



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

**NAME OF THE
APPLICANT:**

CUCHRON (PTY) LTD

**REFERENCE
NUMBER:**

LP 30/5/1/2/3/2/1(10193) EM

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

**FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING RIGHT APPLICATION
(CUCHRON (PTY) LTD)**

**SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE
NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 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).**

JULY 2021

Compiled by: Diphororo Development (Pty) Ltd

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CUCHRON GRAPHITE MINE: DRAFT EMPr

In terms of the NEMA 2014 EIA Regulations contained in GN R982 of 04 December 2014 (as amended in 2017) the Environmental Impact Assessment Report (EIAR) must comply with Appendix 3 of the NEMA 2014 EIA Regulations.

Legal Requirement		Relevant Section in EMPr
(1)	An EMPr must comply with section 24N of the Act and include—	
(a)	Details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.2.2 Appendix A
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
(c)	a map 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;	Figure 2-6 Appendix B
(d)	a description of the impact management objectives outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including— planning and design; pre-construction activities; construction activities; rehabilitation of the environment after construction and where applicable post closure; and where relevant, operation activities;	Section 3
(e)	The description and identification of impact management outcome required for the aspects contemplated in paragraph (d);	Section 3
(f)	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (d) and (e) will be achieved, and must, where applicable, include actions to avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; comply with any prescribed environmental management standards or practices; comply with any applicable provisions of the Act regarding closure, where applicable; and comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Section 4 Table 3-1
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5 Table 5-1
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5 Table 5-1
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 5 Table 5-1
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 5 Table 5-1
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 5.2
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 5.2
(m)	an environmental awareness plan describing the manner in which— The applicant intends to inform his or her employees of any environmental risk which may result from their work; and Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 7
(n)	Any specific information that may be required by the competent authority.	Section 9

DMRE SCOPING ACCEPTANCE REQUIREMENTS

Acceptance Requirement	Reference in document
Commitment on monitoring and indication of the standards, methods and the frequency of submission of an environmental audit report/performance assessment report to this department.	EMPR Section 5
Clear and specific standards for noise, particulate matter and dust levels and commitment to monitoring levels	EMPR Section 3.2
The inclusion of the procedures that relate to emergencies and proposed remediation hereto, for example: discuss the contingency plans with respect to floods, accidental spills and management of hazardous materials such as oil, diesel, etc; in the proposed mining area.	EMPR Section 6
Details of the future land use for the site and infrastructure after decommissioning in 20-30 years	EMPR Section 3.1
Provide soil quality monitoring programme to minimise or eliminate identified impacts	EMPR Section 5
A construction and operational phase EMP to include mitigation and monitoring measures	EMPR Section 4

LIST OF ACRONYMS

B-BBEE: Broad-Based Black Economic Empowerment
BID: Background Information Document
BLM: Blouberg Local Municipality
LEDET: Limpopo Department of Economic Development Environment and Tourism
DMRE: Department of Mineral Resources and Energy
DWA: Department of Water Affairs
DWS: Department of Water and Sanitation
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
EIA: Environmental Impact Assessment
EIAR: Environmental Impact Assessment Report
EMP: Environmental Management Plan
EMPr: Environmental Management Programme
GNR: Government Notice Regulation
ha: Hectare
HIA: Heritage Impact Assessment
I&APs: Interested and Affected Parties
CRR: Comments and Response Register
IWUL: Integrated Water Use Licence
Diphororo: Diphororo Development (Pty) Ltd
km: Kilometer
LOM: Life of Mine
MAE: Mean Annual Evaporation
MAP: Mean Annual Precipitation
mbsl: Metres below sea level
m: Meter
mm: Millimeter
m²: Square meter
m³: Cubic meter
MWP: Mining Work Programme
CDM: Capricorn District Municipality
NEMA: National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA: National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004)
NEMWA: National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NWA: National Water Act, 1998 (Act 36 of 1998)
PCD: Pollution Control Dam
PP: Public Participation
PPE: Personal Protective Equipment
PPP: Public Participation Process
RDL: Red Data List
ROM: Run of Mine

RWQO: Resource Water Quality Objectives

SAHRA: South African Heritage Resources Agency

SCC: Species of Conservation Concern

S&EIR: Scoping & Environmental Impact Reporting

SLP: Social and Labour Plan

StatsSA: Statistics South Africa

WML: Waste Management Licence

WUL: Water Use Licence

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1 INTRODUCTION

1.1 Background

The project name is the Cuchron Graphite Mine Project. Cuchron holds a valid Prospecting Right No LP/5/1/1/2/10321PR for Graphite over the farm's Steamboat 306MR and Inkom 305MR, covering an area of 1,453 hectares, situated along the Mogalakwena River in the Province of Limpopo.

Steamboat Graphite will establish a Beneficiation Plant in proximity to the mine, to beneficiate and process the graphite for a broader market.

A Mining Right Application has been submitted by Cuchron for the mine development, and acceptance was received on 12 November 2020. A combined Environmental Impact Assessment has been compiled, but a separate Environmental Management Programme Report is prepared for each of the Developments.

Two Environmental Authorisation Applications has been submitted:

- Cuchron has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure
- Steamboat Graphite has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

Approval has been received from DMR to follow a joint and consolidated approach to the Environmental Impact Assessment Process, and produce combined reports for the two applications as envisaged in terms of Regulation 11(4) of the EIA regulations 2014 (as amended) which states *“if one or more proponents intend undertaking interrelated activities at the same or different locations within the area of jurisdiction of a competent authority, the competent authority may, in writing, agree that the proponent or proponents submit a single application in respect of all of those activities and to conduct a consolidated assessment process but the potential environmental impacts of each activity, including its cumulative impacts, must be considered in terms of the location where the activity is to be undertaken”*.

1.2 Applicant and Specialist Details

1.2.1 Applicant

Name of Company / Applicant	Cuchron (Pty) Ltd
Name of the Mine / Production Operation	Cuchron Graphite Mine
Responsible Person	Dawn Makwakwa
Physical Address	174 Veale Street, Nieuw Muckleneuk, Pretoria 0181
Postal Address	PO Box 96023, Waterkloof Village 0146
Cell Number	082 267 1321
Telephone Number	082 267 1321
Fax Number	086 602 5566
Email:	dmakwakwa@gmail.com

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1.2.2 Environmental Assessment Practitioner

EAP:	Mrs Lizinda Dickson		
Qualifications:	Master's in Environmental Assessment and Management, University of Pretoria		
Professional affiliation/registration:	EAPASA awaiting approval IAIA & AP2		
Experience	25 years		
Contact person (if different from EAP):	Mrs Lizinda Dickson		
Company:	Diphororo Development		
Physical address:	151 Sefako Makgatho Drive, Sinoville		
Postal address:	PO Box 13509, Sinoville		
Postal code:	0129	Cell:	082 922 2261
Telephone:	012 543 9093	Fax:	086 602 5566
E-mail:	lizinda@diphororo.com		

The CV of Lizinda Dickson is attached at Appendix A.

2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

2.1 Project Location

The projects are located on the farm's Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require a footprint of 14ha (1% of properties)

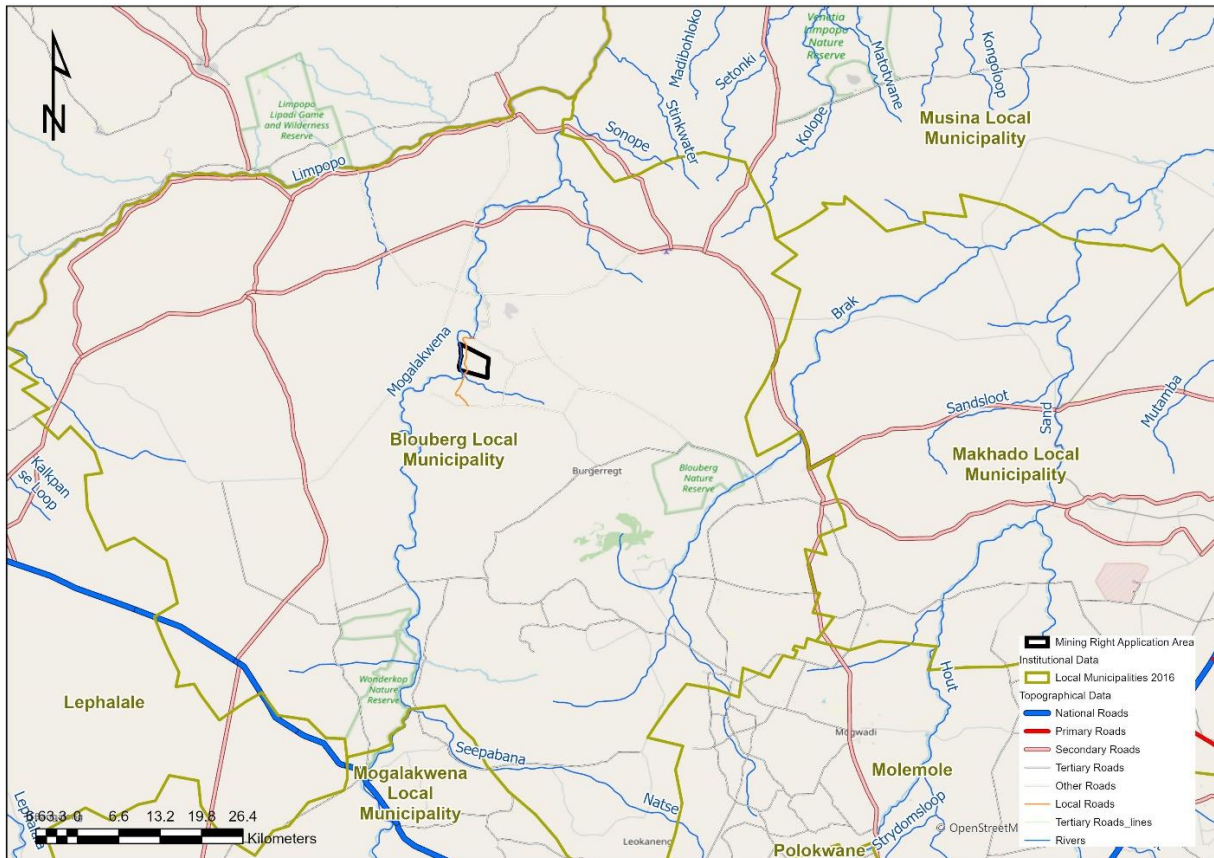


Figure 2-1: Locality Map

The project is located within the Blouberg Municipal area that forms part of the Capricorn District Municipality in Limpopo Province. The project area is situated in Ward 17 and neighboured to the south by Ward 16.

2.2 Properties Description

The registered description of the property involved is tabled below.

