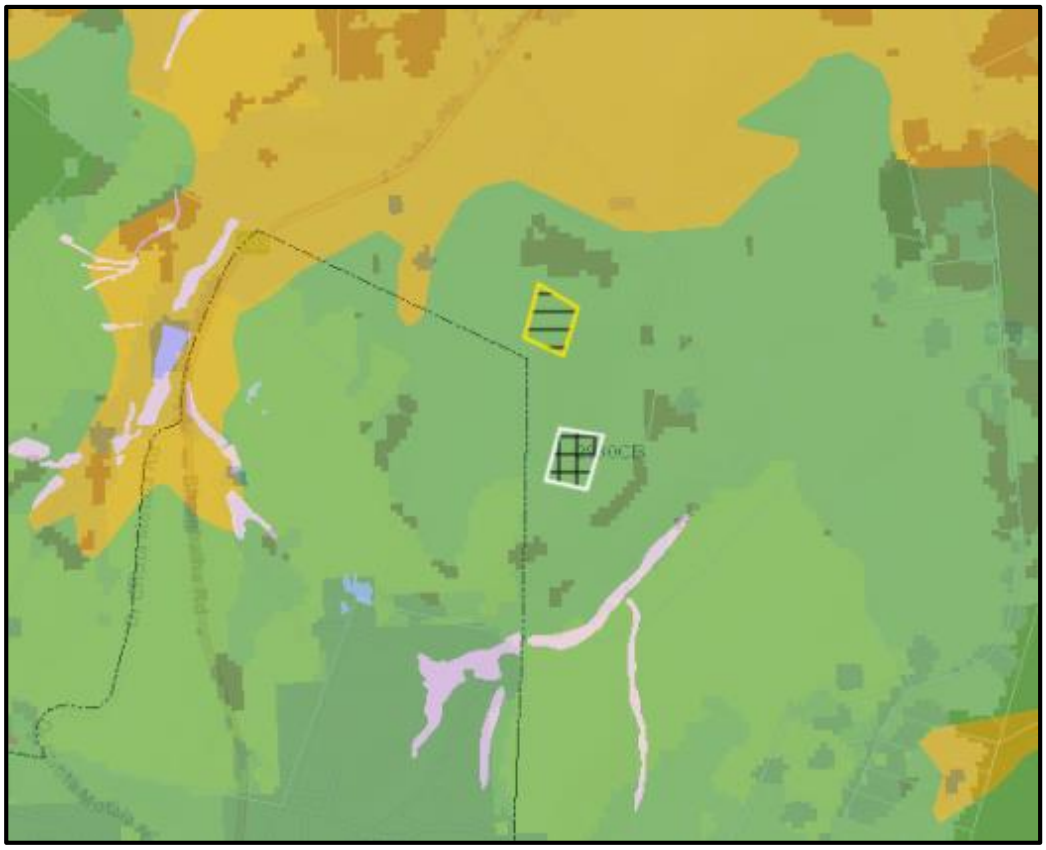


Figure 23: National vegetation cover map showing the study areas (S1 – white crossed polygon & S2 – yellow striped polygon) within the Moist Coast Hinterland Grassland (Gs 20) vegetation type (green shaded area) (image obtained from BGIS Map Viewer – National Vegetation Map).

The vegetation type is typically found in rolling and hilly landscapes. Dense tall sour grassland is dominated by unpalatable Ngongoni grass (*Aristida junciformis*) with this mono-dominance associated with low species diversity, when in good condition dominated by *Themeda triandra* and *Tristachya leucothrix*. It is low in terms of endemicity although certain bioresource units within it are considered endemic. Its status is categorised as Endangered since some 25% has been lost to various forms of agricultural and urban development. The VARA presented the conservation targets, extents, ecosystem status and level of protection as listed in the following

figure. The VARA (Appendix G) provides a list of the plant species of concern that may be present within this specific vegetation type.

	Moist Coast Hinterland Grassland
KZN Biome	Grassland
Conservation target (%)	25
Original extent (ha)	437 556
Remaining natural (ha)	157 573
Remaining natural less fragments (ha)	153 031
Ecosystem status	**Endangered (EN)**
Total Protected Area (ha)	873
Level of protection	Nominally Protected

Figure 24: KwaZulu-Natal (KZN) vegetation type conservation targets, extents, ecosystem status and level of protection based on 2011 accumulated transformation statistics and protected area (PA) proclamation as at January 2016.

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

FAUNA

Although the land use of Portion 0 (Remaining Extent) of the farm Thandisizwe No 1669 has been extended to include additional activities, some sections of the farm is still used for livestock grazing. Apart from the domestic animals, faunal action is mainly contained to the natural vegetated areas of the farm that provides shelter to the animals. The VARA mentions that the natural occurring fauna is very sparse as a result of human activities in the general areas. The following species were observed by the ecologists during the site inspection (birds were omitted since only common species were seen and all species are highly mobile and can readily move away from disturbance):

- Speckled Rock Skink *Trachylepis punctatissima*
- Unidentified Agama *Agama* spp.
- Southern Tree Agama *Agama atricollis*
- Flap-neck Chameleon *Chamaeleo dilepis*
- Scrub Hare *Lepus saxitilis*
- Rats/mice
- Milipede *Zinophora mudenensis*

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from a Heritage Survey of the Thandisizwe Quarry, uMgungundlovu District Municipality, KZN, 2018 by Gavin Anderson)

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 an area of insignificant/zero (grey) concern as presented in the figure below. In light of this, no palaeontological study is required.

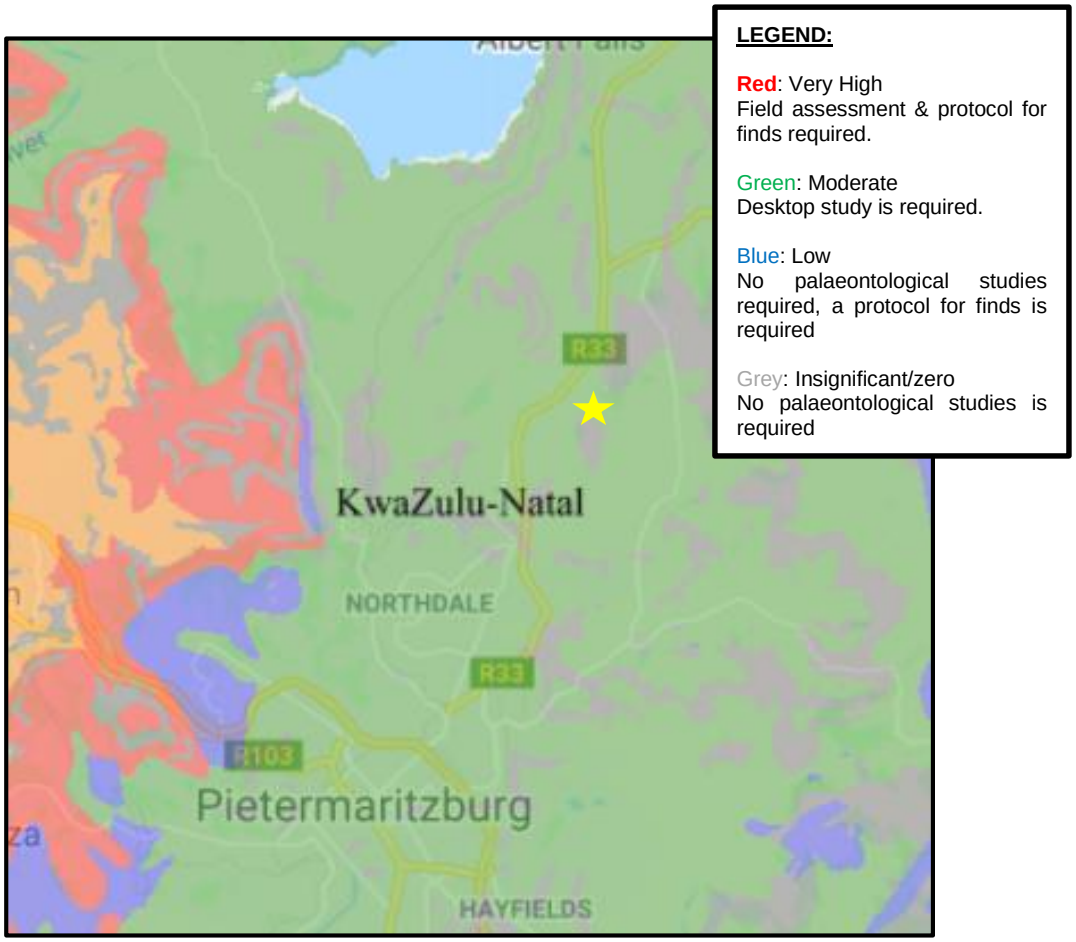


Figure 25: The SAHRA palaeontological sensitivity map shows the proposed mining footprint (yellow star) falls in an area of Insignificant/Zero (grey) concern.

As mentioned earlier, S1 is within close proximity (±240 m) to the existing shale quarry on the property. Prior to the development of the shale quarry, Mr Gavin Anderson undertook a Heritage Impact Assessment of the area (2018). Although Mr Anderson's study mainly focussed on the footprint of the proposed shale quarry, the report did not indicate any areas of concern within the immediate surroundings of the proposed mining area. Likewise, no national monuments, battlefields or cemeteries were identified in the proposed dolerite quarry footprint. A Needs and Desirability Application Form was submitted to AMAFA to inform them of the proposed project and

obtain their comments. To date no feedback was received from AMAFA that could be incorporated into the FBAR.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from Stats SA http://www.statssa.gov.za/?page_id=993&id=umshwathi-municipality)

The proposed mining area is located in ward 10 of the uMshwathi Local Municipality (uMLM). The uMLM is situated within uMgungundlovu District Municipality immediately adjacent to Pietermaritzburg. uMshwathi comprises of four major urban centres (New Hanover, Wartburg, Dalton and Cool Air) as well as the rural residential settlements of Swayimane, Mpolweni, Thokozani and Ozwathini.

According to the revised population estimates based on the 2011 results (Stats SA, 2011), the uMLM has a population of 106 374 with a population growth rate of -0.19%. South Africa as a whole is estimated to have an average annual growth rate of 1.4% and the growth rate of the uMLM it therefore well below the national growth rate.

Gender Profile

The Pie Chart below indicates that the gender ratio in the uMLM is comprised of 52.2% females and 47.5% males (StatsSA). The age/sex distribution of the uMLM shows the highest number of people in the uMLM are between the age of 0 – 29 years of age.

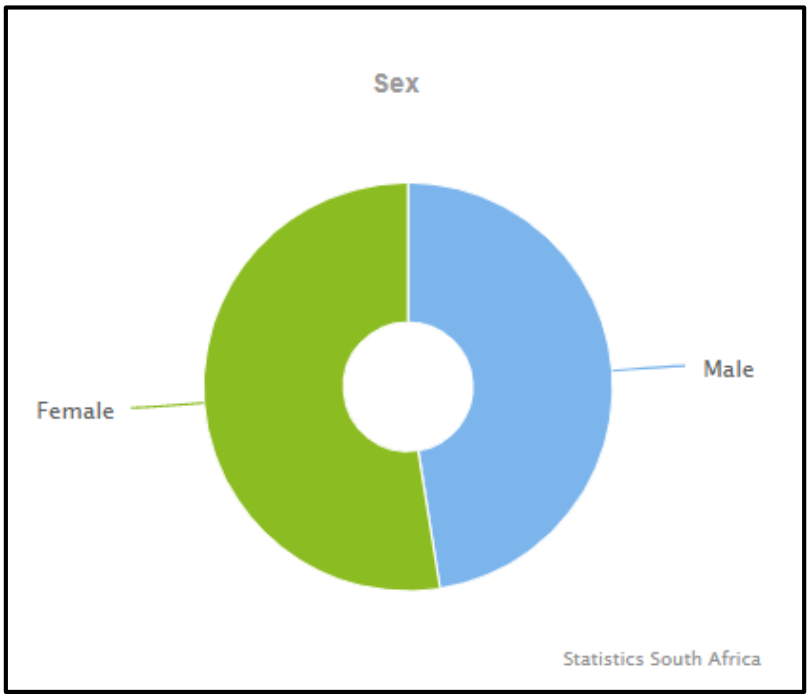


Figure 26: Gender profile (image obtained from Statistics South Africa).

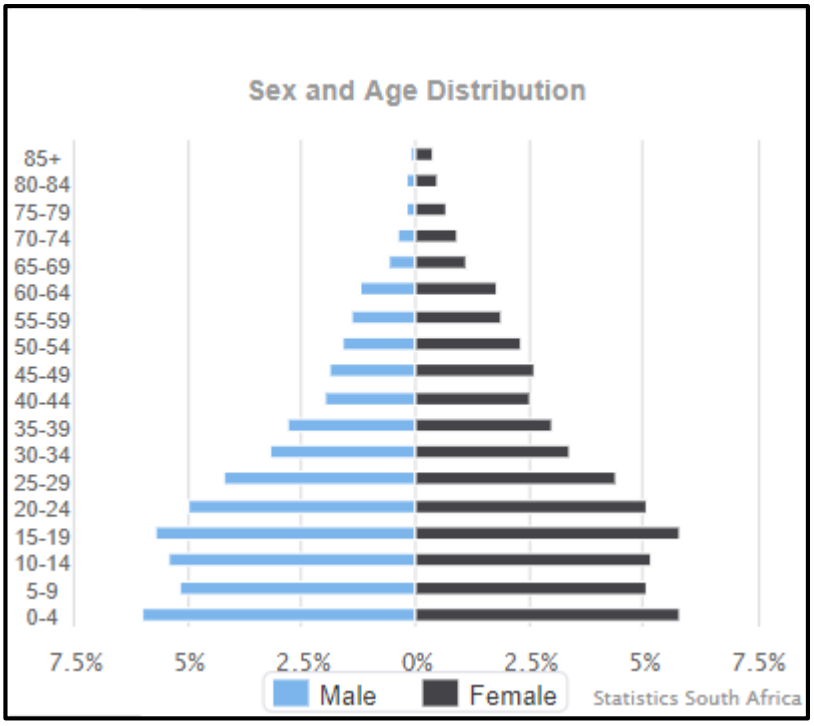


Figure 27: Gender and age distribution profile (image obtained from Statistics South Africa).

Population Profile

Below is a pie chart which indicates the total black African population of uMLM at 95.1%, White at 2.7%, and Indian/Asian population at 1.7%. The Coloured and Others form the lowest proportions of the population with each group accounting for 0.2% respectively.

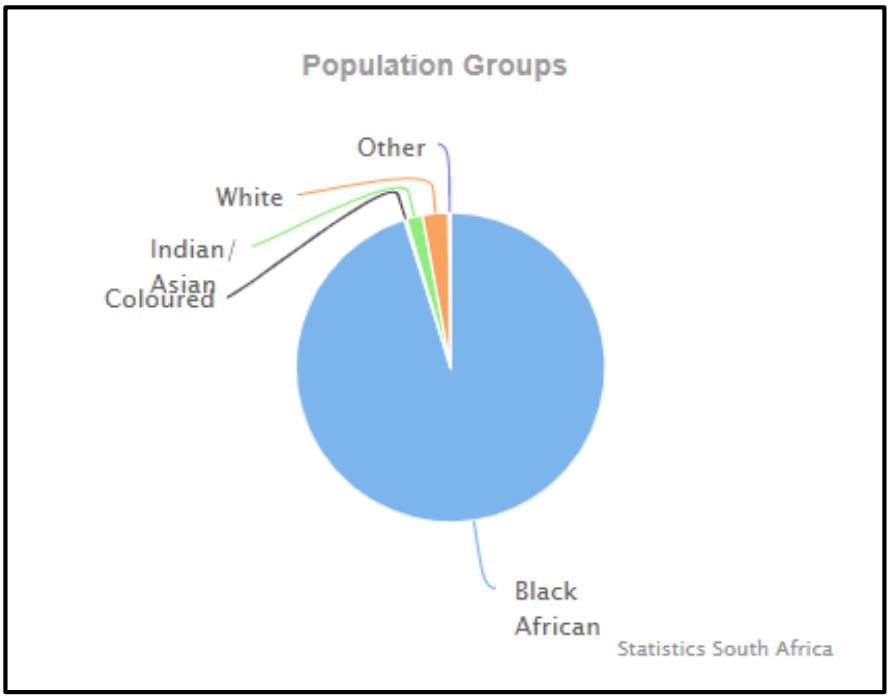


Figure 28: Population profile of the uMshwathi municipal area (image obtained from Statistics South Africa).

Economic Profile

The uMLM is well known for its agriculture, with sugar cane being the predominant pursuit. The municipality has ±32 793 people who are economically active, and of these 24.9% are unemployed. Thirty point eight percent of the average household income of the uMLM range between R 9 601 – R 19 600, followed by an average income of R 19 601 – R 38 200 at 26.2%, while 11.8% of the households registered an income of R 38 201 – R 76 400 as shown below.

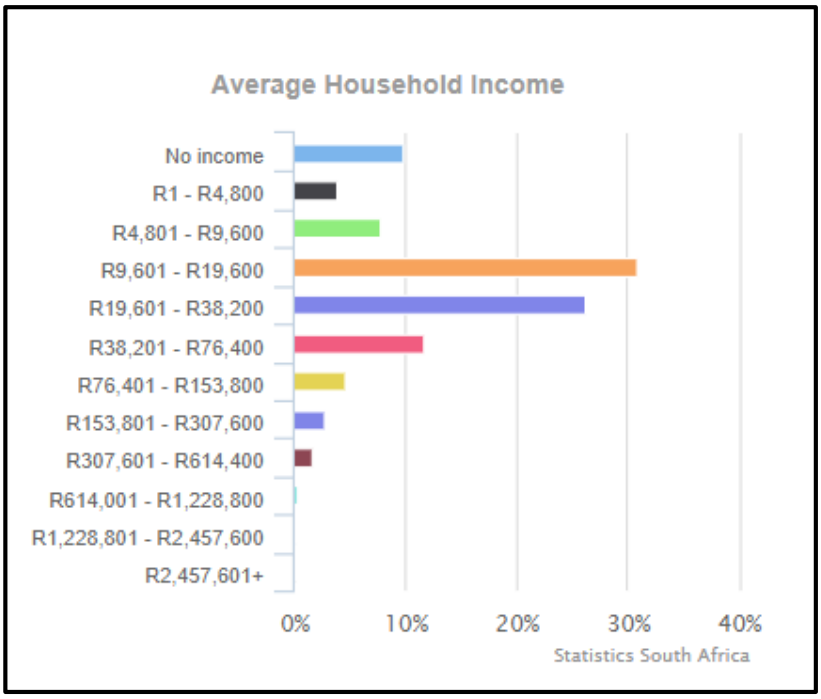


Figure 29: Average household income profile of the uMLM area (image obtained from Statistics South Africa).

The 2011 statistics showed a decrease in the youth unemployment rate of the municipality from 51.5%, in 2001, to 31.5%. The average unemployment rate of the uMLM decreased from 43.5% (2001) to 24.9% in 2011. As mentioned earlier, the economic activities of the uMLM mainly comprise of agriculture, followed by manufacturing, wholesale and trade, finance, community service and households. Agriculture and forestry showed a slight decline of 2,4% when compared to the provincial trend in the period for the uMgungundlovu District Municipality (2012/13). While manufacturing showed a 2% decline for the province, but at district level it seemed consistent at just over 14%. Community service grew at around 2%.

Education Levels

Fifteen point seven percent of the population above the age of 20 has no schooling, 21.3% has obtained matric and 4.7% obtained higher education. The matric rate increased from 10.4% in 2001 to 21.3% in 2011, the no schooling rate decreased from 29.4% to 15.7% and the Higher Education increased from 3.3% to 4.7%.

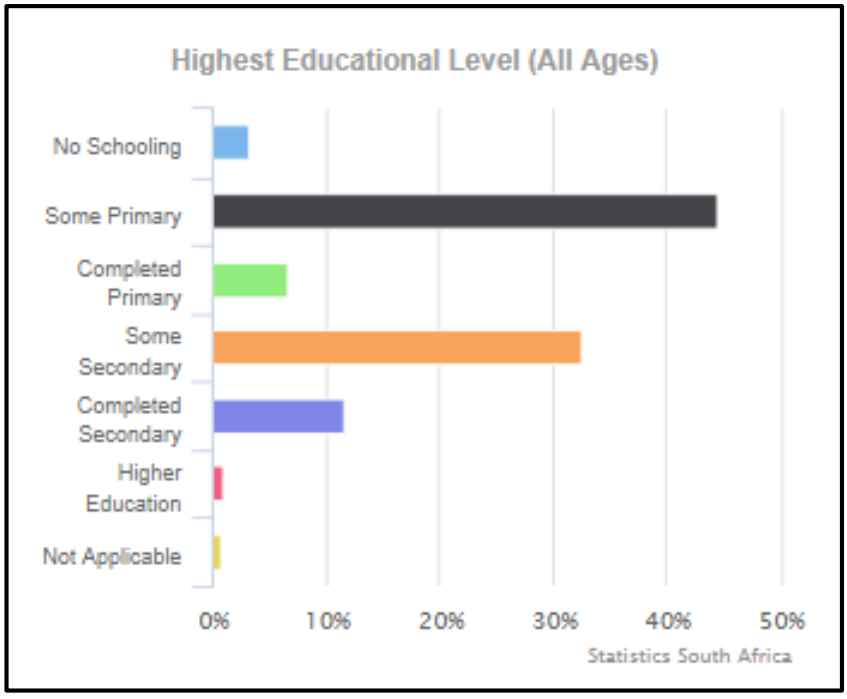


Figure 30: Highest educational level of the uMLM area (image obtained from Statistics South Africa).

(b) Description of the current land uses.

Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 is situated in a rural setting intersected by road-, and electricity infrastructure and transformed by the nearby Copesville residential area (south of the farm). The earmarked property is zoned as Commercial Agricultural. However, due to the low agricultural potential of the soil, the land use was gradually extended to include shale mining and the associated operation of a clay brick factory. The development of a filling station is also proposed (by a separate third party) in the northern corner of the property (bordering the R33 provincial road).

The main land use of the surrounding properties is for agricultural purposes, with sugar cane farming taking precedence to the south and west. Opencast mining takes place on some of the surrounding properties to the north and north-east. As mentioned previously, the Highthorn Private Game Reserve is ±3 km from the study area, and the Albert Falls Dam lays ±5.5 km north of the earmarked property.

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of S1 and/or S2:

Table 11: Land uses and/or prominent features that occur within 500 m radius of S1 and/or S2.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The study area is surrounded by natural areas used for agricultural purposes.
Low density residential	-	**NO**	-
Medium density residential	-	**NO**	-

LAND USE CHARACTER	YES	NO	DESCRIPTION
High density residential	-	**NO**	The Copesville residential area is ±800 m from the nearest point of S1 and ±1.4 m from S2.
Informal residential	-	**NO**	-
Retail commercial & warehousing	**YES**	**NO**	S1: The footprint is not within 500 m of any retail and/or warehousing infrastructure. S2: Some structures of the clay brick factory are within 500 m of the S2 footprint.
Light industrial	**YES**	**NO**	S1: The footprint is not within 500 m of any industrial activities on the property. S2: The footprint of S2 is within 500 m from the clay brick factory on the property.
Medium industrial	-	**NO**	-
Heavy industrial	-	**NO**	-
Power station	-	**NO**	-
High voltage power line	**YES**	-	A high voltage power line traverses the property within 500 m of S1 and S2.
Office/consulting room	**YES**	**NO**	S1: The footprint is not within 500 m of any offices. S2: The sales office of the clay brick factory is within 500 m of the S2 footprint.
Military or police base / station / compound	-	**NO**	-
Spoil heap or slimes dam	-	**NO**	-
Quarry, sand or borrow pit	**YES**	**-**	S1: The footprint is ±240 m from the nearby shale quarry. S2: The footprint of S2 is ±500 m from the shale quarry.
Dam or reservoir	**YES**	-	The dams on the property are within 500 m of the proposed footprint areas (S1 & S2).
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**	Should the filling station application of the Landowner be approved, both S1 & S2 will be more than 500 m from the operation.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Landfill or waste treatment site	-	**NO**	-
Plantation	-	**NO**	-
Agriculture	**YES**	-	As mentioned earlier, the earmarked property is zoned as Commercial Agricultural.
River, stream or wetland	**YES**	-	The uMngeni River as well as the unnamed tributary is within 500 m of the proposed footprints (S1 & S2).
Nature conservation area	-	**NO**	-
Mountain, hill or ridge	**YES**	-	Both S1 and S2 is situated at/on the hill of the property.
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.

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC TOPOGRAPHY

The natural topography of S1 gradually declines along the side of the hill as shown in the figure below. The area has an average slope of -17.1% from 856 mamsl in the south-western corner (highest point) to 796 mamsl in the north-eastern corner (lowest point).

