



**Grasaro (Pty) Ltd**  
Environmental and  
Mining Consultants

**FINAL BASIC ASSESSMENT PROCESS FOR COPPER MINE ON  
PORTION 23 REMAINING EXTENT ON FARM 132 MELKBOSCHKUIL**

**FINAL BASIC ASSESSMENT REPORT**

**DMR REFERENCE NUMBERS:**

**NCS 30/5/1/3/2/1 (10734) MP**

**PREPARED FOR:**

**CAROLUSBERG COPPER PTY LTD**

**JULY 2019**



**Grasaro (Pty) Ltd**  
Environmental and  
Mining Consultants

Paardevelei Office Part, Baker Square, Rm 14, Somerset West, 7130  
Postnet Suite 295, Private Bag X15, Somerset West 7129  
[www.grasaro.co.za](http://www.grasaro.co.za)



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**BASIC ASSESSMENT REPORT  
AND  
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

**NAME OF APPLICANT:** Carolusberg Copper Pty Ltd

**TEL NO:** 074 872 2277

**FAX NO:** 086 520 3958

**POSTAL ADDRESS:** Postnet Suite 1027, Private Bag X2, Century City 7441

**PHYSICAL ADDRESS:** The Business Centre, Nr. 1 Bridgeways Road, Century City 7441

**FILE REFERENCE NUMBER SAMRAD:** NCS 30/5/1/3/2/1 (10734) MP

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## 1. IMPORTANT NOTICE

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

Unless an Environmental 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 cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA 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, significance, 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.

### 3. PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

#### CONTACT PERSON AND CORRESPONDENCE ADDRESS:

##### A. Details of Environmental Assessment Practitioner

###### (a) Details of the EAP

Name of The Practitioner: Lee-Ann Viona Pretorius

Tel No.: 082 302 0039

Fax No. : 086 672 8399

e-mail address: [leeann@grasaro.co.za](mailto:leeann@grasaro.co.za)

###### (b) Expertise of the EAP.

*The qualifications of the EAP, including Curriculum Vitae*

Baccalaureus Technologiae in Environmental Management

International Association for Impact Assessment (Registration No – 5187)

*Summary of the EAP's past experience.*

Lee-Ann Pretorius is a qualified Environmental Assessment Practitioner (EAP) who holds a Baccalaureus Technologiae in Environmental Management which she obtained from the Cape Peninsula University of Technology in 2013.

She has 7 years' experience in the Environmental Impact Assessment (EIA) and Basic Assessment (BA) procedures and processes. She has been the lead Environmental Practitioner on the Roads Project for the Provincial Transport Department and has obtained many environmental authorisations in various districts. She has also been involved in the implementation of numerous environmental management programmes, environmental impacts for environmental authorisations and mining permits.

She is also actively involved as an Environmental Control Officer (ECO) and assisted on the Pelican Park Residential Development. She was the project manager on the Bergrivier Family and Lifestyle Facility in Laaiplek and managed the EIA processes.

She is currently actively involved in the NEMA Mining process for Uitkyk Diggers Caledon, Heidelberg Quarries, Annev Construction, MOCA Granite and Xwena Copper conducting their mining, prospecting permit process and ECO duties.

(Refer to **Appendix A** for CV)

**B. Location of the overall Activity:**

<b>Farm Name:</b>	Portion 23 (Remaining Extent) of Farm 132 Melkboschkuil
<b>Application area (Ha)</b>	4.8 Ha
<b>Magisterial district:</b>	Namaqualand
<b>Distance and direction from nearest town</b>	The proposed development is located 10.4 km west of Springbok
<b>21-digit Surveyor General Code for each farm portion</b>	C05300000000013200023



### C. Locality map





**Site Plan:**



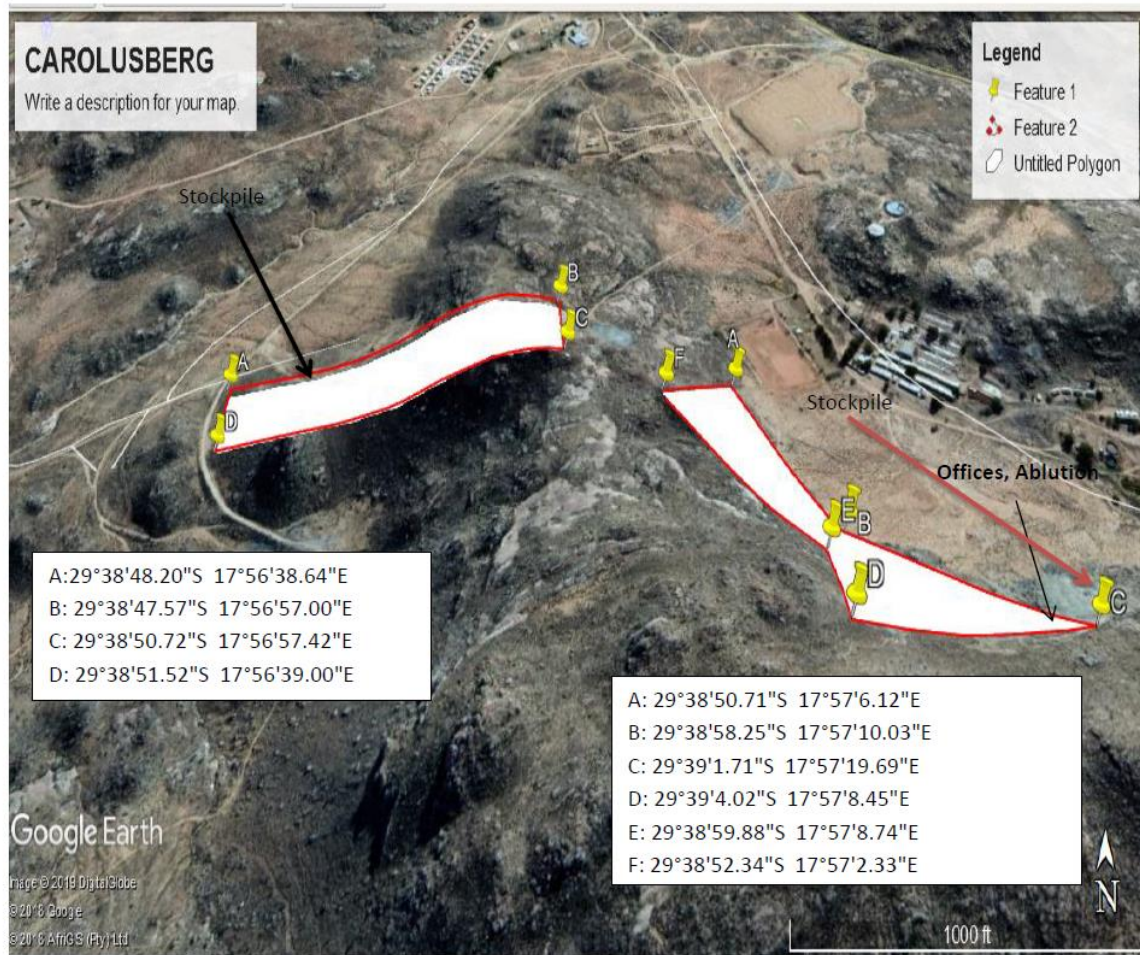
<p><b>Description of Mining Area:</b> The figure lettered B, E, F, J, C in extent 4.8 Ha, represent a mining permit application on Portion 23 (Remaining Extent) for Farm 132 Melkboschkuil.</p>	<p><b>Co-ordinates:</b> B: 29° 38' 47.57" S 17° 56' 57.00" E E: 29° 38' 52.28" S 17° 57' 7.43" E F: 29° 38' 57.58" S 17° 57' 9.39" E J: 29° 38' 58.68" S 17° 57' 5.97" E C: 29° 38' 50.72" S 17° 56' 57.42" E</p>	<p><b>Name of Applicant:</b> Carolusberg Copper  <b>Signature:</b>  <b>Date:</b></p>	<p><b>Sketch Plan Approved:</b> <b>Signature:</b> ..... <b>Name:</b> ..... Regional Manager: Western Cape Department of Mineral Resources <b>Date:</b></p>
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## D. Description of the scope of the proposed overall activity:

The mining permit operation will be run as an open cast mining operation for copper. As the copper is unconsolidated it will be removed by excavator, loader and jack hammer.

### Mining Method

The area consists of a solid Copper Oxide/Carbonate outcrop elevating about 6 meters above surrounding ground level. A Registered blasting Contractor will be used for mining purposes. The main blasting constituent will be Anflex which is fed to predrilled holes. The number of explosives and method will be regulated to minimize fly rock. Local blasting Company like Namakwa Gas will be used for this purpose. Nama Gas has extensive experience in this type of surface blasting as demonstrated by the sewerage line construction within the Okiep residential area. Competency, by Nama Gas has been demonstrated while blasting within 1m of residential properties occurred. No explosives will be stored on site and all statutory regulations for Blasting within this area will be adhere to.