Table 2-1: Project Properties

Farm Name	Steamboat 306MR	Inkom 305MR
Application Area (ha)	663.7223	789.8538
Magisterial District	Capricorn	Capricorn
Registered Owner	National Government of the Republic of South Africa	National Government of the Republic of South Africa
Title Deed Number	T24557/1952PTA	T24557/1952PTA

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21-digit SG Code	000T0MR0000000030600000	000T0MR0000000030500000
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The following adjacent properties are present:

Table 2-2: Adjacent Properties

Properties	Direction	Landowner	Comment
Arrie 308 MR	North	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area
Zondagfontein 300 MR Ptn 1	West	Government of the Republic of South Africa	
Zondagfontein 300 MR Ptn 3	West	Roman Catholic Church	
Zondagfontein 300 RE	West	Ramakwa Project Trust	LRAD community project
Goudmyn 327 MS RE	South	Government of Lebowa	Part of Bahananwa Traditional Authority
Royston 326 RE	East	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area
Voorhout 310 RE	East	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area

The operations are located within the Bahanawa-Ba-Kibi Traditional Authority area. The Bahananwa Traditional Authority borders the MRA to the south.

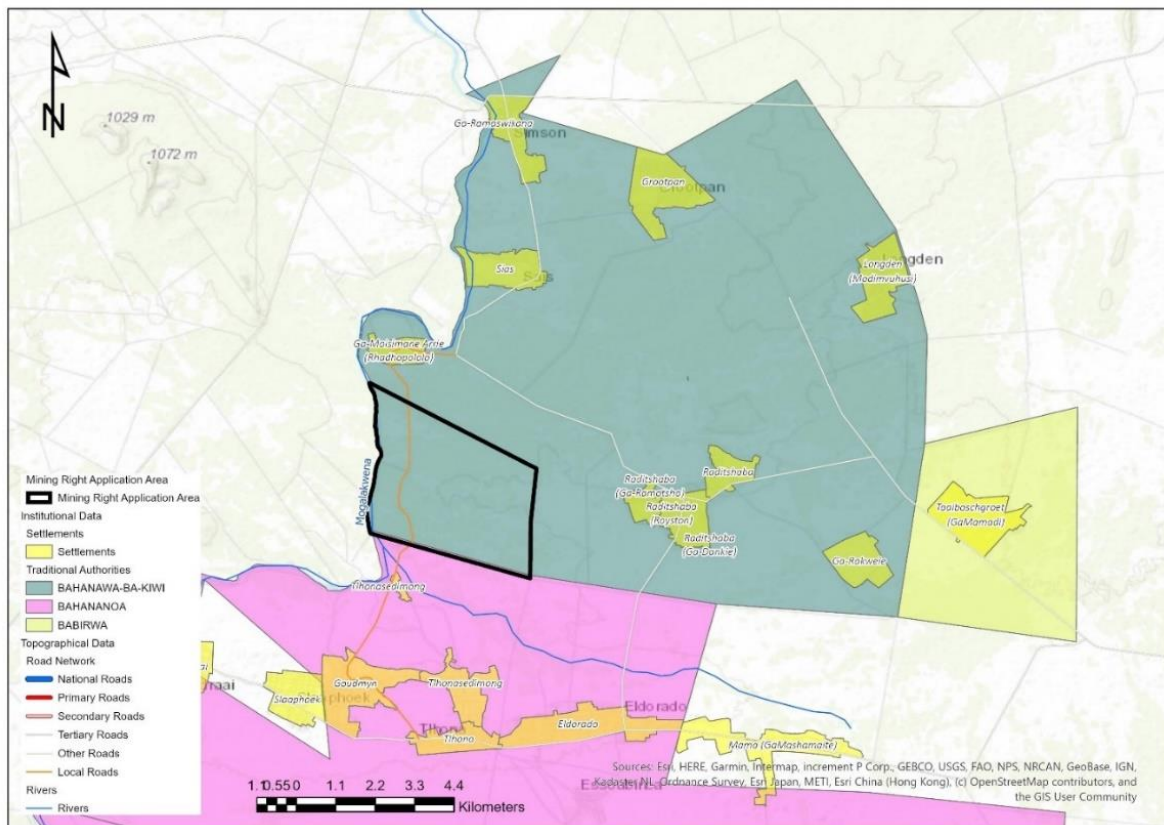


Figure 2-2: Traditional Authorities

2.3 Mining and Infrastructure Layout

Conventional open-pit mining techniques will be used for this mine. Topsoil will be removed at a rate of 2000m³ per annum. The ore will be accessed through drilling and blasting, and effectively involve the removal of blocks of ore, dug from the open pit of the deposit.

2.3.1 Mining Methodology and Schedule

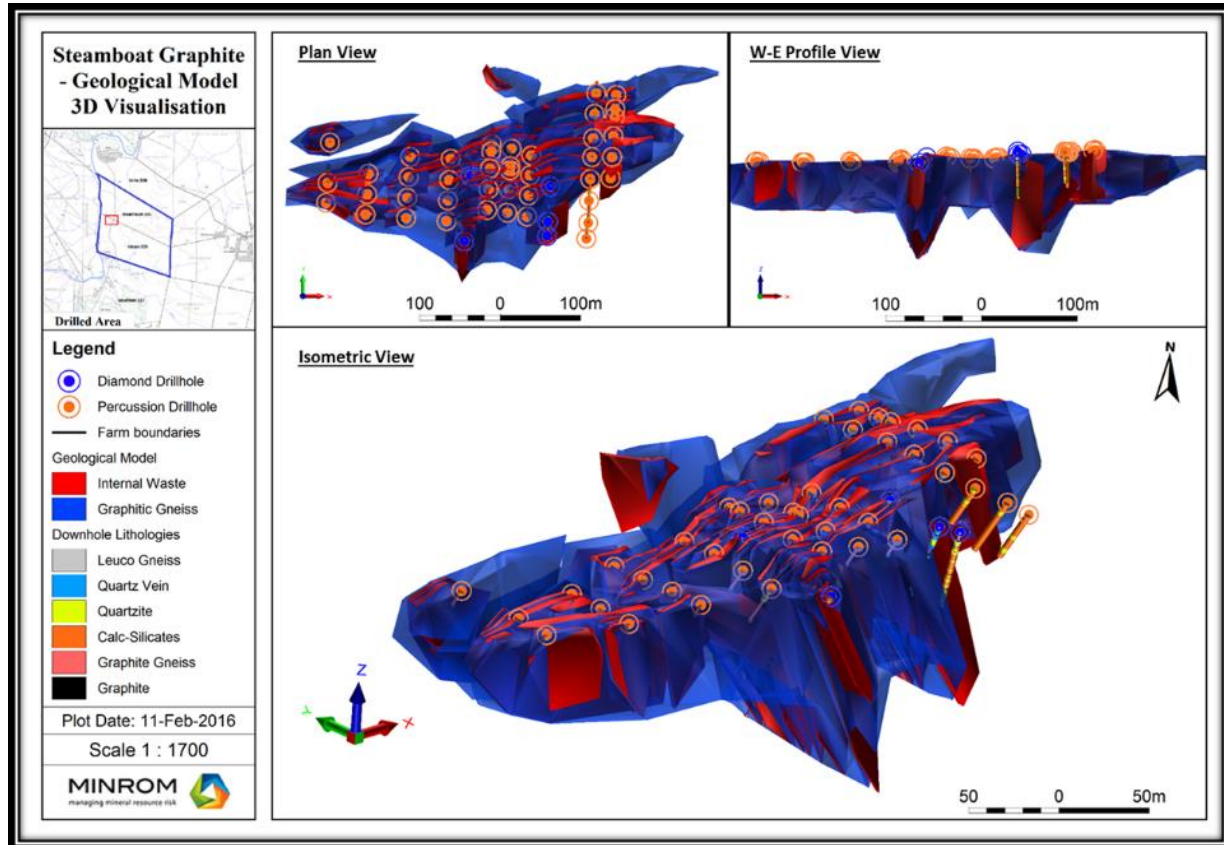


Figure 2-3: Open Pit 3D model

2.3.2 Production Profile

RoM Graphite Feed Grade will be delivered to the customer. It is envisaged that production will be ramped-up from just over 100,000 tonnes per annum in the first year of production to the 500,000 tonnes per annum in the third year of production. The initial Life of Mine (LoM) is estimated at 20 years at the planned mining rate. The life of mine may be expanded as further resources are identified on the properties. The following figure provides the production schedule.

CUCHRON GRAPHITE MINE: DRAFT EMP

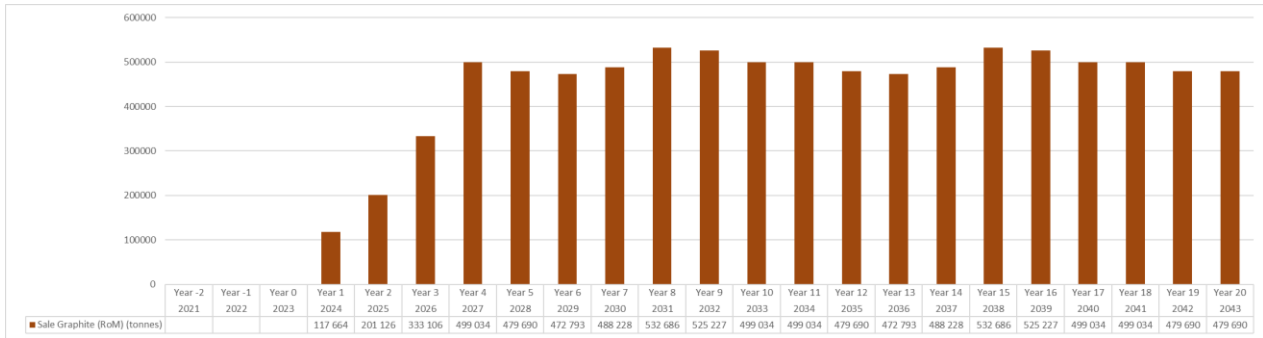


Figure 2-4: LOM Production profile

2.3.3 Resource Particulars

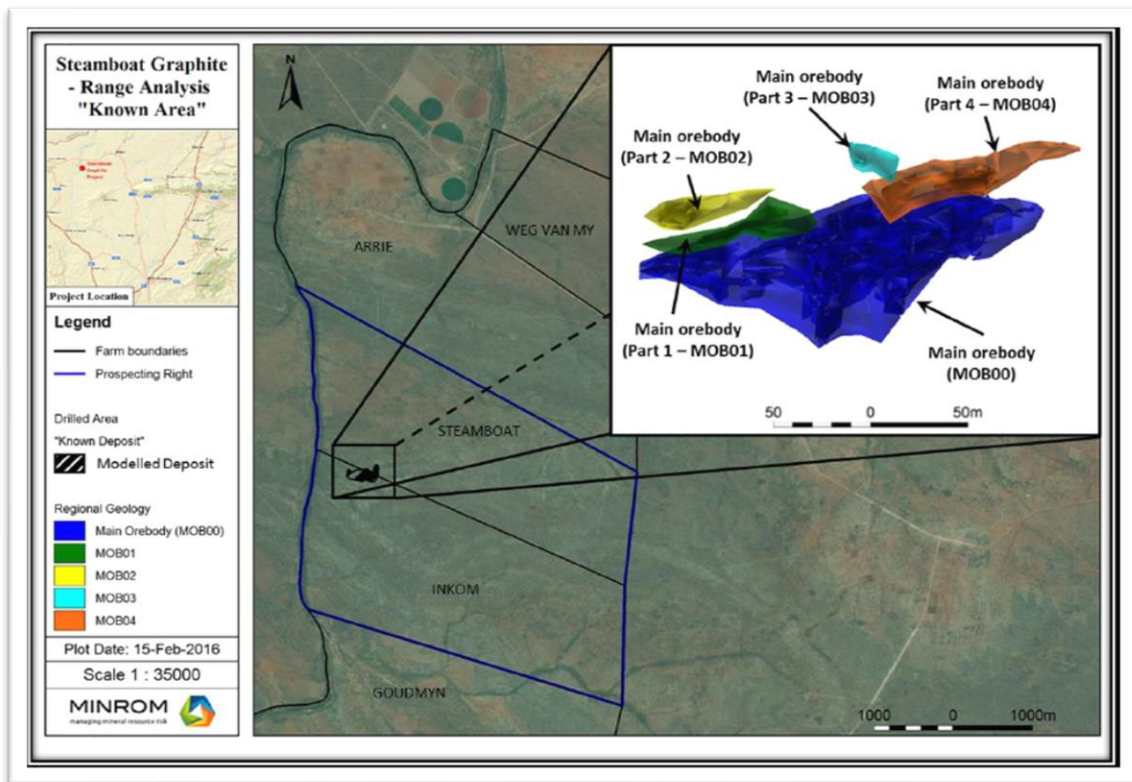


Table 2-3: Location and size of Phase 1 mining

The ore body that was modelled consists of five (5) parts, which collectively are referred to as the Phase 1 mining. Each part reflects a zone of ore-bearing graphitic gneiss which in-turn consists of a variable amount of internal waste¹.

