

**PROPOSED MINING OF AGGREGATE ON THE
REMAINING EXTENT OF PORTION 2 OF THE FARM
WITKLOOF 408 JT, ALBERT LUTHULI LOCAL
MUNICIPALITY, MPUMALANGA PROVINCE**

FINAL BASIC ASSESSMENT REPORT



JULY 2017

***REFERENCE NUMBER:* MP 30/5/1/3/2/11433MP**

PREPARED FOR:

B&E International
Tel: 011 966 4300
P.O. Box 26730
East Rand
Somerset West
1462

PREPARED BY:

Greenmined Environmental
93/94 Maple Street
Pomona
Kempton Park
1619
Tel: 011966 4390
Fax: 086 546 0579
E -mail: yolandie.c@greenmined.co.za



ABBREVIATIONS

DBAR	Draft Basic Assessment Report
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
LED	Local Economic Development
MPRDA	Minerals and Petroleum Resources Development Act, 2002
PPE	Personal Protective equipment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WMA	Water Management Area

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

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).

NAME OF APPLICANT:	<i>B&E International</i>
TEL NO:	<i>011 966 4300 / 082 602 6133</i>
FAX NO:	<i>086 612 8117</i>
POSTAL ADDRESS:	<i>PO Box 26730, East Rand, Kempton Park</i>
PHYSICAL ADDRESS:	<i>93 – 94 Maple Street, Pomona, Kempton Park</i>
FILE REFERENCE NUMBER SAMRAD:	<i>MP 30/5/1/3/2/11433MP</i>

1. 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.

2. 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

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner: Greenmined Environmental
Yolandie Coetzee
Tel No.: 011 966 4390 / 082 734 5113
Fax No.: 086 546 0579
E-mail address: yolandie.c@greenmined.co.za

ii) Expertise of the EAP.

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

Mrs. Yolandie Coetzee has a B.Sc. Degree in Microbiology and Biochemistry and an Honours Degree in Environmental Sciences. Please find full CV attached in Appendix I.

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

Yolandie Coetzee is an Environmental Consultant with 7 years' experience in the environmental sector. She specialized the last 5 years in the rehabilitation of mines where she conducted the conceptual rehabilitation and management designs and the closure plans and programs. She has also been involved in a number of other environmental projects including railway sidings, filling stations, abattoir's, logistics hub and mining sites where she compiled environmental management plans, environmental impact assessments, environmental audits, due diligences, IWULA's/IWWMP's and alien invasive encroachment programs. She studied at the University of Potchefstroom where she has successfully completed her undergraduate degree in microbiology and biochemistry and her Honors degree in environmental sciences. See a list of past project attached as Appendix I.

b) Location of the overall Activity.

Farm Name:	Remaining extent of portion 2 of the farm Witkloof 408 JT, Albert Luthuli Local Municipality, Mpumalanga Province.
Application area (Ha)	4.9ha
Magisterial district:	Albert Luthuli
Distance and direction from the nearest town	14.55km North-West of Carolina, Mpumalanga Province
21 digit Surveyor General Code for each farm portion	T0JT00000000040800002

c) Locality map

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

The requested map is attached as Appendix A1.

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

B&E International (Pty) Ltd intends to apply for a mining permit to mine 4.9 ha of the remaining extent of portion 2 of the farm Witkloof 408 JT, which falls in the Albert Luthuli Local Municipality in the Gert Sibande administrative district, Mpumalanga Province.

The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, the material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be stockpiles and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 4.9ha is extent and the applicant, B&E International (Pty) Ltd, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction

in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Carolina area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment; and
- Mobile crushing and screening plants.

A generator will be used to power the infrastructure on site until an Eskom connection can be secured. Water from the existing pit will be pumped out of the quarry and reused for mineral processing and dust suppression. See the requested map attached as Appendix B.

i) Listed and specified activities

<p>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</p> <p>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.)</p>	<p>Aerial extent of the activity Ha or m²</p>	<p>LISTED ACTIVITY Mark with an X where applicable or affected</p>	<p>APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)</p>
<p>Opencast Mining</p>	<p>4.9ha</p>	<p>X</p>	<p>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21 (Mining Permit area):</p> <p><i>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 —</i></p> <p><i>(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]</i></p>

			<p><i>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</i></p> <p><i>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</i></p>
Opencast Mining	4.9ha	X	<p>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22:</p> <p><i>The decommissioning of any activity requiring –</i></p> <p><i>(i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or</i></p> <p><i>(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;</i></p> <p><i>but excluding the decommissioning of an activity relating to the secondary processing of a –</i></p>

			<p>(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or</p> <p>(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –</p> <p>in which case activity 31 in this Notice applies.</p>
Opencast Mining	4.9ha	X	<p>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 27 (Mining Area):</p> <p><i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.</i></p>
Opencast Mining and stockpile area	4.9ha	X	<p>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 28 (Mining and Stockpile area):</p> <p><i>Commercial and industrial developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</i></p>
Opencast Mining and stockpile area	4.9ha	X	<p>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 35 (Mining and Stockpile area):</p> <p><i>The expansion of residential, retail, recreational, tourism, commercial or institutional developments on land previously used for mining or heavy industrial purposes, where the</i></p>

			<p><i>increased development footprint will exceed 1 000 square meters; excluding—</i></p> <p><i>(i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or</i></p> <p><i>(ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or</i></p> <p><i>(iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.</i></p>
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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)

The area earmarked for the proposed development is situated on the remaining extent of portion 2 of the farm Witkloof 408 is situated approximately 0.7 km East of the R33, 14.55km North-West of Carolina, Mpumalanga Province. The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry.

The GPS coordinates of the proposed mining area are as follow:

Preferred Alternative	
Decimal Degrees	Degrees; Minutes: Seconds
<ul style="list-style-type: none"> ■ A – 25.964892°S; 30.023357°E ■ B – 25.966291S; 30.021705°E ■ C – 25.967790°S; 30.023021°E ■ D – 25.966602°S; 30.024680°E 	<ul style="list-style-type: none"> ■ A 25°57'53.61"S 30° 1'24.09"E ■ B 25°57'58.65"S 30° 1'18.14"E ■ C 25°58'4.04"S 30° 1'22.88"E ■ D 25°57'59.77"S 30° 1'28.85"E

ALTERNATIVE SITE DESCRIPTION

The following alternative site was assessed for the proposed mining but found not environmentally and practically suitable. The site still has a green status and the natural area will need to be disturbed for the quarry to be established.

Site Alternative	
Decimal Degrees	Degrees; Minutes; Seconds
<ul style="list-style-type: none"> ■ A -25.966287°S 30.021722°E ■ B -25.968253°S 30.023456°E ■ C -25.969258°S; 30.022011°E ■ D -25.967659°S; 30.020373°E 	<ul style="list-style-type: none"> ■ A 25°57'58.63"S 30° 1'18.20"E ■ B 25°58'5.71"S 30° 1'24.44"E ■ C 25°58'9.33"S 30° 1'19.24"E ■ D 25°58'3.57"S 30° 1'13.34"E

An application for a mining permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [MPRDA] was submitted to the Department of Mineral Resources (DMR).

The proposed project triggers the following listed activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] and the Environmental Impact Assessment (EIA) Regulations (as amended by GNR 326 effective 7 April 2017), and therefore requires a basic assessment process to obtain environmental authorisation:

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 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 [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]*

(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 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 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.*

■ GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 27:

The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.

■ GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 28:

Commercial and industrial developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

■ GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 35:

The expansion of residential, retail, recreational, tourism, commercial or institutional developments on land previously used for mining or heavy industrial purposes, where the increased development footprint will exceed 1 000 square meters; excluding—

- (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or*
- (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or*
- (iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.*

Other legislation triggered by the proposed project includes:

- An application for a Mining Permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) has been submitted to the Department of Mineral Resource.

Site Establishment / Construction phase:

During the site establishment phase the applicant have to fence the footprint area and clear the topsoil from the applied area, it should be noted that there is very little topsoil on site.

Upon stripping, the topsoil will be stockpiled along the boundaries of the mining area to be used during the rehabilitation phase. Topsoil stripping will be restricted to the areas to be used for aggregate stockpiling and mining. The complete A-horizon (topsoil – 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 has to be stripped. The topsoil will be stockpiled in the form of a berm alongside the boundary of the mining area where it will not be driven over, contaminated, flooded or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and should be planted with indigenous grass species if vegetation does not naturally establish within 6 months of stockpiling to prevent soil erosion and to discourage growth of weeds. The roots of the grass will also improve the viability of the soil for rehabilitation purposes.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment; and
- Mobile crushing and screening plants.

Operational phase:

The proposed mining site will be an extension of the existing quarry pit previously distributed by stone aggregate mining activities. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, the material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 4.9ha is extent and the applicant, B&E International (Pty) Ltd, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Carolina area.

The stockpiling process includes mechanical loading and transportation of the sought aggregate. As mentioned previously the aggregate will be loaded with a front end loader onto trucks upon which it will be weighed and transported to the client. No crushing or washing will be needed. The stockpiling activities will consist of the following:

- Loading of aggregate;
- Weighing of aggregate; and
- Transportation of aggregate.

A chemical toilet will be established on site to be used by the employees. The existing farm and provincial roads currently used to gain access to the property will be used to transport the aggregate

from the mining site to the client. Haul trucks will travel along the existing farm road up to the provincial/public road. Turning right they will travel along the existing R33 road, as illustrated below.



Figure 1: Satellite view indicating the proposed access road to the mining site

Decommissioning phase:

The closure objectives for the mining area is to be made safe, and the remainder of the site to be returned to agricultural use. The perimeter of the site will be subject to 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.

Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding (if applicable) has been done in an area.

Site management will implement an alien invasive plant management plan during the 12 months' aftercare period to address germination of problem plants in the area.

The decommissioning activities will consist of the following:

- Landscaping during rehabilitation;
- Replacing of topsoil; and
- Implementation of an alien invader plant management plan.

e) Policy and Legislative Context

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p> <p>(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)</p>	<p>REFERENCE WHERE APPLIED</p>	<p>HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</p> <p>(E.g. in terms of the National Water Act a Water Use License has/has not been applied for)</p>
<p>Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002)</p> <ul style="list-style-type: none"> • Section 27 	<p>Application for a Mining Permit Ref No: MP 30/5/1/3/2/11433MP</p>	<p>Act No. 28 of 2002 Section 27</p>
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017</p>	<p>Application for environmental authorisation Ref No: MP 30/5/1/3/2/11433MP</p>	<p>GNR 327 Listing Notice 1 Activity 21, 22, 27, 28 and 35</p>
<p>National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) and amendments</p>	<p>Biophysical Environment</p>	<p>Weed / Alien vegetation clearing</p>
<p>Mine Health and Safety Act, 1996 (Act No 29 of 1996)</p>	<p>The mitigation measures proposed for the site includes specifications of the MHSA</p>	<p>The operational phase of the site will trigger the MHSA</p>
<p>National Heritage Resources Act No. 25 of 1999</p>	<p>Cultural and Heritage Environment</p>	<p>No aspects of the project could be identified that triggers the NHRA.</p>
<p>Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)</p>	<p>Biophysical Environment</p>	<p>No aspects on site could be identified that needs protection in terms of the MCA.</p>
<p>Albert Luthuli Local Municipality Spatial Planning and Land Use Management By-law 2015</p>	<p>Part A(iv)(1)(b) Description of the current land uses</p>	<p>The applicant will submit an application for temporary departure from the zoning</p>

Mpumalanga Town Planning and Land Related By-Laws, 2016		provisions in terms of the Land Use Planning Act 3/2014 and the Albert Luthuli Local Municipal Land Use Bylaws 2016 prior to commencement of the proposed activities.
Albert Luthuli Local Municipality Integrated Development Plan	Part A(iv)(1)(b) Description of the current land uses	

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)

The increase in building, construction and road maintenance projects in the vicinity of the property triggered the need of the applicant to trade with the available aggregate. The proposed mining will also contribute to the diversification of activities on the property, extending it from agriculture to include small scale mining.

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

The proposed site earmarked for the mining of the loose aggregate will entail an area previously used for mining. The proposed site was identified as the preferred alternative due to the following reasons:

- The mining site offers the mineral sought after;
- The mineral to be mined is already in aggregate form and will not need to be blasted in order to loosen the material;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to R33. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and

contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

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.