## E. Listed and specified activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
<p>Mining - During the mining process the activities that will take place will be excavation, stockpiling, loading, hauling and trucks for transport off site. There will be no processing plant on site. The only infrastructure should be solar powered lightning, a small temporary office building and the rental ablution facility.</p>	<p>4.8 Ha</p>	<p>Listing 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 —</p> <p>(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)]</p> <p>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating,</p>	<p>LN 1 in GN R327</p>

		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.	
Mine closure - The decommissioning of the 4.8 Ha area. The mine must be operated so that once the mine is closed, the site can be used again.	4.8 Ha	<p>Listing Activity 22 The decommissioning of any activity requiring –</p> <p>(i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or</p> <p>(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</p>	LN 1 in GN R327

		<p>not constitute closure; but excluding the decommissioning of an activity relating to the secondary processing of a –</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; – in which case activity 31 in this Notice applies.</p>	
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## **F. Description of the activities to be undertaken**

### **Mining Method**

The area consists of a solid Copper Oxide/Carbonate outcrop elevating about 6 meters above surrounding ground level. A Registered blasting Contractor will be used for mining purposes. The main blasting constituent will be Anflex which is fed to predrilled holes. The number of explosives and method will be regulated to minimize fly rock. Local blasting Company like Namakwa Gas will be used for this purpose. Nama Gas has extensive experience in this type of surface blasting as demonstrated by the sewerage line construction within the Okiep residential area. Competency, by Nama Gas has been demonstrated while blasting within 1m of residential properties occurred. No explosives will be stored on site and all statutory regulations for Blasting within this area will be adhere to.

### **Air and Noise Quality**

Carolusberg Copper will appoint an environmental Company to install Dust Collection Probes as well as Noise measuring devices at strategic points around the permit area 1 month prior to operation commencement. This will give us a good idea of the current/background dust and noise pollution of the surrounding area. This will give us a standard with which we can compare should mining commence keeping in mind the local statutory threshold. Very little noise is anticipated due to mining and dust will be suppressed by water during loading should the need arise.

### **Transport Routes**

Only existing roads will be used.

### **Access Control**

Access to the mine site will be controlled by a registered Security Company 24 hours per day.

### **Heavy Machinery**

At any given time will only one truck and one Loader be allowed on the premises? The loading and Haulage will be contracted out to a local transport Company.

### **Offices and Ablution**

Two temporary (containerized) offices will be used to be mounted on concrete stands and one abluion facility. The abluion facility will be contracted out to a chemical company. Water for personal use and dust suppression will be supplied from a 10 000 L Jo Jo tank which will be filled by water truck from the plant area (Okiep).

### **Decommissioning:**

The site will be rehabilitated back to agricultural land to be used by the landowner. Rehabilitation will be ongoing as mining progresses.



## G. Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT?
National Environmental Management Act (NEMA) (Act 107 of 1998)	Current Document	NEMA requirement as per protocol.
Environmental Impact Assessment Regulations (Government Notice R982, R983, R984, R985)	Current Document	NEMA requirement as per protocol.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)	Section 10.3	There are no critical biodiversity areas on the site.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	Section 10.4 Section 17.10 Section 18.2	Dust Control measures are discussed in the document.
National Dust Control Regulations (GN R827 of November 2013)	Section 10.4 Section 17.10 Section 18.2	Dust Control measures are discussed in the document.
National Heritage Resources Act, 1999 (Act 25 of 1999)	Section 10.7	A heritage assessment must be conducted according to SAHRA Interim comment.
Mineral and Petroleum Resources Development Act, 2008 (Act 28 of 2008)	Section 3	The application for a mining permit was submitted to DMR in terms of Section 27 of the MPRDA. Protocol establishes DMR as the competent authority for the NEMA application.
Mine Health and Safety Act, 1996 (Act 29 of 1999)	Section 8.3 Section 10.4 Section 10.5	The health and safety of all workers on the mine falls under the MHSA and must be implemented.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000)	Decision by Competent Authority	Governs to conduct of the authority under the Constitution.
Nama Khoi Local Municipality, Draft Integrated Development Plan 2018/2019.	Section F	"Need and Desirability" of the project is described regarding the IDP
Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)	Section 5	Zoning related issues are addressed.
DEA Guidelines e.g. Alternatives, Using Specialists, Needs & Desirability and Public Participation	Current document	The relevant guidelines were used to guide the process and compile this document.



## H. Need and desirability of the proposed activities

The following section is based on the “Needs and Desirability” questionnaire as used by the Western Cape Provincial Department of Environmental Affairs & Development Planning (DEA&DP).

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	The land is currently zoned as open space 1.
<b>2. Will the activity be in line with the following?</b>			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	According to the IDP and PSDF the existing Carolusberg mining quarters has been identified as potentially hazardous and harmful to the environment and community. It is therefore proposed that these structures should be removed through the normal municipal procedures and notices. There is however opportunities for mining and quarries in the area.
(b) Urban edge / Edge of Built environment for the area	YES	NO	The proposed mine site does not fall within an urban edge. (Please see <b>Annexure C</b> for <b>Site Plan</b> ).
(c) Integrated Development Plan and Spatial Development Framework of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	<p>According to the IDP and PSDF the existing Carolusberg mining quarters has been identified as potentially hazardous and harmful to the environment and community. It is therefore proposed that these structures should be removed through the normal municipal procedures and notices. There is however opportunities for mining and quarries in the area.</p> <p><b>Mining &amp; Quarrying</b></p> <ul style="list-style-type: none"> <li>• Mining is a declining sector with major mining companies pulling out of the area. There are some minerals in the Nama Khoi LM that have never been exploited but feasibility studies would need to be conducted if these opportunities were to be taken forward.</li> <li>• There are also limited skilled people in the Nama Khoi Local Municipality, and this may pose a threat to the sustainability of small-scale mining projects.</li> <li>• There is a possibility to negotiate with large mines to improve small miners' access to claims, but the lack of skills will need to be resolved.</li> <li>• Working granite dumps.</li> <li>• Recycle copper and granite dumps.</li> <li>• Local contracting rehabilitation of mining sites.</li> <li>• Building factories to mill minerals.</li> <li>• Milling minerals local adds more value.</li> <li>• Institutional arrangements to stimulate economic development.</li> <li>• Employing local unemployed in projects</li> </ul>
(d) Approved Structure Plan of the Municipality	YES	NO	Unable to source a Structure Plan for Carolusberg.
(e) An Environmental Management Framework (EMF) adopted by the Municipality (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of	YES	NO	No, the approval of this mining permit will in no way compromise the integrity of the Environmental Management priorities.

sustainability considerations?)			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	No other plans exist for the area.
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	<p>According to the IDP and PSDF the existing Carolusberg mining quarters has been identified as potentially hazardous and harmful to the environment and community. It is therefore proposed that these structures should be removed through the normal municipal procedures and notices. There is however opportunities for mining and quarries in the area.</p> <p><b>Mining &amp; Quarrying</b></p> <ul style="list-style-type: none"> <li>• Mining is a declining sector with major mining companies pulling out of the area. There are some minerals in the Nama Khoi LM that have never been exploited but feasibility studies would need to be conducted if these opportunities were to be taken forward.</li> <li>• There are also limited skilled people in the Nama Khoi Local Municipality, and this may pose a threat to the sustainability of small-scale mining projects.</li> <li>• There is a possibility to negotiate with large mines to improve small miners' access to claims, but the lack of skills will need to be resolved.</li> <li>• Working granite dumps.</li> <li>• Recycle copper and granite dumps.</li> <li>• Local contracting rehabilitation of mining sites.</li> <li>• Building factories to mill minerals.</li> <li>• Milling minerals local adds more value.</li> <li>• Institutional arrangements to stimulate economic development.</li> <li>• Employing local unemployed in projects</li> </ul>
5. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Because of the downturn in the economy there is a massive need to support local economies and initiative for growth. This mining venture can contribute to the local economy and to better the poor circumstances of the local communities.
6. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E.)	YES	NO	Services are not to be provided by the municipality. All services will be self-supplied and contained on the mining area.
7. Is this development provided for in the infrastructure planning of the municipality, and if not, what will the implication be on the	YES	NO	The site falls outside of the municipal area. There is no additional pressure on municipal infrastructure.

infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E.)			
8. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Other than job creation this is a purely private business decision.
Do location factors favor this land use (associated with the activity applied for) at this place? (This relates to the contextualization of the proposed land use on this site within its broader context.)	YES	NO	Copper resources occur where they were deposited through geological time.
10. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	YES	NO	There will be no impact on the cultural areas nor sensitive natural areas.
11. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odors, visual character and sense of place, etc.)?	YES	NO	The mining will be temporary with measures in place to prevent any impact on the surrounding population.
12. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	YES	NO	No. Currently the land is not in use.
13. What will the cumulative impacts (positive and negative) of the proposed land use associated with the activity applied for, be?	YES	NO	There are no cumulative impacts other than possible dust pollution associated with this mine. The dust will be managed via the approved EMPr and requirements from DMR.
14. Is the development the best practicable environmental option for this land/site?	YES	NO	Mining will be a low impact activity and mitigation measure will be put in place to prevent any and all possible pollution impacts.
15. What will the benefits be to society in general and to the local communities?	There are jobs created and services and supplies bought from local businesses. It will therefore stimulate the local economy and contribute to the national focus through tax and levies.		
16. Any other need and desirability considerations related to the proposed activity?	No.		

