



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF THE APPLICANT: **STEAMBOAT GRAPHITE (PTY) LTD)**

REFERENCE NUMBER: **LP 30/5/1/2/3/2/1(10193) EM**

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

**FOR LISTED ACTIVITIES ASSOCIATED WITH MINERAL BENEFICIATION
(STEAMBOAT GRAPHITE (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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STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: 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 2-4 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 8

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 Error! Reference source not found.
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
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

TABLE OF CONTENTS

1	INTRODUCTION	8
1.1	Background.....	8
1.2	Applicant and Specialist Details	8
2	DESCRIPTION OF THE ASPECTS OF THE ACTIVITY	10
2.1	Project Location	10
2.2	Properties Description.....	10
2.3	Beneficiation Development Layout.....	11
2.4	Composite Map.....	24
3	DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES	27
3.1	Management Objectives and Outcomes	27
4	IMPACT MANAGEMENT ACTIONS	34
4.1	Roles and Responsibility.....	34
4.2	Mitigation Measures.....	36
5	ENVIRONMENTAL MONITORING AND AUDITING.....	39
5.1	Monitoring.....	39
5.2	Compliance Auditing and Reporting.....	42
6	ENVIRONMENTALLY RELATED EMERGENCIES AND REMEDIATION	43
6.1	List of Potential Emergencies and Remediation	43
6.2	Spill Management	44
7	ENVIRONMENTAL AWARENESS PROGRAMME	47
7.1	Induction Programme.....	47
7.2	Internal Communication and Awareness Campaign.....	47
7.3	External Communication and Awareness Campaign.....	48
8	OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY	49
8.1	Undertaking	49

LIST OF FIGURES

Figure 2-1: Locality Map	10
Figure 2-2: Traditional Authorities	11
Figure 2-5: Mine Infrastructure Site Location Alternatives	12
Figure 2-6: Composite Map	25

LIST OF TABLES

Table 2-1: Project Properties	10
Table 2-2: Adjacent Properties	11
Table 2-7: DDPS standard plant.....	16
Table 2-9: Product Transport Alternatives.....	17
Table 2-10: Gasification Facility Process Flowchart.....	20
Table 2-11: Water Balance	22
Table 2-12: Hydrocarbon requirements for the Project	23
Table 2-3: Beneficiation Plant Listed Activities – Steamboat Graphite (Pty) Ltd	23
Table 2-6: Motivation for preferred development alternatives	26
Table 3-1: Proposed management objectives an outcome for the Cuchron Project.....	27
Table 5-1: Environmental Monitoring programme for Cuchron Project.....	40
Table 6-1: Incident categories	45

1 INTRODUCTION

1.1 Background

The project name is the Steamboat Beneficiation Development, related to the farm name “Steamboat”. The project is located on 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 Cuchron Graphite mine, to beneficiate and process the graphite for a broader market.

A Mining Right Application has been submitted by Cuchron for the mine development. 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	Steamboat Graphite (Pty) Ltd
Name of the Mine / Production Operation	Steamboat Graphite Beneficiation
Responsible Person	Wenzel Kerremans
Physical Address	20 The Gallops Drive, Blue Hills Country Estate, Beaulieu, Midrand 1684, Johannesburg
Postal Address	PO Box 98407, Sloane Park, 2152
Cell Number	082 444 8792
Telephone Number	082 444 8792
Fax Number	086 602 5566
Email:	wenzelk@mweb.co.za

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		
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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 project is 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 13ha (1% of properties)

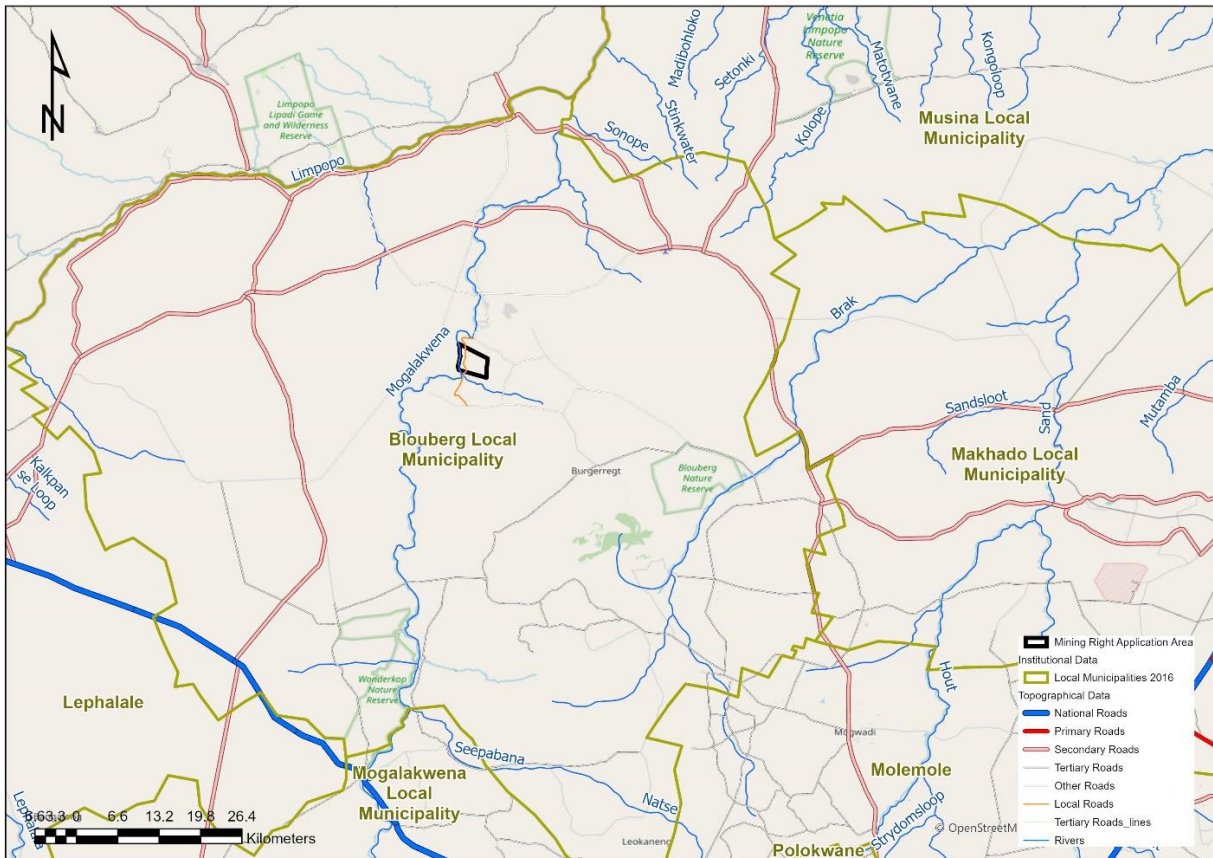


Figure 2-1: Locality Map

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

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMP

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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.