Each of the five (5) parts of the geological model have been assigned a name and code. The nomenclature can be seen in Figure 21 and is as follows:

- Main orebody (code: MOB00) - the majority of the Phase 1 deposit,

¹ Internal waste is defined as any lithology that does not contain graphite

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- Main orebody part 1 (code: MOB01) - the orebody section just northeast of the Main orebody which is separated from the Main orebody by a thick unit of barren calc-silicate,
- Main orebody part 2 (code: MOB02) - the orebody section just north of the MOB01 which represents lens of graphitic gneiss completely surrounded by calc-silicate and quartzite units,
- Main orebody part 3 (code: MOB03) - the orebody section directly north of the Main orebody which consists of graphitic gneiss separated from the Main orebody by a series of quartz veins,
- Main orebody part 4 (code: MOB04) - the orebody section north-west of the Main orebody which is encapsulated by calc-silicate units but is likely connected to the Main orebody at depth.

The assumptions that the tonnage estimations are based on are as follows:

- The orebody was modelled based on the mapping and drilling data,
- The orebody depth:
 - Does not extend below 120m,
 - Is not less than 20m.
 - The majority of the modelled orebody does not extend below 50m,
- The specific gravity (density) was:
 - Conservatively estimated to be 2.58 for the graphitic gneiss (ore bearing lithology) based on the major lithological and mineral composition of the graphitic gneiss and host calc-silicates,
 - Conservatively estimated to be 1.9 for the Concentrated Graphite Bands, based on the density of graphite.
- The grade values used:
 - were based on the diamond drilling sample data,
 - were based on a total of 14 samples,
 - were assumed to be graphitic carbon percentages and not total carbon percentages,
 - were weighted against the sample length and averaged to yield a weighted average grade for the entire modelled area.

An individual volume and tonnage were calculated for each of the five (5) parts of the geological model. These are shown in the table below:

Table 2-4: Resource Estimate

Category	Subcategory	Surface Area (m ²)	Depth	SG	Estimated Resource		
					Bulk Tonnage	Wt. %GC	Ave. Grade
Main Ore Body (MOB00)	Graphite Gneiss	50 834	50 – 100m	2.58	4 082 198	7.66	312 696
	Concentrated Graphite Bands	3 438	<100m	1.90	7 676	7.22	554
Secondary Ore Bodies	MOB01	5 779	50m	2.58	181 898	7.66	13 933
	MOB02	4 209	50m	2.58	163 123	7.66	12 495
	MOB03	1 959	50m	2.58	99 515	7.66	7 623
	MOB04	10 584	50m	2.58	581 646	7.66	44 554
TOTAL		76 803			5Mt	7.59% GC	0.4Mt

Run Of Mine (ROM) Graphite Contained Feed Grade Ore, estimated 500,000 tonnes per annum when in full production, delivered on a daily basis.

2.3.4 Rehabilitation and Closure Planning

At this stage it is envisaged that backfilling will only start after decommissioning of the mine. During the next study phase an optimised mine plan will be developed to create enough space for in-pit backfilling as soon as practically possible. This will be addressed in the Rehabilitation, Decommissioning and Closure Plan that will be developed in line with the requirements of Government Notice No. R.1147 (GN R.1147): “Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations” promulgated in November 2015. Financial provision will be updated on an annual basis in line with the requirements of GN R.1147.

2.3.5 Surface Infrastructure Layout

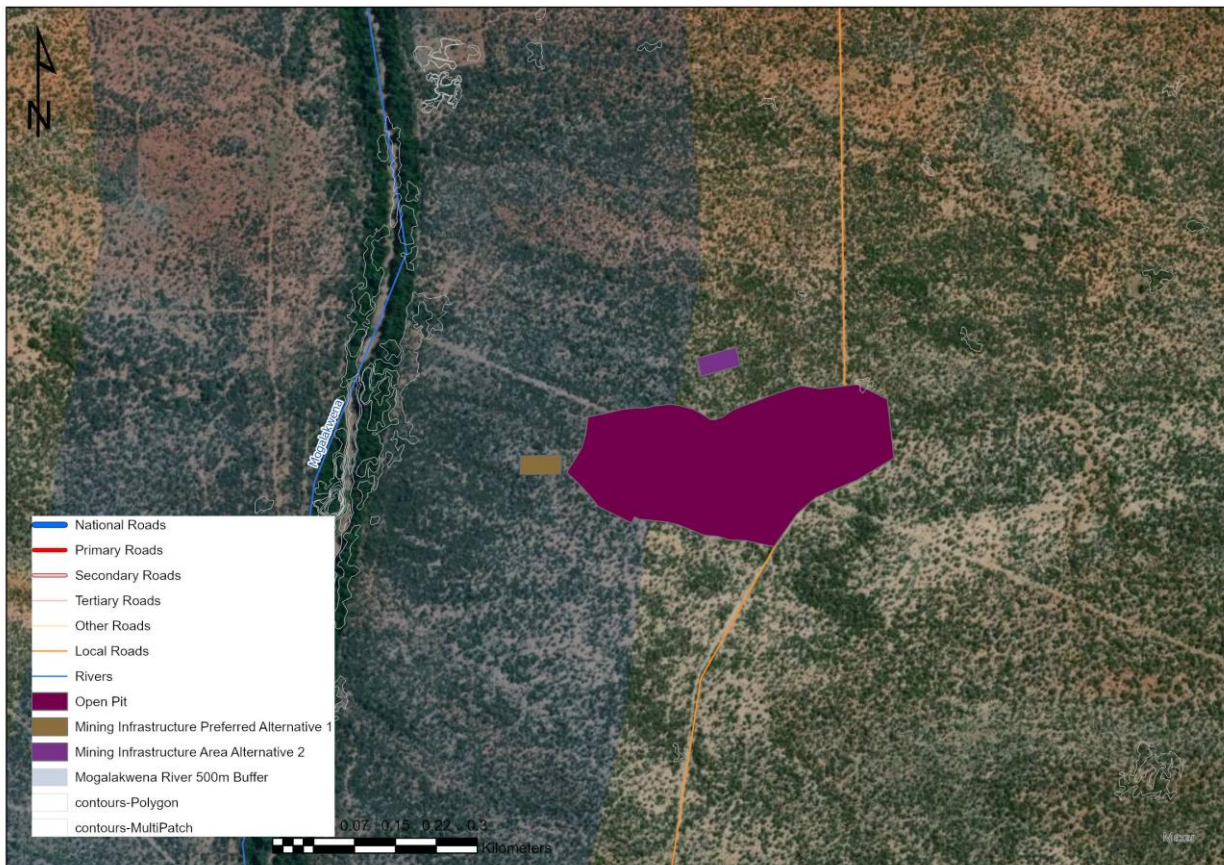


Figure 2-5: Mine Infrastructure Site Location Alternatives

2.3.6 Listed Activities

The Cuchron Mine Development will be open pit mining and has a potential Life-of-Mine (LOM) of 20 years. The envisaged mining method for the open pit area is a conventional drill and blast operation with truck and shovel, load and haul.

The proposed infrastructure to be developed includes:

- Mining Office, Workshop and Storage Area
- Internal Roads

Table 2-5: Mine Listed Activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA OR M ²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Open Pit with a size of 110,000m ² (11ha) Including water management infrastructure: Potable Water Pipelines: 1000m x 5. = 5 000m ² , Dewatering Pipeline: 1000m x 5m = 5 000m ² and a Dewatering dam: 250m ² , volume: 500m ³ (0.5MI). Pipelines will have a throughput below 120 litres per second and an internal diameter that is below 0.36 meters.	120 250m ² (12.025 ha)	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 9 - Activity 12 - Activity 19 - Activity 27 - Activity 28 R984 (R325): -Activity 17 R985 (R324): - Activity 2 - Activity 12 - Activity 14	
Mining Office, Workshop and Storage Area	10 000m ² (1ha)	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 14 - Activity 27 R984 (R325): -Activity 17 R985 (R324): - Activity 2 - Activity 10 - Activity 12 - Activity 14	
Access and Haul Roads: Construct internal service roads: 400m x 8m = 3200m ²	Size of all new roads: 3,200m ² (0.32ha) Total length of roads: 400m Width of roads with shoulder: 8m	X R983 (R327) R985 (R324)	R983 (R327): - Activity 12 - Activity 19 - Activity 24 R985 (R324): - Activity 4 - Activity 12 - Activity 14	

2.4 Composite Map

The final preferred mining and layout infrastructure footprint are indicated in Figure 2-1. The motivation for the preferred development alternatives as detailed in the EIAR is summarised in Table 2-6.