## **I. Motivation for the overall preferred site, activities and technology alternative**

The following factors played a role in the determination of the site.

1. The site has proven resources.
2. The site belongs to a private person.
3. The site is more than 500m from the town and associated activities.
4. The site is not environmentally sensitive.
5. The site is not close to any tourist routes.
6. The site is not visually sensitive.
7. The site does not contain natural vegetation.

The benefits of the project can be divided into social and economic classifications. The mine will provide direct employment to local persons. The operation further creates indirect employment opportunities in equipment supply industries, transport and construction environment. The site layout is restricted to 4.8 Ha as this is the footprint under the MPRDA, 2002.

## **J. Full description of the process followed to reach the proposed preferred alternatives within the site.**

The layout and location of the proposed site is dictated by the location of the resources. It is a section available for mining without significantly impacting on farming / surrounding activities. These facts preclude the identification of alternative layout or location options.

## **K. Details of the development footprint alternatives considered.**

### ***(a) the property on which or location where it is proposed to undertake the activity;***

The site has been tested for copper and has been found to contain viable volumes of the resource. Neighbouring properties were not considered because there is no data available regarding the copper resource.

### ***(b) the type of activity to be undertaken;***

The piece of land under application is the only section of land that contains economically viable volumes for mining. As Carolusberg Copper Pty Ltd are not the owners of the land it cannot propose alternative activities such as housing or commercial developments.

### ***(c) the design or layout of the activity;***

For the venture to be economically viable, the entire 4.8 Ha needs to be mined. Furthermore, the application area constitutes the only viable area on the farm with minimal interference to the other agricultural activities.

***(d) the technology to be used in the activity;***

The technology chosen for this operation is taking cognisance of the fact that water is a scarce commodity and therefore no processing will take place on the site.

***(e) the operational aspects of the activity; and***

The area consists of a solid Copper Oxide/Carbonate outcrop elevating about 6 meters above surrounding ground level. A Registered blasting Contractor will be used for mining purposes. The main blasting constituent will be Anflex which is fed to predrilled holes. The number of explosives and method will be regulated to minimize fly rock. Local blasting Company like Namakwa Gas will be used for this purpose. Nama Gas has extensive experience in this type of surface blasting as demonstrated by the sewerage line construction within the Okiep residential area. Competency, by Nama Gas has been demonstrated while blasting within 1m of residential properties occurred. No explosives will be stored on site and all statutory regulations for Blasting within this area will be adhere to.

***(f) the option of not implementing the activity.***

The no-go option is at play with this application. However, considering the positive benefits garnered from the operation and its very limited negative impact on the land and surrounding community. The local community will benefit in the sense of job creation by using the local community members during the mining operations.

## **L. Details of the Public Participation Process Followed**

The public participation that is followed is being conducted according to the requirements prescribed in Regulation 40 to 44 of the EIA Regulations (GN R326). The following modus operandi is followed:

- The landowner was consulted during the application phase.
- The surrounding/adjacent landowners were consulted during the public participation phase.
- Notices and Background Information Documents (BIDs) will be supplied to all identified Interested and Affected Parties (I&APs).
- A notice was placed in the local newspaper (Die Plattelander)
- Notices were placed in the public library and the Municipal building notice board.
- A copy of the Draft BAR & EMPr will be placed in the Municipal Public Library.

**M. Summary of issues raised by I&APs**

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<b><u>AFFECTED PARTIES</u></b>				
Landowner/s	<b>X</b>			
<b>Nama Khoi Local Municipality</b>		Courier DBAR for comment		
Lawful occupier/s of the land				
Landowners or lawful occupiers on adjacent properties	<b>X</b>			
<b>Municipal Managers</b>	<b>X</b>			
<b>Municipality</b>	<b>X</b>			
<b>Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA</b>				

<b>Communities</b>					
<b>Dept. Land Affairs</b>					
<b>Traditional Leaders</b>					
<b>Dept. Environmental Affairs</b>					
<b>Other Competent Authorities affected</b>					
Environment and Nature Conservation					
Department of Agriculture					
<b><u>OTHER AFFECTED PARTIES</u></b>					
Namakwa District Municipality					
Nama Khoi Local Municipality					
<b><u>INTERESTED PARTIES</u></b>					
WESSA Northern Cape					

## **N. The Environmental attributes associated with the alternatives.**

### **Baseline Environment**

#### **i. Type of environment affected by the proposed activity**

##### **Geographical Environment:**

The site is in the magisterial district of Namaqualand in the Western Cape Province. Carolusberg falls under the Nama Khoi Local Municipality and the Namakwa District Municipality.

##### **Physical Environment:**

###### **Climate:**

Concordia (Namaqualand) normally receives about 83mm of rain per year and because it receives most of its rainfall during winter it has a Mediterranean climate. It receives the lowest rainfall (0mm) in January and the highest (19mm) in June. The monthly distribution of average daily maximum temperatures the average midday temperatures for Concordia (Namaqualand) range from 16.2°C in July to 28.8°C in February. The region is the coldest during July when the mercury drops to 3.2°C on average during the night.

###### **Topography, Soils, Geology:**

###### **Water Resources:**

There are no water resources located close to the proposed development.

###### **Biological Environment:**

The Nama Khoi Local Municipality is a unique and diverse environment owing in large part to the presence of four distinct biogeographical regions within its boundaries. The Orange River valley lies to the north and is characterized by very dry desert conditions. In the west the Local Municipality is composed of coastal plains which transition into granite hills that straddle the escarpment, before transforming into low lying Bushmanland plains to the East of Springbok. Thus, rainfall patterns range from consistent winter rainfall in the west to more unreliable summer rainfall to the east with a variability of between 50 mm to 350 mm between the low-lying areas and the less arid peaks.

###### **Vegetation:**

According to the SA Vegetation Map (Mucina and Rutherford 2012 update) all three mining sites comprises Namaqualand Klipkoppe Shrubland vegetation (Succulent Karoo Biome) (Figure 5). This ecosystem is considered Least Threatened.

Namaqualand Klipkoppe Shrubland occurs within a dramatic landscape of granite and gneiss domes, smooth glaxis and disintegrating boulder koppies supporting open shrubland up to 1 m tall dominated by shrubs of dwarf to medium stature and with ericoid and succulent leaves. A few scattered *Aloidendron dichotomum* (kokerboom) trees are found mostly on north facing slopes. Flat or gently sloping rock sheets (the dominant feature of this unit) support dwarf or prostrate succulents in shallow pockets with soil or in cracks (Mucina & Rutherford, 2006).



Namaqualand Blommeveld is evident within the valleys and flat areas between the granitic rocky hills.

### Habitat condition and Vegetation type:

The field survey confirmed that all three mining sites comprise Namaqualand Klipkoppe Shrubland vegetation which is Least Threatened.

The most prominent species recorded within the target areas include:

- Trees: *Aloidendron dichotomum* (kokerboom), *Ficus ilicina* (louriervy)
- Succulent shrubs: *Antimima mesklipensis*, *Cheiridopsis denticulata* (t'noutsiam), *Euphorbia mauritanica* (melkbos), *Leipoldtia schultzei* (langbeen T'nouroebos), *Manochlamys albicans* (seepbos), *Schlechteranthus albiflorus*
- Shrubs: *Eriocephalus microphyllus var. pubescens* (kapokbos), *Eucleya tomentosa* (klipkers), *Galenea africana* (kraalbos), *Hermannia disermifolia* (jeukbos), *Montinia caryophyllacea* (peperbos), *Otholobium striatum*, *Pteronia incana* (vaalbossie), *Searsia undulata* (koeniebos)
- Herbs: *Ursinia cakilefolia* (bergmagriet)

### Habitat condition:

There is existing mine dumps and excavations within the northern portion of Site 2. The remainder of the site ( $\pm$  4 Ha) is in a good condition. Erosion is evident along access tracks.