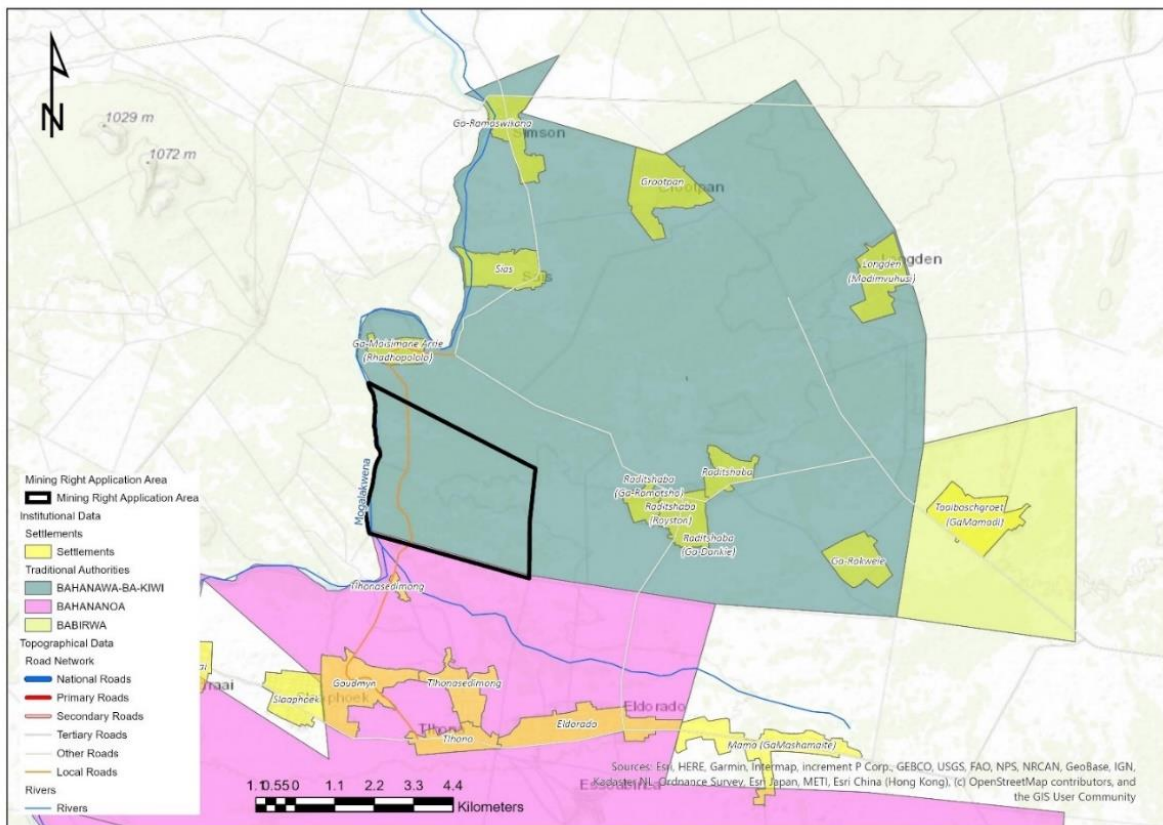


Figure 2-2: Traditional Authorities

2.3 Beneficiation Development Layout

The Beneficiation Plant will be a separate business entity, operated by Steamboat Graphite. The Beneficiation Plant will entail the following infrastructure:

- Beneficiation Plant
- Crushers, Mills and Screens
- Discard and Tailings Facilities
- Sewage Facility
- Syngas Power Generation Facility

2.3.1 Surface Infrastructure Layout

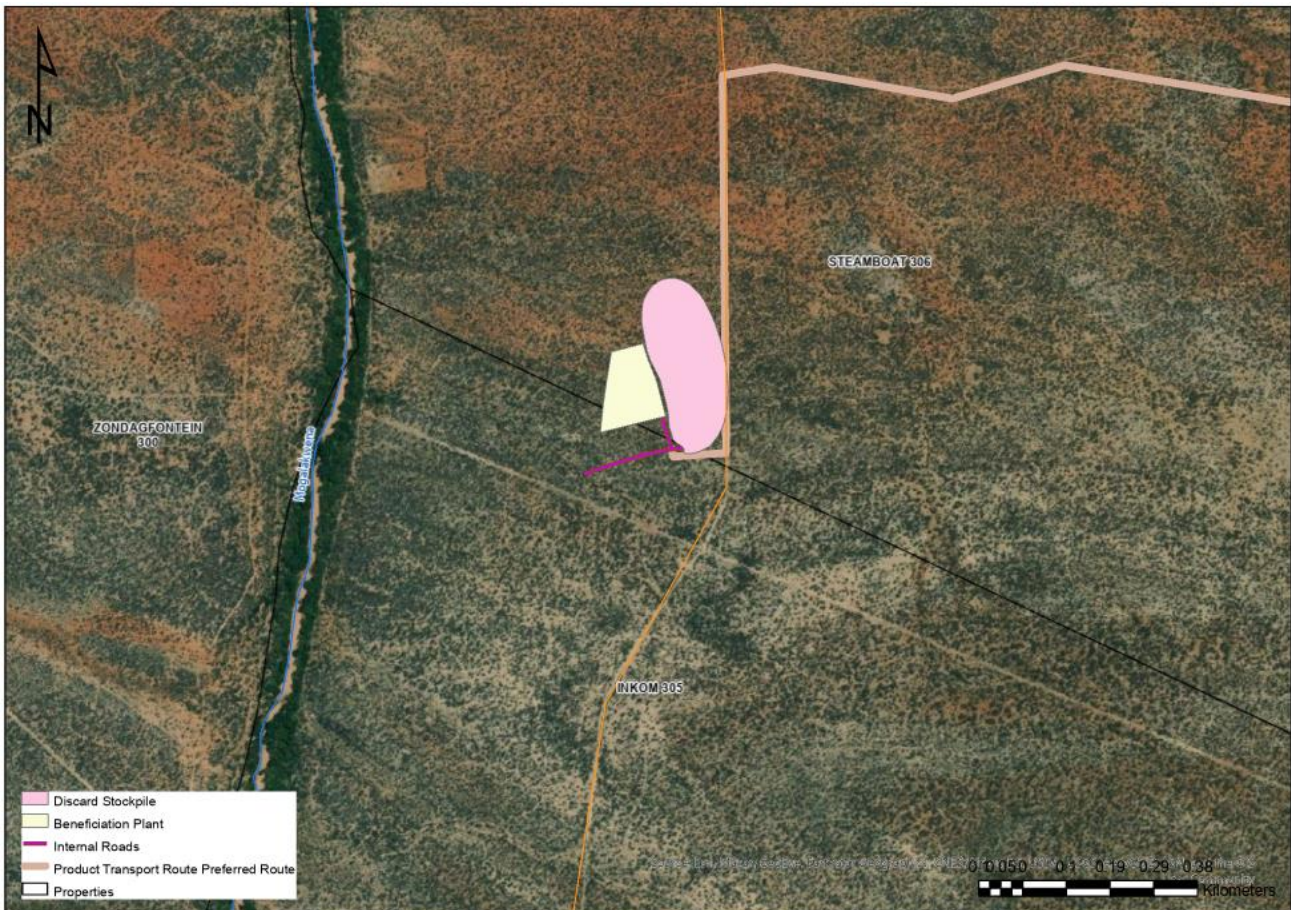


Figure 2-3: Mine Infrastructure Site Location Alternatives

2.3.2 Beneficiation Plant

Steamboat Graphite will establish a beneficiation plant for the further processing and beneficiating of the raw graphite ore. The main aspects of the beneficiation process are:

- Primary, Secondary and Tertiary Crushing
- Primary Milling and Flash Flotation
- Rougher Flotation
- Primary Concentrate Cleaning Circuit
- Fine-Flake Concentrate Cleaning Circuit
- Final Concentrate Attritioning and Cleaning Circuit
- Concentrate leaching
- Concentrate Handling