The applicant identified two alternative sites for the proposed mining activity namely:

1. **Site Alternative 1 (S1) (Preferred Alternative):** The Applicant, B&E International intends to apply for a mining permit, 4.9ha, on the remaining extent of portion 2 of the farm Witkloof 408, within the boundaries of the following GPS Coordinates:

Preferred Alternative	
Decimal Degrees	Degrees; Minutes: Seconds
<ul style="list-style-type: none"> 📍 A – 25.964892°S; 30.023357°E 	<ul style="list-style-type: none"> 📍 A 25°57'53.61"S 30° 1'24.09"E
<ul style="list-style-type: none"> 📍 B – 25.966291S; 30.021705°E 	<ul style="list-style-type: none"> 📍 B 25°57'58.65"S 30° 1'18.14"E
<ul style="list-style-type: none"> 📍 C – 25.967790°S; 30.023021°E 	<ul style="list-style-type: none"> 📍 C 25°58'4.04"S 30° 1'22.88"E
<ul style="list-style-type: none"> 📍 D – 25.966602°S; 30.024680°E 	<ul style="list-style-type: none"> 📍 D 25°57'59.77"S 30° 1'28.85"E



Figure 2: Satellite view showing the position of Site Alternative 1.

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

- The mining site offers the mineral sought after;
- The proposed footprint area was previously used for mining therefore very little indigenous vegetation needs to be disturbed in order to establish the mining area;
- The mining site is more than 14.55km away for the town of Carolina, and will not affect the community with regards to dust and noise;
- The mineral to be mined is already in aggregate form and will not need to be blasted in order to loosen the material;
- The mining area can be reached by an existing farm access road that connects to R33. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins

until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

2. **Site Alternative 2 (S2):** Site Alternative 2 entails the mining of a 4.9 ha area within the boundaries of the following GPS Coordinates:

Site Alternative	
Decimal Degrees	Degrees; Minutes; Seconds
<ul style="list-style-type: none"> ➤ A -25.966287°S 30.021722°E ➤ B -25.968253°S 30.023456°E ➤ C -25.969258°S; 30.022011°E ➤ D -25.967659°S; 30.020373°E 	<ul style="list-style-type: none"> ➤ A 25°57'58.63"S 30° 1'18.20"E ➤ B 25°58'5.71"S 30° 1'24.44"E ➤ C 25°58'9.33"S 30° 1'19.24"E ➤ D 25°58'3.57"S 30° 1'13.34"E



Figure 3: Satellite view showing the position of Site Alternative 2

The applicant investigates the possibility of establishing the proposed mining area next to the old mining area, to be located closer to the haul road to cut down on transport cost. This alternative was however found **not** to be the **preferred** alternative due to the following reasons:

- The site alternative will counteract the visual aesthetic value of the area by being closer to the road;
- The site has not been previously disturbed before; thus the natural area needs to be cleared and is not preferred with regards to sustainable development; and

- In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it.

3. No-go Alternative:

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The aggregate to be stockpiled at the site will be used for road and construction industries, if however, the no-go alternative is implemented the applicant will not be able to utilize the mineral present in the area.

This could have major impacts on aspects such as transporting of material to construction sites from far off mining areas, cost effectiveness of material, impact on roads and road users due to long distance hauling of gravel and loss of income to the Carolina- Belfast business area due to the multiplier effect.

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

- The applicant will not be able to supply in the demand of road or construction contractors,
- The application, if approved, would allow the applicant to utilize the available aggregates as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the applicant, potential employees and clients,
- The applicant will not be able to diversify the income of the property.

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.

The stakeholders and I&AP's were informed of the project by means of I&AP comment/notification letters that were either delivered by hand or sent directly to the contact persons. A 30 days commenting period were allowed which extended from the 2nd of June 2017 to 3rd July 2017. The following I&AP's and stakeholders were contacted to obtain their comments:

INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
<ul style="list-style-type: none"> • Kobus Papenfus 	<ul style="list-style-type: none"> • Mr. CA Habile (Gert Sibande District Municipality)

<ul style="list-style-type: none"> • Mr & Mrs Willie and Cora Cronje • Mr. Gawie van Rensburg • Koos Engelbrecht • Leona Morgan 	<ul style="list-style-type: none"> • Mr. Phiwokuhle Brian Nkosi (Gert Sibande District Municipality) • Mr. Mulaudzi Orbert (Gert Sibande District Municipality) • Cllr VL Nkosi (Gert Sibande District Municipality) • Mr Kunene (Gert Sibande District Municipality) • Ms. P Xulu (Department of Agriculture, Rural Development, Land & Environmental Affairs) • Me Pumelo Thabile Mahlaku (Department of Economic Development, Environment and Tourism) • Mr Maluleka (Department of Economic Development Environment and Tourism – Environmental Impact Management) • Mr. Mathew Mohlasedi (Department of Public Works, Roads and Transport, South African Heritage Resource Agency) • Ms Zithini Dlamini (Department of Rural Development and Land Reform) • Mr. Richard Makoena (Department of Labour) • Mr. M Mulaudzi (Department of Water and Sanitation) • South African Heritage Resource Agency
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On-site notices were placed at the site entrance on the R33 and in town at the local public library/municipality. The project was also advertised in the Highveld Tribune on the 29th of May 2017. The stakeholders and I&AP's will be notified of the availability of the Draft Basic Assessment Report for their perusal. A 30 days commenting period will be allowed for the perusal of the document. Comments received on the document will be added to the Final Basic Assessment Report to be submitted to DMR for review. See attached as Appendix E proof that the stakeholders and I&AP's were contacted.

iii) Summary of issues raised by I&APs

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

Interested and Affected Parties	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.
<p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>				
AFFECTED PARTIES				
Landowner/s	X			
• Mnr. Kobus Papenfus	X	No comments received	No objections	N/A
Lawful occupier/s of the land				
•				
Landowners or lawful occupiers on adjacent properties	X			
• Mr & Mrs Willie & Coral Cronje	X	9 June 2017	No objections	N/A
• Mr Gawie van Rensburg Upheatpropos 1097CC	X	No comments received	N/A	N/A
• Mr Koos Engelbrecht Omnia Group Pty Ltd	X	30/06/2017	Mr. Engelbrecht asked to which site the quarry will be expanded. And not to be included in further correspondence regarding the project.	The quarry will be expanded to the R33 side. Noted.
• Mrs Leona Morgan	X	No comments received	N/A	N/A
Municipal councillor				
Gert Sibande District Municipality Ward 21 councillor VL Nkosi	X	No comments received	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.	
Municipality					
Gert Sibande District Municipality Municipal Manager – Mr CA Habile	X	No comments received	N/A	N/A	N/A
Gert Sibande District Municipality Senior Manager: Planning Mr Phowokule Brian Nkosi	X	No comments received	N/A	N/A	N/A
Gert Sibande District Municipality GraduateTown &Regional Planner Mr. Mulaudzi Orbert	X	No comments received	N/A	N/A	N/A
Gert Sibande District Municipality Mr. Kunene	X	No comments received	N/A	N/A	N/A
Albert Luthuli Local Municipality Municipal Manager	X	No comments received	N/A	N/A	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Department of Public Works, Roads and Transport – Head of Department Mr Mathew Mohlasedi	X	No comments received	N/A	N/A	N/A
Communities					
Dept. Land Affairs					
Department of Agriculture, Rural Development, Land & Environmental Affairs Ms S.P. Xulu	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.	
Department Of Rural Development and Land Reform – Assistant Director Ms. Zithini Dlamini	X	No comments received	N/A	N/A	N/A
Traditional Leaders					
Dept. Environmental Affairs					
Department of Agriculture, Rural Development, Land & Environmental Affairs Ms S.P. Xulu	X	No comments received	N/A	N/A	N/A
Department of economic Development, Environment and Tourism Me Pumelo Thabile Mahlaku	X	No comments received	N/A	N/A	N/A
Department of economic Development, Environment and Tourism – Environmental Impact Management Mr. Maluleka	X	No comments received	N/A	N/A	N/A
Other Competent Authorities affected					
Department of Labour Mr. Richard Mokoena	X	13 July	<ul style="list-style-type: none"> BID has been referred to the office of Occupational Health and Safety Principle Inspector for further processing 	Noted.	N/A
Department of Water and Sanitation Chief Director Mr. M. Mulaudzi	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.
South African Heritage Resource Agency	X	8 July 2016	South African Heritage Resource Agency requested: <ul style="list-style-type: none"> • Upload of application on to SAHRIS 	The following response is offered to South African Heritage Resource Agency: <ul style="list-style-type: none"> • Uploaded onto SAHRIS: 26 June 2017 	N/A
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

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)

Geology:

Karoo-aged strata of the Karoo Supergroup, comprising, in this area, the Beaufort Group, conformably overlain by the Vryheid Formation of the Ecca Group. Sediments of the Karoo Supergroup were deposited unconformable over an undulating pre-Karoo basement. The pre-Karoo consists of both felsite and diabase intrusive associated with the Transvaal Supergroup and the Bushveld Igneous Complex, respectively. Group in age in the Karoo super group. The mudrocks, coals and sandstones of the Vryheid Formation were deposited in a delta plain depositional environment. There is a possibility that Quaternary alluvial deposits may be present along the banks of water courses. Site specific geology includes the group of the Madzaringwe Formation (Karoo Supergroup) or the intrusive Karoo Suite dolerites which feature prominently in the area.

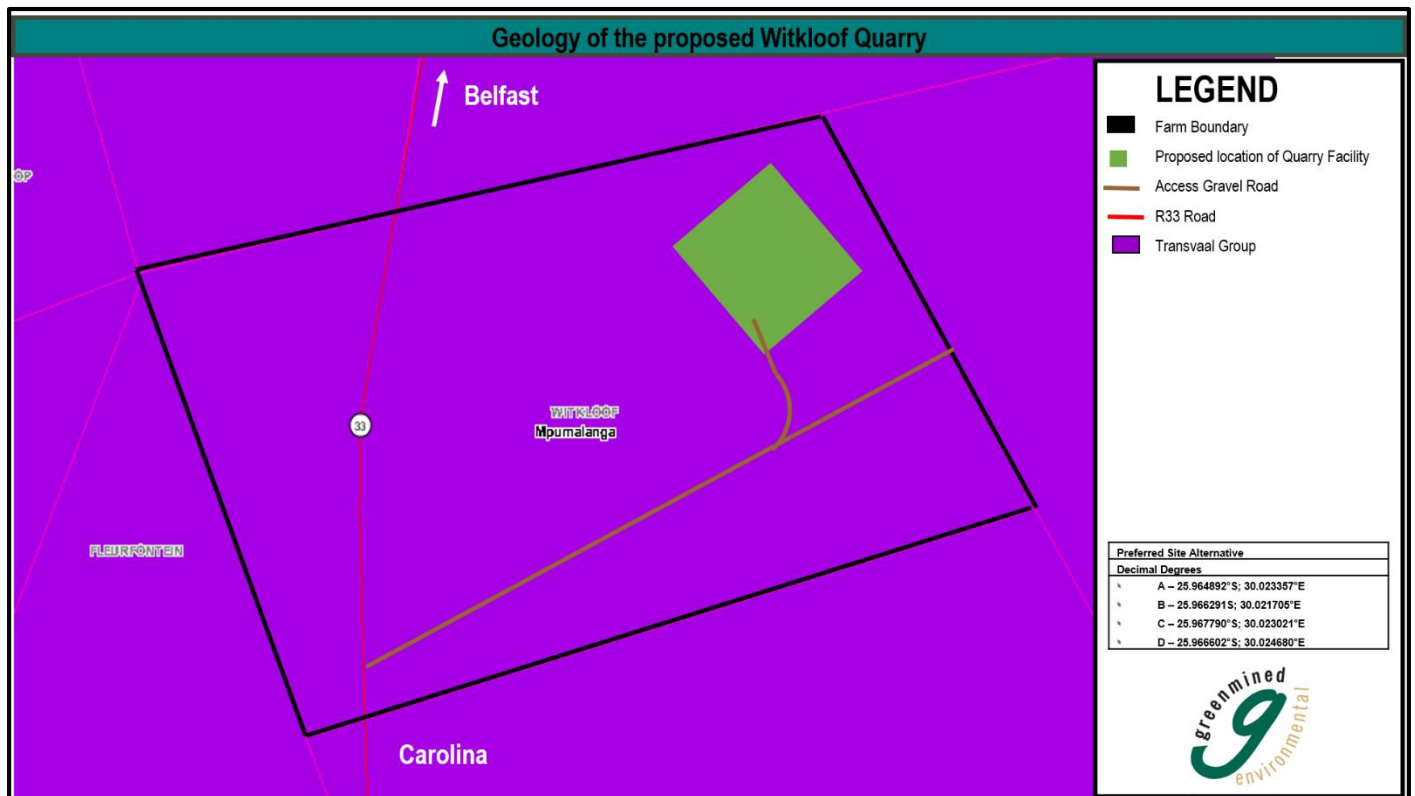


Figure 4: Geology of the Proposed Witkloof Quarry.