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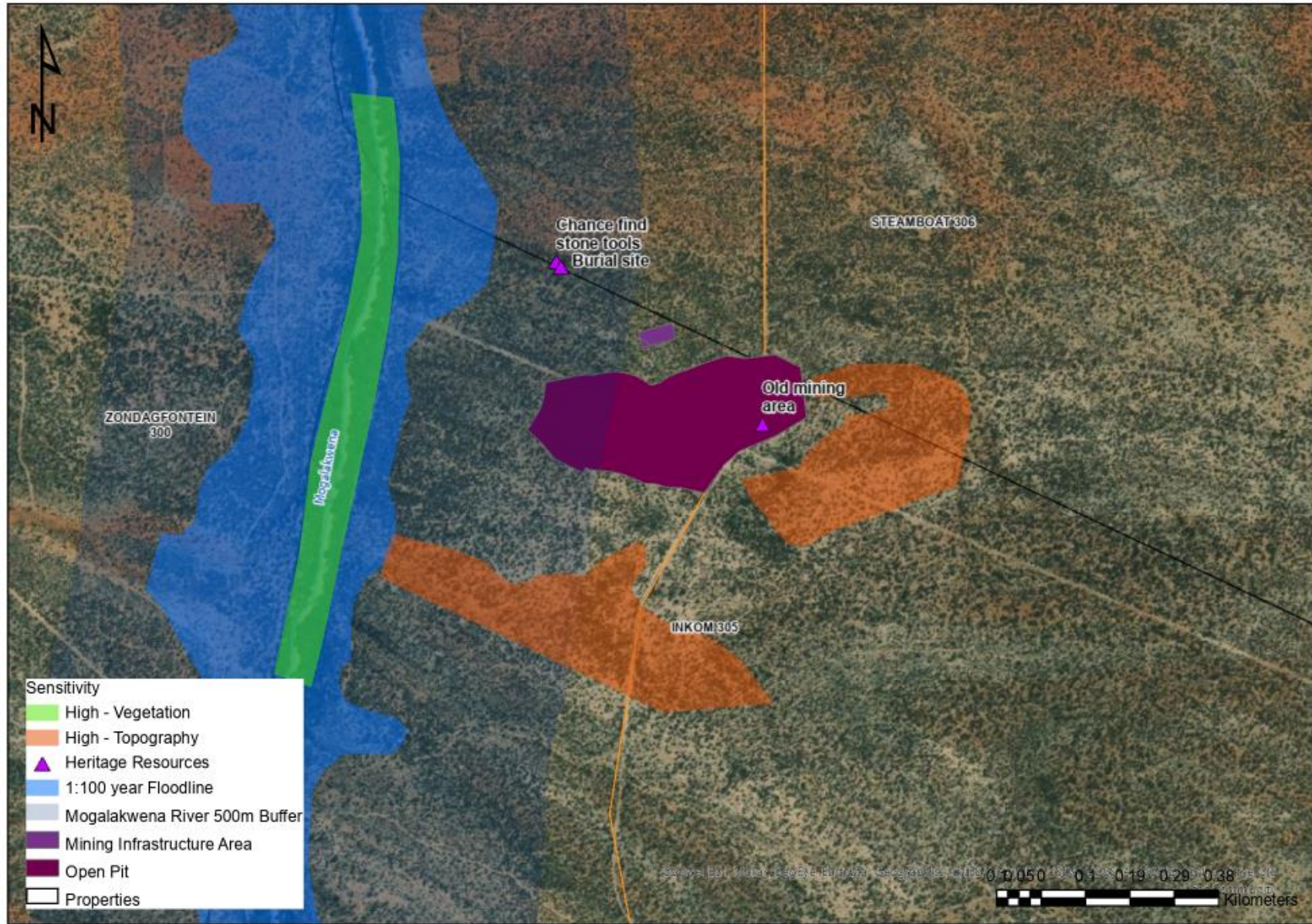


Figure 2-6: Composite Map

Table 2-6: Motivation for preferred development alternatives

Aspect	Preferred Development Alternative	Motivation
Land use activity	Mining	<p>Currently the economic activities within the MRA area are limited and the mine will be a definite economic improvement. Although the proposed mine could potentially impact negatively on the current land use activities on the land surrounding the infrastructure, the net result is a positive improvement in benefits for the area.</p> <p>The positive economic contribution to the Limpopo and National economies is an additional positive factor.</p>
Mine Methodology	Opencast mining	<p>Underground mining is not considered feasible due to the shallow nature of the resource, which is only conducive to open-pit mining operations. These types of operations lead to optimal resource extraction, which results in lower operating costs.</p>
Surface infrastructure location	Mine workshop and office north of the Open Pit	<p>By placing the mine infrastructure in the northern portion of the development footprint, the infrastructure is further than 500m from the Mogalakwena, which has been identified as a sensitive environment.</p>

3 DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES

3.1 Closure Management Outcomes

3.1.1 Closure Guiding Principles

The following closure-related guiding principles underpin the closure planning process for the project:

- To comply with relevant or applicable local legislative requirements.
- To ensure that stakeholders' needs, concerns and aspirations are considered when considering closure and the eventual closure vision.
- To ensure the health, safety and welfare of all humans and the environment are safeguarded from hazards resulting from mining operations that have been terminated.
- To limit or mitigate adverse environmental effects to an extent that it is acceptable by all parties.
- To mitigate socio-economic impacts following decommissioning and subsequent closure as far as reasonably possible.
- To avoid or minimise costs and long-term liabilities to the company and to the State and public.
- To ensure investment decisions include appropriate consideration of closure, including both quantitative and qualitative impacts of closure.

3.1.2 Closure Vision

The overall closure vision for the Project is:

- To achieve a post-mining landscape that is safe, stable and non-polluting, that will sustain rural agricultural activities after mining has ceased.

3.1.3 Closure Objectives and Performance Targets

Aspect	Closure Objective	Rehabilitation-related Performance Target
Infrastructure	To remove and/or stabilise surface infrastructure to facilitate the implementation of post-mining land uses	Identification and retainment of all infrastructure that has a beneficial post-mining use. Transfer of the retained infrastructure to a third party for long-term management and maintenance purposes. Demolish and dismantle all non-beneficial infrastructure and rehabilitate the area to facilitate the post-mining land use
Land capability	To re-instate suitable grazing capabilities	Establishment of a self-sustaining, grazing land capability over the rehabilitated areas
Biodiversity	To re-establish an appropriate mix of grassland and other native flora species in the rehabilitated areas to enable the natural re-instatement of biodiversity over time	Implementation of a low maintenance Alien and Invasive Plant (AIP) Control Plan Establishment of a sustainable vegetation cover to facilitate the final grazing land capability requirements
Post-mining land use	To establish a post-mining land use that will sustain rural agricultural activities once mining is concluded, whilst providing an acceptable	All stockpiled material (overburden, discard) utilised to backfill and rehabilitate the opencast area.

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Aspect	Closure Objective	Rehabilitation-related Target	Performance
	overall aesthetic appearance aligned to the surrounding landscape	Establishment of a sustainable vegetation cover, including trees and shrubs. Restoring the site to a condition in which it is visually acceptable to the community	
Water resources	Prevent erosion and downstream siltation	Establishment of a sustainable vegetation cover to prevent erosion	
	Limit the impact of the groundwater quality and yields	Demonstrate that the surrounding groundwater users are not impacted in terms of quality or yield	
Social	Limit the possible health and safety threats to humans and animals that will utilise the mining site post-closure	Access to high-risk areas are safe-guarded and monitored Eliminating unacceptable health hazards and ensuring public safety	
	Identify and establish livelihood retention projects to create off-mine livelihoods during and post-mining	Projects are in advanced stages of execution with specified timeframes on completion and desired outcomes	
	Equip employees with portable skills that can be used in other sectors post-mining	Successful implementation of Social and Labour Plan	

The final closure objectives will be consulted through the Public Participation process. The recommendations proposed by the IAPs and authorities will be considered during the development of the final closure plan.

3.1.4 Proposed Final Post-Mining Land Use

The objective is to rehabilitate the open pit and other disturbed areas to a post-mining grazing capability class. All surface structures where alternative use is not possible will be demolished and the areas rehabilitated. All stockpiled material (overburden, discard) will be utilised to backfill and rehabilitate the opencast area, no surface dumps will remain post-closure.

3.1.5 Rehabilitation Methodology

At this stage it is envisaged that backfilling will only start after decommissioning of the mine. During the next study phase an optimised mine plan will be developed to create enough space for in-pit backfilling as soon as practically possible. This will be addressed in the Rehabilitation, Decommissioning and Closure Plan that will be developed in line with the requirements of Government Notice No. R.1147 (GN R.1147): "Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations" promulgated in November 2015. Financial provision will be updated on an annual basis in line with the requirements of GN R.1147.

The methodology of rehabilitation of the open pit will be as follows:

- The discards from the discard dump will be placed first on the impermeable sandstone layer across most of the open pit bottom.
- The overburden will be compacted to minimize water infiltration into the underlying layers.
- A 0.5m topsoil layer, retrieved from the topsoil dump, will be placed over the overburden layer.
- This will be followed by soil amelioration and re-vegetation in accordance with the Reclamation Plan.

3.1.6 Final Landform

As far as practically possible, the disturbed infrastructure areas will be designed to be free draining to allow clean surface runoff to be discharged into the natural environment.

3.2 Operational Management Outcomes

3.2.1 Management Objectives and Outcomes

The environmental and social management objectives and impact management outcomes are presented in the table below.

Table 3-1: Proposed management objectives an outcome for the Cuchron Project

Aspect	Management Objectives	Impact Management Outcomes (Performance Target)
Land Capability	To re-instate suitable grazing capabilities over the reclaimed portions of the mine site	Development of a Rehabilitation, Decommissioning and Closure Plan Establishment of a self-sustaining, grazing land capability over the reclaimed areas
Ecology	Minimise impact on the biodiversity habitat in the area	Limit the clearance of vegetation and topsoil to 27 ha (disturbed footprint) Implementation of a Rescue and Relocation Plan Implementation of an AIP Control Plan
	To re-establish an appropriate mix of grassland and other native flora species in the reclaimed areas to enable the natural re-instatement of biodiversity over time	Establishment of a sustainable vegetation cover to facilitate the final grazing land capability requirements
Water Resources	Prevent erosion and downstream siltation	Implement SWMP to separate clean & dirty water
	Limit the impact of the groundwater quality and yields	Groundwater monitoring demonstrates that the surrounding groundwater users are not impacted in terms of quality or yield Implementation of compensation strategy if the above cannot be demonstrated
Air Quality	Limit the risk of dust exposure to the general public	Adhere to Air Quality Standards Dust fallout < 600 mg/m ² /day on MRA boundary PM10 (24-hour) < 75 µg/m ³ on MRA boundary
Noise	Limit the noise impact on sensitive receptors	Rural noise level at daytime of 45 dB and night time of 35 dB at the settlements Increase in ambient noise levels (on MRA boundary) < 7 dB
Heritage/Palaeontology	Prevent as far as possible any impact on heritage and palaeontological material or mitigate such an impact if it cannot be avoided	No damage to heritage and palaeontological material without the necessary investigations and permits
Post-mining Land Use	Establish a post-mining land use that will sustain rural agricultural activities once mining is concluded, whilst providing an acceptable overall aesthetic appearance aligned to the surrounding landscape.	Define, in consultation with all IAPs, the final (post-closure) land use for the mining area, including mining areas, surface and water management infrastructure, roads and powerlines Development of a Rehabilitation, Decommissioning and Closure Plan
Local Community (G-Kibi communities)	Prevent vehicle and pedestrian accidents due to increase in traffic	Implementation of road upgrades and safety measures where the product transport road pass through settlements No fatal accidents
	Maximise social benefits (employment, procurement, etc.) to local communities	Percentage of local employment set at 70% (SLP)

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Aspect	Management Objectives	Impact Management Outcomes (Performance Target)
	Identify and establish livelihood retention projects to create off mine livelihoods during and post mining	Successful implementation of Social and Labour Plan
	Equip employees with portable skills that can be used in other sectors post-mining	Successful implementation of Social and Labour Plan
	Support and build capacity of communities to participate in the ownership and management of the mine	Participation of community representatives on the Cuchron Board of Directors

Appropriate monitoring should be implemented to ensure compliance with the objectives and outcomes as proposed.

