ENVIRONMENTAL IMPACT ASSESSMENT REPORT - SUBMITTED TO THE DEPARTMENT OF MINERAL RESOURCES AND ENERGY, NORTHERN CAPE.

Thaya Trading Enterprise

SUBMITTED TO THE DEPARTMENT OF MINERAL RESOURCES AND ENERGY, NORTHERN CAPE.

SEPT 2021

ENVIRONEMNTAL IMPACT ASSESSMENT REPORT
FOR BOTSHELO T AND G MINING RESOURCES (PTY) LTD
(FOR SUBMISSION)

PROSPECTING RIGHT APPLICATION OF DIAMOND ALLUVIAL, DIAMOND GENERAL, DIAMOND IN KIMBERLITE, MANGANESE AND IRON ORES ON FARMS GASESA 272 & TITANIC 773, KURUMAN, NORTHERN CAPE PROVINCE, SOUTH AFRICA.

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

NAME OF APPLICANT: BOTSHELO T AND G MINING RESOURCES (PTY) LTD

TEL NO: 071 959 9207

FAX NO: 086 522 1335

POSTAL ADDRESS: HOUSE NO. E8, TSINENG VILLAGE, KURUMAN, 8460

PHYSICAL ADDRESS: HOUSE NO. E8, TSINENG VILLAGE, KURUMAN, 8460

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/12365 PR

Author : **Zandile Dwane** (*Pr.Sci.Nat.*)

Project Director : **Kwindla H. Nobaza** (*Pr.Sci.Nat.*)

I. Acronyms

AEL	Atmospheric Emission License
AQMP	Air Quality Management Plan
BAR	Basic Assessment Report
BPG	Best Practice Guideline
CA	Competent Authority
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
COMSA	Chamber of Mines South Africa
CPA	Communal Property Association
CRR	Comments and Responses Report
DEFF	Department of Environment, Forestry and Fisheries
DENC	Department of Environment and Nature Conservation
DARDLR	Department of Agriculture, Rural Development and Land Reform
DME	Department of Mineral Resources and Energy
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
ECO	Environmental Control Officer
EI	Ecological Importance
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EMS	Environmental Management System
ES	Ecological Sensitivity
ESMS	Environmental and Social Management System
FIER	Final Environmental Impact Report
FEPA	Freshwater Ecosystem Priority Areas
FSR	Final Scoping Report
GDP	Gross Domestic Product

GN	Government Notice
Ha	Hectares
HDPE	High Density Polyethylene
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
IEMPr	Integrated Environmental Management Programme
ISO	International Organisation for Standardisation
IWRM	Integrated Water Resources Management
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MPRDA	Mineral and Petroleum Resources Development, 2002 (Act No. 28 of 2002)
MR	Mining Right
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NCDAEARDLR	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998) [as amended]
NWRS	National Water Resource Strategy
PCO	Pest Control Officer
PES	Present Ecological Status
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 µm
PPP	Public Participation Process
RWD	Return water dam
SABS	South African Bureau of Standards
SACNASP	South African Council for National Scientific Professions
SAHRA	South African Heritage Resources Agency
SANAS	South African National Accreditation System

SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SAWQG	South African Water Quality Guidelines
SDF	Spatial Development Framework
S&EIR	Scoping and Environmental Impact Report
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
SIA	Social Impact Assessment
SR	Scoping Report
TDS	Total Dissolved Salts
TOPS	Threatened or Protected Areas
ToR	Terms of Reference
TSS	Total Suspended Solids
VOC	Volatile Organic Compound
WARMS	Water Authorisation Registration and Management System
WCDM	Water Conservation and Demand Management
WESSA	Wildlife and Environmental Society of South Africa
WMA	Water Management Area
WMP	Waste Management Plan
WRC	Water Research Commission
WUL	Water Use License

II. SOME DEFINITIONS

Catchment - The area from which any rainfall will drain into the watercourse or watercourses or part of the water course, through surface flow to a common point or common points

Constitution – Refers to the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996).

Domestic waste - Waste, excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes;

Effective Management of Waste or Spills - Means the taking of all practicable steps to ensure that waste is managed in a manner that will protect health, property and the environment;

Environment – The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group; these circumstances include biophysical, social, economic, historical, cultural and political aspects. Environment means the surroundings within which humans exist and that are made up of-

(i) the land, water and atmosphere of the earth;

(ii) micro-organisms, plant and animal life;

(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and

(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Impact Assessment - An environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the environment. The EIA includes an evaluation of alternatives. As well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and environmental management and monitoring measures.

Existing Lawful use - An existing lawful use means a water use which has taken place at any time during a period of two years immediately before the date of commencement of the National Water Act 1998, (Act 36 of 1998) or which has been declared an existing lawful water use under section 33 and which was authorised by or under any law which was in force immediately before the date of commencement of the National Water Act.

Groundwater Recharge - The inflow of water into a groundwater reservoir from the surface, e.g. infiltration of precipitation and its movement to the water table.

General waste - Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes-

(a) domestic waste;

(b) building and demolition waste;

(c) business waste; and

(d) inert waste.

Hazardous waste - Means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment

Hydrogeological –The study of distribution and movement of groundwater.

Hydrological – The study of movement, distribution and quality of surface water and groundwater.

Inert waste - Means waste that-

(a) does not undergo any significant physical, chemical or biological transformation after disposal;

(b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and

(c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant;

Monitoring programme - means a programme for taking regular measurements of the quantity and/or quality of a water resource, waste or wastewater discharge at specified intervals and at specific locations to determine the chemical, physical and biological nature of the water resource, waste or wastewater discharge.

Public Participation Process – A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

Red Data Book (South African) – An inventory of rare, endangered, threatened or vulnerable species of South African plants and animals.

Recycle - Means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.

Reserve - means the quantity and quality of water required –

(a) to satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act, 1997 (Act No. 108 of 1997), for people who are now or who will, in the reasonably near future, be -

(i) relying upon;

(ii) taking water from; or

(iii) being supplied from, the relevant water resource; and

(b) to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource.

Re-use - Means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles;

The Act - The National Water Act, (NWA) (Act 36 of 1998)

Tributaries - A stream or river which flows directly into a larger river or stream.

Waste - Means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;

(b) which the generator has no further use of for the purposes of production;

(c) that must be treated or disposed of; or

(d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector,

but –

(i) a by-product is not considered waste; and

(ii) Any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Hazardous waste must be classified in terms of SANS 10228 class.

Class 1: Explosives

Class 2: Gases

Class 3: Flammable liquids

Class 4: Flammable solids

Class 5: Oxidising substances and organic peroxides

Class 6: Toxic and infectious substances

Class 7: Radioactive substances

Class 8: Corrosives

Class 9: Other miscellaneous substances

If not listed in SANS 10228 - consult DWS prior to classification.

Watercourse means -

(a) a river or spring;

(b) a natural channel in which water flows regularly or intermittently;

(c) a wetland, lake or dam into which, or from which, water flows; and

(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Water quality means the physical, chemical, toxicological, biological (including microbiological) and aesthetic properties of water that determine sustained (1) healthy functioning of aquatic ecosystems and (2) fitness for use (e.g. domestic, recreational, agricultural, and industrial). Water quality is therefore reflected in (a) concentrations or loads of substances (either dissolved or suspended) or micro-organisms, (b) physico-chemical attributes (e.g. temperature) and (c) certain biological responses to those concentrations, loads or physico-chemical attributes.

Water Resource - A water resource includes any watercourse, surface water, estuary or aquifer. Watercourses include rivers, springs, and natural perennial and non-perennial channels. Wetlands, lakes, dams, or any collection identified as such by the Minister in the Government Gazette.

Water use license - An authorisation from the Department to a designated water user to use water. The authorisation will provide details on the time-frames and conditions for the designated water use

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III. IMPORTANT NOTICE

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

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

IV. Objective of the Environmental Impact Assessment process

The objective of the environmental impact assessment process is to, through a consultative process—

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

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the [preferred location] development footprint on the approved site as contemplated in the accepted scoping report;

(c) identify the location of the development footprint within the [preferred] approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—

  (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts—

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the [preferred] development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the [preferred location] development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;

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

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

V. Executive Summary

South Africa is a developing country within a global space where environmental impacts my not be ignored any longer. The need for sustainable development in a State such as South Africa is accompanied by numerous obligations. Some of these obligations include developing the economy and protecting the environment. In an attempt to protect the environment through impact management in many ways, the international community has entered into agreements and treaties in order to address matters relating to impacts associated with development among others. As a consequence, South Africa is a signatory to a number of international treaties.

The economy of South Africa relies largely on both mining and agriculture. Environmental Impact Assessment (EIA) plays a vital role in informing prospecting developers of sustainable methods of infrastructural development, mining and agriculture among others. If properly implemented, Environmental Impact Assessments assist in ensuring optimal use of available resources, productivity increase and sustainability.

Botshelo T and G Mining Resources (Pty) Ltd proposes to prospect for diamonds on the property Farm Gasesa 272 and Titanic 773, Kuruman, Northern Cape, South Africa. The application area covers approximately 6 043.92 hectares in size. It is located in the Joe Morolong Local Municipality, Magisterial District, Northern Cape Province, South Africa.

This study is going to consider all necessary factors in order to investigate potential impacts of the proposed development against the triple bottom-line of social, economic and environmental impacts.

The concept of sustainable development provides a framework for reconciling socio-economic development and environmental protection. The constitutional framework: Sustainable development is recognised in the Bill of Rights (s 24(b) of the Constitution). In terms of this section, the government must give effect to this right through reasonable legislative and other measures. The Constitution also provides for cooperative governance, which facilitates the implementation of sustainable development.

Sustainable development forms the basis of environmental policy. The White Paper on Environmental Policy states that sustainable development is an overarching goal. The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended is the framework legislation for the environment and it contains uniform norms and standards applicable to all environmental legislation. One of these norms is sustainable development. NEMA defines sustainable development as “the integration of social, economic and environmental factors into planning, implementation and decision-making to ensure that development serves present and future generations”. Sustainable development underpins many principles and objectives of environmental management set out in NEMA. NEMA also provides the framework for compliance with and the enforcement of environmental legislation. Sustainable development is included in sectorial legislation relating to the environment (i.e. the National Water Act, 1998 (Act No. 36 of 1998), the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000)).

The proposed development, intrinsically, requires the implementation of procedures and mechanisms to facilitate co-operative environmental governance. Chapter 3 of the NEMA deals with such procedures. Section 11 of NEMA makes provision for environmental implementation plans and management plans. Every national department listed in Schedule 2 must prepare an environmental management plan. The provinces and departments must further ensure that these environmental implementation or management plans are consistent. The purpose and objectives of these plans are to:

- coordinate and harmonise the environmental policies, plans, programmes and decisions of the various listed national departments and of provincial and local spheres of government, which must be done to minimise the duplication of procedures and functions and to promote consistency;
- give effect to the principle of cooperative government in Chapter 3 of the Constitution;
- secure the protection of the environment across the country as a whole;
- prevent unreasonable actions by provinces in respect of the environment, which actions are prejudicial to the economic or health interests of other provinces or the country as a whole; and
- enable the Minister to monitor the achievement, promotion and protection of a sustainable environment.

The findings of the Environmental Impact Assessment are found in Table 1.

Table 1: Environmental Impacts and Risks

Aspect	Activity	Potential Impact	Phase/s	Significance (Pre-mitigation)	Management actions type	Significance (Post-mitigation)	Impact management objectives
Geology	Mineralised waste Use of facilities and services prospecting final land forms	Loss and sterilisation of mineral resources	Planning Operational Decommissioning	Low	• Management through best practises	Low	Can be managed/mitigated to acceptable levels
Topography	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Deep excavations and infrastructure resulting in safety risks to third parties and animals	Planning Construction Operational Decommissioning	Low - Medium	• Control through access control; • control through management and monitoring; • control through rehabilitation; and • remedy through emergency response procedures • Concurrent backfilling	Low - Medium	Can be managed/mitigated to acceptable levels
Soil and land capability	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resources and land capability through contamination	Planning Construction Operational Decommissioning	Low - Medium	• Control through waste management practices; • control through rehabilitation; • control through appropriate design; and • remedy through emergency response procedures	Low - Medium	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resource and land capability through physical disturbance	Planning Construction Operational Decommissioning	Low - Medium	• Manage through limiting the project footprint; • manage through soil conservation procedures; and • manage through closure planning and rehabilitation	Low - Medium	Can be managed/mitigated to acceptable levels

Biodiversity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Physical destruction of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management though biodiversity action plan and offset (when relevant); • managing through limiting the project footprint; • management through rehabilitation; and • control through permits for removal	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	General disturbance of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management through alien invasive species programme; • management through training; • management through monitoring; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
Surface water	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Alteration of natural drainage patterns	Planning Construction Operational Decommissioning	Medium - High	• Management through storm water control; and • manage through monitoring water requirements	Low - Medium	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and	Contamination of surface water resources	Planning Construction Operational Decommissioning	Low - Medium	• Management through waste management practises; • management through monitoring; • management through	Low	Can be managed/mitigated to acceptable levels

	Trenching; Final land forms				compensation; and • remedy through emergency response procedures		
Groundwater	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of groundwater resources	Planning Construction Operational Decommissioning	Low - Medium	• management through monitoring; • management through compensation; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Deep excavation and pits	Lowering of groundwater levels and reducing availability	Operational	Medium - High	• Management through monitoring; and • management through compensation	Medium - High	Can be managed/mitigated to acceptable levels
Air quality	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Air pollution and Global Warming (Climate Change)	Planning Construction Operational Decommissioning	Low - Medium	• Manage through air controls and monitoring	Low - Medium	Can be managed/mitigated to acceptable levels
Noise & Vibration	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Increase in disturbing vibration and noise levels	Planning Construction Operational Decommissioning	Low - Medium	• Manage through vibration and noise controls and once-off sampling	Low	Can be managed/mitigated to acceptable levels

Visual amenity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Negative visual Views	Planning Construction Operational Decommissioning	Low	• Manage through limiting project footprint, rehabilitation and visual controls	Low	Can be managed/mitigated to acceptable levels
Heritage/cultural and palaeontologic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of heritage/cultural and palaeontological resources	Planning Construction Operational Decommissioning	Medium – High (Heritage) Low – Medium (Palaeontology)	• Control through avoidance; and • remedy through emergency response procedures • Follow Chance-Find Protocol	Low Low	Can be avoided Can be managed through implementation of Chance-Find Protocol
Socio-economic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Influx of labour	Construction Operational	Low - Medium	• Control through the monitoring of living conditions of employees, recruitment processes, disease management; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Socio-economic impact	Planning Construction Operational Decommissioning	Low - Medium	• Control through good communication, recruitment and procurement processes	Low - Medium	Can be managed/mitigated to acceptable levels
Veld fires	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and	Destruction of current land uses and habitat fragmentation patterns	Planning Construction Operational Decommissioning	Low - Medium	• Establish Fire Breaks of no less than six (6) metres in width; • Construct and maintain functioning fire hydrants	Low - Medium	Can be managed/mitigated to acceptable levels

	Trenching; Final land forms						
Health and Safety	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Health and Safety impact	Planning Construction Operational Decommissioning	Low - Medium	• Implement provisions of the Mine Health and Safety Act	Low	Can be managed/mitigated to acceptable levels
Land use	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Interference with land uses	Planning Construction Operational Decommissioning	Medium - High	Management through Communication	Low	Can be managed/mitigated to acceptable levels
Traffic	Use of existing infrastructure with minimal construction of haul roads and use of existing facilities and services	Road disturbance and traffic safety	Planning Construction Operational Decommissioning	Low - Medium	• Manage through road maintenance; • Adherence to speed limit; and • remedy through emergency response procedures	Low - Medium	Can be managed/mitigated to acceptable levels
Wetlands	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Disturbance of Riparian zone	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of avoidance of disturbance of the anything within the Riparian zone; and • Implement recommendations of the wetland specialist, if any.	Low	Can be managed/mitigated to acceptable levels

Waste	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Pollution	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of waste separation at source; • Implement the waste National Waste Management Strategy and Waste Hierarchy	Low	Can be managed/mitigated to acceptable levels
Alien invasive plants	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Colonisation by alien invasive plants	Planning Construction Operational Decommissioning	Medium - High	• Compile weed/alien plant management programme in consultation with DENC and DA. • Implement the compiled weed/alien management programme effectively.	Low	Can be managed/mitigated to acceptable levels

VI. PART A
ENVIRONEMNTAL IMPACT ASSESSMENT REPORT

1. Details of the EAP

1.1 Details of the EAP who prepared the report

The particulars of the EAP(s) involved in this study are presented in Table 2

Table 2: Details of the EAP

Name of Consultancy:	Thaya Trading Enterprise CC
Name of EAP	Zandile Dwane
Physical Address	9705 Eerste Laan Rooisand Kathu 8446
Contact Number:	083 265 7992
E-mail	kamvisto@gmail.com / kwindla.nobaza@thayatrading.co.za
Contact Person:	Kwindla Handy Nobaza
Title	Northern Cape, South Africa.
Experience:	Ms Zandile Dwane holds an M. Sc. degree in Petroleum Geology from the University of the Western Cape. She is an Environmental Consultant specializing in Environmental Impact Assessments (EIA), hydrogeology, geochemistry and Integrated Water Use License Applications (IWULA) for mining projects. Her duties include correspondence with clients and specialists; co-coordinating project meetings; compiling IWULA submission documents, training staff; hydrogeological investigations and providing assistance on general environmental-related queries. Zandile has undertaken some environmental consulting projects for several companies including a Communal Property Association. Zandile completed an M. Sc. degree in Petroleum Geology at the University of the Western Cape. Before she joined TTE as Freelancer, she worked for ERM as a researcher, her main focus was on hydrogeology and geochemistry. Her duties include but not limited to Groundwater sampling; Drilling, Logging, Geological mapping and Groundwater modelling. Zandile conducted some work for Thaya Trading Enterprise (TTE) Whilst working at TTE, Zandile has administrated a number of water use licence applications for mining projects, Environmental Impact Assessments (EIA) as well as conducting hydrogeological investigations. Zandile has also been involved in exploration drilling projects, particular in oil and gas industry for Crown Royale Energy, she was providing technical advice and execute technical evaluation of the subsurface and related operations for gas exploration in the aforesaid TCP (Technical Corporation Permit), Evaluating rock properties and interpret well logs from the available data, she also helped in estimation of the Coal Bed Methane (CBM) prospectively of the TCP area, Predicting gas production from the CBM reservoir in the TCP area as well as Interpret geophysical data. Zandile is registered as a Candidate Scientist with the South African Council for Natural Scientific Professions, the Geological Society of South Africa and the American Association of Petroleum Geologists. Kwindla is the founding member of Thaya Trading Enterprise. He completed an M. Sc. degree in Chemistry with the University of Johannesburg; currently, he is studying towards an LLB degree through UNISA. The Founding Member of Thaya Trading Enterprise has completed courses with the University of South Africa, such as: “Interpretation of Statutes” and “Environmental Law”. Based on completion of the course on Interpretation of Statutes, it is noteworthy that the company (TTE) is under the leadership of an

	individual who understands the contextual approach to interpretation of all pieces of legislation in South Africa. That includes the Mine Health and Safety Act; Mineral and Petroleum Resources Development, 2002 (Act No. 28 of 2002); National Environmental Management Waste Act, 2008 (Act No. 59 of 2008), National Water Act, 1998 (Act No. 36 of 1998) [as amended], among others. Kwindla is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. He has been involved in EIAs for more than four (4) years.

1.2 Expertise of the EAP

The qualifications and summary of the Environmental Impact Assessment Practitioner are also presented in Table 2. Further information on the expertise of EAP, please see Appendix A.

2 Property Description

2.1 Description of Property

The description of property is presented in Table 3.

Table 3: Description of Property

Farm Name:	Farms Gasesa 272 and Titanic 773, within the Administrative District of Kuruman, John Taolo Gaetsewe, Northern Cape, South Africa.
Application area (Ha)	Approximately 5 067,405 Ha
Magisterial district:	Kuruman, John Taolo Gaetsewe, Northern Cape
Distance and direction from nearest town	The application area is situated approximately 25 Km to Hotazel and about 100 Km to Kuruman, Northern Cape, South Africa.
21 digit Surveyor General Code for each farm portion	C04100000000027200000 C04100000000077300000

2.2 Locality Map

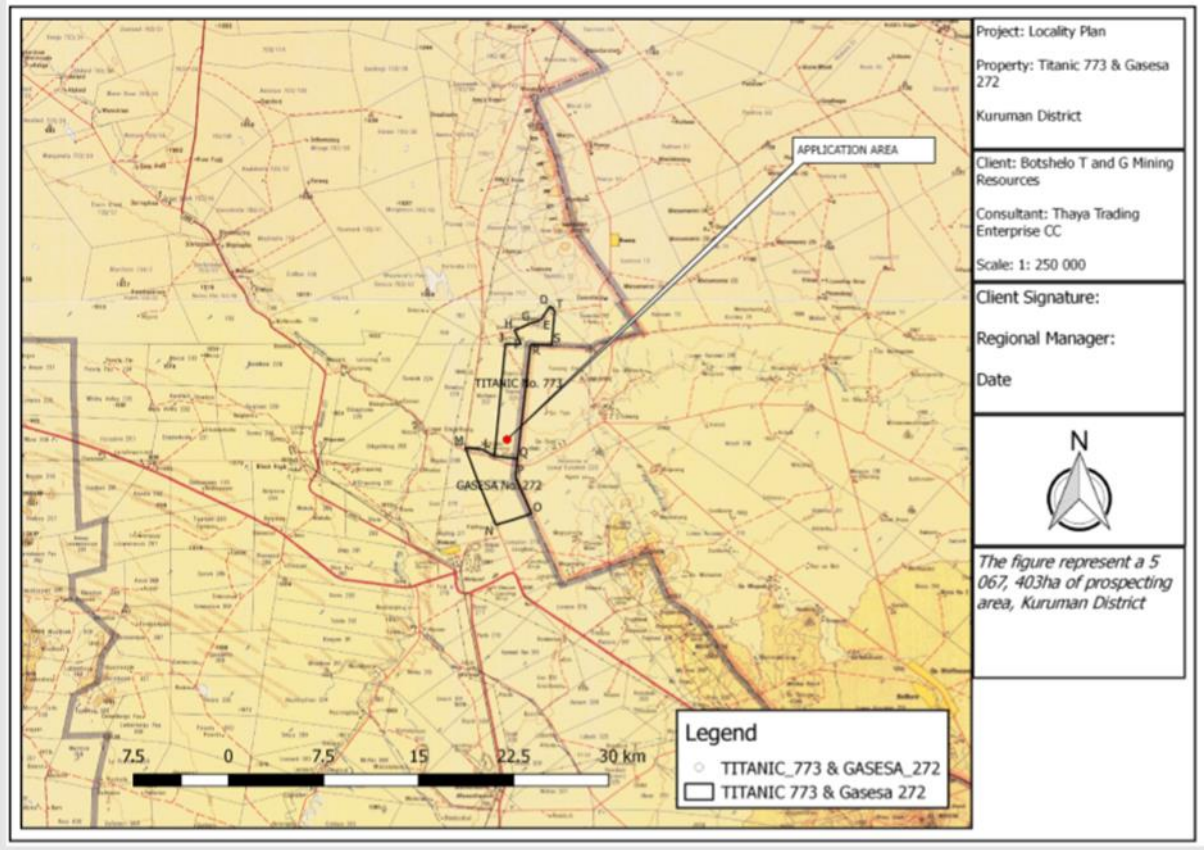
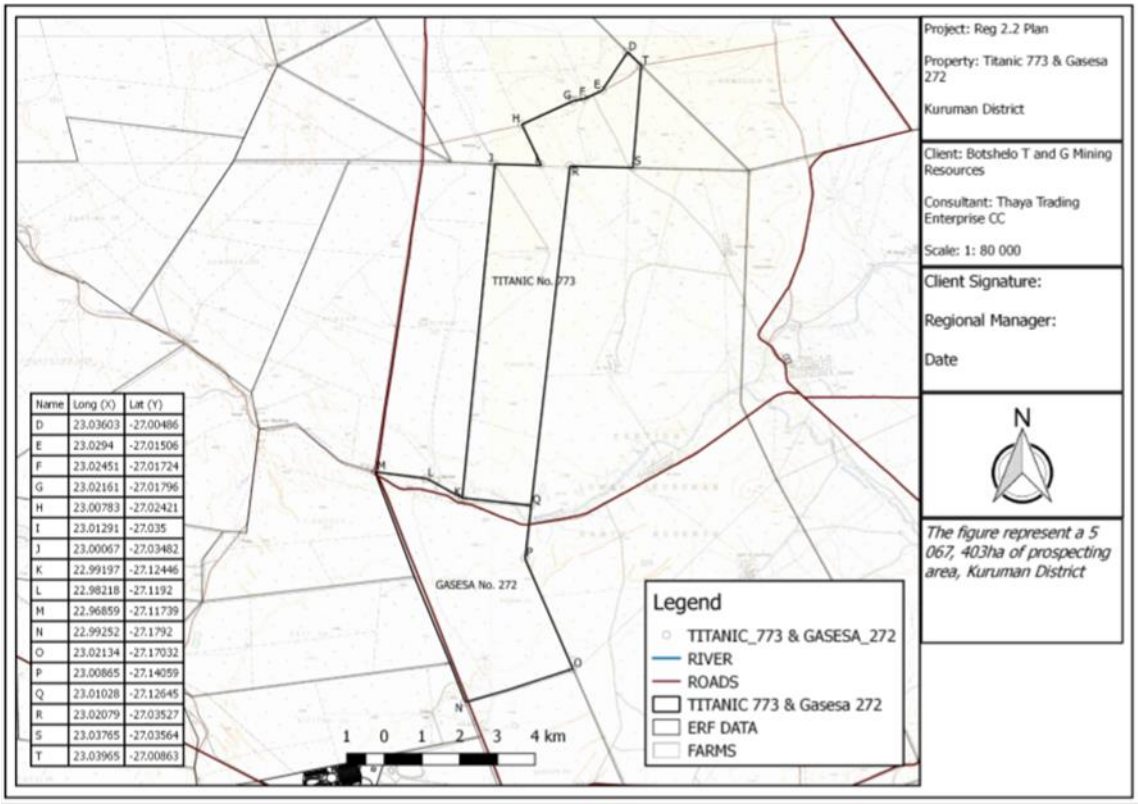


Figure 1: Locality Map John Taolo Gaetsewe Municipality

3 Description of the Scope of Activity



Name	Long (X)	Lat (Y)
D	23.03603	-27.00486
E	23.0294	-27.01506
F	23.02451	-27.01724
G	23.02161	-27.01796
H	23.00783	-27.02421
I	23.01291	-27.035
J	23.00067	-27.03482
K	22.99197	-27.12446
L	22.98218	-27.1192
M	22.96859	-27.11739
N	22.99252	-27.1792
O	23.02134	-27.17032
P	23.00865	-27.14059
Q	23.01028	-27.12645
R	23.02079	-27.03527
S	23.03765	-27.03564
T	23.03965	-27.00863

Figure 2: Map shows the location, and area (hectares) of all the aforesaid main and listed activities

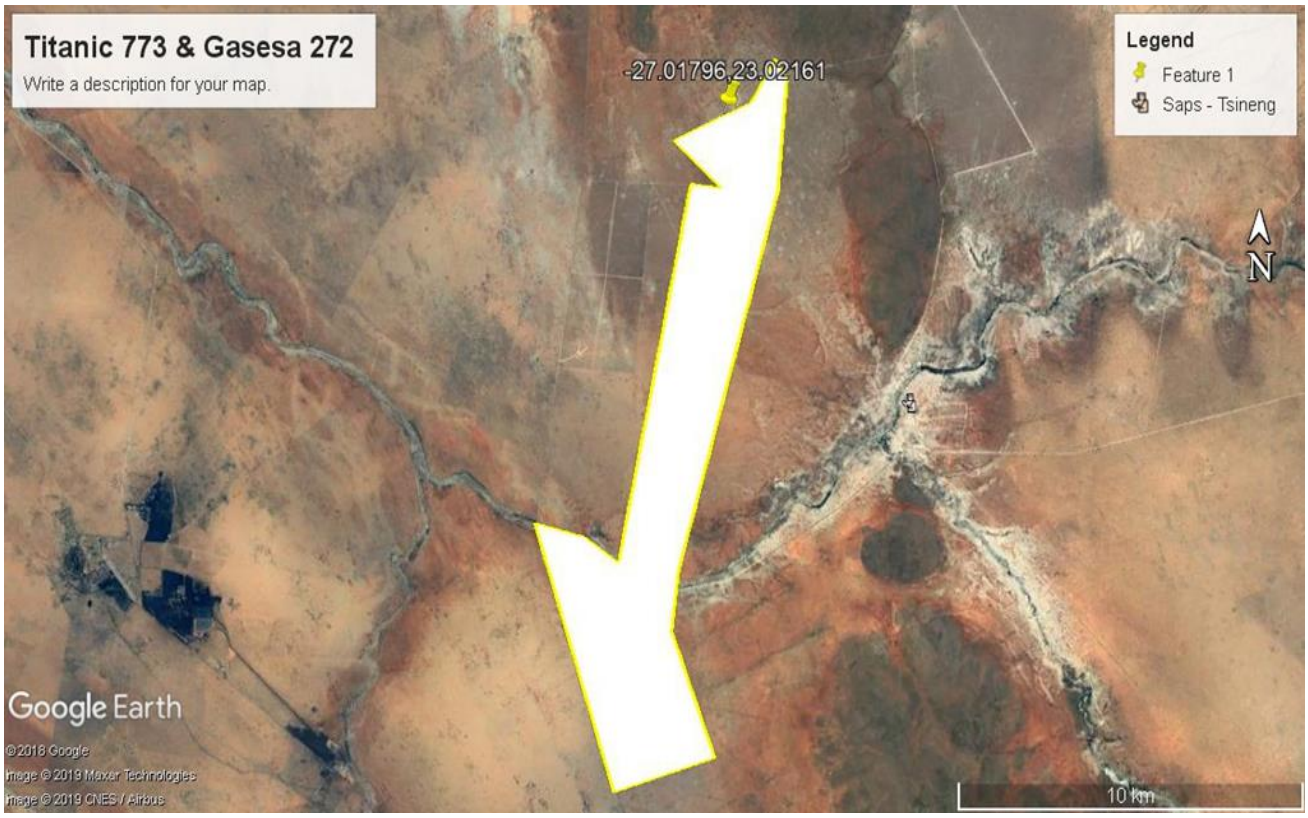


Figure 3: Map shows the location and infrastructure

3.1 Listed Activities

The listed and specified activities potentially triggered by the proposed development are indicated in Table 4.

Table 4: Listed and Specified Activities

NAME OF ACTIVITY **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**Aerial extent of the Activity** **Ha or m²**	**LISTED ACTIVITY** **Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE** ***(GNR 324, GNR 325 or GNR 326)***
The extraction, removal and disposal of minerals that is envisaged in terms of Section 20 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) ("Act"), including affected infrastructure, structures and earthworks, directly related to prospecting of a mineral resource and activities for which an exemption has been issued in terms of Section 106 of the Act. Activity 19 of Listing Notice 2	900 Ha	X	GNR 325 Listing Activity 19
All activities, including the operation of a particular activity associated with primary processing of a mineral resource such as extraction, classifying, reduction, concentrating, winning, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case Activity 6 of this Notice applies. Activity 21 of Listing Notice 2	0.96 Ha	X	GNR 325 Listing Activity 21
Clearance of indigenous vegetation	900 Ha - Only the area where prospecting activities are going to take place will be cleared of indigenous vegetation. Concurrent rehalibilation will be conducted with normal backfilling.	X	GNR. 325, Listing Activity 15
Temporary structures (3 x Park Homes)	0.215 ha		GNR 325, Listed 1, Activity 21
Temporary Dump Site	0.19 ha		GNR 325, Listed 1, Activity 21

Residue Dam	0.5 ha		GNR 325, Listed 1, Activity 21
Concrete spillage control at diesel bousers	100 m^2		Not listed
Oil storage facility	100 m^2		GNR 325, Listed 1, Activity 21
Water pipeline of undetermined length but less than 10 Km	3 Km		GNR 325, Listed 1, Activity 21
Roads to trenches and processing plant	+- 1 Km		GNR 325, Listed 1, Activity 21
Stockpiling of topsoil	900 ha – 3m X 2m X 1 000m pit (200 pits) 200m X 100m X 200m trench (20 trenches)		GNR 325, Listed 1, Activity 21
Handling of General Waste (The waste licensing process for listed activities under Schedule 1 in the National Environment Management Waste Act 2008 is as defined in the environmental impact assessment (EIA) regulations made under section 24(5) of the National Environment Management Act 2008 (NEMA) No. 107 of 1998. This is a Category A Waste License Application for listed activities under Schedule 1 in the National Environment Management Waste Act 2008.)	0.0008 ha	X	NEM:WA - Government Notice Regulation 921 – 29 November 2013
The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	Approx. 2 Km	X	Listing Notice GNR 327, Activity 9
The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	Approx. 2 Km	X	Listing Notice GNR 327, Activity 10
Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[,] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing	Approx. 6 043.918 Ha	X	Listing Notice GNR 327, Activity 20

of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.			
The development of a road— (i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road— (a) [roads] which [are] is identified and included in activity 27 in Listing Notice 2 of 2014; (b) [roads] where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	Access roads and internal road network.	X	Listing Notice GNR 327, Activity 24
The decommissioning of any activity requiring - (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.	Obtain closure certificate after prospecting activities have been completed, if necessary.	X	Listing Notice GNR 327, Activity 22
The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).		X	Category A(15)
The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.		X	Category B(1)
The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage.		X	Category B(5)
The construction of a facility for a waste management activity listed in Category B of this Schedule.		X	Category B(10)

National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) - Government Notice Regulation 921 – 29 November 2013; Category A(15); Category B(1), B(5) and B(10).

National Water Act, 1998 (Act No. 36 of 1998) – section 21(a): Taking water from a water resource and section 21(b): Storing water, section 21(c): Impeding or diverting the flow of water in a watercourse, section 21(i): Altering the bed, banks, course or characteristics of a watercourse; section 21(g): disposing of waste in a manner which may detrimentally impact on a water resource; section 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

An application for Integrated Environmental Authorisation has been lodged with the Department of Mineral Resources and Energy, Northern Cape.

3.2 Description of the Activities

3.2.1 Description of Planned Non-Invasive Activities

Imagery Analysis and Geological Mapping

High resolution satellite images will be studied and used to geologically map the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels or Kimberlites, Manganese and Iron Ores.

A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Analytical Desktop Study

The project Geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no prospecting is done on the ground.

Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the way the work programme is to proceed in terms of activity, quantity, resources, expenditure and duration.

A GIS based database will be constructed to capture all exploration data.

3.2.2 Description of Planned Invasive Activities

During the initial stages of the planned project, Pitting and Trenching are going to be undertaken.

Bulk sampling is a sampling technique

Volumes of the mineral to be tested

About 20 Trenches will be excavated with the dimensions as written in Table 2 in order to determine whether there are any commodities of interest underground. It is estimated that an average 3 – 70 m of overburden (calcrete, dolomite, waste rock and soil) will be removed before accessing the ore body which is expected to host diamonds, manganese and iron ores. The trenches will be 200 m x 100 m x 200 m deep. We calculated the volume of gravel on 50 m and if all 20 trenches are going to be excavated an average of 1 000 000m³ will be tested.

Why will they be tested?

The Iron and Manganese ore will be tested. The testing will be conducted at an analytical laboratory. Kimberlitic material and diamondiferous gravels will be tested to determine a grade (carats per hundred tonne) and value (US$ per carat). The closest iron and manganese ore operations together with the nearby diamond operations may be utilised to processing of material. Alternatively, the applicant may have to utilise processing plant to be placed on site.

Where will they be tested?

All bulk sampling activities will take place on site or out of site. Herewith follows a description of the process: -

The planned bulk sampling technique is that of a typical South African diamond, iron and manganese ore operations and may have to include mining of kimberlite. A part of the planned prospecting method is a strip-mining process with oversize material from the gravel scalping and the tailings from the plant, being used as a backfill material prior to final rehabilitation. The Ores and Gravels are excavated, loaded and transported to the nearby treatment facility using articulated dump trucks. The access to the various trenches will be provided by a haul road to the screening and processing plants. The operation is to be conducted using conventional open pit mining equipment comprising two articulated dump trucks supported by appropriate excavators and a front-end loader. A possibility of establishing underground channels and shafts will be investigated and explored, as it may happen at later stages of this proposed development, that underground operations become necessary. The vegetated soil overlying the planned trenches is stripped prior to excavation of the ores and gravel and stockpiled on a dedicated dump to be used for rehabilitation purposes at a later stage. The ores and gravel is loaded with 60-t excavators onto ADT's. Ore is hauled to the screening plant. As an integral part of the bulk sampling processes, backfilling will take place continuously. The operation is to be conducted using conventional open pit mining equipment at the beginning:

Earthmoving and ancillary equipment

4 x Excavator

4 x Front-end Loader

6 x Articulated Dump Trucks

2 x Water Truck

1 x 16ft-Rotary Pan

1 x Jig/DMS/Sinter Plant

2 Power Generators

Drill Rigs

Screen

Crushers

Utility vehicles and small tools

Diamond recovery unit with Flow sort Machines, Plant, and recovery, crushing and screening equipment

Kimberlitic material and Gravels are loaded onto a vibrating grizzly and the +85mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -85mm fraction is loaded into a 16-foot rotary pan with a treatment capacity of 80 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Approximately 2.5 tonne of concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit. The final recovery unit consists of a holding bin, sizing screen, sizing bins and one state of the art Flowsort X-ray recovery unit which recover diamonds from the +2mm to -32mm size fraction. Final sorting of the X-ray concentrate will be done manually. Rehabilitation will take place continuously and at any stage only one trench will be open.

To whom they will be disposed of:

At an expected grade of 2 carats per hundred tonnes, 8 800 carats could be recovered from the kimberlitic material and gravels. Diamonds will be sold at a reputable diamond tender house in Kimberley or international communities that are affiliated to the Kimberly Process to determine an average US$ carat value for the diamonds.

Another part of Prospecting Method will include site preparation

Site preparation includes the clearing of vegetation and topsoil stripping. Topsoil is stockpiled, for later use in rehabilitation.

5) Earthworks

Following site preparation all topsoil and some waste rock is dozed and stockpiled separately for re-use for rehabilitation activities

Drilling and blasting

Some of the topsoil, overburden material will be removed. The waste rock is drilled and blasted in benches until the economic ore body is exposed. This is done in a manner that is of high quality, effective and efficient. Best industry practices are to be employed in the process. Similarly, drill and blast methods are used to break the ore with careful attention being paid to avoiding contamination of the ore with overburden material and waste.