Topography:

The topography of the area consists out of open low hills / ridges/ the northern area of the site consists out of rolling/ irregular plans with high hills or ridges.

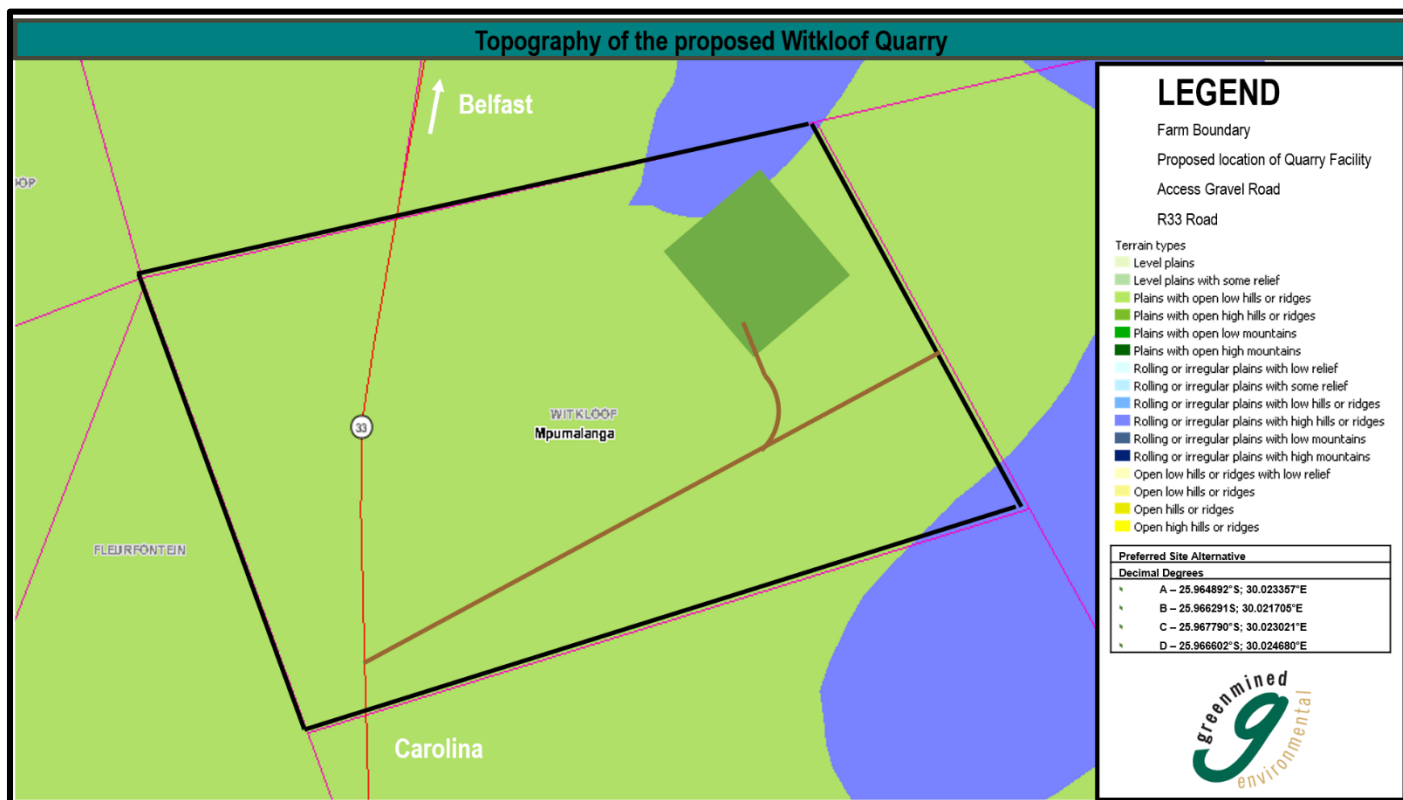


Figure 5: Topography of the Proposed Witkloof Quarry.

Soil, Land Use and Land Capability:

Red to yellow sandy soils of the Ba and B.D land types. The topsoil is between 0 -300mm deep.

The surrounding land uses includes agricultural land and open veldt. Slightly to moderately undulating plains, including some low hills and pan depressions.

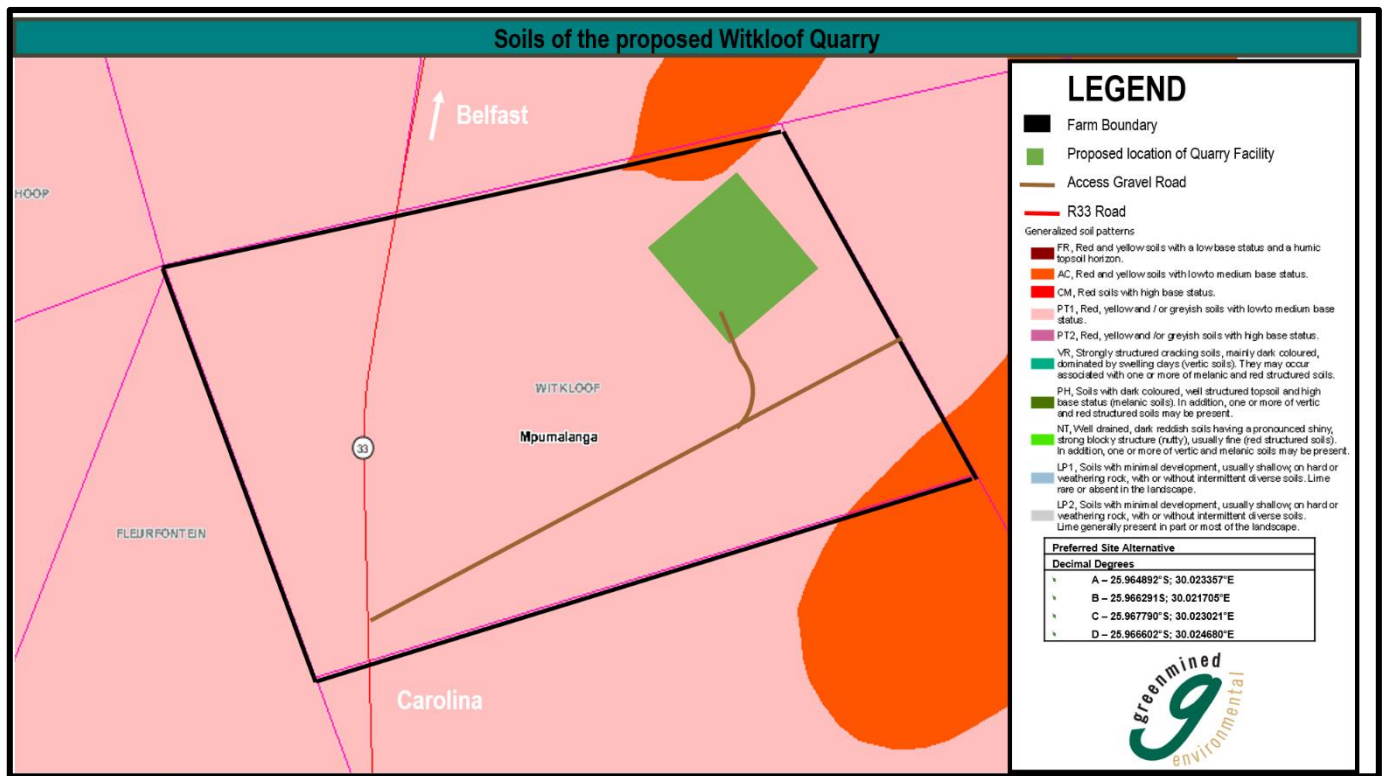
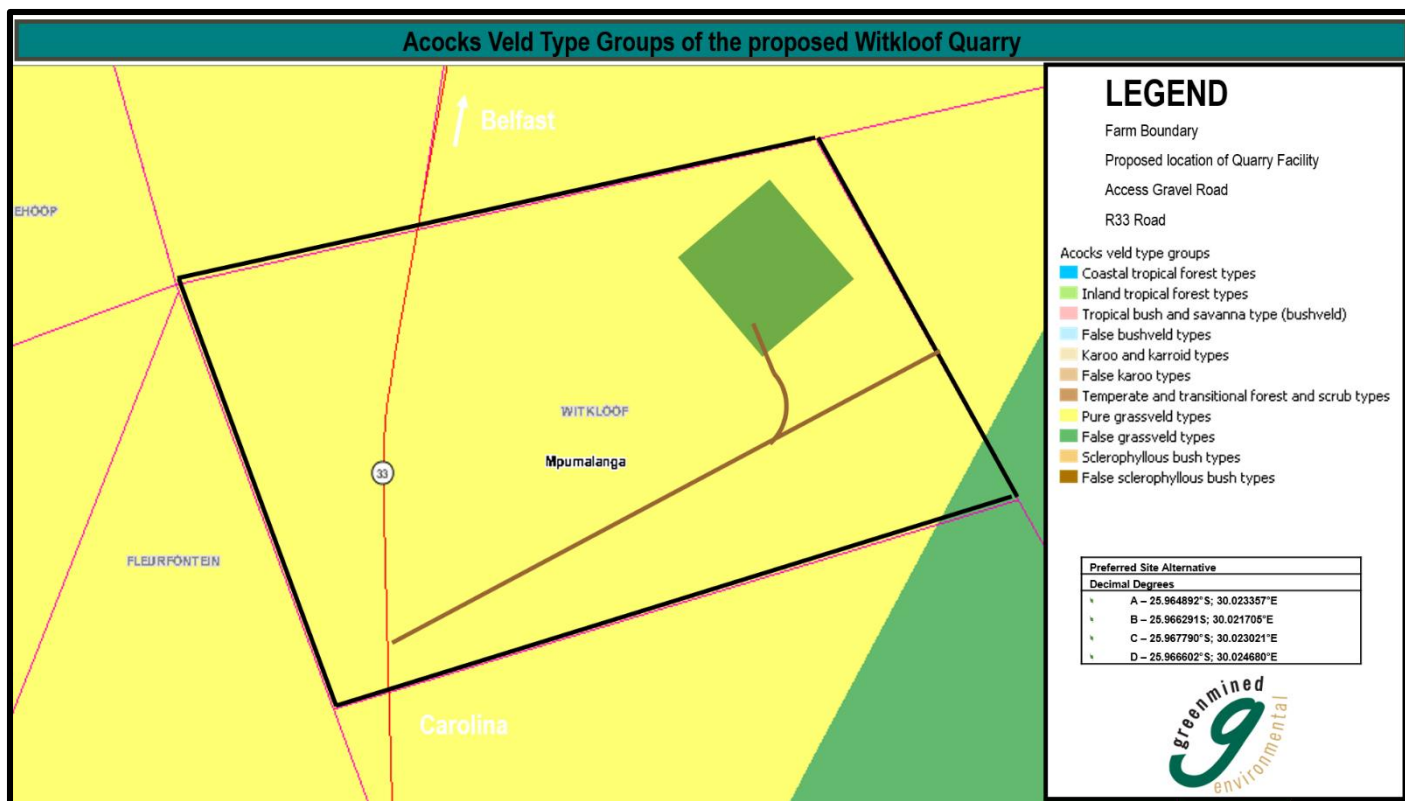


Figure 6: Soil Patterns of the Proposed Witkloof Quarry.

The land capability of the farm consists out of high potential arable land to very high potential arable land. The northern side where the wetland is located is not arable.