### Impact Table:

Site 2:	
<b>Potential impact and risk:</b>	<b>Botanical/Ecological</b>
Nature of impact:	<b>Physical transformation of natural vegetation for purpose of surface mining.</b>
Extent and duration of impact:	<b>Site</b>
Consequence of impact or risk:	<ul style="list-style-type: none"> <li>• Transformation of <math>\pm</math> 4 Ha natural habitat within a CBA2. 1 Ha is degraded.</li> <li>• Localised reduction in the remaining extent of Least Threatened vegetation.</li> </ul>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Marginal loss</b>
Degree to which the impact can be reversed:	<b>Irreversible</b>
Indirect impacts:	<b>None</b>
Cumulative impact prior to mitigation:	<b>Medium</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium-Low</b>
Degree to which the impact can be avoided:	<b>Low</b>
Degree to which the impact can be managed:	<b>Partly</b>
Degree to which the impact can be mitigated:	<b>Partly</b>
Proposed mitigation:	<b>Refer to Section 8</b>
Residual impacts:	<b>The development could result in additional areas being transformed through the establishment of mine heaps and spoil sites.</b>
Cumulative impact post mitigation:	<b>Medium-Low</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>

### **Proposed Mitigation Measures by Botanical Specialist:**

- Intensive land uses within CBA 1 areas are undesirable. It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped (Figure 7).
- All mining areas (Sites 1, 2 and 3) should be clearly demarcated to prevent access or disturbances within adjacent natural areas.
- Mine heaps, laydown areas and spoils sites should be established within previously disturbed areas. Such areas should be identified prior to mining.
- Existing access tracks should be utilised to access the mining areas. Access tracks should be clearly defined.
- Effective measures should be implemented to manage soil erosion along access roads.
- Access to post mining areas should be adequately controlled to prevent unauthorised access by public and illegal dumping.
- Post mining soil and rock faces should be rehabilitated to prevent erosion of exposed, steep slopes and indirect impacts on adjacent natural areas.

### **Recommendations:**

Overall the proposed development will not have any significant impact on plant species and vegetation. The ecosystem is least threatened and due to the limited extent of the mining areas it is unlikely that the development will impact significantly on populations of potential Red data list species that may occur in the local area. The target development areas are however considered important for the long-term persistence of biodiversity and ecological functioning of the landscape (mapped CBA1 and CBA 2 areas). Site 1 is located within a CBA 1 area and comprises portions of pristine natural habitat which forms part of a larger corridor.

It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped.

Development of Sites 2 and 3 are acceptable from a botanical perspective should the proposed mitigation (Section 8) in the Botanical Assessment be implemented.

### **Animal Life:**

Because of the intensive farming practices and constant human traffic there is no animals expected on the site other than transient species

### **Air and Noise Quality**

Carolusberg Copper will appoint an environmental Company to install Dust Collection Probes as well as Noise measuring devices at strategic points around the permit area 1 month prior to operation commencement. This will give us a good idea of the current/background dust and noise pollution of the surrounding area. This will give us a standard with which we can compare should mining commence keeping in mind the local statutory threshold. Very little noise is anticipated due to mining and dust will be suppressed by water during loading should the need arise.

## **Socio-economic Environment:**

It is proposed that Carolusberg should form part of functional rural region 3 (including Springbok, Bergsig, Okiep, Matjieskloof, Nababeep, Bulletrap, Concordia and Carolusberg). As part of this functional integration, it is important to develop more efficient public transport systems (shuttle services) to transport residents to Springbok and/or Steinkopf and *vice-versa*.

- Infill development should be encouraged in the existing residential area.
- The entire region is characterised as a dry region with weather that is typical of desert and semi-desert areas. Mean maximum summer temperatures vary from 24 to 27°C along the coast and to the east of the mountains, to a slightly higher average of 27 to 30°C in the central mountainous areas, and up to more than 31°C in the eastern interior parts (whilst winter temperatures ranges between 20 to 25°C). It can therefore be assumed that the region is fairly exposed to year-round sunlight. Alternative solar energy projects should therefore be investigated and embarked upon in order to reduce the reliance on the grid system.
- Future growth and development in the Carolusberg area should ideally be focused and concentrated in the direction of Springbok (towards the N14 highway) in order to support the notion of functional clustering.
- The existing schools in Carolusberg should be utilised as multifunctional centres, however, learners (specifically senior phase) should be encouraged to attend school in the major economic hubs (i.e. Bergsig, Springbok or Steinkopf). These learners can be transported to these economic hubs via more efficient public transport systems. Such improved transport systems are not only necessary to improve access and connectivity but also to transport school children and people in need of medical services.

In addition, student hostel and places of residence should be made available for these commuting learners, specifically during the school week. This aspect needs to be investigated in partnership with the Department of Education, together with a possible solution to financially assist or partially subsidise distant learners.

- The ICT network should be extended and to develop enough capacity and broadband in this area, to provide cyber connectivity and to improve communication.
- Derelict and vacant buildings that are not currently in use should be upgraded and renovated i.e. the existing school buildings and community centre in Carolusberg. These buildings can be more optimally used for the needs of the community. In addition, certain facilities (i.e. the Club Hall) could potentially be used for multi-functional purposes such as community gatherings and functions.
- The existing Carolusberg mining quarters has been identified as potentially hazardous and harmful to the environment and community. It is therefore proposed that these structures should be removed through the normal municipal procedures and notices.
- Upgrade existing sports fields and recreational facilities.

### **ii. Description of the current land uses:**

The application site is currently not used. The mine area is of a mountainous nature and therefore not used for any particular purpose hence the application for a mining permit to make use of the area and provide work and give back to community.

### **iii. Description of specific environmental features and infrastructure on the site**

The mine area is from a mountainous nature and therefore not used for any particular purpose hence the application for a mining permit to make use of the area and provide work and give back to community.



iv. Environmental and current land use map.



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 table will discuss the potential impacts of the mining operation and the applicable mitigation measures.

Aspect	Potential Impact	Mitigation Measures
<b>Construction Phase</b>		
Topography	<ul style="list-style-type: none"> <li>Changing the topographical profile</li> </ul>	<ul style="list-style-type: none"> <li>No mitigation.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>Loss of land capability</li> <li>Topsoil to be removed and used during rehabilitation.</li> </ul>	<ul style="list-style-type: none"> <li>300 mm topsoil will be removed and stored to be used for rehabilitation.</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>Impact on land use.</li> </ul>	<ul style="list-style-type: none"> <li>The land is currently vacant and not used by the landowner.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>There is vegetation on site.</li> <li>Dust pollution potential.</li> </ul>	<ul style="list-style-type: none"> <li>Please see Botanical Study for more detail.</li> <li>Shade netting and covering the mineral to limit dust pollution.</li> </ul>
Surface Water	<ul style="list-style-type: none"> <li>Contamination of surface water sources.</li> <li>Potential erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Cut-off drains can be dug on the borders of the mine site to prevent water from entering the site.</li> <li>The cut-off trenches will linkup with natural drainage features.</li> <li>All cut-off trenches will be equipped with flow arrestors.</li> <li>No servicing of vehicles on site unless in the case of an emergency and then with appropriate measures for example drip trays to prevent oil spillage.</li> </ul>
Ground Water	<ul style="list-style-type: none"> <li>Contamination of groundwater.</li> <li>Reduction of groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>No groundwater abstraction will take place.</li> </ul>
Air Quality – Dust	<ul style="list-style-type: none"> <li>Potential dust pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Shade netting and covering the mineral to limit dust pollution.</li> <li>Vehicle traffic must be limited to a minimum.</li> </ul>
Air Quality – Emissions	<ul style="list-style-type: none"> <li>Potential air pollution.</li> </ul>	<ul style="list-style-type: none"> <li>All vehicles must be regularly serviced and maintained.</li> </ul>
Archaeological	<ul style="list-style-type: none"> <li>Potential loss of archaeological finds.</li> </ul>	<ul style="list-style-type: none"> <li>Any archaeological finds must be reported to SAHRA with immediate effect.</li> </ul>
Visual Aspects	<ul style="list-style-type: none"> <li>Negative visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>The visual aspect will be temporary and can unfortunately not be mitigated.</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>Positive impact</li> </ul>	<ul style="list-style-type: none"> <li>Workforce members will be employed.</li> </ul>