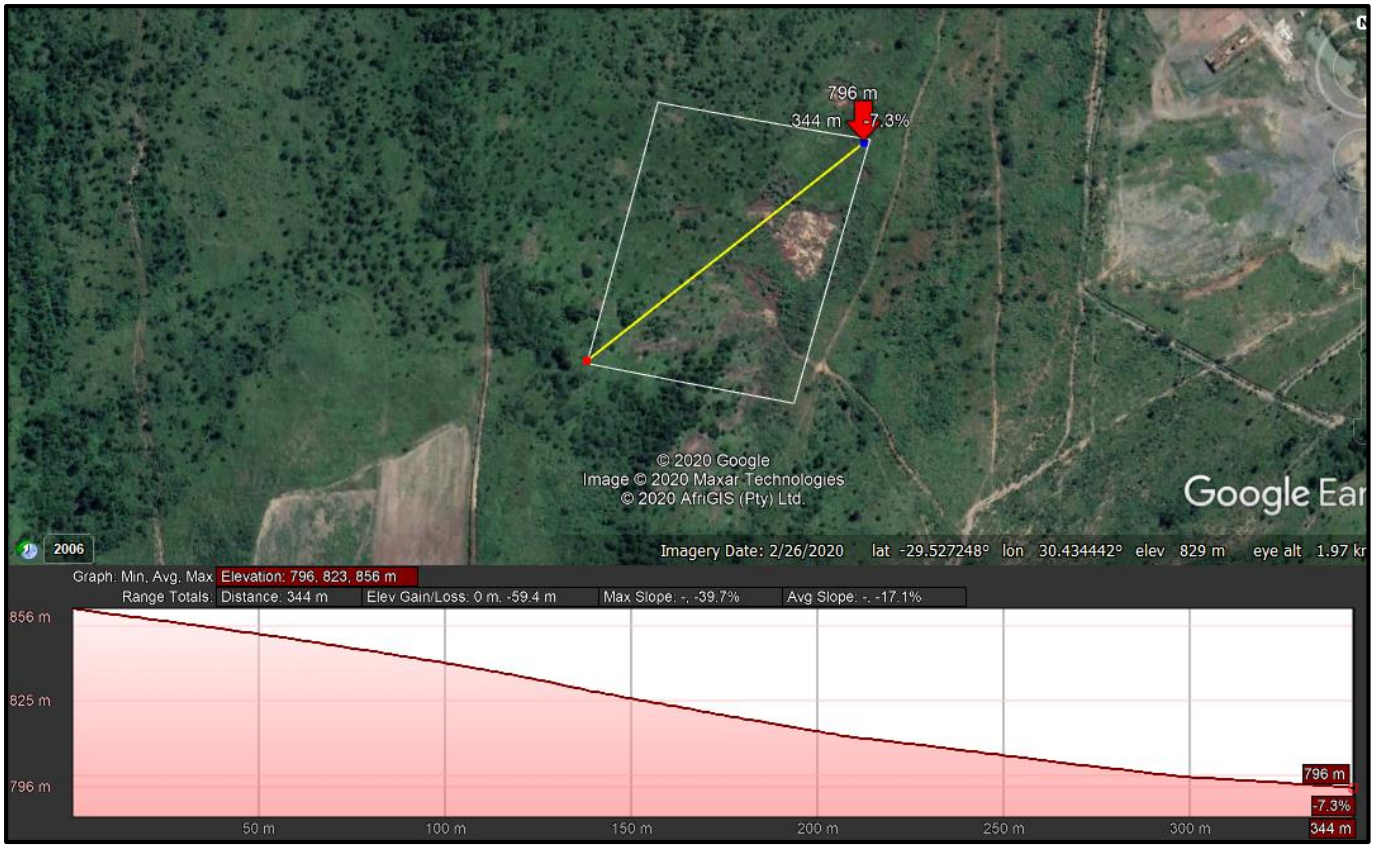


Figure 31: Elevation profile of Site Alternative 1 (Image obtained from Google Earth).

If the same elevation profile is drawn for S2, the natural topography rises from the south-western corner to the highest point that is more or less in the middle of the footprint before it declines towards the north-eastern corner. The area has an average slope of 10.1% / -12.8% from 856 mamsl in the south-western corner to 862 mamsl (highest point) before declining to 834 mamsl in the north-eastern corner (the lowest point of the site is at 830 mamsl at the northern corner) as shown in the figure below.

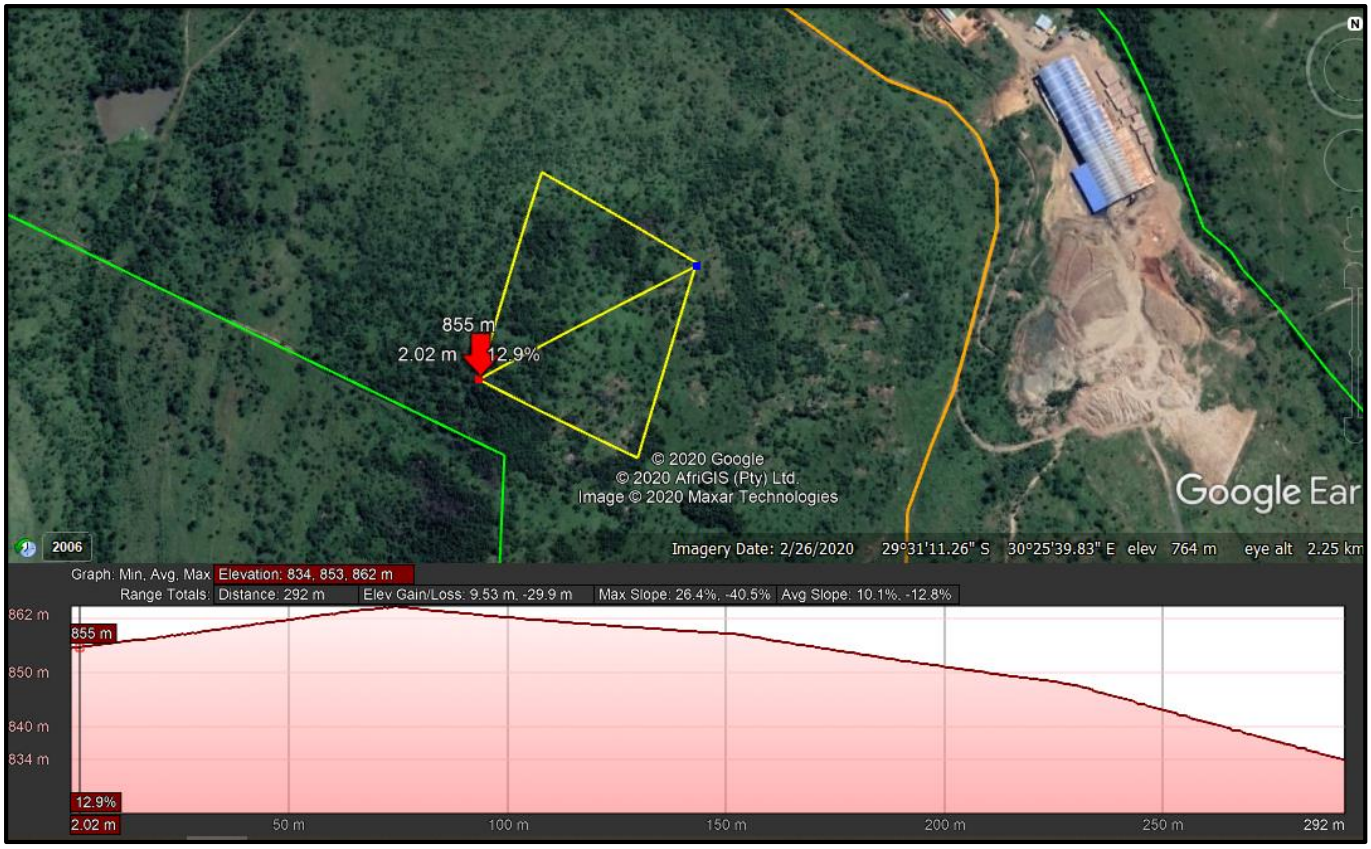


Figure 32: Elevation profile of Site Alternative 2 (Image obtained from Google Earth).

Should S1 be approved, the quarry will be cut into the south-eastern slope of the hill. S2 will entail the mining of the crest of the hill to access the dolerite resource. Due to the nature of the activity, both S1 and S2 will result in the alteration of the topography of the hill in that a depression will be created with stepped side walls as mining progress.

As mentioned earlier, mining the dolerite into the south-eastern face of the hill (S1) should create an excavation with more or less three faces that will be benches as the mining depth increases. Due to the impracticality of importing large volumes of fill material to restore the quarry area to its original topography, the rehabilitation option (upon closure) is to render the quarry safe and leave it as a minor landscape feature. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

SITE SPECIFIC VISUAL CHARACTERISTICS

The following figure shows the viewshed analysis for the footprint of S1 within a ±10 km radius around the study area. The green shaded areas indicate the positions from where the quarry will be visible. The analysis shows that the proposed visual impact will be of low concern as the mining area (S1) will mainly be visible from the immediate surroundings (±3 km) from the north-east towards the south-east due to the higher

elevation of the area east of the uMngeni River. Although the proposed mining area (S1) will be visible within the above mentioned ±3 km radius east of the river, it is proposed that as the distance between the development and the observer increases the visual impact will decrease.

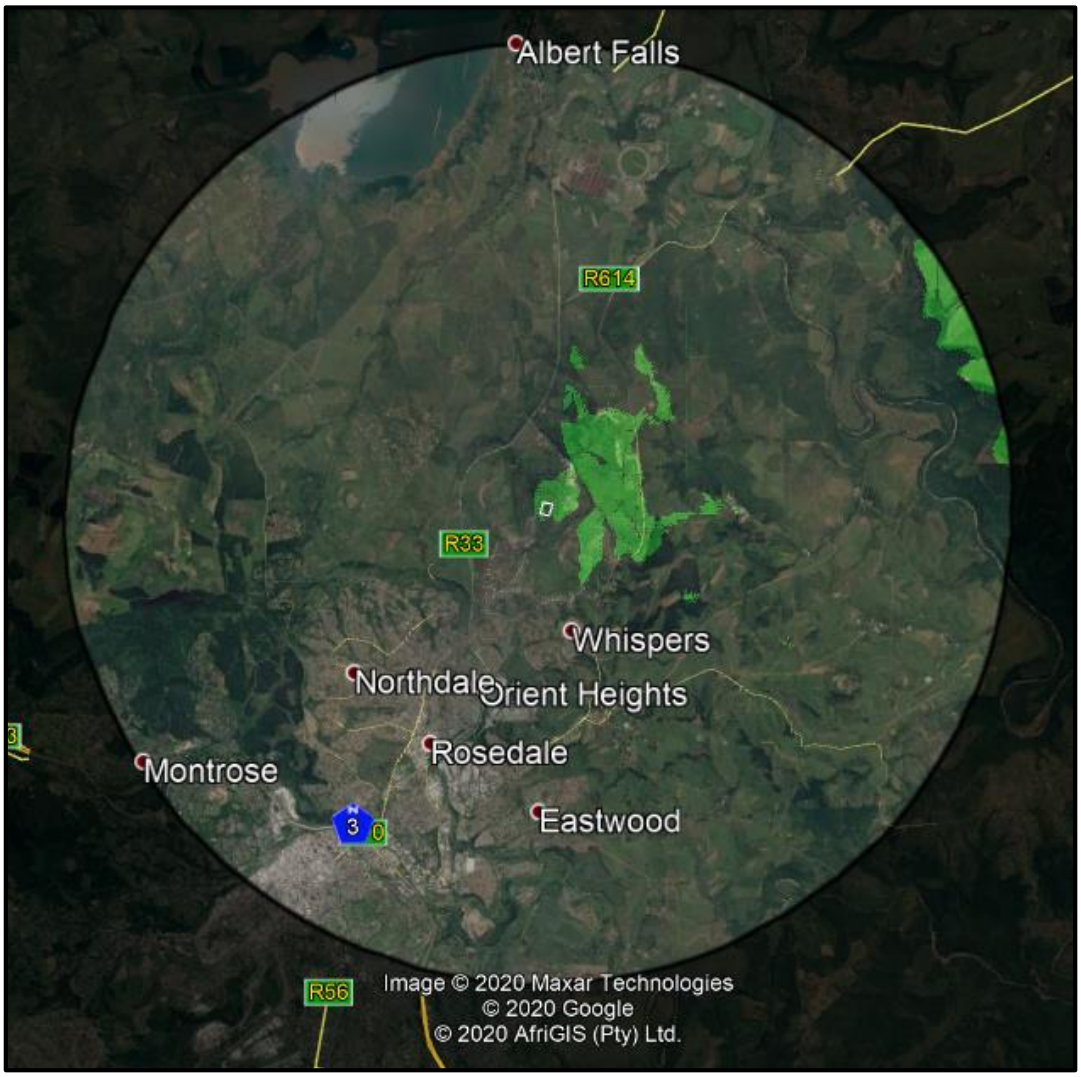


Figure 33: Viewshed analysis of S1 where the green shaded areas indicate the positions from where the highest point of the earmarked area (white polygon) will be visible. (Image obtained from Google Earth).

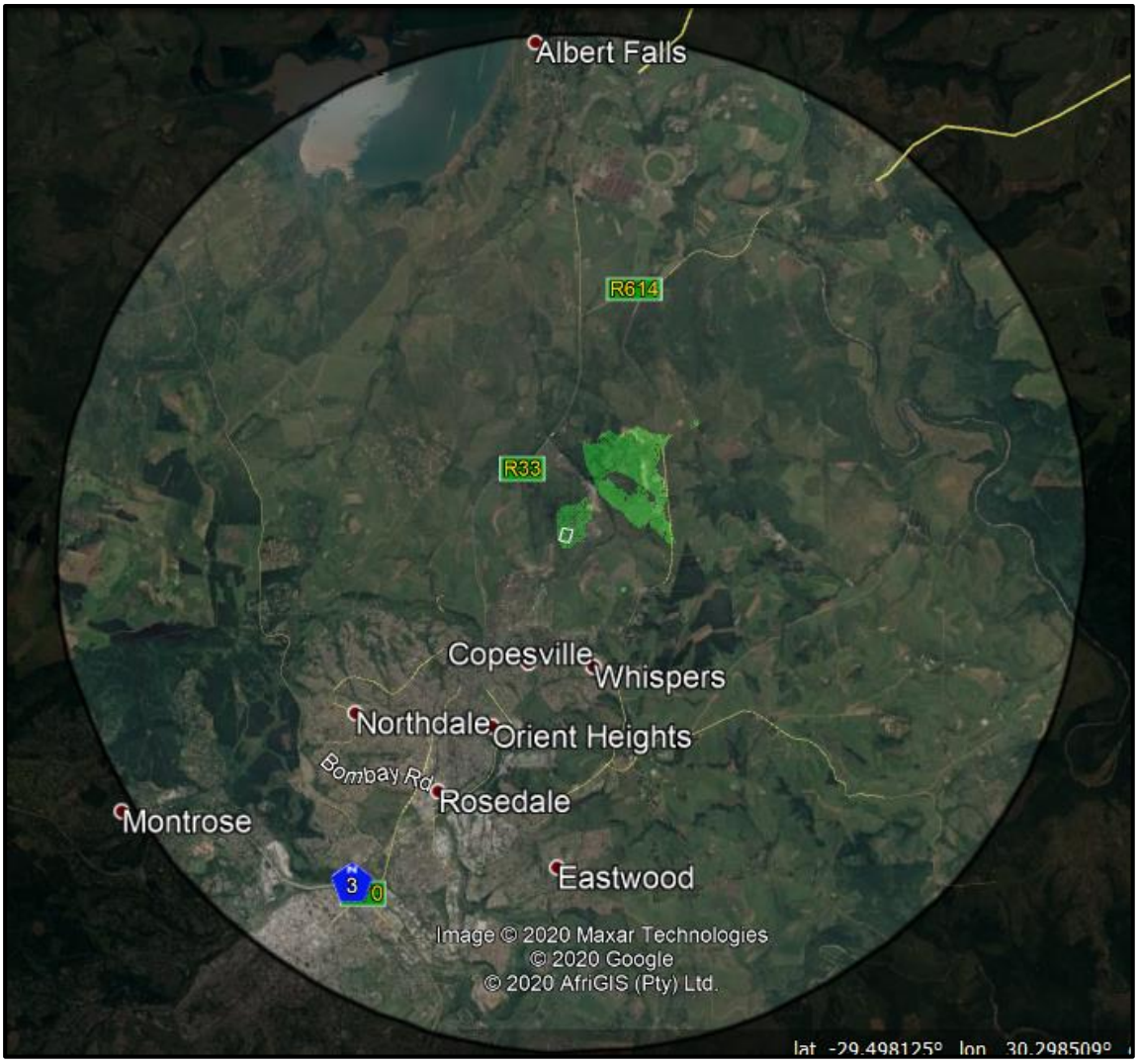


Figure 34: Viewshed of S1 where the green shaded areas indicate the positions from where the lowest point of the earmarked area (white polygon) will be visible. (Image obtained from Google Earth).

If the viewshed analysis of S2 is drawn within a ±10 km radius around the study area, the visual impact slightly increases with the earmarked area mainly visible from the north-western to the north-eastern sides along the higher laying areas. The highest part of the earmarked footprint may be visible from the Albert Falls area as well as the R33 and R614 provincial roads passing the property.

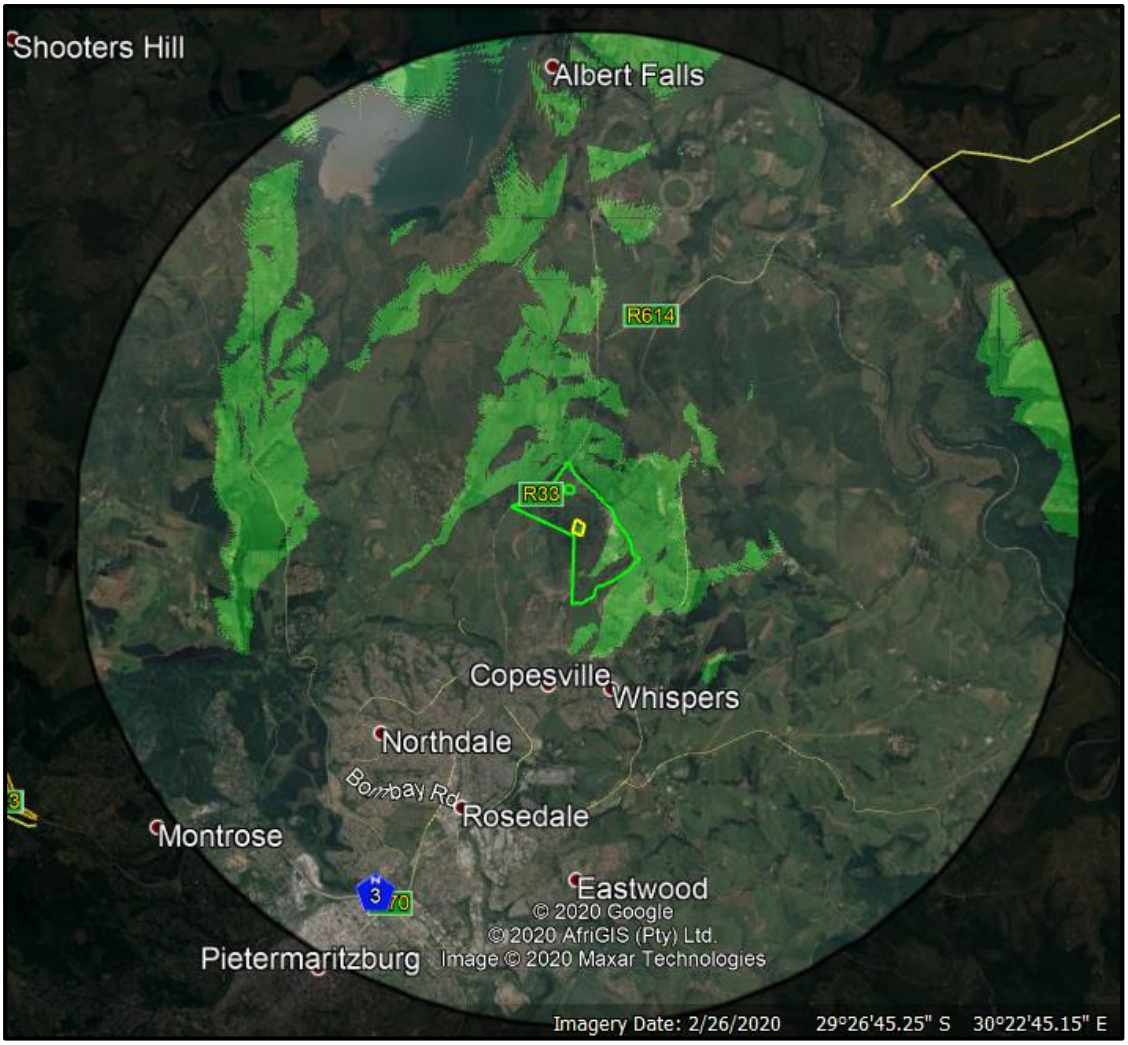


Figure 35: Viewshed of S2 where the green shaded areas indicate the positions from where the highest point of the earmarked area (yellow polygon) will be visible. (Image obtained from Google Earth).

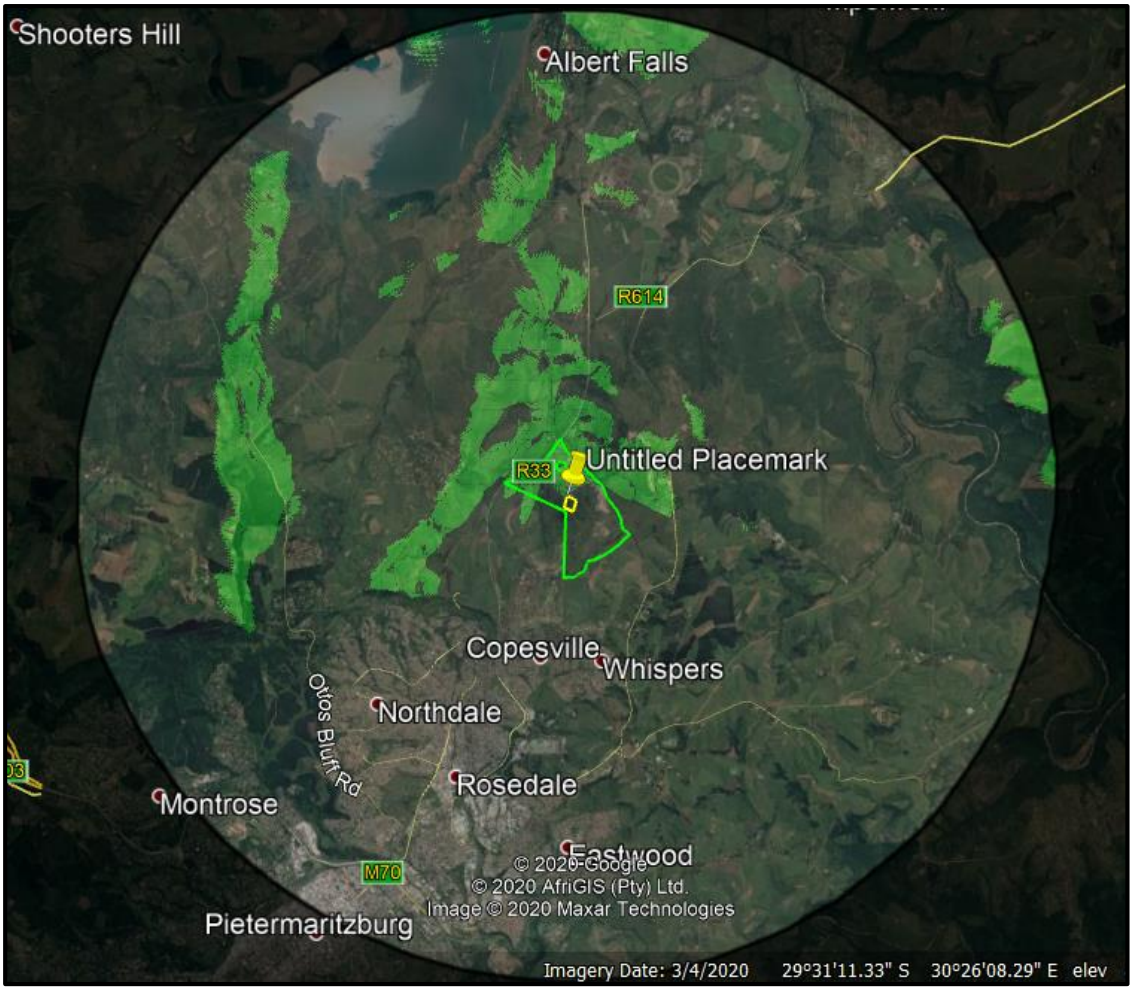


Figure 36: Viewshed of S2 where the green shaded areas indicate the positions from where the lowest point of the earmarked area (yellow polygon) will be visible. (Image obtained from Google Earth).

From the above mentioned, it is deduced that S1 will have a lower visual impact on the receiving environment than S2.

SITE SPECIFIC AIR AND NOISE QUALITY

The nearest residential dwellings to S1 are those of the Copesville area at ±760 m, while S2 is ±1.3 km away. The Clay Brick Factory is ±750 m from S1 and ±400 m from S2. As mentioned earlier, the prevalent wind direction of the study area is in a western direction for most of the year. Currently the air quality of the study area is impacted on by shale mining, clay brick manufacturing, the R33 and R614 road users, and agricultural practices such as the burning of sugar cane.

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The proposed mining activity does not trigger an application in terms of the said act, and emissions to be generated is expected to mainly entail dust due to the displacement of soil, crushing and screening of hard rock, and the transport of material on gravel roads. As the prevalent wind direction is in a western direction dust generated at the proposed quarry (S1 & S2) will be blown away

from the clay brick factory as well as the Copesville community. Should the Applicant implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.

