



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

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FILE REFERENCE NUMBER SAMRAD: NC30/5/1/1/2/13619PR

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.

Objective of the basic assessment process

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts —
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

DEFINITIONS

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

- i. The property on which or location where it is proposed to undertake the activity;
- ii. The type of activity to be undertaken;
- iii. The design or layout of the activity;
- iv. The technology to be used in the activity, and;
- v. The operational aspects of the activity.

Baseline - Information gathered at the beginning of a study which describes the environment prior to development of a project and against which predicted changes (impacts) are measured.

Basic Assessment Process – This is the environmental assessment applied to activities listed in Government Notice No. R 983 (Listing 1) as amended by GNR 327 (dated 7/04/2017) and No. R985 (Listing 3) as amended by GNR 324 (dated 7/04/2017). These are typically smaller scale activities of which the impacts are generally known and can be easily managed. Generally, these activities are considered less likely to have significant environmental impacts and, therefore, do not require a full-blown and detailed Environmental Impact Assessment (see below).

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Borehole - Includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Consultation - A process for the exchange of views, concerns and proposals about a project through meaningful discussions and the open sharing of information.

Critical Biodiversity Area - Areas of the landscape that must be conserved in a natural or near-natural state in order for the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Cumulative Impacts - Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.

Environment - 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 wellbeing.

Environmental Authorisation (EA) – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments, environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Environmental Authorisation.

Gross Domestic Product (GDP) by region - represents the value of all goods and services produced within a region, over a period of one year, plus taxes minus subsidies.

Hydrocarbons – Oils used in machinery as lubricants, including diesel and petrol used as fuel.

Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

Interested and Affected Party (I&AP) – Any individual, group, organization or associations which are interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.

Municipality –

- (a) Means a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998); or
- (b) In relation to the implementation of a provision of this Act in an area which falls within both a local municipality and a district municipality, means
 - (i) The district municipality, or
 - (ii) The local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 982, R 983, R984 and R 985 in the Government Gazette of 4 December 2014 refer as amended by GNR 324, 325, 326 and 327 of 7 April 2017.

No-Go Alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo

Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.

Registered Interested and Affected Party – All persons who, as a consequence of the Public Participation Process conducted in respect of an application, have submitted written comments or attended meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail

Scoping Report – The report describing the issues identified during the scoping process.

Significant impact – Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.

Specialist study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.

Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.

Sustainable development - Sustainable development is generally defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Visibility - The area from which the project components would actually be visible and depends upon topography, vegetation cover, built structures and distance.

Visual Character - The elements that make up the landscape including geology, vegetation and land-use of the area.

Visual Quality - The experience of the environment with its particular natural and cultural attributes.

Visual Receptors - Individuals, groups or communities who are subject to the visual influence of a particular project.

ACRONYMS AND ABBREVIATIONS

amsl	Above mean sea level
BA	Basic Assessment
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Area
DM	District Municipality
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
DSR	Draft Scoping Report
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EStA	Early Stone Age
FoT	“Free on Truck “: means there is no processing and that it’s a raw product.
FSR	Final Scoping Report
GA	General Authorisation
GDP	Gross Domestic Product
GDPR	Regional Gross Domestic Product
GGP	Gross Geographic Product
GNR	Government Notice Reference
ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
km	Kilometres
km ²	Square kilometres
LED	Local Economic Development
LM	Local Municipality
LoM	Life of Mine
LN	Listing Notice
L/s	Litres per second
LSA	Late Stone Age
m ³	Metres cubed
MAP	Mean Annual Precipitation
MAPE	Mean Annual Potential Evaporation
MASMS	Mean Annual Soil Moisture Stress (% of days when evaporation demand was more than double the soil moisture supply)
MFD	Mean Frost Days
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act 107 of 1998 as amended
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NEM:WA	National Environmental Management: Waste Act 59 of 1998
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act 25 of 1999
NWA	National Water Act 36 of 1998
PES	Present Ecological State
RDL	Red Data List
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African National Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SLP	Social and Labour Plan

StatsSA
WMA
WML
WUL A

Statistics South Africa
Water Management Area
Waste Management License
Water Use License Application

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1 Contact Person & Contact Details EAP

1.1 Details of EAP

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EAPASA Reg. Number 2019/2034

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1.2 Expertise of the EAP

The qualifications of the EAP

Current qualifications in this field were obtained through formal studies at the Cape Town Technicon, Nelson Mandela Metropolitan University and the University of the Orange Free State, which is the following:

- National Diploma Nature Conservation (1986)
- National Higher Diploma (B-Tech) Nature Conservation (1992)
- Master's Degree Environmental Management (MOB 750) (2001)

Further qualifications in this field were also obtained through short courses at the University of the Orange Free State, which is the following:

Environmental Impact Assessment (2001)
Wildlife Management through Veld Management (2001)
Resource evaluation and game ranch management (2003)
Arc GIS (2009)

Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

With the implementation of the Mineral and Petroleum Resources Development Act 28 of 2002 Mr. van Zyl has started assisting small scale miners with all facets of applications for mining permits in terms of section 27 and prospecting rights in terms of section 16 of the MPRDA. Mr van Zyl has an excellent knowledge of the relevant acts applicable to the mining sector including the following:

- Mineral and Petroleum Resources Development Act 28 of 2002
- Mineral and Petroleum Resources Development Amendment Act 49 of 2008
- Mineral and Petroleum Resources Regulations 2004
- National Environmental Management Act 107 of 1998 as amended
- National Environment Laws Amendment Act 25 of 2014 as amended
- NEMA: Environmental Impact Assessment Regulations, 2014
- NEMA: Financial Provisioning Regulations, 2015
- NEMA: Waste Act 59 of 2008 as amended
- NEMA: Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015
- National Water Act 36 of 1998 as amended (with special attention to section 21 water uses)

Since 2002 Mr. van Zyl completed more than 150 applications for mining permits and more than 100 applications for prospecting rights. The mineral regulations and environmental management for most of these projects were managed throughout the life of the project including:

- Applications – manual and Samrad
- Prospecting work programs including financial and technical competence
- Public participation process
- EIA and EMP's now BAR and EMPr's
- Annual Rehabilitation Plans
- Final Rehabilitation, Decommissioning and Mine Closure Plans including Risk Assessment Reports
- Execution and registration of rights including sec 42 diagrams for MPTR0

- Performance audits including reviews of Annual Closure Plans and Rehabilitation, Decommissioning and Mine Closure Plans together with financial quantum reviews.
- Application for closure certificate

Although Mr. van Zyl specializes in small scale mining operations and prospecting operations that requires investigation, assessment and communication according to the procedure as prescribed in regulations 19 and 20 of the EIA Regulations he also assists 5 mining rights with environmental management. Other sections of the MPRDA that Mr. van Zyl has experience in is:

- Section 102 applications and Section 20 applications
- Section 53 Applications and Section 11 Applications

2 Location of the overall Activity

Table 1: Location of the overall Activity

Farm Name:	Portion of Portion 5 Farm Kamaggas 200
Application area (Ha)	1182 Ha
Magisterial district:	Namakwaland Northern Cape Province Namakwa District Municipality Nama Khoi Local Municipality
Distance and direction from nearest town	50 Km west of Springbok on the R355
21-digit Surveyor General Code	05300000000020000005

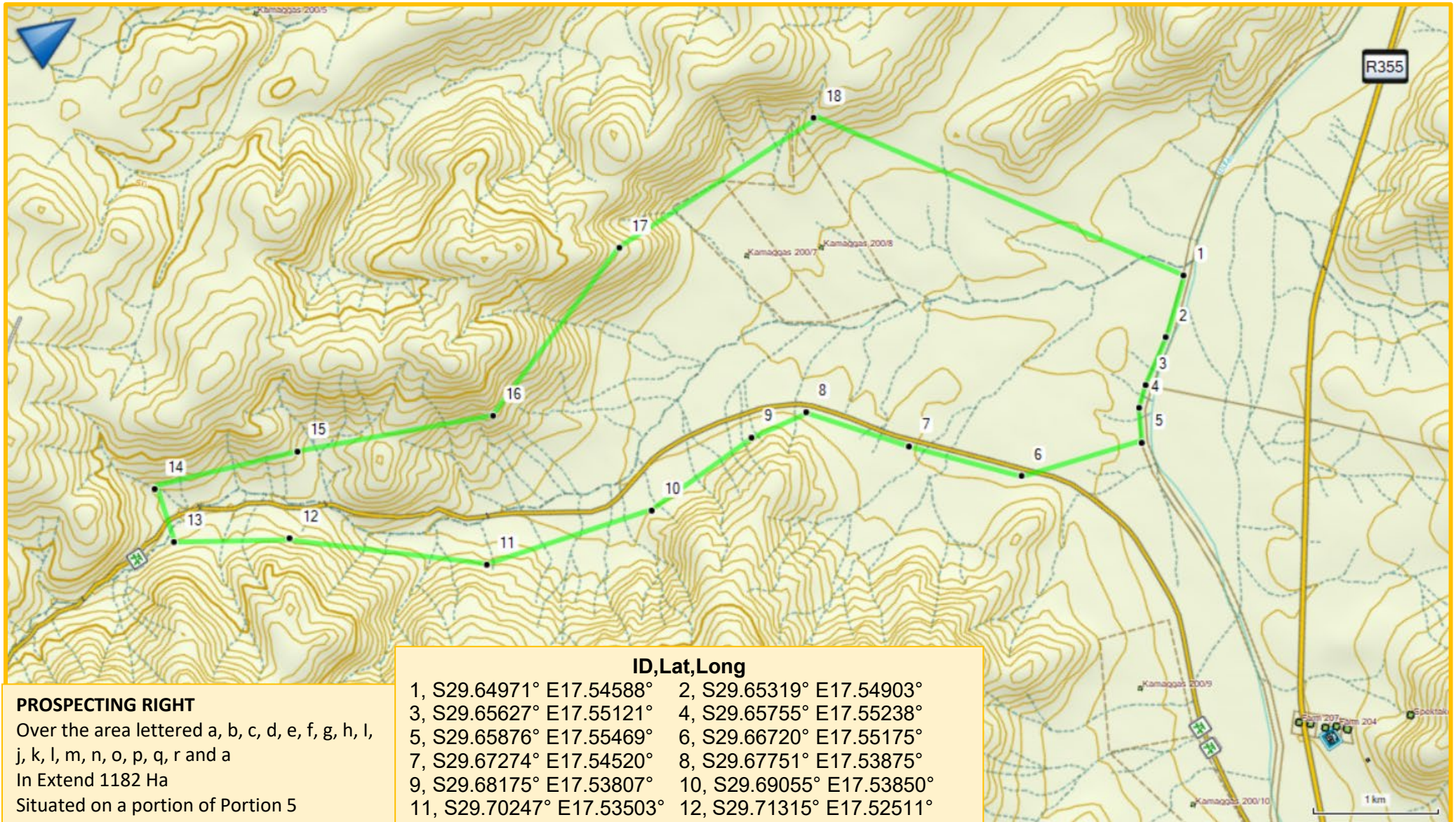
2.1 Locality map (show nearest town, scale not smaller than 1:250000).

The proposed Prospecting Area is located on a portion of Portion 5 Farm Kamaggas 200 situated in the Namakwa District Municipality and Nama Khoi Local Municipality of the Northern Cape Province in extend 59817.3613H. Registered in the name of Gemeenskap van Komaggas by virtue of Title deed T102440/1998CTN. The prospecting area is located approximately 50 Km west of Springbok on the R355. Refer to the locality plan Figure 1 and Figure 2 that shows the properties and co-ordinates.

Figure 1: Locality plan with major Towns and Routes



Figure 2: Layout plan



PROSPECTING RIGHT

Over the area lettered a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r and a
 In Extend 1182 Ha
 Situated on a portion of Portion 5
 Farm Kamaggas 200
 Administrative District Namaqualand
 Northern Cape Province

ID, Lat, Long

1, S29.64971° E17.54588°	2, S29.65319° E17.54903°
3, S29.65627° E17.55121°	4, S29.65755° E17.55238°
5, S29.65876° E17.55469°	6, S29.66720° E17.55175°
7, S29.67274° E17.54520°	8, S29.67751° E17.53875°
9, S29.68175° E17.53807°	10, S29.69055° E17.53850°
11, S29.70247° E17.53503°	12, S29.71315° E17.52511°
13, S29.72017° E17.52052°	14, S29.71923° E17.51639°
15, S29.70928° E17.51999°	16, S29.69625° E17.52590°
17, S29.68214° E17.52058°	18, S29.66550° E17.52050°

Figure 3: Site Plan showing landscape with priority areas



3 Description of the scope of the proposed overall activity

This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a brief period of compiling and evaluating results. These results will not only determine whether the project proceeds, but also the manner in which it will go forward. Essentially, the Company will only action the next stage once satisfied with the results obtained. In addition, smaller, non-core parts of the work program will be undertaken if warranted.

The evaluation of a diamond deposit is the process followed to establish economic viability and to identify the “footprint” of the deposit. The “footprint” is a profile of the type of diamonds present, which may be important for market planning. Economic sensitivity analyses indicate that all diamond deposits are most sensitive to diamond value and grade, and these are the dominant factors that influence the decision to proceed with a project.

The objective of this is a preliminary evaluation phase to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource.

If the results of this work are favorable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.

If conceptual economic modelling of the measured resource indicates that the deposit may be viable, then the project will move to the feasibility and mining phase. A risk decision is made each time a project moves or does not move from one phase to the next. A risk decision may be made to skip phases of the process for example the project may proceed to feasibility and mining directly from this preliminary evaluation stage. The way risk decisions are managed is to enter the available geological data into economic models with variables such as operating costs, capital costs, recovery factors, dilution, stripping ratios, etc. In this way, projects that are most likely and least likely to be viable can be prioritised, held or abandoned. The effect of changes in parameters such as diamond values, new technology, royalties, etc., can then be recognised in terms of their effect on the potential return on investment for the project.

The prospecting work program Table 2 below is schematic and applicable to “virgin territory”. Unforeseen circumstances, e.g., earlier than anticipated identification of mineralization, may necessitate that the prospecting phases or subphases be accelerated for a portion of the prospecting area, while proceeding elsewhere at a slower rate.

Initial prospecting will be carried out by the company itself, utilizing its own in-house geologists and engineers to conduct and oversee the majority of the work. Drilling will be contracted out to service providers.

It is not possible to give details of the position of drilling or prospecting pits before the surveys and surface work is completed but previous investigations did identify priority areas refer figure 3.

Table 2: Prospecting Work Program

Phase	Activity	Skill(s) required	Timeframe	Outcome	Timeframe for outcome	What technical expert will sign off on the outcome?
Non-invasive						
1	Literature Study	Geologist Geophysicist	Month 1-12	Maps, plan Digital data & Report	Month 24	Geologist Geophysicist
	Imagery Analysis Geological Mapping					
	Ground Resistivity measurements		Month 13 -24	Bedrock elevation contours and potential diamond traps		
Invasive						
2	Preliminary evaluation Prospecting Pits where bedrock elevation is less than 5 meters Reverse Circulation drilling where bedrock elevation is more than 5 meters and up to 10 meters	Geologist Drill foreman	Month 24-36	Diamond Ore Characterization (DOC) study for metallurgical purposes	Month 48	Geologist
Pre-Feasibility						
3	Analytical Desktop Study Application for Renewal to provide for Evaluation phase Bulk sampling (Trenching) if necessary.	Geologist	Month 48-60	Maps, Final Exploration Report with mapping	Month 60	CEO/Geologist Mining engineer

3.1 Listed and specified activities

Table 3: Listed and specified activities

NAME OF ACTIVITY	Aerial extent Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
<p>The operation directly relates to prospecting of a mineral resource (diamonds) and requires a prospecting right in terms of section 16 of the MPRDA</p> <ul style="list-style-type: none"> • Refer to Figure 1 and 2: Mine Layout • Accessing the site via existing tracks and access roads to the area. • Prospecting pits will be developed as shown in Fig 3 • After results are logged the pit will be backfilled immediately for security and safety reasons before the project moved to the next pit position. • In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation. • No water will be extracted or used during exploration activities. • No processing will take place and no Tailings and Fine residue (slimes) dumps will be created. • Temporary stockpiling of topsoil, and overburden in separate stockpiles as shown in Fig 3. • Refuse collection containers. • Mobile ablution facilities 	<p>1182 Ha</p>	<p>X</p>	<p>GNR 983 Listing notice 1 of 2014 as amended by GNR 327 of 7 April 2017 and GNR 517 of 2021 Activity 20 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, as well as any other applicable activity as contained in Listing Notice 1 or in Listing Notice 3 of 2014, required to exercise the prospecting right.”</p>	<p>NA</p>

3.2 Description of the activities to be undertaken

3.2.1 Description of Planned Non-Invasive Activities:

In order to direct the exploration program in an efficient manner, there will be a review of all information and data gathered by previous exploration in the surrounding area. A desktop study will also be undertaken of the diamond potential of the total area based on historical data and data from surrounding diamond mining. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed if this operation advances to a mining right phase.

Aerial photographs and satellite images will be studied to ascertain additional target areas. The aerial photographs will also be used to structurally and geologically map the prospecting area and surrounds.

During this phase the desktop studies and studying of available information on surrounding exploration work will be supplemented by geophysical surveys in order to identify drill and sample locations. Such surveys included ground magnetics, ground penetrating radar (GPR), time-domain electromagnetics (TDEM), EM34, frequency domain electromagnetics (FDEM) and electrical resistivity tomography (ERT).

Ground geophysical surveys involve the systematic measurement of magnetic, gravitational and electromagnetic fields over target areas of interest within the property. These surveys are carried out using handheld instruments as shown in Figure 4 below.

The surveyor moves through the identified survey area on foot, using these instruments to gather data from the ground surface. The individual survey areas vary between 500 x 500 m to 2 x 2 km in extent depending on the inferred size of the target area. Magnetic survey lines are spaced at a maximum of 50 m apart and readings will be taken at a minimum of 5 m intervals along the lines. Electromagnetic and gravity survey lines are spaced at a maximum of 100 m apart with readings taken at a maximum of 50 m along the lines. This method of data collection is non-invasive and does not require clearance or disturbance of the vegetation therefore the only potential impact of this data collection process is inconvenience to the landowner, who would need to grant access to the survey site. After data collection has been completed, data processing and visualization is carried out to allow the interpretation of the survey. The final purpose of this phase will be to determine bedrock elevation contours and potential diamond traps

Figure 4: Typical Proton Magnetometer (Source: www.geophysical-equipments.com)



3.2.2 Description of planned invasive activities:

The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective method available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed on areas where bedrock elevation is less than 5 meters. Provision is however also made for reverse circulation drilling where bedrock elevation is more than 5 meters and up to 10 meters.

Prospecting Pits

Pit development will be the same as for trench development (Bulk Sampling) as shown in the diagrams below but on a much smaller scale. There will only ever be three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development and it is anticipated that no more than 10 such pits will be developed. After results are logged the pit will be backfilled immediately for security and safety reasons before the project moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.

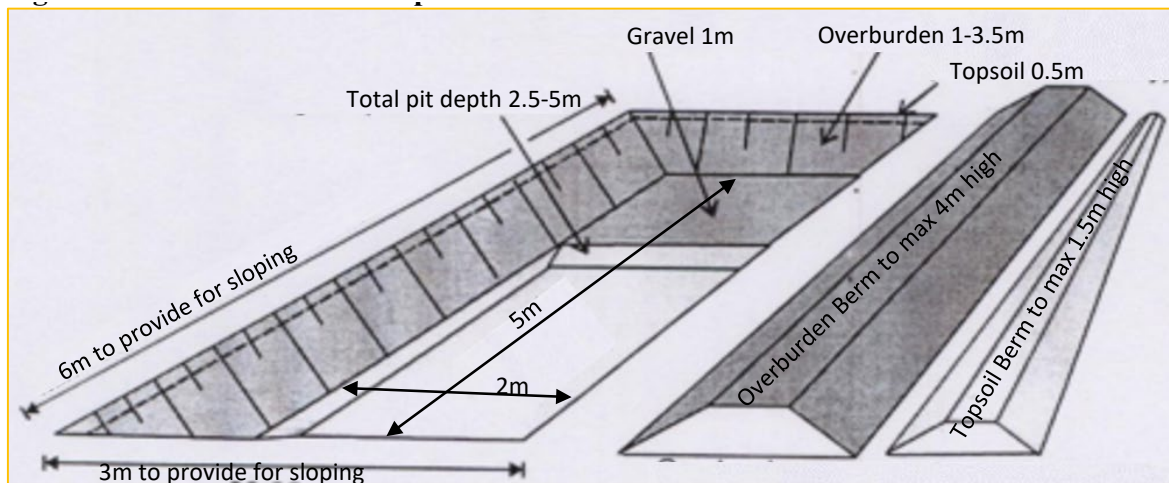
The following volumes requiring earthmoving is only an estimation used in the costing exercise (Figure 5):

- Pit floor to inspect and logged the gravel: 5.0m long and 2.0m wide (10m²)
- Depth of Topsoil to be stockpiled separate from overburden: 0.5m
- Depth of Overburden to be stockpiled separate from topsoil: Max 3.5m but information on surrounding area has shown that bedrock elevation is rarely more than 2m with little or no topsoil. For budgeting purposes, an average depth of 3m is used
- Depth of Gravel to be logged and photographed: 1m
- Total Depth of Prospecting Pit: 2-5m max
- Footprint including sloping: 6m long x 3m wide (18m²)
- Volume topsoil: 18m² X 0.5m = 9m³
- Volume overburden (average for 18m² top & 10m² bottom): 14m² X 2m = 28m³
- Volume gravel: 10m² X 1m = 10m³

Total footprint of surface disturbance from 10 Prospecting pits: 180m²

Total earthmoving from 10 Prospecting pits: 9m^3 topsoil + 28m^3 overburden X 10 pits = 370m^3
 Note that gravel from the pits is not taken out and treated but left intact and closed after logging of results.

Figure 5: Schematic Pit Development



Reverse Circulation Drilling

Reverse circulation drill holes (usually up to 165mm in diameter) will be positioned at targets identified during Phase 1 where bedrock elevation is more than 5 meters and up to 10 meters. For each target identified only one RC hole is required and chip samples from the cyclone will be collected every metre and logging will be done by a qualified geologist who will record the lithology. Apart from gravel resources calculations the drilling information will be used to construct gravel thickness, overburden thickness and verify bedrock elevation contour plans.

A resource calculation will not be possible at this stage but a detailed analysis of the chip samples and the presence of indicator minerals like G10 garnets will be possible and also to obtain an idea as to what standard the alluvial deposits is mineralized.

For budgeting purposes, the drilling of 5 holes to a depth of 10 m is suggested and would give a good idea of the grade and morphology of alluvial deposits discovered.

Bulk Sampling

If the results of this preliminary evaluation phase are favorable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.

The excavation and processing of bulk samples however requires a section 20 permission. Bulk sampling is also a separate listing activity under NEMA that require a different EA process and specialised studies that is not possible at this early stage.

If this project moves on to the evaluation phase (bulk sampling) it will be done as an extension to the initial prospecting phase in terms of section 102 and is not included as part of this application.

3.2.3 Description of Pre-/Feasibility Studies:

The project geologist monitors the program, consolidates and processes the data and amends the program depending on the results. This is a continuous process throughout the program 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 manner in which the work program is to proceed in terms of activity, quantity, resources, expenditure and duration. A GIS based database will be constructed capturing all exploration data.

3.2.4 Associated infrastructure

Accommodation will be provided off-site in one of the nearby towns.

Fuel will be contained in a mobile bowser.

Equipment will be transported to site via the existing roads (including gravel and jeep track).

No new roads will be required.

No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) and no water reticulation will be laid-on to the mine work area(s) either.

No processing plant and services will be developed on the prospecting area.

No offices and accommodation will be provided onsite that need decommissioning.

A temporary equipment laydown area will form part of sampling area. This is also the area where the earth moving equipment will be parked when not in use and will include an equipment/ materials laydown (storage) area and a chemical toilet.

3.2.5 Decommissioning phase

Planning for closure and restoration from the beginning of an operation makes the process easier; waste can be removed as it is created, disturbance can be planned so that topography restoration is less complicated, and topsoil can be re-used at shorter intervals. Site rehabilitation can make the land more valuable and attractive for resale. Additionally, establishing a closure strategy (and communicating that activity to the public) can help enhance the company's reputation as a socially-responsible operation. The decommissioning and closure phase at the end of the life of the mine will consist of implementing the Final Rehabilitation, Decommissioning and Closure Plan (attached at Annexure 1).