		<ul style="list-style-type: none"> <li>The workforce will reside in Carolusberg.</li> </ul>
Interested & Affected Parties	<ul style="list-style-type: none"> <li>Positive relations.</li> </ul>	<ul style="list-style-type: none"> <li>Regular meetings with the land owner will take place to discuss the operation.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Potential noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>The construction vehicles must only be operational during working hours to avoid disturbance of the local community.</li> <li>Work hours will be restricted.</li> </ul>
<b>Operational Phase</b>		
Topography	<ul style="list-style-type: none"> <li>Changing the topographical profile</li> </ul>	<ul style="list-style-type: none"> <li>The local topography of the site will be slightly disturbed during the mining operations. It will however be rectified during rehabilitation.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>Loss of land capability</li> <li>Topsoil will be removed to be used during rehabilitation.</li> </ul>	<ul style="list-style-type: none"> <li>300 mm topsoil will be removed and stored to be used for rehabilitation</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>Impact on land use.</li> </ul>	<ul style="list-style-type: none"> <li>The land is currently vacant and not used by the landowner.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>There is vegetation on the mining area.</li> <li>Dust pollution potential.</li> </ul>	<ul style="list-style-type: none"> <li>Please see Botanical Study for more detail.</li> <li>Shade netting and covering the mineral to limit dust pollution.</li> </ul>
Surface Water	<ul style="list-style-type: none"> <li>Contamination of surface water sources.</li> <li>Potential erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Cut-off drains will be dug on the borders of the mine site to prevent water from entering the site.</li> <li>The cut-off trenches will linkup with natural drainage features.</li> <li>All cut-off trenches will be equipped with flow arrestors.</li> </ul>
Ground Water	<ul style="list-style-type: none"> <li>Contamination of groundwater.</li> <li>Reduction of groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>No groundwater abstraction will take place.</li> </ul>
Air Quality – Dust	<ul style="list-style-type: none"> <li>Potential dust pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Shade netting and covering the mineral to limit dust pollution.</li> <li>Vehicle traffic must be limited to a minimum.</li> </ul>
Air Quality – Emissions	<ul style="list-style-type: none"> <li>Potential air pollution.</li> </ul>	<ul style="list-style-type: none"> <li>All vehicles must be regularly serviced and maintained.</li> </ul>
Archaeological	<ul style="list-style-type: none"> <li>Potential loss of archaeological finds.</li> </ul>	<ul style="list-style-type: none"> <li>Any archaeological finds must be reported to SAHRA with immediate effect.</li> </ul>
Visual Aspects	<ul style="list-style-type: none"> <li>Negative visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>The visual aspect will be temporary and can unfortunately not be mitigated.</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>Positive impact.</li> </ul>	<ul style="list-style-type: none"> <li>Workforce members will be employed.</li> <li>The workforce will reside in Carolusberg.</li> </ul>
Interested & Affected Parties	<ul style="list-style-type: none"> <li>Positive relations.</li> </ul>	<ul style="list-style-type: none"> <li>Regular meetings with the land owner will take place to discuss the operation.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Potential noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>The construction vehicles must only be operational during working hours to avoid disturbance of the local community.</li> <li>Work hours will be restricted.</li> </ul>
<b>Decommissioning Phase</b>		



Topography	<ul style="list-style-type: none"> <li>Changing the topographical profile</li> </ul>	<ul style="list-style-type: none"> <li>The site will be rehabilitated as per the recommendations from the Department of Mineral Resources.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>Loss of land capability</li> <li>Loss of top soil</li> </ul>	<ul style="list-style-type: none"> <li>All the soil taken out of the geological profile will be returned other than the rock fraction.</li> <li>There is no topsoil to remove and use during the rehabilitation phase. The applicant will have to rehabilitate the area as recommended from the Department of Mineral Resources.</li> </ul>
Land Use	Impact on land use	<ul style="list-style-type: none"> <li>The land is currently vacant and not used by the landowner.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>There is vegetation present on site.</li> <li>Dust pollution potential.</li> </ul>	<ul style="list-style-type: none"> <li>Please see Botanical Study for more detail.</li> <li>Shade netting and covering the mineral to limit dust pollution.</li> </ul>
Surface Water	<ul style="list-style-type: none"> <li>Contamination of surface water sources.</li> <li>Potential erosion.</li> </ul>	<ul style="list-style-type: none"> <li>No surface water will be contaminated.</li> <li>The cut-off trenches will be removed to allow natural drainage patterns to resume.</li> </ul>
Ground Water	<ul style="list-style-type: none"> <li>Contamination of groundwater.</li> <li>Reduction of groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>Groundwater will not be impacted because the entire geological profile will be replaced.</li> </ul>
Air Quality – Dust	<ul style="list-style-type: none"> <li>Potential dust pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Dust will be combated during rehabilitation by shade netting or covering material that is not yet transported off site.</li> </ul>
Air Quality – Emissions	<ul style="list-style-type: none"> <li>Potential air pollution.</li> </ul>	<ul style="list-style-type: none"> <li>All vehicles will be removed from the site.</li> <li>The rehabilitation vehicles will be fitted with SABS standard silencers to combat noise.</li> </ul>
Archaeological	<ul style="list-style-type: none"> <li>Potential loss of archaeological finds.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable.</li> </ul>
Visual Aspects	<ul style="list-style-type: none"> <li>Positive visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>After the mining area has been rehabilitated back to agricultural land or to how the area was prior to mining. The visual impact will improve.</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>Positive impact</li> </ul>	<ul style="list-style-type: none"> <li>The work force will be absorbed into other projects post mining.</li> </ul>
Interested & Affected Parties	<ul style="list-style-type: none"> <li>Negative relations.</li> </ul>	<ul style="list-style-type: none"> <li>The I&amp;As will be informed of the closure process.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Potential noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>The only noise will be from the rehabilitation vehicles and that will cease with handover to the farmer.</li> </ul>

**i. 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 were determined in order to decide the extent to which the initial site layout needs revision).

**Impact Assessment Methodology**

The following generic criteria will be used to describe magnitude and significance of impacts in a systematic manner. The criteria are:

- extent or spatial scale of the impact;
- intensity or severity of the impact;
- duration of the impact;
- mitigation potential;
- acceptability;
- degree of certainty;
- status of the impact; and
- legal requirements.

Ratings are assigned for each criterion. The significance of impacts of the proposed project is assessed both with and without mitigation action.

**Table 1: Categories for the rating of impact magnitude and significance**

Impact Magnitude and Significance Rating	
High:	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of a substantial order within the bounds of impacts that could occur.
Medium:	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly easily possible. Social, cultural and economic activities of communities are changed, but can be continued (albeit in a different form). Modification of the project design or alternative action may be required. In the case of beneficial impacts, other means of achieving this benefit are about equal in time, cost and effort.
Low:	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.
No impact:	Zero impact.



## Extent and Spatial Scale

Extent or spatial scale of the impact description will be provided as to whether impacts are either limited in extent or affect a wide area or group of people.

**Table 2: Criteria for rating the extent or spatial scale of impacts**

Rating	
High:	Widespread. Far beyond site boundary. Regional /national /international scale.
Medium:	Beyond site boundary. Local area.
Low:	Within site boundary.

## Intensity or Severity of Impacts

A description will be provided as to whether the intensity of the impact is high, medium, low or has no impact in terms of its potential for causing negative or positive effects.

**Table 3: Criteria for rating the intensity or severity of impacts**

Rating	
High:	Disturbance of pristine areas that have important conservation value. Destruction of rare or endangered species.
Medium:	Disturbance of areas that have potential conservation value or are of use as resources. Complete change in species occurrence or variety.
Low:	Disturbance of degraded areas, which have little conservation value. Minor change in species occurrence or variety

## Duration of the impact

The duration of the impact will be classified as short term (0 to 5 years), medium term (5 to 15 years), long term (more than 15 years, with the impact ceasing after the operational life of the development) or considered permanent.

**Table 4: Criteria for rating the duration of impacts**

Rating	
High (Long term):	Permanent. Beyond decommissioning. Long term (More than 15 years).
Medium (Medium term):	Reversible over time. Lifespan of the project. Medium term (5 - 15 years)
Low (Short term):	Quickly reversible. Less than the project lifespan. Short term (0 - 5 years)

## Mitigation potential

The potential to mitigate the negative impacts and enhance the positive impacts is determined in the specialist reports. For each identified impact, mitigation objectives that would result in a measurable reduction in impact should be provided. Management actions that could enhance the condition of the environment (i.e. potential positive impacts of the proposed project) will be identified. Performance criteria for reviewing or tracking the effectiveness of the proposed mitigation action will be provided where appropriate.

**Table 5: Criteria for rating the mitigation potential of impacts**

Rating	
High:	High potential to mitigate negative impacts to the level of insignificant effects.
Medium:	Potential to mitigate negative impacts. However, the implementation of mitigation measures may still not prevent some negative effects.
Low:	Little or no mechanism to mitigate negative impacts.

## Acceptability

The level of acceptability often depends on the stakeholders, particularly those directly affected by the proposed project, legal limits, guidelines and industry standards.

**Table 6: Criteria for rating the acceptability of impacts**

Rating	
High (Unacceptable):	Abandon project in part or in its entirety. Redesign project to remove or avoid impact.
Medium (Manageable):	With regulatory controls. With project proponent's commitments.
Low (Acceptable):	No risk to public health

## Degree of certainty

A description is to be provided of the degree of certainty of the impact occurring as unsure, possible, probable, or definite (impact will occur regardless of prevention measures).