As with air quality, the current activities on the property and surrounding environment already impact the noise ambiance of the study area. Traffic along the R33 and R614 provincial roads, as well as the shale mining operations and brick factory increase the natural noise levels of the receiving environment. The noise to be generated at the proposed dolerite quarry will contribute to these daily noise levels. The proposed activity will contribute noise generated as a result of blasting, as well as the crushing and screening and transporting of material. The nuisance value of noise generated by heavy earthmoving equipment, to residence in the near vicinity is deemed to be of low significance, as the hill will act as a sound barrier to the nearest residential occupants (Copesville). The noise caused by blasting will be instantaneous and of short duration.

Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low-medium significance.

SITE SPECIFIC GEOLOGY AND SOIL

The site specific geology resembles the geology as described under *Part A(h)(iv)(1)(a) Type of Environment Affected by the Proposed Activity – Geology and Soil*. The geology of the study area is intersected by a dolerite intrusion as presented in the following figure. This application is for the mining of dolerite that will be crushed to various sized aggregates before it is sold to clients.

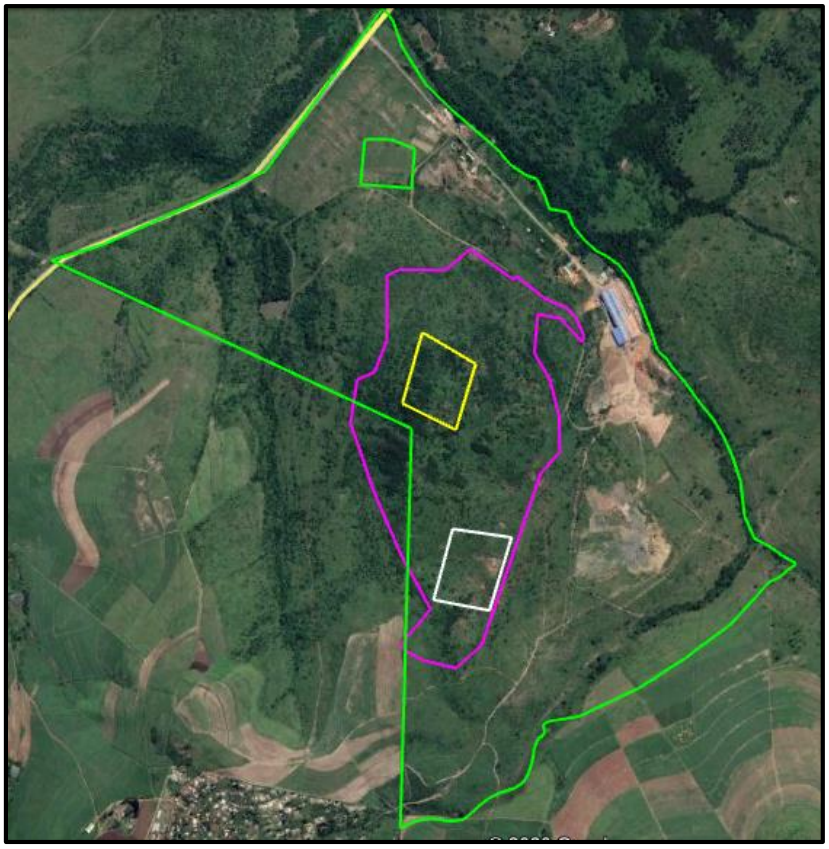


Figure 37: Rough estimation of the proposed dolerite intrusion (pink polygon) on the earmarked property, where the white polygon indicates S1, and the yellow polygon S2. (Image obtained from Google Earth).

SITE SPECIFIC HYDROLOGY

(Information extracted from the Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg area, Mshwati Municipality, KwaZulu-Natal, 2020)

As mentioned earlier, the uMngeni River forms the eastern boundary of the property with an unnamed tributary draining into it from the south-east. Alletson Ecological & Amanzi Aquatics were contracted to compile (amongst others) a Baseline Aquatic and DWS Risk Assessment of the proposed mining area (see Appendix G). The objective of the study was to determine the baseline condition and PES of the above mentioned tributary prior to the mining of the proposed dolerite quarry (S1). During the site inspection the stream was dry and no surface water or diatoms could be collected. Therefore, a visual assessment was done (see following figure) in order to discuss the impact to the system.

A follow-up inspection by members of the project team, during the rainy season (November 2020), confirmed that the said tributary is of non-perennial nature and even though the area received substantial rains the stream and earth dams remained dry.

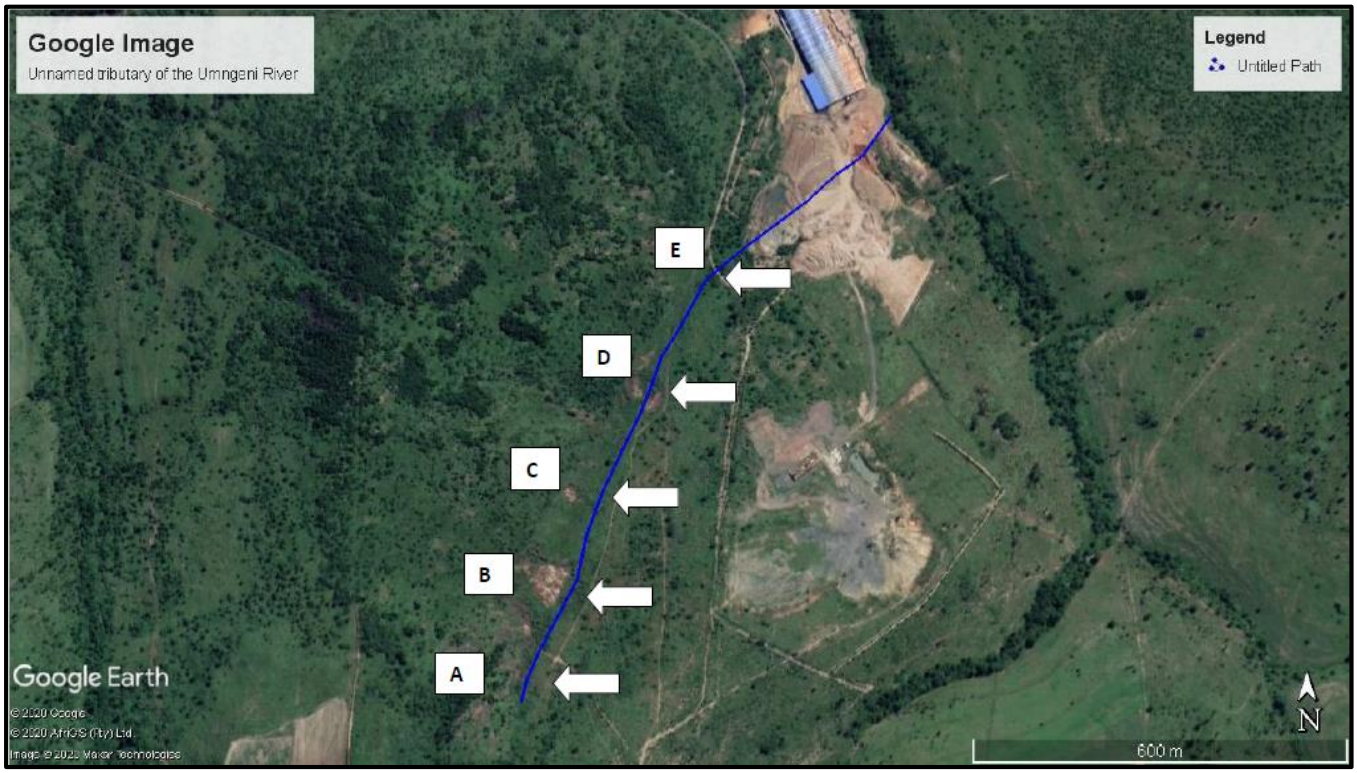


Figure 38: Observation points along the unnamed tributary of the uMngeni River (image obtained from the VARA).

The specialist found that the overall instream and riparian habitat, and basic ecosystem functions of the unnamed tributary are impacted on by alien vegetation, inundation by middle earth dams, drainage trenches, dirt roads and power line crossings, foot paths etc.

The DWS Risk Assessment was conducted in accordance with the DWS risk-based water use authorisation approach and delegation guidelines (refer to Appendix G). The results for the risk assessment are presented in the following figure with all components scoring a moderate to high impact significance. Borderline risk scores were manually adapted and reduced all components to a low to moderate impact significance with the application of various mitigation measures. The specialist concluded that based on the results of the DWS risk assessment, a Water Use Licence (WUL) is required for the proposed dolerite quarry, as per Section 21 of the National Water Act No. 36 of 1998 and Notice 509 of 2016.

No.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Boderline Low Moderate Rating Classes
1	Construction	Establishment of the construction camp and activities for quarry mining	Direct modification and destruction of instream and riparian habitats due to construction	Direct modification, fragmentation and destruction of instream and riparian habitat	1	2	2	1	2	2	2	6	4	5	5	3	17	102	Moderate	102	Moderate
2	Construction	Establishment of the construction camp and activities for quarry mining	Flow modification, erosion and sedimentation	Removal of vegetation will temporarily destabilise soils and make them subject to potential erosion, increased dust, altered flow regimes and lead to water quality	4	3	3	1	4	4	5	13	4	5	5	3	17	221	High	200	High
3	Construction	Establishment of the construction camp and activities for quarry mining	Increased in hardened surfaces, dust and toxic chemicals from hydrocarbons, metals, nutrients etc from construction vehicles	Pollution of water and soil environments	3	3	3	2	4	3	4	11	4	4	5	3	16	176	High	150	Moderate

No.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Boderline Low Moderate Rating Classes
4	Operational	Quarry Mining	Operation and maintance of infrastructure	Direct modification, fragmentation and destruction of instream and riparian habitats	1	3	3	1	3	3	3	9	4	4	5	3	16	144	Moderate	120	Moderate
5	Operational	Quarry Mining	Pollutition associated with quarry mining	Pollution of water and soil environments	3	3	3	2	4	4	4	12	4	4	5	2	15	180	Moderate	160	Moderate
6	Operational	Quarry Mining	Stormwater associated with quarry mining	Flow modification and increase turbidity and sedimentation due to increased hardened surfaces and stormwater discharges into watercourse	3	3	3	2	4	4	4	12	4	4	5	2	15	180	High	168	Moderate
7	Operational	Quarry Mining	Post disturbance invasion of ruderal and alien invasive species	Recruitment of alien plant species	3	1	3	3	3	3	3	9	4	4	5	2	15	135	High	54	Low

Figure 39: Significance rating matrix for the impacts associated with the proposed dolerite mine (image obtained from the VARA).

Inzalo submitted a WUL application to the DWS on 24 November 2020 that is currently in progress. As mentioned earlier, the proposed mining footprint (S1) will extend across the identified drainage line (upon approval of the WULA), however it is proposed that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

SITE SPECIFIC TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER

(Information extracted from the Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg area, Mshwati Municipality, KwaZulu-Natal, 2020)

The VARA notes that the study area is located within Ecoregion 16: South Eastern Upland, specifically 16.03. As mentioned earlier, both S1 and S2 is situated over areas of highest biodiversity importance with a corresponding rating of highest risk for mining. The study area (S1 & S2) also extends into an area classified as CBA 3 Optimal and BSP 3 in terms of the KZN Biodiversity Sector Plan. The broad scale mapping of the uMDM-EMF shows the study area to be of high agricultural-, and water yield significance, very high biodiversity- and water quality significance, and low to moderate wetland sensitivity.

In light of the above mentioned, Alletson Ecological & Amanzi Aquatics were contracted to compile (amongst others) a baseline vegetation assessment of the proposed mining area (see Appendix G). Upon undertaking a desktop survey, the findings were validated during a two-day site visit. Ground-truthing confirmed that the landscape around the proposed quarry site is already transformed by (amongst others) shale mining, brickworks, nearby low income housing (Copesville) and sugar cane farming. The groundcover of the site specific study area (S1) was found to be in a generally poor condition due to frequent veld burning and overgrazing.

The VARA identified the following vegetation communities on the study area (S1 & S2) (see following figure):

- **Semi-open savannah:** This vegetation community is dominated by grasses but also contains most of the small flowering plants as well. The low-growing Aloes (*Aloe maculata*) are generally associated with this community. Trees such as *Acacia sieberiana* are present but are scattered and the canopies do not touch. It was noted that such areas are now showing signs of degradation as a result of over-frequent burning and of heavy trampling and grazing by livestock. As a result, soil surface erosion is becoming apparent in many places and smaller weed species are encroaching.

- **Semi-closed savannah:** This vegetation community has numerous trees and the canopies touch or are in close proximities to one another. Typically, it occurs along the crest of the ridge or in rocky areas. Most of the large aloes are associated with this community.

- **Degraded areas:** In several places around the ridge, including within the project site (S1), are degraded areas. Typically, these areas have been deliberately altered as a result of human action and those noted included extraction of shale and the construction of scrape dams with the latter being of relevance in the project area. The degraded areas are typically dominated by a variety of weed species.

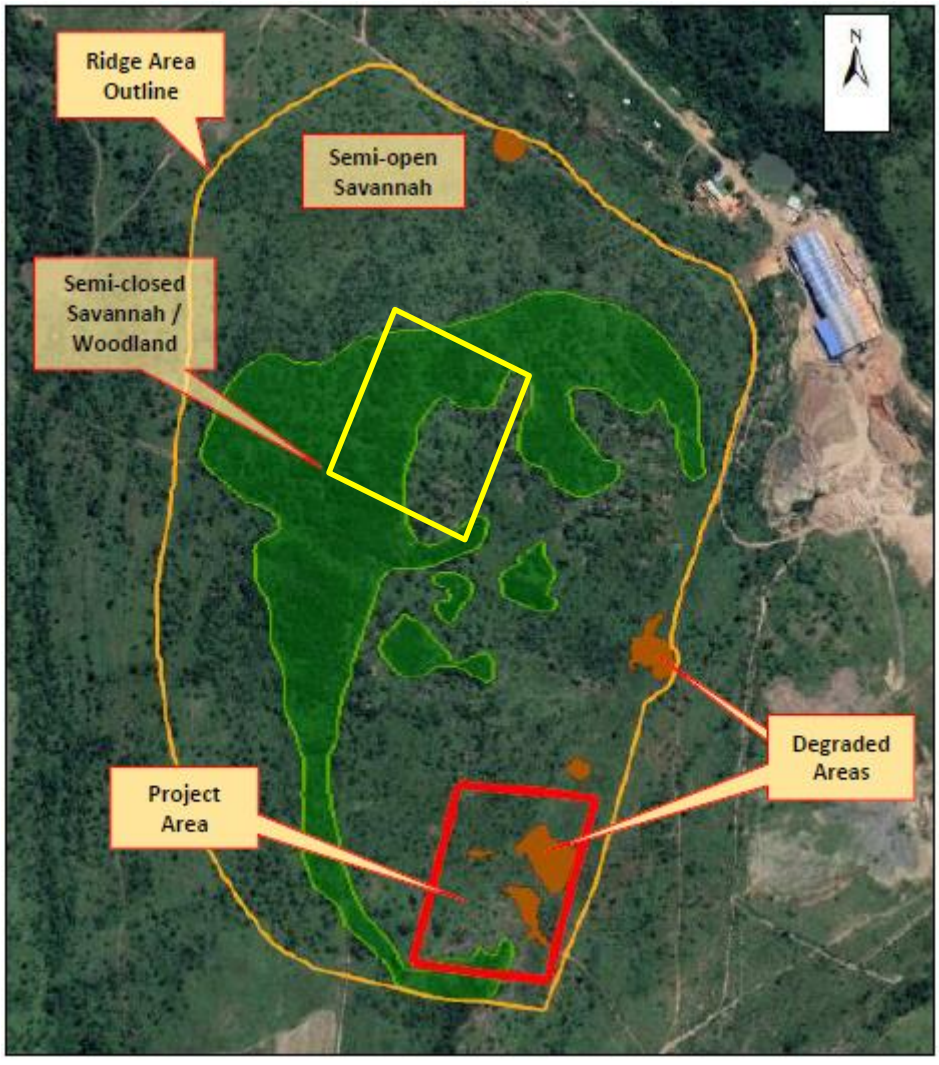


Figure 40: Vegetation communities in and around the project area, where the red polygon shows S1 and the yellow polygon S2 (image obtained from the VARA – yellow polygon added).

Within the project area (S1) the semi-open savannah is the most common vegetation community (4.05 ha), followed by degraded areas (0.7 ha), and semi-closed savannah (0.25 ha). The largest portion of the S2 footprint extends across the semi-closed savannah/woodland vegetation community, with the remainder classified as semi-open savannah.

Figure 41: Landscape view of vegetation in the project area (S1) (image obtained from the VARA).

The list of indigenous species found during the site inspection is presented in Table 5-1 of the attached VARA. According to the report, the greater majority of the indigenous plant species are, classified in the SANBI list as being, "Least Concern". The single species (identified during the inspection) that is "Vulnerable" is *Brachystelma franksiae*. The reason for the listing is described as follows: "*This subspecies was previously thought to have a restricted range occurring in a highly transformed area between Pietermaritzburg and Camperdown. However, recent collections have enlarged its range to 16 000 km². It is now known from between four and eight locations and remains severely threatened by urban expansion and alien plant invasion at the majority of its locations.*". The unsustainable harvesting of Bitter Aloes (*Aloe ferox*) was also noted on site.

The ecologist noted that the area is heavily infested with alien weed species. The most common and widespread species is Lantana (*Lantana camara*) which is both widespread and occurring as dense mono-species thickets in places. Other species such as Prickly Pear (*Opuntia ficus-indica*) are present as just a small number of individual plants. Refer to Appendix G for a list of the alien weed species identified on site.

The VARA concluded that of the identified 58 indigenous species only one (*Brachystelma franksiae*) was found to be listed as a species of concern as it is rated as "Vulnerable" due to habitat loss. The specialist noted that because of the nature of the proposed operation, it is inevitable that the vegetation at the site will eventually be destroyed, and due to the pit that will remain as a landscape feature it will not be

possible to re-establish a vegetation cover over much of the affected area (upon closure).

However, the VARA notes that the quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigatory measures put forward (in this report) are adhered to. Since the earmarked footprint (S1) is already degraded and ground-truthing confirmed that it is not rated as being of high conservation priority, it is therefore the opinion of the specialist that the impacts on the vegetation do not constitute a fatal flaw to the proposed project and so there is no reason to block the project in that regard.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

No sites of archaeological or cultural importance were identified during the EIA. Consultation with the interested and affected parties did not identify any potential area of concern and the SAHRA palaeontological sensitivity map shows that the area falls in an area of insignificant concern. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed insignificant. Site management will implement chance find protocol should any artefacts of archaeological- and/or palaeontological significance be discovered during the various phases of the mining activities.

SITE SPECIFIC INFRASTRUCTURE

No infrastructure exists in the 4.9 ha footprint of either S1 or S2 as both these areas are greenfield sites. As mentioned earlier, the study areas are within the boundaries of a farm with various land uses. Infrastructure within close proximity to the footprint of S1 and/or S2 include the existing access (farm) road to be used by the mining contractor, the Eskom power line, and the buildings of the clay brick factory. It is believed that the mining activity will not impact the infrastructure of the clay brick factory due to it being ±400 m removed from S2 and ±750 m from S1. Should the mitigation measures proposed in this document be implemented the existing infrastructure on the farm will be safeguarded against mining related impacts.

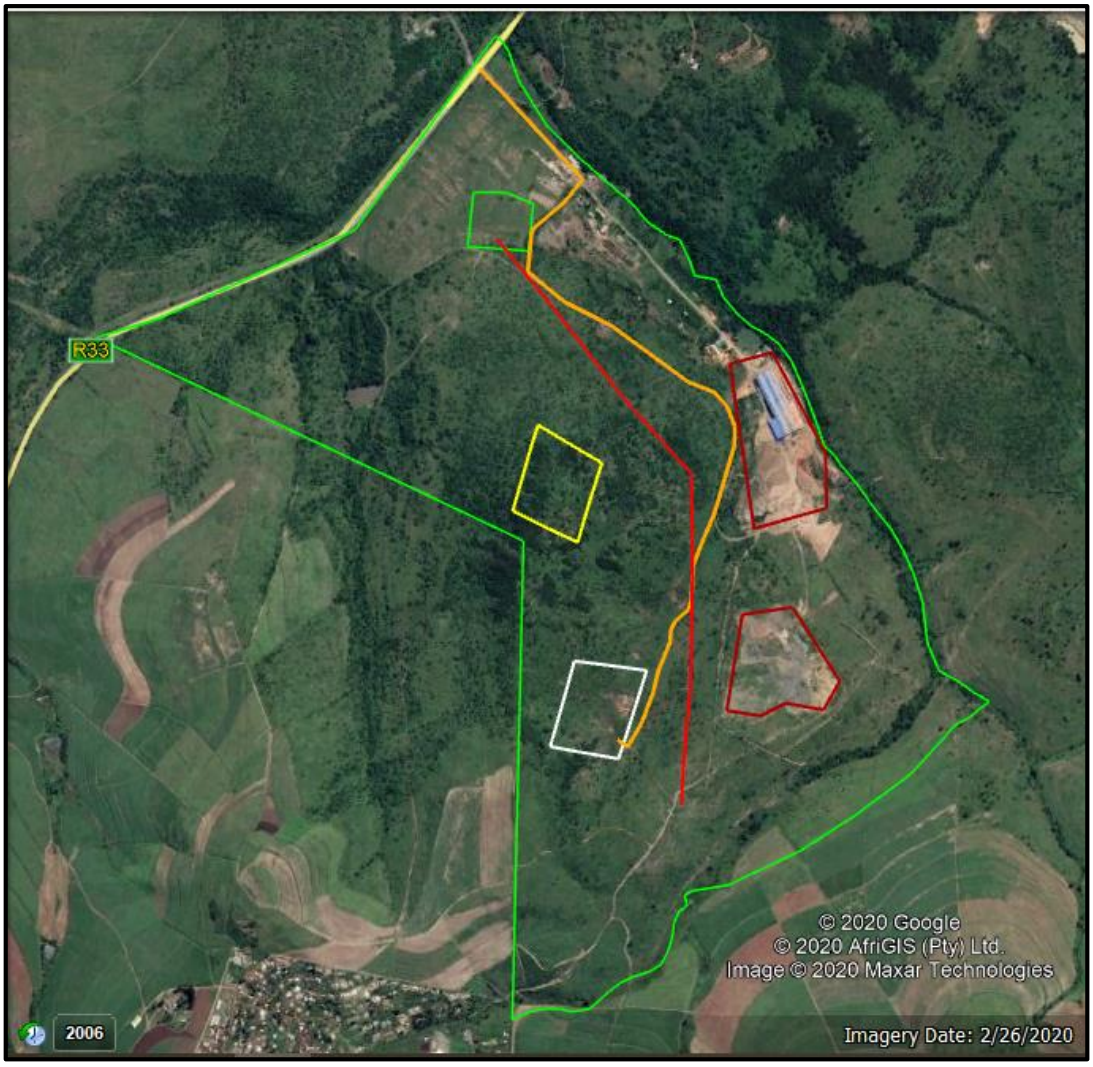


Figure 42: Satellite view showing the existing structures on the property (property boundary - green polygon) where S1 is indicated by the white polygon, S2 the yellow polygon, the access road by the orange line and the shale quarry and brick factory by the brown polygons. The red line shows the position of the Eskom power line (image obtained from Google Earth).

(d) Environmental and current land use map.

(Show all environmental and current land use features)

The environmental and current land use map is attached as Appendix D.