3.2.2 Ecological and Biodiversity Management

3.2.2.1 Reclamation Plan

A Reclamation Plan must be developed for this project, inclusive of the following aspects:

- Rescue and Relocation Strategy: Protected plants must be removed or transplanted before any mining or construction activities start. The necessary permits to remove and/or destroy protected transplantable and non-transplantable plants must be obtained.
- Collection of local seeds for reproduction in a nursery: Seed from as many of the species as possible will be collected for the re-vegetation programme.
- Re-vegetation trials.
- Maintenance: The maintenance plan must address challenges experienced for both the soil and vegetation resource to achieve sustainable reclamation and improved agricultural potential and final land-use, which is important for mine closure planning.
- Monitoring: The following parameters can be used to establish the condition of the vegetation with other landscape function parameters: basal cover; biomass production; and botanical composition.

3.2.2.2 Utilisation of natural resources

The relatively dense vegetation within the proposed mining and infrastructure areas will produce a large volume of biomass that has to be removed and stockpiled before mining commences.

The majority of the biomass will be utilised in the power generation facility.

Some biomass must however be reserved to be chipped for compost, mulching and stabilising berms in the mine. This organic material will be mixed into the top 0.3 m of the rehabilitated topsoiled areas.

Excess wood not used will be stockpiled and distributed to the local communities, for building purpose or as firewood, as required. It may even offer entrepreneurs the opportunity to start a small business.

3.2.3 Water Management

The majority of the stormwater network for project will be designed as an open channel network with separate systems for dirty water areas and clean water areas. The stormwater conveyance elements

will include the following items such as Channels, Berms and Culverts. The open system alleviates the necessary maintenance procedures to keep the network clean of silt, while access to the various structures opposite of the channels will be provided using culvert crossings.

Stormwater storage dams serve as the receiving bodies for stormwater runoff from dirty and clean water systems on the mine site. The design and operation of stormwater dams will comply with the legal requirements, including the assessment of the required dam capacity, the location of the dam and the discharge frequency (Government Notice 704 of 4 June 1999).

Stormwater storage dams will include:

- Clean water storage dam
- Dirty water storage dam, which will also be the dam utilised for pit dewatering and storage of raw processing water. The quality will be monitored for processing purposes.

The stormwater management plan must consist of detailed stormwater design including the following:

- Sizing of channels and storage containment facilities must be undertaken during a detailed design.
- The detailed stormwater design plan should also take into account of the mine plant stormwater management.
- It is recommended that a pit water management system be put in place during the detailed design of the stormwater management plan.
- Peak flows and all detailed design criteria must be included in the stormwater management report; and
- The detailed designs of the channels should consider suitable erosion protection measures.

3.2.4 Mine Residue Management

All overburden from the mine will be stockpiled on the Discard Dump that forms part of the Beneficiation Plant Development.

3.2.5 Archaeological and Heritage Management

3.2.5.1 Management and Mitigation of Identified Heritage Sites

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

The objectives are:

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.

- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- The old graphite mine workings in the project area is probably older than 60 years, is rare and therefore formally protected by the NHRA of 1999. Impact on or destruction of this feature for the purposes of the new mining operation would require a permit which must be obtained from SAHRA/PHRA prior to any work being carried out. This permit will only be issue after the proposed mitigation measures have been successfully implemented.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

3.2.5.2 Chance Find Protocol

Most archaeological and palaeontological remains are subterranean and there is always a chance that archaeological material (including burial sites) may be exposed during earthworks. The Chance Find Protocol below indicates the procedure that need to be followed in such an event.

- **Archaeological or historical material:** If any unidentified archaeological or historical material are identified and/or exposed during any of the developmental phases of the project, the following steps must be implemented subsequent to those outlined above:
 - All work at the affected area must cease and reported to the immediate supervisor and through their supervisor to the senior on-site manager.
 - The area should be demarcated to prevent any further work there until an investigation has been completed.
 - An archaeologist should be contacted immediately to provide advice on the matter.
 - The archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit.
 - If needed, the necessary permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist.
 - The appropriate action will be determined by the nature of the find and the possibilities given the restriction placed upon it by mining activities.
 - Work on site will only continue after the archaeologist/ SAHRA has agreed to such a matter.

- **Human remains:** If unidentified burial grounds, graves or human remains are identified and/or exposed during any of the developmental phases of the project, the following steps must be implemented subsequent to those outlined above:
 - All work at the affected area must cease and reported to the immediate supervisor and through their supervisor to the senior on-site manager.
 - The area should be demarcated to prevent any further work there until an investigation has been completed.
 - An archaeologist should be contacted immediately to provide advice on the matter.
 - The archaeologist must confirm the presence of burial grounds, graves or human remains.
 - If this is the case, the archaeologist must inform the local South African Police Services (SAPS) and traditional authority (if applicable). SAHRA's BGG Unit should also be notified in the case of human remains.
 - The archaeologist, in conjunction with the SAPS and traditional authority, will inspect the possible graves and make an informed decision whether the remains are of forensic, recent, cultural-historical or archaeological significance.
 - Should it be concluded that the find is of heritage significance and therefore protected in terms of heritage legislation, the archaeologist will notify the relevant authorities and institute the grave relocation procedure.

- **Palaeontology:** If any palaeontological material or fossils are exposed during any of the developmental phases of the project, the following steps must be implemented subsequent to those outlined above:

- All work at the affected area must cease and reported to the immediate supervisor and through their supervisor to the senior on-site manager.
- The area must be fenced-off with a 30 m barrier and the area declared as a no-go area.
- A palaeontologist should be contacted immediately to confirm the presence of palaeontological material and/or fossils.
- If this is the case, SAHRA must be contacted for further investigation and mitigation.
- Three types of permits are available: Mitigation, Destruction and Interpretation. The specialist will apply for the permit at the beginning of the process.
- Mitigation will involve recording, rescue and judicious sampling of the fossil material present and will include a Phase 2 Palaeontological Impact Assessment (PIA).

3.2.6 Social Impact Management

The Socio-economic Impact Assessment has identified and developed Social Management and Monitoring Strategies that would be implemented to ensure that all identified impacts are addressed and managed accordingly. The main aim of the strategies is to minimise negative impacts and maximize positive impacts by means of effective mitigation measures. Refer to the Social Impact Assessment for the detail management plans

- Communication, Consultation and Awareness Strategy
 - To develop and maintain an ongoing process of stakeholder engagement to ensure the continued involvement of interested and affected parties in the project in a meaningful and responsible way
 - To establish a Coordinating Committee (CC) to participate in discussions on the community development, environment impacts and planning and implementation processes
 - Consult and constitute an CC
 - Develop a constitution for the CC to guide its operations
 - Hold Quarterly meetings
- Issue and Grievance Management Strategy
 - Define mechanisms and procedures to manage the land use and influx that may result due to the mine development during construction and operational phases
 - Develop an Issue and Grievance Procedure to be signed-off by both companies internally and by the CC externally
 - Implement the Issues and Grievance Procedure and raise awareness amongst communities and stakeholders
 - Compile and provide report to the CC every quarter on issues and grievances and the resolution of these
- Recruitment Strategy

- Maximise employment opportunities for the local communities, including identifying and encouraging use of labour intensive practices in such a way as not to negatively influence the operation quality or quantity, project timeframes;
- Ensure that pursuant to the completion of construction and operation phases, developed skills are retained in long-term employment opportunities, and where appropriate and possible, through the assistance of local business, be transferred to related local employment opportunities and businesses;
- Provide appropriate incentives for local businesses that provide skills transfer opportunities and new employment opportunities to the local community;
- Minimise the utilization of imported labour as far possible within the ambit of applicable legislation
- Development of a Recruitment Policy that adheres to relevant labour legislation such as the Basic Employment Conditions Act and the Labour Relations Act

- Procurement Policy
 - To develop a procurement policy within the guidelines and stipulations of relevant legislation
 - To maximise employment, training and development opportunities for local businesses, HDI- owned businesses, SMMEs, women-owned businesses, as well as disabled business people.
 - To ensure transparent tendering and procurement procedures
 - To offer assistance to local businesses in tender and procurement procedures
 - Drafting of a Procurement Policy reflecting the objectives of the relevant legislation and project employment and procurement objectives. In cases of discrepancies between project objectives and legislation, legislation takes precedence.
 - Monitoring of Procurement Policy implementation by relevant project role-players and CC.

4 IMPACT MANAGEMENT ACTIONS

4.1 Roles and Responsibility

To ensure the success of the EMPr, it is important to assign definite roles and responsibilities. Compulsory adherence to the EMPr is required. The obligations of the EMPr create a legally binding document in terms of environmental legislation and civil law. It is important that Cuchron, its contractors and sub-contractors ensure that all relevant aspects of the EMPr are communicated to all of their employees. It is the duty of Cuchron, its contractors, sub-contractors and their employees to fulfil the project objectives with specific reference to the prevention and mitigation of impacts caused by the project development activities. It is the responsibility of the DMRE to ensure that the development takes place in accordance with relevant legislation.

4.1.1 Government Departments

As the responsibility for the protection of our natural heritage lies with the government departments, they have the power to conduct site inspections to ensure that the development complies with all legislation, regulations and standards. They may enforce penalties where non-compliance occurs.

4.1.2 Mine/Site Manager

The Mine/Site Manager will oversee all the activities. He/she will be responsible for the activities on site and see to the implementation of the EMPr. He/s will establish a communication network between the different components conducting the work. All incidents and reports will be made to the Mine/Site Manager. Ultimate responsibility in terms of compliance to the EMPr lies with the Mine/Site Manager.

4.1.3 Contractors

Where contractors are used during the LoM, the on-site responsibility for environmental and social matters lies with the Contractor Engineer. They will be responsible for the day-to-day direction and management of their particular activities on the site throughout the life of the project.

4.1.4 Environmental Officer

An Environmental Officer ("EO") or Health, Safety and Environmental ("HSE") Officer will be appointed by the Mine/ Site Manager. It will be the responsibility of the EO/ SHEQ Officer to:

- Oversee that the day-to-day activities that will take place on site comply with the EMPr and the relevant legislation;
- Ensure that environmental sampling schedules are compiled and adhered to.
- To prepare a detailed communication strategy for liaison with I&APs, stakeholders and contractors;
- Manage and document forward and backward information flows between the Mine/ Site Manager, the Contractors, the I&APs and Cuchron. This includes information pertaining to monitoring and evaluation;

- Assist Cuchron upon request, with daily project communication with I&APs;
- Ensure meaningful participation with the I&APs, including capacity building exercises where the need is identified;
- Give induction and environmental awareness training;
- Ensure that a record keeping system is maintained; and
- Promote co-regulation, shared responsibility and a sense of ownership amongst all parties involved.

4.1.5 Environmental Control Officer

To ensure full compliance to the EMPr and in effect the legislation, Cuchron must appoint an Environmental Control Officer ("ECO").