**Table 7: Criteria for rating the degree of certainty of impacts**

Rating	
Definite:	More than 90% sure of a fact. Substantial supportive data exist to verify the assessment.
Probable:	Over 70% sure of a factor of the likelihood of that impact occurring.
Possible:	Only over 40% sure of a factor of the likelihood of an impact occurring.
Unsure:	Less than 40% sure of a fact or the likelihood of an impact occurring. No risk to public health

**ii. 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)

<b>Positive Impacts</b>	<b>Negative Impacts</b>
Creating job opportunities.	Life of mine visual impact.
Supporting local businesses.	Life of mine potential dust pollution.
Contributing to the national focus through tax and royalties.	Life of mine noise pollution.
Natural Vegetation	Botanical report will indicate the negative impact on the natural vegetation if present. <b>See Annexure E for Botanical Report.</b>

**iii. The possible mitigation measures that could be applied and the level of risk**

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

The level of risk with all three the identified potential impacts are low. Two of the impacts (dust and noise) are manageable and can be controlled to the point that it will not be a factor.

**Proposed Mitigation Measures by Botanical Specialist:**

- Intensive land uses within CBA 1 areas are undesirable. It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped.
- All mining areas (Sites 1, 2 and 3) should be clearly demarcated to prevent access or disturbances within adjacent natural areas.
- Mine heaps, laydown areas and spoils sites should be established within previously disturbed areas. Such areas should be identified prior to mining.
- Existing access tracks should be utilised to access the mining areas. Access tracks should be clearly defined.
- Effective measures should be implemented to manage soil erosion along access roads.
- Access to post mining areas should be adequately controlled to prevent unauthorised access by public and illegal dumping.
- Post mining soil and rock faces should be rehabilitated to prevent erosion of exposed, steep slopes and indirect impacts on adjacent natural areas.

**Recommendations:**

Overall the proposed development will not have any significant impact on plant species and vegetation. The ecosystem is least threatened and due to the limited extent of the mining areas it is unlikely that the development will impact significantly on populations of potential Red data list species that may occur in the local area. The target development areas are however considered important for the long-term persistence of biodiversity and ecological

functioning of the landscape (mapped CBA1 and CBA 2 areas). Site 1 is located within a CBA 1 area and comprises portions of pristine natural habitat which forms part of a larger corridor.

It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped.

Development of Sites 2 and 3 are acceptable from a botanical perspective should the proposed mitigation (Section 8) in the Botanical Assessment be implemented.

#### **iv. Motivation where no alternative sites were considered**

Alternative sites could not be considered because of the following reasons:

- Mineral deposits occur where they occur in the geological profile. Alternative sites will not exhibit the same mineralisation or geological occurrence. Mining is conducted where the mineral occurs in economic quantities.
- The layout and use pattern of the farm is such that this is the only minable block which will not impact on other surrounding areas besides the community which is in proximity.
- The resource has been identified through third-party prospecting confirming the occurrence of rock.
- The site features easy access to the copper with little to no overburden.

#### **v. Statement motivating the alternative development location within the overall site**

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

Because the site is 4.8 Ha all of it will be mined. The primary processing plant will not be located on the site. There can therefore be no alternative development location within the overall site.

#### **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.)

The risk assessment and impact analysis done for the mine was based on a combination of desktop studies, prior experience in this field, consultation with interested and affected parties and specialist input. Site visits to assess the situation on the ground was done. Each potential impact was then evaluated according to the methodology as described.

### O. 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).

<b>NAME OF ACTIVITY</b>  (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc  E.g. For mining - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	<b>POTENTIAL IMPACT</b>  (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b>  In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	<b>SIGNIFICANCE if not mitigated</b>	<b>MITIGATION TYPE</b>  (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	<b>SIGNIFICANCE if mitigated</b>
Vegetation clearing	<ul style="list-style-type: none"> <li>Clearing of vegetation from the site.</li> <li>Potential dust pollution.</li> </ul>	Environmental Social	Construction Operational	Very Low (No natural vegetation)	Topsoil Management. Dust Control.	Low Negative
Mining	<ul style="list-style-type: none"> <li>Dust pollution.</li> <li>Noise Pollution.</li> <li>Visual Impact.</li> </ul>	Environment Social	Operational	Moderate Negative	Dust Control. Vehicle and Plant Maintenance.	Low Negative
Decommissioning & Rehabilitation	<ul style="list-style-type: none"> <li>Dust pollution.</li> <li>Noise pollution.</li> </ul>	Environment Social	Mine Closure	Moderate Positive	Dust Control. Vehicle Maintenance.	Low Negative

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

**P. 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.
Botanical Assessment	<p><b>Proposed Mitigation Measures by Botanical Specialist:</b></p> <ul style="list-style-type: none"> <li>• Intensive land uses within CBA 1 areas are undesirable. It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped.</li> <li>• All mining areas (Sites 1, 2 and 3) should be clearly demarcated to prevent access or disturbances within adjacent natural areas.</li> <li>• Mine heaps, laydown areas and spoils sites should be established within previously disturbed areas. Such areas should be identified prior to mining.</li> <li>• Existing access tracks should be utilised to access the mining areas. Access tracks should be clearly defined.</li> <li>• Effective measures should be implemented to manage soil erosion along access roads.</li> <li>• Access to post mining areas should be adequately controlled to prevent unauthorised access by public and illegal dumping.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Post mining soil and rock faces should be rehabilitated to prevent erosion of exposed, steep slopes and indirect impacts on adjacent natural areas.</li> </ul> <p><b>Recommendations:</b> Overall the proposed development will not have any significant impact on plant species and vegetation. The ecosystem is least threatened and due to the limited extent of the mining areas it is unlikely that the development will impact significantly on populations of potential Red data list species that may occur in the local area. The target development areas are however considered important for the long-term persistence of biodiversity and ecological functioning of the landscape (mapped CBA1 and CBA 2 areas). Site 1 is located within a CBA 1 area and comprises portions of pristine natural habitat which forms part of a larger corridor.</p> <p>It is recommended that mining within Site 1 be restricted to the western portion which is already partly transformed. Additional mining should be considered, if required, within degraded areas directly south and west of this area. The eastern portion of Site 1 is in a pristine condition and should remain undeveloped.</p> <p>Development of Sites 2 and 3 are acceptable from a botanical perspective should the proposed mitigation (Section 8) in the Botanical Assessment be implemented.</p>		
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## Q. Environmental impact statement

### i. Summary of the key findings of the environmental impact assessment;

Three impacts were identified as relevant with regard to the proposed operation:

- Potential Dust Pollution – Dust pollution is the major impact that must be managed on the site. Shade netting or covering materials are one of the necessary mitigation measures.
- Potential Noise Pollution. – Noise pollution is a significant factor as the construction vehicles will enter and leave the site. Mining vehicles will only be allowed a certain time to work to minimize disturbance.
- Visual Impact – The area will not be visible to the community or cause disturbance to the traffic.
- Natural vegetation – Please see Botanical Assessment under Annexure E.

### ii. Final Site Map

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

Please see **Annexure C** for the formal Site Plan.

### Mining Sequence



The mining blocks will be mined in this sequence please see image above. Each block will be rehabilitated prior to moving to the next block.



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

<b>Positive Impacts</b>	<b>Negative Impacts</b>
Creating job opportunities.	Life of mine visual impact.
Supporting local businesses.	Life of mine potential dust pollution.
Contributing to the national focus through tax and royalties.	Life of mine noise pollution.
Natural Vegetation	Botanical report will indicate the negative impact on the natural vegetation if present. <b>See Annexure E for Botanical Report.</b>

**R. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;**

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

i. **Aspects for inclusion as conditions of Authorisation**

Any aspects which must be made conditions of the Environmental Authorisation

**Dust Control and Monitoring:**

- Dust abatement by covering exposed areas and tracks or introducing shade netting.
- Vehicles will stay on the approved or available tracks as far as practically possible.
- Low speed limits will be set to avoid the creation of dust (20km/hr.).
- Any complaints or claims emanating from the dust pollution shall be attended to immediately by the Mine Manager.

ii. **Description of any assumptions, uncertainties and gaps in knowledge**

(Which relate to the assessment and mitigation measures proposed?)

The only inferred assumption is the occurrence of the copper ore across the entire site based on limited test hole results.

iii. **Reasoned opinion as to whether the proposed activity should or should not be authorised**

The proposed activity should be authorized.

iv. **Reasons why the activity should be authorized or not**

The activity does not pose any significant negative impacts. The minor impacts can be mitigated and managed so to remove the impact through low technology means.

**v. Conditions that must be included in the authorisation**

The dust control management strategy must be implemented and monitored.

**vi. Period for which the Environmental Authorisation is required**

Authorization is required for the duration of the mining permit.

**vii. 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 requirements of the section will be addressed in the EMPr in Part B.