Blasting will occur only if deemed necessary. All the recommended best practices will be observed should blasting be deemed necessary at any stage of this proposed development.

Removal of waste rock

Broken waste rock is loaded by excavator and hauled by auxiliary dump trucks to the waste dumps where it is tipped.

Rehabilitation

Once the open pit and trench reach a steady state, on-going rehabilitation of the excavated areas using methods such as concurrent backfilling will occur as prospecting activities advance. In this regard, waste rock will be used to backfill the pit voids (once there is enough space to dump)

MINERAL PROCESSING METHOD

Primary crushing and screening

ROM is delivered to the primary crushing and screening plant using auxiliary dump trucks. The primary crushing and screening plant are used to reduce the size of the ore to fractions required by the downstream plant processes. ROM that has been subjected to the primary crushing and screening plant is stockpiled prior to being sent to the secondary crushing and screening plant using machinery or conveyor for further re-sizing. Dust suppression using appropriate techniques should be employed at all crushing and screening locations.

Secondary crushing and screening

The secondary crushing and screening plant is used to size the ore according to product specifications. The final product from the secondary crushing and screening plant is stockpiled at one of the product stockpile areas or the crushed ROM stockpile. The processed ore that is going to be stockpiled may vary between -6+1 mm and -75 + 6 mm. Different individual fractions may be stockpiled separately. The final product is loaded out of site to be sold to local and international markets for further beneficiation. Front end loaders or equivalent loaders are to be used to load product out of site.

Superfine waste material will be re-used as topsoil for rehabilitation and re-vegetation purposes.

Tertiary crushing and screening (to be sent to nearby mining operations for further processing)

The tertiary crushing and screening section (– 40, +6 mm material) will be used to prepare the ore for sinter plant feed. High grade product will be stockpiled at the tertiary product stockpile prior to being sent to the sinter plant. Manganese that is below the required grade from the tertiary crushing and screening plant will be stockpiled at a low grade stockpile prior to being sent to the Dense Medium Separator (DMS) for further processing. Any fines material (-1 mm) produced at the tertiary crushing and screening plant will be sent to the thickener for disposal to the tailings dam

Sintering (to be sent to nearby mining operations for further processing)

In the sinter plant, ore will be sintered by the application of heat, to agglomerate it and to increase the manganese content (by burning off the carbonaceous material). Raw materials will be mixed with the manganese ore in a rotating mixing pan prior to agglomeration in a rotary drum. The agglomerated material will be fed into the sinter furnace on a steel belt. The sinter furnace is a multi-compartment oven that is ignited with gas or heavy fuel oil. The front compartments will be used for drying, ignition and sintering. The back compartments will be for cooling. Gas emissions will be scrubbed in cascade scrubbers to remove most of the particulates and pollutants. The dirty scrubber water will be re-cycled in the thickener plant. Dust emissions will be captured in bag filters and recycled into the sinter feed. The final product will be stockpiled on the product stockpile prior to being loaded out of site to be sold to third parties.

Dense medium separation (to be sent to nearby mining operations for further processing)

Prior to the sintering stage, manganese ore that is below the required grade (– 6 + 1 MM) can be beneficiated using dense medium separation, effectively upgrading the ore. Using density differential between manganese and waste; the material will be sent to the sinter feed stockpile prior to being sent to the sinter plant while the waste will be disposed onto the temporary discard dump. Samples will be sent to a laboratory for analysis whilst a backup samples is stored.

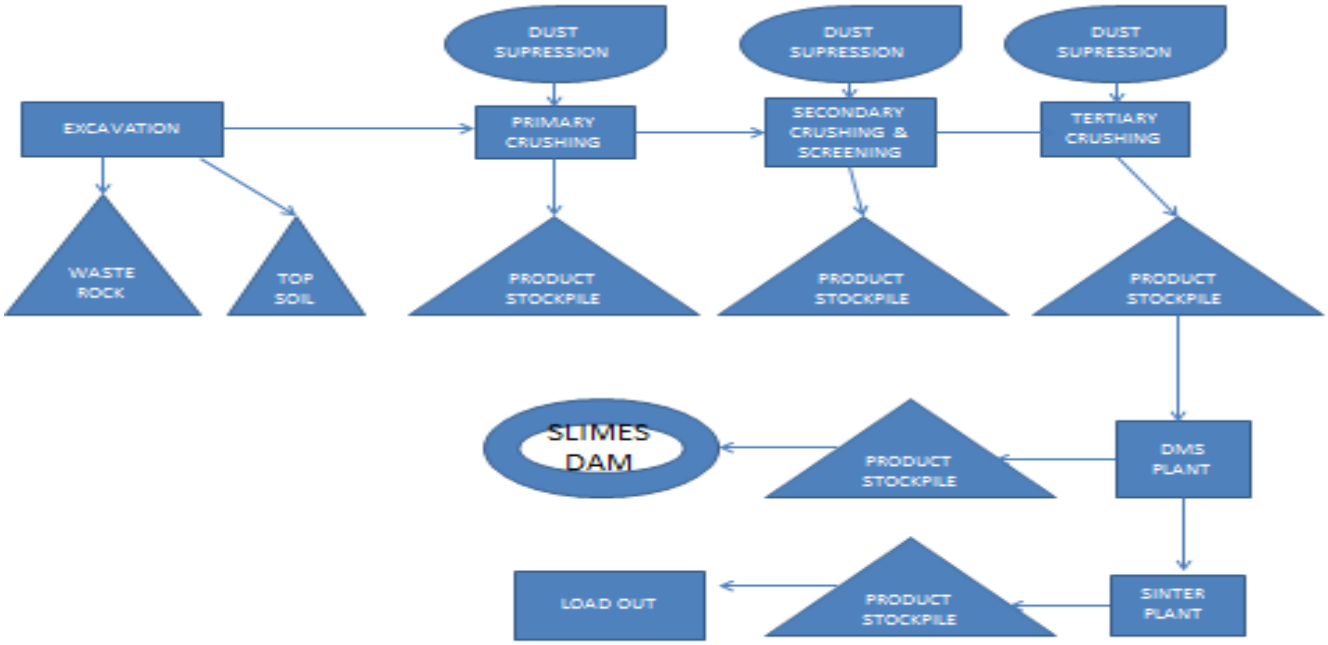


Figure 4: Schematic representation of the planned process flow

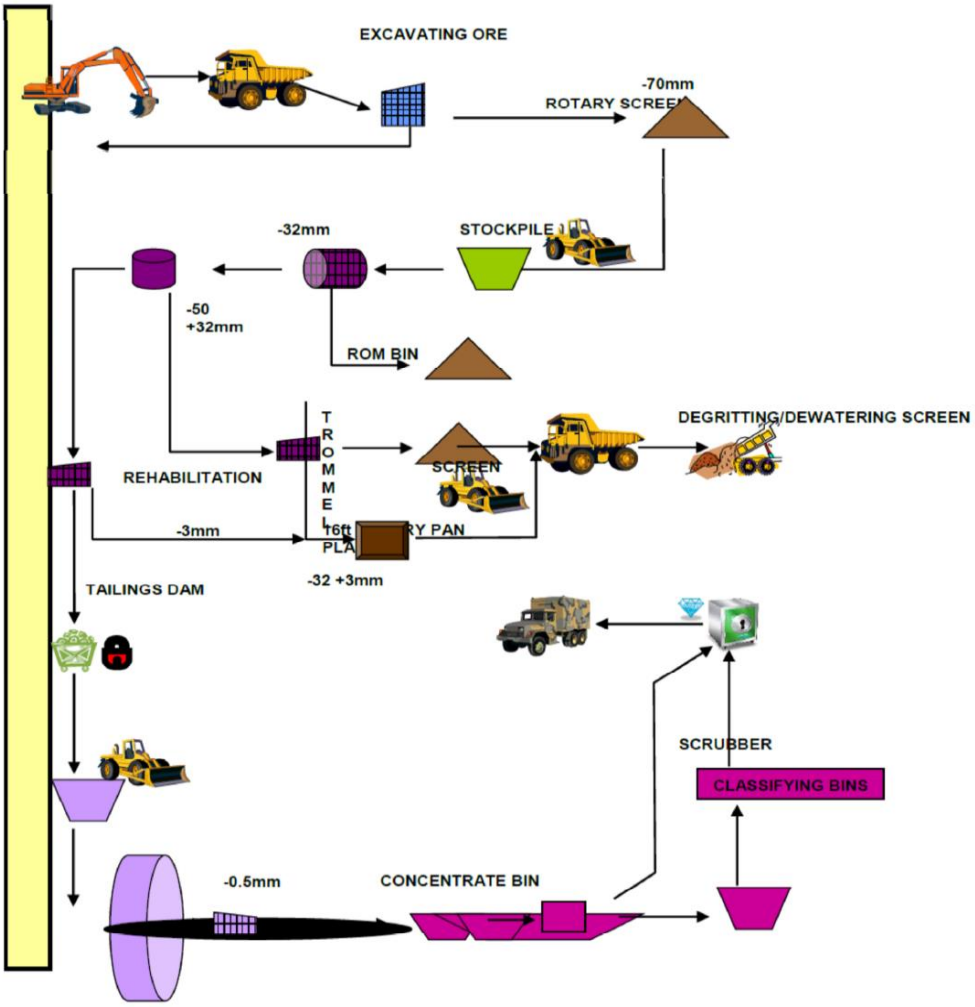


Figure 3: Schematic representation of the planned process flow

3.2.3 Construction Phase

The Construction Phase includes the following:

- Preparing the area to cater for a campsite to accommodate personnel and infrastructure relevant to the planned mining, crushing, recovering activities, among others;
- Site clearance (where necessary), construction of earthworks and removal of rubble;
- Deposit waste rock and overburden material;
- Topsoil stripping and stockpile establishment;
- Construction of pollution control facilities, if necessary.
- Construction of storm water management facility in order to limit the amount of water that enters the pits;
- Establish Waste Management Facilities, if necessary; and
- Establish access roads and internal temporary road network.

3.2.4 Operational Phase

The Operational Phase includes the following:

- Excavation, Crushing, Screening, Sorting, Load and Haul of material;
- Operation of equipment and machinery;
- Use of Water and Hydrocarbons;
- Use of pollution control and waste management equipment and machinery;
- Maintenance of equipment and machinery;
- Pitting and trenching;
- Dewatering of pits and trenches, if necessary; and
- Concurrent Backfilling, Closure and Rehabilitation

3.2.5 Decommissioning Phase

Mobile equipment is going to be used in these operations. When mobile infrastructure is used, the decommissioning phase is going to be straight forward as the infrastructure would be transported away from site. It is worth mentioning that the schedule of rehabilitation is going to be phased to run in parallel with the mining and crushing activities to ensure 'pain-free' rehabilitation ultimately. Removed and relocated species are going to be planted again or returned to their habitat.

Table 5: Bulk Sampling Activities

ACTIVITY		DETAILS
Number of pits/trenches planned		20 trenches and 200 test pits
	Number of pits/trenches	**Length Breath Depth**
	200/20	200 m 100 m 200 m
Locality		See figure 1
Volume Overburden (Waste)		1 000 000 m^3
Volume Ore		> 125 000 m^3
Density Overburden		To be determined during Prospecting Activities.
Density Ore		To be determined during Prospecting Activities.
Phase when bulk sampling will be required		Phase 3
Timeframe(s)		From time-to-time during months 7 to 30

4 Policy and Legislative Context

In order to protect the environment and ensure that this development is undertaken in an environmentally responsible manner, there are a number of significant pieces of legislation that will be consulted for this study. After a brief scoping of applicable legislation these include but may not be limited to the following:

4.1 The Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa, 1996 is the supreme law and the nucleus of all legislation in South Africa. The Constitution guarantees equality before the law, all the basic freedoms which human beings must enjoy, and must be reasonably entitled to, social and economic justice.

Section 24 of the Constitution states that:

"Everyone has the right:

- *to an environment that is not harmful to their health or well-being; and*
- *to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that –*
    - *prevent pollution and ecological degradation;*
    - *promote conservation; and*
    - *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

Section 24 of the Constitution therefore guarantees citizens of South Africa the right to an environment that is not harmful to human health or well-being, and specifically imposes a duty on the State to enact legislation and take necessary steps to ensure that the right is upheld and to ensure sustainable development through prevention, minimization of control of ecological degradation and pollution. As enshrined in the Bill of Rights, the environmental management objectives of proposed project is to ensure that present and future generations benefit from this development, to support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in nearby communities to the project location.

4.2 Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

Botshelo T and G Mining Resources (Pty) Ltd has submitted a Prospecting Right application (with bulk sampling) to the Department of Mineral Resources and Energy in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

4.3 NEMA and EIA Regulations published on 7 April 2017 (GN R327, GN R326, GN R325 and GN R324)

The Nation Environmental Management Act, 1998 (Act No. 107 of 1998) sets out a number of principles in the first two (2) chapters of the act to give guidance to applicant or proponents, private land owners, members of public and authorities on how to handle environmental matters. The NEMA is the national legal framework that regulates environmental issues. Various necessities such as cooperative environmental governance,

compliance and non-compliance, enforcement, and regulating government and business impacts on the environment, underpin the NEMA. The NEMA, as the primary environmental legislation, is complemented by a number of sectoral laws governing mining, waste, air quality, biodiversity, marine living resources, forestry, protected areas, pollution and integrated coastal management. The triple bottom line principle proposes that development must be socially, environmentally and economically sustainable. Principle Number 4(a) states that all relevant factors must be considered, inter alia i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and viii) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

The national legal framework under which Environmental Impact assessments are undertaken is the National Environmental Management Act, 1998 (Act No. 107 of 1998) NEMA (as amended). The EIA studies under discussion are often complex as a result of many contributing factors. For purposes of remaining within the scope of work of this study, it is not necessary to discuss further these complexities. It is therefore important to highlight that the ultimate aim of EIA studies is to uphold environmental and socio-economic justice pertaining to any proposed development among other things. A definition of "environment" is given in section 1 of the NEMA. Section 2(2) of the NEMA urges sensitivity to the welfare of communities regarding their physical, psychological, developmental, cultural and social interests. Development must be socially, environmentally and economically sustainable, which requires that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimized and remedied.

The EIA Regulations (2017) under the NEMA consist of three (3) categories of activities namely: Listing Notice 1 Activities (GNR. 327 of 2017) which require a Basic Assessment study, Listing Notice 2 Activities (GNR. 325 of 2017) which require both a Scoping and an EIA study for authorisation and Listing Notice 3 Activities (GNR. 324 of 2017) which requires a Basic Assessment study for specific activities in identified sensitive geographical areas. The DMRE is responsible for the authorisation of these activities.

4.4 The National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) provides legal framework for the management of cultural and heritage resources in South Africa. Section 3 of the NHRA lists a wide range of phenomena under which resources may fall with the definition of heritage.

The NHRA was promulgated in order to introduce an integrated and interactive system for the management of the heritage resources, to promote good government at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic.

In terms of section 38 (subject to the provisions of subsections (7), (8) and (9) of the Act), any proponent who proposes to undertake a development categorised as:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50 m in length;
- Any development or other activity which will change the character of a site: - Exceeding 5 000 m² in extent;
    - Involving three or more existing erven or subdivisions thereof; or
    - Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- The re-zoning of a site exceeding 10 000 m^2 in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The provincial/national offices of the South African Heritage Resource Agency (SAHRA) are going to be provided with all relevant documentation that will enable them to make an informed statutory comment as enshrined in the NHRA.

A Heritage Impact Assessment and a Palaeontological Impact Assessment (Desktop Study) were undertaken during the EIA Phase of the proposed development. These environmental specialist studies to be undertaken will be included in the EIA Reports that is going to be published for review by I&APs during the EIA Phase.

In order to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed applications and findings and recommendations of specialist are going to be considered in the EIA.

4.5 The National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) makes provision for Section 21 Water Uses for which an application could be lodged and those that already exist. The NWA is the principal legal instrument relating to water resource management in South Africa and contains comprehensive provisions for the protection, use, development, conservation, management and control of the country's water resources. In addition, the management of water as a renewable resource must be carried out within the framework of environmental legislation, i.e. the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), under Regulations R324 to 327, of 07 April 2017.

A key aspect of the National Water Policy is Integrated Water Resources Management (IWRM). This recognises that water resources can only be successfully managed if the natural, social, economic and political environments in which water occurs and is used are taken into consideration. IWRM aims to strike a balance

between the use of water resources for livelihoods and conservation of the resource whilst promoting social equity, environmental sustainability and economic growth and efficiency.

In addition to the National Water Act, 1998 (Act No. 36 of 1998) and the National Environmental Management Act, 1998 (Act No. 107 of 1998), the following legislation and guidelines/quality standards are applicable to hydrogeological investigations and assessments:

- National Water Act, 1998 (Act No. 36 of 1998);
- National Water Resource Strategy (NWRS, 1st Ed., September 2004);
- Department of Environmental Affairs and Development Planning's (DEA&DP) Guideline for Involving Hydrogeologists in EIA Processes (June 2005) (Snayman, 2005);
- NWA, Regulation 267 of March 2017; and
- Department of Water Affairs and Forestry's (DWAF) Integrated Water Resource Management: Guidelines for Groundwater Management in Water Management Areas in South Africa (DWAF, 2004).

The NWA defines eleven (11) consumptive and non-consumptive water uses:

- 21(a): Taking water from a water resource;
- 21(b): Storing water;
- 21(c): Impeding or diverting the flow of water in a watercourse;
- 21(d): Engaging in a stream flow reduction activity;
- 21(e): Engaging in a controlled activity;
- 21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit;
- 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;
- 21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process;
- 21(i): Altering the bed, banks, course or characteristics of a watercourse;
- 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and,
- 21(k): Using water for recreational purposes.

Section 27 of the NWA specifies that the following factors regarding water use authorisation be taken into consideration:

- The efficient and beneficial use of water in the public interest;
- The socio-economic impact of the decision whether or not to issue a license;
- Alignment with the catchment management strategy;
- The impact of the water use and possible resource directed measures; and,
- Investments made by the Applicant in respect of the water use in question.

This EIA study underway is going to be used to support the Water Use Licencing Application Process.

4.5.1 Controlled Activities

The Minister of Human Settlement, Water and Sanitation is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. The following are considered to be controlled activities:

- Irrigation of any land with waste or water containing waste generated through any industrial activity or by a water work;
- An activity aimed at the modification of atmospheric precipitation;
- A power generation activity which alters the flow regime or a water resource;
- Intentional recharging of an aquifer with any waste or water containing waste; and
- An activity which has been declared as such under Section 38.

No person may undertake a controlled activity unless such person is authorised to do so by or under this Act. The Minister may, by notice in the Gazette, in general or specifically, declare an activity to be a controlled activity. Such notice might be for a specific activity on a specific site.

4.6 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

The National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS).

The objectives of the NEM:WA relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

Government Notice Regulations 921 (of 29 November 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) determine that no person may commence, undertake or conduct a waste management activity listed in the schedule unless a license is issued in respect of that activity.

4.7 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The object of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in South Africa; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.

Government Notice Regulation 248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (Act No. 39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed

development. However, at mining right phase, if applicable, the Atmospheric Emission License will be applied for.

4.8 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) provides for "the management and conservation of South Africa's biodiversity within the framework of the NEMA, the protection of species and ecosystems that warrant national protection, and the use of indigenous biological resources in a sustainable manner, amongst other provisions". The NEM:BA specifies that the state is the custodian of South Africa's biological diversity and is committed to respect, protect, promote and fulfil the constitutional rights of its citizens.

Furthermore, the NEM:BA prohibits loss of biodiversity through habitat loss, degradation or fragmentation must be avoided, minimised or remedied. The loss of biodiversity includes inter alia the loss of threatened or protected species. Biodiversity offsets are a means of compensating for the loss of biodiversity after all measures to avoid, reduce or remedy biodiversity loss have been taken, but residual impacts still remain and these are predicted to be medium to high. Chapter 5 of NEM:BA (Sections 73 to 75) regulates activities involving invasive species, and lists duty of care as follows:

- the land owner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or re-establishment;
- take all required steps to prevent or minimise harm to biodiversity; and
- ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

An amendment to the NEM:BA has been promulgated, which lists 225 threatened ecosystems based on vegetation types present within these ecosystems. Should a project fall within a vegetation type or ecosystem that is listed, actions in terms of NEM:BA are triggered. Based on the preliminary sensitivity screening undertaken for the proposed site, none of the threatened ecosystems occur within the study area. This will be confirmed as part of the Ecological Impact Assessment study to be undertaken.

4.9 National Forests Act, 1998 (Act No. 84 of 1998)

The National Forest Act, 1998 (Act No. 84 of 1998) allows for the protection of certain tree species. The Minister has the power to declare a particular tree to be a protected tree. According to Section 12 (1) d (read with Sections (5) 1 and 62 (2) (c)) of the National Forest Act (Act 84 of 1998), a licence is required to remove, cut, disturb, damage or destroy any of the listed protected trees. The most recent list of protected tree species was published in November 2014. The Department of Agriculture, Forestry and Fisheries (DAFF) is authorised to issue licences for any removal, cutting, disturbance, damage to or destruction of any protected trees. The protected trees that commonly occur in this region are *Acacia erioloba* and *Boscia albitrunca*. Biodiversity Assessment has been conducted in relation to the EIA process that ensued. .

4.10 Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

The objectives of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA) are to provide for the conservation of the natural agricultural resources of South Africa by the:

- maintenance of the production potential of land;
- combating and prevention of erosion and weakening or destruction of the water sources; and
- protection of the vegetation and the combating of weeds and invader plants.

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource. The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

- Category 1 may not be grown and must be eradicated and controlled;
- Category 2 may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled; and
- Category 3 plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or landowner to control invasive alien plants occurring on the land under their control.

Should alien plant species occur within the study area; this will be managed in line with the EMPr. Rehabilitation after disturbance to agricultural land is also managed by CARA. The DAFF reviews and approves applications in terms of these Acts according to their Guidelines for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011.

4.11 Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)

A change of land use (re-zoning) for the development on agricultural land needs to be approved in terms of the Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970) (SALA). This is required for long term lease, even if no subdivision is required.

4.12 Development Facilitation Act, 1995 (Act No. 67 of 1995)

The Development Facilitation Act, 1995 (Act No. 67 of 1995) (DFA) sets out a number of key planning principles which have a bearing on assessing proposed developments in light of the national planning requirements. The planning principles most applicable to the study area include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;

- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Promoting the establishment of viable communities; and
- Promoting sustained protection of the environment.

4.13 Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)

The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) was promulgated in order to enhance planning and land use management efficiently and effectively. The SPLUMA enable urban areas to drive spatial transformation. Re-zoning application (to Special Zoning - Mining) is going to be lodged in terms of SPLUMA.

4.14 Other Relevant Pieces of Legislation

Other pieces of legislation that are applicable include the following:

- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003);
- Agricultural Laws Rationalisation Act, 1998 (Act No. 72 of 1998);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- Fencing Act, 1963 (Act No. 31 of 1963);
- Electricity Act, 1987 (Act No. 41 of 1987);
- Electricity Regulations Amendments (August 2009);
- Biodiversity Act, 2004 (Act No. 10 of 2004);
- Hazardous Substance Act, 1973 (Act No. 15 of 1973);
- Agricultural Product Standards Act, 1993 (Act No. 129 of 1993);
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Regulations;
- Road Transportation Act, 1977 (Act No. 74 of 1977)
- Civil Aviation Authority Act, 1998 (Act No. 40 of 1998); and
- Civil Aviation Act, 2009 (Act No. 13 of 2009) and Civil Aviation Regulations (CAR) of 1997;

4.14.1 Provincial Legislation

i. Northern Cape Nature Conservation, 2009 (Act No. 09 of 2009)

The Northern Cape Nature Conservation Act, 2009 (Act No. 09 of 2009) and in particular the Northern Cape Conservation promotes the protection of listed species. The Northern Cape Nature Conservation Act provides for sustainable development in terms of establishing and maintaining balance in the use of natural resource and protection or conservation thereof. The Act includes six schedules, as follows:

- Schedule 1 - Specially Protected species;
- Schedule 2 - Protected species;
- Schedule 3 - Common indigenous species;

- Schedule 4 - Damage causing animal species;
- Schedule 5 - Pet species; and
- Schedule 6 - Invasive Species.

With regards to protected flora, the Northern Cape Nature Conservation Act includes a list of protected flora. The plant species potentially present within the proposed project area will be identified as part of the Biodiversity Assessment as proposed. If any of the listed species are found, the relevant permits should be obtained by the proponent prior to their relocation or removal. In addition, the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform must be consulted before the planned clearance of indigenous vegetation on site takes place.

ii. The Provincial Spatial Development Framework for the Northern Cape (Office of the Premier of the Northern Cape, 2012)

The Provincial Spatial Development Framework (PSDF) provides for developmental planning to in consistence with the provincial legislation. In the province of the Northern Cape where agriculture and mining are predominant, solar and wind renewable energy are now emerging as some of the province's major activities.

The spatial vision for the province outlines a well-structured system of sustainable land-use zones that support the Northern Cape's economy vested in the primary economic sectors, in particular, mining, agriculture, tourism, and the energy industry.

5 Need and Desirability

5.1 Prospecting for Mineral Resources and subsequent Mining Development, if feasible.

Sustainability in mining development is one of the key factors to consider as it plays a pivotal role in ensuring effective and efficient implementation of industry's best practices. The developing countries such as South Africa need now, more than ever, to ensure continued support, maintenance and monitoring of mining development as the world faces climate change which threatens food security among other things. The mining sector is one of the most important sectors of the South African economy. Not only does it contribute towards the country's GDP, the sector also contributes in poverty elevation, job creation and revenue collection by the State. These factors or aspects of the mining sector have to be considered in policy formulation in order to ensure sustainability for current and future generations.

Land uses in South Africa are regulated. The process of spatial and land use change through zoning are easy to understand and implement. They are influenced by many factors such as population growth, household formation and economic development.
In order to meet current and future demands, technology that is applicable in mining projects has been evolving.

For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's GDP. The economy of South Africa is built mostly on gold and diamond-mining, with gold-mining contributing over a third of the country's exports. Whereas, South African diamond-mining industry

was listed as one of the largest mining countries in the world in the year 2009. It is predicted that mining will still play an important role to the economy, most notably through foreign exchange earnings and employment provision. It is also one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people. The South African mining industry has its origin in small-scale to medium-scale mining activities, with these operations offering much needed employment opportunities and entrepreneurship, as well as contributing to the mineral sector and local economy. Small-scale mining and medium-scale mining's impact on employment is especially observed in the rural areas and province such as the Northern Cape where there are limited opportunities; providing significant livelihood for rural communities and a means of alleviating poverty.

The proposed development of the Mine is aimed at supporting the economy of South Africa by producing a commodity that has a potential to leverage the economy of the country. The primary beneficiaries of this project include, among others, the employees, members of surrounding communities and the country. Secondary beneficiaries include the suppliers of goods and services, and the local businesses through the buying power of employees. This is in line with the National Development Plan (NDP). The Social Labour Plan of the Proposed development is aimed at ensuring local economic development through implementation of the various projects.

The applicant estimates that these small pieces of land could, if prospecting rights are granted, prove to be bearing commodities of high economic value. Only small portions of the farms that are targeted will be temporarily disturbed. The remainder of the farm portions will proceed as normal.

5.1.1 National Development Plan 2030

The National Development Plan envisions a South Africa where “everyone feels free yet bounded to others”; where everyone embraces their full potential, a country where “opportunity is determined not by birth, but by ability, education and hard work”. A South Africa where “we participate fully in efforts to liberate ourselves from the conditions that hinder the flowering of our talents” as articulated in the Vision 2030.

- The NDP aims to achieve the following objectives by year 2030**:**Uniting South Africans of all races and classes around a common programme to eliminate poverty and reduce inequality;
- Encourage citizens to be active in their own development, in strengthening democracy and in holding their government accountable;
- Raising economic growth, promoting exports and making the economy more labour absorbing;
- Focusing on key capabilities of both people and the country;
- Capabilities include skills, infrastructure, social security, strong institutions and partnerships both within the country and with key international partners;
- Building a capable and developmental state; and
- Strong leadership throughout society that work together to solve our problems

At the core of the Nation Development Plan is the aim to ensure the achievement of a “decent standard of living” for all South Africans by 2030. A “decent standard of living” entails the following core elements as enshrined in the Bill of Rights:

- Housing, water, electricity and sanitation;
- Safe and reliable public transport;
- Quality education and skills development;

- Safety and security;
- Quality health care;
- Social protection;
- Employment;
- Recreation and leisure;
- Clean environment; and
- Adequate nutrition

South Africa's National Development Plan (NDP) 2030 was adopted by Government in year 2012.

6 Period for which the environmental authorisation is required

The Environmental Authorisation is required for a minimum period of 5 years.

7 Motivation For The Preferred Development Footprint On The Site Including The Process Followed To Define The Preferred Development Alternatives

7.1 Details of Development Footprint Considered

The EIA process identifies, among others, critical components of alternatives to be considered whilst ensuring that the desired outcome pertaining to the proposed project is realised. In the process of identifying and assessing the feasible options, factors such as the National Development Plan and sustainable development to mention just a few are considered. The assessment process may include the environmental friendliness, economic and social viability, in order to ensure Sustainable Development. As a consequence, alternatives for the locality of the prospecting activities are partly discussed in this piece of work because the position and location of the mine are influenced to an unlimited extent by the availability of the commodity at a particular location. In order to determine a relatively suitable site / property for a proposed development, various factors should be considered. However, only the application area relevant to this piece of work was considered for application that was lodged with the DMRE. Alternative sites / properties are not applicable. Alternatives (A, B and C) proposed for locating processing plant are similar in ecological status. However, alternative C has a slightly different ecological setting as the location is in proximity to a pan.

Land use

There are specialist comparative studies in place at the present that are in place for the proposed prospecting work area. Specialists were commissioned by the Consultant. The process that is going to be employed from beginning to end of prospecting works is going to be step-wise; the initial step is going to be to establish whether or not there are commodities of economic value that could be mined in the area of interest before any development can take place. Some parts of the farms of interest have been prospected, partly, for diamonds, Iron and Manganese Ores previously. It would be convenient, environmentally friendly and economically viable to utilise some of the existing infrastructure with minor amendments where necessary. If need arises, during prospecting phase, the infrastructure used will be mobile only.

The rehabilitation process and the prospecting phase are going to be conducted simultaneously in order to ensure that the pits that get opened during the prospecting phase are backfilled concurrently. All the material taken out of the pits that does not bare the commodity of interest will be deposited back into the pits. The rehabilitation process will be performed with the aim to enable normal agricultural activities to be undertaken after the prospecting has been deemed economically not viable, if applicable.

Consultation of I&APs

Results obtained from the consultation process followed are going to be discussed later in this report.

Biodiversity and Ecology
The proposed development is going to have an impact on biodiversity because some indigenous vegetation is going to be removed. Additionally, there is going to be some destruction of habitats. However, none of this destruction would have been possible if this proposed development was not going to go on.

Heritage and Cultural Resources

The existing heritage resources, if any, are going to be protected through demarcation of the NO-GO zone(s). All encountered graves, if any, are going to be preserved. Buffer zones may be built, at least 100 m away from the preserved heritage resource. Specialists and relevant authorities will be notified and called in should any Heritage Resources of significant importance be encountered. Alternatively, a procedure/protocol that is recommended by specialists may have to be followed.

Socio-Economy

The proposed project will, if proven to be economically viable, contribute to the economy of the local communities, and to that of the country at large. On prospecting phase of the proposed development alone, there are some people who are going to benefit as employees of the company.

Botshelo T and Mining Resources (Pty) Ltd (is in a position to employ people from all walks of life; however, preference is going to be given to locals. Furthermore, Botshelo T and Mining Resources (Pty) Ltd is committed to Development and Sustainability of the Local Economy and Infrastructure Development.

Site Layout Alternatives

The site layout alternatives are going to be considered during the Environmental Impact Assessment that is going to be conducted. Alternative site layout alternatives are expected to be influenced significantly by the findings and recommendations of the detailed specialist studies that are going to be conducted during the second phase of this piece of work. In order to determine a relatively suitable site for the proposed development, various factors were considered. These factors include the following:

- Accessibility of location;
- Availability of infrastructure;
- Available Literature;
- The availability of ore body of economic value underground and water;
- Avoidance measures in terms of sterilising mineral resources; an
- General environmental and socio-economic justice that is possible to achieve pertaining to the proposed development

Technology to be used during Activities

In terms of the technologies proposed, these have been chosen based on the long-term success of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme is dependent on

the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

The preferred technology for the proposed mining activity will be to remove the diamond bearing gravel with an excavator, depositing it in the 10 – 18 feet rotary pan(s) to be washed and sorted. However, if it happens, kimberlite deposits are identified on this site, the Dense Media Separation (DMS) plant may become a technique of choice.

Operational Aspect of the Activity

Sections 24(4)(b)(i) and 24(4A) of the NEMA make provision for an EIA to encompass investigation and assessment of impacts that are associated with alternatives in relation to a proposed project. Furthermore, Section 24O(1)(b)(iv) provides for the Competent Authority, in its evaluated of Environmental Authorisation, takes into account "where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment".
It is common practise for assessment of alternatives to include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

Due to the nature of the prospecting activities, no permanent services in terms of water supply, electricity, or sewerage services are required, however, substantial amounts of these resources are going to be utilised during the operations of the proposed project.
The activities will commence with a site investigation and desktop studies, which will comprise of non-invasive techniques. This manner of survey will ensure that the applicant can clearly delineate areas which are suitable for further investigation and no unnecessary surface disturbance will be undertaken.

Based on the outcome of the desktop studies and site investigation, pits will be dug by an excavator for the purpose of soil sampling. If gravel is found, the applicant will determine the composition and quality of the gravel.
The applicant will proceed with this way of prospecting by means of the open cast/trenching method, simultaneously or after pitting depending on the information obtained from the earlier work done. The trenches will be dug to remove and wash the gravel. It will be washed by a washing pan to determine diamond proceeds per 100 tons of gravel or kimberlitic ore.

All data will be consolidated and processed to determine the diamond bearing resources on the property. This will be a continuous process throughout the prospecting work programme.

No feasible alternatives to the pitting and trenching method currently exist as far as we are aware. Impacts associated with the prospecting operations will be managed through the implementation of a management plan developed as part of the application for authorization.

For further details on the motivation for preferred location, please see ANNEXURE D.

7.1.1 The "No-Go" Alternative

This process includes comparison of all site alternatives in order to determine whether or not the project may proceed. It is noteworthy that, on one hand, the proposed development has a potential to possess some economic benefits. On the other hand, the proposed development poses some negative impacts on the environment.

No-Go Alternative

Identified Impact: Negative: Loss of opportunity to liberate the Resource.

The proposed development has a potential to possess some economic benefits. If the proposed development does not go ahead, all the benefits associated with it will be lost.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of locating surface infrastructure and associated activities would bare minimal magnitude on sterilisation of any mineral resources. Severity is high before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is high.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is trans-boundary before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is local.

Duration

The economic opportunities will be available during the prospecting operations. This is residual. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is high before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low - medium.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is high before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low - medium.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 6: No-Go Alternative

Impact Identified	**Footprint Alternative**					
Los of opportunity to liberate the resource	**No-Go Alternative**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Trans-boundary (5)	Life of operation (2)	Residual (4)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	+1	5	5	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
70	It is the opinion of the EAP for the prospecting right to be issued if specialist reports to be commissioned.					
Significance Rating (Post-mitigation)						
120						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	0	1		2	

7.2 Details of Public Participation Followed

Letters were sent out by registered mail to interested and affected parties (land owners, neighbouring farmers, certain government departments and parastatals). Identified I&APs, including key stakeholders representing various sectors, were directly informed of the proposed development and the availability of the Environmental Impact Assessment Report via local Newspaper (Kathu Gazette).

The consulted parties include the following:

Departments:
Water and Sanitation, SAHRA, Agriculture, Environment and Nature Conservation, Eskom, Transnet, Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Public Works, Rural Development, Land Commission & SANRAL

A notice was published in English on Kathu Gazette newspaper and on site for public participation and registration as Interested and Affected Parties (I&APs) to comment. All the I&APs were requested to submit comments and objections to Thaya Trading Enterprise within 30 days of the advertisement.

The process as described by NEMA for Environmental Authorisation was followed. Letters were sent by registered mail to all parties given below. See attachment.

7.3 Summary of Issues Raised By I&APs

A summary of issues raised in presented in Table 7.

Table 7: Summary of issues raised by I&APs (Please see Annexure C)

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s	X				
Kuruman, John Taolo Gaetsewe	X				
Joe Morolong Local Municipality	X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Municipal councillor	X				
Municipality	X				
Organs of state (Responsible for			This notice affects the existing		Annexure D

infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e			**Eskom Distribution's power lines, Eldoret/Laxey 1 22kV Overhead Line which traverses the proposed mining area. The approximate positions of these services are indicated on the attached locality Map.** **Eskom Distribution will raise no objection to the proposed Mining operations on the above mentioned properties provided Eskom's rights and services are acknowledged and respected at all times.**		
Communities					
Dept. Land Affairs	**X**		**With reference to your letter dated 24 October 2019, the Department need to respond with the following comments:** **• No natural storm water pattern or flow may be altered, restricted or blocked with the new development on proposed sites.** **• The removal of protected species i.e. thorn trees etc. must be done with the relevant approval and**		

			permits. **Adherence to Act 43 of 1983(with applicable regulations), the conservation of natural resources.** **The Department request to be kept updated and informed on any activity that may take place on the potential or existing agricultural land.** **The Department is of the opinion that above conditions are applicable on your EIA application for mining operations.** **Kindly forward any information or decisions on the project to The Northern Cape Department of Agriculture, Land Reform and Rural Development, The Head of Department- Mr L.M.M. Wa Modise, Private Bag X5018, Kimberley, 8300, Attention Ms T. Mmereki. It would be appreciated if an electronic copy would be send to mmerekit@ncpg.gov.za.** **Page 2 of 2** **The Department trust you would find above acceptable and kindly contact the Department if any additional information is needed.**		
Traditional Leaders					

Dept. Environmental Affairs					
Other Competent Authorities affected					
SANRAL	**X**				
Transnet	**X**				
OTHER AFFECTED PARTIES					
SAHRA			**SAHRA requests that an assessment of the impacts of all planned invasive activities on heritage resources that complies with section 38(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA) as required by section 38(8) of the NHRA and section 24(4)b(iii) of NEMA be conducted as part of the EA process.** **The assessment must include an assessment of the impact to archaeological and palaeontological resources.** **The assessment of archaeological resources must be conducted by a qualified archaeologist and the report comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports (see www.asapa.co.za or www.aphp.org.za for a list of**		**Annexure D**

		qualified archaeologists). **The palaeontological report must be conducted by a qualified palaeontologist and the report comply with the 2012 Minimum Standards: Palaeontological Component of Heritage Impact Assessments (a list of qualified palaeontologists can be found at https://www.palaeosa.org/heritage-practitioners.html). The PIA must take into consideration the depth of the trenches and pits when conducting the assessment.** **Any other heritage resources as defined in section 3 of the NHRA that may be impacted, such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.** **The draft EIA and appendices must be submitted to SAHRA at the beginning of the public review process so that an informed comment may be issued.** **Should you have any further queries, please contact the designated official using the case number quoted** **above in the case header.**		

INTERESTED PARTIES				
None				

7.4 Environmental Attributed Associated with the Project and Alternatives

7.4.1 Baseline Environment Affected By The Proposed Activity

7.4.1.1 Geology of the Area

Rocks of the area are composed of pink white and grey fined-grained porphyritic granitic types which are the oldest rocks of the Swazian Erathem in the area.
The Schmidtsdrif Subgroup forms the lower part of the Ghaap Group and is divided into two formations (Boomplaas and Clearwater Formations) of approximately 100 m thick. In the middle of the formation shale becomes more predominant and ferruginised shale greywith siltstone and interbanded thin dolomite. Chert and chert conglomerate are present at the base. The upper formation consists of calcretic dolomite with few stromatolites and thin banded shale and siltstones (Beukes, 1987). The Ghaap Plateau Formation can be distinguished from the underlying formation only where the quartzite is present on the latter. Elsewhere the rocks consist of dark blue finegrained dolomite. A few stromatolite-bearing zones, small lenses of black chert locally developed in thin shale and siltstone are present. Brown ferruginous jasper layers up to 12 m thick, separate the lower part of the formation from the overlying grey coursegrained dolomite. A Breccia of black chert and a few stromatolites occur in the dolomite.