4 Policy and Legislative Context

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
Legislation		
<p>Constitution of South Africa, specifically everyone has a right;</p> <ul style="list-style-type: none"> a. to an environment that is not harmful to their health or wellbeing; and b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: <ul style="list-style-type: none"> i. prevents pollution and ecological degradation; ii. promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. 	Prospecting activities	<p>The prospecting activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together avoided be minimised and mitigated in order to protect the environmental right of South Africans.</p>
<p>Minerals and Petroleum Development Resources Act, Act 28 of 2002 (MPRDA) section 16 (as amended)</p> <p>MPRDA Regulations as amended by GNR349 of 18 April 2011.</p>	Application to the DMR for a prospecting right in terms of Section 16	<p>The conditions and requirements attached to the granting of the Prospecting Right will apply to the prospecting activities. DMR is the Competent Authority (CA) for this NEMA and NEM:WA application.</p>
<p>Mine Health and Safety Act, 1996 (No. 29 of 1996) (MHSA) and Regulations</p>	Safety precautions to be considered by the Project Team in the prospecting planning	<p>The objective of the Act is to cover all aspects relating to health and safety of employees and other persons on the mine property. The Act places the responsibility on the mine owner for ensuring that the mine is designed, constructed and equipped in a manner which allows for a safe and healthy working environment.</p>

<p>National Environmental Management Act, No 107 of 1998 (as amended) (NEMA) Environmental Impact Assessment Regulations, 2014 (EIA Regulations 2014) and Environmental Impact Assessment Regulations Listing notices 1, 2 and 3 published in terms of NEMA in Government Notices 982, 983, 984 and 985 of 4 December 2014 (as amended by GN No. 517 of 11 June 2021)</p> <p>Regulation 16{1}(b)(v) submission of a report generated from the national web based environmental screening tool report will be compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21. "Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of NEMA, 1998, when applying for EA ("the Protocols"), in Government Gazette (GG) 43110 (dated 20 March 2020) and Government Notice (GN) 320. Protocols in GG 43855 of GN No. 1150 dated 30 October 2020 provide for Terrestrial and Animal Plant Species.</p> <p>Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production</p> <p>National Guideline on minimum information requirements for preparing Environmental Impact Assessments for mining activities that require environmental authorisation, published in terms of NEMA in Government Notice 86 of 2018</p>	<p>Application to the DMR for Environmental Authorisation in terms of the 2014 EIA Regulations</p>	<p>An Application for Environmental Authorisation must be submitted to DMR for an Environmental Authorisation. The application for EA including screening tool report must be acknowledged by the competent authority before the BAR process can start. The listed activities (Listing Notice 1, Activity 21) that are triggered determine the Environmental Authorisation (EA) application process to be followed</p> <p>Where specialist assessments were identified the protocols for compiling the identified specialist assessments for specific environmental themes provided as part of the screening tool will form part of the terms of reference for specialist as this protocol replaces the requirements of Appendix 6 of the EIA Regulations. Refer Section 10.3 Summary of specialist reports</p> <p>These regulations have informed the Final Closure Plan and financial provisioning for the Project. The disturbed area shall be rehabilitated in such a way that is stable, non-polluting, non-eroded, free from alien invasive species and suitable for the agreed post closure land use.</p> <p>The compilation of this Basic Assessment Report including a Final Rehabilitation, Decommissioning and Mine Closure Plan and the Public Participation Process are required in terms of NEMA.</p>
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<p>National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA)NEM: WA (as amended) National Waste Information Regulations published in GN 625 of 2012 Waste Classification and Management Regulations in GN 634 of 2013 Waste listed activities in GN 921 of 2013 National Norms and Standards for the Storage of Waste, in GN 926 of 2013 National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, in GN 1093 of 2017 National Norms and Standards for the Assessment of Waste for</p>	<p>General waste management measures as part of environmental awareness plan</p>	<p>These regulations have informed the planning and management of waste for the Project. No listed activities are triggered or included as part of the Environmental Authorisation (EA) application process. The generation of potential waste will be minimized through ensuring employees of the Applicant are subjected to the appropriate environmental awareness campaign before commencement of operations. All waste generated during the project will be disposed of in a responsible legal manner. Proof of legal disposal will be maintained on site.</p>
<p>National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] National list of ecosystems that are threatened and in need of protection, 2011 (in GN 1002 dated 2 December 2011) Alien and Invasive Species List, 2016 (in GN No. 864 dated 29 July 2016)</p>	<p>Section 9</p>	<p>There are no listed Critically Endangered, Endangered or Vulnerable ecosystems on site. The prospecting area is located within a Critical Biodiversity Areas. Although CBAs confer no rights and have no official conservation status in law, they provide an indication of ecological status (biodiversity). This does not mean that CBA's need to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem. Good planning and mitigation are provided for in the EMPr. Due to the small scale of invasive activities <1Ha less than 0.01% of the area will be disturbed and rehabilitation is provided for in the EMPr</p>
<p>National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). National Dust Control Regulations in GN R827 of 1 November 2013 List of Activities which Result in Atmospheric Emissions, published in GN 893 of 2013 National Ambient Air Quality Standards (NAAQS), in GN 1210 of 2009 National Atmospheric Emission Reporting Regulations, in GN 283 of 2015</p>	<p>Section 9</p>	<p>These regulations have informed the planning and management of emissions from the Project. Dust control measures are included in the EMPr</p>
<p>National Heritage Resources Act, 25 of 1999 ("NHRA")</p>	<p>Section 9</p>	<p>A HIA and PIA will be done to identify no go areas during sampling and all mitigation measures and conditions will form part of the final EMPr</p>

<p>National Water Act (Act 36 of 2008) Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources in GNR 704 of 1999 Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals in GNR 267 of 2017 Several General Authorisations have been published in terms of Section 39 of the NWA (various dates) Purification of Waste Water or Effluent, published in GNR 991 of 1984 Regulations for the erection, enlargement, operation and registration of Water Care Works, published in GNR 2834 of February 1986</p>	<p>Section 9 for description of water resources in local area,</p>	<p>These regulations have informed the planning and management of water and stormwater arising from the Project A Water Use Authorisation (License or GA) in terms of Sec 21(c) and 21(i) is required for drilling within, or within 500m of any drainage channels. A Water Use Authorisation (License or GA) in terms of Sec 21(a) is required for abstracting groundwater. None of these activities are planned but if the situation changed the necessary application will be lodged. At this stage any water required for drilling activities will be obtained from a legal source i.e., local authority and brought in via a mobile water tanker.</p>
<p>Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) [PAJA]</p>	<p>Decision by the Competent Authority</p>	<p>Gives effect to section 33 of the Constitution that requires that “Everyone has the right to administrative action that is lawful, reasonable and procedurally fair”. All administrative actions must be based on the relevant considerations</p>
<p>Protection of Personal Information Act, 2013 (Act No. 14 of 2013) (POPIA) Clarity On Applicability of The Protection of Personal Information Act, 2013 To Requirements of The Environmental Impact Assessment Regulations, 2014 Relating to Registers of Interested and Affected Parties and The Inclusion of Comments in Reports (circulated on 3 September 2021)</p>	<p>Annexure 2: PPP Report</p>	<p>The guidance document provided by the Department of Forestry, Fisheries and the Environment was used to determine the information to be included or excluded from the public domain to protect private or personal information.</p>
<p>Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)</p>	<p>Comments required from the Nama Khoi Local Municipalities.</p>	<p>Consent use in terms of the Municipal Planning By-Law, 2015 is required to permit mining on properties that are zoned for Agricultural purposes.</p>
<p>Hazardous Substances Act, 1973 (Act No. 15 of 1973) (HAS)</p>		<p>These regulations have informed the planning and management of hazardous substances for the Project.</p>
<p>National Forest Act, 1998 (Act No. 84 of 1998) (NFA) Provincial Environmental Legislation: The Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) (NCNCA)</p>		<p>Permit(s) will be required if any protected species are cut, removed and/or translocated from the Project footprints.</p>
<p>National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003) (NEM:PAA)</p>		<p>These regulations have informed the planning and management of the Project. The Project footprint does not overlap with any existing protected areas, or any areas identified for protected area expansion.</p>

Municipal Plans and Policies		
Namakwa District Municipality Integrated Development Plan (IDP) 2017/2022	Section 5 & 9	The Need & Desirability of the project is referenced in terms of the District Municipality IDP, specifically relating to employment creation, and ensuring the implementation of environmentally sustainable practices, along with an integrated approach to addressing climate change response, which are included in the EMPr
Nama Khoi Local Municipality Integrated Development Plan (IDP), 2018/2019	Section 5 & 9	The Need & Desirability of the project is referenced in terms of the IDP, specifically relating to employment creation and sustainable resource utilisation. Relevant mitigation measures are included in the EMPr.
Northern Cape Provincial Spatial Development Framework (NCPSDF)	Section 5 & 9	Sustainable development is a key consideration as addressed in this impact assessment report.
Northern Cape Provincial Growth and Development Strategy 2004-2014 (NCPGDS)	Section 5 & 9	Sustainable development is a key consideration as addressed in this impact assessment report.
Standards, Guidance and Spatial Tools		
Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming	Section 5 & 9	The mitigation measures to address and mitigate the potential impacts of the mining are included in the EMPr.
DEA Guideline on Need & Desirability (2017)	Section 5	Refer to Section 5
DEA Guideline on PPP DMR Guideline on Consultation with Communities and I&APs	Section 7	Refer to Section 7
DEAT Integrated Environmental Management Information Series 5: Impact Significance (2002)	Section 12	Refer Impact Assessment Table
DEAT Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Section 12	Refer Impact Assessment Table
Namakwa District Biodiversity Sector Plan (2008)	Baseline environmental description	Used during desktop research to identify sensitive environments within the mining right area.
SANBI BGIS databases (www.bgis.sanbi.org)		
SANS 10103:2008 The Measurement and Rating of Environmental Noise with Respect to Land Use, Health, Annoyance and to Speech Communication	Management / Monitoring measures	Used to set the standard allowable for noise mitigation measures are included in the EMPr.
SANS 1929:2005 Edition 1.1 – Ambient Air Quality Limits for Common Pollutants		Standard for dust fallout. Dust mitigation measures are included in the EMPr.

5 Need and desirability of the proposed activities

5.1 Mining and Biodiversity Guidelines (2013)

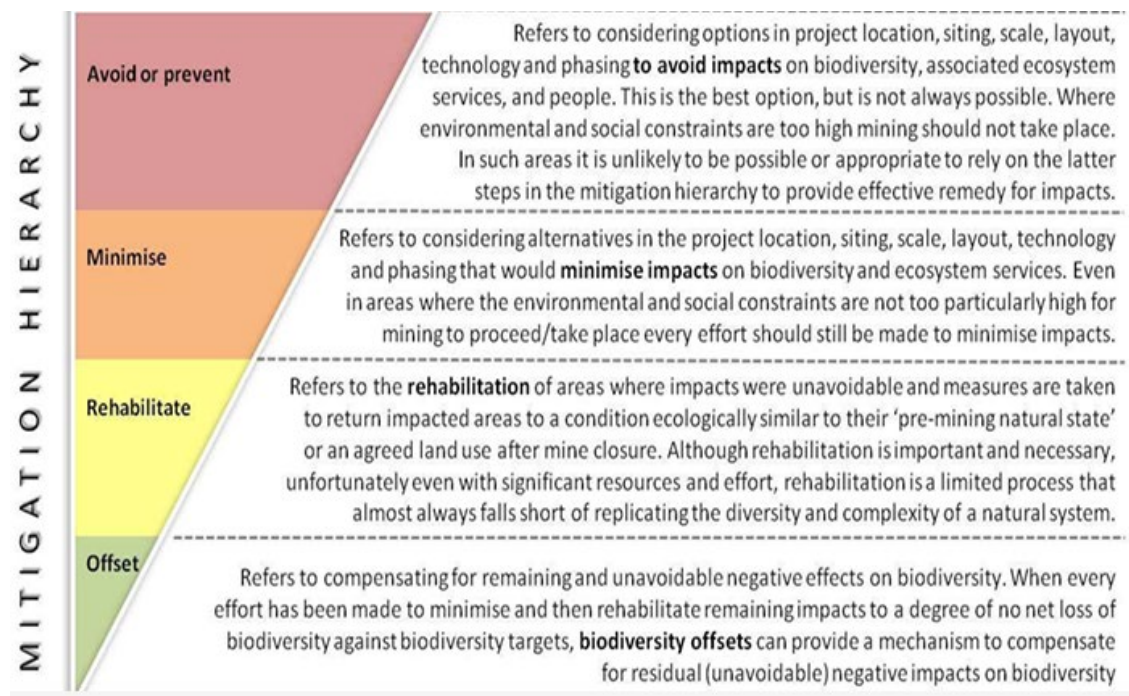
The Mining and Biodiversity Guidelines (2013)¹ state that: “Sustainable development is enshrined in South Africa’s Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in a number of Acts, not least the National Environmental Management: Biodiversity Act (No. 10 of 2004) (hereafter referred to as the Biodiversity Act) and is fundamental to the notion of sustainable development. International guidelines and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa”.

DMR, as custodian of South Africa’s mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to “prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”².

The primary environmental objective of the MPRDA is to give effect to the “environmental right”³ contained in the South African Constitution. The MPRDA further requires the Minister to ensure the sustainable development of South Africa’s mineral resources, within the framework of national environmental policies, norms, and standards, while promoting economic and social development.

The Mining and Biodiversity Guidelines (2013) also provides for a mitigation hierarchy that provides a clear approach for avoiding impact.

Figure 6: Mitigation hierarchy



¹ Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.

² Constitution of the Republic of South Africa (No. 108 of 1996).

³ Section 24 of the Constitution states that “everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) 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.”

The Mining and Biodiversity Guidelines (2013) document identifies four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining. The categories are as follows: Category B: Highest Biodiversity importance – highest risk for mining; Category C: High Biodiversity Importance – high risk to mining; and “Category D: Moderate Biodiversity Importance” – moderate risk for mining.

These categories have since been superseded by the Critical Biodiversity Area (CBA) map (Section 8), which would be interpreted as Category B is now CBA 1, Category C is now CBA 2 and Category D is now Ecological support areas.

Although CBAs confer no rights and have no official conservation status in law, they provide an indication of ecological status (biodiversity). This does not mean that CBA’s need to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem. These categories basically require an environmental impact assessment process to address the issues of sustainability.

5.2 Employment benefits

The proposed prospecting activity is considered to be a temporary land use, and the area will be rehabilitated in accordance with the Mining Closure and Rehabilitation Plan, attached as Annexure 1. The benefits of the project can be divided into social and economic classifications. In terms of employment opportunities and job security, the prospecting activities themselves would not directly lead to job opportunities. Should prospecting activities prove that a feasible resource mineral is present to allow for mining, a new mine may be developed which would generate extensive employment opportunities in an area where employment is needed. The proposed prospecting operation will however assist in providing job security, local employment, local skills transfer and economic upliftment, in a sustainable manner.

5.3 Namakwa District Municipality IDP

The vision of the Namaqua District Municipality IDP is: “Namakwa District Municipality, a centre of excellence!”

The Mission Statement is:

- The stimulation of radical economic and social transformation;
- The fostering of partnership with relevant role-players;
- Supporting and capacitating of local municipalities;
- Transparent and accountable processes; and
- Providing of local leadership

The Strategic Objectives are

- Monitor and support local municipalities to deliver basic services which include water, sanitation, housing, electricity and waste management
- Support vulnerable groups
- Improve administrative and financial viability and capability
- Promote and facilitate Local Economic development
- Enhance good governance
- Promote and facilitate spatial transformation and sustainable urban development
- Improve communication and communication systems
- Establish a customer care system
- Invest in the improvement of ICT systems
- To render a municipal health service

- To coordinate the disaster management and fire management services in the district
- Implement the climate change response plan
- Caring for the environment

Values

- The Namakwa District Municipality adheres to the values contained in the Batho Pele Principles.
- Caring for the environment and the effects of climate change, such as flood events, on the proposed prospecting project will be mitigated as per the measures contained in the EMPr. The mitigation for emissions of greenhouse gases from vehicles and machinery associated with the prospecting activities are addressed in the EMPr.

5.4 Nama Khoi Local Municipality IDP

In the Constitution of South Africa (108 of 1996) the objectives of a municipality or local government structure are described as follows under “section 152. (1) The objects of local government are-

- (a) to provide democratic and accountable government for local communities;
- (b) to ensure the provision of services to communities in a sustainable manner;
- (c) to promote social and economic development;
- (d) to promote a safe and healthy environment; and
- (e) To encourage the involvement of communities and community organisations in the matters of local government”.

The vision of the Nama Khoi Local Municipality is: “To proudly deliver sustainable local economic development & climate resilient quality services to the Nama Khoi Municipality”

The IDP states that it is important that economic opportunities are expanded in local areas, in a way that takes both people and biodiversity into account to ensure sustainable livelihoods.

The report highlights that the Industrial mining corridor as indicated in the PSDF must be investigated for opportunities and exploited where possible.

The IDP identifies its strengths which include high quality & unspoiled environment, diversity of scenic landscapes and vast amounts of open land, a large labour pool and solar energy; weaknesses which include undiversified economy: over-dependence on mining and government services sectors, lack of jobs and economic development, lack of skills and poor quality of education; opportunities which include unexploited mineral opportunities’ and Eco-tourism initiatives; and threats as water supply, water quality and brain-drain as individuals from the Northern Cape migrate from scarcity of business, finance and technical skills.

In terms of employment opportunities and job security, the prospecting activities themselves would not directly lead to job opportunities. Should prospecting activities prove that a feasible resource mineral is present to allow for mining, a new mine may be developed which would generate extensive employment opportunities in an area where employment is needed. The proposed prospecting operation will however assist in providing job security, local employment, local skills transfer and economic upliftment, in a sustainable manner.

5.5 Northern Cape Provincial Spatial Development Framework (NCPSDF)

The NCPSDF states that the: “Northern Cape is not one of South Africa’s richest provinces in monetary terms. Accordingly, there is a need for coherent prioritisation of projects within a spatial economic framework that takes due cognisance of environmental realities and the imperative to create a developmental state”. The NCPSDF was designed as an integrated planning and management tool for all spheres of government to facilitate on-going sustainable development throughout the province.

The NCPSTDF, together with the Provincial Growth and Development Strategy (PGDS), is set to fulfil an important role as a spatial and strategic guideline that addresses the key challenges of poverty, inequality and environmental degradation through the innovative use of the resources (capital) of the province for the benefit of all concerned.”

The potential for job security, employment and skills transfer are identified as positive environmental impacts in this impact assessment.

5.6 Northern Cape Provincial Growth and Development Strategy (NCPGDS)

The NCPGDS has the following vision for the province: “Building a prosperous, sustainable growing provincial economy to reduce poverty and improve social development.” The strategy for the growth and development of the province is guided by the following key principles:

- Equality – notwithstanding the need to advance persons previously disadvantaged, development planning should ensure that all persons should be treated equally;
- Efficiency –the promotion of the optimal utilisation of existing physical, human and financial resources;
- Integration – the integration of spatially coherent regional and local economic development and improved service delivery systems.
- Good Governance – the promotion of democratic, participatory, cooperative and accountable systems of governance and the efficient and effective administration of development institutions;
- Sustainability – the promotion of economic and social development through the sustainable management and utilisation of natural resources and the maintenance of the productive value of the physical environment;
- Batho Pele – the placement of people and their needs at the forefront of its concern and serve their physical, psychological, developmental, economic, social and cultural interests equitably.

5.7 DEA Guideline on Need and Desirability

As referenced in the DEA Guideline on Need and Desirability (2017), NEMA defines “evaluation” as “the process of ascertaining the relative importance or significance of information, in the light of people’s values, preferences and judgements, in order to make a decision.” In evaluating each impact (negative and positive) in terms of each of the aspects of the environment, “need and desirability” must specifically be considered in the analysis of each impact of the proposed activity. However, to determine if the proposed activity is the best option when considering “need and desirability”, it must also be informed by the sum of all the impacts considered holistically. In this regard “need and desirability” also becomes the impact summary with regard to the proposed activity.

These Guidelines state that: “In considering the impact summary it must be remembered that ultimately the aim of EIA is to identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternatives and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved”.

The **principles of Integrated Environmental Management (EIM)** as set out in Section 23 of NEMA have been considered in this environmental assessment as explained below.

- **Environmental management placing people and their needs at forefront of its concern, and serve their physical, physiological, developmental, cultural and social**

interests equitably – This process is being undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and interested and affected parties. Public participation is being undertaken to obtain the issues / concerns / comments of the affected people for input into the process. Refer to Section 7 in this report.

- **Socially, environmentally and economically sustainable development** – All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures have been proposed to ensure that the impact is mitigated, and these are detailed and included in the EMPr.
- **Consideration for ecosystem disturbance and loss of biodiversity** – the project site includes portions identified as Critical Biodiversity Areas (CBA) 1 (**Figure 10**). The vegetation type found on site is not listed in the "National List of Threatened Ecosystems that are Threatened and in Need of Protection" in GN 1002 dated 9/12/2011. Ecosystem disturbance and loss of biodiversity are considered in the impact assessment. The prospecting process is considered to be a relatively benign type of operation. Rehabilitation back to the natural state is a key component and will be undertaken in a phased manner as the activities progress. This EMPr and the Final Rehabilitation, Decommissioning and Closure Plan (Closure Plan) (Annexure 1) proposes mitigation measures which will minimise the impacts of the operation on the environment.
- **Pollution and environmental degradation** – The implementation of recommendations made and proposed mitigations are detailed in the EMPr, and Closure Plan to ensure minimum environmental degradation.
- **Landscape disturbance** – All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures have been detailed in the EMPr and Closure Plan to ensure that the impacts are mitigated. For example, landscape disturbance impacts associated with the excavations, surface disturbance, erosion and dust have been identified and detailed mitigation measures are included in the EMPr to minimise the impacts.
- **Waste avoidance, minimisation and recycling** – These aspects were considered and incorporated into the EMPr and the Closure Plan.
- **Responsible and equitable use of non-renewable resources** – These aspects have been considered and there is not much scope to reduce the use of non-renewable resources, such as vehicle transport.
- **Avoidance, minimisation and remedying of environmental impacts** - All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures will be proposed to ensure that the impact is mitigated. A number of mitigation measures have been included in the EMPr and the Closure Plan.
- **Interests, needs and values of Interested and Affected Parties** – This process has been undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and interested and affected parties (I&APs). Comments received from I&APs on the Draft Basic Assessment Report was included as part of this Final Basic Assessment Report as summarised in Section 7, Table 5.
- **Access of information** – Potential Interested and Affected Parties were notified of the proposal and the availability of the DBAR. They were also notified of having the opportunity to register as an I&AP and registered I&APs have been kept informed of the commencement of the Basic Assessment process.

- **Promotion of community well-being and empowerment** – This process is being undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and registered I&APs.

Potential impacts on the biophysical environment and socio-economic conditions have been assessed, and steps have been taken to mitigate negative impacts, and enhance positive impacts. Adequate and appropriate opportunity is being provided for public participation. Environmental attributes have been considered based on the available information, and environmental management practices have been identified and established to ensure that the proposed activities will proceed in accordance with the principles of IEM.

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

No site or technology alternatives have been considered for this prospecting application. The areas included in the prospecting rights application were identified through historical prospecting and production records for the area and from designated research. Diamond exploitation and exploration in the general area has been ongoing for many years and the area applied for is located within relatively close proximity to known diamond mines, which is therefore considered highly prospective.

The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective method available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed on areas where bedrock elevation is less than 5 meters. Provision is however also made for reverse circulation drilling where bedrock elevation is more than 5 meters and up to 10 meters.

7 Details of the Public Participation Process Followed

7.1 Introduction

The public participation process has been conducted according to the requirements as prescribed in Regulations 40 to 44 of the EIA Regulations, 2014 (as amended).

The formal public participation process, which meets the requirements of the NEMA EIA Regulations and the MPRDA has been followed and include the following activities:

Potential I&APs were notified about the project and of commencement of the Basic Assessment (BA) process and invited to registration as stakeholders by means of:

- Personal notification to directly affected landowners together with a Background Information Document (BID);
- Written notifications to other stakeholders including neighbours, Relevant Government Department, Local and District Municipalities (including traditional authorities where applicable) together with a Background Information Document (BID); and
- The general public were notified by means of site notices and media advertisements.
- Registered I&APs including the Relevant Government Department were given the opportunity to review and comment on the Draft Basic Assessment Report.
- Registered I&APs will be notified of the outcome of the environmental authorisation, and if required the appeal process to be followed.

7.2 Summary of issues raised by I&Aps

Table 5: Summary of issues raised by I&Aps – Also refer Annexure 2 to be included as part of the Final Basic Assessment Report

Interested and Affected Parties, persons consulted is marked with an X	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in this report where the issues and or response were incorporated.
ORGANS OF STATE				
Landowners or Lawful occupier/s of the land				
Landowners or lawful occupiers on adjacent properties				
Other Interested parties				

8 Process to reach the proposed preferred alternative

8.1 Site alternatives

8.1.1 Location

As discussed above, the prospecting location has been informed by historical prospecting and production records. As such the applicant believes there is a possibility of encountering diamond reserves on the property subject to this prospecting right application. The prospecting site has therefore been informed by the locality of other diamond mines in the area. Until such time that the non-invasive activities have been completed the exact location of the sampling sites cannot be confirmed. However, the following restrictions will be applied to the final site selection:

- No sampling site will be positioned within 500m of any existing infrastructure.
- No sampling site will be positioned within 100m of a graveyard if discovered
- No sampling site will be positioned within 100m of any drainage channel or 500m of a wetland (Estuary).
- Where possible existing access roads will be utilised to access the sampling sites.
- Prospecting activities will be conducted during daylight hours to minimize exposure to light and noise pollution.
- If necessary certain sampling can be timed to occur only during weekdays as may be required in certain instances by stakeholders. The time of implementing sampling activities during the day may also be reconsidered in consultation with landowners.
- Ideally sampling activities will occur continuously until such time that sample is completed and area rehabilitated, with no operations during the night.

8.1.2 Type of activity

The Applicant is not the land owner, so it would not be realistic for this company to propose another type of activity, as their core business is the mining of base metals. The applicant is required to rehabilitate the environment affected by prospecting to its natural state or to another predetermined land use. The prospecting activity takes place over a relatively short time period, so the selection of the best post-mining long term land use is an important consideration. In the case of this application the best post-mining land use alternative is to return the area to its natural state. Other activity alternatives have therefore not been considered as the purpose of the proposed project is to explore the area for base metals as indicated. The only other activity required to be assessed in terms of NEMA is the “do-nothing” alternative, as detailed further below.

8.1.3 Design or Layout of activity

The outcomes of the non-invasive Phase 1 prospecting activities will inform Phase 2 and the layout of the sample sites may therefore be refined based on the detailed findings of the ongoing desktop review and mapping exercises

Site establishment is done with closure in mind to ensure that only the required size is disturbed. No camp site will be erected on site, as existing establishments will be used for accommodation in the nearby town(s).

Less than 10m³ of dangerous goods in containers will be stored on-site.

Temporary waste storage facilities will be provided. The volumes of waste stored will not exceed 10m³ for hazardous waste and/or 5m³ for general waste at any one time, and will be remove from site on a daily basis.

The design or layout of an exploration project is determined by the shape, position and orientation of the mineral resource. Geophysical methods have been proven to be very useful in detecting potential targets and will therefore be used to identify optimal locations of potential mineralisation of economic interest within the prospecting area prior to sampling.

- The preferred and only location of the prospecting activity is on the earmarked section.
- The preferred and only activity is the prospecting for any potential mineral mineralisation.
- The preferred and only technology is the use of drilling and excavation equipment for the location of potential mineralisation.

The significance of the environmental impacts associated with different possible design or layout alternatives would be very similar, therefore layout alternatives have not been assessed.

8.1.4 The technology to be used in the activity;

Regarding technologies, evaluation of a diamond deposit is the process followed to establish economic viability and to identify the “footprint” of the deposit. The “footprint” is a profile of the type of diamonds present, which may be important for market planning. Economic sensitivity analyses indicate that all diamond deposits are most sensitive to diamond value and grade, and these are the dominant factors that influence the decision to proceed with a project. The objective of this is a preliminary evaluation phase to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource.

If the results of this work are favorable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.

If conceptual economic modelling of the measured resource indicates that the deposit may be viable, then the project will move to the feasibility and mining phase.

A risk decision is made each time a project moves or does not move from one phase to the next. A risk decision may be made to skip phases of the process for example the project may proceed to feasibility and mining directly from this preliminary evaluation stage. The way risk decisions are managed is to enter the available geological data into economic models with variables such as operating costs, capital costs, recovery factors, dilution, stripping ratios, etc. In this way, projects that are most likely and least likely to be viable can be prioritised, held or abandoned. The effect of changes in parameters such as diamond values, new technology, royalties, etc., can then be recognised in terms of their effect on the potential return on investment for the project.