## 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 “Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision provided by a Mine”, the “Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), Revision 1.6 (7<sup>th</sup> September 2004)” was used to guide the calculation of the financial provision.

The proposed operation is classified as a Class C mine. Therefore, the minimum rate for Class C mines are established as R20 000-00 per hectare as per the guideline (Section 4.5) with a minimum amount of R10 000-00.

With a compound 6% escalation calculated from 2004 on the master rate as recommended by DMR, the amount comes to R37965.97/Ha.

The financial provision is therefore calculated as:

Mine	Area	Sensitivity	Rate / Ha	Financial Provision
Carolusberg Copper Pty Ltd	4.8 Ha	Low	R38 000/Ha	R182400-00

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

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

The Rehabilitation Fund will be provided as a Bank Guarantee by Carolusberg Copper Pty Ltd

**T. Specific Information required by the competent Authority:**

**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: -**

- i. 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 landowner (Nama Khoi Local Municipality) was informed of the Mining Application process.

- ii. 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)(j)(vi) and (vii) of that 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).

It is extremely unlikely that any heritage artefacts will be present on the site. However, cognisance is taken of the National Heritage Resources Act (1999) and an assessment of the site will be done by a specialist.

- iii. Other matters required in terms of sections 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 issue of alternatives for the proposed operation has been discussed under Section O (iv) & (v) (page 29).

## 4. PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### U. FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME.

#### i) Details of the EAP,

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

The details and expertise of the EAP is presented in Part A, Section 1(a).

#### ii) Description of the Aspects of the Activity

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

The aspects are presented in Part A, Section (1)(h).

#### iii) 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)



The site will be mined in sequence from Blocks 1 to 4 as shown in the image above. As mining progresses the rehabilitation of the mined-out area will follow concurrently. The sequence will repeat with the other blocks.

#### **iv) Description of Impact management objectives including management statements**

##### **(a) Determination of closure objectives**

(ensure that the closure objectives are informed by the type of environment described)

The closure objectives for the proposed mine is to leave it as a functional piece of land to be used by the landowner and community of Carolusberg.

Objective 1: To ensure the effective rehabilitation of the mining permit area.

- The site is to be landscaped for used prior to mining.
- Soil to be replaced across the entire area.

Objective 2: To minimize pollution or degradation of the environment.

- Provision of chemical toilets for workers.
- Ensure that no fuel or oil spills occur in the mining area.
- Ensure that no solid waste or rubble is dumped on the site.

Objective 3: To minimize the social impacts of the mine.

- Operate only normal working hours.
- Minimize dust and noise pollution.
- Ensure that mine workers stay within the mining area
- Pro-actively communicate with I&APs.
- To respond immediately to any complaints.

##### **(b) Volumes and rate of water use required for the operation.**

Two temporary (containerized) offices will be used to be mounted on concrete stands and one ablution facility. The ablution facility will be contracted out to a chemical company. Water for personal use and dust suppression will be supplied from a 10 000 L Jo Jo tank which will be filled by water truck from the plant area (Okiep)

##### **(c) Has a water use licence has been applied for?**

A water use license has not been applied for by Carolusberg Copper Pty Ltd. There are no water resources located close to the proposed mining area.

v) Impacts to be mitigated in their respective phases

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

ACTIVITIES  (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc  E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	PHASE  (of operation in which activity will take place.  State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	SIZE AND SCALE of disturbance  (volumes, tonnages and hectares or m <sup>2</sup> )	MITIGATION MEASURES  (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS  (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION  Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: - Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Vegetation is present on site. <b>(Please see Botanical Report under Annexure E)</b>	Construction	4.8 Ha	Topsoil Management. Dust Control.	Industry Best Practice	Ongoing
Mining	Operational	4.8 Ha	Dust Control. Vehicle Maintenance.	Industry Best Practice	Ongoing
Decommissioning & Rehabilitation	Operational	4.8 Ha	Dust Control. Vehicle Maintenance.	Industry Best Practice	Ongoing until Closure Certificate is issued.

## vi) Impact Management Outcomes

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

<b>ACTIVITY</b> (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.).	<b>POTENTIAL IMPACT</b>  (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.... etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	<b>MITIGATION TYPE</b>  (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"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation.</li> </ul>	<b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Vegetation is present on site. <b>(Please see Botanical Report under Annexure E)</b>	<ul style="list-style-type: none"> <li>• Clearing of vegetation from the site.</li> <li>• Potential dust pollution.</li> </ul>	Environmental Social (Land owners / neighbours)	Construction / Operational	Control through management and monitoring.	Industry best standards: Impact reduced to negligible level.  For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)
Mining	<ul style="list-style-type: none"> <li>• Dust pollution.</li> <li>• Noise Pollution.</li> <li>• Visual Impact.</li> </ul>	Environmental Social (Land owners / neighbours)	Operational	Control through management and monitoring.	Industry best standards: Impact reduced to negligible level.  For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)
Decommissioning & Rehabilitation	<ul style="list-style-type: none"> <li>• Dust pollution.</li> </ul>	Environmental	Operational	Control through management and monitoring.	Industry best standards: Impact reduced to negligible level.



	<ul style="list-style-type: none"><li>Noise pollution.</li></ul>	Social (Land owners / neighbours)			For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)
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## vii) Impact Management Actions

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

<b>ACTIVITY</b> 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.).	<b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	<b>MITIGATION TYPE</b>  (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. • <b>Modify through alternative method.</b> • <b>Control through noise control</b> • <b>Control through management and monitoring</b> • <b>Remedy through rehabilitation.</b>	<b>TIME PERIOD FOR IMPLEMENTATION</b>  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.	<b>COMPLIANCE WITH STANDARDS</b>  (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)
Vegetation is present on site. (Namaqualand Klipkoppie Shrubland)	<ul style="list-style-type: none"> <li>• Clearing of vegetation from the site.</li> <li>• Potential dust pollution from denuded areas.</li> </ul>	Control through management and monitoring. Remedy thorough Rehabilitation.	Throughout the life of the mine with immediate implementation.	Industry best standards:  For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)
Mining	<ul style="list-style-type: none"> <li>• Dust pollution due to vehicular movement</li> <li>• Noise Pollution from vehicles.</li> </ul>	Control through management and monitoring. Remedy thorough Rehabilitation.	Throughout the life of the mine with immediate implementation	Industry best standards:  For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)

	<ul style="list-style-type: none"> <li>• Visual Impact mining operation.</li> </ul>			
Decommissioning & Rehabilitation	<ul style="list-style-type: none"> <li>• Dust pollution from vehicles.</li> <li>• Noise pollution from vehicles.</li> </ul>	Control through management and monitoring. Remedy thorough Rehabilitation.	Throughout the life of the mine with immediate implementation	Industry best standards:  For dust: adhere to Air Quality Act. For Noise: Adhere to Noise Regulations (SANS 10103)

## V. Financial Provision

### Determination of the amount of Financial Provision

**i. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

The closure objectives for the proposed mine is to leave it as a functional piece of land to be used by the landowner (Nama Khoi Local Municipality).

Objective 1: To ensure the effective rehabilitation of the mining permit area.

- The site is to be landscaped back to its previous state prior to mining.
- Topsoil to be replaced across the entire area.

Objective 2: To minimize pollution or degradation of the environment.

- Provision of chemical toilets for workers.
- Ensure that no fuel or oil spills occur in the mining area.
- Ensure that no solid waste or rubble is dumped on the site.

Objective 3: To minimize the social impacts of the mine.

- Operate only normal working hours.
- Minimize dust and noise pollution.
- Ensure that mine workers stay within the mining area.
- Pro-actively communicate with I&APs.
- To respond immediately to any complaints.

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

The landowner was consulted Nama Khoi Local Municipality.

**iii. 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 site will be mined in sequence from Blocks 1 to 4 as shown in the image above. As mining progresses the rehabilitation of the mined-out area will follow concurrently. The sequence will repeat with the other blocks.

## **Soil Management**

### Topsoil Management

*The process followed for topsoil stripping:*

There is topsoil (300mm) to be removed and will be stockpiled for use during rehabilitation.

### **Mulching**

There is vegetation present on site (Namaqualand Klipkoppie Shrubland). The removal of vegetation (small trees / alien and invasive plants) will take place prior to removal of material.

### **Seeding and seed mixtures**

Any type of soil that was removed contains the organic nutrients and seed required to facilitate plant growth and no artificial fertilizer will be added.

### **Soil Erosion Management**

- Cut-off drains will be dug on the borders of the mine site to prevent water from entering the site.
- The cut-off trenches will linkup with natural drainage features.
- All cut-off trenches will be equipped with flow arrestors.

## General Rehabilitation

Implement the site clearance strategy. Implement the Monitoring and Reporting Protocols as per the Rehabilitation Plan.