A third zone can be distinguished in the upper part of the formation. It contains lenses of limestone and a prominent layer of chert forms the top of the succession. The layer of chert occurs sporadically on the Maremane anticline where it is brecciated in places to form the silica breccia (Moen et al., 1977). Asbestos Hills Subgroup is the sole representative of the Ghaap Group in this area and follows conformably on the underlying rocks. The formation is divided into the Kuruman 41 and Danielskuil Formations. The uppermost chert of the Ghaap Group grades into banded iron formation of the Kuruman Formation which varies in thickness from 180 m to 240 m. It consistes of a succession of thin alternating layers of light coloured chert and jasper and dark coloured ferruginous jaspilite. The jaspilite contains mainly magnetite, haematite and limonite. A few thin layers of riebeckite-amphibolite and shale occur in places. The rock has well developed bedding plane cleavage and contains several crocidolite bearing zones. The basal layer of the banded iron formation lies on the dolomite of the Ghaap Plateau Formation in the Maremane anticline, is brecciated and ferruginised in places and constitutes the Blinkklip Breccia (Moen et al., 1977).

The “Main Marker” with a thickness of approximately 10 m, lies conformably on the banded iron formation (BIF) and forms the base of the overlying jaspilite. It is characterized by an undulating structure and consists of brown jaspilite with thin magnetite layer and chert nodules. The overlying jaspilite attains a thickness of 150 m and contains several marker layers. Several “speckled markers” are present in the lower 40 m of the succession, of which only the upper one is indicated on the map. In the south a layer of eolithic chert with the appearance of quartzite is associated with the upper speckled marker. The two together are known as the quartzite marker. The intermediate quartzite maker occurs between lower speckled markers (Moen, 1977). The Gamagara Formation was deposited on the Maremane anticline and rests unconformably on dolomite and the BIF of the underlying strata Ghaap Plateau Formation. The succession consists of a basal conglomerate with pebbles of jasper and banded iron formation, shale and white to brown quartzite. The Makganyene Formation lies unconformably on the Gamagara Formation and has a maximum thickness of less than 480 m. Tillite occurs at the base of formation and contains fragments of black, white and red chert in a reddish brown sandy ground mass. Higher up in the succession, alternating layers of grit, tillite, and silicified mudstone and feldspathic quartzite occur. Dolomite or limestone occur interbanded in mudstone (Moen et al., 1977).

The Ongeluk Formation forms the lower part of the Olifantshoek Group. The formation consists of greyish-green andesitic lava with amygdales and lenses of red jasper. The Voëlwater Formation overlies the Ongeluk Formation and has a thickness of 450 m. The lower beds are banded iron stone and banded red jaspilite with chert, dolomite and lava. The upper portion of the succession consists predominantly of dolomite with chert, banded jasper and lava (Moen et al., 1977). The Lucknow Formation occurs east of the Olifantshoek Group in

the Korannaberg where the strata are disturbed by a number of faults Fig 5. It lies unconformably on the Voëlwater Formation and is absent in places in the north. The formation has a maximum thickness of 1500 m. The lower portion consists mainly of shale with subordinate layers of quartzite and lava and an upper portion of whitish quartzite with lenses of flagstone and dolomitic limestone. The Hartley Formation, the upper part of Olifantshoek Group, follows conformably on the Lucknow Formation with a basal conglomerate containing pebbles of quartzite, jaspilite and lava. It is overlain by andesitic lava which contains amygdales, tuff, breccia and pebbles of quartzite (Moen et al., 1977). The Matsap Subgroup lie conformably on the Hartley Formation but in places is found unconformably on the Voëlwater Formation in the Korannaberg. Three members were recognized. They consist predominantly of sub-greywacke and purple, grey and brown quartzite with thin pebble beds and a layer of conglomerate in which quartz, banded iron formation and red jasper pebbles are abundant. The Brulsand Formation consists mainly of quartzite with subordinate shale and subgreywacke. Together with the Matsap Subgroup they form the Volop Group with a thickness of 500m (Moen et al., 1977).

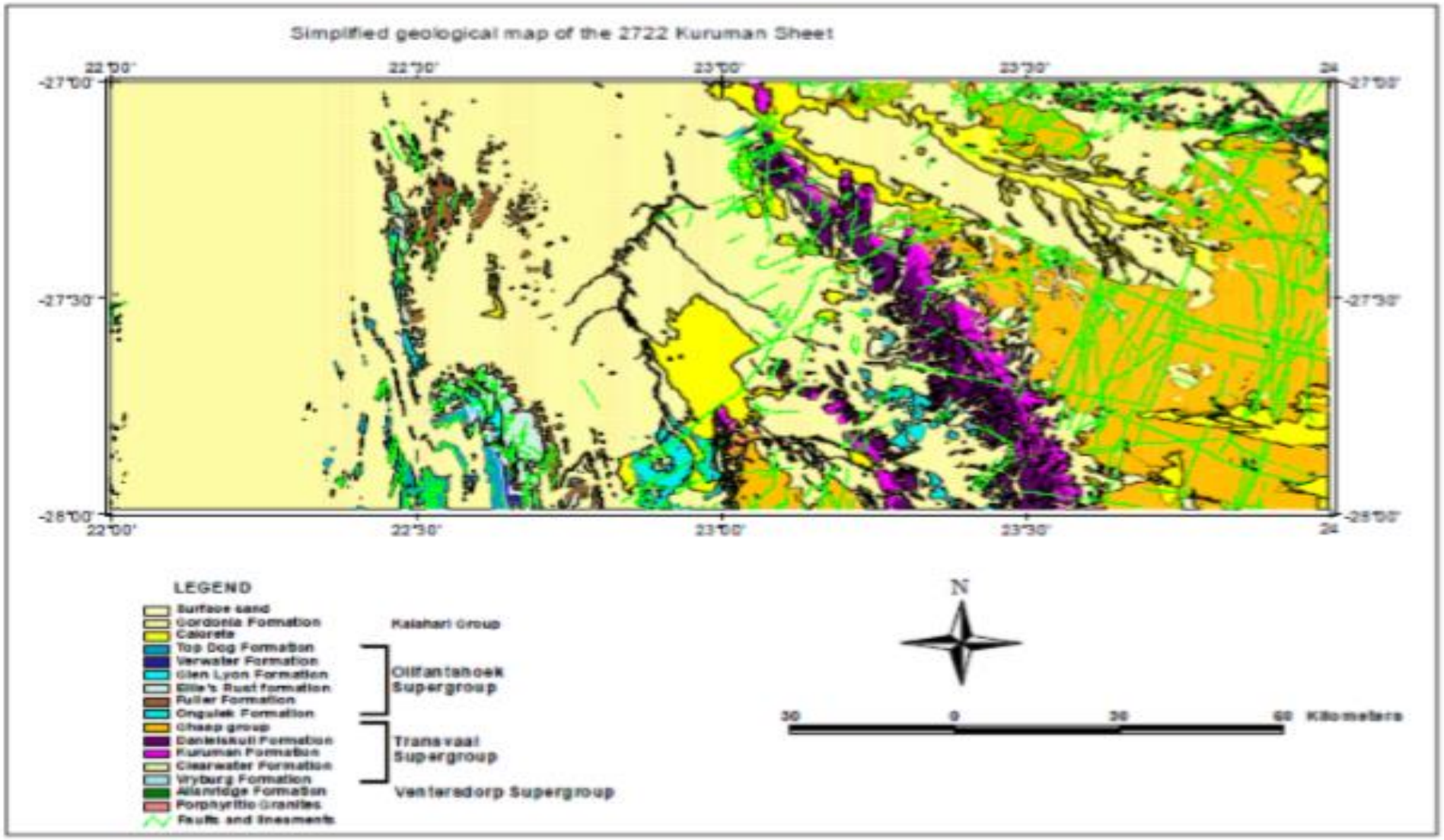


Figure 5: ***A simplified geological area of Kuruman (after Moen, 1979)***

Table 8: Lithostratigraphic column of the Kuruman Area

STRATIGRAPHY				DESCRIPTION	MAGNETIC EVENT
				Red to flesh-coloured wind-blown sand	
				Rubble	
				River-sand and gravel	
				Surface limestone	
OLIFANTSHOEK SUPERGROUP (±2 223-2 216 MA)	BRULPAN GROUP		Groblershoop Fm	Quartzite, quartz-sericite schist	Dolerite dykes
	VOLOP GROUP	Brulsand SBGRP	Top dog Fm	White, grey and pink quartzite with subordinate brown subgreywacke	
			Verwater Fm	Grey quartzite with nodule of and lenses of haematite	
		Matsap SBGRP	Glen Lyon Fm	Brown subgreywacke and conglomerate	
			Ellie's Rust Fm	Quartzite and subgreywacke	
			Fuller Fm	Quartzite, subgreywacke and conglomerate	
		Hartley Fm		Andesitic lava with interbedded tuff, agglomerate, quartzite and conglomerate	
		Lucknow Fm		Quartzite, dolomitic limestone; shale and lava	
	MASBURG GROU	Voëlwater SBGRP		Red jasper, dolomite, chert and lava	Basic lava
		Ongeluk Fm		Amygdaloidal andelisitic lava with interbedded tuff, agglomerate, chert, red jasper	
TRANVAAL SUPERGROUP (±2 224-2 219 MA)		Makganyene Fm		Diamicite, banded jasper, siltstone, mudstone, sandtone grit and dolomite	
	GHAAP GROUP	Campbell Rand SBGRP	Monteville Fm	Dolomite; quartzite	
		Asbestos Hills SBGRP	Danielskuil Fm	Yellow-brown jaspilite with crocidolite; conglomerate	
			Kuruman Fm	Banded Iron formation, subordinate amphibolite, crocidolite, jaspilite and chert	
		Schmidtsdrif SBGRP	Clearwater Fm	Conglomerate, chert ans dolomite, shale	
			Boomplaas Fm	Oolitic and stromatic dolomite and dolomite with chert and quartzite lenses	
	Vryburg Fm		Quartzite, grit, conglomerate, shale amygdaloidal lava		
VENTERSDORP SUPERGROUP (±2 714 MA)			Allanrigde Fm	Andesitic lava, amygdales and agglomerate	Andesitic lava

Porphyritic granite (basement)	

7.4.1.2 Land Use and Soil

The land use and land cover of the area can be classified into three classes. These are: grazing land, forest and bushveld land. Most of the area is bare land, with thin soil layer between fractures and also covered by thin vegetation which was used for grazing by the farmers. Currently, major land uses in the region include activities related to mining, game-farming and agriculture. The land capability for the study site is non-arable with low potential grazing land. The agricultural region is demarcated for cattle farming. It is expected that there is continued use of fertiliser on the agricultural land. Furthermore, there are relatively high levels nutrients such as nitrates and bacteria such as *E.coli.* It is well documented that *E.coli* may be found in water sources, such as boreholes, that may be contaminated with faeces infected humans and/or with dung from infected animals.

Currently, the farm is utilised as natural pastures for cattle, sheep, goats and a few horses.

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of mining operations, soil is even more significant if one considers that mining is a temporary land use where after rehabilitation (using soil) is the key to re-establishing post closure land capability that will support post closure land uses.

Mining projects have the potential to damage soil resources through physical loss of soil and/or the contamination of soils, thereby impacting on the soils' ability to sustain natural vegetation and altering land capability. Contamination of soils may in turn contribute to the contamination of surface and groundwater resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration

The soil study indicates that the soil form associated with the BOTSHELO T AND G MINING RESOURCES (PTY) LTD is Hutton. The Hutton soil form comprises the following characteristics:

- homogeneous texture, structure, and soil depth;
- reddish brown a pedal sandy topsoil on yellowish red apedal sandy subsoil;
- low clay content; and
- it consists of deep (1.5m) windblown sand and therefore drains rapidly.

7.4.1.3 Climate

The area of interest is situated approximately 25 Km to Hotazel and about 100 Km to Kuruman. The climate is predominantly semi-arid with low rainfall and high evaporation. Climate plays a vital role in determining the availability of water resources, the nature of the natural landscape and vegetation types. Temperatures are high during the summer and low during the winter. The coldest months are experienced from June to August while the hottest months range from September to March. The average daily temperatures range from 18.5°C in June, to 35°C in January. The mean maximum average temperature during the summer months range from 27 to 34°C, while during the winter months the mean average minimum temperature range from between 5.6 and 7.4°C. The average rainfall is 427 mm. The area also experiences extreme events on a regular basis, including frost, hail, drought, and high speed winds. Prevailing winds are north-westerly with an average speed of 15km/h, between the driest and wettest months; the difference in precipitation is 73 mm. During the year, the average temperatures vary by 15.3 °C.

Climate can influence the potential for environmental impacts and related mine design. Specific issues include:

- rainfall could influence erosion, evaporation, vegetation growth, rehabilitation planning, dust suppression, and surface water management planning;
- temperature could influence air dispersion through impacts on atmospheric stability and mixing layers, vegetation growth, and evaporation which could influence rehabilitation planning; and
- wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

7.4.1.4 Topography

The area is characterised by a flat topography with gentle slope towards the North West. The elevation is approximately 1 077m. The terrain morphological class of the area can be described as plains with high relief, either moderately or strongly undulating. The area lies at an altitude of 1145 meters above sea level, with the highest elevations (1 213m) occurring in the north east corner. Matlhwareng River flows westward, and traverses south of the Project area.

7.4.1.5 Ecology

The propose development site is located approximately 10 Km north east of Hotazel in the Northern Cape. The study area falls within two vegetation types, namely, Kuruman Thornveld and Kuruman Mountain Bushveld (Mucina & Rutherford 2006). Vegetation types can be categorised according to their conservation status, which is in turn, assessed according to the degree of the transformation relative to the expected extent of each vegetation type. The status of a habitat or vegetation type is based on how much of its original area still remains intact relative to various thresholds. The original extent of a vegetation type is as presented in the national vegetation map (Mucina & Rutherford 2006) and is the extent of the vegetation type in the absence of any historical human impact. On a local scale the various habitat types or vegetation communities may have varying degrees of sensitivity or conservation value owing to their particular species composition of habitat structure.

Much of the site has been overgrazed resulting in the encroachment of *Senegalia mellifera* causing vegetation transformation in terms of species composition and structure. The extended drought in the area has exacerbated the effects of the long term overgrazing. These factors contribute to the disruption of ecosystem function and habitat transformation across the property. Although much of the site falls within an identified Ecological Support Area (ESA), the extensive degradation and encroachment of *S. mellifera* has resulted in the disruption of the ecosystem function. Although ESAs do not need to be completely natural, they must be kept at least semi-natural so that they retain their ecological functioning. It should be noted that the CBA map was developedwithout extensive field investigation and it is unlikely that this area has been ground truthed, to determine ecosystem functionality. With the state of over utilization, species compositional change, bush encroachment and lack of natural faunal species it is doubtful that ecological function is being maintained within this area. The conservation value and sensitivity of this area is greatly reduced. There are some pans within this section of the property and their sustainability given the degradation of habitat in the areas immediately surrounding them is concerning.

Generally pans are considered high sensitive no go areas. The pans on the eastern boundary fall with a CBA 2 and should thus be excluded from any mining or mining related activity. In order for them to maintain some functionality they will require an adequate buffer zone extending into a viable ecological corridor linking the adjacent pans. This ecological corridor should form part of the buffer zone.

There was little to no evidence of faunal species on the property and given the disturbance to the vegetation, the fauna that are likely to occur would be composed of widespread generalist species.
It is highly unlikely that species of conservation concern are present in the area. Overall the site has few floral species or features of concern, there are however some protected trees which occur on site. The presence of

these species does increase the conservation worthiness of the area, however these trees do not occur in high densities within the study area.

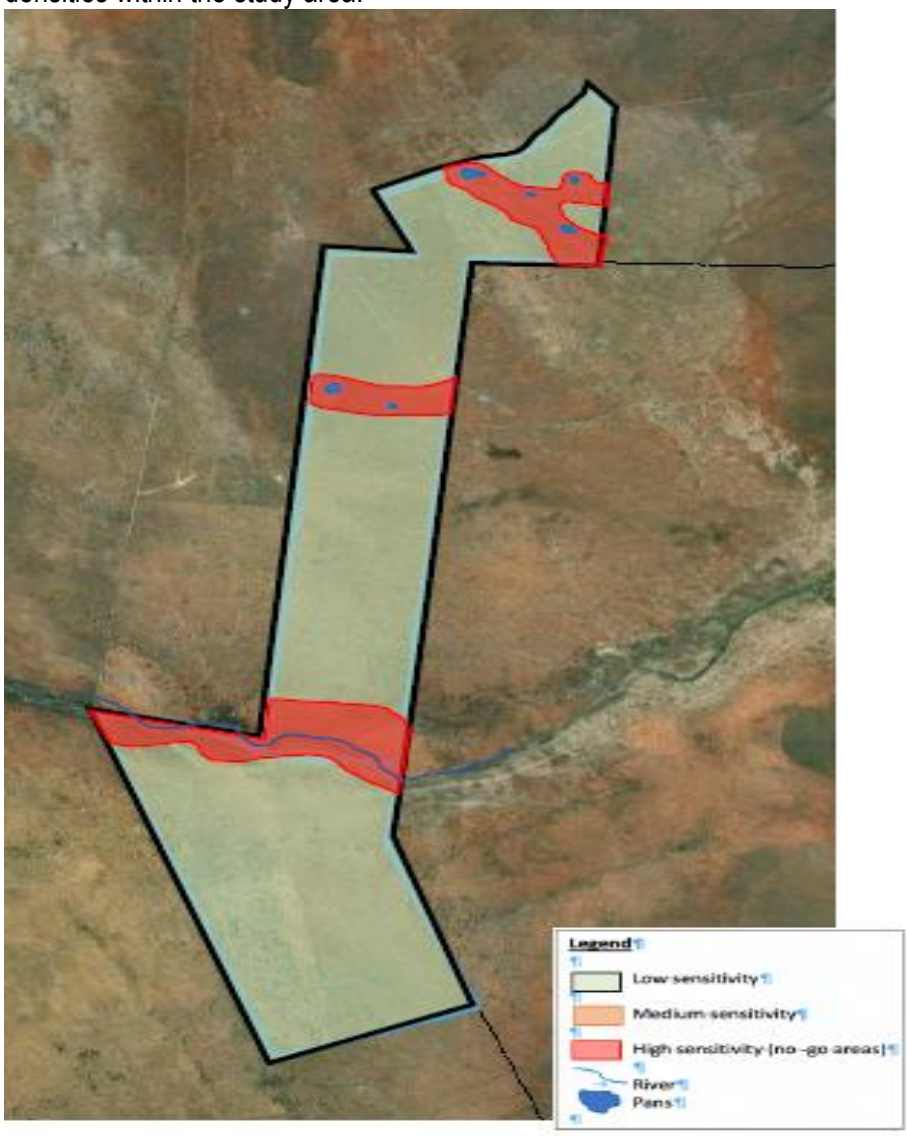


Figure 6: Site Sensitivity map of farm Gasesa 272 and Titanic 773 (Source: Ecological Management Services)

Flora

This area forms part of the Savannah Biome and falls within the Kalahari Bushveld Ecosystem Group, the site contains three of the vegetation types found in the Kalahari Bushveld Ecosystem Group, namely, Kuruman Thornveld and Kathu Bushveld. The Kuruman Thornveld is also listed as least threatened, 2% is considered transformed but it is not conserved in statutory conservation areas. Kathu bushveld is classified as least threatened (target 16%), however this vegetation types not well conserved more than 1% has already been transformed, threats are from mining and to a lesser extent heavy grazing pressure. The vegetation is extensively invaded by *Senegalia mellifera*, and contains little to no ground cover. Very few grass species are present most likely as a result of the prolonged drought and considerable overgrazing. Overall plant species diversity was notably reduced and in some areas was comprised of only three or four species. Tree and shrubs such as *Vachellia erioloba, Lycium hirsutum, Tarchonanthus camphoratus,* and *Vachellia hebeclada,* were

noted within this vegetation type. *Aristida meridionalis, Eragrostis lehmanniana*, *Sporobolus spp*, *Tribulus zeyheri, Lantana rugosa, Aptosimum spp, Felicia spp*, and *Phaeoptilum spinosum* were also noted to occur.

Occurring within this vegetation type are a number of pans here the limestone layer is exposed. The most prominent species surrounding these pans include the trees *Searsia lancea, Vachellia karroo, Ziziphus mucronata* and *Senegalia mellifera*. The grass layer was cropped extremely short and consisted mostly of *Cynodon dactylon*.

The Kuruman Mountain Bushveld occurs on the rolling hills within the study area, in its natural state it forms an open shrubveld, however *Senegalia mellifera* has encroached in areas to form a thicket. The grass layer is has largely been removed as a result of overgrazing and drought, where grass occurs it has been closely cropped. *Senegalia mellifera* dominates this vegetation type however other species such as, *Searsia lancea, Searsia ciliata*, *Anthephora pubescens, Geigeria ornativa,* and *Helichrysum cerastiodes*, were noted.

The most distinctive trees in the area are the Camel Thorn (*Acacia erioloba*) and the Camphor Bush (*Tarchonanthus camphorates*). Other prominent trees are the Portly Baobab (*Adansonia digitata*) and the Candelabra tree (*Euphorbia ingens*).

Owing to the narrow temporal window of sampling some species may not have been recorded, this however does not preclude them from occurring within the development site. Species that could possibly occur have been included in the species checklist. It is therefore recommended that prior to clearing an additional walk through is conducted. In order to remove species listed in Schedule 1 & 2 of the NCNCA, during site clearing activities an integrated permit application will have to be made to the DENC to obtain the required permission to remove and/or translocate these species from site. In order to remove the protected trees a license application will have to be made to the Department of Forestry.

This area forms part of the Savannah Biome and falls within the Kalahari Bushveld Ecosystem Group, the site contains three of the vegetation types found in the Kalahari Bushveld Ecosystem Group, namely, Kuruman Thornveld and Kuruman Mountain Bushveld. The Kuruman Thornveld is listed as least threatened, 2% is considered transformed but it is not conserved in statutory conservation areas. The Kuruman Mountain Bushveld vegetation type is also listed as least threatened, it is not conserved in statutory conservation areas, however, very little is considered transformed.

The proposed development area falls within a River FEPA (Fresh Water Ecosystem Priority Area) for the Molopo River water management area and an Upstream Management Area (see Appendix 2 for map). Although FEPA status applies to the actual river reach within the sub-quaternary catchment the surrounding land and smaller stream network needs to be managed in a way that maintains the good condition. Upstream Management Areas are sub- quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs. There are also a number of identified wetlands (pans) and a FEPA wetland cluster on the eastern boundary of the study area. According to the Mining and Biodiversity Guidelines (Appendix 2), a biodiversity priority area falls within the proposed mining area and is associated with the wetland cluster on the eastern boundary of the property.

Focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large protected areas. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the National Protected Area Expansion Strategy 2008 (NPAES). They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES, and were designed with strong emphasis on climate change resilience and requirements for freshwater ecosystems.

No important bird areas fall within or surrounding the project site.

The study area falls within the Griqualand West Centre of Endemism (GWC) (Van Wyk & Smith, 2001). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics. Centres of endemism are important because it is these areas, which if conserved, would safeguard the greatest number of plant species. They are extremely vulnerable; relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-restricted species. The GWC is one of the 84 African centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The GWC is considered a priority in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood.

Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority. The area contains a Critical Biodiversity Area Two (CBA 2) and an ecological support area (ESA) covers most of the property. The CBA2 is associated within the wetland cluster. An ESA is an area that must retain its ecological processes. A biodiversity sector plan or bioregional plan should provide land-use guidelines for ESAs, generally CBA landuse guidelines propose no mining within ESAs and CBSs.

Fauna

The vegetation within the study area consists of an open to closed shrubland, with a low diversity in plant species composition. The study area and the areas immediately surrounding the study area is used as grazing land. Much of this area has been severely overgrazed which has resulted in a change of structure and plant species composition. These factors result in disturbances to the naturally occurring faunal species. Disturbances that alter the natural environment have two effects namely; it may cause the loss of certain species due to the destruction of habitat. It may also cause the influx of species previously unable to colonise an area owing to lack of suitable habitat or because they have been excluded through competition.

Owing to the degraded nature of the area, the faunal population in this area has been disturbed, there was little to no evidence of faunal species occurring within the property. Although it is not always possible to compile a complete list of species present on the property during a field survey, as many species that potentially occur on-site may not have been present/active when the survey was undertaken. Therefore, observations made during the site visit are largely in the form of tracks, sightings of burrows and scats. Very little evidence of faunal species and/or activity was visible within the study area. Emphasis was therefore placed on the habitat in order to determine potential occurrence of species of conservation concern.

7.4.1.6 Air Quality

The air quality of the pre-mining period is expected to have been of a better quality; however, the existing mines in the surrounding areas also contribute to the air quality degradation. The main concern in this regard would however be dust from the proposed diamond mining settling on surrounding areas. However, a dust control plan will be implemented for the proposed project in order to control any possible nuisance dust that might give rise from the surrounding. The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM_{10}), larger total suspended particulates (TSP) that relate to dust fallout, VOC, SO_2, NO_2 and gaseous emissions mainly from vehicles and generators. A change in ambient air quality can have health and/or nuisance impacts. Related mitigation measures focus on pollution prevention and monitoring.

7.4.1.7 Wetlands

A wetland as defined by the National Water Act refers to land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which under normal circumstances supports or would support vegetation typically adapted to life in water saturated soil. However, there are no wetlands in the region surrounding the project area.

The proposed Project area is in a low rainfall area and Sandstone and congloromate are a prominent feature of the geology and result in considerable linkage between surface and ground water systems.

There are some wetland pans that are found within some sections of the property, specifically, within the northern section of the study area. Generally pans are considered high sensitive No-Go areas.

7.4.1.8 Hydrogeology

According to the Hydrogeological Map of the Republic of South Africa (Sheets 2722 – Kimberly 1:500 000) the main water bearing strata in the area is an intergranular and fractured aquifer made up of sandstone and conglomerate rocks.

According to the map, groundwater resources are generally limited, with sustainable borehole yields ranging from 0.6 – 1.7 l/s. The groundwater quality is thought to be good, with total dissolved solids (TDS) of less than 300mg/l. In intergranular and fractured aquifers, the water occurs in both the upper weathered rock zone and the fractured but fresh rock formation below. These zones are in hydraulic contact. The regional aquifer system is defined as a Minor Aquifer System (Parsons, 2005) with low to moderate vulnerability to contamination. Minor Aquifer Systems can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability. The aquifer extent may be limited, and water quality may be variable. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and in supplying base flow to rivers.

Local Hydrogeology - Two types of aquifer systems have been recognized in the Project area, represented by:

- Weathered Aquifer - The Ecca sediments are weathered to depths between 5 – 15 metres below surface throughout the area. The upper aquifer, typically perched, is associated with this weathered zone and water is often found within a few metres of the surface (Hodgson, 2001). This aquifer is recharged by rainfall which infiltrates into the weathered rock and soon reaches an impermeable layer of shale, underneath the weathered zone. The movement of groundwater on top of this layer is lateral and in the direction of the surface slope (Hodgson, 2001); and

- Fractured Aquifer - The pores within the Ecca sediments are too well cemented to allow any significant permeation of water. All groundwater movement is therefore along secondary structures, such as fractures, cracks and joints. These structures are better developed in competent rocks such as sandstone, hence the better water-yielding properties of the latter rock type (Hodgson, 2001). It should, however, be emphasised that not all of the secondary structures are water-bearing. Many of these structures are closed due to compressional forces and the chances of intersecting a water-bearing fracture by drilling therefore decreases rapidly with depth.

Groundwater Levels and Flow Direction – Groundwater depths range from 0 to 150 mbgl. In general, groundwater follows the topographical setting of the area.

7.4.1.9 Local Hydrology

The proposed development by Botshelo T and G Mining Resources (Pty) Ltd is located in the Lower Vaal basin, quaternary catchment D41L. The Matlhwareng River traverses through the prospecting right application area. A 100m buffer is recommended on both river banks of the said river.

7.4.1.10Visual Amenity

Prospecting activities and associated infrastructure possess potential to impact negatively on the visual aspect of the environment. Dust that is going to be generated from the proposed prospecting activities is going to affect vision. Other visual impacts will be on the landscape character, scenic quality among others. ―Visual, scenic and cultural components of the environment can be seen as a resource, much like any other resource, which has a value to individuals, to society and to the economy of the region‖ (Oberholzer, 2005).

7.4.1.11Traffic

The area of application is located where there low traffic flows. However, the proposed development may increase traffic volumes in the locality. This is going to pose some risks to humans and animals. An increase in traffic volumes results in increase in air and noise pollution and possibility of accidents to occur.

7.4.1.12Socio-economic

The proposed development possess some potential to impact both positively and negatively to the socio-economic conditions of personnel in the locality and countrywide. The applicant is advised to adopt a recruitment policy. This policy must be implemented effectively in order to recruit suitable candidates in each role. The unemployment rate is going to be reduced in the area. The national revenue collector is going to benefit thereby strengthening the economy.

There is going to be an influx of labour into the area, which is a factor that may increase health and safety risks on local community members and to the proposed development. Also, job losses will lead to loss of income upon closure of the operations.

7.4.1.13Waste

Waste is expected to be generated as a result of the proposed development and associated activities. It is proposed that waste that is generated on site should be separated at source. Waste Separation at Source pertains to setting aside post-consumer dry recyclable waste and household generated garden waste for the purpose of re-use, recycling, composting, or further processing of these materials.
Enormous value in waste separation at source emanates from, among others, procurement, recycling materials that are well sorted and uncontaminated. A basic requirement to achieve this value is that as much as possible, and efficiently as possible, waste or materials are separated early in the recycling process. This is separating waste at source essentially.
In South Africa, waste management is governed by the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) which came into effect on 1 July 2009. Following the enactment of the NEM:WA, the Minister of Environmental Affairs established the National Waste Management Strategy (NWMS) to ensure the achievement the objectives of the NEM:WA. The NWMS was approved for implementation by the Cabinet in November 2011. The Waste Act supports the waste management hierarchy in its approach to waste management, by promoting cleaner production, waste minimisation, reuse, recycling and waste treatment with disposal seen as a last resort in the management of waste. There are a number of types of waste to be transported. Before any waste is transported, the person responsible for transporting such waste needs to

assess the nature as well as the requirements for a specific load if waste to be transported. Understandably the preparations for transporting building rubble for instance, would be different to that of medical waste.

7.4.2 Description of the current land uses.

The farm land in the broader region is mostly used for agriculture in the form livestock grazing, with many small-scale to large-scale mining operations found throughout the region. The site is covered with indigenous vegetation of mixed shrubland/grassland, as well as alien bushtrees. There is also historic evidence of mining activities around the site, in the form of shallow holes and spoil heaps that have eroded with time. The majority of the land area is used for cattle grazing and, as such, is degraded from its natural state. The proposed area is in close proximity of a non-perennial river, Matlhwaring River.

7.4.3 Description of specific environmental features and infrastructure on the site.

Please refer to section 7.4.1

7.4.4 Environmental and current land use map.

Currently, major land uses in the region include activities related to mining and agriculture. The land capability for the study site is non-arable with low potential grazing land. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 20 Ha/LSU.

Apart from the current prospecting right application, a portion of the property has been drilled in the past. Currently, the farm is utilised as natural pastures for cattle, sheep, goats and a few horses.

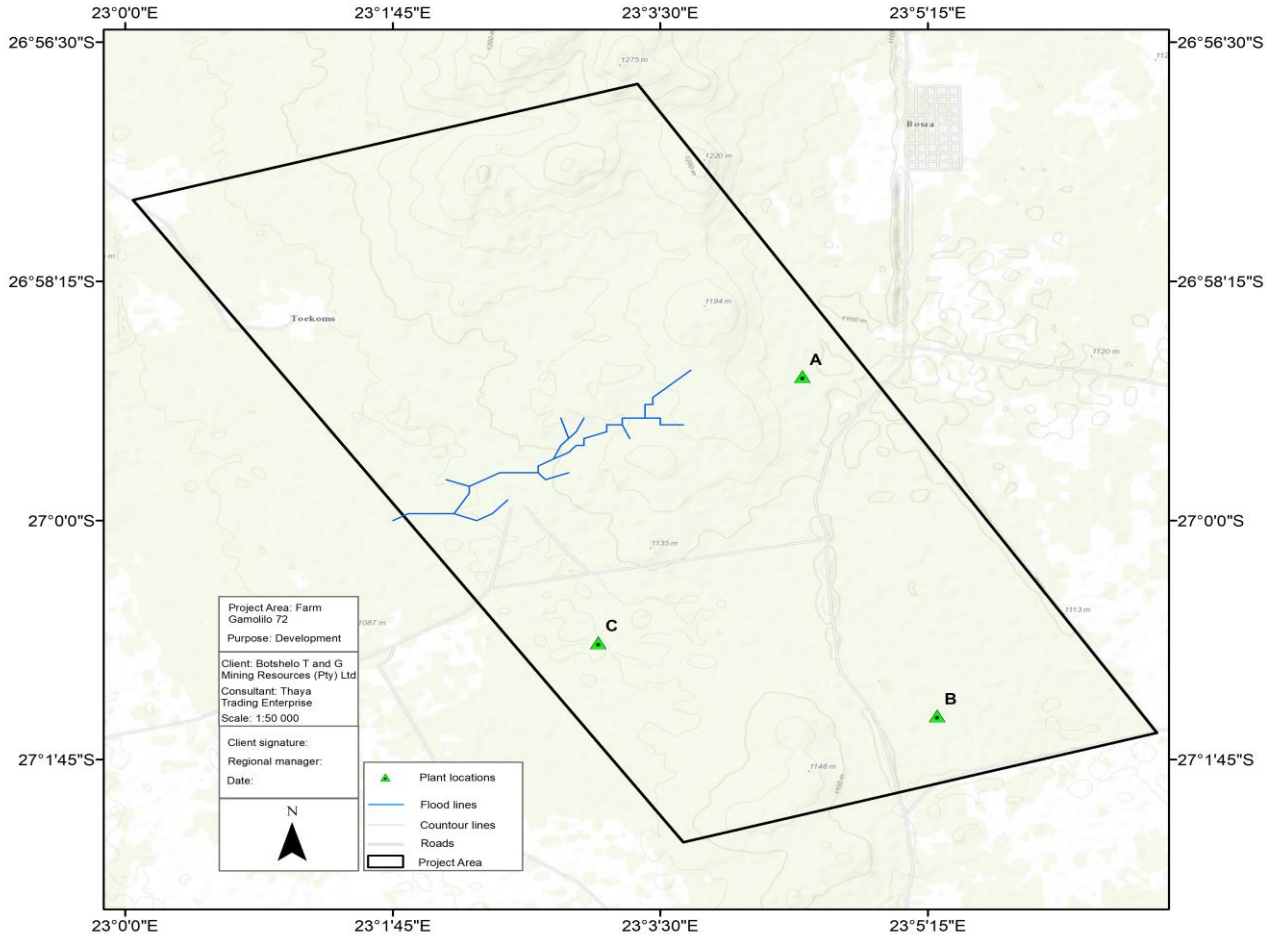


Figure 7: Current land use Map

7.5 Environmental Impacts and Risks Associated with the Alternatives

The identified potential impacts that are associated with the proposed development are presented in Table 8.

Table 9: Potential impacts identified

Environmental Factor	Nature of impact	Management
Geology and mineral resource	Sterilisation of mineral resources.	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of mine residue deposits.	Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface topography of excavations and plant site, and to stabilise the mine residue deposit.
Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Employ appropriate management strategies to preserve soil resources.
Land capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of Surface infrastructure and ineffective rehabilitation	Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Groundwater	Pollution of underground water sources and degradation of aquifers.	Construction of measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages	Frequent monitoring of surface water resources (Standing water). Prevention of overspill of mine associated activities into the surrounding drainage channels streams. Implementation of the necessary management programs to ensure the integrity of surface water (Standing water) resources.
Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Alien invasive plants	Proliferation of alien invasive plants species.	Eradicate, and control the spread, of alien invasive species.
Fauna	Displacement of fauna	Prevention of overspill of activities onto the surrounding ecological environment. Employ proper protection strategies.
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of	Prevention of overspill of mine associated activities onto the surrounding ecological

	ecosystem function.	environment. Employ proper protection and rehabilitation strategies.
Air quality	Sources of atmospheric emission associated with the prospecting operation are likely to include greenhouse gas emissions from vehicles, TMM's, fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Effective soil management; identification of the required control efficiencies in order to maintain greenhouse gas emissions, dust generation within acceptable levels.
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Minimise the generation of excessive noise an vibration; Ensure all vehicles and equipment is in a good working order; proper communication.
Visual impacts	Visual impact of the mine infrastructure excavations, mine residue deposits, and waste rock stockpile; visibility of dust.	Effective planning of the location of Infrastructure and operations to minimise visual impact.
Traffic	Potential negative impacts on traffic safety And deterioration of the existing road networks	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The deterioration of sites of cultural and Heritage importance.	Preservation and protection of heritage and Cultural resources identified within a no go zone; further resources uncovered during prospecting activities need to be reported to a suitably qualified Archaeologist and/or Palaeontologist.
Socio-economic	Negative: Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during mine closure.	Application of commitments made in the Social and Labour Plan; implementation of Community development programmes.
Interested and affected parties	Loss of income.	Ensure continuous and transparent communication with IAP's.
Interested and affected parties	Health and Safety	Control Access into the property; Fence may be erected around pits; Implement and monitor EMPR presented herein.
Waste	Pollution of the environmental.	Ensure effective Integrated Waste and Water Management Plan and environmentally friendly remediation of hydrocarbon-contaminated sites.
Disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.	Potential negative impacts on wildlife	Enter into amicable agreements that will promote wellbeing and protection of wildlife. Should there be necessity to relocate wild animals that should be done in sustainable, environmentally friendly and safe manner.
Impacts on	Potential negative impacts on agricultural	Enter into amicable agreements that will promote

Agricultural Activities	activities	wellbeing and protection of on-going agricultural activities. Should there be necessity to relocate wild animals, which should be done in sustainable, environmentally friendly and safe manner.