- Concentrate Screening and Bagging
- Final Tailings Handling and Disposal

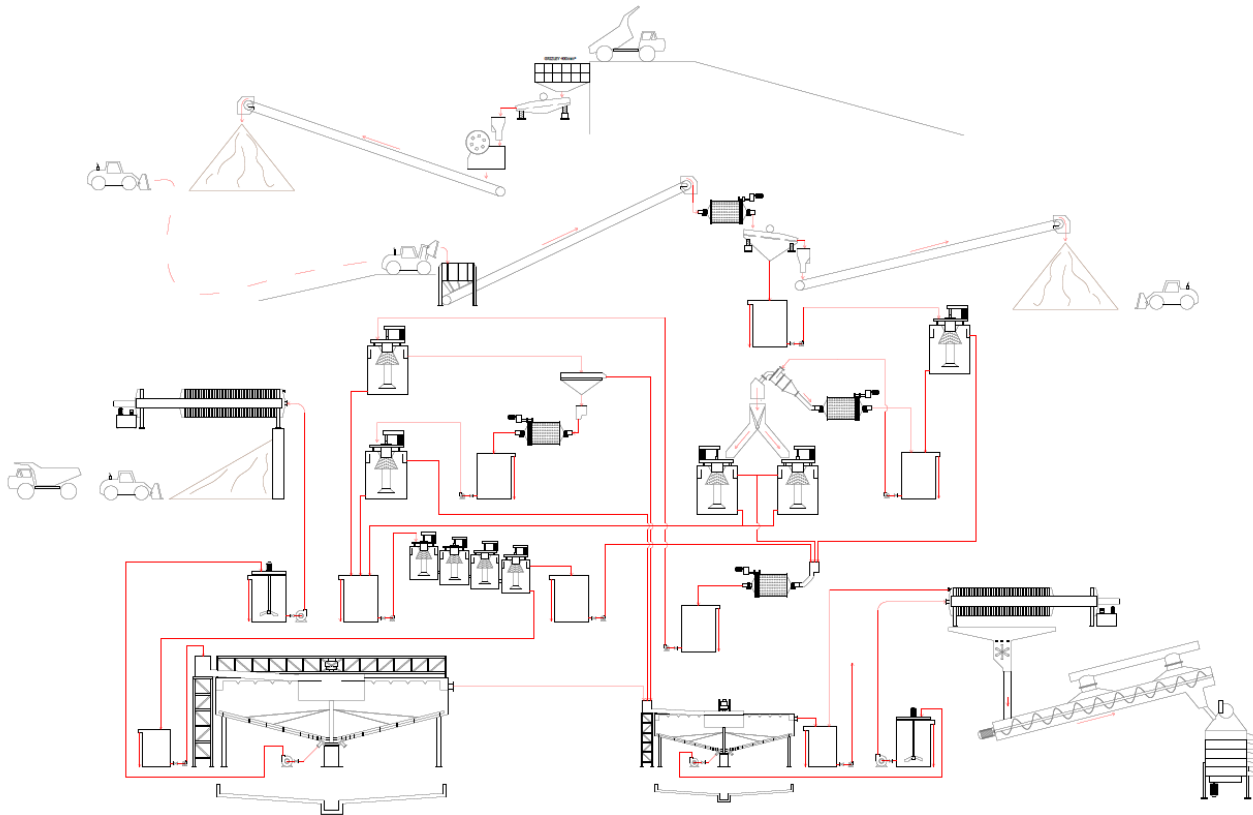


Figure 2: Processing Flow Chart

These processes are explained more fully below.

- **Primary, Secondary and Tertiary Crushing:** The crusher circuit is fed with ROM material using a front-end loader (FEL) at a rate of 100 t/h. The ROM material is screened using a ROM static grizzly screen, located at the top of the primary crusher bin to reject rocks larger than 300 mm (oversize material). The oversize material shall be stockpiled near the feed bin and may be manually crushed using rock breakers. The static grizzly undersize material (-300 mm) is further screened using the grizzly feeder, which is fitted with 70 mm openings; the oversize material (+70 mm) is discharged into the jaw crusher. The crusher is set to a Closed Side Setting CSS value of 75 mm and is expected to produce 100% -120 mm material. The crusher product and the grizzly undersize are discharged onto the primary crusher discharge conveyor. The primary crusher product is fed to the classification screen via the classification screen feed conveyor. The classification screen is fitted with two decks; the top deck is fitted with 35 mm screen panels while the bottom deck is fitted with 16 mm panels. Oversize from the top deck (+35 mm) discharge into the secondary crusher feed bin and is fed to the secondary crusher via a feed conveyor and the secondary crusher feeder. Oversize material from the bottom deck (-35+16 mm size fraction) flows by gravity into the tertiary crusher feed bin and is fed to the tertiary crusher via the tertiary crusher feed conveyor and the tertiary crusher feeder. Products from the secondary and tertiary crushers are combined and recycled

back to the classification screen. The bottom deck screen undersize (-16 mm size fraction) from the classification screen is fed to the mill feed bin via the mill feed conveyor.

- **Primary Milling and Flash Flotation:** The crushed material from primary mill feed bin is fed to the primary mill scalping screen at the flowrate of 30 t/h via the mill feed bin feeder and the primary mill feed conveyor. The scalping screen is fitted with 2 mm aperture panels. Oversize from the screen (+2 mm) flows into the primary ball mill by gravity. Spillage material in the primary milling circuit is pumped to the scalping screen through the mill area spillage pump. The mill is expected to produce a product with a grind of 80% passing 500 microns; this product is discharged into the primary ball mill discharge sump. Slurry from the mill discharge sump is pumped (via the primary mill discharge pump to the primary mill screen which is fitted with a 600 μm aperture panels and discharges the oversize (+600 μm) back into the primary mill. The -2 mm material from the scalping screen flows by gravity into the flash flotation cell; the flash flotation cell is installed to recover graphite flakes liberated at coarse particle sizes. Flash flotation produces a concentrate at a mass yield of 3%. Flash flotation tailings are pumped into the primary mill discharge sump via the flash flotation tails pump.
- **Rougher Flotation:** The rougher flotation feed slurry (-600 μm), which consists of the combination of flash flotation tailings and the primary mill product, flows into the rougher flotation bank by gravity at the solid's flowrate of 29 t/h. Frother and collector reagents are added into rougher cell no.1 and rougher cell no.3. Rougher concentrate mass pull is expected to be 8%. The flash flotation concentrate and primary rougher concentrate are combined in the total concentrate sump and pumped to the primary concentrate cleaning circuit using the pumps. The tailings from the rougher flotation circuit are discharged into the combined tailings sump; the combined tailings stream is then pumped to the final tailing's thickener using the combined tailings pump. Any spillage from the rougher flotation section is pumped to the primary ball mill scalping screen using the rougher flotation spillage pump.
- **Primary Concentrate Cleaning Circuit:** The combined concentrate is screened on the primary cleaner dewatering screen; the screen is fitted with 74 μm panels. The oversize from the dewatering screen is discharged into the primary polishing mill. The mill discharge and the dewatering screen undersize are discharged into the primary polishing mill discharge sump. The primary mill discharge sump slurry is pumped to the primary cleaner column cell using the primary polishing mill discharge sump pump. The column flotation cell tailings are pumped to the primary cleaner flotation bank; the tailings stream from this bank is discharged into the primary cleaner scavenging flotation cell bank, which consists of three flotation cells. The primary cleaner flotation concentrate is recirculated back to the primary cleaner column cell. The cleaner scavenger concentrate is recycled back to the polishing mill feed classification screen, while the tails are pumped to the combined tails sump in the rougher flotation area via the final cleaner tails' sump and the final cleaner tails pump. The concentrate from the primary cleaner column cell is screened on the primary column flotation cell concentrate screen, which is fitted with 212 μm screen panels. The oversize from this screen flows by gravity into the fine flake cleaning circuit while the undersize is pumped to this circuit using the primary column cell concentrate undersize pump.