Natural Vegetation:

The proposed mining area fall within the Grassland Biome, specifically the KaNgwane Monate Grassland. According to Acocks veld groups, the area is classified as pure grassveld types and false grassveld types (in the south eastern boundary). The Nooitgedacht Dam Nature reserve is located approximately 2.6km east of the proposed quarry. SANBI list the area as an ecological support area, with a critical biodiversity (CBA irreplaceable).



The vegetation is short dense grasslands dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis racemosa*, *Themenda triandra*, *Tristachye leucothrix* etc.), with small scattered rocky outcrops with wiry, sour grasses and some woody species.

The site earmarked for the proposed mining activity has previously been used for aggregate mining purposes. Although some indigenous vegetation did re-establish through succession the vegetation of the area can be described as disturbed with a high invasion of alien invader plants.

No red data or protected plants could be identified in the proposed footprint area of the mining area.

Fauna:

The Nooitgedacht Dam Nature reserve is located approximately 2.6km east of the proposed quarry. The Nooitgedacht Dam Reserve, in which a number of important ecosystems, and the wildlife it supports, are protected. The wetlands in the area also support a host of birds, over 200 species have been spotted in the nature reserve which includes rare and endemic species.

The resident fauna found during the site inspection mainly comprised of birds such as doves, starlings, sparrows and crows as well as commonly found insects, reptiles and a few small mammals. No protected or red data specie could be identified to be resident within the footprint area of the proposed mining area.

The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers must be educated and managed to ensure that no fauna at the site is harmed. Upon commencement of the proposed mining activities, the mining area must be fenced to prevent livestock, such as cattle and sheep, grazing on the area falling into the quarry.

Surface and Ground Water:

The proposed quarry falls within the Inkomati Water Management Area. The water management area extends over several parallel river catchments which all drain in a general easterly direction, and flow together at the border with Mozambique or within Mozambique, to form the Inkomati River which discharges into the Indian Ocean immediately north of Maputo. A special situation is presented by the Komati River, the most southern tributary of the Inkomati, which rises in South Africa and flows into Swaziland, then re-enters South Africa where it is joined by the Crocodile River at the border with Mozambique, before flowing into Mozambique as the Inkomati. The Sabie River is the other main river in the water management area and flows into Corumuna Dam in Mozambique just downstream of the border with South Africa, and upstream of its confluence with the Inkomati River. The proposed quarry falls within the quaternary catchment area of X11C.

A tributary to the Komati river flows approximately 1.82km north east of the proposed mining area. As the mining activities will be contained within the boundaries of the area the tributary should not be affected by the project. No river diversions will be needed. There is a wetland (unchannelled valley bottom located in the north eastern corner of the property).

Ground water will not be affected with this activity of mining. Although the depth of the groundwater is unknown it is presumed to be deeper than 5m as the existing quarry pit has been mined to 5m and groundwater was not intersected. Mining at the proposed site is expected to be up to a maximum depth of 10m and therefore the impact on the groundwater will need continuous monitoring should ground water be intersected.

Air Quality:

The background air quality of the surrounding area is highly impacted on by vehicles travelling along the R33. Given the surrounding extent of mostly covered vegetated areas, no extreme dust generation under windy conditions is experienced.

Emission into the atmosphere is controlled by the National Management: Air Quality Act, 2004. The proposed activity at the site will however not trigger an application in terms of the Air Quality Act as the emissions to be produced at the mining site will only entail dust generation due to the disturbance of soil. Dust will be generated by the movement of earthmoving equipment, the loading of material and transporting of material from site.

The trucks driving on site has to comply with the speed limit and since the material is coarse and heavy, minimal dust is generated during the transportation of material from the quarry. Loads will be flattened to

ensure that minimal spillage of the material takes place during transportation. Topsoil stockpiles will be planted with indigenous grass species to ensure that exposed surface areas are minimised, reducing windblown dust from the site. The vegetation will also assist in capturing wind born dust and minimising the spread of dust from the site.

Dust generation on the access and haul roads as well as mechanical excavation can be managed through the implementation of dust suppression measures via water carts and a sprinkler system. The applicant has to conduct formal dust monitoring on site to provide management with an effective management tool for mitigating the impact of the mining activity on the surrounding environment with regard to dust pollution.

Ambient Noise:

The background noise level of the surrounding area is highly impacted on by traffic travelling along the R33 road passing the property.

Due to the nature of the proposed activity, noise will be generated as a result of mechanical excavation including activities such as drilling.

The site will be limited to one blast as the mineral is already in aggregate form. The limit for the air blast or “noise” generated by a blasting event is 134dB. Blasting noise is instantaneous and of short duration. If the blast is designed so that the maximum amount of energy released by the explosive goes into breaking and displacing the rock, the air blast is limited.

It is anticipated that blasting will occur once if needed. Site management has to notify the surrounding landowners in writing prior to blasting occasions. In order to minimise the noise impact, blasting has to occur between 8:00 and 15:00 Monday – Fridays.

The nuisance value of noise generated by heavy earthmoving equipment for residence in the near vicinity is deemed to be of low – medium significance, as the mine is expected to be operational 24 hours a day for 6 days a week. The distance of residents from the mining area (>2 km) will however assist in the mitigation of the noise impact. All mining vehicles 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).

Archaeological and Cultural Interest:

No sites of archaeological or cultural importance were identified at the proposed mining area during the site inspection (Consultants, 2017). The area was previously used for mining and no areas of cultural importance could be identified within the footprint area of the site.

The rocks of the Magaliesburg formation are not known to be fossiliferous anywhere throughout their extent. The presence of spores and pollens has been noted previously elsewhere within the sediments of the Dwyka Group by the author, as well as other workers. Rare plant remains of the Glossopteris Flora and anthropoid trackways have also been noted (Services, 2017).

Visual Exposure:

Due to the current mining disturbance nearby the area the site has a low aesthetic value. The proposed mining area will be visible from R33 passing the property and will therefore have a visual impact on the immediate surrounding area.

The applicant should ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the stockpile area. Upon closure of the mining area and decommissioning of the site, the area should be fully rehabilitated and all exposed areas should be seeded to enhance vegetation recovery should natural vegetation not establish within six months of completion of rehabilitation.

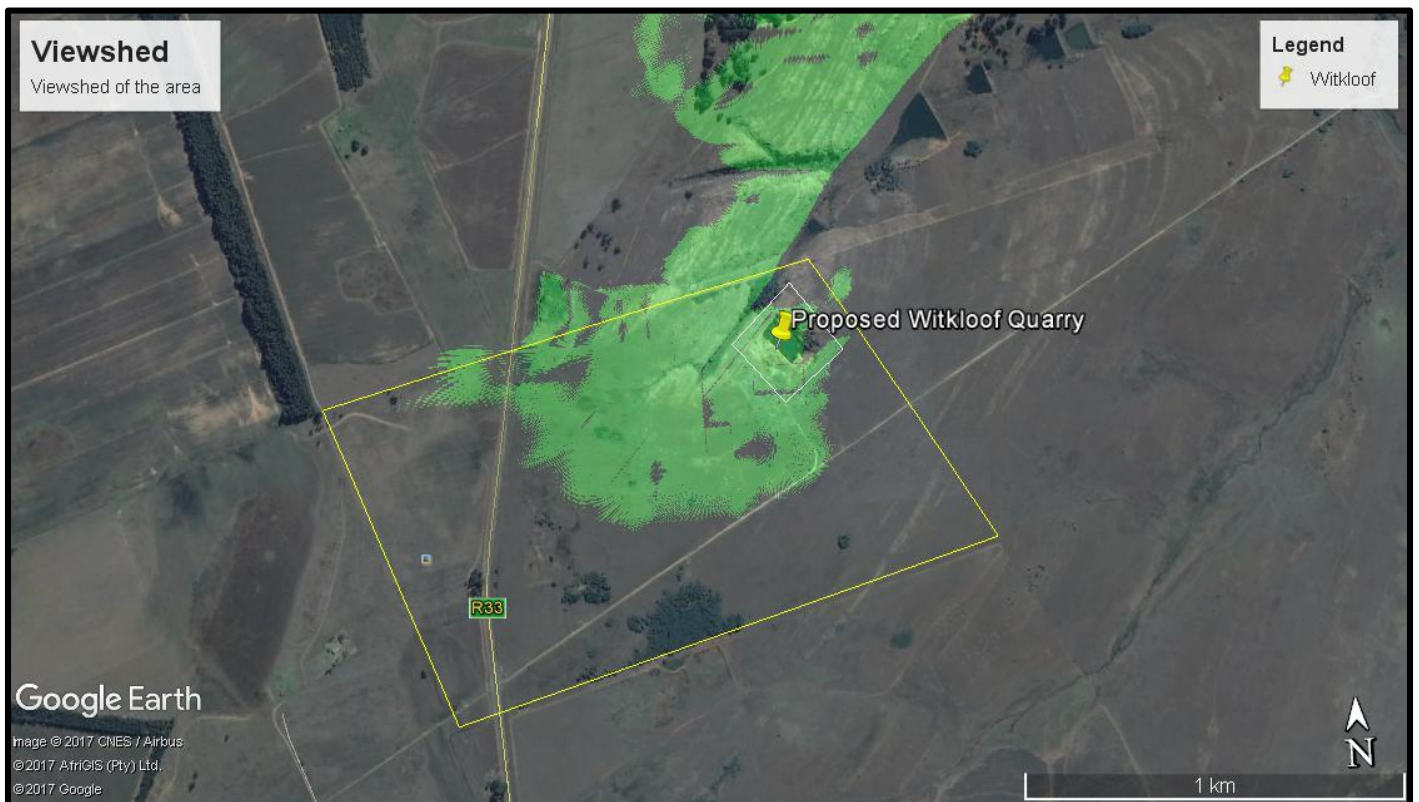


Figure 7: View shed of the proposed Quarry

(b) Description of the current land uses.

The remaining extent of portion 2 of the farm Witkloof 408 JT, Carolina, Mpumalanga Province is situated in an agricultural and mining setting to the east of the R33. The land use of the property comprises of the following:

- Agriculture – Mainly grazing
- Mining – Signs of previous mining activities for aggregate is evident on the farm.

The land use of the surrounding properties comprises of the following:

- Industrial – NONE
- Residents – Residents are situated 1.4km south and 1.4km south east of the mining site

- Transport – Farm road is located 310 m from the proposed quarry, that is connected to the R33 (±1.0 km away)
- Agriculture – Grazing

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

The proposed mining area is approximately 4.9ha in extent and the applicant, B&E International (Pty) Ltd, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Carolina area.

The existing infrastructure within 500 m of the proposed mining area is the Gravel Access Road, R33 and old quarry pit. The provincial road (R33) is approximately next to the proposed mining area. There is power line infrastructure on the property, but will not be affected as it is more than 100m away and blasting will be limited to one blast.

The impact of the proposed mining area on the infrastructural features of the surrounding area is deemed to be of low significance as the impact of the mining activity will be concentrated within the 4.9 ha footprint area of the mine.

In order to mitigate the potential impact on the surface or ground water. Storm water management will be implemented on-site. Storm water will be channelled around the mining area to prevent possible contamination of clean water flowing over dirty areas. If this is implemented the proposed activity is not expected to have a negative effect on the surface or ground water in the vicinity.

(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 C.

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. 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.