The methods detailed Table 2 above would be used to investigate the area and it is not possible to give details of the position of sample sites before the surveys and surface work is completed. The prospecting activities proposed in the Prospecting Work Program (PWP) follow a phased approach, whereby the preceding phase determines if further work is warranted and as a result no alternatives are available to complete the proposed prospecting activities.

The prospecting methodologies have been chosen based on the applicant’s past experience with diamond prospecting, and is considered to be standard practice for such prospecting. The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective technology available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed on areas where bedrock elevation is less than 5 meters. Provision is however also made for reverse circulation drilling where bedrock elevation is more than 5 meters and up to 10 meters.

8.1.5 Operational alternatives

The non-invasive prospecting component will enable the applicant to clearly delineate areas which are regarded as suitable for further investigation without unnecessarily disturbing the prospecting area through invasive means.

During the invasive prospecting component of the project, the following key site activities related to collection of samples will be undertaken:

- Accommodation will not be provided on site but in one of the nearby towns.
- Establishment of sample sites with equipment laydown area and temporary overburden dump sites.
- Establishment of access to sample sites
- Sampling operations (e.g., drilling, pit excavation and gravel sampling)
- Rehabilitation activities (e.g., backfilling of pits and scarifying disturbed areas)

Alternative time frames can be made to ensure that the impact on the day to day running of the inherent land use are minimised, for example sampling on cultivated land can be rescheduled post harvesting or not to coincide with breeding or hunting seasons or during raining season due to access problems. Prospecting activities will be conducted during daylight hours to minimize exposure to light and noise pollution. If necessary certain sampling can be timed to occur during school terms or holidays as may be required in certain instances by stakeholders. The time of implementing sampling activities during the course of the day may also be reconsidered in consultation with landowners. Ideally sampling activities will occur continuously until such time that sample is completed and area rehabilitated, with no operations during the night.

At present, no feasible alternatives to pitting and or drilling are available and impacts associated with the sampling operation will be monitored and managed in terms of the EMPr. There are no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory “no-go” alternative that must be assessed for comparison purposes as the environmental baseline.

8.1.6 The No-go Alternative

The no-go alternative will mean that no prospecting activities are undertaken and the status quo remaining.

Sampling is required in order to investigate the potential and feasibility of a resource and also to generate a SAMREC compliant mineral resource statement. There is no potential for any future investment in a mine without the confirmation of the mineral resources which can only be obtained through sampling activities.

Should the prospecting right be refused, effectively a potential mineral resource will be sterilised. The socio-economic benefit and most notably the future employment potential of a mine development will also be lost if the prospecting activities are not implemented in order to determine the feasibility of any mineralisation within the area. This will mean that the possible existence of economically exploitable minerals will not be known, and in turn none of the benefits associated with the project will be realised (e.g., job creation and stimulation of the local economy). The applicant would also not have the opportunity to utilise (exploit) the possible mineral reserves. Should the prospecting activities not be permitted, then the potential environmental impacts associated with site establishment and sampling would not occur, and the status quo would be maintained.

9 Baseline Environment (Site sensitivity)

9.1 Regional setting

The project site is located within the Succulent Karoo Biome. The Succulent Karoo Biome is found mostly west of the western escarpment from the Luderitz District of Namibia through the western belt of the Northern Cape and Western Cape Provinces, and inland of the Fynbos Biome to the Little Karoo. Much of the terrain is flat to gently undulating, such as the western coastal platform, Knersvlakte and Tanqua Karoo. Hilly and more rugged topography occurs in

Namaqualand, the Robertson Karoo and Little Karoo and parts of the western escarpment. The extreme altitudinal range is from sea level to about 1 500 m, but most of the area lies below 800 m. The area under investigation is fairly flat, sloping gently from the north-west (at 180m above mean sea level) towards the south-east, with an elevation at 140m above mean sea level.

9.2 Geology

Kamaggas lies in the Lower Buffels River Valley, which forms part of the vast coastal plain between the Namaqualand Metamorphic Mountainland and the West Coast of South Africa. The road from Springbok descends impressively from the escarpment into the valley below via the Spektakel Pass.

Sediments of the Namaqualand coastal area overlie the Precambrian Metamorphic Basement Complex, which consists predominantly of granite-gneiss, sparsely interspersed with minor mafic intrusives, and often intersected by quartzite ridges, marble layers and a wide variety of schists (De Villiers & Söhnge, 1959).

The oldest known unmetamorphosed sediments in this area are the Cretaceous silcretes and remaining patches of silicified diamond conglomerate of Late Cretaceous age (~70 m.y.), found on Annex-Kleinsee. The Buffels River palaeo-channel gravels were mainly deposited during wetter climates of Tertiary age, while the raised beach terraces mined on the coastal farms were formed during sea level stillstands since the Late Miocene and throughout the Quaternary period (Kensley & Pether, 1986).

Lower Buffels River alluvium is spread across an extensive coastal floodplain, ~40km long from east to west and up to 10km wide, flanking the Buffels River on both sides. The palaeo-channel deposits are interpreted as derived from a widely meandering palaeo-river, with deltaic distribution towards the Buffels River mouth. The coastal plain is covered by reddish wind-blown sandy overburden, in which calcrete/kaolin crusts often precipitate.

From their kimberlite sources, diamonds are transported across the landscape by the actions of wind, water, and ice (glaciers) under the constant influence of gravity. Diamonds, by far the hardest naturally occurring substance, can withstand transportation over thousands of kilometres during many millions of years.

Due to high density, diamonds tend to concentrate gravitationally and hydrodynamically. These factors cause diamonds to travel and be deposited together for the most part, resulting in the well-known “jackpot” phenomenon, which is mainly dependent on bedrock morphology. Softer patches in the bedrock thus form potholes and boulder pits. Diamondiferous gravels are generally only moved during storm and flood conditions, when energy levels rise to more than ten times average. During floods, boulders and cobbles are moved into bedrock depressions which act as trap sites, where they accumulate to form boulder beds, able to withstand further movement.

Once deposited, the boulder beds lie in stable, densely packed (clast-supported) configurations, and in turn act as trap sites for large amounts of pebble-sized gravel infill. Diamond concentrations are protected against remobilization by overlying gravel and boulder lags, as well as by calcrete, ferricrete, silcrete and gypsum cementation.

The present course of the Buffels River forms the property northern boundary. However, during previous geological ages, the palaeo-Buffels River meandered freely across the width of the Buffels River Valley. It is evident from the placement of the primary boulder and cobble gravel deposits during the main depositional phase of the palaeo-Buffels River. The boulders, cobbles and pebbles generally consist of Nama quartzite, but also of quartzose granite-gneiss from the Namaqualand Metamorphic Mountainland. The pebble fraction also includes vein quartz.

The modern-day Lower Buffels River Valley is a mature valley with a low slope of approximately 1:100, and part of the coastal floodplain between the Mountainland and the West Coast. However, during evolution of the floodplain in very wet climates, the coastward edge of the receding Mountainland formed an S-shaped curve with slopes as high as 1:20, which greatly facilitated the downslope movement of large boulders.

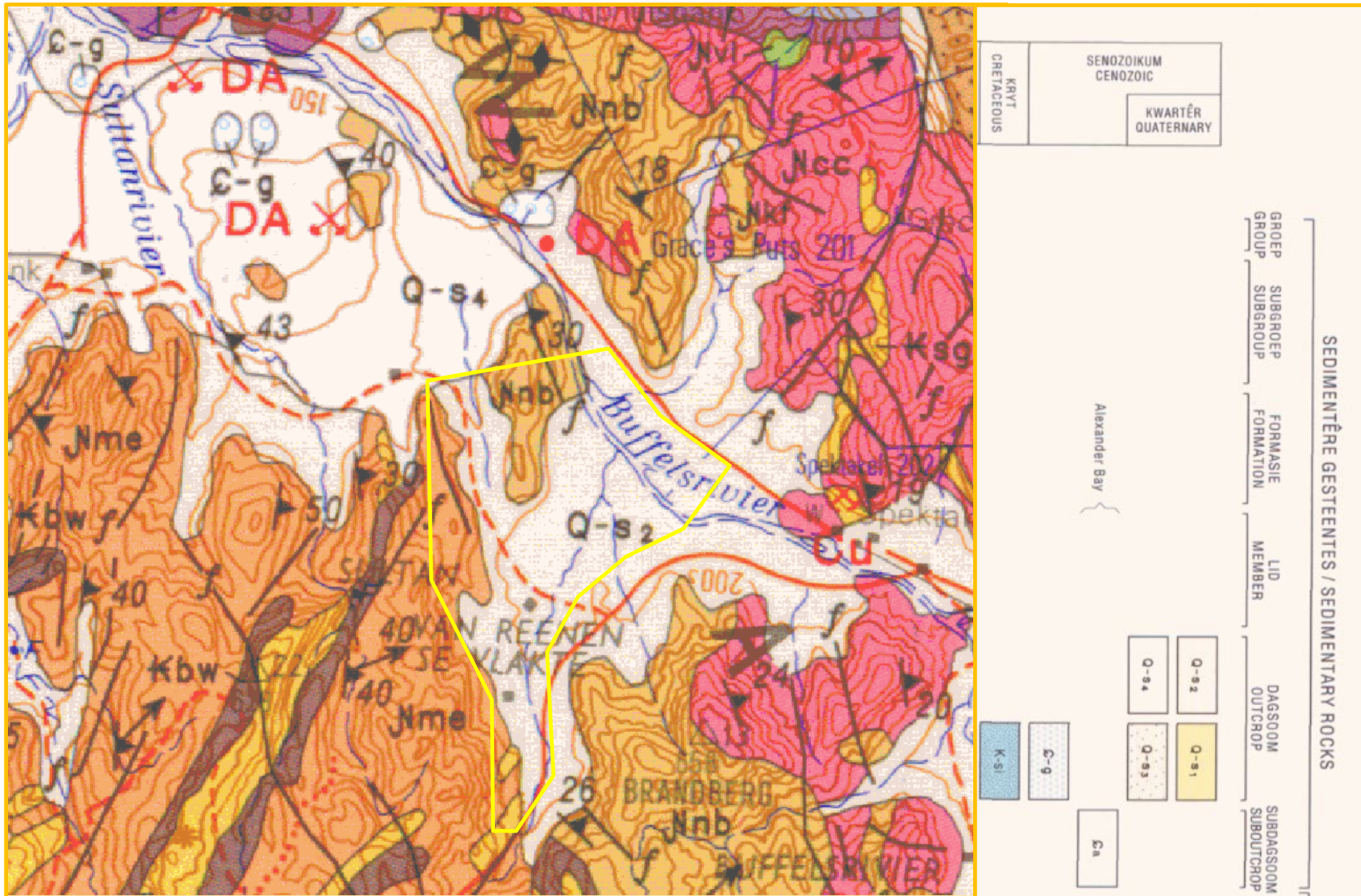
It is generally accepted that all the older tributaries draining the Mountainland and entering the Buffels River Valley contributed diamondiferous gravel derived from older glacial deposits. Thus, gravel was likely contributed by the palaeo-Stry River (also called Stryd River), one of the main tributaries of the palaeo-Buffels River from the north-east, following the overall trend of the basement gneiss regional foliation. The general trend of the regional foliation of the basement gneiss to a large extent controls the direction of mafic lineaments forming within it. While the primary large-boulder beds occupied the larger and deeper bedrock depressions, more widespread primary cobble-pebble gravel terraces formed on the adjacent flat ground, mainly at elevations between 140 and 155 mamsl (metres above mean sea level).

The younger modern Buffels River later progressively deepened the valley and became confined to the central part of the valley during recent more arid climates. Numerous younger tributaries from the adjacent high ground then cut across the palaeo-Buffels River deposits, leaving only the largest and most stable deposits in the deepest bedrock depressions.

Refer Diagram 3 for regional geological map.

(Refer Figure 7).

Figure 7: Geology of Prospecting area



9.3 Soil and land capability

According to the screening report (DEA) no wind or solar developments found within 30 km of the prospecting area and no intersections with Environmental Management Framework areas are present.

The soil and land types identified in the study area could all be classified as land with wilderness land capability. Even though some soil forms have the potential for arable agriculture, the very low rainfall of the study area makes it unsuitable for crop production. The study area could be suitable for grazing by small stock, but this may negatively affect biodiversity.

Table 6 below indicates the set of criteria as stipulated by the guidelines outlined in Section 7 of The Chamber of Mines Handbook of Guidelines for Environmental Protection (Volume 3, 1981) to group soil forms into different land capability classes. Figure 8b show the Land Cover of the study area. Note that current land cover indicators do not consider degradation due to, for example, spread of alien plants, secondary impacts of mining (e.g., sand mobilization) or overgrazing by livestock.

Table 6: Pre-mining land capability criteria

Criteria for Wetland	<ul style="list-style-type: none"> • Land with organic soils; or • A horizon that is gleyed throughout more than 50 % of its volume and is significantly thick, occurring within 750mm of the surface.
Criteria for Arable Land	<ul style="list-style-type: none"> • Land which does not qualify as a wetland; • The soil is readily permeable to the roots of common cultivated plants to a depth of 750mm; • The soil has a pH value of between 4,0 and 8.4; • The soil has a low salinity and SAR; • The soil has a permeability of at least 1,5 mm per hour in the upper 500 mm of soil; • The soil has less than 10 % (by volume) rocks or pedocrete fragments larger than 100 mm in diameter in the upper 750 mm; • Has a slope (in %) and erodibility factor (K) such that their product is <2.0; and • Occurs under a climatic regime, which facilitates crop yields that are at least equal to the current national average for these crops or is currently being irrigated successfully.
Criteria for Grazing Land	<ul style="list-style-type: none"> • Land, which does not qualify as wetland or arable land; • Has soil, or soil-like material, permeable to roots of native plants, that is more than 250 mm thick and contains less than 50 % by volume of rocks or pedocrete fragments larger than 100 mm; and • Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants, utilizable by domesticated livestock or game animals on a commercial basis.
Criteria for Wilderness Land	<ul style="list-style-type: none"> • Land, which does not qualify as wetland, arable land or grazing land.

According to Ndeinoma (2006), the larger Namakwaland region is used for grazing, mining and in very small areas dry- and irrigated crop production. Ndeinoma (2006) indicates the grazing capacity of the area as 10 - 20 ha per Small Stock Unit.

This region is not suited to the production of arable agricultural products owing to the low rainfall. Consequently, there is no record of any form of agricultural production in the study area.

According to the DEA Screening tool the sensitivity regarding Agriculture Theme, is regarded as low (Refer Figure 8a and Table 6a). Due to the limited extend of invasive prospecting activities <1Ha the proposed prospecting activities will not have an impact on agricultural production. No Agro-Ecosystem Specialist Assessment is therefore required even when the areas to be disturbed by bulk sampling has been identified because the complete areas were identified as being of “Low” sensitivity for agricultural resources during the site visit.

Table 6a: Agriculture theme Sensitivity Features

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low

Figure 8a: Map of relative agriculture theme sensitivity

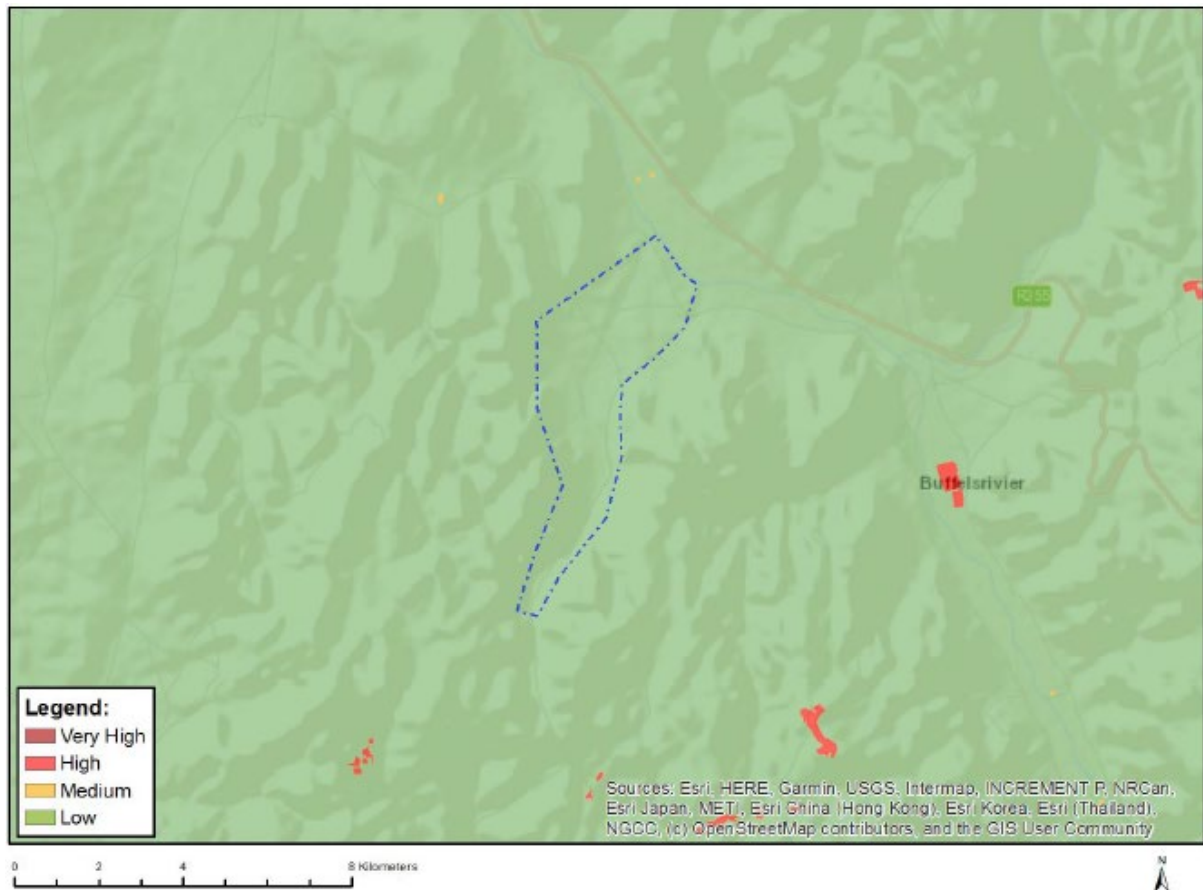


Table 6b. A summary of the extent (% of total LM area) of different land cover categories for local municipalities based on 2005 SPOT5 satellite imagery.

LM Name	Natural	Cultivated Dryland	Cultivated Irrigated	Mining	Settlement
DMA Bushmanland	99.75	0.17	0.02	0.04	0.02
DMA Tankwa	98.69	1.06	0.24	0	0.01
Hantam	97.71	2	0.21	0.01	0.07
Kamiesberg	97.35	2.14	0	0.43	0.07
Karoo Hoogland	99.49	0.32	0.13	0.01	0.06
Khâi-Ma	99.63	0.02	0.18	0.07	0.11
Nama Khoi	98.85	0.36	0.08	0.52	0.19
Richtersveld	97.7	0	0.06	2.15	0.09

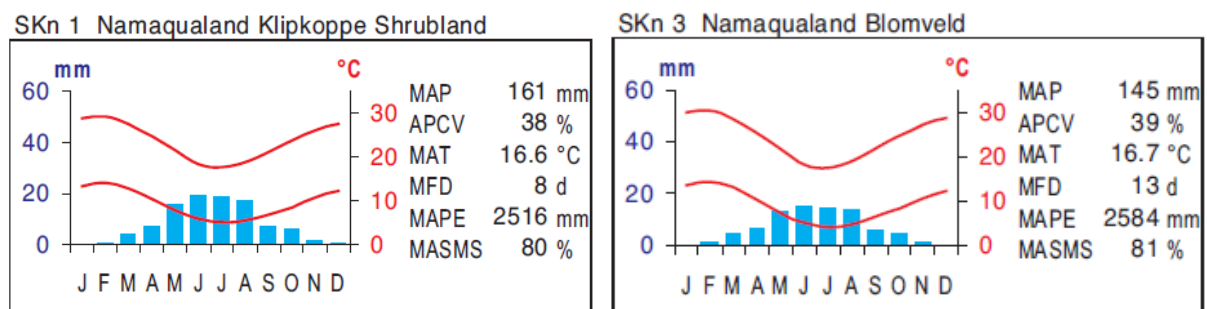
9.3.1 Landscape – Topography

Refer to Figure 2 which shows the contours at 20-meter intervals located between 140m and 180m above mean sea level.

9.3.2 Climate

Seasonal winter rainfall (May to September). MAP about 160 mm, with epizodic drought periods (well below 100 mm per year) of one or two years in succession. Dew is present throughout the winter. MAT 16.6°C. Hot summers, with mean maximum and minimum daily temperatures 30°C and 5°C for January and July, respectively. Frost occurs about 8 days per year, but can vary widely from year to year.

Figure 9: Climate diagram



9.3.3 Biodiversity, Flora and Fauna

Biodiversity

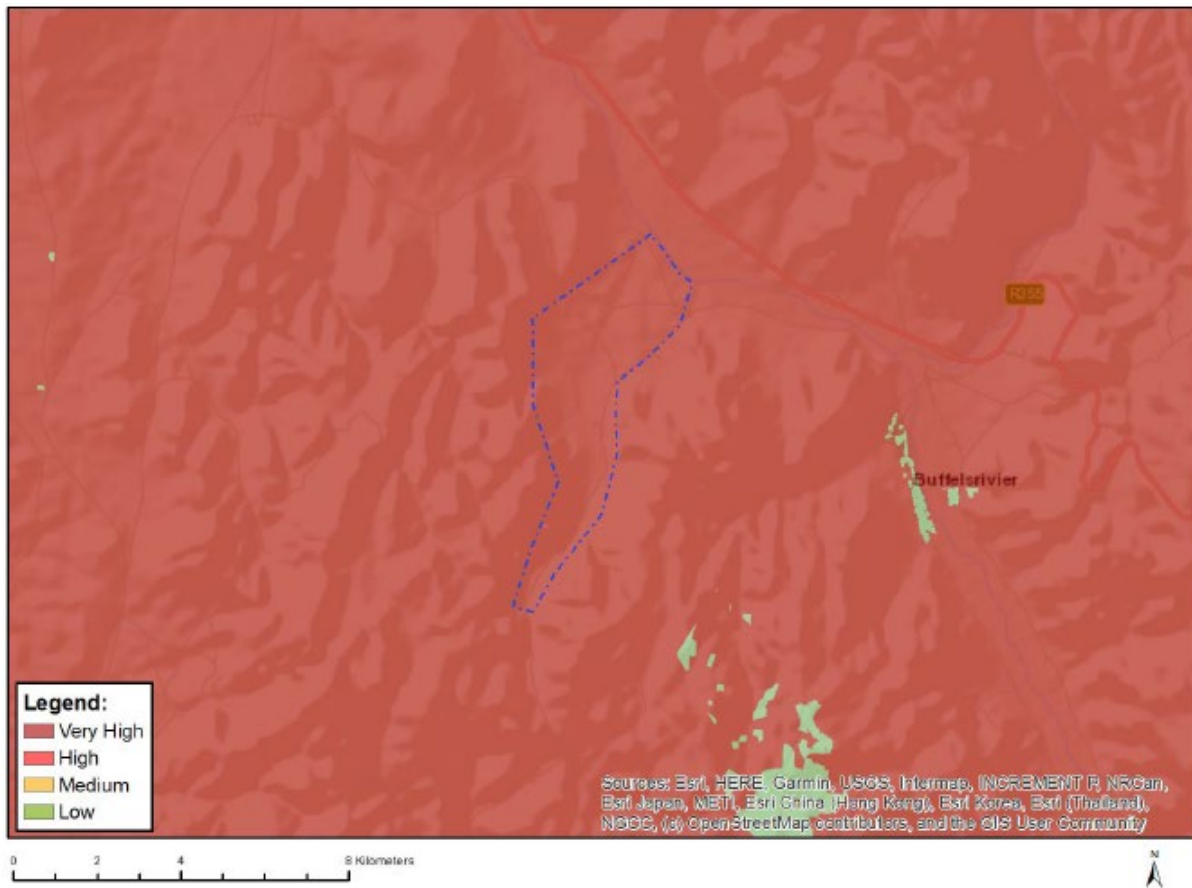
According to the screening report (DEA) the major part of the prospecting area is regarded as very high sensitivity with regard to Terrestrial Biodiversity as it is located within Critical Biodiversity Areas and form part of FEPA Sub-catchments and the National Protected Areas Expansion Strategy (NPAES) (Refer Table 7 and Figure 10a).

Table 7: Terrestrial biodiversity theme Sensitivity Features

Sensitivity	Feature(s)
Very High	Critical biodiversity area 1
Very High	Critical biodiversity area 2
Very High	FEPA Subcatchments
Very High	Protected Areas Expansion Strategy

According to the 2016 Northern Cape Critical Biodiversity Areas in the northern portion of the prospecting area is classified as a Critical Biodiversity Area 2 (CBA 2) with the southern portion of the area classified as Critical Biodiversity Area 1 (CBA 1) (Figure 10b). (Refer Figure 6 and 10b).

Figure 10a: Map of relative terrestrial biodiversity theme sensitivity



The very high sensitivity rating with regard to Terrestrial Biodiversity is based on the CBA 1. This does not mean that CBA's need to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem. It must be pointed out that the 2016 Northern Cape Critical Biodiversity Areas has not been approved and still need some ground truthing. Most of the sampling will also concentrate in the areas identified as CBA 2 (Refer Figure 6 and 10b).

According to the National Protected Areas Expansion Strategy (NPAES) Department of Environment Affairs (DEA) 2009 less than 50% of the area is included in the Namakwa National Park and coastal Primary Focus Area (Refer Figure 10c). No protected areas are located within a 10Km radius of the mining area.

The very high sensitivity rating with regard to Terrestrial Biodiversity is further based on the FEPA Code 1 Sub-catchment status refer section 9.4.