- **Fine-Flake Concentrate Cleaning Circuit:** The undersize from the primary column flotation cell concentrate (fine flakes stream) is dewatered at 75 µm on the fine flake dewatering screen. Oversize from the dewatering screen flows into the fine flake polishing mill; the discharge from the mill and the dewatering screen undersize are discharged into the fine flake polishing mill discharge sump. The sump slurry is pumped to the fine flake column cell using the fine flake polishing mill discharge pump to produce a concentrate at a mass pull of about 7%. The fine flake column concentrate is combined with the primary flotation column screen oversize stream from the primary cleaning circuit; this combined stream is pumped to the attrition cleaning circuit using the combined cleaner concentrate pump. The fine flake column flotation tailings are subjected to cleaning and scavenging flotation. Concentrate from the cleaner cells is recycled back to the fine flake column cell by gravity while the scavenger concentrate is pumped back to the fine flake dewatering screen. The tailings from the scavenger cells flow by gravity back into the final cleaner tails' sump in the primary concentrate cleaning circuit.
- **Final Concentrate Attritioning and Cleaning Circuit:** The cleaner concentrate stream is subjected to thickening in the attrition concentrate thickener; overflow from the thickener is discharged into the process and storm water tank in the water services area. The underflow, which has a density of 1.19 RD, is pumped to the attrition mill. Product from the attrition mill flows into the attrition mill discharge sump and this is pumped to the attrition cleaner column flotation cell using the attrition mill discharge pump. Tailings from the attrition column flotation cell are pumped to the attrition cleaner and scavenging flotation cells. The concentrate from the cleaners is recirculated by gravity back to the attrition column flotation cell while the scavenger concentrate is pumped back to the attrition concentrate thickener. The tailings from the scavenger cells are recycled by gravity back to the final cleaner tails' sump in the primary concentrate cleaning circuit.
- **Concentrate leaching:** A percentage of the flake product may need to be a higher percentage of graphitic content than that can be obtained by physical separation. This does not apply to all the graphite Flake, only a certain percentage of the larger flake material as determined by market demand will be treated chemically to remove 2.4% additional, non-Graphitic impurities.

In order to increase the purity of the graphite from 93.6% to 96% the final concentrate is leached with sulphuric acid to remove impurities. Leaching is done for 120 minutes at a liquid/solid's ratio of 5 in 10% sulfuric acid concentration at 85 degrees Celsius.

In order to be environmentally neutral a process to recycle this spent sulfuric acid is planned, this proven process has considerable cost savings for raw material and effluent disposal using the De Dietrich Process.

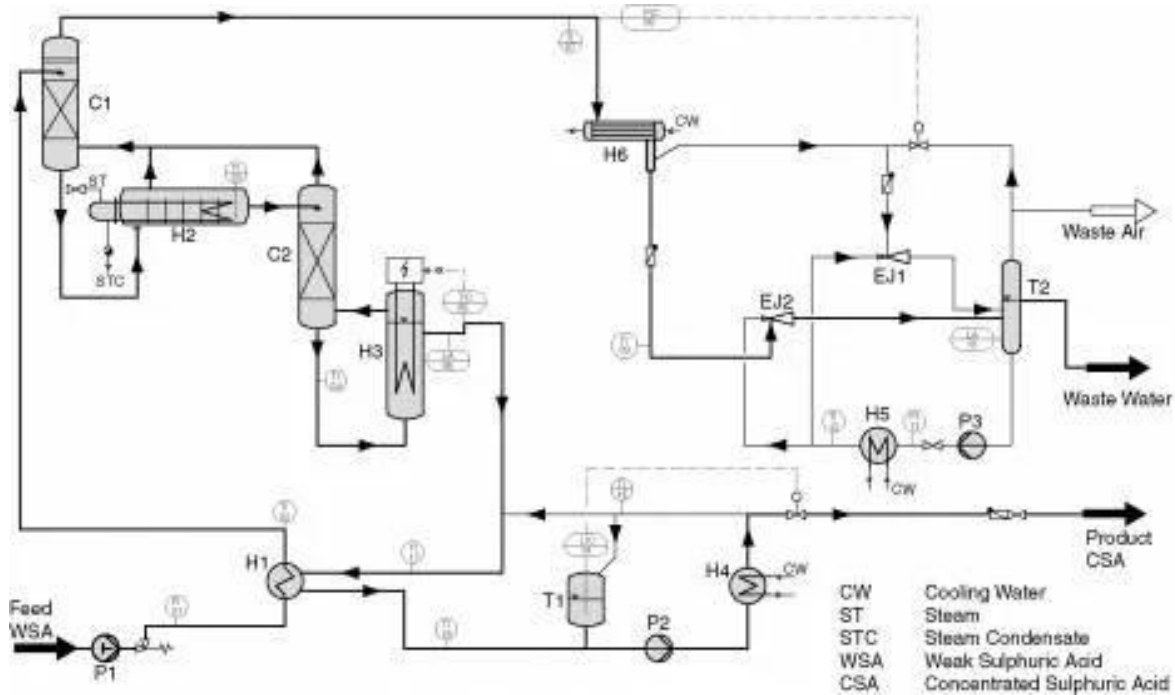


Table 2-3: DDPS standard plant

The DDPS standard plant for concentration of sulfuric acid is depicted in the flowsheet shown above. Weak sulfuric acid, e.g., sulfuric acid of 80 wt.-% H_2SO_4 , is fed by dosing pump P1 via recuperator H1, into scrubbing column C1.

In H1 the acid is preheated by means of the of concentrated product acid, e.g. sulfuric acid of 96 wt.-% H_2SO_4 . In scrubbing column C1 the acidic content of the vapour, produced in evaporator H2 and scrubbing column C2, is washed out. Next, the acid enters the horizontal evaporator H2 at one end and leaves it with higher concentration at the other. Evaporator H2 is designed as a horizontal vessel made of borosilicate glass.

The lower part of the evaporator is equipped with baffles in the transverse direction. Inflow direction the baffles approximate to a chamber cascade, and the acid is concentrated step by step within the chambers.

Discharge of higher concentrated acid out of horizontal evaporator H2 is done via free overflow, and the acid is fed to the top of scrubbing column C2. The aim of column C2 is the first step purification of the vapour rising from evaporator H3. The further scrubbing of acidic content from the vapour out of evaporator H3 is carried out together with the vapour out of evaporator H2 in scrubbing column C1.

Intermediate strength acid from column C2 enters evaporator H3 and leaves this vessel with the desired concentration. The heating of evaporator H3 is maintained electrically by immersion heating units made of quartz, enabling operation at temperatures of 180-220°C.

Discharge of high concentrated product acid from evaporator H3 to recuperator H1 is done via the free overflow. The horizontal concept of both evaporators and of the free flow acid discharge eliminates the need for any pump in the hot process section.

Vapour from scrubbing column C1 is condensed in condenser H6. Arising condensate leaves the plant via free overflow out of separator T2. Vacuum generation is achieved by a liquid jet pump where the arising condensate is used as working fluid.

Due to the use of condensate as the working fluid, additional waste streams are avoided. QVF standard plants for sulfuric acid concentration are equipped with automated process control systems, and the operation is through "on-screen" control.

- Concentrate Handling:** The final concentrate is thickened in the final concentrate thickener. The thickener overflow is discharged into the process water dam, whereas the underflow is filtered in the final concentrate filter press, which is expected to produce a filter cake with less than 20% moisture. The filtrate is pumped back to the final concentrate while the filter cake is discharged onto the final concentrate filter cake conveyor and fed to the final concentrate drying and bagging circuit.
- Concentrate Screening and Bagging:** The filter cake concentrate from the filter is fed into a diesel-fired dryer via a conveyor. The filter cake is dried to a moisture content of lower than 1% (w/w). The dry concentrate is then screened into four size fractions: +400, -400+200, -200+150 and -150 micron. Each of the size fractions is bagged separately as the final product. The area will be located within a closed building with dust collection and filtering systems to contain all airborne dust and Graphite.