The responsibilities of the ECO will be:

- To monitor the construction activities through monthly site inspections to ensure compliance to the EMPr;
- To assess the EMPr as to its effectiveness in mitigating and preventing impacts;
- To assess compliance to the EA;
- To advise the Mine/Site Manager, Resident Engineer, Contractors and EO with respect to the activities and their associated impact on the environment;
- To identify any non-compliances and to advise with regards to the immediate action and remediation therewith;
- To compile reports every two weeks and communicate the findings to the Project Manager and contractors;
- To write a monthly compliance report and submit it to the regulatory authority;
- To ensure monthly project meetings are undertaken with the contractors and the Mine Manager to discuss the findings made during the site visits;
- To ensure that the best environmental options are followed throughout;
- To ensure that a proper training, awareness and competence training programme is implemented; and
- To update, where necessary, the EMPr as new issues may arise.

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4.2 Mitigation Measures

Specialist Area	Potential Impact	Mitigation Measures	
Geology	Disturbance of natural geology	No mitigation is possible for the changes in the geological profile however subsidence can be controlled/prevented. Compaction of overburden and discards placed in the bottom of the pits to limit the potential for subsidence on the rehabilitated open pit. Sterilisation of mineral resources can be mitigated by optimal infrastructure design. Rehabilitating the area as close to the pre-mining area as close as possible or reach an agreement for post-mining land use. The rehabilitated area must be vegetated with indigenous flora.	
Topography	Alteration of topography		
Soils, Land use and Capability	Loss of original soil depth and soil volume.	The available topsoil will be stripped prior to construction for final rehabilitation. A soil analysis will be performed prior to seeding (post-rehabilitation) and the soil fertility rectified (if necessary) to facilitate vigorous growth.	
	Loss of original fertility and organic carbon content.	Minimize affected grazing land Implement measures to improve current grazing capacity, i.e. seeding	
	Soil compaction from heavy machinery	Develop a final land use plan and implementation programme as part of the closure plan, taking into account important issues such as ongoing operational and maintenance requirements and long-term responsibilities and ownership.	
	Loss of grazing land	Set final closure objectives and standards to ensure conformance to the final land use plan, the requirements of the IAPs and relevant environmental legislation.	
	Loss of animal production		
Terrestrial Ecology	Loss of habitat and biodiversity	No development within unit 3 (Riverine area) is recommended.	
	Loss of animal and plant species	Any bulbous or succulent plant species encountered should be removed and temporarily planted in a suitable container and replanted in the area after mining has been completed. No unnecessary removal of plants must take place.	
	Loss of medicinal species	Where vegetation needs to be "opened" to gain access, it is recommended that the herbaceous species are cut short rather than removing them. That will ensure that they regrow during the growing season and also protect the soil against erosion. The removal of indigenous woody species should be avoided as far as possible The topsoil should be stored adjacent to the mining area and must be used to restore the area after mining has ceased. All temporary stockpile areas, litter and dumped material and rubble, must be removed during and on completion of mining activities. Vegetation clearance should be restricted to the mining areas allowing remaining animals an opportunity to move away from the disturbance. No animals should be intentionally killed or destroyed, and poaching and hunting should not be permitted on the site. No hunting with firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property as well as neighbouring areas. A Re-vegetation and Rehabilitation Manual should be prepared for the use of contractors, landscape architects and groundsmen to rehabilitate areas that became degraded due to mining activities. All alien vegetation should be eradicated within the study site and invasive species, as listed in this report should be given the highest priority. Where herbicides are used to clear vegetation, selective and biodegradable herbicides registered for the specific species should be applied to individual plants only.	
	Increased soil erosion		
	Alien plant invasion		
Surface Water	Water Quality Deterioration		Drip trays should be placed under all standing machinery. Oil recovered from any vehicle or machinery on-site should be collected, stored and disposed of by accredited vendors for recycling. Traffic and movement over stabilised areas should be controlled (minimised and kept to specific paths), and damage to stabilised areas should be repaired timeously. A water quality monitoring plan must be formulated before construction. A stormwater management plan that separates dirty and clean water must be developed.
	Alteration of drainage and flow		A construction work method statement must be compiled by the applicant/contractor for all activities and phases associated with the construction process. A stormwater management plan that channels runoff and separate dirty and clean water must be formulated as per the requirements of GN704. A water balance study must be undertaken
	Sedimentation	A service/maintenance plan must be compiled and implemented. The plan must encompass procedures to minimise any impacts on the surrounding environment. Dirty water trenches must be constructed around stockpile areas to capture all dirty water runoff and must be channeled to a dirty water containment structure.	

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Specialist Area	Potential Impact	Mitigation Measures
		Concurrent rehabilitation is encouraged during the operation of the mine to minimise the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff
Groundwater	Clearing of vegetation of topsoil from footprint areas can increase infiltration rates of water to the groundwater system, leading to a slight increase in groundwater levels.	No mitigation required
	Lowering of groundwater levels due to Open Pit excavation	No mitigation measures are available for when mining occurs below the local water table. Only by remaining above the water table can this impact be avoided.
	Effect on groundwater quality due to leachate formation from dirty surface areas	Surface areas below workshops and wash bays should be lined to prevent poor quality seepage from reaching the aquifer and contaminating the underlying groundwater. Surface areas should be bunded to prevent clean surface water runoff from being contaminated by dirty surface areas. Spills should be cleaned up immediately.
	The water level will recover in the backfilled void. Recharge will be higher than pre-mining and the eventual effect will be positive.	None necessary. The effect is positive. Recharge can, however, be further promoted by leaving the final surface as a slight depression and use the pit as source of water supply.
	Migration of contamination away from rehabilitated opencast pit	Dedicated plume monitoring boreholes should be drilled in the down gradient groundwater flow direction and sampled at quarterly intervals to monitor plume migration. Should the monitoring program indicate significant plume migration, interception trenches and/or rehabilitation boreholes may be constructed.
Air Quality	Increased of dust levels because of open pit excavation and backfill	Set the speed limit for on-site hauling vehicles and other vehicles to 40 km/h, and off-site hauling vehicles to 60 km/h on unpaved roads. Actively enforce the speed limits specified. Dust suppression to be conducted on a regular basis. Chemical treatment of access roads to Minimise dust generation utilising water conservation strategies such as 'Dust-a-side'.
Noise	Increased total noise levels in the area, changing existing ambient sound levels at receptors	Machinery and vehicles can be fitted with silencers/mufflers to reduce noise. All staff/contractors on-site are required to wear the PPE. Identify sensitive receptors and conducted noise monitoring if required. Use of low-noise generation plant and equipment. All plant, equipment and vehicles are to be kept in good repair. Off-site hauling of the product should be limited to daylight hours.
Archaeological and Cultural Interest	Impact on chance find stone tools	Avoid the chance stone tools and burial site.
	Impact on burial site	
	Impact on historical/old mine features	Excavation by archaeological techniques and document the site (map and photograph) and analyse the recovered material to acceptable standards. This must be done by a suitably qualified archaeologist.
	Impact on undetected burial sites or sub-surface heritage resources	If any archaeological artefacts are discovered upon excavations, construction must immediately cease, and reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
	Impact on undetected sub-surface palaeontological resources	Phase 1 Palaeontological Impact Assessment: Field Study to be conducted prior to construction If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures.
Visual	Visual intrusion of mining activities, impacting on the sense of place	The development footprint and disturbed areas are to be kept as small as possible and the areas cleared of natural vegetation must be kept to a minimum. The height of infrastructure and stockpiles should be kept as low as possible and should not exceed 10m. Infrastructure such as the stockpile must be shaped and rounded to blend in with the surrounding undulating landscape. Natural colours should be used in all instances and the use of highly reflective material should be avoided. Any metal surfaces should be painted to fit in with the natural environment in a colour that blends in effectively with the background. White structures are to be avoided as these will contrast significantly with the natural surroundings.

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Specialist Area	Potential Impact	Mitigation Measures
	Impact due to night-time lighting	<p>Outdoor lighting must be strictly controlled.</p> <p>High light masts should be avoided. Any high lighting masts should be covered to reduce the glow.</p> <p>Lighting fixtures must be selected and placed so that they direct their light on the intended area only, to avoid light spill and offsite light trespass.</p> <p>Light sources must be shielded by physical barriers.</p> <p>The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent reduces sky-glow and wildlife impacts. Bluish-white lighting is more likely to cause glare and attract insects and is associated with other human physiological issues.</p>
Social	Conflict between job seekers and local communities	<p>Priority employment from local communities with the development of recruitment procedures and utilizing the existing skills available from the local communities</p> <p>Establishing early on skills development programmes in areas where most employment opportunities will be available such as operators and artisans</p>
	Increase in social pathologies such as crime, safety, health, prostitution	<p>Implementation of bursary programme and practical skills programmes as part of the Social and Labour Plan</p> <p>Establishment of a local labour recruitment committee to monitor recruitment procedures and results</p>
	Increase in social pathologies such as crime, safety, health, prostitution	<p>Engage with Traditional Authority to manage and monitor site allocation to job seekers and/or employees in the local communities</p> <p>Induction of contractors and workforce with regard to their code of conduct in the local communities</p>
	Pressure on community infrastructure and services	
	Impact on land use and livelihoods from the reduction in the grazing area	<p>Demarcated areas where fire wood can be collected that was cleared for the Construction Phase</p> <p>Application of the Avoidance Principle by reducing the footprints of infrastructure where possible</p> <p>Supporting the community in the increase of grazing capacity through seeding and debushing</p> <p>Leasing of community land impacted by mining</p> <p>Monitoring the impact on livestock</p>
	Participation of Local Communities in Employment Opportunities	<p>Source the maximum number of employees from the local area for temporary job opportunities</p> <p>Implement skills development programmes in the areas where most job opportunities will be created, i.e. operators and drivers</p>
	Participation of Local Communities in Skills Development	<p>Make available bursary opportunities to build skill capital in the region</p> <p>Establish a database of local people with information on qualifications and skills, utilize this database to develop skills plans and recruit local people.</p>
	Downscaling	<p>Implement portable skills development programmes</p> <p>Design and implement economic development programmes that will assist people being retrenched in sustaining their livelihoods</p> <p>Establish a future forum with representation from the workforce to discuss potential difficulties and solutions</p> <p>Implementation of programmes to minimize and mitigate the impact of downscaling and retrenchment</p>
	Participation of Local Communities in procurement Opportunities	<p>Establish a database of local businesses, utilize this database to establish partnerships between local and larger service providers as well as locally preferred work packages</p>
	Downscaling of business opportunities	<p>Consultation and Feedback on results on a regular basis</p> <p>Implementation of capacity building programmes to minimize and mitigate the impact of mine downscaling and closure.</p> <p>Closure plan implementation</p>
Empowerment of the local community through ownership participation	<p>Transfer of the shares into a community trust properly established and representative of the Ga-Kibi Communities</p> <p>Support to the Trust in management of the funds, selection of projects and implementation</p>	
Community development from ownership participation	<p>Community feedback on the projects selected, implemented and completed.</p>	
Traffic	Disruption of Movement activities	<p>Traffic minimized through bus and combi services to transport workers to the project site</p>
	Disruption of Movement activities	<p>Low speed limits on access roads</p> <p>Road crossings should be managed by signing and traffic management measures</p> <p>Issues and Grievance Procedure available to local people to report bad driving or rules traversing</p>
Blasting	Ground vibration impact on humans and animals - safety and nuisance impacts.	<p>Innovative blasting techniques are to be employed in order to minimise ground and air vibrations and disturbances to minimise the impacts on surrounding faunal species.</p> <p>Mine to initiate a forum to inform the livestock owners about the likely vibration and air blast levels, the proposed blasting schedule and warning methodology the</p>

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Specialist Area	Potential Impact	Mitigation Measures
	Potential for fly-rock, which could harm animals.	mine will employ before a blast. Mine to erect blasting notice boards in the area (on the main access route from the district road to the mine) with blasting dates and times highlighted. Maintain an evacuation zone of 500m, establish an evacuation procedure with the affected parties prior to blasting. Blaster to keep full records of blast (blast design, timing, explosive mass per blast hole, stemming, subdrill, spacing, burden, etc.).