STRIPPING AND STOCKPILING OF TOPSOIL:

Visual intrusion associated with the establishment of the mining area

Rating: Low - Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	2	2	2.00	2	5	3.5	7.00

Dust nuisance caused by the disturbance of the soil

Rating: Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Noise nuisance caused by machinery stripping and stockpiling the topsoil

Rating: Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.33	5	5	5	11.67

Infestation of the topsoil heaps by weeds or invader plants

Rating: Low – Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.33	3	5	4	9.33

Loss of topsoil due to incorrect storm water management

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1		2.67	3		

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1		2.67	3		

BLASTING:

Health and safety risk posed by blasting activities

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1		1.67	1		

Dust nuisance caused by blasting activities

Rating: Low

Degree of Mitigation: Not Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	1		1.33	1		

Noise nuisance caused by blasting activities

Rating: Low

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	2		1.67	1		

EXCAVATION:

Visual intrusion associated with the excavation activities

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2		2.67	3		

Dust nuisance due to excavation activities

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		

2	4	2	2.67	4	5	4.5	12.00
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Noise nuisance generated by excavation equipment

Rating: Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Contamination of surface or groundwater due to effluent runoff from excavation area

Rating: Low - Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
3	4	3	3.33	2	1	1.5	5.00

Unsafe working conditions for employees

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.33	3	3	3	7.00

Negative impact on the fauna and flora of the area

Rating: Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	5	4	10.67

Potential damage to cultural or heritage aspects

Rating: Low Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	1	1	1	2.67

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	4	3.5	9.33

Weed and invader plant infestation of the area

Rating: Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

Crushing And Screening:

Visual intrusion associated with the crushing/screening activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	5	5	5	13.33

Dust nuisance due to crushing/screening activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Noise nuisance caused by vehicles

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

LOADING AND TRANSPORTING:

Visual intrusion associated with the crushing/screening activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	2	3.00	4	4	4	12.00

Loss of topsoil due to ineffective storm water handling

Rating: Low - Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.67	2	2	2	5.33

Infestation of the area by weed and invader plants

Rating: Low - Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.67	4	2	3	8.00

Dust nuisance due to loading and vehicles transporting the material

Rating: Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Degradation of access roads

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	2	2.5	6.67

Noise nuisance caused by vehicles

Rating: Low - Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	2	2.5	6.67

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

SLOPING AND LANDSCAPING DURING REHABILITATION:

Soil erosion

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	4	3.5	9.33

Health and safety risk posed by un-sloped areas

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Dust nuisance caused during sloping and landscaping activities

Rating: Low - Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	3	1	2.00	4	3	3.5	7.00

Noise nuisance caused by machinery

Rating: Low - Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	3	3.5	9.33

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

REPLACING OF TOPSOIL AND REHABILITATION OF DISTURBED AREA:

Loss of reinstated topsoil due to the absence of vegetation

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Infestation of the area by weed and invader plants

Rating: Low - Medium Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Cumulative Impacts:

Additional traffic on the local roads during operational phases

Rating: Low - Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	2	2.67	4	4	4	10.67

The influx of people into the area during the operational phases;

Rating: Low - Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Socio-economic and cultural impacts:

Dust nuisance due to the liberation of dust during the mining process

Rating: Low - Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	1	2.33	3	4	3.5	8.17

Noise nuisance caused by mining activities

Rating: Low – Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	1	2.33	3	4	3.5	8.17

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:

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood}$$

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.

Table 1 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 1: Rating of Severity

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignifiant / 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.

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.

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/neighboring farm area
5	Regional, National, International

Determination of Overall Consequence

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

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.

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.

Rating of Probability:

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

Rating	Description
5	Daily / highly likely / definitely

Overall Likelihood

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

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.

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.

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	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.

Significance	Low	Low-Medium	Medium	Medium-High	High
			risk to company		
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 or 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)

Site Alternative 1 (S1) (Preferred Alternative):

Positive Impacts:

- The mining site offers the mineral sought after;
- The mineral to be mined is already in aggregate form and will not need to be blasted in order to loosen the material;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to R33. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

Negative Impacts:

- Due to the remote location of the mining area very little negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

Site Alternative 2 (S2)

Positive Impacts:

- The site is near the mineral sought after;
- The alternative area will not have to compete with other land uses as all the activities can be contained within the boundaries of the site. Upon closure of the mining area, the land will revert back to agriculture; and
- The aggregate to be mined will be used for the upgrading of the roads in the vicinity of the activity. The alternative mining area will therefore contribute to the upgrading/maintenance of infrastructure in and around Carolina-Belfast area and indirectly contribute to the economy of the area.

Negative Impacts:

- The site alternative will counteract the visual aesthetic value of the area by being closer to the road;
- The site has not been previously disturbed before; thus the natural area needs to be cleared and is not preferred with regards to sustainable development;
- In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it;
- The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding land users if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

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)

Visual Mitigation:

The risk of the proposed mining activity having a negative impact on the aesthetic quality of the surrounding environment can be reduced to a low – medium risk through the implementation of the mitigation measures listed below:

- The site needs to have a neat appearance and be kept in good condition at all times.
- Upon closure the site needs to be rehabilitated to insure that the visual impact on the aesthetic value of the area is kept to a minimum.

Dust Handling:

The risk of dust, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust.
- Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.

Noise Handling:

The risk of noise, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- 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 Road Transport Act.

Management of weed or invader plants:

The risk of weeds or invader plants invading the disturbed area can be reduced to being low through the implementation of the mitigation measures listed below:

- A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
- The temporary topsoil stockpiles need to be kept free of weeds.

Storm water Handling:

The risk of contamination through dirty storm water escaping from work areas, or erosion or loss of stockpiled topsoil caused due to uncontrolled storm water flowing through the mining area can be reduced to being low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the topsoil heaps, and access roads to prevent erosion and loss of material.
- 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:
 - Runoff water should be diverted around the site areas with trenches and contour structures to prevent erosion of the work areas.
 - 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.
 - The 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 the storm water management plan.

Handling of Hazardous Materials and Substances:

- All hazardous materials or substances should be stored in a closed storage facility with an impermeable floor.
- The storage area should meet the following conditions:
 - The storage area should be constructed on a level area to prevent offsite migration of any spilled product.
 - The floor of the storage area should be impermeable to prevent seepage of spilled products into the ground or ground water.
 - The storage area should be out of the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest.
 - The facility should be such that access to the materials/substances can only take place with the prior notification of an appropriate staff member.
- All fuel storage tanks should have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. This bund capacity should 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 should also be taken into consideration to ensure that any spillage does not result in oil spouting beyond the confines of the bund.
- The site manager should 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 should be inspected at least weekly and any accumulated rainwater removed. All valves and outlets should be checked to ensure that they are intact and closed securely.
- The bund base must slope towards a rainwater sump of sufficient size.
- Contaminated water may not be allowed to mix with clean water, and contained until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility.
- Drip trays should be available to be placed underneath all stationary equipment or vehicles.
- The layer of material at the vehicle service area should be removed and if contaminated with hazardous substances such as hydrocarbons should be disposed of as hazardous waste by an appropriately qualified waste handling contractor. The compacted areas should be ripped and the topsoil returned over the area.
- The site should be cleared of all hazardous substances once decommissioning has been completed and should be disposed of by an appropriately qualified waste handling contractor.

Waste Management:

The risk of waste generation having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- No waste stockpile area may be established outside the boundaries of the mining area.
- Vehicle maintenance may only take place within the service bay area of the off-site workshop.
- The diesel bowser needs to be equipped with a drip tray at all times. Drip trays have to 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.
- 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 recognised facility.
- Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof should be filed.
- Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste.

- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- Biodegradable refuse generated should be handled as indicated above.
- Water from the wash bay should drain into the oil sump from where it should be removed by an approved contractor.
- Drip trays should be available to be placed underneath all stationary equipment or vehicles.
- Waste material of any description, including receptacles, scrap, rubble and tyres, should be removed entirely from the mining area and disposed of at a recognized landfill facility once decommissioning has been completed. It will not be permitted to be buried or burned on the site.

Management of Health and Safety Risks:

The health and safety risk, posed by the proposed mining activity can be reduced to being low through the implementation of the mitigation measures listed below:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Occupational Health and Safety Act.

Protection of fauna and flora:

The risk on the fauna and flora of the footprint area as well as the surrounding environment, as a result of the proposed mining activity, can be reduced to being low through the implementation of the mitigation measures listed below:

- The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.
- Workers should 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.
- No plants or trees may be removed without the approval of the ECO.
- Clearing of vegetation has to be restricted to the smallest possible area.

Management of Access Roads:

The risk on the condition of the roads, as a result of the proposed mining activities, can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- Storm water should be diverted around the access roads to prevent erosion.
- Erosion of access road: Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas. Rutting and erosion of the access road caused as a result of the mining activity should be repaired by the applicant.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, should be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil should be returned to its original depth over the area.

Topsoil Handling:

The risk of loss of topsoil can be reduced to being low through the implementation of the mitigation measures listed below:

- Where applicable the first 300 mm of topsoil should be removed in strips and stored along the boundary of the mining area. Stockpiling of topsoil must be done to protect it from erosion, mixing with overburden or other material. The topsoil must be used to cover the rehabilitated area and improve the establishment of natural vegetation.
- The temporary topsoil stockpiles should be kept free of weeds.
- Topsoil stockpiles should be placed on a levelled area and measures should be implemented to safeguard the piles from being washed away in the event of heavy rains/storm water.
- Topsoil heaps should 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.
- Should natural vegetation not establish on the heaps within 6 months of stockpiling it should be planted with an indigenous grass species.
- Storm- and runoff water should be diverted around the topsoil stockpiles and access roads to prevent erosion.

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)

B&E International identified the need for gravel/aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier the quarry pit on the property of the applicant has previously been used for mining purposes. In this light the applicant identified the proposed (site alternative 1) area as preferred and only viable site alternative. The facts that the two existing quarries have not yet been mined out and will be extended were found to be the best option contrary to sustainable development in terms of site alternative 2.

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.

STRIPPING AND STOCKPILING OF TOPSOIL:

Visual intrusion associated with the establishment of the mining area

Rating: Low to medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	2	2	2.00	2	5	3.5	7.00

Dust nuisance caused by the disturbance of the soil

Rating: Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Noise nuisance caused by machinery stripping and stockpiling the topsoil

Rating: Medium Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.33	5	5	5	11.67

Infestation of the topsoil heaps by weeds or invader plants

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	1	2.33	3	5	4	9.33

Loss of topsoil due to incorrect storm water management

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

BLASTING:

Health and safety risk posed by blasting activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	1	1	1.67	1	3	2	3.33

Dust nuisance caused by blasting activities

Rating: Low – Medium

Degree of Mitigation: Not Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	1	1	1.33	1	3	2	2.67

Noise nuisance caused by blasting activities

Rating: Low – Medium

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	1	2	1.67	1	3	2	3.33

EXCAVATION:

Visual intrusion associated with the excavation activities

Rating: Medium**Degree of Mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	5	4	10.67

Dust nuisance due to excavation activities

Rating: Medium**Degree of Mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Noise nuisance generated by excavation equipment

Rating: Medium**Degree of Mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Contamination of surface or groundwater due to effluent runoff from excavation area

Rating: Medium**Degree of Mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
3	4	3	3.33	2	1	1.5	5.00

Unsafe working conditions for employees

Rating: Medium – Medium**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.33	3	3	3	7.00

Negative impact on the fauna and flora of the area

Rating: Low**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	5	4	10.67

Potential damage to cultural or heritage aspects

Rating: Low**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	1	1	1	2.67

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.67	3	4	3.5	9.33

Weed and invader plant infestation of the area

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

Crushing And Screening:

Visual intrusion associated with the crushing/screening activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.67	5	5	5	13.33

Dust nuisance due to crushing/screening activities

Rating: Medium-High

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Noise nuisance caused by vehicles

Rating: Medium-High

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

LOADING AND TRANSPORTING:

Visual intrusion associated with the crushing/screening activities

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	2	3.00	4	4	4	12.00

Loss of topsoil due to ineffective storm water handling

Rating: Low-Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.67	2	2	2	5.33

Infestation of the area by weed and invader plants

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.67	4	2	3	8.00

Dust nuisance due to loading and vehicles transporting the material

Rating: Medium high

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Degradation of access roads

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	2	2.5	6.67

Noise nuisance caused by vehicles

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	3	2	2.5	6.67

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	5	4	10.67

SLOPING AND LANDSCAPING DURING REHABILITATION:

Soil erosion

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	4	3.5	9.33

Health and safety risk posed by un-sloped areas

Rating: Medium – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Dust nuisance caused during sloping and landscaping activities

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	3	1	2.00	4	3	3.5	7.00

Noise nuisance caused by machinery

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.67	4	3	3.5	9.33

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

REPLACING OF TOPSOIL AND REHABILITATION OF DISTURBED AREA:

Loss of reinstated topsoil due to the absence of vegetation

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Infestation of the area by weed and invader plants

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.67	3	3	3	8.00

Cumulative Impacts:

Additional traffic on the local roads during operational phases

Rating: Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	2	2.67	4	4	4	10.67

The influx of people into the area during the operational phases;

Rating: Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	2	2.67	4	5	4.5	12.00

Socio-economic and cultural impacts:

Dust nuisance due to the liberation of dust during the mining process

Rating: Low – Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	1	2.33	3	4	3.5	8.17

Noise nuisance caused by mining activities

Rating: Low – Medium

			Consequence			Likelihood	Significance
Severity	Duration	Extend		Probability	Frequency		
2	4	1	2.33	3	4	3.5	8.17

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).