2.3.3 Road Infrastructure

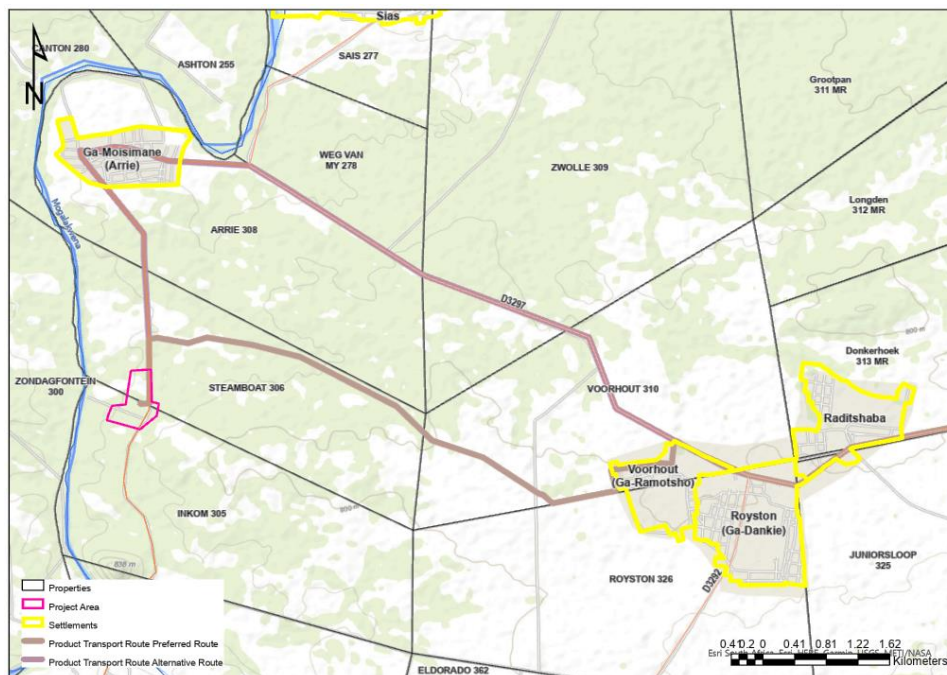


Table 2-4: Product Transport Alternatives

After further investigation during the EIA phase the product transport alternatives were revised. The following two alternative routes for Product Transport on existing roads has been considered and investigated:

- Alternative 1 (14.2km) follows an eastern direction from the site for 8.4km which passes the Voorhout community, onto the D3297 for 5.8km to join the D1589 towards Polokwane
- Alternative 2 (18km) follows a northern direction from the site for 5.5km which passes through Arrie (Ga-Moisimane) community, onto the D3297 for 12.5km to join the D1589 towards Polokwane.

2.3.4 Security and Access Control

Perimeter fencing is planned around the infrastructure areas. These fences will be maintained for the duration of the project. Access control and a security office would be established at the entrance to the infrastructure and operational areas. Safety barriers will be placed around the perimeter of the open-pit mining areas.

2.3.5 Waste Management

2.3.5.1 Discard and Tailings Facilities

In-pit waste dumping will be utilised as far as practically possible, and the remaining waste to be accommodated on the surface near pit exit in a combined discard and tailings facility. The tailings from the beneficiation plant will be dewatered and co-disposed onto the discard dump facility using the paddock theory. Tailings stream from the combined tailings sump in the rougher flotation circuit is thickened in the final tailing's thickener. The thickener underflow from the thickener, which has a slurry density of 1.51 RD, is pumped to the final tailing's filtration circuit and disposal circuit through the final tails' thickener underflow pump and the final tails pump. The thickener overflow stream flows into the process and stormwater tank in the water services area. This part of the circuit is operated in a semi-batch manner and is expected to produce a filter cake with 15% moisture. The final tailings thickener underflow material from the final filtration feed tank is pumped to the final tails filter; the filtrate is discharged into the final tails filtrate tank and recycled to the final tails thickener while the filter cake is stockpiled and discarded by an FEL. During the active waste-tipping phase the waste dump will be contoured to 18 degrees to allow for slope stability and re-vegetation. The waste dump will progress by tipping from a higher level against a window and progressively pushing the waste out with a dozer. Waste dumps should be progressively rehabilitated with topsoil, where possible. Low-grade and ore stockpile dumps will be constructed in close vicinity to the primary crusher tipping point in order to minimise the reclamation costs.

2.3.5.2 Sewage Facility

The only sewage expected to be generated on the mine is from the ablution facilities and washrooms at the plant area. It is envisaged that this sewage will be treated in a package plant, fed by gravity from the various facilities. The proposed sewage treatment works will be a semi-package plant design. The proposed plant has already been utilised on many mines and carries the approval of the

Department of Human Settlements, Water and Sanitation (DHWS). The processes included in the proposed plant are:

- Primary settling
- Anaerobic digestion
- Aerobic digestion
- Final settling
- Disinfection

2.3.5.3 General and Hazardous Waste

Upon approval of the project, a dedicated, approved (registered) waste contractor will be appointed by the mine to manage the non-mining waste generation and safe disposal thereof. The following waste types will be generated during the project:

- Domestic waste
- Hazardous waste, including used oil/diesel/greases
- Fluorescent tubes
- Glass and plastics
- Chemicals
- Medical waste
- Scrap metal
- Building rubble (construction & demolition activities)
- Used tyres
- Old explosives

The different waste streams will be segregated and disposed of in appropriate designated receptacles. All waste will be disposed off-site at approved landfill sites. No landfill site will be established on the Steamboat site.

2.3.6 *Power Generation for Own Supply*

Although ESKOM power supply is available, the capacity and reliability of this supply are not confirmed. Consequently, a self-generation model will be used by establishing a 3MW Biomass/Coal Gasification Facility. This facility will provide 100% of the mine site requirements on a continuous basis. High voltage power will be reticulated around the mine with the reticulation voltage to be determined from the results of final power studies. The facility will involve the installation of a gasifier that will produce syngas from a feedstock of mainly biomass supplemented with coal. The syngas will be used as a fuel for 2 sets of gas turbines to produce a combined approximate 3 MWe Electricity.

The main targets of this project are to:

- Generate electricity through the gasification of biomass
- Reduce fossil fuel dependency for the production of clean energy.
- Reduce industry dependency on the national electricity grid.
- Possible utilisation of ash/char by-product as fertiliser or in cement production pending chemical analysis.