7.6 Methodology Used In Determining The Significance of Environmental Impacts

The impact significance rating methodology presented herein is in compliance with provisions of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, read in tandem with the Environmental Impact Assessment Regulations 2017 (as amended). The approach followed to determine significance rating is that of considering the consequence (*C*) of each impact (comprising Nature, Extent, Duration and Magnitude) and relate this to the probability/ likelihood (*P*) of the impact occurring as a product. This determines the significance of impact. In addition, other factors, including cumulative impacts, public concern, reversibility, and potential for irreplaceable loss of resources, are used to determine Priority. Priority is used as a guide for authorities and stakeholders to making informed decisions pertaining to the development approach. The impact assessment will be applied to all identified alternatives. For purposes of this study, Alternative A was considered because all other alternatives have somehow similar ecological setup to that of Alternative A. Where possible, mitigation measures will be recommended for impacts identified.

Impact Assessment, Rating and Mitigation

The criteria used to assess the significance of the impacts are discussed below. The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered.

These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance rating of the impacts was calculated by using the following formula:

The Significance Rating (*SR*) of an impact is determined by applying Consequence (*C*) of the particular impact and the Probability (*P*) of the impact occurring. Consequence is determined through the consideration of the Nature (*N*), Spatial Scope/Extent (*E*), Duration (*D*), and Severity (*S)* applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = (E+D+S) \times N$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Tables 10 to 14.

The criteria used to assess the significance of the impacts are shown in Tables 10 - 14. The different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. The limits were defined in relation to project characteristics. Those for severity, extent, duration and probability are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The Consequence value of the impacts was calculated by using the following formula:

CONSEQUENCE	*X*	*PROBABILITY*
N x(Severity + Spatial Scope + Duration)		(Frequency of activity + Frequency of impact)

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. These include roads and hauling, excavations, temporary waste dumping, topsoil storage, mine residue deposit dam, plant and processing area, temporary office, workshops and ablution facilities, water tanks, diesel tanks, pipeline, other temporary buildings, etc.

Significance of impacts is described as follows:

Very Low – Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low – Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Low – Medium: Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium – High: Impact would be real and rather substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible, but not necessarily possible without difficulty.

High – Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these factors.

Very High – Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

Table 10: Some Consequence Parameters

Weight	Severity	Spatial Scope/Extent	Duration
0	Insignificant/non-harmful	Activity specific/No effect/Controlled	Immediate (0 – 6 months)
1	Minimal / potentially Harmful	Slight permanent deviation / on-site	Short term / construction (6 months- 1 yr)
2	Medium / slightly Harmful	Immediate surroundings / local / outside mine area	Life of operation
3	High / Critical / Serious	Regional effect	Decommissioning
4	Catastrophic / major	National/ Severe environmental damage	Residual
5	Disastrous	Trans boundary effects	Permanent

Table 11: Probability Parameters

Weight		1	2	3	4	5
Frequency						
Probability	Frequency of Impact	Highly unlikely	Rare	Low likelihood	Probable/ Possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of Activity	Annually or less	6 monthly/temporarily	Infrequent	Half-life of operation	Life of operation

Table 12: Significance Rating (It could be positive or negative, depending on the nature of impact)

CONSEQUENCE (Severity + Spatial Scope + Duration)															
PROBABILITY (Frequency of activity + frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 13: Significance

Colour Code	Significance Rating	Value	Negative Impact Management Strategy	Positive Impact Management Strategy
	VERY HIGH	126 – 150	Improve current management	Maintain current management
	HIGH	101 – 125	Improve current management	Maintain current management
	MEDIUM – HIGH	76 – 100	Improve current management	Maintain current management
	LOW – MEDIUM	51 – 75	Improve current management	Maintain current management
	LOW	26 – 50	Improve current management	Maintain current management
	VERY LOW	1 – 25	Improve current management	Maintain current management

Table 14: The Rating System (Summary of Impact Rating Parameters)

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
+1	Positive	Likely to result in a beneficial impact.
-1	Negative	Likely to result in a detrimental impact.
SPATIAL SCOPE/EXTENT		
This is defined as the area over which the impact will be experienced.		
0	Activity Specific	The impact will only affect the activity and personnel working on it.
1	On-site	The impact will only affect the site.
2	Local or immediate surroundings outside project footprint	Will affect the local area or district.
3	Regional Impact	Will affect the Province
4	National	Will affect the entire country.
5	International	Will affect the Globe/Earth
FREQUENCY OF IMPACT		
This describes the chance of occurrence of an impact.		
1	Unlikely/Annually	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Rare/Temporary	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Relatively low likelihood/Infrequent	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Probable/Possible/Life of operation	Impact will most likely occur (Greater than a 75% chance of occurrence).
5	Definite/Certain/Life of operation	Impact will certainly occur (100% chance of occurrence).
FREQUENCY OF ACTIVITY		
This describes the chance of activity taking place.		
1	Annually of Less	The chance of the activity occurring is extremely low (Less than a 25% chance of occurrence).
2	6 Monthly or Temporarily	The activity may occur (Between a 25% to 50% chance of occurrence).
3	Infrequent	The activity will likely occur (Between a 50% to 75% chance of occurrence).
4	Frequently	Activity will most likely occur (Greater than a 75% chance of occurrence).
5	Life of Operation	Activity will certainly occur (100% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
0	Immediate	The impact is avoidable through conducting and implementing risk assessment.
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter, it will be entirely negated (0 – 2 years).
2	Medium to medium term/ Life of operation	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Medium term/Decommissioning	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).

4	Medium to Long term/Residual	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
5	Long term/Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ SEVERITY		
Describes the severity of an impact.		
0	Insignificant/ Non-harmful	Impact affects results of an performance an individual task.
1	Minimal/ Potentially Harmful	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium/Slightly Harmful	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High/Critical/Serious	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
4	Major/Catastrophic	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation
5	Disastrous	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
0	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
1	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
2	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
3	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question. Cumulative Impact: Considering predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures.		
0	Low cumulative impact	The impact would result in negligible/insignificant cumulative effects.
1	Medium cumulative impact	The impact would result in minor cumulative effects.
2	High cumulative impact	The impact would result in significant cumulative effects
PUBLIC RESPONSE		
1	Low public response	Issue has received relatively low public response
2	Medium Public Response	Issue has received relatively moderate public response
3	High Public Response	Issue has received relatively high public response

SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: **Nature x (Extent + severity + duration) x (frequency of impact +frequency of activity).** The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
1 to 25	Negative very low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
1 to 25	Positive very low impact	The anticipated impact will have negligible positive effects.
26 to 50	Negative low impact	The anticipated impact will have minor negative effects and will require minor mitigation measures.
26 to 50	Positive low impact	The anticipated impact will have minor positive effects.
51 to 75	Negative low to medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
51 to 75	Positive low to medium impact	The anticipated impact will have moderate positive effects.
76 to 100	Negative medium to high impact	The anticipated impact will have moderate to high negative effects and will require moderate to high significant mitigation measures.
76 to 100	Positive medium to high impact	The anticipated impact will have moderate to high positive effects.
101 to 125	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
101 to 125	Positive high impact	The anticipated impact will have significant positive effects.
126 to 150	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
126 to 150	Positive very high impact	The anticipated impact will have highly significant positive effects.
PRIORITY		
Priority is determined through consideration of other parameters that may relate to the proposed development however not necessarily forming part of the process followed to determine significance. Determination of priority is performed for purposes of assisting all stakeholders at decision-making level reach informed decisions. The calculation of Priority of an impact uses the following formula: **Priority = Public Response (*PR*) + Cumulative Impact (*CI*) + Reversibility (*R*) + Irreplaceable Loss of Resources (*LR*)**		
2	Very Low	The anticipated impact is of negligible effects and will require no attention.
3 to 4	Low	The anticipated impact is of minor effects and will require minor attention.
5 to 7	Low to Medium	The anticipated impact is of moderate effects and will require moderate attention.
8 to 10	Medium to High	The anticipated impact is of moderate to high priority and will require moderate to urgent attention.
11 to 12	High	The anticipated impact is of high priority and requires urgent attention.

7.7 Positive And Negative Impacts of The Proposed Activity and Alternatives

During construction and operation of the prospecting operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and excavations will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation will be stripped in preparation for placement of infrastructure and excavations, and therefore the areas will be bare and susceptible to erosion.
Protected trees should be avoided as far as possible during invasive prospecting activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow-growing protected trees as far as possible. Areas with high density protected trees should be regarded as "sensitive" it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.

A search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation will be done. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and Nature Conservation (DENC).

The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitation, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and operation of the prospecting there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusual unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resourced during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitation following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species will be destroyed during the prospecting operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to mining activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the mine and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The prospecting will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The prospecting operation, especially during construction, will create a limited number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the rural area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the prospecting, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact although this will only be a prospecting operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and regional economy with a high probability of occurrence, a high severity and a high significance.

Alternative C is located in proximity to a pan.

Positive impact includes employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

7.8 Possible Management Actions That Could Be Applied and The Level of Residual Risk

Some Possible Management Actions that could be applied are presented in Table 15.

Table 15 : Some Possible Management Actions

Issue and concern raised	Proposed management actions or alternative to address Issue	Impact significance of the possible management actions or alternative before and after management actions	
		Pre-mitigation	Post-mitigation
Adoption of Agenda	Thanked speaker and proposed adoption of house rules	Low	Low
Requested that cell phones be put on silent mode rather than being switched off	Consultant concurred.	Low	Low
A request was made to the effect that copies of environmental reports be placed at Tsineng Library for public review as well.	Consultant asked if Tsineng Library was accessible to the public; attendees replied to suggest that the library was accessible to the public. Consultant promised to place environmental reports at Tsineng Library for public review.	Low	Low
Are prospecting activities going to occur concurrently?	Prospecting Activities may occur concurrently depending on a number of factors such as granting of Prospecting Rights and Budget to mention but a few.	Low	Low
Is rehabilitation going to take place at the end of prospecting phase?	Simultaneous backfilling is going to take place with prospecting activities prior to ultimate rehabilitation in order to minimise hustle and cost of rehabilitation.	Low	Low
What is the duration of the prospecting phase?	An application has been made for a five year period subject to renewal. The prospecting phase may take a shorter period of time as well depending on many factors such as availability of resources and capacity to mention just a few.	Low	Low
Did you say that only 40 Ha out of approximately 11 000 Ha will be disturbed? Why?	Only approximately 40 Ha of the whole area per application will be disturbed at a time. The idea is to ensure that we disturb the environment in a sound and responsible manner and consider cost limitations as well in the process.	Low	Low
I see that we are given a 30 day period here within which we must make comment. Why?	The law requires that the public be given a 30 day period within which to make comments or give inputs or review environmental reports by law.	Low	Low
Why consider 40 Ha only out of 6 000 Ha instead of covering the whole area?	Only approximately 40 Ha of the whole area per application will be disturbed at a time. The idea is to ensure that we disturb the environment in a sound and responsible manner and consider cost limitations as well in the process.	Low	Low
Consider the current land uses and occupiers. There is livestock farming going on there.	Yes, the current land uses and occupiers have been considered. Arrangements will be made to ensure that the activities that take place on the farms continue to take place. Livestock may be moved to parts of the farm that are not going to be affected and so on.	Low	Low
Why not combine CPA owned land only and separate that from the privately owned farm?	Operations may occur on all three farms separately. However, that is yet to be finalised.	Low	Low

What is the involvement of other government departments in this process?	We apply to the Department of Water and Sanitation for Water Use License. The granted Environemntal Authorisation by the Department of Mineral Resources and Energy has to be reviewed by the Department of Environmental Affairs.	Low	Low
Why do you have to go through the Prospecting Phase whereas there is a positive report about the area of application available at the Council for Geosciences?	We do not know of the existence of such a report. It would be appreciated if you could share it with us. What we know is that we are working hard in order to generate a bankable geological report if possible.	Low	Low
The high illiteracy levels are a problem around Kuruman. Please may you establish a dadabase of locals (Tsineng Residents) in order to identify potential from them and empower our youth. Priority should be given to Tsineng residents and Youth.	The normal recruitment process is going to take place. However, mine authorities are aware of their social responsibility. There is no way they can leave Tsineng Residents out of the proposed development even though it is impossible to accommodate Tsineng Residents' individual needs.	Low	Low
Attendees concurred	Consultant proposed closure	Low	Low
What are the consultant's contact details?	Consulant can share them and they are always in the newspaper adverts and the environmental reports. You are encouraged to read local newspaper and review the environmental reports available.	Low	Low
Please advertise also on the Kalahari Bulletin as it is free to obtain	The consultant will do so. Thank you for the suggestion.	Low	Low

Geology and Mineral Resource

Level of risk: Low

Proposed Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning of the prospecting operations;
- The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources; and
- No dumping of materials prior to approval by exploration geologist.

Loss of Vegetation and faunal habitat

Level of risk: Medium to High

Proposed Mitigation measures

- Development planning must ensure loss of vegetation and disturbance is restricted to within the minimum and designated areas only;
- Vegetate and irrigate open areas to limit erosion, but take care not to promote erosion by irrigating;
- Removal of vegetation during construction and operation will be minimised to reduce the risk of excessive open areas occurring;
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no go zone;
- Adhere to existing roads, and if new roads are constructed, these must not cross sensitive areas such as the ridges or drainage lines;
- Protected plant or animal species encountered must be managed in accordance with an accepted management plan for these species;
- Apply for necessary licence and permit with DAFF and DENC;
- A full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance;
- Everyone on site must undergo environmental induction for awareness on not harming or collecting species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site;
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert; and
- Employ measures that ensure adherence to the speed limit to lower the risk of animals being killed on the roads.

Topography

Level of risk: Low to Medium

Proposed Mitigation measures

- Backfill all trenches/excavations continuously;
- Employ effective rehabilitation strategies to restore surface topography of excavations and plant site;

- Stabilise the mine residue deposits; and
- All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Low to Medium

Proposed Mitigation measures

- At no point may plant cover be removed within the no-development zones;
- All attempts must be made to avoid exposure of dispersive soils;
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased;
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible;
- The prospecting operation must co-ordinate different activities in order to optimise the utilisation of the excavated trenches and thereby prevent repeated and unnecessary excavations;
- Construction that required the clearing of large areas of vegetation and excavation should ideally occur during the dry season only;
- Construction during the rainy season (November to March) should be closely monitored and controlled;
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers;
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion;
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses;
- Excavated and stockpiled soil material are to be stored and bermed on theM higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate;
- Stockpiles susceptible to wind erosion are to be covered during windy periods;
- Audits must be carried out at regular intervals to identify areas where erosion is occurring;
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur;
- Rehabilitation of the erosion channels and gullies;
- The prospecting operation should land with steep slopes;
- Dust suppression must take place, without compromising the sensitive water balance of the area; and
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Generation of waste

Level of risk: Low to Medium

- All waste produced to be disposed of in permitted designated waste disposal site;
- Waste must be stored in designated areas for storage;
- Clearly demarcate and label appropriate storage for the different types of waste; and
- Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licenced landfill site.

Soil Pollution

Level of risk: Low

Proposed Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution;
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site;
- Hydrocarbon spill containing mats or pads should be utilised at workshop or under redundant machinery;
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures;
- All facilities where dangerous materials are stored must be contained in a bund wall;
- Vehicles and machinery should be regularly serviced and maintained.

Land Capability and Land Use

Level of risk: Low to Medium

Proposed Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities;
- Surface agreement to be signed with land owners;
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm;
- All activities to be restricted within the demarcated areas; and
- Ensure that land which is not used during construction is made available for grazing.

Groundwater

Level of risk: Medium to High

Proposed Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution;
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site;
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures;
- All facilities where dangerous materials are stored must be contained in a bund wall;
- Vehicles and machinery should be regularly serviced and maintained;
- Monitor the quality of the boreholes located down-gradient of the mining site; and
- Sample according to the sampling method and parameters for analysis is indicated in the Geohydrological study, when available.

Surface Water

Level of risk: Medium to High

Proposed Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution;
- Under no circumstances may ablutions occur outside the provided facilities;
- No uncontrolled discharges from the staff camps to any surface water resources shall be permitted;
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages;
- A walled concrete and roofed platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides;
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site;
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof;
- At all times care should be taken not to contaminate surface water resources;
- Store all litter carefully to prevent it from washing away or blown into any of the water courses within the area;
- Provide bins for staff at appropriate locations, particularly where food is consumed;
- The prospecting site should be cleared daily and litter removed;
- Conduct on-going staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution; and
- Some of these proposed mitigating measures may form part of an offset strategy for any loss of the Matlhwareng River riparian zone/natural seasonal streams due to the planned prospecting activities.

Wetland Assessment and Riparian Zone Assessment

Level of risk: Low to Medium

Proposed Mitigation measures

- If any prospecting activities are to take place within the delineated Matlhwareng River Riparian Zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998);
- A riparian zone offset area must be identified and rehabilitation measure implemented in the offset site as per the offset process;
- The operation must co-ordinate different activities in order to optimise the excavated trenches and thereby prevent repeated and unnecessary excavations;
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased;
- Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate;
- A storm water management plan must be implemented to ensure that dirty water is contained onsite;
- A storm water management plan must be implemented to prevent run-off from the stock piles;
- Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment;
- Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities;

- The operations must have spill procedures in place and specific awareness training. Spill kits from Dritzit or Enertech or Supazorb so if there is a spill it can be cleaned and treated as much as possible and report to authorities in 24 hours; and
- Clearly define roles and responsibilities of all personnel during spillage events;

Indigenous Flora

Level of risk: Medium to High

Proposed Mitigation measures

- Minimise the footprint of transformation;
- Encourage proper rehabilitation of mined areas;
- Encourage the growth of natural plant species;
- Ensure measures for the adherence to the speed limit;
- Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to mining;
- It is recommended that these plants are identified and marked prior to mining;
- These plants should, where possible, be incorporated into the design layout and left *in-situ*;
- However, if threatened of destruction by mining, these plants should be removed (with the relevant permits and license from DAFF and DENC) and relocated if possible;
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation; and
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

All Invasive Plants

Level of risk: Medium to High

Proposed Mitigation measures

- Minimise the footprint of transformation;
- Encourage proper rehabilitation of mined areas;
- Encourage the growth of natural plant species;
- Mechanical methods (hand-pulling) of control to be implemented extensively; and
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Medium to High

Proposed Mitigation measures

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall mining footprint;

- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance;
- The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors;
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site;
- The ECO must ensure that all contractors and workers undergo environmental induction prior to commencing with work on site;
- The environmental induction should occur in the appropriate languages for the workers who may require translation;
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert; and
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Medium to High

Proposed Mitigation measures

- Prospecting activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type; and
- The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Impact on health and safety of humans

Level or Risk: Low to Medium

Proposed Mitigation measures

- Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act;
- Workers to wear Personal Protective Equipment (PPE); and
- Hazardous material must be correctly labelled and handled in a safe manner.

Air Quality

Level of risk: Low to Medium

Proposed Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken;

- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression;
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads;
- The length of time where open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed;
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time; and
- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Low to Medium

Proposed Mitigation measures

- Restrict prospecting activities to daytime unless agreements obtained to do 24hr operations;
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events;
- Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations;
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints; and
- Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Low

Proposed Mitigation measures

- Infrastructure should be placed to optimise the natural screening capacity of the vegetation;
- Where practical, protect existing vegetation clumps during in order to facilitate screening during the prospecting operation;
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional unsightly elements;
- Locate the staff camps and the material stockpiles outside of the visual field of sensitive visual receptors;
- Dust suppression procedures should be implemented especially on windy days during earth works;
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species; and
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Very low

Proposed Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Medium to High

Proposed Mitigation measures

- The heritage and cultural resources (e.g. graveyards, ruins, historic structures, fossils etc.) must be protected and preserved by the delineation of a no-go zone if any of these areas are to be found in the prospecting area;
- Intact bedrock strata should be avoided during mining of terrace gravels where possible;
- Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction;
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction; and
- A buffer zone 100 m away from the heritage resources identified may be created;

Socio-Economic

Level of risk: Low to Medium

Proposed Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation;
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants;
- Contractors and employees should not be permitted to wander outside the mining area;
- Uncontrolled settlement of contractors and workers outside of the site will be prevented;
- The expectations of what benefits can occur to the community must be managed from the initiation of the project; and
- Commitments as set out in the SLP must be attained.

Interested and Affected Parties

Level of risk: Low to Medium

Proposed Mitigation measures

- Maintain active communications with IAP's;
- Ensure transparent communication with IAP's at all times;
- IAP's must be kept up to date on any changes in the prospecting operation; and

- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

Waste

Level of Risk: Low to Medium

Proposed Mitigation Measure:

- Applicant to compile an Integrated Water and Waste Management Plan;
- Identify Waste streams on site and conduct waste classification at an appropriate time;
- Design storm water management plan;
- Compile, Implement and Monitor and Effective Waste Management Plan;
- Design an environmentally friendly remediation of contaminated sites management plan;
- Appoint a competent contractor to handle waste on site;
- Divert clean water around the site and collect storm water into a containment facility;
- Conduct further analyse of waste rock during operation to determine geochemical properties;
- Sewage Septic Tanks should be inspected and serviced regularly;
- All waste produced to be disposed of in permitted designated waste disposal site;
- Waste must be stored in designated areas for storage;
- Clearly demarcate and label appropriate storage for the different types of waste;
- Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licenced landfill site;
- Waste will be collected in colour coded / clearly marked bins;
- Waste must be classified according to the risk that it poses;
- Containers will be placed at strategic points throughout the mining operation site;
- Waste classification is based on the concept of risk. The severity of the risk posed to the environment must be determined as well as the degree of control necessary during disposal;
- The Waste Management Procedure shall be used as a guideline document for classification;
- Hazardous waste must be placed in a suitable bin in accordance with its properties and characteristics;
- Storage must be based on compatibility of raw materials and waste accordingly;
- Containers will be placed at strategic points throughout the prospecting operation site;
- Separation at source strategy must be implemented;
- Waste will be collected in colour coded / clearly marked refuse bags and / or bins;
- Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site;
- Used oil will be recycled as far as possible;
- Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site;
- Garden refuse is transported to the nearest composting site;
- Rubber and contaminated waste is disposed to a licensed landfill site;
- Queries regarding waste classification must be directed to the ECO;
- Scrap metal, electric cable and used conveyor belts are weighed separately and transported to site or recyclers;
- Hazardous waste is disposed to a suitably licensed landfill site;
- SAWIC may be used to register generated waste at all times;
- Document control and proper filing must be in place;
- Waste disposal certificates must be provided by the contractor for each load of waste removed from site and each load disposed to a licensed landfill site;

- Waste tyres: removed from site by service provider and handles according to Waste Tyres Regulations and Integrated Waste Tyre Management Plan;
- There should be constant communication between the ECO and various suppliers of all consumables on site for smooth handling of their waste, information sharing and record keeping; and
- Some waste may be used to backfill excavated areas.

Agriculture

Level of Risk: Medium to High

Proposed Mitigation Measures:

- Botshelo T and G Mining Resources (Pty) Ltd to enter into amicable agreements with personnel who practice agriculture currently;
- The agreements to be signed have to take into consideration sustainable development, environment and safety among other factors;
- Relocate livestock, if necessary, in a manner which is sustainable, safe and protects the health of animals;
- Eliminate, minimise or control dust generation;
- The area of application must be properly fenced; and
- Access into the mining area must be controlled.

Impact on Wildlife

Level of Risk: Medium to High

Proposed Mitigation Measures:

- The area of application must be properly fenced;
- Access into the mining area must be controlled;
- Wildlife should be relocated if endangered; and
- Speed limits set on the mine and in the surroundings must be kept at minimum.

7.9 Motivation Where No Alternative Sites Were Considered

The locality of the prospecting operation is based on the location of the possible diamond, Iron and Manganese deposits that have been identified through minimal exploration activities thus far. There is therefore no other alternative with regard to the overall operation footprint.

The location of the central prospecting site and associated infrastructure is primarily based on proximity to the access roads, proximity to the areas earmarked for prospecting and limited additional impact on the environment and heritage resource.

The prospecting activities and methodologies associated with diamond mining (i.e. open pits with continued backfilling) is the only economic viable method currently being used by the diamond fraternity. There is no alternative prospecting method for the prospecting of diamonds. Noteworthy, diamond kimberlite, if encountered, will be dealt with accordingly.

7.10 Statement Motivating The Preferred Alternative

The site layout would have to be determined by taking into consideration factors such as specialist report inputs (when available), spatial and practical mining operation aspects. Considering the nature of commodity of interest, security measures will be considered in order to determine the final site layout. Alternative A, B and C have comparative ecological setting. That makes alternative A the preferred alternative.

8 Full Description Of The Process Undertaken To Identify, Assess And Rank The Impacts and Risks The Activity Will Impose On The Preferred Site Through The Life of The Activity

8.1 Description of The Process Undertaken To Identify Impacts

Environmental and socio-economic impacts associated with the proposed development were identified using desktop study information, through phase 1 field surveys that were conducted by Thaya Trading Enterprise, consultation with Interested and Affected Parties and related feedback and consideration of the project description and proposed site.

8.2 Description Of The Process Undertaken To Assess and Rank The Impacts and Risks

The assessment methodology enables the assessment of environmental issues in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated. This assessment method was used to assess impacts associated with all project alternatives.
The criteria used to assess the significance of the impacts are shown in Tables 10 – 14

8.3 A Description of The Environmental Impacts and Risks Identified During The Environmental Assessment Process

This section describes potential impacts on environmental and socioeconomic pertaining to each of the fundamental project actions / activities, processes that will be followed and associated infrastructure that will be used in the proposed development (Please see Table 16).

Table 16: Environmental Impacts and Risks Identified

Activity/process or part thereof	Impacts (Pre-mitigation)
Earthworks	Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels

	Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Mineralised ore and waste	Loss and sterilisation of mineral resources Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Non-mineralised waste	Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Water use and management	Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity

	General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Support services	Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Transport system	Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact

	Change in land use Alien invasive plants
Trenching and Pitting	Loss and sterilisation of mineral resources Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Use of Infrastructure and associated activities	Loss and sterilisation of mineral resources Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Final land forms	Loss and sterilisation of mineral resources Deep excavations and infrastructure, posing safety risks to personnel and animals Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Destruction of riverbanks and alteration of natural drainage patterns

	Contamination of surface water resources Contamination of groundwater resources Air pollution, greenhouse gas emissions, global warming Increase in disturbing vibrations and noise levels Negative visual impact Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Waste Economic impact Change in land use Alien invasive plants
Closure	Influx of labour Economic impact

8.4 Description of alternatives to be considered including the option of not going ahead with the activity

The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of Diamonds, Iron and Manganese Ores) present on these properties. In addition to this, should economical reserves be present and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.

9 Assessment of Each Identified Potentially Significant Impact and Risk

A list of identified potential significant impacts and risks is presented in Table 17.

Table 17: Assessment of Significant Impacts and Risks

Aspect	Activity	Potential Impact	Phase/s	Significance (Pre-mitigation)	Management actions type	Significance (Post-mitigation)	Impact management objectives
Geology	Mineralised waste Use of facilities and services prospecting final land forms	Loss and sterilisation of mineral resources	Planning Operational Decommissioning	Low	• Management through best practises	Low	Can be managed/mitigated to acceptable levels
Topography	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Deep excavations and infrastructure resulting in safety risks to third parties and animals	Planning Construction Operational Decommissioning	Low - Medium	• Control through access control; • control through management and monitoring; • control through rehabilitation; and • remedy through emergency response procedures • Concurrent backfilling	Low - Medium	Can be managed/mitigated to acceptable levels
Soil and land capability	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resources and land capability through contamination	Planning Construction Operational Decommissioning	Low - Medium	• Control through waste management practices; • control through rehabilitation; • control through appropriate design; and • remedy through emergency response procedures	Low - Medium	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and	Loss of soil resource and land capability through physical disturbance	Planning Construction Operational Decommissioning	Low - Medium	• Manage through limiting the project footprint; • manage through soil conservation procedures; and • manage through closure	Low - Medium	Can be managed/mitigated to acceptable levels

	Trenching; Final land forms				planning and rehabilitation		
Biodiversity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Physical destruction of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management though biodiversity action plan and offset (when relevant); • managing through limiting the project footprint; • management through rehabilitation; and • control through permits for removal	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	General disturbance of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management through alien invasive species programme; • management through training; • management through monitoring; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
Surface water	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Alteration of natural drainage patterns	Planning Construction Operational Decommissioning	Medium - High	• Management through storm water control; and • manage through monitoring water requirements	Low - Medium	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation	Contamination of surface water resources	Planning Construction Operational Decommissioning	Low - Medium	• Management through waste management practises; • management through	Low	Can be managed/mitigated to acceptable levels

	system; Use of facilities and services; Pitting and Trenching; Final land forms				monitoring; • management through compensation; and • remedy through emergency response procedures		
Groundwater	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of groundwater resources	Planning Construction Operational Decommissioning	Low - Medium	• management through monitoring; • management through compensation; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Deep excavation and pits	Lowering of groundwater levels and reducing availability	Operational	Medium - High	• Management through monitoring; and • management through compensation	Medium - High	Can be managed/mitigated to acceptable levels
Air quality	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Air pollution and Global Warming (Climate Change)	Planning Construction Operational Decommissioning	Low - Medium	• Manage through air controls and monitoring	Low - Medium	Can be managed/mitigated to acceptable levels
Noise & Vibration	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Increase in disturbing vibration and noise levels	Planning Construction Operational Decommissioning	Low - Medium	• Manage through vibration and noise controls and once-off sampling	Low	Can be managed/mitigated to acceptable levels

Visual amenity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Negative visual Views	Planning Construction Operational Decommissioning	Low	• Manage through limiting project footprint, rehabilitation and visual controls	Low	Can be managed/mitigated to acceptable levels
Heritage/cultural and palaeontologic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of heritage/cultural and palaeontological resources	Planning Construction Operational Decommissioning	Medium – High (Heritage) Low – Medium (Palaeontology)	• Control through avoidance; and • remedy through emergency response procedures • Follow Chance-Find Protocol	Low Low	Can be avoided Can be managed through implementation of Chance-Find Protocol
Socio-economic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Influx of labour	Construction Operational	Low - Medium	• Control through the monitoring of living conditions of employees, recruitment processes, disease management; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Socio-economic Impact	Planning Construction Operational Decommissioning	Low - Medium	• Control through good communication, recruitment and procurement processes	Low - Medium	Can be managed/mitigated to acceptable levels
Veld fires	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and	Destruction of current land uses and habitat fragmentation patterns	Planning Construction Operational Decommissioning	Low - Medium	• Establish Fire Breaks of no less than six (6) metres in width; • Construct and maintain functioning fire hydrants	Low - Medium	Can be managed/mitigated to acceptable levels

	Trenching; Final land forms						
Health and Safety	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Health and Safety impact	Planning Construction Operational Decommissioning	Low - Medium	• Implement provisions of the Mine Health and Safety Act	Low	Can be managed/mitigated to acceptable levels
Land use	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Interference with land uses	Planning Construction Operational Decommissioning	Medium - High	Management through Communication	Low	Can be managed/mitigated to acceptable levels
Traffic	Use of existing infrastructure with minimal construction of haul roads and use of existing facilities and services	Road disturbance and traffic safety	Planning Construction Operational Decommissioning	Low - Medium	• Manage through road maintenance; • Adherence to speed limit; and • remedy through emergency response procedures	Low - Medium	Can be managed/mitigated to acceptable levels
Wetlands	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Disturbance of Riparian zone	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of avoidance of disturbance of the anything within the Riparian zone; and • Implement recommendations of the wetland specialist, if any.	Low	Can be managed/mitigated to acceptable levels

Waste	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Pollution	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of waste separation at source; • Implement the waste National Waste Management Strategy and Waste Hierarchy	Low	Can be managed/mitigated to acceptable levels
Alien invasive plants	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Colonisation by alien invasive plants	Planning Construction Operational Decommissioning	Medium - High	• Compile weed/alien plant management programme in consultation with DENC and DA. • Implement the compiled weed/alien management programme effectively.	Low	Can be managed/mitigated to acceptable levels

Cumulative Impacts

Activities related and /or associated with infrastructural development may result in several complex effects (whether jointly, severally or in synergy) on the natural ecosystem and social environment. These impacts are mainly identified in relation to the immediate environment and natural processes. Cumulative impacts can be defined as changes to the environment that are caused by the combined impact of past, present and future human activities and natural processes. Multiple individual activities and associated individual direct impacts may be relatively minor at first glance or during a specific environmental impact assessment process, however, result in significant environmental effects when combined with impacts associated with other activities. These impacts may aggregate or interact with other impacts to cause additional effects, not easily quantified when assessing an individual entity. The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities.

The NEMA, 2014, specifically requires that cumulative impacts be assessed. This section provides a description and analysis of the potential cumulative effects of the diamond prospecting activities and past and present projects hereby considering the effects of any changes on the:

- Biophysical; and
- Socio – Economic conditions.

The impact assessment ratings in relation to cumulative effects could to be utilised as a useful tool for decision-makers and stakeholders in respect of the proposed development in relation to the surrounding environment. Two important aspects require consideration prior to the evaluation of cumulative effects:

- The determination of an appropriate spatial and temporal boundaries for evaluation of cumulative effects of the project; and
- The evaluation of relevant projects for consideration in the cumulative effects analysis.

Spatial and temporal boundaries for analysis of cumulative effects are dependent on several factors, including:

- The size and nature of the project and its potential effects;
- The size, nature and location of past and (known) future projects and activities in the area;
- The aspect of the environment impacted by the cumulative effect; and
- The period of occurrence of effects.

The spatial extent of the cumulative impact analysis is generally aligned with the zone of influence of the project and other projects in the vicinity. Most impact will be localised; however, others may be experienced on a regional scale. This is taken into consideration during the assessment of cumulative impacts.
It is reasonably straightforward to identify significant past and present projects and activities that may interact with the proposed Prospecting Operations to produce cumulative impacts, and in many respects, these are considered in the descriptions of the biophysical and socio- economic baseline.

Air Quality Impacts

The potential air quality and / or Global Warming impacts associated with the proposed prospecting activities relate to the potential generation of VOC's, SO_2, NO_2, $PM_{2.5}$, PM_{10} and dust emissions as a result of site clearance, vehicular movements, and the emission of pollutants from the operations in general.

Mitigation measures have been proposed to mitigate these adverse impacts. It is expected that the implementation of these mitigation measures will reduce this impact to an acceptable standard.
Mismanagement of dust generation sources at the proposed site for development may lead to an increase in air quality contamination in the atmosphere surrounding the Operations; however, the cumulative impact will be negligible.

Noise and Vibration Impacts

The potential vibration and noise nuisance associated with the proposed prospecting activities relate to the movement of vehicles, deep excavations and pitting, and operation of trackless mobile machinery on site. Mitigation measures have been proposed to avoid and/or reduce the nuisance noise impacts. It is expected that with the implementation of the mitigation measures this impact will be reduced to an acceptable level.

The majority of the land use in the vicinity of the proposed Prospecting Operations where the processing plant will be located is mostly agricultural, game farming and small-scale mining in nature, land uses associated with significant nuisance noise levels. It is not anticipated that the proposed prospecting operations will have negative cumulative on noise impact in the area.

Other cumulative impacts have been described as part of the impact assessment discussions provided under the different phases of the proposed prospecting activities. None of the aspects were found to have negative cumulative impacts on the surroundings associated with the diamond prospecting operations.

Groundwater and Surface Water Impacts

The potential groundwater and surface water quality impact associated with the proposed prospecting activities relates to the potential contamination as a result of mismanagement of materials stored and leakages from vehicles and machinery. Mitigation measures have been proposed for the impacts on ground water and surface water contamination. It is expected that with the implementation of the mitigation measures this impact will be reduced to an acceptable level.

10 Summary of Specialist Report Findings

There are specialist reports in place pertaining to this proposed development. Specialists were commissioned by the applicant (Please refer to Table 18).