5 ENVIRONMENTAL MONITORING AND AUDITING

5.1 Monitoring

A comprehensive monitoring system was developed for this project in line with the proposals of the specialists – refer to Table 5-1. The objective of the environmental monitoring system is to:

- Prevent and/or minimise the environmental impact associated with the proposed mining operation;
- Ensure conformance with the management objectives and outcomes;
- Act as a pollution early-warning system;
- Obtain the necessary data required to address knowledge gaps;
- Check compliance with license requirements; and
- Ensure consistent auditing and reporting protocols.

Prior to commencement, a detail Monitoring Procedure will be developed for implementation. A proper data management system will be set up to facilitate trend analyses and preparation of reports. All the monitoring data will be collated and analysed on an annual basis and included in management reports. The results will be reviewed by the EMC.

It must be noted that the monitoring programme is a dynamic system changing over the different life-cycle phases of the mine. The programme will be reviewed on an annual basis by the EMC and revised if necessary.

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Table 5-1: Environmental Monitoring programme for Cuchron Project

Aspect	Issue	Description	Monitoring Location	Frequency of sampling	Frequency of Reporting	Sampling Method	Variables
Surface Water	Potable water	To determine quality of drinking water	Outflow of potable treatment facility	Monthly	Annual	Grab sampling	Turbidity and micro-biological constituents
	Sewage effluent	To determine water quality of sewage effluent (if applicable)	Outflow of STP	Weekly	Monthly	Grab sampling	Turbidity and micro-biological constituents
	Water management infrastructure	Inspection of the temporary channels, and bridges for signs of erosion, cracking and silting to ensure the performance of these remains acceptable. A leak and spill management plan must be formulated to monitor and detect as soon as possible. Site walkovers to determine the condition of facilities and identify any leaks or overflows, blockages, overflows, and system malfunctions for immediate remedial action	All proposed infrastructure Roads and areas where vehicles commute and areas where chemical storage containers are located. Areas where leakage is visible/detected.	Monitoring of erosion should occur during construction after every rainstorm or flood event, and during the operational phase monthly during first the wet season or during routine maintenance inspections, as applicable. Identification of any leakage events should occur monthly during the rehabilitation and construction phase, or directly after a leakage has been detected and for the operational phase, during maintenance activities	After every major rainstorm / flood. Monthly monitoring report compiled by the appointed ECO during the construction phase.	Visual	Evidence of erosion, cracks, subsidence, overgrowth, leachate, etc.
	Dirty water systems	To determine the water quality and long-term chemical changes in the dirty water systems	Pollution Control Dam	Quarterly	Quarterly Reports	Grab sampling	pH, Nitrate as N, Electrical conductivity, Ammonia, TDS, Potassium, TSS, Nickel, Aluminium, Manganese, Calcium, Magnesium, Fluoride as F, Iron, Total alkalinity as CaCO ₃ , Copper, Chloride as Cl, Lead, Sulphate as SO ₄ , Sodium, Uranium, E.coli
	Mogalakwena River Water Quality	Ensure that water quality monitoring is implemented up and downstream at the periphery of the 200 m working area	Immediately upstream and downstream of the Mogalakwena River. GPS co-ordinates of the monitoring locality can be established during the first monitoring.	Quarterly	Reporting should be undertaken after each sampling activity.	Grab sampling	pH, Nitrate as N, Electrical conductivity, Ammonia, TDS, Potassium, TSS, Nickel, Aluminium, Manganese, Calcium, Magnesium, Fluoride as F, Iron, Total alkalinity as CaCO ₃ , Copper, Chloride as Cl, Lead, Sulphate as SO ₄ , Sodium, Uranium, E.coli
Groundwater	Groundwater Quality	To determine any impact on the groundwater quality as a result of mining	Monitoring boreholes	Quarterly	Quarterly Reports	Grab sampling	EC, pH, TDS, total hardness, total alkalinity, calcium, magnesium, sodium, potassium, chloride, sulphate, fluoride, nitrate, iron, manganese, aluminium and turbidity.
	Groundwater levels	To determine any impact on the groundwater levels as a result of mining	Monitoring boreholes	Monthly	Annual reports	Dip meter	Water level (mbs)
	Water Balance	Pit dewatering volume monitoring	Open Pit	Monthly	Annual reports	Volume meter	

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Aspect	Issue	Description	Monitoring Location	Frequency of sampling	Frequency of Reporting	Sampling Method	Variables
Biodiversity	Soil erosion	To pro-actively identify soil erosion in order to rectify prior to serious degradation Soil erosion and sedimentation monitoring in all soil erosion potential sources	Cleared and compacted areas where the infrastructure will be built. The downstream areas of dams and road crossings.	Monthly	Annual reports	Field survey	
Biodiversity / Land use Management	Terrestrial ecological	To determine floral & faunal species composition & abundance and plant basal cover	Fixed point vegetation monitoring in MRA area Rehabilitated areas	Annually	Annual reports	Field survey	
	Alien vegetation	To monitor conformance with alien and invasive eradication plan	MRA area	Monthly (during eradication programme)	Annual reports	Survey	Area (hectares)
	Soils	To monitor soil fertility level of stockpiled soils	Topsoil stockpiles & berms	Annually	Annual reports	Soil sampling	Soil fertility analyses
	Land capability	To determine land capability over rehabilitated areas	Fixed point soil monitoring in rehabilitated areas	Bi-annually for 3 years after seeding, thereafter annually	Annual reports	Soil sampling	Soil fertility analyses
Waste	Waste generation & management	To determine volume of waste generated & disposed	Site	Monthly	Annual reports	Contractor Report	Waste types
Heritage	Heritage/cultural resources	To capture all heritage/cultural resources exposed by development	Mining and Infrastructure area	As required	Annual reports	Archaeologist site visit	
	Palaeontological resources	To capture all palaeontological resources exposed by development	Mining area	Once resource is reached		Palaeontological site survey	

5.2 Compliance Auditing and Reporting

To ensure compliance with this EMPr and to assess the continued appropriateness and adequacy of the report, Cuchron commits to:

- Regular monitoring of all the impact management actions and components shall be carried out by the mine to ensure that the provisions of this programme are adhered to.
- Compile and submit to the Director: Mineral Resources a report on the performance assessment of the EMPr, including the ongoing effectiveness and appropriateness thereof.
- The performance assessments of the EMPr and the compilation and submission of the reports will occur annually.
- Cuchron will appoint a responsible person(s), in writing, who will monitor all environmental aspects of the site on a regular basis.
- Various points of compliance will be identified regarding the various impacts that the operations will have on the environment and the surrounding community. Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on the community and the environment.

5.2.1 Internal Review

- Management meetings – The mine will conduct monthly meetings where relevant Health, Safety, Environmental, Community (HSEC) issues are discussed with the Management Team.
- Review meetings – The Management Team will provide feedback to the General Manager (GM) monthly and all HSEC issues will be included in these meetings.
- Perform annual internal audits as part of the HSEC reporting schedule to ensure conformance to environmental objectives and strategies and the implementation thereof.

5.2.2 External Review

- External EMP performance assessments, as required in terms of the MPRDA, will be performed on an annual basis and submitted to the DMR for distribution to other relevant authorities.

6 ENVIRONMENTALLY RELATED EMERGENCIES AND REMEDIATION

6.1 List of Potential Emergencies and Remediation

An environmental incident is defined as “an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed”. Some environmental emergencies have been identified that could occur during the project, in the event of which immediate remedial action must be undertaken, namely:

- Occurrence of surface fires, including veldt fires
- Compromising of dirty water management structures
- Hydrocarbon spills or leaks from machinery on the surface
- Incident or accident during the transportation of hazardous waste or product
- Flooding of mine workings
- Blasting incidents

6.1.1 Surface Fires

In the event of a fire, the procedure to be followed is provided in Section 18 of the National Veld and Forest Fires Act, 1998 (Act 101 of 1998). The said Act provides for the notification of relevant affected parties, access to land on which a fire is burning for the purpose of extinguishing it and requires that the fire protection officer of the area be informed, as well as those of surrounding areas to which the fire may spread. An emergency procedure will be developed in conjunction with the communities, and the local fire department to ensure in the event of a surface fire, the requirements of the National Veld and Forest Fires Act will be met.

6.1.2 Compromising of Surface or Groundwater Protection Measures

All compromised canals / berms and other surface or groundwater protection measures will immediately be repaired and stabilised to avoid further contamination of clean areas with dirty water and the impacts associated therewith. Also refer to Spill Management Procedure below.

6.1.3 Hydrocarbon Spills or Leaks From Machinery

All areas affected by spills of hydrocarbons will be remedied immediately. Soil rehabilitation by land farming, or other means will be initiated immediately, and the necessary measures will be taken to ensure that pollution of surface water and groundwater does not occur. Refer to Spill Management Procedure below.

6.1.4 Transportation of Hazardous Waste

An emergency plan for possible incidents or accidents during the transportation of hazardous waste was developed – refer to Section 6.2.

6.1.5 Flooding of Mine Workings

A detailed Code of Practice for inrushes will be compiled for the opencast mine workings as required in terms of the Mine Health and Safety Act.

6.1.6 Blasting Incidents

A detailed Emergency Blasting Procedure including an Evacuation Procedure will be developed prior to any blasting in conjunction with relevant community forums and/or representatives.

6.2 Spill Management

6.2.1 Recording Of Incidents

All environmental incidents/accidents or disasters will be reported immediately or during the shift to the responsible manager or immediate supervisor. Contractors and employees will be trained in environmental awareness to assist in identifying such events. The immediate action will be to contain/stop the incident/accident or disaster and the next steps will depend on the nature and magnitude of the event. These steps may include:

- Stop the spill
- Investigate the incidents/accident/disaster
- Clean contaminated areas
- Pump and store affected water
- Construct emergency water management structures
- Treat contaminated natural resources
- Rehabilitation of the affected environment

The relevant interested and affected parties (including the Departments of Water and Sanitation, Department of Mineral Resources, Department of Economic Development, Environment and Tourism and Department of Agriculture) will be notified of moderate, major and critical incidents. The definition of incident categories is described in Table 6-1. Incidents/accidents that fall within those ranges may have an impact on the affected downstream users, the regional users and the national users and it is therefore essential that it be reported to authorities and interested and affected parties. Low and minor incidents however may have an impact on the natural and physical environment on site and it is therefore required to mitigate and rehabilitate the effect of the incident to reach the objectives set in the EMP. Notification will be done by the fastest possible means and the following information will be supplied:

- The date and time of the incident.
- A description of the incident.
- The source of the pollution or potential pollution.
- The impact or potential impact on the water resource and the relevant water users.
- Remedial action taken or to be taken or activity to remedy the effects of the incident.