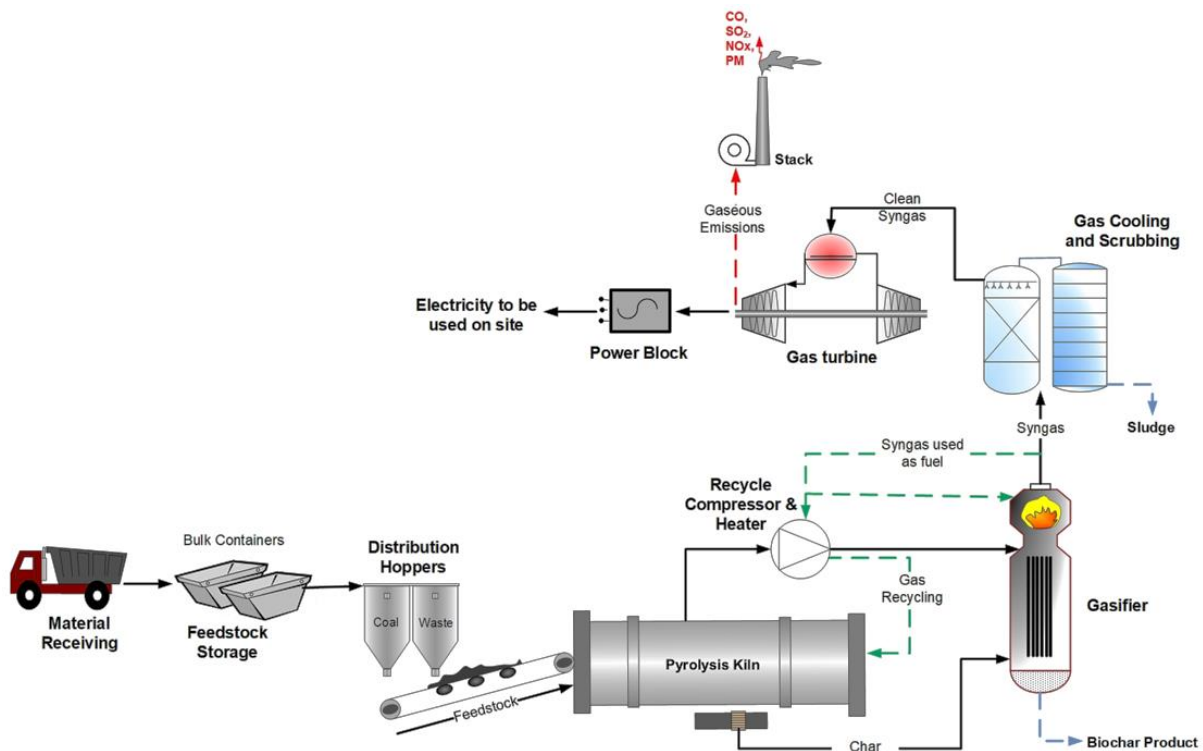


Table 2-5: Gasification Facility Process Flowchart

The following aspects regarding the facility should be noted:

- Waste Receiving and Processing:** Biomass and other solid wastes will be sourced locally and delivered to the site via trucks. The waste is to be stored in water-resistant, flexible bulk containers on an impermeable floor. Coal that will supplement waste feeds will also be delivered to site via road either pre-blended with the feedstock or stored in a hopper. From storage, the waste will be fed into a receiving hopper of a variable speed incline conveyor system that will feed the material into a pyrolysis kiln. The coal will be used only as feedstock security and will be fed proportionally with the feedstock onto the conveyor as required.
- Gasification Process:** The pyrolysis kiln is a heated, oxygen-starved environment which drives off moisture and volatile gases contained in the feedstock. Pyrolysis produces carbon char and ash that moves into a separate, externally heated gasification reactor, which converts the solid carbon molecule into a gaseous state. Gasification is accomplished with heat, pressure, and the injection of ionised water. The injection of ionised water in a process known as steam reformation creates a water shift reaction to produce syngas. The hot syngas is water quenched and cleansed of its impurities in a scrubber system, thus delivering a clean, dry syngas with no liquid discharge from the plant operation.
- Electricity Production:** The clean syngas will be directed into an internal combustion engine coupled with a generator to produce up to 3MWe electricity, to be used within an industrial complex.

- **Energy Use:** All feedstock is to be processed in an enclosed and sealed reactor, allowing contaminants to be efficiently captured and disposed of in ash collectors or through water scrubbing processes. Pollutants are not to be released into the atmosphere in this process, as they would be in a combustion-centric process. A gas recycles compressor will allow for some gas from the pyrolysis kiln to be recycled back to power the kiln. The gasifier will be able to utilise the syngas to fire the burner and will recycle the process water such that the facility has zero liquid discharge. Ash recovered from the system can be further processed to recover elements contained in the ash, and/or the ash can be used in the production of cement or used as a fertiliser. A portion of the ash can be recovered as a bio-char and used as a soil amendment, which provides for carbon capture and sequestration in addition to improved crop performance.
- **Waste Hierarchy:** The proposed project is in line with the national waste management strategy and the promotion of the waste hierarchy through the recovery of waste and subsequent reduction of waste being disposed of to landfill. The Project is aligned with Goal 1 of the National Waste Management Strategy: Goal 1: to Promote waste minimisation, reuse, recycling and recovery of waste. The establishment of the gasification plant will effectively result in:
 - Recovery of waste where such materials might otherwise be disposed of
 - Generation of electricity through the gasification of biomass and other wastes
 - Reduction of solid waste being disposed of to landfill

2.3.7 Bulk Water Supply

2.3.7.1 Water Requirements

Make-up water demand for the Steamboat Project is estimated at 0.5Ml/day (195Ml/annum). The water balance is provided below:

Water Supply will be sourced from inflow groundwater into the pit and groundwater boreholes. The daily bulk water requirements for the Cuchron and Steamboat Project is as follow:

- Beneficiation Plant – 102 200 m³/annum
- Power Generation – 58 400 m³/annum
- Dust suppression – 18 250 m³/annum.
- Washbay – 3 650 m³/annum.
- Potable water – 1 8250 m³/annum.

The available water sources, as calculated with the available information, can be summarised as follow:

- Average annual rainfall – 4 644 m³/annum.
- Open Pit abstraction – 158 800 m³/annum
- Groundwater abstraction – 47 304 m³/annum

- Recyclable beneficiation plant water – It is estimated at this stage that 45% of the water used within the plant will be recycled for reuse and has been incorporated into the water balance.

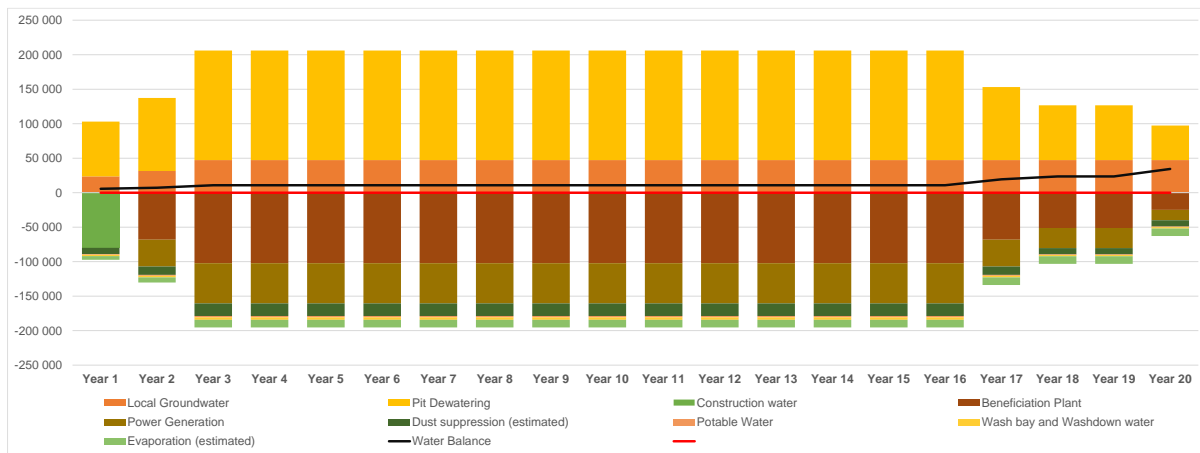


Table 2-6: Water Balance

In-pit flows will provide approximately 435m³/day and 3 boreholes can provide 130m³/day, which together can provide 565m³/day. The mine and beneficiation plant requirements are 535m³/day. A network of pipelines will connect to a single main pipeline, which will pump water to the Process Plant Raw Water Dam.