Figure 10b: Critical Biodiversity Areas

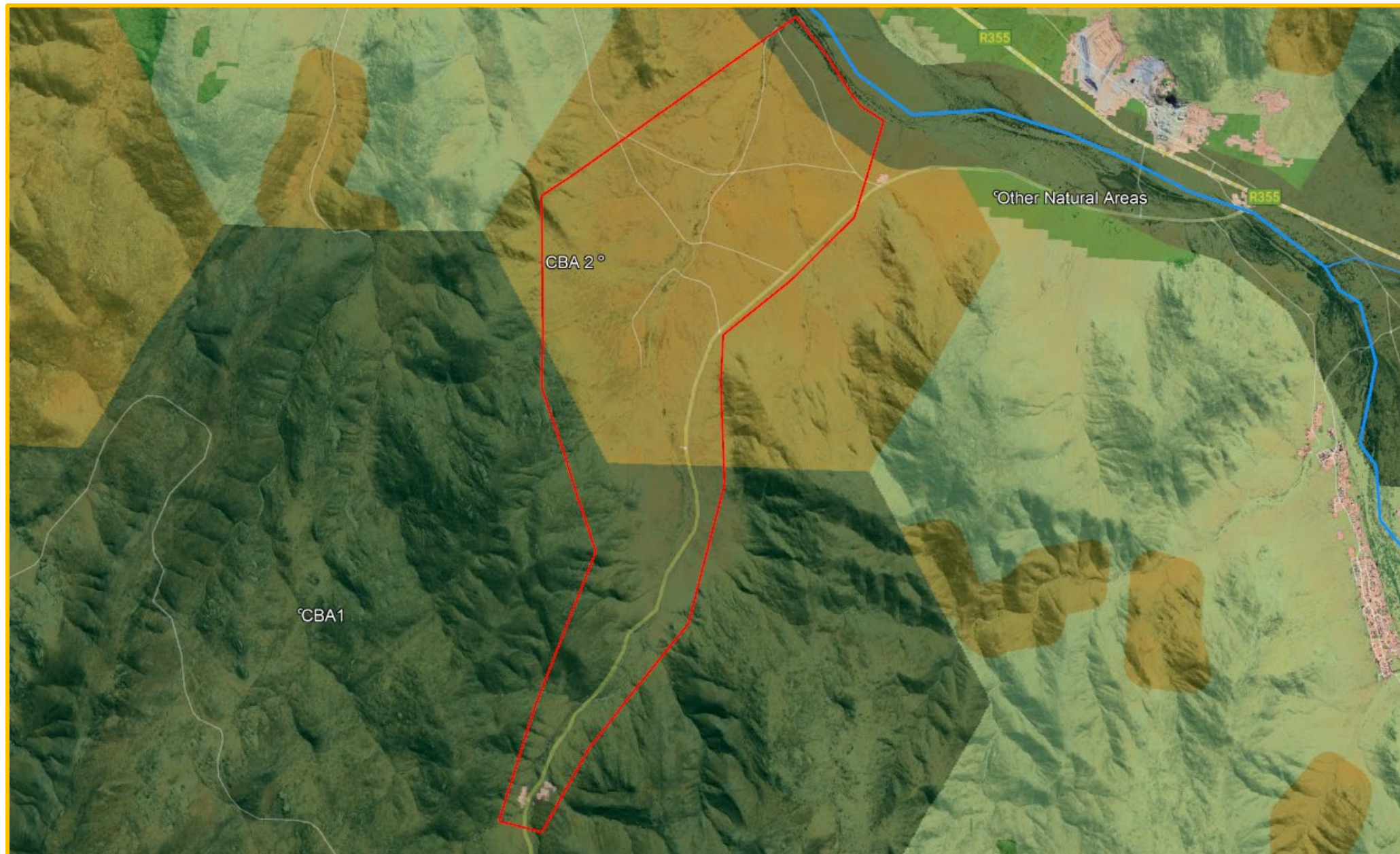
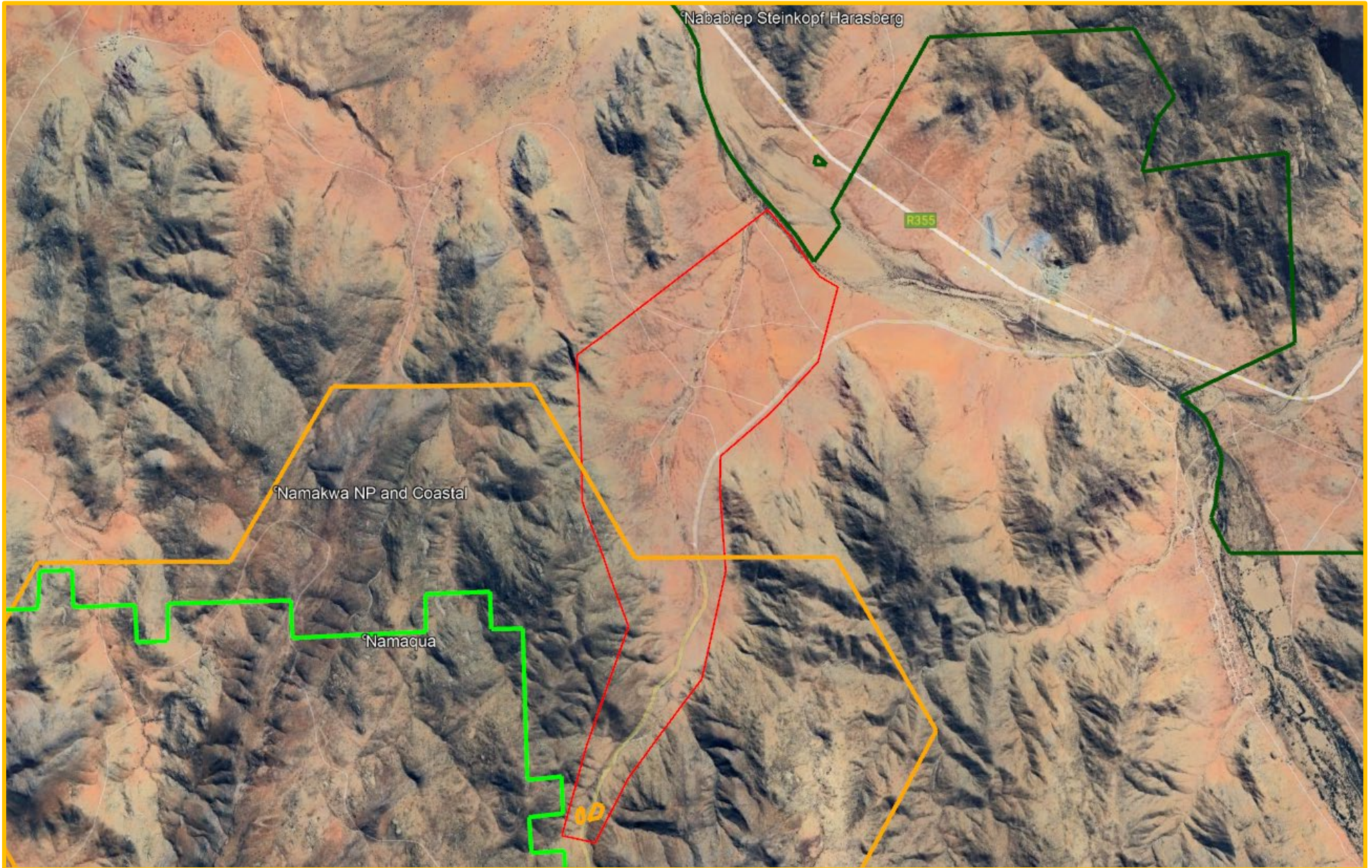


Figure 10c: Sensitive Ecosystems



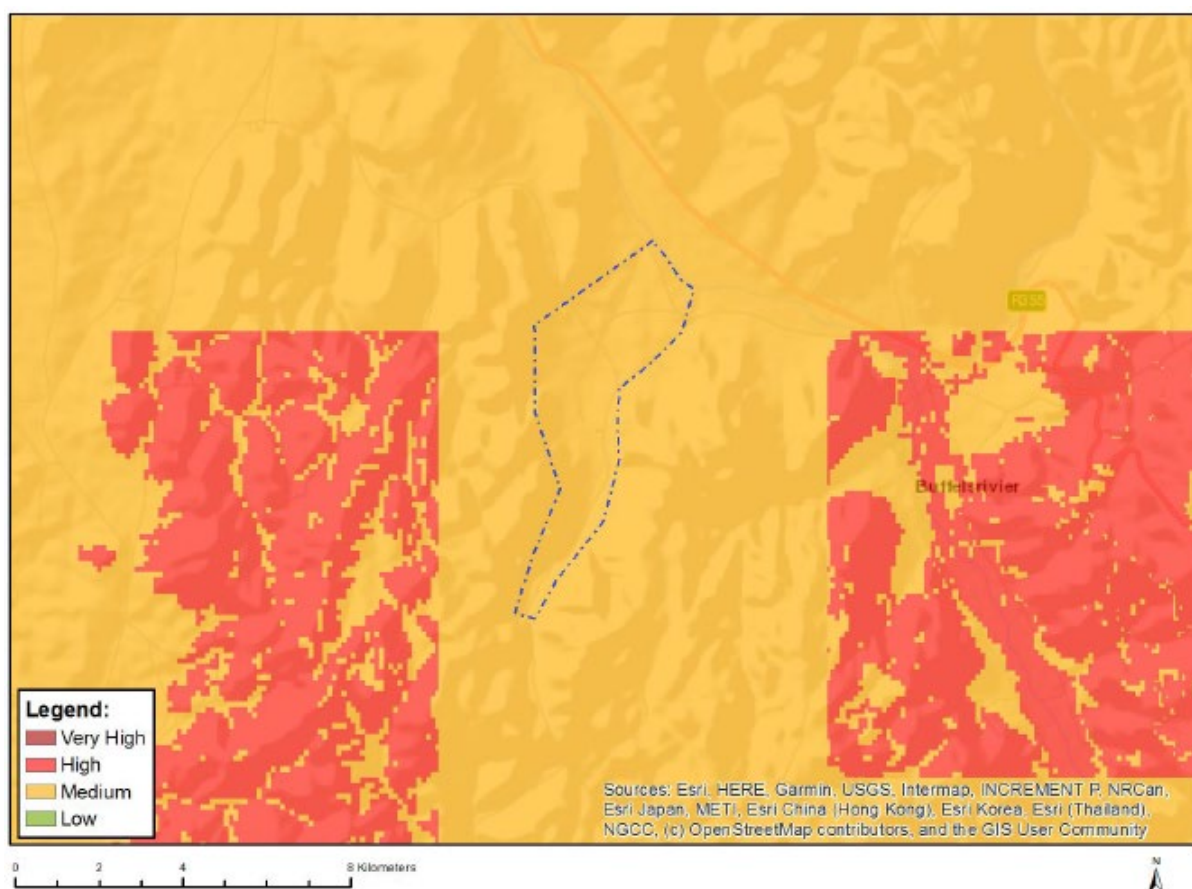
Fauna

According to the screening report (DEA) the prospecting area is regarded as medium sensitivity with regard to Animal Species (Refer Table 8 and Figure 11)

Table 8: Animal Species theme Sensitivity Features

Sensitivity	Feature(s)
Medium	Aves-Afrotis afra
Medium	Aves-Aquila verreauxii
Medium	Aves-Circus maurus
Medium	Sensitive species 32
Medium	Invertebrate-Brinckiella mauerbergerorum
Medium	Invertebrate-Peringueyacris namaqua

Figure 11: Map of relative Animal Species theme sensitivity



With reference to Table 8 the only species of conservation concern is the *Circus maurus* (Black harrier), *Afrotis afra* (Southern Black Bustard) and *Chersobius signatus* (Speckled Dwarf Tortoise, Speckled padloper) that is regarded as Vulnerable in terms of TOPS 2015 list. The other species listed *Brinckiella mauerbergerorum* (Mauerberger's Winter Katydid) is no longer listed in terms of TOPS 2015. *Aquila verreauxii* (Black eagle) No longer on TOPS 2015 list and Least Concern IUCN Red List. *Peringueyacris namaqua* - (Bladder grasshopper) No longer Vulnerable in terms of TOPS 2015 list

Sampling activities will have a medium significant impact on these species due to the small areas to be disturbed and short duration of activities. Mitigation of the disturbance is also possible and after mitigation the impact will be regarded as low significance. It must also be noted that less than 1 Ha will temporary be disturbed by sampling and the clearance of less than 1 Ha is not a listed activity in terms of the NEMA EIA regulations.

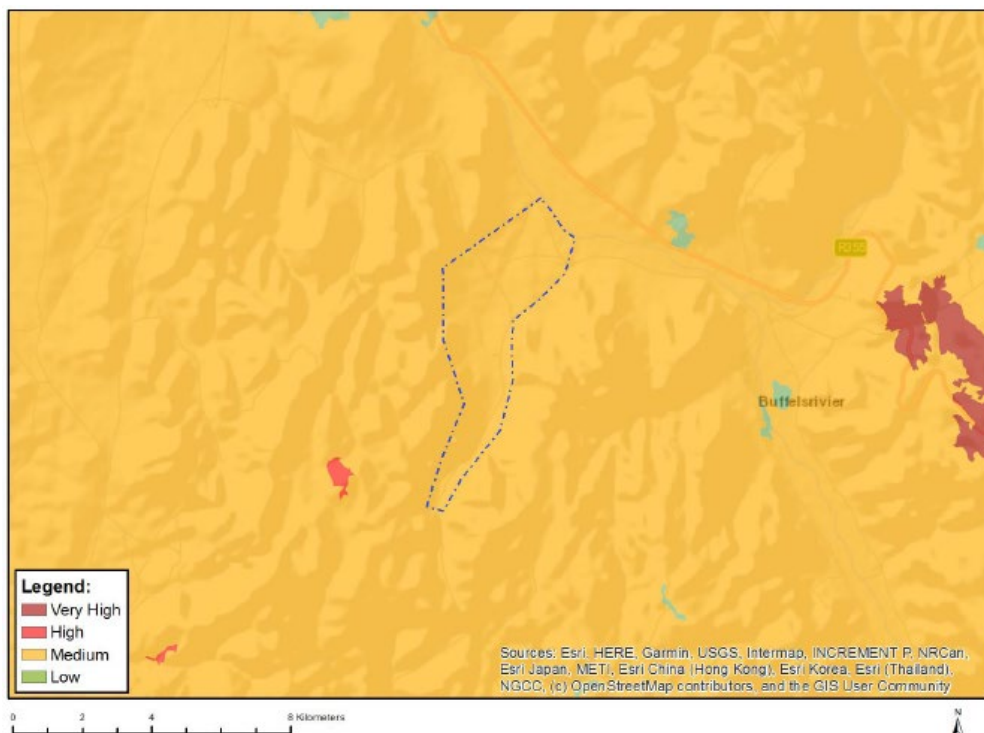
Flora

The prospecting right is located in the Succulent Karoo Biome and the majority of the area dominated by the Namaqualand Klipkoppe Shrubland (SKn1) and Namaqualand Blomveld (SKn3) vegetation units (Figure 12b). The vegetation units are regarded as least threatened. According to the screening report (DEA) the prospecting area is regarded as having a medium sensitivity regarding Plant Species (Refer Table 9 and Figure 12a).

Table 9: Plant Species theme Sensitivity Features

Sensitivity	Feature(s)
Medium	Sensitive species 395
Medium	Sensitive species 608
Medium	Sensitive species 386
Medium	Sensitive species 530
Medium	Sensitive species 888
Medium	Leobordea anthylloides
Medium	Otholobium pustulatum
Medium	Sensitive species 1062
Medium	Sensitive species 818
Medium	Sensitive species 130
Medium	Hessea pilosula
Medium	Sensitive species 817
Medium	Sensitive species 233
Medium	Sensitive species 472
Medium	Sensitive species 359
Medium	Quaqua bayeriana
Medium	Sensitive species 838
Medium	Sensitive species 1205
Medium	Sensitive species 463
Medium	Sensitive species 144

Figure 12a: Map of relative Plant Species theme sensitivity



None of the listed species in Table 9 are legally protected in terms of the listed threatened or protected species (TOPS) regulations in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

The wide spread *Aloidendron dichotomum* (*Quiver Tree*) is the only species of conservation concern (SCC) and is regarded as vulnerable.

No terrestrial plant species specialist assessment is required as no plants were identified as having a “very high” or “high” sensitivity. The project will have a medium significant impact regarding Flora due to the small areas to be disturbed and short duration of activities. Mitigation of the disturbance is also possible and after mitigation the impact will be regarded as low significance. It must also be noted that less than 1Ha will temporary be disturbed by sampling and therefore the clearance of less than 1 Ha is not a listed activity in terms of the NEMA EIA regulations.

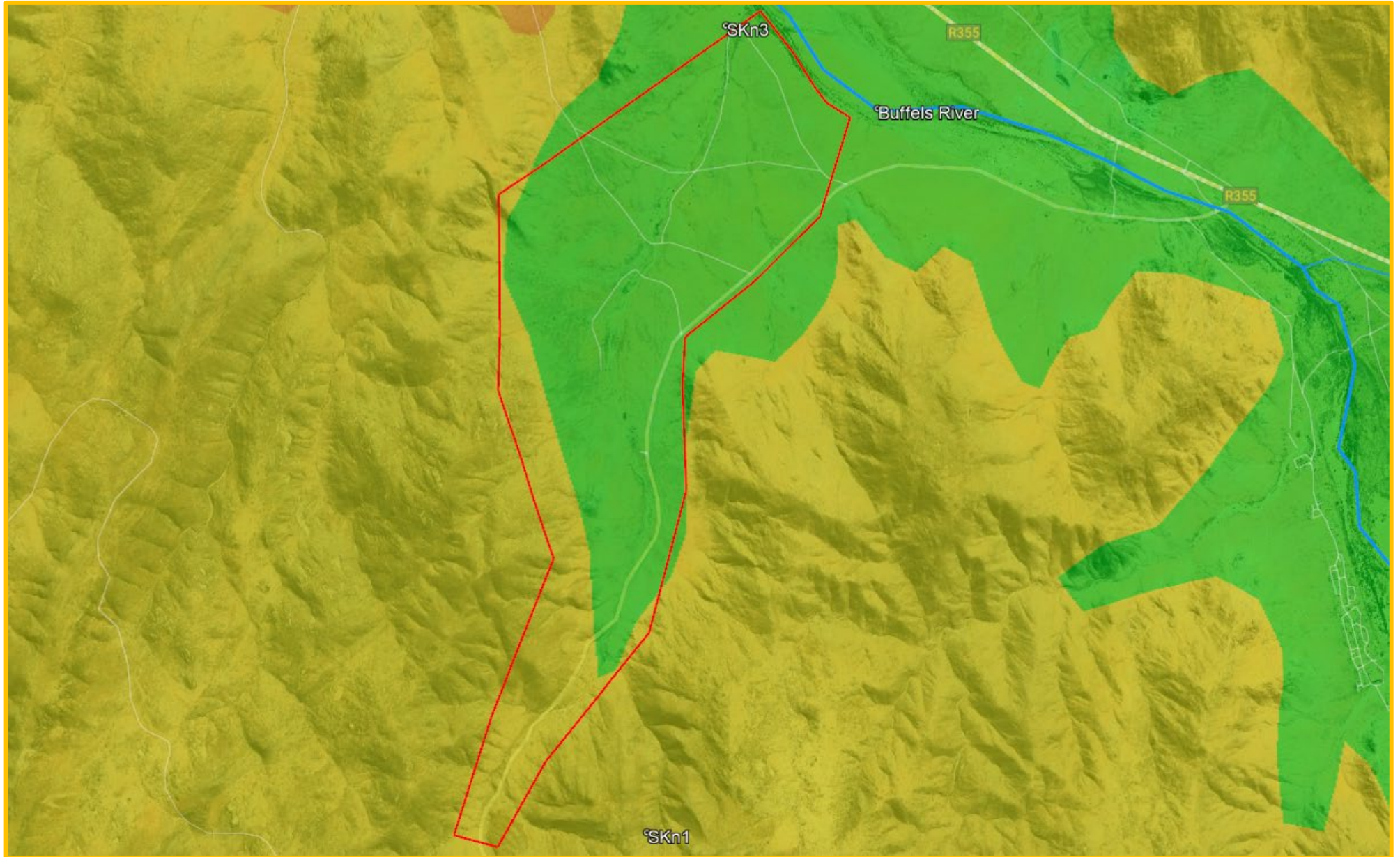
Namaqualand Klipkoppe Shrubland (SKn1)

The conservation status of the Namaqualand Klipkoppe Shrubland, according to Driver et al. 2005 and Mucina et al. 2006 is given as Least threatened. Some 6% statutorily conserved in Namaqua National Park (incl. former WWF Skilpad Wild Flower Reserve), Goegab Nature Reserve with spectacular granite-koppie landscapes, and a small portion in the Moedverloren Nature Reserve. Target 28%. Largely without any alien invaders and hardly any transformation due to agriculture (steep rocky habitats), but old mine spoils (mainly copper) are a disturbing view in some localities. Erosion is moderate (35%), very low (35%) or low (30%).

Namaqualand Blomveld (SKn3)

The conservation target of the Namaqualand Blomveld, according to Driver et al. 2005 and Mucina et al. 2006 is 28%. Small areas (1.5%) statutorily conserved in Goegab Nature Reserve and Namaqua National Park. Some protection is warranted on private game farms. Only about 6% of the total area is transformed, mainly by grain cultivation and some planting of salt-bush (*Atriplex nummularia*). Overgrazing is found almost throughout this unit. The most serious invasive plants are American *Amsinckia retrorsa*, Eurasian *Erodium* and *Bromus*, and Australian *Atriplex lindleyi subsp. inflata*. All alien infestations are only of local extent. Erosion is low (40%), very low (30%) or moderate (30%).

Figure 12b: Vegetation



9.4 Aquatic biodiversity and Water Resources

The prospecting area is located within the Department of Water & Sanitation’s Lower Orange Water Management Area (14) and quaternary drainage area F30F.

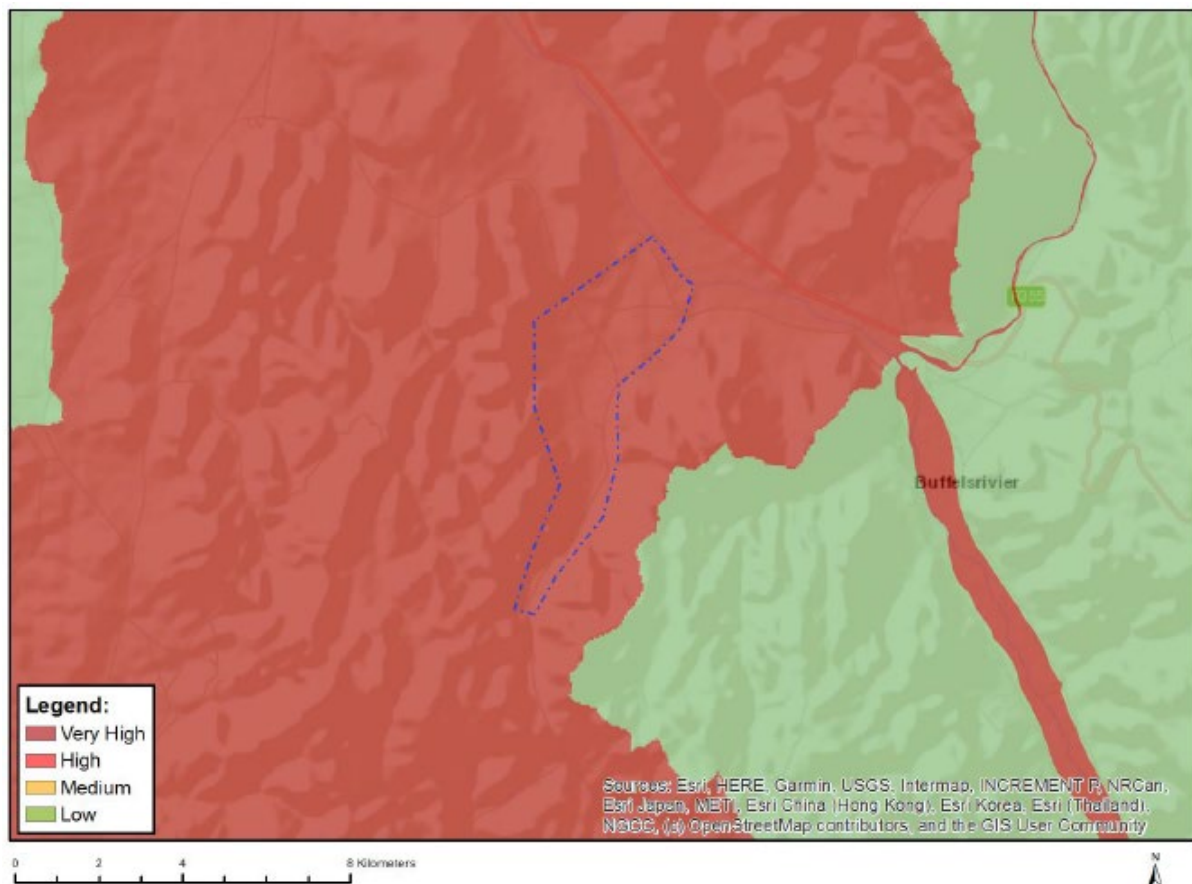
Surface water only accumulates in the drainage channels after exceptionally good rains. The Mean Annual Run-off (MAR) is in any event very low given the low rainfall average is 106mm occurring mainly in the winter months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils. The surface water quality (when available) is suitable for animal consumption but not for potable water.

According to the screening report (DEA) the mining area is rated as having a very high sensitivity regarding Aquatic biodiversity as inland aquatic ecosystems according to the “Classification System for Wetlands and other Aquatic Ecosystems in South Africa are present. According to the classification system distinction is made between seven Hydrogeomorphic (HGM) units the finest spatial scale (Level 4) namely Floodplain wetlands, Un-channeled valley-bottom wetlands, Wetland flats, Channeled valley-bottom wetlands, Depressions, Seeps and Rivers (Table 10 & Figure 13a).