As soon as reasonably possible after the date of the incident/accident or disaster a written report will be forwarded to the relevant government department stating what measures will be taken to correct and prevent a recurrence of the event. In order to prevent the occurrence of such incidents/accidents the proposed management measures will be implemented and the monitoring be done. An incident reporting database / impact register will be established at the mine and all incidents will be entered into a central database by the person reporting the incident or another designated person.

Table 6-1: Incident categories

Low	Minor	Moderate	Major	Critical
Impact zone small with no lasting effect. Low-level impacts on biological or physical environment. Limited damage to minimal area of low significance.	Larger impact zone but still within the boundaries of the mine. Minor effects on biological or physical environment. Minor short-term to medium-term damage to small area of limited significance.	Impact zone extends over the boundaries of the mine, influencing the downstream and/or neighbouring users. Moderate effects on biological or physical environment but not affecting ecosystem function.	Impact zone extends over the region. Serious environmental effects with some impairment of ecosystem function. Widespread medium-term to long-term impacts.	Impact zone extent is national. Very serious environmental effects with impairment of ecosystem function. Long-term widespread effects on the environment.

6.2.2 Spill Management Procedure

6.2.2.1 Minor Risk Incident

- Assess the situation and determine the hazard and extent of the spill, taking into account the quantity of the spillage and the danger of the substance. Refer to MSDS of the substance spilled to identify hazard.
- Contact the Site Manager, detailing the substance, quantity, severity, location and possible environmental impact.
- Demarcate the area where the substance was spilled.
- Contain the spill with the correct control measures i.e. sand, spill-sorb, bunding, spill-kits, etc. Refer to the MSDS of the substance spilled for correct handling and control of the spill.
- The Site Manager must contact the relevant person(s) to attend to the situation.

6.2.2.2 Major Risk Incident or Emergency

- Assess the situation and determine the hazard and extent of the spill, taking into account the quantity of the spillage and the danger of the substance. Refer to MSDS of the substance spilled to identify hazard.
- Raise the alarm and evacuate the area.
- Contact the Site Manager, detailing the substance, quality, severity, location and possible environmental impact.
- Demarcate the area where the substance was spilled.

- If possible, try to contain the spill with the correct control measures i.e. bunding, etc. Ensure not to endanger anyone or yourself by doing this. Refer to MSDS of the substance spilled for correct handling and control of the spill.
- The Site Manager must contact the relevant person(s) to attend to the situation.

6.2.3 Reporting

The reporting and control of an emergency incident should be dealt with in terms of Section 20 of the NWA and in the event of a Major Spill the following agencies should be notified immediately:

- Department of Water Affairs
- Fire Department
- South African Police Services
- Local and District Municipalities

7 ENVIRONMENTAL AWARENESS PROGRAMME

Environmental awareness communication and reporting forms an integral part of an EMP and includes social awareness programmes. For this reason, a procedure will be developed that will describe how the mine will communicate with its employees and with IAPs on environmental issues. The mine acknowledges the importance of effective internal and external communication and as such will maintain communication channels, both within the company and with the IAPs of the mine.

The awareness plan will be implemented at all employees' and contractors' levels, i.e., junior, senior and middle management levels (for unskilled, semi-skilled and skilled workforce). In general, the objectives of the environmental awareness plan will be to:

- Ensure that all employees/contractors understand the HSEC Objectives and Policies.
- Ensure that information regarding the environment is communicated effectively and is readily accessible to all relevant parties.
- Ensure feedback of operational and environmental performance to management.
- Provide for the establishment of forums to discuss environmental issues, allocate resources, and ensure that adequate measures are being taken to address the environmental problems.
- Provide guidelines for communication with outside organisations and IAPs.
- Ensure effective and constructive response with IAPs.
- Ensure that environmental communication and interactions are documented and recorded and accessible.

The formal training, awareness campaigns, sharing of environmental information in meetings and issuing of management instructions will be used to inform employees of potential environmental degradation, compliance levels and feedback on implementation of the required standards.

7.1 Induction Programme

All new employees and contractors carrying out work on the mine property will undergo the environmental induction programme. Included in the programme will be all relevant environmental aspects and conditions of the Environmental Authorisation. All employees will as a condition of employment, be subject to undergo the annual environmental refresher programme.

7.2 Internal Communication and Awareness Campaign

Internal communication will be conducted as follow:

- Notices – Awareness raising initiatives to capacitate both employees and communities and equip them with environmental knowledge will be implemented. Environmental news flashes with relevant messages will be distributed and placed at strategic sites monthly. The environmental news flashes will be discussed in employee's HSEC

forums and form part of the toolbox talks. Awareness raising intervention will further be conducted for specific employees in areas where constant environmental non-compliance activities are experienced. The most effective communication methods will be utilized to communicate environmental topics.

- Environmental information-sharing sessions on environmental risks and performance will be conducted. All employees will be afforded an opportunity to interrogate environmental issues. Monitoring and environmental performance reports will be made available to employees and managers of specific business units.

7.3 External Communication and Awareness Campaign

External communication will be conducted as follow:

- Stakeholder Register – The Cuchron Project has a comprehensive Stakeholder Register because of the EIA process. The register contains a list of all stakeholders and includes the name of the stakeholder organisation, contact details of the IAPs, such as the address (both physical and postal), e-mail address, telephone number, cell phone number and fax number. This register will be maintained and updated on an annual basis.
- Stakeholder Engagement Forums – Annual meetings will be held with major stakeholders to present and discuss HSEC issues. A register of attendees will be completed, and minutes taken during the proceedings, which will be distributed to all the major stakeholders for information purposes, whether they attended the meeting or not. To encourage feedback and facilitate stakeholder participation, feedback sheets will be handed to each stakeholder upon registration and collected after the forum. This will allow the stakeholders to change their contact details, if necessary, and to comment on or enquire as to HSEC matters. Any feedback sheets received will be managed according to fixed operating procedures and any actions taken will be recorded for reference purposes.
- External Complaints Register – An external complaints register will be stationed at the mine security. If a complaint and/or concern are raised, a formal Incident Investigation will be opened, managed and investigated in accordance with the appropriate operating procedure. Records will be kept of the external complaints, as well as the follow-up investigation and actions taken. Regular contact will be kept with the complainant until the complaint has been suitably addressed.

8 FINANCIAL PROVISION

8.1 Closure Cost Assessment

It is firstly important that the various components that need to be part of the closure cost be quantified. The Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (DMR, 2004) was used as a guideline to identify the various components that would form part of such an assessment. In addition to that, attention was also given to the closure objectives and relinquishment criteria.

A rules-based approach was used and related back to the surface area of the various components included in the closure costs. The unit rate (master rate) for each closure component was taken from the DMR guideline and inflated by the Consumer Price Index (CPI) to account for escalation since January 2005. The CPI rates used in this assessment is listed below.

Year	CPI	Year	CPI
2005	0.020	2013	0.058
2006	0.032	2014	0.061
2007	0.061	2015	0.045
2008	0.100	2016	0.066
2009	0.073	2017	0.052
2010	0.041	2018	0.045
2011	0.05	2019	0.041
2012	0.057	2020	0.033

The decommissioning and closure cost estimate for the Cuchron Project was calculated as R960 910 (rounded, inclusive of 15% VAT). Refer to Table 8-1 for detail calculation in line with the Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (DMR, 2004), as escalated by the annual CPI rate.

This is a high-level progressive estimate for the first ten years of the LoM. It assumed that no concurrent rehabilitation will be done during the first 10 years of operations. As the mine is still in the planning stages, a conceptual level of costing (50% accuracy) is adequate. However, when the project is authorised, this will need to be refined to a 70% accuracy level, once the final designs have been completed.

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Table 8-1: Closure Cost Assessment for the Cuchron Project

Description	Unit	A	B	C	D	E=A*B*C*D
		Quantity	Inflated 2020 Master rate	Multiplication factor	Weighting factor	Amount (rands)
Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	R15	1	1	R0.00
Demolition of steel buildings and structures	m2	500	R214	1	1	R107 146.17
Demolition of reinforced concrete buildings and structures	m2	0	R316	1	1	R0.00
Rehabilitation of access roads	m2	950	R38	1	1	R36 429.70
Demolition and rehabilitation of electrified railway lines	m	0	R372	1	1	R0.00
Demolition and rehabilitation of non-electrified railway lines	m	0	R203	1	1	R0.00
Demolition of housing and/or administration facilities	m2	0	R429	1	1	R0.00
Opencast rehabilitation including final voids and ramps	ha	3.62	R218 127	0.04	1	R31 584.80
Sealing of shafts, adits and inclines	m3	0	R115	1	1	R0.00
Rehabilitation of overburden and spoils	ha	0	R149 779	1	1	R0.00
Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	R186 547	1	1	R0.00
Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	R541 821	0.51	1	R0.00
Rehabilitation of subsided areas	ha	0	R125 417	1	1	R0.00
General surface rehabilitation (topsoil & seeding)	ha	3.62	R118 650	1	1	R429 514.02
River diversions	ha	0	R118 650	1	1	R0.00
Fencing	m	0	R135	1	1	R0.00
Water management	ha	1.81	R45 114	0.17	1	R13 881.63
2 to 3 years of maintenance and aftercare	ha	0	R15 790	1	1	R0.00
Specialist study	Sum					R27 000.00
Closure plan	Sum					R45 000.00
Subtotal 1 (Sum of items 1 to 15 above)						R690 556.31
Weighting factor 2		1.05				R725 084.13
Preliminary and General		6%				R41 433.38
Contingency		10%				R69 055.63
Subtotal 2						R110 489.01
Subtotal 3						R835 573.14
Add Vat (15%)						R125 335.97
GRAND TOTAL (incl VAT)						R960 909.11

9 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

9.1 Financial Provision

As a minimum, the Rehabilitation, Decommissioning, and Closure Plan, together with the associated closure costs, will be updated on an annual basis once mining has commenced, as required in terms of the GN R.1147 Regulations. Auditing and review of the closure-related monitoring will be undertaken as part of this annual review.

9.2 Undertaking

I, Lizinda Dickson, herewith confirms:

- i. The correctness of the information provided in the reports;
- ii. The inclusion of comments and inputs from stakeholders and IAPs;
- iii. The inclusion of inputs and recommendations from the specialist reports where relevant; and
- iv. The acceptability of the project in relation to the findings of the assessment and level of mitigation proposed.

Signature of EAP

Date: 13 July 2021

Annexure A: Lizinda Dickson CV