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 & INFRASTRUCTURE DEVELOPMENT:

Alteration of the agricultural sense of place

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	4	5	4.5	**10.4**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	4	5	4.5	**10.4**

Loss of agricultural land for duration of mining

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**

Visual intrusion as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	5	5	5	**13**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	4	2	3	5	5	5	**15**

Potential impact on the CBA/BSP objectives

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	4	4	3	1	2	**8**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	4	4	3	1	2	**8**

Potential impact on vegetation and listed and/or protected plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	4	4	4	2	3	**12**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	4	4	4	2	3	**12**

Potential impact on fauna within the footprint area

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	3	1	2.6	4	3	3.5	**9.1**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	3	1	2.6	4	3	3.5	**9.1**

Potential impact on archaeological artefacts

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	5	5	4.6	1	1	1	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	5	5	4.6	1	1	1	**4.6**

Loss of the unnamed tributary due to mining activities

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

New job opportunities as a result of the mining operation (Positive Impact)

			Consequence			Likelihood	Significance (+)
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 1**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**
Rating: High (+)			**Site Alternative 2**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	5	5	5	**13**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	4	2	3	5	5	5	**15**

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**

Dust nuisance as a result of the disturbance of soil

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	3	2	2.3	4	4	4	**9.2**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	3	2	2.3	4	4	4	**9.2**

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	3	2	2.3	3	5	4	**9.2**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	3	2	2.6	3	5	4	**10.4**

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

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	2	3	5	2	3.5	**10.5**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	5	2	3.5	**10.5**

Potential impact on local fauna due to disturbance and loss of available habitat

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	4	4	4	**9.2**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	4	4	4	**9.2**

Potential erosion of denuded areas

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	2	3	**6.9**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	2	3	**6.9**

Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	4	4	**9.2**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	4	4	**9.2**

DRILLING AND BLASTING:

Health and safety risk posed by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	1	3	4	3	3.5	**10.5**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	1	3	4	3	3.5	**10.5**

Potential damage to the power line

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	4	4	3	1	2	**8**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	4	4	3	1	2	**8**

Dust nuisance caused by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: None**	
3	4	2	3	4	3	3.5	**10.5**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: None**	
3	4	2	3	4	3	3.5	**10.5**

Noise nuisance as a result of blasting

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
3	4	2	3	4	3	3.5	**10.5**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	2	3	4	3	3.5	**10.5**

Potential impact on the shale mining- and brickworks infrastructure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	2	3	3	2	2.5	**7.5**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	3	2	2.5	**7.5**

EXCAVATION, LOADING AND HAULING TO THE PROCESSING PLANT

Dust nuisance due to excavation and from loading and vehicles transporting the material

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	4	5	4.5	**11.7**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	4	5	4.5	**11.7**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	4	5	4.5	**11.7**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	4	2	3	4	5	4.5	**13.5**

Unsafe working environment for employees

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	1	3	4	5	4.5	**13.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	1	3	4	5	4.5	**13.5**

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	5	4.5	**11.7**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	5	4.5	**11.7**

Potential impact on areas of palaeontological concern

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	5	4.3	2	1	1.5	**6.5**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	5	4.3	2	1	1.5	**6.5**

Facilitation of erosion due to mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	5	5	5	**13**
Rating: Medium - High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	2	3	5	5	5	**15**

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	4	5	4.5	**11.7**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	4	2	3	4	5	4.5	**13.5**

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	4	4	**10.4**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	4	4	**10.4**

Overloading of trucks impacting road infrastructure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	5	4	4	5	4.5	**18**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	5	4	4	5	4.5	**18**

Degradation of the access road

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

CUMULATIVE IMPACTS:

Impact the broad-scale ecological processes

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
4	4	4	4	3	1	2	**8**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
4	4	4	4	3	1	2	**8**

Impact on existing infrastructure as a direct result of the mining operation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	5	4.3	3	3	3	**12.9**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	5	4.3	3	3	3	**12.9**

Potential impact on the uMngeni River

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	4	4	3	2	2.5	**10**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	4	4	3	2	2.5	**10**

SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**13.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**13.5**

Erosion of returned topsoil after rehabilitation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	3	3.5	**10.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	3	3.5	**10.5**

Infestation of the reinstated areas by weeds and invader plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	3	3.6	5	5	5	**18**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	3	3.6	5	5	5	**18**

Potential impact associated with litter/waste left at the mining area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**10.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**10.5**

Return of the mining area to agricultural use upon closure (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: N/A**		
3	5	1	3	5	5	5	**15**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: N/A**		
3	5	1	3	5	5	5	**15**

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 in order 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 recognised from the various interpretations:

- Environmental significance is a value judgement
- 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 particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology 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 the purpose of 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.

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

Table 12: 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 13: 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 14: 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 15: 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 16: 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
5	Daily

Determination of Probability

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

Table 17: 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 summarised below, and then dividing the sum by 2.

Table 18: 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 19: 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 prioritisations and decision making process associated with this event, aspect or impact.

Table 20: 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 fairly 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 a number of 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)

The preferred site alternative identified by the Applicant and project team (called Site Alternative 1 (S1) in this document) entails the development of the proposed dolerite quarry within the GPS coordinates as listed in Table 6 above. S1 was identified as the preferred site alternative based on the following:

- The proposed mining footprint lays at the foot of the hill extending into it towards the west/north-west. Placing the quarry at the foot of the hill directly adjacent to the access road simplifies access into the mining area, access to the earmarked mineral, and transport of the material from the mining area.

- Based on the proposed mining method, the permit holder will gradually mine the earmarked area from the lowest point (south-eastern boundary) towards the higher laying north-western boundary. Ultimately, this should create a south-east facing excavation with more or less three faces that will be benched as the mining depth increases. Upon rehabilitation of the excavation, the permit holder will render the said benches safe and reinstate the footprint area to allow for future agricultural (grazing) use. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

- If S1 is approved, the mining area will be facing the surrounding area toward the south-east. This will mean that the mining footprint will be screened from traffic passing on the R33 provincial road (although it will be visible from ±3 km along the R614). As shown by the viewshed analysis the position of S1 will have a lower visual impact than that of S2.

- The proposed dolerite quarry will be ±240 m from the shale quarry on the property. Siting the dolerite quarry at the location of S1 will concentrate the mining activities on the farm to a central area, instead of spreading mining related impacts across the whole property.

- The VARA confirmed that there are already disturbed areas within the proposed footprint of S1, thereby reducing the magnitude of the impact that removal of vegetation, from the mining area, will have on the vegetation cover of the ecosystem/farm. The protected species, identified by the botanist, can be relocated by a suitably qualified contractor upon receipt of a relocation plant permit.

- Although the proposed mining footprint will extend across the identified drainage line (upon approval of the WULA), it is proposed that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

POSITIVE IMPACTS ASSOCIATED WITH S1 AND S2:

- The permit holder will be able to exploit the dolerite resource on the property;
- The landowner will be able to further diversify the income generation of the property;
- At least eight new job opportunities will be created by the proposed activity;
- The presence of the proposed operation will contribute (directly & indirectly) to the local economy with preference give to HDSA & women owned local suppliers;
- Presently, the vegetation of the study area is becoming degraded, indigenous species are harvested for traditional purposes, and the area is infested with weeds/invader plant species. Should the mitigation measures proposed in this document be implemented the management of the footprint area will be in accordance with the relevant environmental legislation that will warrant the protection of listed plant and/or faunal species, the control of weeds/invader plant species, and the proper rehabilitation of the area (including re-vegetation with indigenous species) upon closure.
- Upon closure, the area will be returned to the landowner for continued agricultural use.

POTENTIAL NEGATIVE IMPACTS ASSOCIATED WITH S1 AND/OR S2:

Site establishment & infrastructure development

- Alteration of the agricultural sense of place;
- Loss of agricultural land for duration of mining;
- Visual intrusion as a result of site establishment;
- Potential impact on the CBA/BSP objectives;
- Potential impact on vegetation and listed and/or protected plant species;
- Potential impact on fauna within the footprint area;

- Potential impact on archaeological artefacts;
- Loss of the unnamed tributary due to mining activities (S1);

Stripping and stockpiling of topsoil and/or overburden:

- Visual intrusion caused by mining activities;
- Loss of stockpiled topsoil during mining and stockpiling;
- Dust nuisance as a result of the disturbance of soil;
- Noise nuisance generated by earthmoving machinery;
- Infestation of the topsoil heaps and mining area with weeds or invader plant species;
- Potential impact on local fauna due to disturbance and loss of available habitat;
- Potential erosion of denuded areas;
- Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages;

Drilling and blasting:

- Health and safety risk posed by blasting activities;
- Potential damage to the power line;
- Dust nuisance caused by blasting activities;
- Noise nuisance as a result of blasting;
- Potential impact on the shale mining- and brickworks infrastructure;

Excavation, loading and hauling to the processing plant:

- Dust nuisance due to excavation and from loading and vehicles transporting the material;
- Noise nuisance as a result of the mining activities;
- Unsafe working environment for employees;
- Soil contamination from hydrocarbon spills and/or littering;
- Potential impact on areas of palaeontological concern;
- Facilitation of erosion due to mining activities;

Processing, stockpiling and transporting of material:

- Dust nuisance generated at the processing plant;
- Noise nuisance stemming from operation of the processing plant;
- Potential contamination of environment due to improper waste management;
- Overloading of trucks impacting road infrastructure;
- Degradation of the access road;

Cumulative impacts:

- Impact the broad-scale ecological processes;
- Impact on existing infrastructure as a direct result of the mining operation;
- Potential impact on the uMngeni River;

Sloping and landscaping during rehabilitation:

- Safety risk posed by un-sloped areas;
- Erosion of returned topsoil after rehabilitation;
- Infestation of the reinstated areas by weeds and invader plant species;
- Potential impact associated with litter/waste left at the mining area.

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 mitigation 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 impact of the proposed activity on the surrounding environment:

TOPOGRAPHY

Rehabilitating/Landscaping of Mining Area:

- The excavated area must serve as a final depositing area for the placement of overburden.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- 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.
- No waste may be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
- The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 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.
- 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).

- On completion of mining operations, the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

VISUAL CHARACTERISTICS

Visual Mitigation:

- The site must have a neat appearance and be kept in good condition at all times.
- Mining equipment must be stored neatly in dedicated areas when not in use.
- The permit holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area.
- The excavation must be contained within the approved footprint of the permitted area.
- Upon closure the site must be rehabilitated to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum.

AIR AND NOISE QUALITY

Fugitive Dust Emission Mitigation Measures:

- 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 all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the haul roads must be limited to 20 km/h and 40 km/h on the access road 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.
- The crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts.
- Fines, blowing from the drop end of the crusher plant, can be minimized by attaching strips of used conveyor belts to the conveyor's end.
- Compacted dust must weekly be removed from the crusher plant to eliminate the dust source.
- Loads must be flattened to prevent spillage during transportation on public roads.
- 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, excavation, and transporting of material from site to minimize potential dust impacts.

Noise Handling:

- ❖ The permit holder must ensure that employees and staff 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).
- ❖ The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. Surrounding land owners must be notified in writing prior to each blasting occasion.
- ❖ 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.
- ❖ Site management must strive to minimise the noise caused by generators. All generators must be maintained and equipped with sound mufflers. If possible the generators must be positioned towards the western part of the mining area (S1) as this will point it away from the neighbouring land users. Further to this, all generators must be placed on a level area/footing to minimise vibration noise.
- ❖ Best practice measures shall be implemented in order to minimize potential noise impacts.

GEOLOGY AND SOIL

Topsoil Management:

- ❖ The upper 300 mm of the 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 have to 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 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- The temporary topsoil stockpiles must be kept free of invasive plant species.
- Topsoil heaps to be stored longer than a period of 6 months needs to be vegetated with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season.
- Storm- and runoff water must be diverted around the stockpile area to prevent erosion.
- The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.
- The permit holder 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 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. 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.
- Run-off water must be controlled via temporary berms, where necessary, on the slopes to ensure that accumulation of run-off does not cause down-slope erosion.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Erosion Control and Storm Water Management:

- Clearing of vegetation must be limited to the proposed mining footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place.
- Stormwater must be diverted around the topsoil heaps and mining areas to prevent erosion.
- Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms.
- When mining within steep slopes, it must be ensured that adequate slope protection is provided.

- During mining, the outflow of run-off water from the mining excavation must be controlled to prevent down-slope erosion. This must be done by way of the construction of temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur.
- Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation.
- Any erosion problems within the mining area as a result of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur.
- Silt/sediment traps/barriers must be used where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. These sediment/silt barriers must regularly be maintained and cleared so as to ensure effective drainage of the areas.
- 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.
- Polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site.
- All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. In order to prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated

storage area. The storage areas must feature a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.

Potential Impact on the unnamed tributary and/or uMngeni River:

- The Applicant must adhere to the specifications of the water use licence for the duration of the mining operation.
- The mitigation measures proposed to manage erosion/stormwater, waste and the storage of hazardous substances (proposed in this document) must be implemented throughout all the phase of the activity.
- A monitoring programme must be followed to determine whether the mining activities are impacting any downstream watercourses. If identified, all impacts must be mitigated and rectified immediately.

TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER

Management of Vegetation Removal:

- 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 staff must be educated accordingly.
- A pre-commencement walk-through of the final mining footprint, must be done by a suitably qualified botanist to identify species of conservation concern that need to be removed/relocated prior to bush clearance. The findings of the botanist must be culminated into a Plant Rescue Plan to be implemented on site. A copy of the Plant Rescue Plan must be available on site.
- Permits for the removal of protected plant species (if required) must be obtained from KZN Wildlife/Ezemvelo and kept on-site in the possession (at all times) of the flora search and rescue team.
- A pre-commencement environmental induction for all site staff must be provided to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc.
- Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented.
- Cleared vegetation to be retained at any time may not be burned, but can be mulched and stockpiled. Ideally the heaps can be covered with stockpiled topsoil and the material be retained for future site rehabilitation purposes.
- The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place.

- ❖ All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed.
- ❖ No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits.
- ❖ No fires must be allowed on-site.
- ❖ Spoil heaps and topsoil stockpiles must be provided with a vegetation cover of indigenous grasses as recommended in the VARA (Appendix G of the BAR).
- ❖ If deemed necessary by the ECO, a firebreak must be made around the periphery of the site in autumn every year. Vegetated areas inside the break should be burned (upon recommendation of the ECO) on a biennial basis if deemed necessary. The relevant veld burning legislation must be adhered to.
- ❖ A licence, in terms of the National Forests Act, 1998 must be obtained to clear trees in those parts of the quarry site where the vegetation is deemed to be a "Natural Forest". The appointed ecologist must delineate any such areas prior to commencement of the activities.

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.
- ❖ No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed.
- ❖ All stockpiles (topsoil & overburden) 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.

FAUNA

Protection of Fauna:

- ❖ The site manager must ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with.

- Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person.
- 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.
- All vehicles must adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises.
- No litter, food or other foreign material may be thrown or left around the site. Such items must be kept in the site vehicles and daily removed to the site camp.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- All mining must be confined to the development footprint area.
- 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.

LAND USE

Loss of agricultural land for duration of mining:

- The Applicant signed a lease agreement with the landowner to compensate for the loss of agricultural land for the duration of the mining period. If needed, mined-out/rehabilitated areas could revert back to agricultural use once the cover crop stabilised.

EXISTING INFRASTRUCTURE

Managing the Power Line:

- An adequate no-go buffer (minimum 20 m) should be maintained around the power line as per Eskom standard.
- The blaster must take measures to limit flyrock.
- Eskom must be informed at least two weeks prior to the next blasting event. Notifications must be in writing.
- Should the line be damaged, Eskom must immediately (within the first hour of occurrence) be informed.

Mitigating potential impacts on the nearby shale quarry/brick factory:

- An assessment of the structural integrity of the clay brick factory must be conducted prior to the first blast.
- The owner/manager of the clay brick operation must be notified in writing before each blast.
- Vibration monitoring must be done with each blast. A seismograph must be placed at the factory, for at least the first blast, to establish the ground vibrations associated with blasting at the quarry.
- Should the results indicate that the blasting has a real impact on the factory's infrastructure, monitoring must be continued with each blast.
- Any damage to the clay brick factory infrastructure, as a direct result of the mining activities, must be refurbished by the permit holder at his own cost.

Management of the Access Road:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access road 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 permit holder.
- Overloading of the trucks must be prevented and proof of load weights must be filed and be available for auditing by relevant officials.
- The speed of all mining equipment/vehicles must be restricted to 40 km/h on the access roads.

GENERAL

Waste Management:

- Regular vehicle maintenance, repairs and services may only take place at the 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 in order to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a registered hazardous waste handling facility, alternatively collected by a registered hazardous waste handling contractor. The safe disposal certificates must be filed for auditing purposes.
- If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every 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. The dirty rags used to clean the drip trays must be disposed as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system.
- 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. Proof of safe disposal must be filed for auditing purposes.
- An oil spill kit must be obtained, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit.
- Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. Proof must be filed.
- Suitable covered receptacles must be available at all times and conveniently placed for the disposal of general waste.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area. Proof of disposal must be available for auditing purposes.
- Biodegradable refuse must be handled as indicated above.
- Re-use or recycling of waste products must be encouraged on site.
- No waste may be buried or burned on the site.

- Ablution facilities must be provided in the form of a chemical toilet/s. The chemical toilet must be anchored (to prevent blowing/falling over) and shall be serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. The safe disposal certificates must be filed for auditing purposes.
- The use of any temporary, chemical toilet 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 from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder.
- When small volumes of wastewater are generated during the life of the mine the following is applicable:
  - Water containing waste must not be discharged into the natural environment.
  - Measures to contain the waste water and safely dispose thereof must be implemented.
- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.
- Site management must implement the use of waste registers to keep record of the waste generated and removed from the mining area.

Storage/Handling of Hazardous Substances/Chemicals:

- Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product.
- The floor of the storage area must be impermeable to prevent seepage of spilled products into the ground or ground water.
- Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member.
- The storage area must be out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest.
- A Hazardous Substances Register must be maintained, and Safety Data Sheets (SDS) must be kept current for all chemicals used on site.
- Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity. The distance and height of the bund wall relative to that of the tank must also be taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund.
- The site manager must establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund area must be inspected at least weekly and any accumulated rainwater removed and

handled as contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely.

- The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water, and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility.
- Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and are not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump.

Management of health and safety risks:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- Sanitary facilities must be located within 100 m from any point of work.
- All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).
- The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity.
- The surrounding landowners must be informed in writing ahead of each blasting event.
- The compliance of ground vibration and airblast levels must be monitored to USBM standards with each blasting event.
- A vibro recorder must be used to record all blasts.
- Audible warning of a pending blast must be given at least 3 minutes in advance of the blast.
- Measures to limit flyrock must be taken. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed.

ix) Motivation where no alternative sites were considered.

Not applicable.

x) Statement motivating the alternative development location within the overall site.
(Provide a statement motivating the final site layout that is proposed)

As mentioned earlier, the proposed site earmarked for the mining of dolerite aggregate will be the footprint of Site Alternative 1 that lays in the southern part of the earmarked property.

The proposed site was identified as the preferred alternative based on the following:

- The proposed mining footprint lays at the foot of the hill extending into it towards the west/north-west. Placing the quarry at the foot of the hill directly adjacent to the access

road simplifies access into the mining area, access to the earmarked mineral, and transport of the material from the mining area.

- Based on the proposed mining method, the permit holder will gradually mine the earmarked area from the lowest point (south-eastern boundary) towards the higher laying north-western boundary. Ultimately, this should create a south-east facing excavation with more or less three faces that will be benched as the mining depth increases. Upon rehabilitation of the excavation, the permit holder will render the said benches safe and reinstate the footprint area to allow for future agricultural (grazing) use. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

- If S1 is approved, the mining area will be facing the surrounding area toward the south-east. This will mean that the mining footprint will be screened from traffic passing on the R33 provincial road (although it will be visible from ±3 km along the R614). As shown by the viewshed analysis the position of S1 will have a lower visual impact than that of S2.

- The proposed dolerite quarry will be ±240 m from the shale quarry on the property. Siting the dolerite quarry at the location of S1 will concentrate the mining activities on the farm to a central area, instead of spreading mining related impacts across the whole property.

- The VARA confirmed that there are already disturbed areas within the proposed footprint of S1, thereby reducing the magnitude of the impact that removal of vegetation, from the mining area, will have on the vegetation cover of the ecosystem/farm. The protected species, identified by the botanist, can be relocated by a suitably qualified contractor upon receipt of a relocation plant permit.

- Although the proposed mining footprint will extend across the identified drainage line (upon approval of the WULA), it is proposed that should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

In light of the above mentioned, S1 is believed to be the most practical alternative as the topsoil and/or overburden layer of the footprint is relatively shallow, the dolerite is of good grade, access and rehabilitation is simplified, and the environmental related impacts are acceptable.

i) 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 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 & INFRASTRUCTURE DEVELOPMENT:

Alteration of the agricultural sense of place

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	4	5	4.5	**10.4**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	4	5	4.5	**10.4**

Loss of agricultural land for duration of mining

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**

Visual intrusion as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
1	4	2	2.3	5	5	5	**11.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	5	5	5	**13**

Potential impact on the CBA/BSP objectives

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	4	3.3	2	1	1.5	**4.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	4	3.3	2	1	1.5	**4.9**

Potential impact on vegetation and listed and/or protected plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.6	2	2	2	**5.2**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	3	2	2	2	**6**

Potential impact on fauna within the footprint area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	3	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	3	1	2.3	2	2	2	**4.6**

Potential impact on archaeological artefacts

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	5	5	4.6	1	1	1	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	5	5	4.6	1	1	1	**4.6**

Loss of the unnamed tributary due to mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
1	5	1	2.3	5	1	3	**6.9**

New job opportunities as a result of the mining operation (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 1**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**
Rating: High (+)			**Site Alternative 2**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
1	4	2	2.3	5	5	5	**11.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	5	5	5	**13**

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Dust nuisance as a result of the disturbance of soil

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

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	3	2	2.3	2	5	3.5	**8.1**
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	3	2	2.6	2	5	3.5	**9.1**

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

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Potential impact on local fauna due to disturbance and loss of available habitat

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
1	4	1	2	2	2	2	**4**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
1	4	1	2	2	2	2	**4**

Potential erosion of denuded areas

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

Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages

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

DRILLING AND BLASTING:

Health and safety risk posed by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	1	3	2	1	1.5	**4.5**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	1	3	2	1	1.5	**4.5**

Potential damage to the power line

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	4	4	1	1	1	**4**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	4	4	1	1	1	**4**

Dust nuisance caused by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
3	4	2	3	4	3	3.5	**10.5**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
3	4	2	3	4	3	3.5	**10.5**

Noise nuisance as a result of blasting

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

Potential impact on the shale mining- and brickworks infrastructure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	1	1.5	**3.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	1	1.5	**3.9**

EXCAVATION, LOADING AND HAULING TO THE PROCESSING PLANT

Dust nuisance due to excavation and from loading and vehicles transporting the material

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
1	4	2	2.3	3	5	4	**9.2**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	3	5	4	**10.4**

Unsafe working environment for employees

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	1	1.5	**3.5**

Rating: Low			Site Alternative 2			Degree of Mitigation: Full	
2	4	1	2.3	2	1	1.5	**3.5**

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**

Potential impact on areas of palaeontological concern

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	5	4.3	1	1	1	**4.3**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	5	4.3	1	1	1	**4.3**

Facilitation of erosion due to mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
1	4	2	2.3	2	2	2	**4.6**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.6	2	2	2	**5.2**

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	4	2	2.6	3	4	3.5	**9.1**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	2	3	3	4	3.5	**10.5**

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Overloading of trucks impacting road infrastructure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	3	5	3.3	2	1	1.5	**4.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	3	5	3.3	2	1	1.5	**4.9**

Degradation of the access road

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	2	2	**4.6**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	2	2	**4.6**

CUMULATIVE IMPACTS:

Impact the broad-scale ecological processes

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	4	3.3	2	1	1.5	**4.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	4	3.3	2	1	1.5	**4.9**

Impact on existing infrastructure as a direct result of the mining operation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	2	2	**4.6**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	2	2	2	**4.6**

Potential impact on the uMngeni River

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	4	3.3	2	1	1.5	**4.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	4	3.3	2	1	1.5	**4.9**

SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

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

Erosion of returned topsoil after rehabilitation

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

Infestation of the reinstated areas by weeds and invader plant species

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

Potential impact associated with litter/waste left at the mining area

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

Return of the mining area to agricultural use upon closure (+)