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
<p>Whether listed or not listed.</p> <p>(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.)</p>	<p>(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)</p>		<p>In which impact is anticipated.</p> <p>(E.g. Construction, commissioning, operational Decommissioning closure, post closure.)</p>	<p>If not mitigated.</p>	<p>(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)</p> <p>E.g.</p> <p>Modify through alternative method</p> <p>Control through noise control</p> <p>Control through management and monitoring through rehabilitation.</p>	<p>If not mitigated.</p>

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Demarcation of site with visible beacons.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	N/A	N/A	N/A
STRIPPING AND STOCKPILING OF TOPSOIL	Visual impact due to removal of topsoil.	The visual impact may affect the aesthetics of the landscape.	Operational phase	Low – Medium	<u>Control:</u> Implementation of proper housekeeping	Low – Medium
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Medium	<u>Control:</u> Dust suppression	Low – Medium
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	medium	<u>Control:</u> Noise control measures	Low
	Infestation of the topsoil heaps by weeds and invader plants.	Biodiversity	Operational phase	Low – Medium	<u>Control & Remedy:</u> Implementation of weed control	Low
	Loss of topsoil due to incorrect storm water management	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	Medium	<u>Control:</u> Storm water management	Low – Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste management	Low – Medium
BLASTING	Health and safety risk posed by blasting activities	The impact on health and safety posed by blasting will be contained within the site	Operational phase	low	<u>Control:</u> Implementation of safety control measures	Low
	Dust nuisance caused by blasting activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Low	<u>Control:</u> Dust suppression	Low
	Noise nuisance caused by blasting activities	The noise impact caused by blasting is instantaneous and has a short duration	Operational phase	Low	<u>Control:</u> Noise control measures	Low
EXCAVATION	Visual intrusion associated with the excavation activities	The visual impact may affect the aesthetics of the landscape.	Operational phase	Medium	<u>Control:</u> Implementation of proper housekeeping	Low – Medium
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Medium	<u>Control:</u> Dust suppression	Low – Medium
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property, and will	Operational phase	Medium	<u>Control:</u> Noise control measures	Low – Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
		represent the current noise levels of the farm.				
	Contamination of surface or groundwater due to effluent runoff from excavation area	the impact of surface and groundwater contamination due to the excavated area will be mitigated through berms and topsoil stockpiling	Operational phase	Medium	<u>Control:</u> Measures will be implemented as subscribed by DWS	Low
	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	Medium	<u>Control:</u> Implementation of safety control measures	Low – Medium
	Negative impact on the fauna and flora of the area	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	Low	<u>Control:</u> Implementation of fauna protection measures	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste management	Low - medium
	Weed and invader plant infestation of the area	Biodiversity	Operational phase	Low - Medium	<u>Control & Remedy:</u> Implementation of weed control	Low - medium
LOADING AND TRANSPORTING	Dust nuisance due to loading and	Should dust levels become excessive it	Operational phase	Medium	<u>Control:</u> Dust suppression	Low – Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	transportation of the material	may have an impact on surrounding landowners.				
	Impact on the access roads	All road users will be affected	Operational phase	Medium	<u>Control & Remedy:</u> Road management	Low – Medium
	Noise nuisance caused by vehicles	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	Medium	<u>Control:</u> Noise control measures	Low - Medium
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste management	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Erosion of returned topsoil after rehabilitation	Soil erosion, may affect the agricultural potential of the site after closure of the mine.	Decommissioning phase	Medium	<u>Control:</u> Soil management and seeding of mined areas	Low
	Dust nuisance caused during landscaping activities	Should dust levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	Low – Medium	<u>Control:</u> Dust suppression	Low
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.	Decommissioning phase	Medium	<u>Control:</u> Sloping of area upon decommissioning	Low - Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Noise nuisance caused by machinery	Should noise levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	Low – Medium	<u>Control:</u> Noise management	Low
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Decommissioning phase	Low – Medium	<u>Control:</u> Waste management	Low
	Loss of reinstated topsoil due to the absence of vegetation	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	Low – Medium	<u>Control:</u> Storm water management	Low
	Weeds and invader plant infestation of the area	Biodiversity	Decommissioning phase	Low – Medium	<u>Control & Remedy:</u> Implementation of weed control	Low

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

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):-

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
Archaeological Study	No mitigation needed. If graves are located in the future, they should ideally be preserved in-situ or alternatively relocated according to existing legislation (SAHRA).	X	PART A – h(iv)(1)(a) t (i)
No other specialist studies were deemed necessary for this project as the project entails the establishment of the mining area over an area previously used for agriculture and mining.			

I) 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:

- The project entails the excavation mining of aggregates in an area previously used for mining. Due to the small area used for grazing and mining, mining of aggregates in the area was identified as a more viable use. As a result of the agricultural activities no natural areas needs to be disturbed.
- The mining procedure will only entail the excavation and transporting of the aggregates by means of a front-end loader upon which it will be loaded onto trucks and transported from the mining site to the stockpiling site. The clients will then acquire the aggregate from the stockpiling site. Minimal blasting (limited to one blast).
- The existing roads to the mine area can be used to gain access to the site. No new roads are needed.
- The proposed mining area will be visible from the R33 passing the property and will therefore have a visual impact on the immediate surrounding area.
- Mining activities will be contained within the boundaries of the permitted site. Proper storm water and waste management however needs to be implemented on the site in order to minimise the potential of pollution.

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 B.

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:

- Job creation for approximately 30 employees indirectly contributing to the socio-economic status of the Carolina - Belfast area,
- The aggregate to be mined will be used for the upgrading of roads and construction industry in the vicinity of the mining site, thereby indirectly contributing to infrastructure development,
- The project will assist the landowner and lawful users in diversification of the land use of the property.

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

- Visual intrusion due to the proposed project **Low – Medium**
- Loss of topsoil due to incorrect storm water **Medium**
- Weeds and invader plant infestation of the area **Low – Medium**
- Contamination of area with hazardous waste materials **Medium**
- Dust nuisance stemming from proposed project **Medium**
- Noise nuisance due to proposed activity **Medium**
- Impact on the access roads **Low – Medium**
- Health and safety risk posed by un-sloped areas **Low – Medium**
- Negative impacts of the fauna and flora **Medium**
- Contamination of surface or groundwater due to effluent runoff from excavation area **Medium**

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.

Management Objectives	Role	Management Outcomes
Dust Handling	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p> <p>Dust monitoring consultant to check dust results and provide guidelines.</p>	<ul style="list-style-type: none"> ▪ Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. ▪ Limit speed on the access roads to 40km/h to prevent the generation of excess dust. ▪ Spray roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. ▪ Assess effectiveness of dust suppression equipment. ▪ Re-vegetate all disturbed or exposed areas as soon as possible to prevent any dust source from being created. ▪ Thoroughly soak all stockpiles to ensure dust suppression on the site. ▪ Conduct formal dust monitoring on a monthly basis.
Noise Handling	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ 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 mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. ▪ Plan the type, duration and timing of the blasting procedures with due cognisance of other land users and structures in the vicinity. ▪ Notify surrounding land owners prior to blasting occasions. ▪ Use soft explosives during blasting.

Management Objectives	Role	Management Outcomes
	Compliance to be monitored by the Noise Monitoring Specialist.	<ul style="list-style-type: none"> ▪ Compliance with the appropriate legislation with respect to noise will be mandatory. ▪ Implement formal noise monitoring on a quarterly basis.
Management of weed/invaser plants	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Implement a weed and invader plant control management plan. ▪ Control declared invader or exotic species on the rehabilitated areas. ▪ Keep the temporary topsoil stockpiles free of weeds.
Surface and Storm water Handling	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Divert storm water around the topsoil heaps and access roads to prevent erosion and loss of material. ▪ Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas. ▪ Ensure that water from the wash bay into the oil sump. ▪ Conduct mining 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.
Management of health and safety risks	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p> <p>Blasting contractor to comply with national blasting requirements.</p>	<ul style="list-style-type: none"> ▪ Plan the type, duration and timing of the blasting procedures with due cognisance of other land users and structures in the vicinity, ▪ Inform the surrounding landowners and communities of any blasting event, ▪ Use soft explosives during blasting, ▪ Limit fly rock, ▪ Give audible warning of a pending blast at least 3 minutes in advance of the blast, ▪ Remove all fly rock (of diameter 150mm and larger) which falls beyond the working area, together with the rock spill. ▪ Ensure that workers have access to the correct PPE as required by law. ▪ Ensure all operations comply with the Occupational Health and Safety Act.
Handling of Hazardous Materials and Substance	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer</p>	<ul style="list-style-type: none"> ▪ Store all hazardous materials or substances in a closed storage facility with an impermeable floor. ▪ Storage area to meet the following conditions: ▪ Construct storage area on a level area. ▪ Floor of the storage area should be impermeable. ▪ Storage area should be outside the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest. ▪ Access to the materials/substances may only take place with the prior notification of the site manager. ▪ Fuel storage tanks should have an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity should be sufficient to contain 110% of the tank's maximum capacity. ▪ Consider the distance and height of the bund wall relative to that of the tank to ensure that oil does not spout 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

Management Objectives	Role	Management Outcomes
		<p>leakages. Inspection should be at least weekly and any accumulated rainwater should be removed.</p> <ul style="list-style-type: none"> ▪ All valves and outlets should be checked to ensure that they are intact and closed securely. ▪ Slope the bund base towards a rainwater sump of sufficient size. ▪ Contain contaminated water until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility. ▪ Ensure availability of drip trays underneath all stationary equipment or vehicles.
Waste management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Ensure no waste storage area is established outside the boundaries of the mining area. ▪ Ensure vehicle maintenance only take place within the service bay area of the off-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litre closed container/bin inside the emergency service area. ▪ Ensure diesel bowser is equipped with a drip tray at all times. ▪ Use drip trays during each and every refuelling event. ▪ Ensure the nozzle of the bowser rests in a sleeve to prevent dripping after refuelling. ▪ Keep drip trays clean. No dirty drip trays may be used on site. ▪ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility. ▪ Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. File proof on site. ▪ Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. ▪ Place all used oils, grease or hydraulic fluids therein and remove these receptacles from the site on a regular basis for disposal at a registered or licensed hazardous disposal facility. ▪ Store non-biodegradable refuse such as glass bottles, plastic bags etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognised landfill site. Prevent refuse from being dumped on or in the vicinity of the mining area. ▪ Biodegradable refuse to be handled as indicated above. ▪ generated at the site recording the amount of different types of waste generated by the mine in excel spreadsheet format.
Management of access roads	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Maintain newly constructed access roads so as to minimise dust, erosion or undue surface damage. ▪ Divert storm water around the access roads to prevent erosion. ▪ Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas.
Topsoil handling	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the</p>	<ul style="list-style-type: none"> ▪ Remove the first 300mm of topsoil in strips and store along the boundary of the site. ▪ Keep the temporary topsoil stockpiles free of weeds. ▪ Place topsoil stockpiles on a levelled area and implement measures to safeguard the piles from being washed away in the event of heavy rains/storm water.

Management Objectives	Role	Management Outcomes
	Environmental Control Officer.	<ul style="list-style-type: none"> ▪ Topsoil heaps should 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. ▪ Seed the stockpiled topsoil heaps if vegetation does not re-establish within 6 months of mining. ▪ Divert storm- and runoff water around the stockpile area and access roads to prevent erosion.
Blast Monitoring	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Monitoring to be conducted by blasting contractor.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Monitor ground vibration and air blast levels to USBM standards.
Fauna and Flora	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Ensure no fauna is caught, killed, harmed, sold or played with. ▪ 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. ▪ Do not remove plants or trees without the approval of the ECO.

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 Point m above should be considered for inclusion in the environmental authorisation.

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

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site specific information gathered from the property owner, as well as site inspections, and background information gathering.

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 Point m 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.

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 R356 088.84. Please see the explanation as to how this amount was derived at attached as Appendix G – Financial and Technical Competence. A Bank Guarantee is provided for the proposed site.

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).

The mining operation will be self-funded through income generated by sales of the aggregate mined. Bridging finance, will be supplied where needed by B&E International.