Conducted Study	Recommendations of Specialist	Inclusion of Specialist recommendations in the EIAR	Reference to the application section in the EIAR
Surface Water Resource Assessment	Based on the findings of the surface water resource assessment that was conducted in respect of Prospecting Right application area on the certain piece of land on the Farm Gasesa 272 and Titanic 773, the following recommendations were made: • No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation; • All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation; • If any prospecting activities are to take place within the delineated riparian zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Human Settlements, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (Act No. 36 of 1998); • There are some wetland pans that are found within some sections of the property, specifically, on the northern section of the prospecting right application area. • Should any prospecting activities take place within Matlhwaring Rive Riparian Zone, a riparian zone offset area must be identified before proceeding with operations. • The following recommendations were made: • The applicant must develop an offset strategy for any loss of the Matlhwaring River riparian zone/natural seasonal streams due to the mining activities; • The applicant need to develop and/or update their approved Environmental Management Program/ Plan which describe in detail how identified impacts will be managed on site to ensure that impacts are minimized; • All hydrocarbon storage tanks used on-site should be self bunded and roofed; • Following the detailed design of the mining program, appropriate measures should be implemented to ensure clean and dirty water separation and thereby mitigating the impact of pollution of the receiving Matlhwaring River System; • A clear surface water monitoring plan should be developed prior to starting operations to protect the integrity of the receiving Matlhwaring River System; • The applicant must, throughout all development phases, ensure adherence to the principle of avoidance, management, mitigation and rehabilitation measures of impact on the receiving surface water environment; •	X	Section 5 of PART B APPENDIX E1
Groundwater	• The hydro-census data gives a broad picture that groundwater abstracted in the area is low • Groundwater must be abstracted at the recommended rates for each individual borehole; • Use water sparingly as it is a scarce commodity. • The groundwater monitoring as described in Appendix 1 in this report must be followed;	X	Section 5 of PART B APPENDIX E2

	• Static water levels reaching five meters below the original static water level must be reported to the appointed hydrogeological consultant; • It is thus the recommendation of the specialist that monitoring boreholes must be identified before construction phase commences; • Production boreholes should also form part of monitoring network; • Equip BH3 with a pump that gives higher input than the current one, including the possibility of extending the pump position by approximately 10 mbgl; • Pollution-control dams must be lined with polymeric material to avoid seepage of contaminants. Rehabilitation is the responsibility of the applicant and it needs to be adhered to.		
Biodiversity Assessment	The area of the proposed development consists of natural vegetation which has been severely impacted by past agricultural practices. The area of highest conservation concern for this project is the area of the Kuruman river and its immediate surrounds as well as the ephemeral pans scattered in the northern section of the property. These areas with suitable buffer zones and an ecological corridor should be excluded from the mining footprint. The northern section of the property Titanic 773 is classified as an ecological support area and consequently development should be limited, however the area has been so severely disturbed through overgrazing that its conservation value has been drastically reduced and in its present state it is not a functional ecosystem. Without immediate intervention this area will continue to degrade. A comprehensive rehabilitation plan would be required which would need to include an extensive bush encroachment programme and a re-vegetation programme to ensure the re-establishment of a representative species composition and the creation of suitable habitat to encourage the re-colonisation of the area by faunal species. This could be achieved as part of the post mining rehabilitation programme. The objective of which should be to ensure an improvement in ecosystem function and health from the current status quo. It is recommended that prior to clearing activities an additional walkthrough be conducted. Although it is unlikely that additional species of conservation concern occur it is recommended that this additional survey be conducted. The number of protected trees to be removed will need to be assessed in order to apply for the required removal permits. The proposed mining will not result in the loss of plant communities from the area, as these communities are represented in the surrounding areas. Although some protected species may be lost on site, it is not anticipated that it would result in a significant loss of species from the region or result in a significantly detrimental loss of ecosystem function of the area. Provided the mitigation measures and no-go areas are adhered to and the rehabilitation of this area is completed, the significance of the impact to the biodiversity should not preclude it from development.	X	Section 5 of PART B APPENDIX E3
Heritage Impact Assessment	The prospecting and mining right can be granted in light of the medium to low cultural significance of material found and the understanding that no buildings will be affected. A standard proviso is that in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage	X	Section 5 of PART B APPENDIX E4

	Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.		
Palaeontology Impact Assessment (Desktop)	Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Tertiary limestones or Aeolian sands of the Quaternary. There is a very small chance that fossil may occur in pans or tufas but none is evident from the satellite imagery or been recorded. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once mining has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.	X	Section 5 of PART B APPENDIX E5
Social Impact Assessment	The findings of this report take into consideration the proposed Gasesa and Titanic Prospecting Project's activities, location of the proposed Gasesa and Titanic Prospecting Project, the baseline of the existing socio-economic environment, and the ultimate effect that the Project will have on this environment. It is clear that both the construction and operational phases are typically characterised by negative impacts – although these impact are primarily as a consequence of the various types of activities that take place during construction phase and because this particular phase is limited to approximately 1 year, anticipated to be mostly temporary in nature. None of these negative impacts are considered irreversible or expected to cause irreplaceable damage to the socio-economic environment. In contrast, the operational phase, is considered to bring about more positive impacts that are, similarly, expected to last for the duration of Project life (5 years renewable). These impacts mostly relate to the sustainable development of not only the local economy, but also the region as a whole (through an increase in the national tax base). The proposed Gasesa and Titanic Prospecting Project area is already in the vicinity of medium to large-scale mining and agricultural operations, and a number of existing tourist facilities that continue to operate. Influx associated with these industries is common and is likely to continue as a result of this Project, generating increased pressure on the already strained infrastructure and services, exacerbating the growth of informal settlements and aggravating social ills (such as stock theft COVID-19 and HIV/AIDS). In combination, the noise, air quality, visual, traffic and increase in influx will further degrade the overall sense of place. With effective implementation of the proposed mitigation measures, it is expected that the significance of the social impacts will be reduced to levels that are considered to be acceptable in the context of the receiving environment. Therefore, the impacts of the construction phase that are relatively short-term and mostly limited to the local area, will be outweighed by the more longer-term, widespread positive impacts of the operational phase. Adequate mitigation measures are expected to reduce the significance of negative impacts to acceptable levels, while positive impacts will be enhanced in order to maximise benefits to surrounding settlements.	X	APPENDIX E6

11 Environmental Impact Statement

11.1 Summary of Key Findings of The EIA

This section provides a summary of the findings of identified and assessed potential impacts on the receiving environment in both the unmitigated and mitigated scenarios, including cumulative impacts.

Table 18 : Summary of potential cumulative impacts

ASPECT	Potential Impact	Significance of the Impact (the significance ratings negative unless specified otherwise)	
		(Pre-mitigation)	(Post-mitigation)
Geology	Loss and sterilisation of mineral resources	Low	Low
Topography	Hazardous excavations and infrastructure resulting in safety risks to third parties and animals	Low	Low
Soil and land capability	Loss of soil resources and land capability through Contamination	Low	Low
	Loss of soil resource and land capability through physical disturbance	Low	Low
Biodiversity	Physical destruction of biodiversity	Low	Low
	General disturbance of biodiversity	Low	Low
Surface Water	Alteration of natural drainage patterns	Medium	Low
	Contamination of surface water resources	Medium	Low
Groundwater	Contamination of groundwater resources	Medium	Low
	Lowering of groundwater levels and reducing Availability	Medium	Low
Air Quality	Air pollution and Global Warming	Low	Low
Noise and Vibration	Increase in disturbing vibration & noise levels	Medium	Low
Visual	Negative visual views	Low	Low
Heritage and Palaeontology	Loss of heritage/cultural resources	Low	Low
	Loss of palaeontological resources	Low	Low
Socio-economic	Inward migration	Low	Low
	Economic impact	Low	Low
Health and Safety	Deterioration of health and decrease in safety	Low	Low
Land Use	Change in land use	Low	Low
Traffic	Road disturbance and traffic safety	Low	Low
Wetlands	Disturbance of Wetland and Riparian Zone	Low	Low
Waste	Pollution	Low	Low
Alien invasive plants	Proliferation of alien invasive plants species	Low	Low

The environmental impact assessment of the proposed development, by virtue of the nature of prospecting activities, indicates that such a project poses a risk to the environment. The negative impacts prospecting activities present to the environment, pre-mitigation, include impact on water resources, socio-economic and cultural, and the general ecology on site and to the surrounding environment as a whole. These impacts can be avoided/prevented, minimised/reduced and/ or mitigated to acceptable levels. The environmental management programme is designed to take into cognisance all these factors.

11.2 Final Site Map

Please see ANNEXURE B

11.3 Summary of The Positive And Negative Implications and Risks of The Proposed Activity and Identified Alternatives

All site alternatives have relatively the same ecological setup. That is the reason why Alternative A results are the only ones presented herein.

12 Impact Management Objectives and Outcomes For Inclusion In The EMPr

12.1 Proposed Management Objectives and Outcomes For Environmental and Socio-Economic Impacts

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

Specific environmental objectives to control, remedy or stop potential impacts emanating from the project are provided in Table 19.

Table 19: Environmental Objectives and Outcomes

Aspect	Environmental Objective	Expected Outcome
Geology	To prevent unnecessary mineral sterilisation	Avoidance of unnecessary mineral sterilisation
Topography	To prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure	To maintain natural topography as far as reasonably practicable ensure the safety of people and animals
Soil and land capability	To prevent soil pollution and to minimise the loss of soil resources and related land capability through physical disturbance, erosion and compaction	To handle, manage and conserve soil resources to be used as part of rehabilitation and re-establishment of the pre-mining land capability
Biodiversity	To prevent the unacceptable disturbance and loss of biodiversity and related ecosystem functionality through physical and general disturbance	To limit the area of disturbance as far as reasonably practicably possible

Surface Water	To prevent unacceptable alteration of drainage patterns and related reduction of downstream surface water flow and to prevent pollution of surface water resources	To ensure surface water quality remains within acceptable limits for both domestic and agricultural purposes (where relevant). To ensure that the reduction of the volume of run-off into the downstream catchment is limited to what is necessary and that natural drainage patterns are re-established as part of rehabilitation.
Groundwater	To prevent pollution of groundwater resources and related harm to water users and to prevent losses to third party water users.	To ensure groundwater quality remains within acceptable limits for both domestic and agricultural purposes. To ensure that groundwater continues to be available to current users.
Air Quality	To prevent air pollution and lower impact on global warming.	To ensure that any pollutants emitted as a result of the project remain within acceptable limits.
Noise and Vibration	To prevent public exposure to disturbing vibration & noise	To ensure that any vibration and noise generated as a result of the project remains within acceptable limits.
Visual	To limit negative visual impacts	To ensure visual views that complement the surrounding environment
Heritage and Palaeontology	To minimize the disturbance of palaeontological and heritage Resources	To protect heritage resources where Possible If disturbance is unavoidable, then mitigate impact in consultation with a specialist and the SAHRA and in line with regulatory requirements
Socio-economic	To limit inward migration and related social impacts and enhance positive economic impacts	To work together with existing structures and organisations and to establish and maintain a good working relationship with surrounding communities, local authorities and land owners
Health and Safety	To prevent impact on health and safety of personnel	Maintain good health and safety of personnel
Land Use	To prevent unnecessary negative impacts on surrounding land uses	To co-exist with existing land uses To negatively impact existing land uses as little as possible
Traffic	To prevent transport related accidents and/or injury to people and livestock.	To ensure the operation's use of public roads is one in a responsible manner.
Wetlands	To prevent destruction of wetlands	To ensure wetlands remain "alive" especially considering that South Africa, the Northern Cape Province is water scarce.
Waste	To prevent pollution of the environment	To ensure waste generation and disposal are avoided, where possible.
Alien invasive plants	Proliferation of alien invasive plants species.	Eradicate, and control the spread, of alien invasive species.

13 Final Proposed Alternatives

No site layout alternatives were considered at the final stage of compiling this report because the ecology of site A, B and C are, to a great level, relatively similar.

14 Aspects for Inclusion as Conditions of the Authorisation

The applicant must comply with all pieces of legislation and accompanying regulations that apply to environmental affairs.

The recommendations, if any, on aspects for inclusion as conditions of the authorisation that were made by specialists were commissioned should be considered.

A consideration that this application is in respect of a proposed prospecting project, plant location may be change during any phase of the project development.

No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation;

All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation;

If any prospecting activities are to take place within the delineated riparian zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Human Settlements, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (Act No. 36 of 1998);

There are some wetland pans that are found within some sections of the property and their sustainability considering the fragmentation or degradation of habitat in the areas that are located immediately around them is of concern. Generally pans are considered high sensitive No-Go areas. The pans on the eastern boundary fall with a CBA 2 and should thus be excluded from any mining or mining-related activity;

A 500 m buffer zone extending into a viable ecological corridor linking the adjacent pans is recommended around the pans and ecological corridor on site in order to protect the integrity of the system notwithstanding the fact that the riparian vegetation and to maintain some functionality;

All protected plant species must be left *in-situ*, alternatively the applicant must apply to obtain the applicable permits and authorisations before removal of protected plant species.

The prospecting and mining application can be considered with guarantees provided that the rock engravings are protected with the proposed 200 m buffer around them. As a standard precaution, in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.

Implement **Chance Find Protocol** or **Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.**

a) The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.

b) When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
c) Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figures 4-6). This information will be built into the EMP's training and awareness plan and procedures.
d) Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
e) If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
f) Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
g) If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
h) If no fossils are found and the excavations have finished then no further monitoring is required.

15 Assumptions, Uncertainties and Gaps in Knowledge

Uncertainties form part of any proposed development pertaining to the accuracy of the actual degree of impact on the environment that the proposed development will have. This report was compiled by incorporating information provided by the applicant and the various project specific employees/directors and no warranty or guarantee, whether expressed or implied, is made by the EAP with respect to the completeness, accuracy or truth or any aspect of this document with reference to the instructions, information and data supplied by the aforementioned parties. This piece of work may be amended to incorporate recommendations pertaining to Assumptions, Uncertainties and Gaps in Knowledge if necessary.

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based more on rule-of-thumb and experience.

It was assumed that, by and large in this particular landscape segment, with its relatively sparse vegetation, surface archaeological traces would be relatively visible. However it was likely that where artefacts are present, they would tend to occur in buried ore and gravel deposits.
A proviso is routinely given, that should sites or features of significance be encountered during mining on the site (this could include an unmarked burial, an ostrich eggshell water flask cache, or a high density of stone tools, for instance), specified steps are necessary (beginning with immediate suspension of work, and reporting to the heritage authority).

The specialist reports add more to the list presented in this section.

A potential limitation associated with the sampling approach is the narrow temporal window of sampling undertaken as part of the field work. Ideally, the site should be visited several times during different seasons to ensure that the full complement of plant and animal species present are observed, recorded and reported. However, this is rarely possible due to time and cost constraints. The information presented in this piece of work

represents the dry/Winter season study. The present area of application presents an advantage for identification of plant species throughout the year because it along the Matlhwareng River and therefore is not as dry as the rest of the Northern Cape Province. A full plant species list was compiled for the site from the site visit; this was complemented by a list of any listed species which are known from other studies to occur in the broad vicinity of the site. The lists of amphibians, reptiles and mammals for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach that takes account of the study limitations.

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The loose sands of the Tertiary and Quaternary period would not preserve fossils. Only palaeo-pans or palaeo-springs could preserve fossils but no such feature is evident.

15.1 Environmental Assessment Limit

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based on rule-of-thumb and experience.

15.2 Biodiversity Assessment

The major potential limitation associated with the sampling approach is the narrow temporal window of sampling. Ideally, a site should be visited several times during different seasons to ensure a comprehensive database of plant and animal species are captured. However, this is rarely possible due to time and cost constraints and therefore these surveys usually represent a “moment in time” survey. The site survey represents the summer/wet season survey as it was conducted in February. The survey has been conducted during an extended period of below average rainfall for the region, although some summer rains had fallen. This does limit the potential to encounter all the species that may be present and hinders the identification of some species. A plant species list was compiled for the site from the site visit, this was augmented by a list of species which are known from other studies to occur in the broad vicinity of the site. The lists of amphibians, reptiles and mammals for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach that takes account of the study limitations.

There is no quantitative analysis of the resource base for the protected trees (*Vachellia erioloba and Vachellia haematoxylon*) thus it is not known how many of the trees can be removed from an area without detrimentally affecting the overall population numbers.

15.3 Groundwater

Some data pertatining to groundwater of the application area was obtained from third party sources. The accuracy of such date and information was not verified. A Garmin GPS 64s unit that was used for wetland delineations and it is accurate to within five meters.

15.4 Heritage/ Cultural and Palaeontological Resources

All possible care was taken to identify and document heritage resources during the survey in accordance with best practices in archaeology and heritage management. However it is always possible that some hidden or

subterranean sites are overlooked during a survey. The Consultant and / or Specialists will not be held liable for such oversights and additional costs thereof.

The sparse density of artefacts on the sand veld might not reflect low hunter-gatherer activity as possible burial of artefacts by the shifting sands.
The commissioned Palaeontological Impact Assessment (Desktop Study) that was commissioned did not cover the following:

- Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (*not applicable to this assessment*);
- Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (*not applicable to this assessment*); and
- Determination of fossils' representivity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (*not applicable to this assessment*).

15.5 Socio-Economic Impact

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of receiving environment within the scope of this study as follows:

- The findings of this assessment are based on the information collected during the site visit that was conducted during November 2019;
- COVID-19 related / associated lockdowns hindered a broader public participation process from occurring;
- This report and assessment are dependent on the accuracy of the publicly available secondary information; such as Statistics South Africa (StatsSA, 2011 and community survey, 2016). Where possible, the information was verified during a site visit. The data was considered sufficient for the purpose of this study;
- The study is based on data obtained from the community survey, 2016, which may not reflect accurate information;
- Not every individual in the community could be interviewed therefore only key people in the community and meeting attendees were approached for discussion;
- It should be noted that the social environment is a dynamic, constantly changing entity. It is therefore not always possible to predict all social impacts to a very high level of accuracy. Care has been taken to identify the most likely and significant impacts in the most appropriate way for the current local context;
- Social impacts can be experienced by affected communities on an actual or a perceptual level. It is therefore not always possible to quantify social impacts properly;
- It should be noted that predictions concerning the characteristics of the receiving socio-economic environment at the time of decommissioning are subject to a large margin of error, thus significantly reducing the accuracy of impact assessment- the specialist has attempted to assess (where possible) the impact during the decommissioning phase; and
- Individuals' view possible social impacts differently due to their association with the anticipated impact. Impacts could therefore be perceived and rated differently than those contained in the other reports. Further public participation can be used to refine findings.

15.6 Surface Water Resource Assessment

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of receiving environment within the scope of this study as follows:

- The findings of this assessment are based on the information collected during the site visit that was conducted during February 2022. Any changes within the project area that may affect the integrity and

functionality of the delineated wetland post the site investigations have not been identified and therefore the results of such impacts on the surface water resource have not been taken into consideration as part of this assessment;
- Base scenario including the status quo is presented;
- The flowering times for wetland plant species are variable and some of the species were not flowering during the time of field investigations may have been overlooked;
- The site visit was undertaken as a once-off field trip during spring season when the water quantity levels were low (February 2022);
- A Garmin GPS 64s unit that was used for wetland delineations and it is accurate to within five meters.

16 Reasoned Opinion As To Whether The Proposed Activity Should or Should Not Be Authorised

16.1 Reasons Why The Activity Should Be Authorized or Not

Mining/Prospecting is one of the most important economic activities in the Northern Cape. There are no significant reasons why the activity should not be authorized. However, if the proposed management and mitigation measures are not properly applied or if the prospecting/mining operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPr.

16.2 Conditions That Must Be Included In The Authorisation

Apart from ensuring that the necessary permits are obtained for restricted activities, all recommendations and mitigation measures as set out in the EMPr should be adhered to or other reasonable mitigating measures, including conditions of the Environmental Authorisation (if granted) should be implemented.

No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation;

All prospecting activities should be performed in a manner that applies the principle of avoidance, management, mitigation and rehabilitation;

If any prospecting activities are to take place within the delineated riparian zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Human Settlements, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (Act No. 36 of 1998);

There are some wetland pans that are found within some sections of the property and their sustainability considering the fragmentation or degradation of habitat in the areas that are located immediately around them is of concern. Generally pans are considered high sensitive No-Go areas. The pans on the northern section should thus be excluded from any mining or mining-related activity;

A 500 m buffer zone extending into a viable ecological corridor linking the adjacent pans is recommended around the pans and ecological corridor on site in order to protect the integrity of the system notwithstanding the fact that the riparian vegetation and to maintain some functionality;

All protected plant species must be left *in-situ*, alternatively the applicant must apply to obtain the applicable permits and authorisations before removal of protected plant species.

As a standard precaution, in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend

16.2.1 Specific Conditions For Inclusion In The EMPr

Please refer to Sections 26.5.1; 26.5.2; 26.5.3 and 29 of Part B of this piece of work.

16.2.2 Rehabilitation Requirements

17 Period For Which Authorisation Is Required

Environmental Authorisation is required for a minimum 5 years.

18 Undertaking

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Report.

19 Financial Provision

19.1 Method To Derive The Financial Provision

The quantum of the financial provision contemplated in Regulation 54 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be revised and adjusted accordingly annually, based on a survey assessment of the environmental liability of Botshelo T and G Mining Resources (Pty) Ltd. Surveys of excavations are conducted by a registered surveyor and results are forwarded to the Environmental Manager who calculates the outstanding rehabilitation as per the agreed rate in the DMRE Guideline. A bank guarantee is prepared for the amount and submitted to the DMRE.

Financial provision for the rehabilitation or management of negative environmental impacts caused by the mining operation [as required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] will be made in the form of a financial guarantee from a South African registered bank. This document will guarantee the financial provision relating to the Environmental Management Programme in a format as approved by the Director-General.

The financial provisions presented herein are preliminary in nature.

It is important to note that during the Operational Phase of the proposed development, concurrent backfilling is going to take place. If the applicant prospects according to the provisions of this piece of work, it is expected that only less than a hectare will remain for final rehabilitation at the end of the prospecting activities.

19.2 Confirm That The Amount Can Be Provided For From Operating Expenditure

Botshelo T and G Mining Resources (Pty) Ltd does require external funding for purposes of conducting prospecting and mining activities.

20 Deviations From Scoping Report and Approved Plan of Study

20.1 Deviation From The Methodology Used In Determining The Significance of Potential Environmental

There are no significant deviations from the methodology used in determining the significance of potential environmental.

20.2 Motivations For Deviation

Not applicable. If any, the applicant has encountered limitations in accessing some necessary resources.

21 Other Information Required By The Competent Authority

21.1 Impact On The Socio-Economic Conditions of Any Directly Affected Person

The prospecting process is going to have a positive impact as a minimum of 30 jobs are going to be created.

21.2 Impact On Any National Estate Referred To In Section 3(2) of The National Heritage Resources Act

Where and when level of significance of impacts before mitigation is high, the Department of Mineral Resources and Energy, SAHRA and heritage specialist will be notified.

The prospecting activity may not impact on any heritage estate if effectively mitigated referred to in section 3(2) of the National Heritage Resources Act. In terms of the National Heritage Resource Act, 1999 (Act No. 25 of 1999), Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA will be contacted immediately and work will stop. Alternatively, relevant specialist may be called in to site and in the case of fossils a representative sample may be sent for further studies or preservation.

22 Other Matters Required In Terms of Sections 24(4)(a) and (b) of The Act

There are no alternatives, as the application area applied for is the area identified with potential for a diamond, Iron and Manganese Ores prospecting operation.

PART B - ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

23 Details of EAP

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in PART A, Section 1.1 herein as required.

24 Description of The Aspects of The Activity

The requirement to describe the aspects of the activity that are covered by the environmental management programme is included in PART A, Section 3.2.

25 Composite Map

Refer to the figure below for a map that superimposes the proposed activity, its associated structures and infrastructures on the environmental sensitivities of the preferred site, also indicating any areas that should be avoided, including buffers. Final site layout is presented after consideration of all specialist findings and recommendations when available.

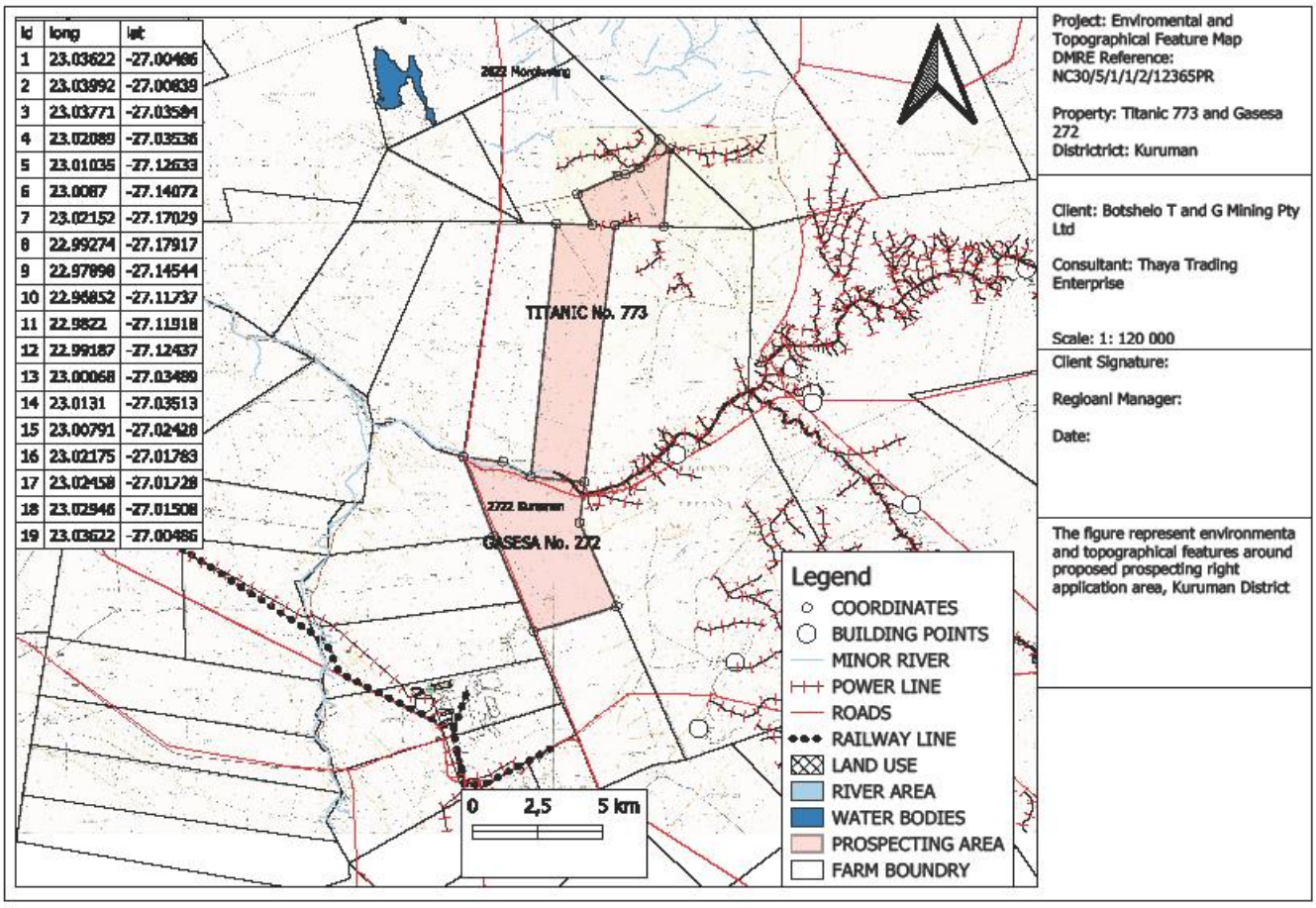


Figure 8: A composite map of the proposed prospecting activity

26 Description of The Impact Management Objectives Including Management Statement

26.1 Determination of Closure Objectives

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in stable, self-sustainable state. The closure objectives for the project were determined taking into account the existing type of environment as described in Section 7.4, in order to ensure that the closure objectives strive to achieve a condition approximating its natural state as far as reasonably practicable possible. Furthermore, the preliminary closure plan objectives and principles have been developed against the background of the proposed prospecting activity location in the Kuruman region of the Northern Cape Province, and include the following:

- that environmental damage is minimised to the extent that it is acceptable to all parties involved;
- that at closure, the land will be rehabilitated to achieve an end use of wilderness and grazing;
- that all surface infrastructure will be removed from site after closure. Any open drills will be completely backfilled at operational phase and the remaining waste rock dumps shaped accordingly;
- that contamination beyond the prospecting site by wind, surface run-off or groundwater movement will be prevented;
- that closure of prospecting area is achieved efficiently, cost effectively and in compliance with the law;
- that the social and economic impacts resulting from closure of prospecting area are managed in such a way that negative socio-economic impacts are minimised.

The closure target outcomes for the site are therefore assumed to be as follows:

- to achieve chemical, physical and biological stability for an indefinite, extended time period over all disturbed landscapes and residual prospecting infrastructure;
- to protect surrounding surface water, groundwater, soils and other natural resources from loss of current utility value or environmental functioning;
- to limit the rate of emissions to the atmosphere of particulate matter and salts to the extent that degradation of the surrounding areas' land capability or environmental functioning does not occur;
- to maximise visual 'harmony' with the surrounding landscape;
- to backfill and compact the disturbed areas;
- to remove and send out for recycling HDPE lining that is utilised in the construction of Pollution Control Dams;
- to undertake landscaping;
- to re-vegetate the area where vegetation clearance occurred; and
- to create a final land use that has economic, environmental and social benefits for future generations that outweigh the long term aftercare costs associated with the mine.

Botshelo T and G Mining Resources (Pty) Ltd will be using a mobile camp site for its prospecting activities, and therefore no infrastructure associated with the camp site will require breaking down or demolishing at closure. The areas disturbed as a result of the prospecting operation will be rehabilitated by maintaining the general topography of the surrounding area, ensuring that there are no remnants of the structures. The closure objectives aim to return the affected area to a land use condition or desired state similar to that of the pre-mining state. Closure and rehabilitation of pits will be undertaken during the operational phase when the activities are completed in those pits, to achieve a desired land condition as early as possible. The pollution control dams (PCD) will be removed at closure and the plastic lining will be removed and recycled.

The associated environmental impact caused by the proposed development is relatively of low significance. Archaeological, Biodiversity and hydrological sensitivity are the only activity that rate relatively higher - that is medium significance. The condition or state of vegetation has degraded already. This is a factor that that could be alluded to previous vegetation clearing activities and farming that occurred in and around the area of application. Be that as it may, the potential environmental impacts associated with the proposed development are the following:

- Disturbance of some heritage resources if proposed mitigation measures are not implemented;
- Geology;
- Topography and visual alteration;
- Soils and Land Capability;
- Land Uses;
- Biodiversity;
- Noise and vibration generation or pollution;
- Air quality;
- Land capability;
- Traffic;
- Heritage inclusive of Palaeontological Resources;
- Global Warming;
- Ecology;
- Invasive alien plant species; and,
- Water sources.

An effective implementation of this environmental management plan and any other reasonable and acceptable prevention, reduction, or control and remedy of any impacts need to be ensured. This effective management of impacts will assist greatly to achieve "pain free" rehabilitation to an acceptable and self-sustainable state.

26.2 Potential Risk of Acid Mine Drainage (AMD)

AMD is not a significant factor in these Prospecting Activities.

26.3 Volumes And Rate of Water Use For Mining

The operation would require about 80 000 m^3/a (estimated) over the 5-year period of prospecting operations.

26.4 Has A Water Use Licence Been Applied For?

The water use license application is in progress.

26.5 Impacts To Be Mitigated In Their Respective Phases

The EMPr addresses the following three (3) phases:

26.5.1 Construction Phase

Table 20 contains a list of potential environmental issues and the appropriate mitigation measures that may be associated with the construction phase of this proposed development. This section serves as a framework for

the construction contractor even though Botshelo T and G Mining Resources (Pty) Ltd plans to utilise mostly mobile equipment and machinery for the prospecting phase of this project within which to execute his contractual duties. This detailed EMPr may be included in the final contract(s) with the relevant construction contractors. The table only addresses those impacts that may occur on the site during the Construction and associated management measures that may require additional environmental management.

Table 20: Construction Phase

Issue	Mitigation	Responsible party	Frequency of Action
Geology			
Objective: To prevent loss and Sterilisation of Minerals			
Loss & Sterilisation of mineral resources	Ensure that optimal use is made of the available mineral resource through proper planning of the prospecting operations.	ESHRQ Department & Mine Management	When necessary
	The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.		On-going
Topography			
Objective: To minimise topographic alterations			
General land disturbance	Manage through limiting all project-related activities to the proposed prospecting footprint area.	ESHRQ Department	Continuous
Soils and Land Capability			
Objective: To minimise soil degradation			
Soil Erosion by Water	Manage through best practices. Construct and monitor soil conservation measures at stockpiled sites as well as during construction and road-building activities.	ECO/Contractor	When necessary
	Avoid bare, disturbed surfaces for long periods of time (e.g. re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable.		On-going
	Avoid undue storm-water concentration (e.g. construct runoff measures according to soil conservation principles). The run-off from the exposed ground should be controlled with the careful placement of flow-retarding barriers.		When necessary
	The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion. The placement of the flow retarding barriers must occur in consultation with the Environmental Officer and as part of an overall storm water management system during the construction phase. All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosive losses.	ECO/Contractor	On-going On-going
Soil Erosion by Wind	All attempts must be made to avoid exposure of dispersive soils. Avoid bare, disturbed surfaces (e.g. re-vegetate stockpiled soils). Backfill as quickly as reasonably practicable.		
	Cover exposed soils with brush-packs of non-invasive species in order to minimise erosive losses. Construct windbreaks, where necessary.		When necessary
Erosion by water and wind.	At no point may plant cover be removed outside of the proposed footprint area and beyond the prospecting authorised area.	Mine community; ESHRQ Department	On-going
	The removal of plant material must be kept to a minimum. Audits must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the cause of the erosion must be undertaken.	ECO/Contractor Mine community; Contractor	On-going When necessary and/or during windy periods; after rain
	Rehabilitation of the erosion channels and gullies must take place. Re-establishment of indigenous plant cover on disturbed areas must take place as soon as possible once activities in that area have ceased.	ECO/Contractor ESHRQ Department; Contractor	When necessary
Dustiness.	Limit traffic congestion and traffic speed to definite, set limits and existing paths.	ECO/Contractor	On-going
	Grade, seal and water road surfaces. Re-vegetate and irrigate dust sources.	ESHRQ Department ECO/Contractor	When necessary
Chemical Soil pollution.	Manage through best practices. Personnel must be trained to be able to prevent or manage chemical and hydrocarbon spills. Combat chemical pollution in order to avoid toxic substances entering water sources, health and safety of human beings and that of the environment.	ESHRQ Department ECO/Contractor	On-going

	Spill kits absorbents and spill mats must be available on-site at all times in order to ensure rapid response following spill incidents. Personnel must be suitably trained in the use of spill kits and bioremediation equipment.	ESHRQ Department	
Soil microbiological degradation Topsoil Degradation	Stockpile topsoil in heaps not exceeding two (2) m in height. Use only the A-horizon for topsoil purposes.	ECO/Contractor	
	Handle topsoil only in the moist state to prevent wind erosion. All possible efforts must be made by the contractors to strip topsoil to a reasonable practicable level.		
	Topsoil stockpiles must be kept as small as possible in order to minimise compaction, wind erosion and the formation of anaerobic conditions.	ECO/Contractor	On-going
	Topsoil must be stockpiled for the shortest possible timeframes in order to ensure that the quality of the topsoil is not impaired. Topsoil must not be handled when the moisture content exceeds 12 %.		On-going
Topsoil Degradation	Topsoil stockpiles must be kept separate from subsoil. Excavated and stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate. The topsoil should be replaced as soon as possible on any backfilled areas, thereby allowing for the regrowth of the seed bank contained within the topsoil. Cover exposed soils with brush-packs of non-invasive species in order to maximise nutrient cycling and minimise erosive losses.		When necessary
	Stockpiles susceptible to wind erosion are to be covered during windy periods. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.	ESHRQ Department	On-going
	Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.		
Surface Water			
Objective: To mitigate negative impacts on the aquatic systems			
Sedimentation of water resources	Manage through best practices. To prevent erosion of material that is stockpiled for long periods, the material must be retained in a bermed area.	ECO/Contractor	On-going
	All topsoil must be removed and stockpiled on the site. Stockpiles should not be higher than two (2) m to avoid compaction, and single handling is recommended.		
	Dust suppression is necessary for stockpiles older than a month – with either water or a Bio-degradable chemical binding agent.		When necessary
Surface Water pollution	All construction areas should be suitably rehabilitated and re-vegetated as soon as possible after construction.		
	Particles stockpiled on the tailings dam contain diamondiferous gravel and kimberlitic material, which can enter the surface water via runoff or wind drift transport, if the tailings dam is located close to the surface water.	ESHRQ Department	Once off
	Implementation of the one hundred 100 m buffer zone along the river.		
	Construction vehicles must be maintained in good working order, to reduce the probability of leakage of fuels and lubricants.	ECO/Contractor	On-going
Surface Water pollution	A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas.	ESHRQ Department	
	Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump, which will separate these chemicals and oils.		
	All Portable septic toilets must be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage.	ESHRQ Department	On-going
	Under no circumstances may ablutions occur outside of the provided facilities.	ECO/Contractor	
	Trees must be planted over drainage plumes from the tailings dam in order to control the pollution of the water by nitrates, phosphates and sulphates.	ESHRQ Department	
	Where possible and if necessary, an artificial wetland must be established immediately downstream of the tailings dam for the		Once off

	removal of heavy metals from water resources.		
	If servicing and washing of the vehicles are to occur on site, there must be specific areas constructed for this activity. This areas needs to have a concrete foundation, bunded as well as have oil traps to contain any spillages likely to occur.		Once off
Surface water pollution: Mixing of concrete	Oil residue shall be treated with oil absorbent such as OBC, Bioremediation, GK-Spill kits or Drizzit or similar and this material removed to an approved waste site. Spill kits must be easily accessible and workers must undergo induction regarding the use thereof. Concrete must be mixed on mixing trays or plastic liners. If mixing of concrete is to take place on exposed soil, this has to occur in demarcated areas that must be bunded. This is so that the cement is not washed away during heavy rainfall events.	ECO/Contractor	On-going
	Concrete and tar shall be mixed in specifically demarcated areas only. All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and disposed of at a registered landfill site. After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at a registered landfill site.		When necessary
Surface water pollution: Mixing of concrete	Storm water shall not be allowed to flow through the above-mentioned areas. Ensure that there are clean water separation systems preventing clean water from entering the affected areas and measure to contain any contaminated water occurring within the actual areas.	ECO/Contractor	On-going On-going
Surface water pollution: litter	Cement and sediment shall be removed from time to time and disposed of in a manner as instructed by the Mine Manager. In the case of pollution of any surface or groundwater, the Regional Representative of the DHSWS must be informed immediately. Provide bins for construction workers and staff at appropriate locations, particularly where food is consumed.	ESHRQ Department	When necessary Once off
Impeding or diverting the flow of water in a watercourse Altering the bed, banks, course or characteristics of a watercourse	The construction site should be cleaned daily and litter removed. Apply for authorisation from Department of Human Settlements, Water and Sanitation. Compile an IWWMP. Devise an offset strategy for rehabilitation of destructed riparian zone of the river and the natural seasonal streams. Where mining infrastructure, such as haul roads, are required across natural watercourses, new storm water infrastructure, such as pipes and culverts could replace the hydraulic function currently offered by the natural water courses. An offset strategy for pitting and trenching within the riparian zone of Matlhwareng River and within the ephemeral drainage patterns must be implemented effectively and monitored. Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within the ephemeral drainage lines must occur during the direst seasons (March to September). This infrastructure should be designed for both hydraulic performance and environmental functionality. A thorough assessment of the suitability of the new stormwater infrastructure must be made at preliminary design stage. The water quality of rivers and the proposed canals should be monitored on a monthly basis as described in the operational management plan.	ECO/Contractor Mine Management	Daily When necessary
Ground water **Objective: To mitigate negative impacts on ground water systems**			
Groundwater level impact - dewatering	Water level monitoring in boreholes located adjacent to the decline and near the surface mining area. The location of boreholes between the river and the mining operation in the corridor would assist with the identification of impacts the activities may have on the river.	ESHRQ Department	Monthly