Table 10: Aquatic biodiversity theme Sensitivity Features

Sensitivity	Feature(s)
Very High	FEPA Subcatchment
Very High	Wetlands_(River)

Figure 13a: Map of relative Aquatic biodiversity theme sensitivity

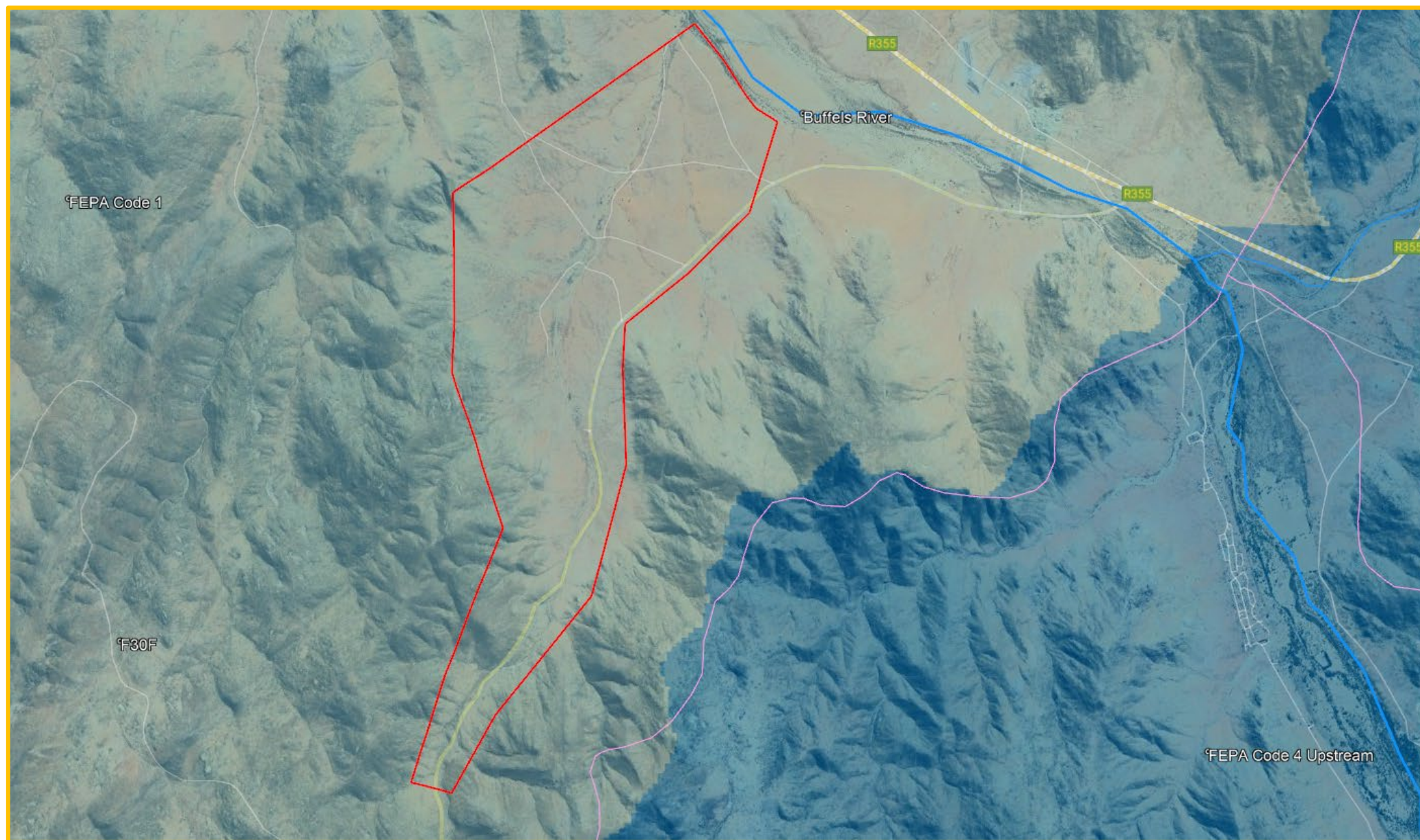


As can be seen from Figure 13b no Wetlands and Estuaries are located within the prospecting area. River FEPAs are present within the prospecting area with the Buffels River classified as a NFEPA River (FEPA 1) running close to the prospecting area in the north. River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species, and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicates that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources. However, the prospecting area has been identified as a Freshwater ecosystem priority area quinary catchment (FEPA Code 1) regarded as very high sensitivity. The idea is not for FEPAs to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem

As part of good planning, decision-making and management, a Water Use Authorisation (License or GA) in terms of Sec 21 of the National Water Act (Act 36 of 2008) for Impeding or diverting the flow of water in a watercourse (Sec 21c) and Altering the Bed, Banks, Course or Characteristics of a Watercourse (Sec 21i) is required for sampling within, or within 500m of FEPA rivers. A Water Use Authorisation in terms of Sec 21(a) is also required for abstracting groundwater. None of these activities are planned but if the situation changed the necessary application will be lodged.

No other Aquatic Ecosystems like wetland are present. No Strategic Fresh Water Source Area is present and the nearest one is the Komaggas Cluster for underground water to the south east. Due to the shallow nature of operations the impact on the groundwater is considered insignificant.

Figure 13b: Location of Prospecting area in relation to Aquatic biodiversity and Water Resources



9.5 Emissions

Air Quality

Dust is generated by wind over un-vegetated or denuded areas and given the surrounding extent of semi-desert dust generation is high under windy conditions (dust storm). Dust is generated off un-surfaced roadways on site, and during the existing mining operations from the adjacent mine which has transported the finer sand over the adjacent areas. Prospecting activities will take place in a very remote area and dust generation will be limited to a small radius around the operation.

Noise

Traffic-generated noise occurs in the area and such noise levels are low (observed estimate at ± 55 dBA). Noise from earth moving equipment and machinery associated with the prospecting operation will be within the norm and due to the remote locality of the operation will have no impact.

9.6 Socio-economic

The Namaqua District is sparsely populated, with a population of 115 842 and is the least populated district in the Northern Cape Province (and Country, although geographically the largest) with a population comprising 10,11% of the province's total population.

- The average growth rate for GGP in the area from 1996-2011 was 5.4 % and in 2007-2011 this has slowed down slightly to an average growth rate of 4.8%.
- The largest contributing sector to employment in the local economy (21.12% of total employment in the formal sector) is the Retail, Catering and accommodation sector

9.7 Paleontological, Archaeological and Cultural and Heritage Resources

All aspects of the proposed development are relevant, since excavations and or clearing may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

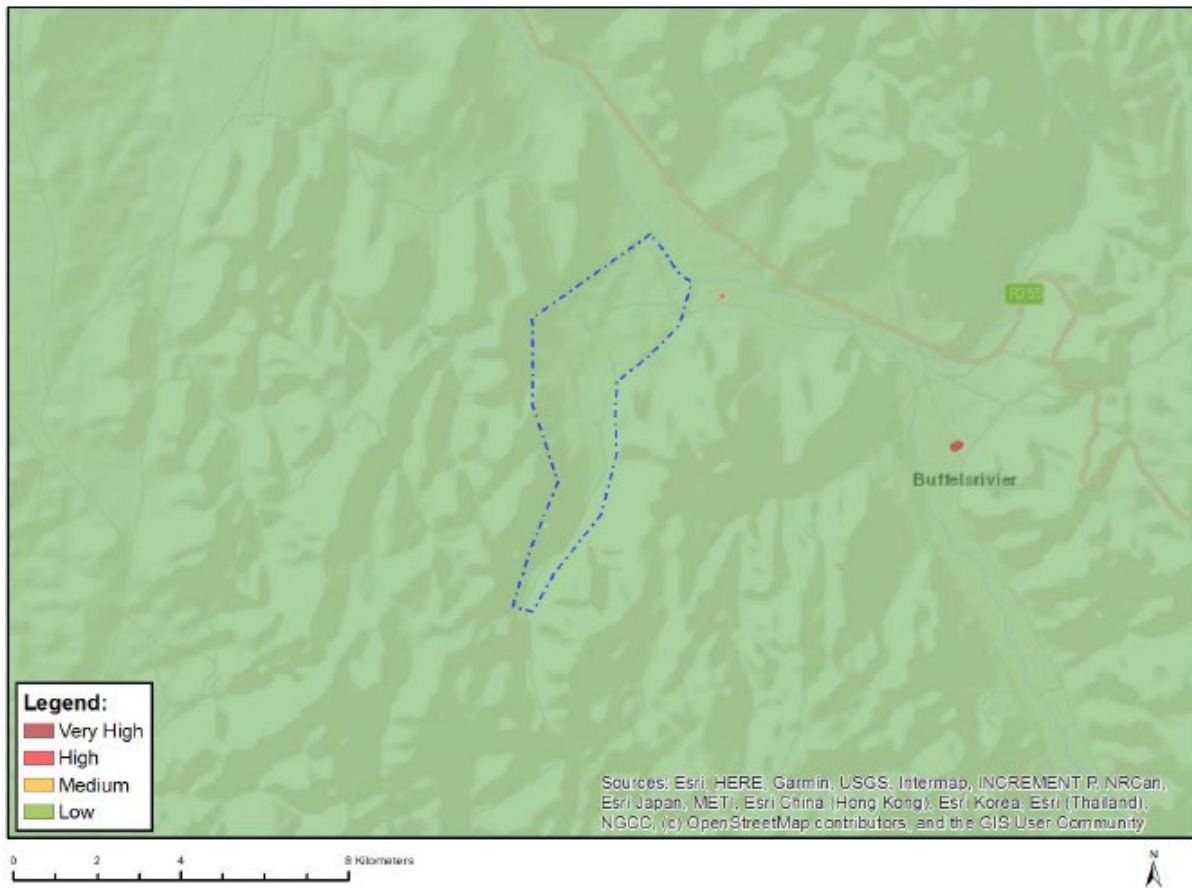
According to the screening tool the relative archaeological and cultural heritage sensitivity is rated as low (Refer Table 11 and Figure 14a).

A Phase 1 HIA will be done to identify no go areas during sampling and all mitigation measures and conditions will form part of the final EMPr and additional recommendations provided by the SAHRA will also be included as part of the EMPr.

Table 11: Archaeological and Cultural and Heritage theme Sensitivity Features

Sensitivity	Feature(s)
Low	Low sensitivity

Figure 14a: Map of relative Archaeological and Cultural and Heritage theme sensitivity



According to the screening tool the relative paleontological sensitivity is rated as low (Figure 14c) and the SAHRIS Palaeosensitivity map shows the study area to be of largely low and zero palaeontological sensitivity (Figure 14d).

Few fossils of any description have been reliably reported from the Miocene and Pliocene fluvial terrace deposits of the Buffelsrivier, or from the overlying Quaternary colluvial and aeolian sequences. It is evident that fossils are very rare in these deposits (Refer Table 12 and Figure 14b & 14c).

A desktop PIA will be done to identify no go areas during sampling and all mitigation measures and conditions will form part of the final EMPr and additional recommendations provided by the SAHRA will also be included as part of the EMPr.

Table 12: Palaeontological theme Sensitivity Features

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity

Figure 14c: Map of relative Palaeontological theme Sensitivity

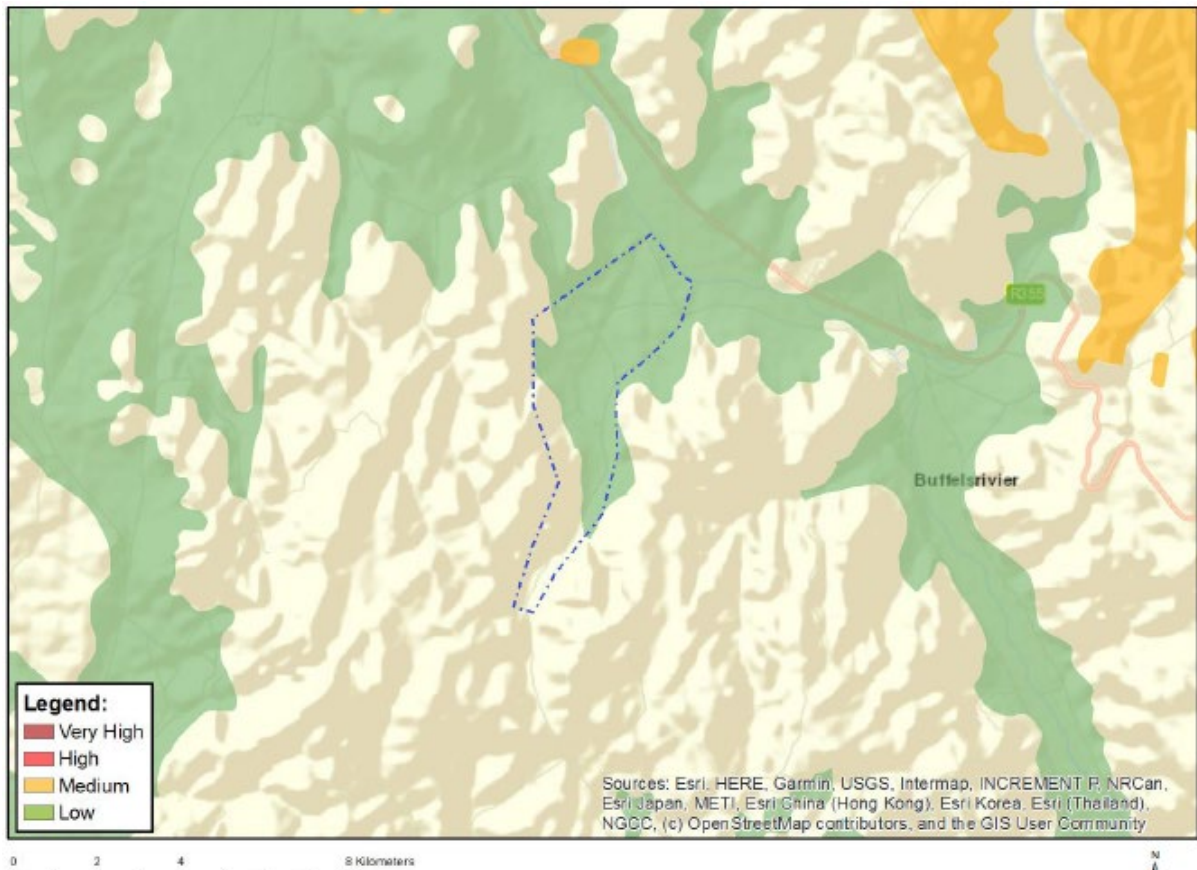
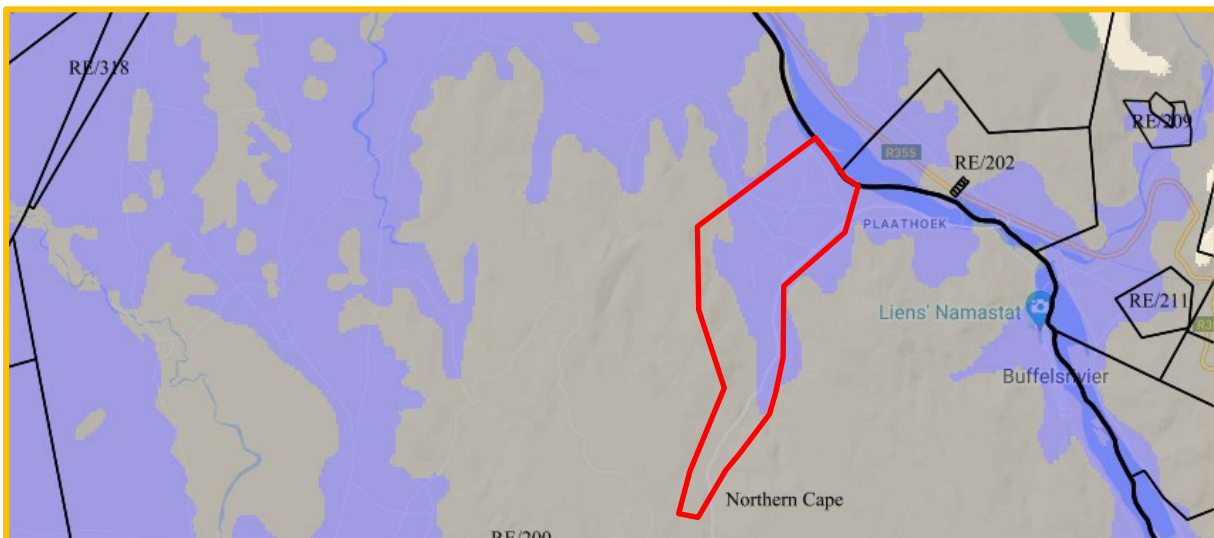


Figure 14d: Extract from the SAHRIS Palaeosensitivity map showing the study area to be of low sensitivity (blue shading) and zero significance (grey shading).



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

10 Description of specific environmental features and infrastructure on the site

Based on the outcomes of the initial prospecting phases (non-invasive activities), the location of any invasive activities (sampling) will be determined and the impacts on the identified environmental features will subsequently be determined. It is expected that for the invasive activities (sampling), only localised clearing of shrubs is required.

The area also has a number of farm tracks that traverse the site from the R355. The invasive activities will seek to use existing roads in order to access the property and it is not expected that any new access roads will be opened up. The map Figure 1 to 3 above gives an overview of the prospecting area, settlements and roads that traverse the site.

11 Environmental and current land use maps

Refer section 9 as part of the specific attributes.

12 Impacts and risks identified

As described earlier in this report, the prospecting activities will comprise of desktop and geophysical activities and dependant on the outcome of these phases, targets will be selected for sampling activities. The impact assessment therefore focuses only on the invasive aspects (sampling and associated activities) as these will have the potential to impact on the biophysical and social environment. The impact assessment is furthermore separated into three distinct phases, namely:

- Construction phase (Site establishment);
- Operational phase (Sampling and Drilling), and.
- Decommissioning

12.1 Potential Risks/impacts

12.1.1 Potential Risks associated with safety

- Safety of personnel operating large earth-moving equipment.
- Management of dust, noise and vibration associated with prospecting activities, in relation to surrounding communities.
- Potentially dangerous areas like excavations or equipment left behind and uncontrolled access to a potentially unsafe post-prospecting area.

12.1.2 The potential Risks associated with Environmental features

- Loss of indigenous vegetation due to disturbed footprints at sample areas.
- Increased soil erosion causing loss of topsoil.
- Oil fuel leaks onto soil through the earthmoving and transport equipment and machinery or spillage of fuel during the transfer from fuel bowser to equipment.
- Post-prospecting topography is not compatible with the original landform.
- The post-prospecting landscape increases the requirement for long-term monitoring and management.
- Change in topography due to spoils from excavations remaining after sampling.
- Unwanted ruins, buildings, foundations, footings and waste management practices creating or leaving legacies.
- Equipment and other items used during the prospecting operation were left behind.
- Incomplete removal of re-usable infrastructure.
- Rubble from demolished infrastructure left behind.
- Disturbance to sensitive environments such as Critical Biodiversity areas and any associated biodiversity corridors, land with historical or conservation value part of NPAES, Wetlands and other Aquatic Ecosystems, terrestrial habitats for species of conservation concern (SCC)

and high potential agricultural land.

- Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.
- Chemical contaminants impacting surface and/or groundwater quality or resulting in discharge that exceeds the concentrations permitted.
- Waste classes are not kept in separate streams and incomplete removal of waste.
- Vehicle wash bays and workshop facilities produce petrochemical and solvent contaminated runoff.
- Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water.

12.1.3 Potential risks associated with viable and sustainable land.

- Uncontrolled expansion of prospecting footprint by not restricting the area disturbed by prospecting and the associated activities/infrastructure, resulting in loss of land with agricultural potential.
- Uncontrolled development of roads, where existing farm roads are not used for prospecting operations and redundant internal roads are left behind.
- Post-prospecting landform not compatible with the surrounding landscape and not capable of productive land use that achieves a land capability equal to that of pre-prospecting conditions.
- Sub-surface infrastructure remaining behind, limiting the intended post-closure land use including footings and foundations, power supply and water installations including pumps and pipelines.
- Long term changes in land use are caused by not implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual rehabilitation plan.
- Unsuccessful rehabilitation can reduce the post-prospecting land use options. Rehabilitated areas could be too unstable to support post-prospecting land use objectives compatible with surrounding areas.
- Disturbance of ecology due to loss of habitat and cumulative impact of illegal collecting during long-term or life of mine can degrade areas and reduce the viability of adjacent areas.
- Inadequate control of alien invasive vegetation species can result in the establishment of populations or seed sources that threaten adjacent areas.

12.1.4 Potential Risks associated with a post-prospecting landform.

- Impact on surface water through modification of infiltration rates by increasing the extent of hardened surfaces.
- Inadequate topsoil restoration or creation of unnatural surface topography or slope form which could impact lower or adjacent slopes due to increased runoff velocity.
- Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems. Concentrated storm runoff from infrastructure areas is erosive, causing sheet, rill and donga erosion features.
- Potentially dangerous areas like excavations incorrectly rehabilitated including uncontrolled access to potentially unsafe post-prospecting areas.

12.1.5 Potential Risks associated with the socio-economic environment.

- Disturbance of local communities in urban and rural areas caused by noise and dust emissions and increase in heavy vehicles along transport routes.
- An influx of people into the local communities looking for work, with an increase in demand for housing, schooling and services. Such an influx of workers into a community often results in a change in social dynamics.
- Positive impacts include, for example, the creation of both formal and informal businesses to supply additional needs, whilst negative social impacts include, for example, an increase

in substance abuse, HIV transmission and unwanted pregnancies.

- Staff losing their jobs at mine closure can have devastating effects on communities that are reliant on mine-based income.
- Job losses of secondary industries, businesses and contractors and contractual agreements with service providers surpassing mine closure date.
- Lack of compliance with the approved EMPr and a lack of auditing of the EMPr.
- Prospecting activities closure stalled due to non-compliance with relevant legislation (national, provincial and local).
- Insufficient funds for complete rehabilitation.

12.1.6 Potential Risks associated with visual intrusion, noise, vibration, light pollution and air emissions.

- Terrain morphology plays a critical role in defining the visual envelope of prospecting developments and can either reduce or enhance visual impact. Apart from visual intrusion, there is also the risk of a reduced sense of place. The visual intrusion impact of prospecting activity would be on nearby roads, homesteads, settlements, tourist accommodation, and along tourism routes or corridors.
- The visual disturbance would be caused by prospecting activities such as excavations. Buildings provide a colour contrast, as do disturbed areas against adjacent natural areas.
- Nuisance effects of air emissions due to a lack of implementation of dust suppression activities could impact on communities.
- Dust generated on haul roads reduces visibility, representing a safety hazard.
- Dust can retard vegetation growth and reduce the palatability of vegetation.
- The cumulative effect of a rise in the ambient noise levels or high noise levels in specific areas that exceed specified levels would impact on communities in close proximity.
- Noise disturbance and light pollution would result from night-time activities (if applicable) in areas that are in close proximity to communities.

12.1.7 Potential Risks associated with regard archaeological, cultural heritage or paleontological sites

- Disturbance of identified surface, or unknown sub-surface sites, if mitigation and monitoring is not implemented as per mitigating measures in the Heritage and Palaeontology Impact Assessment
- Progressive development can encroach upon or disturb identified sites.

12.1.8 Potential Impacts and Risks associated with the Preferred Alternative.

Refer to Section 3, Section 5 and Section 6 above, which describes the location, type of activity, design or layout, technology and operational alternatives, and the preliminary result of having a preferred and only alternative. The potential impacts and risks associated with this preferred and only alternative are listed in Table 13 below.

12.1.9 Potential Impacts and Risks associated with the No-Go Alternative

There would be no change to the biophysical environment with the No-Go Alternative. The No-Go Alternative implies that the Applicant would forgo an opportunity to provide employment opportunities in an area and sector identified for opportunities for job provision and economic growth, and the sourcing of minerals. This potential would not be reached with the "no-go" option.

Table 13: Preferred Alternative: Potential Impacts and Risks per Phase per Activity

Phase	Activities	Potential Impacts
Construction Phase Site establishment	Access & Haul Roads	Dust generation from vehicles using existing access and haul roads
		Soil compaction from repeated use of existing access and haul roads
	Construction of Site Establishment Activities (Including associated infrastructure, Water and wastewater infrastructure, Electricity infrastructure, Waste management, Storm water control)	Topsoil stripping and stockpiling, soil erosion and soil compaction (land capability)
		Surface and ground water resource pollution
		Water resources (Quality & Quantity) from activities within drainage channels and water abstraction
		Biodiversity disturbance from activities and vehicles. Disturbance of onsite Wildlife and Vegetation from removal of existing vegetation from sampling areas and service roads.
		Soil compaction from repeated use of access track to sampling sites (twee-spoor) and Soil erosion from exposed areas
		Soil contamination and waste management
		Dust fall, nuisance from activities & visual intrusion from development
		Emissions (Dust and light), Noise and Vibration causing nuisance from topsoil stripping, site establishment activities and vehicles
Potential impacts on archaeological and paleontological resources		
Socio- economic impact		
Operational Phase Sampling	Collection of samples and Sample Analysis (Including: excavations, drilling, refueling, waste generation & management, spoils and overburden dumps)	Change in topography
		Erosion control or runoff diversion structures and soil compaction (land capability)
		Water quantity, abstraction from water resources
		Water quality, potential for groundwater pollution from hydrocarbons.
		Biodiversity disturbance from activities
		Soil contamination and waste management
		Visibility of prospecting operations
		Dust, vehicle, noise and light emissions from site activities and haul trucks
		Potential impacts on archaeological and paleontological resources
Lack of socio-economic impact on job security, employment creation and economic spin-offs (i.e., prior to prospecting)		
Decommissioning Phase	Rehabilitation of the prospecting right area: backfilling shaping landscape profile; scarifying compacted areas and vehicle tracks; replacing topsoil, etc.	Biodiversity (wildlife and vegetation) disturbance from vehicles
		Dust and vehicle emissions from rehabilitation activities
		Soil erosion of topsoil before vegetation is re-established
		Visibility of the rehabilitated prospecting operations, erosion control or run-off diversion structures
		Socio-economic impacts: employment during rehabilitation and decommissioning activities.

12.2 Methodology used in determining the significance of potential impacts

Refer to Table 14 below, which provides the impact assessment criteria applied in the rating of the impacts associated with each phase of the proposed prospecting activity for the Preferred and Only Alternative.