Severity (+)	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance (+)**
Rating: Medium-High (+)			**Site Alternative 1**		**Degree of Mitigation: N/A**		
3	5	1	3	5	5	5	**15**
Rating: Medium-High (+)			**Site Alternative 2**		**Degree of Mitigation: N/A**		
3	5	1	3	5	5	5	**15**

j) 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 21: 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 not mitigated.
❖ Demarcation of site 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	Control through management and monitoring.	N/A
❖ Site establishment and infrastructure development**.**	❖ Alteration of the agricultural sense of place.	The impact may affect the agricultural	Site Establishment &	❖ Medium (S1 & S2)	The study area does not have a high agritourism-, or cultivation potential	❖ Medium (S1 & S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
		opportunities of the property.	Operational Phase		and the proposed mining operation (S1) will have a low visibility. The impact must be controlled through proper management.	
❖ Site establishment and infrastructure development.	❖ Loss of agricultural land for duration of mining.	The impact may affect the agricultural opportunities of the property.	Site Establishment & Operational Phase	❖ Medium (S1 & S2)	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area (S1), only to be reversed upon the closure of the mine. The impact could be controlled through progressive rehabilitation.	❖ Medium (S1 & S2)
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Visual intrusion as a result of site establishment. ❖ Visual intrusion caused by mining activities.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	❖ Medium (S1) ❖ Medium-High (S2)	Control: Implementing proper housekeeping.	❖ Medium (S1) ❖ Medium (S2)
❖ Site establishment and infrastructure development. ❖ Cumulative Impacts	❖ Potential impact on the CBA/BSP objectives. ❖ Impact the broad-scale ecological processes.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	❖ Low-Medium (S1 & S2)	Control: Implementing proper housekeeping.	❖ Low (S1 & S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Site establishment and infrastructure development.	❖ Potential impact on vegetation and listed and/or protected plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	❖ Medium (S1 & S2)	<u>Control & Stop:</u> Implementing good management practices and adhering to the recommendations of the botanist.	❖ Low-Medium (S1 & S2)
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Potential impact on fauna within the footprint area. ❖ Potential impact on local fauna due to distrubance and loss of available habitat.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	❖ Low-Medium (S1 & S2)	<u>Control & Stop:</u> Implementing good management practices.	❖ Low (S1 & S2)
❖ Site establishment and infrastructure development. ❖ Excavation, loading and hauling to the processing plant.	❖ Potential impact on archaeological artefacts. ❖ Potential impact on areas of palaeontological concerns.	This could impact on the cultural and heritage legacy of the receiving environment.	Site Establishment, & Operational Phase.	❖ Low (S1 & S2) ❖ Low-Medium (S1 & S2)	<u>Control & Stop:</u> Implementing good management practices.	❖ Low (S1 & S2) ❖ Low (S1 & S2)
❖ Site establishment and infrastructure development.	❖ Loss of the unnamed tributary due to mining activities. ❖ Potential impact on the uMngeni River.	This could impact the hydrology of the receiving environment.	Site Establishment, & Operational Phase.	❖ Low-Medium (S1 & S2) ❖ Medium (S1 & S2)	<u>Control:</u> Implementing the WUL conditions and specifications.	❖ Low-Medium (S1 & S2) ❖ Low (S1 & S2)
❖ Site establishment and infrastructure development.	❖ New job opportunities as a result of the mining operation (+)	Contribution to the socio-economic status of the area.	Site Establishment, & Operational Phase.	❖ High+ (S1) ❖ High+ (S2)	N/A	❖ High+ (S1) ❖ High+ (S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Stripping and stockpiling of topsoil and overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation.	❖ Loss of stockpiled topsoil during mining and stockpiling. ❖ Potential erosion of denuded areas. ❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	The loss/contamination of topsoil and erosion of the footprint will affect the rehabilitation of the excavation upon closure of the site.	Site Establishment-, Operational and Decommissioning Phase	❖ Low-Medium (S1 & S2) ❖ Low-Medium (S1 & S2) ❖ Low-Medium (S1 & S2) ❖ Medium (S1 & S2)	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	❖ Low (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1 & S2)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Dust nuisance caused as a result of the disturbance of soil. ❖ Dust nuisance caused by blasting activities. ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material. ❖ Dust nuisance due generated at the processing plant.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	❖ Low-Medium (S1 & S2) ❖ Medium (S1 & S2) ❖ Medium (S1 & S2) ❖ Medium (S1) ❖ Medium-High (S2)	<u>Control:</u> Dust suppression methods and proper housekeeping.	❖ Low (S1 & S2) ❖ Medium (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1) ❖ Low-Medium (S2)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting.	❖ Noise nuisance generated by earthmoving machinery. ❖ Noise nuisance as a result of blasting. ❖ Noise nuisance as a result of the mining activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the	Site Establishment-, Operational-, and Decommissioning Phase	❖ Low-Medium (S1) ❖ Medium (S2) ❖ Medium (S1 & S2)	<u>Control:</u> Noise suppression methods and proper housekeeping.	❖ Low-Medium (S1 & S2) ❖ Low-Medium (S1 & S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Noise nuisance stemming from operation of the processing plant.	receiving environment.		❖ Medium (S1 & S2) ❖ Medium (S1 & S2)		❖ Low-Medium (S1) ❖ Medium (S2) ❖ Low-Medium (S1) ❖ Medium (S2)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Sloping and landscaping during rehabilitation phase.	❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Infestation of the reinstated areas by weeds and invader plant species.	Infestation of the footprint by invader plant species may affect the biodiversity of the receiving environment.	Site Establishment-, Operational, and Decommissioning Phase	❖ Medium (S1 & S2) ❖ Medium-High (S1 & S2)	<u>Control & Remedy:</u> Implementation of an invasive plant species management plan.	❖ Low (S1 & S2) ❖ Low (S1 & S2)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material. ❖ Sloping and landscaping during rehabilitation phase.	❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages. ❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential contamination of environment due to improper waste management. ❖ Potential impact associated with litter/waste 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 permit holder.	Site Establishment-, Operational-, and Decommissioning Phase	❖ Low-Medium (S1 & S2) ❖ Low-Medium (S1 & S2) ❖ Medium (S1 & S2) ❖ Medium (S1 & S2)	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	❖ Low (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1 & S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation phase.	❖ Health and safety risk posed by blasting activities. ❖ Unsafe working environment for employees. ❖ Safety risk posed by un-sloped areas.	An unsafe working environment affects the labour force, as well as pose a threat to animals and humans that may enter the mining footprint.	Operational-, and Decommissioning Phase	❖ Medium (S1 & S2) ❖ Medium (S1 & S2) ❖ Medium (S1 & S2)	Stop & Control: Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	❖ Low (S1 & S2) ❖ Low (S1 & S2) ❖ Low (S1 & S2)
❖ Drilling and blasting.	❖ Potential damage to the power line.	Damage to the power line will have a detrimental effect on the electricity supply of the community.	Operational Phase	❖ Low-Medium (S1 & S2)	Stop & Control: Adherance to the blasting rules and regulations, and Eskom specifications.	❖ Low (S1 & S2)
❖ Drilling and blasting. ❖ Cumulative impact.	❖ Potential impact on the shale mining- and brickworks infrastructure. ❖ Impact on existing infrastructure as a direct result of the mining operation.	Damage to the nearby mining and/or brickworks infrastructure will affect the business of the owner.	Operational Phase	❖ Low-Medium (S1 & S2) ❖ Medium (S1 & S2)	Stop & Control: Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	❖ Low (S1 & S2) ❖ Low (S1 & S2)
❖ Processing, stockpiling and transporting of material.	❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	Collapse of the internal road infrastructure will affect the landowner and lawful occupiers negatively. If the	Operational phase	❖ Medium-High (S1 & S2) ❖ Medium (S1 & S2)	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leabing it in a representative or better	❖ Low (S1 & S2) ❖ Low (S1 & S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
		mine negatively affect public traffic it may incur additional costs and complaints from the public.			condition than prior to mining.	
❖ Sloping and landscaping during rehabilitation	❖ Return of the mining area to agricultural use upon closure (+)	The area will be returned to the landowner for future use.	Decommissioning Phase	❖ Medium-High+ (S1 & S2)	N/A	❖ Medium-High+ (S1 & S2)

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

k) 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):-

Table 22: 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
Vegetation, Aquatic and Risk Assessment. Vegetation, Aquatic and Risk Assessments for the Proposed Dolerite Quarry outside Pietermaritzburg Area, Mshwati Municipality, KwaZulu-Natal. September 2020 *(See Appendix G for a full copy of the report)*	**Mitigation Measures:** ❖ All quarry activities may only be undertaken within the registered and mapped space of the quarry site. This site must be clearly pegged out and be fenced prior to the start of operations. ❖ In accordance with Mine Health and Safety Requirements, the walls of the pit will be stepped with near vertical sections being reduced in height by a series of horizontal steps which will be formed (cut) as a part of the mining operations. ❖ Ablutions should be provided onsite, at least one for every 15 workers, and should be located at least 50m away from the edge of the riparian zone (until the unnamed tributary is completely transformed into a quarry). ❖ Regularly check vehicles, machinery and equipment operating on site, to ensure that none have leaks or cause spills of oil, diesel, grease or hydraulic fluid. ❖ All temporary and permanent erosion and sediment control structures must be monitored for the duration of the construction phase and repaired immediately when damaged. ❖ A search-and-rescue for desirable plants should be undertaken by an ecologist prior to vegetation clearing. All interested parties, including plant nursery operators may be invited to take part. ❖ Vegetation clearing may only be done on an “as-needed” basis. This means that only areas that are about to be worked may be cleared.	All the mitigation measures proposed by the specialist were included in this report.	Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk: Potential impact on the unnamed tributary and/or uMngeni River & Management of Vegetation Removal. Closure Plan attached as Appendix J.

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
	❖ As far as possible all wood and other resources, including Aloes, should be made available to the local community for their use. ❖ Cleared vegetation to be retained at any time may not be burned but must be mulched and be stockpiled. Ideally the heaps will be covered with stockpiled topsoil and the material be retained for future site rehabilitation purposes. ❖ All spoil heaps and stockpiles must be provided with a vegetation cover consisting of indigenous grasses. Recommended species include the following: ▪ Love Grass. *Eragrostis curvula* ▪ Couch Grass *Cynodon dactylon* ▪ Finger Grass *Digitaria eriantha* ❖ All infrastructure, including the containers, machinery and crushers etc. are to be removed from the processing area and the footprint will be landscaped, compacted areas will be ripped and the topsoil will be returned and the area seeded with the listed grass species. ❖ Once mining operations are over, pit overburden material must be pushed back into the pit to fill the upper step or steps to produce a sloped surface. Topsoil from the stockpiles must then be pushed down so that a substrate for vegetation growth may be established. The listed grass species may be used for this purpose. ❖ All waste is to be removed from site and any stockpiled dolerite (product) will either be sold or returned to the quarry pit and used in the sloping of the quarry sides. ❖ From the start of operations an alien weed programme must be implemented for the entire property including the working areas where relevant. This programme must be pre-planned and approved and specific targets must be set.		

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
	❖ After closure, the alien weed control measures will continue right through the maintenance and aftercare period of the quarry. ❖ Dust management measures must be set in place so as to minimise the dust from the crushers being blown into the surrounding areas. ❖ Undisturbed areas of vegetation must be suitably managed. This management will include the alien weed control programme but must also make provision for some protection from over frequent fires. This will require burning of a firebreak around the periphery in autumn every year. The area inside the break should be burned on a biennial (every second year) basis. The relevant veld burning legislation must be adhered to. ❖ A licence, in terms of the Forests Act will be required to clear trees in those parts of the quarry site where the vegetation is deemed to be a “Natural Forest”3. The appointed ecologist will delineate any such areas. ❖ A Monitoring programme must be followed to determine if the activities from the proposed quarry have any negative impacts on the downstream watercourses. All impacts must be mitigated and rectified immediately.		

l) Environmental impact statement

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

The key findings of the environmental impact assessment entail the following:

Project proposal:

- Inzalo Crushing and Aggregates (Pty) Ltd, applied for environmental authorisation to mine dolerite from 4.9 ha of Portion 0 (Remaining Extent) of the farm Thandisizwe No 16691 in the uMgungundlovu Magisterial District. The dolerite will be mined through conventional opencast mining methods and sold to the construction, building and road maintenance industry. The proposed quarry will appoint ±11 employees (including management), and make use of temporary/mobile infrastructure.

- Two site alternatives (S1 & S2) as well as the no-go option were assessed during the EIA process. S1 is believed to be the most practical alternative as the topsoil and/or overburden layer of the footprint is relatively shallow, the dolerite is of good grade, access and rehabilitation is simplified, and the environmental related impacts are acceptable.

Topography:

- Due to the impracticality of importing large volumes of fill material to restore the quarry area to its original topography, the rehabilitation option (upon closure) is to render the quarry safe and leave it as a minor landscape feature. In light of the end-use of the mining area, it is proposed that the final layout of the excavation (S1) will be better suited to grazing, and more attractive to the landowner than that of S2.

Visual Characteristics:

- From the viewshed analyses, it is deduced that S1 will have a lower visual impact on the receiving environment than S2.

Air and Noise Quality:

- The proposed activity does not require an air emissions licence.
- Should the Applicant implement the proposed mitigation measures the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.
- Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low-medium significance.

Hydrology:

- Based on the results of the DWS risk assessment, a Water Use Licence (WUL) is required for the proposed dolerite quarry, as per Section 21 of the National Water Act No. 36 of 1998 and Notice 509 of 2016.
- Inzalo submitted a WUL application to the DWS on 24 November 2020 that is currently in progress. Should the mitigation measures of this document, the aquatic biomonitoring programme, and the conditions of the WUL be implemented, the impact of mining through the drainage line (within the mining boundaries) will be negated.

Terrestrial Biodiversity, Conservation Areas and Groundcover:

- The study area is located within Ecoregion 16: South Eastern Upland. Both S1 and S2 is situated over areas of highest biodiversity importance with a corresponding rating of highest risk for mining. The study area (S1 & S2) also extends into an area classified as CBA 3 Optimal and BSP 3 in terms of the KZN Biodiversity Sector Plan. The broad scale mapping of the uMDM-EMF shows the study area to be of high agricultural-, and water yield significance, very high biodiversity- and water quality significance, and low to moderate wetland sensitivity.
- One indigenous species (*Brachystelma franksiae*) of concern (Vulnerable) was found in the study area.
- The quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigatory measures are adhered to. Since the earmarked footprint (S1) is already degraded and ground-truthing confirmed that it is not rated as being of high conservation priority, it is the opinion of the specialist that the

impacts on the vegetation do not constitute a fatal flaw to the proposed project and so there is no reason to block the project in that regard.

Cultural and Heritage Environment:

- No sites of archaeological or cultural importance were identified during the EIA. The SAHRA palaeontological sensitivity map shows the area to be of insignificant concern. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed insignificant.

Existing Infrastructure:

- No infrastructure exists in the 4.9 ha footprint of either S1 or S2.
- The mining activity will not impact the infrastructure of the clay brick factory due to it being ±400 m removed from S2 and ±750 m from S1. Should the mitigation measures proposed in this document be implemented the existing infrastructure on the farm will be safeguarded against mining related impacts.

Land Use:

- According to the landowner, the grazing value of the study area (S1) is of no significance and therefore he supports the proposed mining operation.

ii) Final Site Map

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

See the map indicating site activities attached as Appendix C.

iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

The positive impacts associated with the project include:

- The permit holder will be able to exploit the dolerite resource on the property;
- The landowner will be able to further diversify the income generation of the property;
- At least eight new job opportunities will be created by the proposed activity;
- The presence of the proposed operation will contribute (directly & indirectly) to the local economy with preference give to HDSA & women owned local suppliers;
- Presently, the vegetation of the study area is becoming degraded, indigenous species are harvested for traditional purposes, and the area is infested with

weeds/invader plant species. Should the mitigation measures proposed in this document be implemented the management of the footprint area will be in accordance with the relevant environmental legislation that will warrant the protection of listed plant and/or faunal species, the control of weeds/invader plant species, and the proper rehabilitation of the area (including re-vegetation with indigenous species) upon closure.

- Upon closure, the area will be returned to the landowner for continued agricultural use.

The negative impacts associated with the project that was deemed to have a Low-Medium or higher significance includes:

- Alteration of the agricultural sense of place — Medium (S1 & S2)
- Loss of agricultural land for duration of mining — Medium (S1 & S2)
- Visual intrusion as a result of the mining activities — Medium (S1 & S2)
- Potential impact on vegetation and listed and protected plant species — Low-Medium (S1 & S2)
- Loss of the unnamed tributary due to mining activities — Low-Medium (S1)
- Noise nuisance due to mining activities — Low-Medium (S1), Medium (S2)
- Dust nuisance caused by mining activities — Low-Medium (S1 & S2)

m) 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 condition of authorisation.

Table 23: 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.	❖ Use the excavated area for the final depositing of overburden. ❖ Dump rocks and coarse material removed from the excavation into the excavation. ❖ Remove coarse natural material used for the construction of ramps and dump it into the excavations. ❖ Remove stockpiles during the decommissioning phase, rip the area and return the topsoil to its original depth to provide a growth medium. ❖ Do not permit any waste to be deposited into the excavations. ❖ Return the previously stored topsoil to its original depth, once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures. ❖ If necessary, fertilize the area to allow vegetation to establish rapidly. Seed the site with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within six months from closure of the site. ❖ If required by the Regional Manager (DMRE) the soil must be analysed and any deleterious effects on the soil arising from the mining operation must be corrected and the area be seeded with a vegetation seed mix to his/her specification. ❖ On completion of operations, deal with all structures or objects in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). ❖ On completion of mining operations, scarify the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and	❖ Effectively restoring the mined area to allow the return of land use to agricultural purposes.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		dumping operations, to a depth of at least 200mm and graded it to an even surface condition. Where applicable/possible return topsoil to its original depth over the area.	
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 have a neat appearance and is kept in good condition at all times. ❖ Store mining equipment in a dedicated area when not in use. ❖ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ❖ Contain excavations to the approved footprint of the permitted area. ❖ Upon closure, rehabilitate the site to ensure that the visual impact on the aesthetic value of the area is reduced to the 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 AND NOISE QUALITY Dust Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Control the liberation of dust into the surrounding environment by the use of; 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 haul roads to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust. ❖ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ❖ Install water sprayers at the crusher plant to alleviate dust generation from the conveyor belts. ❖ Minimise fines, blowing from the drop end of the crusher plant by attaching strips of used conveyor belts to the conveyor's end. ❖ Weekly remove compacted dust from the crusher plant to eliminate the dust source. ❖ Flatten loads to prevent spillage during transportation on public roads. ❖ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts.	❖ Dust prevention measures are applied to minimise the impact.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ 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, excavation, and transporting of material from site to minimize potential dust impacts.	
AIR AND NOISE QUALITY Noise 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 employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted 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. ❖ Plan the type, duration and timing of the blasting procedures with due cognizance of other land users and structures in the vicinity. Notify the surrounding land owners in writing prior to each blasting occasion. ❖ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008. ❖ Implement best practice measures to minimise potential noise impacts.	❖ Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.
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 on a levelled area, within the mining footprint. Do not stockpile topsoil in undisturbed areas.	❖ Adequate fertile topsoil is available to rehabilitate the mined area.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Protect topsoil stockpiles against losses by water- and wind erosion. Position stockpiles so it is not vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. ❖ Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. ❖ Keep temporary topsoil stockpiles free of invasive plant species. ❖ Vegetate the topsoil heaps to be stored longer than 6 months with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. ❖ Divert storm- and runoff water around the stockpile area to prevent erosion. ❖ Spread the topsoil evenly, to a depth of 300 mm, over the rehabilitated area upon closure of the site. ❖ 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. ❖ Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. ❖ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
HYDROLOGY Erosion Control and Storm Water Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	❖ Limit clearing of vegetation to the proposed mining footprint and associated infrastructure. Ensure no clearing takes place outside the minimum required footprint.	❖ Impact on the environment caused by stormwater discharge is avoided and erosion is managed.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer.	❖ Divert stormwater around the topsoil heaps and mining areas to prevent erosion. ❖ Protect stockpiles from erosion, and store it on flat areas surrounded by appropriate berms where possible. ❖ Ensure that adequate slope protection is provided when mining within steep slopes. ❖ Control the outflow of run-off water from the mining excavation to prevent down-slope erosion, by constructing temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur. ❖ Regularly monitor roads and other disturbed areas within the project for erosion, and ensure problem areas receive follow-up monitoring to assess the success of the remediation. ❖ Rectify erosion problems within the mining area as a result of the mining activities immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. Regularly maintain and clear the sediment/silt barriers to ensure effective drainage of the areas. ❖ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. ❖ Restrict polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards to the workshop areas and ensure it takes place on impermeable hard standing surfaces, which formally drain to a dirty water drainage system at the site. ❖ Contain all fuels and chemicals stored or used on site in fit for purpose containers and store within designated storage areas. Ensure the designated storage areas are situated on an impermeable surface with a perimeter bund and a drainage sump. Size the volume of the bund and sump to contain at least 110% of the total volume of the fuel and	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		chemicals being stored within the designated storage area. Ensure that the storage areas have a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.	
HYDROLOGY Mining of the unnamed tributary and/or impacting the uMngeni River	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Adhere to the specifications of the water use licence for the duration of the mining operation. ❖ Implement the mitigation measures proposed to manage erosion/stormwater, waste and the storage of hazardous substances (proposed in this document) throughout all the phase of the activity. ❖ Follow a monitoring programme to determine whether the mining activities are impacting any downstream watercourses. If identified, mitigate and rectify all impacts immediately.	❖ The mining activities have not impact on the uMngeni River.
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER Management of vegetation removal.	Permit holder to apply for a destruction/removal plant permit from Ezemvelo/KZN Wildlife 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 staff accordingly. ❖ Arrange a pre-commencement walk-through of the final mining footprint by a suitably qualified botanist for species of conservation concern that need to be removed/relocated prior to bush clearance. Obtain and implement a Plant Rescue Plan at the property. Keep a copy of the plan at the site. ❖ Obtain permits from Ezemvelo/KZN Wildlife for the removal of protected plant species (if required) and keep it on-site in the possession (at all times) of the flora search and rescue team. ❖ Arrange a pre-commencement environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This must include awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ Only commence with bush-clearance once the recommendations of the specialist (pre-commencement walkthrough) have been implemented.	❖ Vegetation clearing is restricted to the authorised development footprint of the mine.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Do not burn cleared vegetation to be retained at any time, but rather mulch and stockpiled it. Ideally cover the heaps with stockpiled topsoil and retain the material for future site rehabilitation. ❖ The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place. ❖ Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. ❖ Do not translocated, uprooted or disturbed plants for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ Do not allow fires on-site. ❖ Provide spoil heaps and topsoil stockpiles with a vegetation cover of indigenous grasses. ❖ If deemed necessary by the ECO, make a firebreak around the periphery of the site in autumn every year. Upon recommendation of the ECO, burn the vegetated areas inside the break on a biennial basis if deemed necessary. Adhere to the relevant veld burning legislation. ❖ Obtain a licence, in terms of the National Forests Act, 1998 to clear trees in those parts of the quarry site where the vegetation is deemed to be a "Natural Forest". The appointed ecologist must delineate any such areas prior to commencement of the activities.	
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS 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 to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do weed/alien ongoing clearing on throughout the life of the mining activities. ❖ Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose. ❖ Keep all stockpiles (topsoil & overburden) free of invasive plant species.	❖ Mining area is kept free of invasive plant species.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Control declared invader or exotic species on the rehabilitated areas.	
FAUNA Protection of fauna	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with. ❖ The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. ❖ Arrange that all personnel 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. Instruct workers to report any animals that may be trapped in the working area. ❖ Ensure no snares are set or nests raided for eggs or young. ❖ Ensure all vehicles adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. ❖ Prevent litter, food or other foreign material thrown or left around the site. Keep such items in the site vehicles and daily removed it to the site camp.	❖ Disturbance to fauna is minimised.
CULTURAL AND HERITAGE ENVIRONMENT Archaeological, heritage and palaeontological aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Confine all mining to the development footprint area. ❖ 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.	❖ Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		▪ 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.	
LAND USE Loss of agricultural land 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-out/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 Managing the Power Line	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Maintain a no-go buffer (minimum 20 m) around the power line as per Eskom standard. ❖ The blaster must take measures to limit flyrock. ❖ Inform Eskom at least two weeks prior to the next blasting event. Notifications must be in writing. ❖ Should the line be damaged, immediately (within the first hour of occurrence) inform Eskom.	❖ Mining has no impact on the power line.
EXISTING INFRASTRUCTURE Potential impacts on the nearby shale quarry/brick factory.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Assess the structural integrity of the clay brick factory prior to the first last. ❖ Notify the owner/manager of the clay brick operation in writing before each blast. ❖ Monitor the vibrations of each blast. Place a seismograph at the factory, for at least the first blast, to establish the ground vibrations associated with blasting at the quarry. ❖ Continue monitoring with each blast, should the results indicate that the blasting has a real impact on the factory's infrastructure.	❖ Mining has no direct impact on the shale quarry or clay brick infrastructure.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Refurbish any damage to the clay brick factory infrastructure, directly caused by the mining activities.	
EXISTING INFRASTRUCTURE Management of the access road.	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 trucks and file proof of load weights for auditing by relevant officials. ❖ Restrict the speed of all mining equipment/vehicles to 40 km/h on the access roads.	❖ The access road remains accessible to the landowner and lawful occupiers during the operational phase, and upon closure, the road is returned in a better, or at least the same state as received by the permit holder.
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 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 in order to ensure proper disposal. Treat this as hazardous waste and dispose of it at a registered hazardous waste handling facility, alternatively arrange collection by a registered hazardous waste handling contractor. File safe disposal certificates for auditing purposes. ❖ If a diesel bowser is used on site, equip it with a drip tray at all times. Use drip trays during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ❖ Ensure drip trays are cleaned after each use. Do not allow dirty drip trays to be used on site. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system.	❖ Wastes are appropriately handled and safely disposed of at recognised waste facilities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and remove it from the site, either for resale or for appropriate disposal at a recognized facility. File proof. ❖ Obtain an oil spill kit, and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. ❖ Clean spills immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. File proof. ❖ Ensure suitable covered receptacles are available at all times and conveniently placed for the disposal of general waste. ❖ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a recognized landfill site. Take specific precautions to prevent refuse from being dumped on or in the vicinity of the mine area. File proof of disposal. ❖ Handle biodegradable refuse as indicated above. ❖ Encourage re-use or recycling of waste products. ❖ Do not bury or burn waste on the site. ❖ Provide ablution facilities in the form of a chemical toilet/s. Anchor the chemical toilet (to prevent blowing/falling over) and arrange that it is serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. File the safe disposal certificates. ❖ Ensure that the use of any temporary, chemical toilet facilities do not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. ❖ Do not discharge water containing waste into the natural environment.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Implement measures to contain the waste water and safely dispose thereof. ❖ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. ❖ Implement the use of waste registers to keep record of the waste generated and removed from the mining area.	
GENERAL Storage/handling of hazardous substances/chemicals.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Place chemical storage areas on level ground to prevent offsite migration of any spilled product. ❖ Ensure that the floor of the storage area is impermeable to prevent seepage of spilled products into the ground or ground water. ❖ Control access to the chemicals/substances and implement a notification system of an appropriate staff member. ❖ Ensure that the storage area is out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ Maintain a Hazardous Substances Register, and keep Safety Data Sheets (SDS) current for all chemicals used on site. ❖ Ensure any fuel/used oil tanks have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. Check that the bund capacity is sufficient to contain 110% of the tank's maximum capacity. Ensure that the distance and height of the bund wall relative to that of the tank is taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspect the bund area at least weekly and remove any accumulated rainwater and hand it as contaminated water. Check all valves and outlets to ensure that its intact and closed securely.	❖ The chemical/hazardous substances used on site are stored according to specifications without contaminating the receiving environment.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Ensure that the bund base slope towards an oil sump of sufficient size. Do not allow contaminated water to mix with clean water, and contain it until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ Use drip trays under all stationary equipment or vehicles. Place used drip trays within a bunded area and do not store on the bare soil. Discard the waste water originating from the cleaning of drip trays into the oil sump.	
GENERAL Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Ensure that workers have access to the correct PPE as required by law. ❖ Locate sanitary facilities within 100 m from any point of work. ❖ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ Plan the type, duration and timing of blasting with due cognizance of other land users and structures in the vicinity. ❖ Inform the surrounding landowners and communities in writing ahead of any blasting event. ❖ Monitor the compliance of ground vibration and airblast levels to USBM standards with each blasting event. ❖ Record all blasts with a vibro recorder. ❖ Give audible warning of a pending blast at least 3 minutes in advance of the blast. ❖ Limit fly rock, and collect and remove flyrock and rock spill that falls beyond the working area.	❖ Employees work in a healthy and safe environment.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The management objectives listed in this report under *Part A(1)(m) 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 site inspections, specialist and desktop studies, and background information that were gathered.