	A water balance for the operations should include a measurement of the water collected in the decline and the underground mine/s as a result of dewatering activities. This volume should be reconciled with the findings from the numerical groundwater model.		On-going
	Water volumes and the water balance should be compiled using actual flows. These flows should be measured using strategically placed, calibrated flow meters.		
Groundwater quantity impact	Water level monitoring on the site and in neighbouring boreholes to determine water level changes and aquifer storage changes with time. These impacts are not likely to be directly related to a change in recharge, however, a result of dewatering and the removal of groundwater from the aquifers.		Monthly
Groundwater pollution of the neighbouring users water quality	Monitoring of water quality in neighbouring boreholes should be considered for background water quality identification. The frequency of sampling would be less than for the on-site monitoring boreholes. These boreholes are categorised as off-site boreholes.	ESHRQ Department	Monthly
	Indigenous trees must be planted over drainage plumes from the tailings dam in order to control the pollution of the water by nitrates, phosphates and sulphates.		On-going
	Where possible, an artificial wetland must be established immediately downstream of the tailings dam for the removal of heavy metals from water resources.		Once off
Monitoring	A groundwater and surface water monitoring programme should be planned and implemented prior to the commencement of mining. Monitoring measures must be implemented as detailed.	ESHRQ Department	
	Monitoring boreholes should be established as soon as infrastructure design is completed and approved.		
	Monitoring boreholes should be identified constructed during mining right application process and sited according to DHSWS standards and guidelines.		
	Additional site characterisation boreholes should be drilled around the mine site to determine the position of the aquifers over the whole site during mining right application process.	ESHRQ Department; Geo-hydrologist	Once off
	The site characterisation boreholes with water strikes should be tested for aquifer parameters i.e. transmissivity and storativity,	ESHRQ Department	Monthly
	Water level and quality monitoring should commence when the construction of the decline commences.		
Flora			
Objective: To mitigate the removal and/or disturbance to flora			
Loss of vegetation of high ecological importance	No development should take place within 100 metres Matlhwareng River.	ESHRQ Department	On-going
	Where natural habitats must be transformed, consideration should be given to the quality of the habitat (based on the presence of microhabitats).		Once off
	The highest quality habitat should be conserved.	Ecologist; ESHRQ Department	When necessary
	Minimise the footprint of transformation.		On-going
Loss of vegetation of medium ecological importance	The highest quality habitat must be conserved.		Once off
	Incorporate as much of the indigenous vegetation into the design layout as possible.		
Loss of vegetation of medium ecological importance	After pegging of the site, the ecologist must return to site to provide the final consent regarding the location of the pegs.		
	Where natural habitats must be transformed, consideration should be given to the quality of the habitat (based on the presence of microhabitats).		
Loss of conservation important plant taxa.	Footprint areas of the proposed development must be scanned for Red Listed, protected and important plant species. There were a number protected plant species that were identified on the area. Recommendations of the Ecologist, if any, must be adhered to.		
Loss of trees due to water extraction.	Trees within the draw-down area must be monitored.		Annually
Fragmentation of Natural Habitat.	No development may take place within the 100 m of developmental zone along the Matlhwareng River.	ESHRQ Department	On-going
	Retain natural corridors within the design layout as far as possible.	ESHRQ Department	On-going
	Natural corridors must be retained where possible to promote movement of fauna, especially during the construction phase when a high rate of natural disruption is expected.	Ecologist; ESHRQ Department	

	All road networks must be planned with care to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.		
	The EIAR must advise the applicant regarding exact placement of measures such as fencing of nest sites on the final approved layout, especially if mining will ever take place.		Once off
Floral disturbance in riparian zone.	No development within the 100 m of developmental zone.	ESHRQ Department	On-going
	No vehicular movement within the 100 m of development zone.	ESHRQ Department; Contractor	
Vegetation clearance	Herbicides will not be used for vegetation clearance.	Contractor	
	Plant species pre-inoculated with *mycorrhizae* may be planted on tailings in experimental plots as soon as possible to test species suitability for decommissioning.	ESHRQ Department	
Vegetation clearance	Stockpile all non-invasive woody vegetation removed for site establishment for brush packs to be used during rehabilitation.		
	Cover exposed soils with brush-packs of non-invasive species in order to maximise nutrient cycling and floral re-establishment.		
	Access roads must be kept to a minimum, and where possible existing tracks should be used	Contractor	
Fauna			
Objective: To mitigate disturbance of fauna			
Faunal displacement and loss of habitat	The 100 m no development zone around the Matlhwareng River must be avoided.	ESHRQ Department	On-going
	Careful consideration is required when planning the placement for stockpiling construction material, topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall development footprint.	ESHRQ Department; Contractor	Once off
	Placement thereof should occur in areas of medium ecological importance only, and not areas of high ecological importance.		
	The appointment of a full-time Environmental Control Officer must render guidance to the contractors with respect to suitable areas for all construction-related disturbance.	ESHRQ Department	
Disturbance to fauna.	The extent of the proposed prospecting activities should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as "no-go" areas for employees, machinery or even visitors.	Contractor	On-going
	All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.	ESHRQ Department; Contractor	On-going
	The Environmental Control Officer must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.	ESHRQ Department	When necessary
	The environmental induction should occur in the appropriate languages for the workers who may require translation.	ESHRQ Department	
	Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert, if practically feasible.	ECO/Contractor	
Disturbance of Raptor nests	Raptor nests located in large trees may be destroyed during the construction phase. It is therefore strongly advised, that all large trees within the development footprint be scanned for nests by suitable person. As should any nest be present, they can be relocated or chicks removed, should no other alternative be available.	ESHRQ Department	Once off
Mortality of invertebrates and other nocturnal species.	The lights used for illumination of the plant will attract many invertebrates and other nocturnal species. The light causes disorientation and often results in mortality. It is therefore recommended that the lights should not include any source that emits light in the white spectrum (e.g. mercury arc or halogen lamps). It is therefore recommended that all lights be fitted with sodium lights (yellow), if practicable.		
Air Quality			
Objective: To mitigate negative impacts on ambient air quality			
Dust entrainment and concomitant PM10 emissions	Vegetation is to only be removed when soil stripping is required. These areas should be limited to include only those areas required for development, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.	ECO/Contractor	When necessary
	Brush packs on exposed soil will limit the amount of dust liberated from these exposed surfaces.		
	Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression. (Usually, the		

	options exist in scheduling this activity to coincide with periods when soil moisture can be expected to be optimal. However, in the current case, given the arid nature of the environment, it would be impractical to base topsoil removal activity schedule based on soil moisture considerations.)		
Dust entrainment and concomitant PM10 emissions	Where it is logistically possible, control methods for unpaved roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression (or chemical suppression to reduce water requirements), avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.	ECO/Contractor	When necessary
	The length of time where open areas are exposed should be restricted. Construction of infrastructure should not be delayed after land has been cleared and topsoil removed.		On-going
	Dust suppression methods must, where logistically possible, be implemented at all areas that may / are exposed for long periods of time.		When necessary
	Blasting and drilling (if required) should be delayed under unfavourable windy and atmospheric conditions. Where logistically feasible, seasonal meteorological conditions should be taken into consideration during construction activities (i.e. precipitation and wind field).	ESHRQ Department	
	For all construction activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.		On-going
Global Warming	The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM10), larger total suspended particulates (TSP) that relate to dust fallout, VOC's, SO_2, NO_2 and gaseous emissions mainly from TMM's, vehicles and generators must be kept below WHO concentration limits.	ESHRQ Department/ Mine Management	On-going
	Use diesel with relatively low concentrations of SO_2 in TMM's.	ESHRQ Department/ Mine Management	On-going
Noise and vibration			
Objective: To minimise the disruption of ambient noise levels and/or increase in continuous noise levels			
The impact of the operations on ambient noise climate	Maintenance of equipment and operational procedures: Proper design and maintenance of silencers on diesel-powered equipment, systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.	ESHRQ Department; Contractor	On-going
	Placement of material stockpiles: Where possible material stockpiles should be placed so as to protect the boundaries from noise from individual operations. If a levee is constructed, it should be of such a height as to effectively act as a noise barrier, if line of sight calculations show this to be practicable.	ECO/Contractor	When necessary
The impact of the operations on ambient noise climate	Equipment noise audits: Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.	ECO/Contractor	Monthly
	Environmental noise monitoring should be carried out regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.	ECO/Contractor	Monthly
Sites of Heritage and Cultural Interest **Objective: To protect and preserve all cultural and heritage resources located within the study area**			
Destruction of heritage resources.	The mine prospecting can go ahead, mindful of the sites that have been flagged for protection. As a standard precaution archaeological deposits are usually buried underground. Should archaeological artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.	ESHRQ Department;	On-going
	A 100 metre protection buffer must be kept around the graves during all phases of this proposed development and in the vicinity.	ESHRQ Department;	Once off
	If fossils are found once mining has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample. Implement Chance-Find Protocol if proposed by Palaeontologist.	ESHRQ Department;	On-going
Disruption of sites with archaeological and/or cultural	If any archaeological or palaeontological sites are exposed during construction work, operations should be halted and find(s) should immediately be reported to a museum or SAHRA, preferably one at which an archaeologist or palaeontologist is	ECO/Contractor	On-going

interest.	available, in order for further investigations to be conducted. Or a specialist should be called in to give guidance on how to handle the heritage resource.		
Visual Aspects			
Objective: To minimise extensive scarring of the landscape			
Visual Impact	Locate construction camps and stockyards out of the visual field of highly sensitive visual receptors. Utilise the existing screening capacity of the site and provide an additional screen shade by enclosing the construction site and stockyards with dark green.	ESHRQ Department	Once off
	Retain some of the existing vegetation cover of the site through selective clearing. Where practically feasible, protect existing vegetation clumps during the construction phase in order to facilitate screening during construction and operational phases.		On-going
	It is imperative that topsoil from the footprint of the prospecting infrastructure is stripped and stockpiled. Stockpile the topsoil from the construction site on the perimeter of the facility to firstly construct a visual barrier and secondly, to protect the topsoil and the seed bank contained in it for future use in rehabilitation. The topsoil must not be stockpiled higher than two (2) m and must be vegetated directly after placement.	ECO/Contractor	
	Pave roads where relatively high traffic volumes are expected, to minimise dust generation and the potential unsightly discoloration of vegetation along these roads.	ESHRQ Department	On-going
	Keep the construction sites and camps neat, clean and organised in order to portray a general tidy appearance.	ECO/Contractor	
	Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the construction site free from additional unsightly elements.		Monthly
	Locate the construction camps and the material stockpiles outside of the visual field of sensitive visual receptors. It is proposed to locate the temporary facilities of the construction camp on one of the areas earmarked for a stockpile or slimes dam. This will reduce the footprint of disturbance over time and effectively reduce the associated landscape impact.	ESHRQ Department	Once off
	If construction is necessary during night time, light sources shall be directed away from residential units and roads as to prevent obtrusive lighting.		On-going
	Dust suppression procedures should be implemented especially on windy days during earth works.	Contractor	When necessary
Socio-Economic Structure			
Objective: To avoid detrimental impacts on the communities			
Socio-economic	It is recommended that a Community Liaison Forum (CLF) must be established for the surrounding communities. This committee would serve as a communication channel between the communities and the applicant. Members of the committee should include representatives from environmental groups, civil society, ward councillors, government departments (DENC, DA), District and Local Municipalities, construction teams and the applicant. Such a committee will play an important role in executing the proposed mitigation measures.	ESHRQ Department	On-going
Socio-economic	The CLF should ensure that the needs of all the different groups are addressed and that decisions are clearly communicated to the community at large.	ESHRQ Department ESHRQ Department	On-going
	The CLF, if established, must meet on a monthly basis before and during the construction phase and on a bimonthly basis during the operational phase. If necessary, it can be replaced by the Future Forum as prescribed by the MPRDA, on the condition that the relevant parties remain members of the committee. Local people should, as far as possible, be utilised in the construction and operation of the project. This will maximise local economic development and the creation of employment in the area. This will also serve to minimise the risk of negative feelings and behaviour between locals and new comers, and lessen the need for developing temporary housing for construction workers. However, it is not anticipated that the mine could be staffed from local people only, and therefore it is very likely that a construction camp would be necessary. Using local labour would ensure a smaller camp.		
	Recreational facilities should be established for labourers living in the construction camp, either in town or on site, to reduce the levels of mischief.		Once off
	The local community must not be exploited. If they are employed, they should receive proper contracts in accordance to the Labour Act.		

	Provision must be made for public transport needs like drop off zones and bus stations. In addition a transport system should be devised on the basis of the existing transport infrastructure to provide the labourers with transportation to and from home. The transport costs of the labourers should be subsidised if the applicants do decide to fully rely on the current infrastructure. However, local entrepreneurs should preferably be consulted to provide the applicants with this service.		On-going
	It is advised that some effort be made to uplift the surrounding communities by either providing employment opportunities exclusively for these communities, or by providing bursaries and on the job training for those interested in studying an area relevant to mining.		
Socio-economic	Local materials should be used for construction as far as possible and sustainable.	ESHRQ Department	On-going
	The importance of the maintenance of the roads in the area should be emphasised to the relevant authorities. The applicant must also make some contribution to maintaining the main access roads and ensure that the construction phase will do as little damage to the road surface as possible.	Applicant	
	During the construction phase it is advised that contactors, working on the site, must wear visible identification cards/uniforms and that the CLF must work with the police and the Community Police Forum to ensure that the community is aware of the newcomers in the area and they should devise a strategy on access, movement and transportation. It is imperative that the applicant must become part of the community police forum.	ESHRQ Department	
	Strict health and safety measures must be implemented during the construction and operation phases. These measures must be enforced, and if someone does not adhere to it a penalty system should be in place. The rules must be enforced on contractors and permanent employees.		
	Construction vehicles must be scheduled to travel through towns during off-peak times.	ECO/Contractor	
	The mine should ensure that all employees are adequately trained and qualified to perform their duties. Visitors must be familiarised with the safety precautions of the mine. This aspect will most likely be addressed by the Occupational Health and Safety officer employed.	ESHRQ Department	
Health and Safety			
Objective: To protect Health and Safety			
deterioration of health and safety of personnel	Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act. Workers to wear Personal Protective Equipment (PPE).	Mine Management	On-going
	Control Access into the property; Fence may be erected around pits; Implement and monitor EMPr presented herein.		
	Hazardous material must be correctly labelled and handled in a safe manner.	ESHRQ Department/ECO	On-going
	Adhere to provisions of Mine Health and Safety Act.	Mine Management	On-going
Land Use			
Objective: To prevent unnecessary negative impacts on surrounding land uses			
Interference with existing land uses	Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities.. Enter into Land Surface agreement to be signed with land owners.	Mine Management	Mine Management When necessary
	Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable. All activities to be restricted within the demarcated areas.	ESHRQ Department & Mine Management	On-going Continuous
	Ensure that productive land which is not used during construction is made available for farming.	Mine Management	Mine Management
Traffic **Objective: To prevent traffic-related accidents and/or injury to people and livestock**			
Impacts on traffic safety and	Implement measures that ensure the adherence to traffic rules.	ESHRQ Department/ECO	When necessary

deterioration of the existing road networks	Maintain good road surface condition.		
Waste			
Objective: To prevent pollution of environment			
Pollution of the environmental	All waste produced to be disposed of in permitted designated waste disposal site. Waste must be stored in designated areas for storage. Clearly demarcate and label appropriate storage for the different types of waste.	ESHRQ Department/ECO/Mine Management	Continuous
	Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licensed landfill site.		
	Applicant to compile an Integrated Water and Waste Management Plan. Identify Waste streams on site and conduct waste classification at an appropriate time. Design storm water management plan.		
	Compile, Implement and Monitor and Effective Waste Management Plan. Design an environmentally friendly remediation of contaminated sites management plan. Appoint a competent contractor to handle waste on site.		
	Divert clean water around the site and collect storm water into a containment facility. Conduct further analyse of waste rock during operation to determine geochemical properties. Sewage Septic Tanks should be inspected and serviced regularly.		Continuous
	All waste produced to be disposed of in permitted designated waste disposal site. Waste must be stored in designated areas for storage. Clearly demarcate and label appropriate storage for the different types of waste.		
	Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licensed landfill site.		
	Waste will be collected in colour coded / clearly marked bins. Waste must be classified according to the risk that it poses. Containers will be placed at strategic points throughout the mining operation site.		
	Waste classification is based on the concept of risk. The severity of the risk posed to the environment must be determined as well as the degree of control necessary during disposal. Hazardous waste must be placed in a suitable bin in accordance with its properties and characteristics.		
	Storage must be based on compatibility of raw materials and waste accordingly. Containers will be placed at strategic points throughout the prospecting operation site. Separation at source strategy must be implemented. Waste will be collected in colour coded / clearly marked refuse bags and / or bins. Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site. Used oil will be recycled as far as possible.		Continuous

	Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site. Garden refuse is transported to the nearest composting site.		
	Rubber and contaminated waste is disposed to a licensed landfill site. Scrap metal, electric cable and used conveyor belts are weighed separately and transported to site or recyclers.		
	Hazardous waste is disposed to a suitably licensed landfill site. SAWIC may be used to register generated waste at all times. Document control and proper filing must be in place.		
	Waste disposal certificates must be provided by the contractor for each load of waste removed from site and each load disposed to a licensed landfill site.		
	Waste Tyres: removed from site by service provider and handles according to Waste Tyres Regulations and Integrated Waste Tyre Management Plan.		Continuous
	There should be constant communication between the ECO and various suppliers of all consumables on site for smooth handling of their waste, information sharing and record keeping.		
	Some waste may be used to backfill excavated areas.		
Wetlands			
Objective: To prevent destruction of wetlands			
Disturbance of water resource and destruction of riparian zone	If any prospecting activities are to take place within the delineated Matlhwareng River Riparian Zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998).	Mine Management/ ESHRQ Department/ECO	On-going
	A riparian zone offset area must be identified and rehabilitation measure implemented in the offset site as per the offset process. Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within the ephemeral drainage lines must be conducted during the driest seasons. The operation must co-ordinate different activities in order to optimise the excavated trenches and thereby prevent repeated and unnecessary excavations.		When necessary
	Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.		
	Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.		
	A storm water management plan must be implemented to ensure that dirty water is contained onsite.		
	A storm water management plan must be implemented to prevent run-off from the stock piles.		

	Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment. Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. The mine must have spill procedures in place and specific awareness training. Spill kits such as from Drizzit or Enertech or Supazorb and so on, so if there is a spill it can be cleaned and treated as much as possible and report to authorities in 24 hours. Clearly define roles and responsibilities of all personnel during spillage events.		When necessary
Alien Invasive Plants **Objective: To eradicate and control the spread of alien invasive species**			
Proliferation of alien invasive plants species	Eradicate, and control the spread, of alien invasive species. Compile a working weed/alien plant management programme in collaboration with the Department of Environment, Fisheries and Forestry. Implement effectively the compiled weed/alien plant management programme. All landscaping must take place with indigenous species occurring in the area. All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure in order to limit the opportunity for invader species establishment. These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase.	Mine Management/ ESHRQ/ECO	On-going

26.5.2 Operational Phase

Table 20 only addresses those impacts that may occur on the site during the Operational and associated management measures that may require additional environmental management.

Table 21: Operational Phase

Issue	Mitigation	Responsible Party	Frequency of Action
Geology **Objective: To optimise the exploitation of the mineral resource.**			
Loss of mineral resource.	Optimise prospecting activities and locate strategically the related infrastructure in order to access the mineral resource and recover it effectively.	ESHRQ Department	On-going
Topography			
Objective: To minimise topographic alterations.			
General land disturbance.	Manage through best practices and limit all activities to the proposed prospecting footprint area.	ESHRQ Department	When necessary
	The stockpiles and tailings dams will be located on the proposed prospecting footprint area. Conduct concurrent backfilling.	Mine Authorities	Continuous
Soils and Land Capability **Objective: To minimise soil degradation and ensure the implementation of effective rehabilitation measures.**			
Soil erosion.	Avoid bare, disturbed surfaces for long periods (e.g. re-vegetate stockpiled soils) and undue storm-water concentration (e.g. construct runoff measures according to soil conservation principles).	ESHRQ Department	On-going
Soil erosion by wind	Avoid bare, disturbed surfaces for prolonged period of time. Re-vegetate the disturbed area as soon as reasonably practicable. Cover exposed soils with brush packs at the earliest point following exposure. Construct windbreaks if necessary.		When necessary
Erosion by water and wind	At no point may plant cover be removed outside of the development zone.		On-going
	The removal of plant material must be kept to a minimum. All plant material removed must be used for the establishment of brush packs. Cover exposed soils with brush packs at the earliest point following exposure.		When necessary
	Audits must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the cause of the erosion must be undertaken. Rehabilitation of the erosion channels and gullies must take place.	ESHRQ Department	As necessary during windy periods and after rain When necessary
	Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in that area have ceased.		
Dustiness	Limit traffic congestion and speed to definite road zones and set threshold. Grade and water road surfaces.	ESHRQ Department	On-going
	Re-vegetate and irrigate sources of dust.		When necessary
Chemical Soil pollution	Personnel must be trained to be able to prevent chemical and hydrocarbon spills.		On-going
	Combat chemical pollution in order to avoid toxic substances entering food chains.		
Topsoil degradation.	Use only the A-horizon for topsoil purposes.		

Soil pollution through acid mine drainage	Handle topsoil only when moist to prevent wind erosion but not when moisture exceeds 12 % in order to prevent destruction of soil structure. Ground exposure should be minimised in terms of the surface area and duration, wherever possible.		
	The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers. Audits of Mine Residue Deposits, including water return dams, waste rock dumps, tailings storage facilities must be carried out at regular intervals to ensure that best practices are being followed throughout the operations. Water from mine dewatering must be used wherever possible within the process and not discharged directly into the environment.		On-going Daily inspections, monthly audits. On-going
Surface Water **Objective: To minimise negative impacts on the aquatic systems**			
Pollution of surface water – hydrocarbons	Hydrocarbon contamination of the soil by diesel and oil spillage during earthworks must be prevented. Biodegradation of contaminated soils and water sources should be carried out when necessary.	ESHRQ Department	On-going
	Trucks should be inspected and in good working order. Following the detailed design of the prospecting program, appropriate measures should be implemented to ensure clean and dirty water separation and thereby mitigating the impact of pollution of the receiving Matlhwareng River System. A clear surface water monitoring plan should be developed prior to starting operations to protect the integrity of the receiving Matlhwareng River System.		
Impeding or diverting the flow of water in a watercourse	Apply for authorisation from Department of Human Settlements, Water and Sanitation. Compile an IWWMP. Implement IWWMP effectively. Where mining infrastructure, such as haul roads, are required across natural watercourses, new storm water infrastructure, such as pipes and culverts could replace the hydraulic function currently offered by the natural water courses. Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within the ephemeral drainage lines must be undertaken during the driest seasons (March to September of every year). This infrastructure should be designed for both hydraulic performance and environmental functionality. A thorough assessment of the suitability of the new stormwater infrastructure must be made at preliminary design stage. The water quality of rivers and the proposed canals should be monitored on a monthly basis as described in the operational management plan.	Mine Management	When necessary
Ground Water **Objective: To minimise negative impacts on the groundwater systems**			
Groundwater pollution – seepage from the slimes dam	The rates of seepage should be determined by means of geotechnical investigations and leachate tests on the tailings material to determine the composition of the possible seepage.	ESHQ Department	On-going
	Monitoring of seepage water quality in the toe drains by means of scheduled sampling for the constituents. Monitoring boreholes down-gradient of slimes dam for water level and water quality. Sampling according to the sampling method and parameters for analysis.		Monthly
Groundwater pollution – seepage from the slimes dam	Monitoring of water quality in the penstock by means of sampling. Monitoring of the success of establishment of suitable woodland species to control nitrates, phosphates and sulphates in the slimes dam plume Monitoring of the success of establishment of suitable wetland species to control heavy metals below the slimes dam.	ESHRQ Department	Monthly On-going at regular intervals (e.g. six months)
Groundwater pollution – impact on the background and neighbouring users	Monitoring of water quality in neighbouring boreholes should be considered for background water quality identification. The frequency of sampling would be less than for the on-site monitoring boreholes. These boreholes are categorised as off-site		Monthly

water quality	boreholes. This may be minimal or negligible at prospecting phase, however, necessary at mining phase.		
Groundwater level impact – dewatering	Water level monitoring in boreholes sited next to the decline and near the area of operations. Borehole between the non-perennial stream and the operations in the migration corridor would assist in identifying any impacts the activities may have on the non-perennial stream. A water balance for the operations should include a measurement of the water collected in the decline and the underground mine/s as a result of dewatering activities. This volume should be reconciled with the findings from the numerical groundwater model. Water volumes and the water balance should be compiled using actual flows. These flows should be measured using strategically placed, calibrated flow meters.	ESHQ Department	On-going
Groundwater quality impact	Water level monitoring on the site and in neighbouring boreholes must take place to determine water level changes and aquifer storage changes with time. These impacts are not likely to be directly related to a change in recharge, however, as a result of dewatering and the removal of groundwater from the aquifers. This may be necessary at mining phase. Water from the dewatering process must be re-used.	ESHRQ Department	Monthly Continuous
Monitoring	The site characterisation boreholes with water strikes should be tested for aquifer parameters i.e. transmissivity and storativity,		Monthly
Monitoring	The slimes and ore material should be tested with leachate testing. The analyses should include arsenic, selenium, hexavalent chromium tin and mercury.		
	Seepage tests should be conducted at the site of the proposed slimes dam. The contaminant transport model should be updated with the leachate test results.		
Groundwater pollution – spillage of chemicals and hydrocarbons	All possible measures must be implemented to ensure that groundwater reserves are not polluted, including the following: Prevention of hydrocarbon spills: Correct storage of hydrocarbons underground and above-ground within concrete bunded areas; High standard of maintenance on vehicles to prevent hydrocarbon leaks; Refuelling to take place within a bunded area; High standard of maintenance on refuelling equipment; Availability of spill kits as well as training of personnel in the use thereof; and Implementation of measures to ensure rapid clean-up following spill events.		On-going
Flora			
Objective: To minimise the disturbance and/or removal of flora			
Proliferation of invasive plant species.	Landscaping must be associated with indigenous species that occur naturally in the area.	ESHRQ Department	On-going
	All landscaping must take place with indigenous species occurring in the area. All invasive species must be eradicated from the site and prevented from spreading	ESHRQ Department	On-going
	All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure. These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase. These areas must also be watered to a limited degree with water from the dewatering (if fit for the purpose) in order to ensure that the indigenous species establish as soon as possible.		
Vegetation clearance.	Storm water management will be implemented to ensure that polluted and clean water will be separated and to reduce the velocity of the storm water.		
	Access roads must be kept to a minimum, and where possible existing tracks must be used. Vehicles should remain only in the area to be disturbed by the road and other works at all times.		
Loss of trees due to water extraction.	Herbicides must not be used for vegetation clearance. Water must be piped in, which will prevent the depletion of groundwater reserves and the subsequent negative impact on groundwater.		
Fragmentation of natural habitat	Natural corridors must be retained where possible to promote movement of fauna.		
Floral disturbance in riparian zone.	No vehicle movement must take place within the buffer zone.	ESHRQ Department	On-going
Fauna			
Objective: To prevent the disturbance to fauna as far as reasonably practicable			
Faunal displacement and loss of	All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.	ESHQ Department	On-going

habitat.	The Environmental Control Officer must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.		
	The environmental induction should occur in the appropriate languages for the workers who may require translation.		When necessary
Air Quality			
Objective: To mitigate negative impacts on the ambient air quality			
Dust entrainment and concomitant PM10 emissions	The following mitigation measures, proposed for implementation by the applicant are acknowledged and supported: • Extraction of dust-laden air from raw materials handling area, final products handling area and the sorting pan. Further mitigation measures that are recommended for implementation are as follows: • Crushing operations, a significant source of particulate should be effectively controlled • The best technology for dust control in this context is by means of extraction hoods and ducting, followed by capture in a collector. Depending on further destinations of captured dust, the decision between wet or dry capture may be made. Dry capture methods include fabric filters and electrostatic precipitation. Wet scrubbing technologies range from the lower efficiency types (e.g. spray chambers) to high efficiency venture type scrubbers.	Design Engineers; Applicant	On-going
Dust entrainment and On-going concomitant PM10 emissions.	The following abatement measures are listed to serve as a *guideline* in the mitigation of emissions. • Tailings impoundments – Dust mitigation measures that are logistically feasible given the nature of the environment must be identified and implemented. Typical temporary mitigation measures include wet and chemical suppression with more permanent measures comprising, wind sheltering, vegetation and rock cladding. • Unpaved road surfaces - The currently unpaved access road should preferably be paved or treated with a chemical surfactant if necessary. Alternatively, wet suppression could be used depending on the availability of water. Watering represents a commonly used, relatively inexpensive option, but only serves as a temporary form of dust control. Although biodegradable chemical treatment of the exposed surfaces is relatively expensive it provides for longer dust suppression. If a chemical is used it must be ensured that it is carefully administered and is not harmful to the receiving biophysical environment. • Surface Conveyor Belts - The proposed prospecting activities produce ore that would be transported via conveyor belt to the stockpile if necessary. Recommended mitigation measures for implementation are presented below.	Design Engineers; Applicant; ESHRQ Department	On-going
Dust entrainment and On-going concomitant $PM_{2,5}$ & PM_{10} emissions. Dust arising from conveyor usage.	Cover all exposed soils with suitable brush packs. Install sprays at transfer points to wet dust and particles and prevent liberation thereof.	ESHRQ Department	When necessary When necessary
	Install side wind guards. Place covers on high and/or steep parts of the conveyor (where applicable).		Once off On-going
	Ensure belt is clean. Install dust collection systems, if necessary, (these systems are used to capture, transport and separate dust that has been emitted. Dust collection provides a cost effective means of controlling respirable dust emission while wet sprays are effective in suppressing visible dust).		Once off On-going
	Enclosure maintenance.		
Global Warming	The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM_{10}) including $PM_{2,5}$ and larger total suspended particulates (TSP) that relate to dust fallout, VOC's, SO_2, NO_2 and gaseous emissions mainly from TMM's, vehicles and generators must be kept below WHO concentration limits.	ESHRQ Department/ ECO	On-going
	Use diesel with relatively low concentrations of SO_2 in TMM's.		
Noise and Vibrations **Objective: To minimise the disruption of ambient noise levels and/or increase in continuous noise levels**			
The impact of the operations on ambient noise climate	Maintenance of equipment and operational procedures: Proper design and maintenance of silencers on diesel-powered equipment if necessary, systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.	ESHRQ Department	On-going

	Placement of material stockpiles: Where possible material stockpiles should be placed so as to protect the boundaries from noise from individual operations. If a levee is constructed, it should be of such a height as to effectively act as a noise barrier, if line of sight calculations show this to be practicable.	ESHRQ Department	When necessary
	Equipment noise audits: Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.		Monthly
	Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.		
Sites of Heritage and Cultural Interest **Objective: To protect and preserve all cultural and heritage resources located within the study area**			
Disruption of sites with palaeontological/archaeological and/or cultural interest.	The mine prospecting can go ahead, mindful of the sites that have been flagged for protection. As a standard precaution archaeological deposits are usually buried underground. Should archaeological artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place. No development must take place within 100 metres of the graves in order to prevent disturbance to heritage resources or sites. If fossils are found once prospecting operations have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample and follow the proposed Chance Find Protocol, if any.	ESHRQ Department	On-going
Visual Aspects			
Objective: To avoid extensive scarring of the landscape and poor visibility			
Visual impact	Maintain the site and facility to a high aesthetic level by regularly replacing broken windows, painting blighted facades and maintain the landscape around the facility healthy and neat. If practically feasible, keep the tailings stockpile and slimes dam to a maximum height equal or lower than the prevailing vegetation cover, i.e. five (5) m or lower. Alternatively, implement progressive rehabilitation on the side slopes of the tailings stockpile and slimes dam to reduce the exposed surface of contrasting material. Avoid the installation of lights on the perimeter of the site in order to limit/eliminate obtrusive lighting and the potential disturbance of adjacent landowners and users.	ESHRQ Department	On-going
	Refrain from installing permanent lighting where light is required intermittently. Lighting can be switched on manually or through an automatic time switch, synchronised with the times light is required.	ESHRQ Department	On-going
Socio-Economic			
Objective: To avoid detrimental impacts on the communities			
Socio-economic	The CLF, if established, must meet on a monthly basis before and during the construction phase and a bimonthly base during the operational phase. If necessary, it can be replaced by the Future Forum as prescribed by the MPRDA, on the condition that the relevant parties remain members of the committee.	ESHRQ Department	On-going
	Local people should, as far as possible, be utilised in the operation of the project. This will maximise local economic development and the creation of employment in the area. This will also serve to minimise the risk of negative feelings and behaviour between locals and new comers.	Applicant	
Socio-economic	Provision must be made for public transport needs like drop off zones and bus stations. In addition a transport system should be devised on the basis of the existing transport infrastructure to provide the labourers with transportation to the site and back home. The transport costs of the labourers should be subsidised if the applicants do decide to fully rely on the current infrastructure. However, local entrepreneurs should preferably be consulted to provide the applicants with this service. It is advised that some effort be made to uplift the surrounding communities by either providing employment opportunities exclusively for these communities, or by providing bursaries and on the job training for those interested in studying an area relevant to prospecting.		

	Strict health and safety measures must be put in place during the operation phases. These measures must be enforced, and if someone does not adhere to it a penalty system should be in place. The rules must be enforced on contractors and permanent employees. The community must be educated about the possible health impacts of these operations. This can be done via the distribution of information pamphlets and lectures from the occupational health professionals in the community. The mine must ensure to have monitoring equipment in place to ensure that records of levels of chemicals, dust and noise are measured before the commencement of the project. This will ensure that a scientific baseline is in place. The mine should ensure that all employees are adequately trained and qualified to perform their duties. Visitors must be familiarised with the safety precautions of the mine. This aspect will most likely be addressed by the Occupational Health and Safety officer employed by the mine authorities.	ESHRQ Department	On-going On-going
Health and Safety **Objective: To protect Health and Safety**			
deterioration of health and safety of personnel	Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act.	Mine Management	On-going
	Workers to wear Personal Protective Equipment (PPE). Control Access into the property; Fence may be erected around pits; Implement and monitor EMPr presented herein.		
	Hazardous material must be correctly labelled and handled in a safe manner. Adhere to provisions of Mine Health and Safety Act.	ESHRQ Department/ECO Mine Management	 On-going
Land Use **Objective: To prevent unnecessary negative impacts on surrounding land uses**			
Interference with existing land uses	Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities.	Mine Management	Mine Management
	Enter into Land Surface agreement to be signed with land owners.		When necessary
	Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable.	ESHRQ Department & Mine Management	On-going
	All activities to be restricted within the demarcated areas. Ensure that productive land which is not used during construction is made available for farming.	 Mine Management	Continuous Mine Management
Traffic **Objective: To prevent traffic-related accidents and/or injury to people and livestock**			
Impacts on traffic safety and deterioration of the existing road networks	Implement measures that ensure the adherence to traffic rules. Maintain good road surface condition.	ESHRQ Department/ECO	Continuous
Waste **Objective: To prevent pollution of environment**			
Pollution of the environmental	All waste produced to be disposed of in permitted designated waste disposal site.	ESHRQ Department/ECO/Mine Management	Continuous
	Waste must be stored in designated areas for storage.	ESHRQ Department/ECO	
	Clearly demarcate and label appropriate storage for the different types of waste. Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licensed landfill site. Applicant to compile an Integrated Water and Waste Management Plan.		
	Identify Waste streams on site and conduct waste classification at an appropriate time.		

	Design storm water management plan.		
	Compile, Implement and Monitor and Effective Waste Management Plan. Design an environmentally friendly remediation of contaminated sites management plan.		
	Appoint a competent contractor to handle waste on site. Divert clean water around the site and collect storm water into a containment facility.		
	Conduct further analyse of waste rock during operation to determine geochemical properties. Sewage Septic Tanks should be inspected and serviced regularly.		
	All waste produced to be disposed of in permitted designated waste disposal site. Waste must be stored in designated areas for storage.	ESHRQ Department/ECO ESHRQ Department/ECO	Continuous Continuous
	Clearly demarcate and label appropriate storage for the different types of waste. Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licensed landfill site. Waste will be collected in colour coded / clearly marked bins.	ESHRQ Department/ECO	
	Waste must be classified according to the risk that it poses. Containers will be placed at strategic points throughout the mining operation site.		
	Waste classification is based on the concept of risk. The severity of the risk posed to the environment must be determined as well as the degree of control necessary during disposal.		
	Hazardous waste must be placed in a suitable bin in accordance with its properties and characteristics. Storage must be based on compatibility of raw materials and waste accordingly.		
	Containers will be placed at strategic points throughout the prospecting operation site. Separation at source strategy must be implemented.		
	Waste will be collected in colour coded / clearly marked refuse bags and / or bins. Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site.	ESHRQ Department/ECO ESHRQ Department/ECO	 Continuous
	Used oil will be recycled as far as possible. Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site.	ESHRQ Department/ECO	Continuous
	Garden refuse is transported to the nearest composting site. Rubber and contaminated waste is disposed to a licensed landfill site.		
	Scrap metal, electric cable and used conveyor belts are weighed separately and transported to site or recyclers. Hazardous waste is disposed to a suitably licensed landfill site.		
	SAWIC may be used to register generated waste at all times. Document control and proper filing must be in place.		
	Waste disposal certificates must be provided by the contractor for each load of waste removed from site and each load disposed to a licensed landfill site.		
	Waste Tyres: removed from site by service provider and handles according to Waste Tyres Regulations and Integrated Waste Tyre Management Plan.		
	There should be constant communication between the ECO and various suppliers of all consumables on site for smooth handling of their waste, information sharing and record keeping.		
	Some waste may be used to backfill excavated areas.	ESHRQ Department/ECO	Continuous
Wetlands			
Objective: To prevent destruction of wetlands			
Disturbance of water resource and destruction of riparian zone	If any prospecting activities are to take place within the delineated Matlhwareng River Riparian Zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998).	Mine Management/ ESHRQ Department/ECO	On-going
	A riparian zone offset area must be identified and rehabilitation measure implemented in the offset site as per the offset process.	ESHRQ Department/ECO	When necessary

	Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within the ephemeral drainage lines must be undertaken during the driest seasons (March to September). The operation must co-ordinate different activities in order to optimise the excavated trenches and thereby prevent repeated and unnecessary excavations. Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.		
	Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.		
	A storm water management plan must be implemented to ensure that dirty water is contained onsite. A storm water management plan must be implemented to prevent run-off from the stock piles.	ESHRQ Department/ECO	When necessary
	Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment. Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities.	ESHRQ Department/ECO	When necessary When necessary
	The mine must have spill procedures in place and specific awareness training. Spill kits such as from Drizzit or Enertech or Supazorb and so on, so if there is a spill it can be cleaned and treated as much as possible and report to authorities in 24 hours. Clearly define roles and responsibilities of all personnel during spillage events.		
Alien Invasive Plants **Objective: To eradicate and control the spread of alien invasive species**			
Proliferation of alien invasive plants species	Eradicate, and control the spread, of alien invasive species.	Mine Management/ ESHRQ Department/ECO	On-going
	Compile a working weed/alien plant management programme in collaboration with the Department of Environment, Fisheries and Forestry.	ESHRQ Department/ECO	
	Implement effectively the compiled weed/alien plant management programme. All landscaping must take place with indigenous species occurring in the area.		
	All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure in order to limit the opportunity for invader species establishment. These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase.		