2.3.7.2 Water treatment and storage reservoirs

On-mine water treatment and storage facilities will be established to facilitate daily demands. The following infrastructure is planned:

- Potable water tanks
- Raw and service water Reservoir.

2.3.7.3 Stormwater 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.

2.3.7.4 Hydrocarbon Requirements

A total of 50 m³ of hydrocarbon storage facilities will be required for the operational phase, as indicated in Table 2-7.

Table 2-7: Hydrocarbon requirements for the Project

Quantity	Volume	Location
1	30 000 litres	Bulk storage for diesel at the workshop area facility
1	10 000 litres	Bulk storage facilities for new oils and lubricants at the workshop area
1	10 000 litres	Bulk storage facilities for used oils at the workshop area

2.3.8 Listed Activities

Table 2-8: Beneficiation Plant Listed Activities – Steamboat Graphite (Pty) Ltd

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m ²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Graphite Beneficiation Plant with a size of 20,000m ² (2ha) Including water management infrastructure: Process Water Pipeline: 2000m x 5m = 10 000m ² , Potable Water Pipelines: 1000m x 5. = 5 000m ² and a Pollution Control Dam: 500m ² , volume: 1000m ³ (1Ml). Pipelines will have a throughput below 120 liters per second and an internal diameter that is below 0.36 meters.	38 500m ² (3.85ha)	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 9 - Activity 10 - Activity 12 - Activity 27 - Activity 28 R984 (R325): - Activity 6 - Activity 21 R985 (R324): - Activity 2 R985 (R324): - Activity 12 - Activity 14	X Category B Activity 11
Electricity Generation Facility with a generation capacity of 3MW, utilizing non-renewable resources	Size: 3ha Output: 3MW	X R983 (R327) R985 (R324)	R983 (R327): - Activity 2 - Activity 12 R985 (R324): - Activity 12 - Activity 14	X Category A Activity 5, 6, 12 Category C Activity 1
Discard Dump including stormwater management	Dump Size: 32, 000m ² and Volume: 570 tons total Stormwater channels of 1500m x 2m = 3 000m ²	X R983 (R327) R985 (R324)	R983 (R327): - Activity 9 - Activity 12 - Activity 19 - Activity 27 R985 (R324): - Activity 12 - Activity 14	X Category B Activity 11
Access and Haul Roads: Construct internal service roads: 350m x 8m = 2800m ² and a new Access Road: 800m x 8m = 6,400m ²	Size of all new roads: 9,200m ² (0.9ha) Total length of roads: 1150m Width of roads with shoulder: 8m	X R983 (R327) R985 (R324)	R983 (R327): - Activity 12 - Activity 19 - Activity 24 - Activity 27 R985 (R324): - Activity 4 - Activity 12 - Activity 14	

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m ²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Product Transport Roads: The upgrade of existing roads, alternative 1 is 800m x 8m = 6,400m ² and alternative 2 200m x 8m = 17,600m ²	17,600m ² (1.76ha) Length 3000m Widening of road with 4m	X R985 (R324)	R985 (R324): - Activity 4 - Activity 18	
Hazardous storage of Waste: Diesel tanks and Emulsion/Chemical stores that exceed 500m ³ Electricity Generation Facility processing waste of more than 10 tons per day but less than 100 tons	Stores capacity: 1000m ³ Waste processing: 99 tons per day	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 14 R984 (R325) -Activity 4 R985 (R324): - Activity 10 - Activity 12	X Category A Activity 5, 6, 12 Category C Activity 1

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 2-9.

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

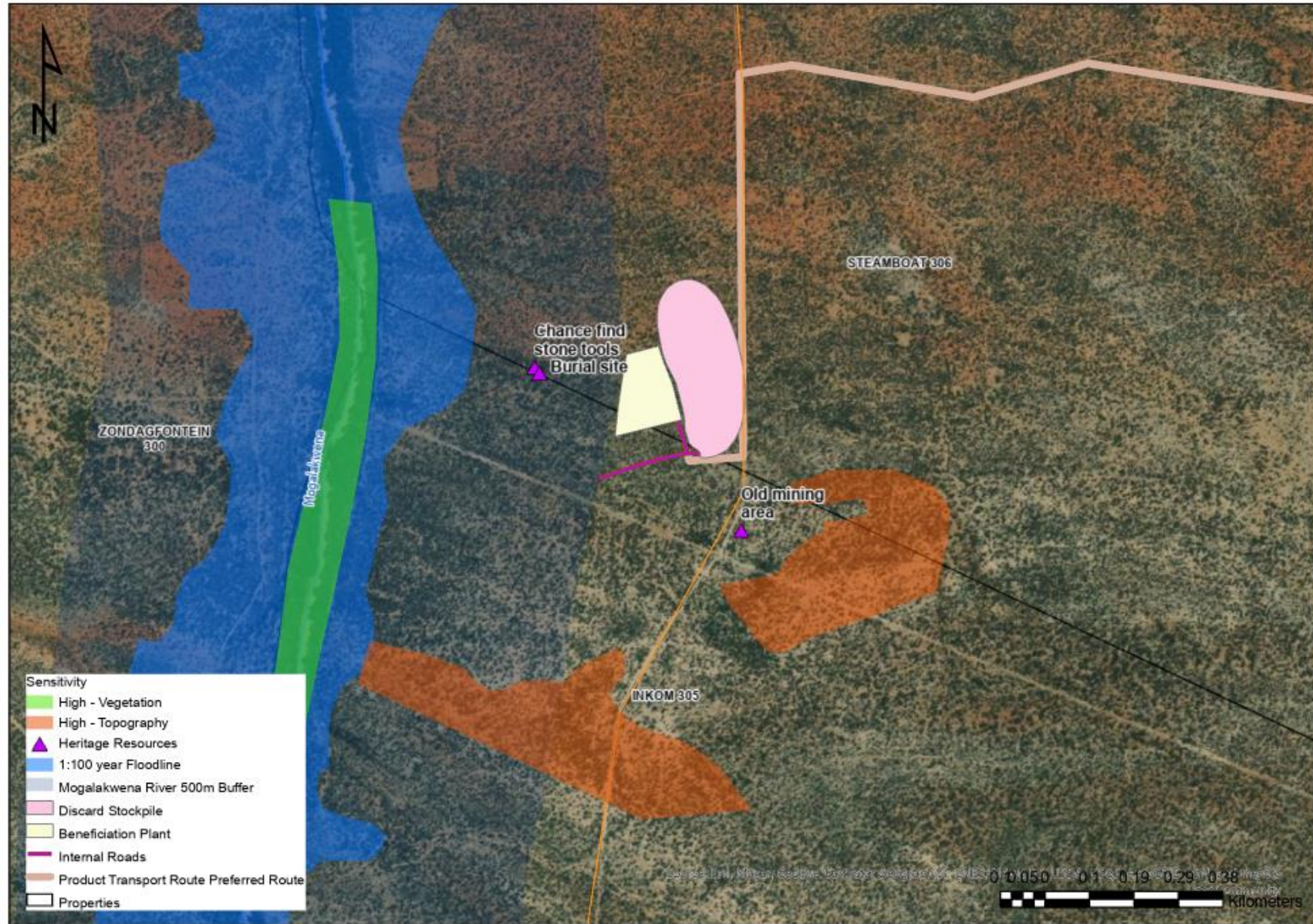


Figure 2-4: Composite Map

Table 2-9: Motivation for preferred development alternatives

Aspect	Preferred Development Alternative	Motivation
Land use activity	Beneficiation	Currently the economic activities within the project area are limited and the beneficiation development will be a definite economic improvement. Although the proposed project 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. The positive economic contribution to the Limpopo and National economies is an additional positive factor.
Surface infrastructure location	Beneficiation Plant, offices and Power Generation Facility Discard Dump	By placing the 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.
Product Transport	Product Transport Route	Although both alternatives will have social, traffic and safety related impacts that will need to be mitigated, the Alternative selected passing through Voorhout has the least constraints and is shorter in distance and has therefore been selected as the preferred alternative

3 DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES

3.1 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
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)
	Identify and establish livelihood retention projects to create off mine livelihoods during and post mining	Identify and Implement Community Development Projects

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

3.1.1 Ecological and Biodiversity Management

3.1.1.1 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.