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)

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

Visual exposure:

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding areas have previously been disturbed by mining activities, and this application entails the extension of the existing mining areas. The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times.

Air Quality:

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld and agriculture in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the proposed operation through blasting (limited to one blast) and the movement of machinery and vehicles. Dust suppression measures should be implemented to prevent

excessive dust on site. Due to the remote setting of the proposed mining area the potential impact of dust nuisance on the surrounding environment is deemed to be of low significance.

Noise:

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the R33 and other public roads surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed site (site alternative 1) operation is expected to temporarily increase the noise levels of the area. Blasting noise will be instantaneous and of short duration occurring only once. Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures should be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

Existing Infrastructure:

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed (Site alternative 1) footprint area will not require the building of any permanent structures. The proposed production of aggregate on the property will also reduce the amount of trucks delivering aggregate, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

(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 of archaeological or cultural importance were identified at the proposed mining area during the site inspection (Consultants, 2017). The area was previously used for mining and no areas of cultural importance could be identified within the footprint area of the site.

The rocks of the Magaliesburg formation are not known to be fossiliferous anywhere throughout their extent. The presence of spores and pollens has been noted previously elsewhere within the sediments of the Dwyka Group by the author, as well as other workers. Rare plant remains of the Glossopteris Flora and anthropoid trackways have also been noted (Services, 2017).

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 and project alternatives investigated during the impact assessment process were done at the hand of information obtained during the site investigation, public participation process as well as desktop studies conducted of the study area. As discussed earlier the following alternatives were considered:

1. Site Alternative 1 – The proposed mining area over a 4.9 ha footprint area (Preferred Alternative).
2. Site Alternative 2 – The proposed mining area over a 4.9 ha footprint area.
3. No-go Alternative.

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 Yolandie Coetzee of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix I 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 B 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)**

Rehabilitation of the excavated area:

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 slopes on the benches below, thereby reducing the overall face angle.

Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry should be capped with suitable soil material and re-vegetated.

Rocks and coarse material removed from the excavation must be dumped into the excavation.

No waste will be permitted to be deposited in the excavations. Once overburden, rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.

The area shall be fertilized 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. 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 will 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 10cm 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 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.

Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred. 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 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 and maintenance, and weed / alien clearing.

All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.

Waste material of any description, including receptacles, scrap, rubble and tyres, will 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.

Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.

Seeding of the area:

Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

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

Water will be transported to the site on a daily basis. Water in the existing quarry will be pumped out of the quarry and reused for mineral processing and dust suppression purposes. A water truck will be used to spray access roads to alleviate dust generation. It is proposed that the mining activities will require approximately 20 000 – 40 000 l of water per day.

iii) Has a water use licence has been applied for?

The applicant will apply for general authorization for the water uses that is applicable to the project.

iv) Impacts to be mitigated in their respective phases

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
(as listed in 2.11.1)	of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	(volumes, tonnages and hectares or m ²)	(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	(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)	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	Construction / Site Establishment phase	4.9 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. <ul style="list-style-type: none"> • MHSA, 1996 • OHSA, 1993 	Beacons need to be in place throughout the life of the activity.
STRIPPING AND STOCKPILING OF TOPSOIL & BLASTING & EXCAVATION	Operational phase	4.9 ha	Visual Mitigation: <ul style="list-style-type: none"> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. 	Land use zoning: <ul style="list-style-type: none"> • Eastern Cape LUPA, 2014 • Lukhanji Municipality: Land Use Planning Bylaws, 2015 • The property is zoned for agriculture as primary use. 	Throughout operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION</p>	<p>Operational phase & Decommissioning phase</p>	<p>4.9 ha</p>	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. During periods of high wind spells, the stockpiles must be dampened to control dust emission. The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. 	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1) 	<p>Throughout operational and decommissioning phases</p>
<p>STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION</p>	<p>Operational phase & Decommissioning phase</p>	<p>4.9 ha</p>	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987 	<p>Throughout operational and decommissioning phases</p>

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Operational phase & Decommissioning phase	4.9 ha	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: <ul style="list-style-type: none"> ○ "The plants can be uprooted, felled or cut off and can be destroyed completely." ○ "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds. 	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> • NEMBA (Act No. 10 of 2004). • GNR 598 and 599 of 2014 	Throughout operational and decommissioning phases
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	4.9 ha	<p><u>Loss of topsoil due to incorrect storm water management</u></p> <ul style="list-style-type: none"> • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion 	<p><u>Loss of topsoil due to incorrect storm water management:</u></p> <ul style="list-style-type: none"> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the 	Throughout operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<p>become apparent soil erosion protection measures must be implemented.</p> <ul style="list-style-type: none"> • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted 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 of Mineral Resources may impose: <ul style="list-style-type: none"> ○ 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. ○ Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). ○ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered 	<p>area for agricultural purposes.</p>	

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			and incorporated into the storm water management.		
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & BLASTING & EXCAVATION	Operational phase	4.9 ha	<u>Negative impact on fauna that may enter the area:</u> <ul style="list-style-type: none"> The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. 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. 	<u>Negative impact on fauna that may enter the area:</u> <ul style="list-style-type: none"> NEM:BA, 2004 Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities. 	Throughout operational phase
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION	Operational phase & Decommissioning phase	4.9 ha	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> Regular vehicle maintenance may only take place at the workshop on site. 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 200 litre closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. 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. Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it 	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply. 	Throughout operational and decommissioning phases

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<p>at a recognized facility. Proof must be filed.</p> <ul style="list-style-type: none"> • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of 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, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above. 		

e) Impact Management Outcomes

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	(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. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	(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 processing area.	N/A	Construction / Site Establishment phase	Control through management and monitoring	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. <ul style="list-style-type: none"> • MHSA, 1996 • OHSA, 1993
STRIPPING AND STOCKPILING OF TOPSOIL	Visual impact due to removal of topsoil	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	<u>Land use zoning:</u> <ul style="list-style-type: none"> • Mpumalanga Town Planning Repeal Bill 2 of 2016 • Albert Luthuli Local Municipality: Land Use Planning Bylaws, 2015 • The property is zoned for agriculture as primary use.
	Loss of natural vegetation (Site Alternative 1)	The loss of natural vegetation may affect the biodiversity of the surrounding environment.	Operational phase	<u>Control:</u> Management of buffer areas and demarcation of work areas	<u>Negative impact on biodiversity of the area (Site Alternative 1):</u> <ul style="list-style-type: none"> • NEM:BA, 2004
	Loss of natural vegetation (Site Alternative 2)	The loss of natural vegetation may affect the biodiversity of the	Operational phase	<u>Modify:</u> Consider use of a less sensitive area	<u>Negative impact on biodiversity of the area (Site Alternative 2):</u> <ul style="list-style-type: none"> • NEM:BA, 2004

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
		surrounding environment.			
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property and will represent the current noise levels of the site.	Operational phase	<u>Control:</u> Noise control measures	<u>Noise Handling:</u> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Infestation of the topsoil heaps by weeds and invader plants.	Biodiversity	Operational phase	<u>Control & Remedy:</u> Implementation of weed control and the weed/invader plant management plan	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> NEMBA (Act No. 10 of 2004).
	Loss of topsoil due to incorrect storm water management.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	<u>Control:</u> Storm water management	<u>Loss of topsoil due to incorrect storm water management:</u> <ul style="list-style-type: none"> NEMBA (Act No. 10 of 2004). NEMA, 1998 NWA, 1998 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes.
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
					<ul style="list-style-type: none"> Every precaution must be taken to prevent contamination. The precautionary principal must apply.
BLASTING	Health and safety risk posed by blasting activities	The impact on health and safety posed by blasting will be contained within the site	Operational phase	<u>Control:</u> Implementation of safety control measures	<u>Blasting standards implemented</u> <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
	Dust nuisance caused by blasting activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by blasting activities	The noise impact caused by blasting is instantaneous and has a short duration	Operational phase	<u>Control:</u> Noise control measures	<u>Noise Handling:</u> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
EXCAVATION	Visual intrusion associated with the excavation activities	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	<u>Land use zoning:</u> <ul style="list-style-type: none"> Mpumalanga Town Planning Repeal Bill 2 of 2016 Albert Luthuli Local Municipality: Land Use Planning Bylaws, 2015 The property is zoned for agriculture as primary use.
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	<u>Control:</u> Noise control measures	<u>Noise Handling:</u> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	<u>Control:</u> Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
	Negative impact on the fauna and flora of the area	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	<u>Control:</u> Implementation of fauna protection measures	Protection of Fauna on site: <ul style="list-style-type: none"> NEM:BA, 2004
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Weed and invader plant infestation of the area	Biodiversity	Operational phase	<u>Control & Remedy:</u> Implementation of weed control	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
LOADING AND TRANSPORTING	Dust nuisance due to loading and transportation of the material	Should dust levels become excessive it may have an impact on surrounding landowners.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by vehicles	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	<u>Control:</u> Noise control measures	<u>Noise Handling:</u> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Impact on the access roads	All road users will be affected	Operational phase	<u>Control & Remedy:</u> Road management	<u>Degradation of the gravel access road:</u> <ul style="list-style-type: none"> NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Erosion of returned topsoil after rehabilitation	Soil erosion, may affect the agricultural potential of the site after closure of the mine.	Decommissioning phase	<u>Control:</u> Soil management	<u>Erosion of returned topsoil after rehabilitation:</u> <ul style="list-style-type: none"> NEM:BA, 2004 MPRDA, 2008 The replacement of the topsoil and sloping of the area is of utmost importance to ensure the

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
					effective future use of the area for agricultural purposes. Rehabilitation cannot be considered complete until the first cover crop is well established.
	Dust nuisance caused during landscaping activities	Should dust levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	<u>Control:</u> Dust suppression	Dust Handling: <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery	Should noise levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	<u>Control:</u> Noise management	Noise Handling: <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987

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)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. <ul style="list-style-type: none"> Modify through alternative method. 	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.	(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)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<ul style="list-style-type: none"> • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	
DEMARCATON OF SITE WITH VISIBLE BEACONS	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Control through management and monitoring	Beacons need to be in place throughout the life of the mine.	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. <ul style="list-style-type: none"> • MHSA, 1996 • OHSA, 1993
STRIPPING AND STOCKPILING OF TOPSOIL	Visual impact due to removal of topsoil.	<u>Control:</u> Implementation of proper housekeeping	Throughout operational phase	<u>Land use zoning:</u> <ul style="list-style-type: none"> • Mpumalanga Town Planning Repeal Bill 2 of 2016 • Albert Luthuli Local Municipality: Land Use Planning Bylaws, 2015 • The property is zoned for agriculture as primary use.
	Loss of natural vegetation (Site Alternative 1)	<u>Control:</u> Management of buffer areas and demarcation of work areas	Throughout operational phase	<u>Negative impact on biodiversity of the area (Site Alternative 1):</u> <ul style="list-style-type: none"> • NEM:BA, 2004
	Loss of natural vegetation (Site Alternative 2)	<u>Modify:</u> Consider use of a less sensitive area	Throughout operational phase	<u>Negative impact on biodiversity of the area (Site Alternative 2):</u> <ul style="list-style-type: none"> • NEM:BA, 2004
	Dust nuisance caused by the disturbance of soil.	<u>Control:</u> Dust suppression	Throughout operational phase	<u>Dust Handling:</u> <ul style="list-style-type: none"> • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil	<u>Control:</u> Noise control measures	Throughout operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Infestation of the topsoil heaps by weeds and invader plants.	<u>Control</u> & <u>Remedy</u> : Implementation of weed control and weed/invader plant management plan	Throughout operational phase	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.
	Loss of topsoil due to incorrect storm water management	<u>Control</u> : Storm water management	Throughout operational phase	<u>Loss of topsoil due to incorrect storm water management:</u> <ul style="list-style-type: none"> NEMBA, 2004 NEMA, 1998 NWA, 1998 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes
	Contamination of area with hazardous waste materials	<u>Control</u> : Waste management	Throughout operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principle must apply.
BLASTING	Health and safety risk posed by blasting activities	<u>Control</u> : Implementation of safety control measures	Throughout Operational phase	<u>Blasting standards implemented</u> <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
	Dust nuisance caused by blasting activities	<u>Control</u> : Dust suppression	Throughout Operational phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by blasting activities	<u>Control</u> : Noise control measures	Throughout Operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> NEM: AQA, 2004 Regulation 6(1)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
				All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
EXCAVATION	Visual intrusion associated with the excavation activities	<u>Control:</u> Implementation of proper housekeeping	Throughout Operational phase	<u>Land use zoning:</u> <ul style="list-style-type: none"> Mpumalanga Town Planning Repeal Bill 2 of 2016 Albert Luthuli Local Municipality: Land Use Planning Bylaws, 2015 <p>The property is zoned for agriculture as primary use.</p>
	Dust nuisance due to excavation activities	<u>Control:</u> Dust suppression	Throughout Operational phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance generated by excavation equipment	<u>Control:</u> Noise control measures Operational phase	Throughout Operational phase	<u>Noise Handling:</u> 🚧 NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Unsafe working conditions for employees	<u>Control:</u> Implementation of safety control measures	Throughout Operational phase	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
	Negative impact on the fauna and flora of the area	<u>Control:</u> Implementation of fauna protection measures	Throughout Operational phase	Protection of Fauna on site: <ul style="list-style-type: none"> NEM:BA, 2004
	Contamination of area with hydrocarbons or hazardous waste materials	<u>Control:</u> Waste management	Throughout Operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Weed and invader plant infestation of the area	<u>Control & Remedy:</u> Implementation of weed control	Throughout Operational phase	<u>Management of weed- or invader plants:</u>