26.5.3 Decommissioning Phase

Most of mitigation that is proposed to be undertaken during decommissioning phase is applicable though all phases (Construction, Operational and Decommissioning Phases) of this proposed development. To decommission operations and rehabilitate the environment, refer to Table 21.

Table 22: **Decommissioning Phase**

Issue	Mitigation	Responsible Party	Frequency of Action
Geology	• Recover lost minerals, if necessary.	ESHRQ Department/ECO	On-going
Topography	• Restore topography reasonably practicable possible	ESHRQ Department/ECO	On-going
Soils and Land Capability	• Restore state of land as much as reasonably practicable possible.	ESHRQ Department/ECO	On-going
Fauna and flora	• Limit vegetation clearance to only the area where activities are to take place.	ESHRQ Department/ECO	On-going
	• Restore the disturbed area to a state where possibly animals will become attracted post closure.		
Surface Water	• Ensure adherence to recommendations of the DHSWS	ESHRQ Department/ECO	On-going
Groundwater	• Apply water-saving techniques such as re-use of the resource.	ESHRQ Department/ECO	On-going
	• Implement pollution control measures.		
Soil Erosion	• Limit stockpile slopes angle to minimal threshold angle in accordance to the height of the slope.	ESHRQ Department/ECO	On-going
GHG Emission (Global Warming)	• Keep emissions within acceptable levels	ESHRQ Department/ECO	
Dust generation	• Manage emissions of dust through dust suppression.	ESHRQ Department/ECO	On-going
Socio-economic	• Prepare UIF applications, if necessary.	ESHRQ Department/ECO	On-going
Traffic	• Obtain necessary permits or permit to transport abnormal loads, if necessary.	ESHRQ Department/ECO	On-going
Waste	• Waste must be stored in demarcated temporary storage facilities and be disposed of in accordance with applicable pieces of legislation and best practise guidelines.	ESHRQ Department/ECO	On-going
	• Some waste may be used to backfill excavated areas.		
Wetlands	• Remove demarcations.	ESHRQ Department/ECO	On-going
Invasive Alien Plants	• Monitor effectiveness of weed management programme.	ESHRQ Department/ECO	On-going
Infrastructure	• All mobile machinery will be removed from site.	ESHRQ Department/ECO	On-going
	• Manage activity footprint as much as reasonable practicably possible.		
	• Monitoring to be conducted a reasonably practicable possible long enough period post closure, i.e. 1 - 2		

	years		
Land Uses	• Plant indigenous plants.	ESHRQ Department/ECO	On-going

27 Impact Management Outcomes

The impact management outcomes are presented in Table 23.

Table 23: Impact Management Outcomes

Aspect	Activity	Potential Impact	Phase/s	Significance (Pre-mitigation)	Management actions type	Significance (Post-mitigation)	Impact management objectives
Geology	Mineralised waste Use of facilities and services prospecting final land forms	Loss and sterilisation of mineral resources	Planning Operational Decommissioning	Low	• Management through best practises	Low	Can be managed/mitigated to acceptable levels
Topography	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Deep excavations and infrastructure resulting in safety risks to third parties and animals	Planning Construction Operational Decommissioning	Low - Medium	• Control through access control; • control through management and monitoring; • control through rehabilitation; and • remedy through emergency response procedures • Concurrent backfilling	Low - Medium	Can be managed/mitigated to acceptable levels
Soil and land capability	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resources and land capability through contamination	Planning Construction Operational Decommissioning	Low - Medium	• Control through waste management practices; • control through rehabilitation; • control through appropriate design; and	Low - Medium	Can be managed/mitigated to acceptable levels

					• remedy through emergency response procedures		
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resource and land capability through physical disturbance	Planning Construction Operational Decommissioning	Low - Medium	• Manage through limiting the project footprint; • manage through soil conservation procedures; and • manage through closure planning and rehabilitation	Low - Medium	Can be managed/mitigated to acceptable levels
Biodiversity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Physical destruction of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management though biodiversity action plan and offset (when relevant); • managing through limiting the project footprint; • management through rehabilitation; and • control through permits for removal	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	General disturbance of biodiversity	Planning Construction Operational Decommissioning	Medium - High	• Management through alien invasive species programme; • management through training; • management through monitoring; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
Surface	Earthworks; Mineralised waste; Water use and	Alteration of natural drainage	Planning Construction	Medium - High	• Management through storm water control; and	Low - Medium	Can be managed/mitigated to

	management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	patterns	Operational Decommissioning		• manage through monitoring water requirements		acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of surface water resources	Planning Construction Operational Decommissioning	Low - Medium	• Management through waste management practises; • management through monitoring; • management through compensation; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
Groundwater	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of groundwater resources	Planning Construction Operational Decommissioning	Low - Medium	• management through monitoring; • management through compensation; • management through appropriate design; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Deep excavation and pits	Lowering of groundwater levels and reducing availability	Operational	Medium - High	• Management through monitoring; and • management through compensation	Medium - High	Can be managed/mitigated to acceptable levels
Air quality	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Air pollution and Global Warming (Climate Change)	Planning Construction Operational Decommissioning	Low - Medium	• Manage through air controls and monitoring	Low - Medium	Can be managed/mitigated to acceptable levels

Noise & Vibration	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Increase in disturbing vibration and noise levels	Planning Construction Operational Decommissioning	Low - Medium	• Manage through vibration and noise controls and once-off sampling	Low	Can be managed/mitigated to acceptable levels
Visual amenity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Negative visual Views	Planning Construction Operational Decommissioning	Low	• Manage through limiting project footprint, rehabilitation and visual controls	Low	Can be managed/mitigated to acceptable levels
Heritage/cultural and palaeontologic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of heritage/cultural and palaeontological resources	Planning Construction Operational Decommissioning	Medium – High (Heritage) Low – Medium (Palaeontology)	• Control through avoidance; and • remedy through emergency response procedures • Follow Chance-Find Protocol	Low Low	Can be avoided Can be managed through implementation of Chance-Find Protocol
Socio-economic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Influx of labour	Construction Operational	Low - Medium	• Control through the monitoring of living conditions of employees, recruitment processes, disease management; and • remedy through emergency response procedures	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in	Socio-economic impact	Planning Construction Operational Decommissioning	Low - Medium	• Control through good communication, recruitment and procurement processes	Low - Medium	Can be managed/mitigated to acceptable levels

	line with closure plan						
Veld fires	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Destruction of current land uses and habitat fragmentation patterns	Planning Construction Operational Decommissioning	Low - Medium	• Establish Fire Breaks of no less than six (6) metres in width; • Construct and maintain functioning fire hydrants	Low - Medium	
Health and Safety	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Health and Safety impact	Planning Construction Operational Decommissioning	Low - Medium	• Implement provisions of the Mine Health and Safety Act	Low	Can be managed/mitigated to acceptable levels
Land use	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Interference with land uses	Planning Construction Operational Decommissioning	Medium - High	Management through Communication	Low	Can be managed/mitigated to acceptable levels
Traffic	Use of existing infrastructure with minimal construction of haul roads and use of existing facilities and services	Road disturbance and traffic safety	Planning Construction Operational Decommissioning	Low - Medium	• Manage through road maintenance; • Adherence to speed limit; and • remedy through emergency response procedures	Low - Medium	Can be managed/mitigated to acceptable levels

Wetlands	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Disturbance of Riparian zone	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of avoidance of disturbance of the anything within the Riparian zone; and • Implement recommendations of the wetland specialist, if any.	Low	Can be managed/mitigated to acceptable levels
Waste	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Pollution	Planning Construction Operational Decommissioning	Low - Medium	• Manage through the principle of waste separation at source; • Implement the waste National Waste Management Strategy and Waste Hierarchy	Low	Can be managed/mitigated to acceptable levels
Alien invasive plants	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Colonisation by alien invasive plants	Planning Construction Operational Decommissioning	Medium - High	• Compile weed/alien plant management programme in consultation with DENC and DA. • Implement the compiled weed/alien management programme effectively.	Low	Can be managed/mitigated to acceptable levels

28 Financial Provision

28.1 Determination of The Amount of The Financial Provision

As stated in the draft report that was submitted to the Competent Authority pertaining to the proposed development, concurrent backfilling is going to be undertaken during the prospecting phase. If the applicant or technical partner implements the plan as recommended in this piece of work, only less than one hectare will remain at final rehabilitation and closure of the project.

28.1.1 Description of The Closure Objectives and The Alignment With The Baseline Environment

The preliminary closure plan objectives and principles have been developed against the background of the mine location in the Kimberley region of the Northern Cape Province, and include the following:

- that environmental damage is minimised to the extent that it is acceptable to all parties involved;
- that at closure, the land will be rehabilitated to achieve an end use of wilderness and grazing;
- that all surface infrastructure will be removed from site after closure. The open pit will be completely backfilled and the remaining waste rock dumps shaped accordingly;
- that contamination beyond the mine site by wind, surface run-off or groundwater movement will be prevented;
- that closure prospecting operations is achieved efficiently, cost effectively and in compliance with the law; and,
- that the social and economic impacts resulting from closure of operations are managed in such a way that negative socio-economic impacts are minimised.

The closure target outcomes for the site are therefore assumed to be as follows:

- to achieve chemical, physical and biological stability for an indefinite, extended time period over all disturbed landscapes and residual mining infrastructure;
- to protect surrounding surface water, groundwater, soils and other natural resources from loss of current utility value or environmental functioning;
- to limit the rate of emissions to the atmosphere of particulate matter and salts to the extent that degradation of the surrounding areas' land capability or environmental functioning does not occur;
- to maximise visual 'harmony' with the surrounding landscape; and
- to create a final land use that has economic, environmental and social benefits for future generations that outweigh the long term aftercare costs associated with the mine.

28.1.2 Confirmation That The Closure Objectives Have Been Consulted With Landowners and I&APs

The consultation process with interested and affected parties (neighbouring farmers and land owners) will be completed. Regular contact sessions will be held with neighbouring farmers and land owners which are currently affected by the prospecting operations. Records will be kept of the complaints and the mitigation measures will be implemented. An advert in the Kathu Gazette will also be placed in order for other interested parties to come forward and register as interested parties in the project.

28.1.3 Rehabilitation Plan

Infrastructure Areas

On completion of the prospecting operations, the various surfaces, including the access road, the office area, storage areas and the screening plant site should finally be rehabilitated as follows:

- All remaining material on the surface should be removed to the original topsoil level. This material should then be backfilled into the depressions. Any compacted area should be ripped to a depth of 300 mm, where possible, the topsoil or growth medium returned and landscaped;
- All infrastructures, equipment, screening plant, and other items used during the operational period should be removed from site; and
- On completion of operations, all buildings, structures or objects on the office site should be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should be permitted to be buried or burned on the site.

On-going Seepage, Control of Rain Water: It is not foreseen that any monitoring of ground or surface water should take place after mine closure, except if so requested by the DHWS – Northern Cape.

Long-Term Stability and Safety: It should be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads

After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources and Energy.

Submission of Information

Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources and Energy – Northern Cape, as described in Regulation 55.

Maintenance (Aftercare)

Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme. The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.

The aim with the closure of the mine should be to create and acceptable post-mine environment and land-use. Therefore all agreed commitments should be implemented by Mine Management.

After-effects Following Closure

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long Term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent cleaning of all tailings material and replacement of topsoil where available should be ensured.

The percentage share due to the landowner, Botshelo T and G Mining Resources (Pty) Ltd must be inclusive of amount of compensation as determined in the offset strategy. This must be in a form of a binding agreement or may be annexed to an already existing binding agreement as an addition to the percentage share agreed upon. The steps to be followed in final rehabilitation are presented in Table 23 as preliminary step that may be reviewed.

Table 24: Final Rehabilitation

Step	Final Rehabilitation	Target	Responsible Person	Timeframe
1	**Pre-closure activities**			
1,1	The closure plan presented herein should be reviewed throughout the life of operation.	In order ensure compliance and / or meet provisions of Land surface use agreement.	ECO/ESHRQ Department/Rehabilitation Specialist	Annually
1,2	Consult with the Competent Authority before commencement of final rehabilitation.	In order ensure compliance and / or meet provisions of Land surface use agreement.	ECO/ESHRQ Department/Rehabilitation Specialist	Before final rehabilitation commences
1,3	Apply for necessary permits and licenses before disturbing protected plant and animal species.	In rescue protected species and to ensure compliance.	ECO/ESHRQ Department/Rehabilitation Specialist	Before disturbance of Protected Species
1,4	Utilise available resources, environmentally friendly waste and material during rehabilitation.	In order to ensure implementation of RRR's in waste management.	Project Manager/ECO	On-going
1,5	Separated and classified waste, if applicable, must be disposed of in accordance with applicable piece of legislation and regulations.	In order to ensure implementation of RRR's in waste management.	Project Manager/ECO/ ESHRQ Department	On-going
1,6	Call in a suitably qualified Archaeologist or Palaeontologist to attend and Notify SAHRA if any heritage and palaeontological resources are encountered during rehabilitation.	In order to preserve and rescue resources of heritage, cultural and palaeontological significance.	Project Manager/ECO/ ESHRQ Department	On-going
2	**Surface infrastructure**			
2,1	Create a database and collect data through taking of clear photographs of activity and of associated and / or related infrastructure (before, during and after rehabilitation).	In order to ensure compliance end adherence to land surface use agreement provisions	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Before commencement of operations and on an on-going basis.
2,2	Remove mobile infrastructure from site.	In order to restore the state of land.		After prospecting activities have been completed
2,3	Demolish, dismantle and /or remove all other infrastructure from site, if applicable.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
2,4	Rehabilitate disturbed areas.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
2,5	Caution must be exercised in removing infrastructure for purposes of enabling re-usability and resale.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
2,6	Pollution control dams and associated infrastructure will be rehabilitated after all water grey has been used during rehabilitation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
2,7	Soil that was beneath hydrocarbon storage facilities and TMM parking area must be screened and / or analysed for presence of hydrocarbons by an experienced and suitably qualified consultant.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
3	**Soil and Land**			
3,1	Landscaping should be conducted.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,2	Soil erosion should be taken into account when landscaping is conducted.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,3	Restore topography to acceptable levels.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going

3,4	If concurrent back-filling was conducted during operational phase, the topsoil may be compacted and prepared for re-vegetation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,5	Disturbed areas that were covered by concrete previously must be prepared for re-vegetation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
4	**Re-vegetation (before and during)**			
4,1	Measure should be put in place to ensure that topsoil is suitable for re-vegetation purposes.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Before re-vegetation commences
4,2	Control access into the rehabilitated areas.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
4,3	The rehabilitated areas must be protected and monitored for three (3) years post-closure.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Post decommissioning and closure
5	**Maintenance and monitoring**			
5,1	Keep the Competent Authority updated of progress and of any developments.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
5,2	Maintenance of rehabilitated areas should be performed on an on-going basis.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
5,3	Monitoring of rehabilitated areas must be performed for three (3) years post-closure.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going

28.1.4 Explain why it can be confirmed that the rehabilitation plan is compatibility with the closure objectives

The ultimate rehabilitation of the prospecting site that involves the sloping, levelling, replacement of topsoil and the seeding of an grass seed mix in areas that does not recover acceptably as agreed to by the land owner will ensure that the site could be regarded as safe for humans and animals and will also ensure that the site is stable from an erosion point of view and also ensuring that the site could be used for grazing again.

The removal of waste material of any description from the prospecting area and the disposal thereof at a recognised landfill facility is going to be facilitated.

- The removal of infrastructure, equipment, plant and other items from the site;

- The ripping of compacted areas to a level of 300 mm and the levelling of such areas in order to re-establish a growth medium for plants (such areas will furthermore be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the prospecting operation, if the re-establishment of vegetation is unacceptably slow.

The backfilling of the final excavations with subsoil and the covering thereof with previously stored topsoil (where-after this area will also be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the proposed operation, and seedlings protected for a period of one) if the re-establishment of vegetation is unacceptably slow.

28.1.5 Calculate and State The Quantum of The Financial Provision

The financial provisions presented herein are preliminary in nature.

It is important to note that during the Operational Phase of the proposed development, concurrent backfilling is going to take place. If the applicant prospects according to the provisions of this piece of work, it is expected that only less than a hectare will remain for final rehabilitation at the end of the prospecting activities.

CALCULATION OF THE QUANTUM

Applicant: **Botshelo T and G Mining Resources (Pty) Ltd** **Ref No.: 12365PR**
Date:25 February

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and pow erlines)	m3	1000	15,94	1	1	15940
2 (A)	Demolition of steel buildings and structures	m2	0	221,99	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	327,14	1	1	0
3	Rehabilitation of access roads	m2	500	39,72	1	1	19860
4 (A)	Demolition and rehabilitation of electrified railw ay lines	m	0	385,55	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railw ay lines	m	0	210,3	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	443,97	1	1	0
6	**Opencast rehabilitation including final voids and ramps**	**ha**	**0,2**	**225 957,57**	**1**	**1**	**45191,514**
7	Sealing of shafts adits and inclines	m3	0	119,17	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,3	155 155,97	1	1	46546,791
8 (B)	Rehabilitation of processing w aste deposits and evaporation ponds (non-polluting potential)	ha	0	193 243,96	1	1	0
8 (C)	Rehabilitation of processing w aste deposits and evaporation ponds (polluting potential)	ha	0	561 272,05	1	1	0
9	Rehabilitation of subsided areas	ha	0	129 919,76	1	1	0
10	General surface rehabilitation	ha	0,3	122 909,70	1	1	36872,91
11	River diversions	ha	0	122 909,70	1	1	0
12	Fencing	m	0	140,2	1	1	0
13	Water management	ha	0,5	46 733,73	1	1	23366,865
14	2 to 3 years of maintenance and aftercare	ha	2	16 356,80	1	1	32713,6
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		220491,68
1	Preliminary and General		26459,0016		**weighting factor 2** 1		26459,0016
2	Contingencies			22049,168			22049,168
					Subtotal 2		268999,85
					VAT (15%)		37659,98
					Grand Total		**306660**

28.1.6 Confirmation That The Financial Provision Will Be Provided

It is hereby confirmed that financial provisions will be submitted with bank guarantees to the Department of Mineral Resources and Energy.

29 Mechanisms For Monitoring Compliance and Performance Against The EMP

Table 25: Monitoring measures

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All Prospecting Activities	Biodiversity; Heritage and Cultural Resources Groundwater Quality; Groundwater Quality and Quanity	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme Pollutants Quality Meteorological data	Geologist	Submit an annual prospecting progress report to DMRE Monthly Quarterly Daily
	All commitments contained in the EIA Report and accompanying EMPr.	Ensure commitments made within the approved EIA and EMPr are being adhered to.	ESHQ Department	Undertake and submit an environmental performance audit every two years to DMRE
Drilling/Trenching and Pitting Activities	Cultural Heritage Resources	Monitor groundwater quality and level; Monitor protection of areas of heritage and cultural significance, including Biodiversity, especially protected species.	Appointed drilling/excavation service provider/contractor	Weekly inspection and reporting
Drilling/Trenching and Pitting Activities	Noise Dust fall Visual amenity Soil & Vegetation Soil, Surface Water & Groundwater Socio-economic Housekeeping & Maintenance Waste management Rehabilitation	within 500m from a drill site or trenches (If any). Weekly inspections will cover the following: - Implementation of effective waste management - Establish and implement a stakeholder compliant register on site and ensure that all complaints are responded to promptly. - Ensure that an oil spill kit is readily available. - Ensure that all chemicals and hydrocarbons are stored within bundwalls - Ensure that the fire brake is maintained. - Rehabilitation of drill pads, trenches and pits; - Records of water intersections on borehole logs	Appointed drilling service provider/contractor	Weekly inspection and reporting

		- Control and minimise the development of new access tracks - Appropriate storage and handling of topsoil. Ensure that monitoring is implemented to cover all prospecting activity areas. Sites should be located up and downstream of the prospecting site. Analytical suites for water quality analysis recommended Site walkabouts to determine the condition of facilities and identify any leaks or overflows, blockages, overflows and system malfunctions for immediate remedial action Measure rainfall for water balance updates where possible		
Post Drilling, Excavation or Pitting	Groundwater Re-vegetation Stability Soil erosion Alien invasive species	Monitor the external boreholes within 500m from drill post drilling (if any) or excavations. The Drill, Trench and Pit sites shall be monitored six monthly until closure certificate is obtained.	ESHQ Department	Monitoring report

29.1 Indicate the frequency of Performance Assessment Report/Environmental Audit Report

An environmental audit should be conducted annually and submitted to the DMRE annually. The environmental manager will conduct internal management audits against the commitments in the EMPr in accordance with an annual audit plan. In the operational phase, these audits will be conducted on a quarterly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

30 Environmental Awareness Plan

30.1 Manner in which applicant intends to inform employees of the environmental risks which may result from their work.

Environmental conditions will be included in any operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity to prevent impacts by implementing the proposed mitigation measures. The following principles will apply to the Environmental Awareness Plan (Safety, Health and Environment):

- All personnel will as a minimum undergo general SHE induction and awareness training; and
- The Environmental Control Officer(s) or the responsible personnel from the SHEQ Department will identify the Safely, Health and Environment (SHE) training requirements for all personnel and contractors. The training requirements will be recorded in a training need matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administrated by the SHEQ Department;

Development of a training programme:

- General Awareness training. It should include a general environmental awareness training module that will need to be integrated into the induction programme. The training manual shall include a review of the Environmental Policy, a review of significant environmental aspects, a description of the EMP and the importance of compliance to its requirements, general responsibilities of personnel with regard to the EMP and a review of the emergency and corrective action procedures.

Specific environmental training:

- Specific environmental training will be in line with the requirements identified in the training matrix; and
- People whose work tasks can impact on the environment will be made aware of the requirements of appropriate procedures/ work instructions. The SHE Representative will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.

Training evaluation and re-training:

- Effectiveness of the environmental training will be reflected by the degree of non-conformance to EMPr requirements, the results of internal audits and the general performance achieved.
- Incidents and non-conformances raised against the EMPr will be assessed by the ESHQ manager and SHE Representative (s) determine the cause. Should it be evident that retraining is required the SHE Representative (s) will take the appropriate actions.

The Environmental topics to be covered in awareness training should include the following:

RESOURCE MANAGEMENT

- The importance of saving water;
- South Africa is a water scarce country and rivers are polluted;
- Do not throw litter into river or water drains;
- Do not dispose of oils in sewers;
- Air pollution - Climate change;
- The use of fossil fuels is increasing the amount of greenhouse gases that are discharged to the atmosphere. Share transport or use public transport;
- Don’t burn any rubbish, the smoke pollutes the air;
- Plant trees, they clean the air, provide us with oxygen;
- remove the greenhouse gas carbon dioxide from the air;

- Soil conservation;
- Prevent overgrazing of farmlands, keep vegetation on the surface of the land to prevent soil erosion; and
- Plant trees.

HAZARDOUS SUBSTANCE USE AND STORAGE

- Solvent, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers are harmful to the environment and to your health. Use them sparingly and do not let them get into the water systems. Containers must be disposed of to a licensed hazardous waste disposal facility;
- Hazardous substances must be stored and used correctly;
- Ensure that 16-point Material Substances Safety Data Sheets (MSDS) are available at point of store;

- d. Compressed gas storage requirements; and
- e. Flammable substances store requirements.

INCIDENT AND EMERGENCY REPORTING

- The company must have an emergency/incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on.

OIL / DIESEL / PETROL SPILL CLEAN UP

- All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available on site, drip trays must be used when servicing vehicles.

CONSERVATION OF WATER

- Campaign to save water on site;
- Clean water is expensive and potable water must be used carefully; and
- Prevent pollution of water by preventing spills and dispose of wastes properly.

CONSERVATION OF VEGETATION

- Plants, grasses and trees are very important to our existence on the earth, they provide food, fuel, shelter, raw materials and they clean the air. Indigenous plants are especially important for *muti* and the whole ecology of life. Human activities are destroying the natural forests of the earth. The natural forests are the "lungs" of the planet and unfortunately they are being cleared faster than they can be regenerated;
- EIA's are to be done before virgin bush can be cleared;
- Vegetation cover reduces water and topsoil loss from the ground, do not clear vegetation unnecessarily;
- Indigenous trees provide shade, attract wild birds;
- Do not chop down indigenous trees without good reason;
- Implement a tree planting programme; and
- Remove alien invasive trees in the area such Prosopis, Syringa and Pepper trees, cactus plants.

WASTE MANAGEMENT

- Employees must be instructed on how to tell the difference between hazardous waste and general waste;
- They must know how to separate hazardous and general waste and where to dispose of these wastes in the correct way;
- Examples of hazardous waste which must be recycled or sent to companies such as AVERDA, Enviroserv, InterWaste, Waste Tech, Waste Group or any other authorised entity for disposal:
- Oil, diesel, batteries, acids, paint, thinners, electronic waste;
- Pesticides, Jik and Handy Andy;
- Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Oilkol of the Rose Foundation, Drizit, GK, SpillTech or any other authorised entity will collect old oil;
- Mercury in fluorescent light bulbs is hazardous, fluorescent lights must be handled with great care so as not to break the glass and release the mercury vapour into the air to breath;
- Examples of general wastes which can go to the municipal landfill;

- Wood, paper, plastic, glass, old PPE;
- Recycle, Reuse, Reduce, and Recover wherever possible.

30.2 Manner in which risks will be dealt with to avoid pollution or degradation of the environment

Botshelo T and G Mining Resources (Pty) Ltd will develop and implement an Environmental Management System (EMS) that complies with the requirements of ISO14001:2004 Environmental Management Systems and is certified by the South African Bureau of Standards. Surveillance audits are conducted annually and recertification audits every third year. The proposed development's EMS addresses the following elements of the ISO14001 standard and these, in conjunction with the environmental commitments, ensure that potential environmental impacts arising from the prospecting activities are managed appropriately:

- An environmental policy that includes commitments to prevent pollution, comply with applicable legal requirements and provides a framework for setting environmental objectives and targets;

- A register of environmental aspects and impacts with a view to implementing operational control measures to limit environmental impacts;
- A register of all applicable legal requirements to ensure legal compliance;
- A register of environmental objectives and targets that is consistent with the environmental policy and takes into account significant environmental impact and the management thereof, together with a program for achieving the identified objectives and targets;
- Resources to ensure implementation of the EMS;
- An environmental training and awareness program to ensure that persons performing tasks that could cause significant environmental impacts are aware of such impacts and are competent to perform such tasks;
- A communication procedure for internal and external communication in respect of significant environmental aspects;
- All Environmental Management System Documentation, as required by the ISO14001 standard, which includes control procedures for documents and records;

- Operational control procedures for activities that could cause significant environmental impact to ensure that correct procedures are implemented to;
- minimise potential environmental impacts;
- An emergency preparedness and response procedure that identifies potential emergency situations and potential accidents that can impact on the environment to ensure that such situations are dealt with in an appropriate manner;
- An environmental monitoring and measurement program to monitor and measure the key characteristics of the operation that can cause significant environmental impact and to gauge the success of implemented mitigation measures;
- A procedure for periodically evaluating compliance with applicable legal requirements;
- A procedure for dealing with non-conformities in terms of their identification, corrective action and preventative action;
- Audit programs and procedures that makes provision for internal and external audits focussing on implementation of the requirements of the EMS and legal requirements;
- Management reviews undertaken at planned intervals to ensure the system's continuing suitability, adequacy and effectiveness; and,
- Within the context of the principles listed above, the long term sustainability objectives of the Mine are:

- To avoid impacts by effective planning in order to prevent and limit possible impacts;

- To minimize impacts by implementing decisions or activities that are designed to reduce the undesirable impact on the bio-physical and socio-economic aspects detailed in the previous sections; and

- Rectifying impacts by rehabilitating or restoring, where applicable, the affected environment. This will include attempts at habitat re-creation, and restoring the land to the natural pre-mining land uses or to a pre-determine and approved land use

31 Specific Information Required By The Competent Authority

Section 41 of the MPRDA and regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

The holder of a right as described in the relevant sections of the MPRDA and its regulations must provide the Department of Mineral Resources (DMR) with sufficient financial provision. Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the mine at that time.

The holder of a prospecting right, mining right or mining permit is required to annually assess the total quantum of environmental liability for the mining operation and ensure that financial provision are sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability.

It is hereby confirmed that the financial provision will be reviewed annually.

32 Undertaking

2) UNDERTAKING

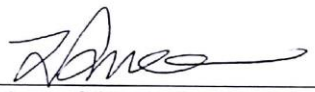
The EAP herewith confirms

a) the correctness of the information provided in the reports ☐

b) the inclusion of comments and inputs from stakeholders and I&APs ; ☐

c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☐and

d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein. ☐



Signature of the environmental assessment practitioner:

Thaya Trading Enterprise CC

Name of company:

Date:

-END-

ANNEXURE A
CV OF EAP

SA

Zandile Dwane

610 Antoon Benning

Willie Hofmeyer Street

Bellville, 7535

Drivers Licence: Code B

32

YEARSOLD

Nationality: South African

I am a highly motivated, self-disciplined person and driven in achieving my biggest goals in life. I am a skilful communicator and strive to spread positivity. I am flexible, quick to pick up new skills and eager to learn from others. I am a fast learner and looking forward to face new challenges.

PERSONAL SKILLS

- CREATIVE
- INOVATIVE
- EXCELLENT INTERPERSONAL SKILLS
- QUICK THINKER
- PROBLEM SOLVING
- EFFECTIVE COMMUNICATOR
- ANALYTICAL
- GOOD TIME MANAGEMENT

+ 27 83 265 7992

kamvisto@gmail.com

References are available on request

OBJECTIVES

To work in an industry with a professional work driven environment where I can utilize and apply my knowledge. To make use of my expertise, this will sharpen my ability to work well for growth, individually and/or in a team with people of diverse backgrounds and different cultures. Use my technical and interpersonal skills for working in a team and successfully completing projects.

EDUCATION

Masters Degree- Petroleum Geology - University of the Western Cape

12- 12- 2016

BSc Honours Degree – Applied Geology - University of the Western Cape

17-03- 2014

BSc Undergraduate Degree – Applied Geology – University of the Western Cape

CUM LAUDE

22-03-2013

Grade 12: Batandwa Ndondo S.S.S (2003)

SPECIAL ACHIEVEMENTS

>Nominated among the best top 5 students who completed the Reservoir Engineering training courses with Total Professors with a Distinction in 2015.

>Completed Cum Laude graduation in March 2013

>Nominated for the International Scholar Laureate 2012 by Golden Key

>Certificate by golden key for the best academic performance in 2011

>Nominated among the best top 15% academic performances in 2010

PROFESSIONAL AFFILIATIONS

Geological Society of South Africa (GSSA)
South African Council for Natural Scientific Professions (SACNASP)
American Association of Petroleum Geologists (AAPG)

CONFERENCES ATTENDED

Investing in African Mining Indaba
(2018)
Investing in African Mining Indaba
(2017)
23rd Africa Oil Week held at the Cape Town International Convention Centre (2016)

22nd Africa Oil Week held at the Cape Town International Convention Centre (2015)

WORK EXPERIENCE

Zandile Dwane is an Environmental Consultant specializing in Environmental Impact Assessments (EIA) and Water Use Licence Applications (WULA) for mining projects. Her duties include; correspondence with clients, specialists and DWS; attending project meetings; compiling WULA submission documents, training staff; and providing assistance on general environmental-related queries. Whilst working at Thaya trading Enterprice, Zandile has done some environmental consulting projects for Nyezi Holdings (Pty) Ltd (Environmental Authorozation granted by DMR), Basic Assessment report (BAR) for Khayalethu Mlobeli (Mining Permit was granted by DMR), BAR for Simonsus Developments (Pty) Ltd, BAR for Palesa Mulaudzi and Environmental Authorization application for Tawana Investment Holdings (Pty) Ltd.

15-02-2016 to date

Institution: THAYA TRADING ENTERPRISE CC

Position Held: Environmental Consultant

Roles and responsibilities:

- Assist with research for a variety of environmental related projects
- Assists with EIA application, WULA and maintenance report writing for clients
- Assists with proposal preparation and costing
- Provide support on GIS projects, particularly relating to capturing and verification of data into the municipalities GIS.
- Applied GIS and remote sensing
- Waste management and solid waste management
- Land and Mine Rehabilitation
- Water Sampling
- Preservation and Quality Monitoring

01-04-2014 to 23-12-2014

Institution: ERM (Environmental Resource Management)

Position Held: Researcher

Roles and responsibilities included, but not limited, to the following:

Interpretation of geological structures
Soil and Groundwater sampling
Soilbore Logging
Conduct geological Mapping,
Capturer geological data on the system and create maps
Geological, geochemical and geophysical interpretation and modelling
Writing reports and doing presentations
Continuously updating geological data and conducting subsurface mapping
Create Site Drawing / Plan (Generating 2D and 3D drawings)
Supervising Installation of monitoring wells (Drilling).

Skills Developed: Report-writing and presentation skills, research skills, team working skills
Planning and organizing skills.
Strong oral and written communication Skills
Coaching skills
Commitment to safe work practice
Ability to work to deadlines and under pressure
Creativity and Lateral thinking skills
Analytical and Problem Solving skills
Financial management skills
Attention to details and the ability to record information accurately
Leadership and performance management skills

Technical Competencies: IT skills to process data and produce 3-D models of geophysical features,

Identifying geological formations and rock types
Interpretation of geological models
Groundwater Assessment
Environmental Impact Assessment
Environmental Rehabilitation
Environmental Regulations and Acts

SYSTEM KILLS

Microsoft Office ®
Remote Sensing ENVI ®
MODFLOW®
GEOVIA Surpac ®
MINEX ®
Sharepoint®
Petrel ® (3D Seismic Modelling and Interpretation)
Downhole Explorer ®
Microstation®
VULCAN GeoModeller (Maptek) ®
Surfer ®
ArcGIS ®
Strater 5 ®
S3Graf ®

ANNEXURE B
ENLARGED MAPS

ANNEXURE C
PUBLIC PARTICIPATION RECORDS

ANNEXURE D
CRITERIA OF IMPACT ASSESSMENT

1 INTRODUCTION

The impact significance rating methodology presented herein is in compliance with provisions of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, read in tandem with the Environmental Impact Assessment Regulations 2017 (as amended). The approach followed to determine significance rating is that of considering the consequence (*C*) of each impact (comprising Nature, Extent, Duration and Magnitude) and relate this to the probability/ likelihood (*P*) of the impact occurring as a product. This determines the significance of impact. In addition, other factors, including cumulative impacts, public concern, reversibility, and potential for irreplaceable loss of resources, are used to determine Priority. Priority is used as a guide for authorities and stakeholders to making informed decisions pertaining to the development approach. The impact assessment will be applied to all identified alternatives. For purposes of this study, only Alternative A was considered because all other alternatives have comparable ecological setup to that of Alternative A. Where possible, mitigation measures will be recommended for impacts identified.

1.1 Impact Assessment, Rating and Mitigation

The criteria used to assess the significance of the impacts are discussed below. The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered.

These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance rating of the impacts was calculated by using the following formula:

The Significance Rating (*SR*) of an impact is determined by applying Consequence (*C*) of the particular impact and the Probability (*P*) of the impact occurring. Consequence is determined through the consideration of the Nature (*N*), Spatial Scope/Extent (*E*), Duration (*D*), and Severity (*S)* applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$C = (E+D+S) \times N$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Tables 1 to 5.

The criteria used to assess the significance of the impacts are shown in Tables 1 - 5. The different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. The limits were defined in relation to project characteristics. Those for severity, extent, duration and probability are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The Consequence value of the impacts was calculated by using the following formula:

CONSEQUENCE	*X*	*PROBABILITY*
N x(Severity + Spatial Scope + Duration)		(Frequency of activity + Frequency of impact)

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. These include roads and hauling,

excavations, temporary waste dumping, topsoil storage, mine residue deposit dam, plant and processing area, temporary office, workshops and ablution facilities, water tanks, diesel tanks, pipeline, other temporary buildings, etc.

Significance of impacts is described as follows:

Very Low – Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low – Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Low – Medium: Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium – High: Impact would be real and rather substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible, but not necessarily possible without difficulty.

High – Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these factors.