3.1.1.2 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.

3.1.2 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.

3.1.3 Residue Management

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

3.1.4 Archaeological and Heritage Management

3.1.4.1 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.

3.1.4.2 Chance Find Protocol

Most archaeological and palaeotological 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.

3.1.5 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 Plant Managers

The Plant Managers 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 Plant Manager. Ultimate responsibility in terms of compliance to the EMPr lies with the Plant Managers.

4.1.3 Contractors

Where contractors are used during the development and/or operations, 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 Plant 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 Plant Manager, the Contractors, the I&APs and Steamboat Graphite. This includes information pertaining to monitoring and evaluation;
- Assist Steamboat Graphite 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, Steamboat Graphite 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 Plant 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.

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

4.2 Mitigation Measures

Specialist Area	Potential Impact	Mitigation Measures
Topography	Alteration of topography	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.
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.
	Loss of original fertility and organic carbon content.	A soil analysis will be performed prior to seeding (post-rehabilitation) and the soil fertility rectified (if necessary) to facilitate vigorous growth. Minimize affected grazing land
	Soil compaction from heavy machinery	Implement measures to improve current grazing capacity, i.e. seeding
	Loss of grazing land	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 animal production	Set final closure objectives and standards to ensure conformance to the final land use plan, the requirements of the IAPs and relevant environmental legislation.
Terrestrial Ecology	Loss of habitat and biodiversity	
	Loss of animal and plant species	
	Loss of medicinal species	
	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. 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
	Handling of waste /Transport of material can cause spills that may infiltrate and contaminate the groundwater system.	Waste should be stored/managed/contained in allocated waste areas. Spills should be cleaned up immediately. Domestic waste must either be stored in an approved waste site or removed by credible contractors.
	Lowering of groundwater levels due to Groundwater abstraction	Boreholes should only be pumped at sustainable yields. More boreholes spread over a larger area and pumped at lower rates should decreased the drawdown effect.
	Effect on groundwater quality due to leachate from stockpiles	Stockpiles, plant footprint and the overburden dump should be kept as small as practically possible. Any runoff from these areas should be contained

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

Specialist Area	Potential Impact	Mitigation Measures
	containing remnants nitrate based explosives	
	Water retaining facilities designed & constructed to prevent any poor quality water leachate entering the underlying aquifer	All water and effluent retaining facilities should be lined with an impervious liner to prevent dirty water from reaching the underlying aquifer and contaminating the groundwater. Spills should be cleaned up immediately. Proper management and regular inspections for leakages.
	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.
	Down gradient movement of residual contamination will continue for some time after closure.	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 hauling operations on stockpile	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.
	Increased of dust levels because of product transport on public roads	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'.
	Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility	Monitoring emissions from the Syngas facility to ensure air quality standards are not exceeded
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	
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.
	Visual intrusion of plant and stockpile activities, impacting on the sense of place	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.
	Impact due to night-time lighting	Outdoor lighting must be strictly controlled. High light masts should be avoided. Any high lighting masts should be covered to reduce the glow. 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. Light sources must be shielded by physical barriers. 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.
Social	Conflict between job seekers and local communities	Priority employment from local communities with the development of recruitment procedures and utilizing the existing skills available from the local communities Establishing early on skills development programmes in areas where most employment opportunities will be available such as operators and artisans
	Increase in social pathologies such as crime, safety, health, prostitution	Implementation of bursary programme and practical skills programmes as part of the Social and Labour Plan Establishment of a local labour recruitment committee to monitor recruitment procedures and results
	Pressure on community infrastructure and services	Engage with Traditional Authority to manage and monitor site allocation to job seekers and/or employees in the local communities Induction of contractors and workforce with regard to their code of conduct in the local communities

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

Specialist Area	Potential Impact	Mitigation Measures
	Impact on land use and livelihoods from the reduction in the grazing area	Demarcated areas where fire wood can be collected that was cleared for the Construction Phase Application of the Avoidance Principle by reducing the footprints of infrastructure where possible Supporting the community in the increase of grazing capacity through seeding and debushing Leasing of community land impacted by mining Monitoring the impact on livestock
	Participation of Local Communities in Employment Opportunities	Source the maximum number of employees from the local area for temporary job opportunities Implement skills development programmes in the areas where most job opportunities will be created, i.e. operators and drivers
	Participation of Local Communities in Skills Development	Make available bursary opportunities to build skill capital in the region Establish a database of local people with information on qualifications and skills, utilize this database to develop skills plans and recruit local people. Implement portable skills development programmes Design and implement economic development programmes that will assist people being retrenched in sustaining their livelihoods Establish a future forum with representation from the workforce to discuss potential difficulties and solutions Implementation of programmes to minimize and mitigate the impact of downscaling and retrenchment
	Participation of Local Communities in procurement Opportunities	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
	Downscaling of business opportunities	Consultation and Feedback on results on a regular basis Implementation of capacity building programmes to minimize and mitigate the impact of mine downscaling and closure. Closure plan implementation
Traffic	Disruption of Movement activities	Traffic minimized through bus and combi services to transport workers to the project site
	Disruption of Movement activities	Low speed limits on access roads Road crossings should be managed by signing and traffic management measures Issues and Grievance Procedure available to local people to report bad driving or rules traversing
	Increased traffic on the Product Transport Route impacting on road safety and infrastructure	Mitigation to control traffic and ensure safety such as speed limits as well as road signs. All heavy vehicles must be restricted to designated routes and not permitted on other roads. Off-site hauling of product should be limited to daylight hours. Set the speed limit for off-site hauling vehicles to 60 km/h on gravel roads and enforce the speed limits specified. Include speed-bumps where appropriate to control the speed limits. Trucks transporting product will be covered, with tarpaulins, to minimise the generation of dust and the impact on ambient air quality. The covers/tarpaulin used to cover the transported material will be secured. Trucks will be weighed on site before departing to limit the risk of product spillage.

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.

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

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)
	Soil erosion	To pro-actively identify soil erosion in order to rectify prior to serious degradation	Cleared and compacted areas where the	Monthly	Annual reports	Field survey	

STEAMBOAT GRAPHITE – BENEFICIATION DEVELOPMENT: DRAFT EMPr

Aspect	Issue	Description	Monitoring Location	Frequency of sampling	Frequency of Reporting	Sampling Method	Variables
Biodiversity / Land use Management		Soil erosion and sedimentation monitoring in all soil erosion potential sources	infrastructure will be built. The downstream areas of dams and road crossings.				
	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	

5.2 Compliance Auditing and Reporting

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

- Regular monitoring of all the impact management actions and components shall be carried out by the company to ensure that the provisions of this programme are adhered to.
- Compile and submit to the regulator 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.
- Steamboat Graphite 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 NEMA, will be performed on an annual basis.

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
- Incident or accident during the transportation of product

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 Transportation of Product

The purpose will be to develop a Road Safety Plan for implementation by the transport contractor in consultation with Local Government Traffic Authorities. The plan will include detail procedures in respect of road upgrades and maintenance, road accident emergencies and remediation, and pedestrian (community) awareness.

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 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

8.1 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