Table 14: Impact Assessment Criteria

ASSESSMENT CRITERIA	
Nature	
Rating	Criteria
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial or harmful
Severity	
Rating	Criteria
6 Very High	The impact is result in a complete loss of all resources. Irreparable damage to highly valued species, habitat or ecosystem
5 High	The impact will result in significant loss of resources. Very serious, long-term environmental impairment of ecosystem function that may take several years to rehabilitate.. Very serious widespread social impacts. Irreparable damage to highly valued items.
4 Medium	The impact will result in marginal loss of resources. Serious medium term environmental effects. Environmental damage can be reversed in less than a year. On-going social issues. Damage to structures/items of cultural resources of low significance, mostly repairable.
3 Low	Moderate, short- term effects but not affecting ecosystem function. Rehabilitation requires no intervention of external specialists and can be done in less than a month. On-going social issues. Some damage to insignificant cultural resurces.
2 Very low	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants. Minor medium-term social impacts on local population. Low-level repairable damage to commonplace historical structures
1 None	The impact will not result in the loss of any resources. Limited damage to minimal area of low significance, (e.g. ad hoc spills within plant area). Will have no impact on the social environment. Cultural functions and processes not affected.
Spatial Scale	
Rating	Criteria
6 Very High	Will affect areas across international boundaries
5 High	Will affect the entire country
4 Medium	Will affect the entire province or region
3 Low	Will affect the local area or district
2 Very low	The impact will only affect the site
1 None	The impact will only affect portions of the site
Duration	
Rating	Criteria
6 Very High	Permanent no mitigation possible
5 High	Permanent but mitigation possible
4 Medium	Long term (6-15 years)
3 Low	Medium term (1-5 years)
2 Very low	Short term (Less than 1 year)
1 None	Immediate (Less than 1 month)

Probability																	
Rating	Criteria																
6 Very High	Certain/Definite Impact will certainly occur (100% probability of occurring)																
5 High	Almost certain/ High probability Impact will occur (>75% probability of occurring)																
4 Medium	Impact likely to occur (50 - 75% probability of occurring)																
3 Low	Impact may occur (25-50% probability of occurring)																
2 Very low	Unlikely/ Low probability. Impact unlikely to occur (0 - 25% probability of occurring)																
1 None	Highly Unlikely/ None Impact unlikely to occur (0% probability of occurring)																
SIGNIFICANCE Consequence x Probability Presented as a score out of 108																	
Rating	Criteria																
84-108 High	Long-term environmental change with great social importance.																
50-83 Medium	Medium to long term environmental change with fair social importance.																
27-49 Low	Short to medium term environmental change with little social importance.																
12-26 Very low	Short-term environmental change with no social importance																
3-11 None	No environmental change																
Unknown	Due to lack of information																
Consequence = Severity + Spatial Scale +Duration Presented as a score out of 18																	
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Probability	1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	2	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
	3	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54
	4	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72
	5	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	6	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108
CUMULATIVE EFFECTS																	
Rating	Criteria																
High	The impact would result in significant cumulative effects																
Medium	The impact would result in moderate cumulative effects																
Low	The impact would result in minor cumulative effects																
REVERSIBILITY																	
Rating	Criteria																
Reversible	Impacts can be reversed through the implementation of mitigation measures																
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures																
DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED																	
Rating	Criteria																
High	The impact could be significantly avoided/managed/mitigated.																
Medium	The impact could be fairly avoided/managed/mitigated.																
Low	The impact could be avoided/managed/mitigated to a limited degree.																
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact																

12.3 Positive and negative impacts of proposed activity and alternatives

12.3.1 Positive impacts

- Creation of employment and job security with economic spin-offs.
- Provision of minerals for local and international markets.

12.3.2 Negative impacts

The key potential negative impacts associated with the prospective activity include the following:

- Site access:
 - Disturbance of onsite biodiversity, fauna and flora.
 - Soil compaction from repeated use of access tracks.
- Site Establishment Activities (topsoil stripping and stockpiling, placement of logistics, waste generation and management)
 - Visual intrusion.
 - Emissions (dust, vehicle and noise) from topsoil stripping; vehicles and machinery.
 - Wildlife and vegetation disturbance from site preparation.
 - Contamination and disturbance of topsoil and soil from compaction, including soil disturbance due to topsoil stockpiling.
 - Waste generation.
 - Water use for dust suppression during site establishment.
- Prospecting activities:
 - Noise is caused by the machinery and vehicles on-site, and by vehicles on haul roads.
 - Visibility of the prospecting operations.
 - Dust emissions from general site activities (vehicle entrained dust).
 - Disturbance of biodiversity due to prospecting operations.
 - Contamination of soil from hydrocarbon spills and compaction on access tracks.
 - Contamination of groundwater through unmanaged use of machinery.
 - Storage and use of hazardous chemicals in processing.
 - Disturbance to Heritage and Paleontological resources.
 - Unauthorised access to prospecting activities leading to injury.
- Rehabilitation of the prospected area:
 - Dust emission from decommissioning activities (vehicle entrained dust).
 - Soil erosion of topsoil.
 - Revegetation slow due to poor rehabilitation and topsoil return.

12.4 Mitigation measures to be applied

Refer to Table 16 for the mitigation measures included under each impact. The detail mitigating measures are as follows:

12.4.1 Site Access and Site Establishment

Soil and Land Capability:

The impacts of soil and land capability have been assessed as being of low significance even before mitigation.

The impact can be reduced to very low by only using existing farm roads and tracks. Where new access tracks are required to get to the sampling site, the impact can be reduced if no vegetation will be cleared. Leaving roots intact will prevent soil loss and enable vegetation to coppice and regrow. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. Where clear scraping (dozing) or removal of vegetation cannot be avoided areas should be kept to an absolute minimum. All tracks and drill traverses (two-spool) will be scarified and any topsoil stockpiled removed to be spread over the disturbed area. Dual use access roads must be handed back to the landowner in a good state of repair.

Biodiversity Flora and Fauna:

The impacts of sampling (pit excavation or drill pad clearing and soil compaction) have been assessed as being of medium significance before mitigation.

The impact can be reduced to very low significance by limiting the activities and clearance to the smallest area that is necessary and rehabilitating the disturbed area as soon as possible. Furthermore, no clear scraping (dozing) will be carried out unless absolutely necessary. Rather that surface vegetation be cleared leaving the roots intact will ensure that vegetation can coppice and regrow. Vehicle's speed must take into account the possibility of collisions with fauna.

Aquatic Biodiversity and Water Resources:

Potential Impacts on Aquatic biodiversity & Water Resources is assessed as being of insignificance even before mitigation.

The impact can be avoided by ensuring that measures are put in place to prevent any sampling activities within 100m from a water course. Maintaining all equipment as per supplier specification and using drip trays under stationary equipment and diesel bowser to contain any spillages, should it occur including having oil spill kit as a recovery measure will prevent contamination.

Emissions (Air quality, visual intrusion & Noise Generation):

The impact of emissions is assessed as being of low significance before mitigation. If the mitigation measure below is put in place the significance rating can be reduced to insignificant. It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health implications because the dust is not inhaled. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected.

The proposed operation falls within the boundaries of the Namakwa District Municipality's and the company may be required to operate within the air quality requirements of the Municipality's Air Quality Management Plan.

The impact can be reduced by wet suppression and enforcement of low vehicle speeds. Separation of distance of minimum 100m, but preferably 500m to be maintained between sample sites and dwellings will also reduce the impact of dust fall.

Acceptable dust fall rates in terms of the National Dust Control Regulations (GN R. 827 of 1 November 2013) are presented in the table below. In terms of these regulations, the local air quality officer may prescribe a dust fall monitoring programme, the implementation of dust control measures and continuous ambient air quality monitoring.

The method to be used for measuring dust fall rate and the guideline for locating sampling points shall be ASTM D1739: 1970, or equivalent method. Acceptable dust fall rates are provided in the table below.

Restriction Areas	Dust fall rate (D) (mg/m ² /Day, 30- day average)	Permitted frequency of exceeding dust fall rate
Residential area	D < 600	Two within a year, not sequential months
Non-residential area	600 < D < 1 200	Two within a year, not sequential months

The nuisance (visual) impact can be reduced by taking into account available vegetation screening, the locations of visual receptors on the prospecting areas and adjacent properties and locating the equipment in a way that it is screened from points of visual reception wherever possible.

Taking into account the existing background noise levels of the general area which is rural in nature, the significance of the noise caused by the earth moving equipment, vehicles going to and from each sampling is also low before mitigation.

Typical noise levels generated by various types of construction equipment are listed in the table below.

Equipment	Typical operational Noise level at given offset (dBA)							
	5m	10m	25m	50m	100m	250m	500m	100m
Air compressor	91	85	77	71	65	57	51	46
Crane (mobile)	93	87	79	73	67	59	53	47
Dozer	95	89	81	75	69	61	55	49
Pump	86	80	72	66	60	52	46	40
Rock Drill	108	102	94	88	82	74	68	62
Trucks	87	81	73	67	64	60	57	54

In South Africa, the noise impact on human receptors is evaluated in terms of the SANS 10103 guidelines for sound pressure levels as listed in the table below.

Type of District	Equivalent continuous rating level for ambient noise - dBA					
	Outdoors			Indoors with windows open		
	Day-night	Daytime	Night	Day-	Daytime	Night-
Rural districts	45	45	35	35	35	25
Suburban district	50	50	40	40	40	30
Urban traffic	55	55	45	45	45	35
Urban districts	60	60	50	50	50	40
Central business district	65	65	55	55	55	45
Industrial district	70	70	60	60	60	50

Daytime and night-time refer to the hours from 06h00 to 22h00 and 22h00 to 06h00 Respectively

Mitigation if required will include limiting the site establishment activities to daylight hours (06h00 to 18h00) and not undertaking such activities at all on Sundays and public holidays, as well as by applying a separation distance of a minimum 100m, but preferably 500m between sample sites and any dwellings. The vehicles on site will be limited to the absolute minimum required. It must be noted that the speed limit for driving within the prospecting area shall be limited to 40Km/h.

Socio- economic impact

Refer Operational phase below

Palaeontological, Archaeological and Cultural Heritage Resources

The impact on Cultural and Heritage Resources is assessed as being of medium significance before mitigation.

The impact can be avoided by ensuring that recommendations from specialist studies are implemented

- All the identified archaeological sites and their buffers must be avoided if possible;
- If avoidance of archaeological sites (Grade GPB or higher) is not possible then they must be sampled by a qualified archaeologist under a permit issued by SAHRA;
- All surface disturbance must be rehabilitated; and
- If any archaeological material or human burials are uncovered during the course of THE development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
- No-go bufferzones of 30 m must be maintained around all identified heritage sites of Grade GPB or higher;
- If it is not possible to avoid the above sites, permits in terms of section 35(4) of the NHRA must be applied from SAHRA prior to construction commencing;
- If any evidence of archaeological sites or remains (e.g., remnants of stone-made

structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal, and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit must be alerted

- If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately
- If heritage resources are uncovered during the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

Regardless of the above recommendations, all sample sites should be carefully inspected by project staff to ensure that no heritage features are present. Equipment moving on site will, where ever possible, be confined to established roads and tracks. Where this is not possible, access routes will be walked prior to entry of equipment to ensure that there are no graves present. Should graves be identified, the access route will be realigned to avoid such heritage resources, which will then be clearly marked with stakes and Chevron tape to minimise risk of accidental damage. If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Any identified heritage feature will be cordoned off with stakes and Chevron tape and measures put in place to prevent any activities within 100m. All personnel including contractors involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them. Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.

No-go areas of palaeontological sensitivity are not identified in the Project Area. The only requirement is that the Environmental Control Officer (ECO) for the project must inform staff of the need to watch for potential fossil occurrences at the sample sites and implementing the fossil Chance Finds Procedure in the event of any chance finds of fossils. In the context under consideration, it is improbable that fossil finds will require delineation of “no go” zones. At most a temporary pause in activity at a limited locale may be required. The strategy is to rescue the fossil material as quickly as possible. The procedures below are in general terms, to be adapted as befits a context. They are couched in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur. Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

Isolated Bone Finds

In the process of sampling and excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds 6 pieces, the finds must be treated as a bone cluster (below).

Response by personnel in the event of isolated bone finds

- Action 1: An isolated bone or tooth exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside. This also applies to potential fossils of any kind embedded in broken chunks of cemented deposit.

- Action 2: The Project Manager/Geologist/Environmental Control Officer (ECO) must be informed.
- Action 3: The responsible field person (geologist or ECO) must take custody of the fossil. The following information to be recorded:
 - Location co-ordinates (such as obtained by GPS in decimal degrees).
 - Digital images of excavation showing vertical section (mine face) and position of the find.
 - Digital images of fossil.
 - Geological context obtained from the mine geologist.
- Action 4: A loose fossil should be placed in a bag (e.g., a Ziplock bag), along with any detached fragments. A label must be included with the date of the find, position info., depth. Cemented deposit chunks with an embedded fossil must also be labelled (e.g., with a paint marker) and appropriately stored for safekeeping.
- Action 5: Geologist/ECO contacts the standby palaeontologist and/or SAHRA to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of isolated bone finds

The palaeontologist or SAHRA will assess the information and liaise with the prospecting rights holder, the land owner and the ECO/geologist and a suitable response will be established. On the discovery of conservation-worthy fossils, a collection permit must be applied for from the South African Heritages Resources Agency (SAHRA).

With the passage of time arrangements must be made to transport fossil material deemed worthy of conservation and study to an appropriate curatorial institution.

Cluster Finds

A bone cluster is a major find of bones, i.e., several bones in close proximity or bones resembling part of a skeleton. These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

On the basis of existing observations of the Buffelsrivier fluvial deposits it is unlikely that a major bone cluster find will be encountered.

Response by personnel in the event of a bone cluster find

- Action 1: Immediately stop excavation in the vicinity of the potential material. Mark (flag) the position and also spoil that may contain fossils.
- Action 2: Inform the pit foreman and the ECO.
- Action 3: ECO contacts the standby archaeologist and/or palaeontologist. ECO to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out asap.

It will probably be feasible to “leapfrog” the find and continue the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the rights holder, the owner and the environmental consultants.

The field assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is required.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is required.

Rescue Excavation

Rescue Excavation refers to the removal of the material from the excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonably rapid to avoid any undue delays to the mining schedule.

In principle, the strategy during mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossils and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material enclosed in loose material.
- Fragile material in loose/crumblly sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar and removed for preparation in a laboratory.
- Chunks of cemented rock with embedded fossils would be carefully trimmed of unnecessary excess rock and removed for preparation in a laboratory.

If the fossil occurrence is dense and is assessed to be a significant find then carefully controlled excavation is required.

12.4.2 Operational Phase

Soil and Land Capability:

The impacts of soil compaction have been assessed as being of low significance. The impact on soil contamination can be reduced to very low by the mitigating measure applicable to waste management and by limiting the activities and clearance of the sampling site to the smallest area that is necessary. Furthermore, no clear scraping (dozing) will be carried out unless absolutely necessary and in this case the compacted area will be scarified and any topsoil stockpiled removed to be spread over the disturbed area immediately after completion of the activity.

Topography

The impacts of topography have been assessed as being of very low significance before mitigation. The impact can be reduced to one of insignificant by backfilling of excavations/sumps whereafter the change in topography from prospecting activities would be slight depressions created in the landscape. All spoils need to be returned to the excavations for backfilling. Drilling muds will be contained in lined drill sumps and this material will be removed from site and disposed in a licensed disposal facility.

Pit development will be the same as for trench development (Bulk Sampling), but on a much smaller scale. There will only ever be three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development and it is anticipated that no more than 10 such pits will be developed.

After results are logged the pit will be backfilled immediately for security and safety reasons before the project is moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.

Biodiversity Flora and Fauna:

Disturbance of Biodiversity wildlife and vegetation in areas where sampling is taking place is rated as being of medium significance.

The impact can be reduced to very low significance by prior delineation of the area via geophysical characterisation in order to minimise the area that needs to be disturbed. Furthermore, no clear scraping (dozing) must be carried out unless absolutely necessary.

Sample sites where clear scraping were required must be rehabilitated by scarifying trampled and compacted areas to a dept of $\pm 300\text{mm}$ areas. Windrows created by scarifying needs to be left in place to create a rough surface that can act as seed trap and create a micro-habitat to promote natural re-vegetation.

Aquatic Biodiversity and Water Resources:

The potential impact on Aquatic Biodiversity and Water Resources is assessed as insignificant even before mitigation mainly due to contamination of surface and groundwater with hydrocarbons. The impact can be further reduced by implementing the measures recommended for the construction phase. Fuel storage must be contained in mobile bowsers and refuelling will be done with care to minimise the chance of spillages. Only re-fuel machines at fuelling station, if possible, construct structures to trap fuel spills at fuelling station. Oils and lubricants must be stored within sealed containment structures and minimise storage of hazardous substances onsite.

Only emergency repairs to mechanical equipment will take place onsite. Repairs must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Ensure vehicles and equipment are in good working order and regularly inspected for leaks and drivers and operators are properly trained.

Any spillages will be cleaned up immediately and dispose contaminated material (soil, etc.) at licensed sites only.

A spill kit will be available on each site where prospecting activities are in progress. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) without the necessary authorisations.

Emissions (Air quality, visual intrusion & Noise Generation):

Refer Site Access and Site Establishment phase above

Socio- economic impact

Job creation and local economic spin offs through increased income earned, and through purchasing of local materials is a positive impact and outweigh the insignificant negative impacts below.

The prospecting sites are located in a rural farming area with farm dwellings. Some landowners cherish the peaceful and quiet lifestyle of the area and friction between local residents and a crew of strangers is very possible. Conflict with other mining companies or land users on the same property is also a possibility. The potential for conflict is assessed as being insignificant. The impact can be further reduced by taking appropriate social management measures.

Non-invasive activities will be completed off-site. All access will be arranged beforehand with landowner and a supervisor will be present at all times and will report to the landowner when accessing and leaving the property. Indemnity will be signed by all mining personnel entering the property to protect the landowner against claims regarding personal loss and injury.

Landowner will be updated with regard to the progress of implementing the PWP and any invasive operation and concurrent rehabilitation will be planned in consultation with landowner.

Agreements between any existing mining operations or other land users and landowner will be respected and adopted as part of this operation.

Palaeontological, Archaeological and Cultural Heritage Resources

Refer Site Access and Site Establishment phase above

12.4.3 Decommissioning phase:

Soil & Land capability

Positive impact after implementation of the following mitigation measures. All compacted areas that are not required for aftercare access shall be scarified. Dual use access roads must be handed back to the landowner in a good state of repair.

Implementing screening as part of the cleaning activities before materials are moved from the mine. The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. Any compacted

movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.

Redundant structures will be removed for use elsewhere or demolished and discarded. All steel structures and reinforcing will be discarded or sold as scrap. All equipment and other items used during the prospecting operation needs to be removed from the site. Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA.

Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.

Topography

Positive impact as all mitigation will be addressed as part of the annual rehabilitation plan as part of the operational phase.

The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Final Rehabilitation, Decommissioning and Closure Plan must be reviewed periodically for continued relevance in the light of changed prospecting path or long-term plans.

When activities are completed on one sample site disturbed site should be rehabilitated immediately as part of the annual rehabilitation plan. Dual use access roads must be handed back to the landowner in a good state of repair.

A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan.

Socio- economic impact

The impact on Socio- economic impact is of low significance and even with mitigation, the impact will remain one of low significance due to the impact off job losses and potential contractual agreements with service providers surpassing mine closure date.

Other impacts like not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management systems as well as insufficient funds for complete rehabilitation can however be mitigated to some degree as follow.

A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan.

Contract durations with service providers will be limited to address the risk of contractual agreements with service providers surpassing the mine closure date. Maintain positive and transparent relationships with stakeholders as well as maintaining communication channels and undertaking environmental management in accordance with the approved EMPr and Closure Plan.

12.4.4 Assessment of potential cumulative impacts

Cumulative impacts are the successive, incremental and combined impacts of one, or more, activities on society, the economy and the environment. Cumulative impacts result from the aggregation and interaction of impacts on a receptor and may be the product of past, present or future activities. In this case the potential cumulative impacts will be insignificant due to the small scale of operations. The total prospecting area is ±7643.76Ha but the total footprint of all disturbance planned is less than 1Ha or 0.01% at the end of the prospecting operation.

12.5 Motivation where no alternative sites were considered

Alternatives have been considered for this project, as described in Section 6 above. Where alternatives are not likely to be considered in the Impact Assessment Phase, reasons have been provided in Section 6 above.

12.6 Statement Motivating the Preferred Sites

The layout and technology of each prospecting pit and associated infrastructure has been determined by the shape, position and orientation of the mineral resource expected to be found.

In summary, therefore:

- The Preferred Alternative is the prospecting of diamonds, as per the locations shown in Figure 4.
- The existing access roads will be utilised and sections upgraded or new routes developed as required. No electricity powerline connections are required.
- The preferred activity alternative is the prospecting for alluvial diamonds based on the mineral resources investigated.
- The preferred operational alternative is the method of having three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development.

The operational approach is practical and based on best practice to ensure a phased approach of prospecting followed by rehabilitation in sequential stages.

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory “no-go” alternative that must be assessed for comparison purposes.

13 Environmental Impact Assessment

13.1 Full Description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site

This BAR and EMPr were compiled through a detailed desktop investigation in order to determine the environmental setting in which the project is located. Input from stakeholders during the public participation process also assist the EAP in the identification of any additional impacts associated with the proposed prospecting activities. The methodology described in Section 12.2 above was used to assess the significance of the potential impacts of the prospecting activities. The assessment of impacts is based on the experience of the EAP with similar projects. The applicant also has practical experience through exploration geologists and therefore the identification of impacts and assessment of their significance is informed by first-hand experience of exploration activities. The mitigation measures proposed in Table 16 are considered to be reasonable and based on the location of the prospecting area and must be implemented in order for the outcome of the assessment to be accurate.

13.2 Assessment of each identified potentially significant impact and risk

The supporting impact assessment is provided in Table 16.

13.3 Summary of specialist reports.

The Screening Report in terms of Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014 was developed to allow a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended to screen their proposed site for any environmental sensitivity and enable the applicant to manipulate the development footprint on a site to avoid environmental sensitivities before submitting the application. The Screening Report also identify specialist assessments for inclusion in the assessment report based on the environmental sensitivities of the proposed development footprint.

It is however the responsibility of the EAP to confirm the list of specialist assessments and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation. The site sensitivity assessment report form part of section 9 in this BAR and the specialist studies identified is listed in table 15.

For mining and prospecting operations, the position of the mineral resource is fixed therefore the Screening Report required to accompany any application for Environmental Authorisation is not applicable as there are no alternative footprints for screening and comparison.

For small scale mining and prospecting operations where there will be no permanent infrastructure development and where the location of development is informed by historical prospecting and production records for the area, as well as the most likely position of potential mineral deposits no reasonable and feasible alternatives can be investigated.

In the case of prospecting the location of these sample sites will also not be known at the time that the application for EA is lodged. For prospecting areas, that normally covers a large area it is accepted that some areas will be of high or even very high sensitivity and no specialist assessments is needed to verify this. For this reason, mining operations that is a short-term change in land use must provide mitigation measures and financial provision to return the site to it pre-prospecting during the closure phase not applicable to other development.

For mining operations, the initial list of environmental attributes will be compiled based on experience of the EAP in similar development types and through site visits and appraisals, desktop screening via Geographical Information System (GIS) and aerial photography, incorporating existing information from previous studies, and input received from authorities and l&APs.

Further to this, the Screening Tool identifies related exclusions e.g., industrial development zones that is not applicable to minerals as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users.

Table 15: Summary of specialist studies

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMEN-DATIONS INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE RECOMMENDATIONS HAVE BEEN INCLUDED.
Phase 1 HIA	To be supplied	To be included	Table 16 and Section 9.3 The possible mitigation measures that could be applied and the level of risk. Section 13.1 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

Table 16: Impact assessment

Site Access and Site Establishment - Potential Impacts on other land uses	Significance	Before	After
<p>No Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area identified. No intersection with Environmental Management Frameworks relevant to the application Development incentives, restrictions, exclusions or prohibitions and their implications are not applicable to mining operations as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users. The impact on Civil Aviation and Defence is also not applicable to this application as no high structures will be constructed and no defence installations or test areas are present in close proximity to this project.</p> <p><u>Indirect impacts:</u> None</p> <p><u>Residual impacts:</u> None</p>	Nature	Neutral	Neutral
	Severity		
	Spatial Scale		
	Duration		
	Consequence		
	Probability		
	Significance		
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u>			
• None			
Site Access and Site Establishment - Potential Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
<p>Regarding Land capability for Agriculture the sensitivity for more than 99% of the area is regarded as low and is used for livestock grazing and production, with the remainder regarded as medium sensitivity and comprising of small patches along the non-perennial drainage channels where small patches cultivated drylands for crop production did occur in the past. As drylands crop production no longer takes place and the limited extend of invasive prospecting activities <1Ha the proposed prospecting activities will not lead to a loss of agricultural production. Potential contamination of soil from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances. Accidental spills not cleaned up immediately. The clearing of areas for new overburden and topsoil stockpiles including for logistics will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from ongoing repeated use of access tracks.</p> <p><u>Indirect impacts:</u> Windblown litter will cause visual blight. . Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning. A lack of waste food management encourages vermin. Dust impacting on adjacent vegetation and causing a nuisance to workers or residents. Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates.</p> <p><u>Residual impacts:</u> Recycling of waste material creates employment. Potential loss of invertebrates that live in the top layers of the soil. Current land cover indicators do not take into account degradation due to, for example, spread of alien plants, secondary impacts of mining (e.g., sand mobilization) or overgrazing by livestock.</p>	Nature	Negative	Negative
	Severity	4	2
	Spatial Scale	1	1
	Duration	3	1
	Consequence	8	4
	Probability	4	4
	Significance	32	16
	Cumulative Effects	Low	Very Low
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		High

Mitigation

- Existing farm roads and tracks must be used as far as possible. In case of new tracks, no clear scraping (dozing) or removal of topsoil will be carried out if possible. Leaving roots intact will prevent soil loss and enable vegetation to coppice and regrow. Where clear scraping (dozing) or removal of vegetation cannot be avoided areas should be kept to an absolute minimum and incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.
- Remove and stockpile 300mm topsoil prior to construction for use to restore disturbed areas. The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis.
- Topsoil storage areas must be convex and should not exceed 2m in height and turn soil or re-use every six months..
- Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction.
- In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles.
- After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff.
- Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off. Stabilized areas shall be demarcated accordingly.
- Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas not in use and maintaining maximum vegetation coverage.
- Soil erosion is to be regularly monitored and repaired.
- Contaminated soil must be treated by first removing the source of contamination - removing the source of contamination should allow the system to recover without further clean-up required.
- Petrochemical spillages to be collected in a drum and store excavated spill affected soil for disposal at a registered facility or onsite treatment.
- The most promising techniques for in-site treatment involve bioremediation. Bioremediation involves the use of microorganisms to destroy hazardous contaminants.

Waste Management

- Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure. In order to ensure that waste classes are kept in separate streams, people will be trained on the different waste classes. Recycling and reusing materials may reduce garbage haul fees or generate income through the sale of scrap metal and old equipment.
- All waste should be stored in a temporary waste storage area with pollution prevention measures and unwanted steel, sheet metal and equipment need to be stored in a demarcated salvage yard.
- Used oils / hydrocarbons fuels / liquids are to be collected in sealed containers (stored on concrete slabs) and removed from site for recycling by a reputable company.
- All waste in the temporary storage area for used lubrication products and other hazardous chemicals will be disposed of at a collection point from where it will be collected by a waste recycling company.
- Mobile generators or fuel bowser to be supplied with bunded facility or necessary pollution control measures (drip trays).
- Clean out content of oil traps and dispose of waste at registered and purpose designed landfill sites.
- Tyres to be return to supplier or a company that uses old tyres for making door mats, shoes, swings, etc.
- Batteries to be return to supplier or dispose at a permitted hazardous waste facility.
- Fluorescent tubes to be collected in sealed containers (stored on concrete slabs) and removed from site for disposal at a permitted hazardous waste facility.
- Chemical containers to be returned to supplier or disposed of at a legal, permitted facility that is capable of disposing of the waste. (DO NOT sell chemical containers to workers or communities).
- Laboratory waste (chemicals) - Returned to supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of on the waste dumps.
- Domestic waste (i.e., waste that is generated from the accommodation and offices) separated at source into recyclable products. These must then be removed and recycled by recognised contractors. (Note that the mine is responsible for the waste from cradle to grave). Domestic waste generated by workers needs to be sorted and all biodegradable waste must be stored in separate drums. This biodegradable waste will be dumped in a landfill provided for onsite.
- Disposal non-biodegradable waste at a registered and officially permitted commercial or municipal landfill site is the most cost-effective option for materials that cannot be recycled.