Very High – Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

Table 1: Some Consequence Parameters

Weight	Severity	Spatial Scope/Extent	Duration
0	Insignificant/non-harmful	Activity specific/No effect/Controlled	Immediate (0 – 6 months)
1	Minimal / potentially Harmful	Slight permanent deviation / on-site	Short term / construction (6 months- 1 yr)
2	Medium / slightly Harmful	Immediate surroundings / local / outside mine area	Life of operation
3	High / Critical / Serious	Regional effect	Decommissioning
4	Catastrophic / major	National/ Severe environmental damage	Residual
5	Disastrous	Trans boundary effects	Permanent

Table 2: Probability Parameters

Weight		1	2	3	4	5
Frequency						
Probability	Frequency of Impact	Highly unlikely	Rare	Low likelihood	Probable/ possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of Activity	Annually or less	6 monthly/temporarily	Infrequent	Half-life of operation	Life of operation

Table 3: Significance Rating (It could be positive or negative, depending on the nature of impact)

CONSEQUENCE (Severity + Spatial Scope + Duration)															
PROBABILITY (Frequency of activity + frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 4: Significance

Colour Code	Significance Rating	Value	Negative Impact Management Strategy	Positive Impact Management Strategy
	VERY HIGH	126 – 150	Improve current management	Maintain current management
	HIGH	101 – 125	Improve current management	Maintain current management
	MEDIUM – HIGH	76 – 100	Improve current management	Maintain current management
	LOW – MEDIUM	51 – 75	Improve current management	Maintain current management
	LOW	26 – 50	Improve current management	Maintain current management
	VERY LOW	1 – 25	Improve current management	Maintain current management

Table 5: The Rating System (Summary of Impact Rating Parameters)

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
+1	Positive	Likely to result in a beneficial impact.
-1	Negative	Likely to result in a detrimental impact.
SPATIAL SCOPE/EXTENT		
This is defined as the area over which the impact will be experienced.		
0	Activity Specific	The impact will only affect the activity and personnel working on it.
1	On-site	The impact will only affect the site.
2	Local or immediate surroundings outside project footprint	Will affect the local area or district.
3	Regional Impact	Will affect the Province
4	National	Will affect the entire country.
5	International	Will affect the Globe/Earth
FREQUENCY OF IMPACT		
This describes the chance of occurrence of an impact.		
1	Unlikely/Annually	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Rare/Temporary	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Relatively low likelihood/Infrequent	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Probable/Possible/Life of operation	Impact will most likely occur (Greater than a 75% chance of occurrence).
5	Definite/Certain/Life of operation	Impact will certainly occur (100% chance of occurrence).
FREQUENCY OF ACTIVITY		
This describes the chance of activity taking place.		
1	Annually of Less	The chance of the activity occurring is extremely low (Less than a 25% chance of occurrence).
2	6 Monthly or Temporarily	The activity may occur (Between a 25% to 50% chance of occurrence).
3	Infrequent	The activity will likely occur (Between a 50% to 75% chance of occurrence).
4	Frequently	Activity will most likely occur (Greater than a 75% chance of occurrence).
5	Life of Operation	Activity will certainly occur (100% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
0	Immediate	The impact is avoidable through conducting and implementing risk assessment.
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter, it will be entirely negated (0 – 2 years).
2	Medium to medium term/ Life of operation	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes

		thereafter (2 – 10 years).
3	Medium term/Decommissioning	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Medium to Long term/Residual	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
5	Long term/Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ SEVERITY		
Describes the severity of an impact.		
0	Insignificant/ Non-harmful	Impact affects results of an performance an individual task.
1	Minimal/ Potentially Harmful	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium/Slightly Harmful	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High/Critical/Serious	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
4	Major/Catastrophic	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation
5	Disastrous	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
0	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
1	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
2	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
3	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question. Cumulative Impact: Considering predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures.		
0	Low cumulative impact	The impact would result in negligible/insignificant cumulative effects.
1	Medium cumulative impact	The impact would result in minor cumulative effects.

2	High cumulative impact	The impact would result in significant cumulative effects
PUBLIC RESPONSE		
1	Low public response	Issue has received relatively low public response
2	Medium Public Response	Issue has received relatively moderate public response
3	High Public Response	Issue has received relatively high public response
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: **Nature x (Extent + severity + duration) x (frequency of impact +frequency of activity).** The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
1 to 25	Negative very low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
1 to 25	Positive very low impact	The anticipated impact will have negligible positive effects.
26 to 50	Negative low impact	The anticipated impact will have minor negative effects and will require minor mitigation measures.
26 to 50	Positive low impact	The anticipated impact will have minor positive effects.
51 to 75	Negative low to medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
51 to 75	Positive low to medium impact	The anticipated impact will have moderate positive effects.
76 to 100	Negative medium to high impact	The anticipated impact will have moderate to high negative effects and will require moderate to high significant mitigation measures.
76 to 100	Positive medium to high impact	The anticipated impact will have moderate to high positive effects.
101 to 125	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
101 to 125	Positive high impact	The anticipated impact will have significant positive effects.
126 to 150	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
126 to 150	Positive very high impact	The anticipated impact will have highly significant positive effects.
PRIORITY		
Priority is determined through consideration of other parameters that may relate to the proposed development however not necessarily forming part of the process followed to determine significance. Determination of priority is performed for purposes of assisting all stakeholders at decision-making level reach informed decisions. The calculation of Priority of an impact uses the following formula: **Priority = Public Response (*PR*) + Cumulative Impact (*CI*) + Reversibility (*R*) + Irreplaceable Loss of Resources (*LR*)**		
2	Very Low	The anticipated impact is of negligible effects and will require no attention.
3 to 4	Low	The anticipated impact is of minor effects and will require minor attention.
5 to 7	Low to Medium	The anticipated impact is of moderate effects and will require moderate attention.
8 to 10	Medium to High	The anticipated impact is of moderate to high priority and will require moderate to urgent attention.
11 to 12	High	The anticipated impact is of high priority and requires urgent attention.

IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

- Public Response;
- Cumulative impacts;
- Reversibility; and
- The degree to which the impact may cause irreplaceable loss of resources.

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential resultant impacts, changes to the environment that are caused by the combined impact of past, present and future human activities and natural processes are considered in the decision making process.

Criteria of Determining Prioritisation are as follows:

Priority = Public Response (*PR*) + Cumulative Impact (*CI*) + Reversibility (*R*) + Irreplaceable Loss of Resources (*LR*)

The priority ratings are presented in Table 6

Table 6: Determination of Priority

Priority	**Rating**
2	Very Low
3	Low
4	Low
5	Low to Medium
6	Low to Medium
7	Medium to Medium
8	Medium to High
9	Medium to High
10	Medium to High
11	High
12	High

IMPACT IDENTIFICATION

Potential environmental and socio-economic impacts were identified by Thaya Trading Enterprise as part this piece of work. The identified impacts were assessed in an integrated manner in order to promote sustainable development of the proposed prospecting activities. In order to assess cumulative impact, consideration of factors such as predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures.

The criteria used to rate each impact is outlined in sections vi) and e. The assessment of potential impacts that were identified in relation to this proposed project was conducted both pre-mitigation (before management measures were considered) and post-mitigation (after management measures were considered).

As a way to manage identified impacts pertaining to this proposed project, actions such as prevention (avoid), minimization (reduce), control, correction (remedy) were considered in planning for the management of each impact. Proposed management actions are specified in section viii) of part A and in section 5 of part B.

For the purpose of presenting data in a manner that is easy for the reader to understand, discussion of the identified impacts has been grouped per aspect, unless specified otherwise.

Activities that are associated with the proposed development, per phase, include the following:

CONSTRUCTION PHASE

Construction-related activities may include, but not limited to, the following:

Selective vegetation clearance;

Generation of rubble;

Stripping and stockpiling of topsoil;

Offset strategy for riparian zone and ephemeral drainage line destruction

Establishment of clean/dirty water separation system, pollution control systems/tanks/Dams.

OPERATIONAL PHASE

Operation-related activities may include, but not limited to, the following:

Waste Rock Dumps;

Slimes Dams/Tanks and Pollution Control System;

Haul Roads;

Implement and monitor devised offset strategy;

Drill Holes, Trenches and Open Pits;

ROM Stockpiles;

Fencing and Access Control Points;

Trackless Mobile Machinery Parking Area;

Area Designated for Processing of Ores and Gravel and related stockpiling;

Generator and Power generation-related infrastructure area;

Offices, Kitchen, Ablution facility, and Training Rooms (Mobile Units),

Sorting Rooms

Waste Management Area;

Ancillary Equipment Diesel Storage and Refuelling Area;

DECOMMISSIONING AND CLOSURE PHASE

A preliminary mine closure plan has been compiled for the applicant in accordance with the NEMA Regulations (Regulation 1147 of 2015) pertaining to the financial provision for prospecting operations. In this regard, the preliminary closure plan and objectives for decommissioning and closure is outlined in the EMPr.

Environmental impacts associated with the project that will be assessed in this section include the following:

Table 7: Identified Impacts

Environmental Factor/Aspect	Nature of impact	Management
Geology and mineral resource	Sterilisation of mineral resources.	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of prospecting operations residue deposits.	Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface topography of excavations and plant site, and to stabilise the mine residue deposit.
Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Employ appropriate management strategies to preserve soil resources.
Land capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of Surface infrastructure and ineffective Rehabilitation	Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Groundwater	Pollution of underground water sources; destruction of aquifers.	Construction of measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages and alteration of river banks.	Frequent monitoring of surface water resources (Standing water). Prevention of overspill of mine associated activities into the surrounding drainage channels streams. Implementation of the necessary management programs to ensure the integrity of surface water (Standing water) resources.
Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Environmental Factor/Aspect	**Nature of impact**	**Management**
Alien invasive plants	Proliferation of alien invasive plants species.	Eradicate and control the spread of alien invasive species.
Fauna	Displacement of fauna	Prevention of overspill of activities onto the surrounding ecological environment. Employ proper protection strategies.
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Air quality and Global Warming Impact	Sources of atmospheric emission associated with the prospecting operation are likely to include greenhouse gas emissions from vehicles, Global Warming; TMM's, fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Effective soil management; identification of the required control efficiencies in order to maintain greenhouse gas emissions, dust generation within acceptable levels.
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by	Minimise the generation of excessive noise an vibration; Ensure all vehicles and equipment is in a good working order; proper

	means of increased noise and vibration.	communication.
Visual impacts	Visual impact of the mine infrastructure excavations, mine residue deposits, and waste rock stockpile; visibility of dust.	Effective planning of the location of Infrastructure and operations to minimise visual impact.
Traffic	Potential negative impacts on traffic safety And deterioration of the existing road networks	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The deterioration of sites of cultural and Heritage importance.	Preservation and protection of heritage and Cultural resources identified within a no go zone; further resources uncovered during prospecting activities need to be reported to a suitably qualified Archaeologist and/or Palaeontologist.
Socio-economic	Negative: Loss of agricultural potential; influx of workers to the area increases health risks, squatting and loitering (resulting in lack of security and safety); negative impact of employment loss during prospecting activities closure. Positive: Economic Growth	Application of commitments made in the Social and Labour Plan; implementation of Community development programmes.
Interested and affected parties	deterioration of health and safety of personnel	Ensure continuous and transparent communication with IAP's.
Interested and affected parties	Health and Safety	Control Access into the property; Fence may be erected around pits; Implement and monitor EMPR presented herein.
Land Use	interference with existing land uses	All activities to be restricted within the demarcated areas and Ensure that productive land which is not used during construction is made available for farming.
Waste	Pollution of the environmental.	Ensure effective Integrated Waste and Water Management Plan and environmentally friendly remediation of hydrocarbon-contaminated sites.
Disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.	Potential negative impacts on wildlife	Enter into amicable agreements that will promote wellbeing and protection of wildlife. Should there be necessity to relocate wild animals, which should be done in sustainable, environmentally friendly and safe manner.
Impacts on Agricultural Activities	Potential negative impacts on agricultural activities	Enter into amicable agreements that will promote wellbeing and protection of on-going agricultural activities. Should there be necessity to relocate wild animals, which should be done in sustainable, environmentally friendly and safe manner.
Wetlands	Disturbance of water resource and destruction of riparian zone	Manage through the principle of avoidance of disturbance of the anything within the Riparian zone; and Implement recommendations of the wetland specialist, if any.

Geology of the Area

Identified Impact: Sterilisation of mineral resources

The surface geology of the area comprises mainly of Quaternary sediments namely alluvial diamondiferous gravel, sand (red and grey aeolian dune sands), shale and andesite in places amygdaloidal and/porphyritic with quartzite and conglomerate lenses near the bottom. Sterilisation and/or loss of mineral resources may occur if during prospecting activities feasible mineral resources are disposed under any circumstances onto the waste rock dumps that will be used during backfilling of trenches and pits.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Vegetation Clearance; Location of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Rating of Impact

Severity/Magnitude

An assessment of locating surface infrastructure and associated activities would bare minimal magnitude on sterilisation of any mineral resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 8: Sterilisation of mineral resources

Impact Identified	**Footprint Alternative**					
Sterilisation of mineral resources.	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	Minimal (1)	Insignificant (0)	On-site (1)	On-site (1)	Life of operation (2)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	3	3	3	3
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
24		Ensure that optimal use is made of the available mineral resource.				
Significance Rating (Post-mitigation)						
18						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	2	2		5	

Management objectives

In order to prevent unnecessary sterilisation of mineral from occurring

Proposed Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning of the prospecting operations;
- The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources; and,
- No dumping of materials prior to approval by exploration geologist who must promote best prospecting practises.

Topography

Identified Impact: Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of prospecting operations residue deposits.

The area is characterised by a flat topography. The elevation is approximately 1 077 m. The terrain morphological class of the area can be described as plains with high relief, either moderately or strongly undulating. The area lies at an altitude of 1 145 meters above sea level, with the highest elevations occurring in the east. Matlhwareng River flows westward and traverses south of the Project areas.

Deep excavations are expected to occur during the proposed prospecting operations. The infrastructure to be utilised is anticipated to be mobile. During the operational phase of the project, deep excavations are going to take place although these will be backfilled concurrently during the operational phase.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Vegetation clearance; Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of topography and associated activities would bare minimal magnitude on sterilisation of any mineral resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 9: Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of mine residue deposits

Impact Identified	**Footprint Alternative**					
Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of mine residue deposits	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	Medium (2)	On-site (1)	On-site (1)	Residual (4)	Residual (4)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	4	4
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
72		Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface topography of excavations and plant site, and to stabilise the prospecting operation residue deposit.				
Significance Rating (Post-mitigation)						
63						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	2	2		5	

Management objectives

In order to prevent physical harm to third party, be it humans or animals from effect of deep excavations and associated infrastructure

Proposed Mitigation measures

- Backfill all trenches/excavations continuously;
- Employ effective rehabilitation strategies to restore surface topography of excavations and plant site;
- Stabilise the mine residue deposits;
- All temporary infrastructures will be demolished during closure.

Soil and Land Capability

Identified Impact: Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages; Loss of land capability through topsoil removal, disturbances and loss of soil fertility

The Matlhwareng River in the area meanders through various geological structures which give rise to a variety of soil types and textures. Based on the soil textural classification method, the soil that is found in the study area is grouped into different soil classes. **Namely: sandy loam, clayey sand and sandy clay loam**.

Prospecting with bulk sampling activities possess potential to pose a threat to land capability through contamination during all phases.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Vegetation Clearance; Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of soil erosion and loss of land capability and associated activities would bare minimal magnitude on sterilisation of any mineral resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 10: Soil Erosion and loss of land capability

Impact Identified	**Footprint Alternative**					
Soil Erosion and loss of land capability	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	Medium (2)	On-site (1)	On-site (1)	Life of operation (2)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	3	5	3
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
54		Utilise compost during final rehabilitation				
Significance Rating (Post-mitigation)						
30						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	1		3	

Management objective

In order to prevent soil pollution

Proposed Mitigation measures:

- At no point may plant cover be removed within the no-development zones;
- All attempts must be made to avoid exposure of dispersive soils;
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased;
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible;
- The prospecting operation must co-ordinate different activities in order to optimise the utilisation of the excavated trenches and thereby prevent repeated and unnecessary excavations;
- Construction that required the clearing of large areas of vegetation and excavation should ideally occur during the dry season only;
- Construction during the rainy season (November to March) should be closely monitored and controlled;
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers;
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion;
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses;
- Excavated and stockpiled soil material are to be stored and bermed on them higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate;
- Stockpiles susceptible to wind erosion are to be covered during windy periods;
- Audits must be carried out at regular intervals to identify areas where erosion is occurring;

- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur;
- Rehabilitation of the erosion channels and gullies;
- The prospecting operation should land with steep slopes;
- Dust suppression must take place, without compromising the sensitive water balance of the area;
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.
- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities;
- Surface agreement to be signed with land owners;
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm;
- All activities to be restricted within the demarcated areas;
- Ensure that land which is not used during construction is made available for grazing.

Ecology and Biodiversity

Identified Impact: The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function; Displacement of fauna

The proposed operation itself is expected to cause habitat transformation along the paleo-terraces of the Matlhwareng River through the excavation of open pits, and will thereby contribute to cumulative habitat loss and the disruption of the broad-scale landscape connectivity in the region.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Vegetation Clearance; Site Establishment; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of ecology and biodiversity and associated activities would bare minimal magnitude on sterilisation of any mineral resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

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Table 11: The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function

Impact Identified	**Footprint Alternative**					
The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	5	5
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
80		Adhere to recommendations made by Ecologist, if any.				
Significance Rating (Post-mitigation)						
60						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	2		4	

Management objective

In order to prevent the unacceptable disturbance and loss of biodiversity and related ecosystem functionality through physical and general disturbance

Proposed Mitigation measures:

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall mining footprint;
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance;
- The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors;
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site;
- The ECO must ensure that all contractors and workers undergo environmental induction prior to commencing with work on site;
- The environmental induction should occur in the appropriate languages for the workers who may require translation;
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert;
- Employ measures that ensure adherence to the speed limit.

- Minimise the footprint of transformation;
- Encourage proper rehabilitation of mined areas;
- Encourage the growth of natural plant species;
- Ensure measures for the adherence to the speed limit;
- Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to mining;
- It is recommended that these plants are identified and marked prior to mining;
- These plants should, where possible, be incorporated into the design layout and left *in situ*;
- However, if threatened of destruction by mining, these plants should be removed (with the relevant permits and license from DAFF and DENC) and relocated if possible;
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation;
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

Hydrology

Identified Impact: Deterioration in water quality through spillages and alteration of river banks; destruction of ephemeral drainage lines and riparian zone of Matlhwareng River

The proposed Prospecting Area is located in the Matlhwareng River basin, quaternary catchment D41L. The prospecting area is situated directly on the bank of the Matlhwareng River which drains in a westerly direction directly to the Matlhwareng River.

These proposed operations have a potential to have long-term effects on both contamination of surface water resources, destruction of ephemeral drainage patterns the alteration of river banks, and impeding flow of water in the watercourse.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of hydrology and associated activities would bare minimal magnitude on surface water. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 12: Deterioration in water quality through spillages and alteration of river banks

Impact Identified	**Footprint Alternative**					
Deterioration in water quality through spillages and alteration of river banks	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
90	Implement recommendations made by Water Resource Specialist, if any.					
Significance Rating (Post-mitigation)						
70						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	

1	1	1	1	4

Management Objective

In order to prevent unacceptable alteration of drainage patterns and related reduction of downstream surface water flow and to prevent pollution of surface water resources

Proposed Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution;
- Under no circumstances may ablutions occur outside the provided facilities;
- No uncontrolled discharges from the staff camps to any surface water resources shall be permitted;
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages;
- A walled concrete and roofed platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides;
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site;
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof;
- At all times care should be taken not to contaminate surface water resources;
- Store all litter carefully to prevent it from washing away or blown into any of the water courses within the area;
- Provide bins for staff at appropriate locations, particularly where food is consumed;
- The prospecting site should be cleared daily and litter removed;
- Devise and implement offset strategy for destruction of riparian zone of Matlhwareng River and ephemeral drainage lines.
- Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within ephemeral drainage lines may occur during driest seasons (March to September);
- Conduct on-going staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution;
- Some of these proposed mitigating measures may form part of an offset strategy for any loss of the Matlhwareng River riparian zone/natural seasonal streams due to the planned prospecting activities.

Groundwater

Identified Impact: Pollution of underground water sources; destruction of aquifers

Two types of aquifer systems have been recognized in the Project area, represented by weathered and fractured aquifers

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of locating surface infrastructure and associated activities would bare minimal magnitude on groundwater. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 13: Pollution of underground water sources

Impact Identified	**Footprint Alternative**					
Pollution of underground water sources	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Residual (4)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
80	Line settling ponds; prevent seepage of water into the aquifer.					
Significance Rating (Post-mitigation)						
80						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
1	1	1	2		5	

Management objective

In order to prevent pollution of groundwater resources

Proposed Mitigation measures:

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution;
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site;
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures;
- All facilities where dangerous materials are stored must be contained in a bund wall;
- Vehicles and machinery should be regularly serviced and maintained;
- Conduct remediation (preferably bioremediation) of contaminated sites;
- Monitor use of fertiliser and impact of animal dung in water;
- Monitor the quality of the boreholes located down-gradient of the mining site; and,
- Sample according to the sampling method and parameters for analysis are indicated in the Geohydrological study when available.

Air Quality

Identified Impact: Sources of atmospheric emission associated with the prospecting operation are likely to include greenhouse gas emissions from vehicles, Global Warming; TMM's; fugitive dust from materials handling operations; wind erosion of stockpiles; and vehicle entrainment of road dust

The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM_{10}), larger total suspended particulates (TSP) that relate to dust fallout, VOC's, SO_2, NO_2 and gaseous emissions mainly from vehicles and generators.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of locating surface infrastructure and associated activities would bare minimal magnitude on air quality or global warming. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 14: Global Warming Impact (greenhouse gas emissions) and generation of dust

Impact Identified	**Footprint Alternative**					
Global Warming Impact (greenhouse gas emissions) and generation of dust	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Life of operation (2)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
70	Implement plans to limit gas emissions					
Significance Rating (Post-mitigation)						
70						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	2	2		5	

Management Objective

In order to prevent air pollution and lower impact on global warming.

Proposed Mitigation measures:

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken;
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression;
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads;
- The length of time where open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed;
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time;
- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.
- The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM_{10}), larger total suspended particulates (TSP) that relate to dust fallout, VOC's, SO_2, NO_2 and gaseous emissions mainly from TMM's, vehicles and generators. A change in ambient air quality can have health and/or nuisance impacts. Related mitigation measures focus on pollution prevention and monitoring.

Noise and Vibration

Identified Impact: Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration

In general, for a sound wave traveling through air, the vibrations of the particles are described as longitudinal. Sound is produced from source to make a noise. Noise may be distinguished in to two types, namely: noise disturbance and noise nuisance. It is a norm that activities that take place through all the phases in relation to mining cause some noise and vibration.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on noise and vibration receptors. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 15: The disruption of sensitive receptors by means of increased noise and vibration increase in continuous noise levels

Impact Identified	**Footprint Alternative**					
The disruption of sensitive receptors by means of increased noise and vibration Increase in continuous noise levels	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	Medium (2)	Local (2)	Local (2)	Life of operation (2)	Short-term (1)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	4	4	4
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
63		Lubricate machinery and equipment				
Significance Rating (Post-mitigation)						
40						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
1	1	1	2		5	

Management Objective

To prevent public exposure to disturbing vibration & noise

Proposed Mitigation measures:

- Restrict prospecting activities to daytime unless agreements obtained to do 24hr operations;
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events;
- Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations;
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints;
- Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Identified Impact: Visual impact of the mine infrastructure excavations, mine residue deposits, and waste rock stockpile; visibility of dust

Activities that relate to mineral prospecting projects and associated infrastructure normally have negative impacts on the receiving environment through all phases. In general, relatively larger operations pose higher visual impacts to the receiving environment in terms of significance.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Earthworks; Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on visual amenity. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 16: Visual impact of the mine infrastructure excavations, mine residue deposits, and waste rock stockpile; visibility of dust

Impact Identified	**Footprint Alternative**					
Visual impact of the mine infrastructure excavations, mine residue deposits, and waste rock stockpile; visibility of dust	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	Medium (2)	Medium (2)	Local (2)	Local (2)	Life of operation (2)	Short-term (1)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	3	4	3
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
48		Effective planning of the location of Infrastructure and operations				
Significance Rating (Post-mitigation)						
30						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	2		4	

Management Objective

In order to limit negative visual impacts

Proposed Mitigation measures

- Infrastructure should be placed to optimise the natural screening capacity of the vegetation;
- Where practical, protect existing vegetation clumps during in order to facilitate screening during the prospecting operation;
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional unsightly elements;
- Locate the staff camps and the material stockpiles outside of the visual field of sensitive visual receptors;
- Dust suppression procedures should be implemented especially on windy days during earth works;
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species;
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Heritage and Cultural Resources

Identified Impact: The deterioration of sites of cultural and Heritage importance

There is a potential to damage heritage/cultural resources on site as a result of carrying out the proposed activities.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Earthworks; Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on Heritage and Cultural Resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 17: Impact Heritage and Cultural Resources.

Impact Identified	**Footprint Alternative**					
Impact Heritage and Cultural Resources.	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Short-term (1)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	3	5	3
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
80	Implement recommendations made by Archaeologist					
Significance Rating (Post-mitigation)						
30						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	3		5	

Management Objectives

In order to minimize the disturbance of heritage and cultural resources

Proposed Mitigation measures:

- The heritage and cultural resources (e.g. graveyards, ruins, historic structures, fossils etc.) must be protected and preserved by the delineation of a no-go zone if any of these areas are to be found in the prospecting area;
- Intact bedrock strata should be avoided during mining of terrace gravels where possible;
- Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction;
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction;
- A buffer zone 200 m away from the heritage resources identified may be created;

Palaeontological Resources

Identified Impact: The destruction of palaeontological resources

A qualified Palaeontologist must conduct a Palaeontological Impact Assessment in respect of this proposed development.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Earthworks; Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on paleontological resources. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 18: Impacts on Palaeontological Resources

Impact Identified	**Footprint Alternative**					
Impacts on Palaeontological Resources	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Life of operation (2)	Short-term (1)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	4	3	3
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
42	Implement Chance Find Protocol as proposed by Palaeontologist, if any.					
Significance Rating (Post-mitigation)						
28						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	2	3		6	

Management Objectives

To minimize the disturbance of palaeontological resources

Proposed Mitigation measures:

- Adhere to recommendations that were made by the Palaeontologist, if any.

Socio-economic

Identified Impact: Negative: Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during prospecting activities closure

There is always an expectation of employment opportunities getting created, amongst the general public when a project of this nature is proposed. South Africa has high unemployment rate currently. Jobseekers are likely to immigrate towards Kuruman. Factors such as safety and security, accommodation, service delivery or lack thereof may face the local community and proposed operations.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on the social and economic status quo. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 19: Influx of workers to the area increases health risks and loitering

Impact Identified	Footprint Alternative					
Influx of workers to the area increases health risks and loitering.	Alternative A					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Life of operation (2)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	5	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
70	Effective implementation of Social, Recuitment Policy and Labour Plan and community development programmes					
Significance Rating (Post-mitigation)						
70						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	0	1		2	

Management Objectives

In order to limit inward migration and related social impacts and enhance positive economic impacts

Proposed Mitigation measures:

- The mine must ensure that false expectations are not created regarding job creation;
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants;
- Contractors and employees should not be permitted to wander outside the mining area;
- Uncontrolled settlement of contractors and workers outside of the site will be prevented;
- The expectations of what benefits can occur to the community must be managed from the initiation of the project;
- Commitments as set out in the SLP must be attained.

Socio-economic

Identified Impact: Negative: Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during prospecting activities closure

Mining as an industry contributes positively towards the economy of the country. Local entrepreneurs, employees the revenue collector and shareholders benefit from mining operations.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Earthworks; Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on social and economic baseline. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 20: Economic Impact

Impact Identified	Footprint Alternative					
Economic Impact	Alternative A					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Life of operation (2)	Immediate (0)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	+1	+1	5	5	5	5
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
70		Effective implementation of Social and Labour Plan and community development programmes;				
Significance Rating (Post-mitigation)						
50						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	2	1	1		4	

Management Objective

In order to enable economic growth

Proposed Mitigation measures:

- Implement recruitment policy effectively and efficiently;
- Maintain healthy relations with local community members;
- Comply with MPRDA and the Tax Administration Act;
- Encourage local community members to develop themselves professionally; and,
- Comply with provisions of Mine Health and Safety Act and the Mining Charter

Health and Safety

Identified Impact: deterioration of health and safety of personnel

Health and Safety is an important aspect associated with mineral resource mining/prospecting. A piece of legislation that focuses on mining has had to be enacted as a consequence. Impact on health and safety is expected to be affected throughout the life of operation.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting and associated activities would bare minimal magnitude on health and safety. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 21: Impact on Health and Safety

Impact Identified	**Footprint Alternative**					
Impact on Health and Safety	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	3	4	3
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
72		Implement provisions of Health and Safety Act where reasonable practicable				
Significance Rating (Post-mitigation)						
42						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	2	2		5	

Management Objective

In order to prevent impact on health and safety of personnel

Proposed Mitigation measures

- Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act;
- Workers to wear Personal Protective Equipment (PPE);
- Control Access into the property; Fence may be erected around pits; Implement and monitor EMPR presented herein;
- Hazardous material must be correctly labelled and handled in a safe manner; and,
- Adhere to provisions of Mine Health and Safety Act.

Land Use

Identified Impact: interference with existing land uses

There are a number of land uses that are taking place on the area of application currently, such as crop and animal farming. Previously, small-scale mining and prospecting activities have taken place within the boundaries of the property. The proposed activities are expected to interfere with current land uses through all phases.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	**Operational**	**Decommissioning**
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on interference with existing land uses. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 22: Interfere with current land uses

Impact Identified	**Footprint Alternative**					
Interfere with current land uses	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	4	5	5
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
80		Ensure neither landowner nor land occupier becomes disadvantaged				
Significance Rating (Post-mitigation)						
54						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Prioritisation Factor	
0	1	2	3		6	

Management Objective

In order to prevent unnecessary negative impacts on surrounding land uses

Proposed Mitigation measures:

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities;
- Enter into Land Surface agreement to be signed with land owners;
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable;
- All activities to be restricted within the demarcated areas;
- Ensure that productive land which is not used during construction is made available for farming.

Traffic

Identified Impact: Potential negative impacts on traffic safety and deterioration of the existing road networks

Throughout all phases of this project, traffic and from the property is going to increase. However, the area within which the area of application falls has low traffic volumes, which is a factor that will not have much impact on road user safety and on capacity of roads.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Use of existing infrastructure with minimal construction of haul roads and use of existing facilities and services	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on traffic. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 23: Road disturbance and traffic safety

Impact Identified	Footprint Alternative					
Road disturbance and traffic safety	Alternative A					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	Local (2)	Local (2)	Life of operation (2)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	3	5	5
Significance Rating (Pre-mitigation)	Proposed Mitigation Measures					
70	Maintain Roads, Adhere to speed limit and					
Significance Rating (Post-mitigation)						
56						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	0	2		3	

Management objective

In order to prevent traffic-related accidents and/or injury to people and livestock

Proposed Mitigation measures:

- Implement measures that ensure the adherence to traffic rules.

Waste

Identified Impact: Pollution of the environmental

The proposed development is expected to generate different kinds of waste streams which include waste rock, building rubble, domestic and hazardous waste to mention but a few. The South African Government has a vision to divert zero waste to landfill site. This vision has to be considered when planning methods of handling waste.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting activities and associated activities would bare minimal magnitude on waste generation. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 24: Pollution of environment

Impact Identified	**Footprint Alternative**					
Pollution of environment	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	Medium (2)	Local (2)	Local (2)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	4	4	4
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
72		Encourage waste separation at source; Ensure effective Implementation Integrated Waste and Water Management Plan and environmentally friendly remediation of hydrocarbon-contaminated sites.				
Significance Rating (Post-mitigation)						
48						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	2		5	

Management objective

To prevent pollution of environment

Proposed Mitigation measures:

- All waste produced to be disposed of in permitted designated waste disposal site;
- Waste must be stored in designated areas for storage;
- Clearly demarcate and label appropriate storage for the different types of waste;
- Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licenced landfill site.
- Applicant to compile an Integrated Water and Waste Management Plan;
- Identify Waste streams on site and conduct waste classification at an appropriate time;
- Design storm water management plan;
- Compile, Implement and Monitor and Effective Waste Management Plan;
- Design an environmentally friendly remediation of contaminated sites management plan;
- Appoint a competent contractor to handle waste on site;
- Divert clean water around the site and collect storm water into a containment facility;
- Conduct further analyse of waste rock during operation to determine geochemical properties;
- Sewage Septic Tanks should be inspected and serviced regularly;
- All waste produced to be disposed of in permitted designated waste disposal site;
- Waste must be stored in designated areas for storage;
- Clearly demarcate and label appropriate storage for the different types of waste;
- Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site at a licensed landfill site;
- Waste will be collected in colour coded / clearly marked bins;
- Waste must be classified according to the risk that it poses;

- Containers will be placed at strategic points throughout the mining operation site;
- Waste classification is based on the concept of risk. The severity of the risk posed to the environment must be determined as well as the degree of control necessary during disposal;
- The Waste Management Procedure shall be used as a guideline document for classification;
- Hazardous waste must be placed in a suitable bin in accordance with its properties and characteristics;
- Storage must be based on compatibility of raw materials and waste accordingly;
- Containers will be placed at strategic points throughout the prospecting operation site;
- Separation at source strategy must be implemented;
- Waste will be collected in colour coded / clearly marked refuse bags and / or bins;
- Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site;
- Used oil will be recycled as far as possible;
- Industrial, hazardous and contaminated waste is transported to the to the nearest license disposal site;
- Garden refuse is transported to the nearest composting site;
- Rubber and contaminated waste is disposed to a licensed landfill site;
- Queries regarding waste classification must be directed to the ECO;
- Scrap metal, electric cable and used conveyor belts are weighed separately and transported to site or recyclers;
- Hazardous waste is disposed to a suitably licensed landfill site;
- SAWIC may be used to register generated waste at all times;
- Document control and proper filing must be in place;
- Waste disposal certificates must be provided by the contractor for each load of waste removed from site and each load disposed to a licensed landfill site;
- Waste Tyres: removed from site by service provider and handles according to Waste Tyres Regulations and Integrated Waste Tyre Management Plan;
- There should be constant communication between the ECO and various suppliers of all consumables on site for smooth handling of their waste, information sharing and record keeping; and,
- Some waste may be used to backfill excavated areas.

Wetlands

Identified Impact: Disturbance of water resource and destruction of riparian zone

A wetland as defined by the National Water Act refers to land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which under normal circumstances supports or would support vegetation typically adapted to life in water saturated soil.

Prospecting Operation Phase and associated infrastructure and / or associated activities

Construction	Operational	Decommissioning
Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting and associated activities would bare minimal magnitude on wetlands. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 25: Disturbance of Wetland and Riparian Zone

Impact Identified	**Footprint Alternative**					
Disturbance of Wetland and Riparian Zone	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	4	3	3	3
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
56		Implement recommendations of Wetland Specialist, if any.				
Significance Rating (Post-mitigation)						
36						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	3	3		7	

Management objective

To prevent destruction of wetlands

Proposed Mitigation measures:

- If any prospecting activities are to take place within the delineated Matlhwareng River Riparian Zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998);
- A riparian zone offset area must be identified and rehabilitation measure implemented in the offset site as per the offset process;
- The operation must co-ordinate different activities in order to optimise the excavated trenches and thereby prevent repeated and unnecessary excavations;
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased;
- Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate;
- Devise and implement offset strategy for destruction of riparian zone of Matlhwareng River and ephemeral drainage lines.
- Pitting and trenching within the 1:100 flood line of the Matlhwareng River and within ephemeral drainage lines may occur during driest seasons (March to September);
- A storm water management plan must be implemented to ensure that dirty water is contained onsite;
- A storm water management plan must be implemented to prevent run-off from the stock piles;
- Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment;
- Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities;

- The mine must have spill procedures in place and specific awareness training. Spill kits such as from Drizzit or Enertech or Supazorb and so on, so if there is a spill it can be cleaned and treated as much as possible and report to authorities in 24 hours;
- Clearly define roles and responsibilities of all personnel during spillage events;

Alien invasive plants

Identified Impact: Proliferation of alien invasive plants species

The extent of alien invasive species in the area shows low levels of past disturbance interference in the natural ecosystem. While general clearing of the area and excavation activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity as well as the ecological and agricultural value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

Construction	Operational	Decommissioning
Vegetation Clearance; Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting and associated activities would bare minimal magnitude on proliferation of alien and invasive plant species. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among

other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 26: Alien Invasive Species

Impact Identified	**Footprint Alternative**					
Invasive Species	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	On-site (1)	On-site (1)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	4	5	5
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
80		Adhere to recommendations made by Ecologist, if any.				
Significance Rating (Post-mitigation)						
54						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	1		4	

Management objective

To eradicate and control the spread of alien invasive species

Proposed Mitigation measures

- Eradicate and control the spread of alien invasive species;
- Compile a working weed/alien plant management programme in collaboration with the Department of Environment, Fisheries and Forestry; and
- Implement effectively the compiled weed/alien plant management programme.

Veld fires

Identified Impact: Management of veld fires

The extent of diverse land uses in the area shows veld fires can start at any time and cause interference in the natural ecosystem.

Construction	Operational	Decommissioning
Vegetation Clearance; Mineralised waste; Use of infrastructure and associated activities; Waste Management; Water use and management	Mineralised waste; Use of infrastructure and associated activities; trenching and pitting; backfilling	Mineralised waste; Use of infrastructure and associated activities; Final land forms

Severity/Magnitude

An assessment of prospecting and associated activities would bare minimal magnitude on the spread of veld fires. Severity is minimal before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, severity is insignificant.

Extent/Spatial

The spatial scale or extent is a relative term that links the identified impact to the spatial scale or extent of the prospecting area and the world as a whole. The extent is on-site before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, the extent is on-site.

Duration

The sterilisation of resources will be limited to occur during the prospecting operations because mobile infrastructure is going to be utilised in most instances. This is throughout the life of operation. Post effective implementation of proposed mitigation measures, duration, remains throughout life of operation.

Consequence

The consequence is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, consequence is low.

Probability

Probability (synergy /summation) of impact frequency and activity frequency is low to medium before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, such as, among other, selection of location infrastructure and associated activities in a manner that will promote actions such as prevention (avoid), minimization (reduce), control, correction (remedy).

Significance

The significance is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, significance is low.

Cumulative Impact

The cumulative impact rating considers the predicted effects, residual effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts and mitigation measures, within the context of proposed prospecting activities. The cumulative impact is low before proposed mitigation measures are implemented effectively. Post effective implementation of proposed mitigation measures, cumulative impact is low.

Table 28: Veld fires

Impact Identified	**Footprint Alternative**					
Veld fires	**Alternative A**					
Impact Rating						
Parameter/Attribute	Severity/Magnitude		Extent/Spatial		Duration	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	High (3)	High (3)	local (2)	local (2)	Residual (4)	Life of operation (2)
Parameter/Attribute	Nature		Frequency of Impact		Frequency of Activity	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
	-1	-1	5	4	5	5
Significance Rating (Pre-mitigation)		Proposed Mitigation Measures				
90		Adhere to recommendations made by Ecologist, if any.				
Significance Rating (Post-mitigation)						
63						
Impact Prioritisation						
Cumulative Impact	Public Response	Reversibility	Irreplaceable loss of resources		Priority	
0	1	1	1		4	

Management objective

To manage the spread of Veld fires

Proposed Mitigation measures

- Prohibit open or naked fires on site;
- Any work or hot work that is capable of starting a fire must be undertaken in an enclosed area and be monitored or supervised;
- Compatibility tables must be used to store materials in order to avoid incidents such as explosions, fires, illnesses to mentions just a fe;
- It is recommended that the making of fires by construction workers is restricted to areas where tight control can be exerted, or that the making of fires be prohibited;
- Establish Fire Breaks that are up to standard, of no less than six (6) metres in width;
- Ensure that the area where work is undertaken is surrounded by Firebreaks and that there are functioning and well maintained fire hydrants in the vicinity to extinguish veld fires;
- Establish and maintain relationship with Local Fire Prevention Associations;

- Construct fire hydrants and associated infrastructure;
- Formulate emergency preparedness and response procedures that employees have to be trained on;

ANNEXURE E
SPECIALIST STUDY REPORTS