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
				<ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Dust nuisance caused during landscaping activities	<u>Control:</u> Dust suppression	Throughout decommissioning phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery	<u>Control:</u> Noise management	Throughout decommissioning phase	<u>Noise Handling:</u> NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Contamination of area with hazardous waste materials	<u>Control:</u> Waste management	Throughout decommissioning phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Loss of reinstated topsoil due to the absence of vegetation	<u>Control:</u> Storm water management	Throughout decommissioning phase	<u>Erosion of returned topsoil after rehabilitation:</u> <ul style="list-style-type: none"> NEM:BA, 2004 MPRDA, 2008 The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. Rehabilitation cannot be considered complete until the first cover crop is well established.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Weeds and invader plant infestation of the area	<u>Control & Remedy:</u> Implementation of weed control	Throughout decommissioning phase	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> • The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) • Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

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 closure objectives entail the sloping, landscaping and replacement of the topsoil over the processing area in order to rehabilitate the disturbance. The stockpiled topsoil will be spread over the disturbed area to a depth of at least 500 mm.

Final rehabilitation will entail the removal of all infrastructure and equipment from the site. Final sloping, landscaping, levelling and top dressing will be done on all areas. Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area. Site management will implement an alien invasive plant management plan during the 12 months' aftercare period to address germination of problem plants in the area. The applicant will comply with the minimum closure objectives as prescribed by DMR.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

This report, the Draft Basic Assessment Report, includes all the environmental objectives in relation to closure and will be made available for perusal of I&AP's and stakeholders. Any additional comments received during the commenting period will be added to the Final Basic Assessment Report to be submitted to DMR for approval.

(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 D. Upon closure of the mining activity all infrastructure will be removed. The compacted areas will be ripped and levelled upon which the topsoil will be replaced. No permanent structures will remain upon closure of the site.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation of the mining area as indicated on the rehabilitation plan attached as Appendix D will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

Rehabilitation of the excavated area:

- 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 slopes on the benches below, thereby reducing the overall face angle.
- Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry should be capped with suitable soil material and re-vegetated.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.
- The area shall be fertilized 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.
- 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 will 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 [MPRDA], 2002 (Act No. 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 10cm 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 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.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- 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 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 and maintenance, and weed / alien clearing.
- All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will 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.
- Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as weeds according to the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Seeding of the area:
 - Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The

plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

- (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	Gravel
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
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Level of information

According to Step 4.2:

Level of information available	Limited
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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	Yes	
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	212440	0.04
7	Sealing of shafts, adits and inclines		

Component No.	Main description	Master rate	Multiplication factor
8(A)	Rehabilitation of overburden and spoils	141626	1
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	112192	1
11	River diversions		
12	Fencing	128	1
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	14930	1

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1
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							
CALCULATION OF THE QUANTUM							
Mine:	Remaining Extent of Portion 2 of the farm Witkloof 408, Carolina, Mpumalanga Province			Location:	Carolina		
Evaluators:	S Smit			Date:	6/19/2017		
No	Description	Unit	A Quantity	B Master rate	C Multiplication factor	D Weighting factor 1	E=A *B*C*D Amount (rands)
			Step 4.5	Step 4.3	Step 4.3	Step 4.4	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m ³	0	15	1	1	R 0.00
2(A)	Demolition of steel buildings and structures	m ²	0	203	1	1	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m ²	0	299	1	1	R 0.00
3	Rehabilitation of access roads	m ²	1,350	36	1	1	R 48,600.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	352	1	1	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	192	1	1	R 0.00
5	Demolition of housing and/or administration facilities	m ²	0	405	1	1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	1.3	212,440	0.04	1	R 11,046.88
7	Sealing of shaft, audits and inclines	m ³	0	109	1	1	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0.2	141,626	1	1	R 28,325.20
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	176,393	1	1	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	512,329	0.51	1	R 0.00
9	Rehabilitation of subsided areas	ha	0	118,591	1	1	R 0.00
10	General surface rehabilitation	ha	1.5	112,192	1	1	R 168,288.00
11	River diversions	ha		112,192	1	1	R 0.00
12	Fencing	m	1.5	128	1	1	R 192.00
13	Water Management	ha		42,659	0.17	1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	0	14,930	1	1	R 0.00
	Specialists study	Sum				1	R 0.00
	Specialists study	Sum					R 0.00
							R 256,452.08
	Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)			1.05		Sub Total 1	R 269,274.68
	Preliminary and General	6%					R 16,156.48
	Contingency	10.0% of Subtotal 1					R 26,927.47
	(Subtotal 1 plus management and contingency)					Sub Total 2	R 312,358.63
	Vat (14%)					Sub Total 3	R 43,730.21
	(Subtotal 3 plus VAT)					GRAND TOTAL	R 356,088.84

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 356 088.84**

(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**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	<ul style="list-style-type: none"> • MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Demarcation of site with visible beacons	Maintenance of beacons	<ul style="list-style-type: none"> • Visible beacons need to be established at the corners of the processing area. • A 20 m buffer area (if applicable) from any natural areas need to be demarcated. • A 30 m buffer area from a watercourse needs to be demarcated if applicable. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • Ensure beacons are in place throughout the life of the activity. 	<ul style="list-style-type: none"> • Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & BLASTING & EXCAVATION	Monitoring of visual impacts	<ul style="list-style-type: none"> • Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer. Role:	<ul style="list-style-type: none"> • Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly 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)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		<ul style="list-style-type: none"> Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status. 	<ul style="list-style-type: none"> Minimize the visual impact of the activity on the surrounding environment. 	<ul style="list-style-type: none"> Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION	Dust Monitoring: <ul style="list-style-type: none"> The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods. 	Dust Handling and Monitoring: <ul style="list-style-type: none"> Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. Dampen the stockpiles during periods of high wind spells. Assess effectiveness of dust suppression equipment. Limit speed on the access roads to 40km/h to prevent the generation of excess dust. Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF	Noise Monitoring <ul style="list-style-type: none"> The noise impact should be contained within the boundaries of the property, as it will represent the current activities. 	Noise Handling and Monitoring: <ul style="list-style-type: none"> Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. Compliance with the appropriate legislation with 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role:	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly 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)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION		respect to noise will be mandatory.	<ul style="list-style-type: none"> Ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<ul style="list-style-type: none"> Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Management of weed or invader plants <ul style="list-style-type: none"> The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. 	Management of weed or invader plants: <ul style="list-style-type: none"> Removal of weeds must be manually or by the use of an approved herbicide. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Implement a weed and invader plant management plan. Control declared invader or exotic species on the rehabilitated areas. Keep the temporary topsoil stockpiles free of weeds. 	<ul style="list-style-type: none"> Throughout Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Topsoil management	Topsoil Handling: <ul style="list-style-type: none"> Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. Berms to be made to direct storm- and runoff water 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Strip and stockpile the upper 500 mm of the soil and protect as topsoil. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly 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)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		around the stockpiled topsoil area.	<ul style="list-style-type: none"> Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS. 	<ul style="list-style-type: none"> Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of natural vegetation	Management of buffer areas: <ul style="list-style-type: none"> Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Contain all activities within the boundaries of the approved processing area. Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING &	Protection of fauna	Protection of fauna: <ul style="list-style-type: none"> Site management has to protect fauna that enters the processing area. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role:	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
BLASTING & EXCAVATION			<ul style="list-style-type: none"> Ensure no fauna is caught, killed, harmed, sold or played with. 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. 	<ul style="list-style-type: none"> Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION	<p>Waste Management:</p> <ul style="list-style-type: none"> Management of waste must be a daily monitoring activity. Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily. 	<p>Waste Management:</p> <ul style="list-style-type: none"> Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. Drip trays must be available to place underneath equipment parked for the night. Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. Waste disposal register and file for the keeping of safe disposal records. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litre closed container/bin inside the emergency service area. Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. 	<ul style="list-style-type: none"> Throughout Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. Biodegradable refuse to be handled as indicated above. 	
LOADING AND TRANSPORTING	Management of Access Roads <ul style="list-style-type: none"> The condition of the access road must be continuously monitored. 	Management of Access Roads: <ul style="list-style-type: none"> Dust suppression equipment such as a water car and dispenser. Grader to restore the road surface when needed. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Divert storm water around the access roads to prevent erosion. Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. Repair rutting and erosion of the access roads caused by the processing activities. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Soil erosion: <ul style="list-style-type: none"> Loss of reinstated topsoil after rehabilitation. 	Erosion monitoring: <ul style="list-style-type: none"> Grader to restore areas prone to soil erosion. Planting of a cover crop to stabilize re-instated soil Erosion prevention equipment. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role:	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly 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)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> Control run-off water via temporary banks to ensure that accumulation of run-off does not cause down-slope erosion. Only do topsoil spreading 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 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. Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation must not be considered complete until the first cover crop is well established. Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs. 	<ul style="list-style-type: none"> Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF	Health and safety risk	<ul style="list-style-type: none"> Health and safety Management: Stocked first aid box. Level 1 certified first aider All appointments in terms of the Mine Health and Safety Act. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> Ensure workers have access to the correct personal protection equipment (PPE) as required by law. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	<ul style="list-style-type: none"> MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION			<ul style="list-style-type: none"> Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act. 	
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & BLASTING & EXCAVATION	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. Notify Heritage Mpumalanga and the ECO immediately. Work may only commence once the area was cleared by Heritage Mpumalanga. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental Control Officer.

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

The Mineral and Petroleum Resources Development Regulations stipulates that performance assessment reporting should be done annually. The applicant commits to submitting the performance assessment reports of the proposed processing activity annually to DMR for perusal.

(m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

Once mining of the proposed area starts a copy of the Basic Assessment Report and Environmental Management Programme report will be handed to the site manager during the site establishment meeting. Issues such as topsoil handling, site clearance, 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.

(2) 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.

• **Site Management:**

- Stay within boundaries of site – do not enter adjacent properties
- Keep tools and material properly stored
- Smoke only in designated areas
- Use toilets provided – report full or leaking toilets

• **Water Management and Erosion:**

- Check that rainwater flows around work areas and are not contaminated
- Report any erosion
- Check that dirty water is kept from clean water
- Do not swim in or drink from streams

- **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:
 - ✓ Sweep paved roads
 - ✓ 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 DMR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&AP's
- c) the inclusion of inputs and recommendations from the specialist reports where relevant, a
- 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



Signature of the environmental assessment practitioner:

Greenmined Environmental

Name of Company:

17 July 2017

Date:

-END-

APPENDIX LIST

Appendix A	Main Application Map
Appendix A1	1:250 000 Map
Appendix B	Mine Activities Map
Appendix C	Surrounding Land Use Map
Appendix D	Rehabilitation Plan
Appendix E	Comments and Response Report
Appendix E1	Proof of Consultation
Appendix F	Supporting Impact Assessment
Appendix G	Financial and Technical Competence
Appendix H	Photographs of the site
Appendix I	CV and Experience Record of EAP
Appendix J	Specialist Reports