Site Access and Site Establishment - Potential Impacts on topography	Significance	Before	After
No change in topography during Site Access and Site Establishment	Nature	Neutral	Neutral
Indirect impacts:	Severity		
None	Spatial Scale		
Residual impacts:	Duration		
None	Consequence		
	Probability		
	Significance		
	Cumulative Effects		
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		High
<u>Mitigation</u>			
• None			
Site Access and Site Establishment - Potential Impacts on Biodiversity, Flora & Fauna	Significance	Before	After
The western portion of the prospecting area is classified as a (CBA 2) and a small section of the south eastern side is classified as a (ESA) with the majority of the area is classified as (CBA 1). The eastern side where sampling will concentrate is however classified as other natural areas. This does not correspond with the Mining and Biodiversity Guidelines (2013) document that identify only the river and riparian section as category B: Highest Biodiversity importance – highest risk for mining and the majority of the area as category D: Moderate Biodiversity Importance” moderate risk for mining with the rest regarded as Zero risk for mining. According to the (NPAES) (DEA) 2009 the area is not included in the NPAES and no protected areas are located within a 10Km radius.	Nature	Negative	Negative
Regarding Fauna the only species of conservation concern is the (Black harrier) and (Speckled padloper) that is regarded as Vulnerable in terms of TOPS 2015 list.	Severity	5	2
Although no sensitive mammal species are listed for the prospecting area the area is included in the Namaqualand Centre of Endemism as the prospecting area also form part of the distribution area of the endemic mole rat that cover most of Namaqualand.	Spatial Scale	1	2
Regarding Flora no species listed for the project site are legally protected in terms of the (TOPS) regulations in terms of the NEMBA.	Duration	3	2
<u>Indirect impacts:</u>	Consequence	9	6
Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation.	Probability	6	2
Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.	Significance	54	12
<u>Residual impacts:</u>	Cumulative Effects	Medium	Very Low
The local fauna is familiar with the existing prospecting and mining activities on site.	Reversibility		Reversible
The project area has been heavily impacted by over grazing.	Degree to which the impact can be avoided/managed/mitigated:		Medium
<u>Mitigation</u>			
<ul style="list-style-type: none"> • Mitigation measures for soil erosion & soil compaction will also be applicable to promote natural revegetation: • The sampling sites will be informed by the findings of non- invasive prospecting and must be clearly demarcated, and no activities may take place outside of demarcated areas. • Movement of vehicles and machinery will be restricted to demarcated areas and roads with no off-road driving permitted. Vehicles speed must take into account the possibility of collisions with fauna. . • Provide all workers with environmental awareness training. 			

Site Access and Site Establishment - Potential Impacts on Aquatic biodiversity & Water Resources	Significance	Before	After
<p>No Wetlands and Estuaries are located within the prospecting area and no River FEPAs are present within the prospecting area with the Buffels River classified as a NFEPA River (FEPA 1) adjacent to the prospecting area. The entire prospecting area has however been identified as a Freshwater ecosystem priority area quinary catchment (FEPA Code 1) regarded as very high sensitivity.</p> <p>Surface and Ground water use</p> <p>Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.</p> <p>Accidental spills not cleaned up immediately.</p> <p><u>Indirect impacts:</u></p> <p>Rainfall is very seldom and evaporation rate is very high.</p> <p>Indirect impacts on surface water are very unlikely.</p> <p><u>Residual impacts:</u></p> <p>None</p>	Nature	Negative	Negative
	Severity	2	1
	Spatial Scale	1	1
	Duration	2	1
	Consequence	5	3
	Probability	2	2
	Significance	10	6
	Cumulative Effects	Insignificant	Insignificant
	Reversibility	Reversible	
	Degree to which the impact can be avoided/managed/mitigated:	High	
<p><u>Mitigation</u></p> <ul style="list-style-type: none"> • No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) without the necessary permission. Potable and process water to be obtained from legal source and brought on site. • Prevent any invasive prospecting activities within 100m from a water course. • A Water Use Authorisation (License or GA) in terms of Sec 21 of the NWA for Impeding or diverting the flow of water in a watercourse (Sec 21c) and Altering the Bed, Banks, Course or Characteristics of a Watercourse (Sec 21i) is required for sampling within, or within 500m of FEPA rivers. A Water Use Authorisation in terms of Sec 21(a) is also required for abstracting groundwater. • Provide mobile ablution facilities and take care that temporary onsite sanitation facilities are well maintained and serviced regularly. • Draw-up and strictly enforce procedures for the storage, handling and transport of different hazardous materials and ensure that good housekeeping rules are applied. • Ensure vehicles and equipment are in good working order and drivers and operators are properly trained. Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only. • Minimise storage of hazardous substances onsite during construction. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling. • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled. • Storm water diversion and erosion control contour berms will separate clean and contaminated water systems around the pit and infrastructure areas. • Slow storm water runoff with contoured, low-gradient drains and channels and although erosion and runoff are natural processes it should be managed by maintaining maximum existing vegetation coverage. 			
Site Access and Site Establishment - Potential Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	Significance	Before	After
<p>Caused by machinery, topsoil stockpiles, cleared areas, and movement of trucks on site during preparation of site establishment.</p> <p>Noise and dust will be created by mining equipment (e.g. front-end loaders) and vehicles,</p> <p><u>Indirect impacts:</u></p> <p>The site is flat, with views obstructed by low level vegetation in most places, effectively screening the interspersed sampling pits or trenches.</p> <p>Carbon emissions from vehicle exhausts have a negative impact on the ozone layer.</p> <p>Local residents along the access tracks and roads would be impacted on by noise, dust and vehicle emissions during the construction activities.</p> <p>Increase in Greenhouse Gas Emissions from vehicles.</p> <p><u>Residual impacts:</u></p> <p>Good housekeeping will ensure a neat and well-maintained construction area reducing visual impact.</p> <p>Carbon emissions have impact on climate change.</p>	Nature	Negative	Negative
	Severity	2	1
	Spatial Scale	3	1
	Duration	1	1
	Consequence	6	3
	Probability	4	2
	Significance	24	6
	Cumulative Effects	Low	Insignificant
	Reversibility	Reversible	
	Degree to which the impact can be avoided/managed/mitigated:	High	

<p><u>Mitigation</u></p> <ul style="list-style-type: none"> • Separation distance of minimum 100m, but preferably 500m to be maintained between activities and inhabited dwellings and if not possible agreements with occupants needs to be put in place. • The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • The Applicant shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations and limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding “built-up” area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. • Activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. No amplified music shall be allowed on site. Engines shall be turned off when the vehicle is temporarily parked or stationery for long periods. • On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. At the prospecting area a speed limit of 40km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. The wetting of the roads helps reduce dust generation as will applying dust suppression and/or hardening compound. • Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material and incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. • Health and safety equipment is required for workers. • Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. 			
<p>Site Access and Site Establishment - Potential Impacts on Socio-economic features</p>			
<p>No sttlements will be developed that can have a negative impact regarding translocation Creation of Employment & Job Security with Local And Regional Economic Spin-Offs</p> <p><u>Indirect impacts:</u> Upskilling Local economic spin-offs through increased income earned, and through purchasing of local materials Income generation for landowners in a time of severe drought where livestock farming is not sustainable.</p> <p><u>Residual impacts:</u> The upliftment of unemployed people, with positive impact on standard of living for their families. Local and regional economic spin-offs from investment through Social Labour Plan.</p>	Significance	Before	After
	Nature	Positive	Positive
	Severity		
	Spatial Scale		
	Duration		
	Consequence		
	Probability		
	Significance		
	Cumulative Effects		
	Reversibility		
Degree to which the impact can be avoided/managed/mitigated:			
<p><u>Mitigation</u></p> <ul style="list-style-type: none"> • The same as for the operational phase below 			
<p>Site Access and Site Establishment - Potential Impacts on Paleontological, Archaeological and Cultural Heritage Resources</p>			
<p>Direct impacts to archaeological resources would occur primarily during the construction phase y (e.g. if an excavator drives beyond the demarcated area during construction).</p> <p>Impacts to graves could occur during the construction phase.</p> <p>The impact on paleontological resources are possible during all earthmoving activities.</p> <p><u>Indirect impacts:</u> Loss of archaeological resources, graves and precolonial cultural landscape The material fossil evidence of “deep time” is embedded in the creation of the sacred landscape and contributes to the “sense of place” cultural aesthetic of the region. The loss of fossils and concomitant interpreted knowledge impoverishes the tangible testimony of the prehistoric landscape and ecological context of ancient humans.</p> <p><u>Residual impacts:</u> Negative residual impact arises from the unavoidable loss of fossils of unknown significance in spite of mitigation efforts. Positive residual impact arises from the successful rescue of fossil material for posterity, resulting in material for future research, employment opportunities for budding, young researchers and enhanced insights into the prehistory of the Northern Cape.</p>	Significance	Before	After
	Nature	Negative	Negative
	Severity	5	1
	Spatial Scale	5	1
	Duration	6	1
	Consequence	16	3
	Probability	4	1
	Significance	64	3
	Cumulative Effects	Medium	Insignificant
	Reversibility		Irreversible
Degree to which the impact can be avoided/managed/mitigated:		High	

Mitigation
 The impact can be avoided by ensuring that recommendations from specialist studies listed below are implemented.

- The two possible graves and their buffers must be avoided;
- All the identified archaeological sites and their buffers must be avoided if possible;
- If avoidance of archaeological sites is not possible then they must be sampled by a qualified archaeologist under a permit issued by SAHRA;
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
- Regardless of the above archaeological opinion, all sampled sites should be carefully inspected by project staff to ensure that no heritage features are present and a fossil Chance Finds Procedure must be implemented in the event of any chance finds of fossils, and if any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted.
- Any identified heritage feature will be cordoned off with stakes and Chevron tape. All personnel including contractors involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them.
- Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.
- The best mitigating measure is to try and avoid as many archaeological sites as possible, so mitigation as described here will only be required for those sites that cannot be avoided. Management measures are also required like careful planning by the developer of the project layout. Maps should be prepared showing all areas that will require disturbance.

Operational Phase - Potential Impacts on other land uses	Significance	Before	After
No Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area identified.	Nature	Neutral	Neutral
No intersection with Environmental Management Frameworks relevant to the application	Severity		
Development incentives, restrictions, exclusions or prohibitions and their implications are not applicable to mining operations as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users.	Spatial Scale		
The impact on Civil Aviation and Defence is also not applicable to this application as no high structures will be constructed and no defence installations or test areas are present in close proximity to this project.	Duration		
<u>Indirect impacts:</u>	Consequence		
None	Probability		
<u>Residual impacts:</u>	Significance		
None	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		

Mitigation
 • None

Operational Phase - Potential Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
<p>Drylands crop production no longer takes place and the limited extent of invasive prospecting activities <1Ha the proposed prospecting activities will not lead to a loss of agricultural production.</p> <p>Potential contamination of soil from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances and accidental spills not cleaned up immediately.</p> <p>The clearing of areas for new overburden and topsoil stockpiles with movement areas will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from ongoing repeated use of access tracks.</p> <p><u>Indirect impacts:</u></p> <p>Windblown litter will cause visual blight. Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning. A lack of waste food management encourages vermin.</p> <p>Dust impacting on adjacent vegetation and causing a nuisance to workers or residents.</p> <p>Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates.</p> <p><u>Residual impacts:</u></p> <p>Recycling of waste material creates employment.</p> <p>Potential loss of invertebrates that live in the top layers of the soil.</p> <p><u>Mitigation</u></p> <p>The same mitigating measures as for Site Access and Site Establishment and topography below will be applicable as well as the following:</p> <ul style="list-style-type: none"> • Any stockpiles left or oversize boulders must be removed and used to backfill excavations and or sumps. • Waste or rock material used as refill or landscaping, crushed for other applications, or otherwise dealt with responsibly. • To ensure long-term stability, the restored topsoil cover should attempt to mimic the pre-mining distribution of soil texture and thickness. 	Nature	Negative	Negative
	Severity	4	2
	Spatial Scale	1	1
	Duration	3	1
	Consequence	8	4
	Probability	4	4
	Significance	32	16
	Cumulative Effects	Low	Very low
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		Medium
Operational Phase - Potential Impacts on topography	Significance	Before	After
<p>Change in topography due to excavations and overburden dumps if not backfilled.</p> <p>With mitigation the change in topography from prospecting activities would be slight depressions created in the landscape.</p> <p><u>Indirect impacts:</u></p> <p>None</p> <p><u>Residual impacts:</u></p> <p>Very slight visual change in landscape and topography following rehabilitation.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> • All spoils need to be returned to the trenches for backfilling. • Pit development will be the same as for trench development (Bulk Sampling), but on a much smaller scale and the dimensions provided must not be exceeded. • There will only ever be three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development and it is anticipated that no more than 10 such pits will be developed. • After results are logged the pit will be backfilled immediately for security and safety reasons before the project is moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation. 	Nature	Negative	Negative
	Severity	2	1
	Spatial Scale	1	1
	Duration	1	1
	Consequence	4	3
	Probability	6	1
	Significance	24	3
	Cumulative Effects	Very low	Insignificant
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		Medium

Operational Phase - Potential Impacts on Biodiversity, Flora & Fauna	Significance	Before	After
<p>The area where sampling will concentrate is classified as other natural areas and not listed as a CBA. Disturbance of Fauna SCC. Regarding Flora no SCC listed for the project site.</p> <p>The proposed prospecting area footprint will result in an impact on localized ecological functioning, although limited as prospecting and mining has already occurred in some places; access and haul roads exist; and the laydown area will also be on a disturbed area.</p> <p>The machinery and trucks will continue to disturb local fauna, already accustomed to the existing mining activities.</p> <p><u>Indirect impacts:</u> Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation. Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.</p> <p><u>Residual impacts:</u> The noise and vibration caused by the earthmoving equipment will disturb smaller animals (e.g., snakes). These will move away whilst operations are in progress.</p> <p><u>Mitigation</u></p> <ul style="list-style-type: none"> • Mitigation measures for soil erosion & soil compaction will also be applicable to promote natural revegetation: • The sampling sites will be informed by the findings of non- invasive prospecting and must be clearly demarcated, and no activities may take place outside of demarcated areas. • Movement of vehicles and machinery will be restricted to demarcated areas and roads with no off-road driving permitted. Vehicles speed must take into account the possibility of collisions with fauna. . • Provide all workers with environmental awareness training and ensure all workers comply with the requirements of the EMPr. • Demarcate the sections of existing tracks that may be used to access each sample pit or trench, including the area for turning circles of vehicles. • Conduct a “search and rescue” operation to identify any plants of conservation concern prior to clearing each prospecting pit (footprint of each sample pit is 88m²), no indigenous plants outside of the demarcated work areas may be damaged. • Remove alien invasive vegetation if required and ensure ongoing alien vegetation clearing in the sampling pit . • The noise and vibration caused by the earthmoving equipment will disturb mobile fauna that should move away when activities commence. Should any animals be encountered these should be relocated by a suitably trained nature conservation officer. • Demarcate areas for the sample pits and ensure that all other adjacent areas are regarded as no-go areas. • The Annual Rehabilitation plan must be implemented. 	Nature	Negative	Negative
	Severity	5	2
	Spatial Scale	1	2
	Duration	3	2
	Consequence	9	6
	Probability	6	2
	Significance	54	12
	Cumulative Effects	Medium	Very low
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		Medium
Operational Phase - Potential Impacts on Aquatic biodiversity & Water Resources	Significance	Before	After
<p>Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.</p> <p>Accidental spills not cleaned up immediately.</p> <p>There are no permanent surface water features on site that could be impacted on.</p> <p><u>Indirect impacts:</u> Rainfall is very seldom and evaporation rate is very high. Indirect impacts on surface water are very unlikely.</p> <p><u>Residual impacts:</u> None</p> <p><u>Mitigation</u> The same mitigating measures as for Site Access and Site Establishment will be applicable.</p>	Nature	Negative	Negative
	Severity	2	1
	Spatial Scale	1	1
	Duration	2	1
	Consequence	5	3
	Probability	2	2
	Significance	10	6
	Cumulative Effects	Insignificant	Insignificant
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		Medium

Operational Phase - Potential Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	Significance	Before	After
Noise and dust will be created by the prospecting and processing activities; from the mining equipment (e.g. front-end loaders) and hauling vehicles that also emit Greenhouse Gases.	Nature	Negative	Negative
<u>Indirect impacts:</u> The site is flat, with views obstructed by low level vegetation in most places, effectively screening the interspersed sampling pits or trenches. Carbon emissions from vehicle exhausts have a negative impact on the ozone layer. Residents outside the project site that reside along the hauling roads would be impacted on by noise, dust and vehicle emissions.	Severity	2	1
<u>Residual impacts:</u> Good housekeeping will ensure a neat and well-maintained construction area reducing visual impact. Dust settling on adjacent vegetation can impact on vegetative growth, which is a short-term impact until the rainfall season.	Spatial Scale	3	1
	Duration	1	1
	Consequence	6	3
	Probability	4	2
	Significance	24	6
	Cumulative Effects	Very low	Insignificant
	Reversibility		Reversible
	Degree to which the impact can be avoided/managed/mitigated:		Medium
<u>Mitigation</u> The same mitigating measures as for Site Access and Site Establishment as well as the following: • Temporarily halt material handling in windy conditions and or reduce drop height of material to a minimum. • Minimise use of reverse alarms by proper route planning • Incremental clearing of ground cover should take place to minimise exposed surfaces.			
Operational Phase - Potential Impacts on Socio-economic features	Significance	Before	After
Creation Of Employment & Job Security During Operational Phase with Local And Regional Economic Spin-Offs	Nature	Positive	Positive
<u>Indirect impacts:</u> Upskilling Local economic spin-offs through increased income earned, and through purchasing of local materials required for operational activities. Income generation for landowners in a time of severe drought where livestock farming is not sustainable.	Severity		
<u>Residual impacts:</u> The upliftment of unemployed people, with positive impact on standard of living for their families. Local and regional economic spin-offs from investment through Social Labour Plan.	Spatial Scale		
	Duration		
	Consequence		
	Probability		
	Significance		
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u> • Landowner will be updated with regard to the progress of implementing the PWP and any invasive operation and concurrent rehabilitation will be planned in consultation with landowner. • All operations will be carried out under the guidance of strong, experienced manager and ECO with proven skills in public consultation and conflict resolution. • All personnel will be made aware of the local conditions and sensitivities in the prospecting area and the requirements of the local residents. • There will be a strict requirement to treat local residents with respect and courtesy at all times.			

Operational Phase - Potential Impacts on Paleontological, Archaeological and Cultural and Heritage Resources	Significance	Before	After
Cultural and Heritage Resources	Nature	Negative	Negative
Direct impacts to archaeological resources would occur primarily during the construction phase y (e.g. if an excavator drives beyond the demarcated area during construction).	Severity	5	1
Impacts to graves could occur during the construction phase.	Spatial Scale	5	1
The impact on paleontological resources takes place during all earthmoving activities.	Duration	6	1
<u>Indirect impacts:</u>	Consequence	16	3
Loss of archaeological resources, graves and precolonial cultural landscape	Probability	4	1
The material fossil evidence of “deep time” is embedded in the creation of the sacred landscape and contributes to the “sense of place” cultural aesthetic of the region.	Significance	64	3
The loss of fossils and concomitant interpreted knowledge impoverishes the tangible testimony of the prehistoric landscape and ecological context of ancient humans.	Cumulative Effects	Medium	Insignificant
<u>Residual impacts:</u>	Reversibility		Reversible
Negative residual impact arises from the unavoidable loss of fossils of unknown significance in spite of mitigation efforts. Positive residual impact arises from the	Degree to which the impact can be avoided/managed/mitigated:		Medium
<u>Mitigation</u>			
The same mitigating measures as for Site Access and Site Establishment will be applicable.			
Decommissioning and closure - Potential Impacts on other land uses	Significance	Before	After
No Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area identified.	Nature	Neutral	Neutral
No intersection with Environmental Management Frameworks relevant to the application	Severity		
Development incentives, restrictions, exclusions or prohibitions and their implications are not applicable to mining operations as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users.	Spatial Scale		
The impact on Civil Aviation and Defence is also not applicable to this application as no high structures will be constructed and no defence installations or test areas are present in close proximity to this project.	Duration		
<u>Indirect impacts:</u>	Consequence	0	0
After closure certificate has been issued the area will once again be available for other land uses	Probability		
<u>Residual impacts:</u>	Significance	0	0
None	Cumulative Effects		
<u>Mitigation</u>	Reversibility		
• None	Degree to which the impact can be avoided/managed/mitigated:		
Decommissioning and closure - Potential Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
Implimentation of Rehabilitation, Decommissioning and Mine Closure Plan	Nature	Positive	Positive
<u>Indirect impacts:</u>	Severity		
None.	Spatial Scale		
<u>Residual impacts:</u>	Duration		
Increase in natural habitat following rehabilitation processes.	Consequence	0	0
	Probability		
	Significance	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		

<u>Mitigation</u> <ul style="list-style-type: none"> • Compacted areas that are not required for aftercare access shall be scarified. Dual use access roads must be handed back to the landowner in a good state of repair. • Implementing screening as part of the cleaning activities before materials are moved from the mine. The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. Any compacted movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled. • Redundant structures will be removed for use elsewhere or demolished and discarded. • All steel structures and reinforcing will be discarded or sold as scrap. • All equipment and other items used during the prospecting operation needs to be removed from the site. • Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA. • Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site. 				
Decommissioning and closure - Potential Impacts on topography		Significance	Before	After
Implimentation of Rehabilitation, Decommissioning and Mine Closure Plan		Nature	Positive	Positive
Indirect impacts: Historic disturbances rehabilitated		Severity		
Residual impacts: Increase in natural habitat following rehabilitation processes.		Spatial Scale		
		Duration		
		Consequence	0	0
		Probability		
		Significance	0	0
		Cumulative Effects		
		Reversibility		
		Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u> <ul style="list-style-type: none"> • All mitigation will be addressed as part of the annual rehabilitation plan as part of the operational phase. • The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Final Rehabilitation, Decommissioning and Closure Plan must be reviewed periodically for continued relevance in the light of changed prospecting path or long-term plans. 				
Decommissioning and closure - Potential Impacts on Biodiversity, Flora & Fauna		Significance	Before	After
Implimentation of Rehabilitation, Decommissioning and Mine Closure Plan		Nature	Positive	Positive
Indirect impacts: Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.		Severity		
Residual impacts: Increase in natural habitat following rehabilitation processes.		Spatial Scale		
		Duration		
		Consequence	0	0
		Probability		
		Significance	0	0
		Cumulative Effects		
		Reversibility		
		Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u> <ul style="list-style-type: none"> • All outstanding rehabilitation not completed as part of the Annual Rehabilitation plan needs to be completed as part of the final Rehabilitation, Decommissioning and Mine Closure Plan 				

Decommissioning and closure - Potential Impacts on Aquatic biodiversity & Water Resources	Significance	Before	After
None during decommissioning activities	Nature	Neutral	Neutral
<u>Indirect impacts:</u>	Severity		
None	Spatial Scale		
<u>Residual impacts:</u>	Duration		
None	Consequence	0	0
	Probability		
	Significance	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u>			
None			
Decommissioning and closure - Potential Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	Significance	Before	After
None during decommissioning activities or less than for operational phase	Nature	Neutral	Neutral
<u>Indirect impacts:</u>	Severity		
None	Spatial Scale		
<u>Residual impacts:</u>	Duration		
None	Consequence	0	0
	Probability		
	Significance	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u>			
None			
Decommissioning and closure - Potential Impacts on Socio-economic features	Significance	Before	After
Staff losing their jobs	Nature	Negative	Negative
Contractual agreements with service providers surpassing mine closure date	Severity	4	4
Poorly defined transition from mining to farming activities within different legislation	Spatial Scale	3	3
Not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management system.	Duration	3	3
Insufficient funds for complete rehabilitation	Consequence	10	10
<u>Indirect impacts:</u>	Probability	3	3
Job losses of secondary industries, businesses and contractors	Significance	30	30
Mine closure stalled due to non-compliance with South African legislation (national, provincial and local)	Cumulative Effects	Low	Low
<u>Residual impacts:</u>	Reversibility		Irreversible
Closure standards not accepted and/or are changing Mine closure being jeopardised by other land uses	Degree to which the impact can be avoided/managed/mitigated:		Medium

<u>Mitigation</u>				
<ul style="list-style-type: none"> • Contract durations with service providers will be limited to address the risk of contractual agreements with service providers surpassing the mine closure date. • Maintain positive and transparent relationships with stakeholders and maintaining communication channels. • Undertaking environmental management in accordance with the approved EMPr and Closure Plan. 				
Decommissioning and closure - Potential Impacts on Paleontological, Archaeological and Cultural and Heritage Resources		Significance	Before	After
None during decommissioning activities or less than for operational phase		Nature	Neutral	Neutral
<u>Indirect impacts:</u>		Severity		
None		Spatial Scale		
<u>Residual impacts:</u>		Duration		
None		Consequence	0	0
		Probability		
		Significance	0	0
		Cumulative Effects		
		Reversibility		
		Degree to which the impact can be avoided/managed/mitigated:		
<u>Mitigation</u>				
None				

14 Environmental impact statement

14.1 Summary of the key findings of the environmental impact assessment

The majority of the prospecting activities are non-invasive and hence will have no environmental or social impact. The invasive activities will only entail sampling by means of small prospecting pits or drilling which will have a minimal environmental and social impact. The total anticipated area for disturbance is anticipated at less than 1Ha which need to be viewed in the context of the entire prospecting area under application which covers 7643.76Ha. The assessed impact ratings after implementation of the mitigation measures described above are as follows:

Site Access and Site Establishment

- Change in Topography: - insignificant
- Contamination and disturbance of soil, Soil erosion & Soil compaction: - low significant reducing to insignificant;
- Surface- and Ground water use and contamination: - insignificance;
- Wildlife and Vegetation - medium significance, reducing to very low significance
- Dust fall nuisance, visual intrusion & noise generation – very low significance, reducing to insignificant
- Cultural and heritage resources - medium significance, reducing to in significance;
- Socio - economic impact – positive impact.