**iv. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

The rehabilitation plan will be written to give execution to obtain the closure objectives. The closure objectives therefore inform and guide the plan to achieve the set goals. The two are interlinked and cannot operate separately from each other.

**v. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

The “Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision provided by a Mine”, the “Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), Revision 1.6 (7<sup>th</sup> September 2004)” was used to guide the calculation of the financial provision.

The proposed operation is classified as a Class C mine. Therefore, the minimum rate for Class C mines are established as R20 000-00 per hectare as per the guideline (Section 4.5) with a minimum amount of R10 000-00 with a compound 6% escalation calculated from 2004 on the master rate as recommended by DMR, the amount comes to R37 965.97/Ha.

The financial provision is therefore calculated as:

Mine	Area	Sensitivity	Rate / Ha	Financial Provision
Carolusberg Copper Pty Ltd	4.8 Ha	Low	R38 000/Ha	R182400-00

**vi. Confirm that the financial provision will be provided as determined.**

The financial provision will be provided as a bank guarantee by Carolusberg Copper Pty Ltd.

**W. Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including**

Monitoring of Impact Management Actions

Monitoring and reporting frequency

Responsible persons

Time period for implementing impact management actions

Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Soil	<ol style="list-style-type: none"> <li>1) Removal and stockpile of topsoil.</li> <li>2) Erosion of topsoil stockpile.</li> <li>3) Replacement of topsoil on rehabilitated sections.</li> </ol>	<ol style="list-style-type: none"> <li>1) Monitor that all the topsoil is removed and stockpiled correctly.</li> <li>2) Monitor erosion of the topsoil stockpile.</li> <li>3) Test the depth of topsoil replacement to ensure uniform coverage.</li> </ol>	Mine Manager	<ol style="list-style-type: none"> <li>1) Ongoing</li> <li>2) Monthly</li> <li>3) Ongoing during rehabilitation.</li> </ol>
Water	<ol style="list-style-type: none"> <li>1) Water accumulation on the mine site may cause erosion through overflow.</li> <li>2) Erosion of the mining area and rehabilitation sections.</li> <li>3) Run-off water with high silt content indicates erosion.</li> </ol>	<ol style="list-style-type: none"> <li>1) Monitor water accumulation points on the mine site.</li> <li>2) Monitor erosion on the mine site.</li> <li>3) Monitor run-off during rain events.</li> </ol>	Mine Manager	<ol style="list-style-type: none"> <li>1) After rain events.</li> <li>2) Quarterly.</li> <li>3) After rain events.</li> </ol>

Air	<ol style="list-style-type: none"> <li>1) Excessive dust pollution.</li> <li>2) Dust effect on land owner and neighbours.</li> </ol>	<ol style="list-style-type: none"> <li>1) All equipment operators must do daily visual inspections to check for dust pollution.</li> <li>2) Severe dust conditions must immediately be reported to the Mine Manager for action.</li> <li>3) Severe dust episodes must be reported in the Incident Reporting Book.</li> </ol>	All employees / Mine Manager	Continual.
Vegetation	<ol style="list-style-type: none"> <li>1) Check for re-vegetation success on rehabilitated areas.</li> <li>2) Alien and invasive species must be eradicated.</li> </ol>	<ol style="list-style-type: none"> <li>1) Monitor for good nurse crop plant densities to combat wind erosion.</li> <li>2) Monitor the occurrence of alien and invasive species for action.</li> </ol>	Mine Manager	Quarterly.
Noise	<ol style="list-style-type: none"> <li>1) Noise levels on site.</li> <li>2) Noise effect on land owner and neighbours.</li> </ol>	<ol style="list-style-type: none"> <li>1) Monitor noise on the site, specifically with regard to wind direction.</li> <li>2) Consult regularly with the land owner and neighbours.</li> <li>3) All noise complaints must be reported in the Incident Reporting Book.</li> </ol>	Mine Manager	Continually
Pollution	<ol style="list-style-type: none"> <li>1) Occurrence of litter and rubble.</li> <li>2) Occurrence of oil spills.</li> </ol>	Monitor on weekly basis for the occurrence of litter, rubble or oil spills.	Mine Manager	Continually



**i) The frequency of the submission of the performance assessment/environmental audit report**

The Performance Assessment Report must be submitted annually to the DMR.

## **X. Environmental Awareness Plan**

### **i) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work**

Induction training will be held for all employees before commencing work on the site. Weekly “toolbox talks” will be held by the mine manager. The following subjects will be covered:

- The environmental management goals on the mine site.
- Rehabilitation goals.
- The environmental monitoring protocols.
- Waste management on site.
- Dealing with spills and soil contamination.
- Dealing with environmental risks pertinent to the site.

### **ii) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment**

All relevant mitigation and management measures pertaining to environmental risks should be discussed during induction training. Compliance to these procedures by all personnel must be monitored by the mine manager.

**Y. Specific information required by the Competent Authority**  
(Among others, confirm that the financial provision will be reviewed annually).

No specific information was requested by the authorities.

## 5. UNDERTAKING

The EAP herewith confirms

- the correctness of the information provided in the reports ✓
- the inclusion of comments and inputs from stakeholders and I&APs ;✓
- the inclusion of inputs and recommendations from the specialist reports where relevant; ✓ and
- that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.✓



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Signature of the environmental assessment practitioner:

Grasaro (Pty) Ltd.

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Name of company:

04 July 2019

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Date:

**-END-**

**Physical and chemical components**

The following components are evaluated:

- Geology
- Air Quality – Dust
- Air Quality – Emissions
- Groundwater
- Visual Aspects
- Surface Water
- Topography

**Impact on the physical and chemical components**

	<b>Impact Magnitude &amp; Significance</b>	<b>Spatial Scale of impact</b>	<b>Impact Severity / Intensity</b>	<b>Duration of impact</b>	<b>Mitigation potential</b>	<b>Acceptability of impacts</b>	<b>Certainty of impacts</b>
<b>Geology</b>	Low	Low	Low	Medium	High	Low	Definite
<b>Air Quality - Dust</b>	Low	Medium	Low	Medium	High	Medium	Possible
<b>Air Quality - Emissions</b>	Low	Low	Low	Medium	High	Low	Probable
<b>Groundwater</b>	Low	Medium	Low	Medium	High	Low	Probable
<b>Visual Aspects</b>	Low	Medium	Low	Medium	Medium	Low	Probable
<b>Surface Water</b>	Low	Low	Low	Medium	High	Low	Probable
<b>Topography</b>	Low	Low	Low	Medium	High	Low	Definite

**Sociological and cultural components**

The following components are evaluated: Interested and Affected Parties  
 Archaeological Artefacts  
 Noise

**Impact on sociological and cultural components**

	<b>Impact Magnitude &amp; Significance</b>	<b>Spatial Scale of impact</b>	<b>Impact Severity / Intensity</b>	<b>Duration of impact</b>	<b>Mitigation potential</b>	<b>Acceptability of impacts</b>	<b>Certainty of impacts</b>
<b>Interested and Affected Parties</b>	Low	Medium	Low	Medium	High	Low	Probable
<b>Archaeological Artefacts</b>	Low	Low	Low	High	High	Medium	Possible
<b>Noise</b>	Low	Medium	Low	Low	High	Low	Probable

**Economical and operational components**

The following components are evaluated: Regional Socio-Economic Structure  
 Impact on economical and operational components

	<b>Impact Magnitude &amp; Significance</b>	<b>Spatial Scale of impact</b>	<b>Impact Severity / Intensity</b>	<b>Duration of impact</b>	<b>Mitigation potential</b>	<b>Acceptability of impacts</b>	<b>Certainty of impacts</b>
<b>Regional Socio-Economic Structure</b>	Low (Positive)	Low	Low	Medium	High	High	Definite

## Botanical Impact Table:

<b>Site 2:</b>	
<b>Potential impact and risk:</b>	<b>Botanical/Ecological</b>
Nature of impact:	<b>Physical transformation of natural vegetation for purpose of surface mining.</b>
Extent and duration of impact:	<b>Site</b>
Consequence of impact or risk:	<ul style="list-style-type: none"> <li>• Transformation of ± 4 Ha natural habitat within a CBA2. 1 Ha is degraded.</li> <li>• Localised reduction in the remaining extent of Least Threatened vegetation.</li> </ul>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Marginal loss</b>
Degree to which the impact can be reversed:	<b>Irreversible</b>
Indirect impacts:	<b>None</b>
Cumulative impact prior to mitigation:	<b>Medium</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium-Low</b>
Degree to which the impact can be avoided:	<b>Low</b>
Degree to which the impact can be managed:	<b>Partly</b>
Degree to which the impact can be mitigated:	<b>Partly</b>
Proposed mitigation:	<b>Refer to Section 8</b>
Residual impacts:	<b>The development could result in additional areas being transformed through the establishment of mine heaps and spoil sites.</b>
Cumulative impact post mitigation:	<b>Medium-Low</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>