Uncertainty exists on the number of protected and/or red data listed plant species that are present within the proposed mining footprint. Should the Applicant however appoint the botanist, upon receipt of the EA and mining permit, to conduct the plant rescue walk-through prior to bush clearance this matter will be addressed in the Plant Rescue Plan that will follow.

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

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

Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed as severe as to prevent the activity continuing.

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* should be considered for inclusion in the environmental authorisation.

q) Period for which the Environmental Authorisation is required.

The Applicant requests the Environmental Authorisation to be valid for a five-year period in order to correspond with the validity of the mining permit.

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 Basic 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 annual amount required to manage and rehabilitate the environment was estimated to be ±R 1 208 500. Please see the explanation as to how this amount was derived at attached as Appendix I – Financial and Technical Competence Report.

ii) Confirm that this amount can be provided 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).

Inzalo Crushing and Aggregates (Pty) Ltd will be responsible for the financial and technical aspects of the proposed mining project. The operating expenditure is provided for as such in the Financial and Technical Competence Report attached as Appendix I to this report.

t) Specific 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 an Appendix)

Also refer to Part A(1)(i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site through the life of the activity.

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

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

  The viewshed analysis shows that the proposed visual impact will be of low concern as the mining area (S1) will mainly be visible from the immediate surroundings (±3 km) from the north-east towards the south-east due to the higher elevation of the area east of the uMngeni River. Although the proposed mining area (S1) will be visible within the above mentioned ±3 km radius east of the river, it is proposed that as the distance between the development and the observer increases the visual impact will decrease. The residual impact of the activity is expected to be of low-medium significance upon rehabilitation of the footprint area.

- **Dust nuisance caused as a result of the proposed mining activities:**

  The proposed activity will generate dust as a result of blasting, the movement of earthmoving equipment, processing of the hard rock, and the loading and transporting of the material from site. The Applicant will have to implement dust suppression measures in order to control dust generation and prevent a dust nuisance to surrounding landowners/residents. The impact on the surrounding environment is deemed to be of low-medium significance. There will be no residual impact after closure.

- **Noise nuisance as a result of mining activities:**

  Due to the nature of the proposed activity, noise will be generated as a result of blasting, the processing of the material, as well as loading and transporting. The nuisance value of noise to be generated by heavy earthmoving equipment and the processing plant, to residence in the near vicinity is deemed to be of low-medium significance. The noise caused by blasting will be instantaneous and of short duration. The Applicant will timeously inform all the surrounding residents and occupants of the farm of each blasting event. All vehicles associated with the proposed activity will also 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). There will be no residual impact after closure.

- **Potential impact on the Eskom power line and/or brickworks:**

  Should the permit holder implement the mitigation measures proposed in this document, the potential of the mining activity impacting any of the nearby infrastructure will be negligible.

(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 the Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

No sites or artefacts classified as national estate as referred to in section 3(2) of the NHRA, 1999 were identified within the footprint of the proposed mining area.

u) Other matters 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 site alternatives associated with the proposed mining 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. As discussed earlier the following alternatives were considered:

1. Site Alternative 1 – Development of the proposed dolerite quarry within the GPS coordinates as listed in Table 6 at the foot of the hill on the property.

2. Site Alternative 2 – Development of the proposed dolerite quarry at the crest of the hill within the GPS coordinates as listed in Table 7.

3. No-go Alternative – No change to the *status quo*.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

a) Details of the EAP,

(Confirm that the requirements 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 Christine Fouché of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix M as required.

b) Description of the Aspects of the Activity

(Confirm that the requirements 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 has been described and included in Part A, section (1)(h).

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 any areas that should be avoided, including buffers)

As mentioned under Part A, section (1)(l)(ii) this map has been compiled and is attached as Appendix C to this document.

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)

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 period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) [MPRDA]. To realise this, the following main objectives must be achieved:

- Remove all temporary infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources.
- Shape and contour disturbed areas in compliance with the EMPR.

- Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the uncontrolled 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 the attached Closure Plan (Appendix J), however, a summary of the closure objectives for the proposed mine were included below.

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature. This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form scree slopes on the benches below, thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

The decommissioning activities will therefore consist of the following:

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

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

Inzalo will comply with the minimum closure objectives as prescribed by the DMRE and detailed below:

- Rehabilitation of the excavated area:

  The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be dumped into the excavation.

  No waste may be permitted to be deposited in the excavations.

  Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

  The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from closure of the site.

  If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager 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 plant, office and service areas:

  Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.

  Stockpiles must be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.

  On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.

- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager. _

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm 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.

❖ <u>Final rehabilitation:</u>

Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing.

All mining equipment, 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) will be eradicated from the site.

Final rehabilitation shall be completed within a period specified by the Regional Manager.

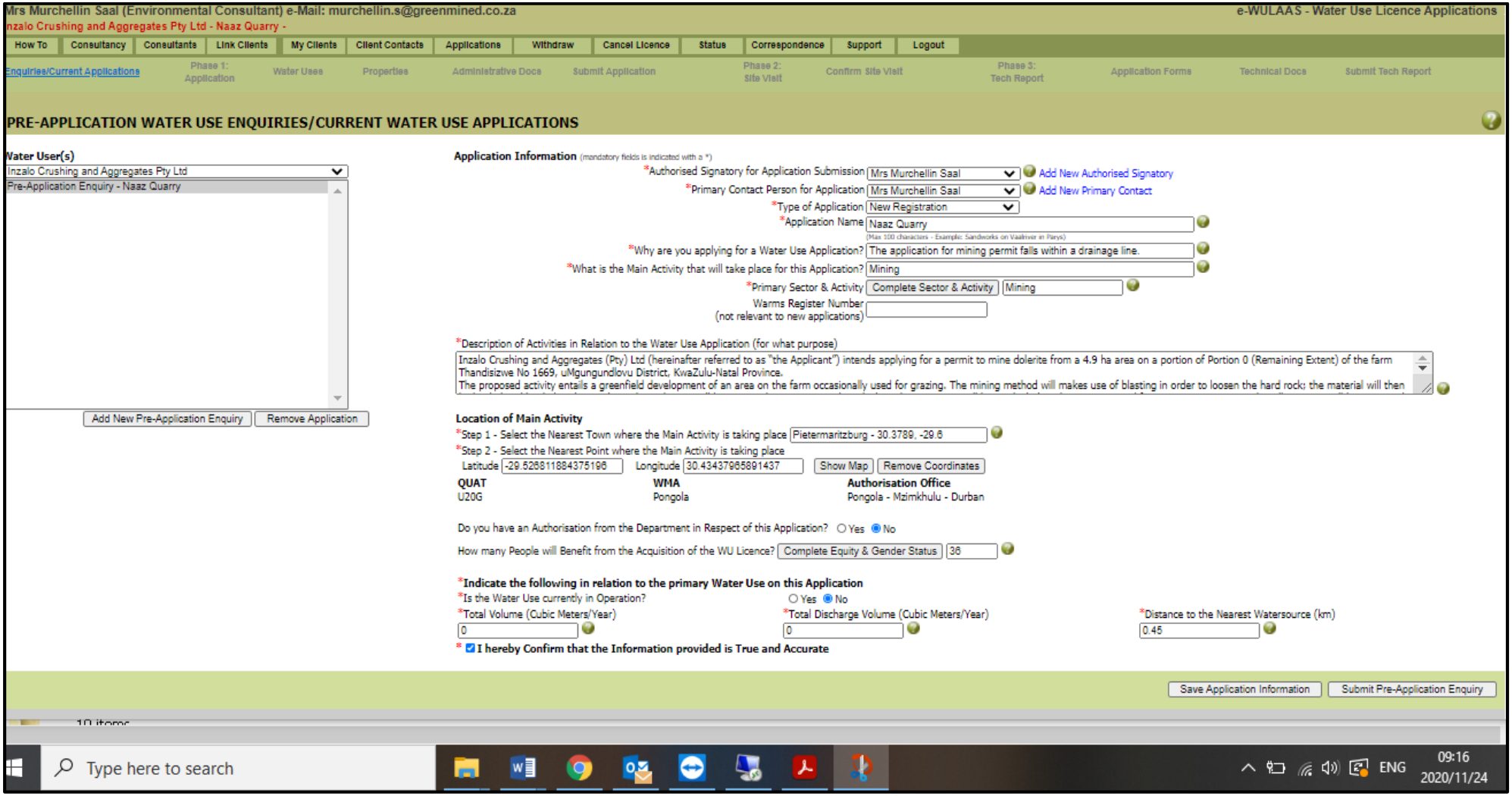
Once the mining area was rehabilitated the permit holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose 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).

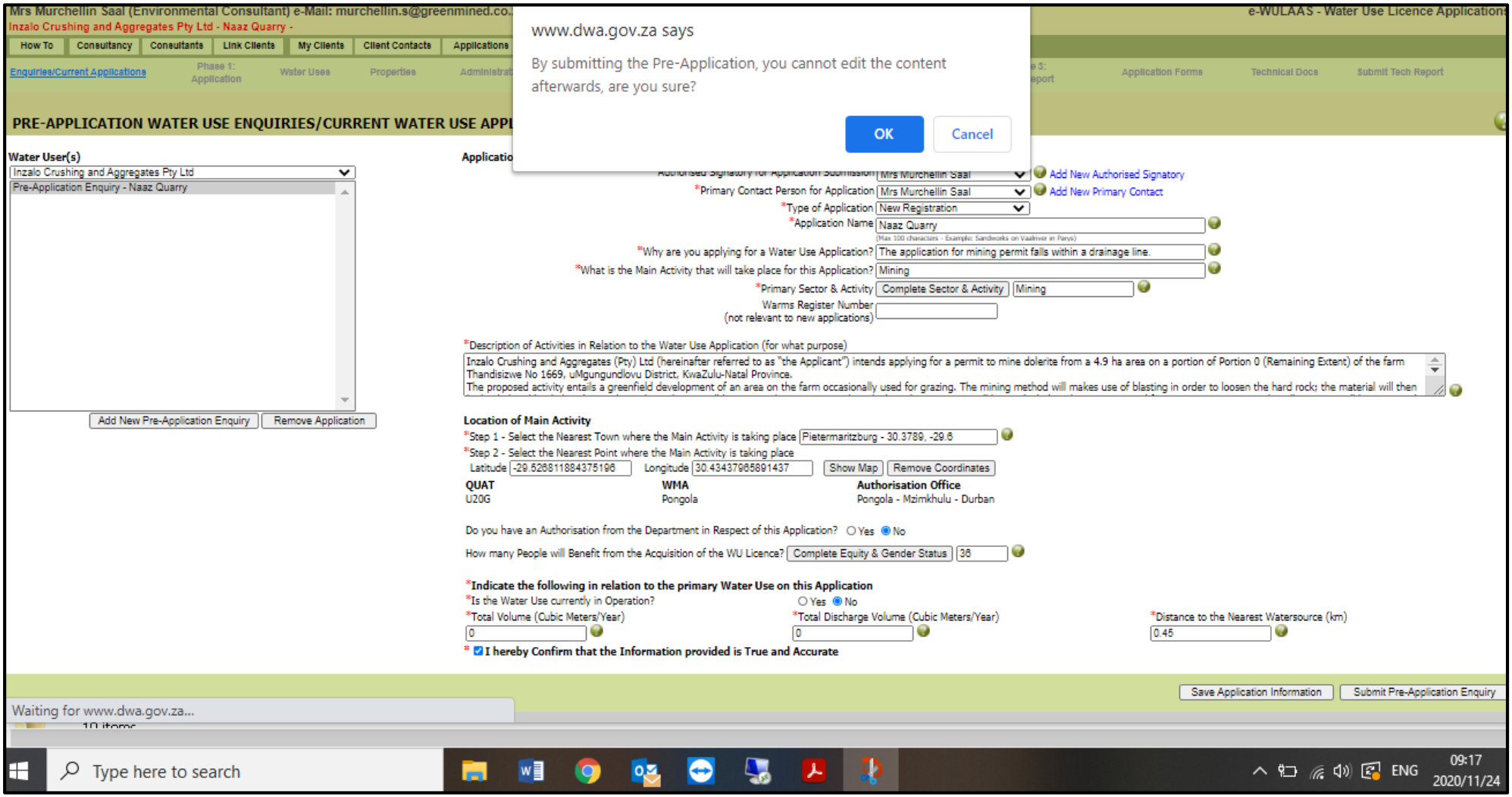
ii) Volume and rate of water use required for the operation

Any water required for the implementation of the project will be bought and transported to the mining area (in a truck) where it will be stored in tanks until used. Presently, no washing of material is proposed and Inzalo will therefore mainly use the water for dust suppression purposes on denuded areas, the processing plant, and access road (when needed). It is proposed that ±20 000 l water/day will be need for dust suppression measures during the dry months.

iii) Has a water use licence been applied for?

As mentioned earlier, the hydrologist concluded that based on the results of the DWS risk assessment, a Water Use Licence (WUL) is required for the proposed dolerite quarry, as per Section 21 of the National Water Act No. 36 of 1998 and Notice 509 of 2016. The application was submitted and is currently in Phase 1 in the e-WULAAS application process (see figure below).


Mrs Murchellin Saal (Environmental Consultant) e-Mail: murchellin.s@greenmined.co.za
e-WULAAS - Water Use Licence Applications
nzalo Crushing and Aggregates Pty Ltd - Naaz Quarry -
How To
Consultancy
Consultants
Link Clients
My Clients
Client Contacts
Applications
Withdraw
Cancel Licence
Status
Correspondence
Support
Logout
Enquiries/Current Applications
Phase 1: Application
Water Uses
Properties
Administrative Docs
Submit Application
Phase 2: Site Visit
Confirm Site Visit
Phase 3: Tech Report
Application Forms
Technical Docs
Submit Tech Report
PRE-APPLICATION WATER USE ENQUIRIES/CURRENT WATER USE APPLICATIONS
Water User(s)
Inzalo Crushing and Aggregates Pty Ltd
Pre-Application Enquiry - Naaz Quarry
Add New Pre-Application Enquiry
Remove Application
Application Information (mandatory fields is indicated with a *)
*Authorised Signatory for Application Submission
Mrs Murchellin Saal
Add New Authorised Signatory
*Primary Contact Person for Application
Mrs Murchellin Saal
Add New Primary Contact
*Type of Application
New Registration
*Application Name
Naaz Quarry
(Max 100 characters - Example: Sandworks on Vaalriver in Parys)
*Why are you applying for a Water Use Application?
The application for mining permit falls within a drainage line.
*What is the Main Activity that will take place for this Application?
Mining
*Primary Sector & Activity
Complete Sector & Activity
Mining
Warms Register Number (not relevant to new applications)
*Description of Activities in Relation to the Water Use Application (for what purpose)
Inzalo Crushing and Aggregates (Pty) Ltd (hereinafter referred to as "the Applicant") intends applying for a permit to mine dolerite from a 4.9 ha area on a portion of Portion 0 (Remaining Extent) of the farm Thandisizwe No 1669, uMgungundlovu District, KwaZulu-Natal Province.
The proposed activity entails a greenfield development of an area on the farm occasionally used for grazing. The mining method will makes use of blasting in order to loosen the hard rock; the material will then
Location of Main Activity
*Step 1 - Select the Nearest Town where the Main Activity is taking place
Pietermaritzburg - 30.3789, -29.6
*Step 2 - Select the Nearest Point where the Main Activity is taking place
Latitude
-29.526811884375196
Longitude
30.434379658914 37
Show Map
Remove Coordinates
QUAT
U20G
WMA
Pongola
Authorisation Office
Pongola - Mzimkhulu - Durban
Do you have an Authorisation from the Department in Respect of this Application? Yes No
How many People will Benefit from the Acquisition of the WU Licence?
Complete Equity & Gender Status
36
*Indicate the following in relation to the primary Water Use on this Application
*Is the Water Use currently in Operation? Yes No
*Total Volume (Cubic Meters/Year)
0
*Total Discharge Volume (Cubic Meters/Year)
0
*Distance to the Nearest Watersource (km)
0.45
* I hereby Confirm that the Information provided is True and Accurate
Save Application Information
Submit Pre-Application Enquiry
10 items
Type here to search
ENG
09:16
2020/11/24


Mrs Murchellin Saal (Environmental Consultant) e-Mail: murchellin.s@greenmined.co.
Inzalo Crushing and Aggregates Pty Ltd - Naaz Quarry -
e-WULAAS - Water Use Licence Applications
How To
Consultancy
Consultants
Link Clients
My Clients
Client Contacts
Applications
Enquiries/Current Applications
Phase 1: Application
Water Uses
Properties
Application Forms
Technical Docs
Submit Tech Report
PRE-APPLICATION WATER USE ENQUIRIES/CURRENT WATER USE APPL
www.dwa.gov.za says
By submitting the Pre-Application, you cannot edit the content afterwards, are you sure?
OK
Cancel
Water User(s)
Inzalo Crushing and Aggregates Pty Ltd
Pre-Application Enquiry - Naaz Quarry
Add New Pre-Application Enquiry
Remove Application
Add New Authorised Signatory
*Primary Contact Person for Application
Mrs Murchellin Saal
Add New Primary Contact
*Type of Application
New Registration
*Application Name
Naaz Quarry
*Why are you applying for a Water Use Application?
The application for mining permit falls within a drainage line.
*What is the Main Activity that will take place for this Application?
Mining
*Primary Sector & Activity
Complete Sector & Activity
Mining
Warms Register Number (not relevant to new applications)
*Description of Activities in Relation to the Water Use Application (for what purpose)
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Longitude
30.43437965891437
Show Map
Remove Coordinates
QUAT
U20G
WMA
Pongola
Authorisation Office
Pongola - Mzimkhulu - Durban
Do you have an Authorisation from the Department in Respect of this Application? Yes No
How many People will Benefit from the Acquisition of the WU Licence?
Complete Equity & Gender Status
36
*Indicate the following in relation to the primary Water Use on this Application
*Is the Water Use currently in Operation? Yes No
*Total Volume (Cubic Meters/Year)
0
*Total Discharge Volume (Cubic Meters/Year)
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*Distance to the Nearest Watersource (km)
0.45
* I hereby Confirm that the Information provided is True and Accurate
Save Application Information
Submit Pre-Application Enquiry
Waiting for www.dwa.gov.za...
Type here to search
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2020/11/24

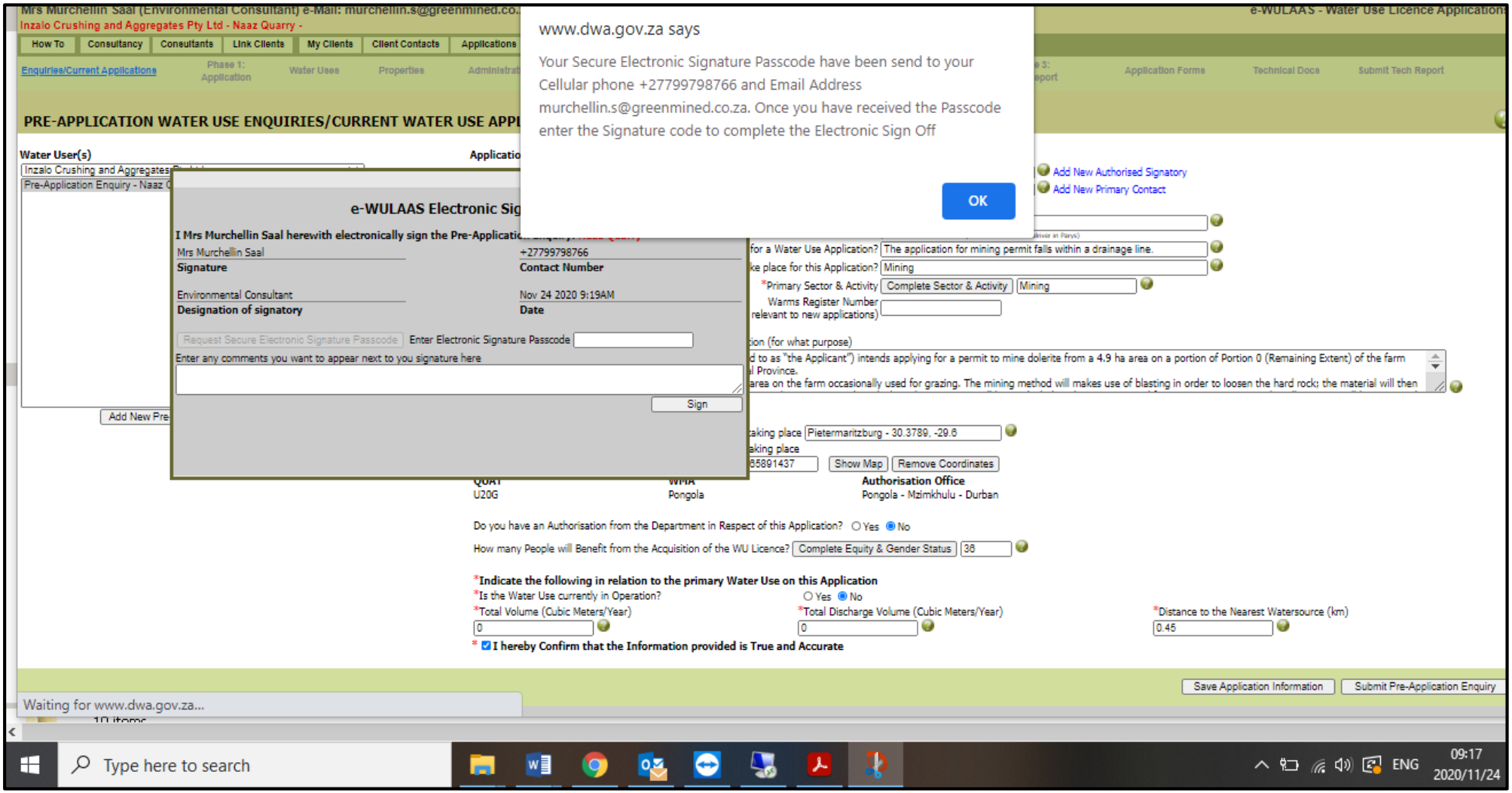

Figure 43: Proof of submission of the water use licence application to the Department of Water and Sanitation