Operational Phase

- Change in Topography – very low significance, reducing to insignificant
- Contamination and disturbance of soil, Soil erosion & Soil compaction: - low significance, reducing to very low significant;
- Surface- and Ground water use and contamination: - insignificant;
- Wildlife and Vegetation - medium significance, reducing to very low significant;
- Dust fall nuisance, visual intrusion & noise generation – very low significance, reducing to insignificant
- Cultural and heritage resources – medium significant to insignificant;
- Socio - economic impact – positive impact.

Decommissioning Phase

- Change in Topography – positive impact.
- Contamination and disturbance of soil, Soil erosion & Soil compaction – positive impact.;
- Socio - economic impact – medium significant and even with mitigation, the impact will remain one of medium significance due to the impact off job losses.

All of the identified impacts will occur for a limited period and the extent of the impacts will be localised. All of the identified impacts can be suitably mitigated with the residual impact ratings being of insignificant.

The conservation status of the vegetation types in the area is regarded as “Least Threatened”; and no threatened ecosystems are present (Refer section 8.2.6).

The main impacts associated with the sampling activities (site disturbance) can be suitable mitigated. After sampling activities have been completed and the excavations backfilled and rehabilitated to preprospecting status, the impacts will cease to exist

14.2 Final Site Map

Please refer to **Figure 1 to 14** for the Environmental Sensitivities Map

14.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

14.3.1 Positive Impacts

This application is for prospecting activities. Should favourable results be obtained from exploration, and it is believed that mining will be economically viable; such mining would contribute to one of the main employment sectors of the Local Municipality. The prospecting activities themselves would not directly lead to job opportunities.

14.3.2 Negative Impacts

- Surface water and groundwater contamination from hydrocarbons during the construction/set-up and operational activities which include earth moving equipment operation and use of vehicles on site; and
- Wildlife and vegetation disturbance from sample site preparation during the construction / set-up and operational phase as contractors rehabilitate one site and move to the next site and prepare it;
- Dust fall & nuisance from construction / excavations, Visual intrusion caused by the excavation activities in the largely rural setting and Noise Generation from construction / set-up and operational activities of sampling;
- Socio-Economic impact due to conflicting land uses during the construction / set-up and operational phase.

14.4 Proposed impact management objectives and the impact management outcomes

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management and closure plan that is effective and practical for implementation.
- Through the implementation of the proposed mitigation measures it is anticipated that the identified social & environmental impacts can be managed and mitigated effectively.
- Surface water and groundwater contamination by hydrocarbons can be managed by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site where prospecting activities are in progress;
- Wildlife disturbance and clearance of vegetation at sample areas will be limited to the absolute minimum required and disturbed areas will be prepared to facilitate natural revegetation with locally indigenous species as soon as possible;
- Dust fall can be managed by reducing driving speeds when driving on unpaved roads;
- Visual intrusion can be managed through consultation with landowners /stakeholders;
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary;
- Through the implementation of the mitigation and management measures it is expected that: Heritage/cultural resources can be managed by avoidance of known resources and through consultation with landowners/stakeholders. Contractor personnel will also be briefed of these sensitivities and consequences of any damage/removal of such features;
- Socio - economic impact can be managed by employing strong, experienced personnel with proven skills in public consultation and conflict resolution during stakeholder consultation phases. All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they treat local residents with respect and courtesy at all times.

14.5 Description of any assumptions, uncertainties and gaps in knowledge.

This report has been completed to the best of the EAPs ability, based on his experience and on information currently available to the EAP as well as provided by the applicant.

Comment received on the draft BAR was reviewed and incorporated into the final BAR. As such, the public perception of the proposed activity was known. In addition, comments and inputs received from the authorities and public provided additional information which were considered.

Mitigation measures are proposed which are considered to be reasonable and must be implemented in order for the outcome of the assessment to be accurate.

The location of sample sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that sampling could occur anywhere around the anomalies identified for this programme.

In addition, landowners will be re-engaged at this stage to communicate the company's intent to progress to sampling and to discuss the proposed sampling activities and identified locations with the I&APs at that point in time.

14.6 Reasoned opinion as to whether the proposed activity should or should not be authorized

14.6.1 Reasons why the activity should be authorized or not.

It is the opinion of the EAP that the proposed prospecting activities should be authorised. In reaching this conclusion the EAP has considered that;

- Based on historical prospecting results, there is a good possibility of encountering mineral deposits in the area
- The exploration program will be developed in a stepwise manner commencing with non-invasive activities to bring refinement to understanding of the geological anomaly.
- Should the exploration program advance to include the need for sampling, the environmental impacts associated with the limited activities are deemed to be insignificant provided that the proposed mitigation is implemented;
- The spatial extent of the physical impact is less than 1Ha over a prospecting right application area of 7643 hectares;
- With appropriate care and consideration, the impacts resulting from sampling can be suitably avoided, minimised or mitigated and even reversed;
- Without implementation of prospecting activities, the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.

14.6.2 Conditions that must be included in the authorisation

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- No sampling site will be positioned within 500m of any existing structure like water intakes.
- No sampling site will be positioned within 100m of a graveyard if discovered
- No sampling site will be positioned within 100m of any drainage channel or 500m of a wetland (Estuary).
- Prospecting activities must be conducted during daylight hours to minimize exposure to light and noise pollution.
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once sample sites are known.

14.6.3 Period for which the Environmental Authorisation is required.

The authorisation is required for the duration of the prospecting right which is an initial 5 years plus a potential to extend the right by an additional 3 years. Normally there is also a time delay in the granting of applications for renewal therefore a total period of 10 years may be required.

14.6.4 Undertaking

An undertaking is provided at the end of this report.

15 Financial Provision

15.1 Legal Framework

Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations under section 44, read with sections 24 of the National Environmental Management Act, 1998 (Act No.107 of 1998) were issued in 2015.

According to the Financial Provisioning regulations, 2015 as amended regulation 7 the applicant or holder of a right or permit must ensure that the financial provision is, at any given time, equal to the sum of the actual costs of implementing the plans and report contemplated in regulation 6 and regulation 11.

In terms of regulation 11(1) the holder of a right or permit must ensure that a review is undertaken of the requirements for (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a final rehabilitation, decommissioning and mine closure plan; and (c) remediation of latent or residual environmental impacts which may become known in the future, as reflected in an environmental risk assessment report.

15.2 Calculation

Financial provision in terms of Regulation 6 of the Financial Provisioning Regulations, 2015 as amended, is covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in the final rehabilitation, decommissioning and mine closure plan attached as Annexure 1.

15.3 Explain how the aforesaid amount was derived.

According to regulation 6 an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for— (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and (c) remediation of latent or residual environmental impacts which may become known in the future, as reflected in an environmental risk assessment report (Refer Annexure 1).

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

The amount needed for the implementation of the final rehabilitation, decommissioning and closure plan will be provided to DMR in the form of a bank guarantee and the plan will be revised on an annual basis in terms of regulation 11(1) of the NEMA Financial Provisioning Regulations 2015 as amended.

Provision for implementation of annual rehabilitation plan to be provided as part of the environmental audit report in terms of Regulation 34 (1)(b) of the NEMA EIA Regulations (2014) will be provided as part of the operational budget and proof of access to the necessary fund were provided as part of the PWP together with proof of access to the necessary financial resources.

16 Specific Information required by the competent Authority

16.1 Compliance with sections 24(4)(a) and (b) of NEMA

According to the National Environmental Management Act (Act 107 of 1998), the EIA report must include the impact on:

The socio-economic conditions of any directly affected person.

A full consultation process has been implemented during the environmental authorisation process. The purpose of the consultation was to provide affected persons the opportunity to raise any potential concerns. Concerns raised has been captured and addressed within the public participation section of this report to inform the decision-making process.

As the final positioning of the sample sites cannot be confirmed without completion of phase 1 of the prospecting work programme, a recommendation has been made to ensure that the directly affected landowners are re-consulted at least 1 month prior to any site activities being undertaken once sample sites are known. The purpose of the re-consultation is to allow for socio-economic impacts on directly affected persons to be raised and where possible addressed.

Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

A Phase 1 HIA and desktop PIA will be conducted by a suitably qualified specialist in order to identify any sensitive areas and resources of significance to be avoided when planning the sampling areas. All mitigating measures proposed in the specialist study will be included as part of the EMPr.

16.2 Other matters required in terms of sections 24(4)(a) and (b) of the Act.

A motivation for not investigating reasonable and feasible alternatives is provided in Section 8 above. The prospecting location has been informed by historical prospecting and production records for the area. The proposed prospecting activities requested as part of this authorisation is the only current viable manner in which a mineral resource can be evaluated to determine its economic viability.

17 Environmental Management Program

17.1 Details of the EAP,

This has already been covered. Refer Section 1 of this document

17.2 Description of the Aspects of the Activity

This has already been covered. Refer Section 3 of this document

17.3 Composite Map

This has already been covered. Refer Figure 1 & 2.

17.4 Description of Impact management objectives including management statements

The main management objectives for the invasive sampling activities are:

- Avoid potential impacts by positioning the sampling sites in a manner which avoids /minimise potential impacts. This can be achieved by implementing appropriate buffer zones;
- Reduce impacts through implementing realistic operational management measures such as imposing restrictions on the time of day when activities can take place and adherence to the site EMPr; and
- Ensure that chemical and hydrocarbon spillages are avoided, where they cannot all together be avoided minimised and mitigated.
- Establish appropriate waste management system

- Restore the physical impact of excavations through implementation of concurrent rehabilitation as and when sampling at one site is completed.

17.5 Determination of closure objectives.

- Objective 1 - To create a safe and healthy post-mining environment with no residual environmental impact.
 - Safe mining area
 - Limited residual environmental impact
- Objective 2 - To create a stable, tree draining post mining landform, which is compatible with the surrounding landscape and which is capable of a productive land use that achieves a land capability equal to that of pre-prospecting conditions
 - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
- Objective 3 – To provide optimal post-mining social opportunities
 - Optimised benefits for the social environment
 - Minimal negative aesthetic impact

17.6 Volumes and rate of water use required for the operation.

No water will be required during this prospecting operation as no processing will take place on site. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998).

17.7 Has a water use license has been applied for?

NA refer above. The department responsible for water resources shall be consulted with regards to any water related concerns.

17.8 Impacts to be mitigated in their respective phases

Table 10: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES Refer Table 8 for complete EIA with mitigation measures	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Non-invasive activities	Pre-Construction	1182Ha	<ul style="list-style-type: none"> • All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution, including environmental coordinator where applicable. • All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area. • There will be a strict requirement to treat local residents with respect and courtesy at all times. 	Environmental Awareness Plan	Before and during prospecting activities
Site Access - Access Roads (temporary, jeep track roads less than 4m wide)	Construction	±950m	<ul style="list-style-type: none"> • Existing farm roads and tracks must be used as far as possible; • Where new access tracks are required, such tracks must be scarified during decommissioning; • Vehicle's speed must take into account the possibility of collisions with fauna. • All compacted areas will be scarified and any topsoil stockpiled to be spread over the disturbed area. 	Approved PWP Environmental Authorisation; NEMA Sec 2 Principles.	Upon cessation of the individual activity
Site establishment: - Demarcation of footprint for prospecting pits and overburden and topsoil dumps - Placement of temporary portable toilets and resting place.	Construction	160m ² per sample site Max ±1 600m ² including equipment laydown area & Sanitation requirements	<ul style="list-style-type: none"> • Avoid cultural/heritage impacts by maintaining 100m buffer from any identified heritage feature and demarcation. • Any buried artefacts that may be uncovered during site activities will require such activities to stop to assess their significance and determine appropriate mitigation measures • The minimal area required for site establishment must be provided. • The soil disturbance and clearance of vegetation for movement areas will be limited to the absolute minimum required and will not be dozed or scraped with vegetation roots left intact for later re-growth. 	Heritage Act Environmental Authorisation; NEMA Sec 2 Principles	Before and during drilling activities Upon cessation of the individual activity

<p>Exploration: - Prospecting pits - Equipment maintenance & refuelling - Vehicle movements - Waste generation & management</p>	<p>Operational phase</p>	<p>Estimated 10 pits 370m³ Hydrocarbon storage <30m³</p>	<ul style="list-style-type: none"> • Equipment and other visually prominent items on the site will be located in consultation with the landowner; • Make use of existing vegetation as far as possible to screen the prospecting operations from view; and • Low vehicle speeds will be enforced on unpaved surfaces. • Maintain a buffer of 100m between sampling sites and dwellings. • Storm water must be diverted around the excavation and stockpiles to prevent erosion, if necessary. • Oils and lubricants must be stored within sealed containment structures. • Fuel storage must be contained in mobile bowzers. • All chemicals and hydrocarbons shall be stored within 110% bund wall capacity. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • Refuelling will be done with care to minimise the chance of spillages. • A spill kit will be available on each site where prospecting activities are in progress; and any spillages will be cleaned up immediately. • Underneath equipment with potential oil spillages shall be lined with plastic liner to prevent soil and water contamination. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Avoid hydrocarbon spills by employing proper vehicle maintenance. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling. • Due to the remote location of the site, dust emissions are unlikely to be a source of nuisance; however, the site must be wetted if required. • Rehabilitation, backfilling and preparation for re-vegetation must be done as soon as work is completed and before moving to the next sample site. • The disturbed overburden and topsoil dumpsite and movement areas should be rehabilitated by scarifying compacted areas. • Any stored topsoil should be spread over the scarified surface to promote re-vegetation and prevent soil erosion. 	<p>SANS 10103 guideline GN R. 827 (NEM: AQA) GN R. 704 (NWA) NEMA</p>	<p>Upon cessation of the individual activity Immediately in case of spills</p>
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<p>Final Rehabilitation and removal of temporary infrastructure</p>	<p>Decommissioning</p>	<p><1Ha</p>	<ul style="list-style-type: none"> • Dual use access roads must be handed back to the landowner in a good state of repair. • A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan. • All fixed assets that can be profitably removed will be removed for salvage or resale. • All redundant infrastructure and services need to be demolished including ruins, buildings, foundations, footings. • Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in closure cost estimation) and the remaining treated as waste and removed from site. • Redundant structures, buildings and civil foundations (down to 500mm below surface for subsurface infrastructure) will be removed for use elsewhere or demolished and discarded. • Inert waste, which is more than 500 mm underground, such as pipes, will be left in place • All services related to the mining operation, water supply lines and storage on site will have to be demolished. • All redundant power lines and cable associated with electrical supply will be removed. • Implementing screening as part of the cleaning activities before materials are moved from the mine. • The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. • The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled. • Excavations created by removing subsurface infrastructure needs to be filled, levelled and compacted. • Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site. 	<p>Environmental Authorisation; NEMA Section 2 Principles</p>	<p>Final decommissioning</p>
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17.9 Impact Management Outcomes

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	STANDARD TO BE ACHIEVED
General prospecting	Conflict with other land users	Social	Life of operation	Control through monitoring & management	Impact minimised and mitigated.
Site Access	Disturbance of onsite flora and fauna	Fauna and Flora	Construction	Remedy through restriction and rehabilitation	Impact minimised and mitigated.
	Soil compaction from repeated use of access road	Soil resources		Remedy through rehabilitation	
Site Establishment Sampling and laydown area Vegetation clearance	Disturbance of onsite flora and fauna	Fauna and Flora	Construction	Remedy through restriction and rehabilitation	Impact mitigated end use objectives
	Noise Generation	Noise		Control through monitoring & management	Impact mitigated
	Visual intrusion	Visual			Impact mitigated
Site Establishment Sampling and laydown area Topsoil stripping & stockpiling Compaction due to overburden dumps and vehicle movement	Destruction or loss of Cultural and Heritage Resources	Cultural and Heritage	Construction	Avoidance by relocation of activity	Impact avoided
	Soil disturbance and compaction and topsoil stockpiling	Soil		Remedy through restriction and rehabilitation	Impact mitigated end use objectives
	Noise Generation	Noise		Control through monitoring & management	Impact mitigated
	Dust fall & nuisance from activities	Air quality			Impact mitigated
Erection of temporary structures such as toilets, fuel tanker, water tanker	Visual intrusion	Visual	Construction	Remedy through restriction and rehabilitation	Impact mitigated end use objectives

Sample collection & storage	Vehicle and equipment noise disturbing on-site flora and fauna	Noise	Operational	Control through management and monitoring	Impact mitigated
	Dust emissions from excavations and general site activities (vehicle entrained dust)	Air quality		Control through management and monitoring	Impact mitigated
Equipment maintenance & refuelling Waste generation & management facilities	Surface and ground water contamination From hydrocarbons	Soil and water		Avoidance through management and monitoring	Impact avoided
Removal of temporary infrastructure and site rehabilitation	Dust emissions (vehicle entrained dust)	Air quality	Decommissioning	Control through management and monitoring	Impact mitigated
	Erosion due to slow recovery of vegetation	Soil and vegetation		Remedy through restriction and rehabilitation	Impact mitigated

17.10 Impact Management Actions

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

ACTIVITY whether listed or not	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
General prospecting	<ul style="list-style-type: none"> • Conflict with other land users 	Control through monitoring & management	Concurrently with prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Site Access	<ul style="list-style-type: none"> • Disturbance of onsite flora and fauna • Soil compaction from repeated use of access road to sample sites 	Remedy through restriction and rehabilitation	Immediately on cessation of activities.	
Site Establishment Excavations and laydown area Vegetation clearance	<ul style="list-style-type: none"> • Disturbance of onsite flora and fauna • Noise Generation • Visual intrusion 	Remedy through restriction and rehabilitation Control through monitoring & management	Concurrently with prospecting activities as far as possible, otherwise immediately on cessation of activities.	
Site Establishment Excavations and laydown area Topsoil stripping & stockpiling Compaction due to levelling and vehicle movement	<ul style="list-style-type: none"> • Destruction or loss of Cultural and Heritage Resources • Soil disturbance and compaction and topsoil stockpiling • Noise Generation • Dust fall & nuisance from activities 	Avoidance by relocation of activity Remedy through restriction and rehabilitation Control through monitoring & management		
Erection of temporary structures such as toilets, fuel tanker, water tanker	<ul style="list-style-type: none"> • Visual intrusion 	Remedy through restriction and rehabilitation	Immediately on cessation of activities.	

Sample collection & storage	<ul style="list-style-type: none"> • Vehicle and equipment noise disturbing on-site flora and fauna • Dust emissions from excavations and general site activities (vehicle entrained dust) 	Control through management and monitoring	Concurrently with prospecting activities as far as possible, otherwise immediately on cessation of activities.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Equipment maintenance & refuelling Waste generation & management facilities	<ul style="list-style-type: none"> • Soil, surface and ground water contamination From hydrocarbons 	Avoidance through management and monitoring		
Removal of temporary infrastructure and site rehabilitation	<ul style="list-style-type: none"> • Dust emissions (vehicle entrained dust) • Erosion due to slow recovery of vegetation 	Control through management and monitoring Remedy through restriction and rehabilitation		

18 Financial Provision

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

- Objective 1 - To create a safe and healthy post-mining environment
 - Safe mining area
 - Maintain affected environment in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.
 - No potentially dangerous areas; secured if required
 - Limited residual environmental impact
 - No surface and/or groundwater contamination
 - Waste management practices not creating or leaving legacies
 - Develop a landscape that reduces the requirement for long term monitoring and management
- Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape
 - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
 - Improve Land use with an increased production with regard to grazing.
 - Minimise disturbance of ecology due to loss of habitat and noise/visual/dust
 - Minimise risk of erosion from either increased base flow or prospecting operations:
 - Management of air emissions to minimise nuisance effects; implementation of dust suppression activities.
 - Increase of land with agricultural potential: backfilling, profiling and sloping of remaining excavations and ripping of all compacted areas to facilitate recovery of natural vegetation through colonization by dispersing species (patch dynamics)
 - Prevent long term changes in land use: revert back to mainly stock farming (grazing).
 - Prepare area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species
- Objective 3 – To provide optimal post-mining social opportunities
 - Optimised benefits for the social environment
 - Maintain positive and transparent relationships with stakeholders: maintaining communication channels to all stakeholders and forums.
 - Provide stakeholders with relevant information: making all information available to stakeholders and providing information to authorities as per legislative requirements.
 - Undertaking environmental management in accordance with the implementation, maintenance and auditing of an environmental management system.
 - Minimal negative aesthetic impact
 - Maintain affected environment in an improved state containing no foreign debris or other materials.

The legal framework within which all the above lies entails:

- Defining and meeting closure standards.
- Complying with legislation.

- Sufficient financial provision for mine closure activities.
- Monitoring and plan for latent environmental impact.

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

The closure objectives were reported in the draft BAR as well as the Final Rehabilitation, decommissioning and mine closure plan Including Environmental Risk Assessment and was made available to all registered interested and affected parties.

18.3 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

Refer Final Rehabilitation, decommissioning and mine closure plan Including Environmental Risk Assessment Annexure 1.

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

The closure objectives are to return the land disturbed by drilling activities back to its original condition taking into account the transformation due to historic large-scale mining in the area. The rehabilitation plan provides the detail on how this will be achieved. Through experience, it can be confirmed that effective rehabilitation of drill sites is possible and achievable with the rehabilitation plan set out in Annexure 1.

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

As per Paragraph 15 of this report and Annexure 1.

18.6 Confirm that the financial provision will be provided as determined.

As per Paragraph 15 of this report and Annexure 1.

18.7 Mechanisms for monitoring compliance with and performance assessment against the environmental management program and reporting thereon, including

- i) Monitoring of Impact Management Actions
- ii) Monitoring and reporting frequency
- iii) Responsible persons
- iv) Time period for implementing impact management actions
- v) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All Prospecting Activities	N/A	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme	Site Manager and Geologist	Annual Submit a prospecting progress report to DMR
	All commitments contained in the BA Report and accompanying EMPr	Ensure commitments made within the approved BAR and EMPr are being adhered to.	Site Manager and independent EAP	Annual Undertake and submit an environmental performance audit to DMR
Site establishment	Visual inspection of soil erosion and/or compaction	All exposed areas, access roads, the excavation site and soil stockpiles must be monitored for erosion on a regular basis and specifically after rain events.	Site Manager Contractor (or sub-contractors)	Weekly, and after rain events (only during invasive activities) Weekly monitoring reports to be signed-off by the Site Manager Corrective action to be confirmed and signed-off by the Site Manager Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted to the Site Manager.
Sampling Activities	Visual inspection of biodiversity impacts	Visual inspection of site activities and other possible secondary impacts <ul style="list-style-type: none"> • Ensure that the fire brake is maintained. • Rehabilitation of drill pads • Records of water intersections on borehole logs • Monitor groundwater quality and level within 500m from a drill site (If any). • Control and minimise the development of new access tracks • Appropriate storage and handling of topsoil 		

<p>Sampling Activities</p>	<p>Visual inspection of pollution incidents, the integrity of secondary containment structures and waste management Housekeeping & maintenance</p>	<ul style="list-style-type: none"> • All secondary containment structure will be inspected on a daily basis to confirm the integrity thereof and to identify potential leaks timeously. • All spill incidents will be reported and corrective action taken in accordance with an established spill response procedure. • Standard waste management practices must be implemented to prevent contamination and littering. 	<p>Site Manager Contractor (or sub-contractors)</p>	<p>Weekly monitoring reports to be signed-off by the Site Manager Corrective action to be confirmed and signed-off by the PSM Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted Report incidents in terms of the relevant legislation, including the MPRDA, NWA and NEMA.</p>
<p>Post Prospecting Post Closure</p>	<p>Groundwater Revegetation Stability Soil erosion Alien invasive species</p>	<p>Inspection of all rehabilitated areas to assess whether soil erosion is occurring and to implement corrective action where required.</p> <ul style="list-style-type: none"> • Identify any areas of subsidence around drill holes and under take additional backfilling if required. 	<p>Site Manager</p>	<p>Final Closure A final audit report for site closure must be submitted by the DMR for approval</p>

18.8 Indicate the frequency of the submission of the performance assessment/ environmental audit report.

An external environmental performance audit shall be conducted annually by an independent environmental assessment practitioner that include an annual rehabilitation plan for implementation during the next reporting period. A review of the Final decommissioning, rehabilitation and mine closure Plan will also be done on an annual basis together with an update of the quantum calculations for financial provision for rehabilitation.

19 Environmental Awareness Plan

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

Training is part of its Induction process and environmental Management System (EMS). The induction includes:

- Awareness training for contractors and employees;
- Job specific training – training for personnel performing tasks which could cause
- potentially significant environmental impacts;
- EMS training;
- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills; and
- Training verification and record keeping

Before commencement of the prospecting activities all employees and contractors who are involved with such activities should attend relevant induction and training. It is standard practice for employees and the employees of contractors that will be working on a new project or at a new site to attend an induction course where the nature and characteristics of the project and the site are explained.

The training course should include key information abstracted from the EMP pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors' and personnel.

The full EMP document is also made available to attendees.

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

Environmental risks and how to manage them are dealt with in the induction course referred to in section (m) (i) above. If an incident of environmental pollution or damage does occur it is analysed and appropriate prevention and/or mitigation measures are developed. These measures are added to the EMP and conveyed to the relevant personnel.

All unplanned incidents with the potential to cause pollution or environmental degradation or conflict with local residents will be reported to the Mineral Resources Manager within 24 hours.

Hydrocarbon Spills

Hydrocarbon spills that are considered to be emergency incidents are large-scale spills (cover a surface area >1m²), resulting from situations such as; a leaking diesel bowser, an oil drum that is knocked over, large spillages from equipment, etc.

Activities that are involved in the clean-up of such instances include:

- The containment of the spill,
- The removal of all contaminated material, and
- The disposal (at a licenced hazardous disposal facility) or bioremediation (at a licenced facility) of this material.

Fire

There is the potential for fire to occur in the following locations of the drill site:

- Veld fires across vegetated areas; and
- Vehicles and equipment.

Veld fires: Any person who observes the fire must report it to the fire brigade immediately and then to their supervisor. If possible, additional personnel may be sent to contain the fire, but only if the lives of the personnel will not be endangered.

Vehicles and Equipment: Fire extinguishers will be available at the site where drilling activities will take place and in the vehicles. All staff members will be trained in the use of fire-fighting equipment.

19.3 Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

Not applicable at this stage

20 Undertaking

The EAP herewith confirms

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

Signature of the environmental assessment practitioner:



N.J. van Zyl
Reg. EAP (EAPASA 2019/2034)
October 2023

-END-

Annexure 1: Final Rehabilitation, decommissioning and mine closure plan

Including Environmental Risk Assessment and quantum calculations

Annexure 2: PPP summary (only with Final BAR)

Annexure 3a: HIA (only with Final BAR)

Annexure 3b: PIA (only with Final BAR)