iv) Impacts to be mitigated in their respective phases

Table 24: 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 site with visible beacons.	Site Establishment phase	4.9 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 of the dolerite aggregate is only allowed within the boundaries of the approved area. ❖ MPRDA, 2008 ❖ NEMA, 1998	Beacons need to be in place throughout the life of the activity.
❖ Site establishment and infrastructure development**.**	Site Establishment & Operational Phase	4.9 ha	**<u>Loss of agricultural land for duration of mining:</u>** ❖ The Applicant signed a lease agreement with the landowner to compensate for the loss of agricultural land for the duration of the mining period. If needed, mined-	Use of agricultural land must be managed in accordance with the: ❖ CARA, 1983 ❖ Closure Plan (Appendix J)	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			out/rehabilitated areas could revert back to agricultural use once the cover crop stabilised.		
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	Site Establishment & Operational Phase	4.9 ha	**Visual Mitigation:** ❖ The site must have a neat appearance and be kept in good condition at all times. ❖ Mining equipment must be stored neatly in dedicated areas when not in use. ❖ The permit holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area. ❖ The excavation must be contained within the approved footprint of the permitted area. ❖ Upon closure the site must be rehabilitated to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998	Throughout the site establishment- and operational phases.
❖ Site establishment and infrastructure development. ❖ Cumulative Impacts	Site Establishment phase	4.9 ha	**Management of vegetation removal:** ❖ 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 staff must be educated accordingly. ❖ A pre-commencement walk-through of the final mining footprint, must be done	Natural vegetated areas must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017	Throughout the site establishment- and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			by a suitably qualified botanist to identify species of conservation concern that need to be removed/relocated prior to bush clearance. The findings of the botanist must be culminated into a Plant Rescue Plan to be implemented on site. A copy of the Plant Rescue Plan must be available on site. ❖ Permits for the removal of protected plant species (if required) must be obtained from KZN Wildlife/Ezemvelo and kept on-site in the possession (at all times) of the flora search and rescue team. ❖ A pre-commencement environmental induction for all site staff must be provided to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. ❖ Cleared vegetation to be retained at any time may not be burned, but can be mulched and stockpiled. Ideally the heaps can be covered with stockpiled		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			topsoil and the material be retained for future site rehabilitation purposes. ❖ The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place. ❖ All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed. ❖ No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ No fires must be allowed on-site. ❖ Spoil heaps and topsoil stockpiles must be provided with a vegetation cover of indigenous grasses as recommended in the VARA (Appendix G of the BAR). ❖ If deemed necessary by the ECO, a firebreak must be made around the periphery of the site in autumn every year. Vegetated areas inside the break should be burned (upon recommendation of the ECO) on a biennial basis if deemed necessary. The relevant veld burning legislation must be adhered to.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ A licence, in terms of the National Forests Act, 1998 must be obtained to clear trees in those parts of the quarry site where the vegetation is deemed to be a "Natural Forest". The appointed ecologist must delineate any such areas prior to commencement of the activities.		
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	Site Establishment & Operational Phase	4.9 ha	**Protection of Fauna:** ❖ The site manager must ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with. ❖ Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person. ❖ 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. ❖ All vehicles must adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises.	Site specific fauna must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ No litter, food or other foreign material may be thrown or left around the site. Such items must be kept in the site vehicles and daily removed to the site camp.		
❖ Site establishment and infrastructure development. ❖ Excavation, loading and hauling to the processing plant.	Site Establishment, & Operational Phase.	4.9 ha	**Archaeological, Heritage and Palaeontological Aspects:** ❖ All mining must be confined to the development footprint area. ❖ 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	Cultural/heritage aspects on site must be managed in accordance with the: ❖ NHRA, 1999	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			assessment of the finds who must notify the SAHRA. ❖ Work may only continue once the go-ahead was issued by SAHRA.		
❖ Site establishment and infrastructure development.	Site Establishment, & Operational Phase.	±375 m²	**<u>Mining the unnamed tributary and protection of the uMngeni River</u>** ❖ The Applicant must adhere to the specifications of the water use licence for the duration of the mining operation. ❖ The mitigation measures proposed to manage erosion/stormwater, waste and the storage of hazardous substances (proposed in this document) must be implemented throughout all the phase of the activity. ❖ A monitoring programme must be followed to determine whether the mining activities are impacting any downstream watercourses. If identified, all impacts must be mitigated and rectified immediately.	All water related matters must be managed in terms of the: ❖ NWA, 1998 ❖ WUL conditions	Throughout the site establishment-, and operational phases.
❖ Stripping and stockpiling of topsoil and overburden. ❖ Excavation, loading and hauling to the processing plant.	Site Establishment-, Operational and Decommissioning Phase	4.9 ha	**<u>Topsoil Management</u>** ❖ The upper 300 mm of the 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 must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 ❖ Closure Plan (Appendix J)	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Sloping and landscaping during rehabilitation.			❖ Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to 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 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. ❖ The temporary topsoil stockpiles must be kept free of invasive plant species. ❖ Topsoil heaps to be stored longer than a period of 6 months needs to be vegetated with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. ❖ Storm- and runoff water must be diverted around the stockpile area to prevent erosion. ❖ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			rehabilitated area upon closure of the site. ❖ The permit holder 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 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. 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. ❖ Run-off water must be controlled via temporary berms, where necessary, on the slopes to ensure that accumulation of run-off does not cause down-slope erosion. ❖ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			occurs for at least 12 months after reinstatement.		
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	Site Establishment-, Operational-, and Decommissioning Phase	4.9 ha	**<u>Fugitive Dust Emission Mitigation Measures:</u>** ❖ 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 all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ❖ Speed on the haul roads must be limited to 20 km/h and 40 km/h on the access road 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. ❖ The crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts. ❖ Fines, blowing from the drop end of the crusher plant, can be minimized by	Dust generation on site 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 phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			attaching strips of used conveyor belts to the conveyor's end. ❖ Compacted dust must weekly be removed from the crusher plant to eliminate the dust source. ❖ Loads must be flattened to prevent spillage during transportation on public roads. ❖ 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, excavation, and transporting of material from site to minimize potential dust impacts.		
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and	Site Establishment-, Operational-, and Decommissioning Phase	4.9 ha	**<u>Noise Handling:</u>** ❖ The permit holder must ensure that employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted at the mining area.	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.			❖ 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). ❖ The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. Surrounding land owners must be notified in writing prior to each blasting occasion. ❖ 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. ❖ Site management must strive to minimise the noise caused by generators. All generators must be maintained and equipped with sound mufflers. If possible the generators must be positioned towards the western part of the mining area (S1) as this will point it away from the neighbouring land users. Further to this, all generators must be placed on a level area/footing to minimise vibration noise.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ Best practice measures shall be implemented in order to minimize potential noise impacts.		
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Sloping and landscaping during rehabilitation phase.	Site Establishment-, Operational, and Decommissioning Phase	4.9 ha	**<u>Management of Invasive Plant Species:</u>** ❖ 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. ❖ No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed. ❖ All stockpiles (topsoil & overburden) 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: ❖ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:	Weeds and invader plants on site must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004	Throughout the site establishment-, operational, and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			▪ 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.		
❖ Stripping and stockpiling of topsoil and overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation.	Site Establishment-, Operational and Decommissioning Phase	4.9 ha	**<u>Erosion Control and Storm Water Management:</u>** ❖ Clearing of vegetation must be limited to the proposed mining footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. ❖ Stormwater must be diverted around the topsoil heaps and mining areas to prevent erosion. ❖ Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms. ❖ When mining within steep slopes, it must be ensured that adequate slope protection is provided. ❖ During mining, the outflow of run-off water from the mining excavation must be controlled to prevent down-slope erosion. This must be done by way of the construction of temporary banks and ditches that will direct run-off	Erosion and storm water must be managed in accordance with the: ❖ CARA, 1983 ❖ NEMA, 1998 ❖ NWA, 1998	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			water (if needed). These must be in place at any points where overflow out of the excavation might occur. ❖ Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation. ❖ Any erosion problems within the mining area as a result of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Silt/sediment traps/barriers must be used where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. These sediment/silt barriers must regularly be maintained and cleared so as to ensure effective drainage of the areas. ❖ 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		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			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. ❖ Polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site. ❖ All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			designated storage areas. In order to prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. The storage areas must feature a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.		
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material. ❖ Sloping and landscaping during rehabilitation phase.	Site Establishment-, Operational-, and Decommissioning Phase	4.9 ha	**Waste Management:** ❖ Regular vehicle maintenance, repairs and services may only take place at the 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 in order to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a registered hazardous waste handling facility, alternatively collected by a registered hazardous waste handling contractor. The safe disposal	Mining related waste must be managed in accordance with the: ❖ NWA, 1998 ❖ NEM:WA, 2008	Throughout the site establishment-, operational and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			certificates must be filed for auditing purposes. ❖ If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every 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. The dirty rags used to clean the drip trays must be disposed as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. ❖ 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. Proof of safe disposal must be filed for auditing purposes. ❖ An oil spill kit must be obtained, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. ❖ Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. Proof must be filed. ❖ Suitable covered receptacles must be available at all times and conveniently placed for the disposal of general waste. ❖ Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area. Proof of disposal must be available for auditing purposes. ❖ Biodegradable refuse must be handled as indicated above. ❖ Re-use or recycling of waste products must be encouraged on site. ❖ No waste may be buried or burned on the site. ❖ Ablution facilities must be provided in the form of a chemical toilet/s. The chemical toilet must be anchored (to prevent blowing/falling over) and shall be serviced at least once a week for the duration of the mining activities by a registered liquid waste handling		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			contractor. The safe disposal certificates must be filed for auditing purposes. ❖ The use of any temporary, chemical toilet 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 from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder. ❖ When small volumes of wastewater are generated during the life of the mine the following is applicable: ▪ Water containing waste must not be discharged into the natural environment. ▪ Measures to contain the waste water and safely dispose thereof must be implemented. ❖ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities. ❖ Site management must implement the use of waste registers to keep record of the waste generated and removed from the mining area.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation phase.	Operational-, and Decommissioning Phase	4.9 ha	**Management of health and safety risks:** ❖ Workers must have access to the correct personal protection equipment (PPE) as required by law. ❖ Sanitary facilities must be located within 100 m from any point of work. ❖ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. ❖ The surrounding landowners must be informed in writing ahead of each blasting event. ❖ The compliance of ground vibration and airblast levels must be monitored to USBM standards with each blasting event. ❖ A vibro recorder must be used to record all blasts. ❖ Audible warning of a pending blast must be given at least 3 minutes in advance of the blast. ❖ Measures to limit flyrock must be taken. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed.	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ USBM standards	Throughout the site establishment-,operational and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Drilling and blasting.	Operational Phase	N/A	**Managing the power line:** ❖ An adequate no-go buffer (minimum 20 m) should be maintained around the power line as per Eskom standard. ❖ The blaster must take measures to limit flyrock. ❖ Eskom must be informed at least two weeks prior to the next blasting event. Notifications must be in writing. ❖ Should the line be damaged, Eskom must immediately (within the first hour of occurrence) be informed.	The power line must be protected in accordance with all Eskom specifications.	Throughout the site establishment-, and operational phases.
❖ Drilling and blasting. ❖ Cumulative impact.	Operational Phase	N/A	**Mitigating potential impact on the nearby shale quarry/brick factory:** ❖ An assessment of the structural integrity of the clay brick factory must be conducted prior to the first blast. ❖ The owner/manager of the clay brick operation must be notified in writing before each blast. ❖ Vibration monitoring must be done with each blast. A seismograph must be placed at the factory, for at least the first blast, to establish the ground vibrations associated with blasting at the quarry. ❖ Should the results indicate that the blasting has a real impact on the factory's infrastructure, monitoring must be continued with each blast. ❖ Any damage to the clay brick factory infrastructure, as a direct result of the	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			mining activities, must be refurbished by the permit holder at his own cost.		
❖ Processing, stockpiling and transporting of material.	Operational phase	±2.5 km	**Access road Management:** ❖ Storm water must be diverted around the access road to prevent erosion. ❖ Vehicular movement must be restricted to the existing access road 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 permit holder. ❖ Overloading of the trucks must be prevented and proof of load weights must be filed and be available for auditing by relevant officials. ❖ The speed of all mining equipment/vehicles must be restricted to 40 km/h on the access roads.	The access road must be managed in accordance with the: ❖ NRTA, 1996	Throughout the site establishment-, and operational phases.
❖ Site establishment and infrastructure development.	Site Establishment, & Operational Phase.	±500 m²	**Storage/Handling of Hazardous Substances/Chemicals:** ❖ Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product. ❖ The floor of the storage area must be impermeable to prevent seepage of spilled products into the ground or ground water. ❖ Access to the chemicals/substances must be controlled and require prior	Chemicals/hazardous substances must be stored in accordance with the: ❖ HSA,1973 ❖ NWA, 1998 ❖ NEM:WA, 2008	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			notification of an appropriate staff member. ❖ The storage area must be out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ A Hazardous Substances Register must be maintained, and Safety Data Sheets (SDS) must be kept current for all chemicals used on site. ❖ Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity. The distance and height of the bund wall relative to that of the tank must also be taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ The site manager must establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund area must be inspected at least weekly and any accumulated rainwater removed and handled as contaminated water. All valves and outlets must be checked to		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			ensure that its intact and closed securely. ❖ The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water, and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and are not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump		
❖ Sloping and landscaping during rehabilitation phase.	Decommissioning Phase	4.9 ha	**Rehabilitation/landscaping of mining area:** ❖ The excavated area must serve as a final depositing area for the placement of overburden. ❖ Rocks and coarse material removed from the excavation must be dumped into the excavation. ❖ 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	Rehabilitation of the mining area must be in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 ❖ Closure Plan (Appendix J)	Throughout the decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			ripped and the topsoil returned to its original depth to provide a growth medium. ❖ No waste may be permitted to be deposited in the excavations. ❖ Once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area. ❖ The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 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. ❖ On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Development Act, 2002 (Act 28 of 2002). ❖ On completion of mining operations, the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.		

e) Impact Management Outcomes

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

Table 25: 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 site 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	Control through management and monitoring.	Mining of the dolerite aggregate is only allowed within the boundaries of the approved area. ❖ MPRDA, 2008 ❖ NEMA, 1998
❖ Site establishment and infrastructure development**.**	❖ Alteration of the agricultural sense of place.	The impact may affect the agricultural opportunities of the property.	Site Establishment & Operational Phase	The study area does not have a high agritourism-, or cultivation potential and the proposed mining operation (S1) will have a low visibility. The impact must	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998 ❖ CARA, 1983

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
				be controlled through proper management.	
❖ Site establishment and infrastructure development**.**	❖ Loss of agricultural land for duration of mining.	The impact may affect the agricultural opportunities 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 (S1), 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 J)
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Visual intrusion as a result of site establishment. ❖ Visual intrusion caused by mining activities.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	Control: Implementing proper housekeeping.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998
❖ Site establishment and infrastructure development. ❖ Cumulative Impacts	❖ Potential impact on the CBA/BSP objectives. ❖ Impact the broad-scale ecological processes.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	Control: Implementing proper housekeeping.	Areas of conservation importance must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017
❖ Site establishment and infrastructure development.	❖ Potential impact on vegetation and listed and/or protected plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	Control & Stop: Implementing good management practices and adhering to the recommendations of the botanist.	Natural vegetated areas must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Potential impact on fauna within the footprint area. ❖ Potential impact on local fauna due to distrubance and loss of available habitat.	This will impact on the biodiversity of the receiving environment.	Site Establishment & Operational Phase	Control & Stop: Implementing good management practices.	Site specific fauna must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017
❖ Site establishment and infrastructure development. ❖ Excavation, loading and hauling to the processing plant.	❖ Potential impact on archaeological artefacts. ❖ Potential impact on areas of palaeontological concerns.	This could impact on the cultural and heritage legacy of the receiving environment.	Site Establishment, & Operational Phase.	Control & Stop: Implementing good management practices.	Cultural/heritage aspects on site must be managed in accordance with the: ❖ NHRA, 1999
❖ Site establishment and infrastructure development.	❖ Loss of the unnamed tributary due to mining activities. ❖ Potential impact on the uMngeni River.	This could impact the hydrology of the receiving environment.	Site Establishment, & Operational Phase.	Control: Implementing the WUL conditions and specifications.	Any water related matters must be managed in accordance with the: ❖ NWA, 1998 ❖ WUL conditions
❖ Stripping and stockpiling of topsoil and overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation.	❖ Loss of stockpiled topsoil during mining and stockpiling. ❖ Potential erosion of denuded areas. ❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	The loss/contamination of topsoil and erosion of the footprint will affect the rehabilitation of the excavation upon closure of the site.	Site Establishment-, Operational and Decommissioning Phase	Control & Remedy: Proper housekeeping and storm water management.	Topsoil stripping must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 ❖ Closure Plan (Appendix J)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting.	❖ Dust nuisance caused as a result of the disturbance of soil.	Increased dust generation will impact	Site Establishment-, Operational-, and Decommissioning Phase	Control: Dust suppression methods and proper housekeeping.	Dust generation on site 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
❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Dust nuisance caused by blasting activities. ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material. ❖ Dust nuisance due generated at the processing plant.	on the air quality of the receiving environment.			❖ National Dust Control Regulations, GN No R827 ❖ ASTM D1739 (SANS 1137:2012)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Noise nuisance generated by earthmoving machinery. ❖ Noise nuisance as a result of blasting. ❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance stemming from operation of the processing plant.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	Control: Noise suppression methods and proper housekeeping.	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Sloping and landscaping during rehabilitation phase.	❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Infestation of the reinstated areas by weeds and invader plant species.	Infestation of the footprint by invader plant species may affect the biodiversity of the receiving environment.	Site Establishment-, Operational, and Decommissioning Phase	Control & Remedy: Implementation of an invasive plant species management plan.	Weeds and invader plants on site must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and hauling to the processing plant.	❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages.	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will	Site Establishment-, Operational-, and Decommissioning Phase	Control & Remedy: 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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
❖ Processing, stockpiling and transporting of material. ❖ Sloping and landscaping during rehabilitation phase.	❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential contamination of environment due to improper waste management. ❖ Potential impact associated with litter/waste left at the mining area.	also incur additional costs to the permit holder.			
❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation phase.	❖ Health and safety risk posed by blasting activities. ❖ Unsafe working environment for employees. ❖ Safety risk posed by un-sloped areas.	An unsafe working environment affects the labour force, as well as pose a threat to animals and humans that may enter the mining footprint.	Operational-, and Decommissioning Phase	<u>Stop & Control:</u> Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ USBM standards
❖ Drilling and blasting.	❖ Potential damage to the power line.	Damage to the power line will have a detrimental effect on the electricity supply of the community.	Operational Phase	<u>Stop & Control:</u> Adherance to the blasting rules and regulations, and Eskom specifications.	The power line must be protected in accordance with all Eskom specifications.
❖ Drilling and blasting. ❖ Cumulative impact.	❖ Potential impact on the shale mining- and brickworks infrastructure. ❖ Impact on existing infrastructure as a direct result of the mining operation.	Damage to the nearby mining and/or brickworks infrastructure will affect the business of the owner.	Operational Phase	<u>Stop & Control:</u> Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
❖ Processing, stockpiling and transporting of material.	❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	Collapse of the internal road infrastructure will affect the landowner and lawful occupiers negatively. If the mine negatively affect public traffic it may incur additional costs and complaints from the public.	Operational phase	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leabing it in a representative or better condition than prior to mining.	The access road must be managed in accordance with the: ❖ NRTA, 1996

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes in paragraph (c) and (d) will be achieved)

Table 26: Impact Management Actions

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..)	**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.	**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.	**COMPLIANCE WITH STANDARDS** (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 site with visible beacons.	❖ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Control through management and monitoring.	Beacons need to be in place throughout the life of the mine.	Mining of the dolerite aggregate is only allowed within the boundaries of the approved area. ❖ MPRDA, 2008 ❖ NEMA, 1998
❖ Site establishment and infrastructure development**.**	❖ Alteration of the agricultural sense of place.	The study area does not have a high agritourism-, or cultivation potential and the proposed mining operation (S1) will have a low visibility. The impact must be controlled through proper management.	Throughout site establishment- and operational phases.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998 ❖ CARA, 1983

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
❖ Site establishment and infrastructure development**.**	❖ Loss of agricultural land for duration of mining.	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area (S1), only to be reversed upon the closure of the mine. The impact could be controlled through progressive rehabilitation.	Throughout site establishment- and operational phases.	Use of agricultural land must be managed in accordance with the: ❖ CARA, 1983 ❖ Closure Plan (Appendix J)
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Visual intrusion as a result of site establishment. ❖ Visual intrusion caused by mining activities.	Control: Implementing proper housekeeping.	Throughout site establishment- and operational phases.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998
❖ Site establishment and infrastructure development. ❖ Cumulative Impacts	❖ Potential impact on the CBA/BSP objectives. ❖ Impact the broad-scale ecological processes.	Control: Implementing proper housekeeping.	Applicable during the site establishment phase, and to be managed throughout the operational and decommissioning phases.	Areas of conservation importance must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017
❖ Site establishment and infrastructure development.	❖ Potential impact on vegetation and listed and/or protected plant species.	Control & Stop: Implementing good management practices and adhering to the recommendations of the botanist.	Applicable during the site establishment phase, and to be managed throughout the operational and decommissioning phases.	Natural vegetated areas must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and overburden.	❖ Potential impact on fauna within the footprint area. ❖ Potential impact on local fauna due to distrubance and loss of available habitat.	Control & Stop: Implementing good management practices.	Throughout operational- and decommissioning phases.	Site specific fauna must be managed in accordance with the: ❖ NEM:BA, 2004 ❖ uMDM-EMF, 2017

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
❖ Site establishment and infrastructure development. ❖ Excavation, loading and hauling to the processing plant.	❖ Potential impact on archaeological artefacts. ❖ Potential impact on areas of palaeontological concerns.	Control & Stop: Implementing good management practices.	Throughout site establishment-, and operational phase.	Cultural/heritage aspects on site must be managed in accordance with the: ❖ NHRA, 1999
❖ Site establishment and infrastructure development.	❖ Loss of the unnamed tributary due to mining activities. ❖ Potential impact on the uMngeni River.	Control: Implementing the WUL conditions and specifications.	Throughout site establishment-, and operational phase.	Any water related matters must be managed in accordance with the: ❖ NWA, 1998 ❖ WUL conditions
❖ Stripping and stockpiling of topsoil and overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation.	❖ Loss of stockpiled topsoil during mining and stockpiling. ❖ Potential erosion of denuded areas. ❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	Control & Remedy: Proper housekeeping and storm water management.	Throughout site establishment- and operational phases.	Topsoil stripping must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 ❖ Closure Plan (Appendix J)
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Dust nuisance caused as a result of the disturbance of soil. ❖ Dust nuisance caused by blasting activities. ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material. ❖ Dust nuisance due generated at the processing plant.	Control: Dust suppression methods and proper housekeeping.	Throughout site establishment- and operational phases.	Dust generation on site 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)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material.	❖ Noise nuisance generated by earthmoving machinery. ❖ Noise nuisance as a result of blasting. ❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance stemming from operation of the processing plant.	Control: Noise suppression methods and proper housekeeping.	Throughout site establishment- and operational phases.	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Sloping and landscaping during rehabilitation phase.	❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Infestation of the reinstated areas by weeds and invader plant species.	Control & Remedy: Implementation of an invasive plant species management plan.	Throughout operational- and decommissioning phases.	Weeds and invader plants on site must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and hauling to the processing plant. ❖ Processing, stockpiling and transporting of material. ❖ Sloping and landscaping during rehabilitation phase.	❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages. ❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential contamination of environment due to improper waste management. ❖ Potential impact associated with litter/waste left at the mining area.	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	Throughout operational- and decommissioning phases.	Mining related waste must be managed in accordance with the: ❖ NWA, 1998 ❖ NEM:WA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
❖ Drilling and blasting. ❖ Excavation, loading and hauling to the processing plant. ❖ Sloping and landscaping during rehabilitation phase.	❖ Health and safety risk posed by blasting activities. ❖ Unsafe working environment for employees. ❖ Safety risk posed by un-sloped areas.	Stop & Control: Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	Throughout operational- and decommissioning phases.	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ USBM standards
❖ Drilling and blasting.	❖ Potential damage to the power line.	Stop & Control: Adherance to the blasting rules and regulations, and Eskom specifications.	Throughout operational phase.	The power line must be protected in accordance with all Eskom specifications.
❖ Drilling and blasting. ❖ Cumulative impact.	❖ Potential impact on the shale mining- and brickworks infrastructure. ❖ Impact on existing infrastructure as a direct result of the mining operation.	Stop & Control: Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	Throughout operational phase.	Management of the mining activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998
❖ Processing, stockpiling and transporting of material.	❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leabing it in a representative or better condition than prior to mining.	Throughout site establishment- and operational phases.	The access road must be managed in accordance with 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 the Regulation.

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature. This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form scree slopes on the benches below, thereby reducing the overall face angle. The benches will be top-dressed with topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil. 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.

This report, the Final Basic Assessment Report, includes all the environmental objectives in relation to closure and was available for perusal by the landowner, registered I&AP's and stakeholders over a 34-days commenting period.

(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 requested rehabilitation plan is attached as Appendix E.

(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 mining site. 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 plan attached as Appendix E will comply with the minimum closure objectives as prescribed by DMRE and detailed below, and therefore is deemed to be compatible:

Rehabilitation of the excavated area:

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

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Stockpiles must be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
  - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

- Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager. _

- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the DMRE Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

Final rehabilitation:

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

(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	Dolerite
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	Limited

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	**YES**	-

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components.

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	253 019	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	133 622	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	17 782	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.10
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision

Table 27: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	Thandisizwe Quarry			**Location:**	Pietermaritzburg		
Evaluators:	C Fouché			**Date:**	16 November 2020		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (Rand)**
			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^2	0	17	1.00	1.10	R 0.00
2(A)	Demolition of steel buildings and structures	m^2	0	241	1.00	1.10	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m^2	0	356	1.00	1.10	R 0.00
3	Rehabilitation of access roads	m^2	0	43	1.00	1.10	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	419	1.00	1.10	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	229	1.00	1.10	R 0.00
5	Demolition of housing and/or administration facilities	m^2	0	483	1.00	1.10	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	4	253 019	0.04	1.10	R 44 531.34
7	Sealing of shaft, audits and inclines	m^3	0	130	1.00	1.10	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	168 679	1.00	1.10	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	210 087	1.00	1.10	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	610 192	0.51	1.10	R 0.00
9	Rehabilitation of subsided areas	ha	0	141 244	1.00	1.10	R 0.00
10	General surface rehabilitation	ha	0.9	133 622	1.00	1.10	R 132 285.78

11	River diversions	ha	0	133 622	1.00	1.10	R 0.00
12	Fencing	m	0	152	1.00	1.10	R 0.00
13	Water Management	ha	0	50 807	0.17	1.10	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	4.9	17 782	1.00	1.10	R 95 844.98
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 272 662.10
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 272 662.10		**Sub Total 1**	R 286 295.21

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 17 177.71
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 28 629.52
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 332 102.44
		Vat (15%)	R 49 815.37
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 381 917.81**

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 381 917.81.**

(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 Applicant 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 against 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) Mechanisms for monitoring compliance

Table 28: 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 placed at the corners of the mining area.	Responsibility: ❖ 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. Role: ❖ Ensure beacons are in place throughout the life of the mine.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.
❖ Site establishment and infrastructure development.	Land Use: ❖ Loss of agricultural land for duration of mining.	❖ Mining schedule	Responsibility: ❖ 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
			❖ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Role:</u> ❖ If needed, sign mined-out/rehabilitated areas back to agricultural use once the cover crop stabilised.	❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.
❖ Site establishment and infrastrucutre development. ❖ Stripping and stockpiling of topsoil and/or overburden.	<u>Visual Characteristics:</u> ❖ Visual intrusion as a result of site establishment. ❖ Visual intrusion caused by mining activities.	❖ Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices.	<u>Responsibility:</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>Role:</u> ❖ Ensure that the site have a neat appearance and is kept in good condition at all times. ❖ Store mining equipment in a dedicated area when not in use. ❖ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ❖ Contain excavations to the approved footprint of the permitted area. ❖ Upon closure, rehabilitate the site to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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❖ Site establishment and infrastructure development.	<u>Terrestrial Biodiversity, Conservation Areas and Groundcover:</u> ❖ Potential impact on the CBA/BSP objectives; ❖ Potential impact on vegetation and listed and/or protected plant species.	❖ Visible beacons indicating the boundary of the mineable area (S1). ❖ Pre-commencement walkthrough with botanist. ❖ Removal permit, should protected or red data species be relocated. ❖ Cover crop to seed reinstated areas upon closure.	<u>Responsibility:</u> ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Botanist to identify plants of importance. ❖ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Role:</u> ❖ 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 staff accordingly. ❖ Arrange a pre-commencement walk-through of the final mining footprint by a suitably qualified botanist for species of conservation concern that need to be removed/relocated prior to bush clearance. Obtain and implement a Plant Rescue Plan at the property. Keep a copy of the plan at the site. ❖ Obtain permits from Ezemvelo/KZN Wildlife for the removal of protected plant species (if required) and keep it on-site in the possession (at all times) of the flora search and rescue team. ❖ Arrange a pre-commencement environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			must include awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ Only commence with bush-clearance once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. ❖ Do not burn cleared vegetation to be retained at any time, but rather mulch and stockpiled it. Ideally cover the heaps with stockpiled topsoil and retain the material for future site rehabilitation. ❖ The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place. ❖ Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. ❖ Do not translocated, uprooted or disturbed plants for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ Do not allow fires on-site. ❖ Provide spoil heaps and topsoil stockpiles with a vegetation cover of indigenous grasses.	

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			❖ If deemed necessary by the ECO, make a firebreak around the periphery of the site in autumn every year. Upon recommendation of the ECO, burn the vegetated areas inside the break on a biennial basis if deemed necessary. Adhere to the relevant veld burning legislation. ❖ Obtain a licence, in terms of the National Forests Act, 1998 to clear trees in those parts of the quarry site where the vegetation is deemed to be a "Natural Forest". The appointed ecologist must delineate any such areas prior to commencement of the activities.	
❖ Site establishment and infrastructure development. ❖ Stripping and stockpiling of topsoil and/or oberburden.	<u>Fauna:</u> Potential impact on fauna within the footprint area.	❖ Toolbox talks to educate employees how to handle fauna that enter the work areas.	<u>Responsibility:</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>Role:</u> ❖ Ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with. ❖ The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. ❖ Arrange that all personnel undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			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. ❖ Ensure no snares are set or nests raided for eggs or young. ❖ Ensure all vehicles adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. ❖ Prevent litter, food or other foreign material thrown or left around the site. Keep such items in the site vehicles and daily removed it to the site camp.	
❖ Site establishment and infrastructure development. ❖ Excavation, loading and hauling to the processing plant.	<u>Cultural and Heritage Environment:</u> ❖ Potential impact on arcahaeological artefacts. ❖ Potential impact on areas of palaeontological concern.	❖ Contact number of an archaeologist & palaeontologist that can be contacted when a discovery is made on site.	<u>Responsibility:</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>Role:</u> ❖ Confine all mining to the development footprint area. ❖ 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	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			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.	
❖ Site establishment and infrastructure development. ❖ Cumulative impacts.	<u>Hydrology:</u> ❖ Loss of the unnamed tributary due to mining activities (S1). ❖ Potential impact on the uMngeni River.	❖ Water use licence issued by the DWS. ❖ Monitoring Programme (Appendix G of the BAR).	<u>Responsibility:</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. ❖ Annual compliance monitoring of site by an

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			Role: ❖ Adhere to the specifications of the water use licence for the duration of the mining operation. ❖ Implement the mitigation measures proposed to manage erosion/stormwater, waste and the storage of hazardous substances (proposed in this document) throughout all the phase of the activity. ❖ Follow a monitoring programme to determine whether the mining activities are impacting any downstream watercourses. If identified, mitigate and rectify all impacts immediately.	Environmental Control Officer.
❖ Stripping and stockpiling of topsoil and/or vegetation.	Geology and Soil: ❖ Loss of stockpiled topsoil during mining and stockpiling.	❖ Earthmoving equipment to strip and stockpile topsoil. ❖ Cover crop to be established on topsoil heaps (if needed). ❖ Erosion control infrastructure (if needed).	Responsibility: ❖ 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. Role: ❖ 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.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			❖ Place the topsoil on a levelled area, within the mining footprint. Do not stockpile topsoil in undisturbed areas. ❖ Protect topsoil stockpiles against losses by water- and wind erosion. Position stockpiles so it is not vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. ❖ Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. ❖ Keep temporary topsoil stockpiles free of invasive plant species. ❖ Vegetate the topsoil heaps to be stored longer than 6 months with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. ❖ Divert storm- and runoff water around the stockpile area to prevent erosion. ❖ Spread the topsoil evenly, to a depth of 300 mm, over the rehabilitated area upon closure of the site. ❖ 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.	

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			❖ 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. ❖ Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. ❖ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
❖ Stripping and stockpiling of topsoil and/or overburden; ❖ Drilling and blasting; ❖ Excavation, loading and hauling to the processing plant; ❖ Processing, stockpiling and transporting of material.	<u>Air and Noise Quality:</u> ❖ Dust nuisance as a result of the disturbance of soil. ❖ Dust nuisance caused by blasting activities. ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material. ❖ Dust nuisance generated at the processing plant.	❖ Gravimetric dust monitoring equipment. ❖ Dust suppression equipment such as a water car, water dispenser and sprayers on the crusher plant. ❖ Signage that clearly reduce the speed on the access roads.	<u>Responsibility:</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>Role:</u> ❖ Control the liberation of dust into the surrounding environment by the use of; 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 haul roads to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust.	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			❖ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ❖ Install water sprayers at the crusher plant to alleviate dust generation from the conveyor belts. ❖ Minimise fines, blowing from the drop end of the crusher plant by attaching strips of used conveyor belts to the conveyor's end. ❖ Weekly remove compacted dust from the crusher plant to eliminate the dust source. ❖ Flatten loads to prevent spillage during transportation on public roads. ❖ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. ❖ 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, excavation, and transporting of material from site to minimize potential dust impacts.	
❖ Stripping and stockpiling of topsoil and/or overburden.	<u>Air and Noise Quality:</u> ❖ Noise nuisance generated by earthmoving machinery.	❖ Personal noise exposure monitoring equipment. ❖ Signage indicating noise zones.	<u>Responsibility:</u> ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout site establishment-, and operational phases.

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❖ Drilling and blasting; ❖ Excavation, loading and hauling to the processing plant; ❖ Processing, stockpiling and transporting of material.	❖ Noise nuisance as a result of blasting. ❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance stemming from operation of the processing plant.	❖ 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. ❖ Noise mufflers fitted to generators.	❖ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Role:</u> ❖ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted 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. ❖ Plan the type, duration and timing of the blasting procedures with due cognizance of other land users and structures in the vicinity. Notify the surrounding land owners in writing prior to each blasting occasion. ❖ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008. ❖ Implement best practice measures to minimise potential noise impacts.	❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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❖ Stripping and stockpiling of topsoil and/or overburden; ❖ Sloping and landscaping during rehabilitation.	<u>Terrestrial biodiversity, conservation areas and groundcover:</u> ❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Infestation of the reinstated areas by weeds and invader plant species.	❖ Designated team to cut or pull out invasive plant species that germinated on site. ❖ Herbicide application equipment.	<u>Responsibility:</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>Role:</u> ❖ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do weed/alien ongoing clearing on throughout the life of the mining activities. ❖ Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose. ❖ Keep all stockpiles (topsoil & overburden) free of invasive plant species. ❖ Control declared invader or exotic species on the rehabilitated areas.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and hauling to the processing plant.	<u>Hydrology:</u> ❖ Potential erosion of denuded areas. ❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	❖ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area.	<u>Responsibility:</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.

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❖ Sloping and landscaping during rehabilitation.			<u>Role:</u> ❖ Divert stormwater around the topsoil heaps and mining areas to prevent erosion. ❖ Protect stockpiles from erosion, and store it on flat areas surrounded by appropriate berms where possible. ❖ Ensure that adequate slope protection is provided when mining within steep slopes. ❖ Control the outflow of run-off water from the mining excavation to prevent down-slope erosion, by constructing temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur. ❖ Regularly monitor roads and other disturbed areas within the project for erosion, and ensure problem areas receive follow-up monitoring to assess the success of the remediation. ❖ Rectify erosion problems within the mining area as a result of the mining activities immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. Regularly maintain and clear the sediment/silt barriers to ensure effective drainage of the areas.	❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			❖ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. ❖ Restrict polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards to the workshop areas and ensure it takes place on impermeable hard standing surfaces, which formally drain to a dirty water drainage system at the site. ❖ Contain all fuels and chemicals stored or used on site in fit for purpose containers and store within designated storage areas. Ensure the designated storage areas are situated on an impermeable surface with a perimeter bund and a drainage sump. Size the volume of the bund and sump to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. Ensure that the storage areas have a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.	
❖ Stripping and stockpiling of topsoil and/or overburden. ❖ Excavation, loading and	<u>General:</u> ❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages.	❖ Oil spill kit. ❖ Sealed drip trays. ❖ Formal waste disposal system with waste registers.	<u>Responsibility:</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.

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hauling to the processing plant; ❖ Processing, stockpiling and transporting of material; ❖ Sloping and landscaping during rehabilitation.	❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential contamination of environment due to improper waste management. ❖ Potential impact associated with litter/waste left at the mining area.		<u>Role:</u> ❖ Ensure regular vehicle maintenance, repairs and services only take place at the 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 in order to ensure proper disposal. Treat this as hazardous waste and dispose of it at a registered hazardous waste handling facility, alternatively arrange collection by a registered hazardous waste handling contractor. File safe disposal certificates for auditing purposes. ❖ If a diesel bowser is used on site, equip it with a drip tray at all times. Use drip trays during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ❖ Ensure drip trays are cleaned after each use. Do not allow dirty drip trays to be used on site. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. ❖ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and remove it from the site, either	❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.

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			for resale or for appropriate disposal at a recognized facility. File proof. ❖ Obtain an oil spill kit, and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. ❖ Clean spills immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. File proof. ❖ Ensure suitable covered receptacles are available at all times and conveniently placed for the disposal of general waste. ❖ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a recognized landfill site. Take specific precautions to prevent refuse from being dumped on or in the vicinity of the mine area. File proof of disposal. ❖ Handle biodegradable refuse as indicated above. ❖ Encourage re-use or recycling of waste products. ❖ Do not bury or burn waste on the site. ❖ Provide ablution facilities in the form of a chemical toilet/s. Anchor the chemical toilet (to	

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			prevent blowing/falling over) and arrange that it is serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. File the safe disposal certificates. ❖ Ensure that the use of any temporary, chemical toilet facilities do not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. ❖ Do not discharge water containing waste into the natural environment. ❖ Implement measures to contain the waste water and safely dispose thereof. ❖ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. ❖ Implement the use of waste registers to keep record of the waste generated and removed from the mining area.	
❖ Drilling and blasting; ❖ Excavation, loading and	<u>Health and Safety:</u> ❖ Health and safety risk posed by blasting activities.	❖ Stocked first aid box. ❖ Level 1 certified first aider.	<u>Responsibility:</u> ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout 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
hauling to the processing plant; ❖ Sloping and landscaping during rehabilitation.	❖ Unsafe working environment for employees. ❖ Safety risk posed by un-sloped areas.	❖ All appointments in terms of the Mine Health and Safety Act, 1996. ❖ Vibro recorder.	❖ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Role:</u> ❖ Ensure that workers have access to the correct PPE as required by law. ❖ Locate sanitary facilities within 100 m from any point of work. ❖ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ Plan the type, duration and timing of blasting with due cognizance of other land users and structures in the vicinity. ❖ Inform the surrounding landowners and communities in writing ahead of any blasting event. ❖ Monitor the compliance of ground vibration and airblast levels to USBM standards with each blasting event. ❖ Record all blasts with a vibro recorder. ❖ Give audible warning of a pending blast at least 3 minutes in advance of the blast. ❖ Limit fly rock, and collect and remove flyrock and rock spill that falls beyond the working area.	❖ 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
❖ Drilling and blasting.	Existing Infrastructure: ❖ Potential damage to the power line.	❖ Contact number of an Eskom representative.	Responsibility: ❖ 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. Role: ❖ Maintain a no-go buffer (minimum 20 m) around the power line as per Eskom standard. ❖ The blaster must take measures to limit flyrock. ❖ Inform Eskom at least two weeks prior to the next blasting event. Notifications must be in writing. ❖ Should the line be damaged, immediately (within the first hour of occurrence) inform Eskom.	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Annual compliance monitoring of site by an Environmental Control Officer.
❖ Drilling and blasting.	Existing Infrastructure: ❖ Potential impacts on the nearby shale quarry/brick factory.	❖ Contact number of the shale quarry/brick factory representative.	Responsibility: ❖ 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. Role: ❖ Assess the structural integrity of the clay brick factory prior to the first last.	Applicable throughout operational phase. ❖ 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
			❖ Notify the owner/manager of the clay brick operation in writing before each blast. ❖ Monitor the vibrations of each blast. Place a seismograph at the factory, for at least the first blast, to establish the ground vibrations associated with blasting at the quarry. ❖ Continue monitoring with each blast, should the results indicate that the blasting has a real impact on the factory's infrastructure. ❖ Refurbish any damage to the clay brick factory infrastructure, directly caused by the mining activities.	
❖ Processing, stockpiling and transporting of material.	<u>Existing Infrastructure:</u> ❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	❖ Grader to restore the road suurface when needed.	<u>Responsibility:</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>Role:</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 phase. ❖ 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 trucks and file proof of load weights for auditing by relevant officials. ❖ Restrict the speed of all mining equipment/vehicles to 40 km/h on the access roads.	
❖ Site establishment and infrastructure development.	<u>General:</u> ❖ Storage/handling of hazardous substance/chemicals.	❖ Storage areas with impermeable surfaces and bund walls that can hold 110% of the product amount stored in it. ❖ Hazardous Substances Register and Safety Data Sheets. ❖ Drip trays. ❖ Inspection programme. ❖ Operational oil sump.	<u>Responsibility:</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>Role:</u> ❖ Place chemical storage areas on level ground to prevent offsite migration of any spilled product. ❖ Ensure that the floor of the storage area is impermeable to prevent seepage of spilled products into the ground or ground water. ❖ Control access to the chemicals/substances and implement a notification system of an appropriate staff member. ❖ Ensure that the storage area is out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ Maintain a Hazardous Substances Register, and keep Safety Data Sheets (SDS) current for all chemicals used on site.	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
			❖ Ensure any fuel/used oil tanks have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. Check that the bund capacity is sufficient to contain 110% of the tank's maximum capacity. Ensure that the distance and height of the bund wall relative to that of the tank is taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspect the bund area at least weekly and remove any accumulated rainwater and hand it as contaminated water. Check all valves and outlets to ensure that its intact and closed securely. ❖ Ensure that the bund base slope towards an oil sump of sufficient size. Do not allow contaminated water to mix with clean water, and contain it until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ Use drip trays under all stationary equipment or vehicles. Place used drip trays within a bunded area and do not store on the bare soil. Discard	

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 waste water originating from the cleaning of drip trays into the oil sump.	
❖ Sloping and landscaping during rehabilitation.	Topography: ❖ Landscaping of mining area.	❖ Earthmoving equipment to reinstate mined-out areas. ❖ Cover crop to be established on reinstated area. ❖ Erosion control infrastructure (when needed).	Responsibility: ❖ 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. Role: ❖ Use the excavated area for the final depositing of overburden. ❖ Dump rocks and coarse material removed from the excavation into the excavation. ❖ Remove coarse natural material used for the construction of ramps and dump it into the excavations. ❖ Remove stockpiles during the decommissioning phase, rip the area and return the topsoil to its original depth to provide a growth medium. ❖ Do not permit any waste to be deposited into the excavations. ❖ Return the previously stored topsoil to its original depth, once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures.	Applicable throughout decommissioning phase. ❖ 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
			❖ If necessary, fertilize the area to allow vegetation to establish rapidly. Seed the site with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within six months from closure of the site. ❖ If required by the Regional Manager (DMRE) the soil must be analysed and any deleterious effects on the soil arising from the mining operation must be corrected and the area be seeded with a vegetation seed mix to his/her specification. ❖ On completion of operations, deal with all structures or objects in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). ❖ On completion of mining operations, scarify the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, to a depth of at least 200mm and graded it to an even surface condition. Where applicable/possible return topsoil to its original depth over the area.	

l) Indicate the frequency of the submission of the performance assessment/environmental audit report.

The 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 time period 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 received the mining permit and may commence with the proposed activity, a copy of the Environmental Management Programme will be handed to the site manager for his perusal. Issues such as the mining boundaries, fire principals and hazardous waste handling will be discussed.

An induction meeting will be held with all the site workers to inform them of the Basic Rules of Conduct with regard to the environment.

ii) Manner in which risk 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 EMPR document and its requirement and commitments before any mining takes place. An Environmental Control Officer needs to check compliance of the mining activity to the management programmes described in the EMPR.

The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out 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.
- **<u>Water Management and Erosion:</u>**
  - Check that rainwater flows around work areas and are not contaminated.
  - Report any erosion.
  - Check that dirty water is kept from clean water.
  - Do not swim in or drink from quarry pits.

❖ **Waste Management:**

- Take care of your own waste
- Keep waste separate into labelled containers – report full bins.
- 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.
  - ✓ 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 fire wood.
- 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.
- Do not smoke near gas, paints or petrol.
- 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 [X]
b) the inclusion of comments and inputs from stakeholders and I&AP's [X]
c) the inclusion of inputs and recommendations from the specialist reports where relevant, a [X]
d) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein [X]

Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

28 January 2021

Date:

-END-

APPENDIX A

REGULATION 2(2) MINE MAP

APPENDIX B

1:250 000 LOCALITY MAP

APPENDIX C
SITE ACTIVITIES PLAN

APPENDIX D

LAND USE MAP

APPENDIX E
REHABILITATION PLAN

APPENDIX F1 & F2

COMMENTS AND RESPONSE REPORT

&

PROOF OF PUBLIC PARTICIPATION

APPENDIX F3
LEASE AGREEMENT

APPENDIX G

VEGETATION, AQUATIC AND RISK ASSESSMENT

APPENDIX H

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 activity may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment & Infrastructure Development:			
❖ Alteration of the agricultural sense of place.	**Duration of site establishment phase (±1 month)**	**Possible**	**Medium Concern**
❖ Loss of agricultural land for duration of mining.		**Definite**	**Medium Concern**
❖ Visual intrusion as a result of site establishment.		**Possible**	**Medium Concern**
❖ Potential impact on the CBA/BSP objectives.		**Low Possibility**	**Low Concern**
❖ Potential impact on vegetation and listed and/or protected plant species.		**Low Possibility**	**Low-Medium Concern**
❖ Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
❖ Potential impact on archaeological artefacts.		**Low Possibility**	**Low Concern**
❖ Loss of the unnamed tributary due to mining activities.		**Definite**	**Low-Medium Concern**
❖ New job opportunities as a result of the mining operation (Positive Impact)		**Definite (+)**	**High (+)**
SITE ALTERNATIVE 2			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment & Infrastructure Development:			
❖ Alteration of the agricultural sense of place.	**Duration of site establishment phase (±1 month)**	**Possible**	**Medium Concern**
❖ Loss of agricultural land for duration of mining.		**Definite**	**Medium Concern**
❖ Visual intrusion as a result of site establishment.		**Possible**	**Medium Concern**
❖ Potential impact on the CBA/BSP objectives.		**Low Possibility**	**Low Concern**
❖ Potential impact on vegetation and listed and/or protected plant species.		**Low Possibility**	**Low-Medium Concern**
❖ Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
❖ Potential impact on archaeological artefacts.		**Low Possibility**	**Low Concern**
❖ New job opportunities as a result of the mining operation (Positive Impact)		**Definite (+)**	**High (+)**

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
Stripping and Stockpiling of Topsoil and/or Overburden: ❖ Visual intrusion caused by mining activities. ❖ Loss of stockpiled topsoil during mining and stockpiling. ❖ Dust nuisance as a result of the disturbance of soil. ❖ Noise nuisance generated by earthmoving machinery. ❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Potential impact on local fauna due to disturbance and loss of available habitat. ❖ Potential erosion of denuded areas. ❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages.	**Duration of site establishment phase (±1 month)**	**LIKELIHOOD** **Possible** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Medium Concern** **Low Concern** **Low Concern** **Low-Medium Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 2			
Stripping and Stockpiling of Topsoil and/or Overburden: ❖ Visual intrusion caused by mining activities. ❖ Loss of stockpiled topsoil during mining and stockpiling. ❖ Dust nuisance as a result of the disturbance of soil. ❖ Noise nuisance generated by earthmoving machinery. ❖ Infestation of the topsoil heaps and mining area with weeds or invader plant species. ❖ Potential impact on local fauna due to disturbance and loss of available habitat. ❖ Potential erosion of denuded areas. ❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages.	**Duration of site establishment phase (±1 month)**	**LIKELIHOOD** **Possible** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Medium Concern** **Low Concern** **Low Concern** **Low-Medium Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern**

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
Drilling and Blasting: ❖ Health and safety risk posed by blasting activities. ❖ Potential damage to the power line. ❖ Dust nuisance caused by blasting activities. ❖ Noise nuisance as a result of blasting. ❖ Potential impact on the shale mining- and brickworks infrastructure.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Possible** **Possible** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Medium Concern** **Low-Medium Concern** **Low Concern**
SITE ALTERNATIVE 2			
Drilling and Blasting: ❖ Health and safety risk posed by blasting activities. ❖ Potential damage to the power line. ❖ Dust nuisance caused by blasting activities. ❖ Noise nuisance as a result of blasting. ❖ Potential impact on the shale mining- and brickworks infrastructure.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Possible** **Possible** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Medium Concern** **Low-Medium Concern** **Low Concern**
SITE ALTERNATIVE 1			
Excavation, Loading and Hauling to the Processing Plant: ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material. ❖ Noise nuisance as a result of the mining activities. ❖ Unsafe working environment for employees. ❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential impact on areas of palaeontological concern. ❖ Facilitation of erosion due to mining activities.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low-Medium Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 2			
Excavation, Loading and Hauling to the Processing Plant: ❖ Dust nuisance due to excavation and from loading and vehicles transporting the material.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Possible**	**SIGNIFICANCE** **Low Concern** **Medium Concern**

❖ Noise nuisance as a result of the mining activities. ❖ Unsafe working environment for employees. ❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential impact on areas of palaeontological concern. ❖ Facilitation of erosion due to mining activities.		**Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**Low Concern** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 1			
Processing, Stockpiling and Transporting of Material: ❖ Dust nuisance generated at the processing plant. ❖ Noise nuisance stemming from operation of the processing plant. ❖ Potential contamination of environment due to improper waste management. ❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low-Medium Concern** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 2			
Processing, Stockpiling and Transporting of Material: ❖ Dust nuisance generated at the processing plant. ❖ Noise nuisance stemming from operation of the processing plant. ❖ Potential contamination of environment due to improper waste management. ❖ Overloading of trucks impacting road infrastructure. ❖ Degradation of the access road.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Possible** **Possible** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low-Medium Concern** **Medium Concern** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 1			
Cumulative Impacts: ❖ Impact the broad-scale ecological processes. ❖ Impact on existing infrastructure as a direct result of the mining operation. ❖ Potential impact on the uMngeni River.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern**

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 2			
Cumulative Impacts: ❖ Impact the broad-scale ecological processes. ❖ Impact on existing infrastructure as a direct result of the mining operation. ❖ Potential impact on the uMngeni River.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern**
SITE ALTERNATIVE 1			
Sloping and Landscaping during Rehabilitation: ❖ Safety risk posed by un-sloped areas. ❖ Erosion of returned topsoil after rehabilitation. ❖ Infestation of the reinstated areas by weeds and invader plant species. ❖ Potential impact associated with litter/waste left at the mining area. ❖ Return of the mining area to agricultural use upon closure (Positive Impact)	**Duration of decommissioning phase (±1 month)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite (+)**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**
SITE ALTERNATIVE 2			
Sloping and Landscaping during Rehabilitation: ❖ Safety risk posed by un-sloped areas. ❖ Erosion of returned topsoil after rehabilitation. ❖ Infestation of the reinstated areas by weeds and invader plant species. ❖ Potential impact associated with litter/waste left at the mining area. ❖ Return of the mining area to agricultural use upon closure (Positive Impact)	**Duration of decommissioning phase (±1 month)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite (+)**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**

APPENDIX I
FINANCIAL AND TECHNICAL COMPETENCE

APPENDIX J

CLOSURE PLAN

APPENDIX K

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX L

PHOTOGRAPHS OF THE PROPOSED SITE

PHOTOGRAPHS OF THE PROPOSED MINING AREA	
	
	

APPENDIX M

CV AND EXPERIENCE RECORD OF EAP